CERTIFICATION TEST REPORT

Report Number. : 11789904-E1V4

Applicant	:	MICROSOFT CORP ONE MICROSOFT WAY REDMOND, WA 98052, U.S.A.
Model	:	1782
FCC ID	:	C3K1782
IC	:	3048A-1782
EUT Description	:	PORTABLE COMPUTING DEVICE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E INDUSTRY CANADA RSS - 247 ISSUE 2

Date Of Issue:
December 20, 2017

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	7/07/17	Initial Issue	---
V2	12/07/17	Added DFS data	F. de Anda
V3	12/13/17	Updated section 5.5	C. Susa
V4	12/20/17	Updated section 5.5, Added section 10.5	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: 1782

SERIAL NUMBER: 158395400000226

DATE TESTED: June 16th, 2017 – December 20th, 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:

Francisco de Anda
Program Manager
UL Verification Services Inc.

Prepared By:

Clifford Susa
Project 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 v01r04, 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%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a portable 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	13.14	20.61
5180 - 5240	802.11n HT20	13.09	20.37
5190 - 5230	802.11n HT40	13.20	20.89
5210	802.11ac VHT80	11.23	13.27

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5260 - 5320	802.11a	16.25	42.17
5260 - 5320	802.11n HT20	16.18	41.50
5270 - 5310	802.11n HT40	13.96	24.89
5290	802.11ac VHT80	11.09	12.85

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5500 - 5700	802.11a	15.74	37.50
5500 - 5700	802.11n HT20	15.68	36.98
5510 - 5670	802.11n HT40	13.85	24.27
5530 - 5610	802.11ac VHT80	12.59	18.16

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2TX			
5745 - 5825	802.11a	15.81	38.11
5745 - 5825	802.11n HT20	15.80	38.02
5755 - 5795	802.11n HT40	13.85	24.27
5775	802.11ac VHT80	12.75	18.84

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 integrated antennas, with a maximum gain as follows:

Frequency Band (GHz)	Antenna Gain (dBi)	
	Chain 0 (A)	Chain 1 (B)
5.2	3.30	3.10
5.3	3.50	3.80
5.5	5.30	5.30
5.8	4.40	4.50

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v14.201.151

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

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, 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 with the display in 90° and 45° orientations, it was determined that 90° orientation was the worst-case orientation. Therefore, all final radiated testing was performed with the display EUT at 90° 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.

For simultaneous transmission of multiple channels in the BT/BLE and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.

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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

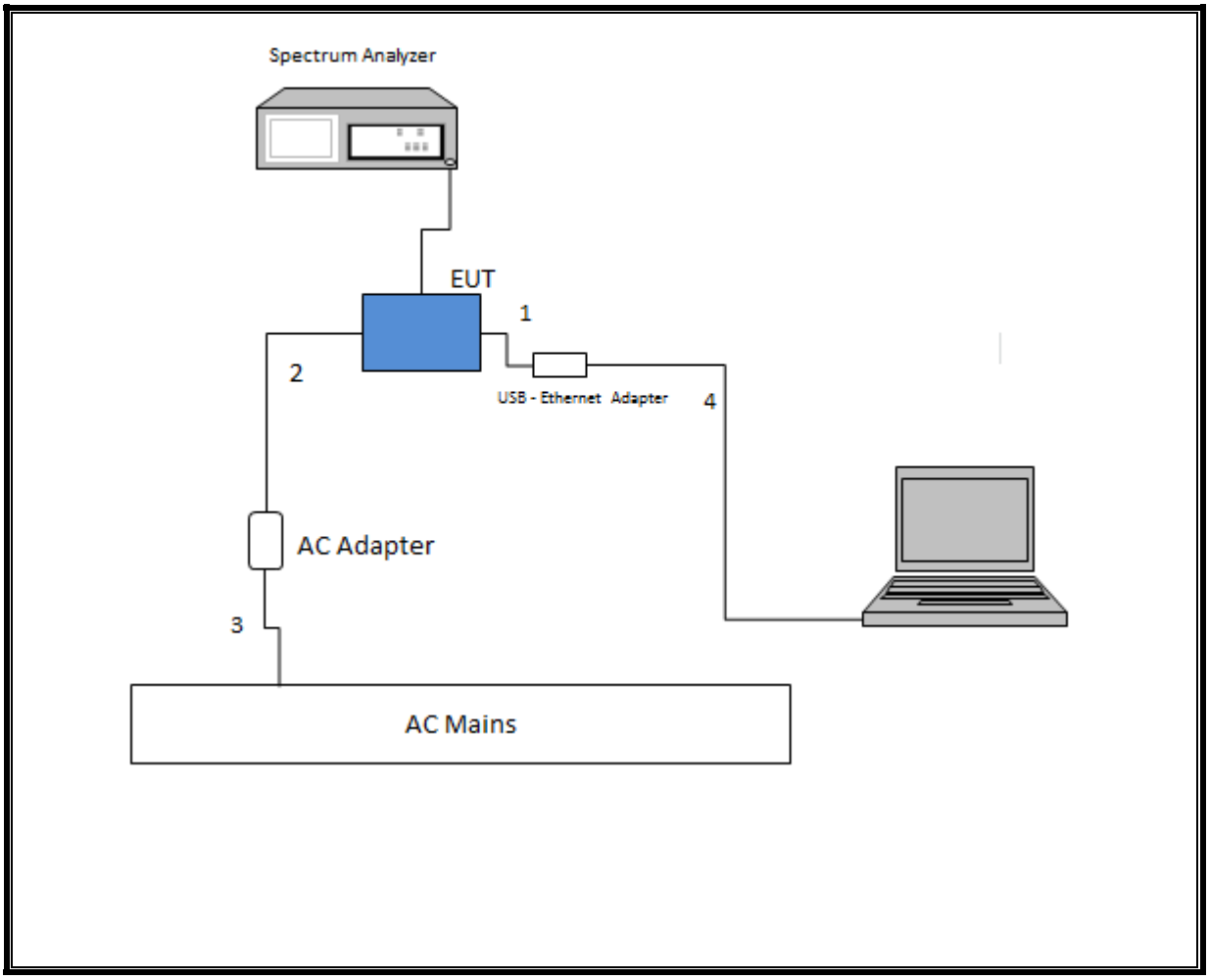
I/O CABLES

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	

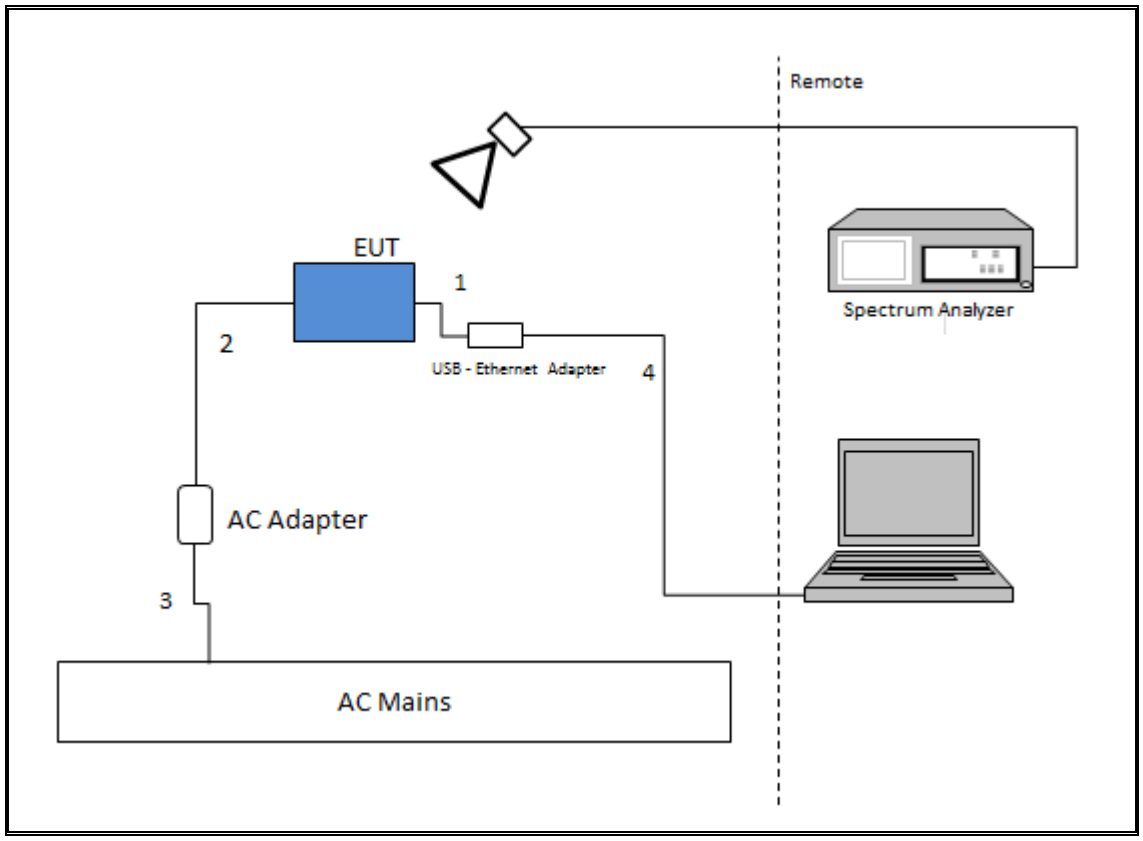
TEST SETUP

The EUT was tested connected to a support Laptop via RJ45/USB adapter. Test software exercised the radio.

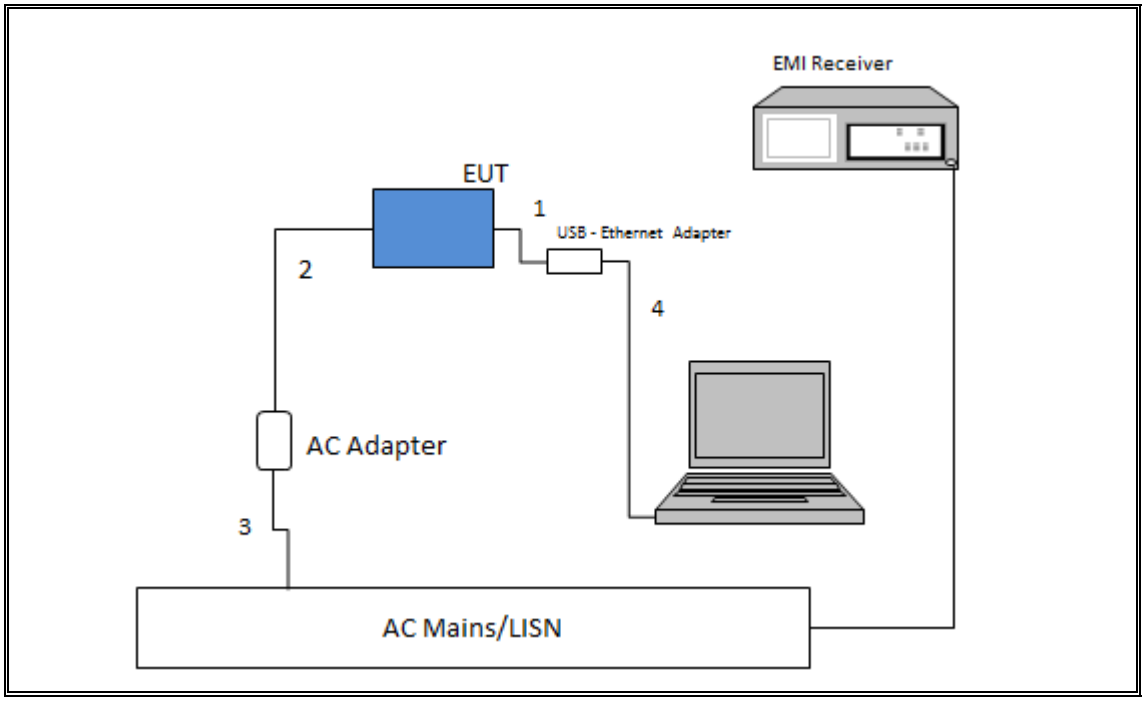
SETUP DIAGRAM FOR ANTENNA PORT CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR AC LINE 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.	JB1	T130	09/23/17
Antenna, Horn, 1-18GHz	ETS Lindgren	3117	T711	01/30/18
Antenna, Horn, 1-18GHz	ETS Lindgren	3117	T712	01/30/18
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T481	08/01/17
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T484	08/01/17
RF Preamplifier, 1 - 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	08/01/17
RF Preamplifier, 1 - 7GHz	Amplical	AMP1G6-10-27	T1370	05/15/18
RF Preamplifier, 1 - 7GHz	Miteq	AMF-4D-01000800-30-29P	T1574	08/26/17
RF Preamplifier, 10kHz - 1GHz	Sonoma	310N	T300	11/10/17
Spectrum Analyzer	Agilent (Keysight) Technologies	E4440A	T199	07/27/17
Spectrum Analyzer	Keysight	N9030A	T1466	04/11/18
Spectrum Analyzer	Keysight	N9030A	T905	01/11/18
LISN	Fischer Custom Communications	FCC-LISN-50/250-25-2	T24	03/01/18
EMI Receiver	Rohde & Schwarz	ESR	T1436	01/06/18
Antenna, Horn, 18-26 GHz	ARA	MWH-1826/B	T447	06/30/17
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	04/29/18
Antenna, Horn, 26-40 GHz	ARA	MWH-2640/B	T90	08/19/17
Power Meter	Keysight	N1911A	T1269	03/29/18
Power Sensor	Keysight	N1921A	T1224	03/29/18
Antenna, Horn, 1-18GHz	ETS Lindgren	3117	T119	03/29/18
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T421	01/25/18
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T425	01/25/18
Spectrum Analyzer	Keysight	N9030A	T340	12/15/18
RF Preamplifier, 1 – 18GHz	Miteq	AFS42-00101800-25-S-42	T742	01/25/18
Filter, BRF, 5150-5350MHz	Micro-Tronics	BRC50703	T1518	11/29/18

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	9.5, 12/01/16
Antenna Port Software	UL	UL RF	6.9, 6/15/17
Conducted Emissions Software	UL	UL EMC	9.5, 5/26/15

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 789033 D02 v01r04, Section B.

26 dB Emission BW: KDB 789033 D02 v01r04, Section C.

99% Occupied BW: KDB 789033 D02 v01r04, Section D.

Conducted Output Power: KDB 789033 D02 v01r04, Section E.3.b (Method PM-G) and KDB 789033 D02 v01r04, Section E.2.b (Method SA-1)

Power Spectral Density: KDB 789033 D02 v01r04, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v01r04, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r04, Sections G.3, G.4, and G.5.

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

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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	3.145	3.170	0.992	99.2%	0.00	0.010
802.11n HT20 2Tx	9.900	9.930	0.997	99.7%	0.00	0.010
802.11n HT40 2Tx	4.792	4.816	0.995	99.5%	0.00	0.010
802.11ac HT80 2Tx	2.235	2.260	0.989	98.9%	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

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9. ANTENNA PORT TEST RESULTS

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

9.1.1. 26 dB BANDWIDTH

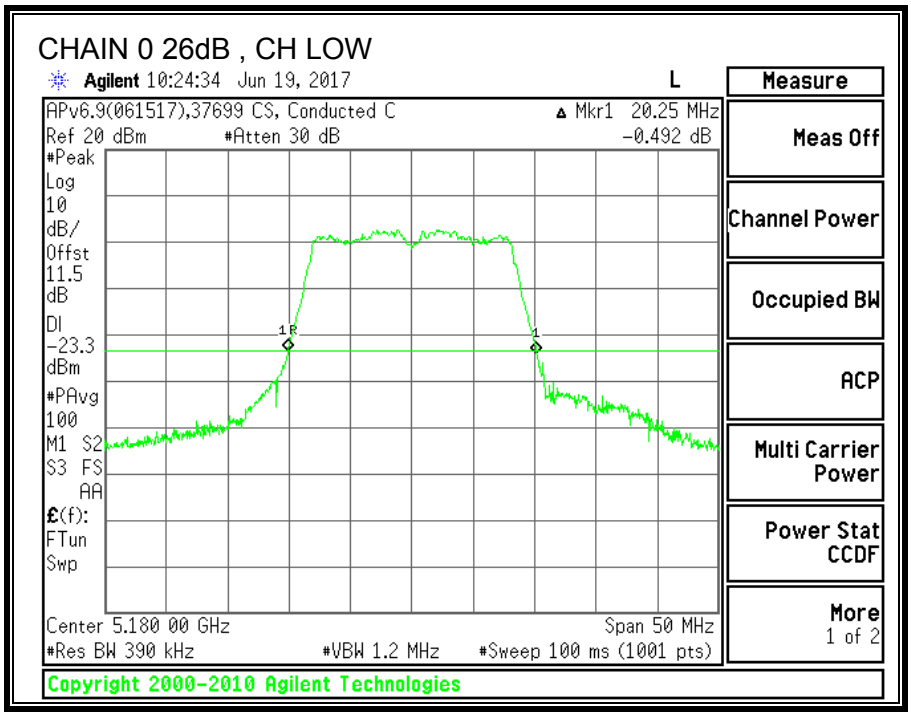
LIMITS

None; for reporting purposes only.

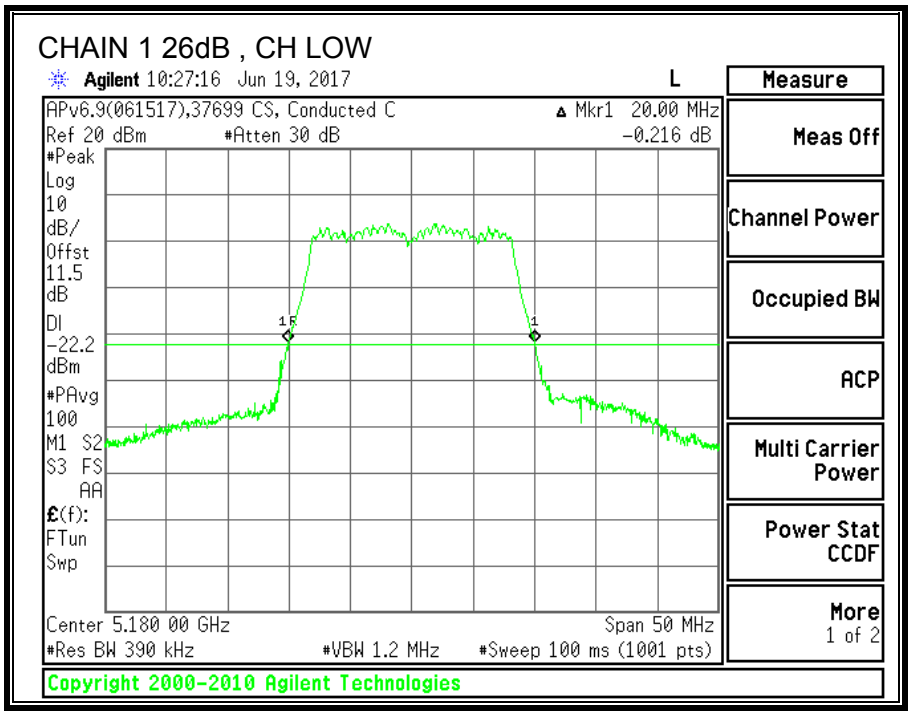
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5180	20.25	20.00
Mid	5200	20.20	20.05
High	5240	20.25	20.05

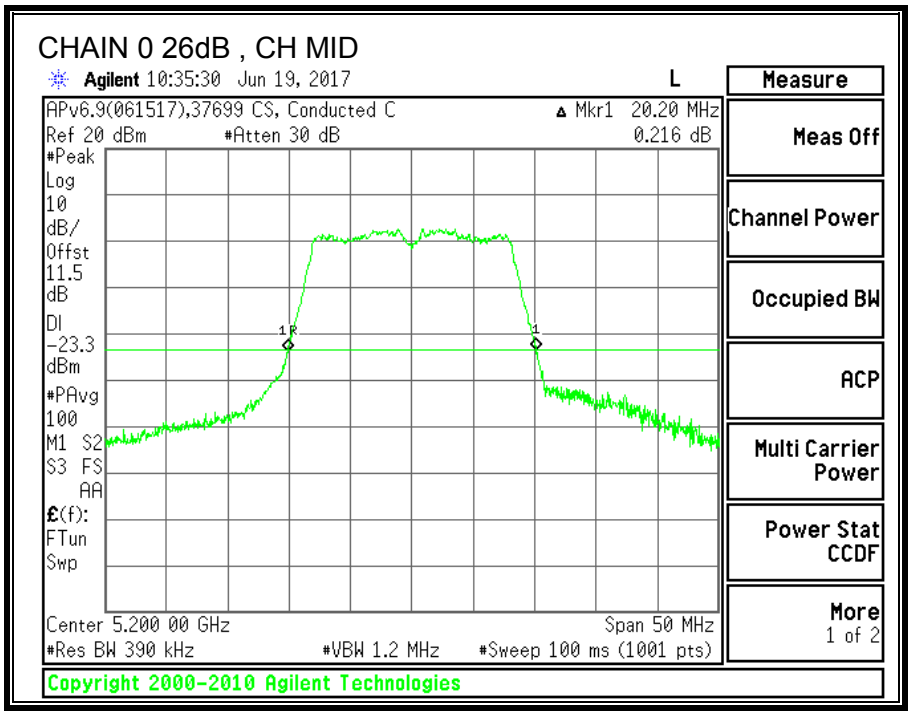
CHAIN 0 26dB , CH LOW



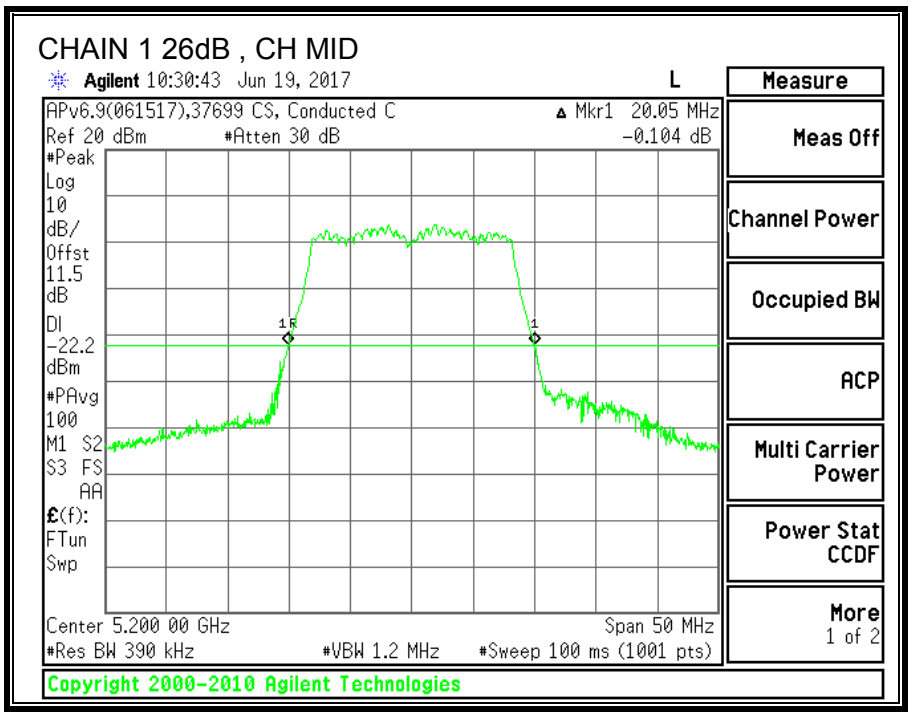
CHAIN 1 26dB , CH LOW



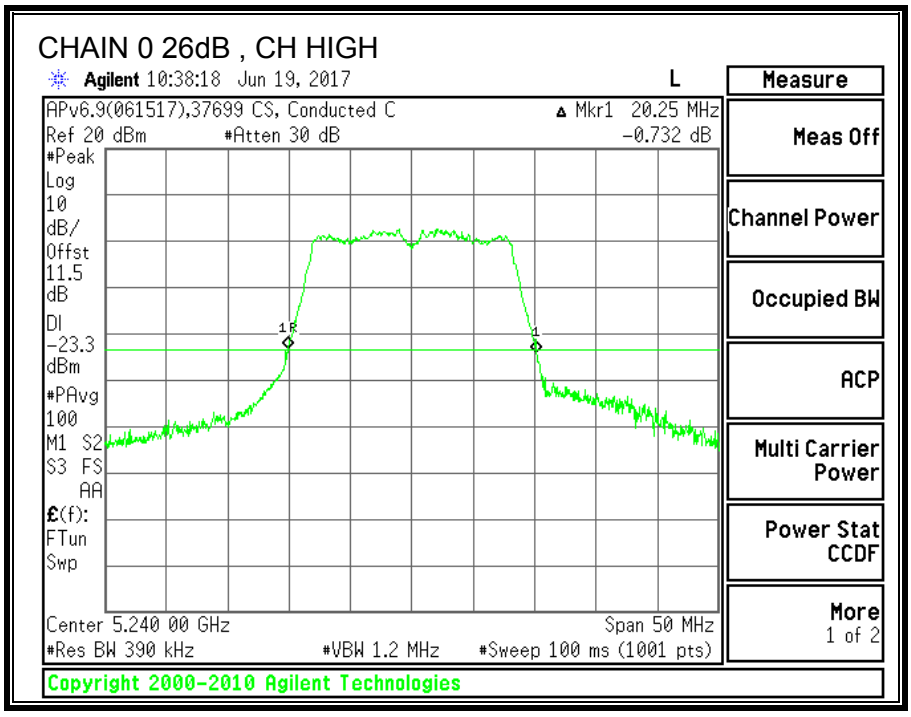
CHAIN 0 26dB , CH MID



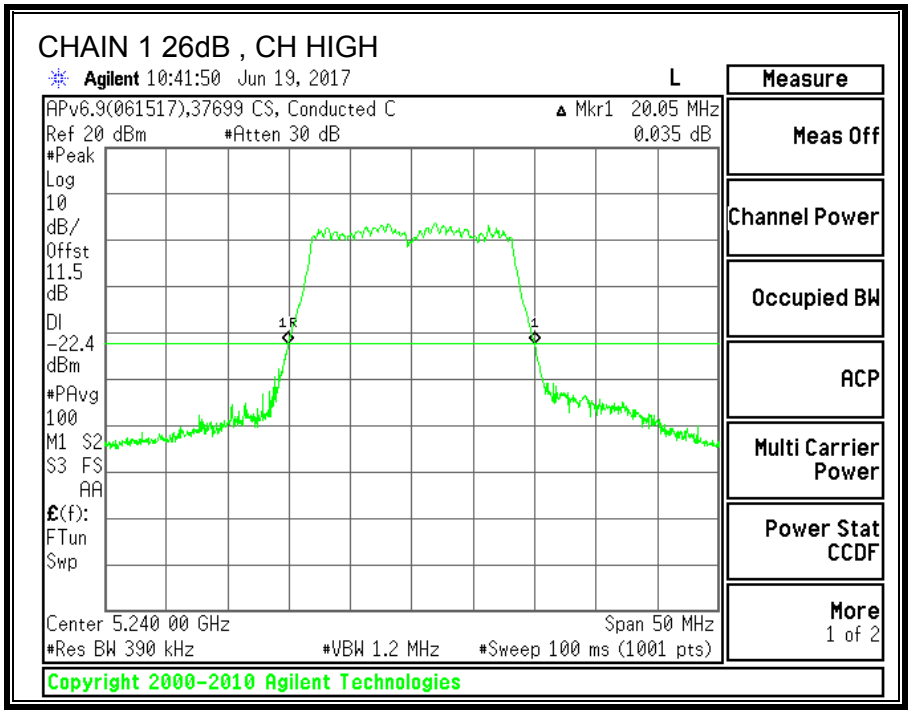
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5180	16.5087	16.4913
Mid	5200	16.5019	16.5018
High	5240	16.4914	16.4840

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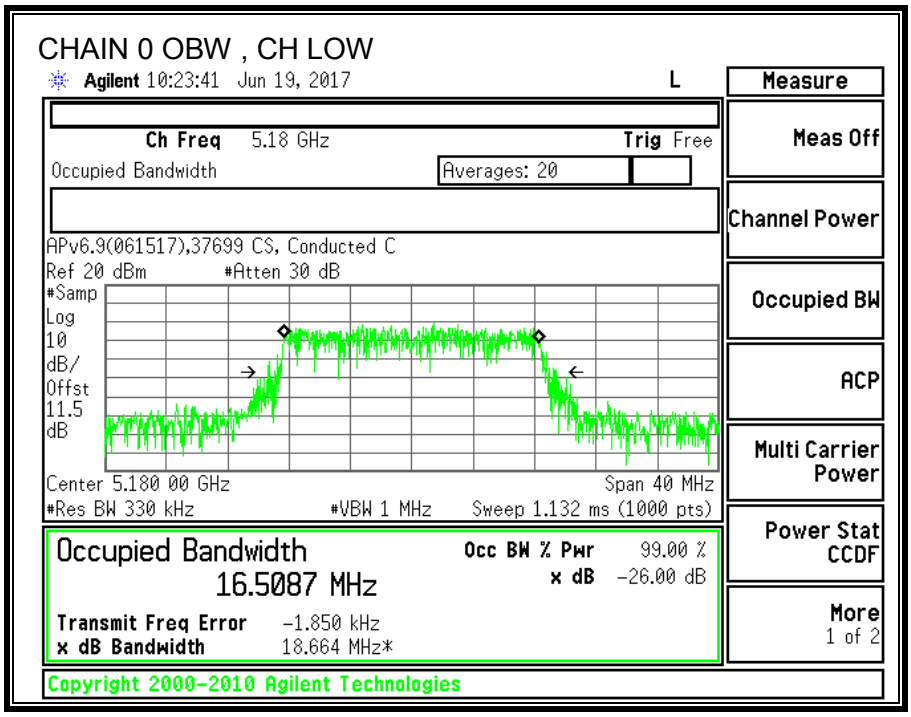
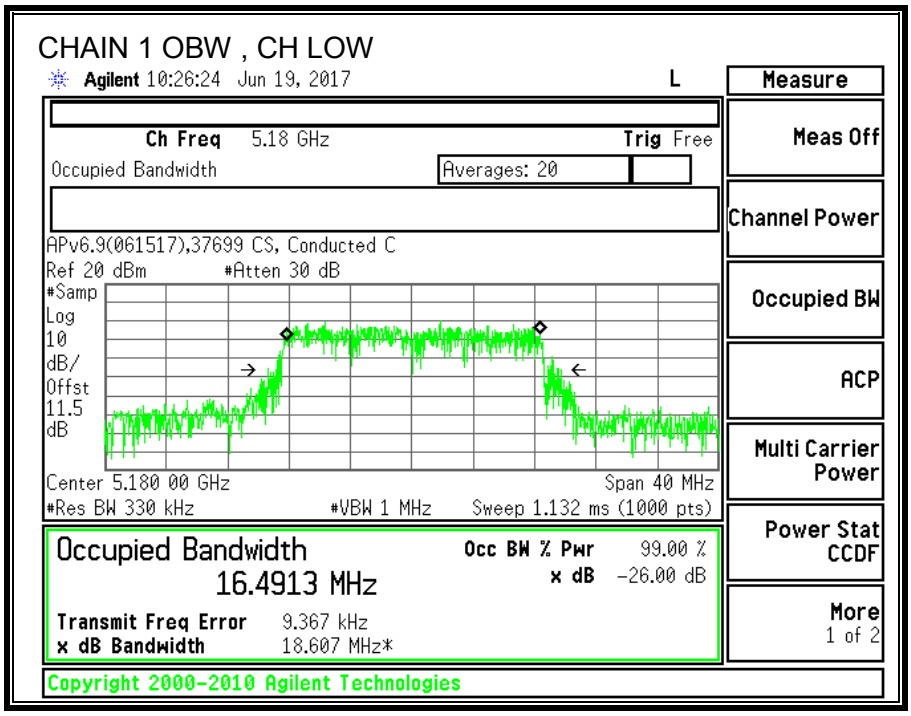
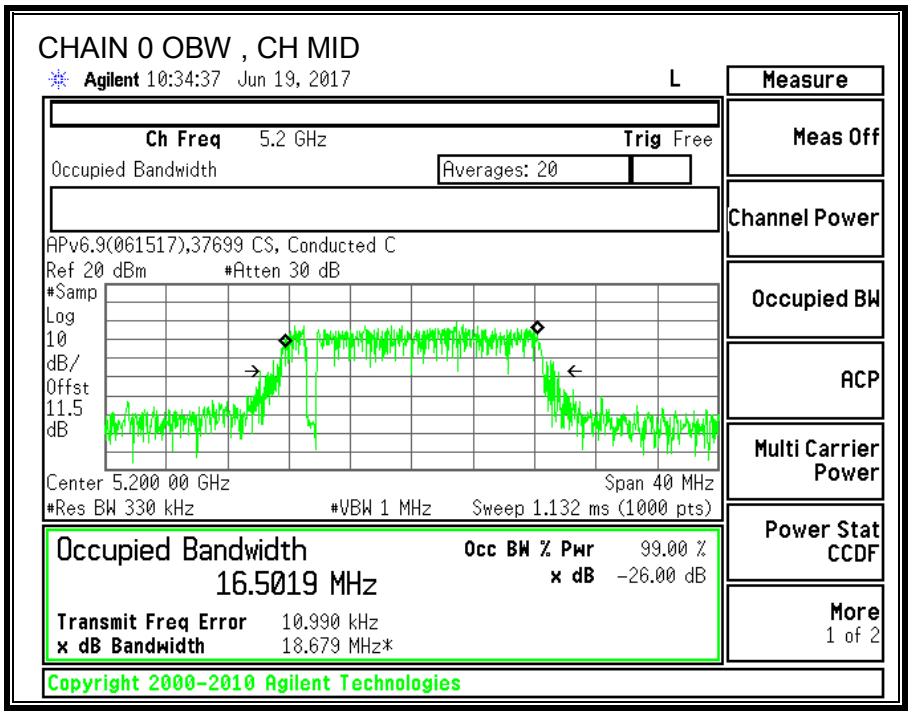
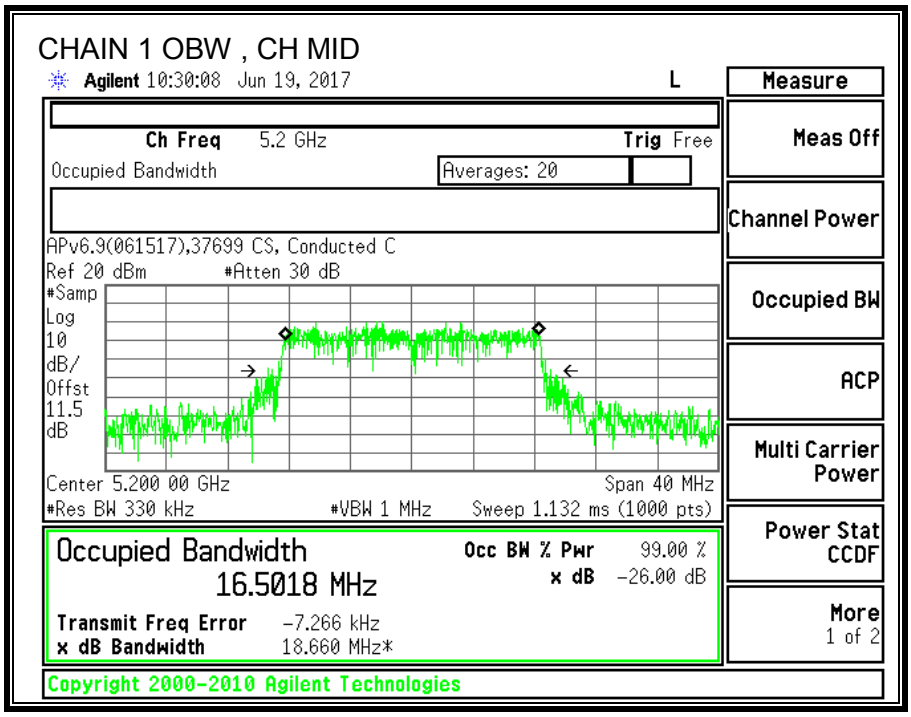
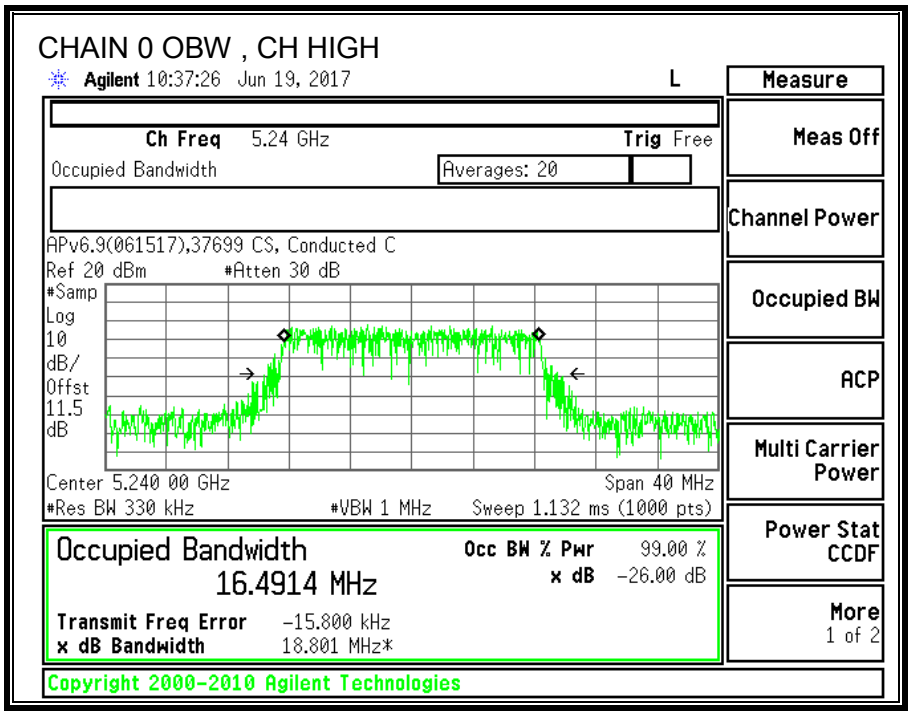
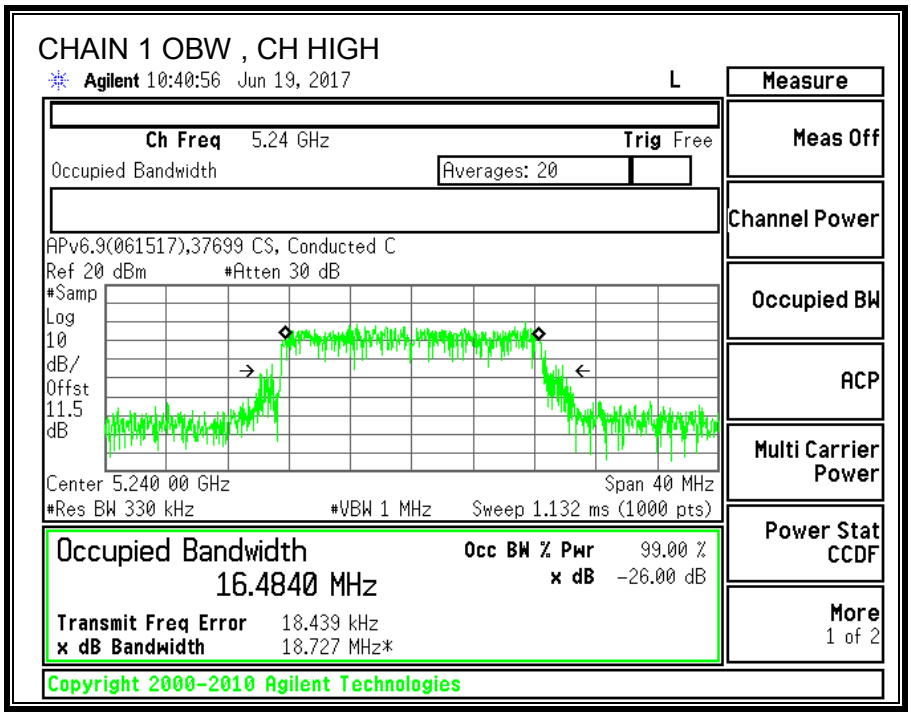












9.1.3. OUTPUT POWER AND PPSD

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)
3.30	3.10	3.20	6.21

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.00	16.49	3.20	6.21
Mid	5200	20.05	16.50	3.20	6.21
High	5240	20.05	16.48	3.20	6.21

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	22.17	18.97	18.97	10.79	10.00	3.79
Mid	5200	24.00	22.17	18.97	18.97	10.79	10.00	3.79
High	5240	24.00	22.17	18.97	18.97	10.79	10.00	3.79

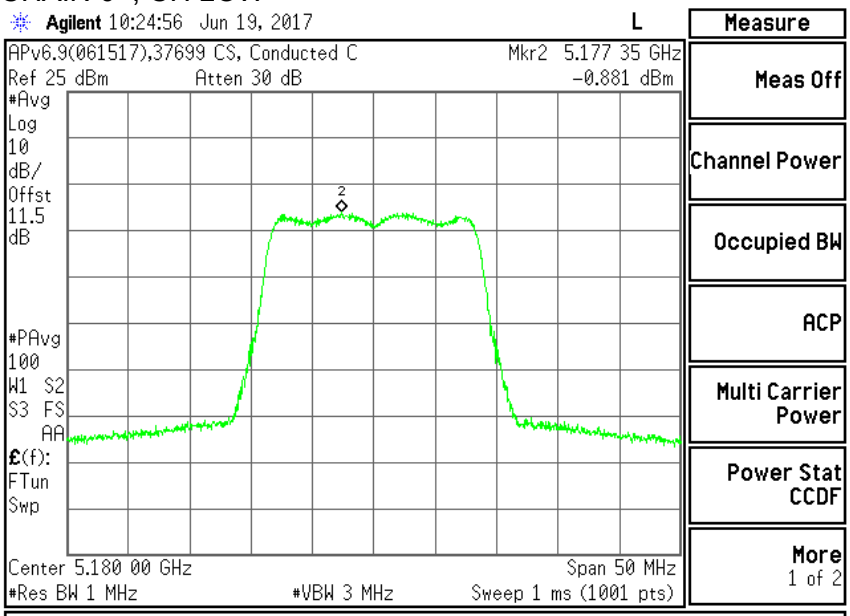
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.87	10.38	13.14	18.97	-5.83
Mid	5200	9.62	10.37	13.02	18.97	-5.95
High	5240	9.89	10.15	13.03	18.97	-5.94

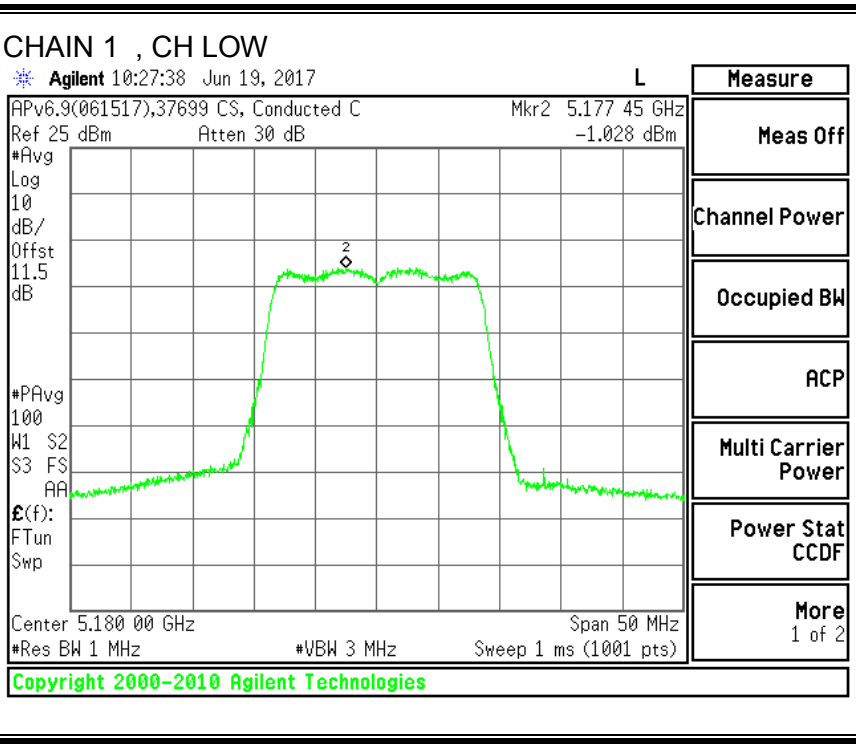
PPSD Results

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	5180	-0.88	-1.03	2.06	3.79	-1.73
Mid	5200	-1.12	-0.90	2.00	3.79	-1.79
High	5240	-0.98	-1.03	2.00	3.79	-1.79

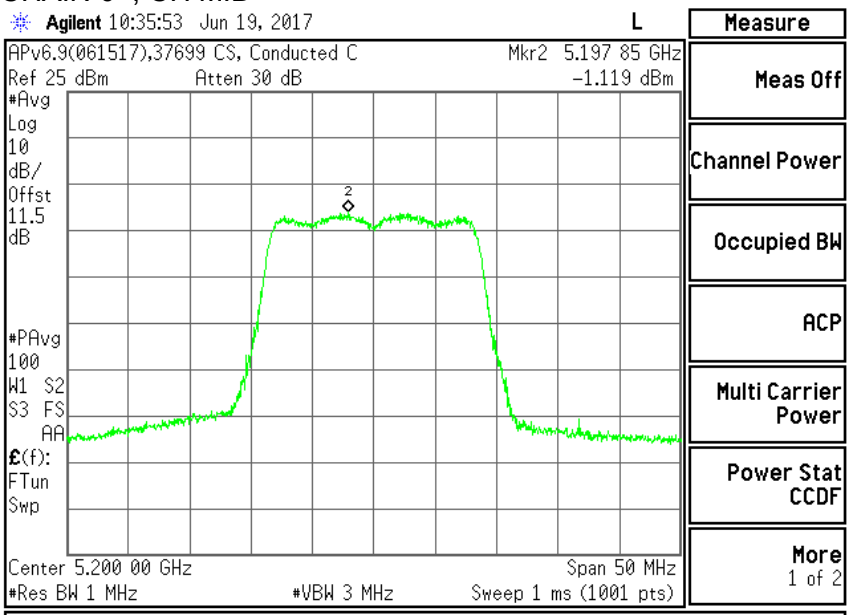
CHAIN 0 , CH LOW



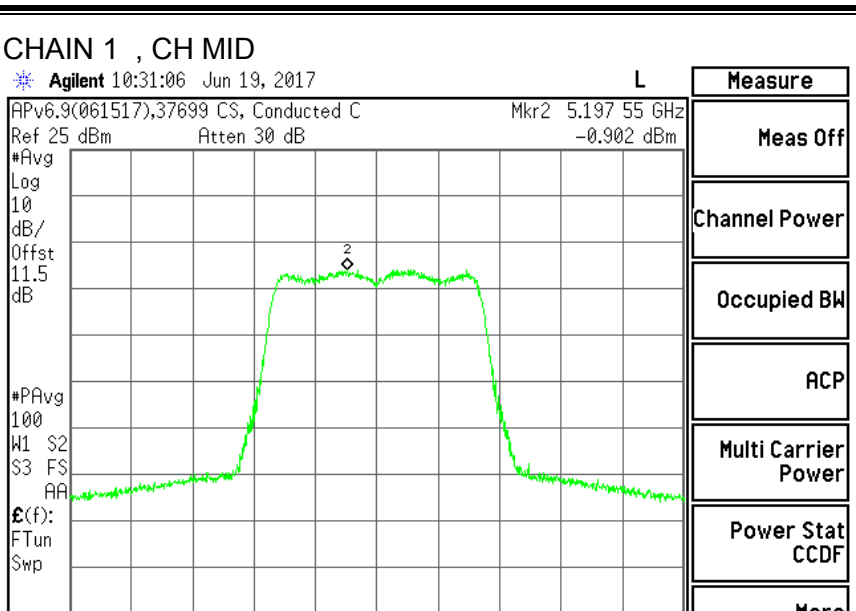
CHAIN 1 , CH LOW



CHAIN 0 , CH MID

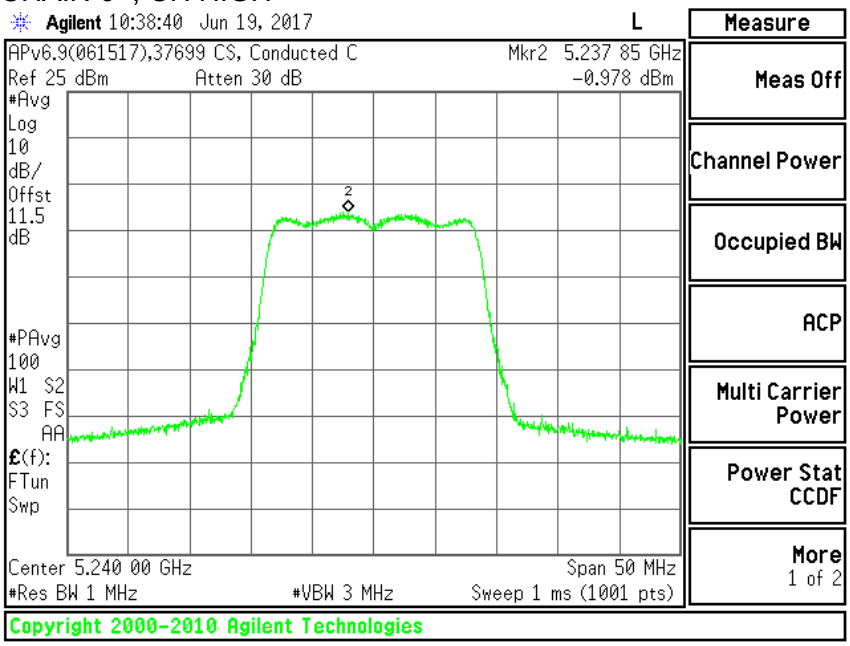


CHAIN 1 , CH MID

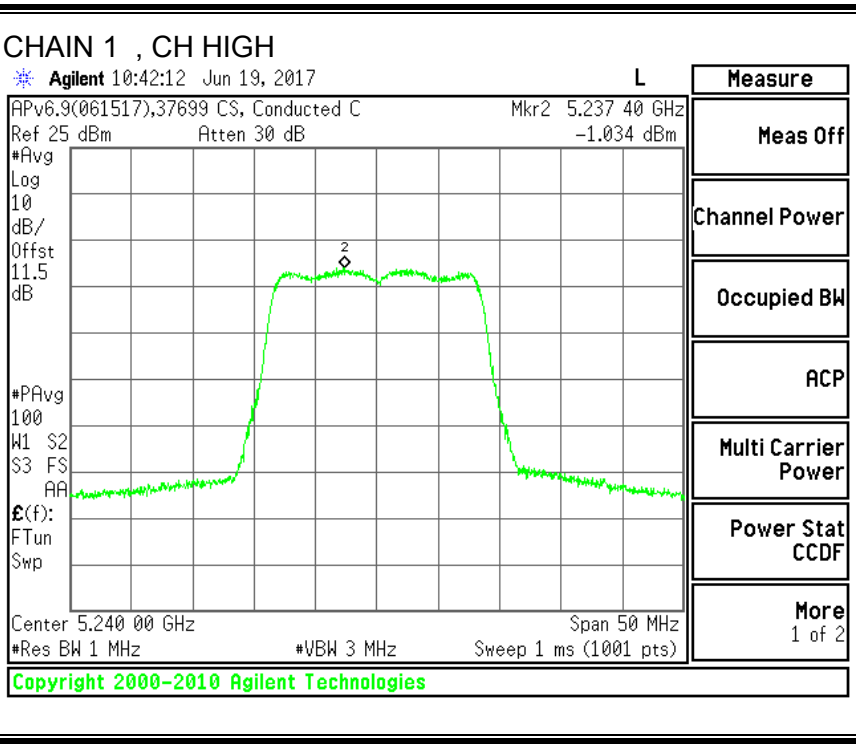


UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.2.1. 26 dB BANDWIDTH

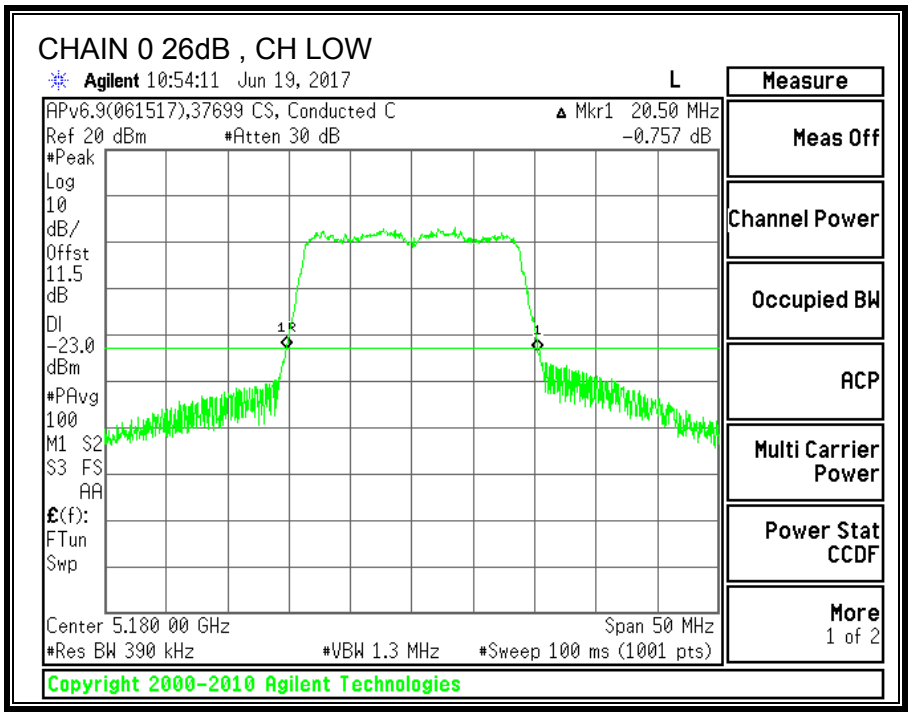
LIMITS

None; for reporting purposes only.

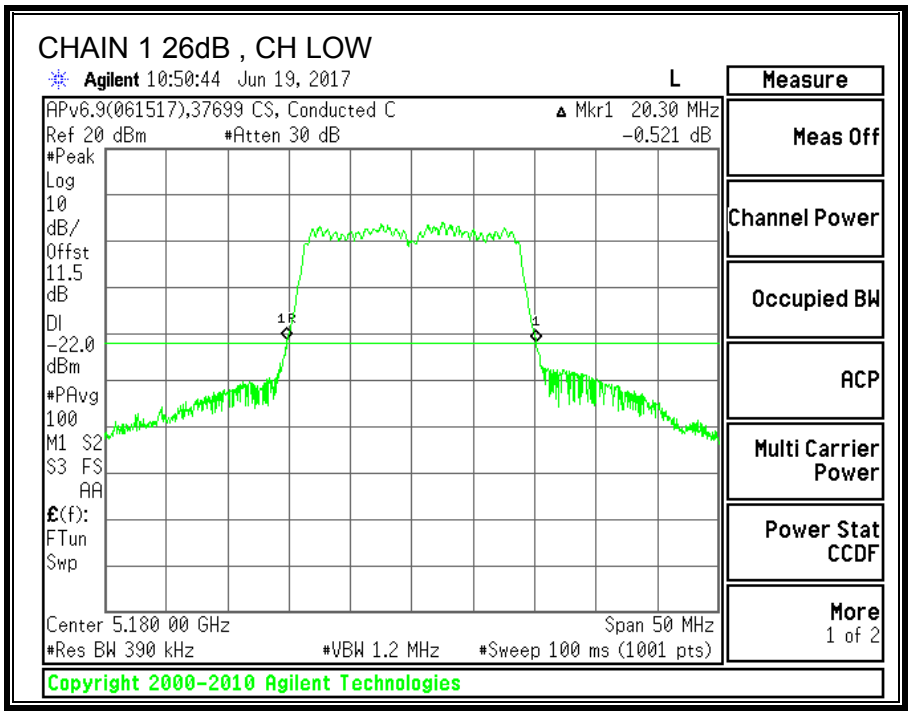
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5180	20.50	20.30
Mid	5200	20.5	20.35
High	5240	20.55	20.25

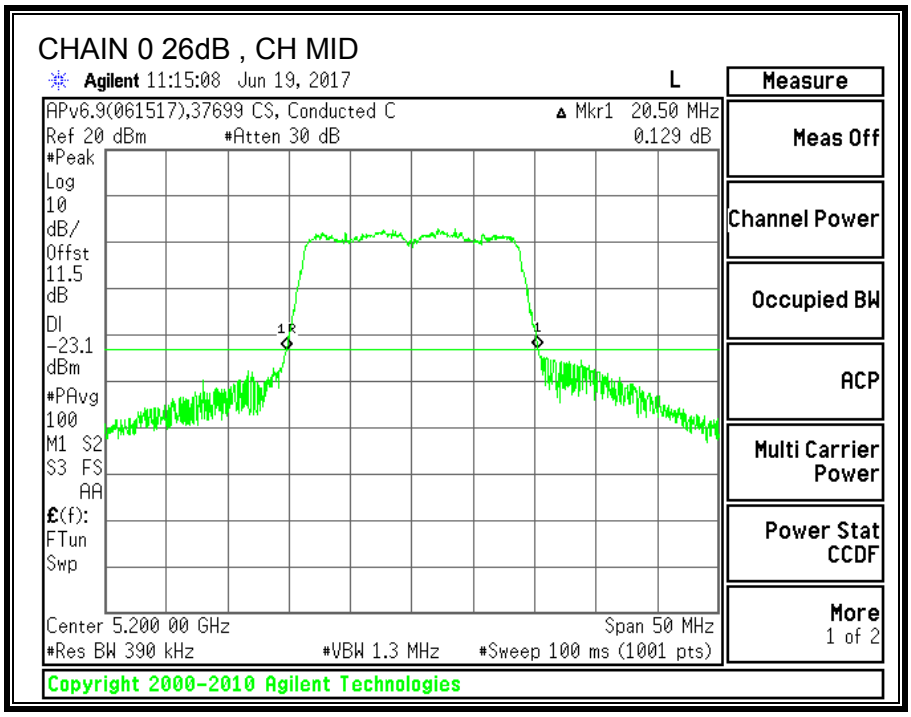
CHAIN 0 26dB , CH LOW



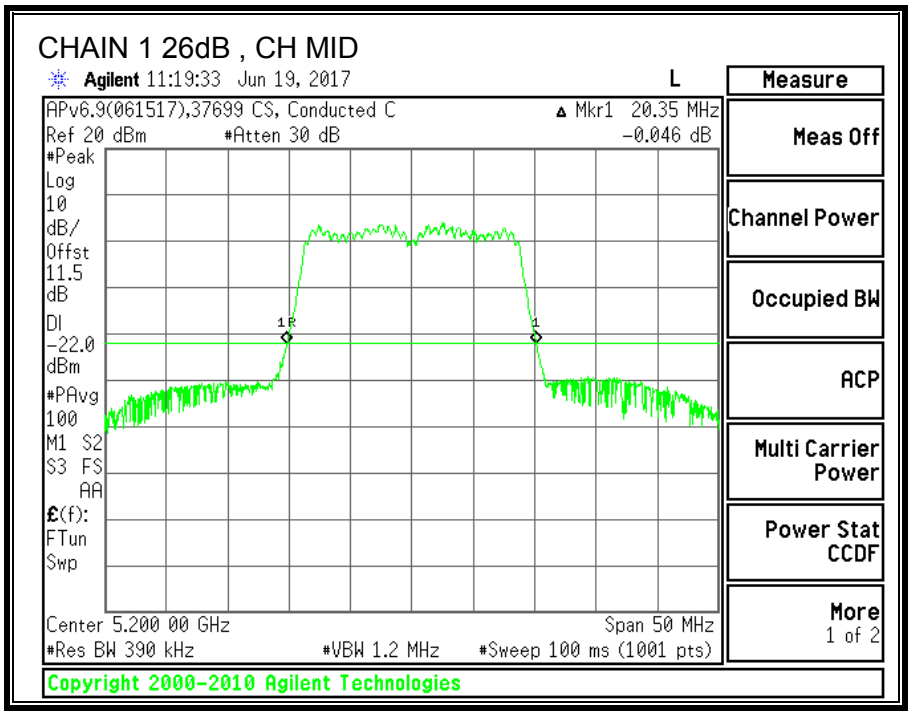
CHAIN 1 26dB , CH LOW



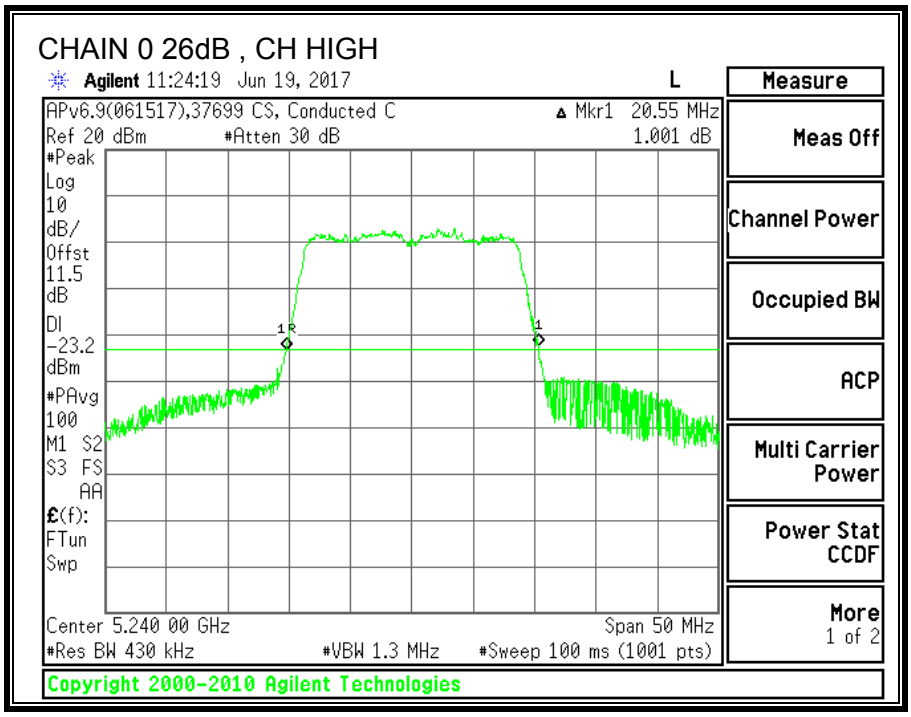
CHAIN 0 26dB , CH MID



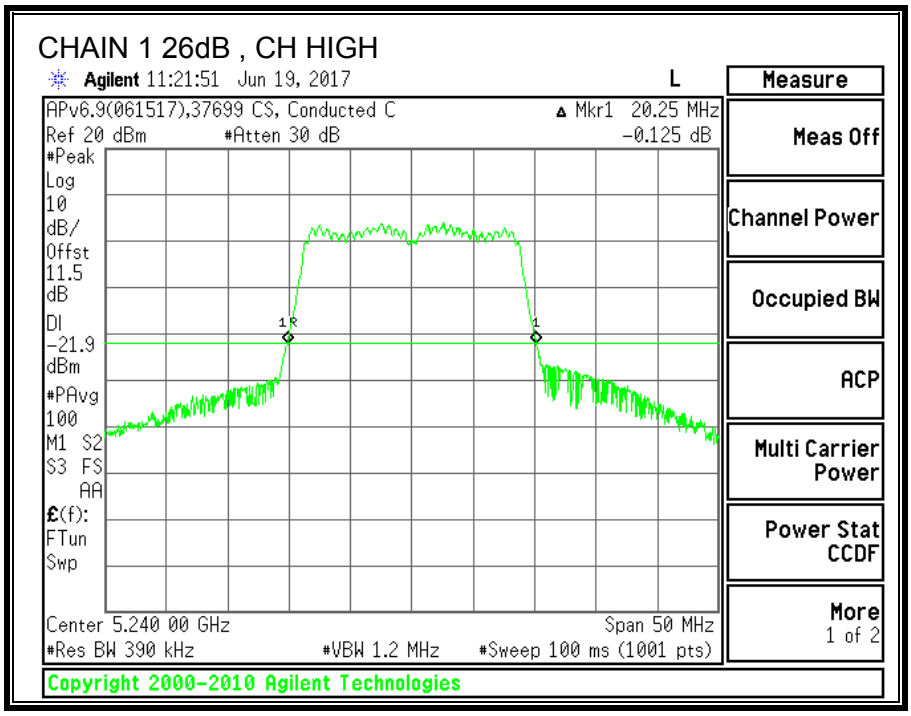
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.2.2. 99% BANDWIDTH

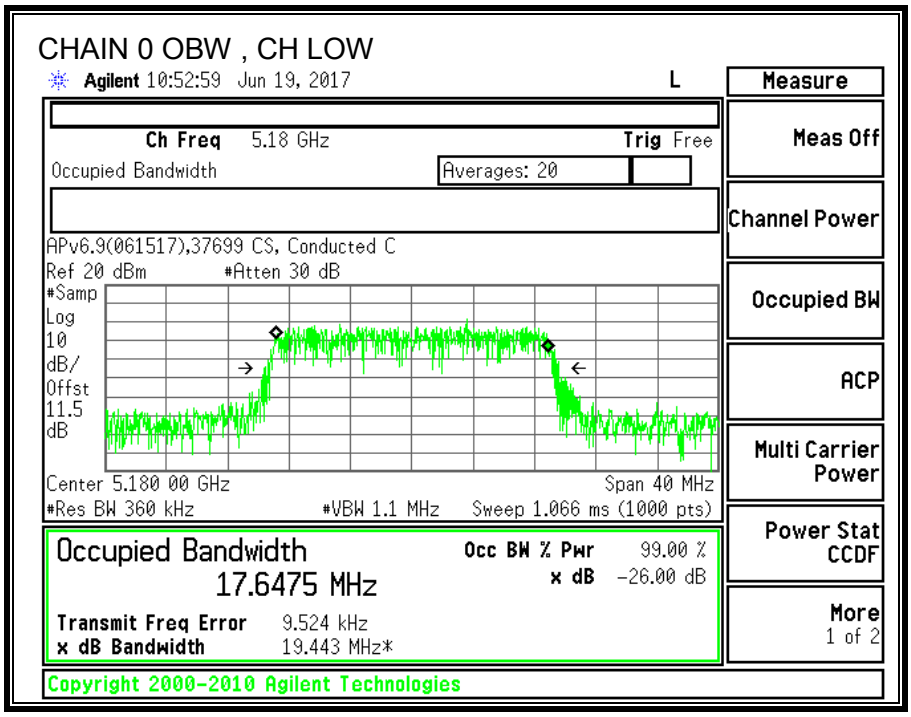
LIMITS

None; for reporting purposes only.

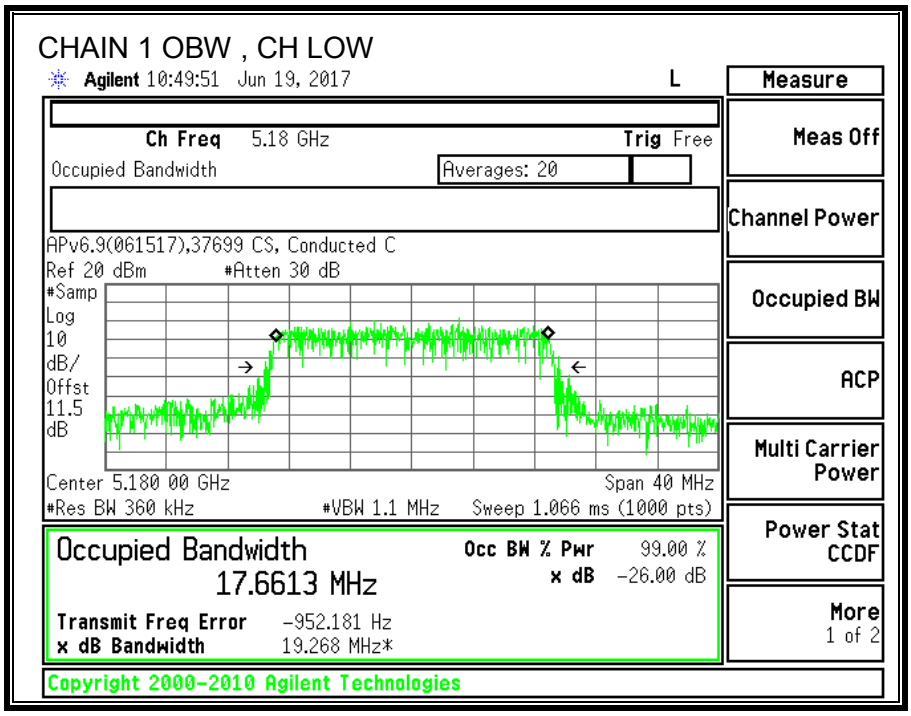
RESULTS

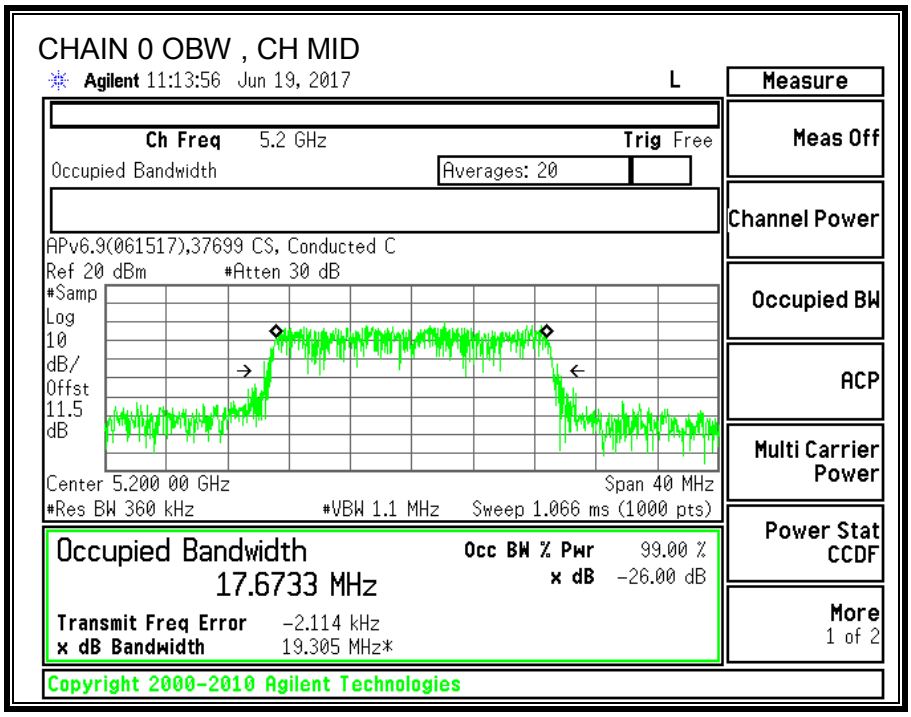
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5180	17.6475	17.6613
Mid	5200	17.6733	17.6860
High	5240	17.6635	17.6529

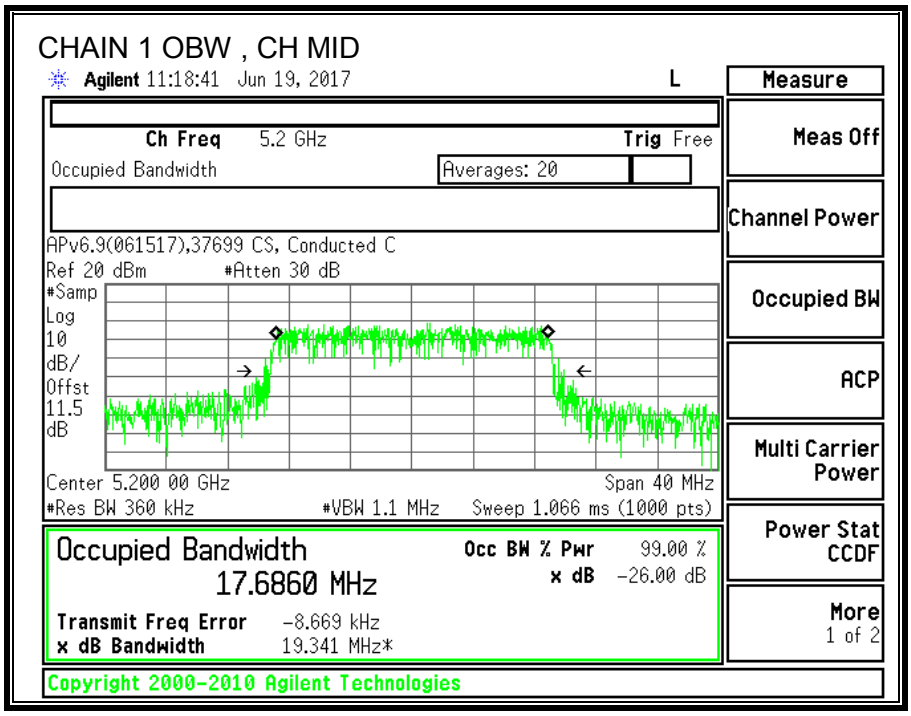
CHAIN 0 OBW , CH LOW

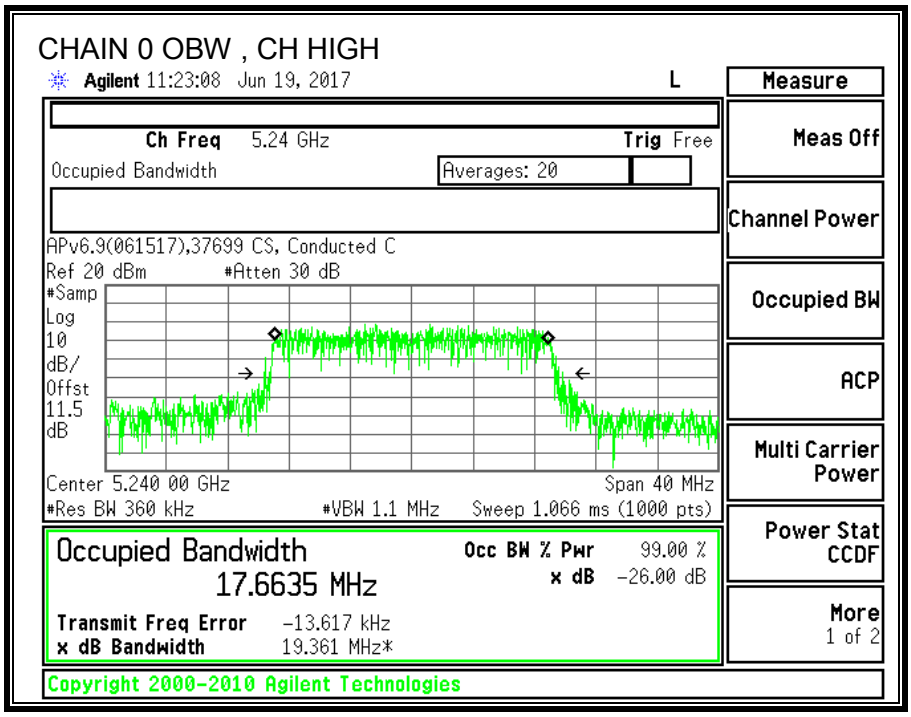


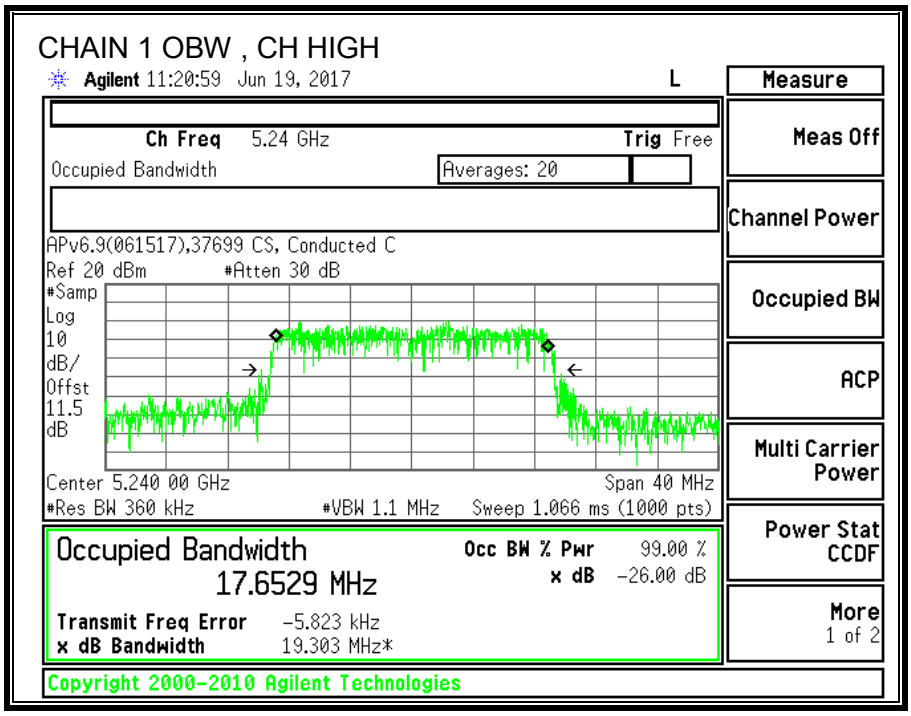
CHAIN 1 OBW , CH LOW











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)
3.30	3.10	3.20	6.21

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.30	17.65	3.20	6.21
Mid	5200	20.35	17.67	3.20	6.21
High	5240	20.25	17.65	3.20	6.21

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	22.47	19.27	19.27	10.79	10.00	3.79
Mid	5200	24.00	22.47	19.27	19.27	10.79	10.00	3.79
High	5240	24.00	22.47	19.27	19.27	10.79	10.00	3.79

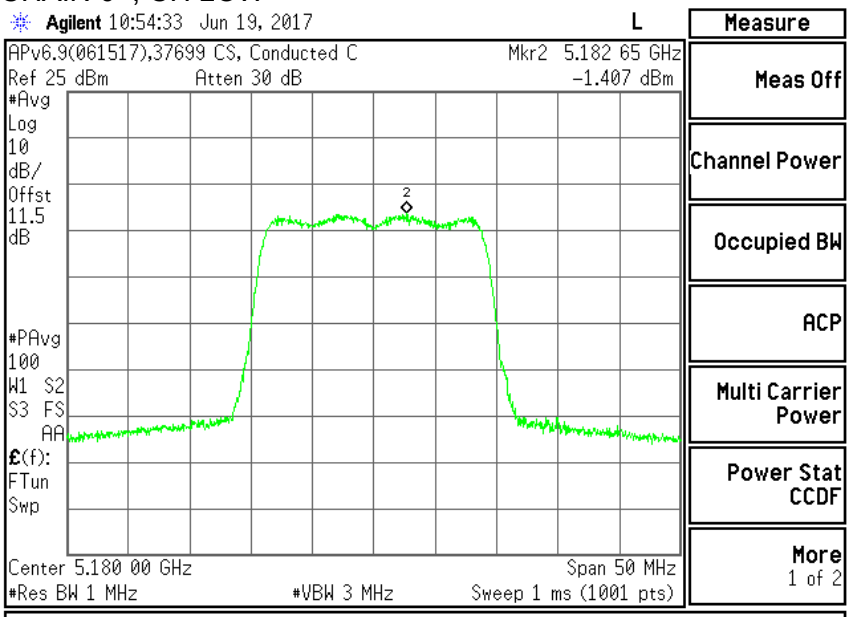
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	9.88	10.21	13.06	19.27	-6.21
Mid	5200	9.79	10.35	13.09	19.27	-6.18
High	5240	9.73	10.37	13.07	19.27	-6.20

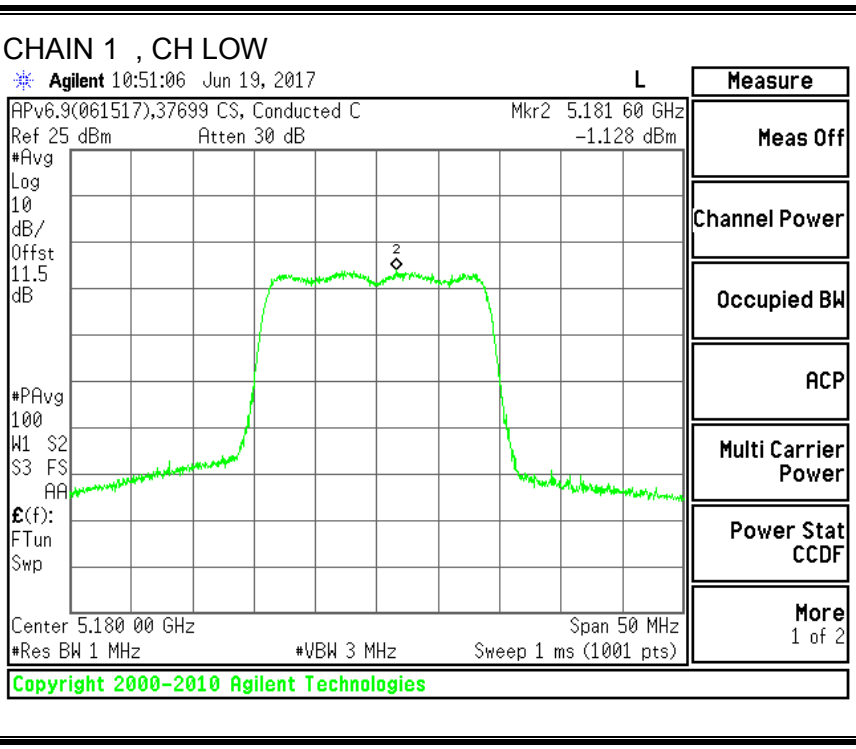
PPSD Results

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	-1.41	-1.13	1.75	3.79	-2.04
Mid	5200	-1.75	-1.39	1.45	3.79	-2.34
High	5240	-1.40	-1.08	1.77	3.79	-2.02

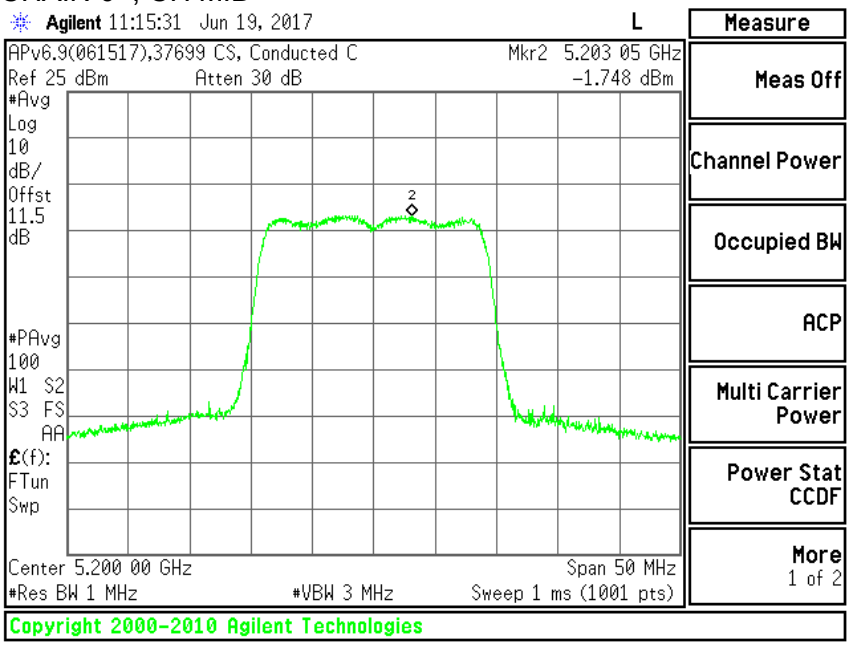
CHAIN 0 , CH LOW



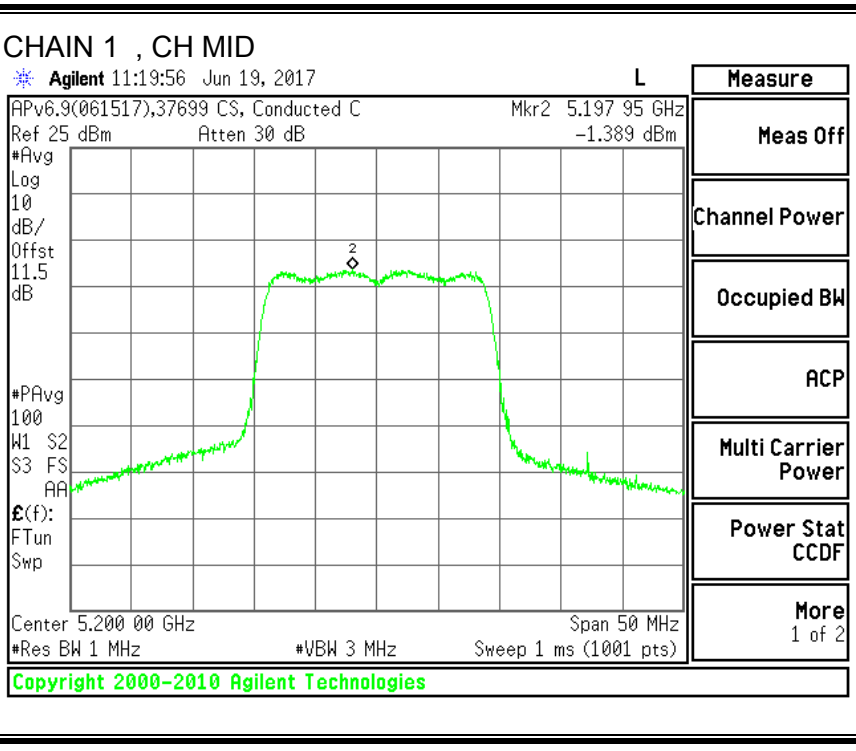
CHAIN 1 , CH LOW



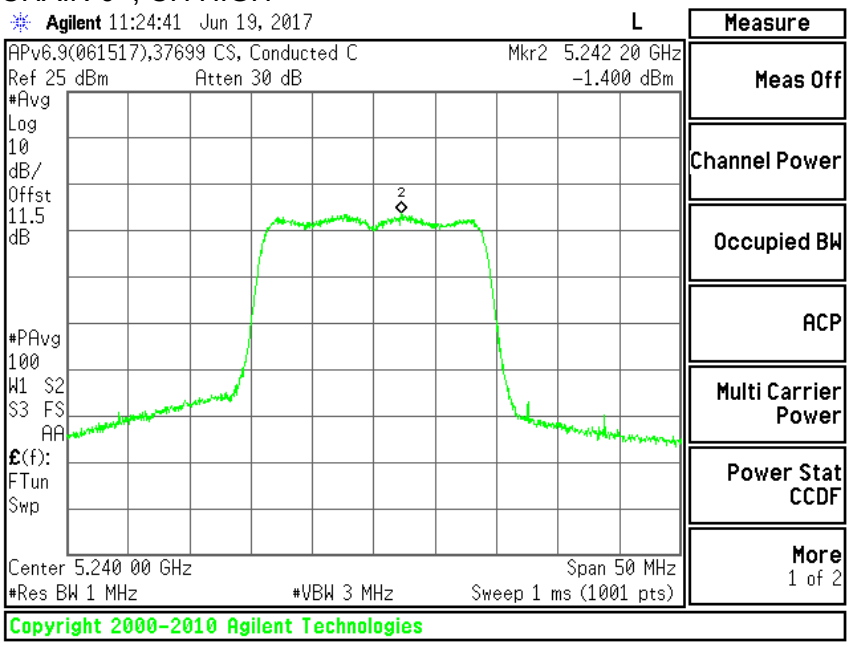
CHAIN 0 , CH MID



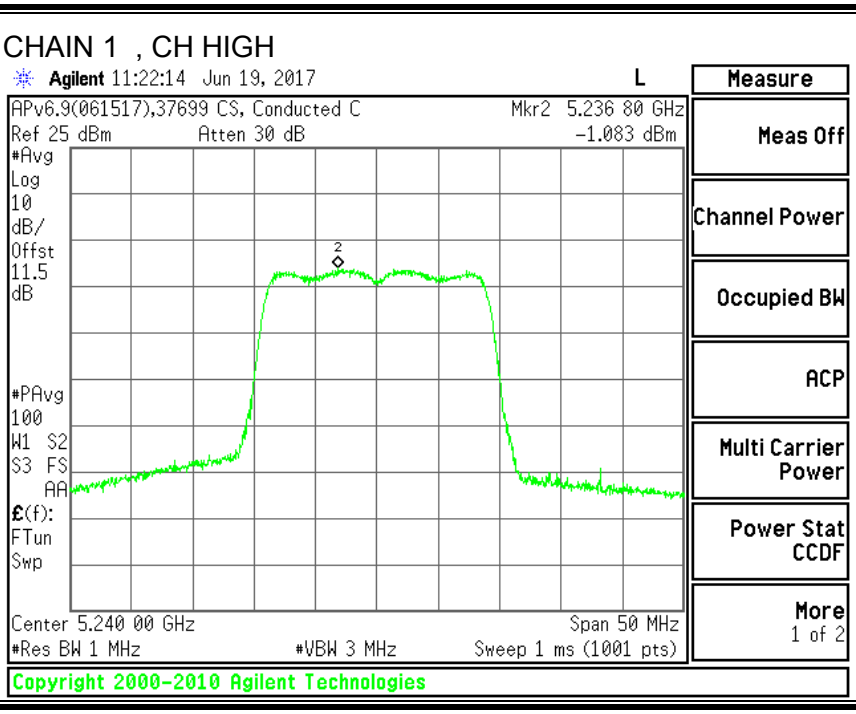
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.3.1. 26 dB BANDWIDTH

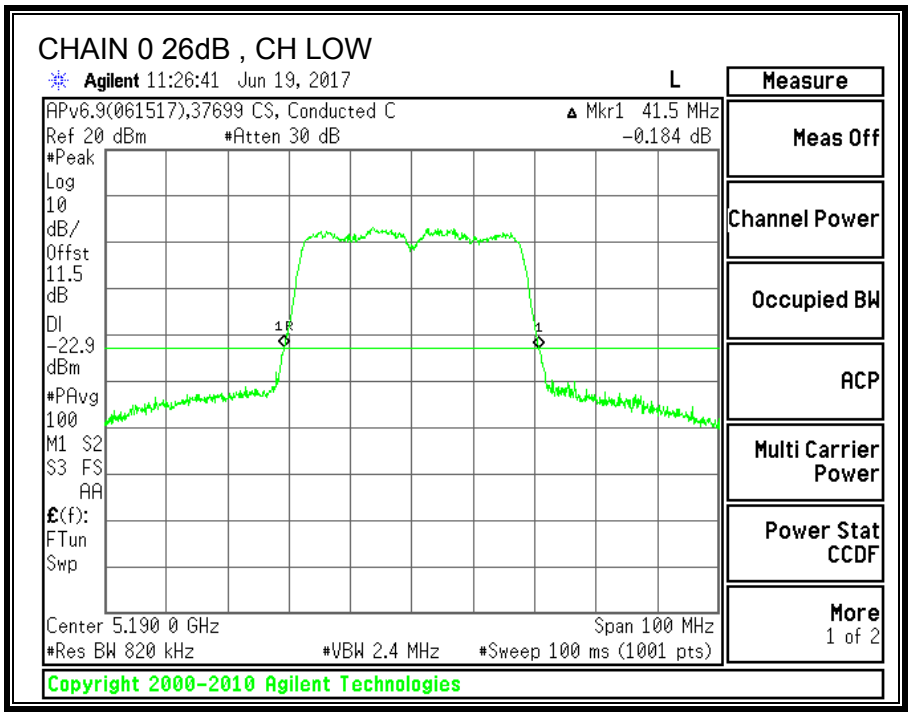
LIMITS

None; for reporting purposes only.

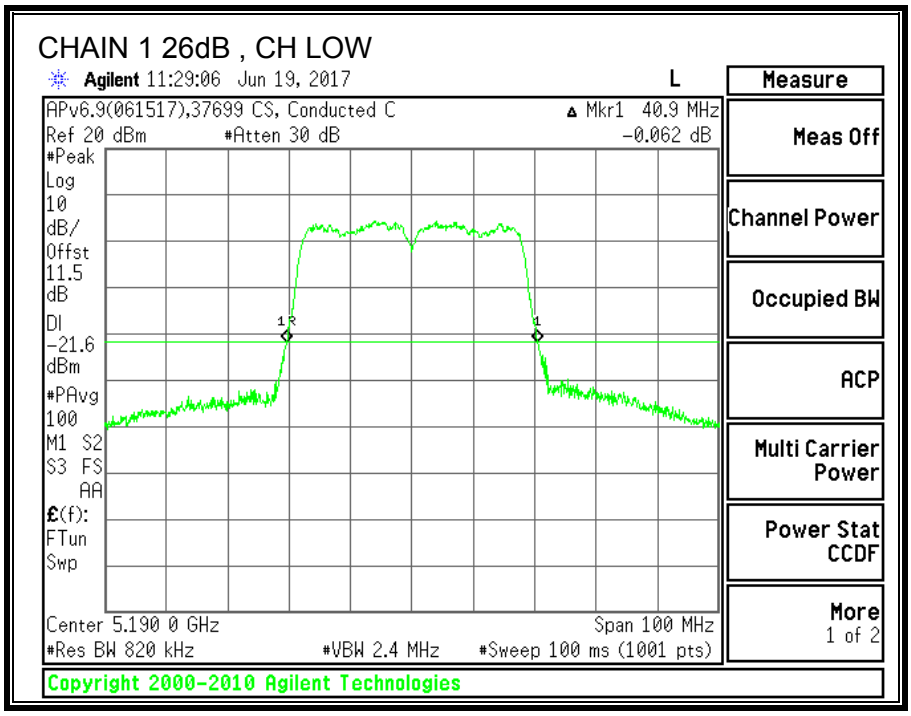
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5190	41.5	40.9
High	5230	41.5	40.9

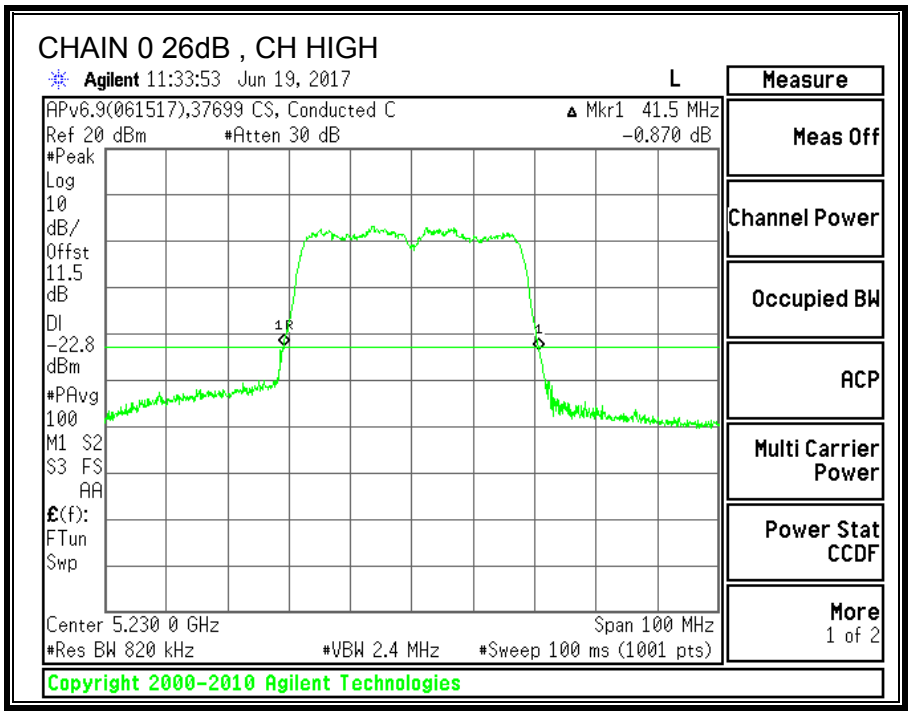
CHAIN 0 26dB , CH LOW



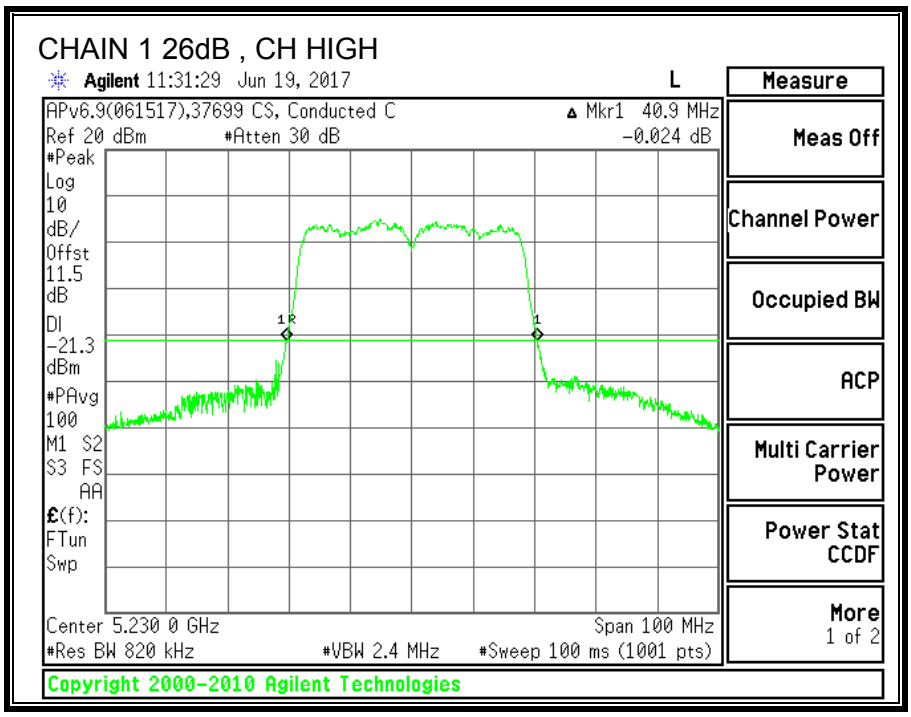
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.3.2. 99% BANDWIDTH

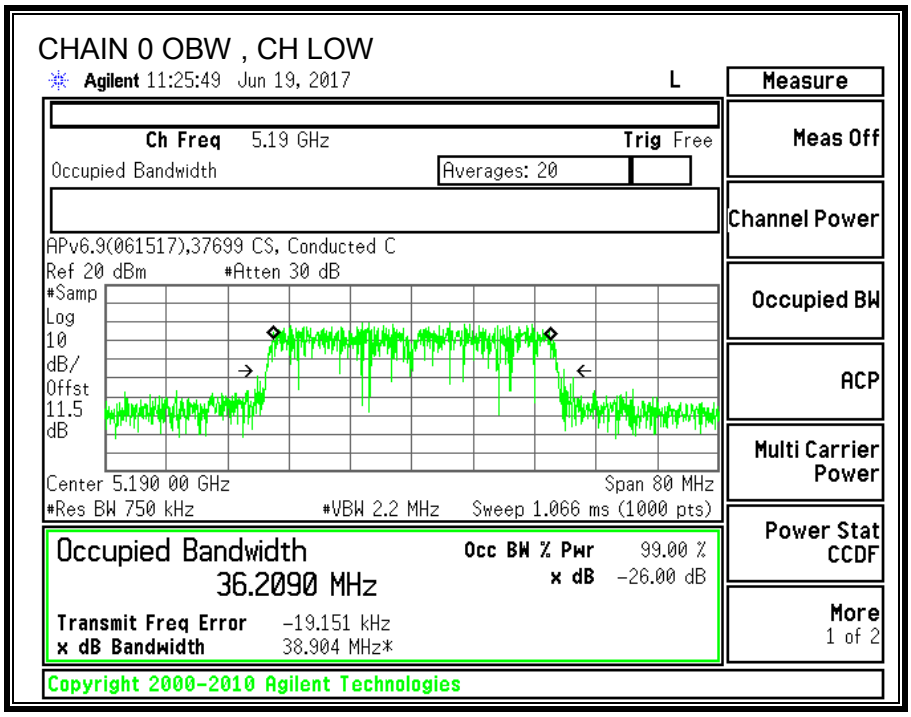
LIMITS

None; for reporting purposes only.

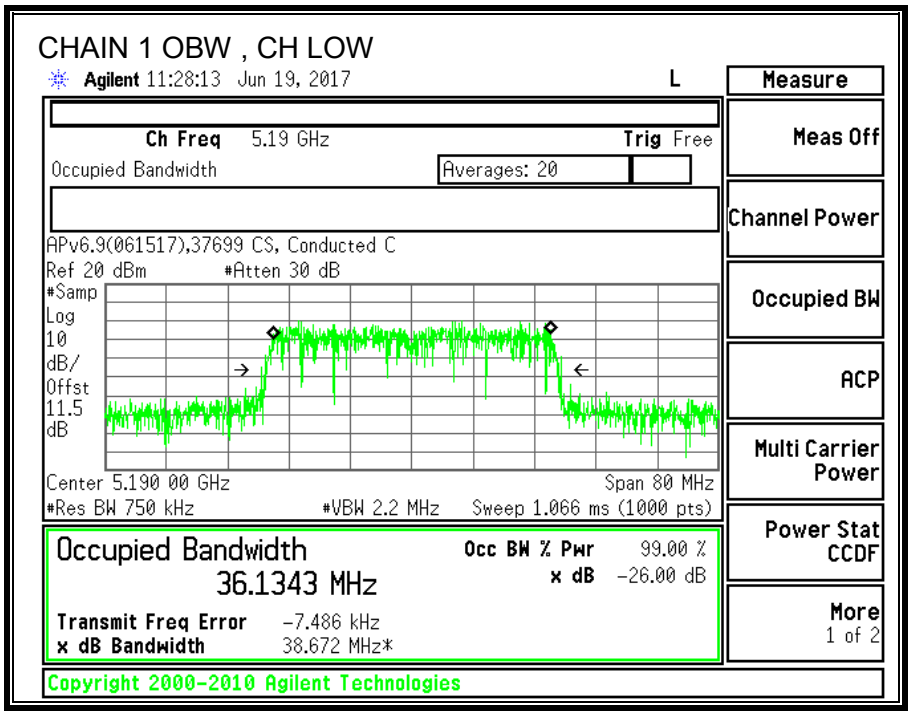
RESULTS

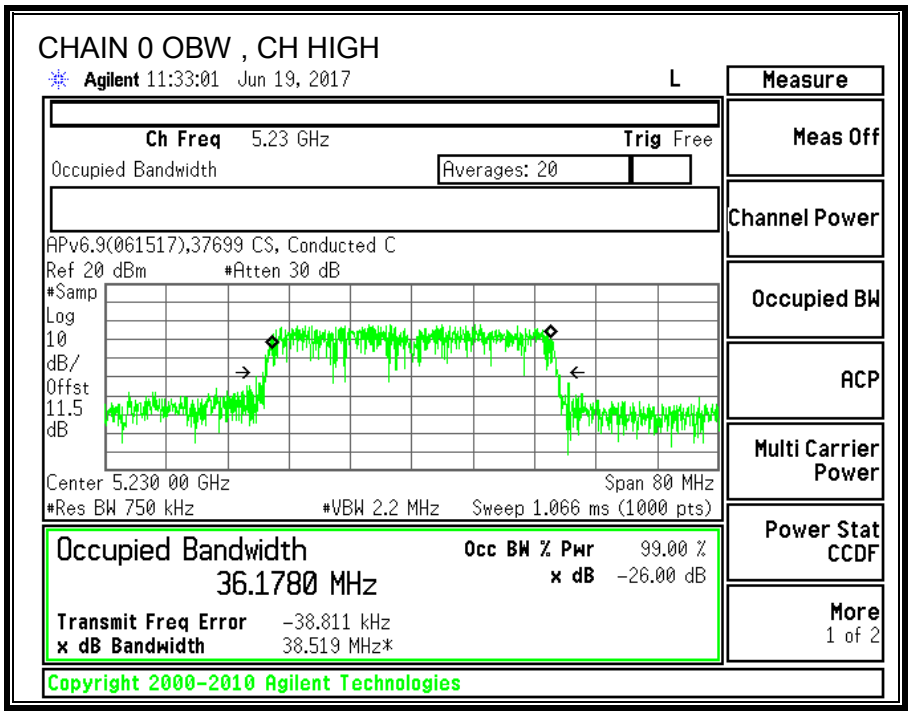
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5190	36.2090	36.1343
High	5230	36.1780	36.1380

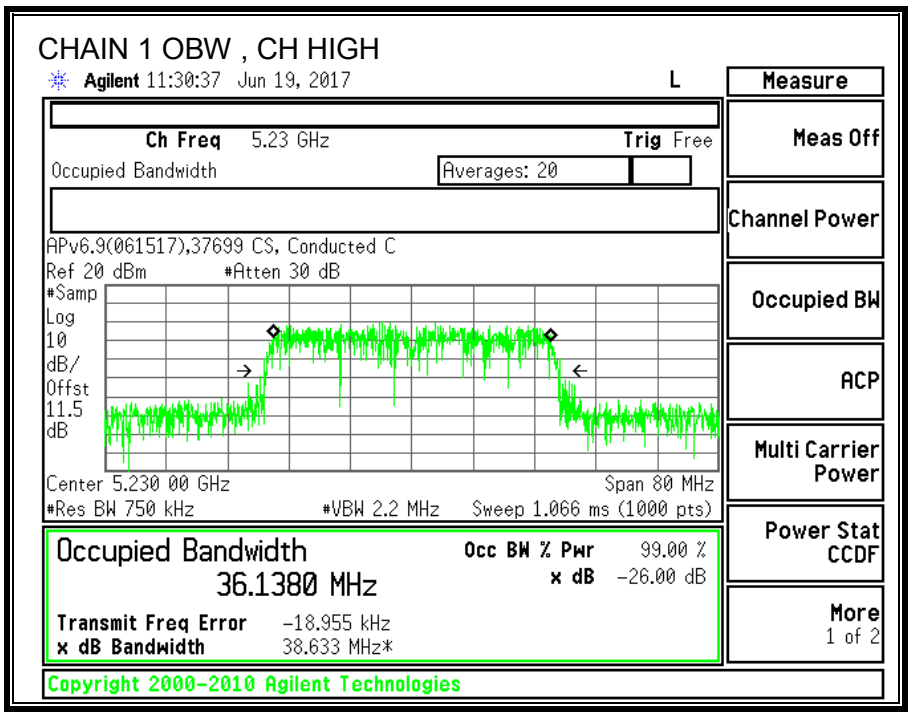
CHAIN 0 OBW , CH LOW



CHAIN 1 OBW , CH LOW







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)
3.30	3.10	3.20	6.21

RESULTS

ID:	37699 CS	Date:	06/16/17

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	40.90	36.13	3.20	6.21
High	5230	40.90	36.14	3.20	6.21

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	19.80	19.80	10.79	10.00	3.79
High	5230	24.00	23.00	19.80	19.80	10.79	10.00	3.79

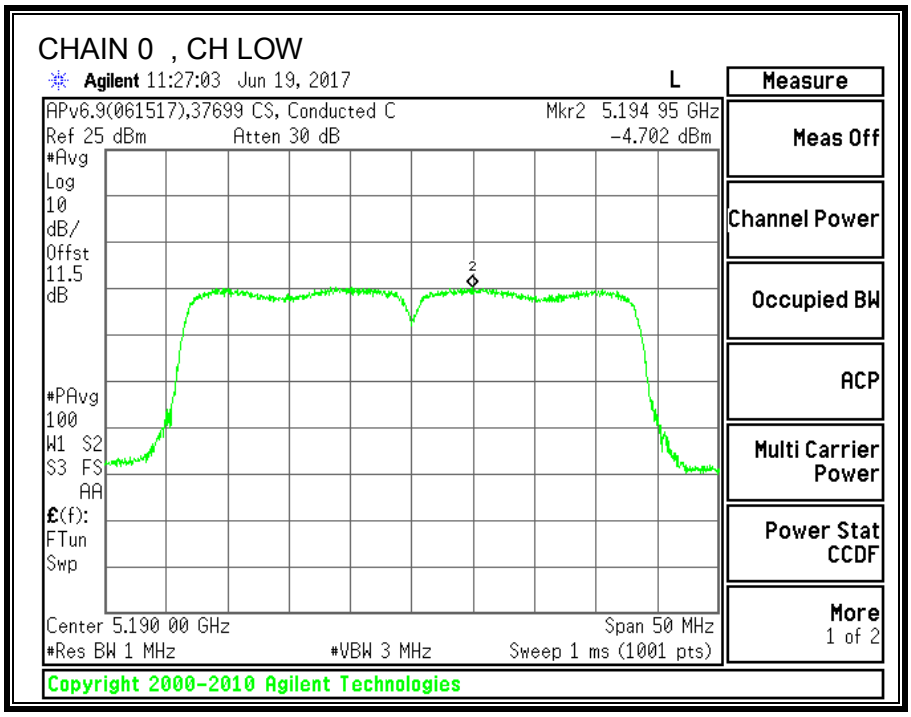
Output Power Results

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	9.84	10.51	13.20	19.80	-6.60
High	5230	9.96	10.26	13.12	19.80	-6.68

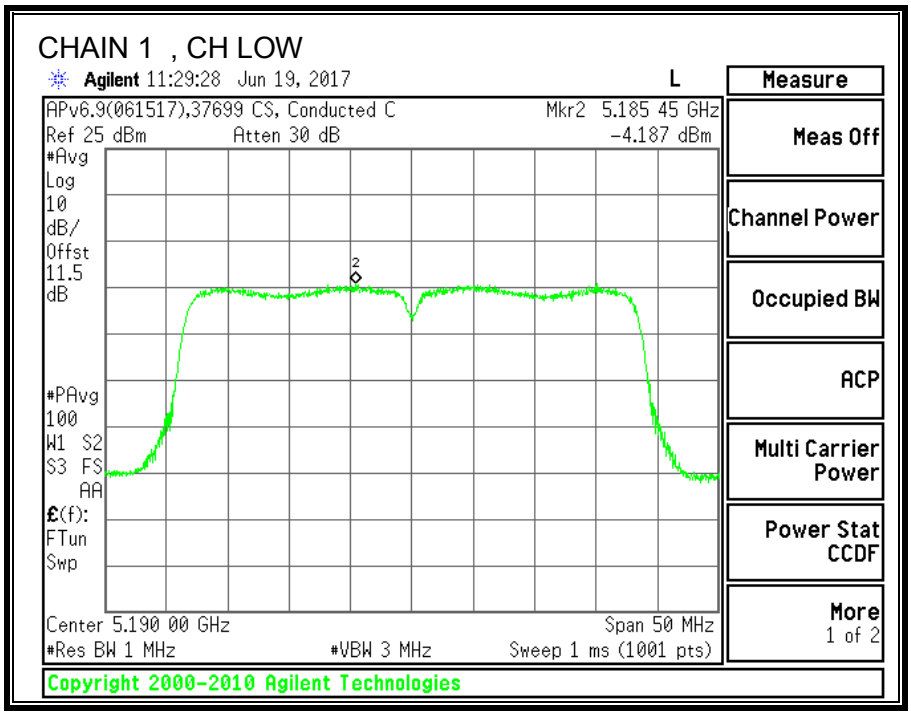
PPSD Results

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	-4.70	-4.19	-1.43	3.79	-5.22
High	5230	-4.69	-4.04	-1.35	3.79	-5.14

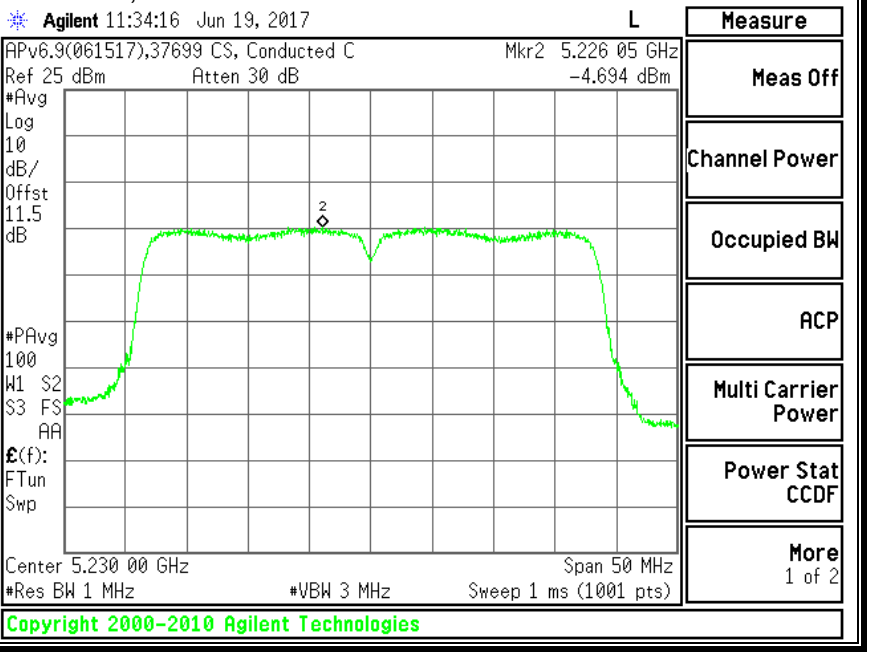
CHAIN 0 , CH LOW



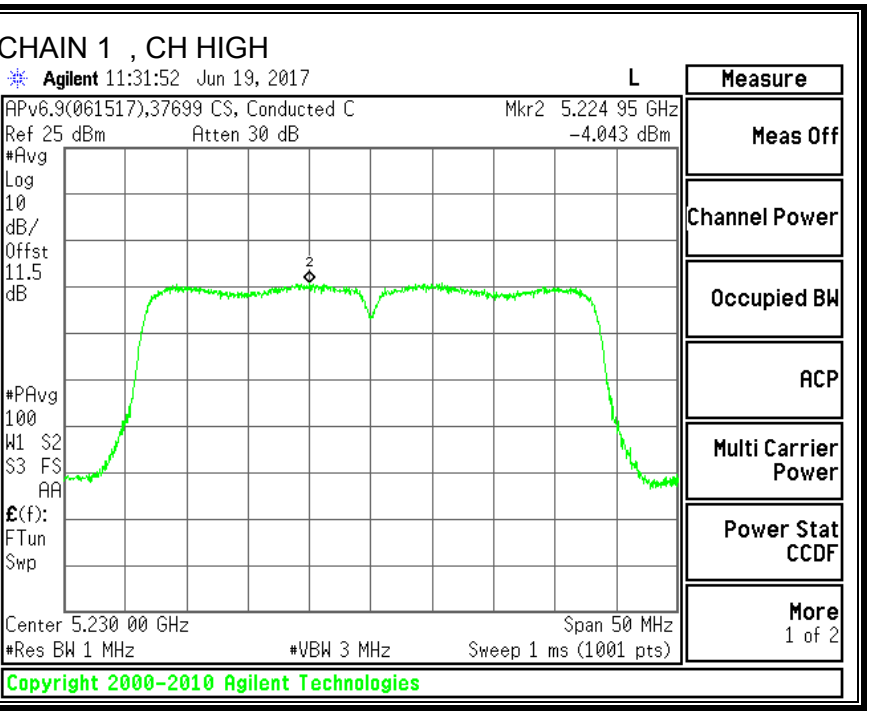
CHAIN 1 , CH LOW



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.4.1. 26 dB BANDWIDTH

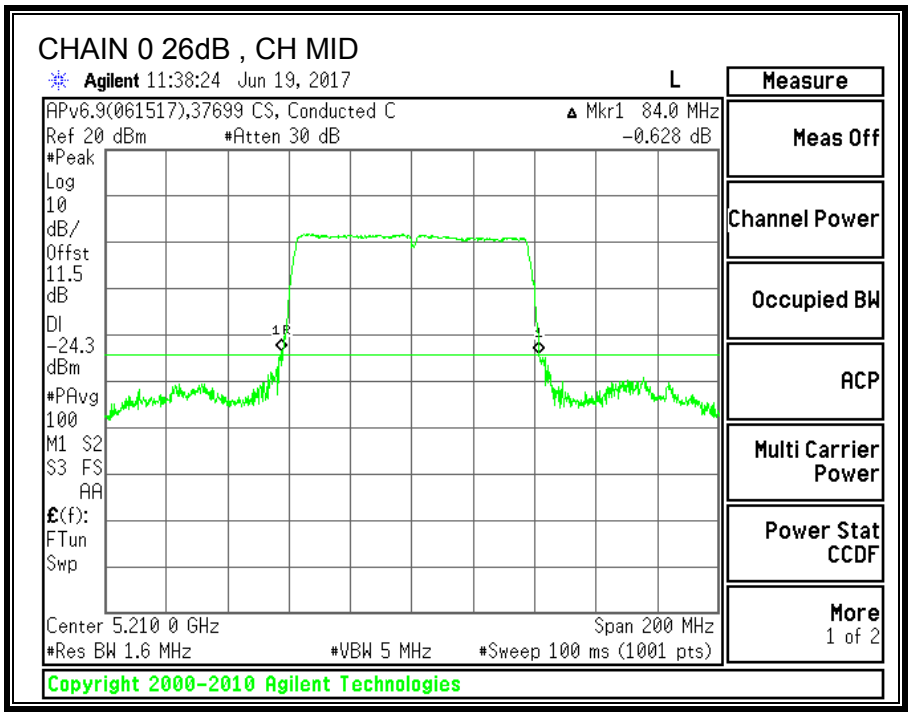
LIMITS

None; for reporting purposes only.

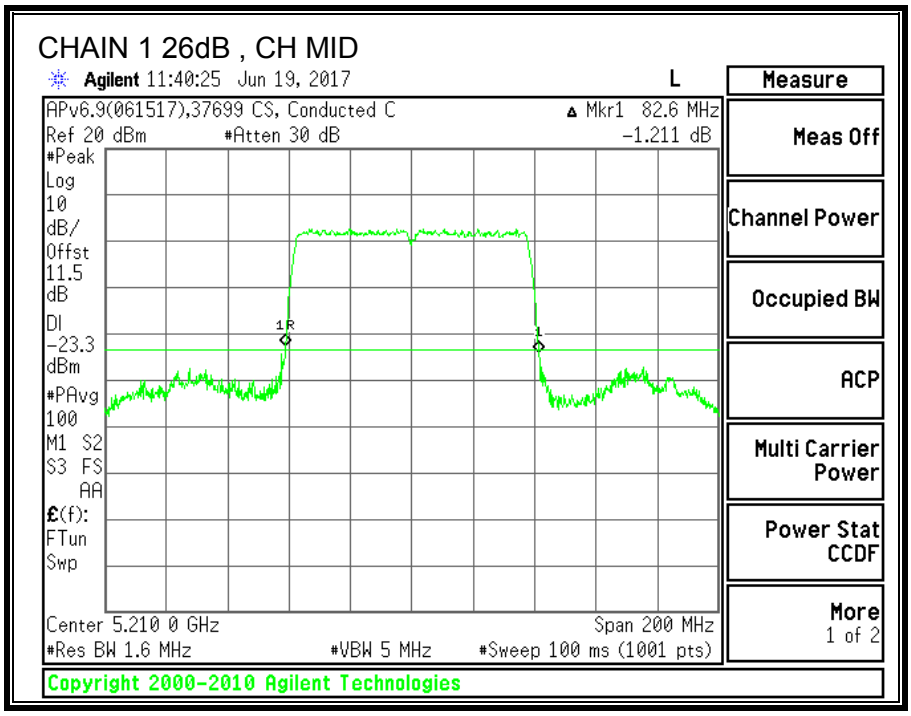
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Mid	5210	84.00	82.6

CHAIN 0 26dB , CH MID



CHAIN 1 26dB , CH MID



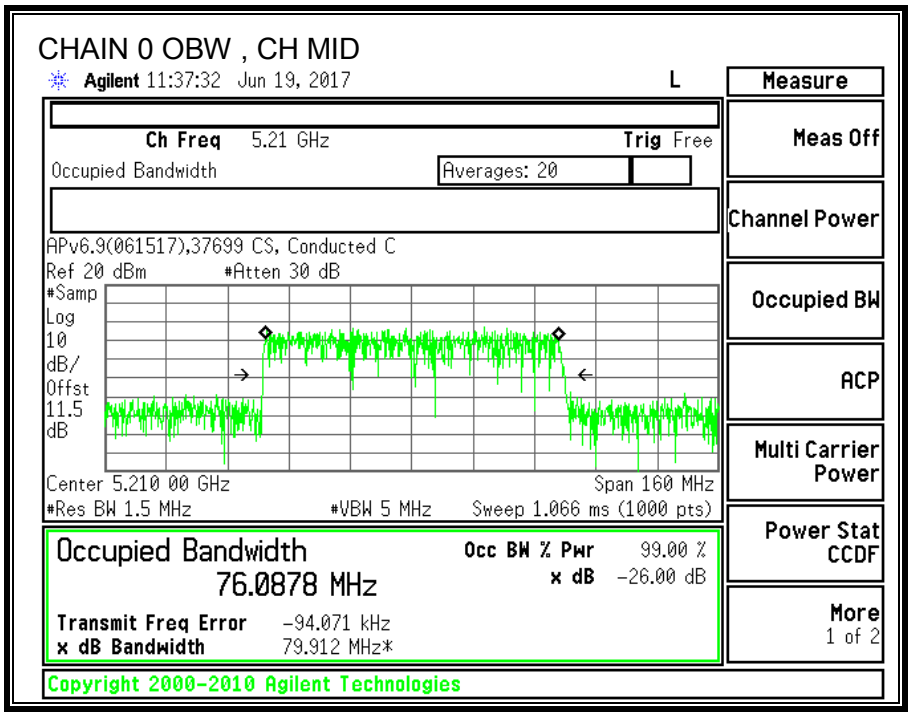
9.4.2. 99% BANDWIDTH

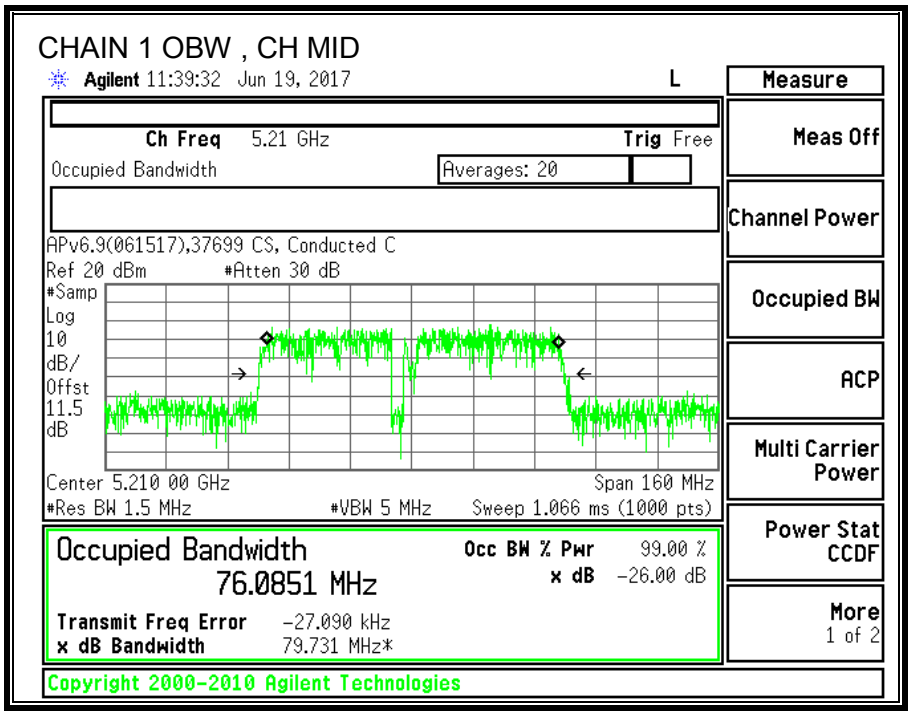
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Mid	5210	76.0878	76.0851





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)
3.30	3.10	3.20	6.21

RESULTS

ID:	37699 CS	Date:	06/16/17

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	82.60	76.09	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

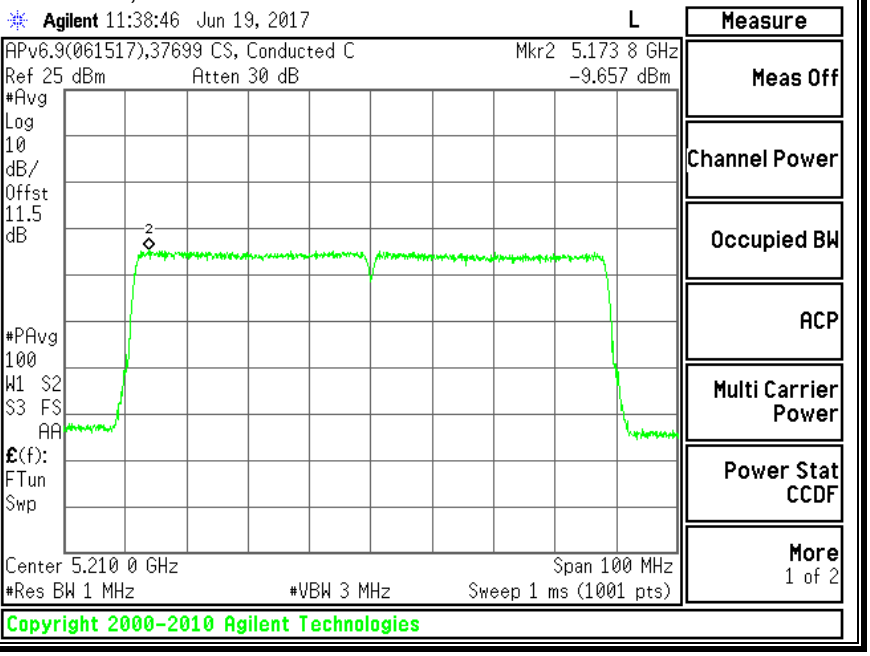
Output Power Results

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	8.03	8.41	11.23	20.43	-9.20

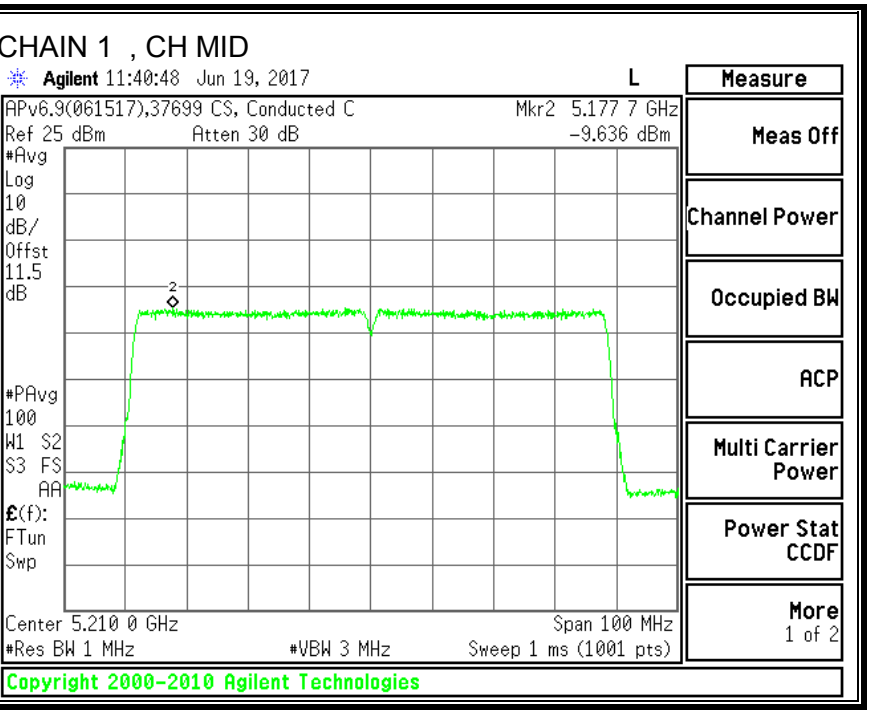
PPSD Results

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	-9.66	-9.64	-6.64	4.43	-11.07

CHAIN 0 , CH MID



CHAIN 1 , CH MID



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

9.5.1. 26 dB BANDWIDTH

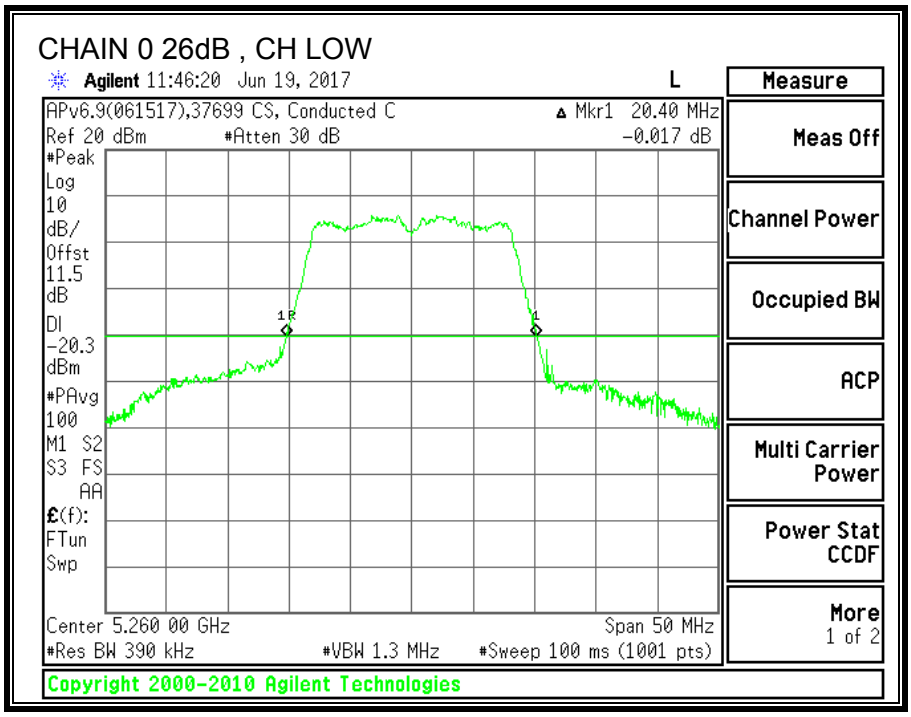
LIMITS

None; for reporting purposes only.

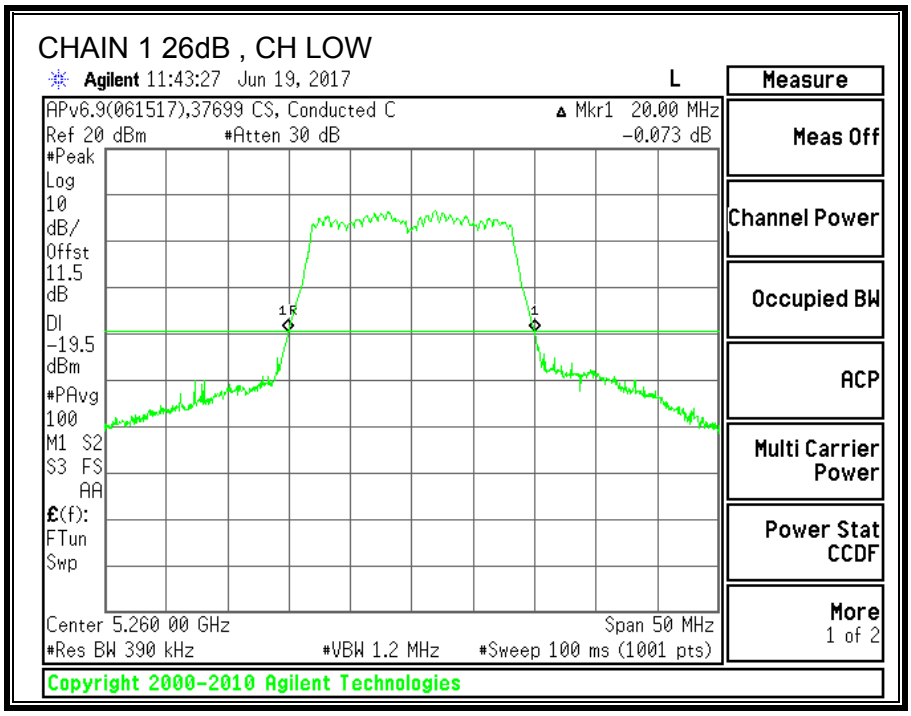
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5260	20.40	20.00
Mid	5300	20.50	20.00
High	5320	20.15	20.00

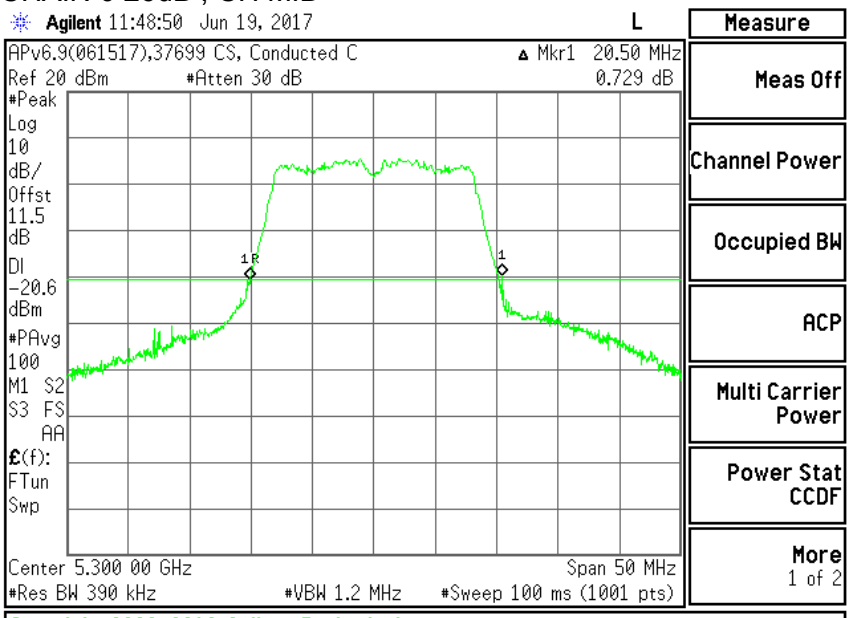
CHAIN 0 26dB , CH LOW



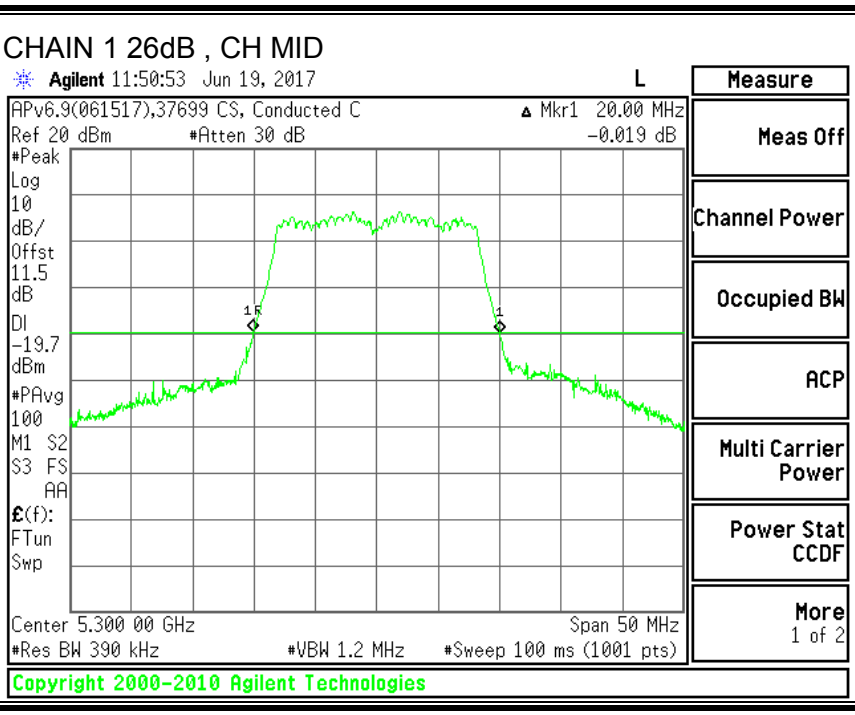
CHAIN 1 26dB , CH LOW



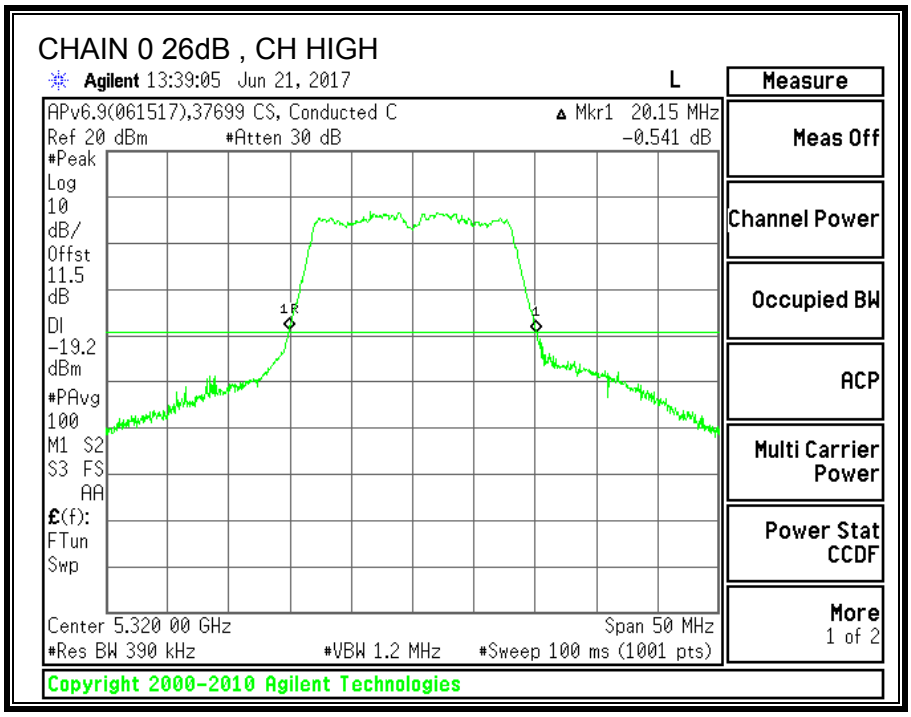
CHAIN 0 26dB , CH MID



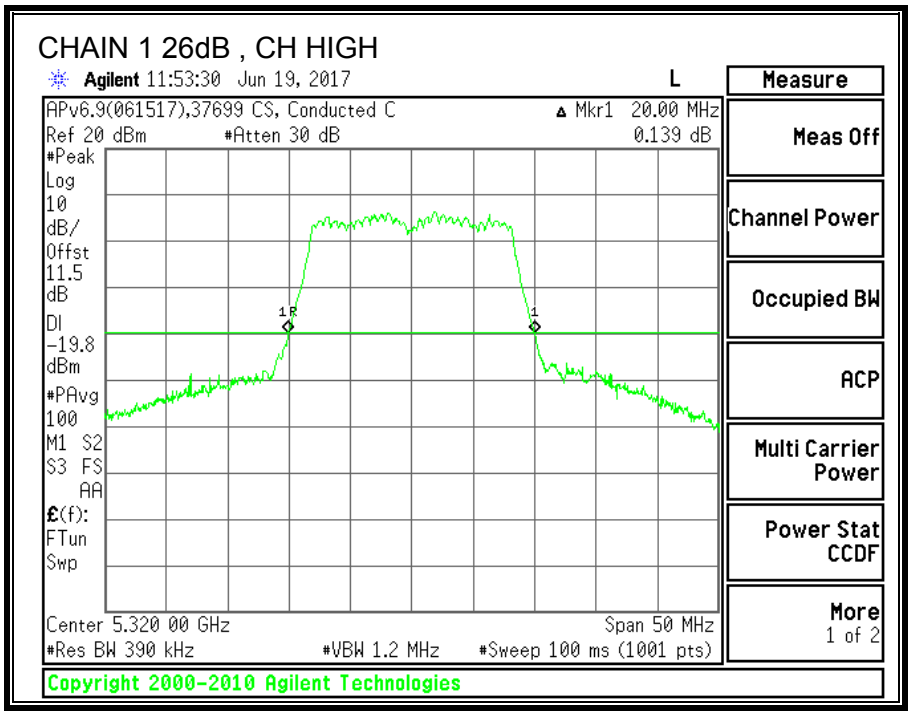
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.5.2. 99% BANDWIDTH

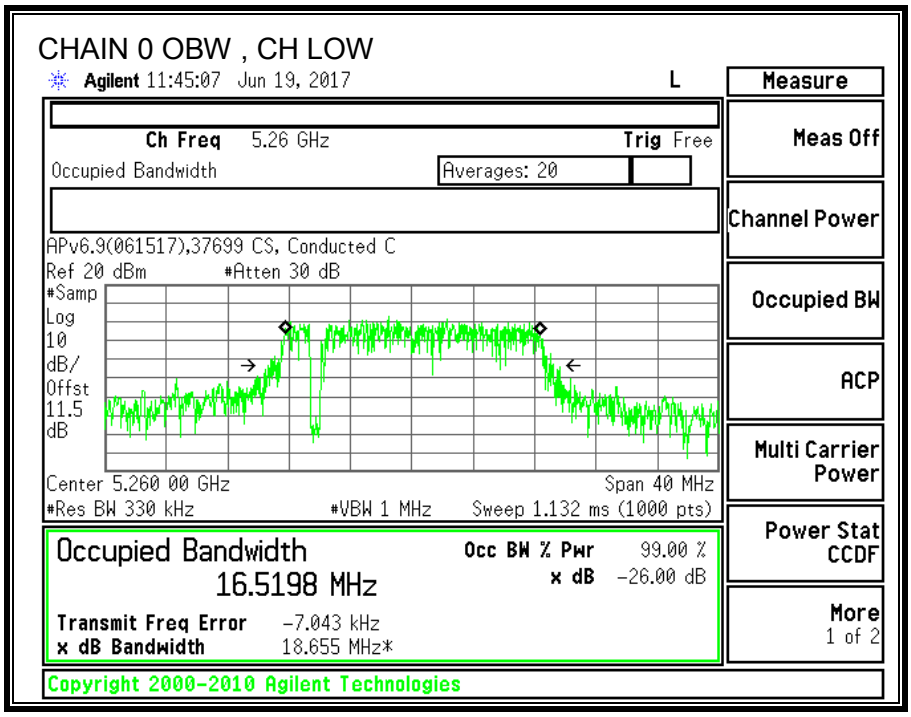
LIMITS

None; for reporting purposes only.

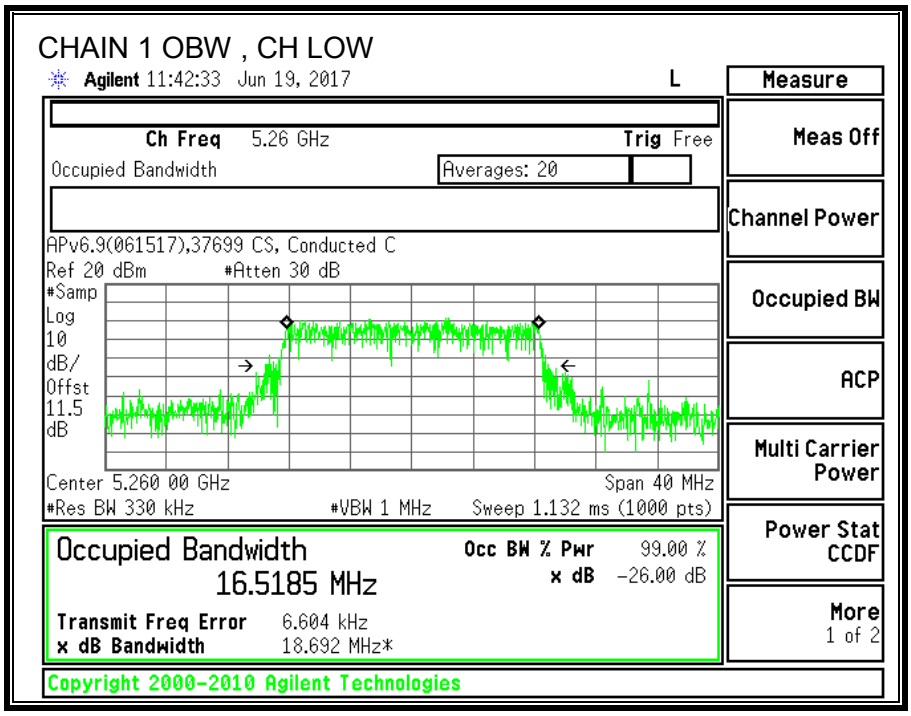
RESULTS

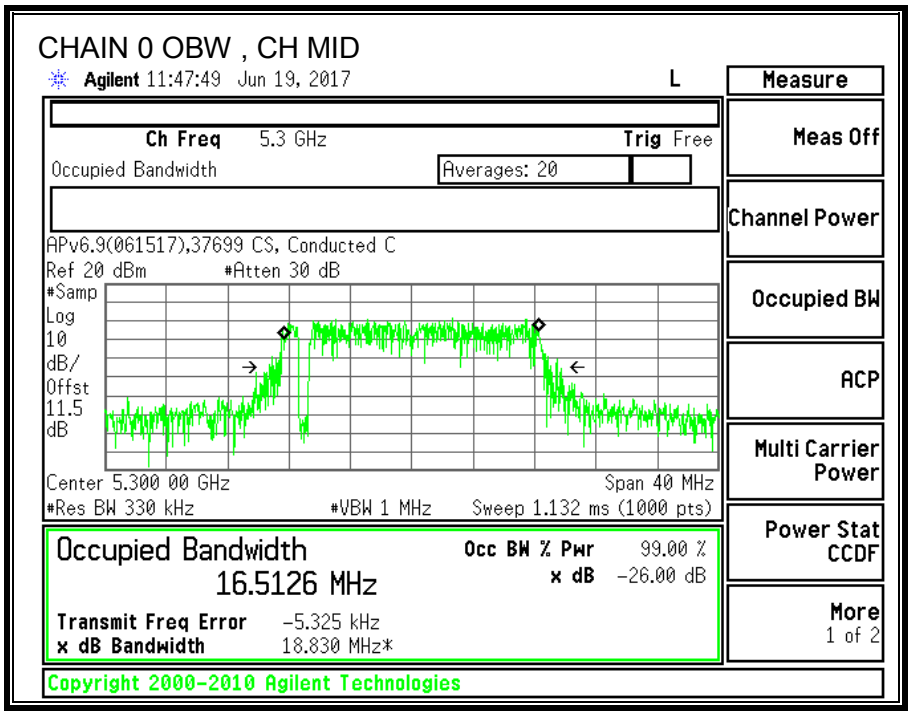
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5260	16.5198	16.5185
Mid	5300	16.5126	16.5225
High	5320	16.5229	16.5282

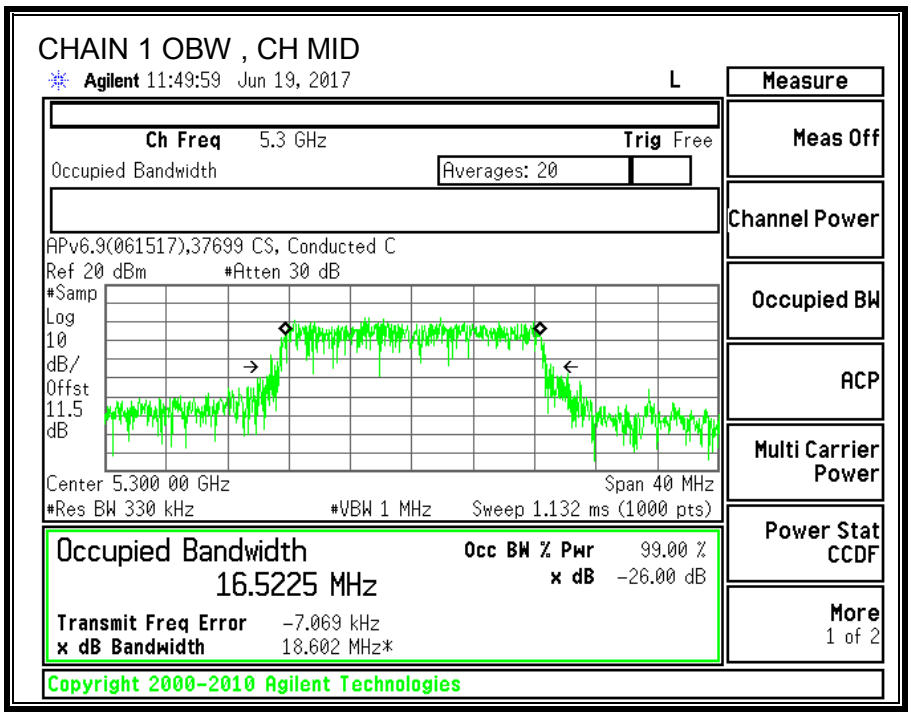
CHAIN 0 OBW , CH LOW

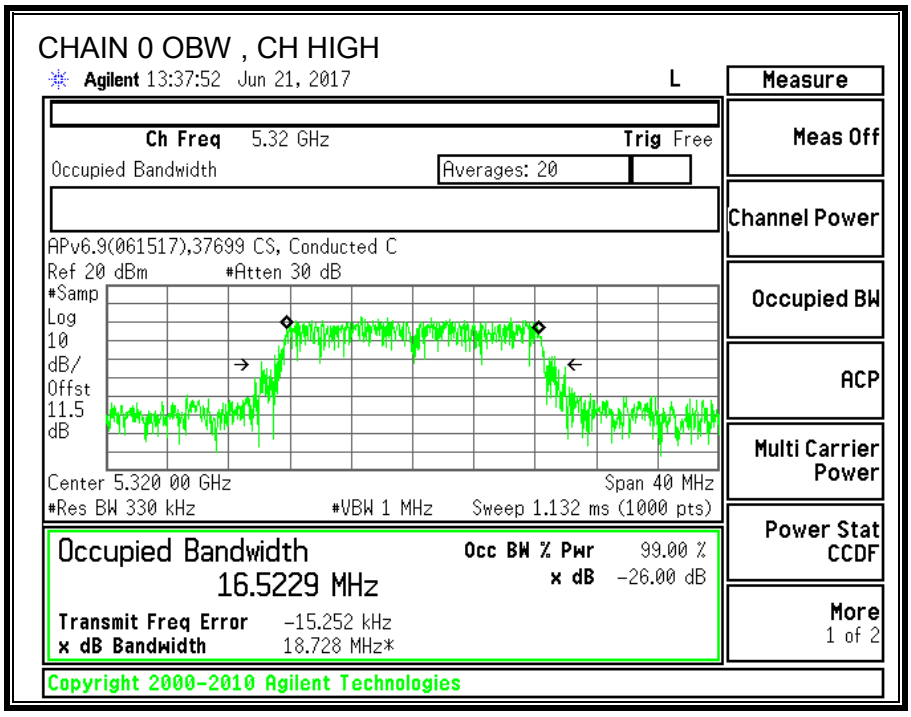


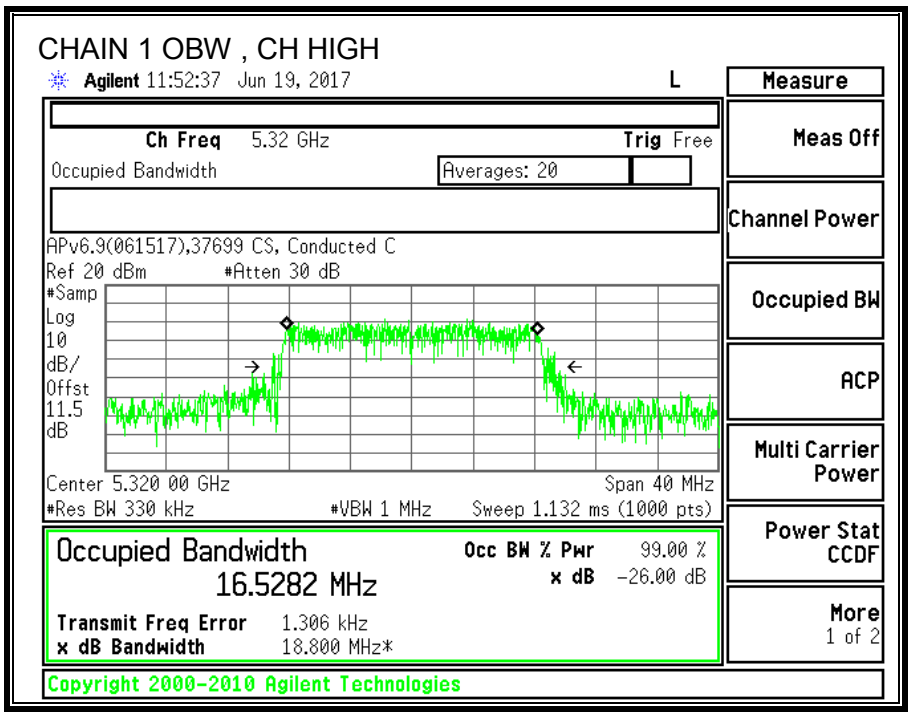
CHAIN 1 OBW , CH LOW











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)
3.50	3.80	3.65	6.66

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.00	16.52	3.65	6.66
Mid	5300	20.00	16.51	3.65	6.66
High	5320	20.00	16.52	3.65	6.66

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	23.18	27.00	23.18	10.34	11.00	10.34
Mid	5300	24.00	23.18	27.00	23.18	10.34	11.00	10.34
High	5320	24.00	23.18	27.00	23.18	10.34	11.00	10.34

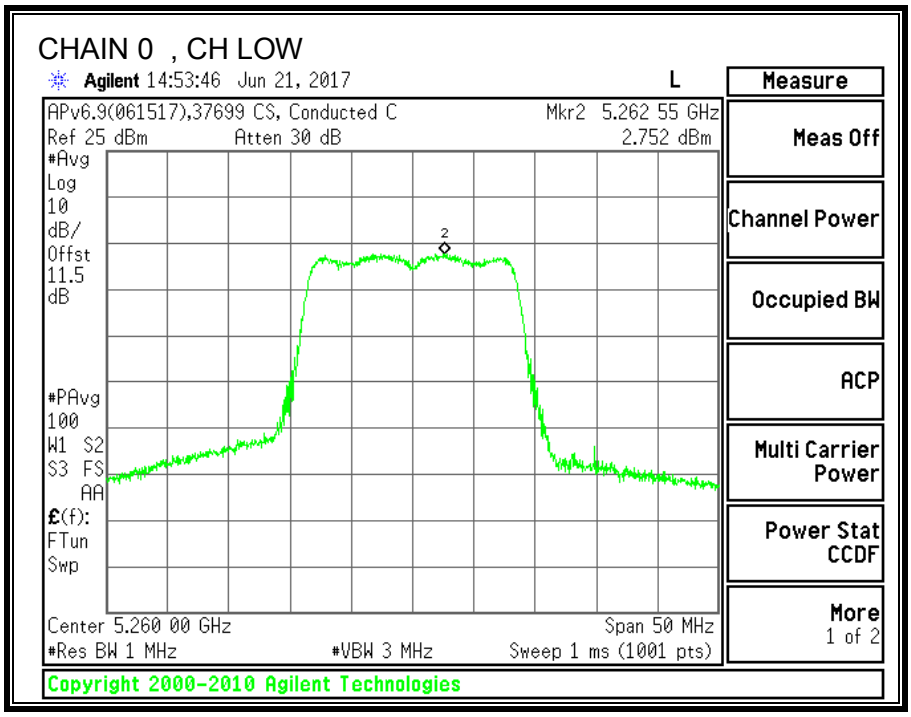
Output Power Results

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	12.89	13.41	16.17	23.18	-7.01
Mid	5300	13.01	13.45	16.25	23.18	-6.93
High	5320	12.98	13.03	16.02	23.18	-7.17

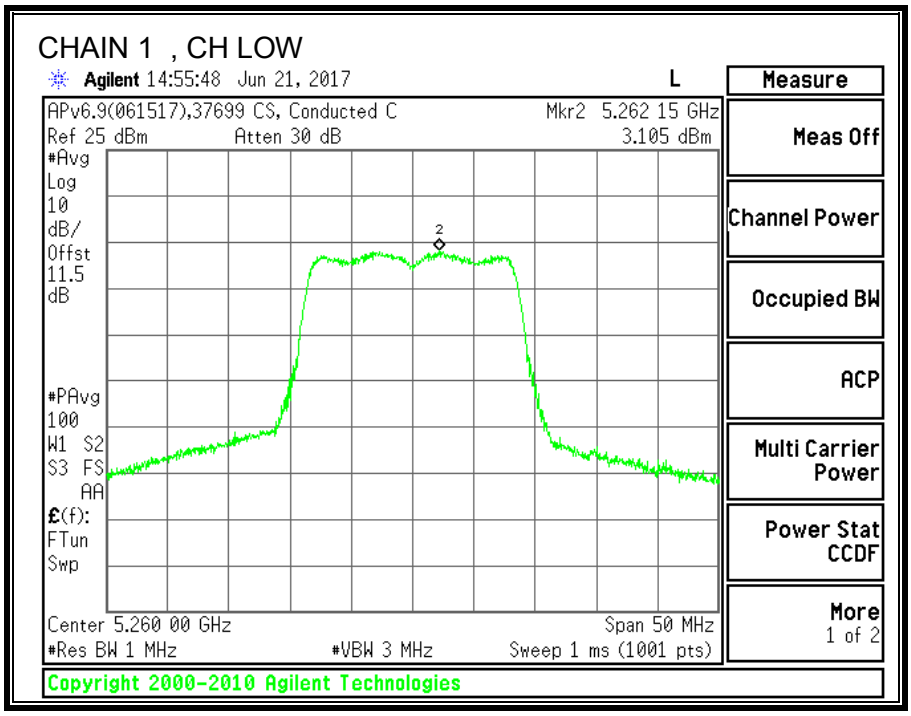
PPSD Results

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	2.75	3.11	5.94	10.34	-4.40
Mid	5300	3.07	3.14	6.11	10.34	-4.23
High	5320	3.16	3.09	6.14	10.34	-4.20

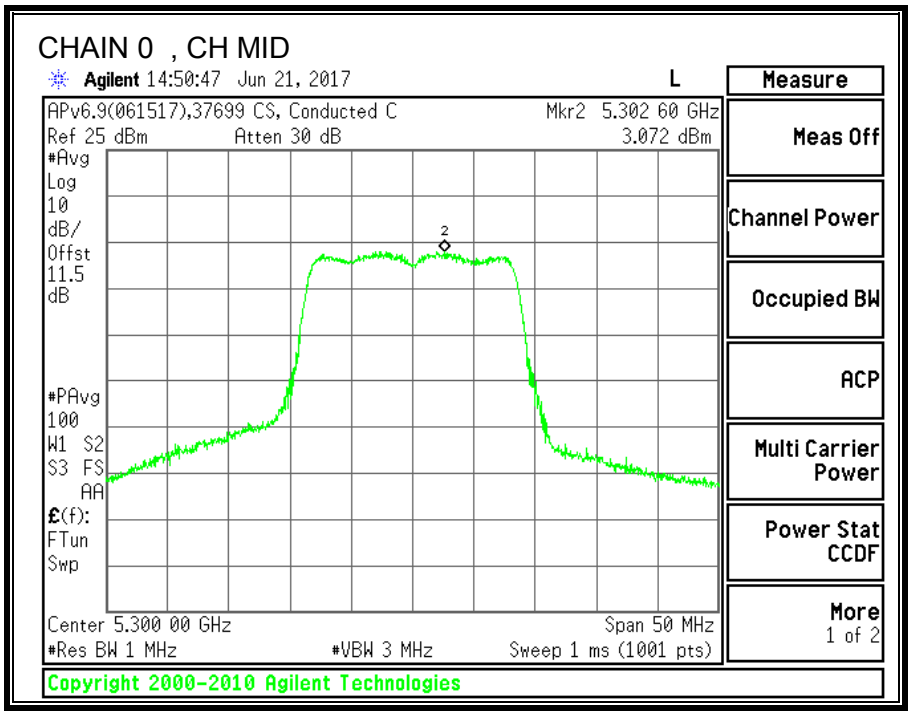
CHAIN 0 , CH LOW



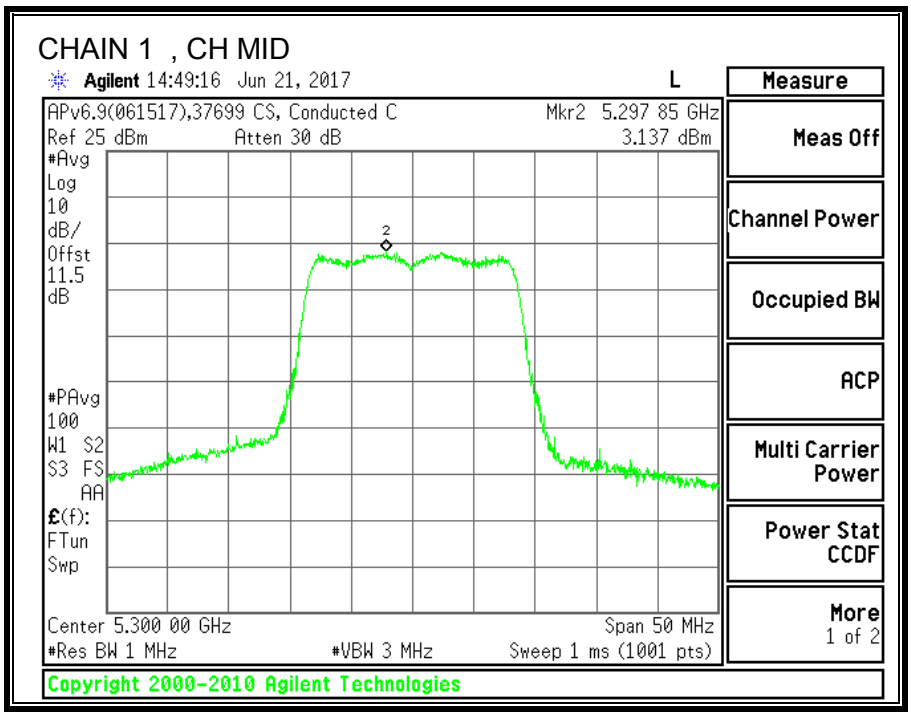
CHAIN 1 , CH LOW



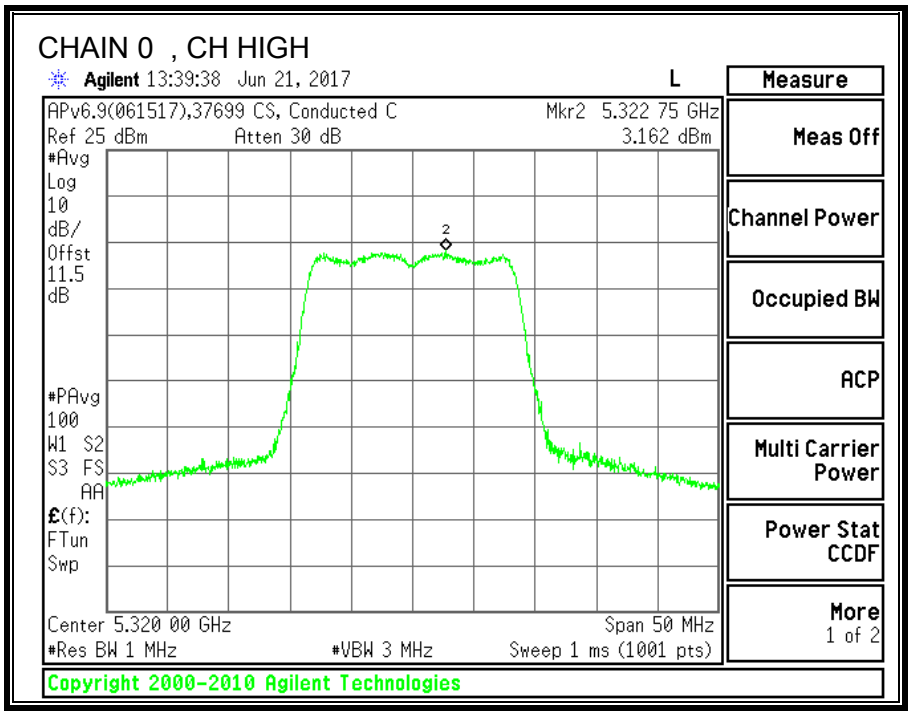
CHAIN 0 , CH MID



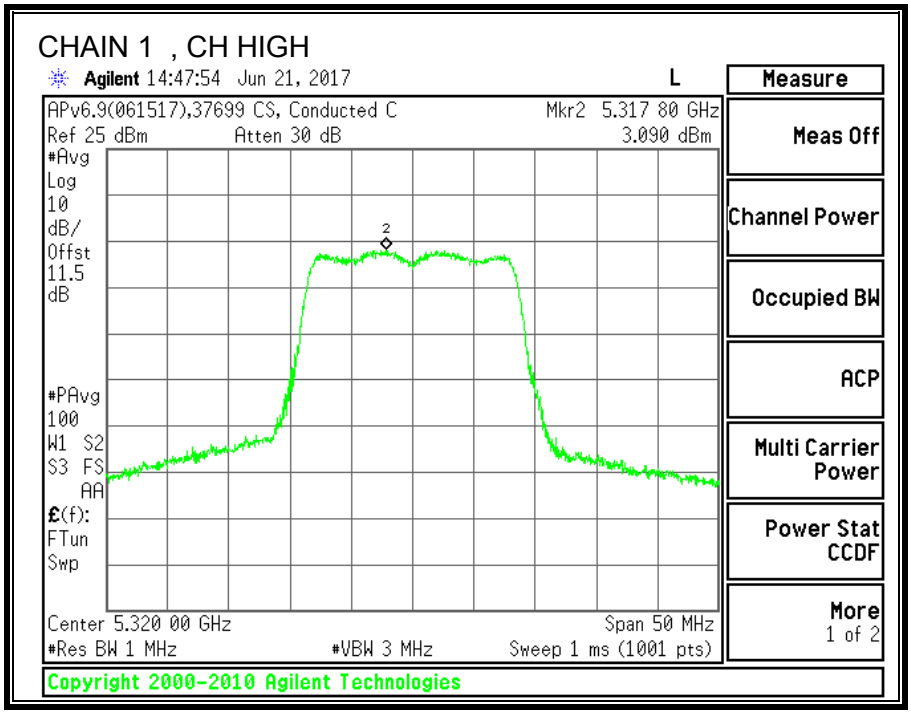
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.6.1. 26 dB BANDWIDTH

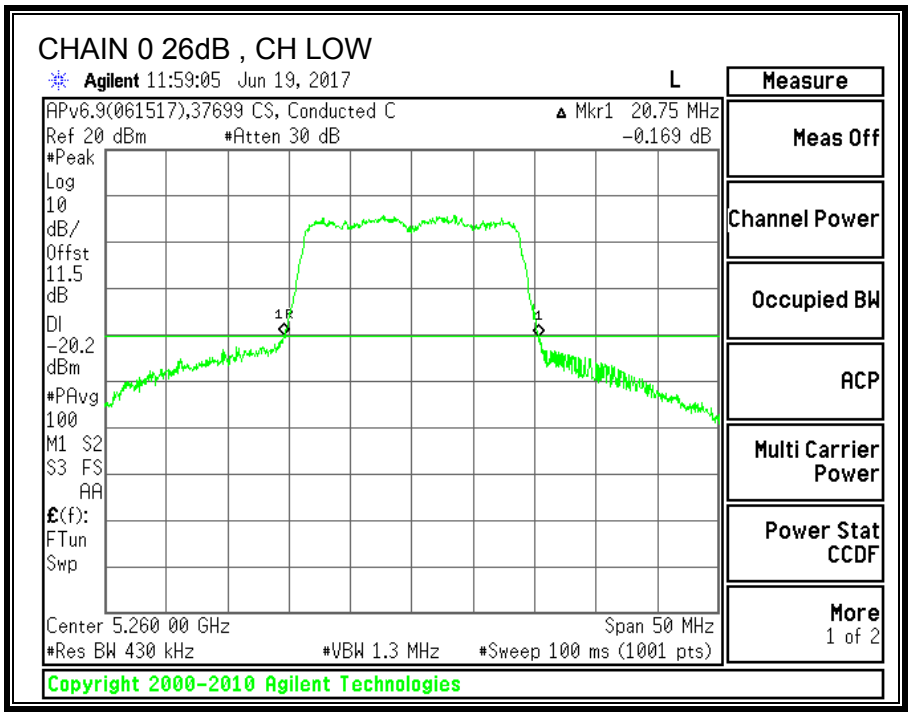
LIMITS

None; for reporting purposes only.

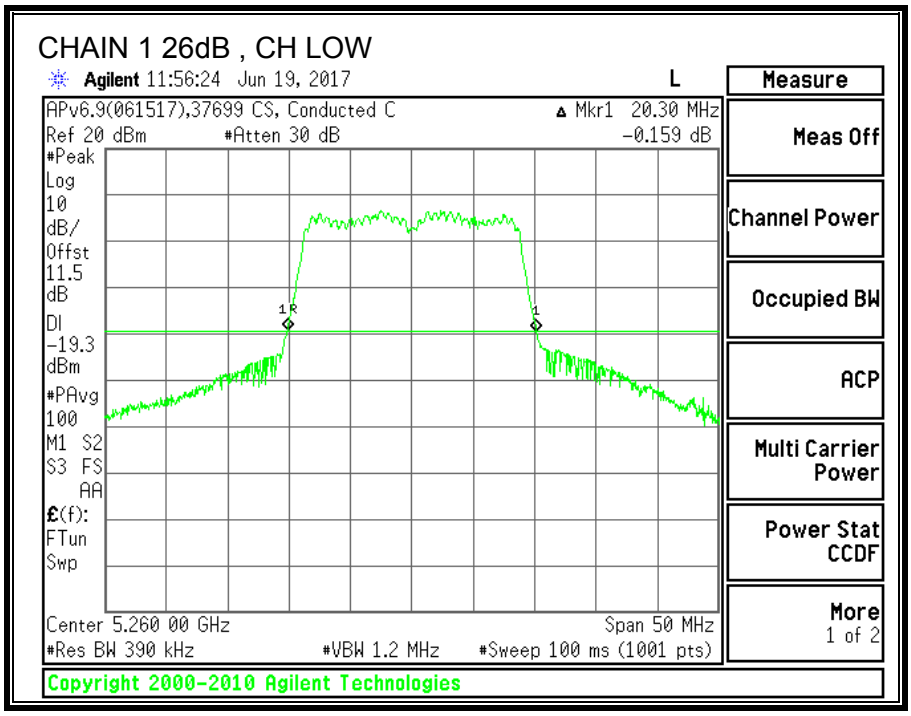
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5260	20.75	20.30
Mid	5300	20.65	20.30
High	5320	20.70	20.30

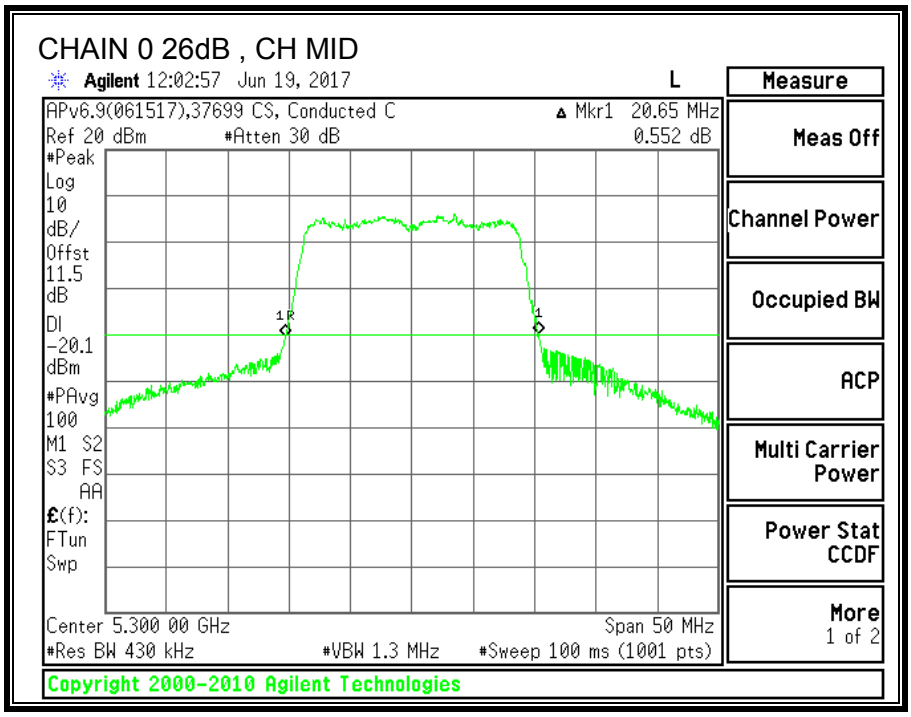
CHAIN 0 26dB , CH LOW



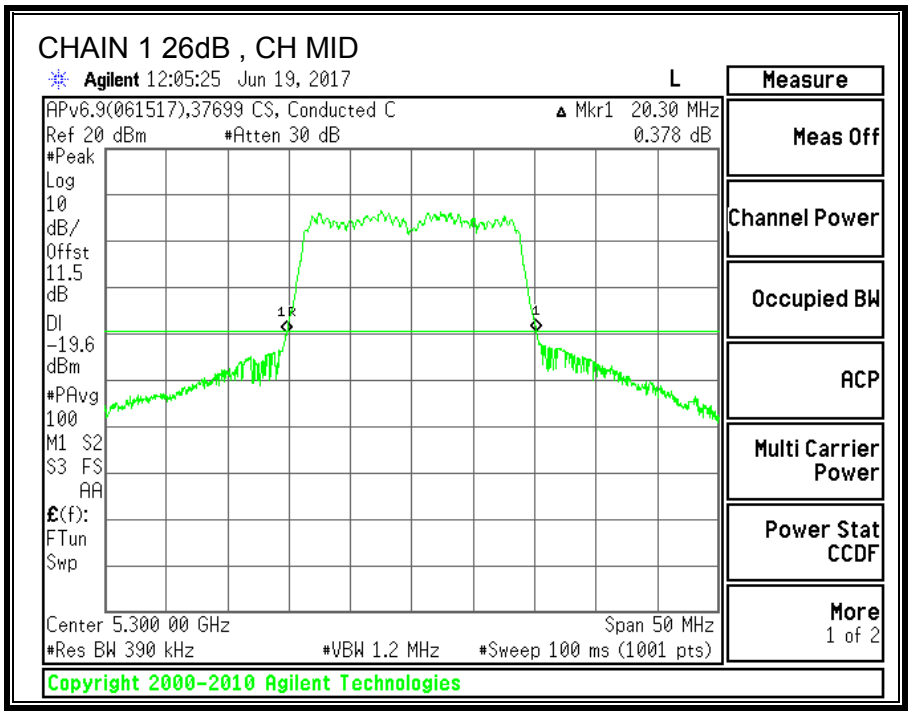
CHAIN 1 26dB , CH LOW



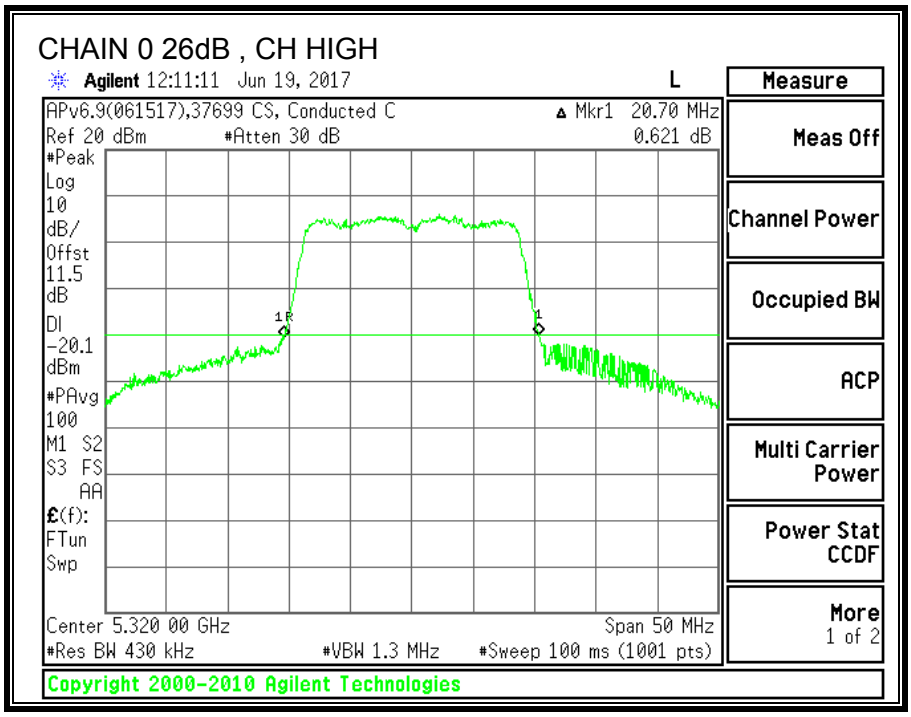
CHAIN 0 26dB , CH MID



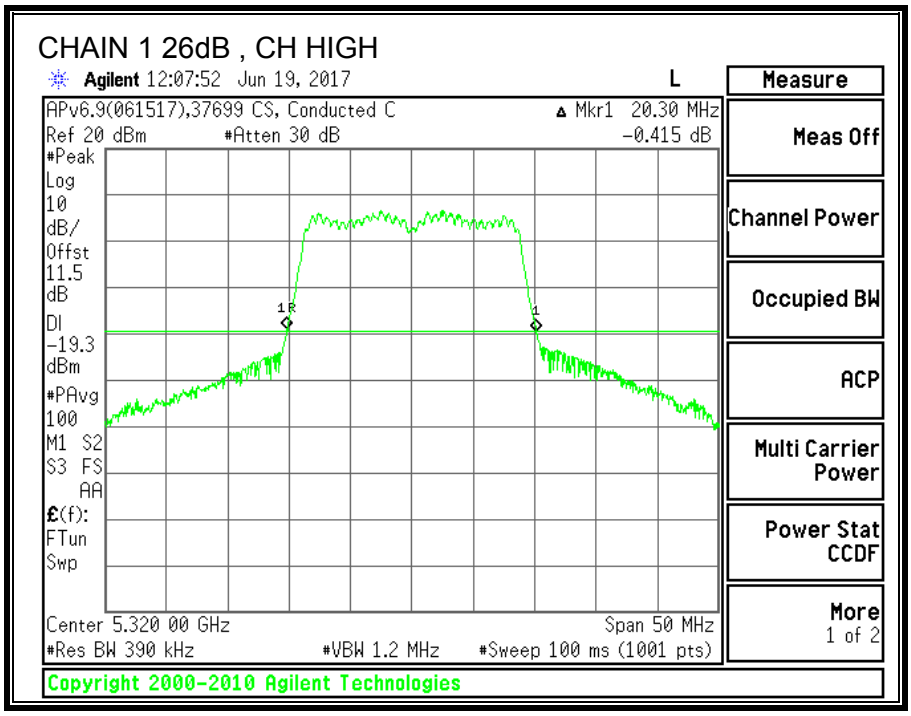
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.6.2. 99% BANDWIDTH

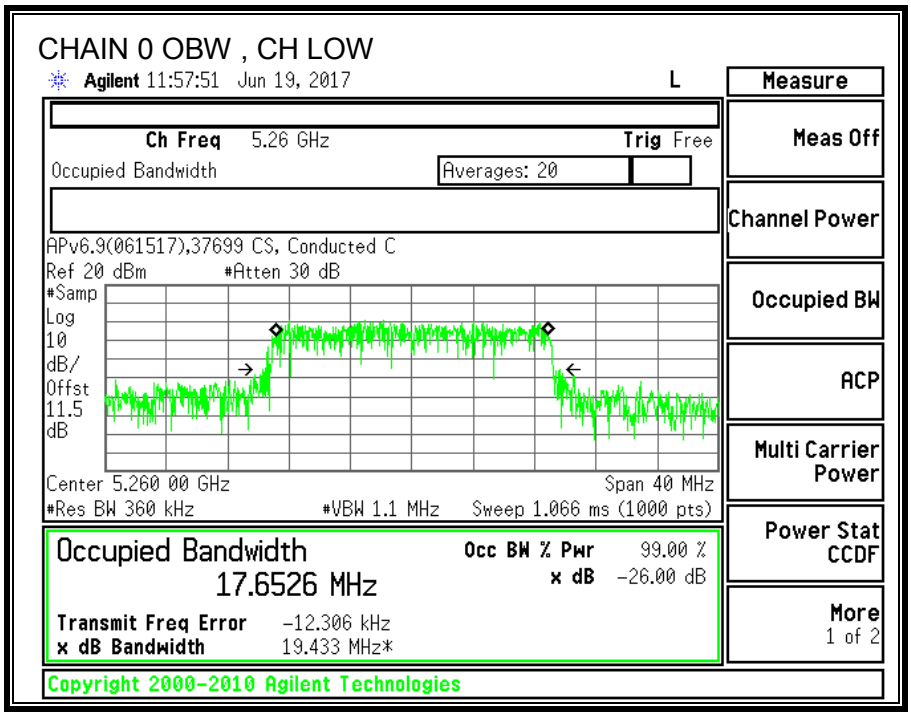
LIMITS

None; for reporting purposes only.

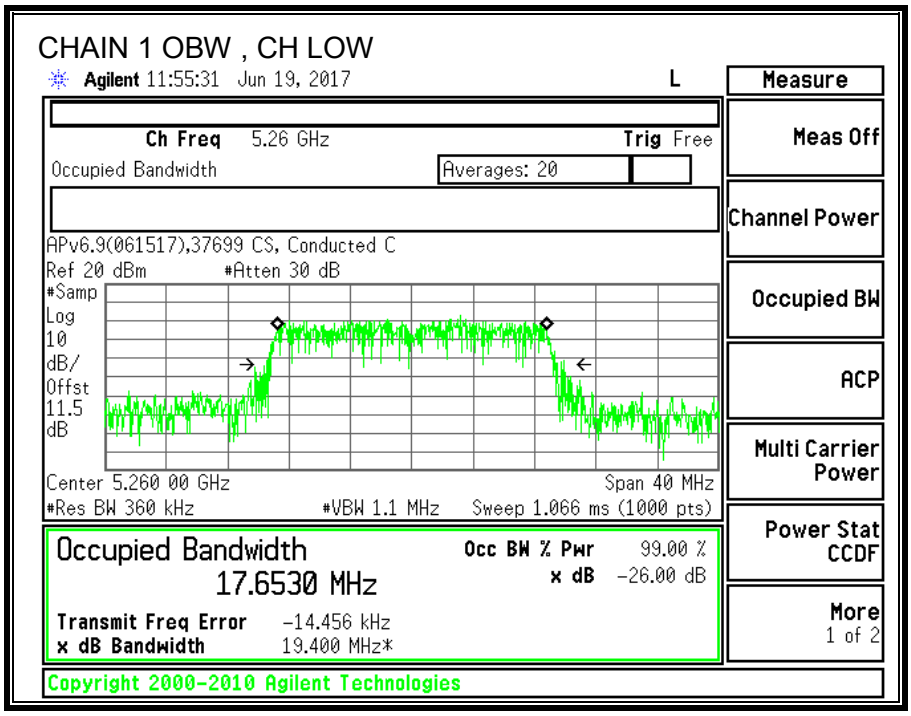
RESULTS

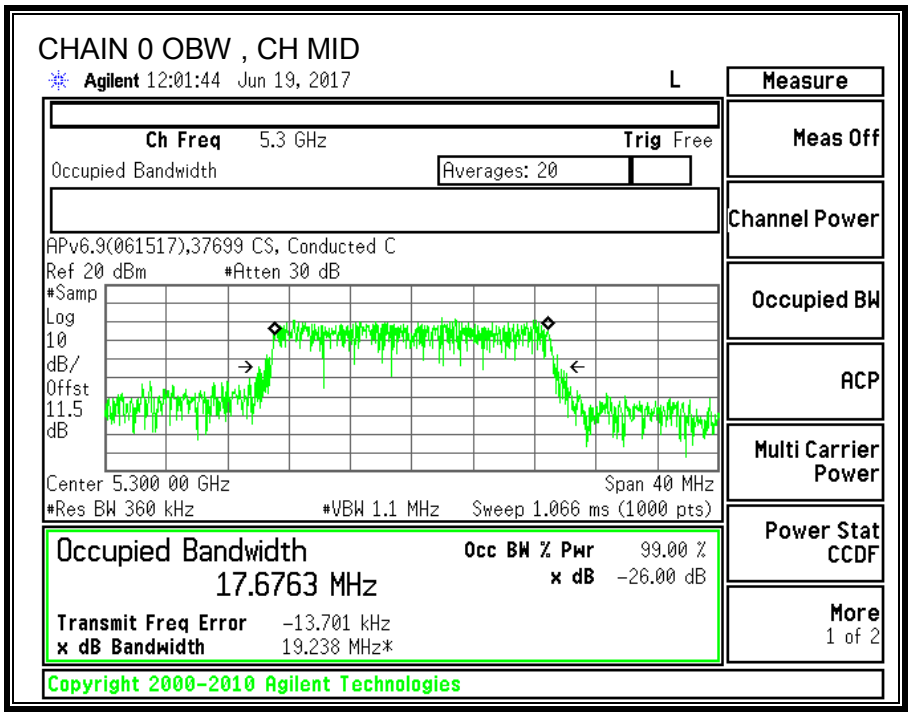
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5260	17.6526	17.6530
Mid	5300	17.6763	17.6559
High	5320	17.6419	17.6512

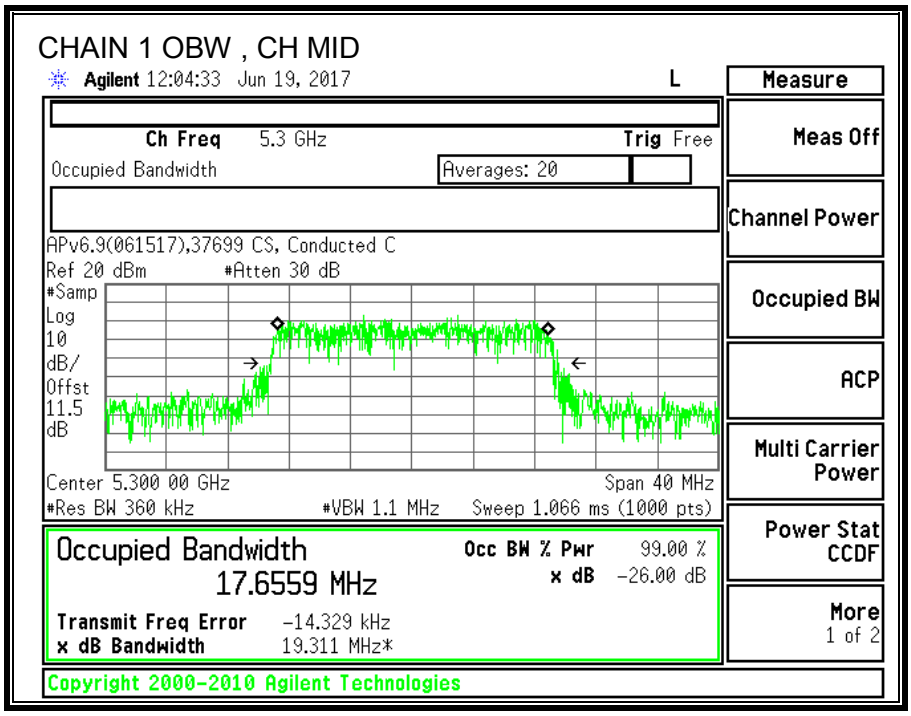
CHAIN 0 OBW , CH LOW

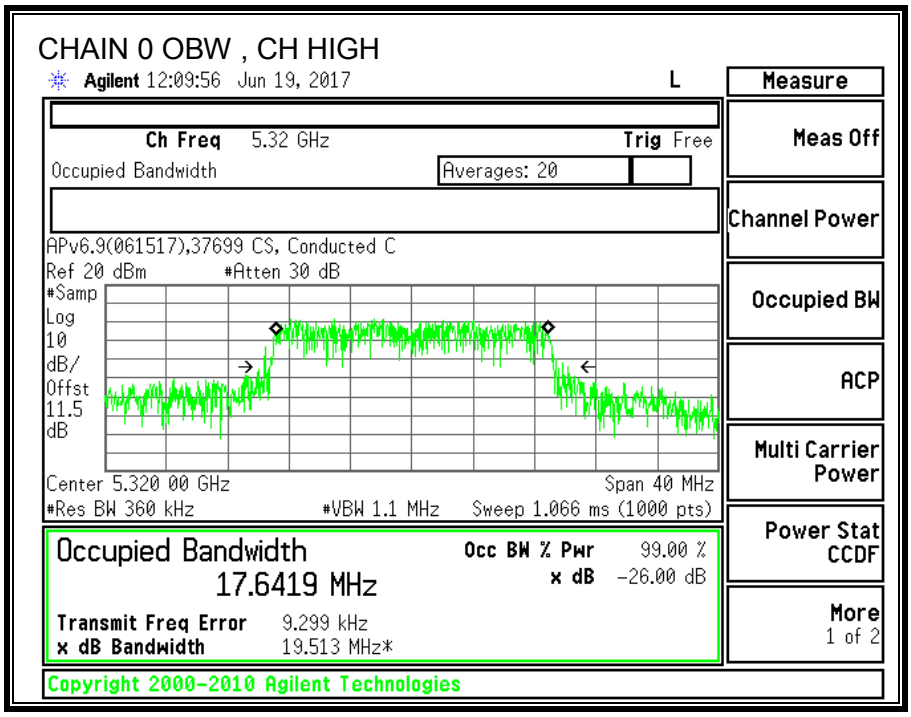


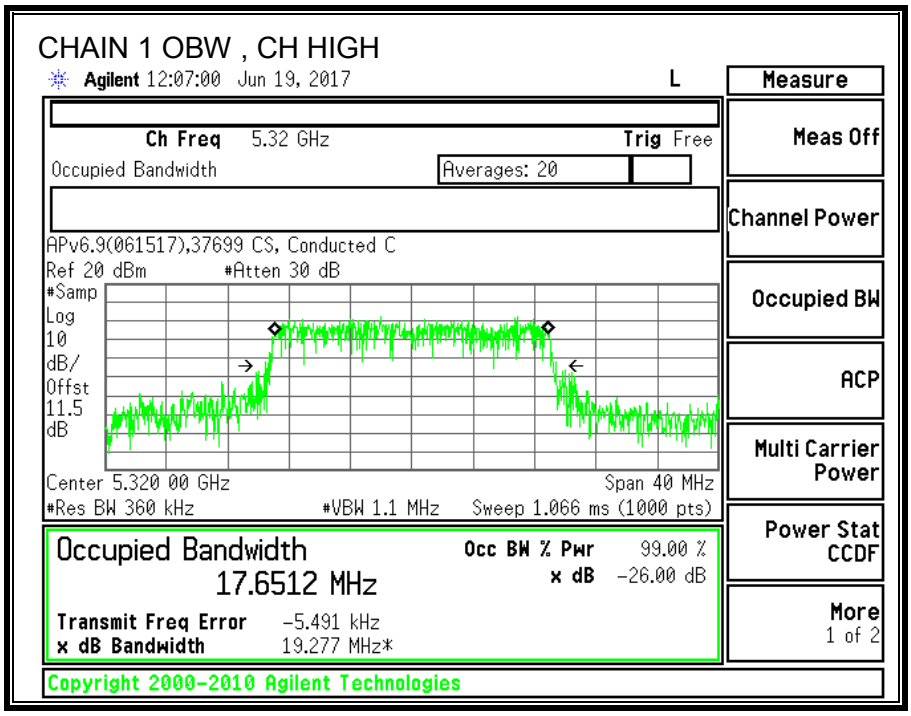
CHAIN 1 OBW , CH LOW











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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)
3.50	3.80	3.65	6.66

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.30	17.65	3.65	6.66
Mid	5300	20.30	17.66	3.65	6.66
High	5320	20.30	17.64	3.65	6.66

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	23.47	27.00	23.35	10.34	11.00	10.34
Mid	5300	24.00	23.47	27.00	23.35	10.34	11.00	10.34
High	5320	24.00	23.47	27.00	23.35	10.34	11.00	10.34

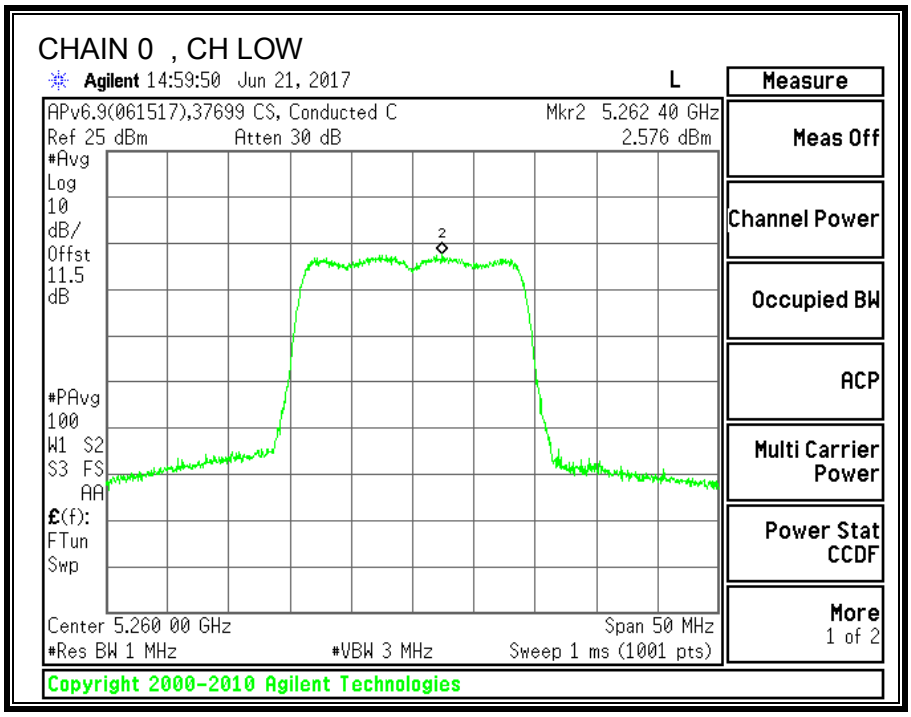
Output Power Results

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	13.08	13.15	16.13	23.35	-7.22
Mid	5300	12.83	13.11	15.98	23.35	-7.37
High	5320	13.03	13.31	16.18	23.35	-7.17

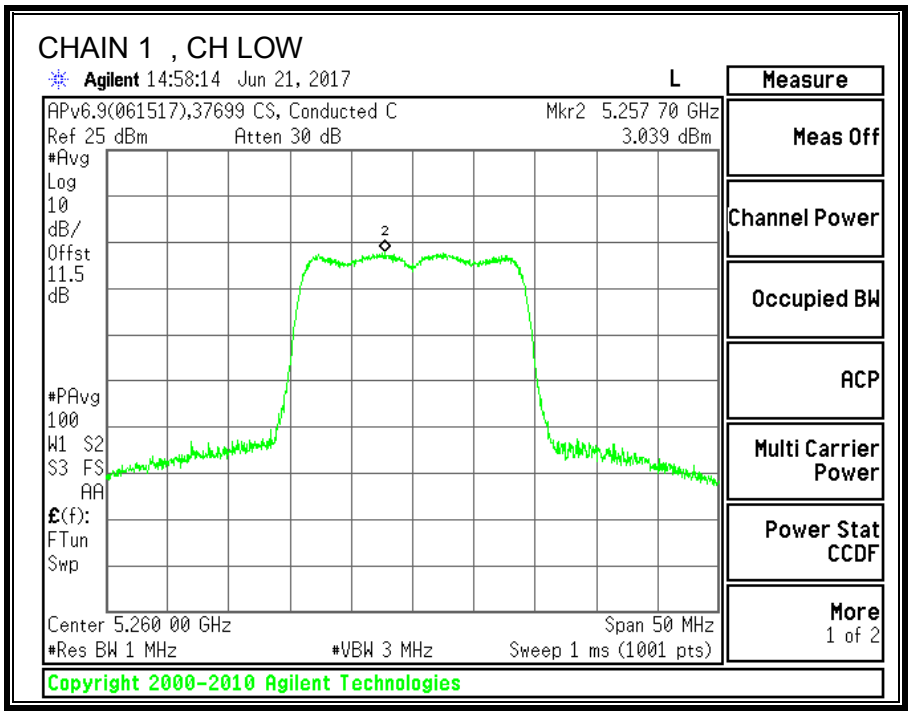
PPSD Results

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	2.58	3.04	5.82	10.34	-4.52
Mid	5300	2.55	3.54	6.08	10.34	-4.26
High	5320	2.88	2.81	5.86	10.34	-4.48

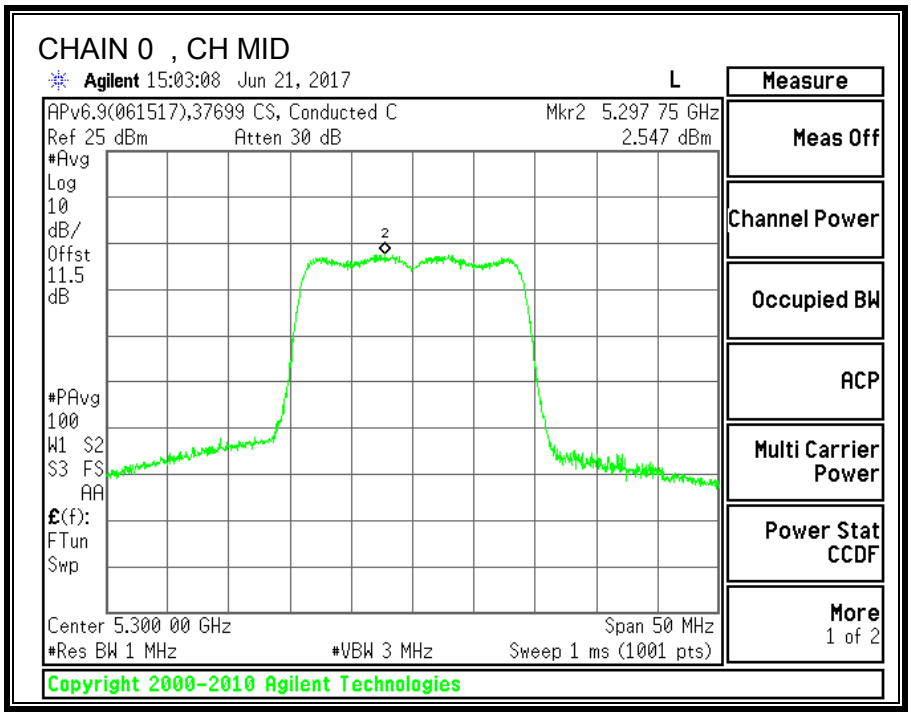
CHAIN 0 , CH LOW



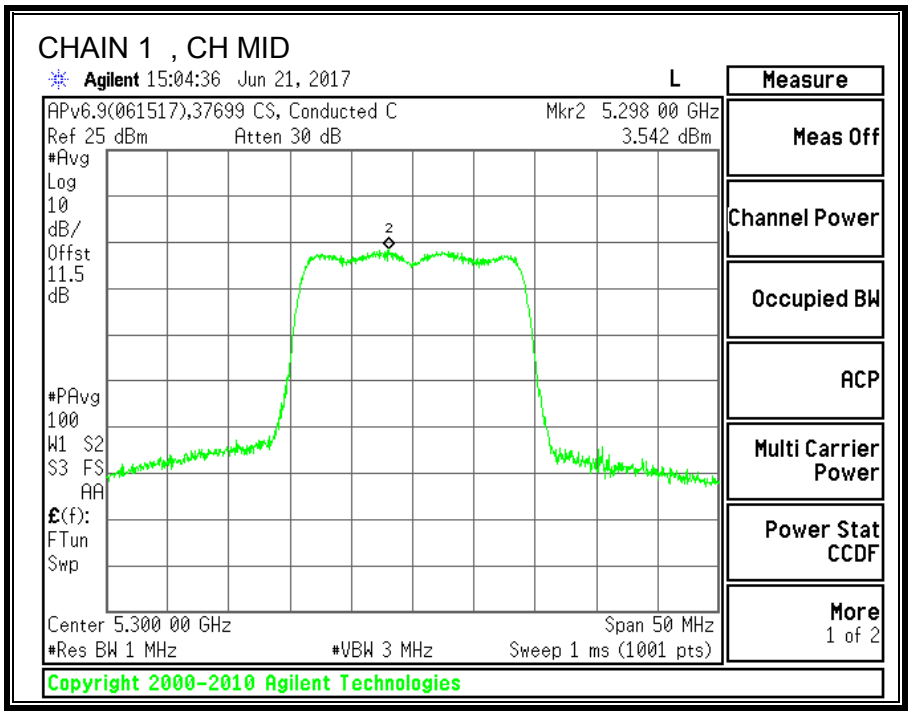
CHAIN 1 , CH LOW



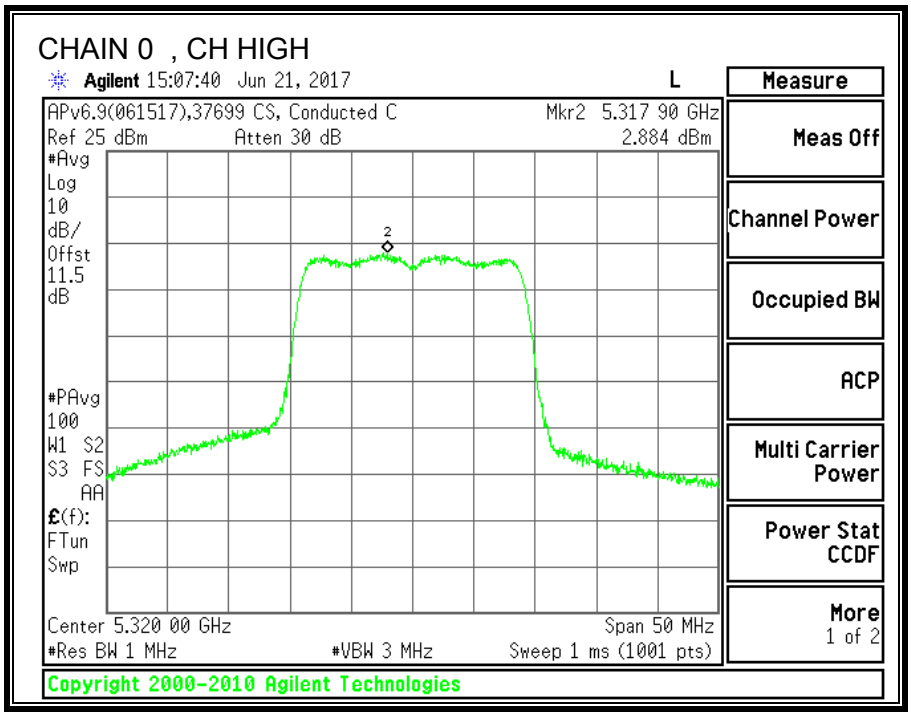
CHAIN 0 , CH MID



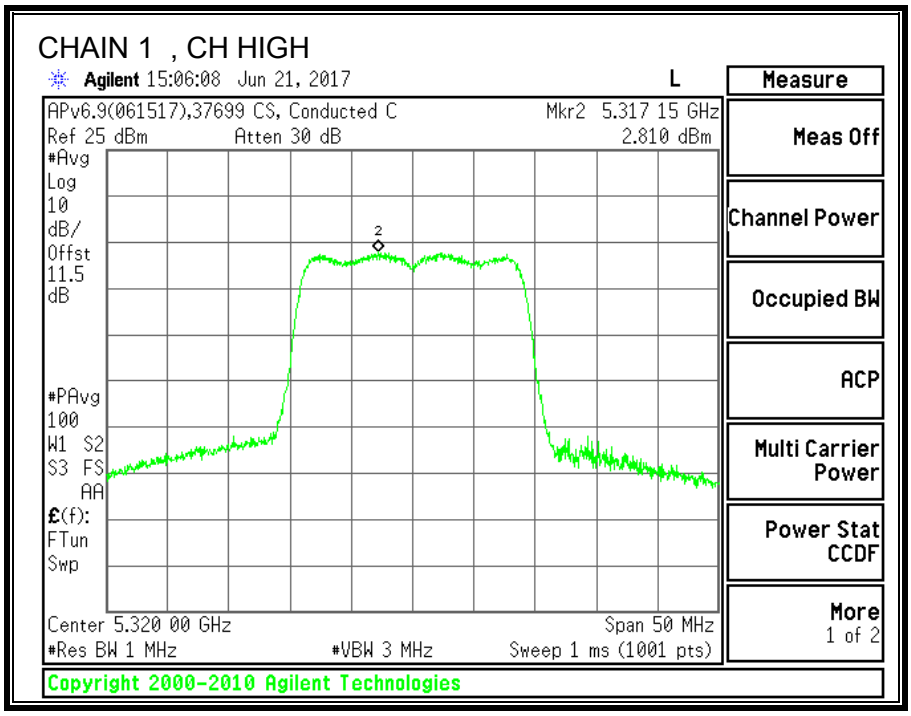
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.7.1. 26 dB BANDWIDTH

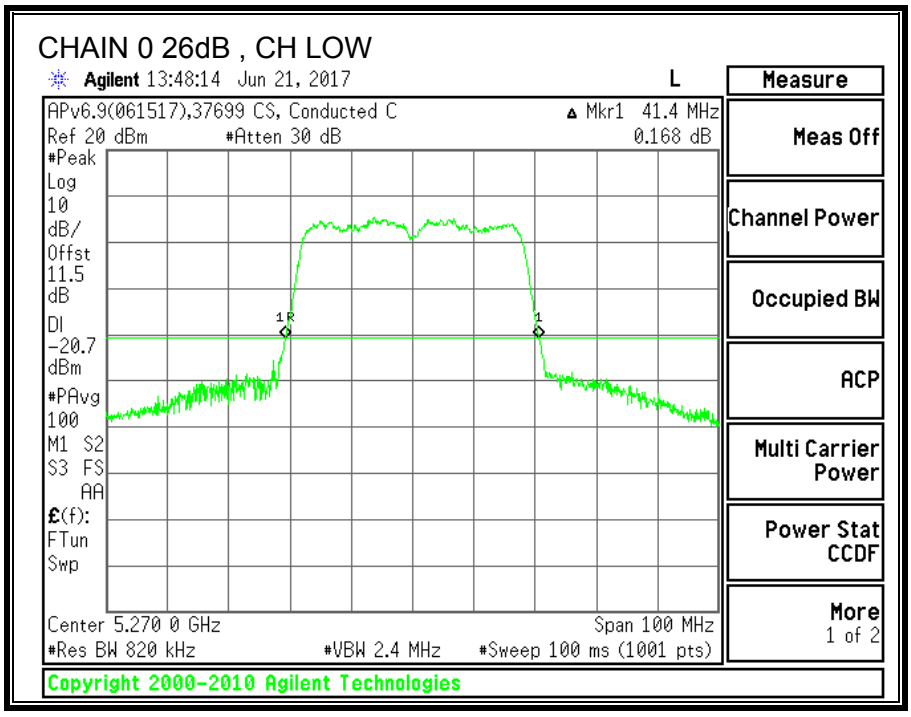
LIMITS

None; for reporting purposes only.

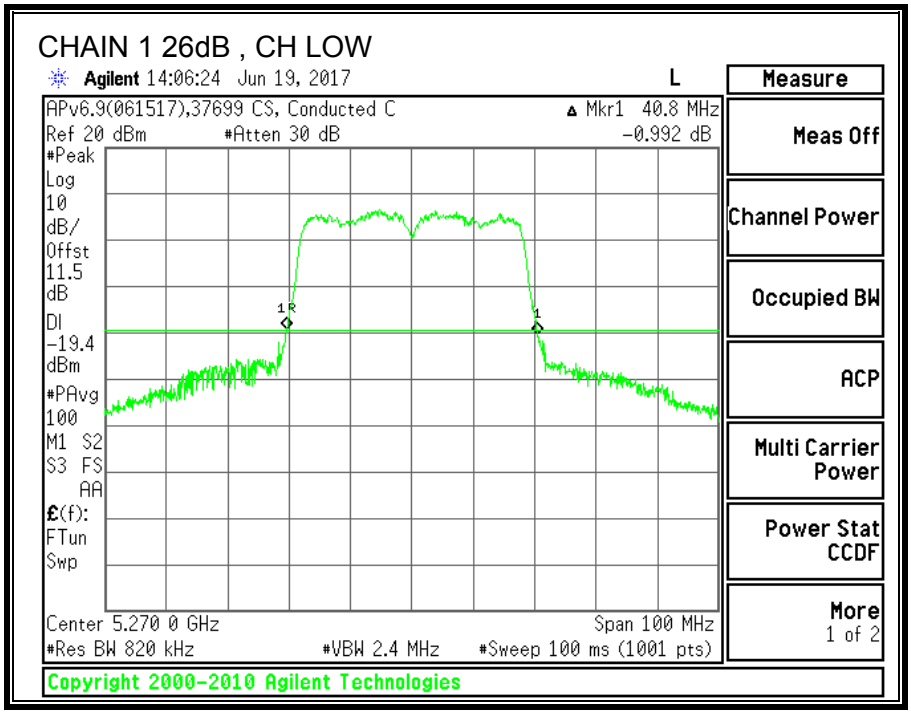
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5270	41.40	40.80
High	5310	41.70	40.90

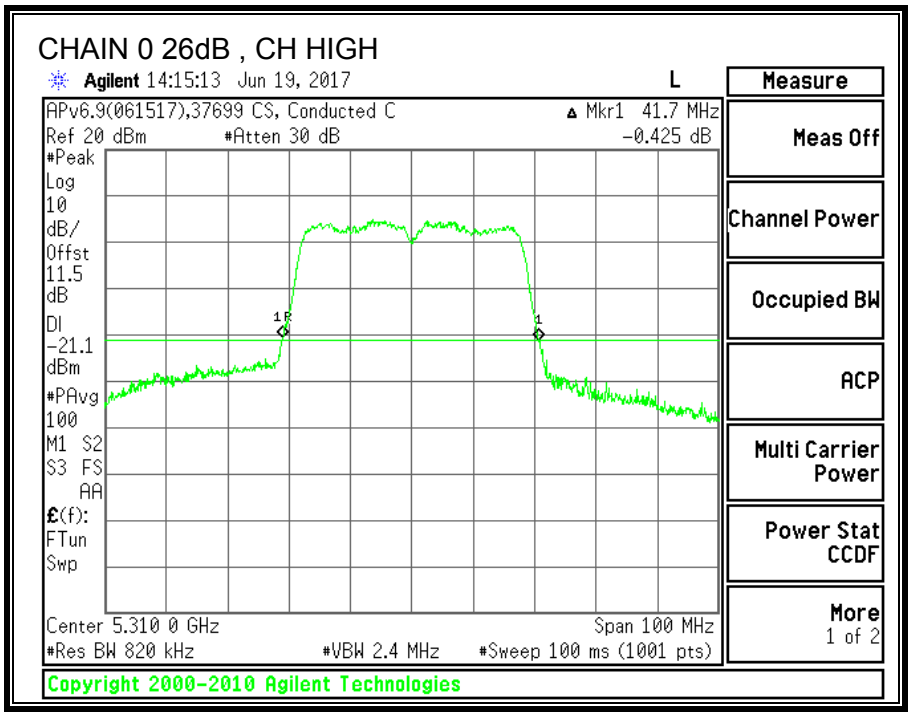
CHAIN 0 26dB , CH LOW



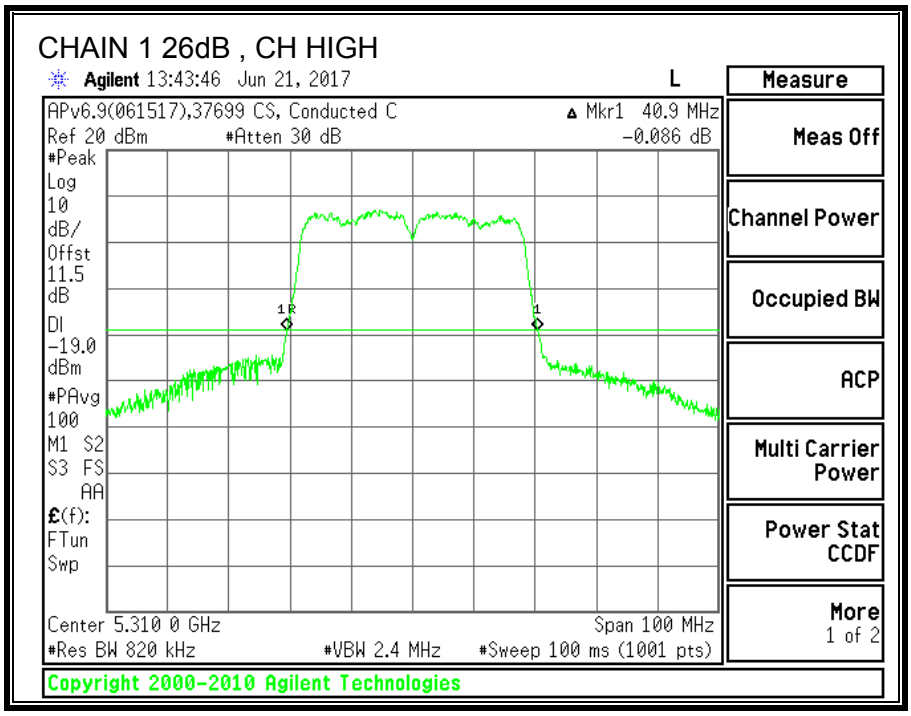
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



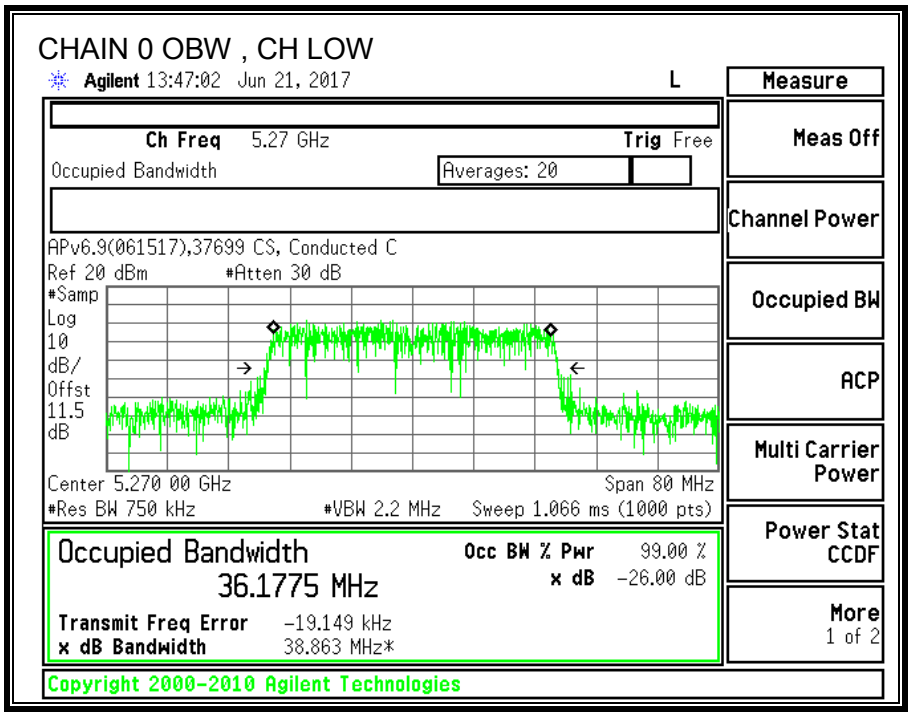
9.7.2. 99% BANDWIDTH

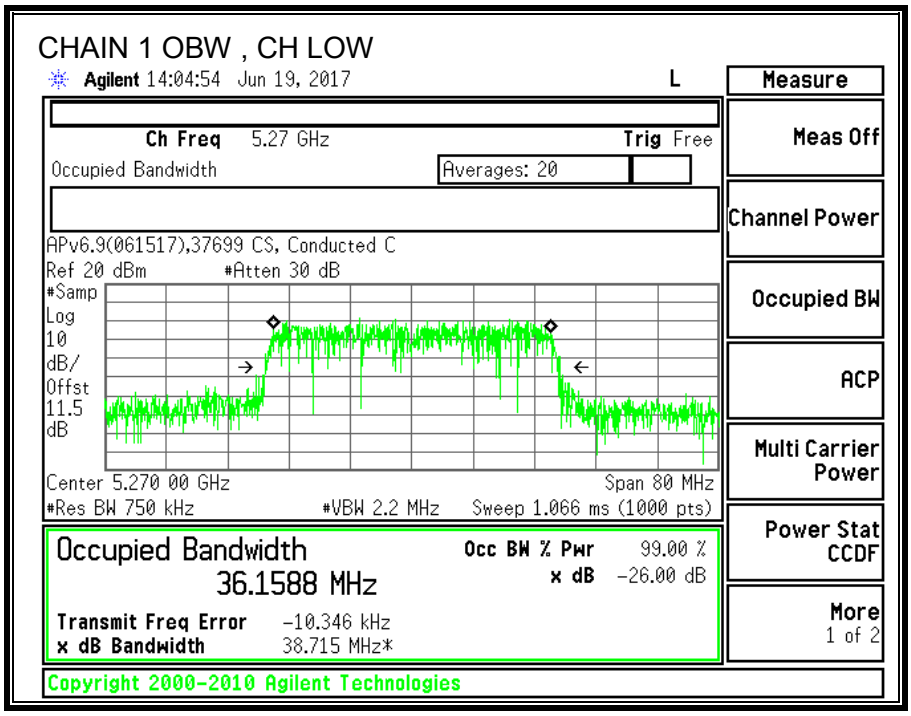
LIMITS

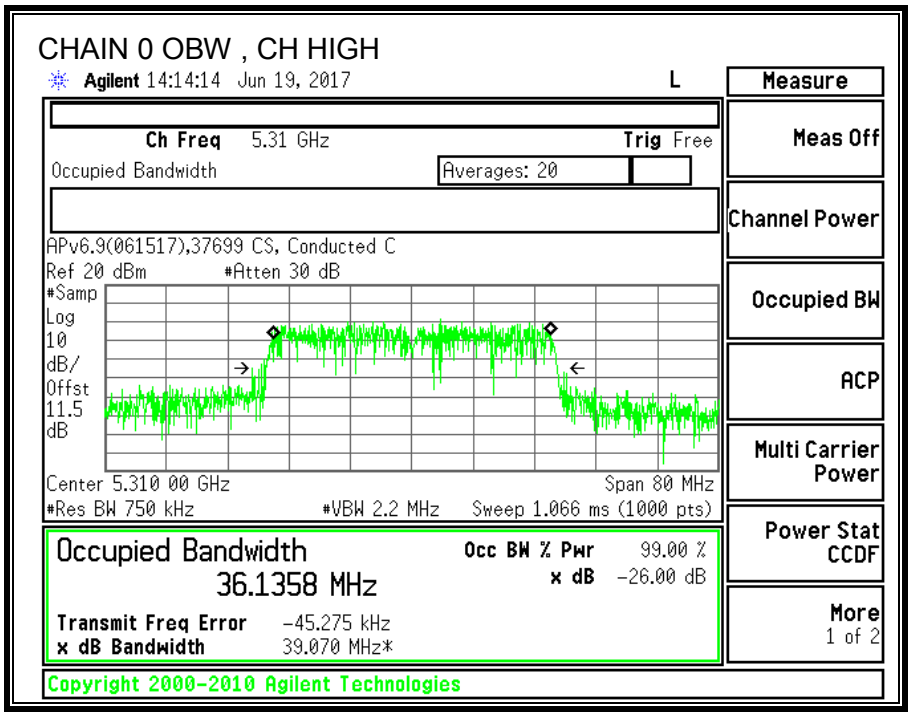
None; for reporting purposes only.

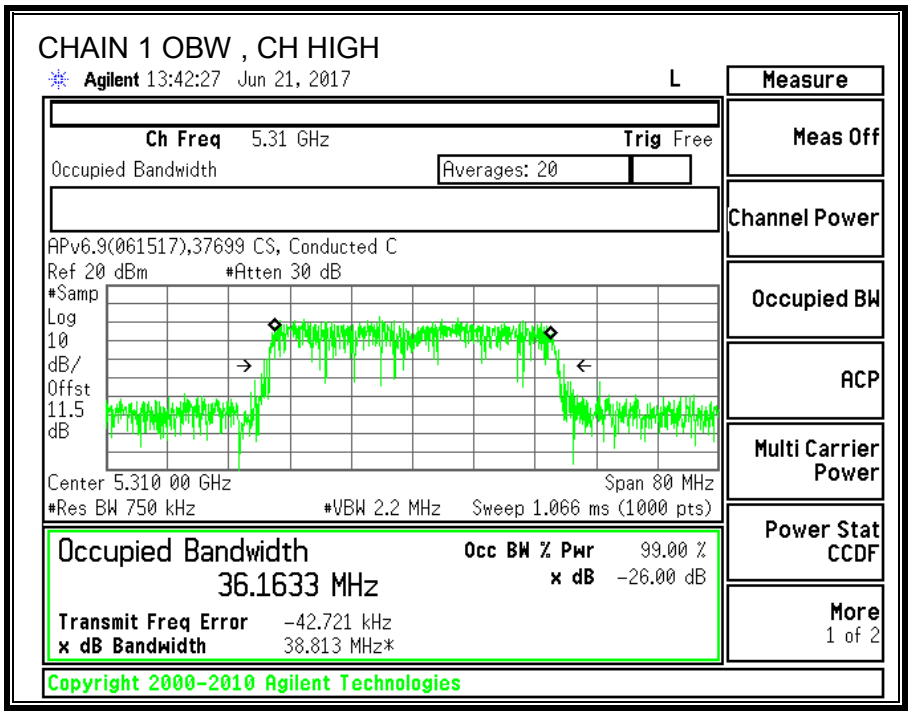
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5270	36.1775	36.1588
High	5310	36.1358	36.1633









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)
3.50	3.80	3.65	6.66

RESULTS

ID:	37699 CS	Date:	06/16/17

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	40.80	36.16	3.65	6.66
High	5310	40.90	36.14	3.65	6.66

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	10.34	11.00	10.34
High	5310	24.00	24.00	30.00	24.00	10.34	11.00	10.34

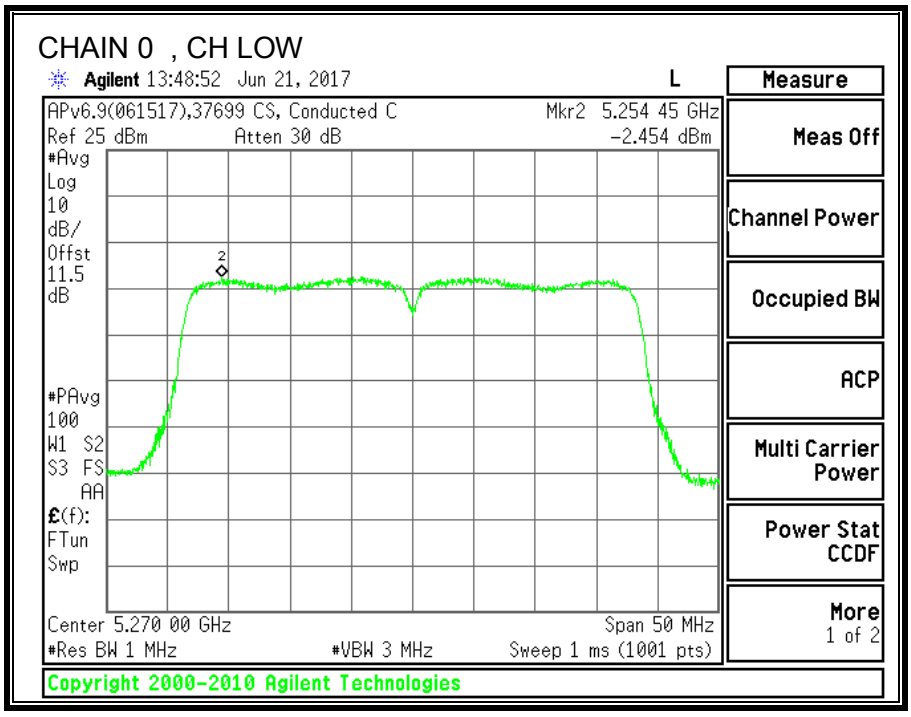
Output Power Results

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	10.67	11.22	13.96	24.00	-10.04
High	5310	10.93	10.87	13.91	24.00	-10.09

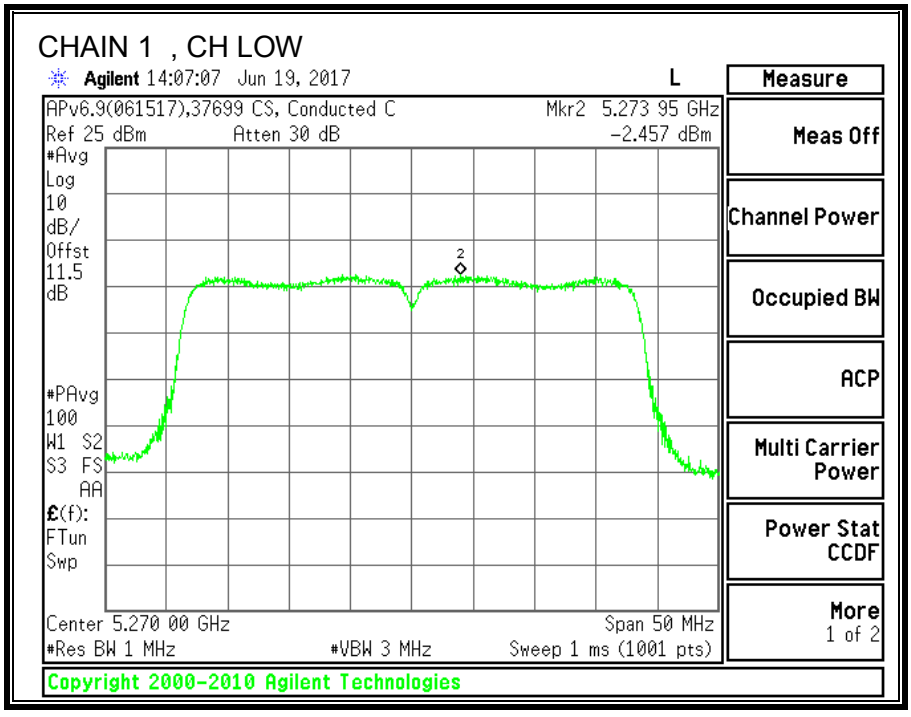
PPSD Results

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	-2.45	-2.46	0.55	10.34	-9.79
High	5310	-2.86	-2.01	0.60	10.34	-9.74

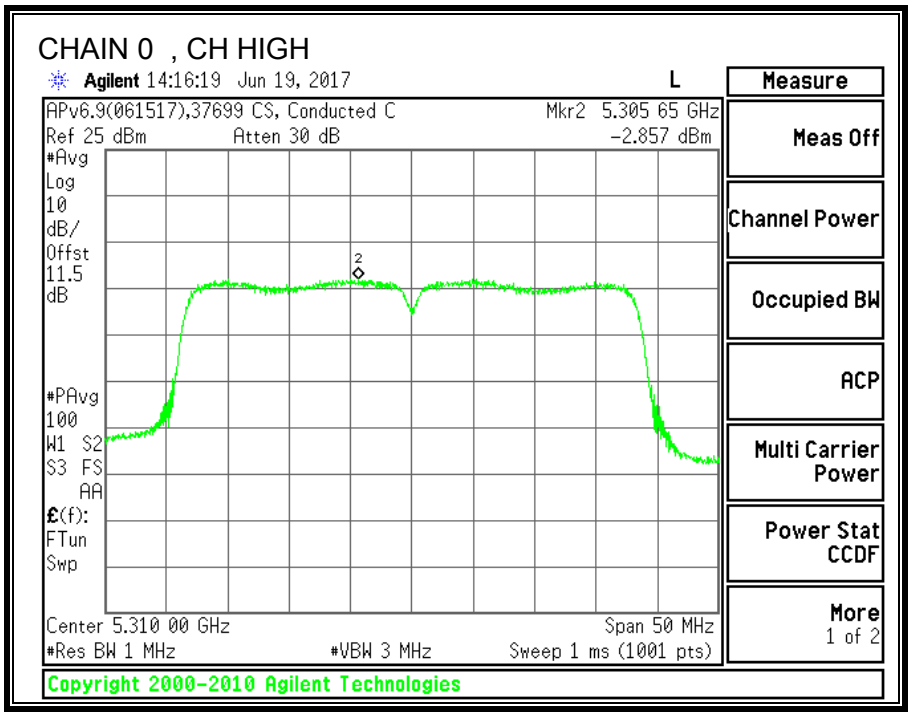
CHAIN 0 , CH LOW



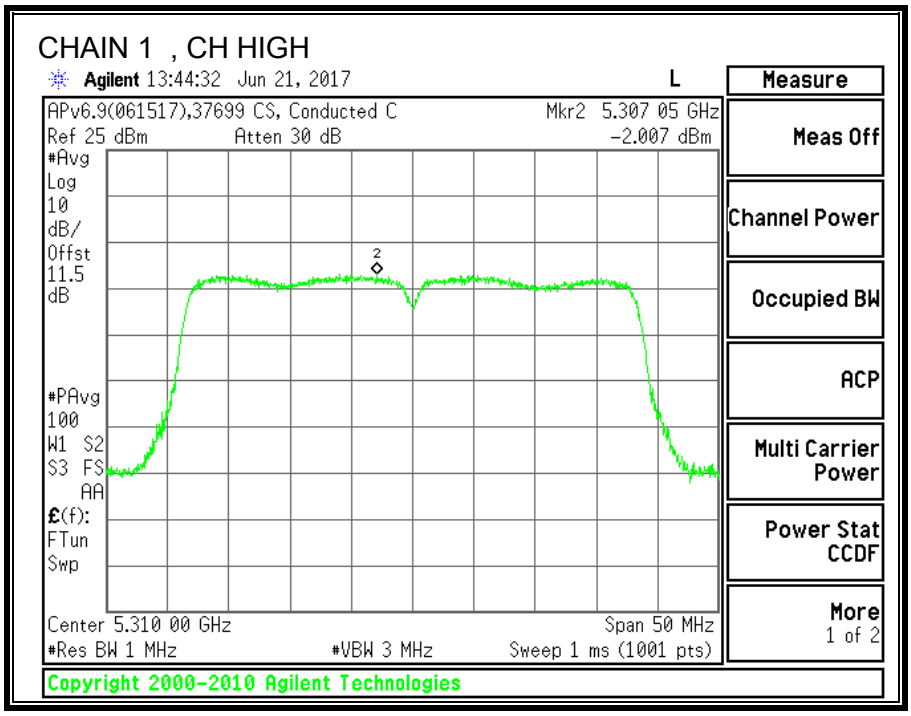
CHAIN 1 , CH LOW



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.8.1. 26 dB BANDWIDTH

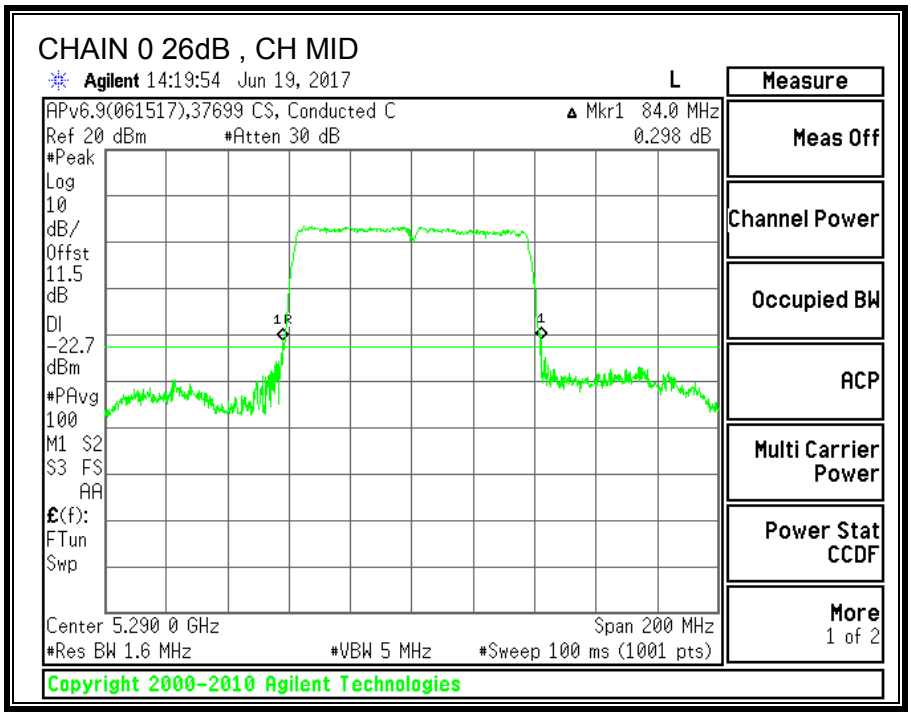
LIMITS

None; for reporting purposes only.

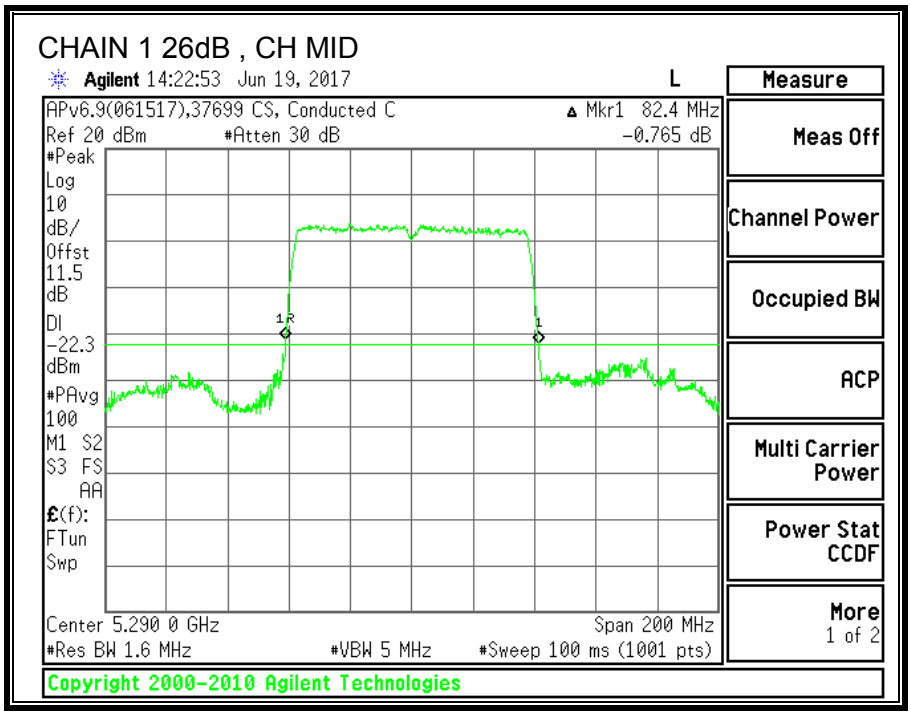
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Mid	5290	84.0	82.4

CHAIN 0 26dB , CH MID



CHAIN 1 26dB , CH MID



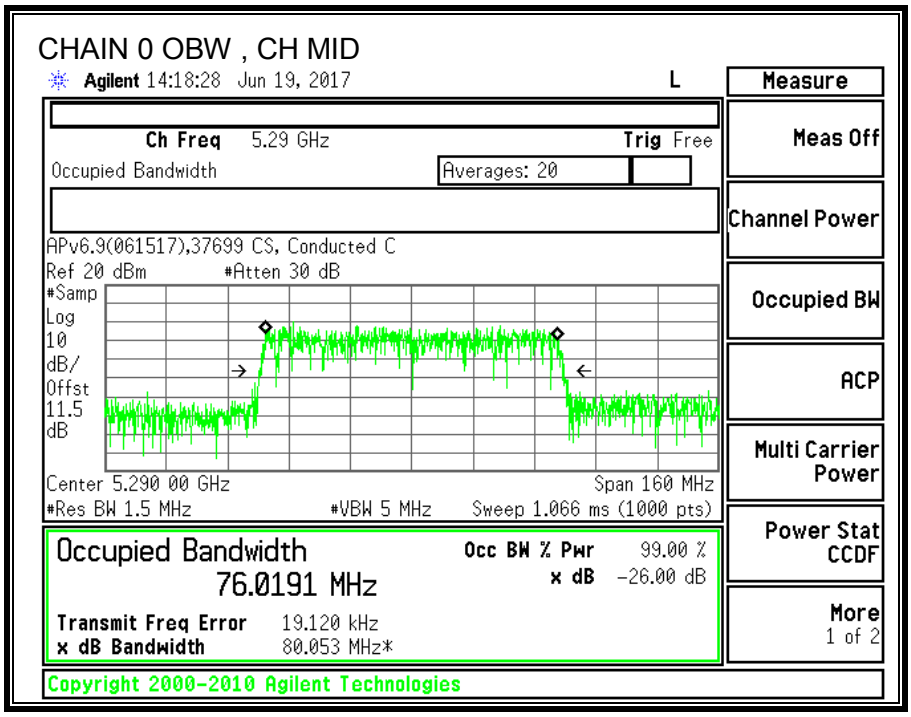
9.8.2. 99% BANDWIDTH

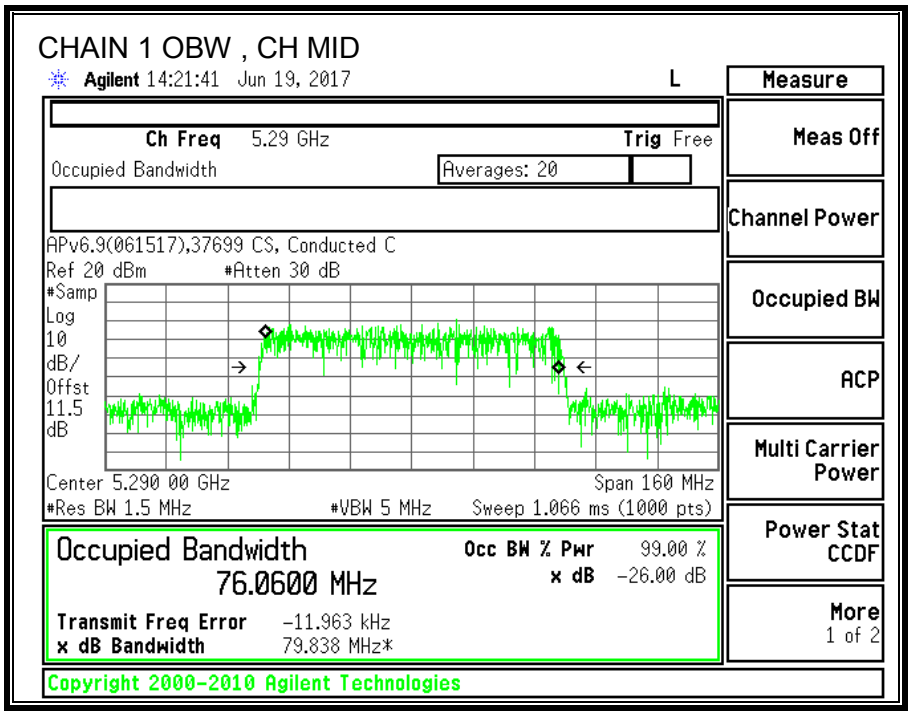
LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Mid	5290	76.0191	76.0600





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)
3.50	3.80	3.65	6.66

RESULTS

ID:	37699 CS	Date:	06/16/17

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	82.40	76.02	3.65	6.66

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	10.34	11.00	10.34

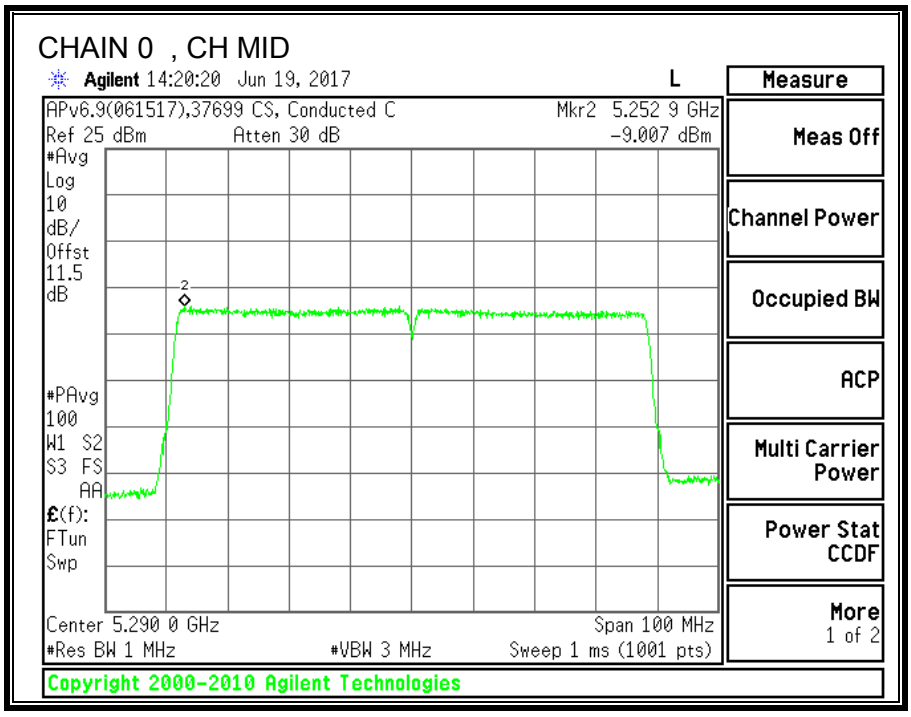
Output Power Results

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	7.91	8.25	11.09	24.00	-12.91

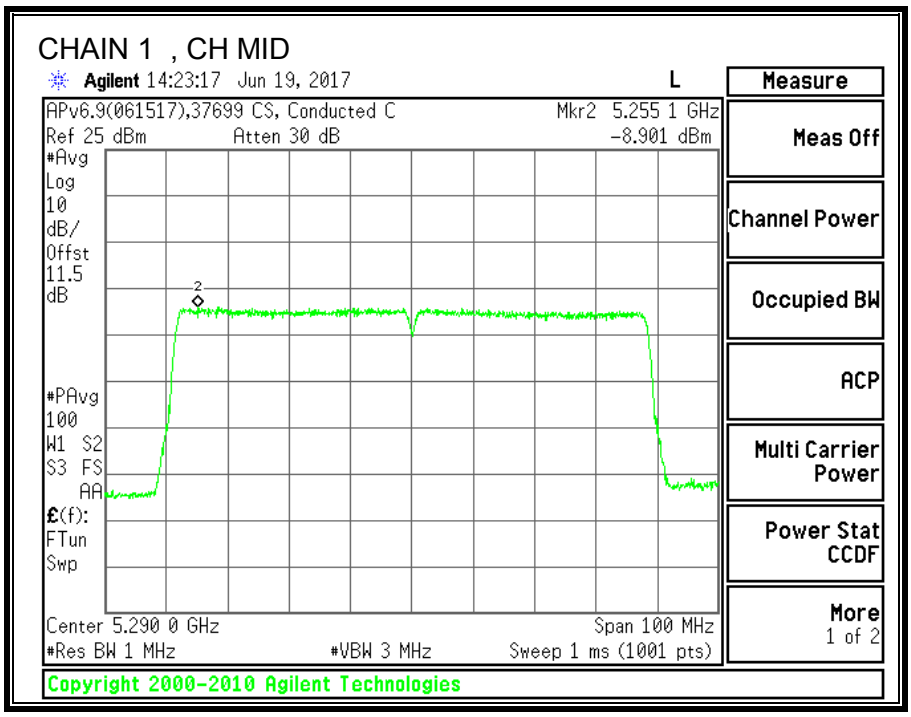
PPSD Results

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	5530	-9.007	-8.901	-5.94	10.34	-16.28

CHAIN 0 , CH MID



CHAIN 1 , CH MID



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

9.9.1. 26 dB BANDWIDTH

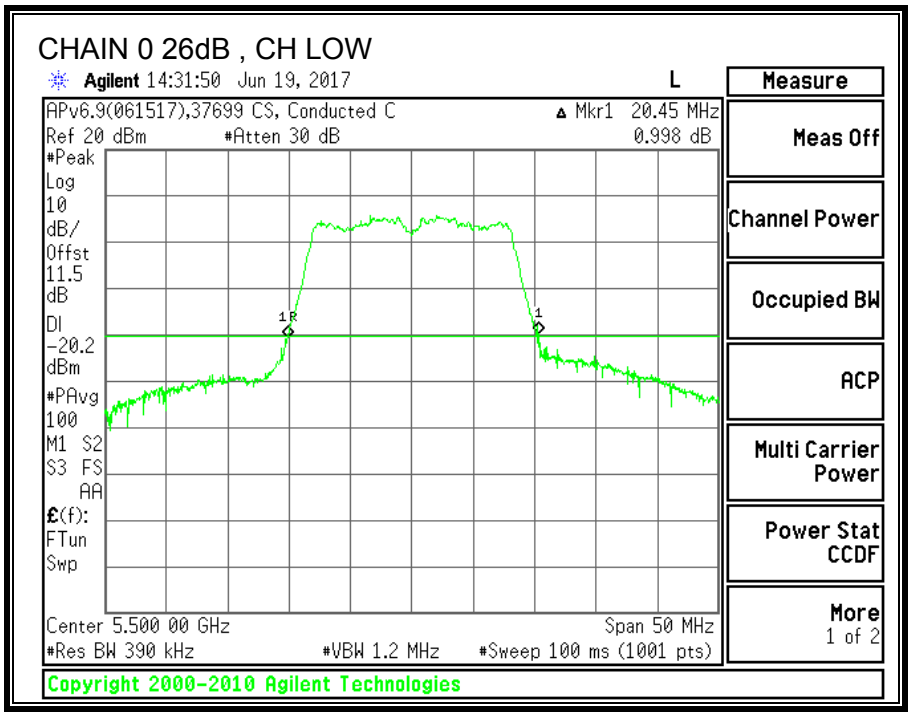
LIMITS

None; for reporting purposes only.

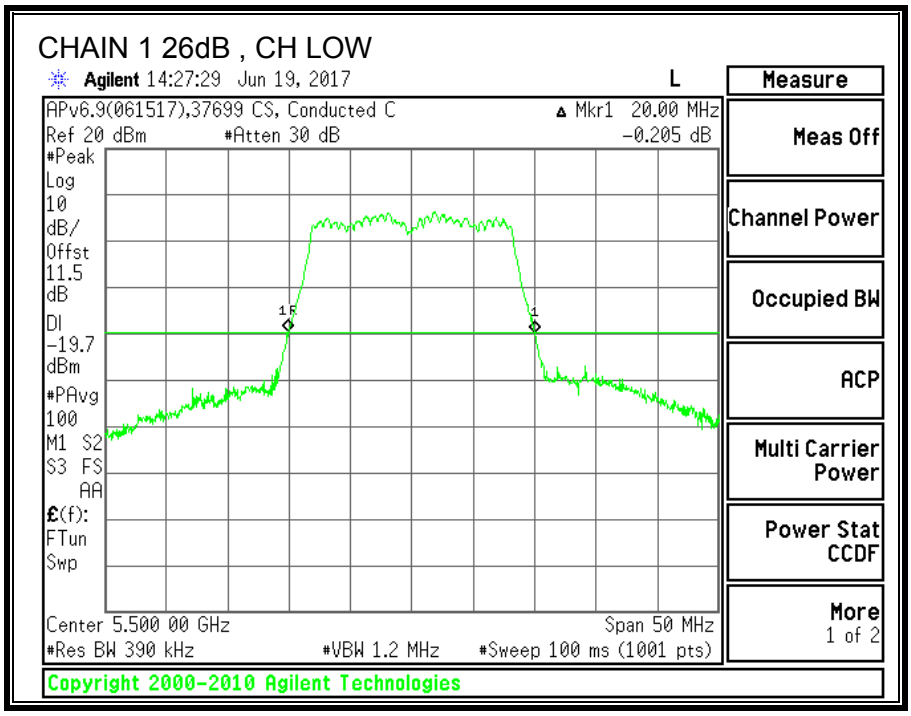
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5500	20.45	20.00
Mid	5580	20.30	20.15
High	5700	20.30	20.25

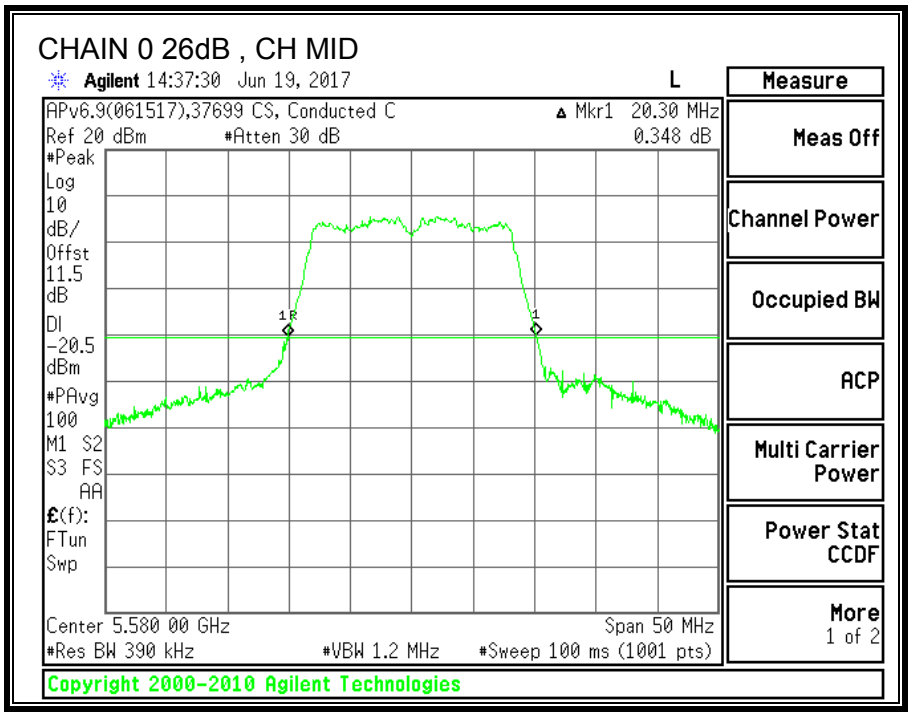
CHAIN 0 26dB , CH LOW



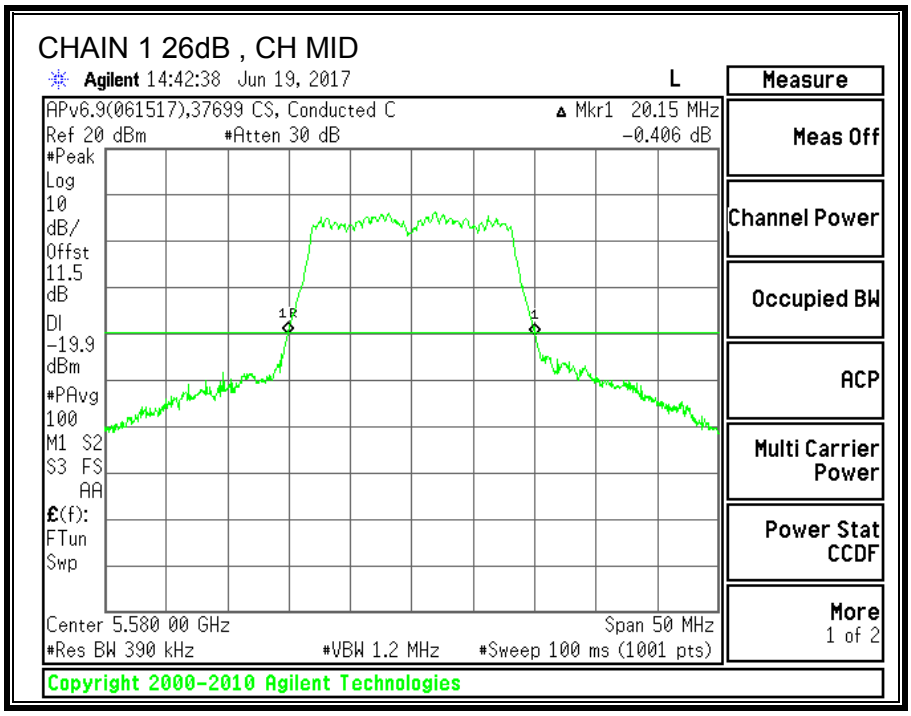
CHAIN 1 26dB , CH LOW



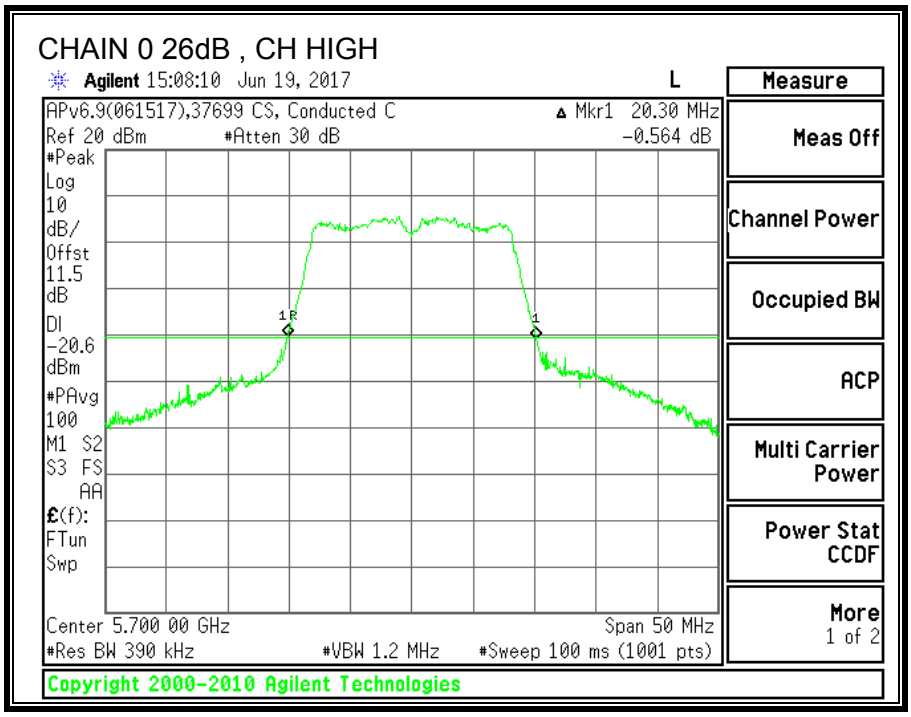
CHAIN 0 26dB , CH MID



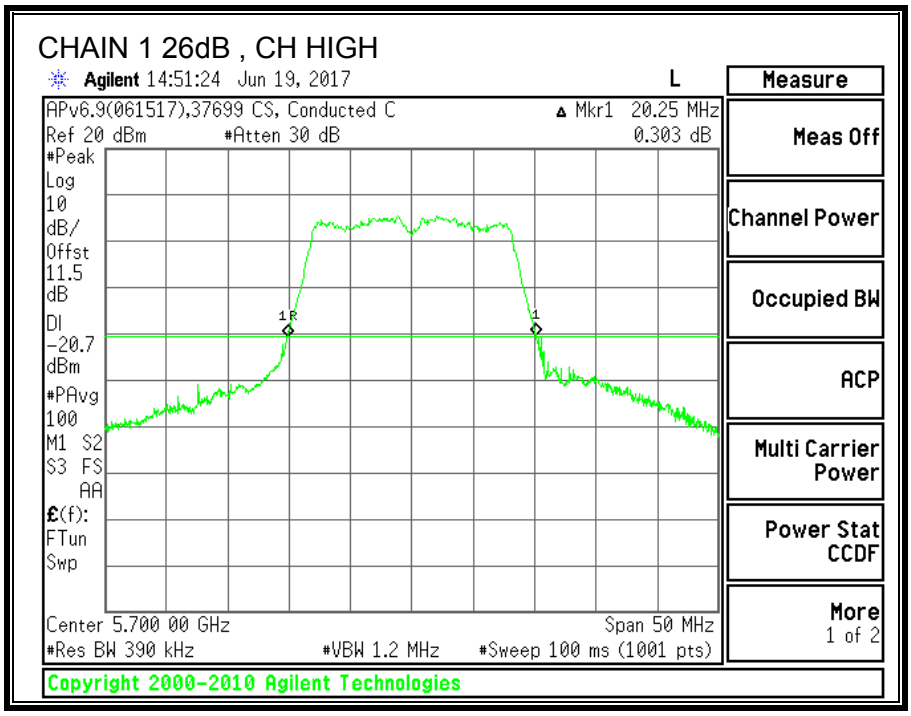
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

9.9.2. 99% BANDWIDTH

LIMITS

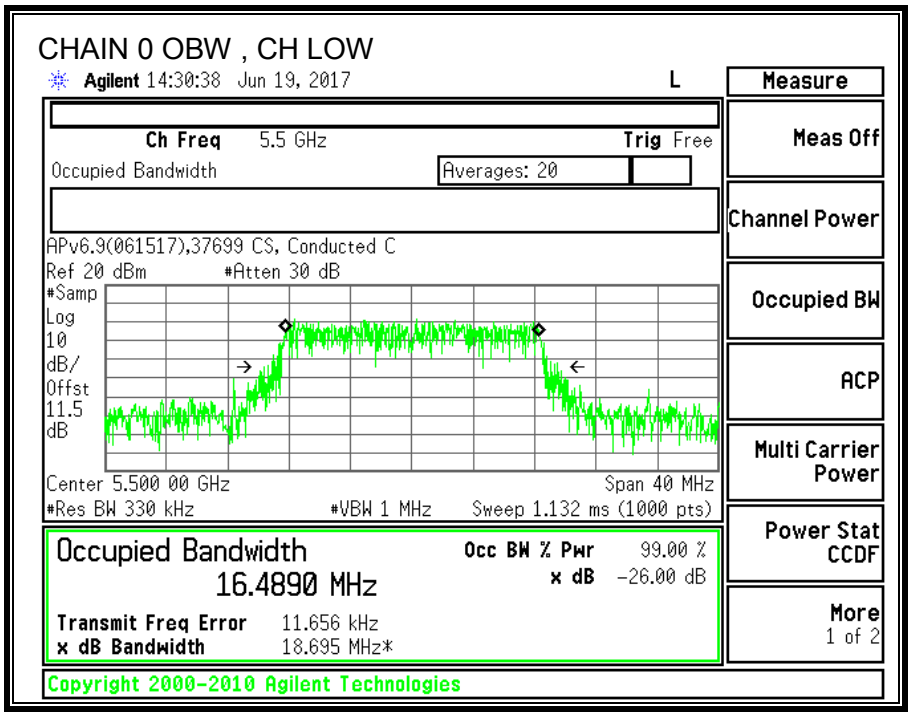
None; for reporting purposes only.

RESULTS

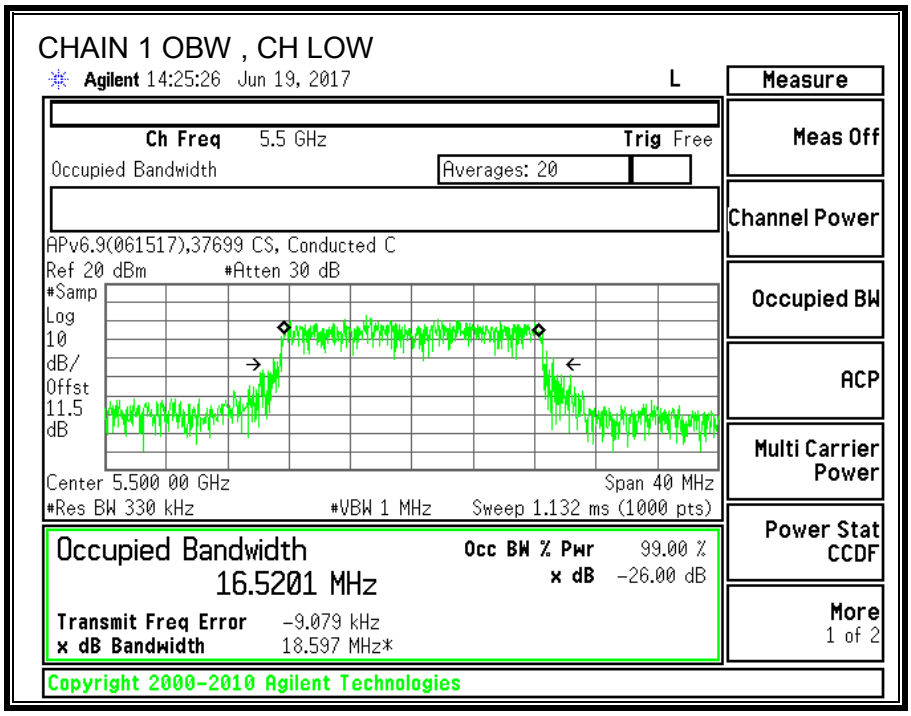
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5500	16.4890	16.5201
Mid	5580	16.5345	16.4746
High	5700	16.5011	16.4950

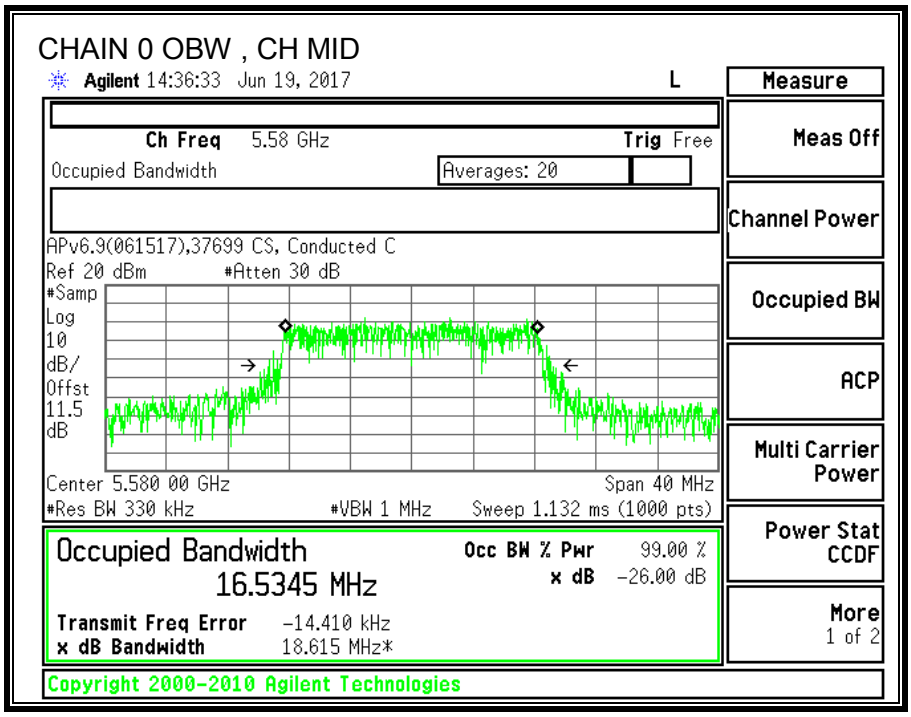
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

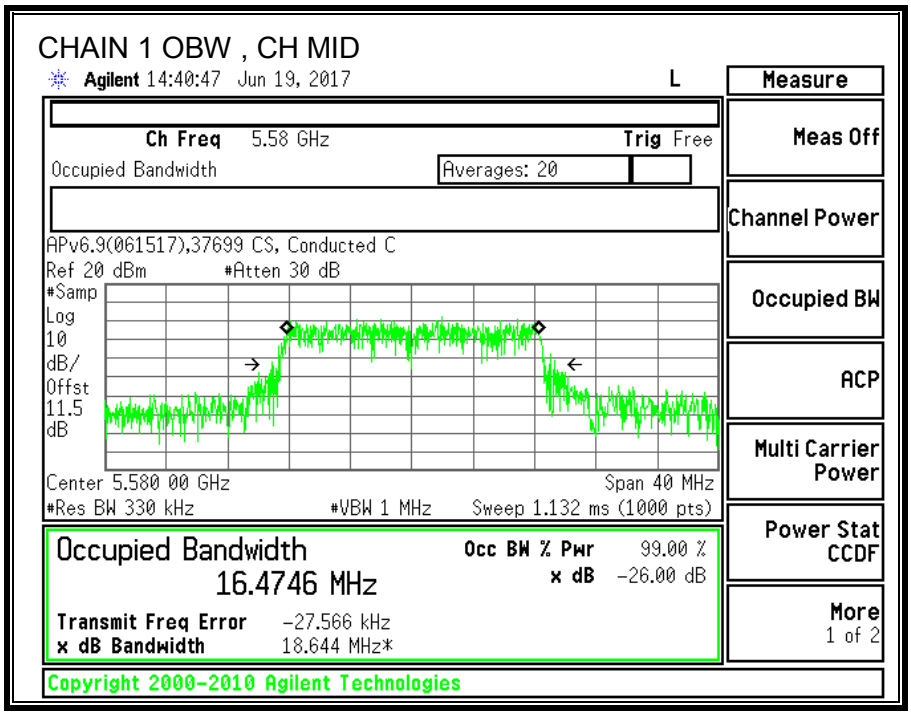
CHAIN 0 OBW , CH LOW



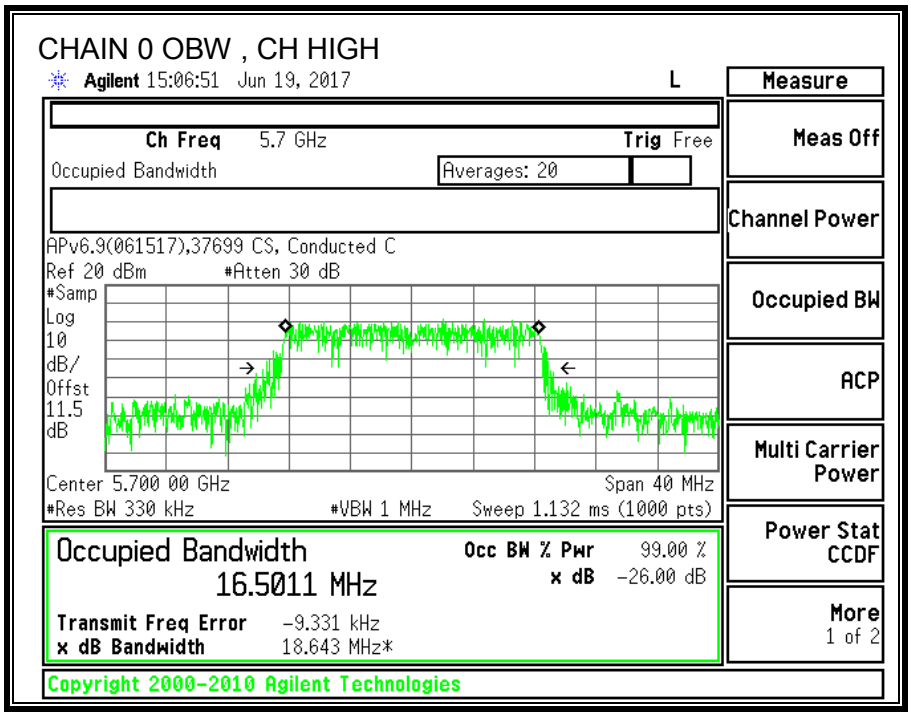
CHAIN 1 OBW , CH LOW



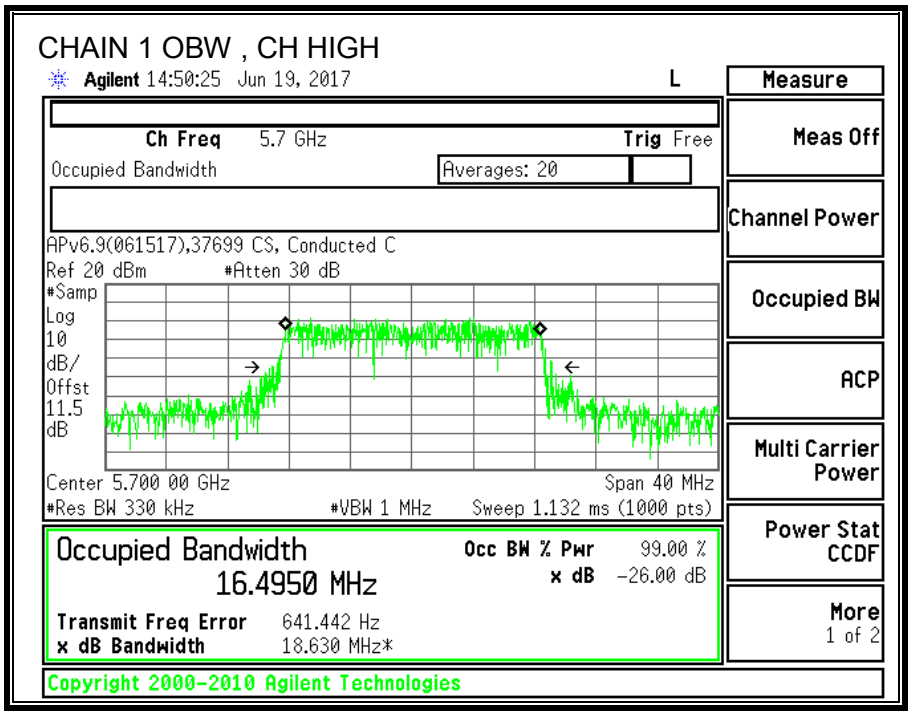




CHAIN 0 OBW , CH HIGH



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)
5.30	5.30	5.30	8.31

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.00	16.49	5.30	8.31
Mid	5580	20.15	16.47	5.30	8.31
High	5700	20.25	16.50	5.30	8.31

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	23.17	27.00	21.70	8.69	11.00	8.69
Mid	5580	24.00	23.17	27.00	21.70	8.69	11.00	8.69
High	5700	24.00	23.17	27.00	21.70	8.69	11.00	8.69

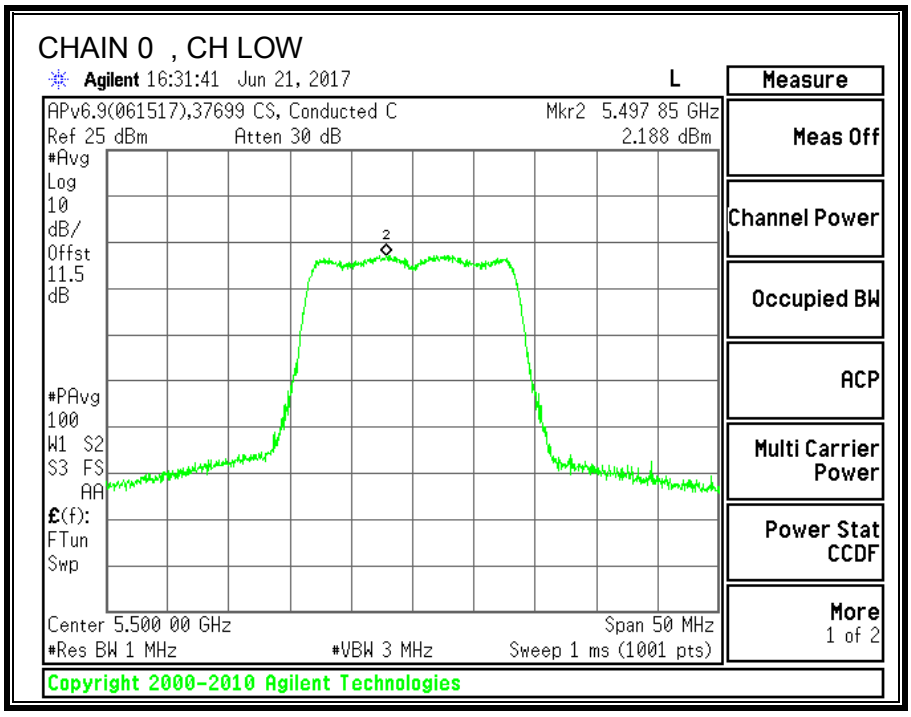
Output Power Results

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	12.61	12.81	15.72	21.70	-5.98
Mid	5580	12.73	12.72	15.74	21.70	-5.96
High	5700	12.47	12.56	15.53	21.70	-6.17

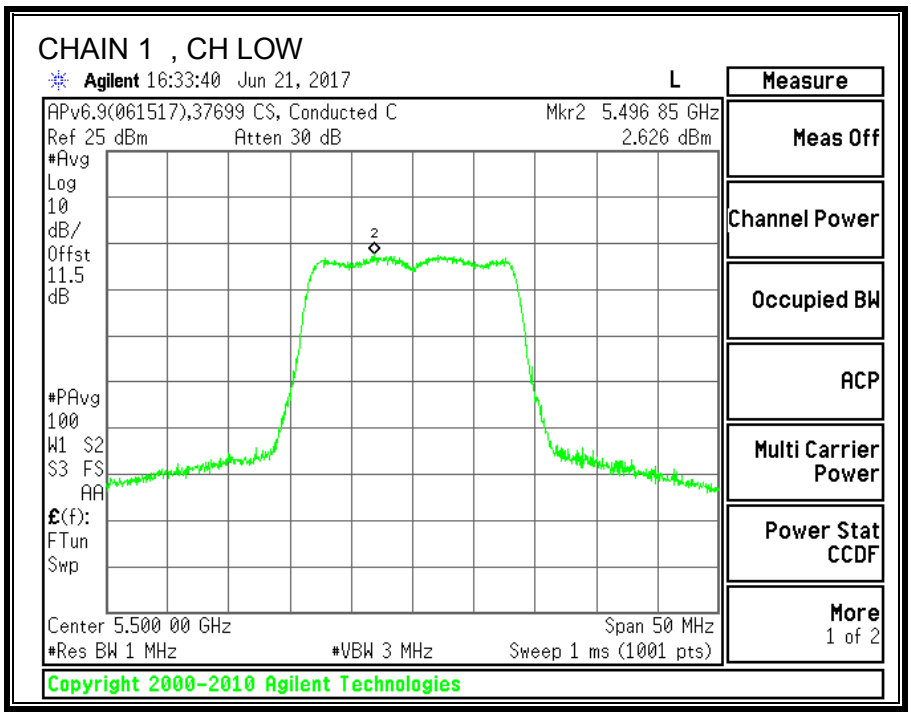
PPSD Results

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	2.19	2.63	5.42	8.69	-3.27
Mid	5580	2.48	2.47	5.48	8.69	-3.21
High	5700	2.24	2.24	5.25	8.69	-3.44

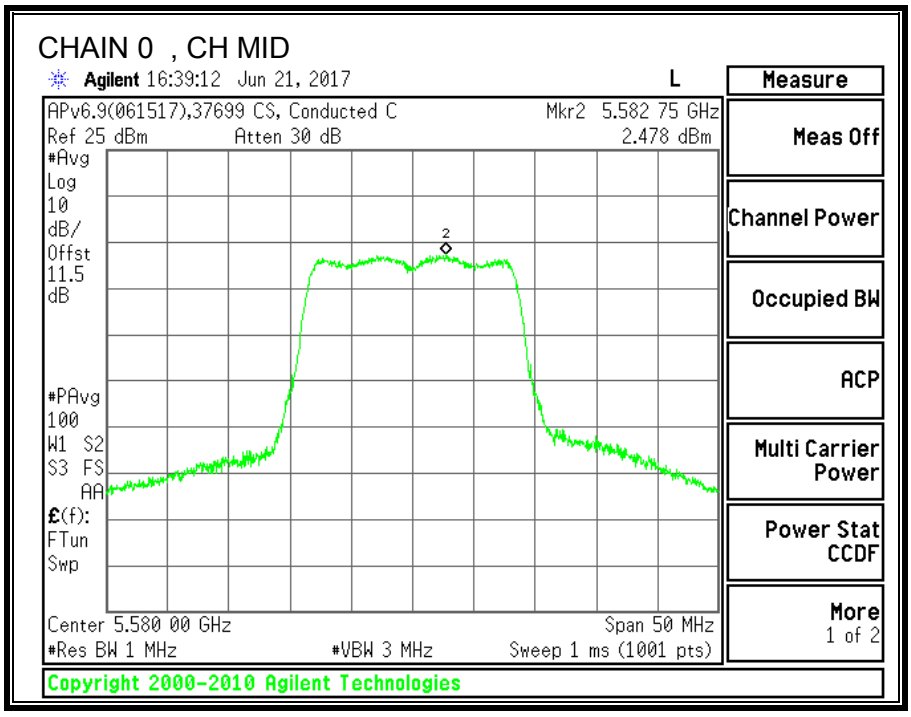
CHAIN 0 , CH LOW



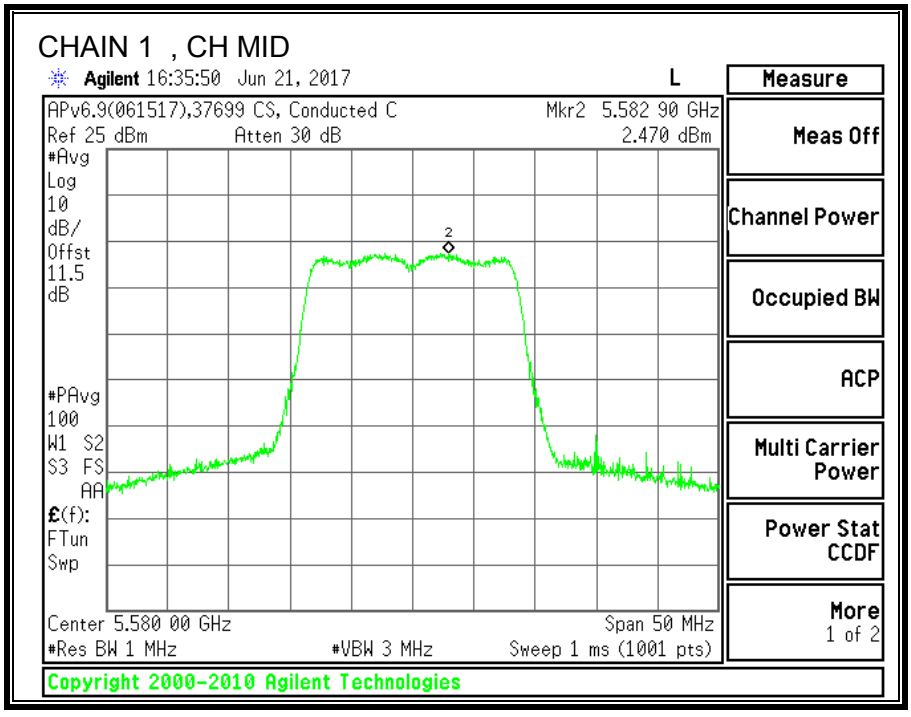
CHAIN 1 , CH LOW



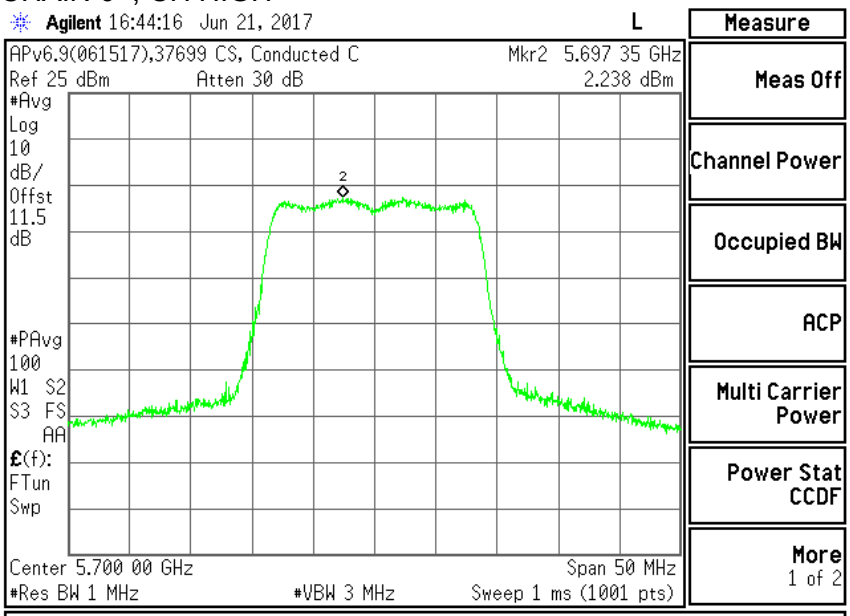
CHAIN 0 , CH MID



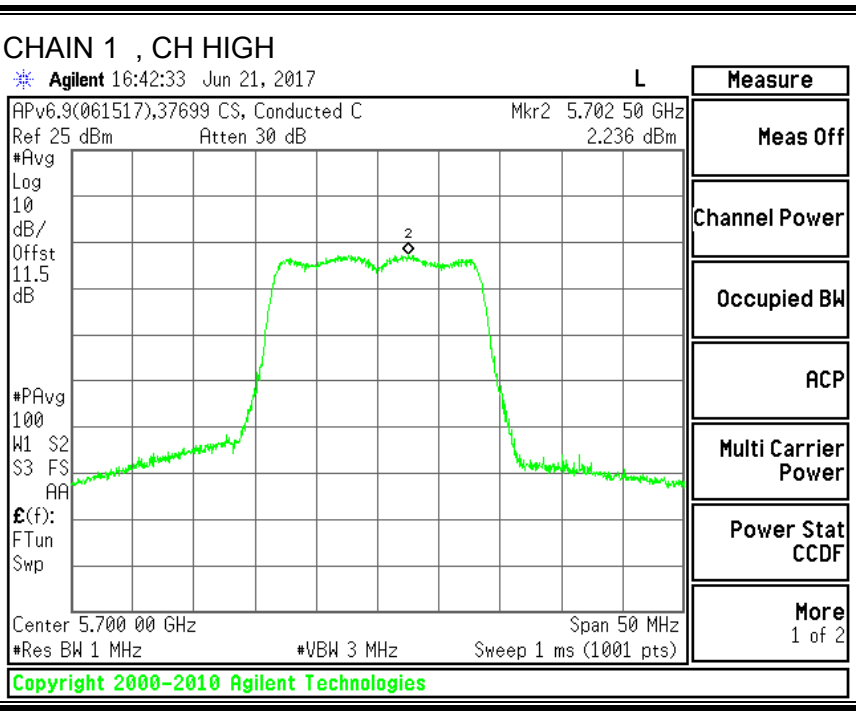
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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	20.45	20.55
Mid	5580	20.55	20.40
High	5700	20.50	20.35

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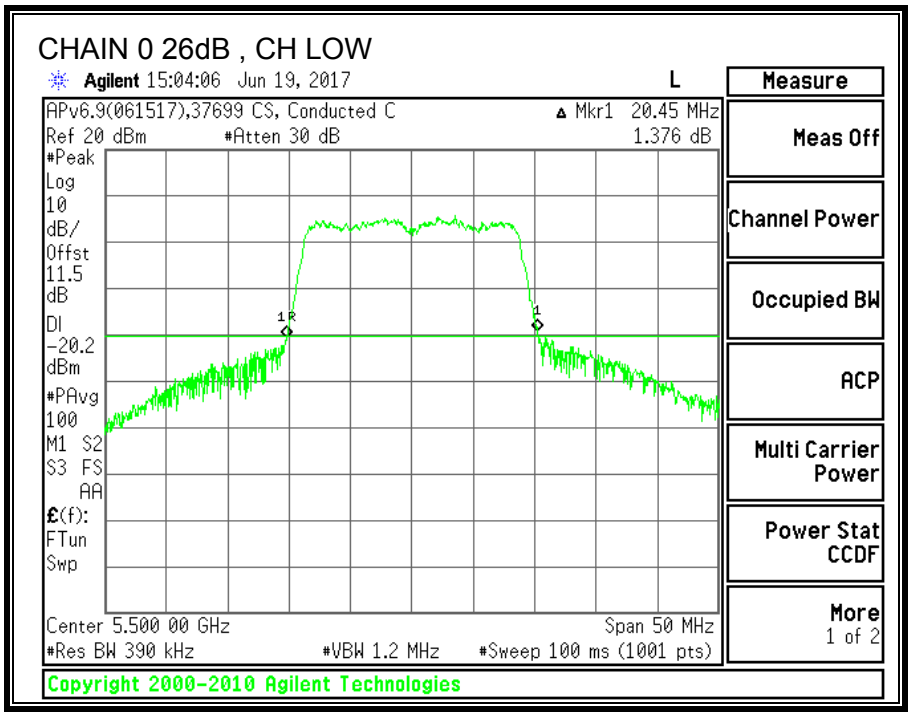
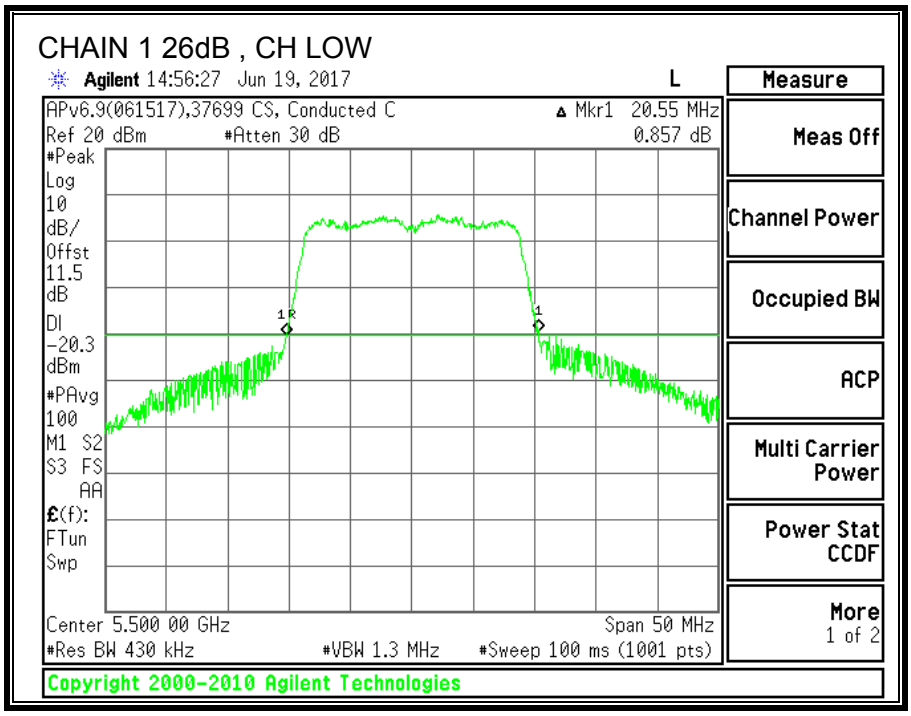
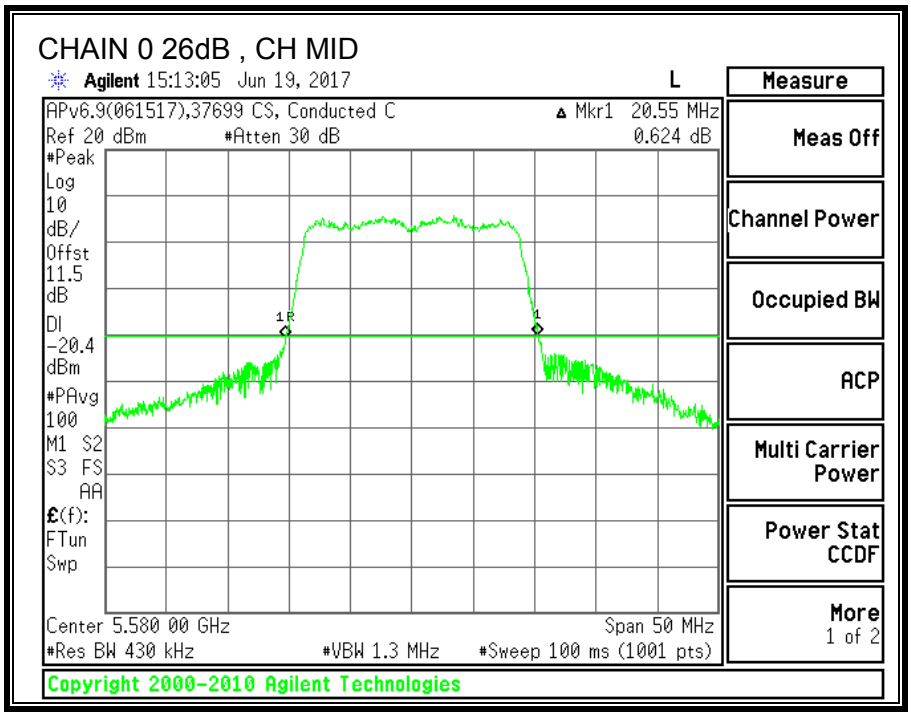
CHAIN 0 26dB , CH LOW



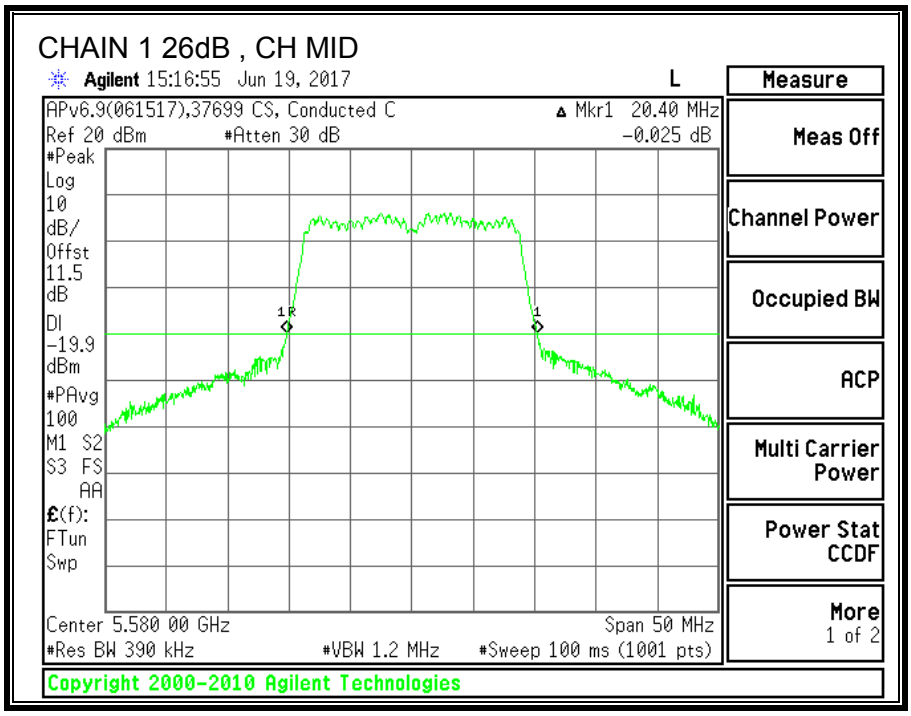
CHAIN 1 26dB , CH LOW



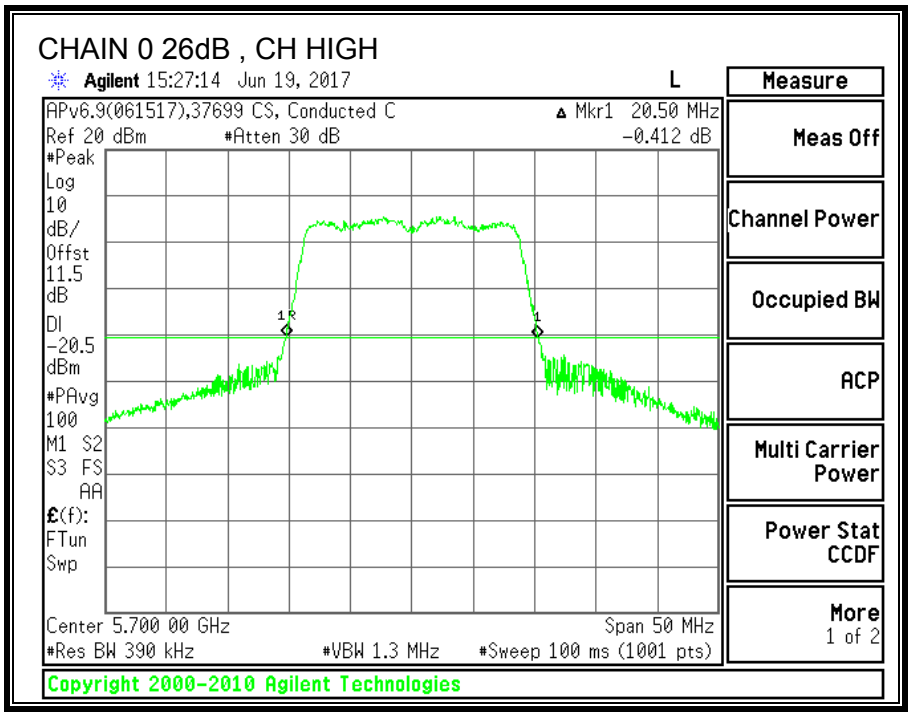
CHAIN 0 26dB , CH MID



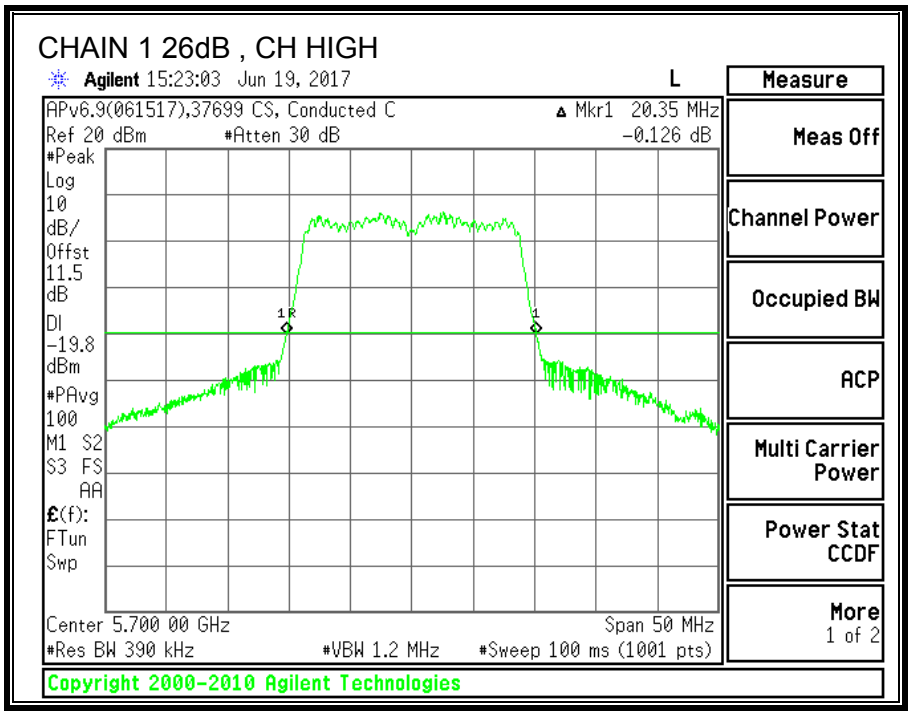
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



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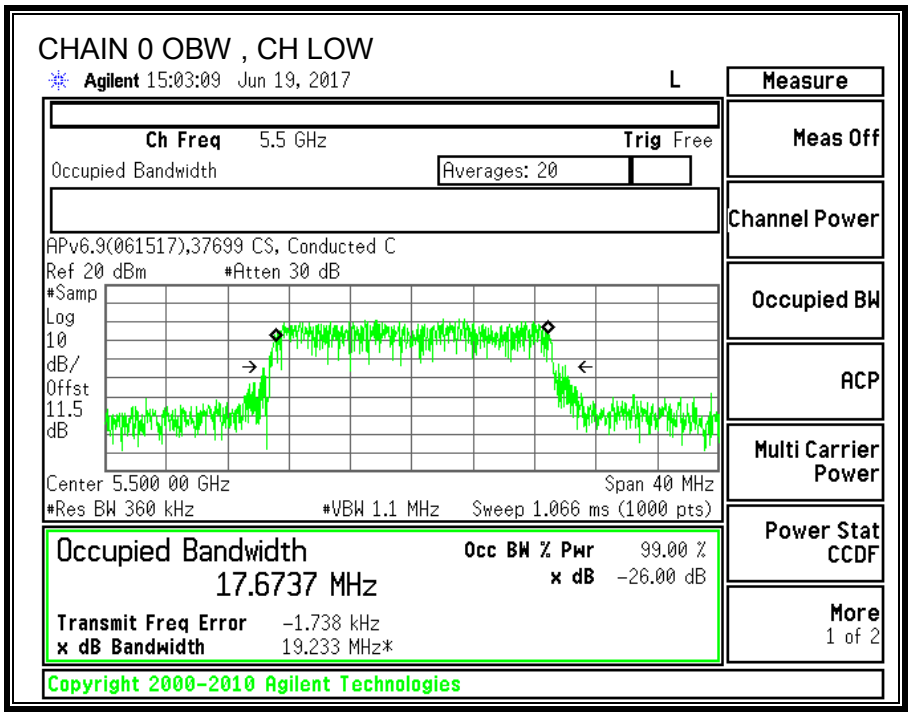
9.10.2. 99% BANDWIDTH

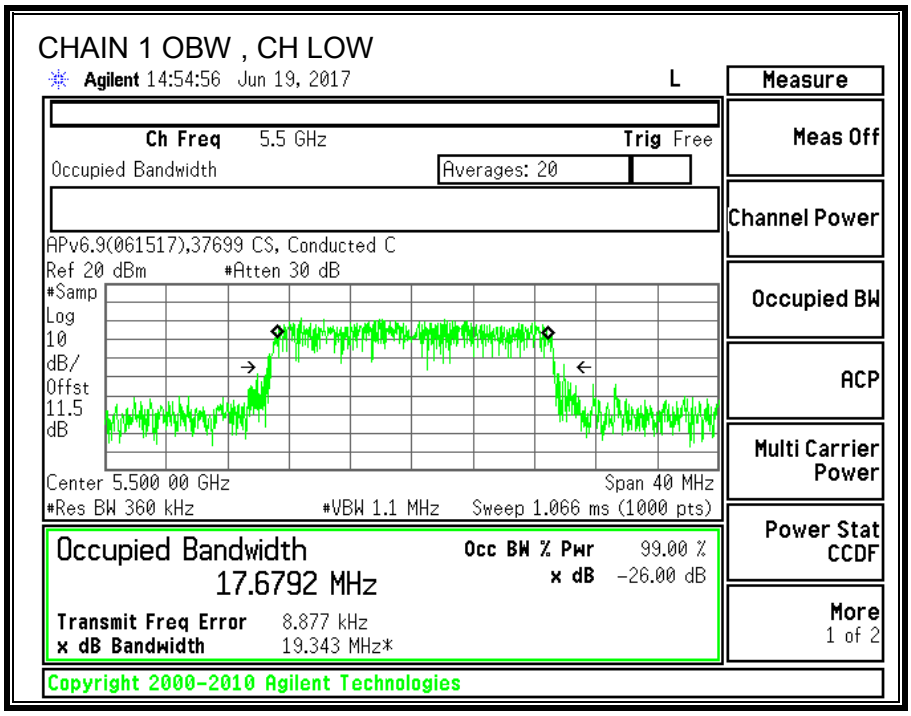
LIMITS

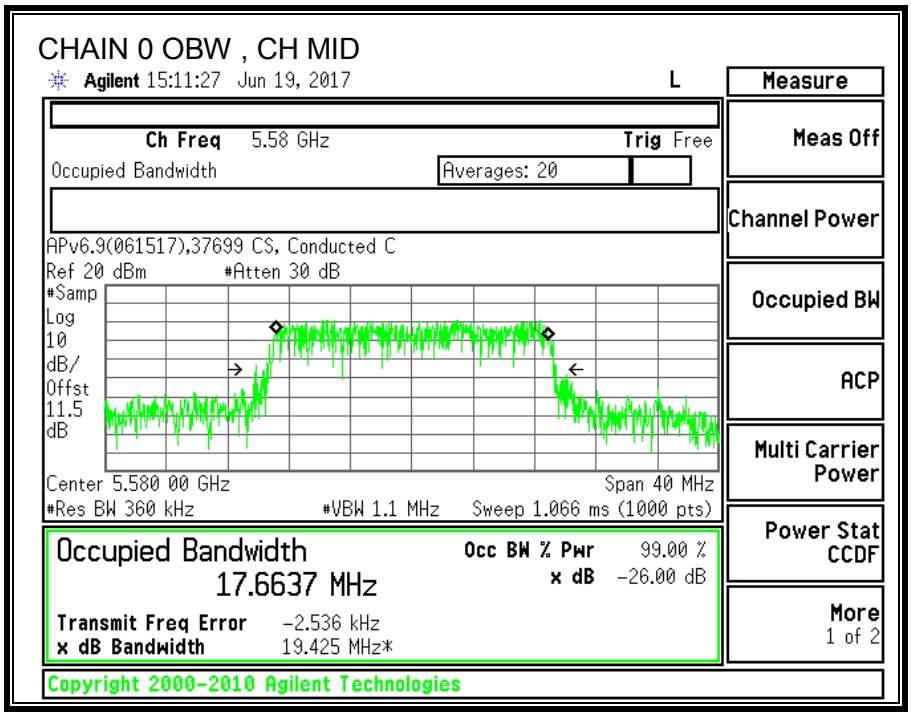
None; for reporting purposes only.

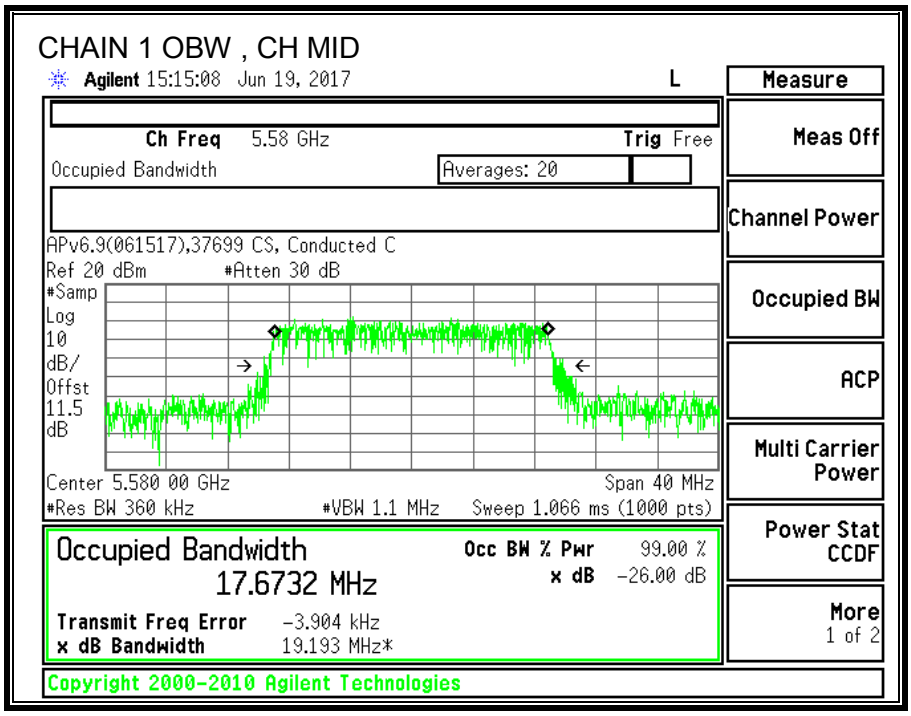
RESULTS

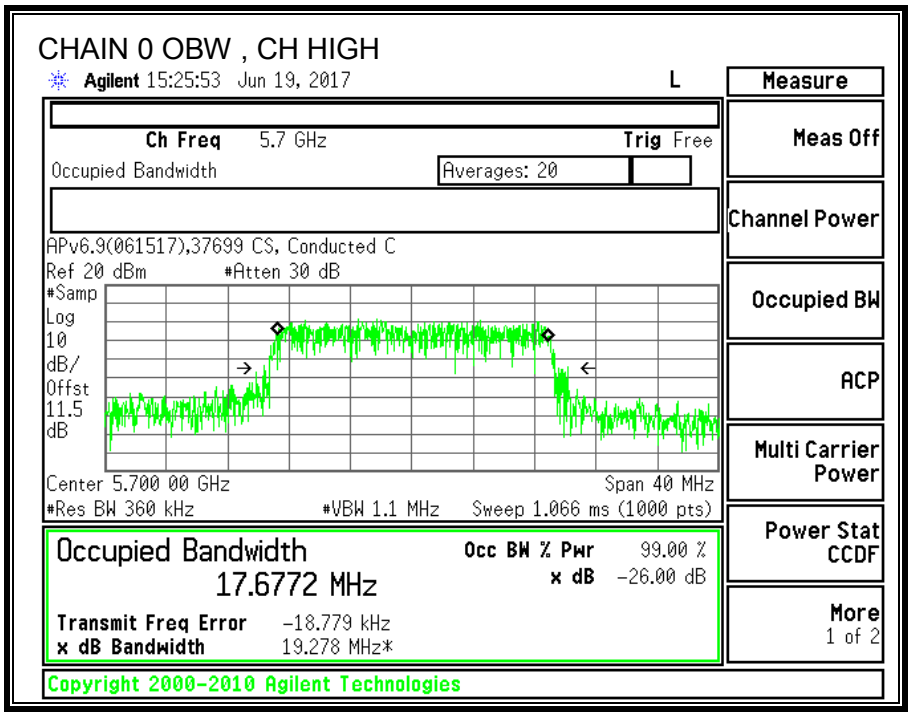
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5500	17.6737	17.6792
Mid	5580	17.6637	17.6732
High	5700	17.6772	17.6808

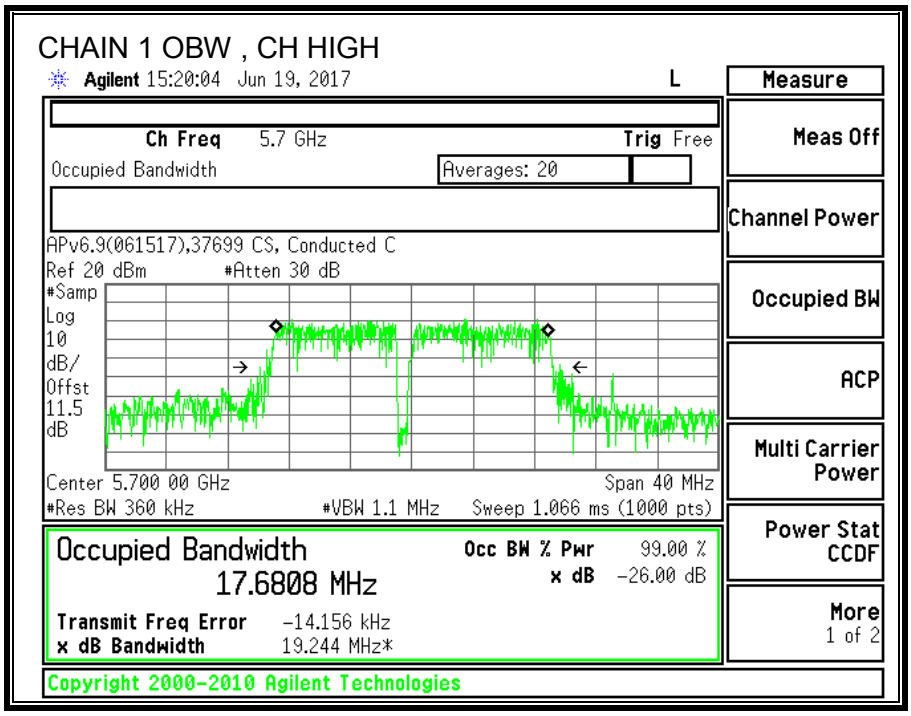












9.10.3. OUTPUT POWER AND PPSD

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)
5.30	5.30	5.30	8.31

RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.45	17.67	5.30	8.31
Mid	5580	20.40	17.66	5.30	8.31
High	5700	20.35	17.68	5.30	8.31

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	23.47	27.00	21.70	8.69	11.00	8.69
Mid	5580	24.00	23.47	27.00	21.70	8.69	11.00	8.69
High	5700	24.00	23.47	27.00	21.70	8.69	11.00	8.69

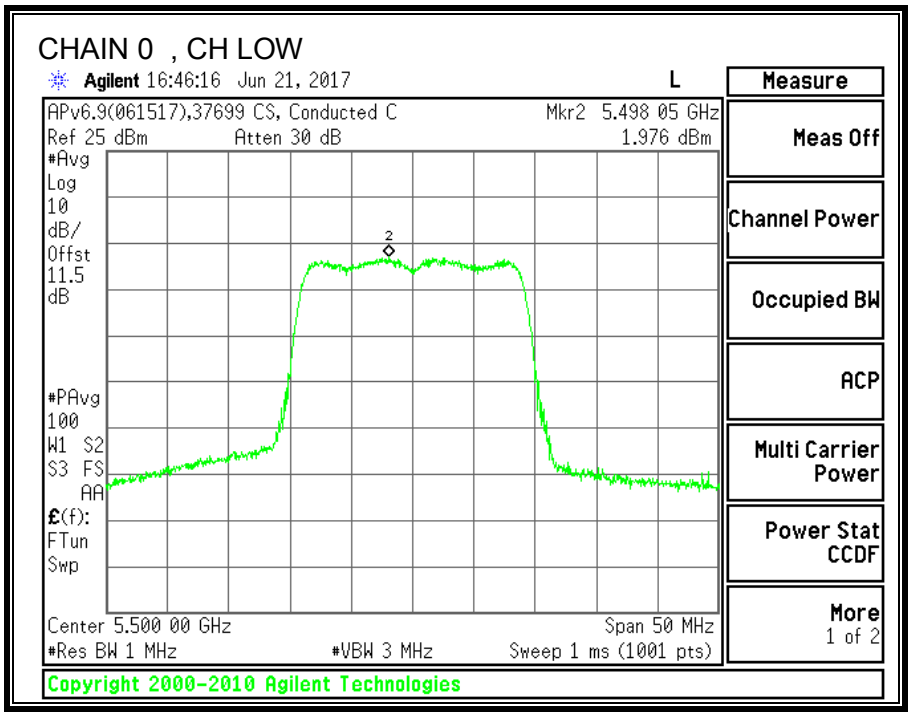
Output Power Results

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	12.41	12.76	15.60	21.70	-6.10
Mid	5580	12.46	12.87	15.68	21.70	-6.02
High	5700	12.45	12.76	15.62	21.70	-6.08

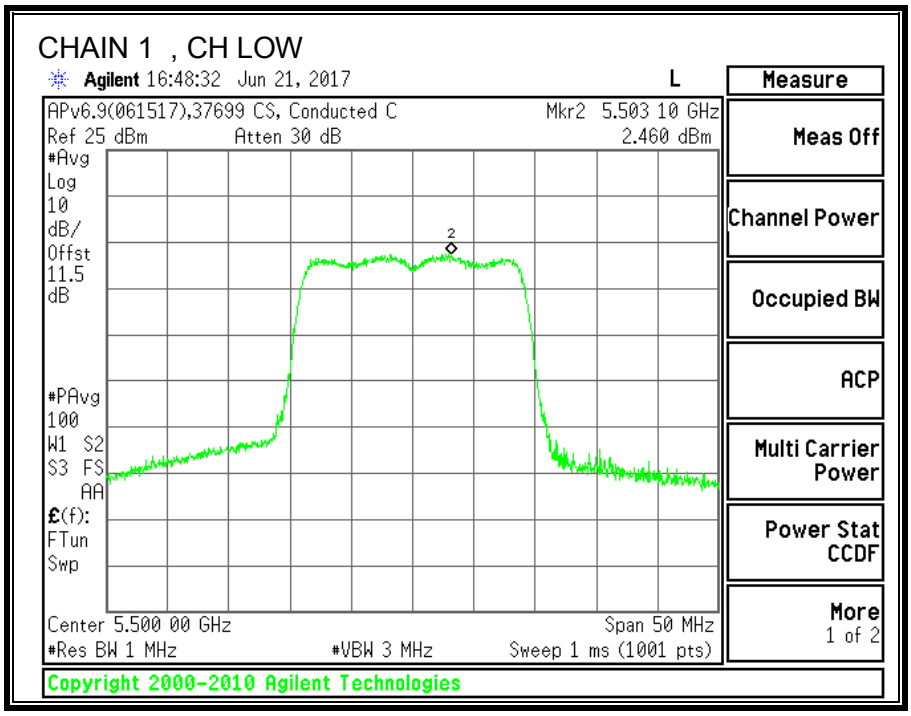
PPSD Results

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	1.98	2.46	5.24	8.69	-3.45
Mid	5580	1.67	1.96	4.83	8.69	-3.86
High	5700	1.71	2.49	5.13	8.69	-3.56

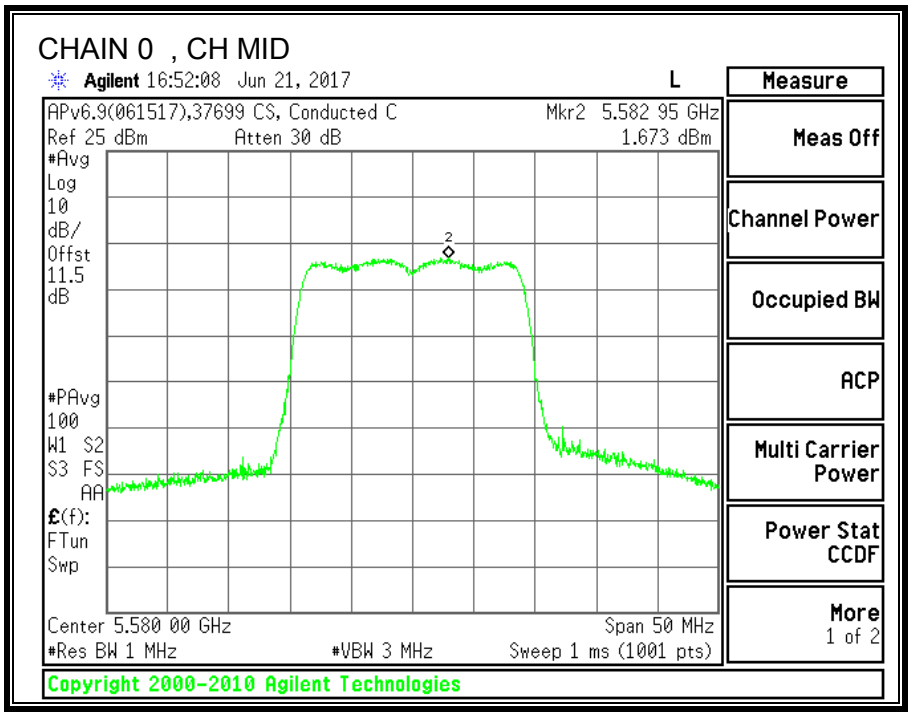
CHAIN 0 , CH LOW



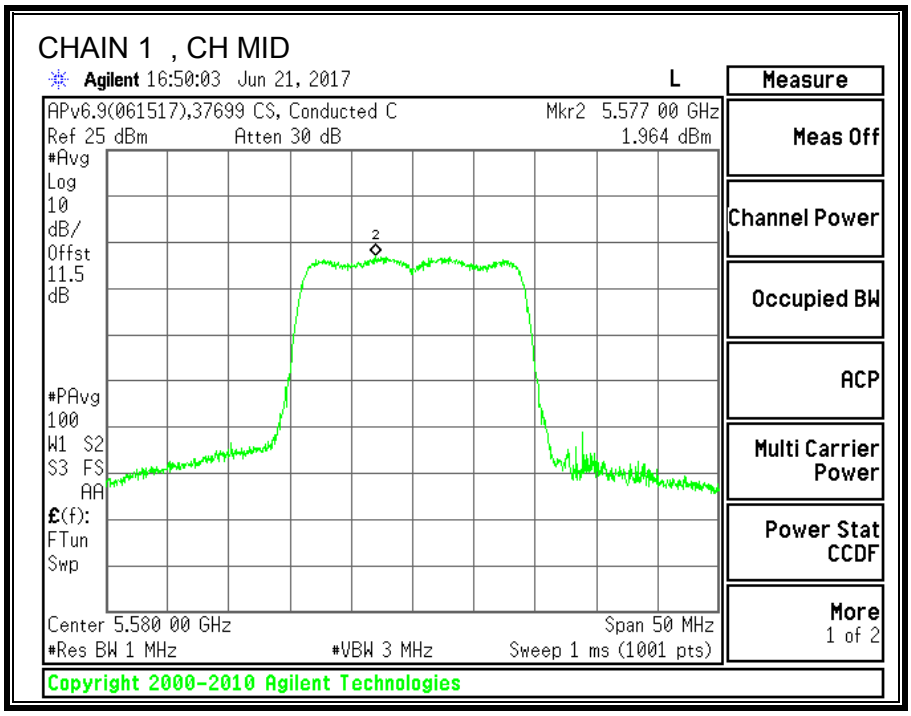
CHAIN 1 , CH LOW



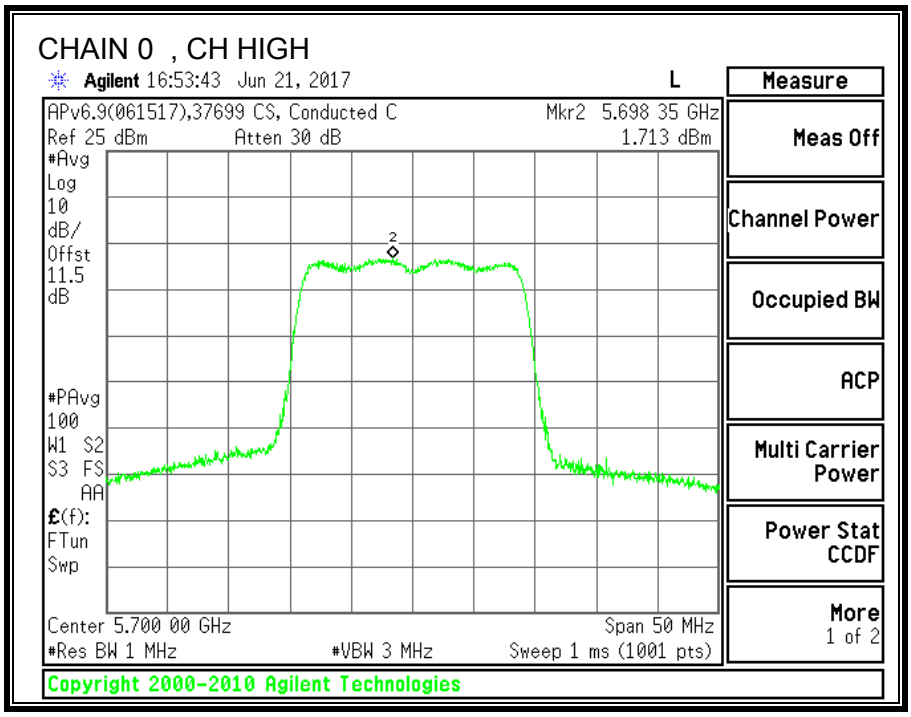
CHAIN 0 , CH MID



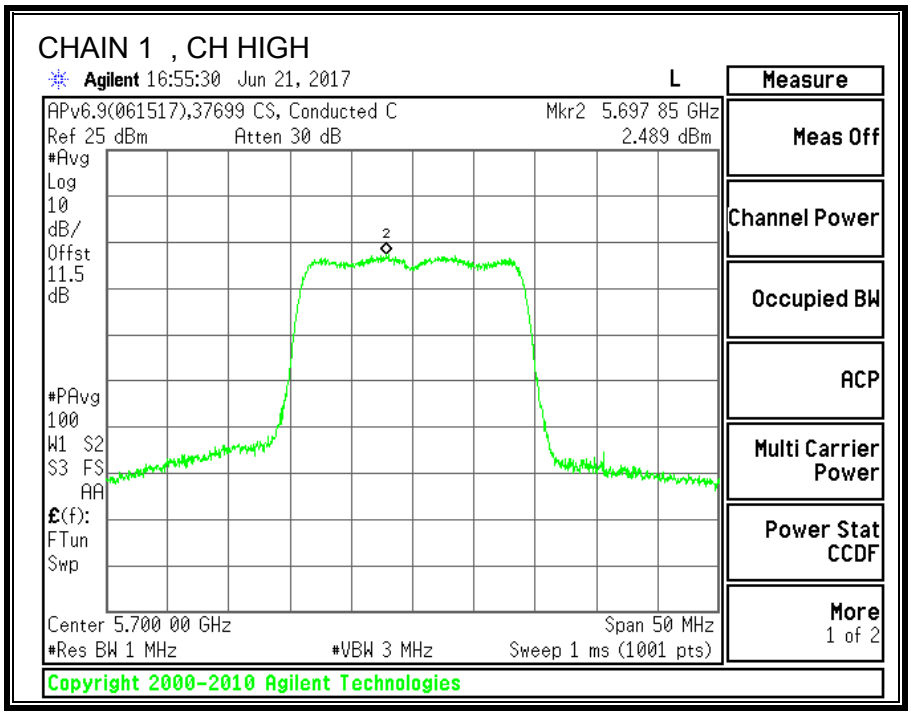
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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	41.40	41.0
Mid	5550	41.50	40.90
High	5670	41.40	40.70

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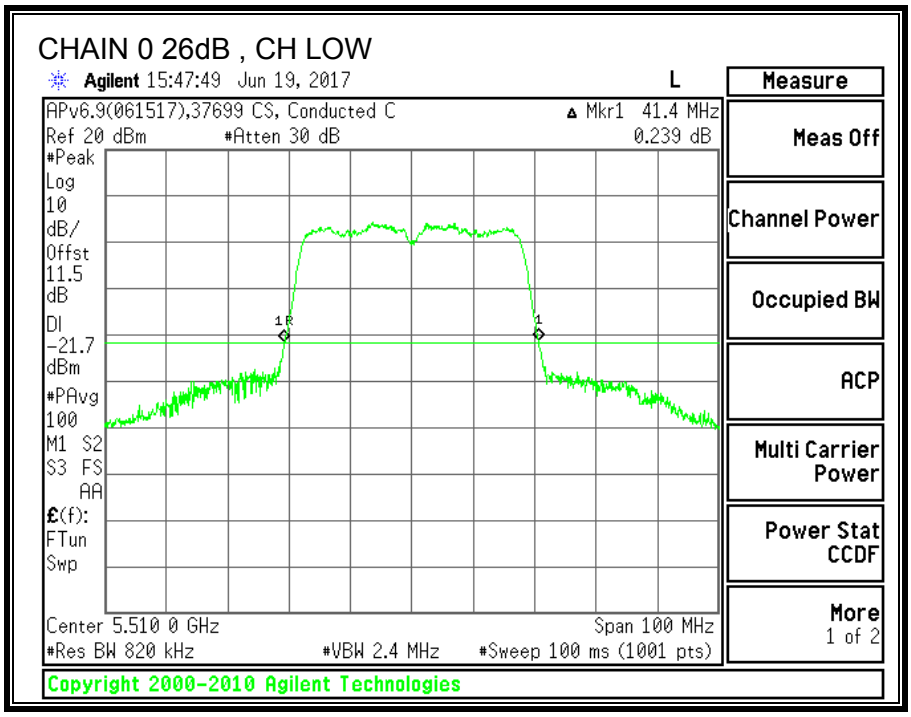
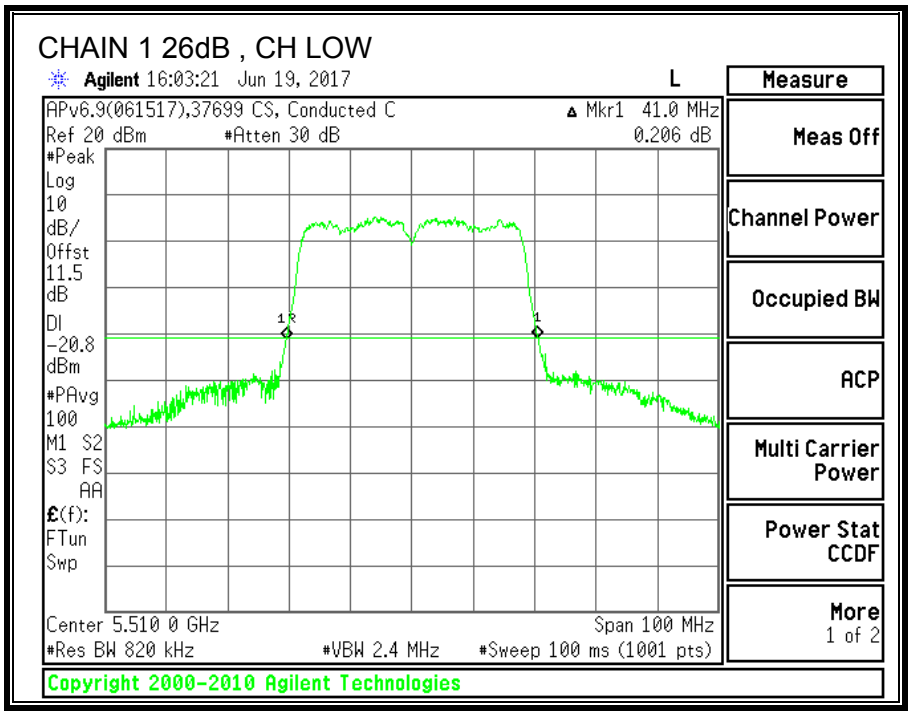
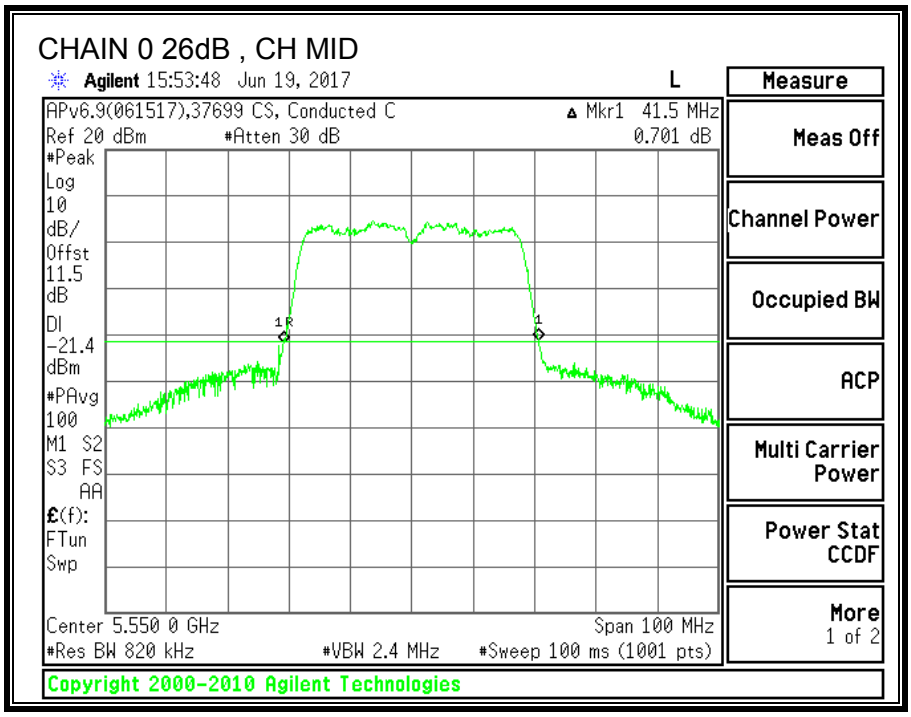
CHAIN 0 26dB , CH LOW



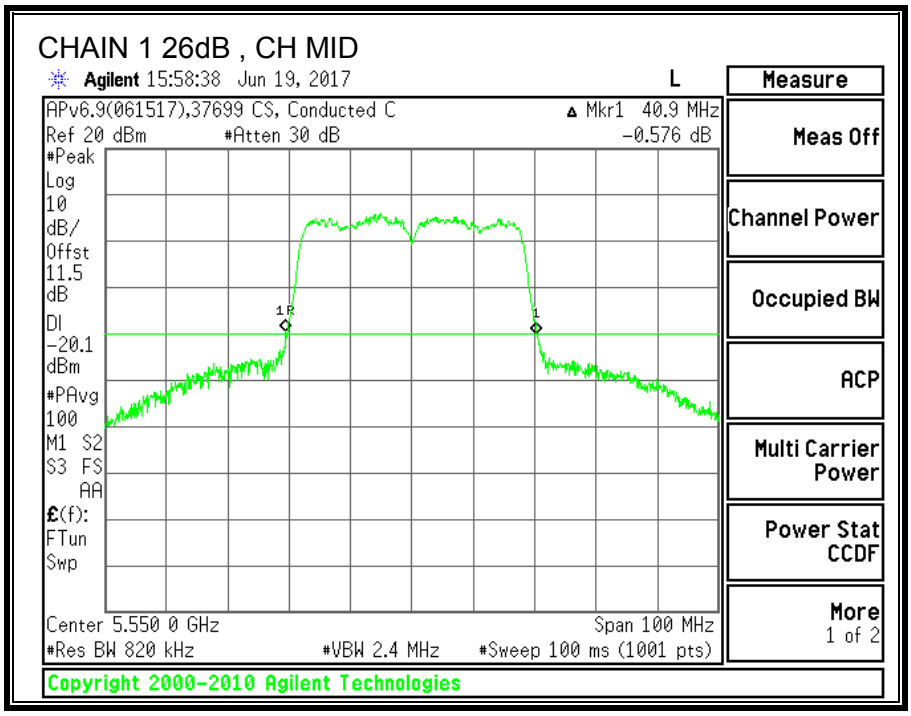
CHAIN 1 26dB , CH LOW



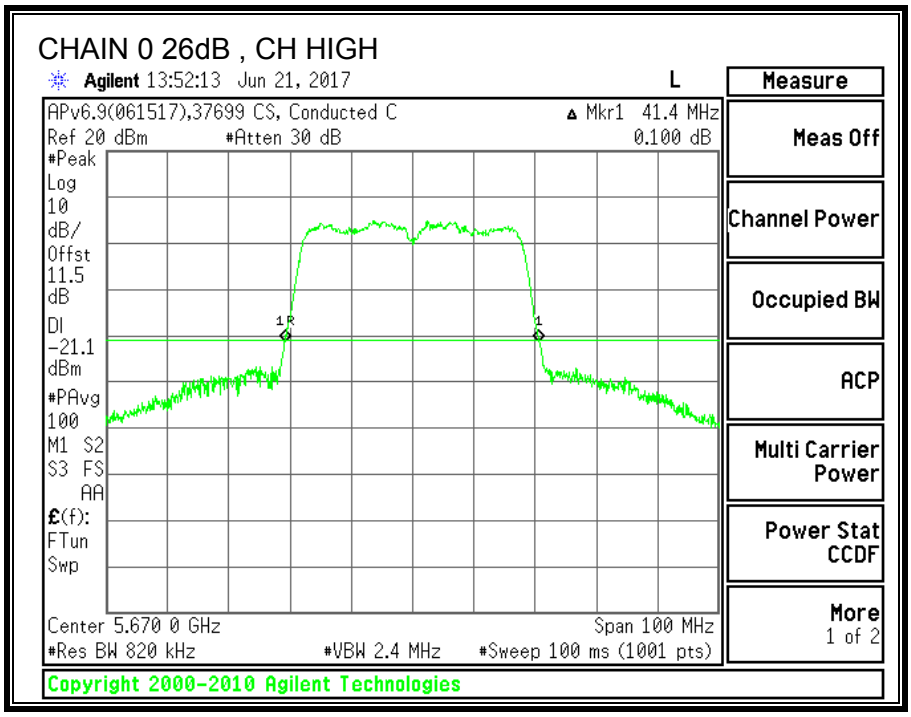
CHAIN 0 26dB , CH MID



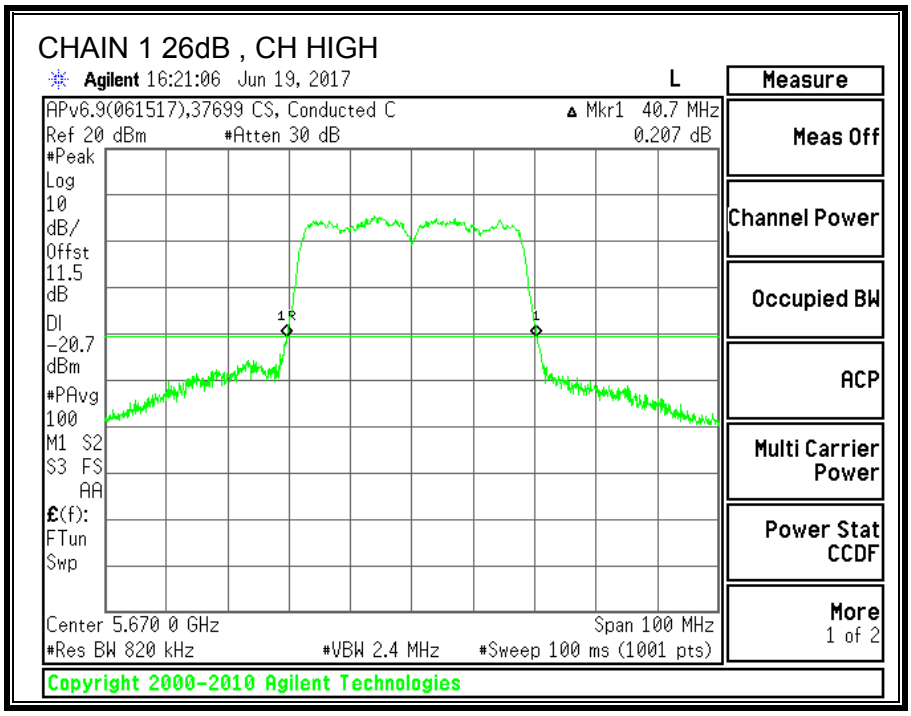
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.11.2. 99% BANDWIDTH

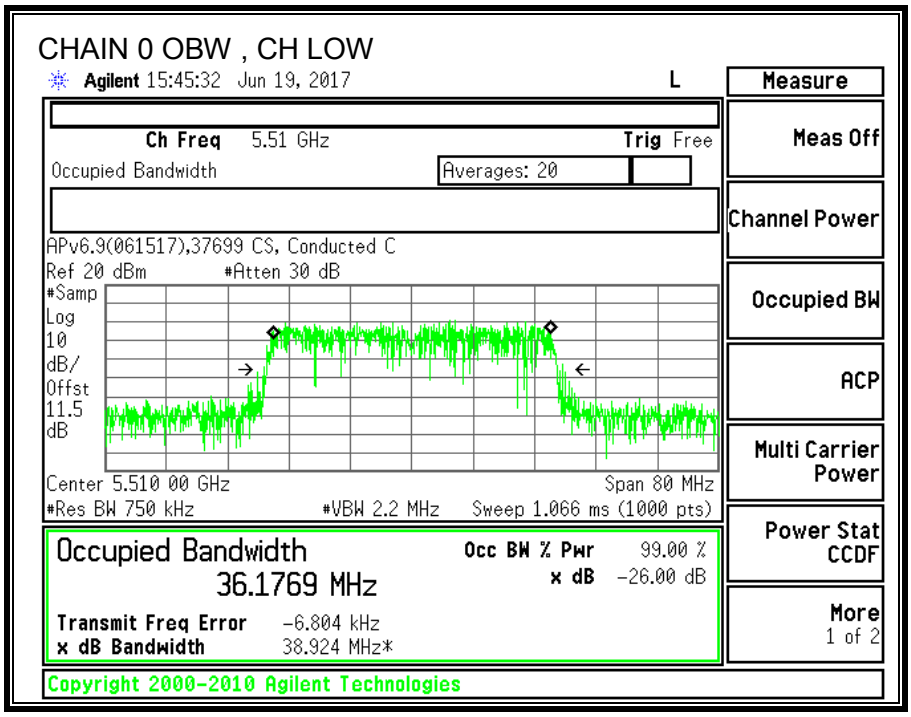
LIMITS

None; for reporting purposes only.

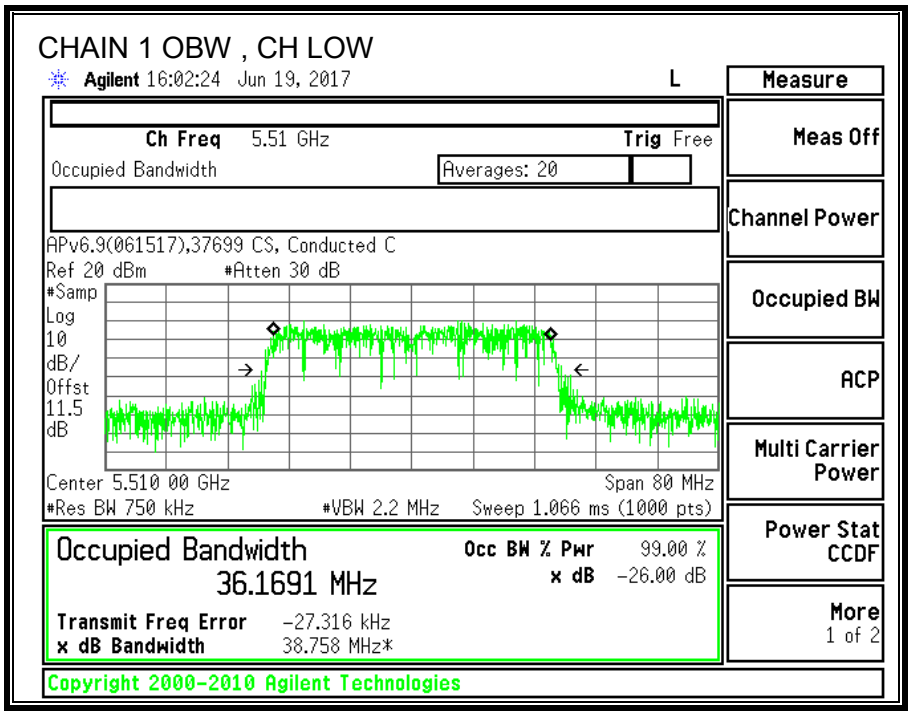
RESULTS

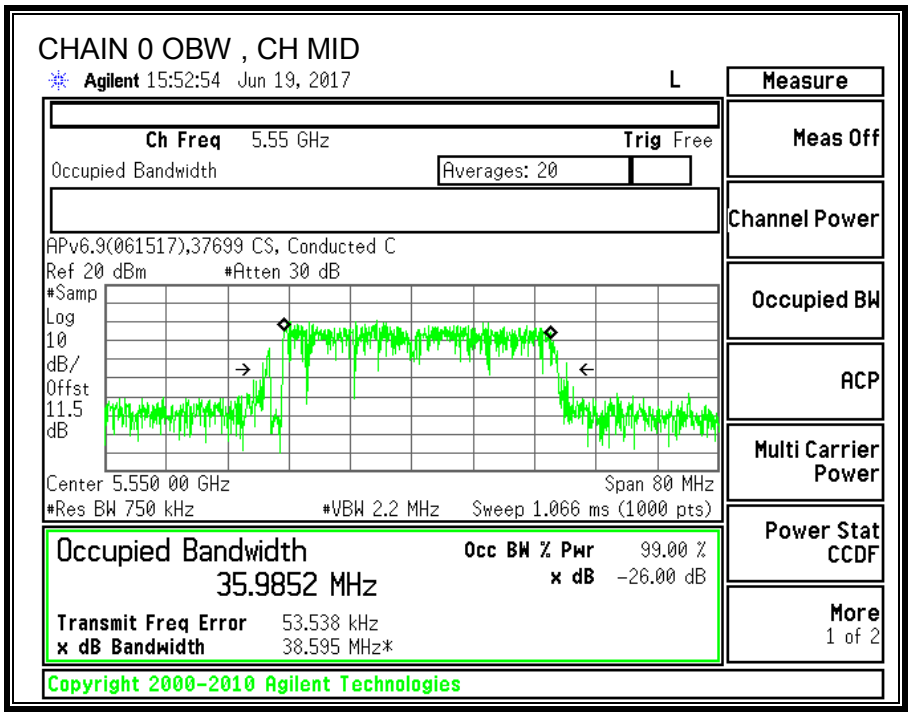
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5510	36.1769	36.1691
Mid	5550	35.9852	36.0974
High	5670	36.1512	36.1261

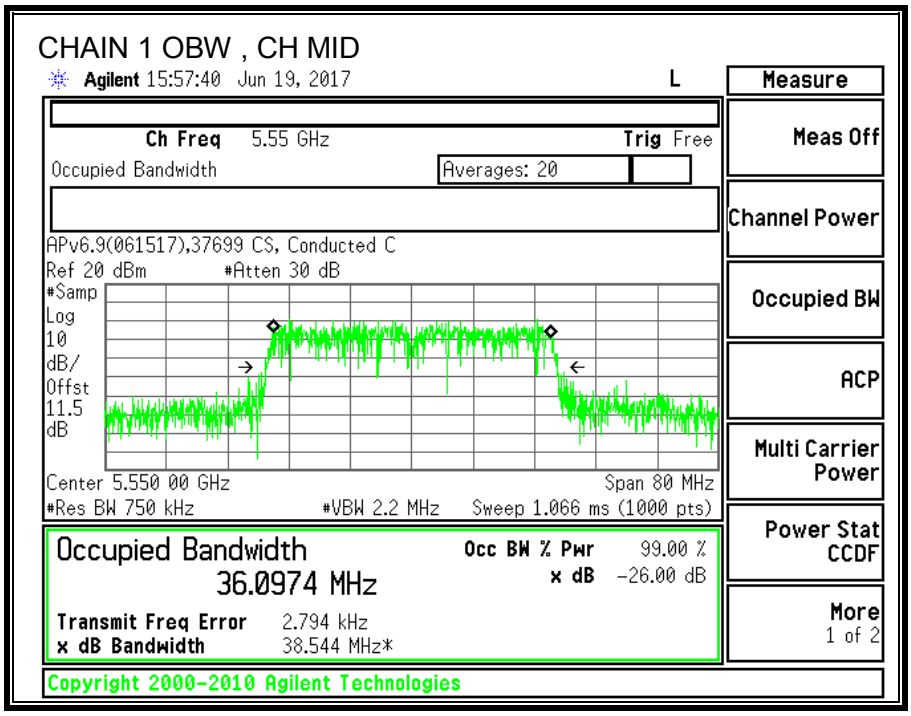
CHAIN 0 OBW , CH LOW



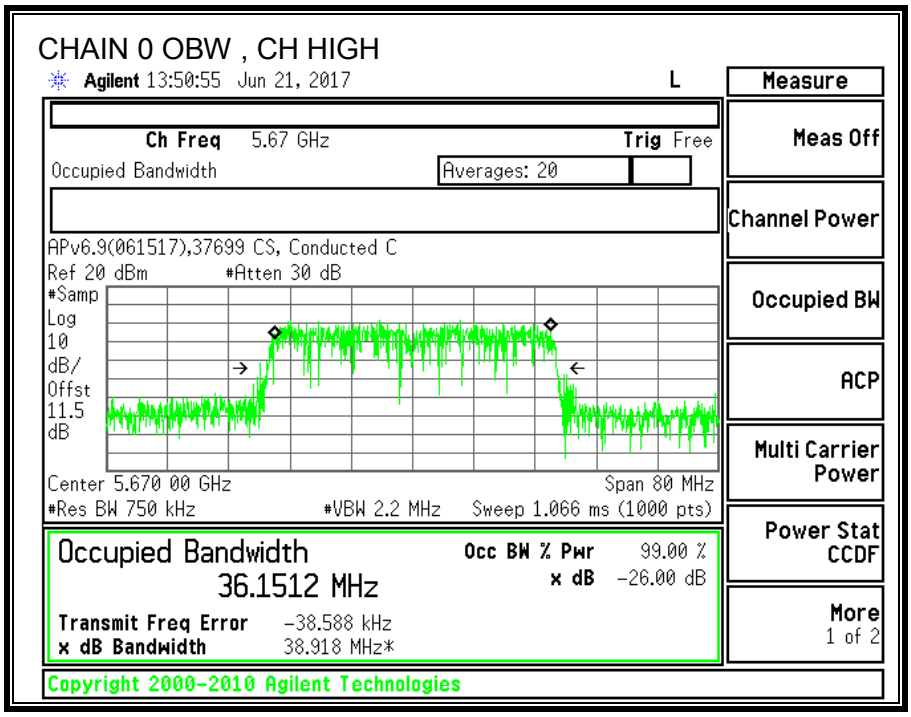
CHAIN 1 OBW , CH LOW



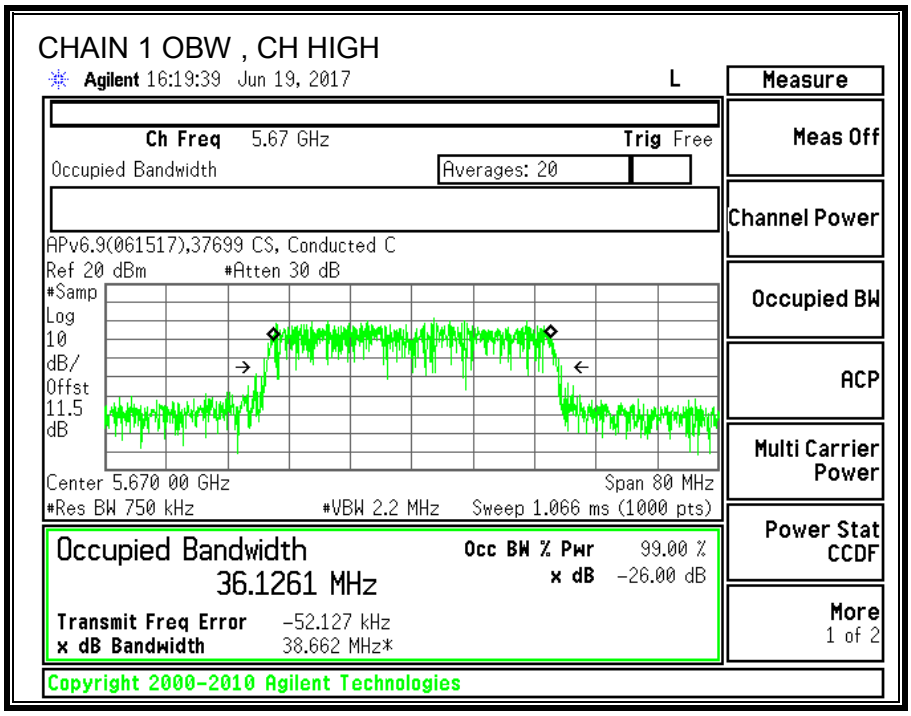




CHAIN 0 OBW , CH HIGH



CHAIN 1 OBW , CH HIGH



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)
5.30	5.30	5.30	8.31

RESULTS

ID:	37699 CS	Date:	06/16/17

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	41.00	36.17	5.30	8.31
Mid	5550	40.90	35.99	5.30	8.31
High	5670	40.70	36.13	5.30	8.31

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	8.69	11.00	8.69
Mid	5550	24.00	24.00	30.00	24.00	8.69	11.00	8.69
High	5670	24.00	24.00	30.00	24.00	8.69	11.00	8.69

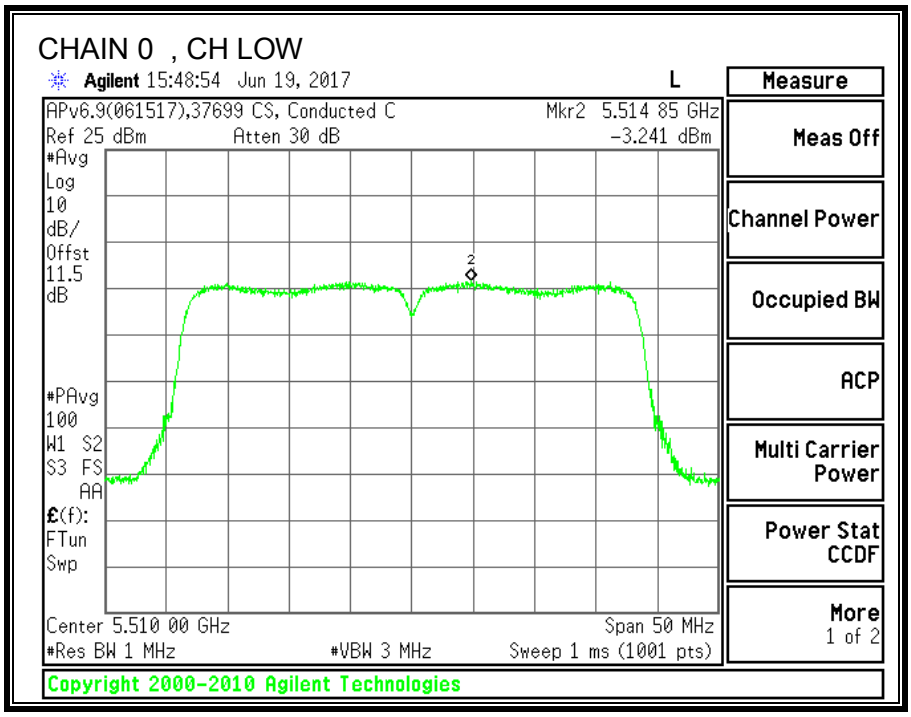
Output Power Results

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	10.31	11.15	13.76	24.00	-10.24
Mid	5550	10.55	11.11	13.85	24.00	-10.15
High	5670	10.62	10.83	13.74	24.00	-10.26

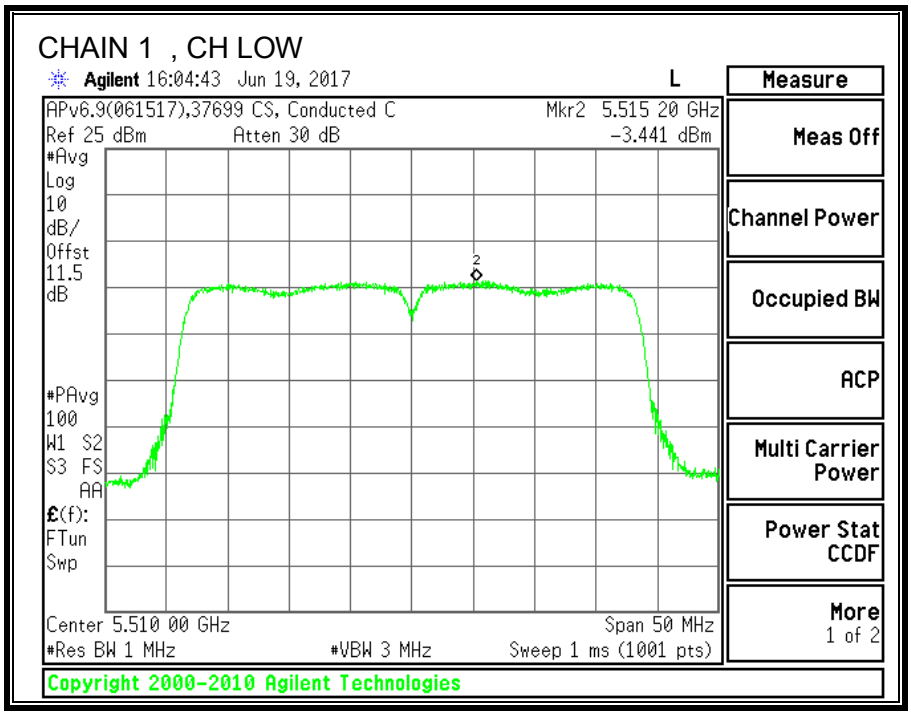
PPSD Results

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	-3.24	-3.44	-0.33	8.69	-9.02
Mid	5550	-2.96	-3.19	-0.06	8.69	-8.75
High	5670	-2.75	-3.50	-0.10	8.69	-8.79

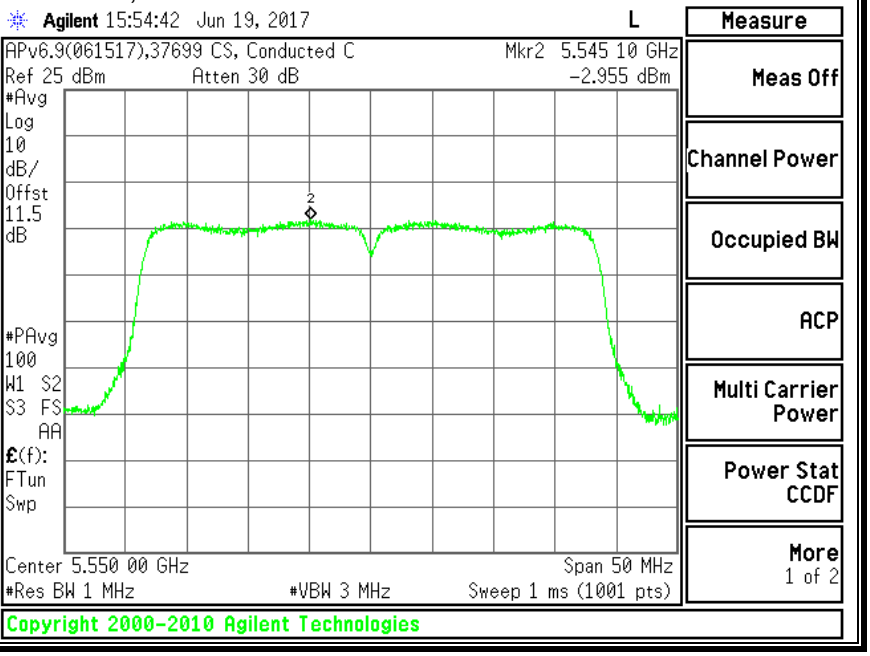
CHAIN 0 , CH LOW



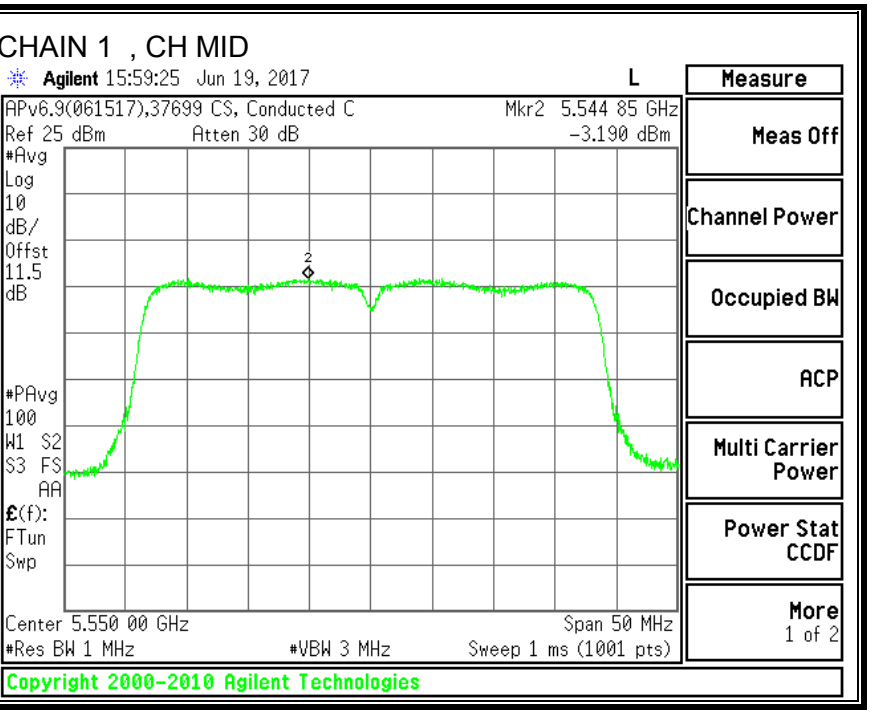
CHAIN 1 , CH LOW



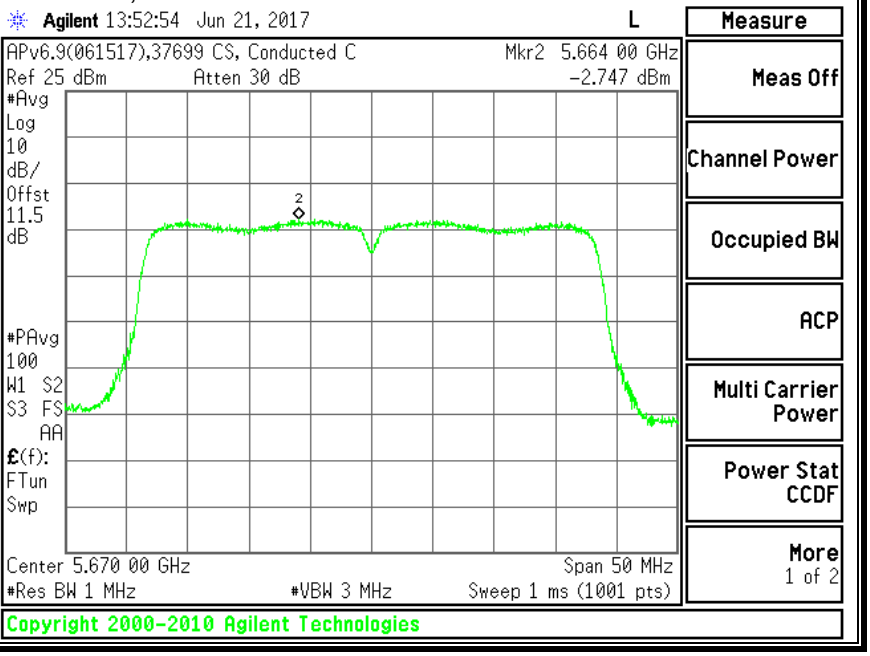
CHAIN 0 , CH MID



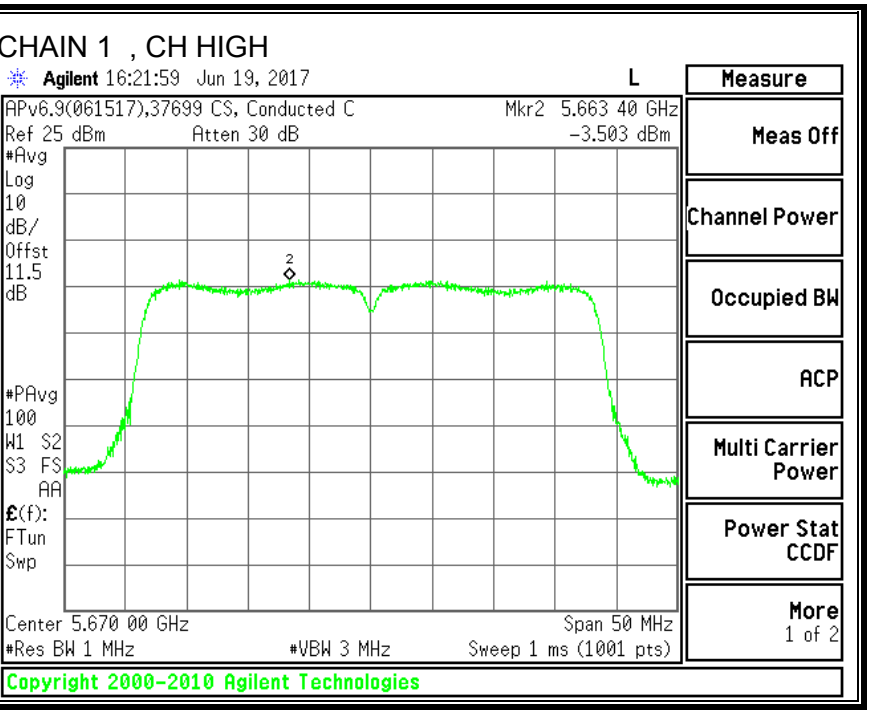
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.12.1. 26 dB BANDWIDTH

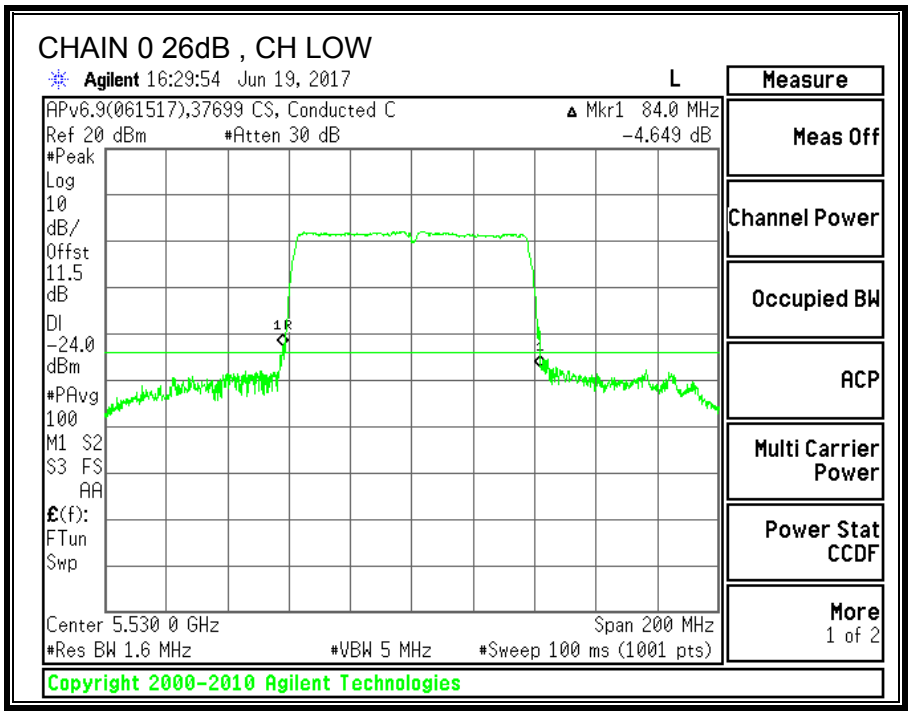
LIMITS

None; for reporting purposes only.

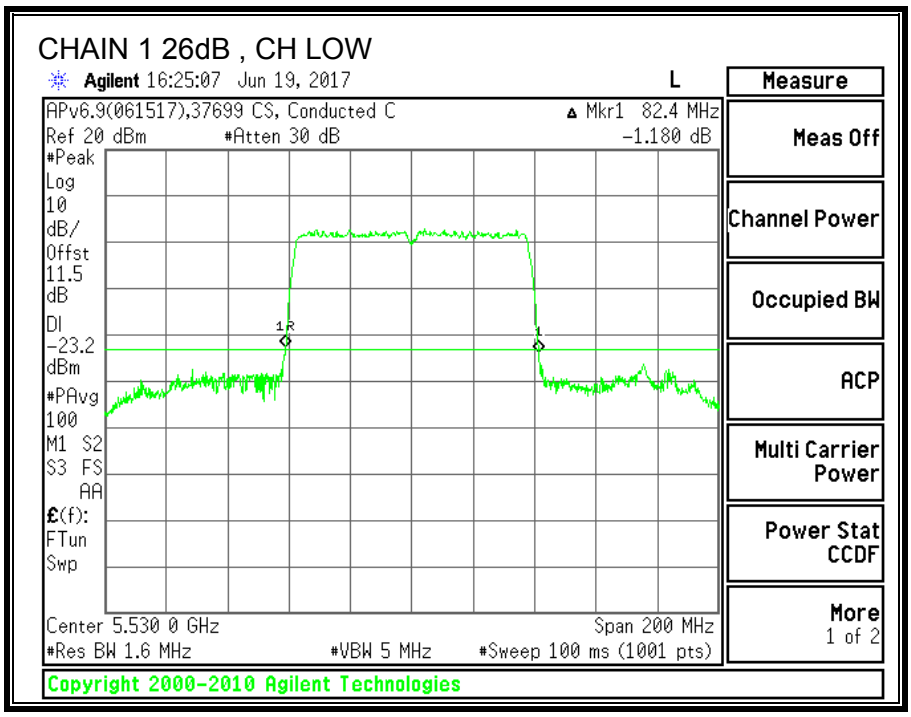
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5530	84.0	82.40
High	5610	84.40	82.40

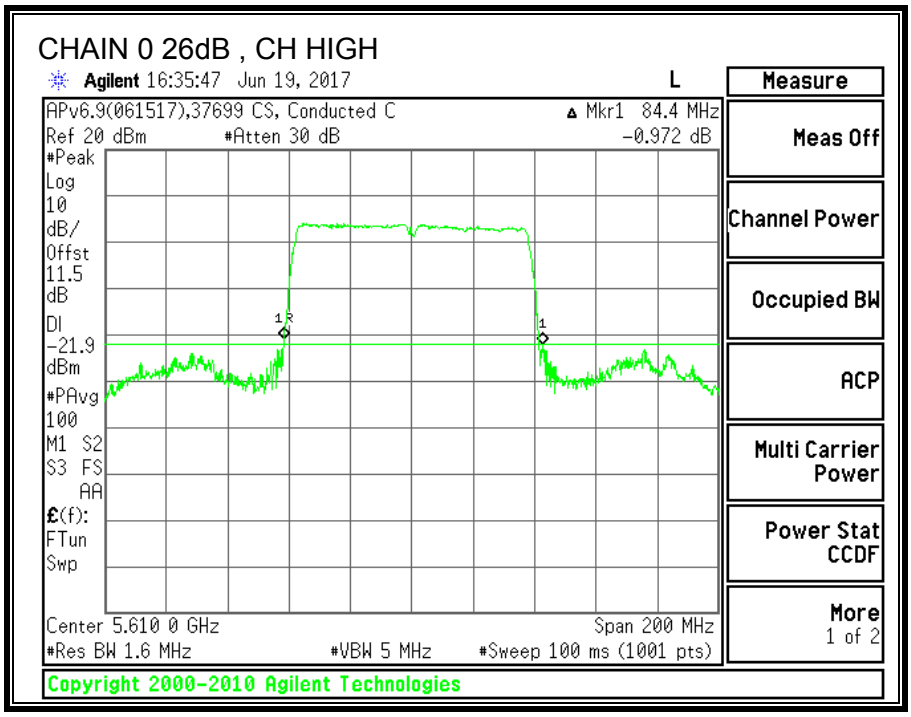
CHAIN 0 26dB , CH LOW



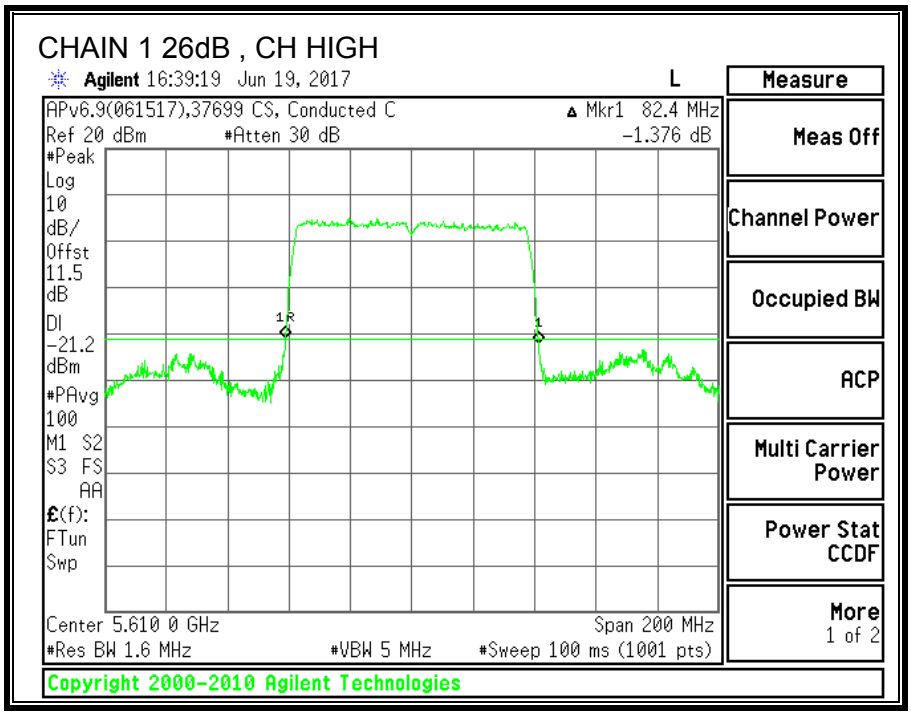
CHAIN 1 26dB , CH LOW



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.12.2. 99% BANDWIDTH

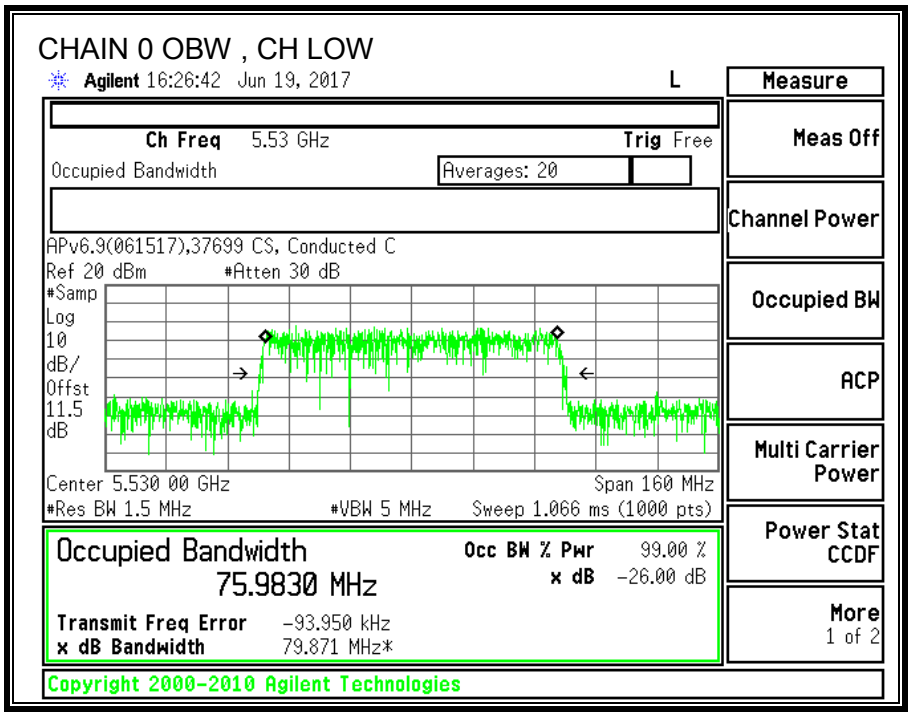
LIMITS

None; for reporting purposes only.

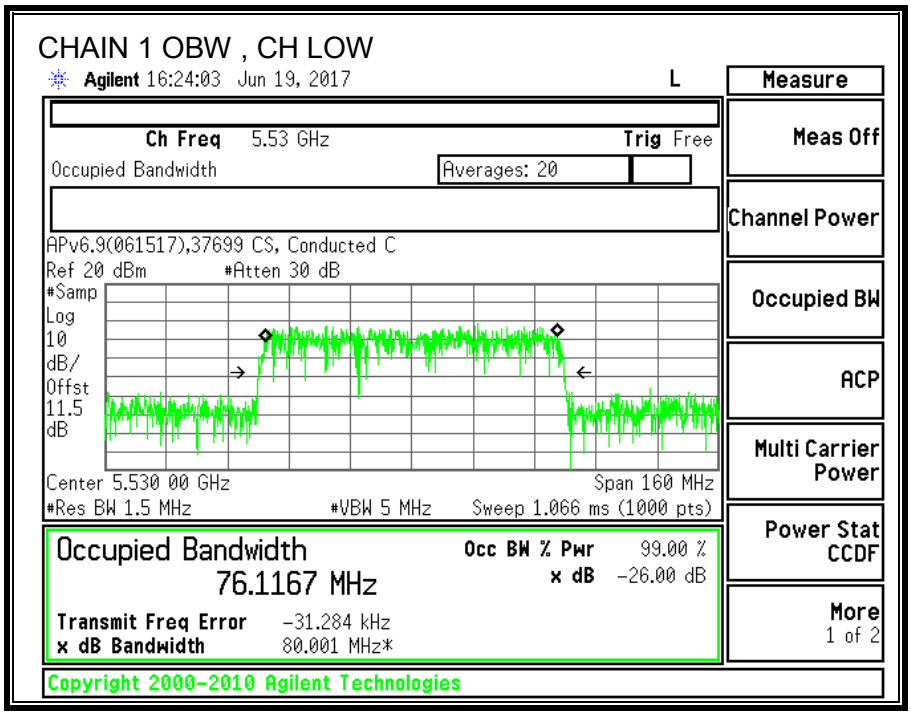
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5530	75.9830	76.1167
High	5610	75.9571	76.0919

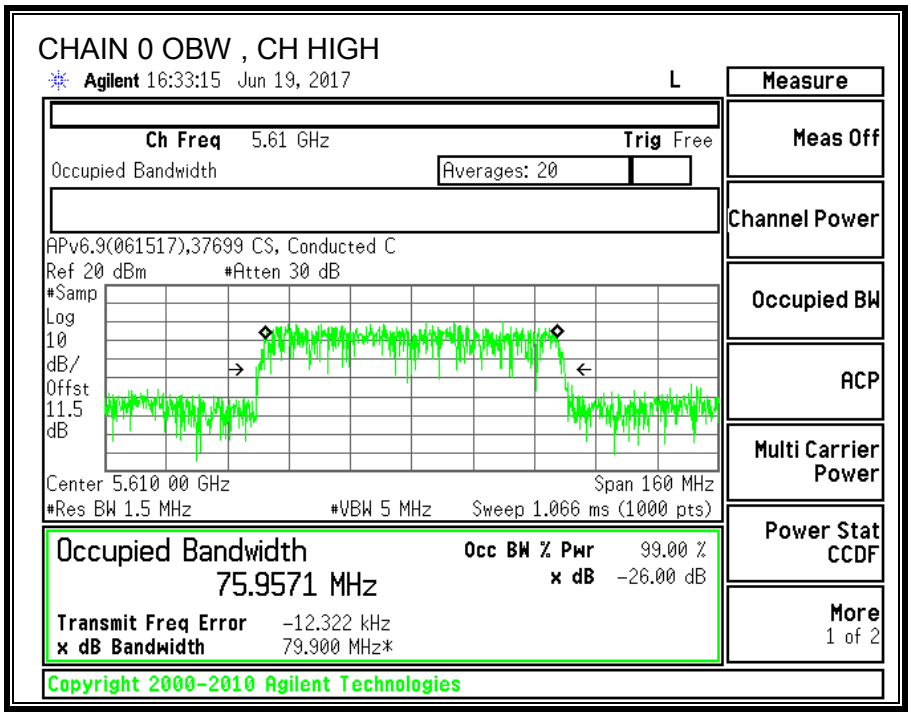
CHAIN 0 OBW , CH LOW



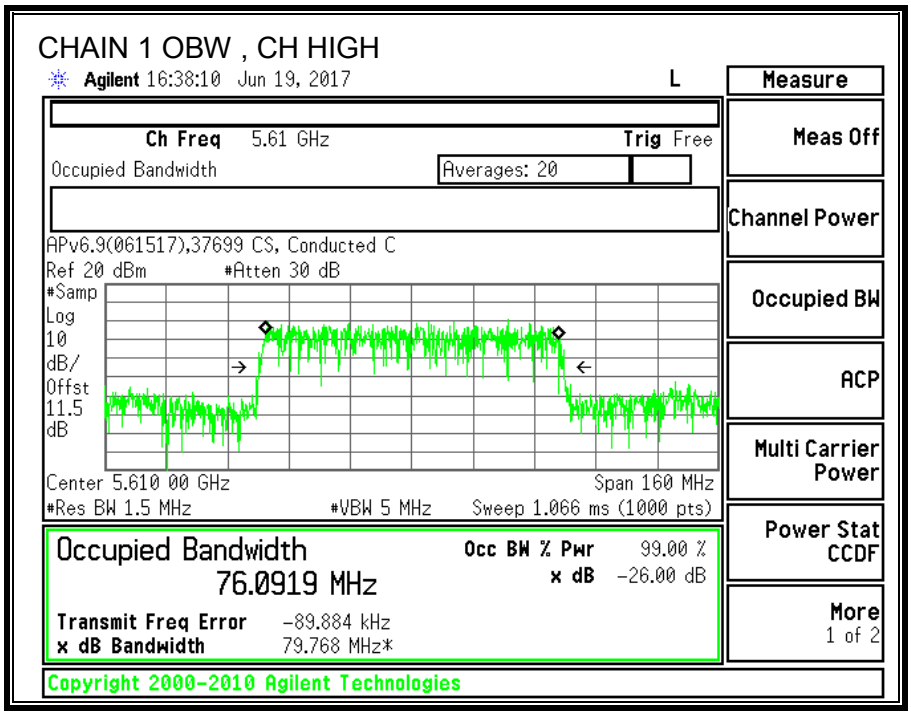
CHAIN 1 OBW , CH LOW



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)
5.30	5.30	5.30	8.31

RESULTS

ID:	37699 CS	Date:	06/16/17

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	82.40	75.98	5.30	8.31
High	5610	82.40	75.96	5.30	8.31

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	8.69	11.00	8.69
High	5610	24.00	24.00	30.00	24.00	8.69	11.00	8.69

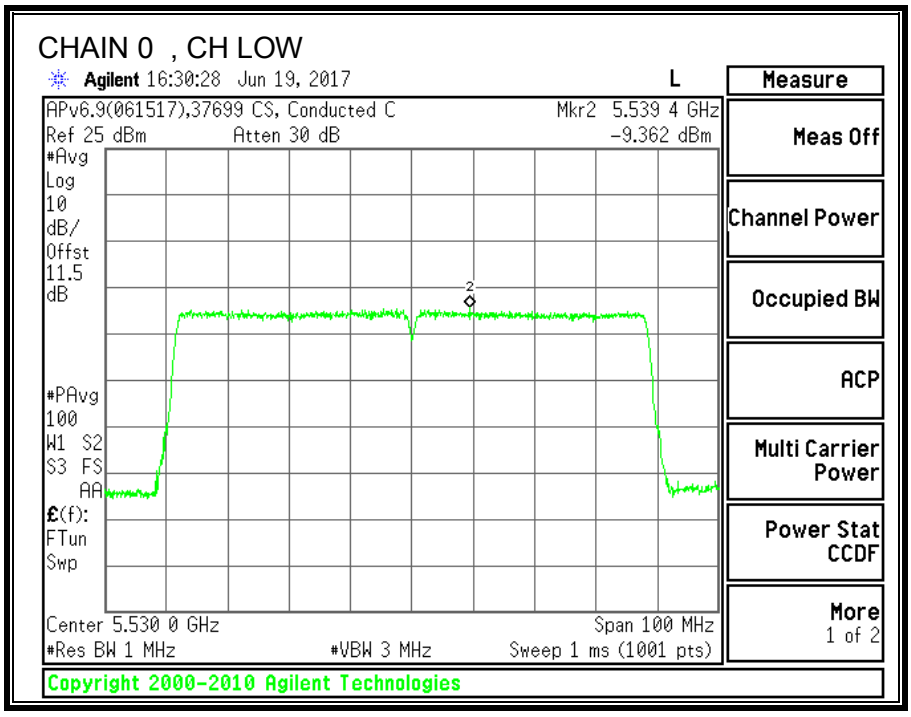
Output Power Results

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	7.58	7.94	10.77	24.00	-13.23
High	5610	9.63	9.52	12.59	24.00	-11.41

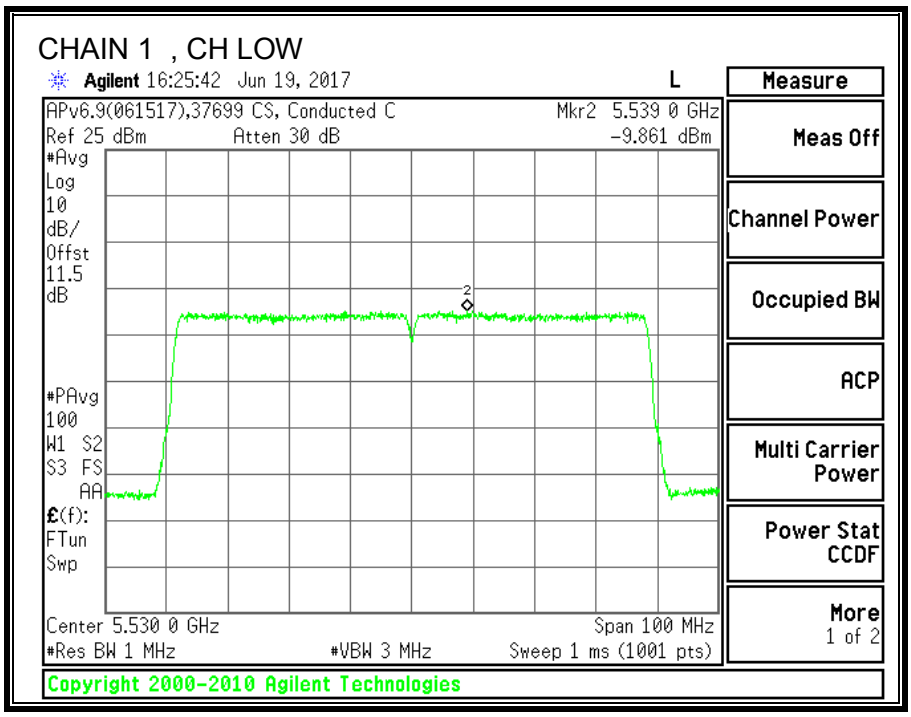
PPSD Results

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	-9.36	-9.86	-6.59	8.69	-15.28
High	5610	-7.69	-7.56	-4.62	8.69	-13.31

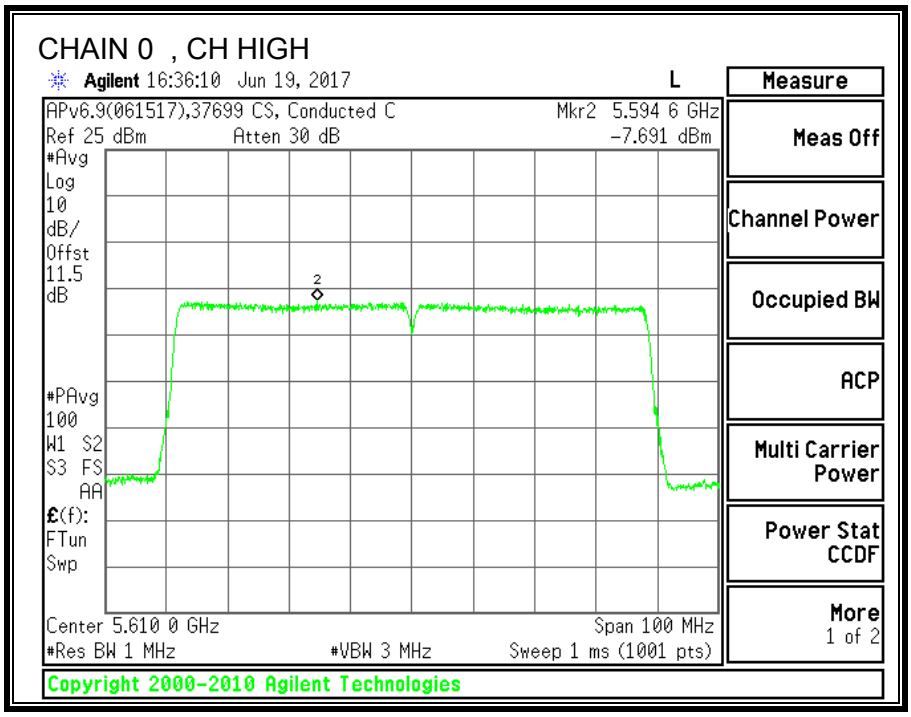
CHAIN 0 , CH LOW



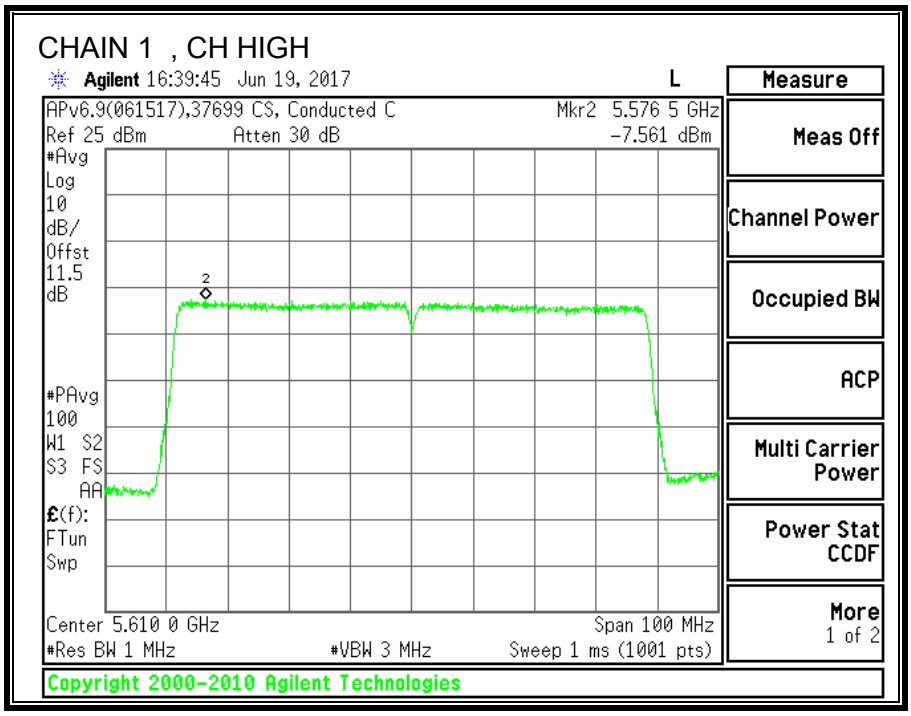
CHAIN 1 , CH LOW



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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

9.13.1. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

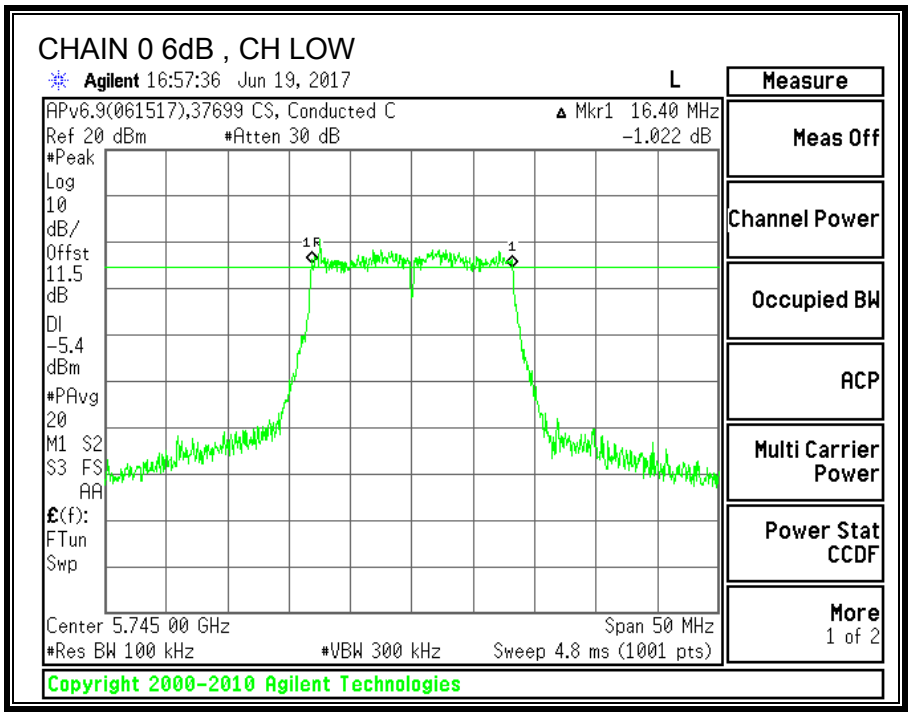
IC RSS-247 (6.2.4) (1)

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

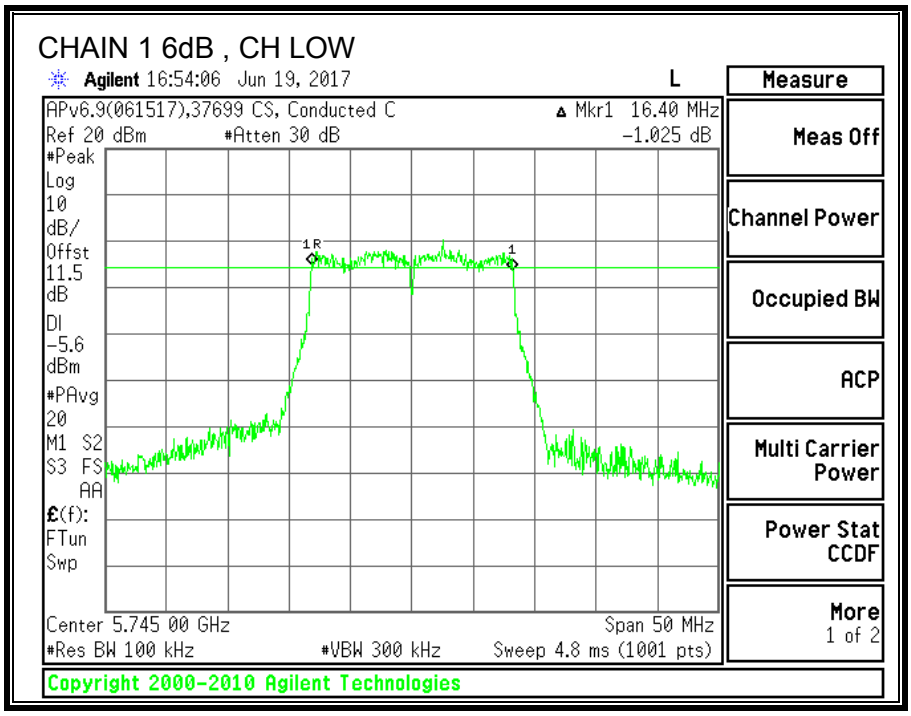
RESULTS

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	16.50	16.50	0.5
High	5825	16.55	16.40	0.5

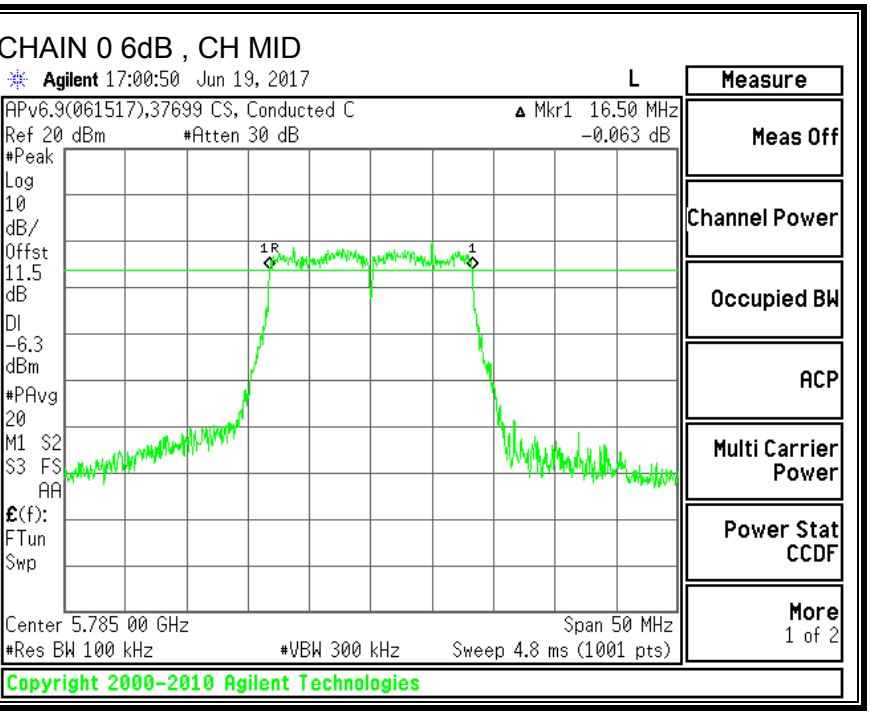
CHAIN 0 6dB , CH LOW



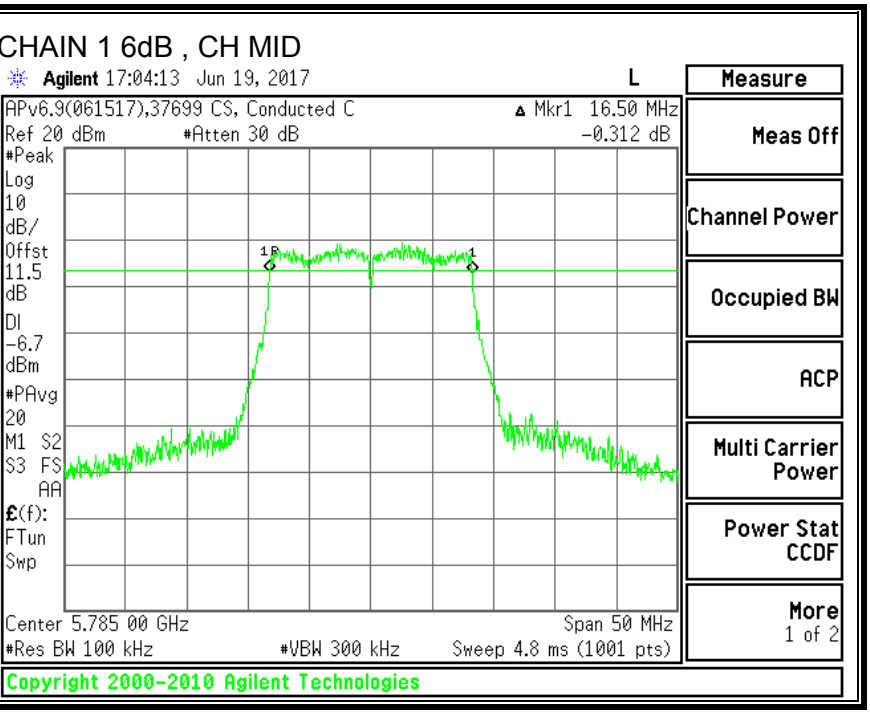
CHAIN 1 6dB , CH LOW



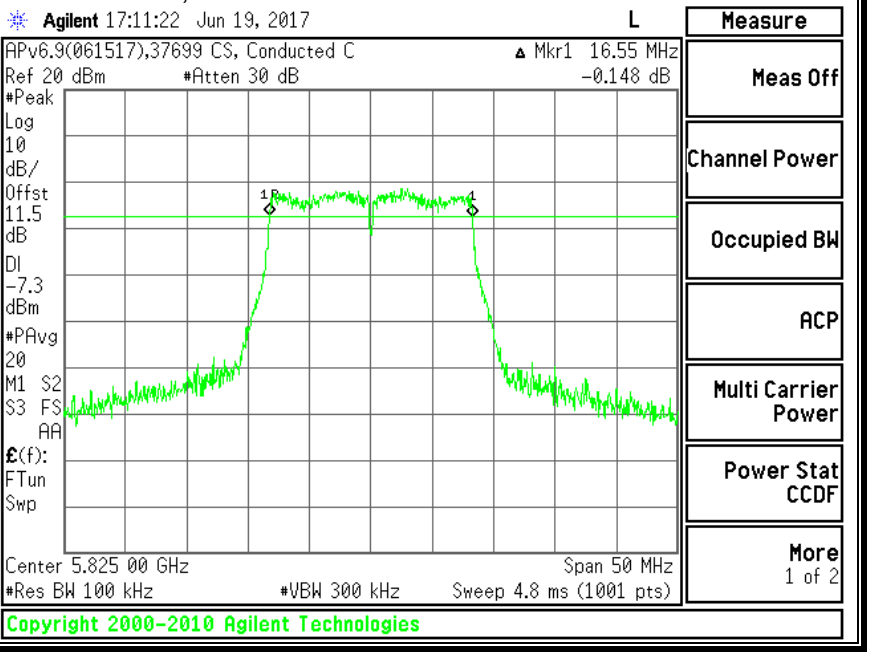
CHAIN 0 6dB , CH MID



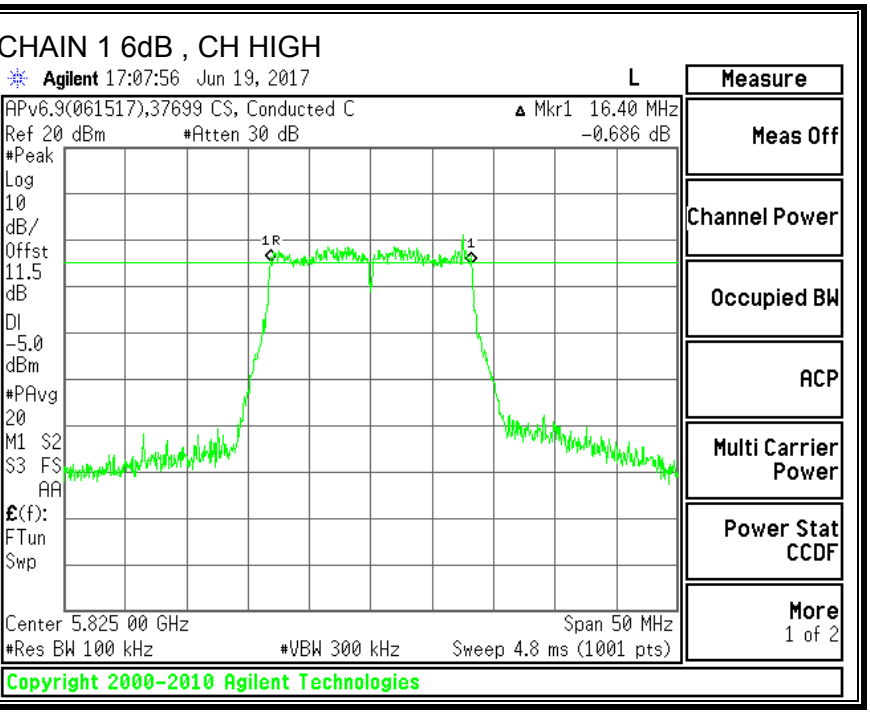
CHAIN 1 6dB , CH MID



CHAIN 0 6dB , CH HIGH



CHAIN 1 6dB , CH HIGH



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	19.95
Mid	5785	20.30	20.00
High	5825	20.50	20.05

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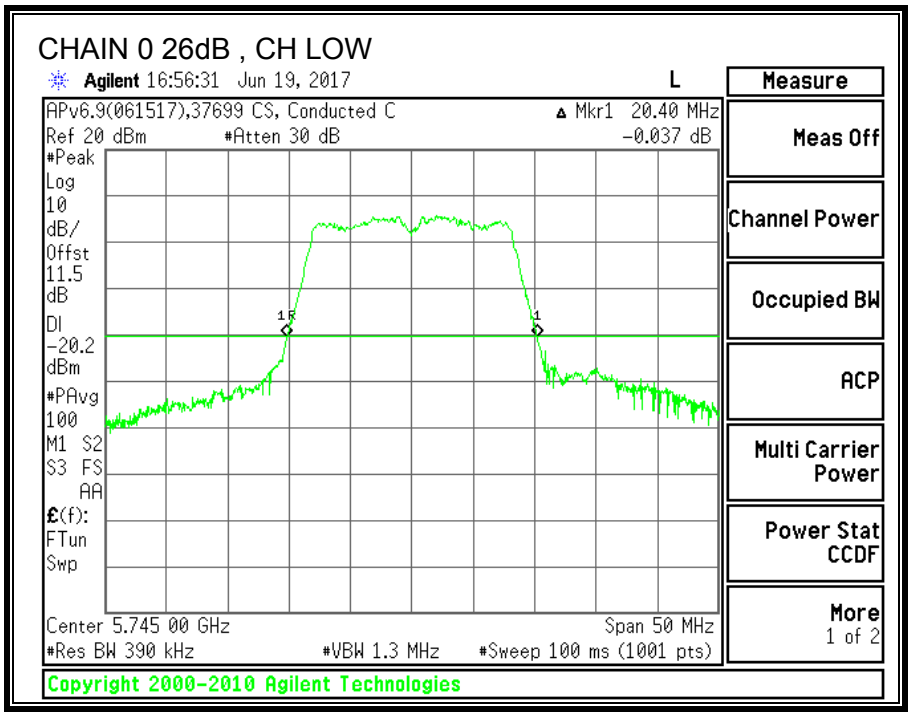
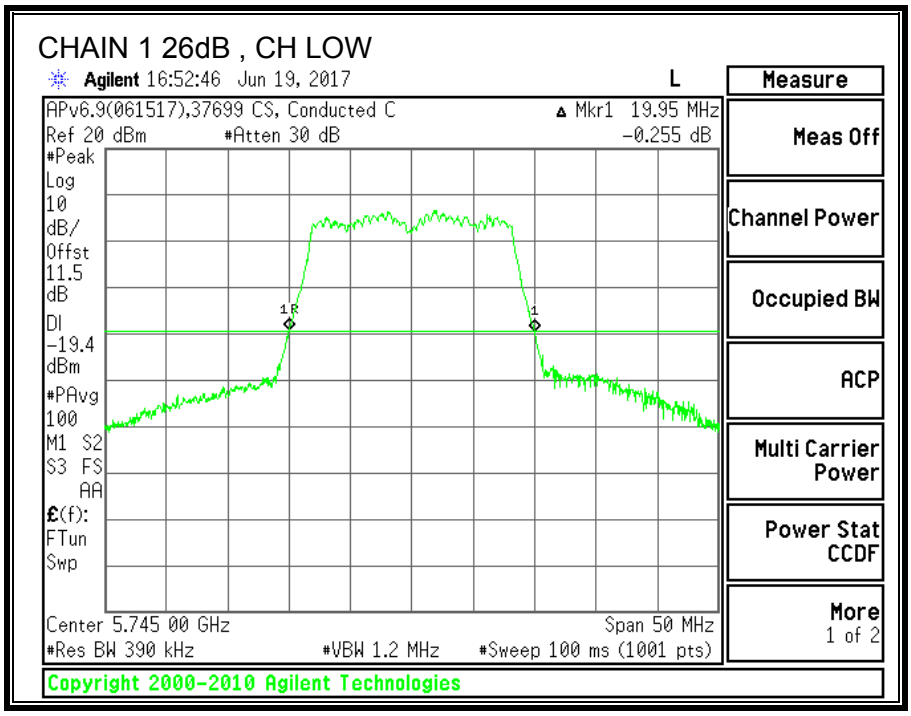
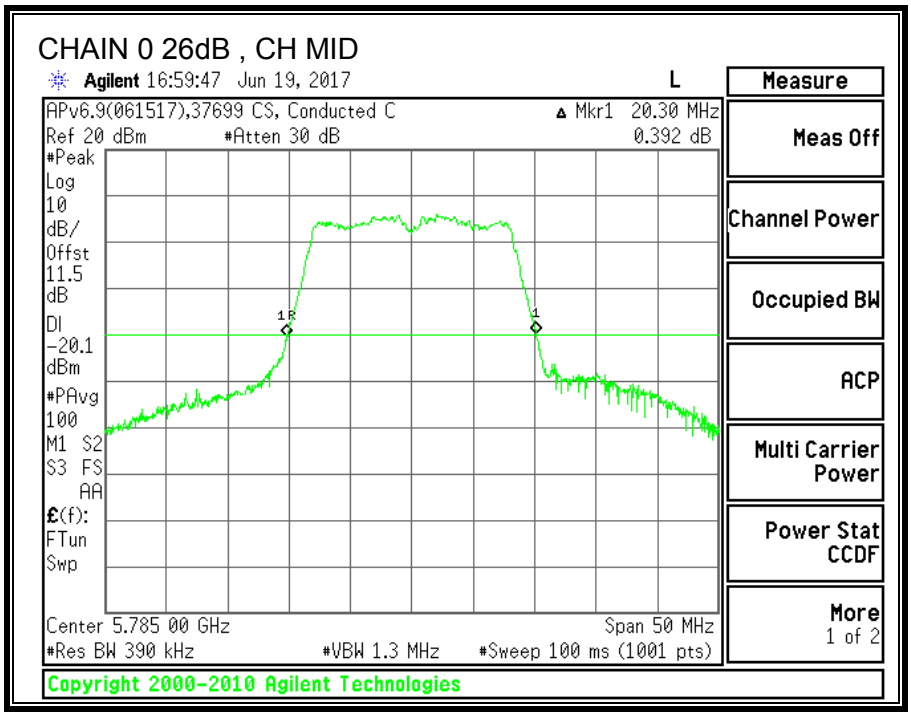
CHAIN 0 26dB , CH LOW



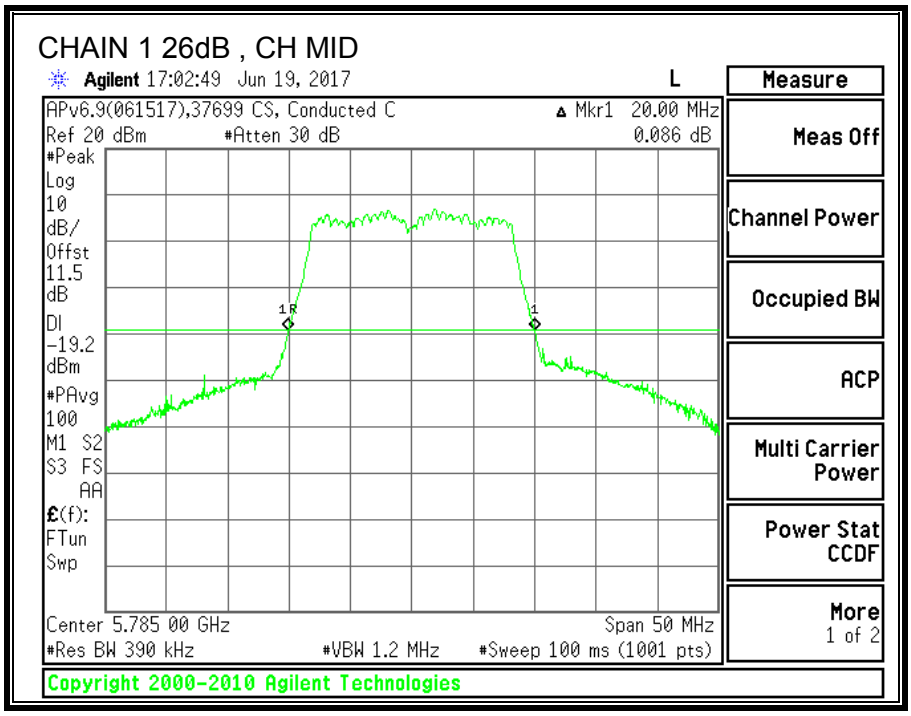
CHAIN 1 26dB , CH LOW



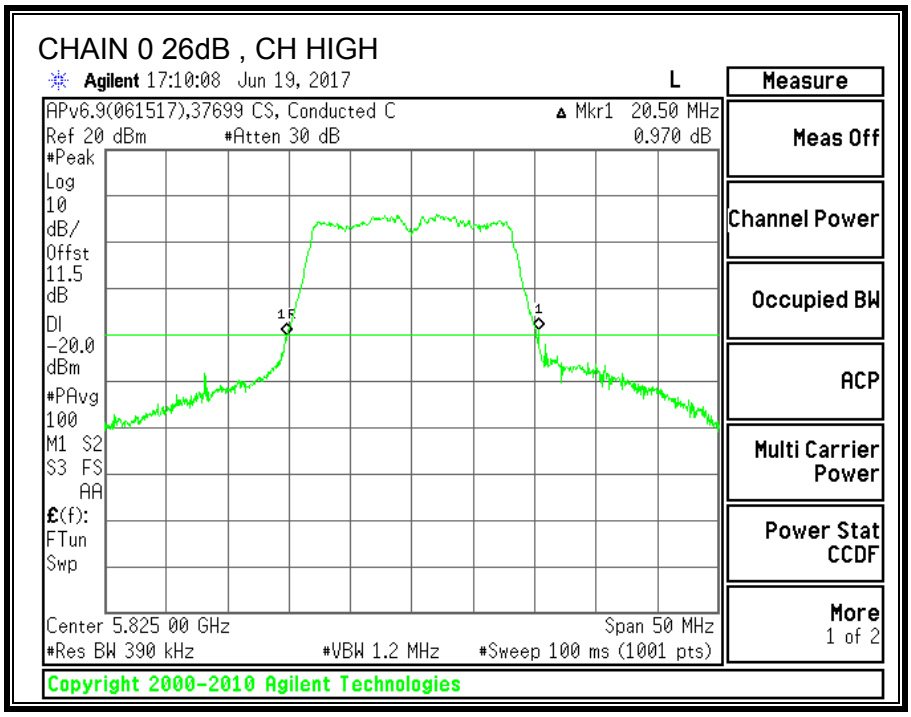
CHAIN 0 26dB , CH MID



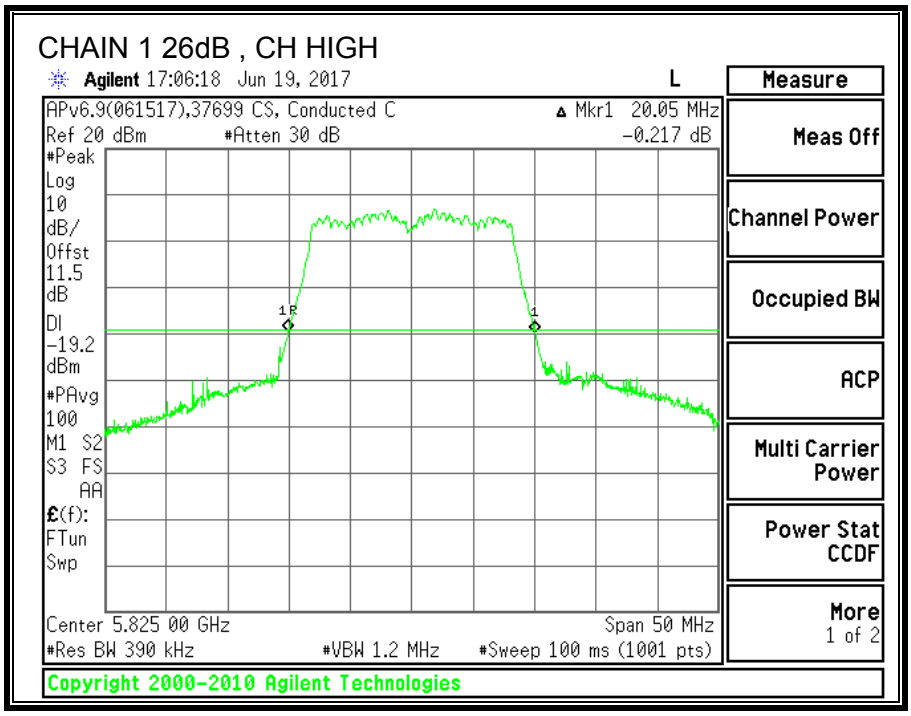
CHAIN 1 26dB , CH MID



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	16.5305	16.4623
Mid	5785	16.5177	16.5264
High	5825	16.4770	16.5255

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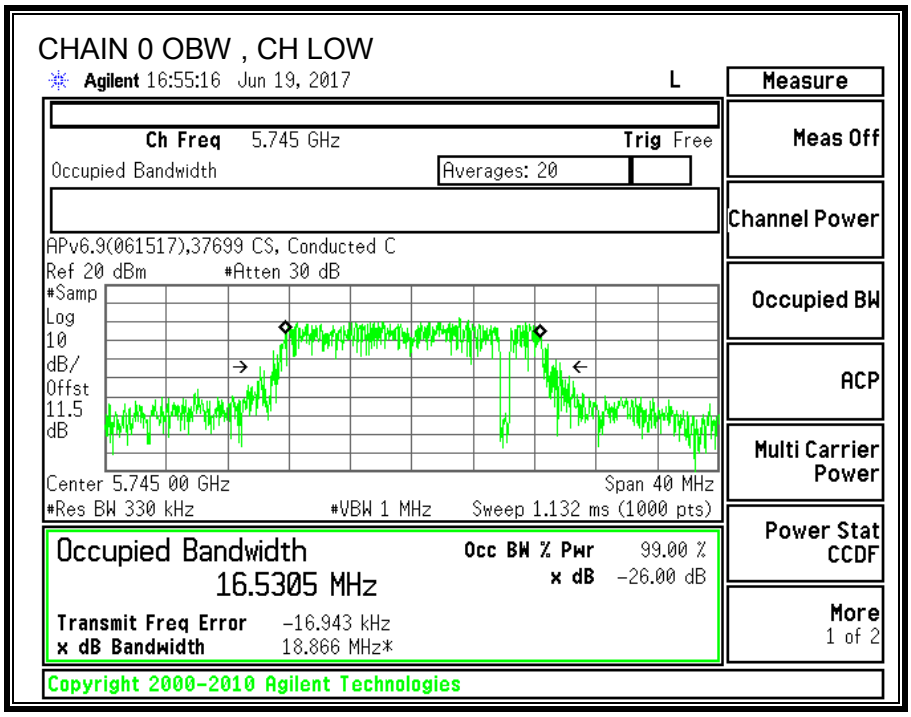
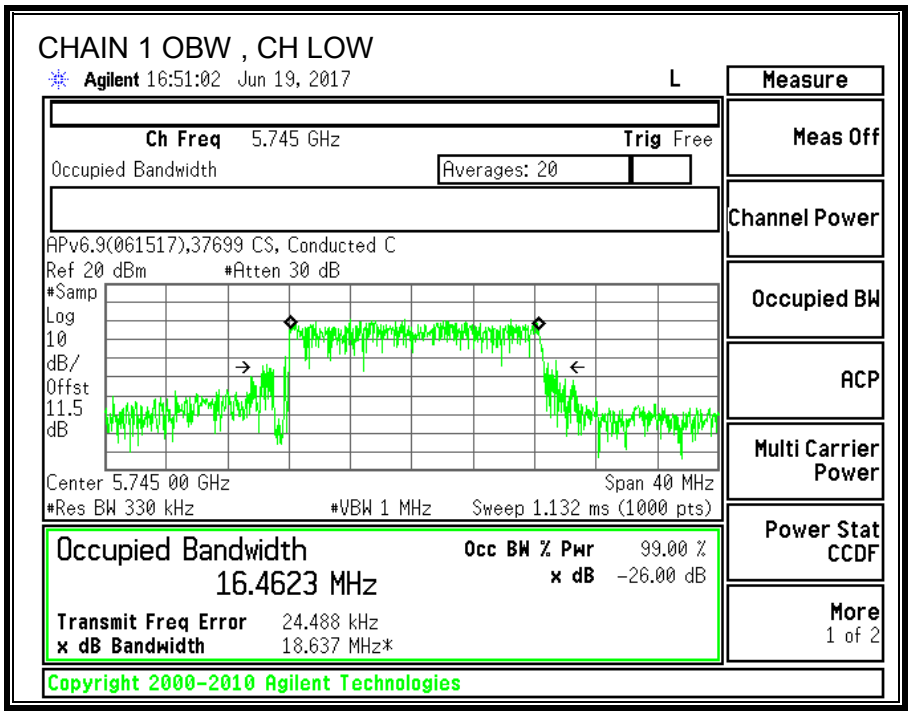
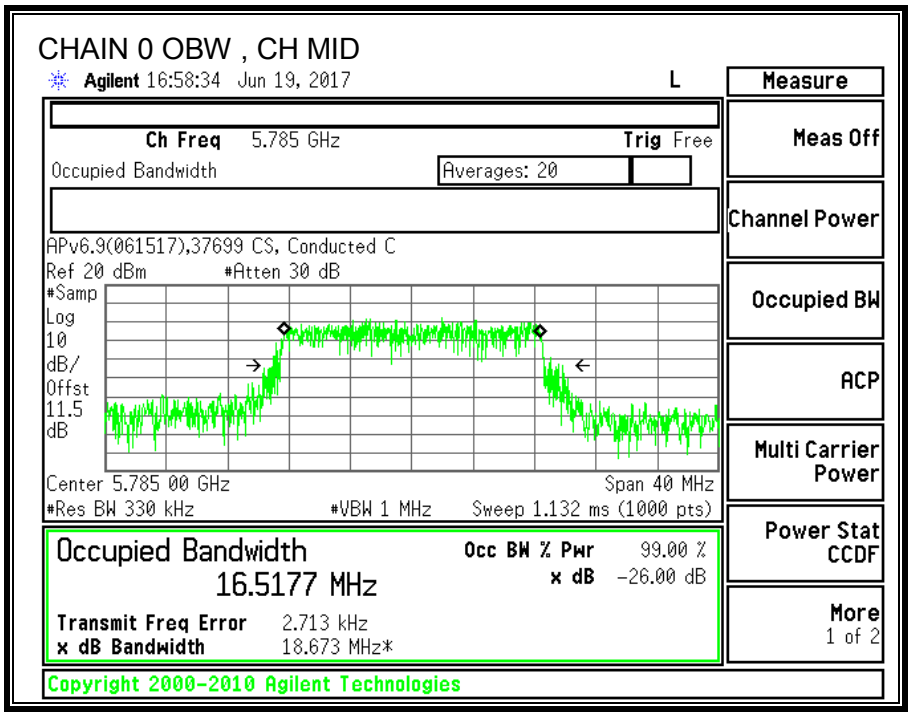
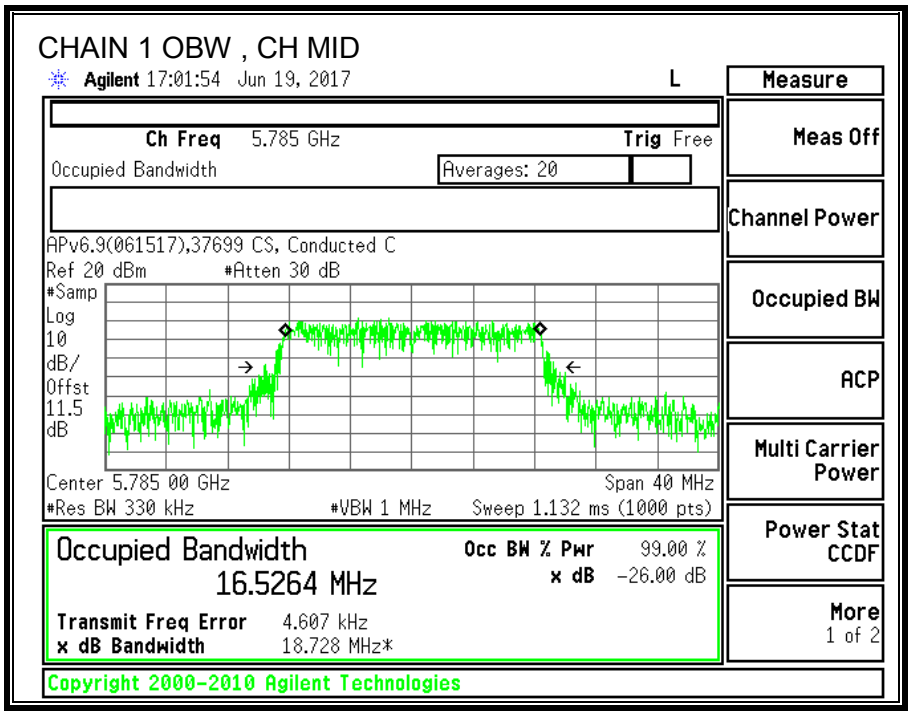
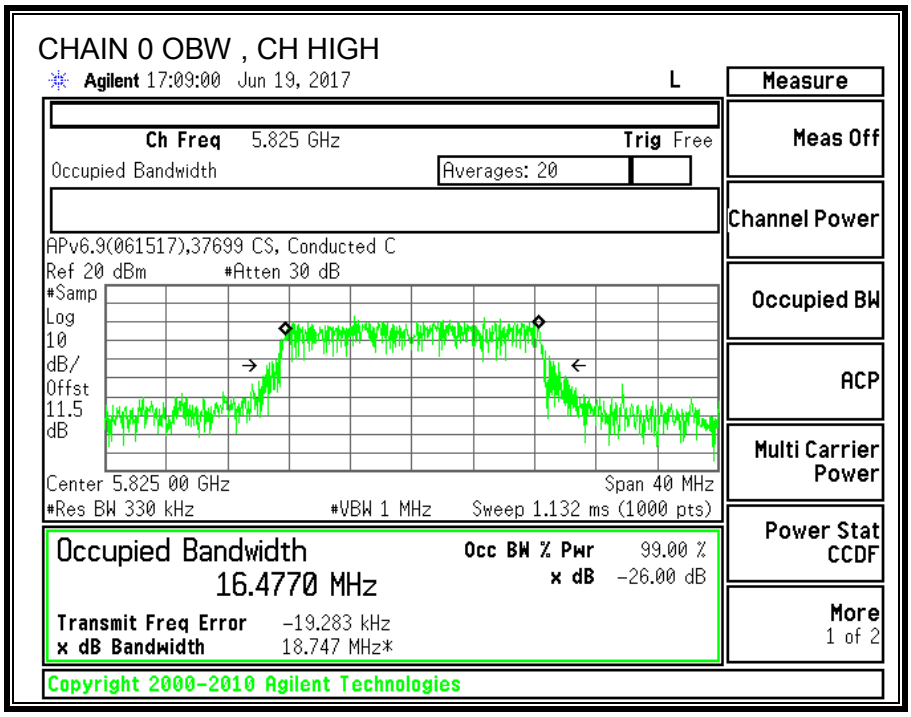




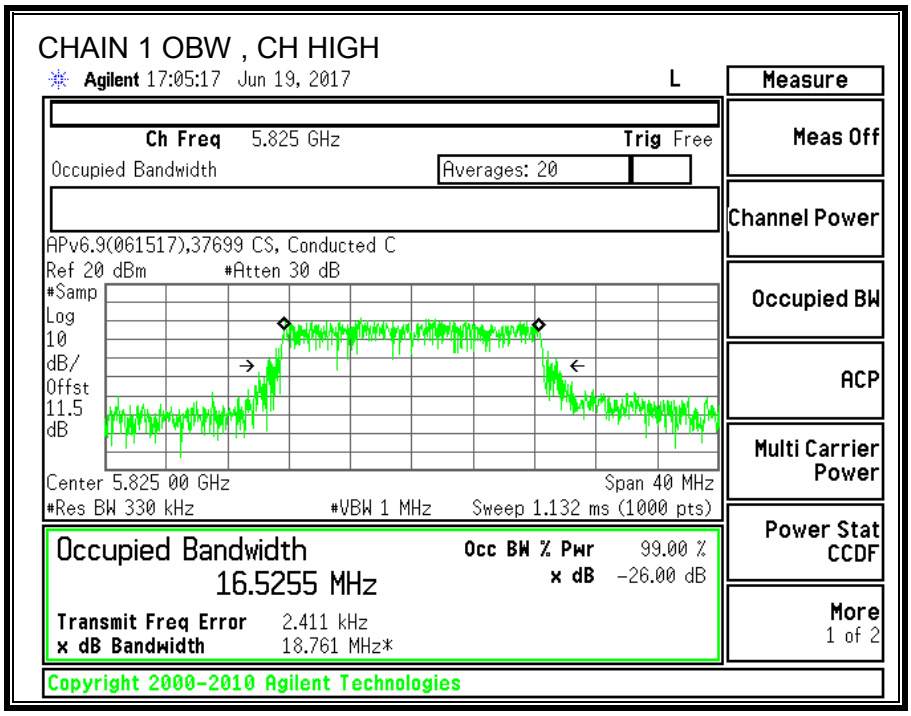




CHAIN 0 OBW , CH HIGH



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)
4.40	4.50	4.45	7.46

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RESULTS

ID:	37699 CS	Date:	06/16/17

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	19.95	16.46	4.45	7.46
Mid	5785	20.00	16.52	4.45	7.46
High	5805	20.05	16.48	4.45	7.46

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	29.16	35.16	29.16	28.54	28.54	28.54
Mid	5785	30.00	29.18	35.18	29.18	28.54	28.54	28.54
High	5805	30.00	29.17	35.17	29.17	28.54	28.54	28.54

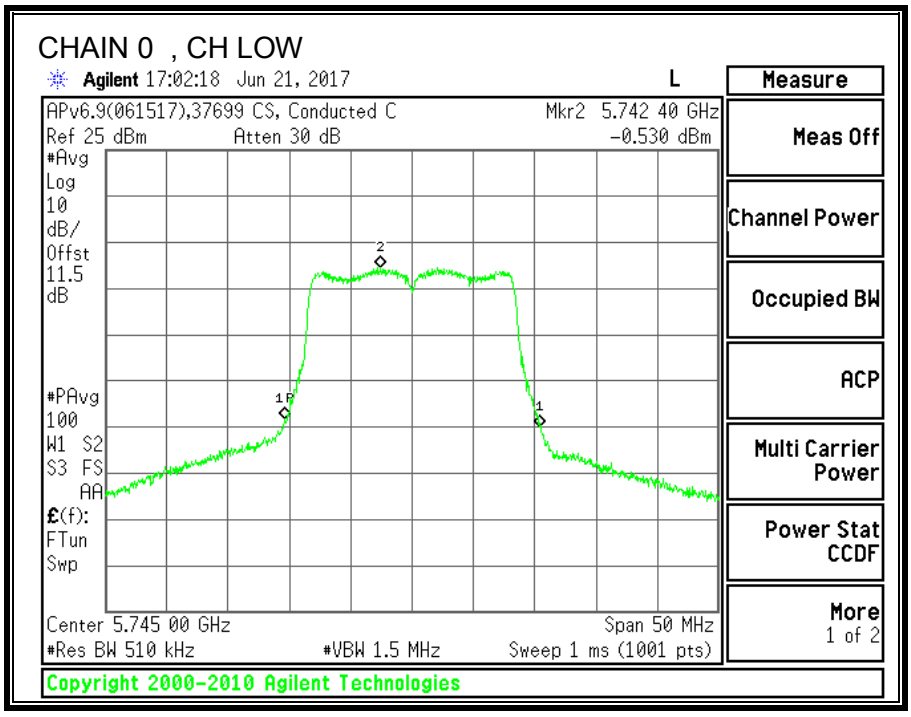
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	12.15	12.73	15.46	29.16	-13.70
Mid	5785	12.35	13.05	15.72	29.18	-13.46
High	5805	12.53	13.05	15.81	29.17	-13.36

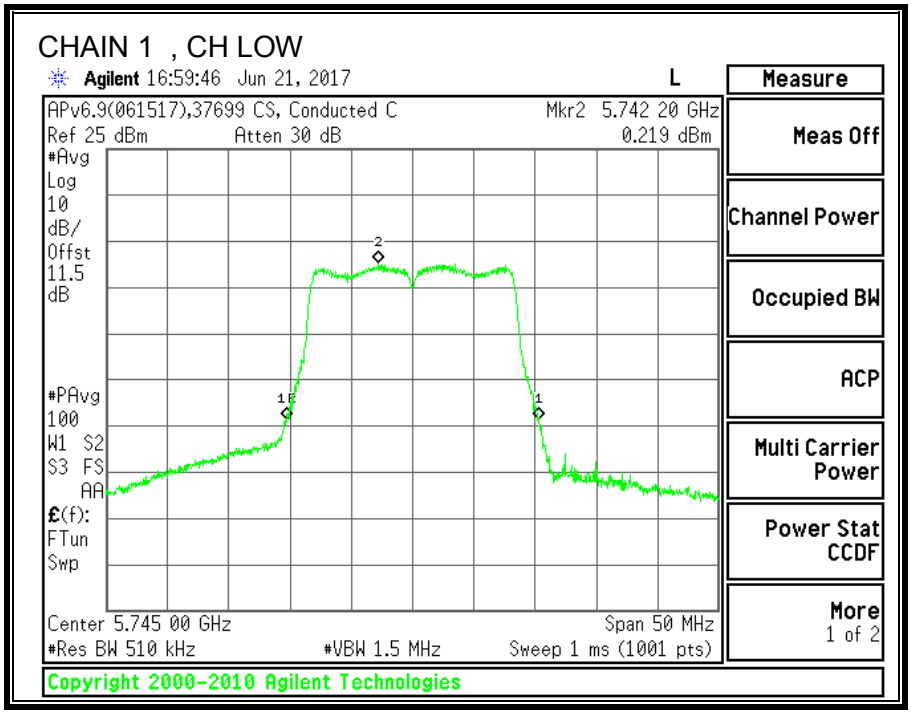
PPSD Results

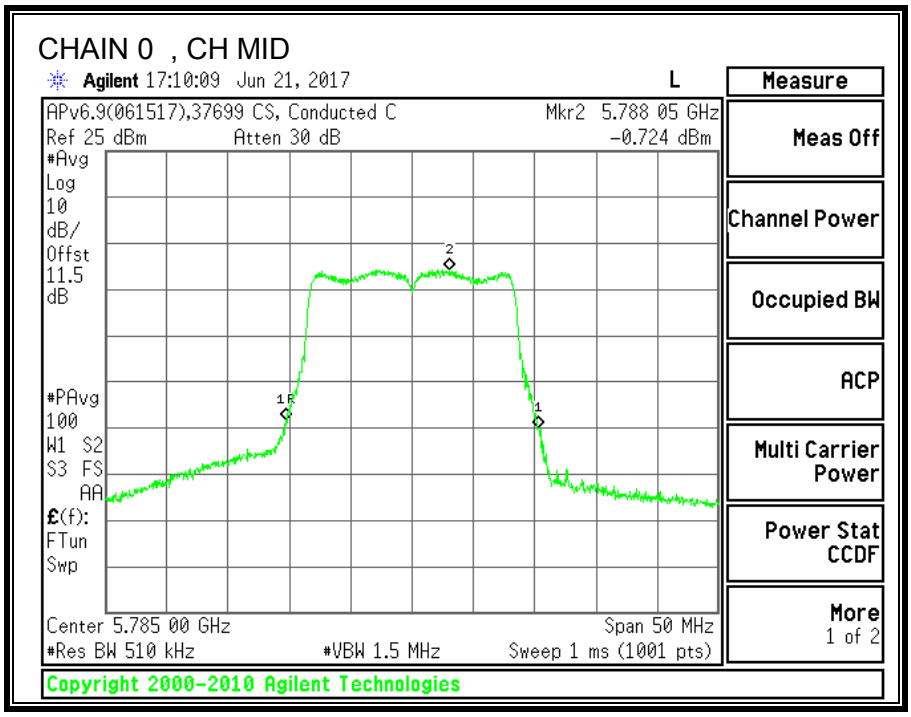
Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Chain 1 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	-0.53	0.22	2.87	28.54	-25.67
Mid	5785	-0.72	0.40	2.88	28.54	-25.66
High	5805	-0.13	0.70	3.32	28.54	-25.22

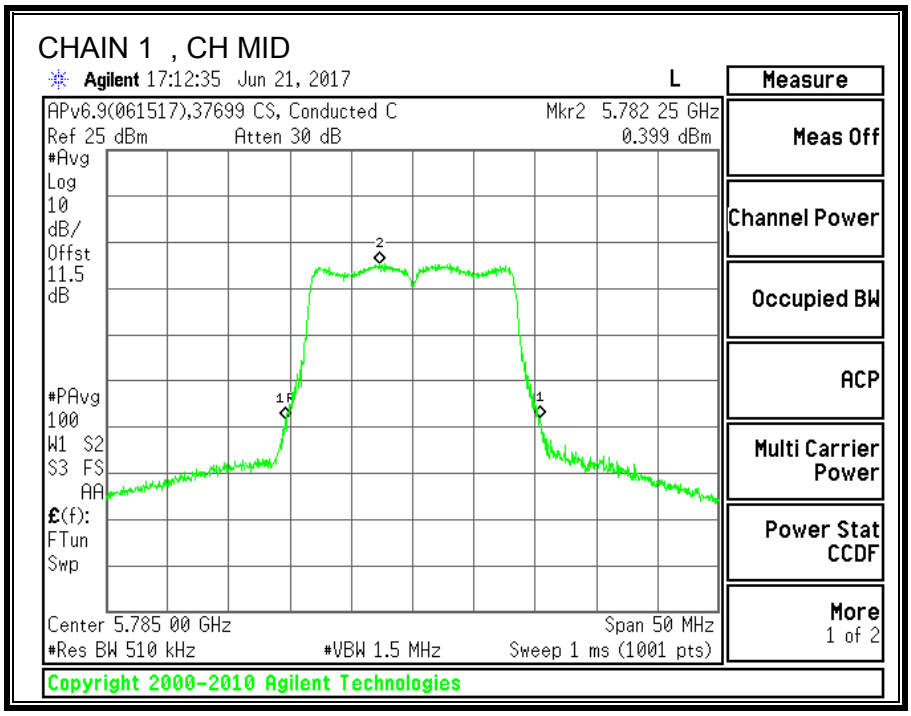
CHAIN 0 , CH LOW



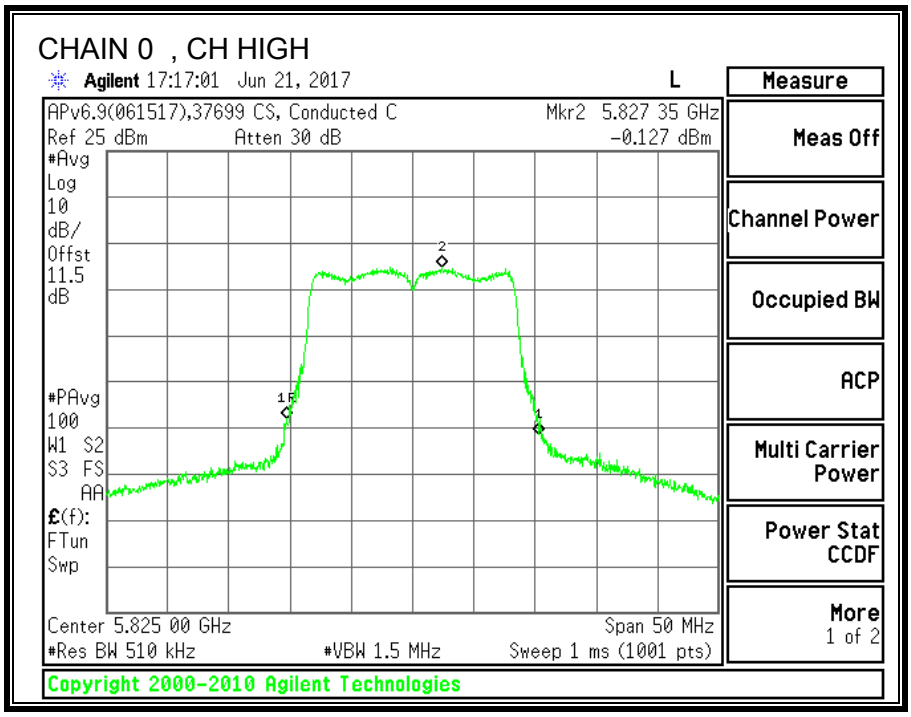
CHAIN 1 , CH LOW



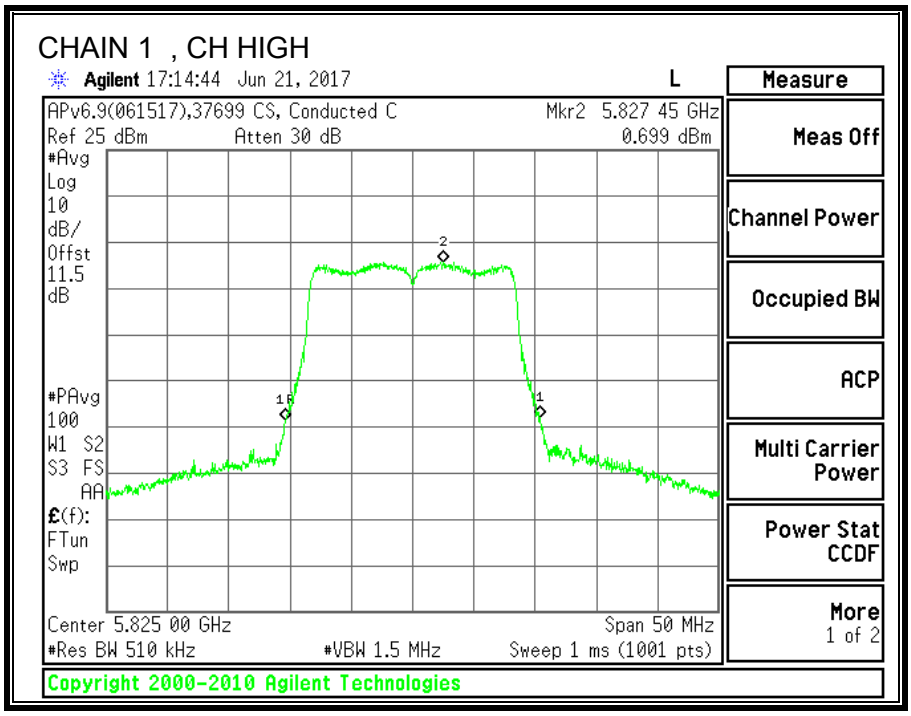




CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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	17.70	17.75	0.5
Mid	5785	17.75	17.75	0.5
High	5825	17.70	17.65	0.5

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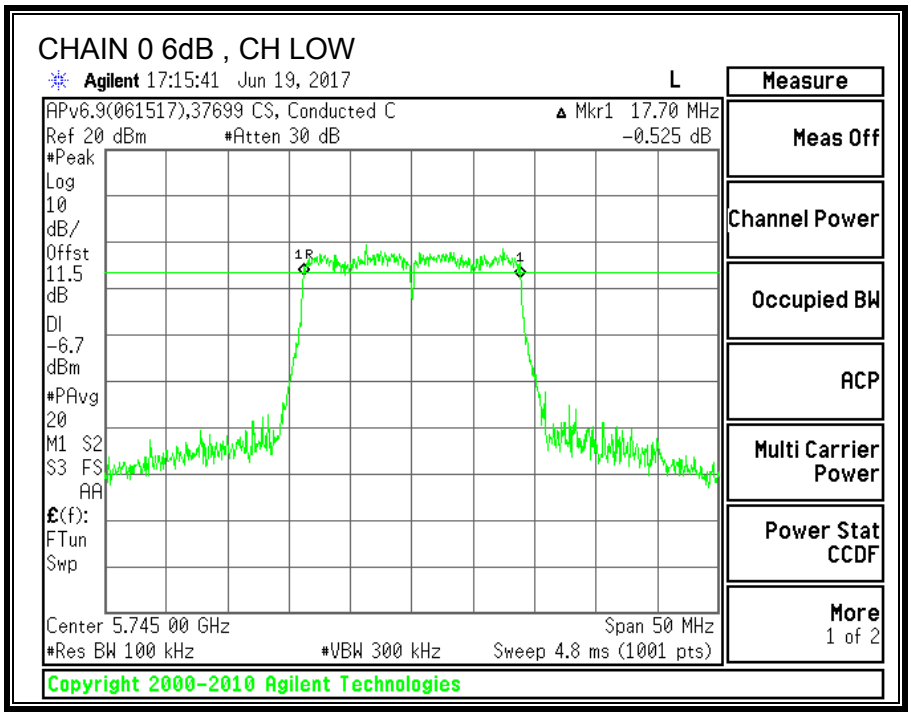
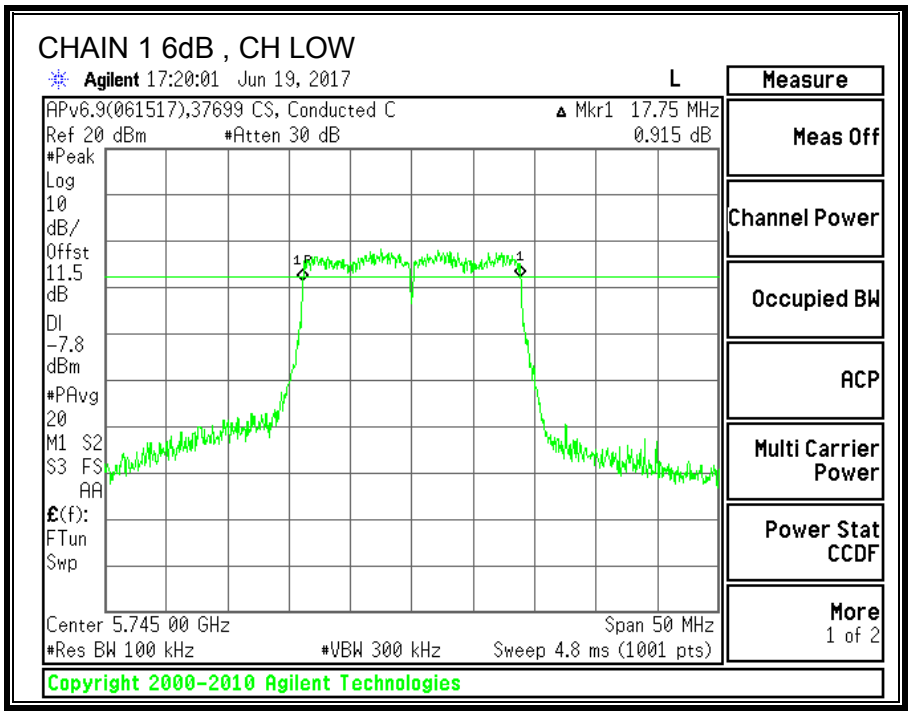
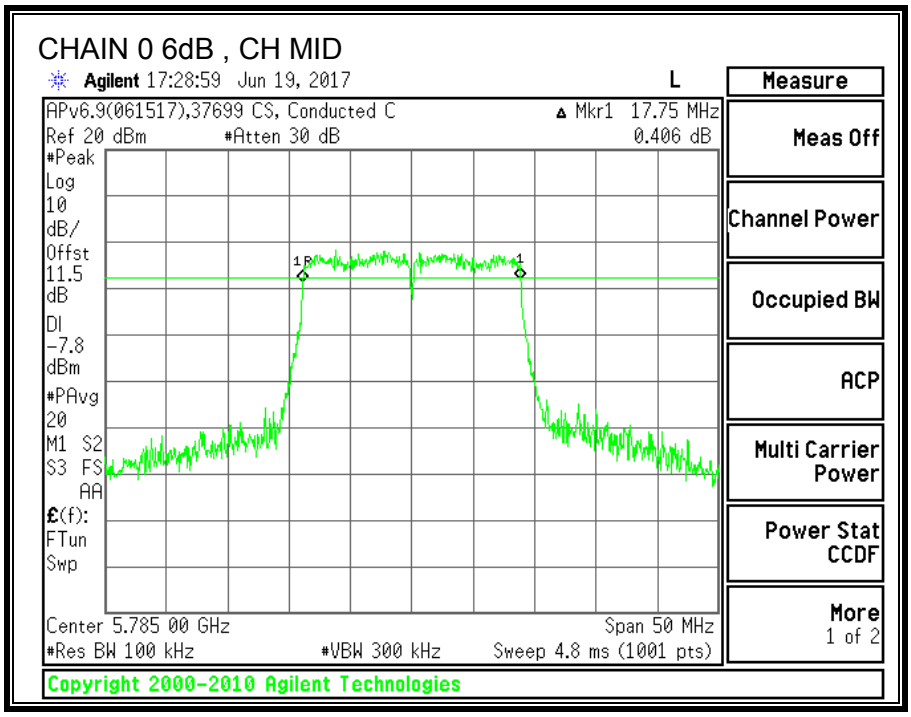
CHAIN 0 6dB , CH LOW



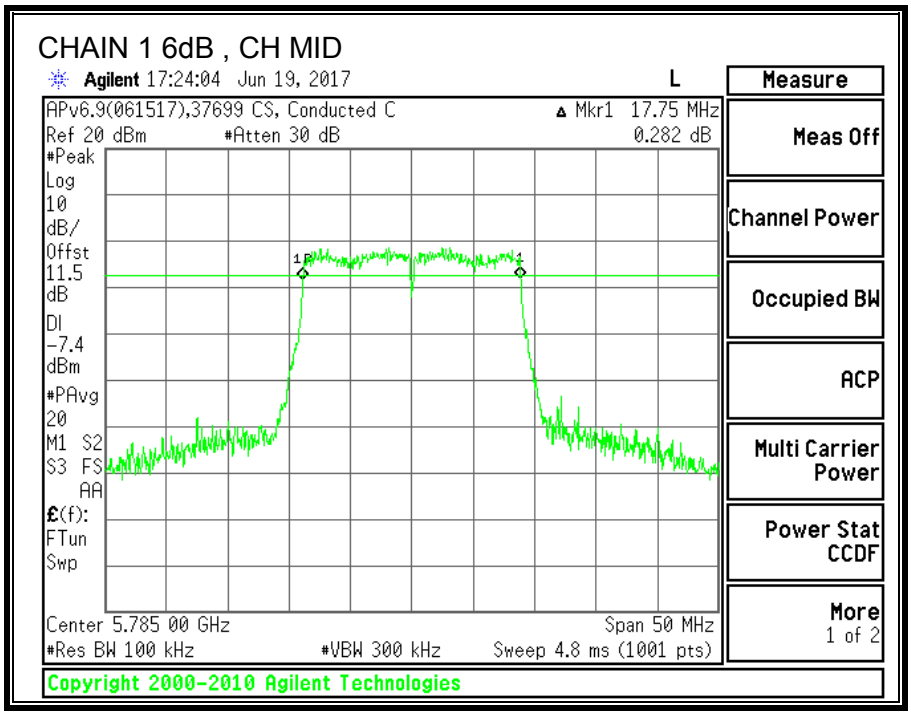
CHAIN 1 6dB , CH LOW



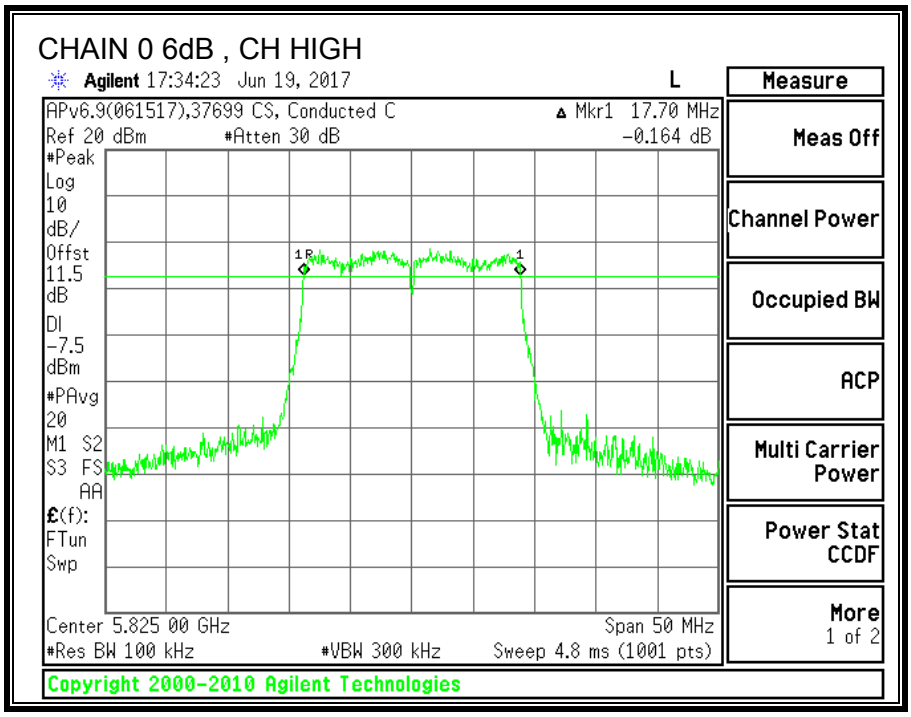
CHAIN 0 6dB , CH MID



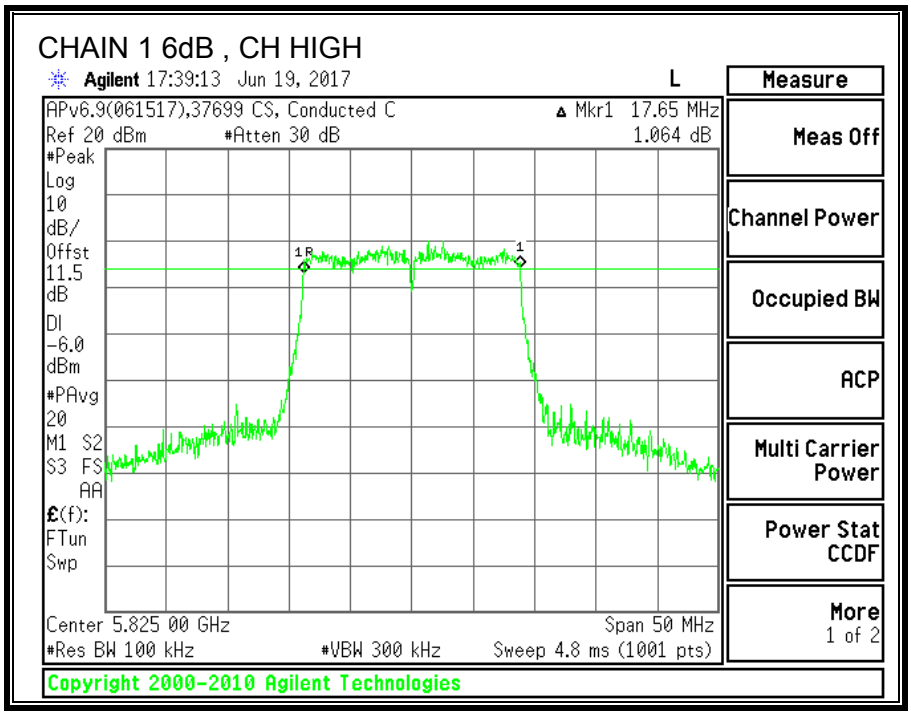
CHAIN 1 6dB , CH MID



CHAIN 0 6dB , CH HIGH



CHAIN 1 6dB , CH HIGH



9.14.2. 26 dB BANDWIDTH

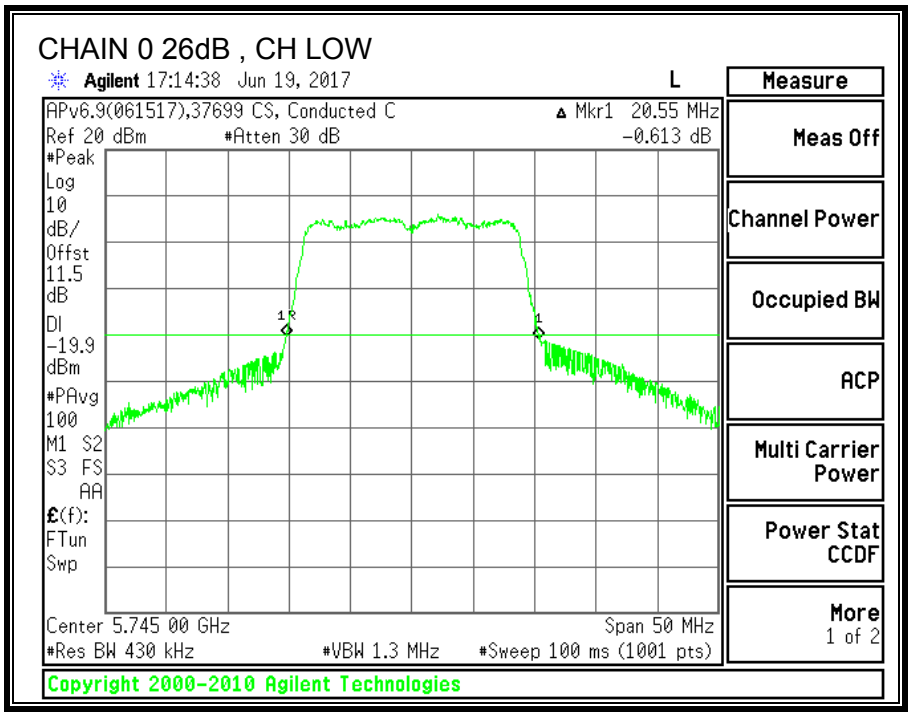
LIMITS

None; for reporting purposes only.

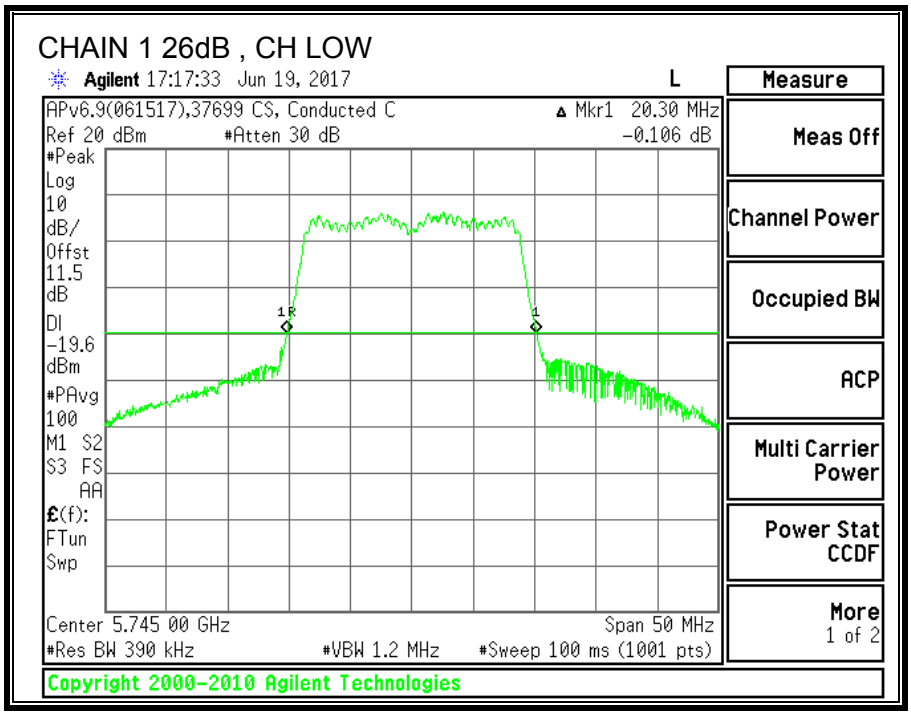
RESULTS

Channel	Frequency	26 dB BW CHAIN 0 (MHz)	26 dB BW CHAIN 1 (MHz)
Low	5745	20.55	20.30
Mid	5785	20.55	20.30
High	5825	20.45	20.30

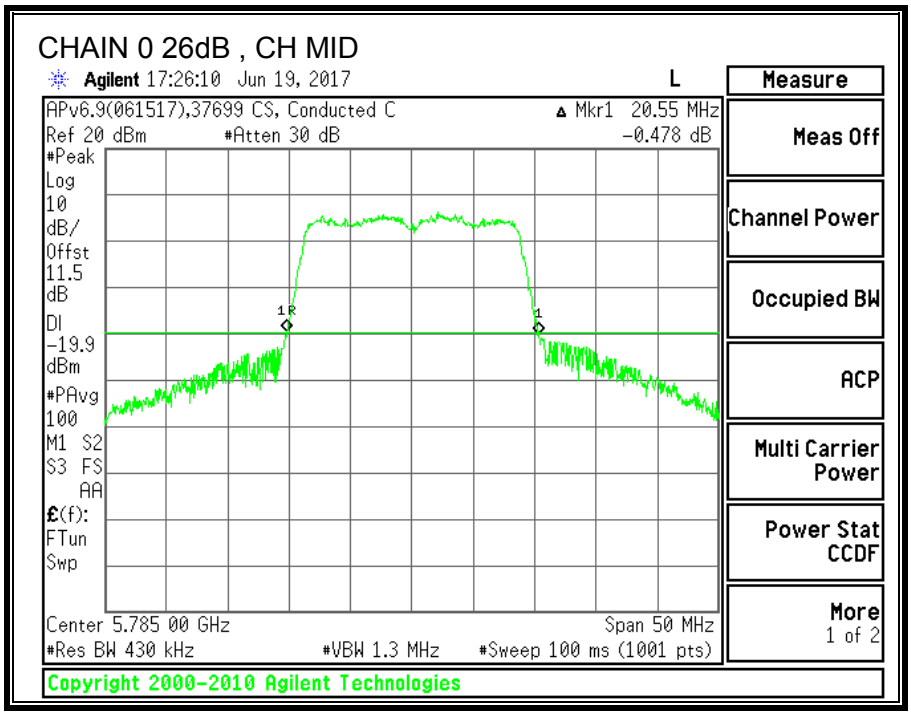
CHAIN 0 26dB , CH LOW



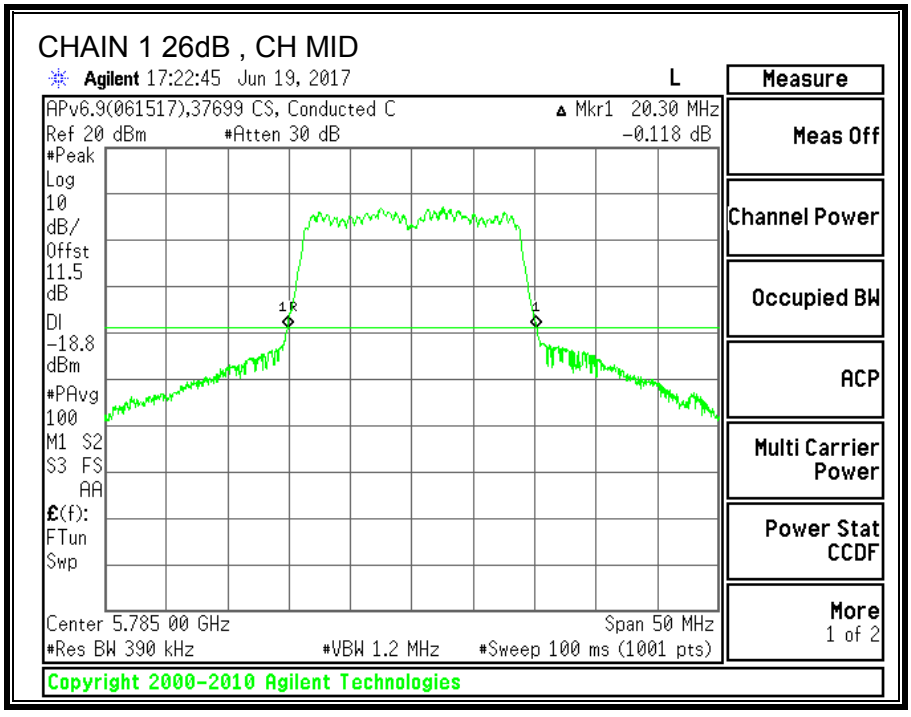
CHAIN 1 26dB , CH LOW



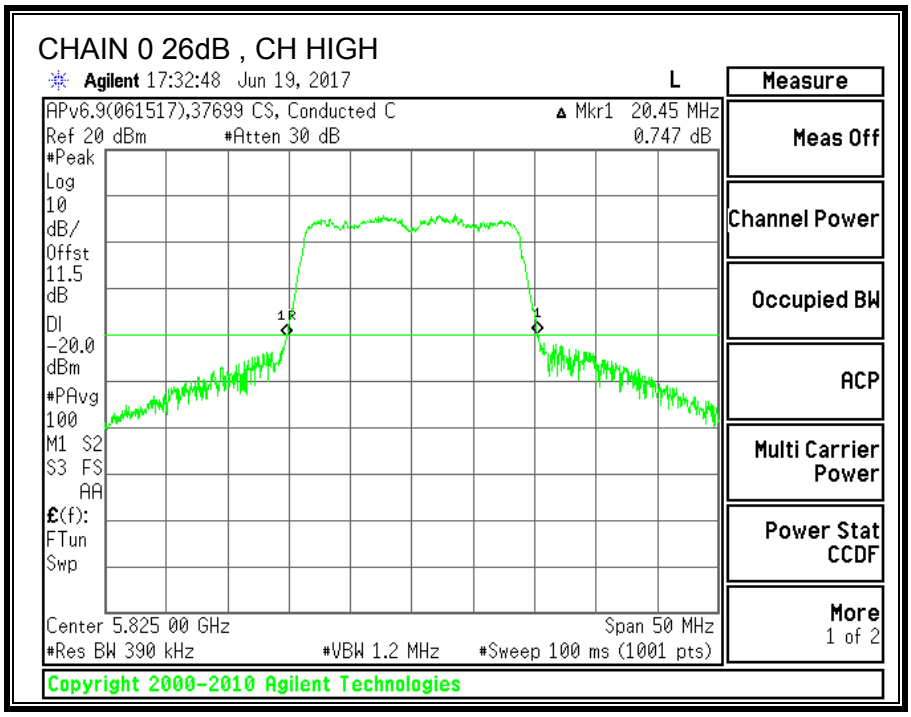
CHAIN 0 26dB , CH MID



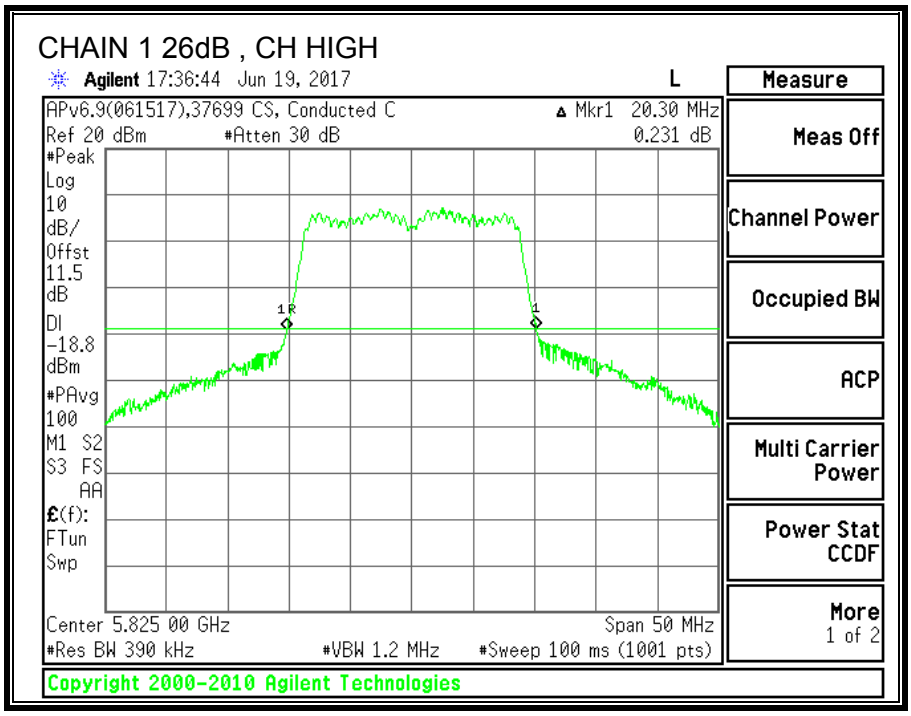
CHAIN 1 26dB , CH MID



CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



9.14.3. 99% BANDWIDTH

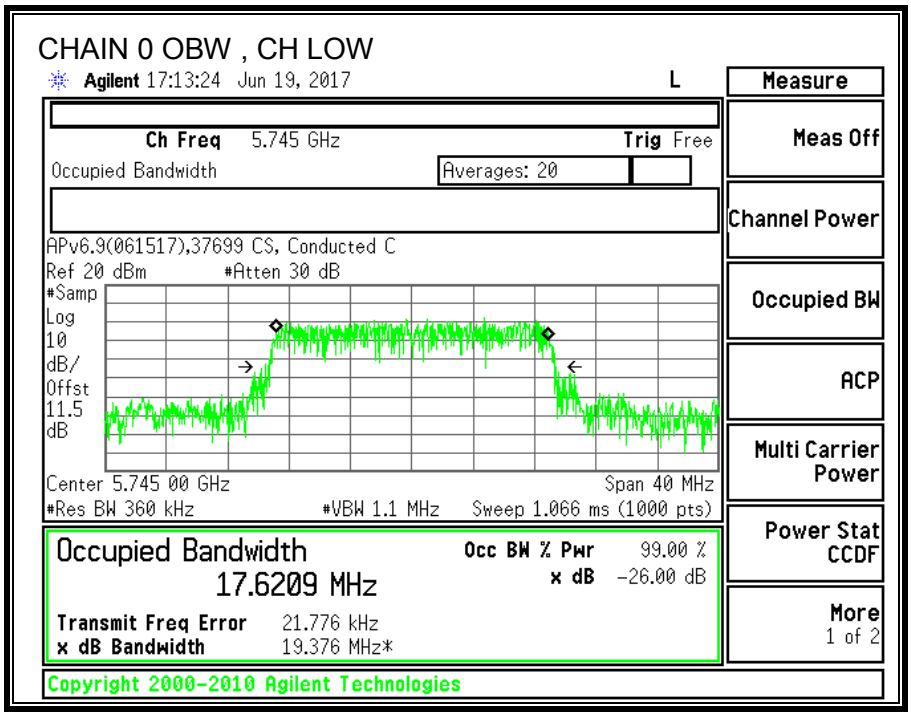
LIMITS

None; for reporting purposes only.

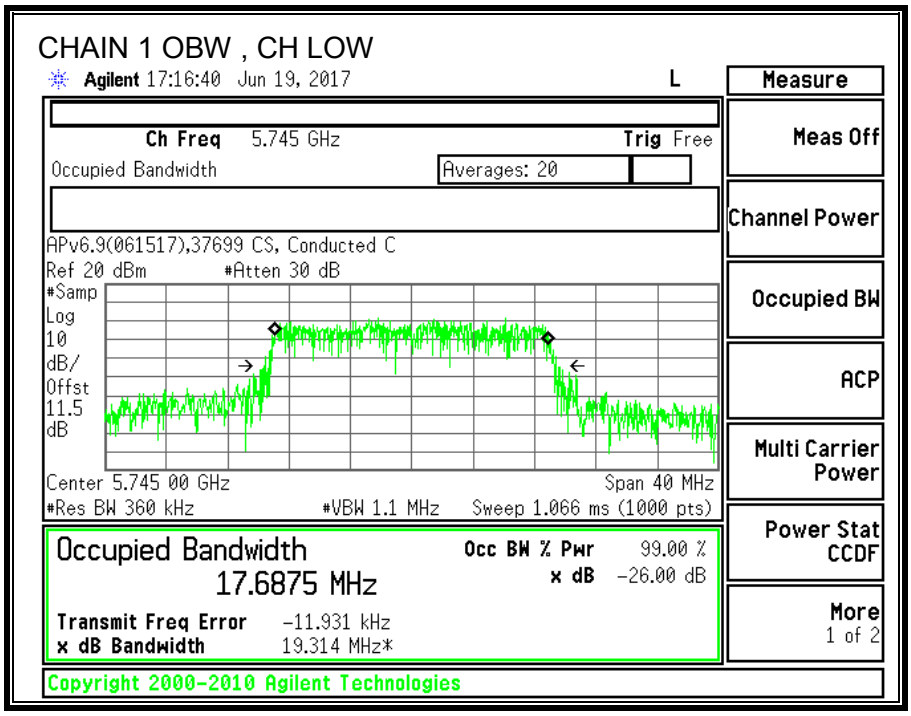
RESULTS

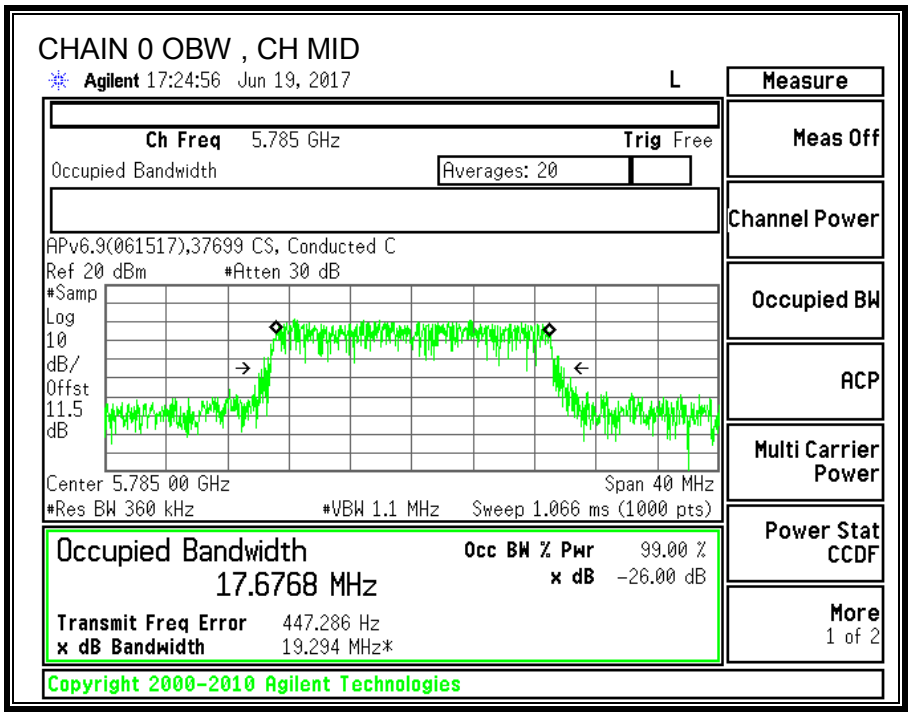
Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5745	17.6209	17.6875
Mid	5785	17.6768	17.6809
High	5825	17.6565	17.6673

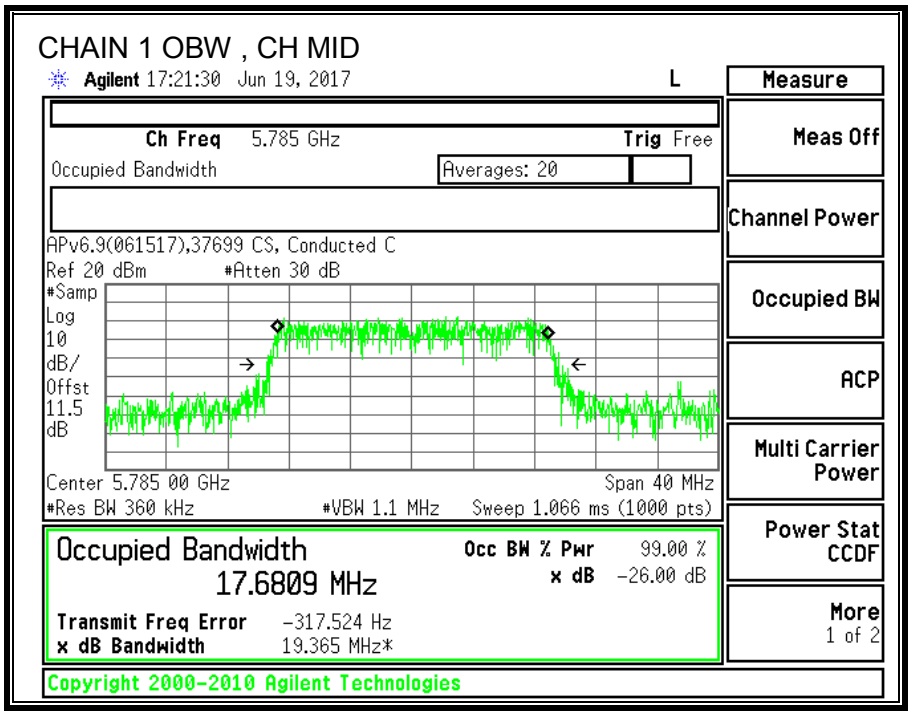
CHAIN 0 OBW , CH LOW

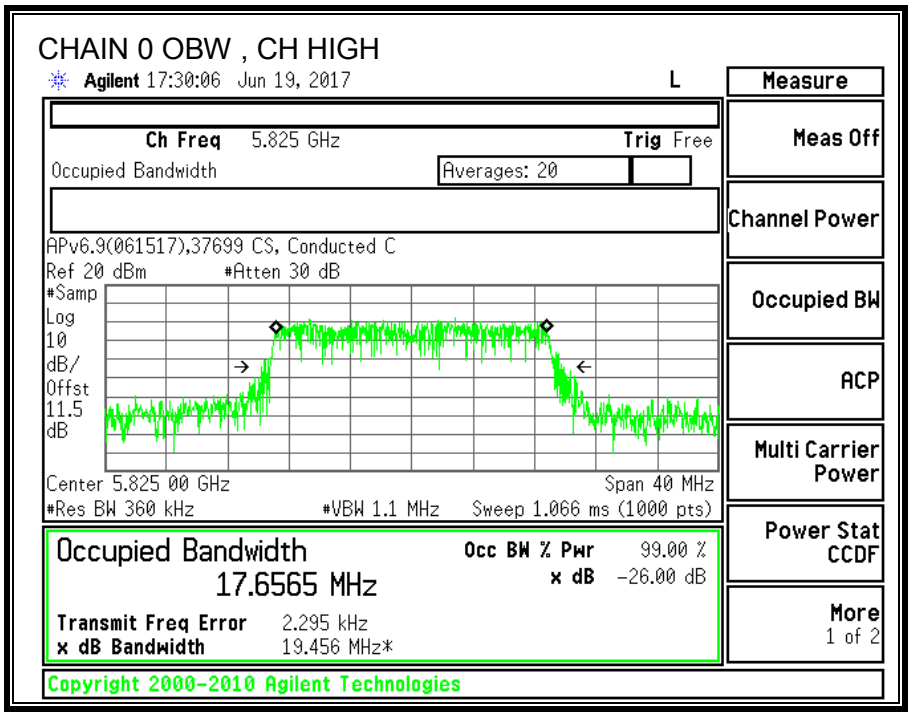


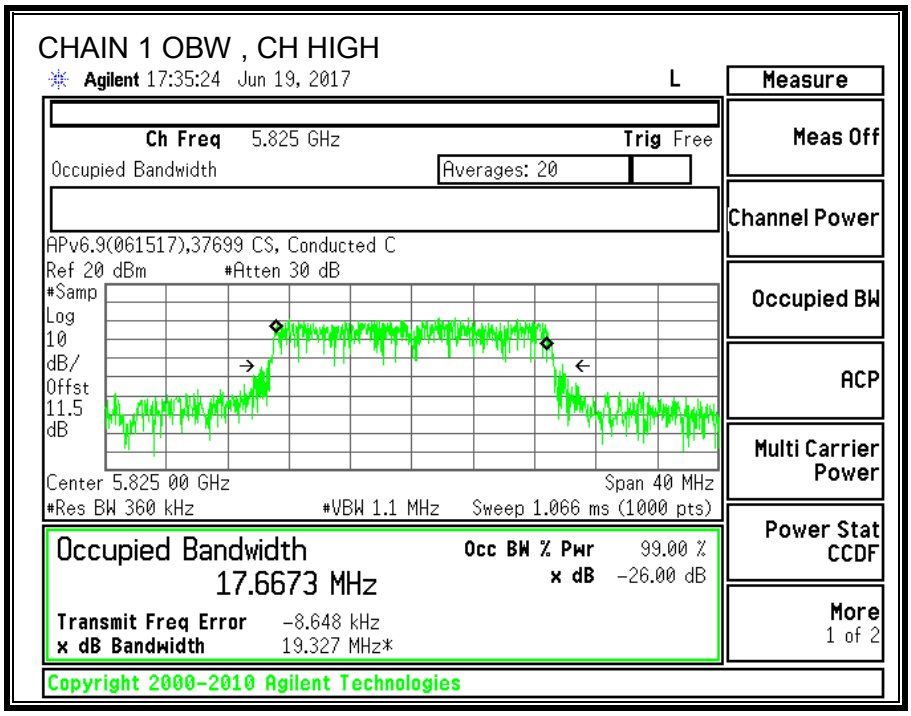
CHAIN 1 OBW , CH LOW











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)
4.40	4.50	4.45	7.46

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RESULTS

ID:	37699 CS	Date:	06/16/17

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	20.30	17.62	4.45	7.46
Mid	5785	20.30	17.68	4.45	7.46
High	5805	20.30	17.66	4.45	7.46

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	29.46	35.46	29.46	28.54	28.54	28.54
Mid	5785	30.00	29.47	35.47	29.47	28.54	28.54	28.54
High	5805	30.00	29.47	35.47	29.47	28.54	28.54	28.54

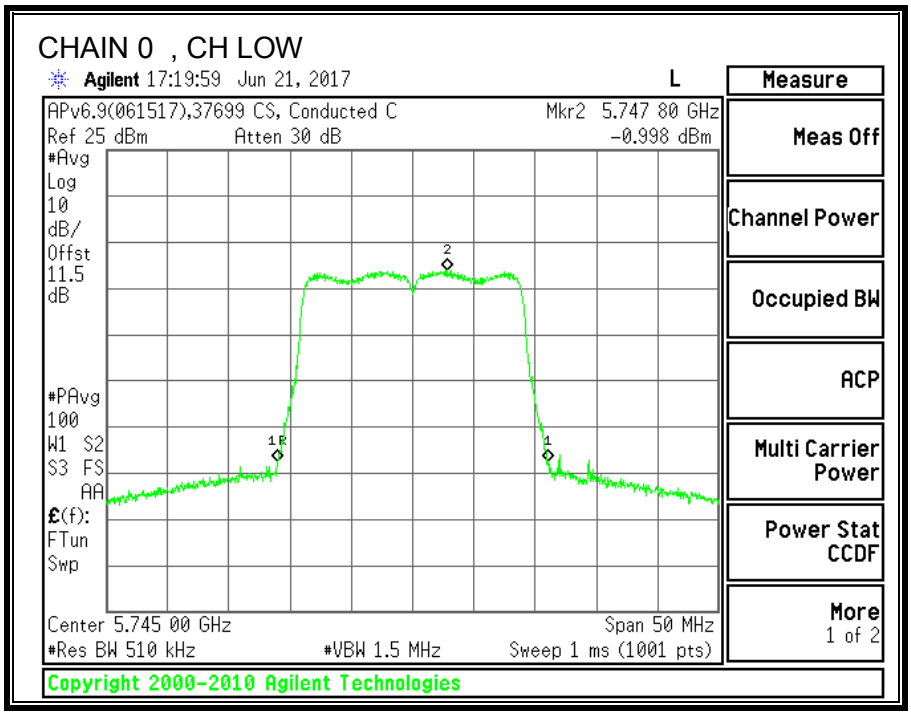
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	12.22	12.64	15.45	29.46	-14.01
Mid	5785	12.43	12.78	15.62	29.47	-13.86
High	5805	12.28	13.25	15.80	29.47	-13.67

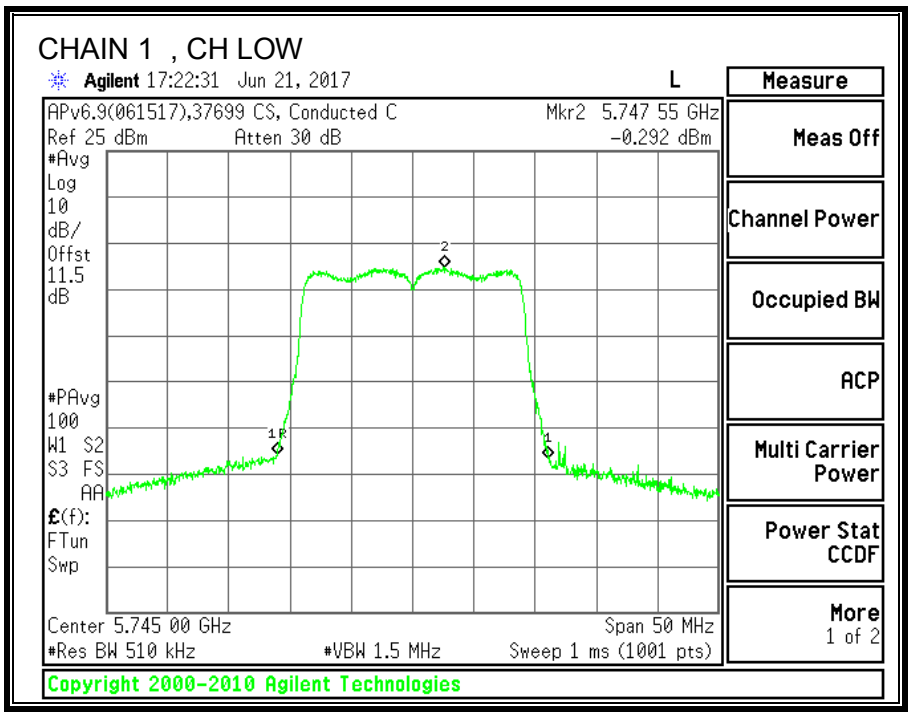
PPSD Results

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	-1.00	-0.29	2.38	28.54	-26.16
Mid	5785	-0.84	0.27	2.76	28.54	-25.78
High	5805	-0.57	0.17	2.83	28.54	-25.71

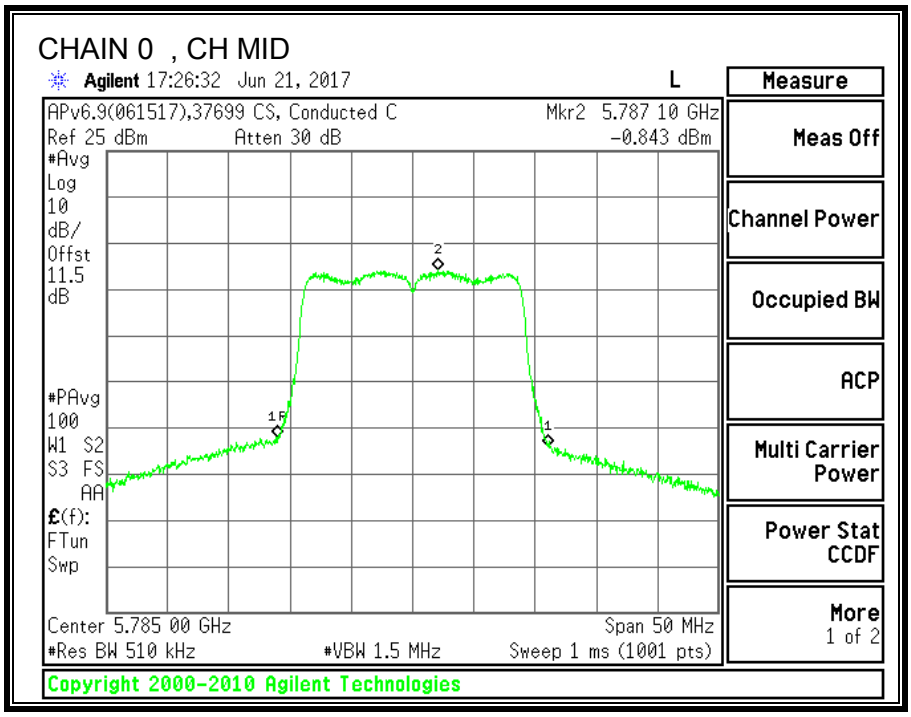
CHAIN 0 , CH LOW



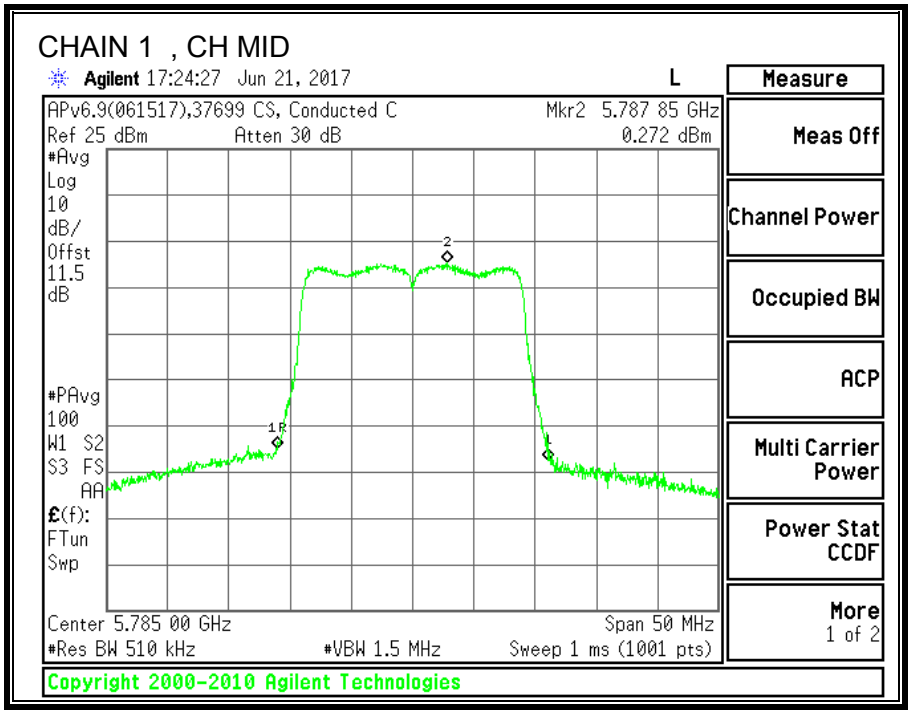
CHAIN 1 , CH LOW



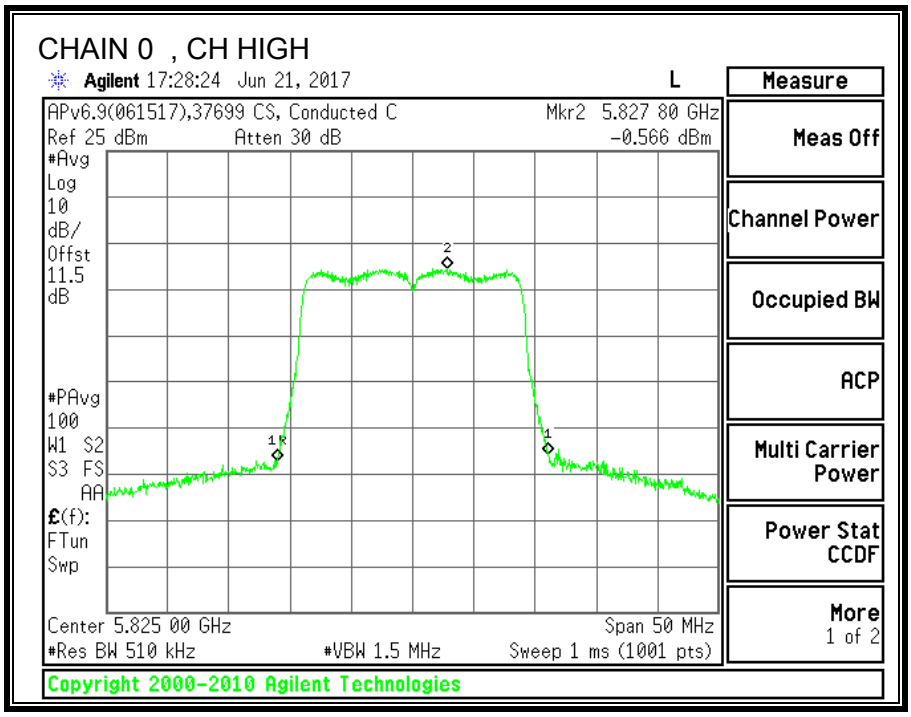
CHAIN 0 , CH MID



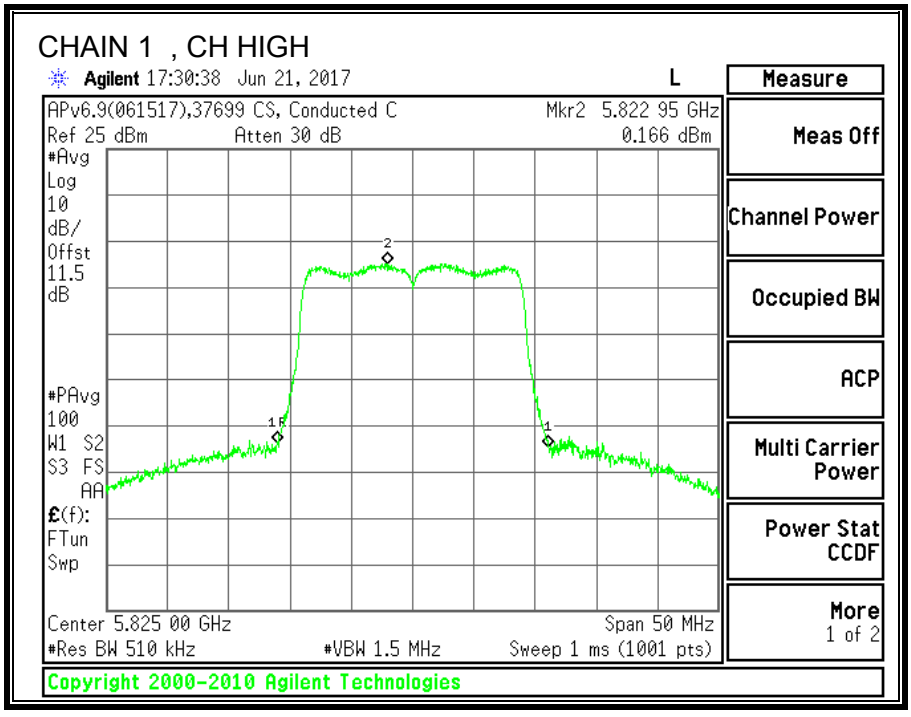
CHAIN 1 , CH MID



CHAIN 0 , CH HIGH



CHAIN 1 , CH HIGH



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	36.5	36.4	0.5
High	5795	36.4	36.4	0.5

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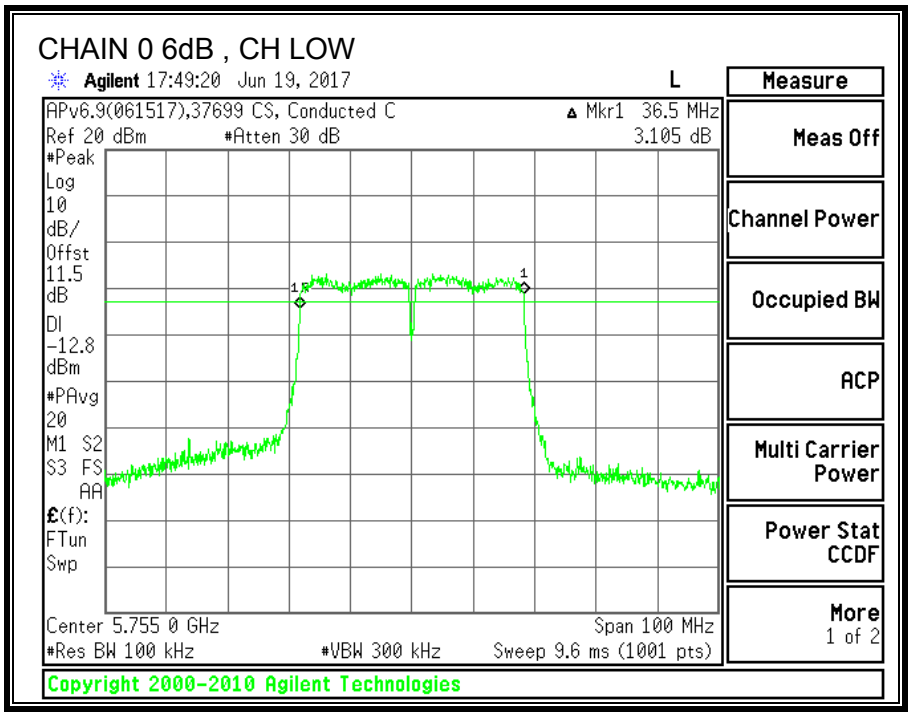
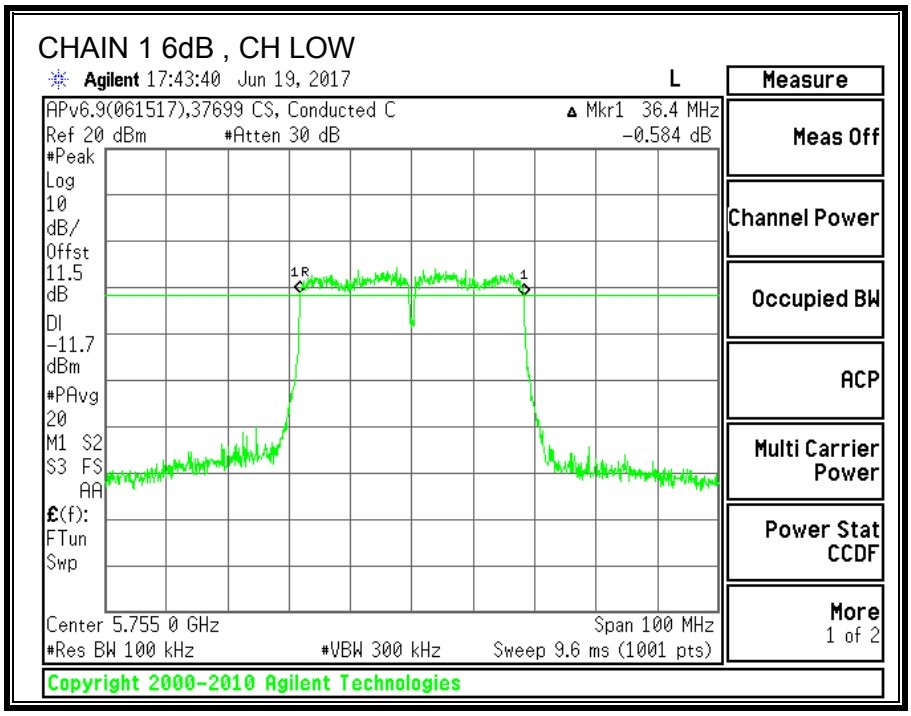
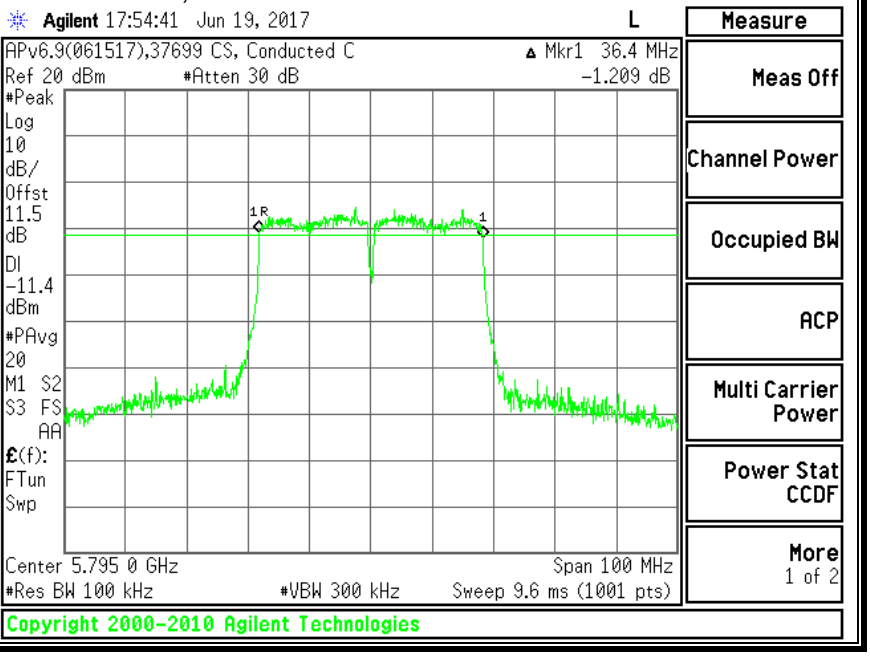
CHAIN 0 6dB , CH LOW



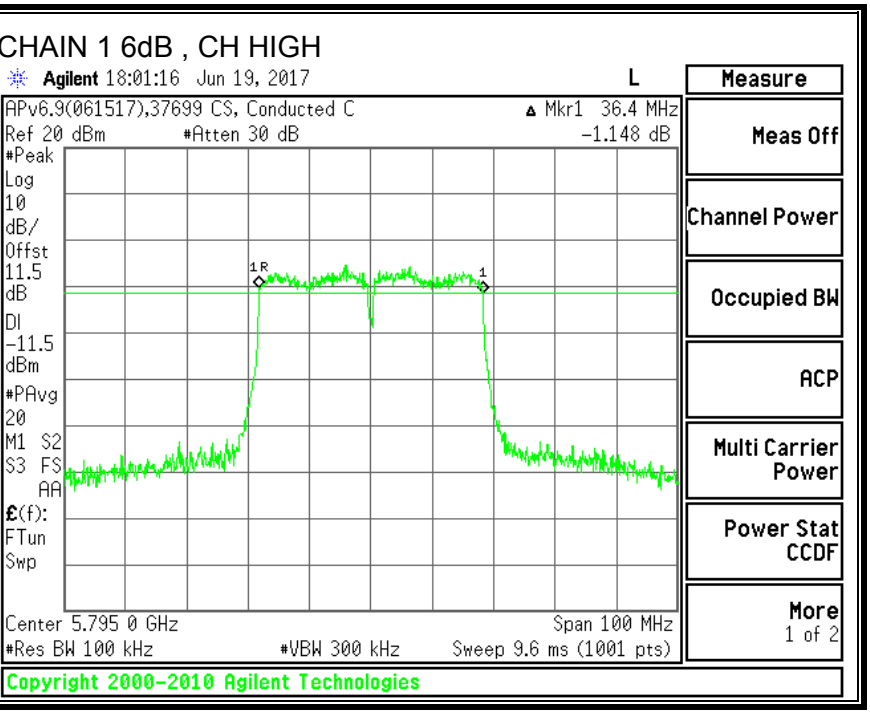
CHAIN 1 6dB , CH LOW



CHAIN 0 6dB , CH HIGH



CHAIN 1 6dB , CH HIGH



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	41.40	40.90
High	5795	41.50	40.80

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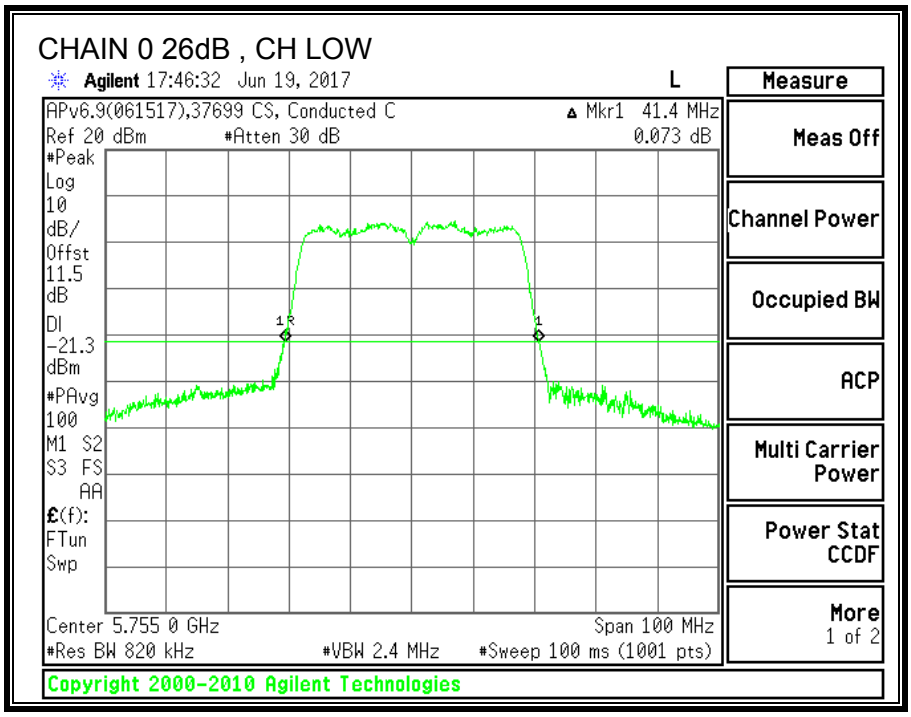
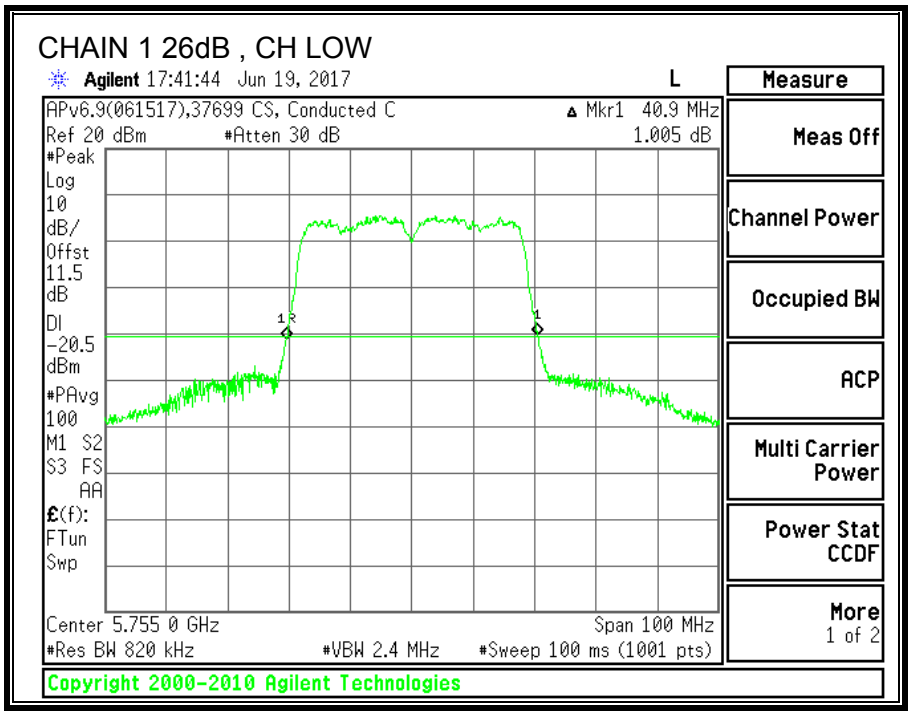
CHAIN 0 26dB , CH LOW



CHAIN 1 26dB , CH LOW



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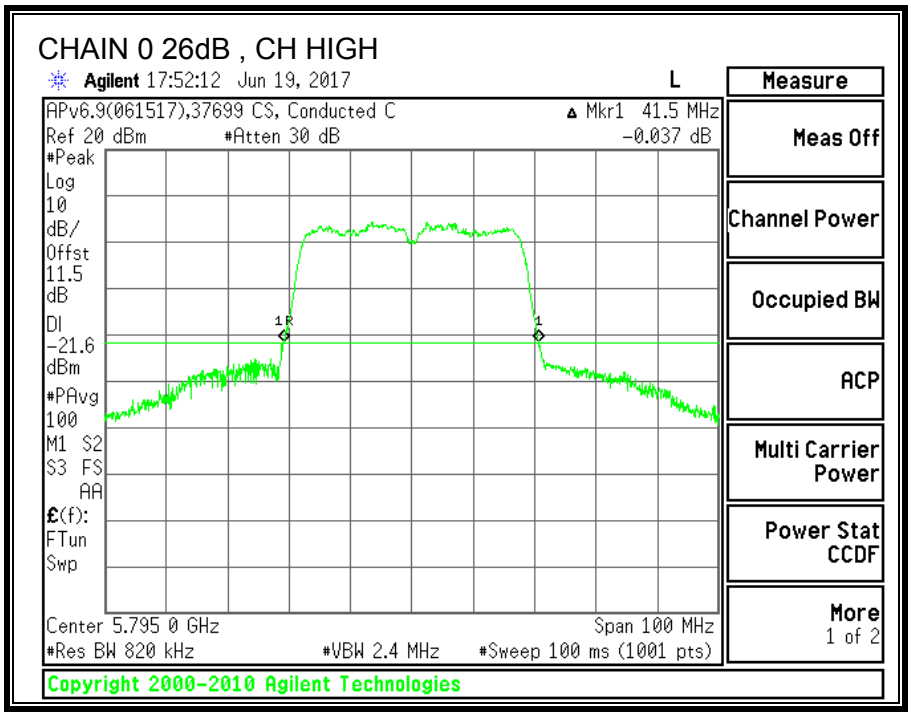
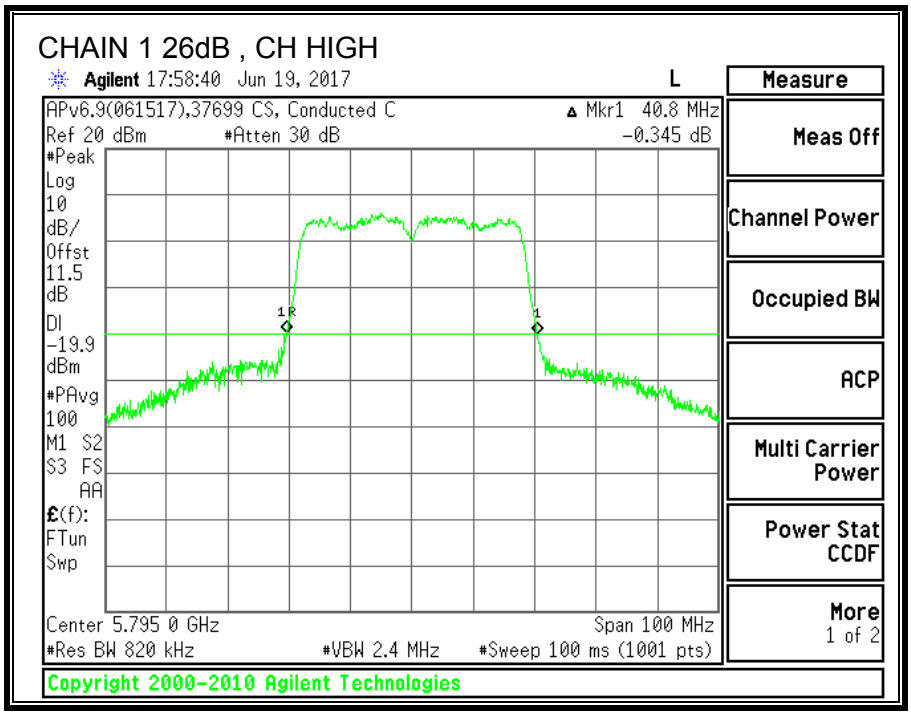
CHAIN 0 26dB , CH HIGH



CHAIN 1 26dB , CH HIGH



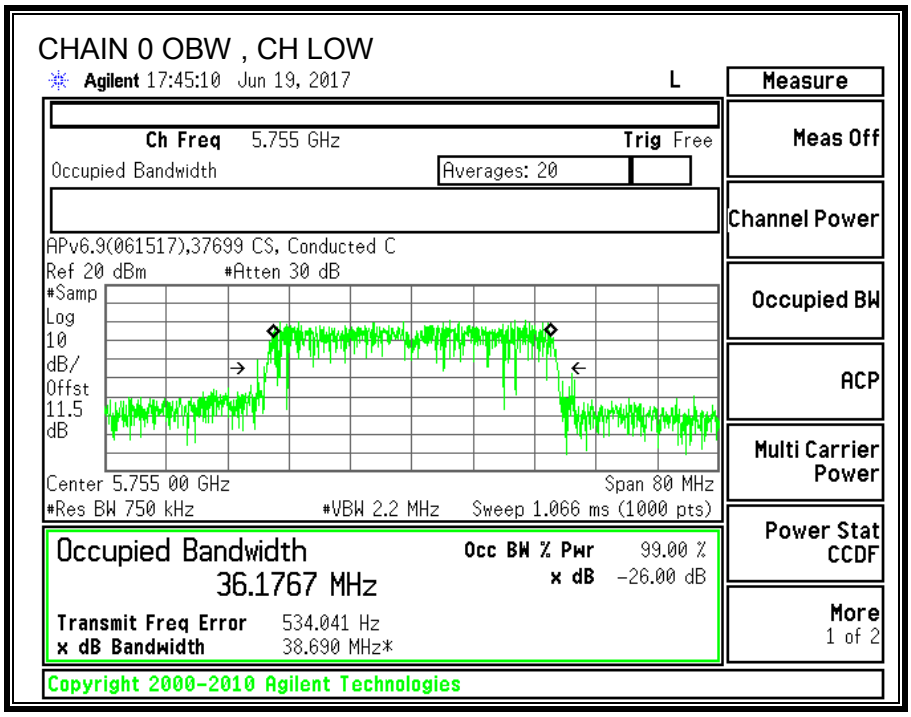
9.15.3. 99% BANDWIDTH

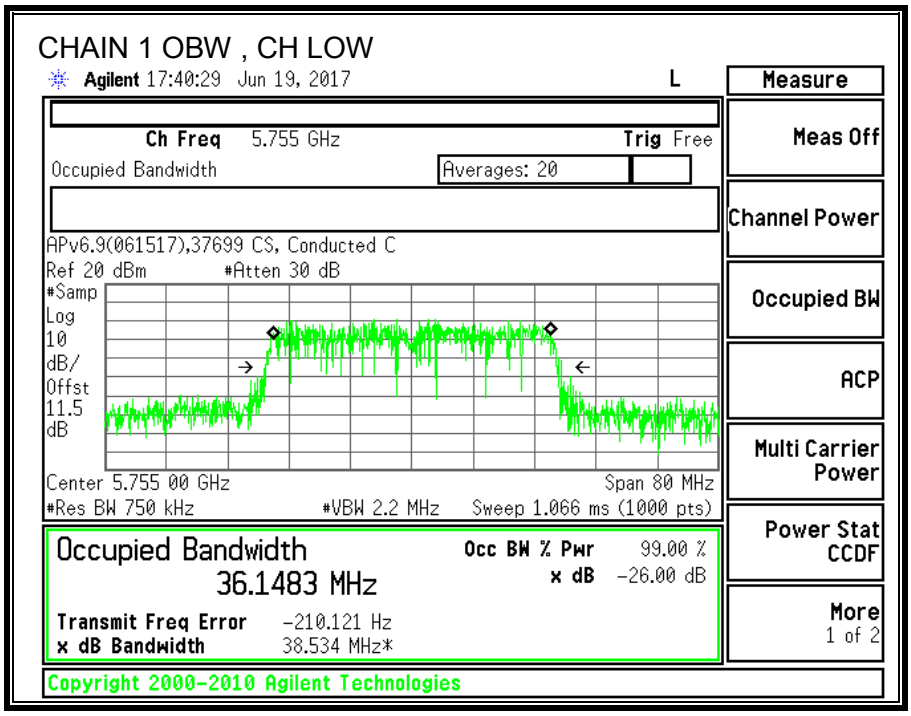
LIMITS

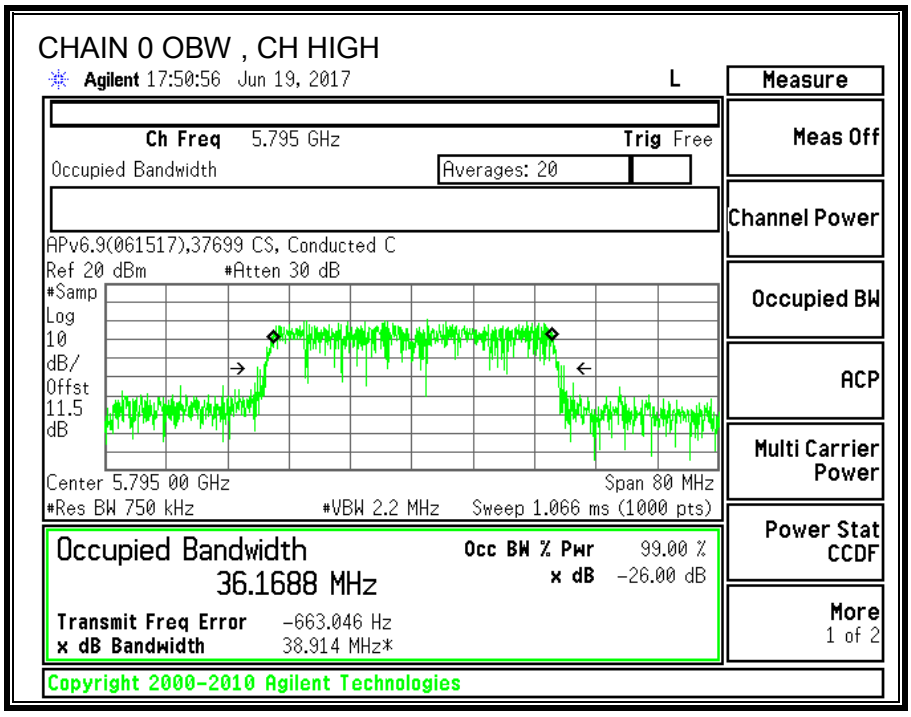
None; for reporting purposes only.

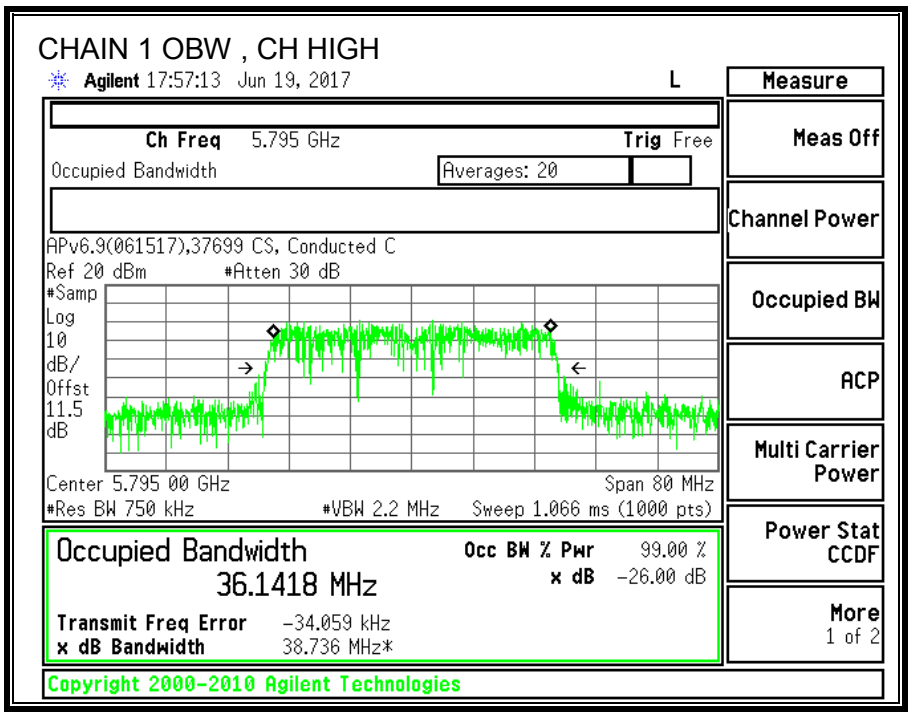
RESULTS

Channel	Frequency	99% BW CHAIN 0 (MHz)	99% BW CHAIN 1 (MHz)
Low	5755	36.1767	36.1483
High	5795	36.1688	36.1418









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)
4.40	4.50	4.45	7.46

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