CERTIFICATION TEST REPORT

Report Number. : 11600175-E4V3

Applicant	:	MICROSOFT CORP ONE MICROSOFT WAY REDMOND, WA 98052, U.S.A.
Model	:	1796
FCC ID	:	C3K1796
IC	:	3048A-1796
EUT Description	:	PORTABLE COMPUTING DEVICE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E INDUSTRY CANADA RSS - 247 ISSUE 2

Date Of Issue:
May 05, 2017

Prepared by:
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	3/14/17	Initial Issue	--
V2	5/02/17	- Updated KDB revisions in section 2 - Updated IC Site code in section 3 - Updated power in sections 9.9.3 and 9.10.3 - Updated power/psd in section 9.12.3 for CH 122 - Updated radiated harmonics in section 10.1.12 for high channel	C. Susa
V3	5/05/17	- Updated sections 9.13.4, 9.14.4, 9.15.4, 9.16.4 to show straddle channel - Updated section 10.1 test procedure description	C. Susa

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORP
ONE MICROSOFT WAY
REDMOND, WA 98052, U.S.A.

EUT DESCRIPTION: PORTABLE COMPUTING DEVICE

MODEL: 1796

SERIAL NUMBER: 035885670353 (Conducted); 035828270353 (Radiated)

DATE TESTED: March 2nd 2017 – May 2nd 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-247 Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:

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CONSUMER TECHNOLOGY DIVISION
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UL Verification Services Inc.

Prepared By:

Clifford Susa
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Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 662911 D01 v02r01, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v01r03, FCC KDB 644545 D03 v01, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☒ Chamber B	☐ Chamber E
☒ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

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

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a handheld computing device with 802.11 2x2, a/b/g/n/ac WLAN, Bluetooth, Bluetooth LE.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5180 - 5240	802.11a	13.23	21.04
5180 - 5240	802.11n HT20	13.21	20.94
5190 - 5230	802.11n HT40	12.52	17.86
5210	802.11ac VHT80	9.43	8.77

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5260 - 5320	802.11a	16.74	47.21
5260 - 5320	802.11n HT20	16.76	47.42
5270 - 5310	802.11n HT40	13.66	23.23
5290	802.11ac VHT80	9.78	9.51

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5500 - 5700	802.11a	16.84	48.31
5500 - 5700	802.11n HT20	17.02	50.35
5510 - 5670	802.11n HT40	15.97	39.54
5530 - 5610	802.11ac VHT80	13.03	20.09

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5745 - 5825	802.11a	16.91	49.09
5745 - 5825	802.11n HT20	17.01	50.23
5755 - 5795	802.11n HT40	13.86	24.32
5775	802.11ac VHT80	10.21	10.50

STRADDLE CHANNELS

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX (Channels overlapping UNII-2C and UNII-3)			
5720 (Whole Fundamental)	802.11a	14.28	26.79
5720 (Whole Fundamental)	802.11n HT20	14.45	27.86
5710 (Whole Fundamental)	802.11n HT40	14.02	25.23
5690 (Whole Fundamental)	802.11ac VHT80	10.56	11.38

List of test reduction

Antenna Port Testing		
Band	**Mode**	**Covered by**
5 GHz band	802.11a 1TX	802.11a 2TX
5 GHz band	802.11n HT20 1TX	802.11n HT20 2TX
5 GHz band	802.11n HT40 1TX	802.11n HT40 2TX
5 GHz band	802.11ac VHT 80 1TX	802.11ac VHT 80 2TX

Note: 802.11n VHT20 and VHT40 modes are leveraged from 802.11n HT20 and HT40.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integrated antenna, with a maximum gain as follows:

Frequency Band (GHz)	Antenna Gain (dBi)	
	Chain 0 (A)	Chain 1 (B)
5.2	2.10	3.00
5.3	1.20	2.80
5.5	0.90	3.60
5.8	1.30	3.60

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 14.2.201.157

The test utility software used during testing was WiFi tool v2.7.6.

5.5. WORST-CASE CONFIGURATION AND MODE

For below 1GHz radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X/Y/Z, it was determined that Y orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in Y orientation.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages and have the same power settings.

For MIMO modes, the 2TX emission testing was considered as a worst case scenario and was performed at power levels, per transmit chain, greater than or equal to the maximum power in any 1TX mode.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop AC/DC adapter	Lenovo	ADLX45NCC2A	11S36200281ZZ20059W0H5	NA
Laptop	Lenovo	11e	LR-04N7BL	NA
USB-Internet Adapter	linksys	USB3GIGV1	15710S08406242	NA

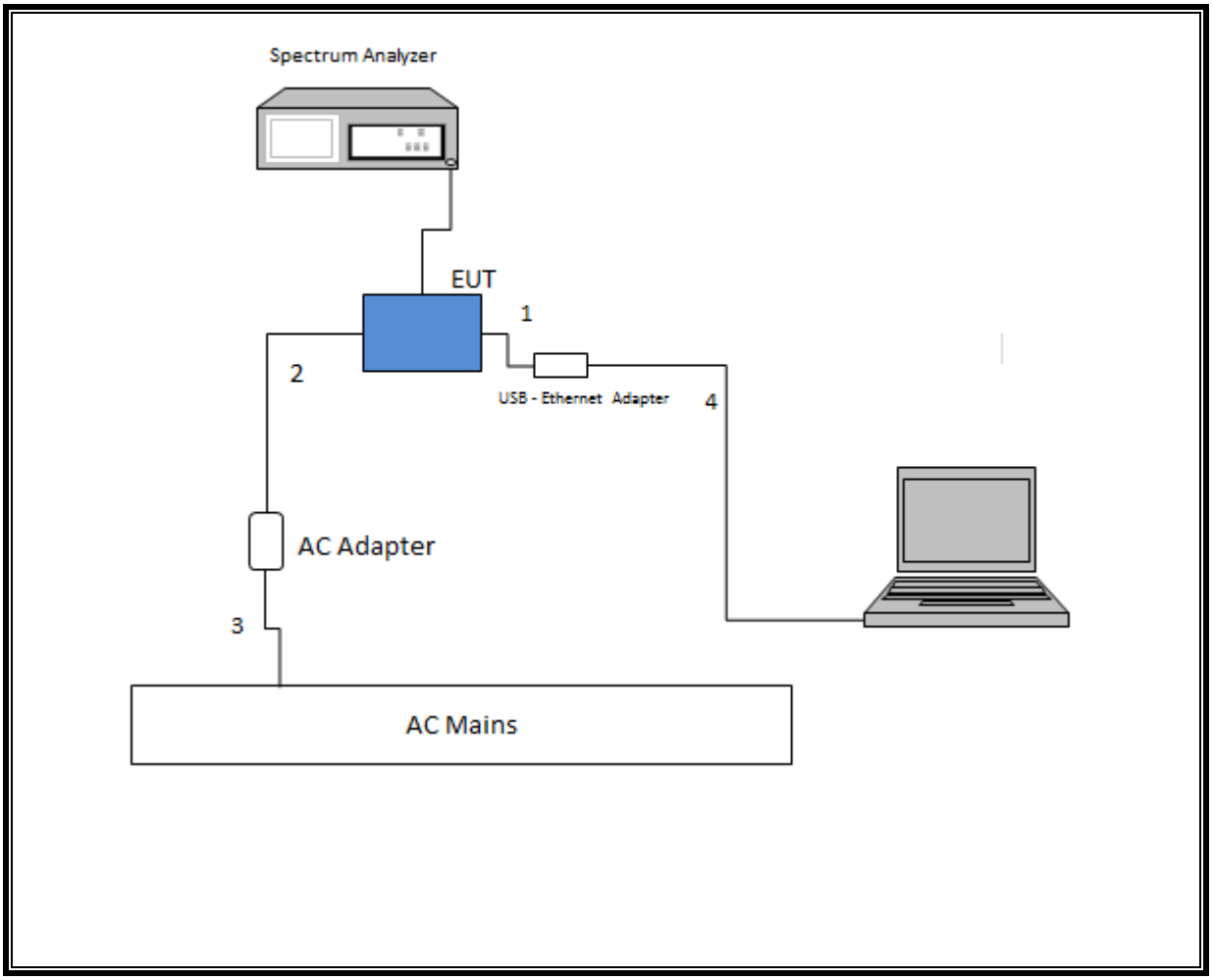
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Un-Shielded	0.17	
2	DC	1	Proprietary	Un-Shielded	1.75	
3	AC	1	2-prong	Un-Shielded	0.5	
4	Ethernet	1	RJ45	Un-Shielded	2	

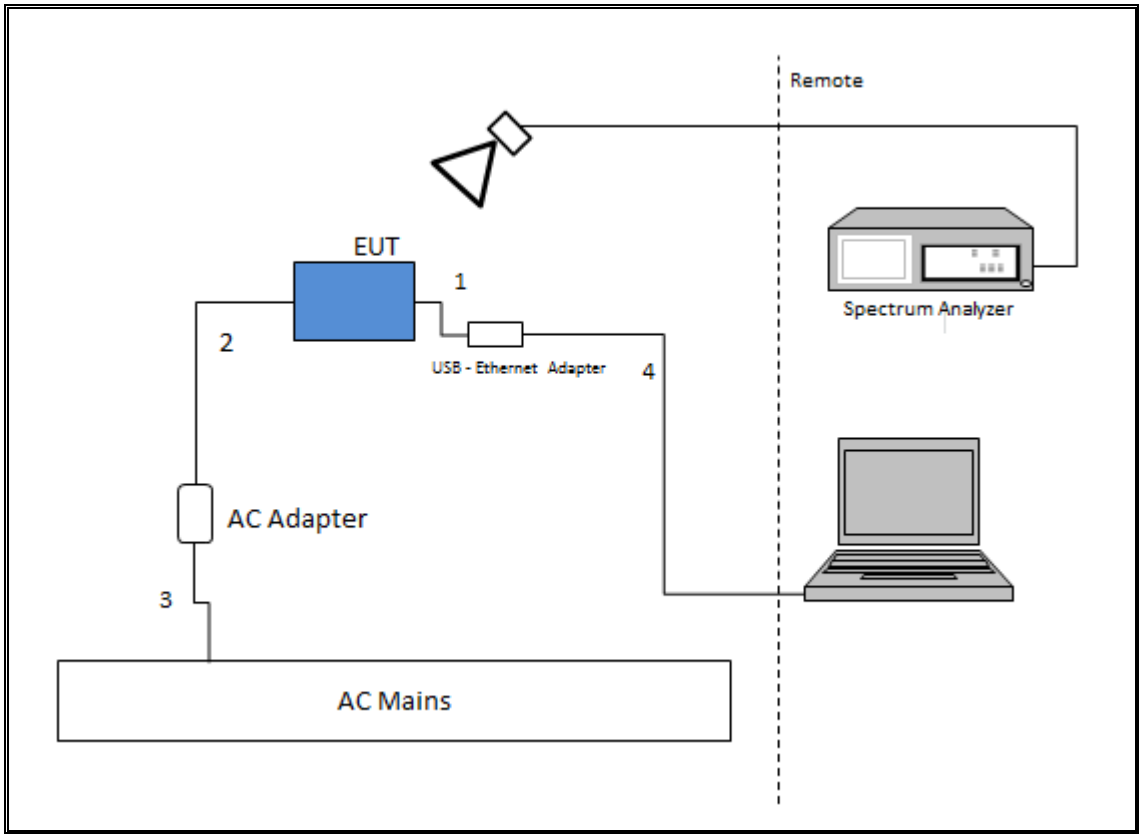
TEST SETUP

The EUT was tested connected to a host Laptop via RJ45/USB cable for antenna port and AC tests. Radiated tests were performed with EUT connected to AC adapter and remote laptop. Test software exercised the radio card.

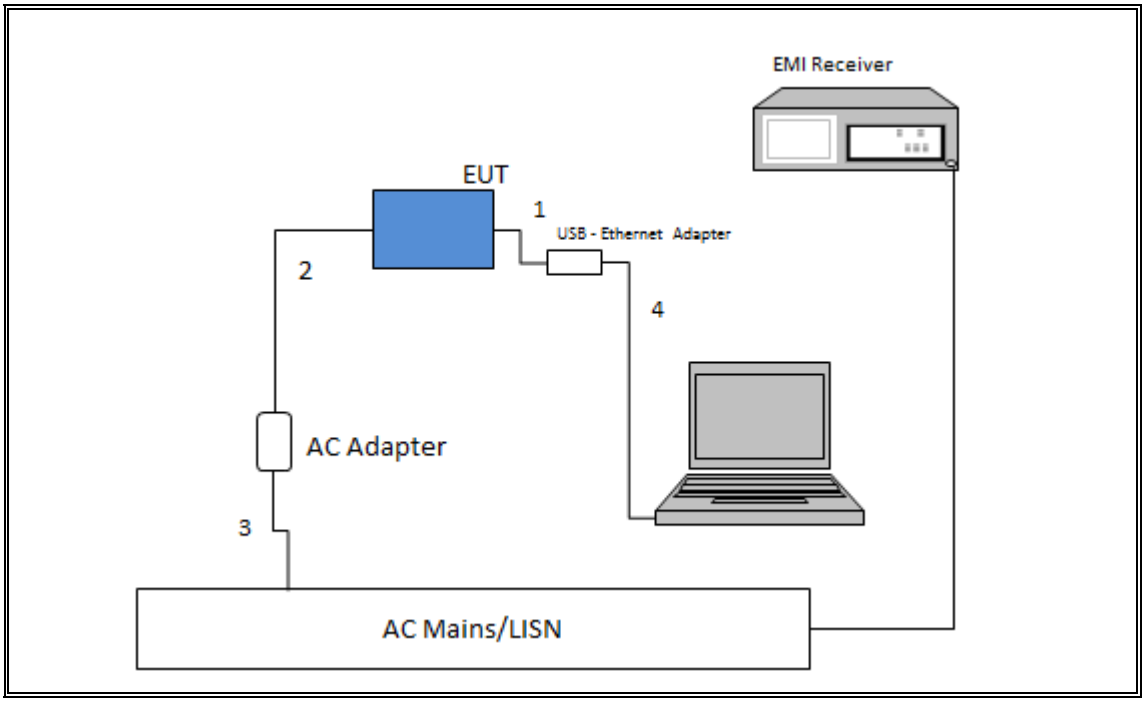
SETUP DIAGRAM FOR ANTENNA PORT CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR ACLINE CONDUCTED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences Corp.	JB3	T408	11/10/17
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	03/30/17
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T711	01/30/18
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T482	2/15/2018
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T483	2/15/2018
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T481	8/1/2017
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T484	8/1/2017
RF Preamplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T493	02/15/18
RF Preamplifier, 1 - 8GHz	Miteq	AMF-4D-01000800-30-29P	T1156	02/15/18
RF Preamplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	08/01/17
RF Preamplifier, 1 - 7GHz	Amplical	AMP1G6-10-27	T1370	04/15/17
RF Preamplifier, 10kHz - 1GHz	Sonoma	310N	T15	08/26/17
Spectrum Analyzer	Agilent (Keysight) Technologies	E4440A	T199	7/22/17
Spectrum Analyzer	Keysight	N9030A	T905	01/11/18
Spectrum Analyzer	Keysight	N9030A	T908	04/13/17
Spectrum Analyzer	Keysight	N9030A	T907	01/23/18
LISN	Fischer Custom Communications	FCC-LISN-50/250-25-2-01	T1310	6/8/2017
EMI Receiver	Rohde & Schwarz	ESR	T1436	1/6/2018
Antenna, Horn, 18-26 GHz	ARA	MWH-1826/B	T449	05/26/17
RF Preamplifier, 1 - 26GHz	Agilent	8449B	T404	07/05/17
Spectrum Analyzer	HP	8564E	T106	09/07/17
RF Preamplifier, 26 - 40GHz	Miteq	NSP4000-SP2	T88	04/07/17
Antenna, Horn, 26-40 GHz	ARA	MWH-2640/B	T446	05/26/17
Power Meter	Keysight	N1911A	T229	7/28/17
Power Sensor	Keysight	N1921A	T413	6/20/17

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	9.5, 4/26/16
Antenna Port Software	UL	UL RF	6.1, 3/1/17
Conducted Emissions Software	UL	UL EMC	9.5, 5/26/15

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v01r03, Section B.

26 dB Emission BW: KDB 789033 D02 v01r03, Section C.

99% Occupied BW: KDB 789033 D02 v01r03, Section D.

Conducted Output Power: KDB 789033 D02 v01r03, Section E.3.b (Method PM-G) and KDB 789033 D02 v01r03, Section E.2.b (Method SA-1)

Power Spectral Density: KDB 789033 D02 v01r03, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r03, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

8. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

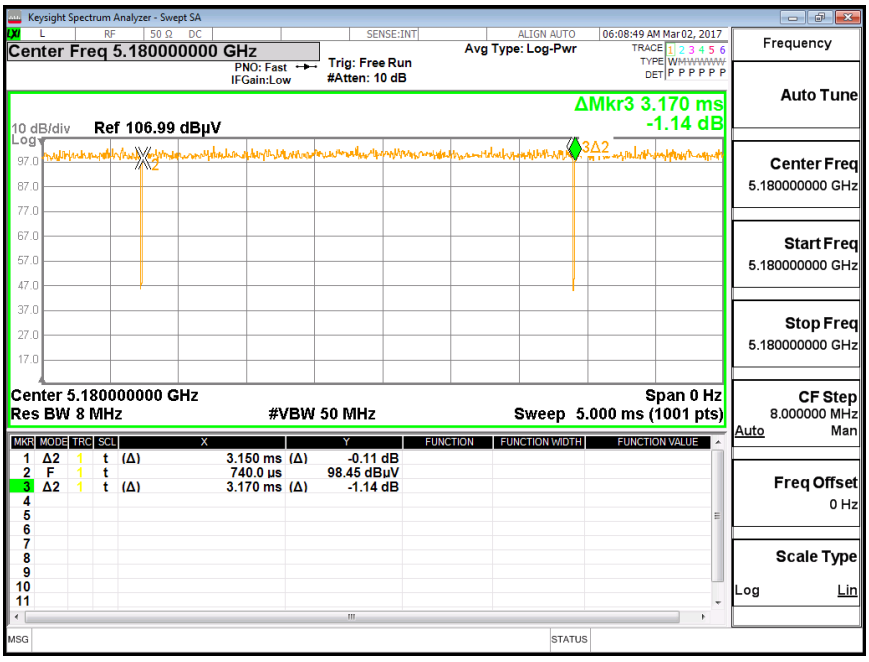
KDB 789033 Zero-Span Spectrum Analyzer Method.

RESULTS

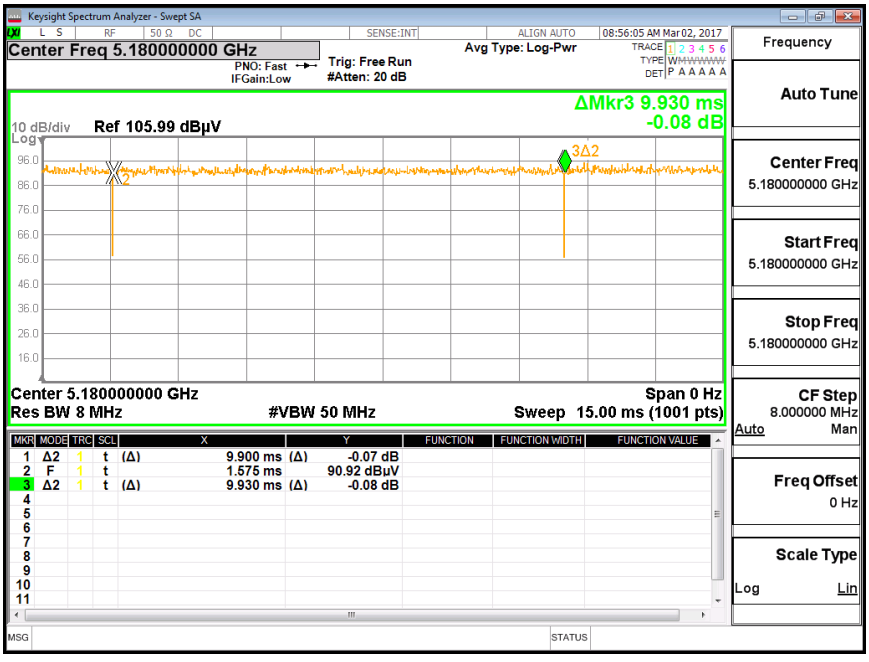
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
802.11a 2Tx	3.150	3.170	0.994	99.4%	0.00	0.010
802.11n HT20 2Tx	9.900	9.930	0.997	99.7%	0.00	0.010
802.11n HT40 2Tx	4.770	4.810	0.992	99.2%	0.00	0.010
802.11ac HT80 2Tx	2.238	2.259	0.991	99.1%	0.00	0.010

DUTY CYCLE PLOTS

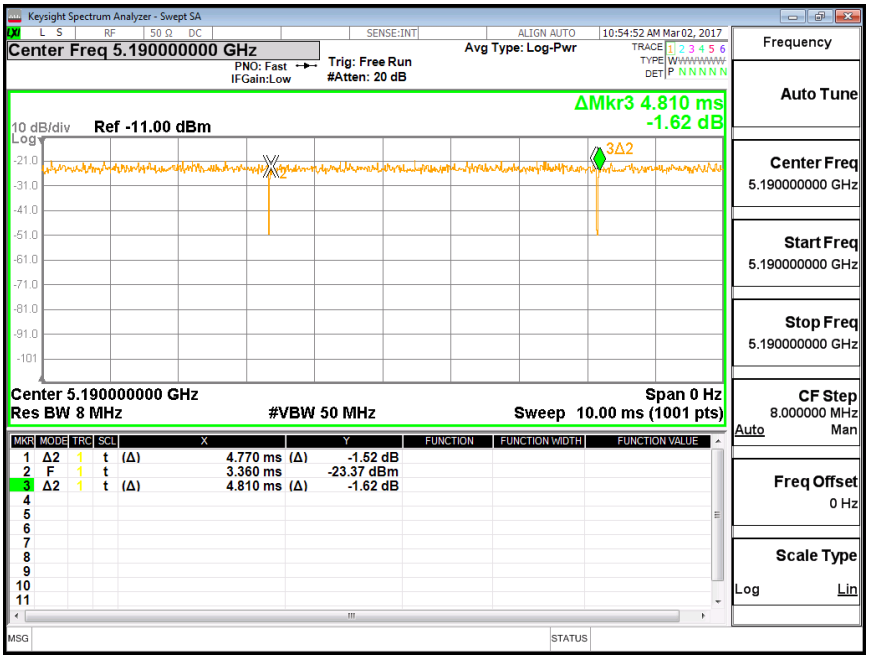
DUTY CYCLE 802.11a 2Tx MODE



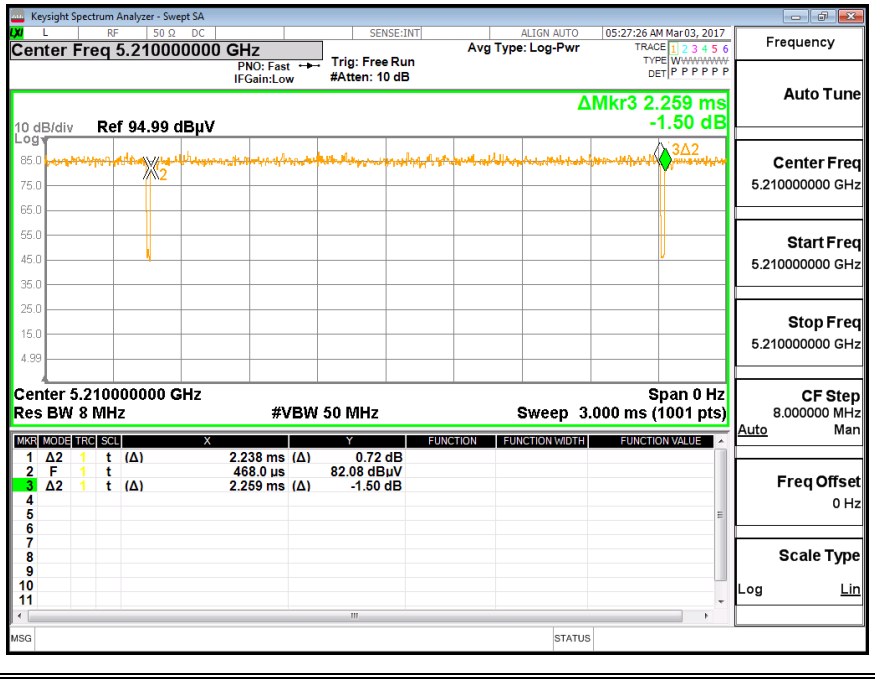
DUTY CYCLE 802.11n HT20 2Tx MODE



DUTY CYCLE 802.11n HT40 2Tx MODE



DUTY CYCLE 802.11ac VHT80 2Tx MODE



9. ANTENNA PORT TEST RESULTS

9.1. 11a 2TX MODE IN THE 5.2GHz BAND

9.1.1. 26 dB BANDWIDTH

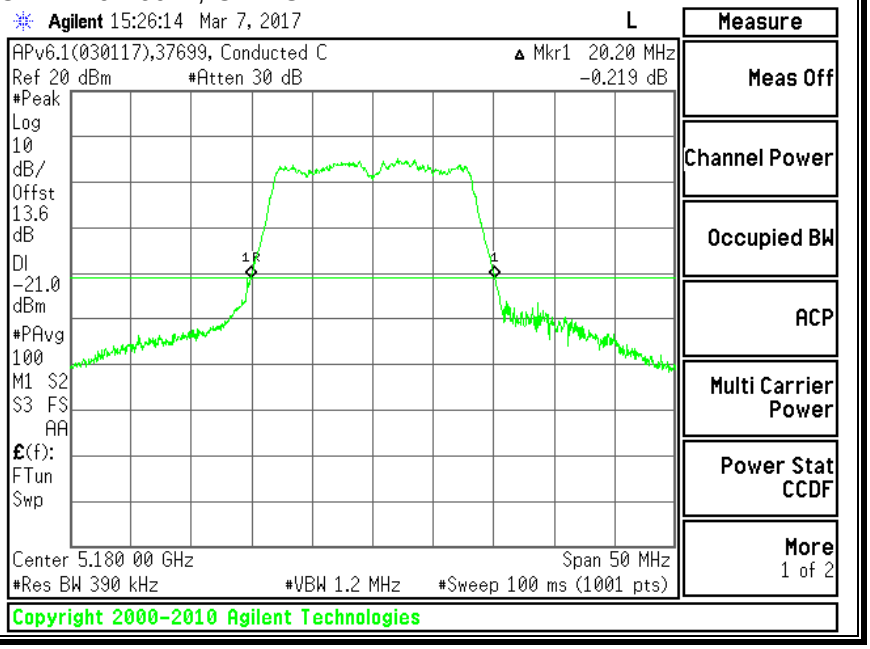
LIMITS

None; for reporting purposes only.

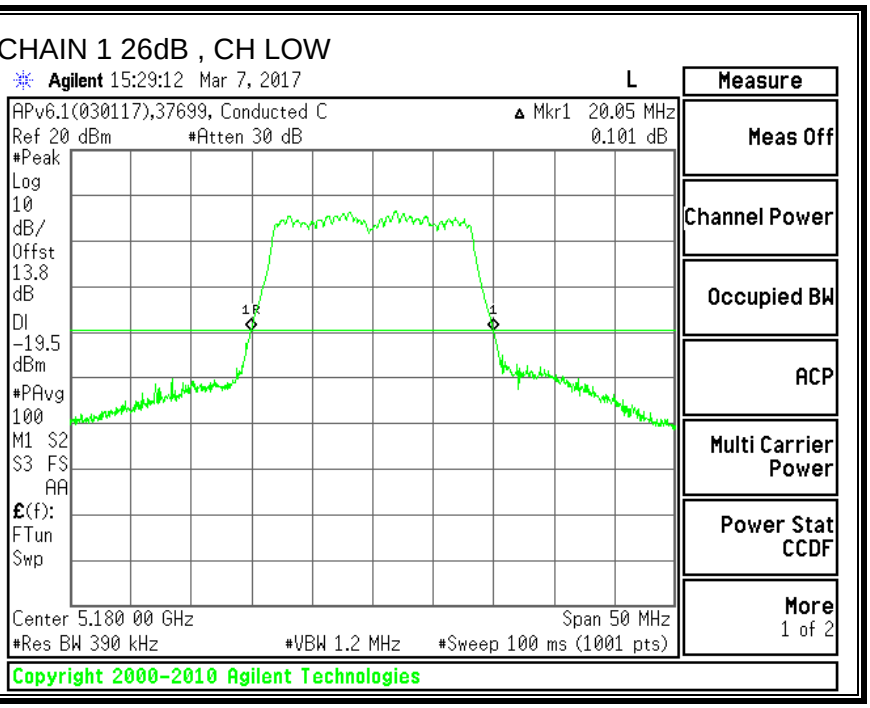
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5180	20.2	20.05
Mid	5200	20.3	20.05
High	5240	20.4	20

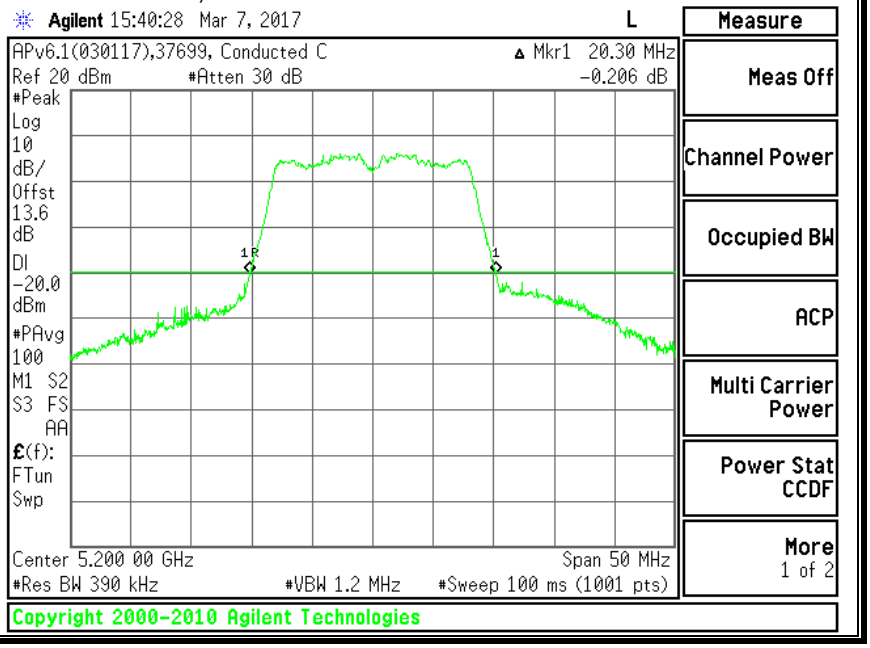
CHAIN 0 26dB , CH LOW



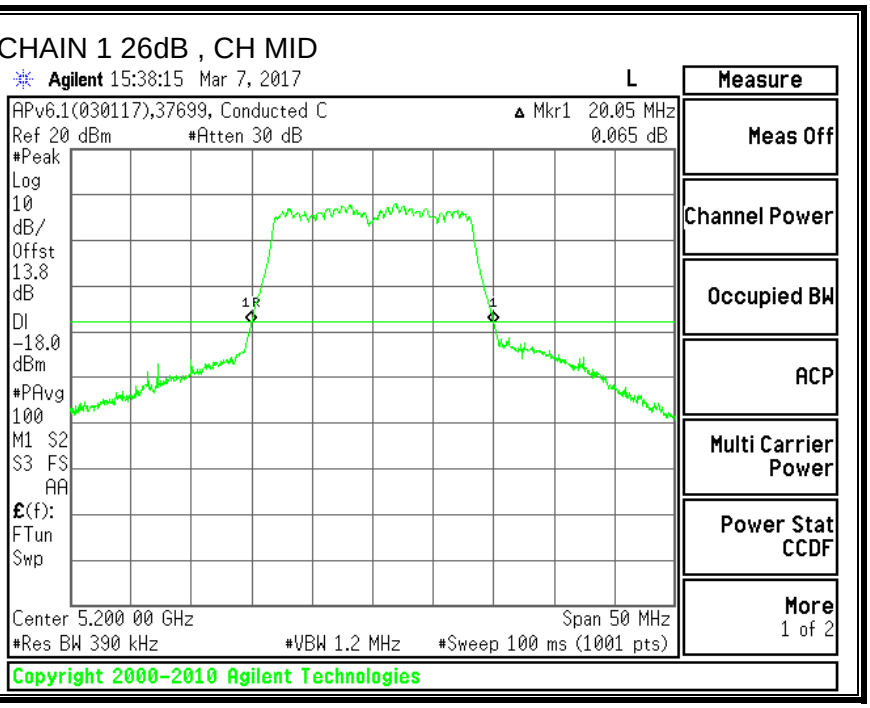
CHAIN 1 26dB , CH LOW



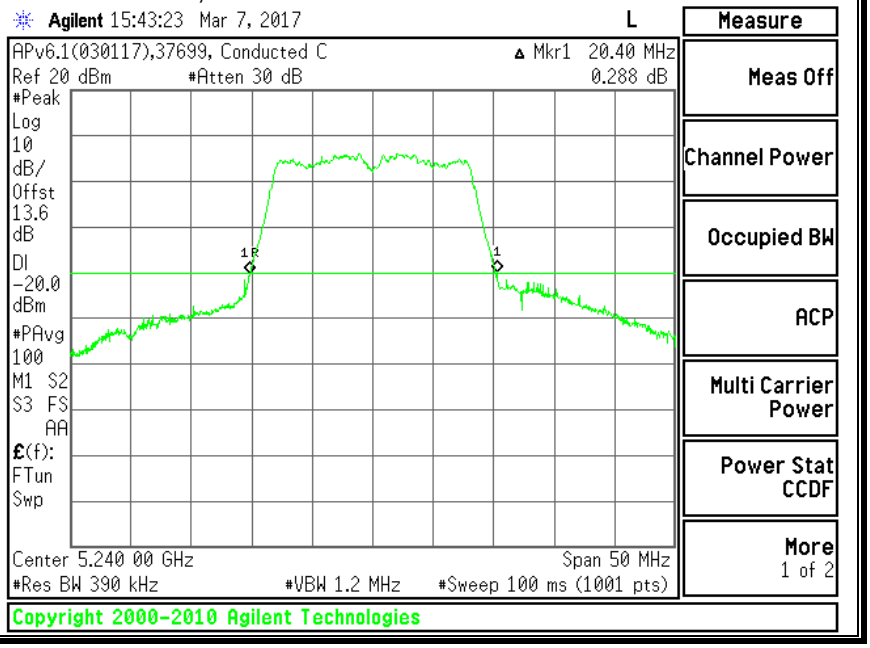
CHAIN 0 26dB , CH MID



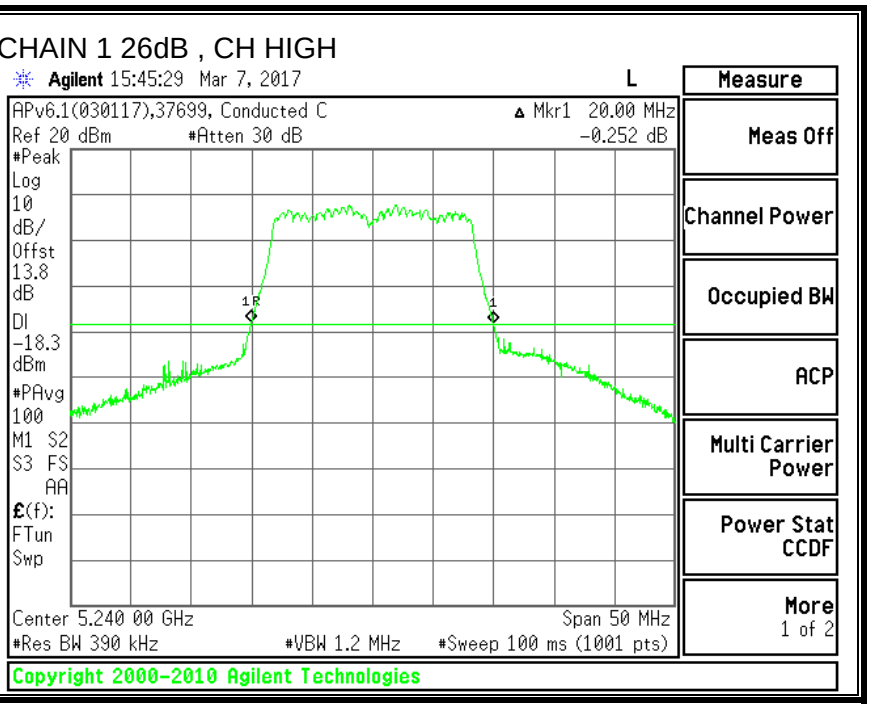
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.1.2. 99% BANDWIDTH

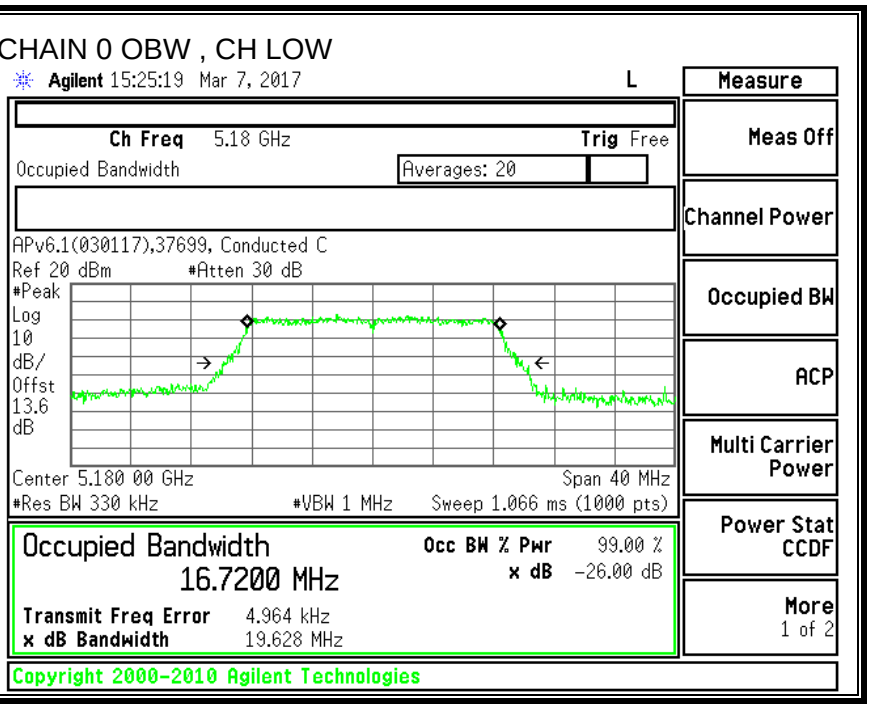
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5180	16.72	16.671
Mid	5200	16.618	16.576
High	5240	16.697	16.572

CHAIN 0 OBW , CH LOW



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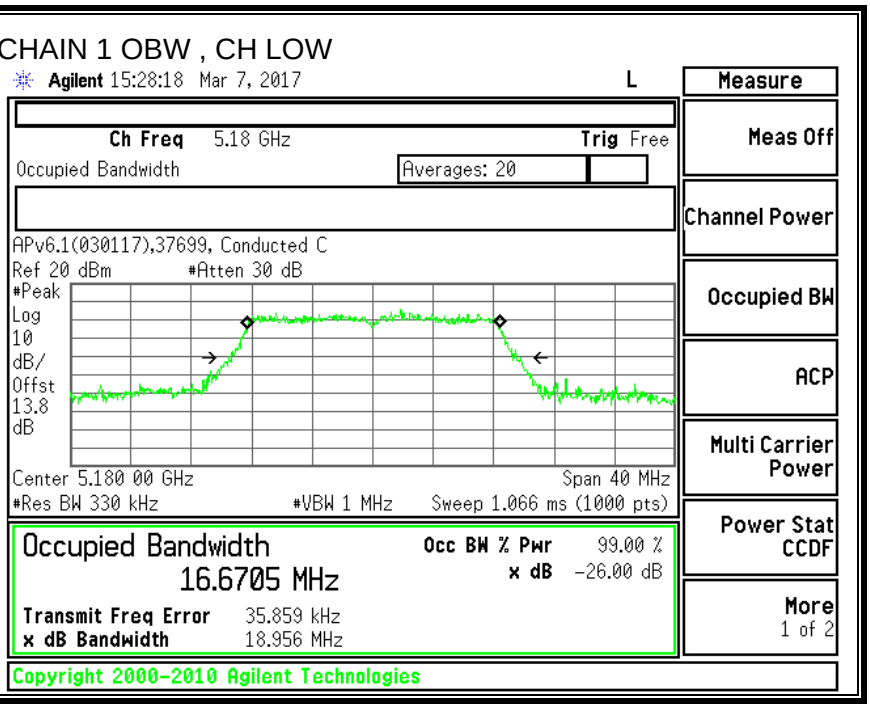
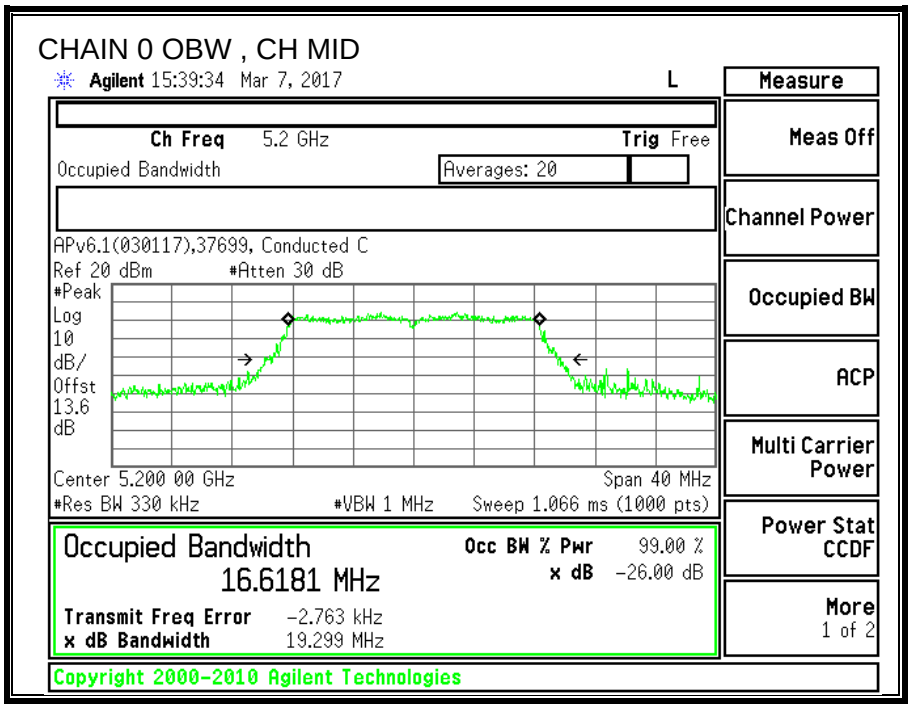
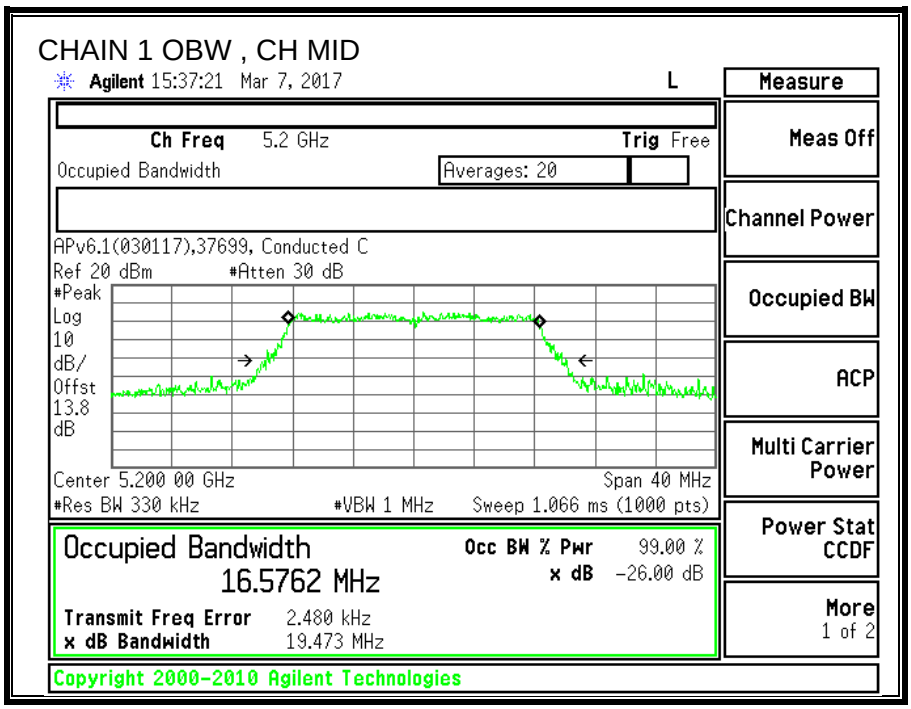


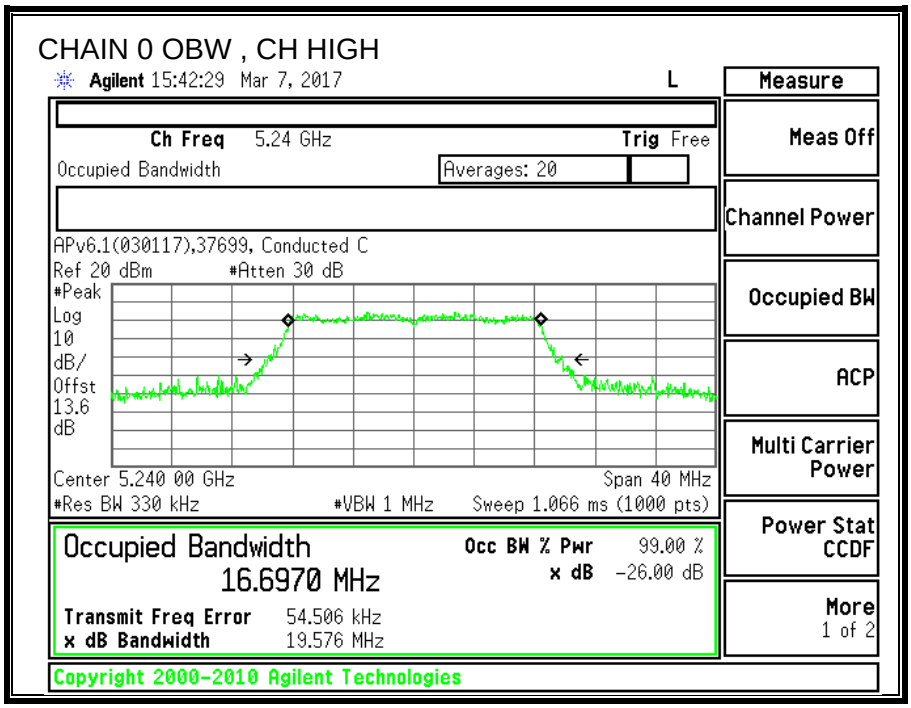
CHAIN 0 OBW , CH MID



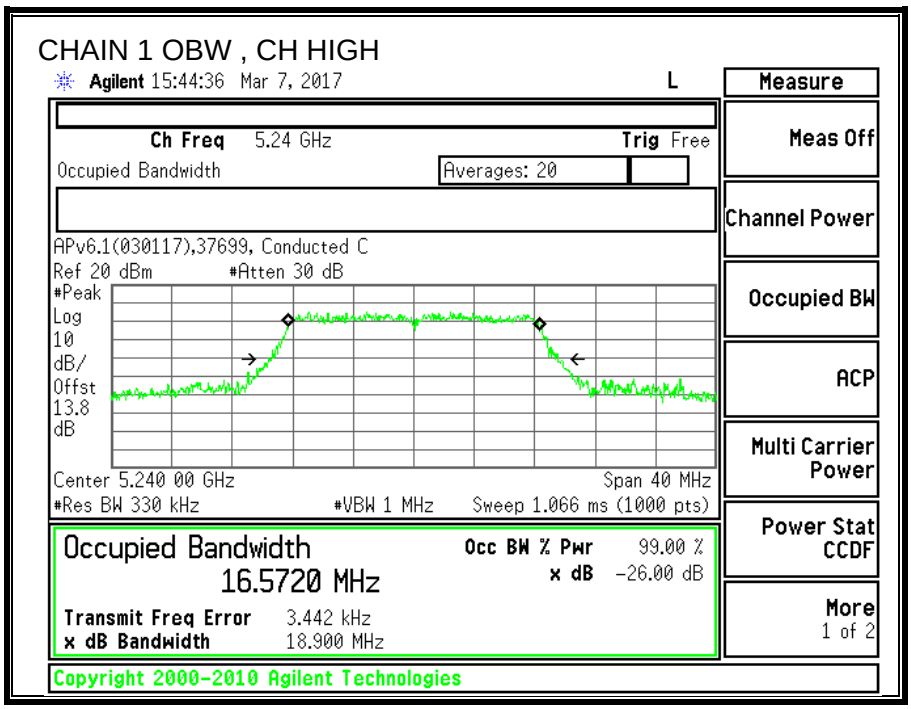
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.1.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(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.

IC RSS-247 6.2.1(1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.10	3.00	2.57	5.57

RESULTS

ID:	50818 JQ	Date:	3/9/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	20.05	16.67	2.57	5.57
Mid	5200	20.05	16.58	2.57	5.57
High	5240	20.00	16.57	2.57	5.57

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	22.22	19.65	19.65	11.00	10.00	4.43
Mid	5200	24.00	22.19	19.62	19.62	11.00	10.00	4.43
High	5240	24.00	22.19	19.62	19.62	11.00	10.00	4.43

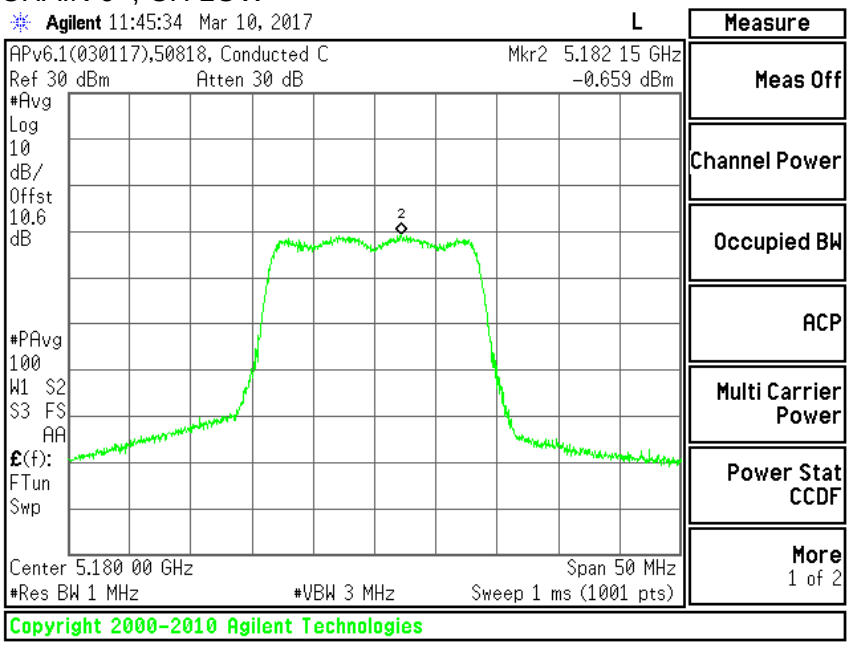
Output Power Results

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	10.33	9.91	13.14	19.65	-6.51
Mid	5200	10.06	9.87	12.98	19.62	-6.65
High	5240	10.62	9.78	13.23	19.62	-6.39

PPSD Results

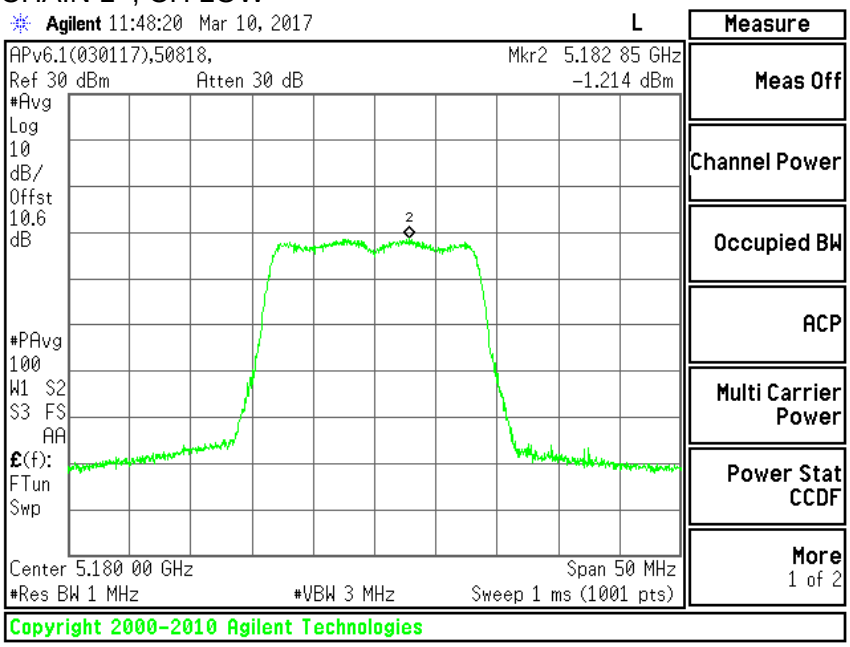
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.16	-0.71	2.58	4.43	-1.85
Mid	5200	-0.36	-0.95	2.37	4.43	-2.06
High	5240	-0.55	-0.74	2.37	4.43	-2.06

CHAIN 0 , CH LOW



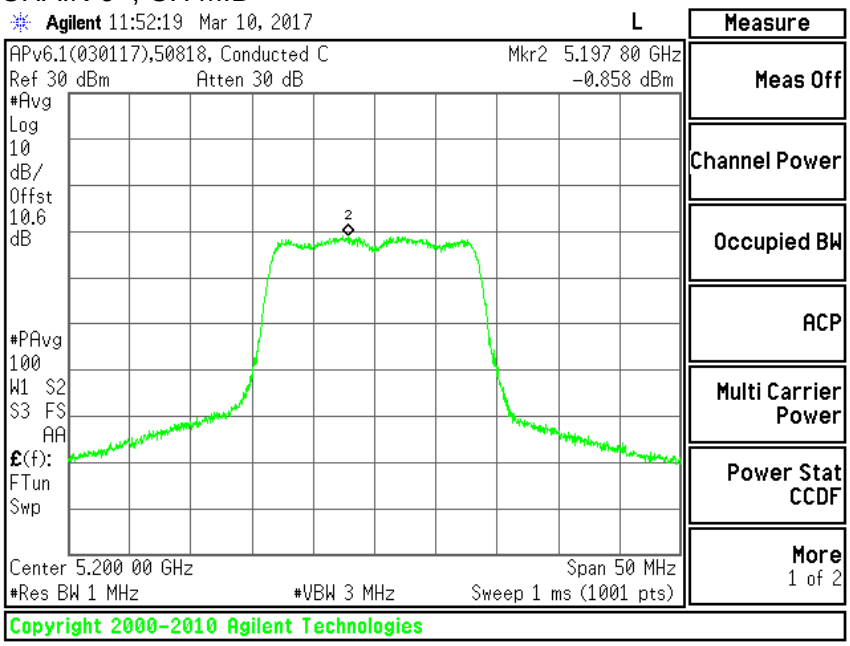
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.159dBm

CHAIN 1 , CH LOW



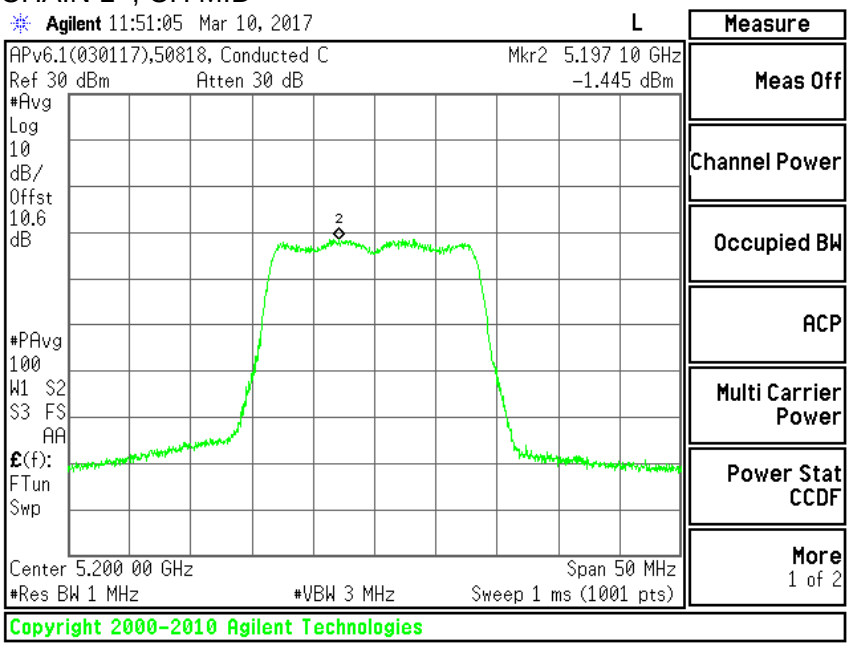
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.714dBm

CHAIN 0 , CH MID



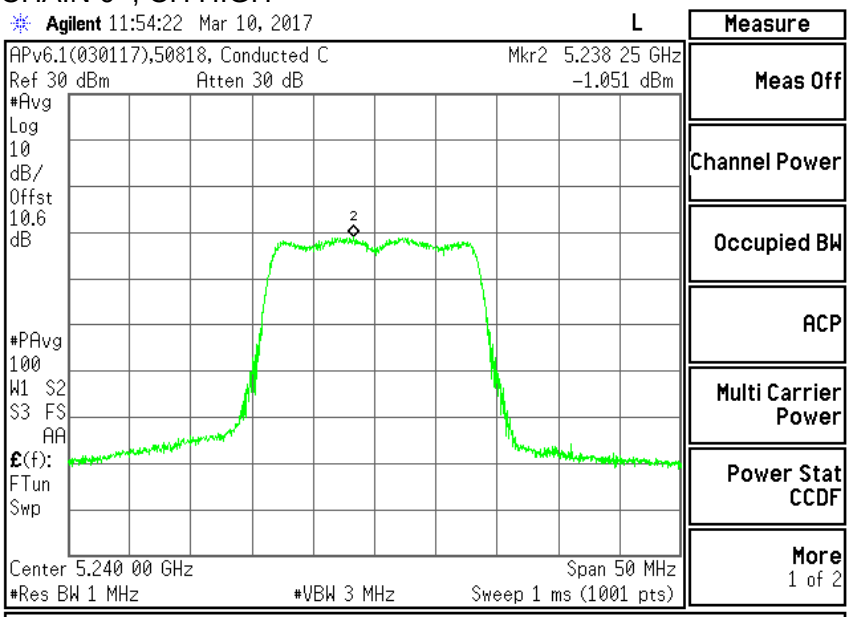
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.358dBm

CHAIN 1 , CH MID



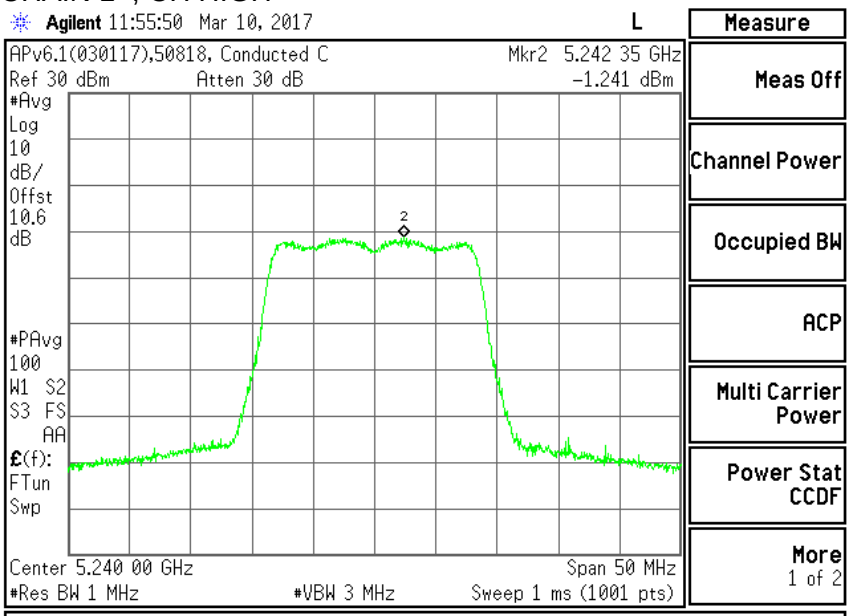
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.945dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.551dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.741dBm

9.2. 11n HT20 2TX MODE IN THE 5.2GHz BAND

9.2.1. 26 dB BANDWIDTH

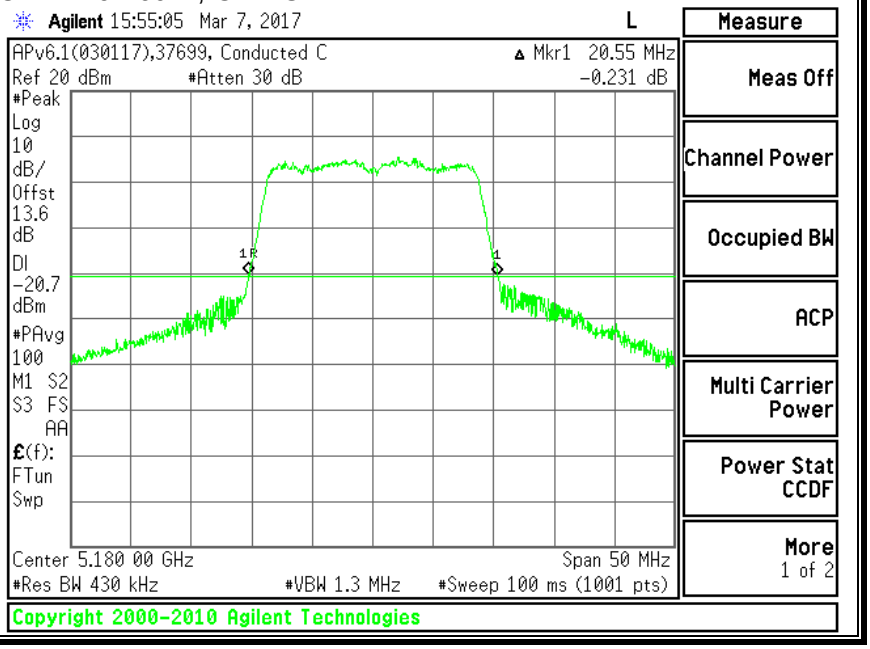
LIMITS

None; for reporting purposes only.

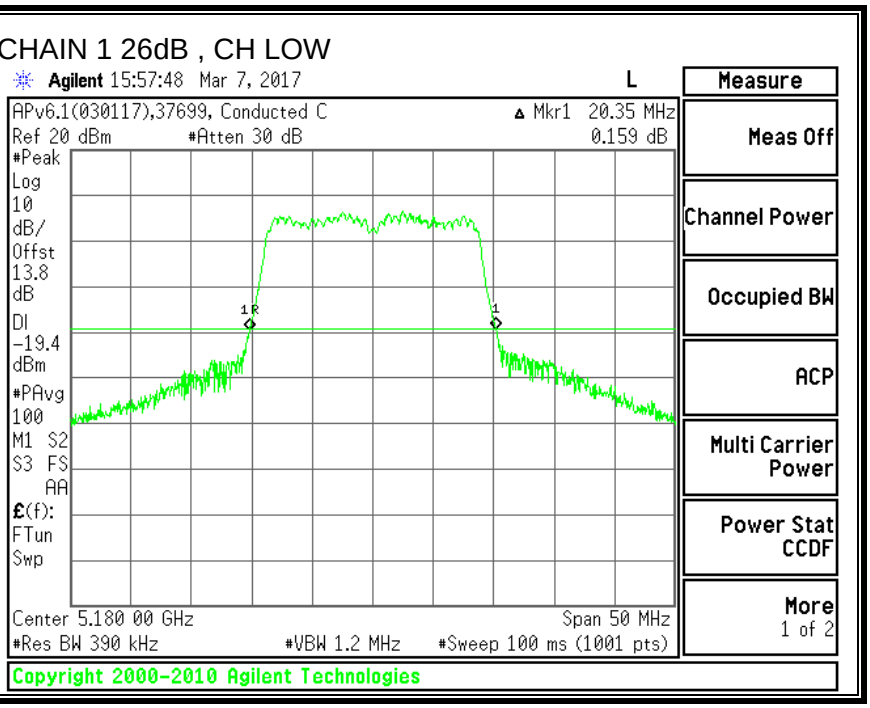
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5180	20.55	20.35
Mid	5200	20.4	20.3
High	5240	20.6	20.35

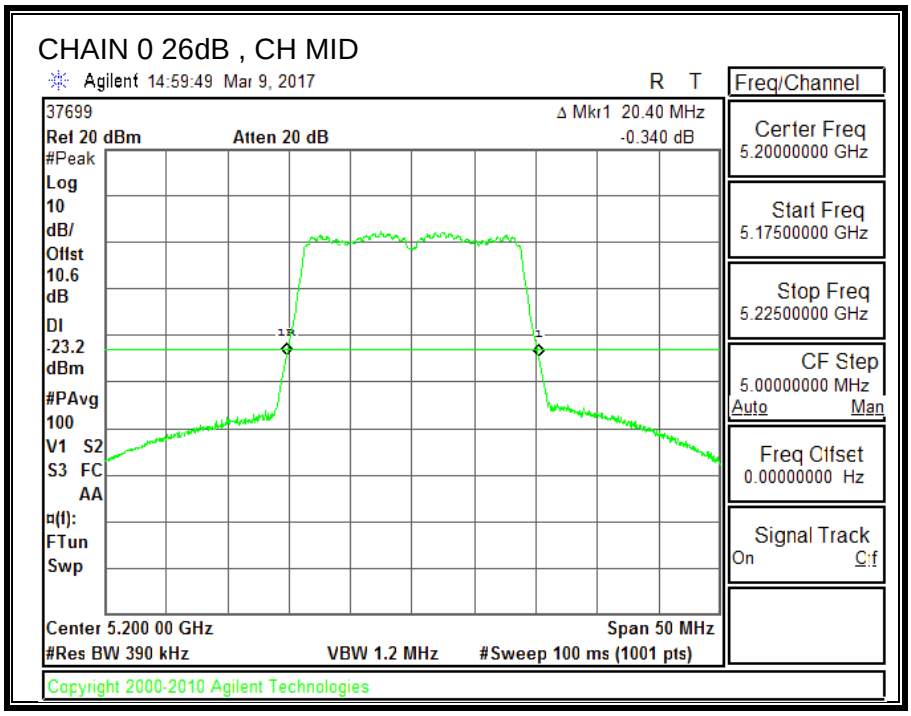
CHAIN 0 26dB , CH LOW



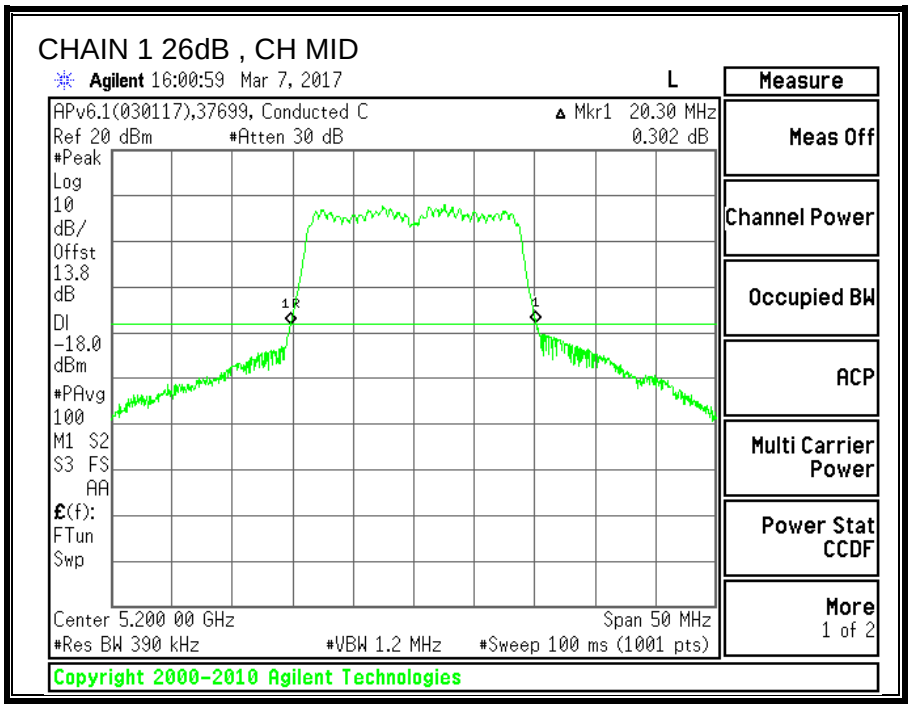
CHAIN 1 26dB , CH LOW



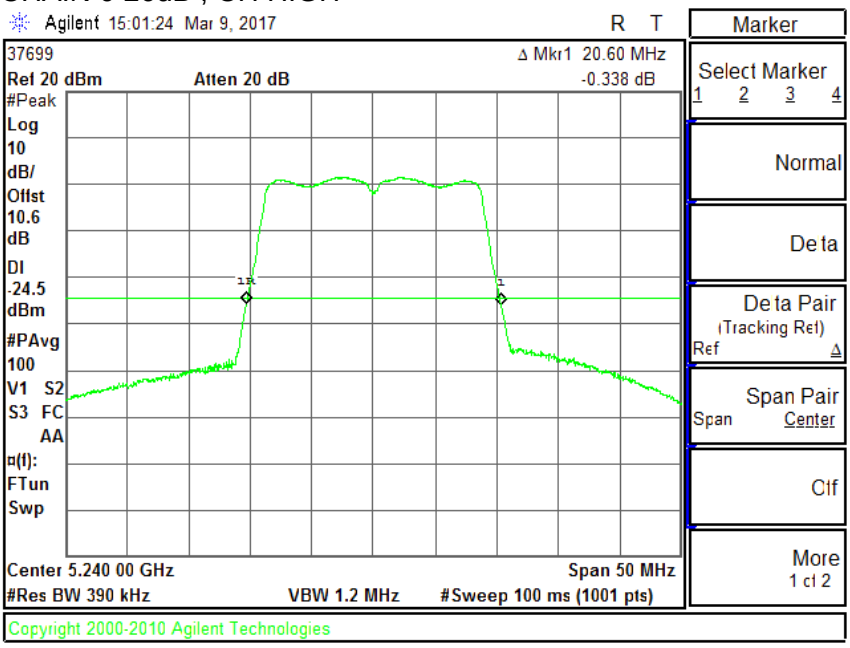
CHAIN 0 26dB , CH MID



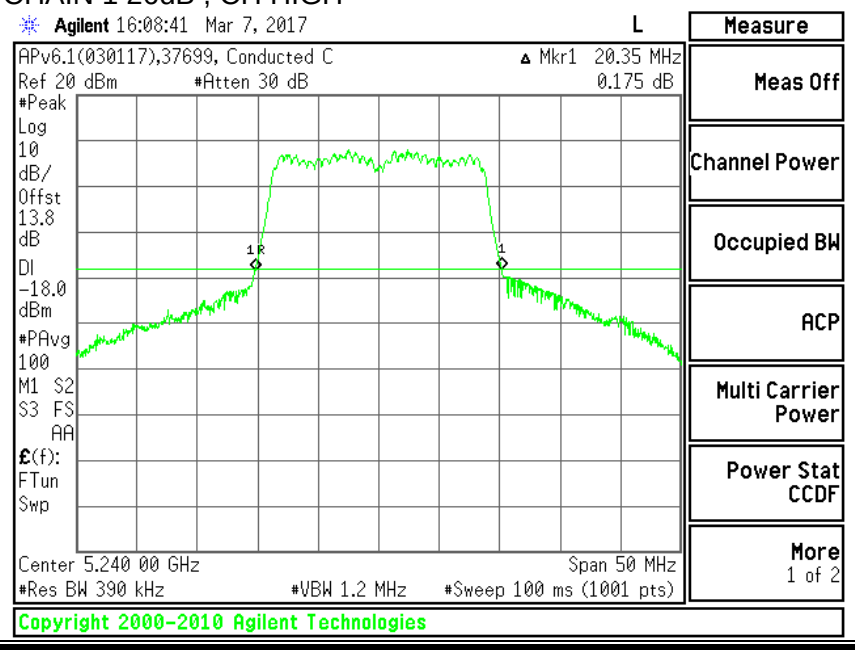
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.2.2. 99% BANDWIDTH

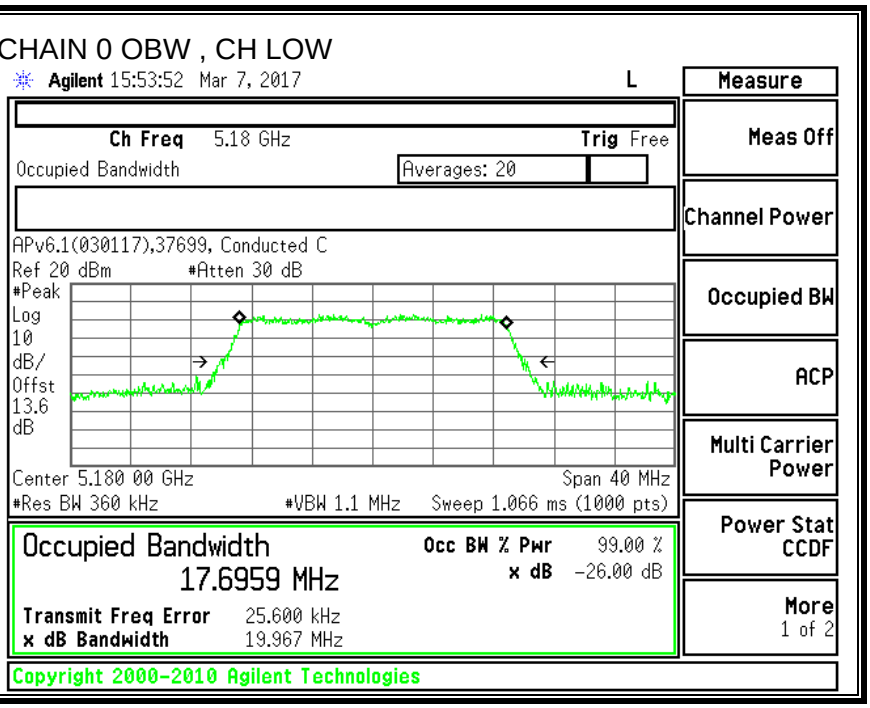
LIMITS

None; for reporting purposes only.

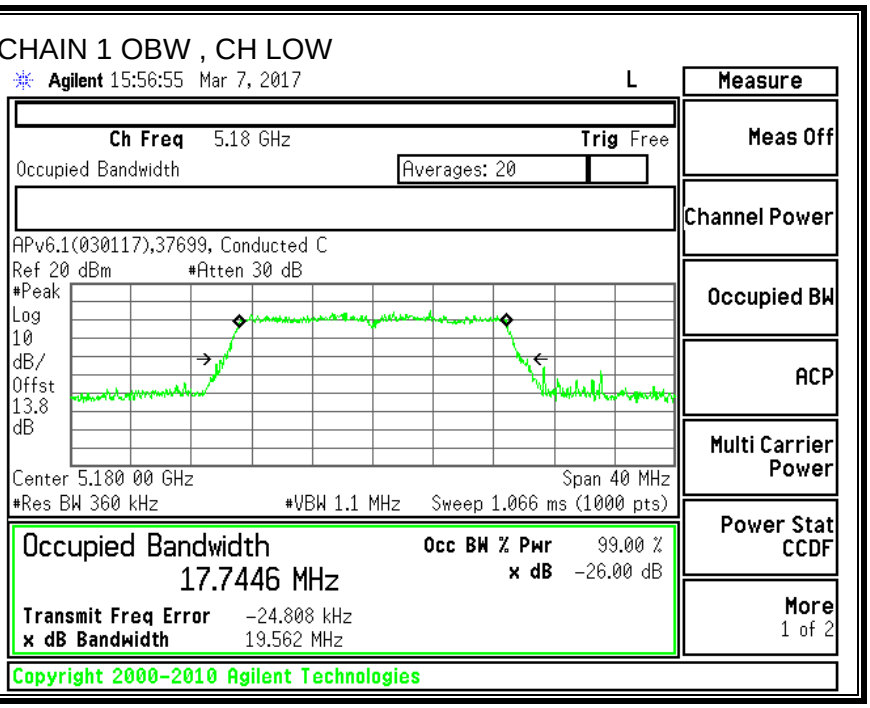
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5180	17.696	17.745
Mid	5200	17.65	17.655
High	5240	17.651	17.695

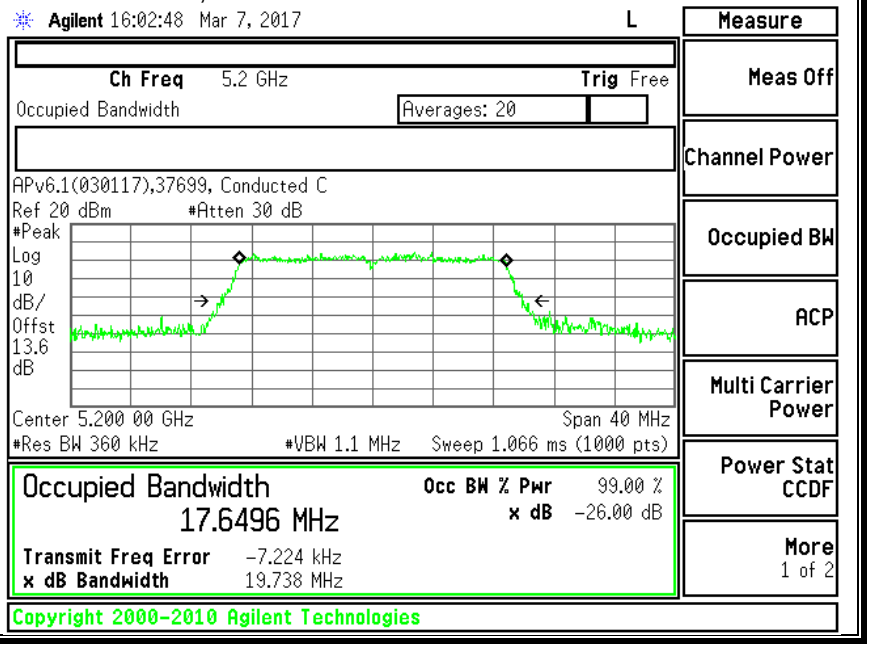
CHAIN 0 OBW , CH LOW



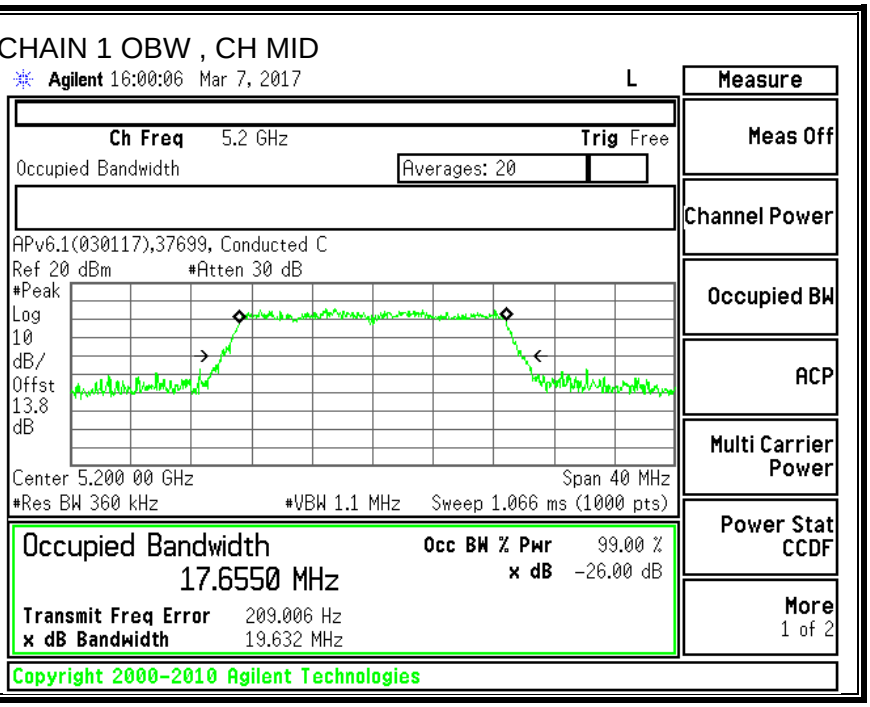
CHAIN 1 OBW , CH LOW



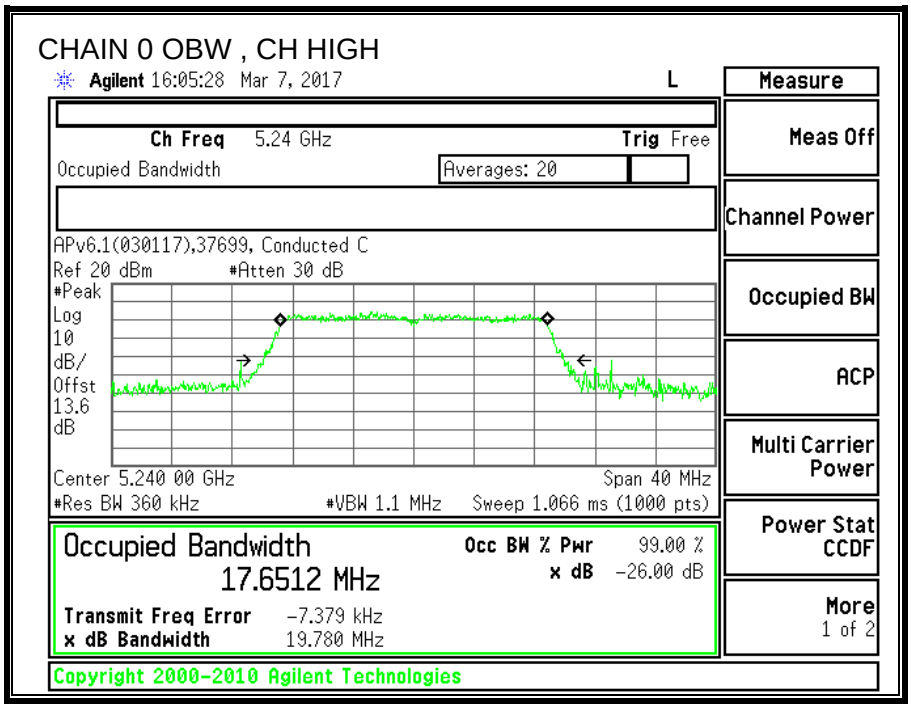
CHAIN 0 OBW , CH MID



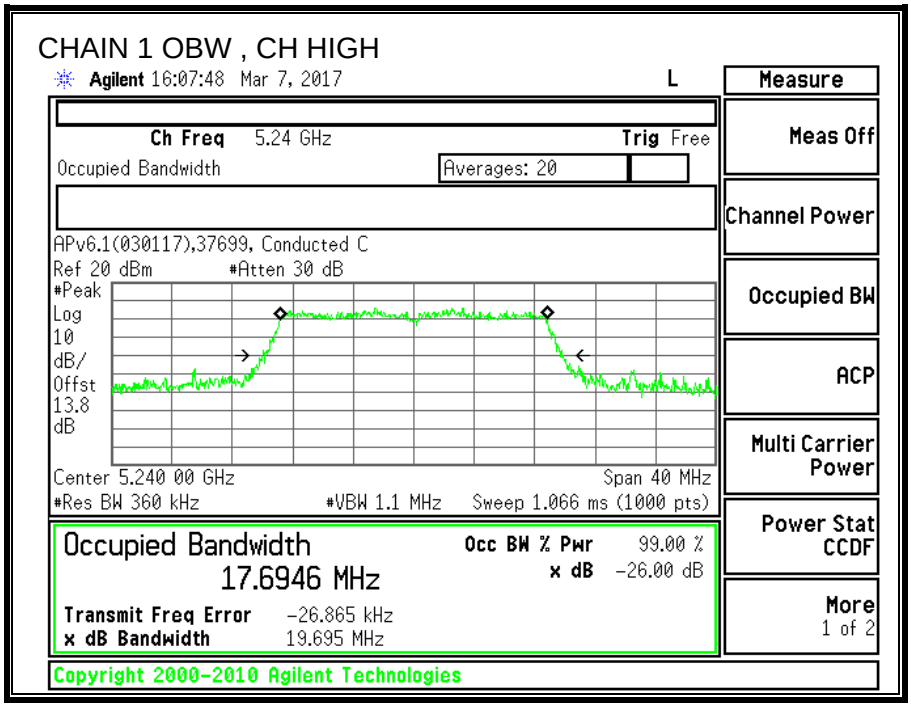
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.2.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(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.

IC RSS-247 6.2.1(1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.10	3.00	2.57	5.57

RESULTS

ID:	50818 JQ	Date:	3/9/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5180	20.35	17.70	2.57	5.57
Mid	5200	20.30	17.65	2.57	5.57
High	5240	20.35	17.65	2.57	5.57

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	22.48	19.91	19.91	11.00	10.00	4.43
Mid	5200	24.00	22.47	19.90	19.90	11.00	10.00	4.43
High	5240	24.00	22.47	19.90	19.90	11.00	10.00	4.43

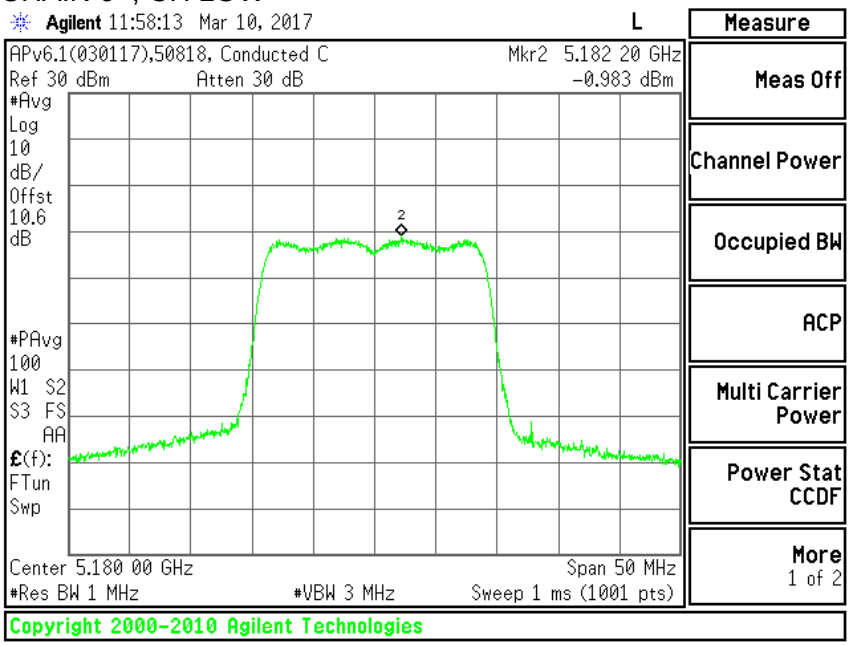
Output Power Results

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	10.41	9.67	13.07	19.91	-6.84
Mid	5200	10.43	9.96	13.21	19.90	-6.69
High	5240	10.75	9.51	13.18	19.90	-6.71

PPSD Results

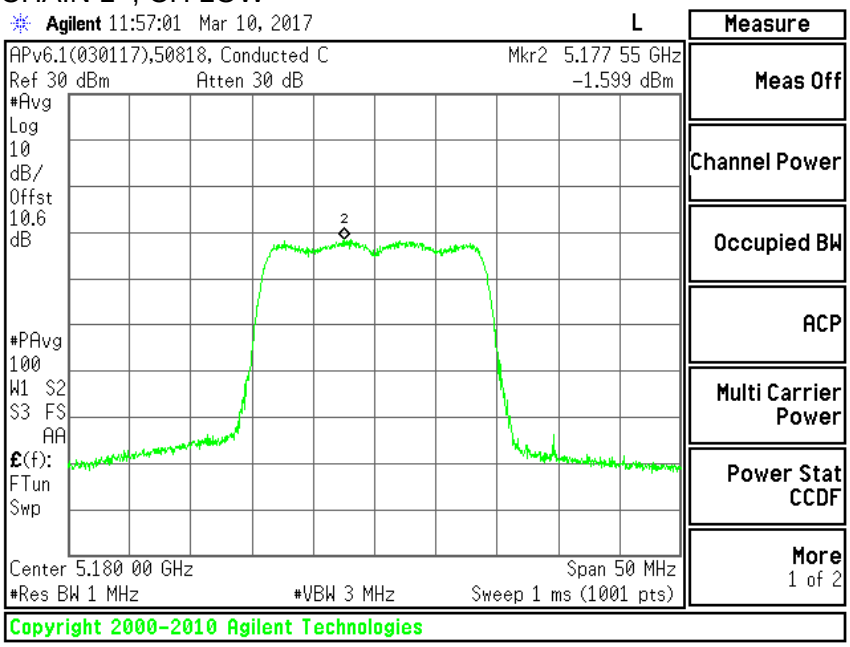
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	-0.48	-1.10	2.23	4.43	-2.20
Mid	5200	-0.66	-0.80	2.28	4.43	-2.15
High	5240	-0.53	-1.39	2.07	4.43	-2.36

CHAIN 0 , CH LOW



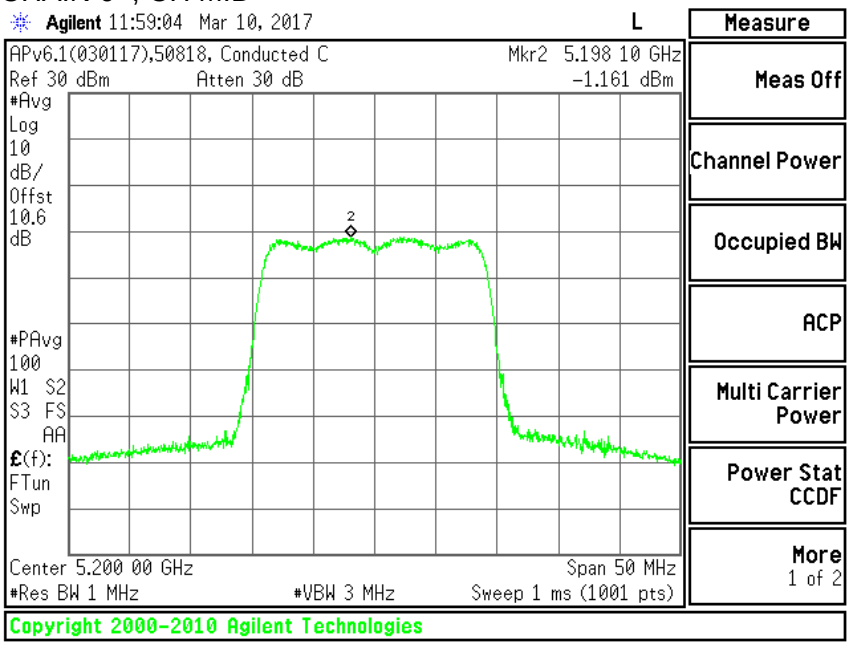
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.483dBm

CHAIN 1 , CH LOW



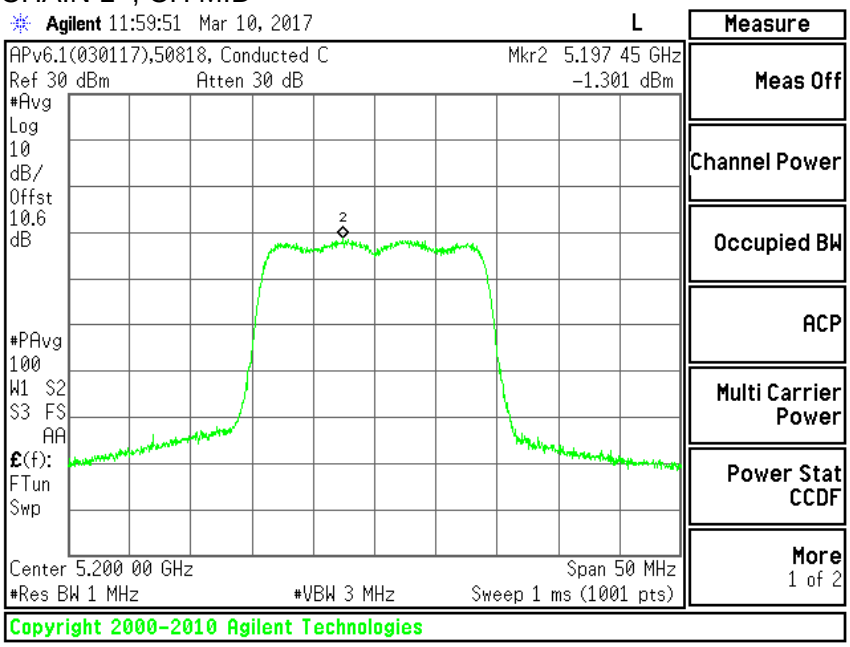
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.099dBm

CHAIN 0 , CH MID



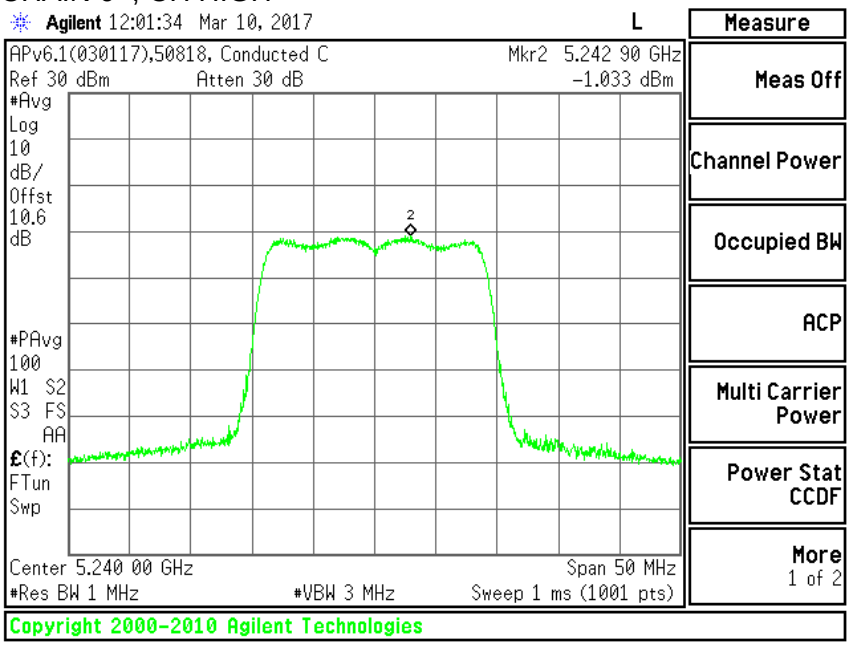
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.661dBm

CHAIN 1 , CH MID



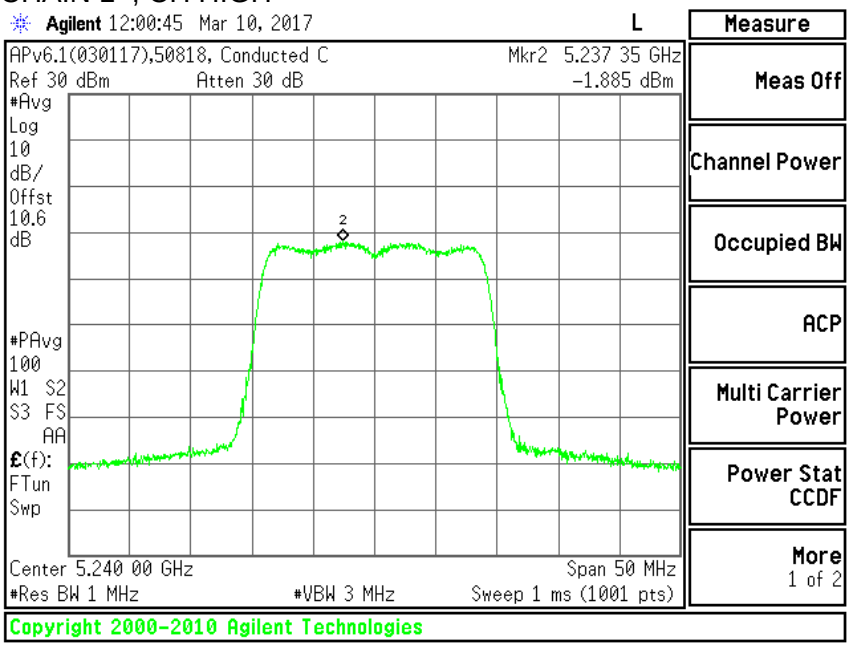
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.801dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.533dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.385dBm

9.3. 11n HT40 2TX MODE IN THE 5.2GHz BAND

9.3.1. 26 dB BANDWIDTH

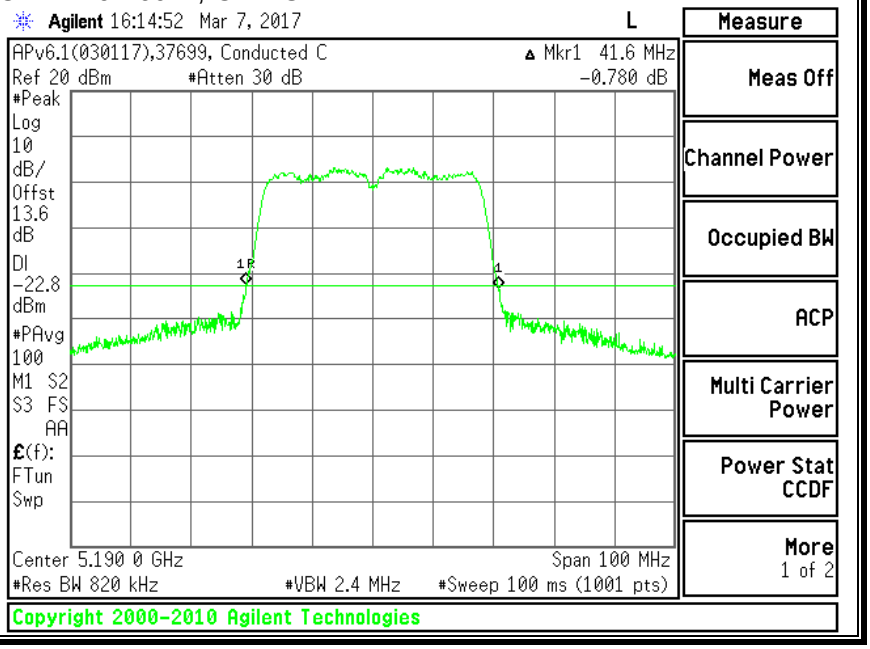
LIMITS

None; for reporting purposes only.

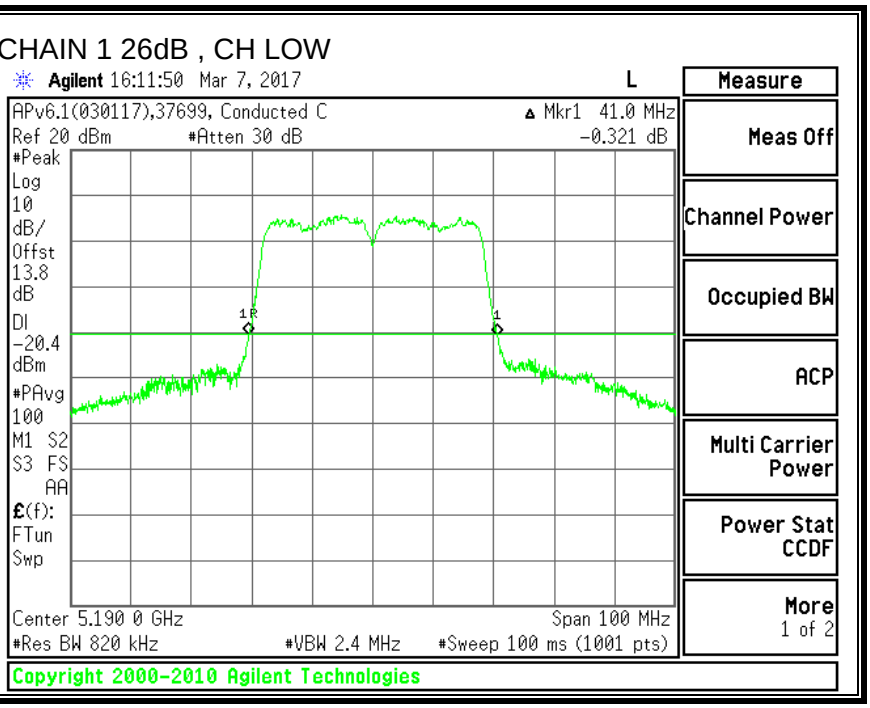
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5190	41.6	41
High	5230	41.7	40.7

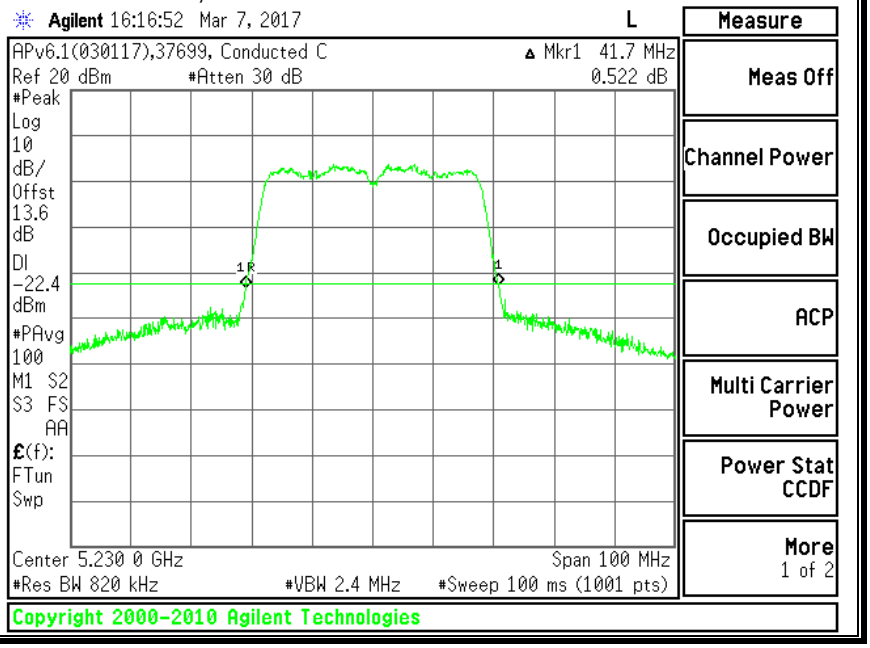
CHAIN 0 26dB , CH LOW



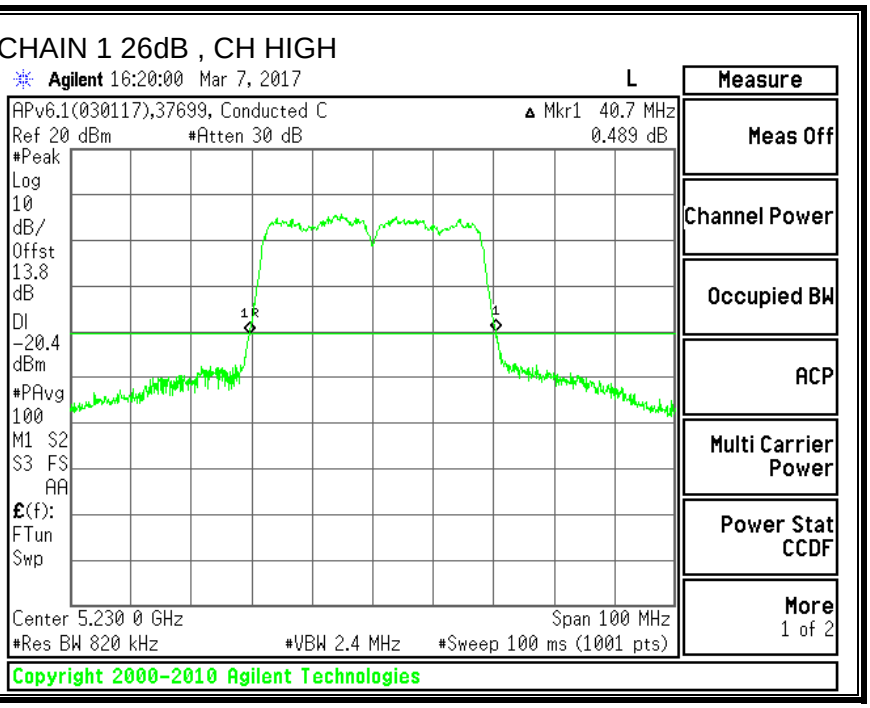
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.3.2. 99% BANDWIDTH

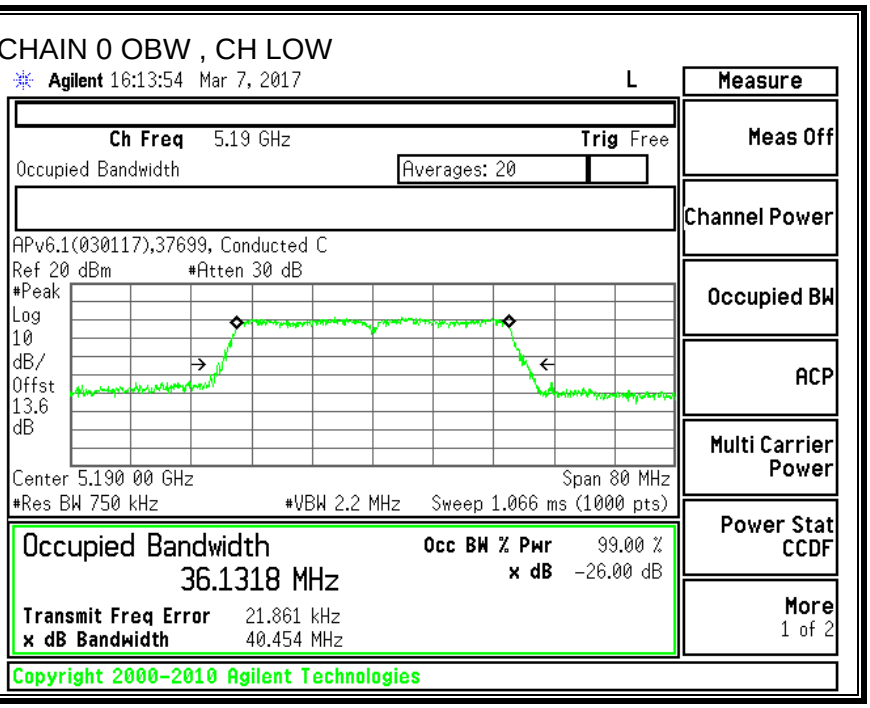
LIMITS

None; for reporting purposes only.

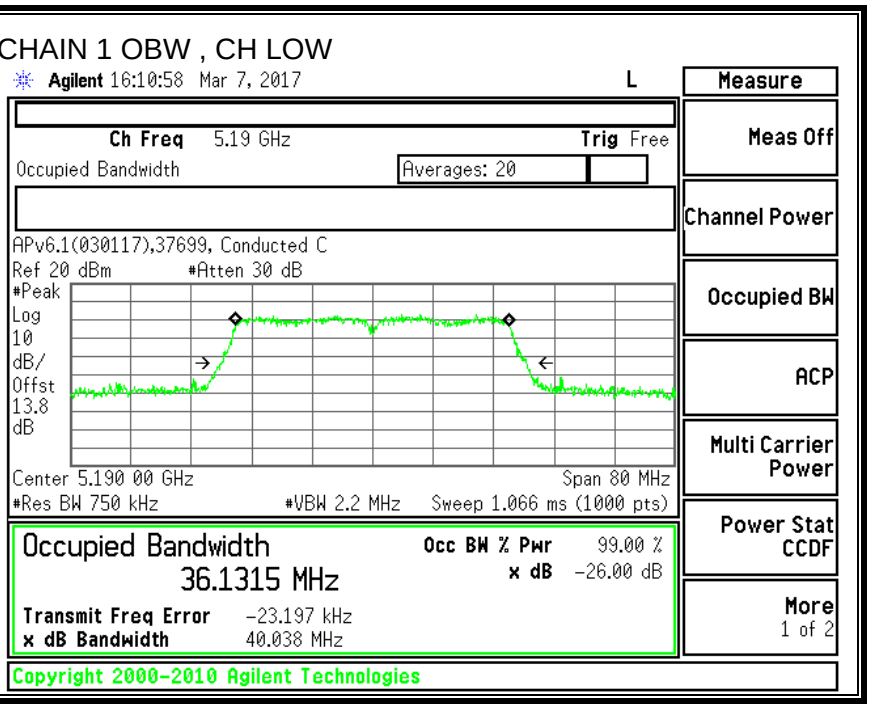
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5190	36.132	36.132
High	5230	36.067	36.082

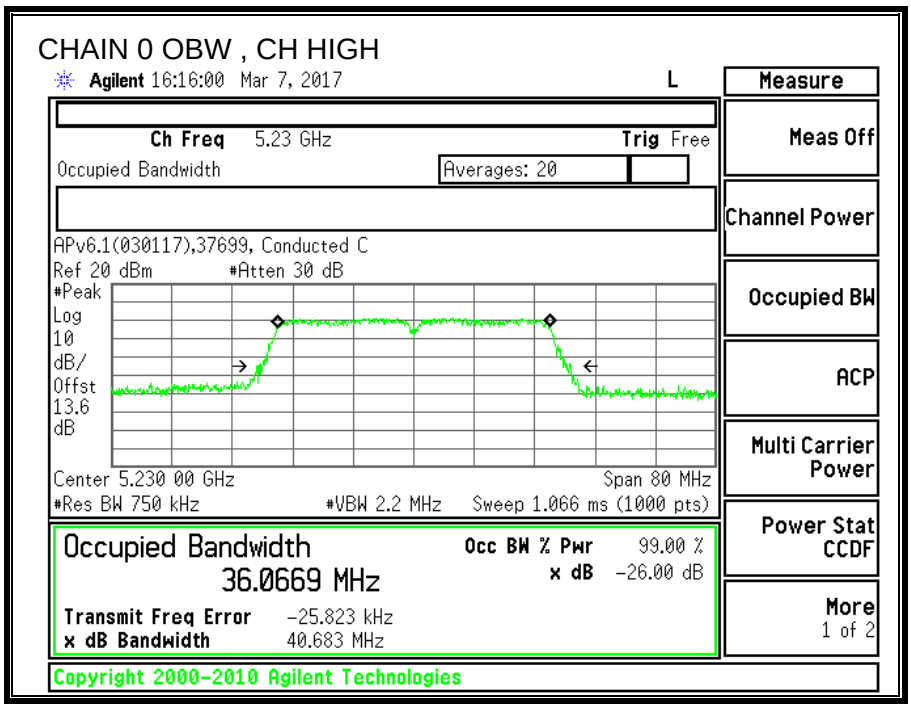
CHAIN 0 OBW , CH LOW



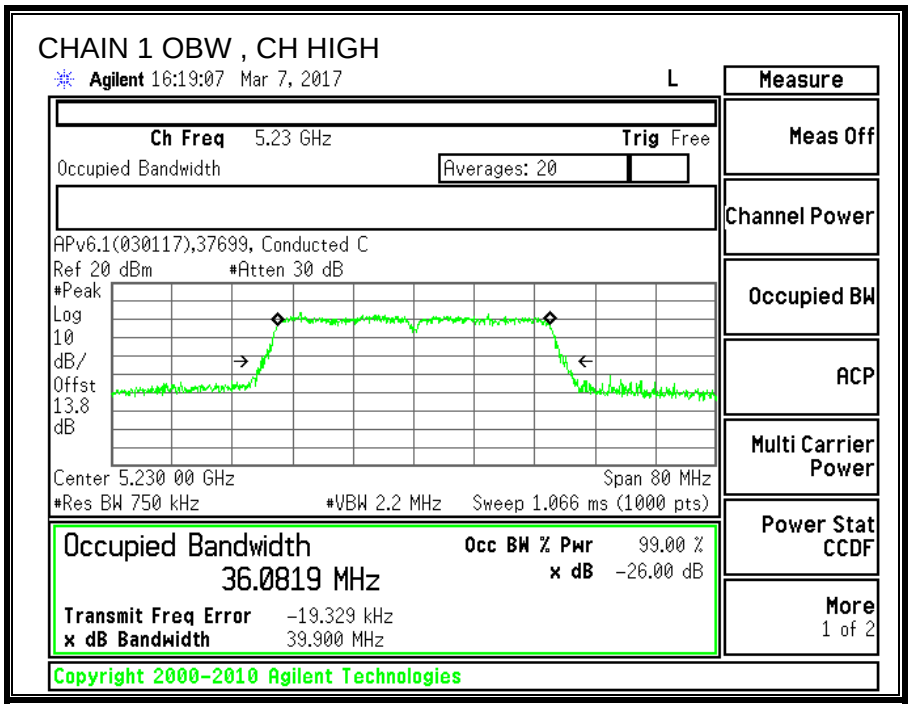
CHAIN 1 OBW , CH LOW



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.3.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(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.

IC RSS-247 6.2.1(1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.10	3.00	2.57	5.57

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5190	41.00	36.13	2.57	5.57
High	5230	40.70	36.07	2.57	5.57

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	24.00	23.00	20.43	20.43	11.00	10.00	4.43
High	5230	24.00	23.00	20.43	20.43	11.00	10.00	4.43

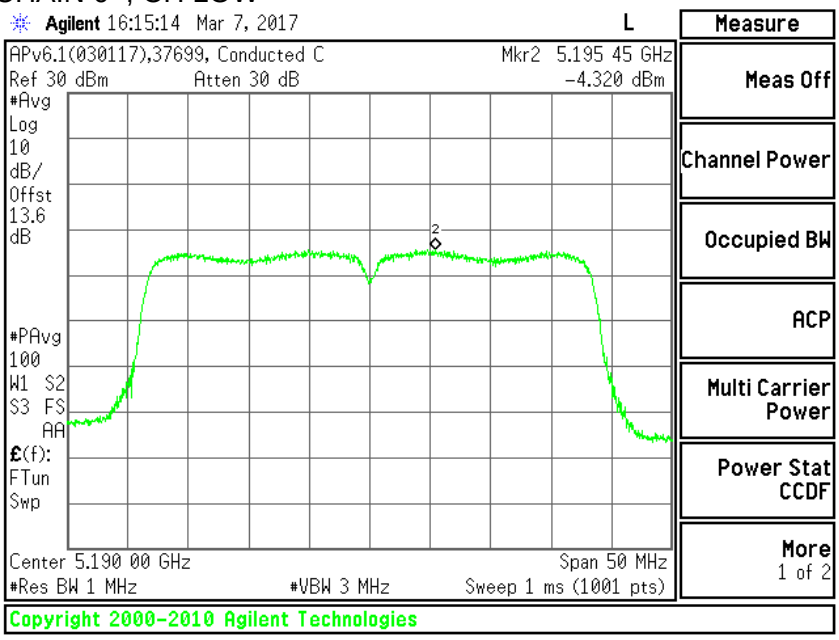
Output Power Results

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	9.69	9.33	12.52	20.43	-7.91
High	5230	10.00	8.95	12.52	20.43	-7.91

PPSD Results

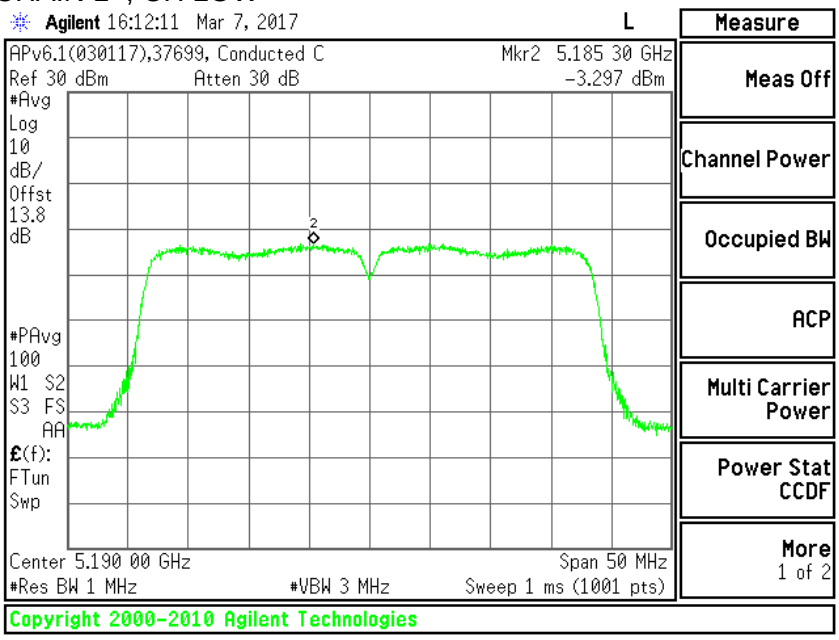
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	-3.82	-2.80	-0.27	4.43	-4.70
High	5230	-3.34	-2.93	-0.12	4.43	-4.55

CHAIN 0 , CH LOW



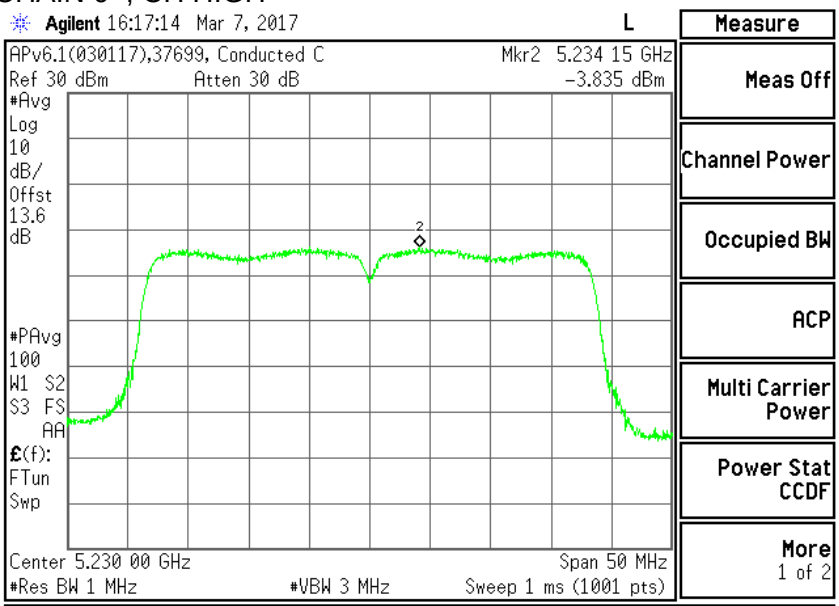
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -3.82dBm

CHAIN 1 , CH LOW



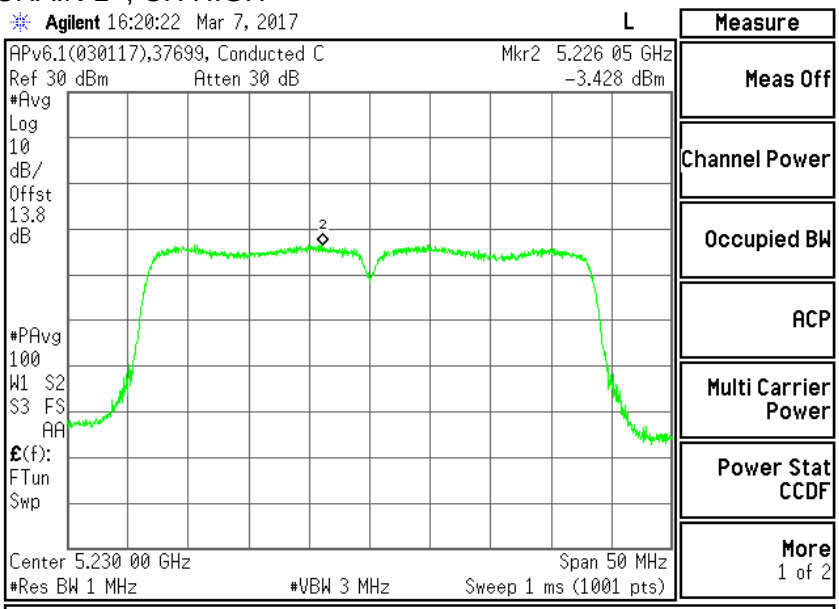
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.797dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -3.335dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.928dBm

9.4. 11ac VHT80 2TX MODE IN THE 5.2GHz BAND

9.4.1. 26 dB BANDWIDTH

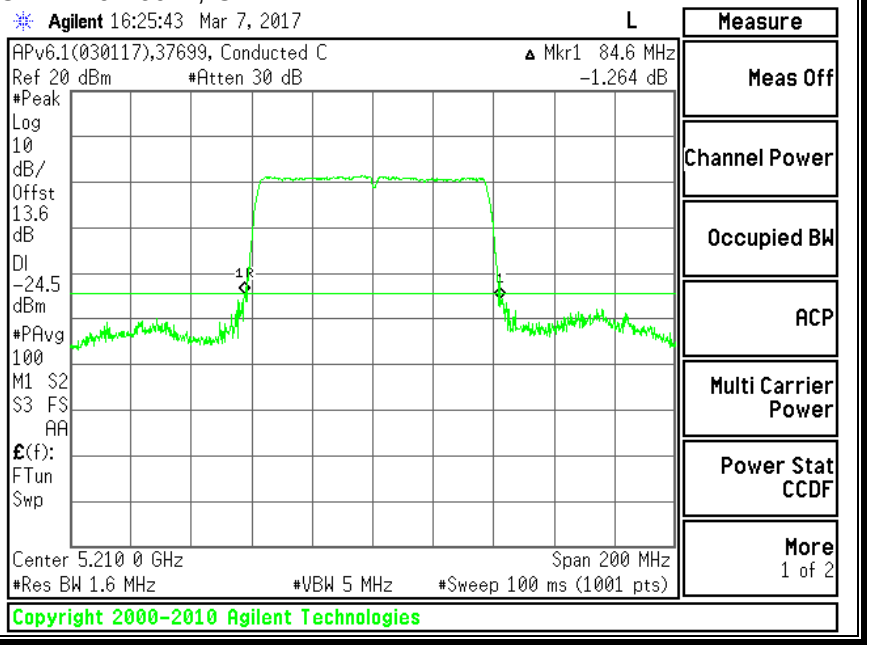
LIMITS

None; for reporting purposes only.

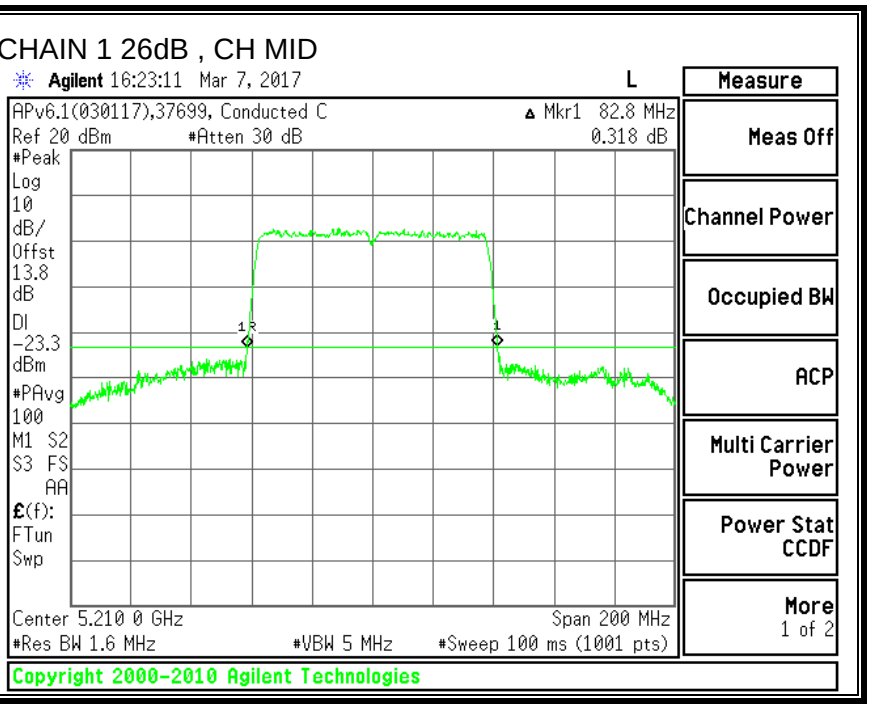
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Mid	5210	84.6	82.8

CHAIN 0 26dB , CH MID



CHAIN 1 26dB , CH MID



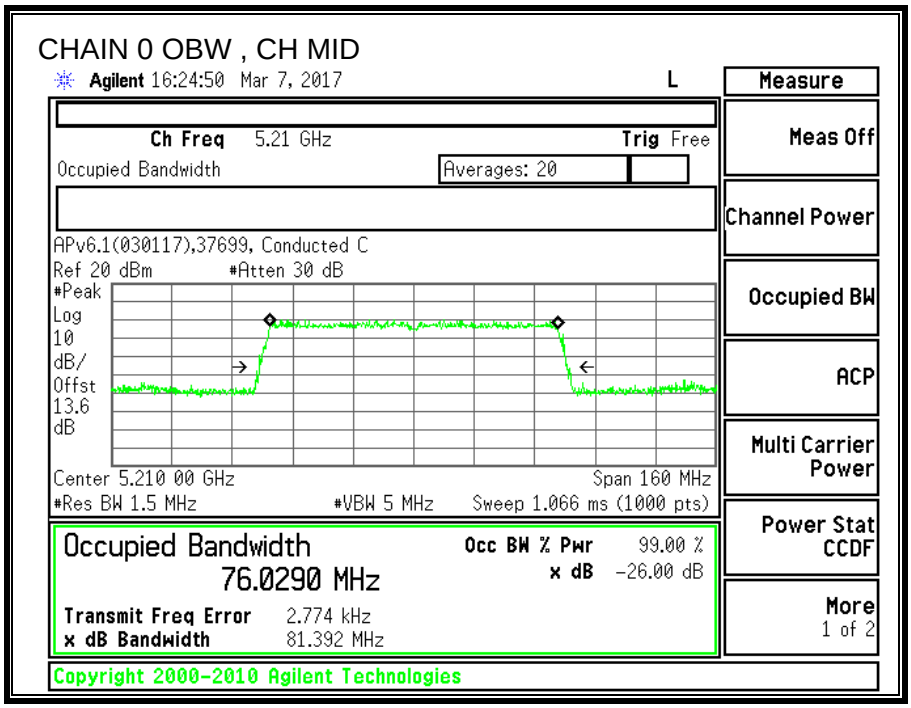
9.4.2. 99% BANDWIDTH

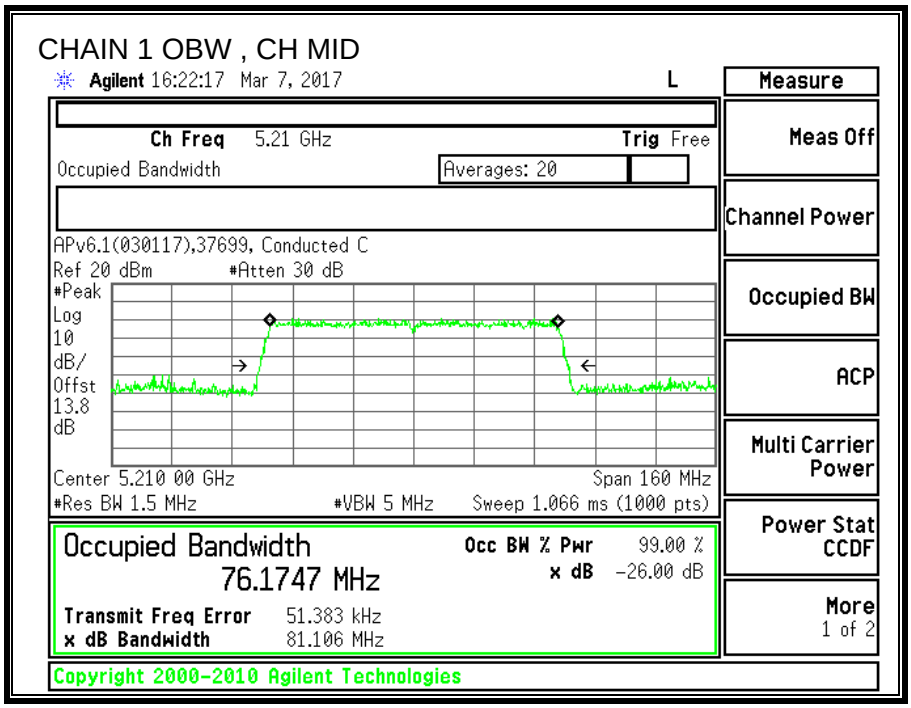
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Mid	5210	76.029	76.175





9.4.3. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a) (1)

(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.

IC RSS-247 6.2.1(1)

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.10	3.00	2.57	5.57

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5210	82.80	76.03	2.57	5.57

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5210	24.00	23.00	20.43	20.43	11.00	10.00	4.43

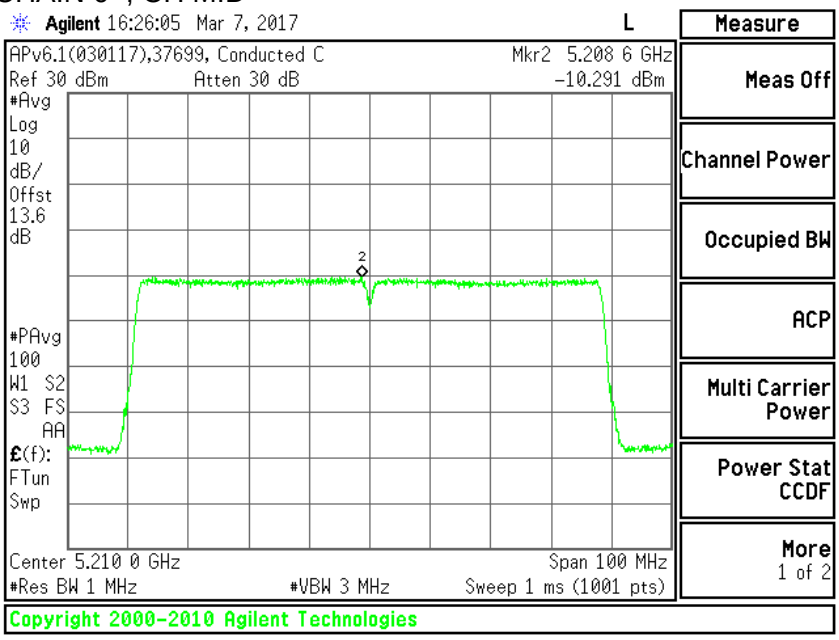
Output Power Results

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	5210	6.72	6.10	9.43	20.43	-11.00

PPSD Results

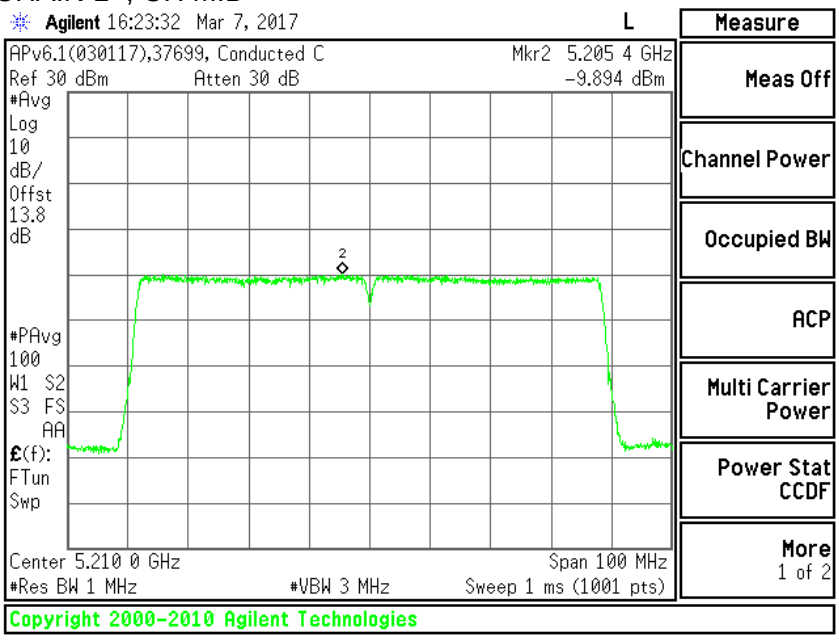
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5210	-9.79	-9.39	-6.58	4.43	-11.01

CHAIN 0 , CH MID



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.791dBm

CHAIN 1 , CH MID



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.394dBm

9.5. 11a 2TX MODE IN THE 5.3GHz BAND

9.5.1. 26 dB BANDWIDTH

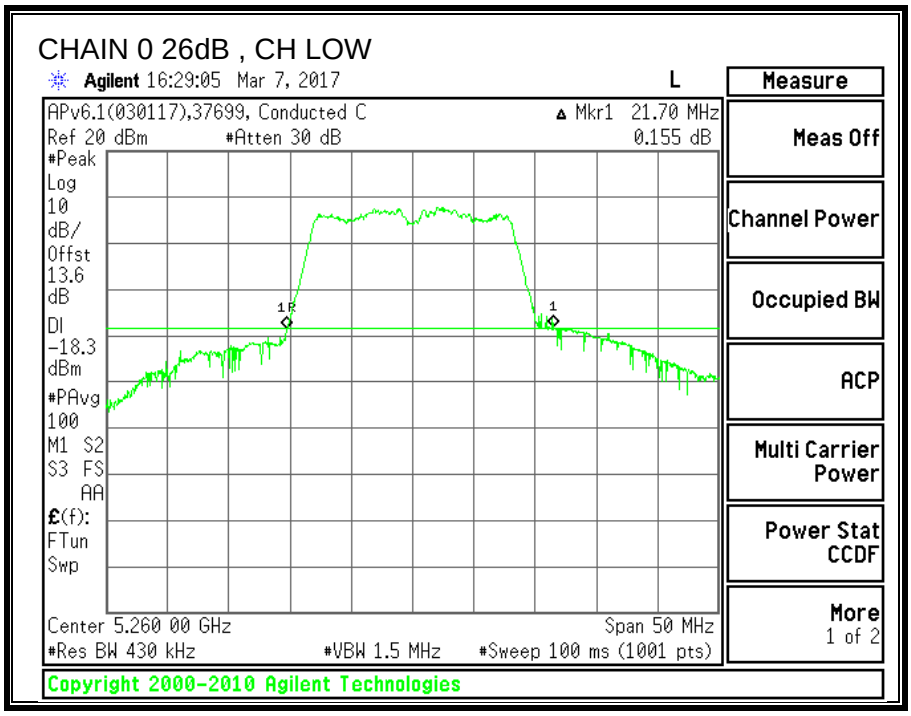
LIMITS

None; for reporting purposes only.

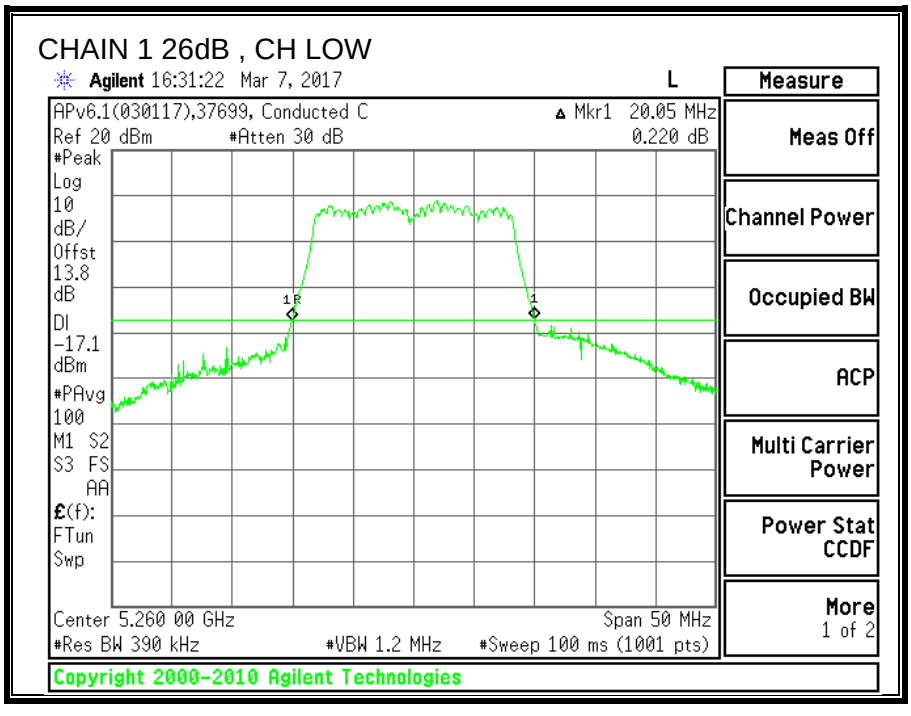
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5260	21.7	20.05
Mid	5300	20.3	20.05
High	5320	21.55	20.05

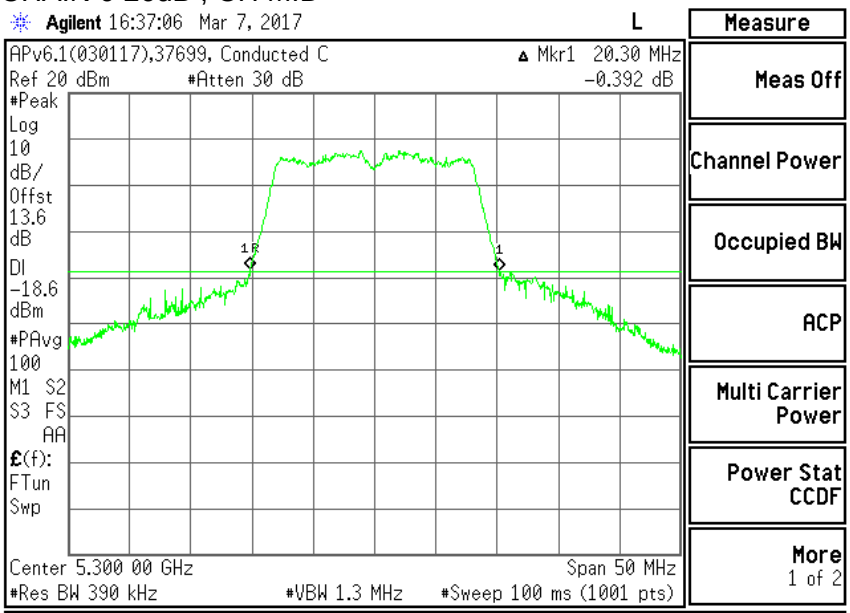
CHAIN 0 26dB , CH LOW



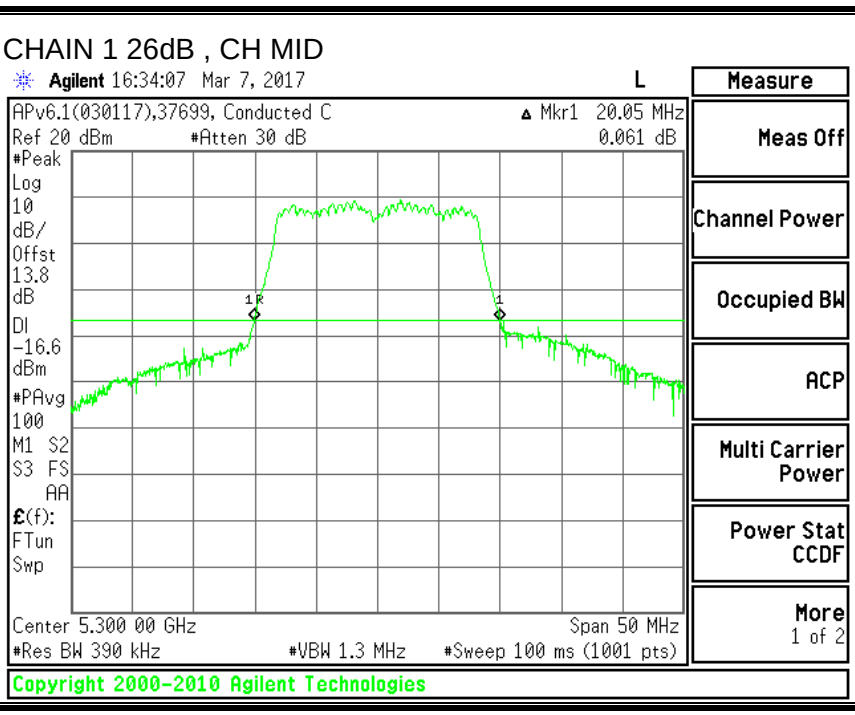
CHAIN 1 26dB , CH LOW



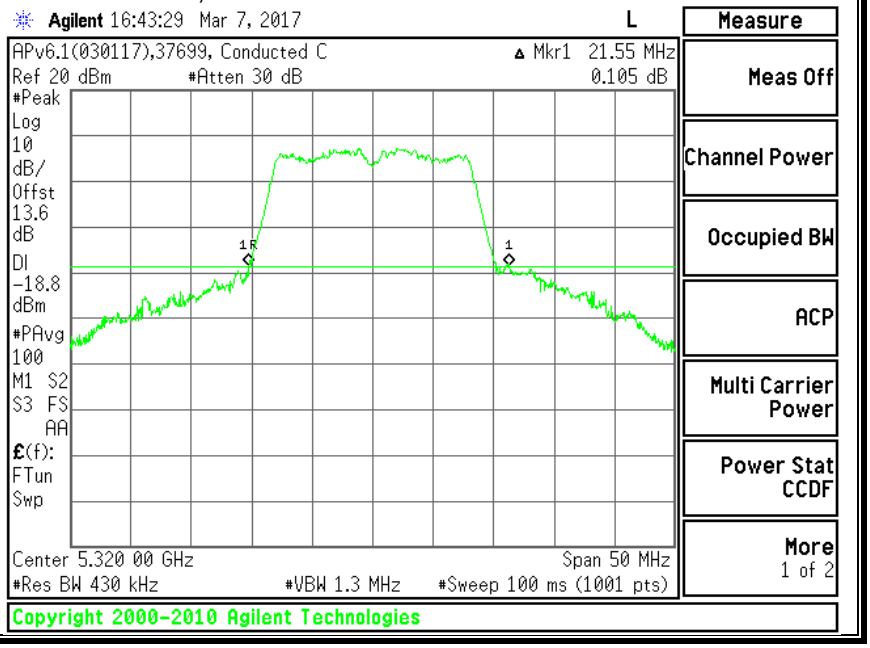
CHAIN 0 26dB , CH MID



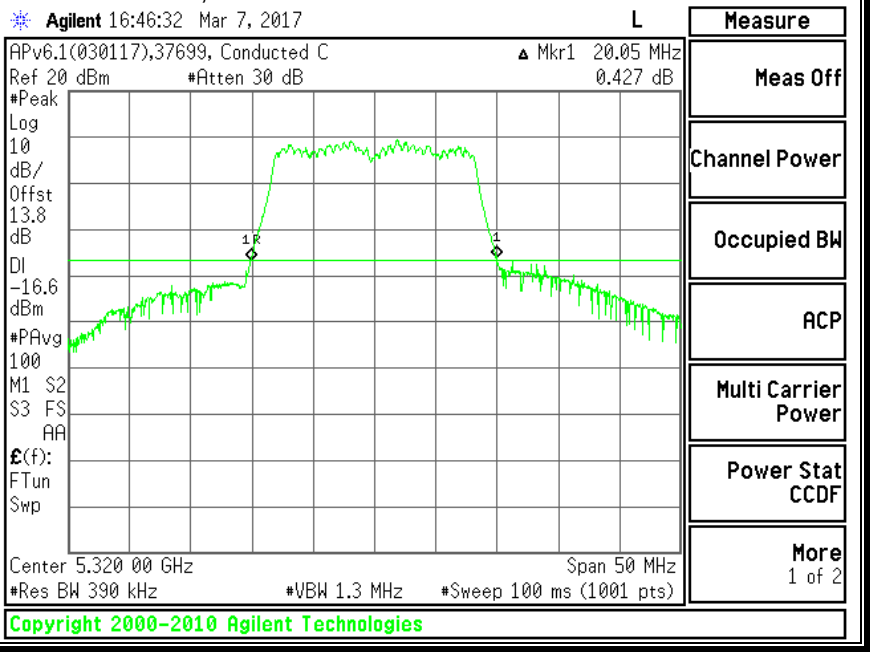
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.5.2. 99% BANDWIDTH

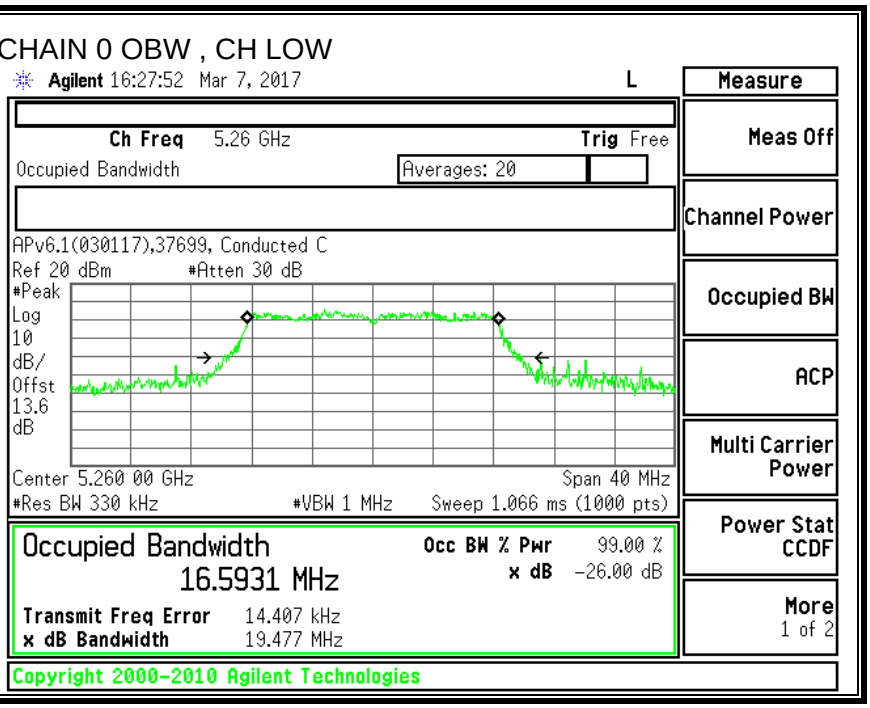
LIMITS

None; for reporting purposes only.

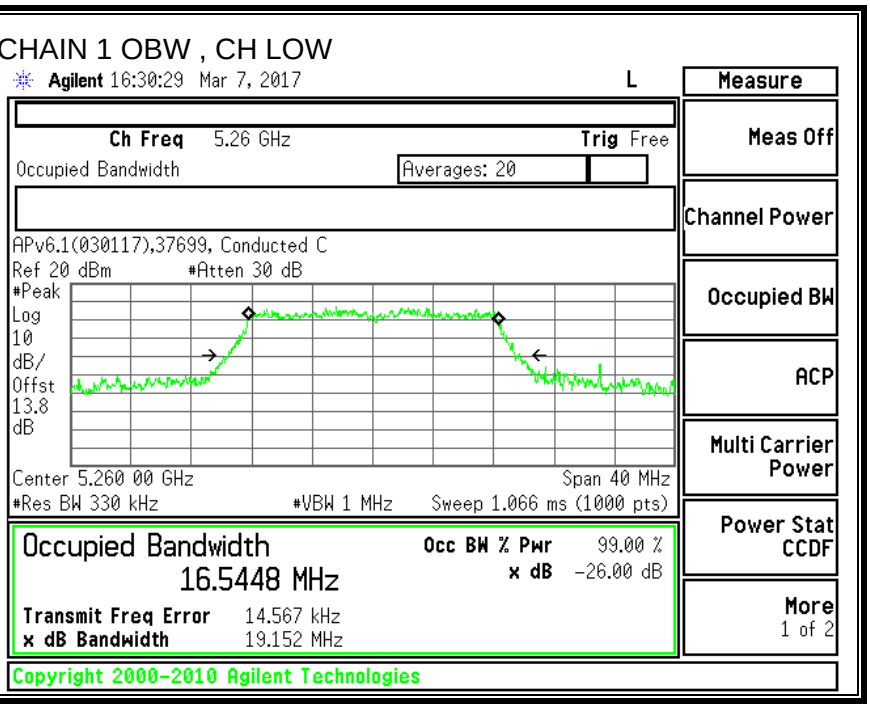
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5260	16.593	16.545
Mid	5300	16.681	16.584
High	5320	16.602	16.58

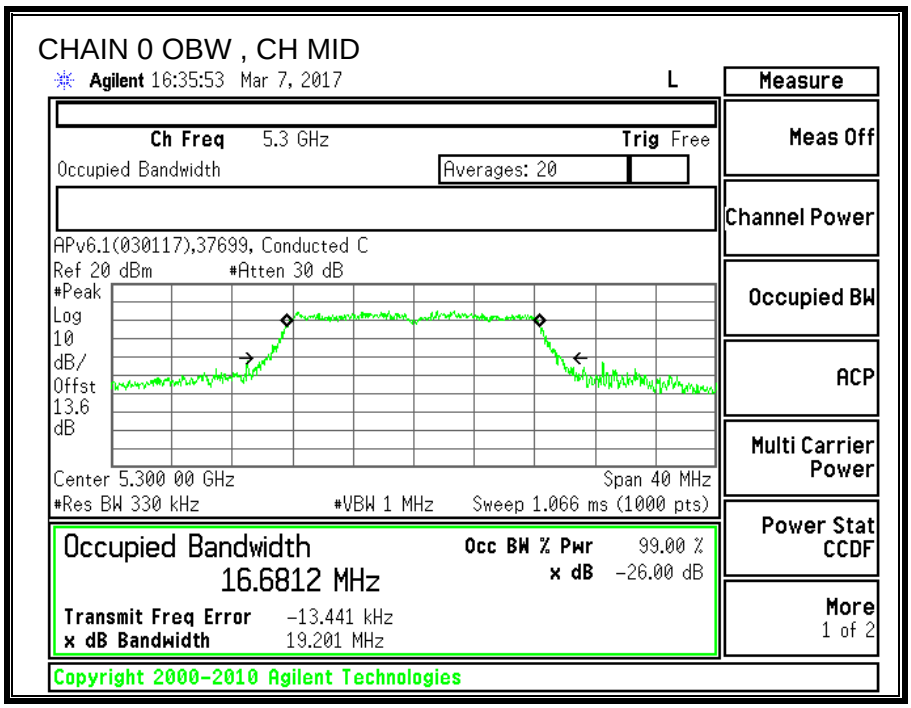
CHAIN 0 OBW , CH LOW



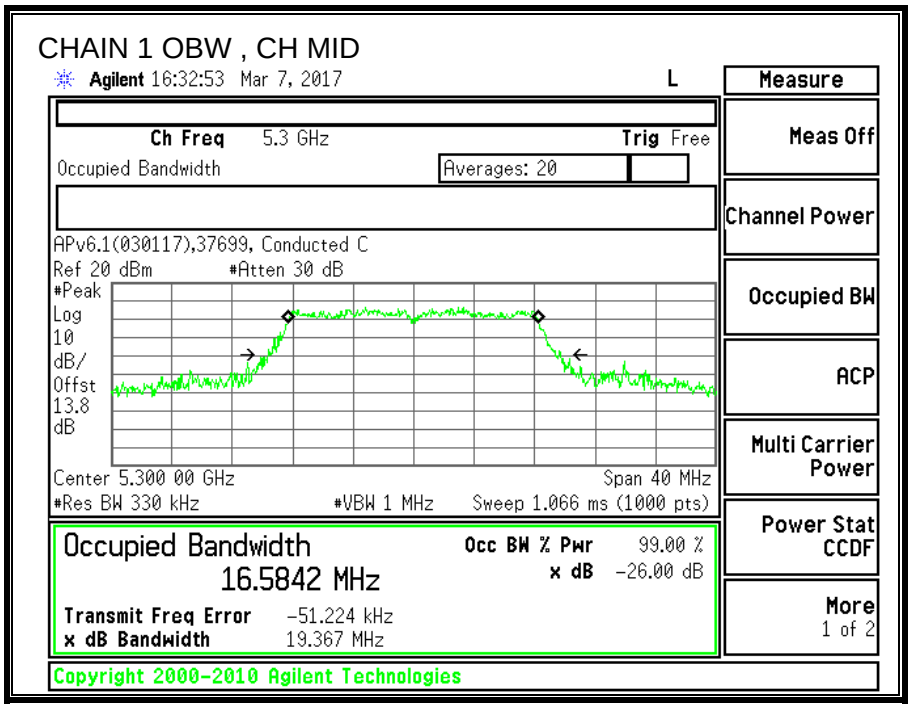
CHAIN 1 OBW , CH LOW



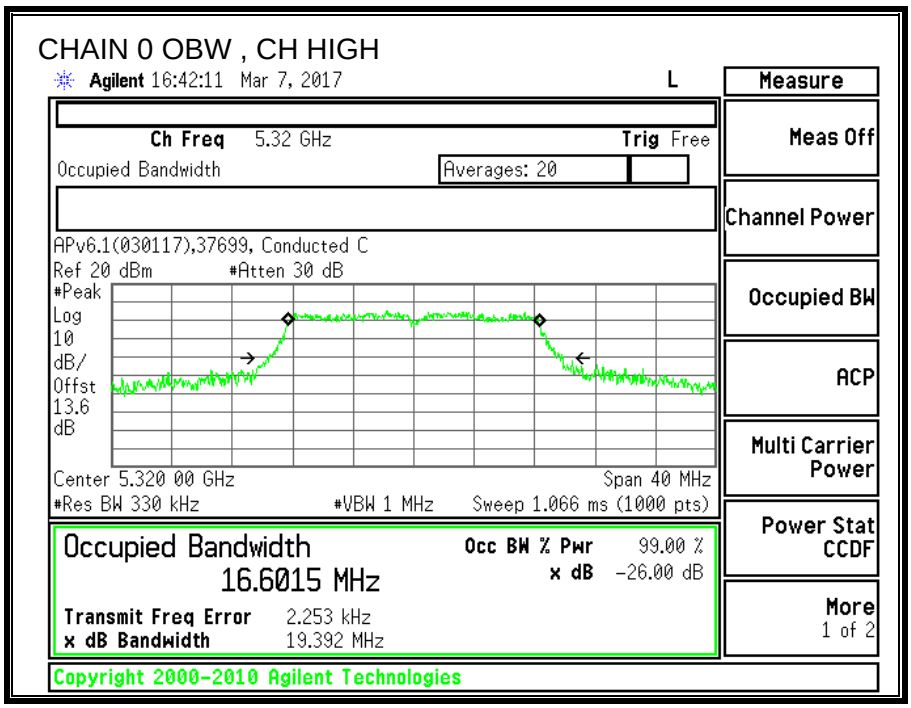
CHAIN 0 OBW , CH MID



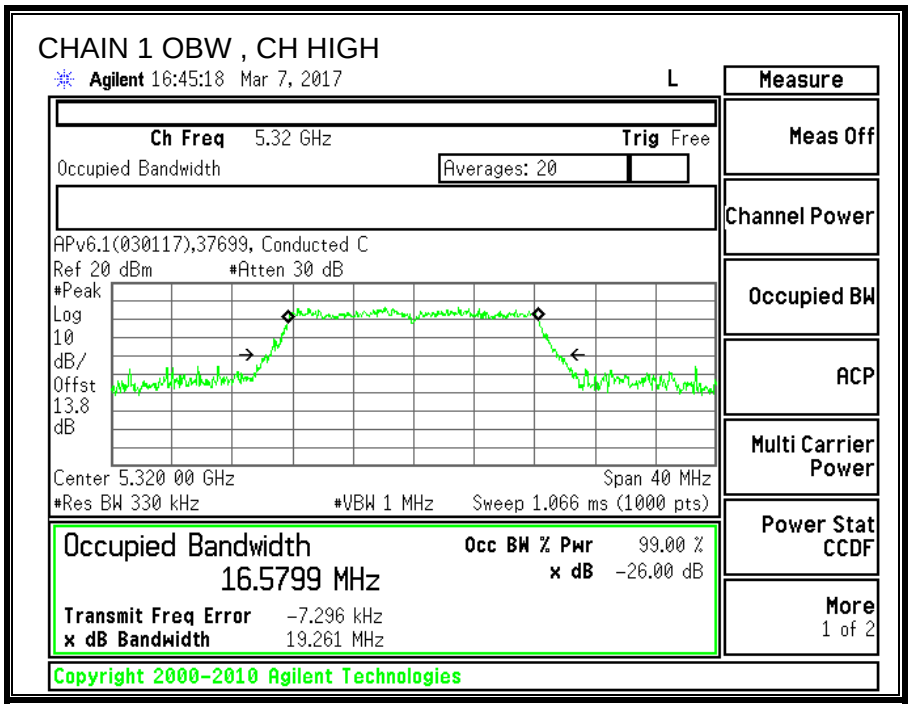
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.5.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (6.2.2) (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.20	2.80	2.07	5.05

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5260	20.05	16.55	2.07	5.05
Mid	5300	20.05	16.58	2.07	5.05
High	5320	20.05	16.58	2.07	5.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.19	27.00	23.19	11.00	11.00	11.00
Mid	5300	24.00	23.20	27.00	23.20	11.00	11.00	11.00
High	5320	24.00	23.20	27.00	23.20	11.00	11.00	11.00

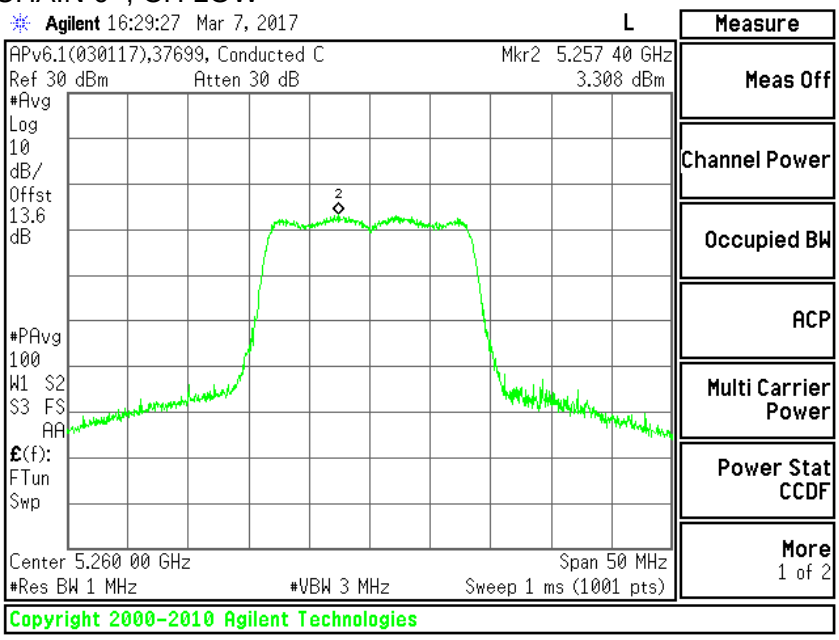
Output Power Results

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	13.55	13.44	16.51	23.19	-6.68
Mid	5300	13.40	13.80	16.61	23.20	-6.58
High	5320	13.59	13.86	16.74	23.20	-6.46

PPSD Results

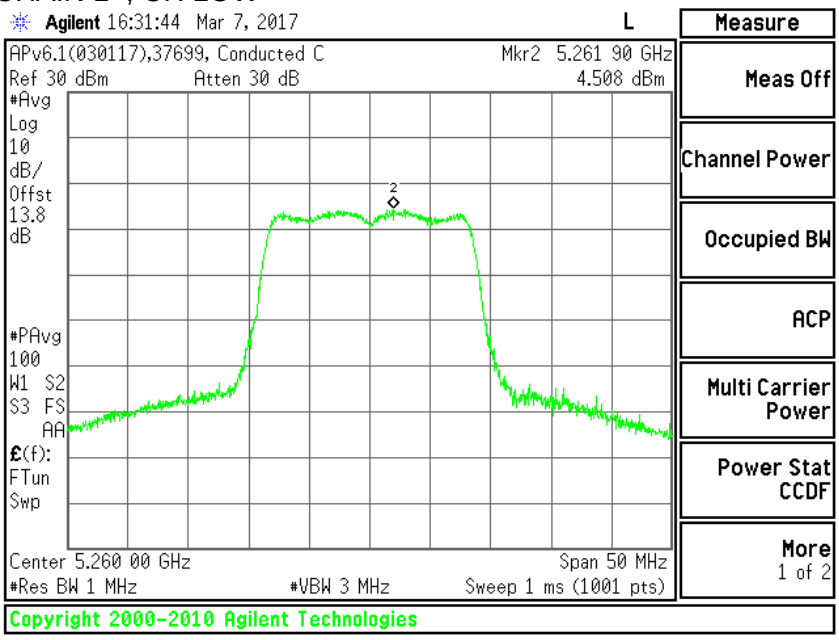
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.81	5.01	7.46	11.00	-3.54
Mid	5300	3.59	4.66	7.17	11.00	-3.83
High	5320	3.45	4.85	7.22	11.00	-3.78

CHAIN 0 , CH LOW



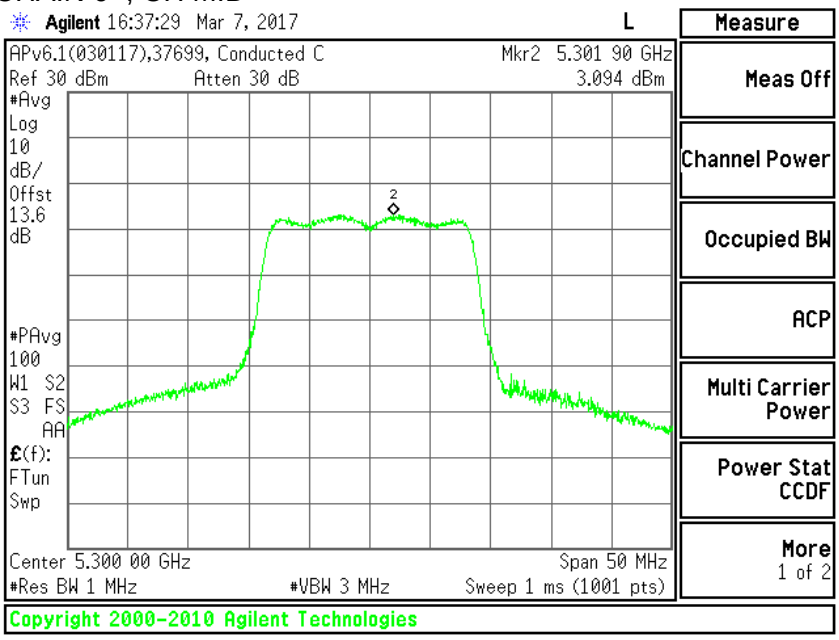
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.808dBm

CHAIN 1 , CH LOW



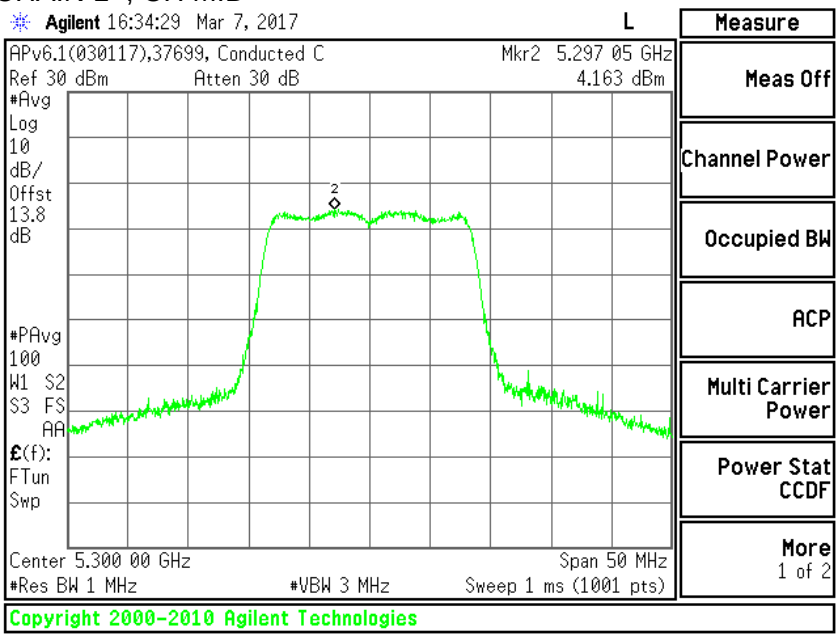
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 5.008dBm

CHAIN 0 , CH MID



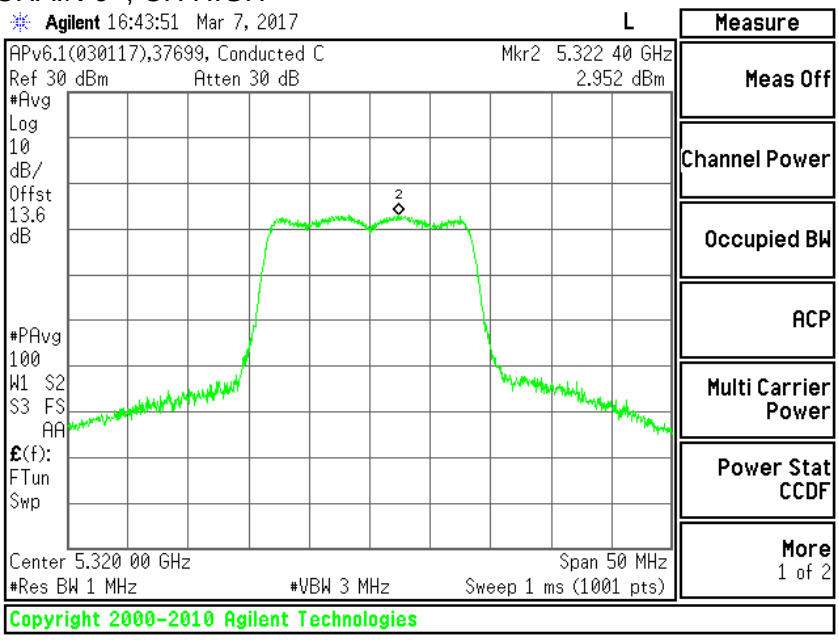
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.594dBm

CHAIN 1 , CH MID



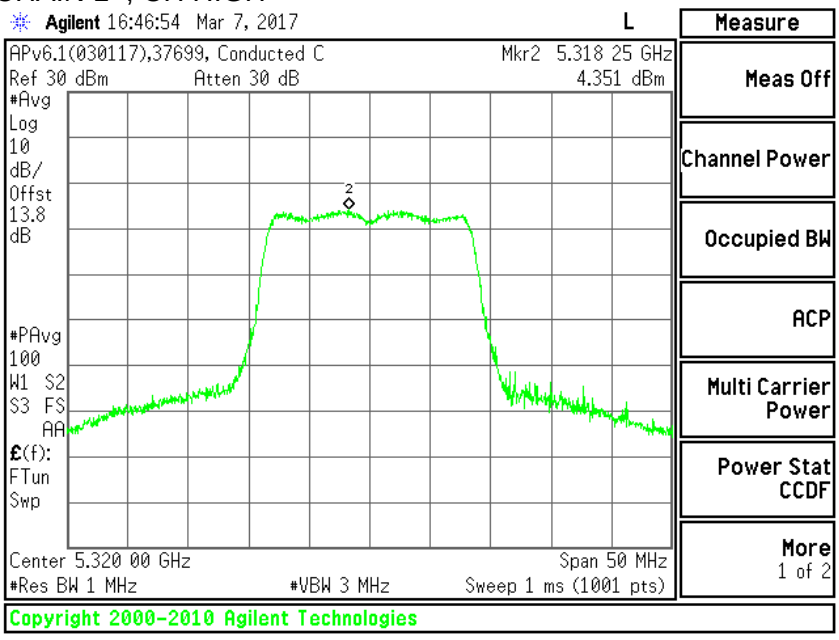
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.663dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.452dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.851dBm

9.6. 11n HT20 2TX MODE IN THE 5.3GHz BAND

9.6.1. 26 dB BANDWIDTH

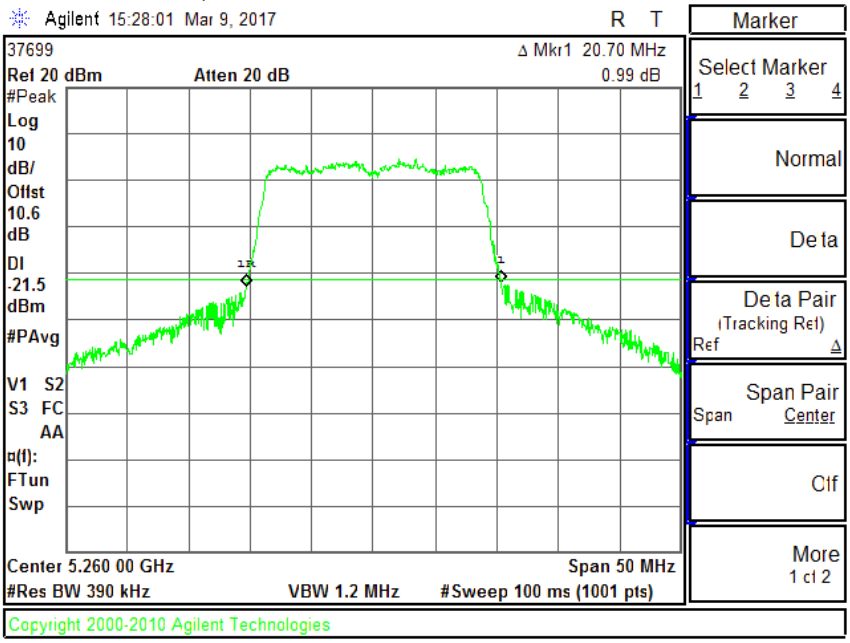
LIMITS

None; for reporting purposes only.

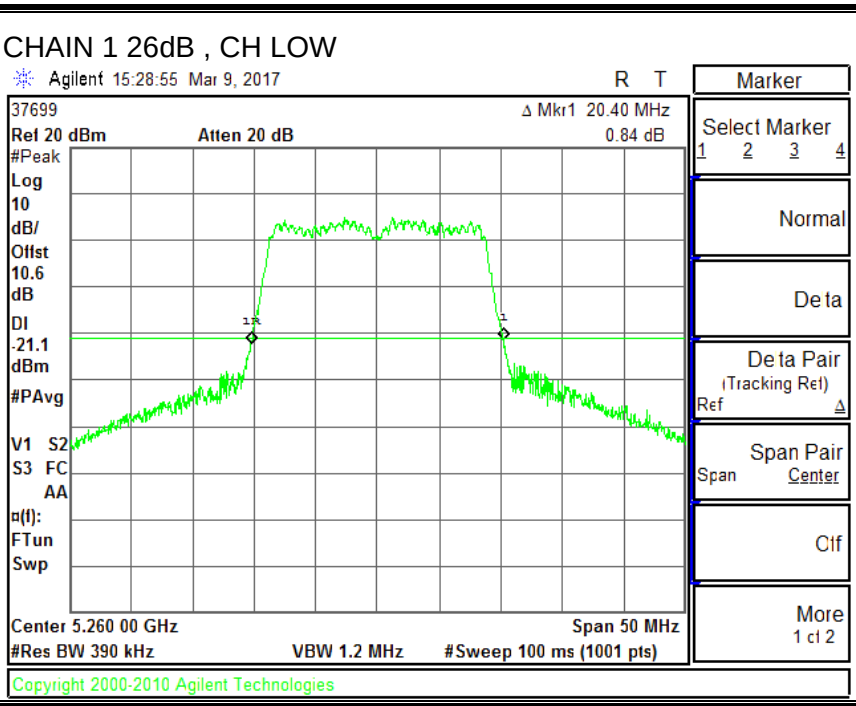
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5260	20.7	20.4
Mid	5300	20.5	20.5
High	5320	20.55	20.4

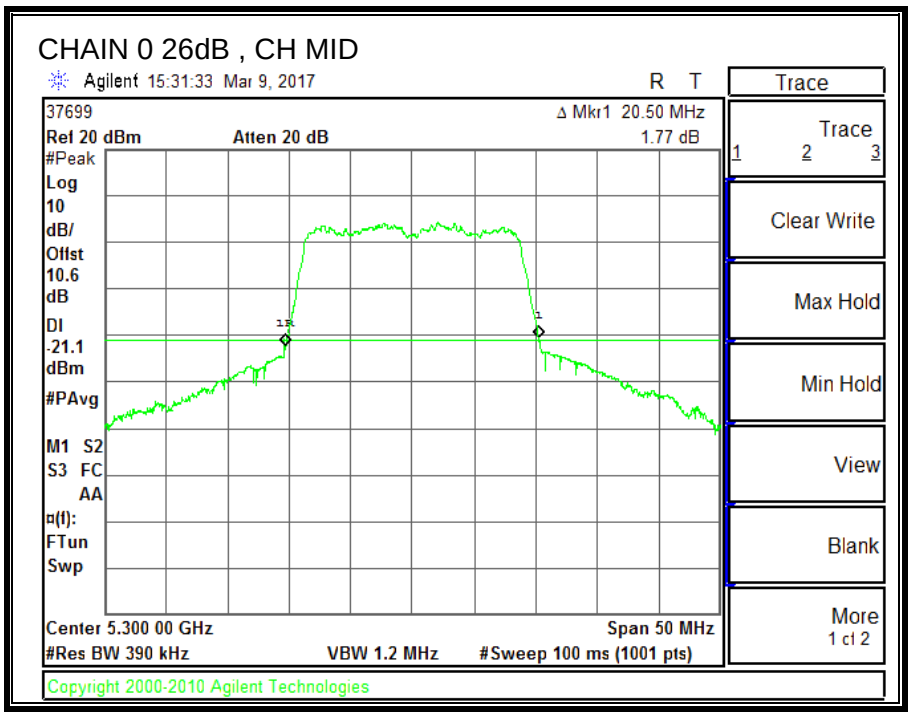
CHAIN 0 26dB , CH LOW



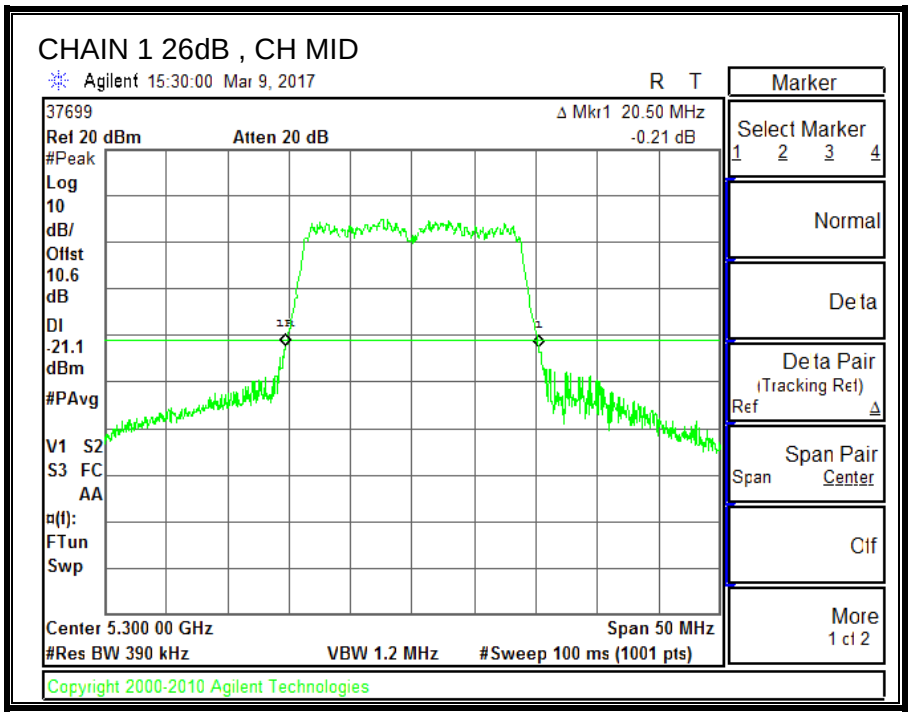
CHAIN 1 26dB , CH LOW



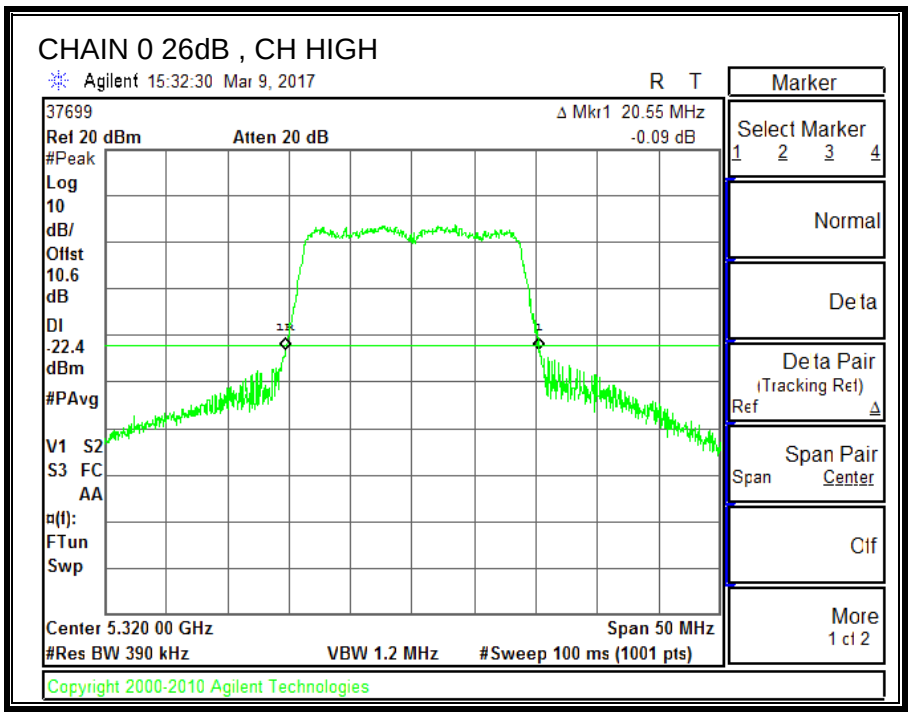
CHAIN 0 26dB , CH MID



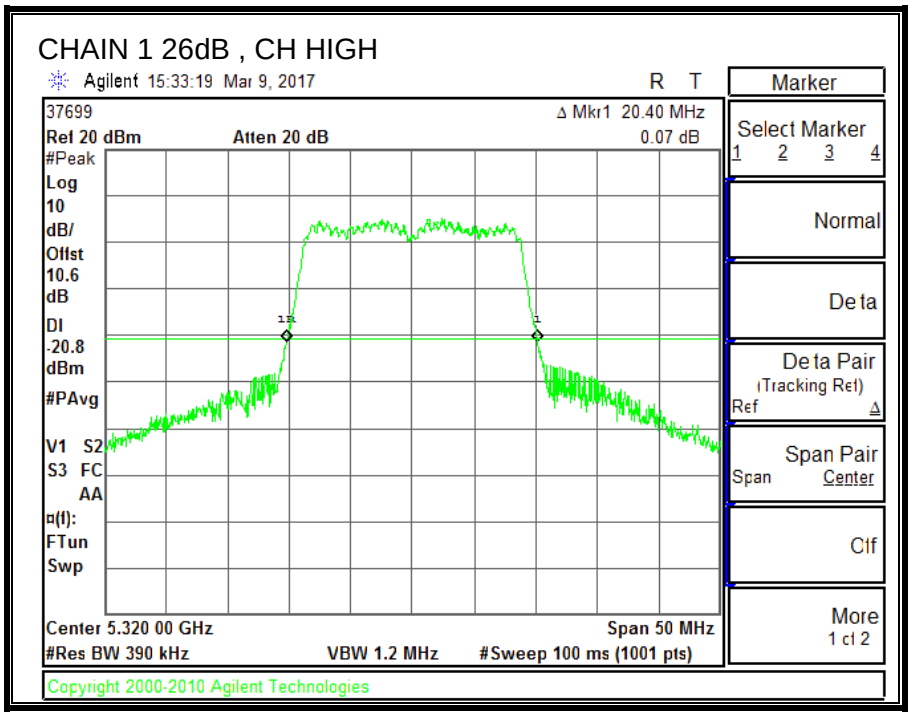
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.6.2. 99% BANDWIDTH

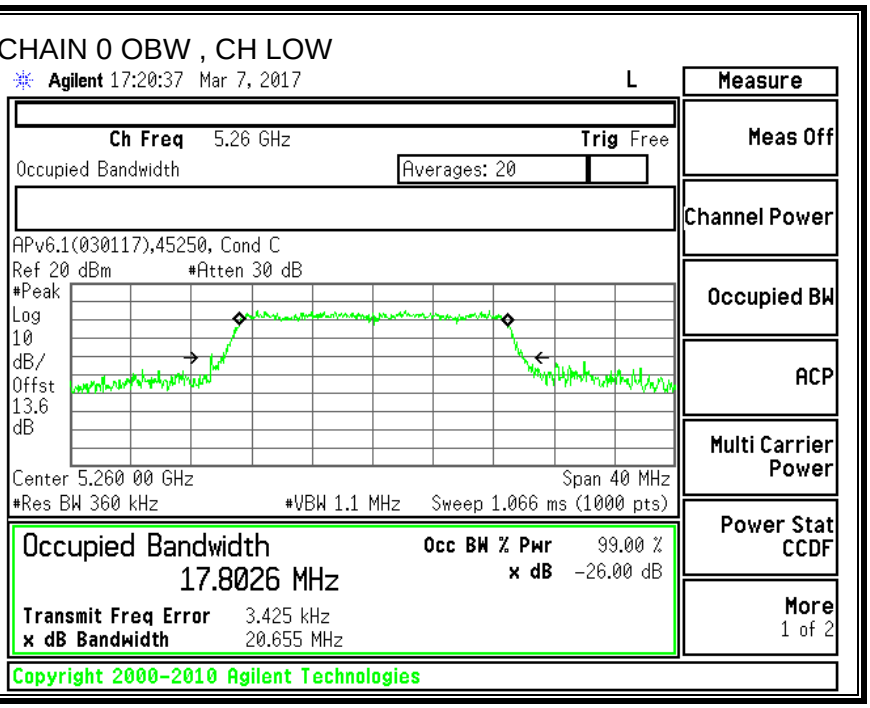
LIMITS

None; for reporting purposes only.

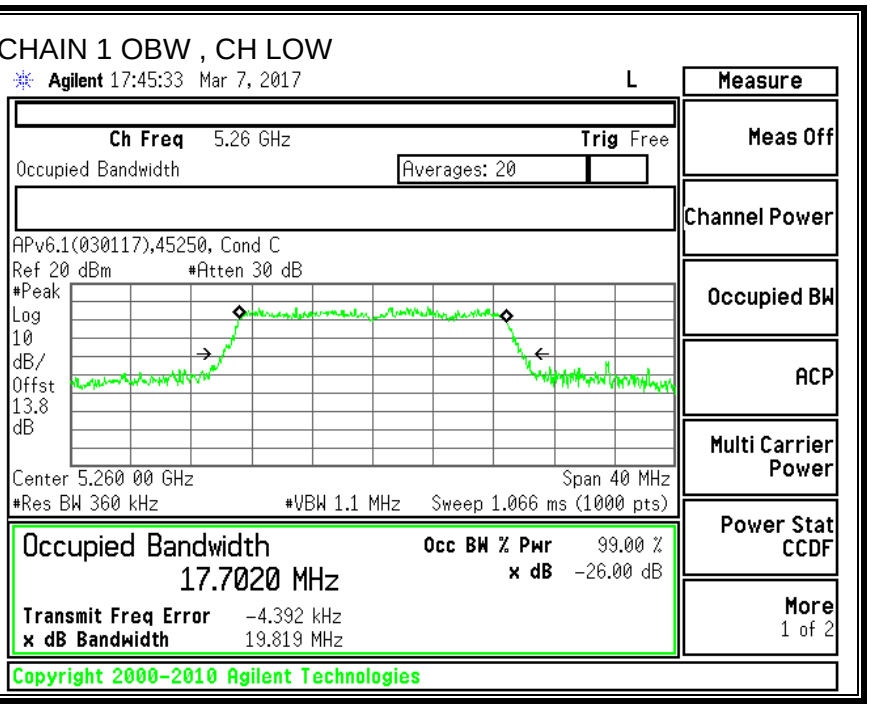
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5260	17.803	17.702
Mid	5300	17.694	17.704
High	5320	17.664	17.738

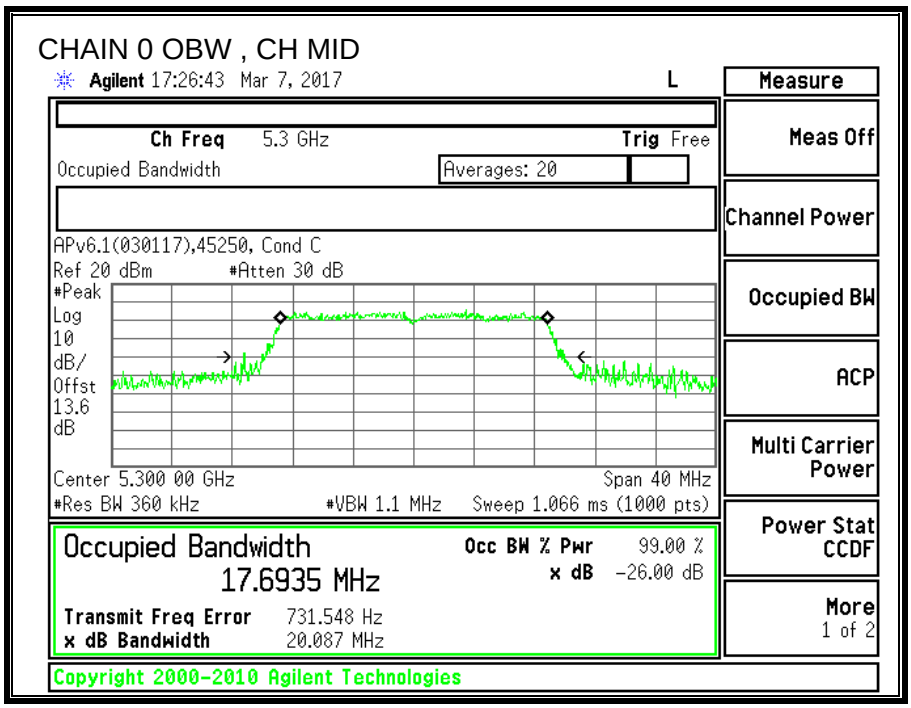
CHAIN 0 OBW , CH LOW



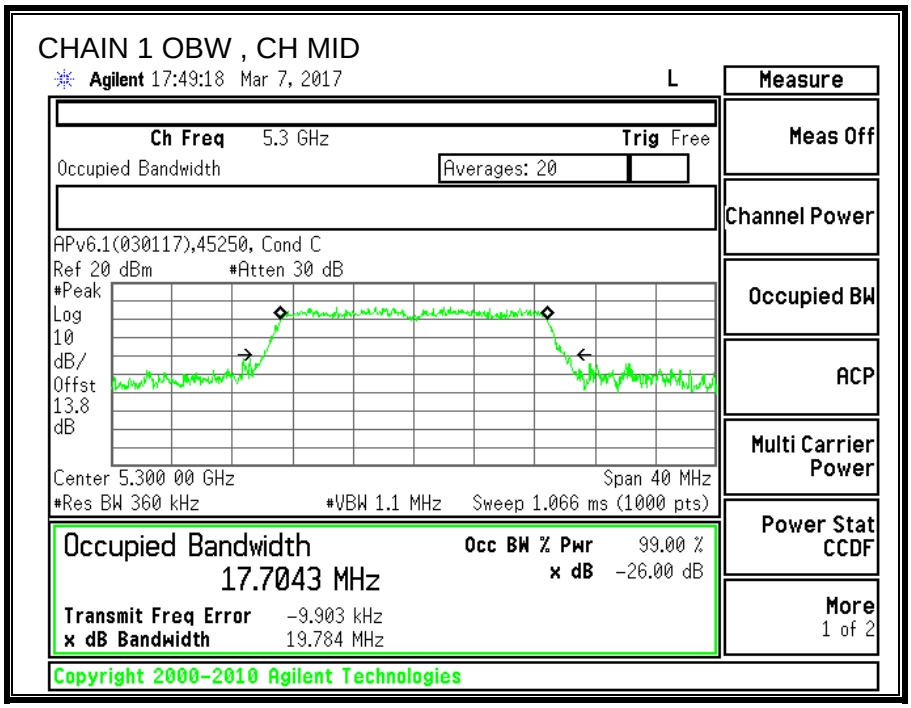
CHAIN 1 OBW , CH LOW



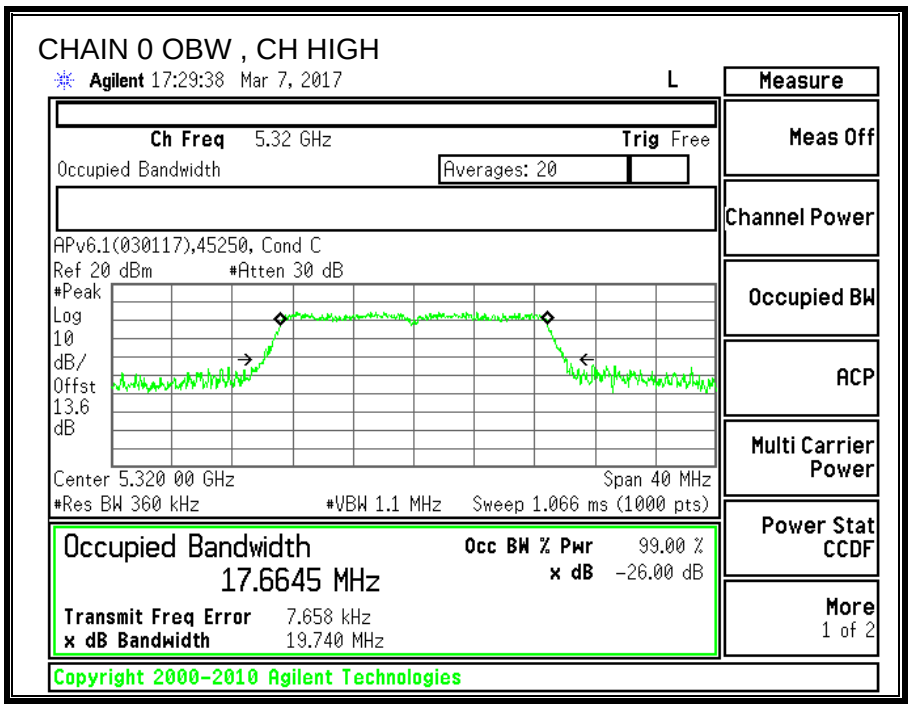
CHAIN 0 OBW , CH MID



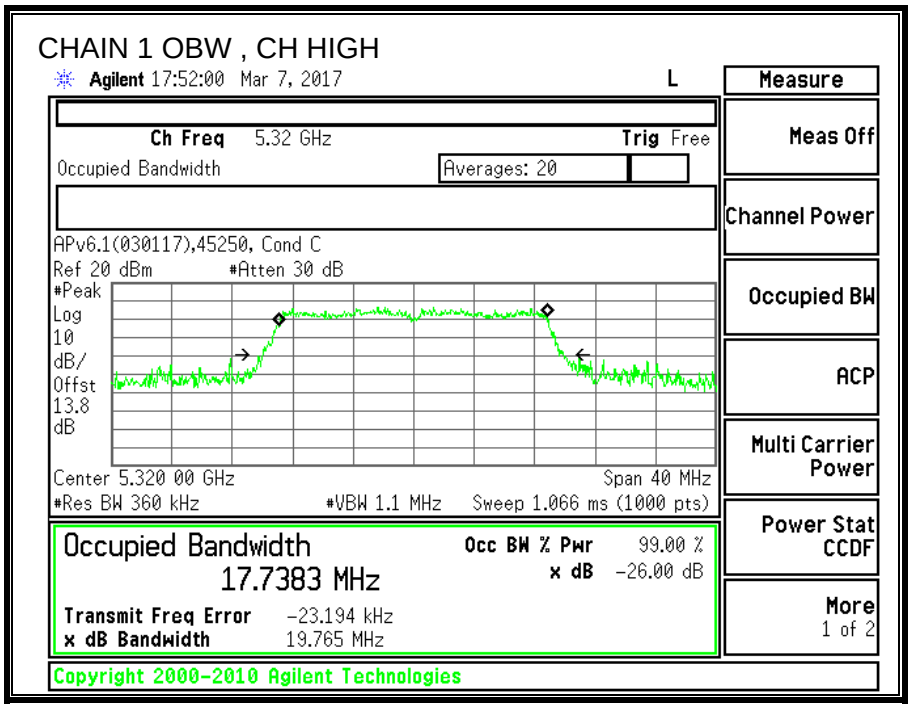
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.6.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (6.2.2) (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.20	2.80	2.07	5.05

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5260	20.40	17.70	2.07	5.05
Mid	5300	20.50	17.69	2.07	5.05
High	5320	20.40	17.66	2.07	5.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.48	27.00	23.48	11.00	11.00	11.00
Mid	5300	24.00	23.48	27.00	23.48	11.00	11.00	11.00
High	5320	24.00	23.47	27.00	23.47	11.00	11.00	11.00

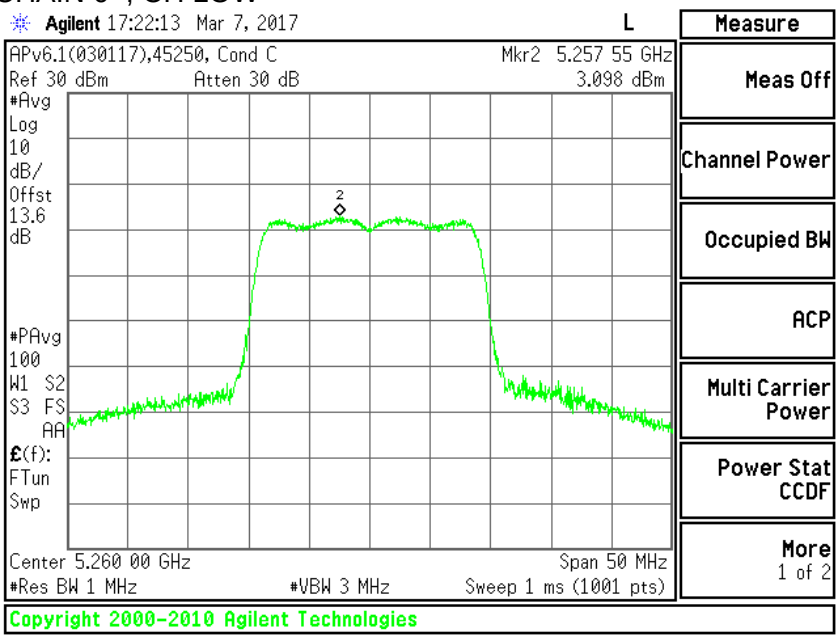
Output Power Results

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	13.75	13.65	16.71	23.48	-6.77
Mid	5300	13.61	13.89	16.76	23.48	-6.72
High	5320	13.38	13.65	16.53	23.47	-6.94

PPSD Results

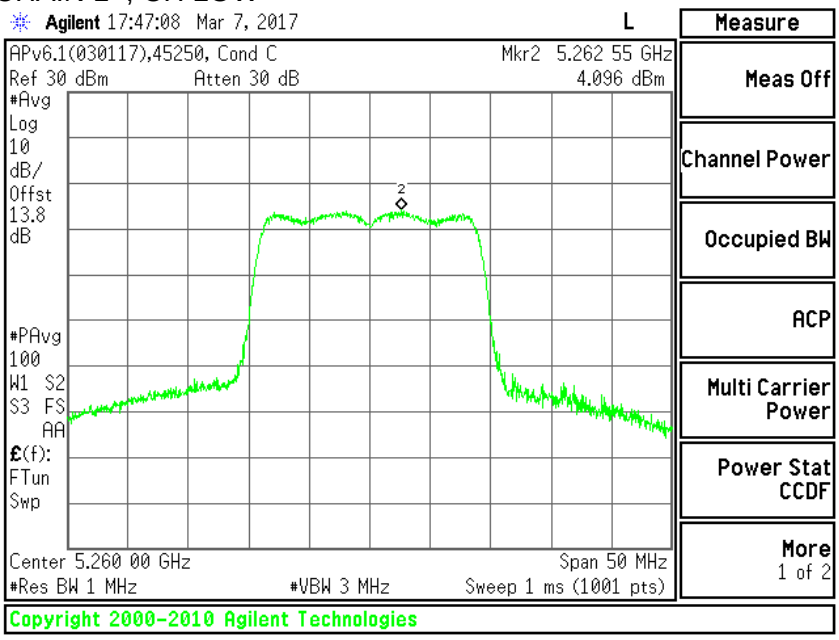
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	3.60	4.60	7.14	11.00	-3.86
Mid	5300	3.59	4.80	7.25	11.00	-3.75
High	5320	3.34	4.50	6.97	11.00	-4.03

CHAIN 0 , CH LOW



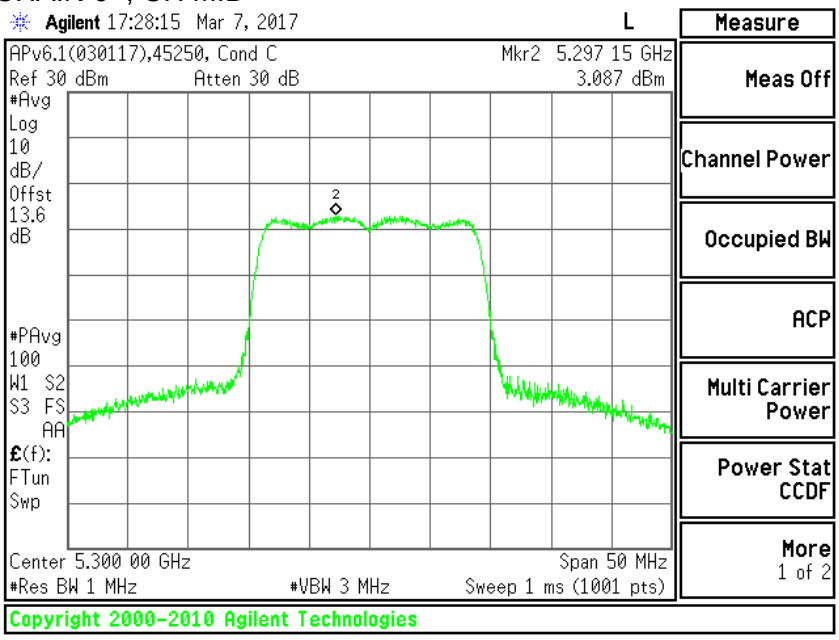
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.598dBm

CHAIN 1 , CH LOW



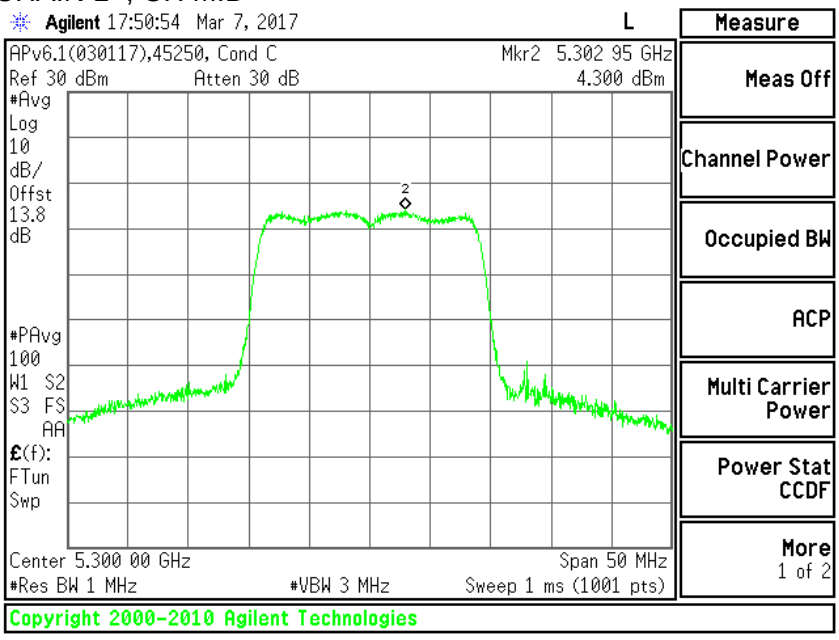
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.596dBm

CHAIN 0 , CH MID



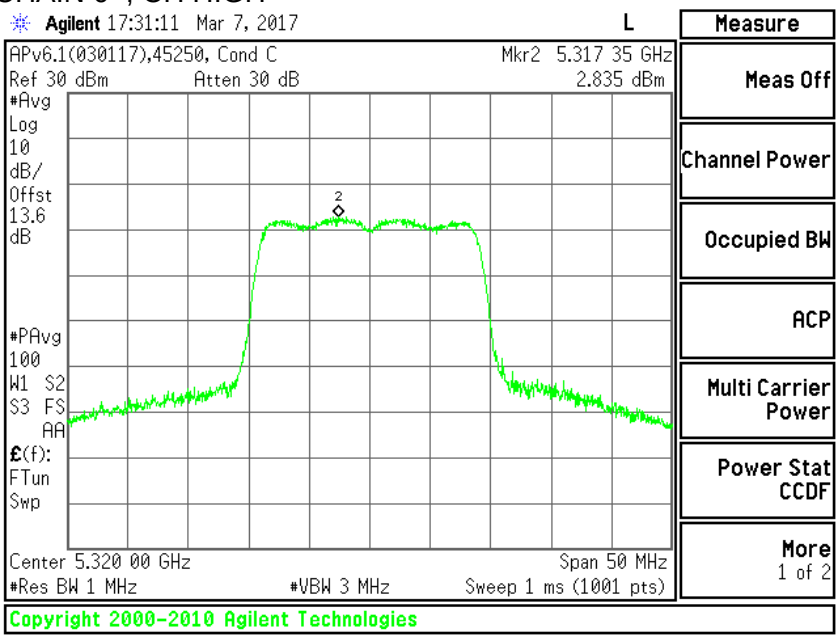
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.587dBm

CHAIN 1 , CH MID



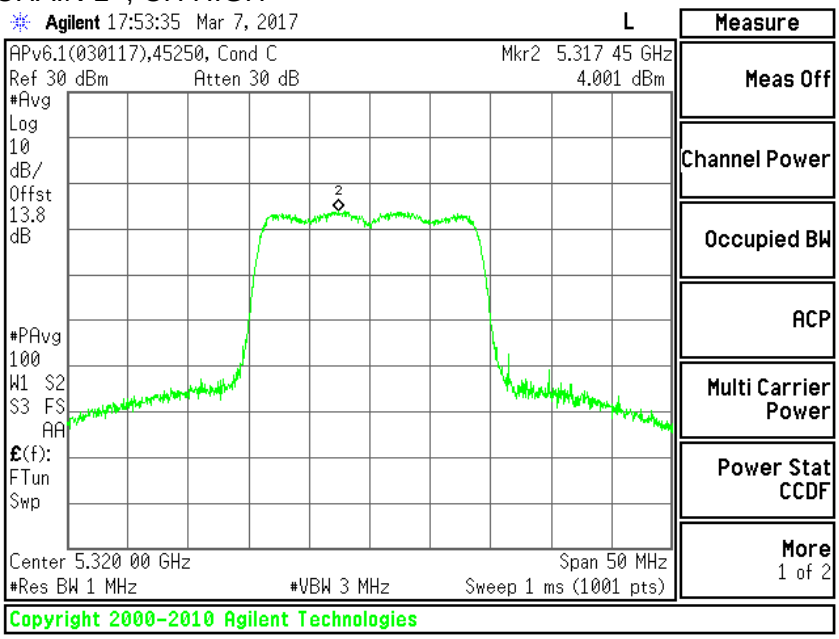
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.800dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.335dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.501dBm

9.7. 11n HT40 2TX MODE IN THE 5.3GHz BAND

9.7.1. 26 dB BANDWIDTH

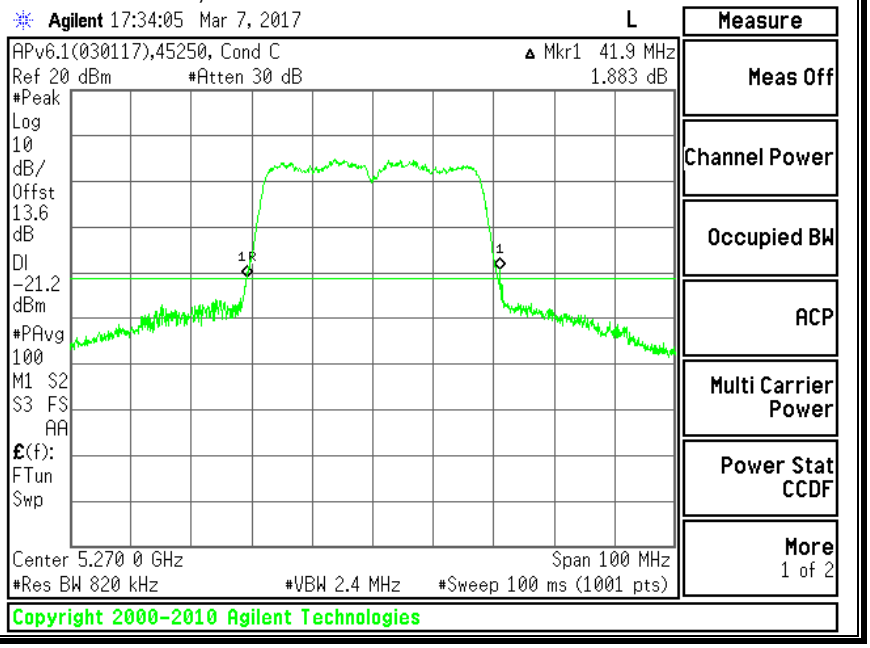
LIMITS

None; for reporting purposes only.

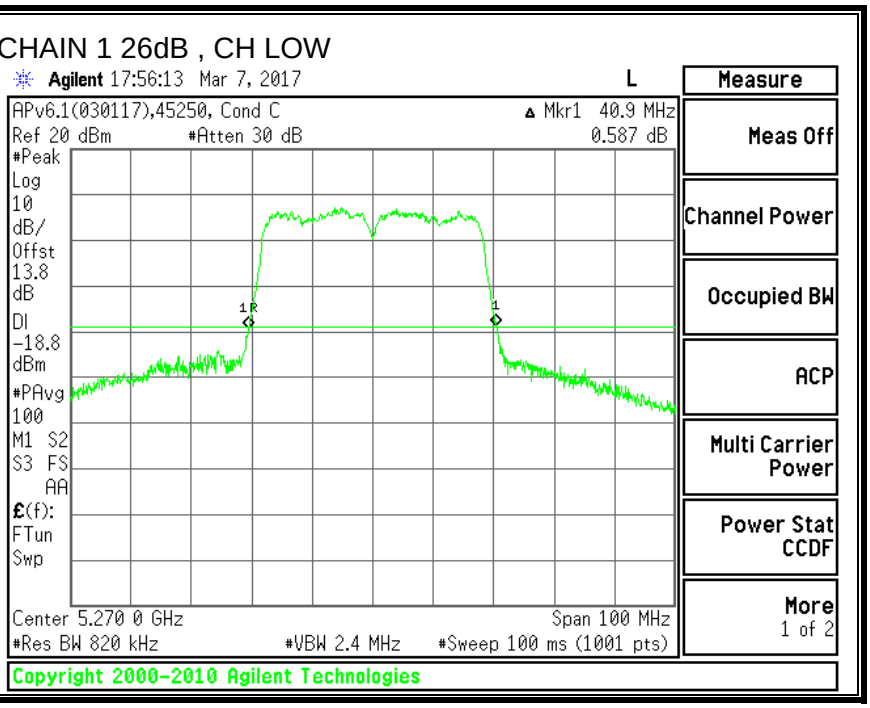
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5270	41.9	40.9
High	5310	42.6	40.8

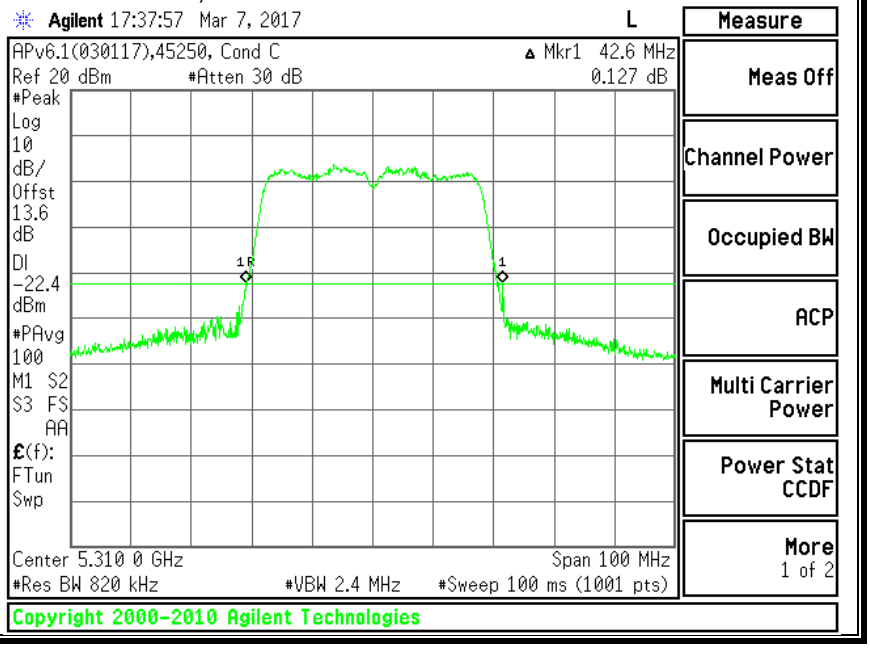
CHAIN 0 26dB , CH LOW



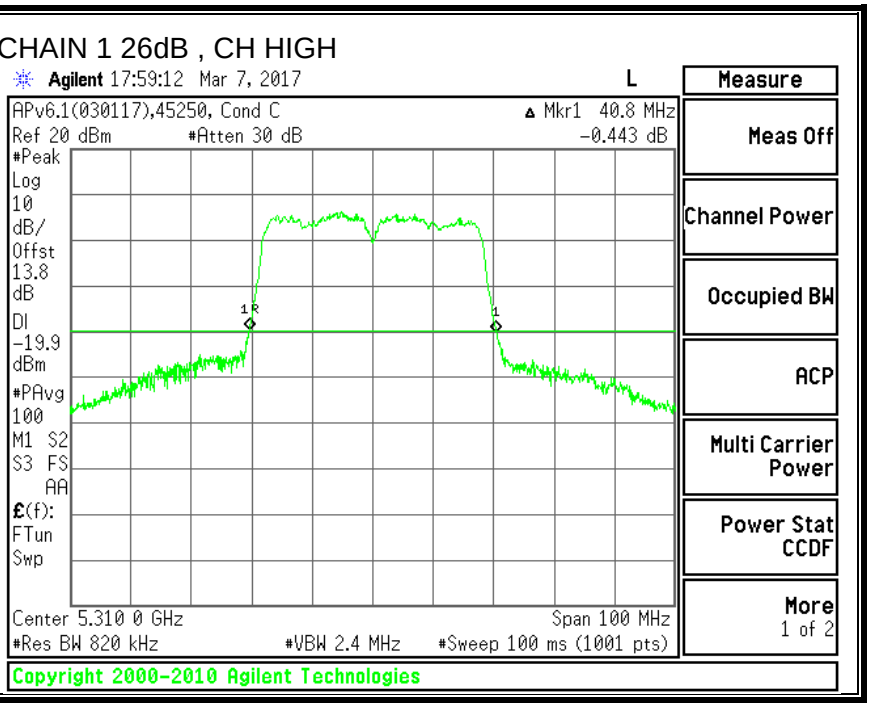
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.7.2. 99% BANDWIDTH

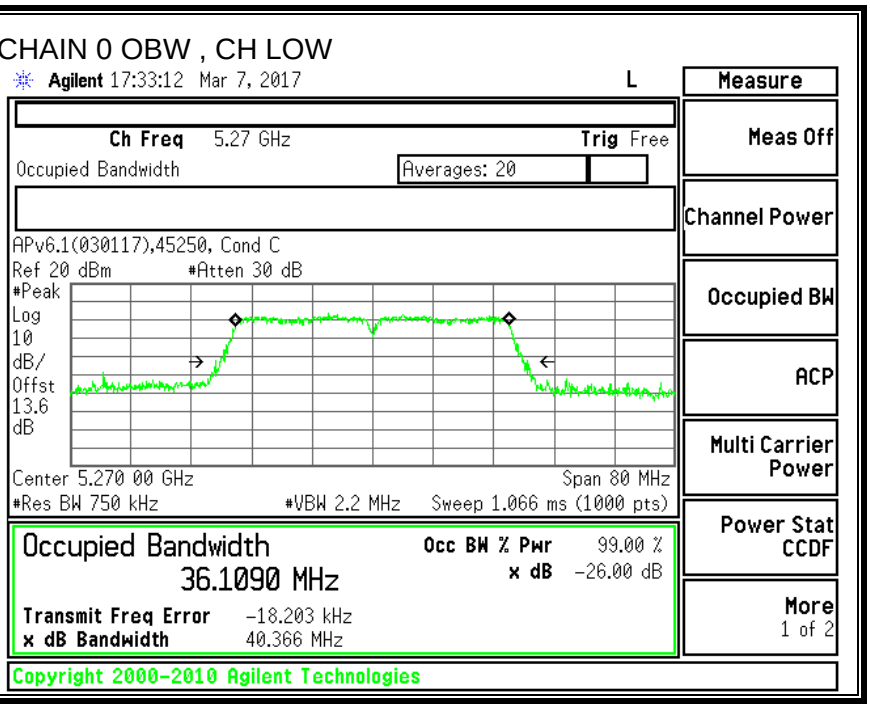
LIMITS

None; for reporting purposes only.

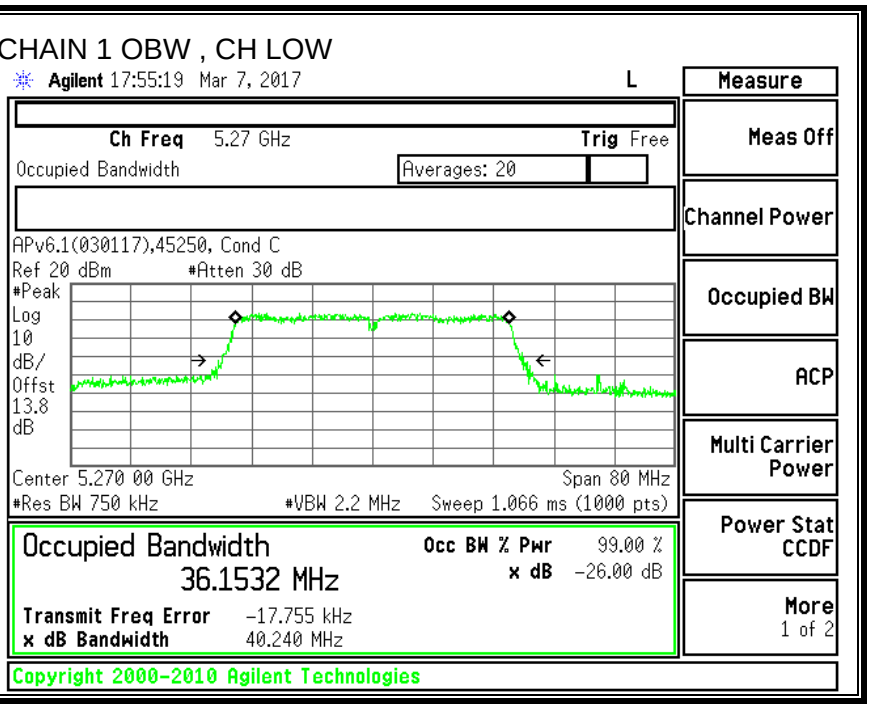
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5270	36.109	36.153
High	5310	36.114	36.256

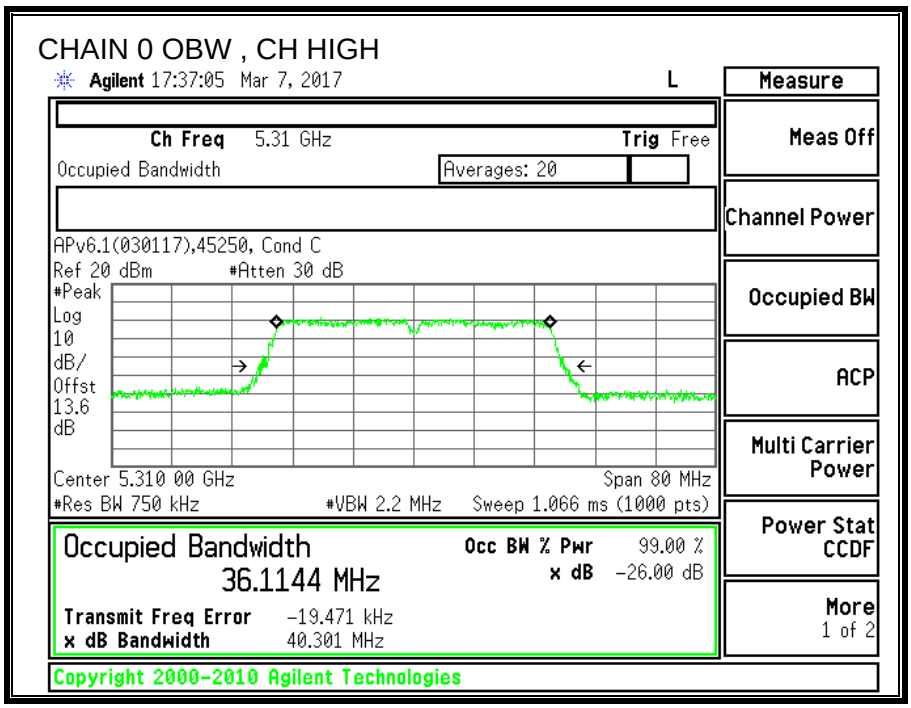
CHAIN 0 OBW , CH LOW



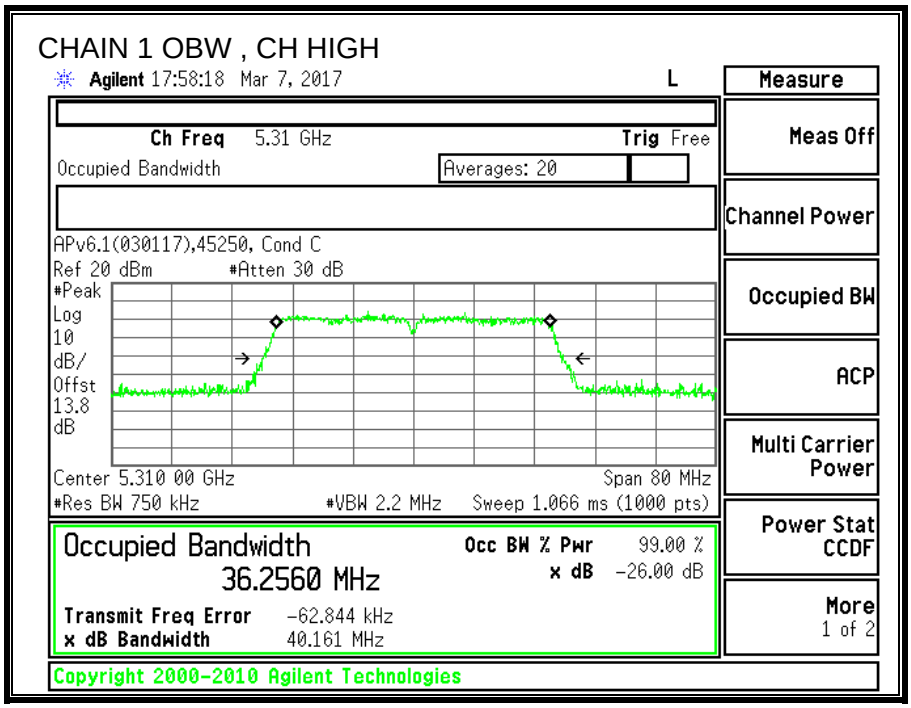
CHAIN 1 OBW , CH LOW



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.7.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (6.2.2) (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.20	2.80	2.07	5.05

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5270	40.90	36.11	2.07	5.05
High	5310	40.80	36.11	2.07	5.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

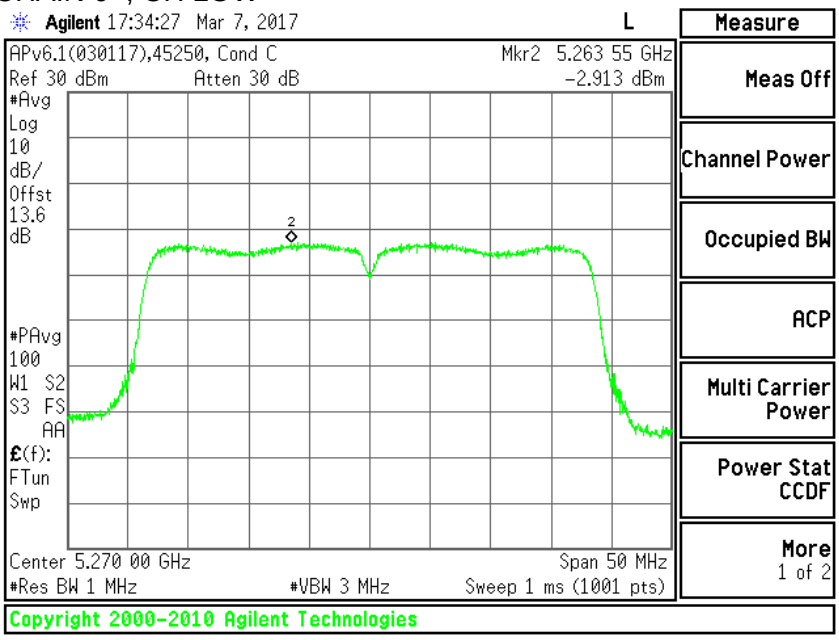
Output Power Results

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	10.62	10.68	13.66	24.00	-10.34
High	5310	9.73	9.49	12.62	24.00	-11.38

PPSD Results

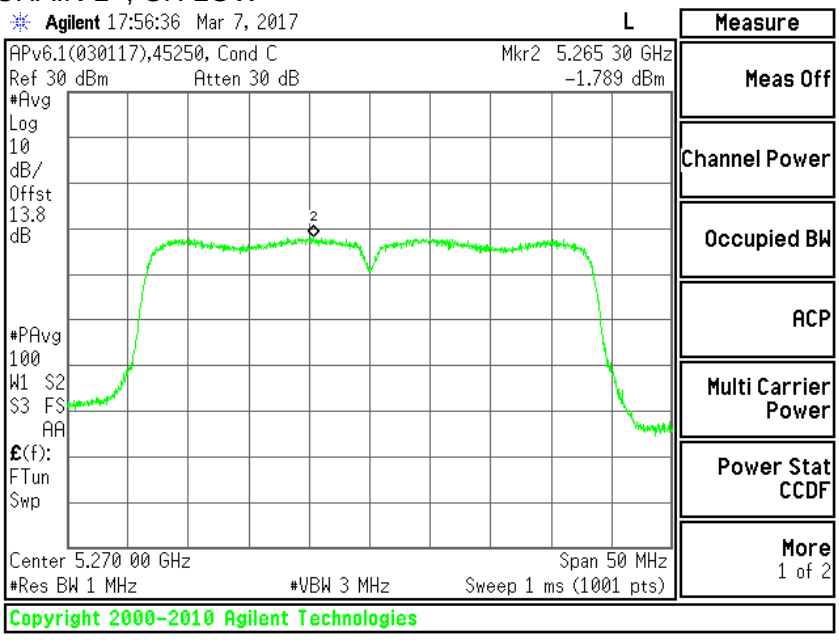
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	-2.41	-1.29	1.20	11.00	-9.80
High	5310	-3.82	-2.11	0.12	11.00	-10.88

CHAIN 0 , CH LOW



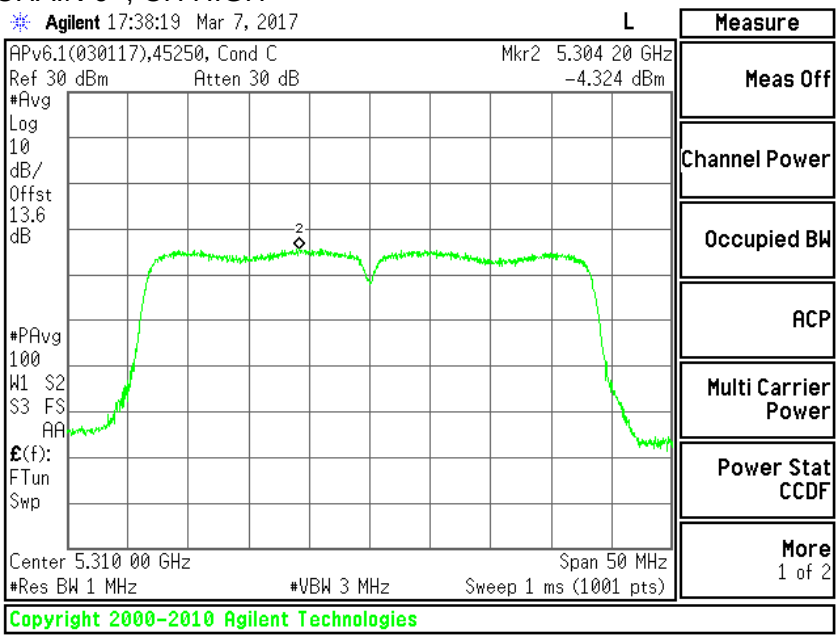
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.413dBm

CHAIN 1 , CH LOW



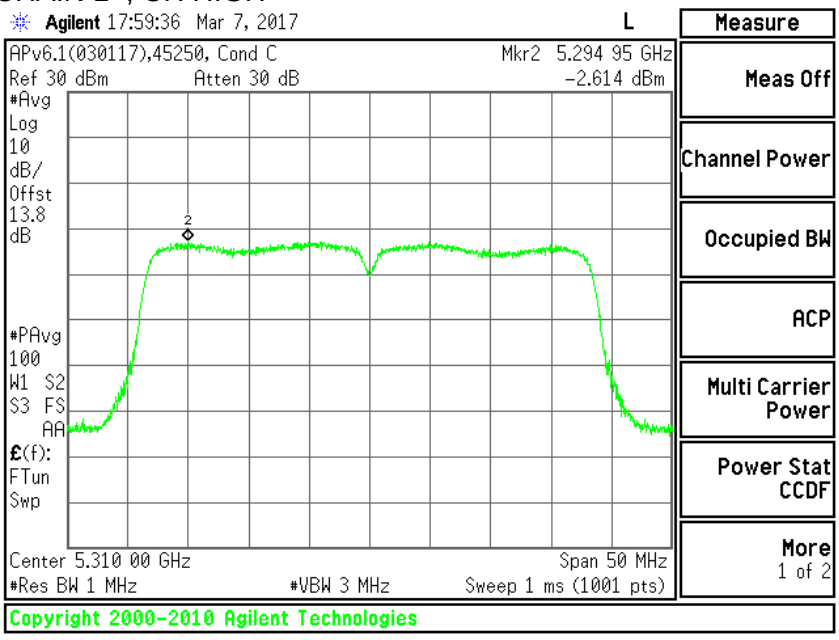
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.289dBm

CHAIN 0 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -3.824dBm

CHAIN 1 , CH HIGH



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.114dBm

9.8. 11ac VHT80 2TX MODE IN THE 5.3GHz BAND

9.8.1. 26 dB BANDWIDTH

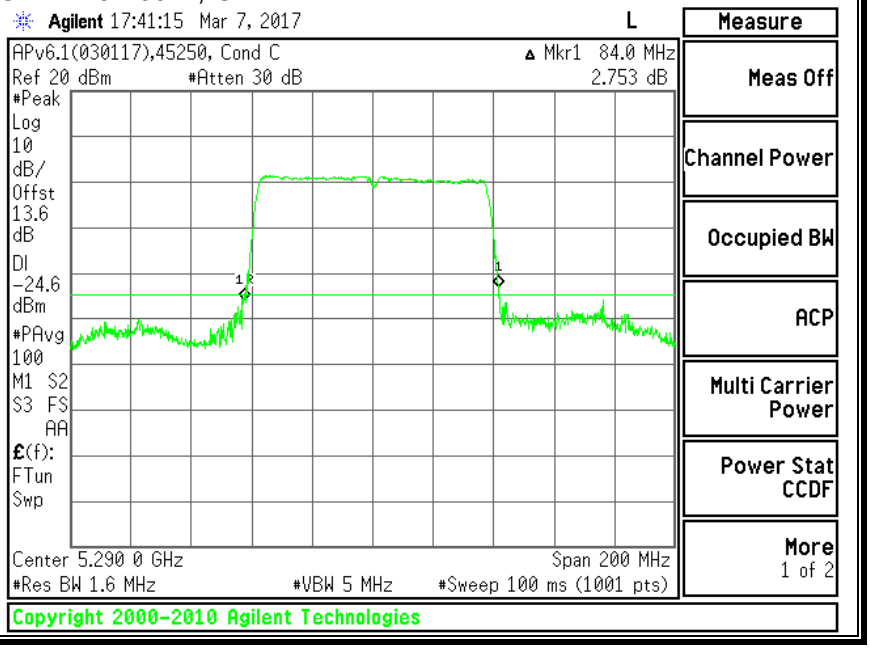
LIMITS

None; for reporting purposes only.

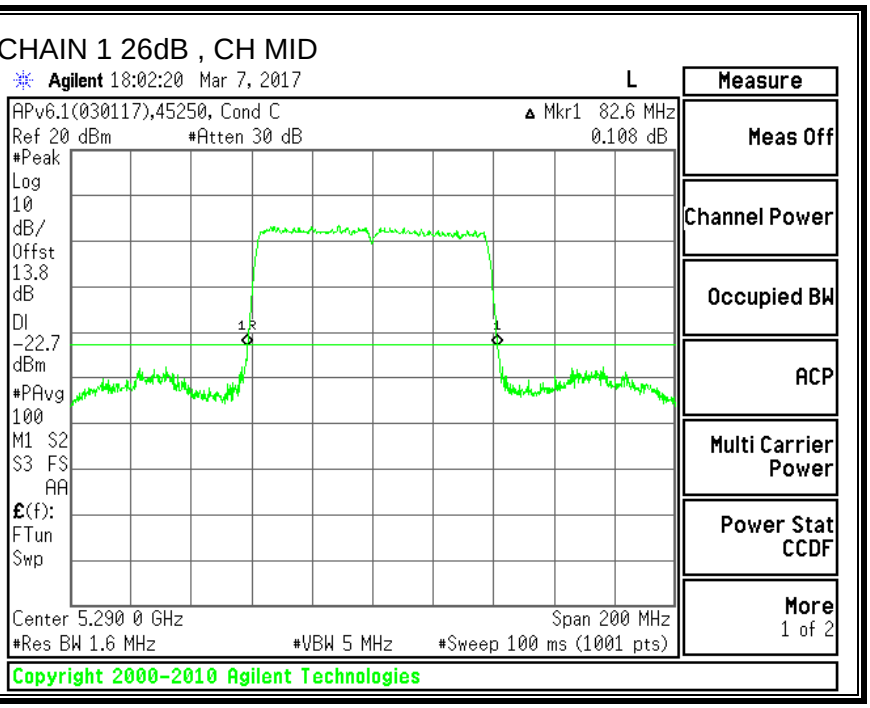
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Mid	5290	84	82.6

CHAIN 0 26dB , CH MID



CHAIN 1 26dB , CH MID



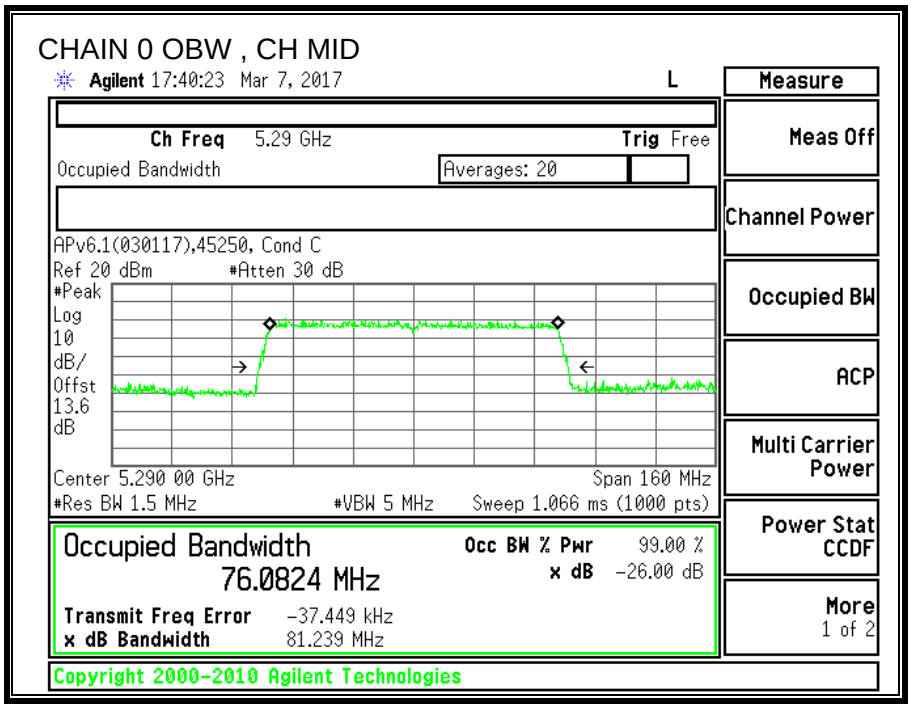
9.8.2. 99% BANDWIDTH

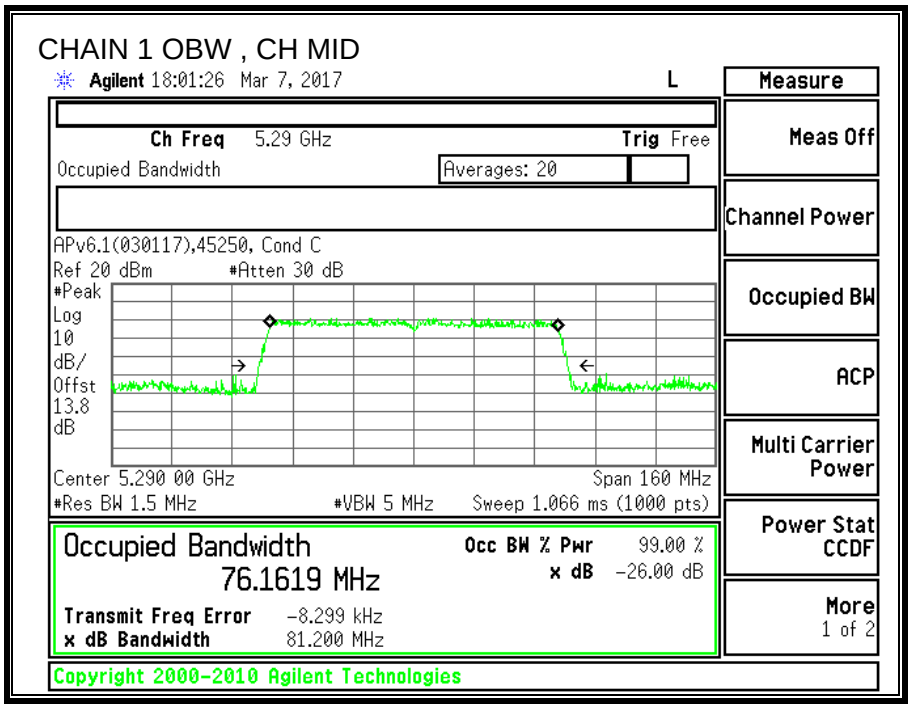
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Mid	5290	76.082	76.162





9.8.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (6.2.2) (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.20	2.80	2.07	5.05

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5530	82.60	76.08	2.07	5.05

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	24.00	24.00	30.00	24.00	11.00	11.00	11.00

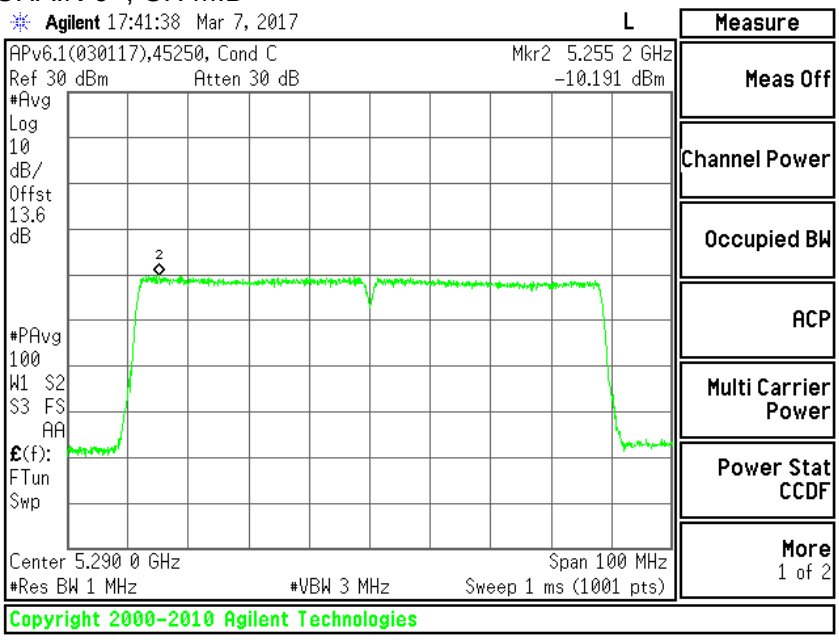
Output Power Results

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	7.21	6.29	9.78	24.00	-14.22

PPSD Results

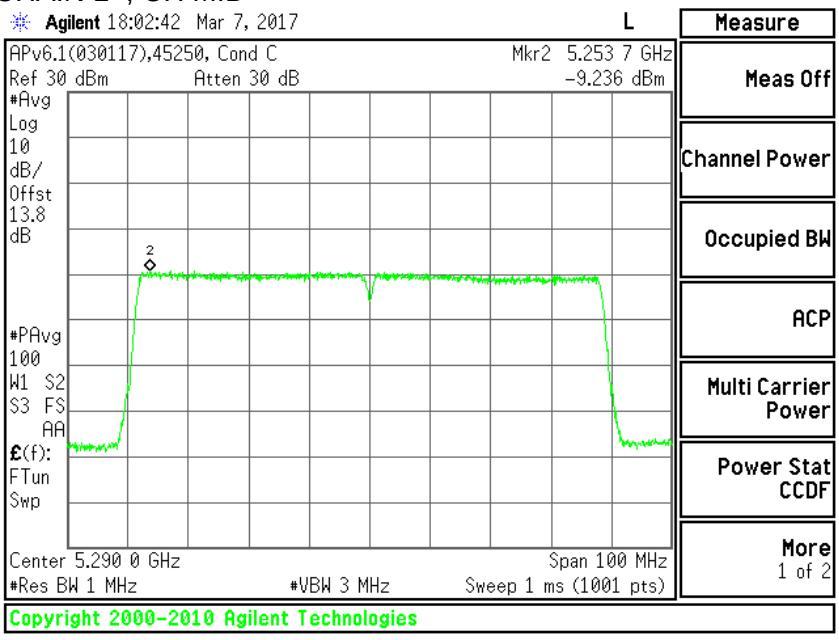
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-9.691	-8.736	-6.18	11.00	-17.18

CHAIN 0 , CH MID



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.691dBm

CHAIN 1 , CH MID



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -8.736dBm

9.9. 11a 2TX MODE IN THE 5.6GHz BAND

9.9.1. 26 dB BANDWIDTH

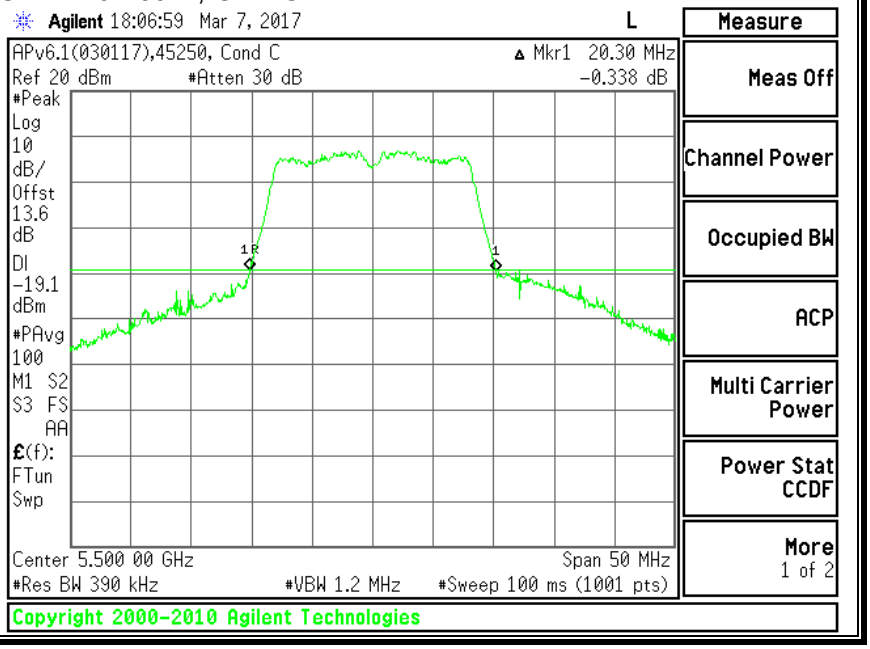
LIMITS

None; for reporting purposes only.

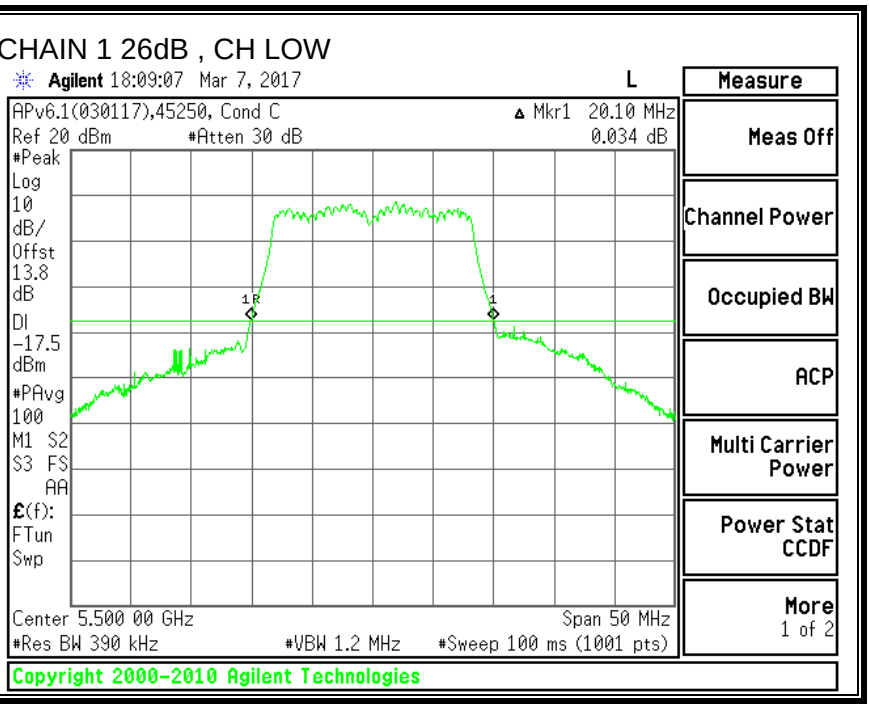
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5500	20.3	20.1
Mid	5580	20.1	20.9
High	5700	20.3	20
144	5720	20.30	19.95

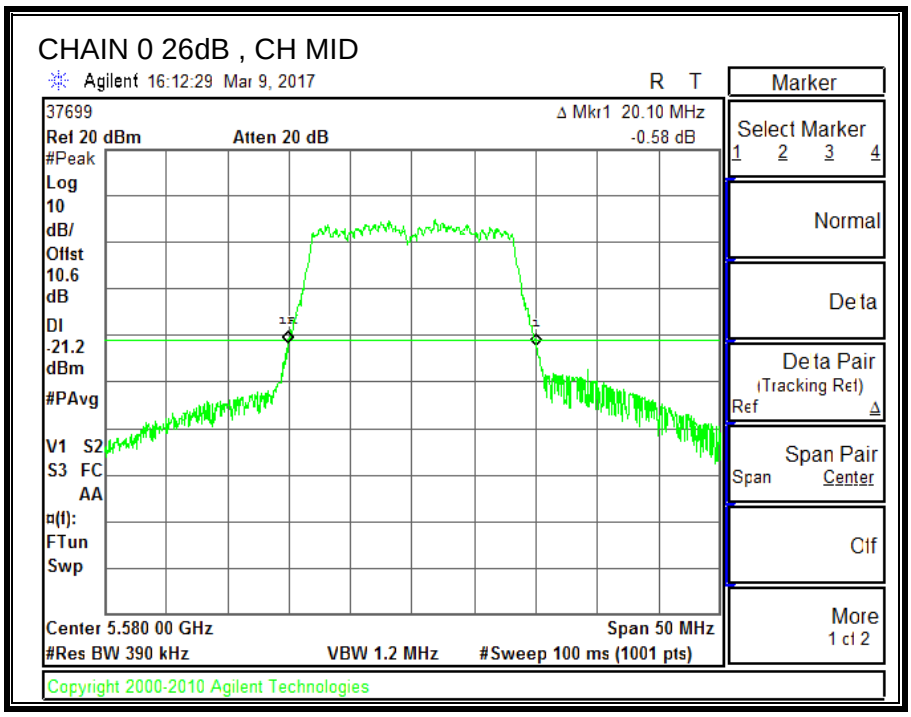
CHAIN 0 26dB , CH LOW



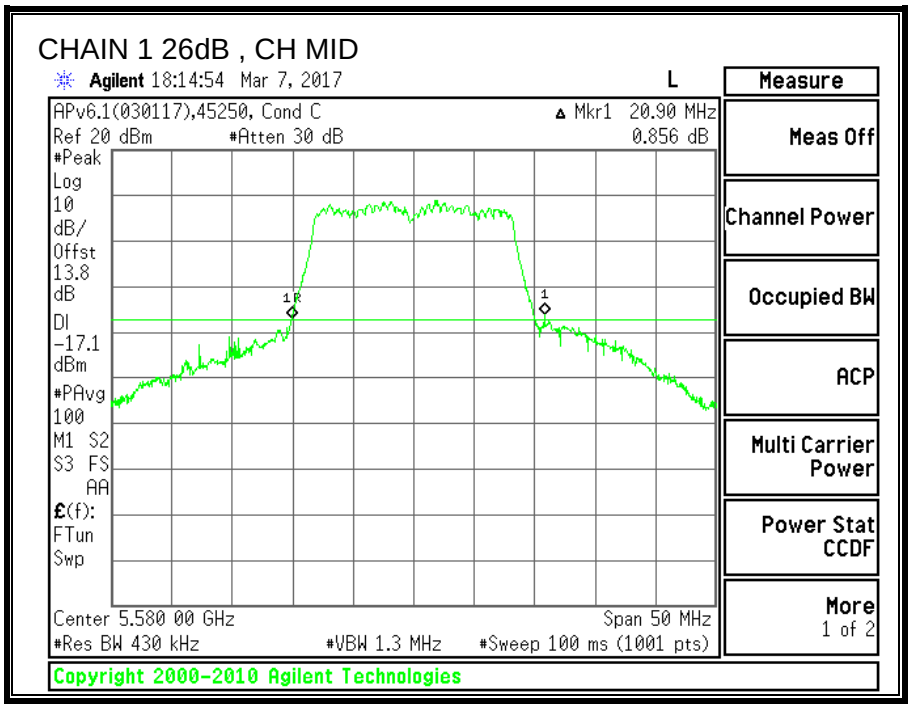
CHAIN 1 26dB , CH LOW



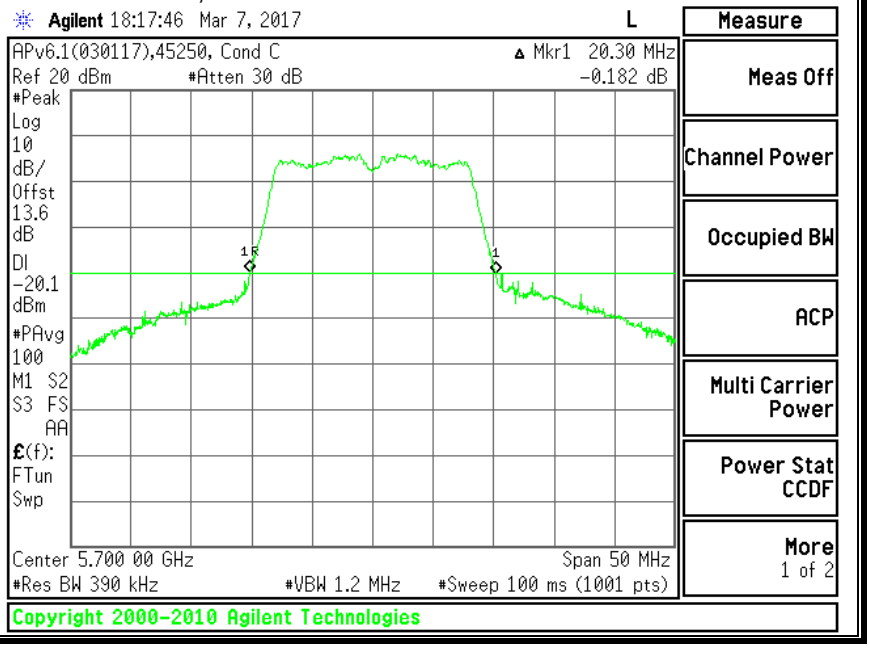
CHAIN 0 26dB , CH MID



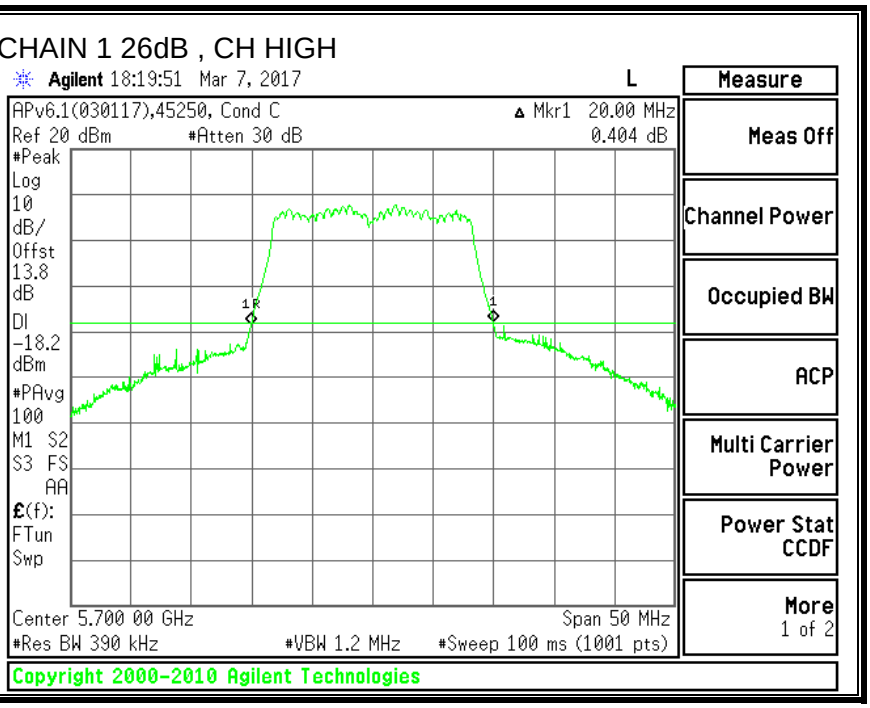
CHAIN 1 26dB , CH MID



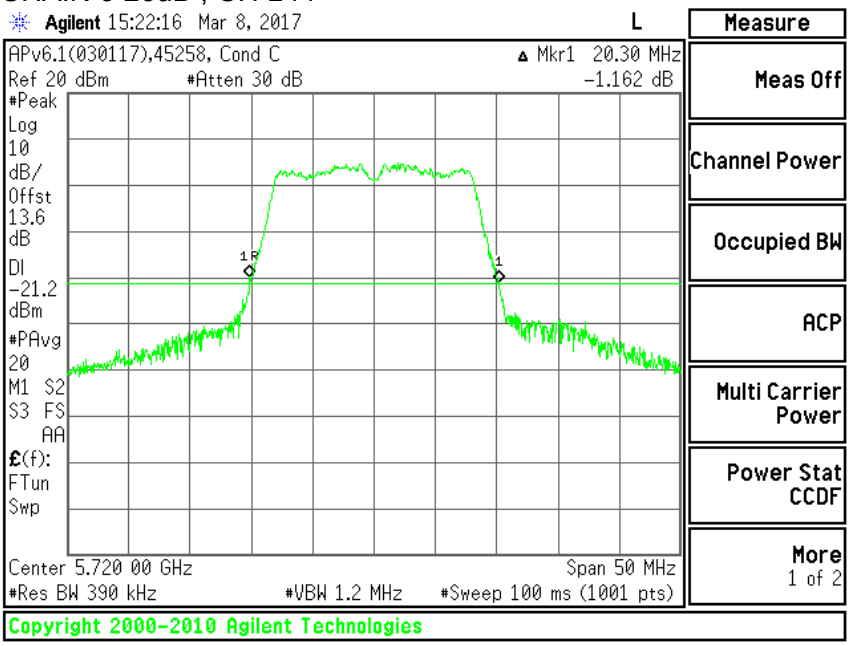
CHAIN 0 26dB , CH HIGH



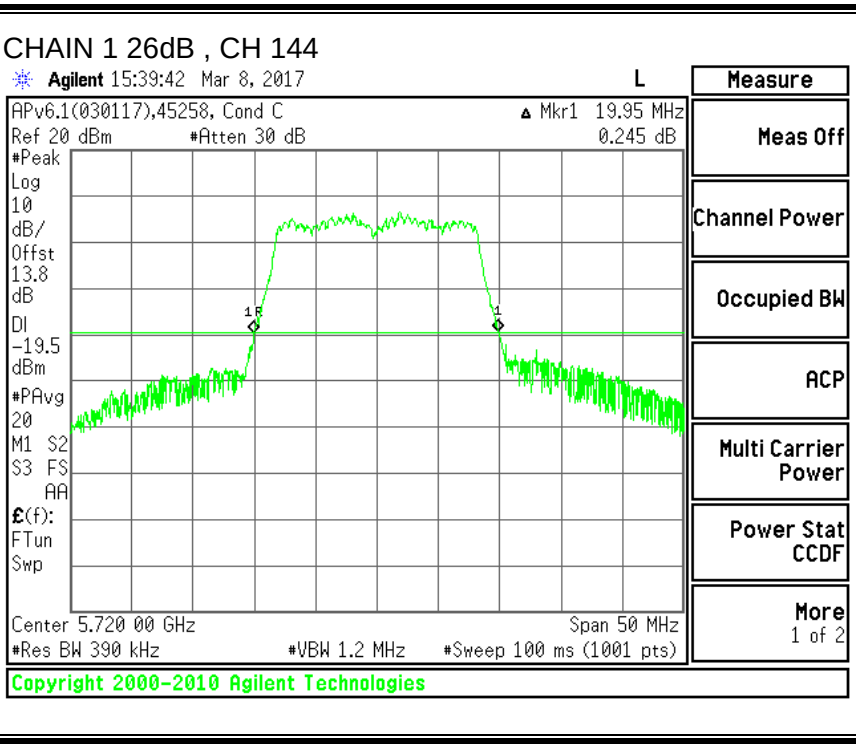
CHAIN 1 26dB , CH HIGH



CHAIN 0 26dB , CH 144



CHAIN 1 26dB , CH 144



9.9.2. 99% BANDWIDTH

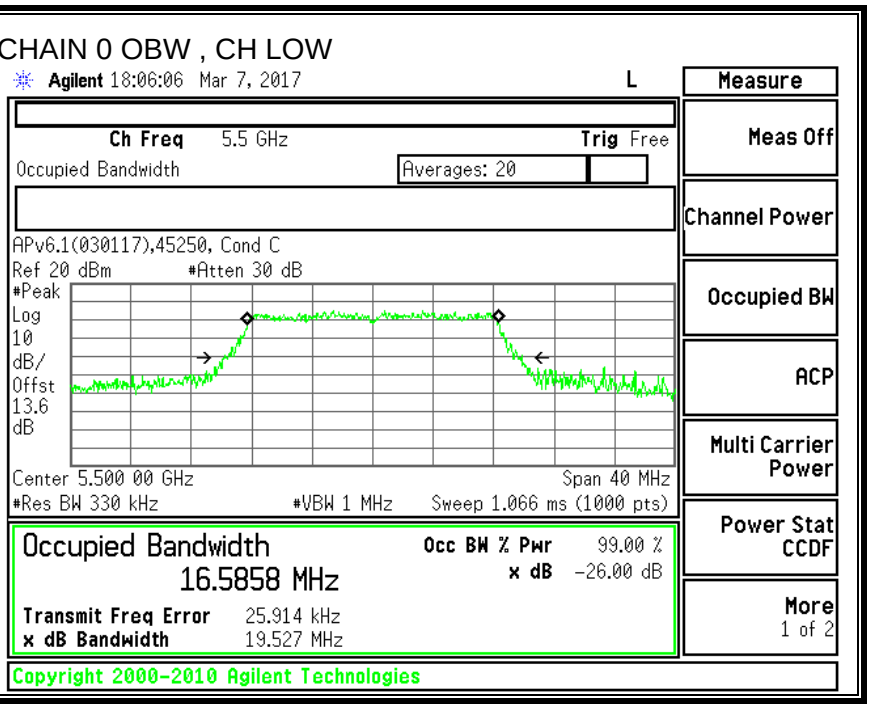
LIMITS

None; for reporting purposes only.

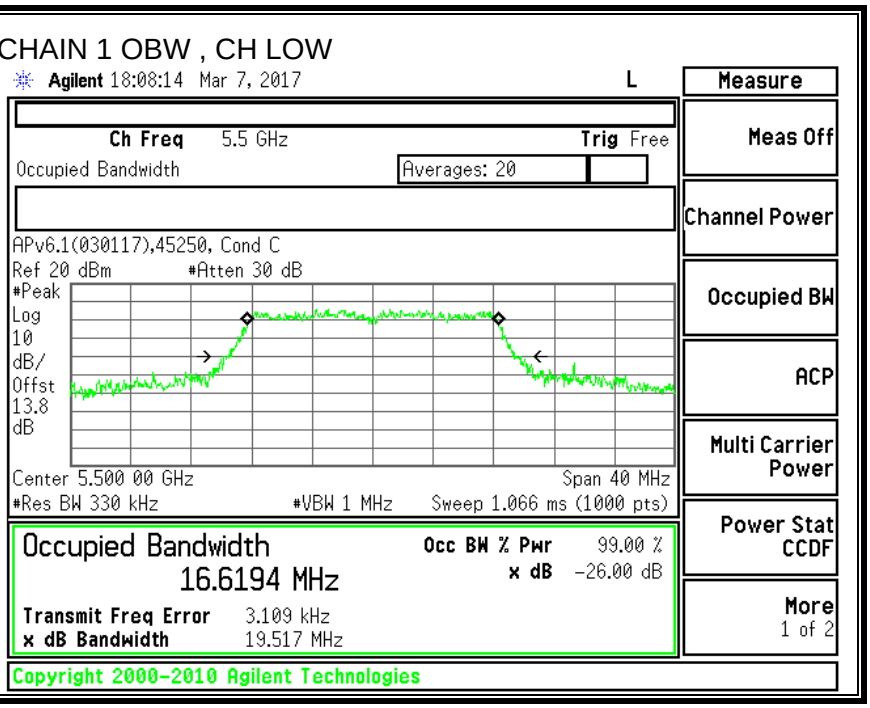
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5500	16.586	16.619
Mid	5580	16.657	16.572
High	5700	16.553	16.589
144	5720	16.509	16.515

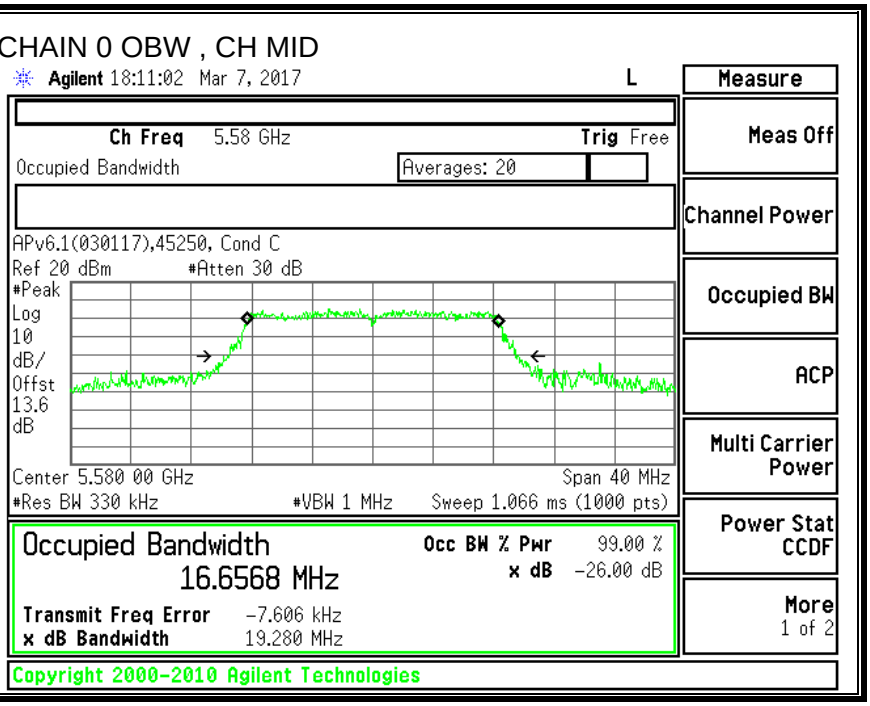
CHAIN 0 OBW , CH LOW



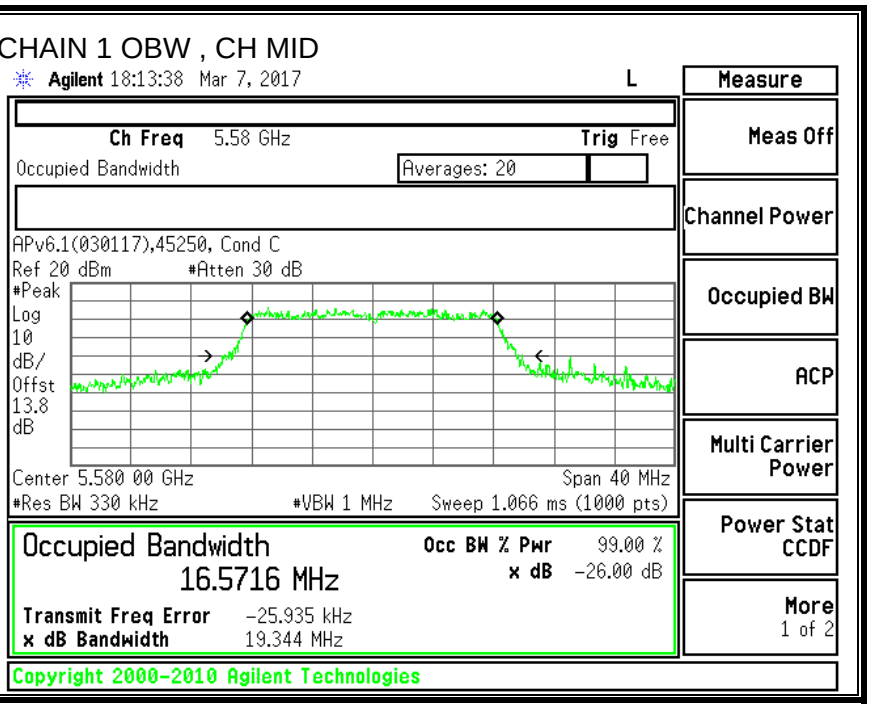
CHAIN 1 OBW , CH LOW



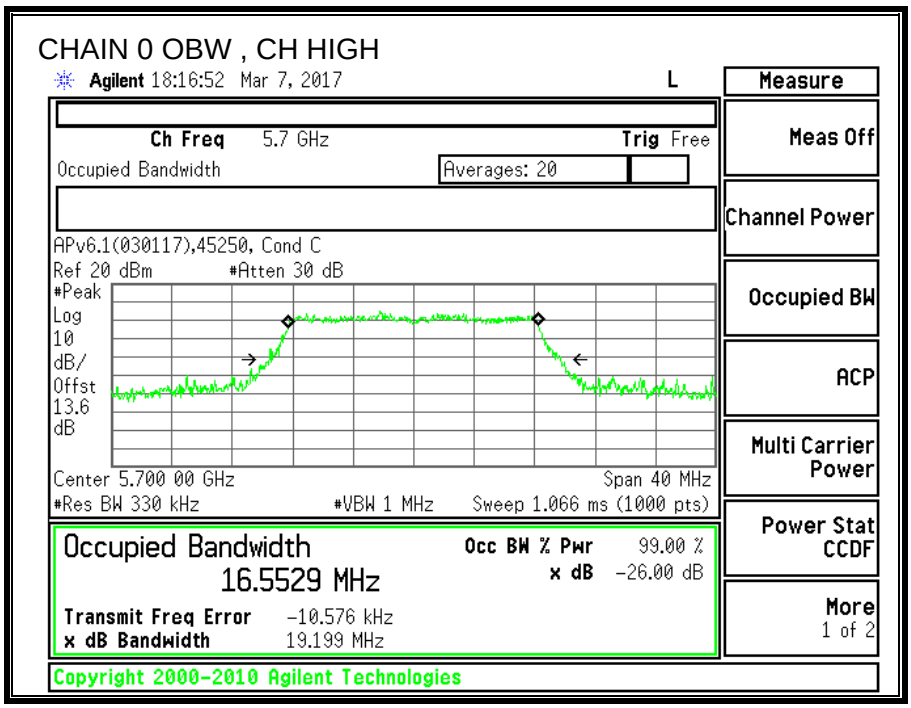
CHAIN 0 OBW , CH MID



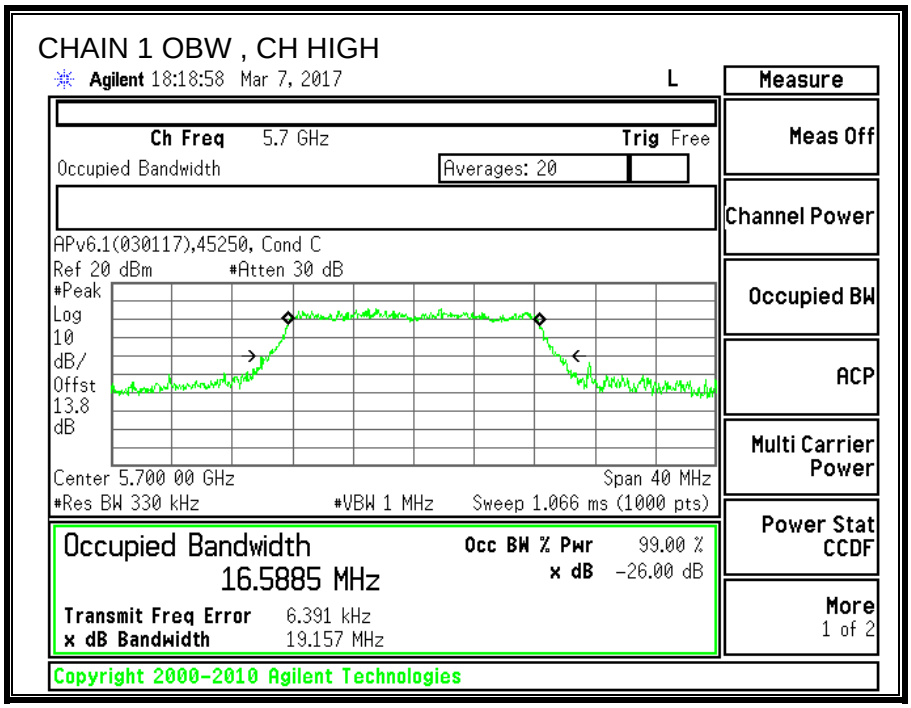
CHAIN 1 OBW , CH MID

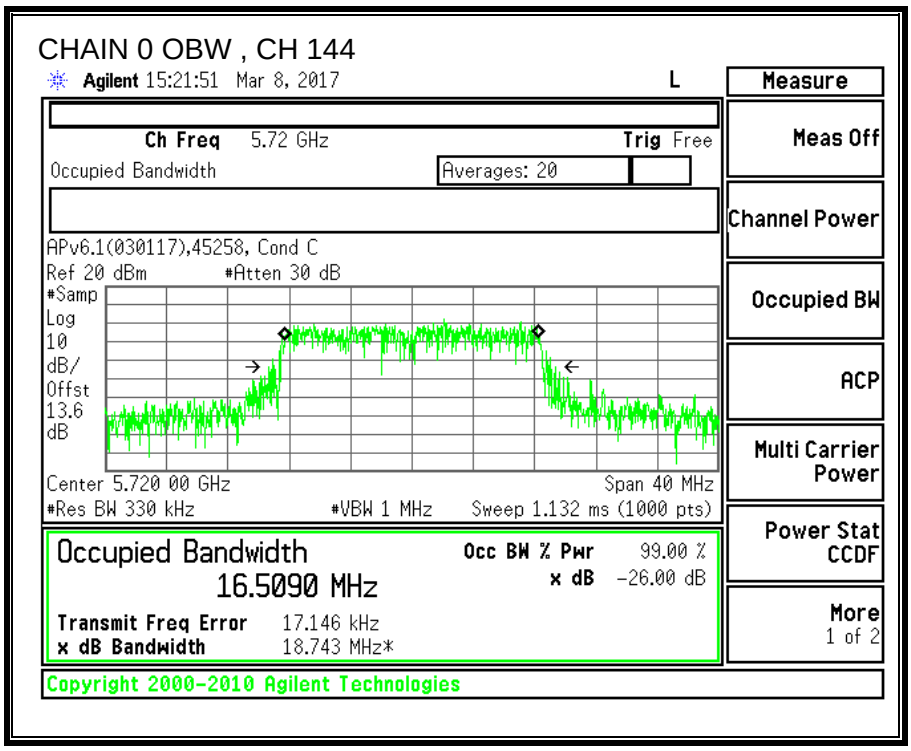


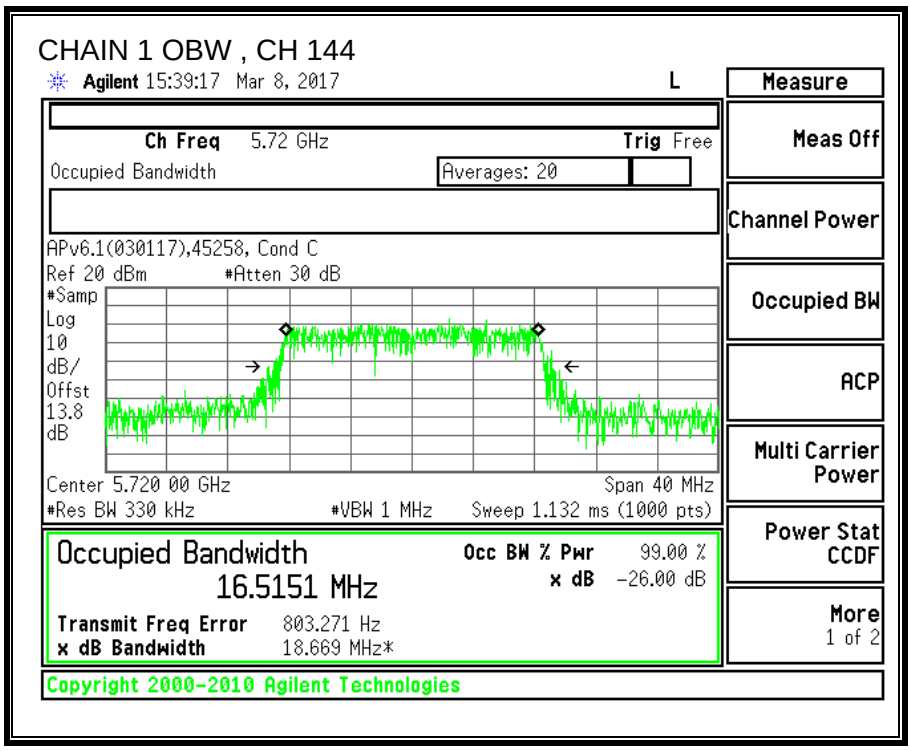
CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH







9.9.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
0.90	3.60	2.46	5.36

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5500	20.10	16.59	2.46	5.36
Mid	5580	20.10	16.57	2.46	5.36
High	5700	20.00	16.55	2.46	5.36
144	5720	19.95	16.51	2.46	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.20	27.00	23.20	11.00	11.00	11.00
Mid	5580	24.00	23.19	27.00	23.19	11.00	11.00	11.00
High	5700	24.00	23.19	27.00	23.19	11.00	11.00	11.00
144	5720	24.00	23.18	27.00	23.18	11.00	11.00	11.00

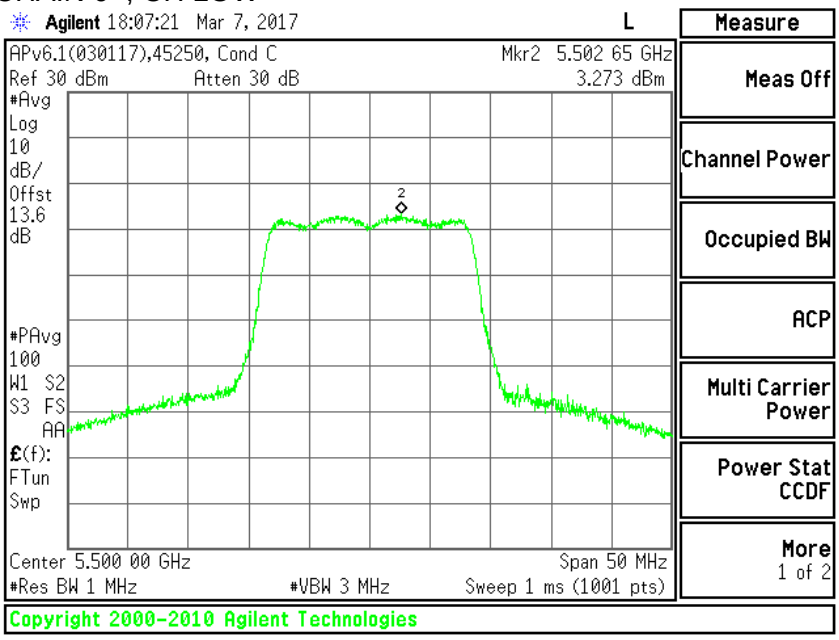
Output Power Results

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	13.16	14.11	16.67	23.20	-6.53
Mid	5580	13.53	14.11	16.84	23.19	-6.35
High	5700	12.85	13.21	16.04	23.19	-7.14
144	5720	10.96	11.56	14.28	23.18	-8.90

PPSD Results

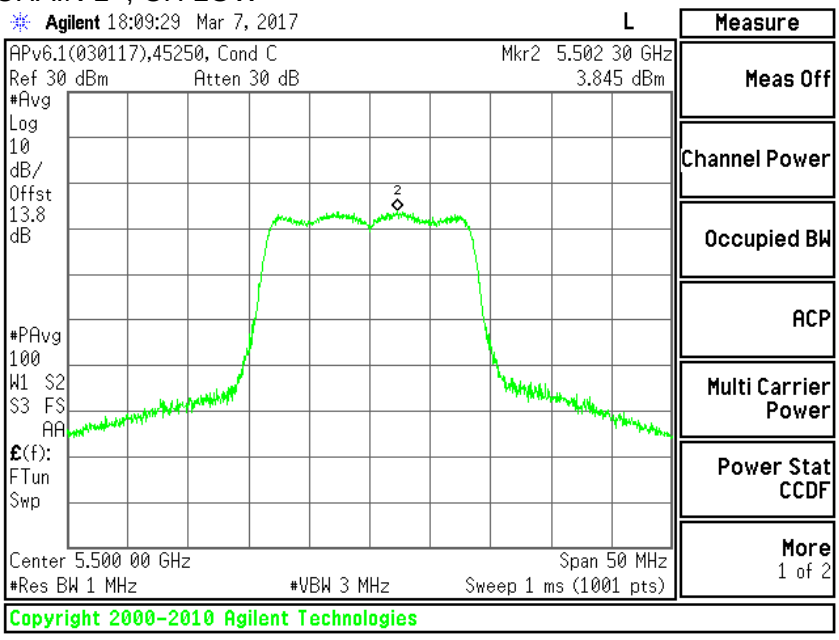
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.77	4.35	7.08	11.00	-3.92
Mid	5580	3.59	4.57	7.12	11.00	-3.88
High	5700	2.54	3.46	6.03	11.00	-4.97
144	5720	1.42	2.13	4.80	11.00	-6.20

CHAIN 0 , CH LOW



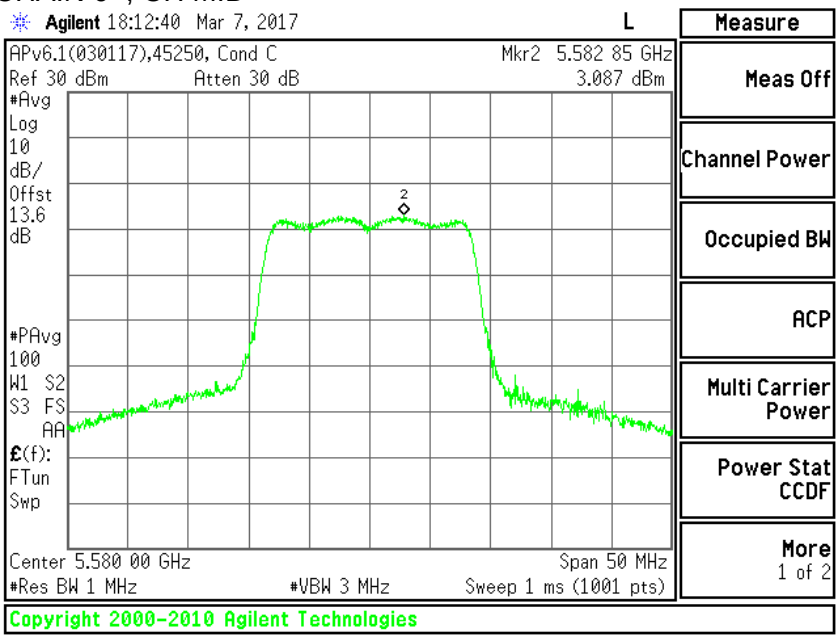
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.773dBm

CHAIN 1 , CH LOW



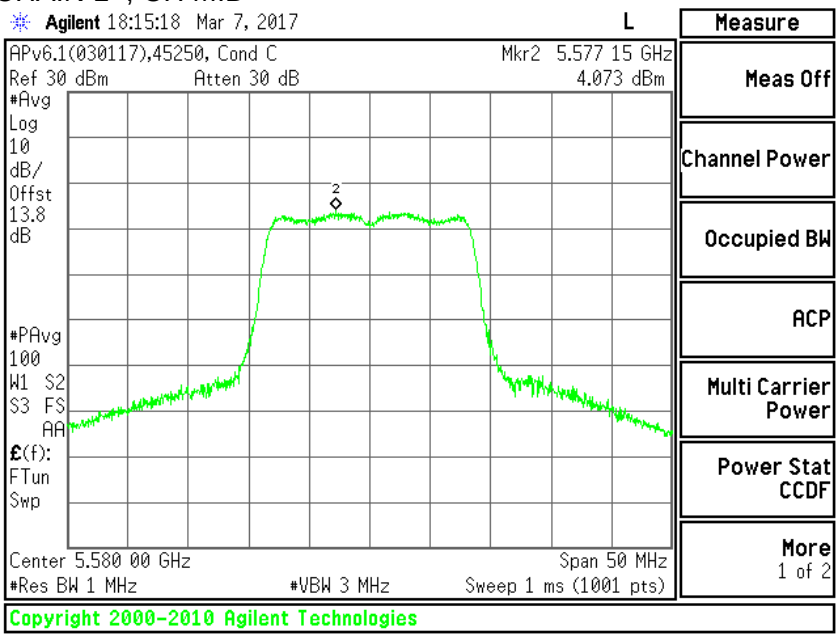
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.345dBm

CHAIN 0 , CH MID



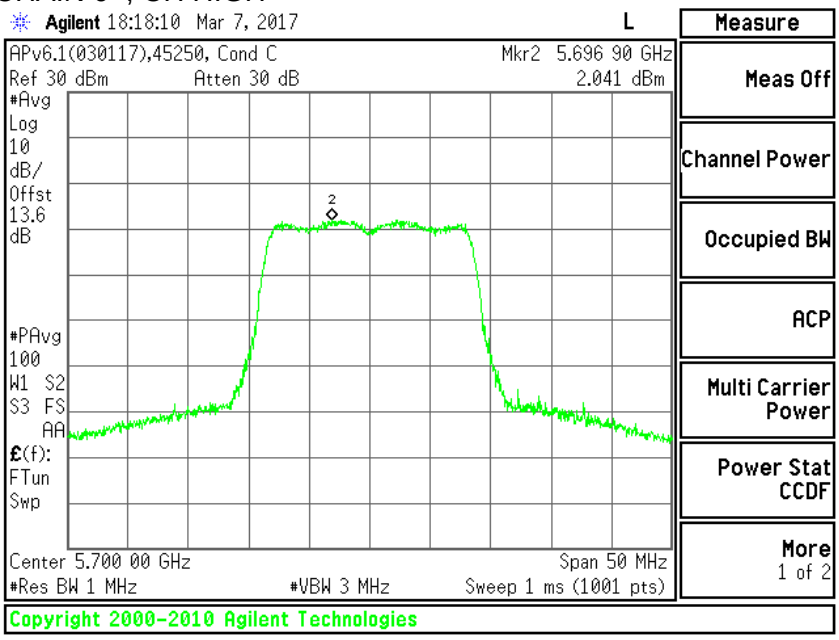
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.587dBm

CHAIN 1 , CH MID



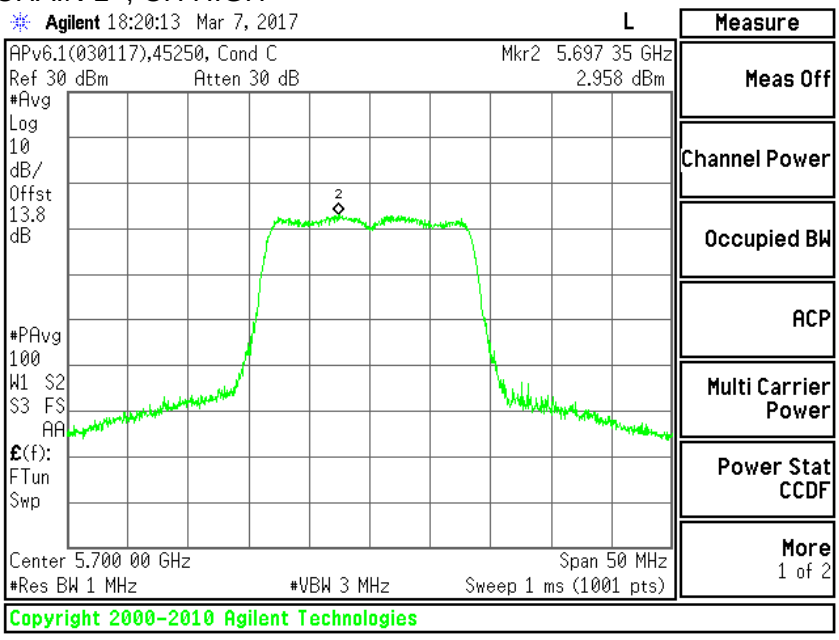
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.573dBm

CHAIN 0 , CH HIGH



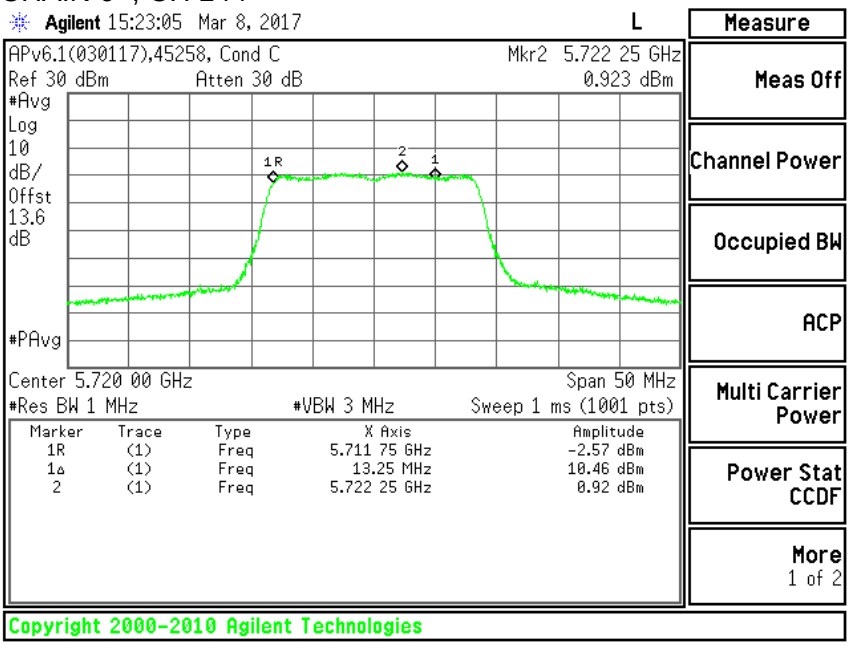
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 2.541dBm

CHAIN 1 , CH HIGH



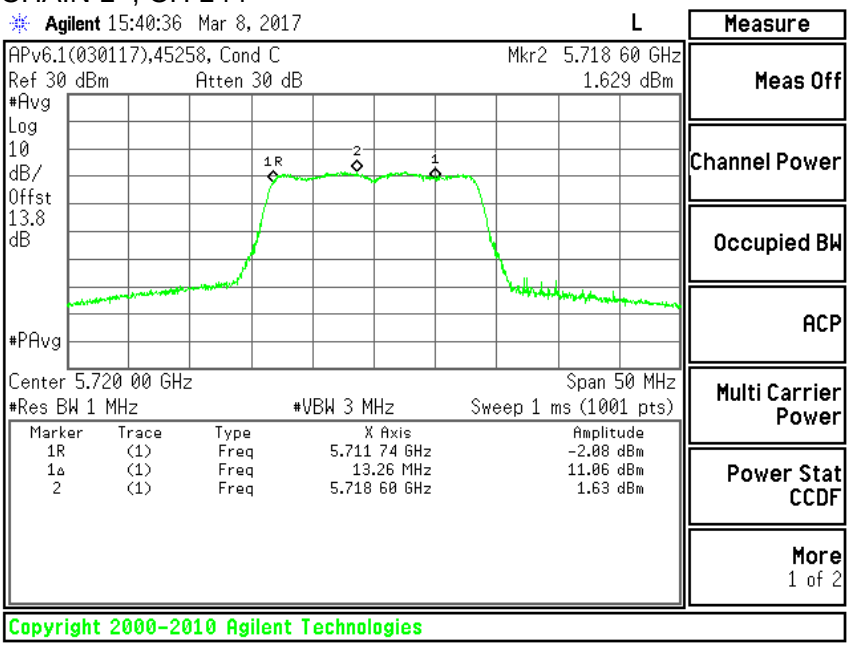
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.458dBm

CHAIN 0 , CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.420dBm

CHAIN 1 , CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 2.130dBm

9.10. 11n HT20 2TX MODE IN THE 5.6GHz BAND

9.10.1. 26 dB BANDWIDTH

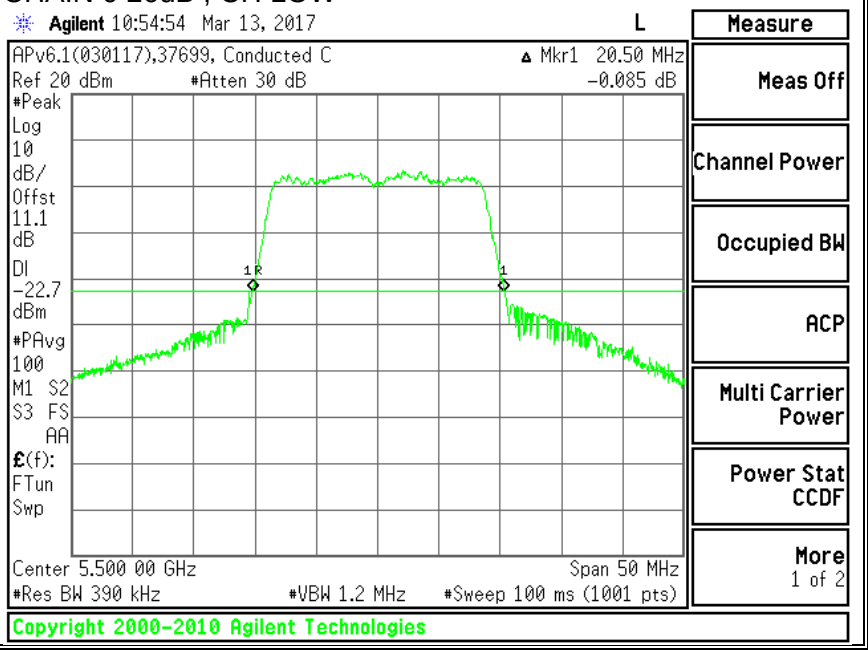
LIMITS

None; for reporting purposes only.

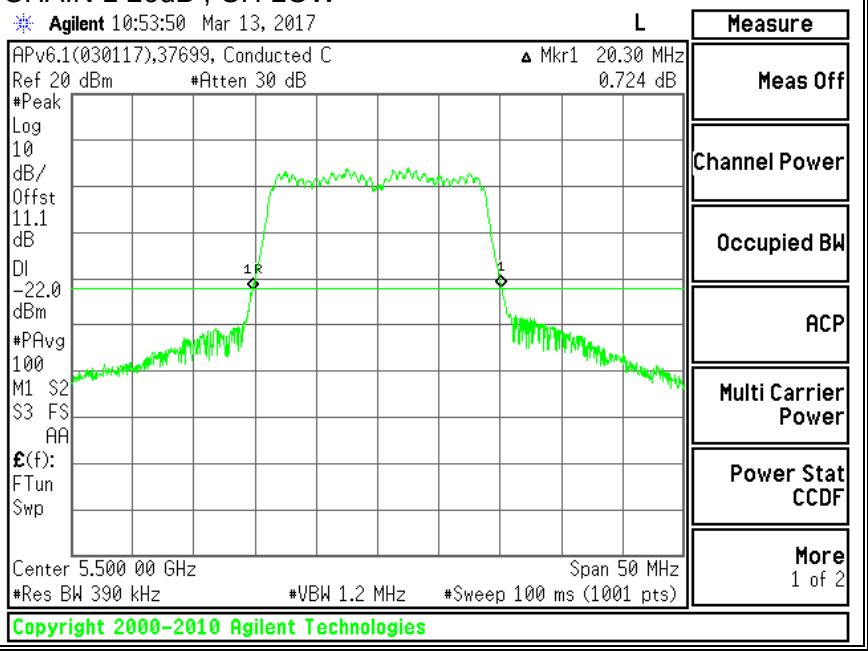
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5500	20.5	20.3
Mid	5580	20.5	20.25
High	5700	20.55	20.35
144	5720	20.45	20.35

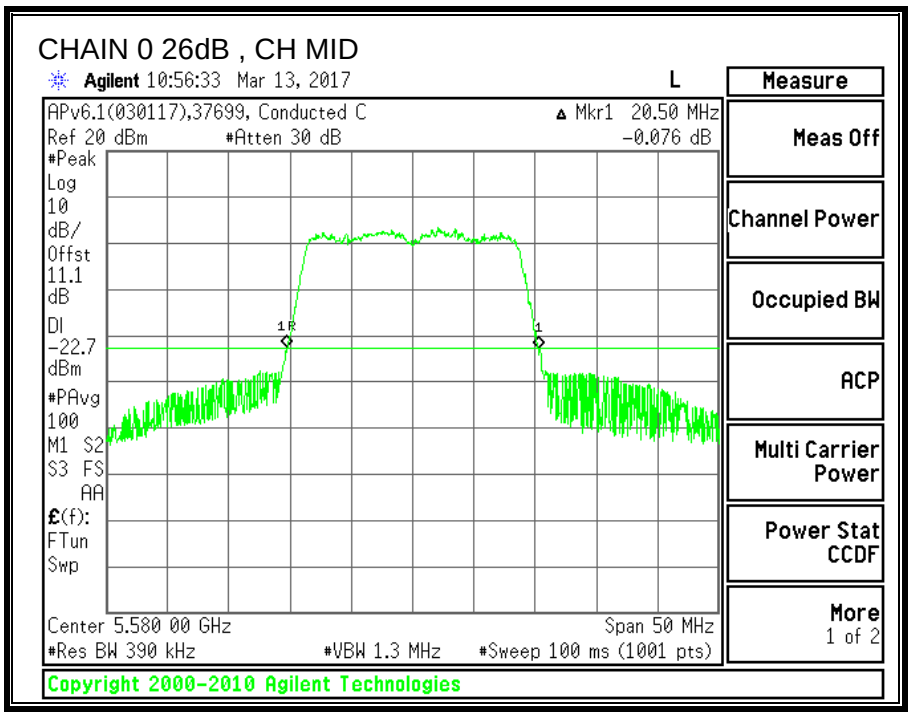
CHAIN 0 26dB , CH LOW



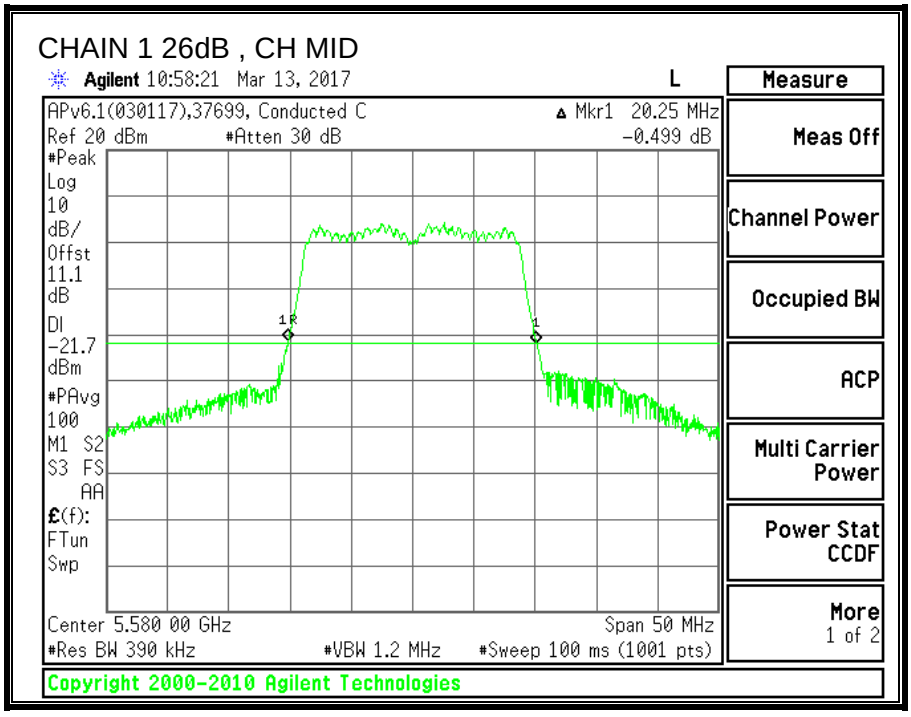
CHAIN 1 26dB , CH LOW



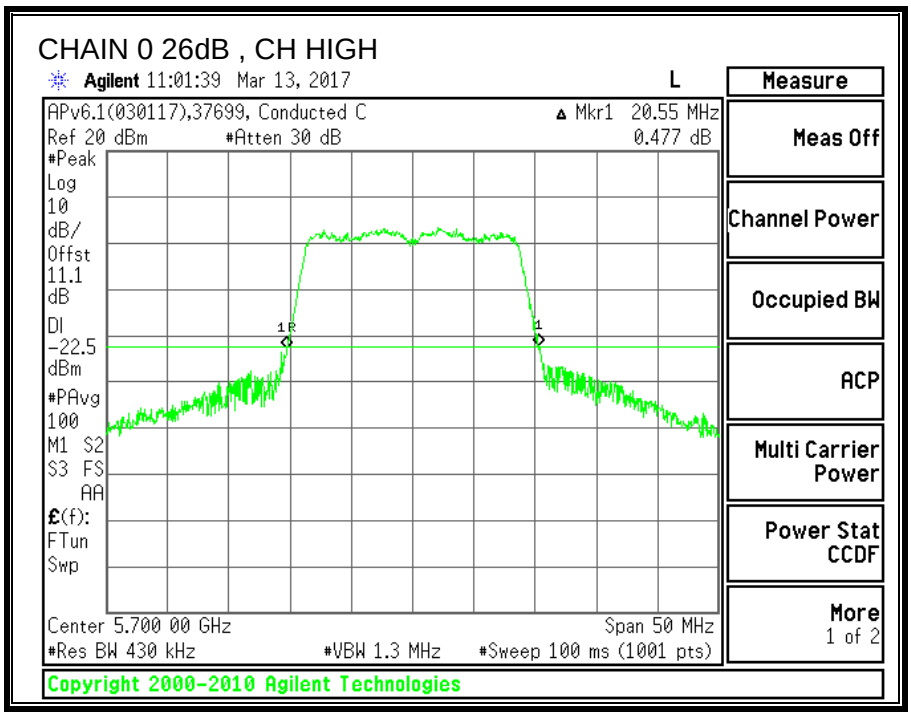
CHAIN 0 26dB , CH MID



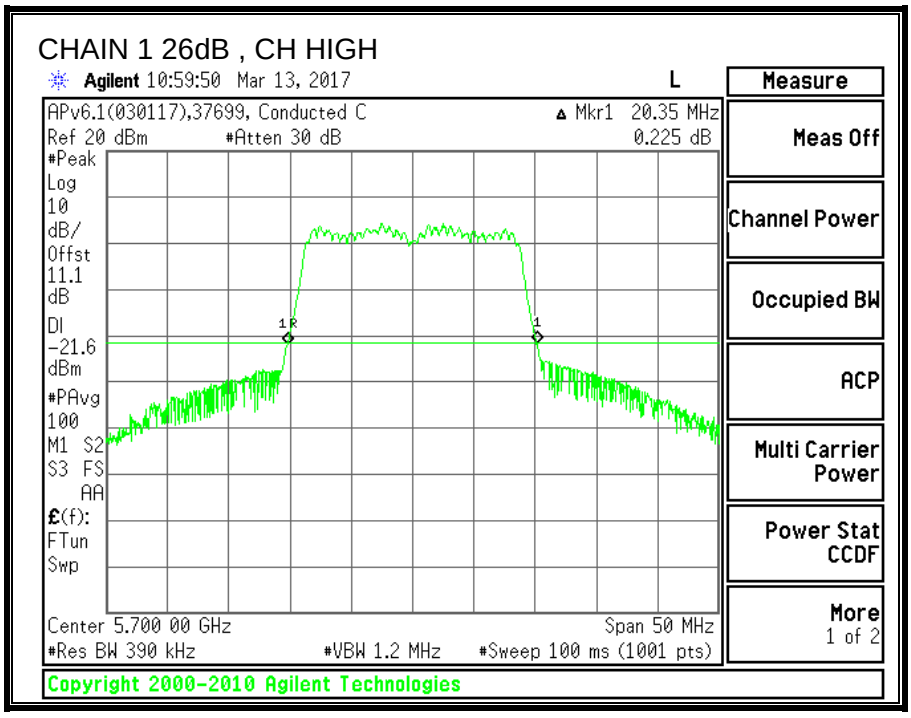
CHAIN 1 26dB , CH MID



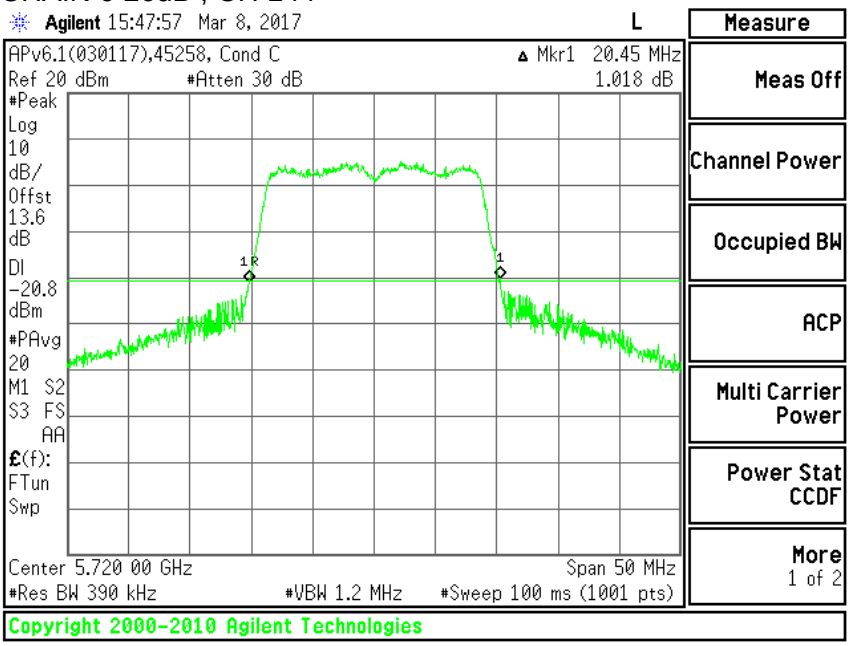
CHAIN 0 26dB , CH HIGH



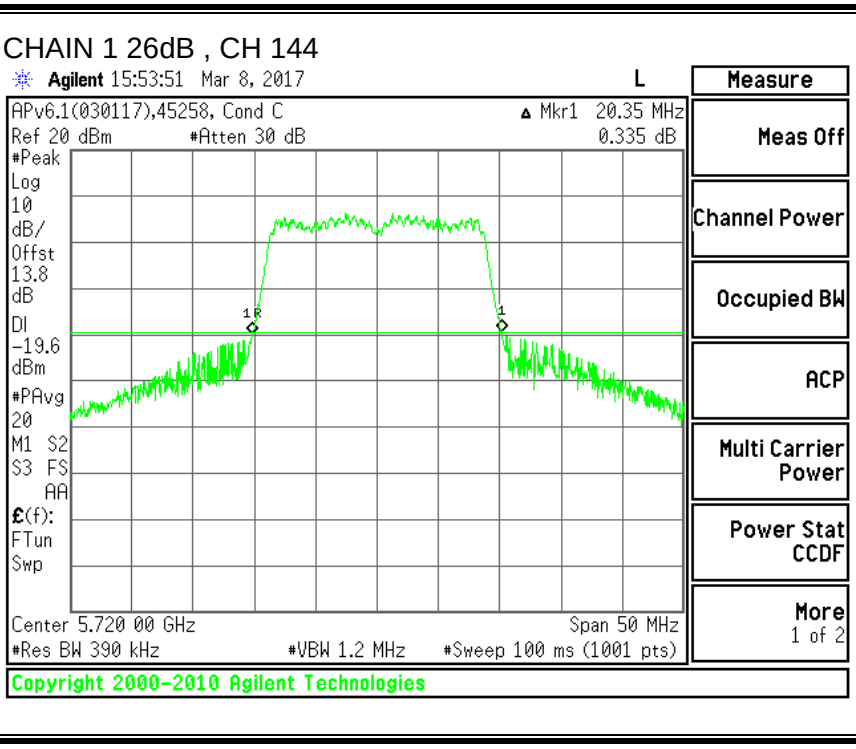
CHAIN 1 26dB , CH HIGH



CHAIN 0 26dB , CH 144



CHAIN 1 26dB , CH 144



9.10.2. 99% BANDWIDTH

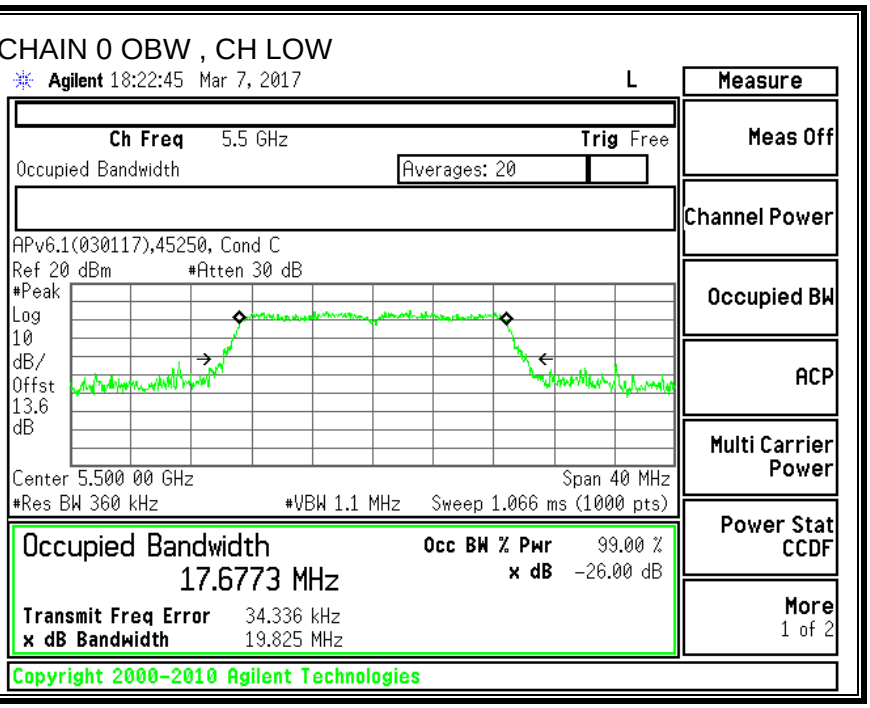
LIMITS

None; for reporting purposes only.

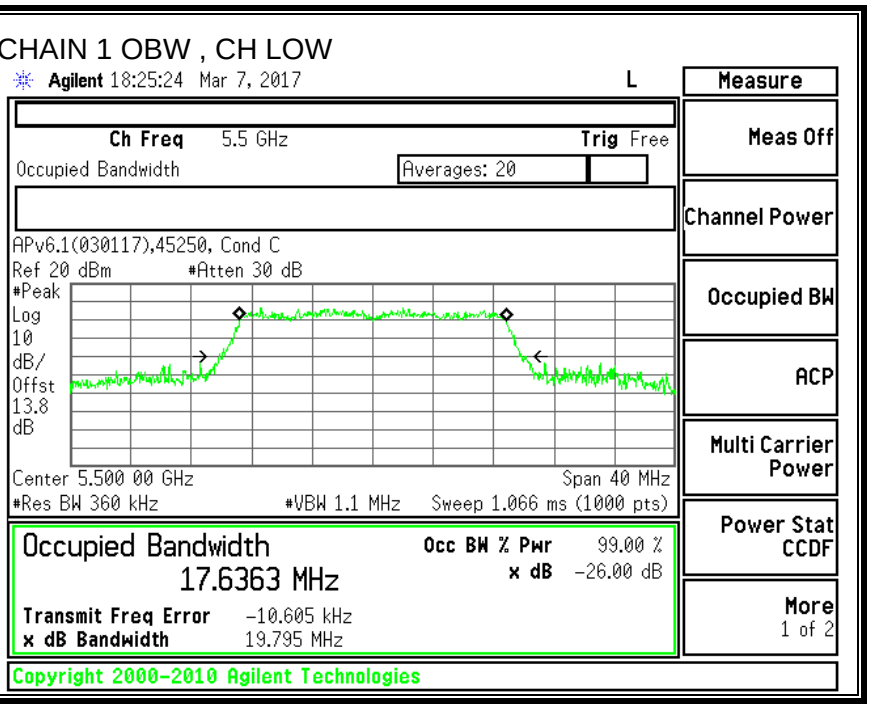
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5500	17.677	17.636
Mid	5580	17.648	17.734
High	5700	17.651	17.709
144	5720	17.657	17.671

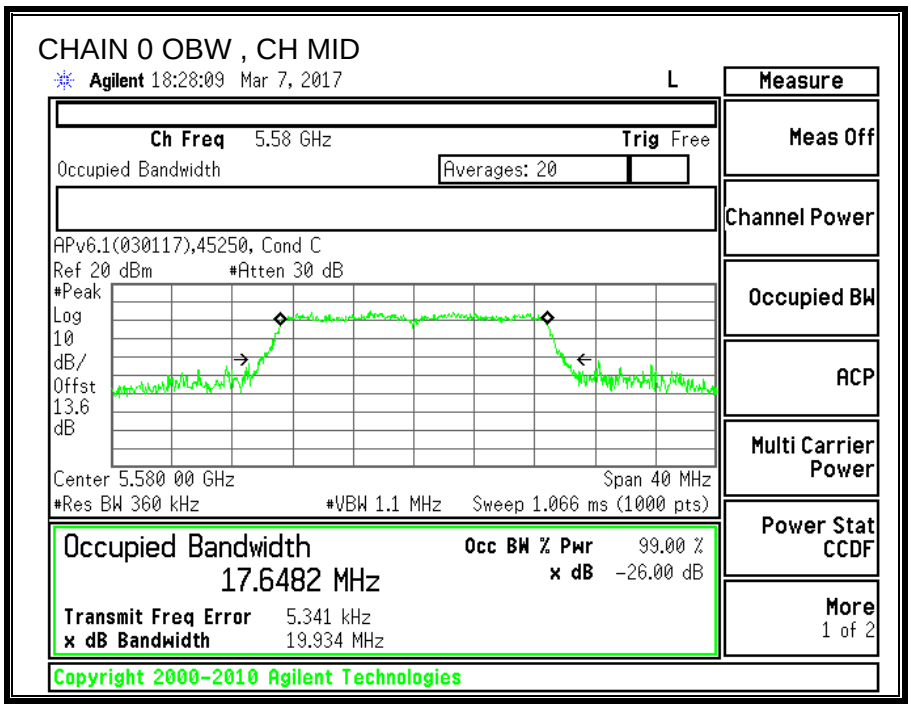
CHAIN 0 OBW , CH LOW



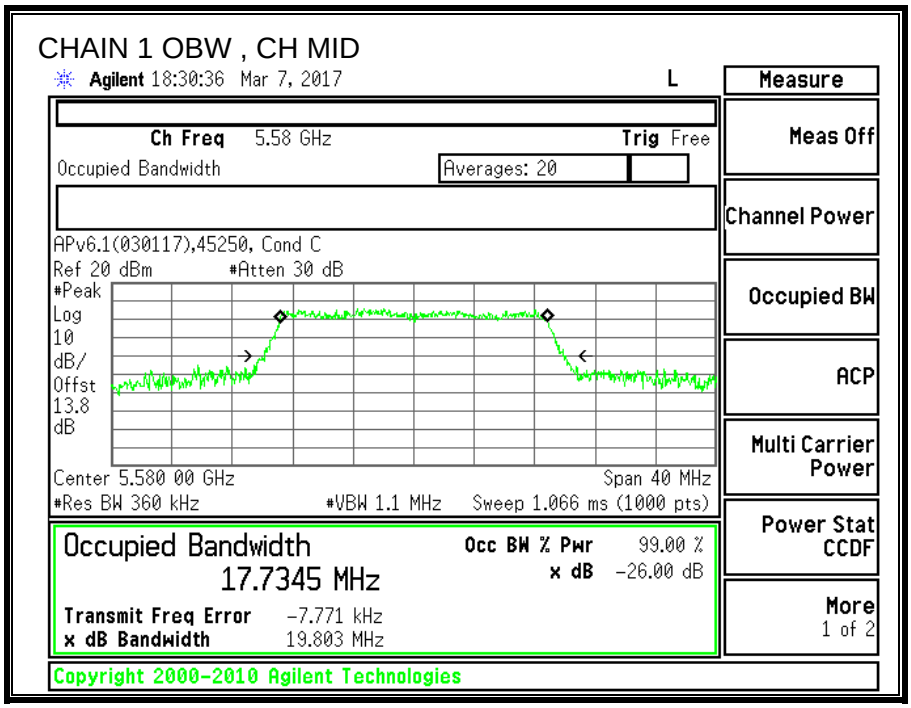
CHAIN 1 OBW , CH LOW



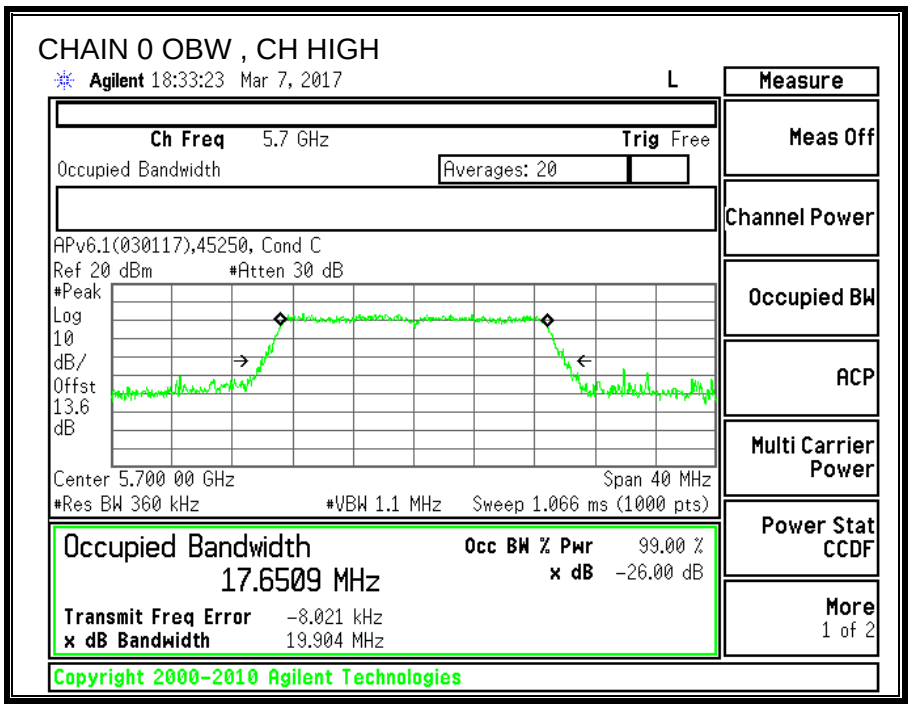
CHAIN 0 OBW , CH MID



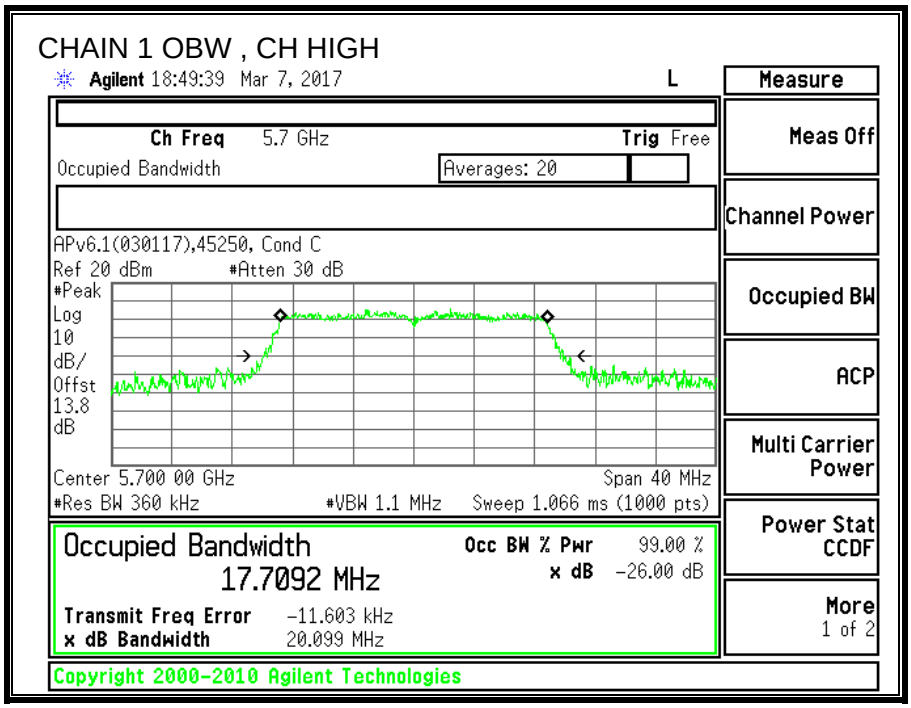
CHAIN 1 OBW , CH MID



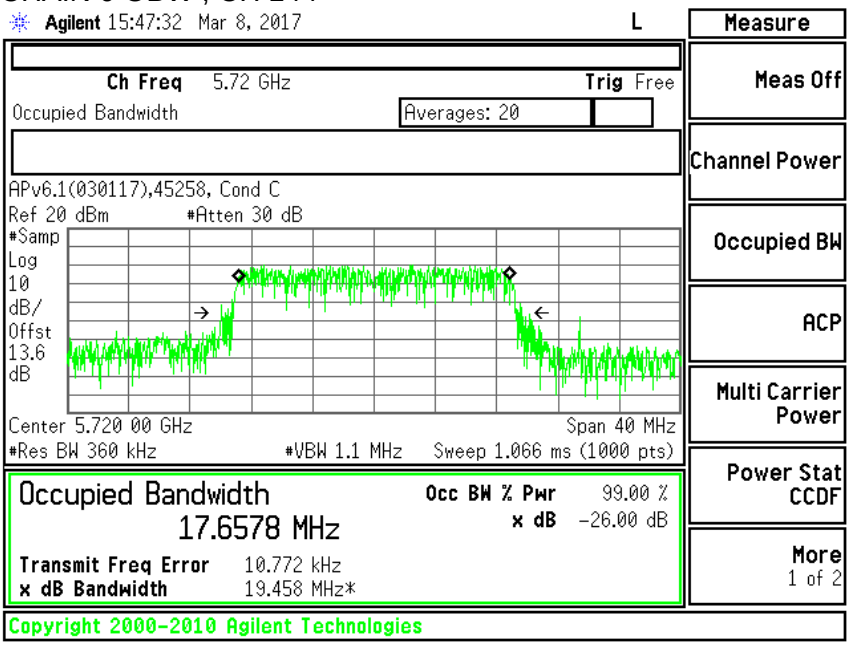
CHAIN 0 OBW , CH HIGH



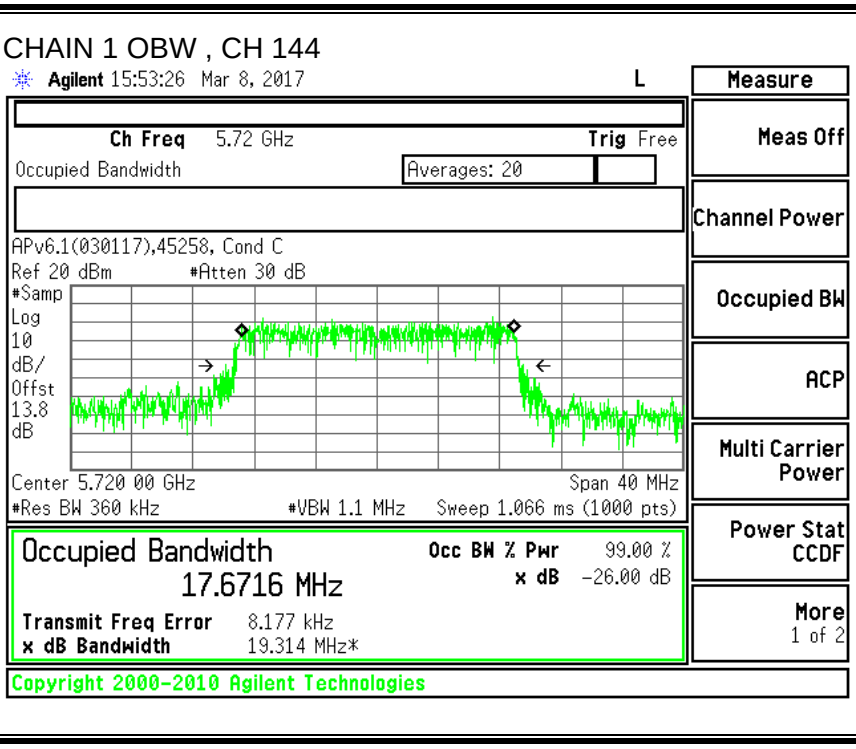
CHAIN 1 OBW , CH HIGH



CHAIN 0 OBW , CH 144



CHAIN 1 OBW , CH 144



9.10.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
0.90	3.60	2.46	5.36

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5500	20.30	17.64	2.46	5.36
Mid	5580	20.25	17.65	2.46	5.36
High	5700	20.35	17.65	2.46	5.36
144	5720	20.35	17.66	2.46	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.46	27.00	23.46	11.00	11.00	11.00
Mid	5580	24.00	23.47	27.00	23.47	11.00	11.00	11.00
High	5700	24.00	23.47	27.00	23.47	11.00	11.00	11.00
144	5720	24.00	23.47	27.00	23.47	11.00	11.00	11.00

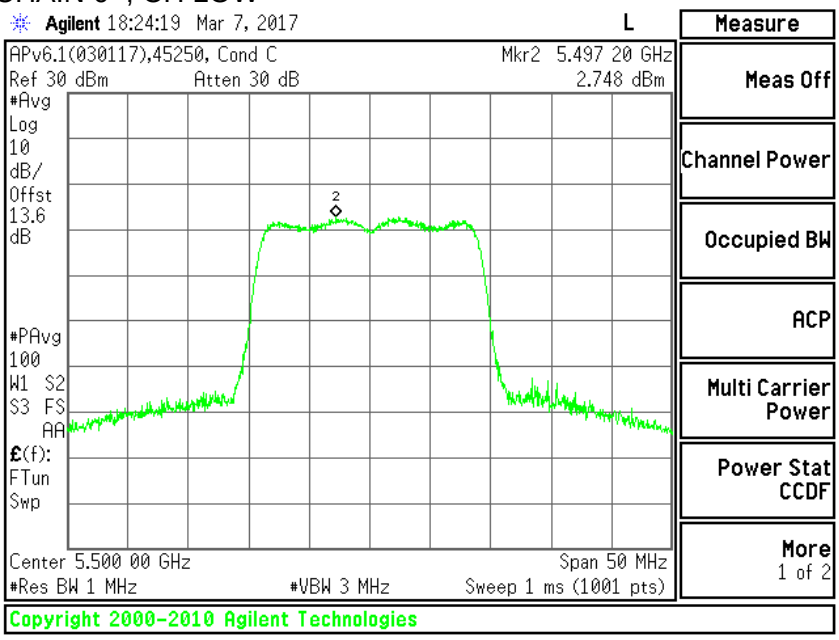
Output Power Results

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	13.00	13.85	16.46	23.46	-7.01
Mid	5580	13.70	14.30	17.02	23.47	-6.45
High	5700	13.01	13.33	16.18	23.47	-7.28
144	5720	11.23	11.64	14.45	23.47	-9.02

PPSD Results

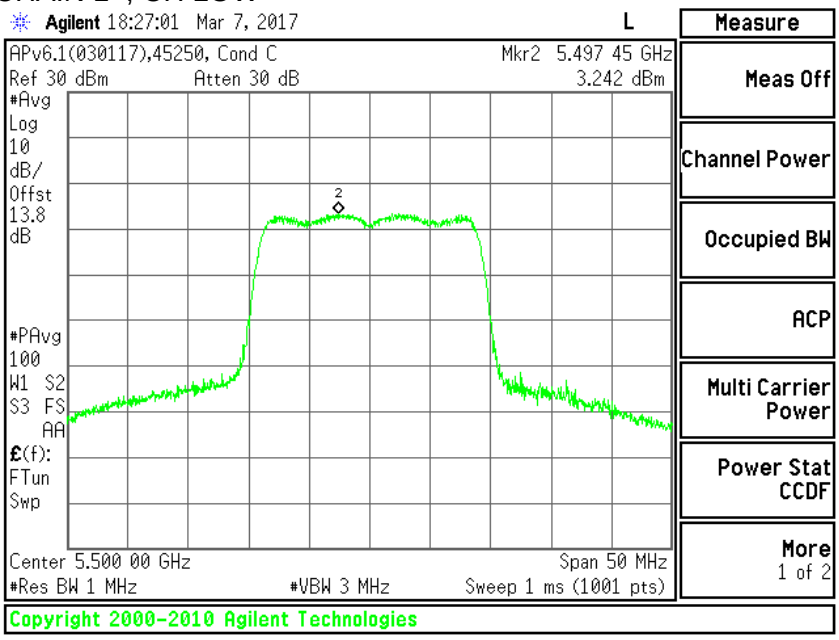
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.25	3.74	6.51	11.00	-4.49
Mid	5580	2.93	3.79	6.39	11.00	-4.61
High	5700	1.94	2.66	5.32	11.00	-5.68
144	5720	1.68	2.19	4.95	11.00	-6.05

CHAIN 0 , CH LOW



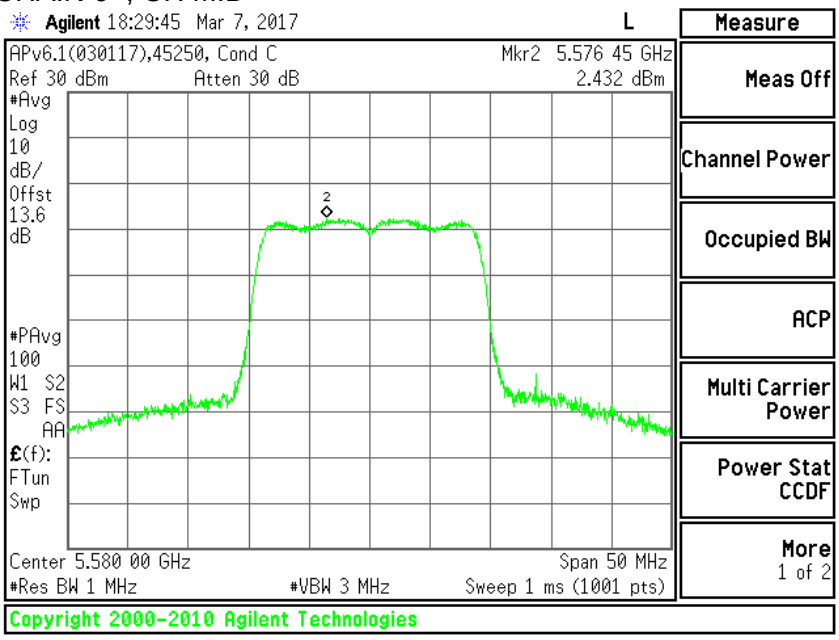
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.248dBm

CHAIN 1 , CH LOW



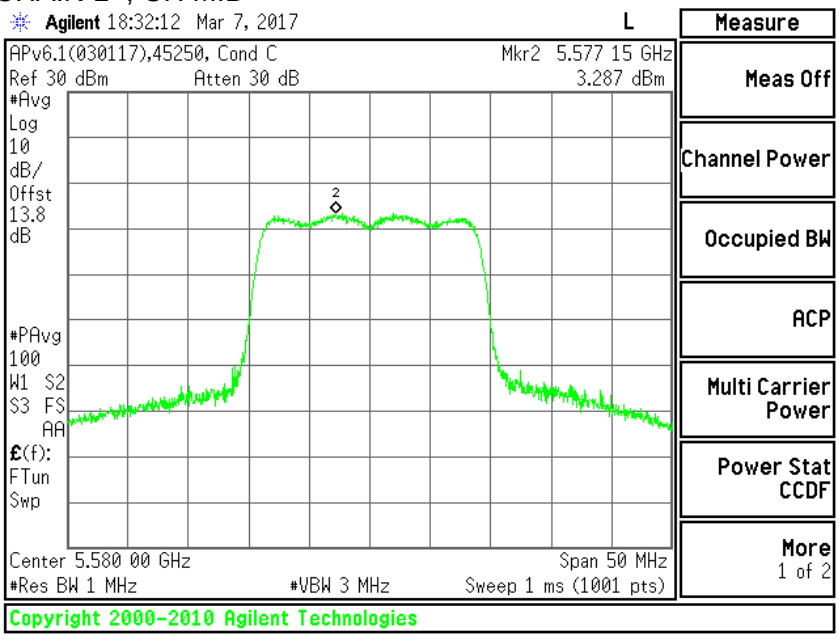
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.742dBm

CHAIN 0 , CH MID



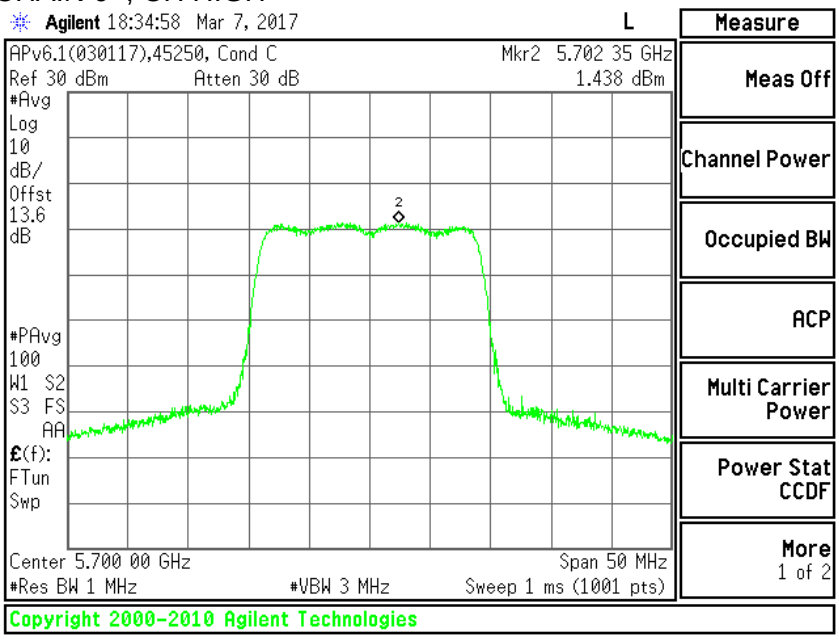
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 2.932dBm

CHAIN 1 , CH MID



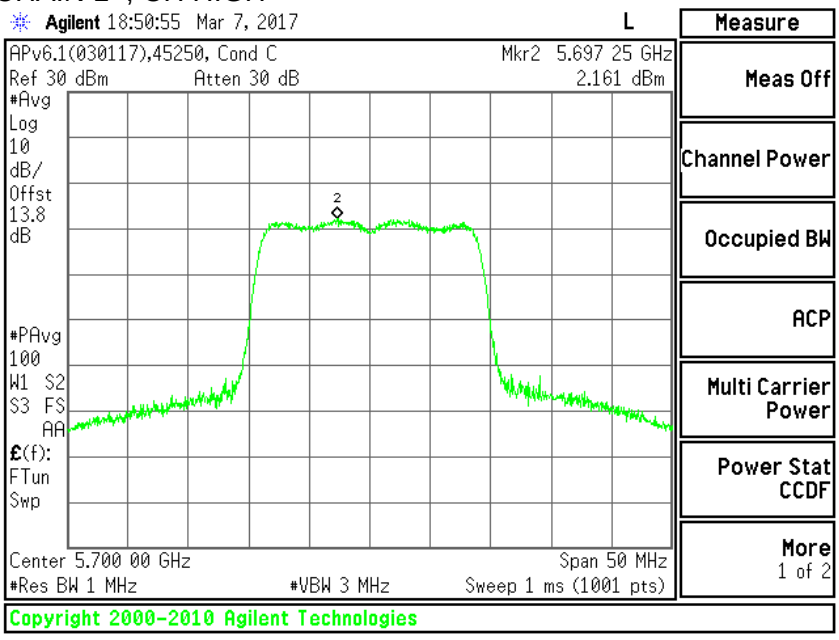
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 3.787dBm

CHAIN 0 , CH HIGH



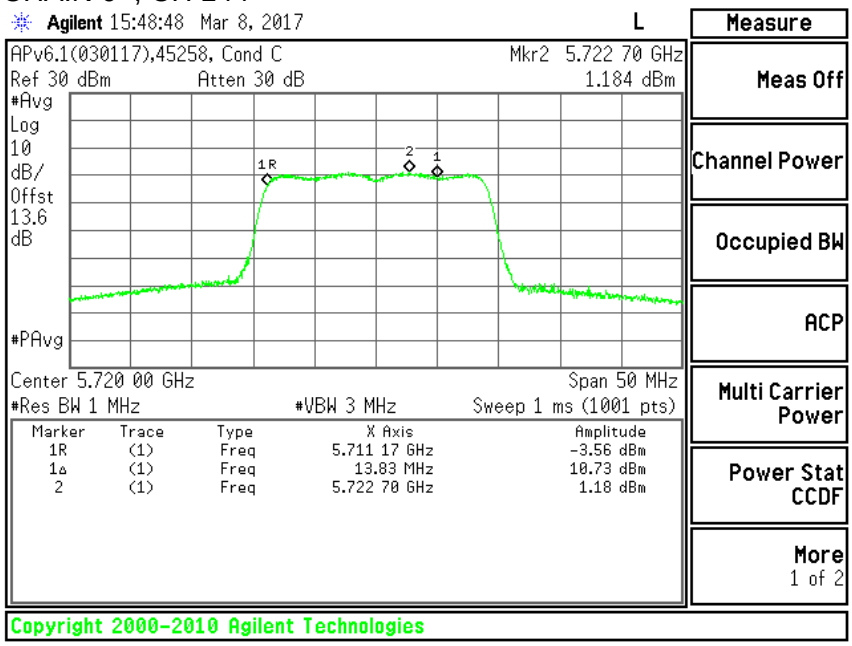
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.938dBm

CHAIN 1 , CH HIGH



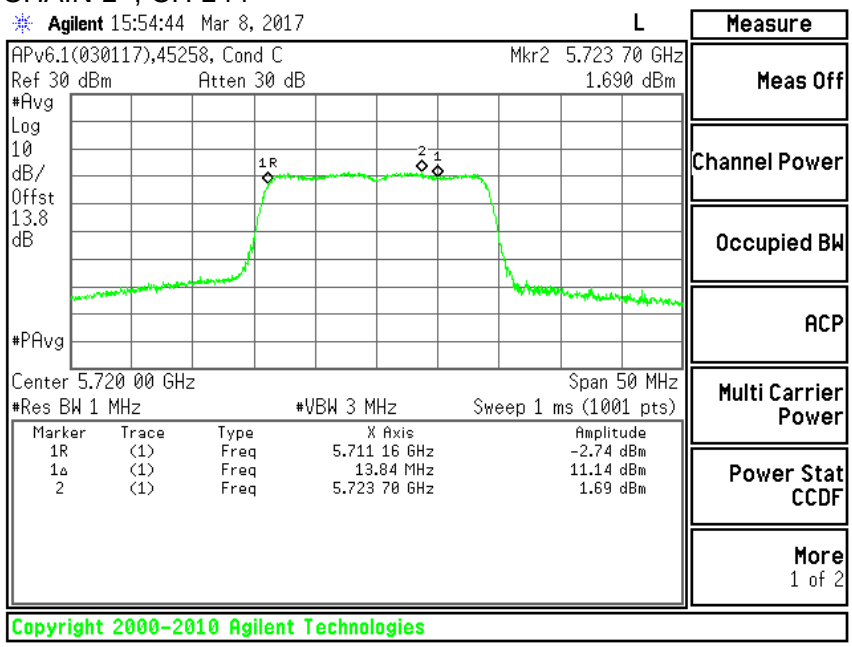
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 2.661dBm

CHAIN 0 , CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.684dBm

CHAIN 1 , CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 2.190dBm

9.11. 11n HT40 2TX MODE IN THE 5.6GHz BAND

9.11.1. 26 dB BANDWIDTH

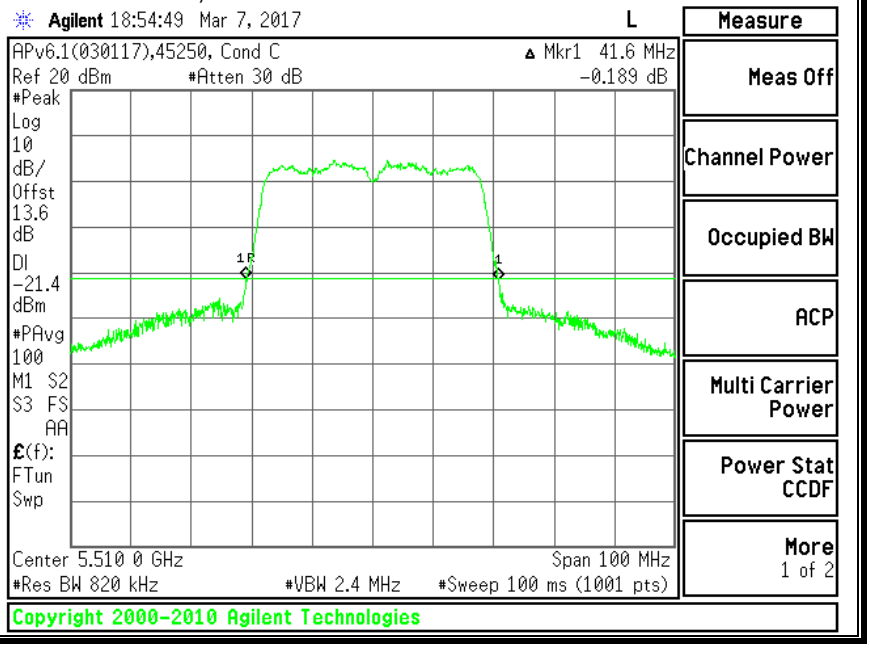
LIMITS

None; for reporting purposes only.

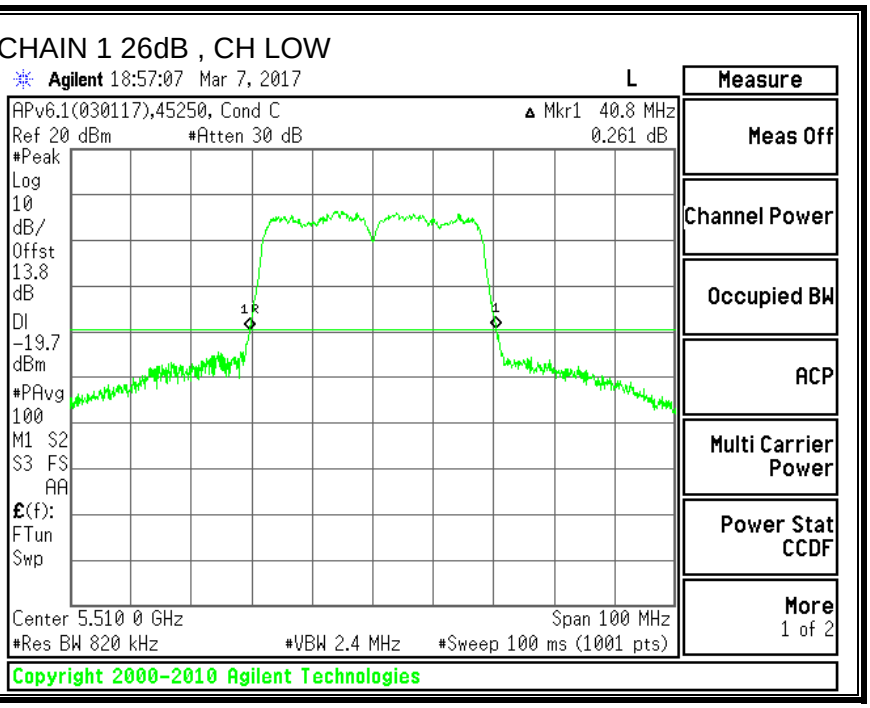
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5510	41.6	40.8
Mid	5550	41.6	41
High	5670	41.7	41.2
142	5710	41.4	40.7

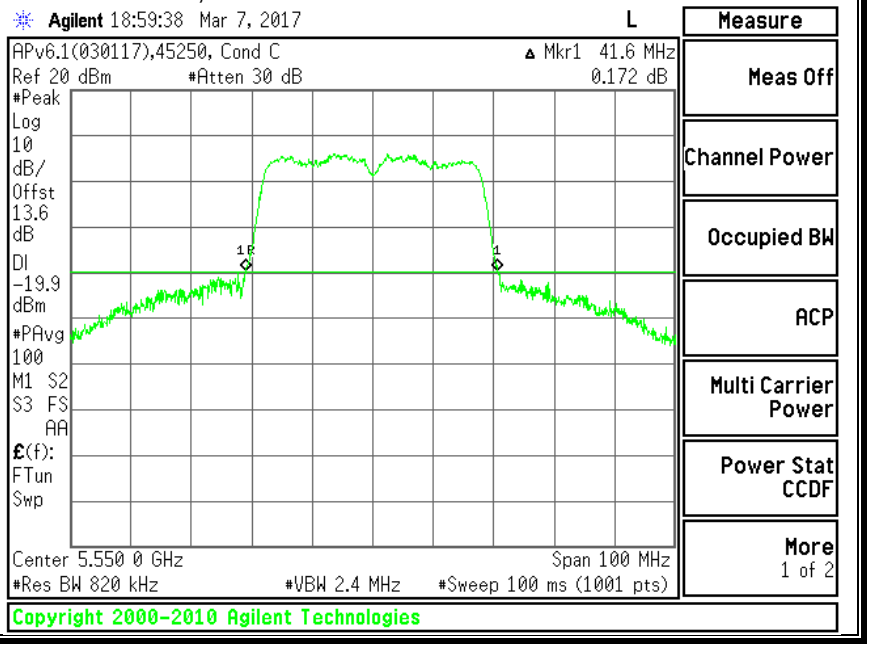
CHAIN 0 26dB , CH LOW



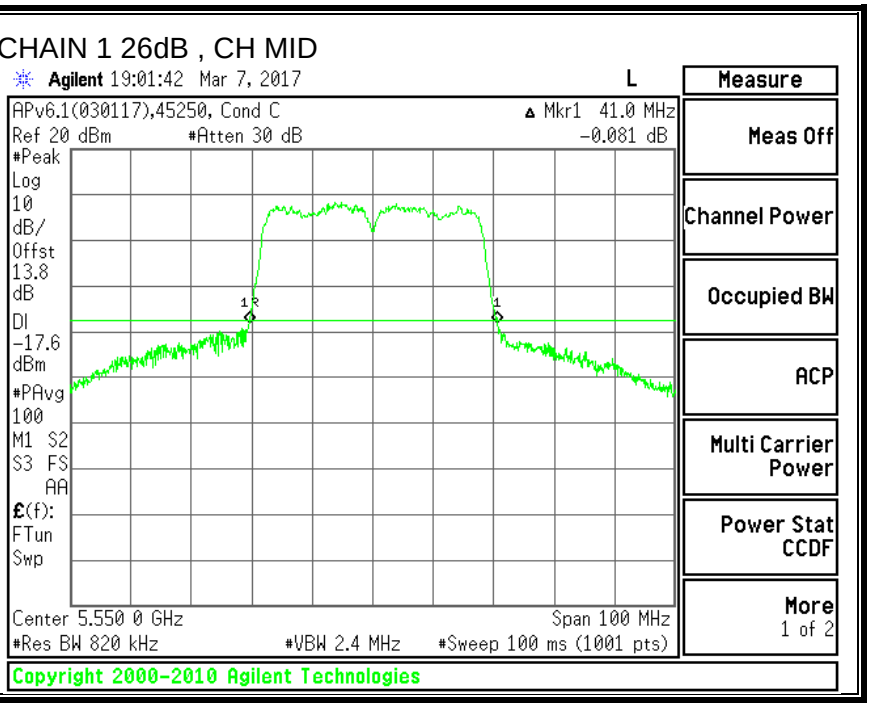
CHAIN 1 26dB , CH LOW



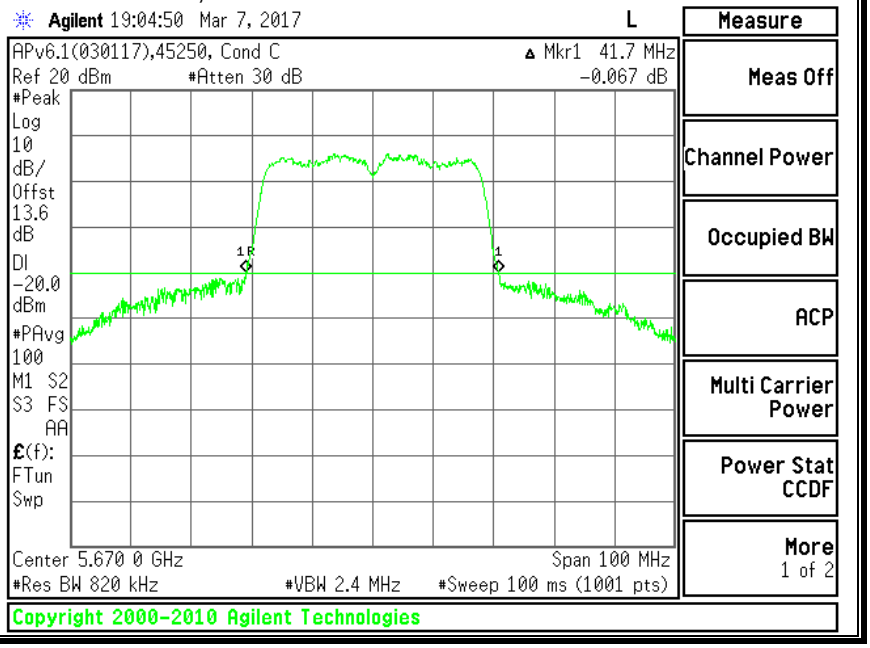
CHAIN 0 26dB , CH MID



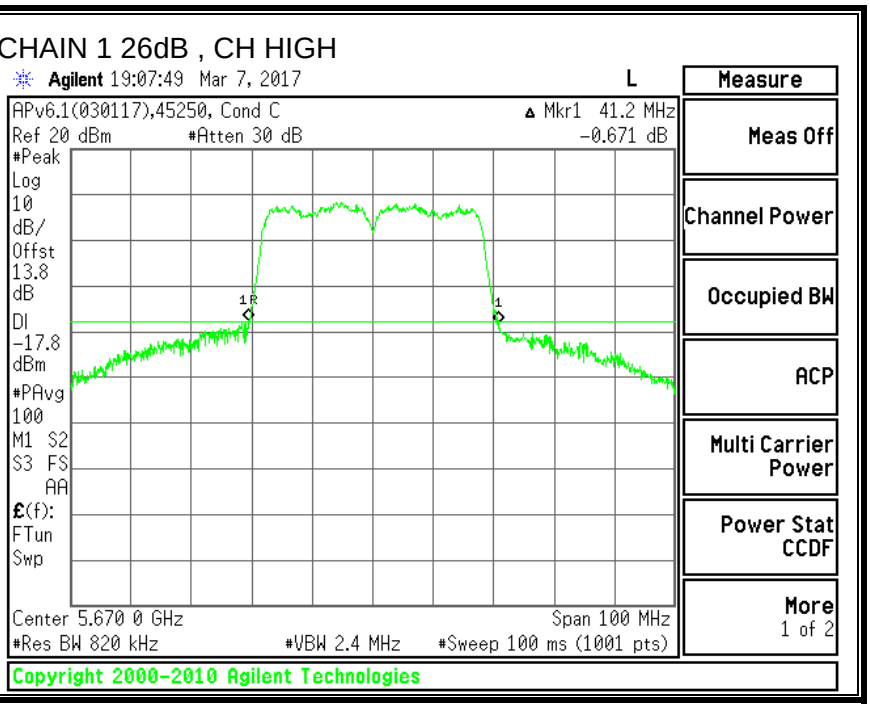
CHAIN 1 26dB , CH MID



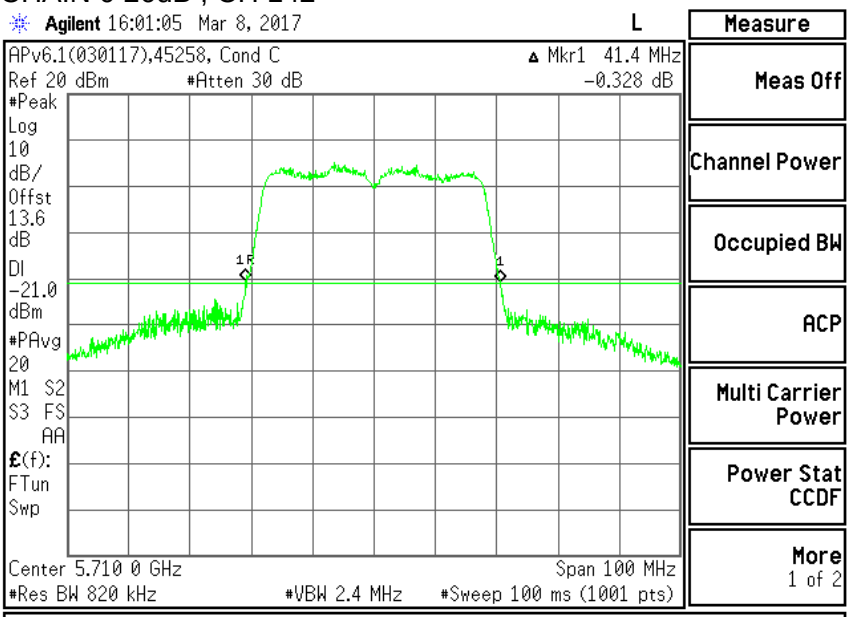
CHAIN 0 26dB , CH HIGH



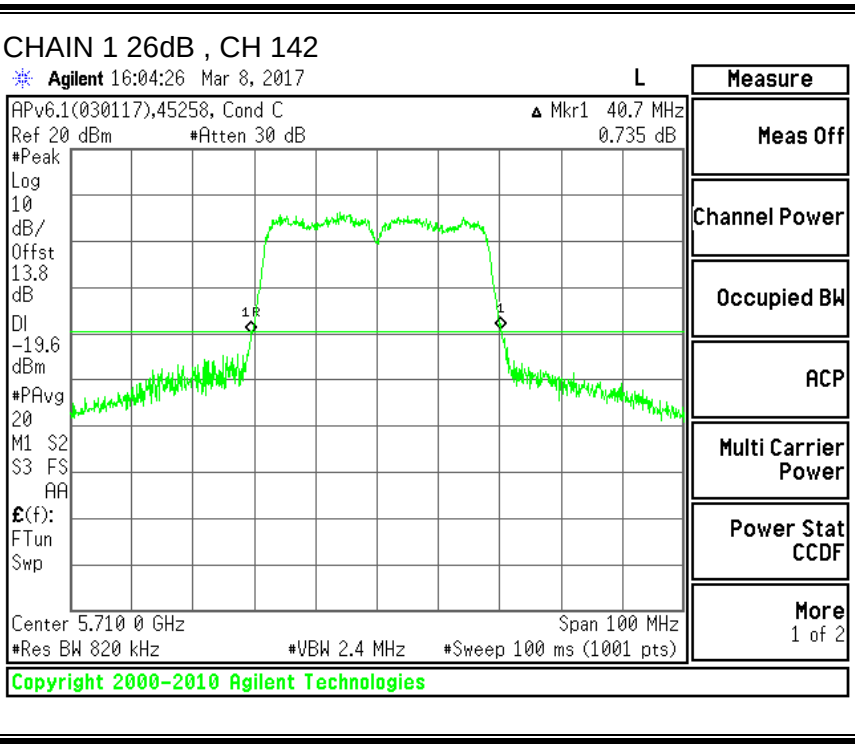
CHAIN 1 26dB , CH HIGH



CHAIN 0 26dB , CH 142



CHAIN 1 26dB , CH 142



9.11.2. 99% BANDWIDTH

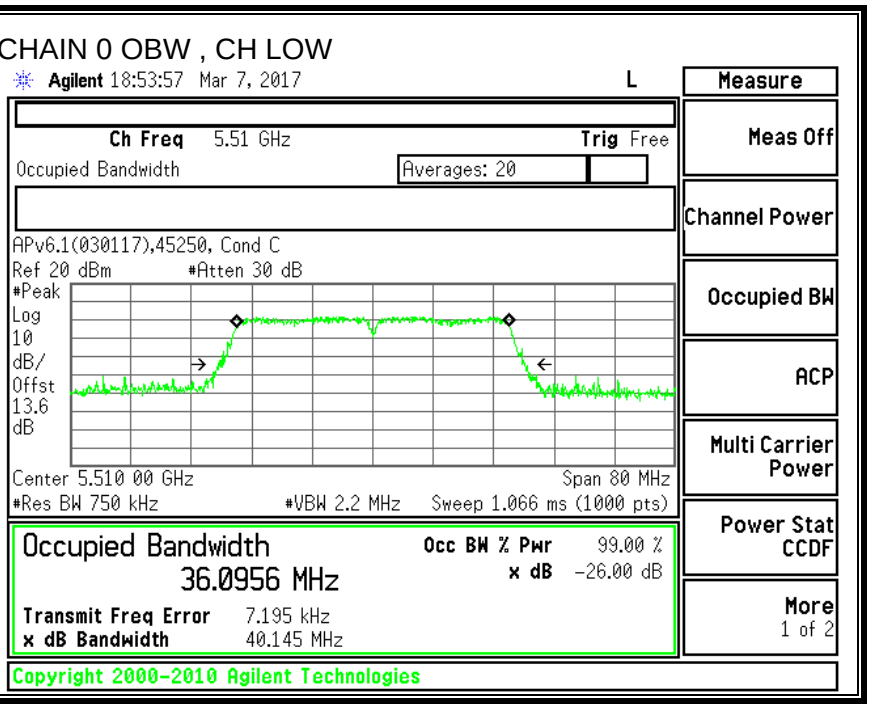
LIMITS

None; for reporting purposes only.

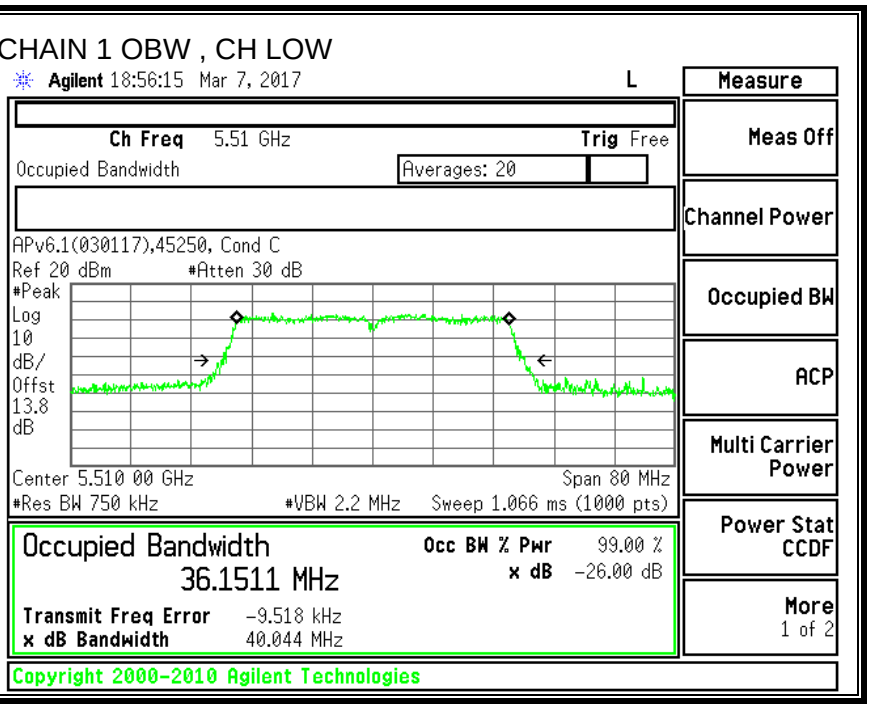
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5510	36.096	36.151
Mid	5550	36.186	36.089
High	5670	36.079	36.148
142	5710	36.192	36.160

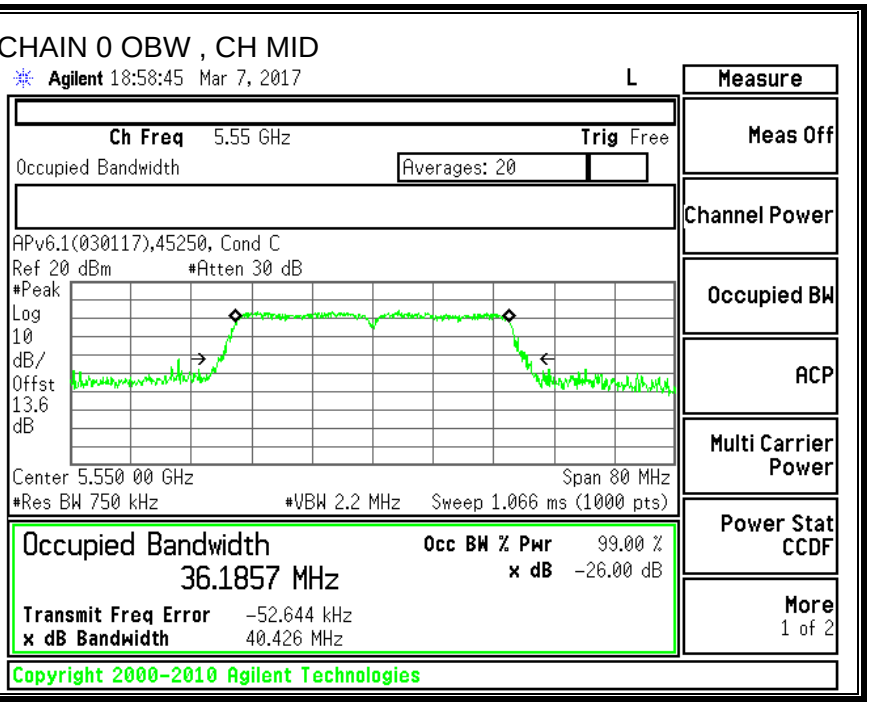
CHAIN 0 OBW , CH LOW



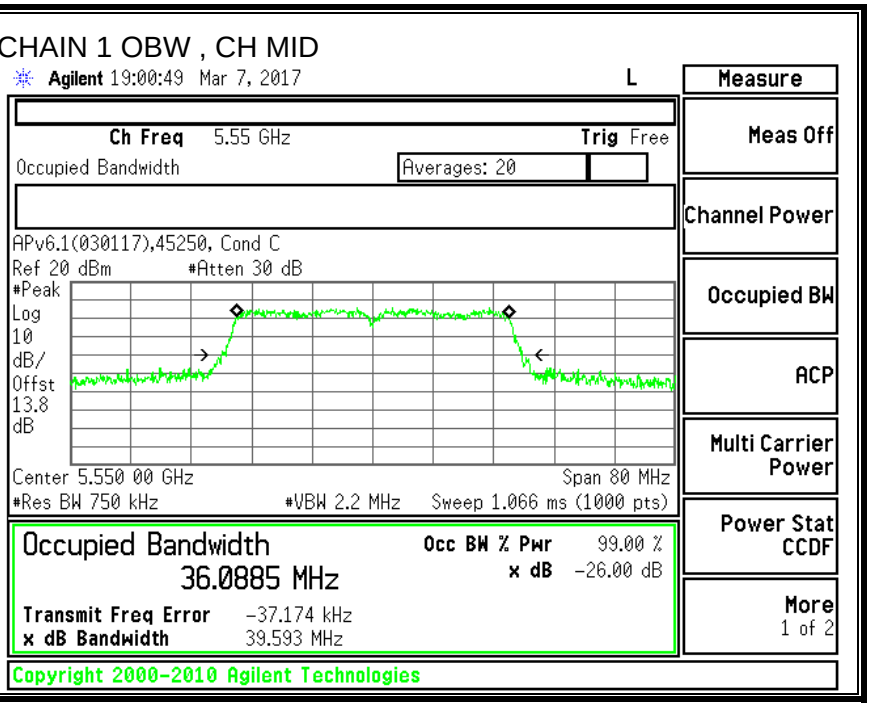
CHAIN 1 OBW , CH LOW



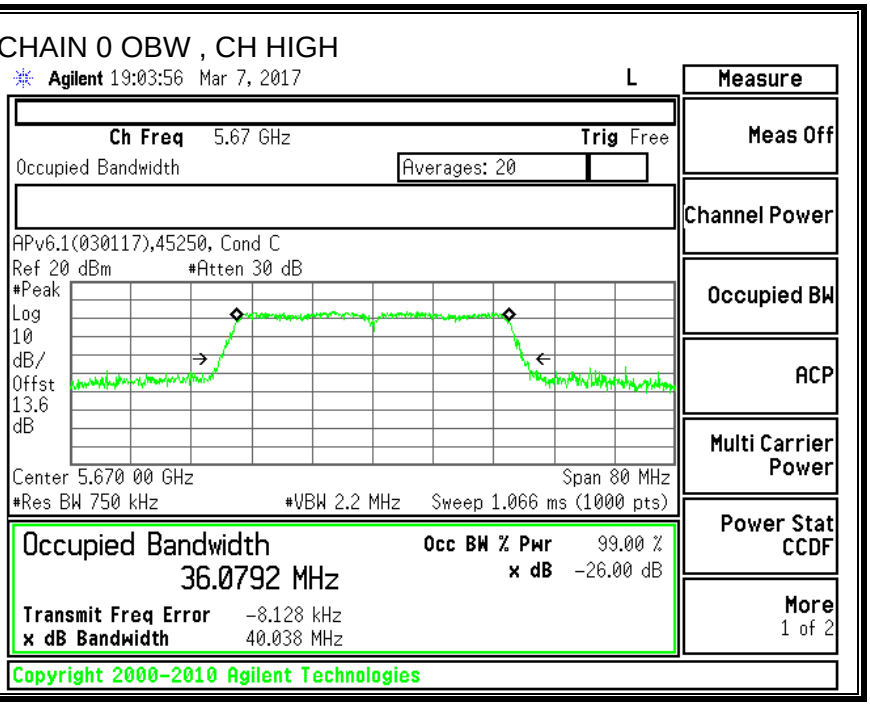
CHAIN 0 OBW , CH MID



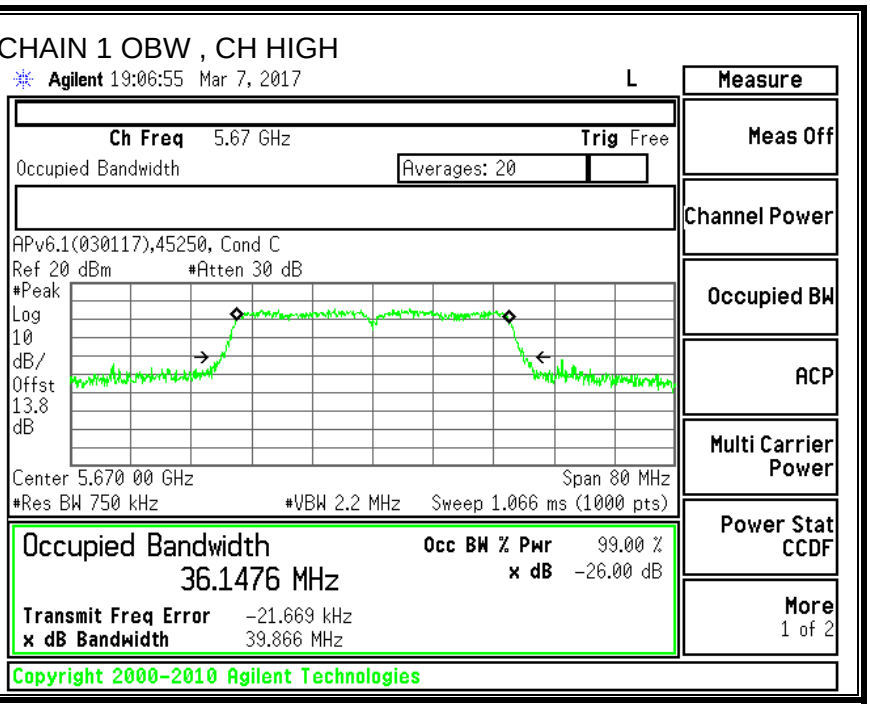
CHAIN 1 OBW , CH MID



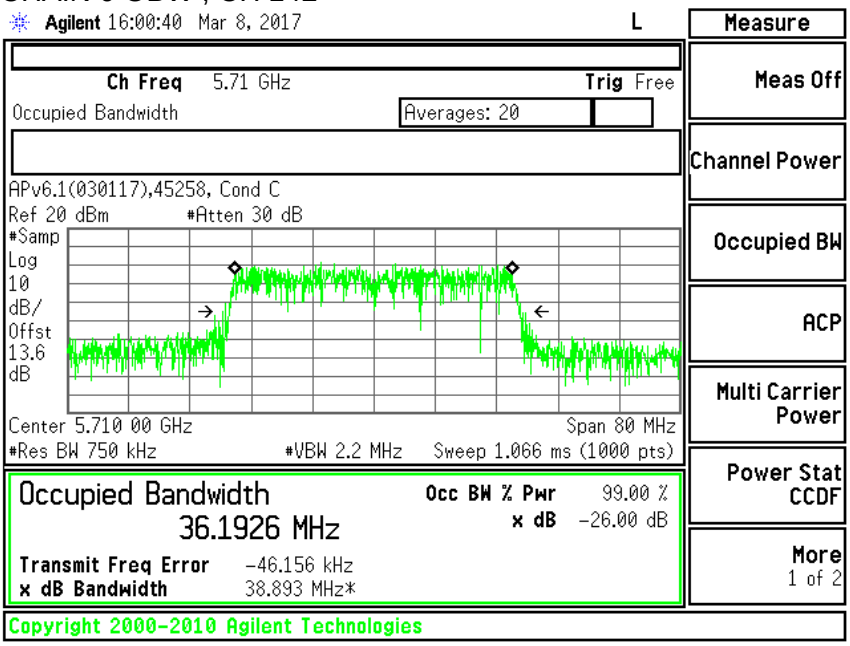
CHAIN 0 OBW , CH HIGH



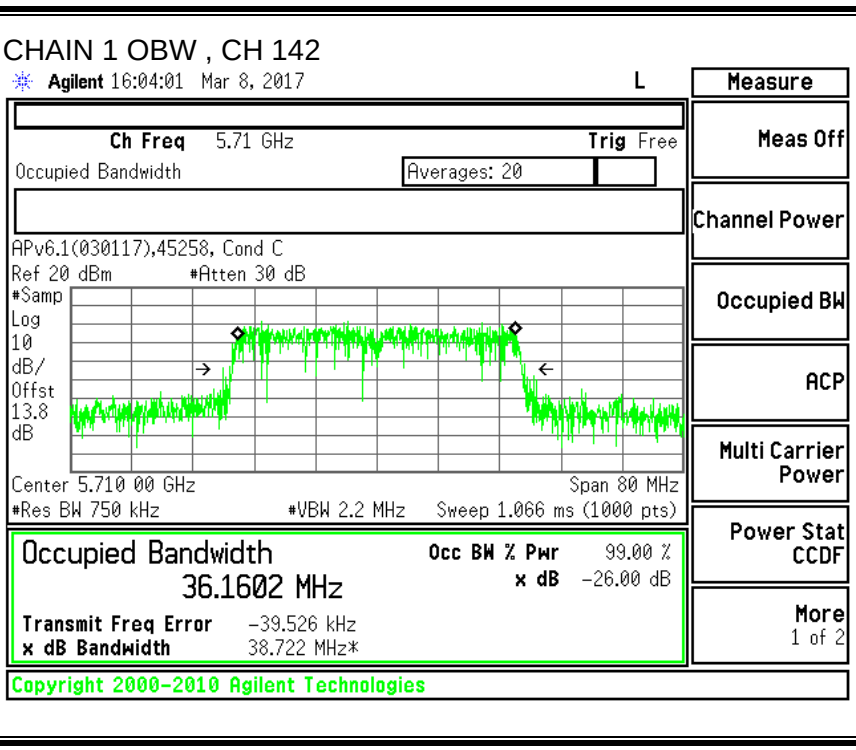
CHAIN 1 OBW , CH HIGH



CHAIN 0 OBW , CH 142



CHAIN 1 OBW , CH 142



9.11.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
0.90	3.60	2.46	5.36

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5510	40.80	36.10	2.46	5.36
Mid	5550	41.00	36.09	2.46	5.36
High	5670	41.20	36.08	2.46	5.36
142	5710	40.70	36.16	2.46	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00
142	5710	24.00	24.00	30.00	24.00	11.00	11.00	11.00

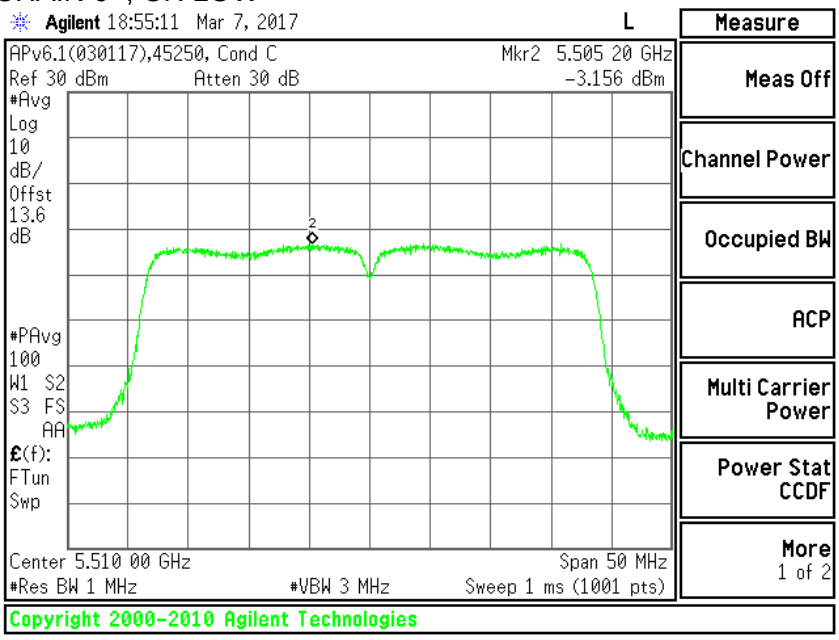
Output Power Results

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	10.28	10.71	13.51	24.00	-10.49
Mid	5550	12.30	12.73	15.53	24.00	-8.47
High	5670	12.74	13.17	15.97	24.00	-8.03
142	5710	10.93	11.09	14.02	24.00	-9.98

PPSD Results

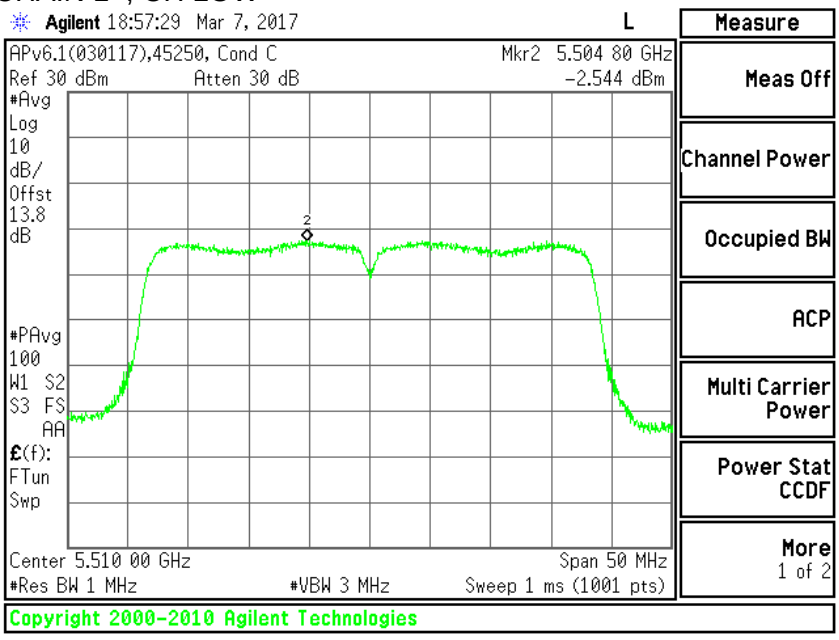
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-2.66	-2.04	0.67	11.00	-10.33
Mid	5550	-1.20	0.06	2.48	11.00	-8.52
High	5670	-1.06	-0.002	2.51	11.00	-8.49
142	5710	-2.33	-1.88	0.91	11.00	-10.09

CHAIN 0 , CH LOW



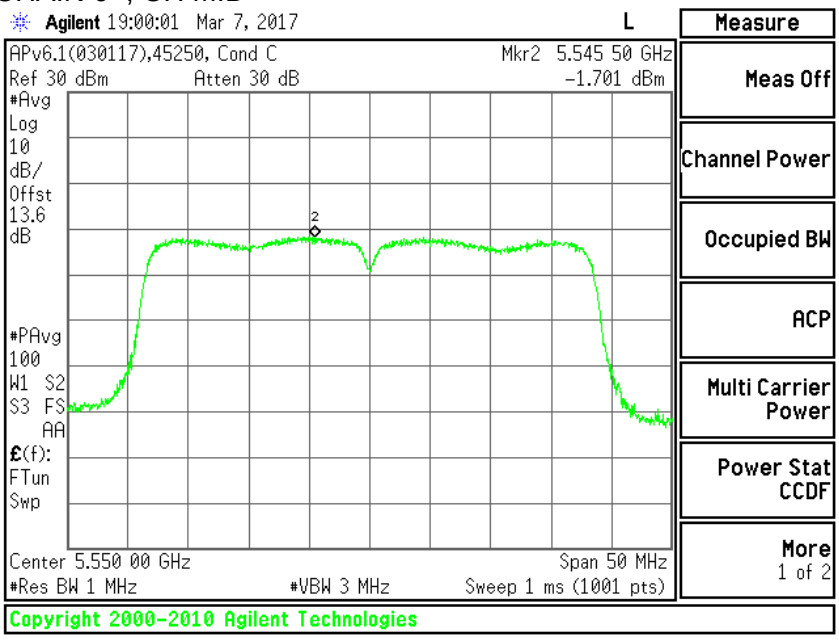
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.656dBm

CHAIN 1 , CH LOW



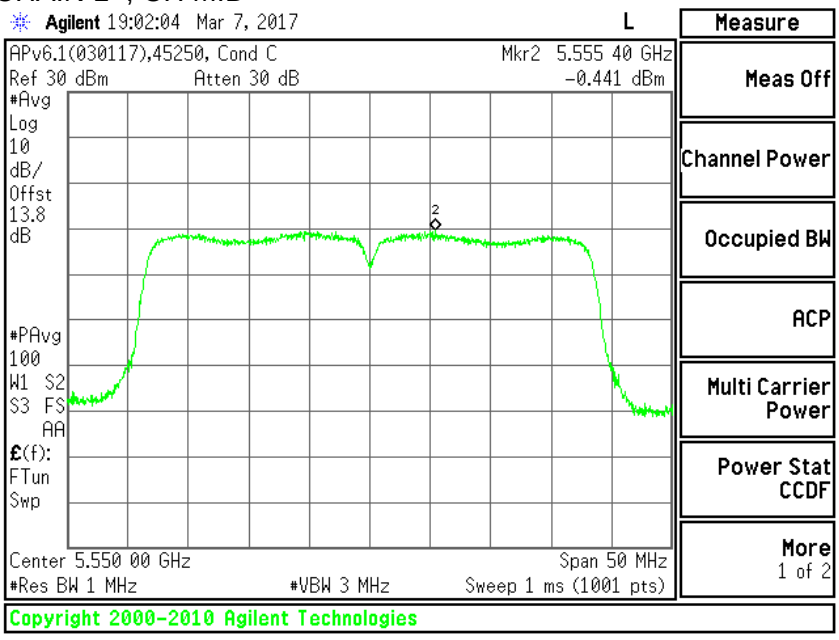
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.044dBm

CHAIN 0 , CH MID



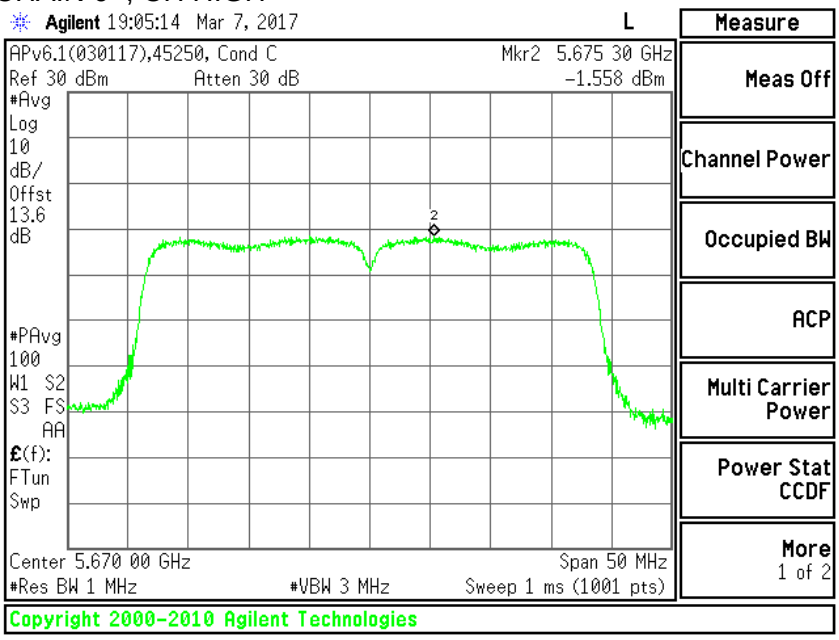
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.201dBm

CHAIN 1 , CH MID



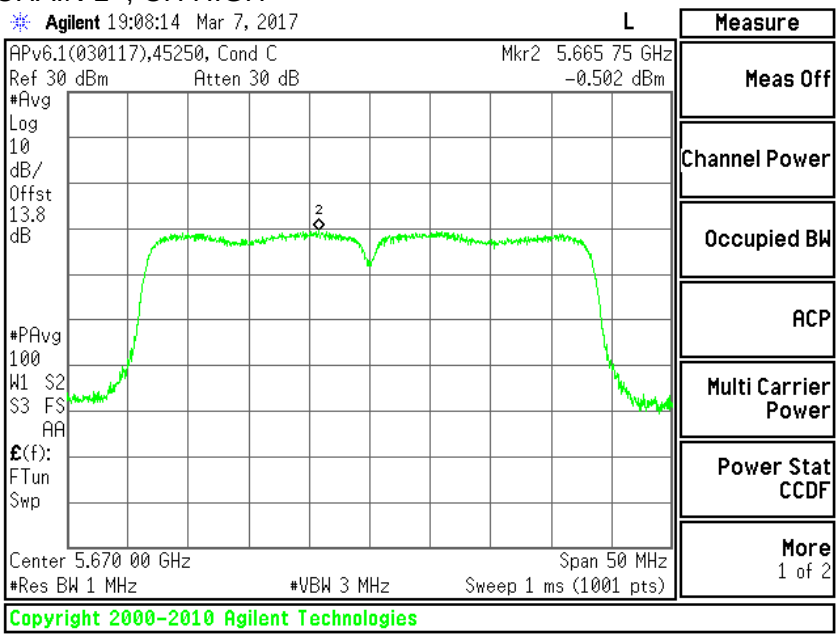
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.059dBm

CHAIN 0 , CH HIGH



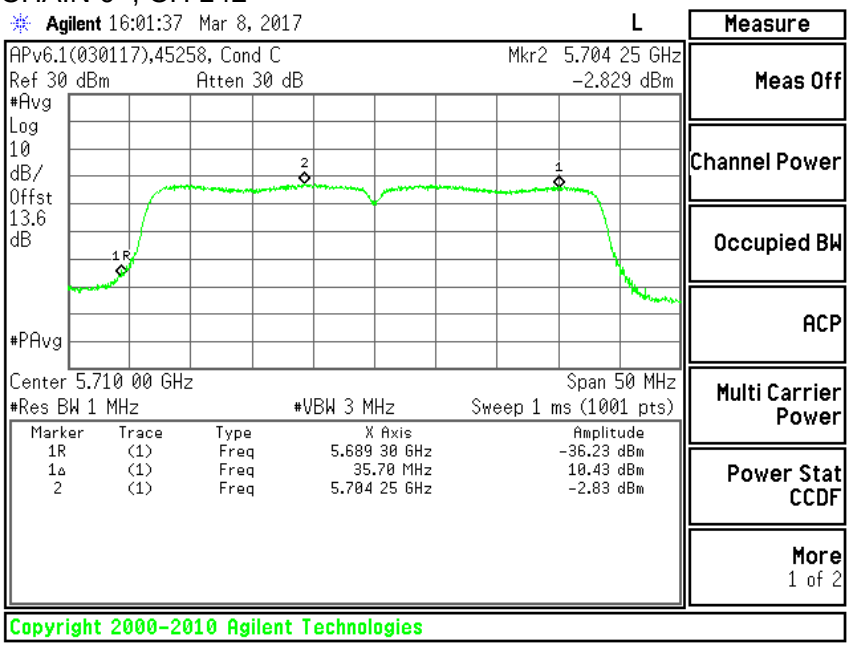
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.058dBm

CHAIN 1 , CH HIGH



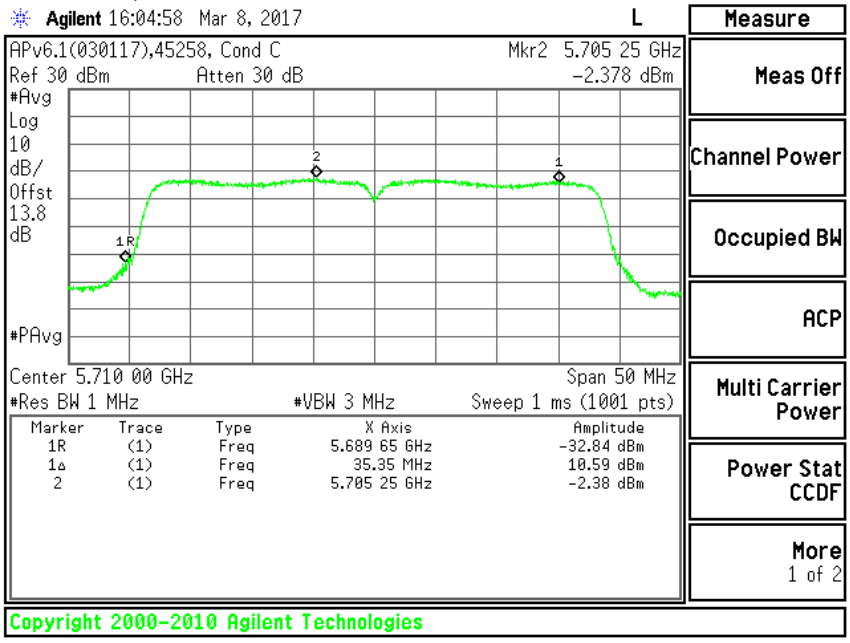
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -0.002dBm

CHAIN 0 , CH 142



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -2.329dBm

CHAIN 1 , CH 142



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.878dBm

9.12. 11ac VHT80 2TX MODE IN THE 5.6GHz BAND

9.12.1. 26 dB BANDWIDTH

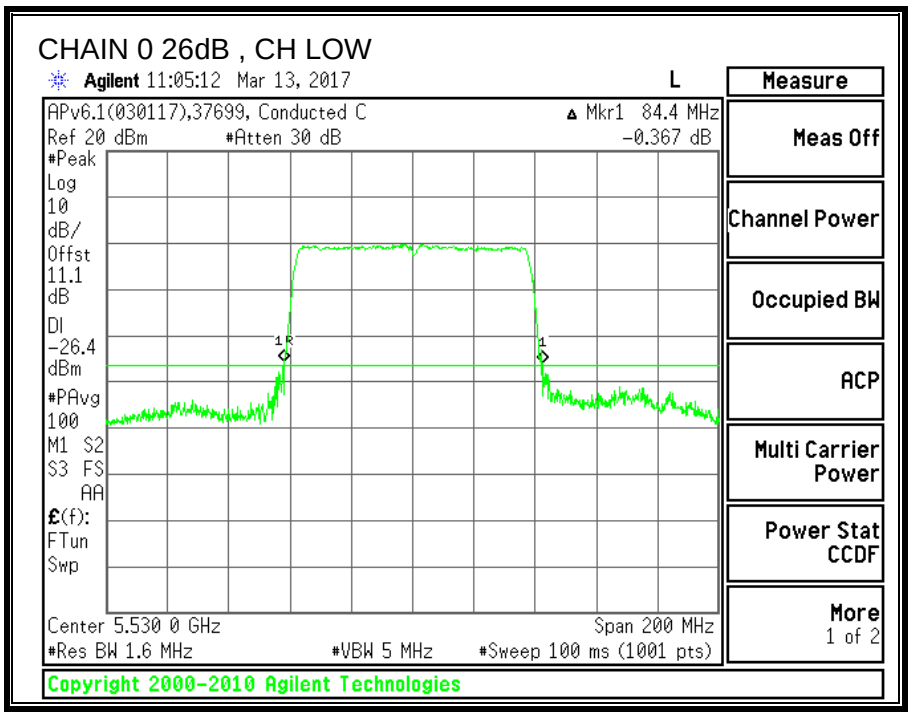
LIMITS

None; for reporting purposes only.

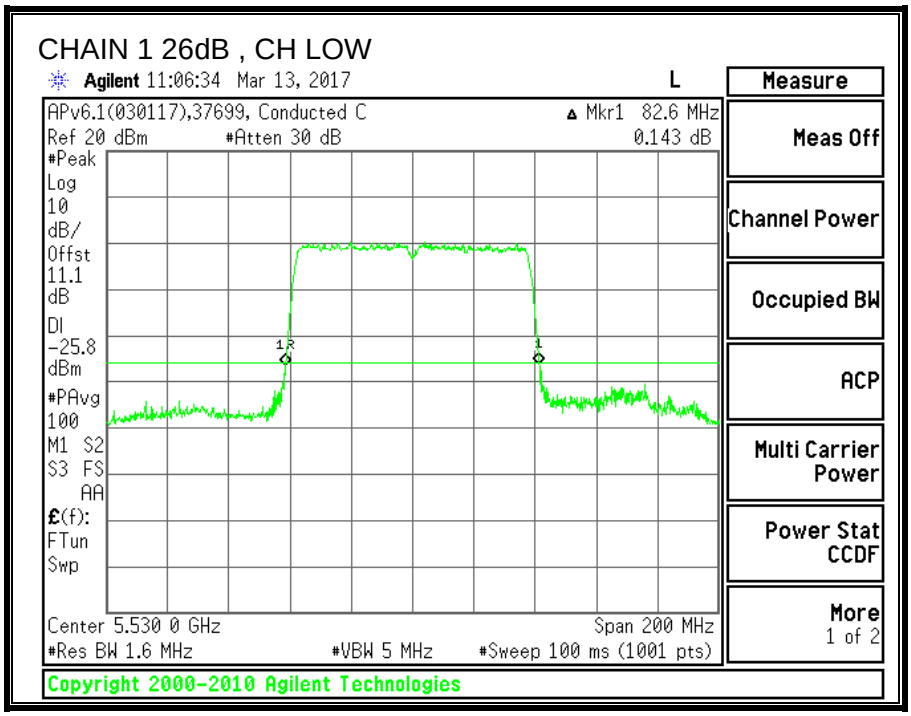
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5530	84.4	82.6
High	5610	85	82.4
138	5690	84	83.8

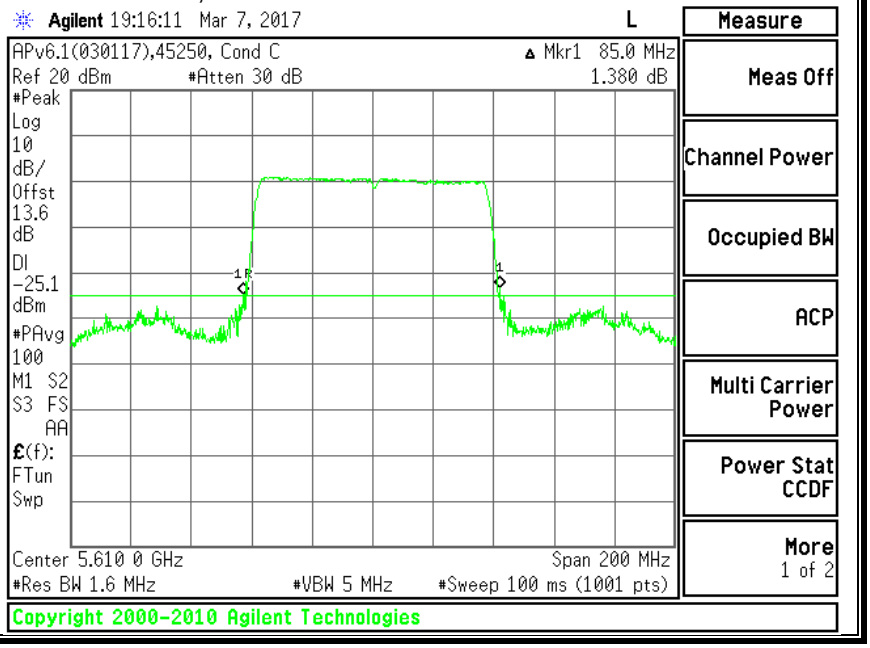
CHAIN 0 26dB , CH LOW



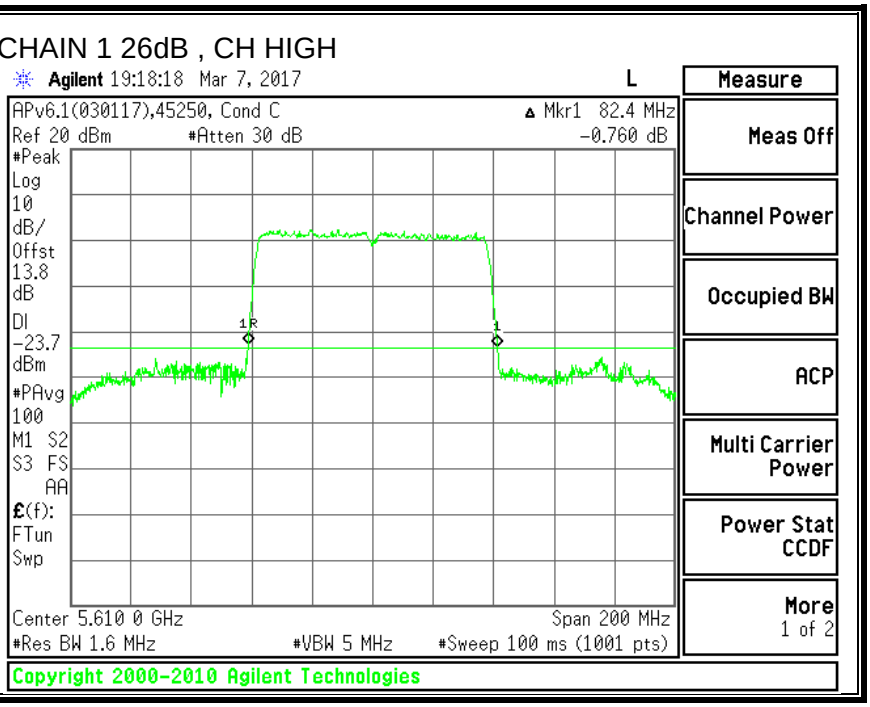
CHAIN 1 26dB , CH LOW



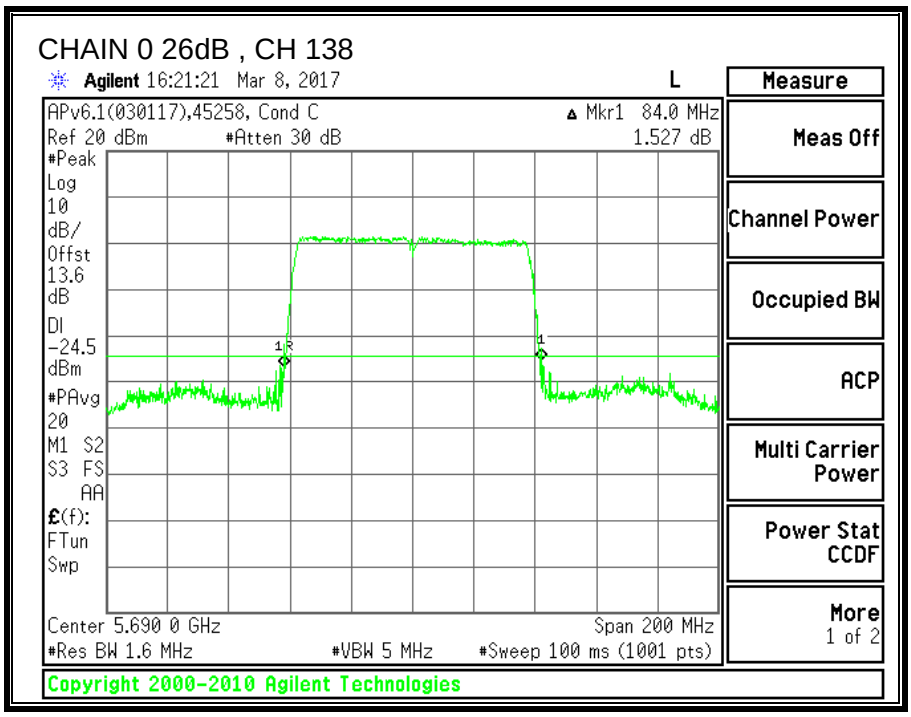
CHAIN 0 26dB , CH HIGH



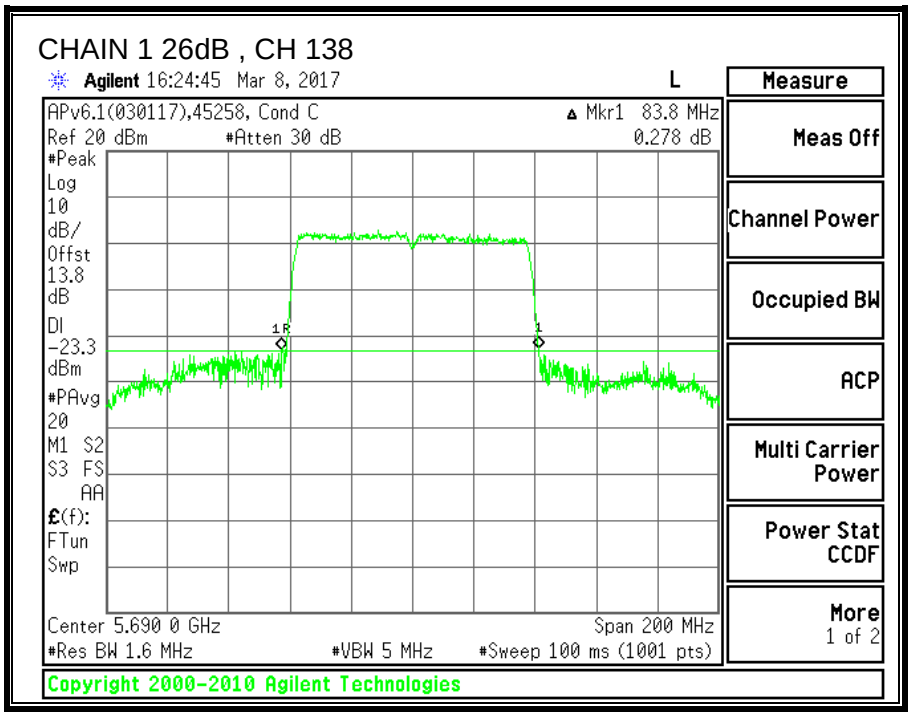
CHAIN 1 26dB , CH HIGH



CHAIN 0 26dB , CH 138



CHAIN 1 26dB , CH 138



9.12.2. 99% BANDWIDTH

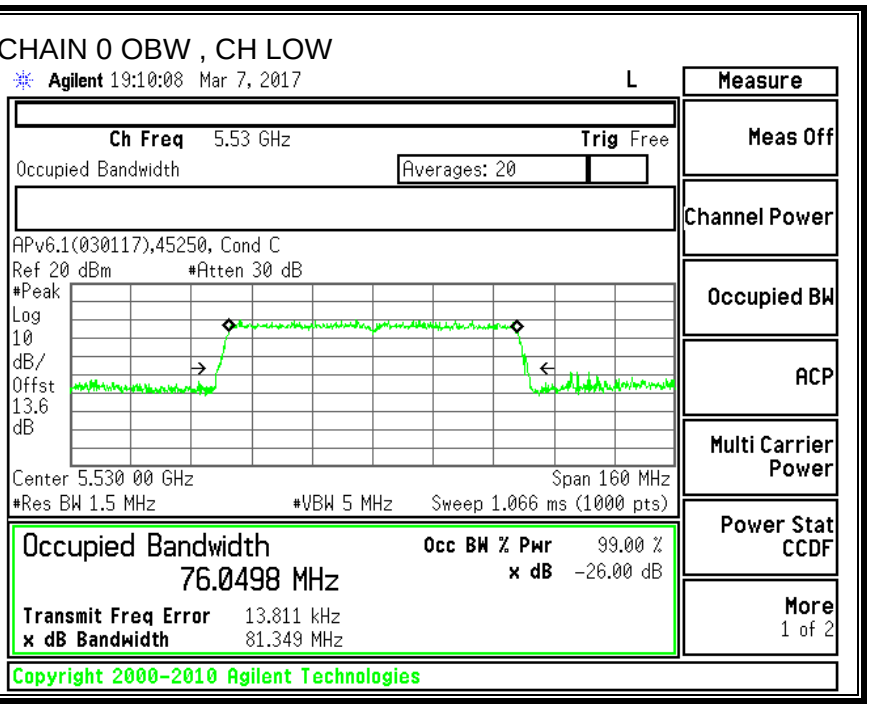
LIMITS

None; for reporting purposes only.

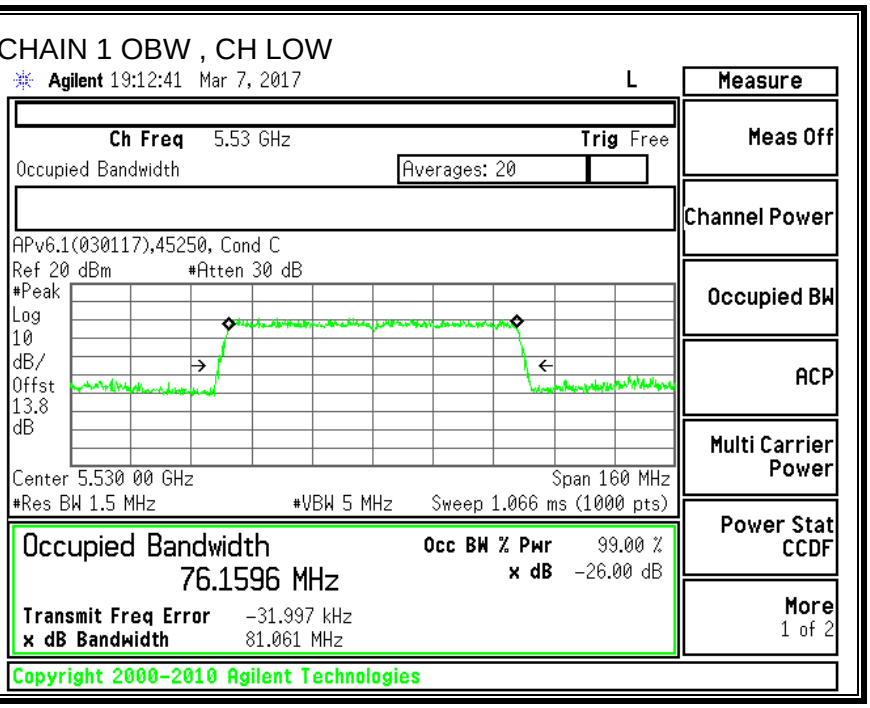
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5530	76.05	76.16
High	5610	76.033	75.912
138	5690	76.149	76.096

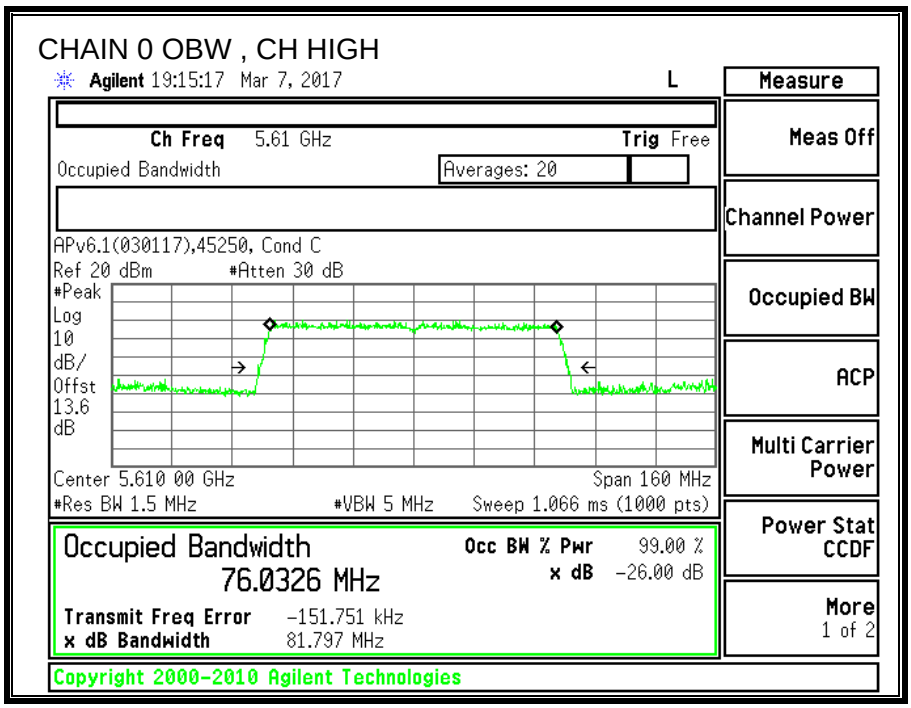
CHAIN 0 OBW , CH LOW



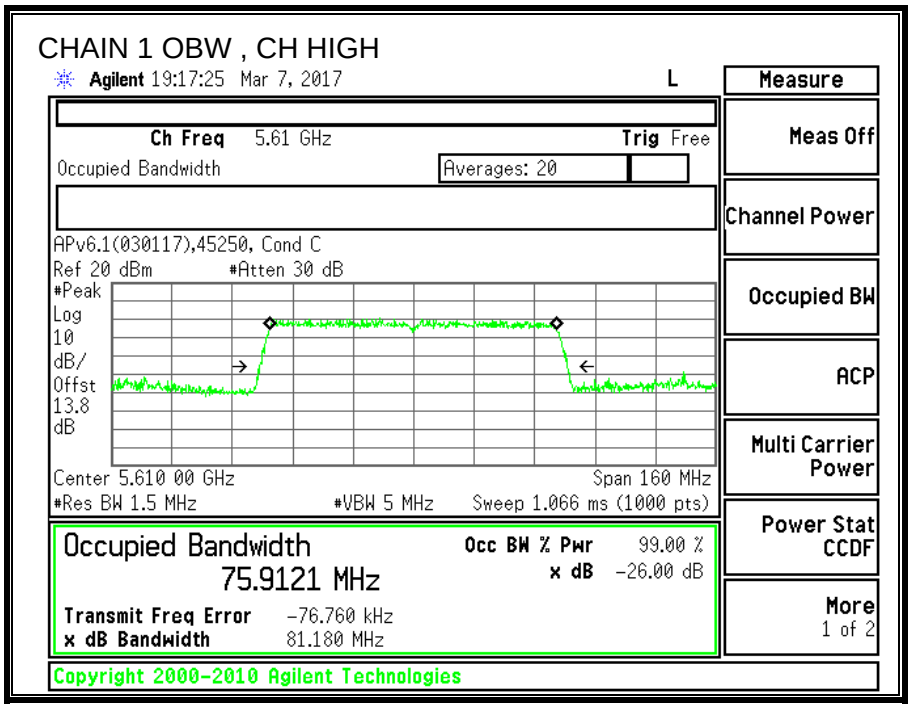
CHAIN 1 OBW , CH LOW

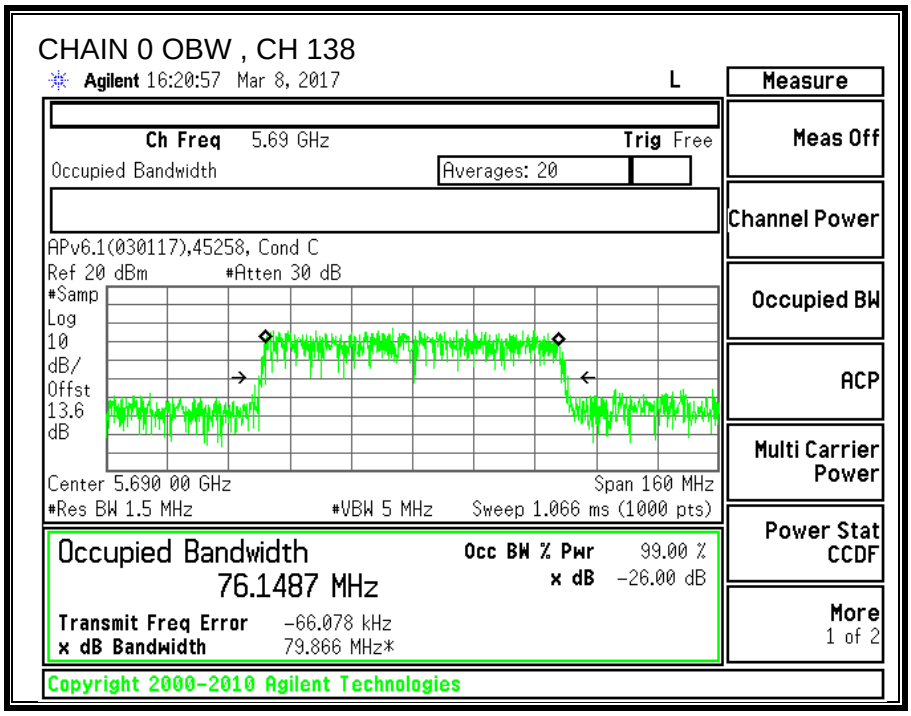


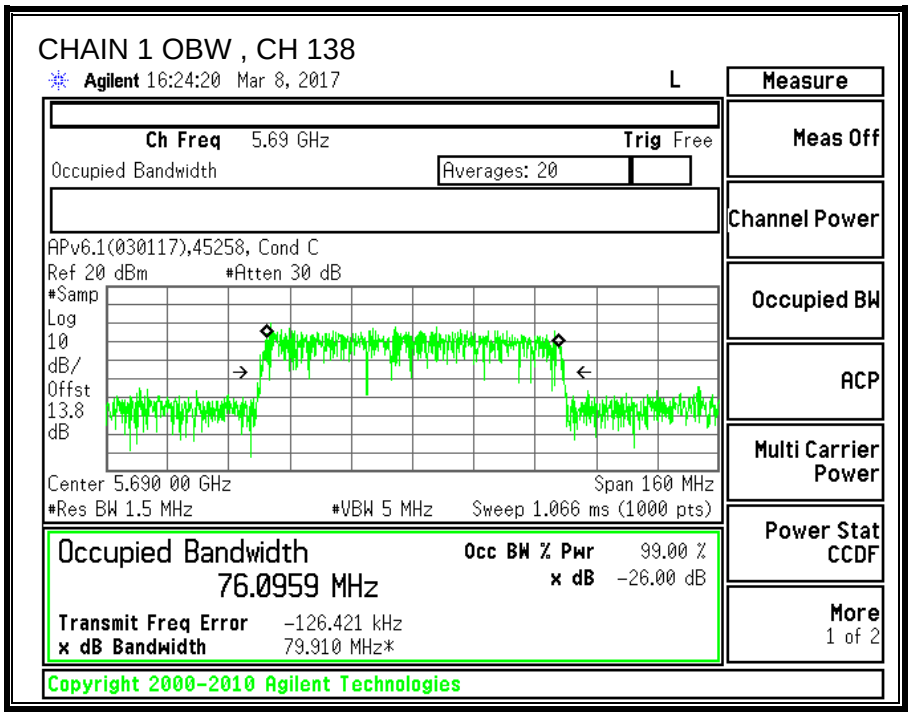
CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH







9.12.3. OUTPUT POWER AND PPSD

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.

IC RSS-247 (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. 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 PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.Straddle channel power is measured using PXA spectrum analyzer, duty cycle correction factor is required.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
0.90	3.60	2.46	5.36

RESULTS

ID:	45258 JL 37699 CS	Date:	3/3/17 5/2/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5530	82.60	76.05	2.46	5.36
High	5610	82.40	75.91	2.46	5.36
138	5690	83.80	76.10	2.46	5.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5530	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5610	24.00	24.00	30.00	24.00	11.00	11.00	11.00
138	5690	24.00	24.00	30.00	24.00	11.00	11.00	11.00

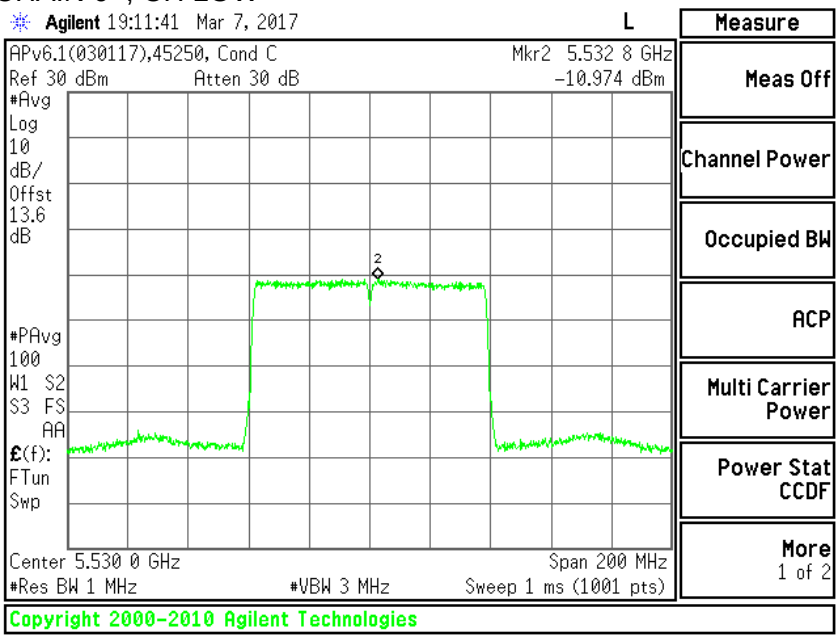
Output Power Results

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	6.22	6.89	9.58	24.00	-14.42
High	5610	9.88	10.16	13.03	24.00	-10.97
138	5690	7.39	7.70	10.56	24.00	-13.44

PPSD Results

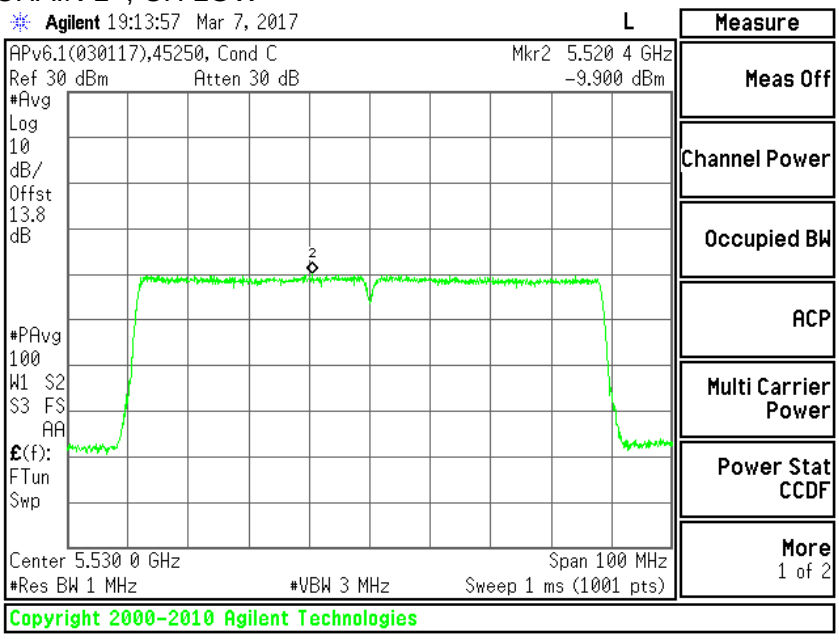
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5530	-10.47	-9.40	-6.89	11.00	-17.89
High	5610	-6.71	-6.81	-3.75	11.00	-14.75
138	5690	-9.52	-9.11	-6.30	11.00	-17.30

CHAIN 0 , CH LOW



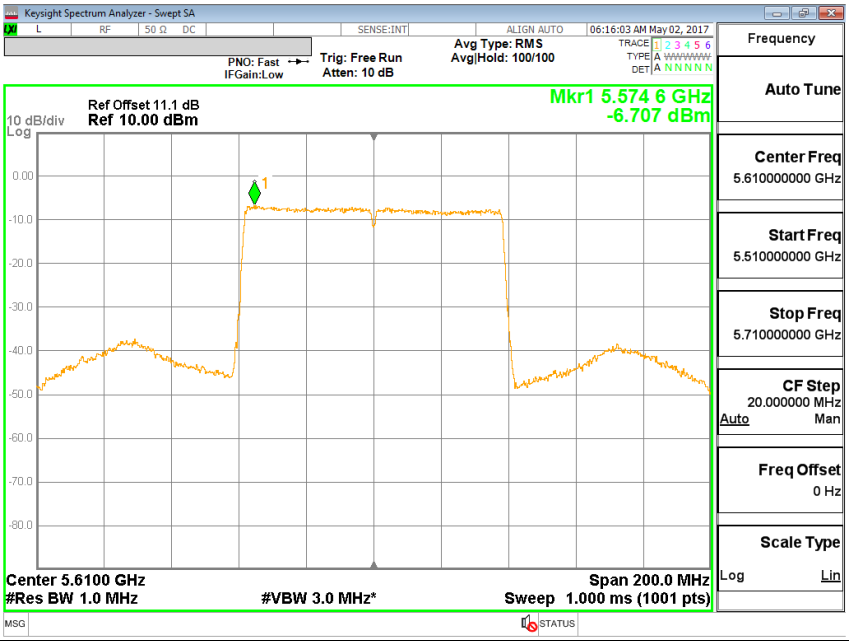
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -10.474dBm

CHAIN 1 , CH LOW

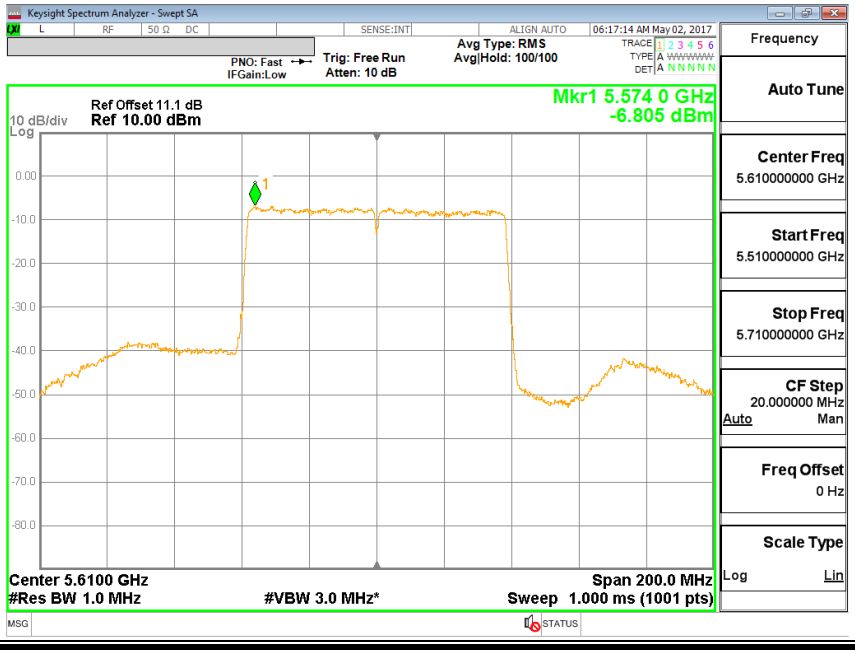


*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.4dBm

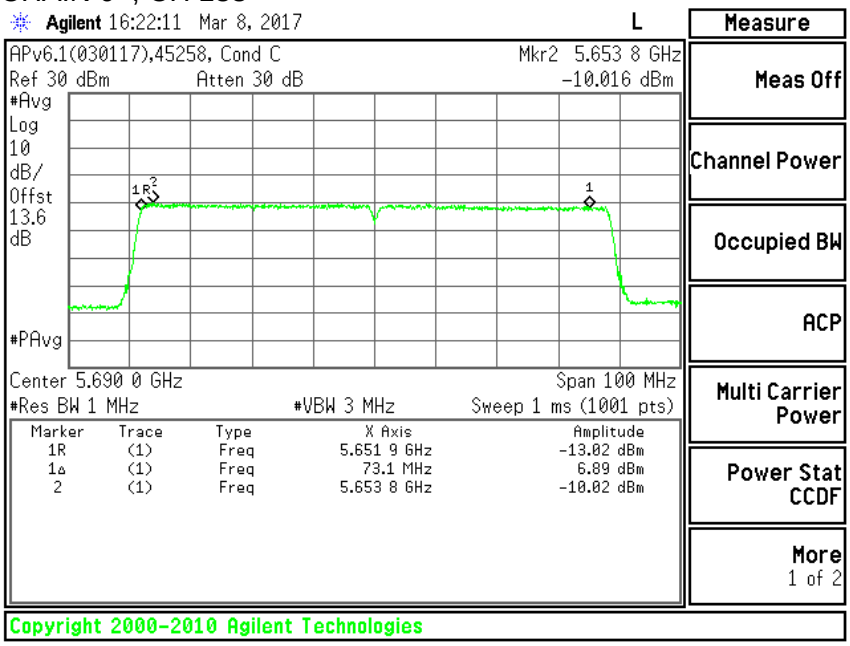
CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH

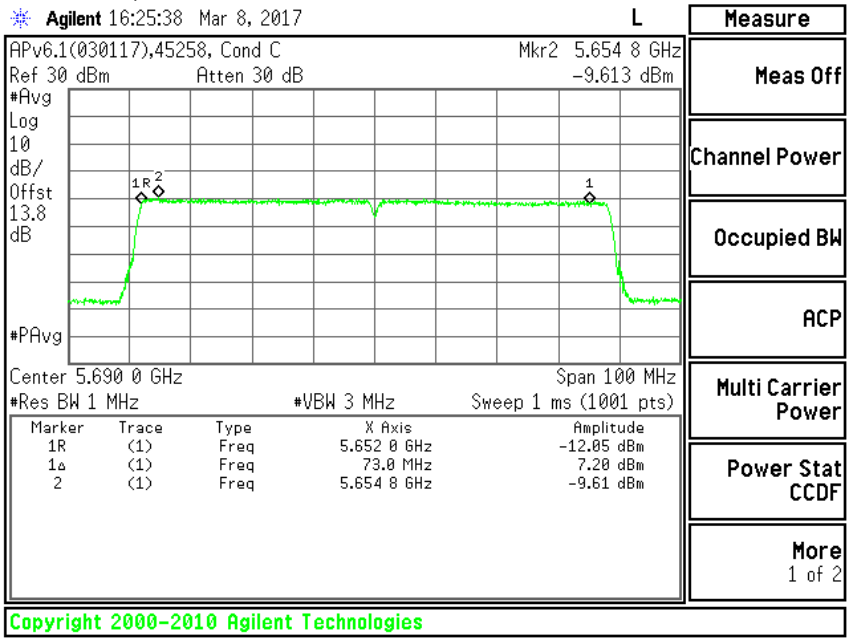


CHAIN 0 , CH 138



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.516dBm

CHAIN 1 , CH 138



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -9.113dBm

9.13. 11a 2TX MODE IN THE 5.8GHz BAND

9.13.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

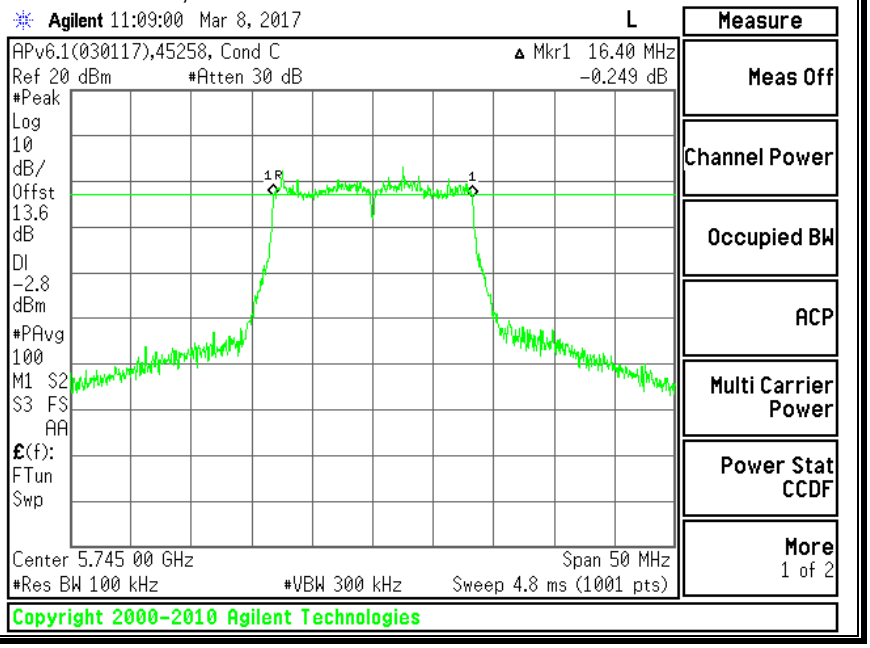
IC RSS-247 (6.2.4) (1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

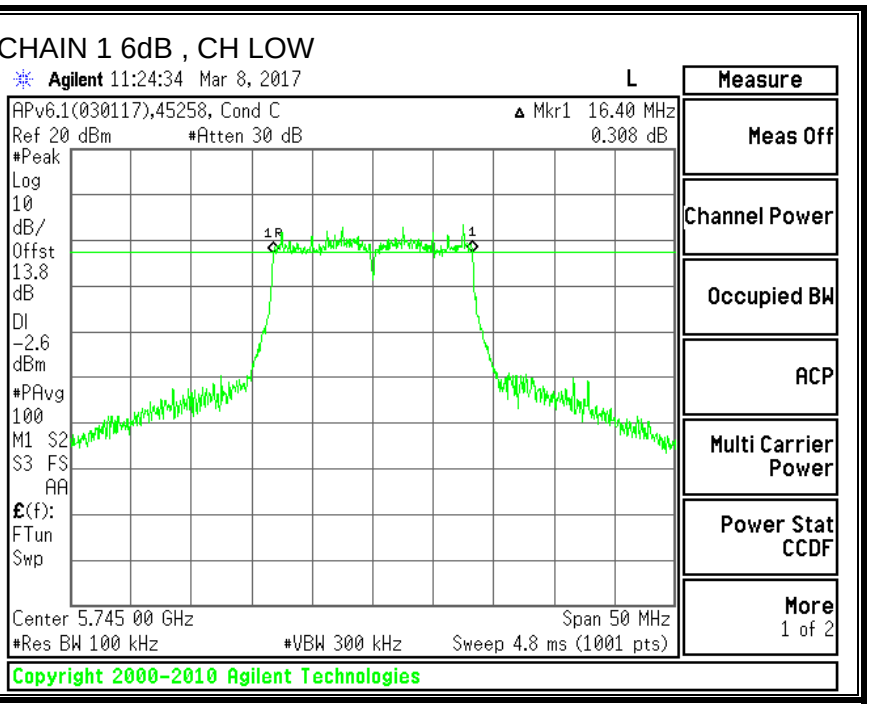
RESULTS

Channel	Frequency	6 dB BW CHAIN 0 (MHz)	6 dB BW CHAIN 1 (MHz)	Minimum Limit (MHz)
Low	5745	16.40	16.40	0.5
Mid	5785	16.40	16.40	0.5
High	5825	16.40	16.40	0.5
144	5720	3.3	3.3	0.5

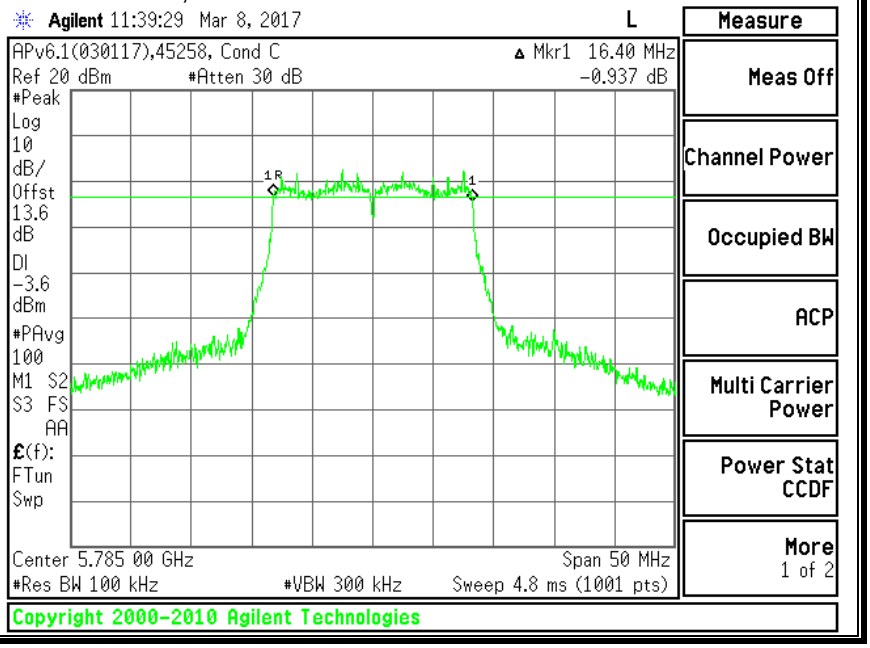
CHAIN 0 6dB , CH LOW



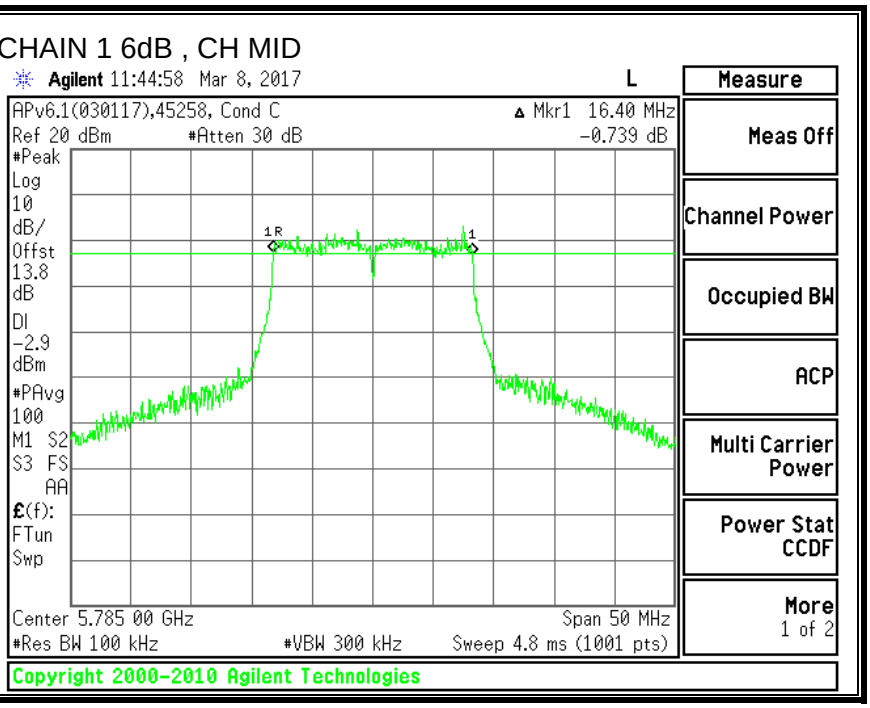
CHAIN 1 6dB , CH LOW



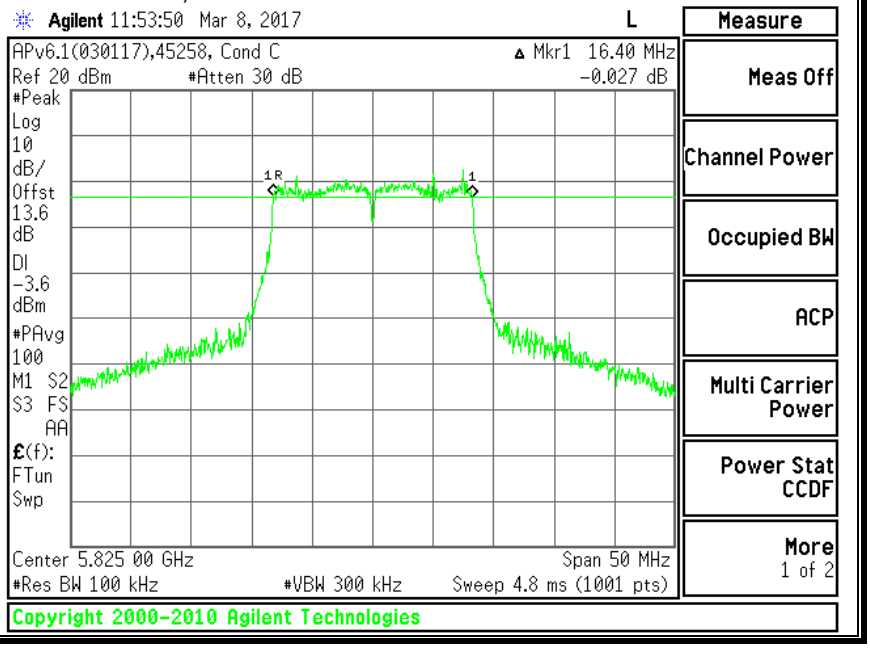
CHAIN 0 6dB , CH MID



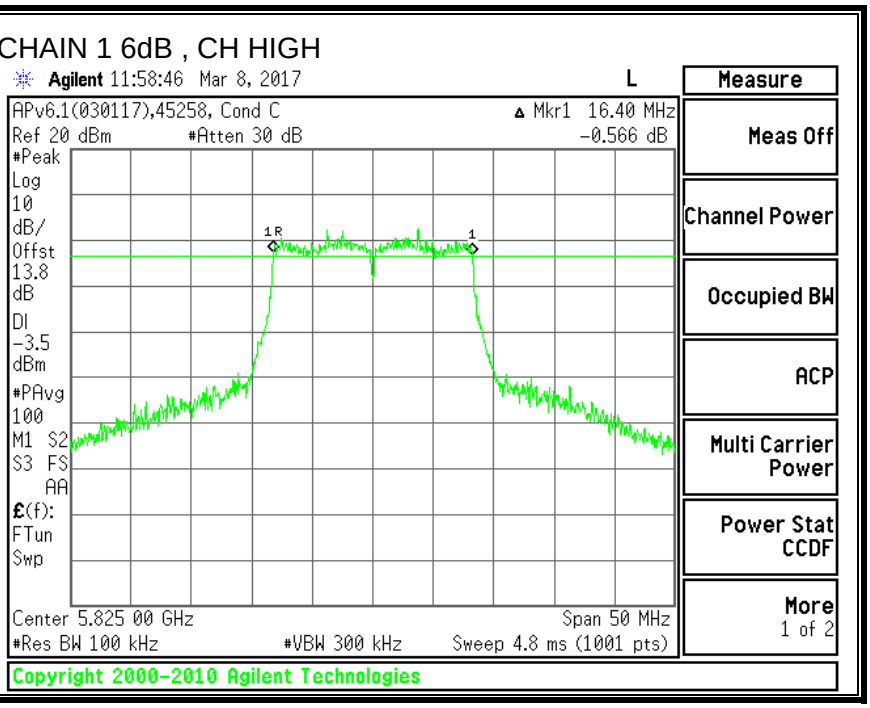
CHAIN 1 6dB , CH MID



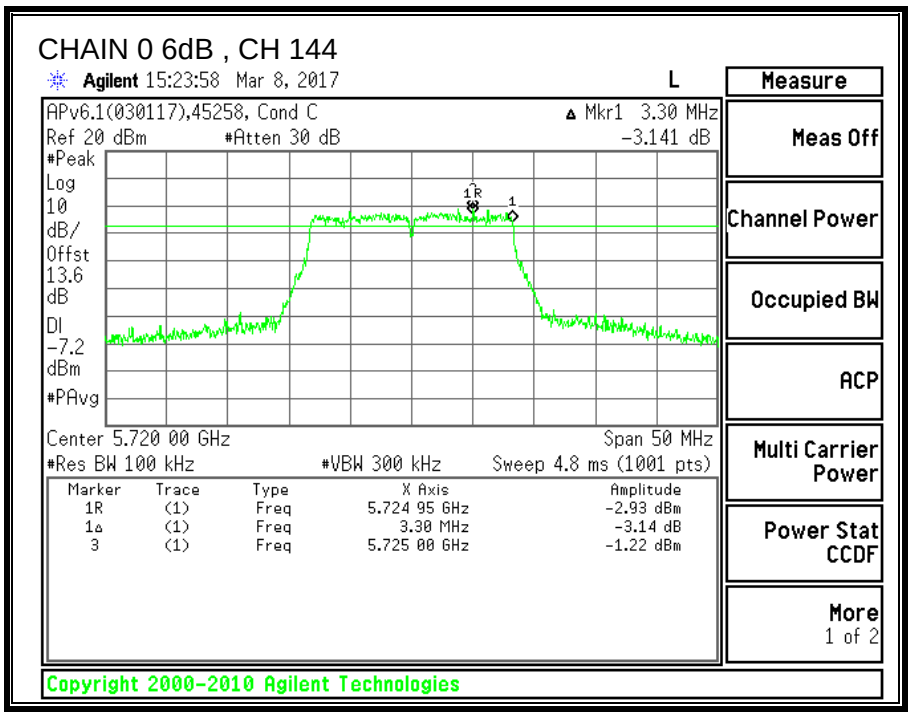
CHAIN 0 6dB , CH HIGH



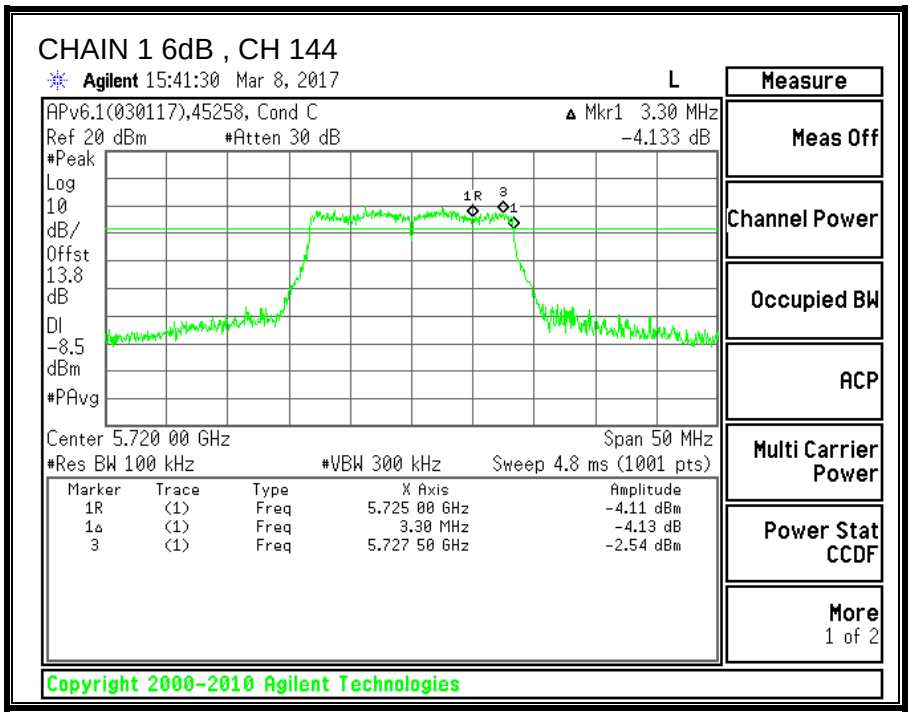
CHAIN 1 6dB , CH HIGH



CHAIN 0 6dB , CH 144



CHAIN 1 6dB , CH 144



9.13.2. 26 dB BANDWIDTH

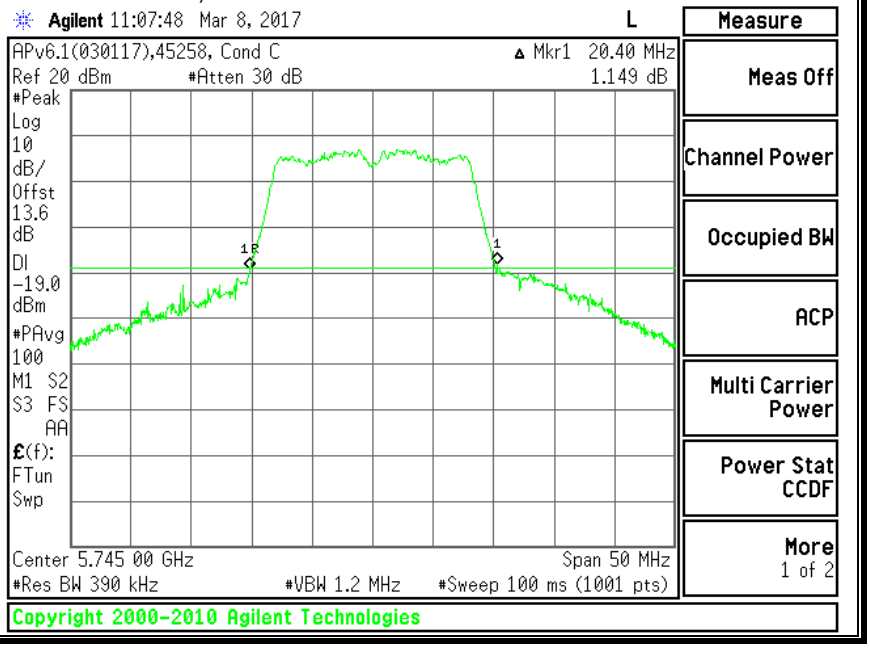
LIMITS

None; for reporting purposes only.

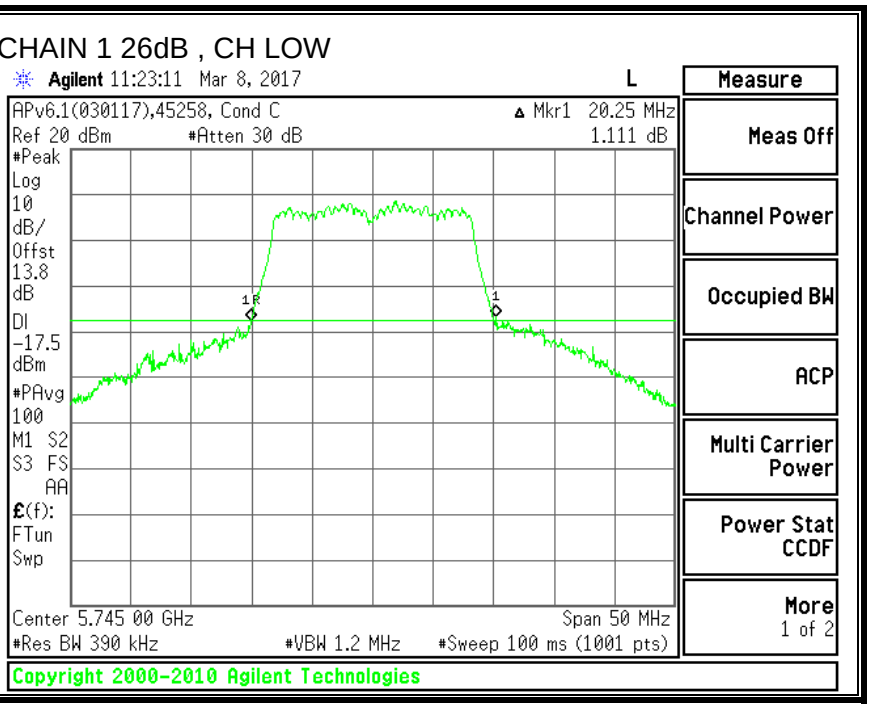
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5745	20.40	20.25
Mid	5785	20.65	21.35
High	5825	21.45	20.15

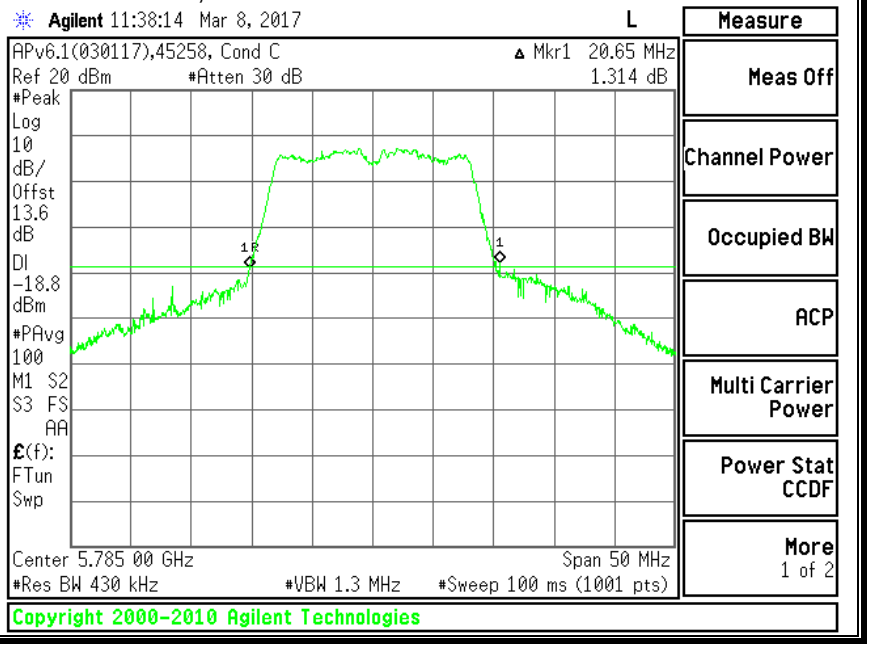
CHAIN 0 26dB , CH LOW



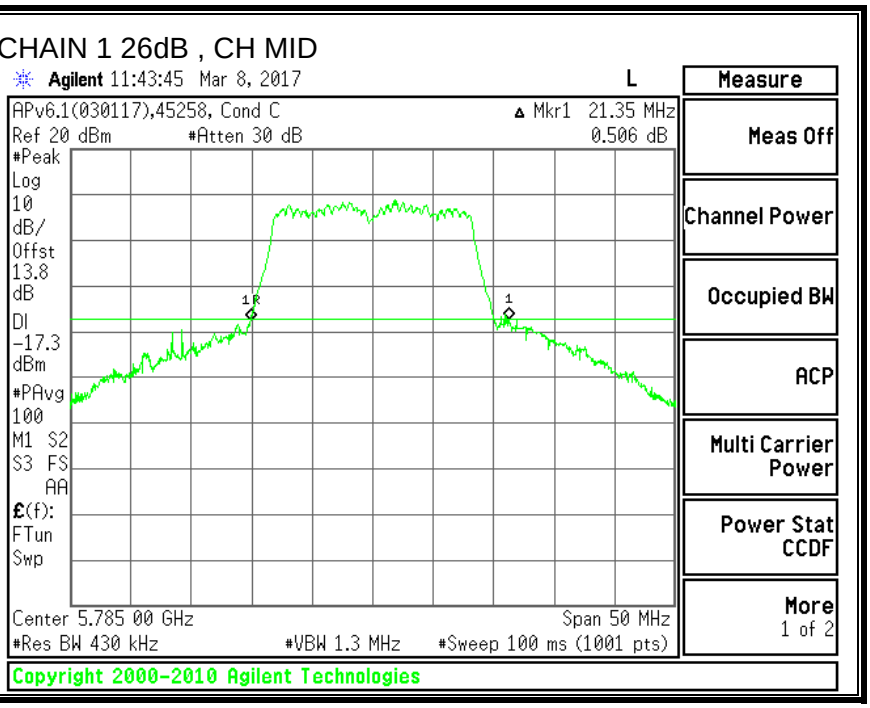
CHAIN 1 26dB , CH LOW



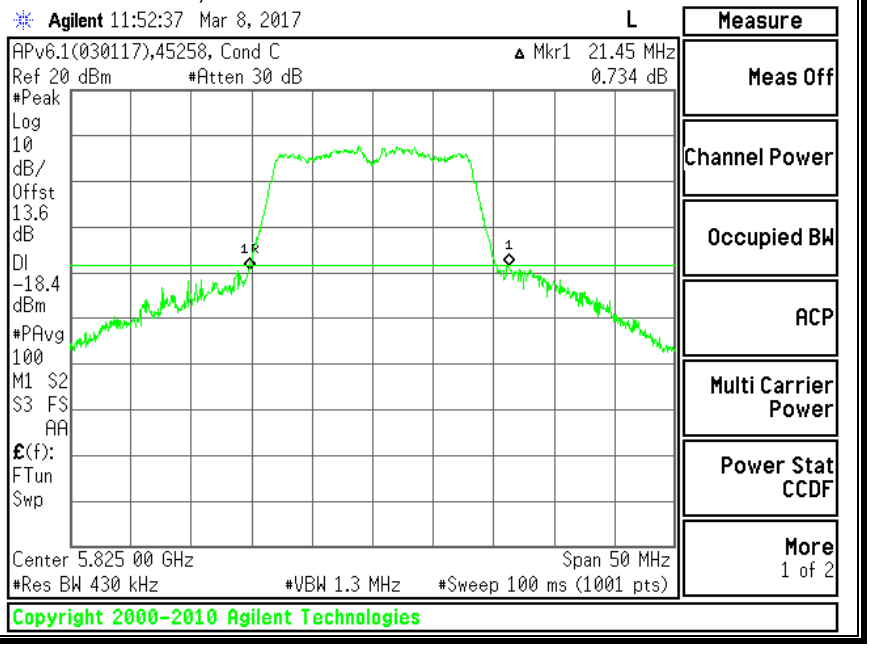
CHAIN 0 26dB , CH MID



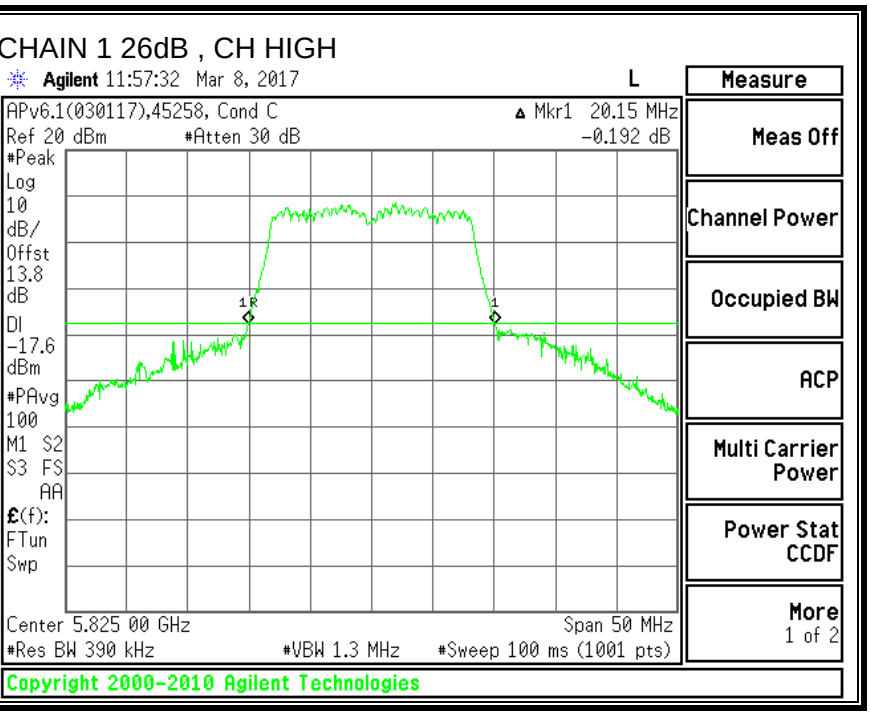
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.13.3. 99% BANDWIDTH

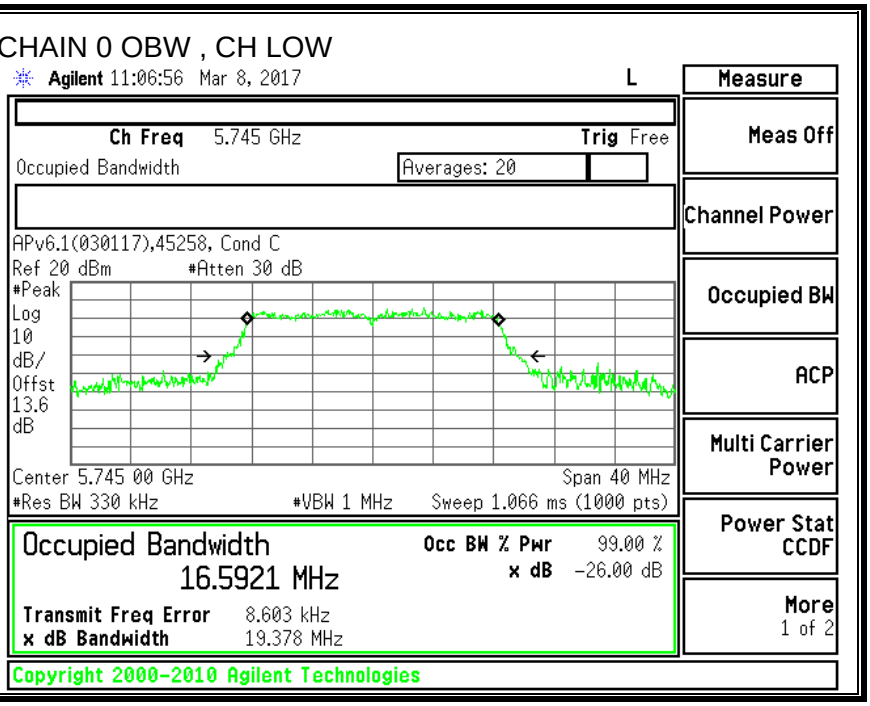
LIMITS

None; for reporting purposes only.

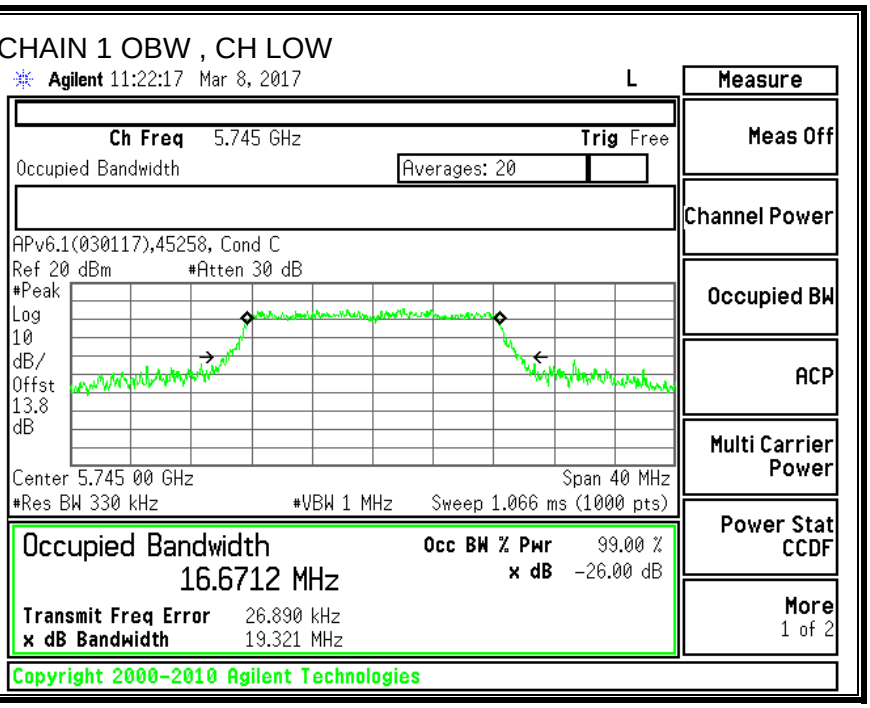
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5745	16.592	16.671
Mid	5785	16.638	16.631
High	5825	16.622	16.552

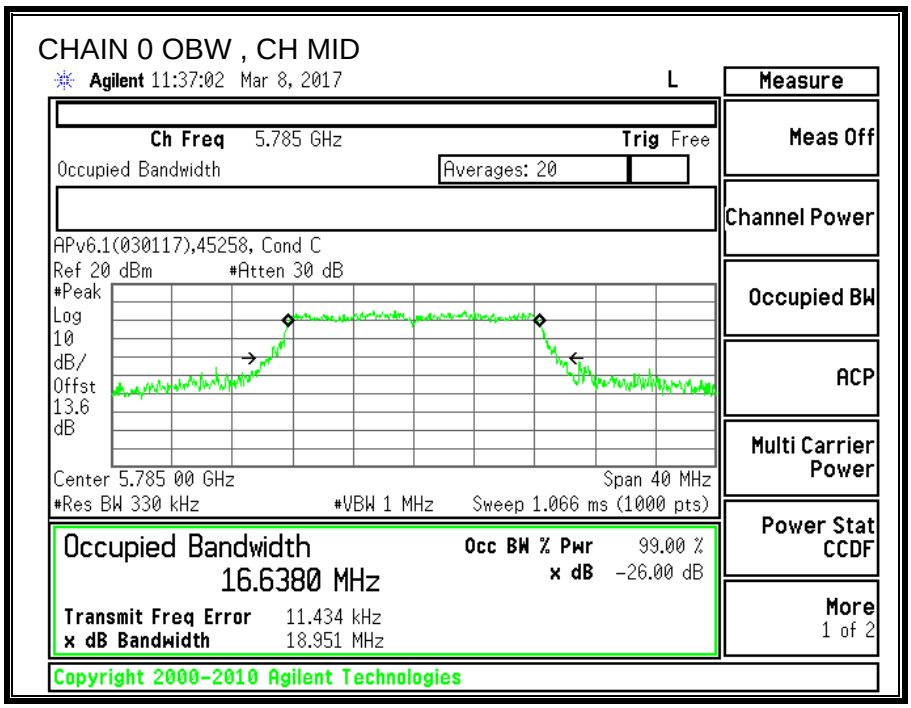
CHAIN 0 OBW , CH LOW



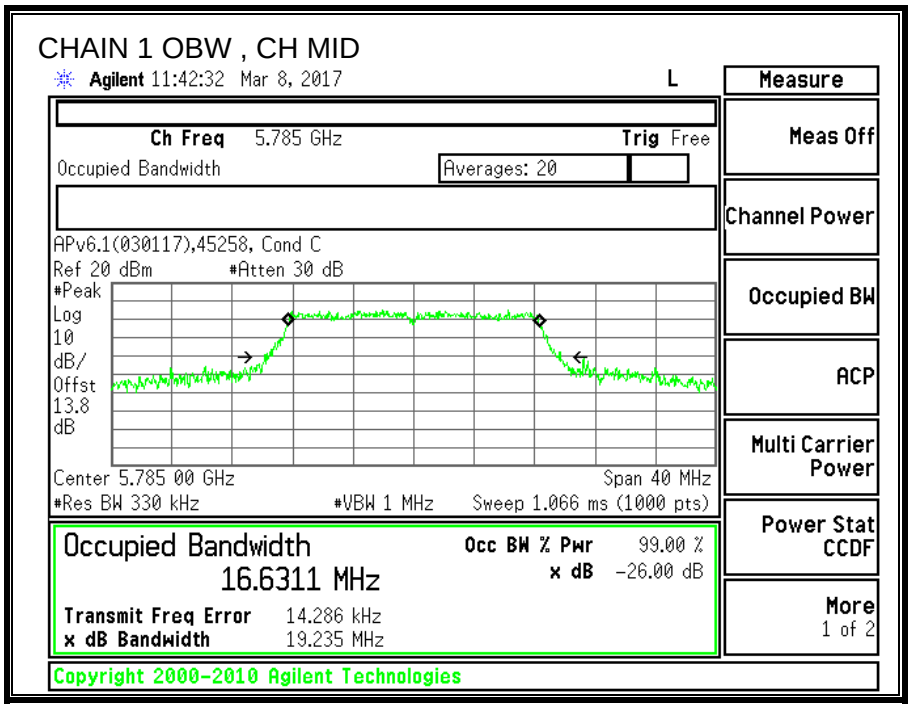
CHAIN 1 OBW , CH LOW



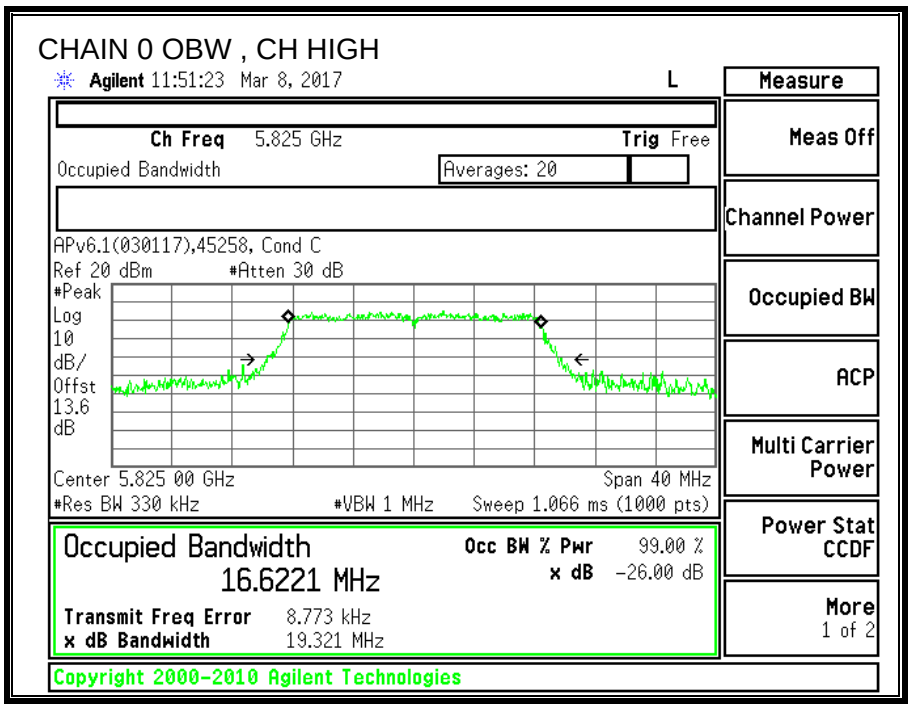
CHAIN 0 OBW , CH MID



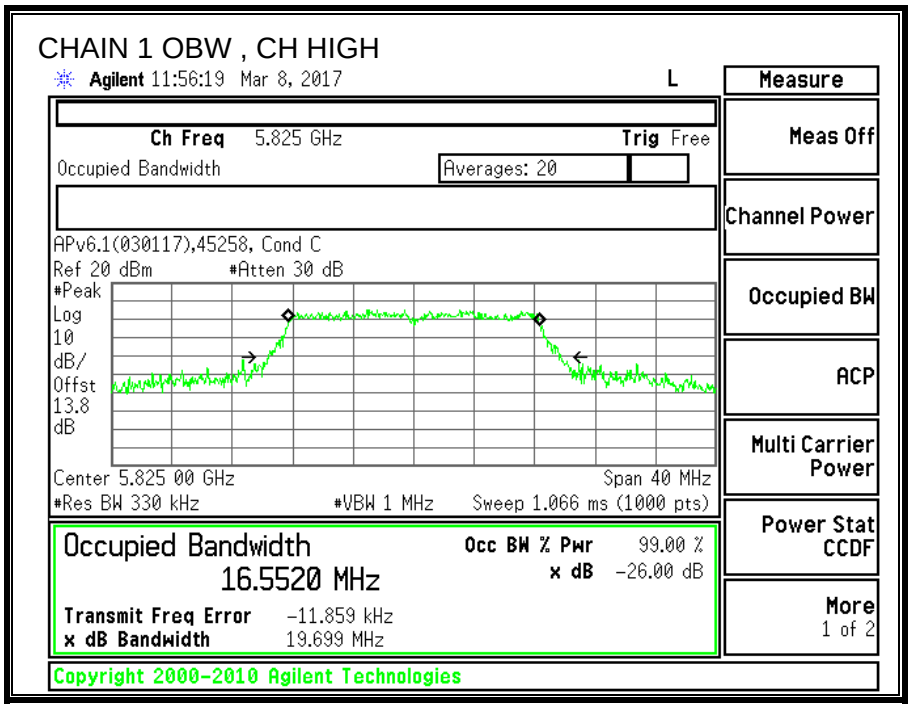
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.13.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3)

IC RSS-247 (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.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.30	3.60	2.60	5.54

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5745	20.25	16.59	2.60	5.54
Mid	5785	20.65	16.63	2.60	5.54
High	5805	20.15	16.55	2.60	5.54
144	5720	19.95	16.51	2.60	5.54

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	30.00	29.20	35.20	29.20	30.00	30.00	30.00
Mid	5785	30.00	29.21	35.21	29.21	30.00	30.00	30.00
High	5805	30.00	29.19	35.19	29.19	30.00	30.00	30.00
144	5720	30.00	29.18	35.18	29.18	30.00	30.00	30.00

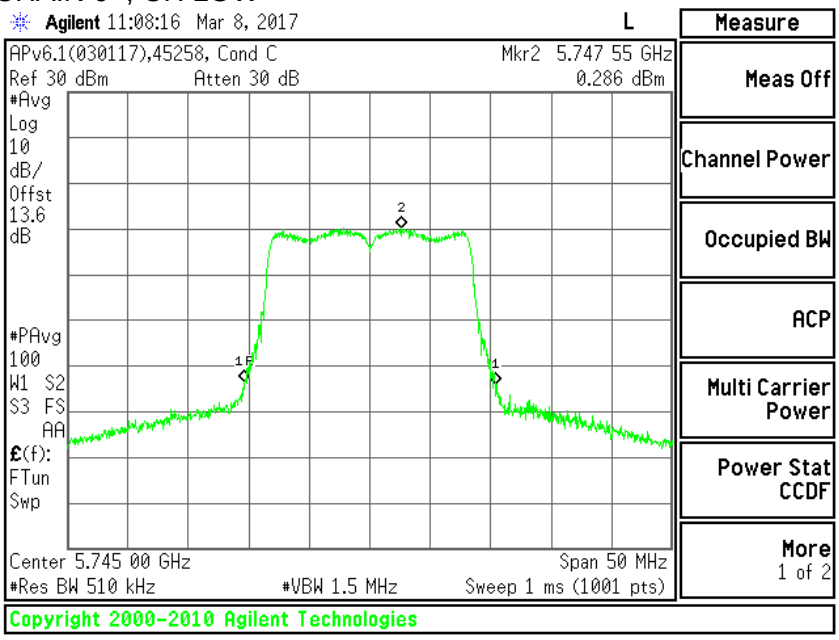
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.08	13.71	16.91	29.20	-12.29
Mid	5785	13.80	13.52	16.67	29.21	-12.54
High	5805	13.62	13.19	16.42	29.19	-12.77
144	5720	4.80	5.27	8.05	29.18	-21.13

PPSD Results

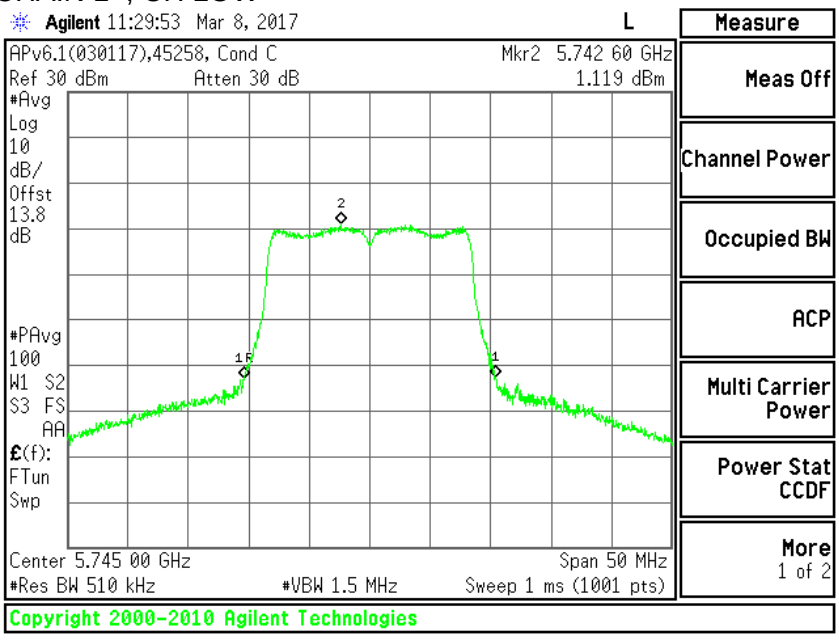
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	0.79	1.62	4.23	30.00	-25.77
Mid	5785	0.84	1.26	4.06	30.00	-25.94
High	5805	0.73	0.92	3.84	30.00	-26.16
144	5720	-1.91	-1.12	1.51	30.00	-28.49

CHAIN 0 , CH LOW



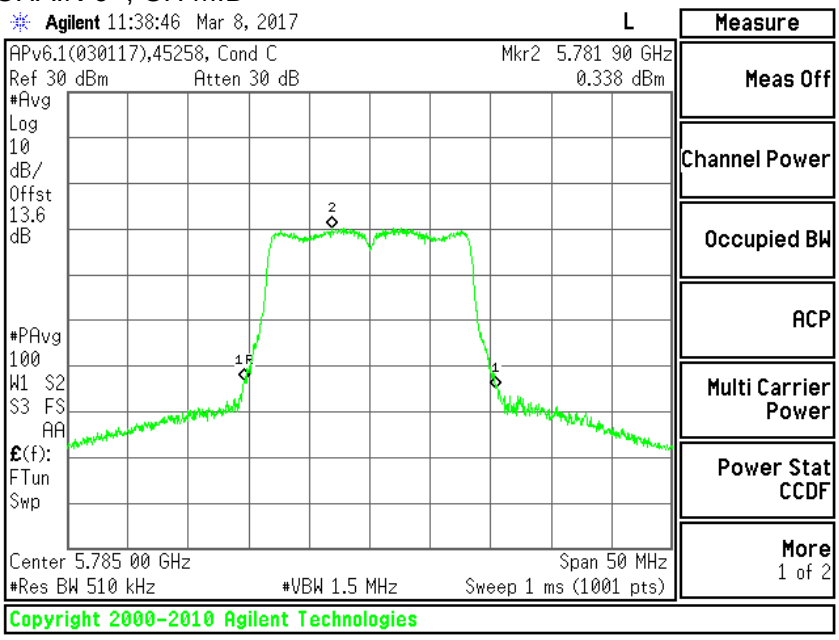
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.786dBm

CHAIN 1 , CH LOW



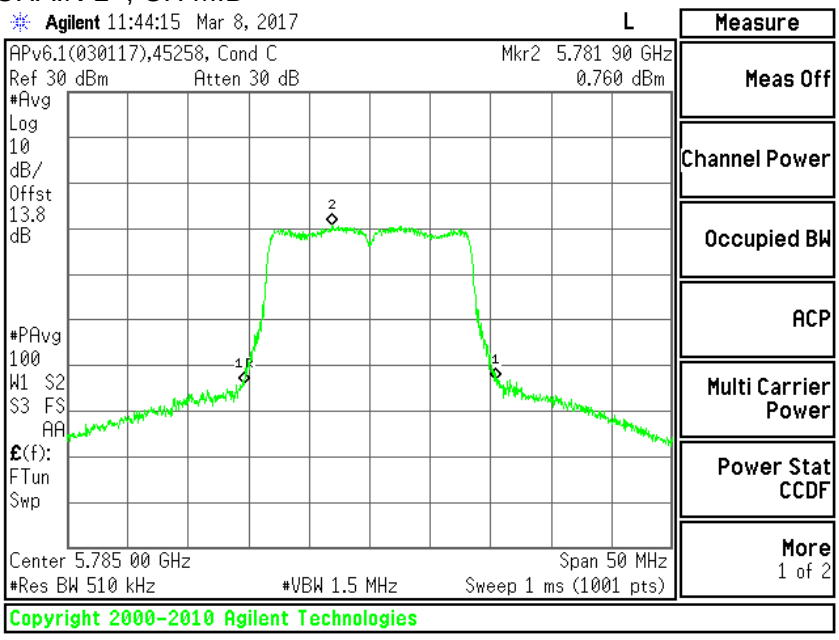
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.619dBm

CHAIN 0 , CH MID



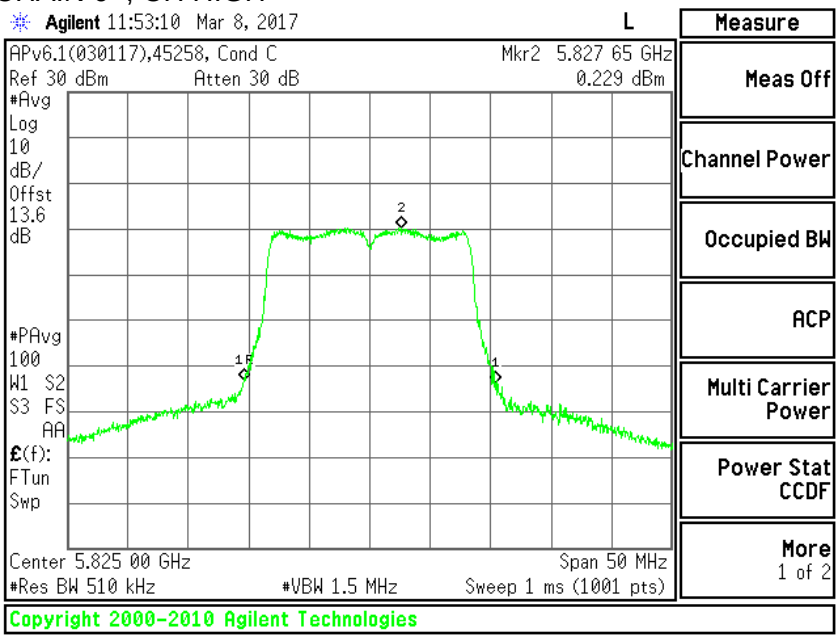
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.838dBm

CHAIN 1 , CH MID



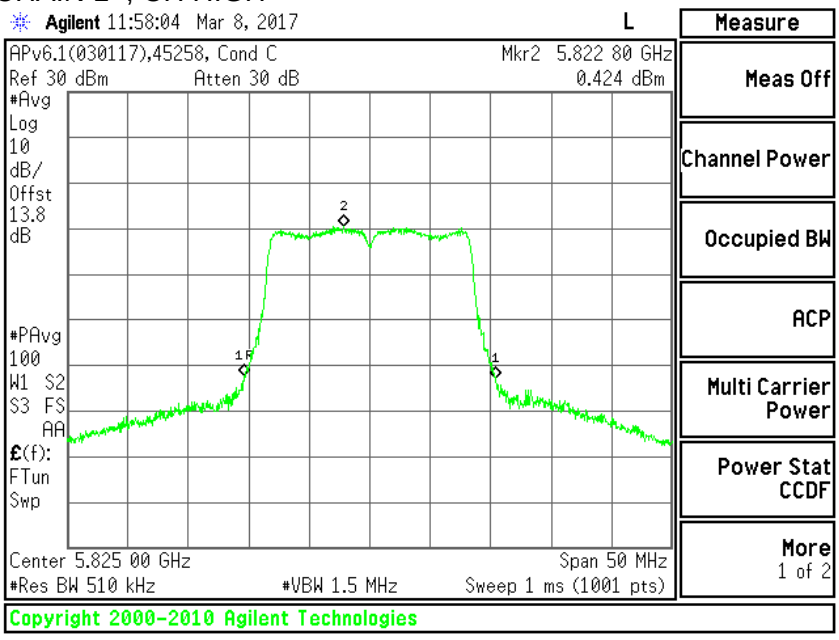
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.26dBm

CHAIN 0 , CH HIGH



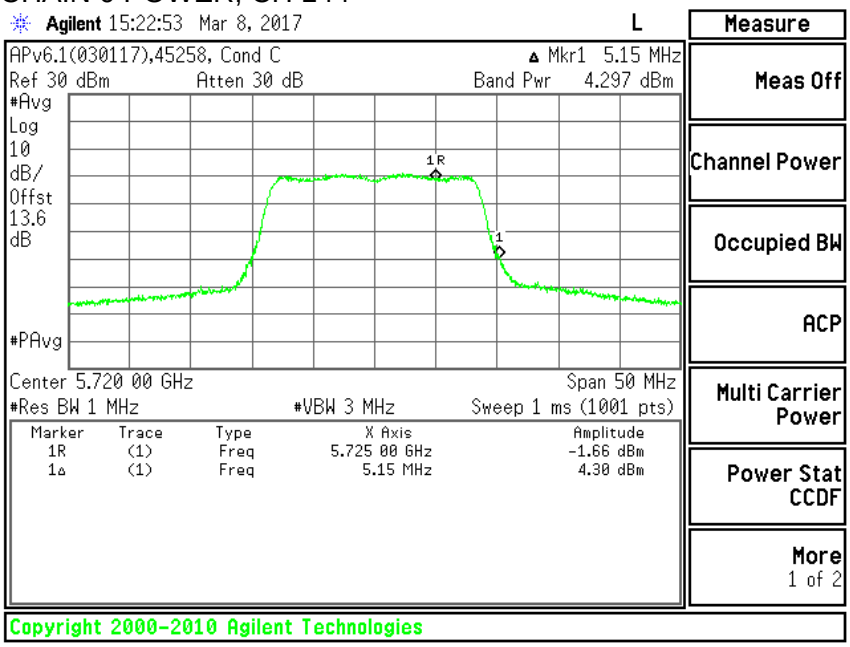
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.729dBm

CHAIN 1 , CH HIGH



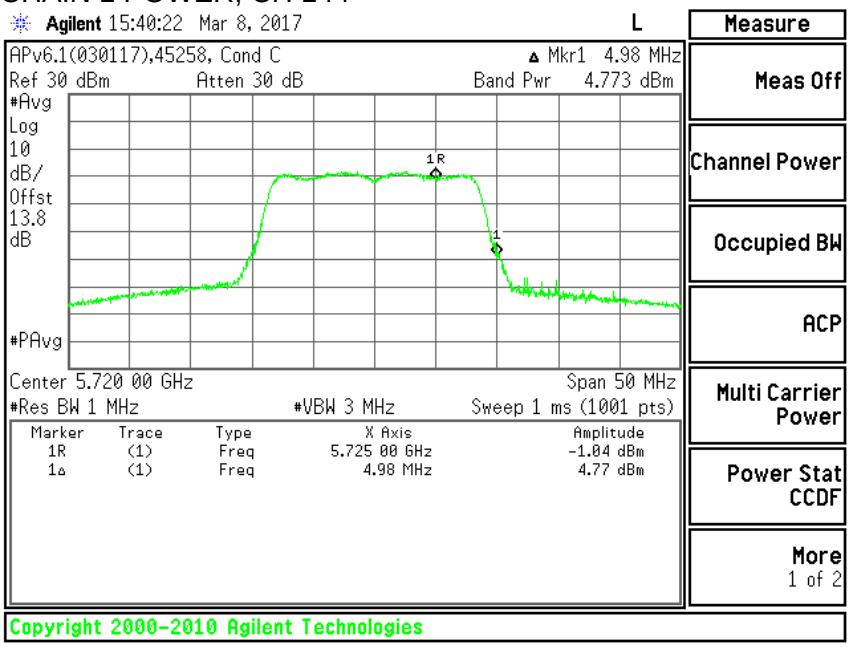
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.924dBm

CHAIN 0 POWER, CH 144



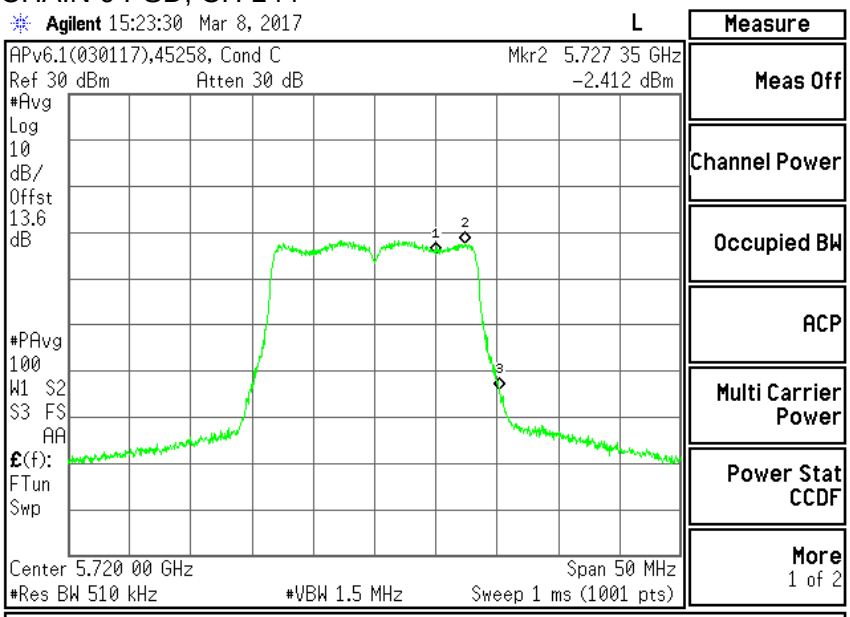
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 4.797dBm

CHAIN 1 POWER, CH 144



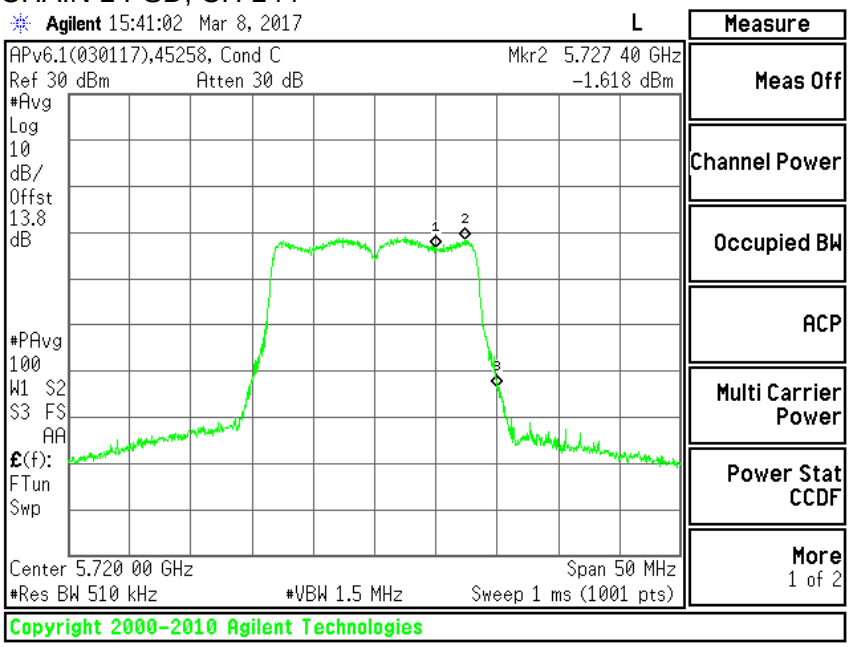
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 5.273dBm

CHAIN 0 PSD, CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.912dBm

CHAIN 1 PSD, CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.118dBm

9.14. 11n HT20 2TX MODE IN THE 5.8GHz BAND

9.14.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

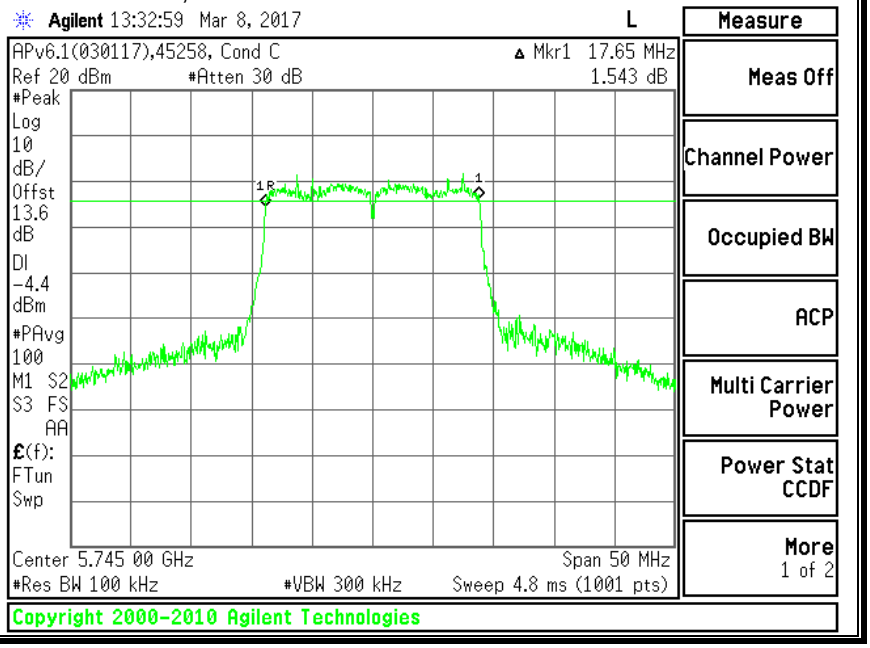
IC RSS-247 (6.2.4) (1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

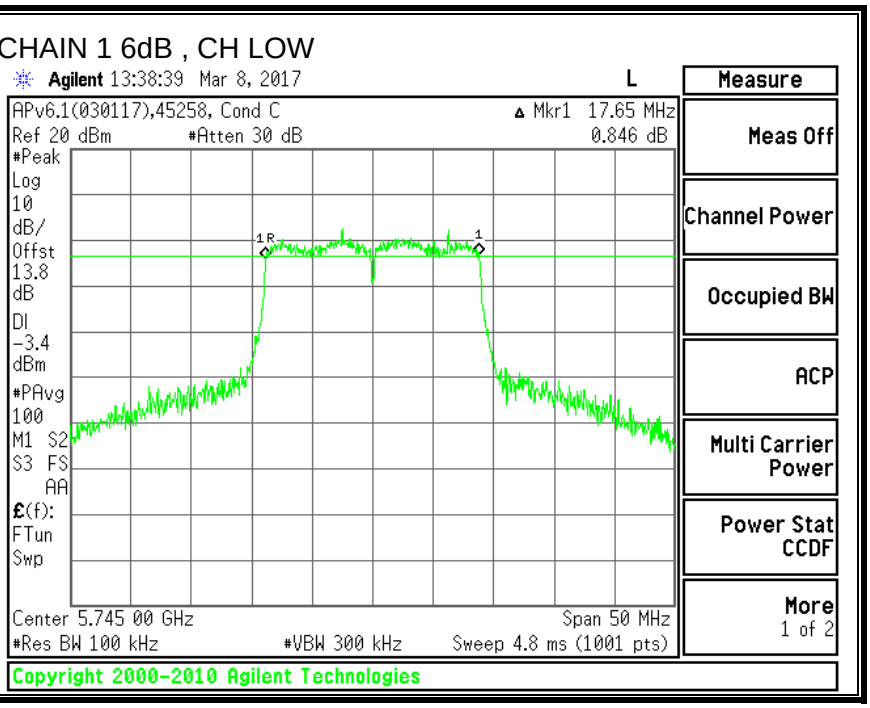
RESULTS

Channel	Frequency	6 dB BW CHAIN 0 (MHz)	6 dB BW CHAIN 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.65	17.65	0.5
Mid	5785	17.70	17.60	0.5
High	5825	17.60	17.60	0.5
144	5720	3.9	3.9	0.5

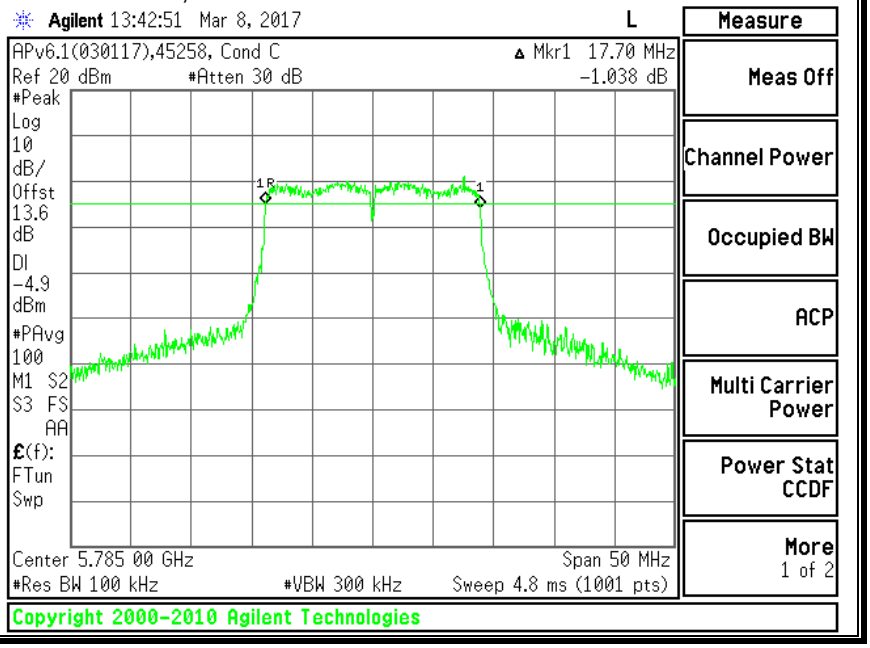
CHAIN 0 6dB , CH LOW



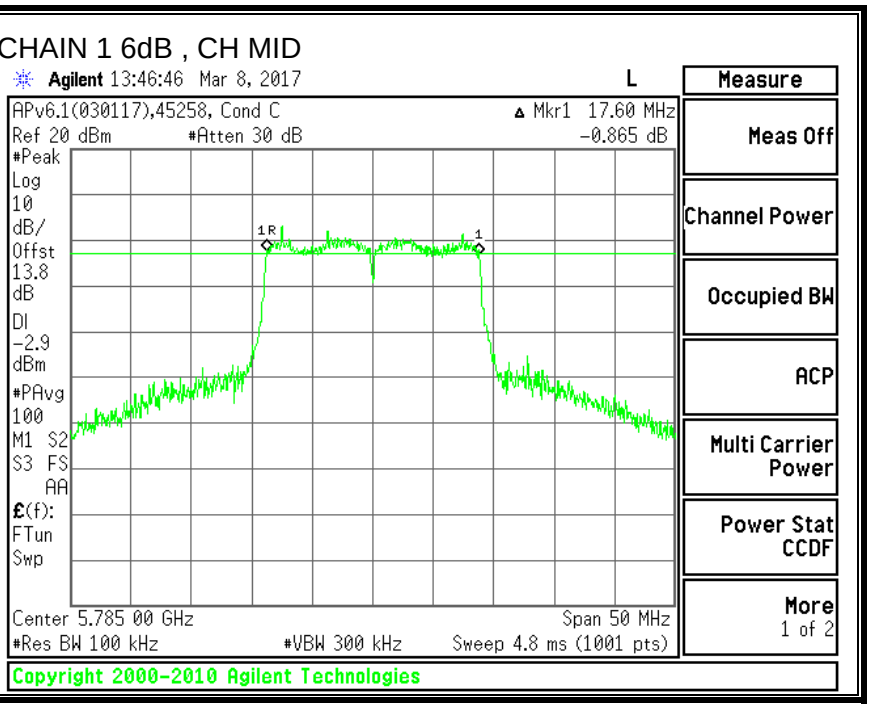
CHAIN 1 6dB , CH LOW



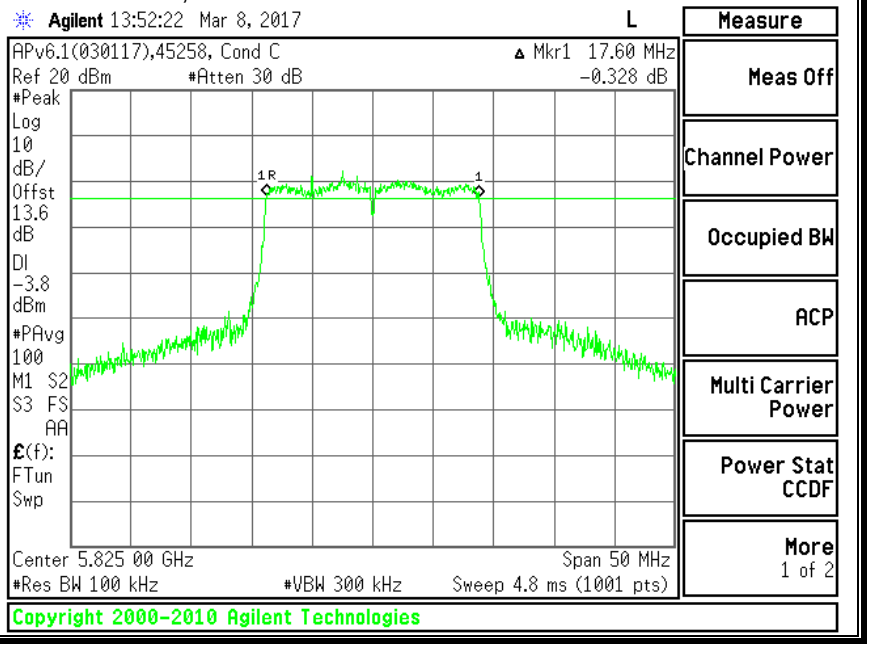
CHAIN 0 6dB , CH MID



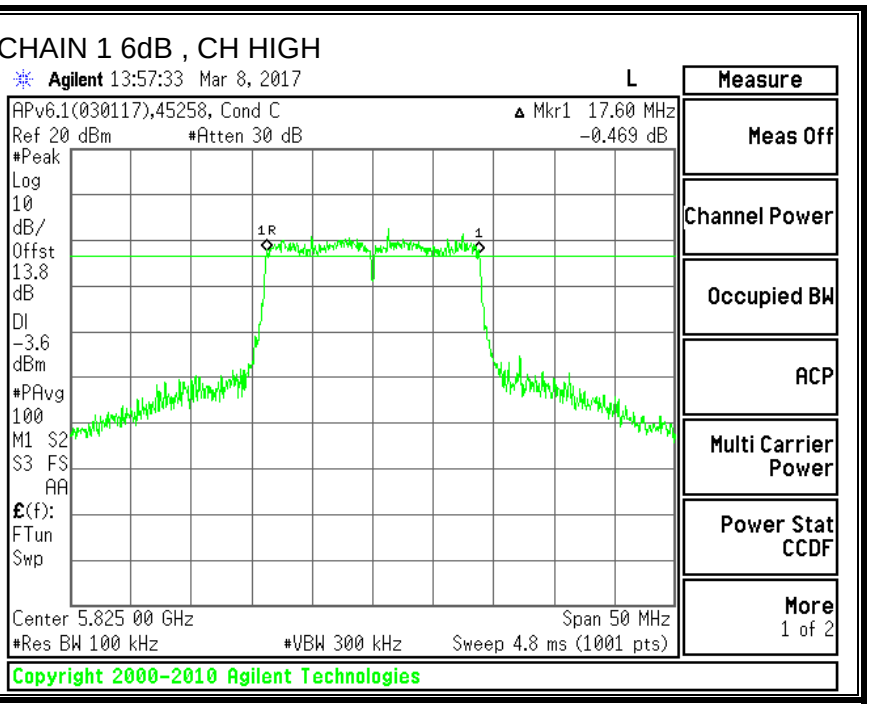
CHAIN 1 6dB , CH MID



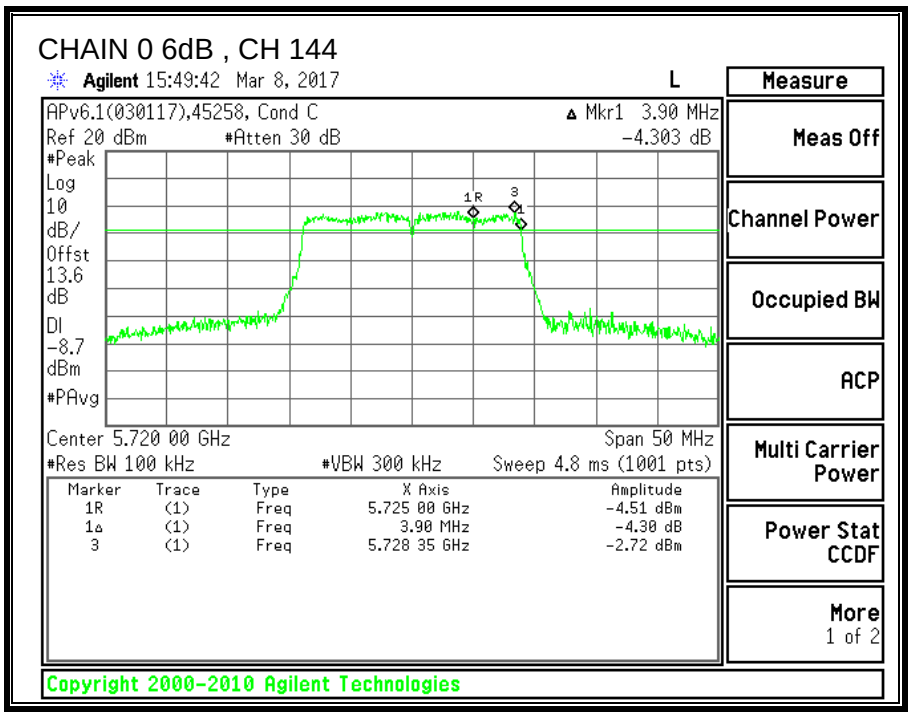
CHAIN 0 6dB , CH HIGH



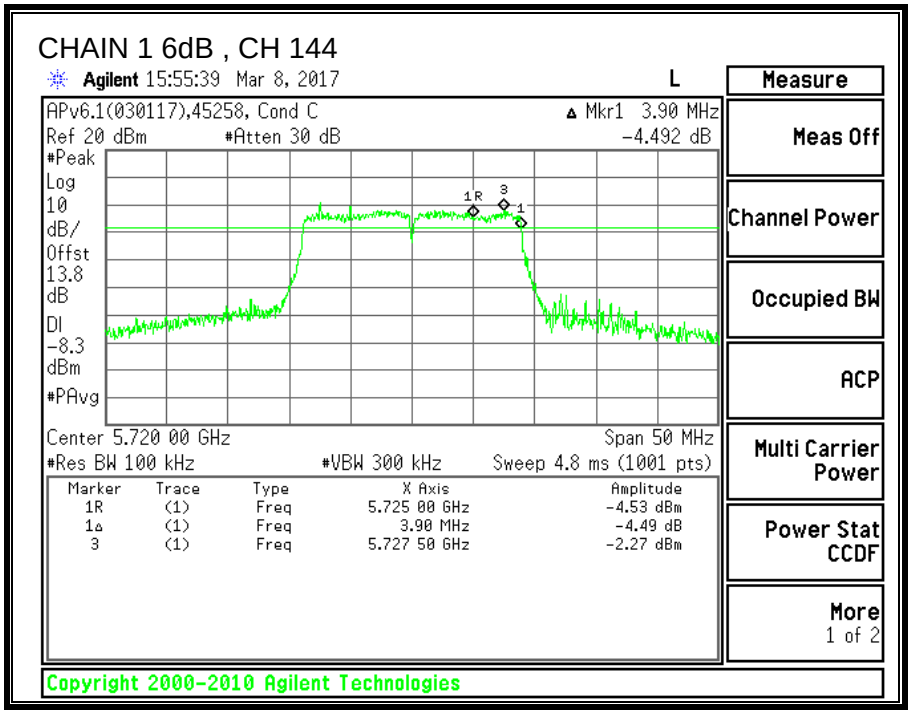
CHAIN 1 6dB , CH HIGH



CHAIN 0 6dB , CH 144



CHAIN 1 6dB , CH 144



9.14.2. 26 dB BANDWIDTH

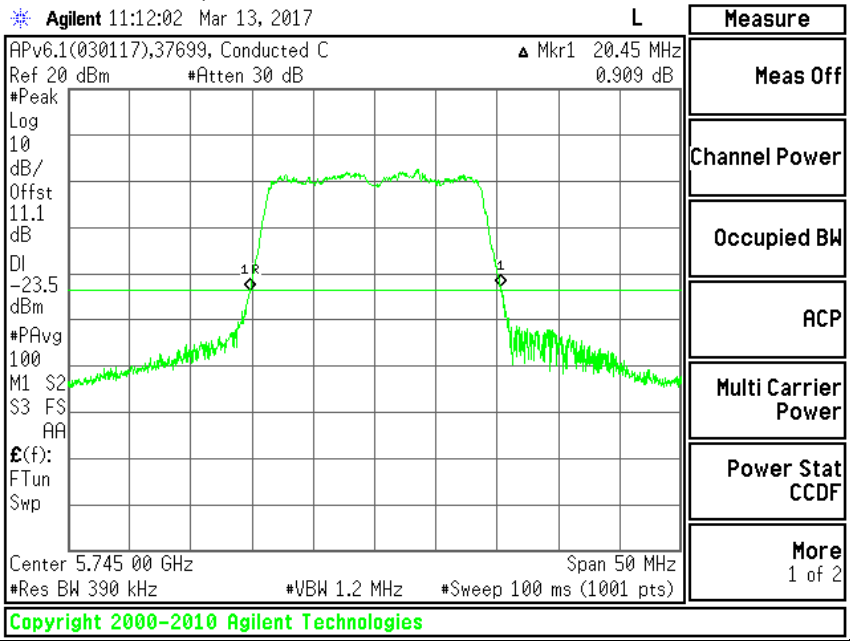
LIMITS

None; for reporting purposes only.

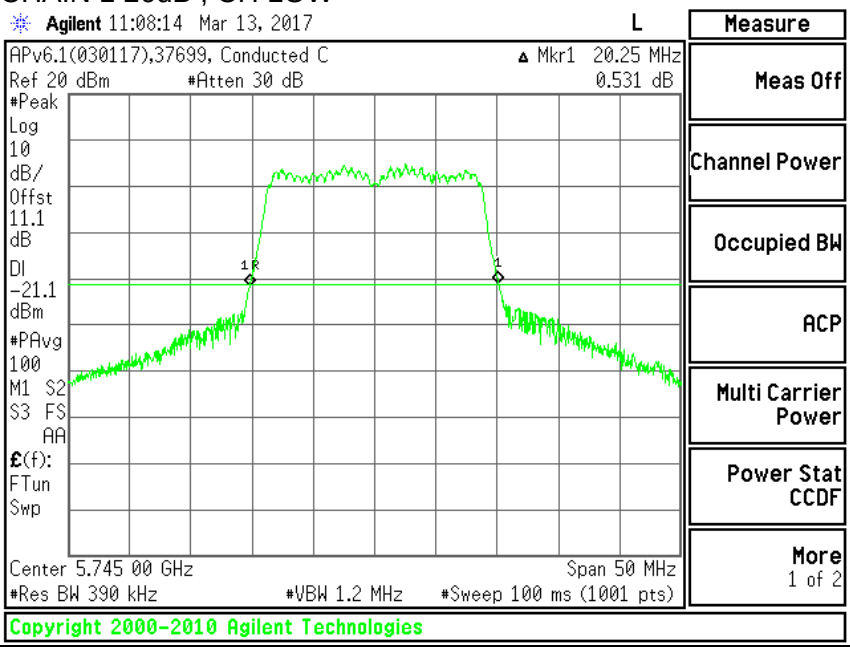
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5745	20.45	20.25
Mid	5785	20.45	20.35
High	5825	20.65	20.3

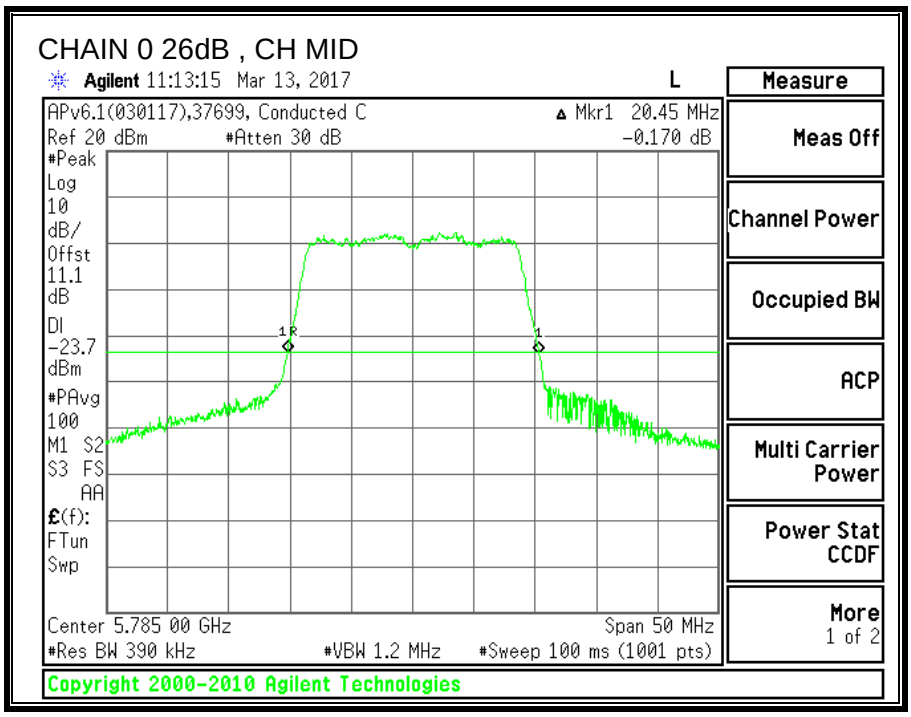
CHAIN 0 26dB , CH LOW



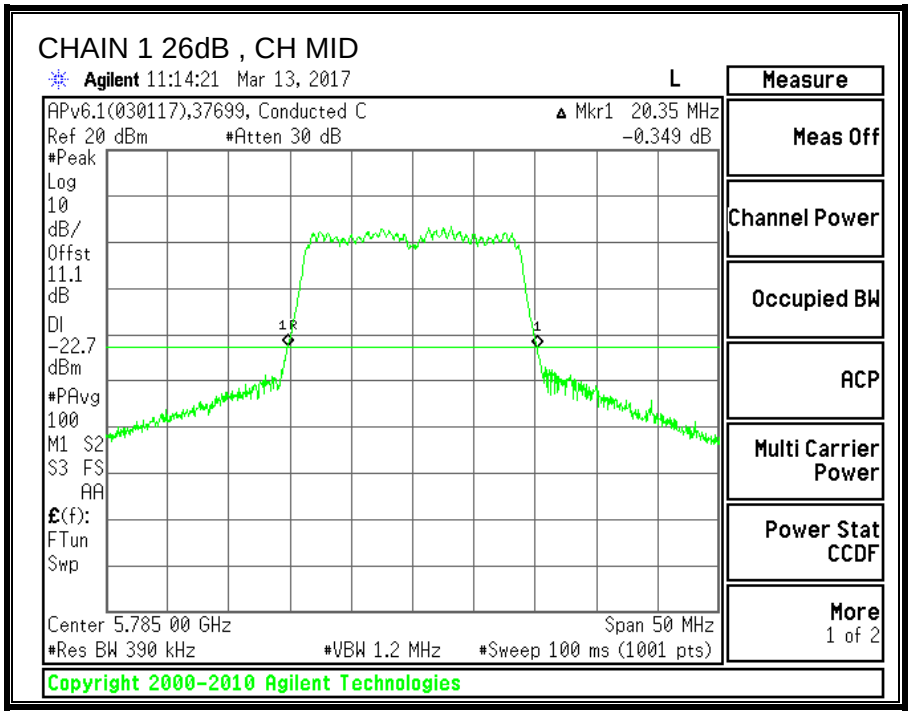
CHAIN 1 26dB , CH LOW



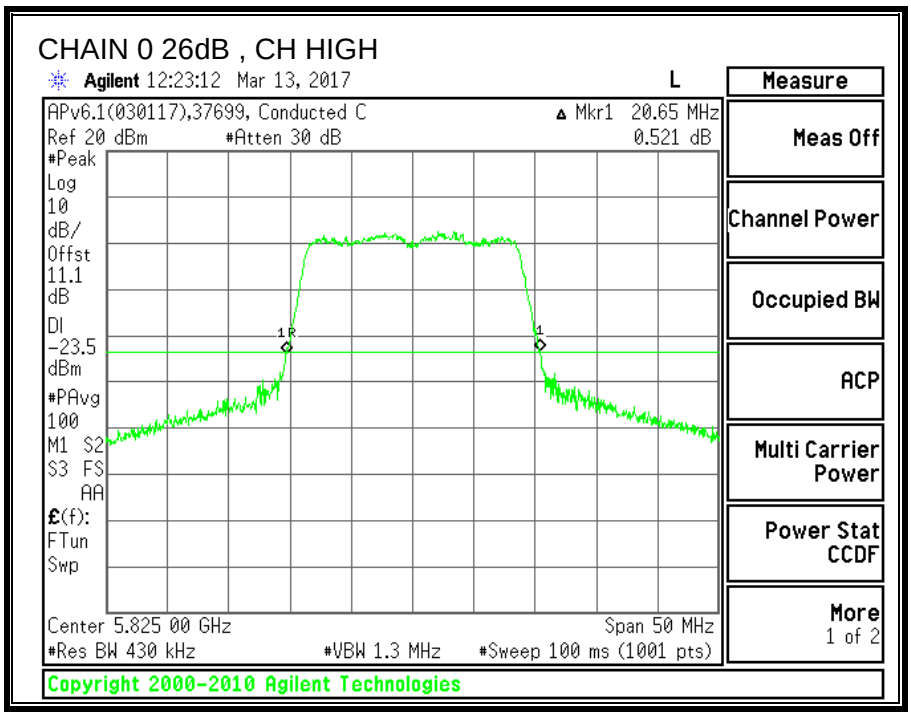
CHAIN 0 26dB , CH MID



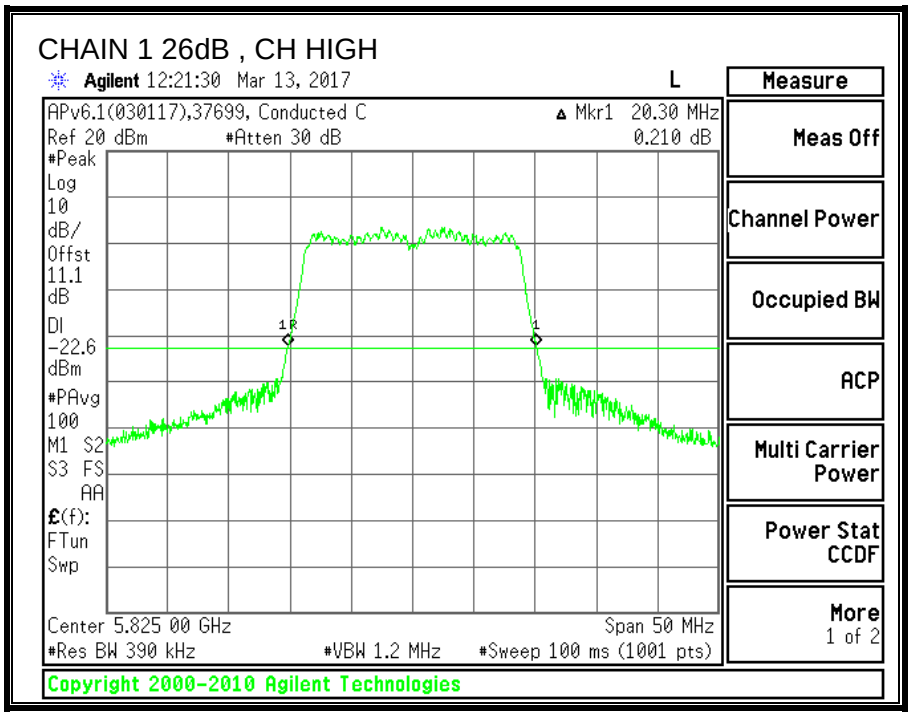
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.14.3. 99% BANDWIDTH

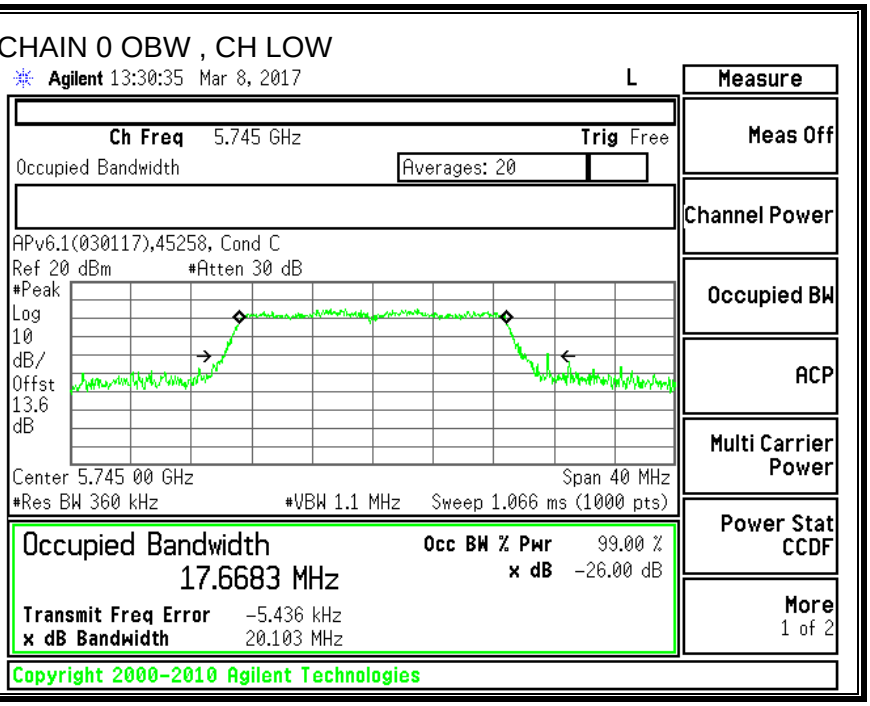
LIMITS

None; for reporting purposes only.

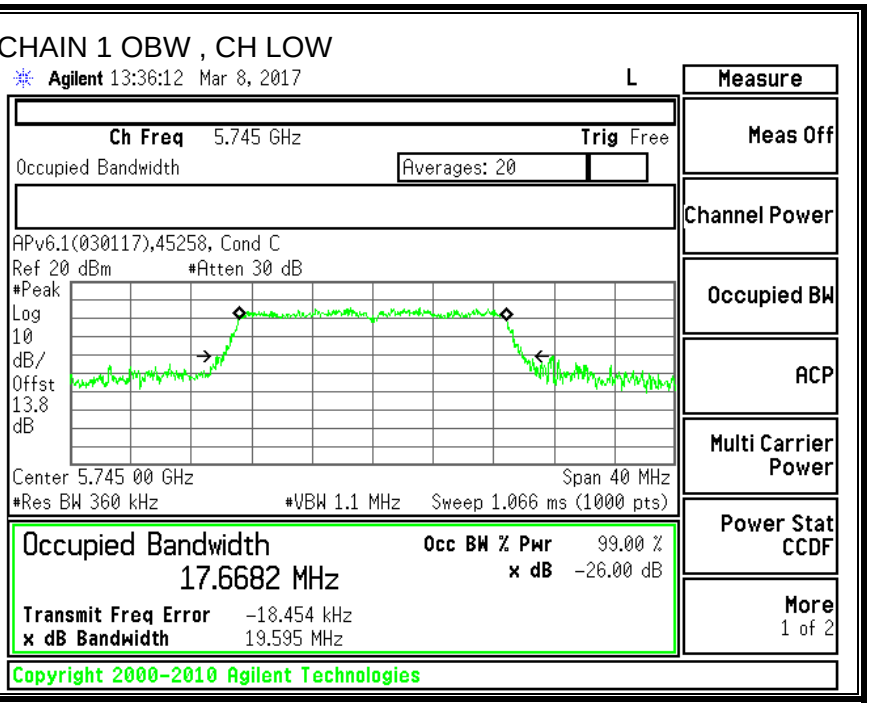
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5745	17.668	17.668
Mid	5785	17.704	17.656
High	5825	17.662	17.667

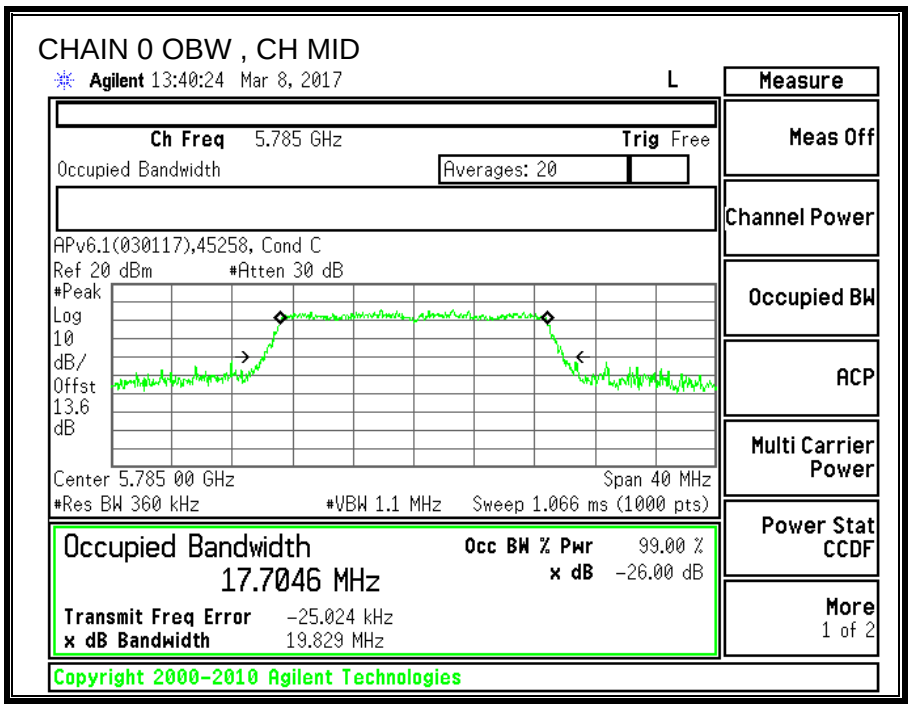
CHAIN 0 OBW , CH LOW



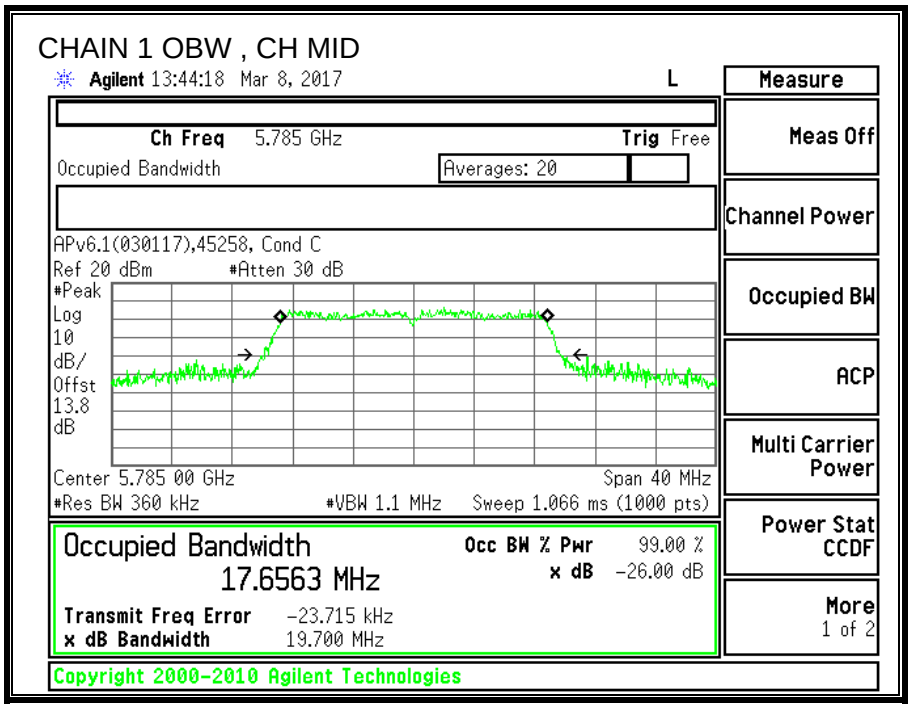
CHAIN 1 OBW , CH LOW



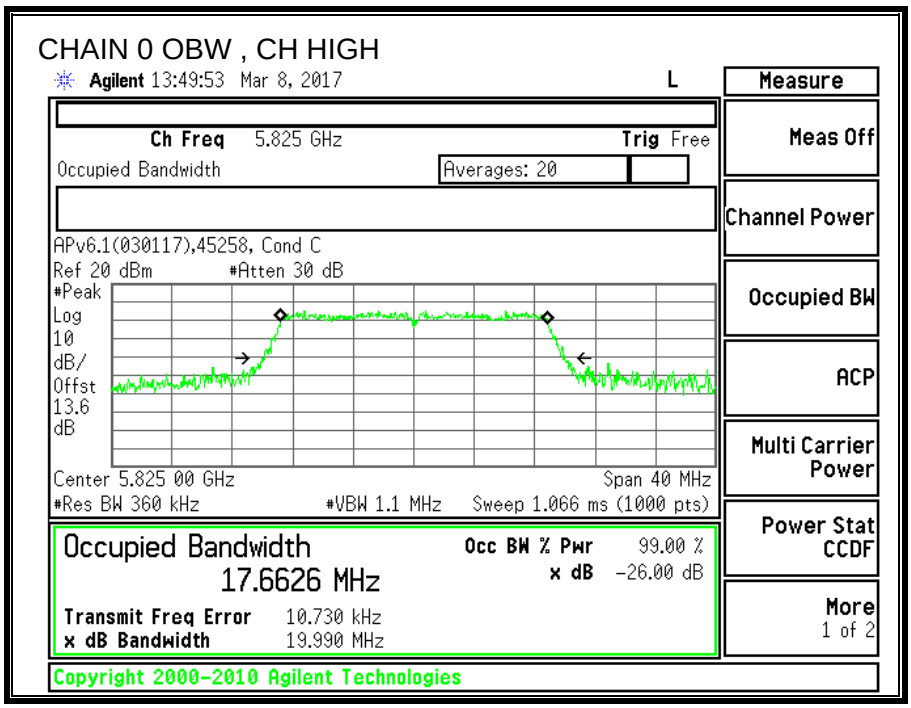
CHAIN 0 OBW , CH MID



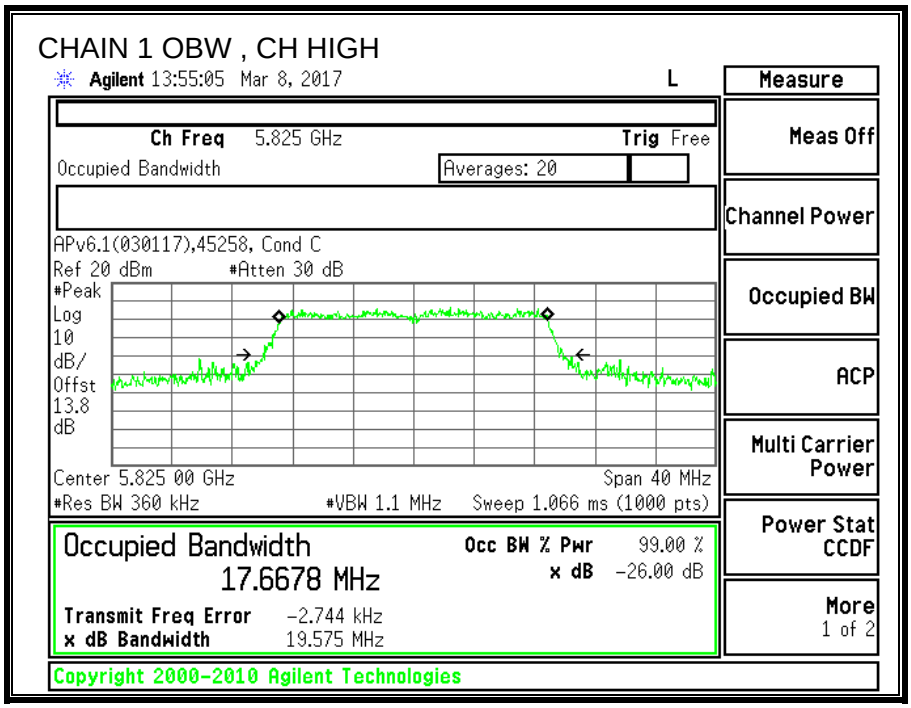
CHAIN 1 OBW , CH MID



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.14.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3)

IC RSS-247 (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.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.30	3.60	2.60	5.54

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5745	20.25	17.67	2.60	5.54
Mid	5785	20.35	17.66	2.60	5.54
High	5805	20.30	17.66	2.60	5.54
144	5720	20.35	17.66	2.60	5.54

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5745	30.00	29.47	35.47	29.47	30.00	30.00	30.00
Mid	5785	30.00	29.47	35.47	29.47	30.00	30.00	30.00
High	5805	30.00	29.47	35.47	29.47	30.00	30.00	30.00
144	5720	30.00	29.47	35.47	29.47	30.00	30.00	30.00

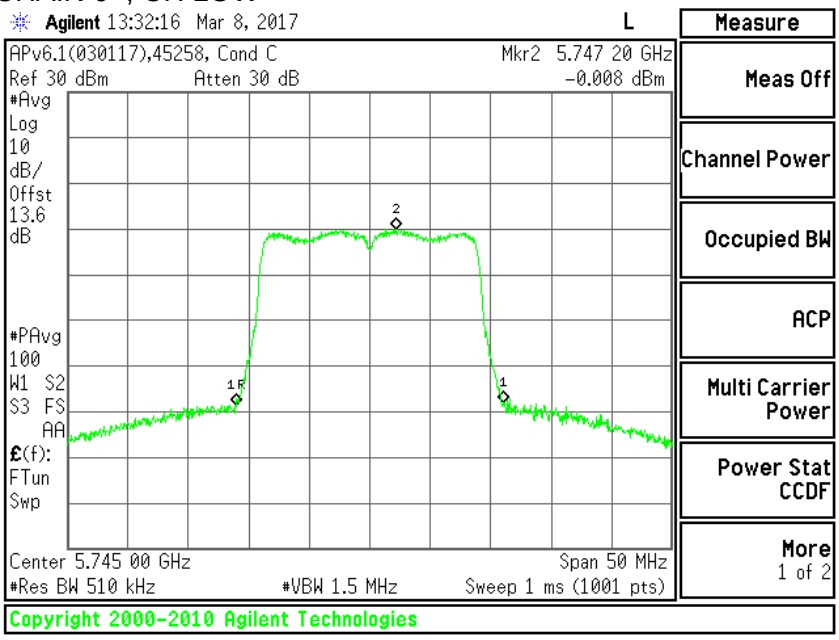
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.16	13.83	17.01	29.47	-12.46
Mid	5785	13.84	13.55	16.71	29.47	-12.76
High	5805	13.95	13.31	16.65	29.47	-12.82
144	5720	5.61	5.87	8.75	29.47	-20.72

PPSD Results

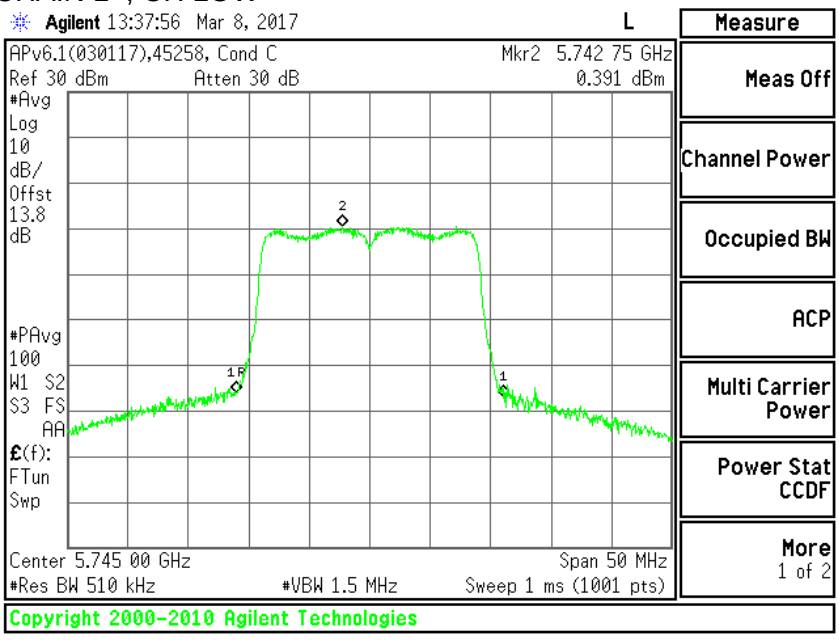
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	0.49	0.89	3.71	30.00	-26.29
Mid	5785	0.89	1.44	4.18	30.00	-25.82
High	5805	0.90	0.73	3.83	30.00	-26.17
144	5720	-1.62	-1.20	1.61	30.00	-28.39

CHAIN 0 , CH LOW



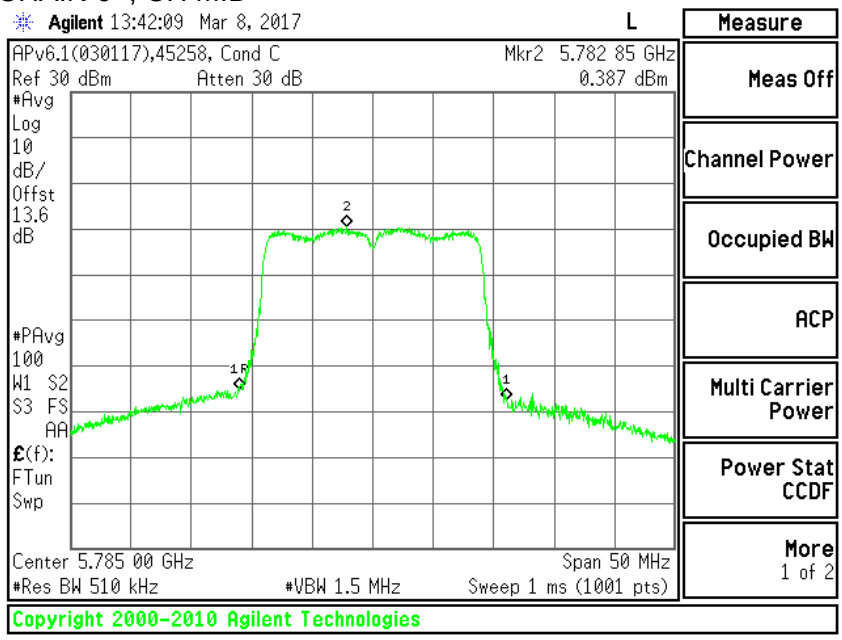
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.492dBm

CHAIN 1 , CH LOW



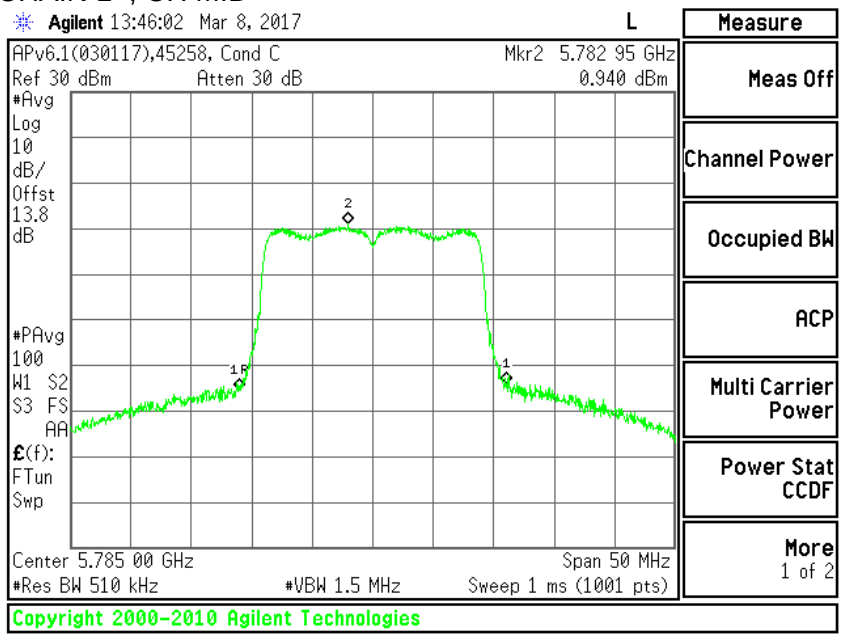
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.891dBm

CHAIN 0 , CH MID



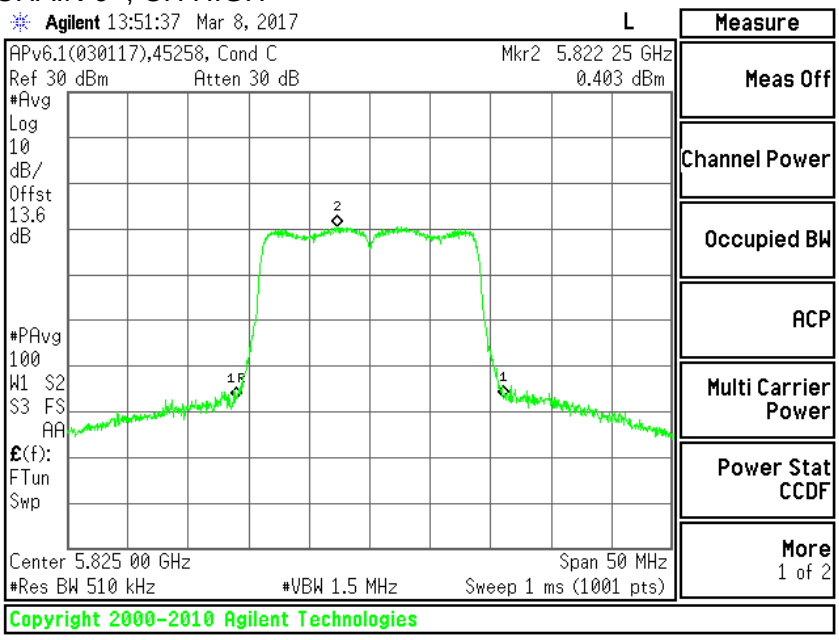
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.887dBm

CHAIN 1 , CH MID



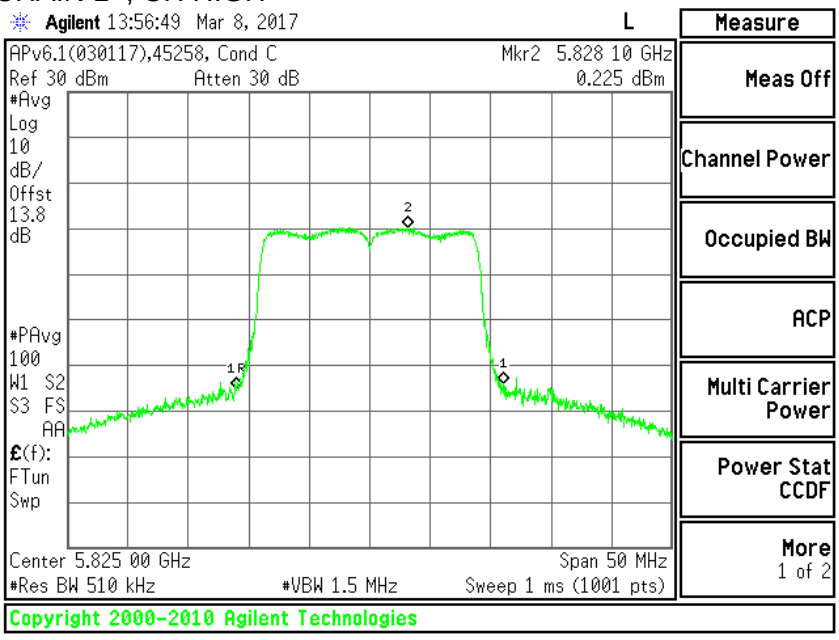
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 1.440dBm

CHAIN 0 , CH HIGH



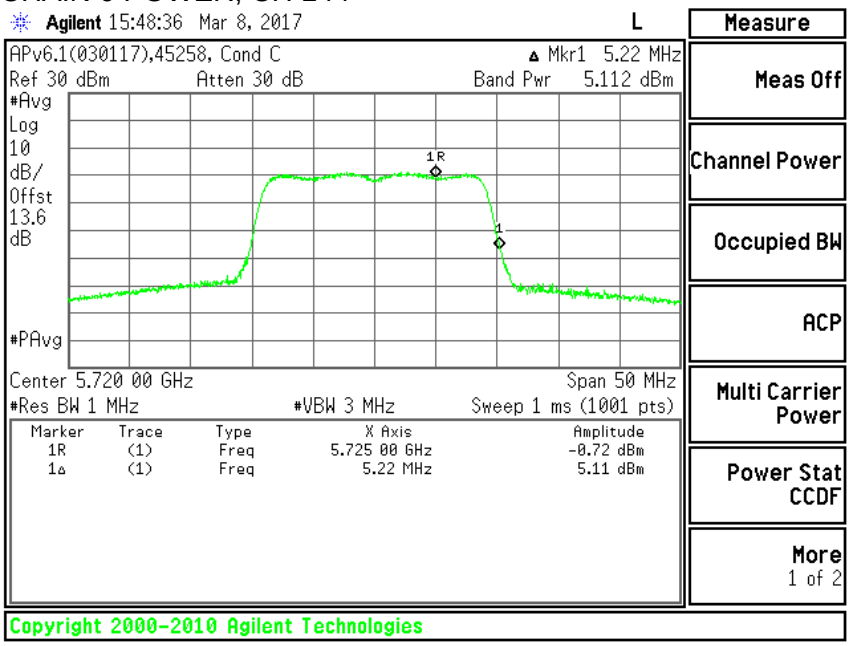
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.903dBm

CHAIN 1 , CH HIGH



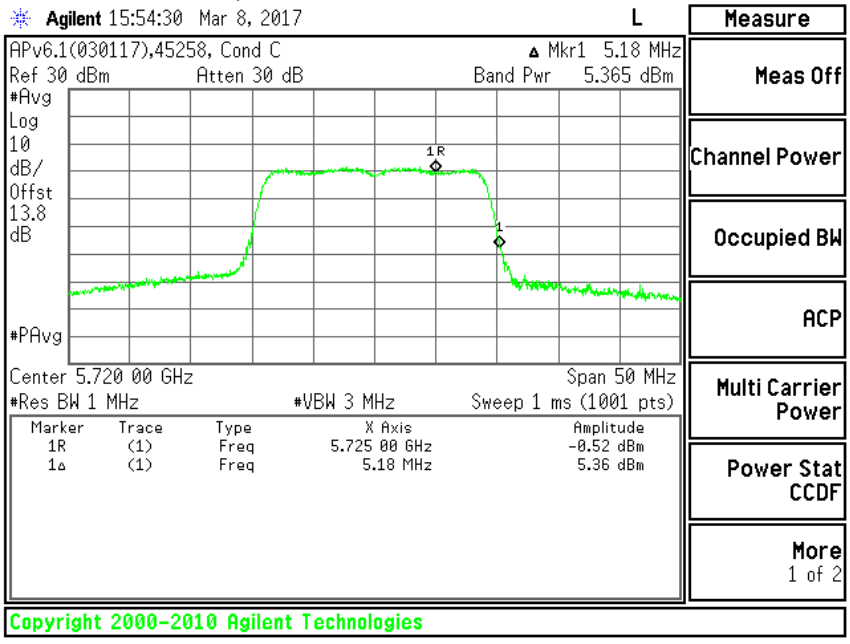
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.725dBm

CHAIN 0 POWER, CH 144



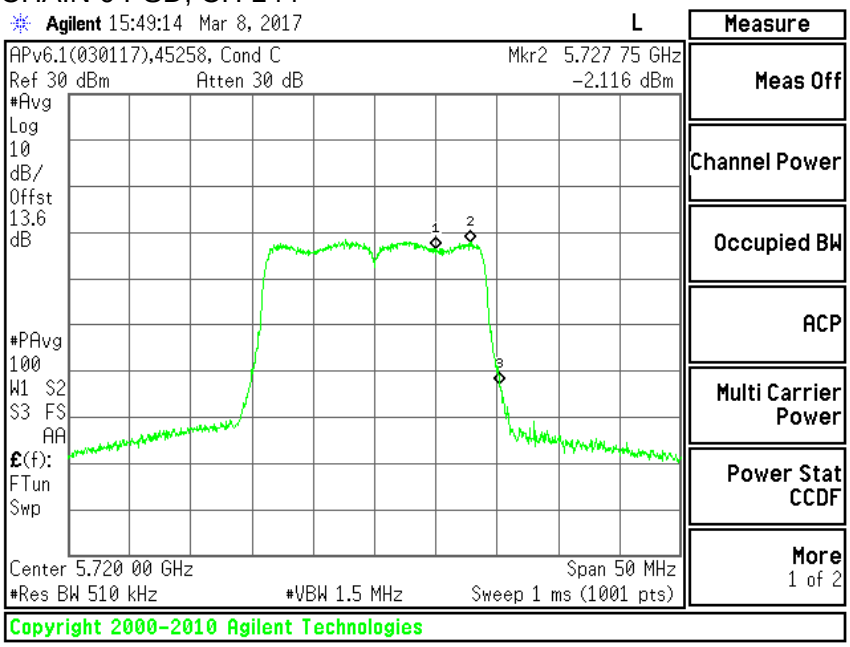
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 5.612dBm

CHAIN 1 POWER, CH 144



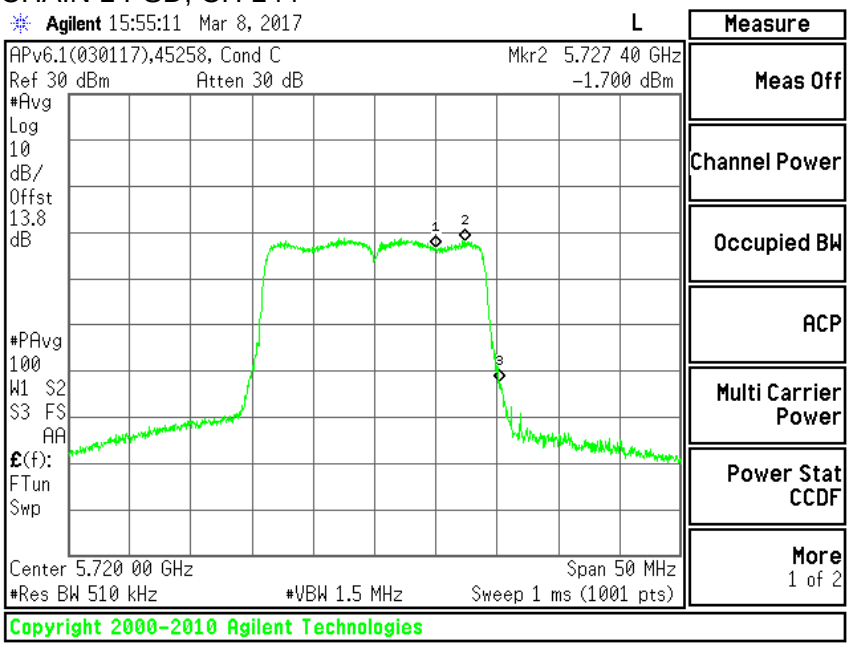
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 5.865dBm

CHAIN 0 PSD, CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.616dBm

CHAIN 1 PSD, CH 144



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -1.2dBm

9.15. 11n HT40 2TX MODE IN THE 5.8GHz BAND

9.15.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

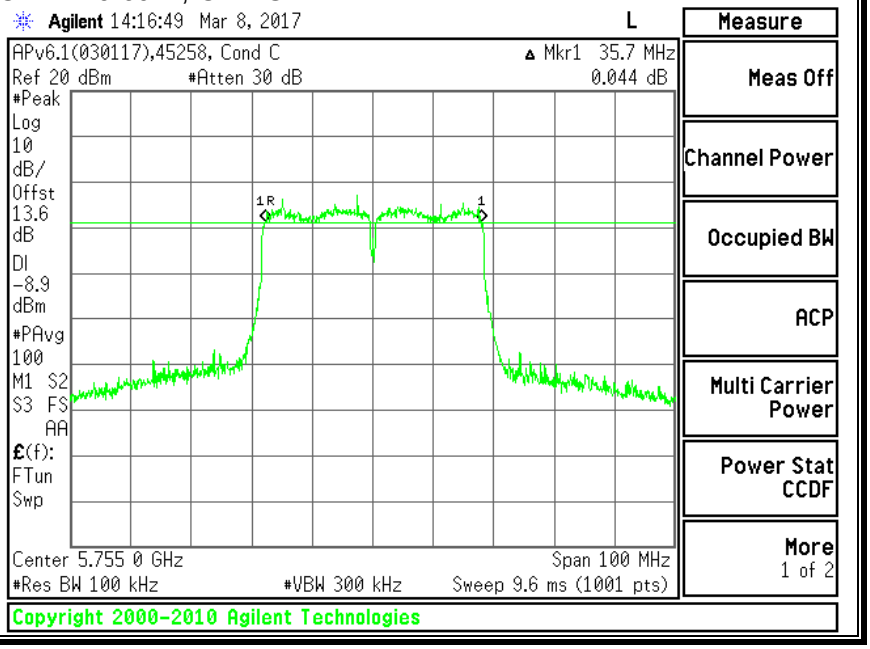
IC RSS-247 (6.2.4) (1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

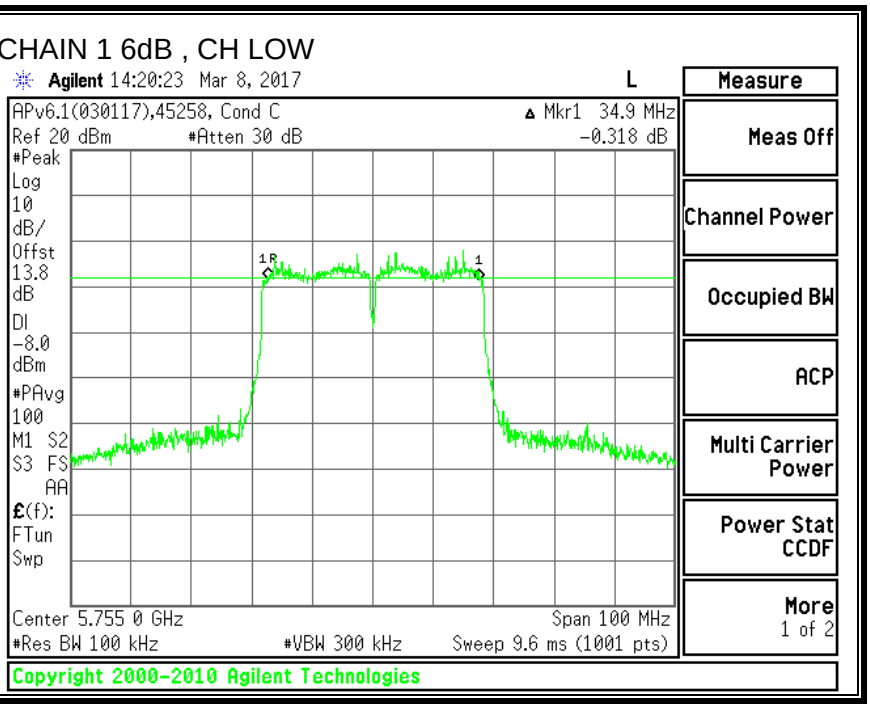
RESULTS

Channel	Frequency	6 dB BW CHAIN 0 (MHz)	6 dB BW CHAIN 1 (MHz)	Minimum Limit (MHz)
Low	5755	35.7	34.9	0.5
High	5795	36.4	35.8	0.5
142	5710	3.4	3.4	0.5

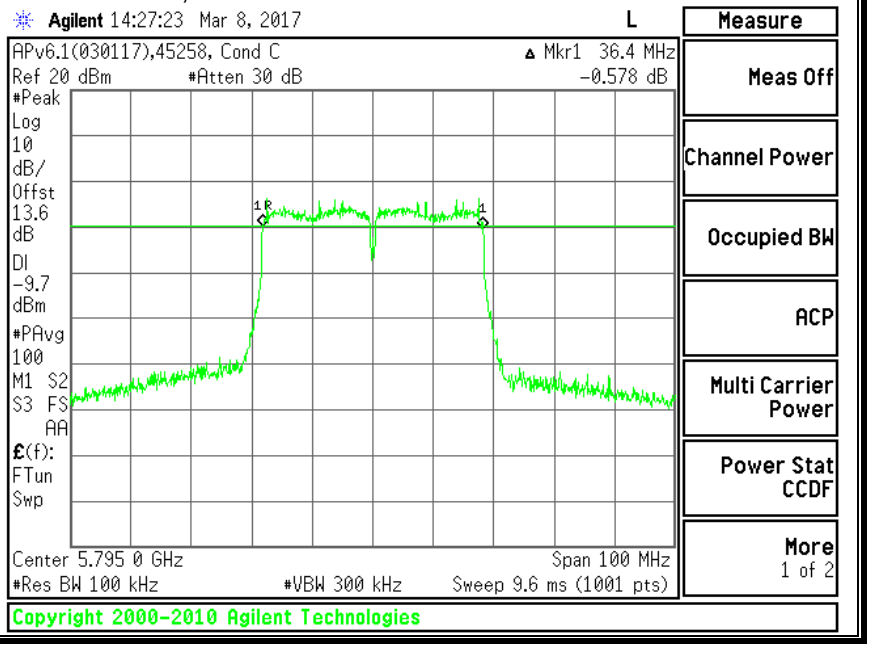
CHAIN 0 6dB , CH LOW



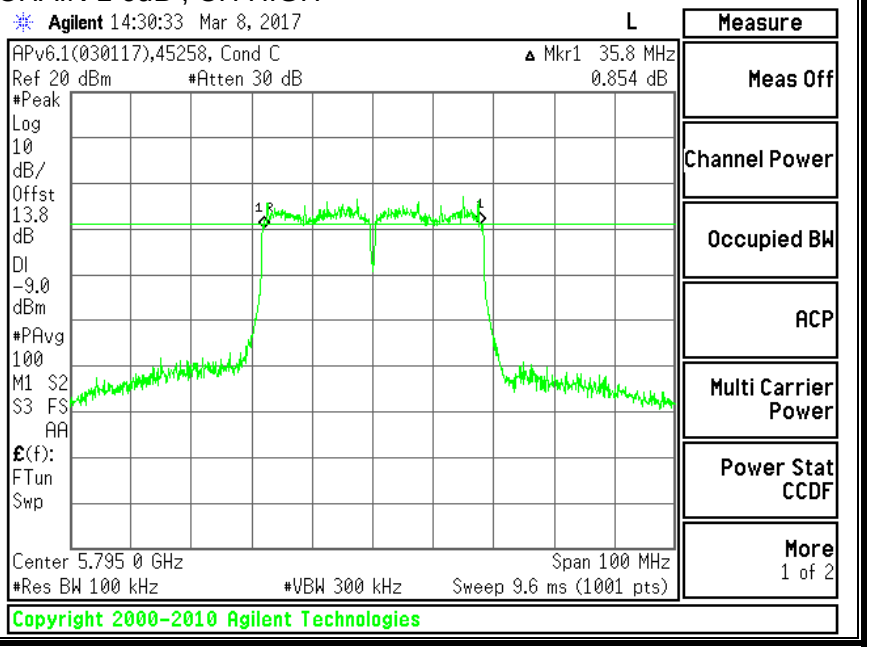
CHAIN 1 6dB , CH LOW



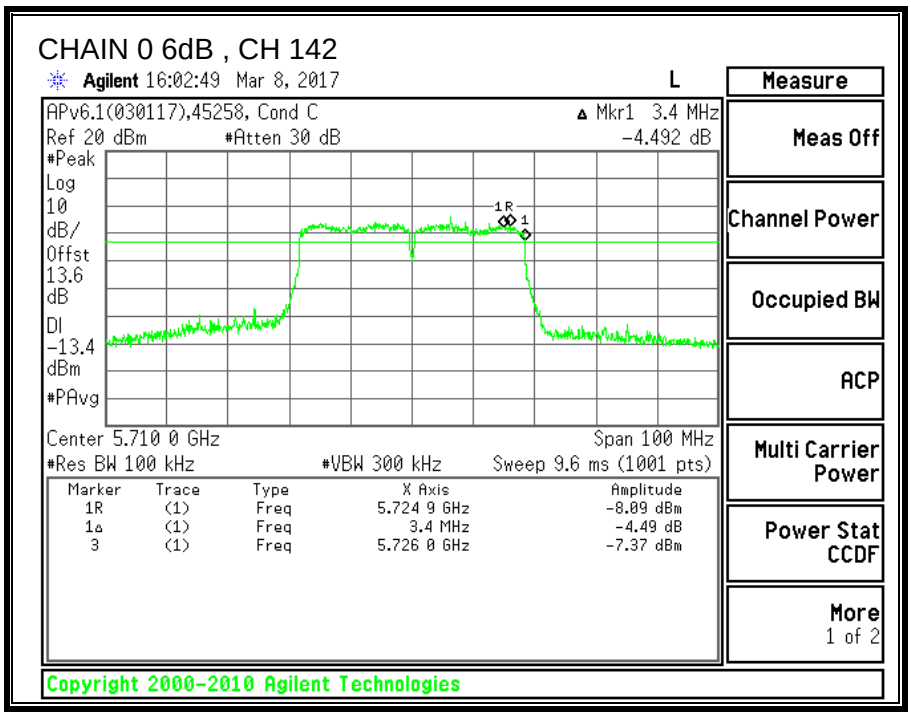
CHAIN 0 6dB , CH HIGH



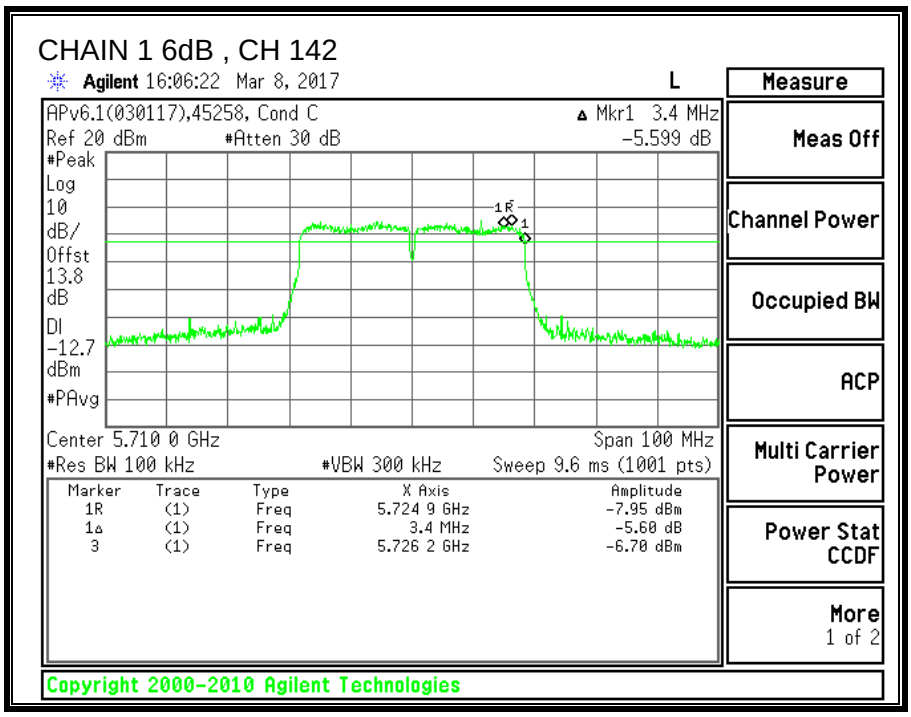
CHAIN 1 6dB , CH HIGH



CHAIN 0 6dB , CH 142



CHAIN 1 6dB , CH 142



9.15.2. 26 dB BANDWIDTH

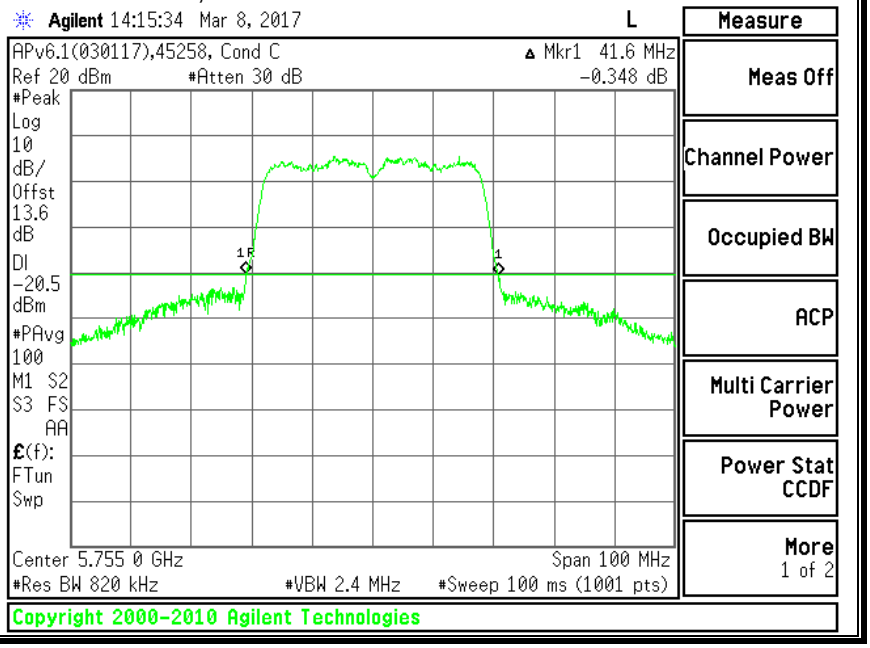
LIMITS

None; for reporting purposes only.

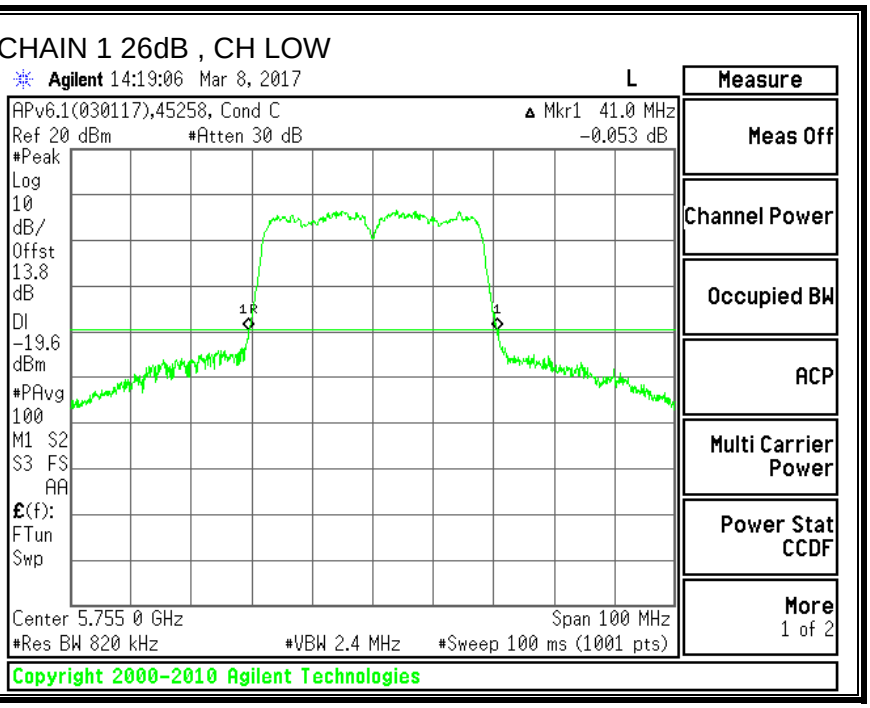
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5755	41.6	41.0
High	5795	41.6	40.8

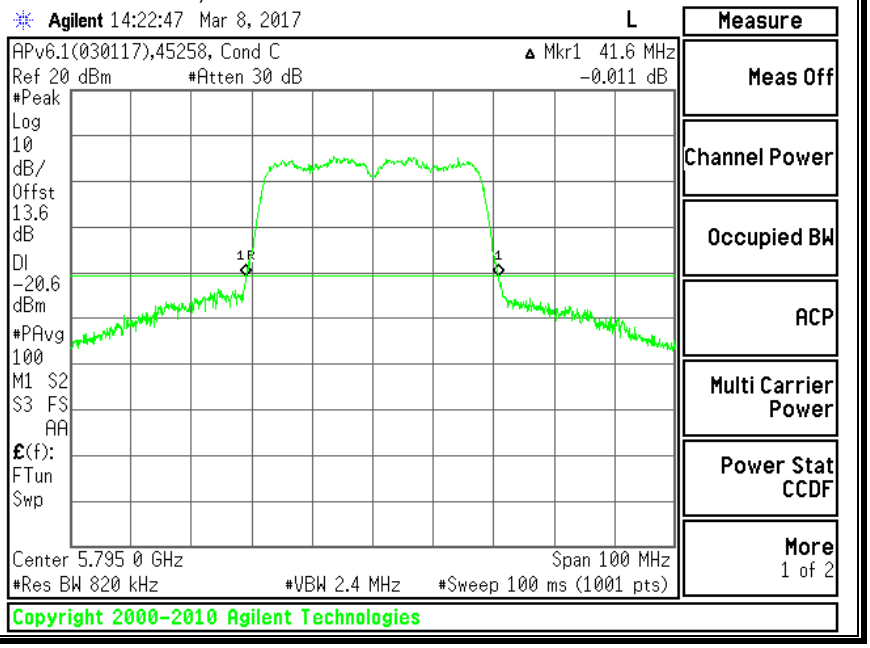
CHAIN 0 26dB , CH LOW



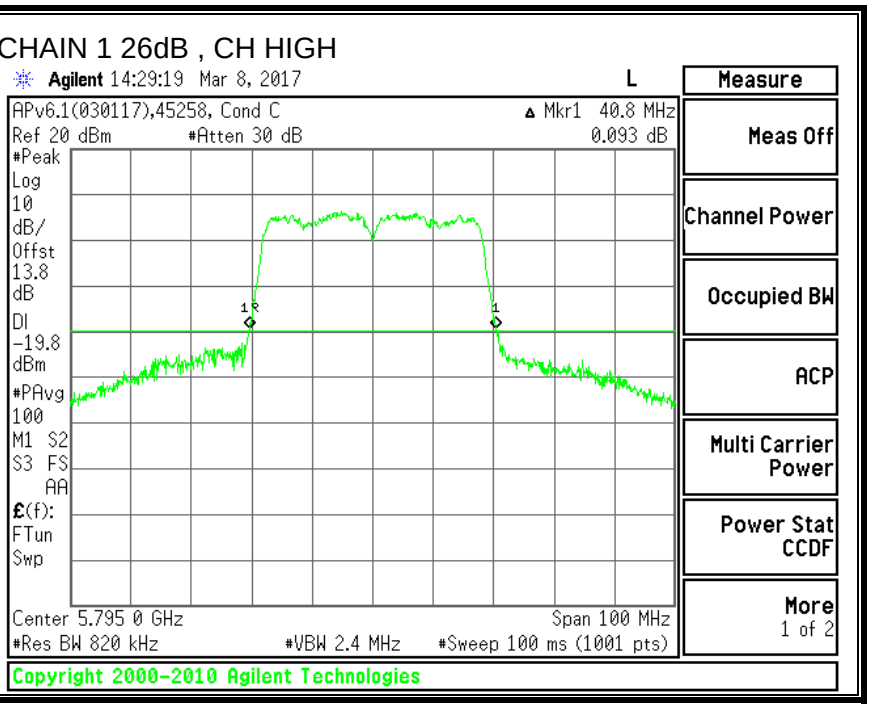
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.15.3. 99% BANDWIDTH

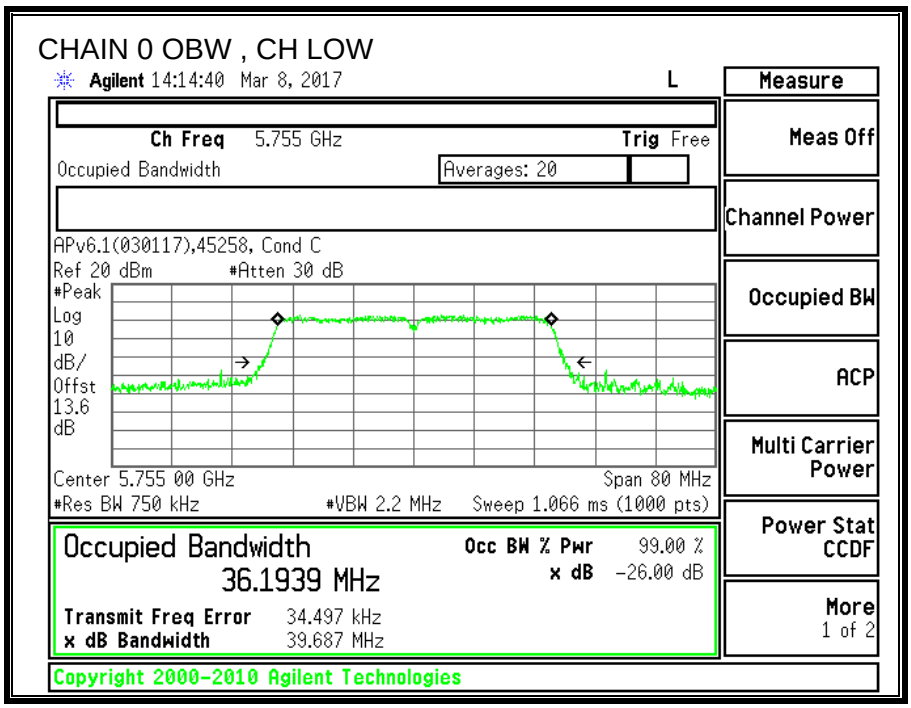
LIMITS

None; for reporting purposes only.

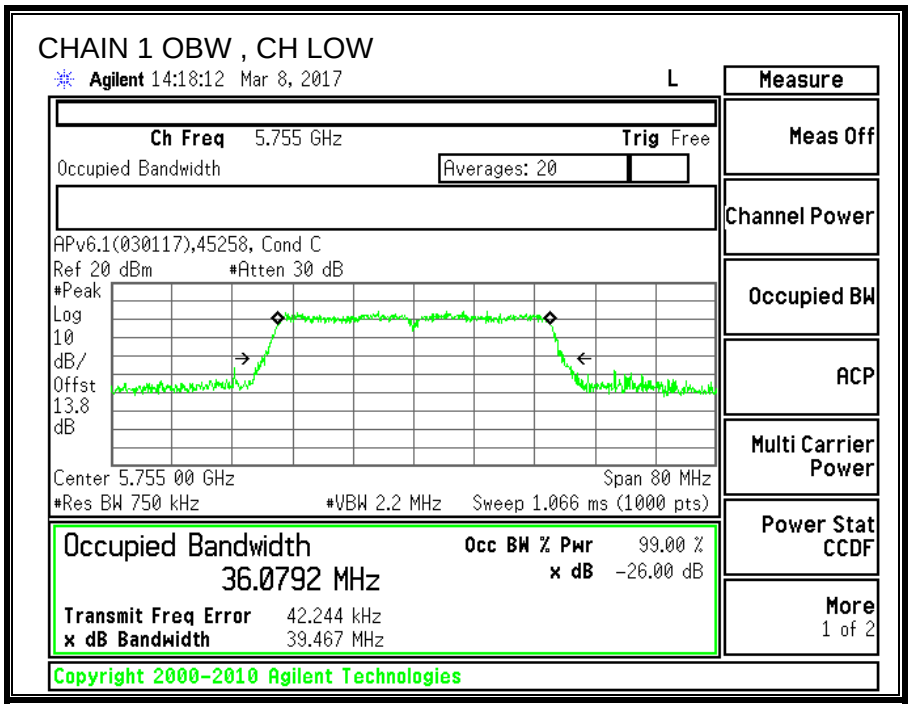
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5755	36.193	36.079
High	5795	36.115	36.141

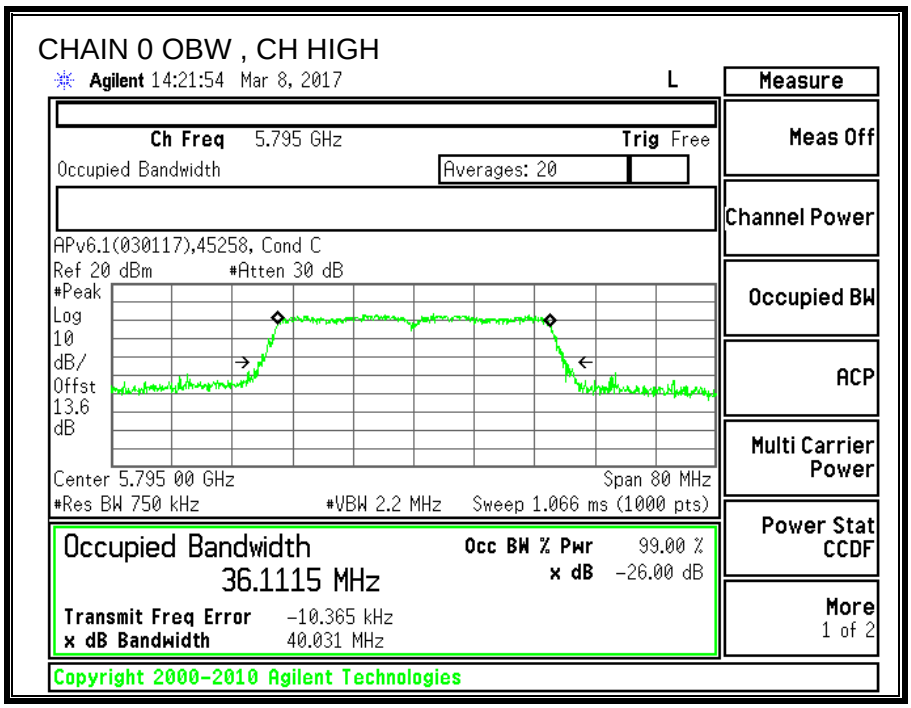
CHAIN 0 OBW , CH LOW



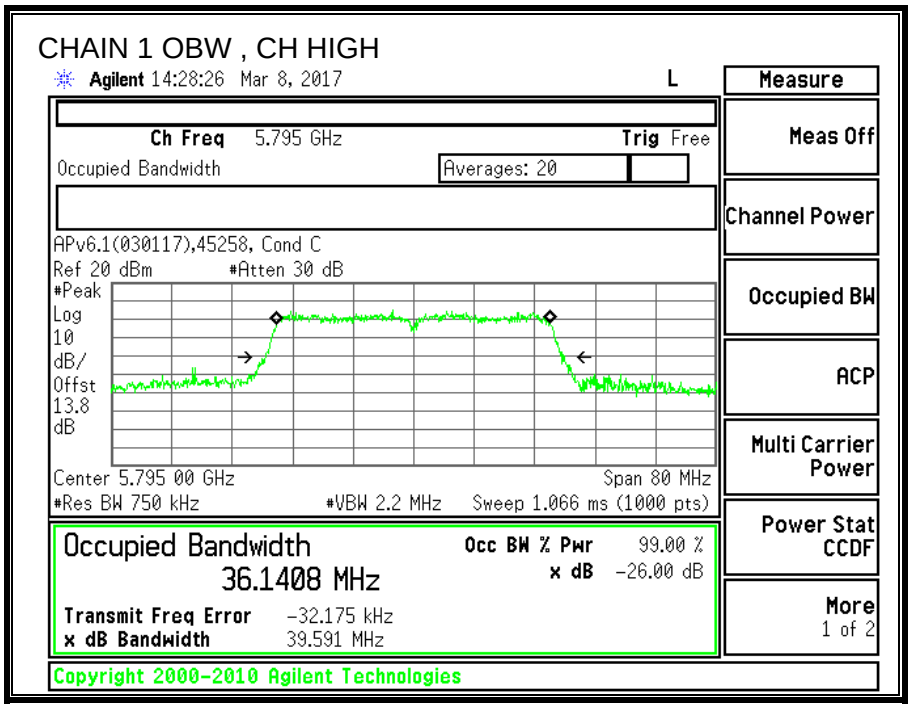
CHAIN 1 OBW , CH LOW



CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



9.15.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3)

IC RSS-247 (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.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.30	3.60	2.60	5.54

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
Low	5755	41	36.08	2.60	5.54
High	5795	40.8	36.12	2.60	5.54
142	5710	40.7	36.16	2.60	5.54

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5755	30.00	30.00	36.00	30.00	30.00	17.00	17.00
High	5795	30.00	30.00	36.00	30.00	30.00	17.00	17.00
142	5710	30.00	30.00	36.00	30.00	30.00	17.00	17.00

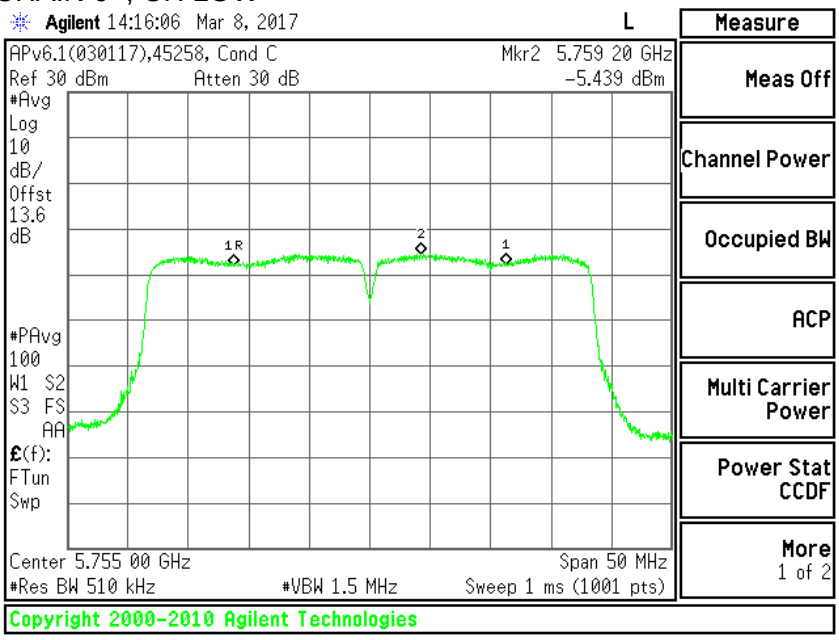
Output Power Results

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	11.15	10.53	13.86	30.00	-16.14
High	5795	10.95	10.41	13.70	30.00	-16.30
142	5710	0.48	0.48	3.49	30.00	-26.51

PPSD Results

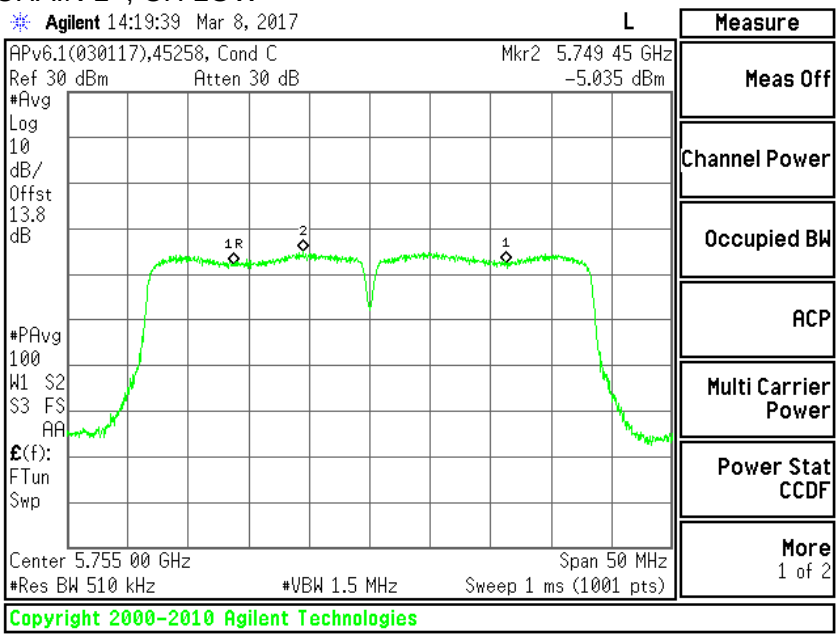
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-4.94	-4.54	-1.72	17.00	-18.72
High	5795	-4.79	-4.91	-1.84	17.00	-18.84
142	5710	-6.08	-6.04	-3.05	17.00	-20.05

CHAIN 0 , CH LOW



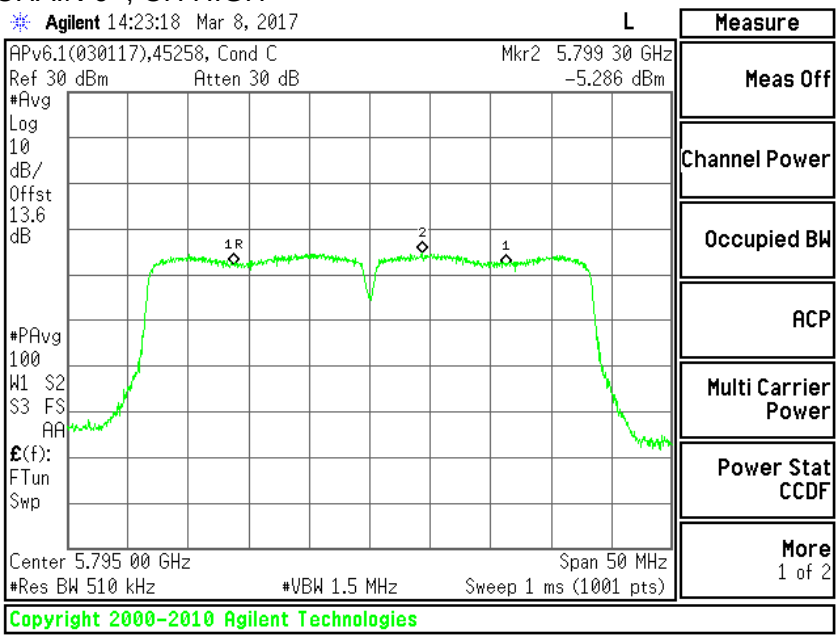
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -4.939dBm

CHAIN 1 , CH LOW



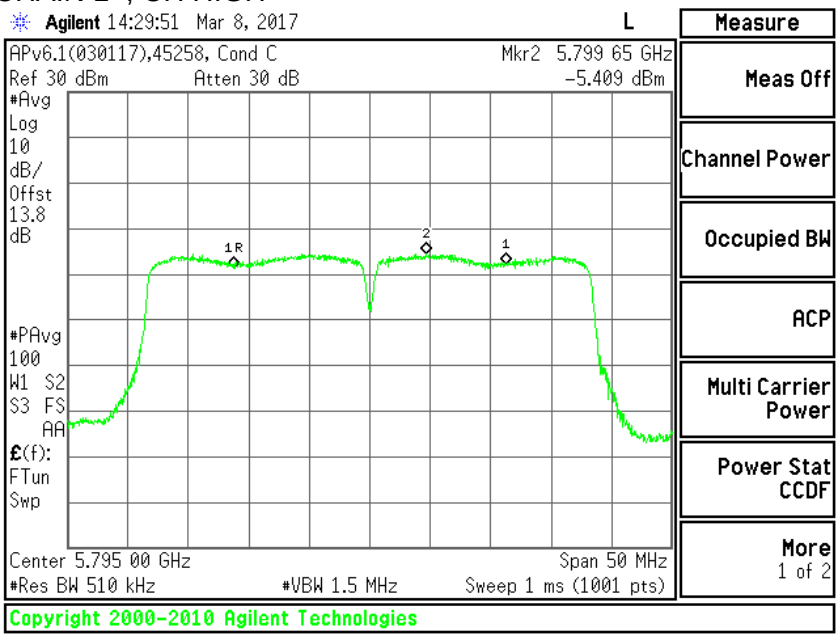
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -4.535dBm

CHAIN 0 , CH HIGH



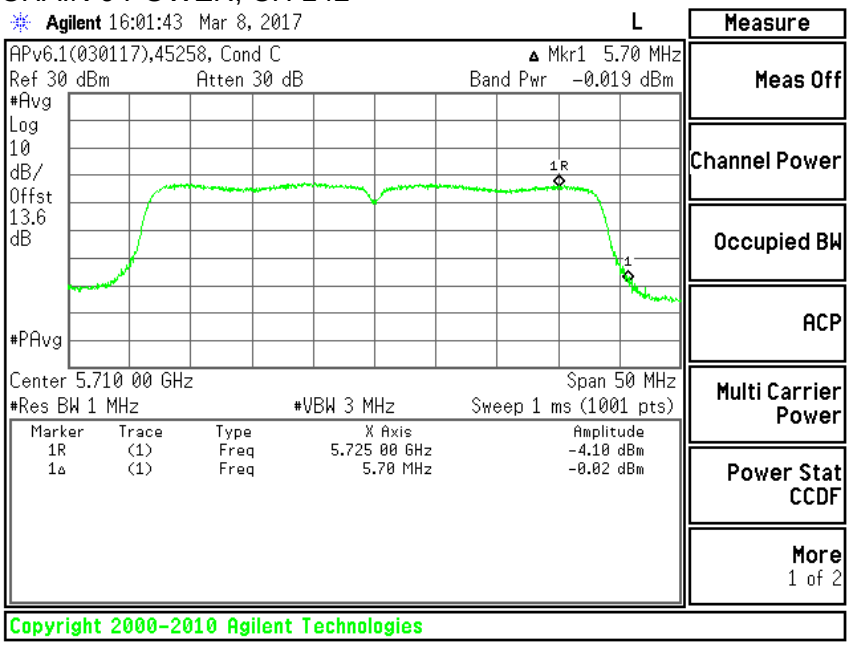
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -4.786dBm

CHAIN 1 , CH HIGH



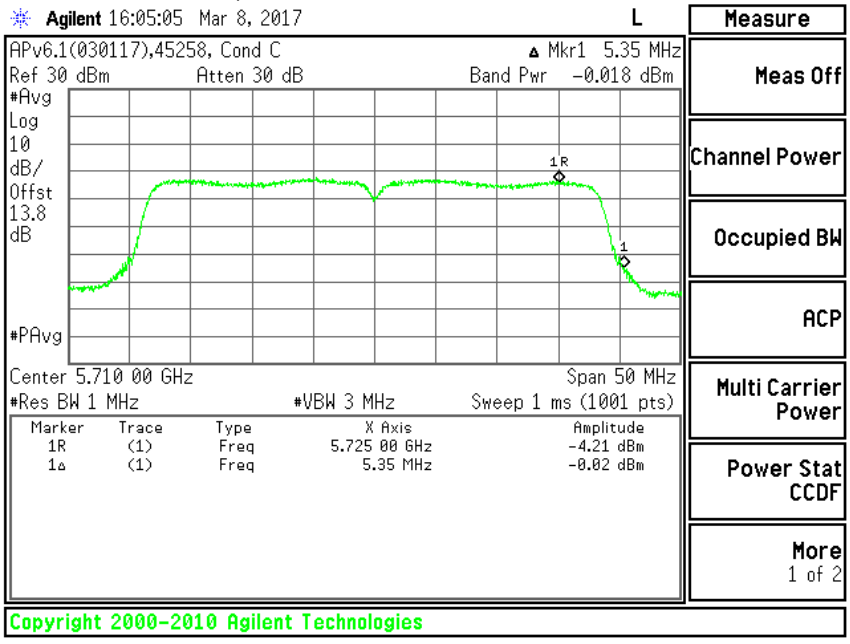
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -4.909dBm

CHAIN 0 POWER, CH 142



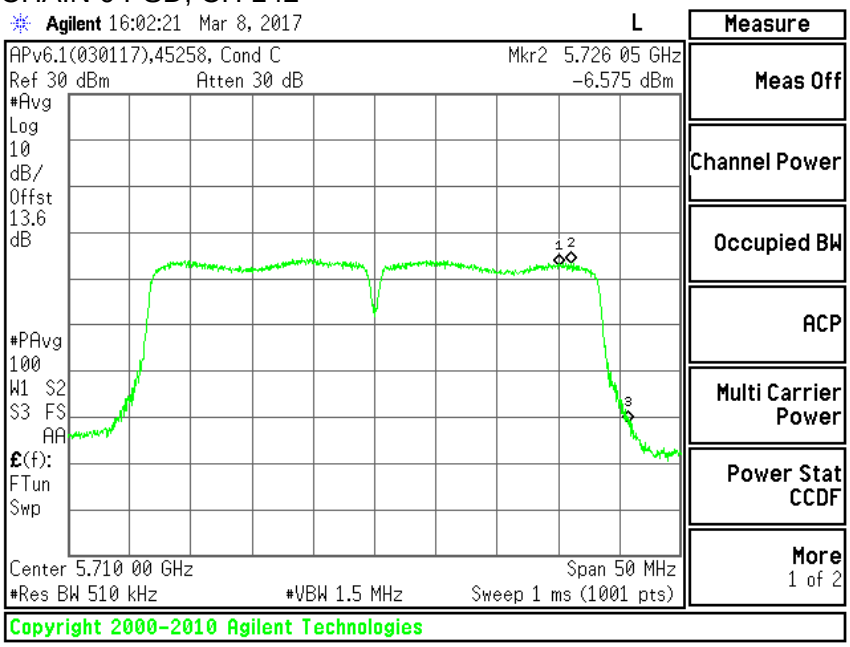
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.481dBm

CHAIN 1 POWER, CH 142



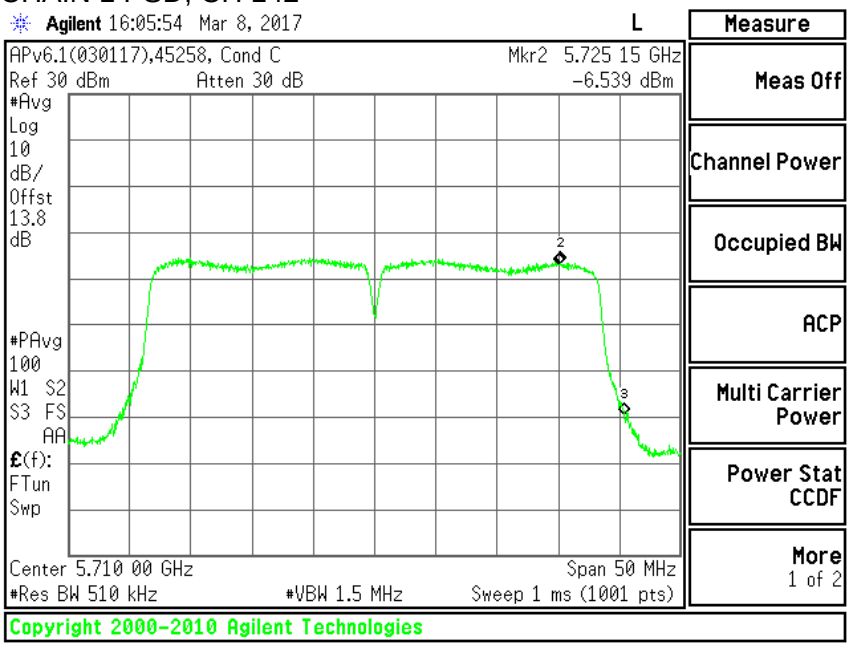
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is 0.482dBm

CHAIN 0 PSD, CH 142



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -6.075dBm

CHAIN 1 PSD, CH 142



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -6.039dBm

9.16. 11ac HT80 2TX MODE IN THE 5.8GHz BAND

9.16.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

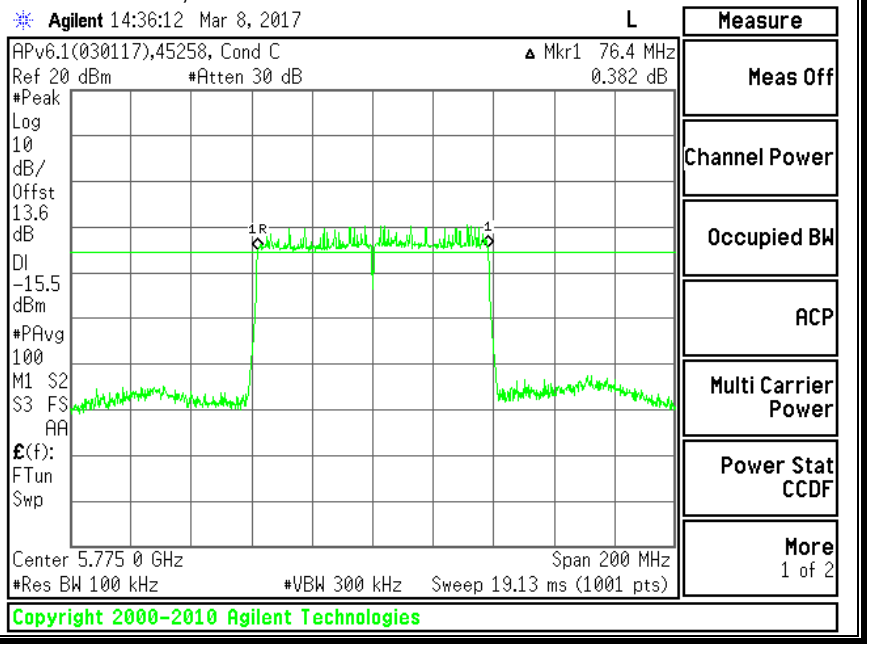
IC RSS-247 (6.2.4) (1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

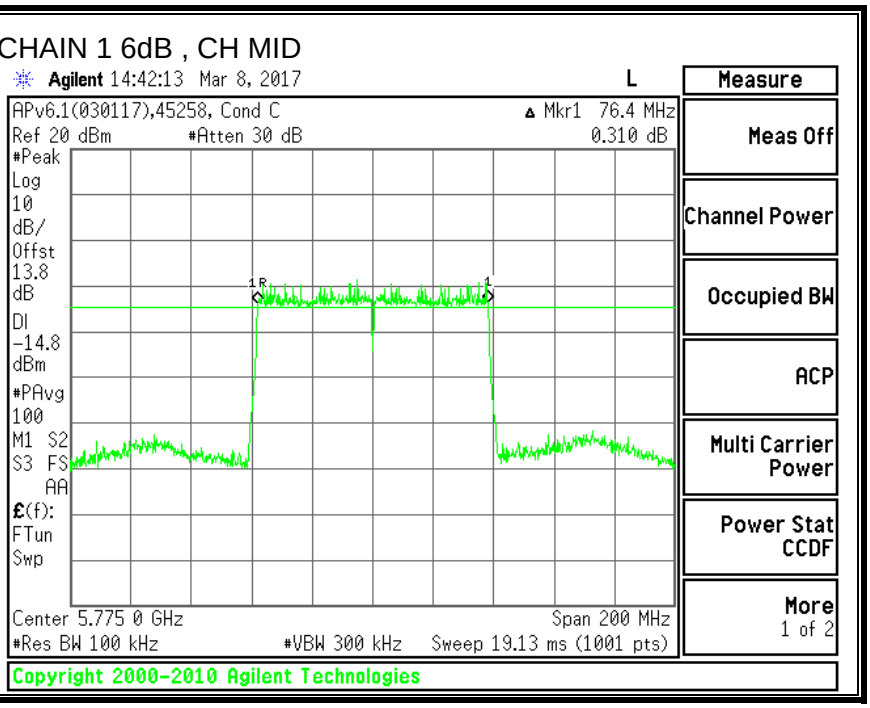
RESULTS

Channel	Frequency	6 dB BW CHAIN 0 (MHz)	6 dB BW CHAIN 1 (MHz)	Minimum Limit (MHz)
155	5775	76.4	76.4	0.5
138	5690	3.2	3.4	0.5

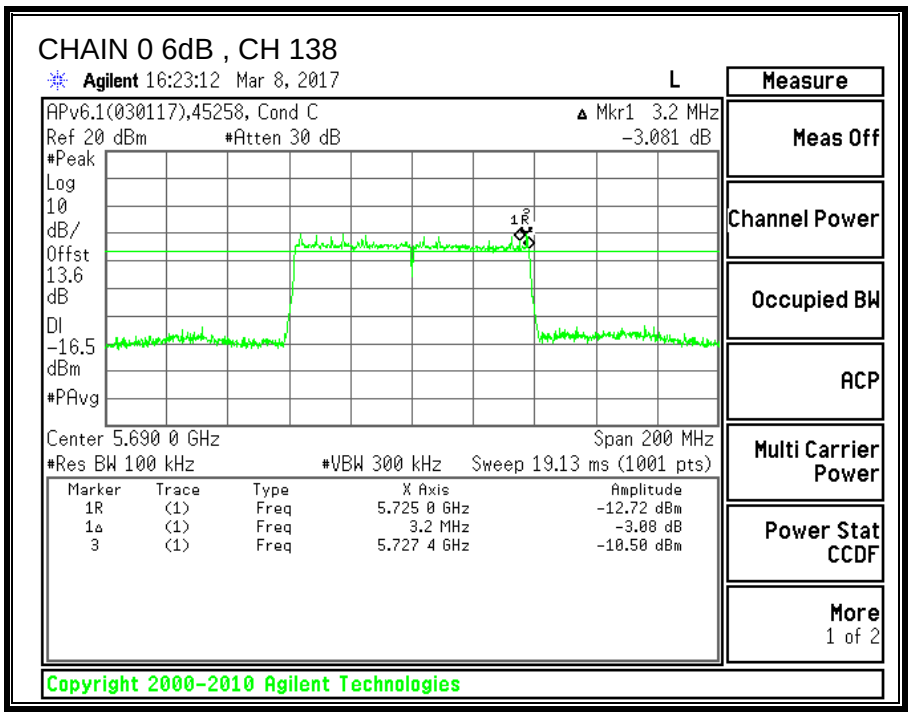
CHAIN 0 6dB , CH MID



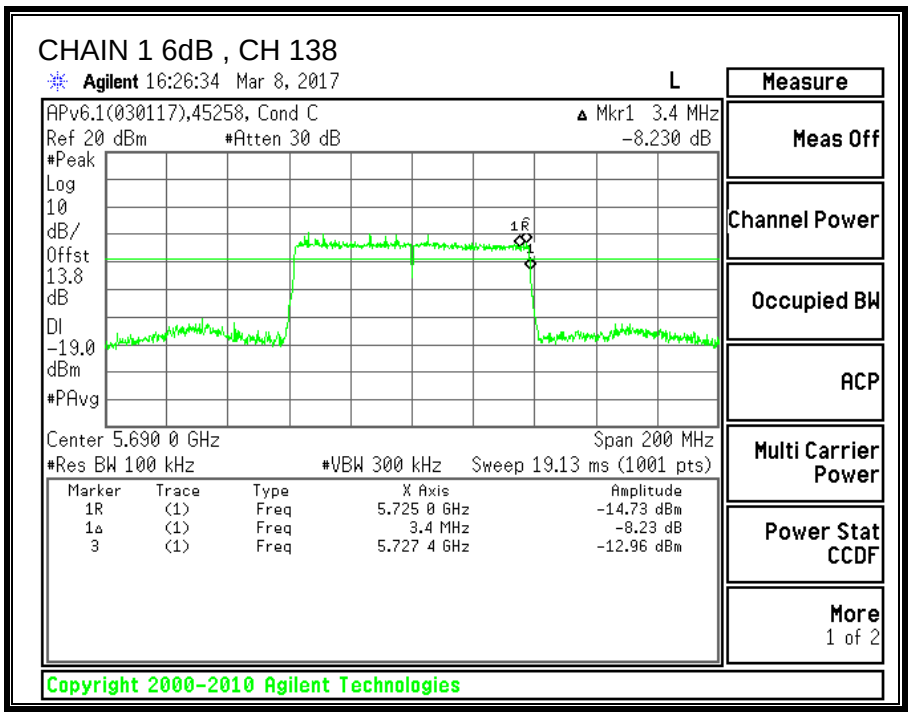
CHAIN 1 6dB , CH MID



CHAIN 0 6dB , CH 138



CHAIN 1 6dB , CH 138



9.16.2. 26 dB BANDWIDTH

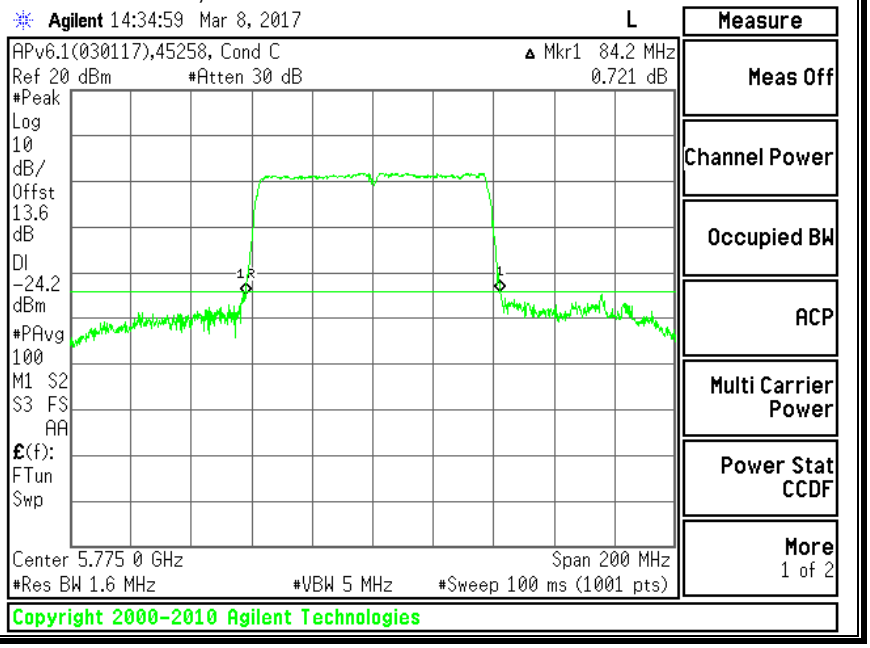
LIMITS

None; for reporting purposes only.

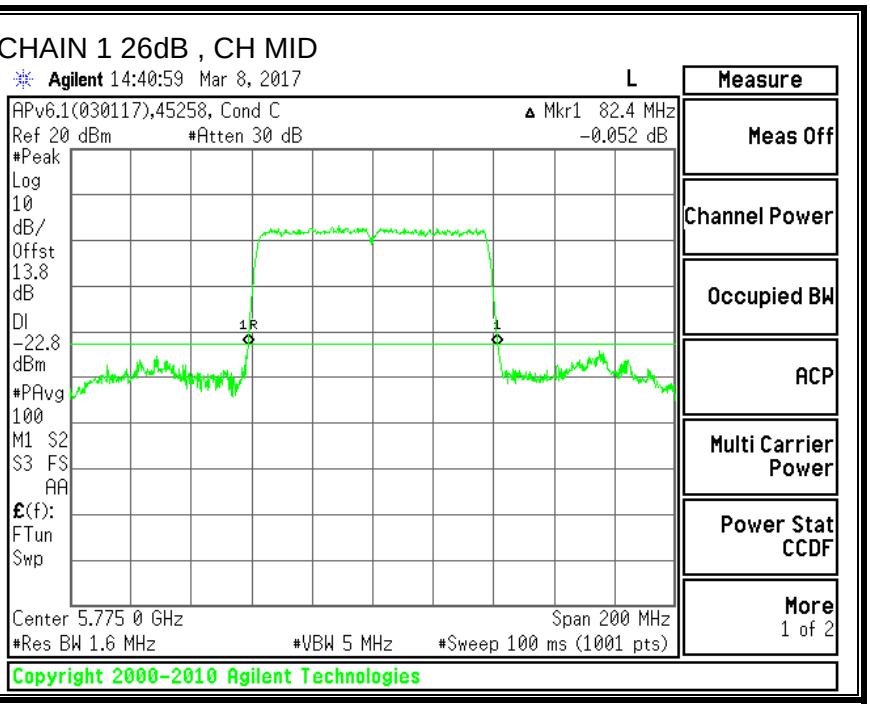
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
155	5775	84.2	82.4

CHAIN 0 26dB , CH MID



CHAIN 1 26dB , CH MID



9.16.3. 99% BANDWIDTH

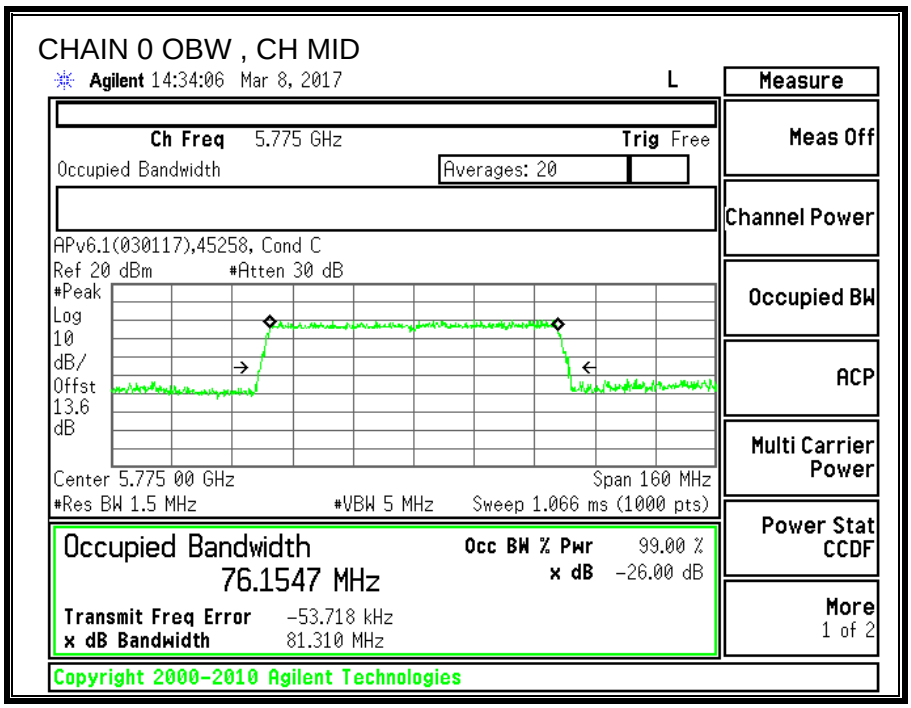
LIMITS

None; for reporting purposes only.

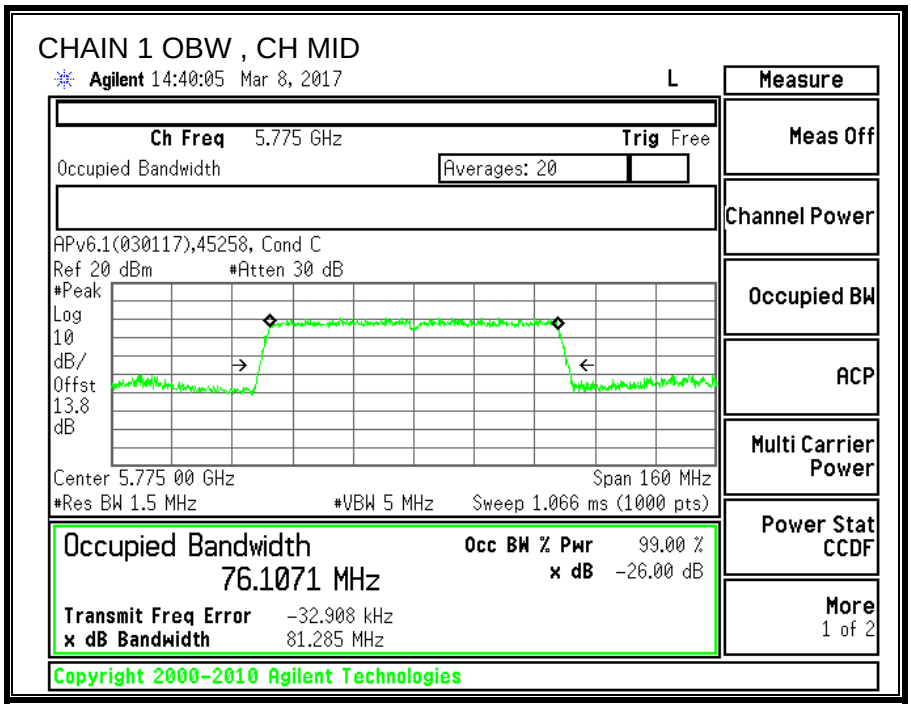
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
155	5775	76.155	76.107

CHAIN 0 OBW , CH MID



CHAIN 1 OBW , CH MID



9.16.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407 (a) (3)

IC RSS-247 (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.

DIRECTIONAL ANTENNA GAIN

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
1.30	3.60	2.60	5.54

RESULTS

ID:	45258 JL	Date:	3/3/17

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain for Power (dBi)	Directional Gain for PPSD (dBi)
155	5775	82.40	76.11	2.60	5.54
138	5690	83.80	76.10	2.60	5.54

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
155	5775	30.00	30.00	36.00	30.00	30.00	17.00	17.00
138	5690	30.00	30.00	36.00	30.00	30.00	17.00	17.00

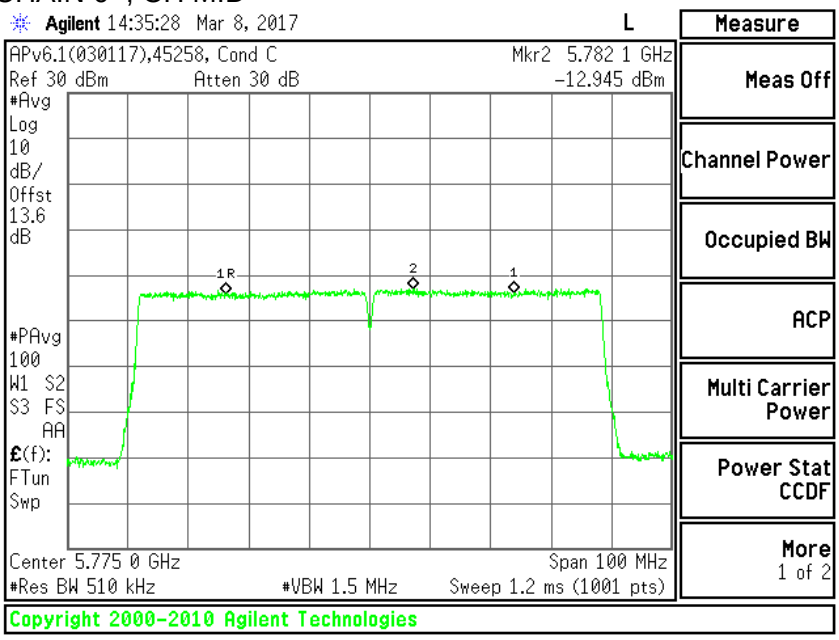
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
155	5775	7.56	6.81	10.21	30.00	-19.79
138	5690	-6.58	-6.25	-3.40	30.00	-33.40

PPSD Results

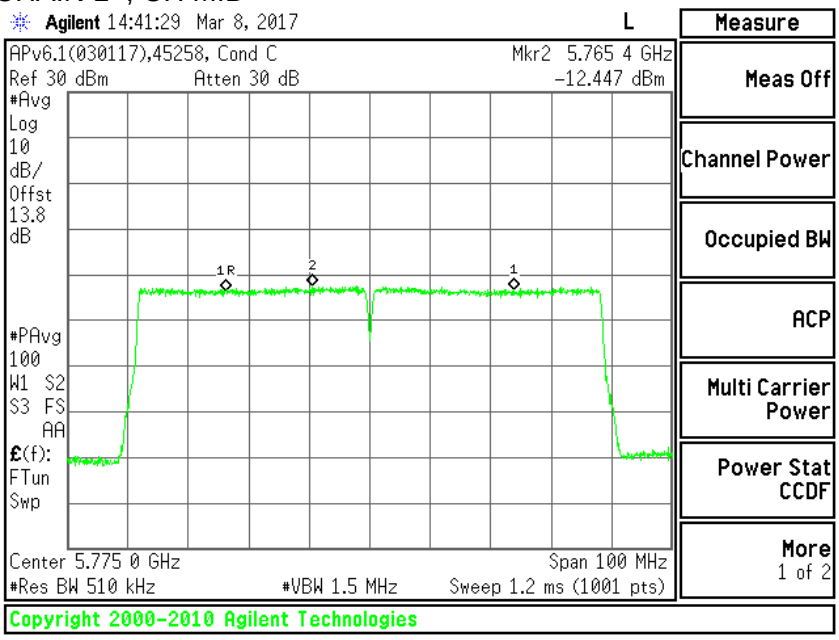
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
155	5775	-12.45	-11.95	-9.18	17.00	-26.18
138	5690	-13.80	-13.31	-10.54	17.00	-27.54

CHAIN 0 , CH MID



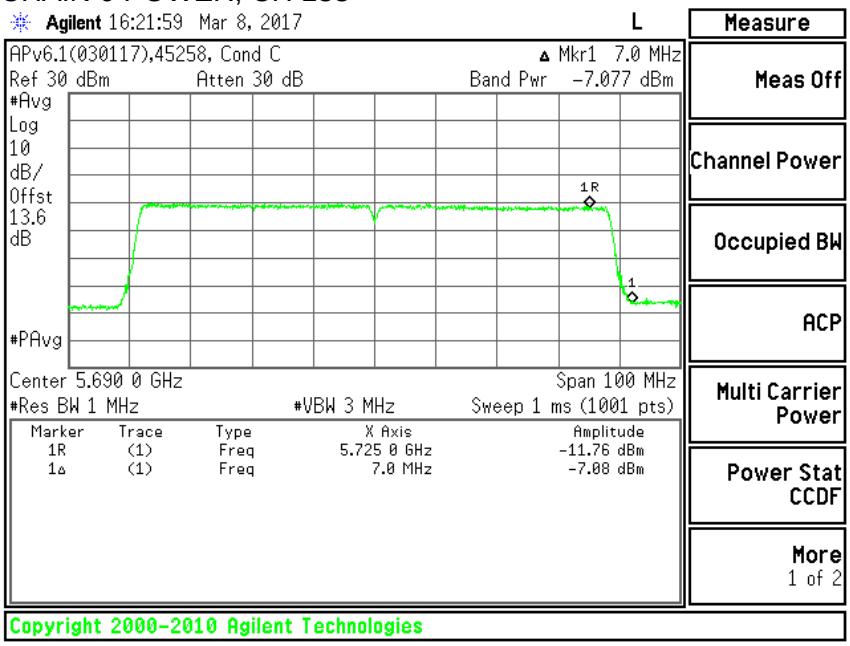
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -12.445dBm

CHAIN 1 , CH MID



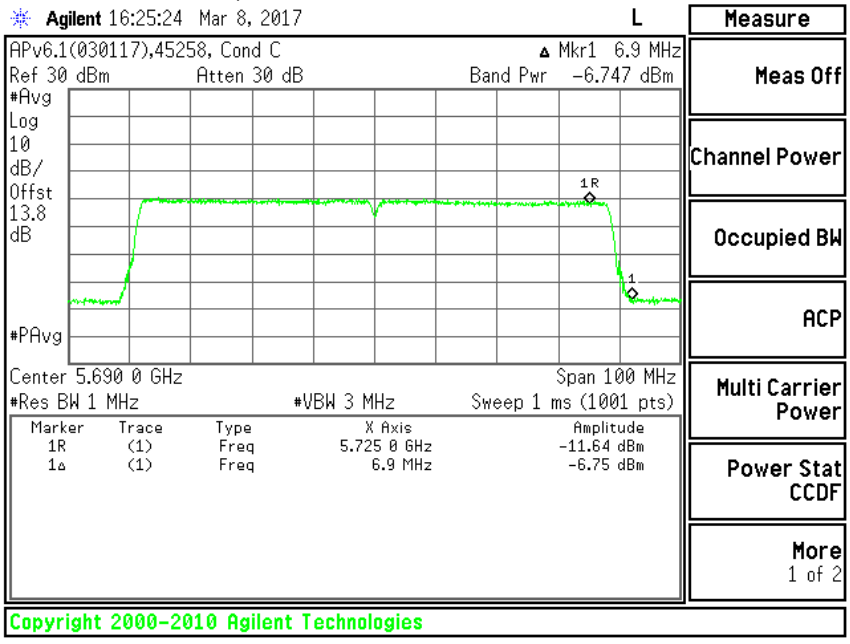
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -11.947dBm

CHAIN 0 POWER, CH 138



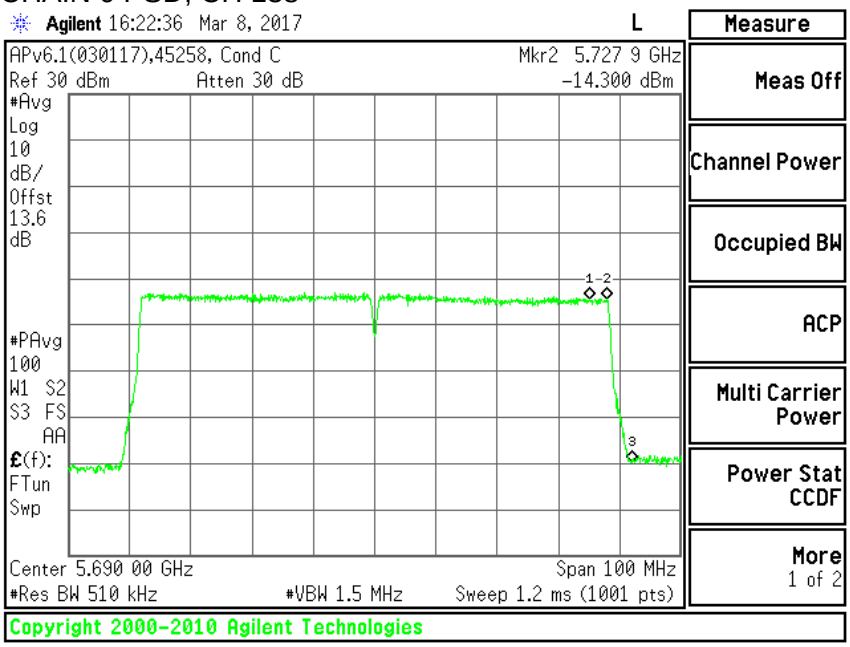
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -6.577dBm

CHAIN 1 POWER, CH 138



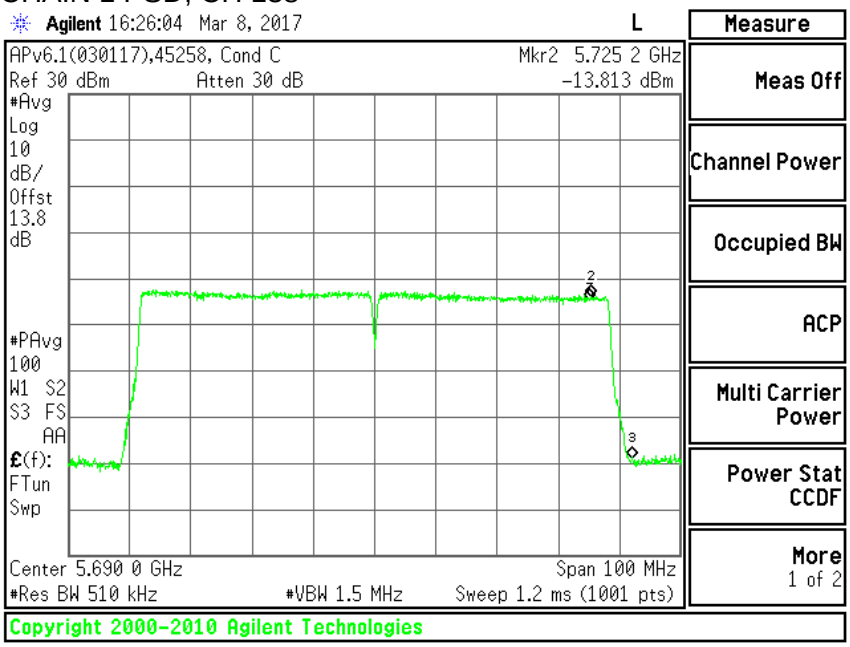
*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -6.247dBm

CHAIN 0 PSD, CH 138



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -13.8dBm

CHAIN 1 PSD, CH 138



*Note: Manufacturer's cable loss value was updated to 1.1dB, therefore the new measured value is -13.313dBm

10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

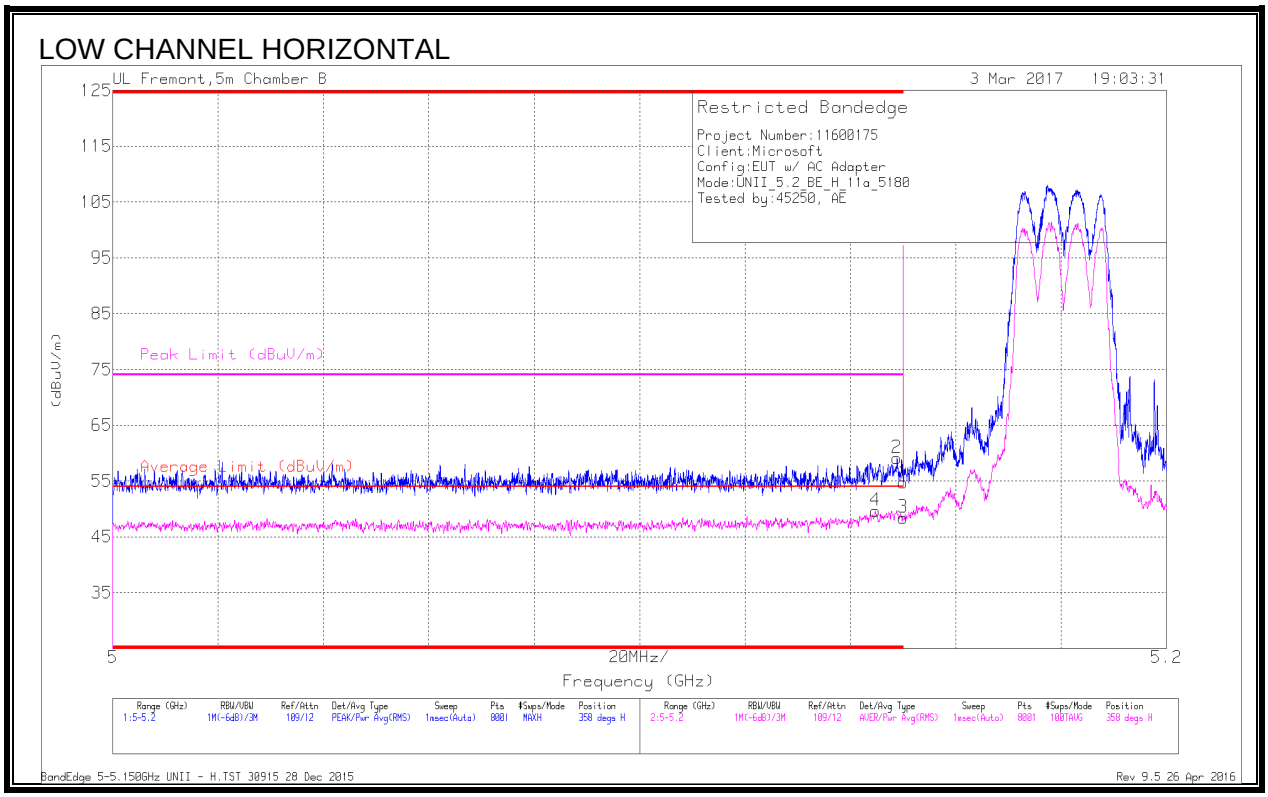
For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

10.1.1. 11a 2TX MODE IN THE 5.2GHz BAND

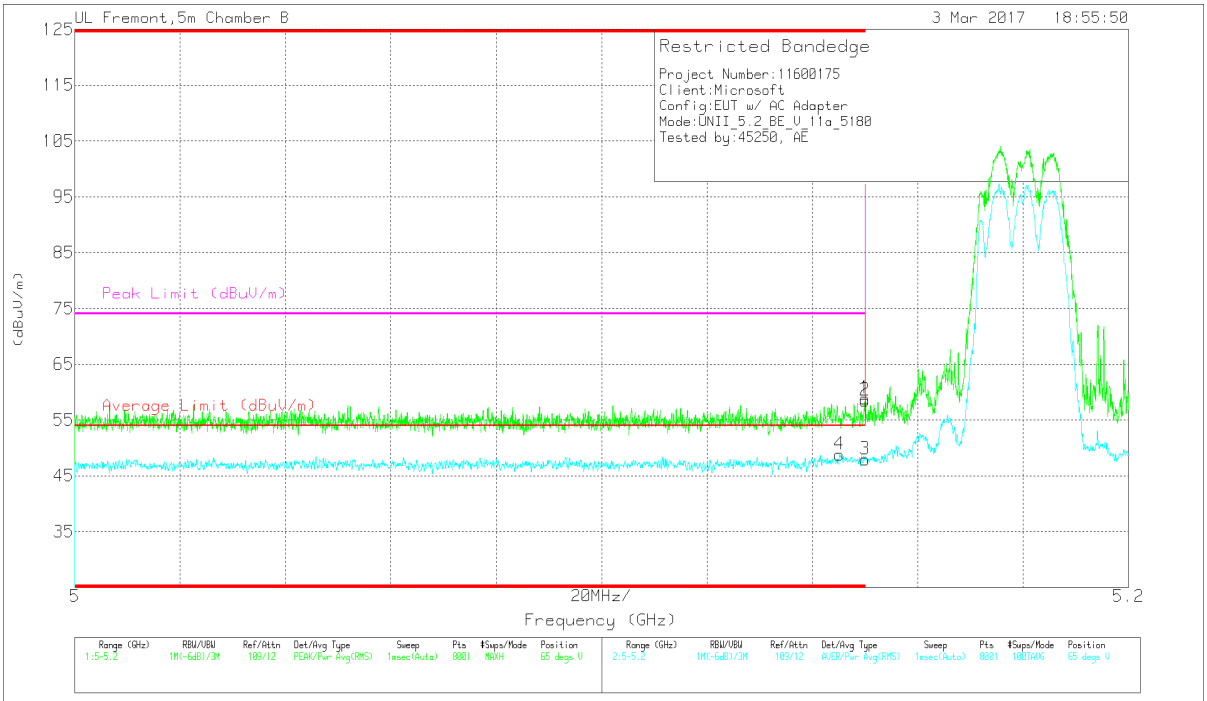
RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.149	43.02	Pk	34.2	-18.1	59.12	-	-	74	-14.88	358	284	H
4	* 5.145	33.29	RMS	34.2	-17.8	49.69	54	-4.31	-	-	358	284	H
1	5.15	38.63	Pk	34.2	-18.1	54.73	-	-	74	-19.27	358	284	H
3	5.15	32.31	RMS	34.2	-18.1	48.41	54	-5.59	-	-	358	284	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

LOW CHANNEL VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.15	42.39	Pk	34.2	-18.1	58.49	-	-	74	-15.51	65	352	V
4	* 5.145	32.39	RMS	34.2	-17.8	48.79	54	-5.21	-	-	65	352	V
1	5.15	42.79	Pk	34.2	-18.1	58.89	-	-	74	-15.11	65	352	V
3	5.15	31.81	RMS	34.2	-18.1	47.91	54	-6.09	-	-	65	352	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection