



**FCC 47 CFR PART 15 SUBPART C
ISED CANADA RSS-247 ISSUE 2
ISED CANADA RSS-GEN ISSUE 4**

CERTIFICATION TEST REPORT

FOR

WIRELESS MODULE

MODEL NUMBER: 424821

FCC ID: A94424821

IC: 3232A-424821

REPORT NUMBER: R12053557-E13

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**Prepared for
BOSE CORPORATION
100 THE MOUNTAIN ROAD
FRAMINGHAM, MA 01701, USA**

**Prepared by
UL LLC
12 LABORATORY DR.
RESEARCH TRIANGLE PARK, NC 27709 USA
TEL: (919) 549-1400**



Revision History

<u>Ver.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
1	2018-05-17	Initial Issue	Brian T. Kiewra
2	2018-05-23	Added KDB662911 D01 v02r01 and KDB644545 D03 references to Section 2 Added 'ac' to Section 5.1. Revised power table in Section 5.2 to include ISED EIRP for 5.2 band. Added references to monitor and headphones and MIMO/802.11vHT20/40 statements in Section 5.5. Added calibration note to Section 6.	Brian T. Kiewra
3	2018-05-31	Simultaneous Transmission statement added to Section 5.5.	Brian T. Kiewra
4	2018-06-06	Revised MIMO statement in Section 5.5 to include why MIMO covers SISO. Revised antenna description in Section 5.3.	Brian T. Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Bose Corporation
100 The Mountain
Framingham, MA 01701, USA

EUT DESCRIPTION: Wireless Module

MODEL: 424821

SERIAL NUMBER: Radiated: 0122, 0180; Conducted: 0199

DATE TESTED: 2018-03-15 to 2018-05-08

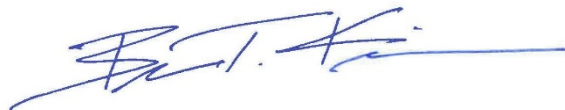
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	Compliant
ISED CANADA RSS-247 Issue 2	Compliant
ISED CANADA RSS-GEN Issue 4	Compliant

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Approved & Released
For UL LLC By:

Prepared By:



Jeffrey Moser
Operations Leader
UL – Consumer Technology Division

Brian T. Kiewra
Project Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10: 2013, KDB 789033 D02 v02r01, KDB662911 D01 v02r01, KDB644545 D03, RSS-GEN Issue 4, RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Drive, Suite B, Morrisville, NC 27560.

12 Laboratory Dr., RTP, NC 27709	
<input type="checkbox"/>	Chamber A
<input type="checkbox"/>	Chamber C

2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560	
<input checked="" type="checkbox"/>	Chamber NORTH
<input checked="" type="checkbox"/>	Chamber SOUTH

The onsite chambers are covered under ISED Canada company address code 2180C with site numbers 2180C -1 through 2180C-4, respectively.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://www.nist.gov/nvlap/>

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY	Required by standard
Occupied Channel Bandwidth	2.00%	±5 %
RF output power, conducted	1.3 dB	±1,5 dB
Power Spectral Density, conducted	2.47 dB	±3 dB
Unwanted Emissions, conducted	2.94 dB	±3 dB
All emissions, radiated	5.36 dB	±6 dB
Temperature	2.26 °C	±3 °C
Supply voltages	2.40%	±3 %
Time	3.39%	±5 %

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a wireless module with 802.11a/b/g/n/ac, BT, and BLE capabilities.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

FCC

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5180 - 5240	802.11a	17.42	55.21
5180 - 5240	802.11n HT20	17.25	53.09
5190 - 5230	802.11n HT40	18.21	66.22
5210	802.11ac VHT80	16.93	49.32
5260 - 5320	802.11a	17.94	62.23
5260 - 5320	802.11n HT20	17.14	51.76
5270 - 5310	802.11n HT40	18.13	65.01
5290	802.11ac VHT80	14.97	31.41
5500 - 5700	802.11a	17.16	52.00
5720 Straddle	802.11a	16.08	40.55
5500 - 5700	802.11n HT20	17.25	53.09
5720 Straddle	802.11n HT20	14.9	30.90
5510 - 5670	802.11n HT40	17.44	55.46
5710 Straddle	802.11n HT40	16.07	40.46
5530-5610	802.11ac VHT80	17.29	53.58
5690 Straddle	802.11ac VHT80	16.27	42.36
5745-5825	802.11a	16.85	48.42
5745-5825	802.11n HT20	16.89	48.87
5755-5795	802.11n HT40	17.51	56.36
5775	802.11ac VHT80	17.27	53.33

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5.2 Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)
5180 - 5240	802.11a	13.37	21.73	2.16	15.53	35.73
5180 - 5240	802.11n HT20	14.21	26.36	2.16	16.37	43.35
5190 - 5230	802.11n HT40	18.21	66.22	2.16	20.37	108.89
5210	802.11ac VHT80	16.93	49.32	2.16	19.09	81.10

5.3/5.6/5.8 Bands

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5260 - 5320	802.11a	17.94	62.23
5260 - 5320	802.11n HT20	17.14	51.76
5270 - 5310	802.11n HT40	18.13	65.01
5290	802.11ac VHT80	14.97	31.41
5500 - 5700	802.11a	17.16	52.00
5720 Straddle	802.11a	16.08	40.55
5500 - 5700	802.11n HT20	17.25	53.09
5720 Straddle	802.11n HT20	14.9	30.90
5510 - 5670	802.11n HT40	17.44	55.46
5690 Straddle	802.11n HT40	16.07	40.46
5530	802.11ac VHT80	14.23	26.49
5690 Straddle	802.11ac VHT80	16.27	42.36
5745-5825	802.11a	16.85	48.42
5745-5825	802.11n HT20	16.89	48.87
5755-5795	802.11n HT40	17.51	56.36
5775	802.11ac VHT80	17.27	53.33

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The module was tested with two different types external antennas; flexible and PCB trace antennas.

Etched PCB Antennas		
Frequency (MHz)	Antenna Gain Antenna 1 (dBi)	Antenna Gain Antenna 2 (dBi)
2.4GHz	3.34	1.61
5GHz	1.52	2.28

External Antennas			
Frequency (MHz)	Antenna Gain (dBi)	Cable Loss (dB)	Net gain (dBi)
2.4GHz	2.403	1.06	1.343
5GHz	3.994	1.83	2.164

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was PCS2.
The EUT driver software installed during testing was 2.1.2.9.
The test utility software used during testing was QRCT3 V6.1.29QPST.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions in range of 1-18GHz, EUT was set to transmit at low, a middle, and high channels. Radiated emissions <1GHz, >18GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power and PSD as worst-case scenario.

EUT was populated with headphones and monitor to maximize emissions.

MIMO and SISO power the same; therefore, MIMO testing covers SISO. Likewise, EUT was tested in CDD mode to cover SDM.

Testing in 802.11nHT20 and 802.11nHT40 modes covers 802.11acVHT20 and 802.11acVHT40.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y, and Z using both external and etched PCB antenna configurations. It was determined that Y orientation was worst-case orientation for both the PCB antenna configuration and external antenna configuration. Therefore, all final radiated testing was performed with the EUT in Y orientation for PCB antennas and external antennas.

Bandedge, power, and in some cases, PSD testing was done at both highest and lowest data rate per mode:

- 802.11a mode: 6Mbps and 54Mbps
- 802.11nHT20: MCS0 and MCS7
- 802.11nHT40: MCS0 and MCS7
- 802.11acVHT80: MCS0 and MCS9

All other testing done, based on the baseline scan, at worst-case data rates of:

- 802.11a mode: 6 Mbps
- 802.11n HT20mode: MCS0
- 802.11n HT40mode: MCS0
- 802.11acVHT80: MCS0

Simultaneous transmission of BT/2.4GHz and BT/5GHz was investigated. Device was found to still be compliant.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	T440	PC041B0G	NA
Monitor	ViewSonic	VS15562	TVT171081663	N/A
AC/DC Adaptor	Bose	S024RU1700100	344666-0020	N/A

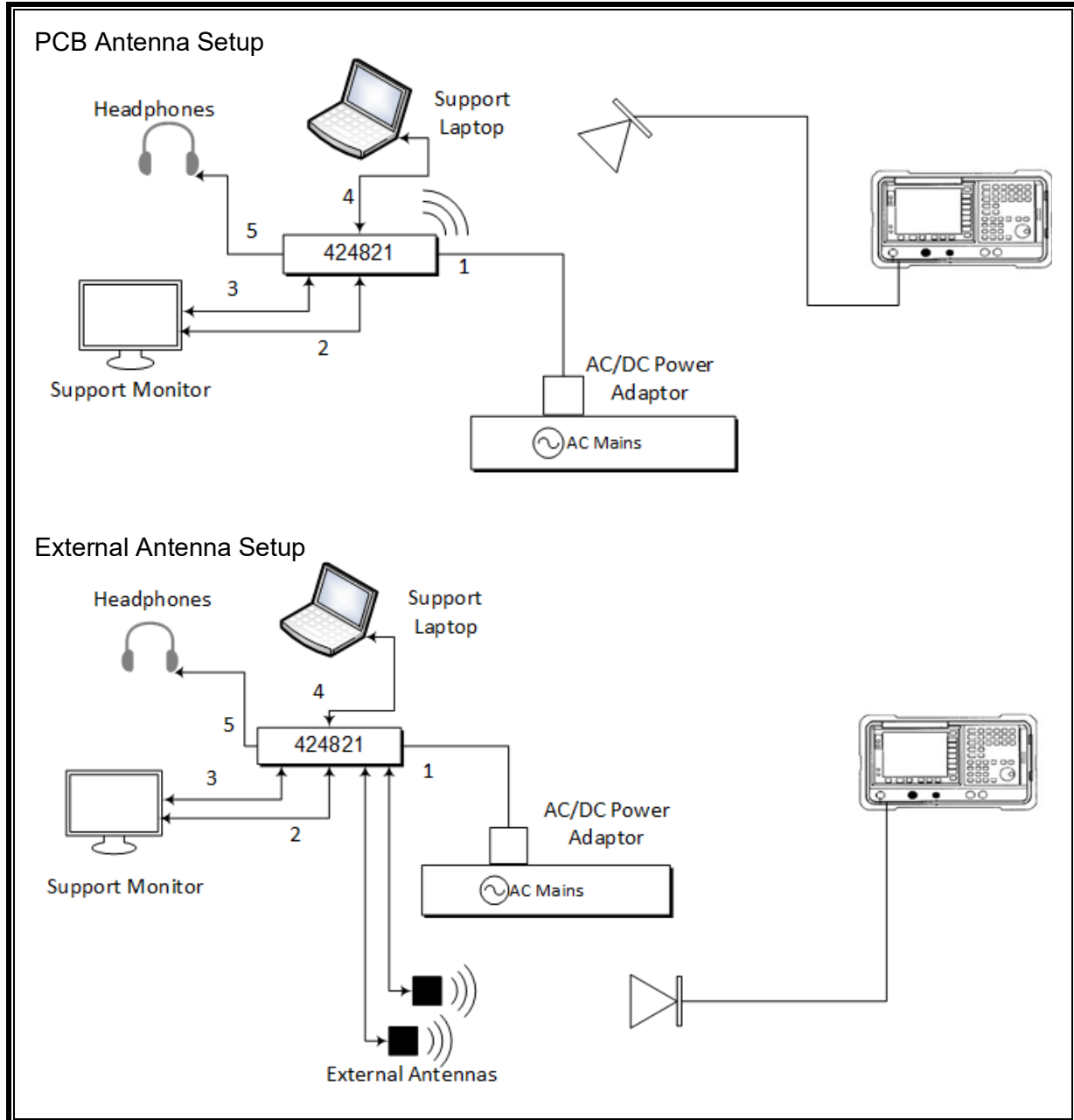
I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	AC/ DC Adaptor	DC Mains	<3m	None
2	HDMI	1	HDMI	HDMI	<3m	Connects to monitor
3	Audio	2	3.5mm plug	Audio	<3m	Connects to monitor
4	USB	1	USB	USB	<3m	Connects to Laptop
5	Audio	2	3.5mm plug	Audio	<3m	Connects to headphones

TEST SETUP

EUT installed as a standalone device.

SETUP DIAGRAM FOR TESTS



Note: Conducted setup was exactly the same, apart from the spectrum analyzer being connected directly to the antenna port.

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Note: All tests performed within equipment calibration intervals. Unless test date occurred between calibration intervals, in which case both calibrations intervals were included.

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz (Loop Ant.)					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2018-01-02	2019-01-02
30-1000 MHz					
AT0073	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2017-07-18	2018-07-31
1-18 GHz					
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-04-05	2018-04-05
AT0067	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2018-03-26	2019-03-26
18-40 GHz					
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2017-10-10	2018-10-10
AT0077	Horn Antenna, 26-40GHz	ARA	MWH-2640/B	2017-10-10	2018-10-10
Gain-Loss Chains					
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2017-09-15	2018-09-15
N-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2017-06-11	2018-06-11
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2017-08-18, 2018-03-23	2018-08-18, 2019-03-23
N-SAC04	Gain-loss string: 18-40GHz	Various	Various	2017-03-03, 2018-04-03	2018-03-31, 2019-04-03
Receiver & Software					
SA0027	Spectrum Analyzer	Agilent	N9030A	2017-03-16	2018-03-16
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 161024690	Environmental Meter	Fisher Scientific	15-077-963	2016-12-21	2018-12-21

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
1-18 GHz					
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-04-05	2018-04-05
AT0078	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2017-09-26	2018-09-26
Gain-Loss Chains					
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2017-12-31, 2018-03-20	2018-12-31, 2019-03-20
Receiver & Software					
SA0025	Spectrum Analyzer	Agilent	N9030A	2017-04-10	2018-04-30
SA0026	Spectrum Analyzer	Agilent	N9030A	2018-03-20	2019-03-20
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
Additional Equipment used					
s/n 161024887	Environmental Meter	Fisher Scientific	15-077-963	2016-12-23	2018-12-23

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 1					
72822 (SA0019)	Spectrum Analyzer	Agilent Technologies	E4446A	2017-08-21	2018-08-21
T177	Spectrum Analyzer	Agilent Technologies	E4446A	2017-03-30, 2018-04-12	2018-03-30, 2019-04-12
SA0020	Spectrum Analyzer	Agilent Technologies	E4446A	2017-08-21	2018-08-21
PWM003	RF Power Meter	Keysight Technologies	N1911A	2017-07-14	2018-07-17
PWM004	RF Power Meter	Keysight Technologies	N1911A	2017-07-17	2018-07-17
PWS003	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2017-07-14	2018-07-14
SN 161024885	Environmental Meter	Fisher Scientific	15-077-963	2016-12-23	2018-12-23

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL076	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3476-240	2017-06-12	2018-06-12
s/n 160938893	Environmental Meter	Fisher Scientific	14-650-118	2016-11-02	2018-11-02
LISN003	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2017-08-22	2018-08-22
PRE0101521 (75141)	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2017-08-23	2018-08-23
TL001	Transient Limiter, 0.009-30MHz	Com-Power	LIT-930A	2017-06-12	2018-06-12
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.

99% Occupied BW: KDB 789033 D02 v02r01, Section D.

Conducted Output Power: KDB 789033 D02 v01r01, Section E.3.b (Method PM-G).

Power Spectral Density: KDB 789033 D02 v02r01, Section F.

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.1, G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.1, G.3, G.4, and G.5.

Use of IEEE 802.11 channels that straddle the UNII-2C and UNII-3 bands at 5725 MHz: KDB 789033 D02 v02r01, Section III

AC Mains: ANSI C63.10:2013 Section 6.2

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a CDD	0.1272	0.2792	0.456	45.56%	3.41	7.862
802.11n HT20 CDD	0.1356	0.2877	0.471	47.13%	3.27	7.375
802.11n HT40 CDD	0.1239	0.2212	0.560	56.01%	2.52	8.071
802.11ac VHT80 CDD	0.1234	0.2840	0.435	43.45%	3.62	8.104

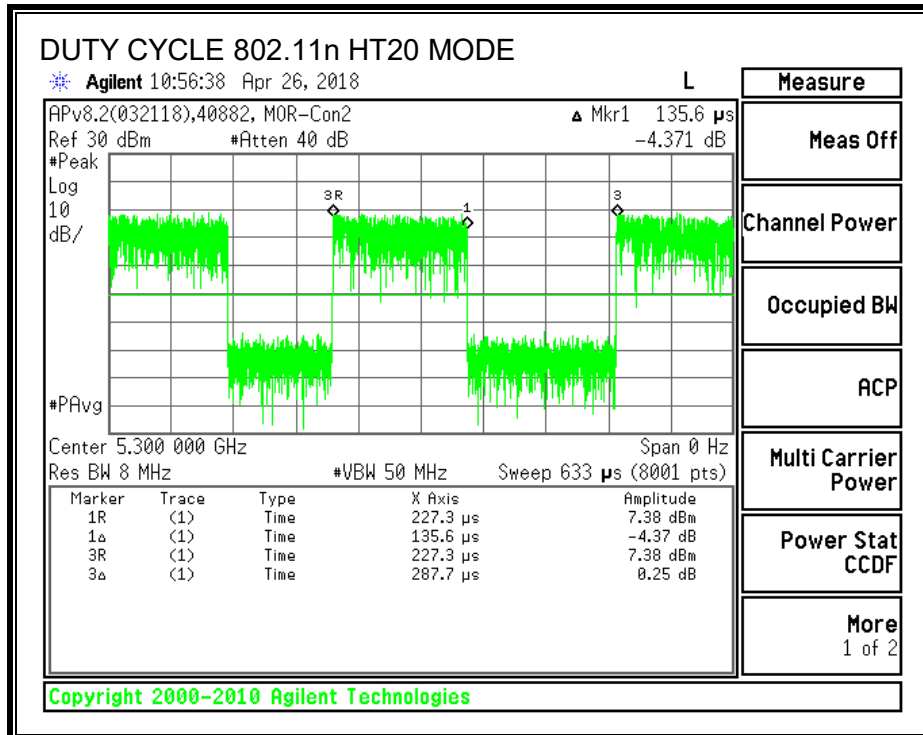
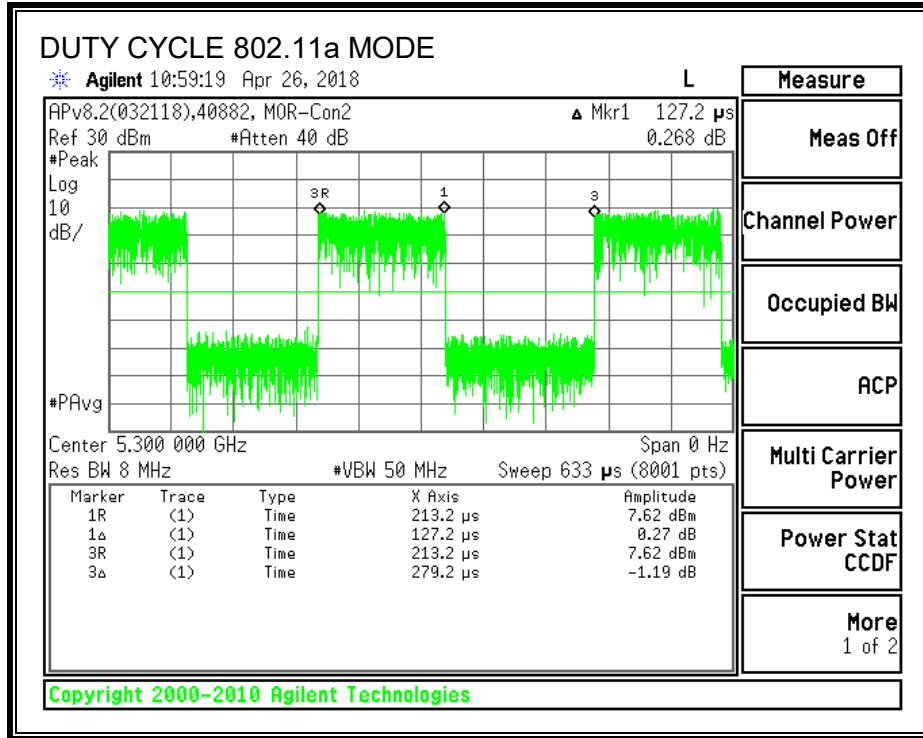
TEST INFORMATION

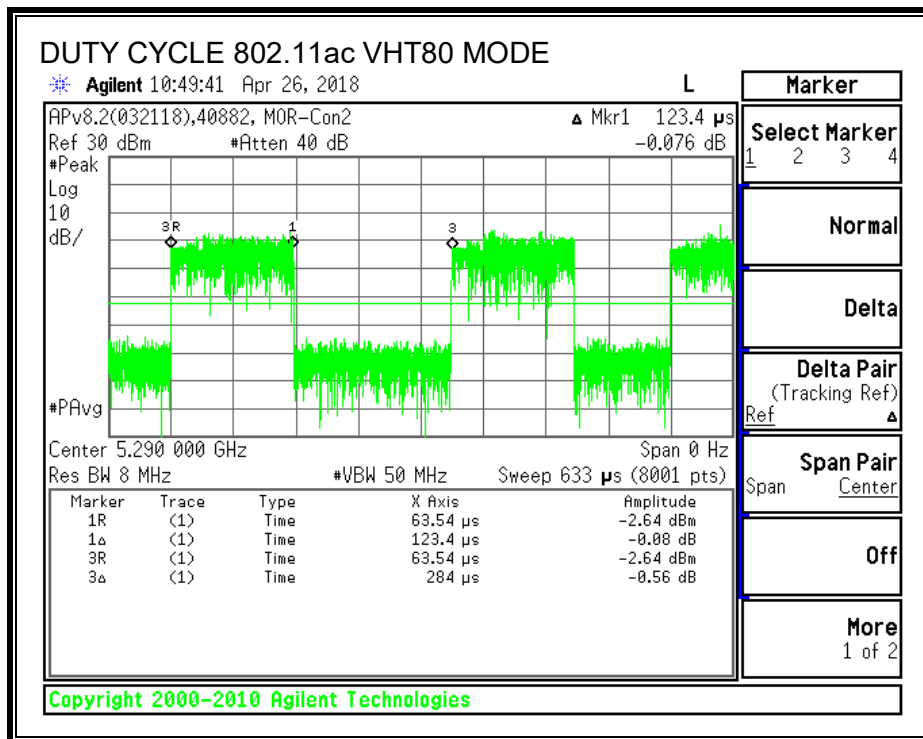
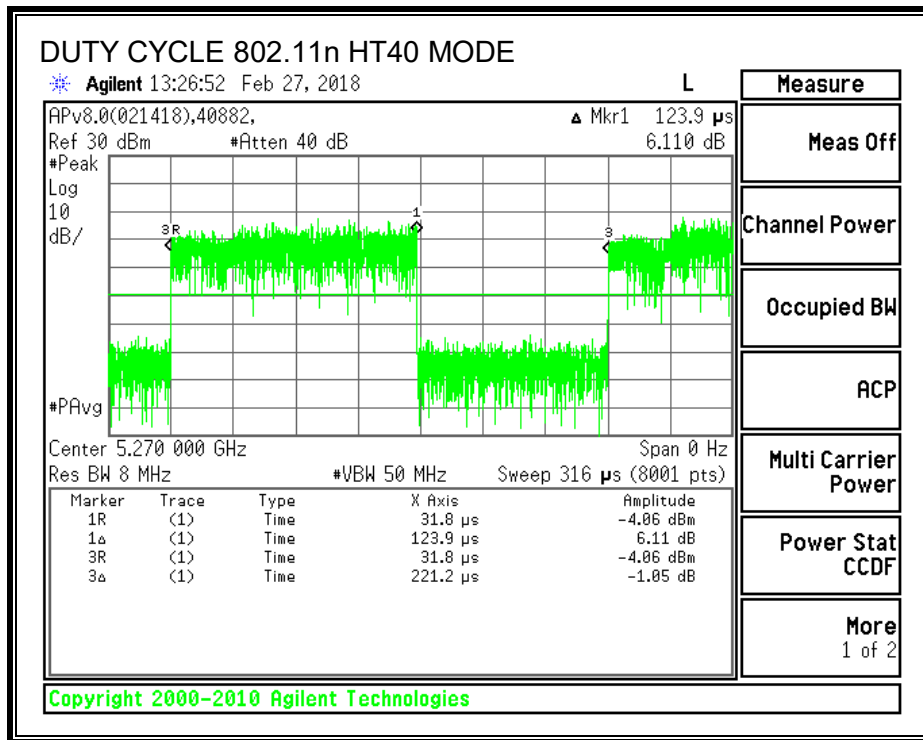
Test Date: 2018-02-27 and 2018-04-26

Project: 12053557

Tested By: 40882

DUTY CYCLE PLOTS





8.2. 802.11a MODE IN THE 5.2 GHz BAND

8.2.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

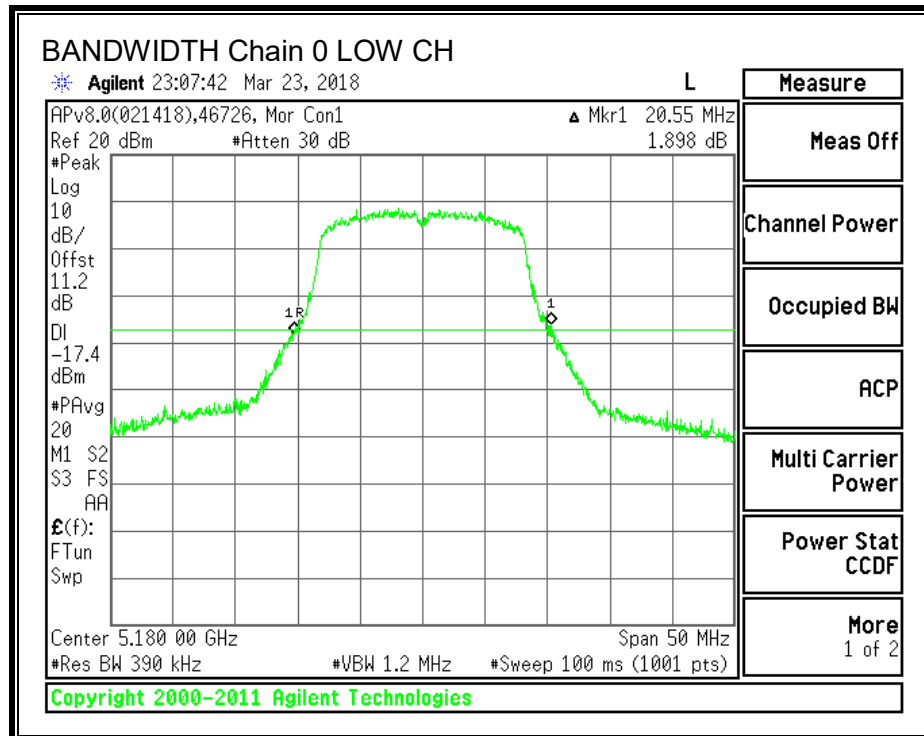
RESULTS

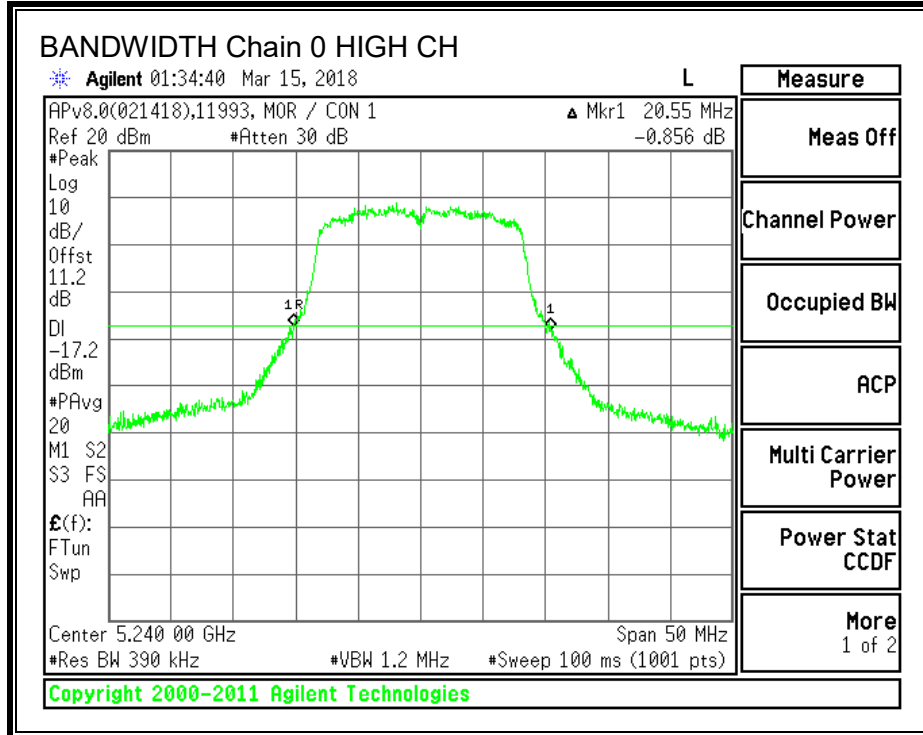
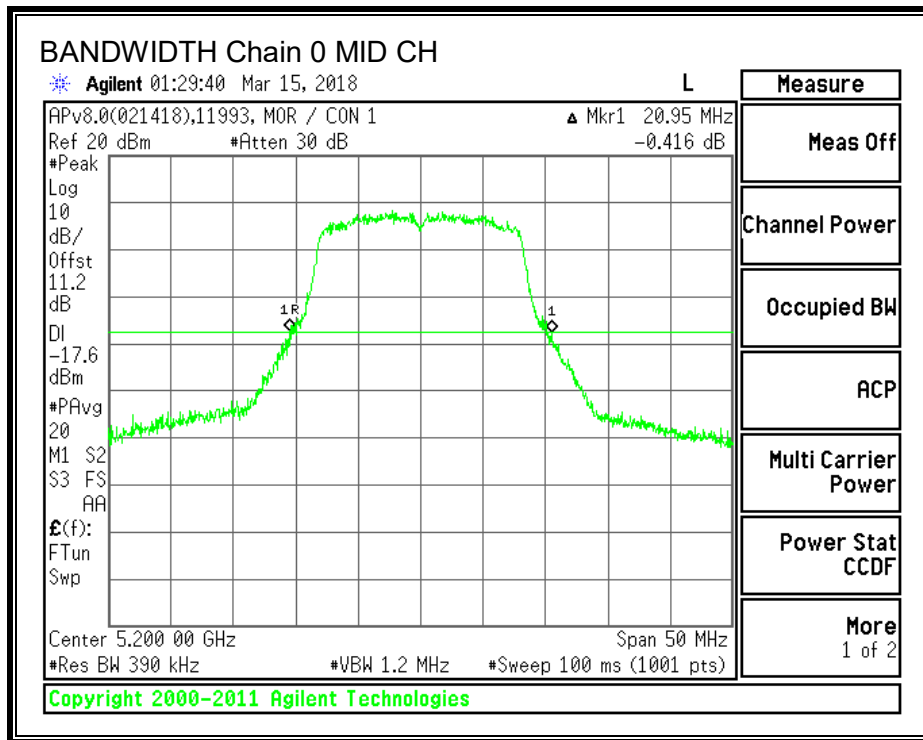
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	20.55	20.40
Mid	5200	20.95	20.80
High	5240	20.55	20.65

TEST INFORMATION

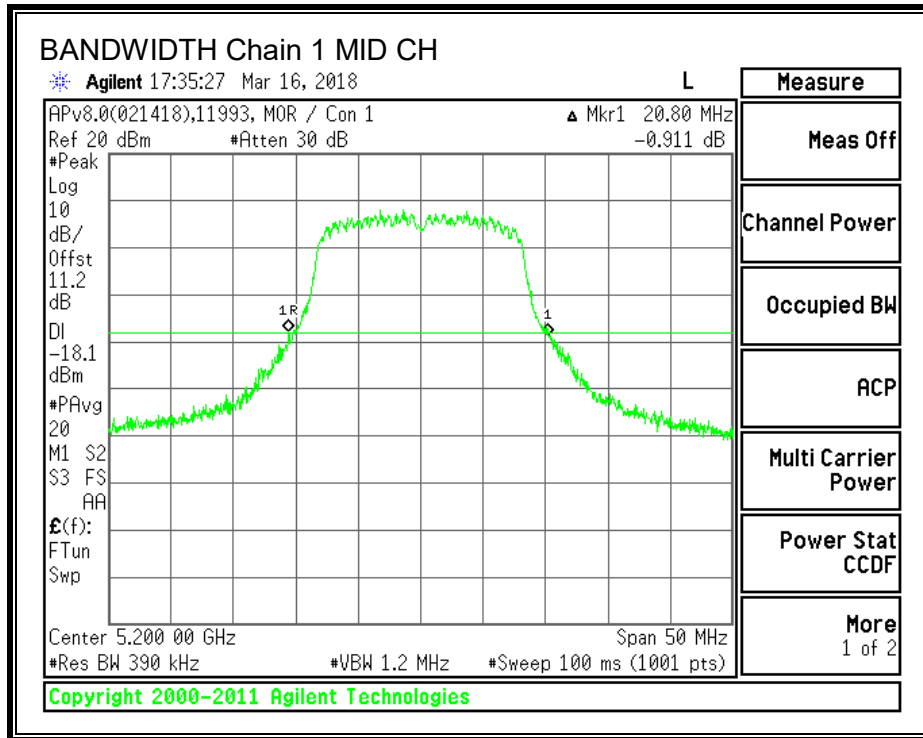
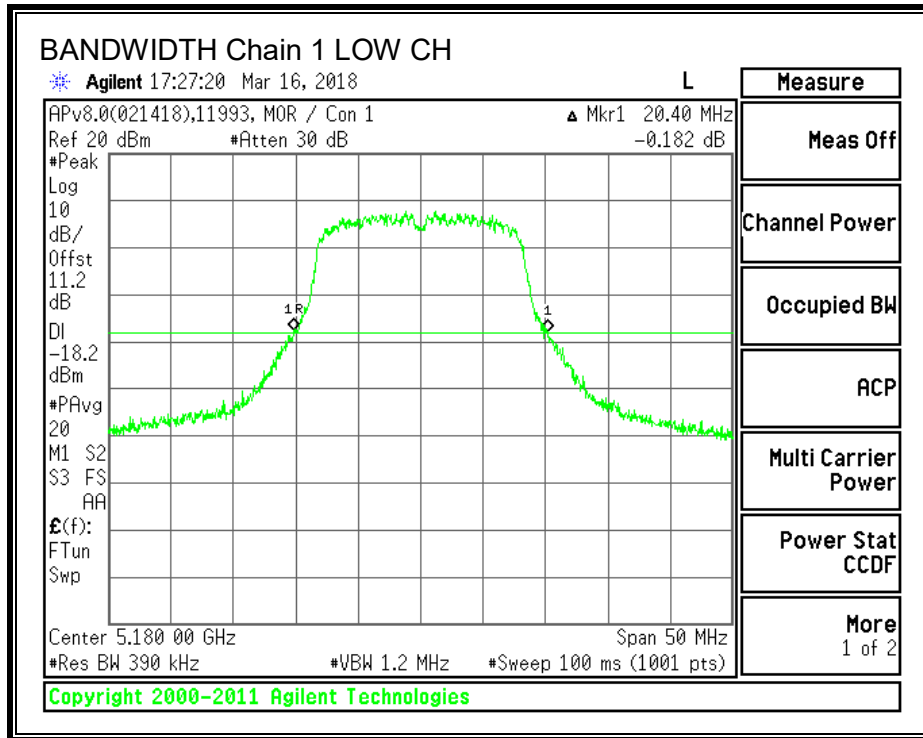
Date: 2018-03-15 to 2018-03-23
 Project: 12053557
 Tested By: 11993 / 46722

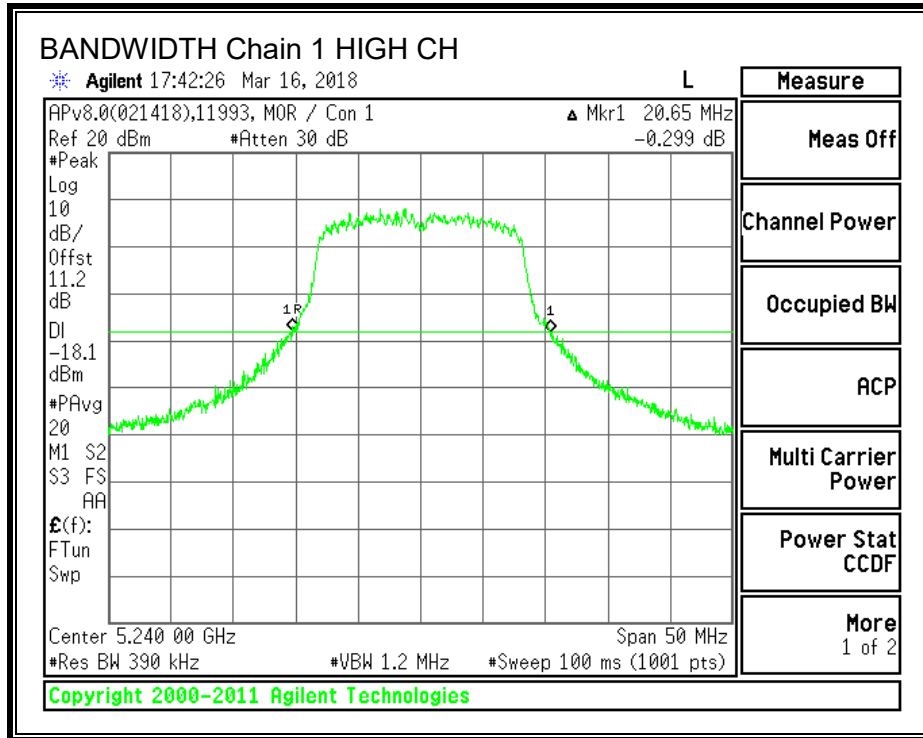
26 dB BANDWIDTH PLOTS, Chain 0





26 dB BANDWIDTH PLOTS, Chain 1





8.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

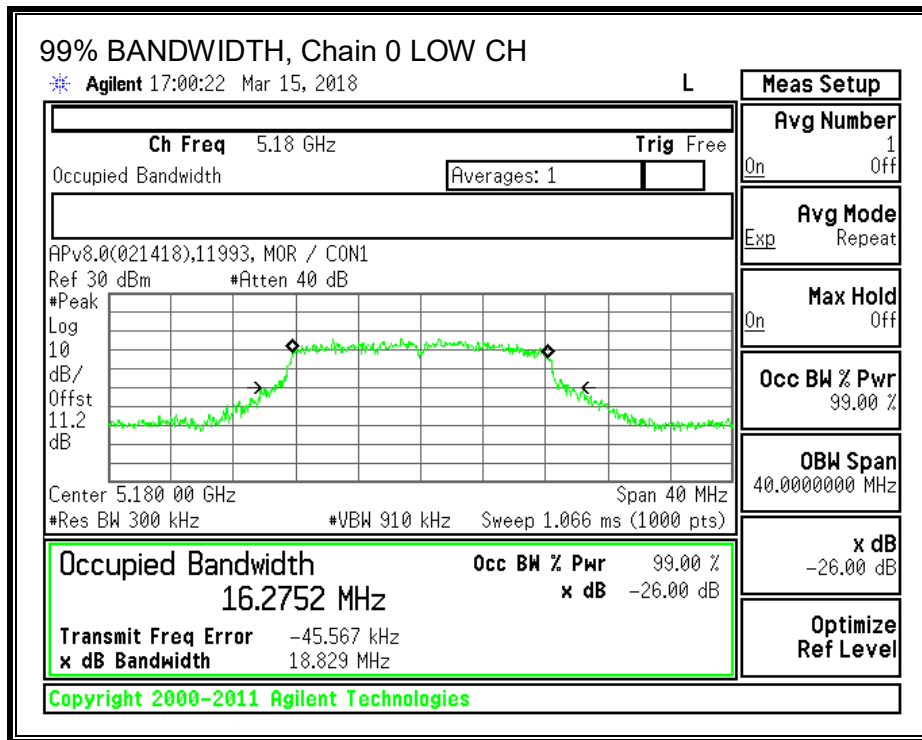
RESULTS

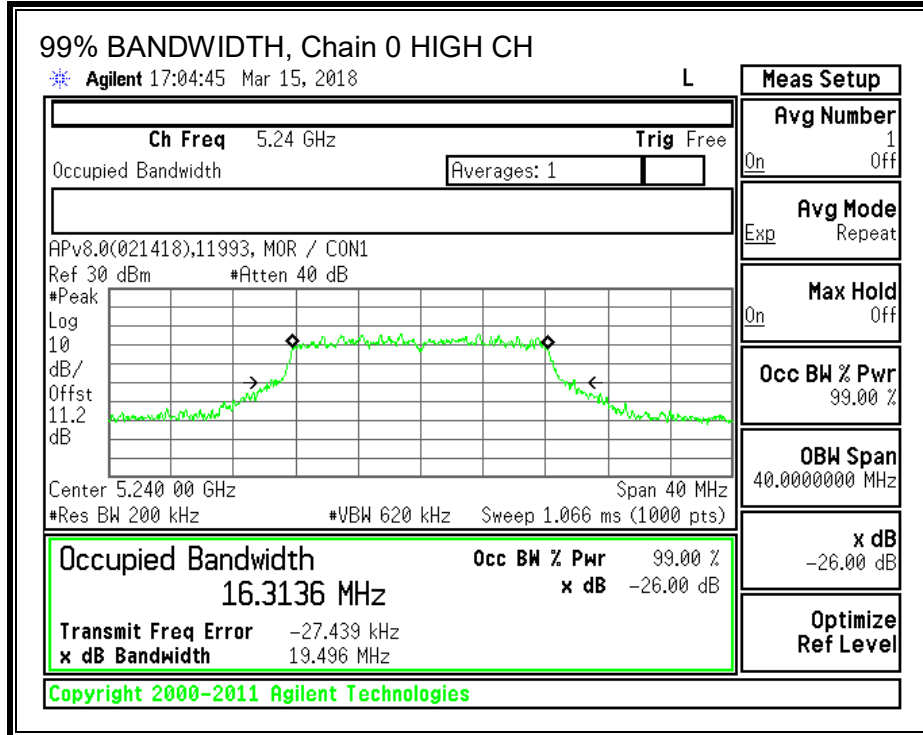
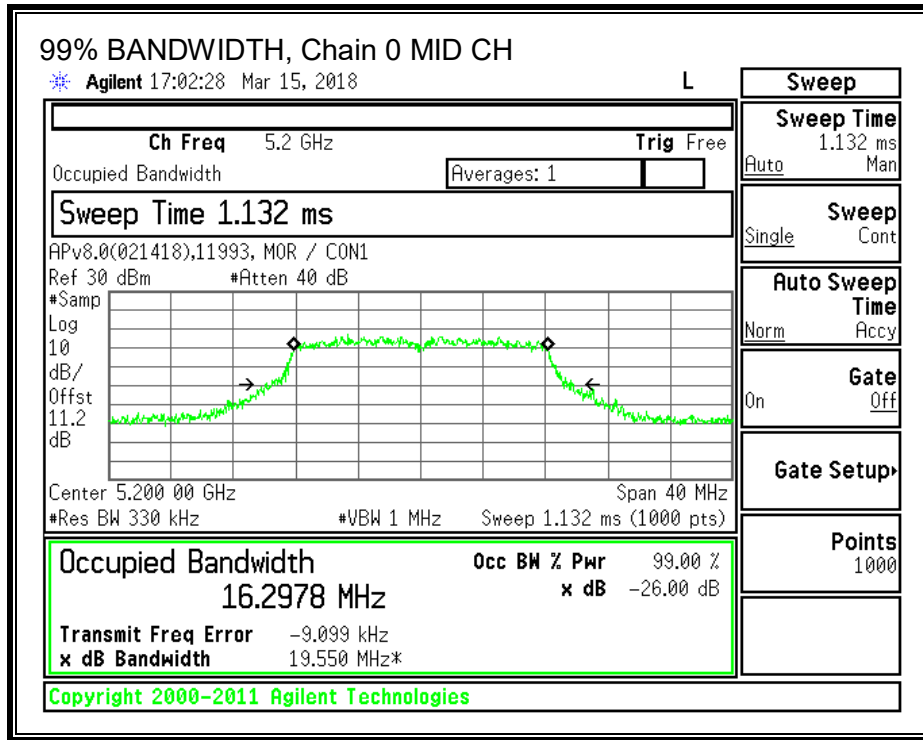
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	16.275	16.256
Mid	5200	16.298	16.255
High	5240	16.314	16.346

TEST INFORMATION

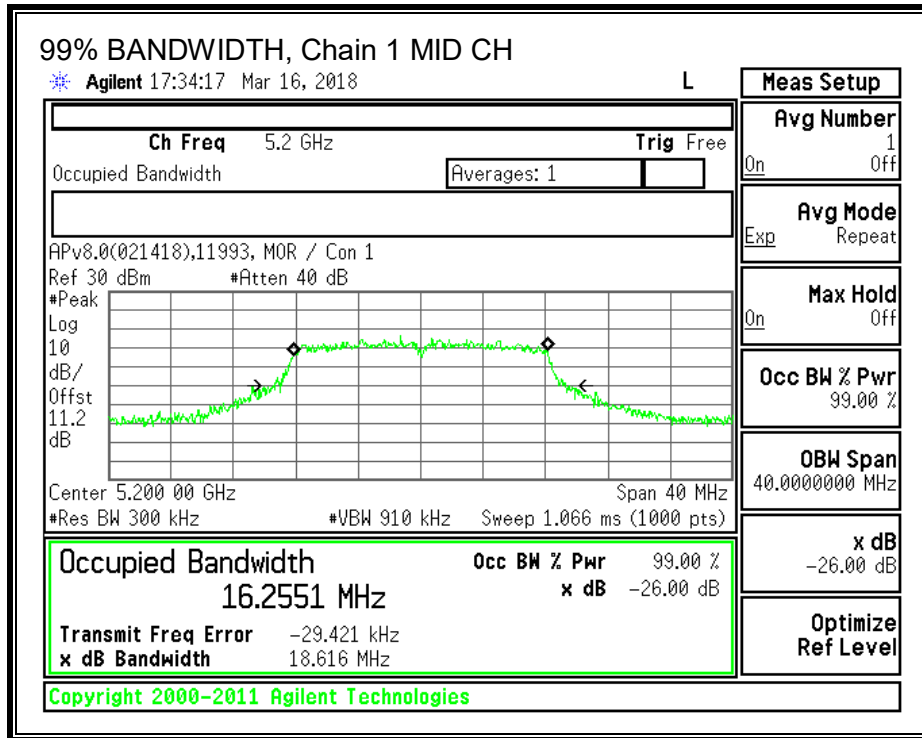
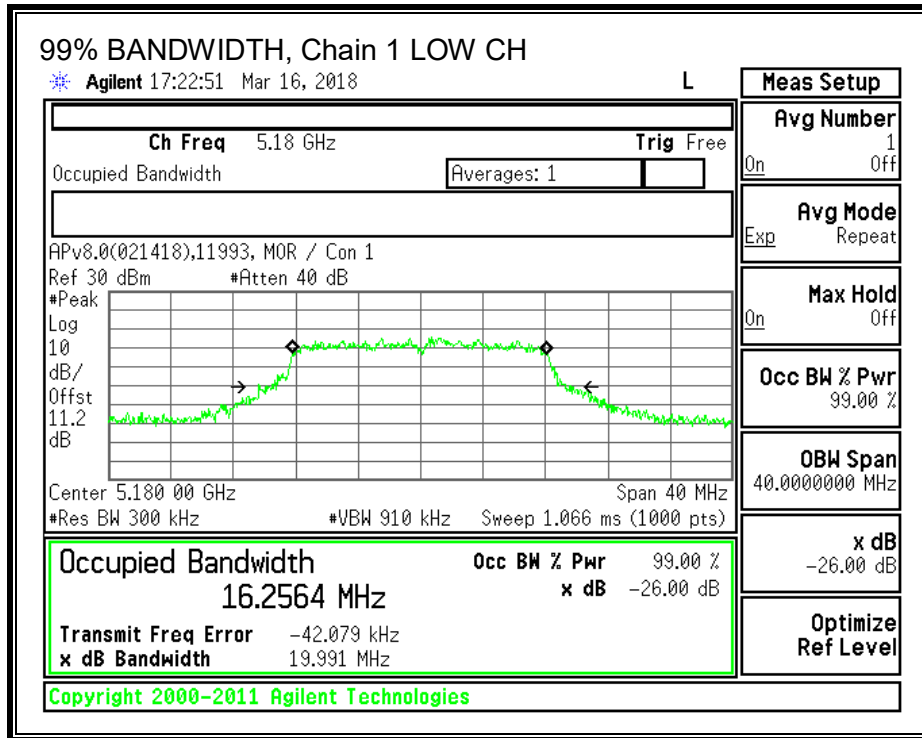
Date: 2018-03-15 to 2018-03-17
 Project: 12053557
 Tester: 11993 / 46722

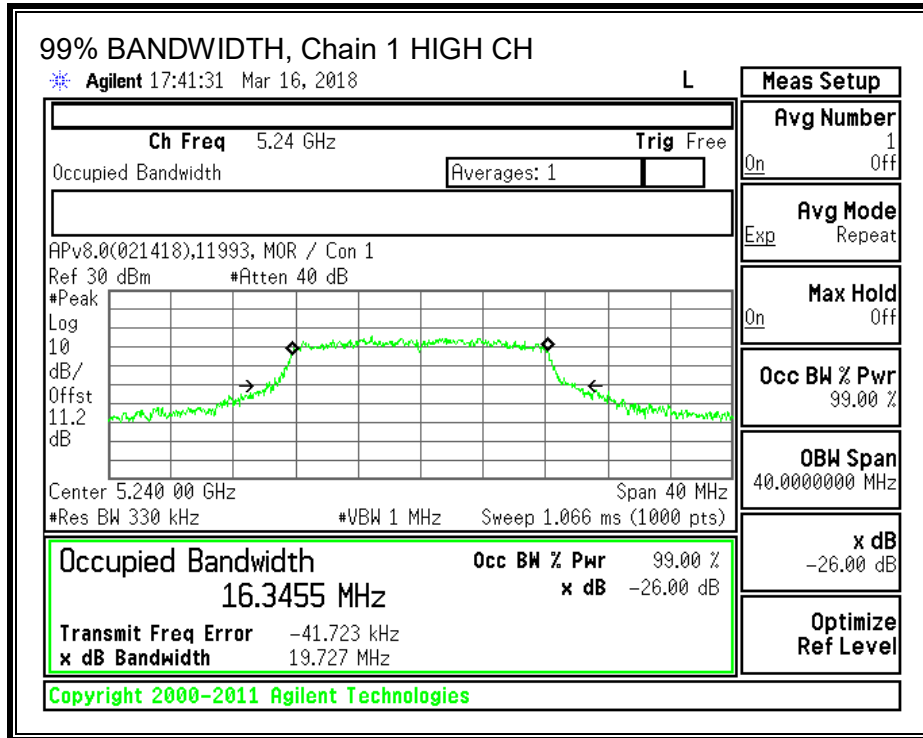
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.2.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Date: 2018-03-15 to 2018-05-01
Project: 12053557
Tester: 11993/46722, 46722, 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) 6 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	2.16	5.17	24.00	11.00
Mid	5200	2.16	5.17	24.00	11.00
High	5240	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.47	14.35	17.42	24.00	-6.58
Mid	5200	14.50	14.29	17.41	24.00	-6.59
High	5240	14.47	14.31	17.40	24.00	-6.60

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.32	0.57	7.38	11.00	-3.62
Mid	5200	1.65	0.42	7.50	11.00	-3.50
High	5240	1.61	0.37	7.45	11.00	-3.55

RESULTS (FCC) 54 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5180	2.16	24.00
Mid	5200	2.16	24.00
High	5240	2.16	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.60	9.24	12.43	24.00	-11.57
Mid	5200	8.81	8.34	11.59	24.00	-12.41
High	5240	9.98	9.03	12.54	24.00	-11.46

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54 Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED) 6 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	2.16	5.17	16.26	22.11	10.00
Mid	5200	2.16	5.17	16.26	22.11	10.00
High	5240	2.16	5.17	16.31	22.13	10.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results 6 Mbps

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	10.42	10.30	15.53	22.11	-6.58
Mid	5200	10.37	10.25	15.48	22.11	-6.63
High	5240	10.29	10.17	15.40	22.13	-6.72

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5180	-2.62	-3.29	8.65	10.00	-1.35
Mid	5200	-2.84	-3.84	8.28	10.00	-1.72
High	5240	-2.56	-3.48	8.59	10.00	-1.41

RESULTS (ISED) 54 Mbps

Antenna Gain and Limits

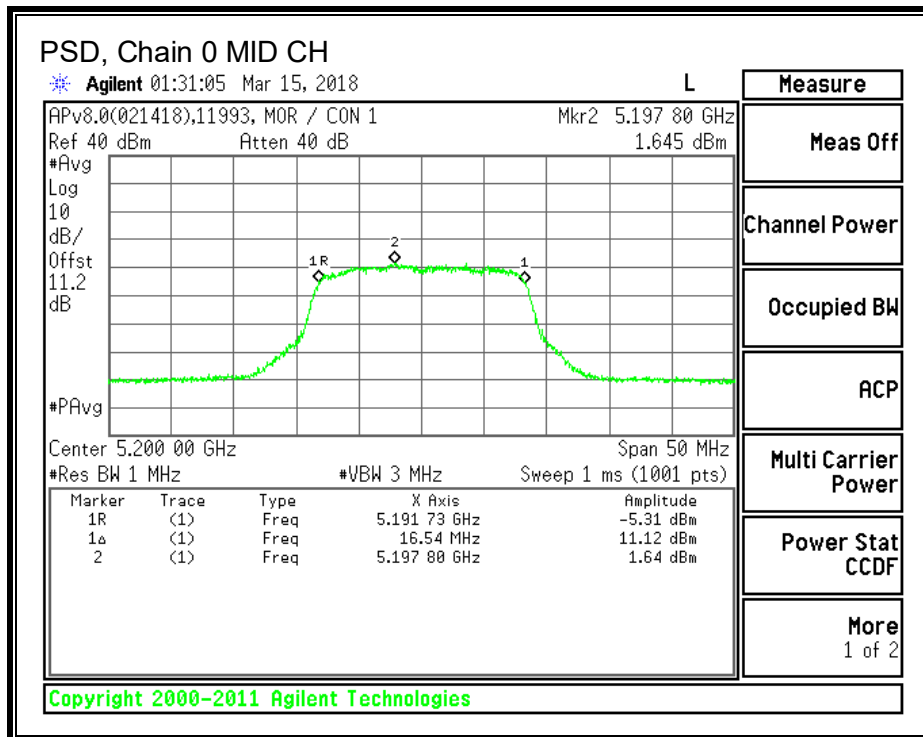
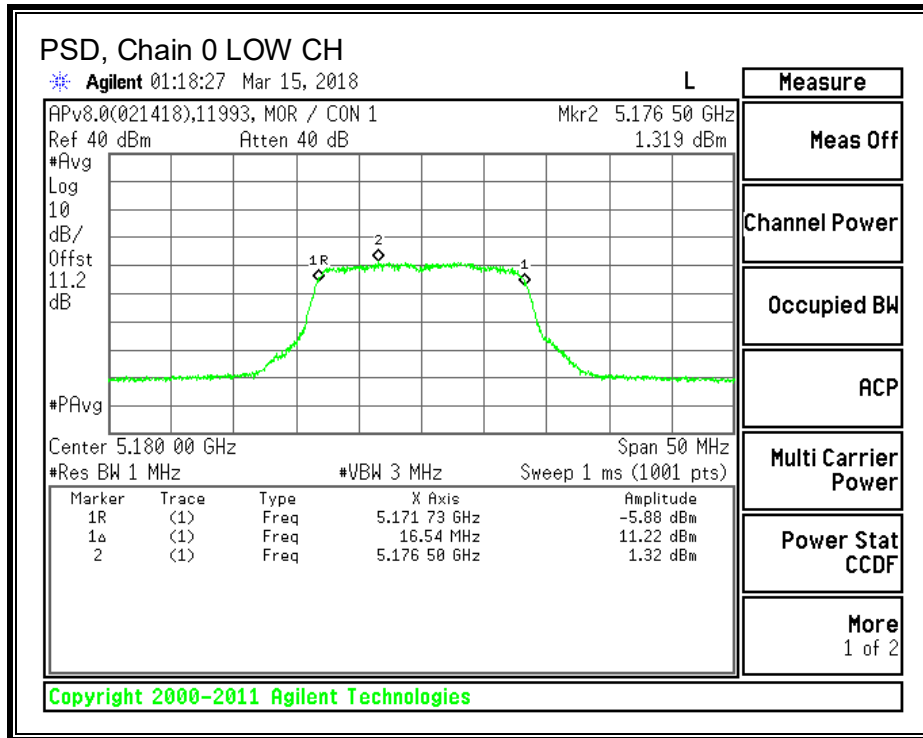
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)
Low	5180	2.16	16.26	22.11
Mid	5200	2.16	16.26	22.11
High	5240	2.16	16.31	22.13

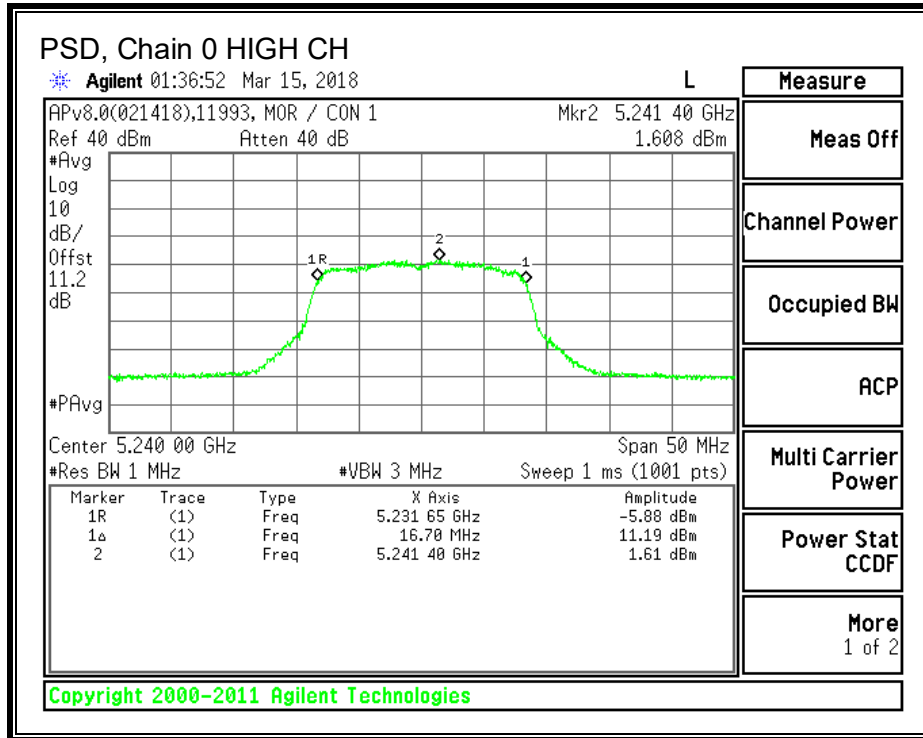
Output Power Results 54 Mbps

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	9.60	9.24	14.59	22.11	-7.52
Mid	5200	8.81	8.34	13.75	22.11	-8.36
High	5240	9.98	9.03	14.70	22.13	-7.42

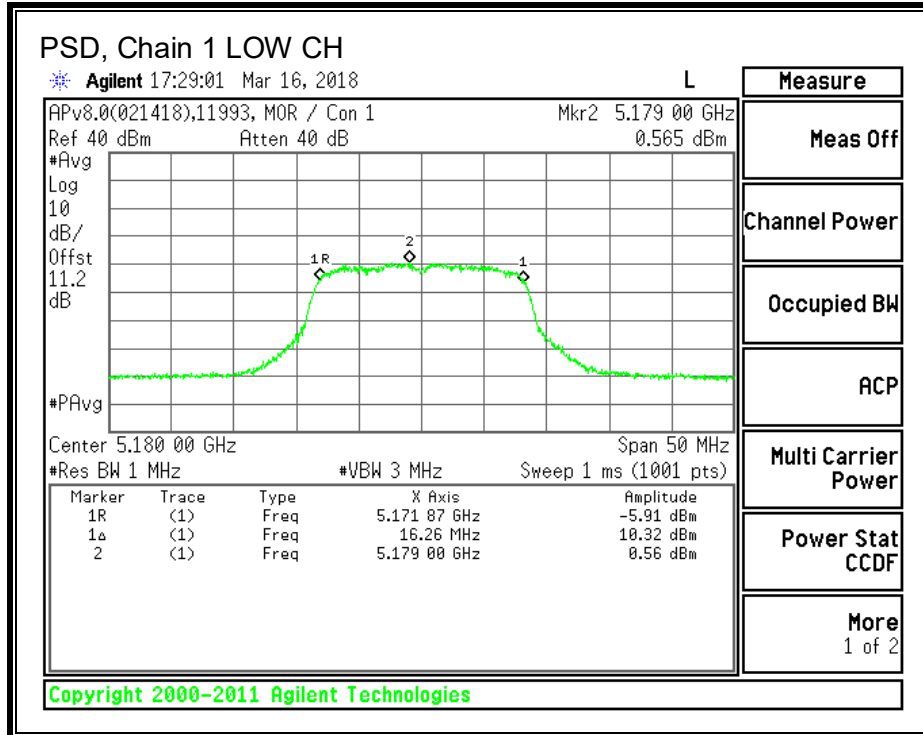
Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54 Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

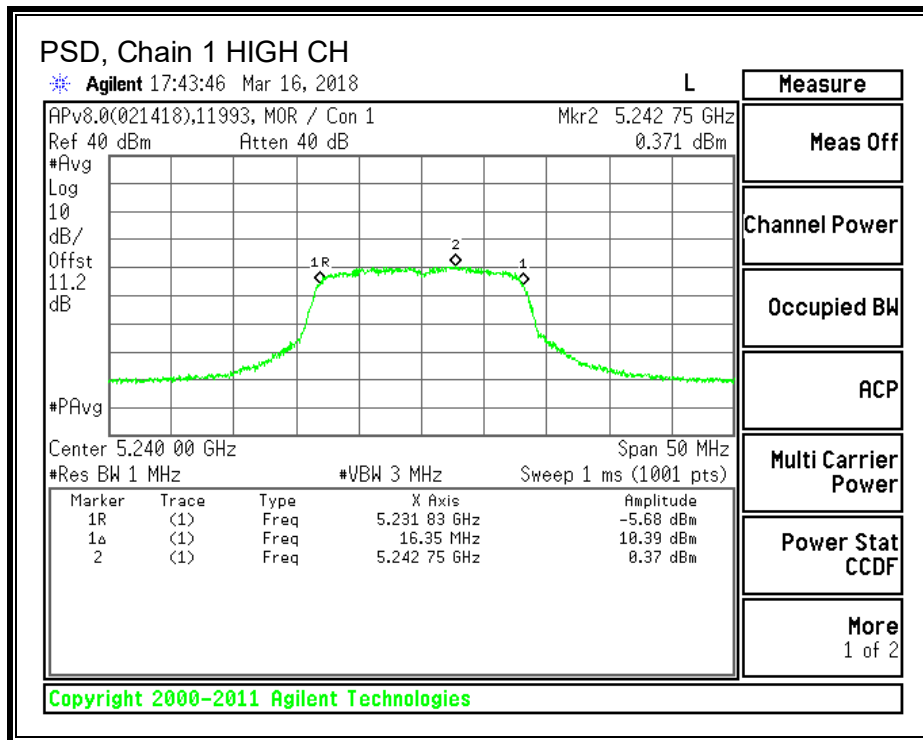
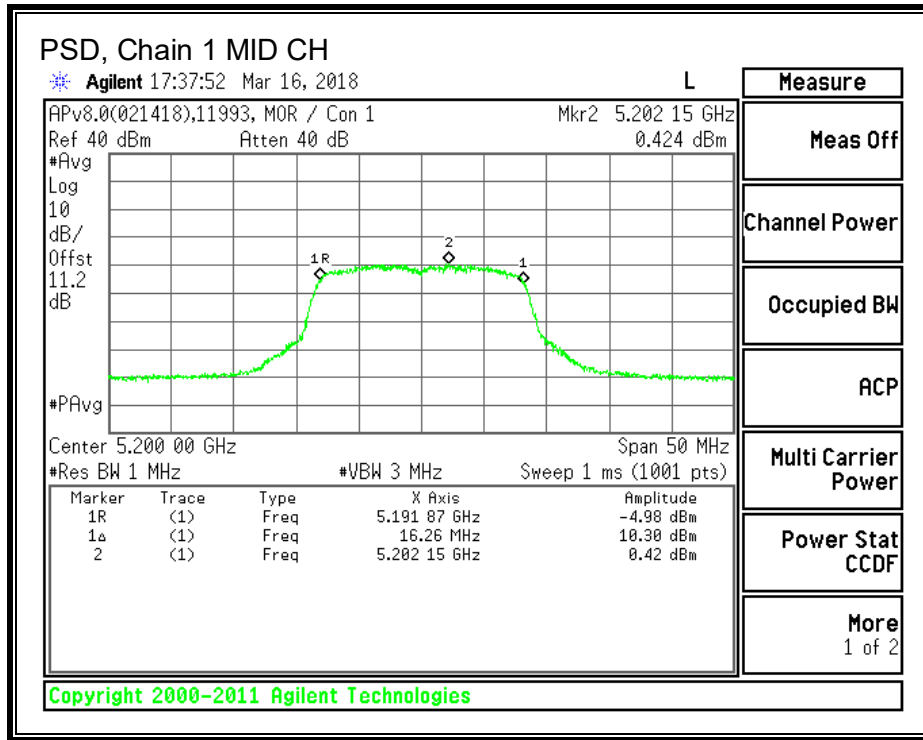
FCC PSD, Chain 0



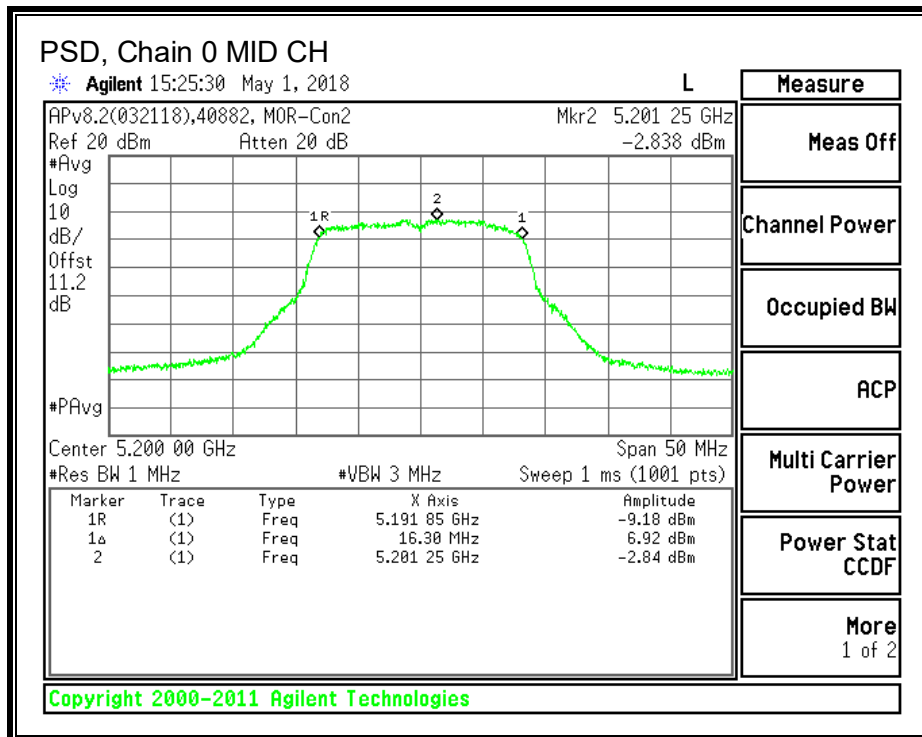
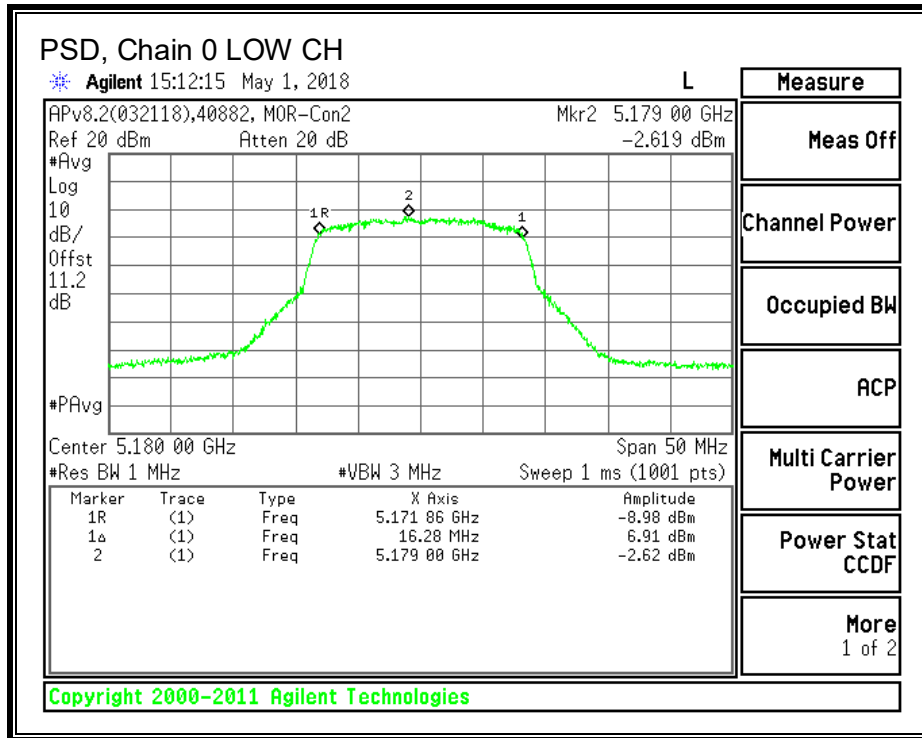


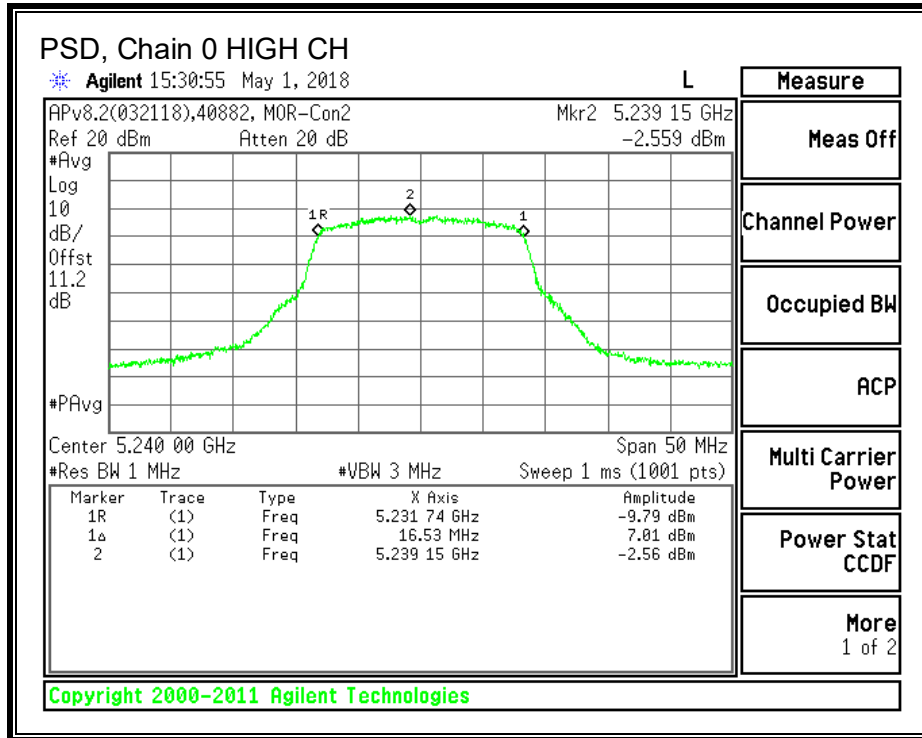
FCC PSD, Chain 1



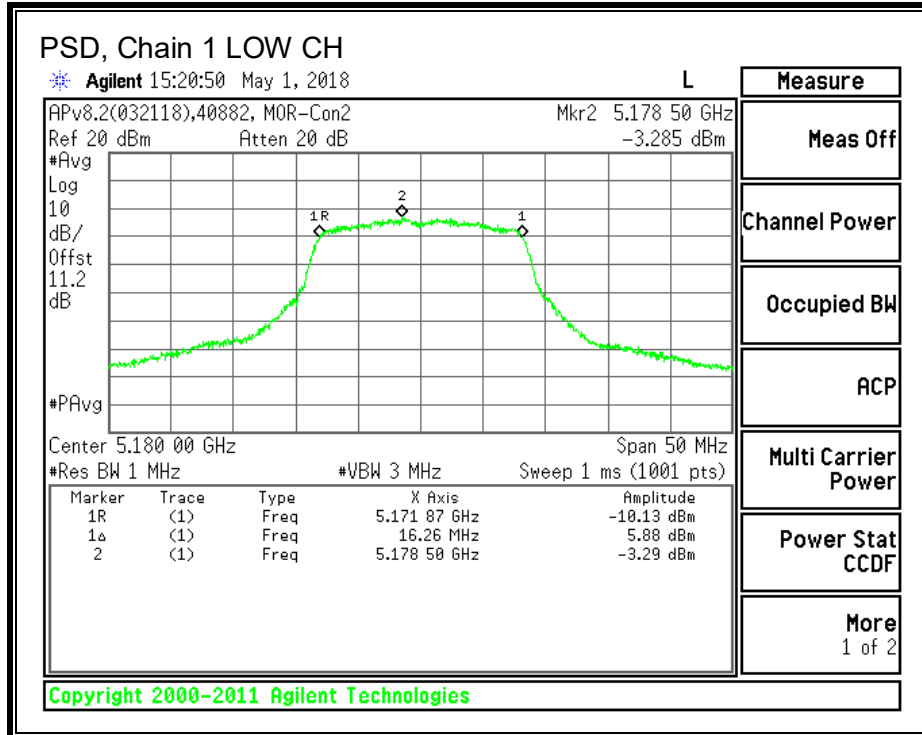


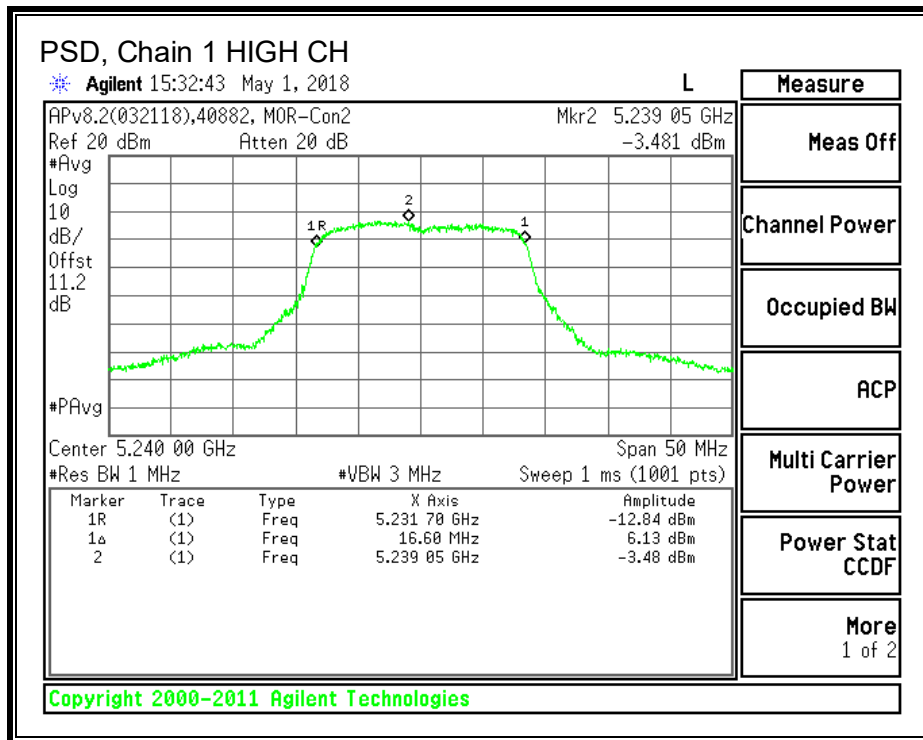
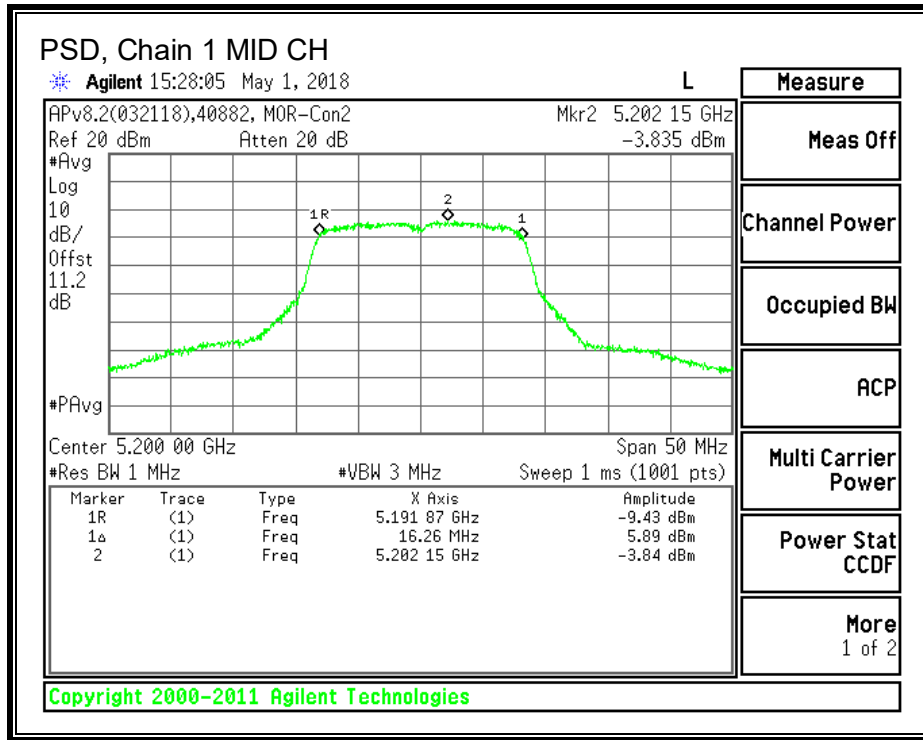
ISED PSD, Chain 0





ISED PSD, Chain 1





8.2.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Date: 2018-03-15 to 2018-05-01
Project: 12053557
Tester: 11993/46722, 46722, 40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) 6 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	1.92	4.92	24.00	11.00
Mid	5200	1.92	4.92	24.00	11.00
High	5240	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.47	14.35	17.42	24.00	-6.58
Mid	5200	14.50	14.29	17.41	24.00	-6.59
High	5240	14.47	14.31	17.40	24.00	-6.60

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.32	0.57	7.38	11.00	-3.62
Mid	5200	1.65	0.42	7.50	11.00	-3.50
High	5240	1.61	0.37	7.45	11.00	-3.55

RESULTS (FCC) 54 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5180	1.92	24.00
Mid	5200	1.92	24.00
High	5240	1.92	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.60	9.24	12.43	24.00	-11.57
Mid	5200	8.81	8.34	11.59	24.00	-12.41
High	5240	9.98	9.03	12.54	24.00	-11.46

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54 Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED) 6 Mbps

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	1.92	4.92	16.26	22.11	10.00
Mid	5200	1.92	4.92	16.26	22.11	10.00
High	5240	1.92	4.92	16.31	22.13	10.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	10.42	10.30	15.29	22.11	-6.82
Mid	5200	10.37	10.25	15.24	22.11	-6.87
High	5240	10.29	10.17	15.16	22.13	-6.96

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5180	-2.62	-3.29	8.40	10.00	-1.60
Mid	5200	-2.84	-3.84	8.03	10.00	-1.97
High	5240	-2.56	-3.48	8.34	10.00	-1.66

RESULTS (ISED) 54 Mbps

Antenna Gain and Limits

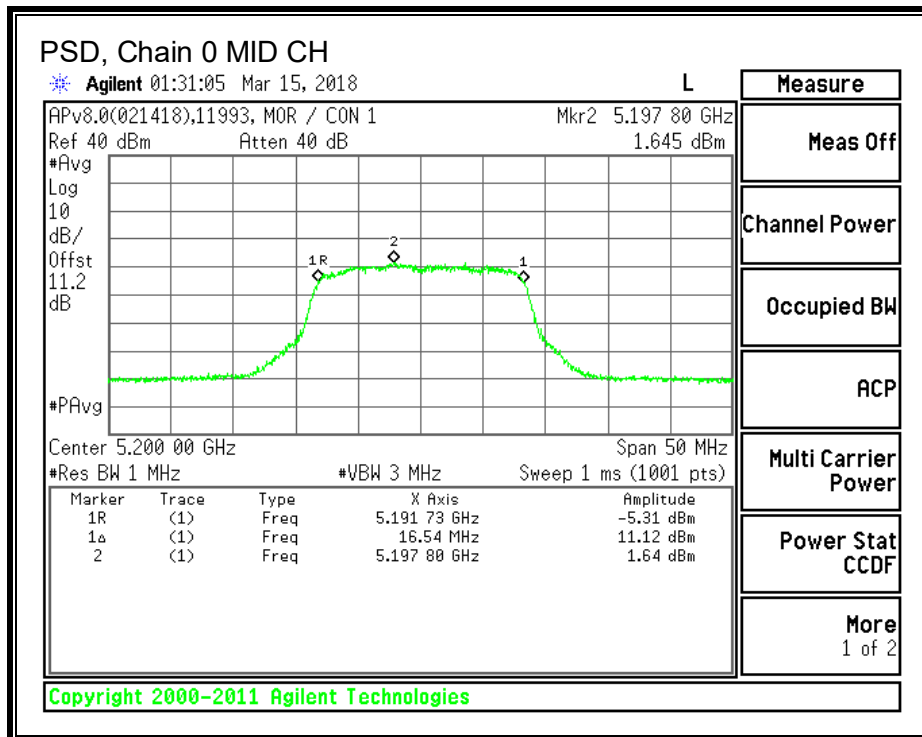
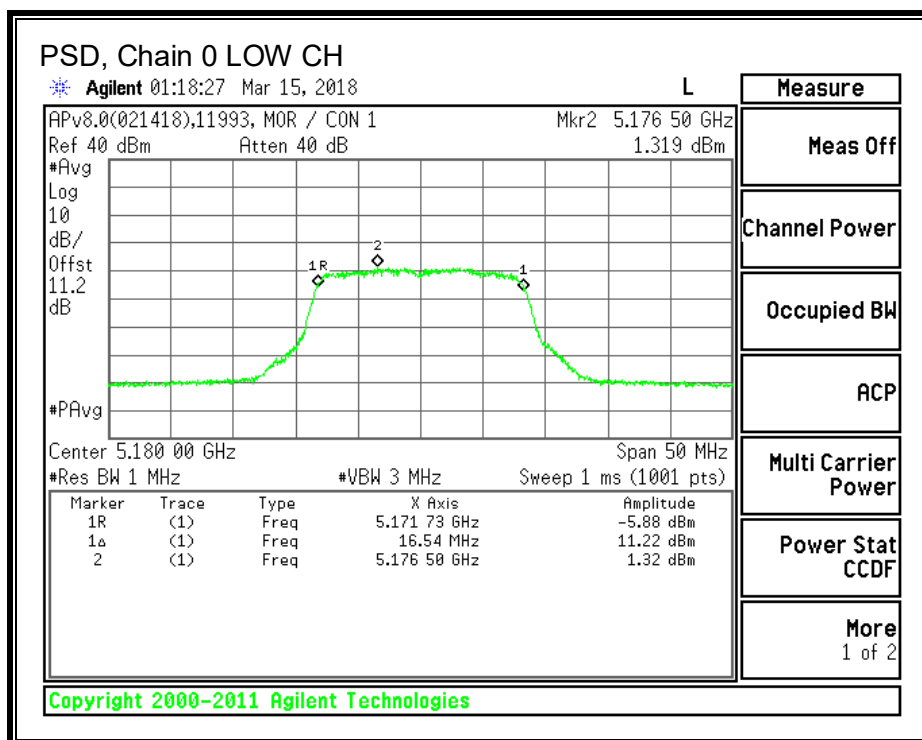
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	1.92	16.26	22.11	10.00
Mid	5200	1.92	16.26	22.11	10.00
High	5240	1.92	16.35	22.14	10.00

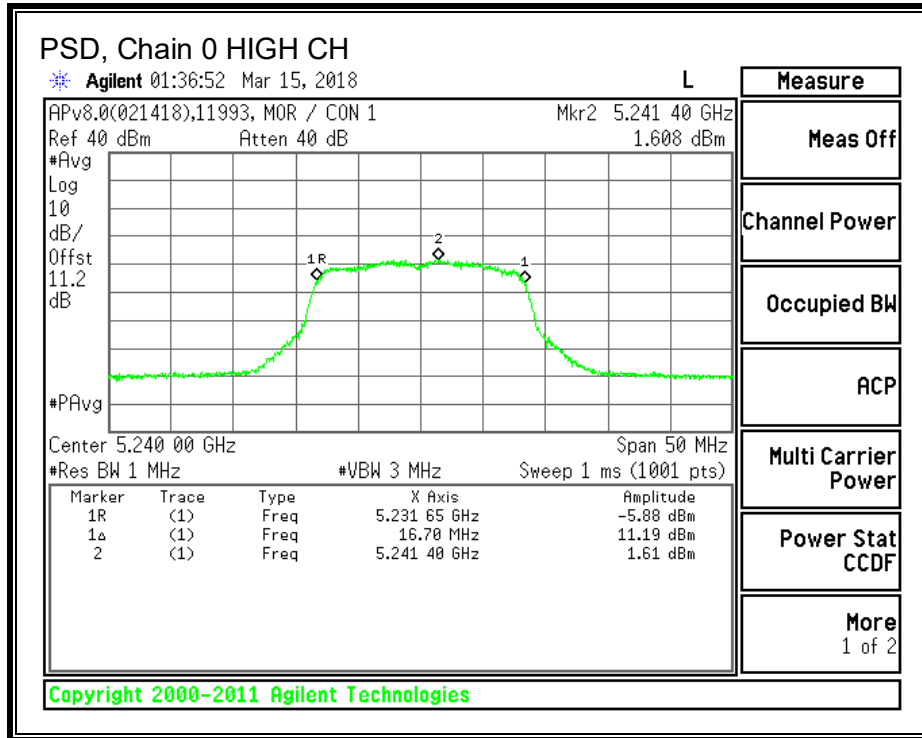
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	9.60	9.24	14.35	22.11	-7.76
Mid	5200	8.81	8.34	13.51	22.11	-8.60
High	5240	9.98	9.03	14.46	22.14	-7.67

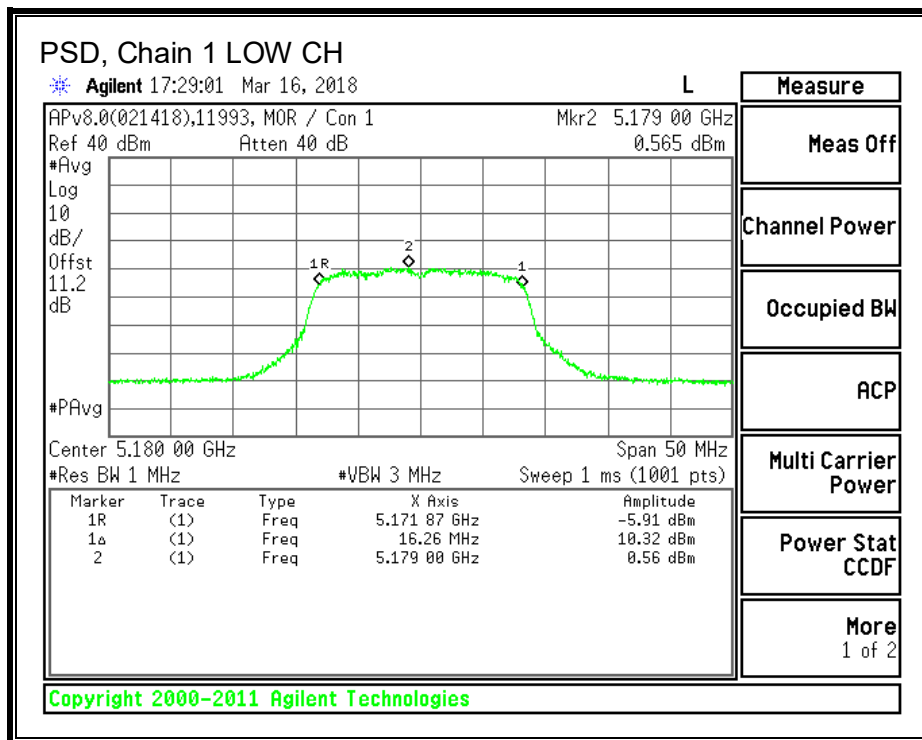
Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54 Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

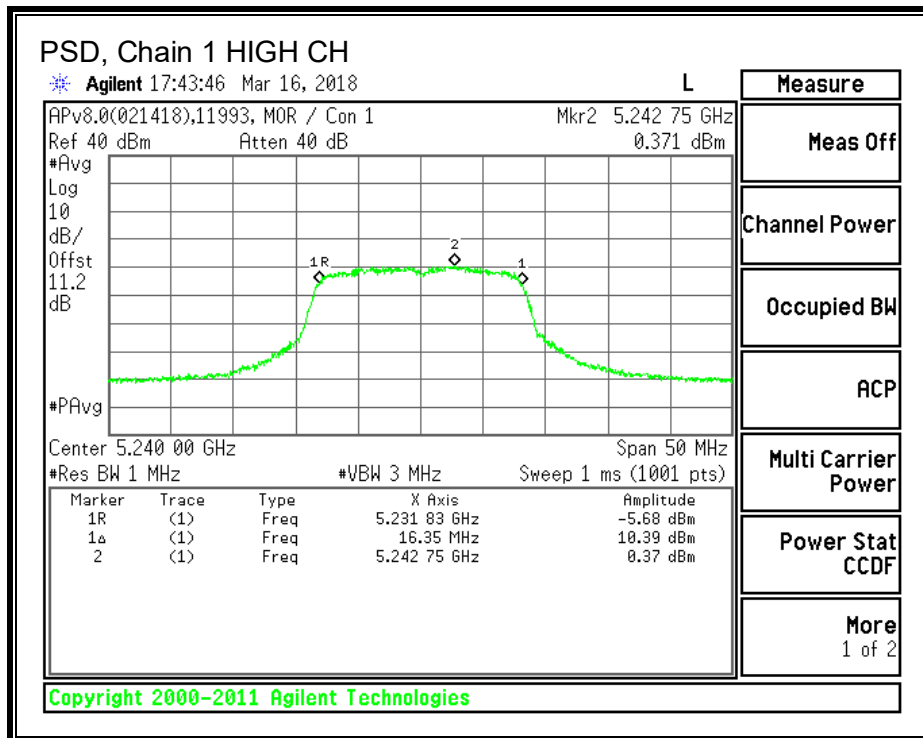
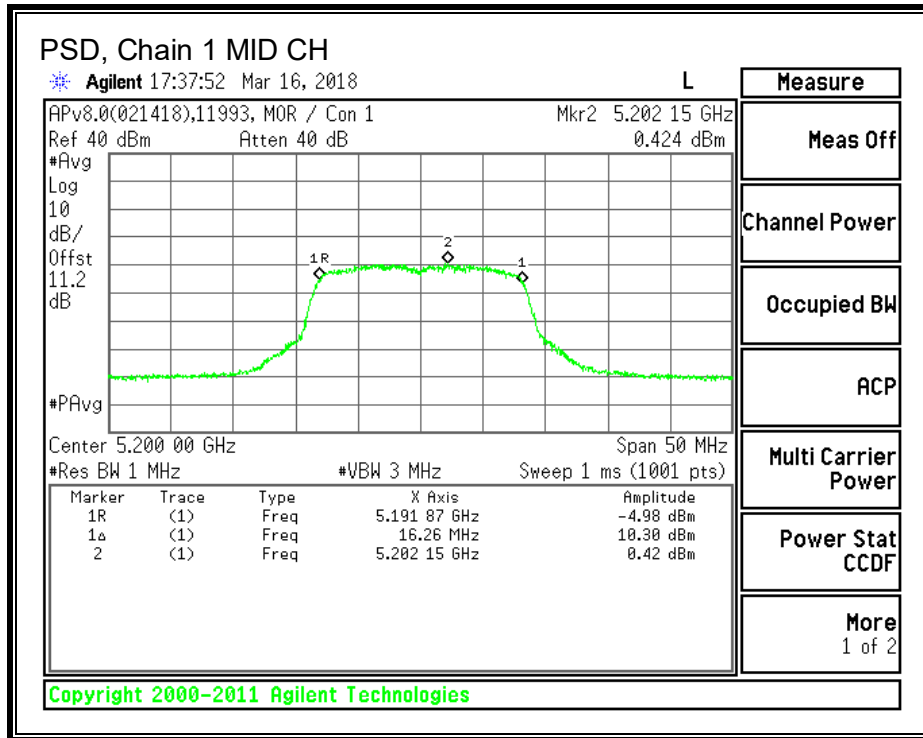
FCC PSD, Chain 0



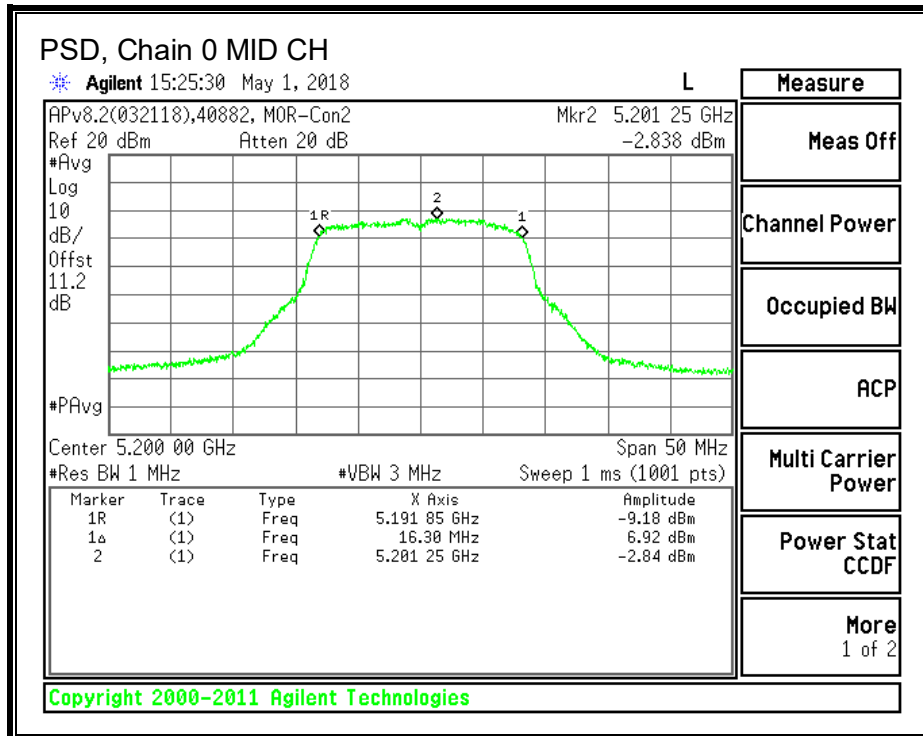
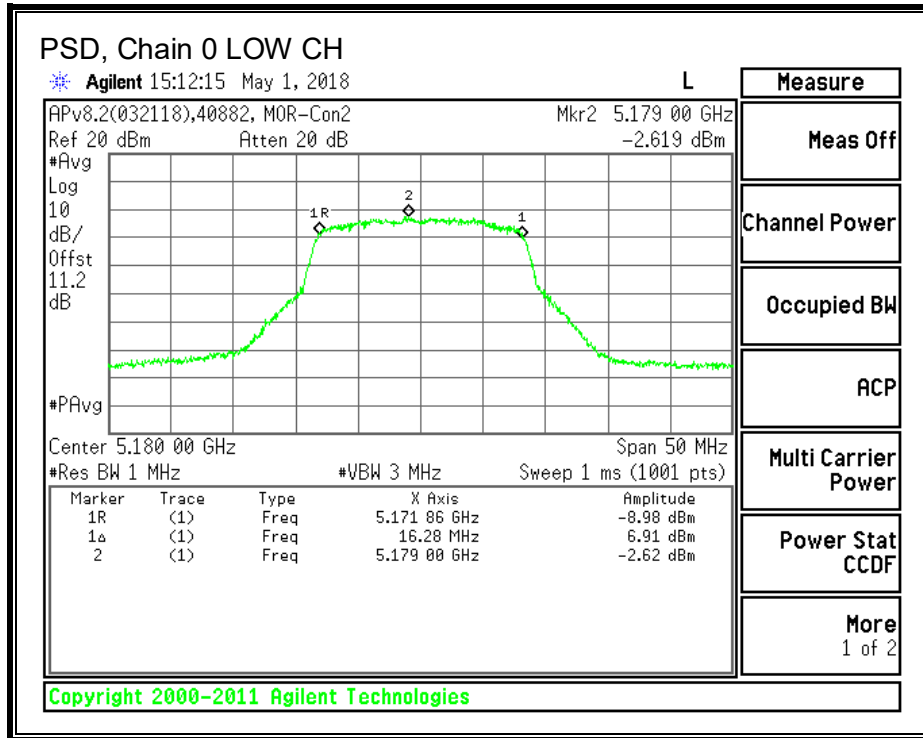


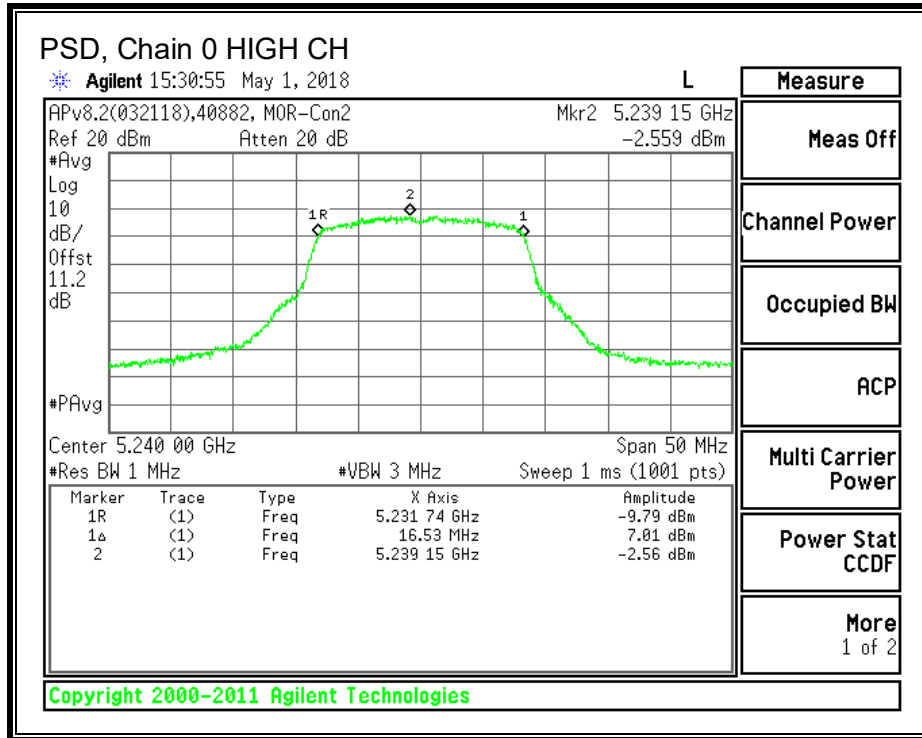
FCC PSD, Chain 1



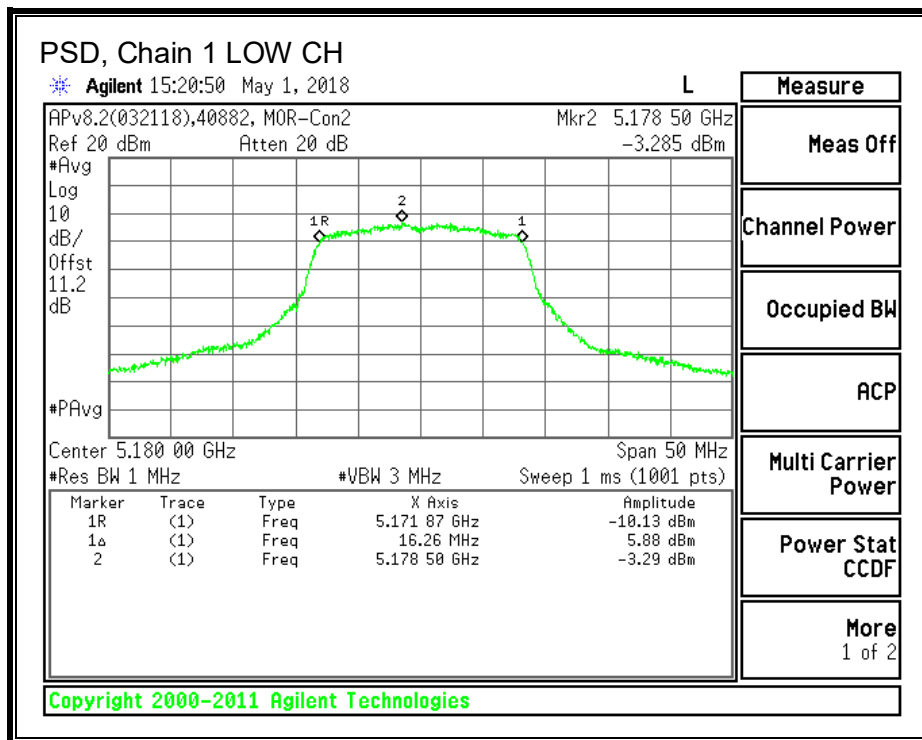


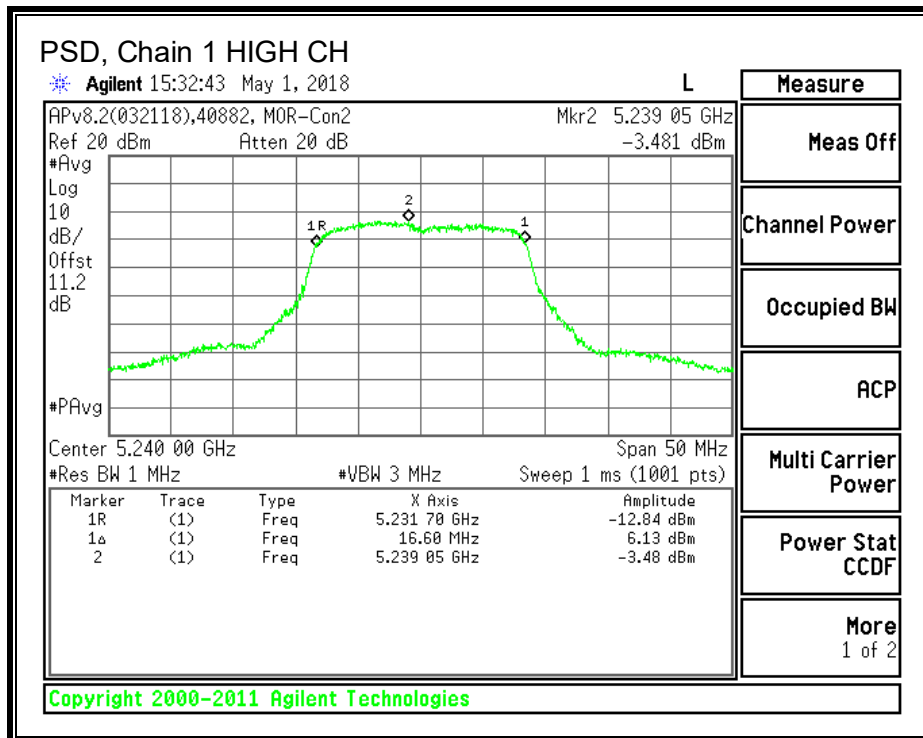
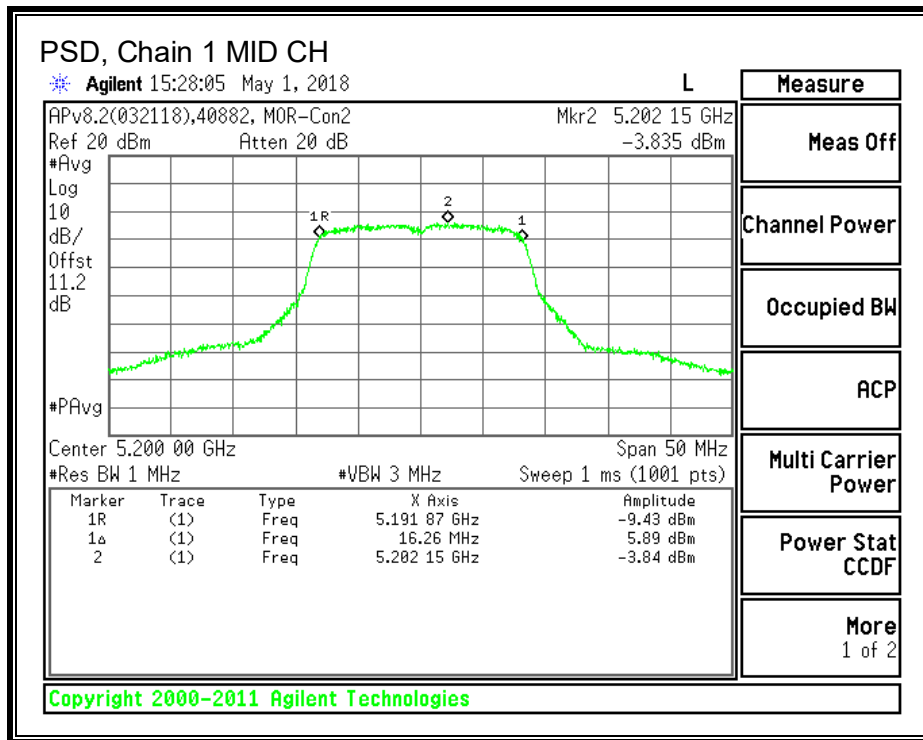
ISED PSD, Chain 0





ISED PSD, Chain 1





8.3. 802.11n HT20 MODE IN THE 5.2 GHz BAND

8.3.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

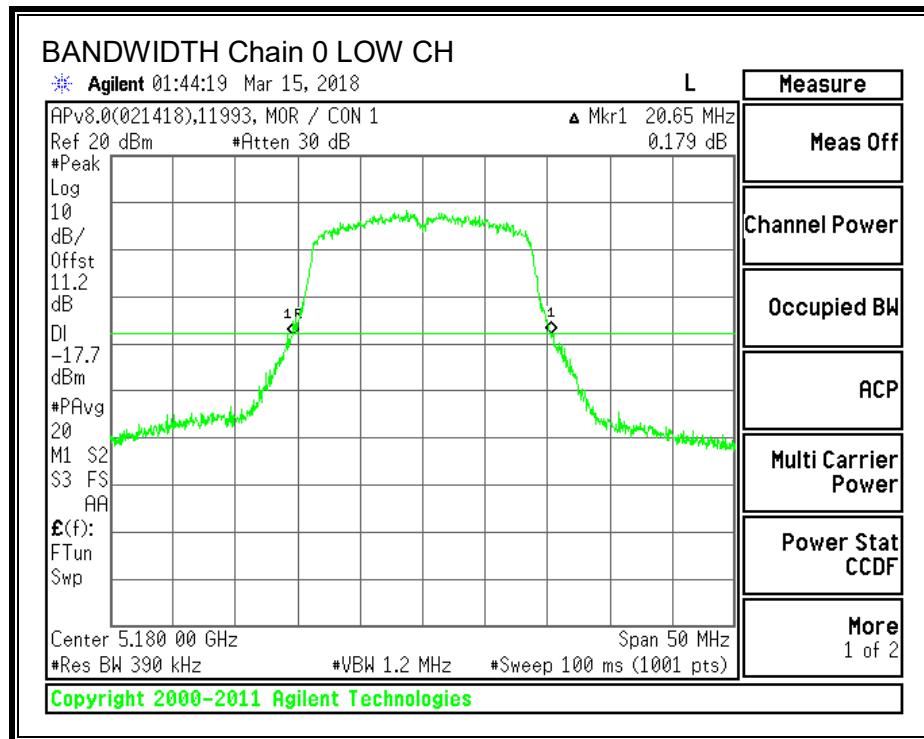
TEST INFORMATION

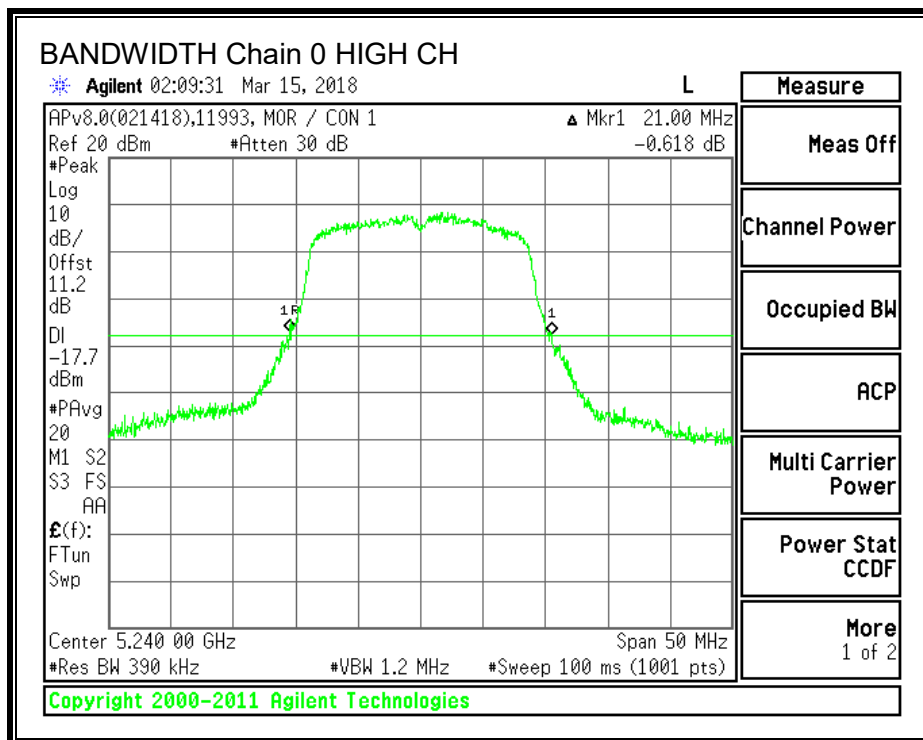
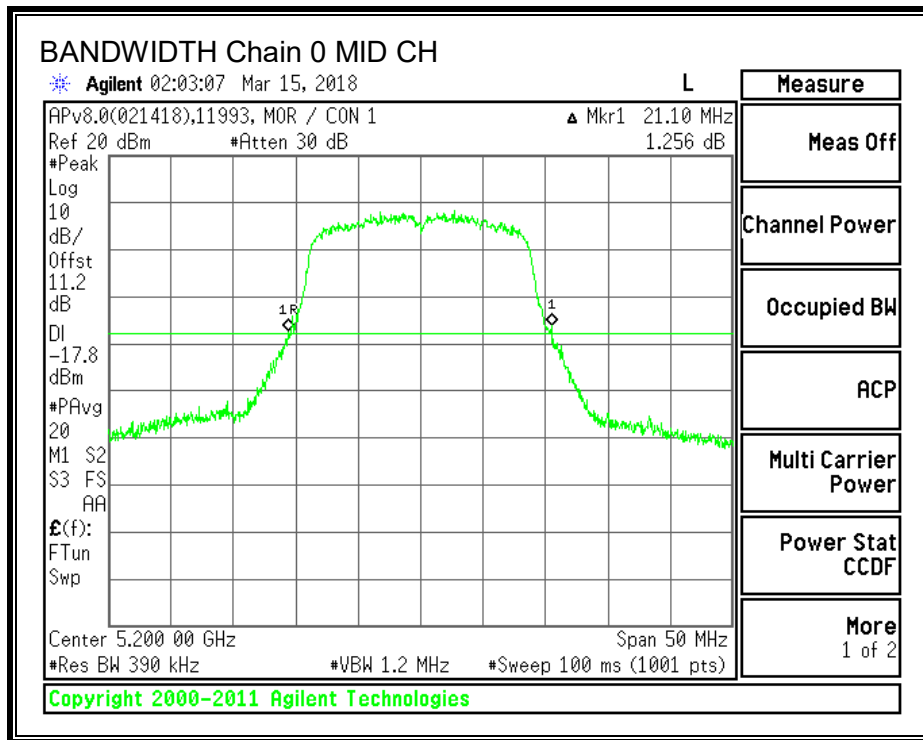
Date: 2018-03-15 to 2018-03-23
 Project: 12053557
 Tester: 11993/46722

RESULTS

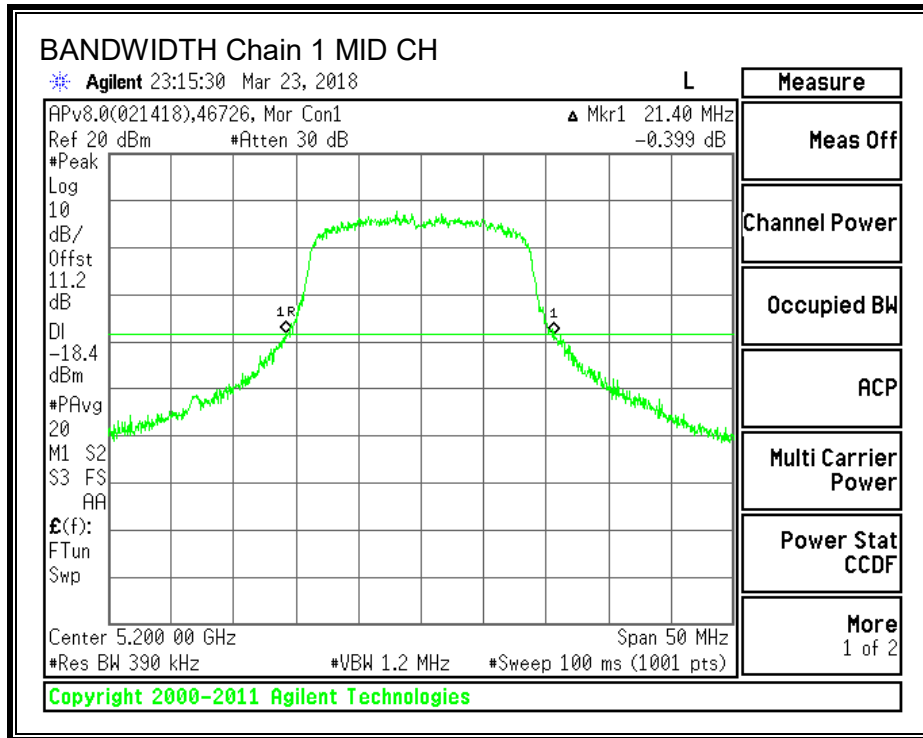
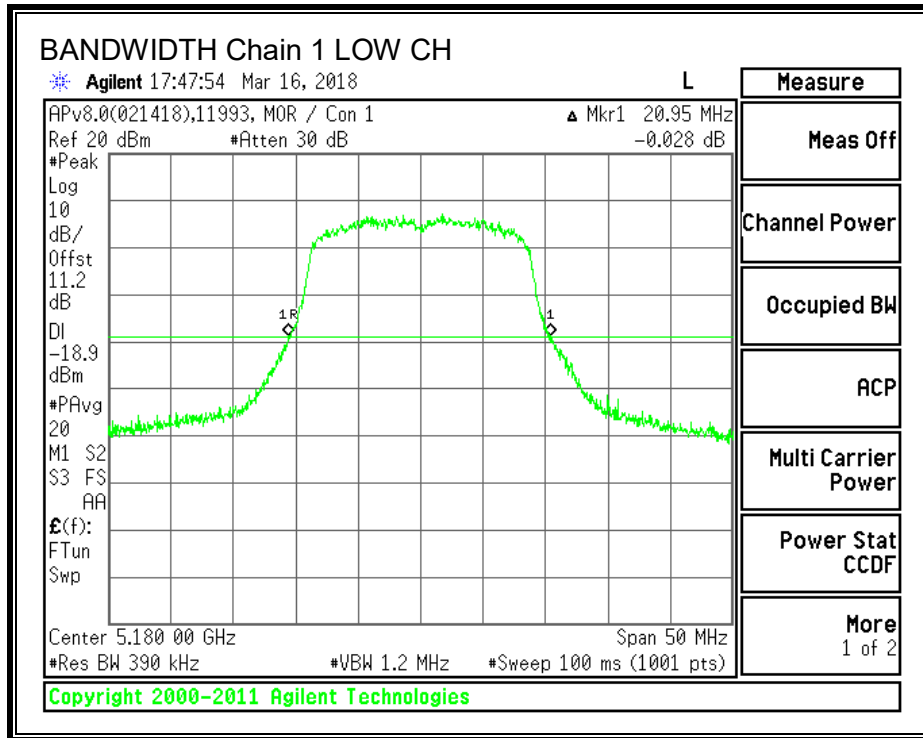
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5180	20.65	20.95
Mid	5200	21.10	21.40
High	5240	21.00	21.30

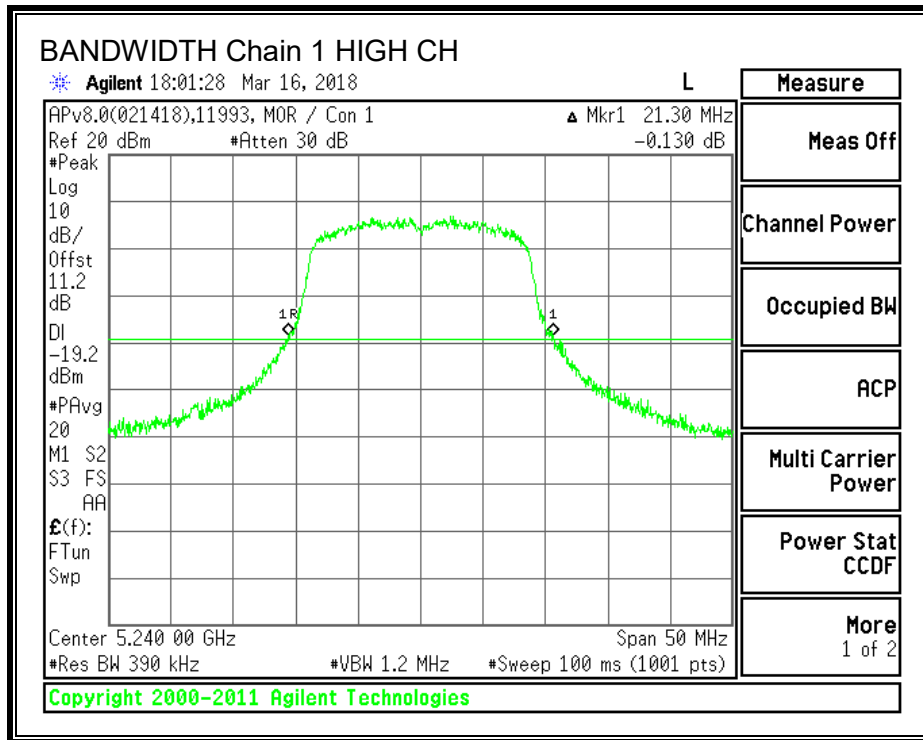
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

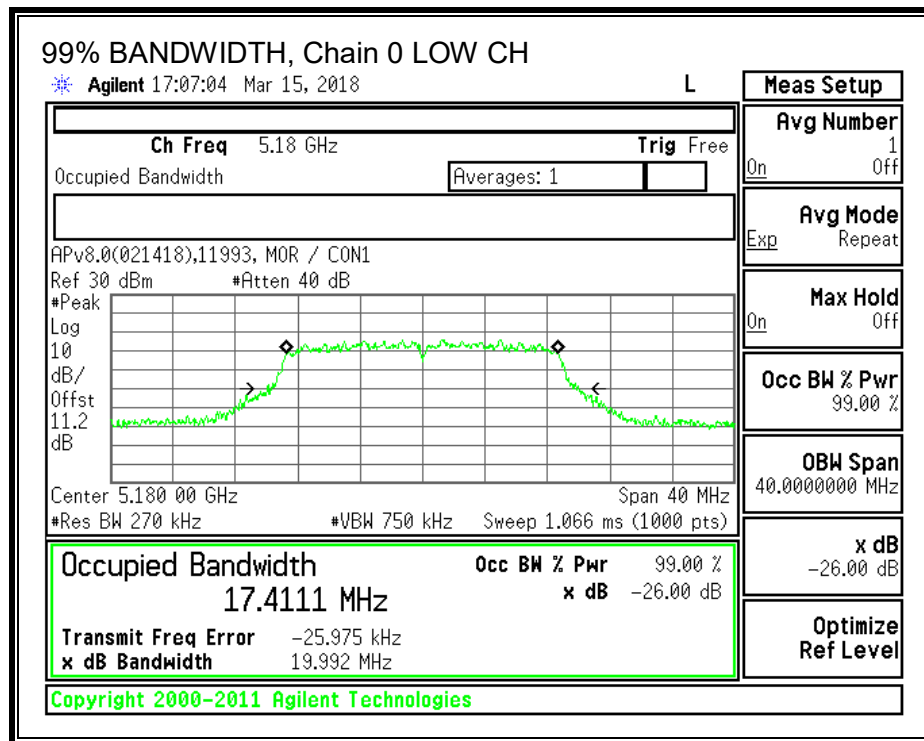
TEST INFORMATION

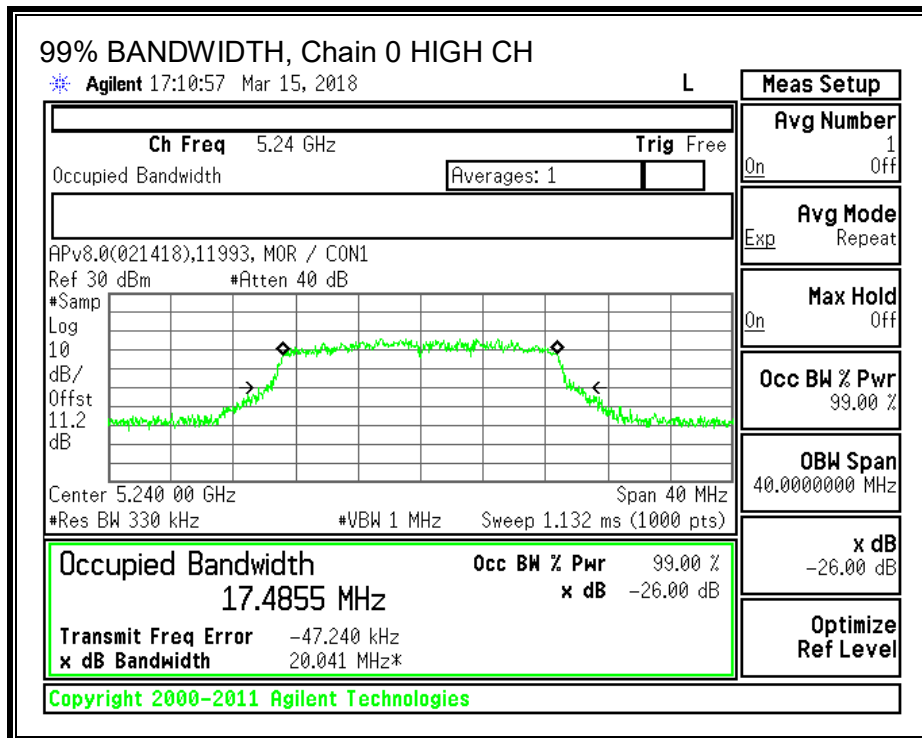
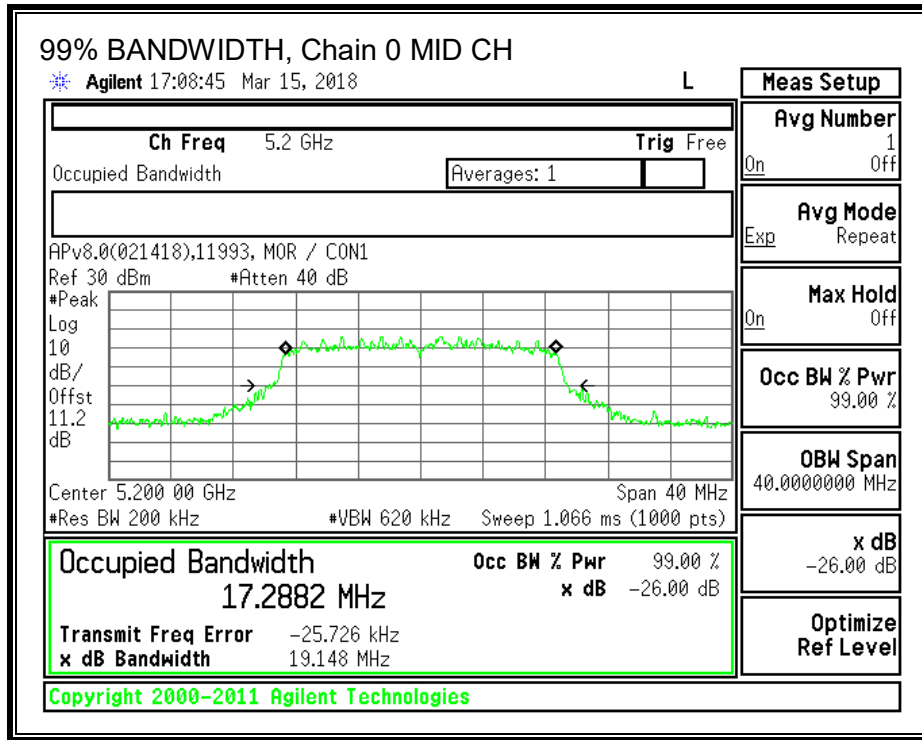
Date: 2018-03-15 to 2018-03-17
 Project: 12053557
 Tested By: 11993 / 46722

RESULTS

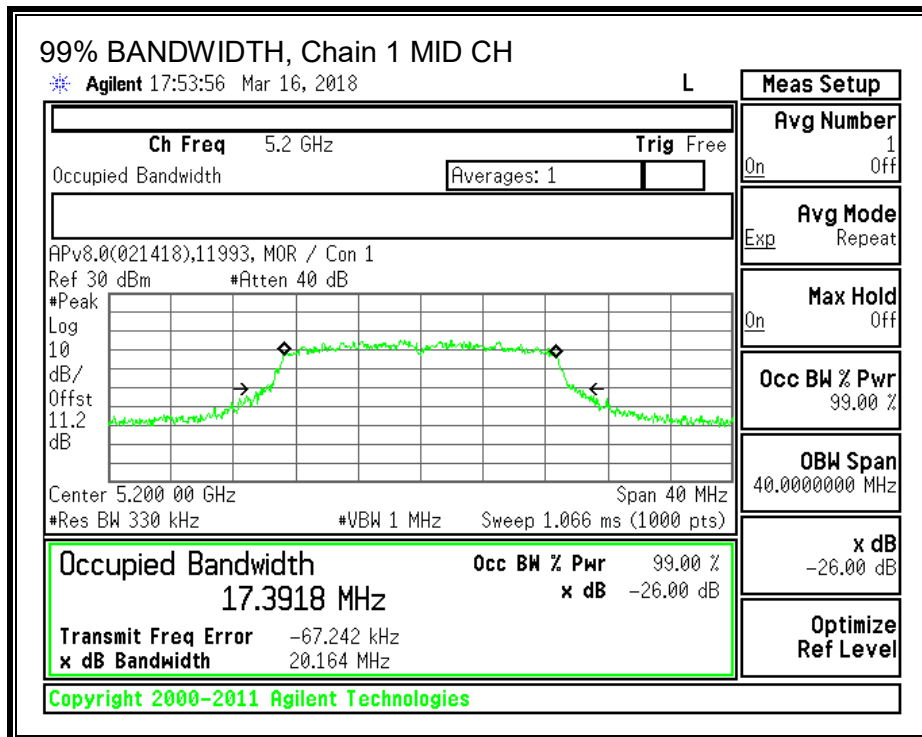
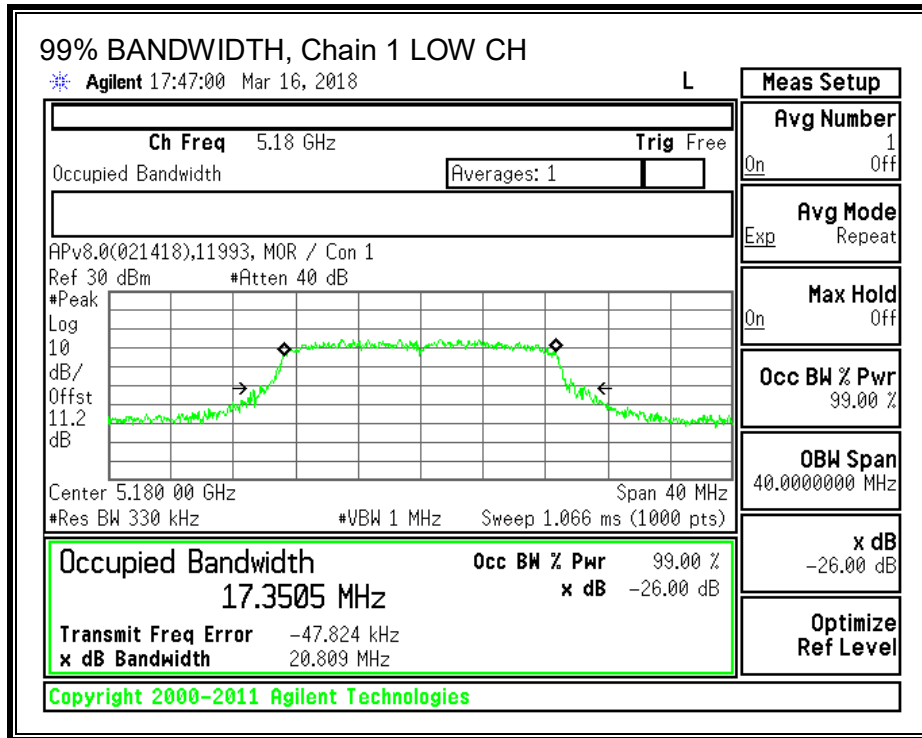
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5180	17.4111	17.3505
Mid	5200	17.2882	17.3918
High	5240	17.4855	17.5090

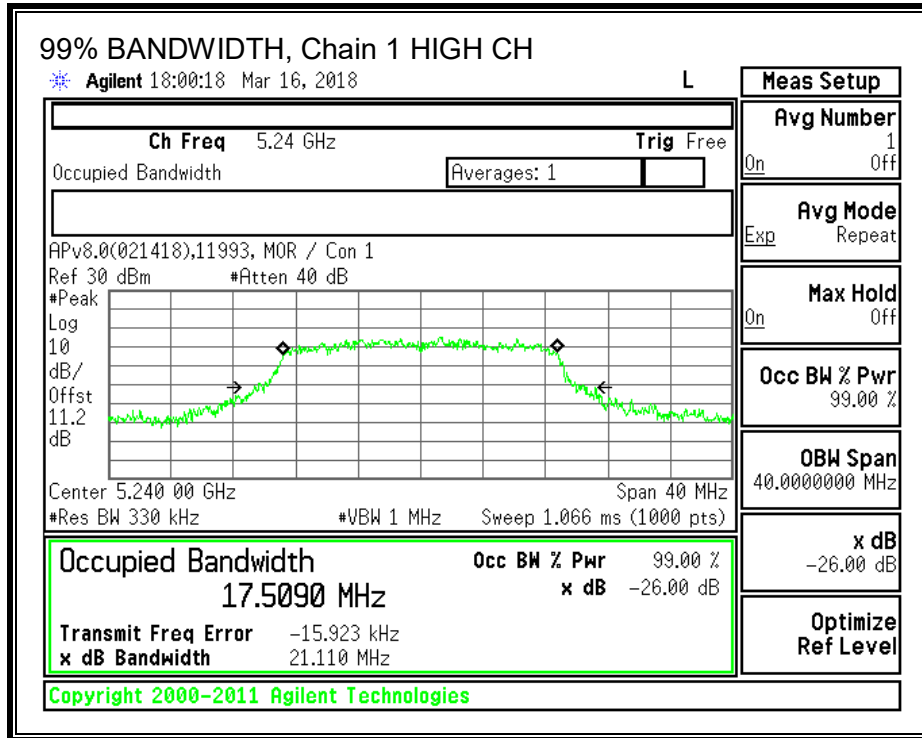
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.3.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Test Date: 2018-03-24 and 2018-05-03
Project: 12053557
Tested By: 11993/46722, 46722, 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	2.16	5.17	24.00	11.00
Mid	5200	2.16	5.17	24.00	11.00
High	5240	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.33	14.14	17.25	24.00	-6.75
Mid	5200	14.26	14.12	17.20	24.00	-6.80
High	5240	14.25	14.07	17.17	24.00	-6.83

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.227	0.647	7.23	11.00	-3.77
Mid	5200	1.242	0.387	7.12	11.00	-3.88
High	5240	1.360	0.628	7.29	11.00	-3.71

RESULTS (FCC) MCS7

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5180	2.16	24.00
Mid	5200	2.16	24.00
High	5240	2.16	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.26	10.23	13.79	24.00	-10.21
Mid	5200	11.21	10.20	13.74	24.00	-10.26
High	5240	11.37	10.17	13.82	24.00	-10.18

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	2.16	5.17	17.35	22.39	10.00
Mid	5200	2.16	5.17	17.29	22.38	10.00
High	5240	2.16	5.17	17.49	22.43	10.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	11.26	11.14	16.37	22.39	-6.02
Mid	5200	11.28	11.08	16.35	22.38	-6.03
High	5240	11.25	11.06	16.33	22.43	-6.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5180	-3.878	-3.419	7.81	10.00	-2.19
Mid	5200	-2.473	-4.029	8.27	10.00	-1.73
High	5240	-2.154	-3.926	8.50	10.00	-1.50

RESULTS (ISED) MCS7

Antenna Gain and Limits

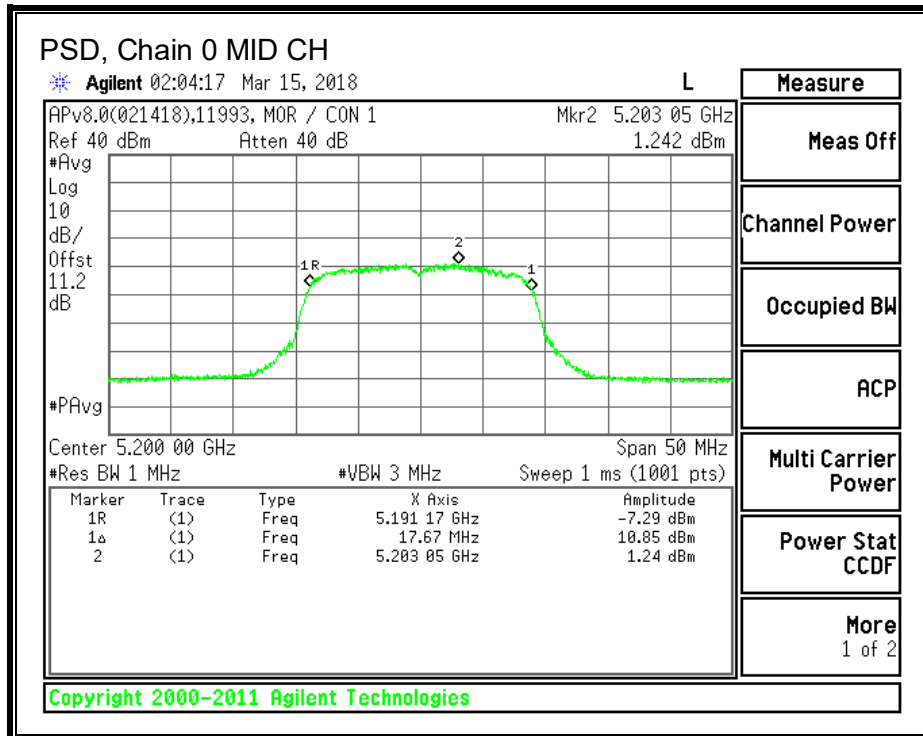
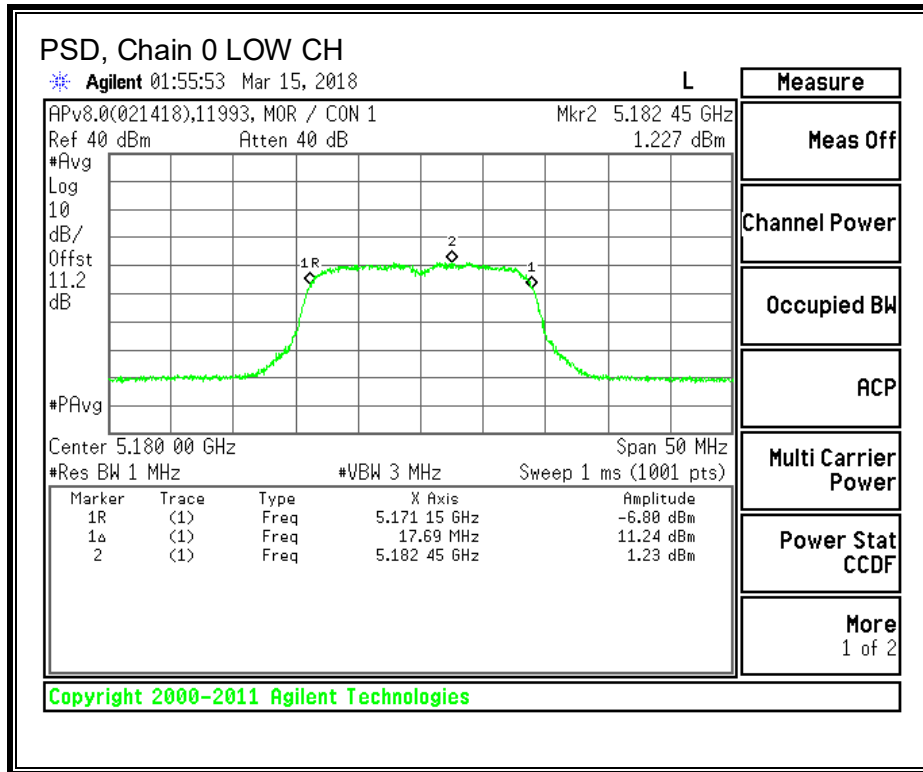
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)
Low	5180	2.16	17.35	22.39
Mid	5200	2.16	17.29	22.38
High	5240	2.16	17.49	22.43

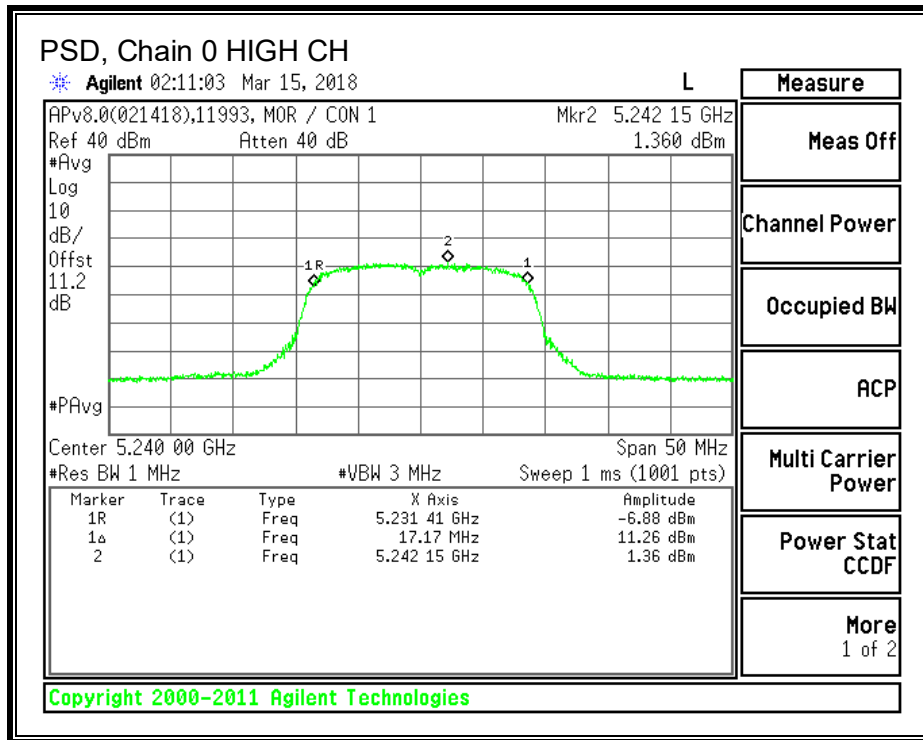
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	11.26	10.23	15.95	22.39	-6.45
Mid	5200	11.21	10.20	15.90	22.38	-6.47
High	5240	11.37	10.17	15.98	22.43	-6.45

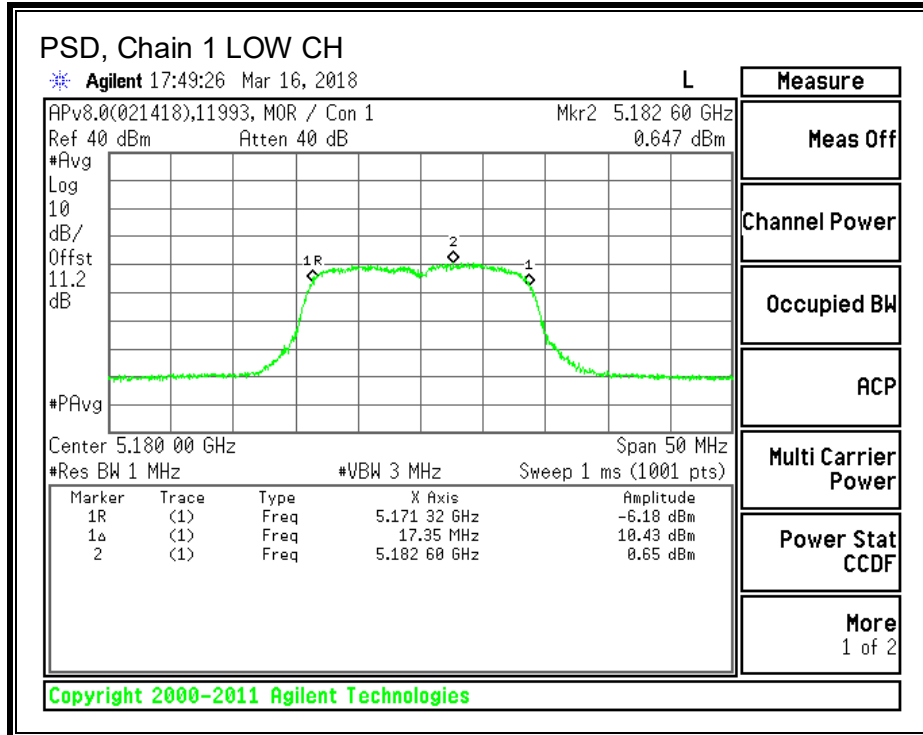
Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

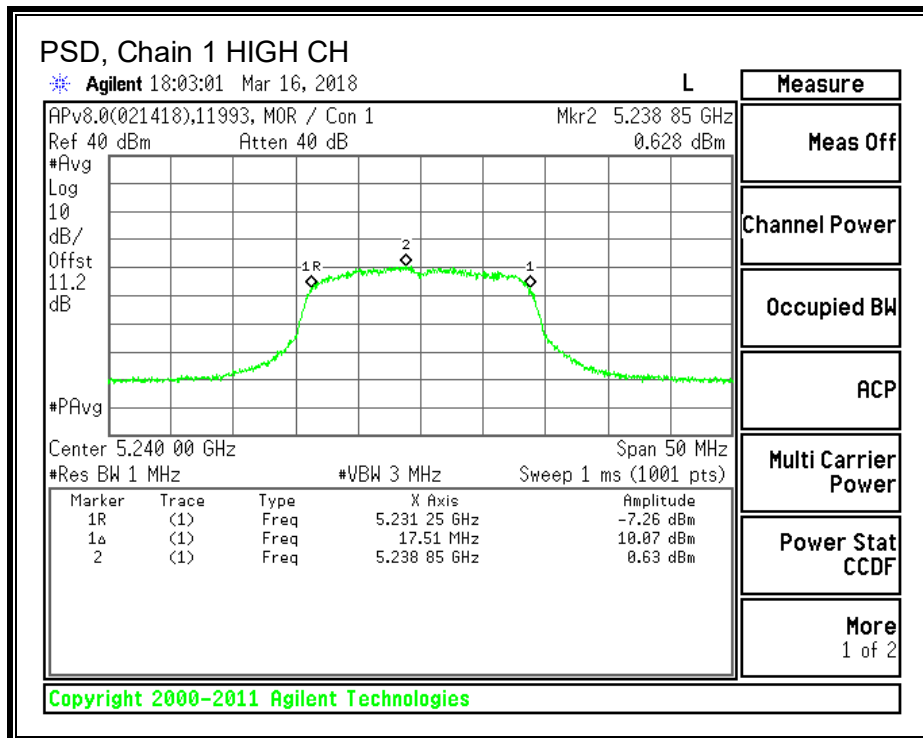
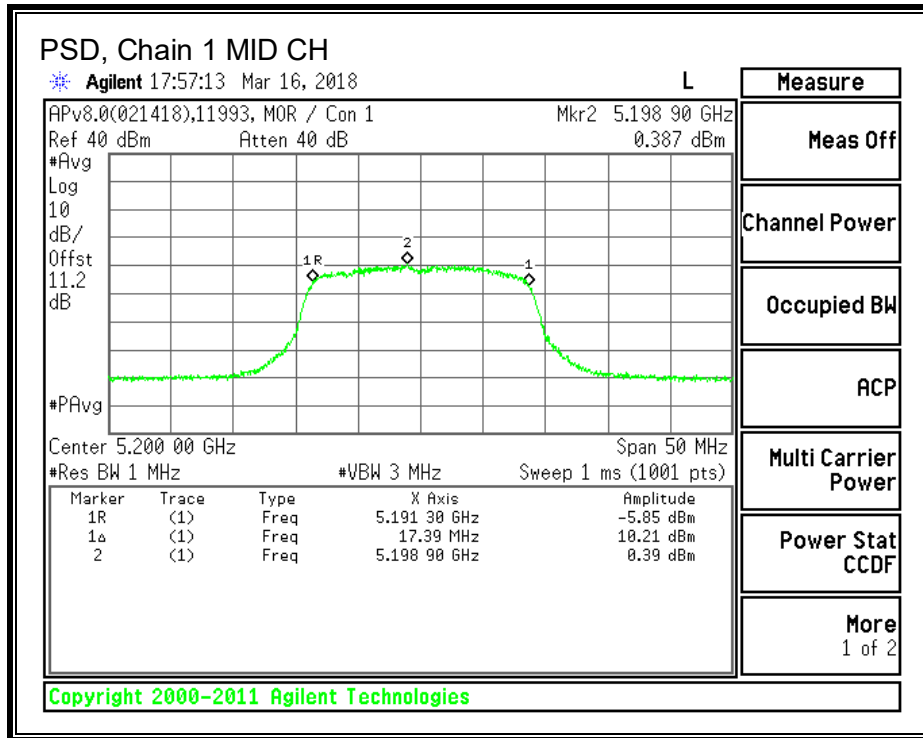
FCC PSD, Chain 0



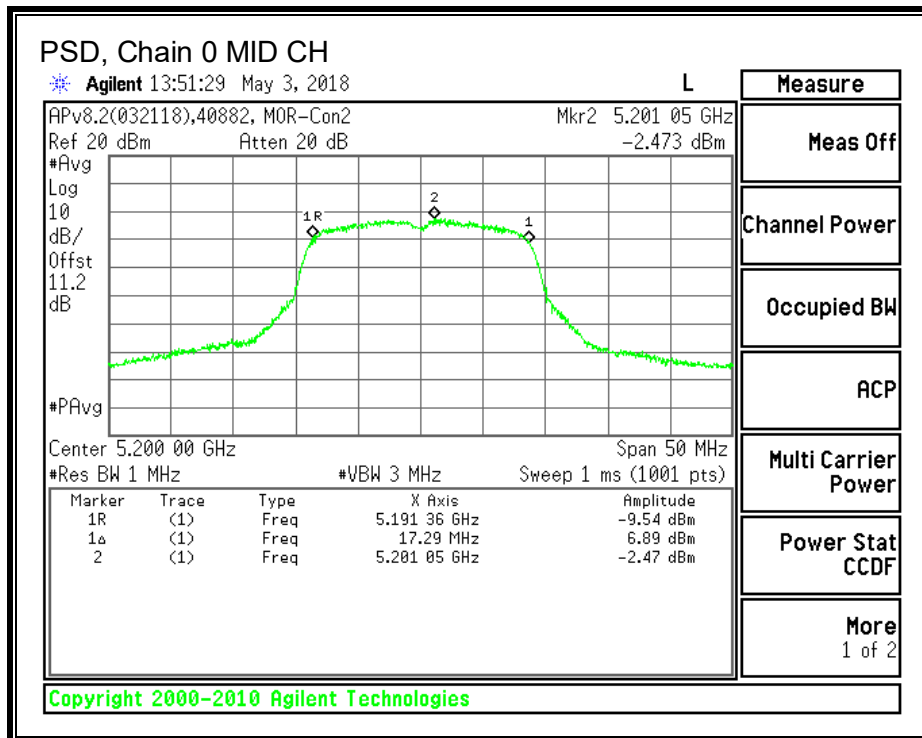
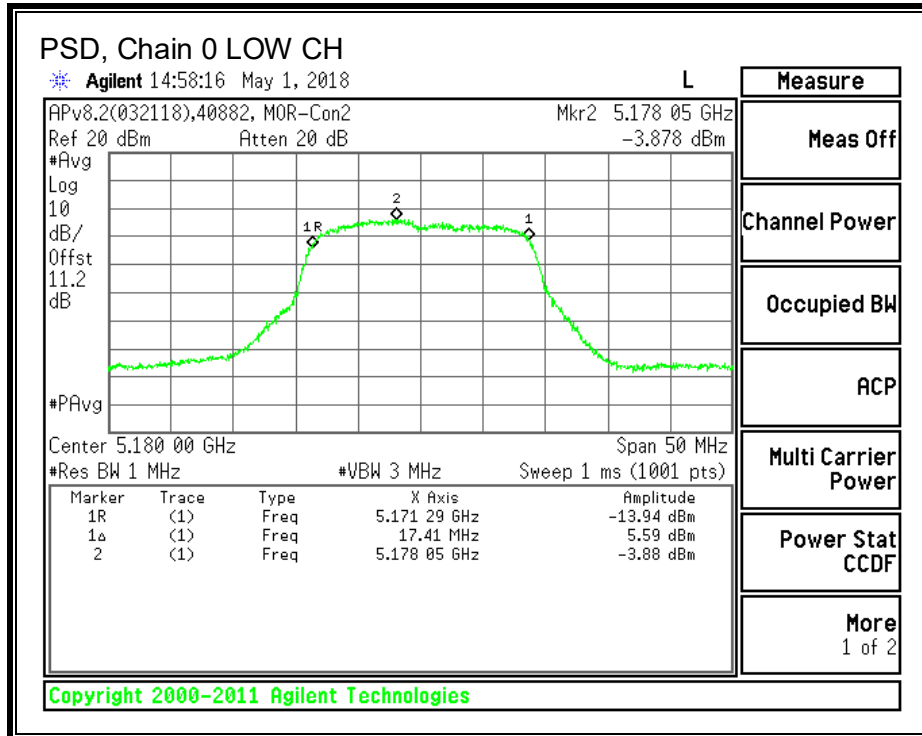


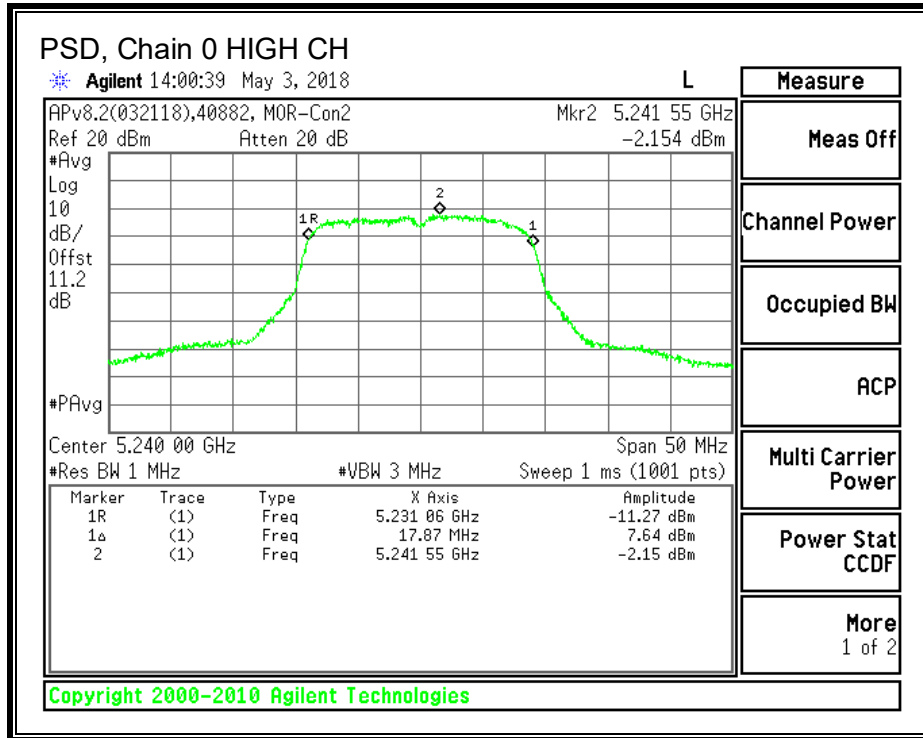
FCC PSD, Chain 1



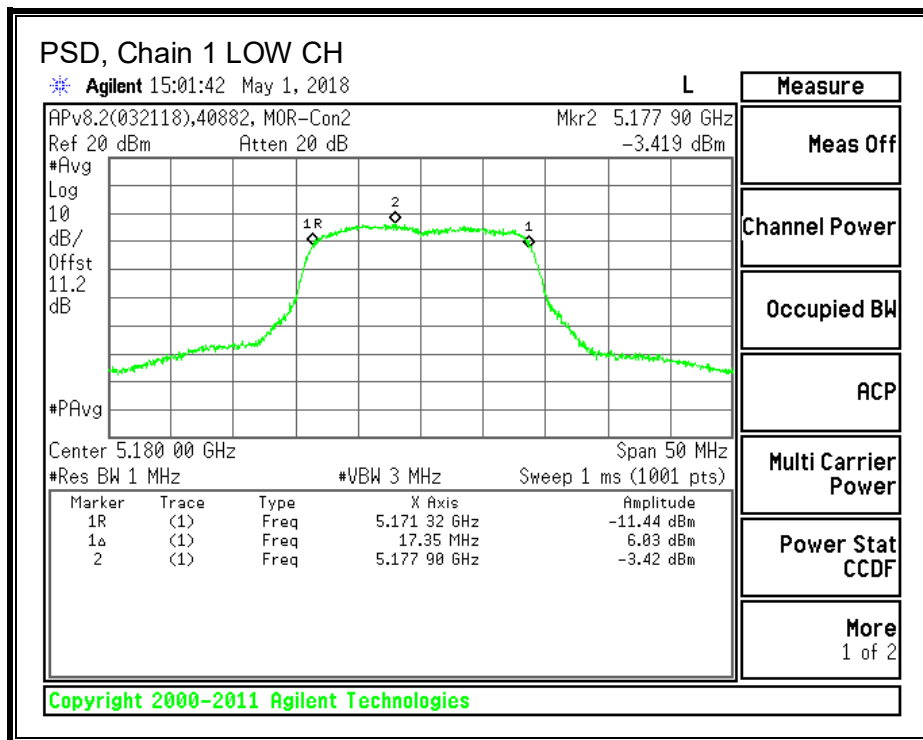


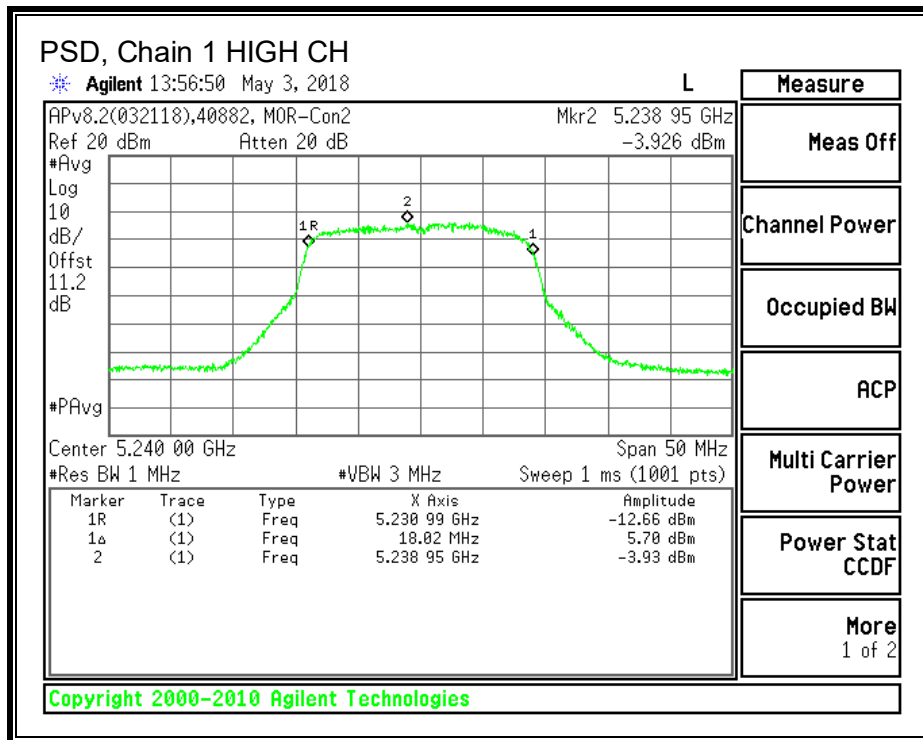
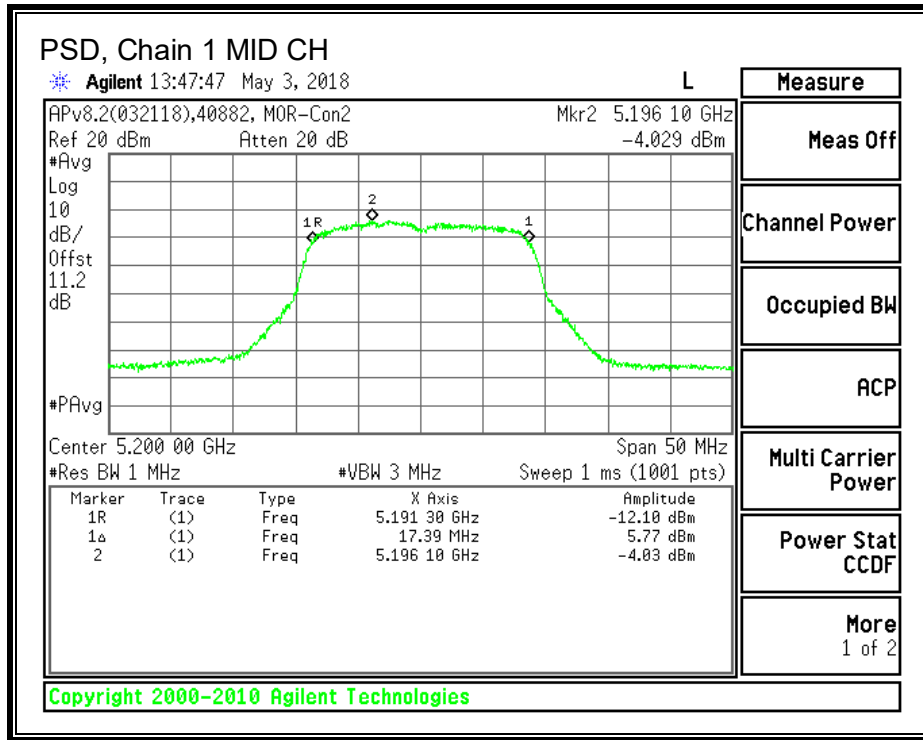
ISED PSD, Chain 0





ISED PSD, Chain 1





8.3.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Date: 2018-03-15 to 2018-05-03

Project: 12053557

Tested By: 11993/46722, 46726/46722, 40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5180	1.92	4.92	24.00	11.00
Mid	5200	1.92	4.92	24.00	11.00
High	5240	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.33	14.14	17.25	24.00	-6.75
Mid	5200	14.26	14.12	17.20	24.00	-6.80
High	5240	14.25	14.07	17.17	24.00	-6.83

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5180	1.23	0.65	7.23	11.00	-3.77
Mid	5200	1.24	0.39	7.12	11.00	-3.88
High	5240	1.36	0.63	7.29	11.00	-3.71

RESULTS (FCC) MCS7

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5180	1.92	24.00
Mid	5200	1.92	24.00
High	5240	1.92	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.26	10.23	13.79	24.00	-10.21
Mid	5200	11.21	10.20	13.74	24.00	-10.26
High	5240	11.37	10.17	13.82	24.00	-10.18

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	1.92	4.92	17.35	22.39	10.00
Mid	5200	1.92	4.92	17.29	22.38	10.00
High	5240	1.92	4.92	17.49	22.43	10.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	11.26	11.14	16.13	22.39	-6.26
Mid	5200	11.28	11.08	16.11	22.38	-6.27
High	5240	11.25	11.06	16.09	22.43	-6.34

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5180	-3.88	-3.42	7.56	10.00	-2.44
Mid	5200	-2.47	-4.03	8.02	10.00	-1.98
High	5240	-2.15	-3.93	8.25	10.00	-1.75

RESULTS (ISED) MCS7

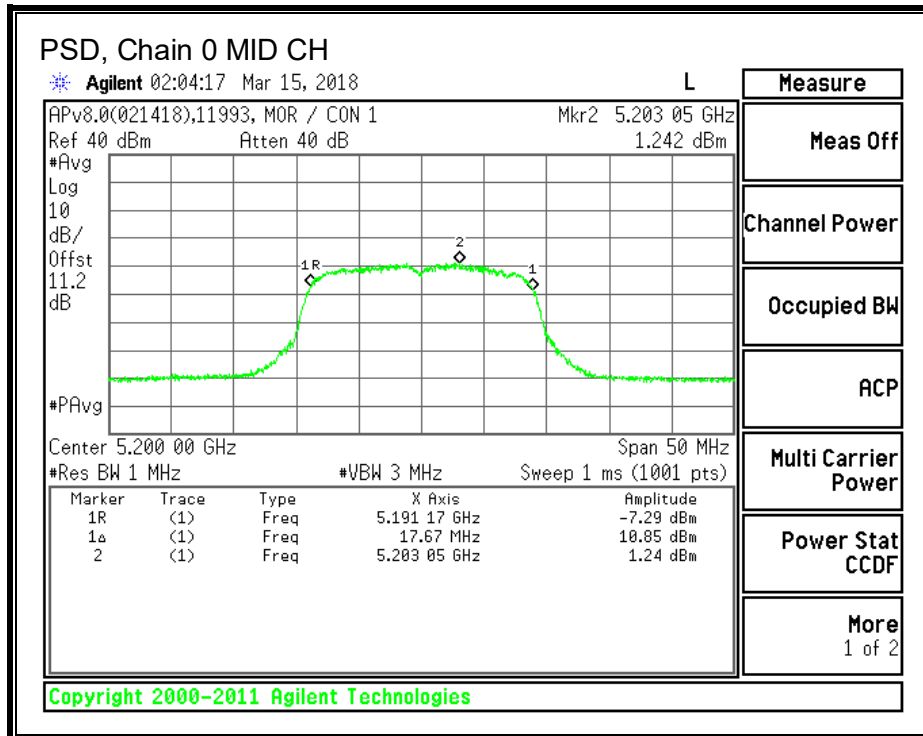
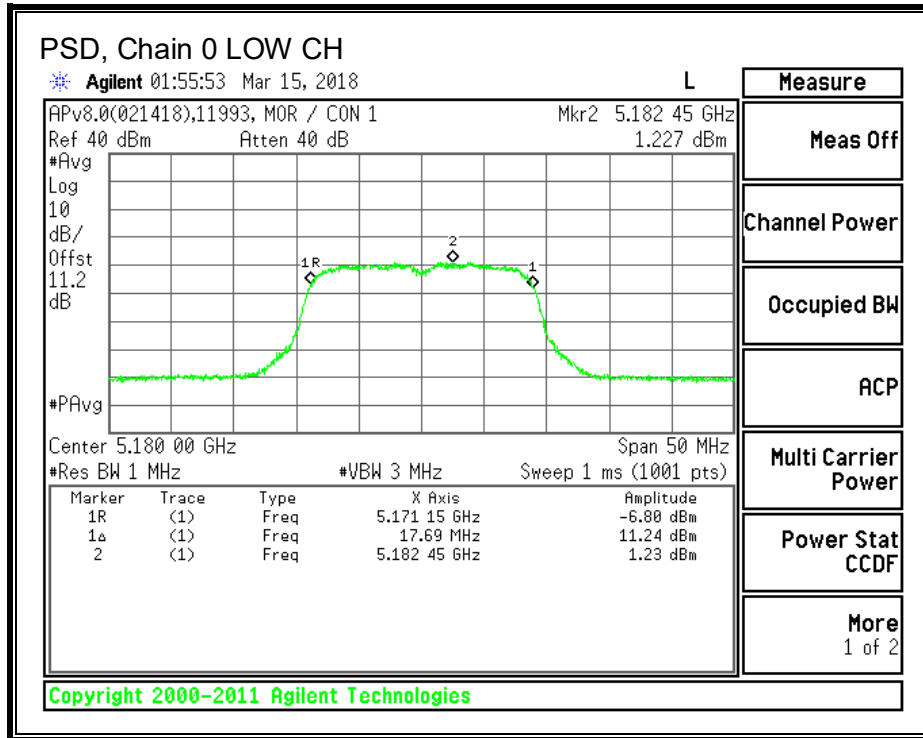
Antenna Gain and Limits

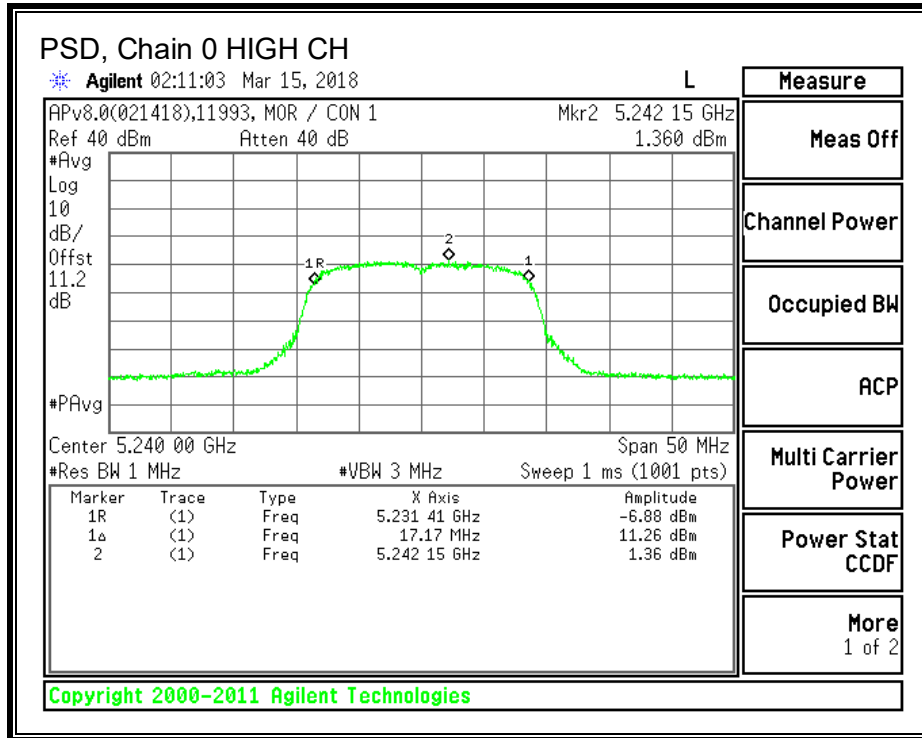
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5180	1.92	17.35	22.39	10.00
Mid	5200	1.92	17.29	22.38	10.00
High	5240	1.92	17.49	22.43	10.00

Output Power Results

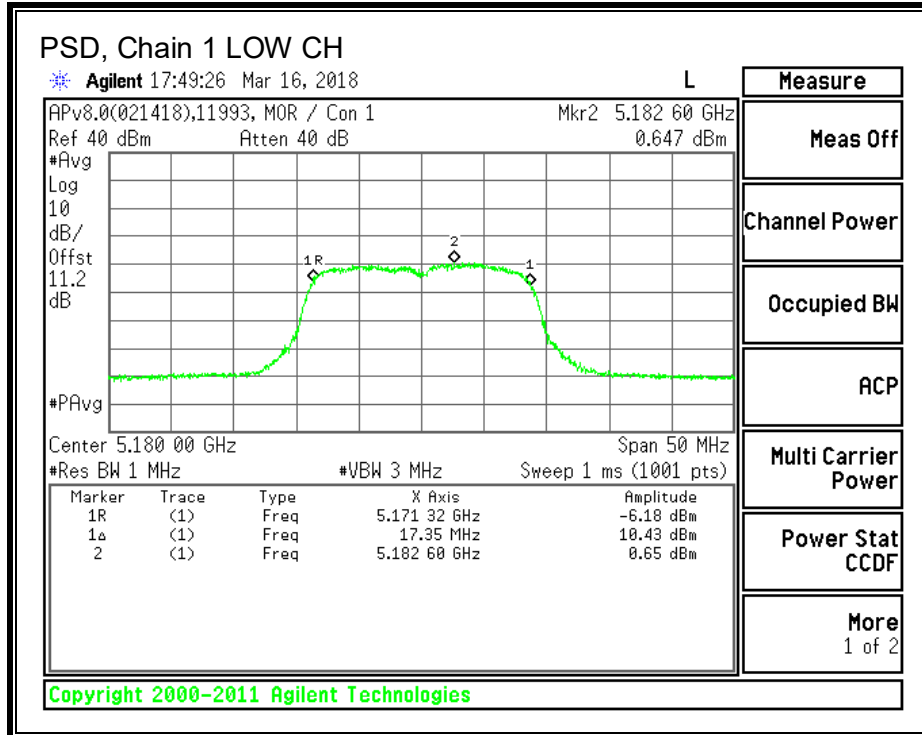
Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5180	11.26	10.23	15.71	22.39	-6.69
Mid	5200	11.21	10.20	15.66	22.38	-6.71
High	5240	11.37	10.17	15.74	22.43	-6.69

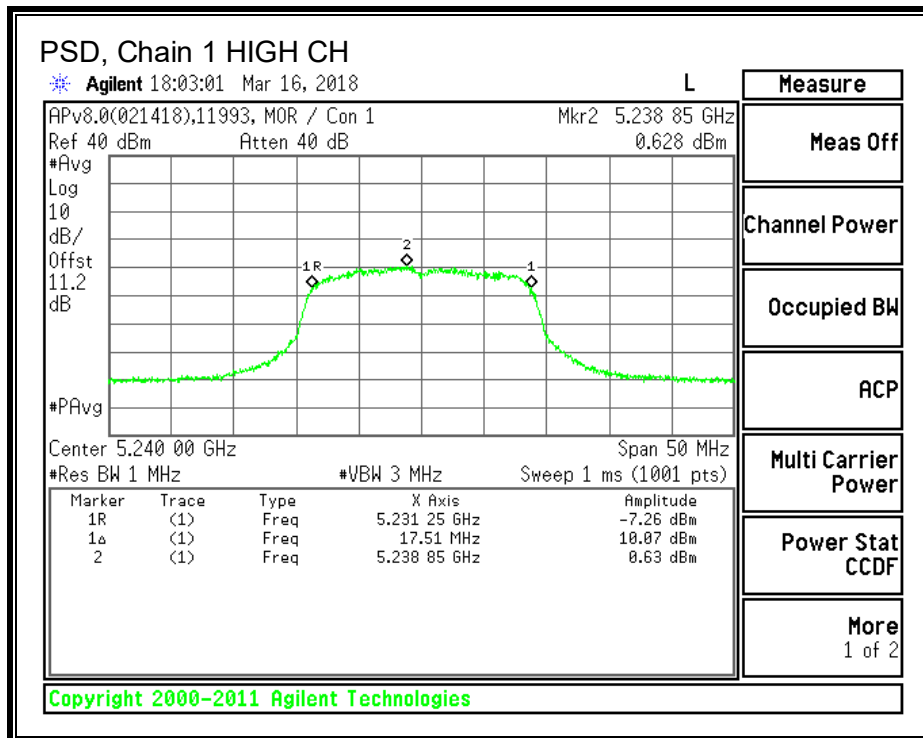
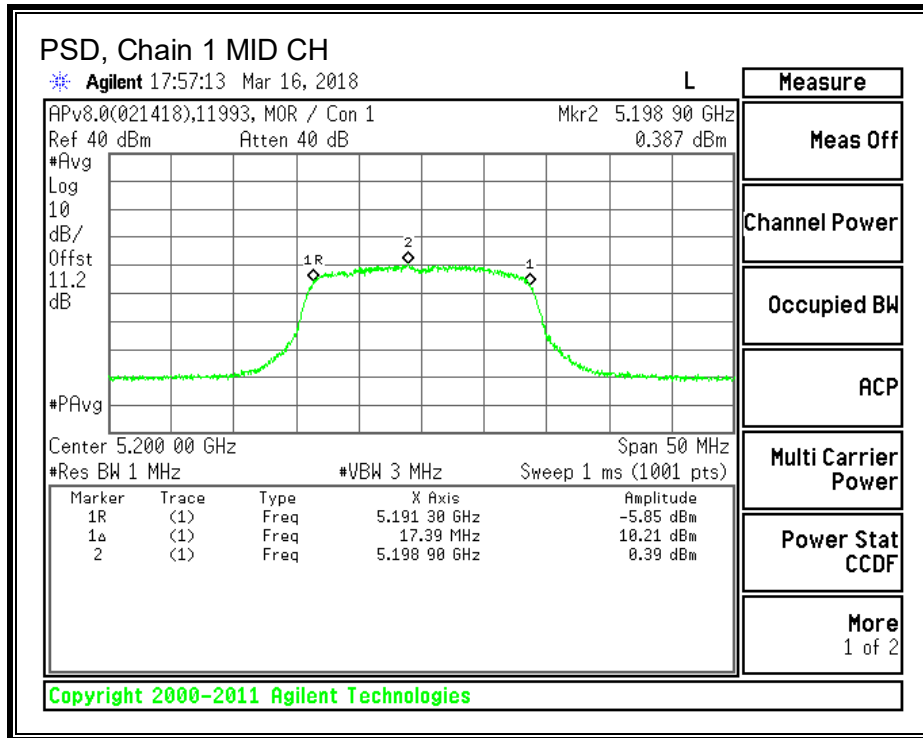
FCC PSD, Chain 0



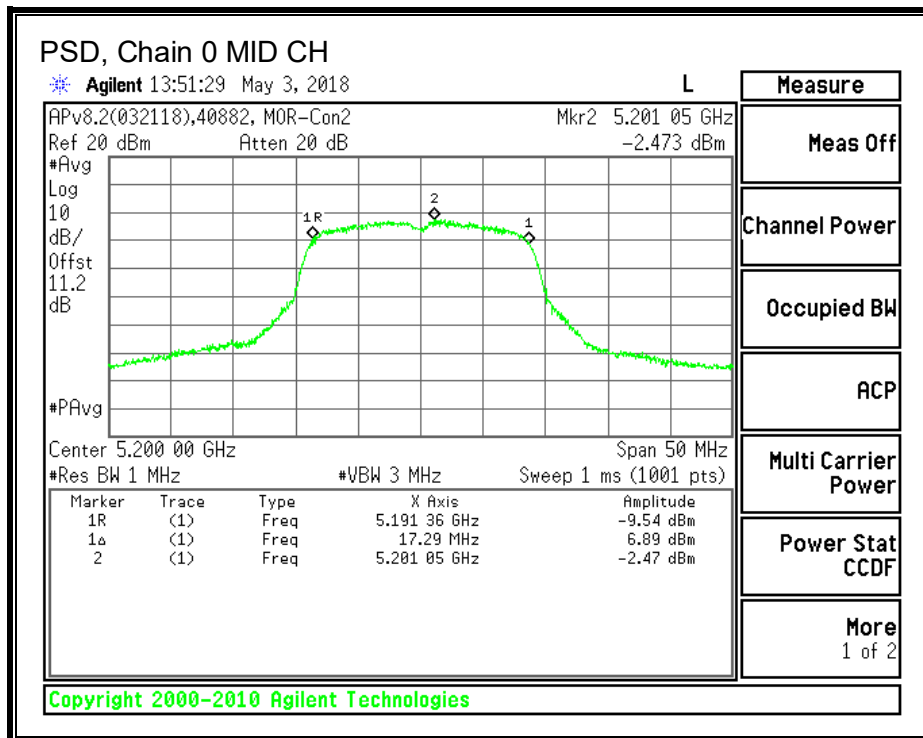
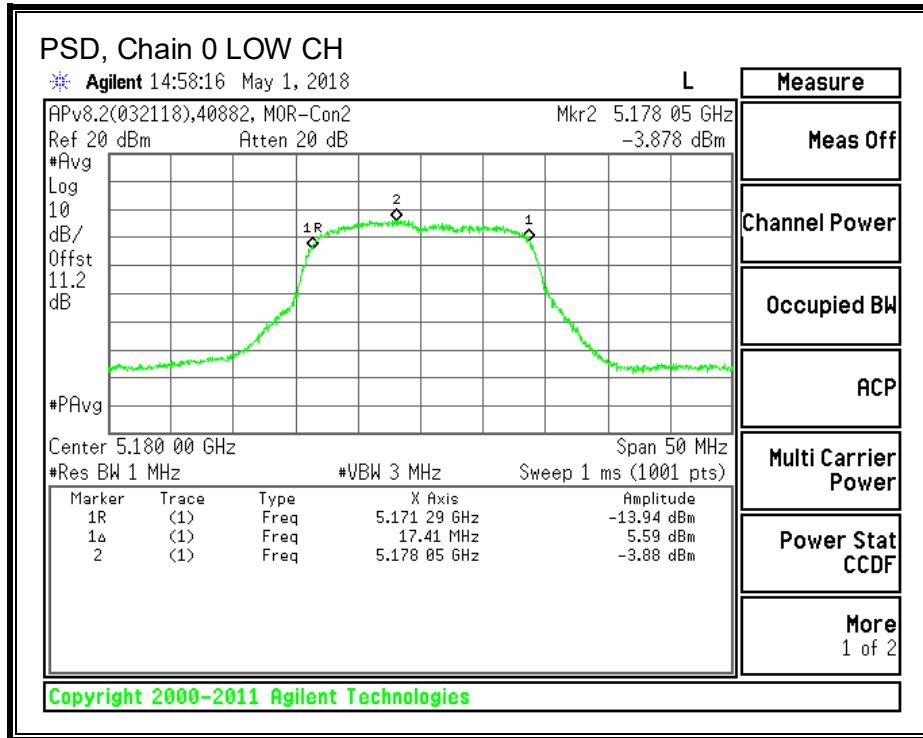


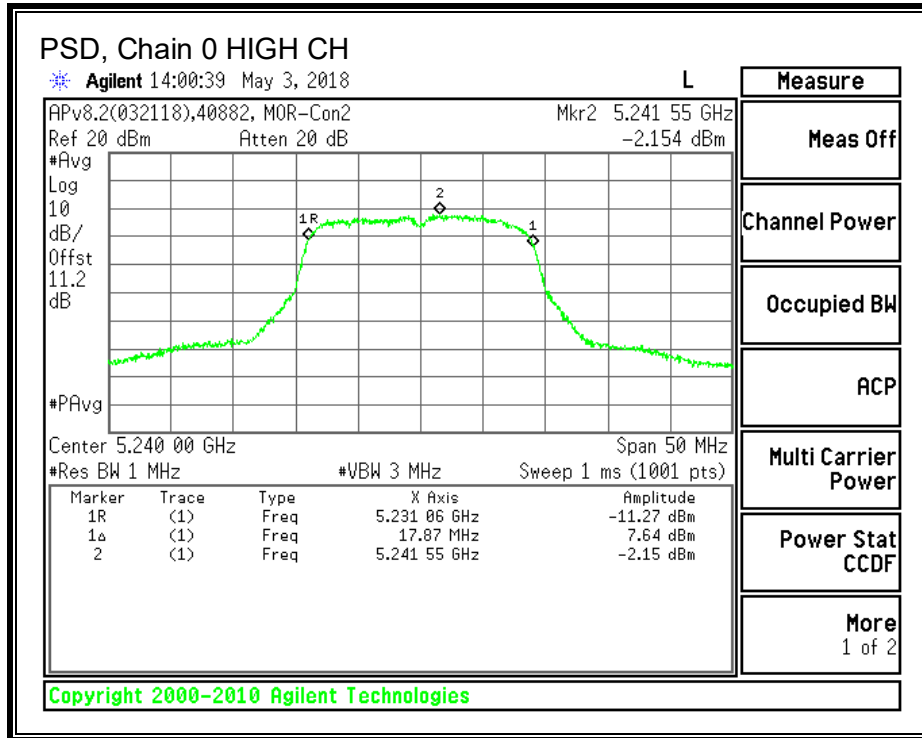
FCC PSD, Chain 1



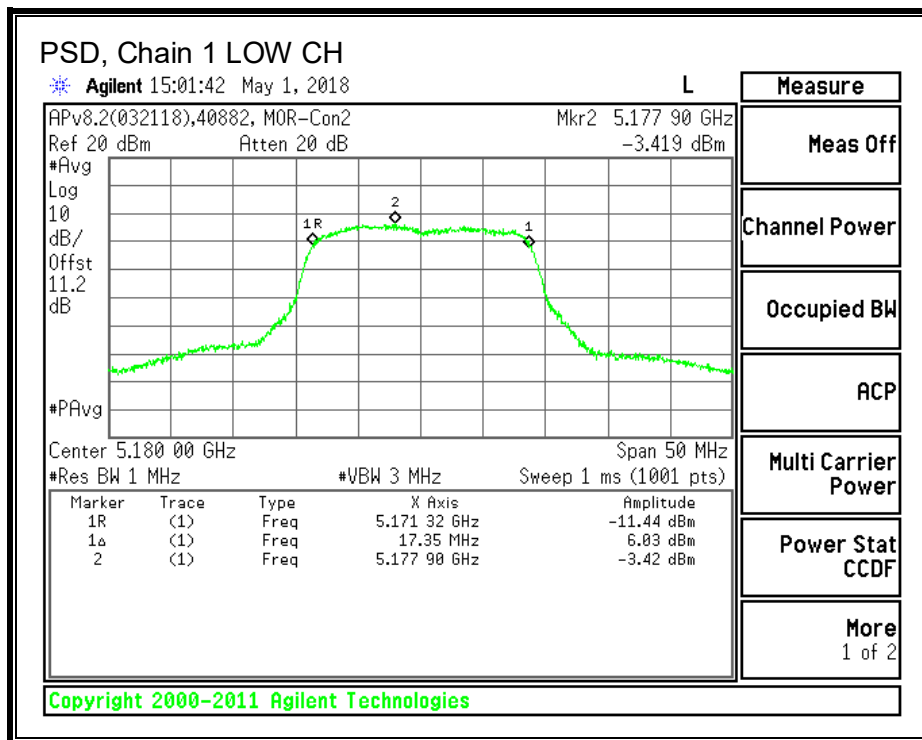


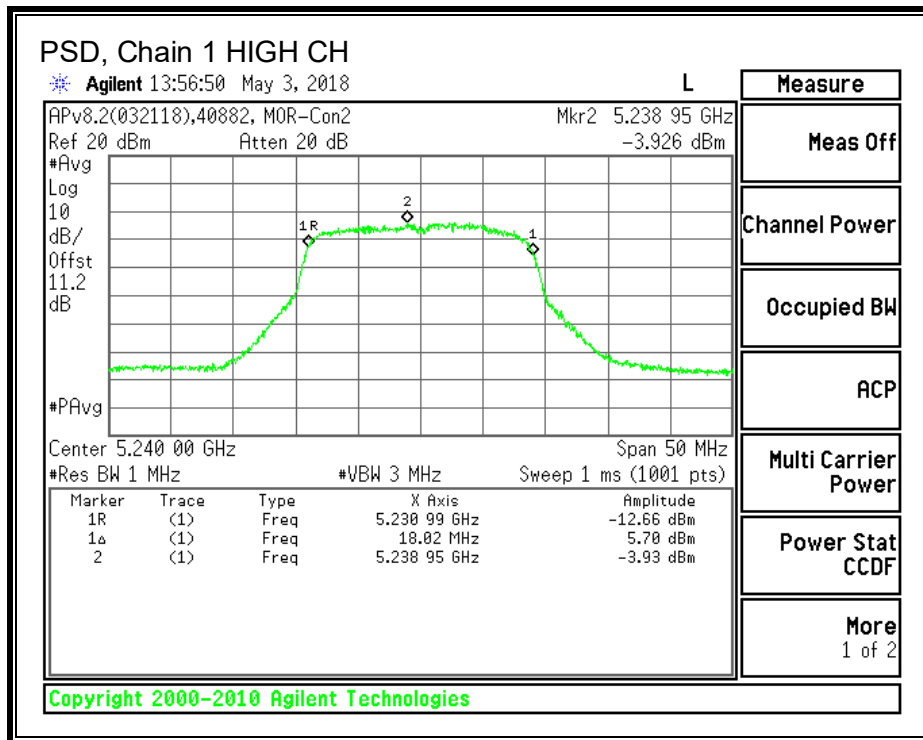
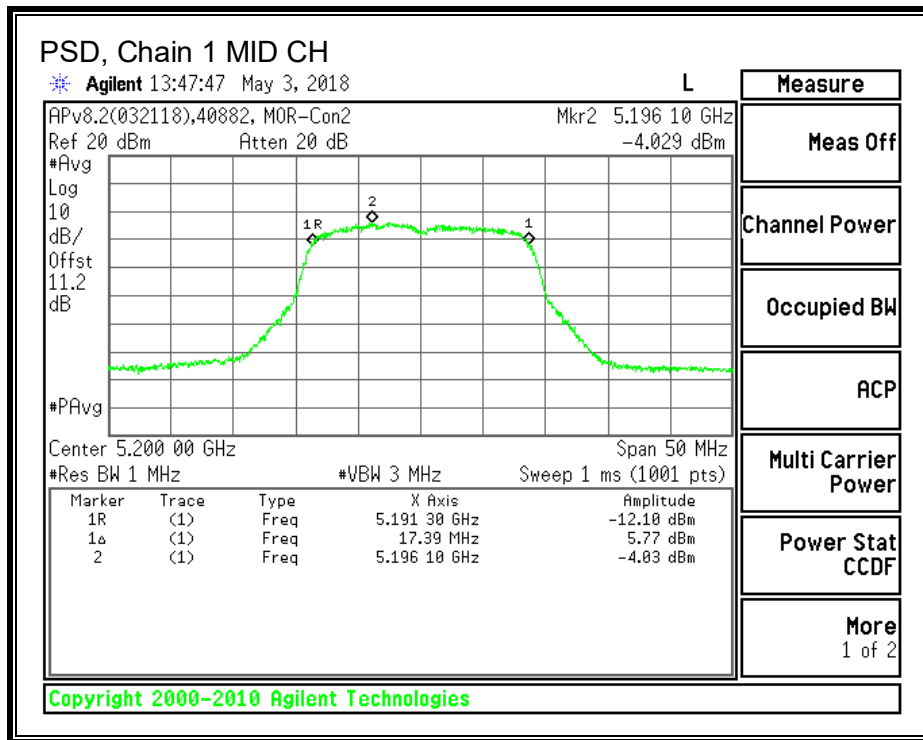
ISED PSD, Chain 0





ISED PSD, Chain 1





8.4. 802.11n HT40 MODE IN THE 5.2 GHz BAND

8.4.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

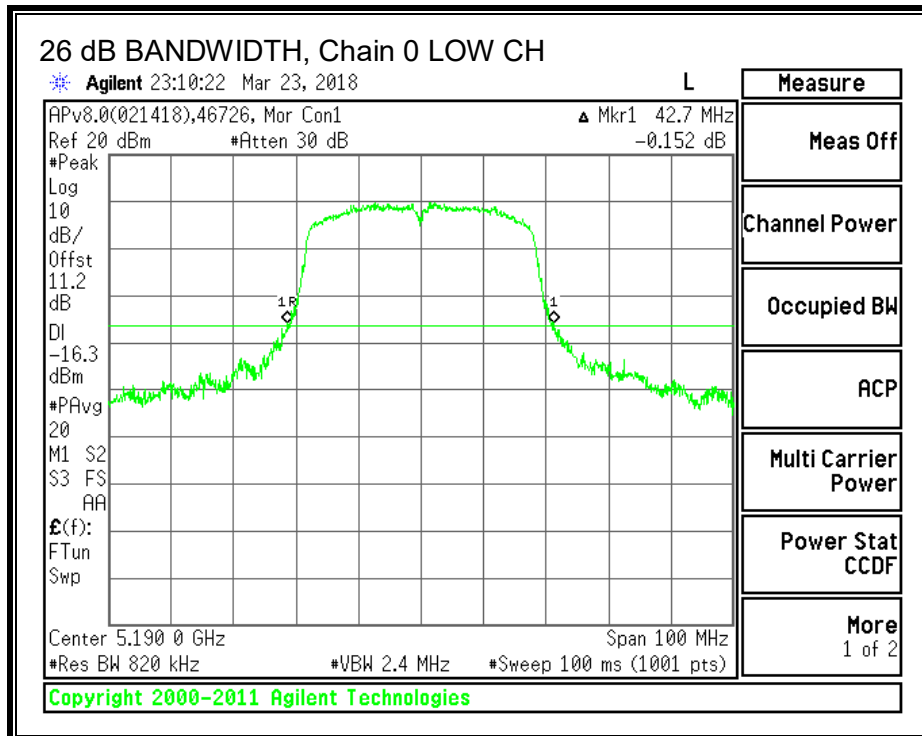
RESULTS

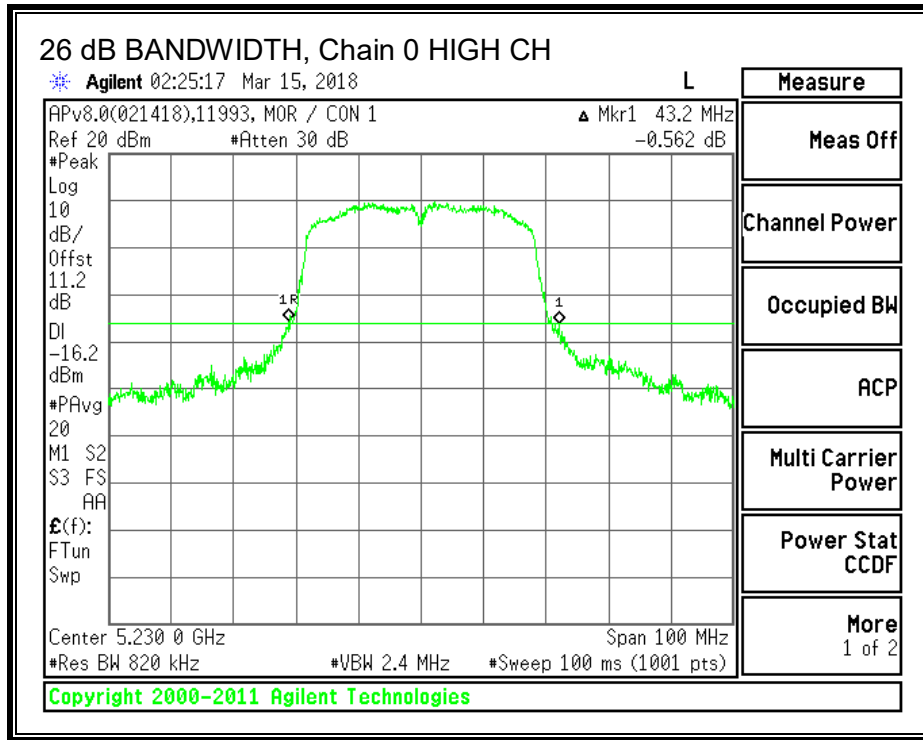
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5190	42.70	42.00
High	5230	43.20	45.70

TEST INFORMATION

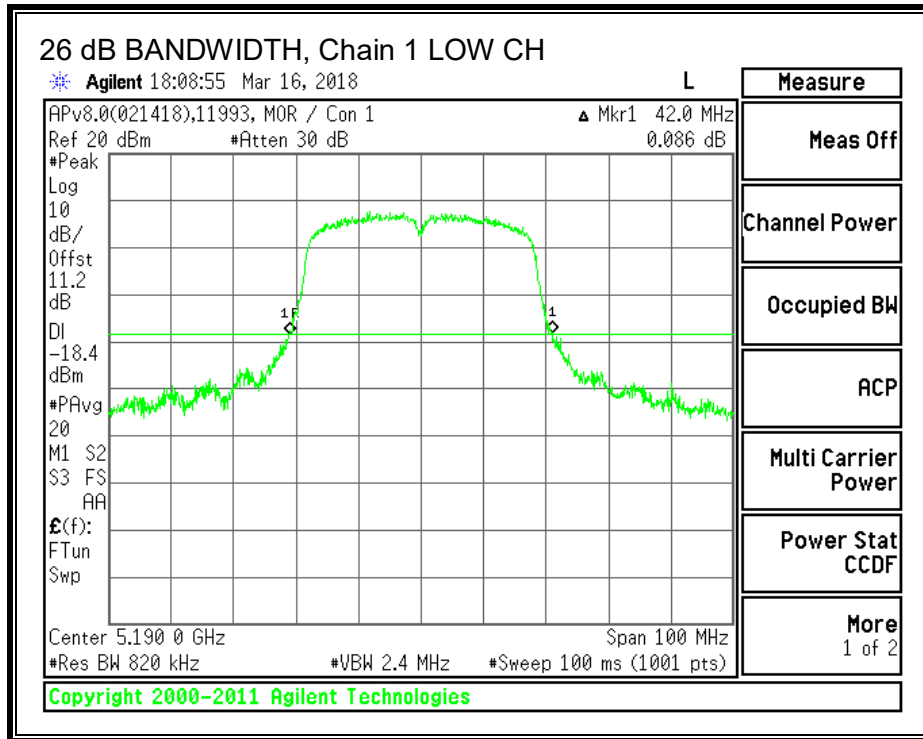
Date: 2018-03-15 to 2018-03-23
 Project: 12053557
 Tested By: 11993/46722

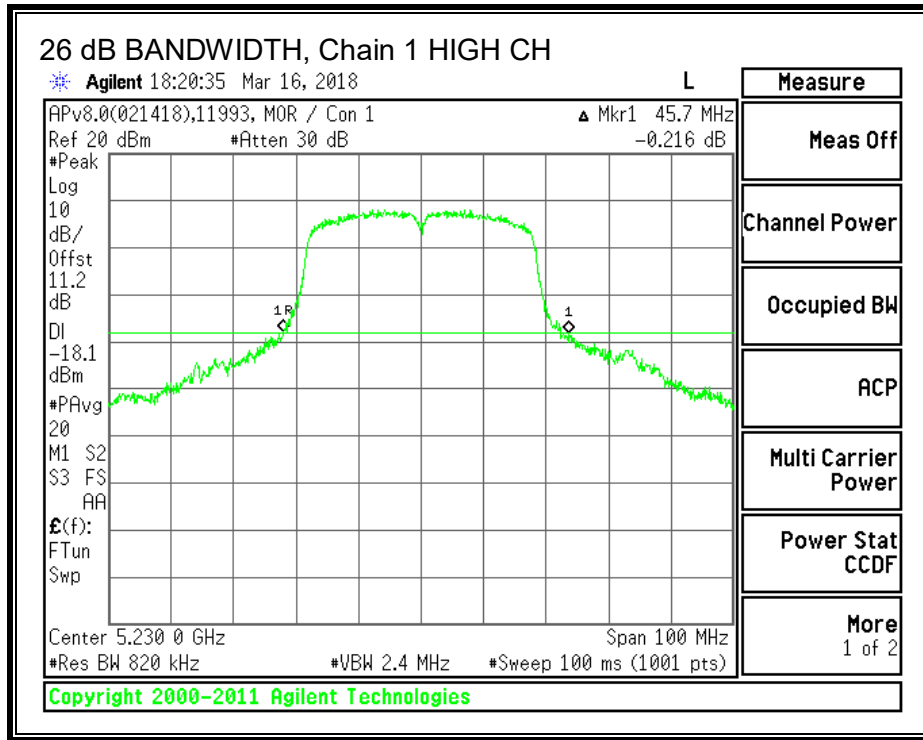
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

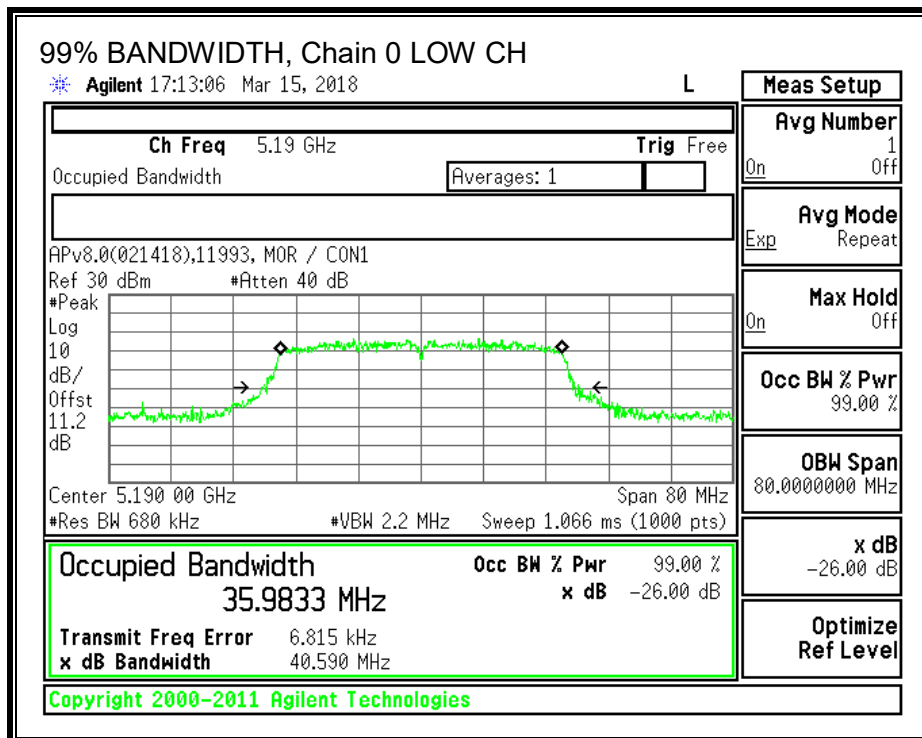
RESULTS

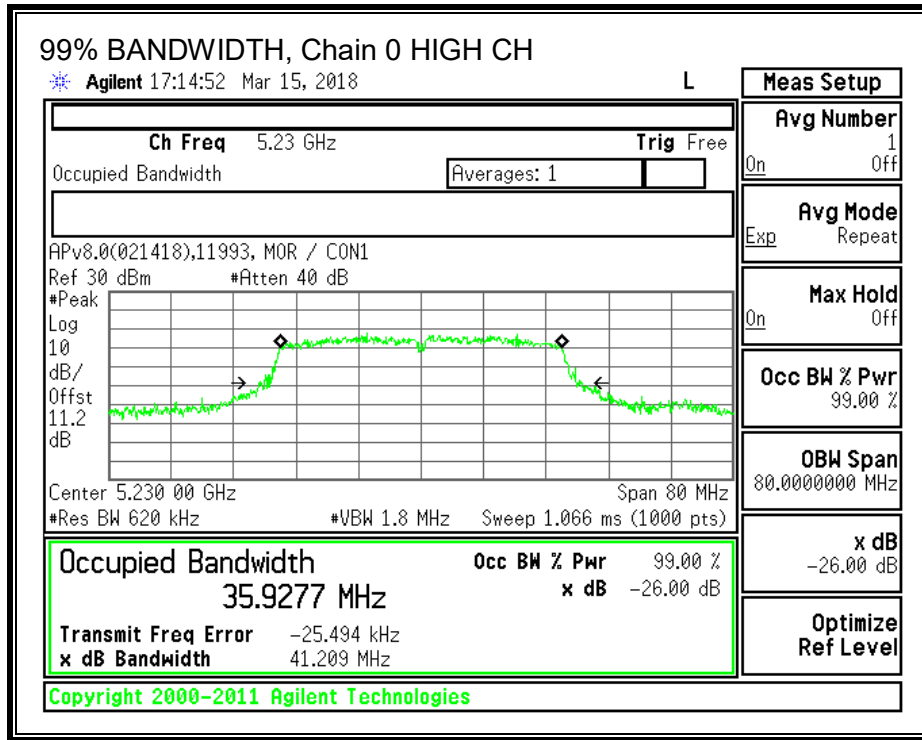
Channel	Frequency (MHz)	99% BW	99% BW
		Chain 0 (MHz)	Chain 1 (MHz)
Low	5190	35.9833	35.8553
High	5230	35.9277	36.0869

TEST INFORMATION

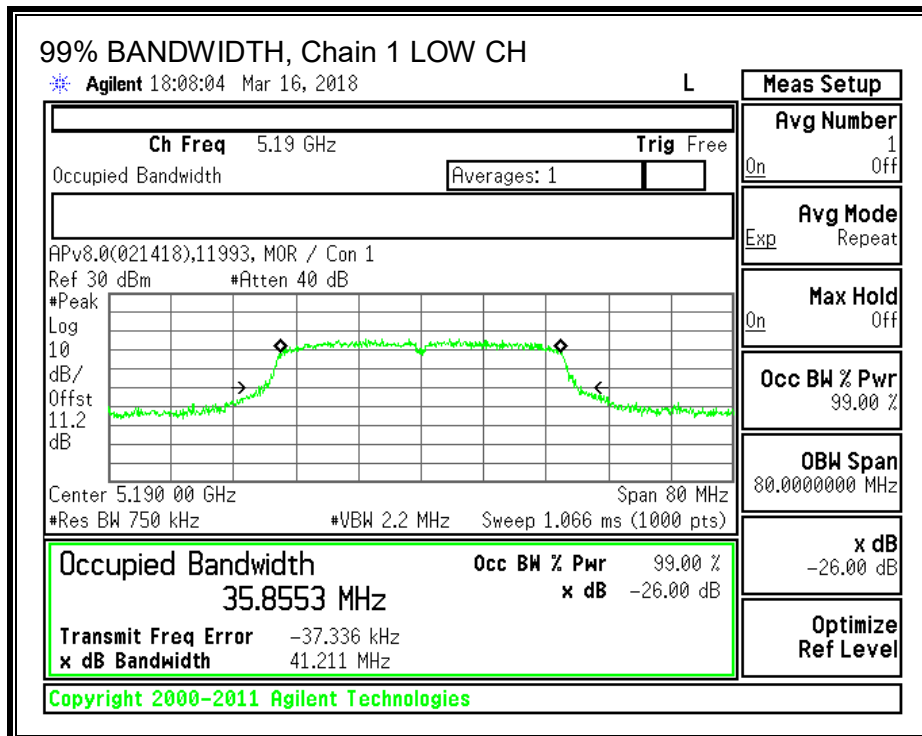
Date: 2018-03-15 to 2018-03-17
 Project: 12053557
 Tester: 11993/46722

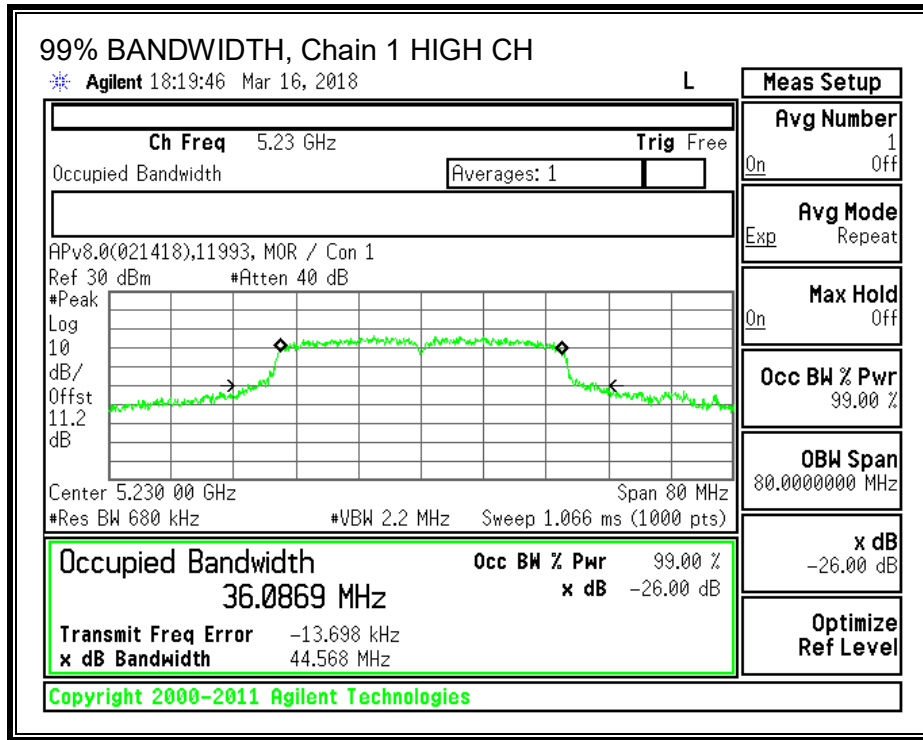
99% BANDWIDTH, Chain 0, MCS0





99% BANDWIDTH, Chain 1, MCS0





8.4.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-03
Project: 12053557
Tested By: 11993/46722, 46722, 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5190	2.16	5.17	24.00	11.00
High	5230	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.71	10.22	13.48	24.00	-10.52
High	5230	15.28	15.12	18.21	24.00	-5.79

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-5.58	-6.50	-0.49	11.00	-11.49
High	5230	-1.13	-2.07	3.96	11.00	-7.04

RESULTS (FCC) MCS7

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5190	2.16	24.00
High	5230	2.16	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.29	8.89	12.66	24.00	-11.34
High	5230	15.24	14.02	17.68	24.00	-6.32

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5190	2.16	5.17	35.85	23.00	10.00
High	5230	2.16	5.17	35.93	23.00	10.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5190	10.71	10.22	15.64	23.00	-7.36
High	5230	15.28	15.12	20.37	23.00	-2.63

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5190	-5.58	-6.50	4.69	10.00	-5.31
High	5230	-1.13	-2.07	9.13	10.00	-0.87

RESULTS (ISED) MCS7

Antenna Gain and Limits

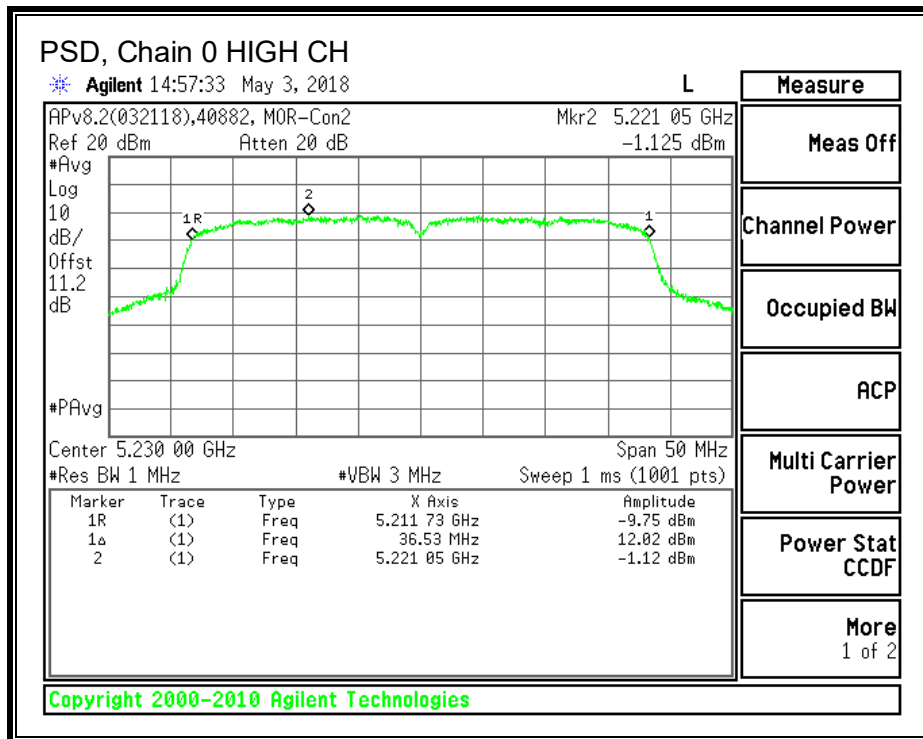
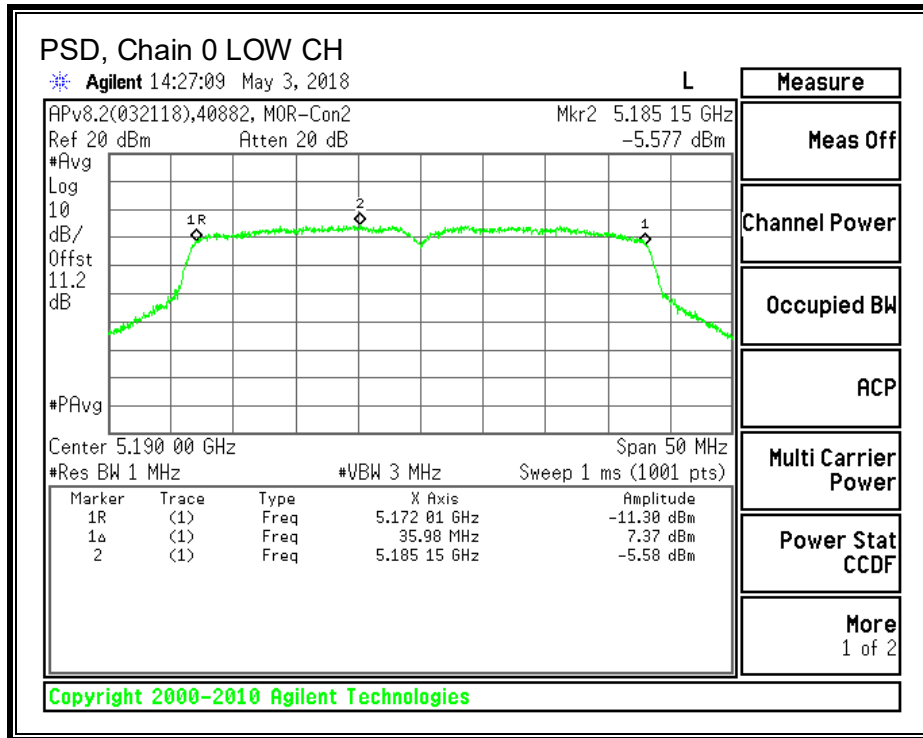
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)
Low	5190	2.16	35.85	23.00
High	5230	2.16	35.93	23.00

Output Power Results

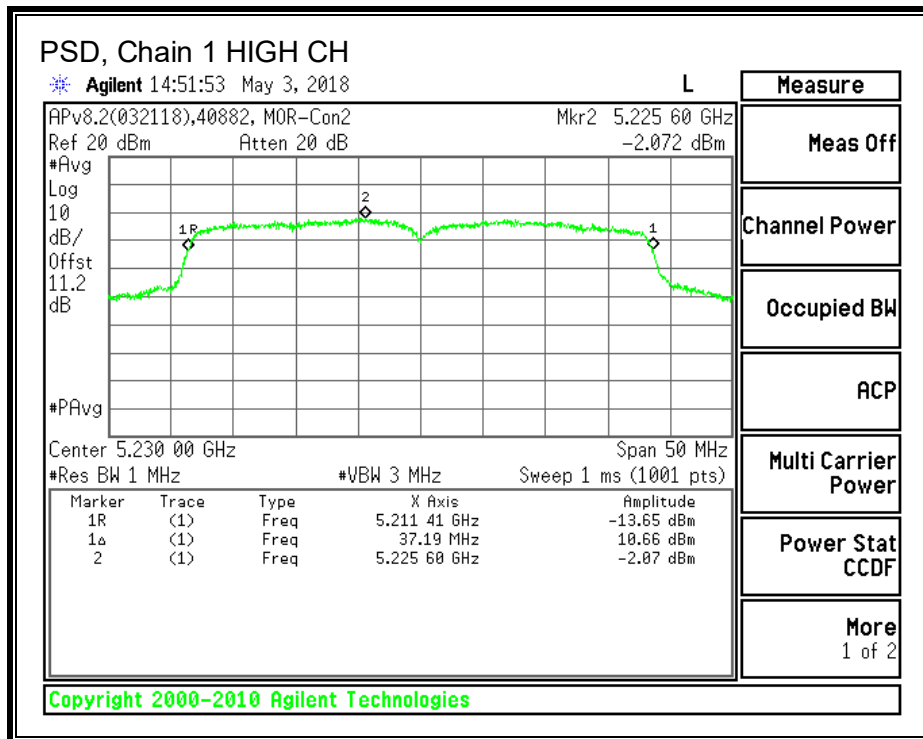
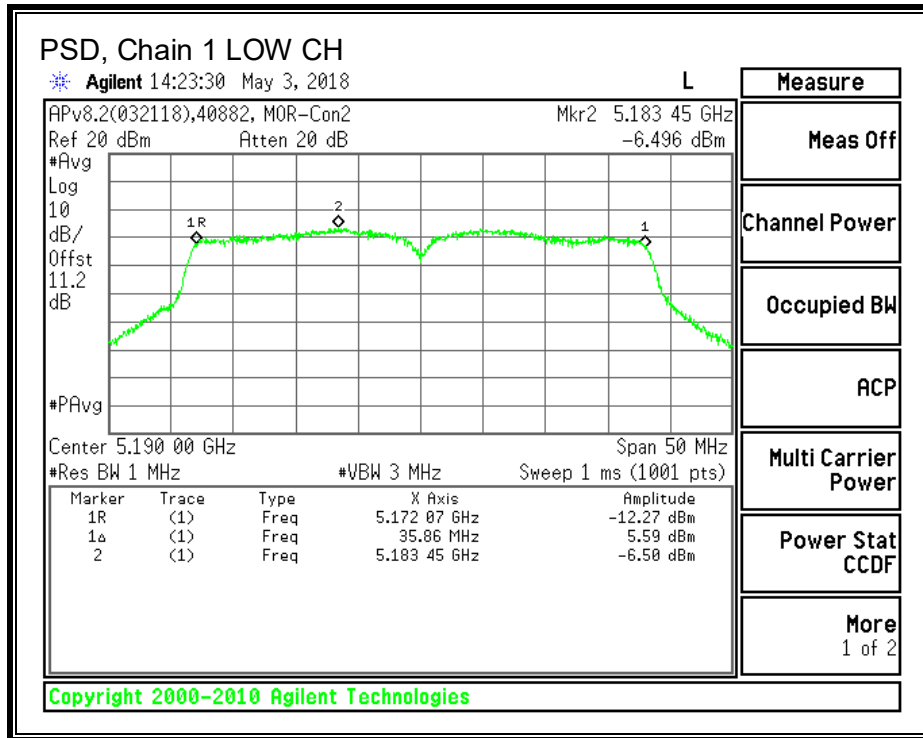
Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5190	10.29	8.89	14.82	23.00	-8.18
High	5230	15.24	14.02	19.84	23.00	-3.16

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

PSD, Chain 0



PSD, Chain 1



8.4.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-03
Project: 12053557
Tested By: 11993/46726 and 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5190	1.92	4.92	24.00	11.00
High	5230	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.71	10.22	13.48	24.00	-10.52
High	5230	15.28	15.12	18.21	24.00	-5.79

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5190	-5.58	-6.50	-0.49	11.00	-11.49
High	5230	-1.13	-2.07	3.96	11.00	-7.04

RESULTS (FCC) MCS7

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5190	1.92	24.00
High	5230	1.92	24.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.29	8.89	12.66	24.00	-11.34
High	5230	15.24	14.02	17.68	24.00	-6.32

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Low	5190	1.92	4.92	35.83	23.00	10.00
High	5230	1.92	4.92	35.93	23.00	10.00

Duty Cycle CF (dB)	2.52	Included in Calculations of PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5190	10.71	10.22	15.40	23.00	-7.60
High	5230	15.28	15.12	20.13	23.00	-2.87

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Low	5190	-5.58	-6.50	4.44	10.00	-5.56
High	5230	-1.13	-2.07	8.88	10.00	-1.12

RESULTS (ISED) MCS7

Antenna Gain and Limits

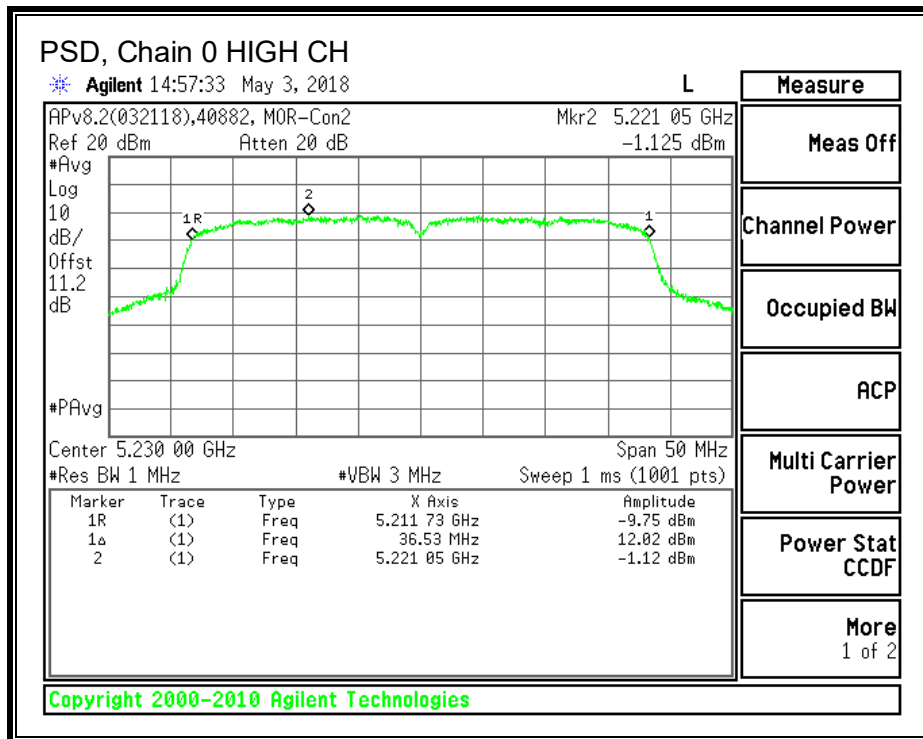
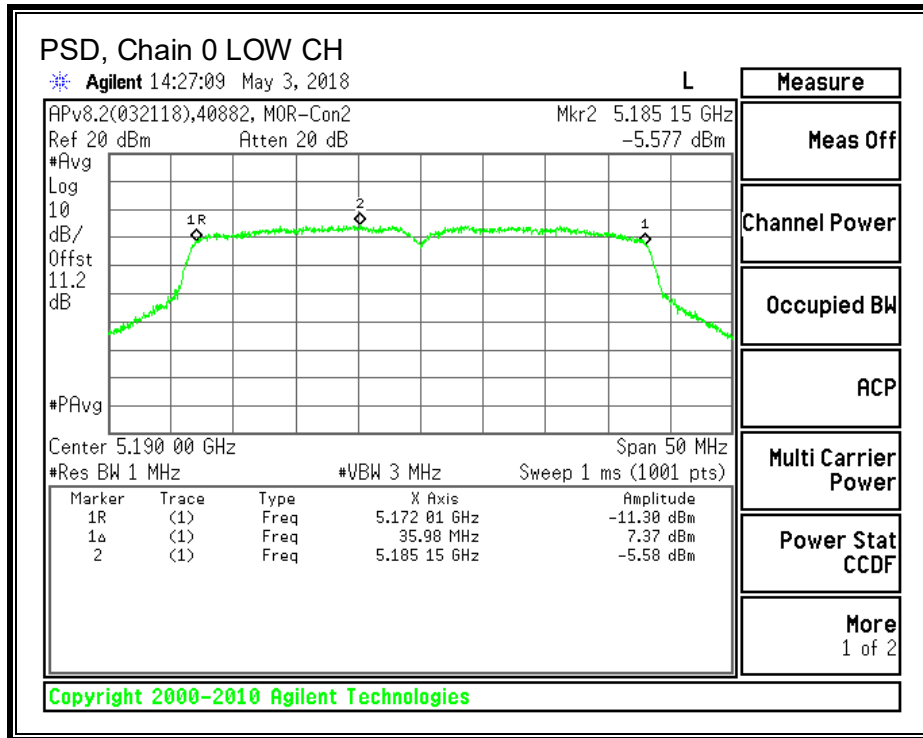
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Occupied 99% BW (MHz)	EIRP Limit (dBm)
Low	5190	1.92	35.83	23.00
High	5230	1.92	35.93	23.00

Output Power Results

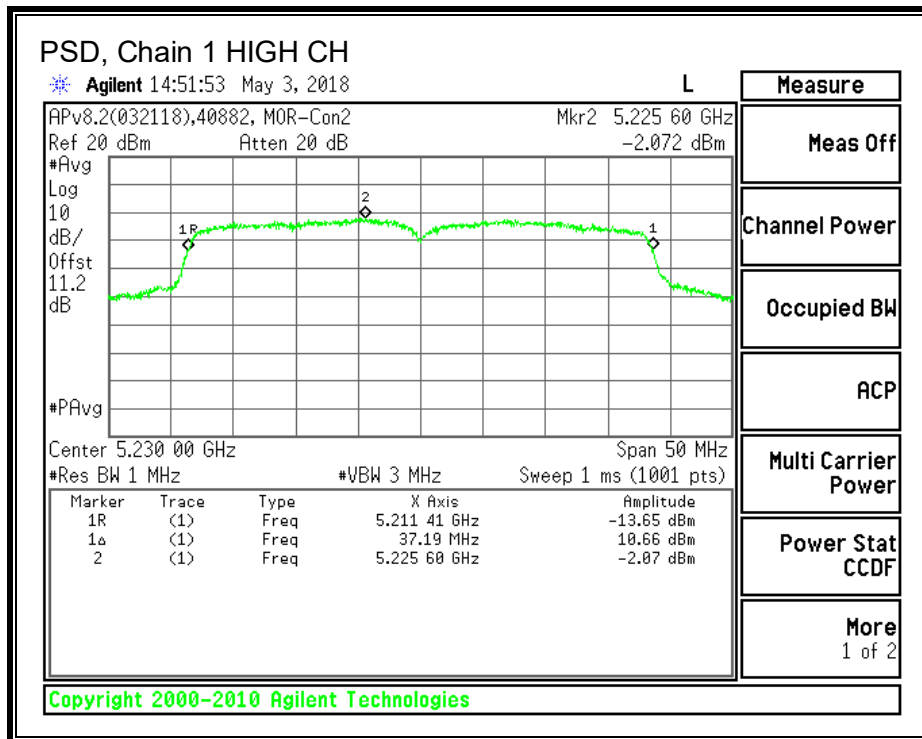
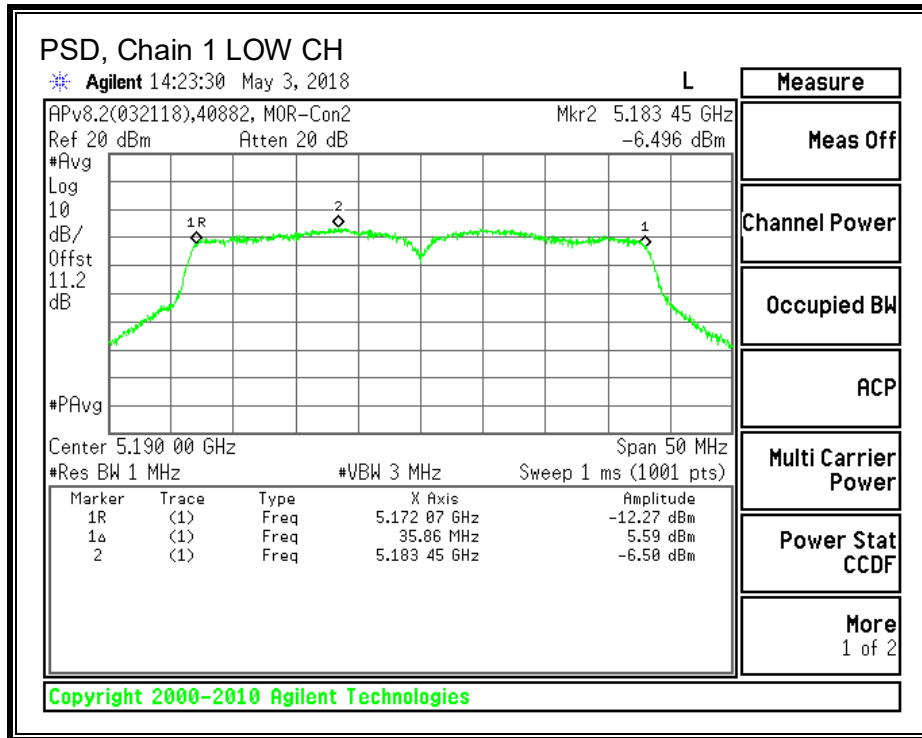
Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5190	10.29	8.89	14.58	23.00	-8.42
High	5230	15.24	14.02	19.60	23.00	-3.40

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

PSD, Chain 0



PSD, Chain 1



8.5.802.11ac VHT80 MODE IN THE 5.2 GHz BAND

8.5.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

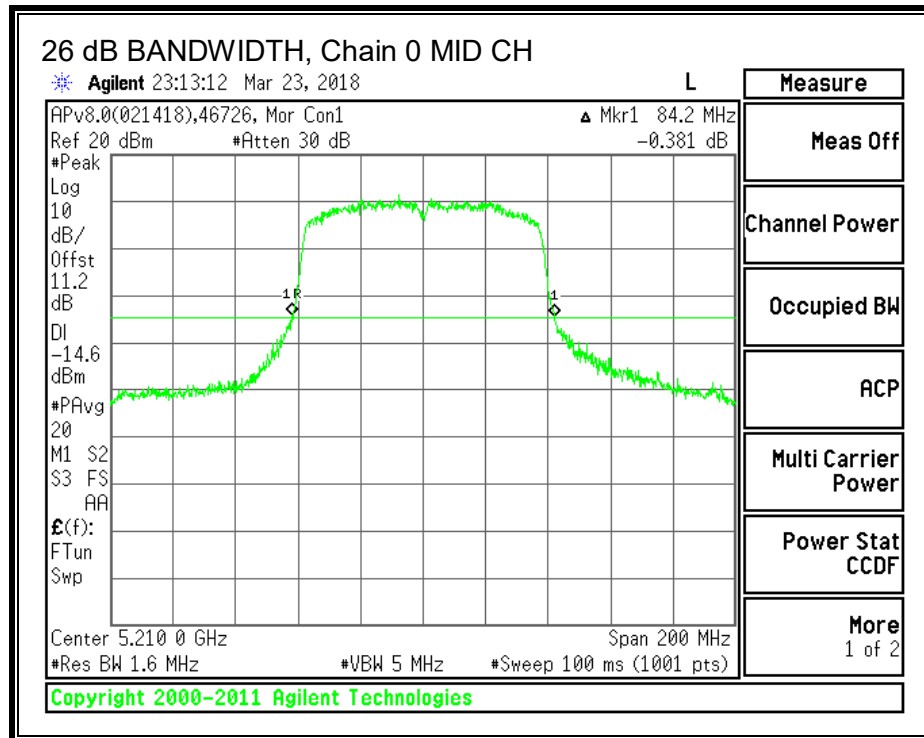
TEST INFORMATION

Date: 2018-03-21 to 2018-03-23
 Project: 12053557
 Tester: 11993/46722

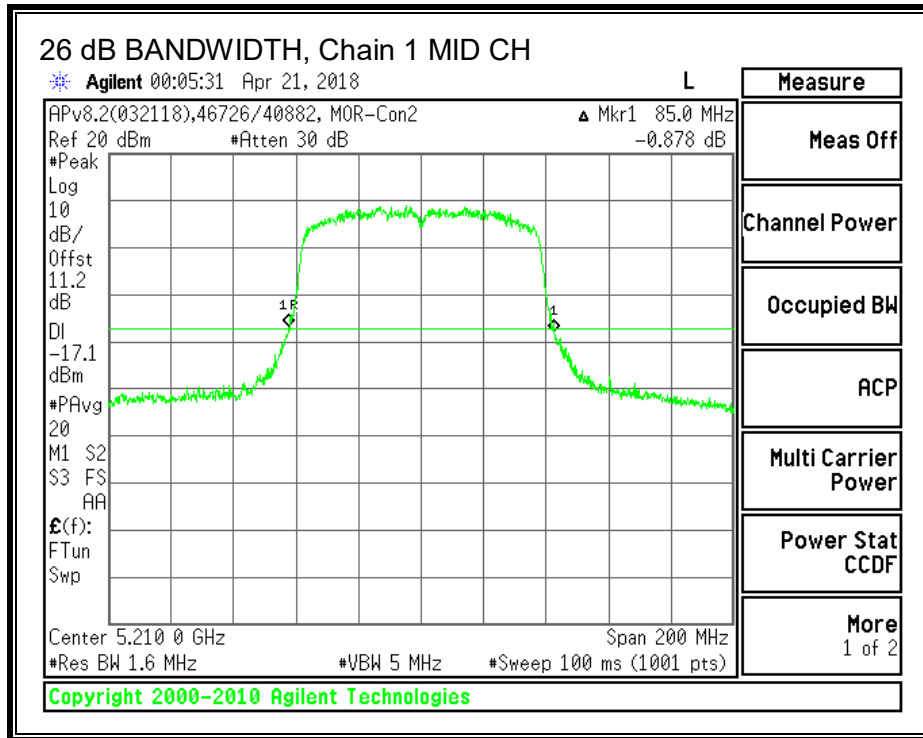
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5210	84.20	85.00

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

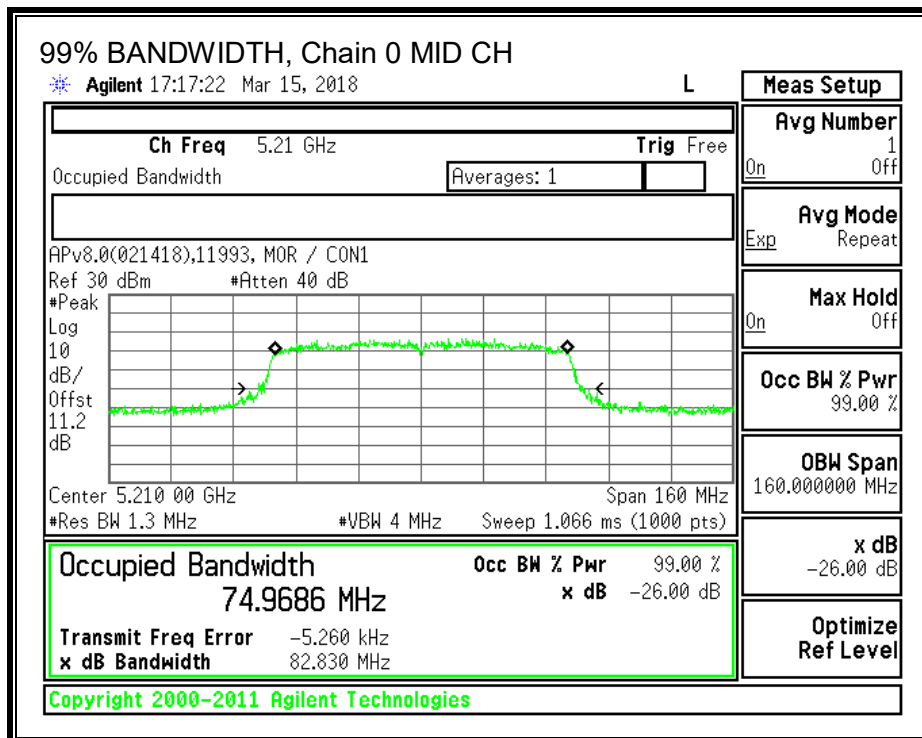
TEST INFORMATION

Date: 2018-03-15 to 2018-03-17
 Project: 12053557
 Tester: 11993/46722

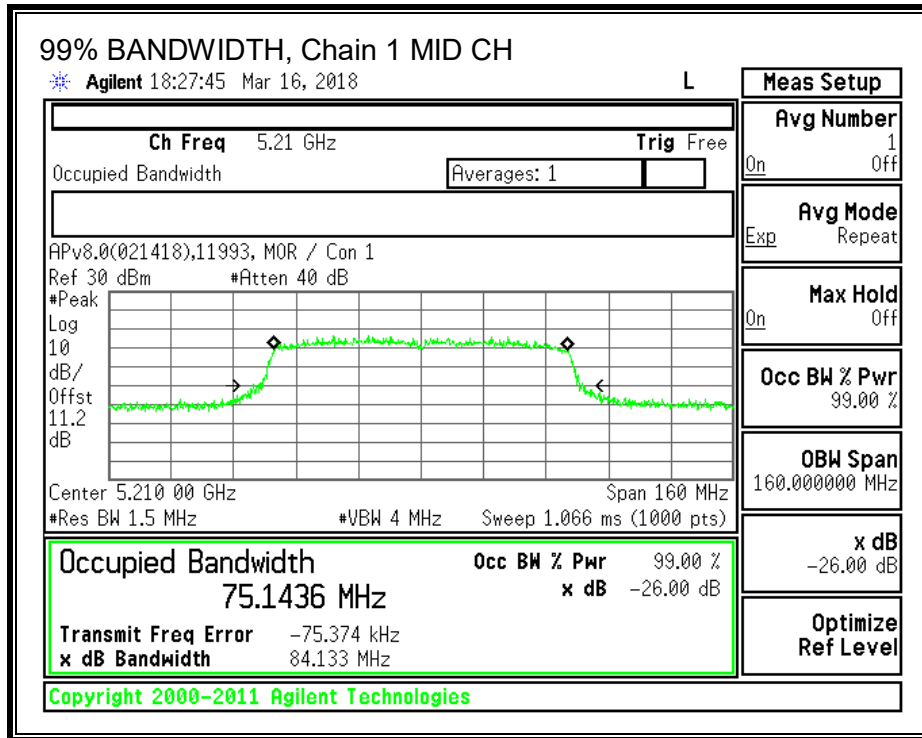
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5210	74.9686	75.1436

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.5.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Date: 2018-03-15 to 2018-03-30
Project: 12053557
Tester: 11993/46726 and 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	$10 * \text{Log} (2 \text{ chains})$ (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5210	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	14.04	13.79	16.93	24.00	-7.07

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-5.45	-6.56	0.66	11.00	-10.34

RESULTS (FCC) MCS9

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Mid	5210	2.16	24.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	10.88	10.53	13.72	24.00	-10.28

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	EIRP 99% BW (MHz)	EIRP PSD Limit (dBm)	Limit (dBm)
Mid	5210	2.16	5.17	74.97	23.00	10.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5210	14.04	13.79	19.09	23.00	-3.91

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Mid	5210	-5.45	-6.56	5.83	10.00	-4.17

RESULTS (ISED) MCS9

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	EIRP 99% BW (MHz)	EIRP PSD Limit (dBm)	Limit (dBm)
Mid	5210	2.16	5.17	74.96	23.00	10.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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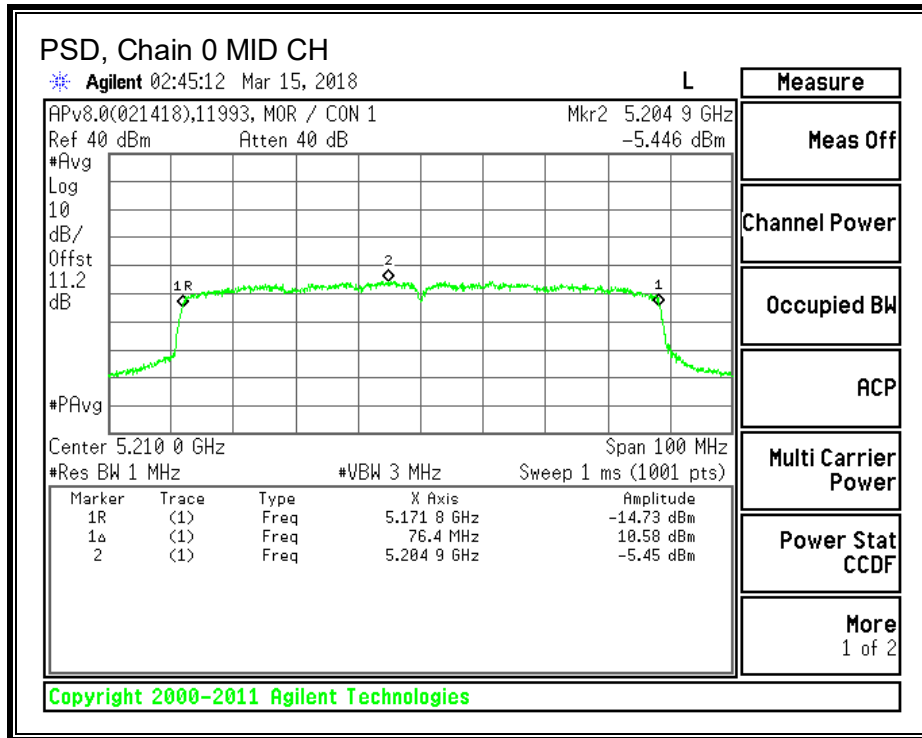
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5210	10.88	10.53	15.88	23.00	-7.12

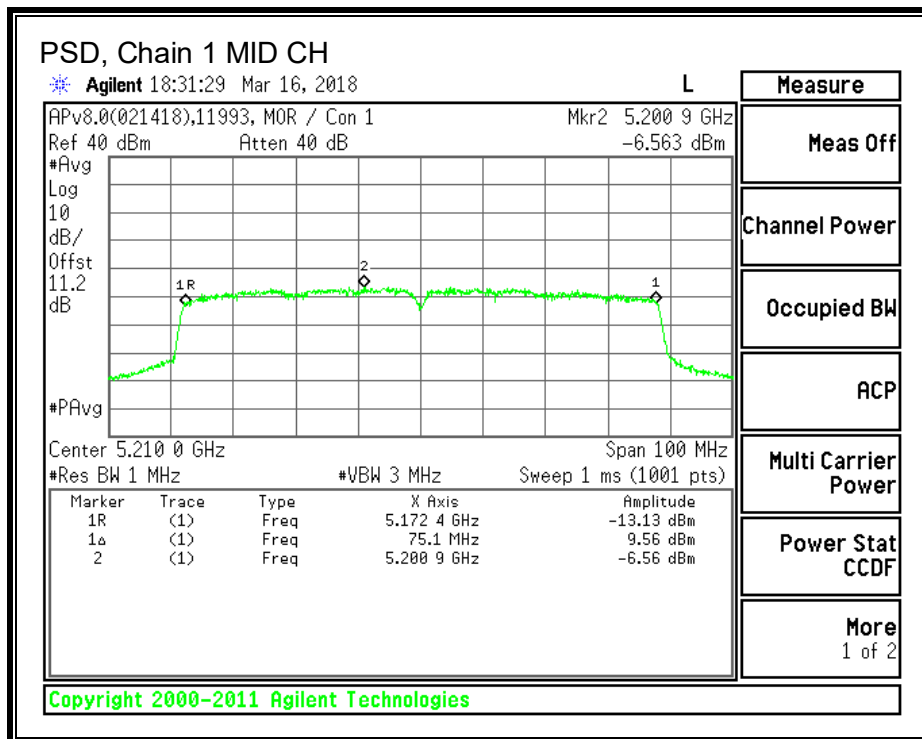
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Mid	5210	-5.45	-6.56	5.83	10.00	-4.17

PSD, Chain 0



PSD, Chain 1



8.5.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS 247 Issue 2, Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST INFORMATION

Date: 2018-03-15 to 2018-03-30
Project: 12053557
Tester: 11993/46726 and 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5210	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.05	11.89	14.98	24.00	-9.02

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5210	-5.45	-6.56	0.66	11.00	-10.34

RESULTS (FCC) MCS9

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5210	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	10.88	10.53	13.72	24.00	-10.28

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED) MCS0

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	EIRP 99% BW (MHz)	EIRP Limit (dBm)	EIRP Limit (dBm)
Mid	5210	1.92	4.92	74.97	23.00	10.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5210	12.05	11.89	16.90	23.00	-6.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas Cond PSD (dBm)	Chain 1 Meas Cond PSD (dBm)	Total Corr'd EIRP PSD (dBm)	EIRP PSD Limit (dBm)	EIRP PSD Margin (dB)
Mid	5210	-5.45	-6.56	5.58	10.00	-4.42

RESULTS (ISED) MCS9

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	EIRP 99% BW (MHz)	EIRP Limit (dBm)	EIRP PSD Limit (dBm)
Mid	5210	1.92	4.92	74.97	23.00	10.00

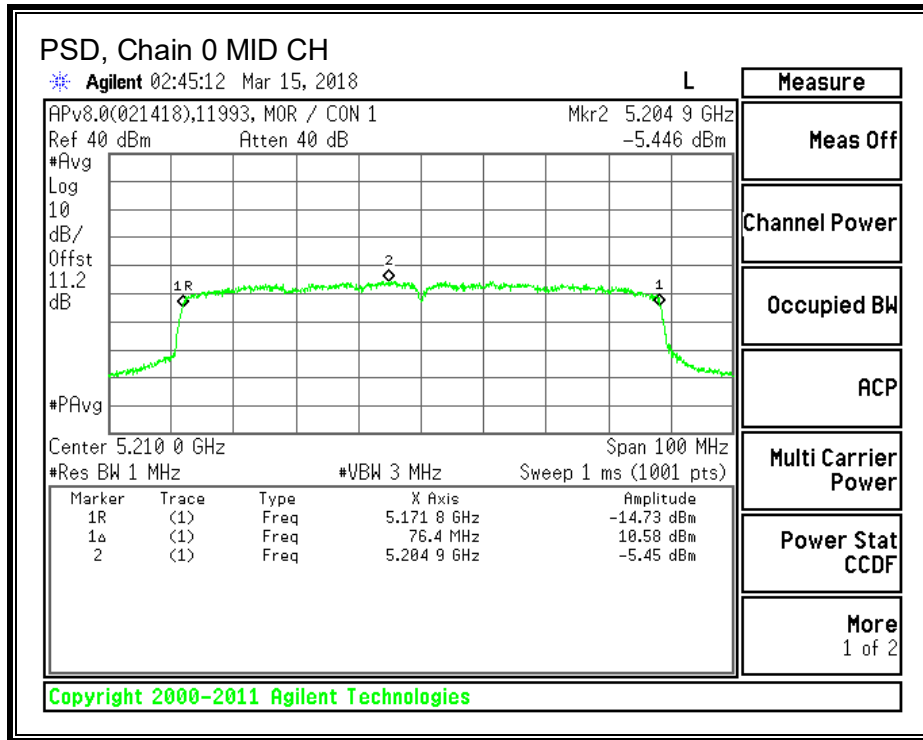
Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

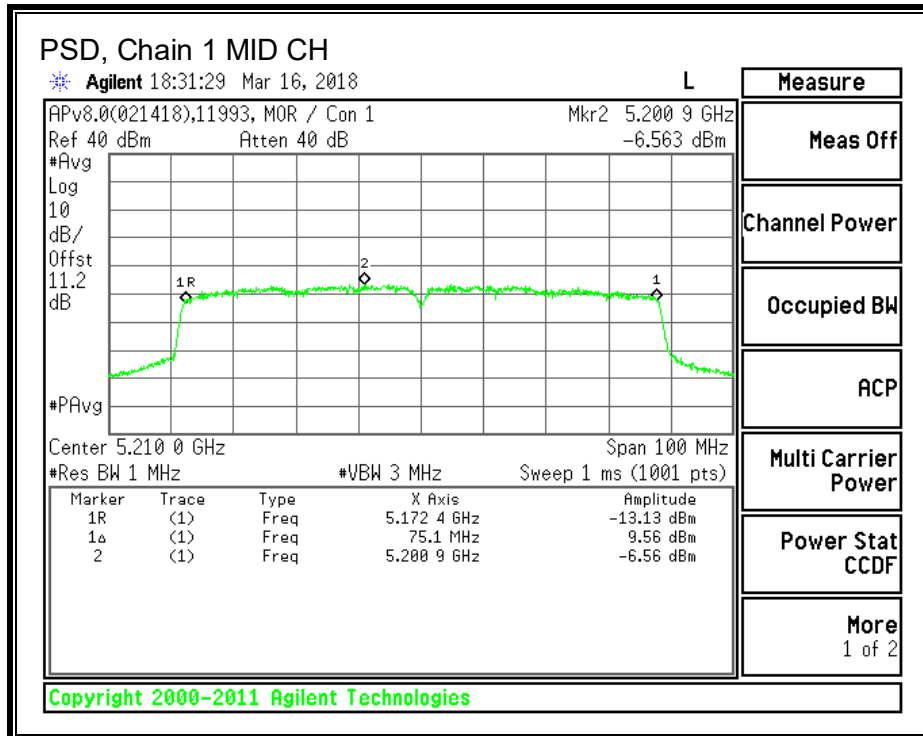
Channel	Frequency (MHz)	Chain 0 Meas Cond Power (dBm)	Chain 1 Meas Cond Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5210	10.88	10.53	15.64	23.00	-7.36

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

PSD, Chain 0



PSD, Chain 1



8.6. 802.11a MODE IN THE 5.3 GHz BAND

8.6.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST INFORMATION

Date: 3/15/2018 and 2018-03-23

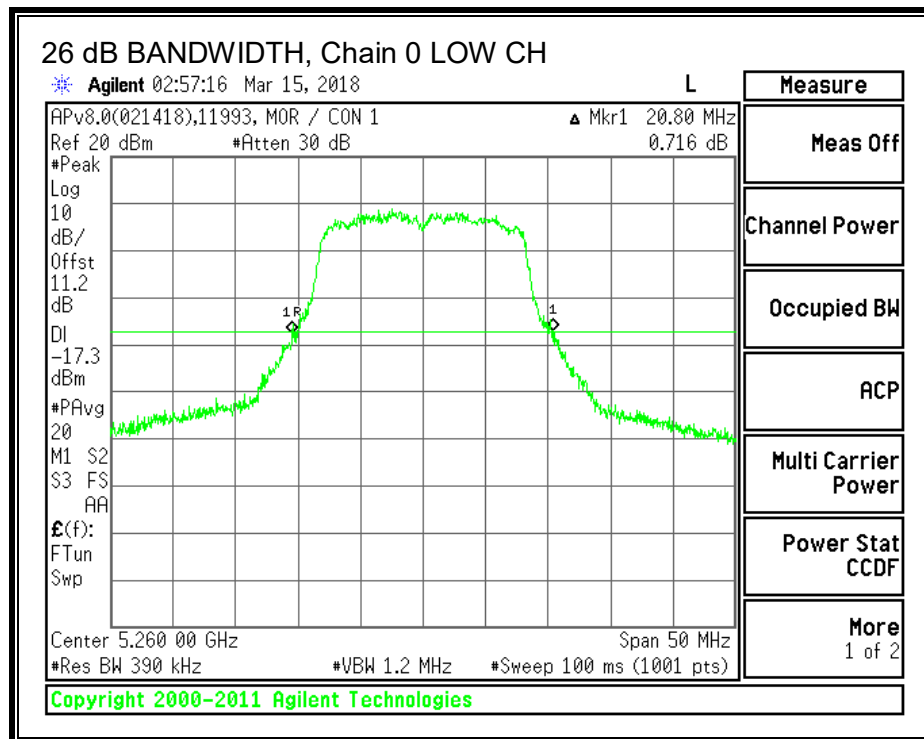
Project: 12053557

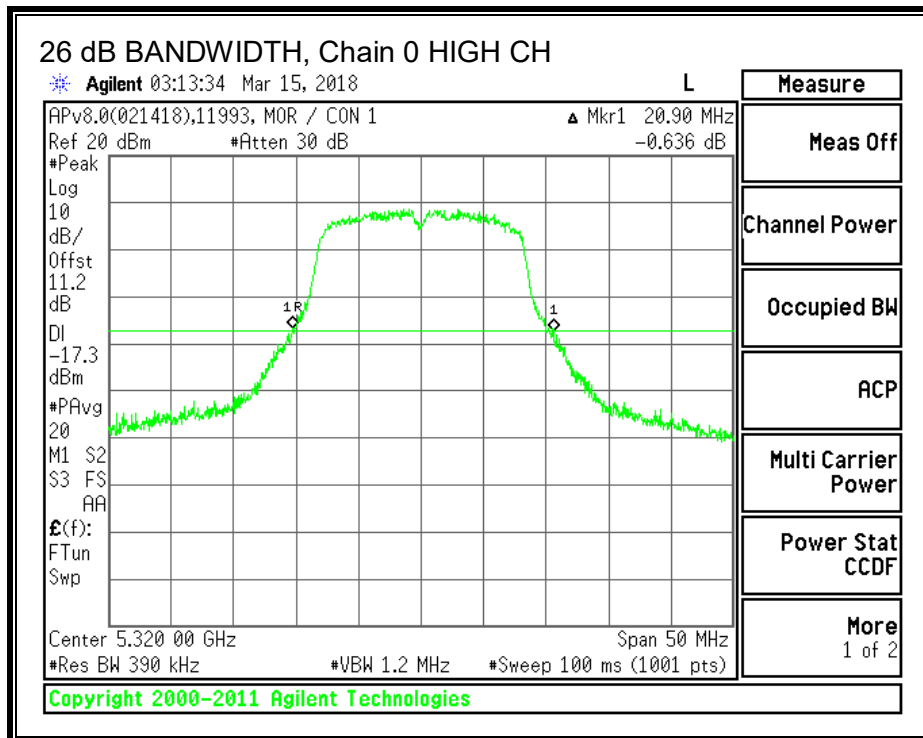
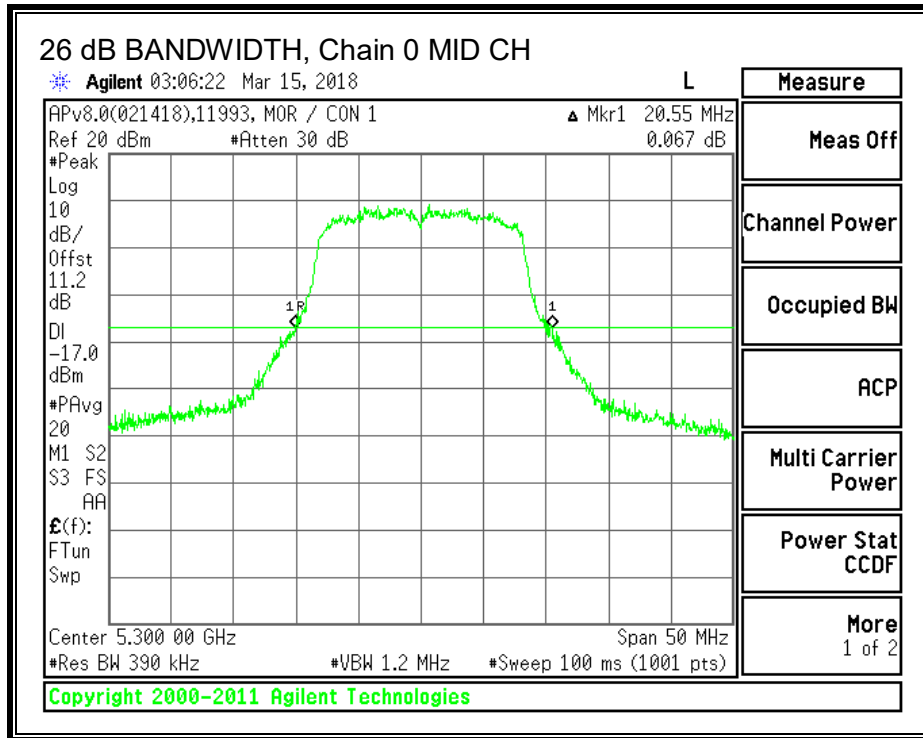
Tester: 11993/46722, 46726/46722

RESULTS

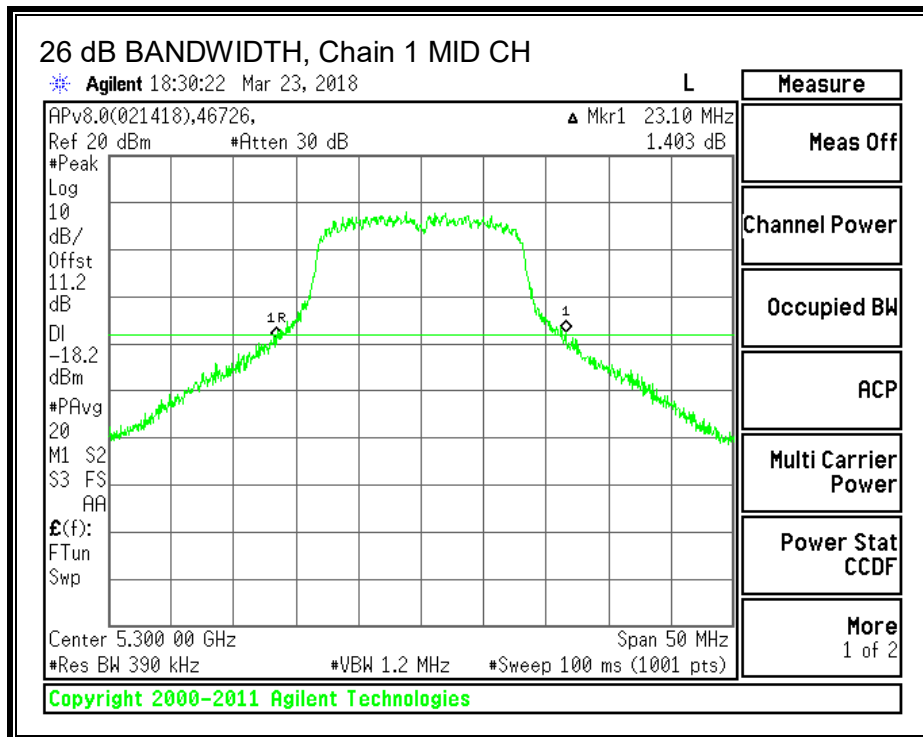
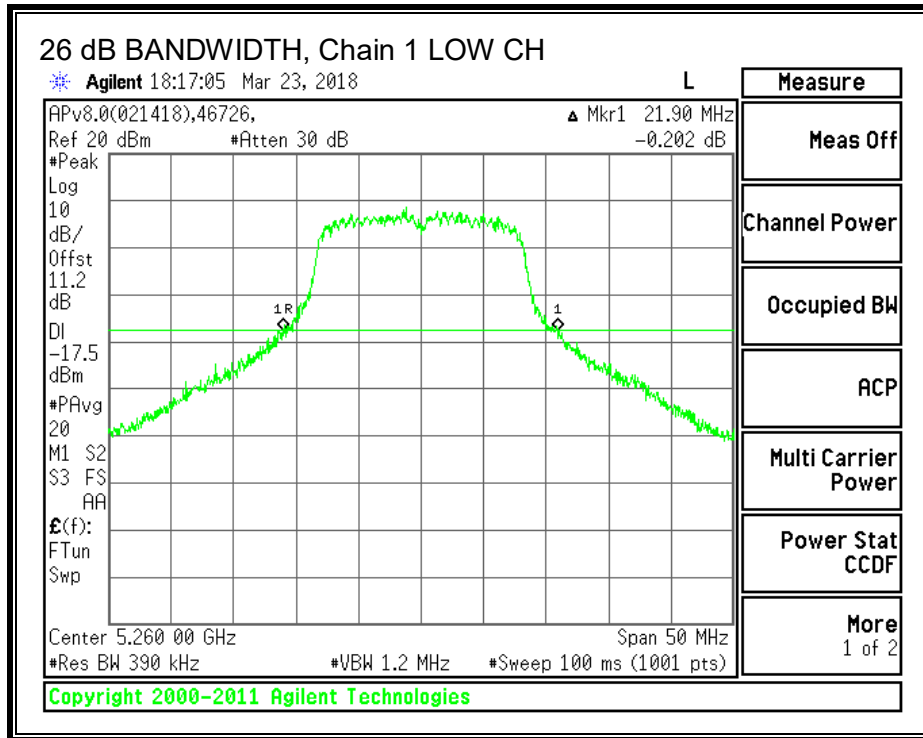
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	20.80	21.90
Mid	5300	20.55	23.10
High	5320	20.90	24.40

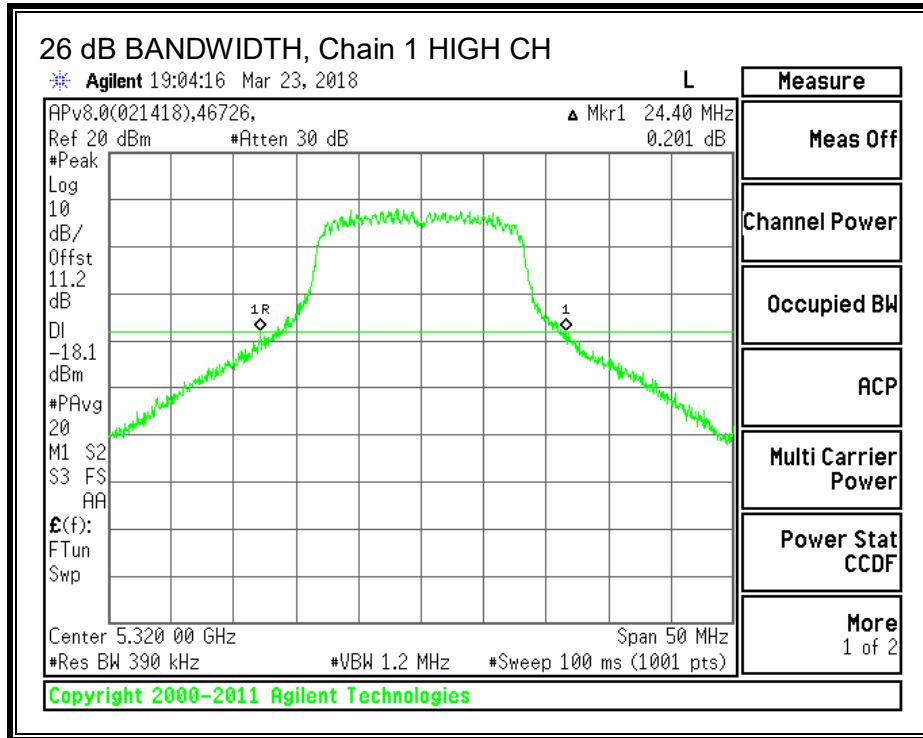
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.6.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

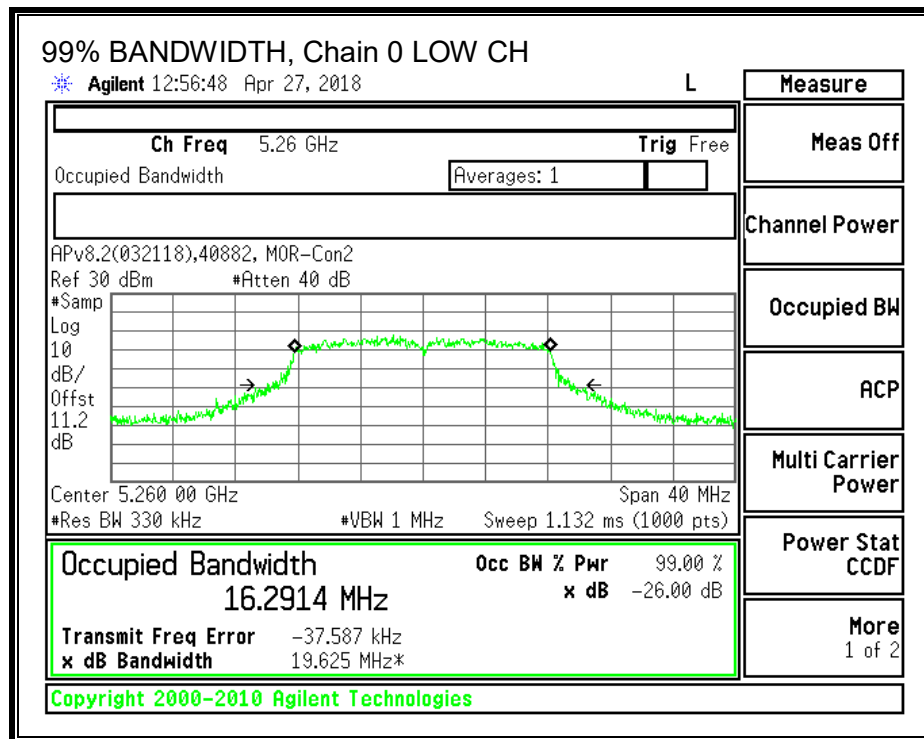
TEST INFORMATION

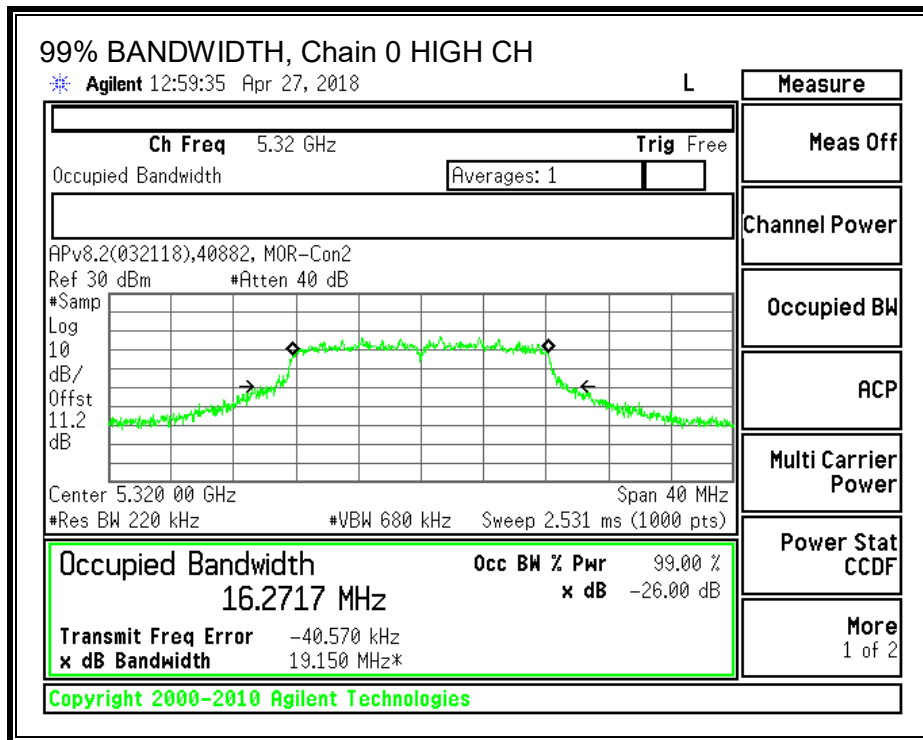
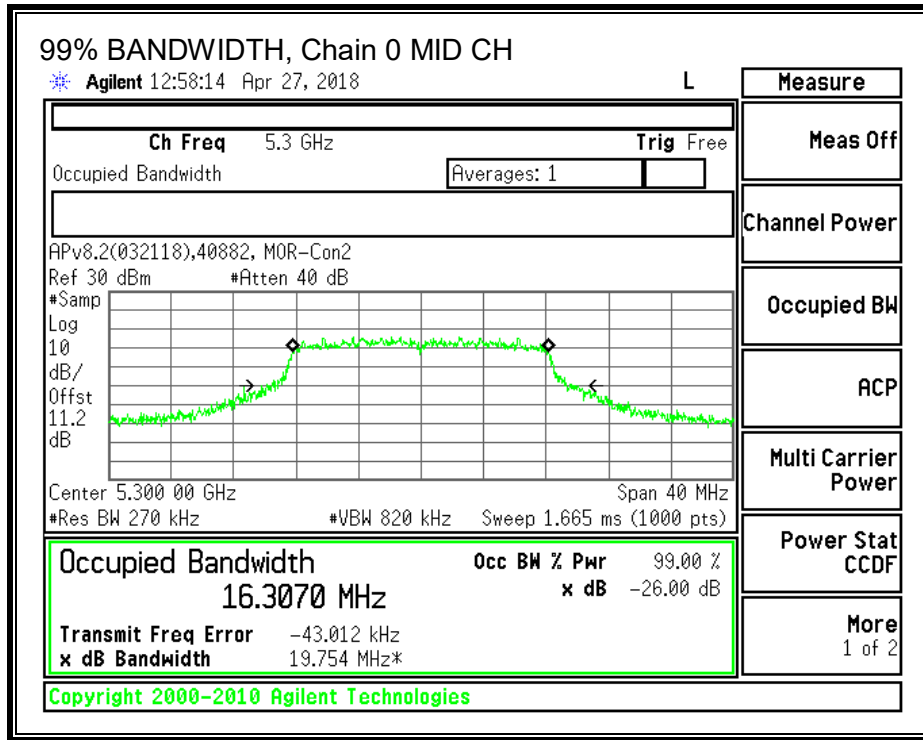
Test Date: 2018-04-27
 Project: 12053557
 Tested By: 40882

RESULTS

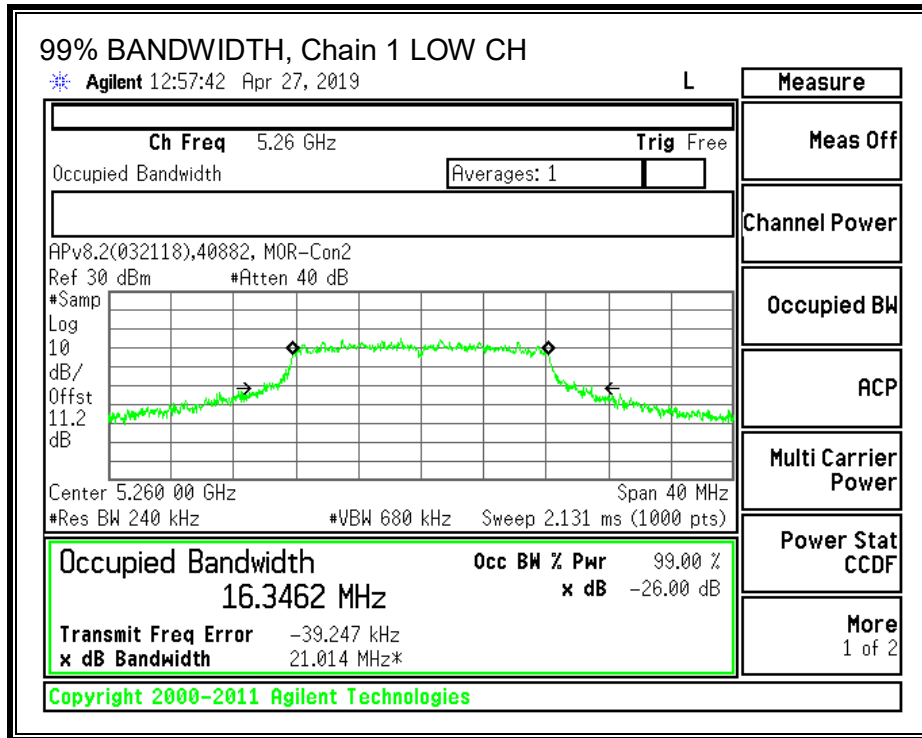
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	16.2914	16.3462
Mid	5300	16.3070	16.4490
High	5320	16.2717	16.3798

99% BANDWIDTH, Chain 0

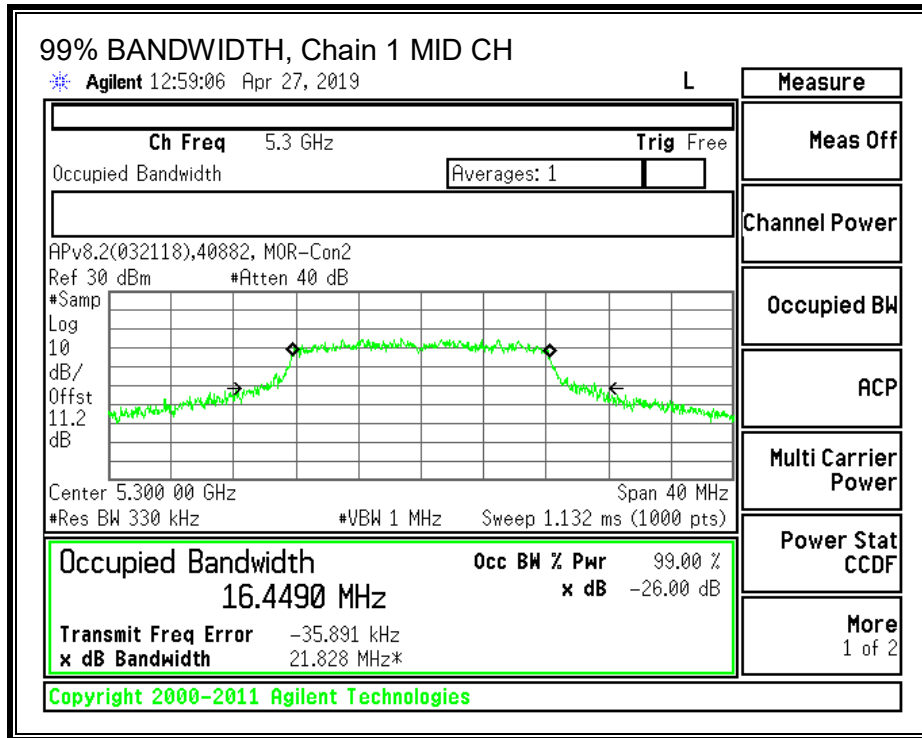




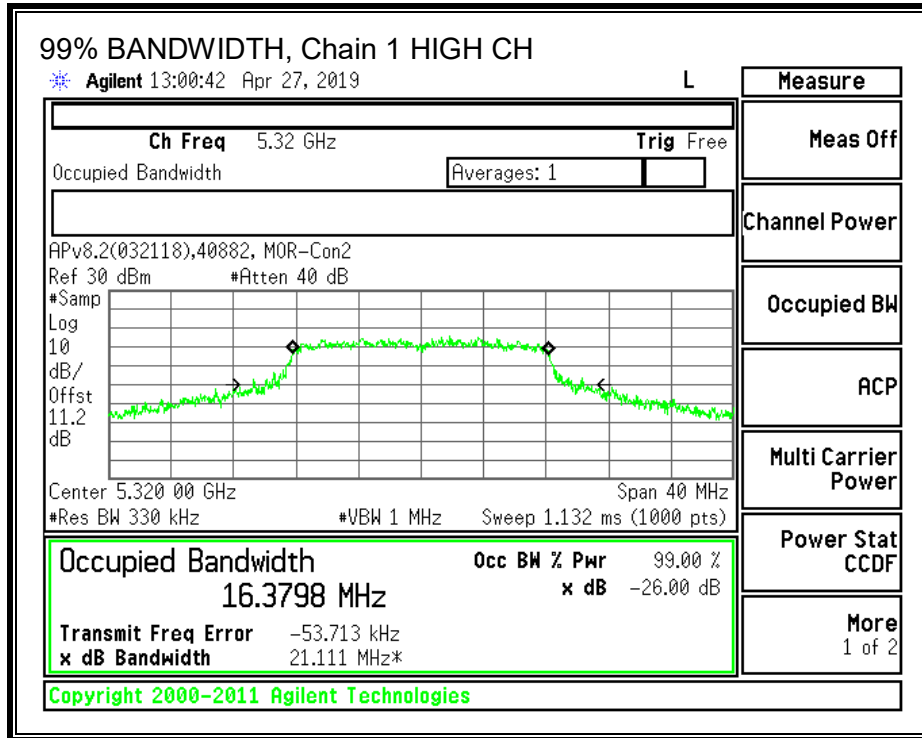
99% BANDWIDTH, Chain 1



Note: Date incorrect, should be Apr 27, 2018.



Note: Date incorrect, should be Apr 27, 2018.



Note: Date incorrect, should be Apr 27, 2018.

8.6.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30
 Project: 12053557
 Tested By: 11993/46722, 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) 6 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	20.80	2.16	5.17	24.00	11.00
Mid	5300	20.55	2.16	5.17	24.00	11.00
High	5320	20.90	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.43	14.20	17.33	24.00	-6.67
Mid	5300	14.36	14.13	17.26	24.00	-6.74
High	5320	14.31	14.07	17.20	24.00	-6.80

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.78	0.77	7.72	11.00	-3.28
Mid	5300	2.01	1.02	7.96	11.00	-3.04
High	5320	2.02	0.98	7.95	11.00	-3.05

RESULTS (FCC) 54 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	20.80	2.16	5.17	24.00	11.00
Mid	5300	20.55	2.16	5.17	24.00	11.00
High	5320	20.90	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.08	14.78	17.94	24.00	-6.06
Mid	5300	15.04	14.62	17.85	24.00	-6.15
High	5320	14.99	14.52	17.77	24.00	-6.23

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) 6 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	16.29	23.12	11.00
Mid	5300	16.31	23.12	11.00
High	5320	16.27	23.11	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.43	14.20	17.33	23.12	-5.79
Mid	5300	14.36	14.13	17.26	23.12	-5.87
High	5320	14.31	14.07	17.20	23.11	-5.91

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.78	0.77	7.72	11.00	-3.28
Mid	5300	2.01	1.02	7.96	11.00	-3.04
High	5320	2.02	0.98	7.95	11.00	-3.05

RESULTS (ISED CONDUCTED POWER) 54 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	16.29	23.12	11.00
Mid	5300	16.31	23.12	11.00
High	5320	16.27	23.11	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.08	14.78	17.94	23.12	-5.18
Mid	5300	15.04	14.62	17.85	23.12	-5.28
High	5320	14.99	14.52	17.77	23.11	-5.34

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) 6 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	16.29	2.16	29.12
Mid	5300	16.31	2.16	29.12
High	5320	16.27	2.16	29.11

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.43	14.20	19.49	29.12	-9.63
Mid	5300	14.36	14.13	19.42	29.12	-9.71
High	5320	14.31	14.07	19.36	29.11	-9.75

RESULTS (ISED EIRP) 54 Mbps

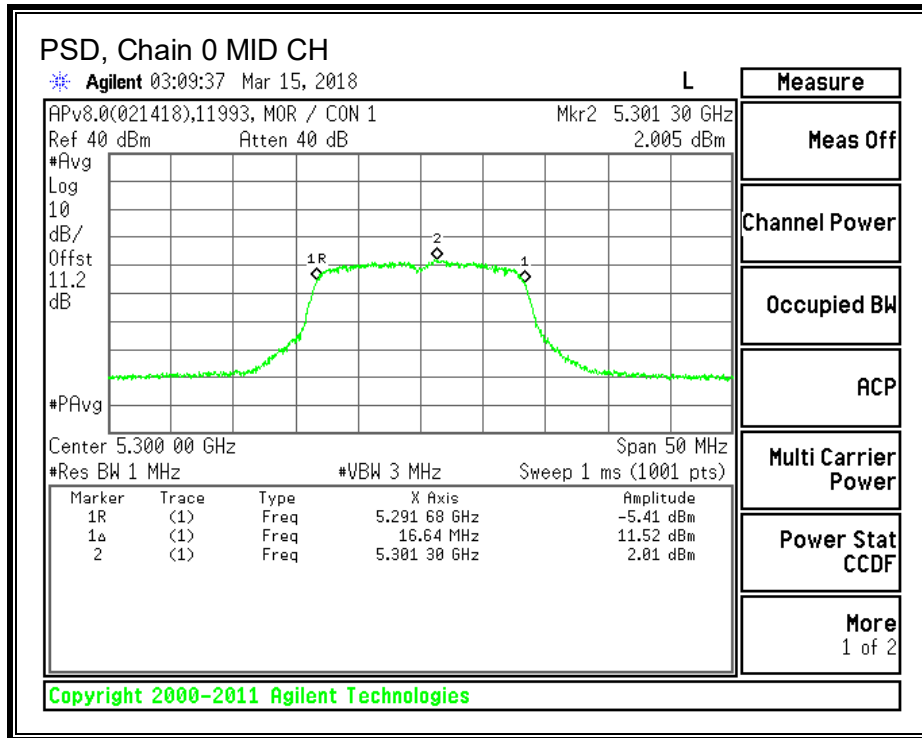
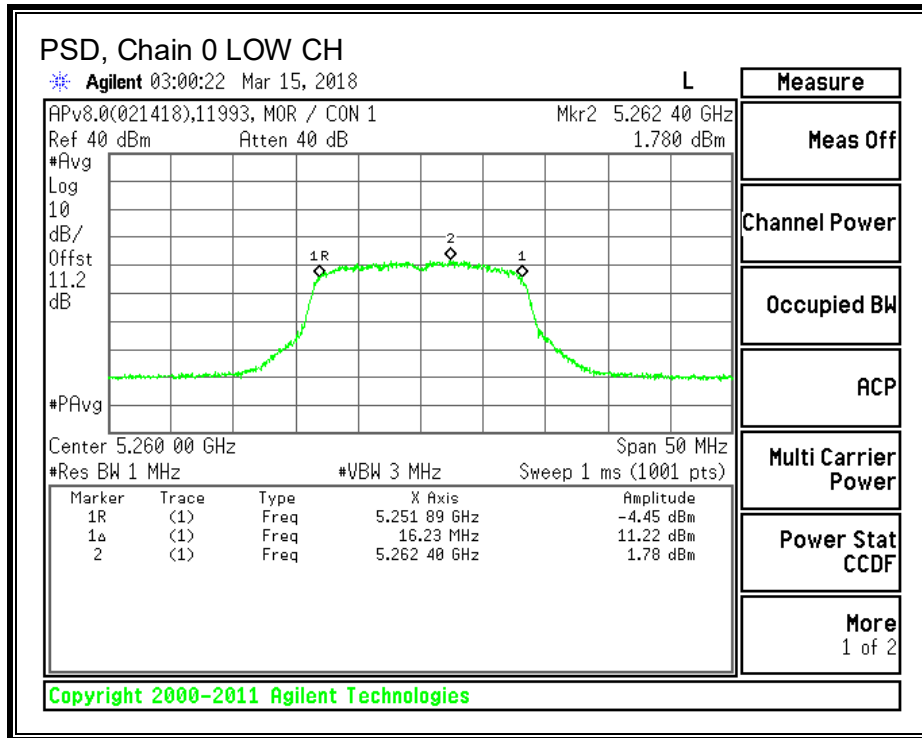
Bandwidth, Antenna Gain and Limits

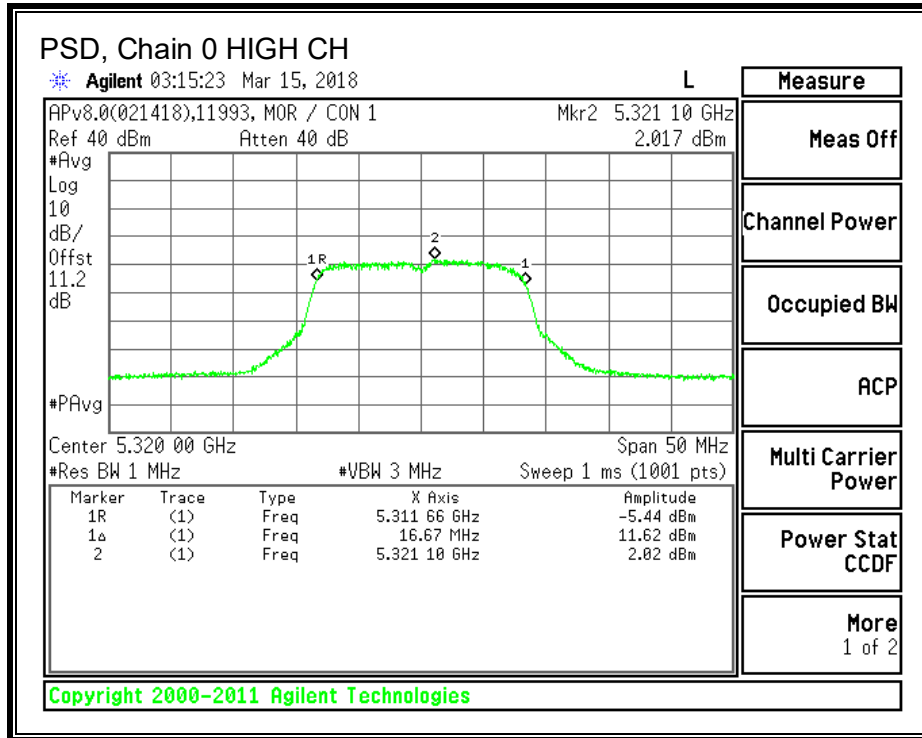
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	16.29	2.16	29.12
Mid	5300	16.31	2.16	29.12
High	5320	16.27	2.16	29.11

Output Power Results

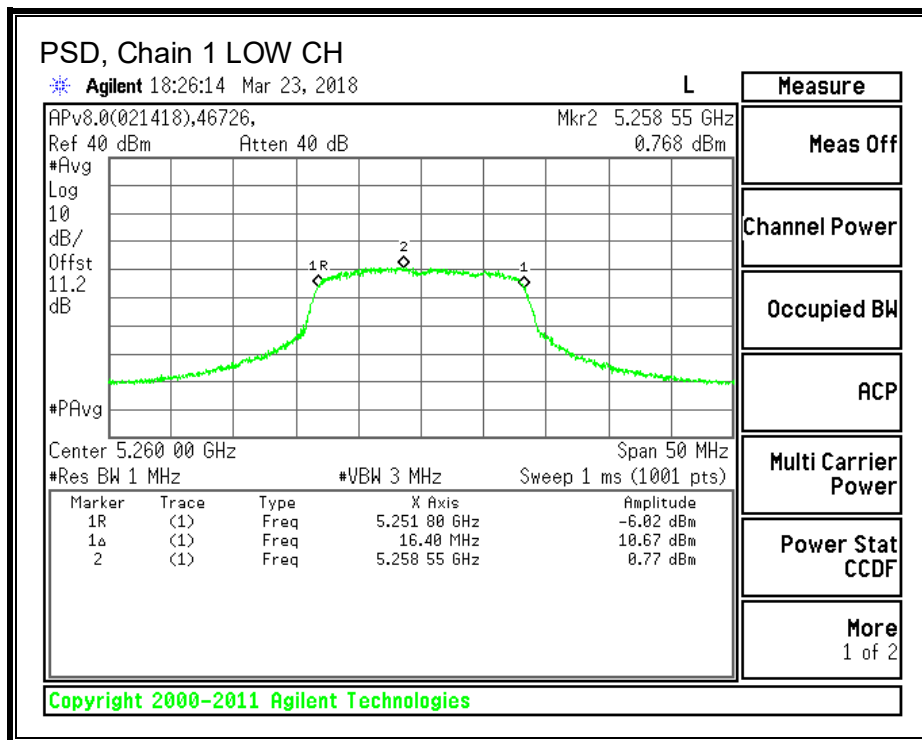
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	15.08	14.78	20.10	29.12	-9.02
Mid	5300	15.04	14.62	20.01	29.12	-9.12
High	5320	14.99	14.52	19.93	29.11	-9.18

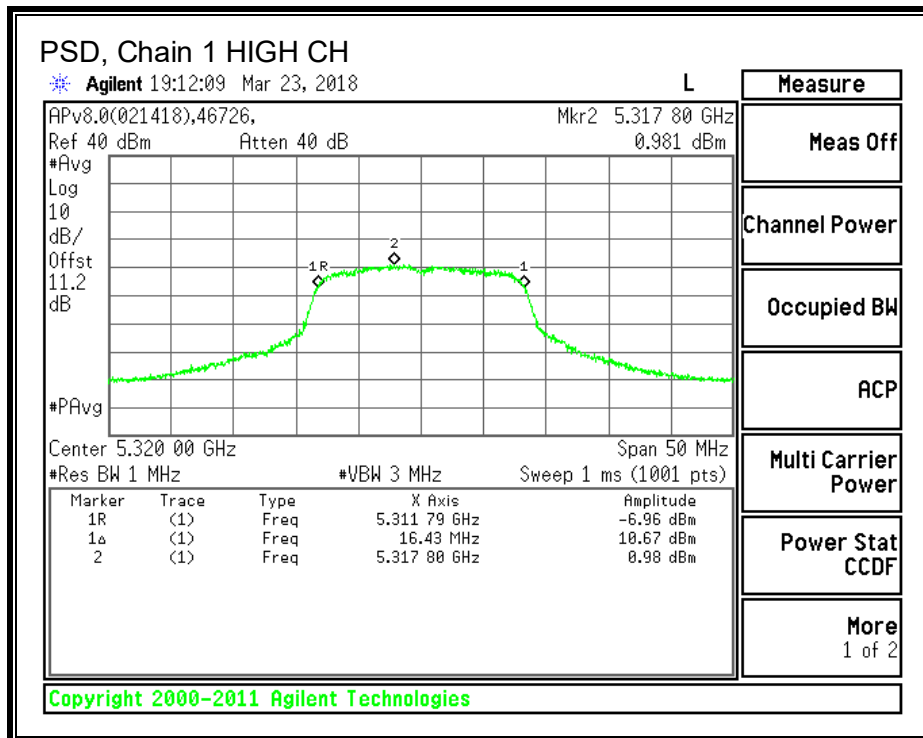
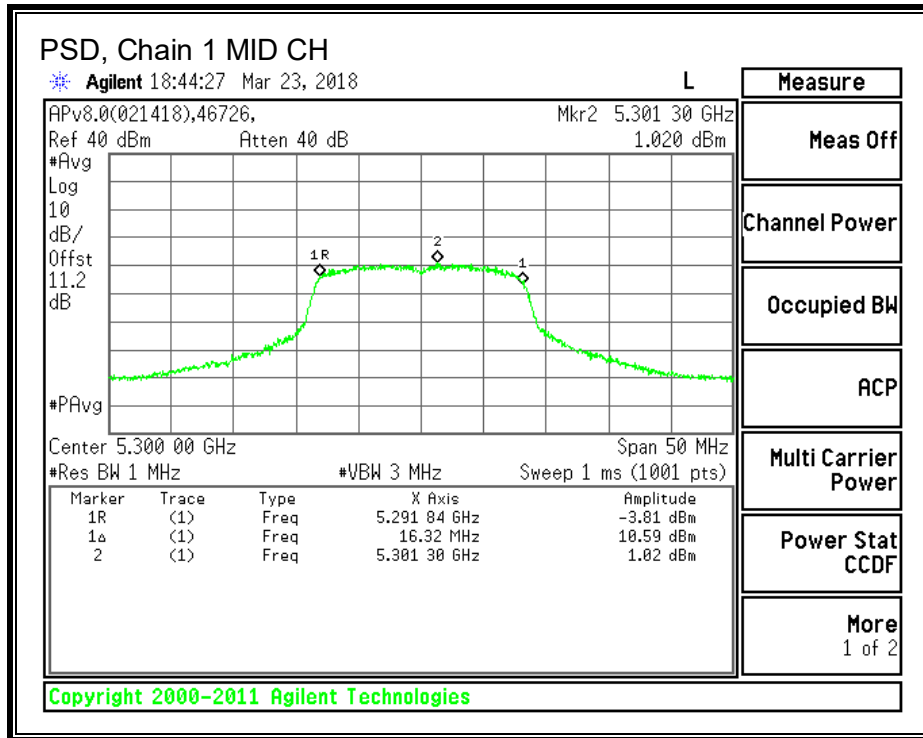
PSD, Chain 0





PSD, Chain 1





8.6.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log 10B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30
Project: 12053557
Tested By: 11993/46722, 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) 6 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	20.80	1.92	4.92	24.00	11.00
Mid	5300	20.55	1.92	4.92	24.00	11.00
High	5320	20.90	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.43	14.20	17.33	24.00	-6.67
Mid	5300	14.36	14.13	17.26	24.00	-6.74
High	5320	14.31	14.07	17.20	24.00	-6.80

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.78	0.77	7.72	11.00	-3.28
Mid	5300	2.01	1.02	7.96	11.00	-3.04
High	5320	2.02	0.98	7.95	11.00	-3.05

RESULTS (FCC) 54 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	20.80	1.92	4.92	24.00	11.00
Mid	5300	20.55	1.92	4.92	24.00	11.00
High	5320	20.90	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.08	14.78	17.94	24.00	-6.06
Mid	5300	15.04	14.62	17.85	24.00	-6.15
High	5320	14.99	14.52	17.77	24.00	-6.23

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) 6 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	16.29	23.12	11.00
Mid	5300	16.31	23.12	11.00
High	5320	16.27	23.11	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.43	14.20	17.33	23.12	-5.79
Mid	5300	14.36	14.13	17.26	23.12	-5.87
High	5320	14.31	14.07	17.20	23.11	-5.91

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.78	0.77	7.72	11.00	-3.28
Mid	5300	2.01	1.02	7.96	11.00	-3.04
High	5320	2.02	0.98	7.95	11.00	-3.05

RESULTS (ISED CONDUCTED POWER) 54 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	16.29	23.12	11.00
Mid	5300	16.31	23.12	11.00
High	5320	16.27	23.11	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	15.08	14.78	17.94	23.12	-5.18
Mid	5300	15.04	14.62	17.85	23.12	-5.28
High	5320	14.99	14.52	17.77	23.11	-5.34

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) 6 Mbps

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	16.29	1.92	29.12
Mid	5300	16.31	1.92	29.12
High	5320	16.27	1.92	29.11

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.43	14.20	19.25	29.12	-9.87
Mid	5300	14.36	14.13	19.18	29.12	-9.95
High	5320	14.31	14.07	19.12	29.11	-9.99

RESULTS (ISED EIRP) 54 Mbps

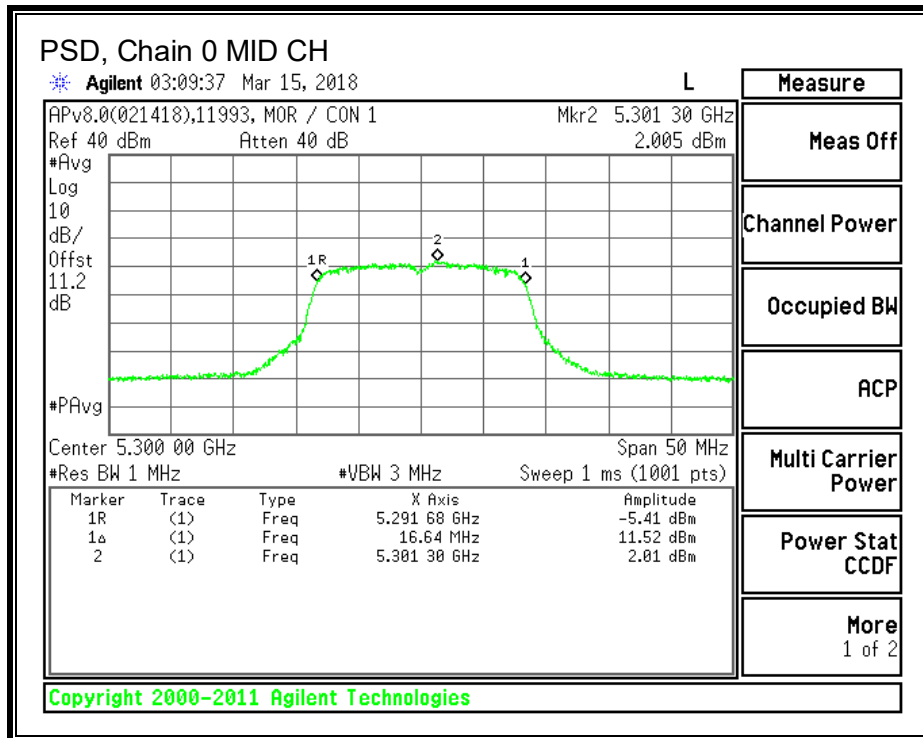
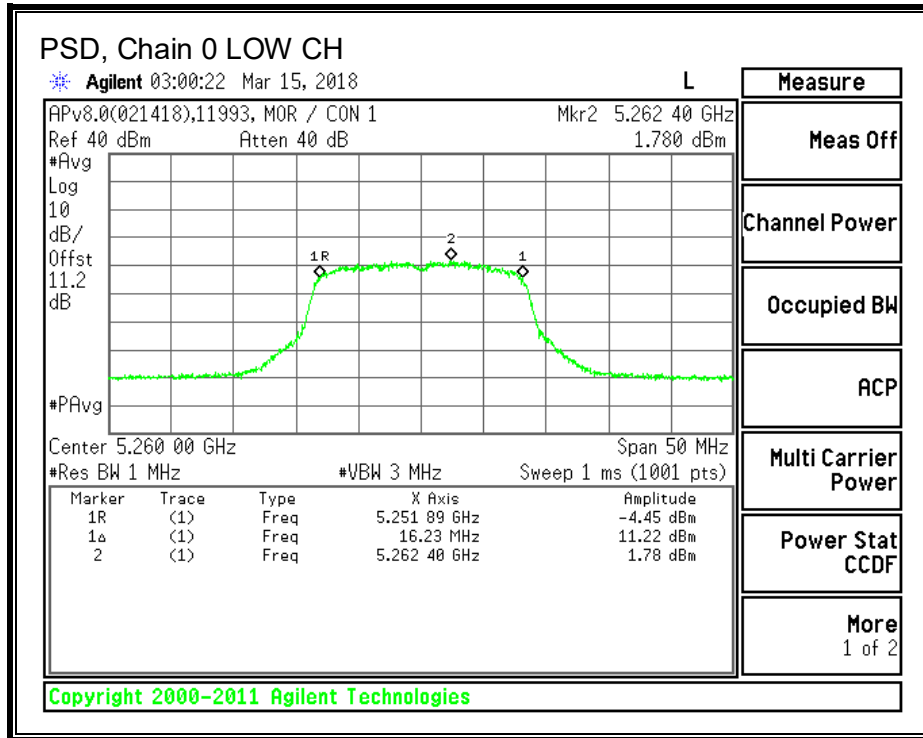
Bandwidth, Antenna Gain and Limits

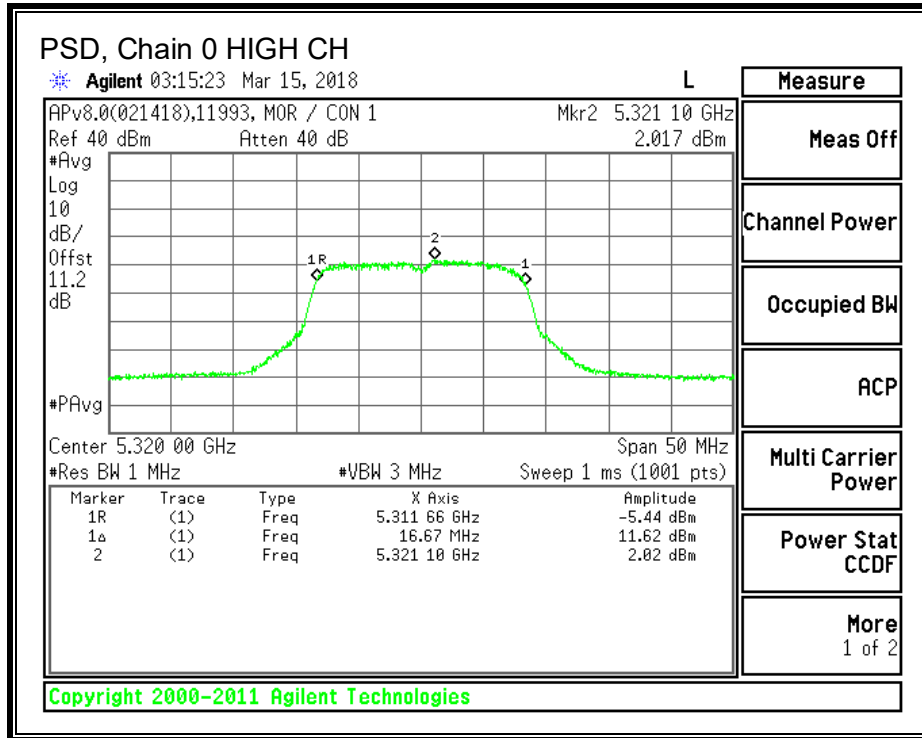
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	16.29	1.92	29.12
Mid	5300	16.31	1.92	29.12
High	5320	16.27	1.92	29.11

Output Power Results

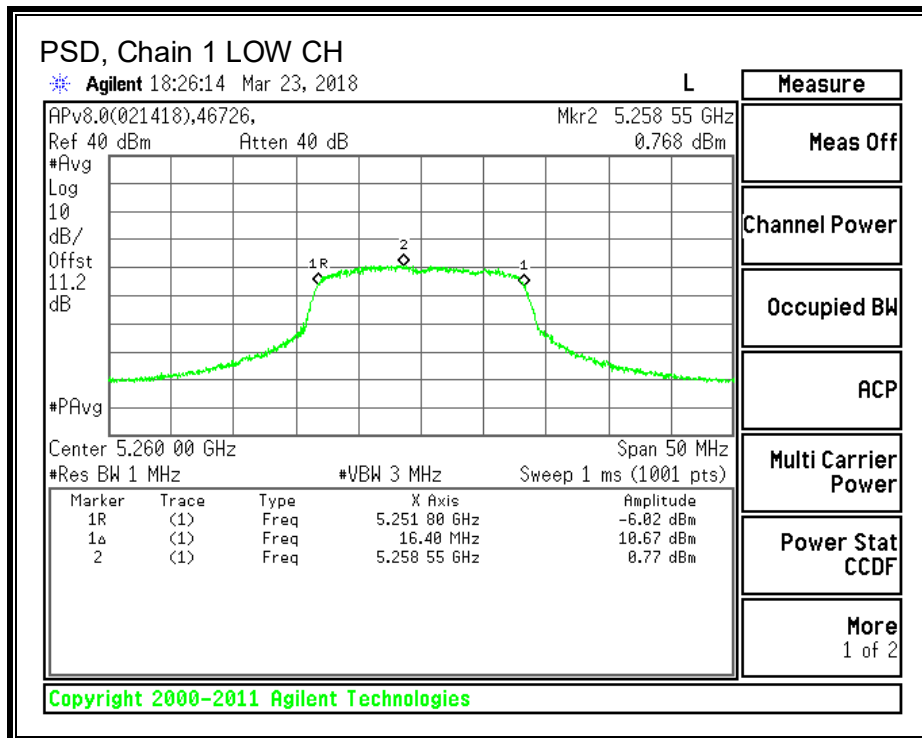
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	15.08	14.78	19.86	29.12	-9.26
Mid	5300	15.04	14.62	19.77	29.12	-9.36
High	5320	14.99	14.52	19.69	29.11	-9.42

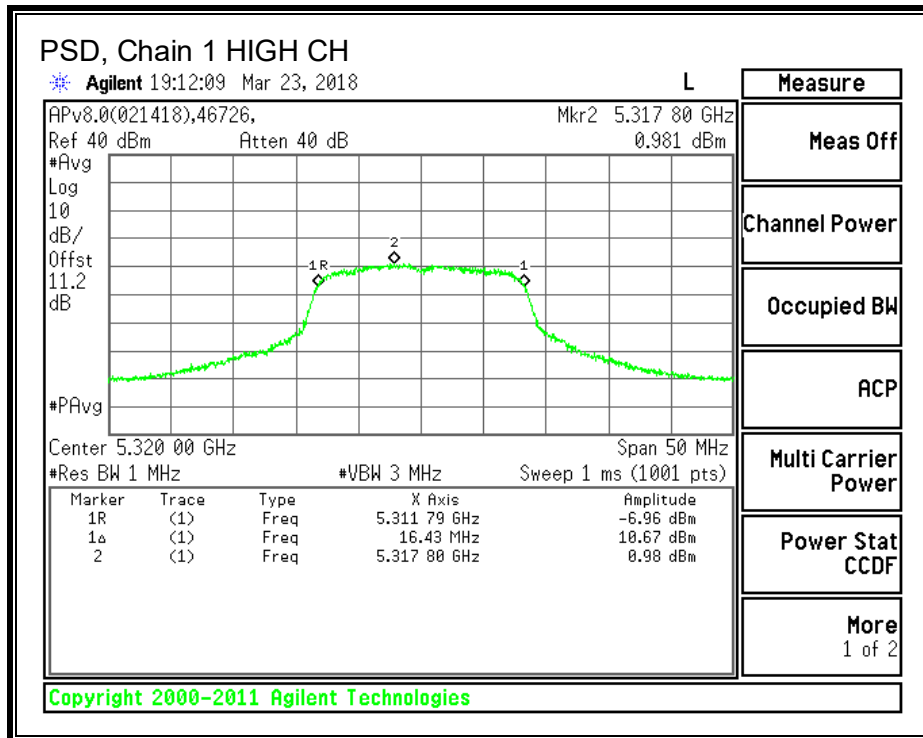
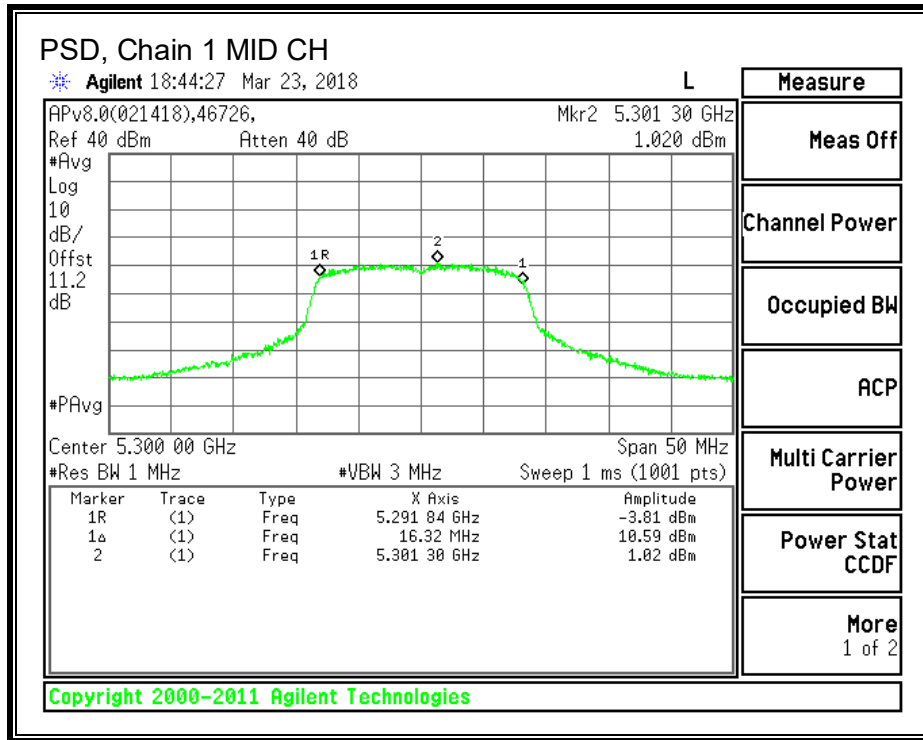
PSD, Chain 0





PSD, Chain 1





8.7. 802.11n HT20 MODE IN THE 5.3 GHz BAND

8.7.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

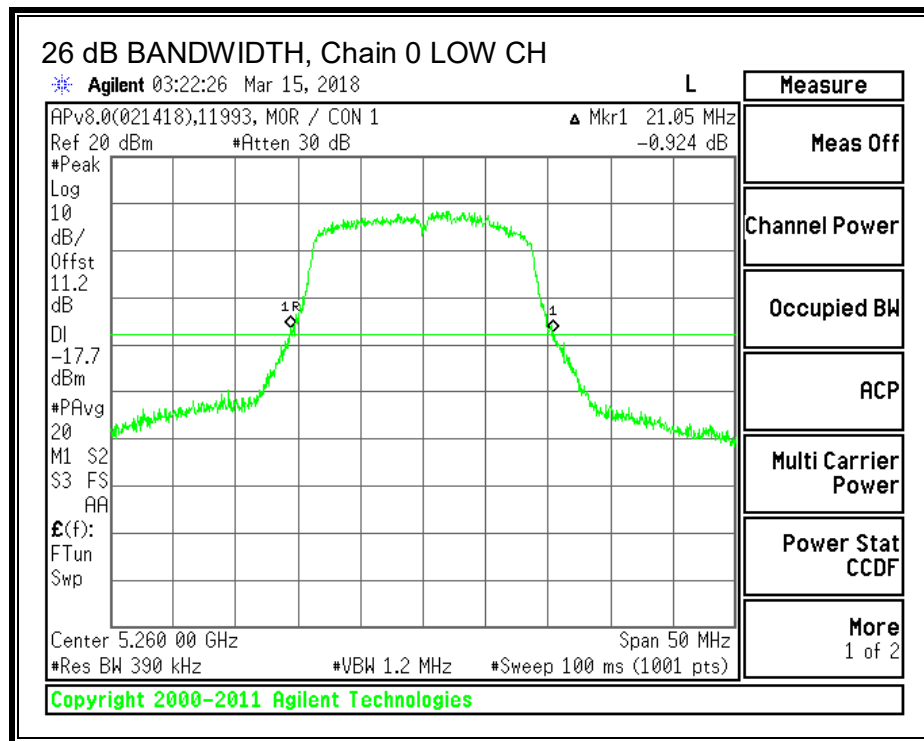
TEST INFORMATION

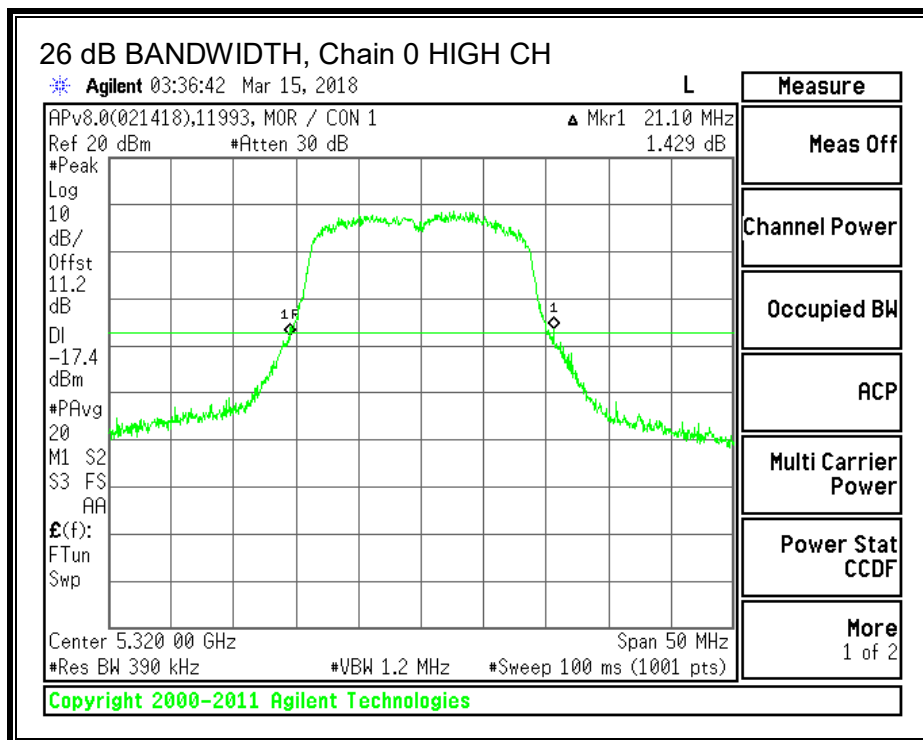
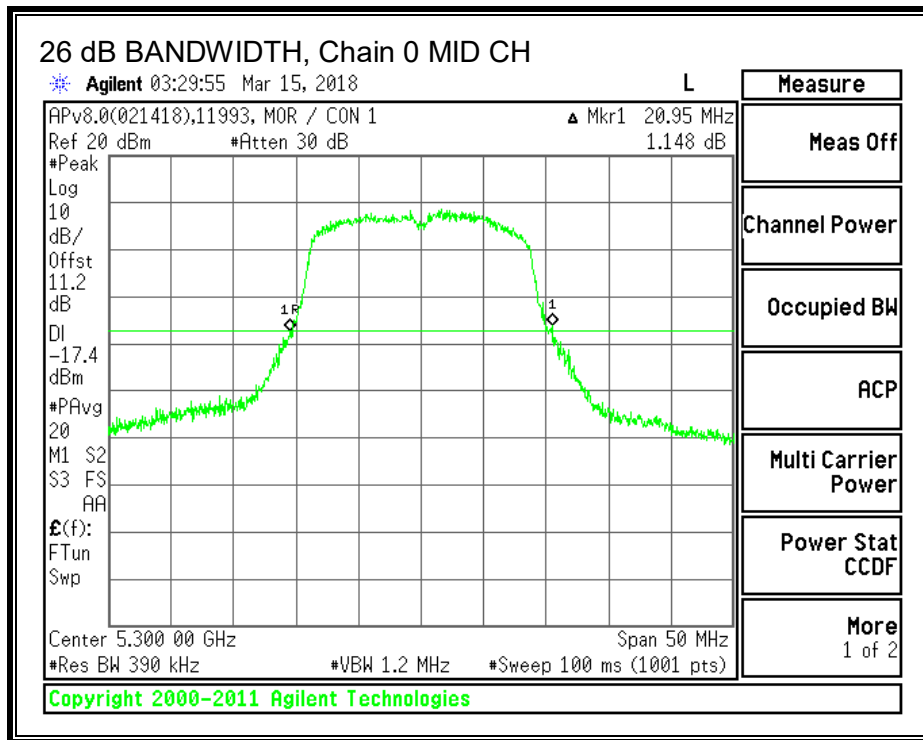
Test Date: 2018-03-15 and 2018-03-23
 Project: 12053557
 Tested By: 11993/46722

RESULTS

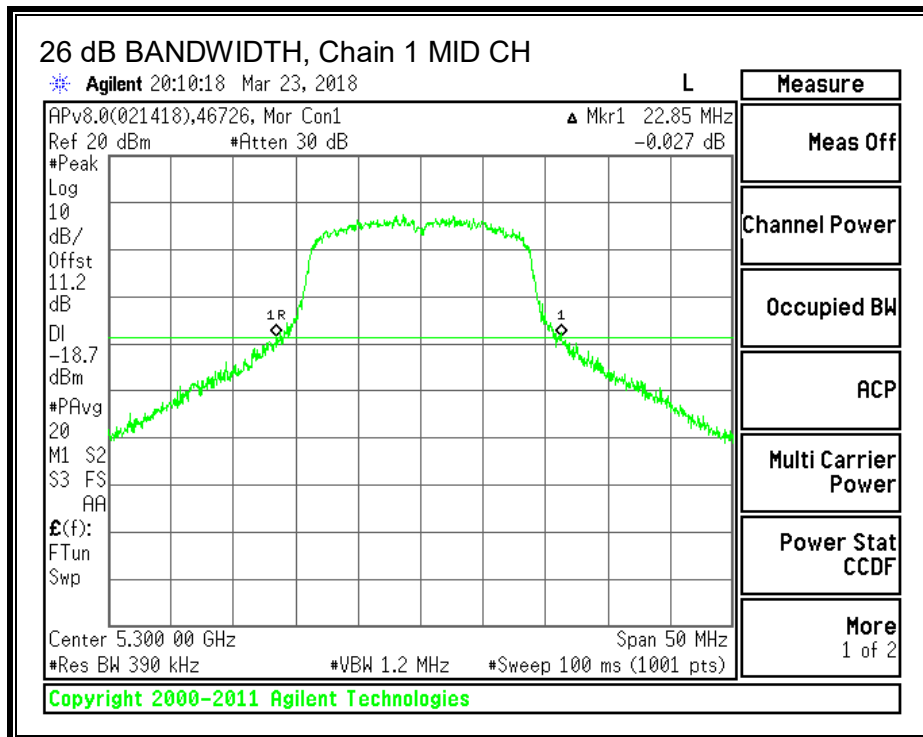
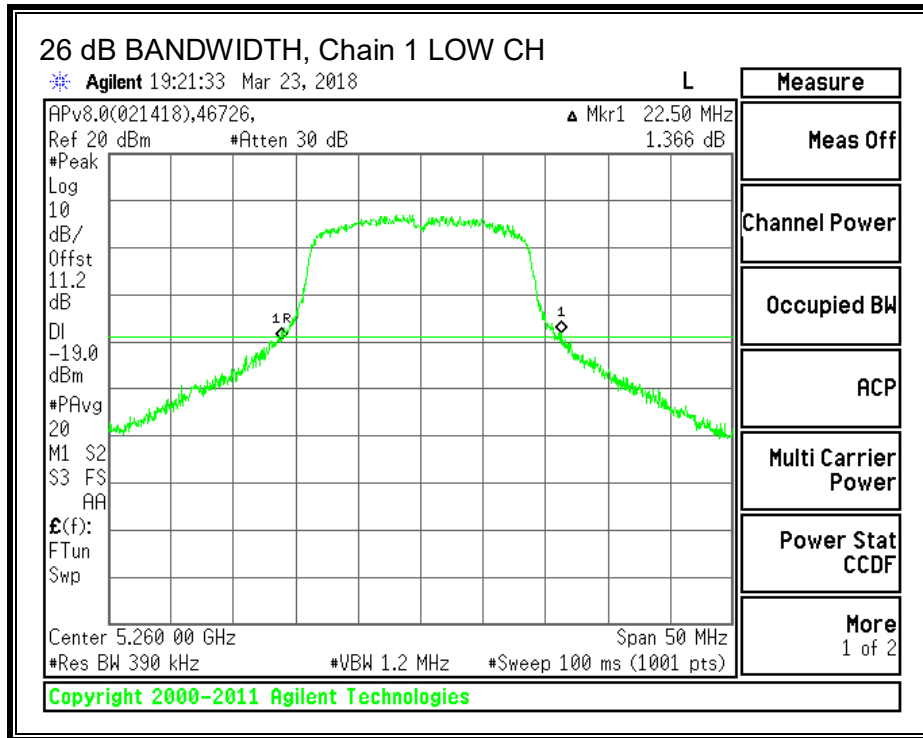
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5260	21.05	22.50
Mid	5300	20.95	22.85
High	5320	21.10	22.90

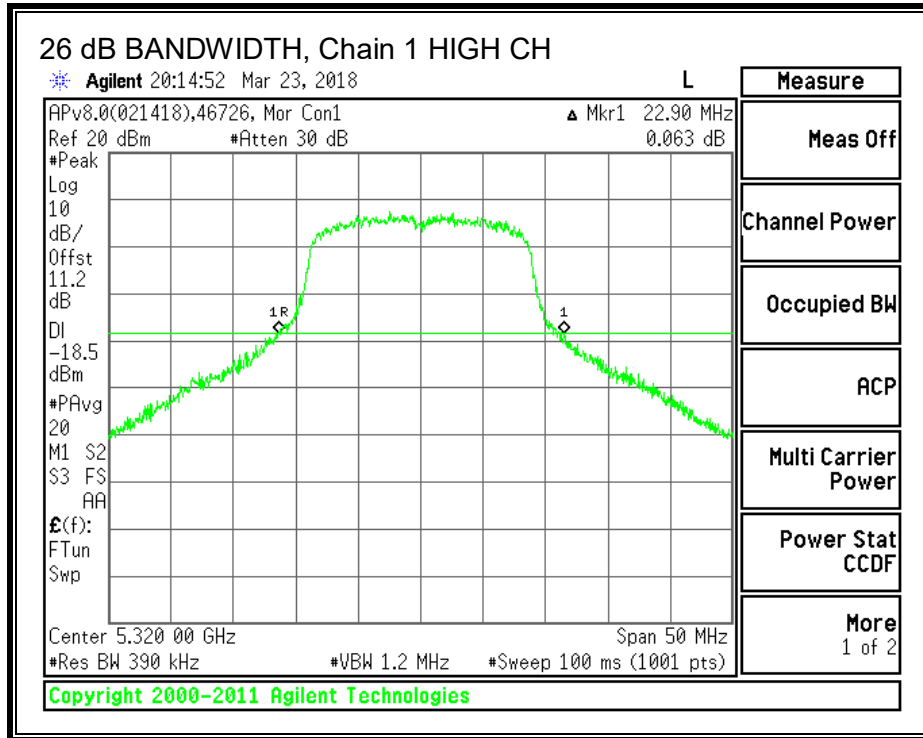
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.7.2. 99% BANDWIDTH

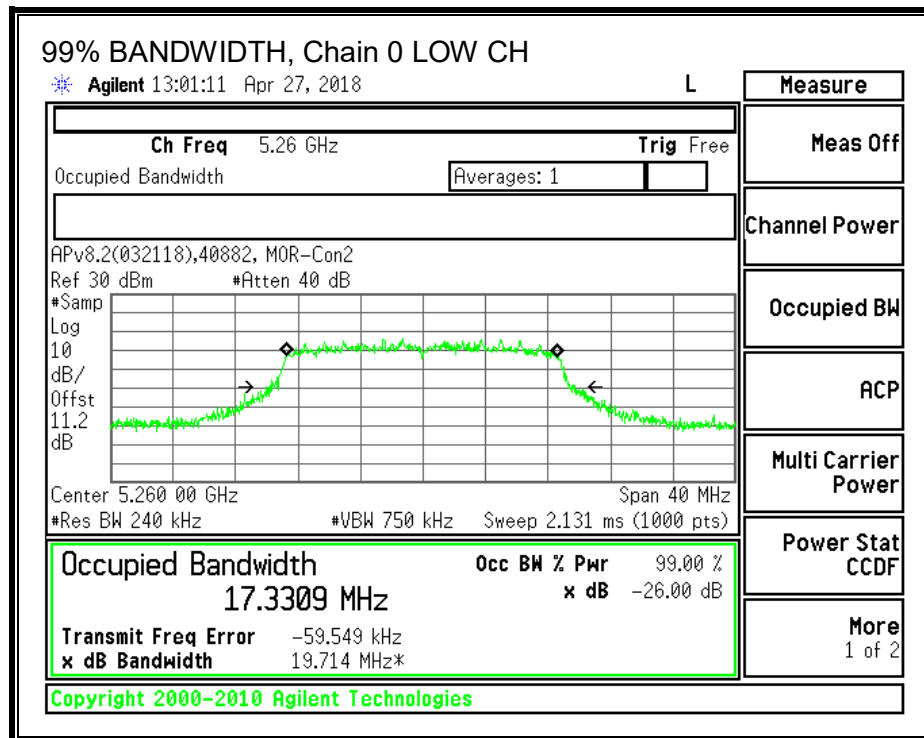
LIMITS

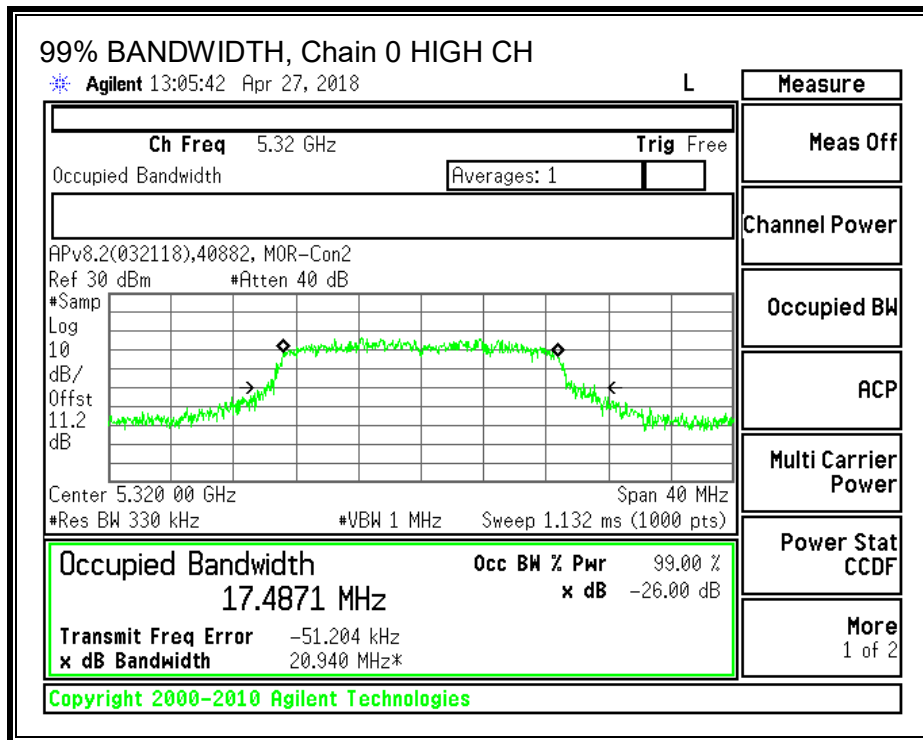
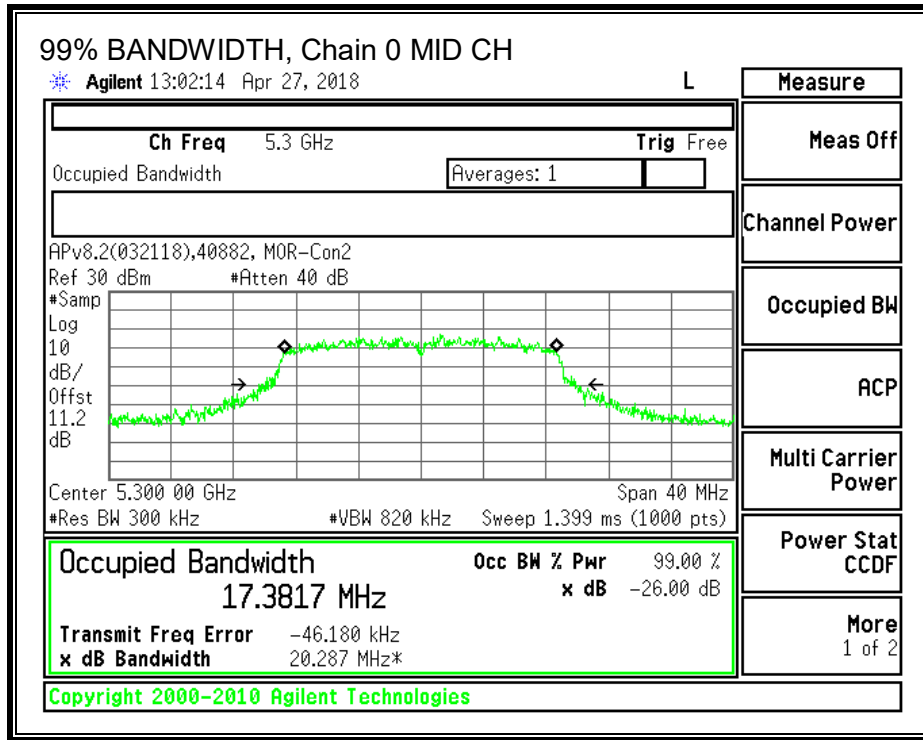
None; for reporting purposes only.

RESULTS

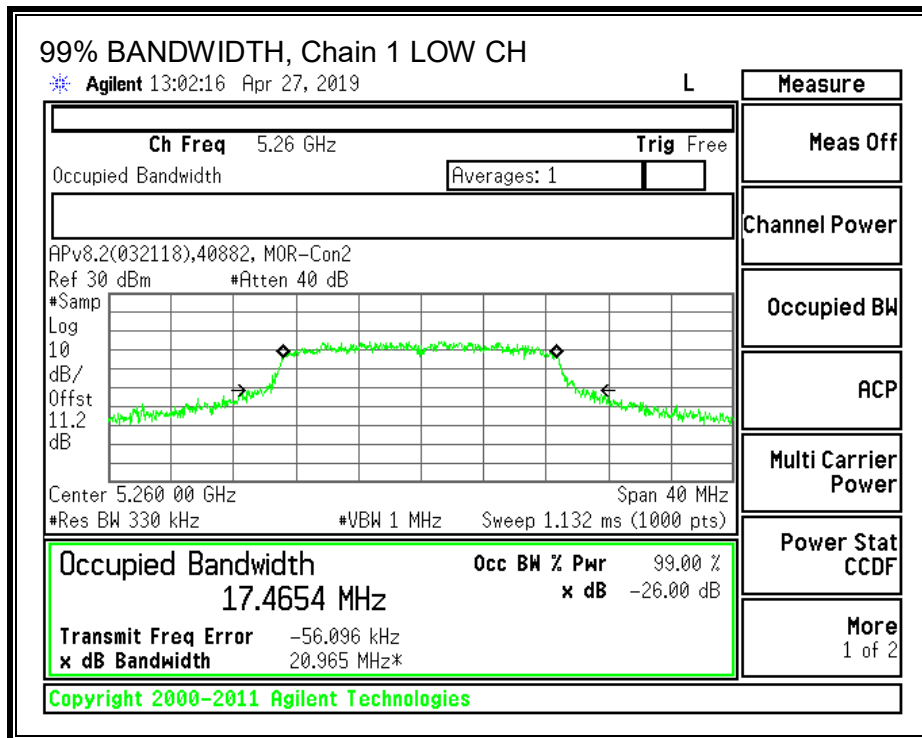
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5260	17.3309	17.4654
Mid	5300	17.3817	17.3934
High	5320	17.4871	17.4616

99% BANDWIDTH, Chain 0

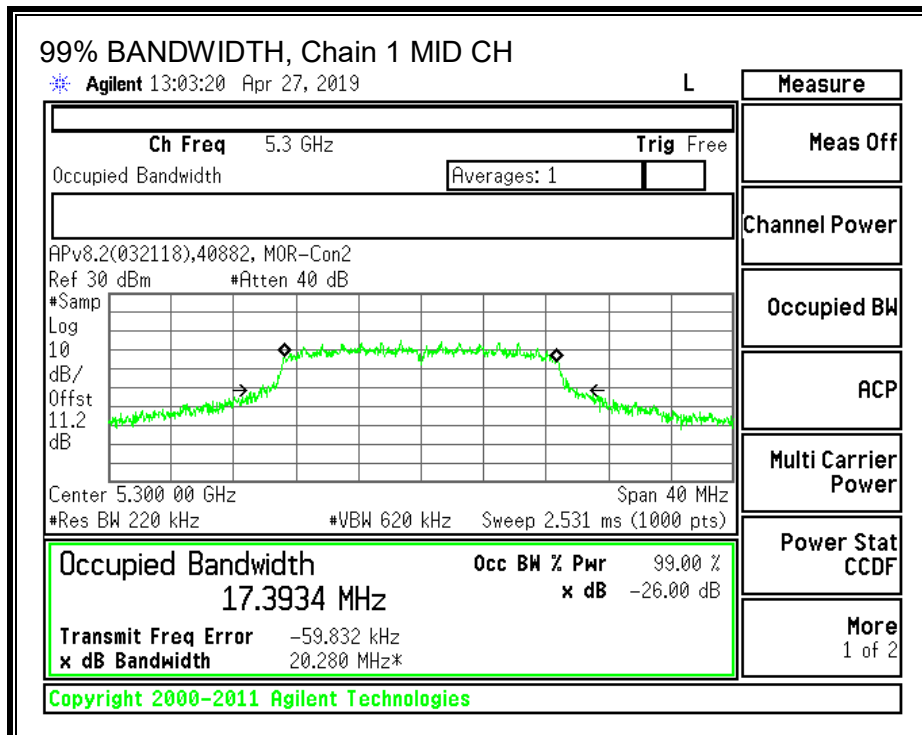




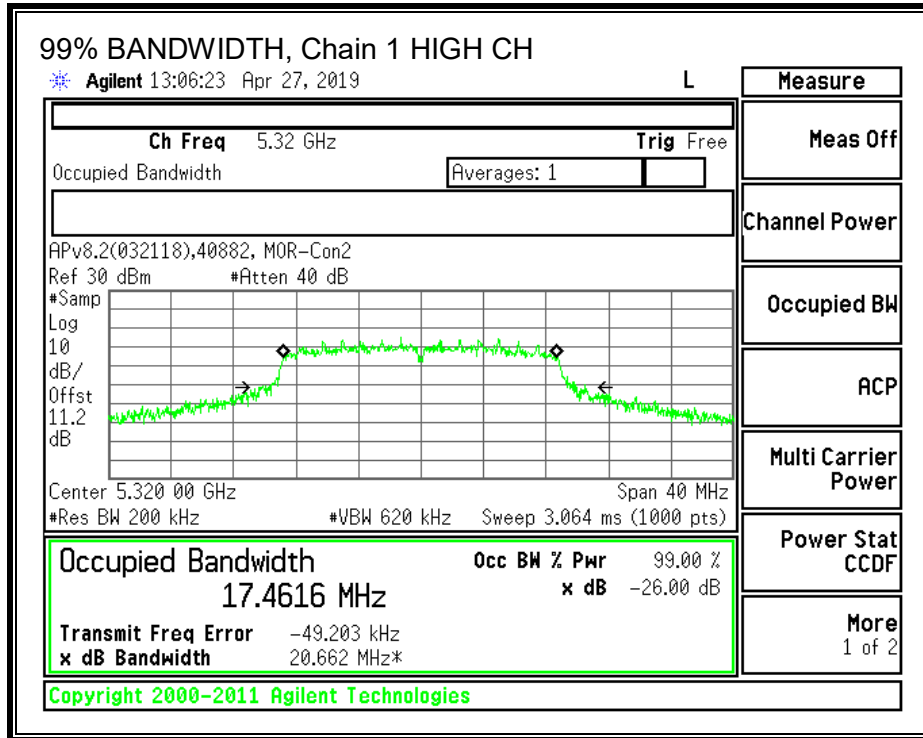
99% BANDWIDTH, Chain 1



Note: Date incorrect, should be Apr 27, 2018.



Note: Date incorrect, should be Apr 27, 2018.



Note: Date incorrect, should be Apr 27, 2018.

8.7.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATION

Test Date: 2018-03-15 and 2018-03-30
 Project: 12053557
 Tested By: 11993/46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	21.05	2.16	5.17	24.00	11.00
Mid	5300	20.95	2.16	5.17	24.00	11.00
High	5320	21.10	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.26	14.00	17.14	24.00	-6.86
Mid	5300	14.15	13.98	17.08	24.00	-6.92
High	5320	14.04	13.90	16.98	24.00	-7.02

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.98	0.79	7.70	11.00	-3.30
Mid	5300	1.51	0.89	7.49	11.00	-3.51
High	5320	2.02	0.66	7.68	11.00	-3.32

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	21.05	2.16	5.17	24.00	11.00
Mid	5300	20.95	2.16	5.17	24.00	11.00
High	5320	21.10	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.18	13.19	16.72	24.00	-7.28
Mid	5300	14.03	13.28	16.68	24.00	-7.32
High	5320	13.98	13.66	16.83	24.00	-7.17

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	17.3309	23.39	11.00
Mid	5300	17.3817	23.40	11.00
High	5320	17.4616	23.42	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.26	14.00	17.14	23.39	-6.25
Mid	5300	14.15	13.98	17.08	23.40	-6.32
High	5320	14.04	13.90	16.98	23.42	-6.44

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.98	0.79	7.70	11.00	-3.30
Mid	5300	1.51	0.89	7.49	11.00	-3.51
High	5320	2.02	0.66	7.68	11.00	-3.32

RESULTS (ISED CONDUCTED POWER) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	17.3309	23.39	11.00
Mid	5300	17.3817	23.40	11.00
High	5320	17.4616	23.42	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.18	13.19	16.72	23.39	-6.66
Mid	5300	14.03	13.28	16.68	23.40	-6.72
High	5320	13.98	13.66	16.83	23.42	-6.59

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	17.3309	2.16	29.39
Mid	5300	17.3817	2.16	29.40
High	5320	17.4616	2.16	29.42

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.26	14.00	19.30	29.39	-10.09
Mid	5300	14.15	13.98	19.24	29.40	-10.16
High	5320	14.04	13.90	19.14	29.42	-10.28

RESULTS (ISED EIRP) MCS7

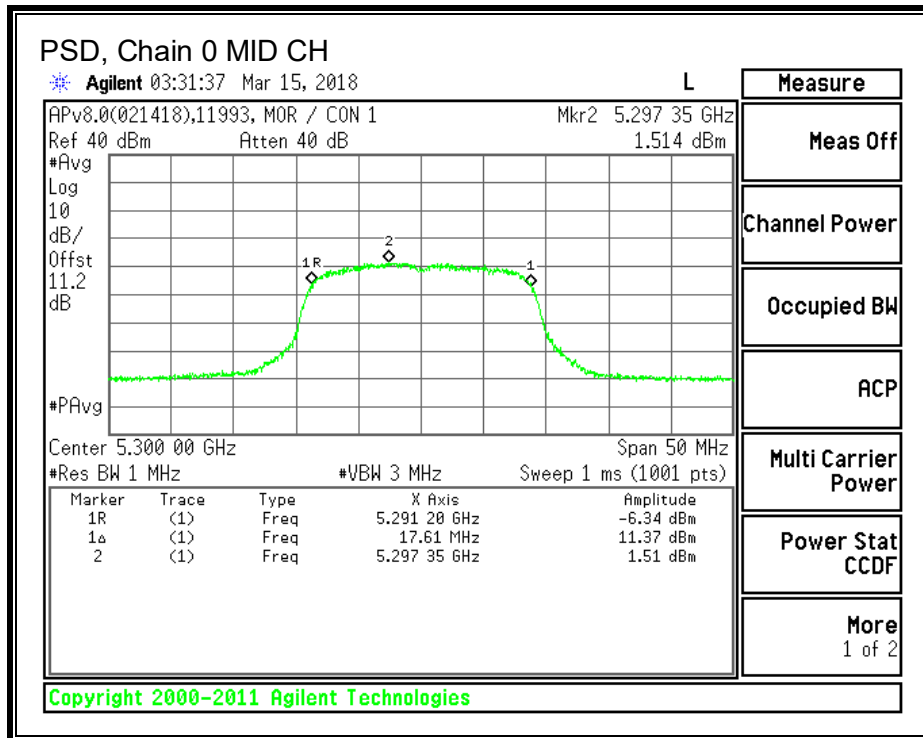
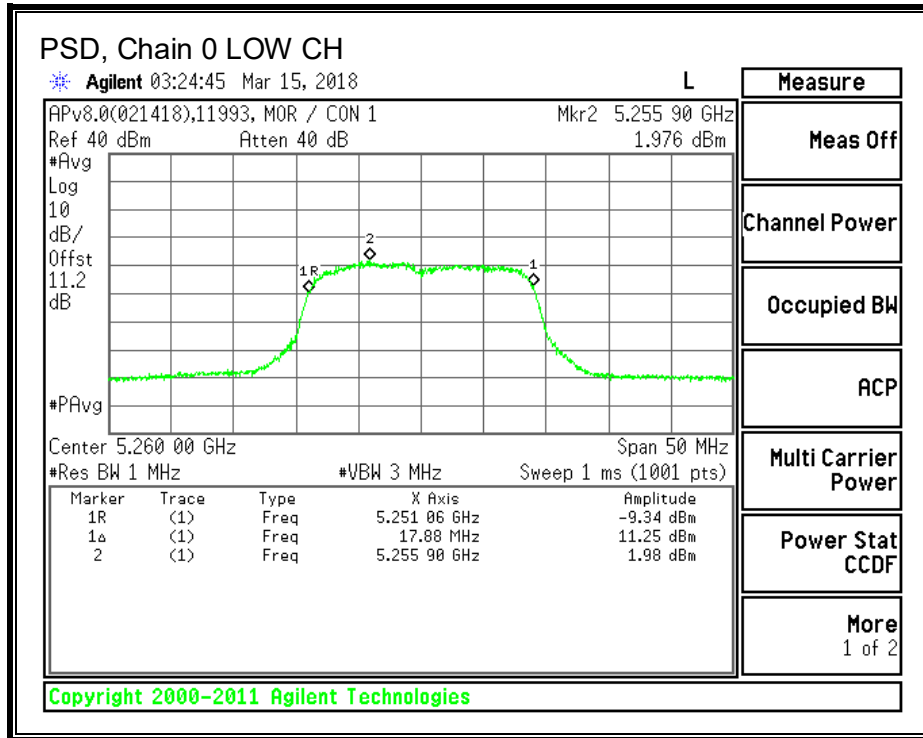
Bandwidth, Antenna Gain and Limits

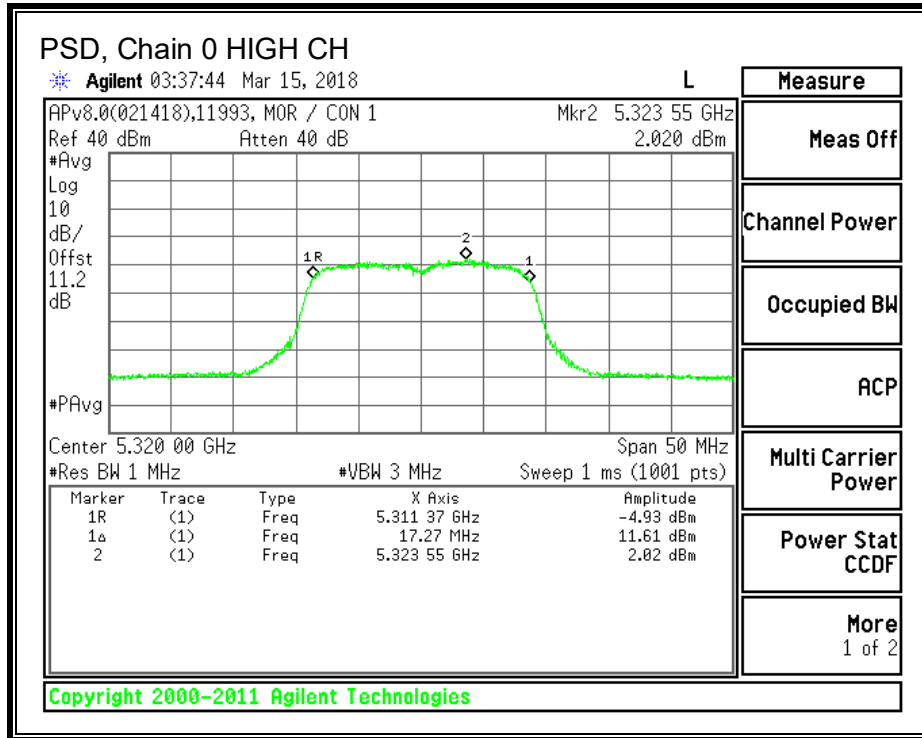
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	17.3309	2.16	29.39
Mid	5300	17.3817	2.16	29.40
High	5320	17.4616	2.16	29.42

Output Power Results

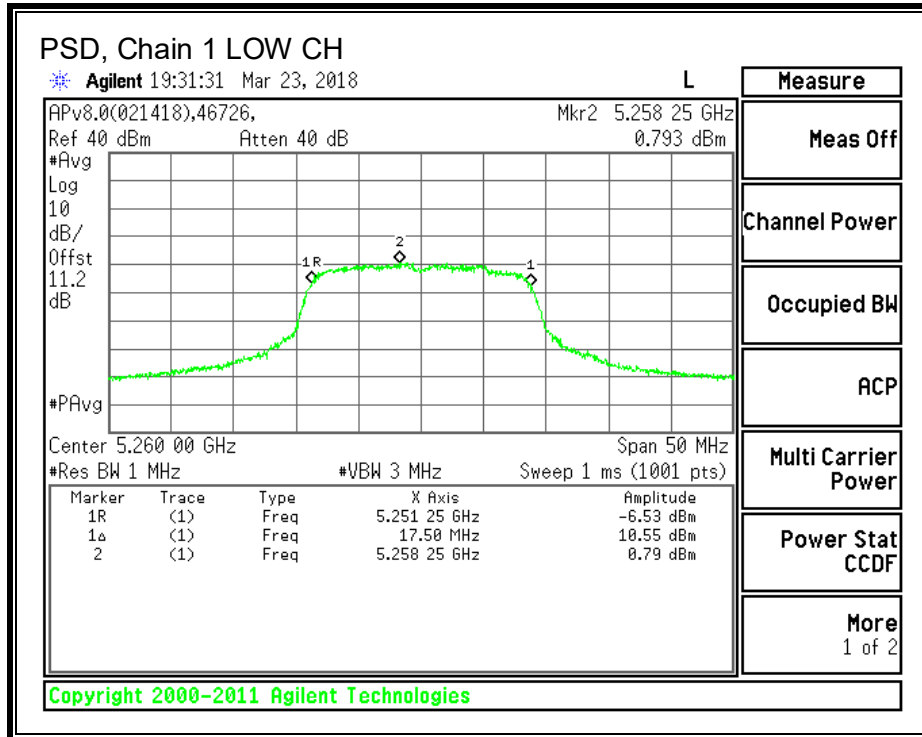
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.18	13.19	18.88	29.39	-10.50
Mid	5300	14.03	13.28	18.84	29.40	-10.56
High	5320	13.98	13.66	18.99	29.42	-10.43

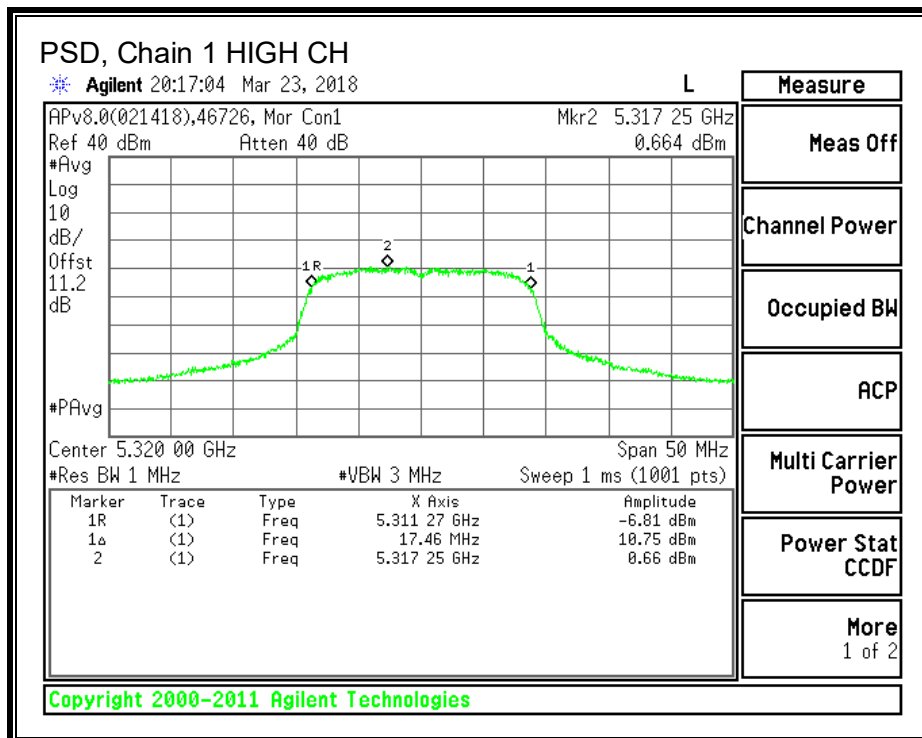
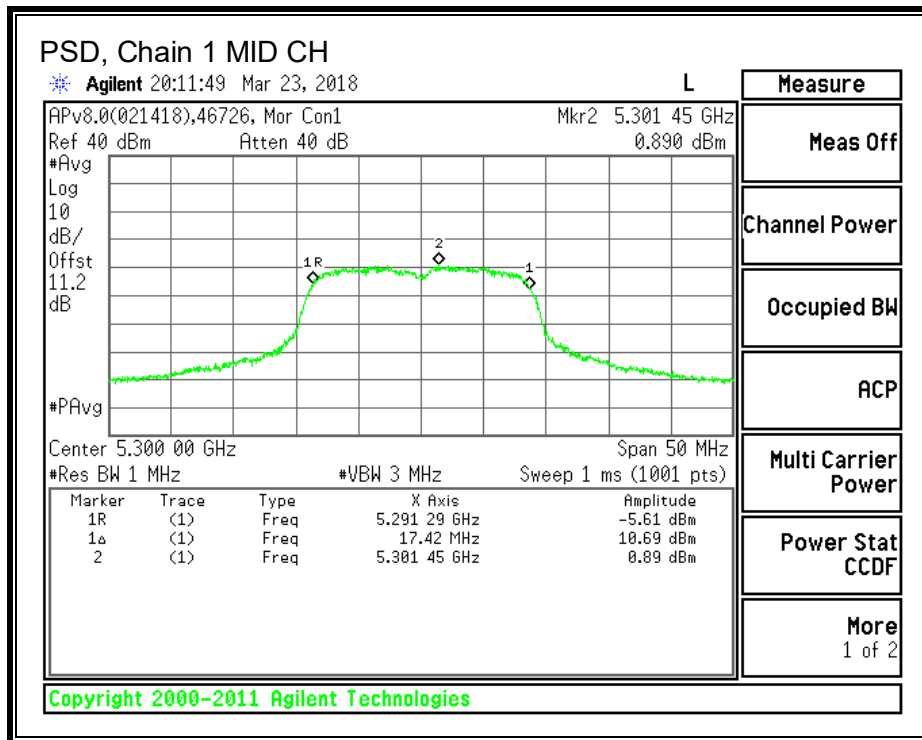
PSD, Chain 0





PSD, Chain 1





8.7.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATION

Test Date: 2018-03-15 and 2018-03-30
 Project: 12053557
 Tested By: 11993/46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	21.05	1.92	4.92	24.00	11.00
Mid	5300	20.95	1.92	4.92	24.00	11.00
High	5320	21.10	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.26	14.00	17.14	24.00	-6.86
Mid	5300	14.15	13.98	17.08	24.00	-6.92
High	5320	14.04	13.90	16.98	24.00	-7.02

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.98	0.79	7.70	11.00	-3.30
Mid	5300	1.51	0.89	7.49	11.00	-3.51
High	5320	2.02	0.66	7.68	11.00	-3.32

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	21.05	1.92	4.92	24.00	11.00
Mid	5300	20.95	1.92	4.92	24.00	11.00
High	5320	21.10	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.18	13.19	16.72	24.00	-7.28
Mid	5300	14.03	13.28	16.68	24.00	-7.32
High	5320	13.98	13.66	16.83	24.00	-7.17

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	17.33	23.39	11.00
Mid	5300	17.38	23.40	11.00
High	5320	17.46	23.42	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.26	14.00	17.14	23.39	-6.25
Mid	5300	14.15	13.98	17.08	23.40	-6.32
High	5320	14.04	13.90	16.98	23.42	-6.44

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5260	1.98	0.79	7.70	11.00	-3.30
Mid	5300	1.51	0.89	7.49	11.00	-3.51
High	5320	2.02	0.66	7.68	11.00	-3.32

RESULTS (ISED CONDUCTED POWER) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5260	17.33	23.39	11.00
Mid	5300	17.38	23.40	11.00
High	5320	17.46	23.42	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.18	13.19	16.72	23.39	-6.66
Mid	5300	14.03	13.28	16.68	23.40	-6.72
High	5320	13.98	13.66	16.83	23.42	-6.59

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	17.3309	1.92	29.39
Mid	5300	17.3817	1.92	29.40
High	5320	17.4616	1.92	29.42

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.26	14.00	19.06	29.39	-10.33
Mid	5300	14.15	13.98	19.00	29.40	-10.40
High	5320	14.04	13.90	18.90	29.42	-10.52

RESULTS (ISED EIRP) MCS7

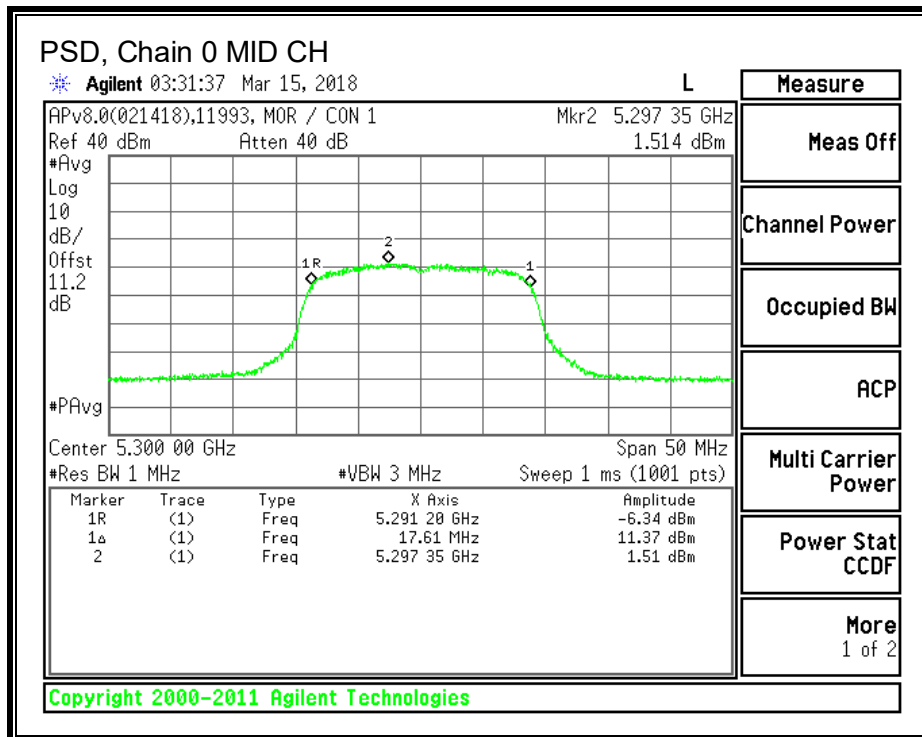
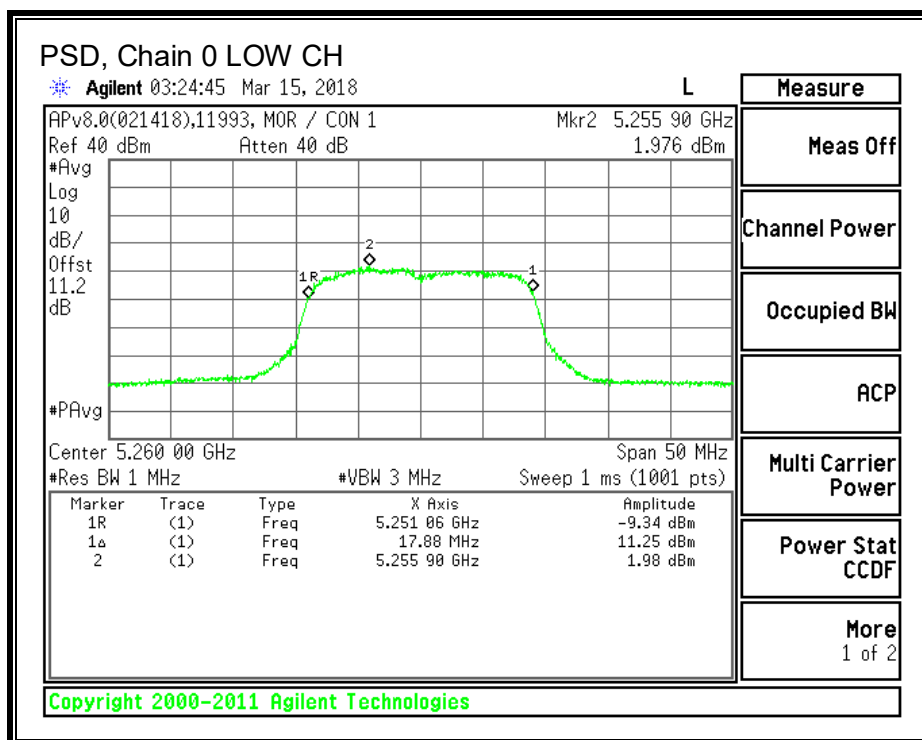
Bandwidth, Antenna Gain and Limits

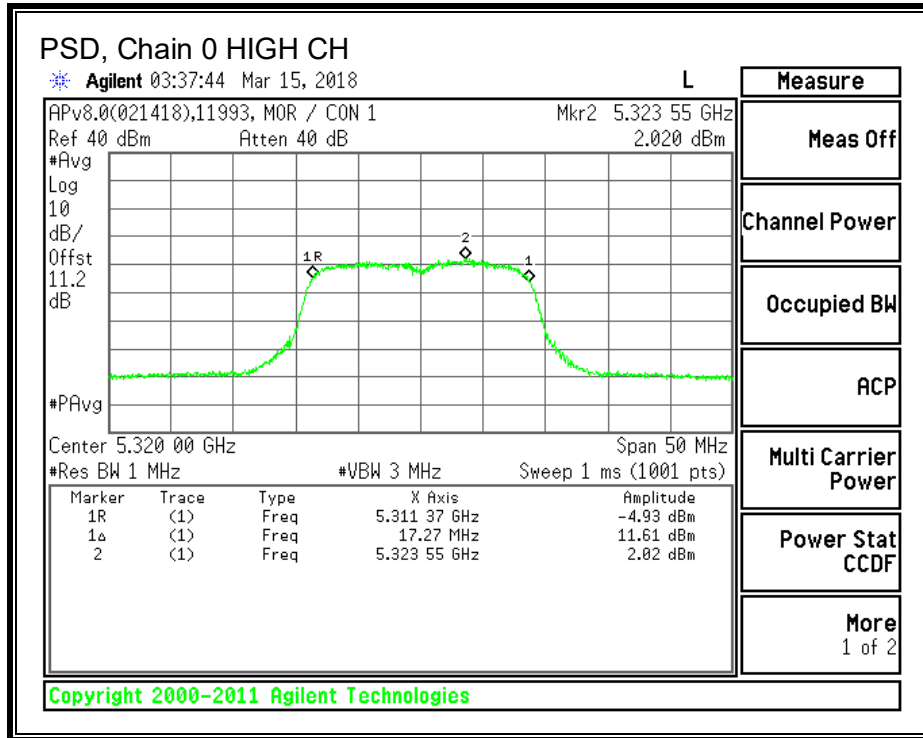
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5260	17.33	1.92	29.39
Mid	5300	17.38	1.92	29.40
High	5320	17.46	1.92	29.42

Output Power Results

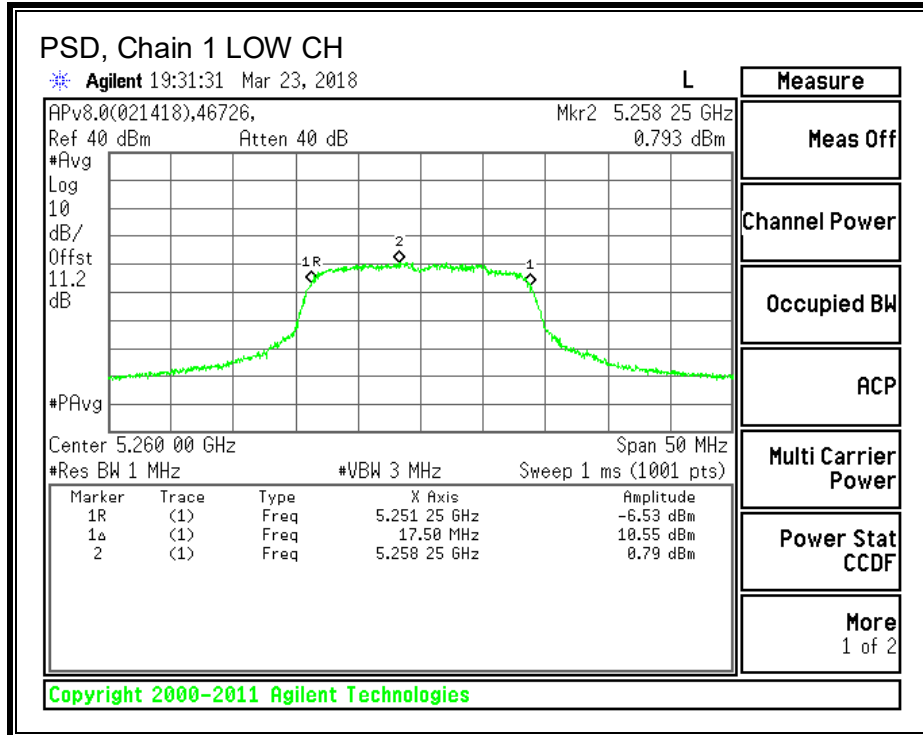
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5260	14.18	13.19	18.64	29.39	-10.74
Mid	5300	14.03	13.28	18.60	29.40	-10.80
High	5320	13.98	13.66	18.75	29.42	-10.67

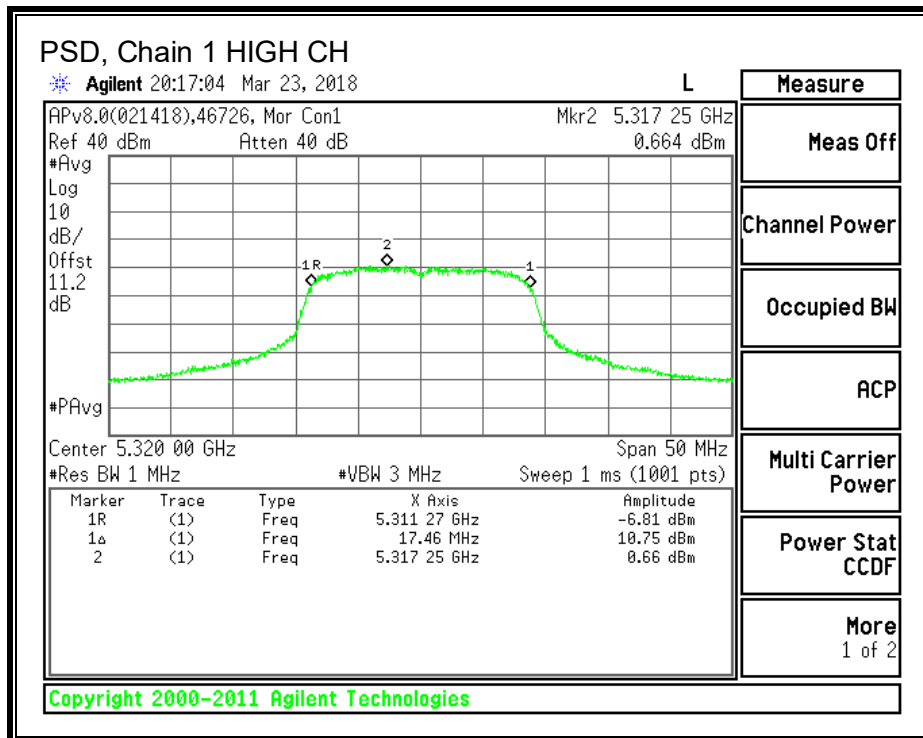
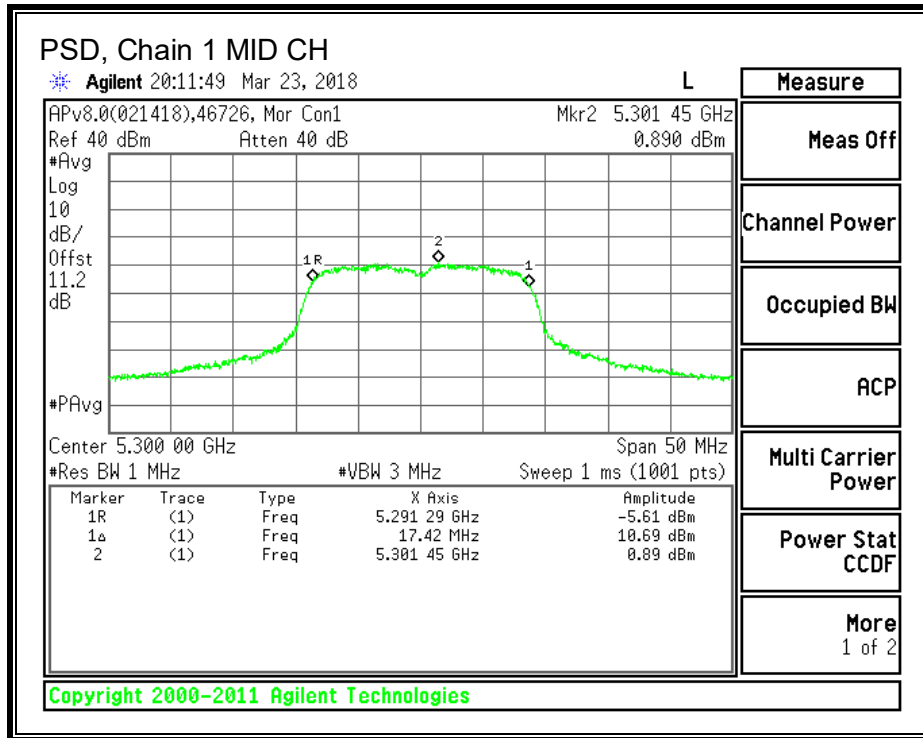
PSD, Chain 0





PSD, Chain 1





8.8. 802.11n HT40 MODE IN THE 5.3 GHz BAND

8.8.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

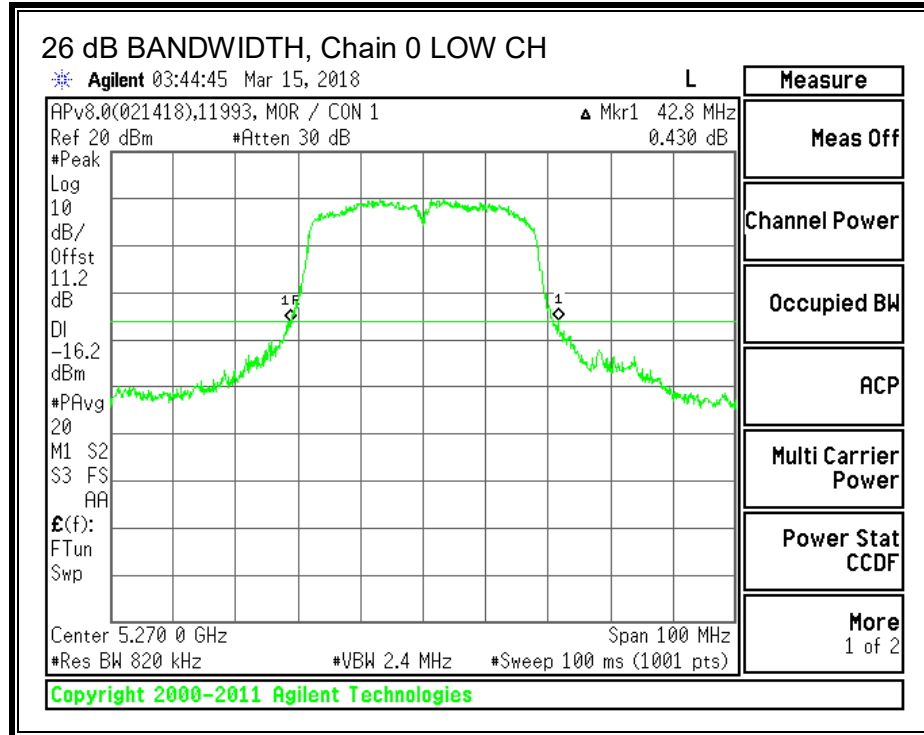
TEST INFORMATION

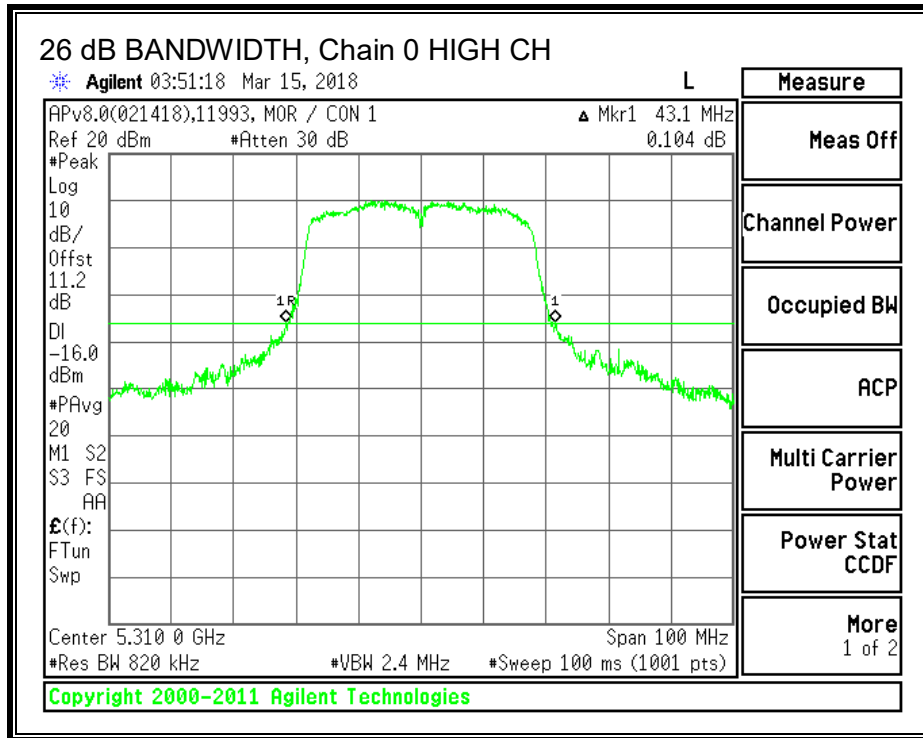
Test Date: 2018-03-15, 2018-03-23, 2018-04-30
 Project: 12053557
 Tested By: 11993/46722, 46726/46722, 40882

RESULTS

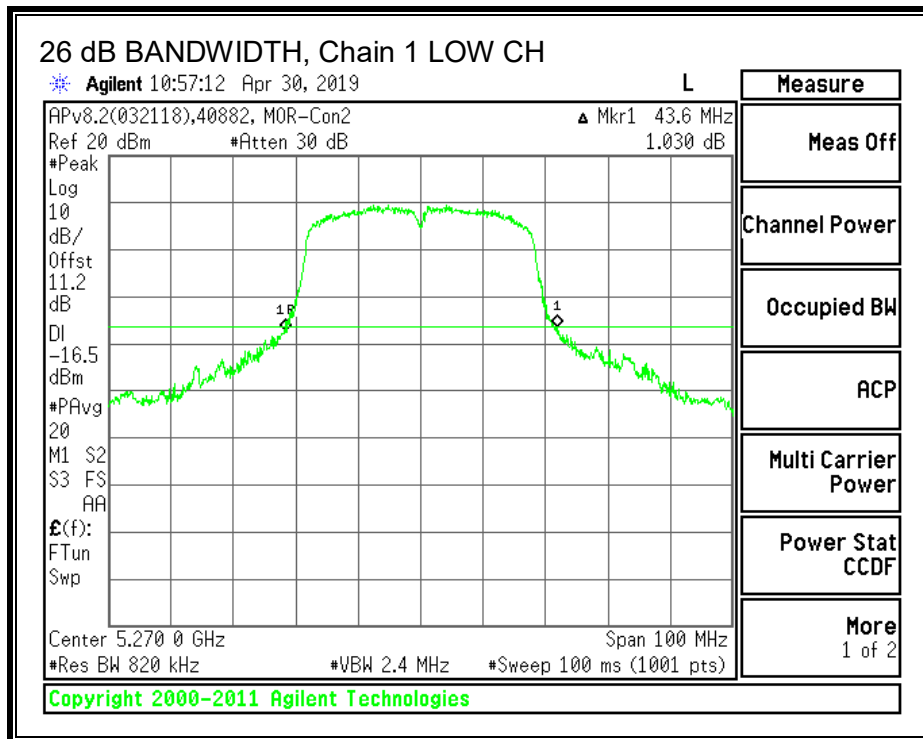
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5270	42.80	43.60
High	5310	43.10	62.00

26 dB BANDWIDTH, Chain 0

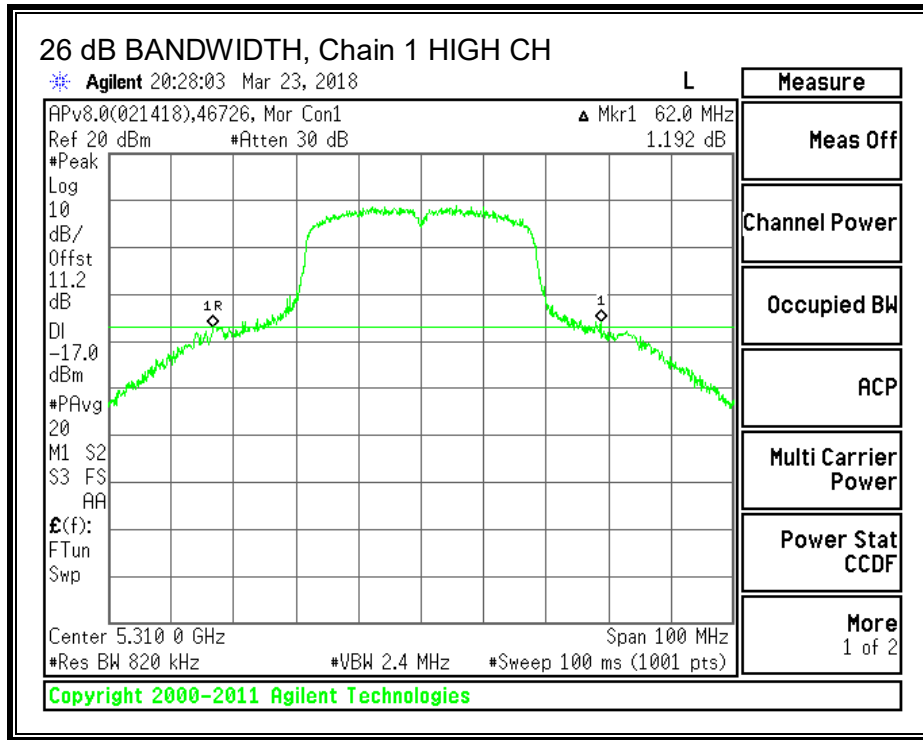




26 dB BANDWIDTH, Chain 1



Note: Date should be Apr 30, 2019.



8.8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

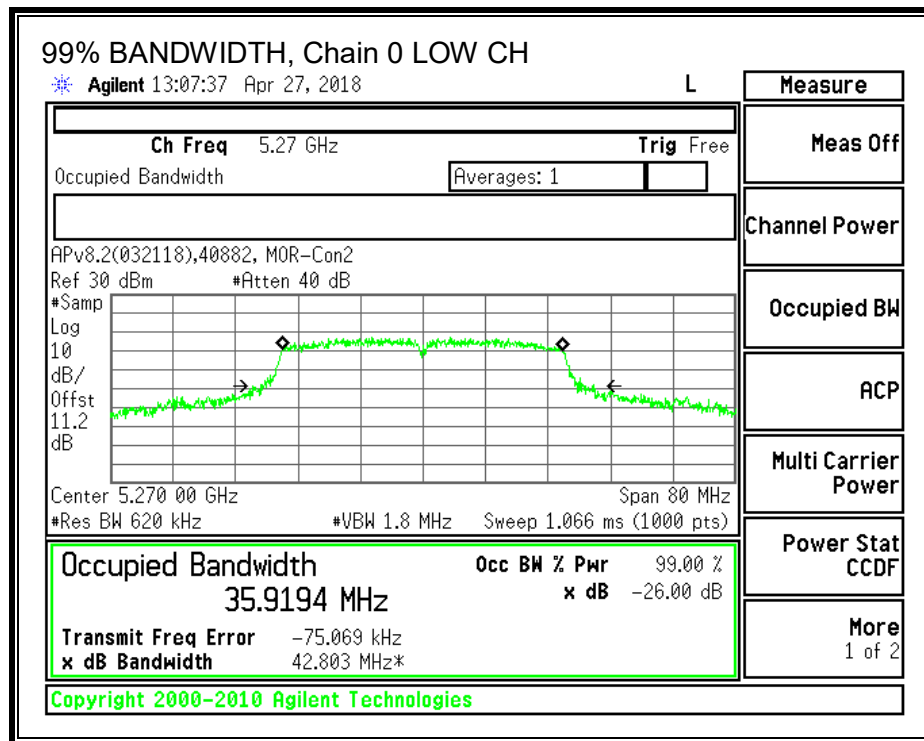
TEST INFORMATION

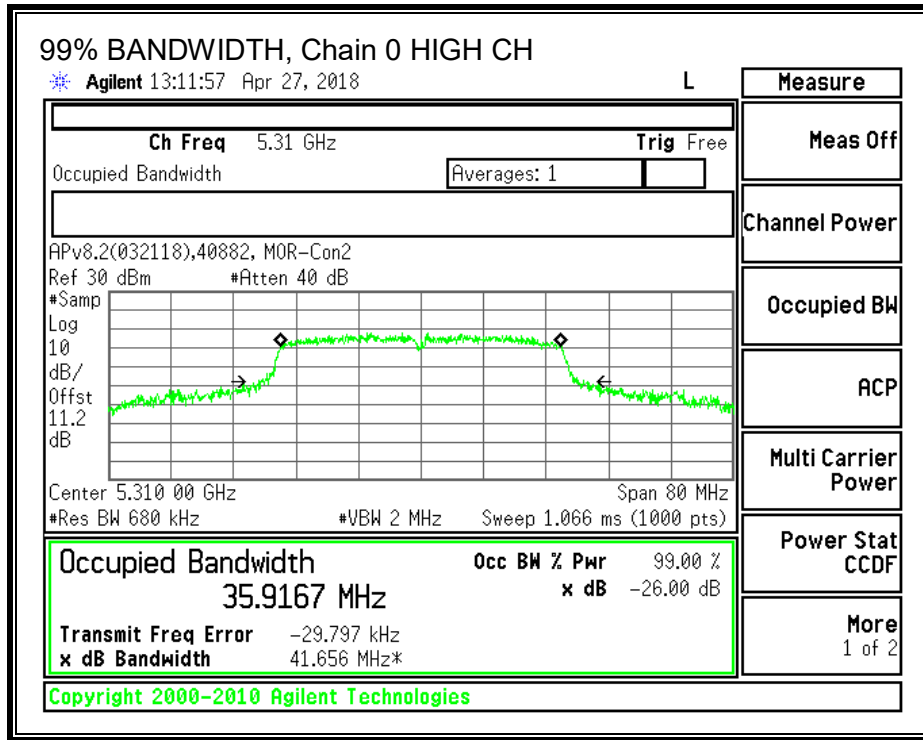
Test Date: 2018-04-27
 Project: 12053557
 Tested By: 40882

RESULTS

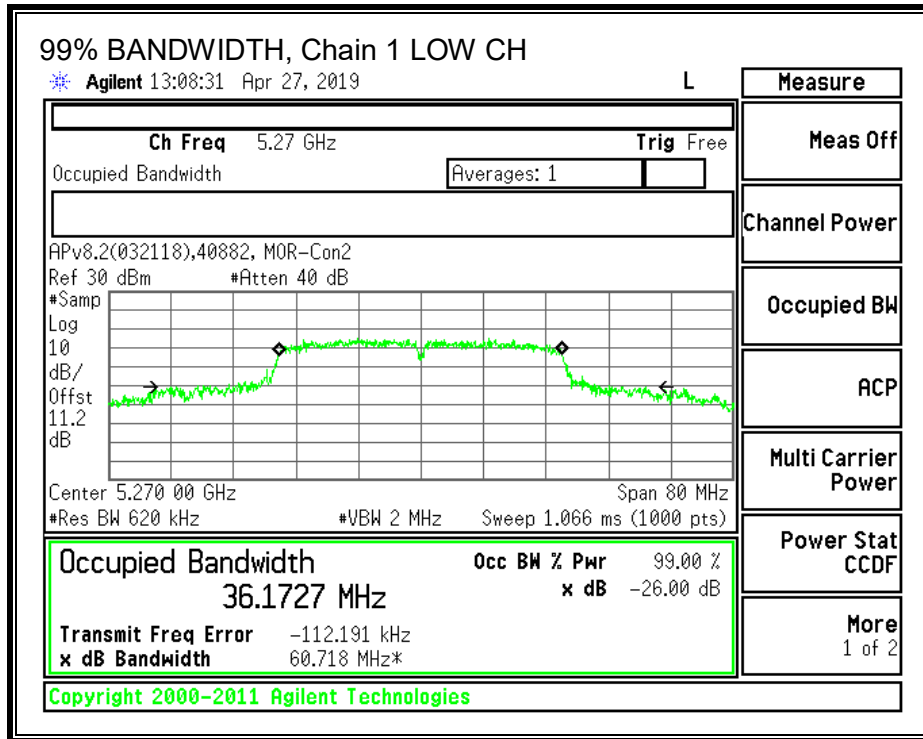
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5270	35.9194	36.1727
High	5310	35.9167	36.2855

99% BANDWIDTH, Chain 0

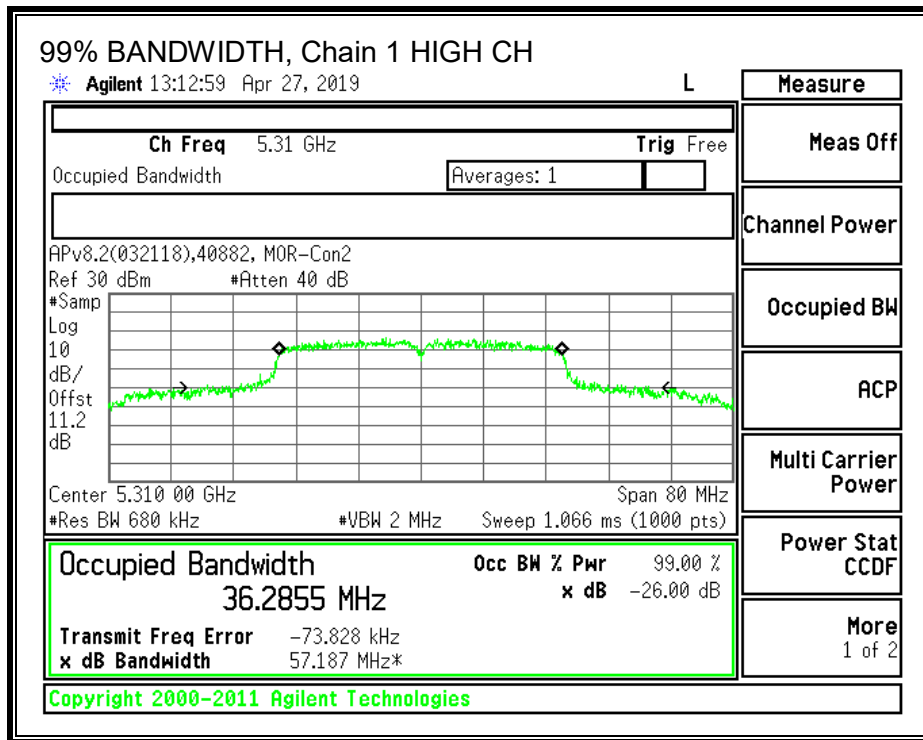




99% BANDWIDTH, Chain 1



Note: Date incorrect, should be Apr 27, 2018.



Note: Date incorrect, should be Apr 27, 2018.

8.8.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATON

Test Date: 2018-03-15 to 2018-03-30
 Project: 12053557
 Tested By: 11933/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	42.80	2.16	5.17	24.00	11.00
High	5310	43.10	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.18	15.05	18.13	24.00	-5.87
High	5310	15.16	14.95	18.07	24.00	-5.93

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	0.03	-1.70	4.78	11.00	-6.22
High	5310	-0.66	-1.27	4.57	11.00	-6.43

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	42.80	2.16	5.17	24.00	11.00
High	5310	43.10	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.09	14.97	18.04	24.00	-5.96
High	5310	12.00	11.85	14.94	24.00	-9.06

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	35.92	24.00	11.00
High	5310	35.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.18	15.05	18.13	24.00	-5.87
High	5310	15.16	14.95	18.07	24.00	-5.93

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	0.03	-1.70	4.78	11.00	-6.22
High	5310	-0.66	-1.27	4.57	11.00	-6.43

RESULTS (ISED CONDUCTED POWER) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	35.92	24.00	11.00
High	5310	35.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.09	14.97	18.04	24.00	-5.96
High	5310	12.00	11.85	14.94	24.00	-9.06

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5270	35.92	2.16	30.00
High	5310	35.92	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5270	15.18	15.05	20.29	30.00	-9.71
High	5310	15.16	14.95	20.23	30.00	-9.77

RESULTS (ISED EIRP) MCS7

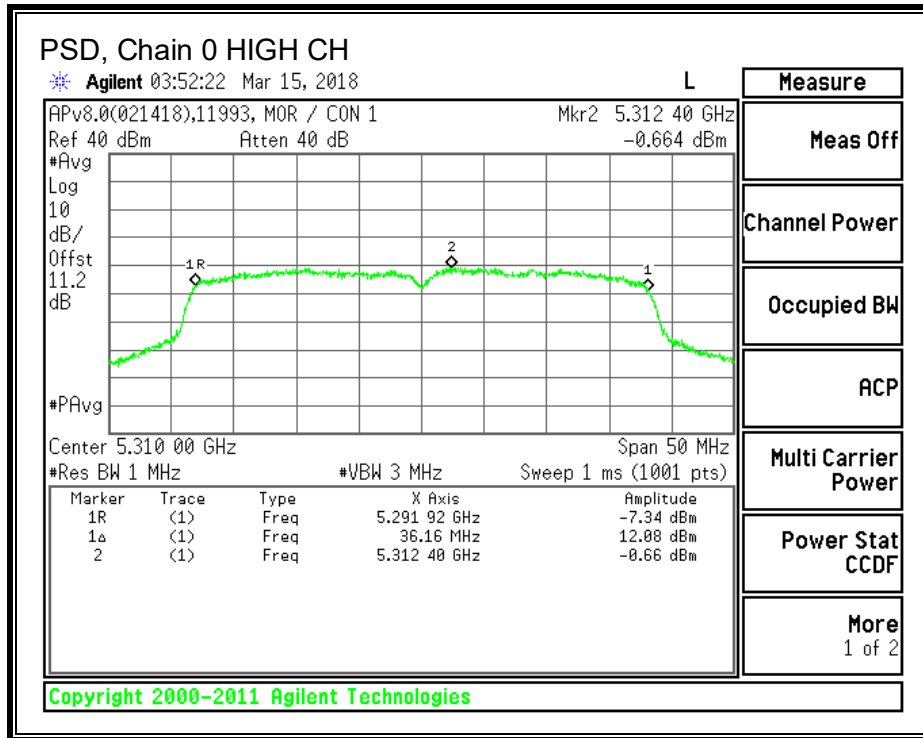
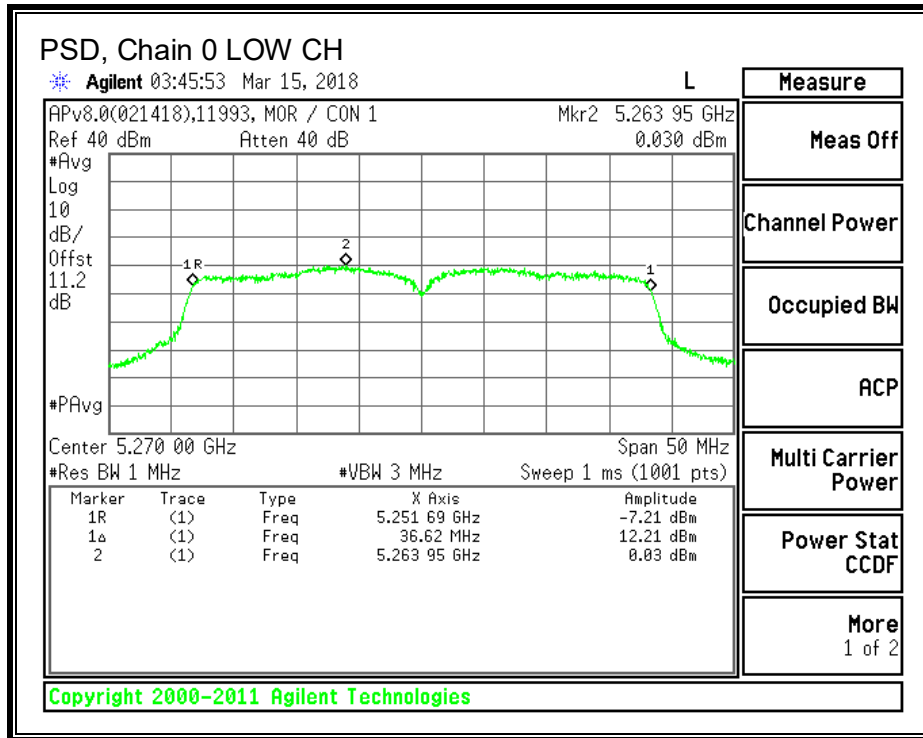
Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5270	35.92	2.16	30.00
High	5310	35.92	2.16	30.00

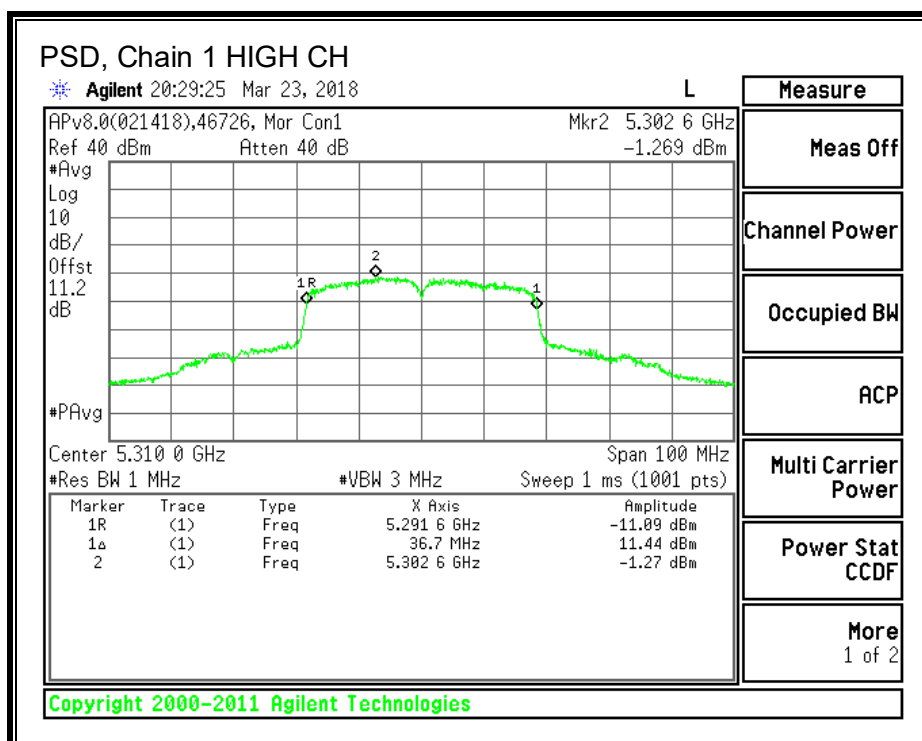
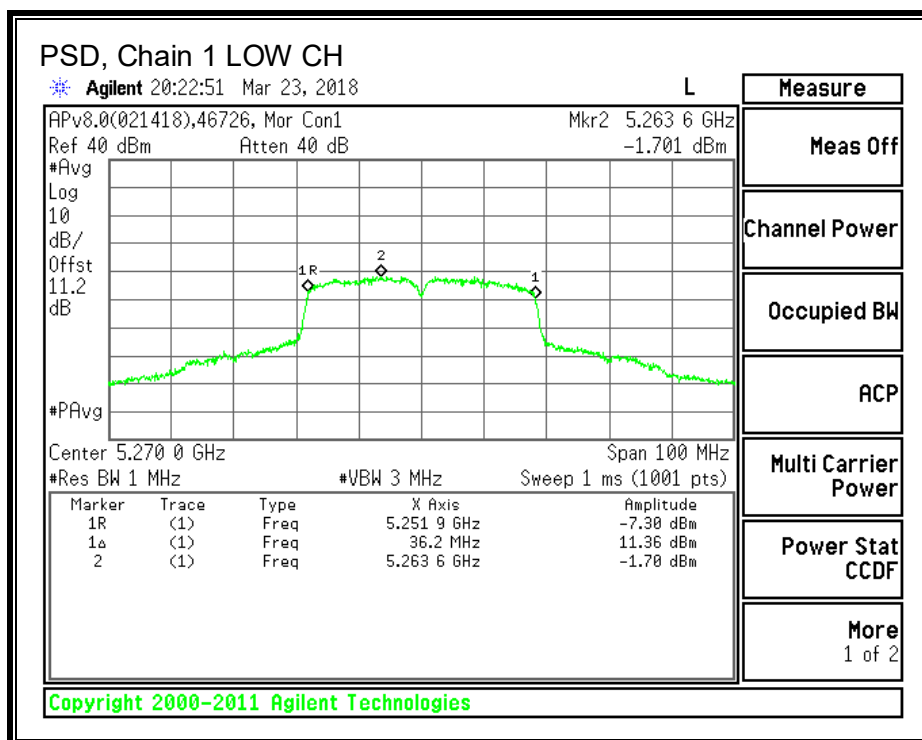
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5270	15.09	14.97	20.20	30.00	-9.80
High	5310	12.00	11.85	17.10	30.00	-12.90

PSD, Chain 0



PSD, Chain 1



8.8.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log 10B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30
Project: 12053557
Tested By: 11933/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	42.80	1.92	4.92	24.00	11.00
High	5310	43.10	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.18	15.05	18.13	24.00	-5.87
High	5310	14.01	13.86	16.95	24.00	-7.05

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	0.03	-1.70	4.78	11.00	-6.22
High	5310	-0.66	-1.27	4.57	11.00	-6.43

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	42.80	1.92	4.92	24.00	11.00
High	5310	43.10	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.09	14.97	18.04	24.00	-5.96
High	5310	11.05	10.80	13.94	24.00	-10.06

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	35.92	24.00	11.00
High	5310	35.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd Power & PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.18	15.05	18.13	24.00	-5.87
High	5310	14.01	13.86	16.95	24.00	-7.05

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5270	0.03	-1.70	4.78	11.00	-6.22
High	5310	-0.66	-1.27	4.57	11.00	-6.43

RESULTS (ISED CONDUCTED POWER) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5270	35.92	24.00	11.00
High	5310	35.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.09	14.97	18.04	24.00	-5.96
High	5310	11.05	10.80	13.94	24.00	-10.06

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5270	35.92	1.92	30.00
High	5310	35.92	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5270	15.18	15.05	20.05	30.00	-9.95
High	5310	14.01	13.86	18.87	30.00	-11.13

RESULTS (ISED EIRP) MCS7

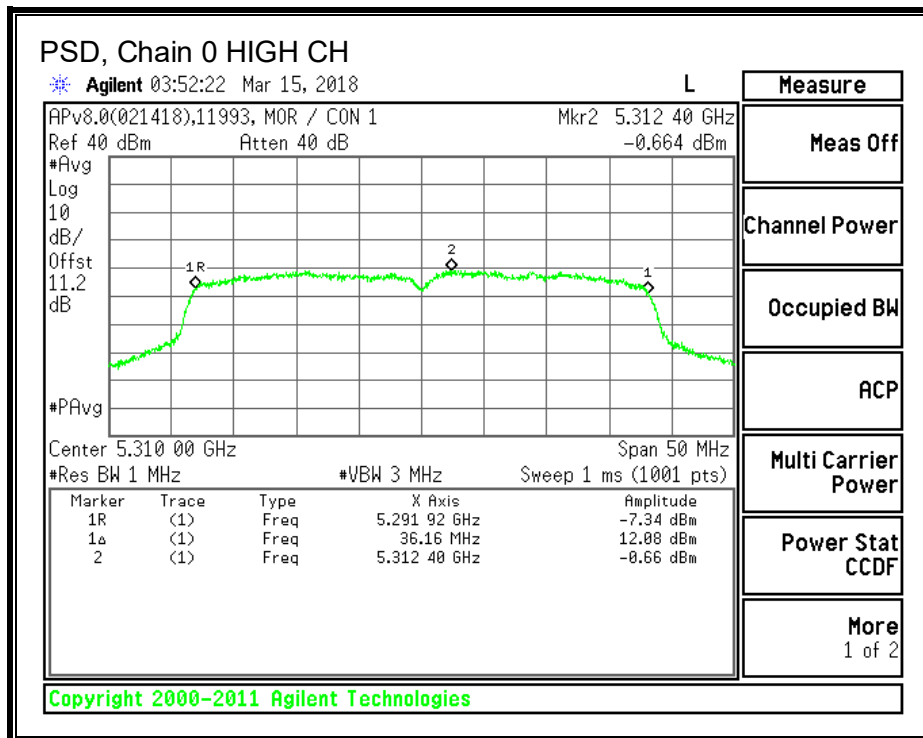
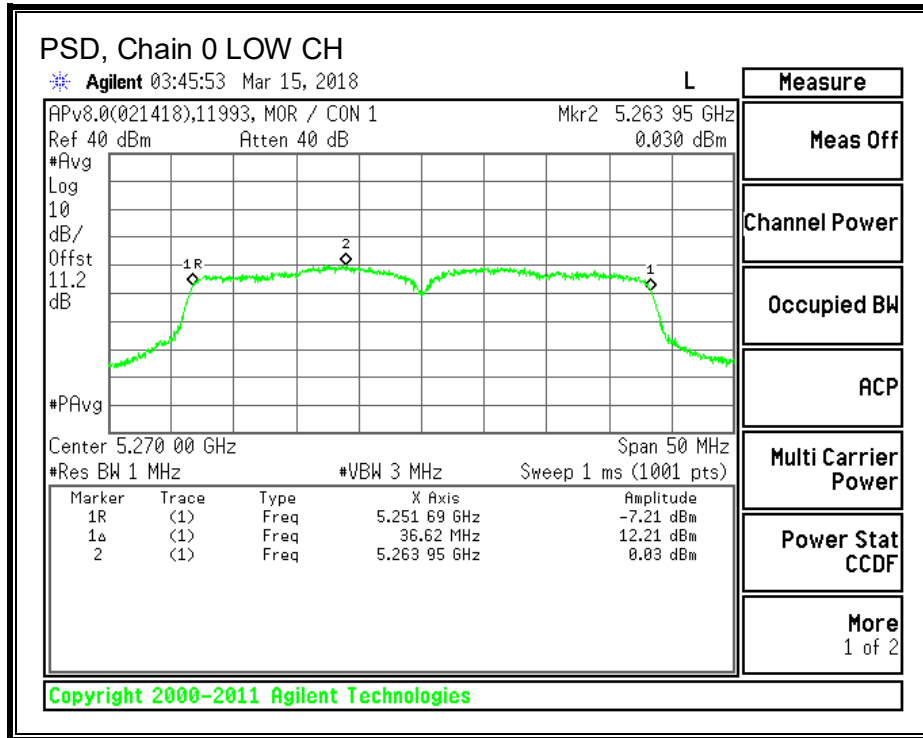
Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Low	5270	35.92	1.92	30.00
High	5310	35.92	1.92	30.00

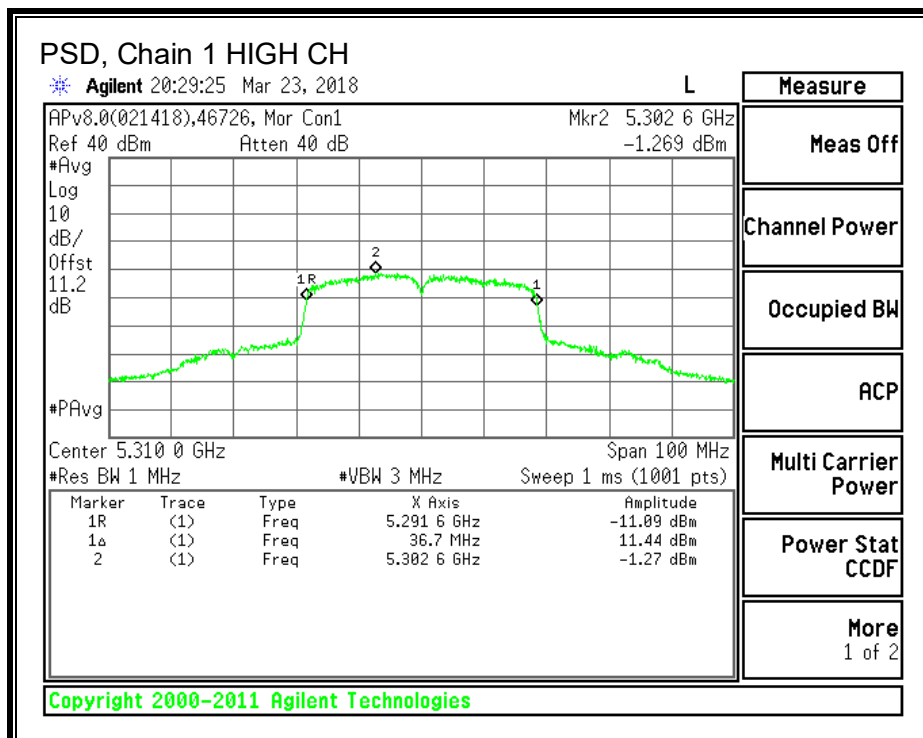
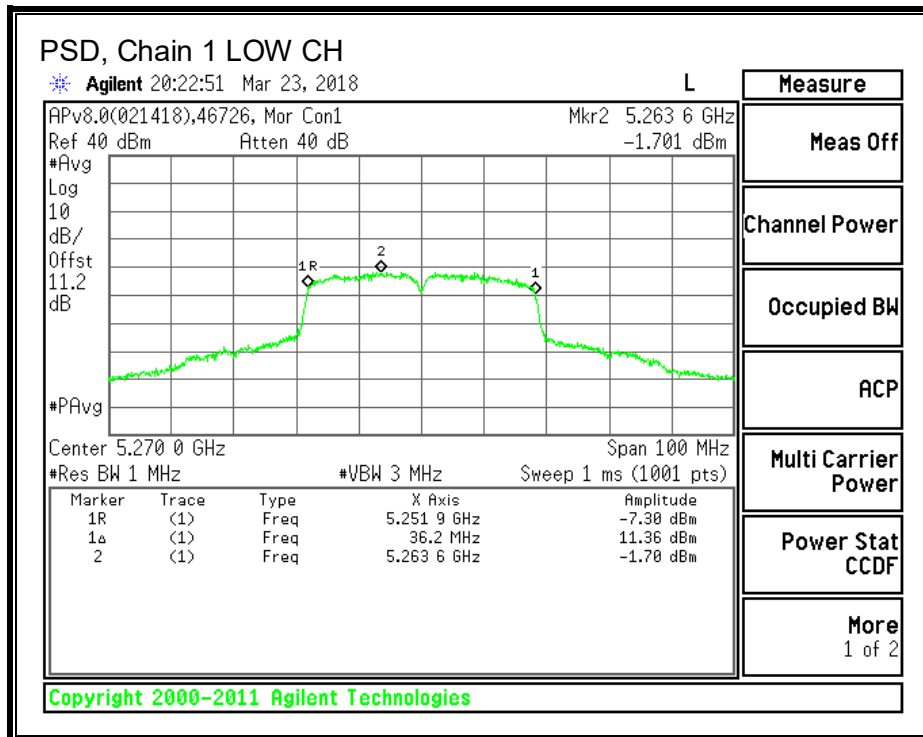
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5270	15.09	14.97	19.96	30.00	-10.04
High	5310	11.05	10.80	15.86	30.00	-14.14

PSD, Chain 0



PSD, Chain 1



8.9. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

8.9.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

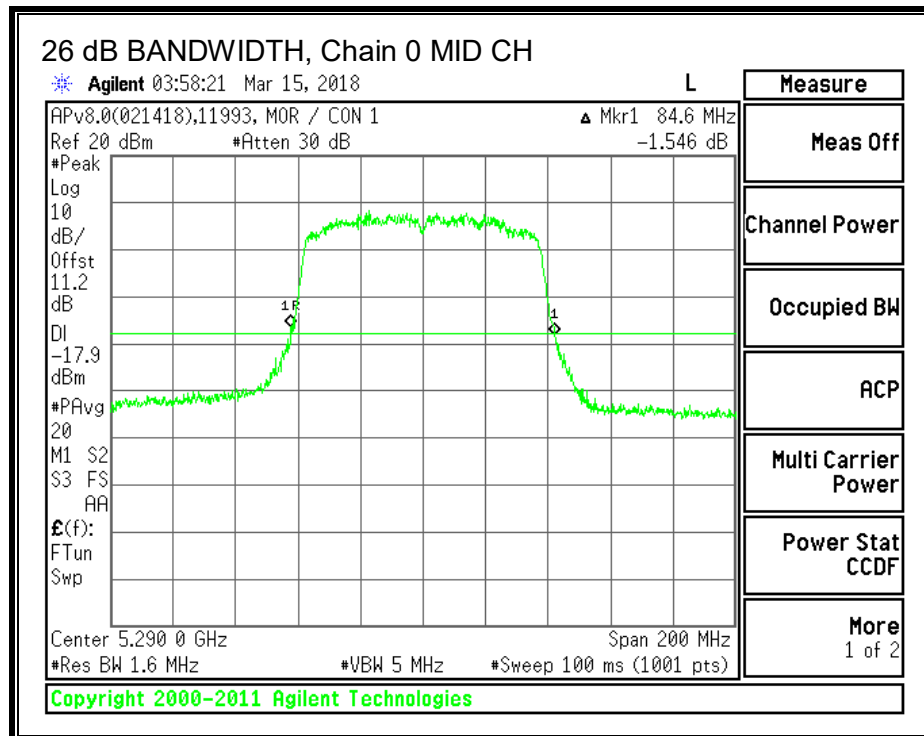
TEST INFORMATION

Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

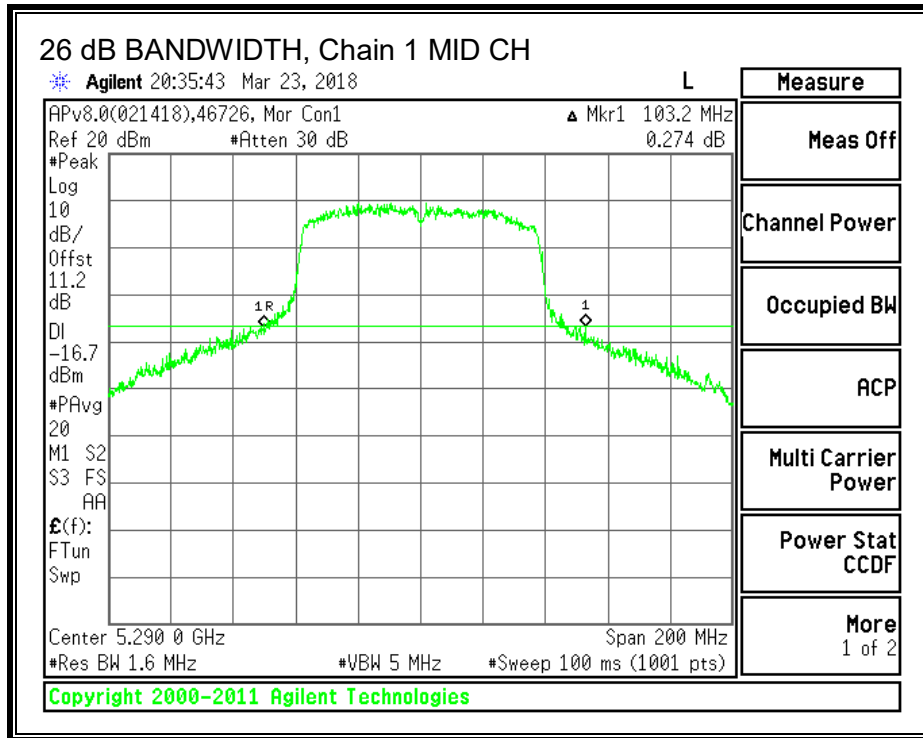
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Mid	5290	84.60	103.20

26 dB BANDWIDTH, Chain 0



26 dB BANDWIDTH, Chain 1



8.9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

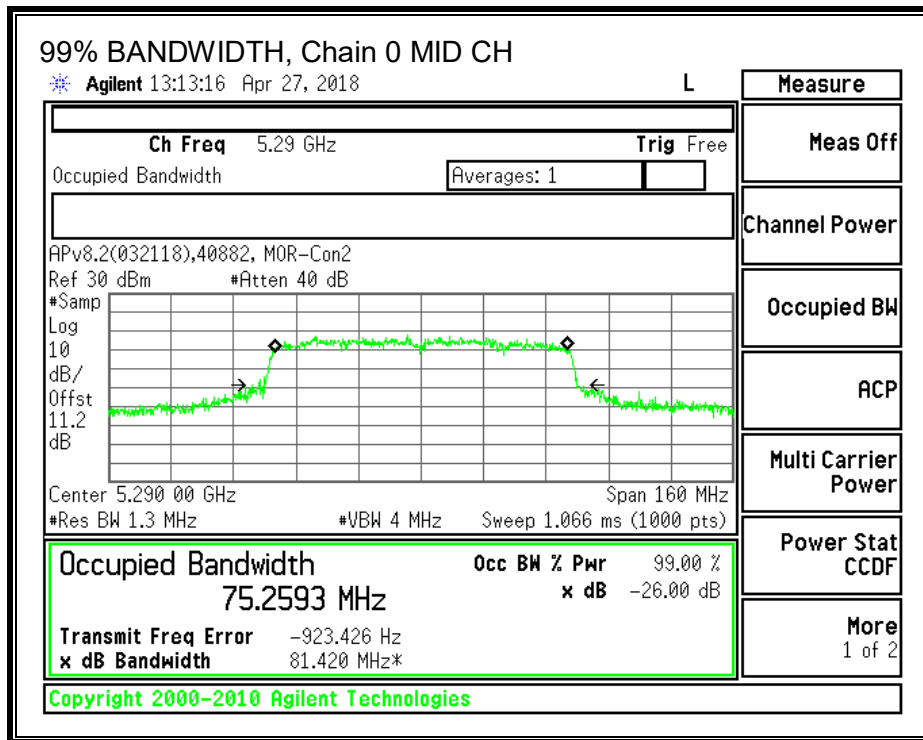
TEST INFORMATION

Test Date: 2018-04-27
 Project: 12053557
 Tested By: 40882

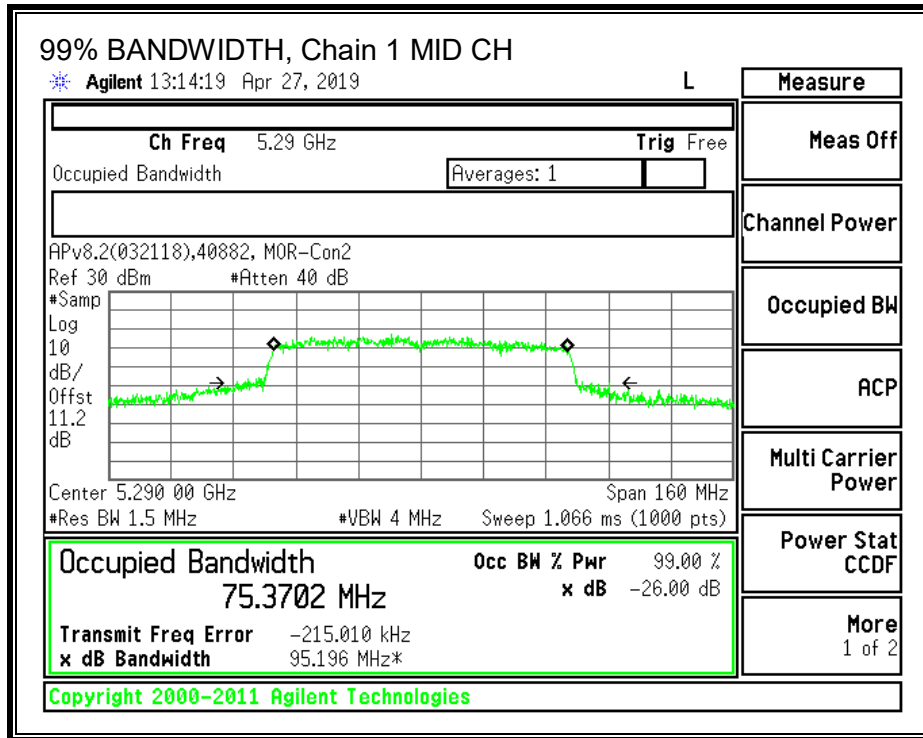
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5290	75.2593	75.3702

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



Note: Date incorrect, should be Apr 27, 2018.

8.9.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

TEST INFORMATION

Test Date: 2018-03-15, 2018-03-30
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	84.60	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.84	11.66	14.76	24.00	-9.24

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-7.27	-4.79	0.77	11.00	-10.23

RESULTS (FCC) MCS9

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	84.60	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	12.07	11.85	14.97	24.00	-9.03

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	75.26	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.84	11.66	14.76	24.00	-9.24

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-7.27	-4.79	0.77	11.00	-10.23

RESULTS (ISED CONDUCTED POWER) MCS9

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	75.26	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	12.07	11.85	14.97	24.00	-9.03

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Mid	5290	75.26	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5290	11.84	11.66	16.92	30.00	-13.08

RESULTS (ISED EIRP) MCS9

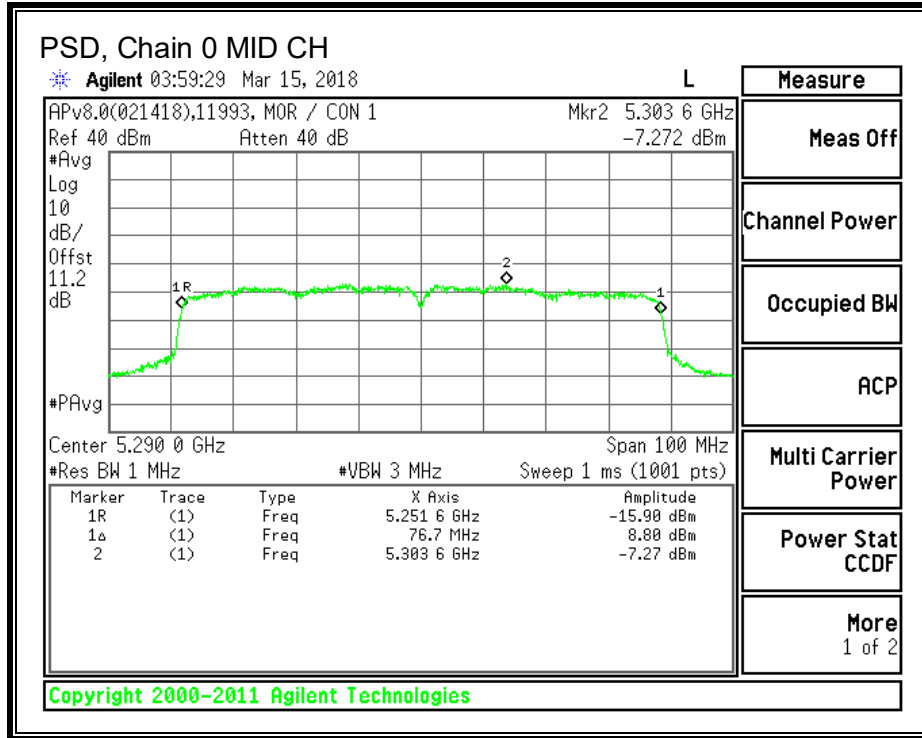
Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Mid	5290	75.26	2.16	30.00

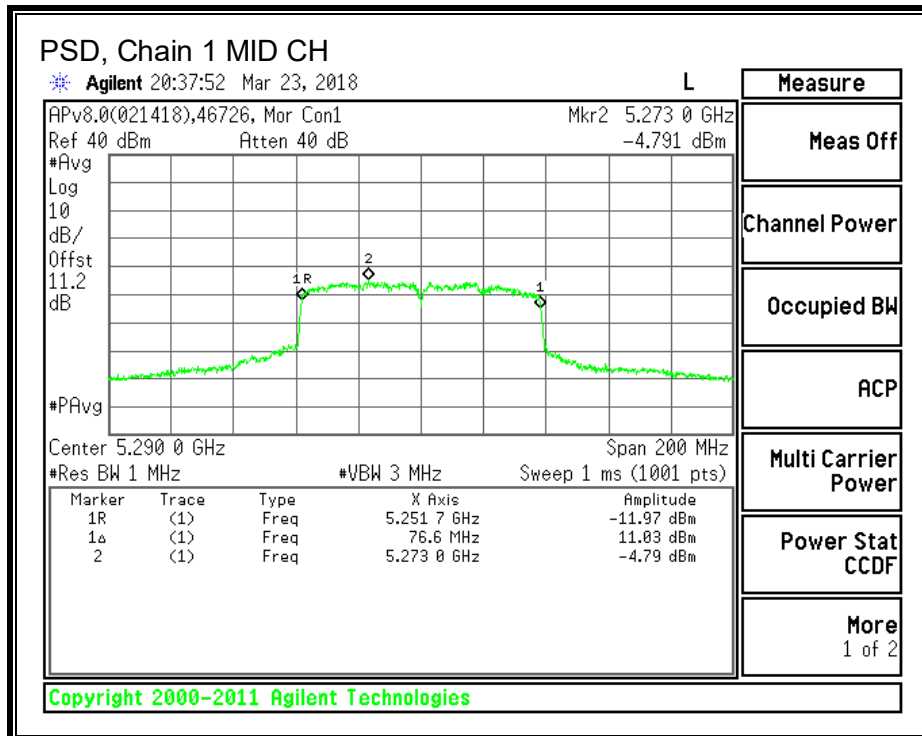
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5290	12.07	11.85	17.13	30.00	-12.87

PSD, Chain 0



PSD, Chain 1



8.9.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Issue 2 Section 6.2.2.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log 10B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

TEST INFORMATION

Test Date: 2018-03-15, 2018-03-30
Project: 12053557
Tested By: 11993/46722, 46726/46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	84.60	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.84	11.66	14.76	24.00	-9.24

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-7.27	-4.79	0.77	11.00	-10.23

RESULTS (FCC) MCS9

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	84.60	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.01	10.82	13.93	24.00	-10.07

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED CONDUCTED POWER AND PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	75.26	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.84	11.66	14.76	24.00	-9.24

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5290	-7.27	-4.79	0.77	11.00	-10.23

RESULTS (ISED CONDUCTED POWER) MCS9

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Mid	5290	75.26	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.01	10.82	13.93	24.00	-10.07

Note: PSD from 802.11ac VHT80 MCS0 was used to represent 802.11ac VHT80 MCS9. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Mid	5290	75.26	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5290	11.84	11.66	16.68	30.00	-13.32

RESULTS (ISED EIRP) MCS9

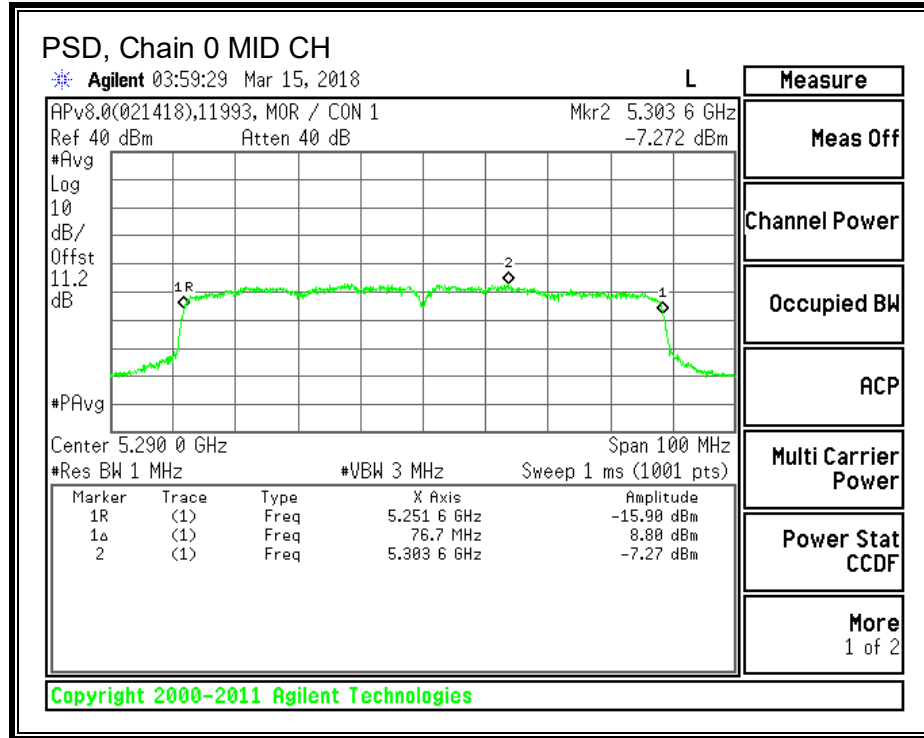
Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant Gain (dBi)	EIRP Limit (dBm)
Mid	5290	75.26	1.92	30.00

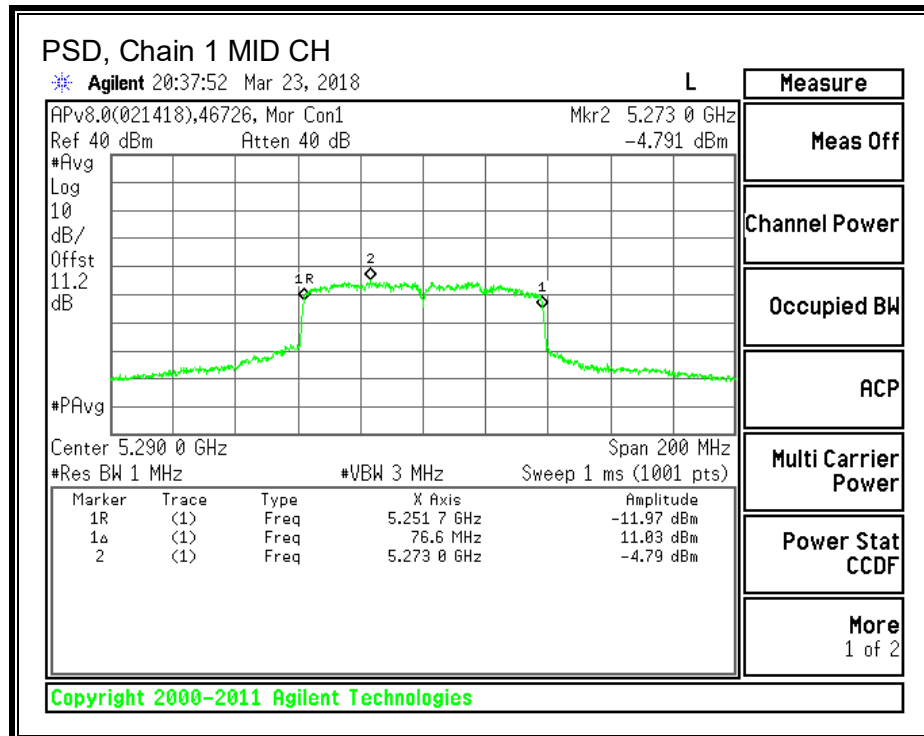
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Mid	5290	11.01	10.82	15.85	30.00	-14.15

PSD, Chain 0



PSD, Chain 1



8.10. 802.11a MODE IN THE 5.6 GHz BAND

8.10.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

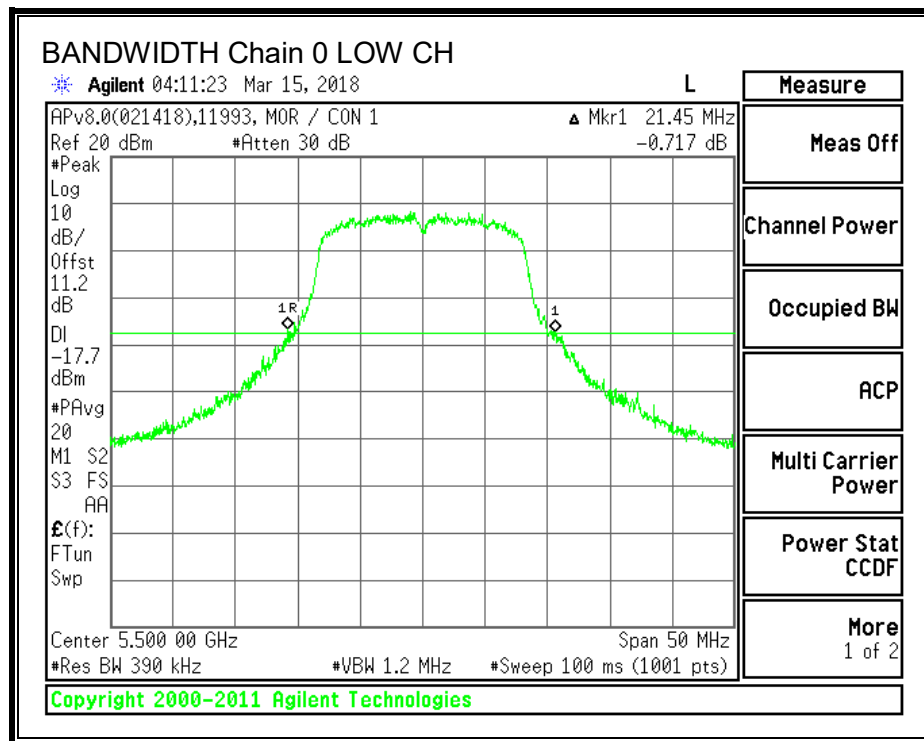
TEST INFORMATION

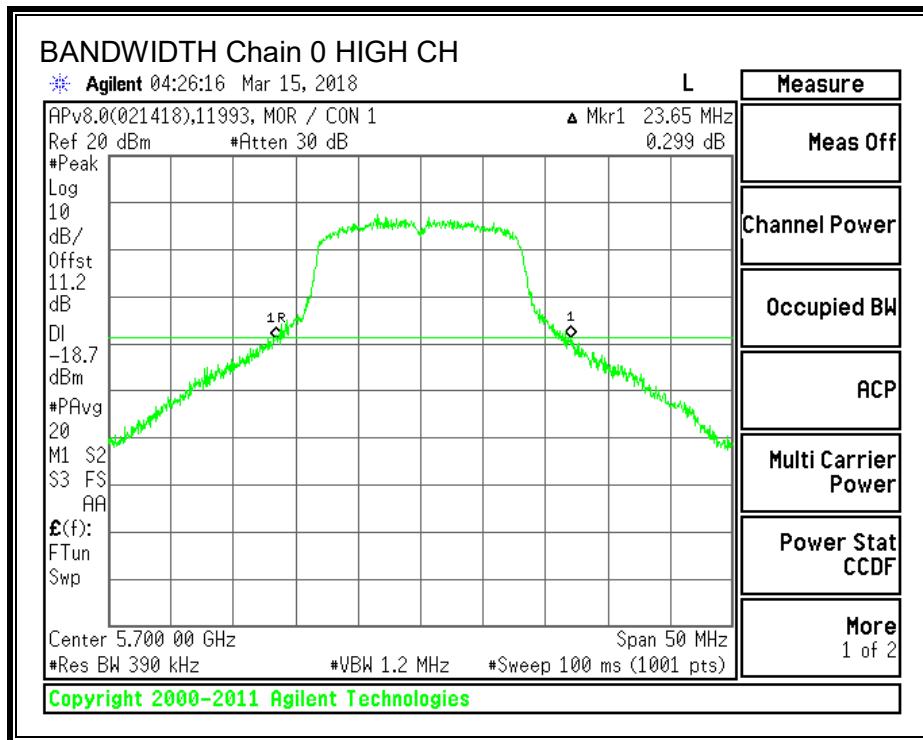
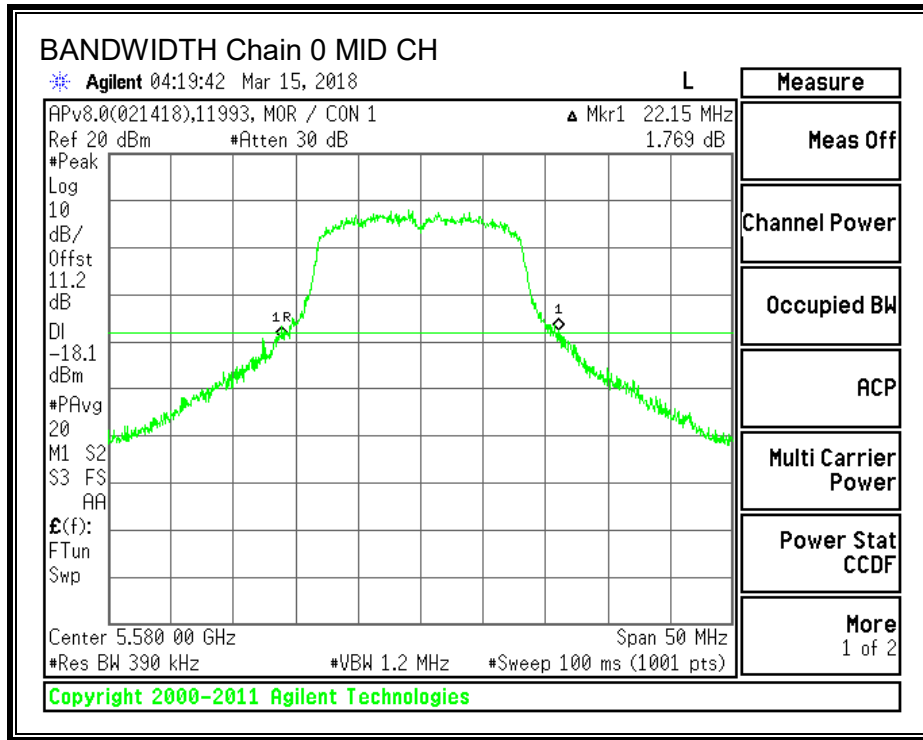
Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

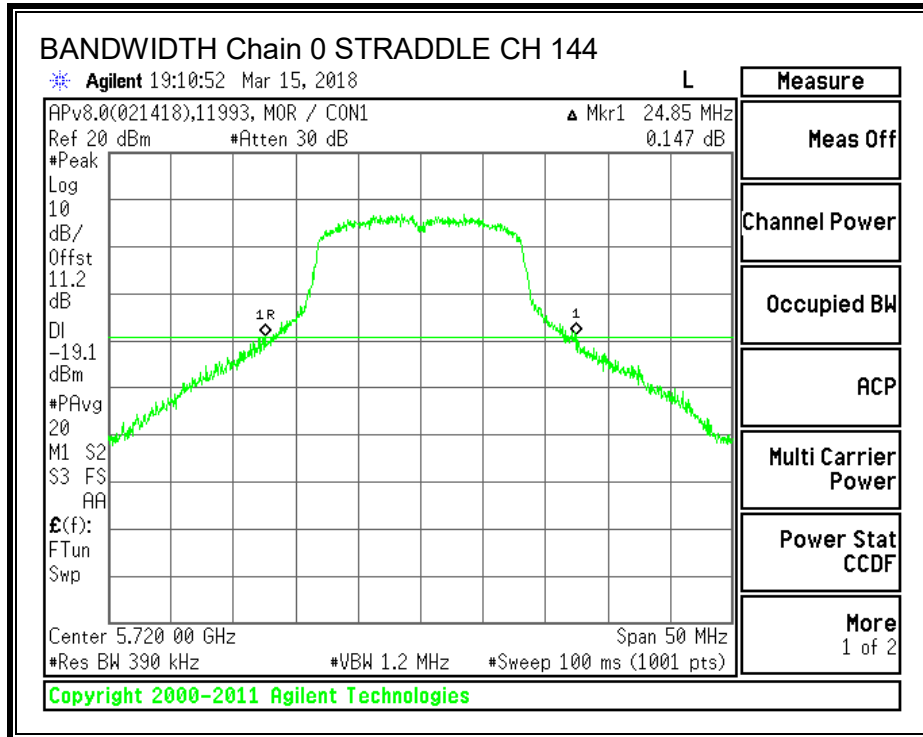
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	21.45	25.55
Mid	5580	22.15	24.35
High	5700	23.65	24.30
144	5720	24.85	26.20

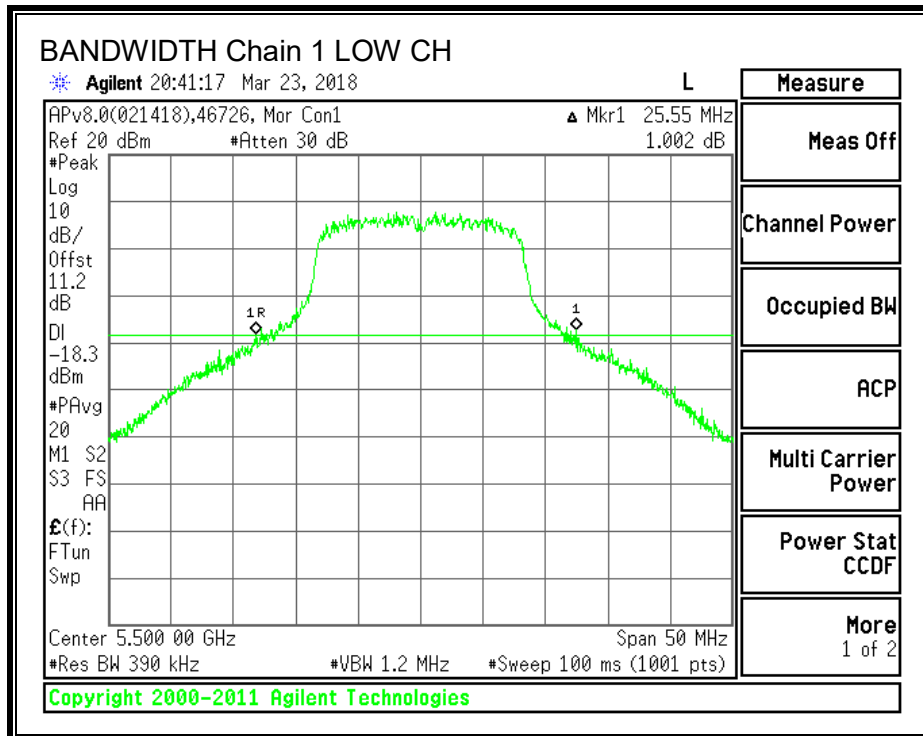
26 dB BANDWIDTH, Chain 0

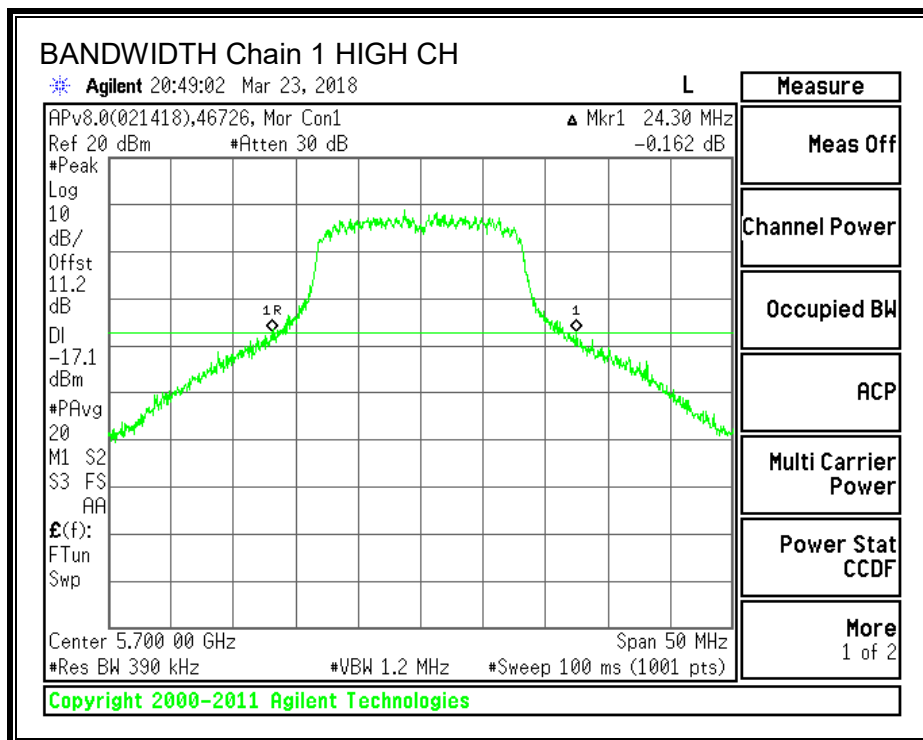
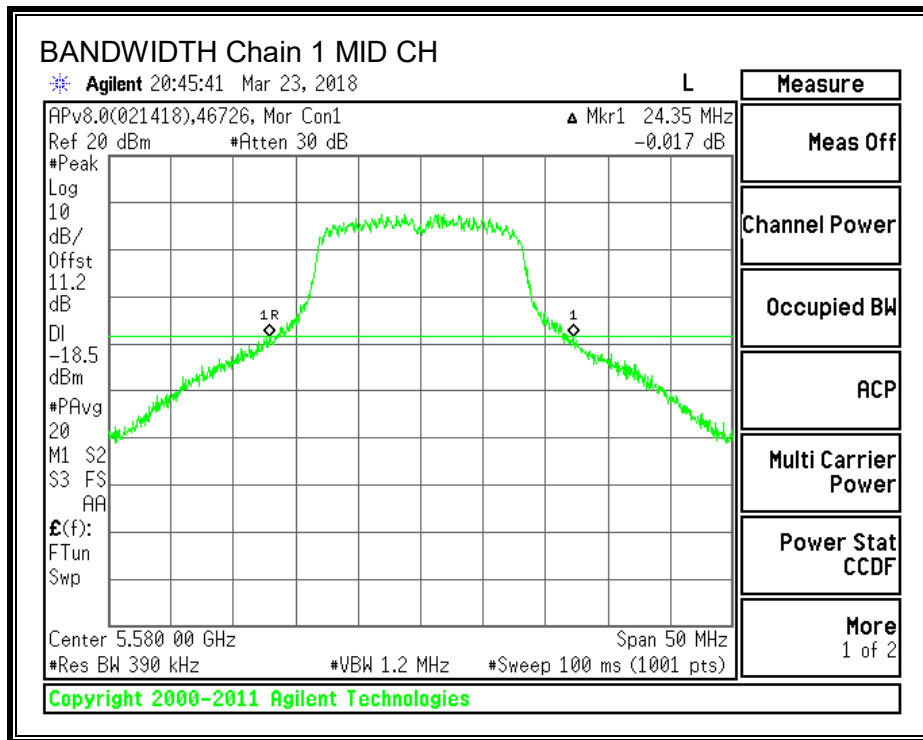


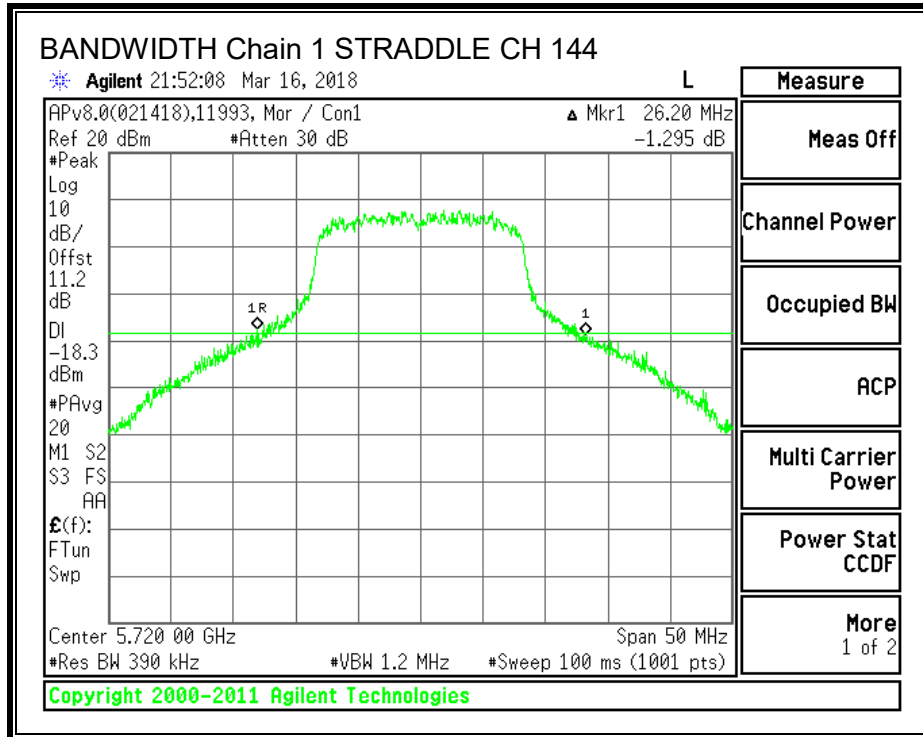




26 dB BANDWIDTH, Chain 1







8.10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

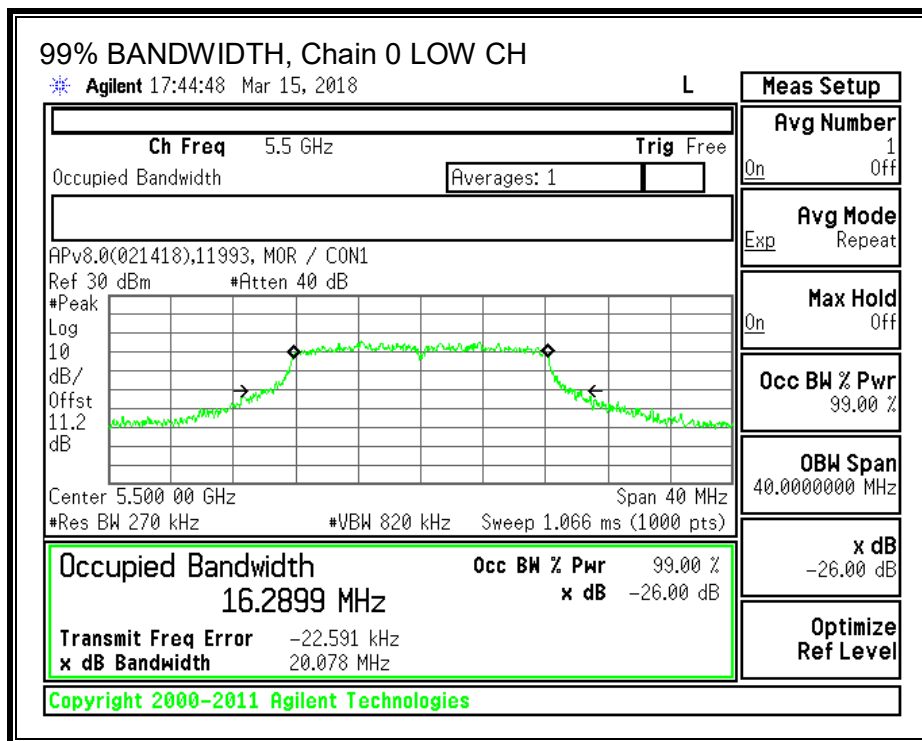
TEST INFORMATION

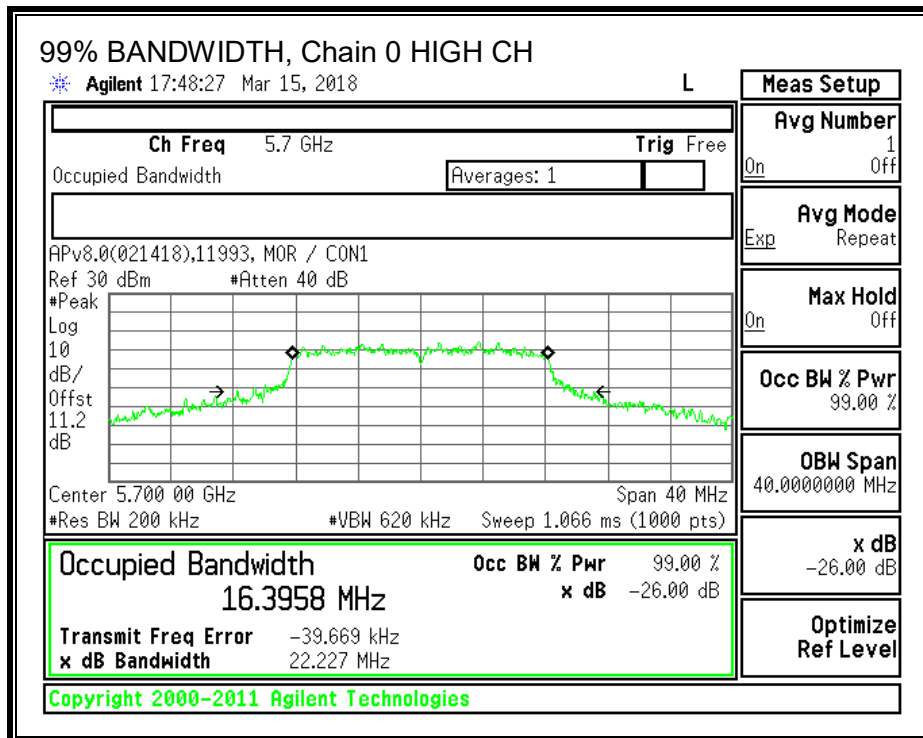
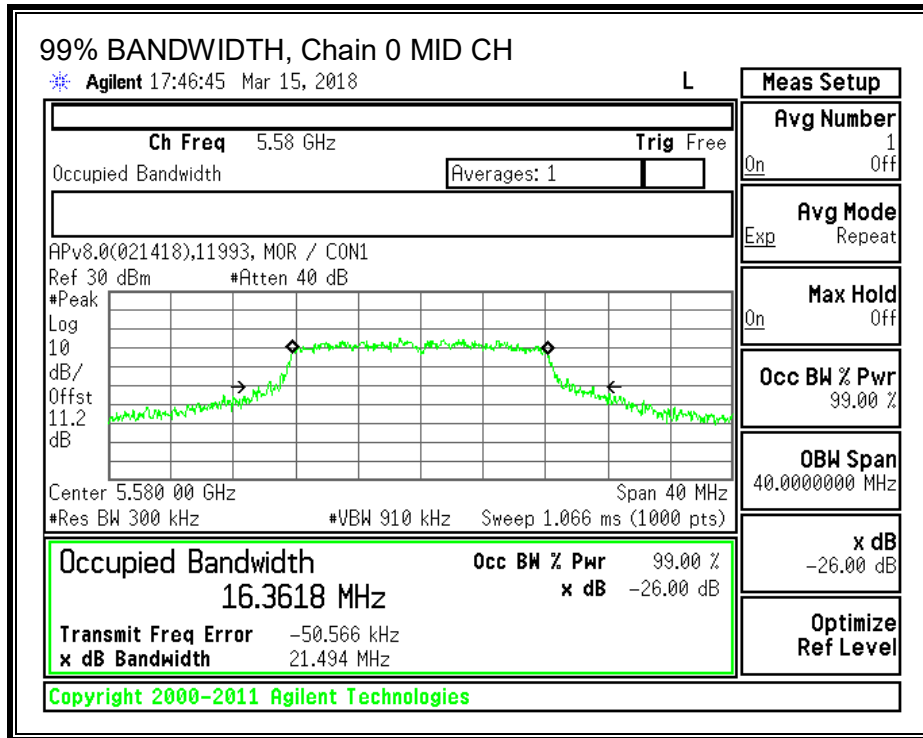
Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

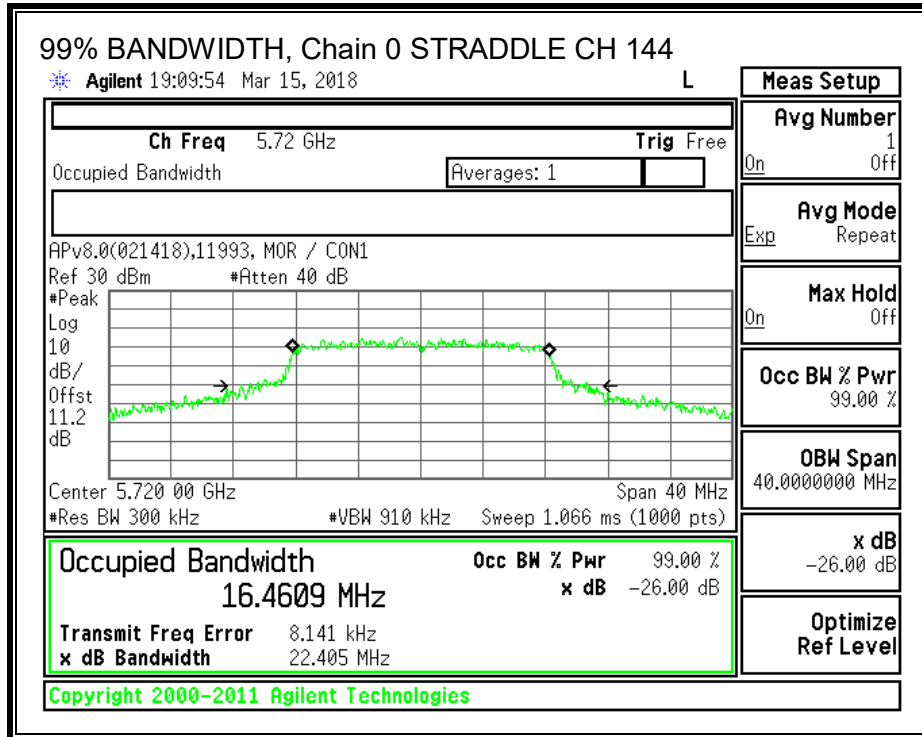
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	16.2899	16.4428
Mid	5580	16.3618	16.4110
High	5700	16.3958	16.4730
144	5720	16.4609	16.5196

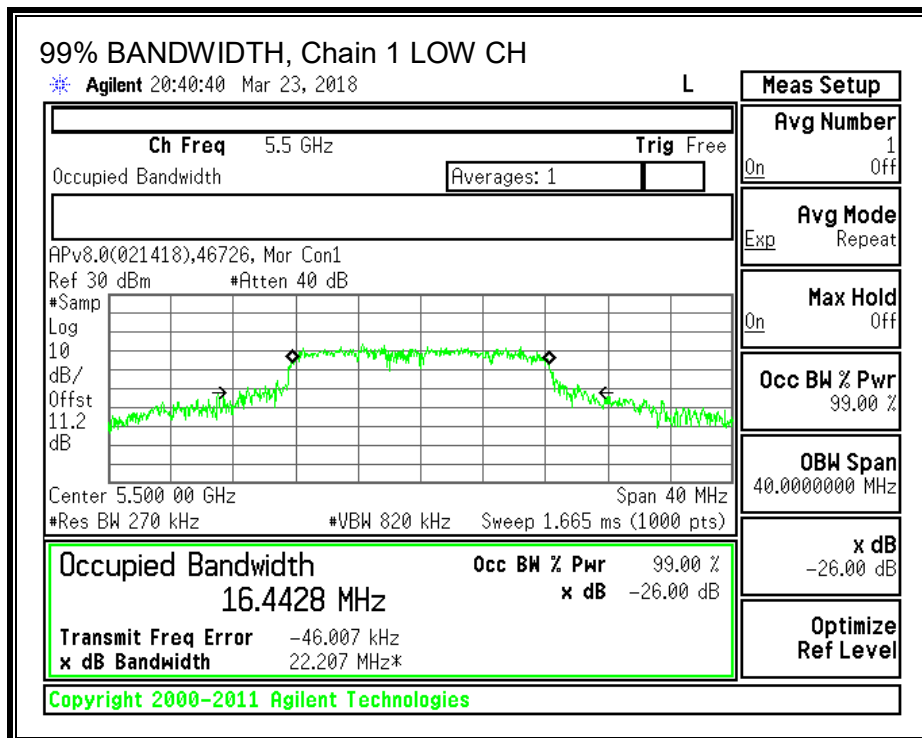
99% BANDWIDTH, Chain 0

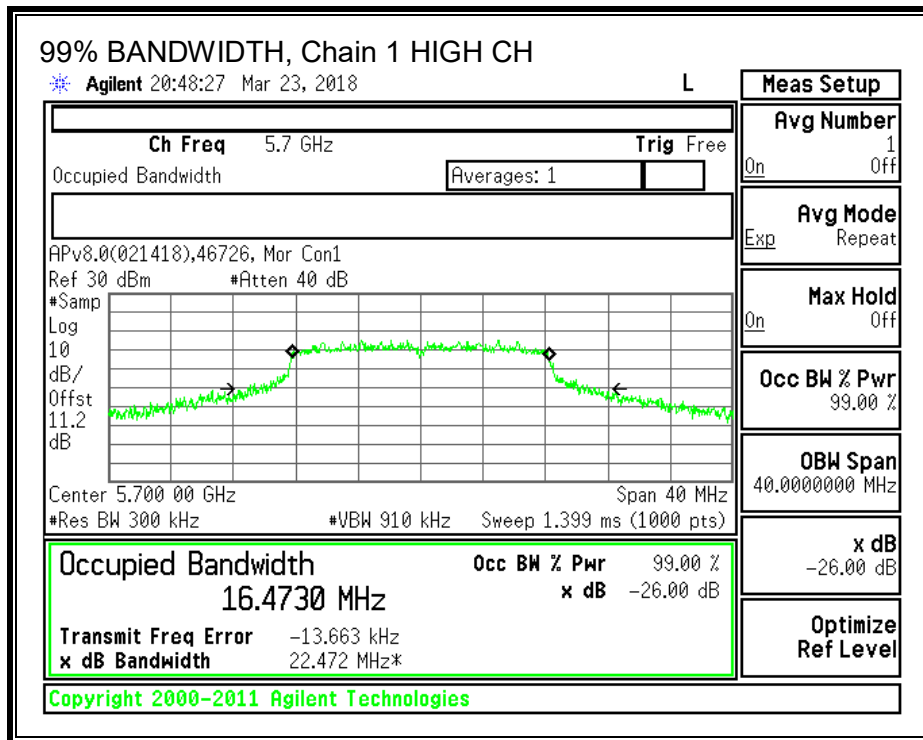
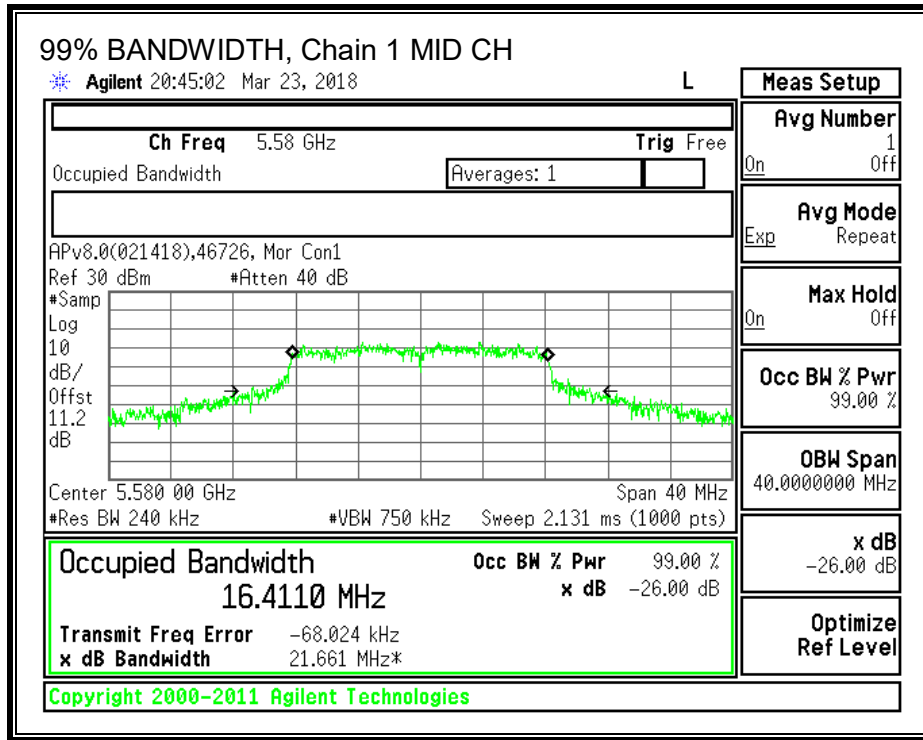


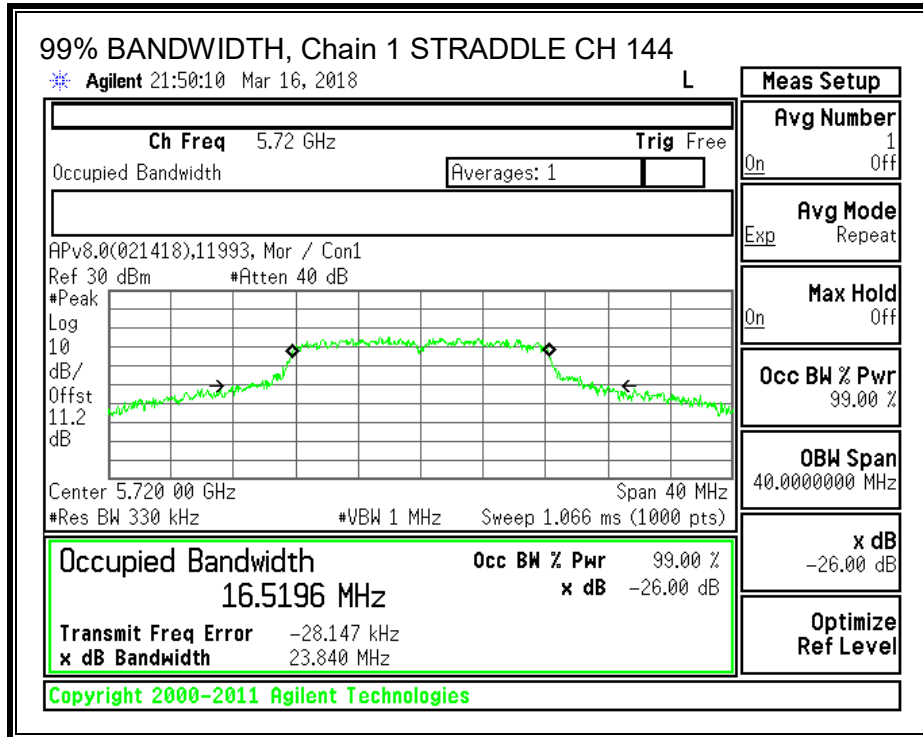




99% BANDWIDTH, Chain 1







8.10.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) 6 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.45	2.16	5.17	24.00	11.00
Mid	5580	22.15	2.16	5.17	24.00	11.00
High	5700	23.65	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.60	13.97	16.80	24.00	-7.20
Mid	5580	13.51	13.78	16.66	24.00	-7.34
High	5700	13.27	14.12	16.73	24.00	-7.27

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.47	0.61	7.48	11.00	-3.52
Mid	5580	1.41	1.00	7.63	11.00	-3.37
High	5700	0.68	0.81	7.17	11.00	-3.83

RESULTS (FCC) 54 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.45	2.16	5.17	24.00	11.00
Mid	5580	22.15	2.16	5.17	24.00	11.00
High	5700	23.65	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.01	14.29	17.16	24.00	-6.84
Mid	5580	13.83	14.17	17.01	24.00	-6.99
High	5700	13.61	14.43	17.05	24.00	-6.95

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) 6 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	16.29	23.12	11.00
Mid	5580	16.36	23.14	11.00
High	5700	16.40	23.15	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.60	13.97	16.80	23.12	-6.32
Mid	5580	13.51	13.78	16.66	23.14	-6.48
High	5700	13.27	14.12	16.73	23.15	-6.42

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.47	0.61	7.48	11.00	-3.52
Mid	5580	1.41	0.995	7.63	11.00	-3.37
High	5700	0.68	0.81	7.17	11.00	-3.83

RESULTS (ISED Conducted Power) 54 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	16.29	23.12	11.00
Mid	5580	16.36	23.14	11.00
High	5700	16.40	23.15	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.01	14.29	17.16	23.12	-5.96
Mid	5580	13.83	14.17	17.01	23.14	-6.12
High	5700	13.61	14.43	17.05	23.15	-6.10

Note: PSD from 802.11ac 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) 6 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	16.29	2.16	29.12
Mid	5580	16.36	2.16	29.14
High	5700	16.40	2.16	29.15

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	13.60	13.97	18.96	29.12	-10.16
Mid	5580	13.51	13.78	18.82	29.14	-10.32
High	5700	13.27	14.12	18.89	29.15	-10.26

RESULTS (ISED EIRP) 54 Mbps

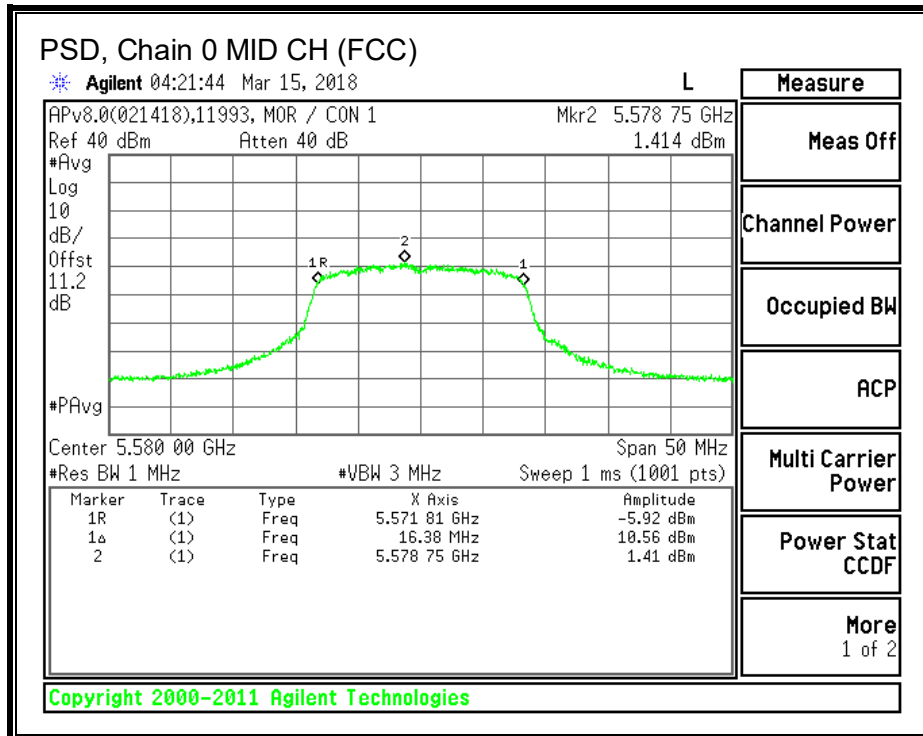
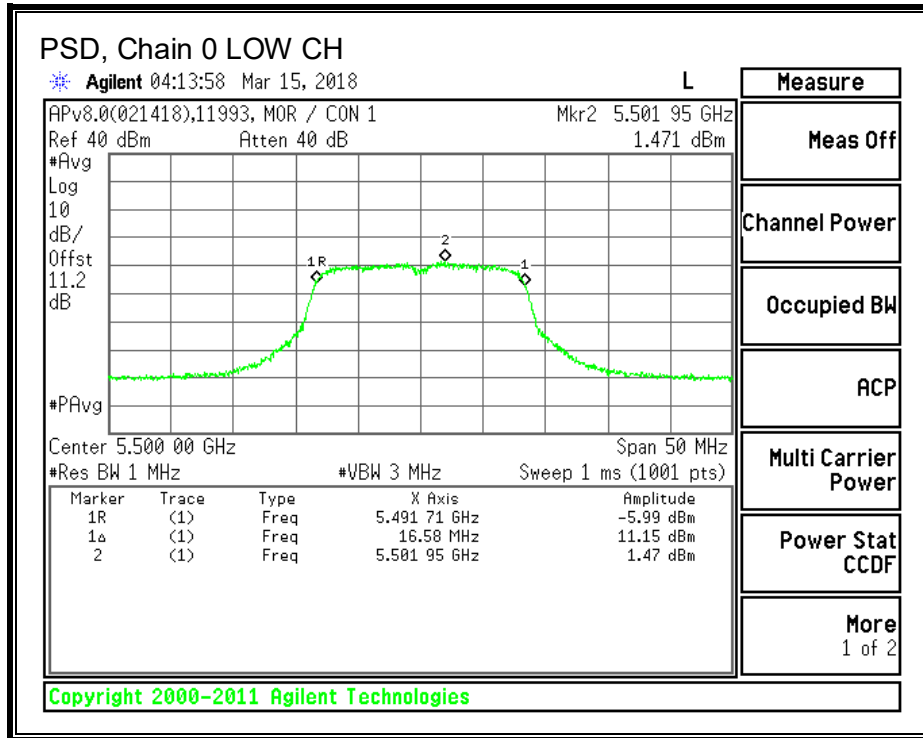
Bandwidth, Antenna Gain, and Limits

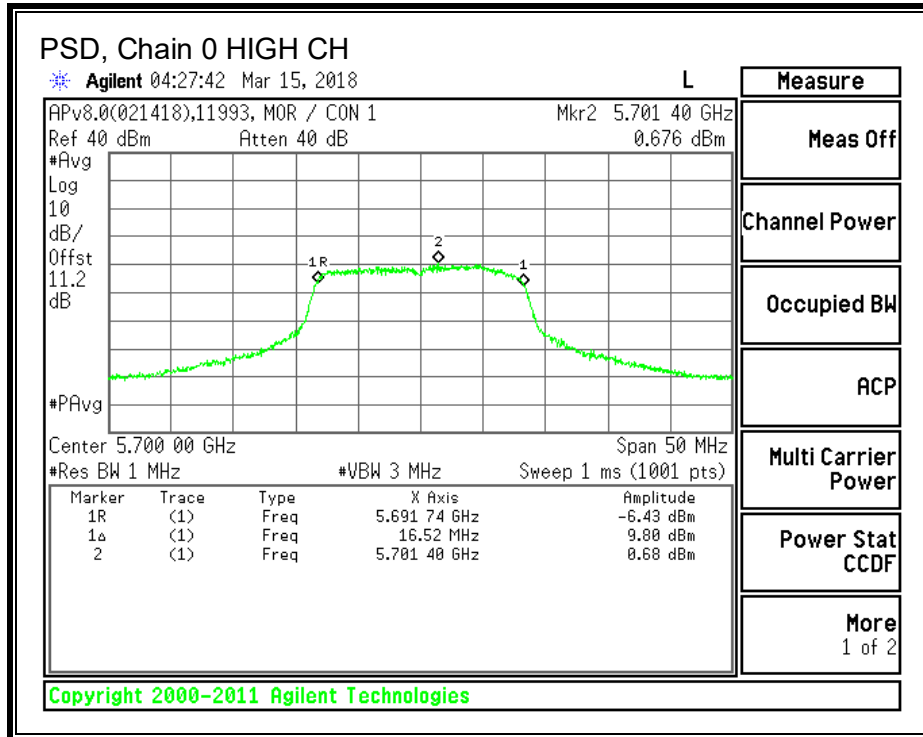
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	16.29	2.16	29.12
Mid	5580	16.36	2.16	29.14
High	5700	16.40	2.16	29.15

Output Power Results

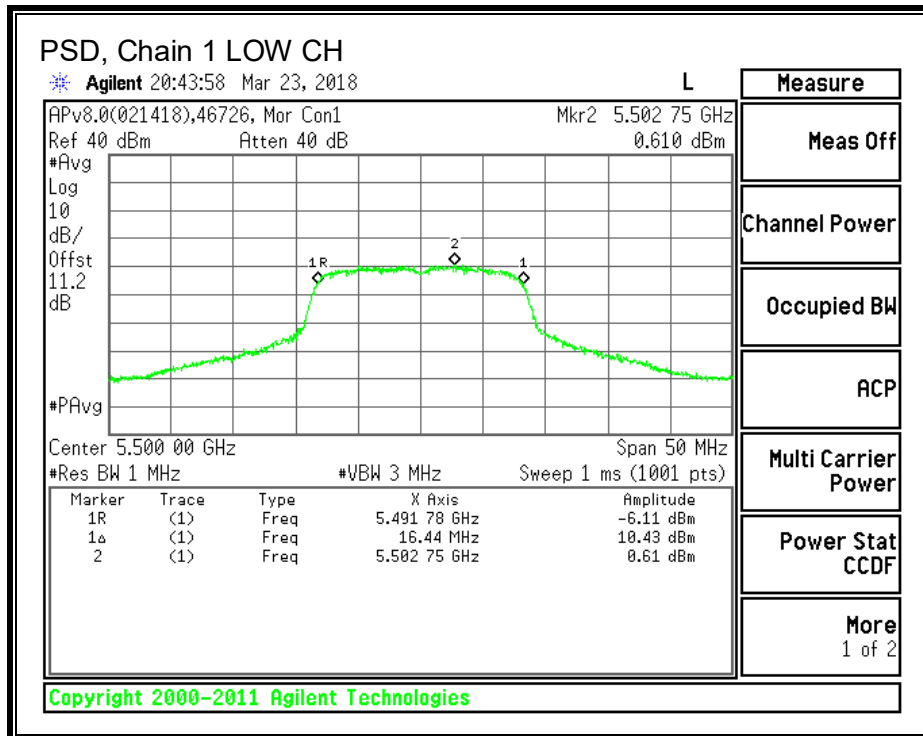
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	14.01	14.29	19.32	29.12	-9.80
Mid	5580	13.83	14.17	19.17	29.14	-9.96
High	5700	13.61	14.43	19.21	29.15	-9.94

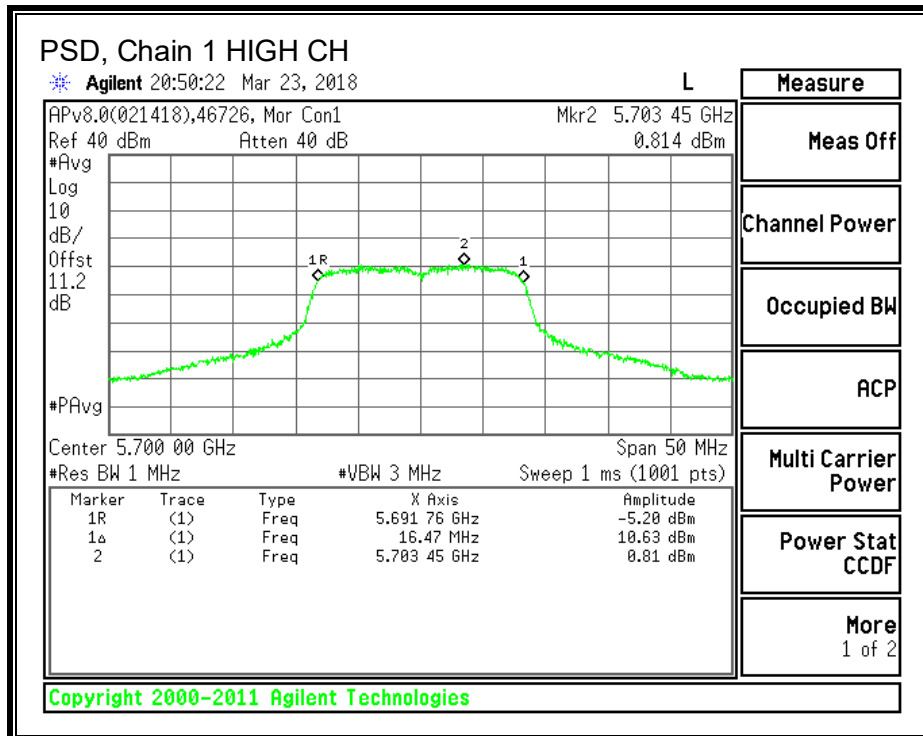
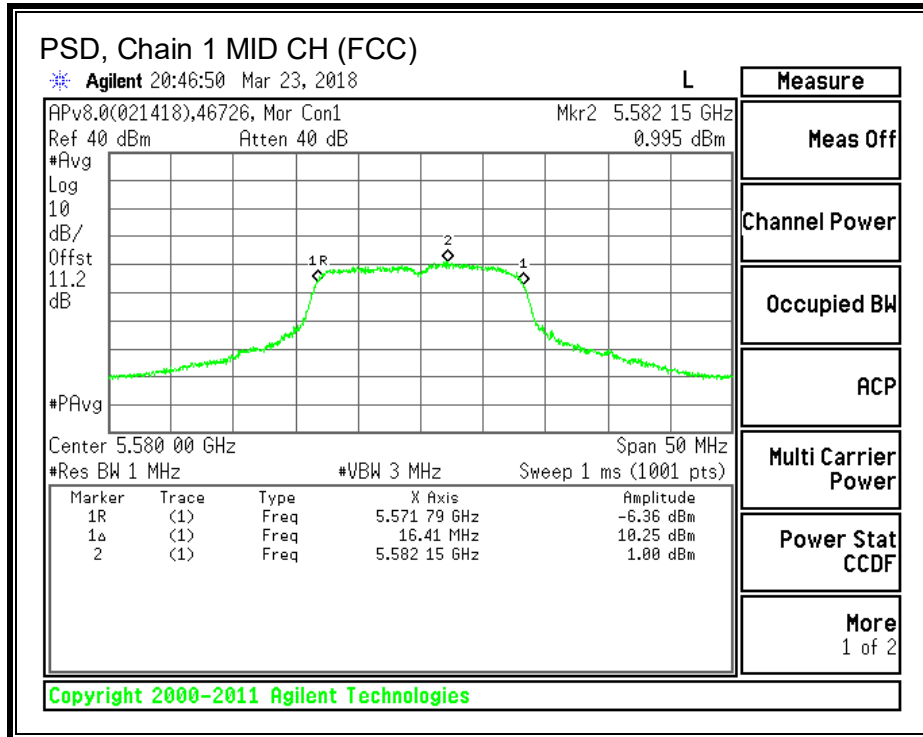
PSD, Chain 0





PSD, Chain 1





STRADDLE CHANNEL 144 RESULTS (FCC) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	24.85	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	24.00	-8.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.16	0.99	7.01	11.00	-3.99

STRADDLE CHANNEL 144 RESULTS (FCC) 54 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	24.85	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	24.00	-7.92

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power and PSD) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	16.46	23.16	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	23.16	-7.67

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.16	0.99	7.01	11.00	-3.99

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power) 54 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	16.46	23.16	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	23.16	-7.09

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	16.46	2.16	29.16

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.67	12.28	17.65	29.16	-11.51

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) 54 Mbps

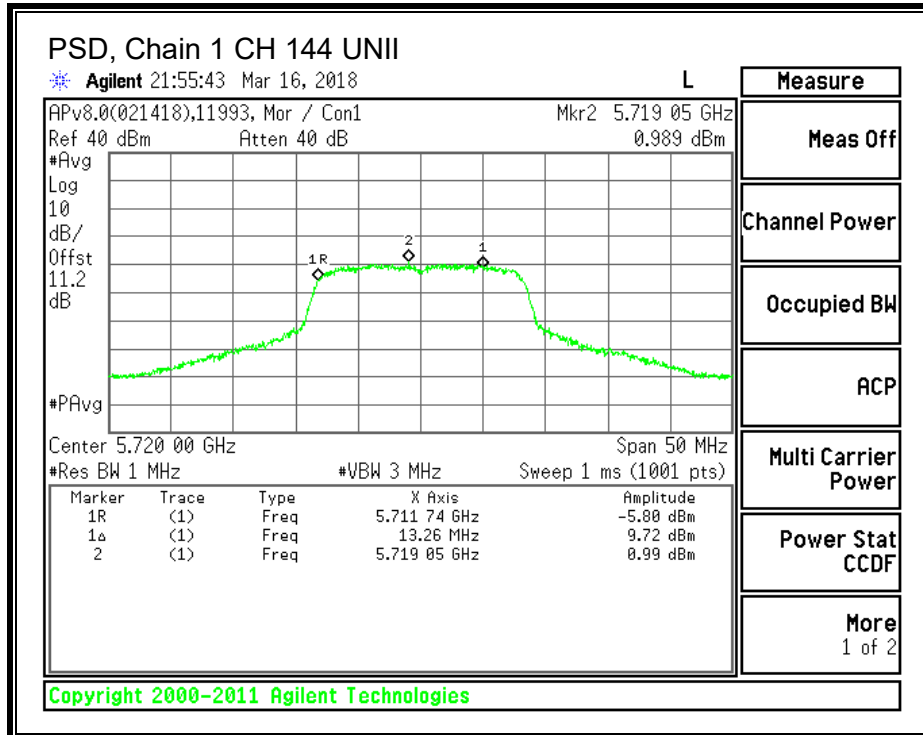
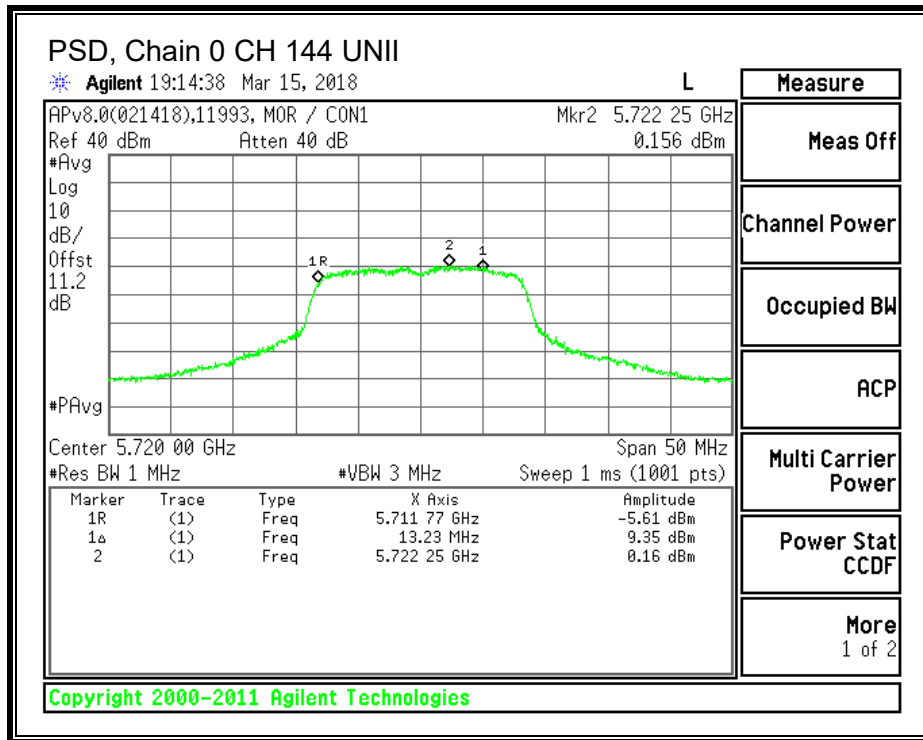
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	16.46	2.16	29.16

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	13.52	12.56	18.24	29.16	-10.93



UNII-3 BAND (FCC and ISSED) 6 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	2.16	5.17	30.00	30.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	30.00	-14.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	-3.94	-3.99	2.45	30.00	-27.55

UNII-3 BAND (FCC and ISSED) 54 Mbps

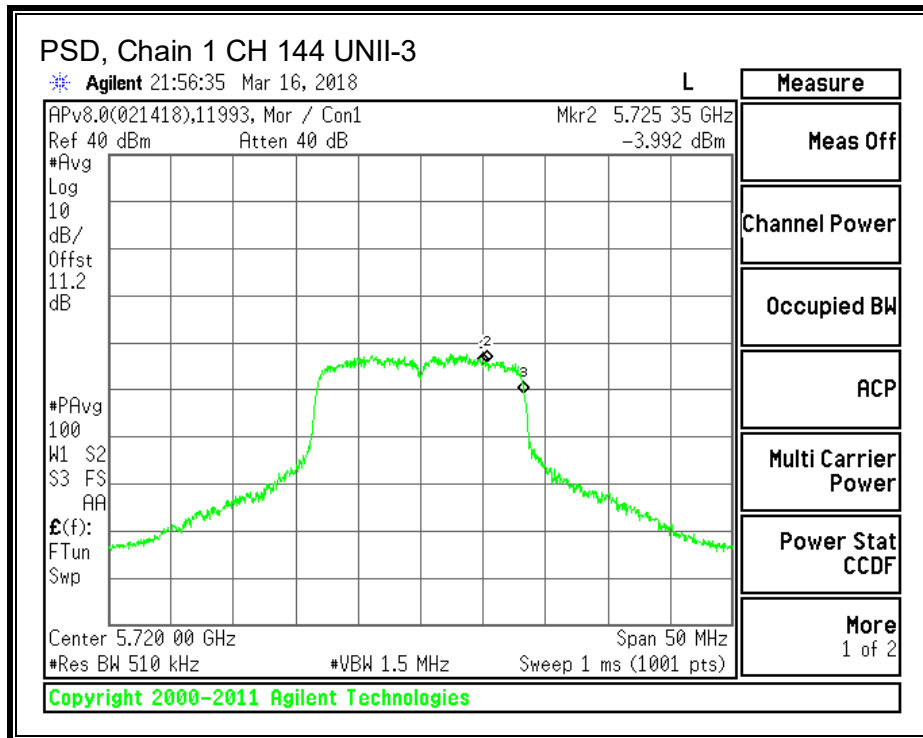
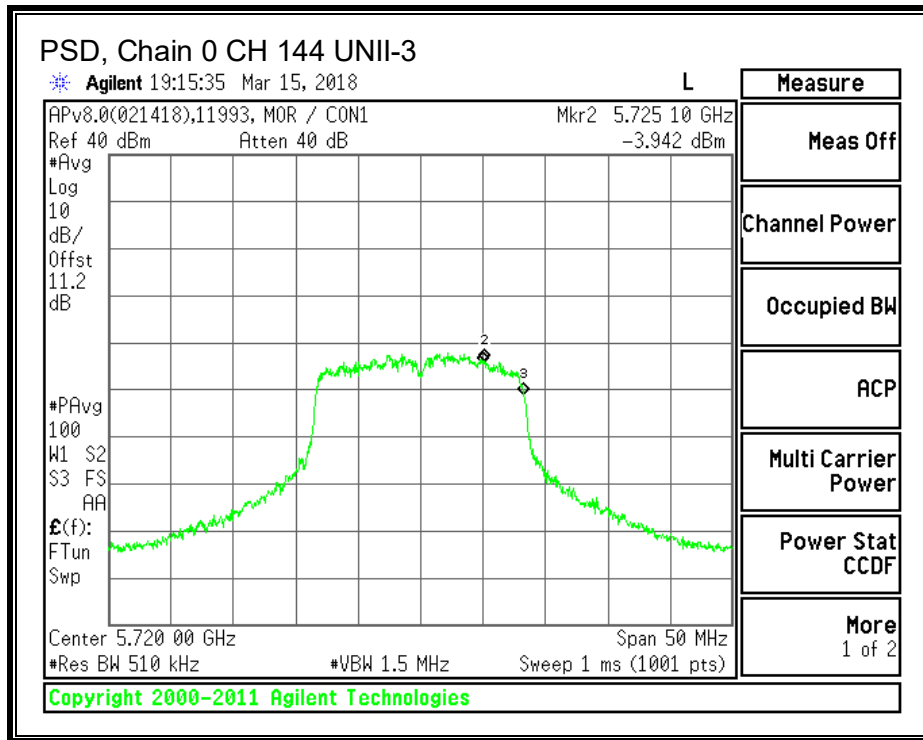
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	2.16	5.17	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	30.00	-13.92

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.



8.10.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) 6 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.45	1.92	4.92	24.00	11.00
Mid	5580	22.15	1.92	4.92	24.00	11.00
High	5700	23.65	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.60	13.97	16.80	24.00	-7.20
Mid	5580	13.51	13.78	16.66	24.00	-7.34
High	5700	13.27	14.12	16.73	24.00	-7.27

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.47	0.61	7.48	11.00	-3.52
Mid	5580	1.41	1.00	7.63	11.00	-3.37
High	5700	0.68	0.81	7.17	11.00	-3.83

RESULTS (FCC) 54 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.45	1.92	4.92	24.00	11.00
Mid	5580	22.15	1.92	4.92	24.00	11.00
High	5700	23.65	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.01	14.29	17.16	24.00	-6.84
Mid	5580	13.83	14.17	17.01	24.00	-6.99
High	5700	13.61	14.43	17.05	24.00	-6.95

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) 6 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	16.29	23.12	11.00
Mid	5580	16.36	23.14	11.00
High	5700	16.40	23.15	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.60	13.97	16.80	23.12	-6.32
Mid	5580	13.51	13.78	16.66	23.14	-6.48
High	5700	13.27	14.12	16.73	23.15	-6.42

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.47	0.61	7.48	11.00	-3.52
Mid	5580	1.41	0.995	7.63	11.00	-3.37
High	5700	0.68	0.81	7.17	11.00	-3.83

RESULTS (ISED Conducted Power) 54 Mbps

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	16.29	23.12	11.00
Mid	5580	16.36	23.14	11.00
High	5700	16.40	23.15	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.01	14.29	17.16	23.12	-5.96
Mid	5580	13.83	14.17	17.01	23.14	-6.12
High	5700	13.61	14.43	17.05	23.15	-6.10

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) 6 Mbps

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	16.29	1.92	29.12
Mid	5580	16.36	1.92	29.14
High	5700	16.40	1.92	29.15

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	13.60	13.97	18.72	29.12	-10.40
Mid	5580	13.51	13.78	18.58	29.14	-10.56
High	5700	13.27	14.12	18.65	29.15	-10.50

RESULTS (ISED EIRP) 54 Mbps

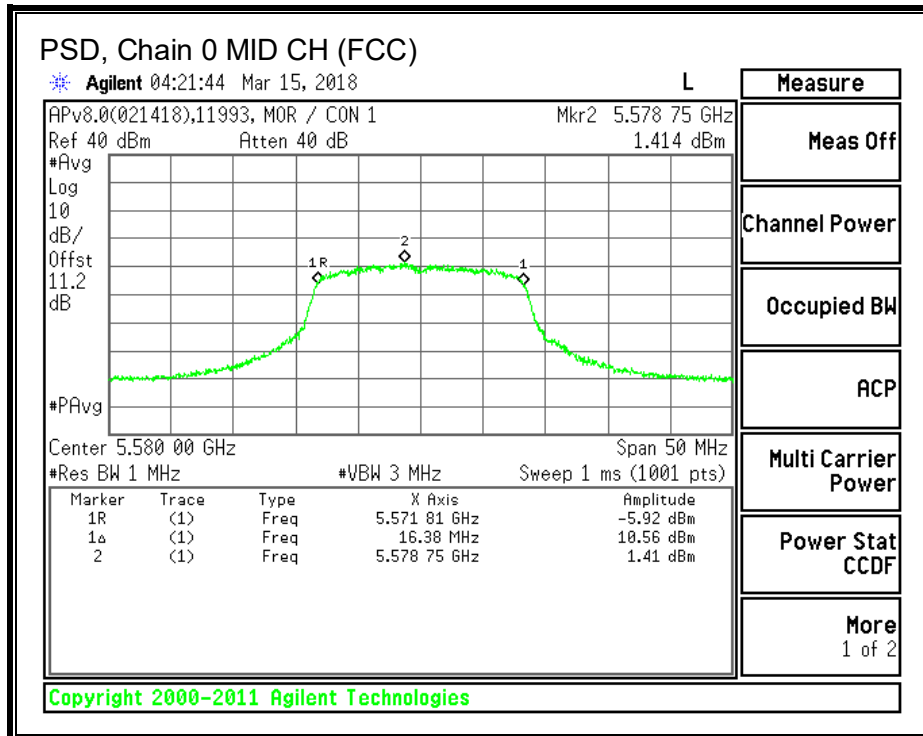
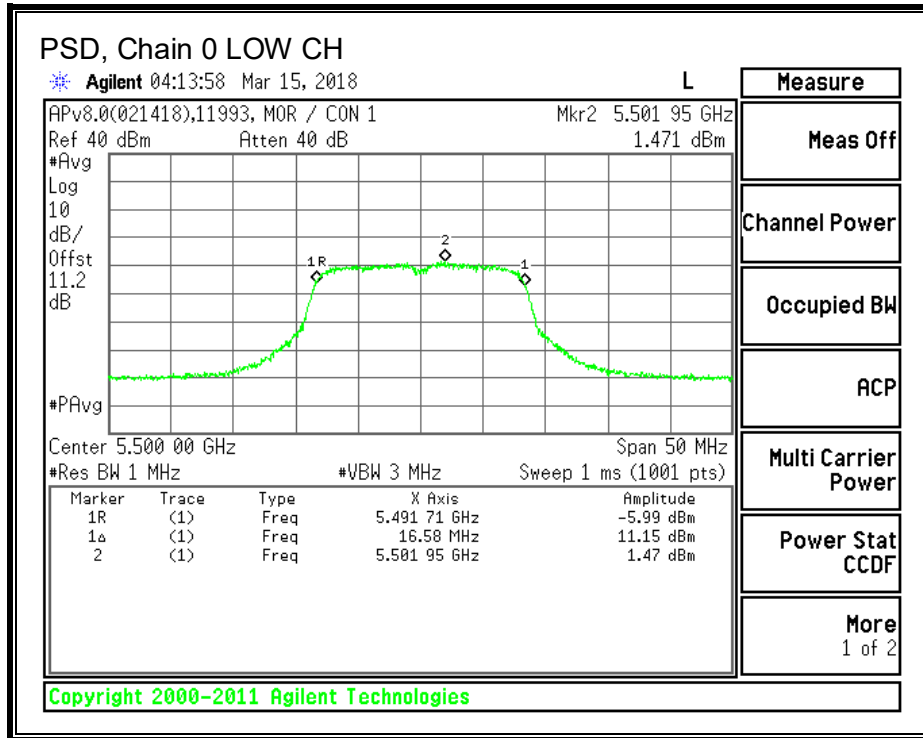
Bandwidth, Antenna Gain, and Limits

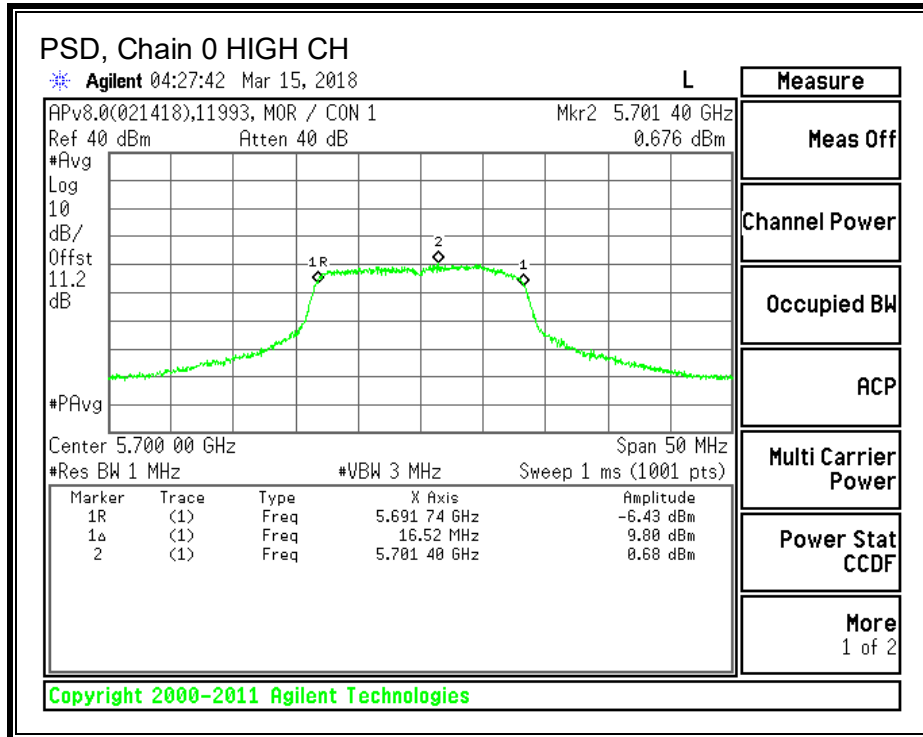
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	16.29	1.92	29.12
Mid	5580	16.36	1.92	29.14
High	5700	16.40	1.92	29.15

Output Power Results

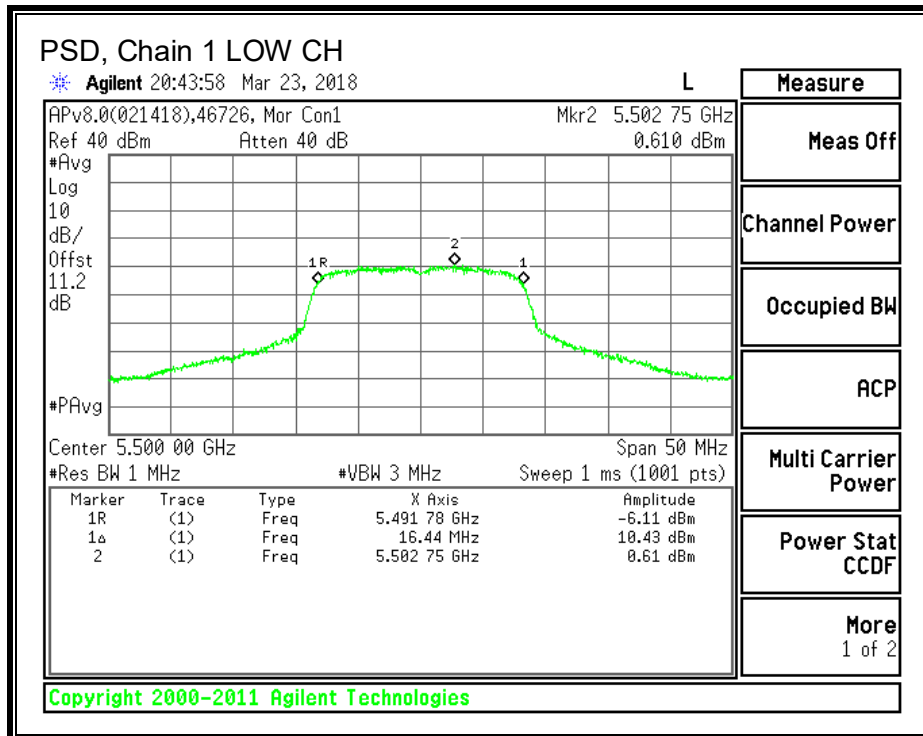
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	14.01	14.29	19.08	29.12	-10.04
Mid	5580	13.83	14.17	18.93	29.14	-10.20
High	5700	13.61	14.43	18.97	29.15	-10.18

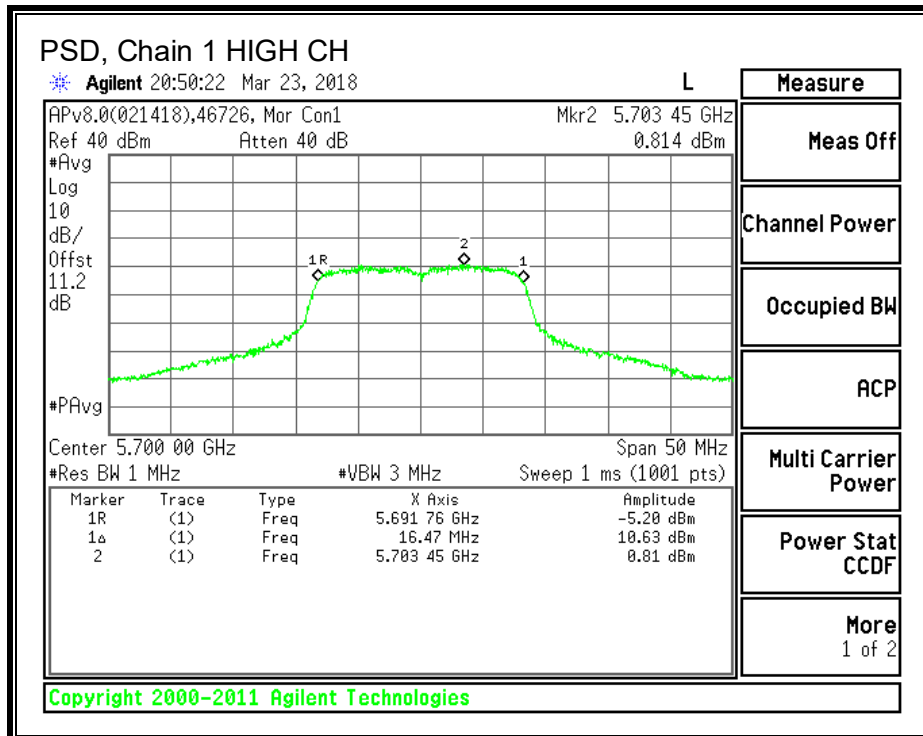
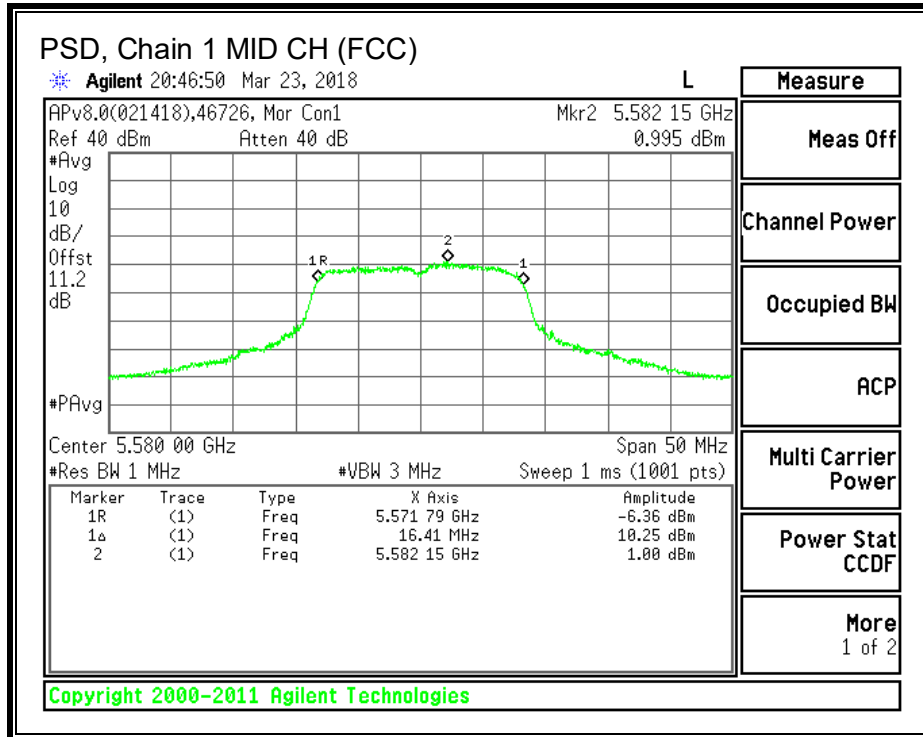
PSD, Chain 0





PSD, Chain 1





STRADDLE CHANNEL 144 RESULTS (FCC) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	24.85	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	24.00	-8.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.16	0.99	7.01	11.00	-3.99

STRADDLE CHANNEL 144 RESULTS (FCC) 54 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	24.85	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	24.00	-7.92

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power and PSD) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	16.46	23.16	11.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd Power & PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	23.16	-7.67

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.16	0.99	7.01	11.00	-3.99

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power) 54 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	16.46	23.16	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	23.16	-7.09

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) 6 Mbps

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	16.46	1.92	29.16

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.67	12.28	17.41	29.16	-11.75

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) 54 Mbps

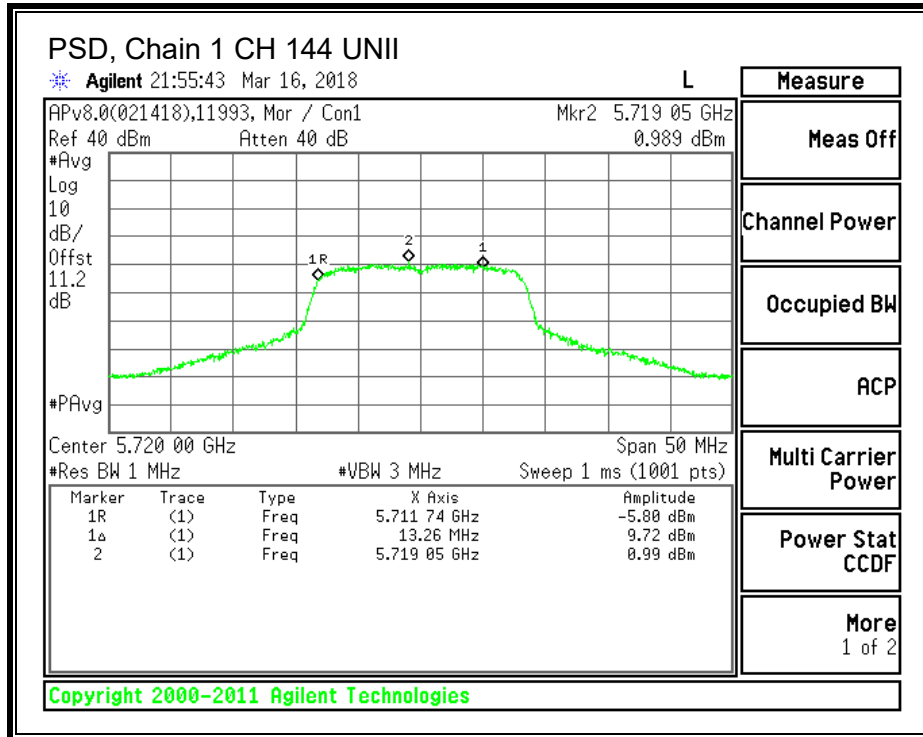
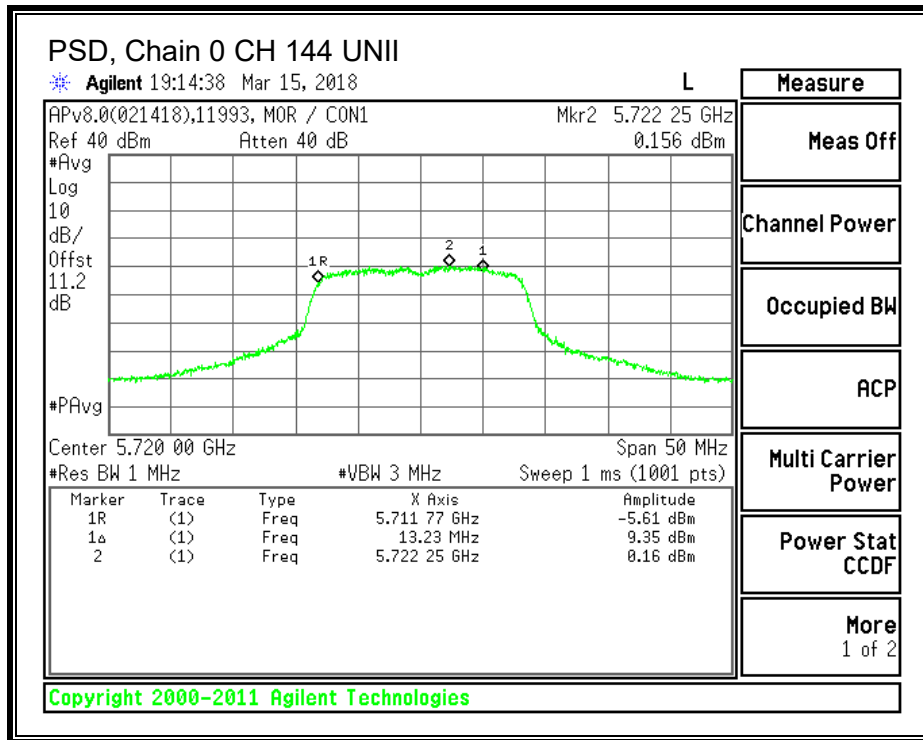
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	16.46	1.92	29.16

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	13.52	12.56	18.00	29.16	-11.17



UNII-3 BAND (FCC and ISSED) 6 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	1.92	4.92	30.00	30.00

Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.67	12.28	15.49	30.00	-14.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	-3.94	-3.99	2.45	30.00	-27.55

UNII-3 BAND (FCC and ISSED) 54 Mbps

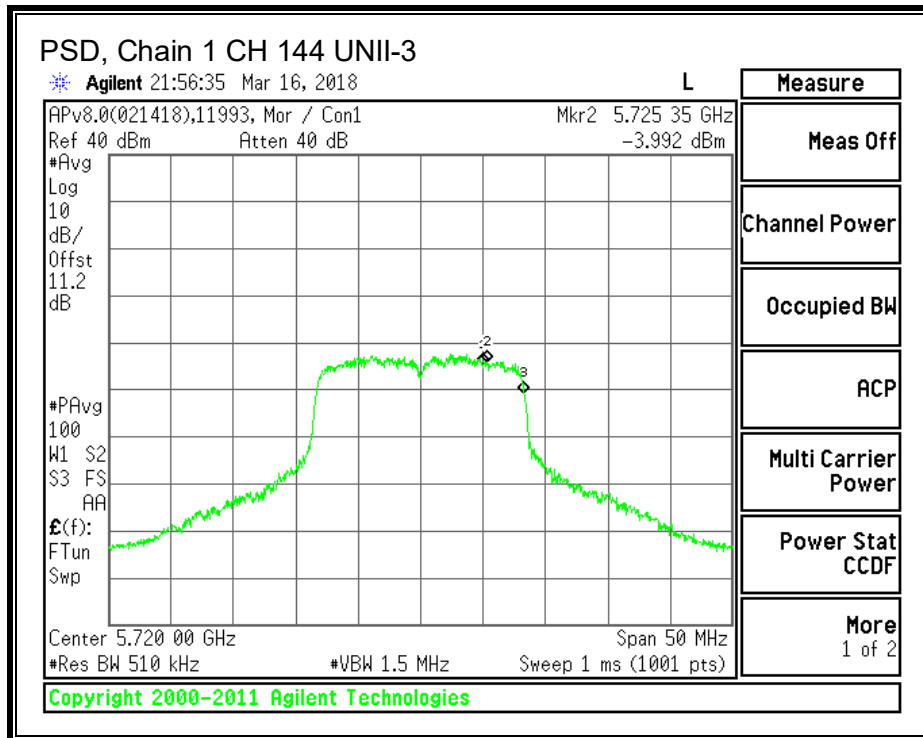
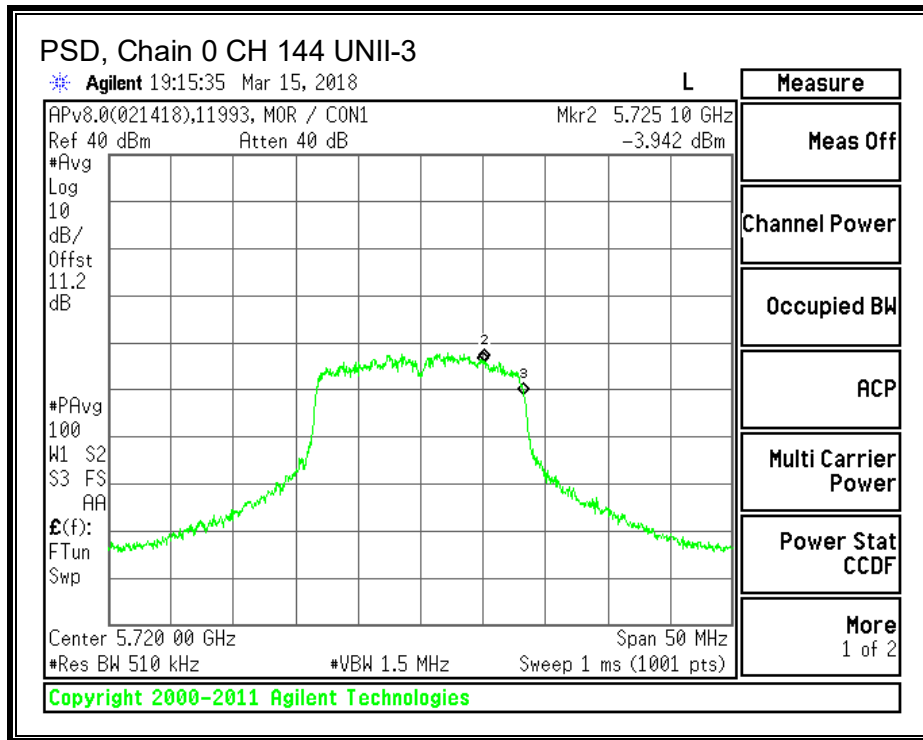
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	1.92	4.92	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	13.52	12.56	16.08	30.00	-13.92

Note: PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps. The 6Mbps data was taken at the same or higher power setting and is therefore worst-case.



8.11. 802.11n HT20 MODE IN THE 5.6 GHz BAND

8.11.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

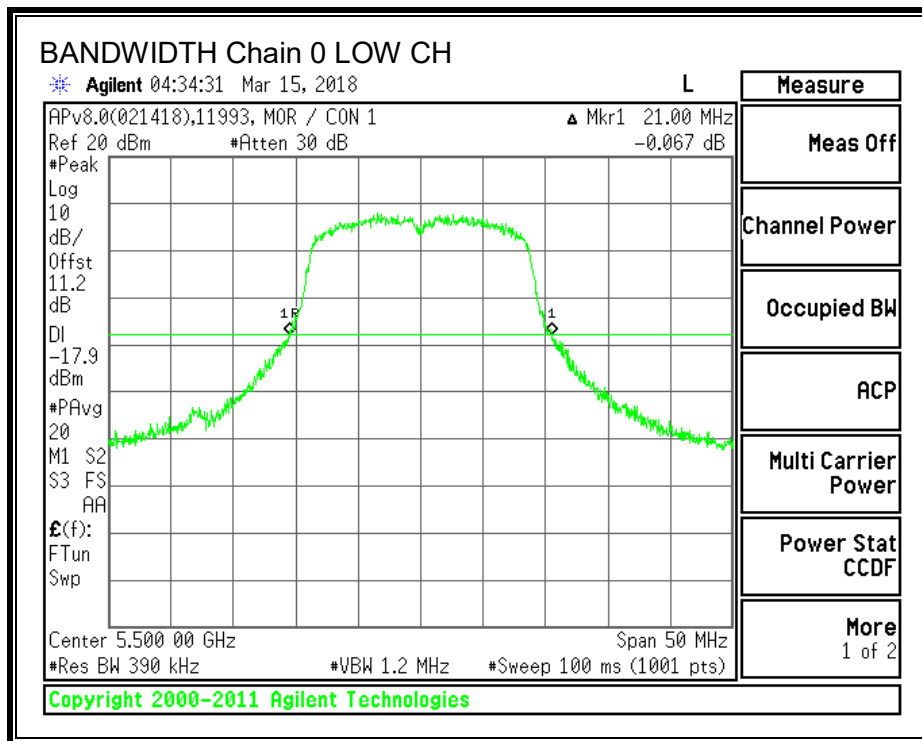
TEST INFORMATION

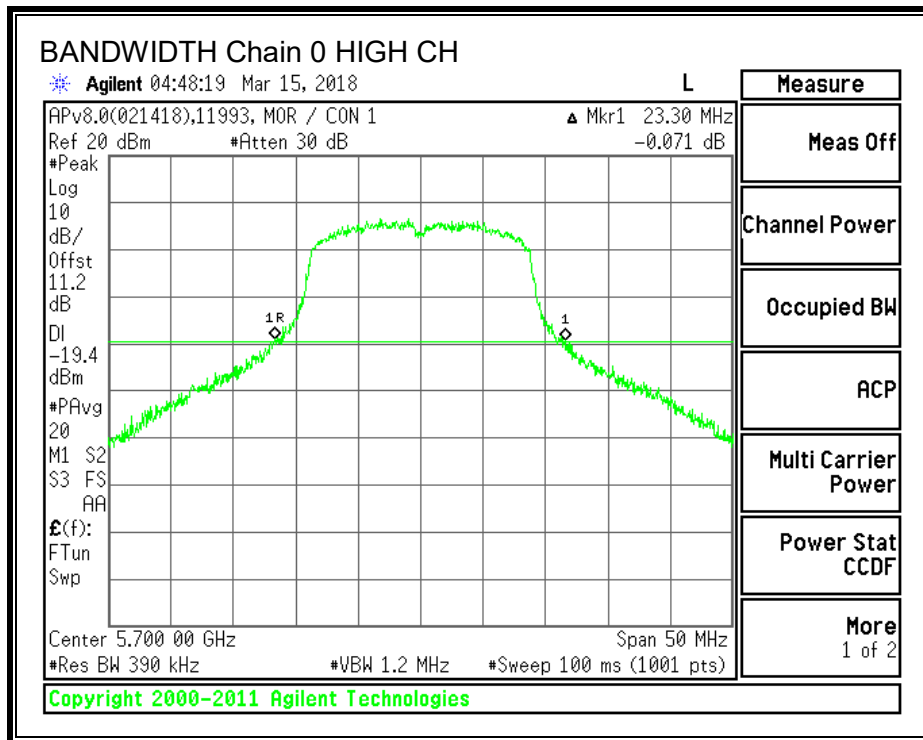
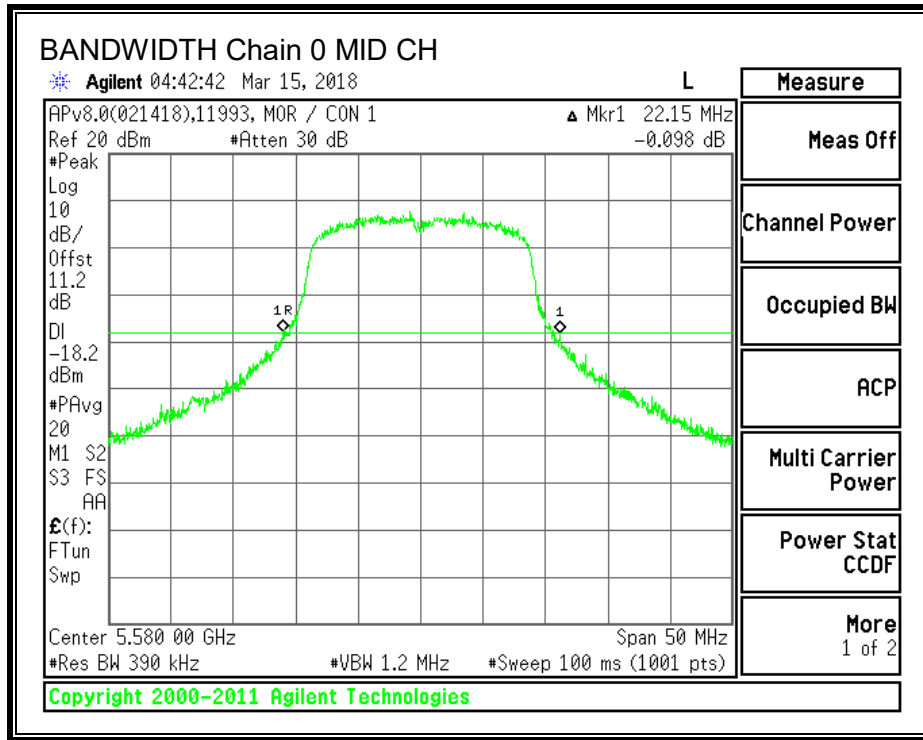
Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

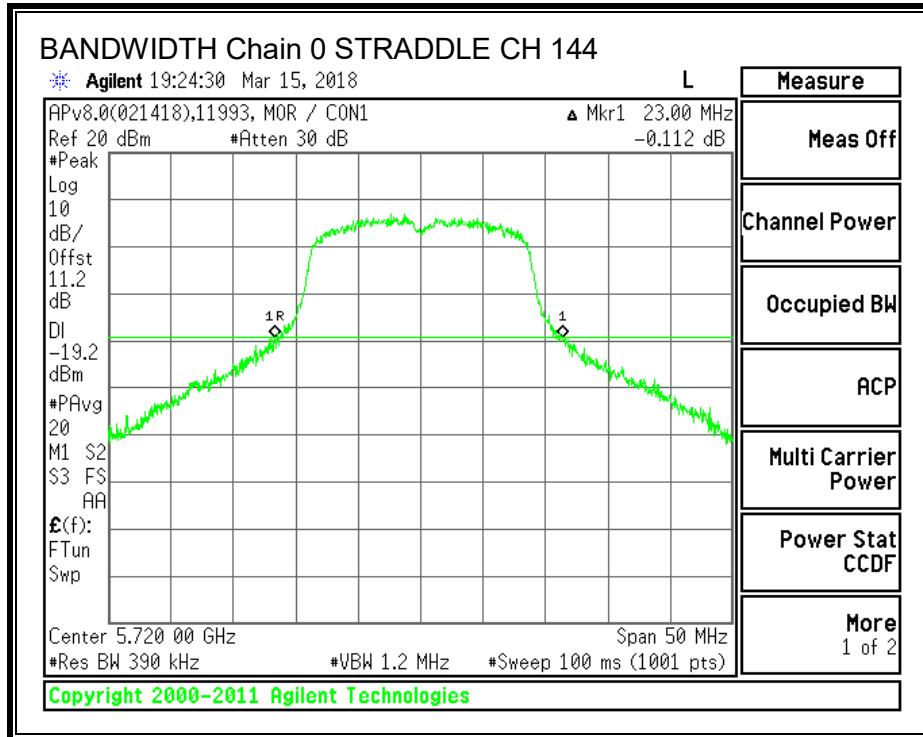
RESULTS

Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5500	21.00	25.00
Mid	5580	22.15	23.95
High	5700	23.30	24.70
144	5720	23.00	24.40

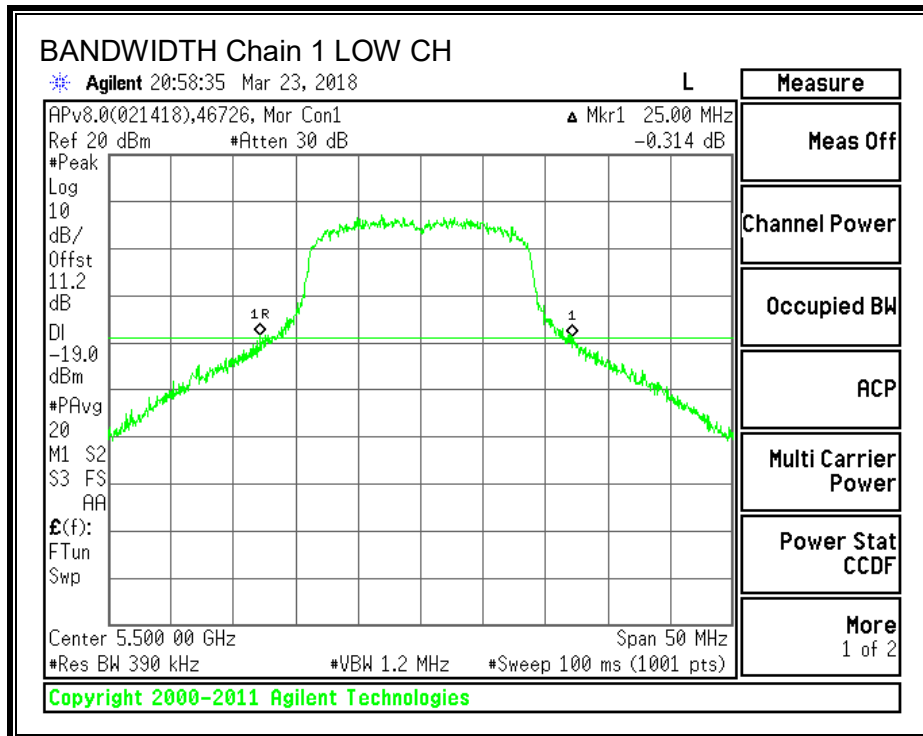
26 dB BANDWIDTH, Chain 0

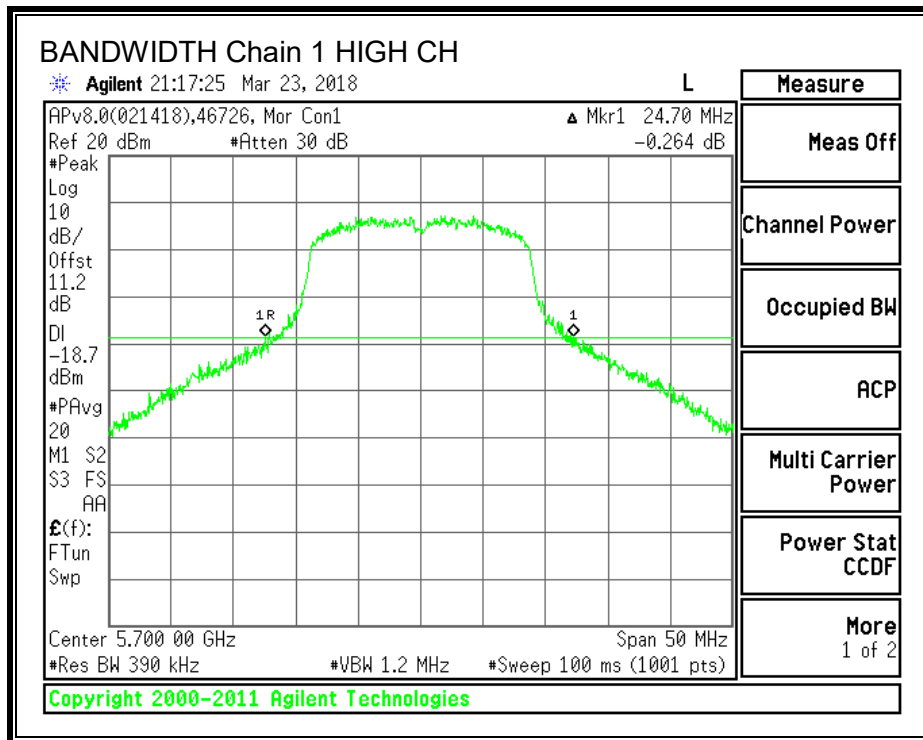
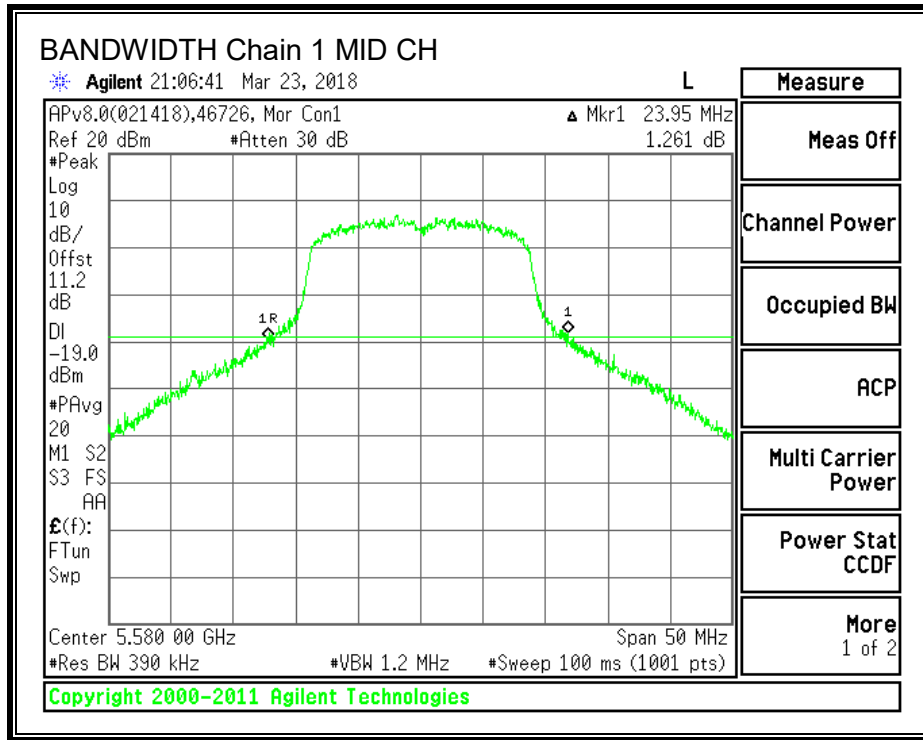


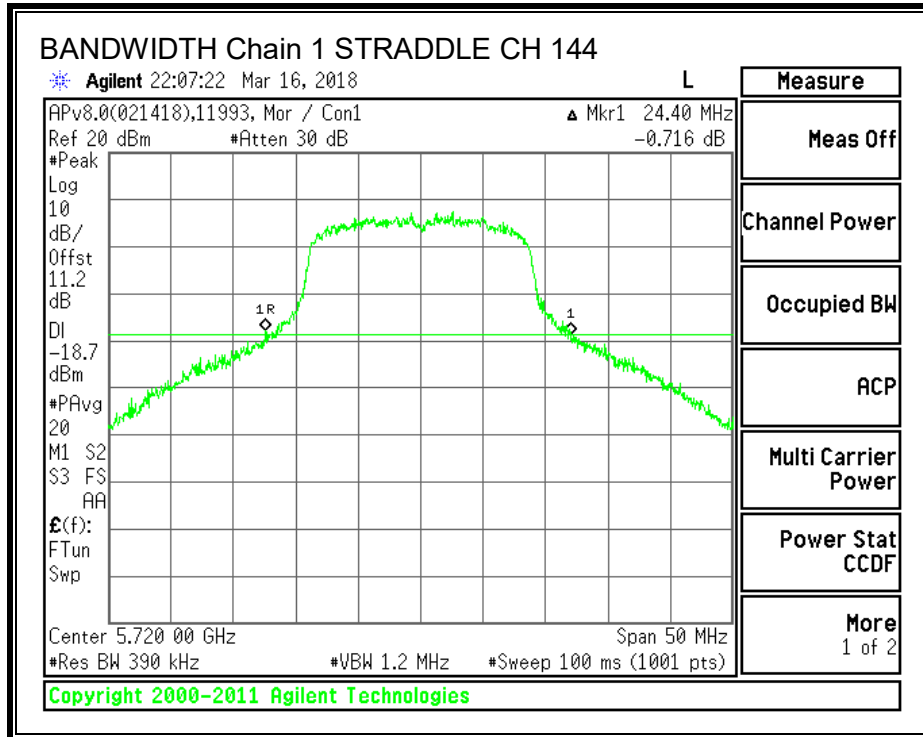




26 dB BANDWIDTH, Chain 1







8.11.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

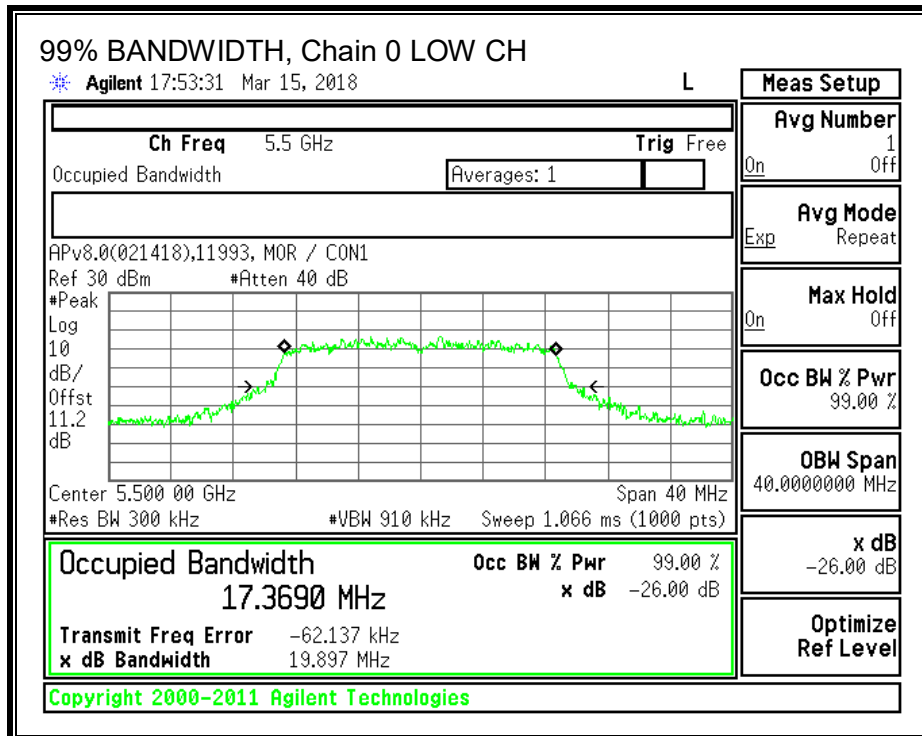
TEST INFORMATION

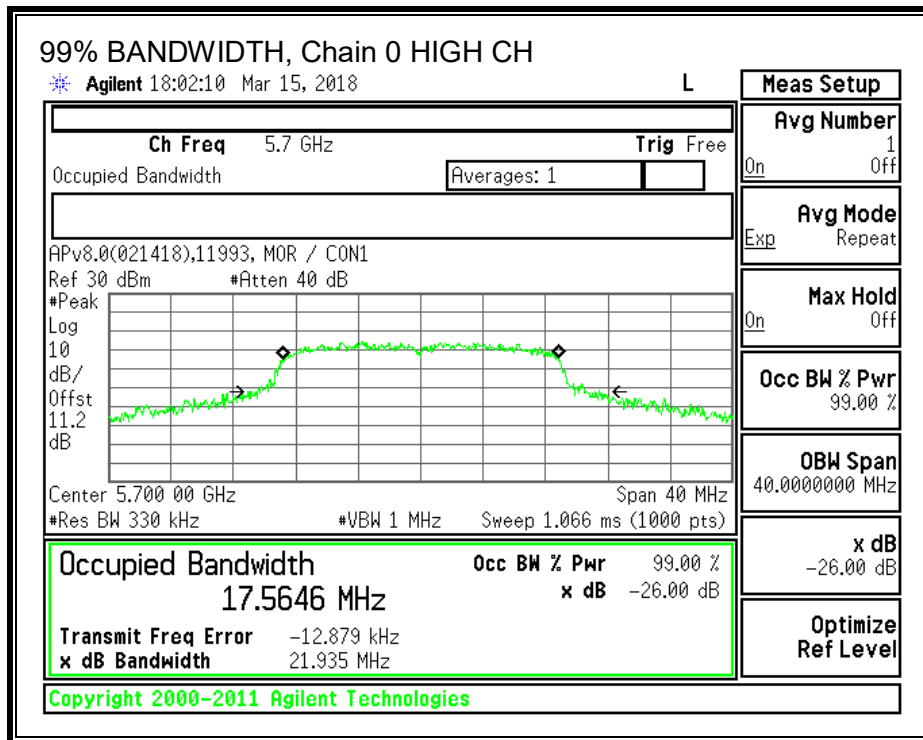
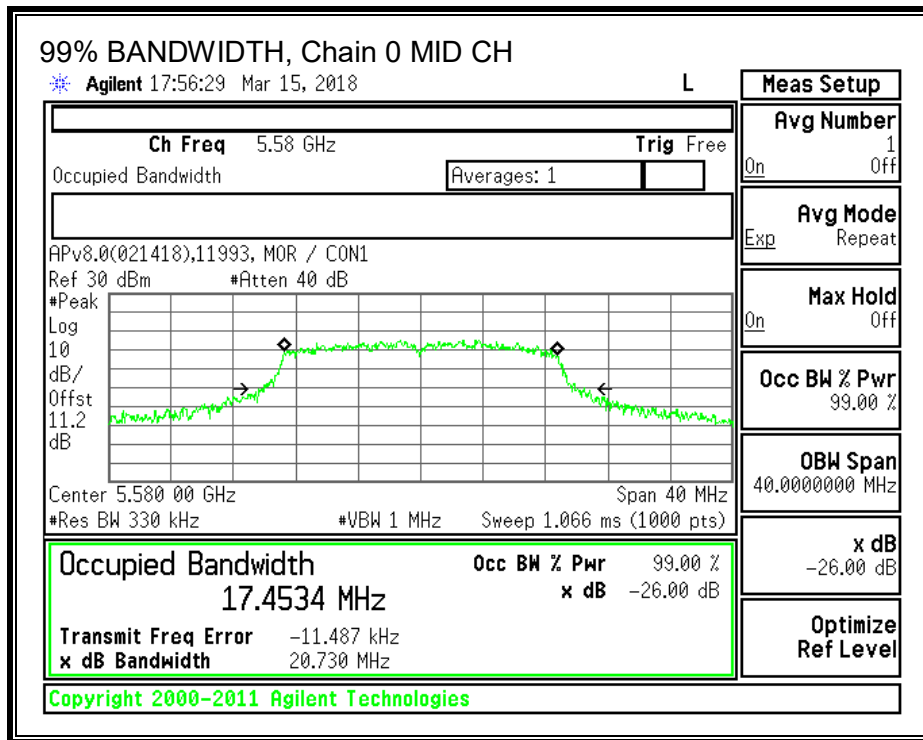
Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Teste By: 11993/46722, 46726/46722

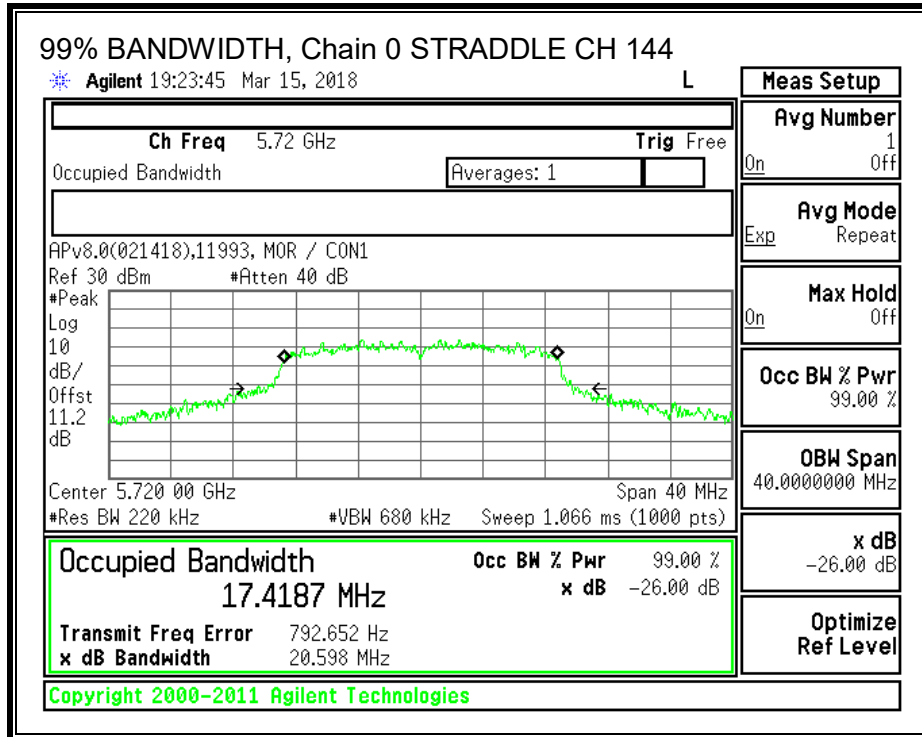
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5500	17.3690	17.3324
Mid	5580	17.4534	17.5265
High	5700	17.5646	17.4807
144	5720	17.4187	17.4956

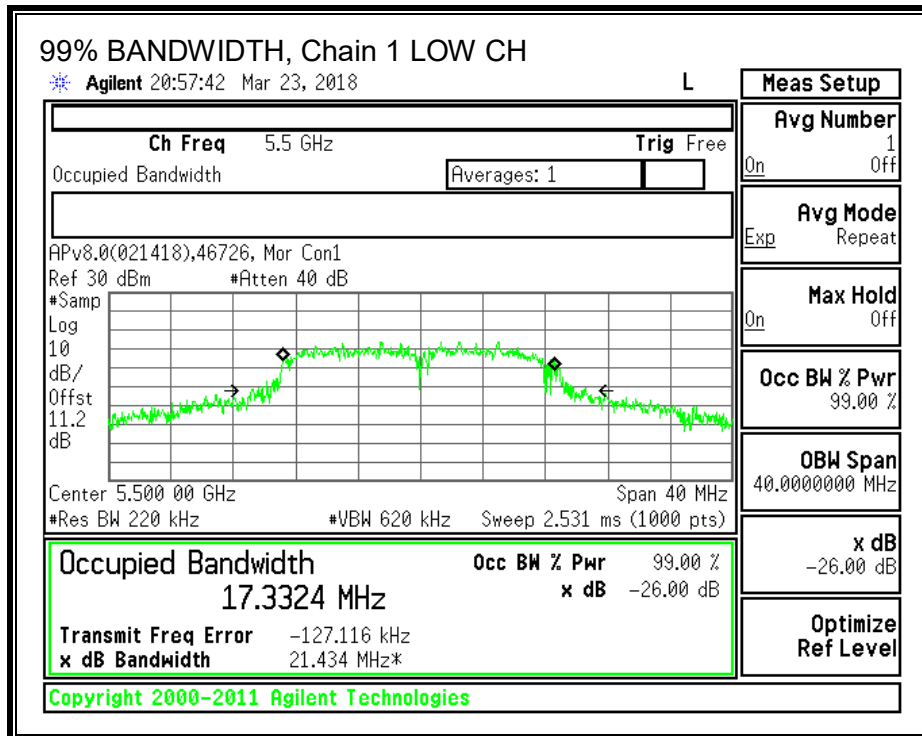
99% BANDWIDTH, Chain 0

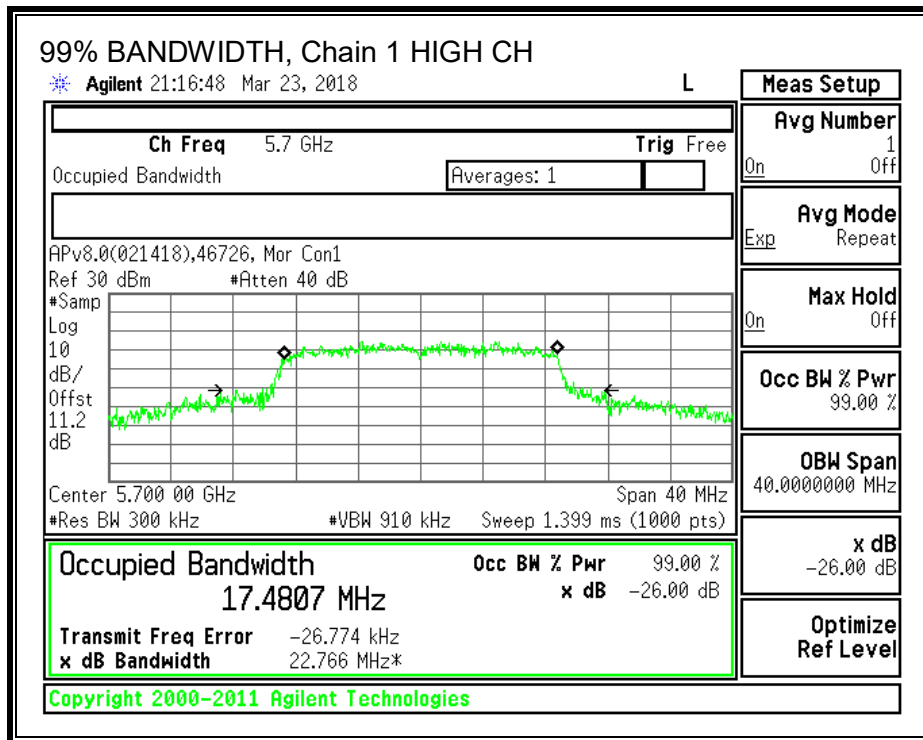
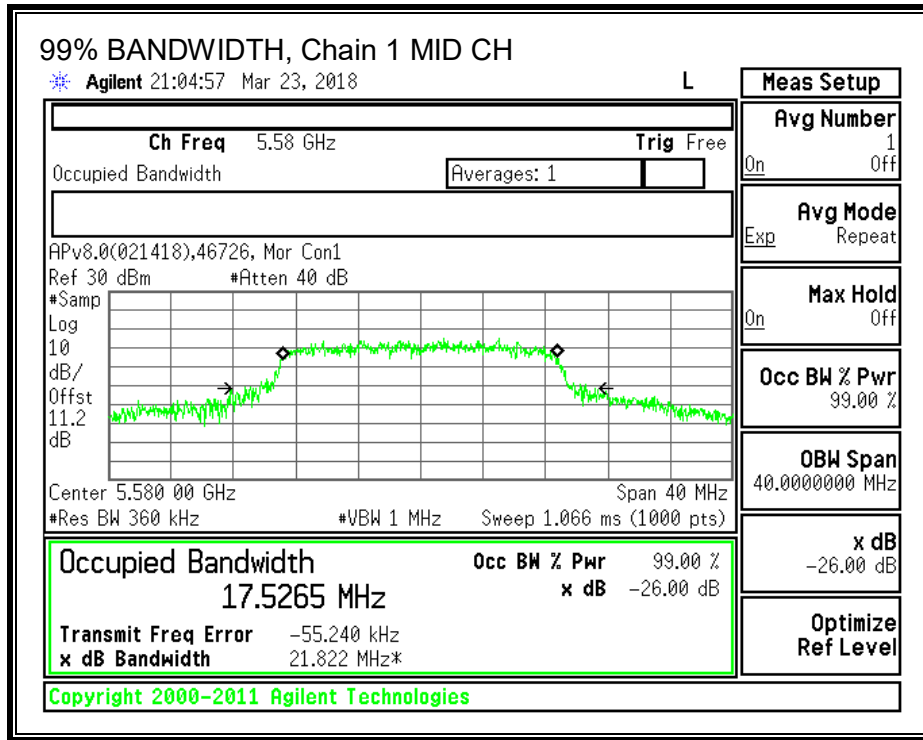


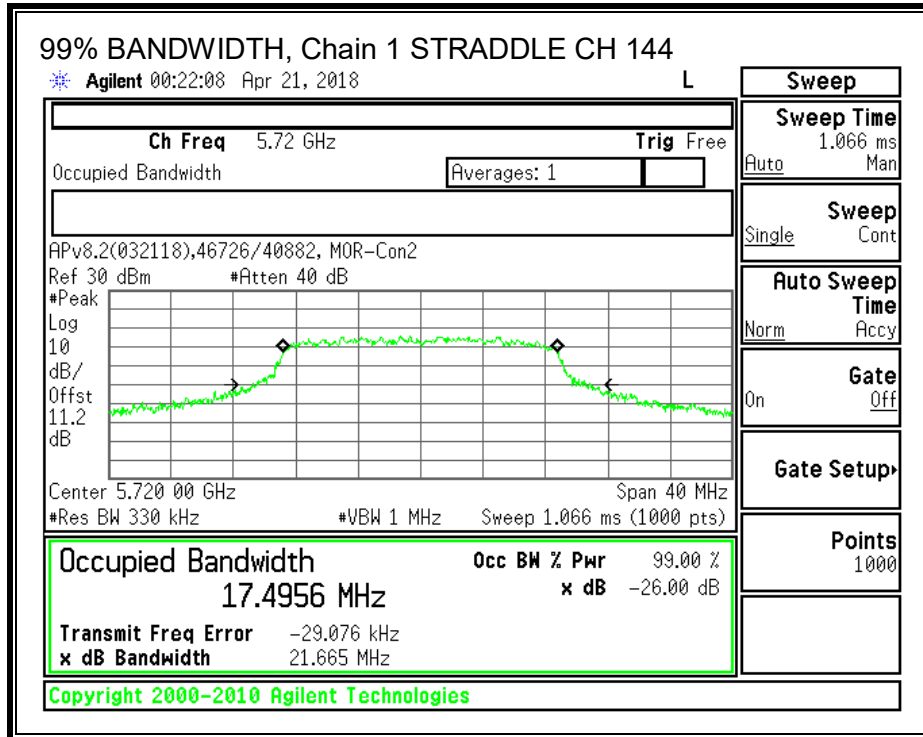




99% BANDWIDTH, Chain 1







8.11.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-16

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722, 12015/40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.00	2.16	5.17	24.00	11.00
Mid	5580	22.15	2.16	5.17	24.00	11.00
High	5680	23.30	2.16	5.17	24.00	11.00
High	5700	23.30	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.40	13.71	16.57	24.00	-7.43
Mid	5580	13.25	13.59	16.43	24.00	-7.57
High	5680	13.48	12.83	16.18	24.00	-7.82
High	5700	11.05	11.84	14.47	24.00	-9.53

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.328	0.175	7.07	11.00	-3.93
Mid	5580	0.534	0.892	7.00	11.00	-4.00
High	5680	0.322	0.066	6.48	11.00	-4.52
High	5700	0.739	1.075	7.19	11.00	-3.81

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.00	2.16	5.17	24.00	11.00
Mid	5580	22.15	2.16	5.17	24.00	11.00
High	5680	23.30	2.16	5.17	24.00	11.00
High	5700	23.30	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.12	14.36	17.25	24.00	-6.75
Mid	5580	13.99	14.14	17.08	24.00	-6.92
High	5680	13.85	13.96	16.92	24.00	-7.08
High	5700	11.67	12.53	15.13	24.00	-8.87

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	17.33	23.39	11.00
Mid	5580	17.45	23.42	11.00
136	5680	17.48	23.43	11.00
High	5700	17.48	23.43	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.40	13.71	16.57	23.39	-6.82
Mid	5580	13.25	13.59	16.43	23.42	-6.99
136	5680	13.48	12.83	16.18	23.43	-7.25
High	5700	11.05	11.84	14.47	23.43	-8.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.33	0.18	7.07	11.00	-3.93
Mid	5580	0.53	0.89	7.00	11.00	-4.00
136	5680	0.322	0.066	6.48	11.00	-4.52
High	5700	0.739	1.075	7.19	11.00	-3.81

RESULTS (ISED Conducted Power) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	17.33	23.39	11.00
Mid	5580	17.45	23.42	11.00
136	5680	17.48	23.43	11.00
High	5700	17.48	23.43	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.12	14.36	17.25	23.39	-6.14
Mid	5580	13.99	14.14	17.08	23.42	-6.34
136	5680	13.85	13.96	16.92	23.43	-6.51
High	5700	11.67	12.53	15.13	23.43	-8.29

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	17.33	2.16	29.39
Mid	5580	17.45	2.16	29.42
136	5680	17.48	2.16	29.43
High	5700	17.48	2.16	29.43

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	13.40	13.71	18.73	29.39	-10.66
Mid	5580	13.25	13.59	18.59	29.42	-10.83
136	5680	13.48	12.83	18.34	29.43	-11.09
High	5700	11.05	11.84	16.63	29.43	-12.79

RESULTS (ISED EIRP) MCS7

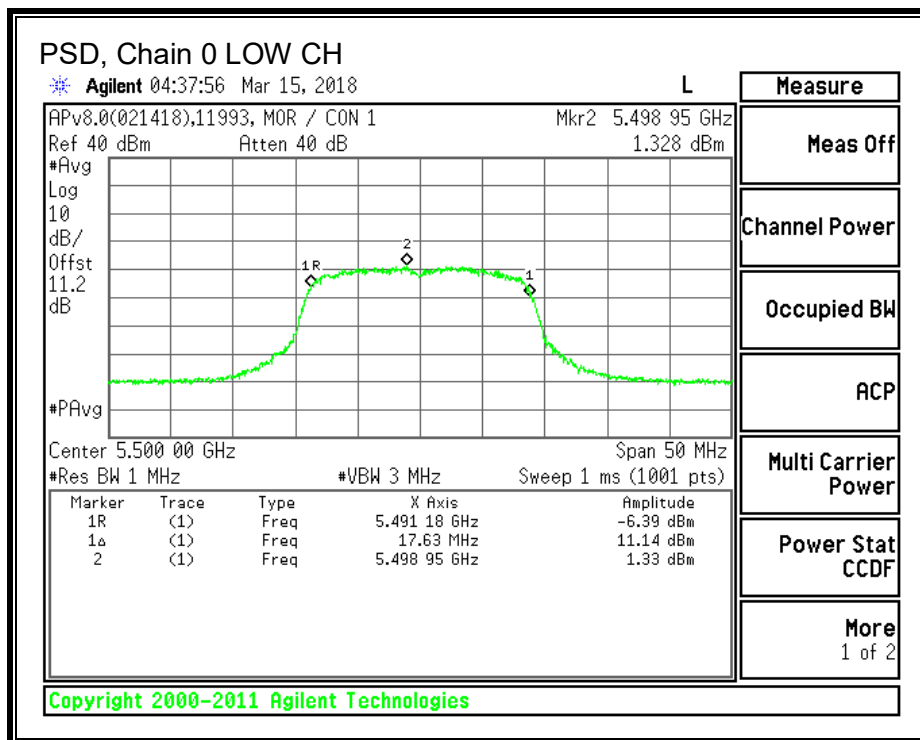
Bandwidth, Antenna Gain, and Limits

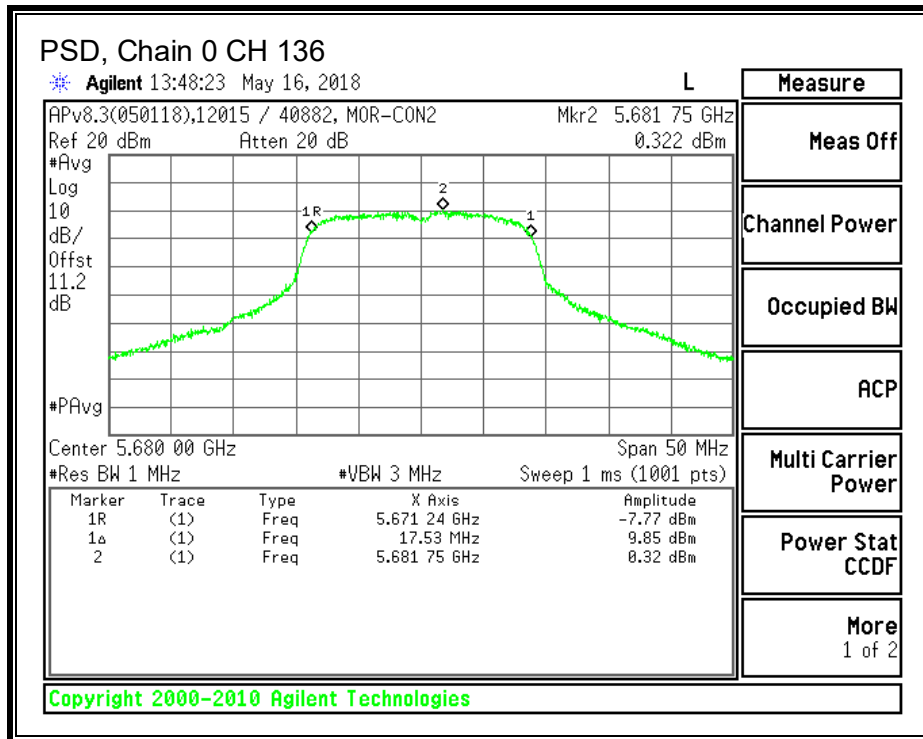
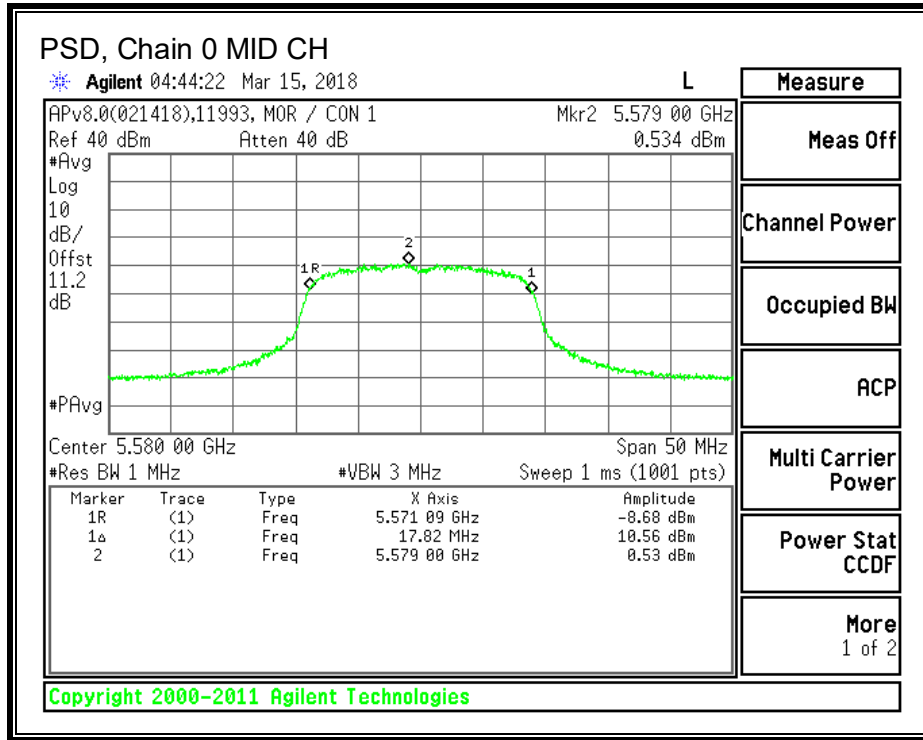
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	17.33	2.16	29.39
Mid	5580	17.45	2.16	29.42
136	5680	17.48	2.16	29.43
High	5700	17.48	2.16	29.43

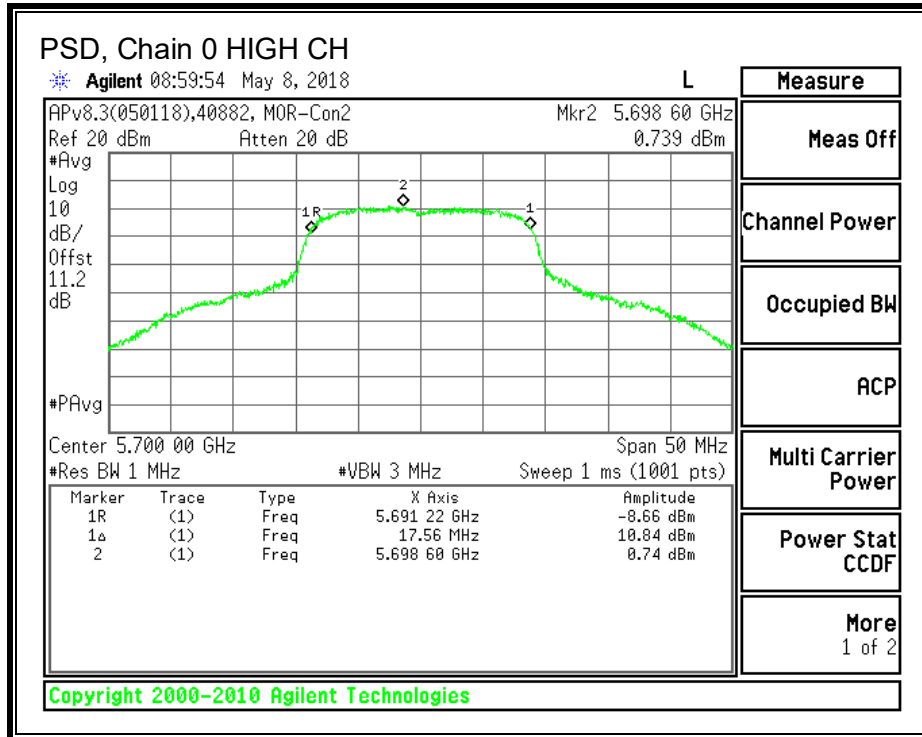
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	14.12	14.36	19.41	29.39	-9.98
Mid	5580	13.99	14.14	19.24	29.42	-10.18
136	5680	13.85	13.96	19.08	29.43	-10.35
High	5700	11.67	12.53	17.29	29.43	-12.13

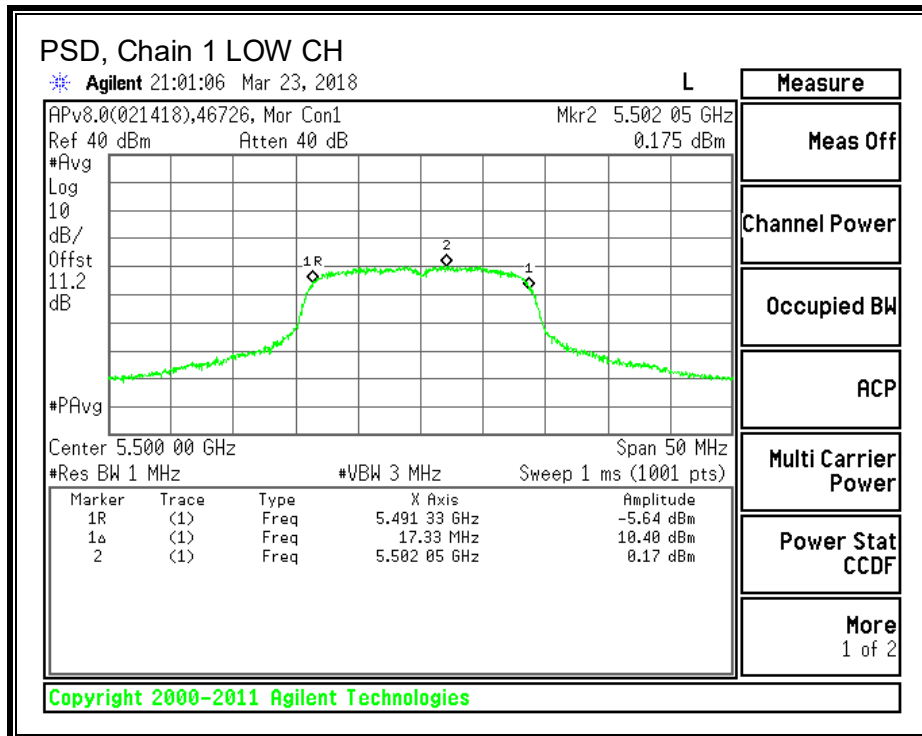
PSD, Chain 0

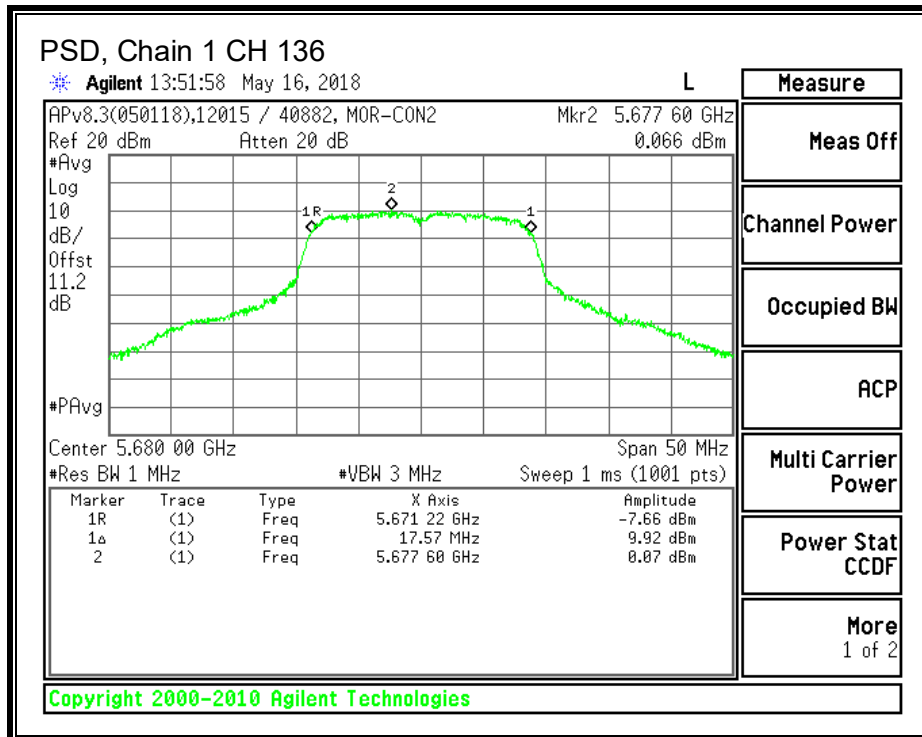
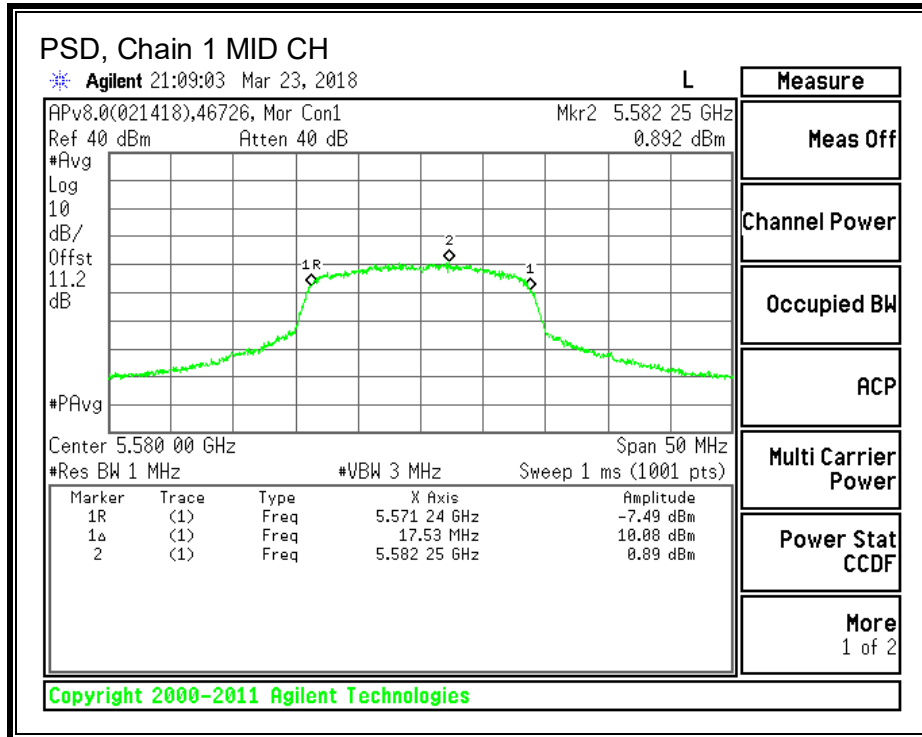


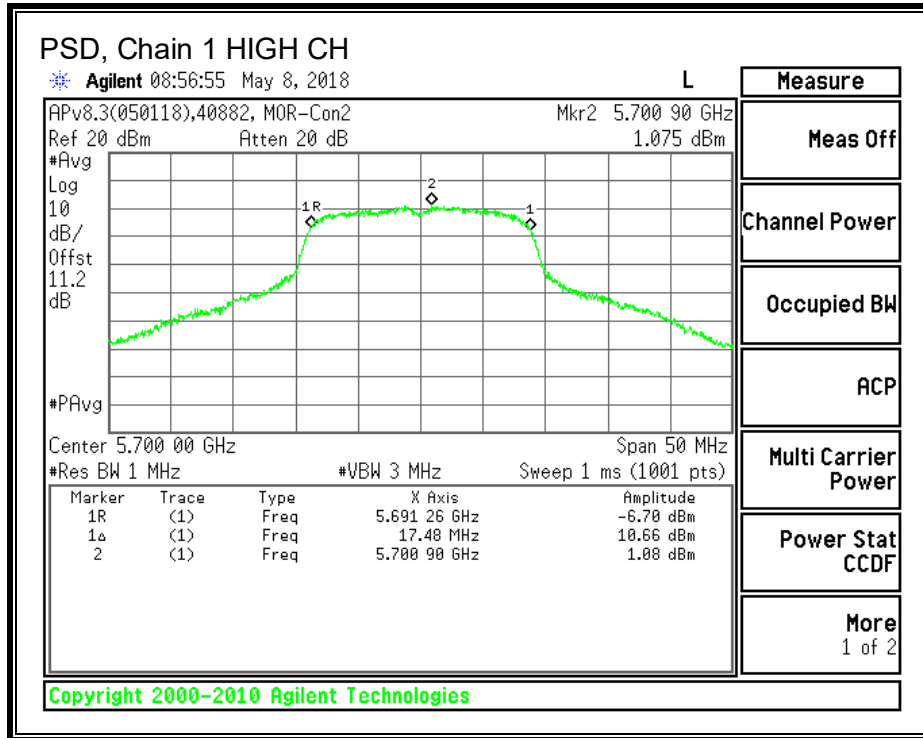




PSD, Chain 1







STRADDLE CHANNEL 144 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	23.00	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	24.00	-9.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.002	0.623	6.60	11.00	-4.40

STRADDLE CHANNEL 144 RESULTS (FCC) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	23.00	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	24.00	-9.15

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	17.42	23.41	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	23.41	-8.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.002	0.623	6.60	11.00	-4.40

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	17.42	23.41	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	23.41	-8.56

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	17.42	2.16	29.41

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.36	11.36	17.06	29.41	-12.35

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) MCS7

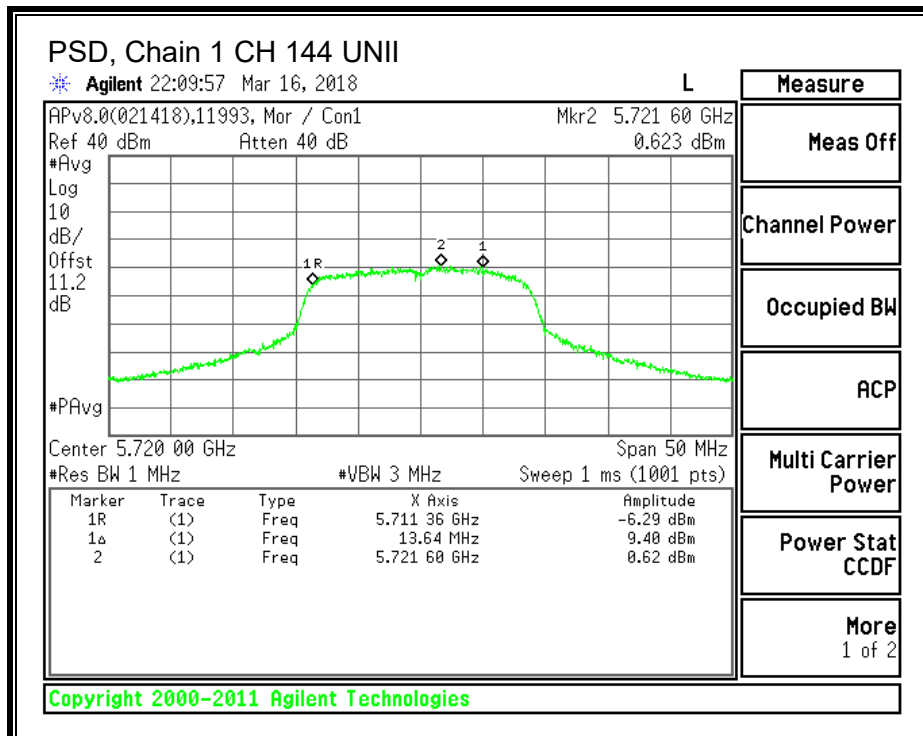
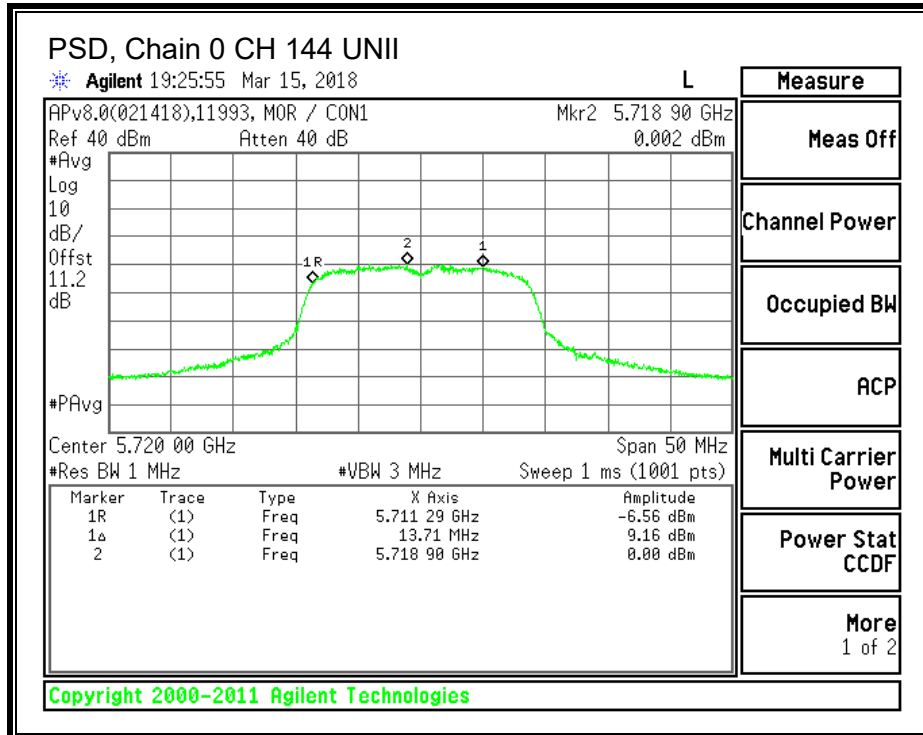
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	17.42	2.16	29.41

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.29	11.33	17.01	29.41	-12.40



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	2.16	5.17	30.00	30.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	30.00	-15.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	-4.071	-2.997	2.78	30.00	-27.22

UNII-3 BAND (FCC and ISSED) MCS7

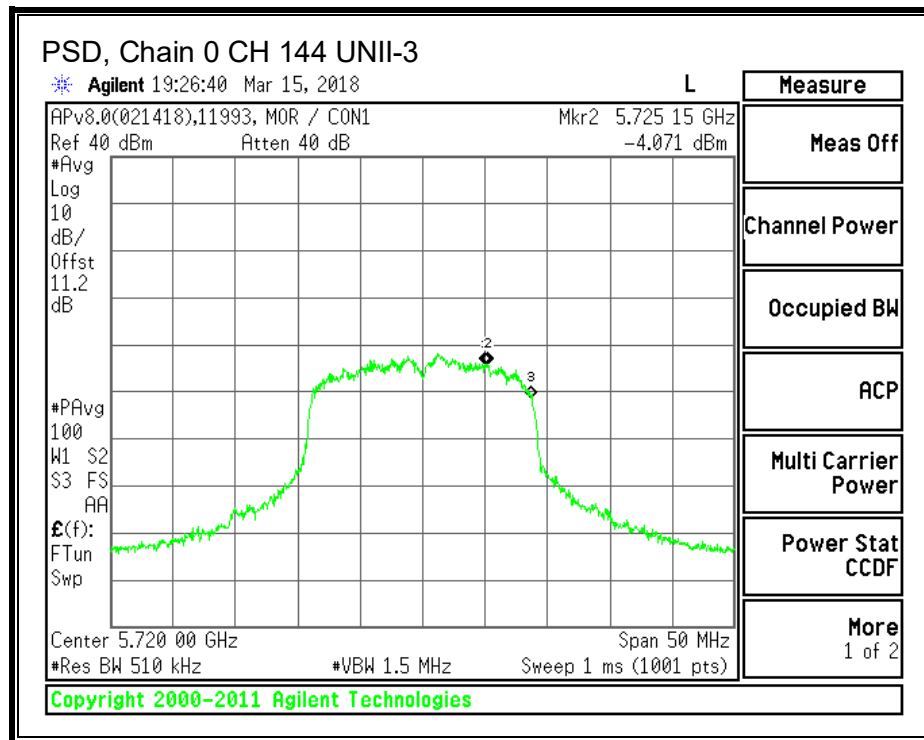
Antenna Gain and Limit

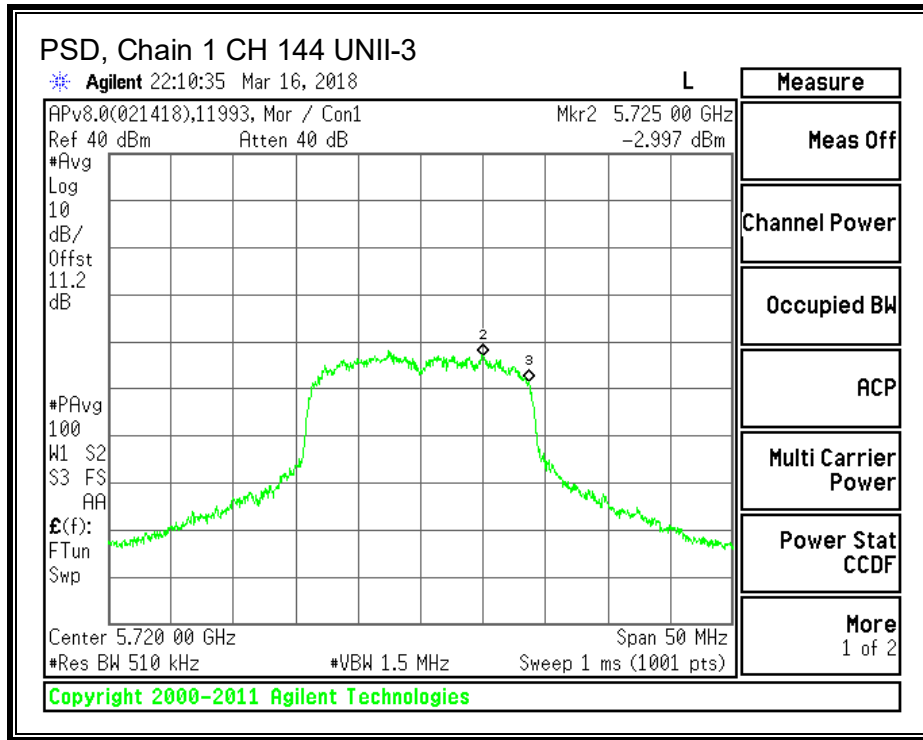
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	2.16	5.17	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	30.00	-15.15

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.





8.11.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-16

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722, 12015/40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.00	1.92	4.92	24.00	11.00
Mid	5580	22.15	1.92	4.92	24.00	11.00
136	5680	23.30	1.92	4.92	24.00	11.00
High	5700	23.30	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.40	13.71	16.57	24.00	-7.43
Mid	5580	13.25	13.59	16.43	24.00	-7.57
136	5680	13.48	12.83	16.18	24.00	-7.82
High	5700	10.06	10.94	13.53	24.00	-10.47

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.328	0.175	7.07	11.00	-3.93
Mid	5580	0.534	0.892	7.00	11.00	-4.00
136	5680	0.322	0.066	6.48	11.00	-4.52
High	5700	0.739	1.075	7.19	11.00	-3.81

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	21.00	1.92	4.92	24.00	11.00
104	5520	21.00	1.92	4.92	24.00	11.00
Mid	5580	22.15	1.92	4.92	24.00	11.00
136	5680	23.30	1.92	4.92	24.00	11.00
High	5700	23.30	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.06	13.50	16.30	24.00	-7.70
104	5520	14.15	14.06	17.12	24.00	-6.88
Mid	5580	13.99	14.14	17.08	24.00	-6.92
136	5680	13.85	13.96	16.92	24.00	-7.08
High	5700	10.73	11.60	14.20	24.00	-9.80

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	17.33	23.39	11.00
Mid	5580	17.45	23.42	11.00
136	5680	17.48	23.43	11.00
High	5700	17.48	23.43	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.40	13.71	16.57	23.39	-6.82
Mid	5580	13.25	13.59	16.43	23.42	-6.99
136	5680	13.48	12.83	16.18	23.43	-7.25
High	5700	10.06	10.94	13.53	23.43	-9.89

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5500	1.33	0.18	7.07	11.00	-3.93
Mid	5580	0.53	0.89	7.00	11.00	-4.00
136	5680	0.322	0.066	6.48	11.00	-4.52
High	5700	0.74	1.08	7.19	11.00	-3.81

RESULTS (ISED Conducted Power) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5500	17.33	23.39	11.00
104	5520	17.33	23.39	11.00
Mid	5580	17.45	23.42	11.00
136	5680	17.48	23.43	11.00
High	5700	17.48	23.43	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.06	13.50	16.30	23.39	-7.09
104	5520	14.15	14.06	17.12	23.39	-6.27
Mid	5580	13.99	14.14	17.08	23.42	-6.34
136	5680	13.85	13.96	16.92	23.43	-6.51
High	5700	10.73	11.60	14.20	23.43	-9.23

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	17.33	1.92	29.39
Mid	5580	17.45	1.92	29.42
136	5680	17.48	1.92	29.43
High	5700	17.48	1.92	29.43

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	13.40	13.71	18.49	29.39	-10.90
Mid	5580	13.25	13.59	18.35	29.42	-11.07
136	5680	13.48	12.83	18.10	29.43	-11.33
High	5700	10.06	10.94	15.45	29.43	-13.97

RESULTS (ISED EIRP) MCS7

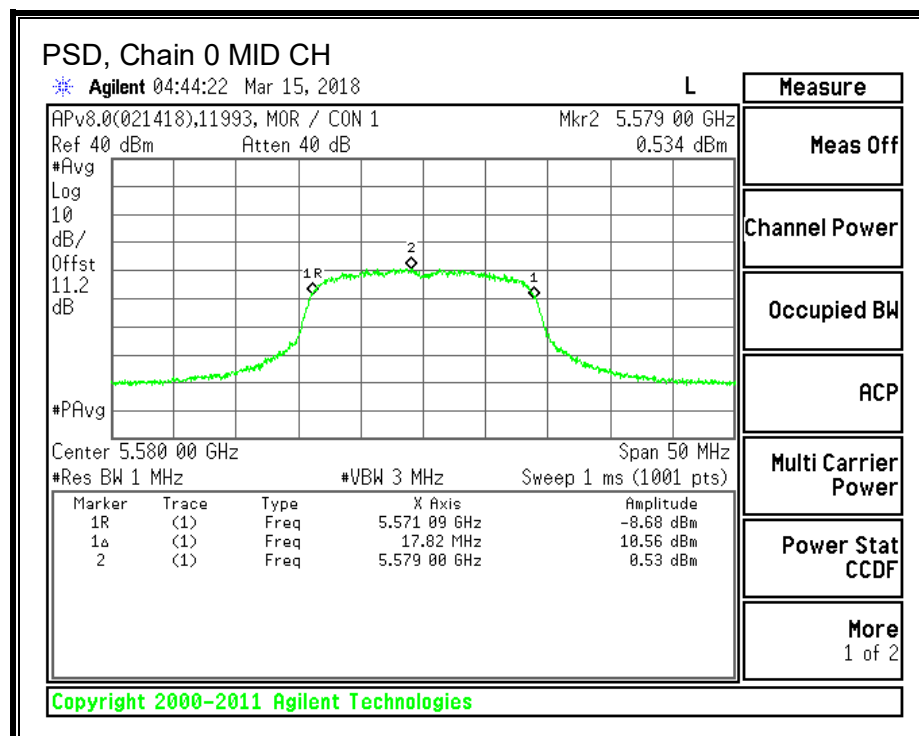
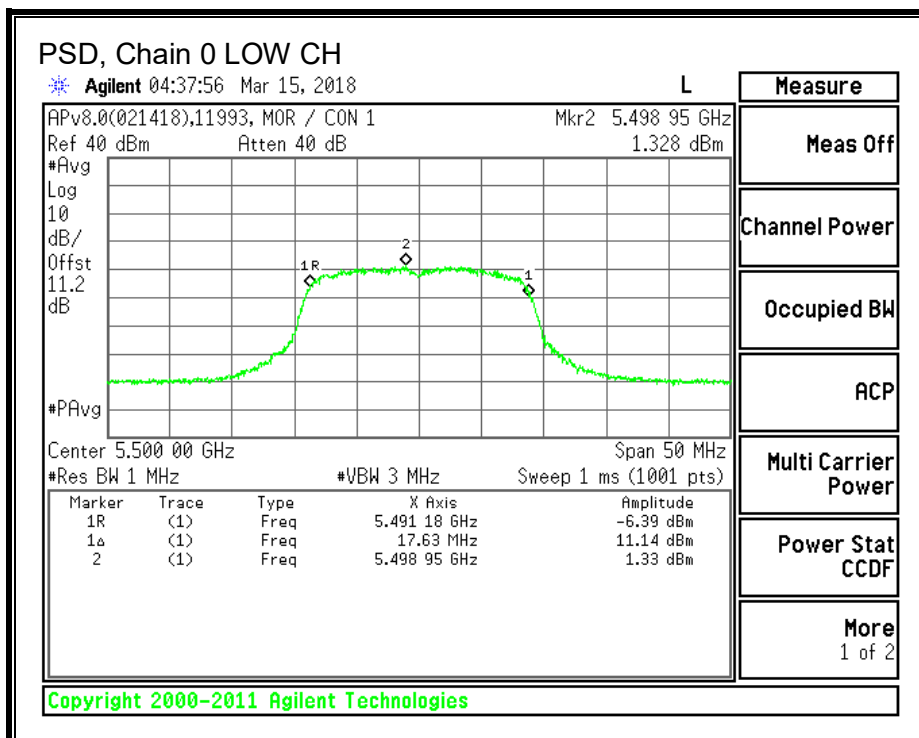
Bandwidth, Antenna Gain, and Limits

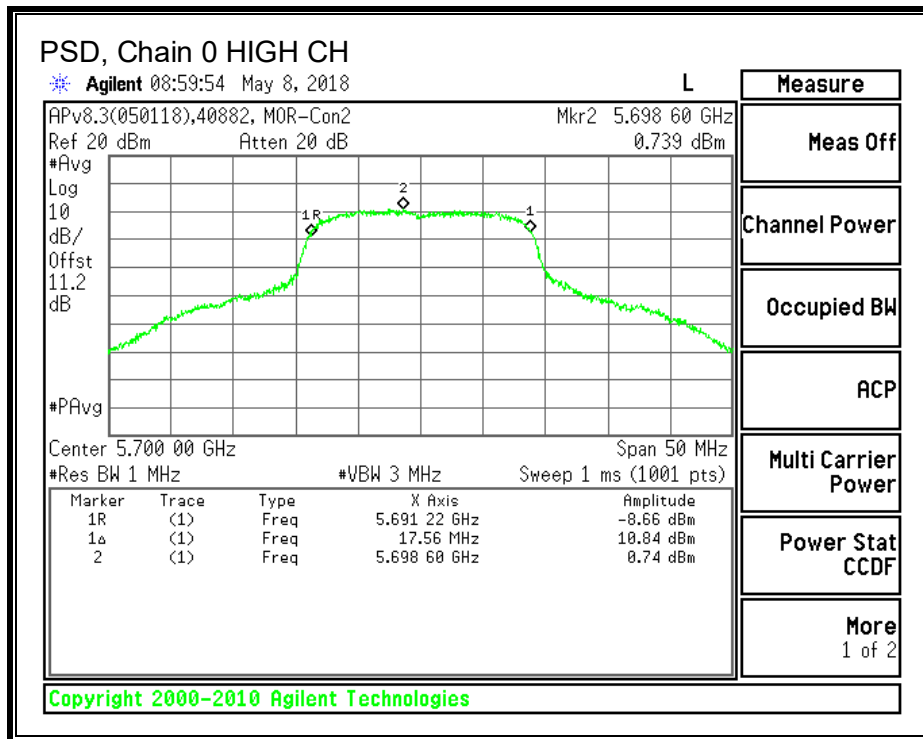
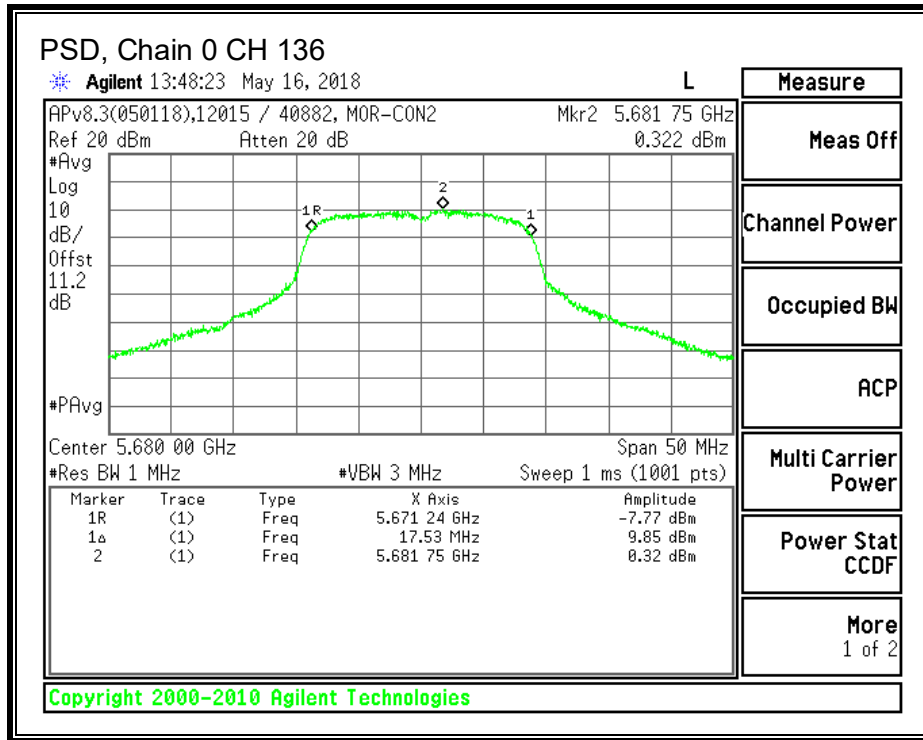
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5500	17.33	1.92	29.39
104	5520	17.33	1.92	29.39
Mid	5580	17.45	1.92	29.42
136	5680	17.48	1.92	29.43
High	5700	17.48	1.92	29.43

Output Power Results

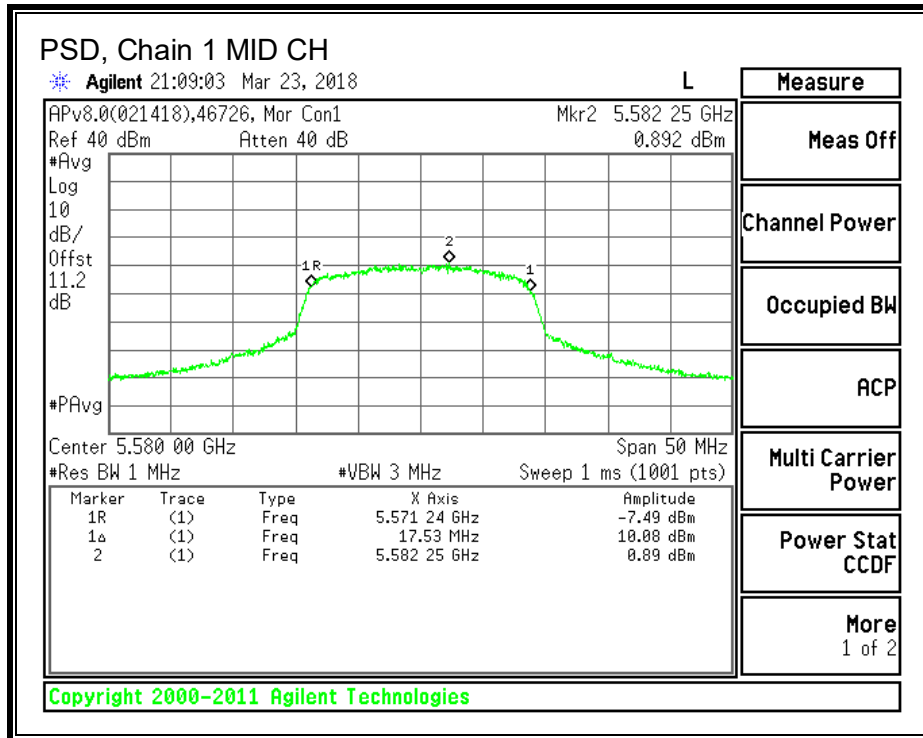
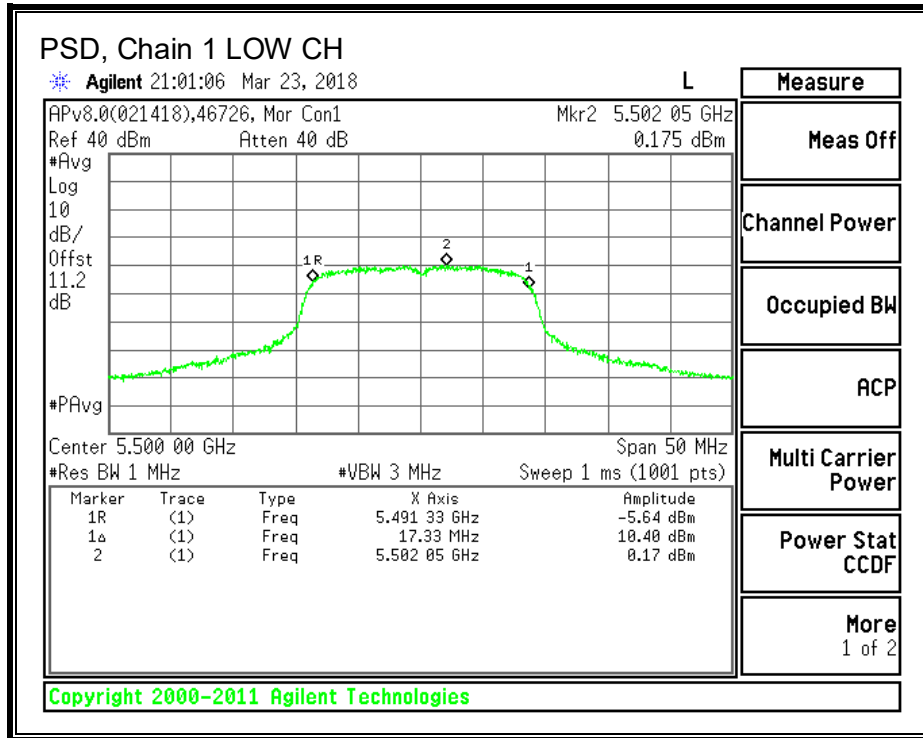
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5500	13.06	13.50	18.22	29.39	-11.17
104	5520	14.15	14.06	19.04	29.39	-10.35
Mid	5580	13.99	14.14	19.00	29.42	-10.42
136	5680	13.85	13.96	18.84	29.43	-10.59
High	5700	10.73	11.60	16.12	29.43	-13.31

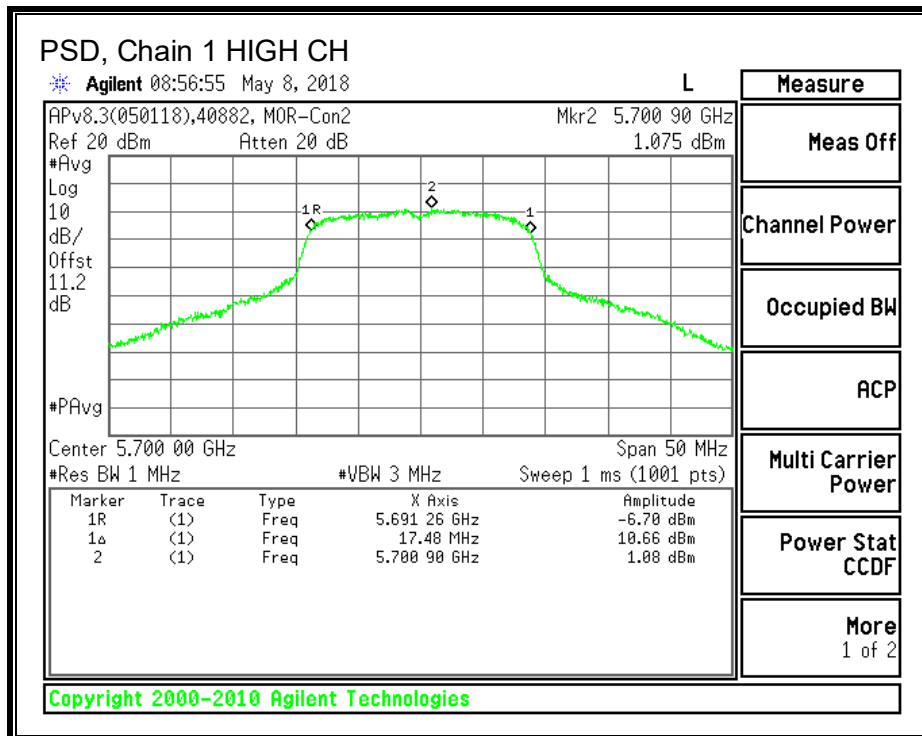
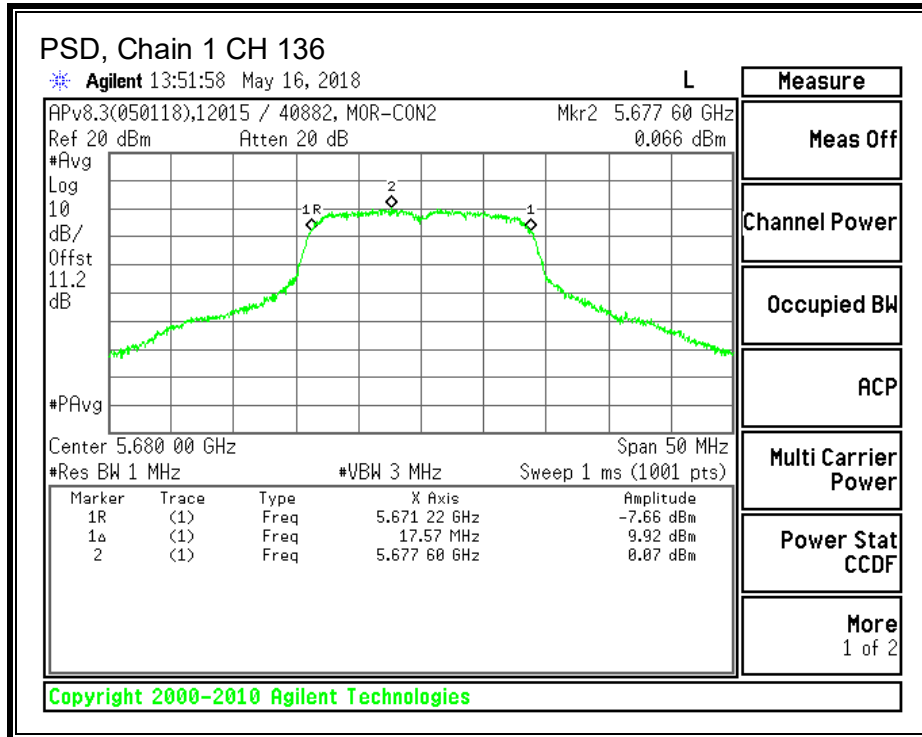
PSD, Chain 0





PSD, Chain 1





STRADDLE CHANNEL 144 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	23.00	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	24.00	-9.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.002	0.623	6.60	11.00	-4.40

STRADDLE CHANNEL 144 RESULTS (FCC) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	23.00	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	24.00	-9.15

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	17.42	23.41	11.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	23.41	-8.51

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	0.002	0.623	6.60	11.00	-4.40

STRADDLE CHANNEL 144 RESULTS (ISED Conducted Power) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	17.42	23.41	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	23.41	-8.56

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	17.42	1.92	29.41

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.36	11.36	16.82	29.41	-12.59

STRADDLE CHANNEL 144 RESULTS (ISED EIRP) MCS7

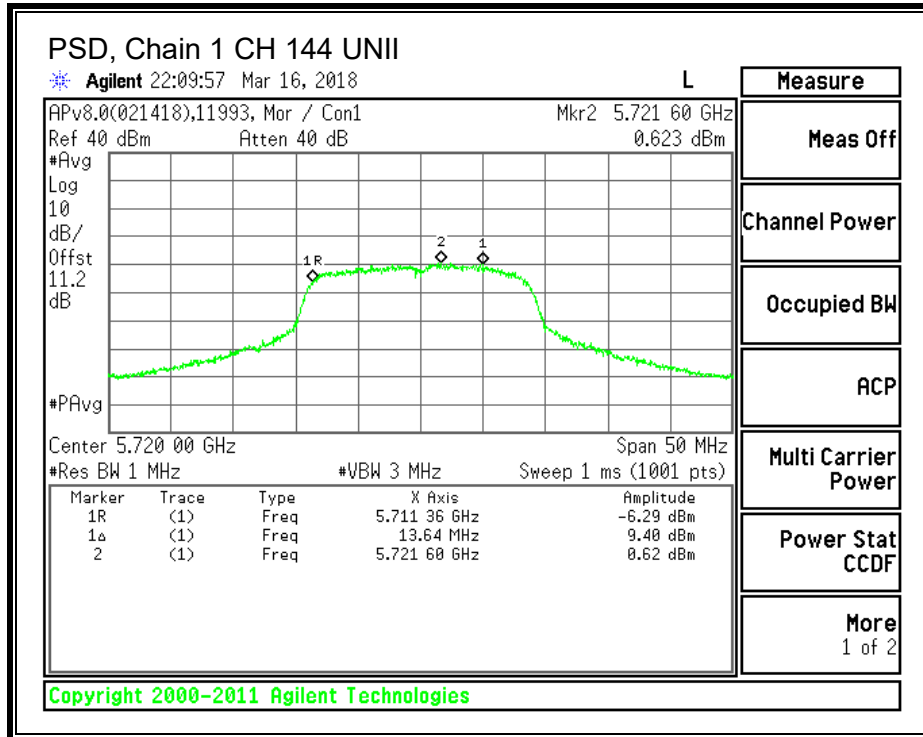
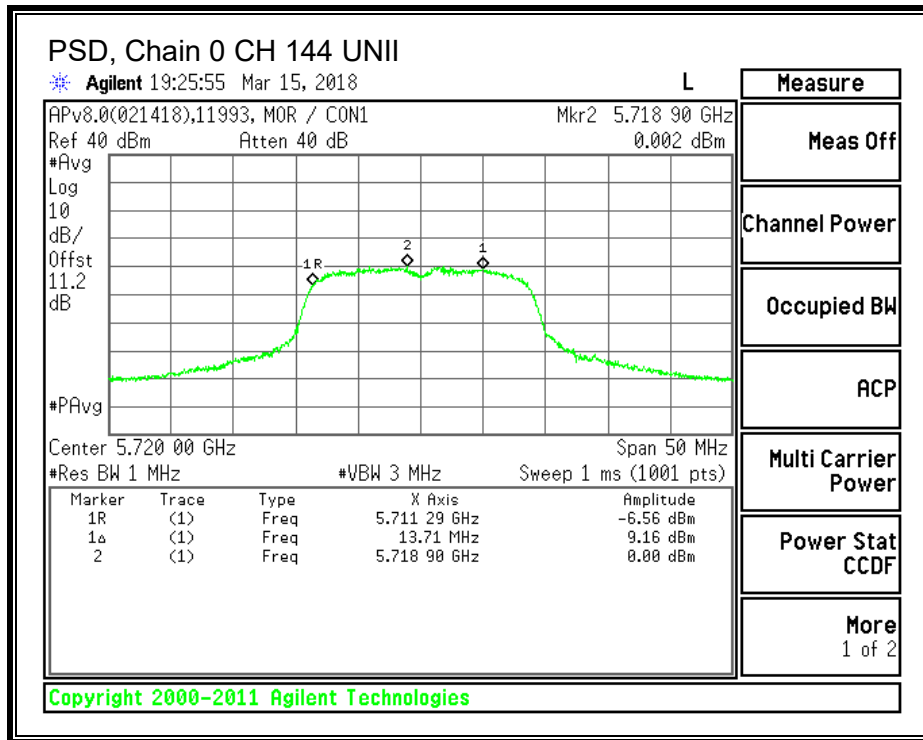
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
144	5720	17.42	1.92	29.41

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
144	5720	12.29	11.33	16.77	29.41	-12.64



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	1.92	4.92	30.00	30.00

Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.36	11.36	14.90	30.00	-15.10

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
144	5720	-4.071	-2.997	2.78	30.00	-27.22

UNII-3 BAND (FCC and ISSED) MCS7

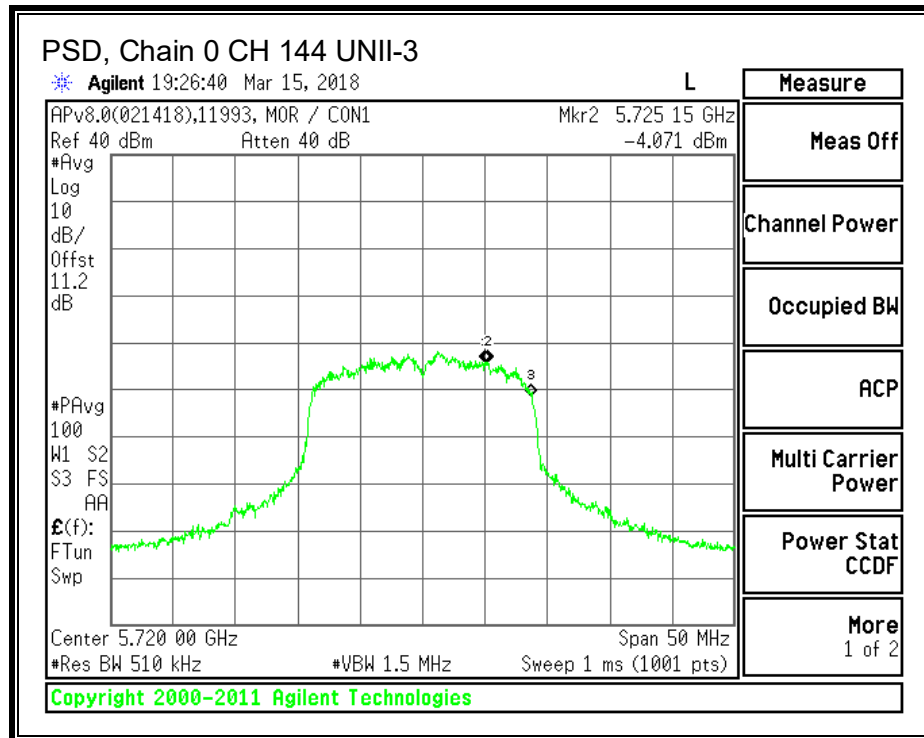
Antenna Gain and Limit

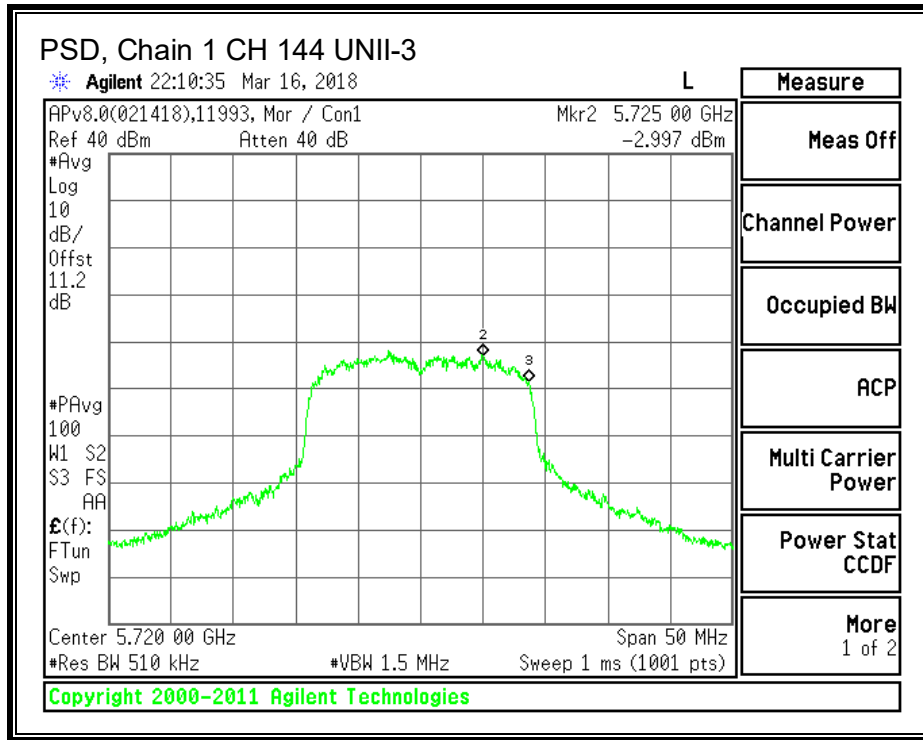
Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
144	5720	1.92	4.92	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
144	5720	12.29	11.33	14.85	30.00	-15.15

Note: PSD from 802.11n HT20 MCS0 was used to represent 802.11n HT20 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.





8.12. 802.11n HT40 MODE IN THE 5.6 GHz BAND

8.12.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST RESULTS

Test Date: 2018-03-15, 2018-03-23

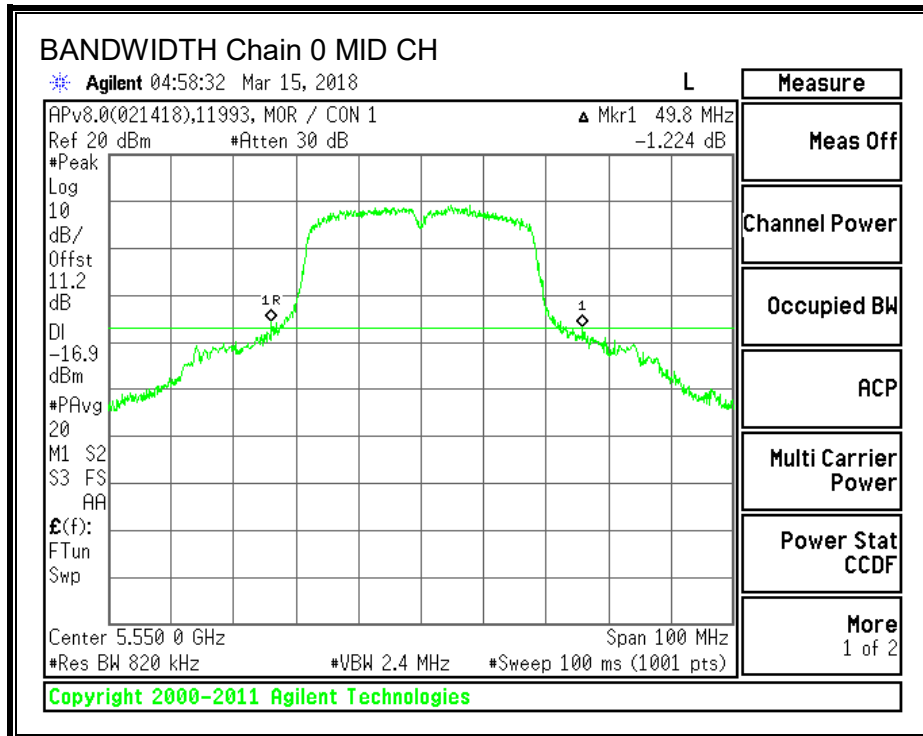
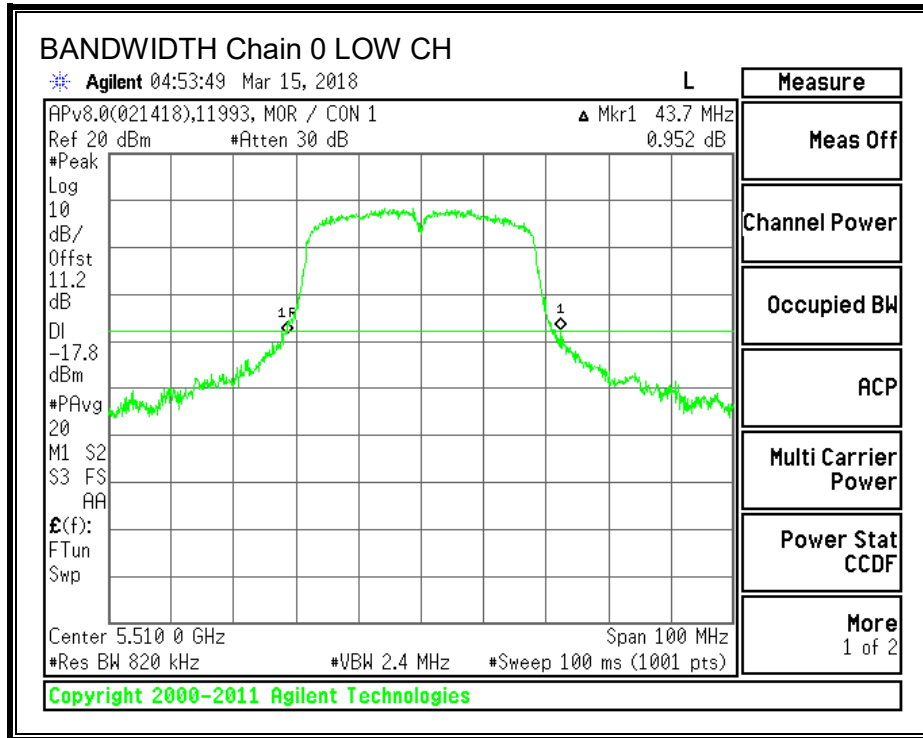
Project: 12053557

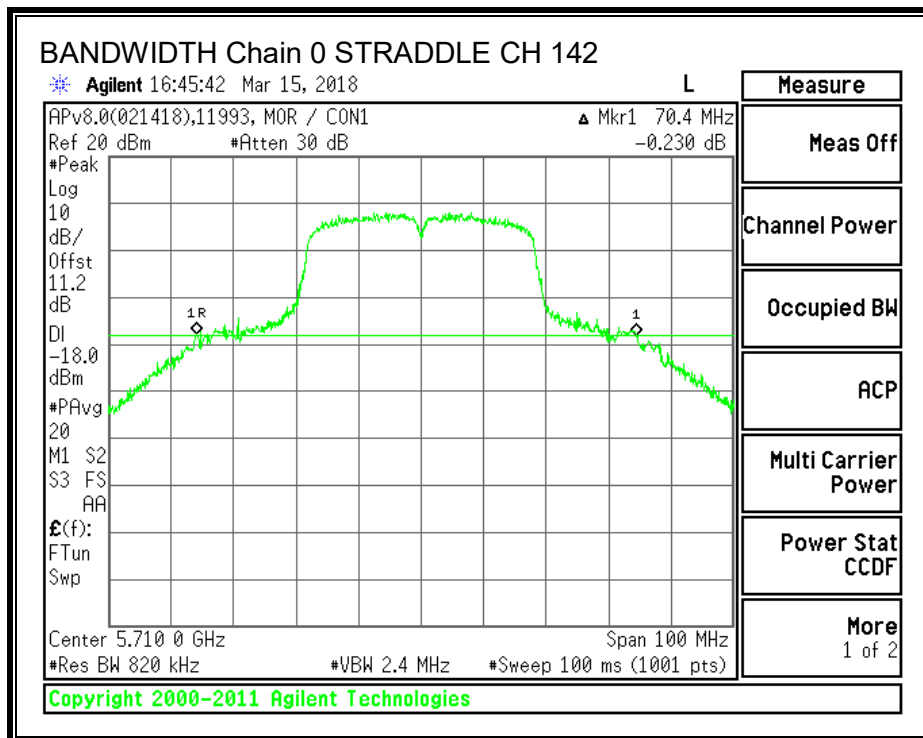
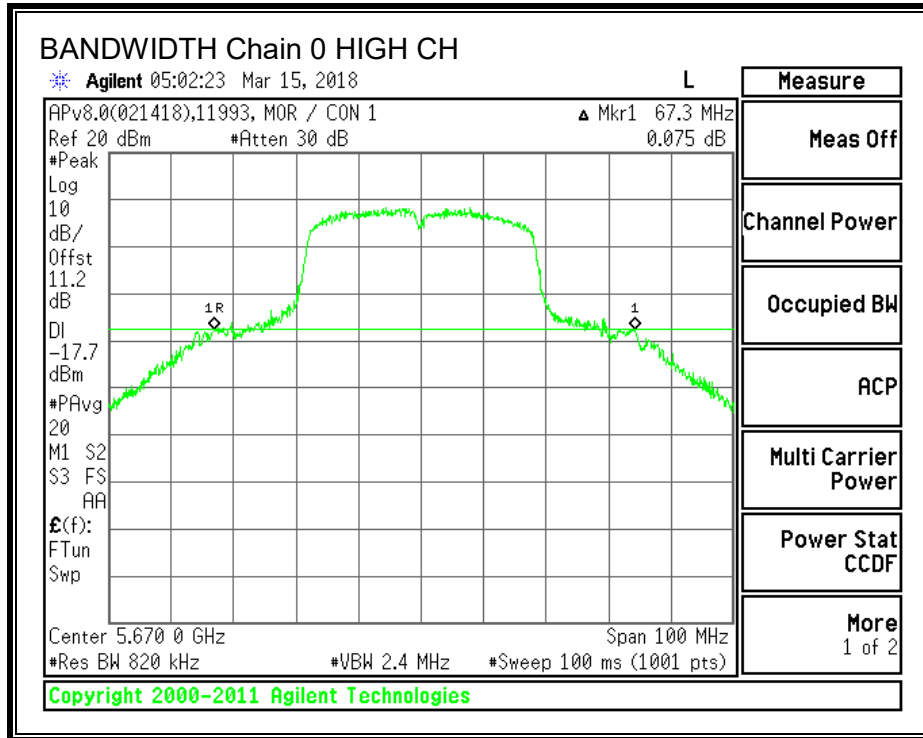
Tested By: 11993/46722, 46726/46722

RESULTS

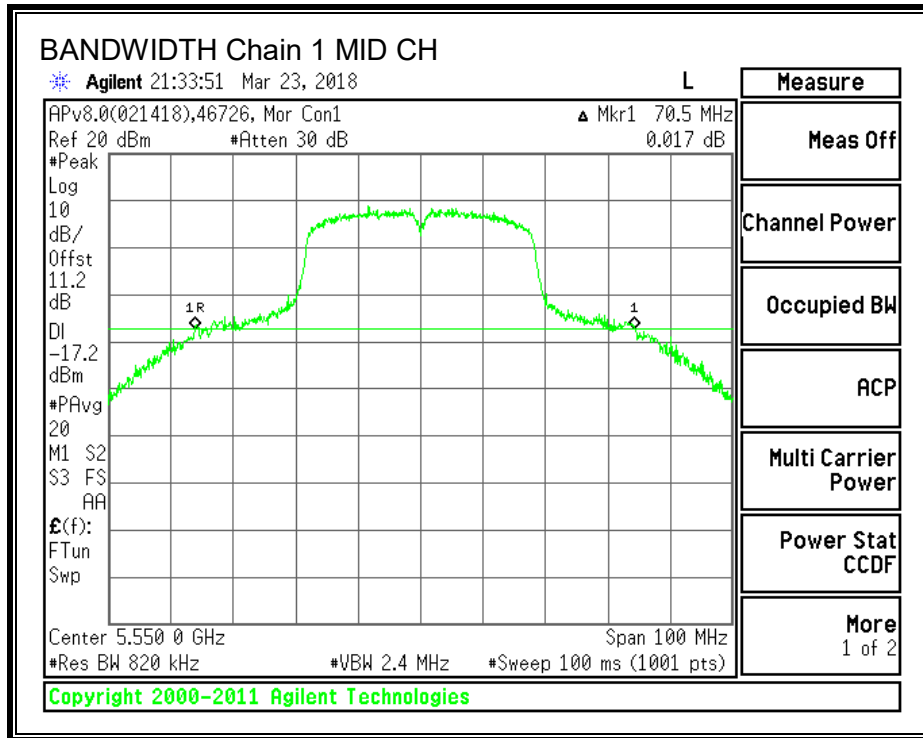
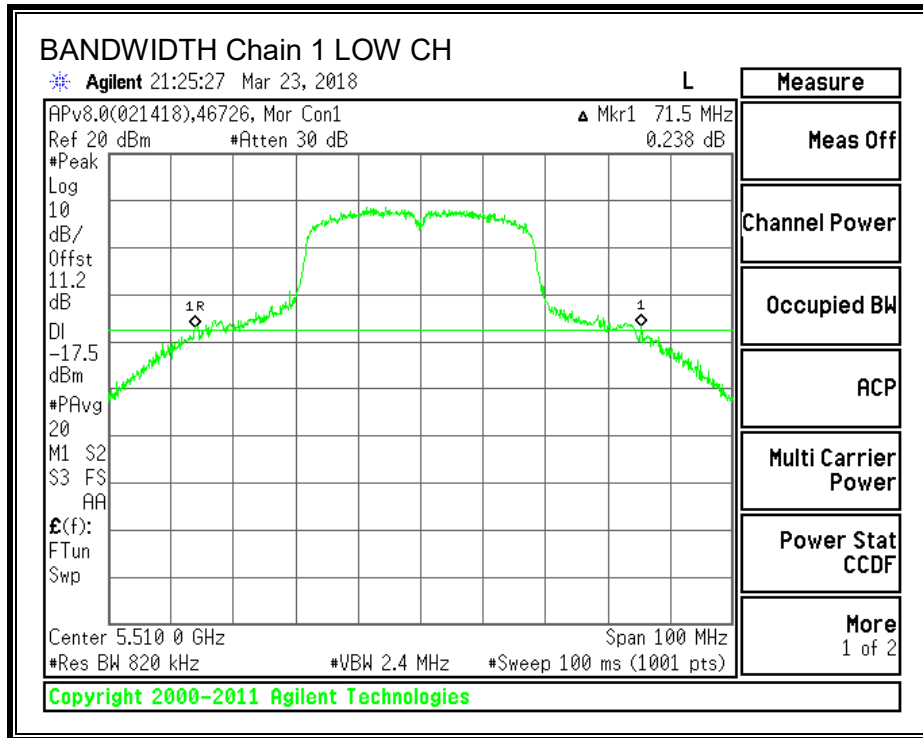
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5510	43.70	71.50
Mid	5550	49.80	70.50
High	5670	67.30	74.80
142	5710	70.40	76.10

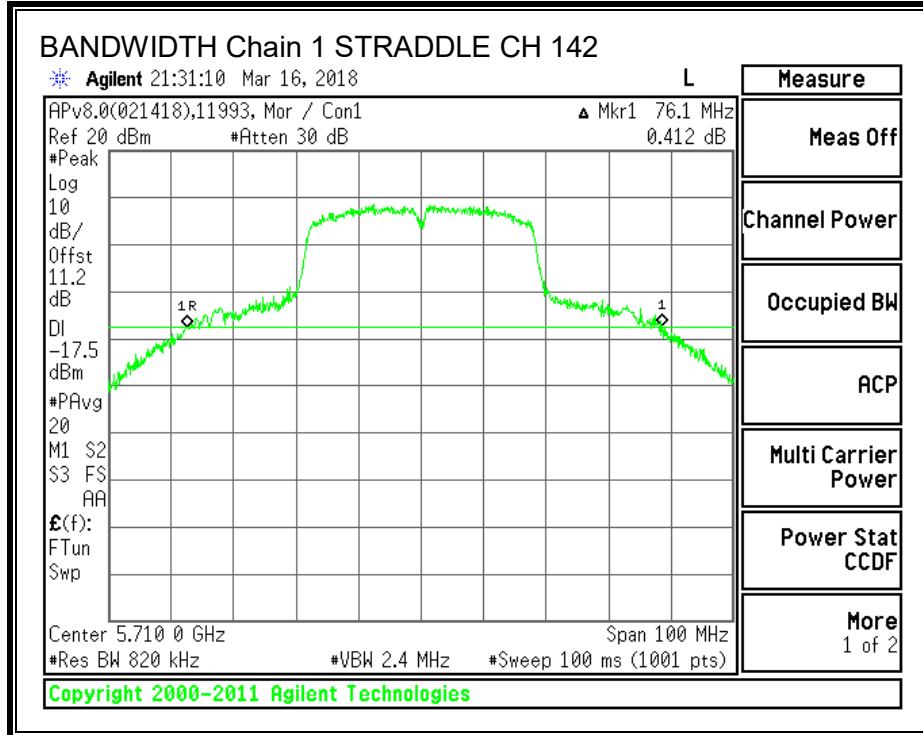
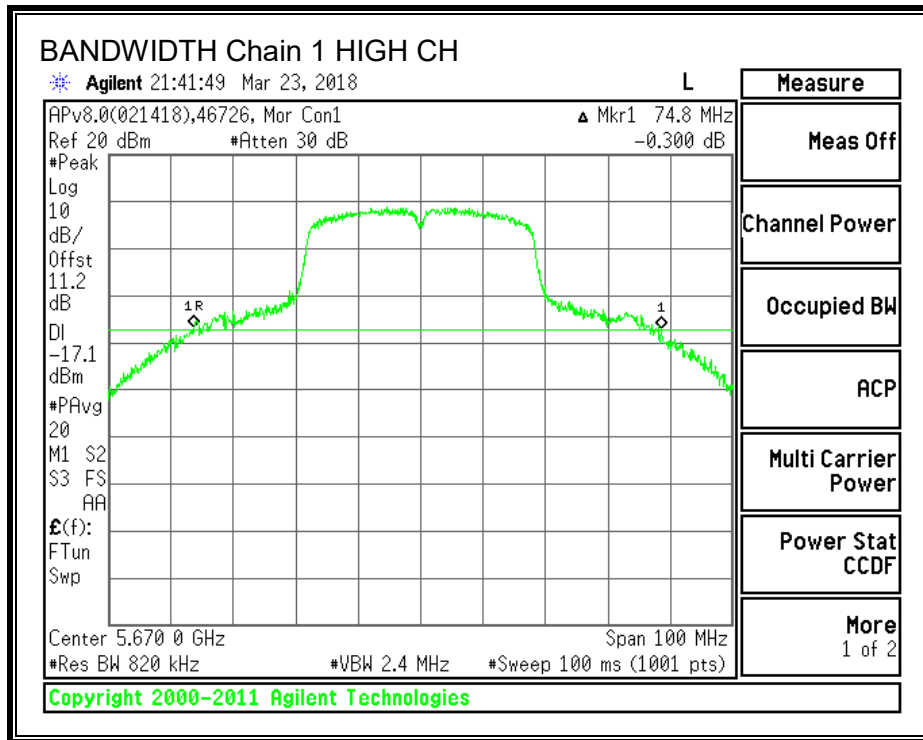
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.12.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

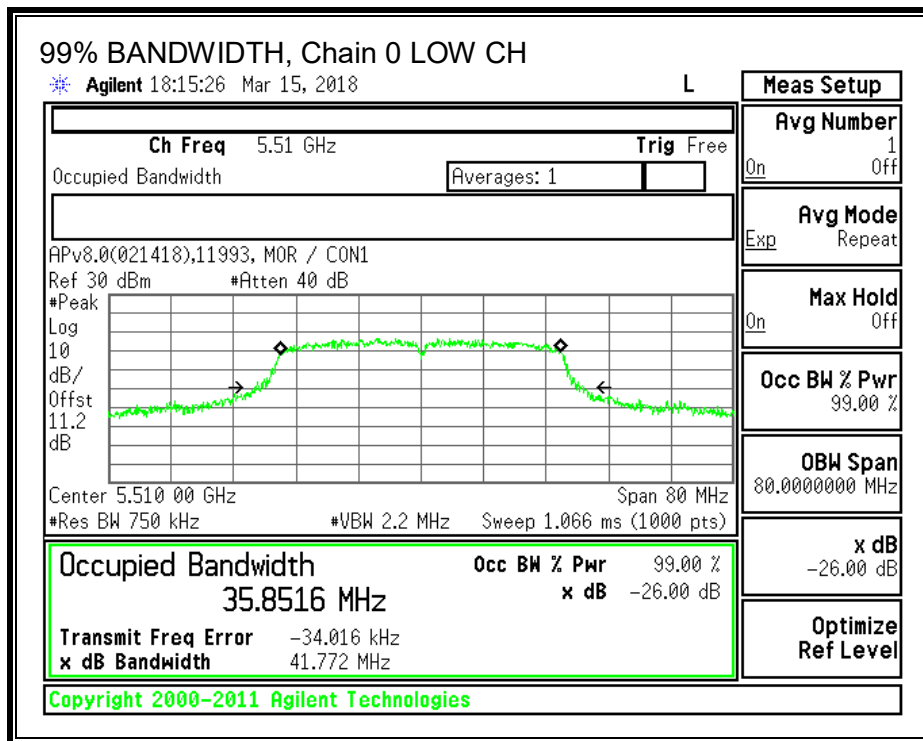
TEST INFORMATION

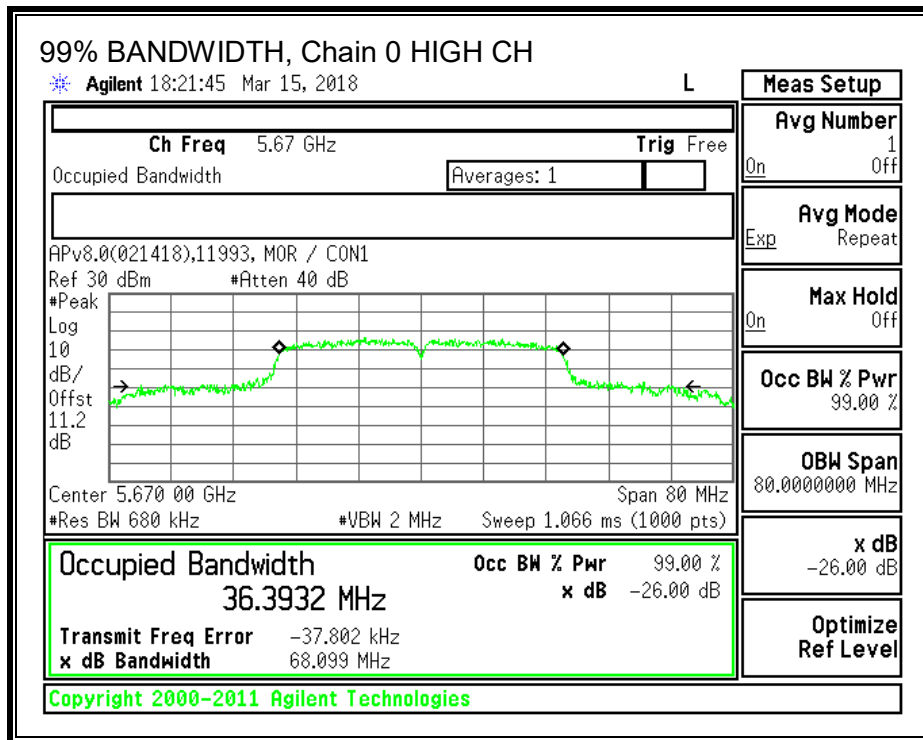
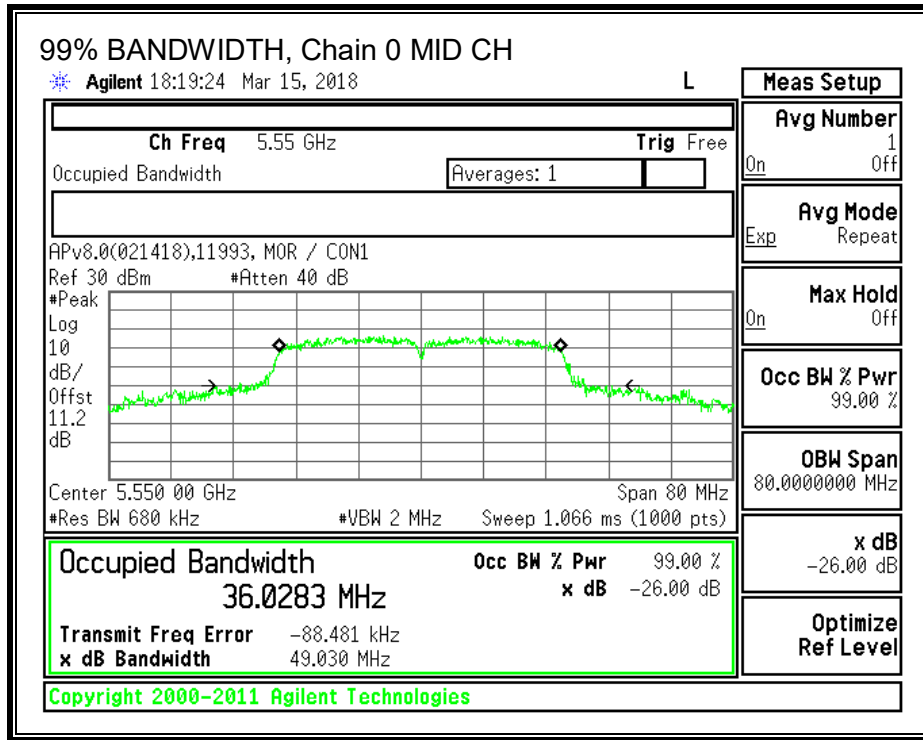
Test Date: 2018-03-15, 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

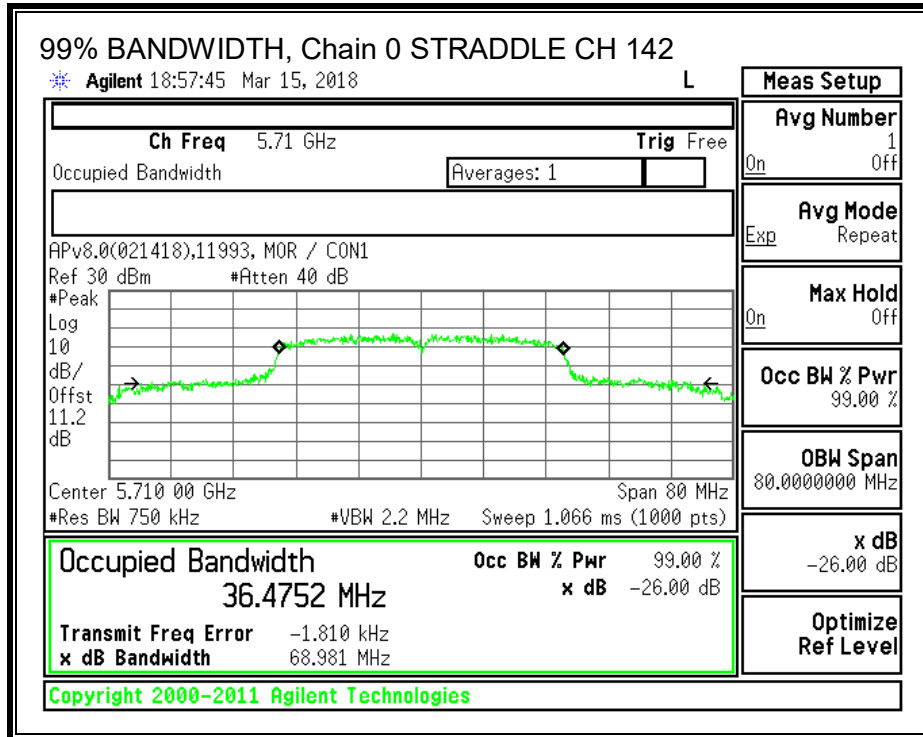
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5510	35.8516	36.7033
Mid	5550	36.0283	36.6523
High	5670	36.3932	37.0895
142	5710	36.4752	38.8383

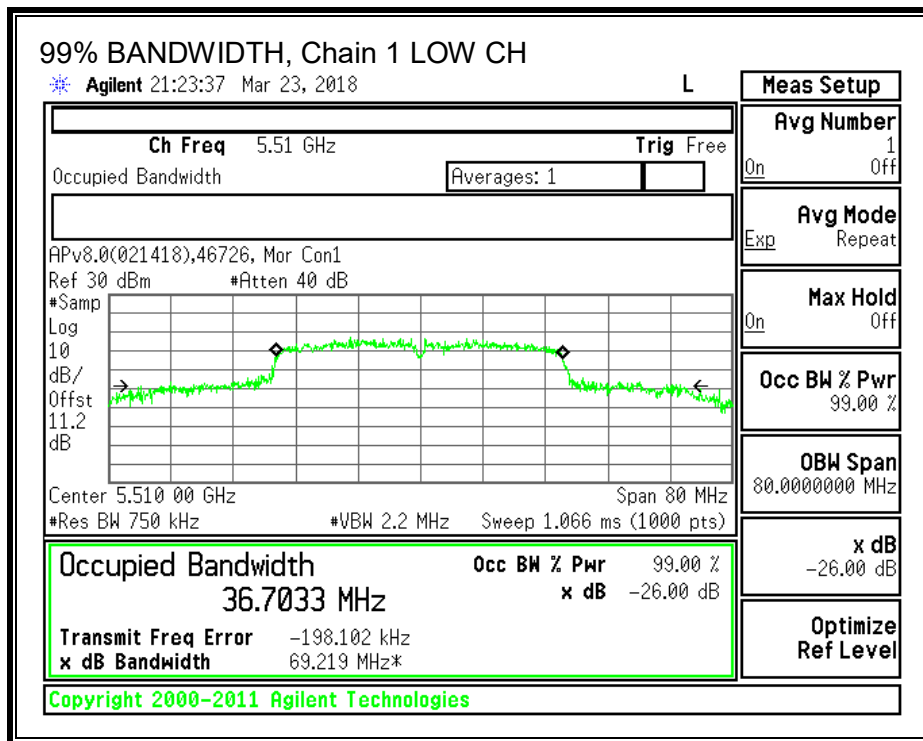
99% BANDWIDTH, Chain 0

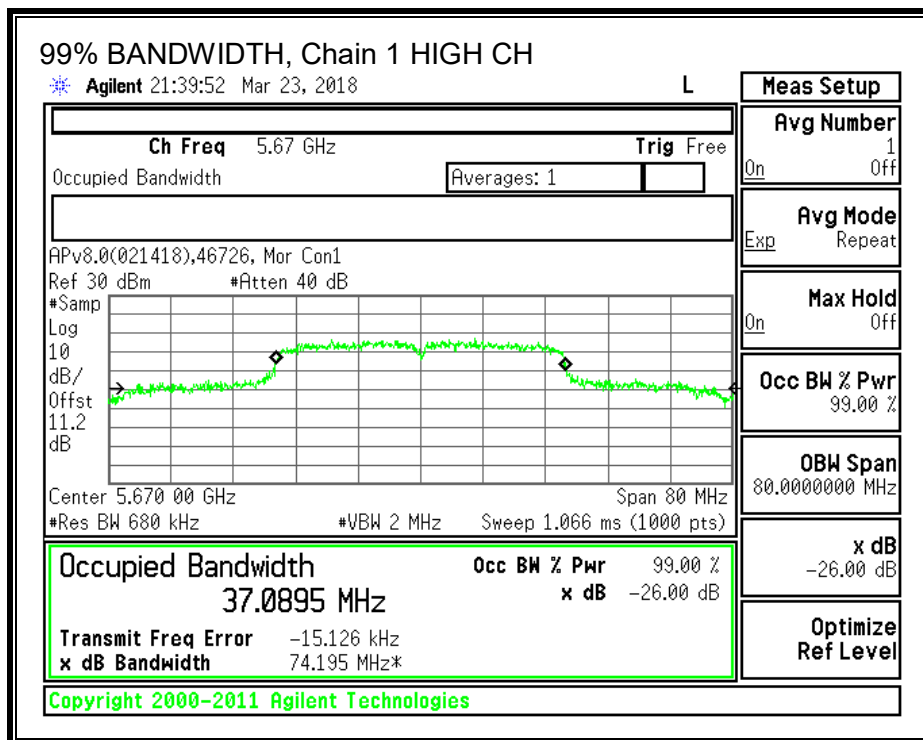
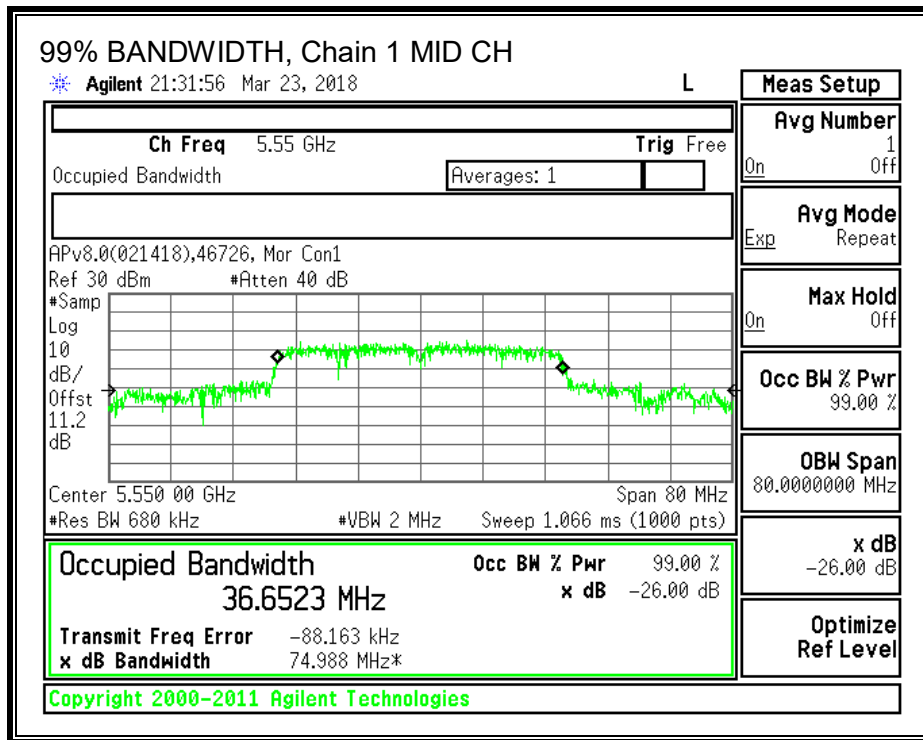


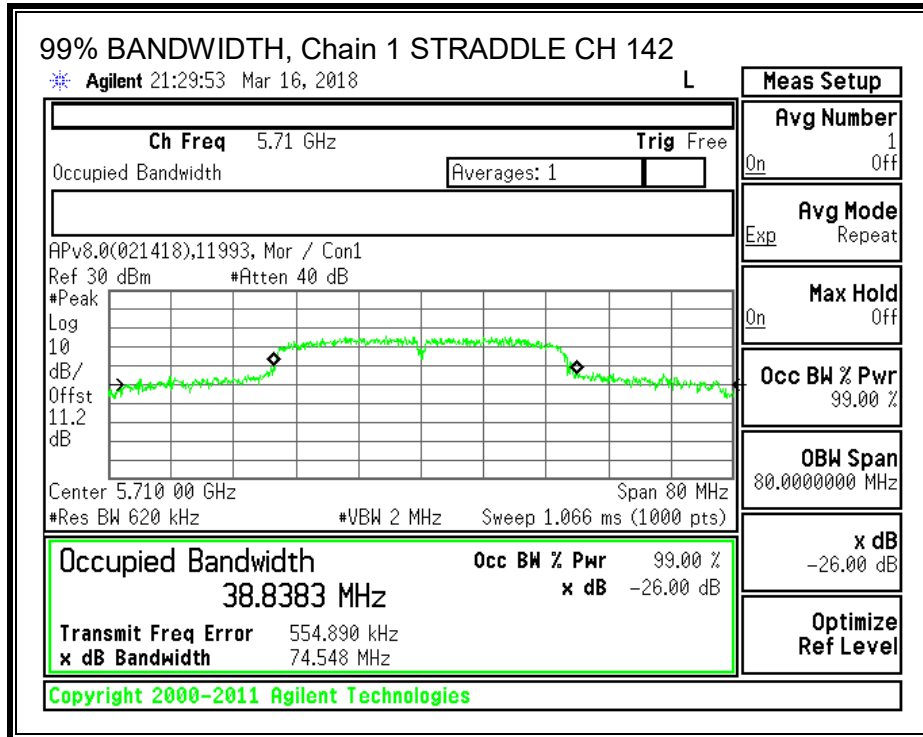




99% BANDWIDTH, Chain 1







8.12.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-08
 Project: 12053557
 Tested By: 11993/46722, 46726/46722, 456722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	43.70	2.16	5.17	24.00	11.00
Mid	5550	49.80	2.16	5.17	24.00	11.00
High	5670	67.30	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.21	13.92	16.59	24.00	-7.41
Mid	5550	14.18	13.99	17.10	24.00	-6.90
High	5670	12.05	13.01	15.57	24.00	-8.43

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-1.766	-1.761	3.77	11.00	-7.23
Mid	5550	-1.831	-2.085	3.57	11.00	-7.43
High	5670	-1.847	-1.256	3.99	11.00	-7.01

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	43.70	2.16	5.17	24.00	11.00
Mid	5550	49.80	2.16	5.17	24.00	11.00
High	5670	67.30	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.29	9.74	12.53	24.00	-11.47
Mid	5550	14.62	14.24	17.44	24.00	-6.56
High	5670	11.89	12.94	15.46	24.00	-8.54

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	35.85	24.00	11.00
Mid	5550	36.03	24.00	11.00
High	5670	36.39	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.21	13.92	16.59	24.00	-7.41
Mid	5550	14.18	13.99	17.10	24.00	-6.90
High	5670	12.05	13.01	15.57	24.00	-8.43

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-1.766	-1.761	3.77	11.00	-7.23
Mid	5550	-1.831	-2.085	3.57	11.00	-7.43
High	5670	-1.847	-1.256	3.99	11.00	-7.01

RESULTS (ISED Conducted Power and PSD) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	35.85	24.00	11.00
Mid	5550	36.03	24.00	11.00
High	5670	36.39	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.29	9.74	12.53	24.00	-11.47
Mid	5550	14.62	14.24	17.44	24.00	-6.56
High	5670	11.89	12.94	15.46	24.00	-8.54

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5510	35.85	2.16	30.00
Mid	5550	36.03	2.16	30.00
High	5670	36.39	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5510	13.21	13.92	18.75	30.00	-11.25
Mid	5550	14.18	13.99	19.26	30.00	-10.74
High	5670	12.05	13.01	17.73	30.00	-12.27

RESULTS (ISED EIRP) MCS7

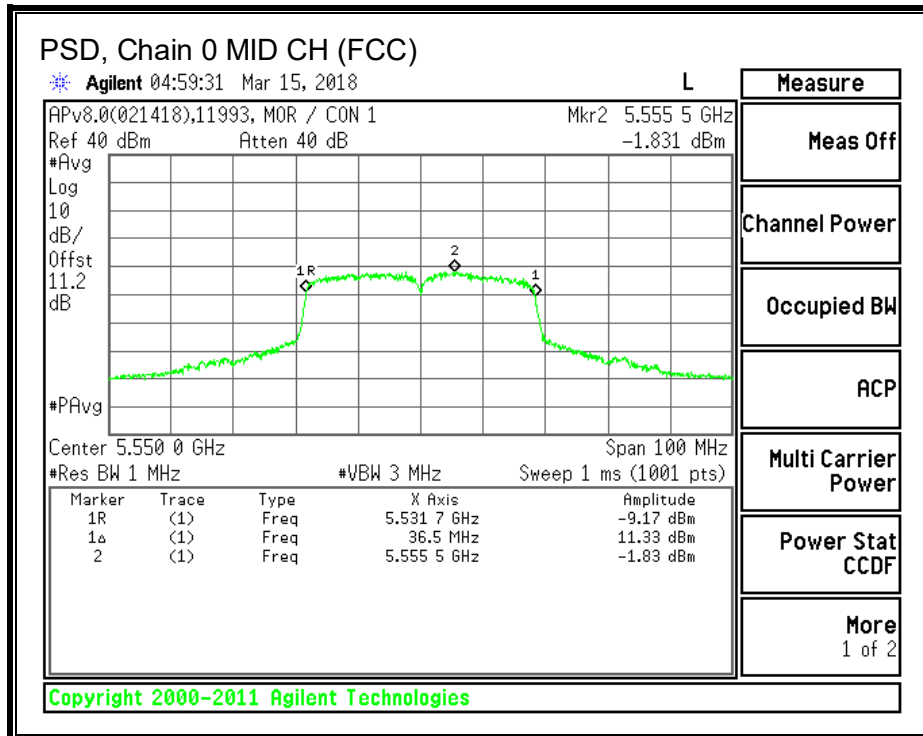
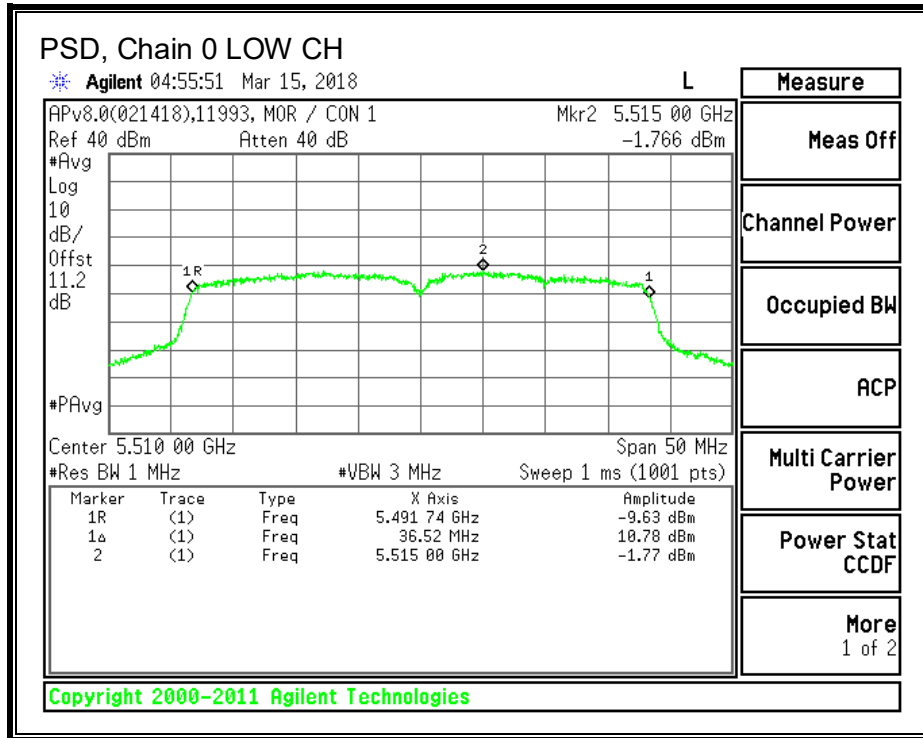
Bandwidth, Antenna Gain, and Limits

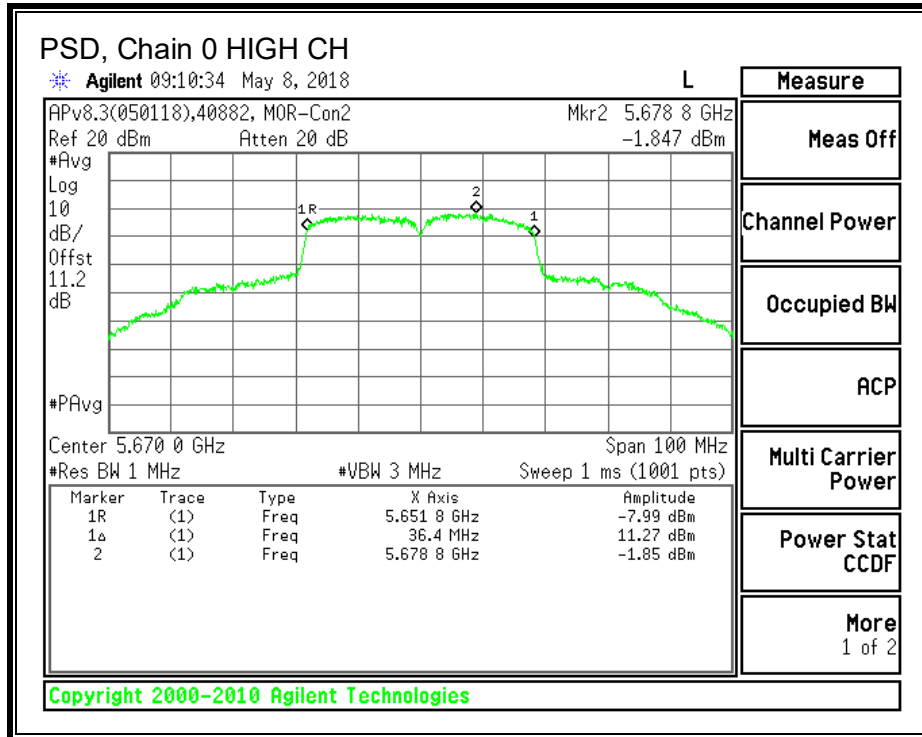
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5510	35.85	2.16	30.00
Mid	5550	36.03	2.16	30.00
High	5670	36.39	2.16	30.00

Output Power Results

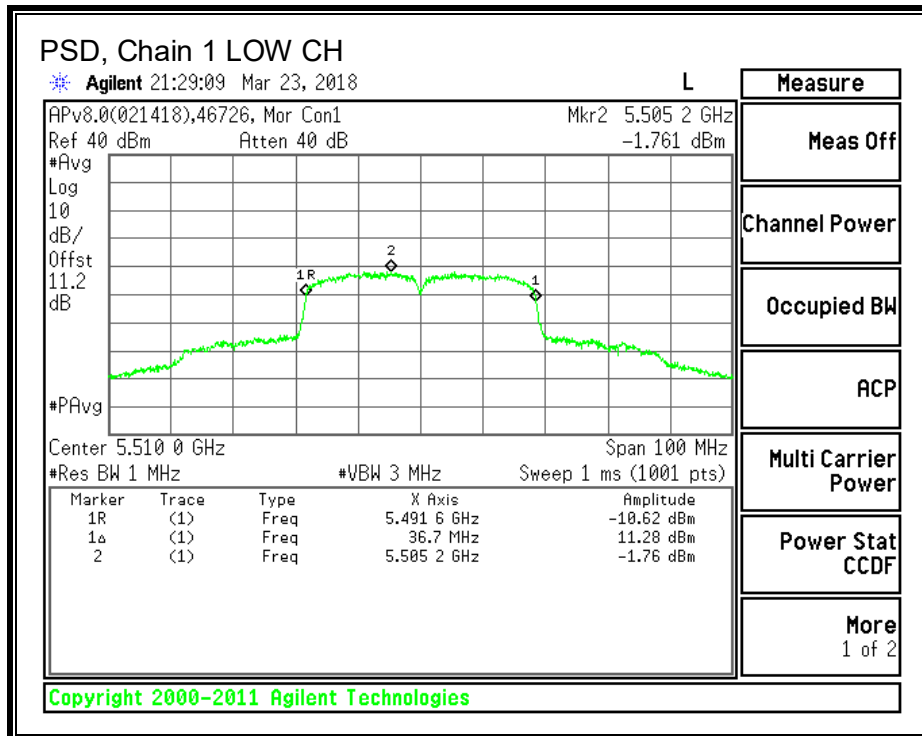
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5510	9.29	9.74	14.69	30.00	-15.31
Mid	5550	14.62	14.24	19.60	30.00	-10.40
High	5670	11.89	12.94	17.62	30.00	-12.38

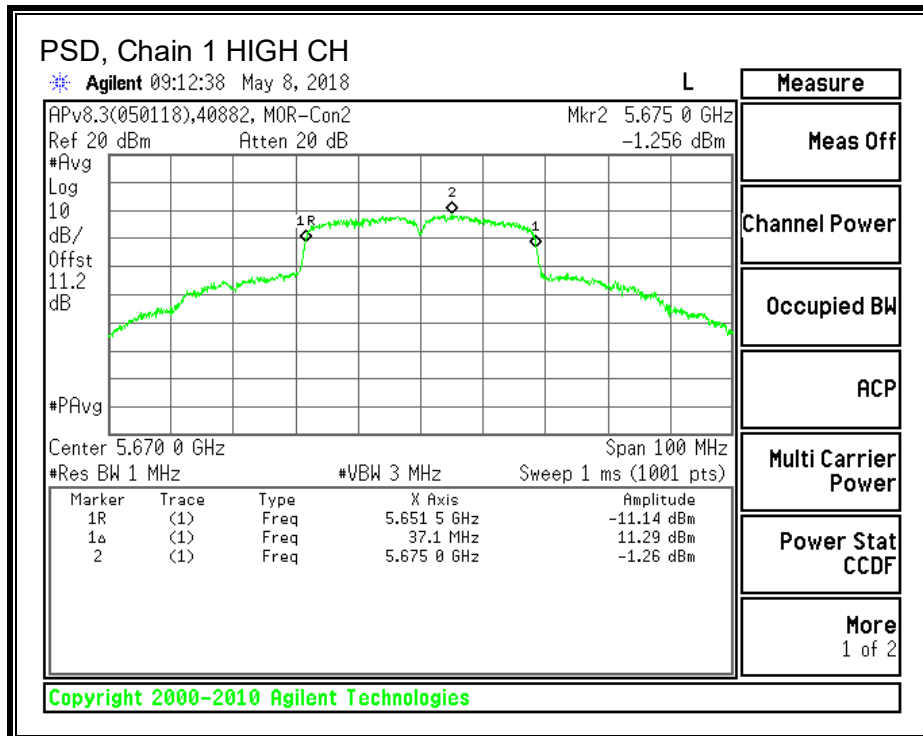
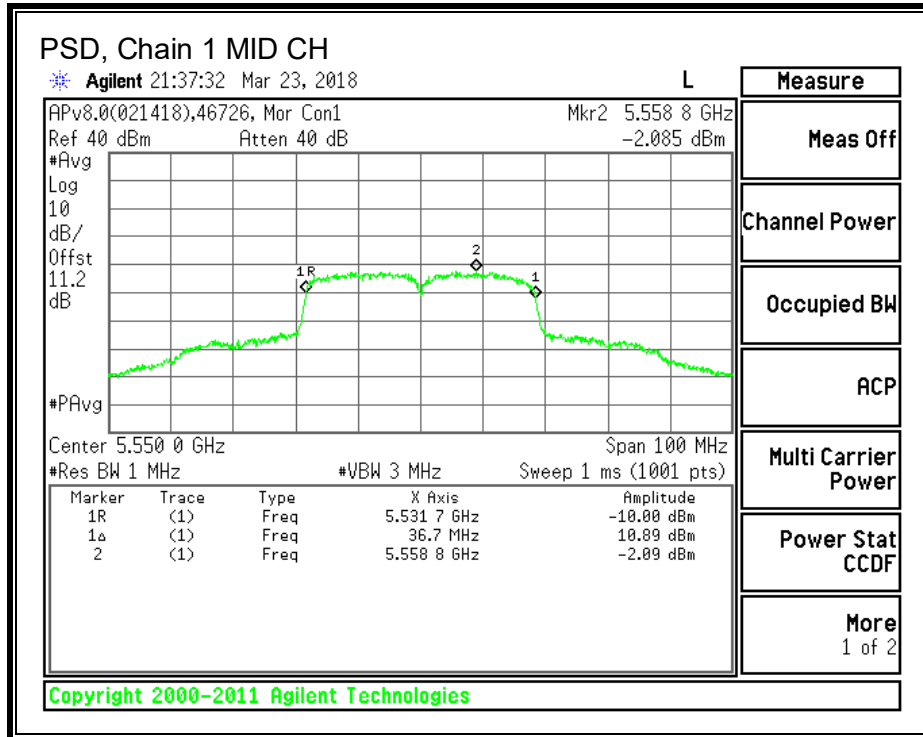
PSD, Chain 0





PSD, Chain 1





STRADDLE CHANNEL 142 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	70.40	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	24.00	-7.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-2.628	-1.693	3.39	11.00	-7.61

STRADDLE CHANNEL 142 RESULTS (FCC) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	70.40	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	24.00	-7.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 142 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	36.48	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	24.00	-7.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-2.628	-1.693	3.39	11.00	-7.61

STRADDLE CHANNEL 142 RESULTS (ISED Conducted Power) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	36.48	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	24.00	-7.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 142 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
142	5710	36.48	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
142	5710	13.23	12.85	18.21	30.00	-11.79

STRADDLE CHANNEL 142 RESULTS (ISED EIRP) MCS7

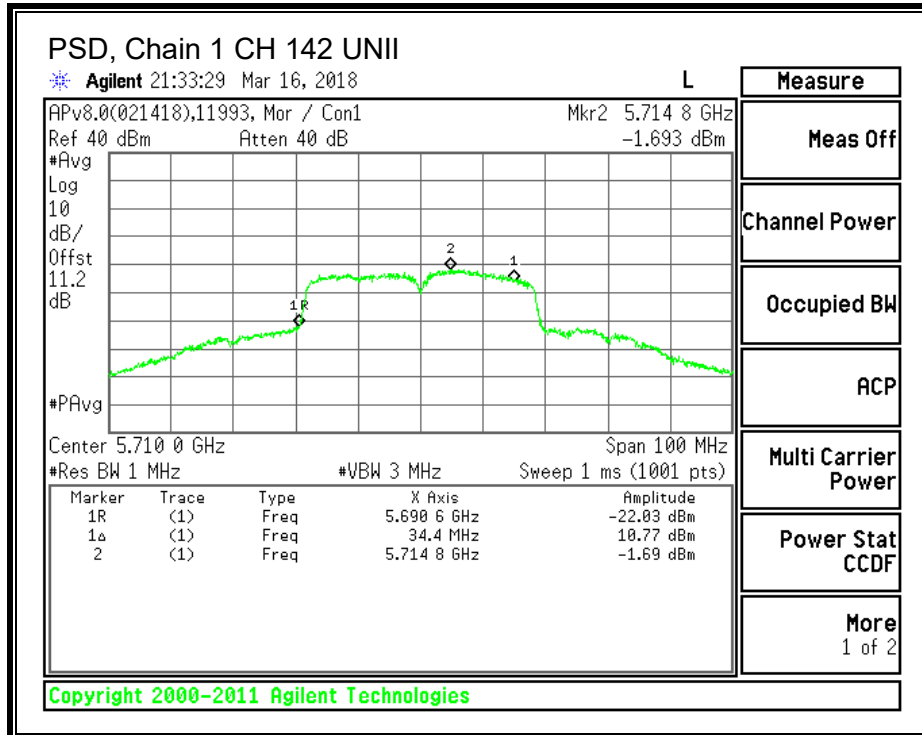
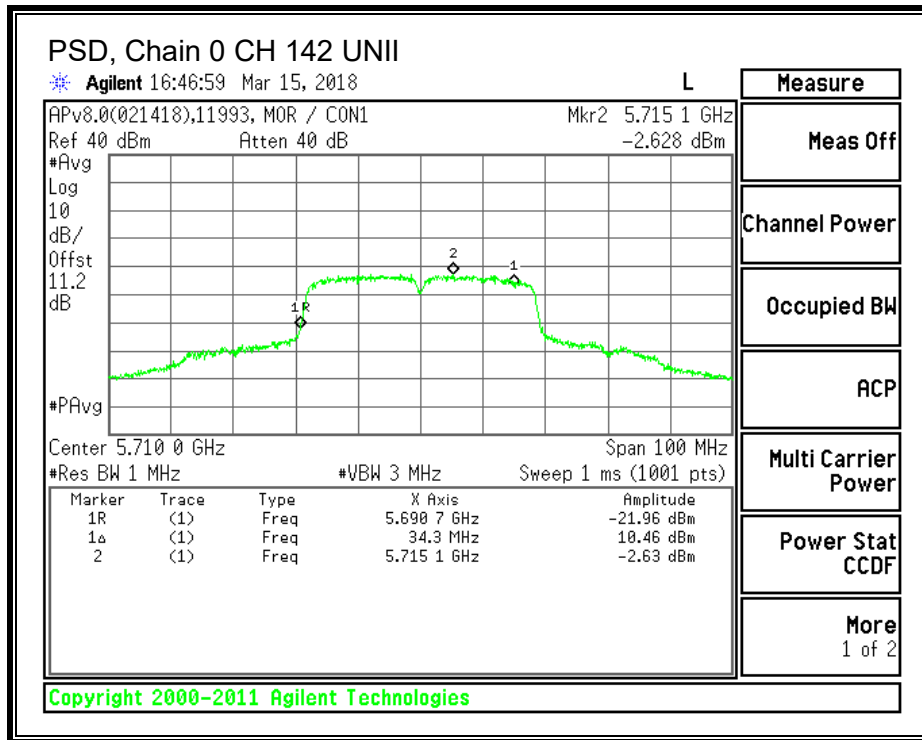
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
142	5710	36.48	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
142	5710	13.74	12.25	18.23	30.00	-11.77



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	2.16	5.17	30.00	30.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'dPSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	30.00	-13.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-7.008	-6.714	-1.33	30.00	-31.33

UNII-3 BAND (FCC and ISSED) MCS7

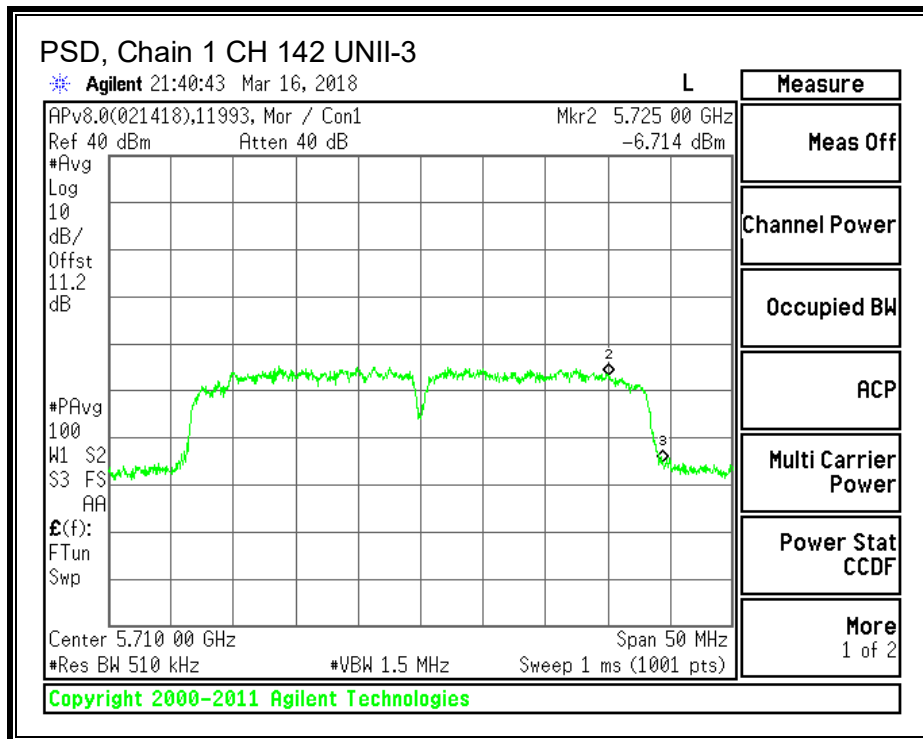
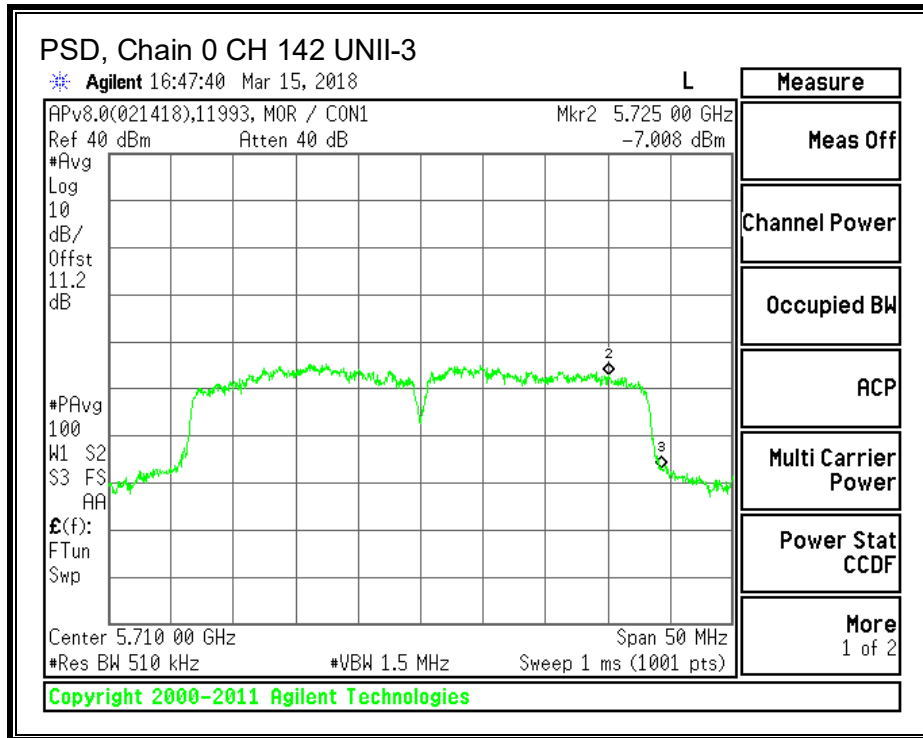
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	2.16	5.17	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	30.00	-13.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7. The MCS0 data was taken at the same or higher power setting and is therefore worst-case.



8.12.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-05-08

Project: 12053557

Tested By: 11993/46722, 46726/46722, 456722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	43.70	1.92	4.92	24.00	11.00
Mid	5550	49.80	1.92	4.92	24.00	11.00
High	5670	67.30	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	10.21	10.77	13.51	24.00	-10.49
Mid	5550	14.18	13.99	17.10	24.00	-6.90
High	5670	12.05	13.01	15.57	24.00	-8.43

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-1.766	-1.761	3.77	11.00	-7.23
Mid	5550	-1.831	-2.085	3.57	11.00	-7.43
High	5670	-1.847	-1.256	3.99	11.00	-7.01

RESULTS (FCC) MCS7

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	43.70	1.92	4.92	24.00	11.00
Mid	5550	49.80	1.92	4.92	24.00	11.00
High	5670	67.30	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.29	9.74	12.53	24.00	-11.47
Mid	5550	14.62	14.24	17.44	24.00	-6.56
High	5670	11.89	12.94	15.46	24.00	-8.54

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	35.85	24.00	11.00
Mid	5550	36.03	24.00	11.00
High	5670	36.39	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	10.21	10.77	13.51	24.00	-10.49
Mid	5550	14.18	13.99	17.10	24.00	-6.90
High	5670	12.05	13.01	15.57	24.00	-8.43

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5510	-1.766	-1.761	3.77	11.00	-7.23
Mid	5550	-1.831	-2.085	3.57	11.00	-7.43
High	5670	-1.847	-1.256	3.99	11.00	-7.01

RESULTS (ISED Conducted Power and PSD) MCS7

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5510	35.85	24.00	11.00
Mid	5550	36.03	24.00	11.00
High	5670	36.39	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	9.29	9.74	12.53	24.00	-11.47
Mid	5550	14.62	14.24	17.44	24.00	-6.56
High	5670	11.89	12.94	15.46	24.00	-8.54

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5510	35.85	1.92	30.00
Mid	5550	36.03	1.92	30.00
High	5670	36.39	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5510	10.21	10.77	15.43	30.00	-14.57
Mid	5550	14.18	13.99	19.02	30.00	-10.98
High	5670	12.05	13.01	17.49	30.00	-12.51

RESULTS (ISED EIRP) MCS7

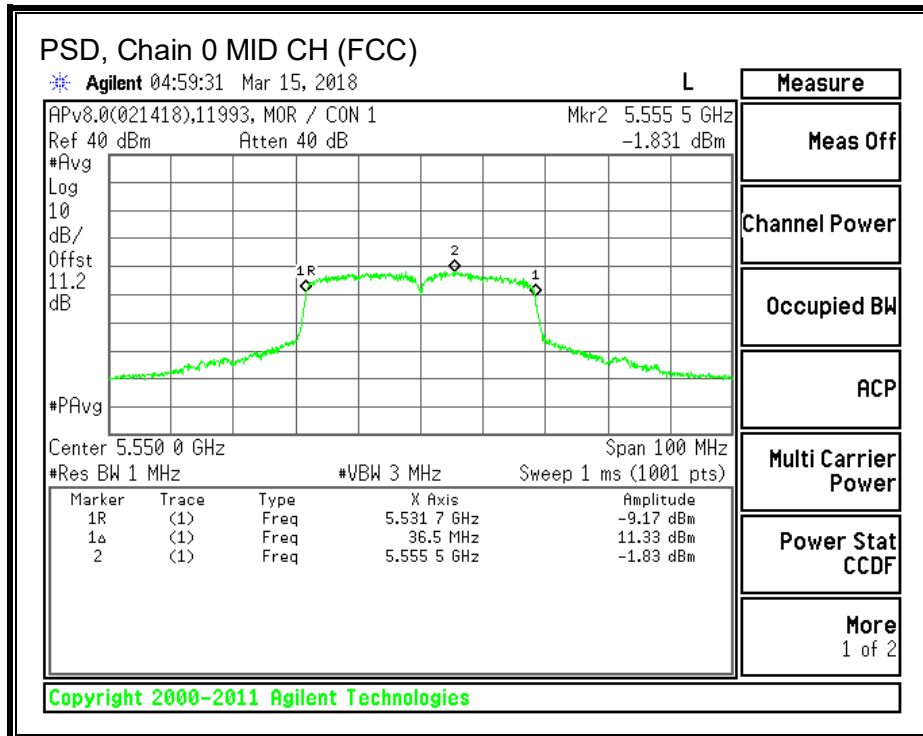
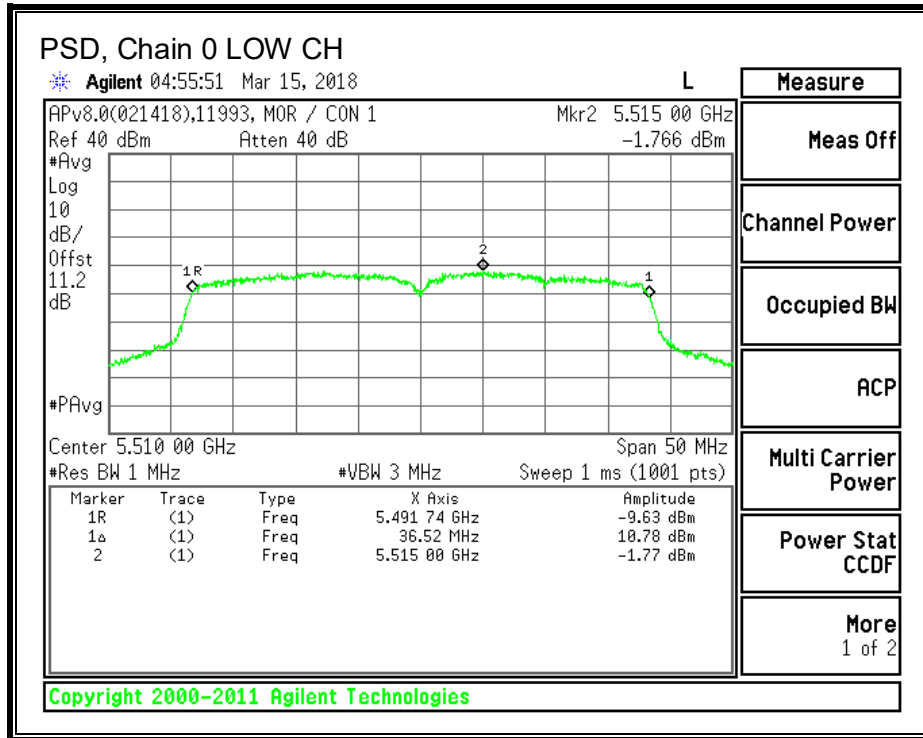
Bandwidth, Antenna Gain, and Limits

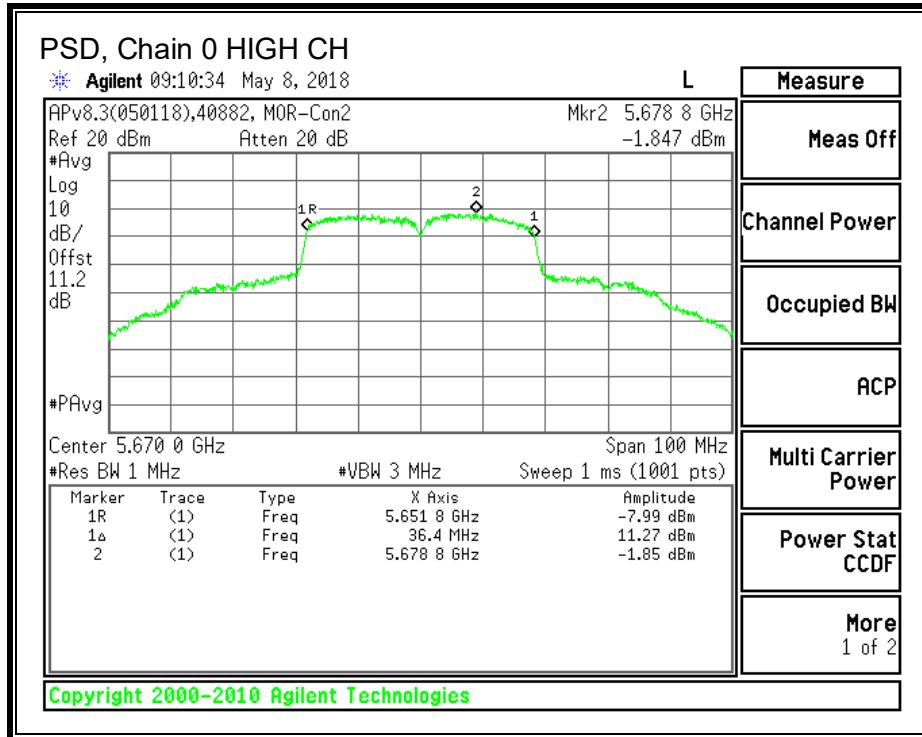
Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5510	35.85	1.92	30.00
Mid	5550	36.03	1.92	30.00
High	5670	36.39	1.92	30.00

Output Power Results

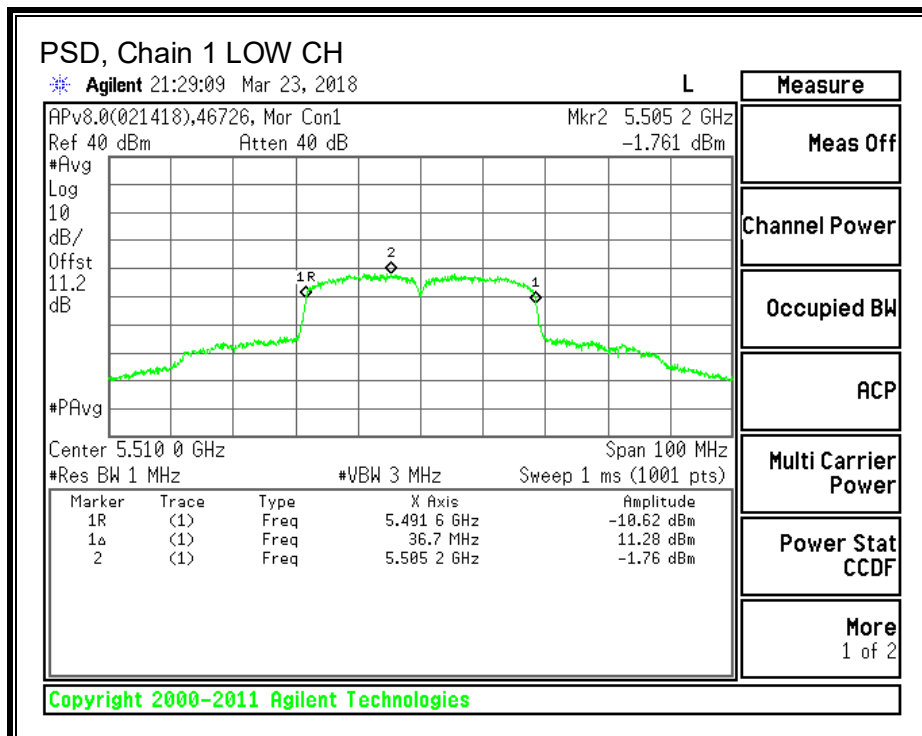
Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5510	9.29	9.74	14.45	30.00	-15.55
Mid	5550	14.23	14.60	19.35	30.00	-10.65
High	5670	11.89	12.94	17.38	30.00	-12.62

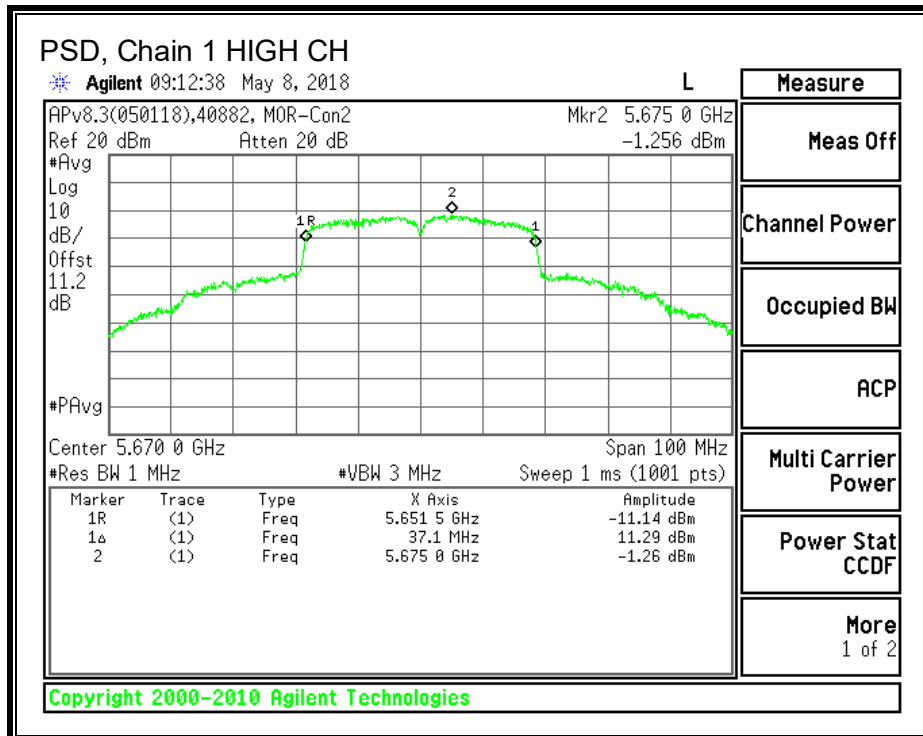
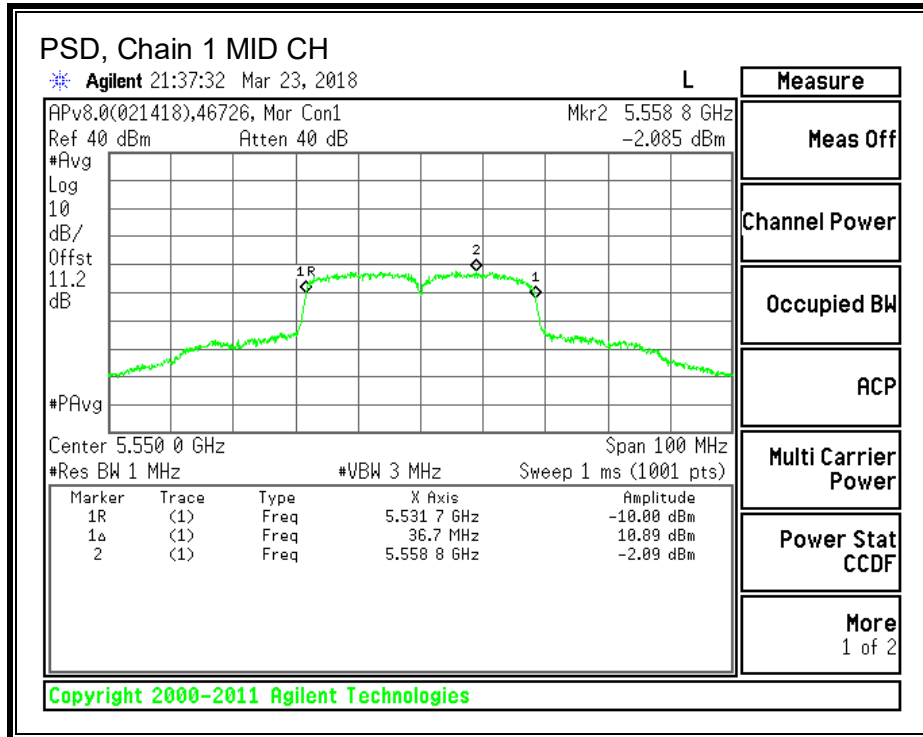
PSD, Chain 0





PSD, Chain 1





STRADDLE CHANNEL 142 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	70.40	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	24.00	-7.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-2.628	-1.693	3.39	11.00	-7.61

STRADDLE CHANNEL 142 RESULTS (FCC) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	70.40	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	24.00	-7.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 142 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	36.48	24.00	11.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	24.00	-7.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-2.63	-1.69	3.39	11.00	-7.61

STRADDLE CHANNEL 142 RESULTS (ISED Conducted Power) MCS7

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	36.48	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	24.00	-7.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.

STRADDLE CHANNEL 142 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
142	5710	36.48	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
142	5710	13.23	12.85	17.97	30.00	-12.03

STRADDLE CHANNEL 142 RESULTS (ISED EIRP) MCS7

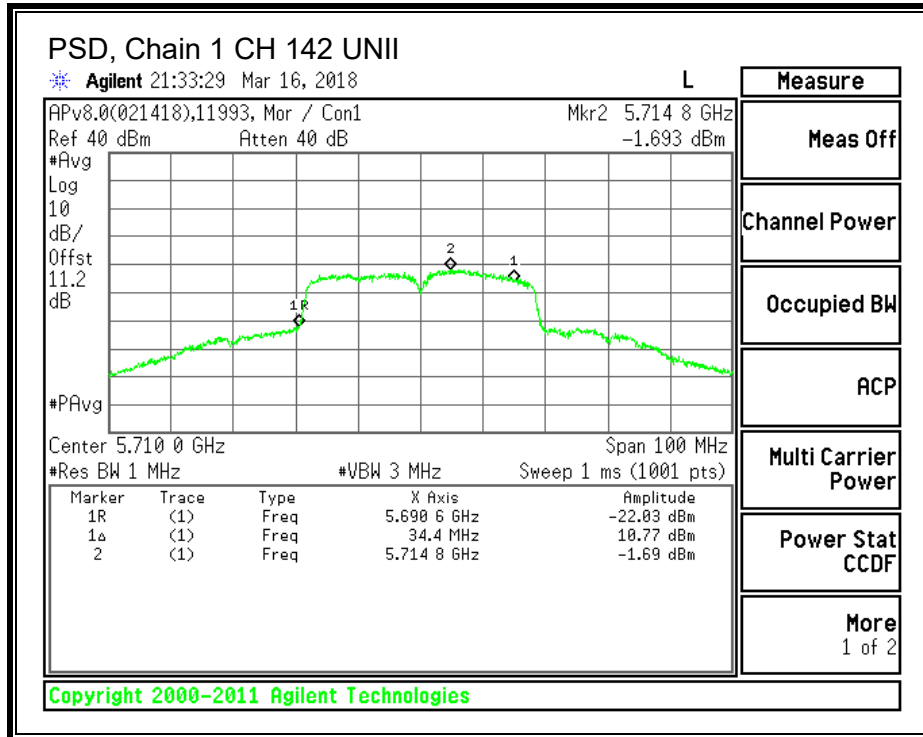
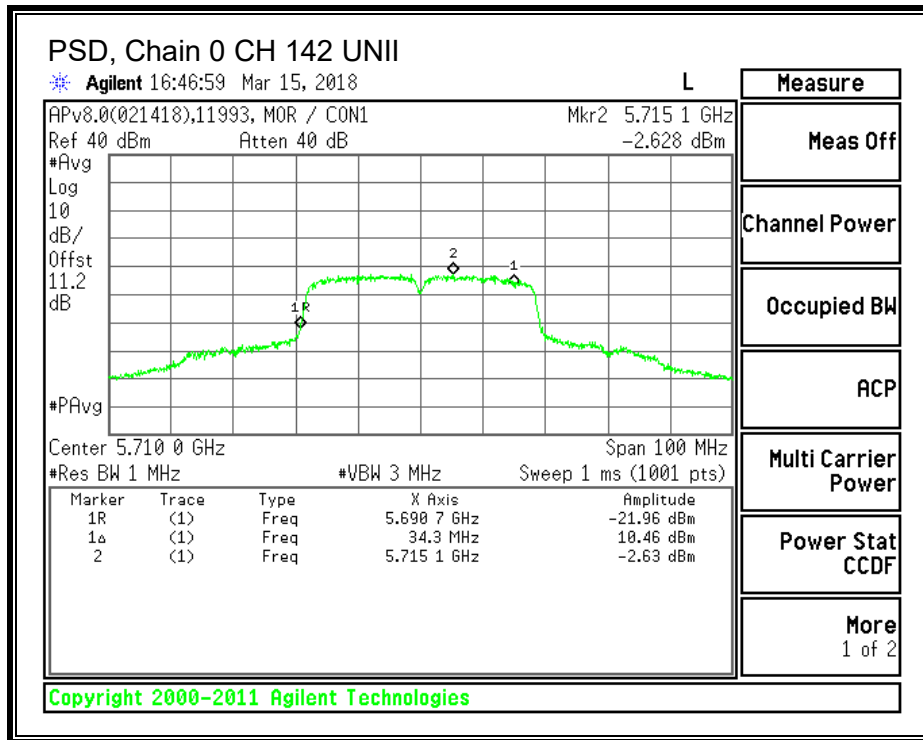
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
142	5710	36.48	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
142	5710	13.74	12.25	17.99	30.00	-12.01



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	1.92	4.92	30.00	30.00

Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'dPSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.23	12.85	16.05	30.00	-13.95

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
142	5710	-7.008	-6.714	-1.33	30.00	-31.33

UNII-3 BAND (FCC and ISSED) MCS7

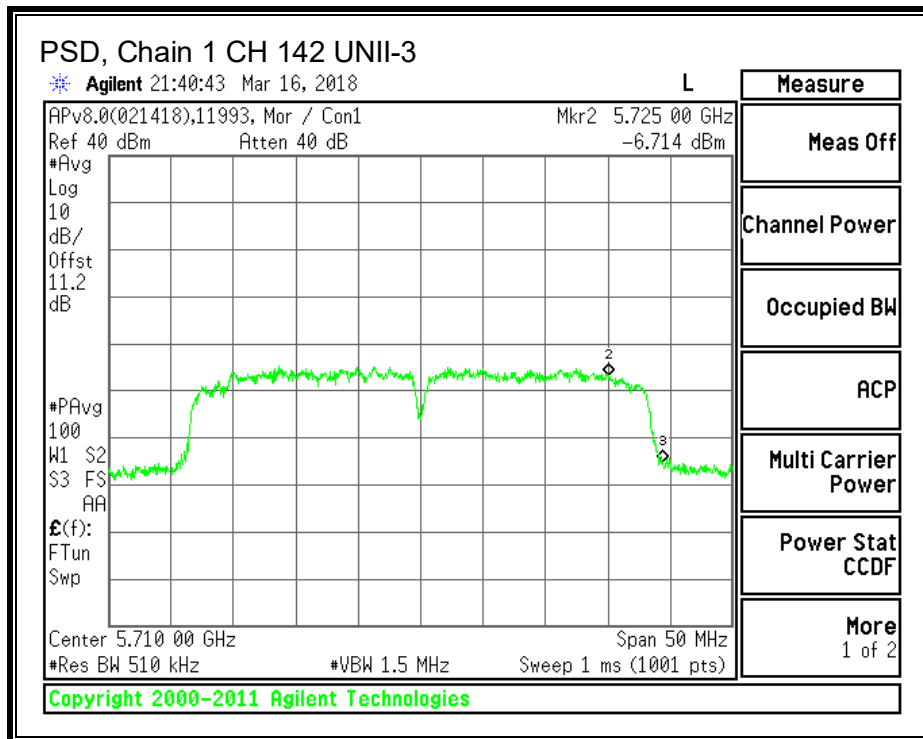
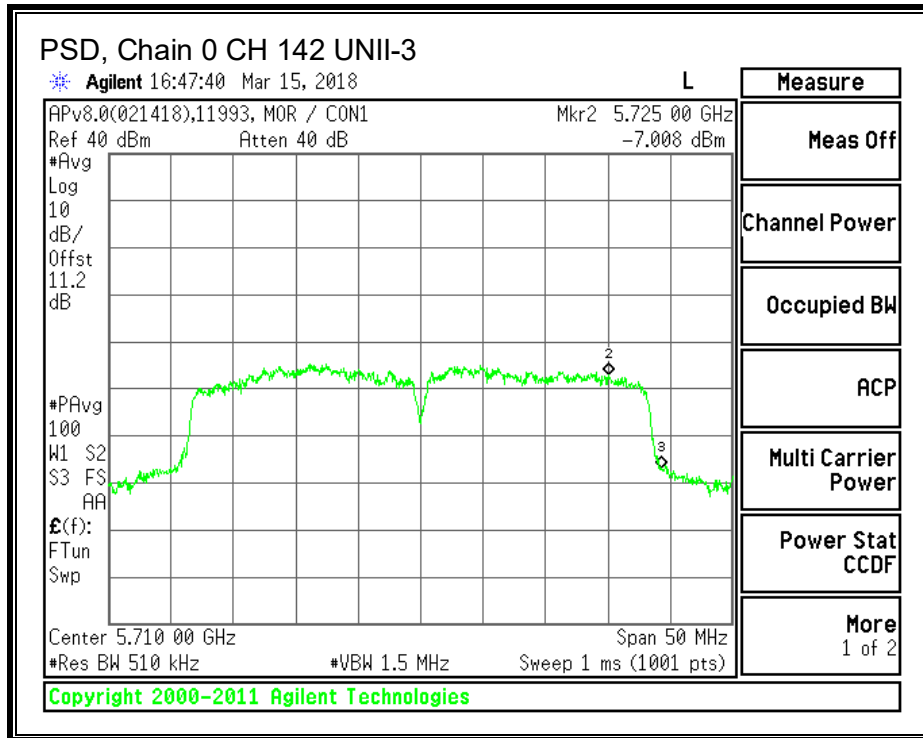
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
142	5710	1.92	4.92	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
142	5710	13.74	12.25	16.07	30.00	-13.93

Note: PSD from 802.11n HT40 MCS0 was used to represent 802.11n HT40 MCS7, the MCS0 data was taken at the same or higher power setting and is therefore worst-case.



8.13. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

8.13.1. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

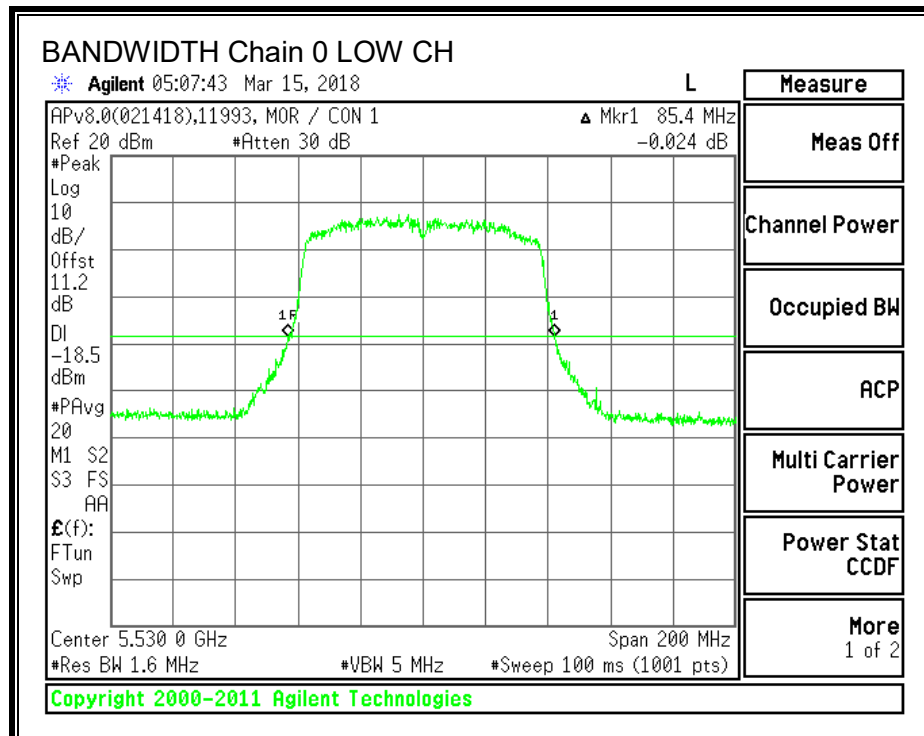
TEST INFORMATION

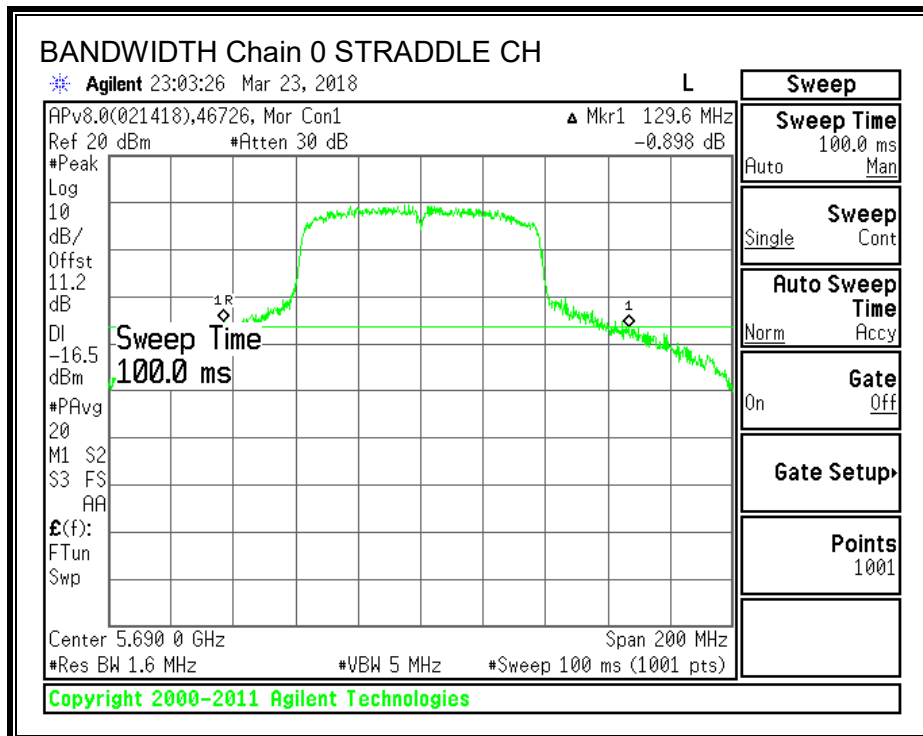
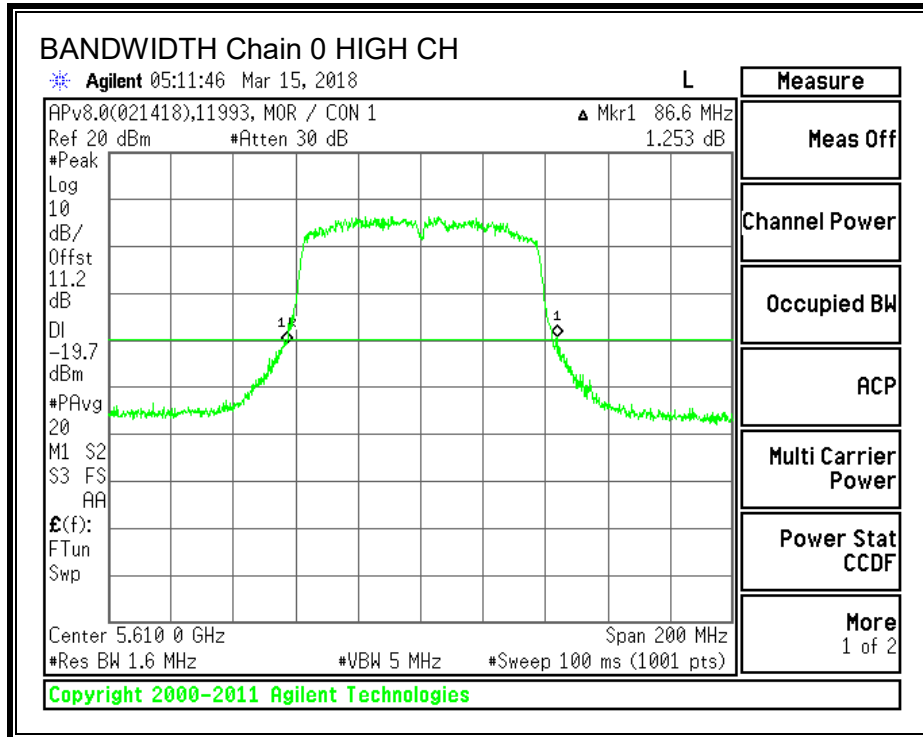
Test Date: 2018-03-15 to 2018-03-23
 Project: 12053557
 Tested By: 11993/46722, 46726/46722

RESULTS

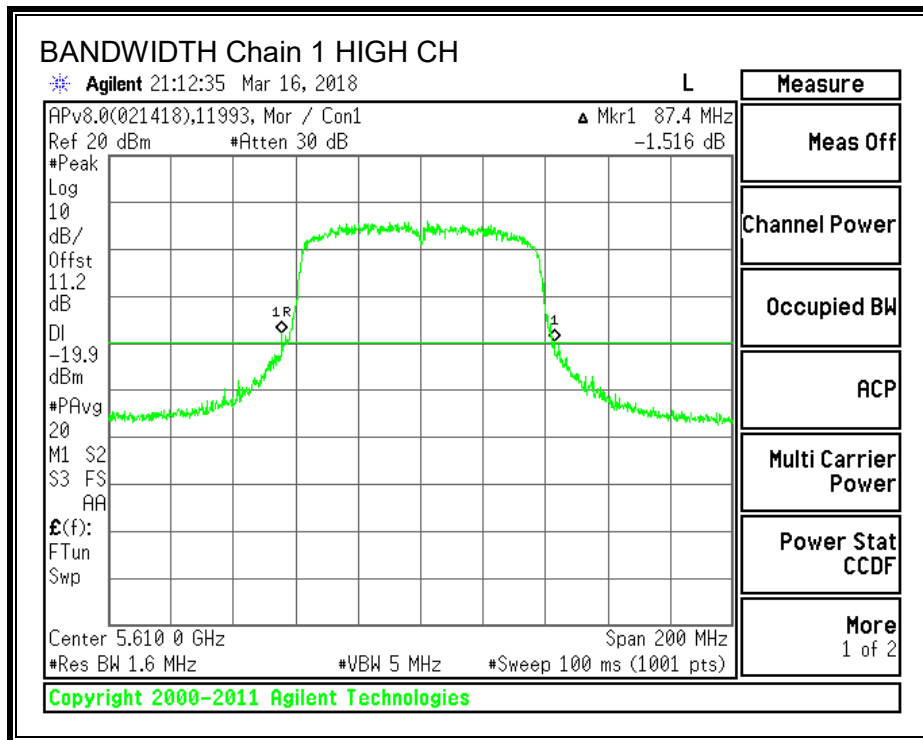
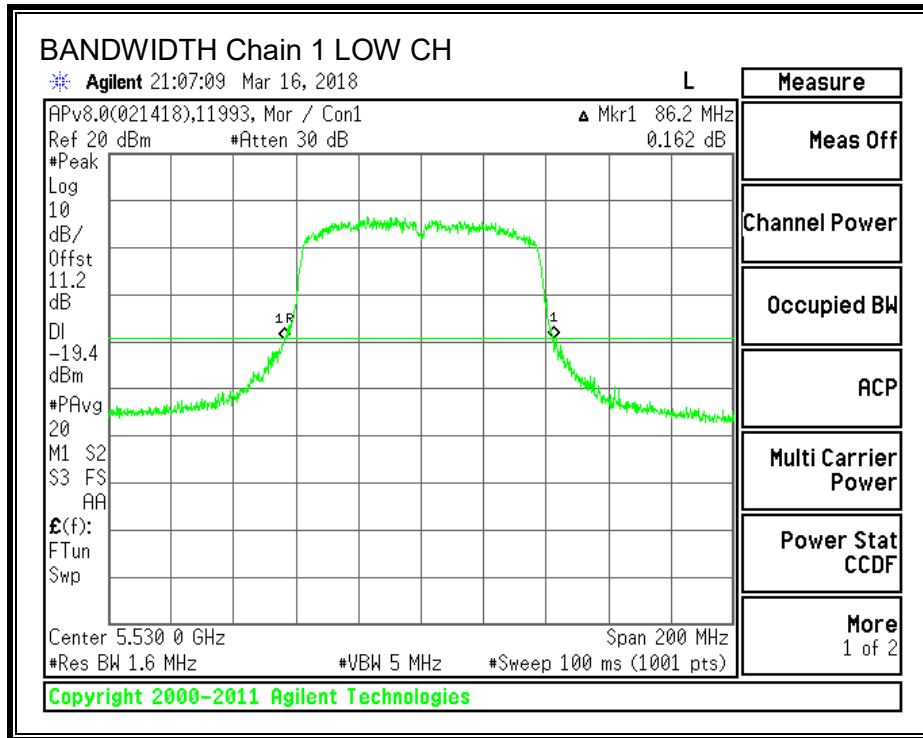
Channel	Frequency (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 1 (MHz)
Low	5530	85.40	86.20
High	5610	86.60	87.40
Straddle	5690	129.60	134.80

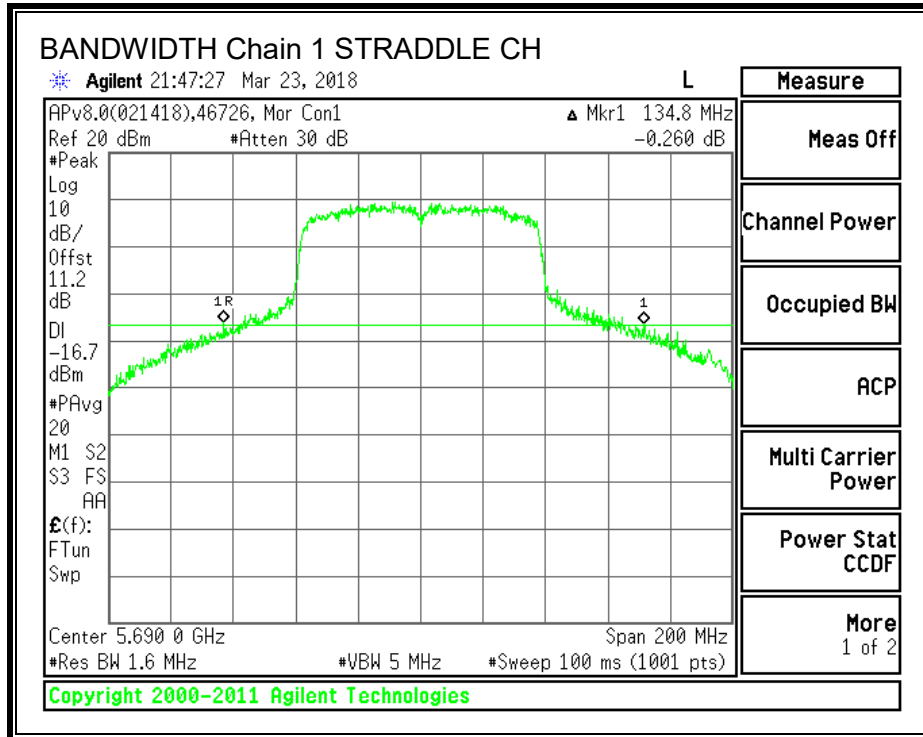
26 dB BANDWIDTH, Chain 0





26 dB BANDWIDTH, Chain 1





8.13.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

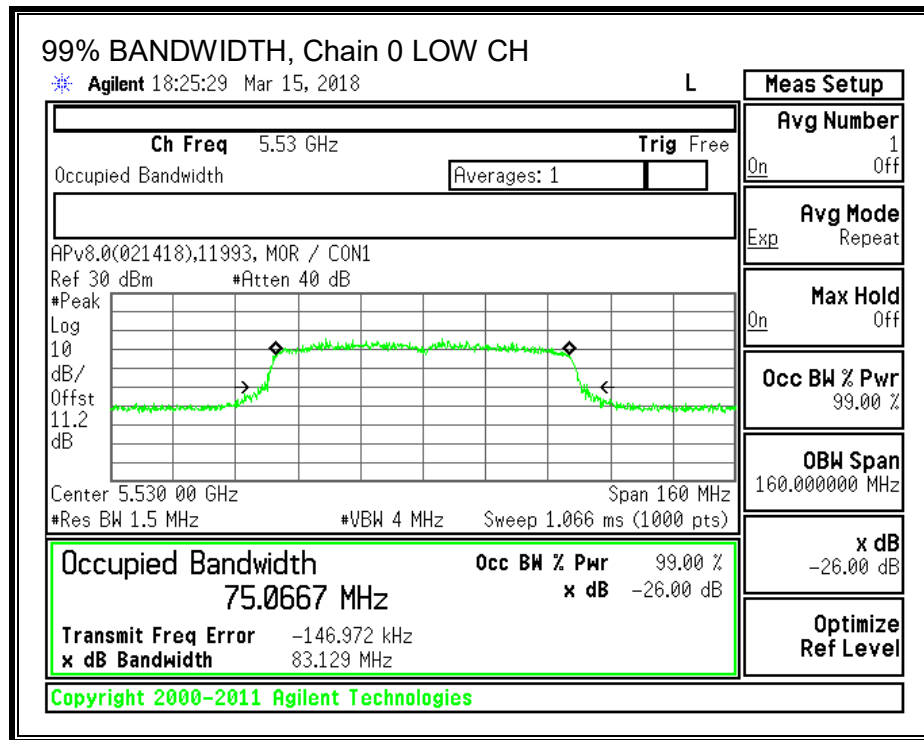
TEST INFORMATION

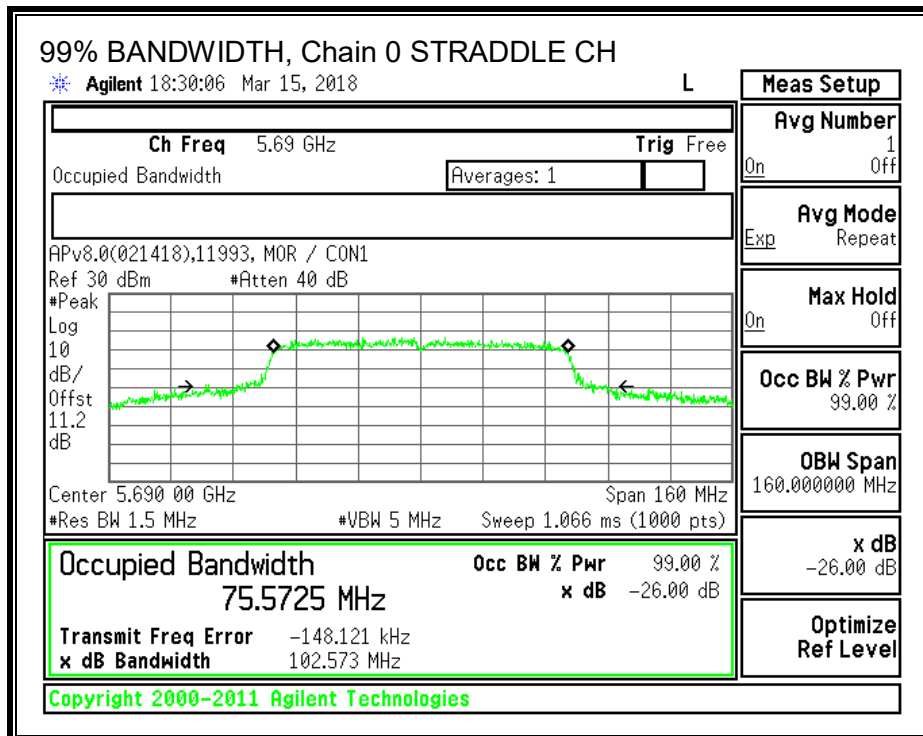
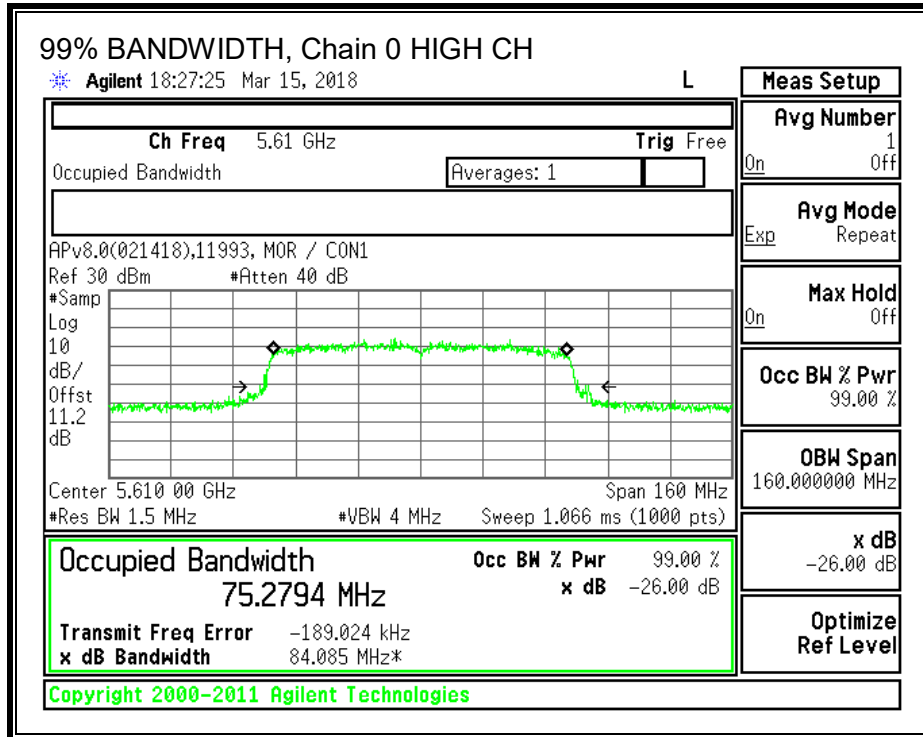
Test Date: 2018-03-15, 2018-03-16, 2018-05-07
 Project: 12053557
 Tested By: 11993/46722, 46726/46722, 40882

RESULTS

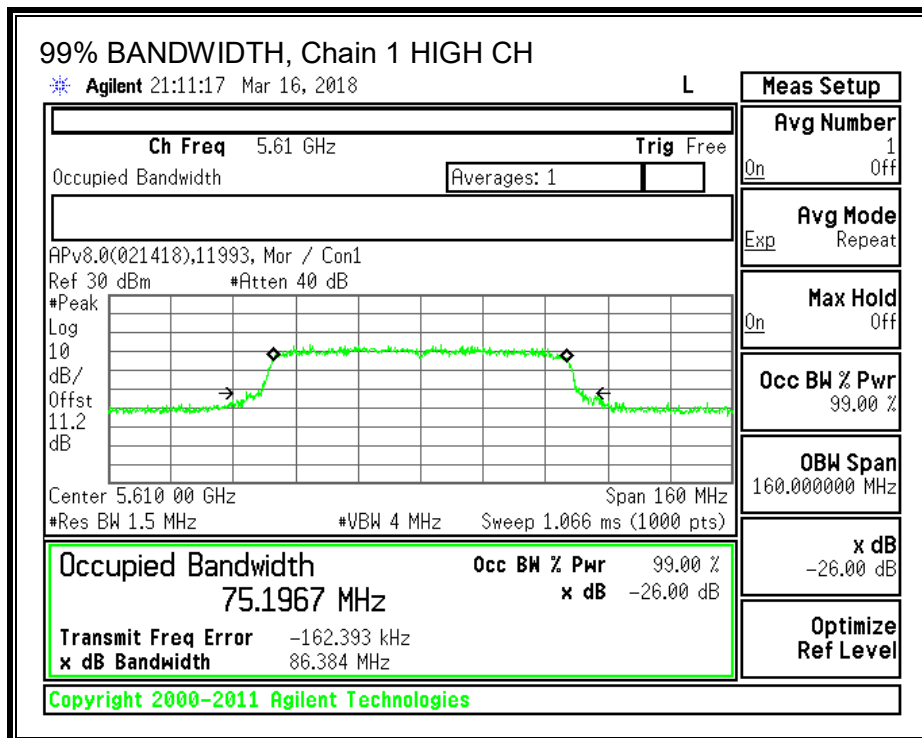
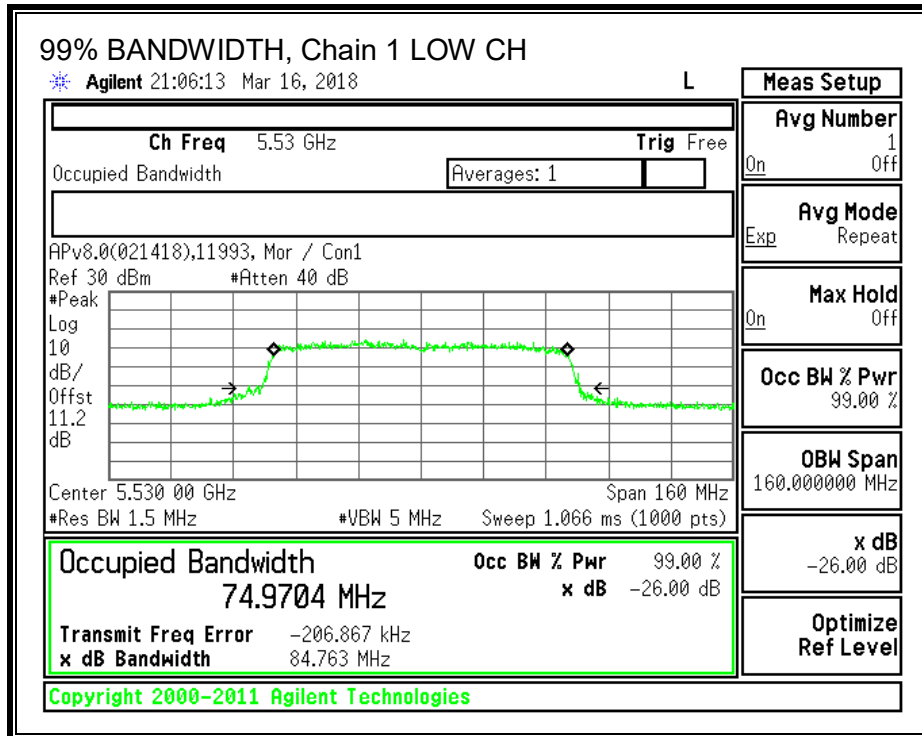
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5530	75.0667	74.9704
High	5610	75.2794	75.1967
Straddle	5690	75.5725	75.9062

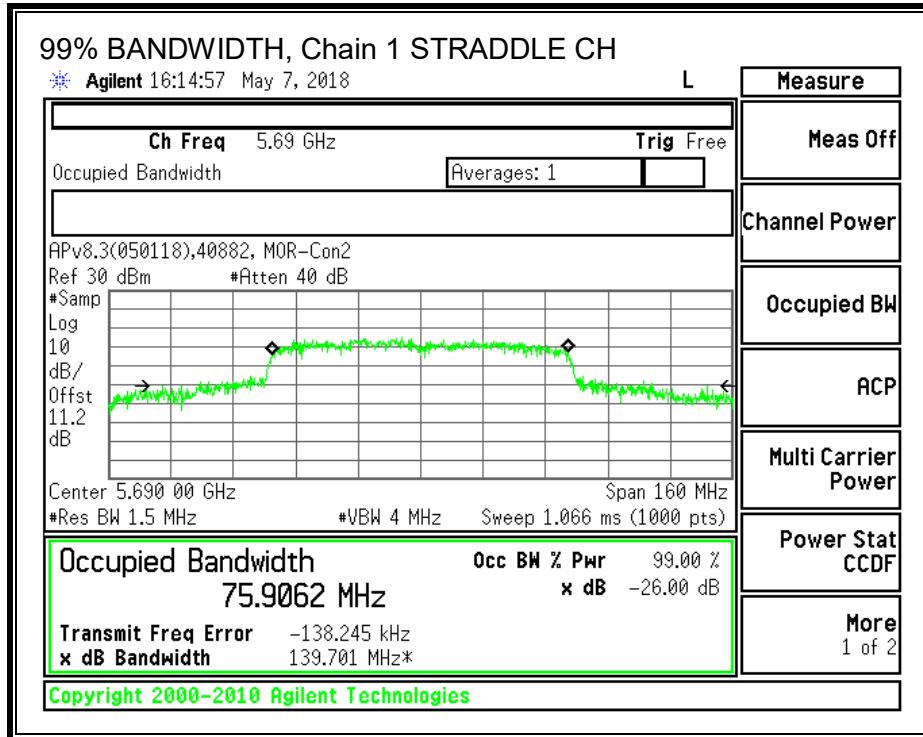
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.13.3. OUTPUT POWER AND PSD – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1–MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	85.40	2.16	5.17	24.00	11.00
Mid	5610	86.60	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	10.98	11.44	14.23	24.00	-9.77
Mid	5610	14.03	14.30	17.18	24.00	-6.82

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5530	-7.264	-8.238	-1.09	11.00	-12.09
Mid	5610	-8.080	-8.749	-1.77	11.00	-12.77

RESULTS (FCC) MCS9

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	85.40	2.16	5.17	24.00	11.00
Mid	5610	86.60	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	9.36	9.77	12.58	24.00	-11.42
Mid	5610	14.14	14.41	17.29	24.00	-6.71

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	74.97	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	10.98	11.44	14.23	24.00	-9.77

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5530	-7.264	-8.238	-1.09	11.00	-12.09

RESULTS (ISED Conducted Power and PSD) MCS9

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	74.97	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	9.36	9.77	12.58	24.00	-11.42

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5530	74.97	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5530	10.98	11.44	16.39	30.00	-13.61

RESULTS (ISED EIRP) MCS9

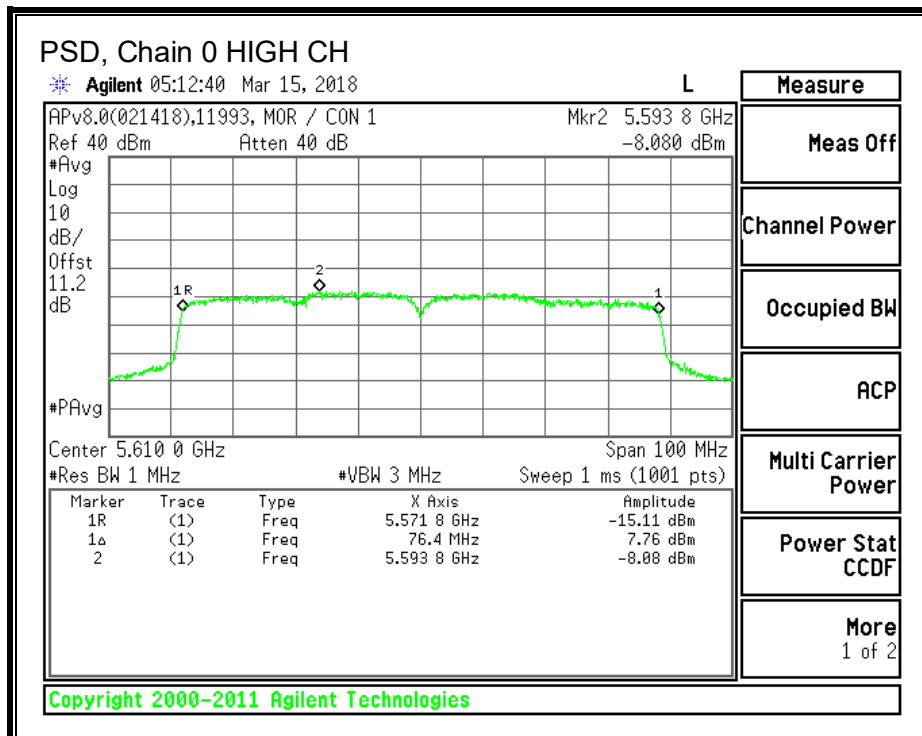
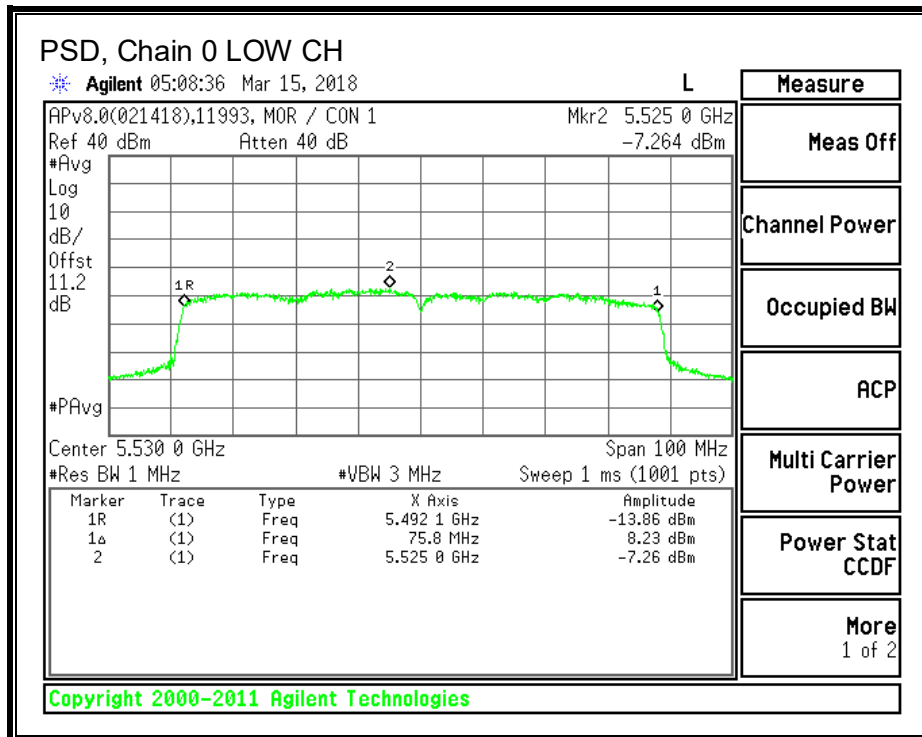
Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5530	74.97	2.16	30.00

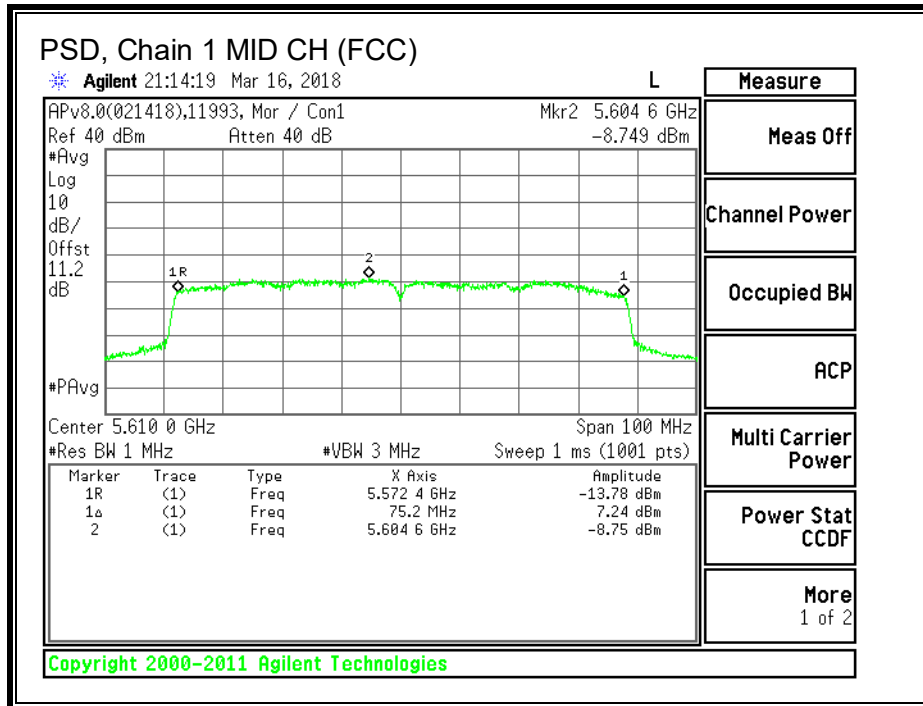
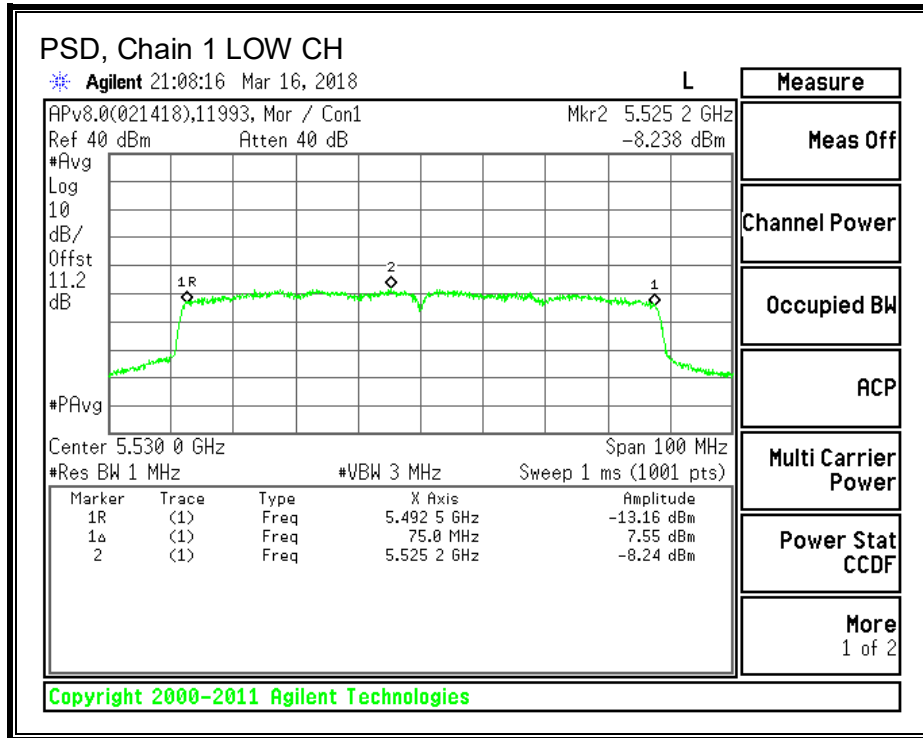
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5530	9.36	9.77	14.74	30.00	-15.26

PSD, Chain 0



PSD, Chain 1



STRADDLE CHANNEL 138 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	129.60	2.16	5.17	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	24.00	-8.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-6.292	-5.792	0.60	11.00	-10.40

STRADDLE CHANNEL 138 RESULTS (FCC) MCS9

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	129.60	2.16	5.17	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	24.00	-7.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

STRADDLE CHANNEL 138 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	75.02	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	24.00	-8.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-6.292	-5.792	0.60	11.00	-10.40

STRADDLE CHANNEL 138 RESULTS (ISED Conducted Power) MCS9

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	75.02	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	24.00	-7.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

STRADDLE CHANNEL 138 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
138	5690	75.02	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
138	5690	13.02	12.49	17.93	30.00	-12.07

STRADDLE CHANNEL 138 RESULTS (ISED EIRP) MCS9

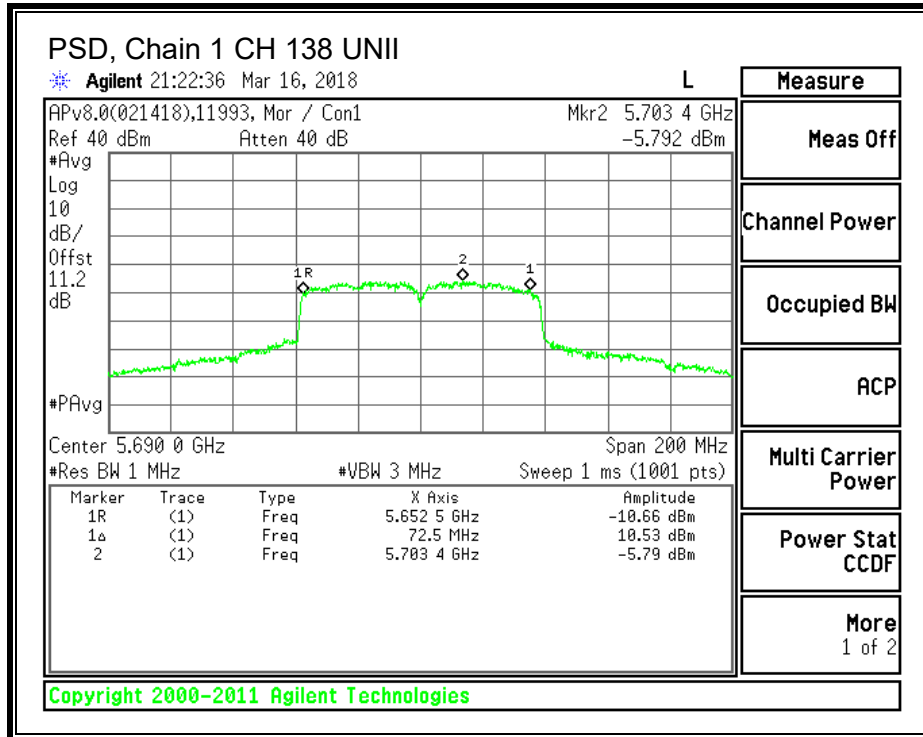
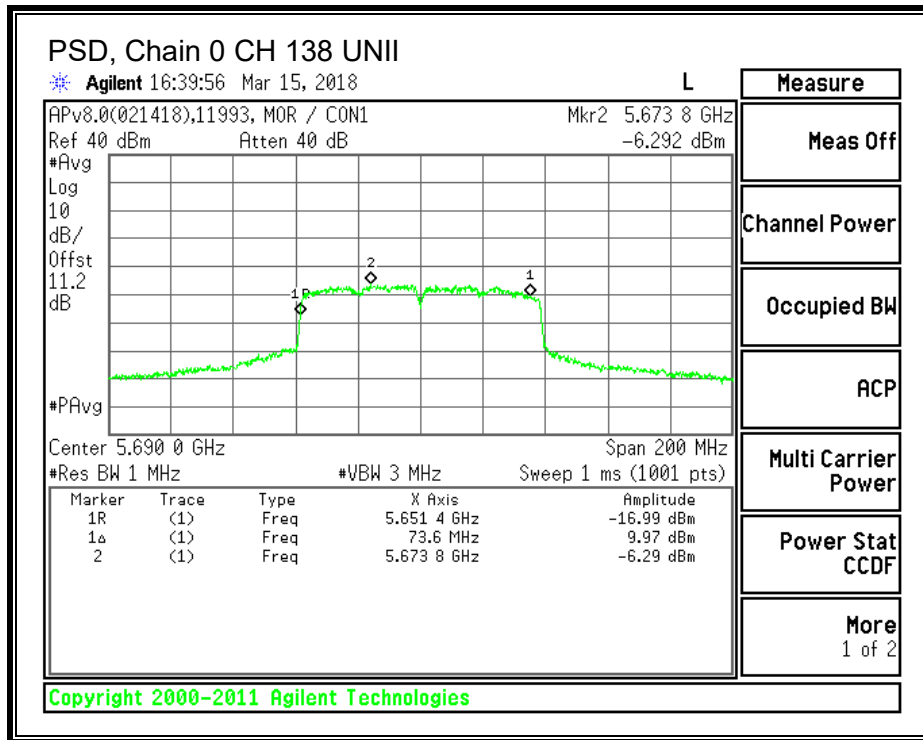
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
138	5690	75.02	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
138	5690	13.68	12.79	18.43	30.00	-11.57



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	2.16	5.17	30.00	30.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	30.00	-14.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-12.22	-12.00	-5.47	30.00	-35.47

UNII-3 BAND (FCC and ISSED) MCS9

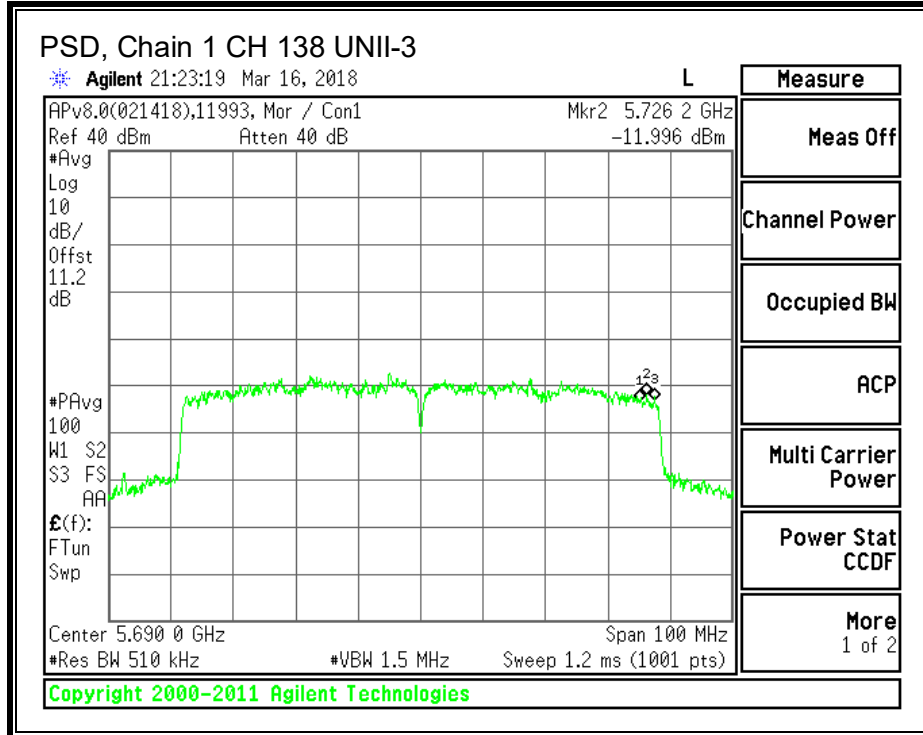
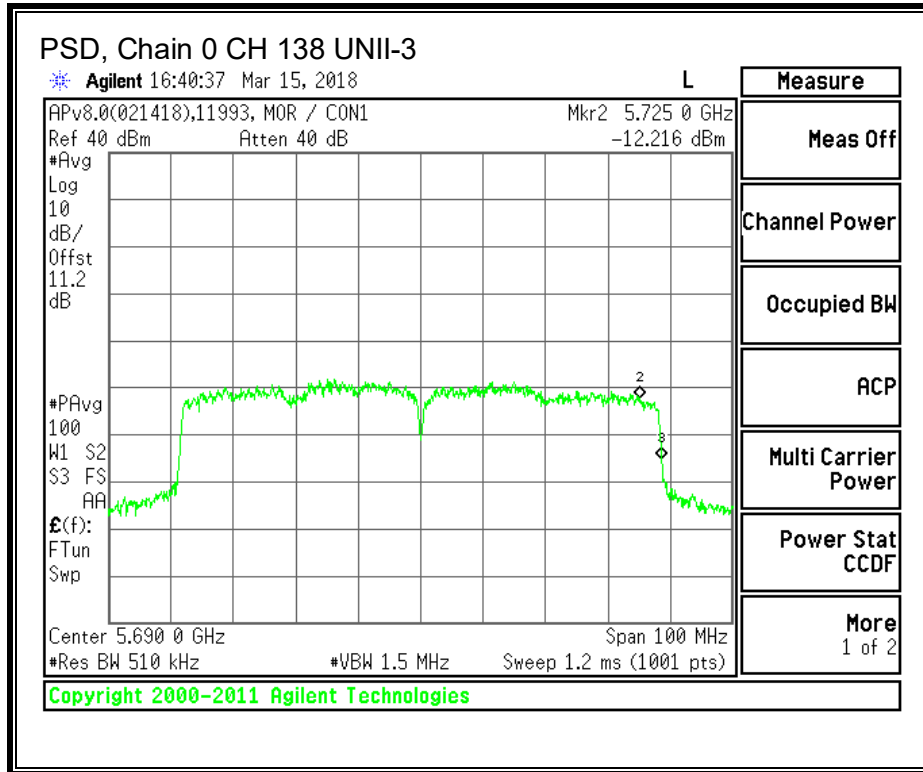
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	2.16	5.17	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	30.00	-13.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.



8.13.4. OUTPUT POWER AND PSD – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (2)

For the band 5.47–5.725 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247 ISSUE 2 SECTION 6.2.3.1

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

TEST INFORMATION

Test Date: 2018-03-15 to 2018-03-30

Project: 12053557

Tested By: 11993/46722, 46726/46722, 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS (FCC) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	85.40	1.92	4.92	24.00	11.00
Mid	5610	86.60	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	10.98	11.44	14.23	24.00	-9.77
Mid	5610	14.03	14.30	17.18	24.00	-6.82

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5530	-7.264	-8.238	-1.09	11.00	-12.09
Mid	5610	-8.080	-8.749	-1.77	11.00	-12.77

RESULTS (FCC) MCS9

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	85.40	1.92	4.92	24.00	11.00
Mid	5610	86.60	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	8.48	8.85	11.68	24.00	-12.32
Mid	5610	14.14	14.41	17.29	24.00	-6.71

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED Conducted Power and PSD) MCS0

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	74.97	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	10.98	11.44	14.23	24.00	-9.77

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5530	-7.264	-8.238	-1.09	11.00	-12.09

RESULTS (ISED Conducted Power and PSD) MCS9

Bandwidth and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
Low	5530	74.97	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	8.48	8.85	11.68	24.00	-12.32

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

RESULTS (ISED EIRP) MCS0

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5530	74.97	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5530	10.98	11.44	16.15	30.00	-13.85

RESULTS (ISED EIRP) MCS9

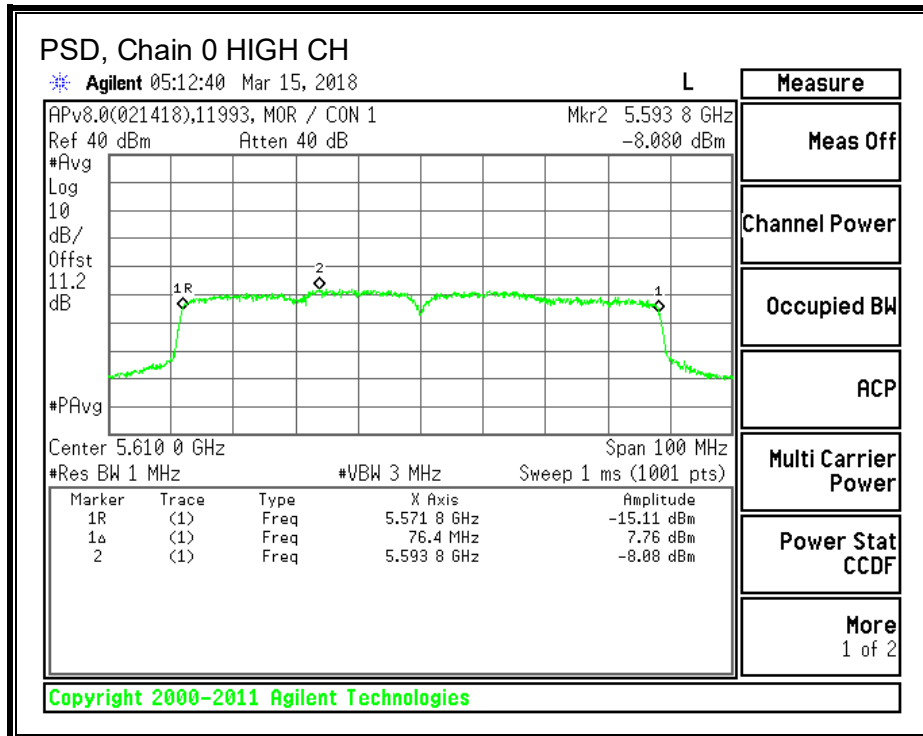
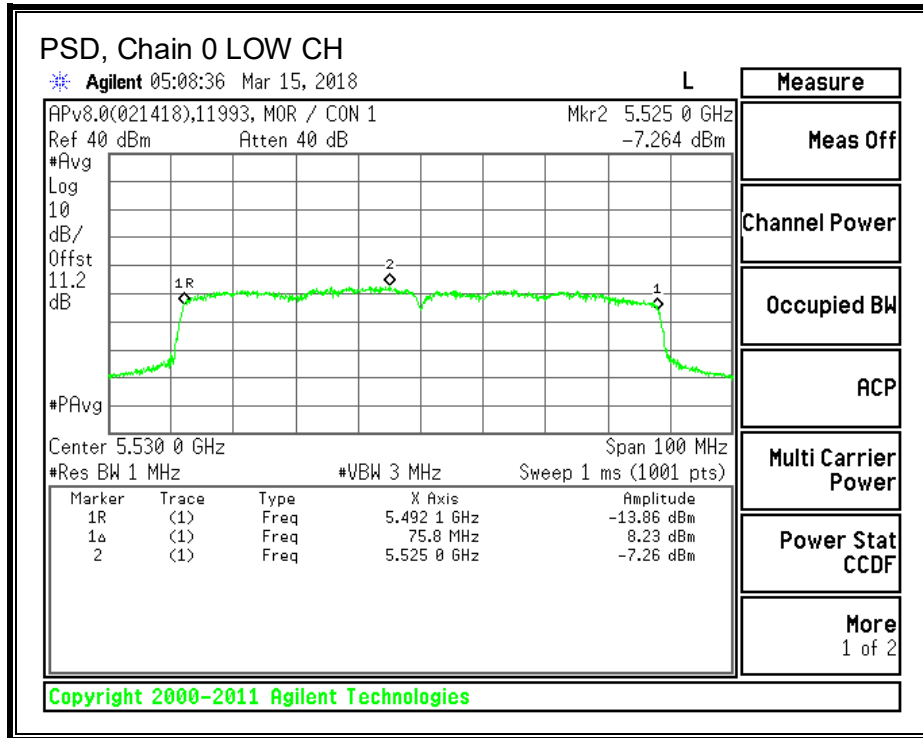
Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
Low	5530	74.97	1.92	30.00

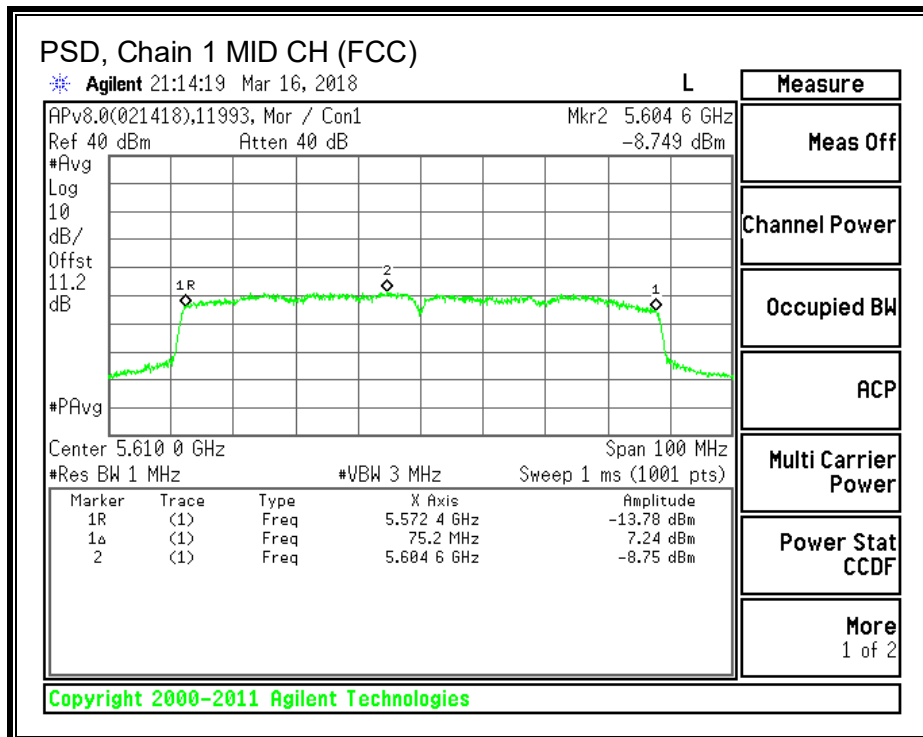
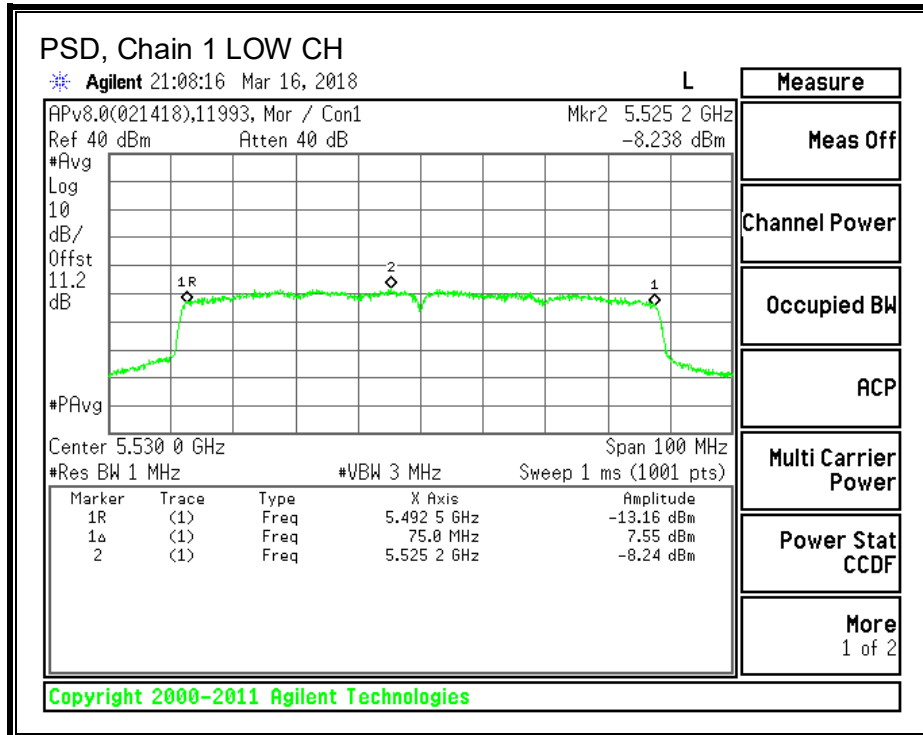
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
Low	5530	8.48	8.85	13.60	30.00	-16.40

PSD, Chain 0



PSD, Chain 1



STRADDLE CHANNEL 138 RESULTS (FCC) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	129.60	1.92	4.92	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	24.00	-8.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-6.292	-5.792	0.60	11.00	-10.40

STRADDLE CHANNEL 138 RESULTS (FCC) MCS9

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	129.60	1.92	4.92	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	24.00	-7.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

STRADDLE CHANNEL 138 RESULTS (ISED Conducted Power and PSD) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	75.02	24.00	11.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	24.00	-8.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-6.292	-5.792	0.60	11.00	-10.40

STRADDLE CHANNEL 138 RESULTS (ISED Conducted Power) MCS9

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	75.02	24.00	11.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	24.00	-7.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

STRADDLE CHANNEL 138 RESULTS (ISED EIRP) MCS0

UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
138	5690	75.02	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
138	5690	13.02	12.49	17.69	30.00	-12.31

STRADDLE CHANNEL 138 RESULTS (ISED EIRP) MCS7

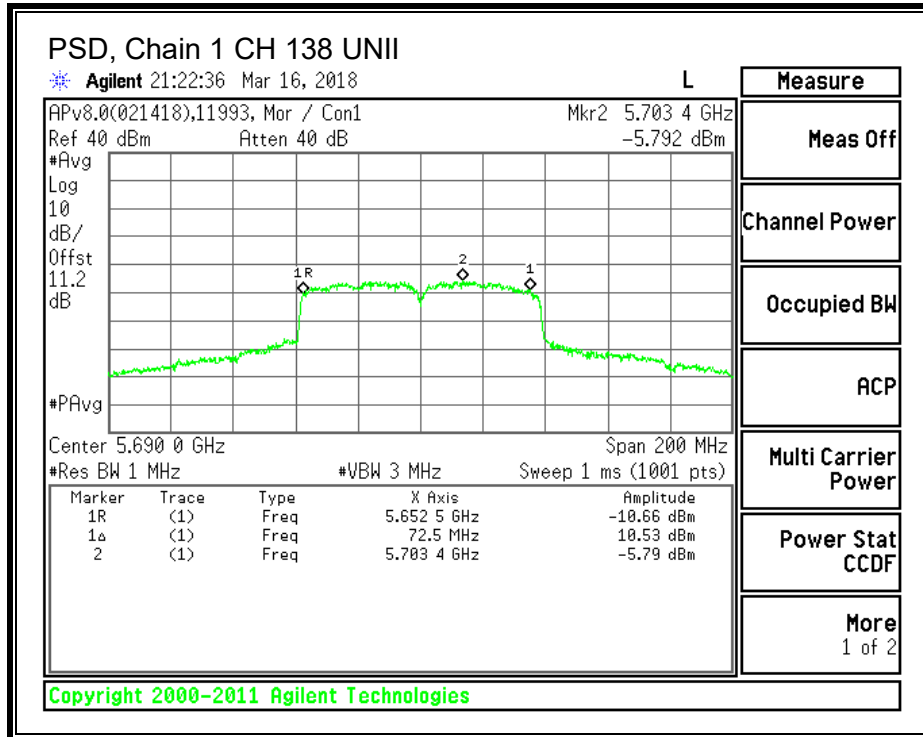
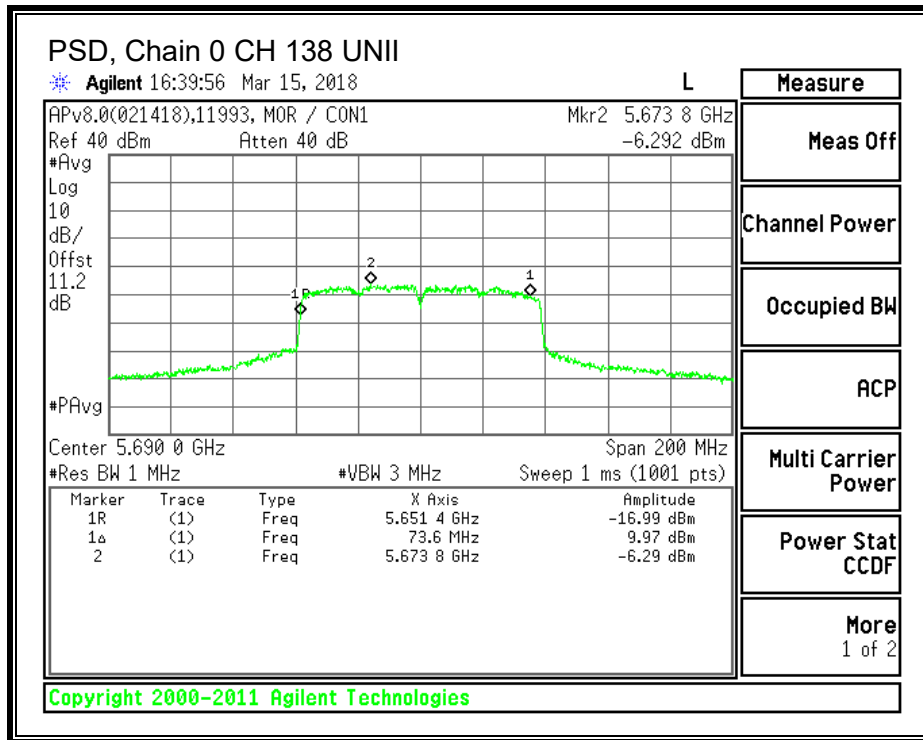
UNII-2C BAND

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Ant. Gain (dBi)	EIRP Limit (dBm)
138	5690	75.02	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
138	5690	13.68	12.79	18.19	30.00	-11.81



UNII-3 BAND (FCC and ISSED) MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	1.92	4.92	30.00	30.00

Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.02	12.49	15.77	30.00	-14.23

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
138	5690	-12.22	-12.00	-5.47	30.00	-35.47

UNII-3 BAND (FCC and ISSED) MCS9

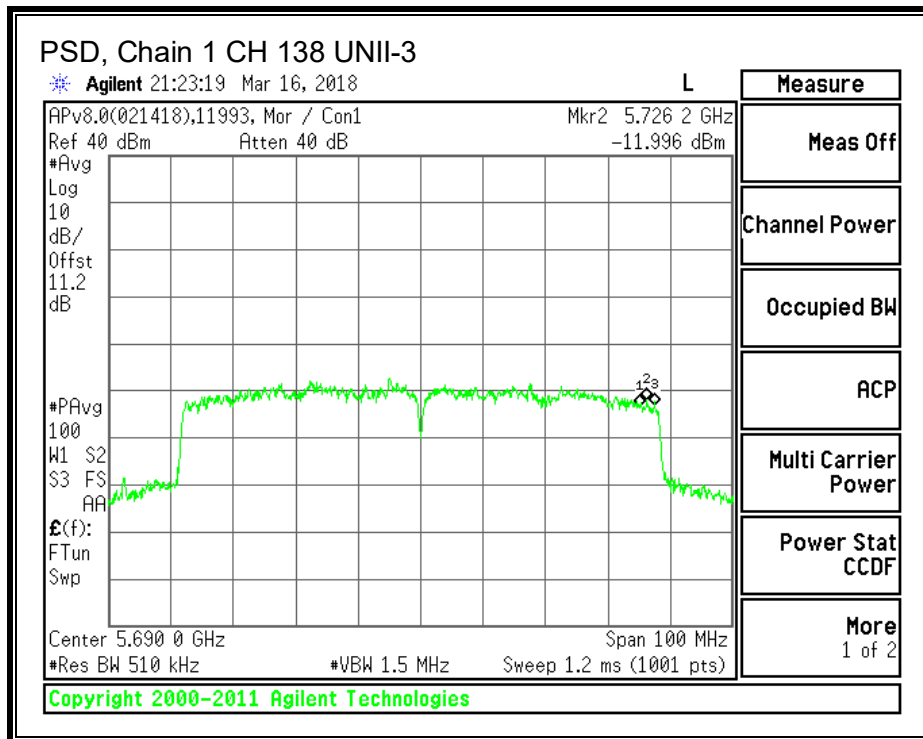
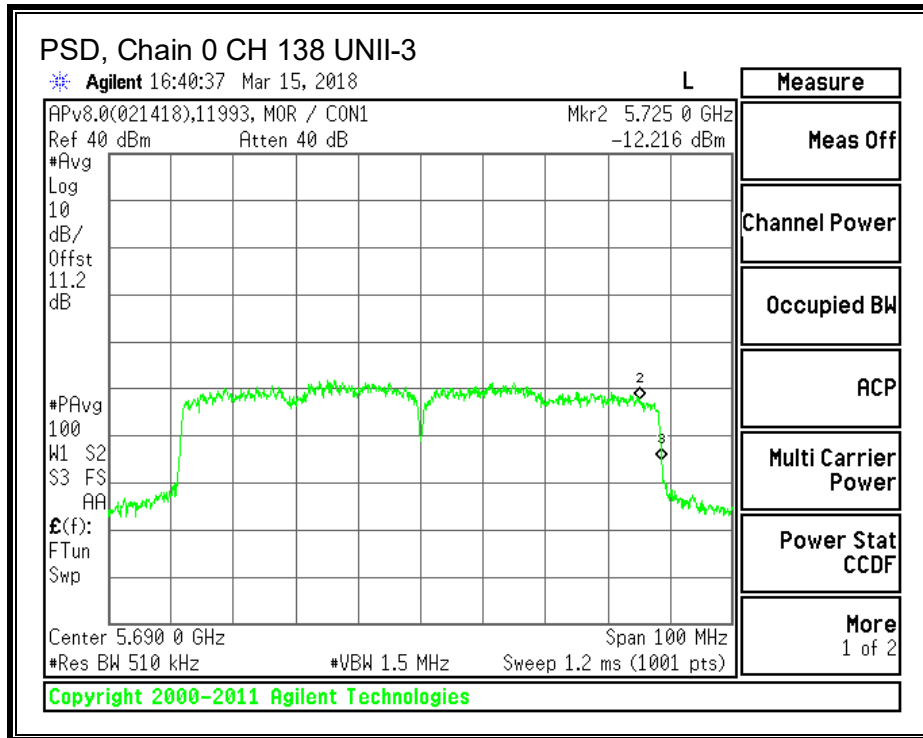
Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm)
138	5690	1.92	4.92	30.00	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
138	5690	13.68	12.79	16.27	30.00	-13.73

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.



8.14. 802.11a MODE IN THE 5.8 GHz BAND

8.14.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 Issue 2 Section 6.2.4.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST INFORMATION

Test Date: 2018-03-23

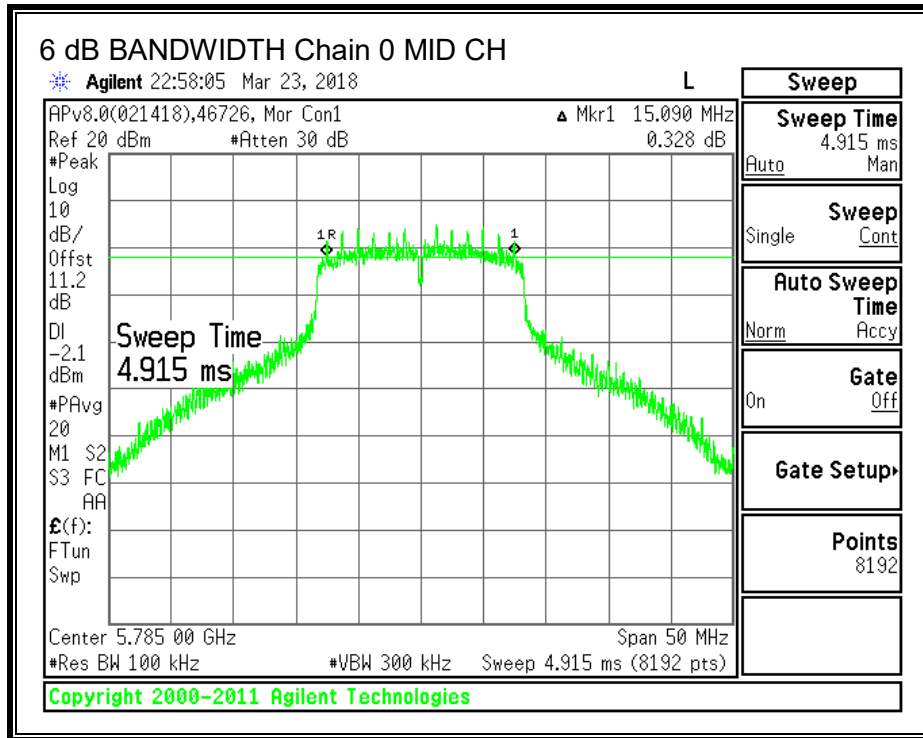
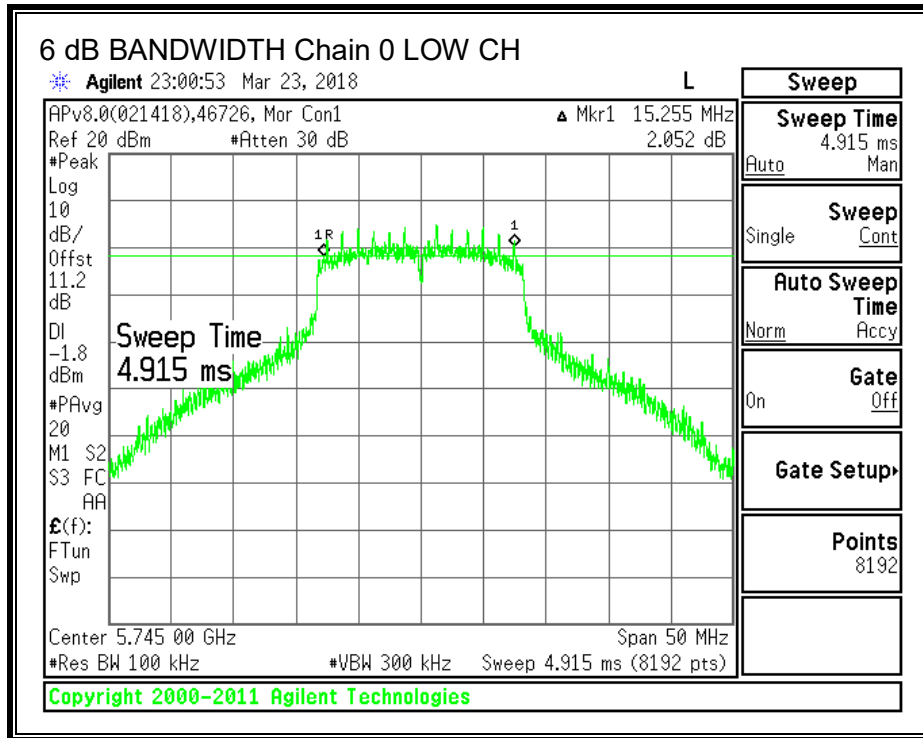
Project: 12053557

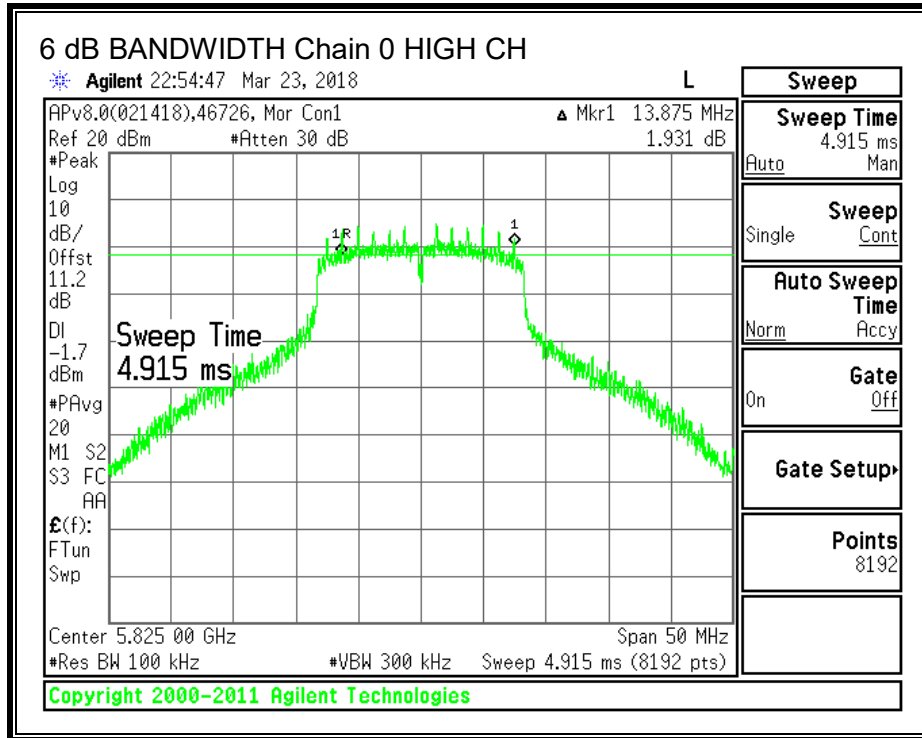
Tested By: 46726/46722

RESULTS

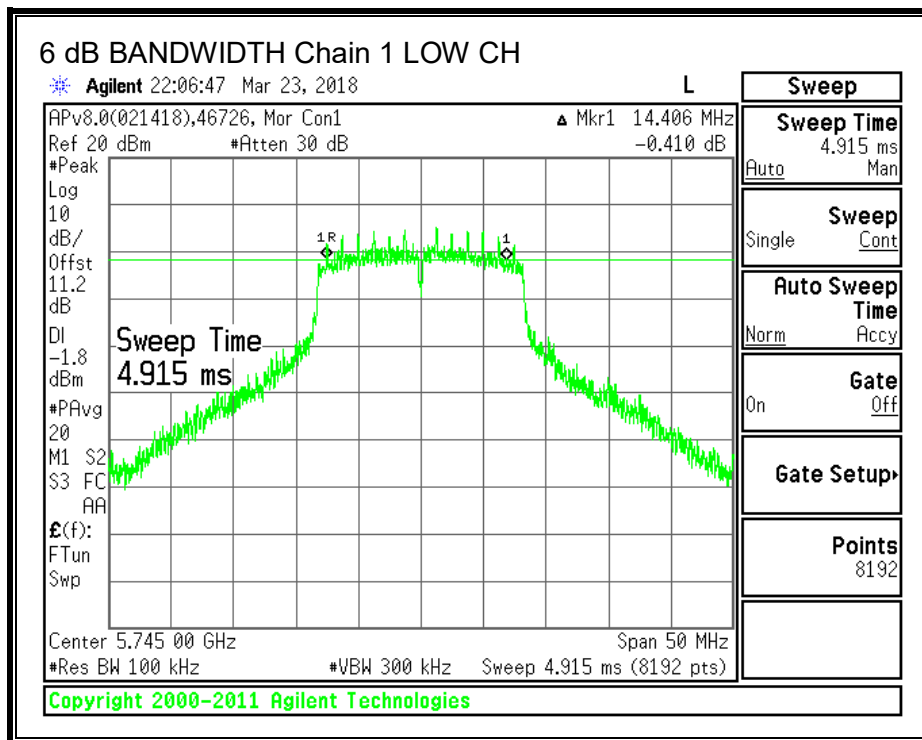
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	15.2550	14.4060	0.5
Mid	5785	15.0900	13.8510	0.5
High	5825	13.8750	14.998	0.5

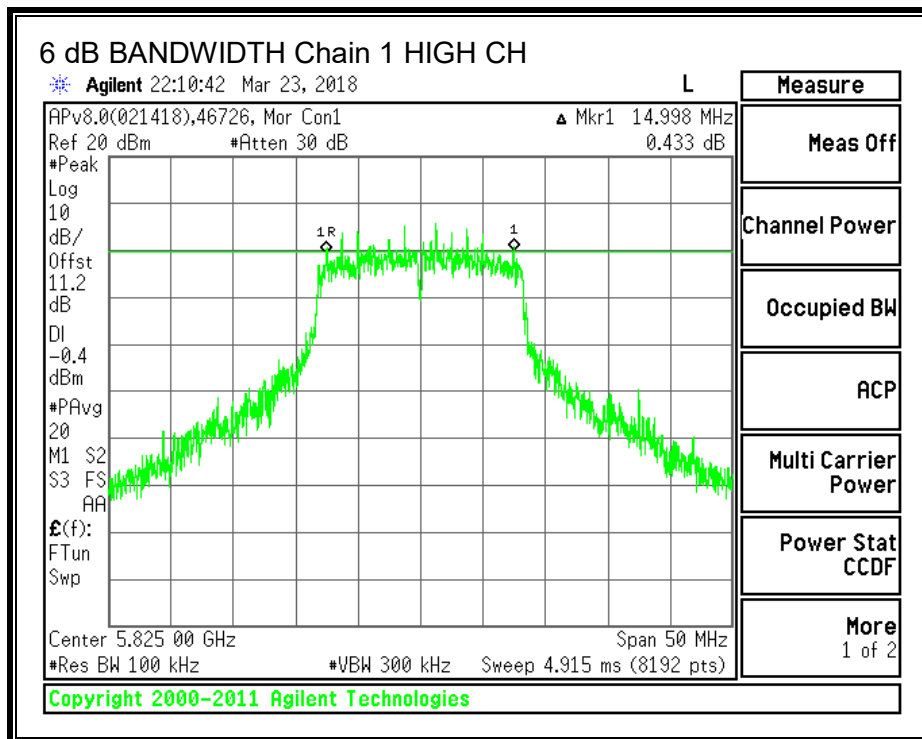
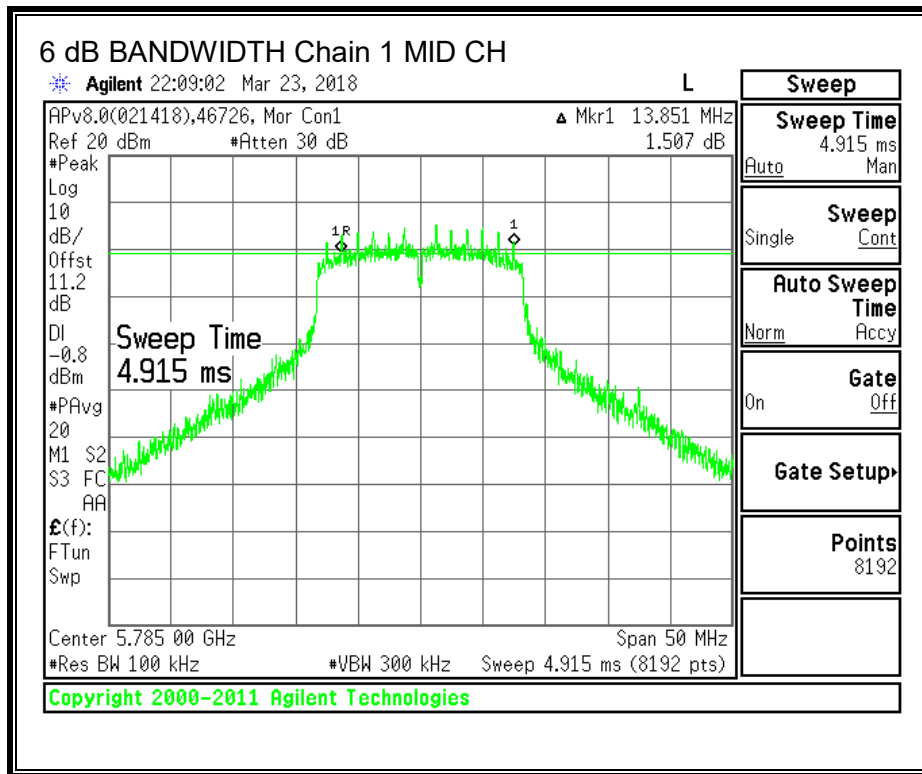
6 dB BANDWIDTH, Chain 0





6 dB BANDWIDTH, Chain 1





8.14.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

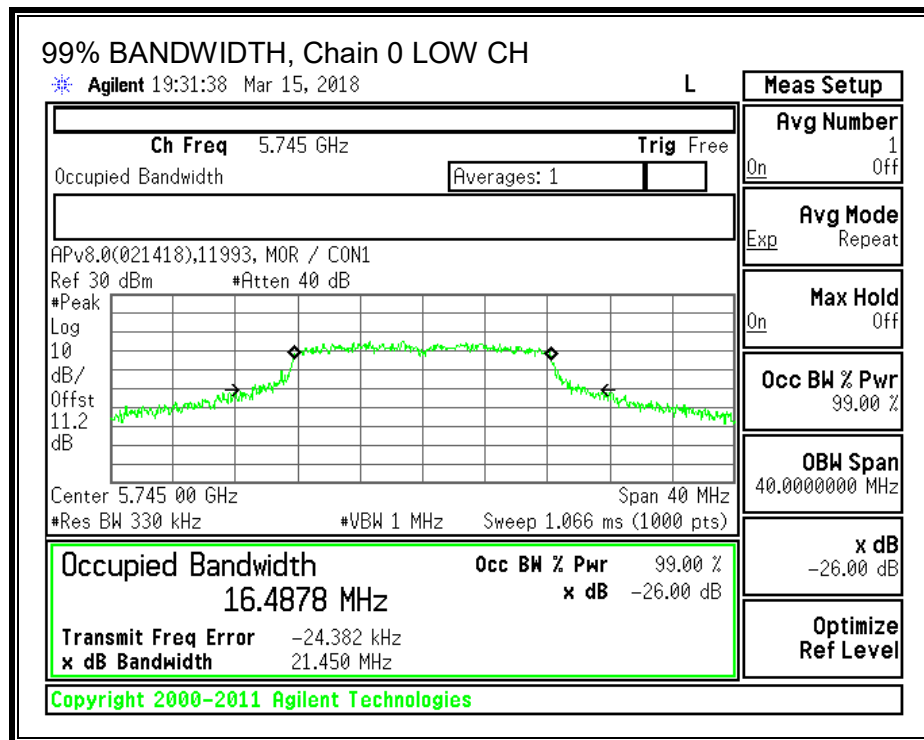
TEST INFORMATION

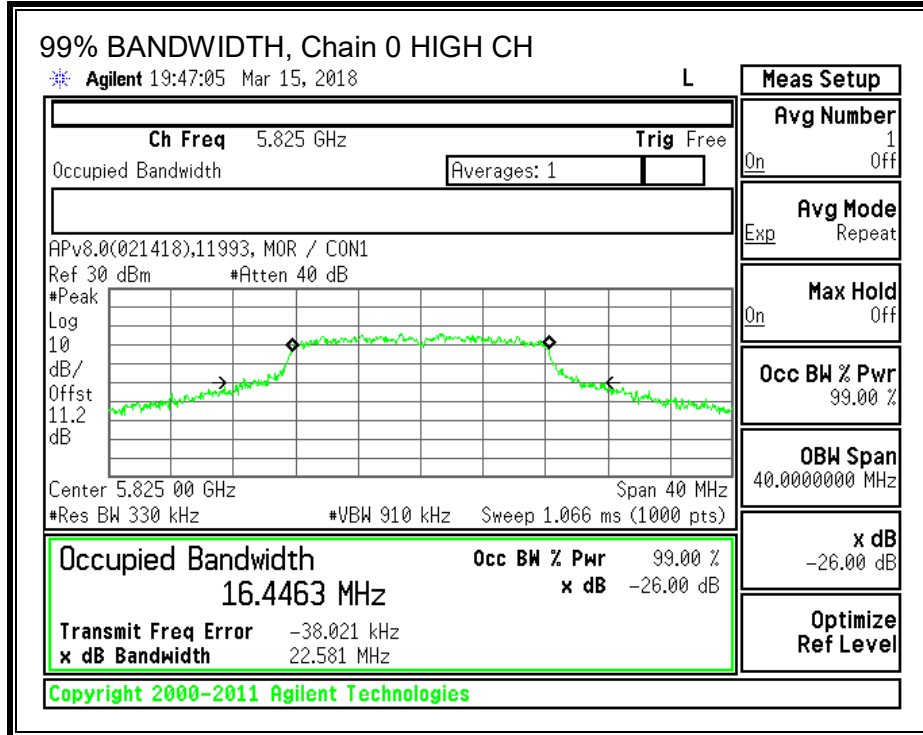
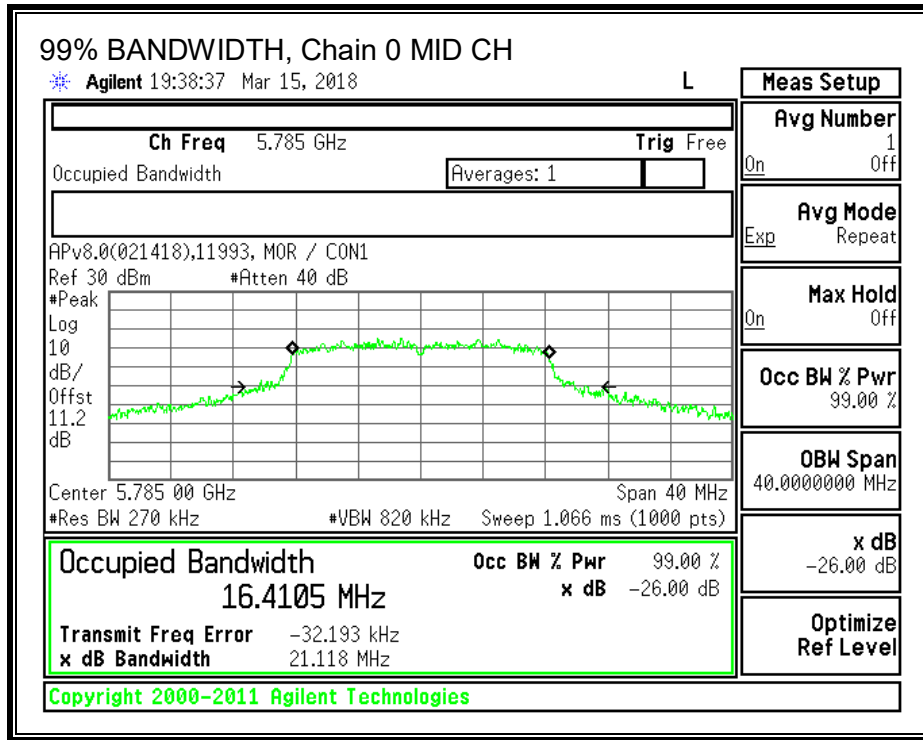
Test Date: 2018-03-15 to 2018-03-16
 Project: 12053557
 Tested By: 11993/46722

RESULTS

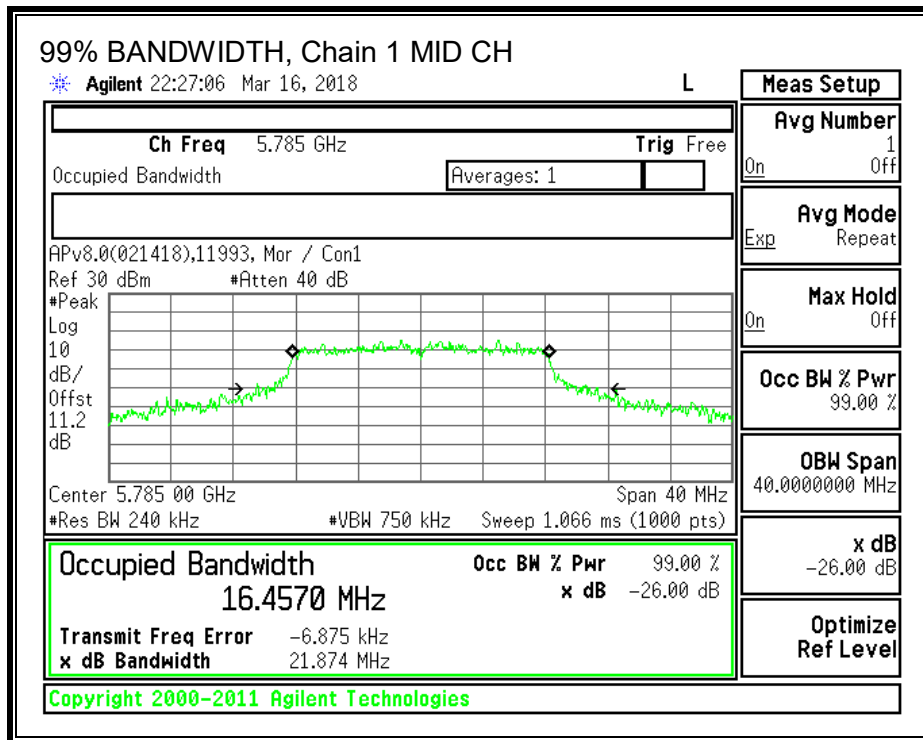
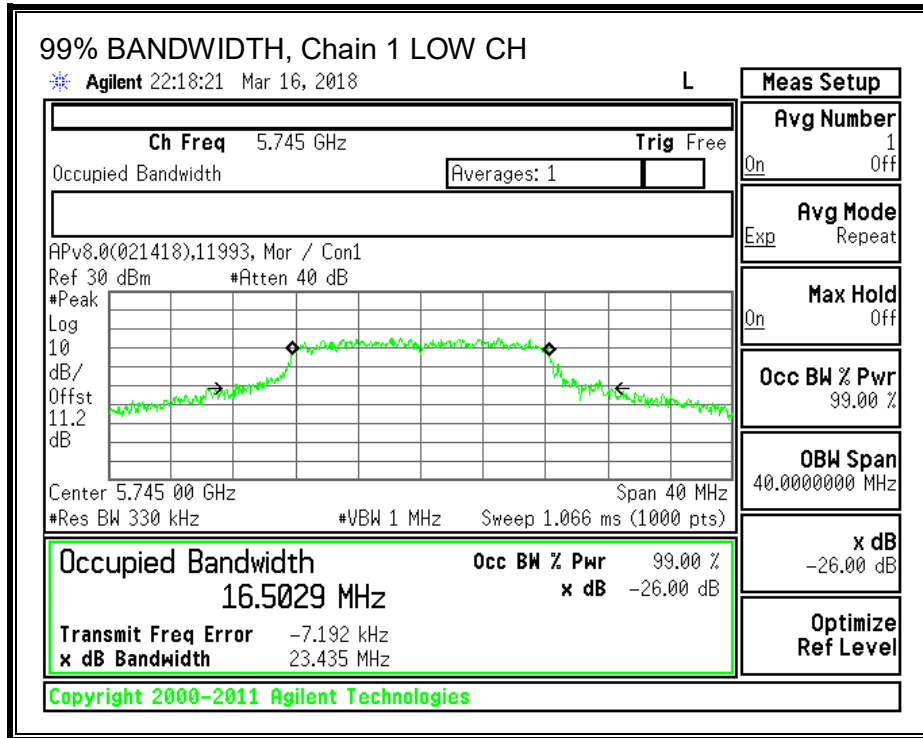
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	16.4878	16.5029
Mid	5785	16.4105	16.4570
High	5825	16.4463	16.4008

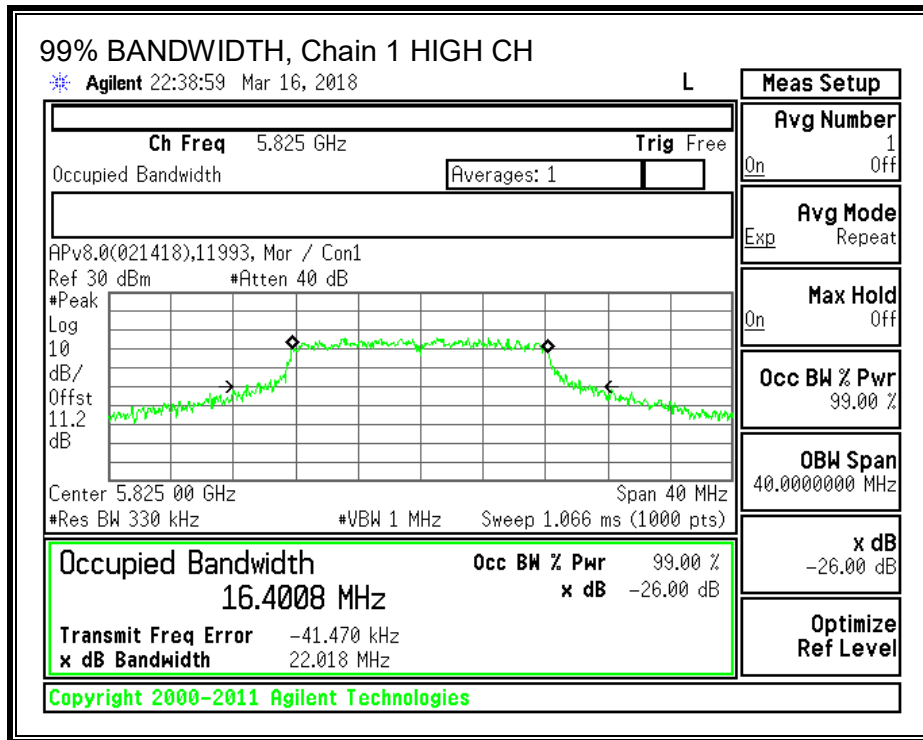
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.14.3. OUTPUT POWER – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date:2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS 6 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	2.16	30.00
Mid	5785	2.16	30.00
High	5825	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.09	13.94	16.55	30.00	-13.45
Mid	5785	13.06	13.81	16.46	30.00	-13.54
High	5825	13.02	13.77	16.42	30.00	-13.58

RESULTS 54 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	2.16	30.00
Mid	5785	2.16	30.00
High	5825	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.47	14.18	16.85	30.00	-13.15
Mid	5785	13.52	14.11	16.84	30.00	-13.16
High	5825	13.47	14.09	16.80	30.00	-13.20

8.14.4. OUTPUT POWER – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date:2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS 6 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	1.92	30.00
Mid	5785	1.92	30.00
High	5825	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.09	13.94	16.55	30.00	-13.45
Mid	5785	13.06	13.81	16.46	30.00	-13.54
High	5825	13.02	13.77	16.42	30.00	-13.58

RESULTS 54 Mbps

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	1.92	30.00
Mid	5785	1.92	30.00
High	5825	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.47	14.18	16.85	30.00	-13.15
Mid	5785	13.52	14.11	16.84	30.00	-13.16
High	5825	13.47	14.09	16.80	30.00	-13.20

8.14.5. MAXIMUM POWER SPECTRAL DENSITY – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27

Project: 12053557

Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	5.17	30.00
Mid	5785	5.17	30.00
High	5825	5.17	30.00

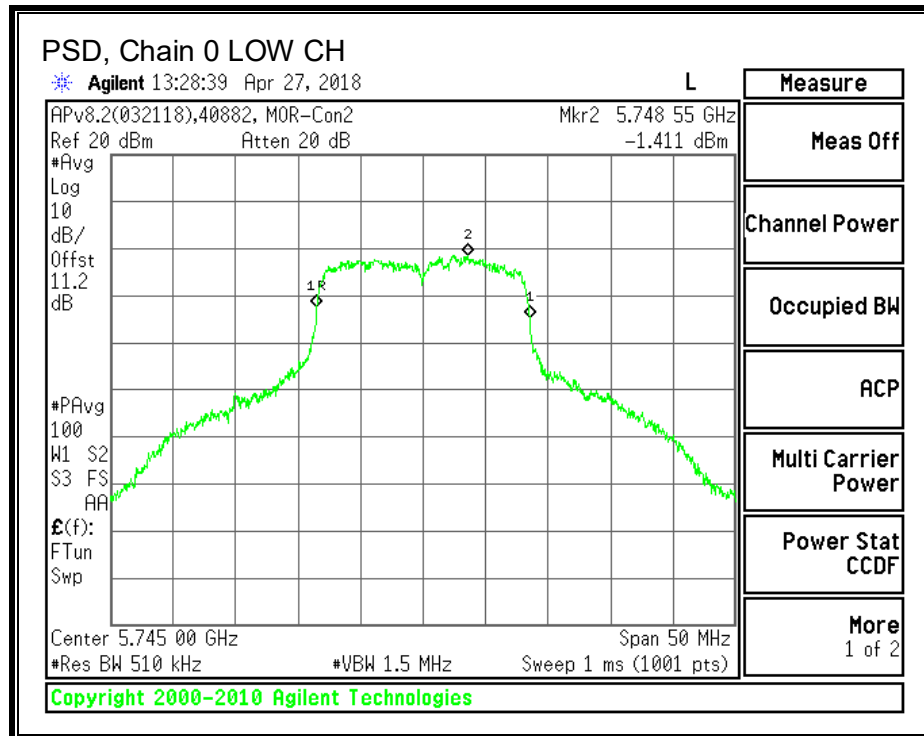
Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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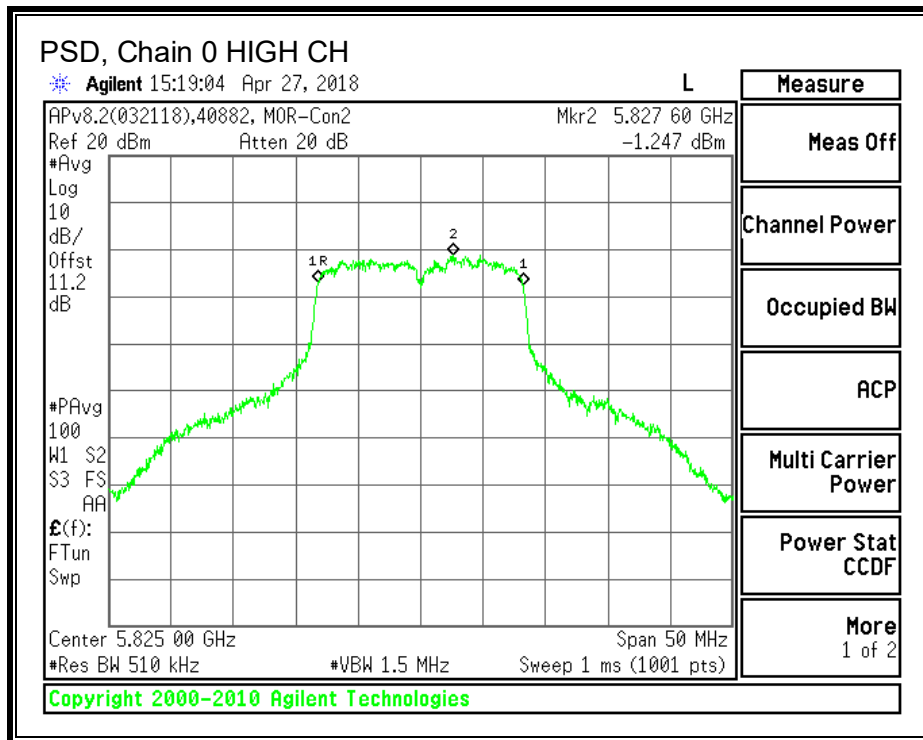
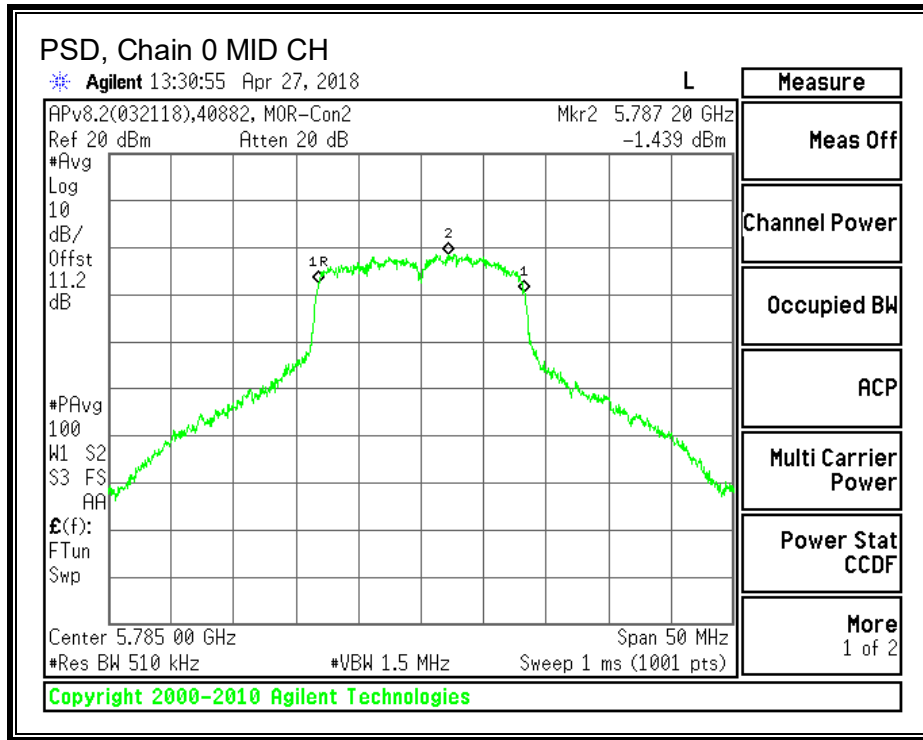
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-1.41	-1.66	4.89	30.00	-25.11
Mid	5785	-1.44	-1.60	4.90	30.00	-25.10
High	5825	-1.25	-1.36	5.12	30.00	-24.88

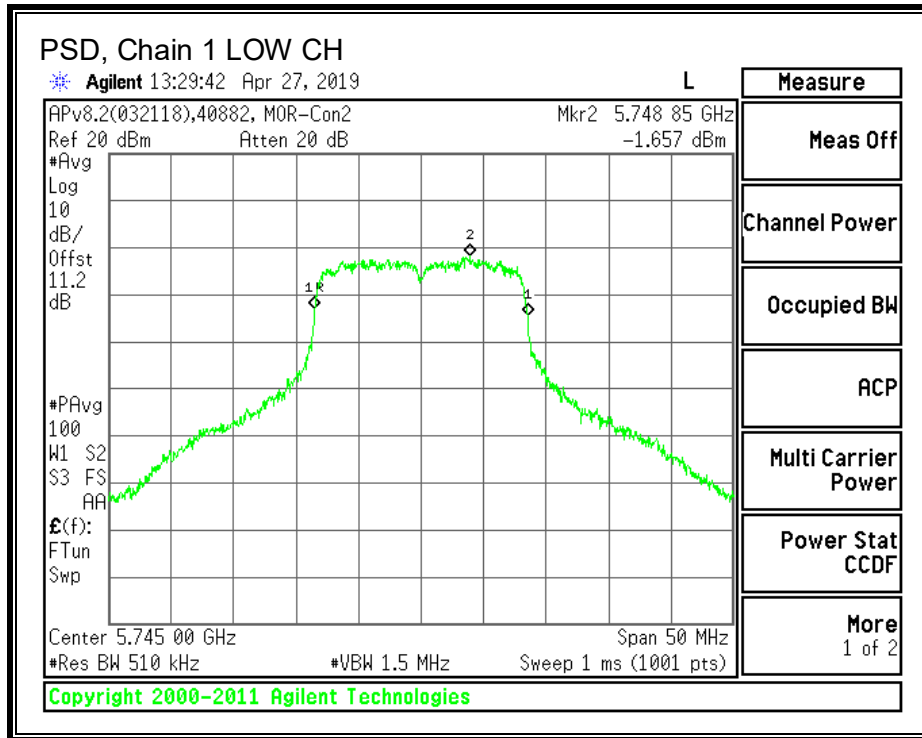
Note - PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0

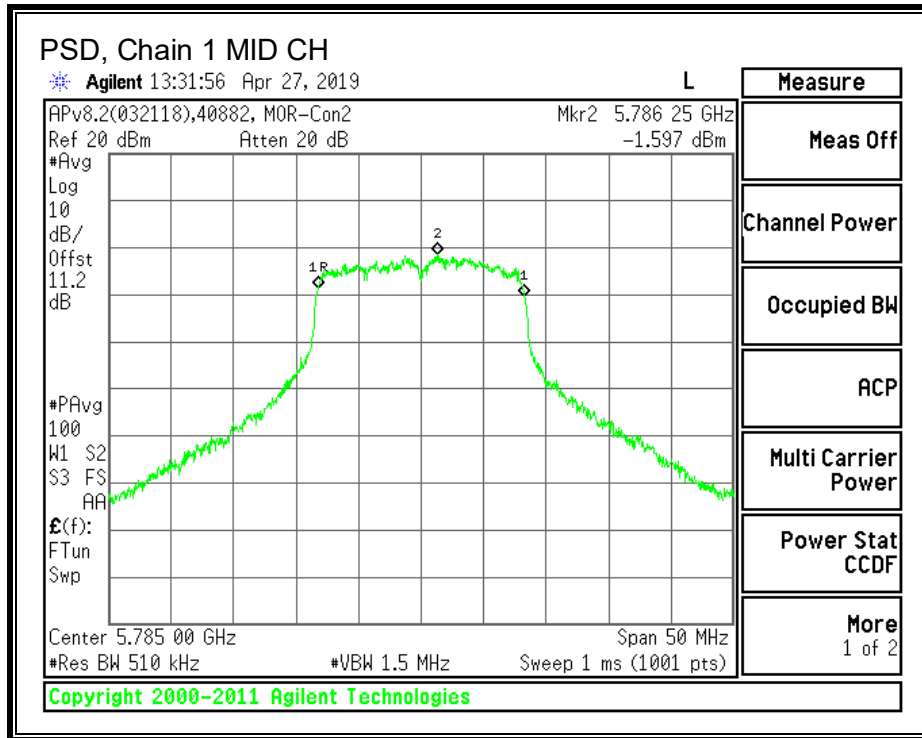




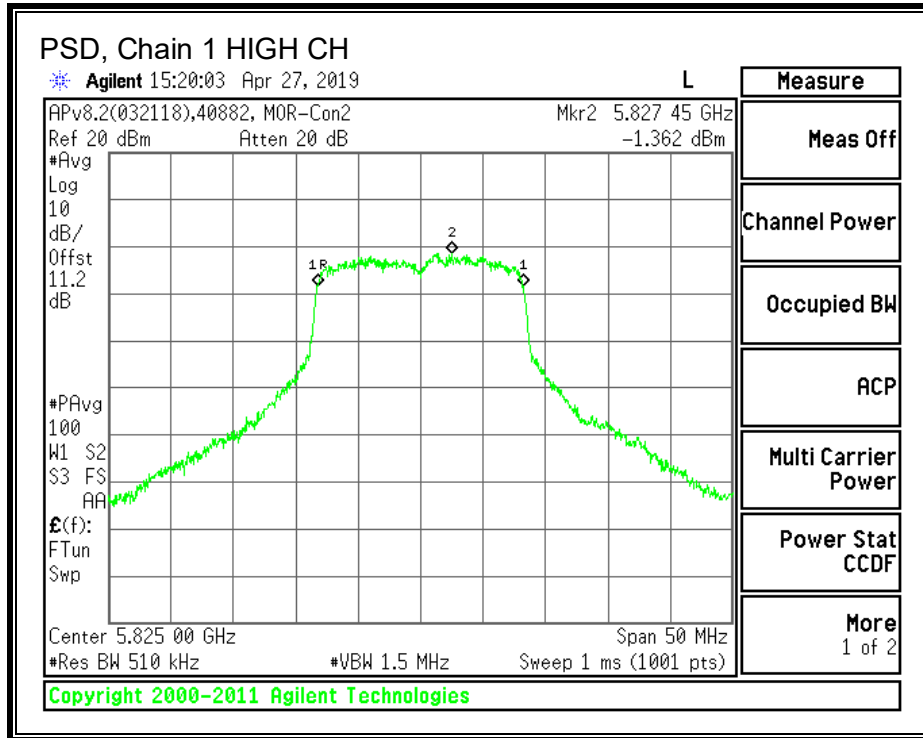
PSD, Chain 1



Note: Date should be Apr 27, 2019.



Note: Date should be Apr 27, 2019.



Note: Date should be Apr 27, 2019.

8.14.6. MAXIMUM POWER SPECTRAL DENSITY – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Tested Date: 2018-04-27
Project: 12053557
Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	4.92	30.00
Mid	5785	4.92	30.00
High	5825	4.92	30.00

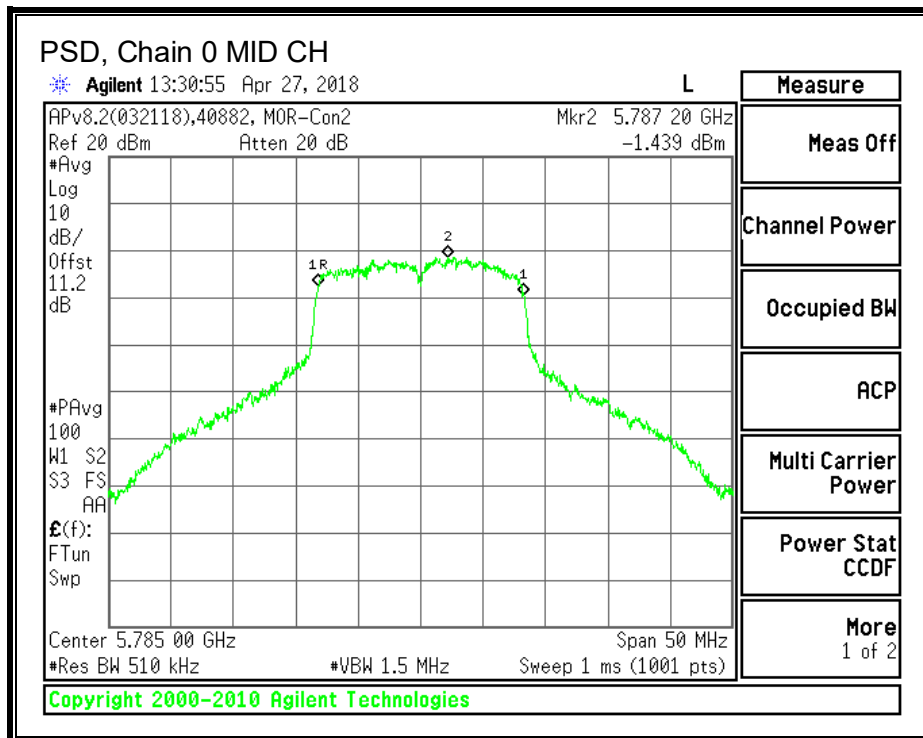
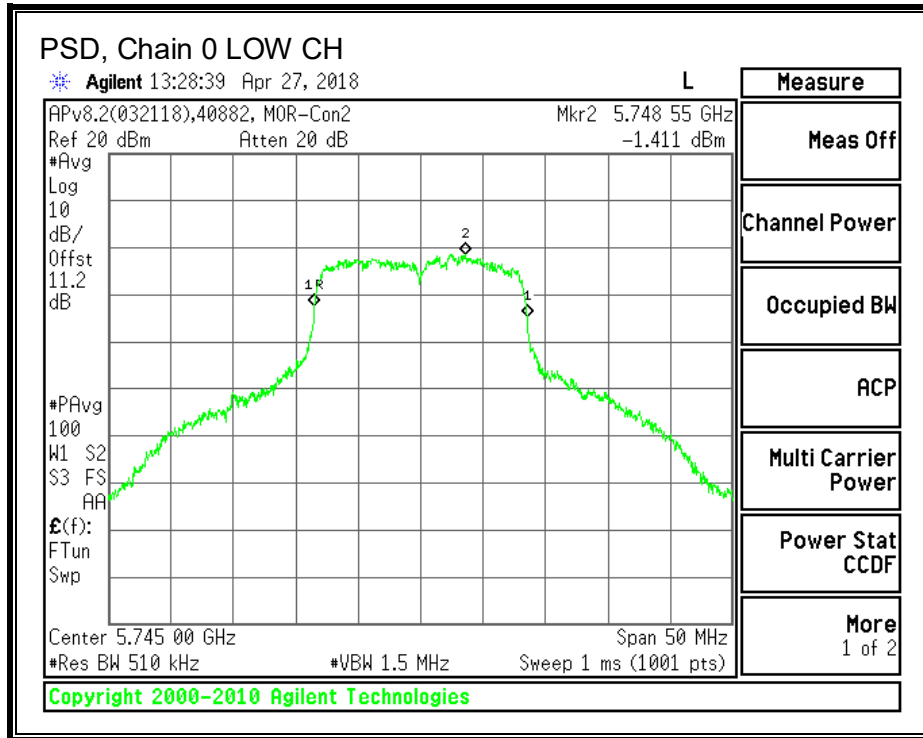
Duty Cycle CF (dB)	3.41	Included in Calculations of Corr'd PSD
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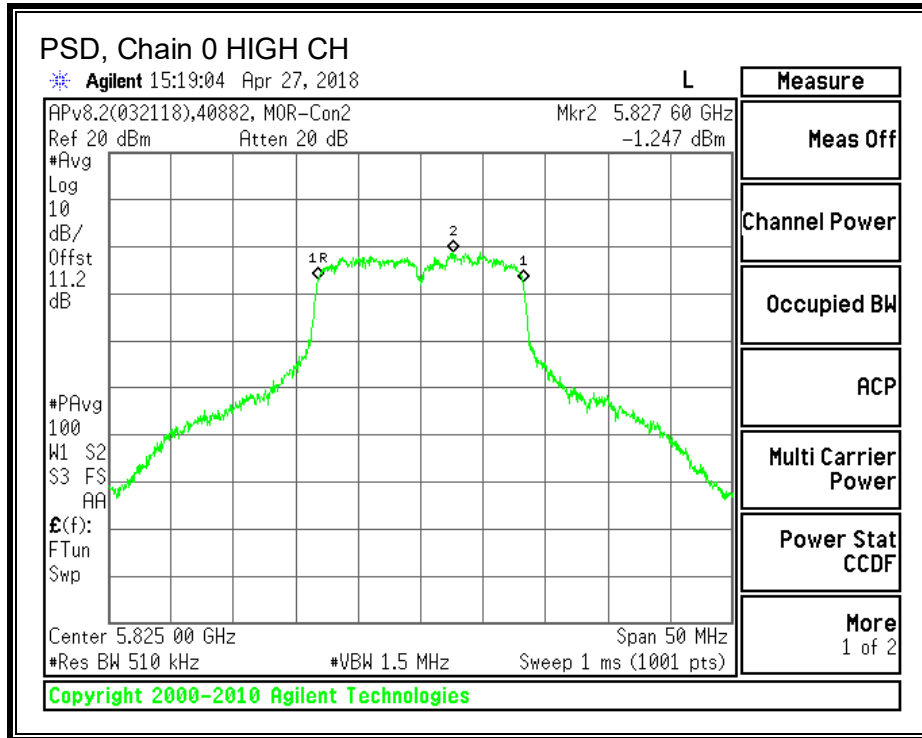
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-1.411	-1.657	4.89	30.00	-25.11
Mid	5785	-1.439	-1.597	4.90	30.00	-25.10
High	5825	-1.247	-1.362	5.12	30.00	-24.88

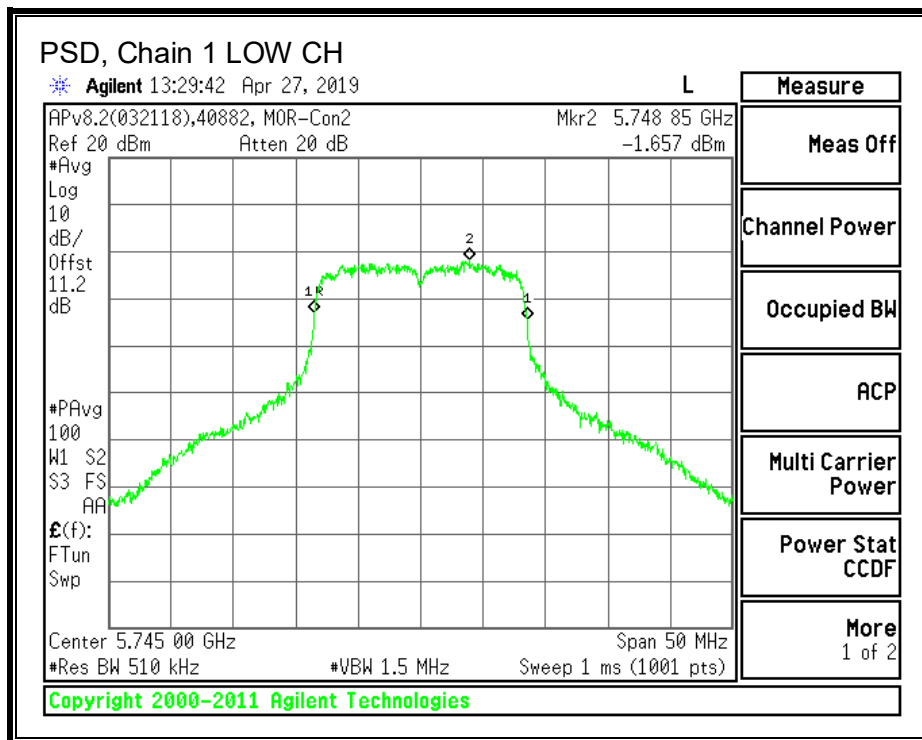
Note - PSD from 802.11a 6Mbps was used to represent 802.11a 54Mbps because the 6Mbps data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0

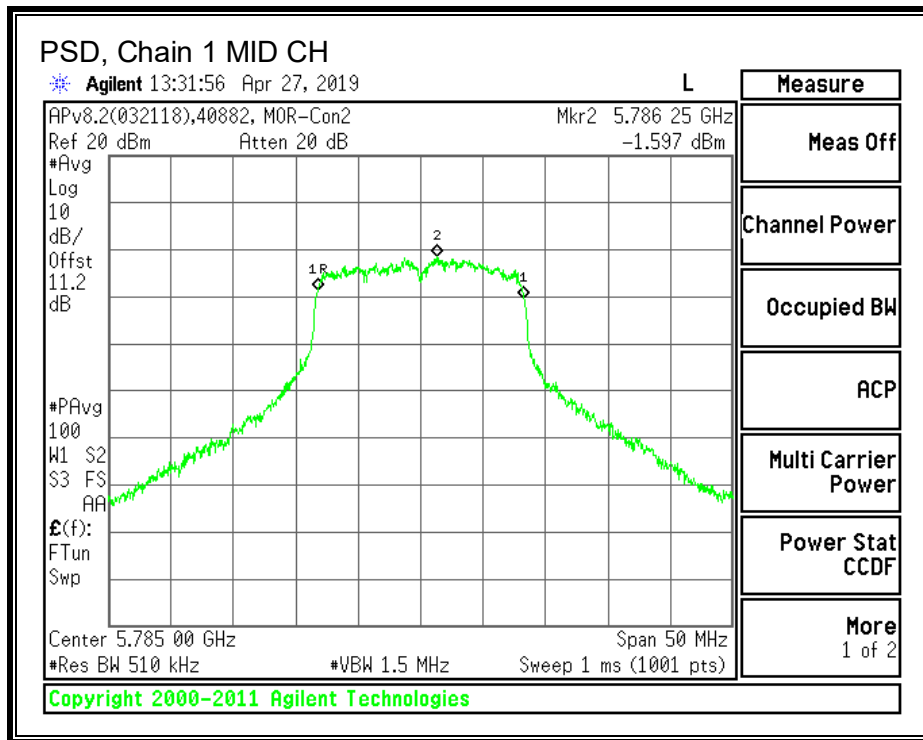




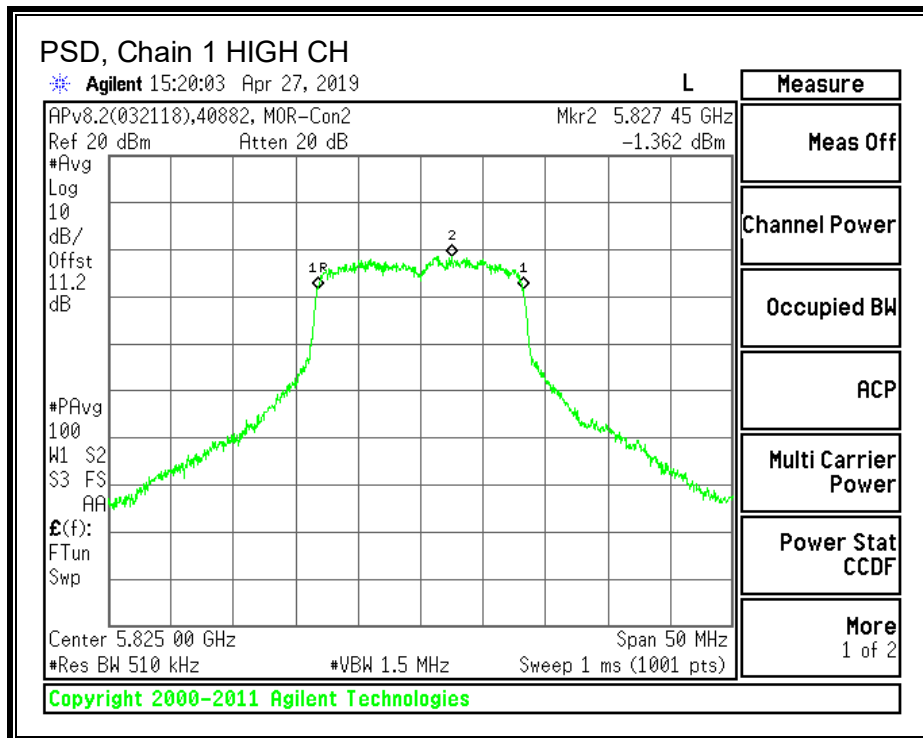
PSD, Chain 1



Note: Date should be Apr 27, 2018.



Note: Date should be Apr 27, 2018.



Note: Date should be Apr 27, 2018.

8.15. 802.11n HT20 MODE IN THE 5.8 GHz BAND

8.15.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 Issue 2 Section 6.2.4.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

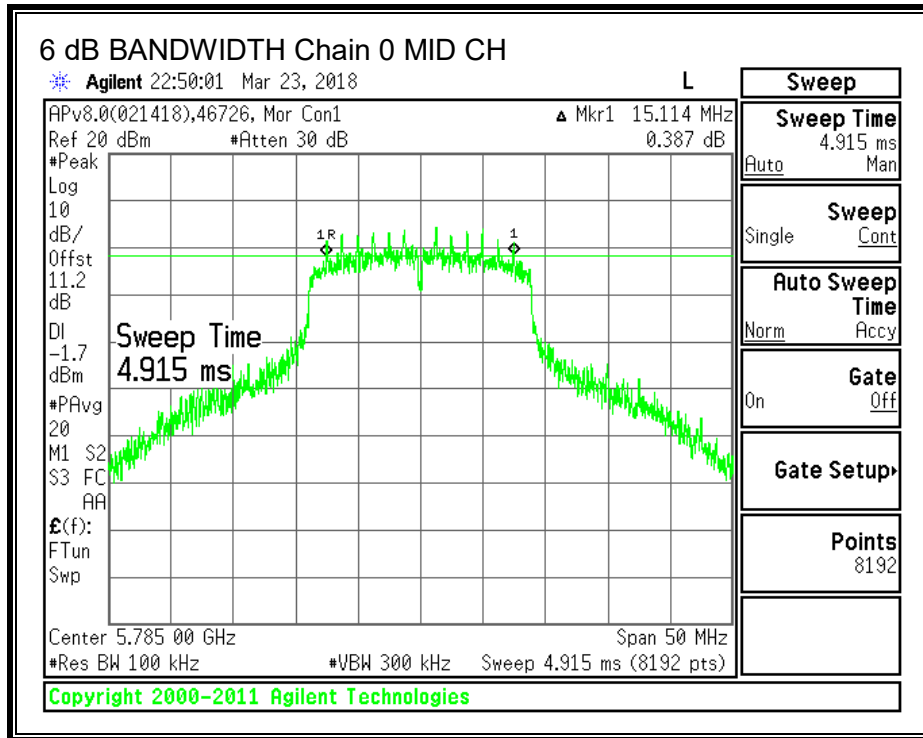
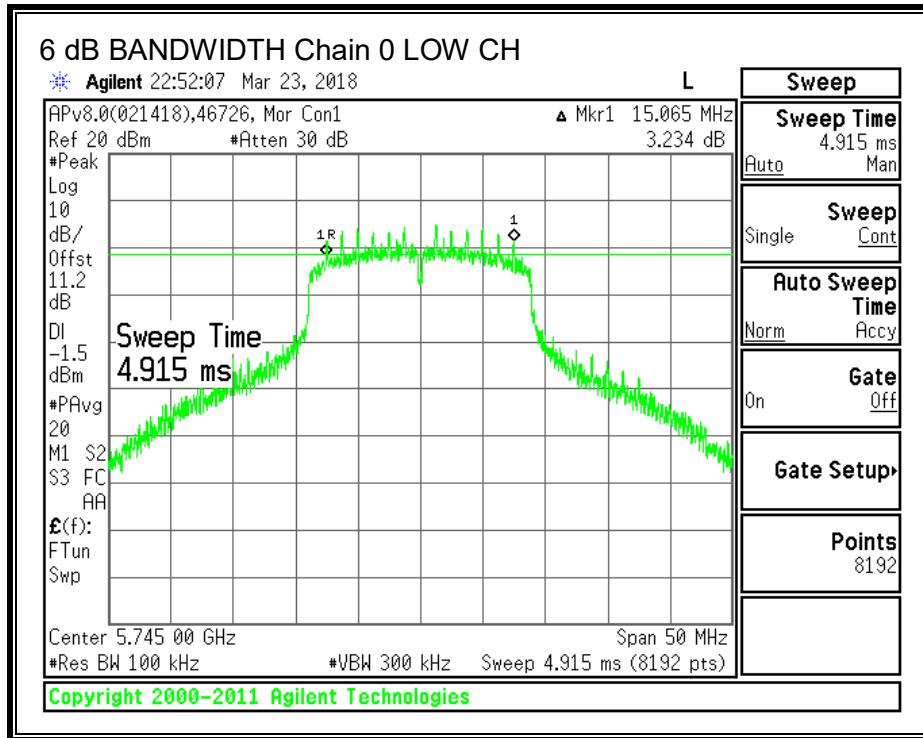
TEST INFORMATION

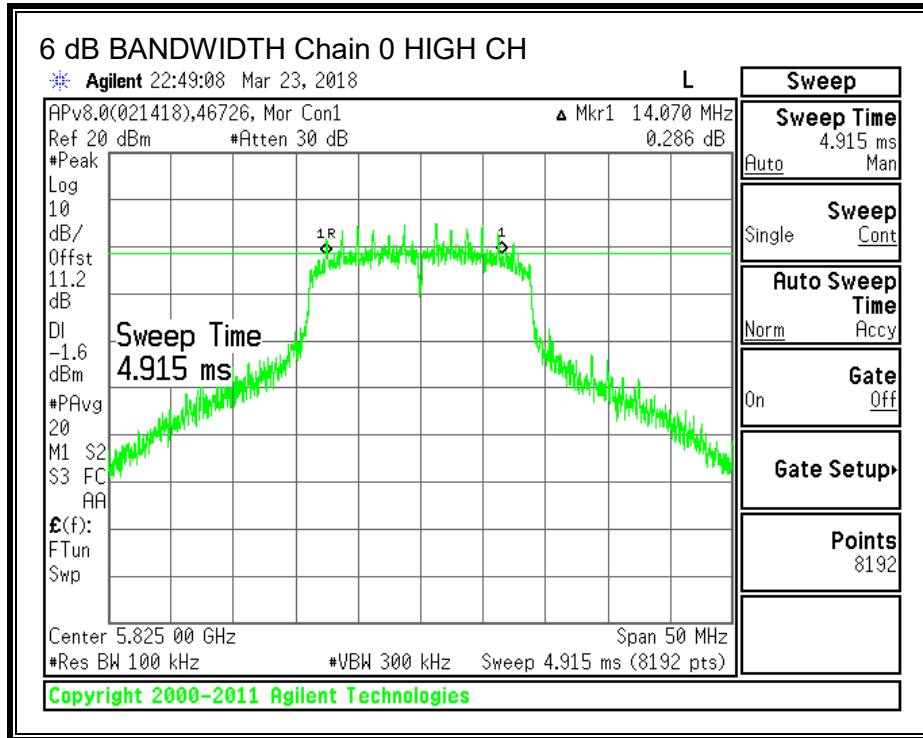
Test Date: 2018-03-23
Project: 12053557
Tested By: 46726/26722

RESULTS

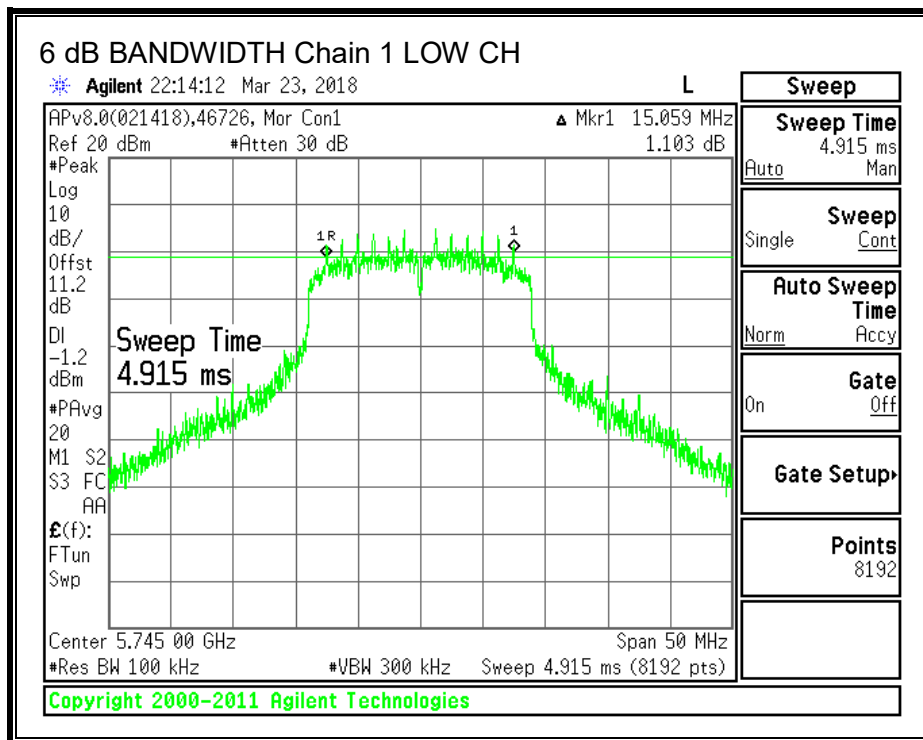
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	15.0650	15.0590	0.5
Mid	5785	15.1140	15.1140	0.5
High	5825	14.0700	15.0650	0.5

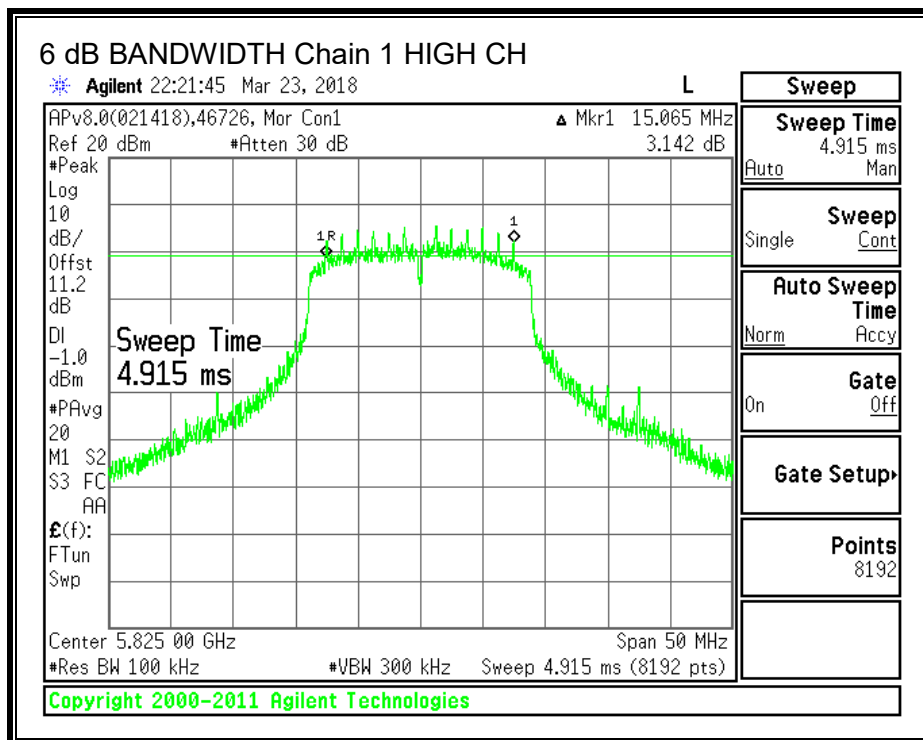
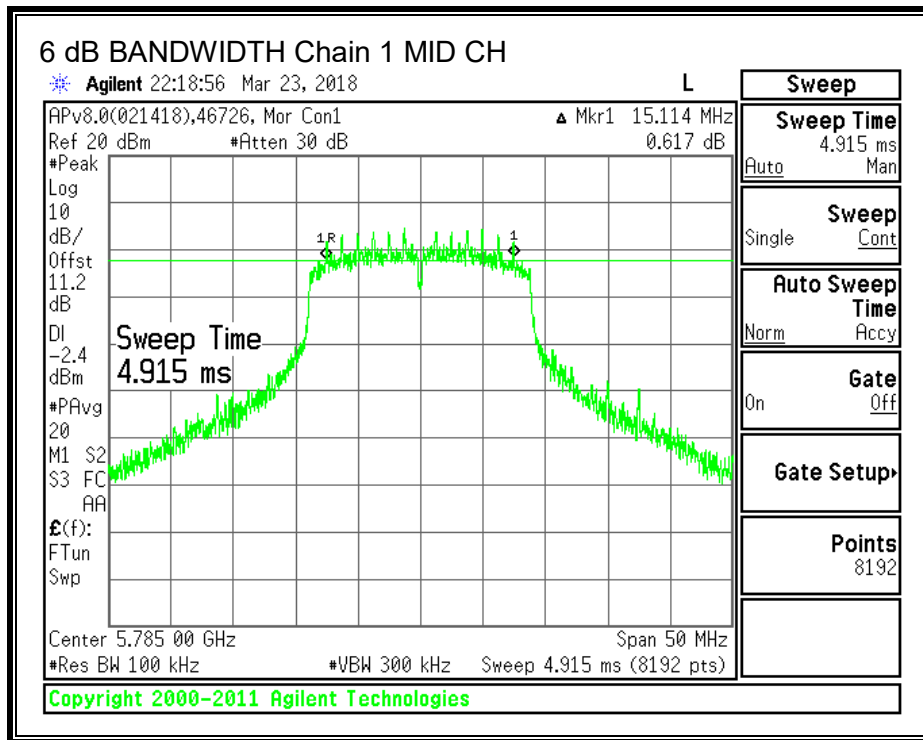
6 dB BANDWIDTH, Chain 0





6 dB BANDWIDTH, Chain 1





8.15.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

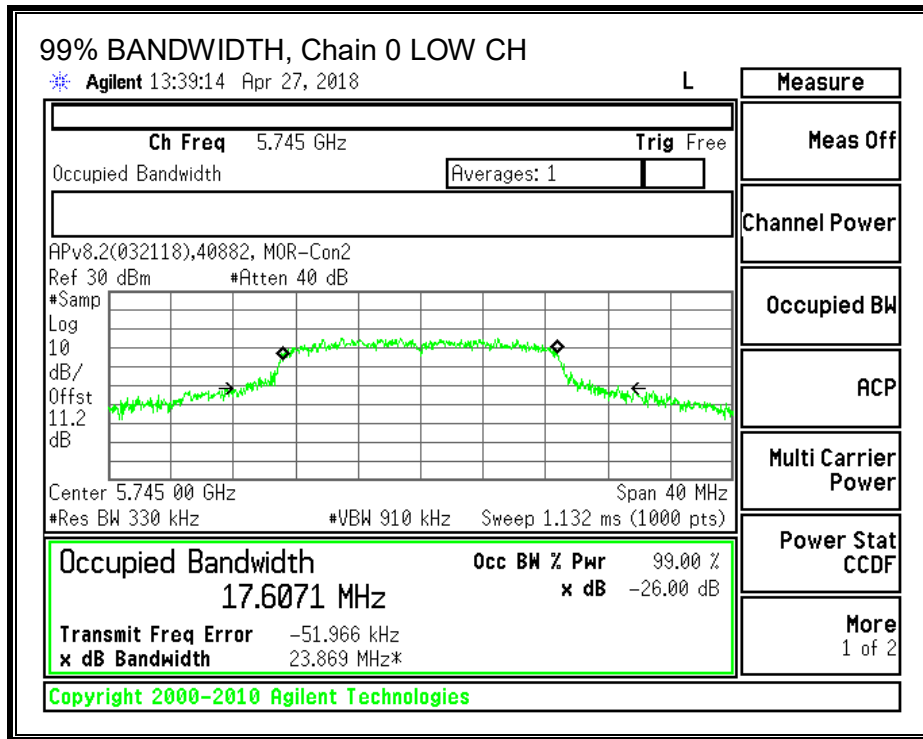
TEST INFORMATION

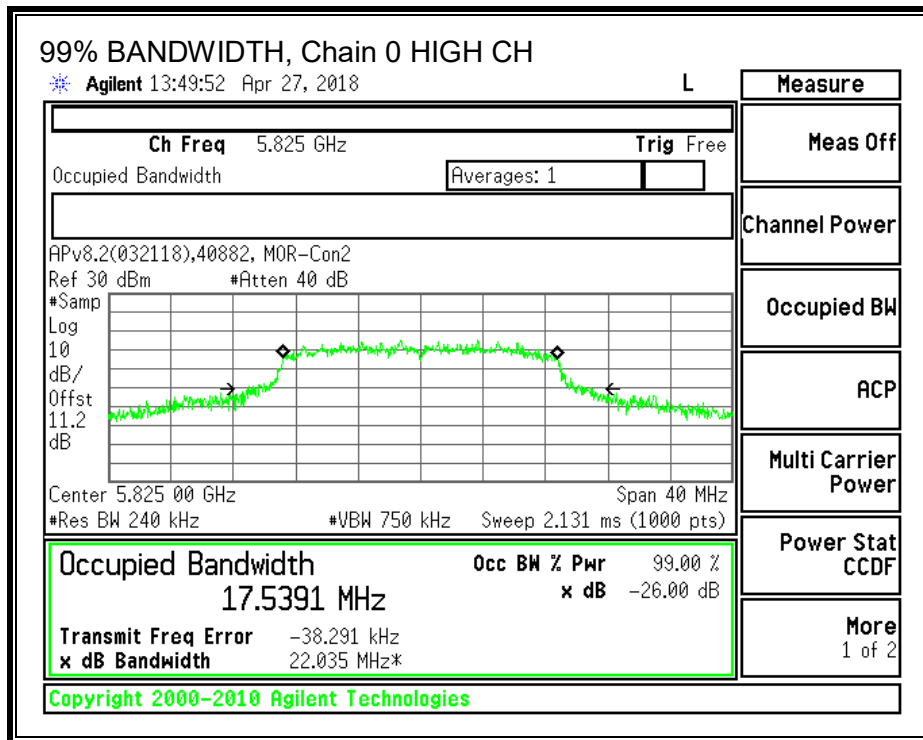
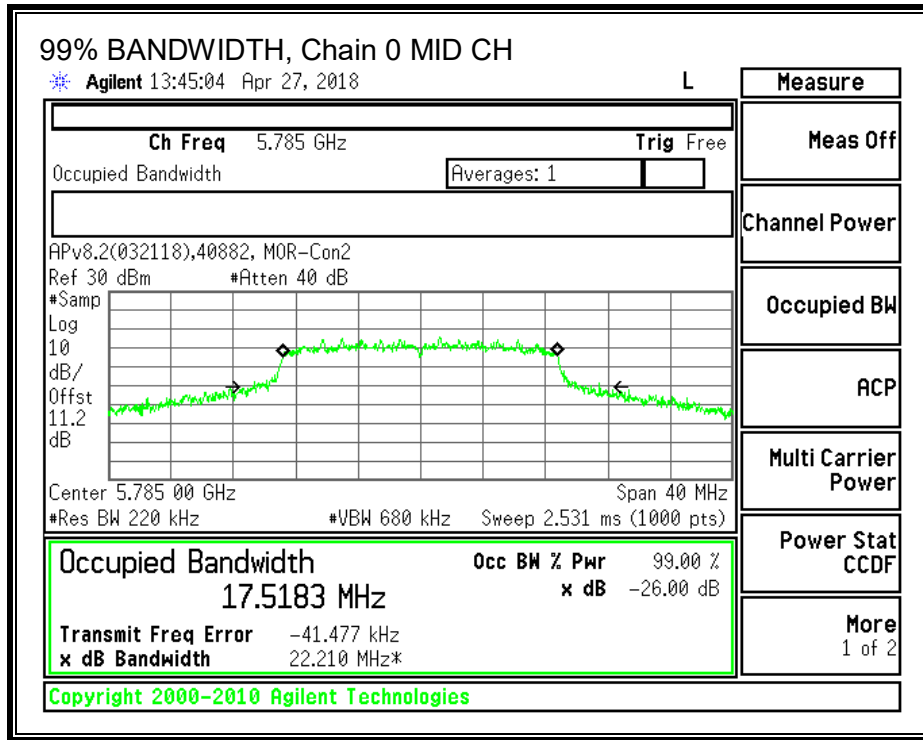
Test Date: 2018-04-27
 Project: 12053557
 Tested By: 40822

RESULTS

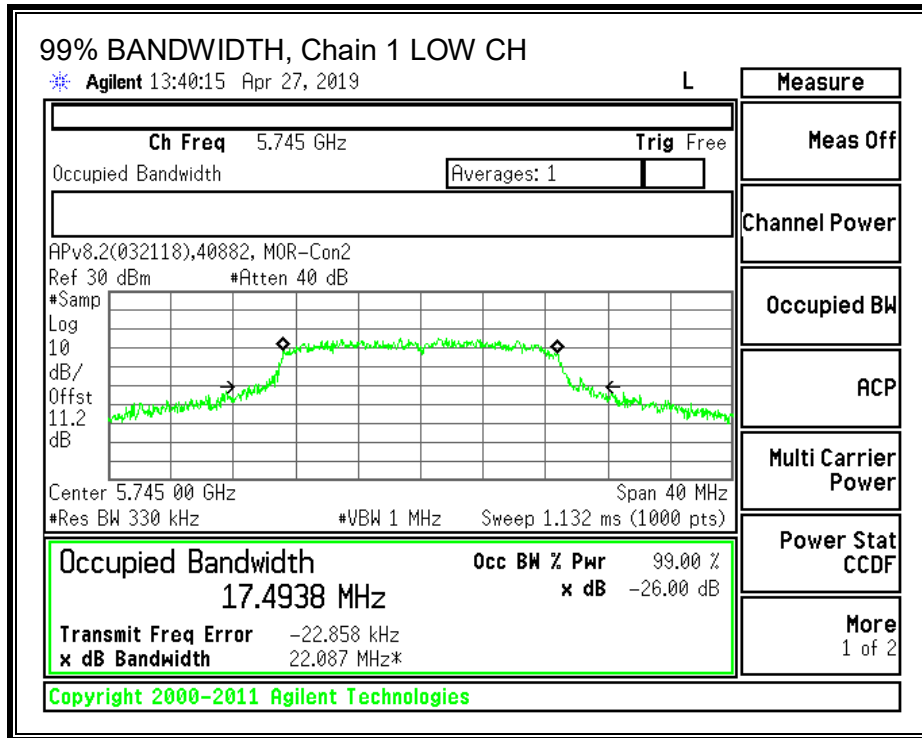
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5745	17.6071	17.4938
Mid	5785	17.5183	17.4292
High	5825	17.5391	17.4419

99% BANDWIDTH, Chain 0

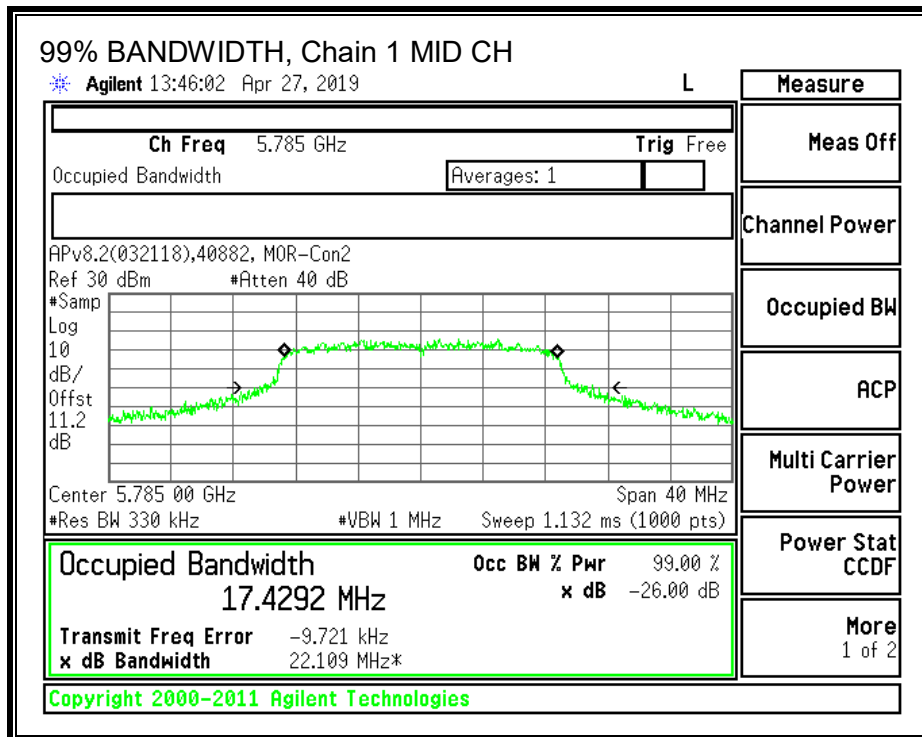




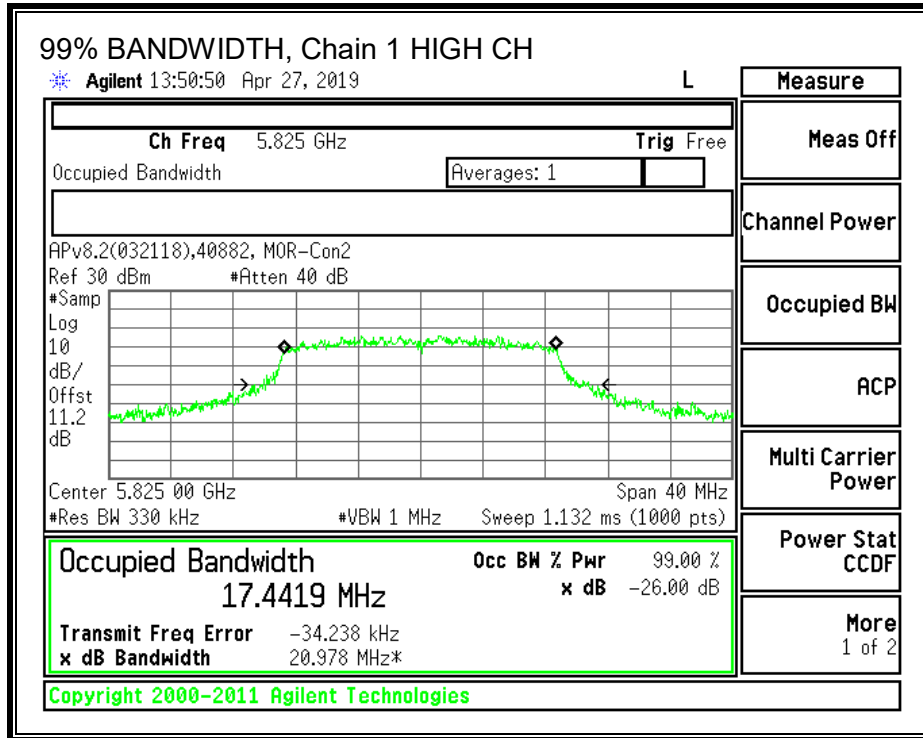
99% BANDWIDTH, Chain 1



Note: Date should be Apr 27,2018.



Note: Date should be Apr 27,2018.



Note: Date should be Apr 27, 2018.

8.15.3. OUTPUT POWER – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	2.16	30.00
Mid	5785	2.16	30.00
High	5825	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	12.90	13.68	16.32	30.00	-13.68
Mid	5785	12.85	13.65	16.28	30.00	-13.72
High	5825	12.80	13.64	16.25	30.00	-13.75

RESULTS MCS7

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	2.16	30.00
Mid	5785	2.16	30.00
High	5825	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.48	14.24	16.89	30.00	-13.11
Mid	5785	13.52	14.13	16.85	30.00	-13.15
High	5825	13.41	14.13	16.80	30.00	-13.20

8.15.4. OUTPUT POWER – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	1.92	30.00
Mid	5785	1.92	30.00
High	5825	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	12.90	13.68	16.32	30.00	-13.68
Mid	5785	12.85	13.65	16.28	30.00	-13.72
High	5825	12.80	13.64	16.25	30.00	-13.75

RESULTS MCS7

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)
Low	5745	1.92	30.00
Mid	5785	1.92	30.00
High	5825	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.48	14.24	16.89	30.00	-13.11
Mid	5785	13.52	14.13	16.85	30.00	-13.15
High	5825	13.41	14.13	16.80	30.00	-13.20

8.15.5. MAXIMUM POWER SPECTRAL DENSITY – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27
Project: 12053557
Tested By: 40822

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	5.17	30.00
Mid	5785	5.17	30.00
High	5825	5.17	30.00

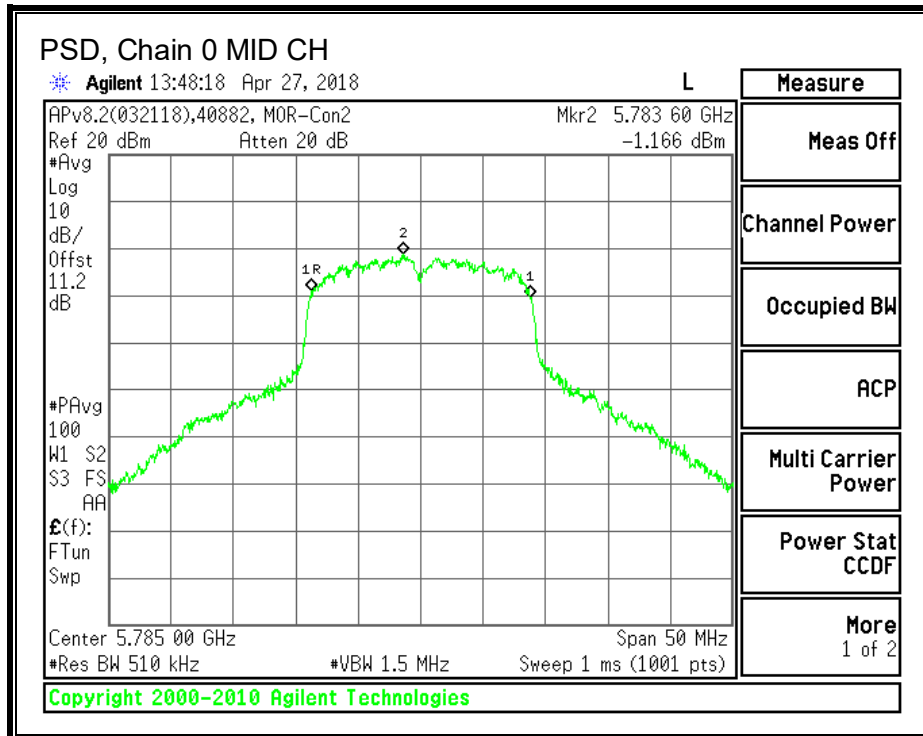
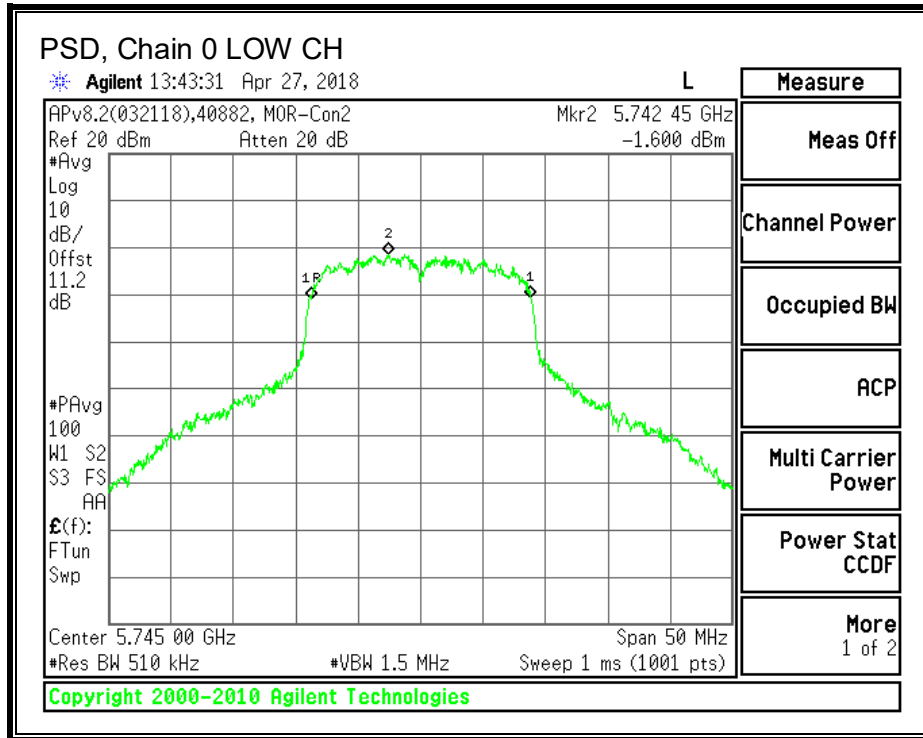
Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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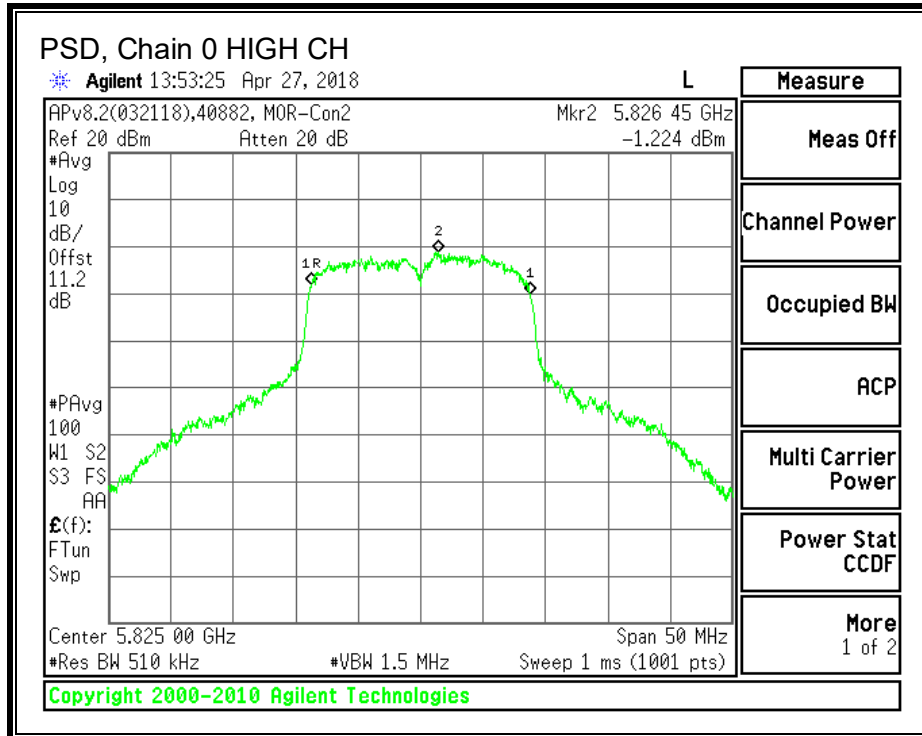
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-1.600	-1.136	4.92	30.00	-25.08
Mid	5785	-1.166	-1.582	4.91	30.00	-25.09
High	5825	-1.224	-1.462	4.94	30.00	-25.06

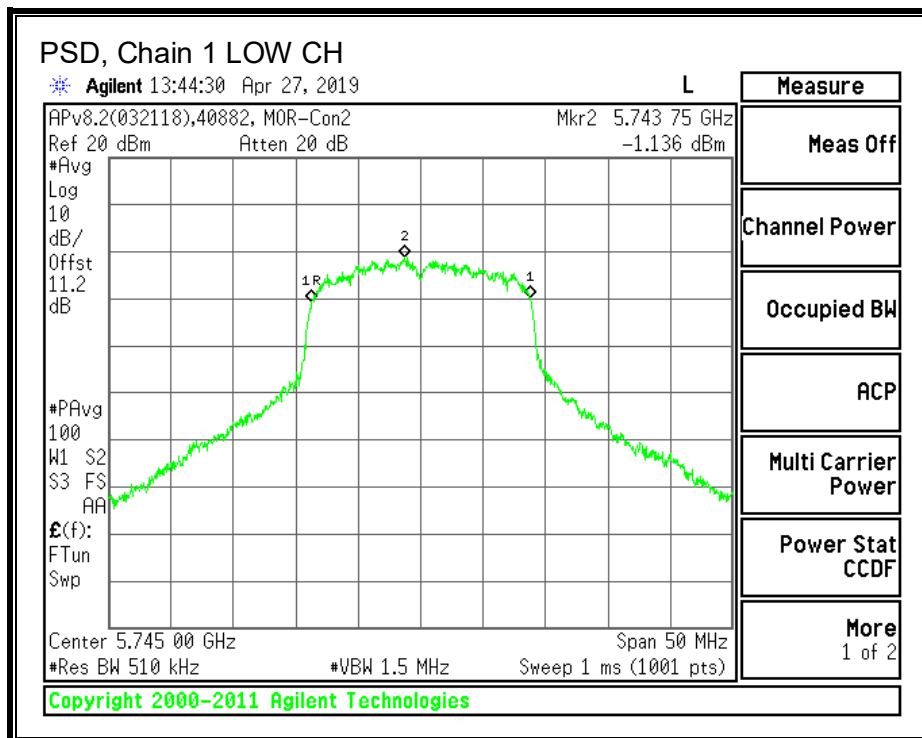
Note - PSD from 802.11n20 MCS0 was used to represent 802.11n20 MCS7 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

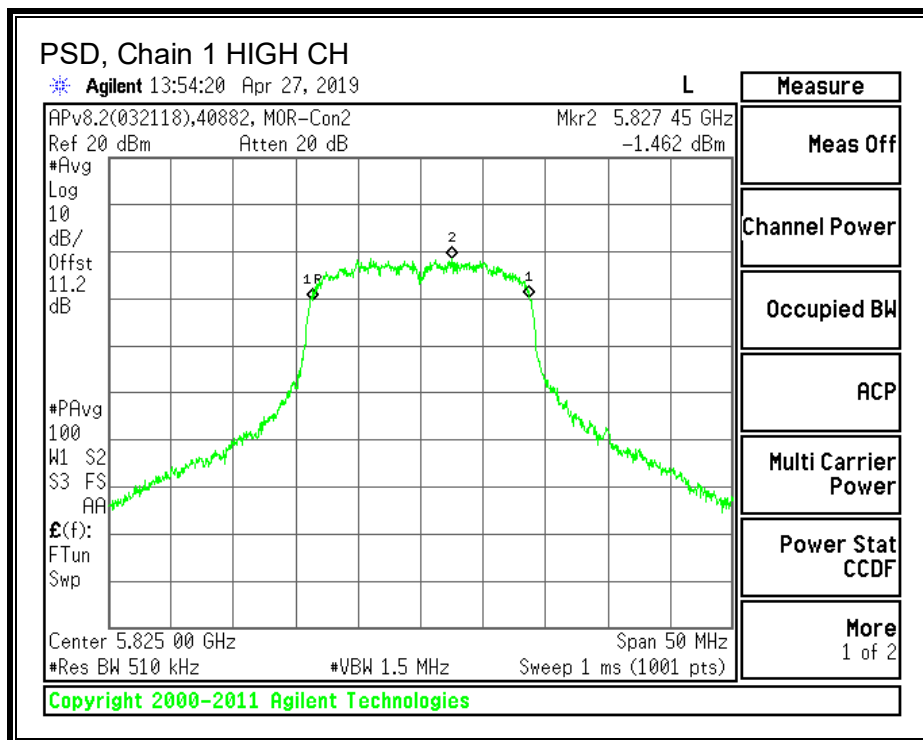
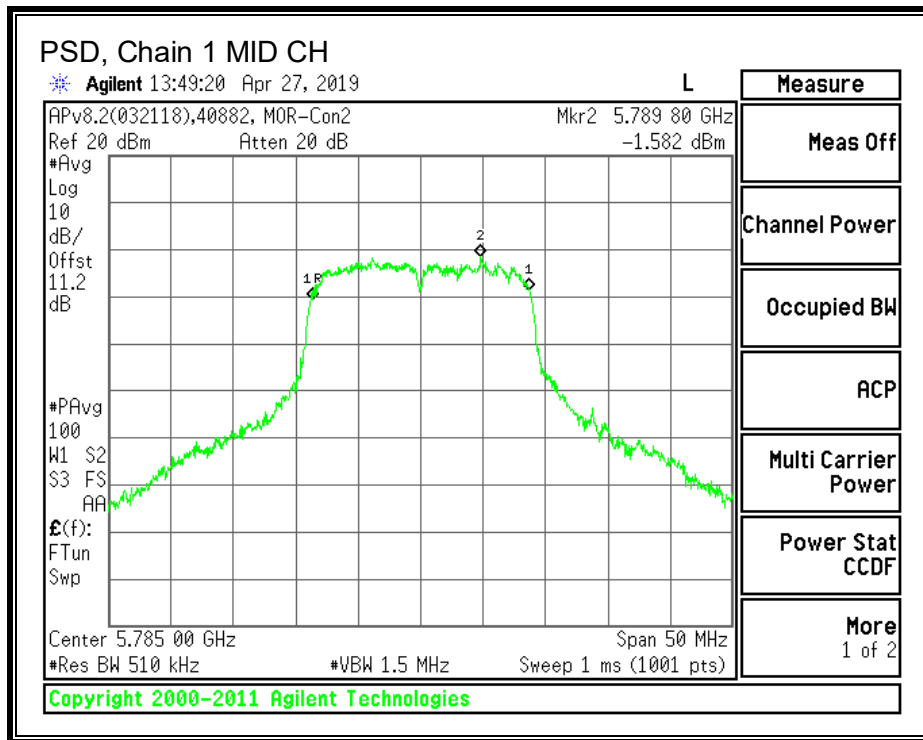
PSD, Chain 0





PSD, Chain 1





8.15.6. MAXIMUM POWER SPECTRAL DENSITY – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30
Project: 12053557
Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5745	4.92	30.00
Mid	5785	4.92	30.00
High	5825	4.92	30.00

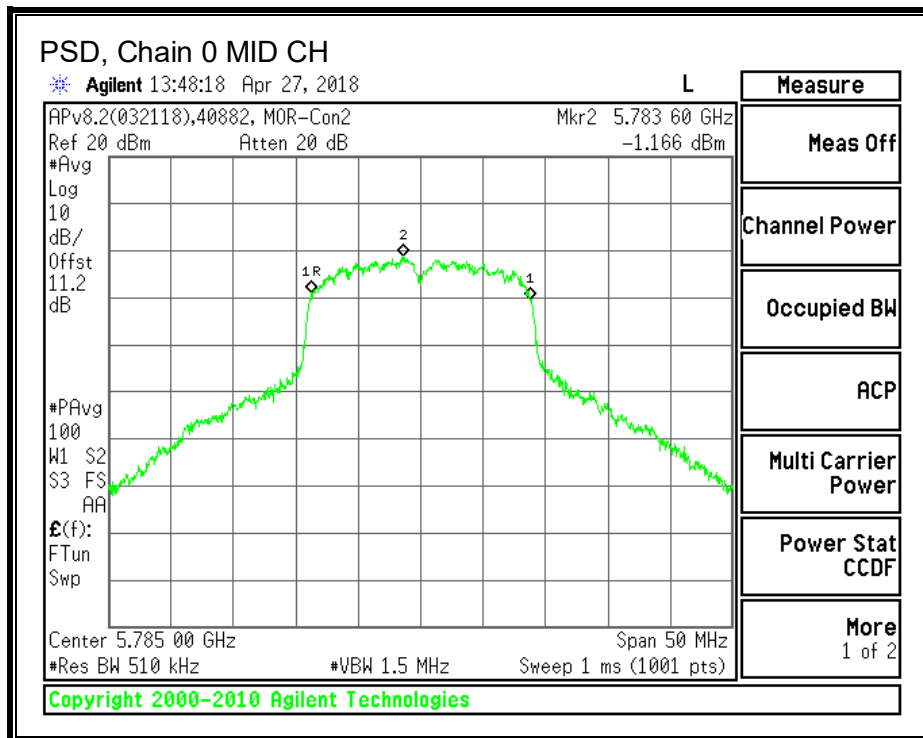
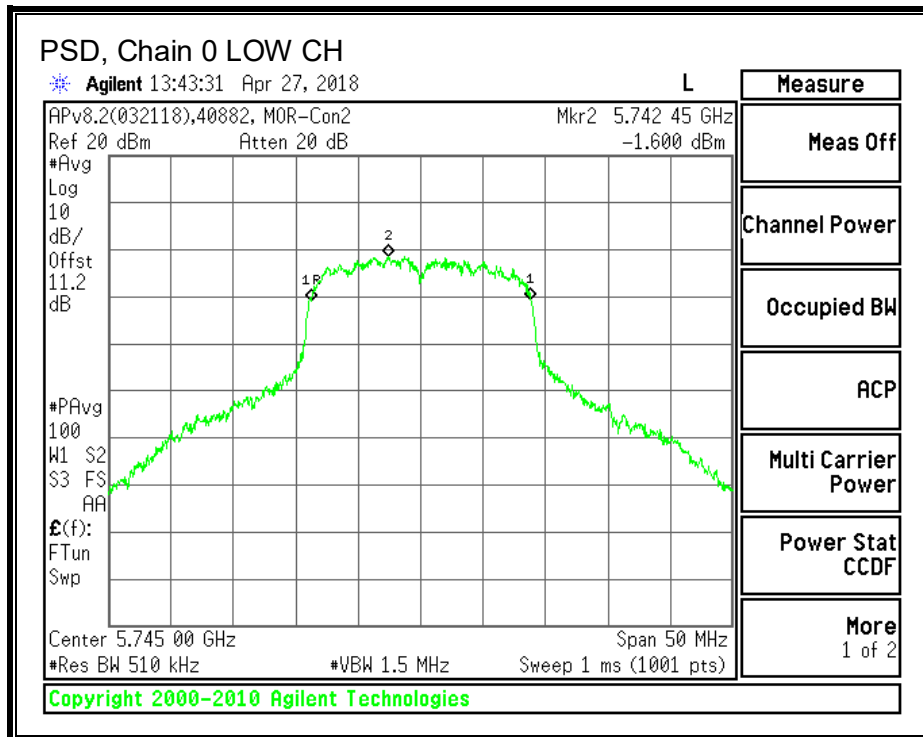
Duty Cycle CF (dB)	3.27	Included in Calculations of Corr'd PSD
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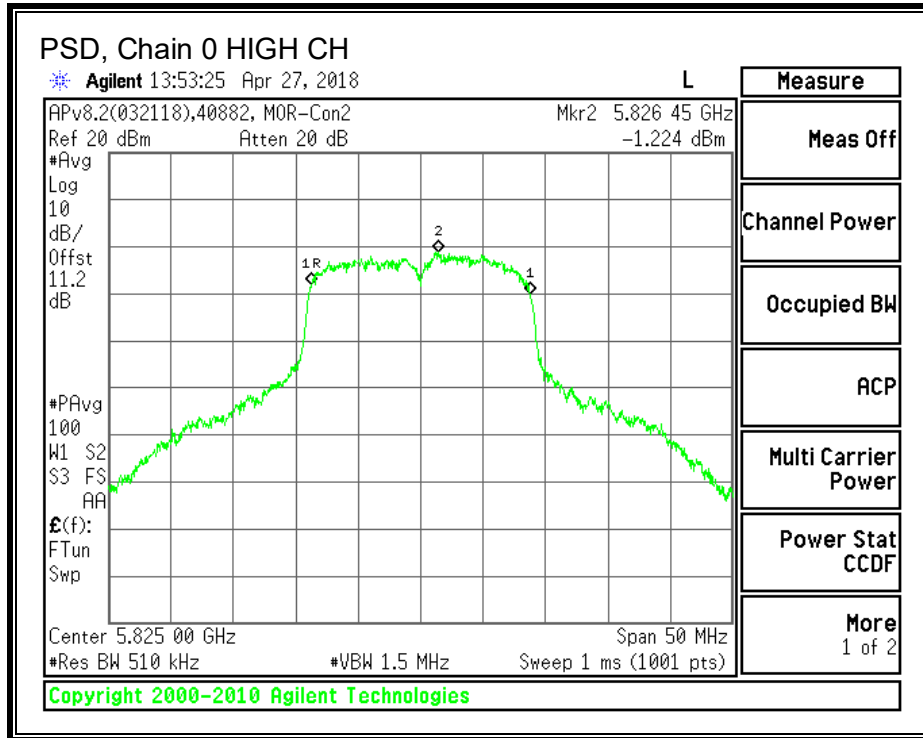
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5745	-1.600	-1.136	4.92	30.00	-25.08
Mid	5785	-1.166	-1.582	4.91	30.00	-25.09
High	5825	-1.224	-1.462	4.94	30.00	-25.06

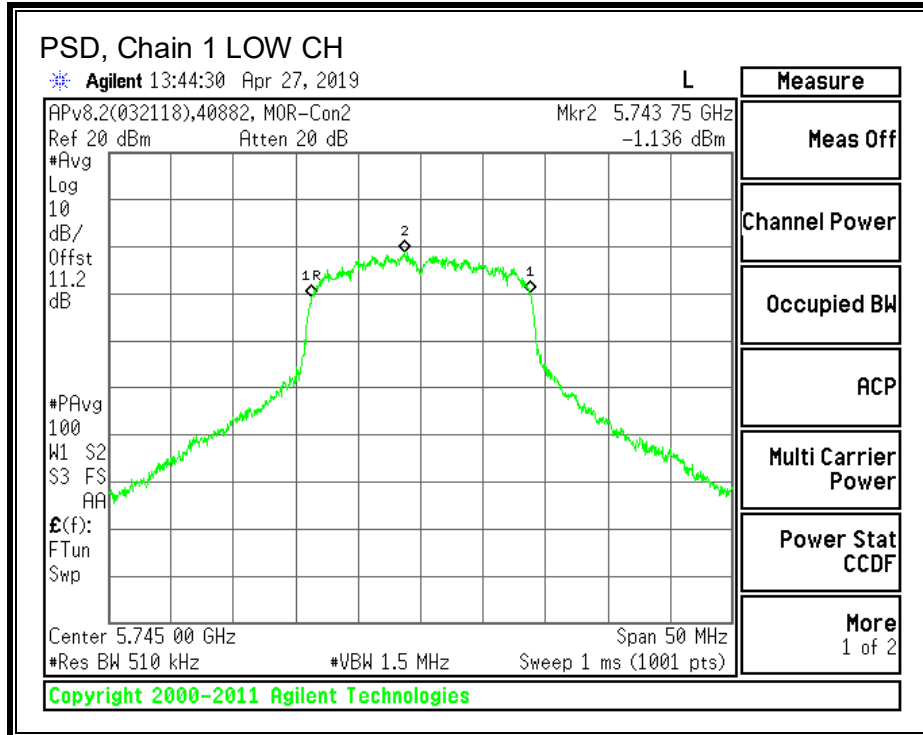
Note - PSD from 802.11n20 MCS0 was used to represent 802.11n20 MCS7 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

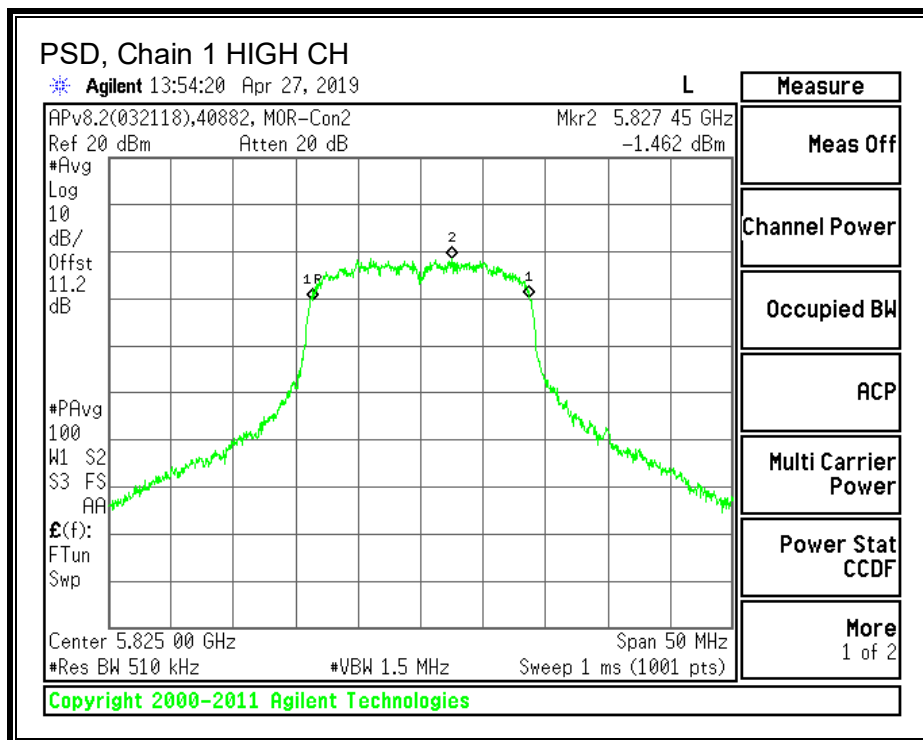
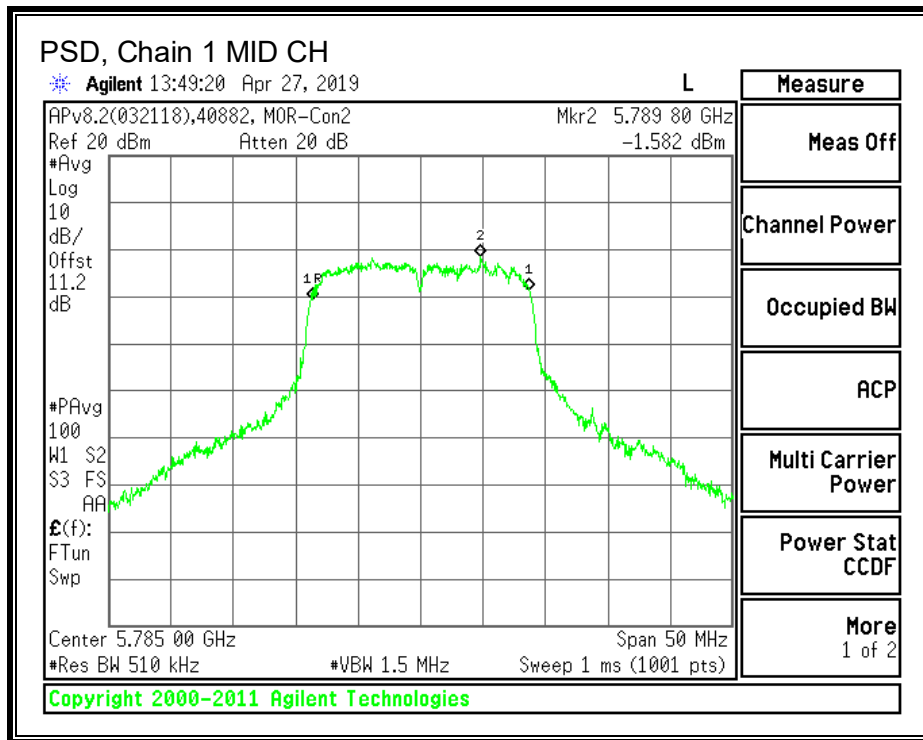
PSD, Chain 0





PSD, Chain 1





8.16. 802.11n HT40 MODE IN THE 5.8 GHz BAND

8.16.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 Issue 2 Section 6.2.4.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

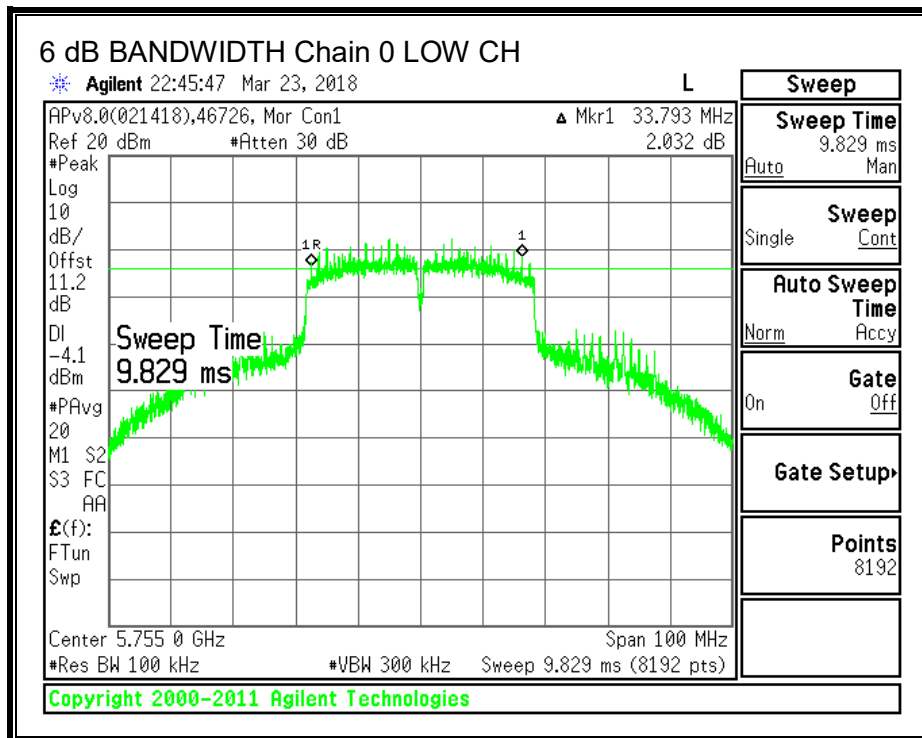
TEST INFORMATION

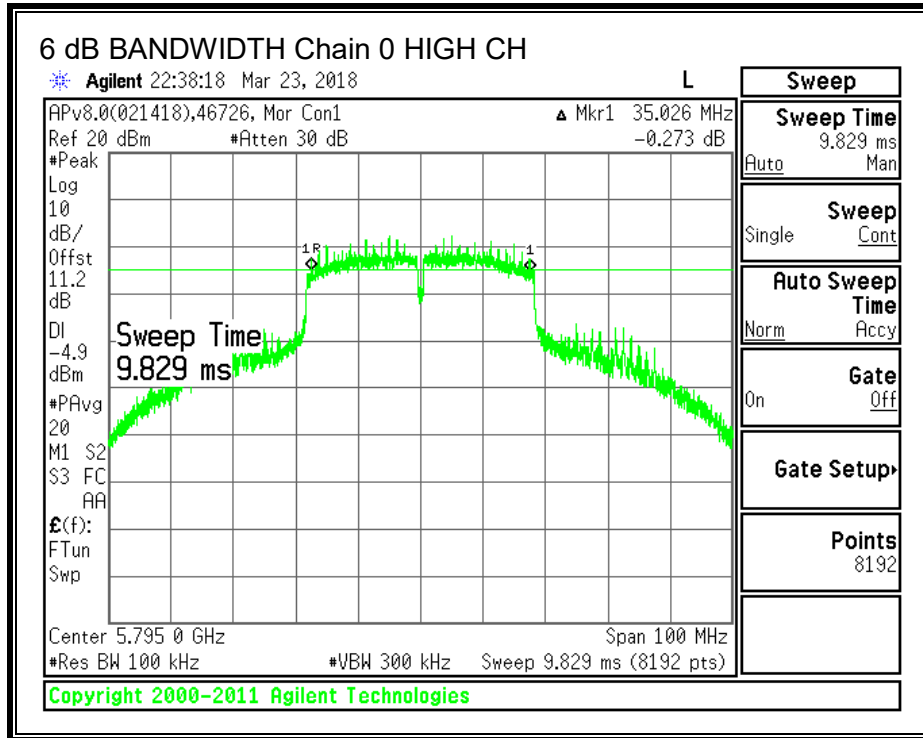
Test Date: 2018-03-23
 Project: 12053557
 Tested By: 46726/46722

RESULTS

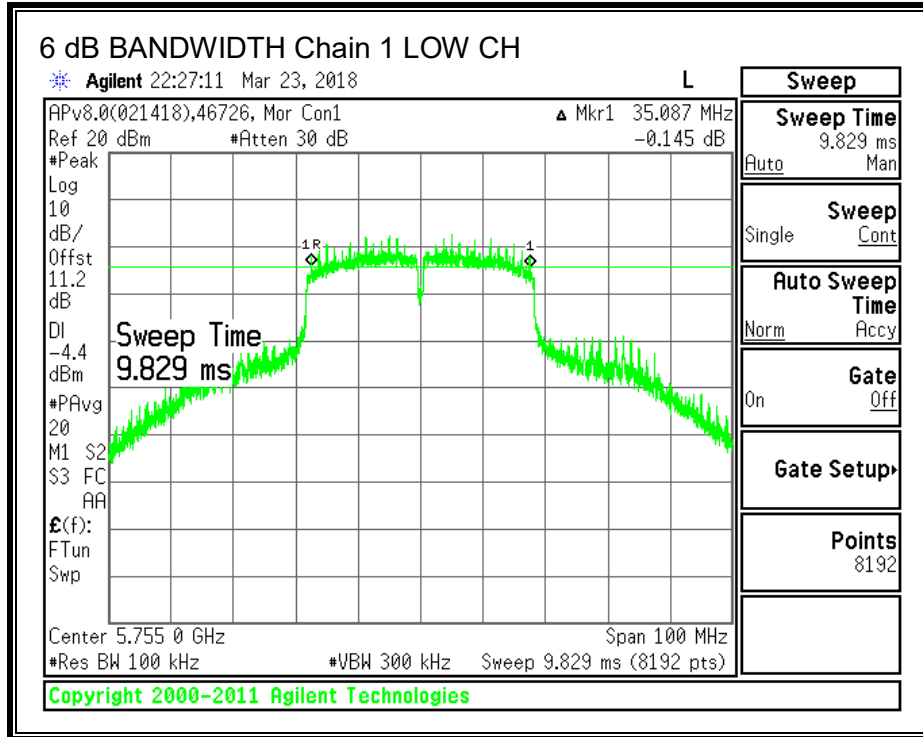
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5755	33.793	35.087	0.5
High	5795	35.026	35.038	0.5

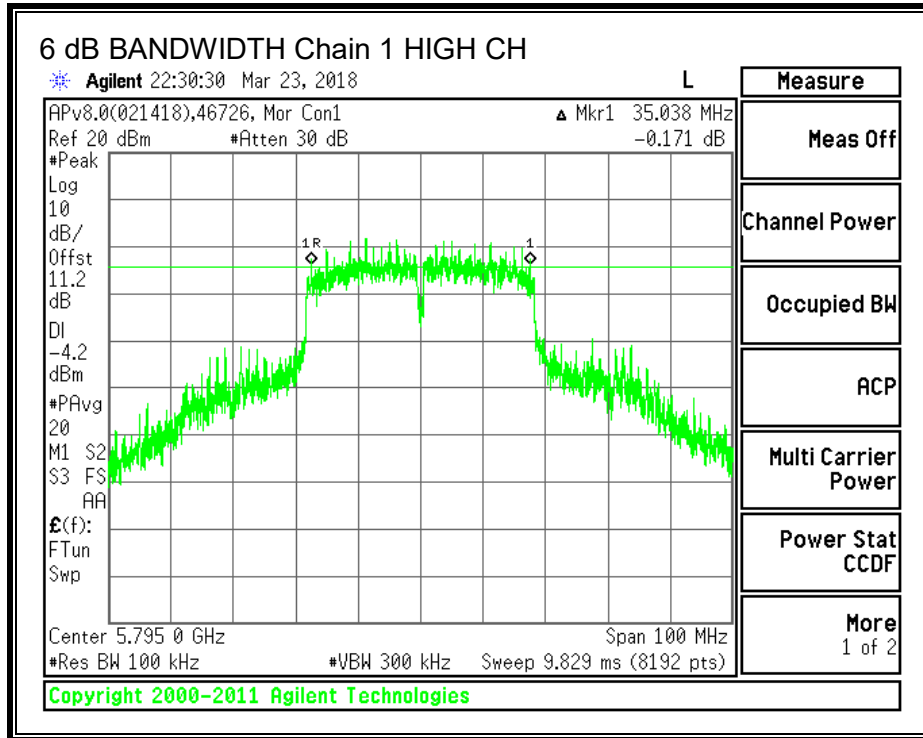
6 dB BANDWIDTH, Chain 0





6 dB BANDWIDTH, Chain 1





8.16.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

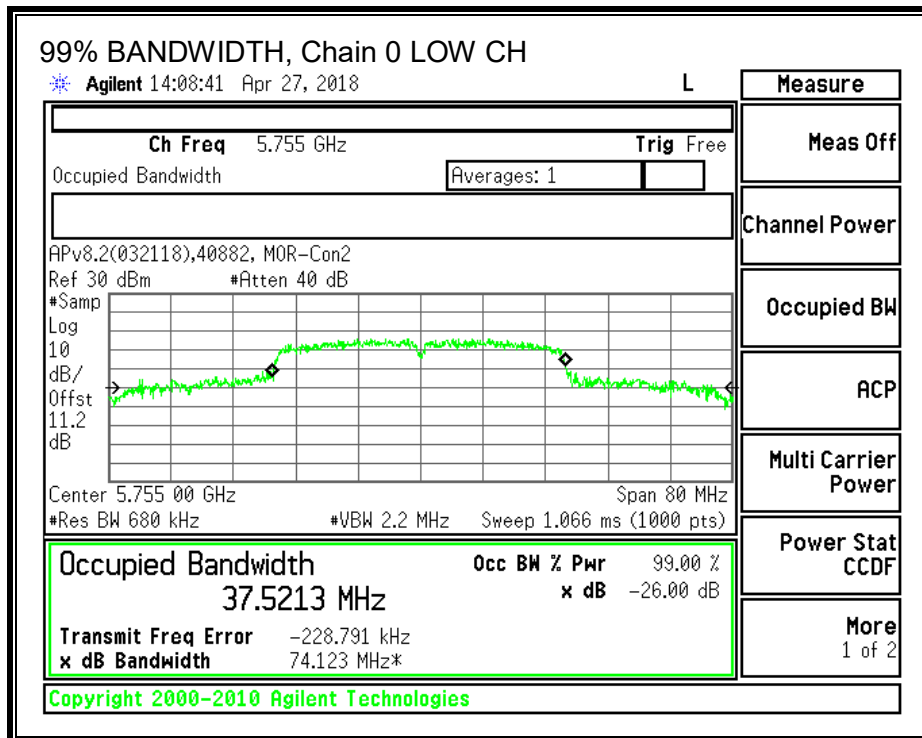
TEST INFORMATION

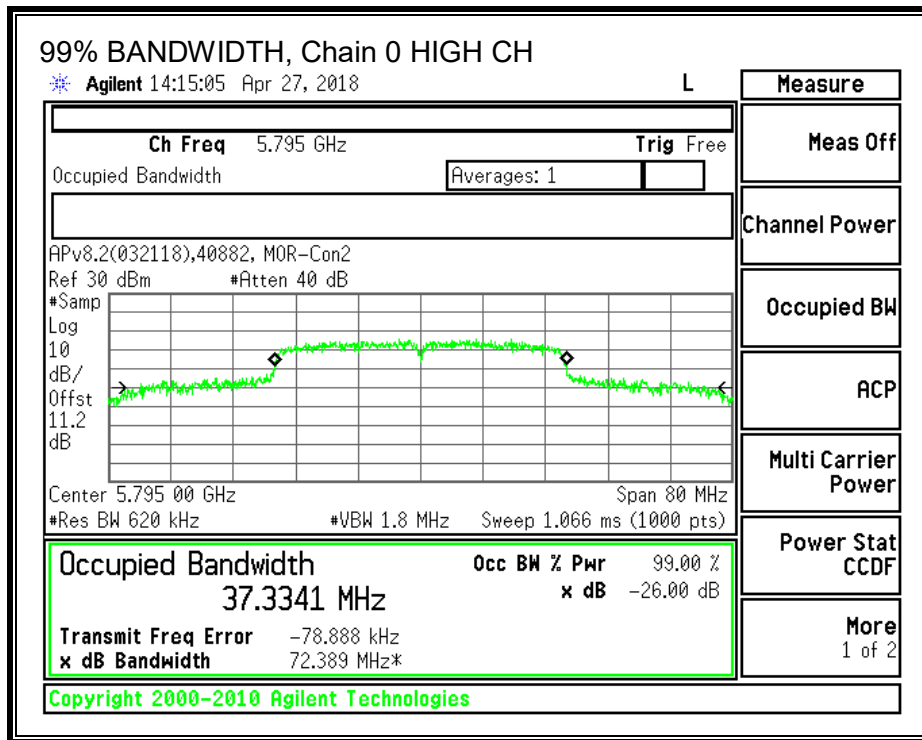
Test Date: 2018-04-27
 Project: 12053557
 Tested By: 40882

RESULTS

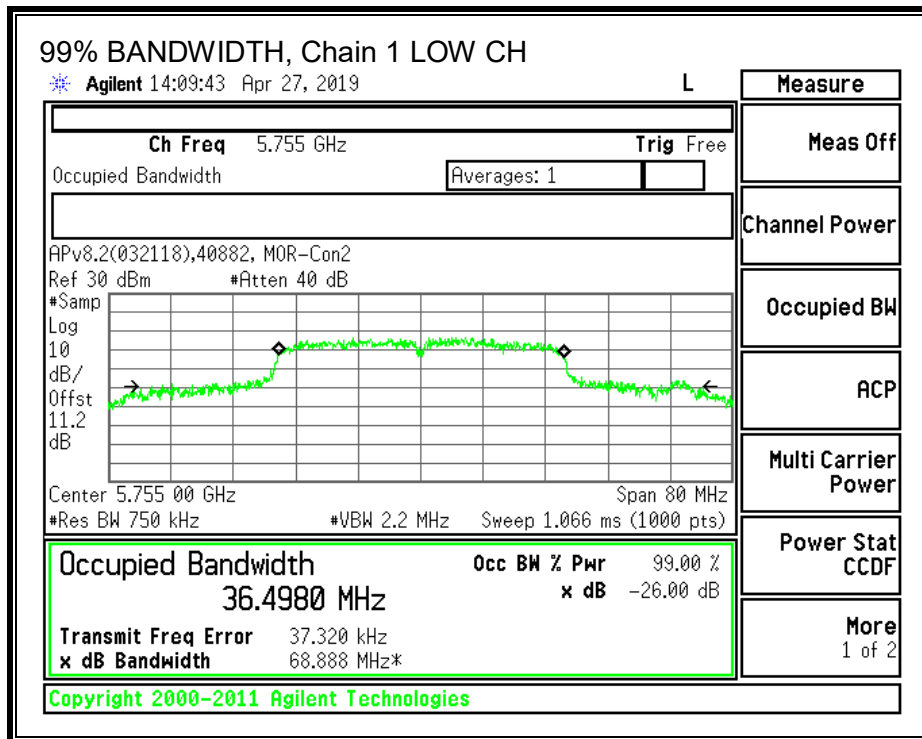
Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Low	5755	37.5213	36.4980
High	5795	37.3341	36.2717

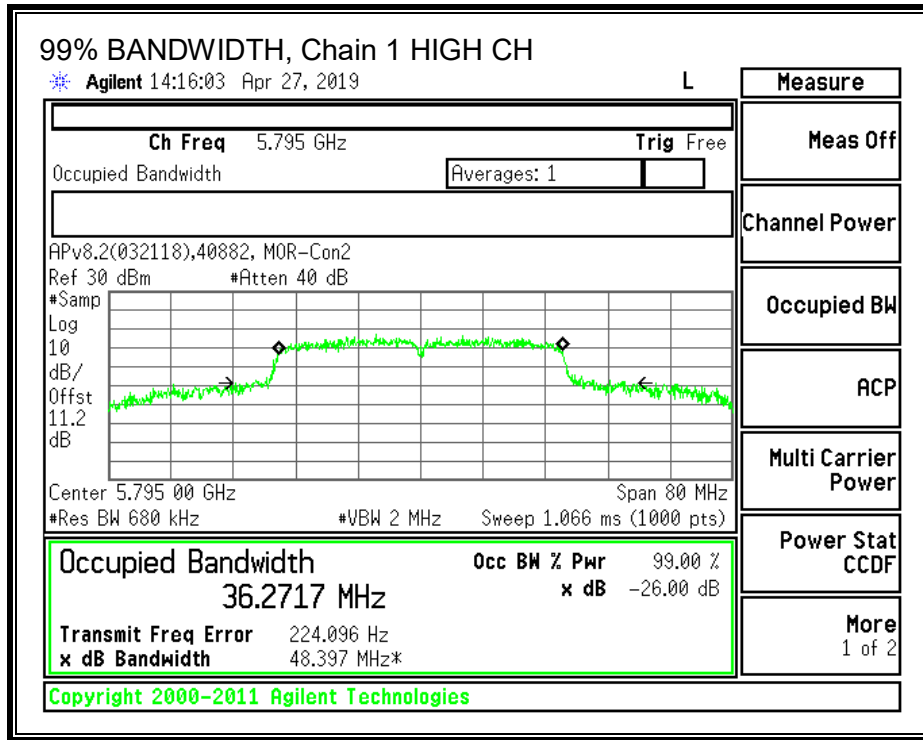
99% BANDWIDTH, Chain 0





99% BANDWIDTH, Chain 1





8.16.3. OUTPUT POWER – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	2.16	30.00
High	5795	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	14.05	14.91	17.51	30.00	-12.49
High	5795	13.96	14.79	17.41	30.00	-12.59

RESULTS MCS7

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	2.16	30.00
High	5795	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	13.97	14.81	17.42	30.00	-12.58
High	5795	13.86	14.67	17.29	30.00	-12.71

8.16.4. OUTPUT POWER – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	1.92	30.00
High	5795	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	14.05	14.91	17.51	30.00	-12.49
High	5795	13.96	14.79	17.41	30.00	-12.59

RESULTS MCS7

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Low	5755	1.92	30.00
High	5795	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	13.97	14.81	17.42	30.00	-12.58
High	5795	13.86	14.67	17.29	30.00	-12.71

8.16.5. MAXIMUM POWER SPECTRAL DENSITY – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27
Project: 12053557
Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5755	5.17	30.00
High	5795	5.17	30.00

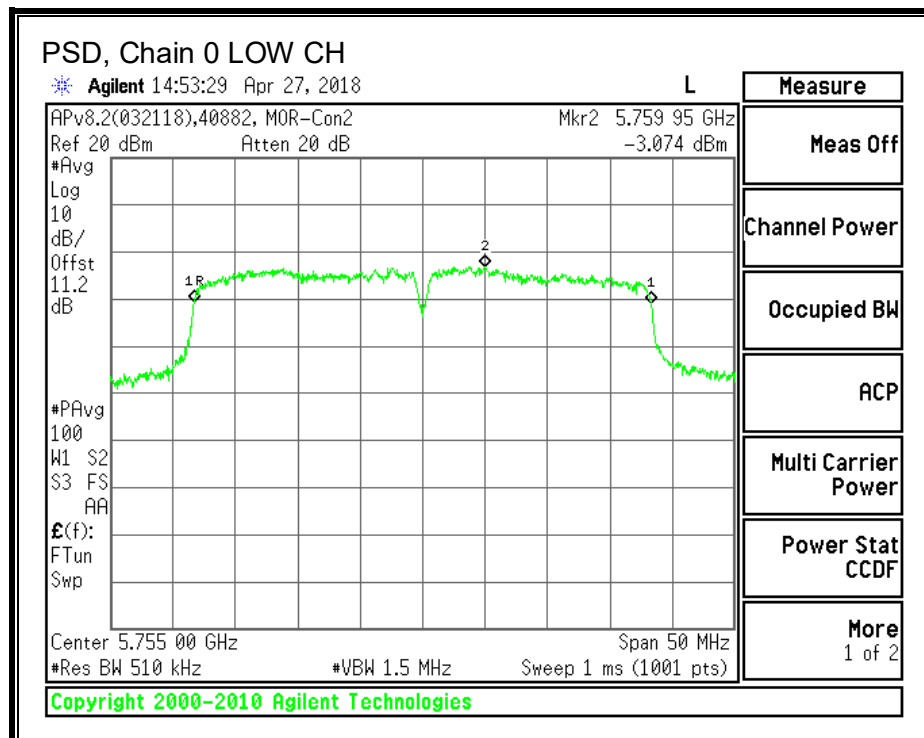
Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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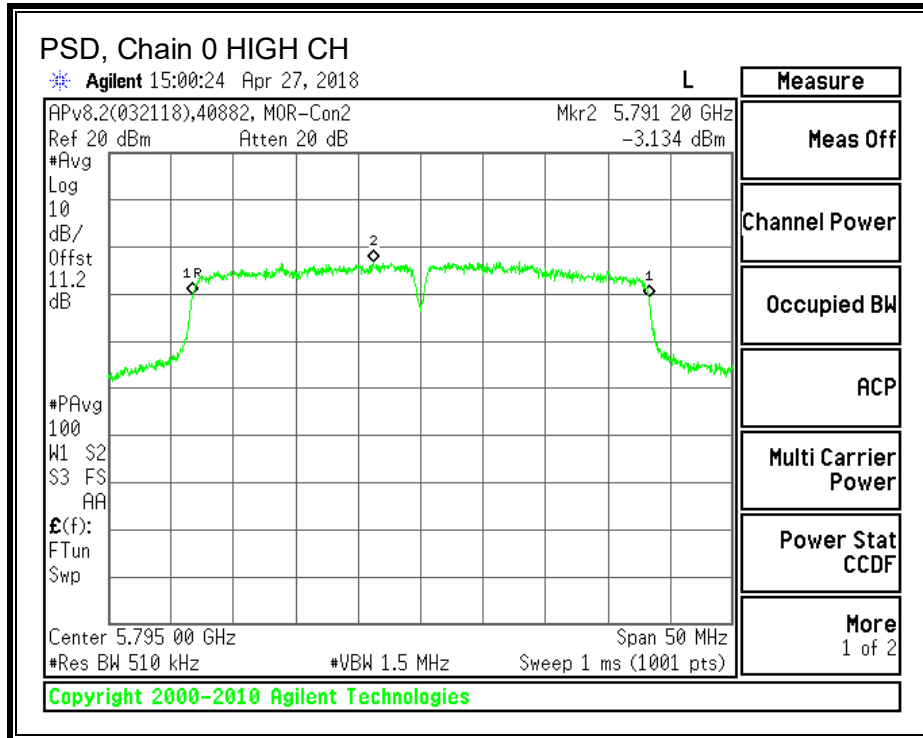
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	-3.074	-3.744	2.13	30.00	-27.87
High	5795	-3.134	-3.337	2.30	30.00	-27.70

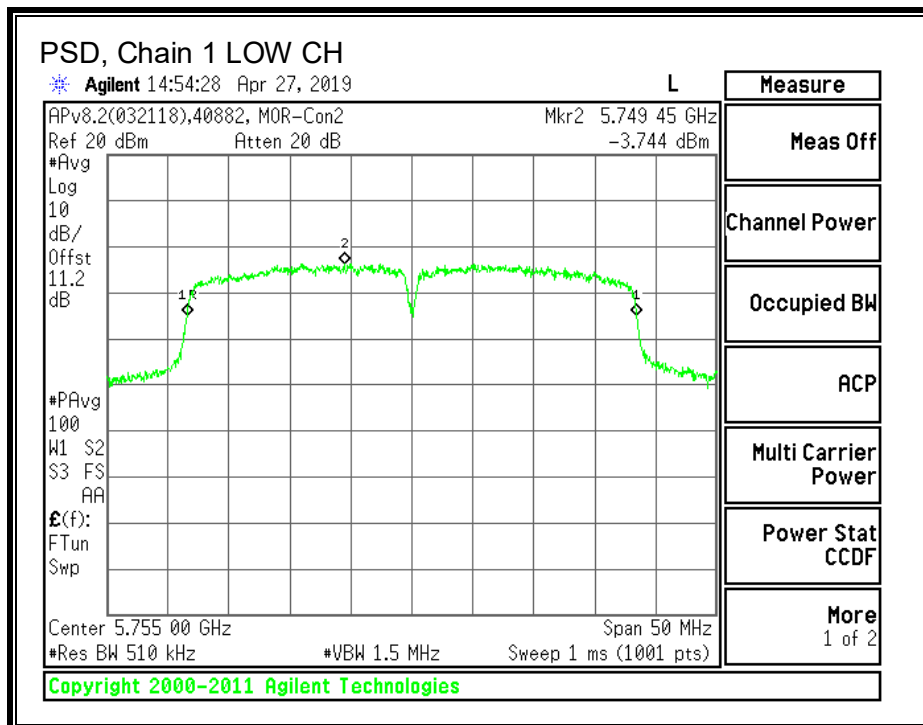
Note - PSD from 802.11n40 MCS0 was used to represent 802.11n40 MCS7 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0

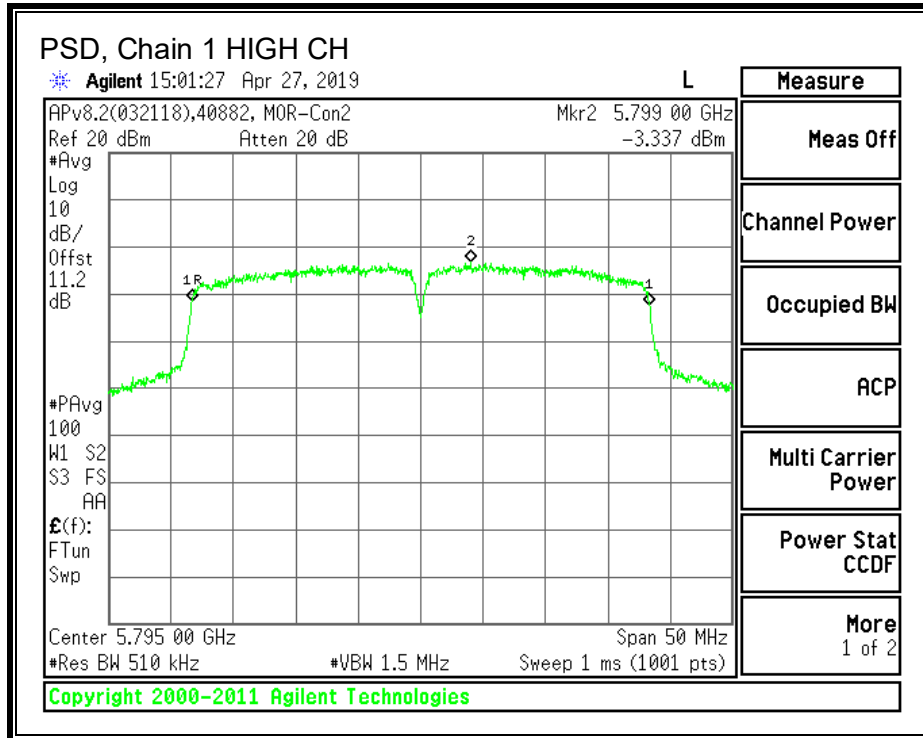




PSD, Chain 1



Note: Date should be Apr 27, 2018.



Note: Date should be Apr 27, 2018.

8.16.6. MAXIMUM POWER SPECTRAL DENSITY – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27

Project: 12053557

Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Low	5755	4.92	30.00
High	5795	4.92	30.00

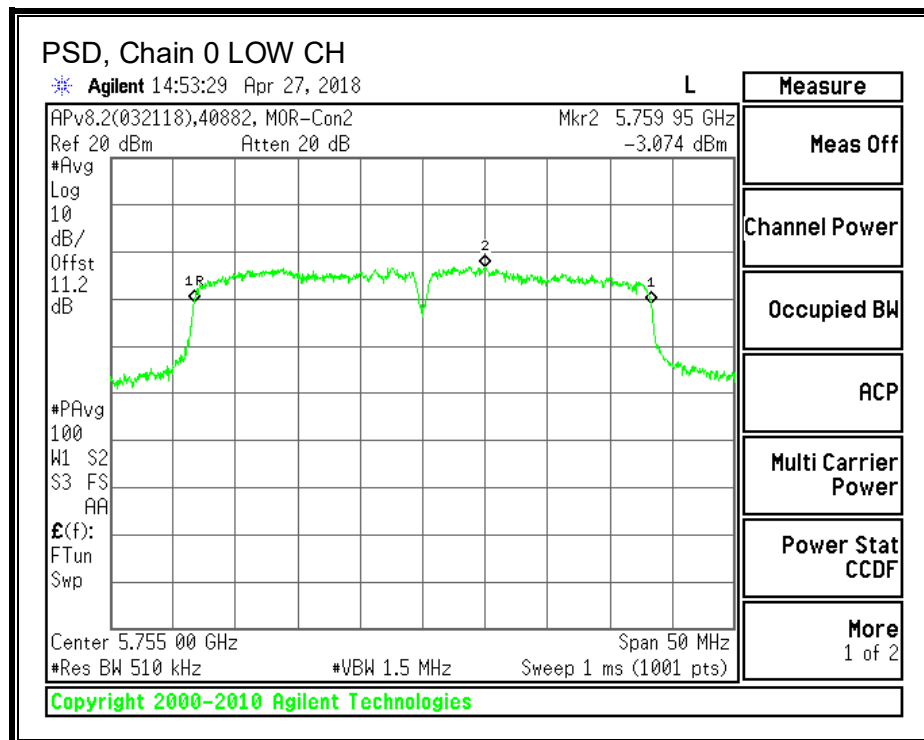
Duty Cycle CF (dB)	2.52	Included in Calculations of Corr'd PSD
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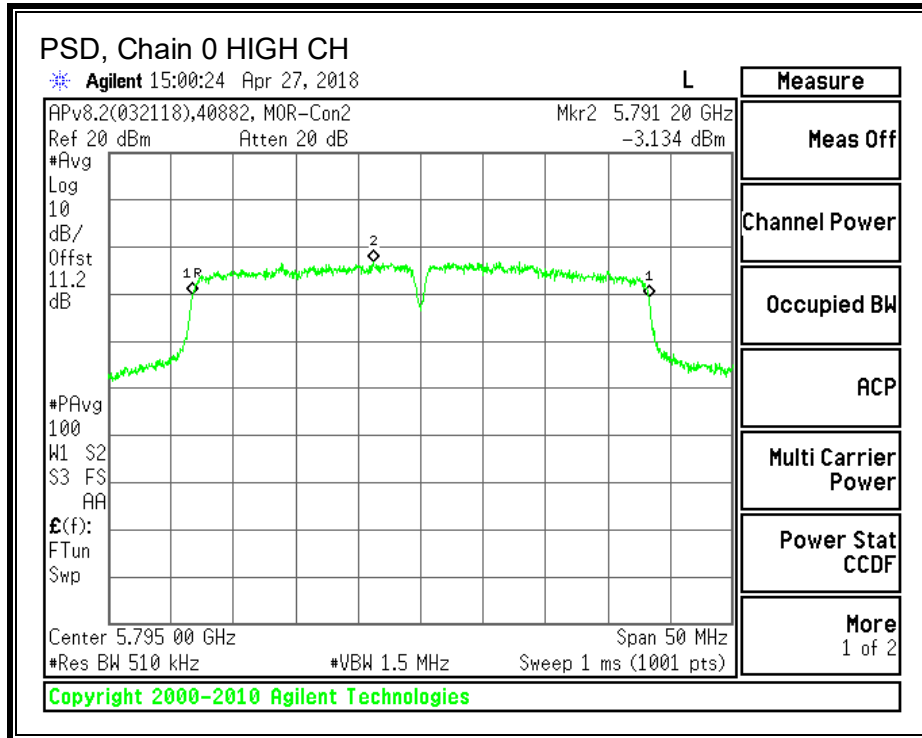
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	-3.074	-3.744	2.13	30.00	-27.87
High	5795	-3.134	-3.337	2.30	30.00	-27.70

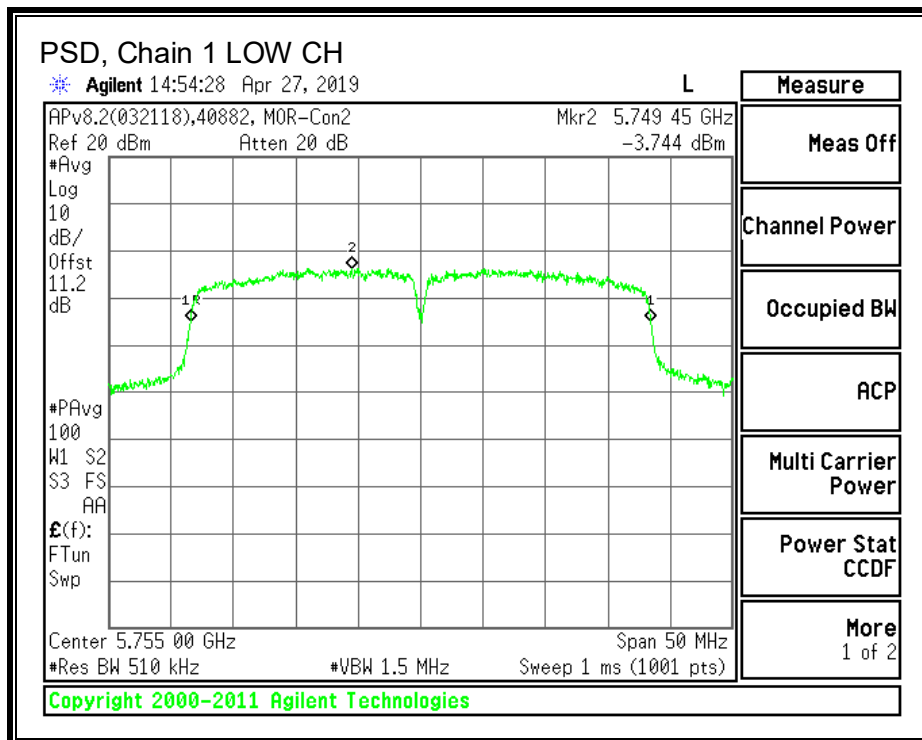
Note - PSD from 802.11n40 MCS0 was used to represent 802.11n40 MCS7 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0

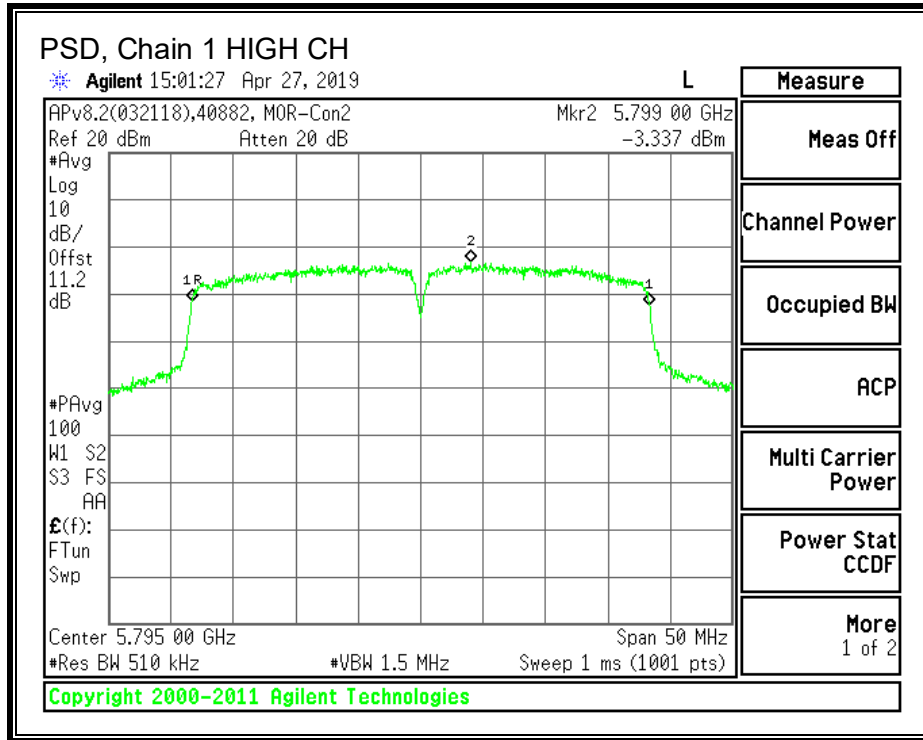




PSD, Chain 1



Note: Date should be Apr 27, 2018.



Note: Date should be Apr 27, 2018.

8.17. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

8.17.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 Issue 2 Section 6.2.4.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

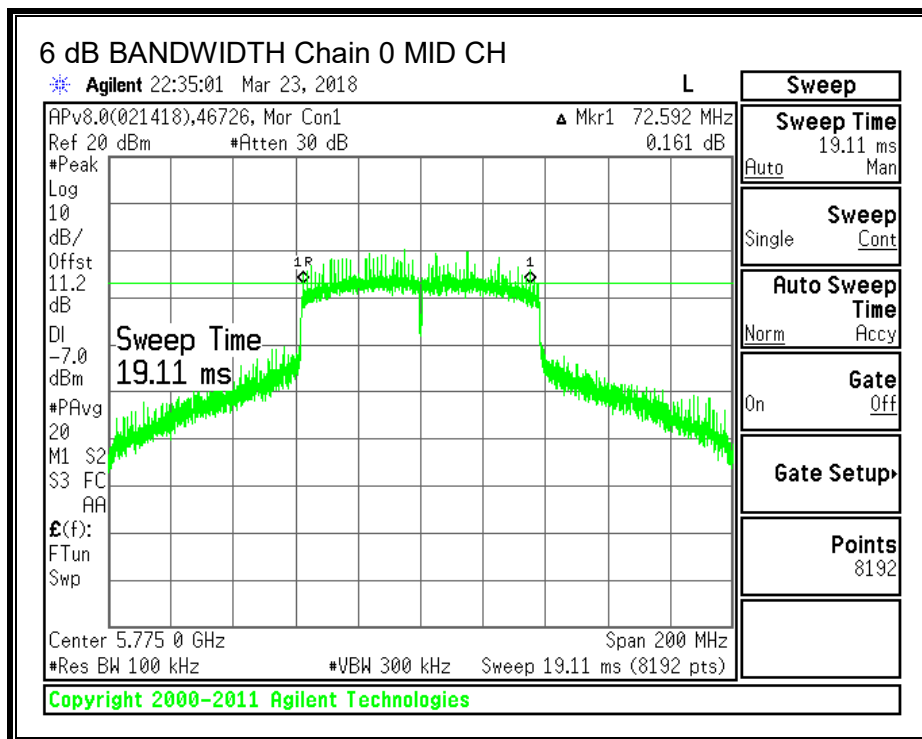
TEST INFORMATION

Test Date: 2018-03-23
 Project: 12053557
 Tested By: 46726/46722

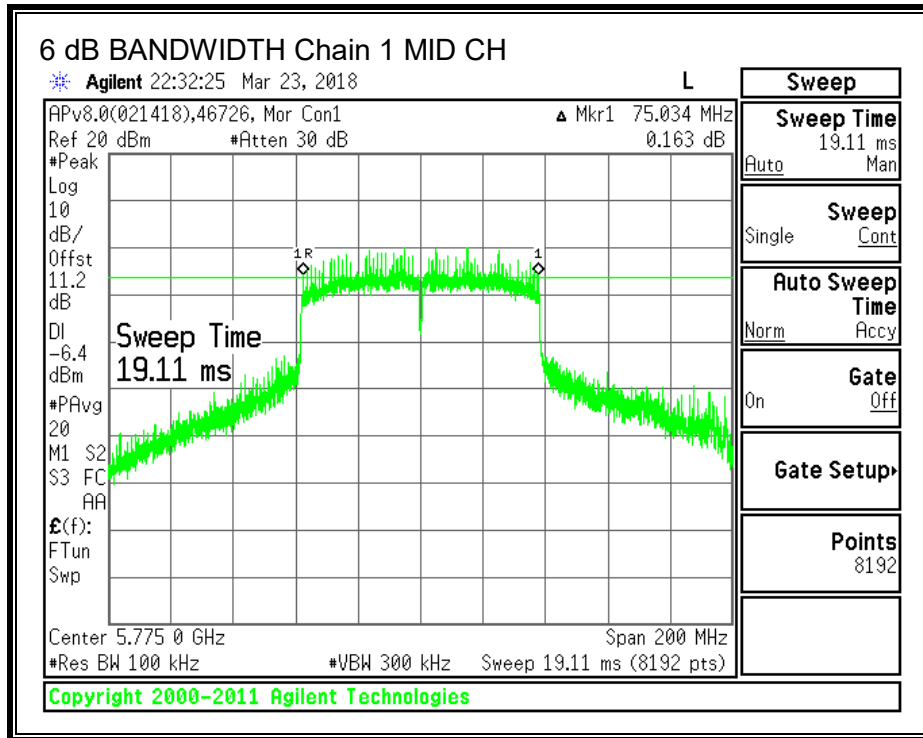
RESULTS

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Mid	5775	72.5920	75.0340	0.5

6 dB BANDWIDTH, Chain 0



6 dB BANDWIDTH, Chain 1



8.17.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

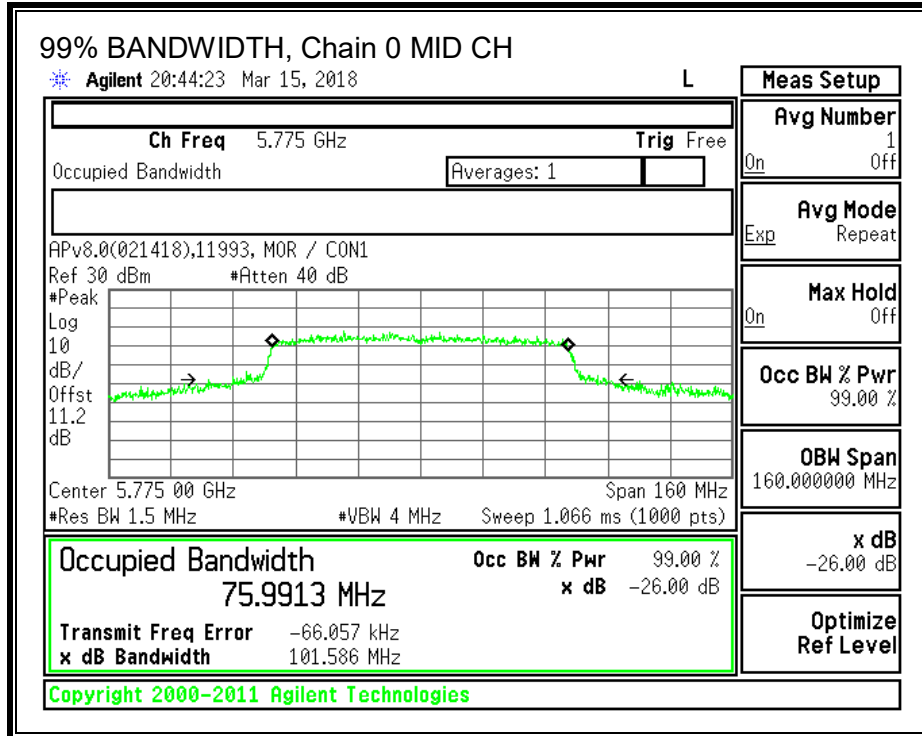
TEST INFORMATION

Test Date: 2018-03-15 and 2018-03-16
Project: 12053557
Tested By: 46726/46722

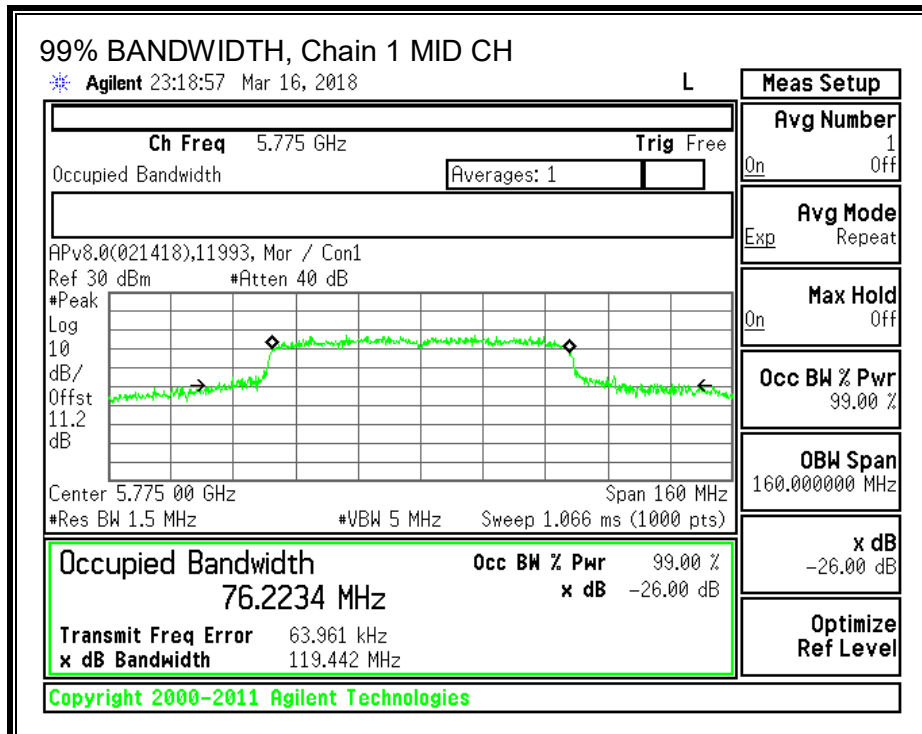
RESULTS

Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 1 (MHz)
Mid	5775	75.9913	76.2234

99% BANDWIDTH, Chain 0



99% BANDWIDTH, Chain 1



8.17.3. OUTPUT POWER – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	13.77	14.53	17.18	30.00	-12.82

RESULTS MCS9

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	2.16	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	13.82	14.65	17.27	30.00	-12.73

8.17.4. OUTPUT POWER – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-03-30

Project: 12053557

Tested By: 46722

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	13.77	14.53	17.18	30.00	-12.82

RESULTS MCS9

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)
Mid	5775	1.92	30.00

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	13.82	14.65	17.27	30.00	-12.73

8.17.5. MAXIMUM POWER SPECTRAL DENSITY – EXTERNAL ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27
Project: 12053557
Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Directional Gain for Power (dBi)
2.16

Antenna Gain (dBi)	10 * Log (2 chains) (dB)	Directional Gain for PSD (dBi)
2.16	3.01	5.17

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Mid	5755	5.17	30.00

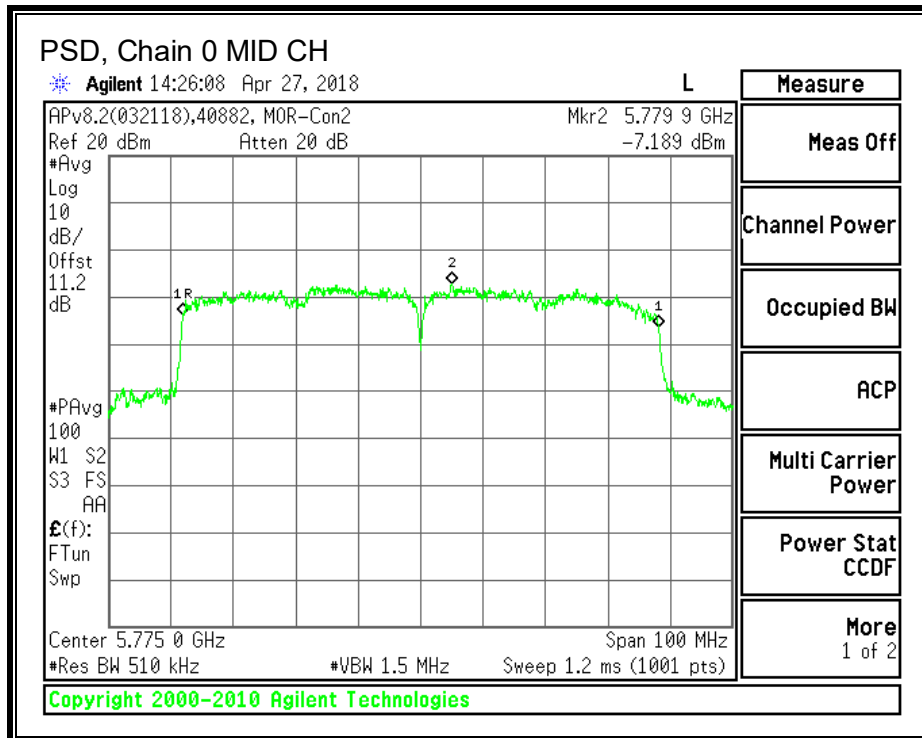
Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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PSD Results

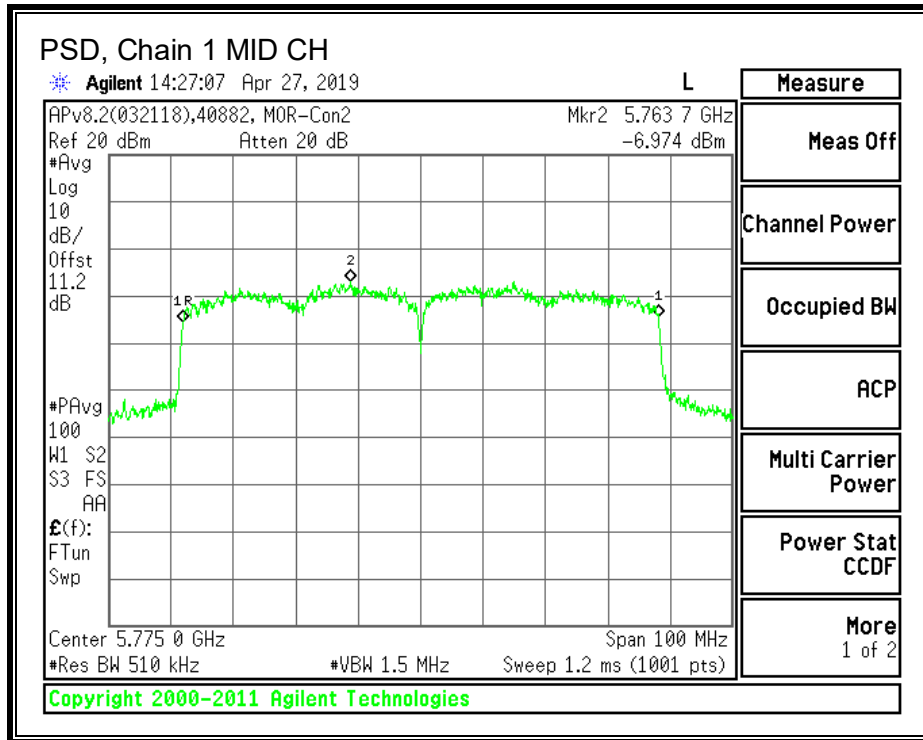
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5755	-7.189	-6.974	-0.45	30.00	-30.45

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0



PSD, Chain 1



Note: Date should be Apr 27, 2018.

8.17.6. MAXIMUM POWER SPECTRAL DENSITY – PCB ANTENNAS

LIMITS

FCC §15.407 (a) (3)

RSS-247 Issue 2 Section 6.2.4.1

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST INFORMATION

Test Date: 2018-04-27

Project: 12053557

Tested By: 40882

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for Power (dBi)
1.52	2.28	1.92

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Directional Gain for PSD (dBi)
1.52	2.28	4.92

RESULTS MCS0

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	PSD Limit (dBm)
Mid	5755	4.92	30.00

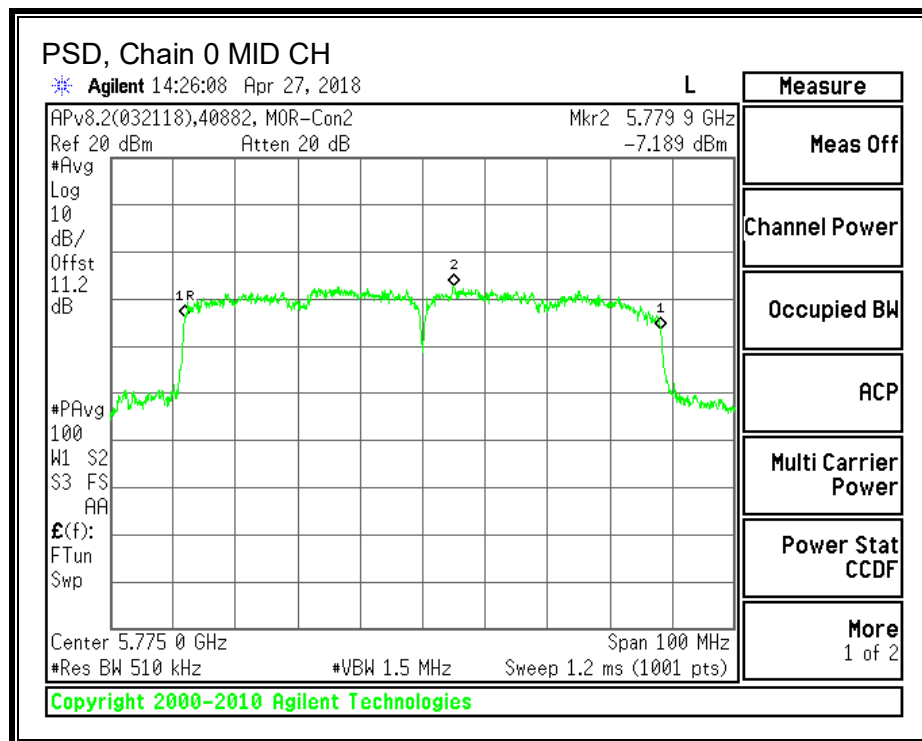
Duty Cycle CF (dB)	3.62	Included in Calculations of Corr'd PSD
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PSD Results

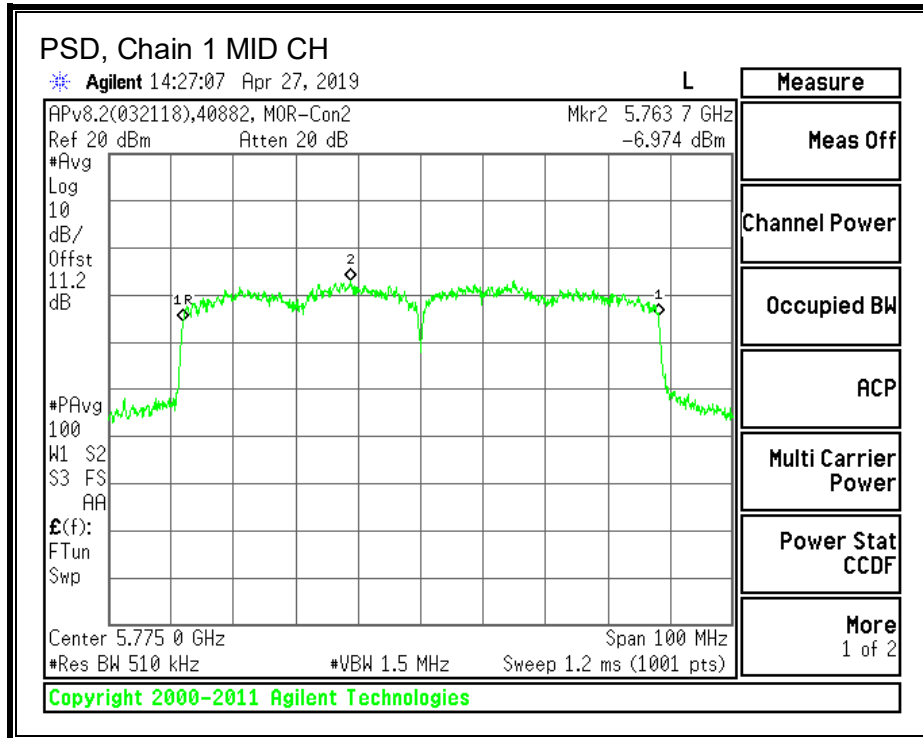
Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm)	Chain 1 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Mid	5755	-7.189	-6.974	-0.45	30.00	-30.45

Note - PSD from 802.11ac80 MCS0 was used to represent 802.11ac80 MCS9 because the MCS0 data was taken at the same or higher power setting and is therefore, worst-case.

PSD, Chain 0



PSD, Chain 1



Note: Date should be Apr 27, 2018.

9. ANTENNA PORT RESTRICTED BAND SPURIOUS EMISSIONS LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Power Limit (dBm)
30 - 88	-55.2
88 - 216	-51.7
216 - 960	-49.2
Above 960	-41.2

TEST PROCEDURE

The conducted measurements were made for this test.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. For this evaluation, RMS Power Averaging was used and the resolution/video bandwidth settings were 1MHz/3MHz.

Spurious emissions below 1GHz and above 18GHz are covered by radiated testing.

The spectrum from 1 to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

Both antenna ports were measured individually and then the ports and their associated antenna gained were summed as described in KDB 789033 D01 v02r01 Section G

All conducted spurious emissions were performed at lowest data rate since this yielded same or worst-case power and PSD as highest data rate. Additionally, all channels were tested at mid channel power settings to yield worst-case results.

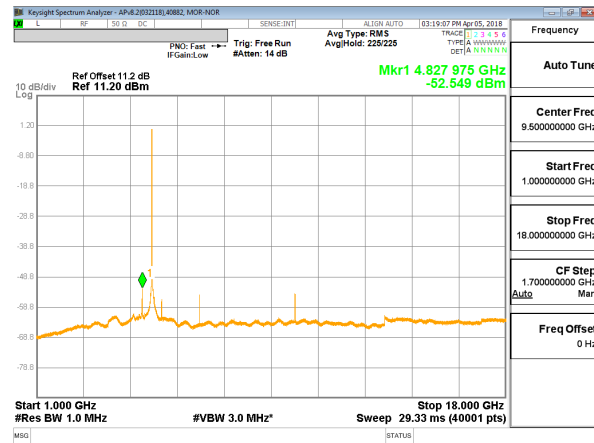
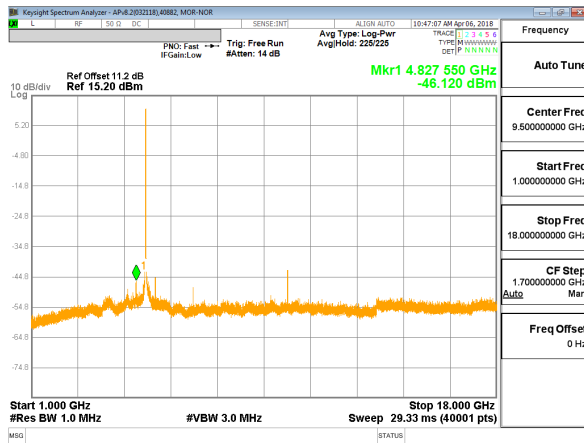
9.1. 5.2GHz BAND

Settings used:

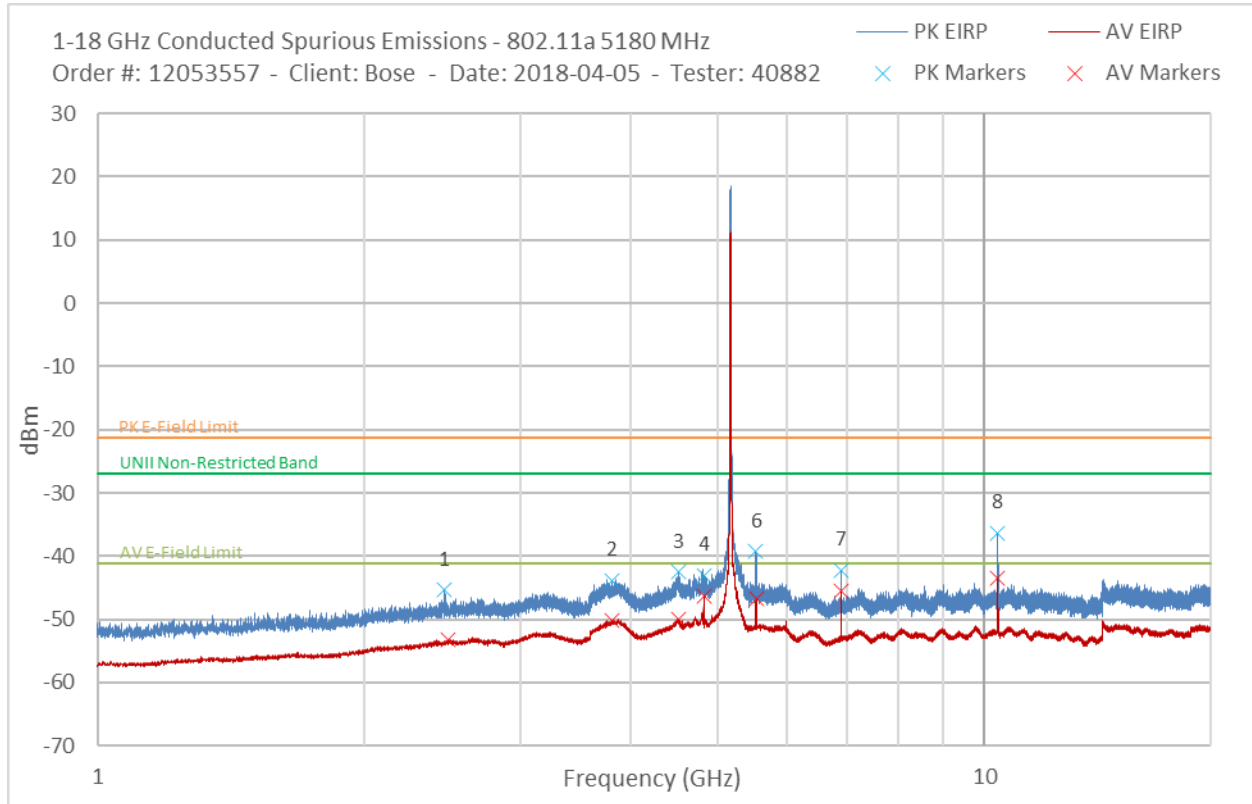
Detector: Pk and AV
RBW: 1M
VBW: 3M
Range: 1-18 MHz
Path Loss: 11.2 (10dB pad + 1.2 cable loss)

Measurements from both chains were inserted into a spreadsheet where the measurements were combined. Worst-case antenna gain (External antenna 2.16 dBi) was used.

Example plots:



9.1.1. 802.11a MODE IN THE 5.2GHz BAND – LOW CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	2463.28	-56.31	-51.85	2.16	2.16	3.01	-45.34	-21.20	-24.14	-27.00	-18.34
2	3803.73	-51.23	-52.96	2.16	2.16	3.01	-43.82	-21.20	-22.62	-27.00	-16.82
3	4517.30	-48.90	-53.92	2.16	2.16	3.01	-42.54	-21.20	-21.34	-27.00	-15.54
4	4827.55	-46.12	-52.15	2.16	2.16	0.00 ¹	-42.99	-21.20	-21.79	-27.00	-15.99
6	5530.08	-45.03	-53.33	2.16	2.16	3.01	-39.25	-21.20	-18.05	-27.00	-12.25
7	6906.65	-48.37	-54.13	2.16	2.16	3.01	-42.17	-21.20	-20.97	-27.00	-15.17
8	10359.35	-42.53	-48.36	2.16	2.16	3.01	-36.35	-21.20	-15.15	-27.00	-9.35

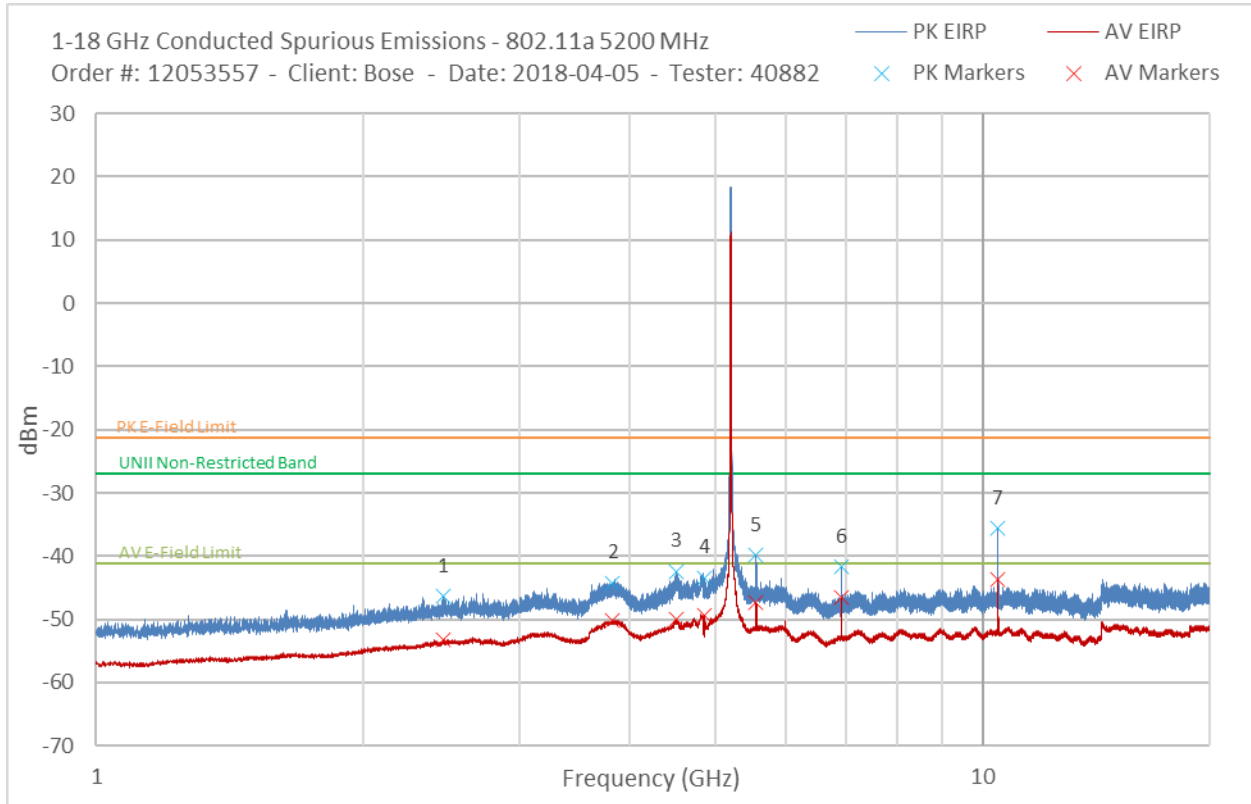
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	2482.40	-65.14	-64.56	2.16	2.16	3.01	3.41	-53.24	-41.20	-12.04
2	3802.03	-61.96	-61.52	2.16	2.16	3.01	3.41	-50.14	-41.20	-8.94
3	4527.50	-60.95	-62.34	2.16	2.16	3.01	3.41	-49.99	-41.20	-8.79
4	4827.98	-52.55	-60.18	2.16	2.16	0.00	3.41	-46.28	-41.20	-5.08
6	5533.05	-56.29	-62.39	2.16	2.16	3.01	3.41	-46.75	-41.20	-5.55
7	6906.65	-54.67	-63.13	2.16	2.16	3.01	3.41	-45.51	-41.20	-4.31
8	10359.78	-54.49	-55.56	2.16	2.16	3.01	3.41	-43.39	-41.20	-2.19

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.2. 802.11a MODE IN THE 5.2GHz BAND – MID CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	2462.85	-53.63	-55.76	2.16	2.16	3.01	-46.38	-21.20	-25.18	-27.00	-19.38
2	3826.25	-51.90	-52.97	2.16	2.16	3.01	-44.22	-21.20	-23.02	-27.00	-17.22
3	4512.20	-50.05	-51.14	2.16	2.16	3.01	-42.38	-21.20	-21.18	-27.00	-15.38
4	4847.95	-47.05	-51.13	2.16	2.16	0.00 ¹	-43.46	-21.20	-22.26	-27.00	-16.46
5	5548.35	-45.63	-53.86	2.16	2.16	3.01	-39.85	-21.20	-18.65	-27.00	-12.85
6	6933.43	-47.56	-55.41	2.16	2.16	3.01	-41.73	-21.20	-20.53	-27.00	-14.73
7	10401.85	-41.62	-48.37	2.16	2.16	3.01	-35.61	-21.20	-14.41	-27.00	-8.61

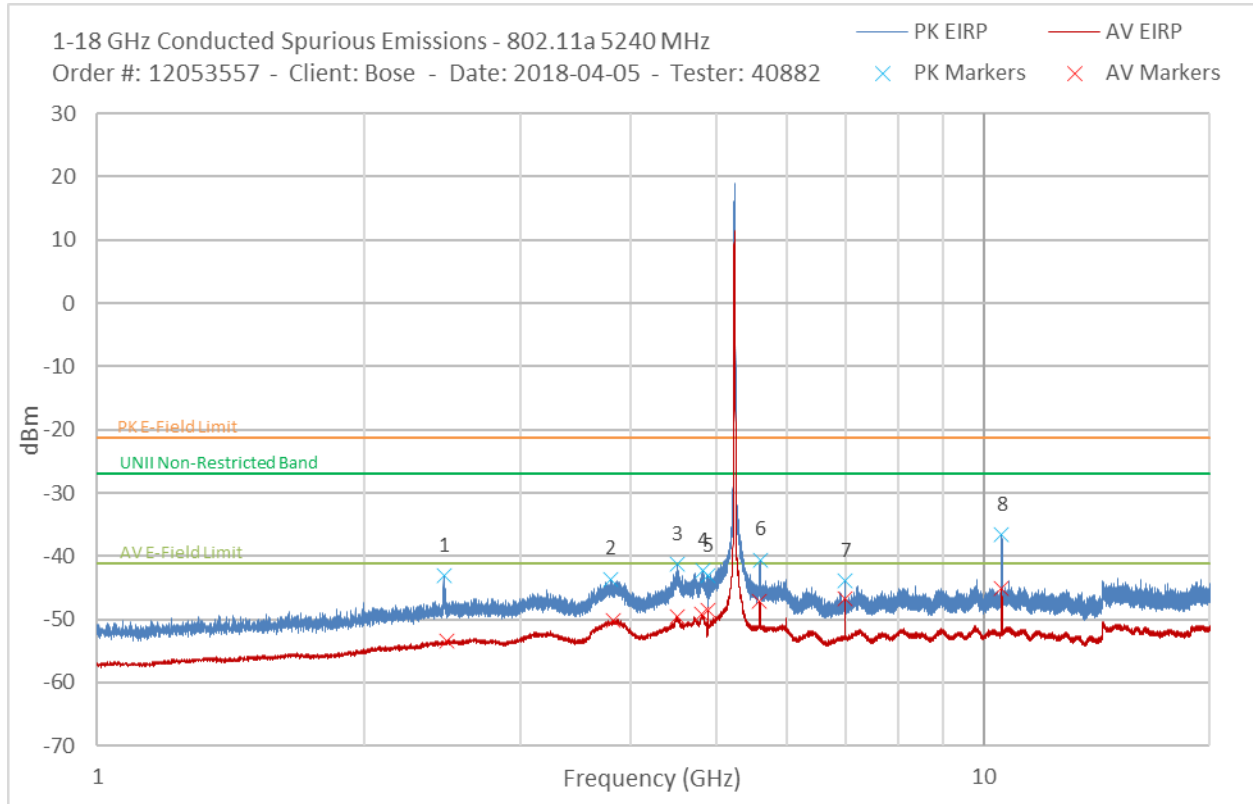
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	2464.55	-64.74	-64.87	2.16	2.16	3.01	3.41	-53.21	-41.20	-12.01
2	3825.40	-61.77	-61.97	2.16	2.16	3.01	3.41	-50.27	-41.20	-9.07
3	4516.45	-61.69	-61.63	2.16	2.16	3.01	3.41	-50.06	-41.20	-8.86
4	4847.95	-56.16	-61.35	2.16	2.16	0.00 ¹	3.41	-49.44	-41.20	-8.24
5	5548.78	-57.05	-62.69	2.16	2.16	3.01	3.41	-47.41	-41.20	-6.21
6	6933.43	-55.78	-63.32	2.16	2.16	3.01	3.41	-46.48	-41.20	-5.28
7	10400.15	-54.43	-56.50	2.16	2.16	3.01	3.41	-43.75	-41.20	-2.55

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.3. 802.11a MODE IN THE 5.2GHz BAND – HIGH CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	2460.30	-55.04	-49.34	2.16	2.16	3.01	-43.13	-21.20	-21.93	-27.00	-16.13
2	3798.20	-52.40	-51.35	2.16	2.16	3.01	-43.66	-21.20	-22.46	-27.00	-16.66
3	4514.75	-49.17	-49.92	2.16	2.16	3.01	-41.35	-21.20	-20.15	-27.00	-14.35
4	4816.50	-49.29	-52.18	2.16	2.16	3.01	-42.31	-21.20	-21.11	-27.00	-15.31
5	4887.90	-46.17	-52.50	2.16	2.16	0.00 ¹	-43.10	-21.20	-21.90	-27.00	-16.10
6	5597.65	-46.39	-54.33	2.16	2.16	3.01	-40.57	-21.20	-19.37	-27.00	-13.57
7	6986.55	-49.99	-56.34	2.16	2.16	3.01	-43.91	-21.20	-22.71	-27.00	-16.91
8	10481.33	-42.78	-49.05	2.16	2.16	3.01	-36.69	-21.20	-15.49	-27.00	-9.69

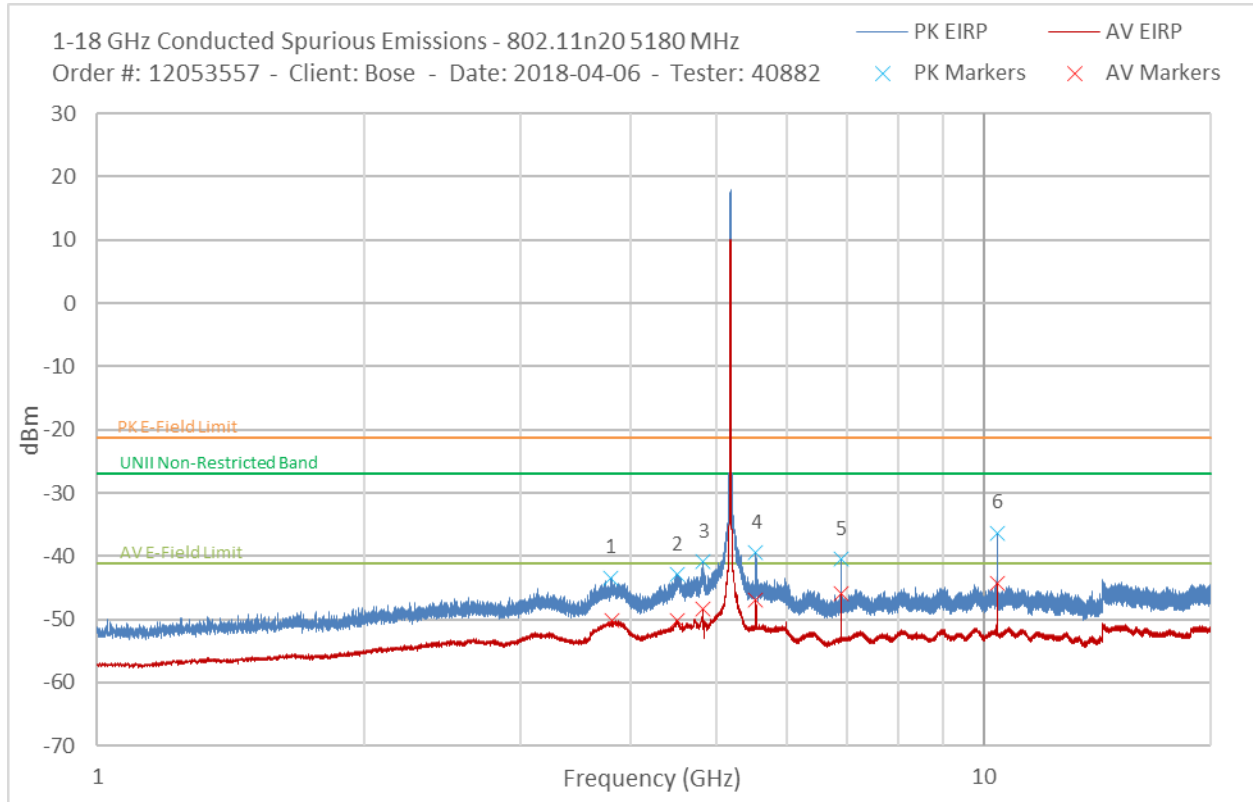
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	2477.30	-64.89	-64.95	2.16	2.16	3.01	3.41	-53.32	-41.20	-12.12
2	3825.83	-61.61	-61.80	2.16	2.16	3.01	3.41	-50.11	-41.20	-8.91
3	4513.90	-60.85	-61.45	2.16	2.16	3.01	3.41	-49.54	-41.20	-8.34
4	4811.83	-60.64	-60.93	2.16	2.16	3.01	3.41	-49.18	-41.20	-7.98
5	4887.90	-54.93	-62.23	2.16	2.16	0.00 ¹	3.41	-48.61	-41.20	-7.41
6	5591.28	-56.88	-62.19	2.16	2.16	3.01	3.41	-47.17	-41.20	-5.97
7	6986.55	-56.04	-63.93	2.16	2.16	3.01	3.41	-46.80	-41.20	-5.60
8	10479.63	-56.03	-57.60	2.16	2.16	3.01	3.41	-45.14	-41.20	-3.94

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.4. 802.11n HT20 MODE IN THE 5.2GHz BAND – LOW CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	3795.23	-51.30	-51.89	2.16	2.16	3.01	-43.40	-21.20	-22.20	-27.00	-16.40
2	4514.33	-49.53	-53.40	2.16	2.16	3.01	-42.86	-21.20	-21.66	-27.00	-15.86
3	4827.13	-43.68	-51.42	2.16	2.16	0.00 ¹	-40.84	-21.20	-19.64	-27.00	-13.84
4	5534.33	-45.16	-54.41	2.16	2.16	3.01	-39.50	-21.20	-18.30	-27.00	-12.50
5	6906.65	-46.10	-56.03	2.16	2.16	3.01	-40.50	-21.20	-19.30	-27.00	-13.50
6	10356.38	-42.68	-47.65	2.16	2.16	3.01	-36.31	-21.20	-15.11	-27.00	-9.31

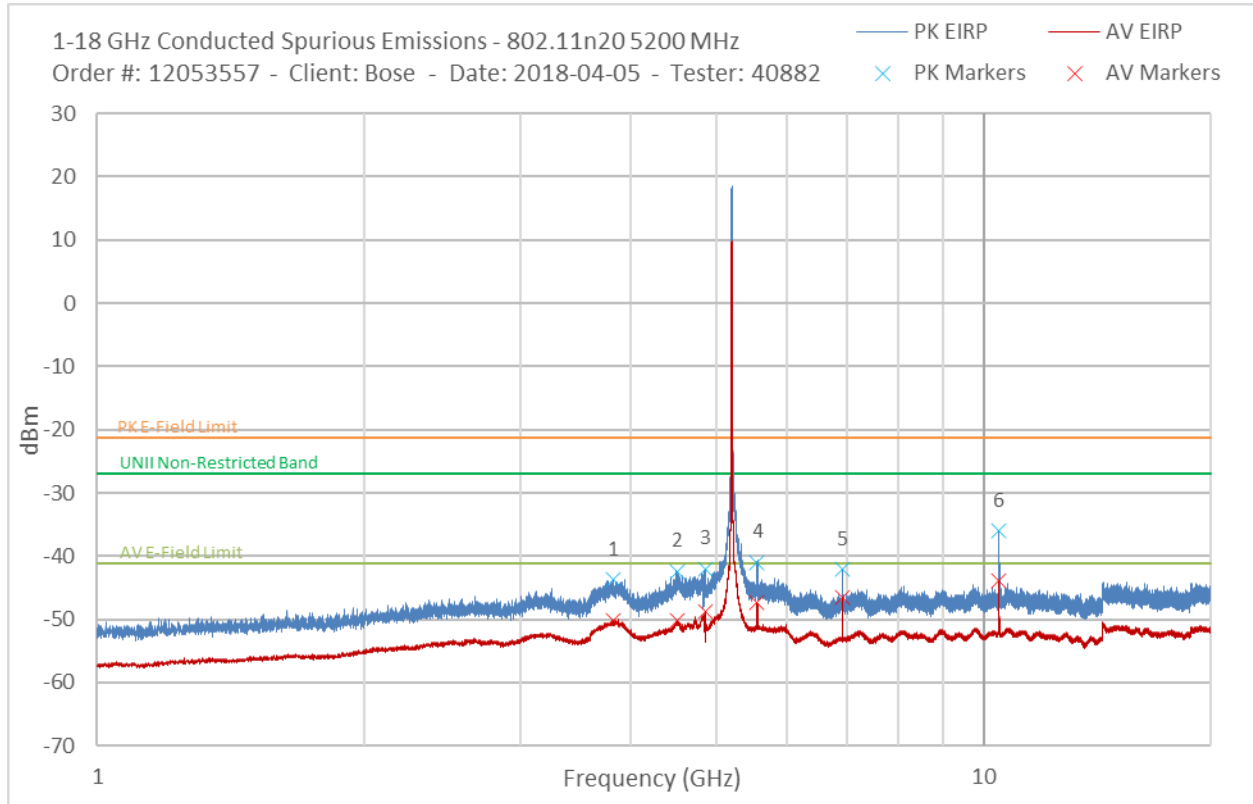
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	3802.03	-61.71	-61.66	2.16	2.16	3.01	3.27	-50.23	-41.20	-9.03
2	4515.60	-61.55	-61.88	2.16	2.16	3.01	3.27	-50.26	-41.20	-9.06
3	4827.98	-55.02	-60.19	2.16	2.16	0.00 ¹	3.27	-48.44	-41.20	-7.24
4	5534.33	-56.21	-62.64	2.16	2.16	3.01	3.27	-46.88	-41.20	-5.68
5	6906.65	-55.07	-63.09	2.16	2.16	3.01	3.27	-45.99	-41.20	-4.79
6	10359.78	-55.32	-56.04	2.16	2.16	3.01	3.27	-44.21	-41.20	-3.01

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.5. 802.11n HT20 MODE IN THE 5.2GHz BAND – MID CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	3819.45	-52.49	-51.34	2.16	2.16	3.01	-43.70	-21.20	-22.50	-27.00	-16.70
2	4514.33	-51.16	-50.04	2.16	2.16	3.01	-42.38	-21.20	-21.18	-27.00	-15.38
3	4848.38	-45.24	-50.91	2.16	2.16	0.00 ¹	-42.04	-21.20	-20.84	-27.00	-15.04
4	5550.05	-47.17	-53.20	2.16	2.16	3.01	-41.03	-21.20	-19.83	-27.00	-14.03
5	6934.28	-48.11	-55.23	2.16	2.16	3.01	-42.17	-21.20	-20.97	-27.00	-15.17
6	10399.30	-42.17	-48.39	2.16	2.16	3.01	-36.07	-21.20	-14.87	-27.00	-9.07

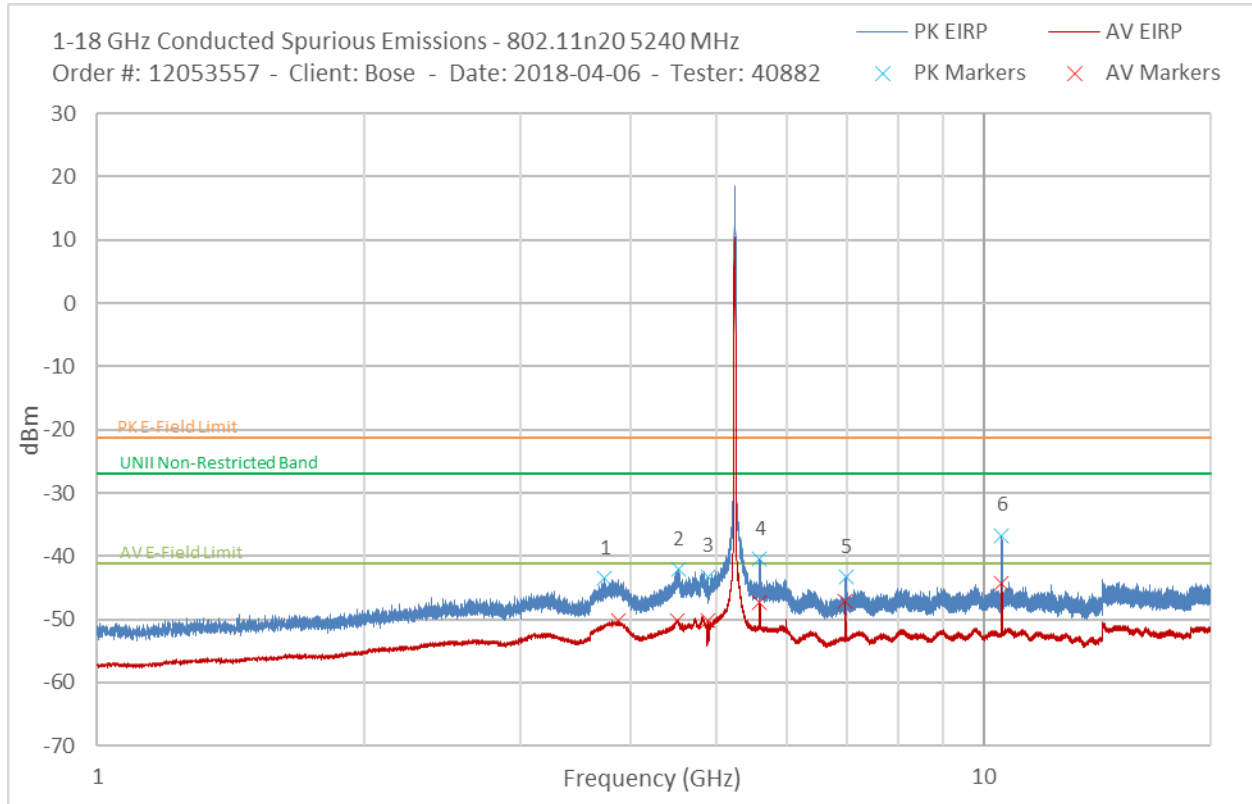
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	3816.90	-61.52	-61.80	2.16	2.16	3.01	3.27	-50.21	-41.20	-9.01
2	4518.58	-61.38	-61.95	2.16	2.16	3.01	3.27	-50.21	-41.20	-9.01
3	4847.95	-55.15	-61.15	2.16	2.16	0.00 ¹	3.27	-48.75	-41.20	-7.55
4	5550.48	-56.76	-63.01	2.16	2.16	3.01	3.27	-47.39	-41.20	-6.19
5	6933.43	-55.59	-63.31	2.16	2.16	3.01	3.27	-46.47	-41.20	-5.27
6	10399.73	-54.58	-56.21	2.16	2.16	3.01	3.27	-43.87	-41.20	-2.67

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.6. 802.11n HT20 MODE IN THE 5.2GHz BAND – HIGH CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	3738.70	-52.40	-51.11	2.16	2.16	3.01	-43.52	-21.20	-22.32	-27.00	-16.52
2	4523.25	-49.89	-50.66	2.16	2.16	3.01	-42.07	-21.20	-20.87	-27.00	-15.07
3	4888.75	-46.15	-53.44	2.16	2.16	0.00 ¹	-43.25	-21.20	-22.05	-27.00	-16.25
4	5591.70	-46.27	-54.22	2.16	2.16	3.01	-40.45	-21.20	-19.25	-27.00	-13.45
5	6987.40	-49.61	-55.04	2.16	2.16	3.01	-43.34	-21.20	-22.14	-27.00	-16.34
6	10476.65	-42.83	-49.29	2.16	2.16	3.01	-36.77	-21.20	-15.57	-27.00	-9.77

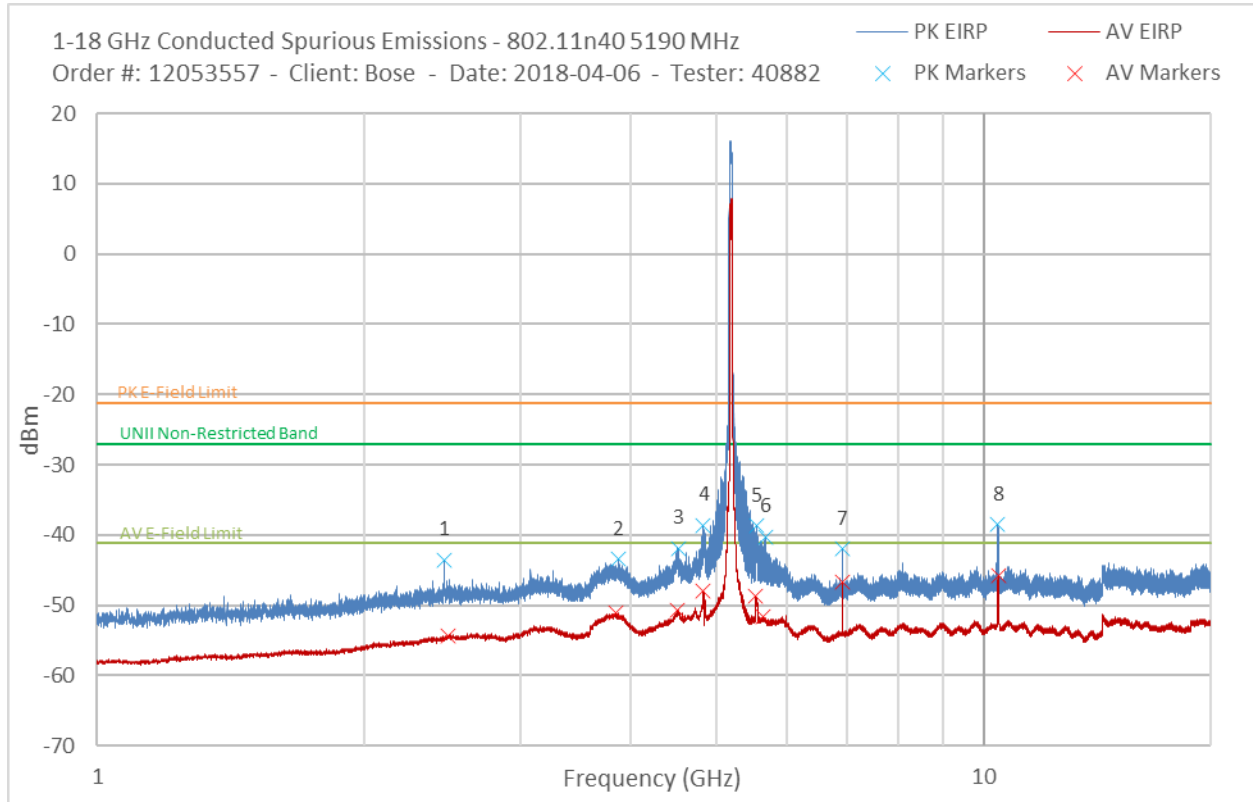
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	3869.18	-61.56	-61.71	2.16	2.16	3.01	3.27	-50.19	-41.20	-8.99
2	4519.00	-61.29	-61.78	2.16	2.16	3.01	3.27	-50.08	-41.20	-8.88
3	4887.90	-56.75	-62.21	2.16	2.16	0.00 ¹	3.27	-50.23	-41.20	-9.03
4	5590.43	-56.76	-62.68	2.16	2.16	3.01	3.27	-47.33	-41.20	-6.13
5	6986.55	-56.25	-64.47	2.16	2.16	3.01	3.27	-47.20	-41.20	-6.00
6	10480.90	-53.53	-59.98	2.16	2.16	3.01	3.27	-44.21	-41.20	-3.01

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.7. 802.11n HT40 MODE IN THE 5.2GHz BAND – LOW CHANNEL



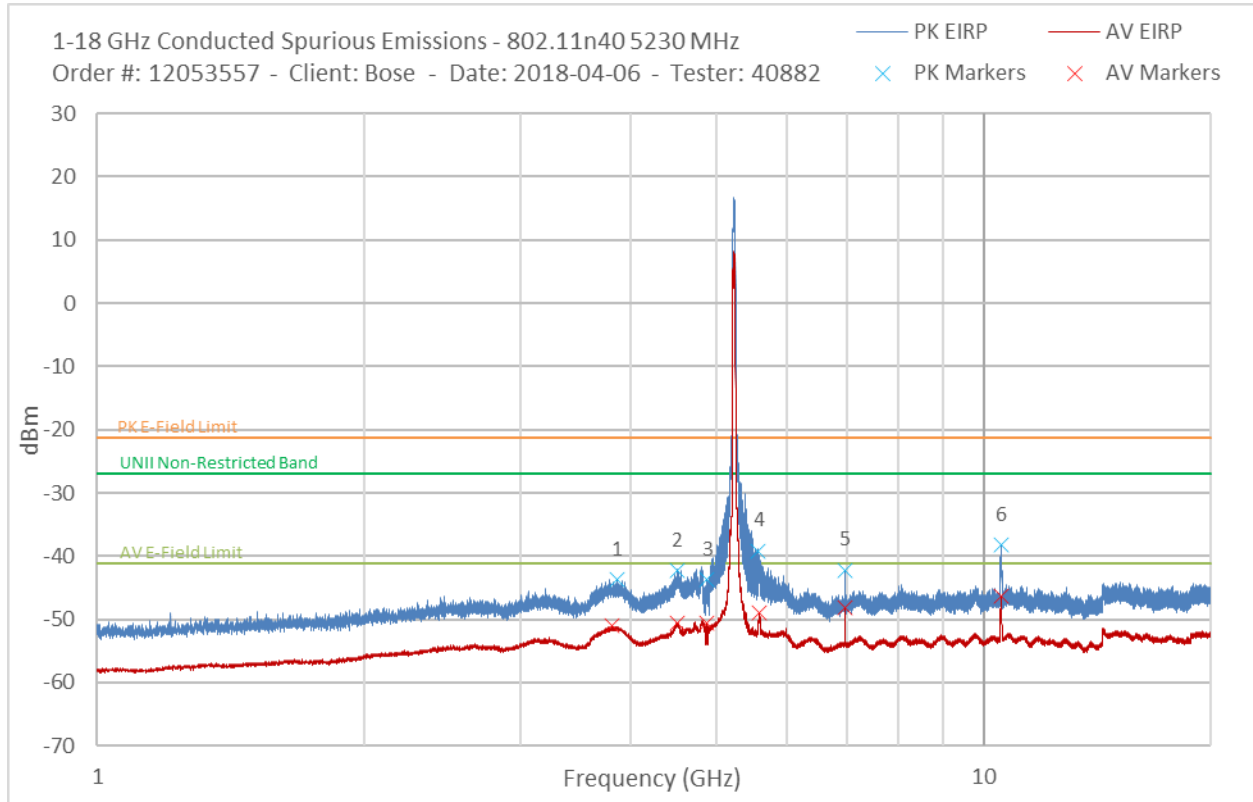
Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	2461.58	-50.82	-52.77	2.16	2.16	3.01	-43.51	-21.20	-22.31	-27.00	-16.51
2	3872.15	-53.83	-50.15	2.16	2.16	3.01	-43.43	-21.20	-22.23	-27.00	-16.43
3	4522.40	-48.23	-53.26	2.16	2.16	3.01	-41.87	-21.20	-20.67	-27.00	-14.87
4	4827.55	-48.12	-45.75	2.16	2.16	3.01	-38.59	-21.20	-17.39	-27.00	-11.59
5	5549.20	-44.42	-53.25	2.16	2.16	3.01	-38.71	-21.20	-17.51	-27.00	-11.71
6	5666.93	-46.09	-53.67	2.16	2.16	3.01	-40.22	-21.20	-19.02	-27.00	-13.22
7	6920.25	-47.68	-56.22	2.16	2.16	3.01	-41.94	-21.20	-20.74	-27.00	-14.94
8	10376.78	-44.19	-53.14	2.16	2.16	3.01	-38.49	-21.20	-17.29	-27.00	-11.49

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	2486.23	-65.12	-64.83	2.16	2.16	3.01	2.52	-54.27	-41.20	-13.07
2	3846.65	-61.38	-62.10	2.16	2.16	3.01	2.52	-51.02	-41.20	-9.82
3	4517.73	-60.91	-61.89	2.16	2.16	3.01	2.52	-50.67	-41.20	-9.47
4	4830.53	-57.07	-61.16	2.16	2.16	3.01	2.52	-47.95	-41.20	-6.75
5	5535.60	-57.47	-63.10	2.16	2.16	3.01	2.52	-48.73	-41.20	-7.53
6	5647.38	-61.97	-62.73	2.16	2.16	3.01	2.52	-51.63	-41.20	-10.43
7	6919.83	-54.91	-63.54	2.16	2.16	3.01	2.52	-46.66	-41.20	-5.46
8	10379.75	-56.65	-56.34	2.16	2.16	3.01	2.52	-45.79	-41.20	-4.59

9.1.8. 802.11n HT40 MODE IN THE 5.2GHz BAND – HIGH CHANNEL



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	3856.85	-51.39	-52.41	2.16	2.16	3.01	-43.69	-21.20	-22.49	-27.00	-16.69
2	4512.63	-48.88	-53.05	2.16	2.16	3.01	-42.30	-21.20	-21.10	-27.00	-15.30
3	4878.98	-46.98	-52.55	2.16	2.16	0.00 ¹	-43.76	-21.20	-22.56	-27.00	-16.76
4	5571.73	-47.11	-47.59	2.16	2.16	3.01	-39.16	-21.20	-17.96	-27.00	-12.16
5	6973.80	-47.92	-56.63	2.16	2.16	3.01	-42.20	-21.20	-21.00	-27.00	-15.20
6	10463.48	-44.36	-50.43	2.16	2.16	3.01	-38.23	-21.20	-17.03	-27.00	-11.23

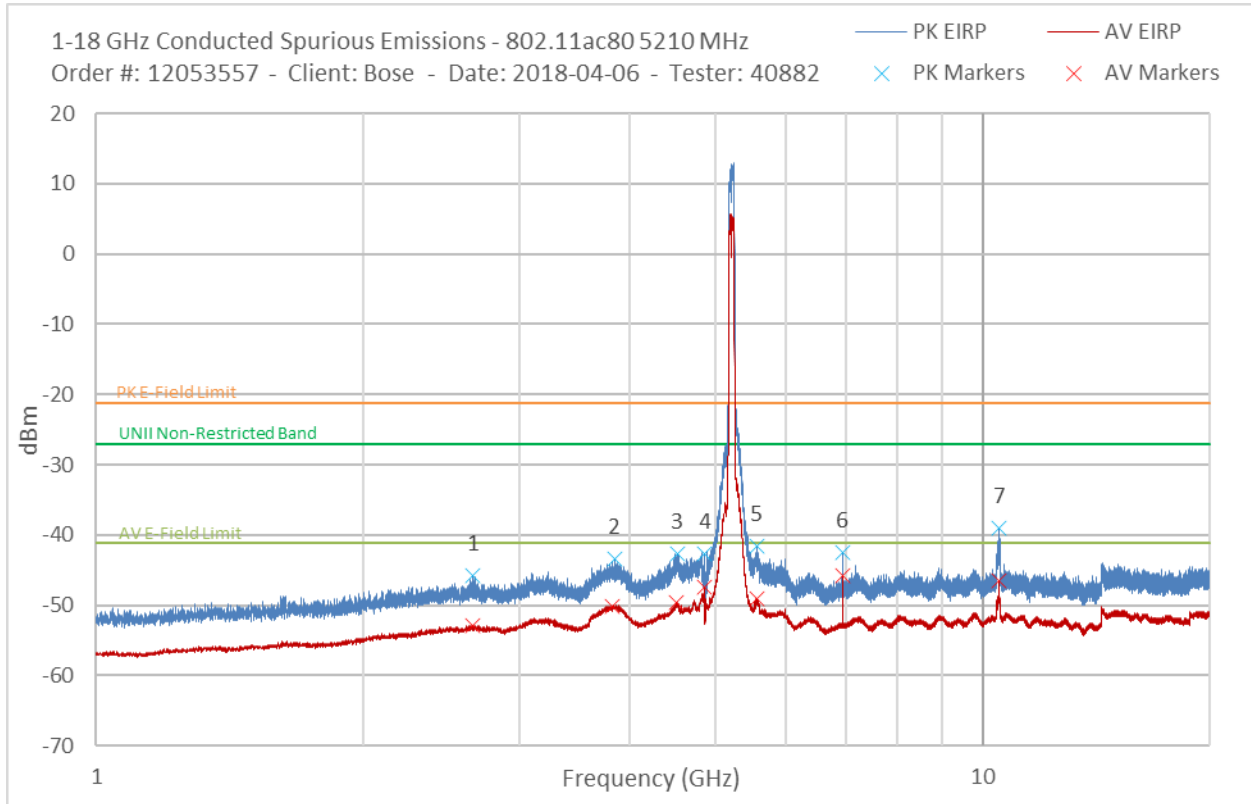
Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	3813.50	-61.92	-61.64	2.16	2.16	3.01	2.52	-51.07	-41.20	-9.87
2	4511.78	-60.49	-62.35	2.16	2.16	3.01	2.52	-50.62	-41.20	-9.42
3	4878.13	-56.19	-62.24	2.16	2.16	0.00 ¹	2.52	-50.54	-41.20	-9.34
4	5589.15	-58.01	-62.67	2.16	2.16	3.01	2.52	-49.04	-41.20	-7.84
5	6973.38	-56.52	-64.31	2.16	2.16	3.01	2.52	-48.16	-41.20	-6.96
6	10460.08	-56.74	-57.19	2.16	2.16	3.01	2.52	-46.26	-41.20	-5.06

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.1.9. 802.11ac VHT80 MODE IN THE 5.2GHz BAND



Peak Scan Tabular Data

#	Frequency (MHz)	Meter PK Corrected Reading Chain 0 (dBm)	Meter PK Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	PK EIRP (dBm)	PK E-field Limit (dBm)	PK E-field Margin (dB)	UNII Non-Restricted Band Limit (dBm)	UNII Non-Restricted Band Margin (dBm)
1	2663.45	-56.09	-52.58	2.16	2.16	3.01	-45.80	-21.20	-24.60	-27.00	-18.80
2	3846.23	-51.06	-51.98	2.16	2.16	3.01	-43.31	-21.20	-22.11	-27.00	-16.31
3	4522.83	-51.66	-50.14	2.16	2.16	3.01	-42.65	-21.20	-21.45	-27.00	-15.65
4	4858.58	-46.21	-50.59	2.16	2.16	0.00 ¹	-42.70	-21.20	-21.50	-27.00	-15.70
5	5562.80	-47.70	-54.03	2.16	2.16	3.01	-41.62	-21.20	-20.42	-27.00	-14.62
6	6947.45	-48.51	-54.70	2.16	2.16	3.01	-42.40	-21.20	-21.20	-27.00	-15.40
7	10447.75	-45.27	-51.00	2.16	2.16	3.01	-39.07	-21.20	-17.87	-27.00	-12.07

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

Average Scan Tabular Data

#	Frequency (MHz)	Meter AV Corrected Reading Chain 0 (dBm)	Meter AV Corrected Reading Chain 1 (dBm)	AG Chain 0 (dBi)	AG Chain 1 (dBi)	Array Gain (dBi)	DCCF (dB)	AV EIRP (dBm)	AV E-field Limit (dBm)	AV E-field Margin (dB)
1	2660.48	-64.76	-64.63	2.16	2.16	3.01	3.62	-52.89	-41.20	-11.69
2	3824.55	-61.98	-61.85	2.16	2.16	3.01	3.62	-50.11	-41.20	-8.91
3	4510.08	-60.84	-61.92	2.16	2.16	3.01	3.62	-49.54	-41.20	-8.34
4	4857.73	-54.21	-60.09	2.16	2.16	0.00 ¹	3.62	-47.43	-41.20	-6.23
5	5561.95	-59.61	-62.50	2.16	2.16	3.01	3.62	-49.01	-41.20	-7.81
6	6946.60	-55.05	-64.02	2.16	2.16	3.01	3.62	-45.74	-41.20	-4.54
7	10420.13	-59.23	-57.61	2.16	2.16	3.01	3.62	-46.54	-41.20	-5.34

Note 1: This frequency is a -352MHz offset of the fundamental and is only located on chain 0. Therefore, array gain is not added to the EIRP reading.

9.2. 5.3GHz BAND

Settings used:

Detector: Pk and AV

RBW: 1M

VBW: 3M

Range: 1-18 MHz

Path Loss: 11.2 (10dB pad + 1.2 cable loss)

Measurements from both chains were inserted into a spreadsheet where the measurements were combined. Worst-case antenna gain (External antenna 2.16 dBi) was used.

Example plots:

