

## FCC CFR47 PART 15 SUBPART E INDUSTRY CANADA RSS-210 ISSUE 8

**C2PC CERTIFICATION TEST REPORT** 

FOR

## 802.11a/g/n/ac WLAN + BLUETOOTH PCI-E CUSTOM COMBINATION CARD

MODEL NUMBER: BCM94360CS2

FCC ID: QDS-BRCM1072 IC: 4324A-BRCM1072

REPORT NUMBER: 13U14796-5, Revision F

ISSUE DATE: APRIL 23, 2013

Prepared for BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.

Prepared by UL CCS 47173 BENICIA STREET FREMONT, CA 94538, U.S.A. TEL: (510) 771-1000 FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

### **Revision History**

Rev.	Date	Revisions	Revised By
	03/18/13	Initial Issue	F. Ibrahim
Α	03/20/13	Revised sections 7.1.1, 9.2.18, 8.14.3, 8.16.3, 8.18.3, 8.20.3, 8.22.3, 8.24.3 and 9.2.18	F. Ibrahim
В	03/21/03	Revised sections 9.2.7, 9.2.9, 9.2.16, 9.2.18, 9.2.30, 9.2.31, 9.2.33, and 9.2.34	F. Ibrahim
С	03/27/13	Added AC80 data and power in the 5.2 GHz band	F. Ibrahim
D	03/27/13	Added the worst-case data rate for AC80 in section 5.5	F. Ibrahim
E	04/18/13	Added AC80 data in the 5.3 and 5.6 GHz UNII bands.	F. Ibrahim
F	04/23/13	Revised sections 5.3 and 8.36.3	F. Ibrahim

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# **1. ATTESTATION OF TEST RESULTS**

	APPLICABLE STANDARDS
DATE TESTED:	January 10 - March 12 and March 14-15, 2013
SERIAL NUMBER:	C8Y2521000NFC31EM & C8Y2521000FC31EK (RF) / C8Y2521000QFC31EK and C8Y3061002TFC31E0 (DFS Standard Client Mode AND DFS Client to Client Mode)
MODEL:	BCM94360CS2
EUT DESCRIPTION:	802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card
COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, U.S.A.

STANDARD	TEST RESULTS			
CFR 47 Part 15 Subpart E	Pass			
INDUSTRY CANADA RSS-210 Issue 8 Annex 9	Pass			
INDUSTRY CANADA RSS-GEN Issue 3	Pass			

UL CCS 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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 any government.

Approved & Released For UL CCS By:

FRANK IBRAHIM WISE PROJECT LEAD UL CCS

Tested By:

VIEN TRAN EMC ENGINEER UL CCS

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# 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 06-96, FCC KDB 789033, ANSI C63.10:2009, RSS-GEN Issue 3, and RSS-210 Issue 8.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

# 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:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 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 an 802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

# 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

AC80 mode has been added to UNII bands 5.3 and 5.6 GHz.

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## 5.3. MAXIMUM AVERAGE OUTPUT POWER

The transmitter has a maximum conducted average output power as follows:

#### 5.2 GHz BAND

Frequency Range	Mode	-	Power, Chain	Output	Output Power		
(MHz)		0 (dBm)	1 (dBm)	Power	(mW)		
				(dBm)			
5.2 GHz band, 1TX							
5180 - 5240	802.11a	16.17	N/A	16.17	41.40		
5190 - 5230	802.11n HT40	16.98	N/A	16.98	49.89		
5210	802.11n AC80	15.48	N/A	15.48	35.32		
5.2 GHz band, 2TX	5.2 GHz band, 2TX						
5180 - 5240	802.11n HT20 CDD	11.85	12.06	14.97	31.380		
5180 - 5240	802.11n HT20 STBC	13.55	13.59	16.58	45.502		
5190 - 5230	802.11n HT40 CDD	13.93	13.98	16.97	49.721		
5190 - 5230	802.11n AC40 BF	11.16	11.05	14.12	25.797		
5210	802.11n AC80 CDD	13.80	14.10	16.96	49.692		
5210	802.11n AC80 BF	11.04	11.06	14.06	25.470		

#### 5.3 GHz BAND

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Output Power (dBm)	Output Power (mW)		
5.3 GHz band, 1TX							
5260 - 5320	802.11a	20.16	N/A	20.16	103.75		
5270 - 5310	802.11n HT40	20.36	N/A	20.36	108.64		
5.3 GHz band, 2TX	5.3 GHz band, 2TX						
5260 - 5320	802.11n HT20 CDD	19.08	19.01	22.06	160.53		
5260 - 5320	802.11n HT20 STBC	20.43	20.36	23.41	219.05		
5270 - 5310	802.11n HT40 CDD	20.12	20.18	23.16	207.03		
5270 - 5310	802.11n AC40 BF	18.03	18.15	21.10	128.85		
5290	802.11n AC80 CDD	14.54	14.90	17.73	59.35		
5290	802.11n AC80 BF	14.12	15.01	17.60	57.52		

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### 5.6 GHz BAND

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX					
5500-5700	802.11a	20.12	N/A	20.12	102.80
5510-5670	802.11n HT40	20.25	N/A	20.25	105.93
5.6 GHz band, 2TX					
5500-5700	802.11n HT20 CDD	18.29	18.53	21.42	138.74
5500-5700	802.11n HT20 STBC	20.21	20.19	23.21	209.43
5510-5670	802.11n HT40 CDD	20.12	20.16	23.15	206.55
5510-5670	802.11n AC40 BF	17.78	17.67	20.74	118.46
5530	802.11n AC80 CDD	14.06	13.95	17.02	50.30
5530	802.11n AC80 BF	12.91	13.27	16.10	40.78

Frequency Range (MHz)	Mode	Power, Chain 0 (dBm)	Power, Chain 1 (dBm)	Output Power (dBm)	Output Power (mW)	
5.6 GHz band, 1TX (C	hannels overlapping UNII and D	)TS bands)				
5720	802.11a	20.04	N/A	20.04	100.93	
5710	802.11n HT40	20.31	N/A	20.31	107.40	
5690	802.11n AC80 20.02 N/A		N/A	20.02	100.46	
5.6 GHz band, 2TX (C	hannels overlapping UNII and D	)TS bands)				
5720	802.11n HT20 CDD	18.82	18.70	21.77	150.34	
5720	802.11n HT20 STBC	20.02	20.09	23.07	202.56	
5710	802.11n HT40 CDD	20.02	20.13	23.09	203.50	
5710	802.11n AC40 BF	20.02	20.13	23.09	203.50	
5690	802.11n AC80 CDD	20.01	20.56	23.30	213.99	
5690	802.11n AC80 BF	20.01	20.56	23.30	213.99	

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### Output power results of straddling channels using spectrum analyzer:

Frequency Range	Mode	Power, Chain	Power, Chain 1	Power, Chain 2	Output Power	Output Power
(MHz)		0 (dBm)	(dBm)	(dBm)	(dBm)	(mW)
5.6 GHz band, 1 <sup>-</sup>	TX (Channels overlapp	ing UNII and	d DTS bands)			
5720 (UNII portion)	802.11a 1TX	N/A	16.06	N/A	16.06	40.36
5720 (DTS portion)	802.11a 1TX	N/A	9.71	N/A	9.71	9.35
5720 (Whole signal)	802.11a 1TX	N/A	16.97	N/A	16.97	49.72
5710 (UNII portion)	802.11n HT40 1TX	N/A	16.99	N/A	16.99	50.00
5710 (DTS portion)	802.11n HT40 1TX	N/A	3.62	N/A	3.62	2.30
5710 (Whole signal)	802.11n HT40 1TX	N/A	17.19	N/A	17.19	52.30
5690 (UNII portion)	802.11ac VHT80 1TX	N/A	17.42	N/A	17.42	55.21
5690 (DTS portion)	802.11ac VHT80 1TX	N/A	3.55	N/A	3.55	2.26
5690 (Whole signal)	802.11ac VHT80 1TX	N/A	17.59	N/A	17.59	57.47
5.6 GHz band, 2 <sup>-</sup>	TX (Channels overlapp	ing UNII and	d DTS bands)			
5720 (UNII portion)	802.11n HT20 CDD 2TX	14.80	14.74	N/A	17.78	59.98
5720 (DTS portion)	802.11n HT20 CDD 2TX	9.05	9.08	N/A	12.08	16.13
5720 (Whole signal)	802.11n HT20 CDD 2TX	15.82	15.78	N/A	18.81	76.11
5720 (UNII portion)	802.11n HT20 STBC 2TX	16.82	16.92	N/A	19.88	97.29
5720 (DTS portion)	802.11n HT20 STBC 2TX	10.58	10.68	N/A	13.64	23.12
5720 (Whole signal)	802.11n HT20 STBC 2TX	17.75	17.85	N/A	20.81	120.41
5710 (UNII portion)	802.11n HT40 CDD 2TX	17.64	17.58	N/A	20.62	115.36
5710 (DTS portion)	802.11n HT40 CDD 2TX	7.21	7.17	N/A	10.20	10.47
5710 (Whole signal)	802.11n HT40 CDD 2TX	18.02	17.96	N/A	21.00	125.83
5710 (UNII portion)	802.11n HT40 BF 2TX	17.64	17.58	N/A	20.62	115.36
5710 (DTS portion)	802.11n HT40 BF 2TX	7.21	7.17	N/A	10.20	10.47
5710 (Whole signal)	802.11n HT40 BF 2TX	18.02	17.96	N/A	21.00	125.83
5690 (UNII portion)	802.11ac VHT80 CDD 2TX	16.11	16.83	N/A	19.50	89.03
5690 (DTS portion)	802.11ac VHT80 CDD 2TX	1.88	2.88	N/A	5.42	3.48
5690 (Whole signal)	802.11ac VHT80 CDD 2TX	16.27	17.00	N/A	19.66	92.51
5690 (UNII portion)	802.11ac VHT80 BF 2TX	16.11	16.83	N/A	19.50	89.03
5690 (DTS portion)	802.11ac VHT80 BF 2TX	1.88	2.88	N/A	5.42	3.48
5690 (Whole signal)	802.11ac VHT80 BF 2TX	16.27	17.00	N/A	19.66	92.51

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### List of test reduction and modes covering other modes:

### 5.2 GHz BAN

5150 - 5250 MHz Au	5150 - 5250 MHz Authorized Frequency Band (Antenna Port Testing)				
Frequency Range	Mode	Covered by			
(MHz)					
5.2 GHz band, 1TX					
5180 - 5240	802.11n HT20	802.11a Legacy			
5.2 GHz band, 2TX					
5180 - 5240	802.11a CDD	802.11n HT20 2TX CDD			
5180 - 5240	802.11a BF	802.11n AC20 2TX BF			
5180 - 5240	802.11n HT20 BF	802.11n HT20 2TX CDD			
5180 - 5240	802.11n AC20 BF	802.11n HT20 2TX CDD			
5190 - 5230	802.11n HT40 BF	802.11n AC40 2TX BF			

5150 - 5250 MHz Au	5150 - 5250 MHz Authorized Frequency Band (Radiated Testing)				
Frequency Range (MHz)	Mode	Covered by			
5.2 GHz band, 1TX	•				
5180 - 5240	802.11n HT20	802.11a Legacy			
5190 - 5230	802.11n HT40 (Harmonics)	802.11n HT40 2TX CDD			
5.2 GHz band, 2TX					
5180 - 5240	802.11a CDD	802.11n HT20 2TX CDD			
5180 - 5240	802.11a BF	802.11n AC20 2TX BF			
5180 - 5240	802.11n HT20 STBC MCS0	802.11n HT20 2TX CDD			
5180 - 5240	802.11n HT20 BF	802.11n HT20 2TX CDD			
5180 - 5240	802.11n AC20 BF	802.11n HT20 2TX CDD			
5190 - 5230	802.11n HT40 BF	802.11n AC40 2TX BF			

### 5.3 GHz BAND

5250 - 5350 MHz Authorized Frequency Band (Antenna Port Testing)				
Frequency Range	Mode	Covered By		
(MHz)				
5.3 GHz band, 1TX				
5260 - 5320	802.11n HT20 802.11a Legacy			
5.3 GHz band, 2TX				
5260 - 5320	802.11a CDD	802.11n HT20 2TX CDD		
5260 - 5320	802.11a BF	802.11n AC20 2TX BF		
5260 - 5320	802.11n HT20 BF	802.11n HT20 2TX CDD		
5260 - 5320	802.11n AC20 BF	802.11n HT20 2TX CDD		
5270 - 5310	802.11n HT40 BF	802.11n AC40 2TX BF		

5250 - 5350 MHz Au	5250 - 5350 MHz Authorized Frequency Band (Radiated Testing)						
Frequency Range (MHz)	Mode	Covered By					
5.3 GHz band, 1TX	5.3 GHz band, 1TX						
5260 - 5320	802.11n HT20	802.11a Legacy					
5270 - 5310	802.11n HT40 (Harmonics)	802.11n HT40 2TX CDD					
5.3 GHz band, 2TX							
5260 - 5320	802.11a CDD	802.11n HT20 2TX CDD					
5260 - 5320	802.11a BF	802.11n AC20 2TX BF					
5260 - 5320	802.11n HT20 STBC MCS0	802.11n HT20 2TX CDD					
5260 - 5320	802.11n HT20 BF	802.11n HT20 2TX CDD					
5260 - 5320	802.11n AC20 BF	802.11n HT20 2TX CDD					
5270 - 5310	802.11n HT40 BF	802.11n AC40 2TX BF					

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### 5.6 GHz BAND

5470 - 5725 MHz Au	5470 - 5725 MHz Authorized Frequency Band (Antenna Port Testing)					
Frequency Range (MHz)	Mode	Covered By				
5.6 GHz band, 1TX	-					
5500-5700	802.11n HT20	802.11a Legacy				
5720	802.11n HT20	802.11a Legacy				
5.6 GHz band, 2TX						
5500-5700	802.11a CDD	802.11n HT20 2TX CDD				
5500-5700	802.11a BF	802.11n AC20 2TX BF				
5500-5700	802.11n HT20 BF	802.11n HT20 2TX CDD				
5720	802.11n HT20 BF	802.11n HT20 2TX CDD				
5500-5700	802.11n AC20 BF	802.11n HT20 2TX CDD				
5720	802.11n AC20 BF	802.11n HT20 2TX CDD				
5510-5670	802.11n HT40 BF	802.11n AC40 2TX BF				
5710	802.11n HT40 BF	802.11n AC40 2TX BF				

5470 - 5725 MHz Au	uthorized Frequency Band (Radiate	d Testing)
Frequency Range (MHz)	Mode	Covered By
5.6 GHz band, 1TX		
5500-5700	802.11n HT20	802.11a Legacy
5720	802.11n HT20	802.11a Legacy
5510-5670	802.11n HT40	802.11n HT40 2TX CDD
5710	802.11n HT40	802.11n HT40 2TX CDD
5.6 GHz band, 2TX		
5500-5700	802.11a CDD	802.11n HT20 2TX CDD
5500-5700	802.11a BF	802.11n AC20 2TX BF
5500-5700	802.11n HT20 STBC MCS0	802.11n HT20 2TX CDD
5720	802.11n HT20 STBC MCS0	802.11n HT20 2TX CDD
5500-5700	802.11n HT20 BF	802.11n HT20 2TX CDD
5720	802.11n HT20 BF	802.11n HT20 2TX CDD
5500-5700	802.11n AC20 BF	802.11n HT20 2TX CDD
5720	802.11n AC20 BF	802.11n HT20 2TX CDD
5510-5670	802.11n HT40 BF	802.11n AC40 2TX BF
5710	802.11n HT40 BF	802.11n AC40 2TX BF

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# 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

No	Antennia Manufacturer	Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz,	Peak gain (5150- 5250MHz) @5200MHz	Peak gain (6250- 6360MHz) @6320MHz	Peak gain (6470-6725MHz)	Peak gain (5725- 5850MHz) @5785, 5805MHz	
	Amplemol/Public	WLANET Antonna	691-1548 WIF) 1	1 67	5.01		541	438	
	Anto(renol/ Pulse	802 Trabgn WLAH LAmens	601-1540 WF12	\$101	15 M -	2.57	5.89	129	19001
-	Amphendi Pulin	802 114hgv WLAVERT Avienti	\$31-1547 WIFT	4 8 J.	59¢	4.93	0.14	40	
2	Amphenol Film	NEAN Antoinna	\$1.1547 WE17	4.87	4.74	521	1	-	Hegi
2	Amphenol/Pulse	802 1 Magin WLANIOT Antegna	631-1547 B1	4.57					

### Notes:

- This table includes two sets of antennas, first set is identified by number (1) in the first column, and the second set is identified by number (2) in the first column.
- Red numbers in this table are the highest antenna gain used for SISO antenna port testing as worst-case scenario.
- Blue highlighted cells in this table are the antenna gains that yield the highest composite gain for 2TX modes, these numbers are used for 2TX antenna port testing as worst-case scenario.
- For radiated testing, the antennas with highest gains from first and second sets were selected as worst-case scenario.

## 5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.118.62. The test utility software used during testing was BCM Internal, rev. 6.30.RC118.62.

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## 5.6. WORST-CASE CONFIGURATION AND MODE

The EUT was tested as an external module installed in a test jig board connected to a host Laptop PC.

Worst-Case data rates, as provided by the client, were as follows:

For 5 GHz Bands: 802.11a: 6 Mb/s. 802.11n 20MHz: MCS0. 802.11n 40MHz: MCS0. 802.11n 80MHz: MCS0.

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

For Radiated Band Edge measurements preliminary testing showed that the worst case was vertical polarization, so final measurements were performed with vertical polarization only.

For all modes with single chain, chain 0 (connector J0, Main port) was selected per the software provided by the client. Based on the client a preliminary investigation was performed on the two chains and chain 0 was found to be worst-case.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List						
Description	Manufacturer	Model	Serial Number	FCC ID		
Laptop	HP	EliteBook 2730p	2CE848852D	DoC		
Laptop	Lenovo	G560	CBU4473193	DoC		
Laptop	Apple	Macbook Pro	C02H124BDV10	DoC		
AC Adapter	HP	PPP09L	592C40CLLUTBUY	DoC		
AC Adapter	Lenovo	ADP-65KH B	11S36001646ZZ1001FKY6	DoC		
AC Adapter	Apple	A1343	C04207625HVDJ92BD	DoC		
Adapter Board	Catalyst	MINI2EXP	N/A	N/A		
Adapter Board	Catalyst	MINI2EXP	N/A	N/A		
Adapter Board	Broadcom	BCM94331CSMFG	1458937	N/A		
Adapter Board	Broadcom	BCM94331CSMFG	1504043	N/A		

### I/O CABLES

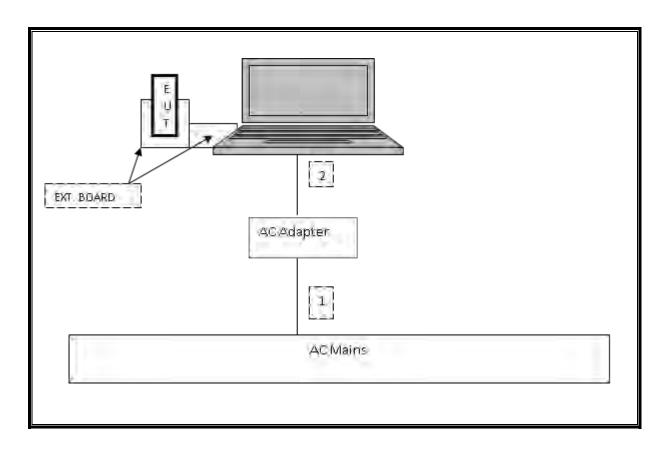
	I/O Cable List							
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks		
1	AC	2	US 115V	Un-Shielded	1.0m	NA		
2	DC	2	DC	Un-Shielded	1.8m	Ferrite at laptop's end		

### TEST SETUP

The EUT is attached to a jig board which is installed in the PCMCI slot of a host laptop computer during the tests. Test software exercised the radio card.

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### SETUP DIAGRAM FOR TESTS



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# 6. TEST AND MEASUREMENT EQUIPMENT

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

	Test Equip	ment List			
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/13/11	12/13/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	05/11/11	05/11/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/13/12	07/06/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/11	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/11	12/13/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	11/12/12	11/12/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00946	11/12/12	11/12/13
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	06/14/12	06/14/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C00885	08/14/12	08/14/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C01016	01/16/13	01/16/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	08/02/11	08/02/13
LISN, 30 MHz	FCC	50/250-25-2	N02396	08/08/12	08/08/13
Reject Filter, 5.15-5.35 GHz	Micro-Tronics	BRC13190	N02680	CNR	CNR
Reject Filter, 5.47-5.725 GHz	Micro-Tronics	BRC13191	N02678	CNR	CNR
Reject Filter, 5.725-5.825 GHz	Micro-Tronics	BRC13192	N02676	CNR	CNR

# 7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

### LIMITS

None; for reporting purposes only.

### PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

Mode	ON Time	Period	Duty Cycle	Duty	Duty Cycle	1/B			
	В		x	Cycle	<b>Correction Factor</b>	Minimum VBW			
	(msec)	(msec)	(linear)	(%)	(dB)	(kHz)			
5GHz Band									
802.11a	2.07	2.09	0.993	99.3%	0.00	0.010			
802.11n HT20 CDD	1.93	1.95	0.989	98.9%	0.00	0.010			
802.11n HT20 STBC	1.93	1.95	0.991	99.1%	0.00	0.010			
802.11n HT40 SISO	0.95	1.00	0.950	95.0%	0.22	1.000			
802.11n HT40 CDD	0.95	1.00	0.950	95.0%	0.22	1.000			
802.11n HT40 STBC	0.95	1.00	0.951	95.1%	0.22	1.000			
802.11n AC80 SISO	0.46	0.49	0.946	94.6%	0.24	2.040			
802.11n AC80 CDD	0.46	0.48	0.962	96.2%	0.17	2.076			

## 7.1.1. ON TIME AND DUTY CYCLE RESULTS

## 7.1.2. MEASUREMENT METHOD FOR POWER AND PPSD

For output power measurement, KDB 789033 Method PM as described in section C) f) was used.

For PSD measurement, KDB 789033 Method SA-1 was used when Duty Cycle is greater than or equal to 98%.

For PSD measurement, KDB 789033 Method SA-2 was used when Duty Cycle is less than 98%.

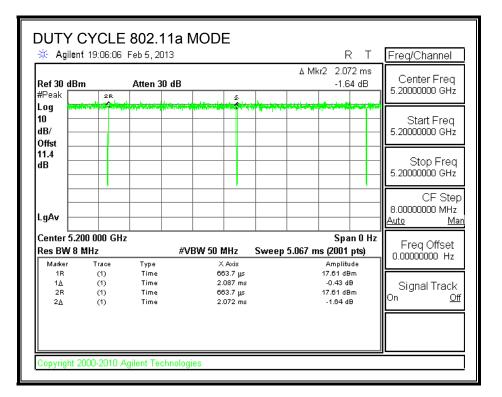
### 7.1.3. MEASUREMENT METHOD FOR AVG SPURIOUS EMISSION ABOVE 1 GHz

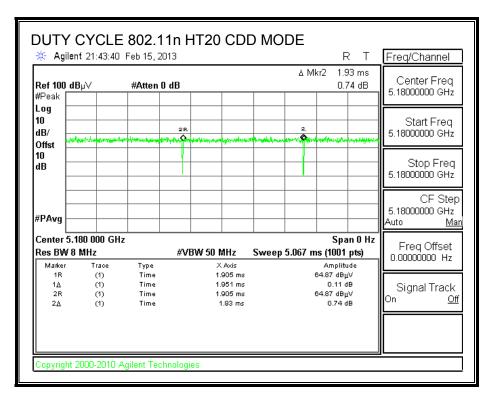
KDB 789033 Method VB with Power RMS Averaging is used.

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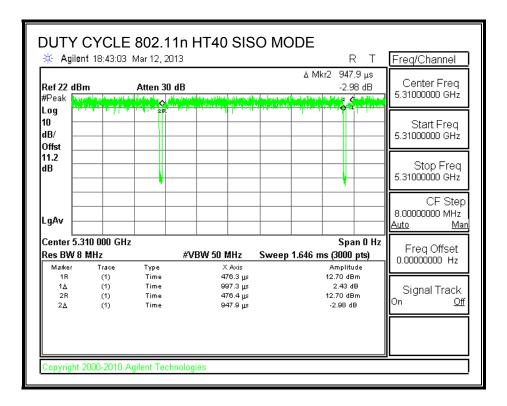
## 7.1.4. DUTY CYCLE PLOTS

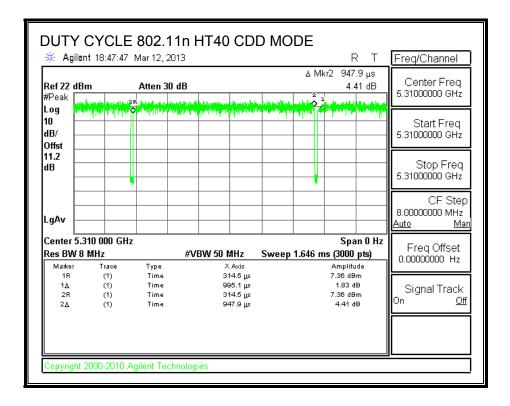
### <u>5 GHz</u>

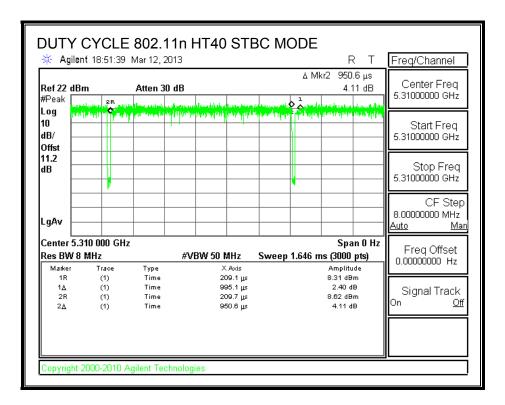




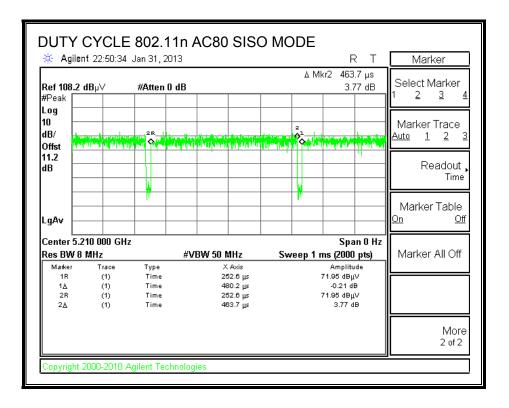
-		Feb 5, 2013				Δ Mk		?Т 33 ms	Freq/Cha	
Ref 20 dBi #Peak		Atten 20 d		hanish hani di			1.	12 dB	Center 5.2000000	
Log 10			28						Start	Frea
dB/ Offst									5.2000000	
11.2 dB										Freq
Ľ									5.2000000	
LgAv									8.0000000	
Center 5.2	00 000 GH	z					Spa	in O Hz	<u>Auto</u>	<u>Mar</u>
Res BW 8	MHz		#VBW 50 N	MHz S	Sweep	5.067 m			Freq C 0.0000000	
Marker 1B	Trace (1)	Type Time		Axis 029 ms			Amplite 16.86 dB			
14	(1)	Time		.029 ms .951 ms			-1.14 d		Signal	Trool
2R	(1)	Time	2.	.029 ms			16.86 dE	9m 🛛	On	Off
2∆	(1)	Time	1.	.933 ms			1.12 c	18	011	<u>01</u>

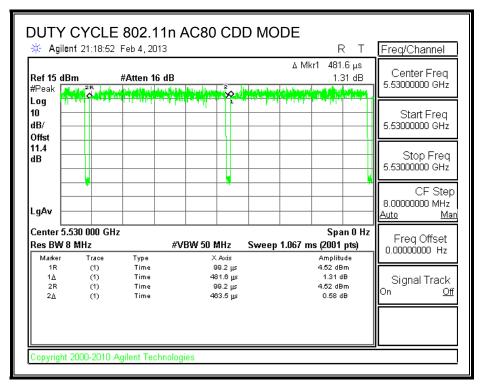






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# 8. ANTENNA PORT TEST RESULTS

## 8.1. 802.11a LEGACY 1TX MODE, 5.2 GHz BAND

## 8.1.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

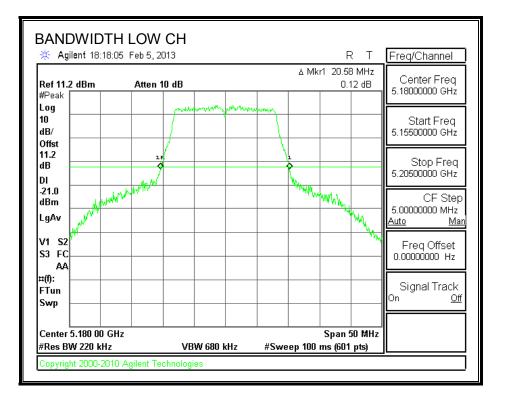
#### **RESULTS**

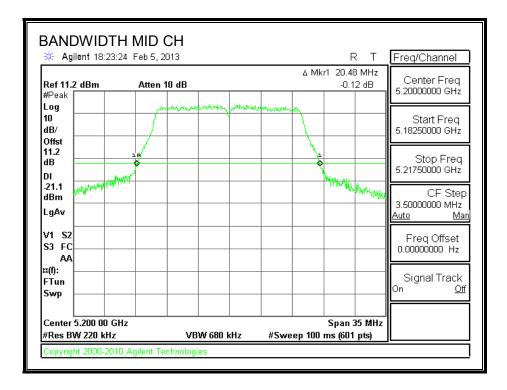
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5180	20.58
Mid	5200	20.48
High	5240	20.42

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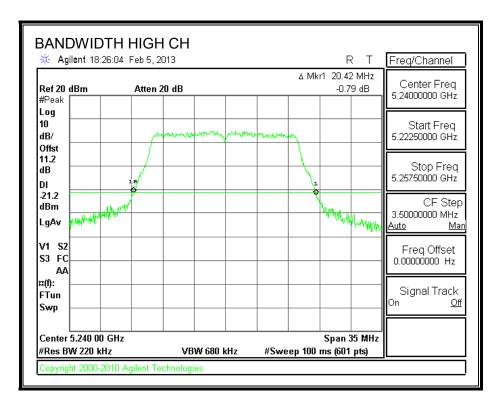
#### 26 dB BANDWIDTH





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### 8.1.2. 99% BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

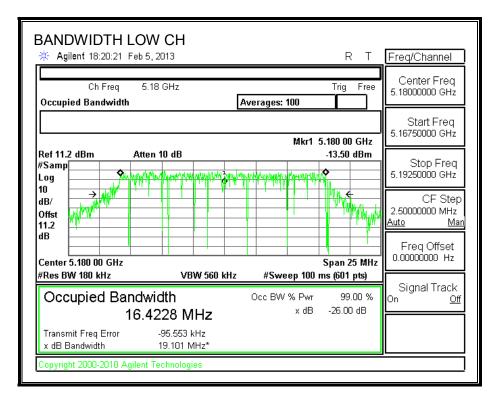
### <u>RESULTS</u>

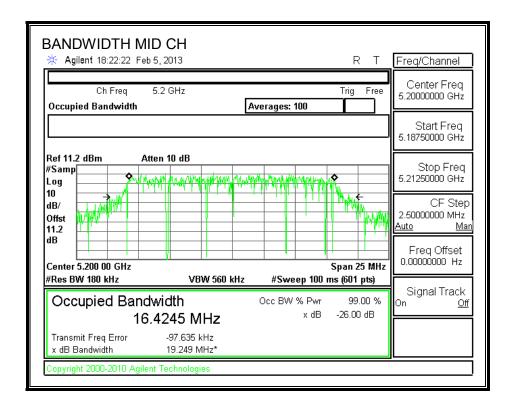
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5180	16.4228
Mid	5200	16.4245
High	5240	16.4159

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### 99% BANDWIDTH





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BANDWIDTH HIGH CH	RТ	Freq/Channel
Ch Freq 5.24 GHz Tr Occupied Bandwidth Averages: 100	ig Free	Center Freq 5.24000000 GHz
		Start Freq 5.22750000 GHz
Ref 20 dBm         Atten 20 dB           #Samp		Stop Freq 5.25250000 GHz
dB/ → m/ Offst 11.2	A <del>C</del>	CF Step 2.5000000 MHz <u>Auto Man</u>
dB Center 5.240 00 GHz Spa #Res BW 180 kHz VBW 560 kHz #Sweep 100 ms (6	n 25 MHz	Freq Offset 0.00000000 Hz
	99.00 %	Signal Track On <u>Off</u>
Transmit Freq Error -97.625 kHz x dB Bandwidth 19.150 MHz*		
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## 8.1.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5180	20.58	16.4228	5.93
Mid	5200	20.48	16.4245	5.93
High	5240	20.42	16.4159	5.93

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5180	17.00	22.15	16.22	16.22	4.00	10.00	4.00
Mid	5200	17.00	22.15	16.22	16.22	4.00	10.00	4.00
High	5240	17.00	22.15	16.22	16.22	4.00	10.00	4.00

### Duty Cycle CF (dB) 0.00

### **Output Power Results**

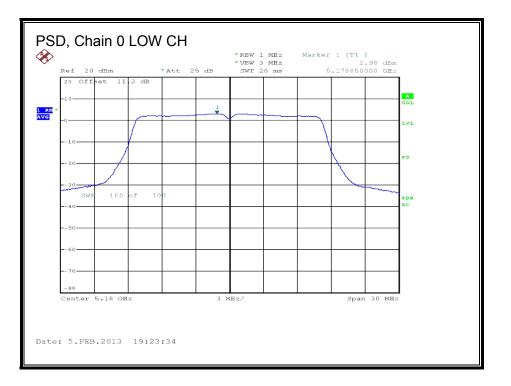
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	16.13	16.13	16.22	-0.09
Mid	5200	16.17	16.17	16.22	-0.05
High	5240	16.15	16.15	16.22	-0.07

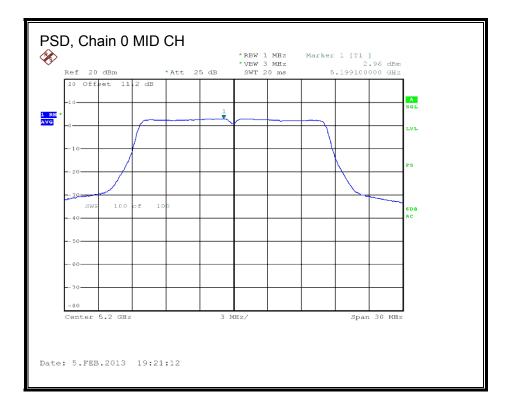
#### **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	2.98	2.98	4.00	-1.02
Mid	5200	2.96	2.96	4.00	-1.04
High	5240	2.75	2.75	4.00	-1.25

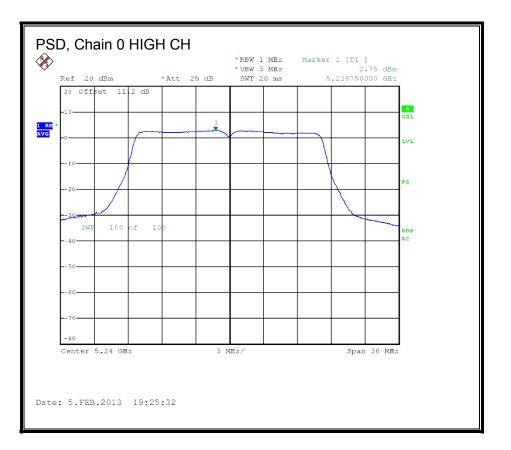
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### PSD, Chain 0





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#### 802.11n HT20 CDD 2TX MODE, 5.2 GHz BAND 8.2.

# 8.2.1. 26 dB BANDWIDTH

## LIMITS

None; for reporting purposes only.

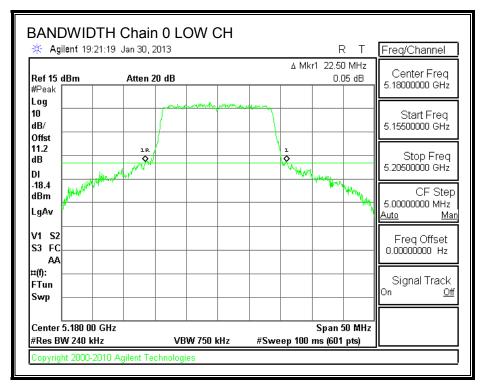
## **RESULTS**

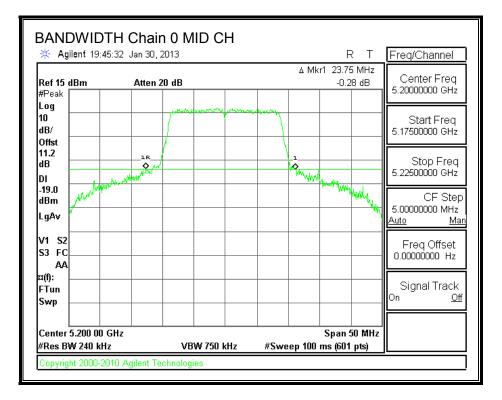
UL CCS

Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5180	22.50	30.67
Mid	5200	23.75	29.17
High	5240	20.67	22.17

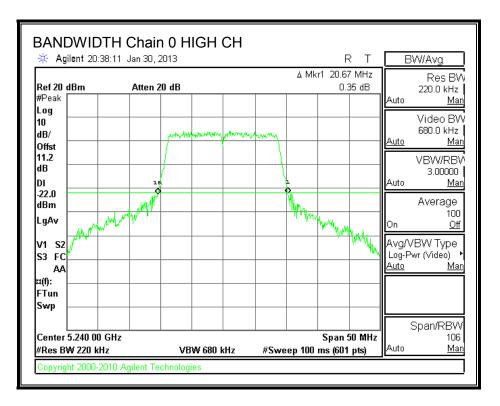
FORM NO: CCSUP4701H 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

#### 26 dB BANDWIDTH, Chain 0

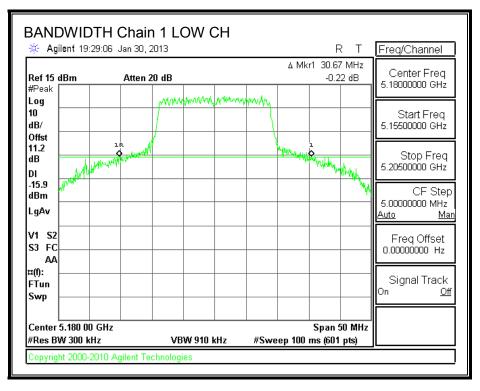




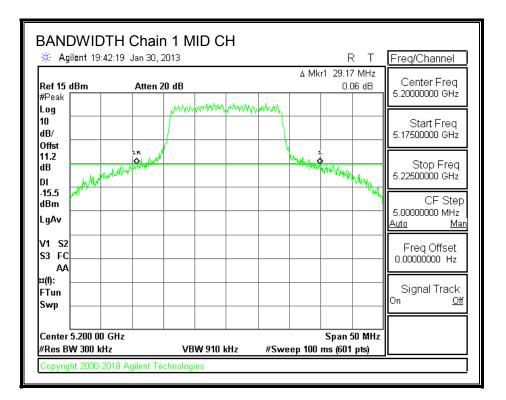
Page 39 of 516 UL CCS 47173 BENICIA STREET, FREMONT, CA 94538, USA This report shall not be reproduced except in full, without the written approval of UL CCS.

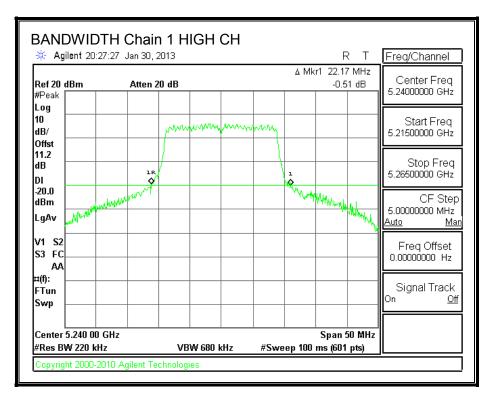


#### 26 dB BANDWIDTH, Chain 1



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## 8.2.2. 99% BANDWIDTH

## LIMITS

None; for reporting purposes only.

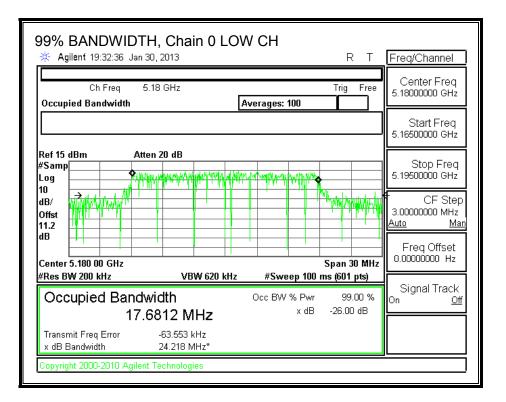
#### <u>RESULTS</u>

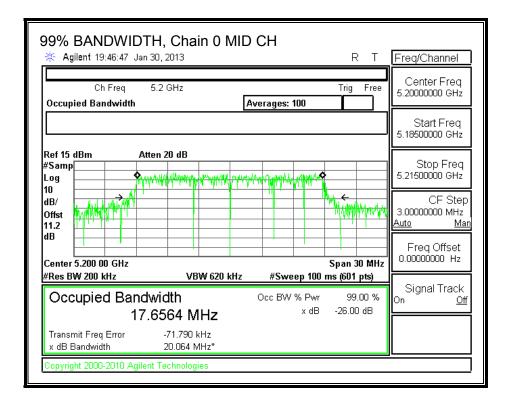
Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5180	17.6812	17.6788
Mid	5200	17.6564	17.6547
High	5240	17.6403	17.6380

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## 99% BANDWIDTH, Chain 0

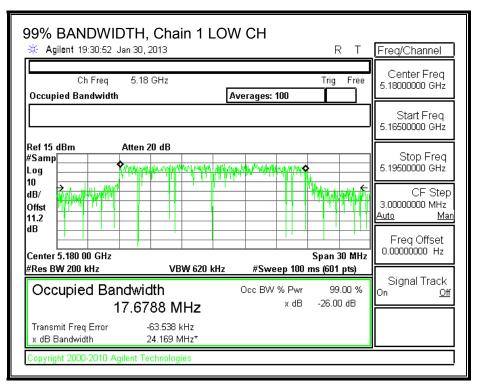




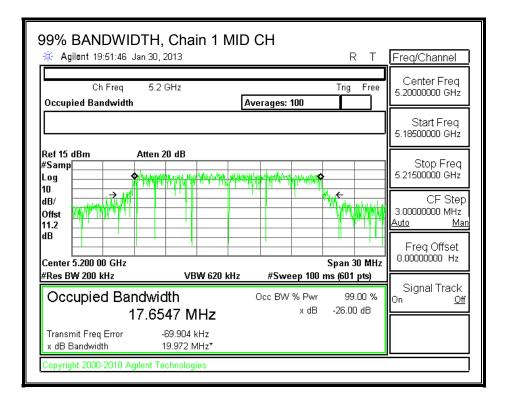
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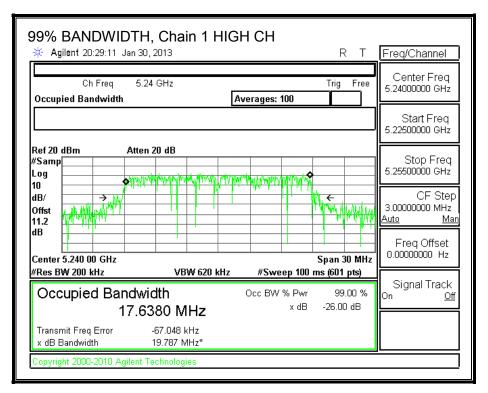
99% BANDWIDTH, C		НСН	RТ	Freq/Channel
Ch Freq 5.24 GH Occupied Bandwidth	·	verages: 100	Trig Free	Center Freq 5.24000000 GHz
				Start Freq 5.22500000 GHz
Ref 20 dBm Atten 20 d #Samp Log 10	an and the state of the			Stop Freq 5.25500000 GHz
dB/ Offst 11.2 dB				CF Step 3.00000000 MHz <u>Auto Man</u>
Center 5.240 00 GHz #Res BW 200 kHz	VBW 620 kHz	#Sweep 100	Span 30 MHz ms (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwidth 17.6403		Occ BW % Pwr x dB		Signal Track On <u>Off</u>
x dB Bandwidth 19.6	144 kHz 549 MHz*			
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#### 99% BANDWIDTH, Chain 1



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# 8.2.3. OUTPUT POWER AND PSD

## LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the two chains are considered uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	5.84

For PSD, the two chains are considered correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	8.85

## **OUTPUT POWER RESULTS**

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5180	22.50	17.6788	5.84
Mid	5200	23.75	17.6547	5.84
High	5240	20.67	17.6380	5.84

#### Limits

Channel	Frequency	FCC	IC	Max	Power
		Power	EIRP	IC	Limit
		Limit	Limit	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5180	17.00	22.47	16.63	16.63
Mid	5200	17.00	22.47	16.63	16.63
High	5240	17.00	22.46	16.62	16.62

Duty Cycle CF (dB) 0.00

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	11.59	11.68	14.65	16.63	-1.99
Mid	5200	11.85	12.06	14.97	16.63	-1.66
High	5240	11.81	12.01	14.92	16.62	-1.70

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#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5180	22.50	17.6788	8.85
Mid	5200	23.75	17.6547	8.85
High	5240	20.67	17.6380	8.85

## Limits

Channel	Frequency	FCC	IC	PSD
		PPSD	eirp	Limit
		Limit	PSD	
			Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
	(11112)		(abiii)	(abiii)
Low	5180	1.15	10.00	1.15
Low Mid		• •	· ,	. ,

Duty Cycle CF (dB) 0.00

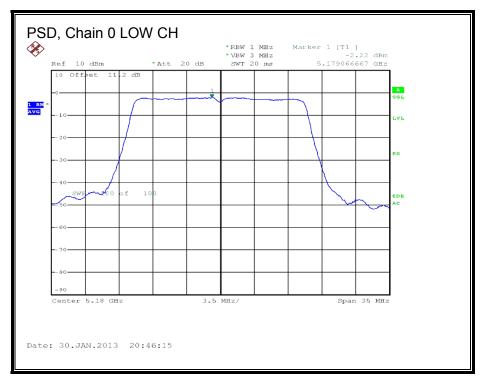
#### **PPSD Results**

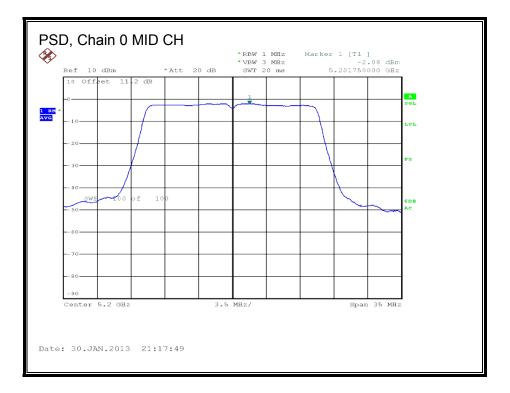
Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	-2.20	-1.96	0.93	1.15	-0.22
Mid	5200	-2.08	-1.77	1.09	1.15	-0.06
High	5240	-2.09	-1.87	1.03	1.15	-0.12

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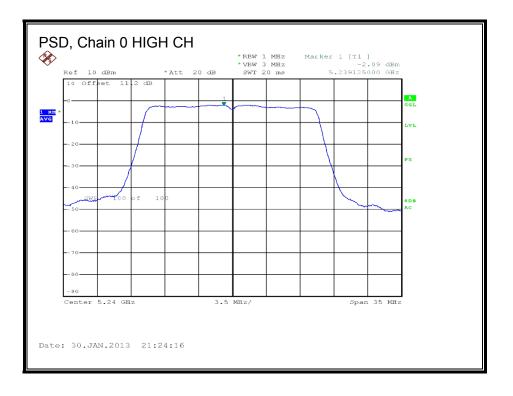
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#### PSD, Chain 0

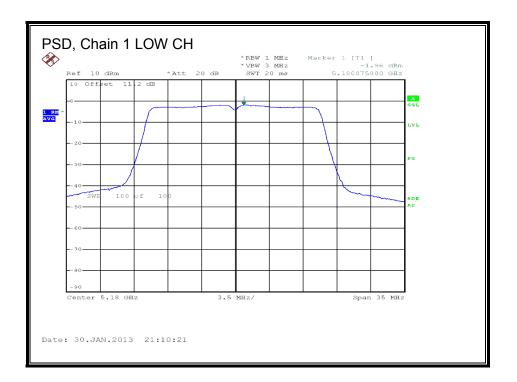




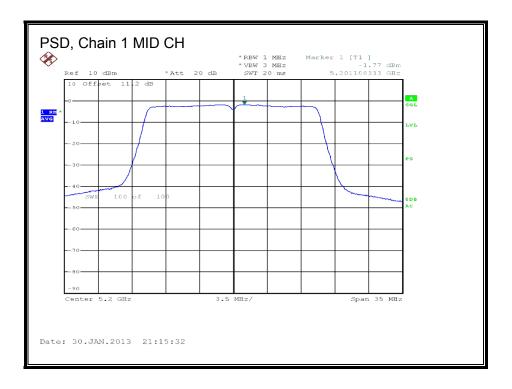
Page 49 of 516 UL CCS FORM NO: CCSUP4701H 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

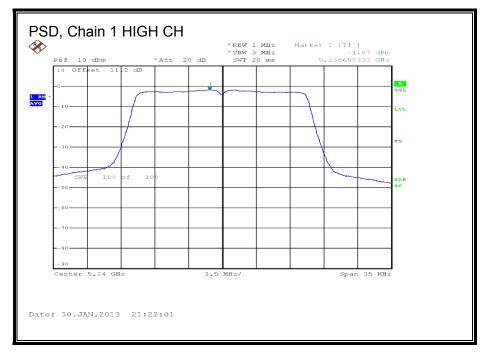


#### PSD, Chain 1



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# 8.3. 802.11n HT20 STBC 2TX MODE, 5.2 GHz BAND

# 8.3.1. 26 dB BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

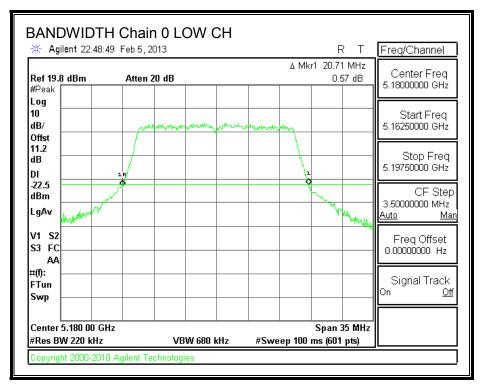
## **RESULTS**

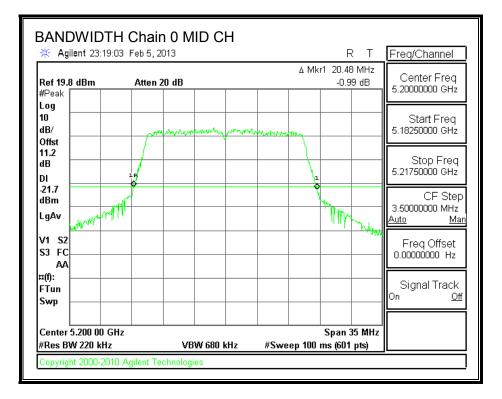
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5180	20.71	20.65
Mid	5200	20.48	20.59
High	5240	20.65	20.65

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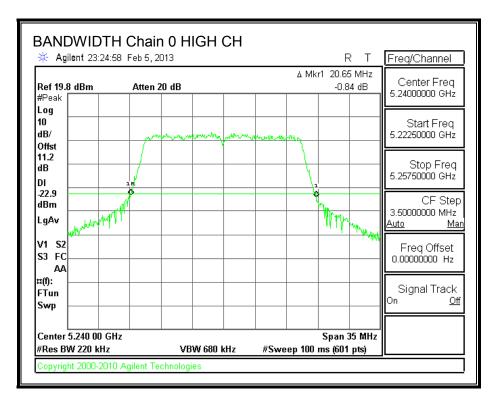
#### 26 dB BANDWIDTH, Chain 0



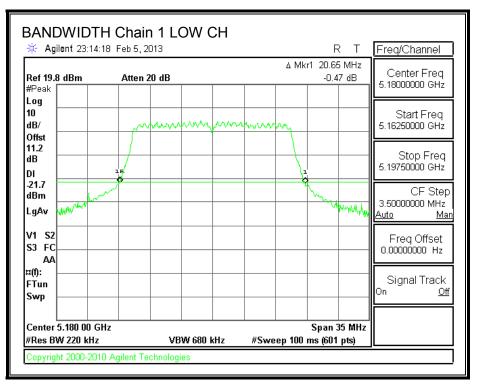


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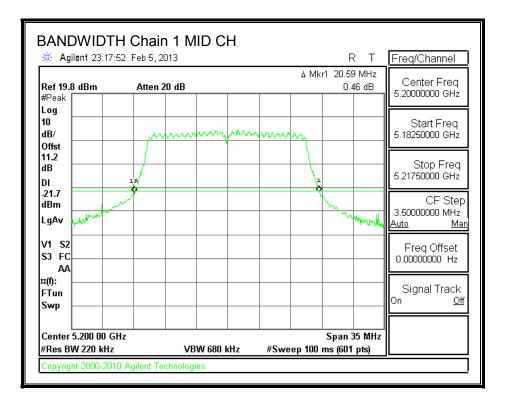
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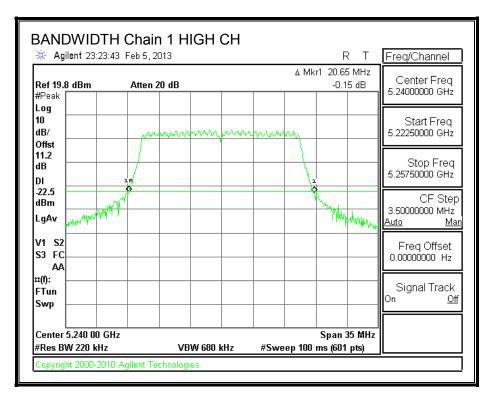


#### 26 dB BANDWIDTH, Chain 1



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## 8.3.2. 99% BANDWIDTH

## LIMITS

None; for reporting purposes only.

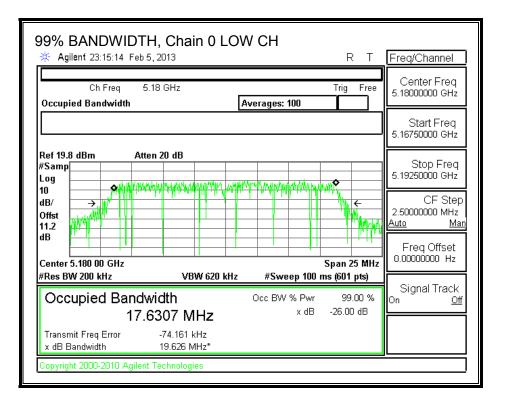
#### <u>RESULTS</u>

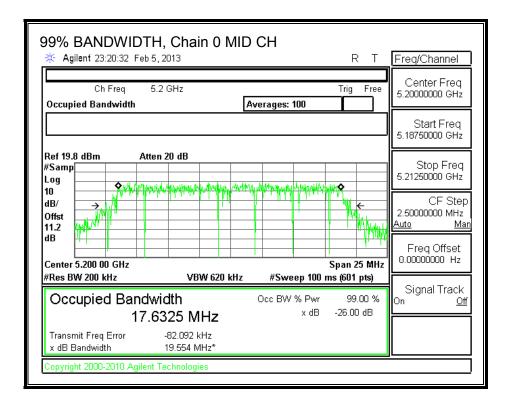
Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5180	17.6307	17.6403	
Mid	5200	17.6325	17.6274	
High	5240	17.6466	17.6631	

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## 99% BANDWIDTH, Chain 0

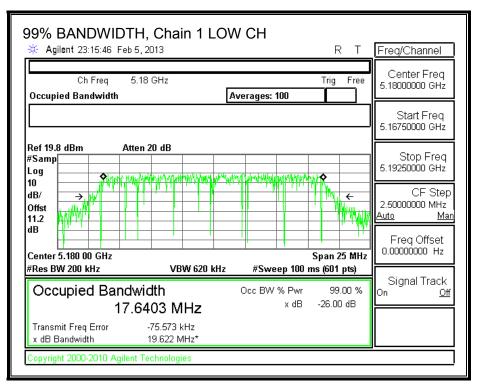




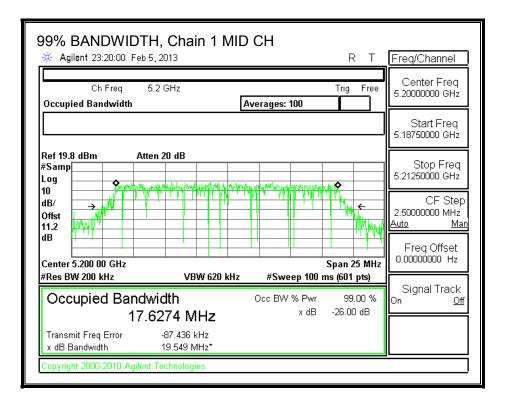
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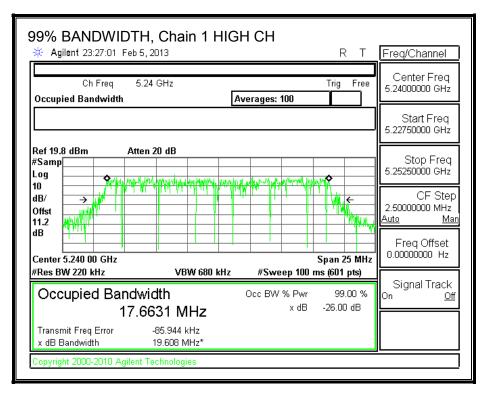
99% BANDWIDTH, (		GH CH	RТ	Freq/Channel
Ch Freq 5.24 G Occupied Bandwidth	θHz	Averages: 100	Trig Free	Center Freq 5.24000000 GHz
				Start Freq 5.22750000 GHz
Ref 19.8 dBm Atten 20 #Samp Log 10		Manda Maria		Stop Freq 5.25250000 GHz
$\begin{array}{c c} dB \\ \hline dB \\ \hline Offst \\ 11.2 \\ dB \\ \hline \end{array}$			• • • • • • • • • • • • • • • • • • •	CF Step 2.50000000 MHz <u>Auto Man</u>
Center 5.240 00 GHz #Res BW 220 kHz	VBW 680 kHz	#Sweep 100	Span 25 MHz ms (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwid 17.646	th 66 MHz	Occ BW % Pwr x dB		Signal Track <sup>On <u>Off</u></sup>
x dB Bandwidth 19	6.895 kHz 9.600 MHz*			
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#### 99% BANDWIDTH, Chain 1



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# 8.3.3. OUTPUT POWER AND PSD

## LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	5.84

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## **OUTPUT POWER RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5180	20.65	17.6307	5.84
Mid	5200	20.48	17.6274	5.84
High	5240	20.65	17.6466	5.84

#### Limits

Channel	Frequency	FCC Power Limit	IC EIRP Limit	Max IC Power	Power Limit	FCC PPSD Limit	IC eirp PSD Limit	PSD Limit
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5180	17.00	22.46	16.62	16.62	4.00	10.00	4.00
Mid	5200	17.00	22.46	16.62	16.62	4.00	10.00	4.00
High	5240	17.00	22.47	16.63	16.63	4.00	10.00	4.00

#### Duty Cycle CF (dB) 0.00

#### **Output Power Results**

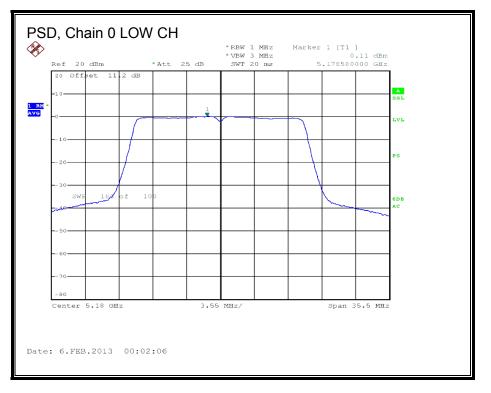
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	13.58	13.52	16.56	16.62	-0.06
Mid	5200	13.52	13.60	16.57	16.62	-0.05
High	5240	13.55	13.59	16.58	16.63	-0.05

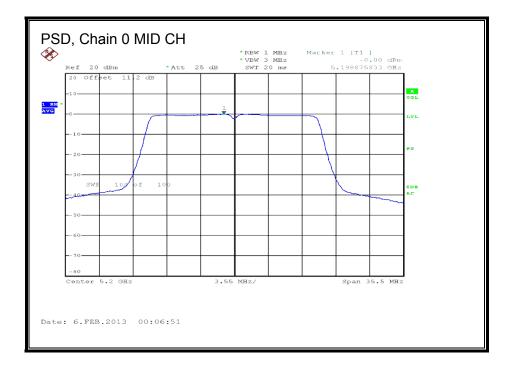
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5180	0.11	0.21	3.17	4.00	-0.83
Mid	5200	0.00	0.08	3.05	4.00	-0.95
High	5240	-0.46	0.07	2.82	4.00	-1.18

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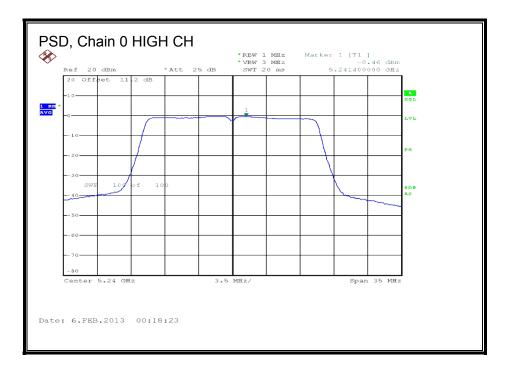
#### PSD, Chain 0



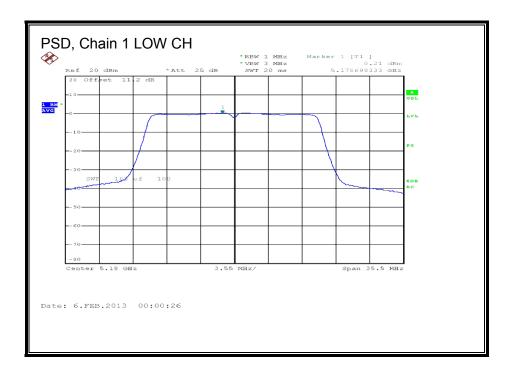


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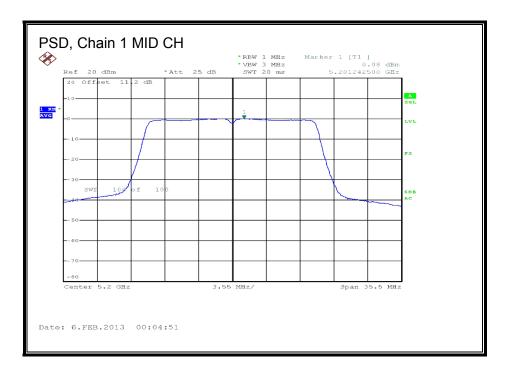


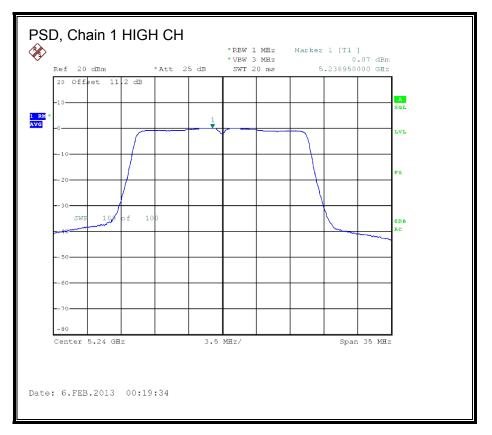
#### PSD, Chain 1



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# 8.4. 802.11n HT40 1TX MODE, 5.2 GHz BAND

# 8.4.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

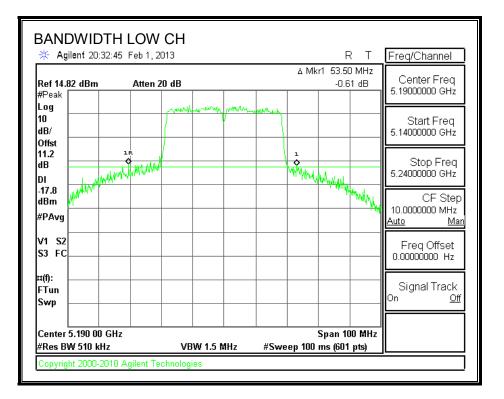
## **RESULTS**

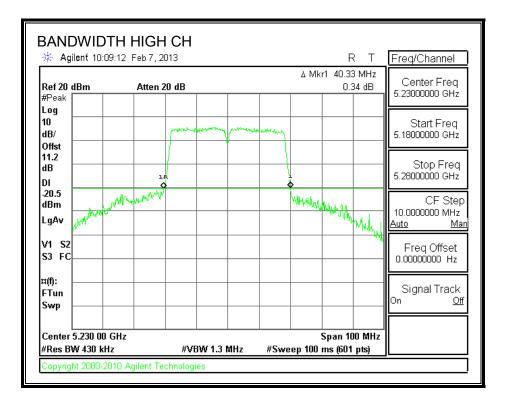
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5190	53.50
High	5230	40.33

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#### 26 dB BANDWIDTH





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## 8.4.2. 99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

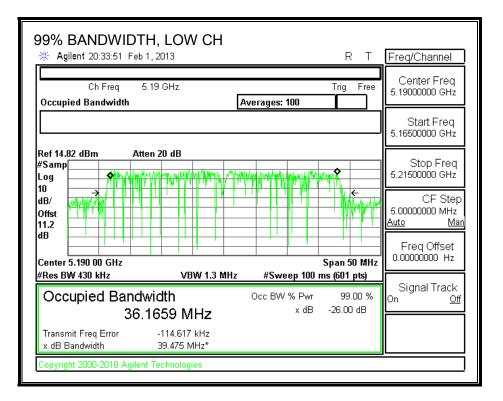
#### <u>RESULTS</u>

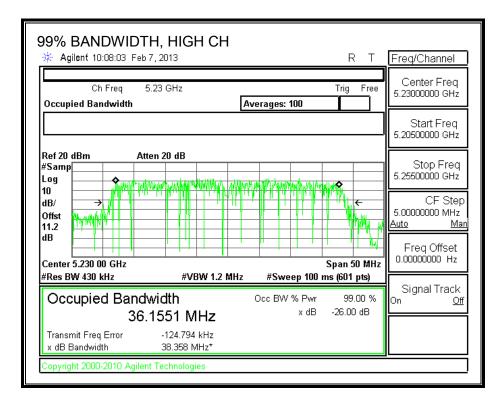
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5190	36.1659
High	5230	36.1551

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#### 99% BANDWIDTH





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# 8.4.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5190	53.50	20 4050	E 02
LOW	5190	55.50	36.1659	5.93

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5190	17.00	23.00	17.07	17.00	4.00	10.00	4.00
High	5230	17.00	23.00	17.07	17.00	4.00	10.00	4.00

Duty Cycle CF (dB) 0.22

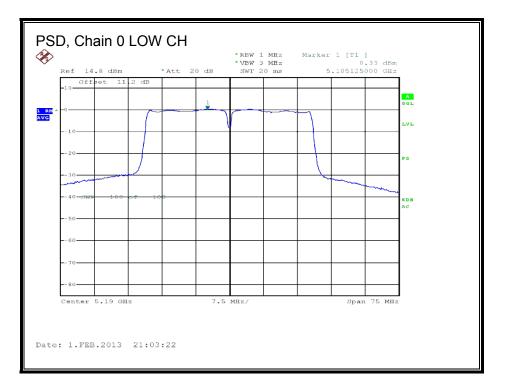
#### **Output Power Results**

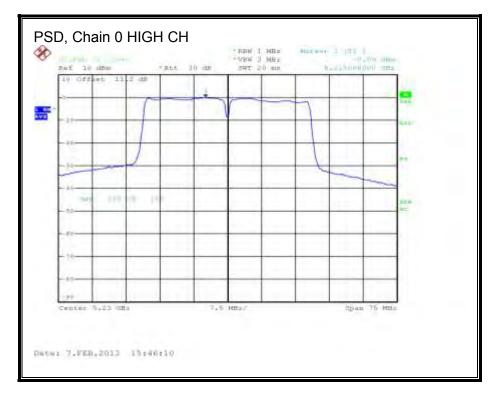
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
		10.00			
Low	5190	16.98	16.98	17.00	-0.02

#### **PSD Results**

Channel	Frequency	Meas	Total Corr'd	PSD Limit	PSD Margin
	(MHz)	PSD (dBm)	PSD (dBm)	(dBm)	(dB)
Low	5190	0.33	0.55	4.00	-3.45
High	5230	-0.09	0.13	4.00	-3.87

## <u>PSD, Chain 0</u>





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# 8.5. 802.11n HT40 CDD 2TX MODE, 5.2 GHz BAND

# 8.5.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

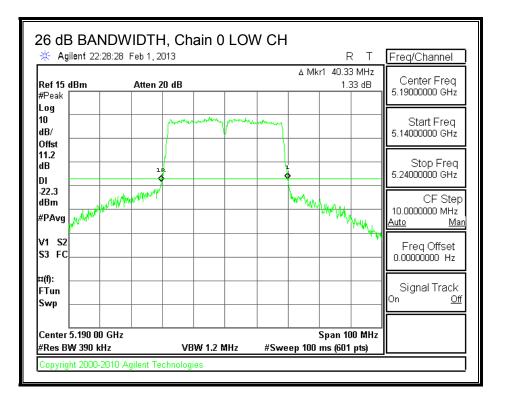
## **RESULTS**

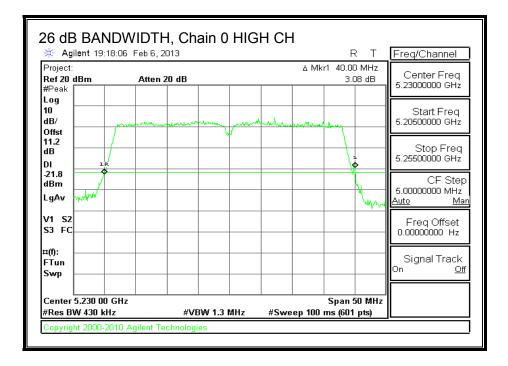
Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5190	40.33	39.83	
High	5230	40.00	39.50	

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#### 26 dB BANDWIDTH, Chain 0

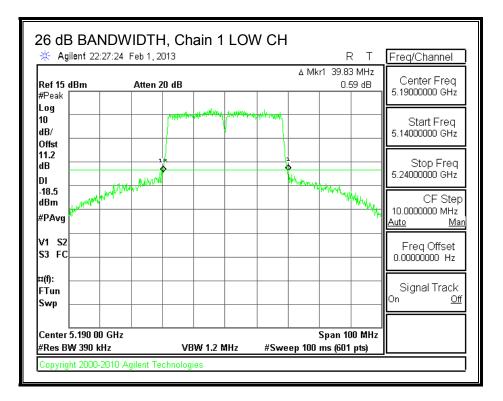


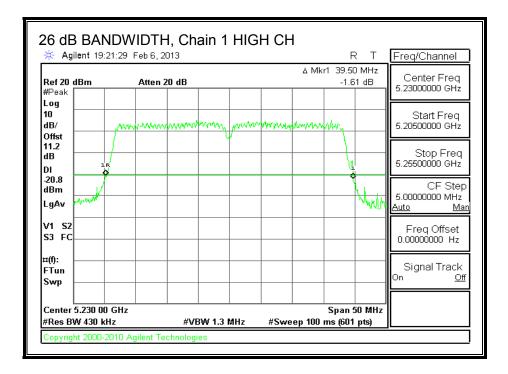


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#### 26 dB BANDWIDTH, Chain 1





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# 8.5.2. 99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

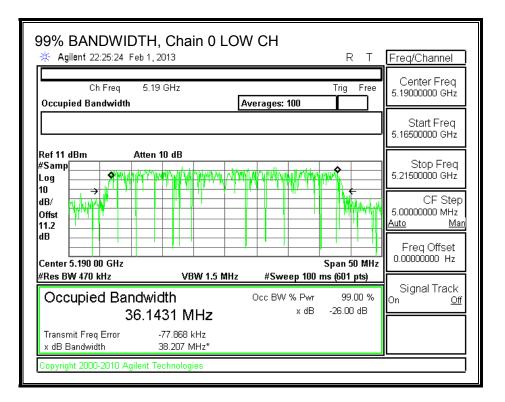
#### <u>RESULTS</u>

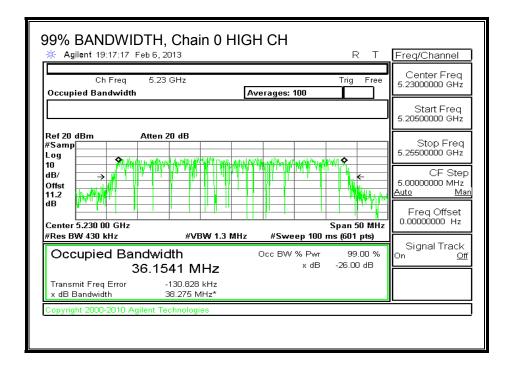
Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5190	36.1431	36.1269	
High	5230	36.1541	36.1294	

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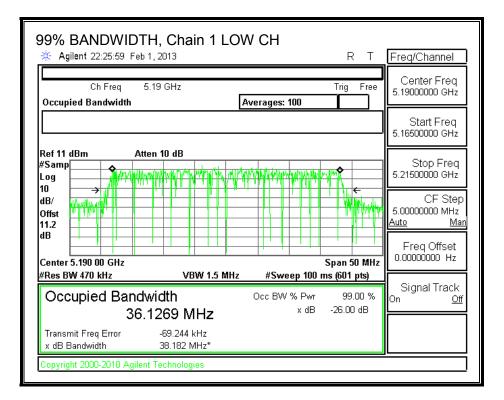
## 99% BANDWIDTH, Chain 0

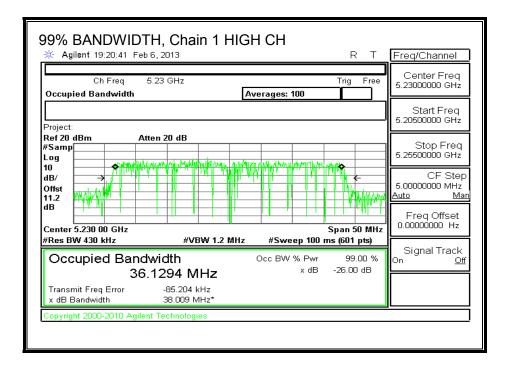




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#### 99% BANDWIDTH, Chain 1





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# 8.5.3. OUTPUT POWER AND PSD

## LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
5.93	5.75	5.84	

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	8.85

## **RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min Uncorrelated		Correlated
		26 dB	99%	Directional	Directional
		BW	BW	Gain	Gain
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5190	39.83	36.1269	5.84	8.85
High	5230	39.50	36.1294	5.84	8.85

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5190	17.00	23.00	17.16	17.00	1.15	10.00	1.15
High	5230	17.00	23.00	17.16	17.00	1.15	10.00	1.15

Duty Cycle CF (dB)	0.22	
--------------------	------	--

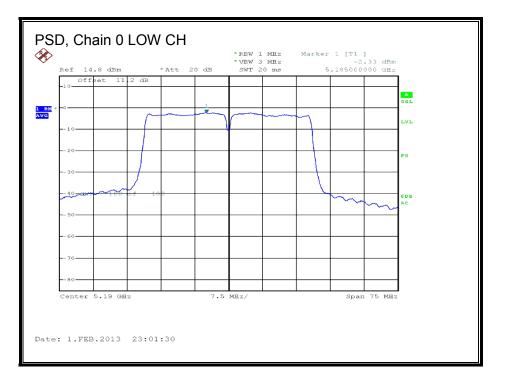
#### **Output Power Results**

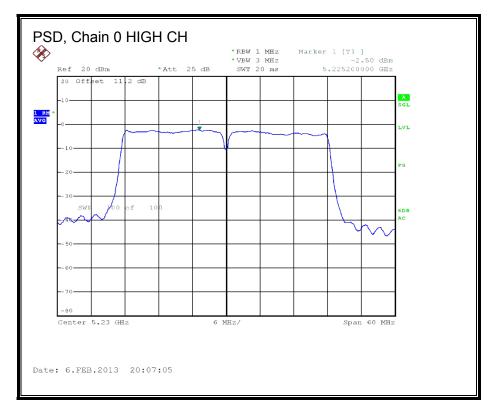
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5190	13.93	13.98	16.97	17.00	-0.03
High	5230	13.91	13.95	16.94	17.00	-0.06

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(8411-)		(al Dura)	(dDma)	(dDma)	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5190	-2.33	( <b>авт)</b> -2.49	0.82	( <b>авт)</b> 1.15	-0.33

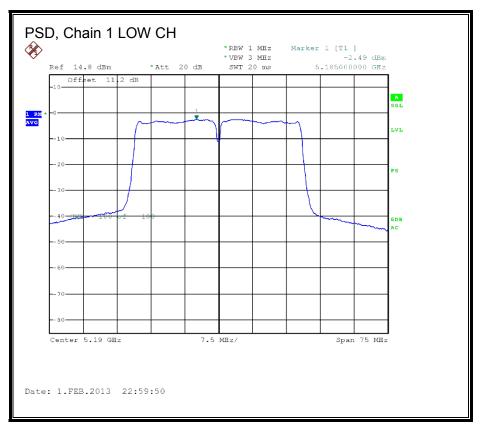
# PSD, Chain 0

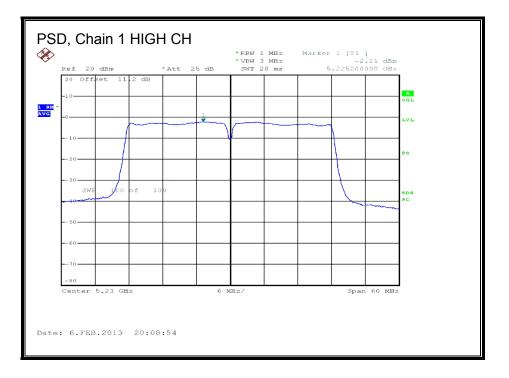




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#### <u>PSD, Chain 1</u>





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# 8.6. 802.11n AC40 BF 2TX MODE, 5.2 GHz BAND

# 8.6.1. 26 dB BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

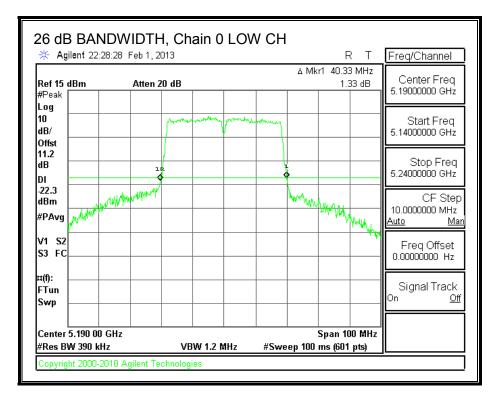
## **RESULTS**

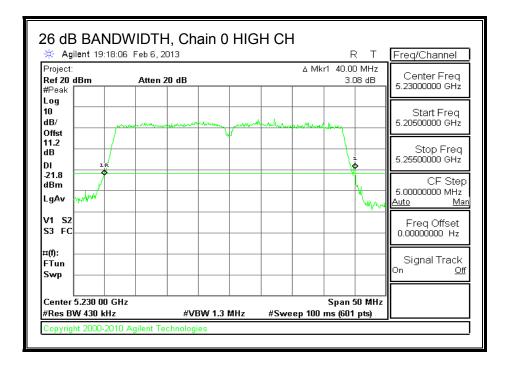
Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5190	40.33	39.83	
High	5230	40.00	39.50	

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#### 26 dB BANDWIDTH, Chain 0

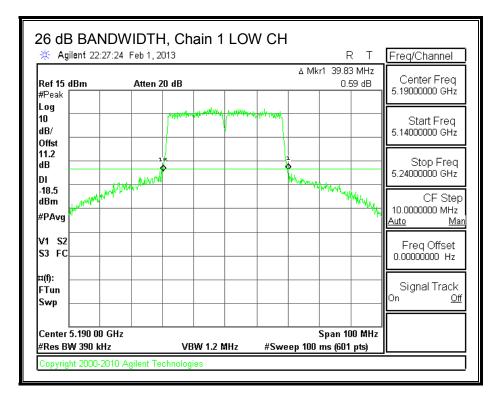


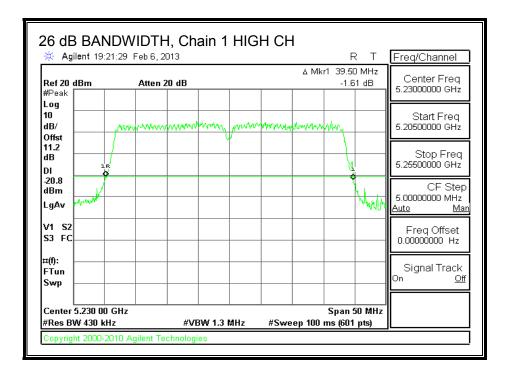


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#### 26 dB BANDWIDTH, Chain 1





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# 8.6.2. 99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

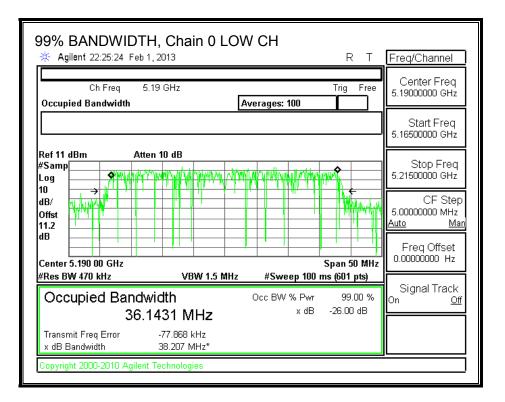
#### <u>RESULTS</u>

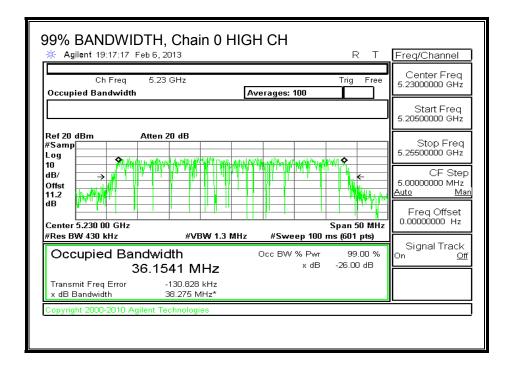
Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5190	36.1431	36.1269
High	5230	36.1541	36.1294

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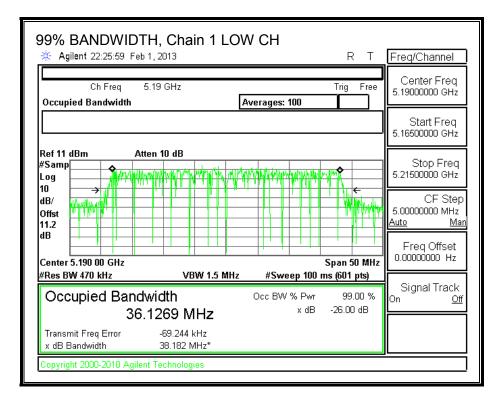
## 99% BANDWIDTH, Chain 0

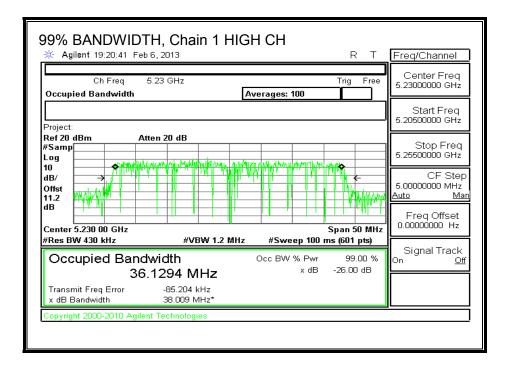




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#### 99% BANDWIDTH, Chain 1





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# 8.6.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
5.93	5.75	8.85	

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#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Grain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5190	39.83	36.1269	8.85
High	5230	39.50	36,1294	8.85

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Low	5190	14.15	23.00	14.15	14.15	1.15	10.00	1.15
High	5230	14.15	23.00	14.15	14.15	1.15	10.00	1.15

Duty Cycle CF (dB)0.22Included in Calculations of PPSD

#### Output Power Results

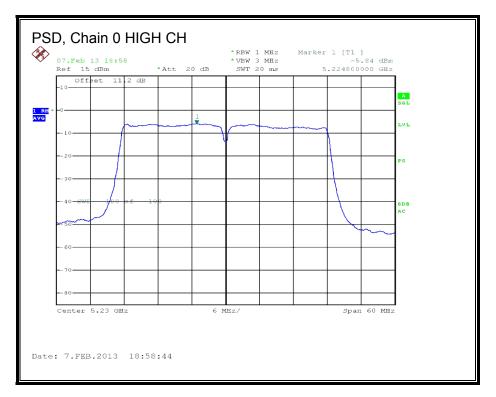
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5190	11.13	11.02	14.09	14.15	-0.06
High	5230	11.16	11.05	14.12	14.15	-0.03

#### **PSD** Results

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5190	-5.94	-6.01	-2.74	1.15	-3.89
High	5230	-5.84	-6.15	-2.76	1.15	-3.91

# PSD, Chain 0

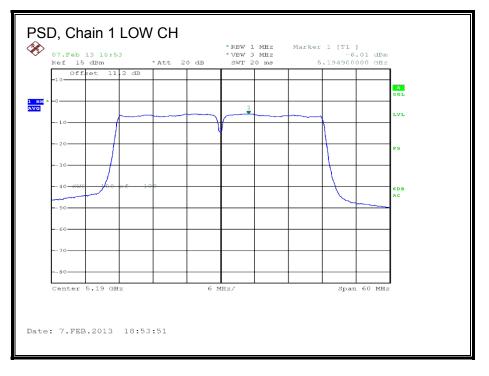


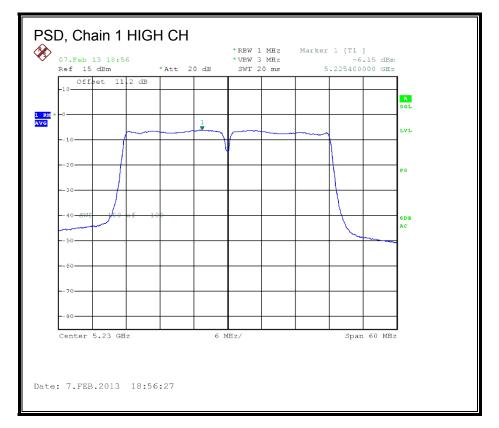


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#### PSD, Chain 1





# 8.7. 802.11n AC80 1TX MODE, 5.2 GHz BAND

# 8.7.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

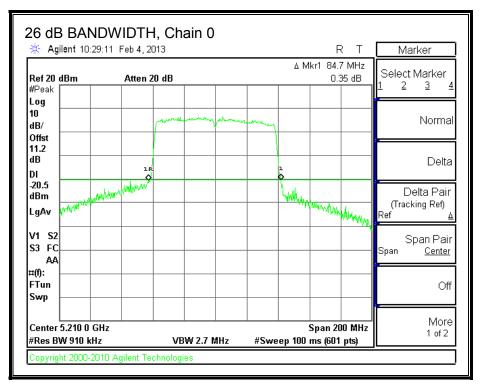
## **RESULTS**

Channel	Frequency	26 dB BW	
		Chain 0	
	(MHz)	(MHz)	
Mid	5210	84.7	

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#### 26 dB BANDWIDTH, Chain 0



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# 8.7.2. 99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

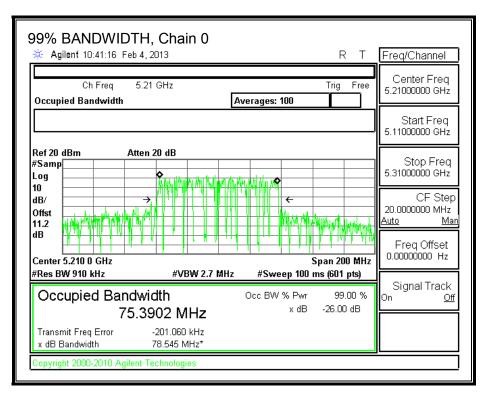
#### **RESULTS**

Channel Frequency		99% BW
		Chain 0
	(MHz)	(MHz)
Mid	5210	75.3902

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## 99% BANDWIDTH, Chain 0



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# 8.7.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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## **RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5210	84.7	75.3902	5.93

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Mid	5210	17.00	23.00	17.07	17.00	4.00	10.00	4.00

Duty Cycle CF (dB) 0.15

#### **Output Power Results**

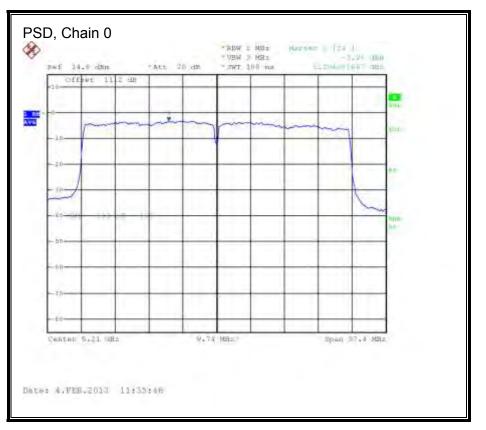
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5210	15.48	15.48	17.00	-1.52

#### **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5210	-3.26	-3.11	4.00	-7.11

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# PSD, Chain 0



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# 8.8. 802.11n AC80 CDD 2TX MODE, 5.2 GHz BAND

# 8.8.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

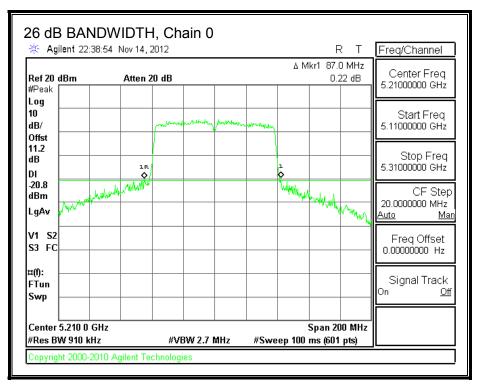
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5210	87.0	82.7

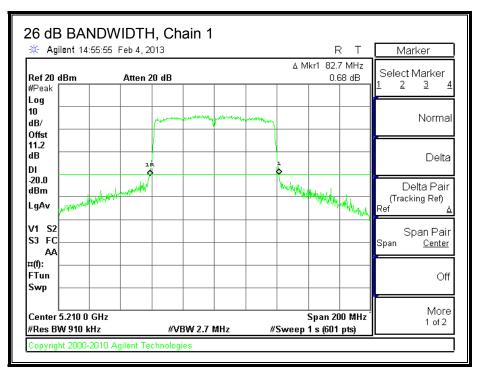
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#### 26 dB BANDWIDTH, Chain 0



#### 26 dB BANDWIDTH, Chain 1



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# 8.8.2. 99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

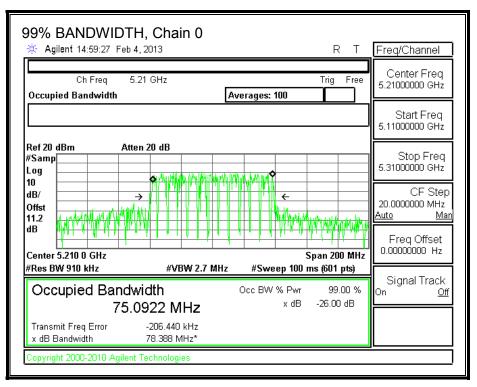
#### **RESULTS**

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5210	75.0922	75.1277

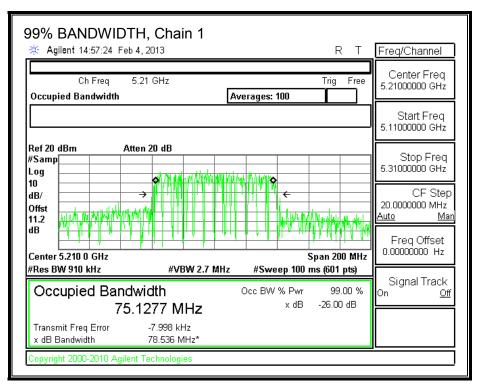
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## 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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# 8.8.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	5.84

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
5.93	5.75	8.85	

## **OUTPUT POWER RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	<b>99%</b>	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
MID	5210	82.70	75.0922	5.84

#### Limits

Channel	Frequency	FCC	IC	Max	Power
		Power	EIRP	IC	Limit
		Limit	Limit	Power	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
MID	5210	17.00	23.00	17.16	17.00

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
MID	5210	13.80	14.10	16.96	17.00	-0.04

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## PSD RESULTS

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
MID	5210	82.70	75.0922	8.85

#### Limits

Channel	Frequency	FCC	IC	PSD
		PPSD	eirp	Limit
		Limit	PSD	
			Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
MID	5210	1.15	10.00	1.15

Duty Cycle CF (dB) 0.17 Inc	ncluded in Calculations of PPSD
-----------------------------	---------------------------------

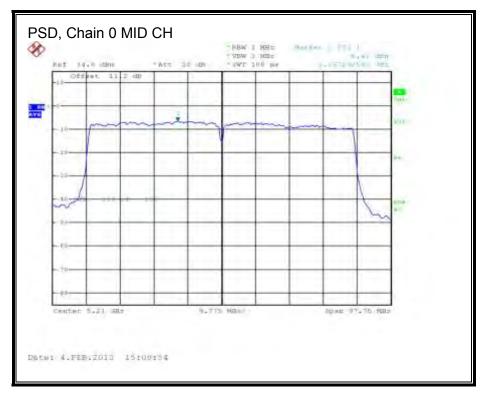
#### PSD Results

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
MID	5210	-6.41	-6.34	-3.19	1.15	-4.34

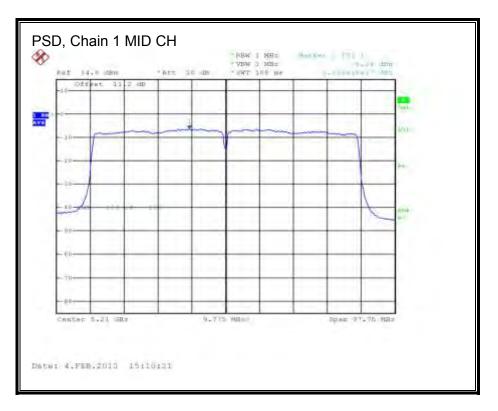
UL CCS FORM NO: CCSUP4701H 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL CCS.

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#### PSD, Chain 0



#### PSD, Chain 1



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# 8.9. 802.11n AC80 BF 2TX MODE, 5.2 GHz BAND

# 8.9.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

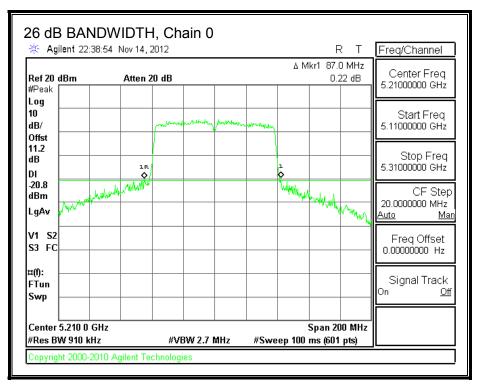
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5210	87.0	82.7

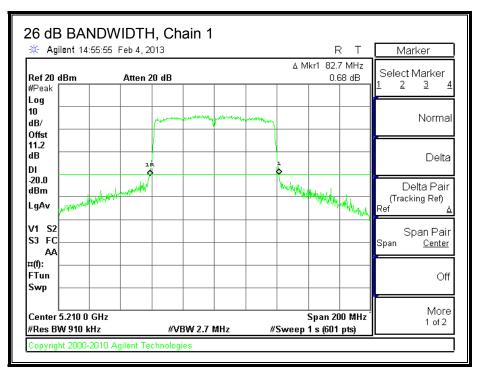
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#### 26 dB BANDWIDTH, Chain 0



#### 26 dB BANDWIDTH, Chain 1



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## 8.9.2. 99% BANDWIDTH

#### LIMITS

None; for reporting purposes only.

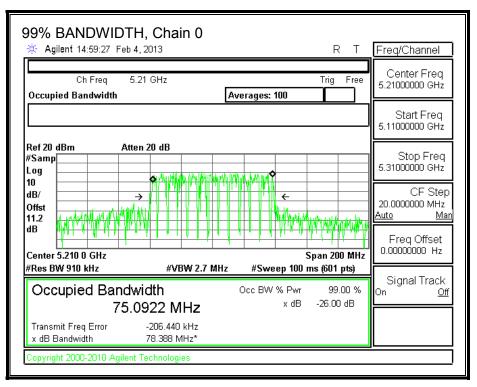
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5210	75.0922	75.1277	

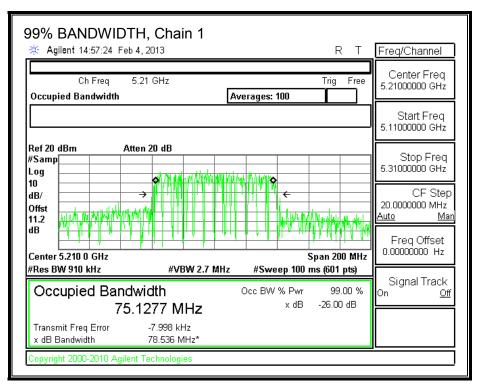
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#### 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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## 8.9.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.93	5.75	8.85

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#### **OUTPUT POWER RESULTS**

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5210	82.70	75.1277	8.85

#### Limits

Channel	Frequency	FCC	IC	Max	Power	FCC	IC	PSD
		Power	EIRP	IC	Limit	PPSD	eirp	Limit
		Limit	Limit	Power		Limit	PSD	
							Limit	
	(MHz)	(dBm)						
Mid	5210	14.15	23.00	14.15	14.15	1.15	10.00	1.15

Duty Cycle CF (dB) 0.17

#### **Output Power Results**

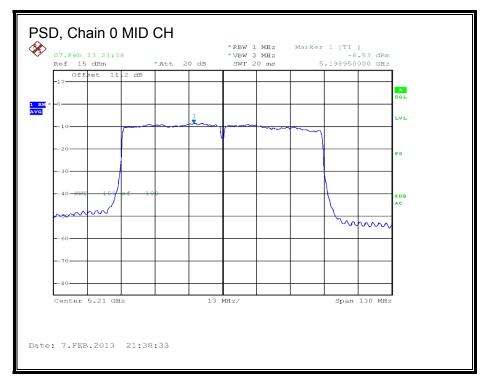
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5210	11.04	11.06	14.06	14.15	-0.09

#### **PSD Results**

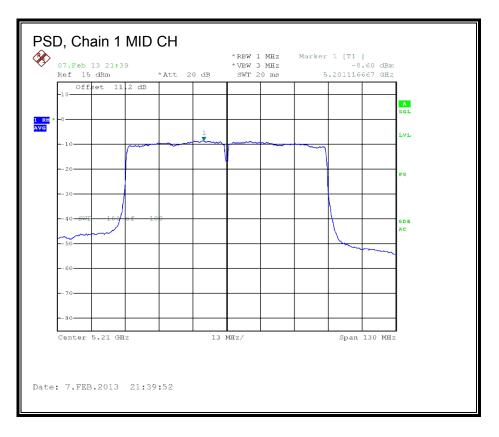
Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5210	-8.53	-8.60	-5.38	1.15	-6.53

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#### PSD, Chain 0



#### PSD, Chain 1



# 8.10. 802.11a LEGACY 1TX MODE, 5.3 GHz BAND

# 8.10.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

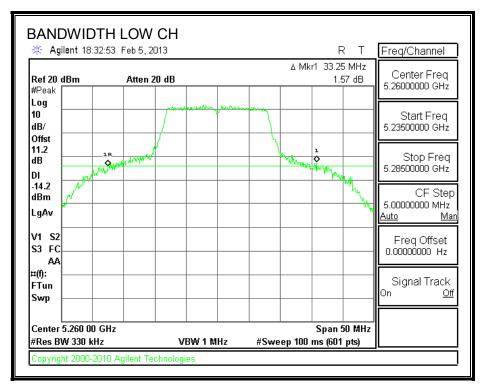
#### **RESULTS**

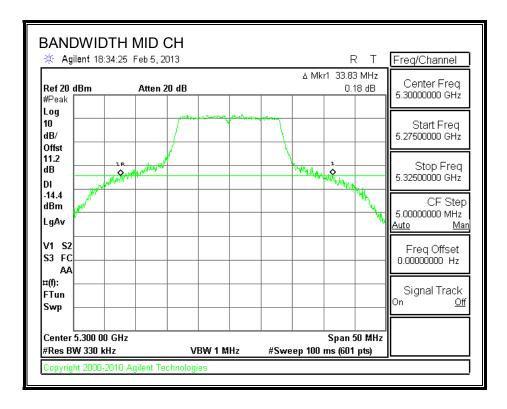
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5260	33.25
Mid	5300	33.83
High	5320	33.00

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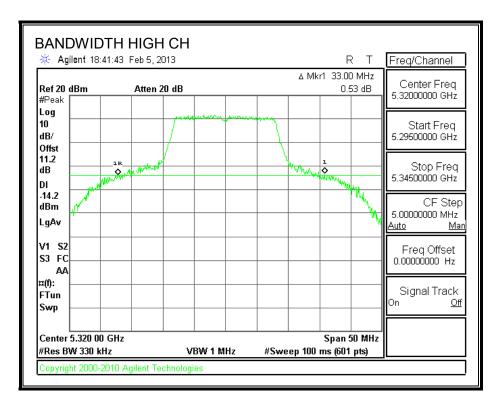
#### 26 dB BANDWIDTH





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# 8.10.2. 99% BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

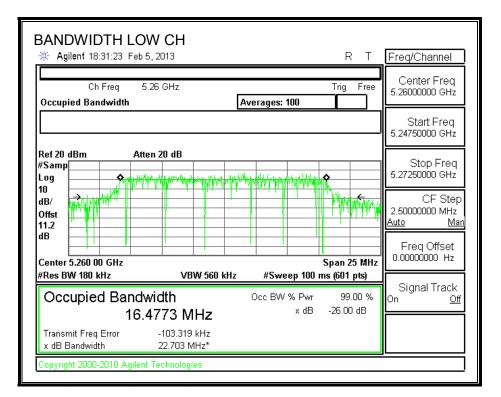
#### <u>RESULTS</u>

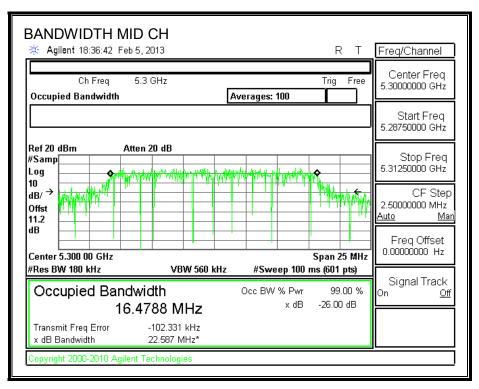
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5260	16.4773
Mid	5300	16.4788
High	5320	16.4730

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#### 99% BANDWIDTH





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BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 5.32 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 5.3200000 GHz
	Start Freq 5.30750000 GHz
Ref 20 dBm Atten 20 dB #Samp Log D0 Atten 20 dB Atten 20 dB	Stop Freq 5.33250000 GHz
dB/ Offst 11.2	CF Step 2.5000000 MHz <u>Auto Man</u>
dB _	Freq Offset 0.00000000 Hz
#Res BW 180 kHz VBW 560 kHz #Sweep 100 ms (601 pts)	
Occupied Bandwidth         Occ BW % Pwr         99.00 %           16.4730 MHz         × dB         -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -100.975 kHz x dB Bandwidth 22.528 MHz*	
Copyright 2000-2010 Agilent Technologies	

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## 8.10.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	33.25	16.4773	6.12
Mid	5300	33.83	16.4788	6.12
High	5320	33.00	16.4730	6.12

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5260	23.88	23.17	29.17	23.05	10.88	11.00	10.88
Mid	5300	23.88	23.17	29.17	23.05	10.88	11.00	10.88
High	5320	23.88	23.17	29.17	23.05	10.88	11.00	10.88

Duty Cycle CF (dB) 0.00

#### **Output Power Results**

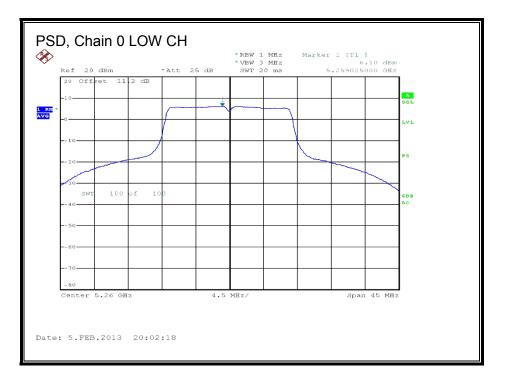
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	20.12	20.12	23.05	-2.93
Mid	5300	20.03	20.03	23.05	-3.02
High	5320	20.16	20.16	23.05	-2.89

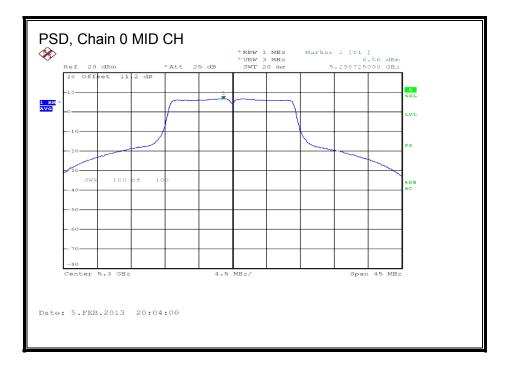
## **PPSD** Results

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	6.10	6.10	10.88	-4.78
Mid	5300	6.56	6.56	10.88	-4.32
High	5320	6.83	6.83	10.88	-4.05

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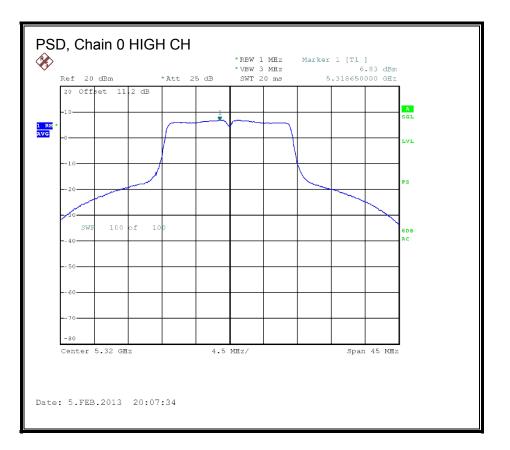
## PSD, Chain 0





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#### 802.11n HT20 CDD 2TX MODE, 5.3 GHz BAND 8.11.

#### 8.11.1. 26 dB BANDWIDTH

#### LIMITS

None; for reporting purposes only.

#### **RESULTS**

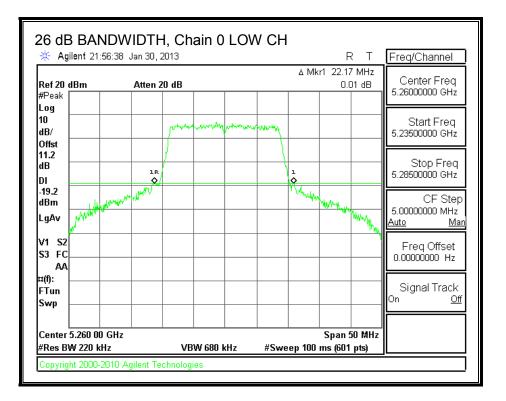
UL CCS

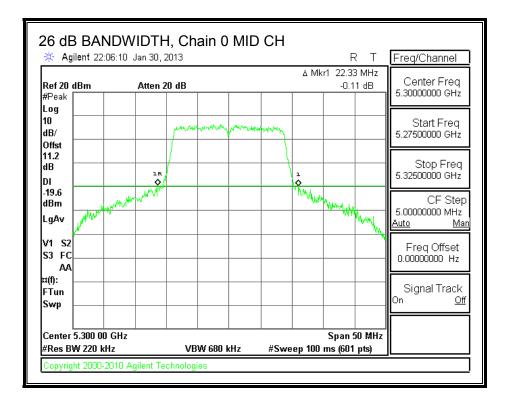
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5260	22.17	26.08
Mid	5300	22.33	25.67
High	5320	22.08	25.25

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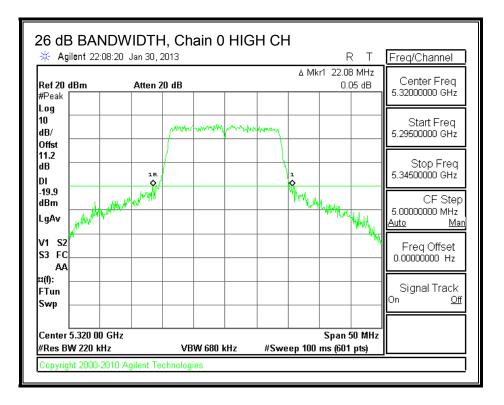
#### 26 dB BANDWIDTH, Chain 0



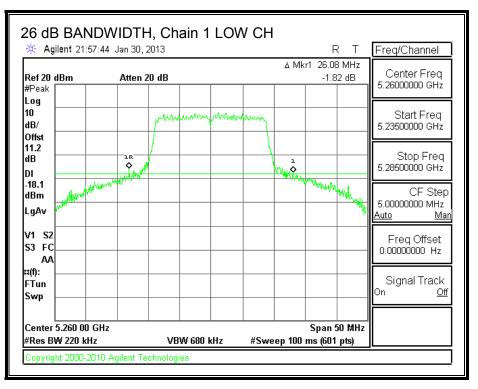


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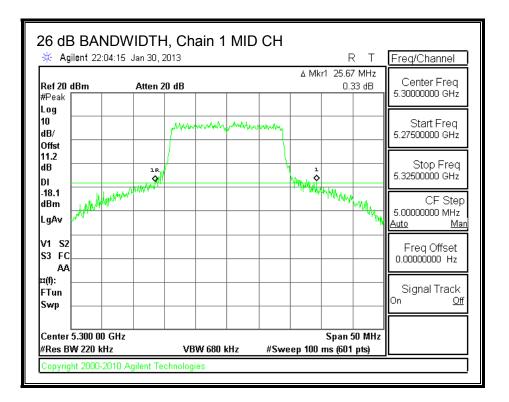


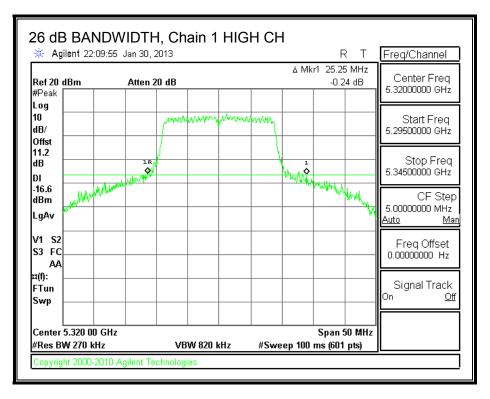
#### 26 dB BANDWIDTH, Chain 1



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# 8.11.2. 99% BANDWIDTH

## **LIMITS**

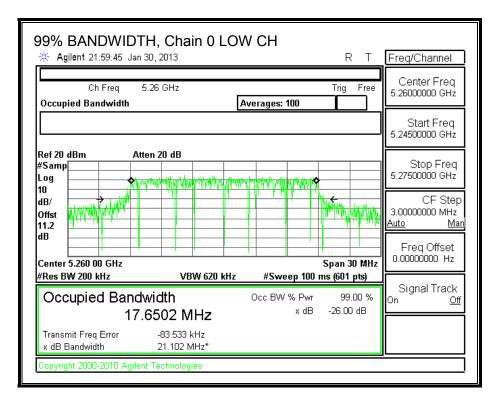
None; for reporting purposes only.

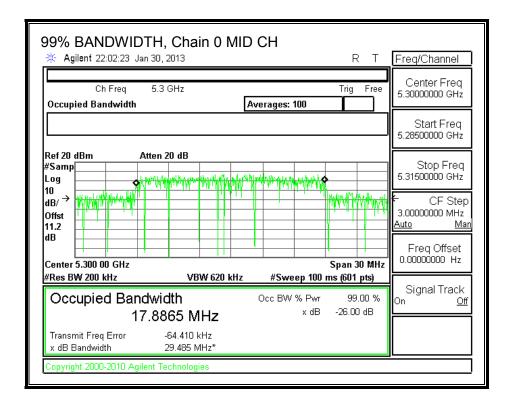
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5260	17.6502	17.6584
Mid	5300	17.8865	17.8522
High	5320	17.6514	17.6585

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#### 99% BANDWIDTH, Chain 0

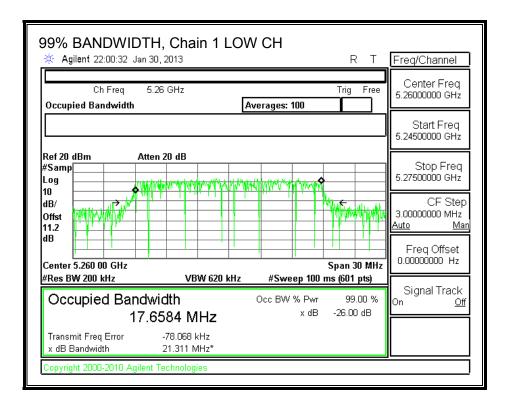




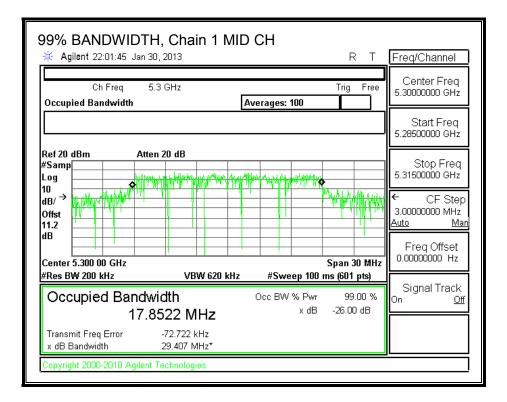
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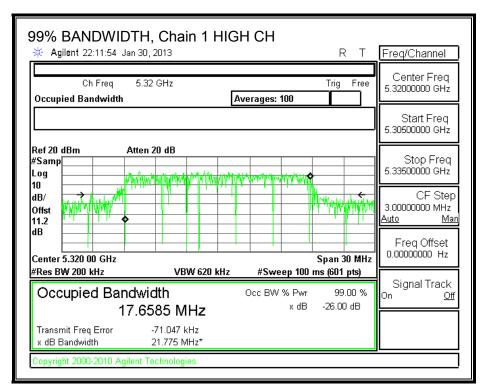
99% BANDWIDTH, Chain 0 HIGH CH	RТ	Freq/Channel
Ch Freq 5.32 GHz Occupied Bandwidth Averages: 100	Trig Free	Center Freq 5.32000000 GHz
		Start Freq 5.30500000 GHz
Ref 20 dBm Atten 20 dB #Samp Log 10		Stop Freq 5.33500000 GHz
dB/ Offst 11.2		CF Step 3.00000000 MHz <u>Auto Man</u>
	an 30 MHz	Freq Offset 0.00000000 Hz
#Res BW 200 kHz         VBW 620 kHz         #Sweep 100 ms           Occupied Bandwidth         Occ BW % Pwr           17.6514 MHz         × dB		Signal Track <sup>On <u>Off</u></sup>
Transmit Freq Error -72.149 kHz x dB Bandwidth 21.208 MHz*		
Copyright 2000-2010 Agilent Technologies		

#### 99% BANDWIDTH, Chain 1



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# 8.11.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	5.85

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	8.86

#### **OUTPUT POWER RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	22.17	17.6502	5.85
Mid	5300	22.33	17.8522	5.85
High	5320	22.08	17.6514	5.85

#### Limits

Channel	Frequency	FCC	IC	IC	Power
		Power	Power	EIRP	Limit
		Limit	Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5260	24.00	23.47	29.47	23.47
Mid	5300	24.00	23.52	29.52	23.52
High	5320	24.00	23.47	29.47	23.47

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Dowor	Power	Bower		
		Power		Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	19.08	19.01	22.06	23.47	-1.41
Mid	5300	18.91	18.85	21.89	23.52	-1.63
High	5320	18.71	18.42	21.58	23.47	-1.89

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#### PSD RESULTS

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	22.17	17.6502	8.86
Mid	5300	22.33	17.8522	8.86
High	5320	22.08	17.6514	8.86

#### Limits

Channel	Frequency	FCC	IC	PSD
		PSD	PSD	Limit
		Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5260	8.14	11.00	8.14
Mid	5300	8.14	11.00	8.14
High	5320	8.14	11.00	8.14

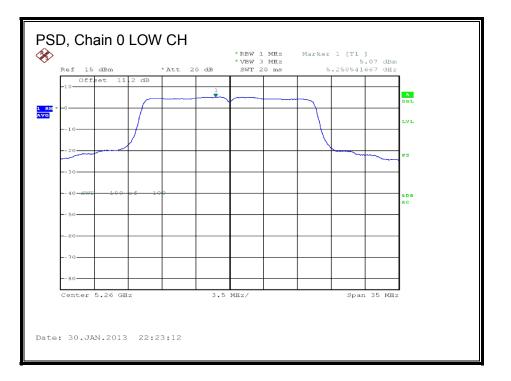
Duty Cycle CF (dB)	0.00	

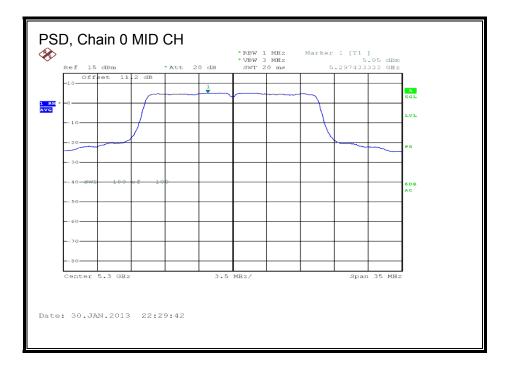
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	5.07	5.12	8.11	8.14	-0.03
Mid	5300	5.05	5.07	8.07	8.14	-0.07
High	5320	5.03	4.96	8.01	8.14	-0.13

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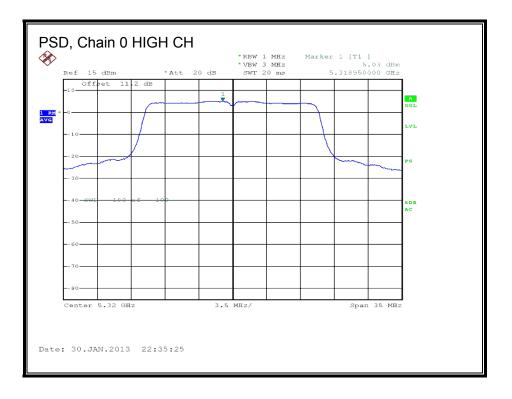
## PSD, Chain 0



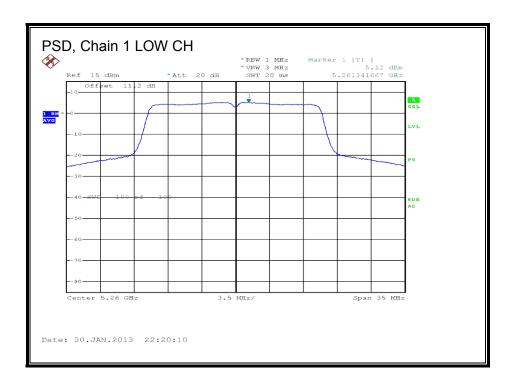


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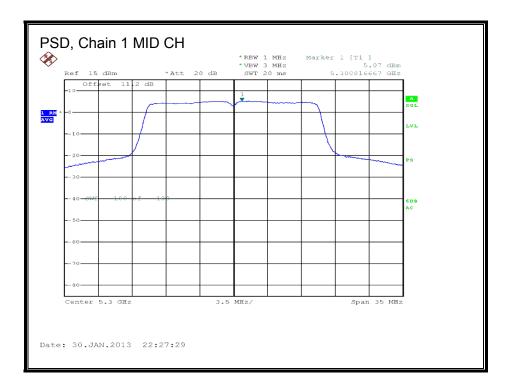


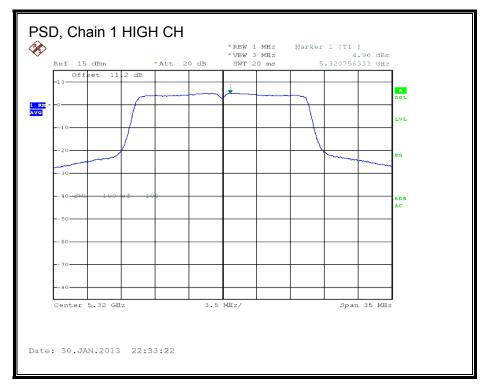
#### PSD, Chain 1



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#### 802.11n HT20 STBC 2TX MODE, 5.3 GHz BAND 8.12.

#### 8.12.1. 26 dB BANDWIDTH

#### LIMITS

None; for reporting purposes only.

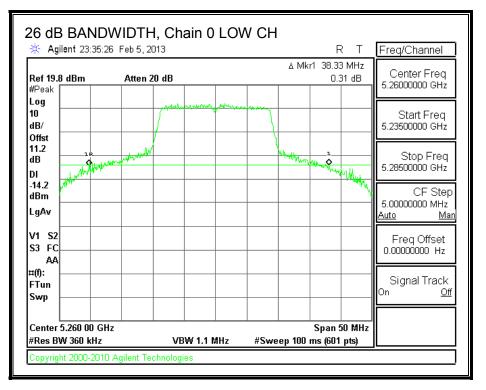
#### **RESULTS**

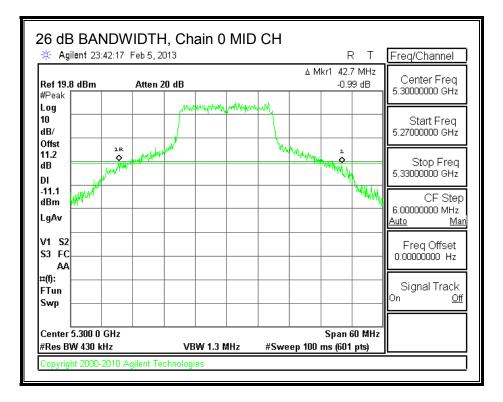
UL CCS

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5260	38.33	36.00	
Mid	5300	42.70	41.90	
High	5320	38.08	37.17	

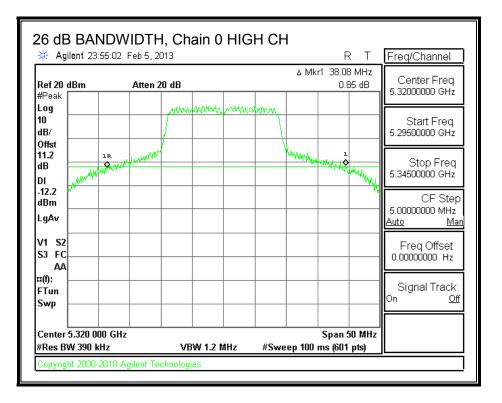
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#### 26 dB BANDWIDTH, Chain 0

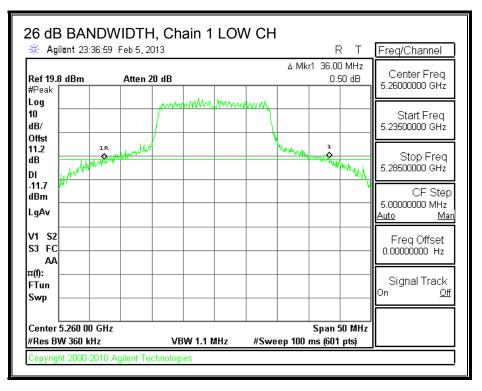




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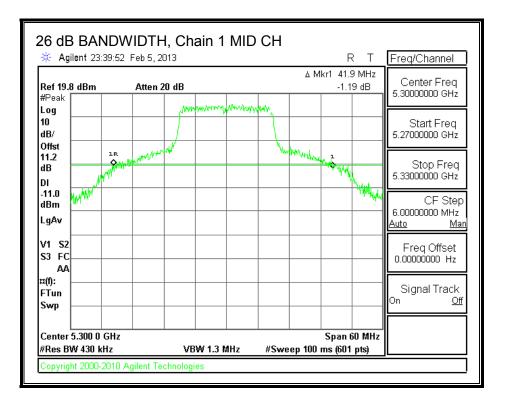


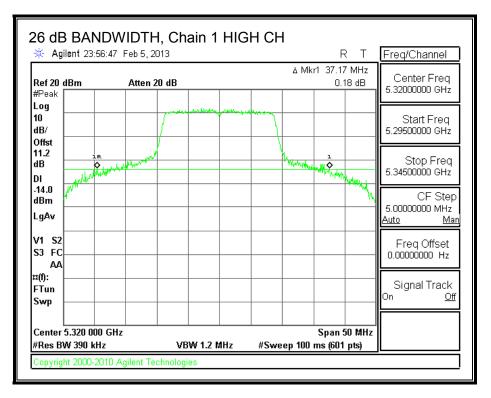
#### 26 dB BANDWIDTH, Chain 1



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# 8.12.2. 99% BANDWIDTH

## **LIMITS**

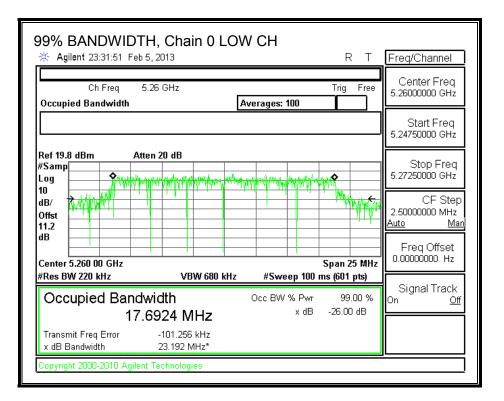
None; for reporting purposes only.

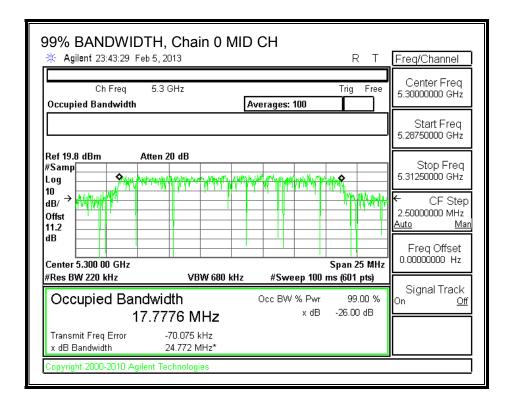
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5260	17.6924	17.6973	
Mid	5300	17.7776	17.7772	
High	5320	17.6914	17.6877	

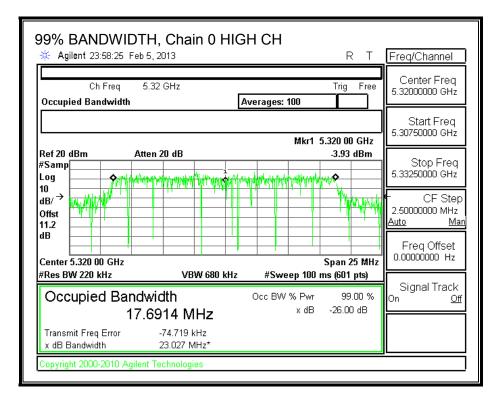
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#### 99% BANDWIDTH, Chain 0

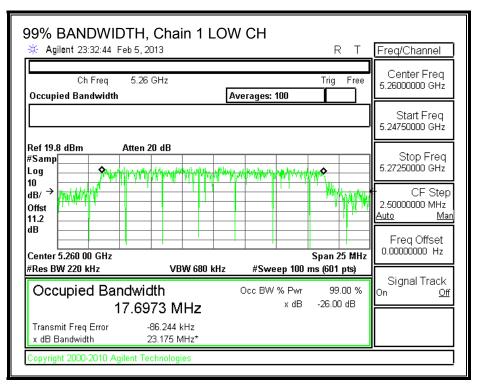




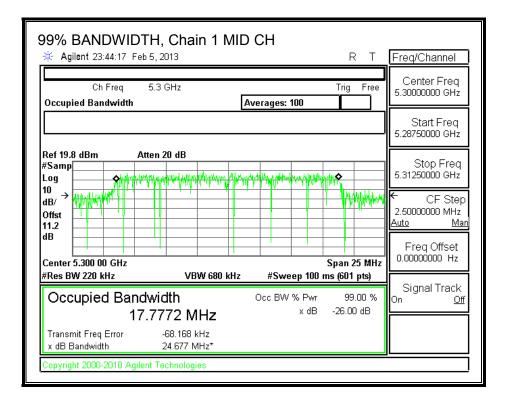
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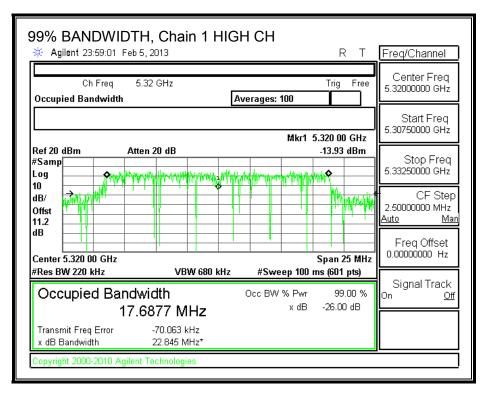


#### 99% BANDWIDTH, Chain 1



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### 8.12.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	5.85

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#### **OUTPUT POWER RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	36.00	17.6924	5.85
Mid	5300	41.90	17.7772	5.85
High	5320	37.17	17.6877	5.85

#### Limits

Channel	Frequency	FCC	IC	IC	Power
		Power	Power	EIRP	Limit
		Limit	Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5260	24.00	23.48	29.48	23.48
Mid	5300	24.00	23.50	29.50	23.50
High	5320	24.00	23.48	29.48	23.48

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Bower	Bower	Dowor		
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	20.25	20.05	23.16	23.48	-0.32
Mid	5300	20.43	20.36	23.41	23.50	-0.09
High	5320	20.28	20.13	23.22	23.48	-0.26

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#### PSD RESULTS

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5260	36.00	17.6924	5.85
Mid	5300	41.90	17.7772	5.85
High	5320	37.17	17.6877	5.85

#### Limits

Channel	Frequency	FCC	IC	PSD
		PSD	PSD	Limit
		Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5260	11.00	11.00	11.00
Mid	5300	11.00	11.00	11.00
High	5320	11.00	11.00	11.00

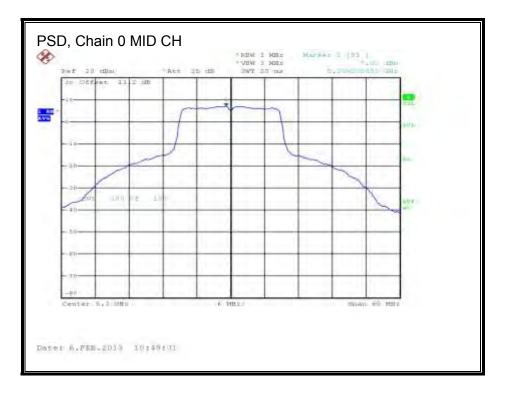
Duty Cycle CF (dB)	0.00	

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5260	6.56	6.38	9.48	11.00	-1.52
Mid	5300	7.00	7.18	10.10	11.00	-0.90
High	5320	7.07	6.93	10.01	11.00	-0.99

#### PSD, Chain 0





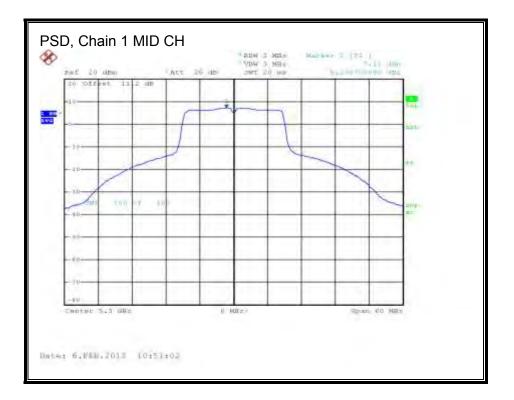
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#### PSD, Chain 1



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# 8.13. 802.11n HT40 TX MODE, 5.3 GHz BAND

### 8.13.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

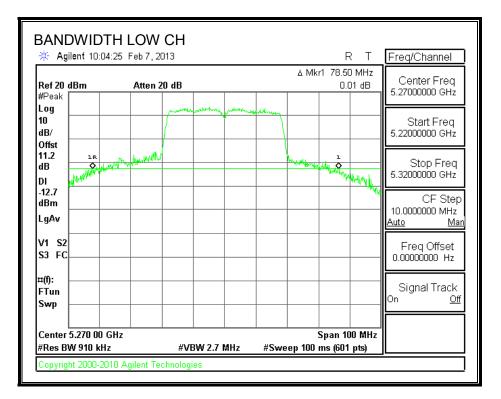
#### **RESULTS**

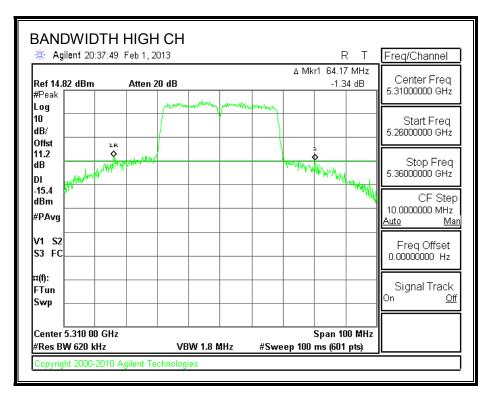
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5270	78.50
High	5310	64.17

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#### 26 dB BANDWIDTH





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### 8.13.2. 99% BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

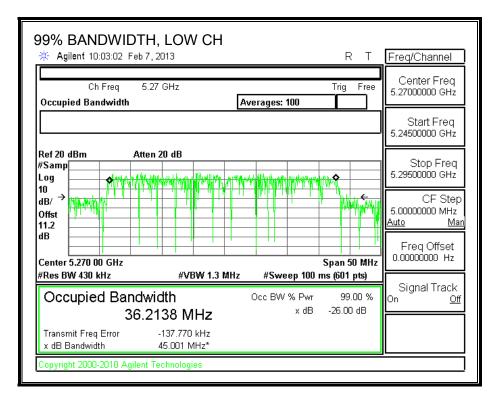
#### <u>RESULTS</u>

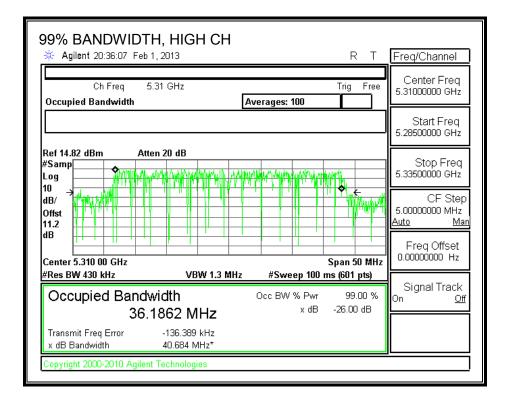
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5270	36.2138
High	5310	36.1862

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#### 99% BANDWIDTH





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### 8.13.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
		(8411-)		
	(MHz)	(MHz)	(MHz)	(dBi)
Low	(MHZ) 5270	(IVIHZ) 78.50	(NITZ) 36.2138	<u>(ав)</u> 6.12

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5270	23.88	24.00	30.00	23.88	10.88	11.00	10.88
High	5310	23.88	24.00	30.00	23.88	10.88	11.00	10.88

Duty Cycle CF (dB) 0.22

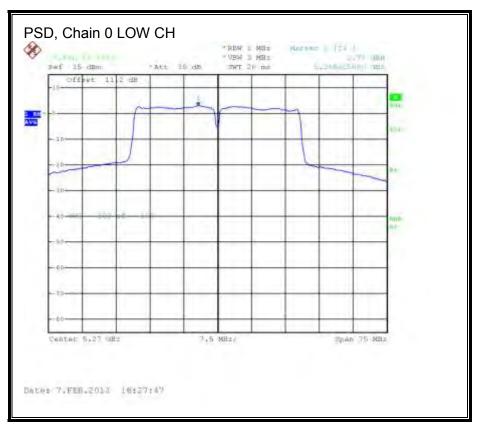
#### **Output Power Results**

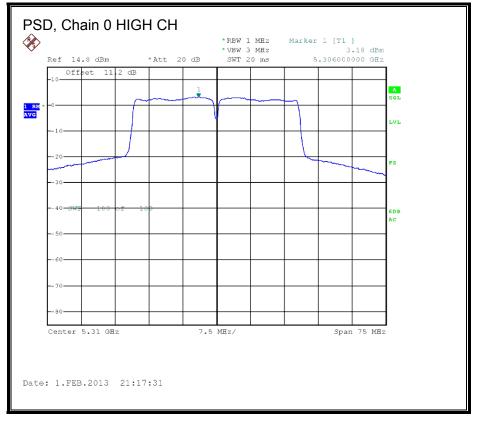
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	20.36	20.36	23.88	-3.52
LOW					

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	<b>(MHz)</b> 5270	(dBm) 2.78	(dBm) 3.00	<b>(dBm)</b> 10.88	(dB) -7.88

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#### PSD, Chain 0





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# 8.14. 802.11n HT40 CDD 2TX MODE, 5.3 GHz BAND

### 8.14.1. 26 dB BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

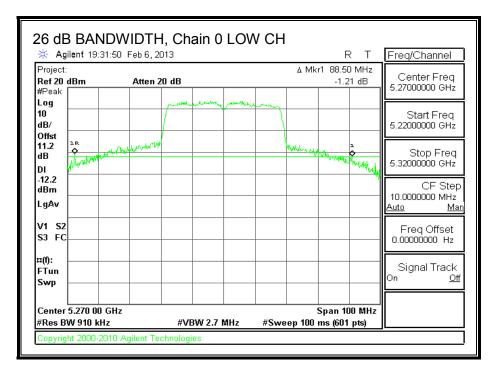
#### **RESULTS**

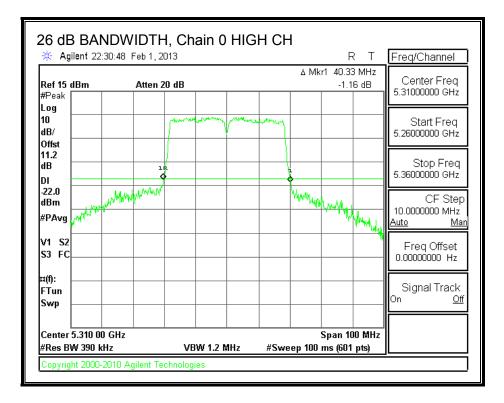
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5270	88.50	88.17
High	5310	40.33	39.67

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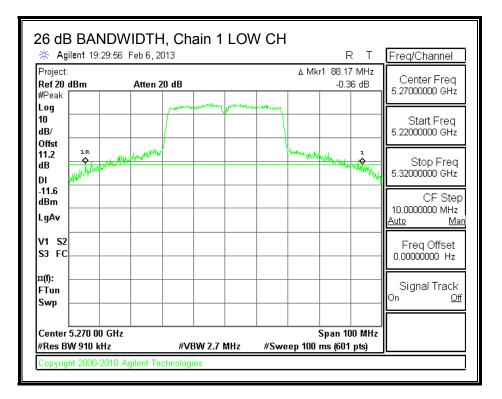
#### 26 dB BANDWIDTH, Chain 0

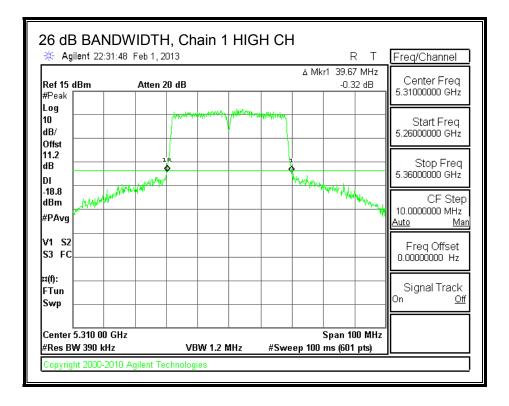




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#### 26 dB BANDWIDTH, Chain 1





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### 8.14.2. 99% BANDWIDTH

#### **LIMITS**

None; for reporting purposes only.

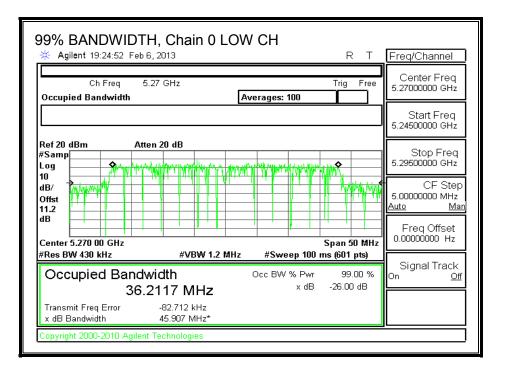
#### <u>RESULTS</u>

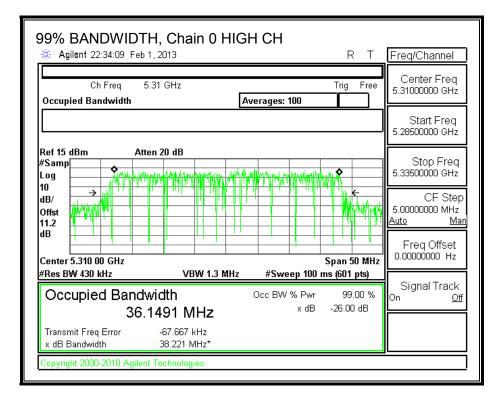
Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5270	36.2117	36.2378
High	5310	36.1491	36.1454

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#### 99% BANDWIDTH, Chain 0

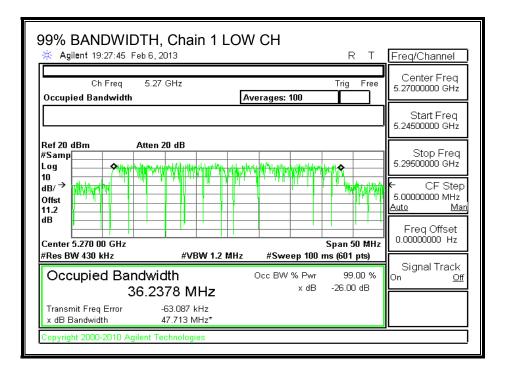


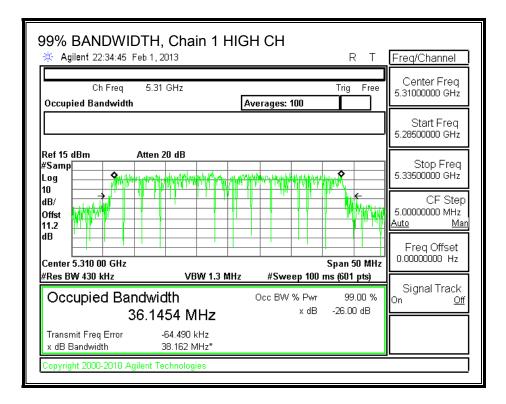


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#### 99% BANDWIDTH, Chain 1





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### 8.14.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	5.85

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	8.86

#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min Uncorrelated		Correlated
		26 dB	99%	Directional	Directional
		BW	BW	Gain	Gain
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5270	88.17	36.2117	5.85	8.86
High	5310	39.67	36.1454	5.85	8.86

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5270	24.00	24.00	30.00	24.00	8.14	11.00	8.14
High	5310	24.00	24.00	30.00	24.00	8.14	11.00	8.14

Duty Cycle CF (dB) 0.22

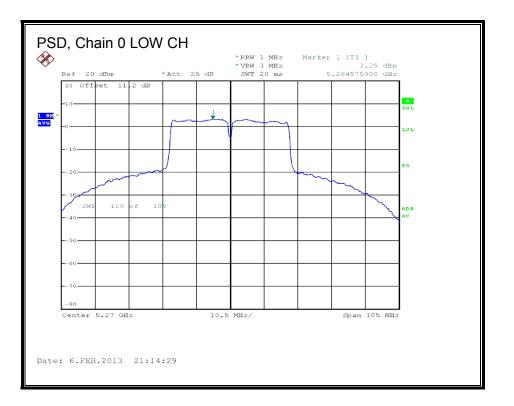
#### **Output Power Results**

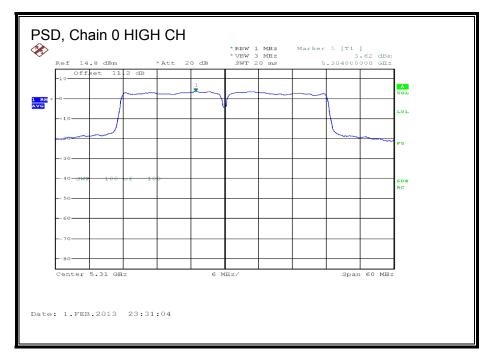
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	20.12	20.18	23.16	24.00	-0.84
	0210		20.10	20.10	2	0.01

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(8411_)		(al Dura)		(dDma)	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	( <b>dBm</b> ) 3.25	(dBm) 3.29	( <b>dBm)</b> 6.50	(авт) 8.14	( <b>ав)</b> -1.64

#### PSD, Chain 0

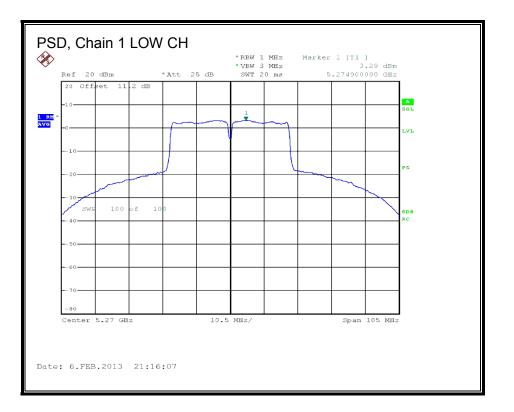


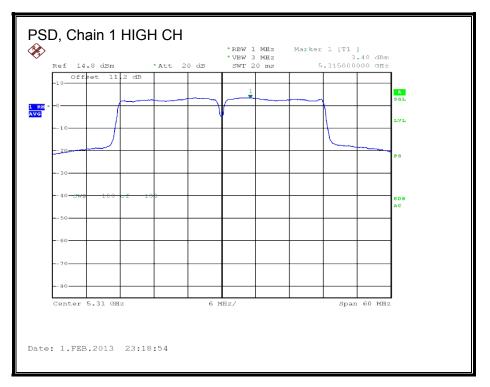


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#### PSD, Chain 1





# 8.15. 802.11n AC40 BF 2TX MODE, 5.3 GHz BAND

### 8.15.1. 26 dB BANDWIDTH

#### LIMITS

None; for reporting purposes only.

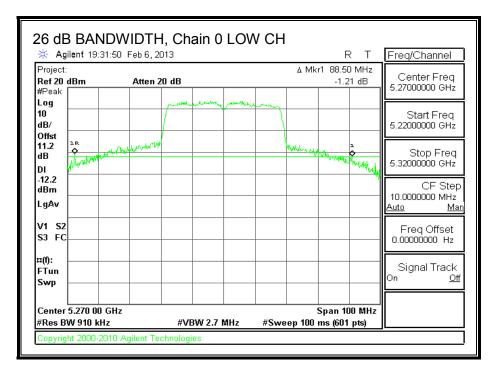
#### **RESULTS**

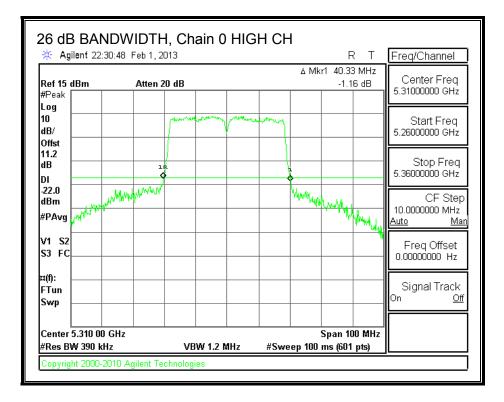
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5270	88.50	88.17
High	5310	40.33	39.67

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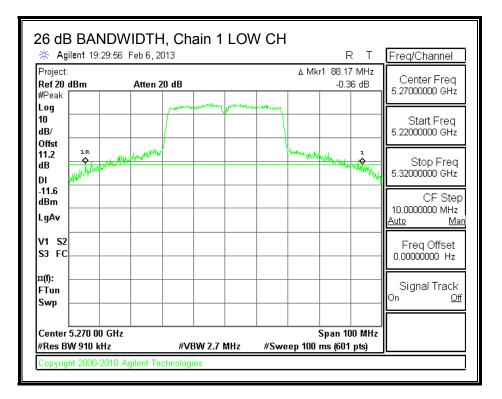
#### 26 dB BANDWIDTH, Chain 0

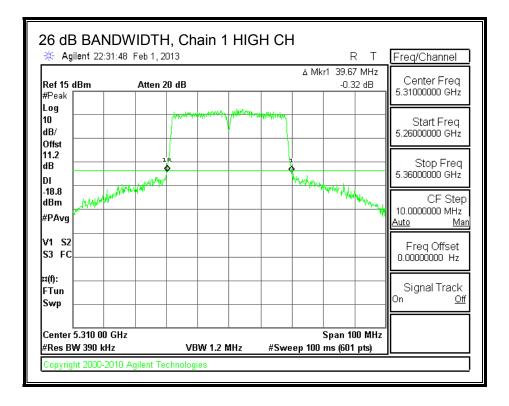




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#### 26 dB BANDWIDTH, Chain 1





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### 8.15.2. 99% BANDWIDTH

#### **LIMITS**

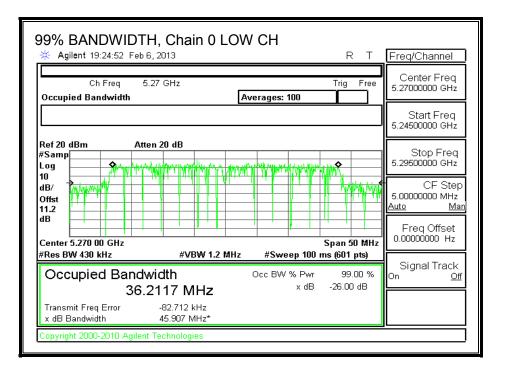
None; for reporting purposes only.

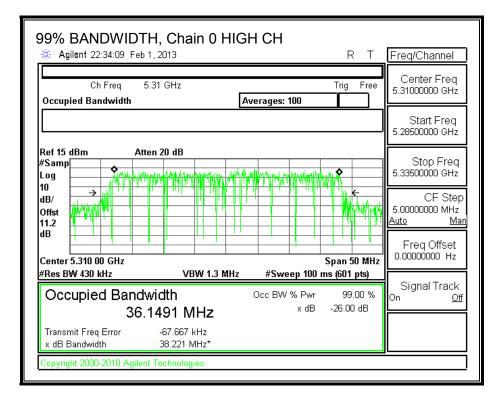
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5270	36.2117	36.2378
High	5310	36.1491	36.1454

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#### 99% BANDWIDTH, Chain 0

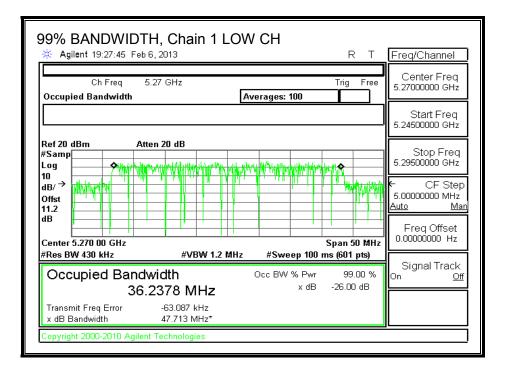


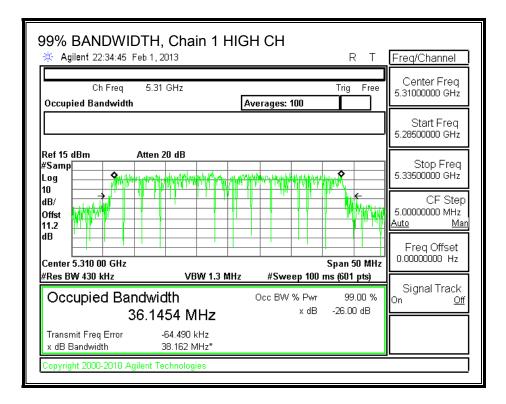


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#### 99% BANDWIDTH, Chain 1





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### 8.15.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	8.86

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#### **RESULTS**

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
			• •	· · ·
Low	5270	88.17	36.2117	8.86

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5270	21.14	24.00	30.00	21.14	8.14	11.00	8.14
High	5310	21.14	24.00	30.00	21.14	8.14	11.00	8.14

Duty Cycle CF (dB) 0.22

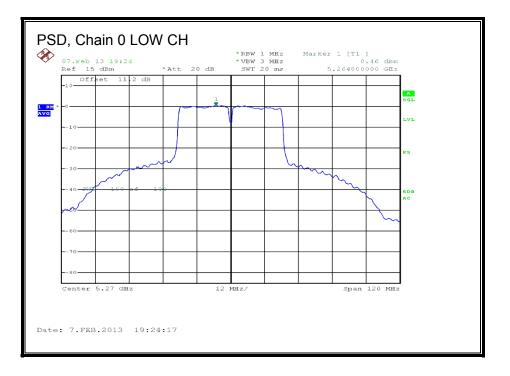
#### **Output Power Results**

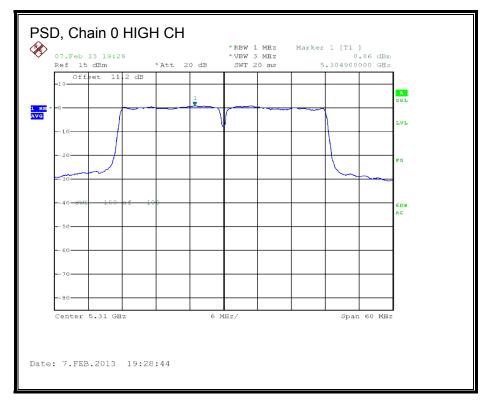
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5270	18.03	18.15	21.10	21.14	-0.04
High	5310	15.08	15.80	18.47	21.14	-2.67

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
	(141112)		(abiii)	(ubiii)	(abiii)	
Low	5270	0.46	0.56	3.74	8.14	-4.40

#### PSD, Chain 0

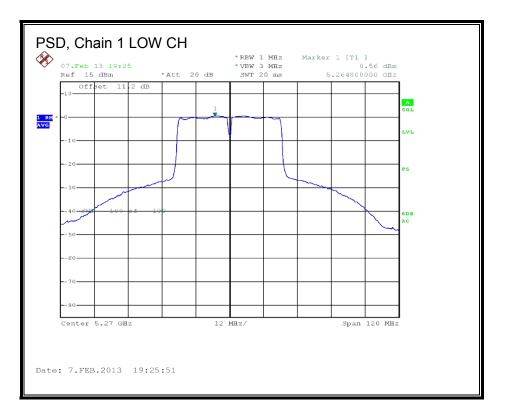




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#### PSD, Chain 1





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# 8.16. 802.11n AC80 1TX MODE, 5.3 GHz BAND

### 8.16.1. 26 dB BANDWIDTH

#### <u>LIMITS</u>

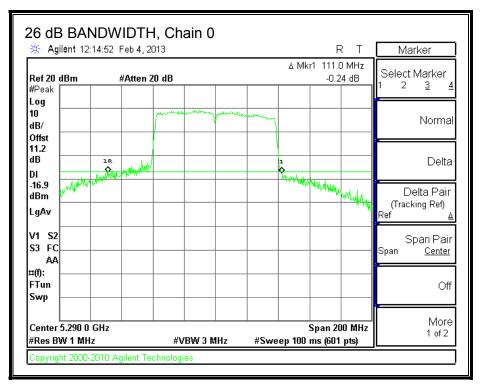
None; for reporting purposes only.

#### **RESULTS**

Channel	Frequency	26 dB BW
		Chain 0
	(MHz)	(MHz)
Mid	5290	111.0

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#### 26 dB BANDWIDTH, Chain 0



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## 8.16.2. 99% **BANDWIDTH**

### LIMITS

None; for reporting purposes only.

### <u>RESULTS</u>

Channel	Frequency	99% BW
		Chain 0
	(MHz)	(MHz)
Mid	5290	75.4522

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### 99% BANDWIDTH, Chain 0

99% BANDWIDTH, ( Agilent 12:18:25 Feb 4, 201		RT	Freq/Channel
Ch Freq 5.29 G Occupied Bandwidth	Hz Averages: 1	Trig Free	Center Freq 5.29000000 GHz
			Start Freq 5.19000000 GHz
Ref 20 dBm Atten 20 #Samp Log 10	dB		Stop Freq 5.3900000 GHz
dB/ Offst 11.2 dB			CF Step 20.0000000 MHz <u>Auto Man</u> Freq Offset
Center 5.290 0 GHz #Res BW 910 kHz	#VBW 2.7 MHz #Swe	Span 200 MHz ep 100 ms (601 pts)	0.00000000 Hz
Occupied Bandwidt 75.452		% Pwr 99.00 % xdB -26.00 dB	Signal Track On <u>Off</u>
	5.226 kHz 382 MHz*		
Copyright 2000-2010 Agilent Tech	nologies		

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### 8.16.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5290	111.0	75.4522	6.12

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5290	23.88	24.00	30.00	23.88	10.88	11.00	10.88

Duty Cycle CF (dB) 0.15

### **Output Power Results**

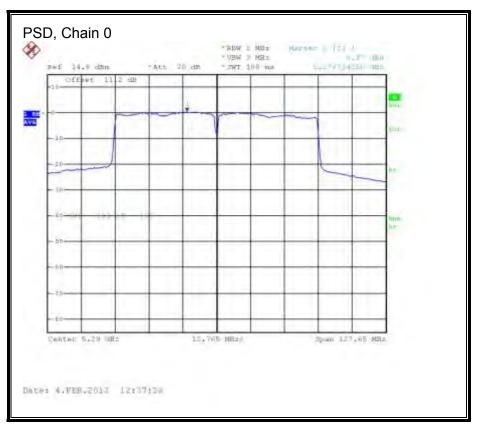
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	17.84	17.84	23.88	-6.04

### **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	0.37	0.52	10.88	-10.36

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### PSD, Chain 0



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# 8.17. 802.11n AC80 CDD 2TX MODE, 5.3 GHz BAND

### 8.17.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

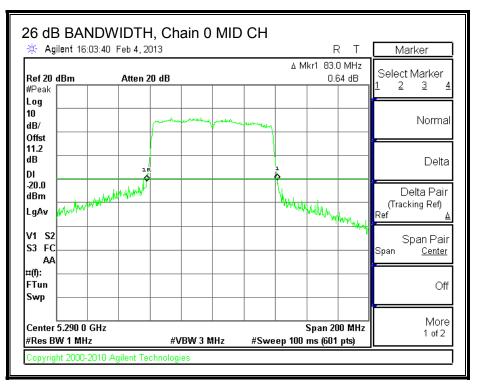
None; for reporting purposes only.

### **RESULTS**

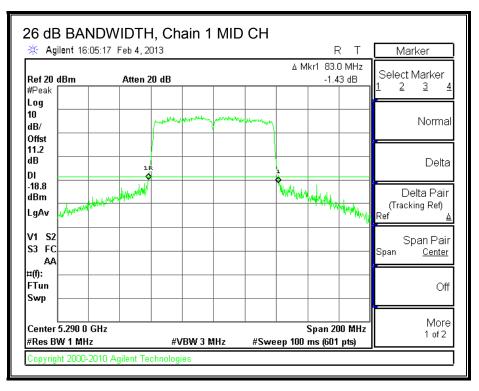
Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5290	83.0	83.0	

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### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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## 8.17.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

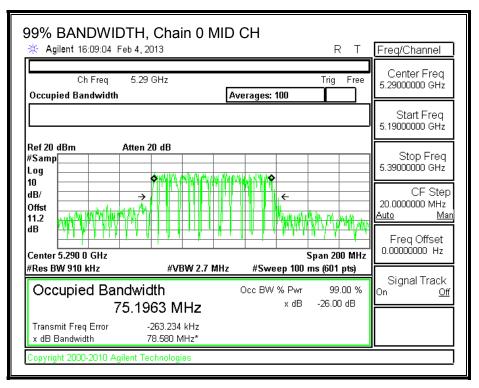
### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5290	75.1963	75.2513

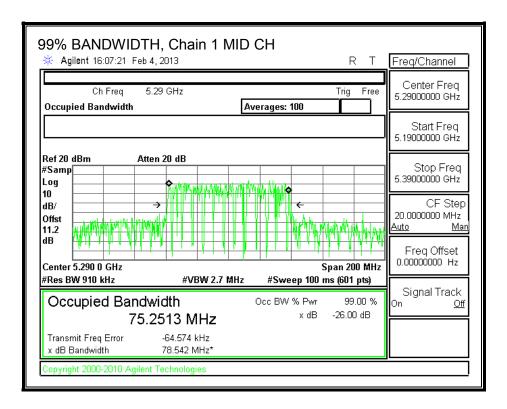
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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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## 8.17.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	5.85

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	8.86

### **OUTPUT POWER RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5290	83.0	75.1963	5.85

#### Limits

Channel	Frequency	FCC	IC	IC	Power
		Power	Power	EIRP	Limit
		Limit	Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Mid	5290	24.00	24.00	30.00	24.00

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	14.54	14.90	17.73	24.00	-6.27

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### PSD RESULTS

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5290	83.0	75.1963	8.86

#### Limits

Channel	Frequency	FCC	IC	PSD
		PSD	PSD	Limit
		Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
Mid	5290	8.14	11.00	8.14

Duty Cycle CF (dB) 0.17

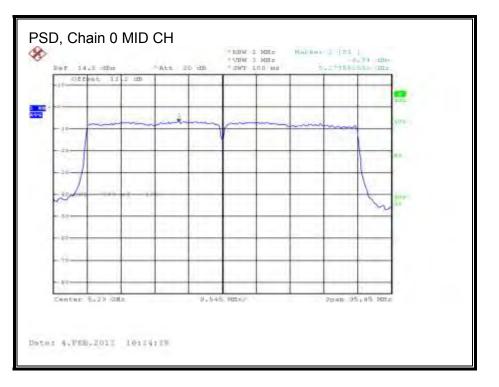
### **PPSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	-6.74	-5.39	-2.83	8.14	-10.97

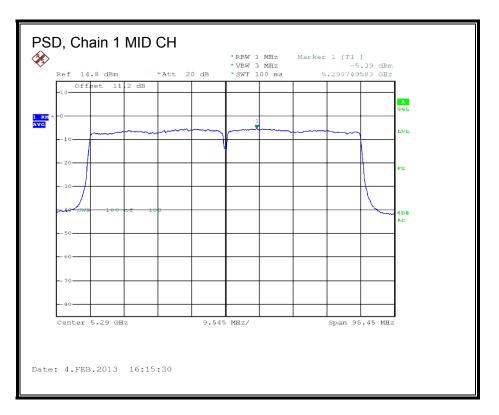
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### PSD, Chain 0



### PSD, Chain 1



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# 8.18. 802.11n AC80 BF 2TX MODE, 5.3 GHz BAND

### 8.18.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

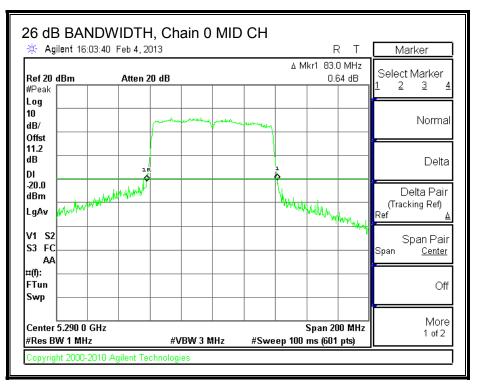
None; for reporting purposes only.

### **RESULTS**

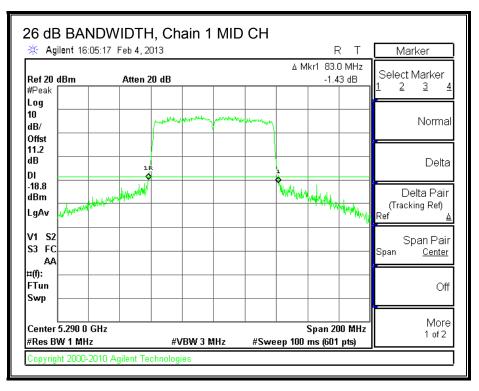
Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5290	83.0	83.0	

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### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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## 8.18.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

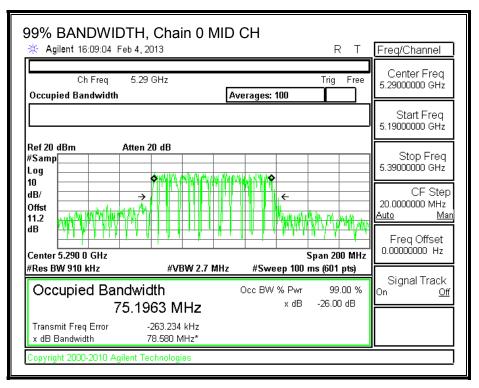
### <u>RESULTS</u>

Channel	Frequency 99% BW		99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5290	75.1963	75.2513	

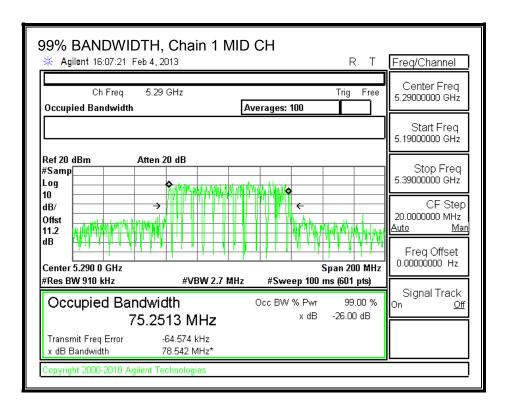
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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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### 8.18.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

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 peak 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-210 A9.2 (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.

### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.12	5.57	8.86

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### **OUTPUT POWER RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5290	83.0	75.1963	8.86

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5290	21.14	24.00	30.00	21.14	8.14	11.00	8.14

Duty Cycle CF (dB) 0.17

### **Output Power Results**

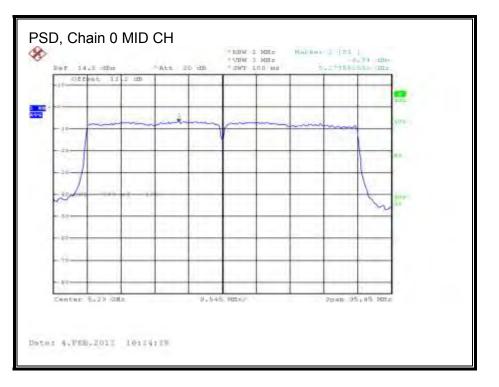
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	14.12	15.01	17.60	21.14	-3.54

### **PSD Results**

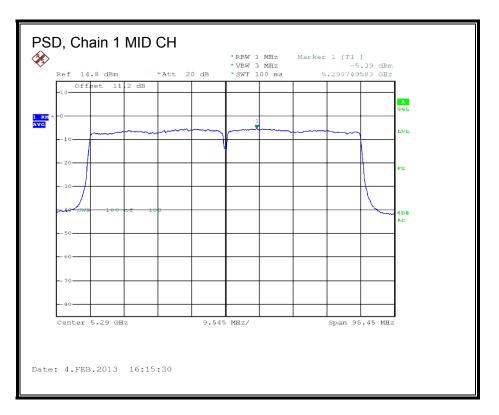
Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5290	-6.74	-5.39	-2.83	8.14	-10.97

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### PSD, Chain 0



### PSD, Chain 1



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# 8.19. 802.11a LEGACY 1TX MODE, 5.6 GHz BAND

### 8.19.1. 26 dB BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

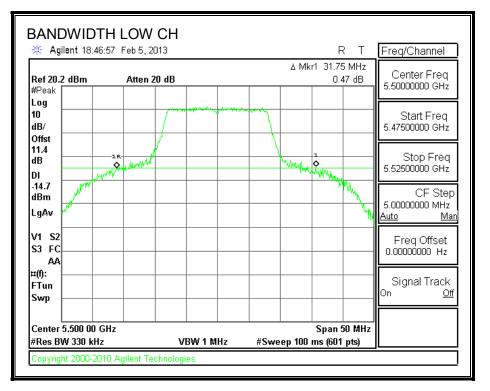
### **RESULTS**

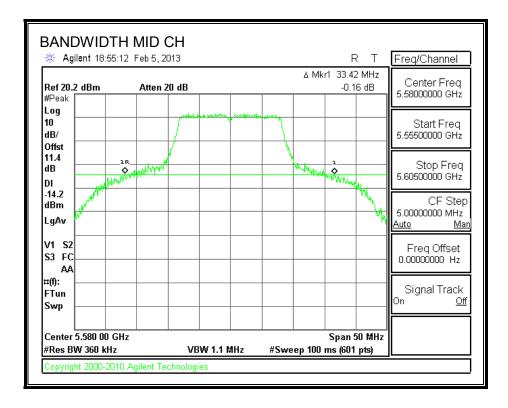
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5500	31.75
Mid	5580	33.42
High	5700	27.33

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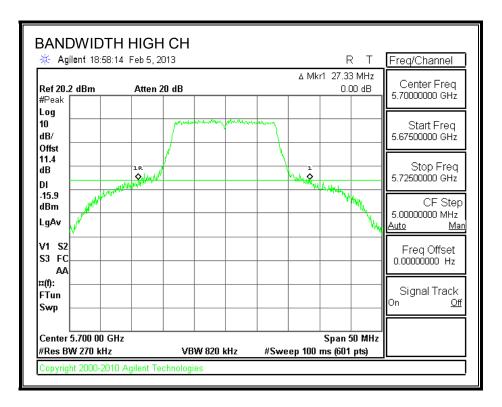
#### 26 dB BANDWIDTH





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#### 8.19.2. 99% BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

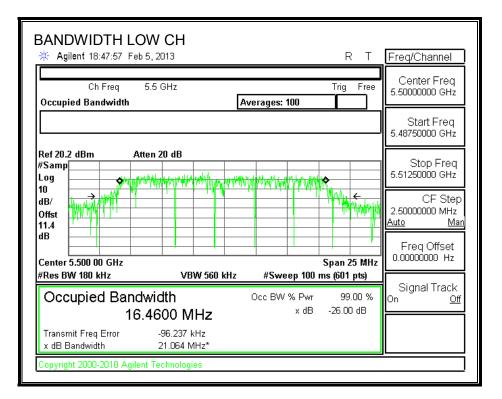
### **RESULTS**

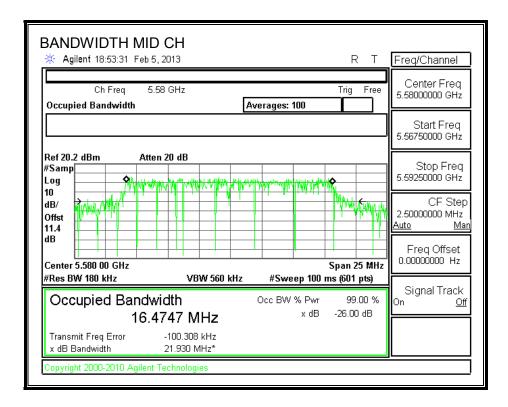
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5500	16.4600
Mid	5580	16.4747
High	5700	16.4517

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### 99% BANDWIDTH





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BANDWIDTH HIGH CH	R T	Freq/Channel
Ch Freq 5.7 GHz Occupied Bandwidth Aver	Trig Free ages: 100	Center Freq 5.70000000 GHz
		Start Freq 5.68750000 GHz
Ref 20.2 dBm Atten 20 dB #Samp Log 10	*******	Stop Freq 5.71250000 GHz
dB/ Offst 11.4		CF Step 2.5000000 MHz <u>Auto Man</u>
dB	Span 25 MHz	Freq Offset 0.00000000 Hz
#Res BW 180 kHz         VBW 560 kHz           Occupied Bandwidth         oc	#Sweep 100 ms (601 pts) cc BW % Pwr 99.00 %	Signal Track On <u>Off</u>
16.4517 MHz	x dB -26.00 dB	
Transmit Freq Error -101.633 kHz x dB Bandwidth 20.246 MHz*		
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### 8.19.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	31.75	16.4600	6.61
Mid	5580	33.42	16.4747	6.61
High	5700	27.33	16.4517	6.61

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5500	23.39	23.16	29.16	22.55	10.39	11.00	10.39
Mid	5580	23.39	23.17	29.17	22.56	10.39	11.00	10.39
High	5700	23.39	23.16	29.16	22.55	10.39	11.00	10.39

### Duty Cycle CF (dB) 0.00

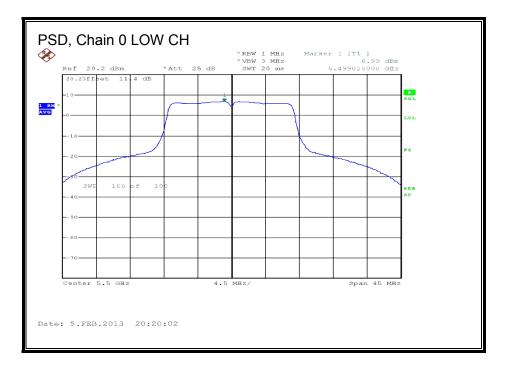
### **Output Power Results**

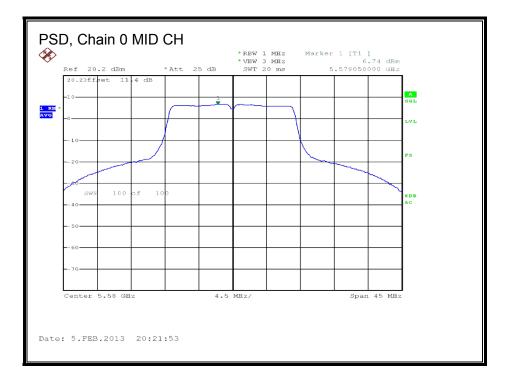
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	20.03	20.03	22.55	-2.52
Mid	5580	20.12	20.12	22.56	-2.44
High	5700	20.02	20.02	22.55	-2.53

### **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	6.99	6.99	10.39	-3.40
Mid	5580	6.74	6.74	10.39	-3.65
High	5700	6.87	6.87	10.39	-3.52

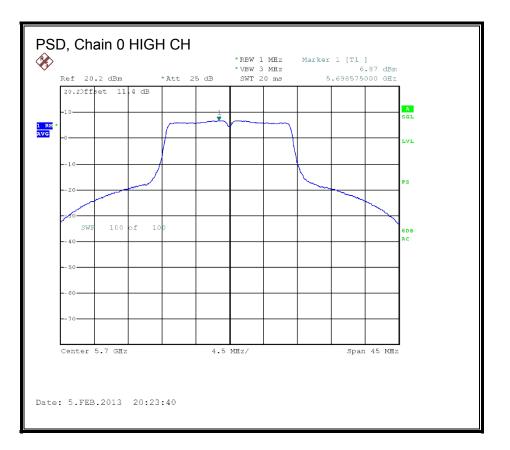
### PSD, Chain 0





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#### 8.19.4. PEAK EXCURSION

### LIMITS

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### RESULTS

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5580	17.58	6.74	0.00	10.84	13	-2.16

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### PEAK EXCURSION

PEAK EX				0.1				R	Т	Freq/Channel
Ref 25 dBm #Peak		Atten 3	0 dB	1	1	1	Mkr1	5.581 53 17.58		Center Freq 5.58000000 GHz
Log 10 dB/			antiter of the second second	ath a way	0	and the second sec	h			Start Freq 5.56000000 GHz
Offst 11.2 dB	huhhrd	, AN					N <sub>WW</sub>	hillmanhur	Minut	Stop Freq 5.60000000 GHz
#PAvg										CF Step 4.00000000 MHz <u>Auto Mar</u>
V1 S2 S3 FC										Freq Offset 0.00000000 Hz
¤(f): FTun Swp										Signal Track On <u>Off</u>
Center 5.580 0 #Res BW 1 MH			v	BW 3 M	Hz	s	weep 1	Span 4 ms (601		

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# 8.20. 802.11a LEGACY 1TX MODE, CHANNEL 144, 5.6 GHz BAND

## 8.20.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

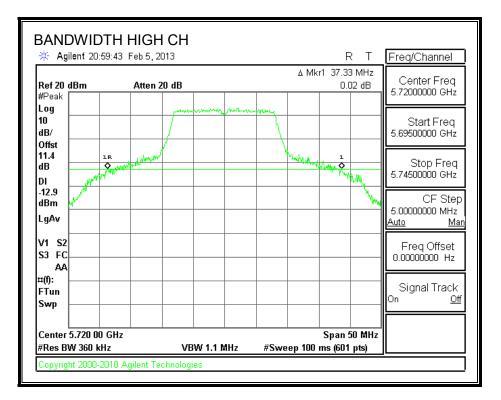
### **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
High	5720	37.33

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#### 26 dB BANDWIDTH



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### 8.20.2. 99% BANDWIDTH

### LIMITS

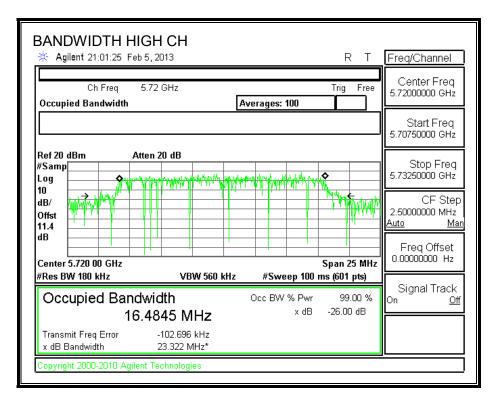
None; for reporting purposes only.

### <u>RESULTS</u>

Channel	Frequency 99% Bandwidth						
	(MHz)	(MHz)					
High	5720	16.4845					

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### 99% BANDWIDTH



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## 8.20.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

#### Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
High	5720	23.67	13.2423	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5720	24.00	22.22	28.22	22.22	10.39	11.00	10.39

#### **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	16.06	16.06	22.22	-6.16

### **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	6.120	6.12	10.39	-4.27

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#### Limits (FCC), portion in 5.8 GHz UNII 3 band

#### Bandwidth and Antenna Gain Channel Frequency Min Min Directional 99% 26 dB Gain BW BW (MHz) (MHz) (MHz) (dBi) 5720 3.2423 High 13.67 6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5720	22.36	16.11	22.11	16.11	10.39	11.00	10.39

#### **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	9.71	9.71	16.11	-6.40

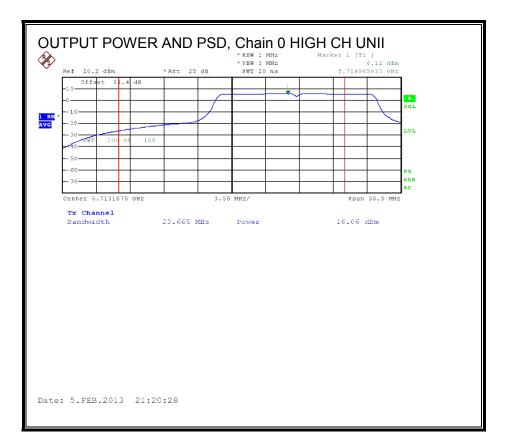
#### **PSD Results**

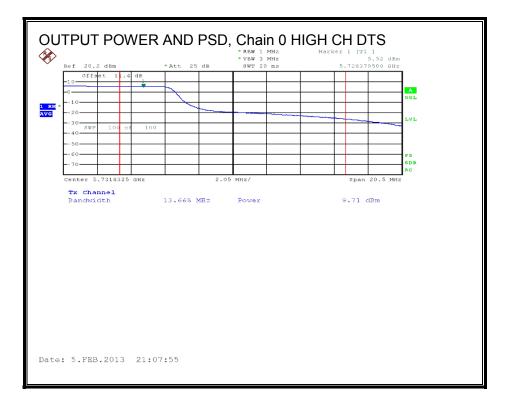
Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	5.520	5.52	10.39	-4.87

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#### OUTPUT POWER AND PSD, Chain 0





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# 8.21. 802.11n HT20 CDD 2TX MODE, 5.6 GHz BAND

# 8.21.1. 26 dB BANDWIDTH

#### <u>LIMITS</u>

None; for reporting purposes only.

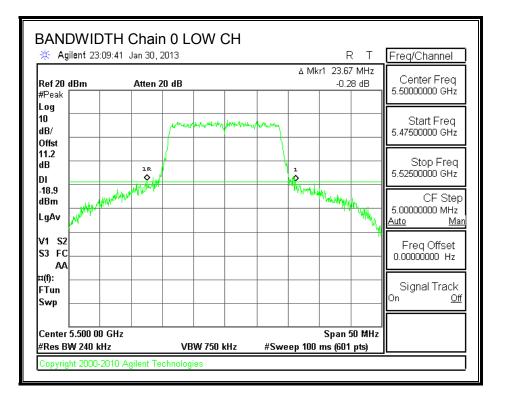
#### **RESULTS**

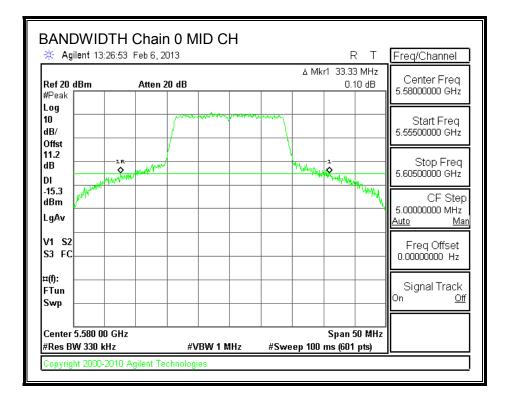
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5500	23.67	28.25
Mid	5580	33.33	35.42
High	5700	25.67	28.25

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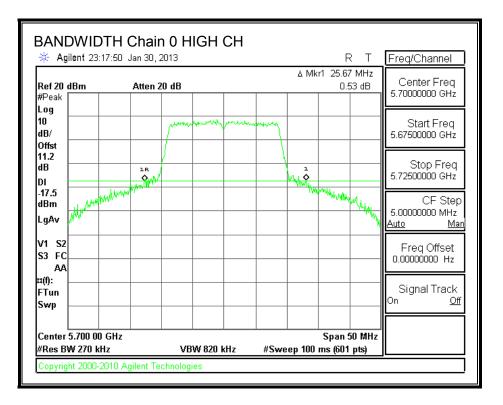
#### 26 dB BANDWIDTH, Chain 0



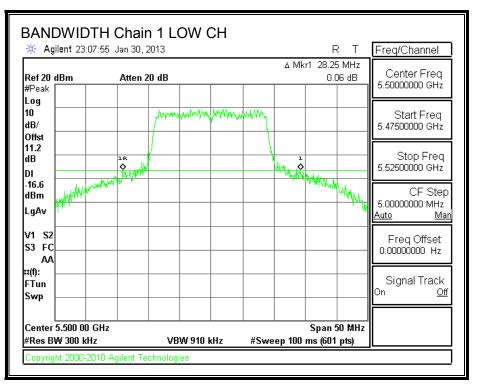


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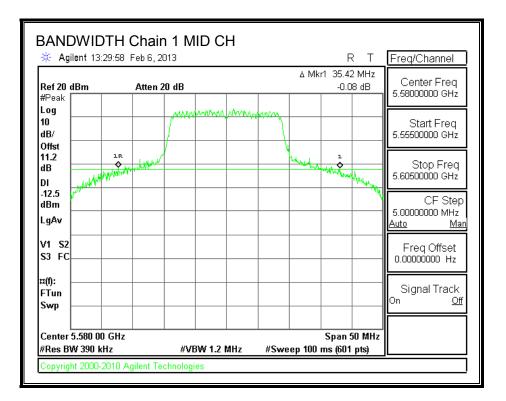


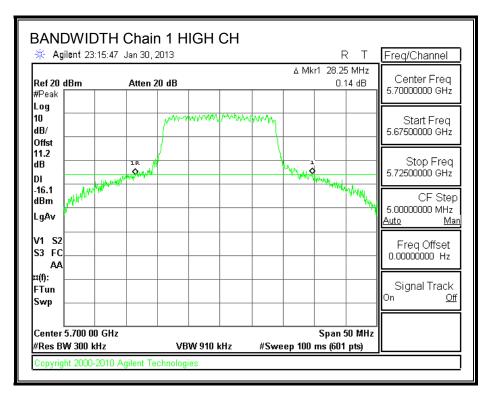
#### 26 dB BANDWIDTH, Chain 1



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# 8.21.2. 99% BANDWIDTH

### **LIMITS**

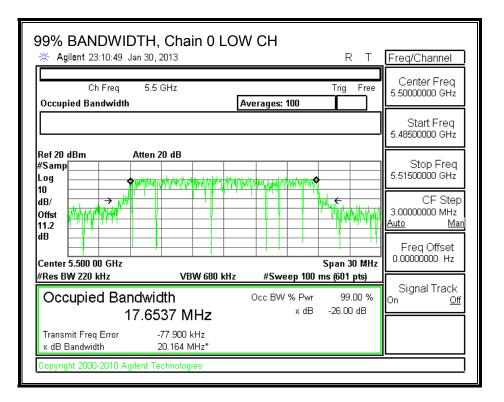
None; for reporting purposes only.

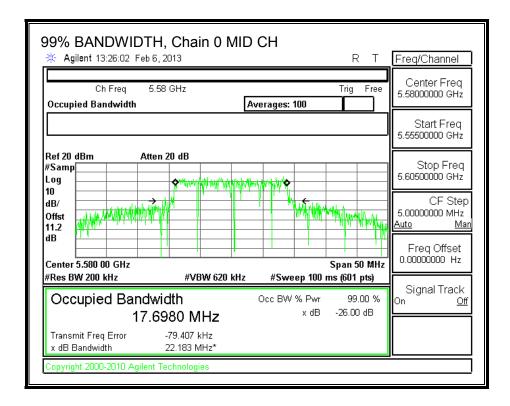
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5500	17.6537	17.6459	
Mid	5580	17.6980	17.7260	
High	5700	17.6611	17.6747	

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#### 99% BANDWIDTH, Chain 0

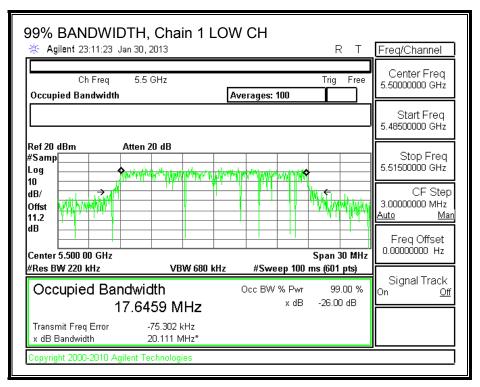




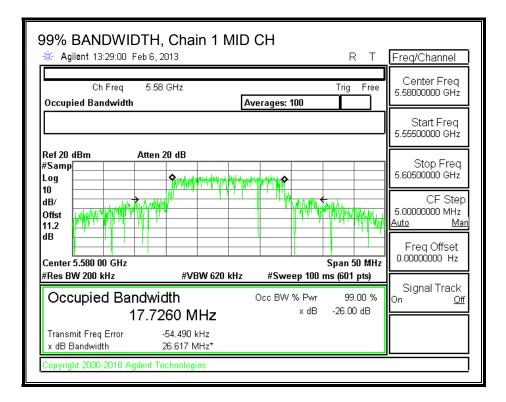
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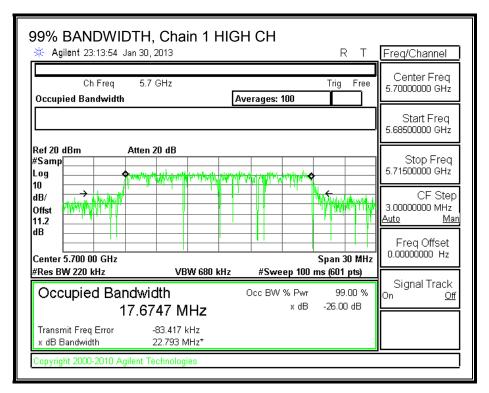
99% BANDWIDTH, C		GH CH	RТ	Freq/Channel
Ch Freq 5.7 GH Occupied Bandwidth	- r	Averages: 100	Trig Free	Center Freq 5.7000000 GHz
				Start Freq 5.68500000 GHz
Ref 20 dBm Atten 20 d #Samp Log 10		White the second state of the second state o		Stop Freq 5.71500000 GHz
dB/ Offst 11.2 dB				CF Step 3.00000000 MHz <u>Auto Man</u>
Center 5.700 00 GHz #Res BW 220 kHz	VBW 680 kHz	#Sweep 10	Span 30 MHz 10 ms (601 pts)	Freq Offset 0.00000000 Hz
Occupied Bandwidth 17.661		Occ BW % Pw x dl		Signal Track On <u>Off</u>
	987 kHz 963 MHz*			
Copyright 2000-2010 Agilent Tech	nologies			

#### 99% BANDWIDTH, Chain 1



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# 8.21.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

#### **OUTPUT POWER RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	23.67	17.6459	6.21
Mid	5580	33.33	17.6980	6.21
High	5700	25.67	17.6611	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power
		Power	Power	EIRP	Limit
		Limit	Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	23.79	23.47	29.47	23.26
Mid	5580	23.79	23.48	29.48	23.27
High	5700	23.79	23.47	29.47	23.26

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	18.29	18.53	21.42	23.26	-1.83
Mid	5580	17.68	17.42	20.56	23.27	-2.71
High	5700	15.15	15.97	18.59	23.26	-4.67

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#### PSD RESULTS

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	23.67	17.6459	9.21
Mid	5580	33.33	17.6980	9.21
High	5700	25.67	17.6611	9.21

#### Limits

Channel	Frequency	FCC	IC	PSD
		PPSD	PSD	Limit
		Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5500	7.79	11.00	7.79
Mid	5580	7.79	11.00	7.79
High	5700	7.79	11.00	7.79

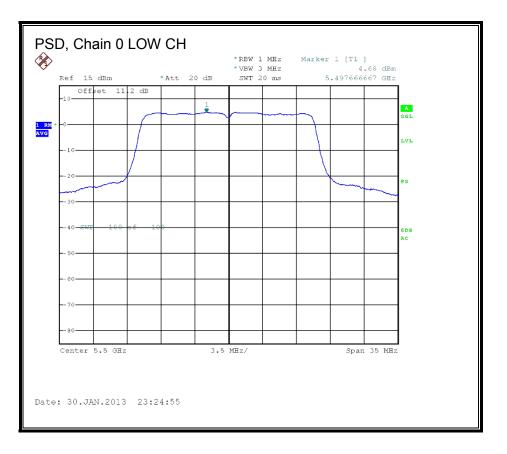
Duty Cycle CF (dB) 0.00	
-------------------------	--

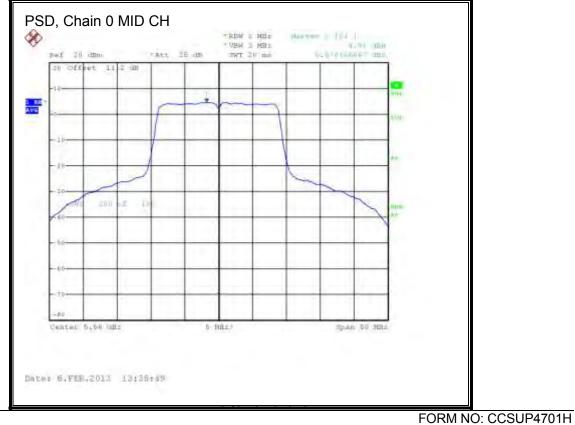
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	4.68	4.73	7.72	7.79	-0.07
Mid	5580	4.58	4.52	7.56	7.79	-0.23
High	5700	4.64	4.78	7.72	7.79	-0.07

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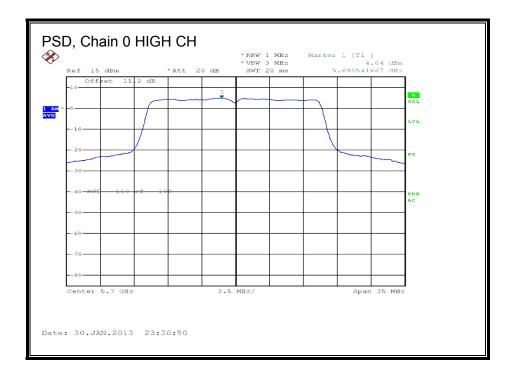
#### PSD, Chain 0



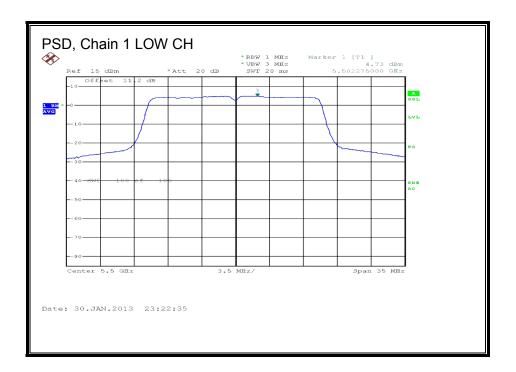


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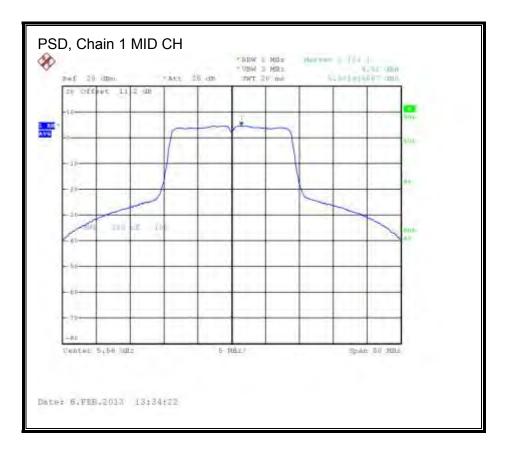


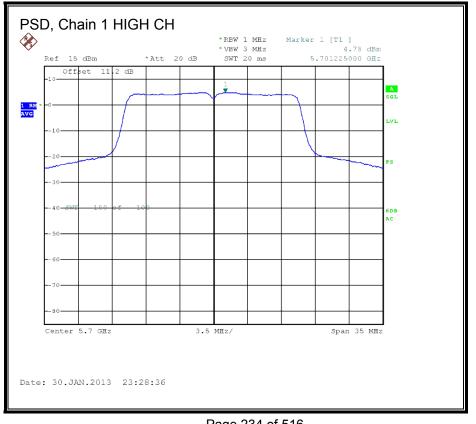
#### PSD, Chain 1



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# 8.21.4. PEAK EXCURSION

#### **LIMITS**

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

#### **RESULTS**

Chain 0

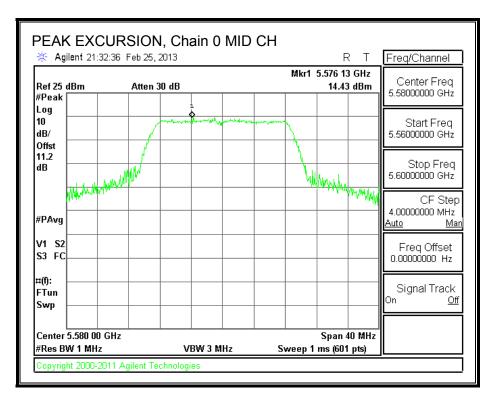
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5200	14.43	4.58	0.00	9.85	13	-3.15

Chain 1

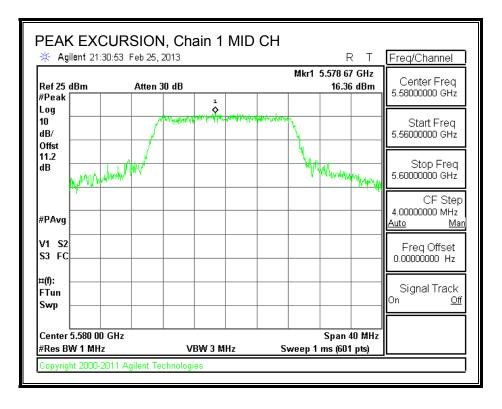
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5200	16.36	4.52	0.00	11.84	13	-1.16

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### PEAK EXCURSION, Chain 0



#### PEAK EXCURSION, Chain 1



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# 8.22. 802.11n HT20 CDD 2TX MODE, CHANNEL 144, 5.6 GHz BAND

# 8.22.1. 26 dB BANDWIDTH- UNII

#### LIMITS

None; for reporting purposes only.

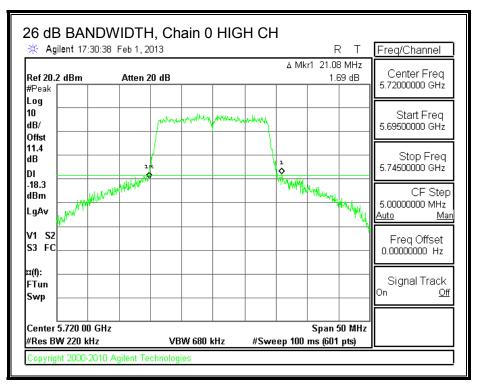
### **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
High	5720	15.54	19.04	

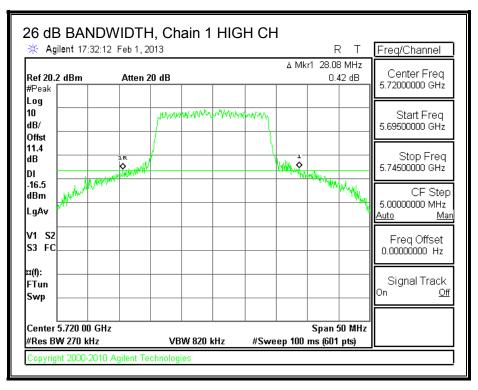
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#### 26 dB BANDWIDTH, Chain 0



#### 26 dB BANDWIDTH, Chain 1



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# 8.22.2. 99% BANDWIDTH

#### LIMITS

None; for reporting purposes only.

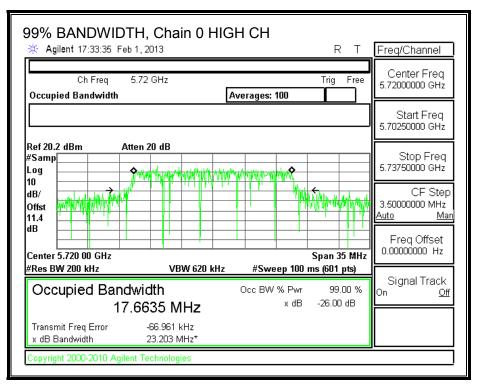
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
High	5720	13.8318	13.8358

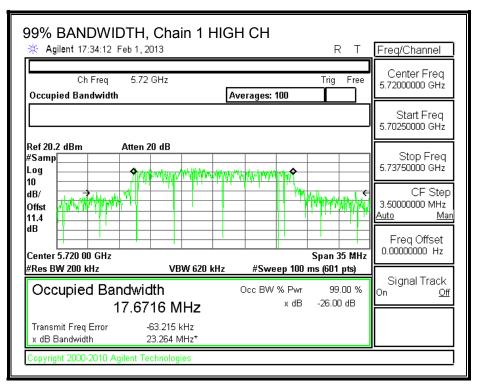
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#### 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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# 8.22.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **DIRECTIONAL ANTENNA GAIN**

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

For PPSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

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#### **RESULTS**

#### Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5720	15.54	13.8318	9.21	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5720	22.70	22.41	28.41	22.20	7.79	11.00	7.79

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	14.80	14.74	17.78	22.20	-4.42

### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	4.670	4.710	7.70	7.79	-0.09

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### Limits (FCC), portion in 5.8 GHz UNII 3 band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5720	5.54	3.8318	9.21	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5720	18.23	16.83	22.83	16.62	7.79	11.00	7.79

#### **Output Power Results**

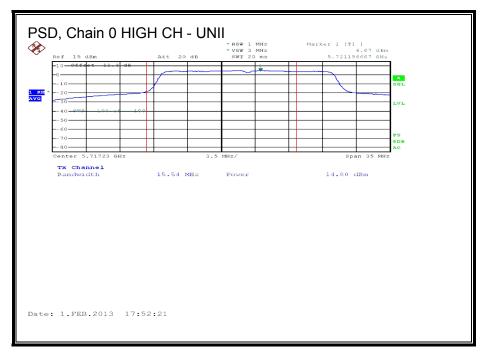
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	9.05	9.08	12.08	16.62	-4.55

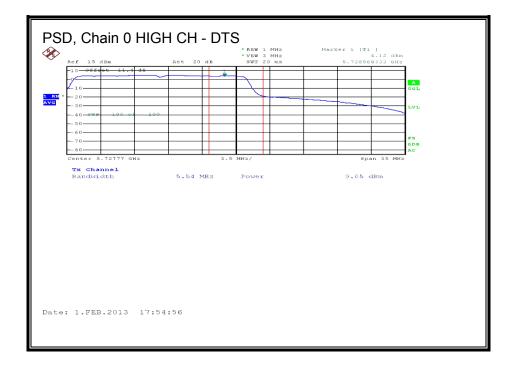
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5720	4.120	4.010	7.08	7.79	-0.71

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#### <u>PSD, Chain 0</u>

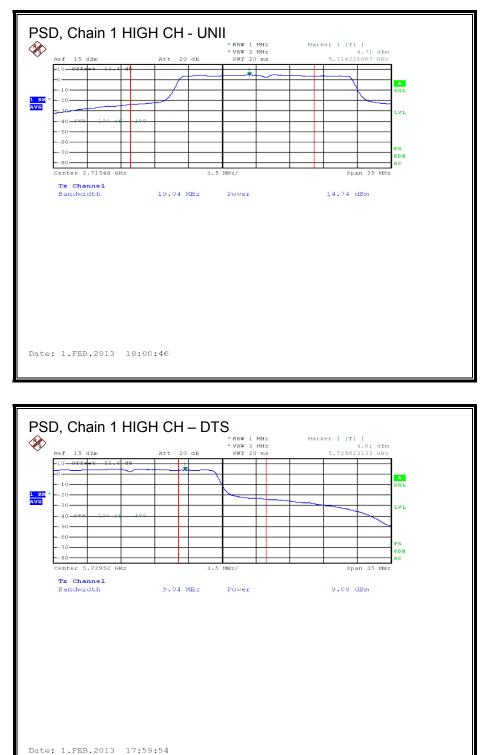




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#### <u>PSD, Chain 1</u>



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# 8.23. 802.11n HT20 STBC 2TX MODE, 5.6 GHz BAND

# 8.23.1. 26 dB BANDWIDTH

#### <u>LIMITS</u>

None; for reporting purposes only.

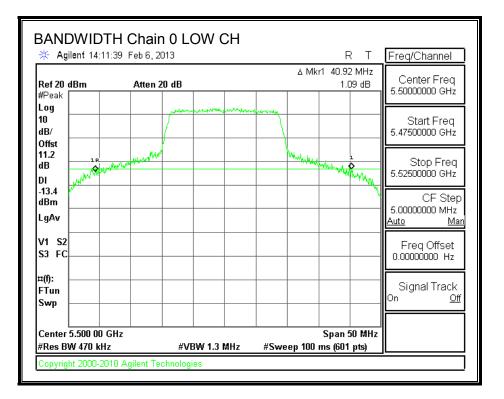
#### **RESULTS**

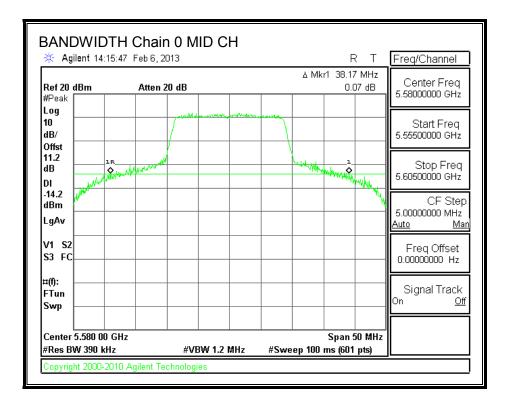
Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5500	40.92	41.17
Mid	5580	38.17	37.75
High	5700	39.00	40.75

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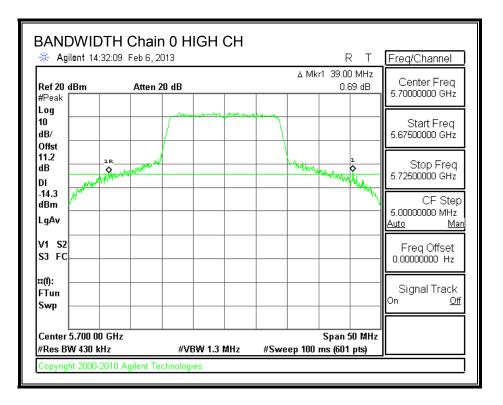
#### 26 dB BANDWIDTH, Chain 0



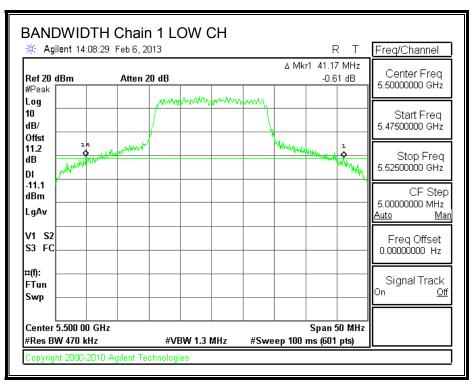


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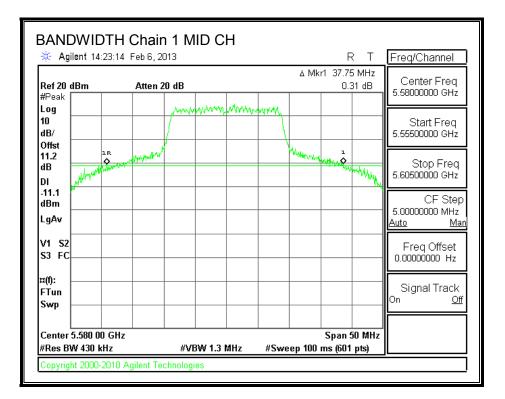
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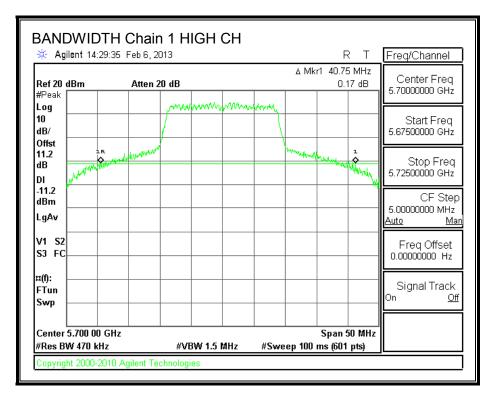


#### 26 dB BANDWIDTH, Chain 1



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# 8.23.2. 99% BANDWIDTH

#### **LIMITS**

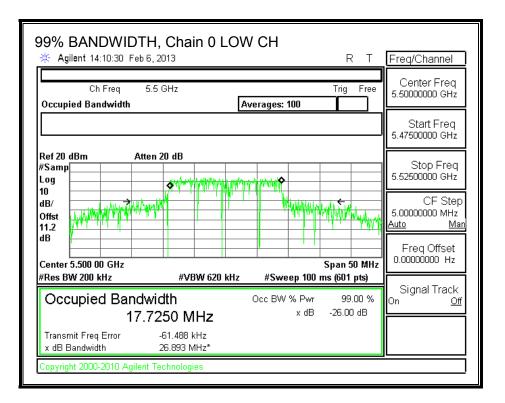
None; for reporting purposes only.

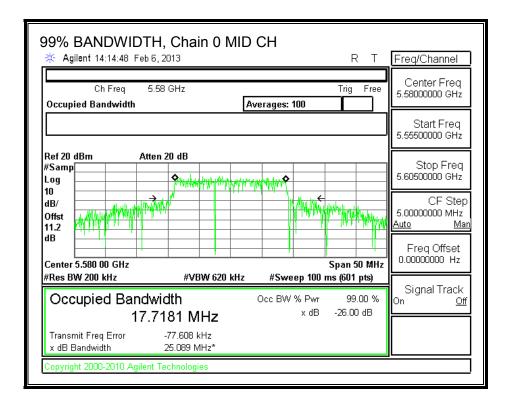
#### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5500	17.7250	17.7825
Mid	5580	17.7181	17.7836
High	5700	17.7013	17.7955

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#### 99% BANDWIDTH, Chain 0

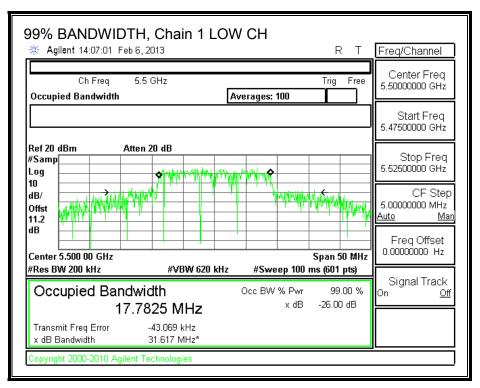




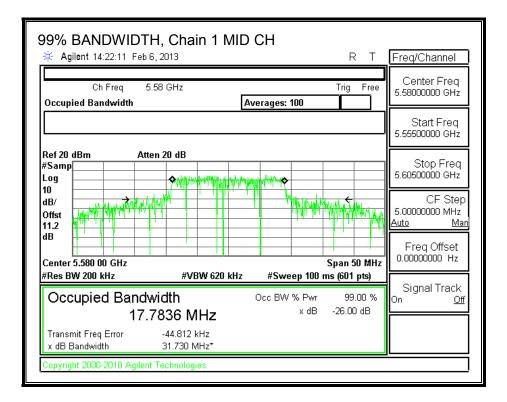
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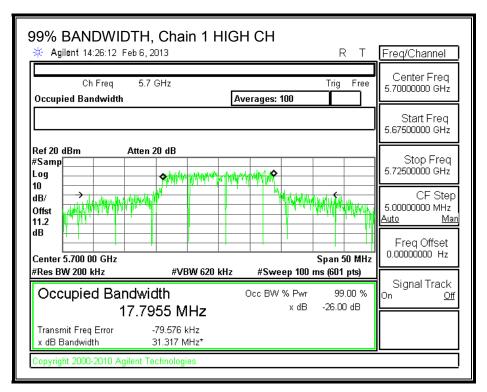
99% BANDWIDTH, Chain 0 HIGH CH	Freq/Channel
Ch Freq 5.7 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 5.70000000 GHz
Ref 20 dBm Atten 20 dB	Start Freq 5.67500000 GHz Stop Freq
	5.72500000 GHz CF Step 5.00000000 MHz <u>Auto Man</u>
dB Center 5.700 00 GHz #Res BW 200 kHz #VBW 620 kHz #Sweep 100 ms (601 pts)	Freq Offset 0.00000000 Hz Signal Track
17.7013 MHz × dB -26.00 dB	On <u>Off</u>
Transmit Freq Error       -55.658 kHz         x dB Bandwidth       23.246 MHz*         Copyright 2000-2010 Agilent Technologies	

#### 99% BANDWIDTH, Chain 1



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### 8.23.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

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### **OUTPUT POWER RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	40.92	17.7250	6.21
Mid	5580	37.75	17.7181	6.21
High	5700	39.00	17.7013	6.21

### Limits

Channel	Frequency	FCC	IC	IC	Power
		Power	Power	EIRP	Limit
		Limit	Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)
Low	5500	23.79	23.49	29.49	23.28
Mid	5580	23.79	23.48	29.48	23.27
High	5700	23.79	23.48	29.48	23.27

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Bowor	Power	Dowor		
		Power		Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	20.01	20.21	23.12	23.28	-0.15
Mid	5580	20.21	20.19	23.21	23.27	-0.06
High	5700	17.01	17.15	20.09	23.27	-3.18

### PSD RESULTS

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5500	40.92	17.7250	6.21
Mid	5580	37.75	17.7181	6.21
High	5700	39.00	17.7013	6.21

### Limits

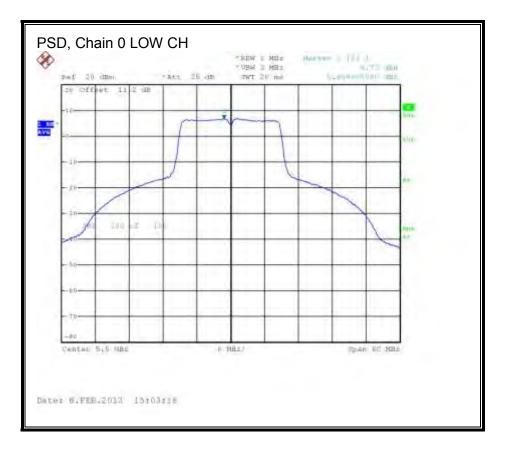
Channel	Frequency	FCC	IC	PSD
		PSD	PSD	Limit
		Limit	Limit	
	(MHz)	(dBm)	(dBm)	(dBm)
Low	5500	10.79	11.00	10.79
Mid	5580	10.79	11.00	10.79
High	5700	10.79	11.00	10.79

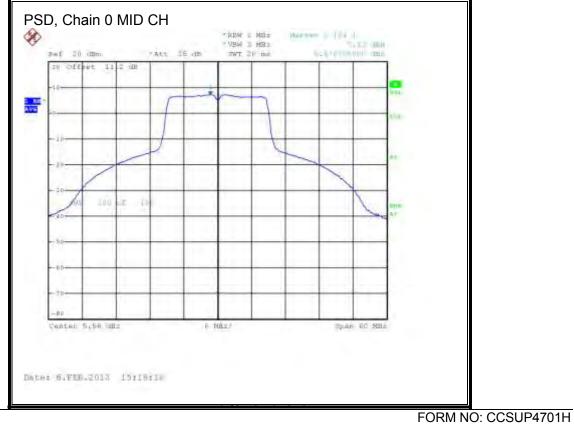
Duty Cycle CF (dB) 0.
-----------------------

### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5500	6.73	6.96	9.86	10.79	-0.93
Mid	5580	7.13	7.40	10.28	10.79	-0.51
High	5700	6.72	6.75	9.75	10.79	-1.04

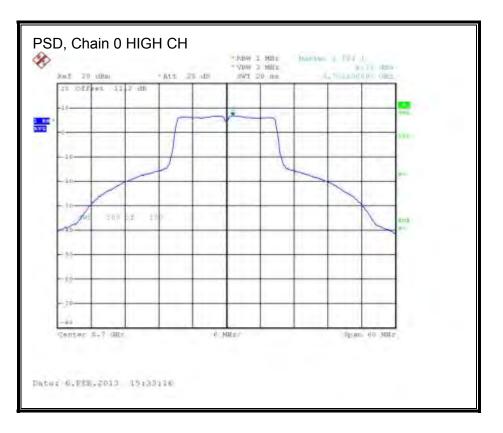
### PSD, Chain 0





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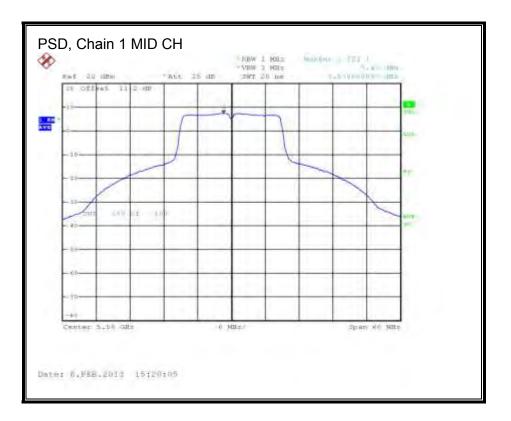
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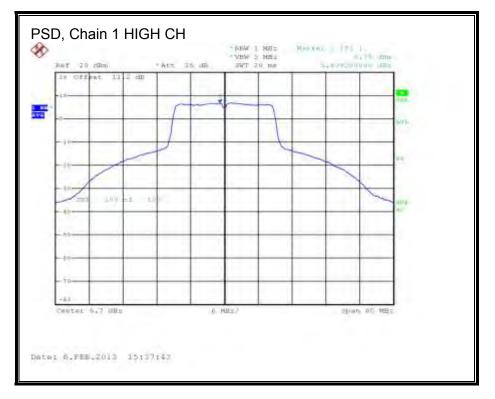


### PSD, Chain 1



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### 8.23.4. PEAK EXCURSION

### **LIMITS**

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### **RESULTS**

Chain 0

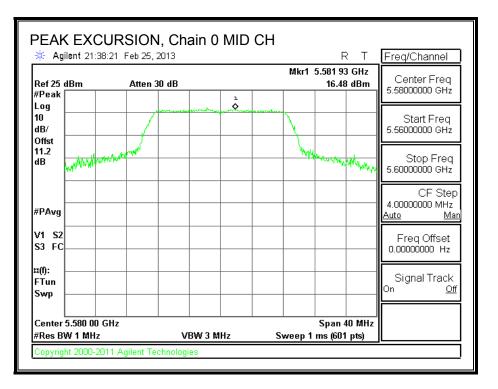
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5580	16.48	7.13	0.00	9.35	13	-3.65

Chain 1

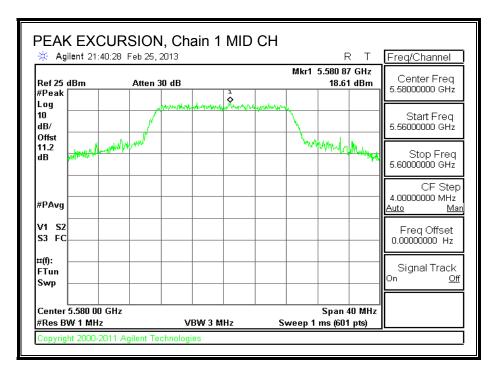
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5580	18.61	7.40	0.00	11.21	13	-1.79

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### PEAK EXCURSION, Chain 0



### **PEAK EXCURSION, Chain 1**



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# 8.24. 802.11n HT20 STBC 2TX MODE, CHANNEL 144, 5.6 GHz BAND

### 8.24.1.26 dB BANDWIDTH- UNII

### **LIMITS**

None; for reporting purposes only.

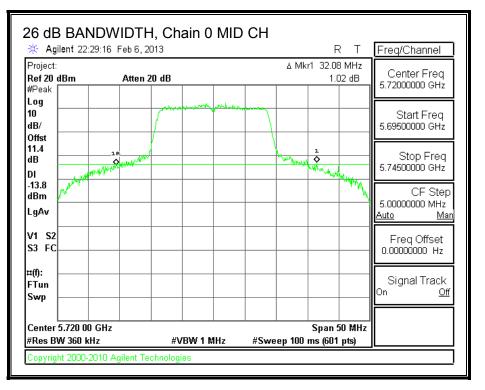
### **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
High	5720	21.04	22.38

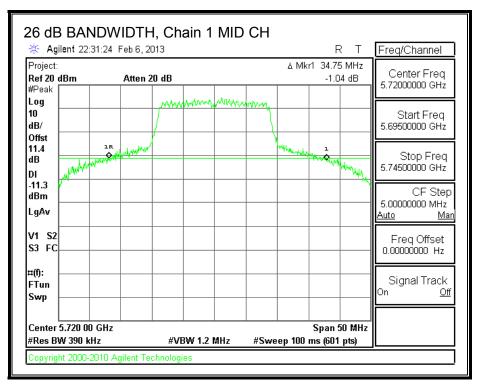
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### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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### 8.24.2.99% BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

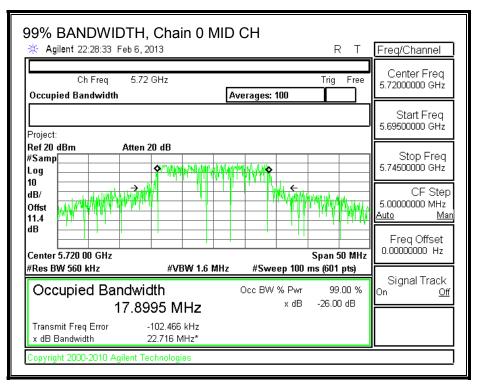
### <u>RESULTS</u>

Channel	nel Frequency 99% B		99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
High	5720	13.9497	13.8891

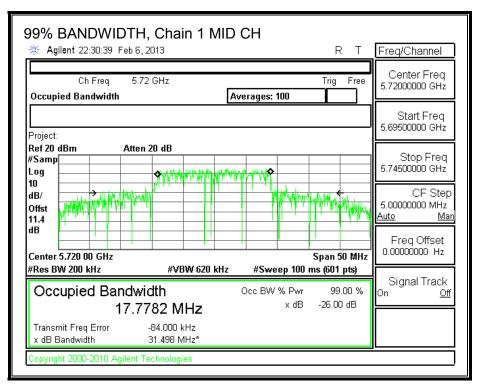
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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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## 8.24.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **DIRECTIONAL ANTENNA GAIN**

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

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### **RESULTS**

### Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Uncorrelated
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5720	21.040	13.8891	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5720	24.00	22.43	28.43	22.43	10.79	11.00	10.79

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5720	16.82	16.92	19.88	22.43	-2.55

### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5720	6.770	6.940	9.87	10.79	-0.92

### Limits (FCC), portion in 5.8 GHz UNII 3 band

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Uncorrelated
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5710	11.04	3.8891	6.21

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5710	21.43	16.90	22.90	16.90	10.79	11.00	10.79

### **Output Power Results**

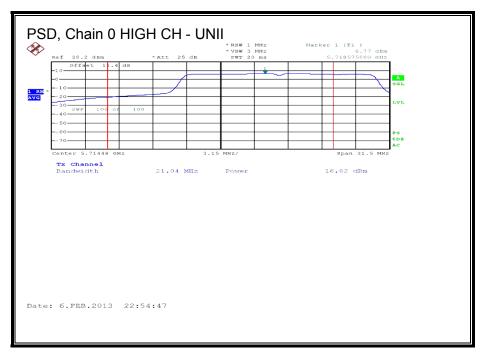
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
						_
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5710	10.58	10.68	13.64	16.90	-3.26

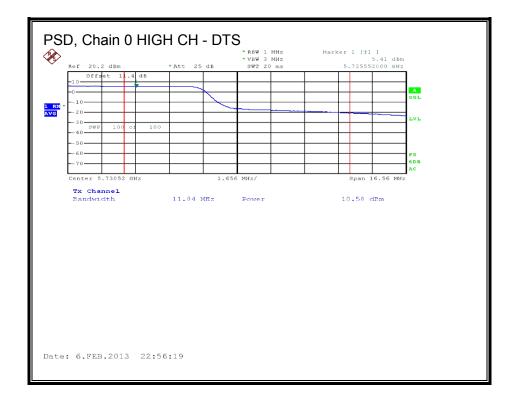
### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5710	5.410	5.670	8.55	10.79	-2.24

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### PSD, Chain 0

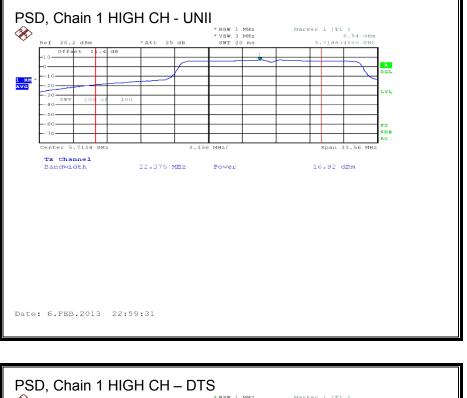


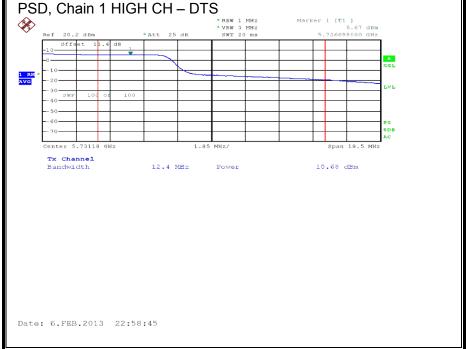


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### PSD, Chain 1





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# 8.25. 802.11n HT40 1TX MODE, 5.6 GHz BAND

## 8.25.1. 26 dB BANDWIDTH

### **LIMITS**

None; for reporting purposes only.

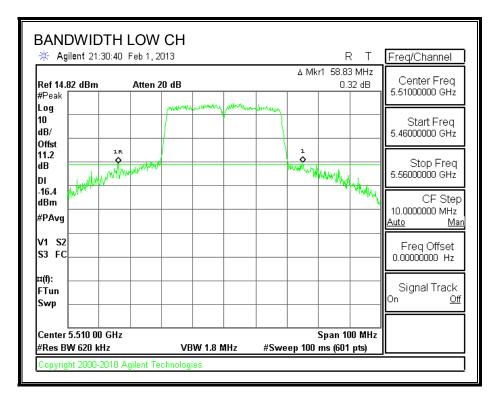
### **RESULTS**

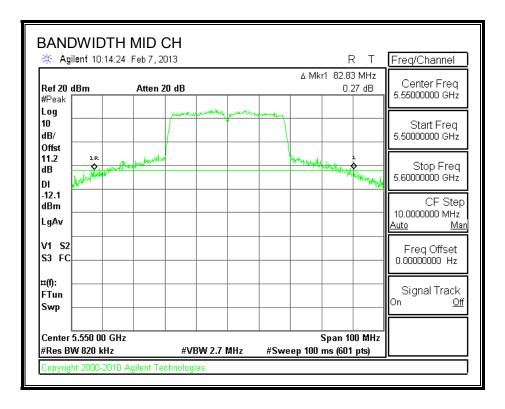
Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
Low	5510	58.83
Mid	5550	82.83
High	5670	71.67

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#### 26 dB BANDWIDTH





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FTun Swp											Signal Track On <u>Off</u>
V1 S2 S3 FC_ ¤íf):											Freq Offset 0.00000000 Hz
dBm #PAvg											CF Step 10.0000000 MHz <u>Auto Mar</u>
11.2 dB DI 4 -13.5	part and a	PHT -	a laring when					adment		the state of the s	Stop Freq 5.72000000 GHz
Log 10 dB/ Offst		1R				*					Start Freq 5.62000000 GHz
Ref 14.82 #Peak	2 dBm		Atten 2	0 dB	method	putning	ortunen	∆ Mk	r1 71.67 -2.2	7 MHz 19 dB	Center Freq 5.67000000 GHz

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#### 8.25.2. 99% BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

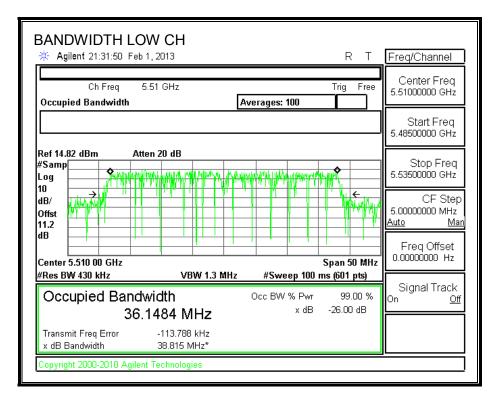
UL CCS

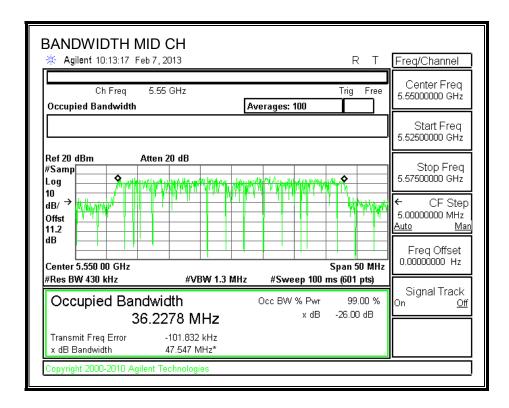
Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
Low	5510	36.1484
Mid	5550	36.2278
High	5670	36.1828

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### 99% BANDWIDTH





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BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 5.67 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 5.67000000 GHz
	Start Freq 5.64500000 GHz
Ref 14.82 dBm         Atten 20 dB           #Samp         ••••••••••••••••••••••••••••••••••••	Stop Freq 5.69500000 GHz
dB/ / / / / / / / / / / / / / / / / / /	CF Step 5.00000000 MHz <u>Auto Man</u>
dB	Freq Offset 0.00000000 Hz
#Res BW 430 kHz VBW 1.3 MHz #Sweep 100 ms (601 pts)	Signal Track
Occupied Bandwidth Occ BW % Pwr 99.00 % 36.1828 MHz × dB -26.00 dB	On <u>Off</u>
Transmit Freq Error -94.784 kHz x dB Bandwidth 44.640 MHz*	
Copyright 2000-2010 Agilent Technologies	

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### 8.25.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5510	58.83	36.1484	6.61
Mid	5550	82.83	36.2278	6.61
High	5670	71.67	36.1828	6.61

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PPSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5510	23.39	24.00	30.00	23.39	10.39	11.00	10.39
Mid	5550	23.39	24.00	30.00	23.39	10.39	11.00	10.39
High	5670	23.39	24.00	30.00	23.39	10.39	11.00	10.39

### Duty Cycle CF (dB) 0.22

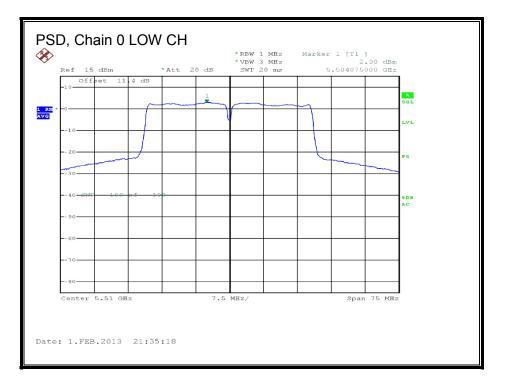
### **Output Power Results**

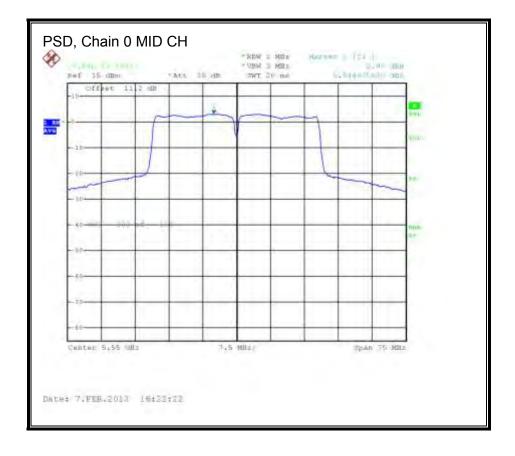
Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	17.79	17.79	23.39	-5.60
Mid	5550	20.25	20.25	23.39	-3.14
High	5670	20.10	20.10	23.39	-3.29

### **PSD Results**

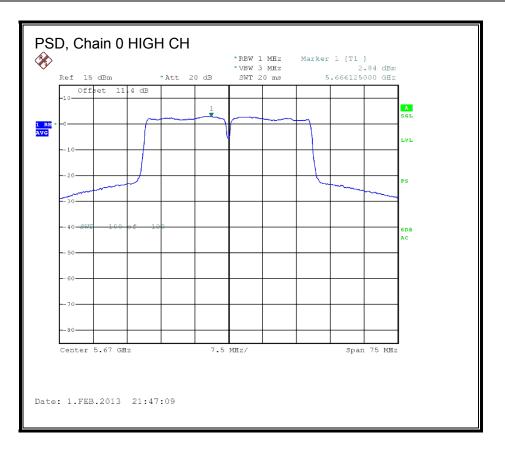
Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	2.90	3.12	10.39	-7.27
Mid	5550	2.98	3.20	10.39	-7.19
High	5670	2.84	3.06	10.39	-7.33

### PSD, Chain 0





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### 8.25.4. PEAK EXCURSION

### **LIMITS**

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### **RESULTS**

Channel	Frequency	PK Level	PSD	PSD DCCF Peak Excursion L		Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5550	13.73	2.98	0.24	10.51	13	-2.49

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### PEAK EXCURSION

🗧 Agilent 21:4	47:00 Feb	25,2013					R	T	Freq/Channel
lef 25 dBm Peak	At	ten 30 dB				Mkr1	5.544 0 13.73	l GHz dBm	Center Freq 5.55000000 GHz
og 0 B/			and you are a feature of the	a the second second	V <sup>ad</sup> an Indonega	marin	1		Start Freq 5.52000000 GHz
offst 1.2 B	public -						hintervely	m July	Stop Freq 5.58000000 GHz
PAvg									CF Step 6.0000000 MHz <u>Auto Ma</u>
1 S2 3 FC									Freq Offset 0.00000000 Hz
(f): Tun Swp									Signal Track <sup>On <u>Off</u></sup>
Center 5.550 0 v Res BW 1 MHz			BW 3 M	Hz	 S1	weep 1	Span 6 ms (601		

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# 8.26. 802.11n HT40 1TX MODE, CHANNEL 142, 5.6 GHz BAND

## 8.26.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

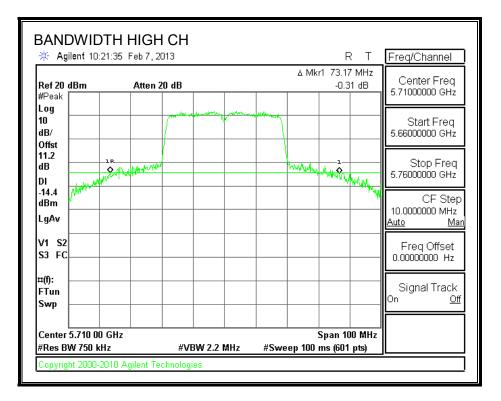
### **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
High	5710	73.17

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#### 26 dB BANDWIDTH



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## 8.26.2. 99% **BANDWIDTH**

### LIMITS

None; for reporting purposes only.

### <u>RESULTS</u>

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
High	5710	36.1865

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### 99% BANDWIDTH

99% BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 5.71 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 5.71000000 GHz
	Start Freq 5.68500000 GHz
Ref 20 dBm Atten 20 dB #Samp Log 10 dB/ Offst 11.2 dB Center 5.710 00 GHz #VBW 1.3 MHz #Sweep 100 ms (601 pts)	Stop Freq           5.73500000 GHz           CF Step           5.00000000 MHz <u>Auto</u> Man           Freq Offset         0.00000000 Hz
Occupied Bandwidth         Occ BW % Pwr         99.00 %           36.1865 MHz         × dB         -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error     -114.289 kHz       x dB Bandwidth     41.788 MHz*       Copyright 2000-2010 Agilent Technologies	

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## 8.26.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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### **RESULTS**

### Limits (FCC), portion in UNII 2 ext band

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
High	5710	51.6	33.0932	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5710	24.00	24.00	30.00	24.00	10.39	11.00	10.39

Duty Cycle CF (dB) 0.22

### **Output Power Results**

Channel	Frequency	Chain 1	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	16.77	16.99	24.00	-7.01

### **PSD Results**

Channel	Frequency	Chain 1	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	3.050	3.27	10.39	-7.12

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# Limits (FCC), portion in 5.8 GHz UNII 3 band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
High	5710	21.6	3.0932	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5710	24.00	15.90	21.90	15.90	10.39	11.00	10.39

Duty Cycle CF (dB) 0.22

#### **Output Power Results**

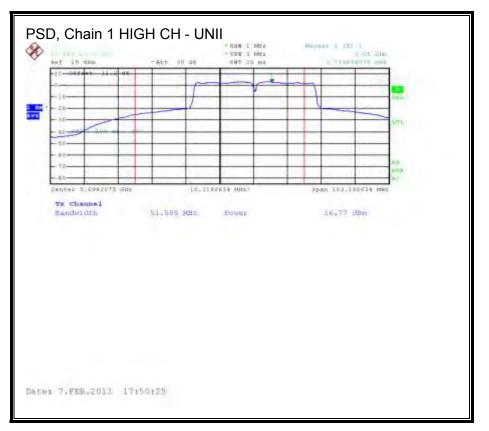
Channel	Frequency	Chain 1	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	3.40	3.62	15.90	-12.28

### **PSD Results**

Channel	Frequency	Chain 1	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	-0.940	-0.72	10.39	-11.11

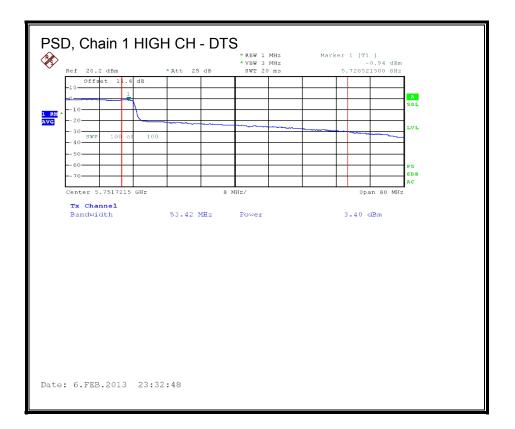
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# PSD, Chain 1



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# 8.27. 802.11n HT40 CDD 2TX MODE, 5.6 GHz BAND

# 8.27.1. 26 dB BANDWIDTH

### **LIMITS**

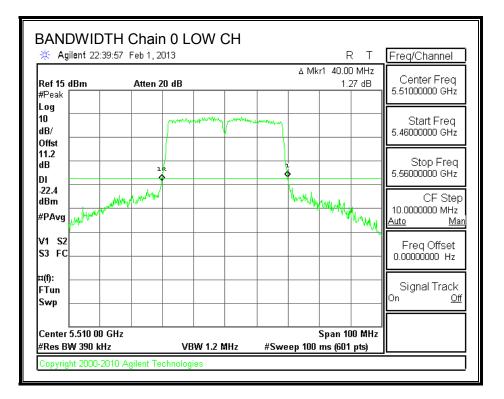
None; for reporting purposes only.

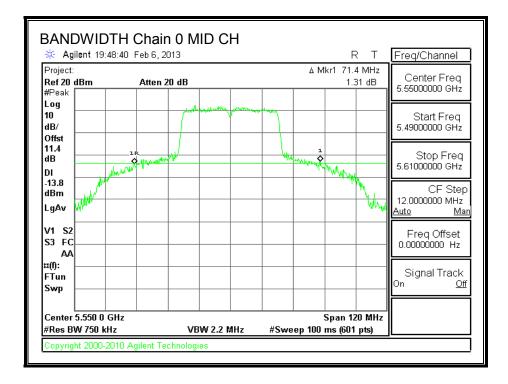
# **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5510	40.00	39.33
Mid	5550	71.40	75.20
High	5670	40.30	39.50

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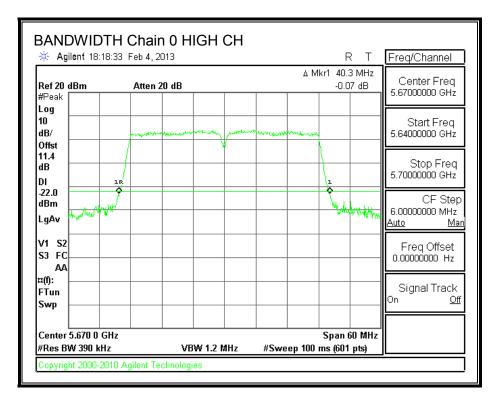
#### 26 dB BANDWIDTH, Chain 0



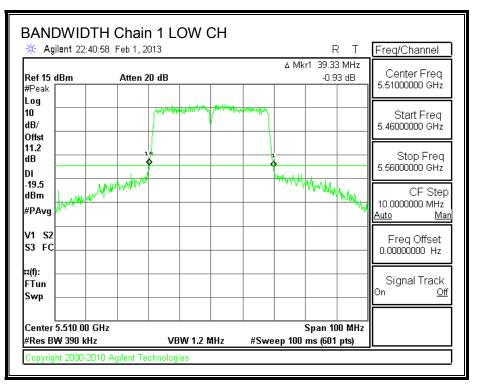


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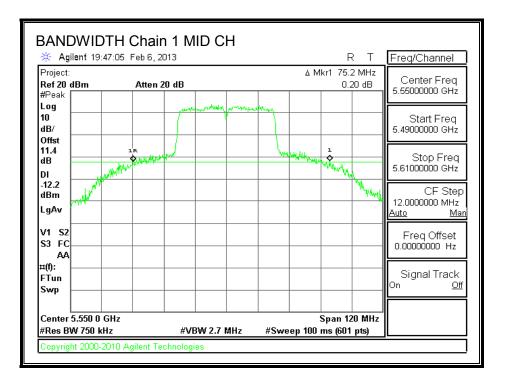


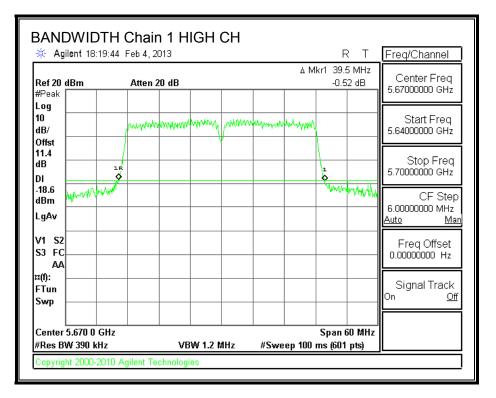
#### 26 dB BANDWIDTH, Chain 1



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# 8.27.2. 99% **BANDWIDTH**

# **LIMITS**

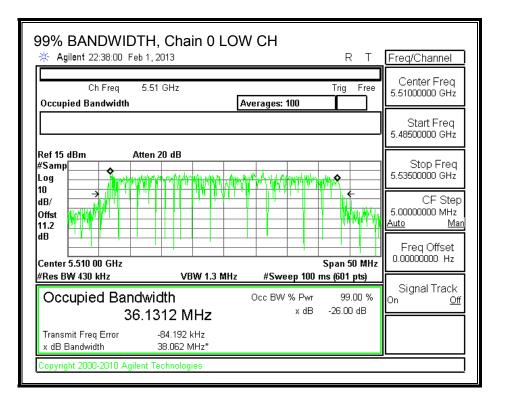
None; for reporting purposes only.

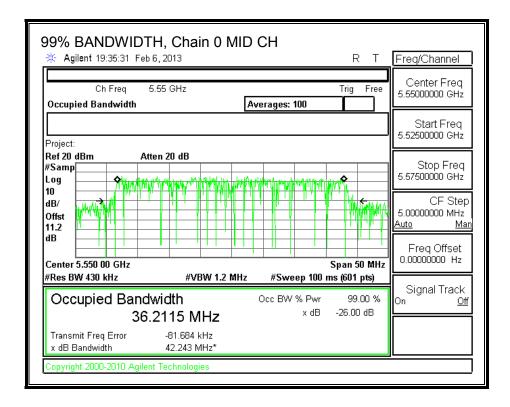
### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5510	36.1312	36.1683	
Mid	5550	36.2115	36.2298	
High	5670	36.1674	36.1513	

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# 99% BANDWIDTH, Chain 0

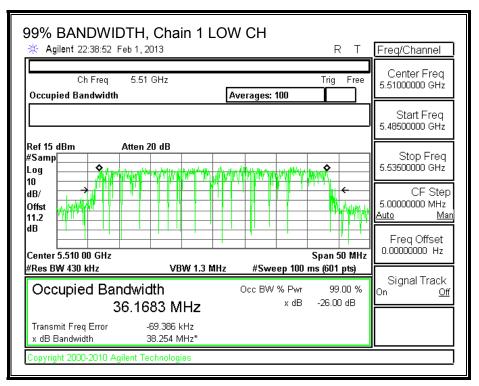




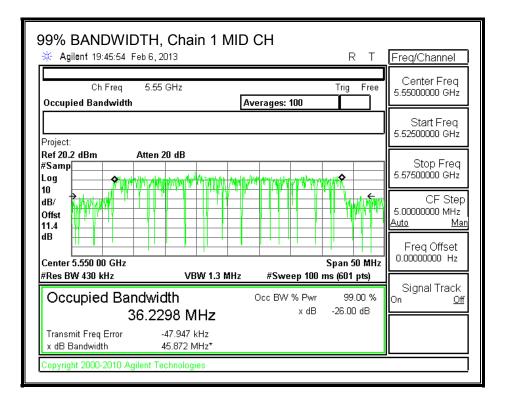
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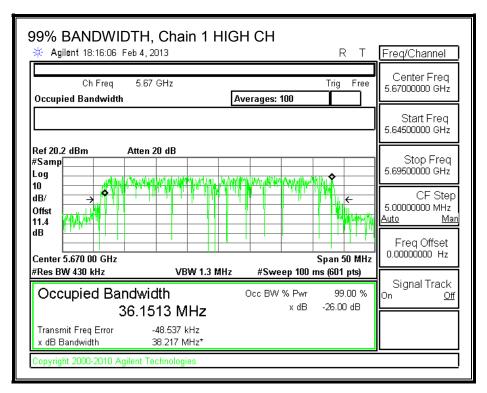
99% BANDWIDTH, Chai	in 0 HIGH CH	RT	Freq/Channel
Ch Freq 5.67 GHz Occupied Bandwidth	Averages: 100	Trig Free	Center Freq 5.6700000 GHz
			Start Freq 5.64500000 GHz
Ref 20.2 dBm Atten 20 dB #Samp Log			Stop Freq 5.69500000 GHz
dB/ Offst 11.4 dB			CF Step 5.00000000 MHz <u>Auto Man</u> Freq Offset
Center 5.670 00 GHz #Res BW 430 kHz VB	W 1.3 MHz #Sweep	Span 50 MHz 100 ms (601 pts)	0.00000000 Hz
Occupied Bandwidth 36.1674 M	Occ BW % F	<sup>D</sup> wr 99.00 % dB -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -60.911 k x dB Bandwidth 38.269 M			
Copyright 2000-2010 Agilent Technologi	es		

#### 99% BANDWIDTH, Chain 1



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# 8.27.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.77	6.61	6.21

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
5.77	6.61	9.21

### **RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Uncorrelated	Correlated	
		26 dB	99%	Directional	Directional	
		BW	BW	Gain	Gain	
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)	
Low	5510	39.33	36.1312	6.21	9.21	
Mid	5550	71.44	36.2115	6.21	9.21	
High	5670	39.50	36.1513	6.21	9.21	

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5510	23.79	24.00	30.00	23.79	7.79	11.00	7.79
Mid	5550	23.79	24.00	30.00	23.79	7.79	11.00	7.79
High	5670	23.79	24.00	30.00	23.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

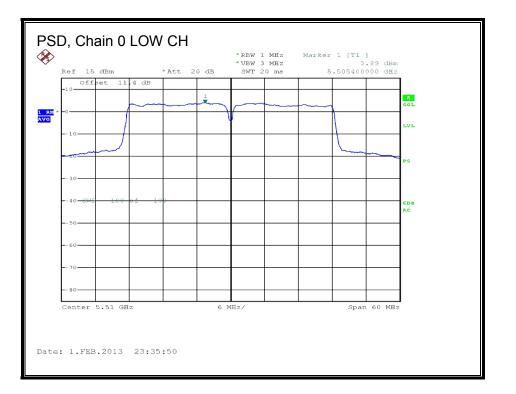
#### **Output Power Results**

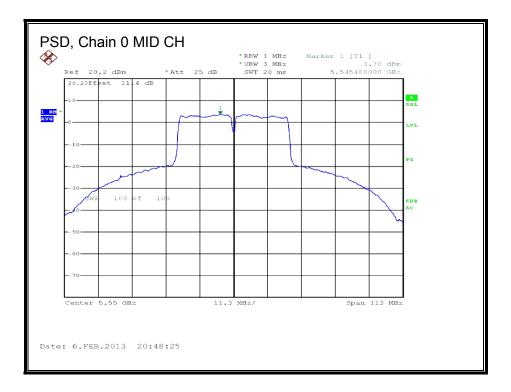
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	14.69	15.31	18.02	23.79	-5.77
Mid	5550	20.12	20.16	23.15	23.79	-0.64
High	5670	20.15	20.12	23.15	23.79	-0.64

### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	3.89	3.86	7.11	7.79	-0.68
Mid	5550	3.78	3.97	7.11	7.79	-0.68
High	5670	3.72	3.70	6.94	7.79	-0.85

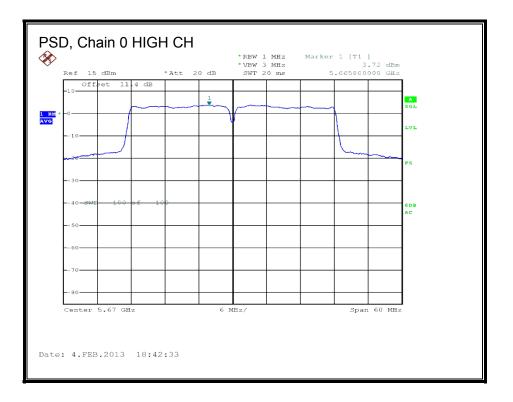
# PSD, Chain 0





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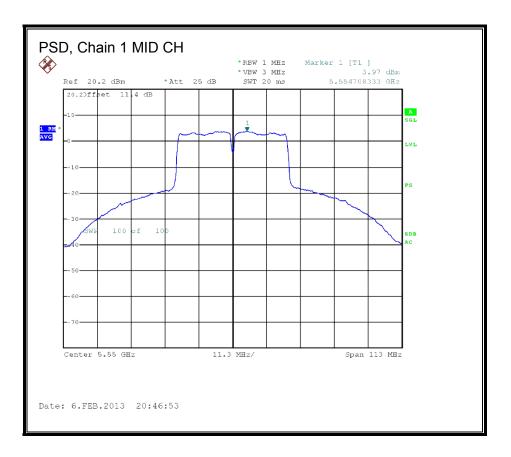
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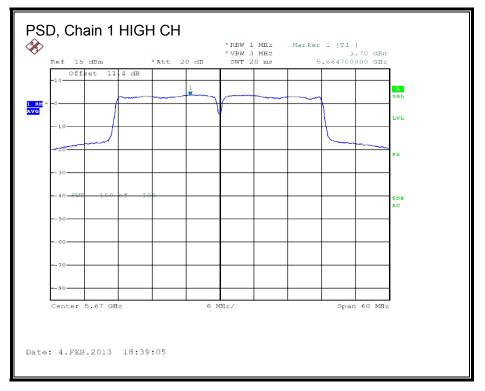


# PSD, Chain 1



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# 8.27.4. PEAK EXCURSION

#### **LIMITS**

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### **RESULTS**

Chain 0

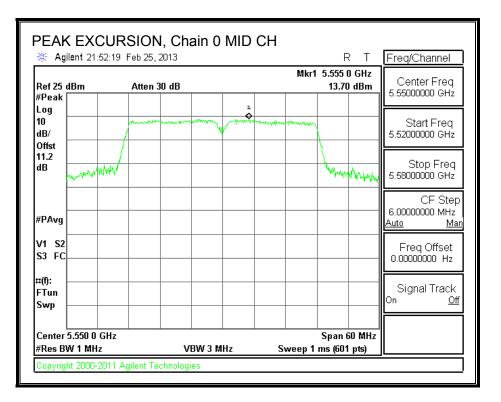
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5550	13.70	3.78	0.25	9.67	13	-3.33

Chain 1

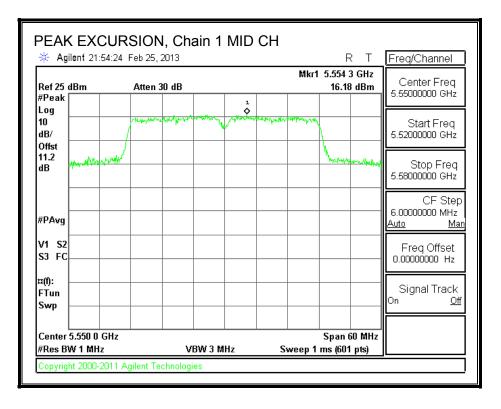
Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5550	16.18	3.97	0.25	11.96	13	-1.04

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# PEAK EXCURSION, Chain 0



#### PEAK EXCURSION, Chain 1



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# 8.28. 802.11n HT40 CDD 2TX MODE, CHANNEL 142, 5.6 GHz BAND

# 8.28.1.26 dB BANDWIDTH- UNII

# <u>LIMITS</u>

None; for reporting purposes only.

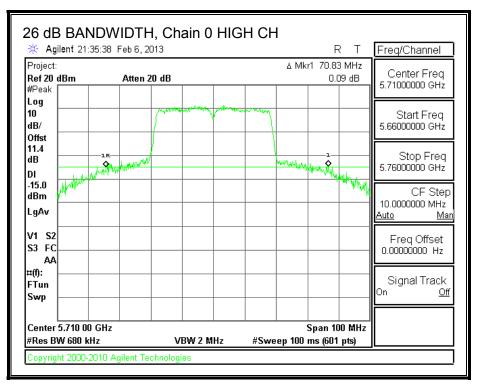
# **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
High	5710	50.42	54.00	

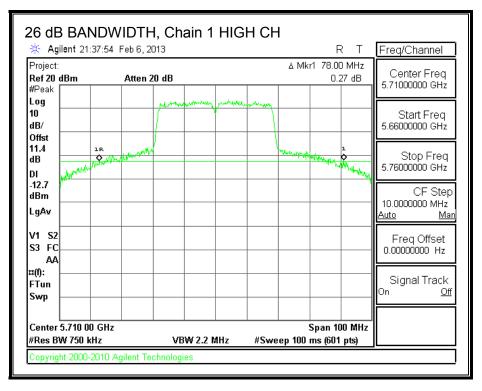
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#### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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# 8.28.2.99% BANDWIDTH

# **LIMITS**

None; for reporting purposes only.

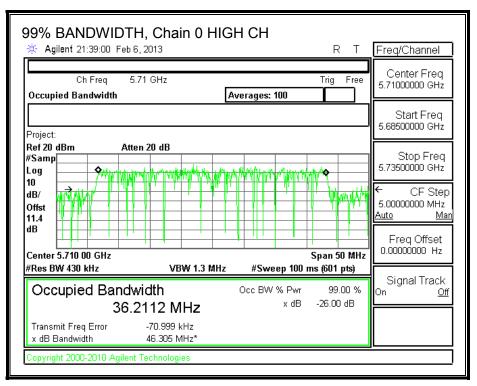
### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
High	5710	36.2112	36.2170

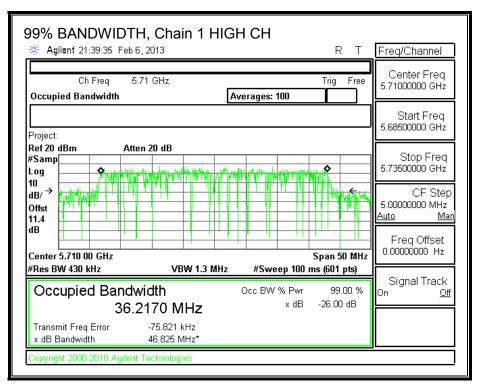
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### 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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# 8.28.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **DIRECTIONAL ANTENNA GAIN**

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

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#### **RESULTS**

# Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5710	50.45	33.1056	9.21	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5710	23.79	24.00	30.00	23.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	17.42	17.36	20.62	23.79	-3.17

# **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	3.700	3.740	6.95	7.79	-0.84

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# Limits (FCC), portion in 5.8 GHz UNII 3 band

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5710	20.4	3.1056	9.21	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5710	23.79	15.92	21.92	15.71	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

#### **Output Power Results**

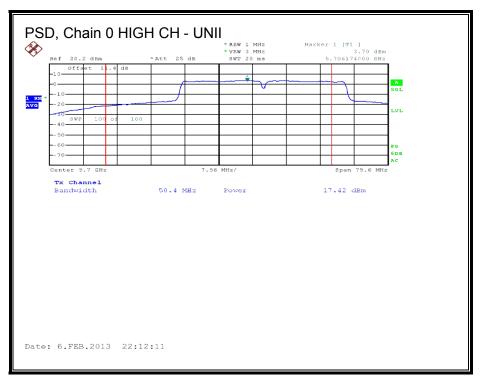
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	6.99	6.95	10.20	15.71	-5.51

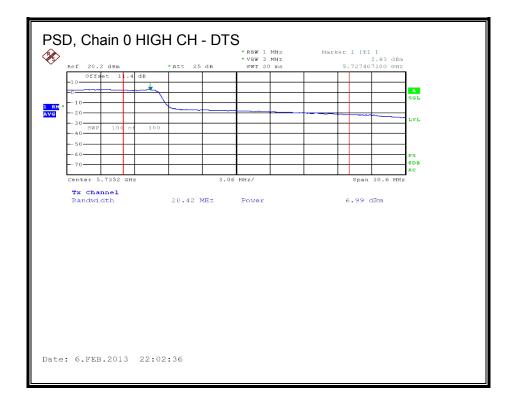
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5710	2.830	2.380	5.84	7.79	-1.95

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#### PSD, Chain 0

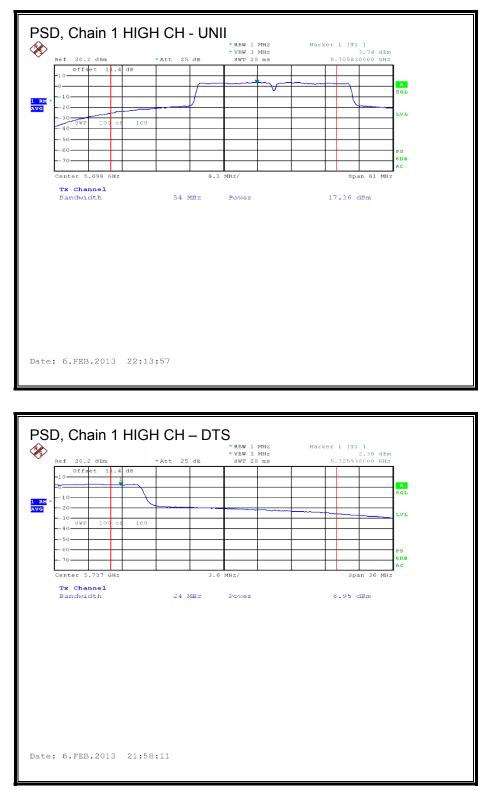




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#### PSD, Chain 1



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# 8.29. 802.11n AC40 BF 2TX MODE, 5.6 GHz BAND

# 8.29.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

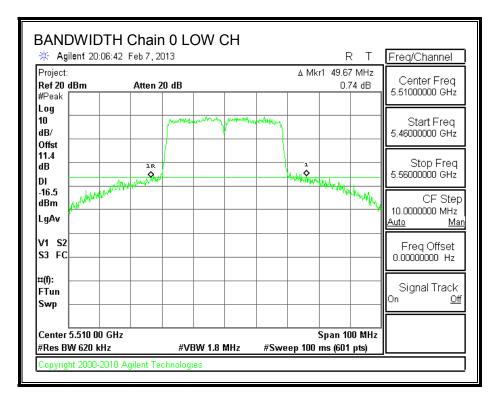
# **RESULTS**

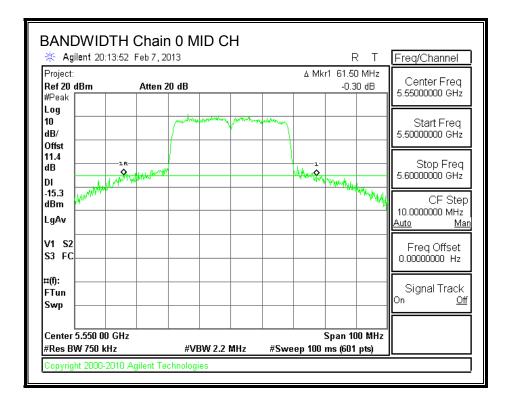
Channel Frequency		26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5510	49.67	72.17	
Mid	5550	61.50	63.17	
High	5670	65.17	69.67	

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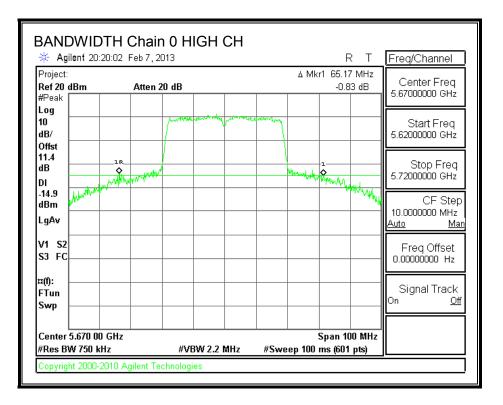
#### 26 dB BANDWIDTH, Chain 0



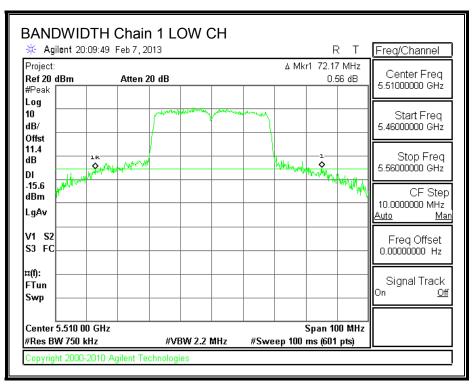


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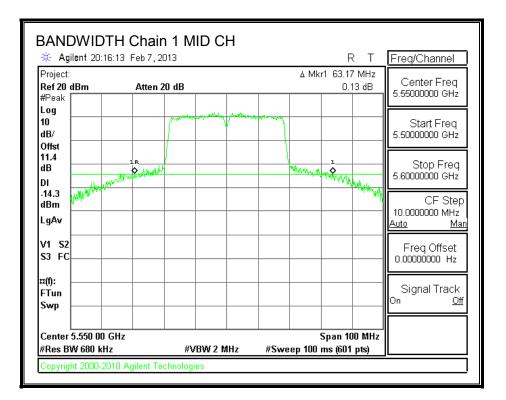
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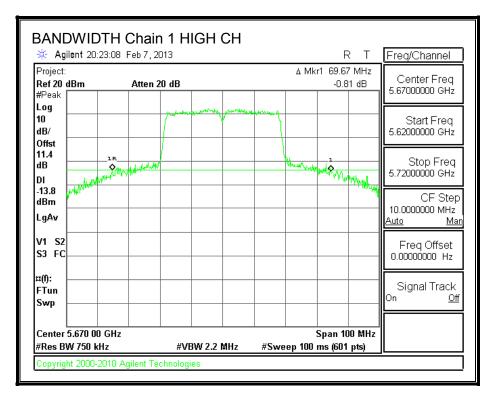


#### 26 dB BANDWIDTH, Chain 1



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# 8.29.2. 99% BANDWIDTH

# **LIMITS**

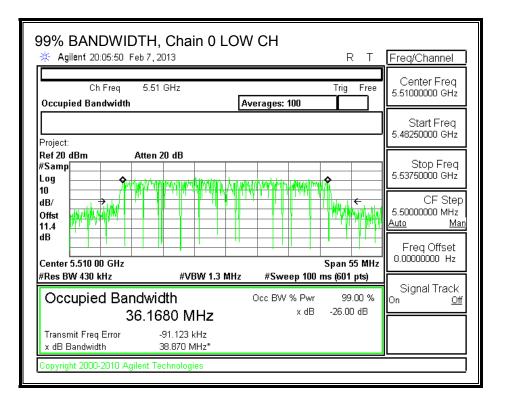
None; for reporting purposes only.

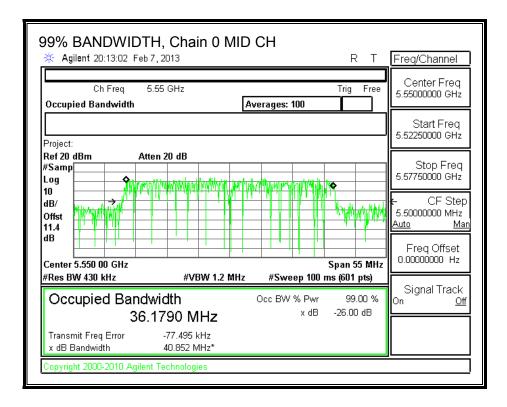
### <u>RESULTS</u>

Channel	hannel Frequency		99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5510	36.1680	36.2063
Mid	5550	36.1790	36.1805
High	5670	36.1668	36.1870

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### 99% BANDWIDTH, Chain 0

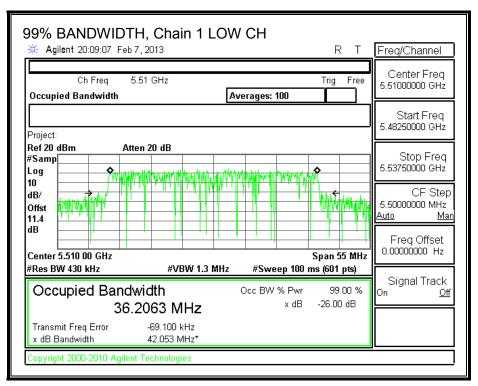




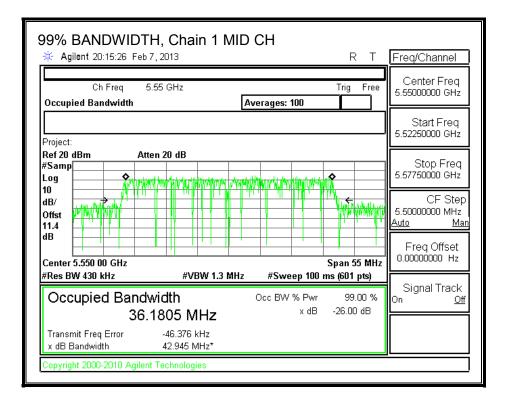
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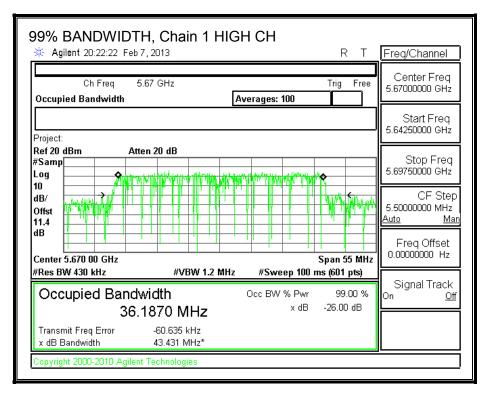
99% BANDWIDTH, Chain	0 HIGH CH	RТ	Freq/Channel
Ch Freq 5.67 GHz Occupied Bandwidth	Averages: 100	Trig Free	Center Freq 5.6700000 GHz
Project:			Start Freq 5.64250000 GHz
Ref 20 dBm Atten 20 dB #Samp Log	in the second	<b>^</b>	Stop Freq 5.69750000 GHz
dB/ Offst 11.4 dB			CF Step 5.5000000 MHz <u>Auto Man</u> Freq Offset
Center 5.670 00 GHz #Res BW 430 kHz #VBV	/ 1.2 MHz #Sweep 100	Span 55 MHz ms (601 pts)	0.00000000 Hz
Occupied Bandwidth 36.1668 MH	Осс ВW % Рwr <b>1z</b> × dB		Signal Track On <u>Off</u>
Transmit Freq Error -67.888 kH x dB Bandwidth 39.712 MH			
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#### 99% BANDWIDTH, Chain 1



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# 8.29.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

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## **RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5510	49.67	36.1680	9.21
Mid	5550	61.50	36.1790	9.21
High	5670	65.17	36.1668	9.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5510	20.79	24.00	30.00	20.79	7.79	11.00	7.79
Mid	5550	20.79	24.00	30.00	20.79	7.79	11.00	7.79
High	5670	20.79	24.00	30.00	20.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

#### **Output Power Results**

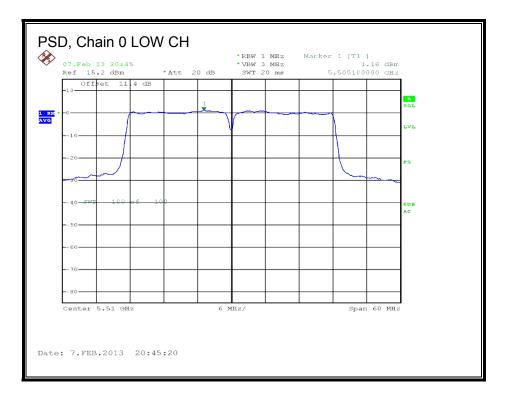
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	13.86	14.71	17.32	20.79	-3.47
Mid	5550	17.78	17.67	20.74	20.79	-0.05
High	5670	17.75	17.65	20.71	20.79	-0.08

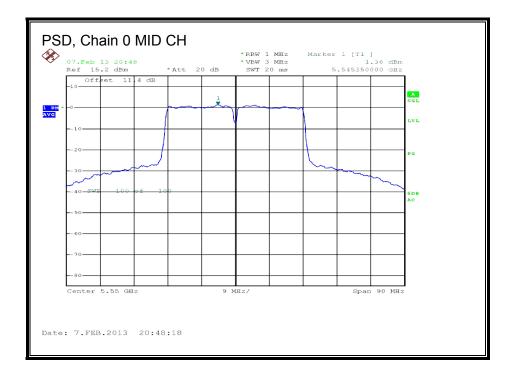
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5510	1.16	1.10	4.36	7.79	-3.43
Mid	5550	1.36	1.25	4.54	7.79	-3.25
High	5670	0.91	0.85	4.11	7.79	-3.68

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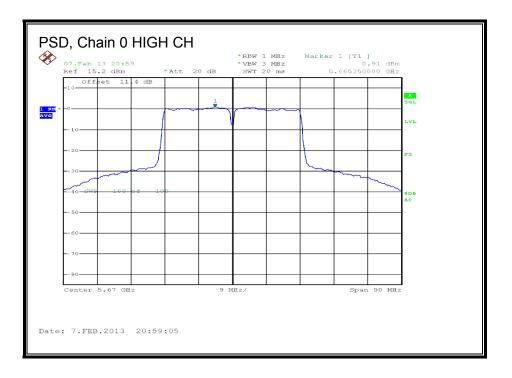
# PSD, Chain 0



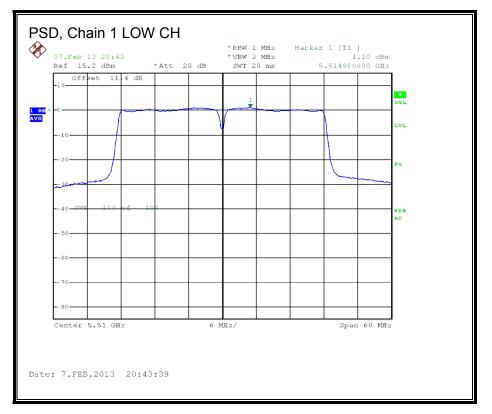


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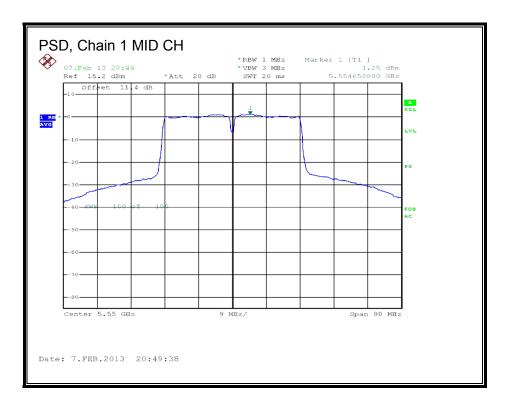
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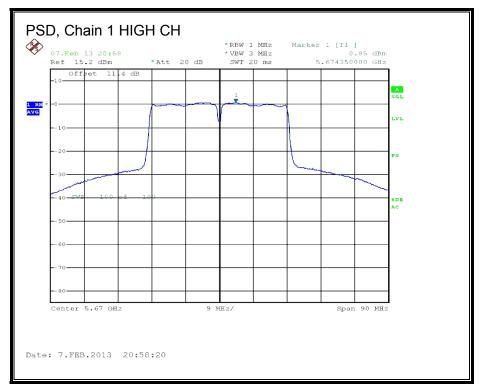


#### PSD, Chain 1



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# 8.30. 802.11n AC40 BF 2TX MODE, CHANNEL 142, 5.6 GHz BAND

# 8.30.1.26 dB BANDWIDTH- UNII

## <u>LIMITS</u>

None; for reporting purposes only.

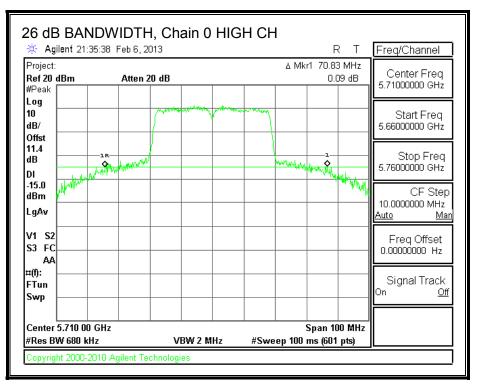
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
High	5710	70.83	78.00	

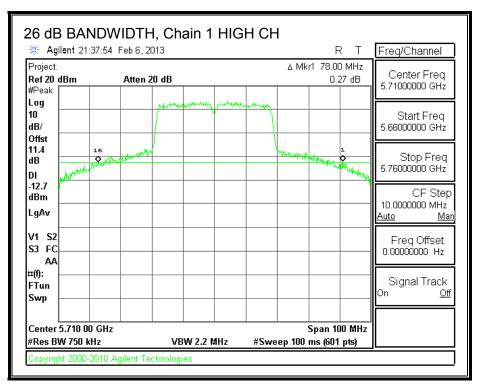
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#### 26 dB BANDWIDTH, Chain 0



#### 26 dB BANDWIDTH, Chain 1



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# 8.30.2.99% BANDWIDTH

## **LIMITS**

None; for reporting purposes only.

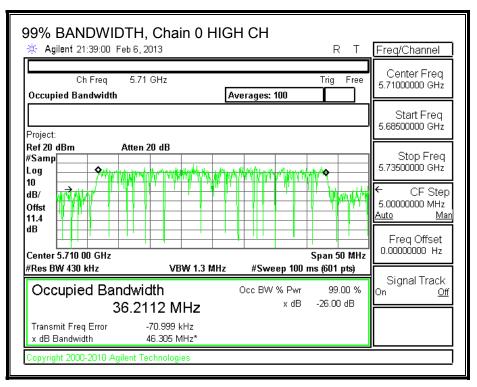
## <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
High	5710	36.2112	36.2170

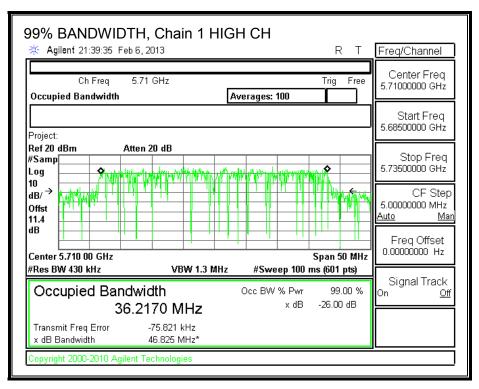
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## 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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# 8.30.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
6.61	5.77	9.21	

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#### **RESULTS**

# Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5710	50.45	33.1056	9.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5710	20.79	24.00	30.00	20.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

#### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
	5710	17.42	17.36	20.62	20.79	-0.17

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5710	3.700	3.740	6.95	7.79	-0.84

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# Limits (FCC), portion in 5.8 GHz UNII 3 band

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5710	20.4	3.1056	9.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5710	20.79	15.92	21.92	12.71	7.79	11.00	7.79

Duty Cycle CF (dB) 0.22

#### **Output Power Results**

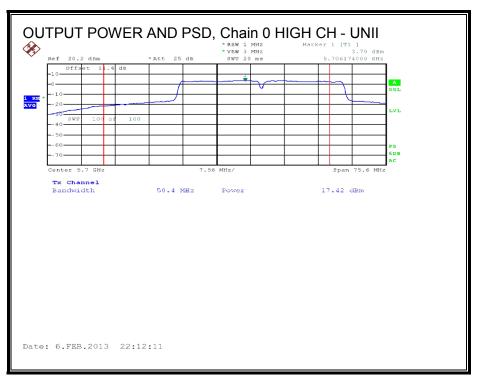
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5710	6.99	6.95	10.20	12.71	-2.51

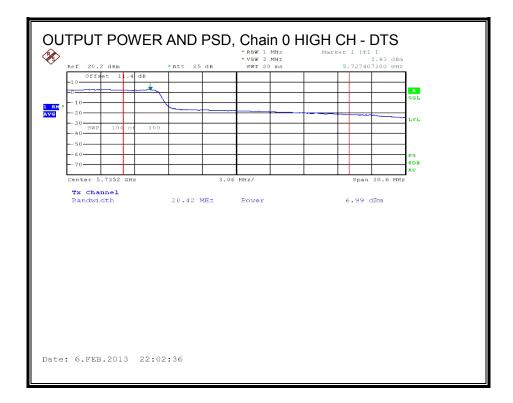
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5710	2.830	2.380	5.84	7.79	-1.95

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#### OUTPUT POWER AND PSD, Chain 0

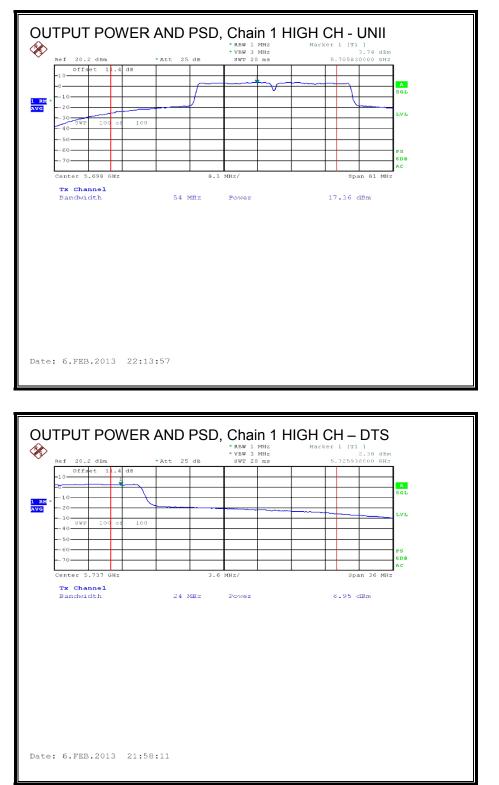




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#### **OUTPUT POWER AND PSD, Chain 1**



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# 8.31. 802.11n AC80 1TX MODE, 5.6 GHz BAND

# 8.31.1. 26 dB BANDWIDTH

## <u>LIMITS</u>

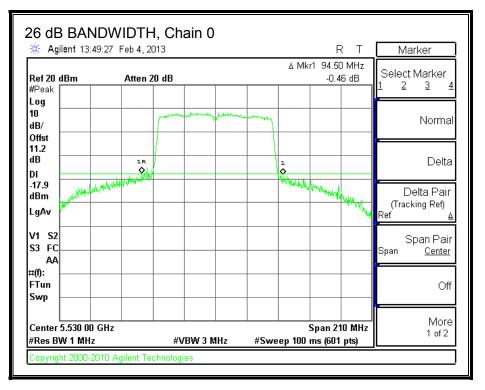
None; for reporting purposes only.

## **RESULTS**

Channel	Frequency	26 dB BW
		Chain 0
	(MHz)	(MHz)
Mid	5530	94.5

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#### 26 dB BANDWIDTH, Chain 0



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# 8.31.2. 99% BANDWIDTH

# LIMITS

None; for reporting purposes only.

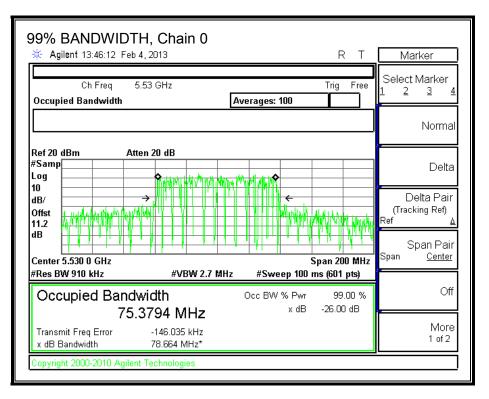
## <u>RESULTS</u>

Channel	Frequency	99% BW
		Chain 0
	(MHz)	(MHz)
Mid	5530	75.3794

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## 99% BANDWIDTH, Chain 0



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# 8.31.3. OUTPUT POWER AND PSD

#### LIMITS

FCC §15.407 (a) (1)

For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 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-210 A9.2 (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.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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## **RESULTS**

# Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5530	94.5	75.3794	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5530	23.39	24.00	30.00	23.39	10.39	11.00	10.39

Duty Cycle CF (dB) 0.15

## **Output Power Results**

Channel	Frequency	Chain 0	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5530	16.93	16.93	23.39	-6.46

# **PSD Results**

Channel	Frequency	Chain 0	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5530	-3.25	-3.10	10.39	-13.49

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# <u>PSD, Chain 0</u>



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# 8.31.4. PEAK EXCURSION

#### **LIMITS**

FCC §15.407 (a) (6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

## <u>RESULTS</u>

Channel	Frequency	PK Level	PSD	DCCF	Peak Excursion	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
Mid	5530	9.02	-3.25	0.15	12.12	13	-0.88

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## PEAK EXCURSION

Agilent 22:07	JRSION MIE :43 Feb 25, 2013		RT	Freq/Channel
Ref 25 dBm #Peak	Atten 30 dB		Mkr1 5.518 80 GHz 9.02 dBm	Center Freq 5.53000000 GHz
Log 10 dB/ Offst	martinuder	1 Subarray and an and an	mon and and and and and and and and and an	Start Freq 5.46000000 GHz
dB				Stop Freq 5.6000000 GHz
#PAvg	wheel		Aquire and a particular and a particular	CF Step 14.0000000 MHz <u>Auto Man</u>
V1 S2 S3 FC				Freq Offset 0.00000000 Hz
¤(f): FTun Swp				Signal Track On <u>Off</u>
Center 5.530 00 G #Res BW 1 MHz		BW 3 MHz	Span 140 MHz Sweep 1 ms (601 pts)	

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# 8.32. 802.11n AC80 1TX MODE, CHANNEL 138, 5.6 GHz BAND

# 8.32.1. 26 dB BANDWIDTH

## <u>LIMITS</u>

None; for reporting purposes only.

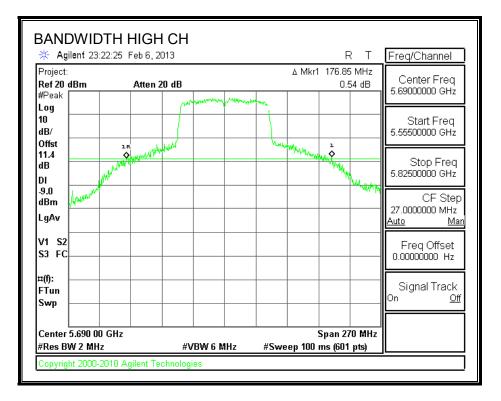
# **RESULTS**

Channel	Frequency	26 dB Bandwidth
	(MHz)	(MHz)
High	5690	176.85

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#### 26 dB BANDWIDTH



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# 8.32.2. 99% BANDWIDTH

# LIMITS

None; for reporting purposes only.

## <u>RESULTS</u>

Channel	Frequency	99% Bandwidth
	(MHz)	(MHz)
High	5690	75.6006

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#### 99% BANDWIDTH

99% BANDWIDTH HIGH CH	Freq/Channel
Ch Freq 5.69 GHz Trig Free Occupied Bandwidth Averages: 100	Center Freq 5.69000000 GHz
Project:	Start Freq 5.6400000 GHz
Ref 20 dBm         Atten 20 dB           #Samp	Stop Freq           5.74000000 GHz           €         CF Step           10.0000000 MHz <u>Auto</u> Man           Freq Offset           0.00000000 Hz
Occupied Bandwidth Occ BW % Pwr 99.00 % 75.6006 MHz × dB -26.00 dB	Signal Track On <u>Off</u>
Transmit Freq Error -81.969 kHz x dB Bandwidth 96.911 MHz* Copyright 2000-2010 Agilent Technologies	

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# 8.32.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.247

IC RSS-210 A8.4

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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#### **RESULTS**

### Limits (FCC), portion in UNII 2 ext band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
High	5690	123.4	72.8000	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5690	24.00	24.00	30.00	24.00	10.39	11.00	10.39

Duty Cycle CF (dB) 0.15

#### **Output Power Results**

Channel	Frequency	Chain 1	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	17.27	17.42	24.00	-6.58

## **PSD Results**

Channel	Frequency	Chain 1	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	0.270	0.42	10.39	-9.97

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# Limits (FCC), portion in 5.8 GHz DTS band

#### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
High	5690	53.4	2.8000	6.61

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5690	24.00	15.47	21.47	15.47	10.39	11.00	10.39

Duty Cycle CF (dB) 0.15

#### **Output Power Results**

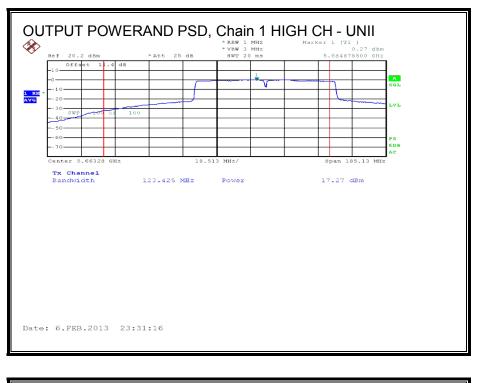
Channel	Frequency	Chain 1	Total	Power	Power
		Meas	Corr'd	Limit	Margin
		Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	3.40	3.55	15.47	-11.92

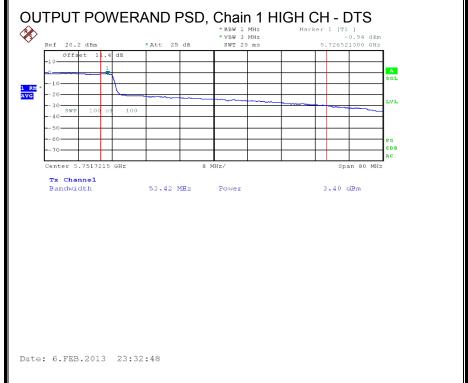
#### **PSD Results**

Channel	Frequency	Chain 1	Total	PSD	PSD
		Meas	Corr'd	Limit	Margin
		PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	-0.940	-0.79	10.39	-11.18

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#### **OUTPUT POWERAND PSD, Chain 1**





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# 8.33. 802.11n AC80 CDD 2TX MODE, 5.6 GHz BAND

# 8.33.1. 26 dB BANDWIDTH

## <u>LIMITS</u>

None; for reporting purposes only.

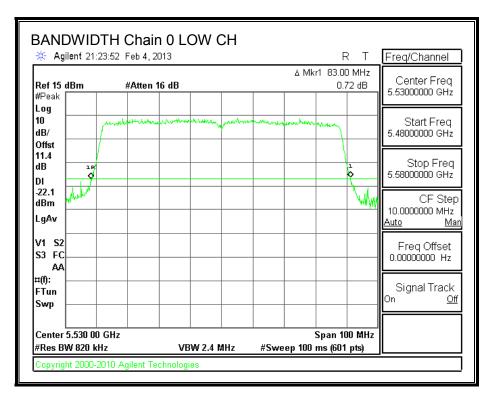
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5530	83.00	82.00	

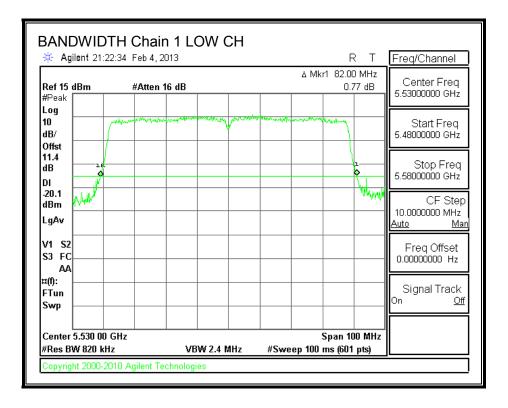
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#### 26 dB BANDWIDTH, Chain 0



#### 26 dB BANDWIDTH, Chain 1



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# 8.33.2. 99% BANDWIDTH

## <u>LIMITS</u>

None; for reporting purposes only.

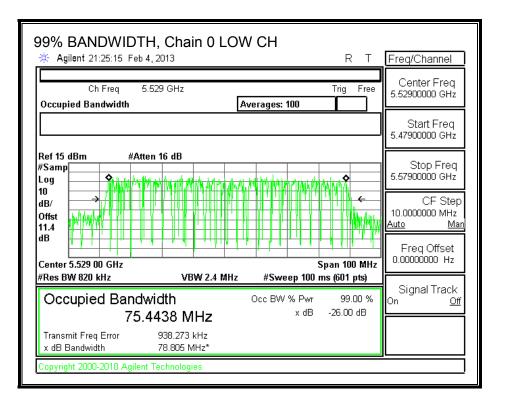
## <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Low	5530	75.4438	75.4540

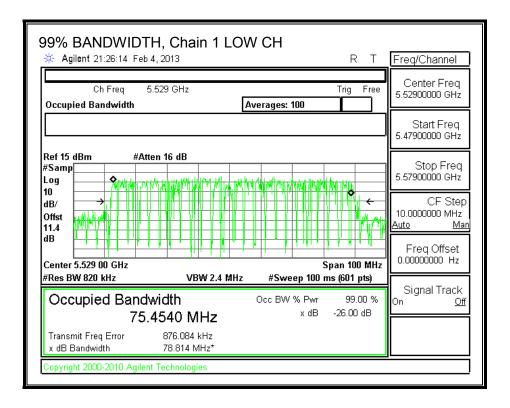
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### 99% BANDWIDTH, Chain 0



#### 99% BANDWIDTH, Chain 1



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# 8.33.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

#### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>		
Antenna	Antenna	Directional		
Gain	Gain	Gain		
(dBi)	(dBi)	(dBi)		
6.61	5.77	6.21		

For PSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

## **RESULTS**

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Uncorrelated	Correlated
		26 dB	99%	Directional	Directional
		BW	BW	Gain	Gain
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
Low	5530	82.00	75.4438	6.21	9.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5530	23.79	24.00	30.00	23.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

#### **Output Power Results**

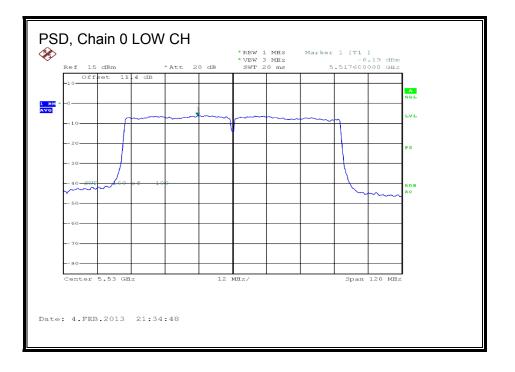
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power			
		Meas	Meas	Corr'd	Limit	Margin			
		Power	Power	Power					
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)			
Low	5530	14.06	13.95	17.02	23.79	-6.77			

# **PSD Results**

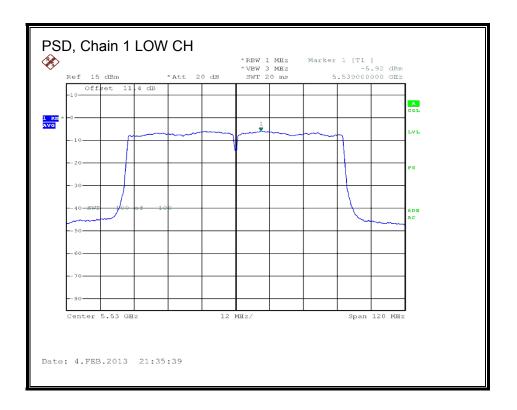
Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5530	-6.19	-5.92	-2.87	7.79	-10.66

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## PSD, Chain 0



## PSD, Chain 1



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# 8.34. 802.11n AC80 CDD 2TX MODE, CHANNEL 138, 5.6 GHz BAND

## 8.34.1.26 dB BANDWIDTH- UNII

### <u>LIMITS</u>

None; for reporting purposes only.

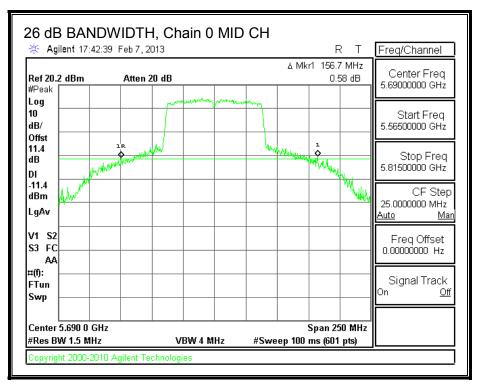
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5690	113.35	133.10	

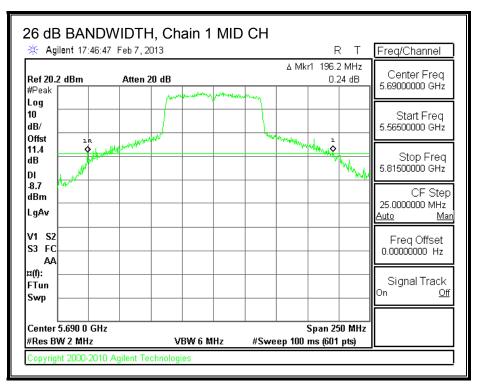
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### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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## 8.34.2.99% BANDWIDTH

## <u>LIMITS</u>

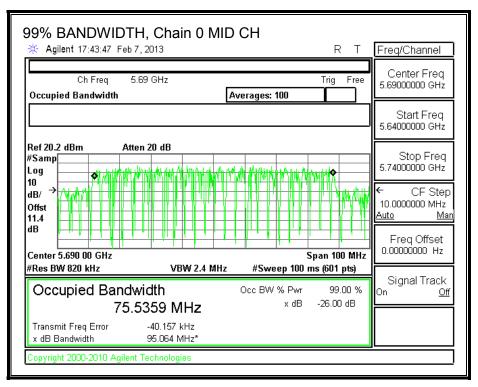
None; for reporting purposes only.

### <u>RESULTS</u>

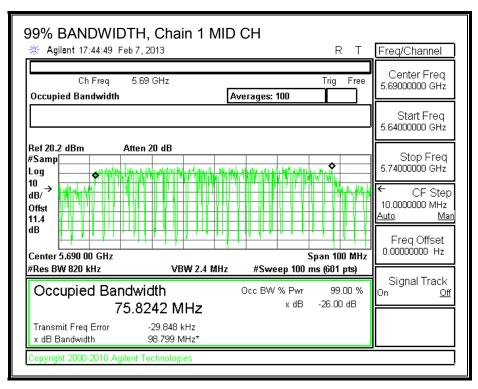
Channel	Frequency	99% BW	99% BW
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5690	7.7680	72.9121

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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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## 8.34.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### DIRECTIONAL ANTENNA GAIN

For output power, the TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Uncorrelated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	6.21

For PPSD, the TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>
Antenna	Antenna	Directional
Gain	Gain	Gain
(dBi)	(dBi)	(dBi)
6.61	5.77	9.21

### **RESULTS**

## Limits (FCC), portion in UNII 2 ext band

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5690	113.4	71.7680	9.21	6.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5690	23.79	24.00	30.00	23.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	15.94	16.66	19.50	23.79	-4.29

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	-0.83	-0.19	2.68	7.79	-5.11

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## Limits (FCC), portion in 5.8 GHz DTS band

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated	Uncorrelated
		26 dB	99%	Gain	Gain
		BW	BW		
	(MHz)	(MHz)	(MHz)	(dBi)	(dBi)
High	5690	43.4	1.7600	9.21	6.21

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
High	5690	23.79	13.46	19.46	13.25	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

### **Output Power Results**

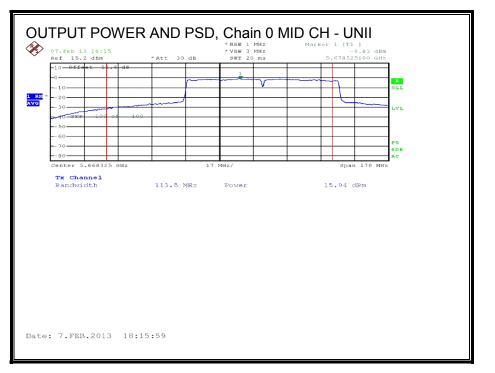
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	1.71	2.71	5.42	13.25	-7.83

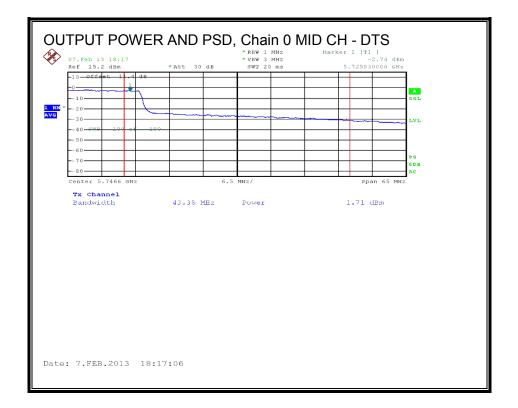
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
High	5690	-2.740	-2.04	0.80	7.79	-6.99

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### **OUTPUT POWER AND PSD, Chain 0**

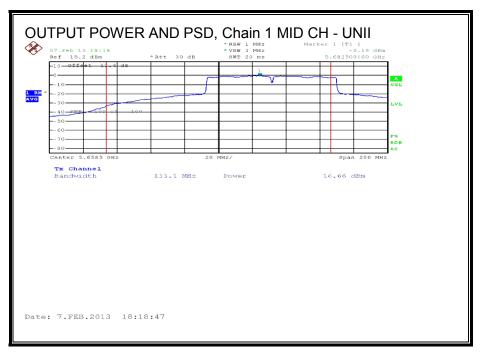


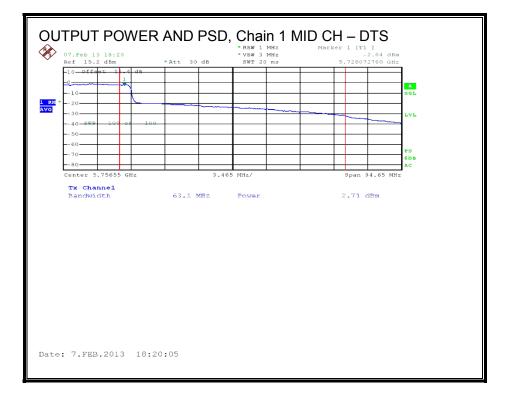


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### OUTPUT POWER AND PSD, Chain 1





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# 8.35. 802.11n AC80 BF 2TX MODE, 5.6 GHz BAND

## 8.35.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

None; for reporting purposes only.

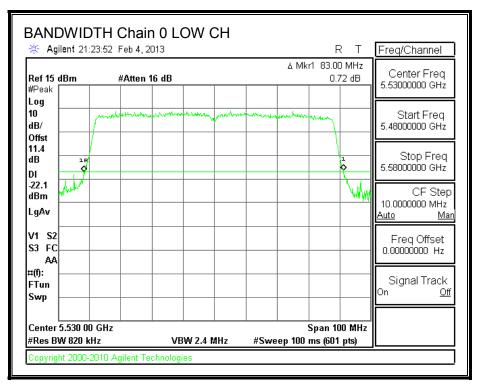
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5530	83.00	82.00	

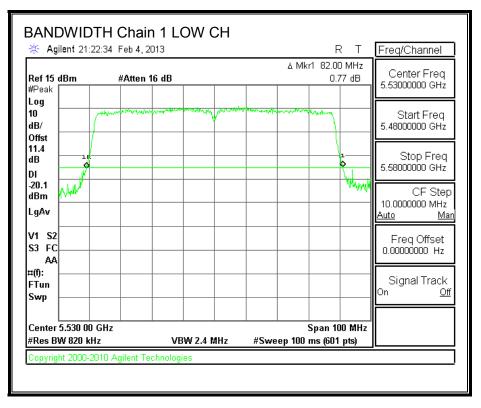
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### 26 dB BANDWIDTH, Chain 0



## 26 dB BANDWIDTH, Chain 1



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## 8.35.2. 99% BANDWIDTH

## LIMITS

None; for reporting purposes only.

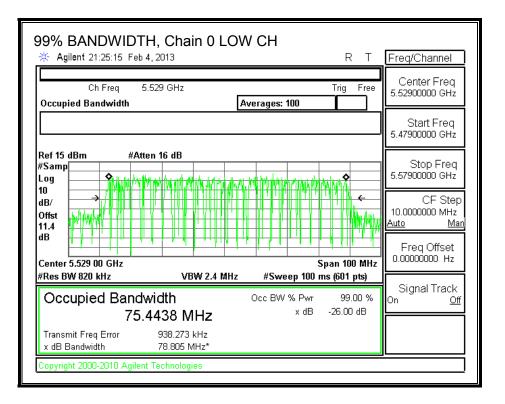
### <u>RESULTS</u>

Channel	Frequency	99% BW	99% BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Low	5530	75.4438	75.4540	

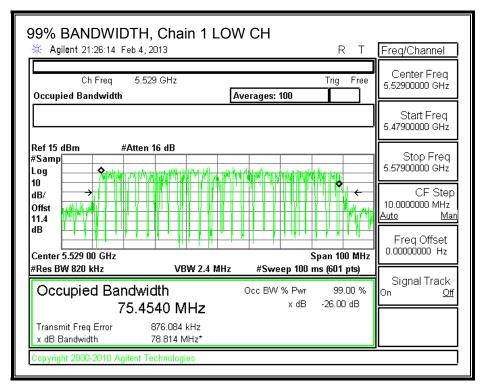
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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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## 8.35.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
6.61	5.77	9.21	

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### **RESULTS**

## Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Directional
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Low	5530	82.00	75.4438	9.21

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Low	5530	20.79	24.00	30.00	20.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

### **Output Power Results**

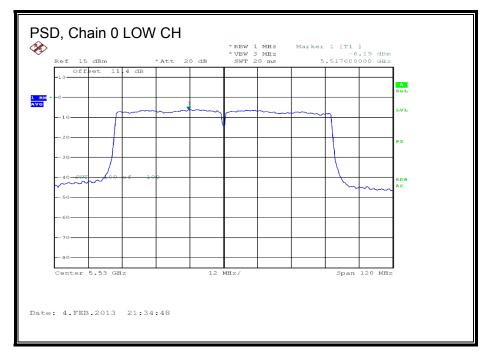
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
	5530	12.91	13.27	16.10	20.79	-4.69

### **PSD Results**

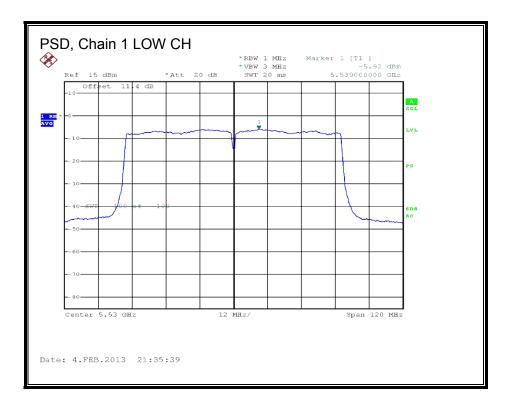
Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Low	5530	-6.19	-5.92	-2.87	7.79	-10.66

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### PSD, Chain 0



### PSD, Chain 1



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# 8.36. 802.11n AC80 BF 2TX MODE, CHANNEL 138, 5.6 GHz BAND

## 8.36.1.26 dB BANDWIDTH- UNII

## <u>LIMITS</u>

None; for reporting purposes only.

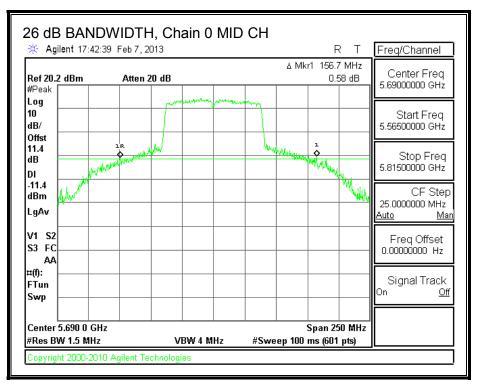
## **RESULTS**

Channel	Frequency	26 dB BW	26 dB BW	
		Chain 0	Chain 1	
	(MHz)	(MHz)	(MHz)	
Mid	5690	113.35	133.10	

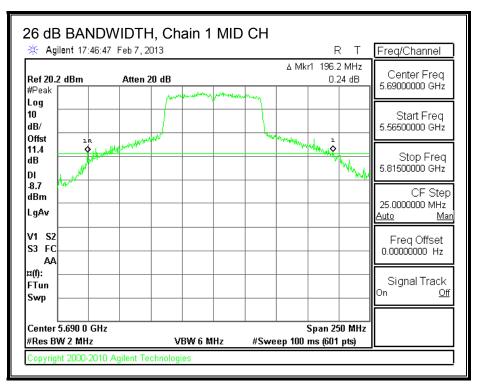
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### 26 dB BANDWIDTH, Chain 0



### 26 dB BANDWIDTH, Chain 1



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## 8.36.2.99% BANDWIDTH

## **LIMITS**

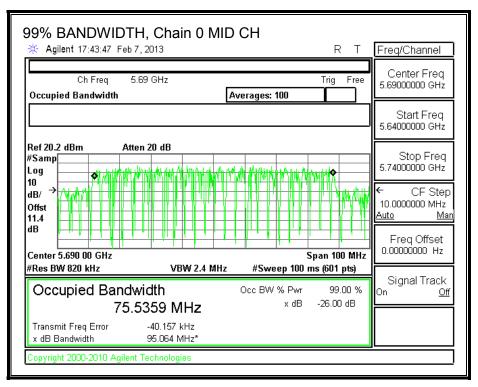
None; for reporting purposes only.

### <u>RESULTS</u>

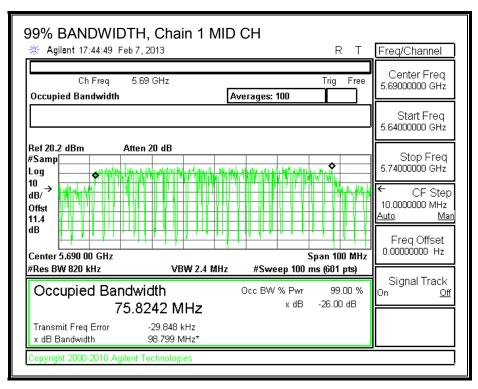
Channel	Frequency	requency 99% BW	
		Chain 0	Chain 1
	(MHz)	(MHz)	(MHz)
Mid	5690	7.7680	72.9121

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### 99% BANDWIDTH, Chain 0



### 99% BANDWIDTH, Chain 1



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## 8.36.3. OUTPUT POWER AND PSD

### LIMITS

FCC §15.407 (a) (1)

For the band 5.5–5.7 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 peak 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-210 A9.2 (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.

### **DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Chain 0	Chain 1	<b>Correlated Chains</b>	
Antenna	Antenna	Directional	
Gain	Gain	Gain	
(dBi)	(dBi)	(dBi)	
6.61	5.77	9.21	

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### **RESULTS**

## Limits (FCC), portion in UNII 2 ext band

### Bandwidth and Antenna Gain

Channel	Frequency	Min	Min	Correlated
		26 dB	99%	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5690	113.4	71.7680	9.21

#### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5690	20.79	24.00	30.00	20.79	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

### **Output Power Results**

Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5690	15.94	16.66	19.50	20.79	-1.29

#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5690	-0.83	-0.19	2.68	7.79	-5.11

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## Limits (FCC), portion in 5.8 GHz UNII 3 Band

Channel	Frequency	Min	Min	Correlated
		26 dB	<b>99%</b>	Gain
		BW	BW	
	(MHz)	(MHz)	(MHz)	(dBi)
Mid	5690	43.4	1.7600	9.21

### Bandwidth and Antenna Gain

### Limits

Channel	Frequency	FCC	IC	IC	Power	FCC	IC	PSD
		Power	Power	EIRP	Limit	PSD	PSD	Limit
		Limit	Limit	Limit		Limit	Limit	
	(MHz)	(dBm)						
Mid	5690	20.79	13.46	19.46	10.25	7.79	11.00	7.79

Duty Cycle CF (dB) 0.17

### **Output Power Results**

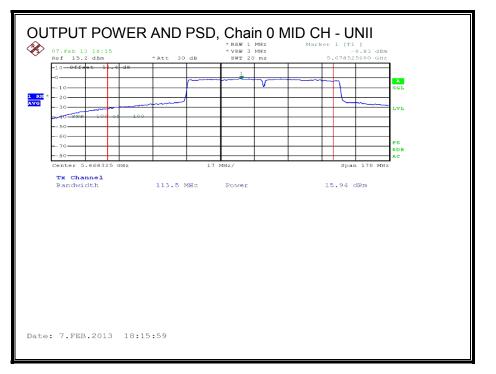
Channel	Frequency	Chain 0	Chain 1	Total	Power	Power
		Meas	Meas	Corr'd	Limit	Margin
		Power	Power	Power		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5690	1.71	2.71	5.42	10.25	-4.83

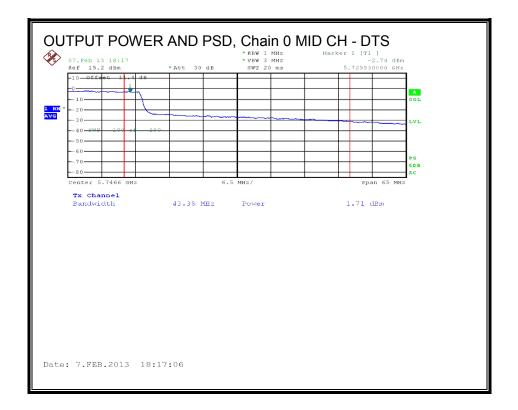
#### **PSD Results**

Channel	Frequency	Chain 0	Chain 1	Total	PSD	PSD
		Meas	Meas	Corr'd	Limit	Margin
		PSD	PSD	PSD		
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
Mid	5690	-2.740	-2.04	0.80	7.79	-6.99

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### **OUTPUT POWER AND PSD, Chain 0**

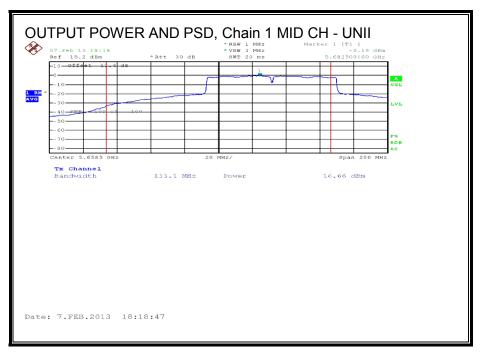


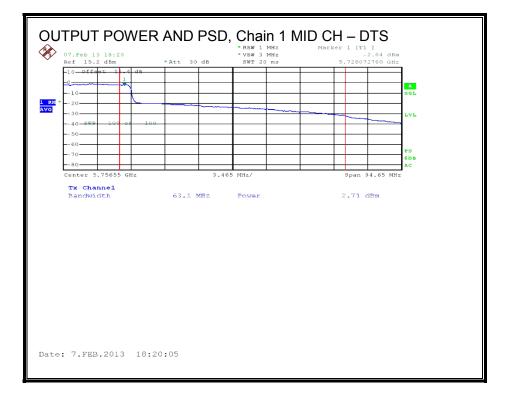


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### OUTPUT POWER AND PSD, Chain 1





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# 9. RADIATED TEST RESULTS

# 9.1. LIMITS AND PROCEDURE

## LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

## TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

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

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

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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

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# 9.2. TRANSMITTER ABOVE 1 GHz

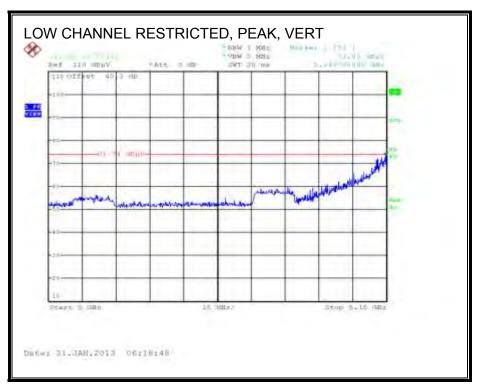
## 9.2.1. 802.11a LEGACY 1TX MODE, 5.2 GHz BAND

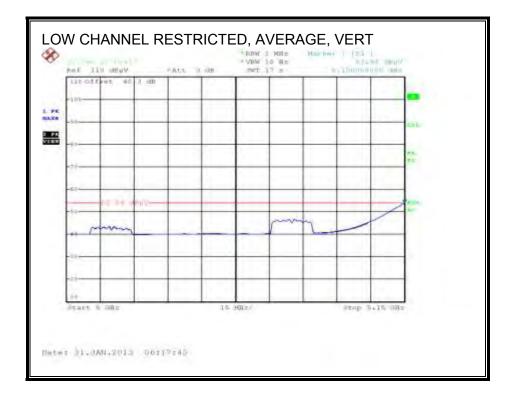
Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

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## 9.2.2. 802.11n HT20 CDD 2TX MODE, 5.2 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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## HARMONICS AND SPURIOUS EMISSIONS

			Measurem			1773	5.									
Compli	ance Co	ertification :	Services, Fr	emont	5m Ch	amber	A									
Compa	ay:		Broadcom (	Corpor	ation											
Project	H:		13U14796	1000												
Date:			2/14/2013													
	ngineer:		K. Nguyen			2.5										
	tration:		BCM94360					ter								
Mode:			13n HT29 3	Mode 4	IA: 5.	2 GHz	Band									
Test E.	quipmen	di.														
٠	iom 1-	18GHz	Pre-at	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	Iz	н	orn > 18G	Hz	1	Limit	
173;	5/11: 671	7 @3m	- T144 N	liteq 30	08400	931 .	TER Min	eq 26-	40GHz	· T89:	ARA 18.264	5Hz; 5/N:10	49	+	FCC 15.205	
[ It Pie	squency Ca	oles	1			- 1				T]		1				
3'	cable 2	22807700	12' c	able 2	28076	500	20° cal	ble 22	2807500		HPF	Re	ject Filter		Measurements MHr. VEW=3MHz	
31	able 22	867700	17.00	able 228	H17600	-	20' cab	der 228	87500	THP	F 7 6GHz	1	200		e Measurements	
1.	abie 11	• 12 ca	ane 226	01000	2	Lev Cale	ių rite		1	Crooke.	31	2		MHz VBW=10Hz		
1	Dist	a raine and	Read Avg.		Ć1.	Amp		Flu	Peak	Avg	Pk Lim		Pk Mar		Notes	
GHz	(m)	dBaV	dBaV	dB/m	dB	dB	dB	dB	dBaV/m	dBaV/m	dBuV/m	dBuV/m	dB	dB	(V/H)	
Channel 15.540	36 (5180	MHz) 46.9	30.7	38.3	13.2	34.7	6.0	6.7	59.5	49.3	74	54	34.5	4.7	v	
15.540	3,0	40.2	29.8	39.3	13.2	.34.7	0.0	9.7	58.8	48.4	74	54	452	.5.6	н	
	40 (5200	Q	-				-		1.000	1	-					
15.600	3,0	43.6	33.4	39,1 39,1	13.3	34.6	6.0	0.7	621	51.6	74	54	11.9	-2.1	V H	
	48 (5240		20.9	3951	143	-34.6	0.0	MAY	59.9	49.1	.14	54	-14.1	-4.7		
15.720	3.0	40.0	28.6	38.8	13.3	.34.0	0.0	0.7	58,2	40.8	74	54	15.0	3.2	V.	
15.720	3.0	39.5	19.5	38.8	13.3	-34.6	9.0	0.7	57.8	47.7	74	54	46.2	-6.3	H	
Rev. 01.3	0.11	_		_	_		_	_								
	f	Measurement Frequency				Апр	Preamp (					Avg Lim Average Field Strength Limit				
	Dist Distance to Antenna								ct to 3 mete					Strength Lie		
	-	Read Analyzer Reading				Avg			Strength @					Average Lis		
	Read	and the second sec	AF Antimona Factor							and the second sec		Pk Mar Margin vs Peak Limit				
	Read	and the second sec	actor			Peak HPF	Calculate High Pas			ingus		F.K. 2008	Second Bar 12	a const training		

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## 9.2.3. 802.11n HT20 STBC 2TX MODE, 5.2 GHz BAND

Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

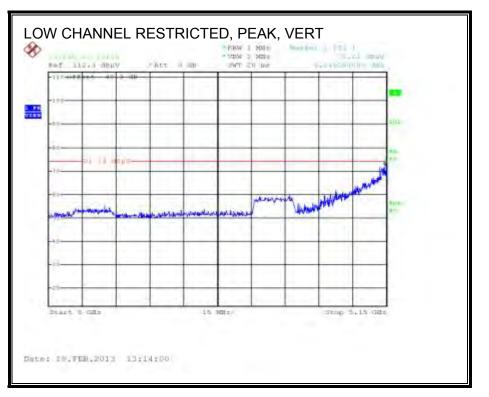
## 9.2.4. 802.11n HT20 BF 2TX MODE, 5.2 GHz BAND

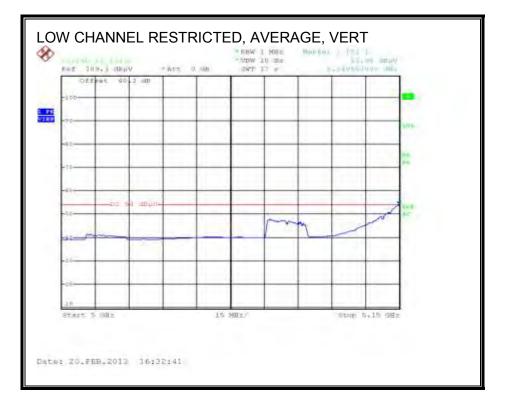
Covered by testing 11n AC20 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

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## 9.2.5. 802.11n AC20 BF 2TX MODE, 5.2 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL)**





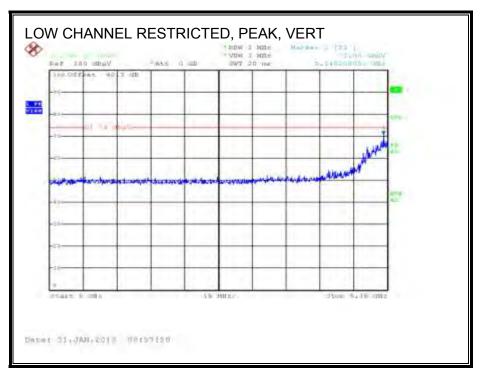
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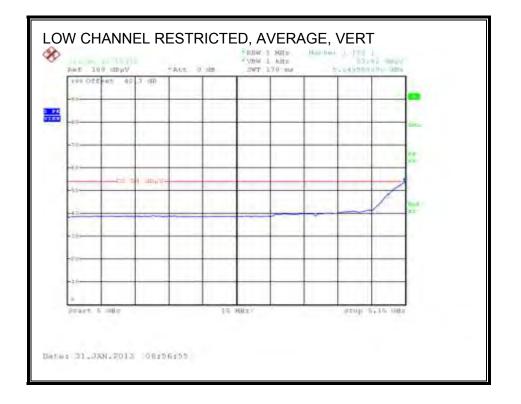
## HARMONICS AND SPURIOUS EMISSIONS

Exercise         Pre-amplifer 1-26GHz         Pre-amplifer 26-40GHz         Horn > 18GHz         Limit           T73: Sift: 6717 @Jm         T144 Milling 3008A00933         T85 Milling 26.40GHz         T89, ARA 18-28GHz; Sift: 1049         EC 15.205           3' cable 22807700         12' cable 22807600         20' cable 22807500         D' cable 22807500         Percentities         <				Broadcom ( 13U14796 2/23/2013 K. Nguyen EUT wir lag Tx 5.2GHz	top, At	C adap											
T73; S/R: 6717 g/g/m       T144 Mitting 3000A00931       T88 Mitting 20-40GHz       T89; ARA 18-26GHz; S/R: 1049       FCC 15.205         M Frequency Casies       T2" cable 22807600       20' cable 22807500       Peak Measurements: RBW=VDW=5MRE: Average Measurements: RBW=VDW=5MRE:         3' cable 22807700       I'' cable 22807600       Peak Measurements: RBW=VDW=5MRE: Average Measurements: RBW=VDW=5MRE:         5' CC 15.205         I'' cable 22807600       Peak Measurements: RBW=VDW=5MRE: Average Measurements: RBW=10Hz;       VBW=10Hz; VBW=10Hz;         GE Dist Read Pk Read Avg       AF       CL       Average Measurements: RBW=10Hz;         Sign Max:       Peak Max:       Peak Measurements: RBW=10Hz;         Sign Max:       Peak Max:       Peak Max: <th cols<="" th=""><th></th><th></th><th></th><th>T</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>- 1</th><th></th></th>	<th></th> <th></th> <th></th> <th>T</th> <th></th> <th>- 1</th> <th></th>				T											- 1	
Int. Str. 10, Str	-					_					-				_		
3' cable 22807700         12' cable 22807600         20' cable 22807500         HPF         Reject Filter         Peak Measurements RBW=VBW=3MFiz           3' cable 22807700         12' cable 22807600         0' cable 22807500         0'''         0'''''         0'''''         0'''''         0'''''         0''''''         0''''''         0'''''''         0''''''''''''''''''''''''''''''''''''			-	- 1144 h	aned 20	ULAUC	- 109	165 Mit	eq 26-	aught.	- 103	ANA 18-204	112; SHE 10	43	1	100 13103 +	
f         Dist         Rend Pk         Read Avg.         AF         CL         Amp         D Corr         Flir         Peak         Avg         Pk Lin         Avg Lin         Pk Mar         Avg Mar         Notes           GHz         (m)         dBaV         dBu'         dB         dB         dB         dB         dB         dB         dB         dB         Avg         Pk Lin         Avg Lin         Avg Mar         Avg Mar         Notes           5540         3.0         44.2         33.6         39.3         13.2         34.7         0.0         0.7         62.8         52.2         74         54         41.2         -1.8         V           5540         3.0         47.0         34.6         39.1         13.2         34.7         0.0         0.7         62.8         52.2         74         54         41.2         -1.8         V           5600         3.0         45.8         34.6         39.1         13.3         34.6         0.0         0.7         63.9         53.0         74         54         40.1         1.0         10           5600         3.0         45.8         34.6         39.1         13.3         34.6				12' c	able 2	28076	500	20' cal	ble 22	2807500		HPF	Re	eject Filte			
GHz         (m)         dBaV         dBaV         dBaw         dB         dB         dB         dB         dB         dBaV/m         dBaV         dBaV/m         dBaV/m	3'2	able 221	107790	- 17 ca	ible 728	07600		20' cab	la 228	07500 .	HP	F_7.6GHz	-				
15.540         3.0         44.2         33.6         39.3         13.2         34.7         0.0         0.7         62.8         52.2         74         54         41.2         41.8         V           15.540         3.0         47.0         34.6         39.3         13.2         34.7         0.0         0.7         62.8         52.2         74         54         41.2         41.8         V           15.540         3.0         47.0         34.6         39.3         13.2         34.7         0.0         0.7         62.8         52.2         74         54         41.2         41.8         V           15.600         3.0         45.8         34.6         39.1         13.3         34.6         0.0         0.7         63.9         53.0         74         54         40.1         1.0         11           15.600         3.0         45.4         33.0         35.8         13.3         34.6         0.0         0.7         63.9         53.0         74         54         40.0         1.0         11           15.720         3.0         45.0         53.5         35.8         13.3         34.6         0.0         0.7         63.3	GHz	(m)	dBaV				1000			1							
framel 40 (5200 MB2)         34.6         39.1         13.3         34.6         0.0         0.7         64.5         53.1         74         54         9.7         -0.9         V           5.600         3.0         45.8         34.6         39.1         13.3         -34.6         0.0         0.7         63.9         53.0         74         54         -9.7         -0.9         V           5.600         3.0         45.4         34.6         39.1         13.3         -34.6         0.0         0.7         63.9         53.0         74         54         -9.7         -0.9         V           5.720         3.0         44.9         33.9         38.8         13.3         -34.6         0.0         0.7         63.1         52.1         74         54         -10.7         -2.3         H           5.720         3.0         45.0         33.5         38.8         13.3         -34.6         0.0         0.7         63.3         51.7         74         54         -10.7         -2.3         H           ter 01 io 11         .0         .0         .0         .0         0.7         63.3         51.7         74         54         -10.7 <t< td=""><td>5.540</td><td>3.0</td><td>44.2</td><td></td><td></td><td></td><td></td><td></td><td>0.7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	5.540	3.0	44.2						0.7								
5500         3.0         45.8         34.6         39.1         13.3         .34.6         0.0         0.7         64.3         53.1         74         54         -9.7         -0.9         V           5600         3.0         48.4         34.6         39.1         13.3         .34.6         0.0         0.7         63.9         53.0         74         54         .40.1         1.0         11           Immat 46 (5240 MHz)         0.0         0.7         63.9         53.0         74         54         .40.1         1.0         11           5720         3.0         44.9         33.9         38.8         13.3         .34.6         0.0         0.7         63.1         .82.1         74         .54         .10.9         .1.9         V           5720         3.0         45.0         33.5         38.8         13.3         .34.6         0.0         0.7         63.1         .82.1         74         .54         .10.7         .3.3         .11         .13         .34.6         0.0         0.7         63.3         .17         .74         .54         .10.7         .3.3         .11           ev 01.30 11         .10         .10         .10			August and a second	34.6	39.5	13.2	347	0.0	0.7	63.6	53.1	74	54	B.4	0.9	Ħ	
f         Measurement         Frequency         Amp         Preamp Gain         Avg Lin         Avg may         Field Strength Linux           f         Measurement         Frequency         Amp         Preamp Gain         Avg Lin         Avg may	5.600	3.0	45.8	and the second second			summer that we are							and the second second			
5.720     3.0     45.0     33.5     38.8     13.3     -34.6     0.0     0.7     63.3     51.7     74     54     -10.7     -2.3     11       f     Measurement Frequency     Amp     Preamp Gain     Avg Lin     Avg Lin     Avgrage Field Strength Linuit       Dist     Distance to Antenna     D Corv     Distance Correct to 3 meters     Pk Lins     Peak Field Strength Linuit       Read     Analyzer Reading     Avg     Average Field Strength @ 3 m     Arg Mar Margin vs. Average Linuit       AF     Attenna Factor     Peak     Calculated Peak, Field Strength     Pk Mar     Margin vs. Peak Linuit				34.0	39.1	13.3	-34,0	-0.0	0.7	03.9	53.0	- 14	-04	101	-1.0		
f       Measurement Frequency       Amp       Preamp Gain       Avg Lin       Average Field Strength Linit         Distance to Antenna       D Corr       Distance Correct to 3 meters       Pk Lin       Peak Field Strength Linit         Read       Analyzer Reading       Avg       Average Field Strength @ 3 m       Avg Mar       Margin vs. Average Linit         AF       Antenna Factor       Peak       Calculated Peak Field Strength       Pk Mar       Margin vs. Peak Linit																	
Distance to Antenna         D Corr         Distance Convect to 3 nuclers         Pk Lin         Peak Field Strength Linit           Read         Analyzer Reading         Avg         Average Field Strength @ 3 m         Avg Mar         Margin vs. Average Linit           AF         Antenna Factor         Peak         Calculated Peak Field Strength         Pk Mar         Margin vs. Peak Linit											34						
Read Analyzer Reading Avg Average Field Strength @ 3 m Avg Mar Margin vs. Average Limit AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit					M												
AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs Peak Limit																	
											utrai		1.6.35104	Sense for an	1 COR JURIA		

# 9.2.6. 802.11n HT40 1TX MODE, 5.2 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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### HARMONICS AND SPURIOUS EMISSIONS

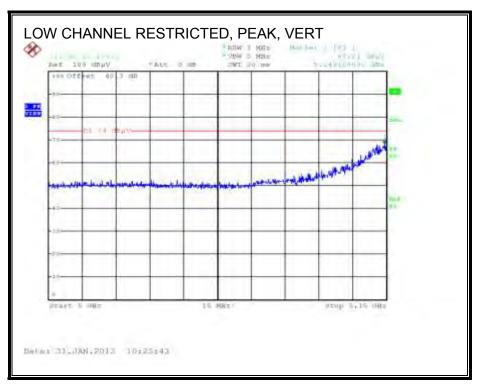
Covered by testing 11n HT40 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

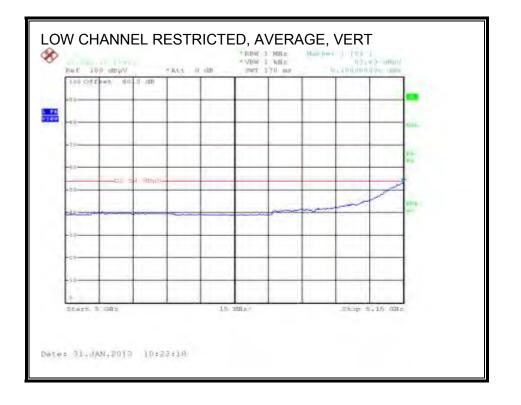
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## 9.2.7. 802.11n HT40 CDD 2TX MODE, 5.2 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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			Broadcom 13U14796 2/20/2013 K. Nguyen BCM94360 Ta Lin HT	0C52 wi	th lapt	top and .	AC adapte	ir.							
føst Eg	nibwev	<u>t:</u>				_									-
н	orn 1-	18GHz	Pre-at	mplifer	1-26	GHz	Pre-am	plifer	26-40GH	z	Н	orn > 18G	Hz	1	Limit
1.55	S/N: 471	1.00	- T144 1	Viteq 30	08400	931 .	TB8 Min	eq 26-	40GHz	- T89	ARA 18-260	SHZ; SAN:10	49	-	FCC 15.205 +
	cable 2	2807700	12's	able 2	28076	500	20' cal	ble 22	2807500		HPF	Re	ject Filte		Measurements MHz: VBW=3MHz
3 6	able 22	807700	12 0	ble 228	07600	2	20 cab	le 228	07500 -		_	• R_	001		ge Measurements MHz : VBW=10Hz
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBaV/m	Pl: Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
hausel. 5.570	38 (8190	MRz) 37,7	26.3	39.I	13.2	34.6	0.0	0.0	58.5	44.1	74	54	-18.5	.9,9	v
5.570	3.0	36.5	25.8	39.2	13.2	-34.6	0.0	0.0	54.3	43.6	74	54	-10.5	-10.4	н
	40 (8230	provide the second					1								
5.690	3.0	35.8	26.2	38.9	13.3	.34.6 -34.6	0.0	0.0	53,4	43.8	74	54	20,6	12.5	V H
Cev. 01.34	f Dist	Measureme Distance to	nt Frequenc	7	-	Amp D Corr	Preamp (		ct to 3 met	46	-			field Strength 1 Strength Lie	
	Read	Analyzer R				Avg			Strength (2)					Average Lis	
	AF	Antenna Fa				Peak	1.1. CMC		k Field San			1 Mar 1 Mar 1		Peak Limit	-
	CL.	Cable Loss	00			HPF	High Pas	s Filter	r.						

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# 9.2.8. 802.11n HT40 BF 2TX MODE, 5.2 GHz BAND

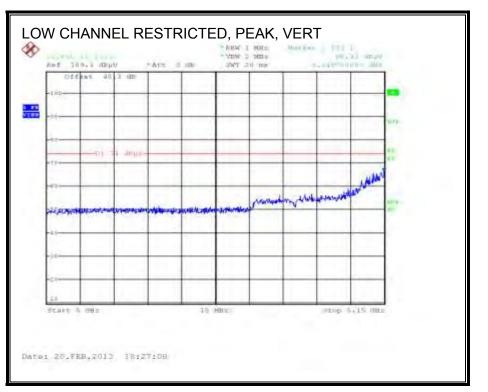
Covered by testing 11n AC40 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

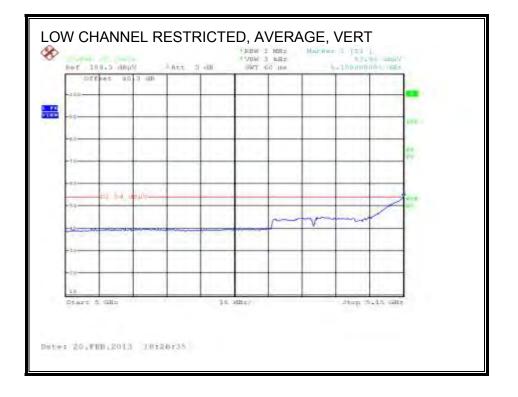
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# 9.2.9. 802.11n AC40 BF 2TX MODE IN THE 5.2 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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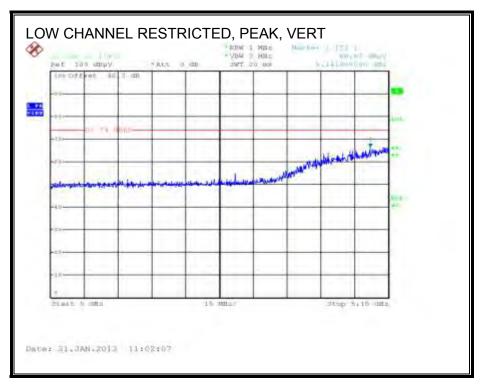
	High	Frequency	Measurem	ient												
Compli	ance Ce	rtification !	Services, Fr	emont	5m Ch	amber	A									
			Broadcom 13U14796 2/24/2013 K. Nguyen EUT with I Tx 5.2GHz	aptop,	AC ad			a								
Test Ec	uipmen	<u>t:</u>														
H	iom 1-	18GHz	Pre-al	mplifer	1-260	SHZ	Pre-am	plifer	26-40GH	z		Н	m > 180	Hz	1	Limit
173;	S/N: 671	7 @Gm	+ 11441	Viiteq 30	GRADOS	131 .	TB& Min	eq 26-	40GHz	•	T89;	ARA 18-260	GH2; S74:10	49	+	FCC 15.205
	cable 2	2807700	12' c	able 2	28076	00	20 <sup>+</sup> cal	ble 22	2807500			HPF	R	ject Filte		Mensurements W=VBW=3MHz
2.0	able 22	307700	12 0	able 228	07600		20' cab	le 228	07500 +		HPT	- 7 6GHZ	2			ge Measurements 1MHz VBW=10Hz
f GRz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Eltr dB	Peak dBaV/m	A dBa	vg Whe	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
	38 (5190		unut		11.17	un	-	0.00	GLING T THE	0.05		o Da Cim	and the	ans		(1144)
5.870	3,0	38.6	26.2	39.2	13.2	34.6	-0.0	0.7	54.1		6,7	74	54	19.9	.43	Ý
5.570	3.0	35.2	26.0	39.2	13.2	-34.6	0.0	0.7	53,7	-4	15	74	54	-20.3	-9.5	Ĥ
5.690	3.0	35.2	26.4	38.9	153	.34.6	0.0	0.7	53.6	- 4	17	74	84	(20.4	.8.3	v
5.690	3.0	35.3	26.6	38.9	13.3	-34.6	0.0	0.7	53.6		1.5	74	54	-29.4	.9.1	H
lev 91.3	9.14															
	ŕ.	Measureme	st Frequenc	y.		Amp	Preamp (	Gain	-				Avg Lin	Average I	seld Strength	Limit
	Dist	Distance to				D Con			ct to 3 meter				Pk Lim		I Strength Li	
	Read	Analyzer R				Asg			Strength @						Average Li	
		Antenna Fa	in land			Peak	Colcular	d Peal	k Field Stre	right			Pk Mar	Margin vs	Peak Lime	
	AF CL	Cable Loss				HPF	High Pas						100 C			

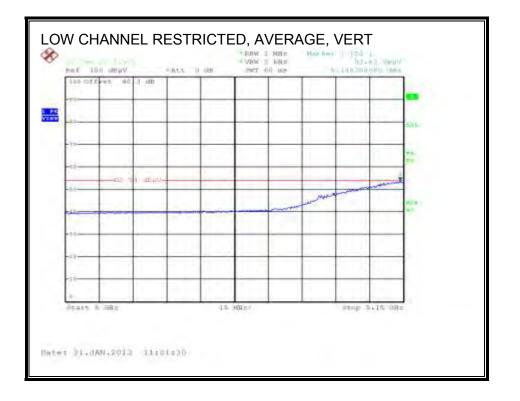
tabular data above this note is a typo.

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# 9.2.10. 802.11n AC80 1TX MODE, 5.2 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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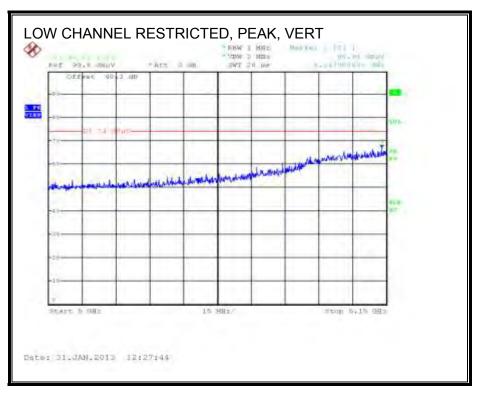
Covered by testing 11n AC80 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

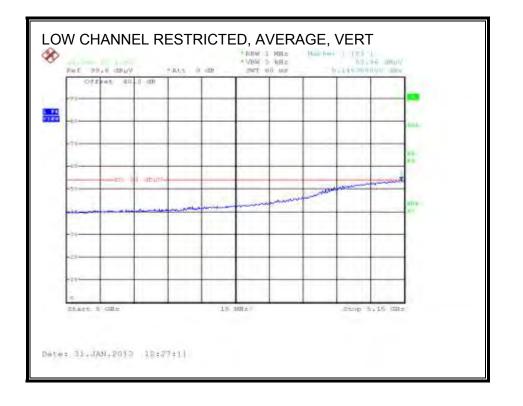
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# 9.2.11. 802.11n AC80 CDD 2TX MODE, 5.2 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





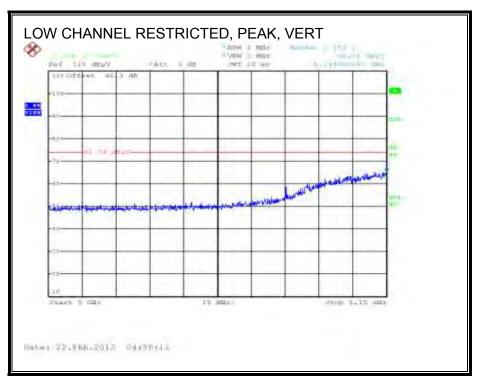
Page 403 of 516

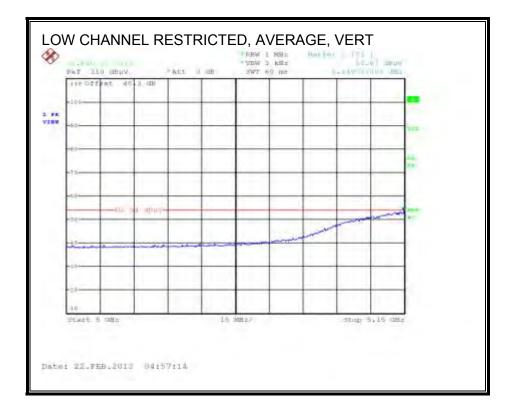
-	_		Measuren		2.5	1	2.									
Complia	ance Co	rtification	Services, Fr	remont	5m Ch	amber .	Δ									
Configu Mode:			Broadcoan 13U14796 1/30/2013 Kris Nguy EUT / Lapi Tx 5/2GHz	op			Channe	142								
н	iom 1-	18GHz	Pre-a	mplifer	1-260	SHZ	Pre-am	plifer	26-40GH	z	н	orn > 180	Hz	T.	Limit	
1.00	S/N: 671	-	- 1144	Witeq 36	08AD09	131 .	TB& Min	eq 26-	40GHz	• T89;	ARA 18.260	GHE; SAN:10	49	+	FCC 15.205	•
	Cable 22807700     12' cable 2280760     12' cable 2280760     12' cable 2280760						20' cal	ble 22	2807500		HPF	Re	ject Filte	er		
3.0	3' cable 22807700 . 12' cable 22807600						20' cab	le 228	07500 .	HP	F_7 6GHZ	2		•		
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
		10MHz		1			Contract of			1.0.1	1					
5.690 5.690	3,0 3.0	35.9	29.5 27.0	38.9 38.9	13.3	.34.6 -34.6	0.0	0,0 0.0	53.5 53.8	47.0	74	54 54	-20,8 -20,2	-7.0 -9.4	V H	-
Rev 01.3	0.23															
	f Dist	Distance to		7		Amp D Core		Corre	ct 10 3 mete		1	Pk Lan	Peak Field	ield Strength I Strength Li	timit	ī
	Read	Analyzer R Antenna Fa				Avg Peak			Strength @ k Field Stre					Average Li Peak Limit		
	CI.	Cable Loss				HPF	High Pas	s Filter								

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# 9.2.12. 802.11n AC80 BF 2TX MODE, 5.2 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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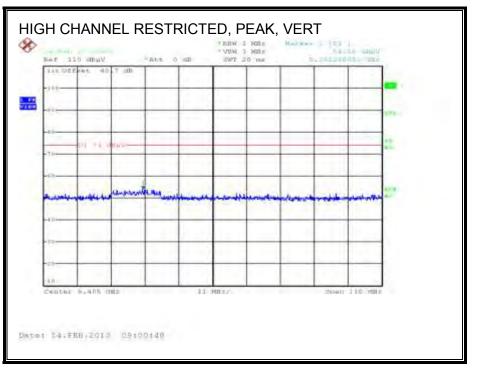
			Measuren																
ompli	ance Co	rtification	Services, Fr	emont !	om Ch	amber	A												
ompai			Broadcom	Corpora	tion														
hate:	a.		2/24/2013																
	igineer:		K. Nguyen																
onligu Iode:	ration:		EUT with I Tx 5.2GHz					a.											
-	nipmen																		
н	iom 1-	18GHz	Pre-at	mplifer	1-260	SHZ	Pre-am	plifer	26-40GH	z		Н	c mo	180	Hz		1	Limit	
-	S/N: 671		-	Mitteg 30			TER Mit	-			T89.	ARA 18.260				_	-	FCC 15.205	
1.00	querity Cel	-	-   ·····	unicid so		-	1	ed co-	and the	-	1000				-		-	1	-
		2807700	12' 0	able 2	28076	00	20' cal	ble 22	2807500			HPF		Re	ject Filte	r		Measureme W=VBW=3MD	
3. c	able 22	807700	07600	*	20' cab	le 228	97500		HPT	7 6GHz	•			•		ge Measuren 1MHz - VBW:			
ſ	1000	1.	Read Avg.		CL.	Amp	D Corr	Flor	Peak		tyg .	Pk Lim	1.1.1.1		Pk Mar	1000		Note	
GH2	(m) 42 (5210	dBuV	dBaV	dB/m	dB	dB	dB	dB	dBuV/m	dB	uV/m	dBuV/m	dBe	V/m	dB	-	dB	(V/H	<u>}</u>
6.630	3.0	38.3	26.3	39.0	13.3	34.6	0.0	0.7	53.8	19	4.7	74		14	20.2		9.3	Ŷ	
5.630	3.0	35.1	26.5	39.0	13.3	-34.6	0.0	0.7	53.5	4	4.9	74		14	-20.5		9.1	Ĥ	
ey. 01.3	6.1i																		
	f	Measureme	ent Frequenc	÷		Апр	Preamp (						Ave	Lin	Average B	field	Strength	h Limir	
		Distance to	Antenna			D-Corr		10100	et to 3 miet				Pk L	im .	Peak Field	d Str	eagth Li	Tur	
	Dist					Ave	Average		Strength @						Margin ys				
	Read	Analyzer R							The A. S. Co	and the second s			PL A	all and a second se	2.4				
			actor			Peak	Calculate High Pag			ngu)			-	aar.	Marga vs	Per	sk Lime		

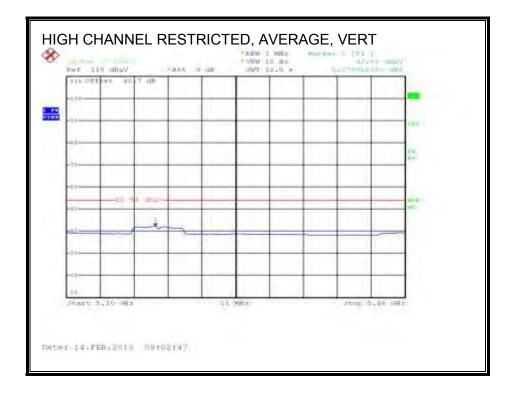
Page 406 of 516

# 9.2.13. 802.11a LEGACY 1TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**

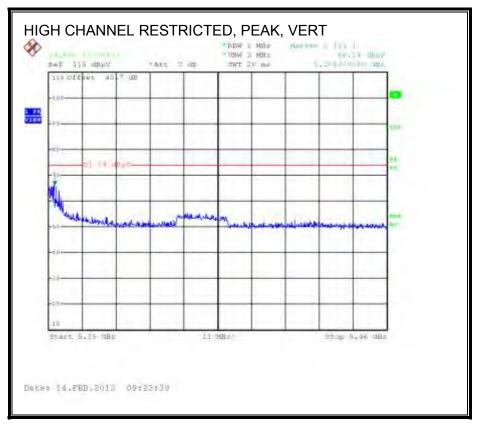
### Channel 60

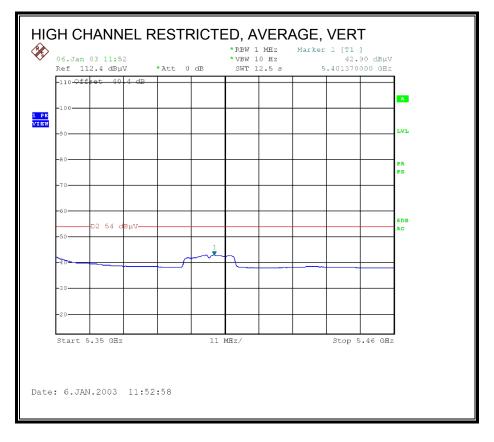




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#### Channel 64





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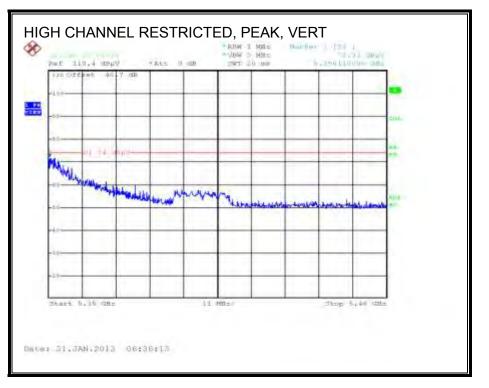
Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

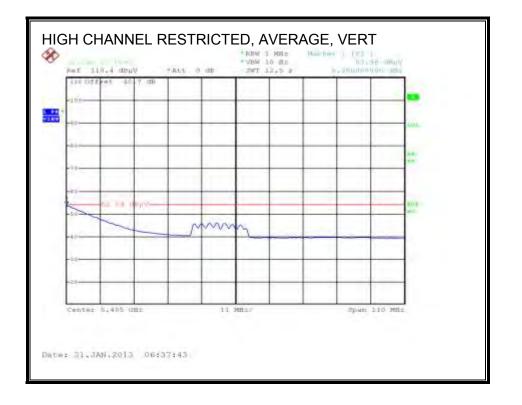
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# 9.2.14. 802.11n HT20 CDD 2TX MODE, 5.3 GHz BAND

### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





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ombli	ance Co	rtification	Services, Fr	emont :	5m Ch	amber .	Δ								
Compa			Broadcom (	Corpera	tion										
Project	H:		13U14796												
Date:			2/14/2013												
	agiacer:		K. Nguyen			1.00		÷.							
	ration:		BCM94360												
Mode:			11n HT20 C	DD M	ode 2	IX; 5.3 (	GHz Band								
Test Ea	quipmen	12													
H	form 1-	18GHz	Pre-an	nplifer	1-26	GHz	Pre-am	plifer	26-40GH	z	He	om > 180	Hz	1	Limit
173;	S/N: 671	7 @3m	- T144 M	Aiteq 30	08A00	931 .	788 Min	eq 26-4	40GHz	- T89;	ARA 18-254	GHz; S/N:10	49	+	FCC 15.205
-	-		21			1	1	-		211				-	1
	QUERCY Ca		1	-	-		-			1		1		ĭ	
3.	cable 2	2807700	12° c	able 2	28076	600	20' cat	ble 22	2807500		HPF	Re	ject Filte	¢	
3.4	able 22	807700	• 12 ca	ible 228	8/600		20° cabi	la 228/	07500 .	HP	F_7 6GHz	-	-	-	
<u> </u>		-	4 1		_			_	-	1		-		-	
f GHz	Dist (m)	Read Pk dBaV	Read Avg. dBaV	AF dB/m	CL dB	Amp dB	D Corr dB	Flir dB	Peak dBoV/m	Avg dBaV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
	(m) 52 (5260		itBaV	dB/m	dB	dB	48	dB	dBaV/m	dBaV/m	dBaV/m	dBuV/m	48	dB	(V/H)
15.780	3.0	40.9	29.9	38.6	13.4	.34.6	8.0	0.7	59.1	48.1	74	54	.119	.5.9	· v
15.780	3.0	38.4	27.9	38.6	13.4	-34.6	0.0	0.7	56.5	46.0	74	54	-17.5	-8.0	н
	60 (5300	MHz)		The state	100		1					-			
10.404	3.0	39.5	30.0	38.5	10.7	-36.2	0,0	0.8	63,3	43.8	74	54	-20.7	-10.2	V
18.604	3.0	37.4	27.2	38.5	10.7	-36.2	0.0	0.8	51.2	41.1	74	54	-22.8	-12.9	H
15.900	3,0	39.2	29.6	38.3	13.4	34.5	0.0	0.7	57,3 55,6	47.8	74	54 54	36.9	-6.5	V H
	3.0		21.0	38.3	13.4	-34.5	9.0	0.1	90.0	45.3	14	54	-18.4	-80	
10.640	3.0	41.2	39.6	38.5	10.7	-36.3	0.0	0.8	55.1	46.4	74	54	18.9	.9.6	v
10.640	3.0	39.5	27.4	38.5	10.7	-36,1	0.0	0.8	53.3	41.2	74	54	28.7	-12.8	В
15.960	3.0	43.5	\$2.8	38.2	13.4	34.5	0.0	0.7	61.7	50.6	74	54	123	3.4	v
15.960	3.0	48.7	39.2	38.2	13.4	34.5	0.0	0.7	58.6	48.0	74	54	-15.4	-6.9	H
Rev. 01.3	0.11														
			15		_	12.1		60				A		ALC: NO	11.5
	f		ent Frequency	£		Amp	Preamp (							ield Strength	
	Dist	Distance to							ct to 3 mete			Pk Lins	and a second particular of	Strength I in	
	Read	Analyzer R				Avg			Strength @					Average Lis	nut
	AF	Antenna Fa				Peak			k Field Stre	ngth		Pk Mar	Margn vs	Peak Line	
	CL	Cable Loss	8			HPF	High Pas	s Filter	F.						

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# 9.2.15. 802.11n HT20 STBC 2TX MODE, 5.3 GHz BAND

Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

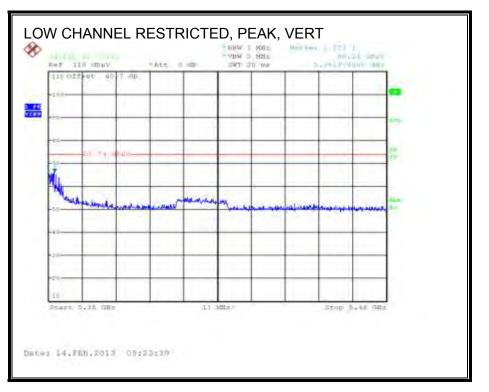
# 9.2.16. 802.11n HT20 BF 2TX MODE, 5.3 GHz BAND

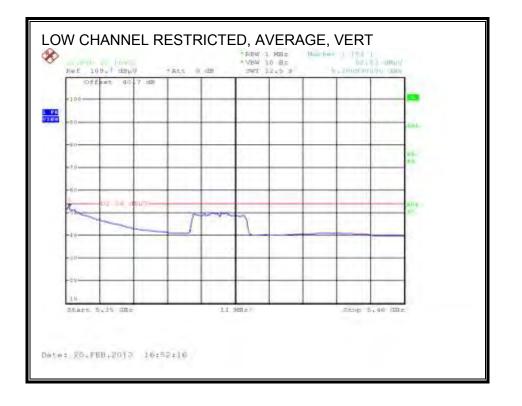
Covered by testing 11n AC20 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

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# 9.2.17. 802.11n AC20 BF 2TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





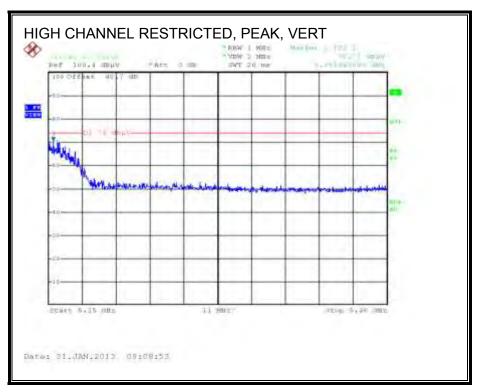
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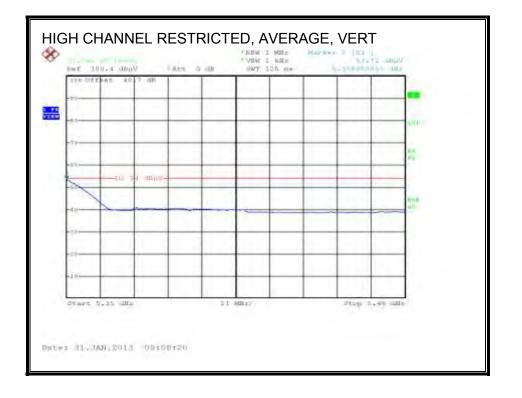
Compan Project Date: Test En Conligu Mode: Lost Eq	W: gineer: ration:		Brosdcom ( 13U14796 92/23/13 K. Nguyen EUT with h Ts 5.3GHz	iptop, A	C ada			5							
		-18GHz	Pre at	nplifer	1.76	CLI-	Dra am	nlifer	26-40GH	aĩ -	H	om > 180	104	1	Limit
-		7@3m	-	Aiteq 30			TES Mit		-		ARA 18-260			-	FCC 15.205 -
3. 0	able 22	22807700		able 2		500	20° cab	-	2807500	HP	HPF	R	ject Filte	RBW-	k Measurements IMHz VBW-3MHz ge Measurements 1MHz VBW=10Hz
f	Dist	and the second second	Read Avg.	AF	CL.	Amp	D Corr	Flit	Peak	Avg	Pk Lim			Avg Mar	Notes
GHz	(m)	dBuV Miz)	dBaV	dB/m	dB	dB	dB	dB	dBuV/m	dBaV/m	dBaV/m	dBuV/m	dB	48	(V/H)
5.780	3.0	45.4	34.2	38,6	13.4	-34.6	0.0	6.7	63.6	52.3	74	54	-10.4	-1.7	v
5,780	3.0	41.7	33.6	.38.6	13.4	-34.6	0.0	0.7	59.9	51.8	74	54	-14.1	-2.2	H
L600	3.0	41.3	38.7	38.5	10.7	-36.2	0.0	6.8	55.1	44.5	74	54	-13.9	.9.5	v
1.600	3.0	41.1	30.8	38.5	10.7	-36.2	0.0	6.8	54.9	44.6	74	54	19.1	-9.4	H
900	3.0	45.2	33.6	38.3	13.4	34.5	0.0	0.7	-63.1	61.5	74	-54	10.9	-2.5	v
006.3	3.0	43.8	32.9	38.3	13.4	-34,5	0.0	0.7	61.7	50.9	74	54	42.3	-3.1	н
1.640	3.9	30.0	28.8	38.5	19,7	.36.1	8.0	0.8	53.8	42.6	74	54	20.2	-11.4	Y
1.640	3.0	38.9	29.3	38.5	10.7	.36.1	0.0	0.8	52.8	43.2	74	54	-21.2	-10.8	H
5,690	3.0	46.8	38.0	38.9	13.3	.34,6	0.0	6.7	65.1	63.3	74	54	-8,9	0.7	Ŷ
5.690	3.8	43.1	32.4	38.9	13.3	-34,6	0.0	0.7	61.4	50.7	74	54	-12.6	-33	н
ev. 01.30	LI.	-			-	1					_				1.1
	f Det Read AF CL	Measureme Distance to Analyzer Re Antenna Fa Cable Loss	Antenna ading clor	5		Amp D Corr Avg Peak HPF	Average	Corre Field S of Peal	ct to 3 mete Strength (2) k Field Stre	3 m		Pk Lim Avg Mar	Peak Field Margin vi	ield Strengt 1 Strength L Average L Peak Limit	mit

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# 9.2.18. 802.11n HT40 1TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





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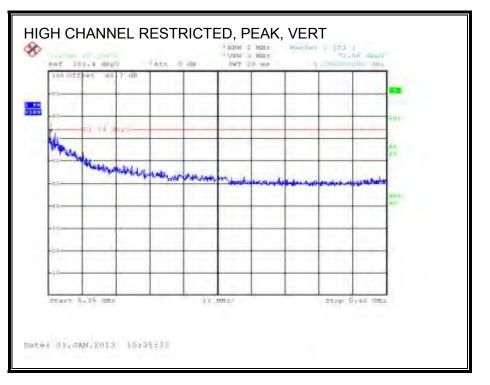
Covered by testing 11n HT40 CDD 2TX, total power across the chains is higher than the power level the device will operate at.

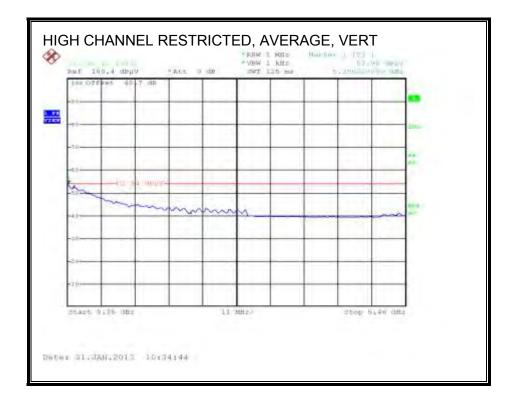
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# 9.2.19. 802.11n HT40 CDD 2TX MODE, 5.3 GHz BAND

### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





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ompli			Measurem Services, Fr		5m Ch	amber.	A									
			Broadcom ( 13U14796 2/20/2013 K. Nguyen EUT with I 11n HT40 (	aptop a	and AC											
est Es	ulpmen	£.														
H	om 1-	18GHz	Pre-at	mplifer	1-260	GHZ	Pre-am	plifer	26-40GH	z	н	om > 18G	Hz	1	Limit	
173;	5/11: 571	7 @Jm	- T144 I	Aiteq 30	ORADO	931 .	TER Min	eq 26-	4DGHz	- T89	ARA 18-264	GHz; 5/N:10	49	-	FCC 15.205	-
	cable 2	2807700	12' 0	able 2	28076	500	20' ca	ble 22	2807500		HPF	Re	ject Filts	ar		
3' 0	able 22	307700	12 ca	ible 228	07600	-	20' cab	le 228		HP	F_7 6GHz	3		•		
f GR2	Dist (m)	Read Pk dBuV	Read Avg. dBaV	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBaV/m	Avg dBaV/m	Pk Lips dBaV/m	Avg Lim dBuV/m	Ph Mar dB	Avg Mar dB	Notes (V/H)		
	54 (5270															_
5,810	3.0	38.9	29.2	38.6	13.4	-34.6	0.0	0.7	57.0	47.3	74	54	-17,0	-8,7	V	
5.510	3.0	36.3	26.8	38.6	13.4	-34.6	0.0	0.7	54.4	41.5	74	54	-19.6	-9.2	н	
2.620	3.0	38.3	29.8	38.5	10.7	-36.2	-0.0	0.8	52.3	43.6	74	54	.21.9	-10.4	v	_
1.620	3.0	36.1	26.7	38.5	10.7	-36.2	0.0	0.8	50.0	40.6	74	54	-24.0	13.4	H	_
5.930	3.0	39.1	36.3	38.2	13.4	34.5	0.0	0.7	56.9	48.2	74	54	17.1	-5.8	Ŷ	
5.930	3.0	39:0	29.9	38,2	13.4	-34.5	0.0	0.7	56.9	47.7	74	54	-17.1	-0.3	н	
ey. (1.3	R.Ú						2.12				-				-	
	f Measurement Frequency Ang						Average	Corre Field S of Peal	ct to 3 mete Strength @ k Field Stre	3 m		Pk Lan Avg Mar	Peak Fiel Margin vi	field Strength I Strength Li Average Li Peak Limit	mit mit	

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# 9.2.20. 802.11n HT40 BF 2TX MODE, 5.3 GHz BAND

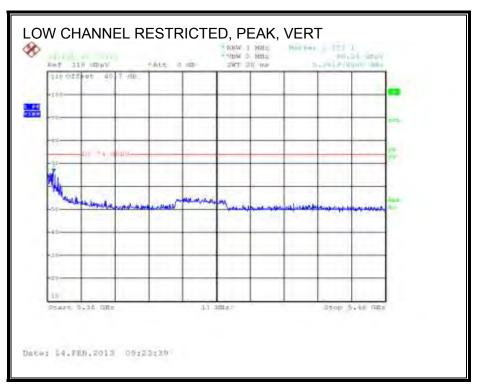
Covered by testing 11n AC40 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

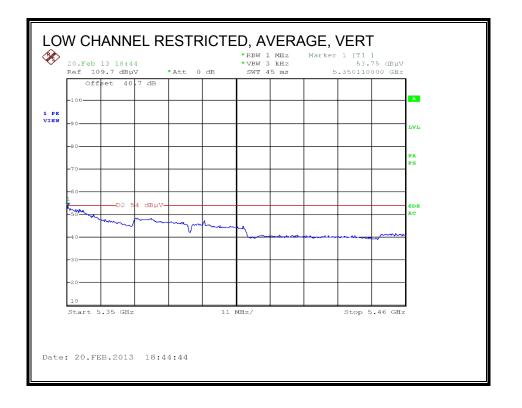
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# 9.2.21. 802.11n AC40 BF 2TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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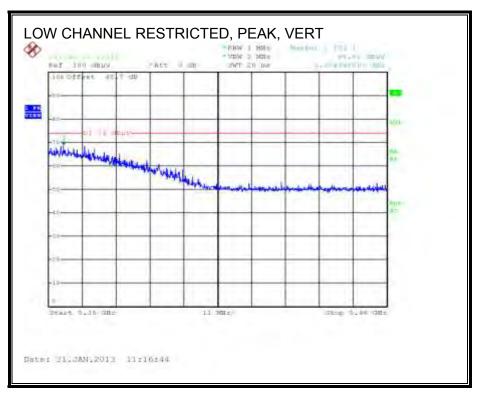
			Services, Fr												
Compan			Breadcon Co	direttion											
Project Date:	WD.		13U14796 274/2013												
Fest En			K. Nguyen												
Configu			BCMP4360CS	withLa	riter. A	Cadante	and anten	-							
Mode:			Tx Un AC40												
Test Eq	nipmen	t.													
н	orn 1-	18GHz	Pre-at	mplifer	1-26	GHz	Pre-am	plifer	26-40GH	z	н	om > 180	Hz	1	Limit
173; 5	S/N: 671	7 @3m	- T141	Aiteq 30	08400	931 .	TES Mit	eq 26-	ADGHz	· T89	ARA 18-26	GHz; S/N:10	49		FCC 15.205 .
	quercy Ca		1	100			-			TI -		1		1	
3.4	cable 2	2807700	12' 0	able 2	28076	500	20° ca	ble 22	1807500		HPF	Re	ject Filte		MEL: VBW=3MR2
3'0	and and and an and an and					•	20° cab	la 228	07500 .	HP	F_7.6GHz	3		Avera	ge Measurements 1MH2 VBW=10H2
f				1.222	CL	Amp	D Corr	Fltr	Peak	Avg	Pk Lim			Avg Mar	Notes
GHz	(m)	dBaV	dBaV	dB/m	dB	dB	48	dB	dBaV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
Channel	3.0	40.7	31.3	38.6	13.4	-34.6	0.0	0.7	58.8	49.4	74	54	45.5	45	v
15.810	3.0	40.4	31.9	38.6	13.4	34.6	0.0	0.7	58.4	50.0	74	54	15.6	4.0	H
	1000				-		5			-		-			
Channel ( 10.620	3.0	MHz) 41.5	33.9	38.5	10.7	30.2	0.0	0.8	35.6	47.7	74	.84	184	.6.3	TV.
18,628	3.0	48.9	31.1	38.5	10.7	-36.2	0.0	0.8	54.8	45.6	74	54	-19.2	-9,6	н
15.930	3.0	-41.9	31.1	38.2	13.4	34.5	9.9	9.7	59.8	49.0	74	54	-142	-5.4	v
15,930	3.0	40.3	31.2	38.2	13,4	34.5	0.0	0.7	58.1	49.1	74	54	-15.9	-4.8	H
Rev: 01 34	i.ii		_	_					_					_	_
	f	Measureme	nt Frequenc	y:		Amp	Preamp (	Gaan				Avg Lim	Average I	ield Strength	Limit
	Dist	Distance to	Antenna			D Corr	Distance	Carre	et to 5 met	ers		Pk Lin	Peak Field	Strength Li	Tal
	Read	Analyzer R.	eading			Aig	Average	Field S	Strength @	3 m		Avg Mar	Margin vs	Average Li	mit
	ÅF	Antenna Fa	ctor			Peak	Calculate	d Peal	Field Stre	mgth		Pk Mar	Margin vi	Peak Limit	
	CL.	Cable Loss				HPF	High Pas	s Filter	1000						

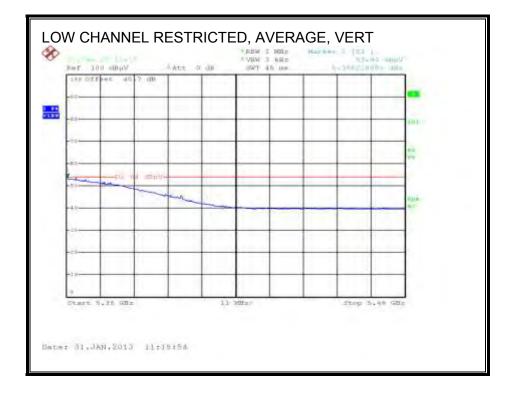
**<u>Note</u>**: the VBW used for the AVG measurements was 1 kHz. The 10 Hz shown the tabular data above this note is a typo.

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# 9.2.22. 802.11n AC80 1TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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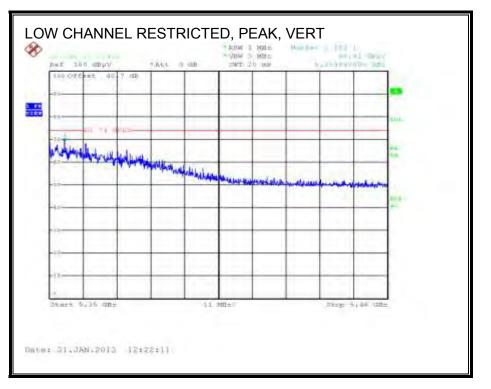
Covered by testing 11n AC80 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

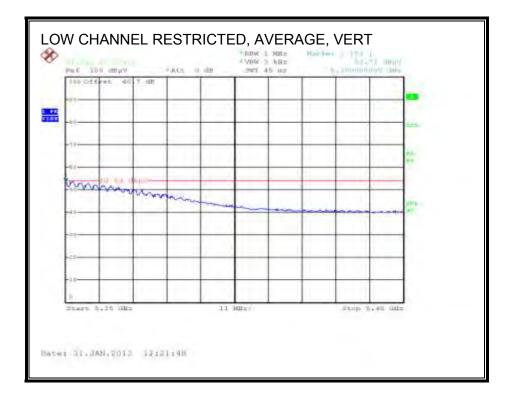
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# 9.2.23. 802.11n AC80 CDD 2TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





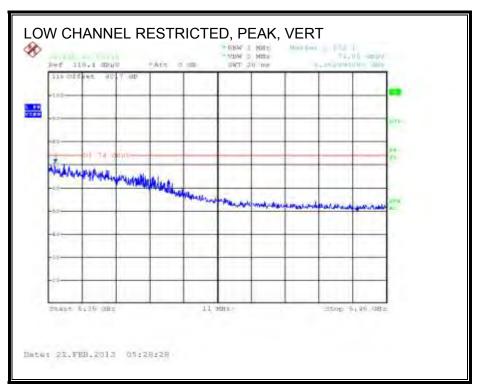
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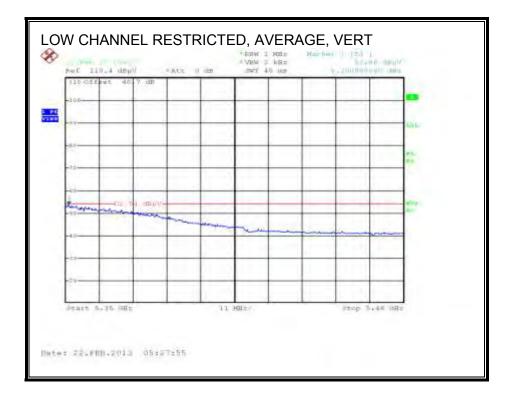
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# 9.2.24. 802.11n AC80 BF 2TX MODE, 5.3 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





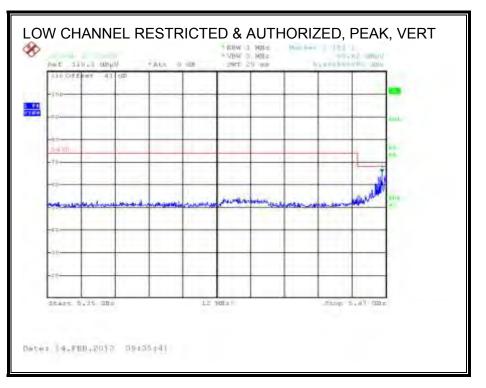
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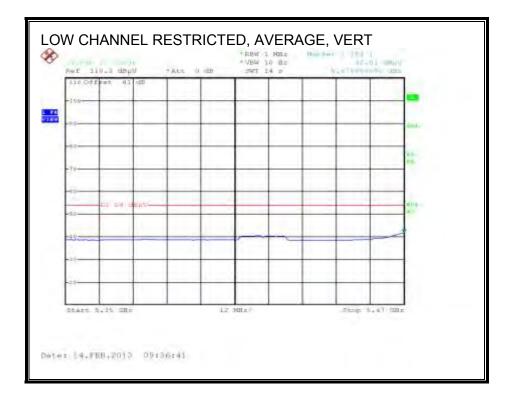
Compliance Certific: Company: Project #: Date: Test Engineer: Configuration: Mode: Test Equipment: Horn 1-18GH T73; S/N: 6717 @3e 14 Prequency Celles = 3' cable 22807	Bre 130 2/2- K.1 EU Ts	Andcom Con 114796 4/2013 Nguyen T with Lap 5.3GHz Ba Pre-amp	rporation top, AC ad ind_11n AC	aptor, a	ad antona		158									
Horn 1-18GF		1					1									
173; S/N: 6717 @3n _ 14 Prequency Cables —		1	the statements													
The Pressure Cables -						plifer	26-40GH	z		Ho	m >1	8GHz		1	Limit	
	3' cable 22807700 12' cable 2280					eq 26.4	IDGH2	•	<b>T89</b> ;	ARA 18.260	iHz; S/N	1049		+	FCC 15.205	•
	7700	12' cab	ole 228076	500	20' cat	ble 22	807500	1		HPF		Reject f	ilter	1		
3' cable 22807700	ō .	12 cable	e 22807600	-	20' cab	le 2280			HPT	7 6GHz	-					
and the second second	ad Pic Re BuV (		AF CL B/m dB	Amp dB	D Corr dB	Eltr dB	Peak dBuV/m		₩g tV/m	Pk Lim dBuV/m	Avg L dBuV	1	- C. C.	Avg Mar dB	Notes (V/H)	
	6.2		18.4 13.4 18.4 13.4	34.2 34.5	0.0	0.7 0.7	54.2 53.2		5/0	74 74	54 54	19		-9.0 -9.7	V H	
tev, 01,30,13																
Dist Dista Read Analy AF Ante	surement F ince to Ani lyzer Readi nna Factor le Loss	tenna ing	Amp D-Corr Avg Peak HPF	Average I	Correc Field S d Peak	et to 3 meto strength @ 1. Field Stre	3 m			Pk Lin Avg M	Peak ar Marg	Field 3	ld Strength Strength Li Average Li Peak Limit	niit		

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# 9.2.25. 802.11a LEGACY 1TX MODE, 5.6 GHz BAND

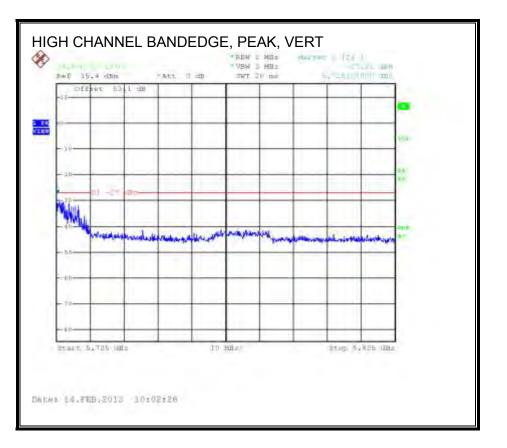
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

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# 9.2.26. 802.11a LEGACY 1TX MODE, CHANNEL 144, 5.6 GHz BAND

#### BANDEDGE

Not Applicable.

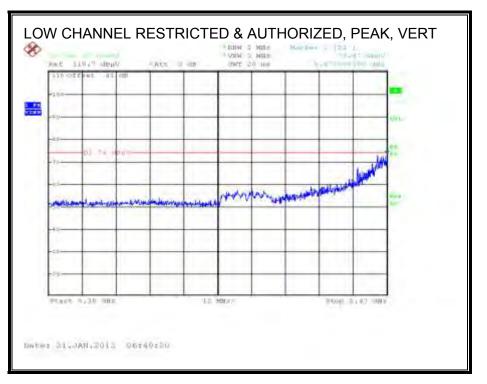
### HARMONICS AND SPURIOUS EMISSIONS

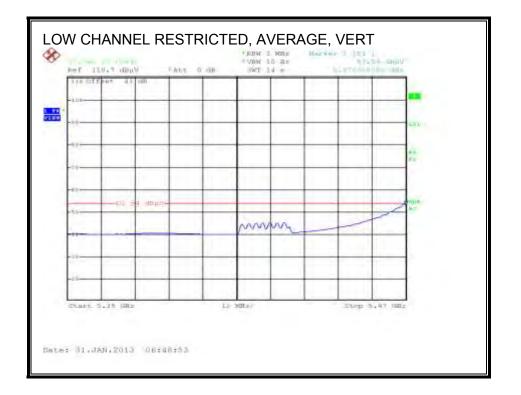
Covered by testing 11n HT20 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

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# 9.2.27. 802.11n HT20 CDD 2TX MODE, 5.6 GHz BAND

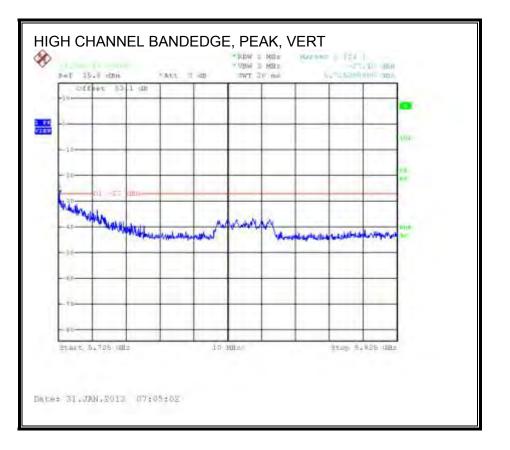
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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			Measurem												
Compli	ance Co	rtification	Services, Fr	emont	5m Cł	amber	A								
Configu Mode:	H: ngiacer; iration:		Broadcom 13U14796 2/22/2013 Kris N/Dan EUT, Adaps HT20 2TX	ter, lap											
	inipmen	18GHz	Dra.at	mplifer	1.76	CHA	Pra am	nillar	26-40GH		H.	orn > 18G	Law	1	Limit
-	S/N: 671			Aiteq 30	_		Tto Mit			and in success	ARA 18-264			-	FCC 15.205
-	cable 2	22807700	_	able 2 able 728			20' cab		280 <b>750</b> 0	HP	HPF F_7.6GHz	Re	ject Filte	RBW	Measurements V=VBW=3MHz e Measurements MHz_VBW=10Hz
f	1000	and the second	Read Avg.		C1.	Amp	D Corr	Fltr	Peak	Avg	Pk Lim			Avg Mar	Notes
GHz	(m) 550030	dBaV	dBaV	dB'm	dB	dB	dB	dB	dBaV/m	dBeV/m	dBnV/m	dBuV/m	dB	dB	(V/H)
11.000	3.0	39.5	29.6	35.7	10.9	-36.0	0.0	0.7	53.8	44.0	74	54	-20.2	-10.0	v
1.000	3.0	38.5	28.5	38,7	10.9	36.0	0.0	0.7	53,2	42.8	74	54	20.8	11.2	Ħ
	5580MB		-			-	1.1.1				-	-			
11.160	3.0	41.0	32.1	38.9	11.0	-36.0	0.0	0.7	55.6	46.7	74	54	18,4	-7.4	V H
	140:570		47.0	1000	110	-30,0		Wit	24.5	**.1		-04			
11.400	3.0	-41.9	31.0	39.1	11.1	35.9	0.0	0.7	56.9	46.9	74	54	47.1	-7-1	v
11.490	3.0	36.4	26.7	39.1	11.1	35,9	0.0	0.7	51,4	41.7	74	54	32.0	-123	н
Rev DI 3	0,11			_		_				_				_	_
	ŕ		ent Frequenc	ý		Amp	Preamp							ield Strength	
	Dist	Distance to				12			et to 3 mete					Strength Lin	
	Read	Analyzer R				Avg			Strength @					Average Lin	nit
		Antenna Fa	actor			Peak	Calculate	d Peal	k Field Stre	ngth		Pk Mar	Margin vs	Peak Limit	
	AF	Cable Loss				HPF	High Pag								

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# 9.2.28. 802.11n HT20 CDD 2TX MODE, CHANNEL 144, 5.6 GHz BAND

#### BANDEDGE

Not Applicable.

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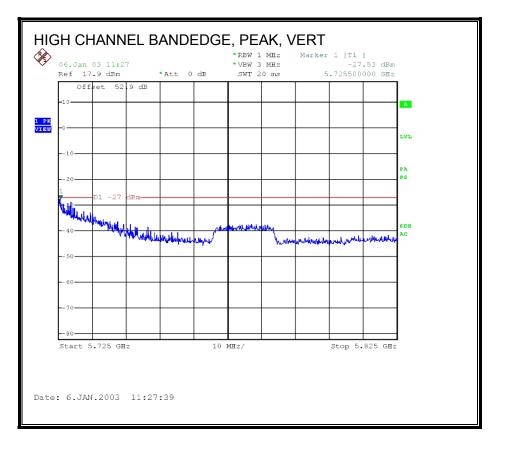
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ompai roject ate: est Ex onfigu Iode:	ny: #: ngineer tration:		Services, Fr Broadcoan 13U14796 2/22/2013 Kris N/Dan EUT, Adap HT20 2TX	ny Vu ter, lapi	op, Ai	ntenna												
	julpmen	18GHz	Pre-at	mplifer	1.260	CH7	Pre-am	plifer	26-40GH			H	om > 180	Hr		1	Limit	1
	S/N: 671		1.00	Aineq 30			TES Mit			•	789;	ARA 18-260				FCC	15.205	
3.		22807700	-	able 2		500			2807500		_	HPF	R	nject Filte		ezk Meas RBW-VBV	V=3MHz	1
3.0	able 22	807700	• 12 ca	ible 226	07600	*	20' cat	ale 228	97500 •		HPT	7 6GHz	-			w=1MHz		
f GH2	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Eltr dB	Peak dBuV/m		vg V/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg M dB	ar	Notes (V/H)	
hannel 1/440 1.440	144: 572 3.0 3.0	0MHz 42.6 36.4	30.8 26.5	.19.1 39.1	11.1 11.1	35,9	6.0	0.7 0.7	37.6 51.5		5,3	74 74	51 54	16,4	4.1		V H	
	AF CL	Analyzer R Artenna Fa Cable Loss	actor			Avg Peak HPF		nd Peal	Strength @ k Field Stre r					Margin ya Margin ya				

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## 9.2.29. 802.11n HT20 STBC 2TX MODE, 5.6 GHz BAND

#### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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### 9.2.30. 802.11n HT20 STBC 2TX MODE, CHANNEL 144, 5.6 GHz BAND

Covered by testing 11n HT20 CDD 2TX CHANNEL 144, total power across the two chains is higher than the power level the device will operate at.

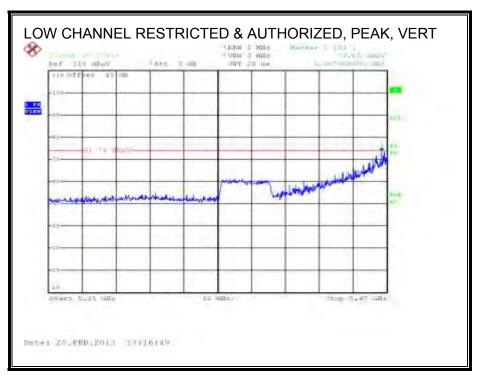
## 9.2.31. 802.11n HT20 BF 2TX MODE, 5.6 GHz BAND

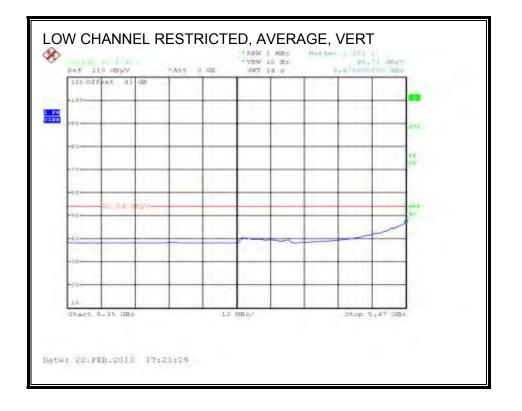
Covered by testing 11n AC20 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

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### 9.2.32. 802.11n AC20 BF 2TX MODE, 5.6 GHz BAND

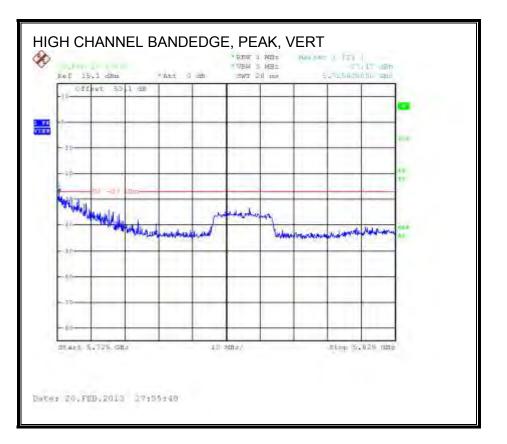
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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onliguration: Iode: est Equipme		ELT / Lapt Tx 5.6GHz												
Fest Equipme	at				20 Txl	BF 2TX								
Horn 1	-18GHz	Pre-at	mplifer	1-260	GHz	Pre-am	plifer	26-40GH	z	Ho	rn > 18G	Hz	1	Limit
T73; S/N: 67	17 @lm	- T1441	Aiteq 30	084005	31 .	TES Mit	ng 26-	40GHz	· T89	ARA 18-266	GHz; S/N:10	49		FCC 15.205
HI Frequency C	ables		_		-	-	_	-	ET .		1		1	
3' cable	22807700	12' 0	able 2	28076	00	20' ca	ble 22	1807500		HPF	Re	ject Filte		k Measurements 1MHr., VBW=3MR
3' cable 22	2807700	12 0	able 728	07600	•	20' cab	la 228	07500 .	HP	7.6GHz	3	-	Avera	age Measurements 1MHz VBW=10Hz
f Dist GHz (m)	and the second se	Read Avg.	AF	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBaV/m	Avg dBeV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	
OW CHANNEL	(100), 5500M	Ha												(V/H)
1.000 3.0 1.000 3.0	39.9	29.5 28.4	38.7 38,7	10.9	-36.0 -36.0	0.0	0.7	54.2 51.9	43.8	74	54 54	-19,8	-10.2	V H
ID CHANNEL (	(116), 5580MH 40.5	r M.4	38.9	11.0	-36.0	0.0	0.7	55.1	46.0	74	54	-18.9	-8.0	v.
11.160 3.0 HGH CHANNEL	38,7	29.1	38.9	11.0	-30,0	0.0	0.7	53.3	43,7	74	- 84	-20,7	10.3	n
1.400 3.0	-41.1	30.8	39.1	11.1	35.9	0.0	0.7	56.1	45.8	74	54	-17.9	-8.2	v
11.490 3.0 Nev 01.39.33	39.5	29.8	39.1	11.1	.35,9	0.0	0.7	54.5	44.8	74	54	-19.8	.9.2	H
ŕ	Measureme	nt Frequenc	ý		Amp	Preamp	Gain			-	Avg Lim	Average F	ield Strengt	th Limit
Dia	Distance to Analyzer R				D Con Avg			ct to 3 mete Strength 2					Strength L Average L	
AF	Antenna Fa				Peak			k Field Stre					Peak Limit	
CL.	Cable Loss				HPF	High Pas	s Filter	p						

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# 9.2.33. 802.11n AC20 BF 2TX MODE, CHANNEL 144, 5.6 GHz BAND

#### BANDEDGE

Not Applicable.

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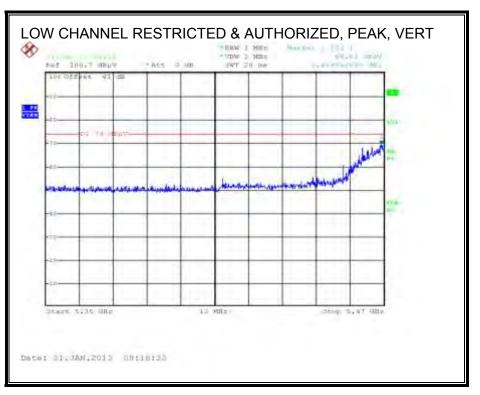
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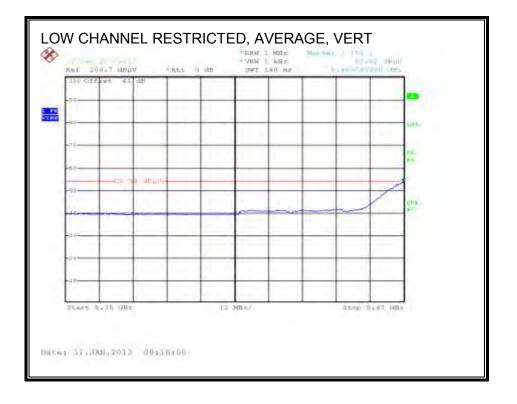
Frequency	Measurem	inst													
ertification S	ervices, Fr	remont	5m Ch	amber	A										
	L3U14796 2/25/2013 Vien Tran EUT / Lapt			C20 Tx1	SF 2TX_C	hanne	4 144								
	Pra	minife	1.26	CHT	Pre.am	olifer	25-4004	-		H	-	180	-	1	Limit
	-				-	-	1.00		T89;			10.5		-	FCC 15.205 .
-				-	1	-			-					-	
					20' cal	ble 22	2807500			HPF	1.	Re	ject Filte		Measurements
				20' cab	le 228	07500 .		HPT	7 6GHz	•	1		Avera	ge Measurements 1MHz VBW=1094z	
1000-000		200	CL	Amp	D Corr	Fltr	Peak		1.00	Pk Line				Contraction of the second second	Notes
		dB/m	dB	dB	dB	dB	dBuV/m	dB	V(m)	dBuV/m	dBa	/m	dB	48	(V/H)
43.3	33.4	39.1	11.1	.35,9	0.0	0.7	58,3	13	8.5	74	54	1	15.7	.1.5	Ŷ
37.8	27.2	39.1	111	-35.9	9.0	0.7	52.9	4	2.3	74	54	1	-21.1	-11.7	Ĥ
Distance to	Antenna	ŝ.			Distance	Care				. 1	Pk Lie	m	Peak Field	i Strength Li	Third
1															
Antenna Fac	ctor.			HPF	High Pas			ingi)			PK M	ar.	Margan vs	Peak Line	
	ertification S nt: -18GHz -18GHz 17 @3m eles 22807700 Read Pk dBuV 144, \$729MB: 43.2 37.8 Measuremet Distance to Analyzer Re	Broadcom 13U14796           Broadcom 13U14796           2/25/2013         View Tran EUT / Lapt Tx 5.6GHz           Pre-an 17 © 3m           18GHz           Pre-an 17 @ 3m           12' cr           22807700         12' cr           Read Pk         Read Avg. dBu V         dBu V           dBu V         dBu V           12' cr           Read Pk         Read Avg. dBu V         dBu V           Measurement Frequenc Distance to Antenna	Broadcom           13/114796           2/25/2013           Vien Tran           EVT / Laptop / An           Ts 5.6GHz Band_           nt:           -18GHz         Pre-amplifer           T144 Mineg 30           cies         12' cable 2           2007700         12' cable 2           Read Pic         Read Avg         AF           dBay         dBay         dBay           144, 57200Mir         33.4         39.1           Measurement Frequency         Distance to Antenna           Analyzer Reading         Measurement Frequency	ertification Services, Fremont 5m Ch Broadcom 13U14796 2/25/2013 View Tran EUT / Laptop / Antenna Tx 5.6GHz Band 11n Ad nt: -18GHz Pre-amplifer 1-26 T144 Mineq 3008A00 cos 22807700 12' cable 2280700 12' cable 2280700 12' cable 2280700 12' cable 2280700 12' cable 2280700 12' cable 2280700 12' cable 2280700 Read Pk Read Avg. AF CL dBuV dBaV dB'm dB 144, 5720MHz 43.2 33.4 39.4 11.1 37.8 27.2 59.1 11.1	ertification Services, Fremont 5m Chamber- Broadcom LiSUL4796 2/25/2013 View Tran EUT / Laptop / Antenna Tx 5.6GHz Band 11n AC20 Tx1 nt: -18GHz Pre-amplifer 1-26GHz T144 Mineq 3008A00931 , ces 22007700 12' cable 22807600 12' cable 22807600	erification Services, Fremont 5m Chamber A Broadcom 13U14796 2/25/2013 Vien Tran EUT / Laptop / Antenna Tx 5.6GHz Band_lln AC 20 TxBF 2TX_C nt: -18GHz Pre-emplifer 1-26GHz Pre-em T144 Mineq 3008A00931 Pre-em T184 Mineq 3008A00931 Pre-em 22007700 12' cable 22807600 20' cab Read Pk Read Avg. AF CL Amp D Corr dBu V dBu V dBu dB dB dB 144, 572504Hz 43.5 35.4 39.1 11.1 35.9 0.0 37.5 27.2 39.1 11.1 35.9 0.0 Stasser to Antenna D Corr Distance Aualyzer Reading Avg Average	ertification Services, Fromont 5m Chamber-A Broadcom 13U14796 2/25/2013 View Tran EUT / Laptop / Antenna Tx 5.6GHz Band_11n AC20 TxBF 2TX_Chemne at: -18GHz 17 @3m • T144 Mineq 3008A00931 • T88 Mineq 26- 22007700 • 12' cable 22807600 12' cable 22807600 20' cable 22 20' c	ertification Services, Fremont 5m Chamber-A Broadcom ISUL4796 2/25/2013 View Tran EUT / Laptop / Antenna Tx 5.6GHz Band 11n AC20 TxBF 2TX_Channel 144 nt: -18GHz Pre-amplifer 1-26GHz T144 Mineq 3008A00931 Pre-amplifer 25-40GH T144 Mineq 3008A00931 Pre-amplifer 25-40GH T188 Mineq 26-40GHz 22007700 12' cable 22807600 20' cable 22807500 20' cable 22807	ertification Services, Fromont 5m Chamber-A Broadcom 13U14796 2/25/2013 View Tran EVT / Laptop / Antenna Tx 5.6GHz Band_11n AC20 TxBF 2TX_Chennel 144 nt: -18GHz T144 Mineq 3008A00931 T144 Mineq 26-40GHz T144 Mineq 3008A00931 T188 Mineq 26-40GHz T188 Mineq 26-40GHz T188 Mineq 26-40GHz T188 Mineq 26-40GHz 20' cable 22807600 20' cable 22807600 20' cable 22807500 20' c	erification Services, Fremont 5m Chamber-A Broadcom 13U14796 2/25/2013 View Tran EVT / Laptop / Antenna Tx 5.6GHz Band_lln AC20 TxBF 2TX_Channel 144 nt: -18GHz Pre-emplifer 1-26GHz Pre-amplifer 26-40GHz T88 -18GHz Pre-emplifer 1-26GHz Pre-amplifer 26-40GHz T88 -18GHz T144 Mineg 3008A00931 T88 Mineg 26-40GHz T88 -18GHz T144 Mineg 3008A00931 T88 Mineg 26-40GHz T88 -18GHz T144 Mineg 3008A00931 T88 Mineg 26-40GHz T88 -18GHz T144 Mineg 3008A00931 T88 -18GHz T88	erification Services, Fremont Sn Chamber-A Broadcom 13U14796 2/25/2013 View Tran EVT / Laptop / Antenna Ts 5.6GHz Band_lin AC20 TxBF 2TX_Chennel 144 nt: -18GHz Pre-amplifer 1-26GHz Pre-amplifer 25-40GHz H4 T88 Mineq 26.40GHz H4 T88 Mineq 26.40GHz H4 T89, ARA 18-264 22007700 12' cable 22807600 20' cable 22807500 12' cable 22807600 20' cable 22807500 HPF_7 6GHz Read Pk Read Avg AF CL Amp D Corr Eltr Peak Avg Pk Lim dBaV dBaV dBaw dB	ertification Services, Fremont 5m Chamber-A Broadcom 13U14796 2/25/2013 View Tran EUT / Laptop / Antenna Ts 5.6GHz Band_11n AC20 TxBF 2TX_Chennel 144 nt: -18GHz 17 @3m Pre-amplifer 1-26GHz T144 Mitteg 3098A00931 Pre-amplifer 26-40GHz T144 Mitteg 26-40GHz T12' cable 22807600 12' cable 22807600 20' cable 22807500 HPF HPF_7 6GHz MPF HPF_7 6GHz Measurement Frequency Amp Preamp Gain Defense to Antenna D Corr Distance Carreet to 3 mieters Ang Average Field Strength @ 3 m Avg 3	erification Services, Fremont 5m Chamber-A Broadcom 13U14796 2/25/2013 View Tran EVT / Laptop / Antenna Ts 5.6GHz Band_11n AC20 TxBF 2TX_Chennel 144 nt: -18GHz Pre-amplifer 1-26GHz Pre-amplifer 25-40GHz Horn > 18G T83; ARA 18-26GHz; 5/R-10 T83; Mileg 26:40GHz T83; ARA 18-26GHz; 5/R-10 T83; ARA 18-26GHz; 5/	ertification Services, Fremont 5m Chamber-A Broadcom ISU14796 2/25/2013 Vien Tran EUT / Laptop / Antenna Ts 5.6GHz Band, 11n AC20 TxBF 2TX_Chennel 144 nt: -18GHz T 6GHz T 144 Mineq 3008A00931 , T 620 m + T 144 Mineq 3008A00931 , T 82 Mineq 26.40GHz , T 82 Mineq 26.40GHz , T 82 Mineq 26.40GHz , T 82 ARA 18.26GHz; 5/R-1049 HPF, Reject Filte 22007700 12' cable 22807600 20' cable 22807500 , HPF, 7 6GHz , Reject Filte Reject Filte Mar dBuV dBuw dB dB dB dB dB dB dB dBuV/m dBuV/m dBuV/m dB 144, 5725MBz 43.2 33.4 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.3 48.5 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.5 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.3 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.5 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.5 74 54 15.7 37.6 27.2 39.1 11.1 35.9 0.0 0.7 58.9 42.5 74 54 15.7 37.6 27.7 27.7 37.8 27.7 37.8 27.7 3	erification Services, Fremont 5m Chamber A Broadcom ISU14796 2/25/2013 View Tran Et 7 / Laptop / Antenna Ts 5.6GHz Band_11n AC20 TxBF 2TX_Channel 144 Att 18GHz 19GHz 19GHz 19Ghu 1769, ARA 18.26GHz; 57k:1049 1789, ARA 18.26GHz; 57k:1049 12' cable 22807600 12' cable 22807600 12' cable 22807600 12' cable 22807600 12' cable 22807600 12' cable 22807500 12' cable 22807600 12' cable 22807500 12' cable 22807600 12' cable 22807500 12' cable 22807500 12' cable 22807500 12' cable 22807500 12' cable 22807600 12' cable 22807500 12' cable 228075

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### 9.2.34. 802.11n HT40 MCS0 1TX MODE, 5.6 GHz BAND

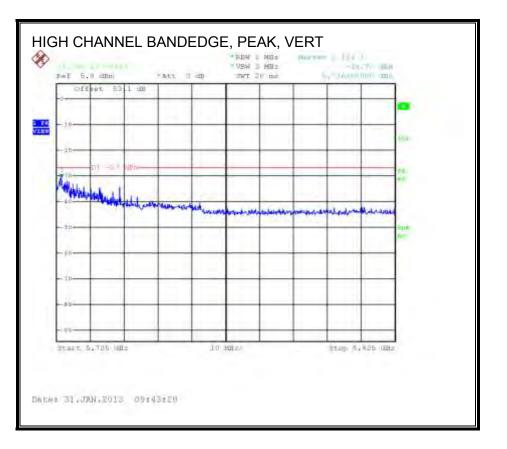
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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Covered by testing 11n HT40 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

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# 9.2.35. 802.11n HT40 MCS0 1TX MODE\_CHANNEL 142, 5.6 GHz BAND

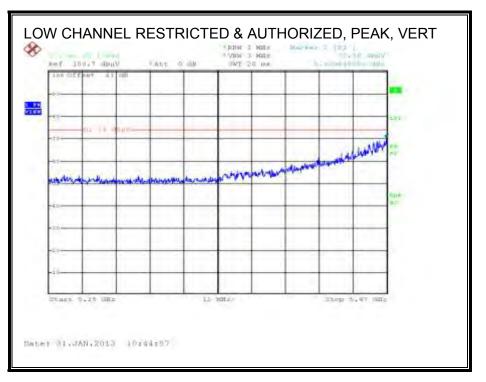
Covered by testing 11n HT40 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

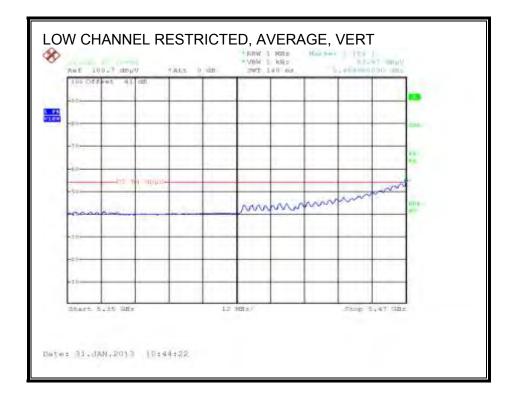
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### 9.2.36. 802.11n HT40 CDD 2TX MODE, 5.6 GHz BAND

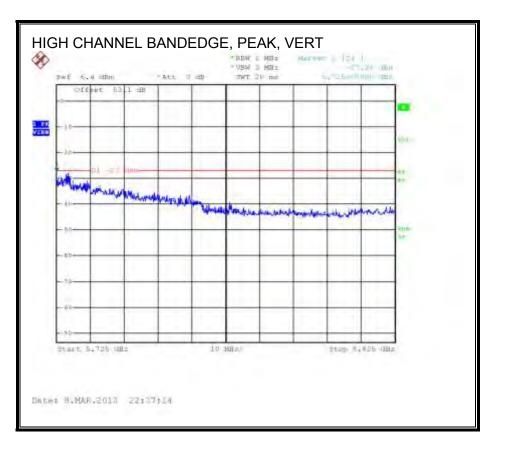
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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ounfi			Measurem Services, Fr		Sm Ck	amber									
empai roject ate: est La onfigu Iode:	iy: N: gineer; ration:		Broadcom ( 13U14796 2/20/2013 K. Nguyen EUT with L 11n HT40 (	Corpur	ntion and AC	Adapte		d							
	uipmen	L 18GHz	Pre-an	n altha	4.90	-	Den am	niller	26-40GH	T.	L.	orn > 18G	Line	1	Limit
_	S/N: 671		_	liteq 30	_	_	The Min	-		and in some	9; ARA 18-264			-	FCC 15.205
3'	and and an are seened and the					500	20' cat 20' cab		2807500	H	HPF #_763Hz	Re	ject Filte	RBW= 1	Measurements MHz , VBW=3MHz ge Measurements MHz , VBW=3 kHz
f GHz	Dist (m)	(m) dBaV dBaV dBm dB				Amp dB	D Corr dB	Fltr dB	Peak dBnV/m	Avg dBaV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
hannel 1.020	102 (551 3.0 3.0	37.7 39.5	30.2	38.7 38.7	10.9	36.0	0.0	0.7	52.1 53.8	44.6	74	54 54	.21.9	-0.4 -8.6	V H
	110 (555		31.0	-10,1	10.9	-30.0	0.0	Q.r	93,8	45,4	74	24	20.2	-0.0	v
.100	9.0	40.1	31.2	38.8	11.0	-36.0	0.0	0.7	54.6	45.6	74	54	-19,4	-8,4	B
100	3.0	38.1	30.4	38.8	11.0	-30,0	-0.0	0.7	52.6	44.9	74	.84	314	.9.1	<u>y</u>
340	3.0	36.7	28.3	39,0	11.1	35.9	0.0	0.7	51.6	43.2	74	54	-22.4	-10.8	v
340	3.0	38.9	27.2	39.0	11.1	.35,9	0.0	0.7	50.8	42.1	74	54	-23.2	-11.9	11
er ol 3	1.11	-	_	-											
	f Measurement Frequency An Disa Distance to Antenna D Read Analyzer Reading Av AF Antenna Factor Pe CL Cable Loss HF						Average	Corres Field S of Peak	ct to 3 mete Strength @ k Field Stre	3 m		Pk Lins Avg Mar	Péak Field Margin va	ield Strength I Strength Li Average Li Peak Limit	mit mit

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## 9.2.37. 802.11n HT40 CDD 2TX MODE, CHANNEL 142 IN THE 5.6 GHz BAND

#### BANDEDGE

Not Applicable.

### HARMONICS AND SPURIOUS EMISSIONS

	ugineer: tration:		2/20/2013 K. Nguyen EUT with L	aptop a	nd AC	Adapte	ar.										
Mode:			11n HT40 (	CDD 21	X; 5.6	GH2 B	and Char	mel la	42								
	Horn         1-18GHz         Pre-amplifer         1-26GHz         Pre-amplifer         26-40GHz         Horn         > 18GHz           T73;         S/N: 6717 @3m         •         T144 Mixeq         3068400931         •         T88 Mixeq         789; ARA 18-26GHz;         S/N:1049         •           M Prevalency Celles         •         •         72° cable 22807500         HDE         Petales Eller         Peak 3										Limit	1					
	S/N: 6717 @3m + T144 Mineq 3008A009						-			-	T89;					FCC 15.205	
3.												HPF	Re	ject Filte	RBW= 1	Measurements MHz , VBW=33	MH2
3. 0	able 22	807700	• 12° ca	ible 228	07600	*	20' cab	le 228	•	U	HPT	7 6GHz	-			ge Measuremen MHz: VBW=31	
f GH2	Dist (m)	Read Pk dBuV	Read Avg. dBaV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	At dBu	M. 1	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	-
"hannel 1.420 1.420	142 (57) 3.0 3.9	0 MHz) 37.7 36.2	27.7 26.8	39.1 39.1	11.1 11.1	.35,9 .35,9	0.0 0.0	0.7 8.7	52,7 51.3	42		74 74	54 54	21.3 -22.7	112	V H	
ey.013	0.13				_			_			_					-	
	f Dist Read AF CL	Measurem Distance to Analyzer R Antenna F/ Cuble Loss	leading actor	k		Amp D Corr Avg Peak HPF	Average	Corre Field S d Peal	et to 3 mete Strength @ k Field Stre	ī m			Pk Lim Avg Mar	Peak Field Margin ys	ield Strength I Strength Lin Average Lin Peak Linu	tion	

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## 9.2.38. 802.11n HT40 BF 2TX MODE, 5.6 GHz BAND

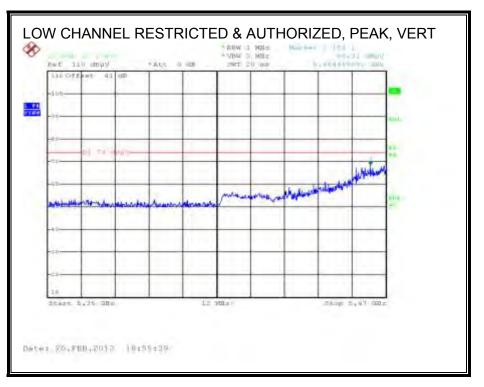
Covered by testing 11n AC40 BF 2TX, total power across the two chains is equal or higher than the power level the device will operate at.

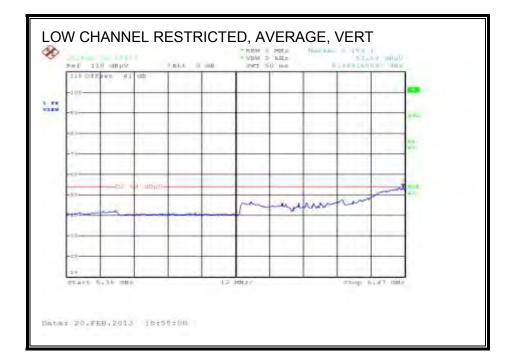
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### 9.2.39. 802.11n AC40 BF 2TX MODE, 5.6 GHz BAND

#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**

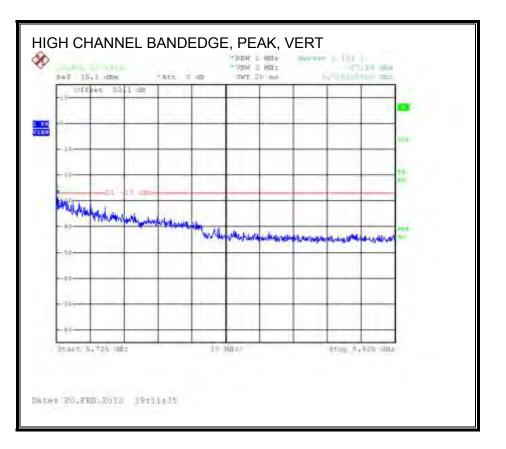




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### AUTHORIZED BANDEDGE (HIGH CHANNEL)



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est Equipment Horn 1-	E					F 2TX								
	10001-	Pra 44	nplifer	1.760	-	Pra am	niller	26-40GH	1	Li.	orn > 18G	Las	Y.	Limit
T73; S/N: 6717		_	Aiteq 30	_		The Min				H ARA 18-264			-	FCC 15.205 -
H Frequency Cab 3' cable 2 3' cable 228	2807700	-	able 2		00	20 <sup>+</sup> cab		2807500	HP	HPF	Re	ject Filte	RBW=1	Measurements Mhr : VBW=3MHr ge Measurements
1	-	11.			2	t	_	-	12		11	_		MH2 VBW=10H2
f Dist GHz (m)	Read Pk dBaV	Read Avg. dBaV	AF dB/m	dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBaV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
hannel 102 (5510 1.020 3.0	44.0	34.7	35.7	10.9	-36.0	0.0	0.7	58.4	49.1	74	54	-15.6	42	v
1.020 3.0	48.5	31.3	38.7	10.9	36.0	6.0	0.7	55.2	45.7	74	54	18.8	.8.3	Ħ
hannel 110 (5550			20.0	11.0	25.0				100	-		14.0		-
1.100 3.0 1.100 3.0	39,7	31.7	38.8	11.0	-36.0	0.0	0.7	54.2 52.4	46.2	74	54 84	-10.8	-7.8	v n
hannel 134 (5670			- Starte				411		-				Territ	
1.340 3.0 1.340 3.0	43.0	33.7	.39.0 .39.0	11.1	35.9	9.0	0.7	57.9 53.4	48.6	74	54	16.1	-5.4	V H
Dist Read AF	Measureme Distance to Analyzer R Antenna Fa Cable Loss	eading actor	'n		Amp D Con Avg Peak HPF	Average	Corre Field S d Peal	ct to 5 mete Strength @ k Field Stren	3 m		Pk Lins Avg Mar	Peak Field Margin vs	uid Strength I Strength Li Average Li Peak Limit	mit

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# 9.2.40. 802.11n AC40 BF 2TX MODE, CHANNEL 142, 5.6 GHz BAND

#### BANDEDGE

Not Applicable.

### HARMONICS AND SPURIOUS EMISSIONS

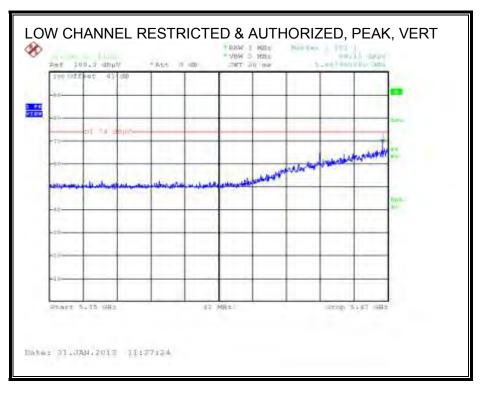
Compli			Measurem Services, Fr		5m Ch	amber	A									
Compa			Broadcom	-	ston											
Project			13U14796	corpora	itioa											
Date:			2/24/2013													
Test E	agineer:		K. Nguyen													
	uration:		EUT with L						1.0							
Hode:			Ts 5.6GHz	Band_1	In AC	40 Tx1	SF 2TX_C	hanne	1 142							
Test E	guipmen	42														
	Hom 1-	18GHz	Pre-ar	nplifer	1-260	Hz	Pre-am	plifer	26-40GH	z		н	om > 18G	Hz	- 1	Limit
173	5/N: 671	7 (#3m	T144 M	Ainea 30	08480	131 -	TES Mit	eg 26.	4DGH/	11	T89;	ARA 18.260	THE: S/N:10	49	-	FCC 15.205
1.2	5/N: 6717 @3m + T144 Milleg 30084009					-	1	ad ra-	acons.	-	100		and a roll	2	-	1
C 14 Pre	nquericy Ca	oles	-	_		- 1				1			7		¥.	
3'	cable 2	2807700	12' c	able 2	28076	00	20' cal	ble 22	2807500			HPF	Re	ject Filte		Measurements
-			-				-			1.	-				RBW-	MHz VEW=3MHz
3.4	cable 22	807700	• 12 ca	ble 228	07600	*	20' cab	le 228	07500 .	Ð	HPT	7 6GHz	-			ge Measurements 1MHz - VBW=10Hz
r	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fltr	Peak	At	z .	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GH2		dBuV	dBaV	dB/m	dB	dB	dB	dB	dBuV/m	dBu\	V/m	dBuV/m	dBuV/m	dB	dB	(V/H)
	1142 (MH			100			-	0.7	-		-		-			
1.420	3.0	43,5	32.2	39.1	11.1	35,9	0.0	0.7	58.5 55.6	49.	-	74	54	-15.5	-4.4	V H
tey DL	90.14															
	f		ent Frequenc	÷		Апр	Preamp								field Strengt	
	Dist	Distance to	. Construction					0.552	et to 3 miet						d Strength Li	
	Read	Analyzer R				Avg			Strength @						Average Li	
	AF	Artenna Fa				Peak			k Field Stre	ngth			Pk Mar	Margan vs	Peak Line	
	CL.	Cable Loss	8			HPF	High Pas	s hiter								

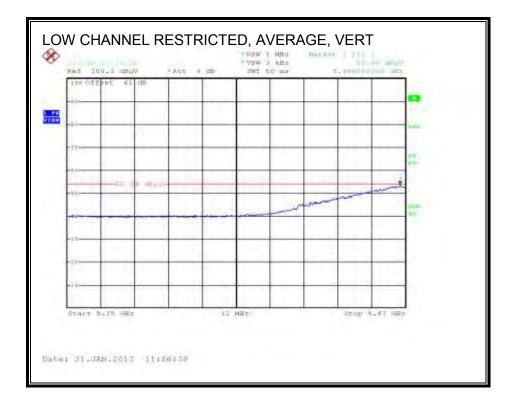
tabular data above this note is a typo.

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# 9.2.41. 802.11n AC80 1TX MODE, 5.6 GHz BAND

#### **RESTRICTED BANDEDGE (LOW CHANNEL)**





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#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**

Not Applicable

UL CCS

#### HARMONICS AND SPURIOUS EMISSIONS

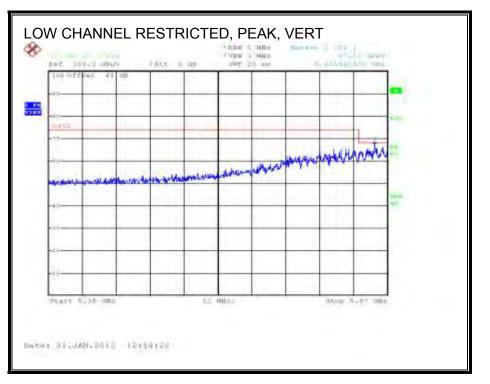
Covered by testing 11n AC80 CDD 2TX, total power across the two chains is higher than the power level the device will operate at.

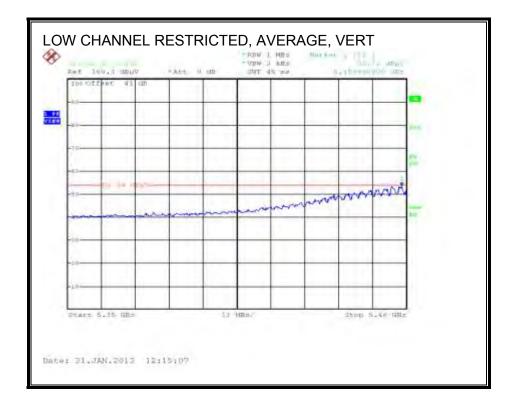
Page 458 of 516 FORM NO: CCSUP4701H 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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### 9.2.42. 802.11n AC80 CDD MCS0 2TX MODE, 5.6 GHz BAND

### **RESTRICTED BANDEDGE (LOW CHANNEL)**





### **RESTRICTED BANDEDGE (HIGH CHANNEL)**

Not Applicable.

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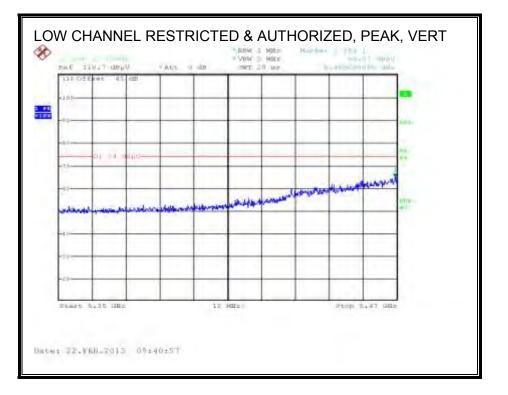
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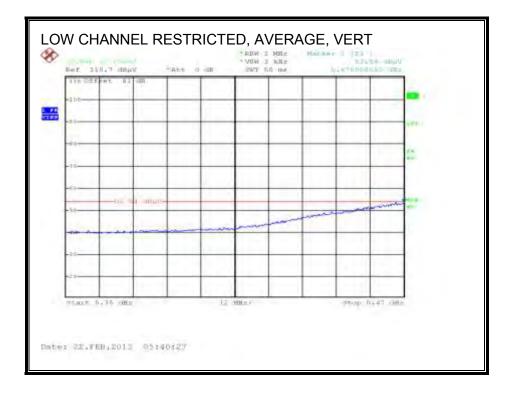
	h Frequency ertification	Measurem Services, Fr		5m Ch	amber										
Company: Project #: Date: est Engineer Configuration (fode:	E-	Broadcoan 13U14796 1/30/2013 Kris Nguyo EUT / Lapta Tx 5.6GHz	en/Dana op	15 Yu			1 1 96 4	\$ 138							
est Equipme	ni:												- /		-
Hom 1	-18GHz	Pre-ar		_	A	Pre-am	plifer	26-40GH	1		om > 18G			Limit	_
T73; S/N: 67	17 @Gm	+ T144 B	liteq 30	GRADOS	31 .	TB8 Min	eq 26-	10GHz	• T89;	ARA 18.260	SHE; SAN: 10	49	*	FCC 15.205	-
3' cable	22807700	12° c	able 2	28076	00	20 <sup>+</sup> cal	ble 22	807500		HPF	Re	ject Filte	r		
3 cable Z	2807700	12 58	ble 228	07600	•	20' cab	le 228	•	HPT	=_7 6GHZ	3				
f Dist GRz (m)	and a strength of the strength	Read Avg. dBuV	AF dB/m	CL dB	Amp	D Corr dB	Fler	Peak dBoV/m	Avg	Pk Lim		Pk Mar dB	Avg Mar dB	Notes	Ξ
GHz (m) hannel 106		dBuv	dB/m	dB	dB	dB	dB	d.EsoV/m	disu V/m	dBuV/m	dBuV/m	as	415	(V/H)	-
1,060 3.0 1,060 3.0	37.0	27.9	38.8 38.8	10.9	-36.0 -36.0	0.0	0.7	51.4 50.9	423	74 74	54 54	22.6	-11.7	V H	_
kannel 138	4			1.00		1.1.1.1.1	1.1.1	1							
1.380 3.0 1.380 3.0	41.0	31.8	39.0 39.0	11.1	35.9	0.0	0.7	55.9 50.5	40.8	74	54 54	-18.1	-7.3	V H	_
f Dist Read AF CL	Measureme Distance to Analyzer R Antenna Fo Cable Loss	eading ictor	7	1.000	Amp D Con Avg Peak HPF	Average	Corres Field S d Peal	ct to 3 mete Strength @ 6 Field Stre	1 m		Pk Lim Avg Mar	Peak Finh Margin vs	Seld Strength A Strength Li Average Li Poak Limit	tion tion	

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### 9.2.43. 802.11n AC80 BF 2TX MODE, 5.6 GHz BAND

#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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### AUTHORIZED BANDEDGE (HIGH CHANNEL)

Not Applicable.

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Compliance C Company: Project #: Date: Cest Enginee Configuration (Code:	п 2	Broadcom ( 13U14796 2/24/2013 K. Nguyen EUT with L Tx 5.6GHz	Corpor	ation AC ad	aptor, a	nd antonn	a							
Cest Equipme	nt													-
Hom 1	-18GHz	Pre-ar	nplifer	1-260	GHZ	Pre-am	plifer	26-40GH	z	Н	om > 180	Hz		Limit
T73; S/N: 67	-	+ T144 I	Aiteq 36	GRADOS	931 .	TEE Min	eq 26-	10GHz	• T8	9; ARA 18-260	GHE: SAN 10	49	+	FCC 15.205 +
3' cable	22807700	12' c	able 2	28076	900	20 <sup>+</sup> cal	ble 22	807500		HPF	Re	ject Filte		k Mensurements IMHz , VBW=3MHz
3' cable 2	2807700	12 53	ible 228	07600	*	20' cab	le 228	• • •	H	PF_7 63H2	2		· Aver	age Measurements =1MHz_VBW=10Hz
f Dis GRz (m)	and a strend to the strend to	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fler	Peak dBaV/m	Avg dBaV/a	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
hannel 106 (55											GLFG F. III			
1,060 5.0	38.9	28.9	38.8	10.9	36.0	0.0	0.7	50,3	40.3	74	54	.23.7	13.7	Ý.
1.060 3.0 hannel 138 (56	36.3 90 MHz)	26.1	38.8	10.9	-36.0	0.0	0.7	50,7	40.6	74	54	-23,3	-13.4	Ĥ
1.380 3.0 1.380 3.0	46.2	36.2	39.0 39.0	11.1	35.9	0.0	0.7	61.1 61.6	51.2 51.4	74	84 54	-12.9	2.8	V H
	Measureme Distance to Analyzer R Antenna Fo Cable Loss	eading ctor	y.	1	Amp D Con Avg Peak HPF	Average	Corres Field S of Peal	ct to 3 mete Strength @ 1. Field Stre	3 m		Pk Lim Avg Mar	Peak Finle Margie vs	Seld Streng A Strength I Average I Peak Lim	limit.
CL.	Cable Loss				HPF	High Pas	s Film							

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## 9.3. WORST-CASE BELOW 1 GHz

### 6 WORST EMISSIONS

#### Project : 13U14796 Company Name: Broadcom Model / Config: BCM94360CS2 Mode: Tx Worst Case Test By: Vien Tran

#### Horizontal 30 - 1000MHz

Marker		Meter		T185 Antenna	T64 preamp/cab le loss loop		FCC Part 15B		Height	
No.	<b>Test Frequency</b>	Reading	Detector	Factor (dB)	(dB)	er)	Class B 3m	Margin	[cm]	Polarity
1	85.25	52.75	РК	7.5	-27.1	33.15	40.0	-6.85	300	Horz
3	128.87	50.11	РК	14.1	-26.8	37.41	43.5	-6.09	200	Horz
5	276.68	46.21	PK	13.3	-26	33.51	46.0	-12.49	100	Horz
8	415.29	47.33	РК	16.1	-25.3	38.13	46.0	-7.87	100	Horz
9	443.88	45.80	PK	16.7	-25.1	37.40	46.0	-8.60	200	Horz
15	960.02	31.16	РК	22.7	-22.5	31.36	54.0	-22.64	100	Horz

Vertical 30 - 1000MHz

					T64					
					preamp/cab	dB				
Marker		Meter		T185 Antenna	le loss loop	(uVolts/met	FCC Part 15B		Height	
No.	<b>Test Frequency</b>	Reading	Detector	Factor (dB)	(dB)	er)	Class B 3m	Margin	[cm]	Polarity
16	84.76	52.16	PK	7.5	-27.1	32.56	40.0	-7.44	200	Vert
18	128.87	47.12	PK	14.1	-26.8	34.42	43.5	-9.08	100	Vert
20	275.71	43.83	PK	13.3	-26.1	31.03	46.0	-14.97	200	Vert
23	415.29	39.80	PK	16.1	-25.3	30.60	46.0	-15.40	100	Vert
24	443.88	39.83	PK	16.7	-25.1	31.43	46.0	-14.57	100	Vert
30	966.80	30.62	PK	22.8	-22.8	30.62	54.0	-23.38	100	Vert

PK - Peak detector

QP - Quasi-Peak detector

LnAv - Linear Average detector

LgAv - Log Average detector

Av - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

PK1 - KDB 789033 v01r02 G)5) Method: Peak

AD1 - KDB 789033 v01r02 G)6) Method: AD Primary Power Average

VB1 - KDB 789033 v01r02 G)6) Method: VB Alternative Reduced Video

PK2 - KDB558074 v02 10.2.3.2/8.1.1 Method: Maximum Peak

MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

MAv2 - KDB558074 v02 10.2.3.3/8.2.2 Option 2 Slow Sweep RMS Average

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# **10. AC POWER LINE CONDUCTED EMISSIONS**

### LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)		
	Quasi-peak	Average	
0.15-0.5	66 to 56	56 to 46 *	
0.5-5	56	46	
5-30	60	50	

Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

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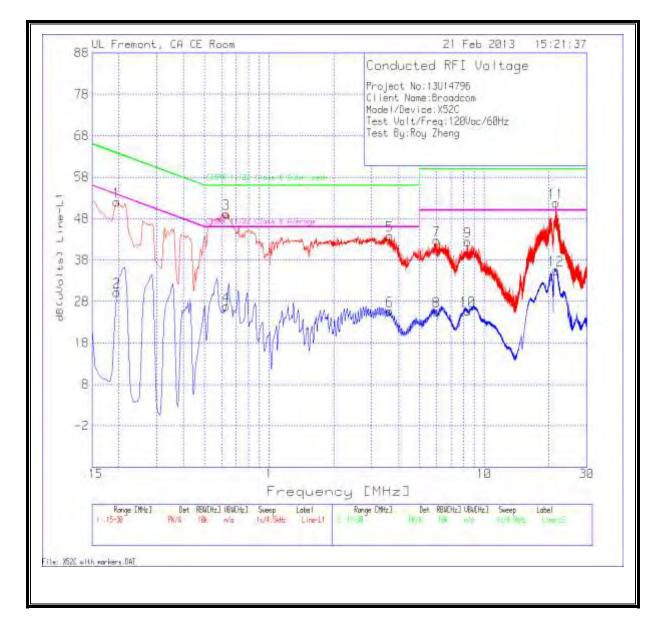
#### **RESULTS**

#### **<u>6 WORST EMISSIONS</u>**

Project No:		13U14796							
Client Name	e:	Broadcom	1						
Model/Devi	ice:	BCM94360CS2	1						
Test Volt/Fr	eq:	120Vac/60Hz	1						
Test By:		Roy Zheng	1						
	1		Γ !		· ·	CISPR			
	1		1 1	LC Cables	'	11/22 Class	i	CISPR	
Test	Meter		T24 IL	1&3.TXT	'	B Quasi-	I	11/22 Class	
Frequency	Reading	Detector	L1.TXT (dB)	(dB)	dB(uVolts)	peak	Margin	<b>B</b> Average	Margin
Line-L1 .15 -			-		-			_ 	
0.195	51.88	РК	0.1	0	51.98	63.8	-11.82	-	-
0.195	30.16	Av	0.1	0	30.26	-	-	53.8	-23.54
0.6315	49.11	РК	0.1	0	49.21	56	-6.79	-	-
0.6315	26.73	Av	0.1	0	26.83	-	-	46	-19.17
3.6375	43.58	РК	0.2	0.1	43.88	56	-12.12	-	-
3.6375	25.42	Av	0.2	0.1	25.72	-	-	46	-20.28
6.0045	42.6	РК	0.1	0.1	42.8	60	-17.2	-	-
6.0045	25.42	Av	0.1	0.1	25.62	-	-	50	-24.38
8.394	42.24	РК	0.1	0.1	42.44	60	-17.56	-	-
8.394	25.52	Av	0.1	0.1	25.72	-	-	50	-24.28
21.5655	51.23	РК	0.3	0.2	51.73	60	-8.27	-	-
21.5655	35.07	Av	0.3	0.2	35.57	-	-	50	-14.43
Line-L2 .15 -			-,	<u> </u>	·	,		<del></del>	
0.195	49.4	РК	0.1	0	49.5	63.8	-14.3	-	-
0.195	27.74	Av	0.1	0	27.84	-	-	53.8	-25.96
0.5055	48.99	РК	0.1	0	49.09	56	-6.91	-	-
0.5055	31.69	Av	0.1	0	31.79	-	-	46	-14.21
0.9375	45.71	РК	0.1	0	45.81	56	-10.19	-	-
0.9375	30.11	Av	0.1	0	30.21	-	-	46	-15.79
3.534	43.72	РК	0.1	0.1	43.92	56	-12.08	-	-
3.534	24.45	Av	0.1	0.1	24.65	-	 	46	-21.35
8.907	42.59	РК	0.1	0.1	42.79	60	-17.21	-	-
8.907	26.6	Av	0.1	0.1	26.8	-	-	50	-23.2
21.759	47.25	РК	0.3	0.2	47.75	60	-12.25	-	-
21.759	27.99	Av	0.3	0.2	28.49	-	-	50	-21.51
								<u> </u>	
PK - Peak de	etector								
QP - Quasi-P	Peak detect	or							
Av - Averag	e detector		1						

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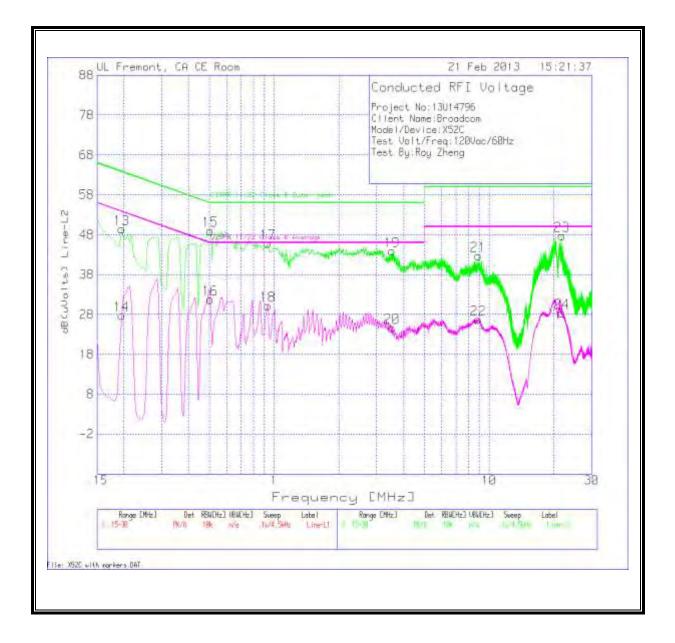
### LINE 1 RESULTS



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# LINE 2 RESULTS



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# 11. DYNAMIC FREQUENCY SELECTION

# 11.1. OVERVIEW

# 11.1.1. LIMITS

# INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) Channel Availability Check Time: ...

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

# FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

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# Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operatio	Operational Mode				
	Master	Client (without radar detection)	Client (with radar detection)			
Non-Occupancy Period	Yes	Not required	Yes			
DFS Detection Threshold	Yes	Not required	Yes			
Channel Availability Check Time	Yes	Not required	Not required			
Uniform Spreading	Yes	Not required	Not required			

# Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational M	Operational Mode			
	Master	Master Client Client			
		(without DFS)	(with DFS)		
DFS Detection Threshold	Yes	Not required	Yes		
Channel Closing Transmission Time	Yes	Yes	Yes		
Channel Move Time	Yes	Yes	Yes		

# Table 3: Interference Threshold values, Master or Client incorporating In-ServiceMonitoring

Maximum Transmit Power	Value
	(see note)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver ass Note 2: Throughout these test procedures an addition of the test transmission waveforms to account for varia will ensure that the test signal is at or above the detect response.	al 1 dB has been added to the amplitude ations in measurement equipment. This

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# Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds +
	approx. 60 milliseconds
	over remaining 10 second
	period

The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

For the Short pulse radar Test Signals this instant is the end of the Burst.

For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.

For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

# Table 5 – Short Pulse Radar Test Waveforms

Radar	Pulse Width	PRI	Pulses	Minimum	Minimum
Туре	(Microseconds)	(Microseconds)		Percentage of	Trials
-				Successful	
				Detection	
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (I	Radar Types 1-4)			80%	120

# Table 6 – Long Pulse Radar Test Signal

Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000- 2000	80%	30

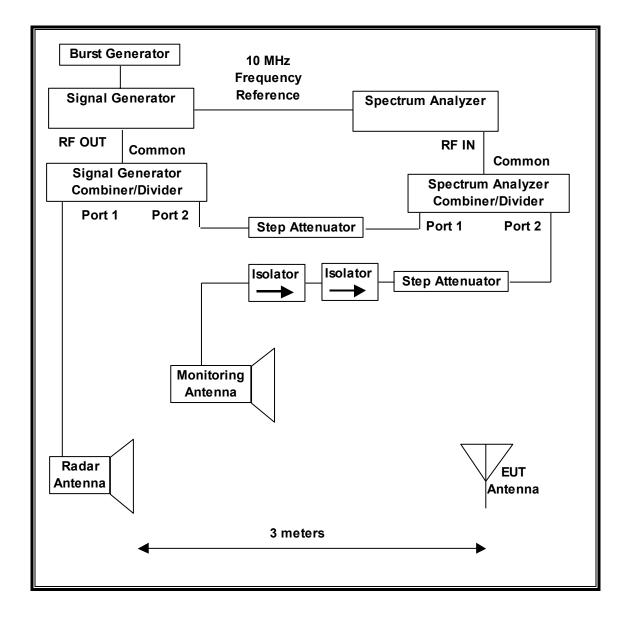
# Table 7 – Frequency Hopping Radar Test Signal

Radar	Pulse	PRI	Burst	Pulses	Hopping	Minimum	Minimum
Waveform	Width	(µsec)	Length	per	Rate	Percentage of	Trials
	(µsec)		(ms)	Нор	(kHz)	Successful	
			. ,	-		Detection	
6	1	333	300	9	.333	70%	30

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# 11.1.2. TEST AND MEASUREMENT SYSTEM

## RADIATED METHOD SYSTEM BLOCK DIAGRAM



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## SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at runtime.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from  $F_L$  to  $F_H$  for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

## SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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## ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

#### TEST AND MEASUREMENT EQUIPMENT

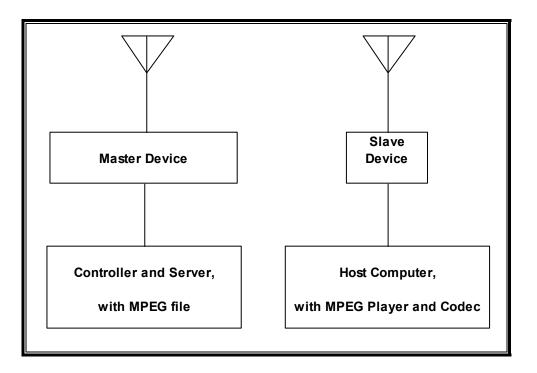
The following test and measurement equipment was utilized for the DFS tests documented in this report:

TEST EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	Cal Due		
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/18/13		
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	11/20/13		

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# 11.1.3. SETUP OF EUT (CLIENT MODE)

# RADIATED METHOD EUT TEST SETUP



## SUPPORT EQUIPMENT

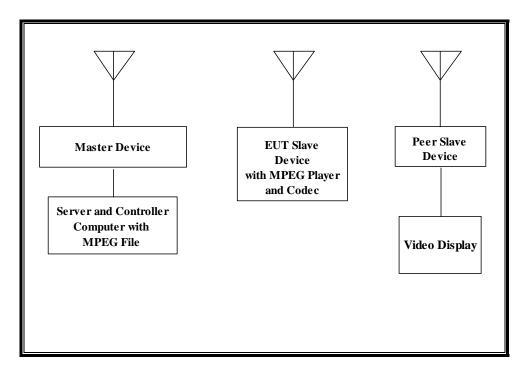
The following support equipment was utilized for the DFS tests documented in this report:

	PERIPHERAL SUPPORT EQUIPMENT LIST							
Description	Manufacturer	Model	Serial Number	FCC ID				
N600 Wireless Dual Band Router	Netgear	WNDR3400	2BK311730FF6B	PY309300116				
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T10209045B	DoC				
Notebook PC (Controller/Server)	HP	Pavilion zv6000	CND5290401	DoC				
AC Adapter	HP	PA-1121-12HD	58B240ALLRK0HU	DoC				
Notebook PC (Host)	Lenovo	0679	CBU4473193	DoC				
AC Adapter (Host PC)	Lite On	PA-1650-56LC	11S36001615ZZ400	DoC				

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# 11.1.4. SETUP OF EUT (CLIENT-TO-CLIENT COMMUNICATIONS MODE)

# RADIATED METHOD EUT TEST SETUP



## SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

	PERIPHERAL SUPPORT EQUIPMENT LIST						
Description	Manufacturer	Model	Serial Number	FCC ID			
N600 Wireless Dual Band Router	Netgear	WNDR3400	2BK311730FF6B	PY309300116			
AC Adapter (AP)	Netgear	FA-1201500SJA / FA-1201500SUA	4F105116T1020904 5B	DoC			
Notebook PC (Controller/Server)	HP	Pavilion zv6000	CND5290401	DoC			
AC Adapter (Controller/Server PC)	HP	PA-1121-12HD	58B240ALLRK0HU	DoC			
Notebook PC (EUT Host)	Apple	MacBook Air A1465	C02JF8GSDRV6	DoC			
AC Adapter (Host PC)	Lite On Technology	PA-1450-8	C0623350GF4F6V 7AR	DoC			
Apple TV	Apple	A1427	DY3J8RZ3DRHN	BCGA1427			
Video Display	Coby Electronics	LEDVD1596	LGWH4XXXT07T0 2S01	DoC			

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# 11.1.5. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without radar detection capability.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 29.26 dBm EIRP in the 5250-5350 MHz band and 29.42 dBm EIRP in the 5470-5725 MHz band.

The highest gain antenna assembly consists of 2 antennas with individual gains of 6.12 dBi, and 5.57 dBi in the 5250-5350 MHz band and 5.77 dBi and 6.61 dBi in the 5470-5725 MHz band. The lowest gain antenna assembly consists of 2 antennas with individual gains of 5.27 dBi and 5.89 dBi in the 5250-5350 MHz band and 4.93 dBi, and 5.21 dBi in the 5470-5725 MHz band.

Two identical antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses two transmitter/receiver chains, each connected to an antenna to perform radiated tests.

WLAN traffic exceeding the transmitter minimum activity ratio of 30% is generated by streaming the compressed video file "6 ½ Magic Hours" from the Master to the Slave in full motion video using the Microsoft Media Player version 11.0.5721.5280 for Standard Client mode and Quick Time Media Player version 10.2 (603.6) for Client to Client Communications mode..

TPC is required since the maximum EIRP is greater than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths are implemented: 20 MHz and 40 MHz.

The software installed in the access point is Linux revision 5.22.84.0.

## UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

## **OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS**

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The Master Device is a Netgear N600 Dual Band Router, FCC ID: PY309300116. The DFS software installed in the Master Device is Linux revision 5.22.84.0. The minimum antenna gain for the Master Device is 2.73 dBi.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm.

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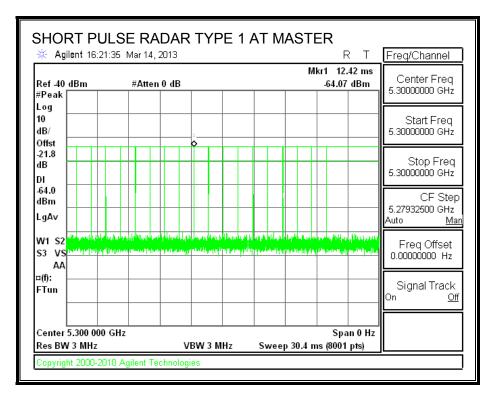
# 11.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH

# 11.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5300 MHz.

# 11.2.2. RADAR WAVEFORM AND TRAFFIC

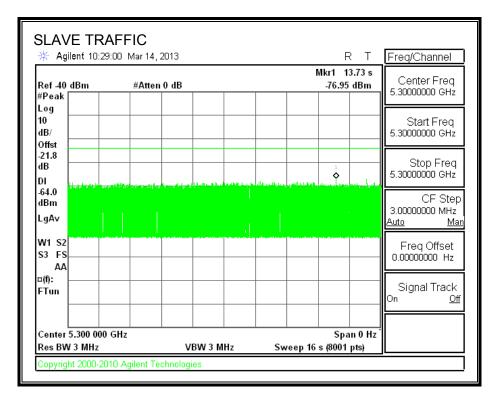
# RADAR WAVEFORM



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#### TRAFFIC



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# 11.2.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

# 11.2.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

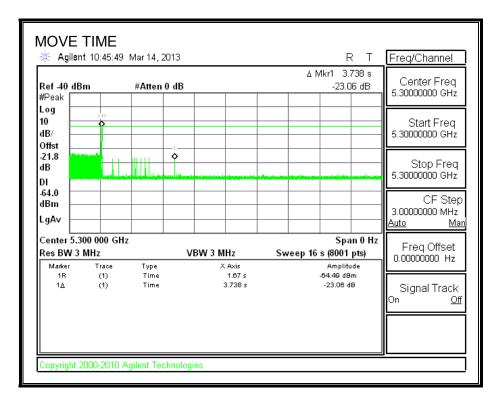
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	3.738	10

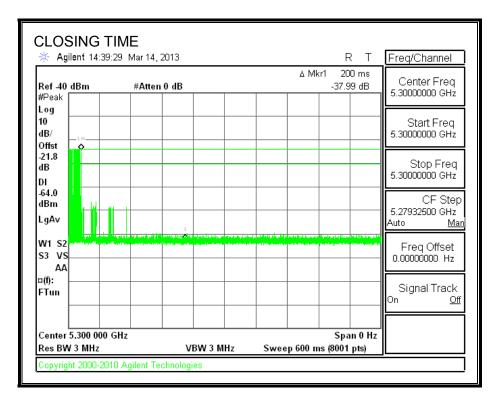
Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	18.0	60
IC	28.0	260

#### MOVE TIME



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## **CHANNEL CLOSING TIME**

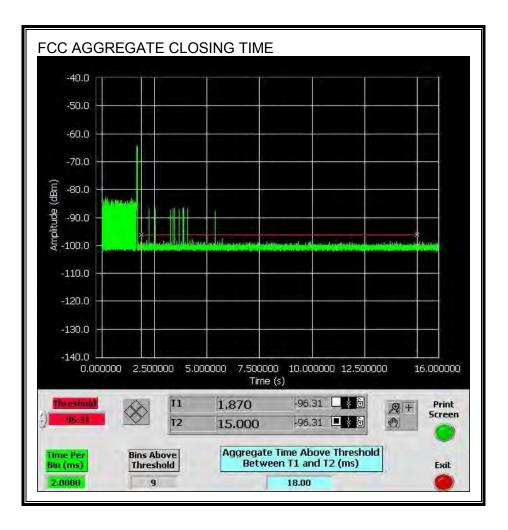


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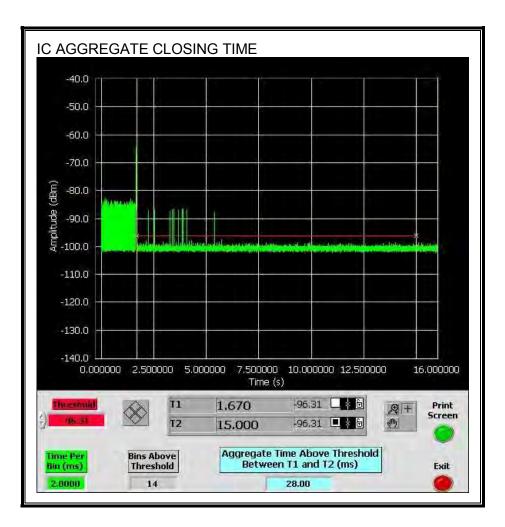
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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.



Only intermittent transmissions are observed during the IC aggregate monitoring period.



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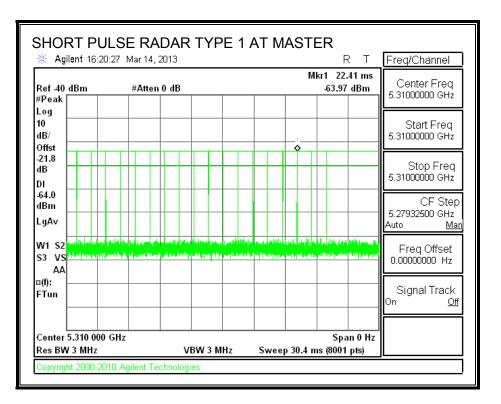
# 11.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH

# 11.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5310 MHz.

# 11.3.2. RADAR WAVEFORM AND TRAFFIC

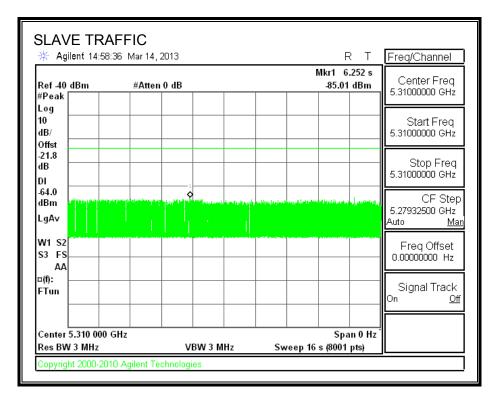
## RADAR WAVEFORM



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# 11.3.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

# 11.3.4. MOVE AND CLOSING TIME

## REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

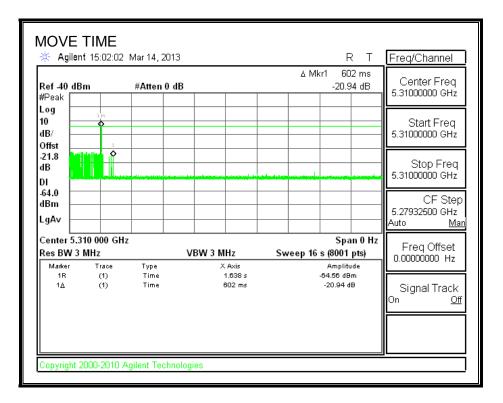
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.602	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	6.0	60
IC	30.0	260

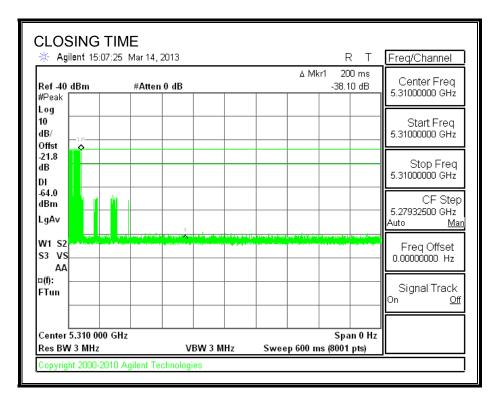
#### MOVE TIME



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## **CHANNEL CLOSING TIME**

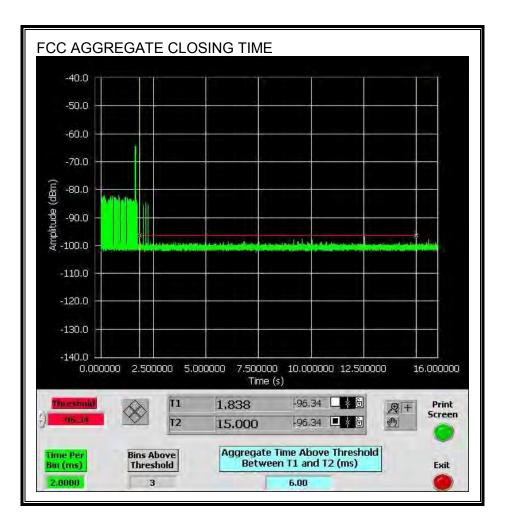


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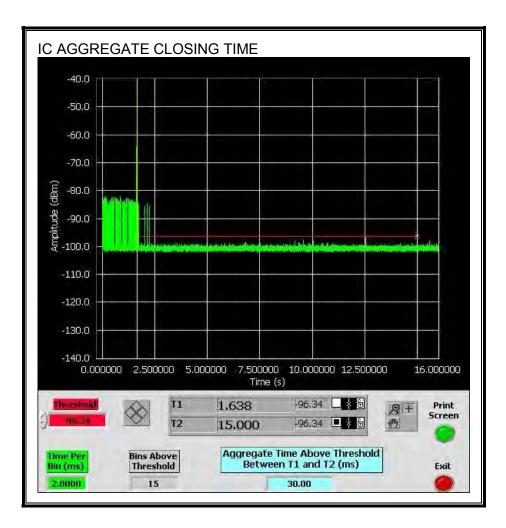
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#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.



Only intermittent transmissions are observed during the IC aggregate monitoring period.

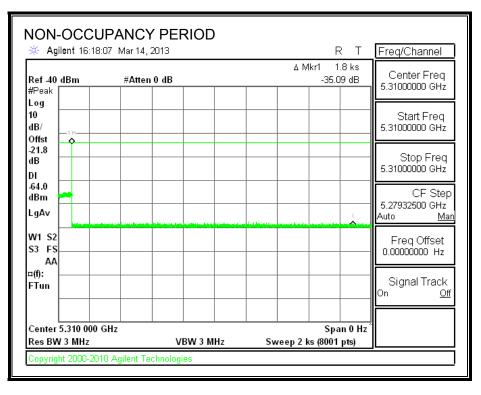


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# 11.3.5. NON-OCCUPANCY PERIOD

## **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.



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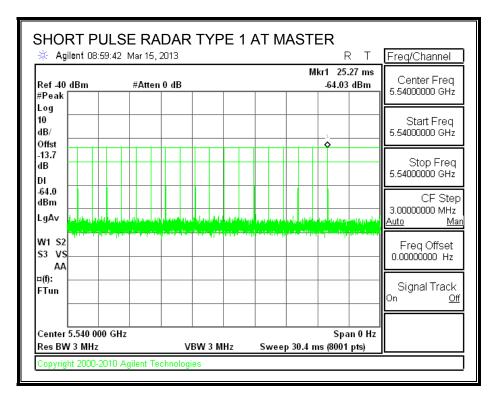
# 11.4. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz BANDWIDTH

# 11.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5540 MHz.

# 11.4.2. RADAR WAVEFORM AND TRAFFIC

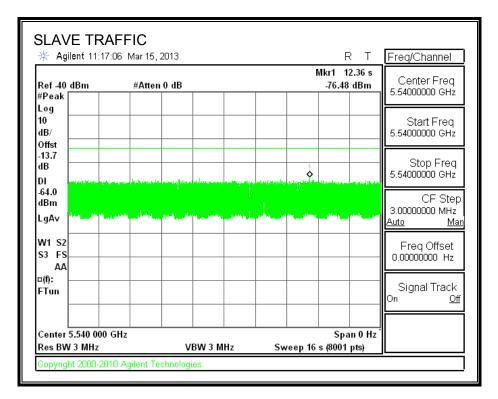
# RADAR WAVEFORM



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#### TRAFFIC



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# 11.4.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

# 11.4.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

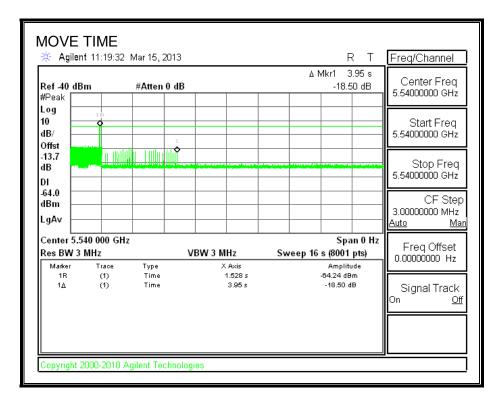
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	3.950	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	58.0	60
IC	100.0	260

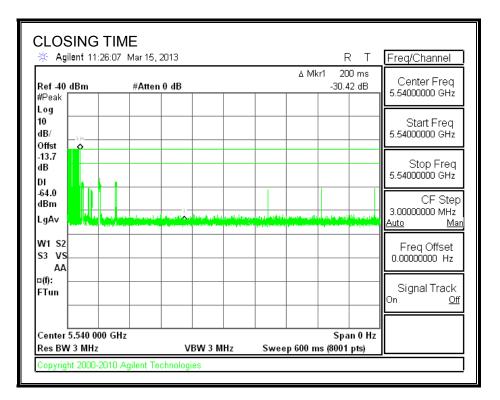
#### MOVE TIME



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## **CHANNEL CLOSING TIME**

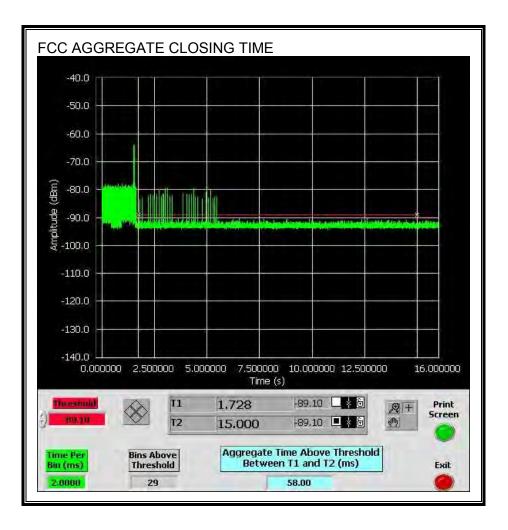


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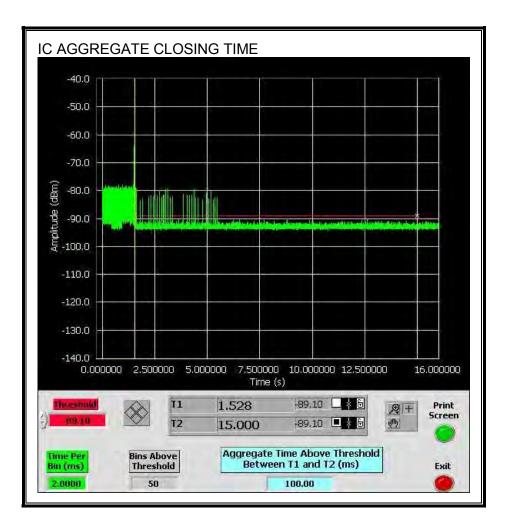
#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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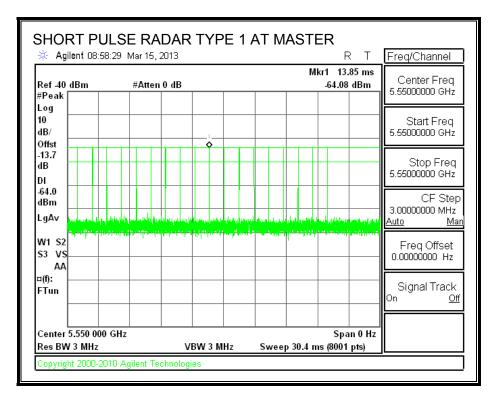
# 11.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz BANDWIDTH

# 11.5.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5540 MHz.

# 11.5.2. RADAR WAVEFORM AND TRAFFIC

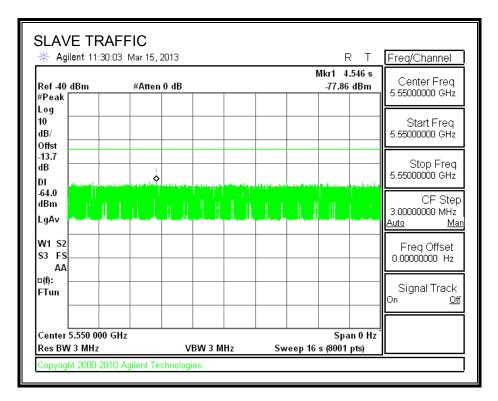
# RADAR WAVEFORM



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#### TRAFFIC



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# 11.5.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

# 11.5.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

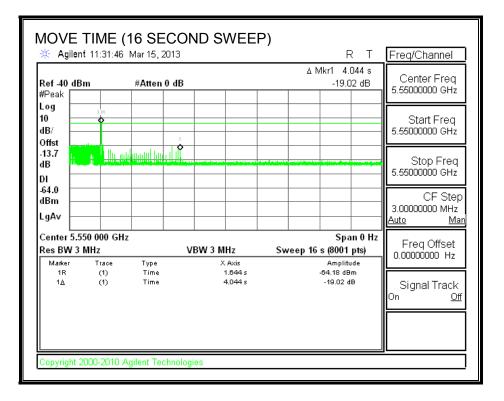
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

## RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	4.032	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	29.0	60
IC	61.0	260

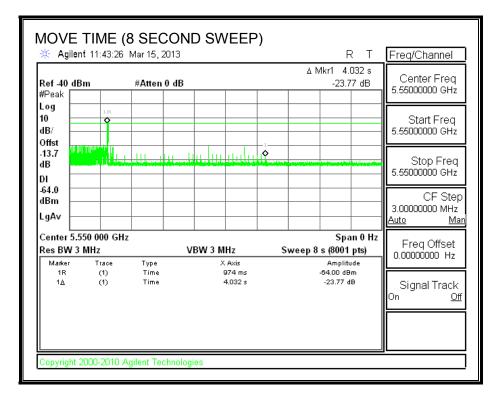
## MOVE TIME (16 SECOND SWEEP)



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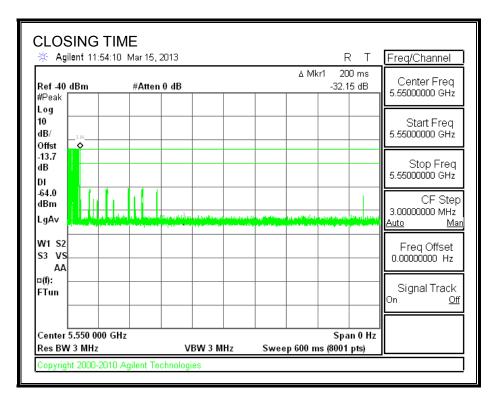
#### MOVE TIME (8 SECOND SWEEP)



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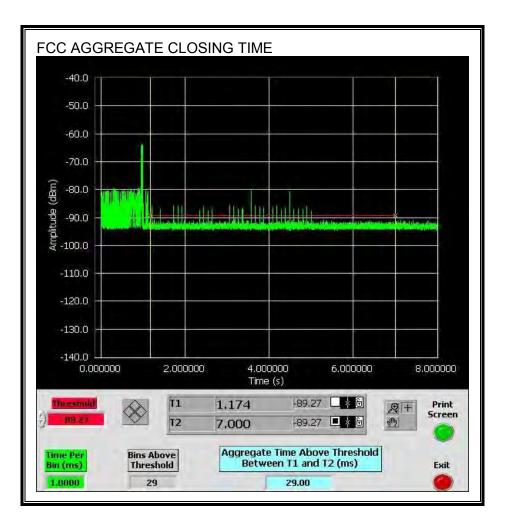
## **CHANNEL CLOSING TIME**



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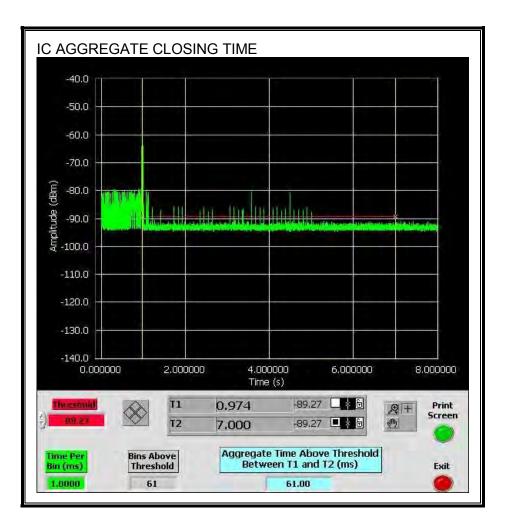
#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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