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

CLASS II PERMISSIVE CHANGE

TEST REPORT

FOR

802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM94360CD

FCC ID: QDS-BRCM1070
IC: 4324A-BRCM1070

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/13/13	Initial Issue	Michael Ferrer
A	08/15/13	Added section 5.2 Revised sections 5.3, 9.2.1, 9.2.5, and 9.2.6 11b 3TX CH12&13 power values have been revised	F. Ibrahim
B	08/18/13	Revised sections 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10 Clarifications on leveraging antenna port testing have been made.	K. Nguyen

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BROADCOM CORPORATION 190 MATHILDA PLACE SUNNYVALE, CA 94086, USA
EUT DESCRIPTION:	802.11a/g/n/ac WLAN + Bluetooth PCI-E Custom Combination Card
MODEL:	BCM94360CD
SERIAL NUMBER:	C86248400DRF6RY11 (RF)
DATE TESTED:	NOVEMBER 5, 2012- JULY 23, 2013

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

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

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

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Michael Ferrer
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UL Verification Services Inc.

Tested By:

DANNY VU
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2003, 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 Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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%.

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

This Class II Permissive Change report is add two higher gain antennas, detailed in Section 5.4, at less than or equal to output power outlined in the original certification report UL Verifications Inc. 12U14669-1B FCC IC DTS WLAN Report. In addition, channel 12 and channel 13 are being added for all modes in supported the 2400-2483.5 GHz band

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

2400 - 2483.5 MHz Authorized Frequency Band						
Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
2412 - 2462	802.11b Legacy 1TX	Covered by the worst case 802.11b CDD 3TX Mode testing				
2412 - 2462	802.11b CDD 2TX	Covered by the worst case 802.11b CDD 3TX Mode testing				
2412 - 2462	802.11b CDD 3TX	21.25	21.31	20.93	25.94	392.44
2412 - 2462	802.11g Legacy 1TX	22.37	N/A	N/A	22.37	172.58
2412 - 2462	802.11g CDD 2TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
2412 - 2462	802.11g CDD 3TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
2412 - 2462	802.11g BF 2TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
2412 - 2462	802.11g BF 3TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
2412 - 2462	802.11n/ac HT/VHT20 1TX	Covered by the worst case 802.11g Legacy 1Tx				
2412 - 2462	802.11n/ac HT/VHT20 2TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing.				
2412 - 2462	802.11ac VHT20 3TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
2412 - 2462	802.11n HT20 3TX	20.26	19.95	20.01	24.85	305.26
2412 - 2462	802.11n/ac HT/VHT20 BF 2TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing.				
2412 - 2462	802.11n HT20 BF 3TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing.				
2412 - 2462	802.11ac VHT20 BF 3TX	20.26	19.95	20.01	24.85	305.26
5725 - 5850 MHz Authorized Frequency Band						
Frequency Range (MHz)	Mode	Avg Power, Chain 0 (dBm)	Avg Power, Chain 1 (dBm)	Avg Power, Chain 2 (dBm)	Total Avg power (dBm)	Total Avg power (mW)
5745 - 5825	802.11a Legacy 1TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11a CDD 2TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11a CDD 3TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11a BF 2TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
5745 - 5825	802.11a BF 3TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
5745 - 5825	802.11n/ac HT/VHT20 1TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11n/ac HT/VHT20 2TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11ac VHT20 3TX	Covered by the worst case 802.11n HT20 CDD 3TX Mode testing				
5745 - 5825	802.11n HT20 3TX	19.62	19.95	19.55	24.48	280.63
5745 - 5825	802.11n/ac HT/VHT20 BF 2TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
5745 - 5825	802.11n HT20 BF 3TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
5745 - 5825	802.11ac VHT20 BF 3TX	19.34	19.49	19.26	24.14	259.15
5755 - 5795	802.11n/ac HT/VHT40 1TX	Covered by the worst case 802.11n HT40 CDD 3TX Mode testing				
5755 - 5795	802.11n/ac HT/VHT40 2TX	Covered by the worst case 802.11n HT40 CDD 3TX Mode testing				
5755 - 5795	802.11ac HT40 3TX	Covered by the worst case 802.11n HT40 CDD 3TX Mode testing				
5755 - 5795	802.11n HT40 3TX	19.36	19.45	19.27	24.13	258.93
5755 - 5795	802.11n HT40 BF 2TX	Covered by the worst case 802.11ac VHT40 BF 3TX Mode testing				
5755 - 5795	802.11ac VHT40 BF 3TX	Covered by the worst case 802.11ac VHT20 BF 3TX Mode testing				
5755 - 5795	802.11ac VHT40 BF 3TX	19.36	19.45	19.27	24.13	258.93
5775	802.11ac VHT80 1TX	Covered by the worst case 802.11ac VHT80 CDD 3TX Mode testing				
5775	802.11ac VHT80 2TX	Covered by the worst case 802.11ac VHT80 CDD 3TX Mode testing				
5775	802.11ac VHT80 3TX	17.76	17.54	17.82	22.48	176.99
5775	802.11ac VHT80 BF 2TX	Covered by the worst case 802.11ac VHT80 BF 3TX Mode testing				
5775	802.11ac VHT80 BF 3TX	19.24	19.17	19.30	24.01	251.66

Note:

1TX and 2Tx power levels may be increased up to the 3Tx emissions limits (based upon PPSD/Power limits per TX mode and differences in the number of TX chains and composite antenna gains) as long as the 1TX and 2Tx composite power levels is always less 3Tx power levels tested and listed on the certificate.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna Set 1:

Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz, (WLAN)	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz
802.11abgn WLAN Antenna	1	6.6	7.8	7.7	6.5	5.9
802.11abgn WLAN Antenna	2	4.8	6	5.4	6.8	5.8
802.11abgn WLAN Antenna	3	5.5	5.9	5.6	7.2	6.7
BT Antenna	BT	4				
	2x2 Composite (Correlated)	9.08	9.96	9.72	10.01	9.32
	3x3 Composite (correlated)	10.44	11.38	11.07	11.61	10.91
	2x2 Composite (Un- correlated)	6.08	6.99	6.78	7.00	6.27
	3x3 Composite (Un-correlated)	5.70	6.66	6.36	6.84	6.15

Antenna Set 2:

Antenna Type	Model	Peak gain @ 2412, 2422, 2432MHz, (WLAN)	Peak gain (5150-5250MHz) @5200MHz	Peak gain (5250-5350MHz) @5320MHz	Peak gain (5470-5725MHz) @5500, 5700MHz	Peak gain (5725-5850MHz) @5785, 5805MHz
802.11abgn WLAN Antenna	1	5.6	6.6	6.5	6.9	7.8
802.11abgn WLAN Antenna	2	3.4	6.9	7.7	5.3	7.4
802.11abgn WLAN Antenna	3	5.9	6	7	6.7	5.9
BT Antenna	4 (BT)	3.9				
	2x2 Composite	8.76	9.76	10.37	9.81	10.61
	3x3 Composite	9.81	11.28	11.85	11.10	11.84
	2x2 Composite (Un- correlated)	5.75	6.75	7.36	6.80	6.71
	3x3 Composite (Un-correlated)	5.10	6.52	7.09	6.36	7.11

Note: Worst case composite gains for a particular band are highlighted in yellow. These worst case antenna gains were used to determine compliance for Output Power and PPSD.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was Broadcom, rev. 6.30.118.23.
The test utility software used during testing was BCM Internal, rev. 6.30.RC118.23.

5.6. WORST-CASE CONFIGURATION AND MODE

Refer to the certification report 12U14669-1B FCC IC DTS WLAN Report.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	G560	CBU4473193	DoC
Laptop	Lenovo	G560	CBU3475167	DoC
Laptop	Dell	E6400	1317590773	DoC
AC Adapter	Lenovo	PA-1650-56LC	CBU4473193	N/A
AC Adapter	Lenovo	PA-1650-56LC	CBU3475167	N/A
AC Adapter	Dell	HP-OO065B83	CNON2765-47890-4	N/A
Adapter Board	Catalyst	MINI2EXP	06824800DRF6RY11	N/A
Adapter Board	Catalyst	MINI2EXP	C863194009FF6RY3E	N/A
Adapter Board/Jig	Atheros Comm	BCM94331CSMFG	C58639140010F6RY3	N/A

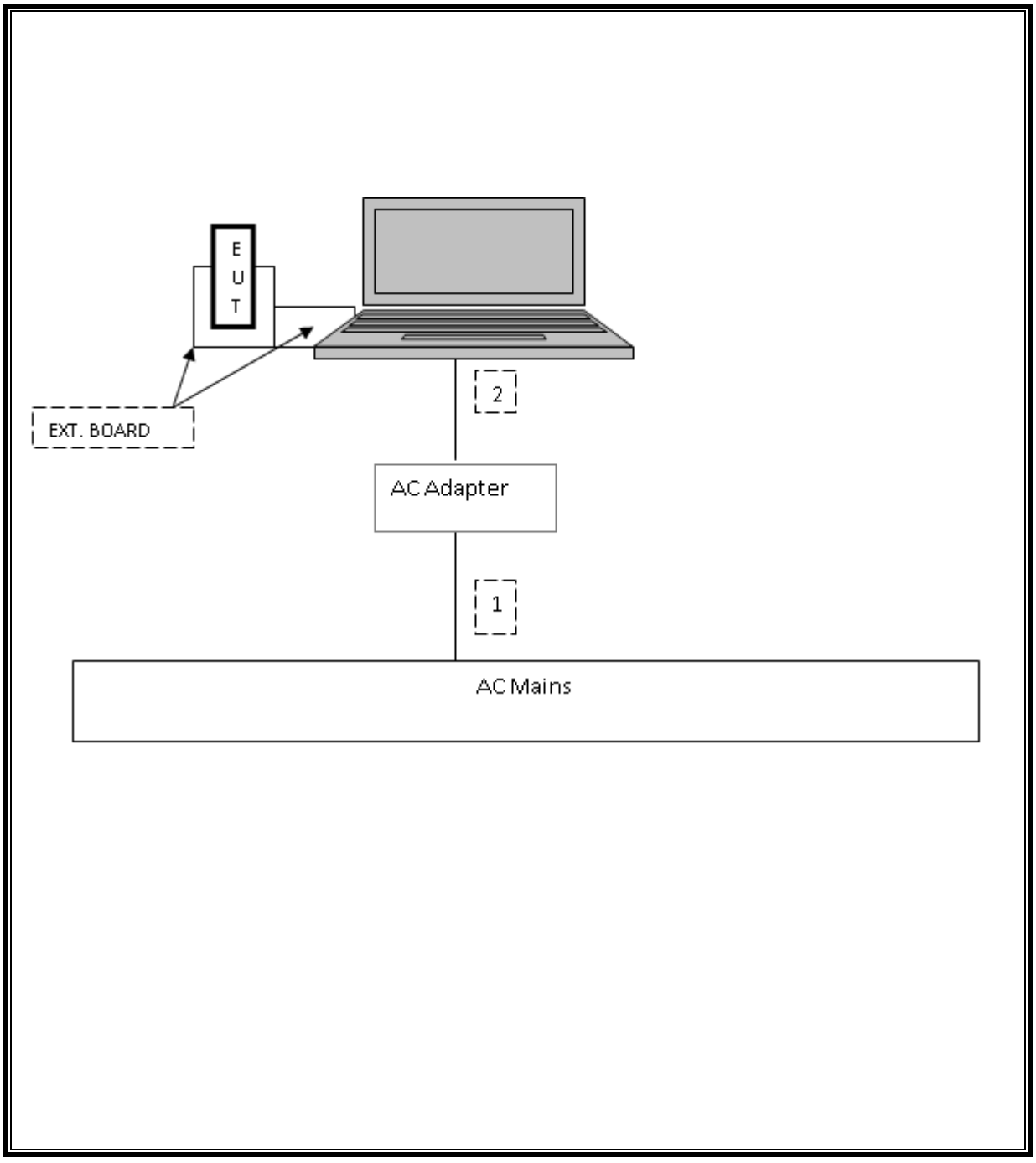
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	US 115V	Un-Shielded	1m	NA
2	DC	1	DC	Un-Shielded	1.8m	NA

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.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/12	02/16/13
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/13	02/16/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/22/12	03/22/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/22/13	03/22/14
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/08/12	08/08/13
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	0	08/21/12	08/21/13
Antenna, Horn, 18 GHz	EMCO	3115	C01218/1000614	01/18/13	01/18/14
Antenna, Horn, 18 GHz	EMCO	3115	C00945	11/12/12	11/12/13
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	0	02/07/13	02/07/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	10/19/12	10/19/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/20/11	12/30/13
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/12	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/12	12/13/13
Power Meter	Agilent / HP	N1911A	0	07/27/12	07/27/13
Peak / Average Power Sensor	Agilent / HP	E9323A	0	07/26/13	07/26/14

7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 D01 v02; Zero-Span Spectrum Analyzer Method.

7.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11b	12.4800	12.6000	0.990	99.0%	0.00
802.11g	2.0600	2.0870	0.987	98.7%	0.00
802.11a 20 MHz	2.0620	2.0900	0.987	98.7%	0.00
802.11n HT20 CDD	1.9230	1.9480	0.987	98.7%	0.00
802.11n HT20 STBC	1.9200	1.9430	0.988	98.8%	0.00
802.11n HT40	0.9260	0.9480	0.977	97.7%	0.10
802.11n HT40 CDD	0.9350	0.9770	0.957	95.7%	0.19
802.11n HT40 STBC	0.9050	0.9640	0.939	93.9%	0.27
802.11n HT80	0.4325	0.4780	0.905	90.5%	0.43
802.11n HT80 CDD	0.4310	0.4825	0.893	89.3%	0.49

7.2. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01

Output Power: KDB 558074 D01,

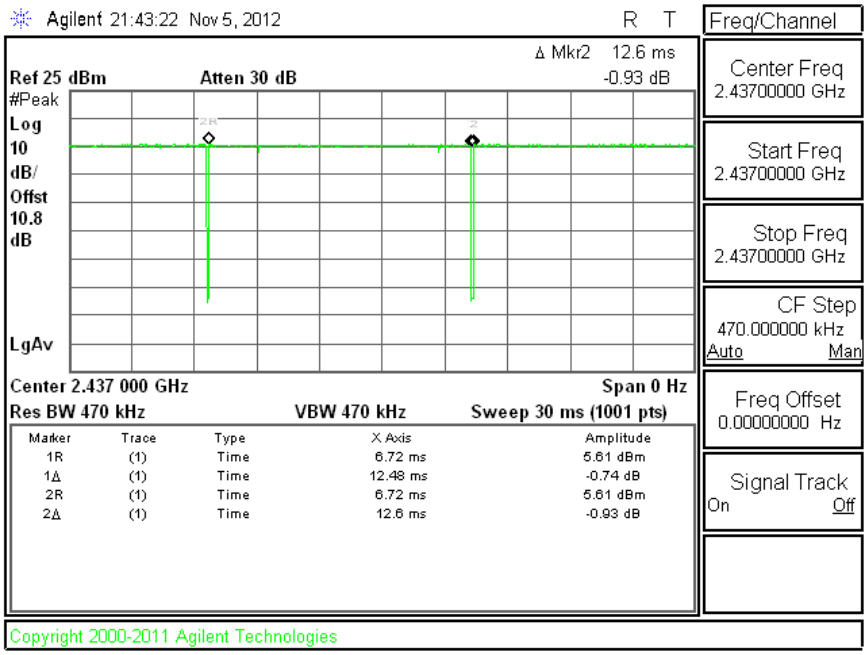
Power Spectral Density: KDB 558074 D01

Out-of-band emissions in non-restricted bands: KDB 558074 D01

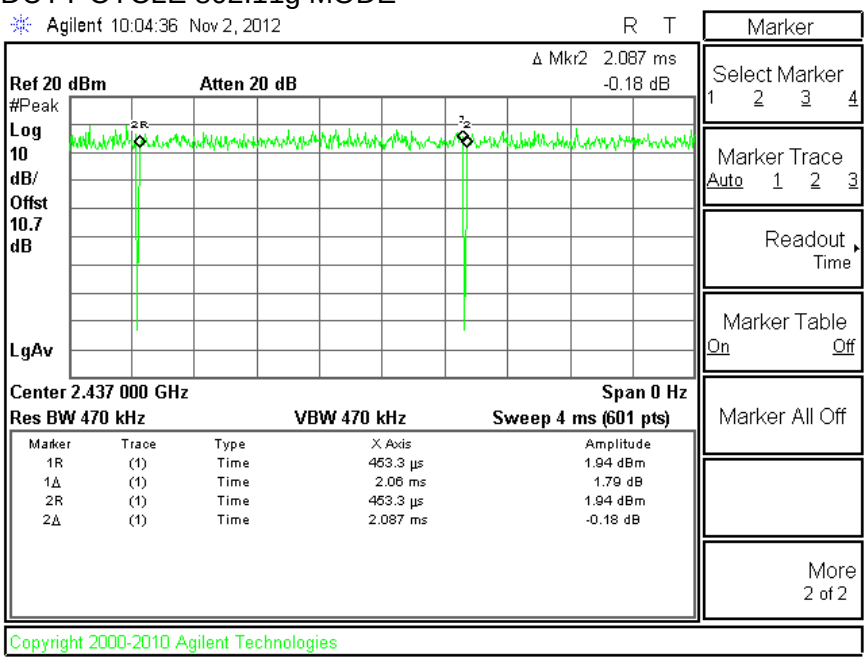
Out-of-band emissions in restricted bands: KDB 558074 D01

7.3. DUTY CYCLE PLOTS

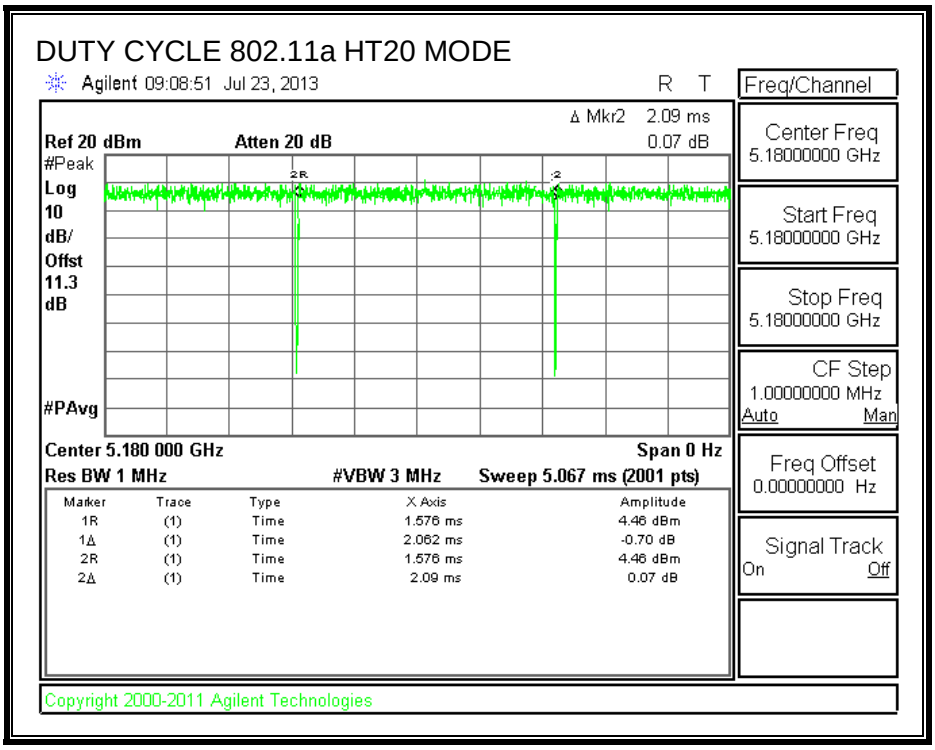
DUTY CYCLE 802.11b MODE



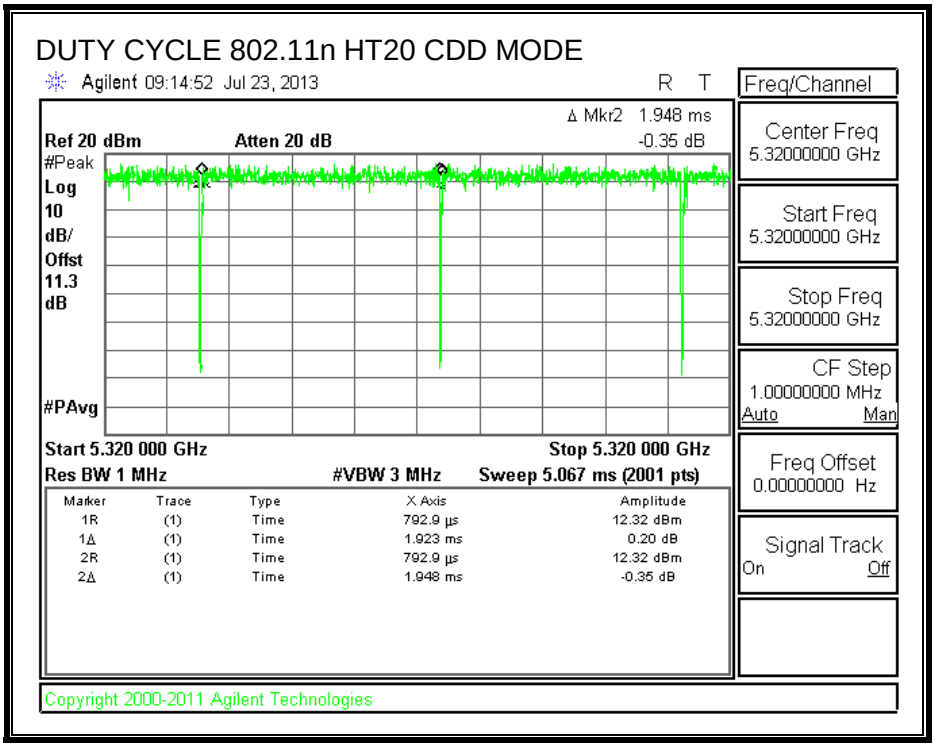
DUTY CYCLE 802.11g MODE



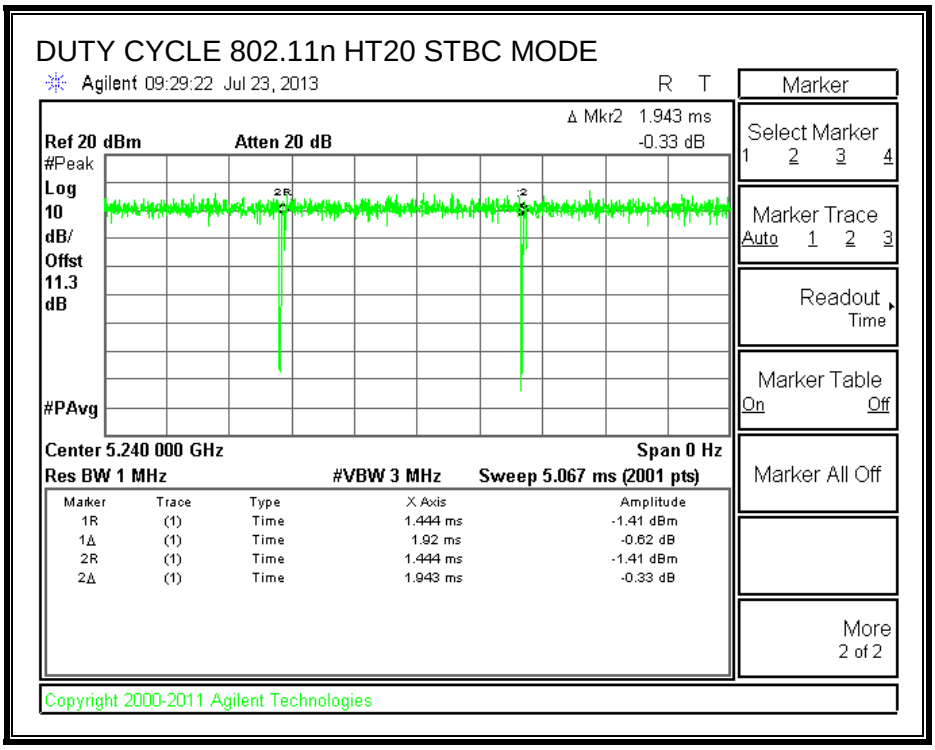
DUTY CYCLE 802.11a HT20 MODE



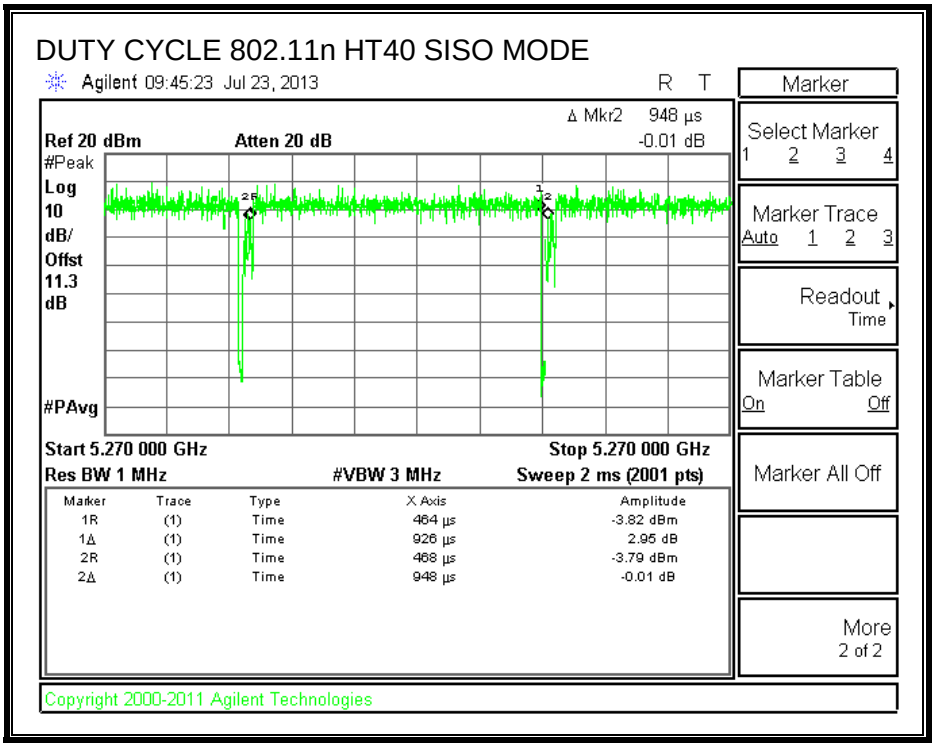
DUTY CYCLE 802.11n HT20 CDD MODE



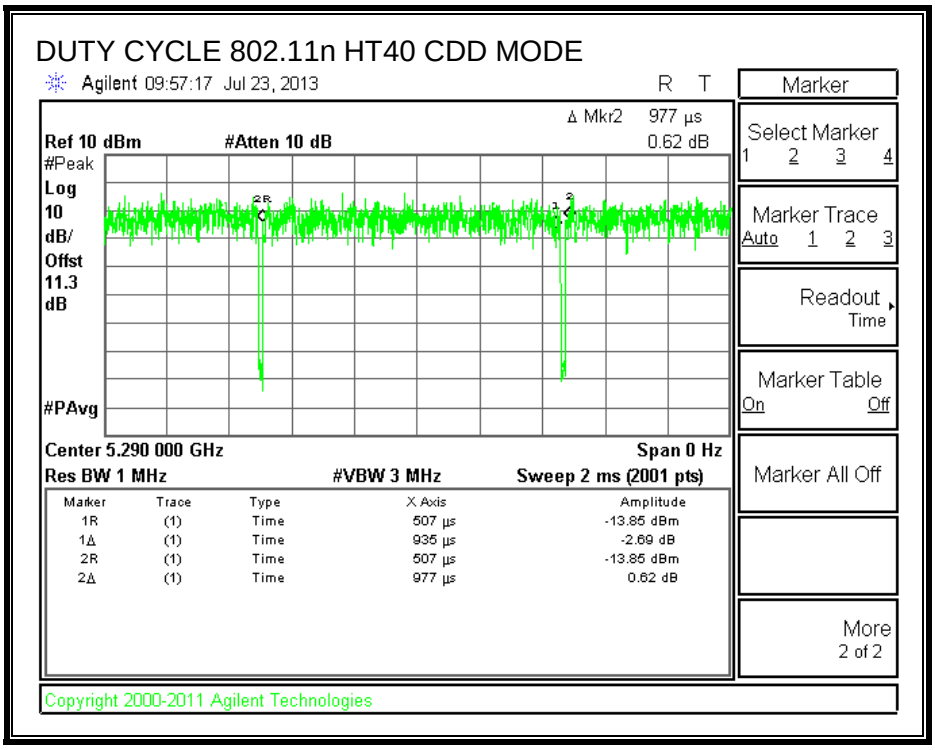
DUTY CYCLE 802.11n HT20 STBC MODE



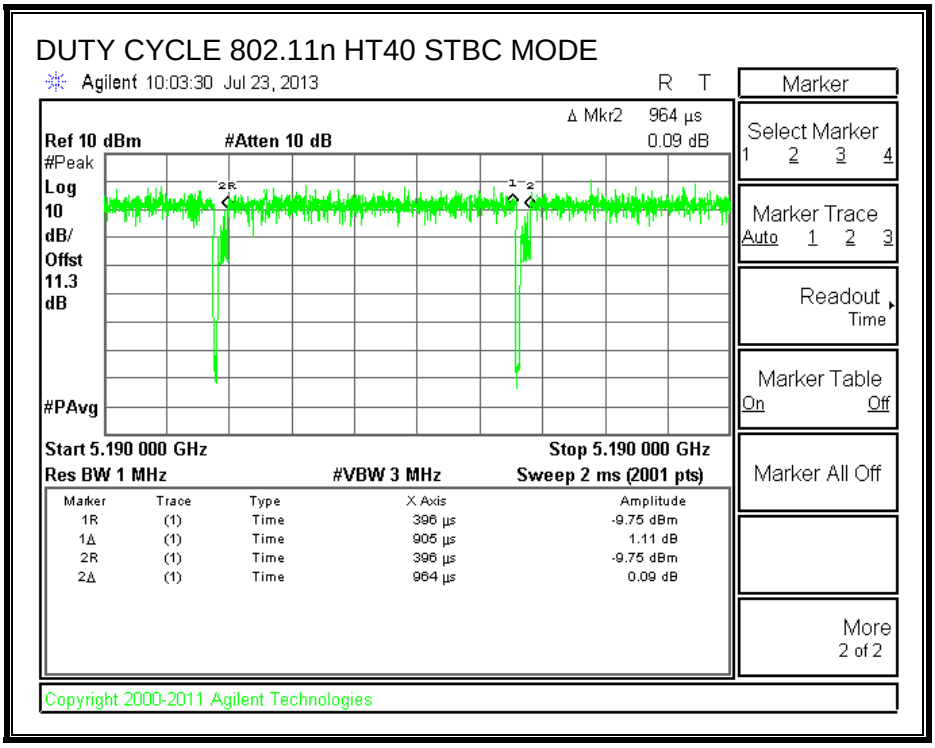
DUTY CYCLE 802.11n HT40 SISO MODE



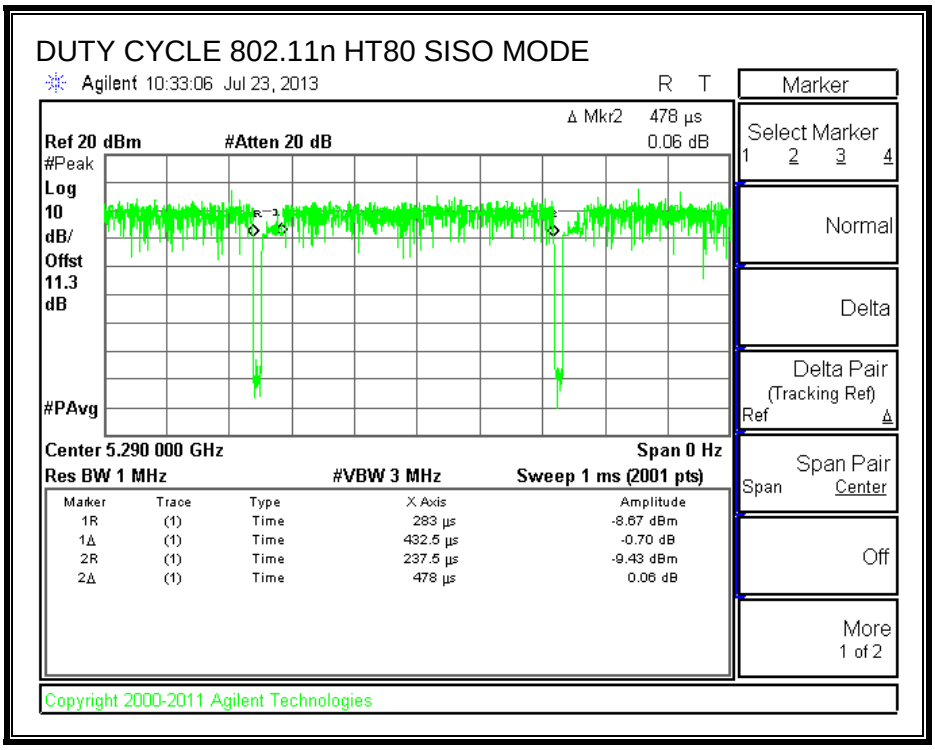
DUTY CYCLE 802.11n HT40 CDD MODE



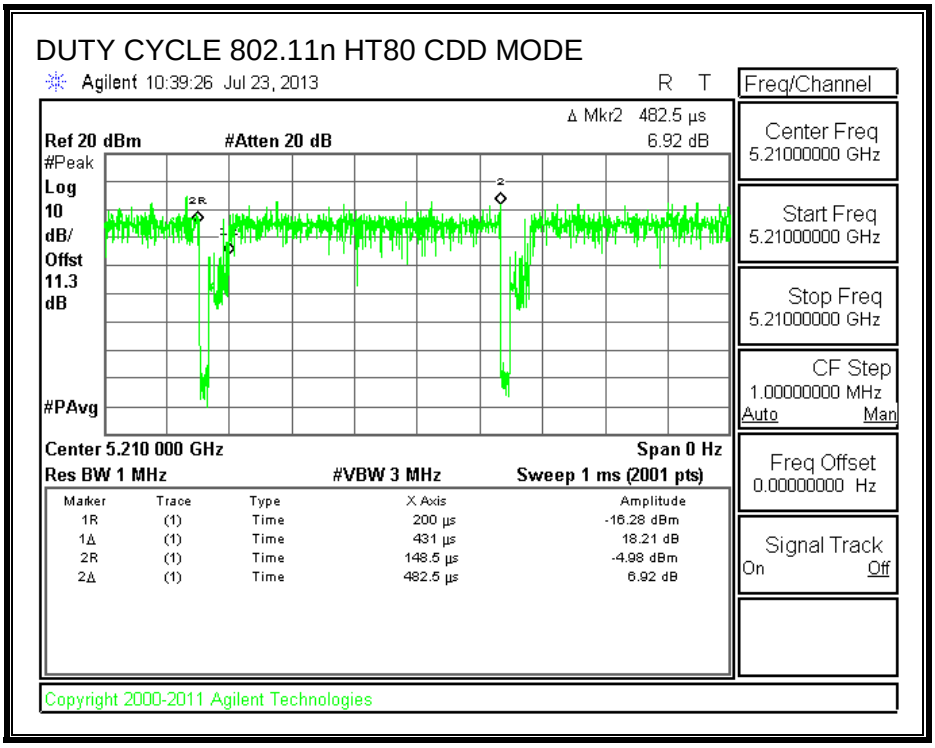
DUTY CYCLE 802.11n HT40 STBC MODE



DUTY CYCLE 802.11n HT80 SISO MODE



DUTY CYCLE 802.11n HT80 CDD MODE



8. ANTENNA PORT TEST RESULTS

8.1. 802.11b 3TX CDD MODE, 2.4 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.1.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	4.80	5.50	5.70

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	5.70	30.00	30	36	30.00
Mid	2437	5.70	30.00	30	36	30.00
High	2462	5.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	19.01	19.10	19.02	23.81	30.00	-6.19
Mid	2437	21.25	21.31	20.93	25.94	30.00	-4.06
High	2462	20.03	18.87	18.90	18.80	30.00	-11.20

8.1.2. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

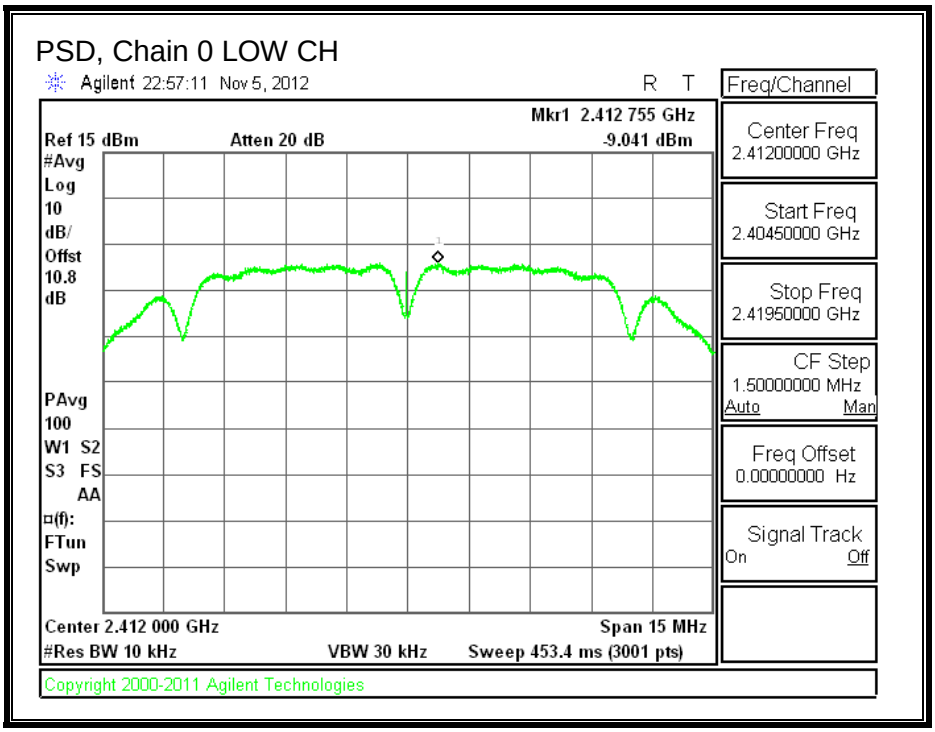
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

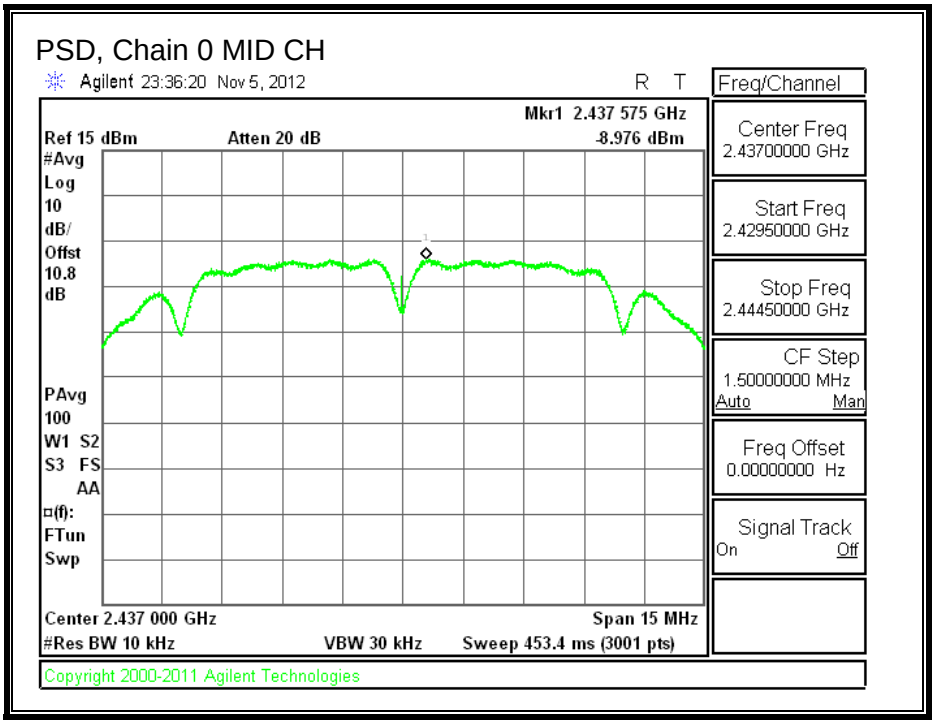
RESULTS

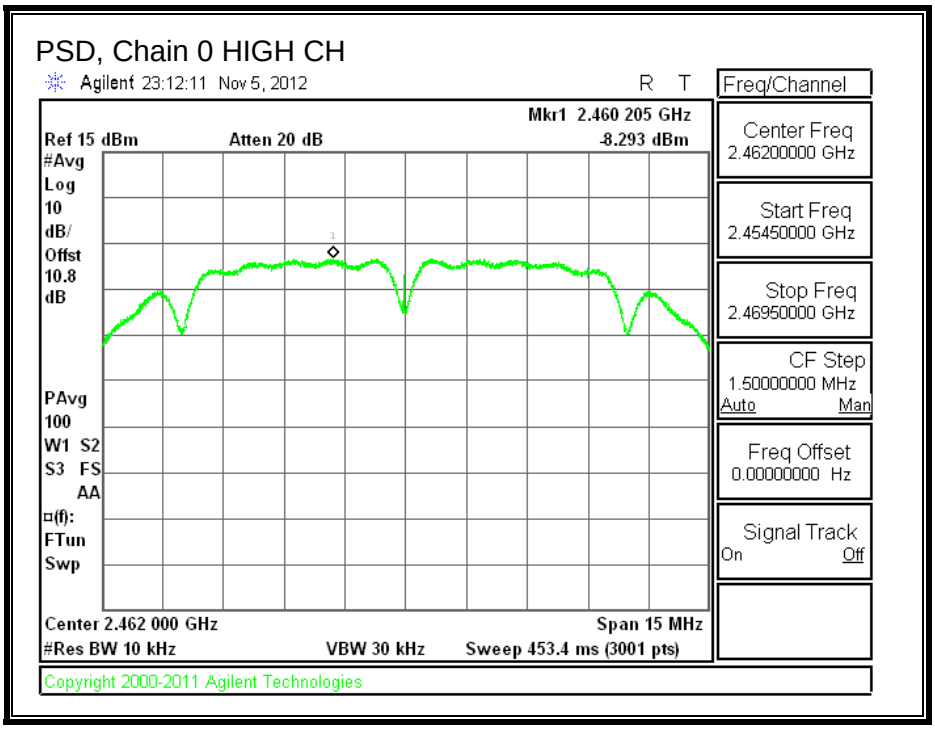
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-9.041	-9.062	-9.239	-4.342	8.0	-12.342
Mid	2437	-8.976	-9.096	-9.129	-4.295	8.0	-12.295
High	2462	-8.293	-8.418	-8.536	-3.643	8.0	-11.643

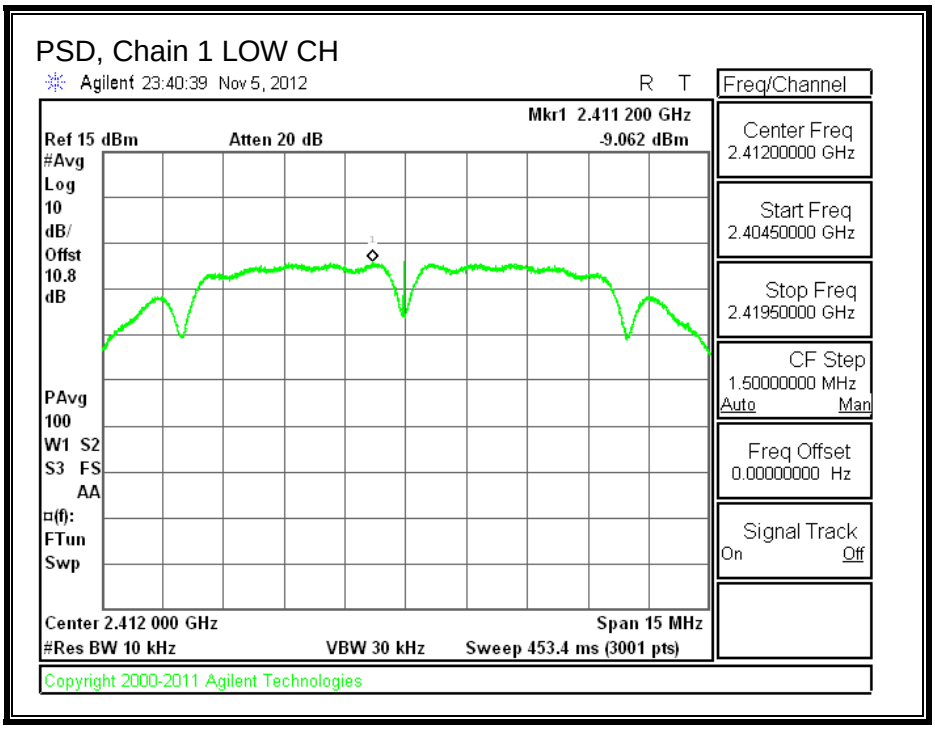
PSD, Chain 0



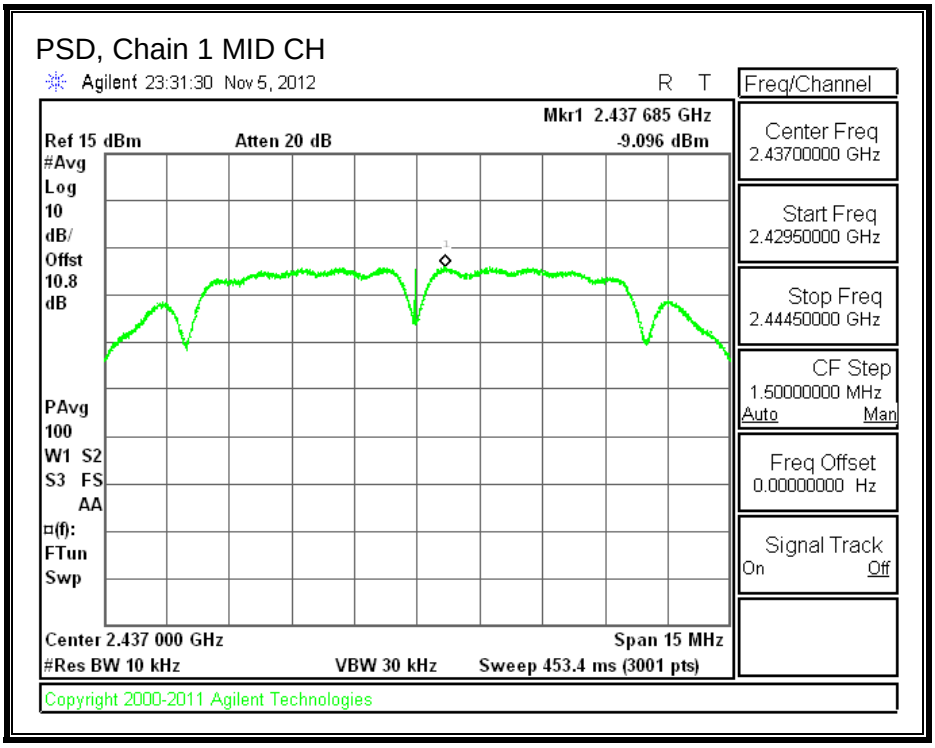




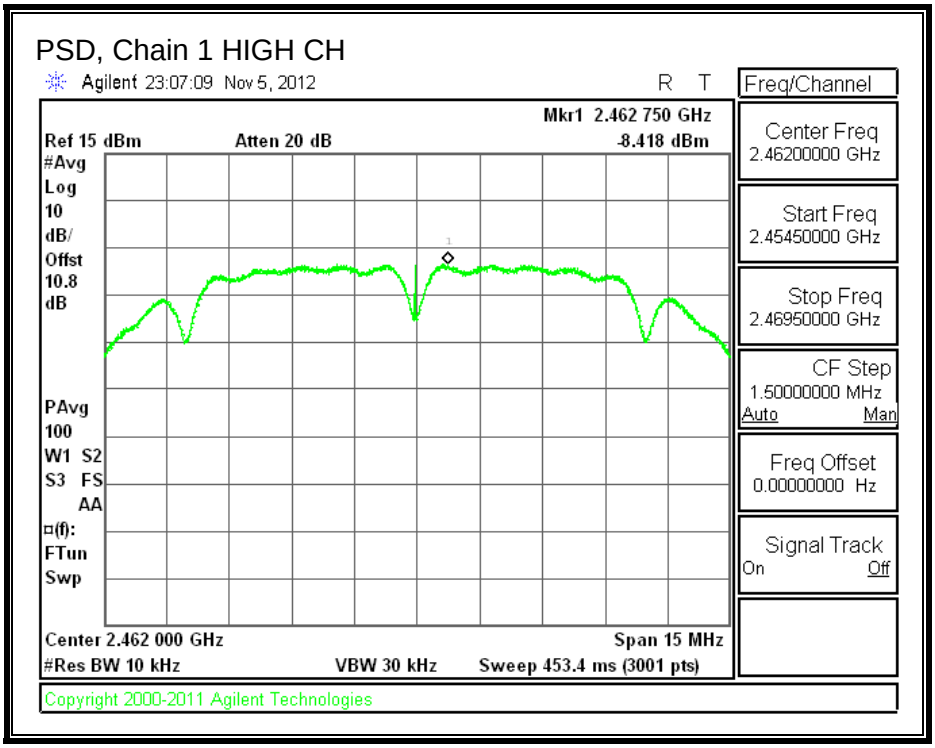
PSD, Chain 1



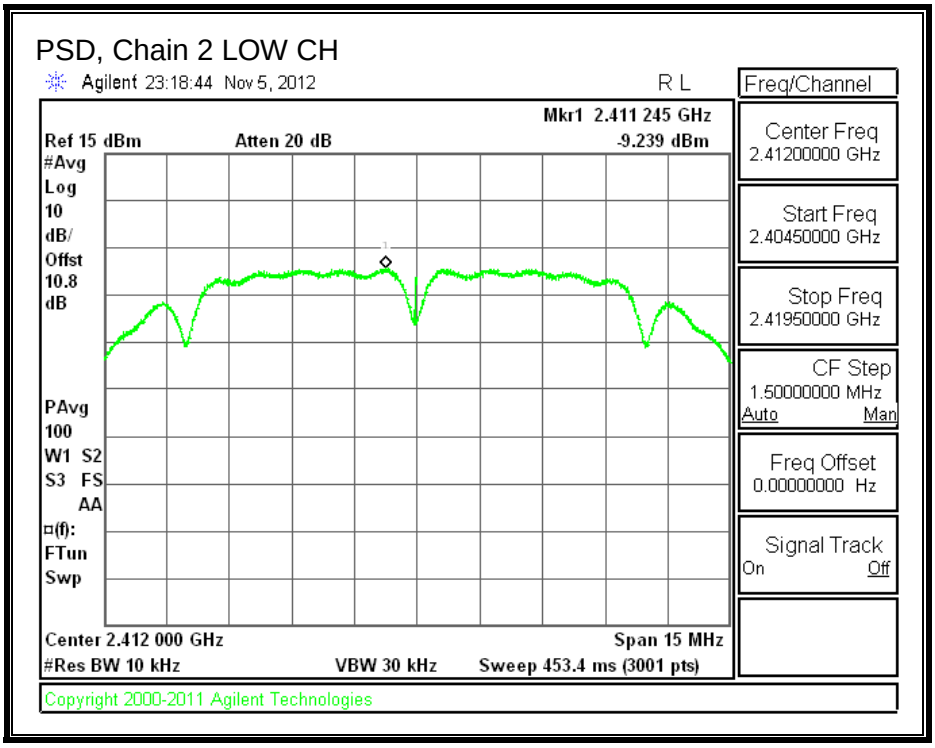
PSD, Chain 1 MID CH

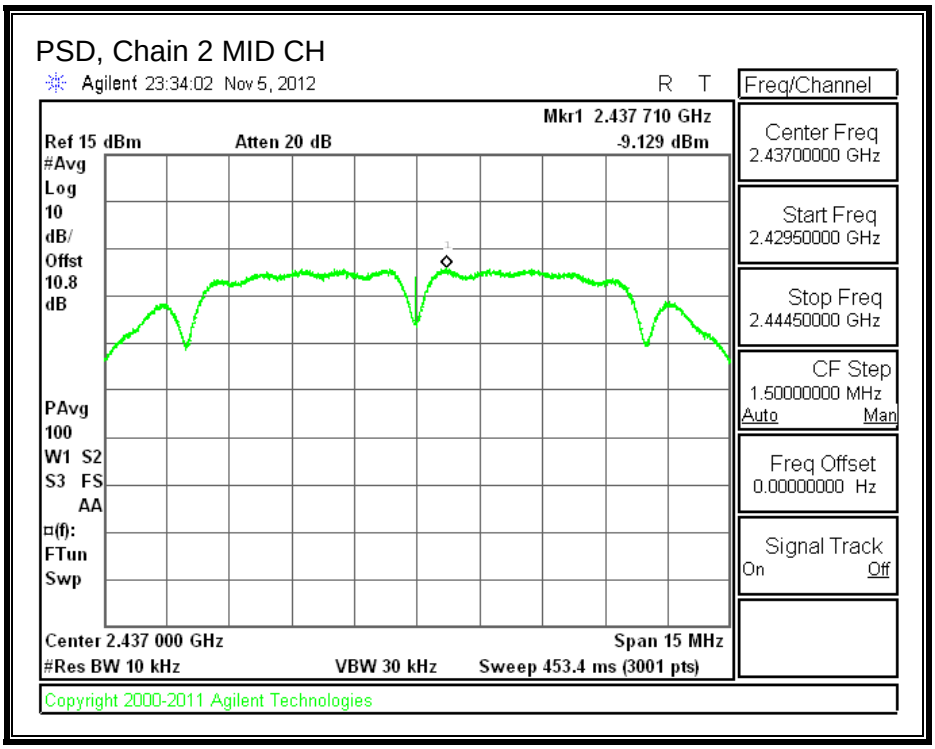


PSD, Chain 1 HIGH CH

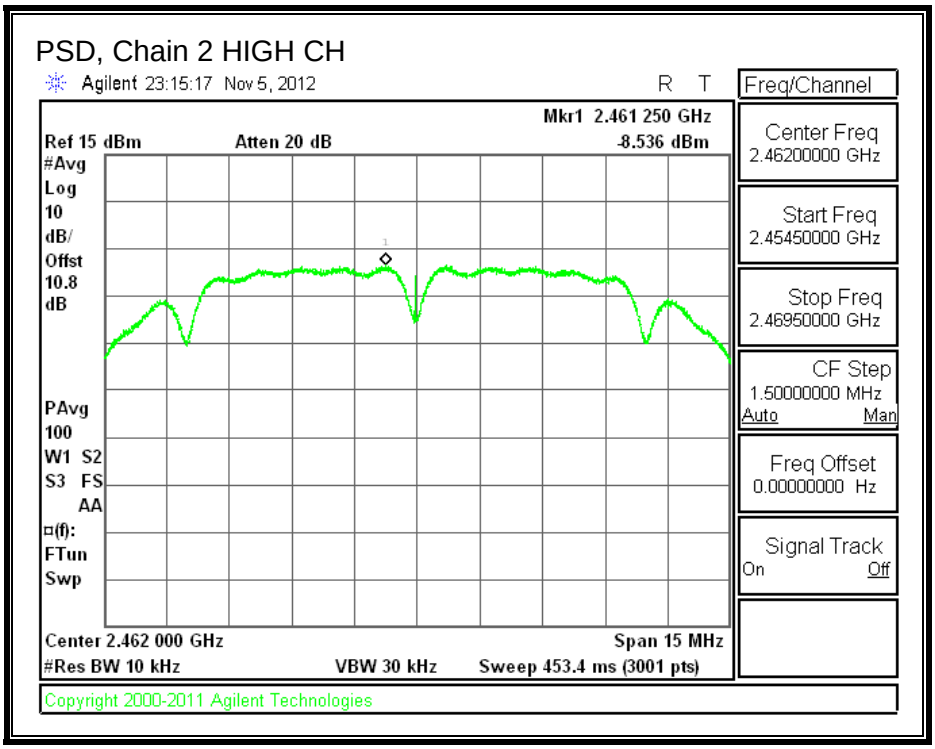


PSD, Chain 2





PSD, Chain 2 HIGH CH



8.2. 802.11g 1TX MODE IN THE 2.4 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.2.1. OUTPUT POWER

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.

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	6.60	29.40	30	36	29.40
Low 2	2417	6.60	29.40	30	36	29.40
Mid	2437	6.60	29.40	30	36	29.40
High 2	2457	6.60	29.40	30	36	29.40
High 1	2462	6.60	29.40	30	36	29.40

Results

Channel	Frequency (MHz)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.40	16.40	29.40	-13.00
Low 2	2417	19.20	19.20	29.40	-10.20
Mid	2437	22.37	22.37	29.40	-7.03
High 2	2457	17.80	17.80	29.40	-11.60
High 1	2462	15.84	15.84	29.40	-13.56

8.2.2. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

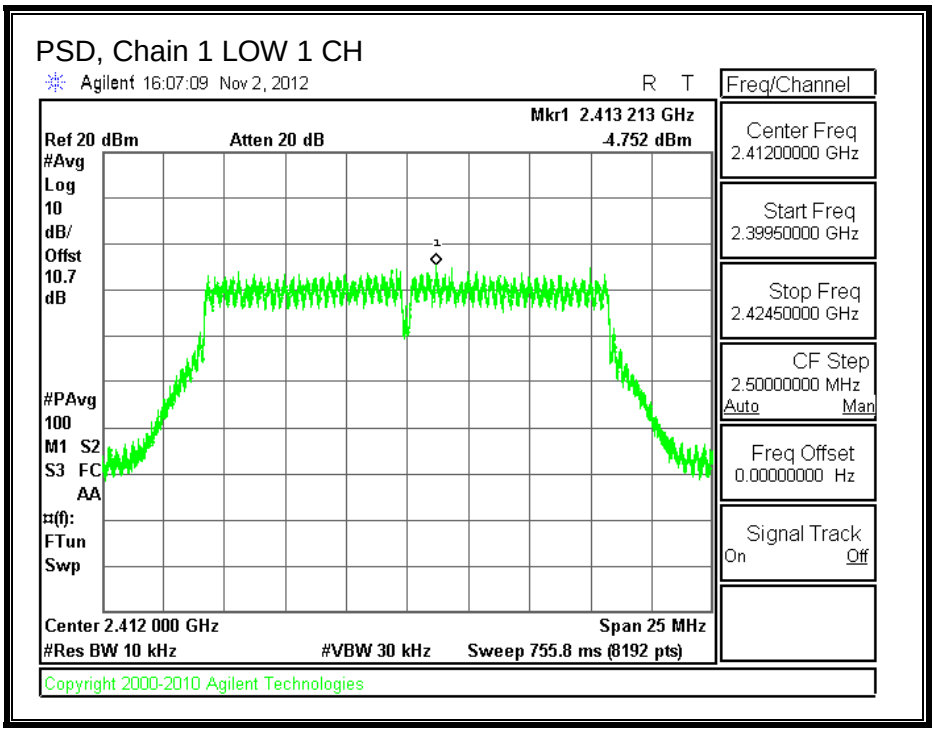
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

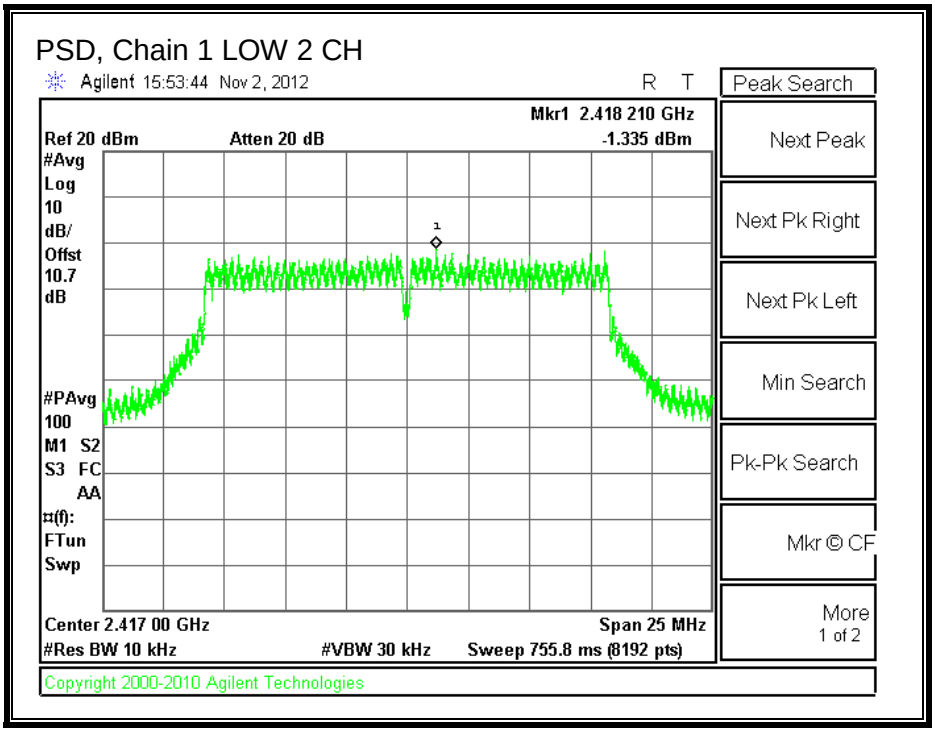
RESULTS

PSD Results

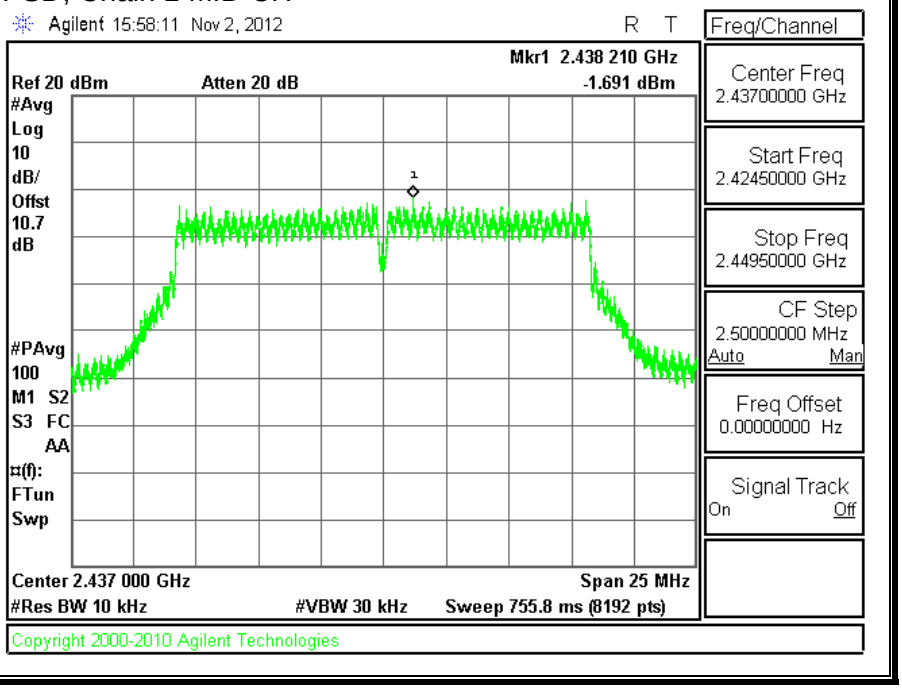
Channel	Frequency (MHz)	Chain 1 Meas (dBm)	DCCF (dB)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low 1	2412	-4.752	0.00	-4.752	8.0	-12.752
Low 2	2417	-1.335	0.00	-1.335	8.0	-9.335
Mid	2437	-1.691	0.00	-1.691	8.0	-9.691
High 2	2457	-3.189	0.00	-3.189	8.0	-11.189
High 1	2462	-6.029	0.00	-6.029	8.0	-14.029

PSD, Chain 0

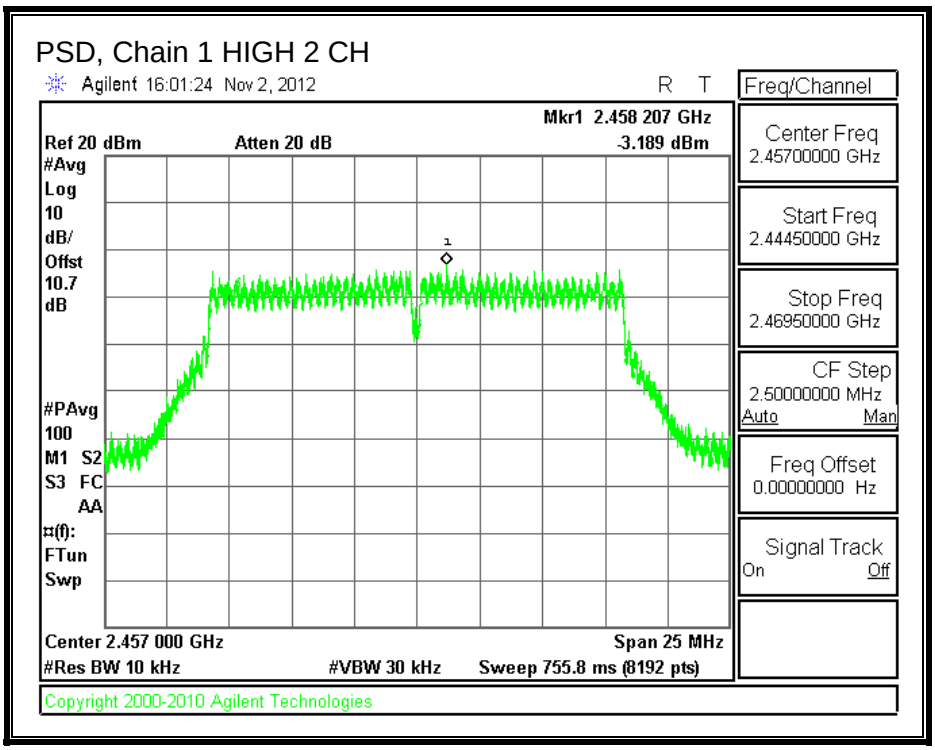


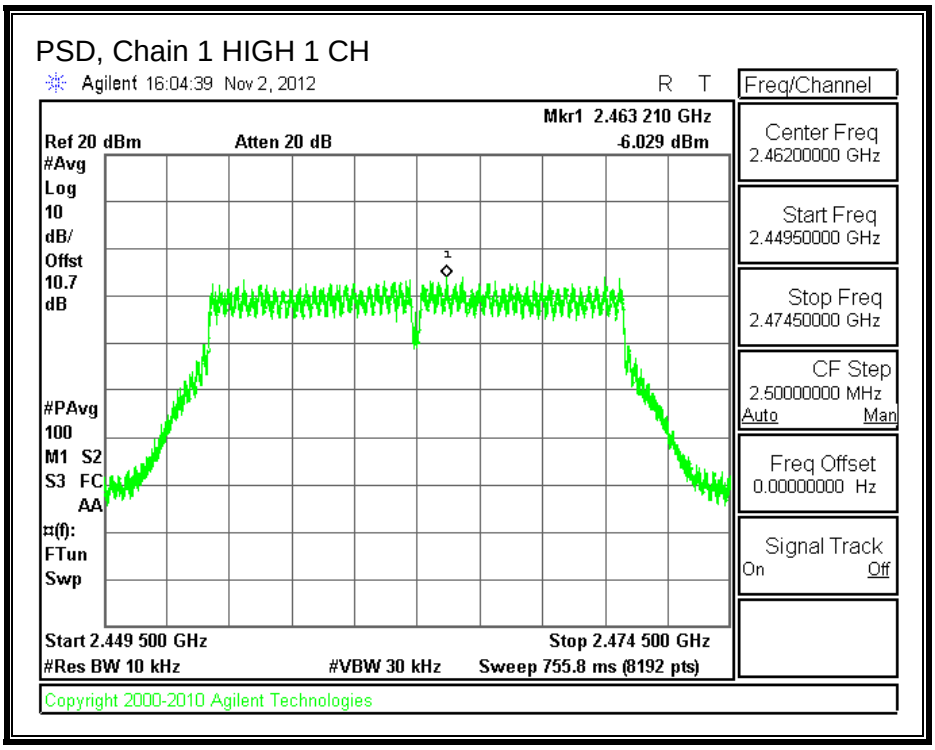


PSD, Chain 1 MID CH



PSD, Chain 1 HIGH 2 CH





8.3. 802.11n HT20 CDD MCS0 3TX MODE, 2.4 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.3.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	4.80	5.50	5.70

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	5.70	30.00	30	36	30.00
Low 2	2417	5.70	30.00	30	36	30.00
Mid	2437	5.70	30.00	30	36	30.00
High 10	2457	5.70	30.00	30	36	30.00
High 11	2462	5.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.48	15.83	15.84	20.83	30.00	-9.17
Low 2	2417	16.30	16.13	16.14	20.96	30.00	-9.04
Mid	2437	20.26	19.95	20.01	24.85	30.00	-5.15
High 10	2457	18.02	17.74	17.81	22.63	30.00	-7.37
High 11	2462	14.81	14.50	14.56	19.40	30.00	-10.60

8.3.2. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

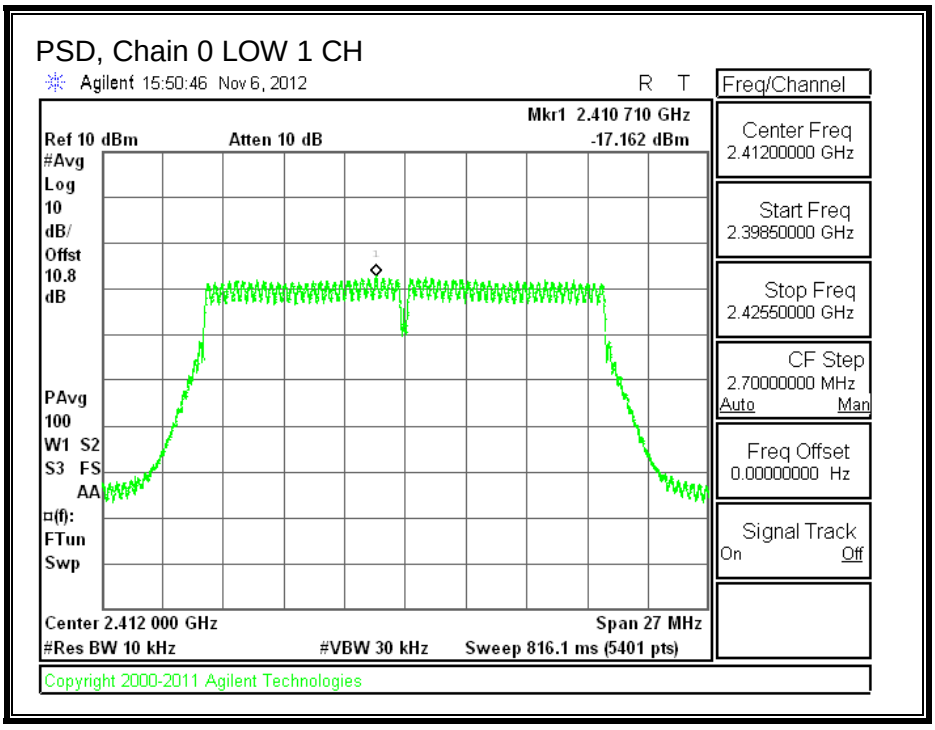
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

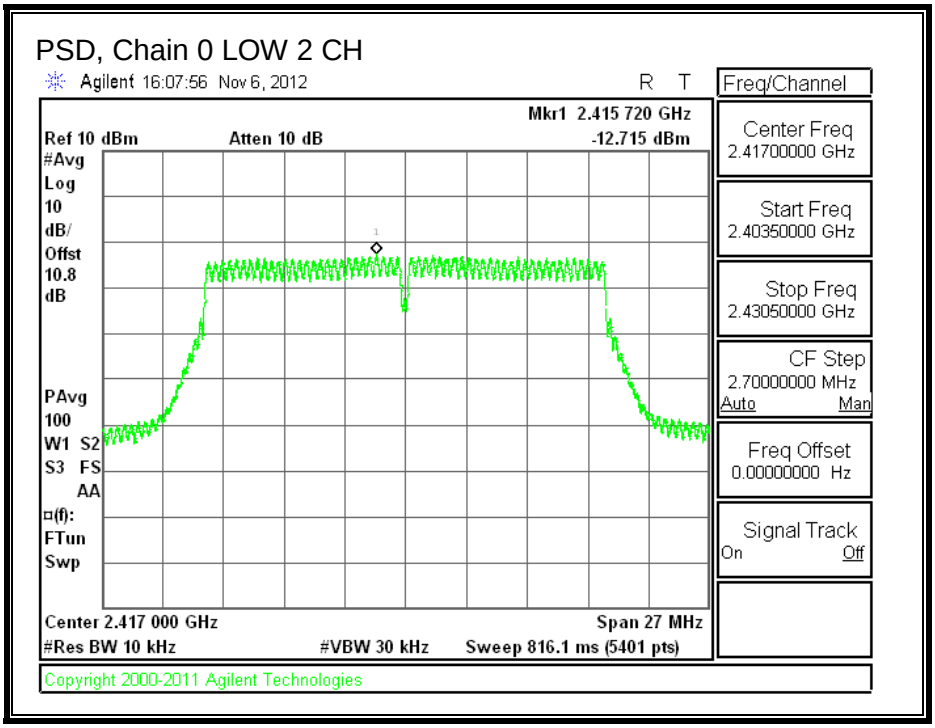
RESULTS

PSD Results

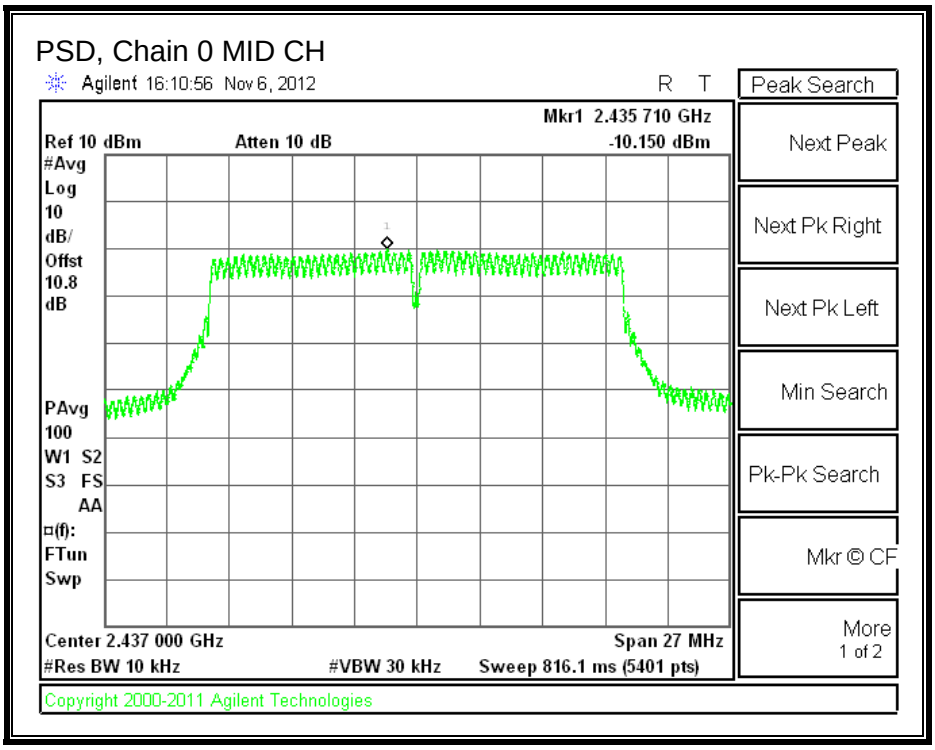
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low 1	2412	-17.162	-17.647	-17.364	-12.615	8.0	-20.615
Low 2	2417	-12.715	-12.623	-12.959	-7.992	8.0	-15.992
Mid	2437	-10.150	-10.263	-10.601	-5.563	8.0	-13.563
High 2	2457	-11.190	-10.864	-10.750	-6.159	8.0	-14.159
High 1	2462	-14.066	-14.534	-14.179	-9.484	8.0	-17.484

PSD, Chain 0

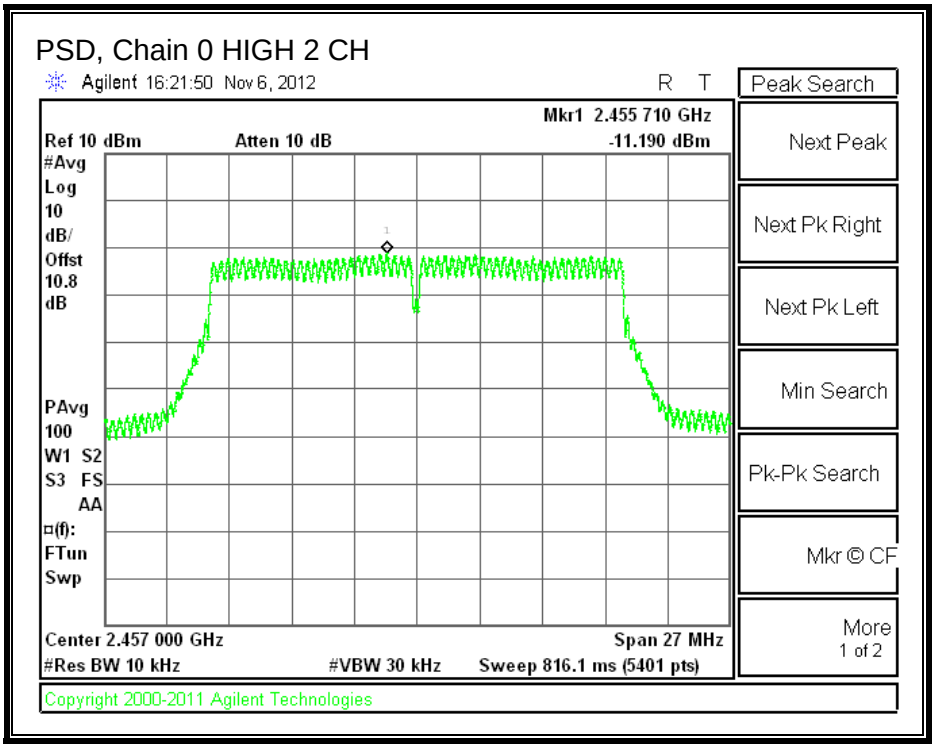


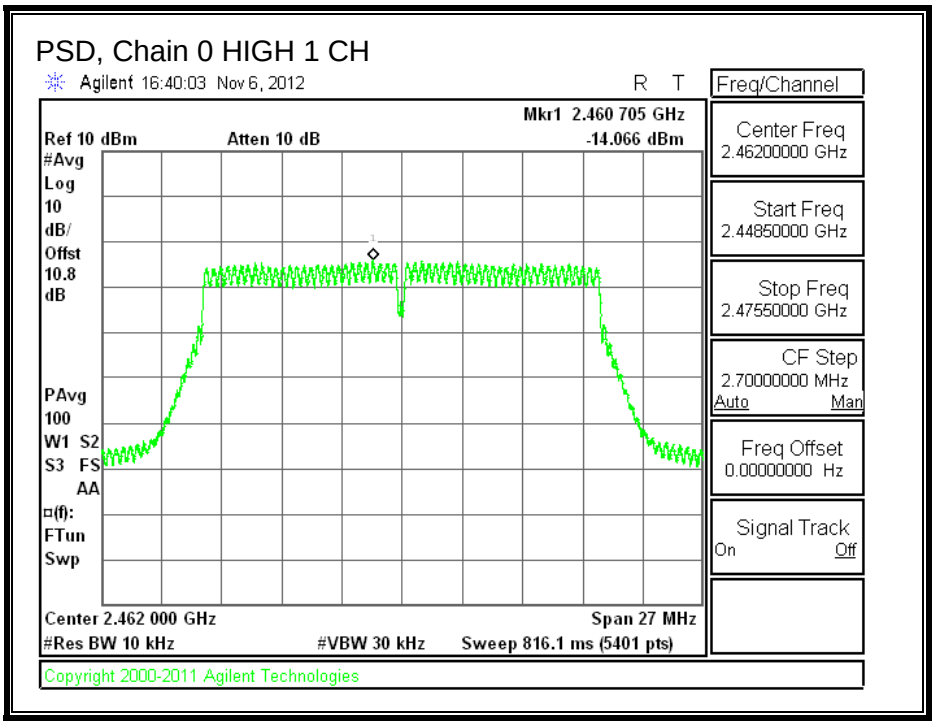


PSD, Chain 0 MID CH

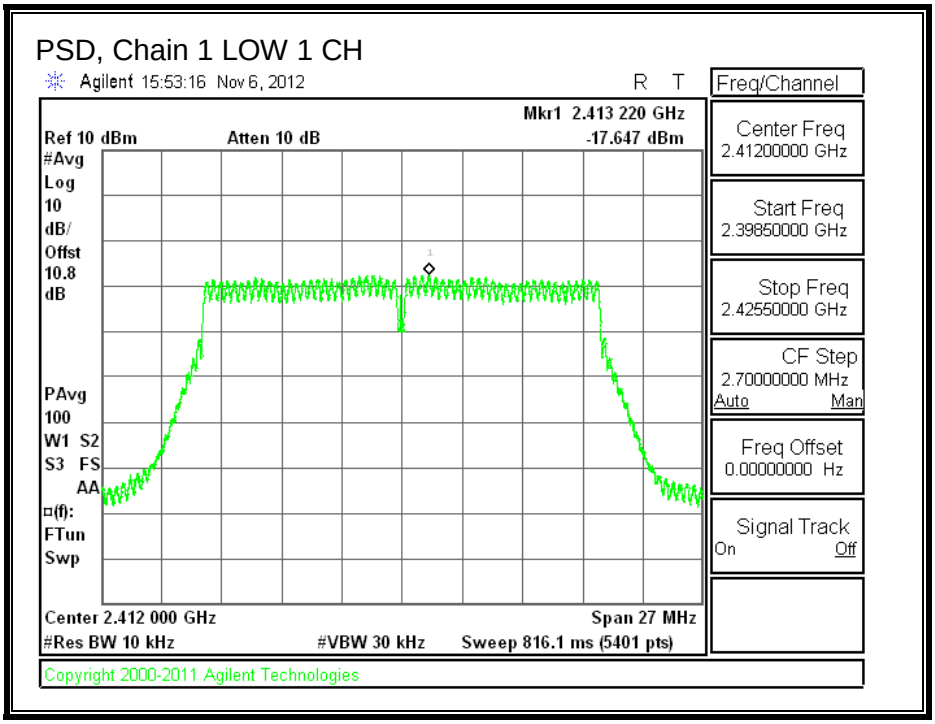


PSD, Chain 0 HIGH 2 CH

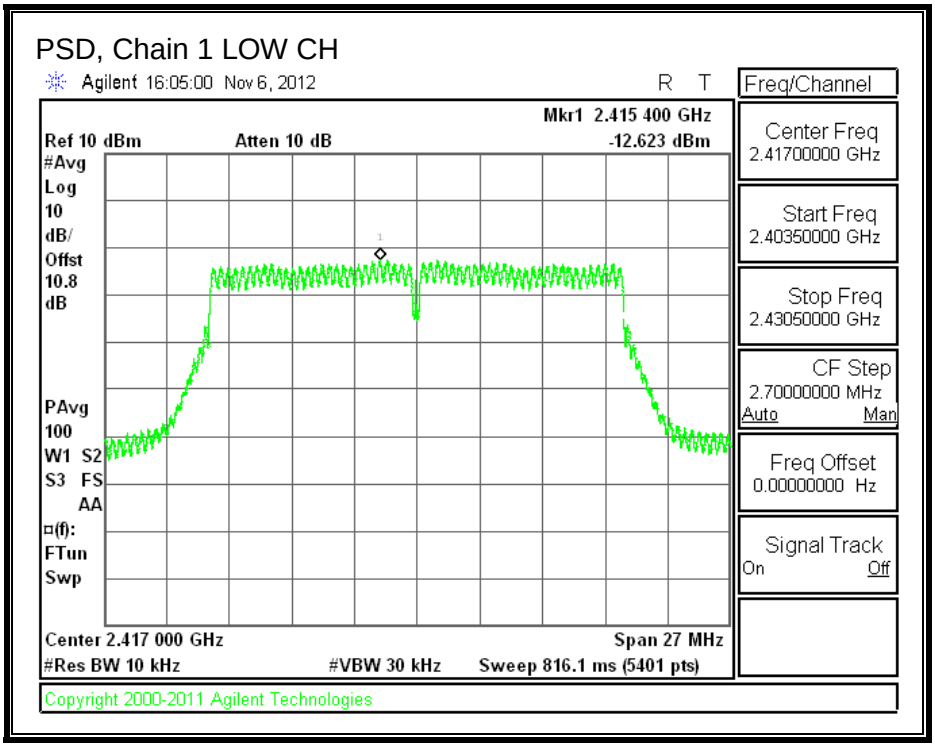




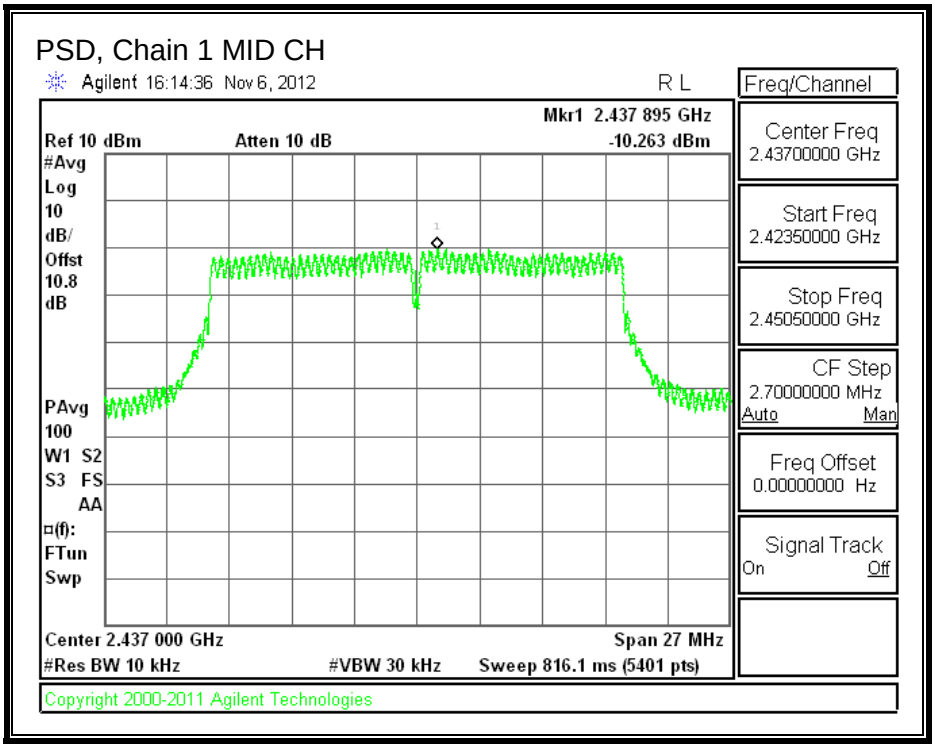
PSD, Chain 1



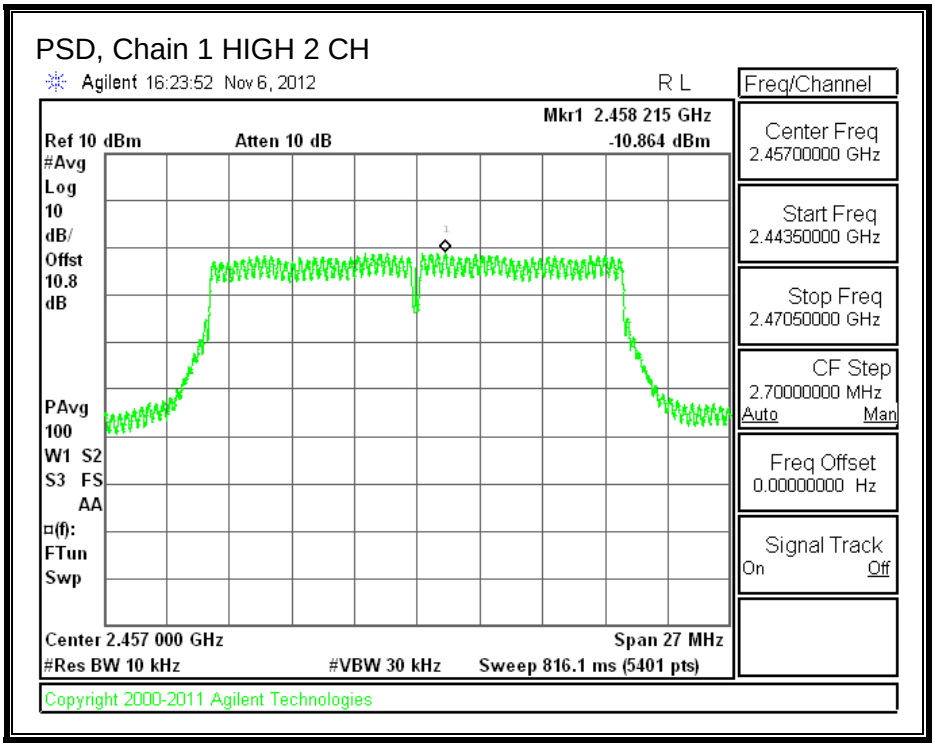
PSD, Chain 1 LOW CH



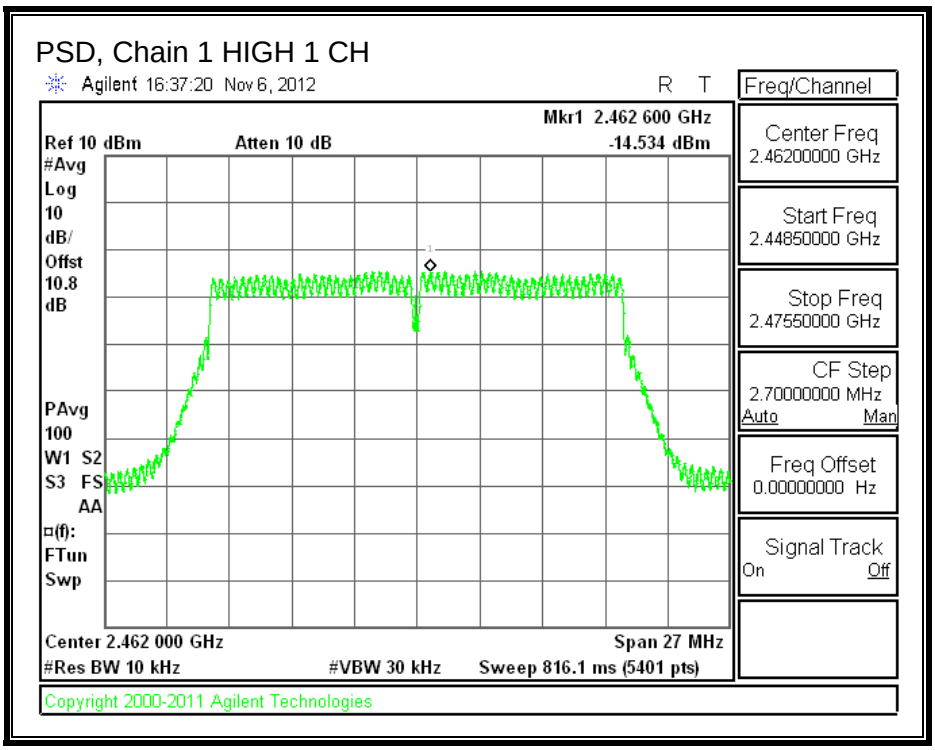
PSD, Chain 1 MID CH



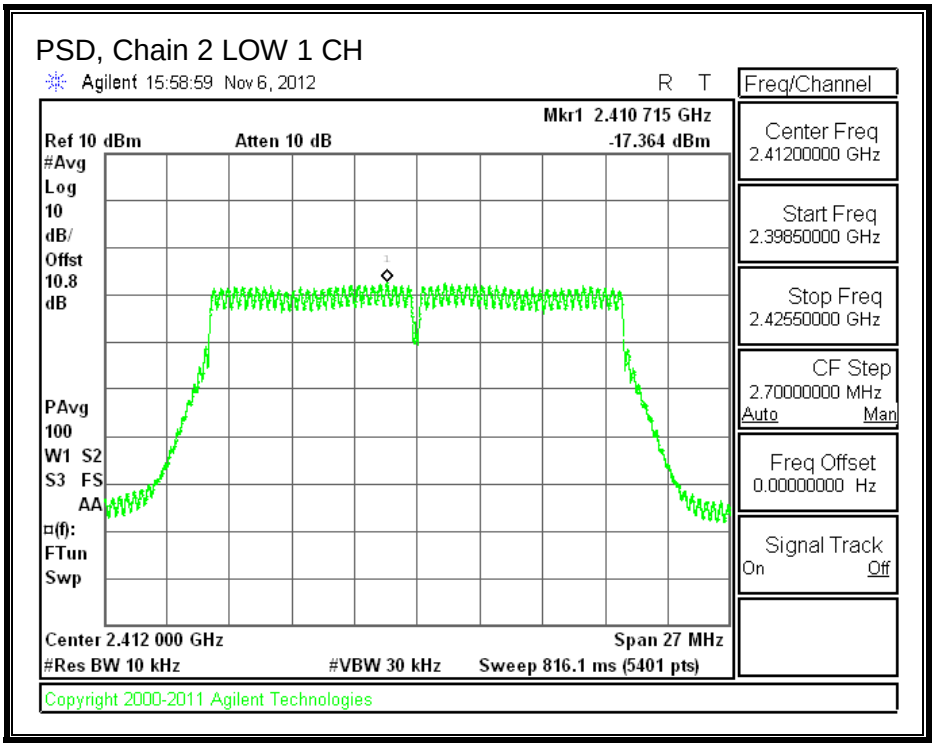
PSD, Chain 1 HIGH 2 CH

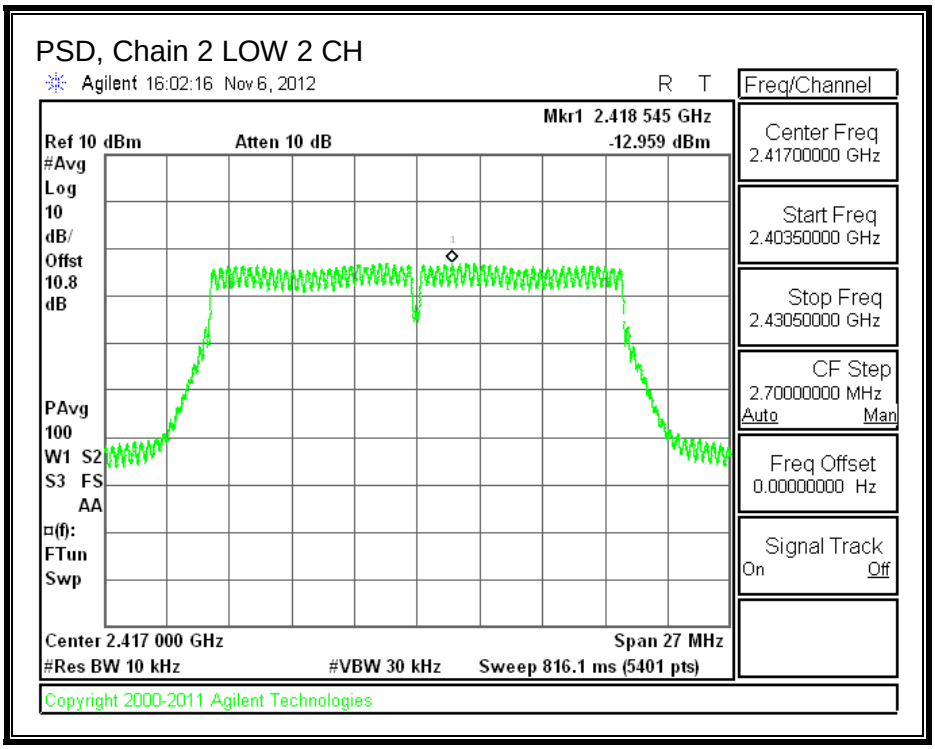


PSD, Chain 1 HIGH 1 CH

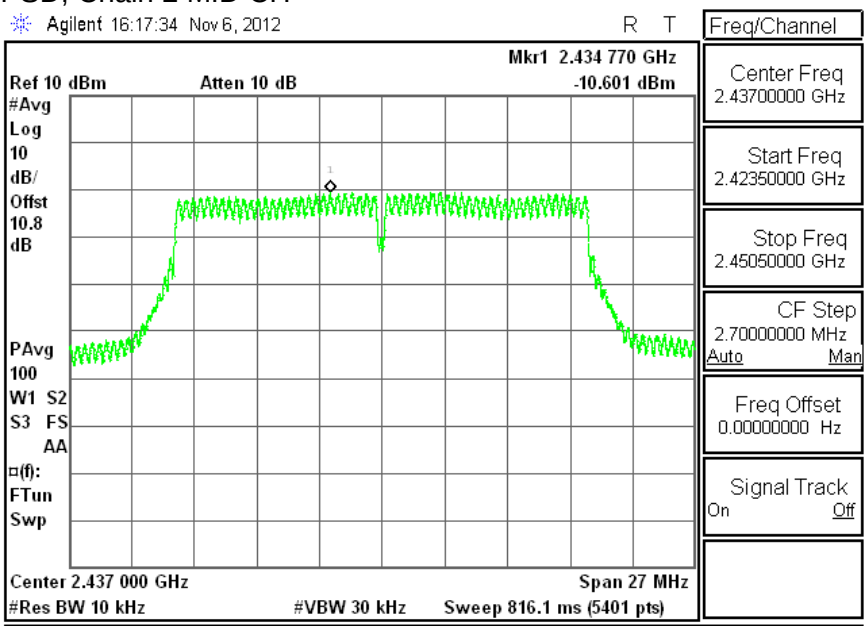


PSD, Chain 2

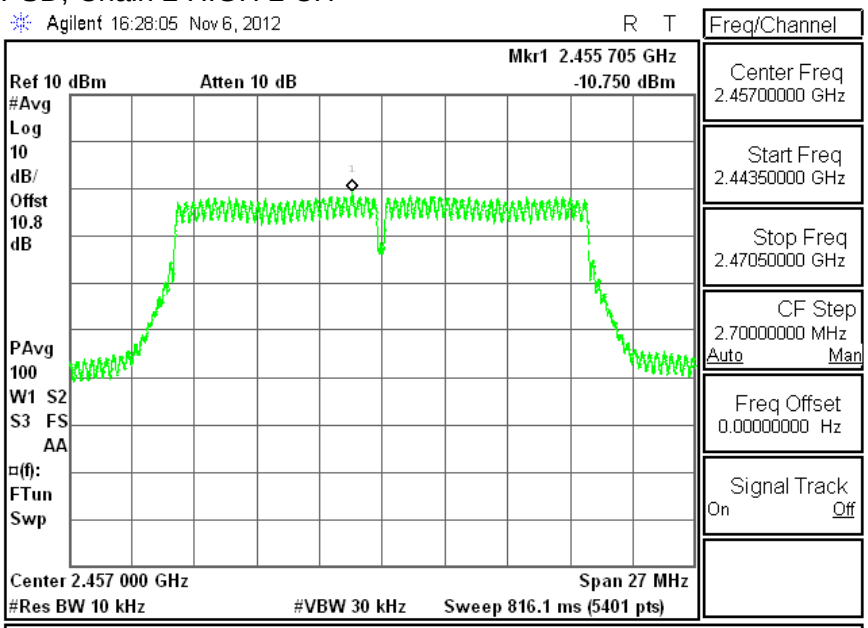




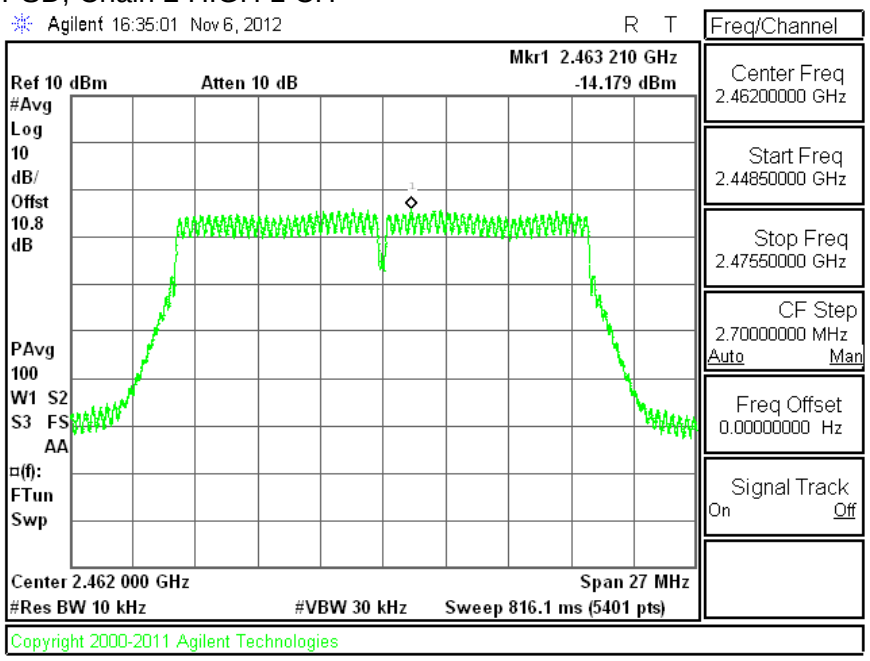
PSD, Chain 2 MID CH



PSD, Chain 2 HIGH 2 CH



PSD, Chain 2 HIGH 1 CH



8.4. 802.11ac VHT20 3TX BF MODE, 2.4 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.4.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
6.60	4.80	5.50	10.44

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low 1	2412	10.44	25.56	30	36	25.56
Low 2	2417	10.44	25.56	30	36	25.56
Mid	2437	10.44	25.56	30	36	25.56
High 10	2457	10.44	25.56	30	36	25.56
High 11	2462	10.44	25.56	30	36	25.56

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low 1	2412	16.48	15.83	15.84	20.83	25.56	-4.73
Low 2	2417	16.30	16.13	16.14	20.96	25.56	-4.60
Mid	2437	20.26	19.95	20.01	24.85	25.56	-0.71
High 10	2457	18.02	17.74	17.81	22.63	25.56	-2.93
High 11	2462	14.81	14.50	14.56	19.40	25.56	-6.16

8.5. 802.11n HT20 CDD 3TX MODE, 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.5.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
7.80	7.40	5.90	7.11

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Mid	5785	7.11	28.89	30	36	28.89

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Mid	5785	19.62	19.95	19.55	24.48	28.89	-4.41

8.5.2. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

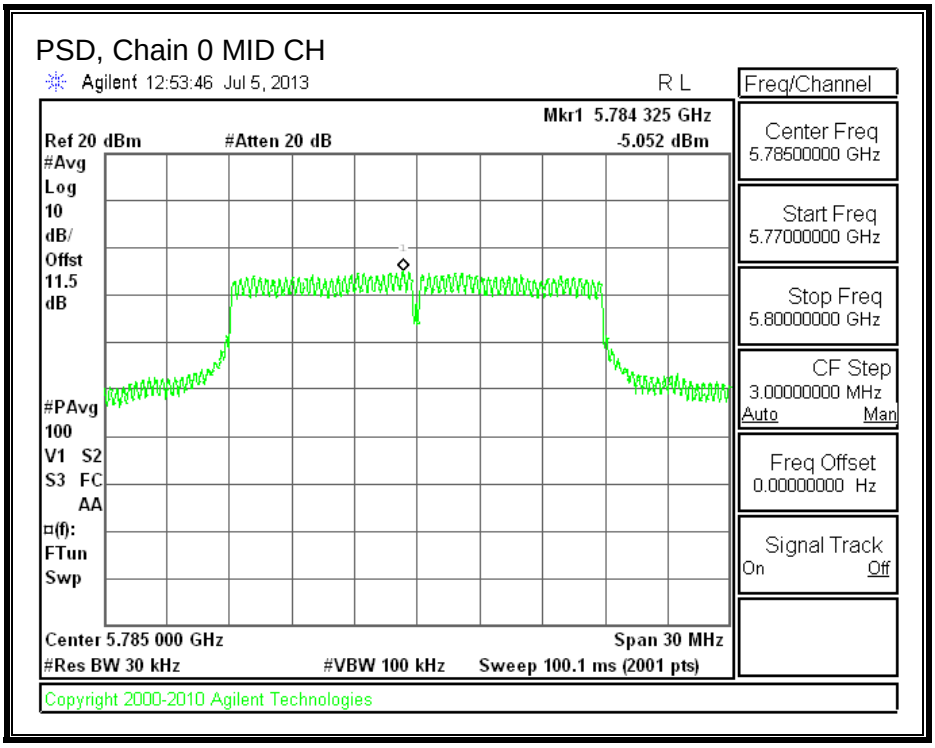
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

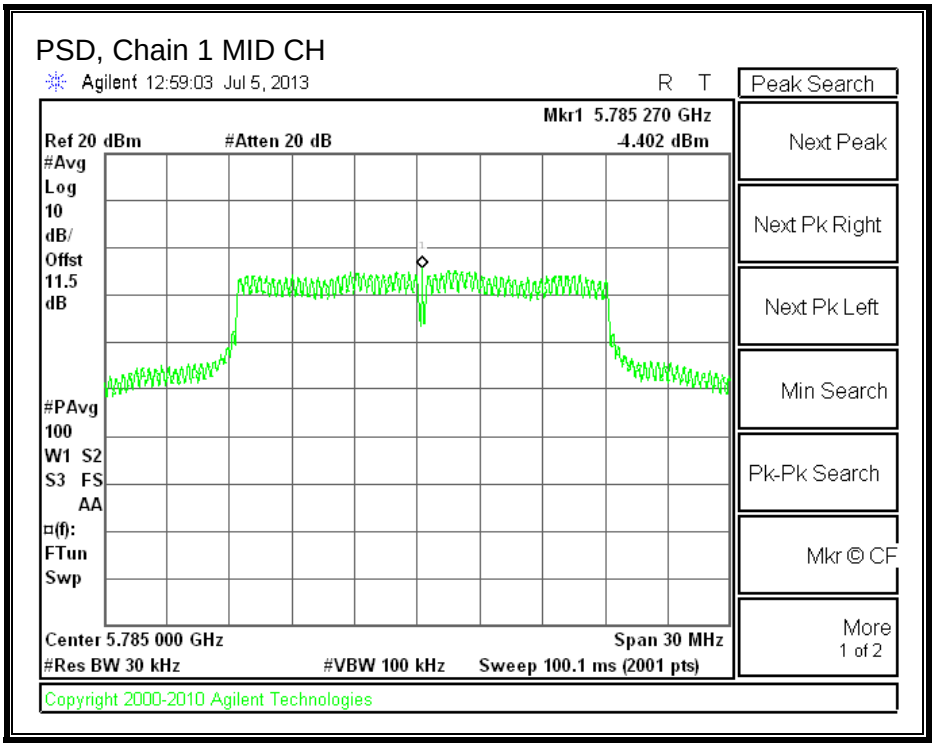
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Mid	5785	-5.052	-4.402	-5.874	-0.30	8.0	-8.3

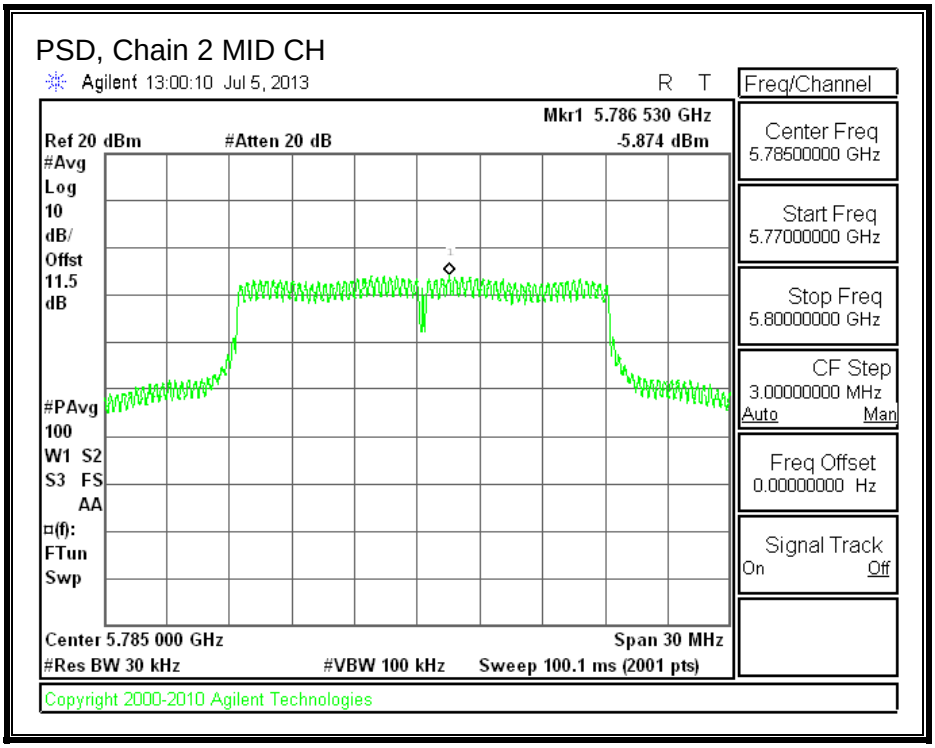
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.6. 802.11ac VHT20 3TX BF MODE, 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.6.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
7.80	7.40	5.90	11.84

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Mid	5785	11.84	24.16	30	36	24.16

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Mid	5785	19.34	19.49	19.26	24.14	24.16	-0.02

8.7. 802.11n HT40 CDD 3TX MODE, 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.7.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
7.80	7.40	5.90	7.11

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High	5795	7.11	28.89	30	36	28.89

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High	5795	19.36	19.45	19.27	24.13	28.89	-4.76

8.7.2. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

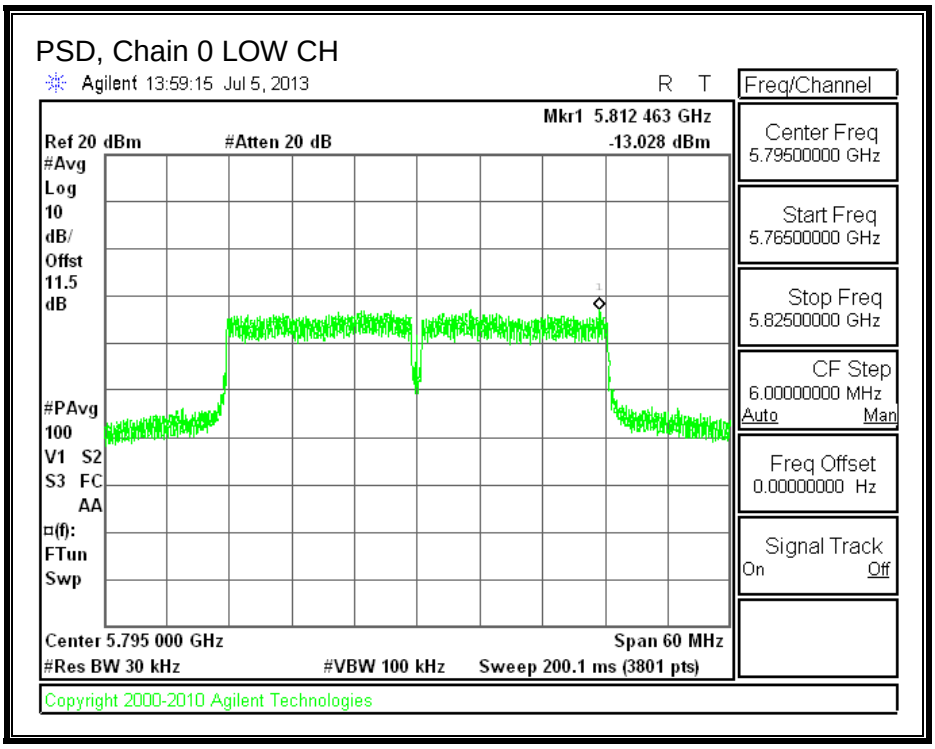
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

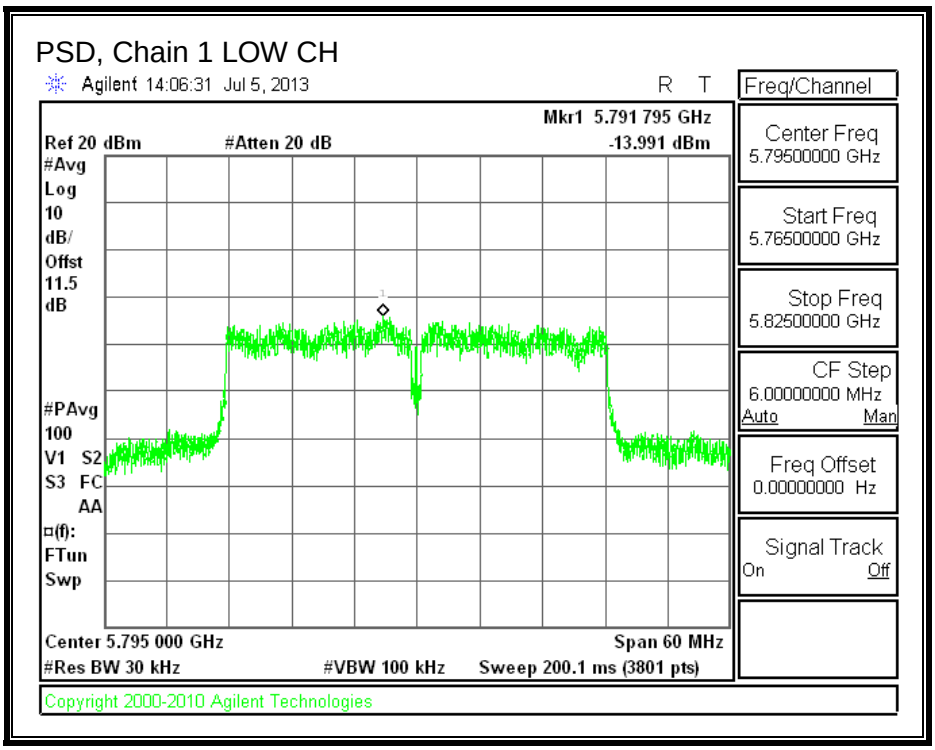
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
High	5795	-13.03	-13.99	-13.13	-8.59	8.0	-16.6

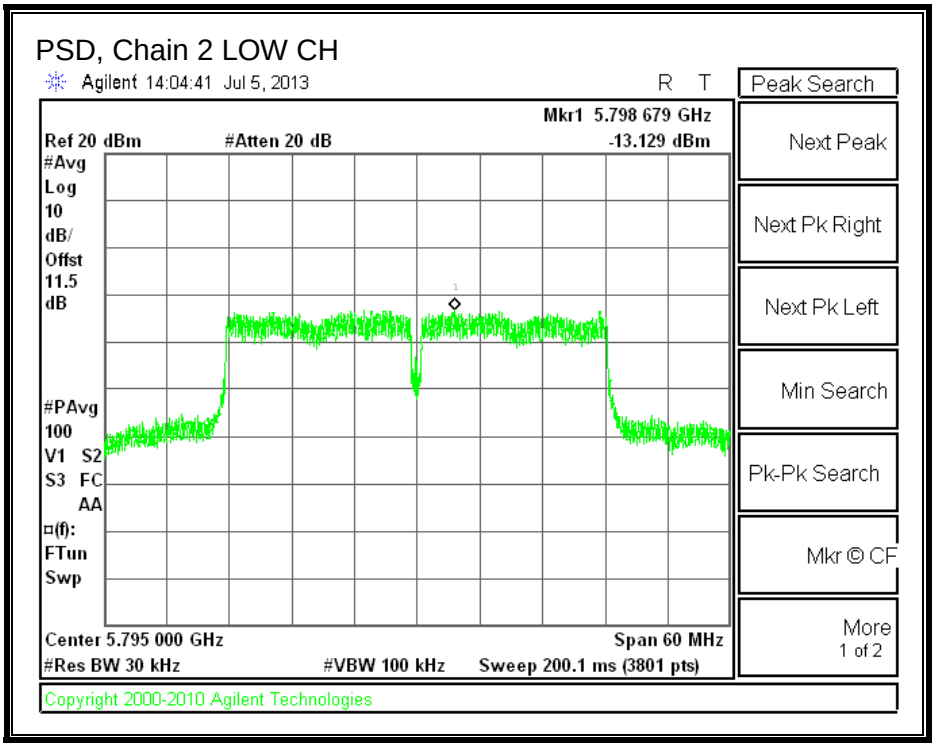
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.8. 802.11ac VHT40 3TX BF MODE, 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.8.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
7.80	7.40	5.90	11.84

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High	5795	11.84	24.16	30	36	24.16

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High	5795	19.36	19.45	19.27	24.13	24.16	-0.03

8.9. 802.11ac VHT80 CDD 3TX MODE, 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.9.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
7.80	7.40	5.90	7.11

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High	5775	7.11	28.89	30	36	28.89

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High	5775	17.76	17.54	17.82	22.48	28.89	-6.41

8.9.2. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

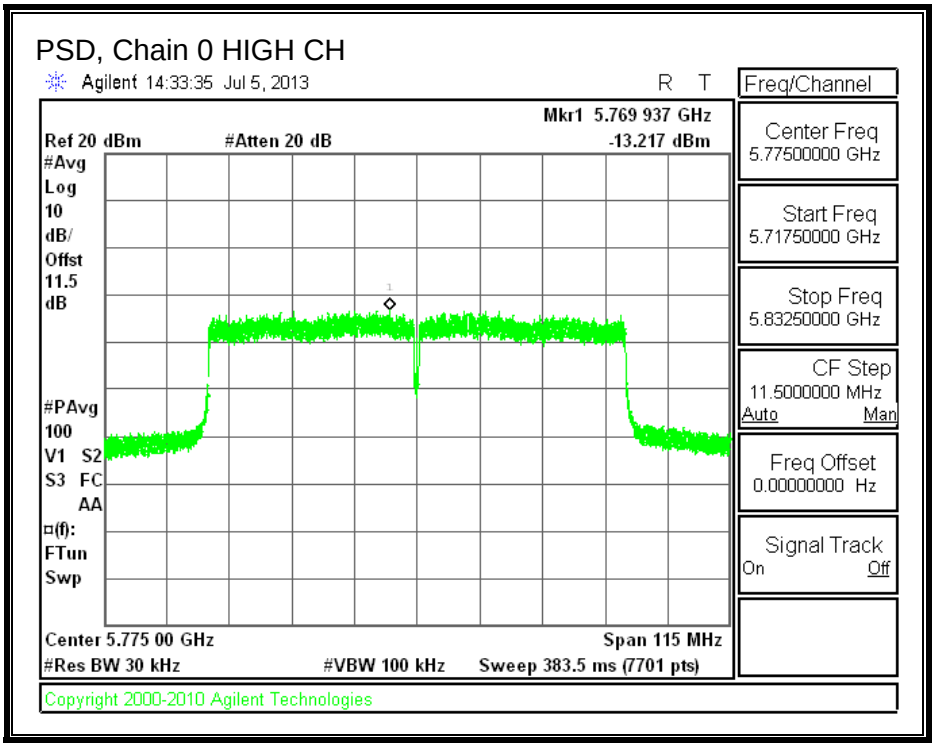
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

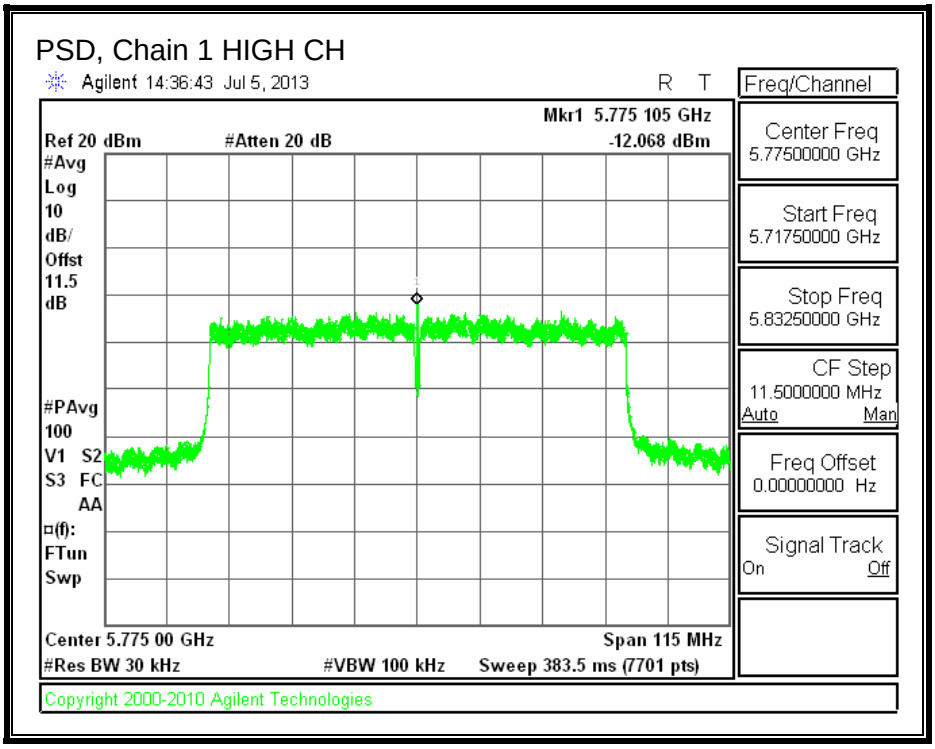
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Low	5775	-13.22	-12.07	-13.24	-8.03	8.0	-16.0

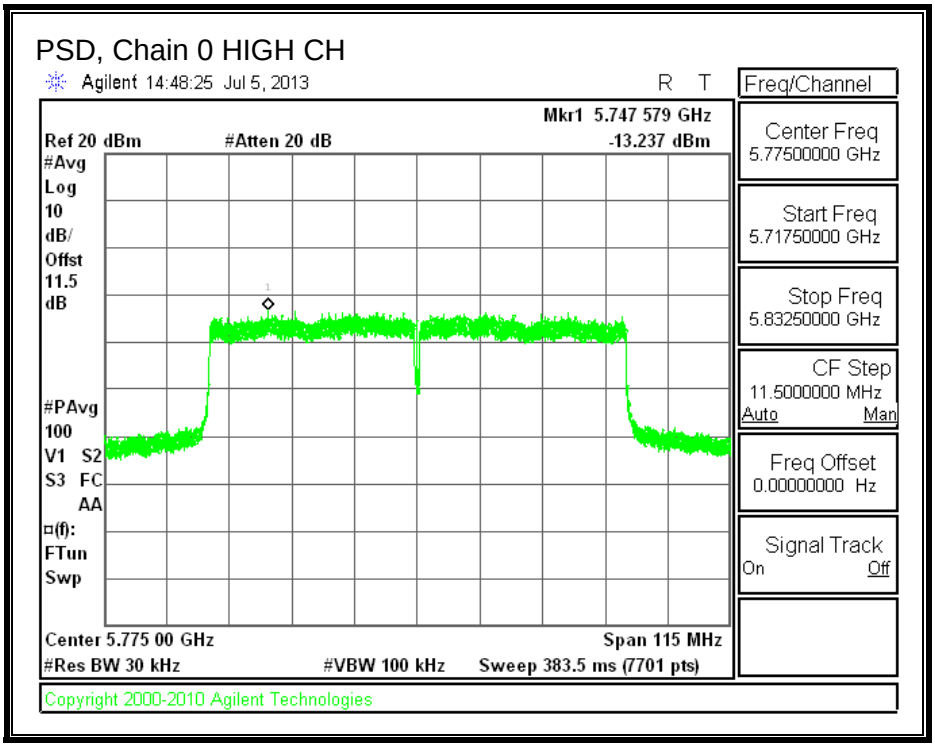
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



8.10. 802.11ac VHT80 BF 3TX MODE IN THE 5.8 GHz BAND

Power measurements are taken directly from the original filing, as documented in report 12U14669-1B, and the limits have been modified to account for the new, higher gain antennas covered by this C2PC. Bandwidth and antenna port conducted spurious measurements remain covered by the data submitted in the original filing as these are independent of antenna gain.

8.10.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
7.80	7.40	5.90	11.84

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Mid	5755	11.84	24.16	30	36	24.16

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Mid	5755	19.24	19.17	19.30	24.01	24.16	-0.15

8.10.2. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-210 A8.2

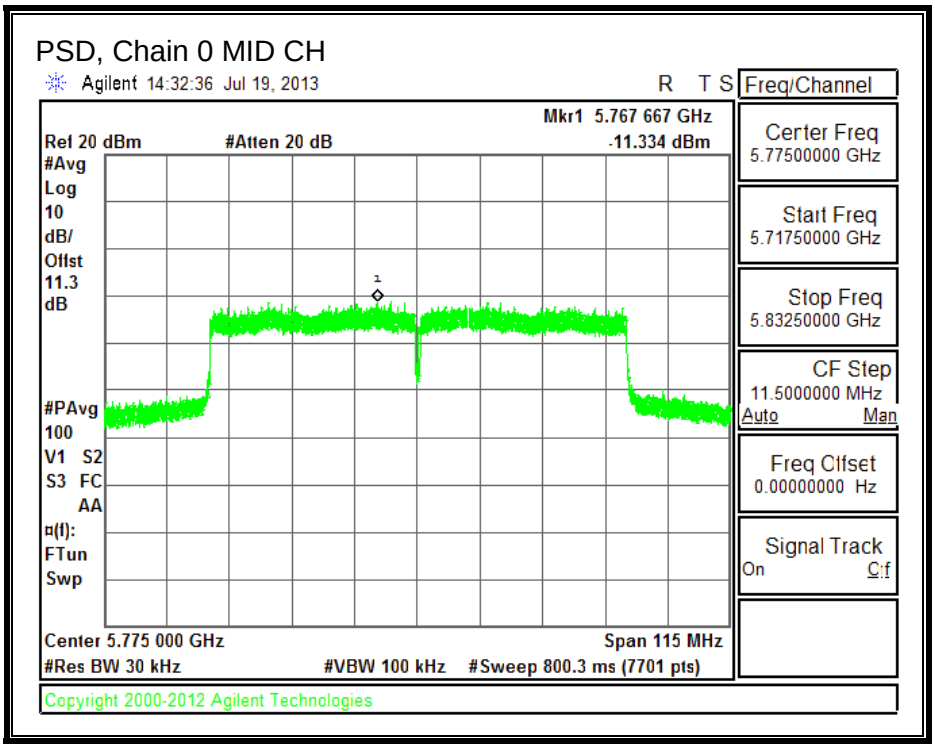
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

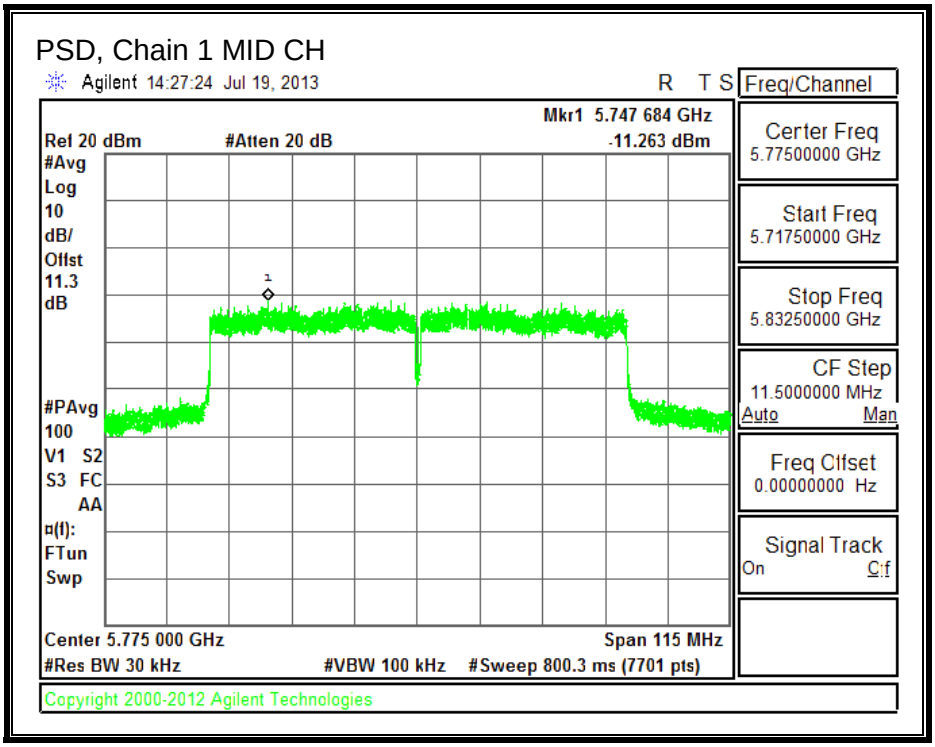
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Chain 1 Meas (dBm)	Chain 2 Meas (dBm)	Total PSD (dBm)	Limit (dBm)	Margin (dB)
Mid	5775	-11.334	-11.263	-9.915	-6.015	8.0	-14.015

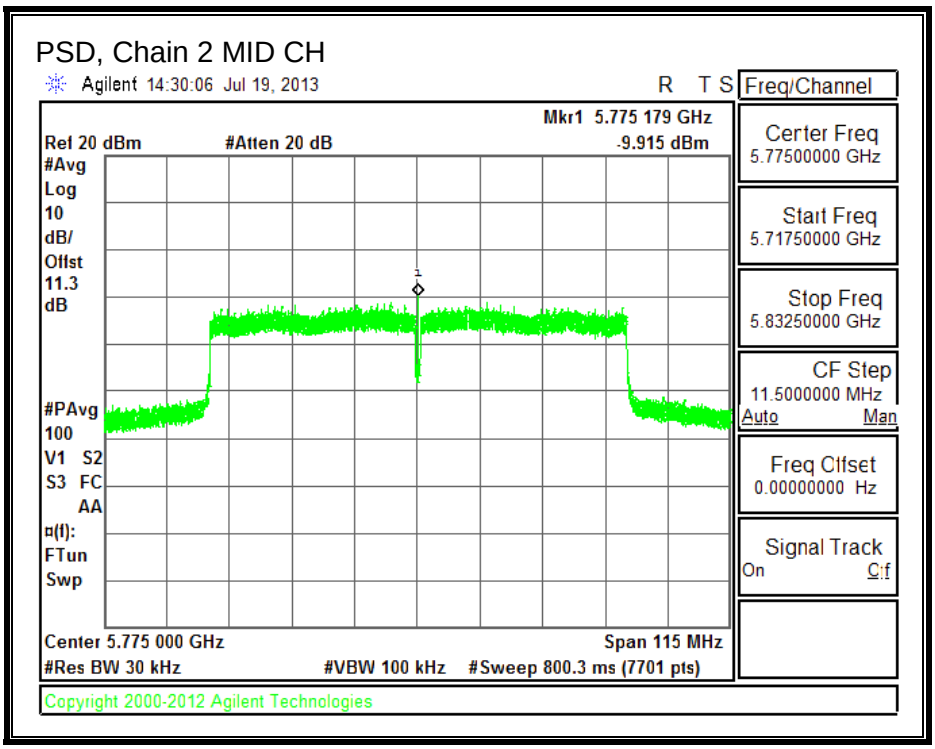
PSD, Chain 0



PSD, Chain 1



PSD, Chain 2



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 3 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.

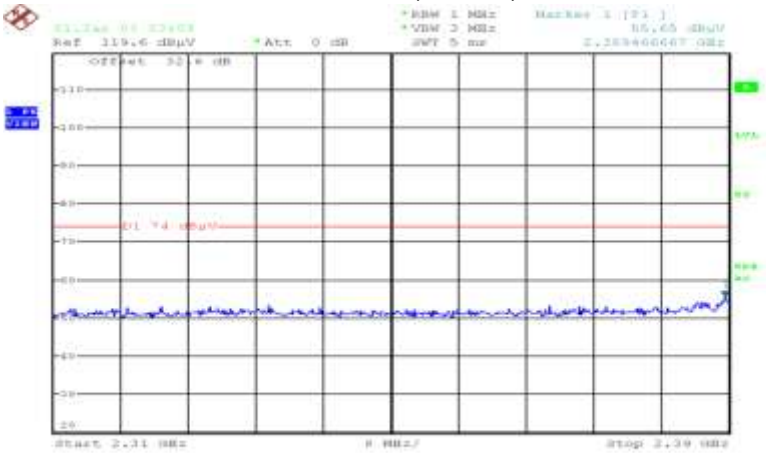
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

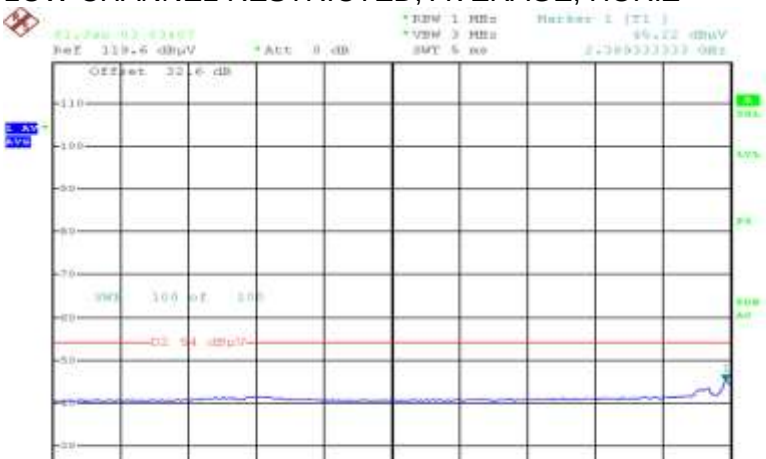
9.2.1. 802.11b 3TX CDD MODE, 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

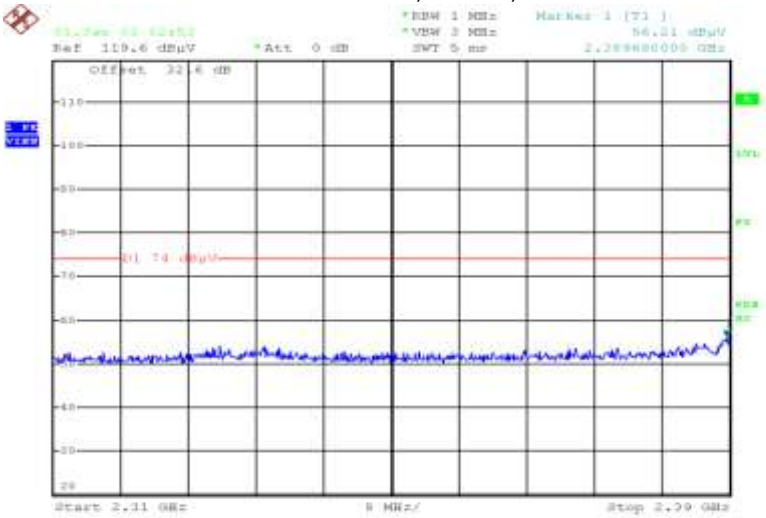
LOW CHANNEL RESTRICTED, PEAK, HORIZ



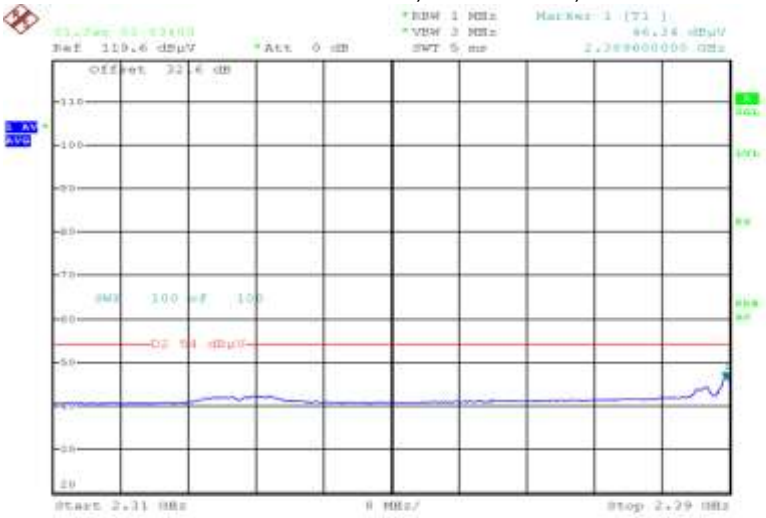
LOW CHANNEL RESTRICTED, AVERAGE, HORIZ



LOW CHANNEL RESTRICTED, PEAK, VERT

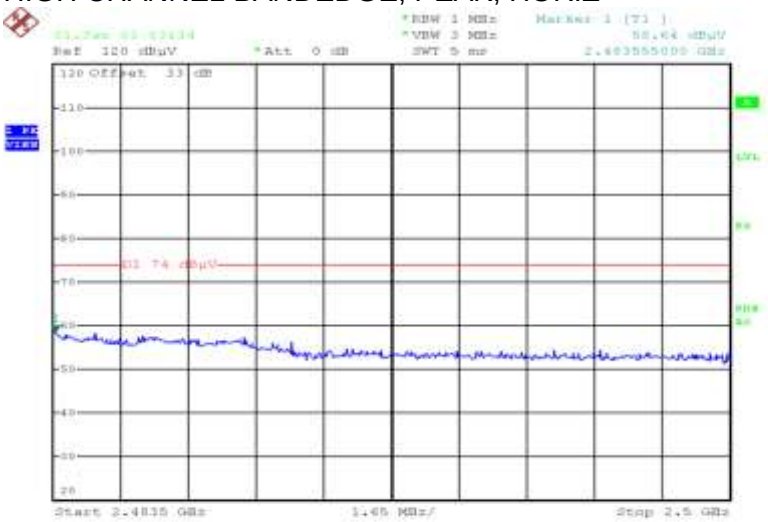


LOW CHANNEL RESTRICTED, AVERAGE, VERT

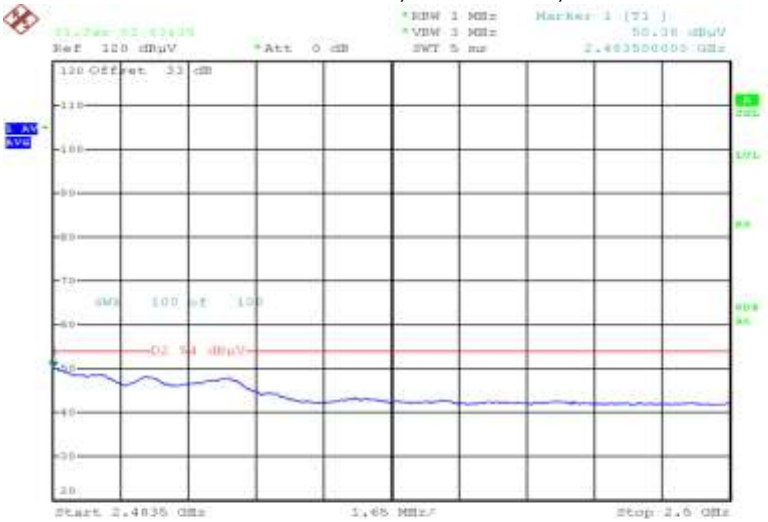


AUTHORIZED BANDEDGE (HIGH CHANNEL)

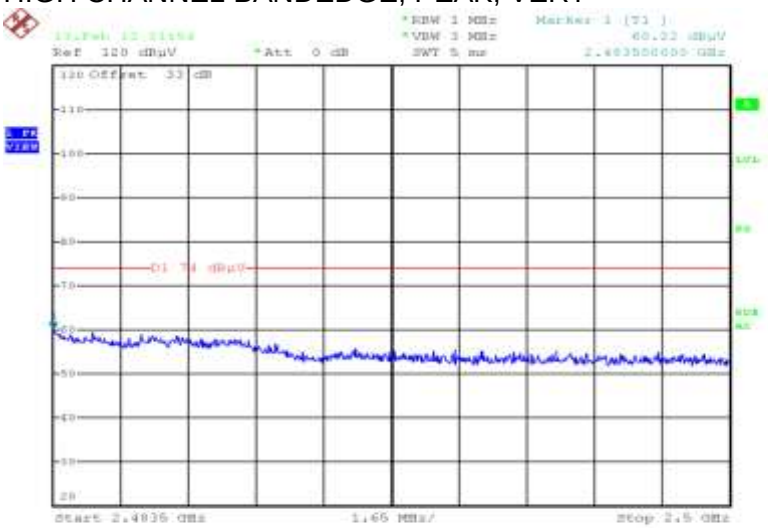
HIGH CHANNEL BANDEDGE, PEAK, HORIZ



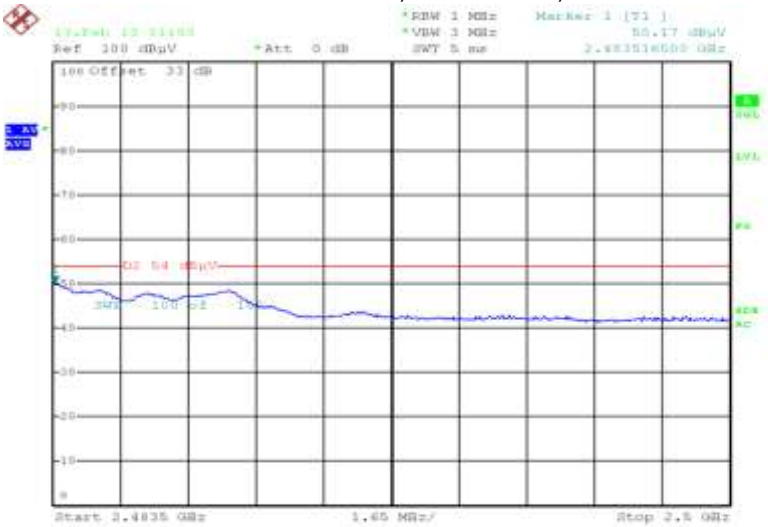
HIGH CHANNEL BANDEDGE, AVERAGE, HORIZ



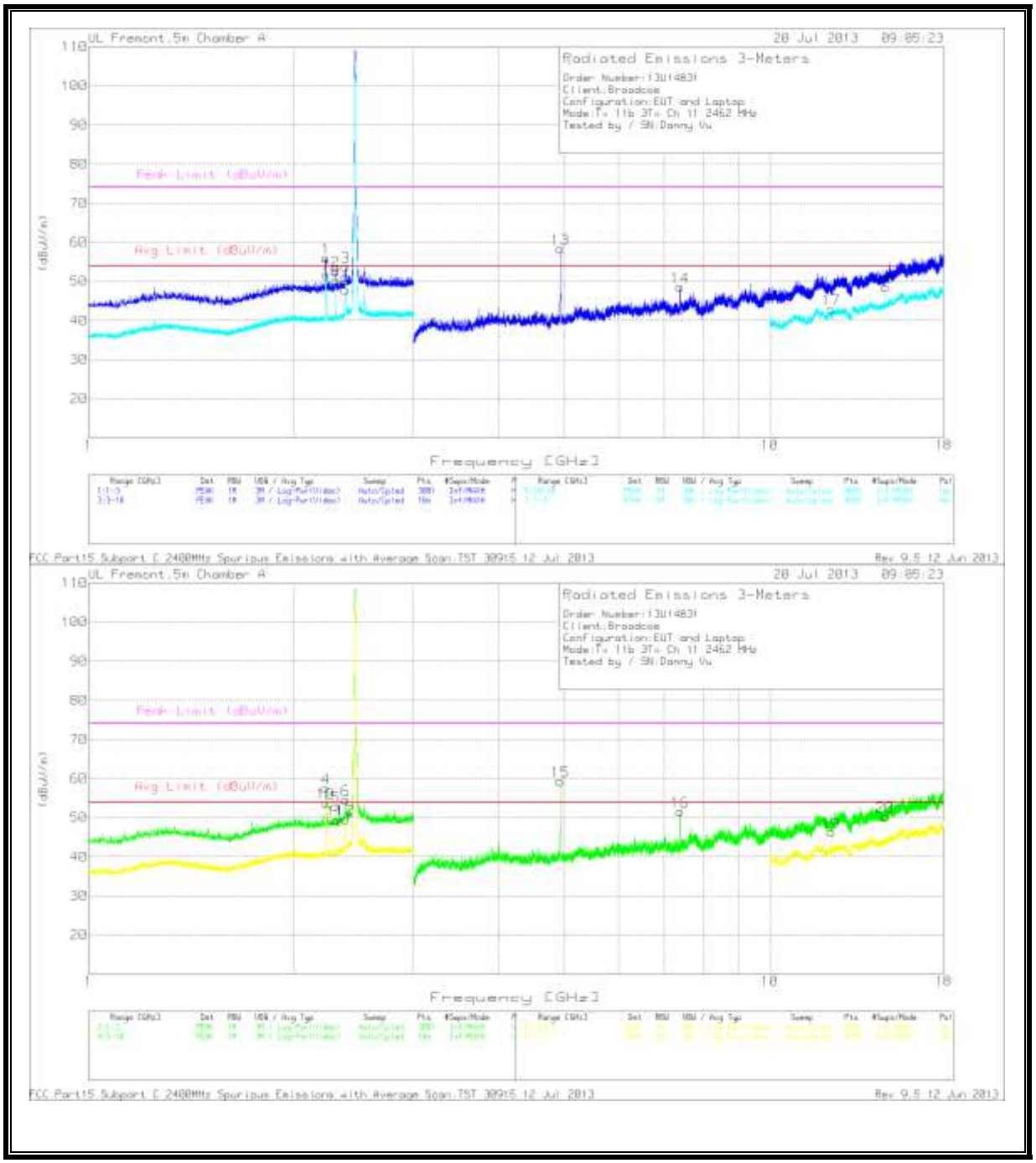
HIGH CHANNEL BANDEDGE, PEAK, VERT



HIGH CHANNEL BANDEDGE, AVERAGE, VERT



HARMONICS AND SPURIOUS EMISSIONS



Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.229	49.23	PK	315	-23.2	57.53	-	-	74	-16.47	0-360	200	V
2.231	47.8	PK	315	-23.2	56.1	-	-	74	-17.9	0-360	100	H
2.308	44.22	PK	316	-23	52.82	-	-	68.2	-15.38	0-360	200	H
2.308	44.44	PK	316	-23	53.04	-	-	68.2	-15.16	0-360	200	V
2.308	41.64	PK	316	-23	50.24	-	-	68.2	-17.96	0-360	200	H
2.308	40.72	PK	316	-23	49.32	-	-	68.2	-18.88	0-360	200	V
2.383	45.36	PK	32	-22.8	54.56	-	-	74	-19.44	0-360	100	V
2.383	44.57	PK	32	-22.8	53.77	53.97	-0.2	74	-20.23	0-360	200	H
2.381	40.46	PK	32	-22.8	49.66	53.97	-4.31	74	-24.34	0-360	100	V
2.383	38.73	PK	32	-22.8	47.93	53.97	-6.04	74	-26.07	0-360	200	H
4.924	51.91	PK	34	-27.5	58.41	-	-	74	-15.59	0-360	200	H
4.924	52.89	PK	34	-27.5	59.39	-	-	74	-14.61	0-360	200	V
7.385	38.87	PK	35.4	-25.7	48.57	53.97	-5.4	74	-25.43	0-360	100	H
7.385	41.9	PK	35.4	-25.7	51.6	53.97	-2.37	74	-22.4	0-360	200	V
12.31	26.27	PK	39	-22.3	42.97	53.97	-11	74	-31.03	0-360	100	H
12.311	29.6	PK	39	-22.3	46.3	53.97	-7.67	74	-27.7	0-360	200	V
14.772	30.6	PK	39.9	-21.9	48.6	-	-	68.2	-19.6	0-360	100	H
14.772	32.29	PK	39.9	-21.9	50.29	-	-	68.2	-17.91	0-360	100	V

PK - Peak detector

Radiated Emissions

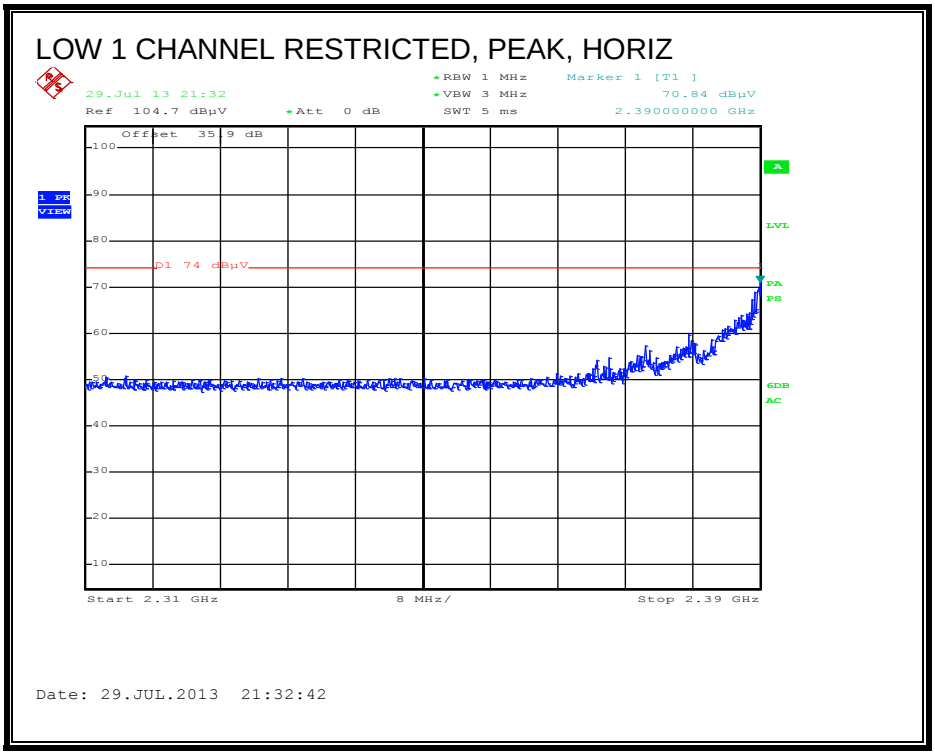
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.23	43.88	MAv1	315	-23.2	52.18	53.97	-1.79	-	-	211	361	H
2.23	44.77	MAv1	315	-23.2	53.07	53.97	-0.9	-	-	114	205	V
2.383	36.55	MAv1	32	-22.8	45.75	53.97	-8.22	-	-	260	267	V
4.924	44.16	MAv1	34	-27.5	50.66	53.97	-3.31	-	-	360	240	H
4.924	53.32	MAv1	34	-27.5	53.77	53.97	-0.2	-	-	43	196	V

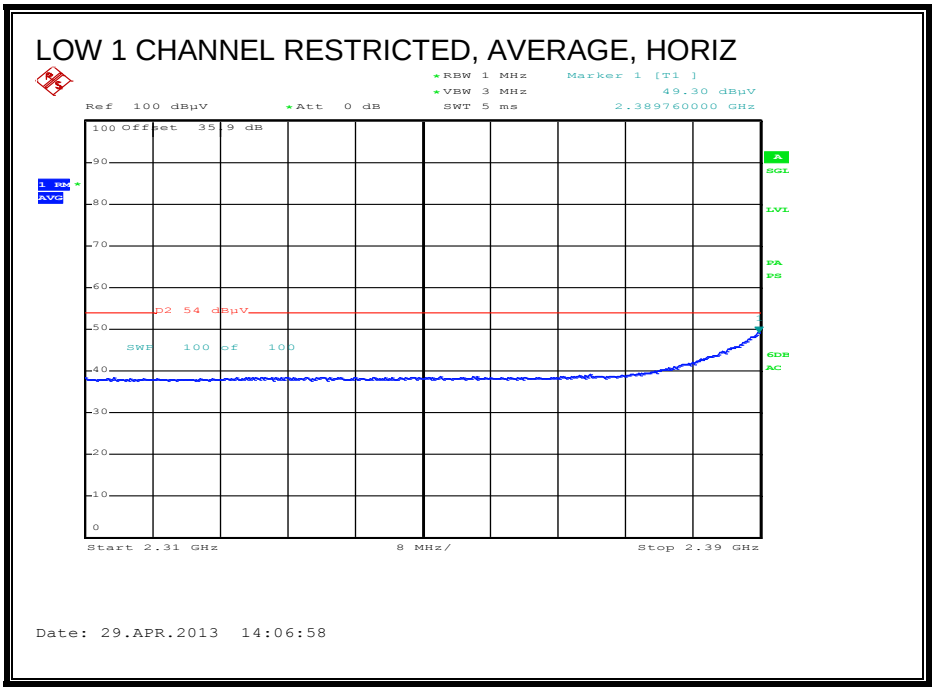
MAv1 - KDB558074 v02 10.2.3.2/8.2.1 Option 1 Maximum RMS Average

Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

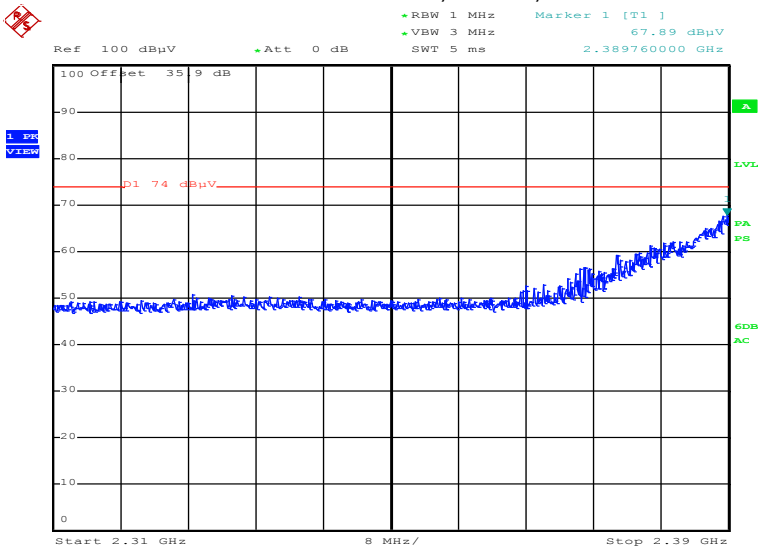
9.2.2. 802.11g 1TX MODE, 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW 1 CHANNEL)



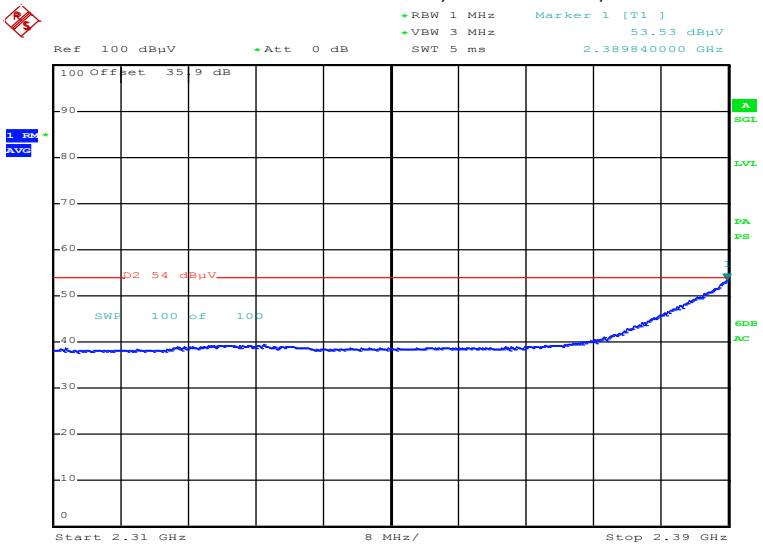


LOW 1 CHANNEL RESTRICTED, PEAK, VERT



Date: 29.APR.2013 13:56:07

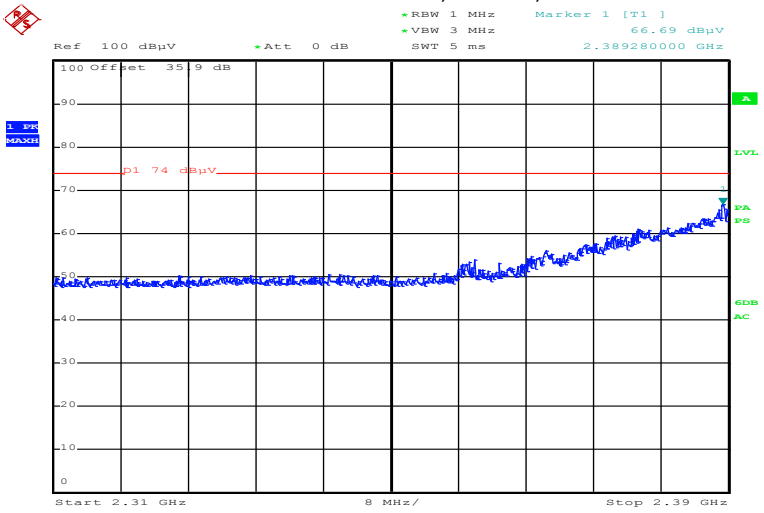
LOW 1 CHANNEL RESTRICTED, AVERAGE, VERT



Date: 29.APR.2013 13:54:58

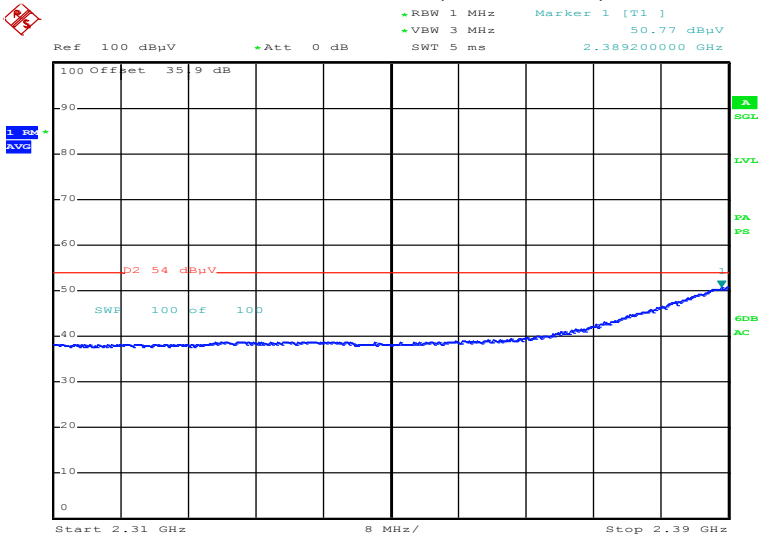
RESTRICTED BANDEDGE (LOW 2 CHANNEL)

LOW 2 CHANNEL RESTRICTED, PEAK, HORIZ



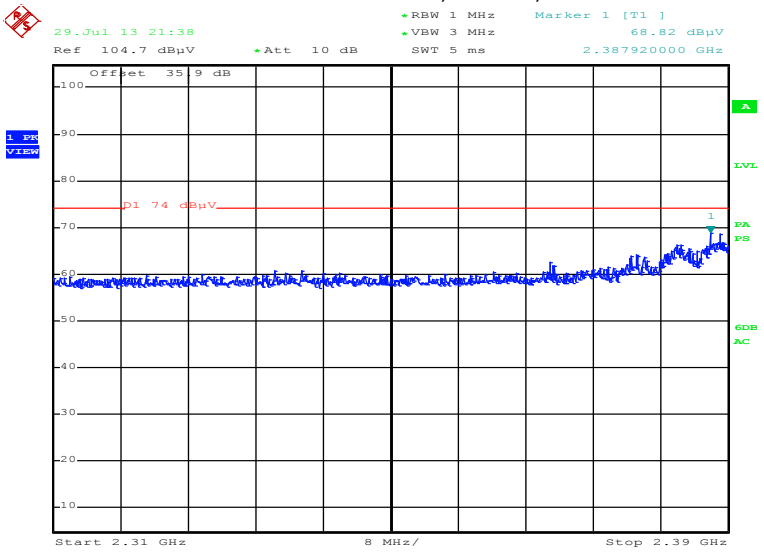
Date: 29.APR.2013 14:31:30

LOW 2 CHANNEL RESTRICTED, AVERAGE, HORIZ



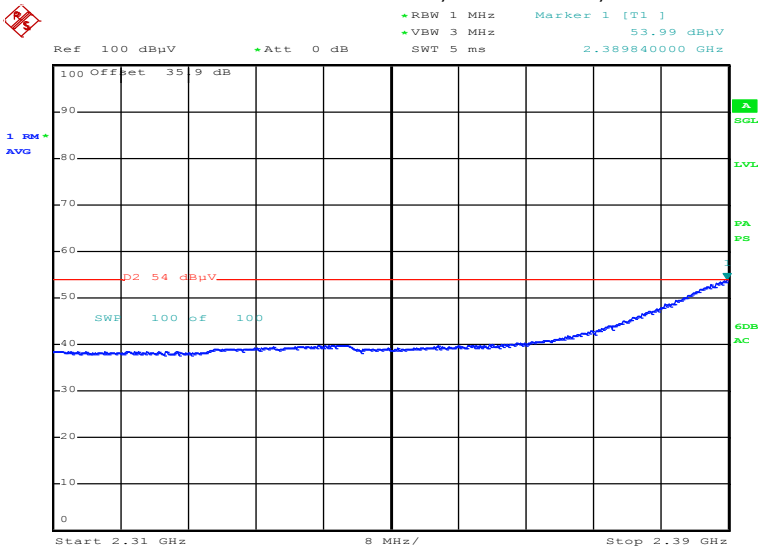
Date: 29.APR.2013 14:30:20

LOW 2 CHANNEL RESTRICTED, PEAK, VERT



Date: 29.JUL.2013 21:38:17

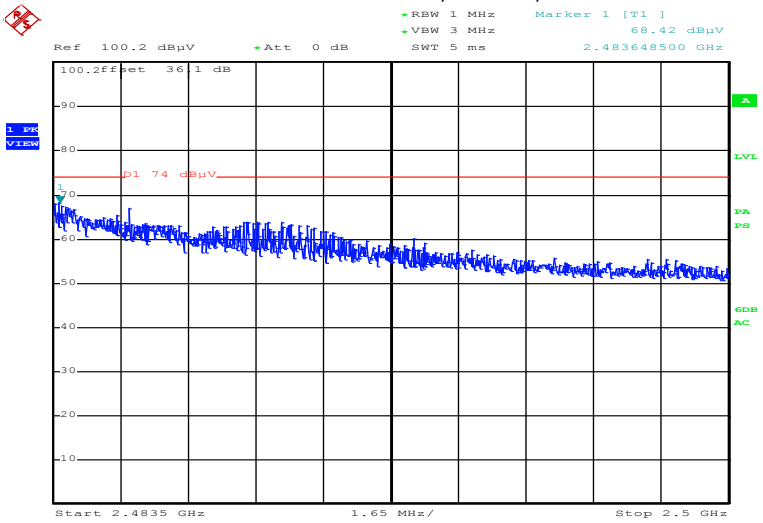
LOW 2 CHANNEL RESTRICTED, AVERAGE, VERT



Date: 29.APR.2013 14:20:48

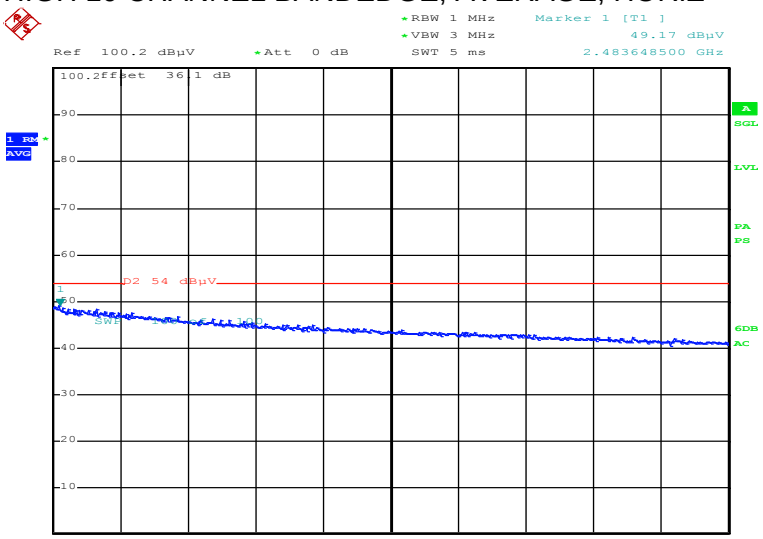
AUTHORIZED BANDEDGE (HIGH 10 CHANNEL)

HIGH 10 CHANNEL BANDEDGE, PEAK, HORIZ



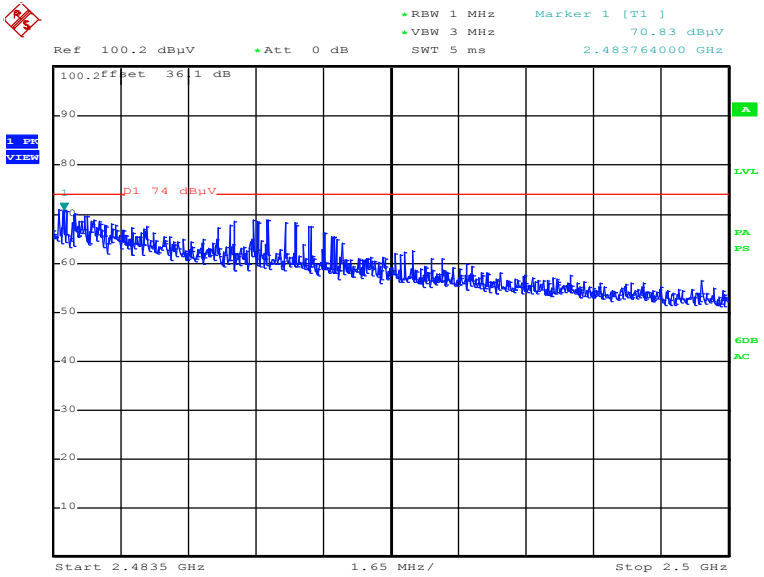
Date: 29.APR.2013 15:04:34

HIGH 10 CHANNEL BANDEDGE, AVERAGE, HORIZ



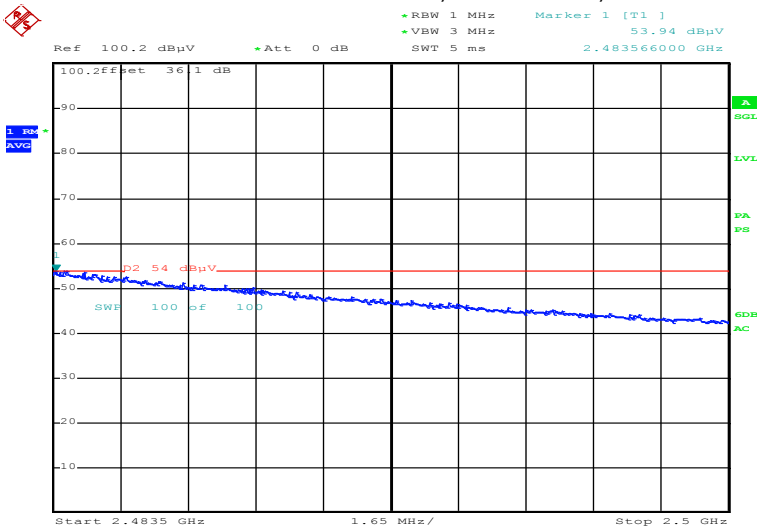
Date: 29.APR.2013 15:05:31

HIGH 10 CHANNEL BANDEDGE, PEAK, VERT



Date: 29.APR.2013 14:58:18

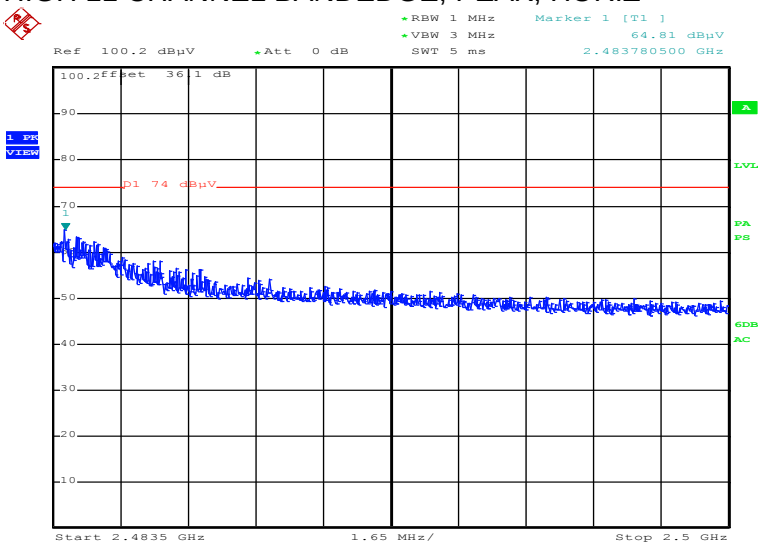
HIGH 10 CHANNEL BANDEDGE, AVERAGE, VERT



Date: 29.APR.2013 14:56:26

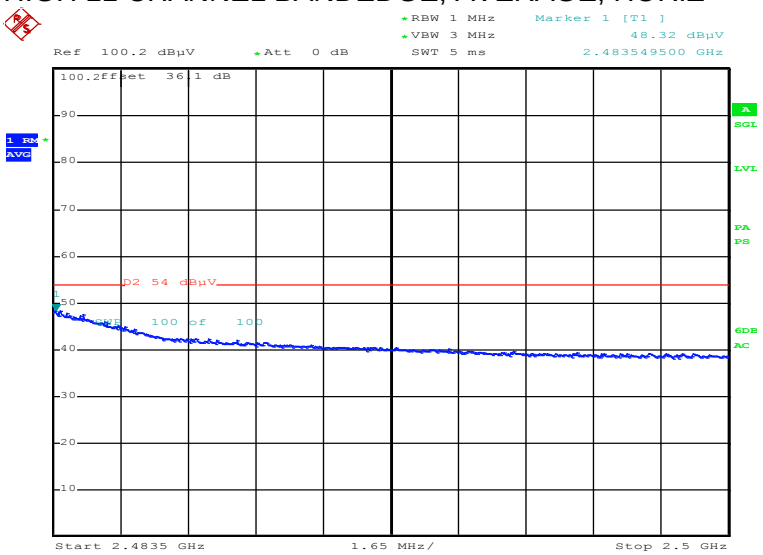
AUTHORIZED BANDEDGE (HIGH 11 CHANNEL)

HIGH 11 CHANNEL BANDEDGE, PEAK, HORIZ



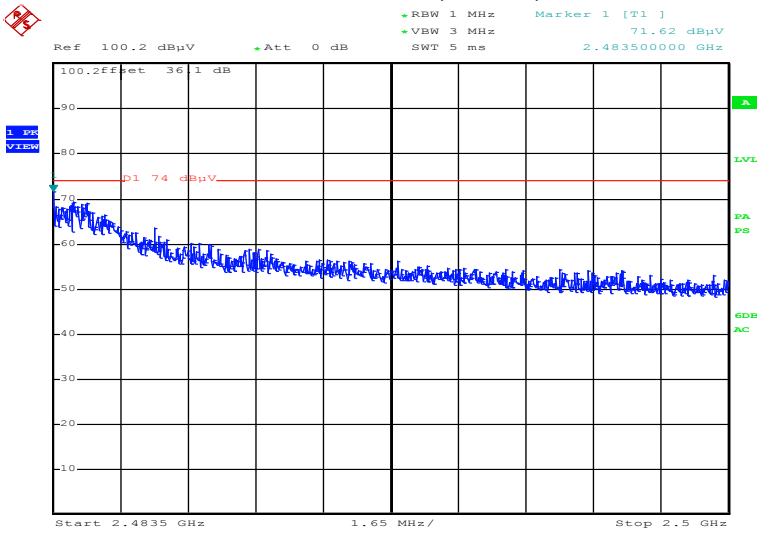
Date: 29.APR.2013 15:25:39

HIGH 11 CHANNEL BANDEDGE, AVERAGE, HORIZ



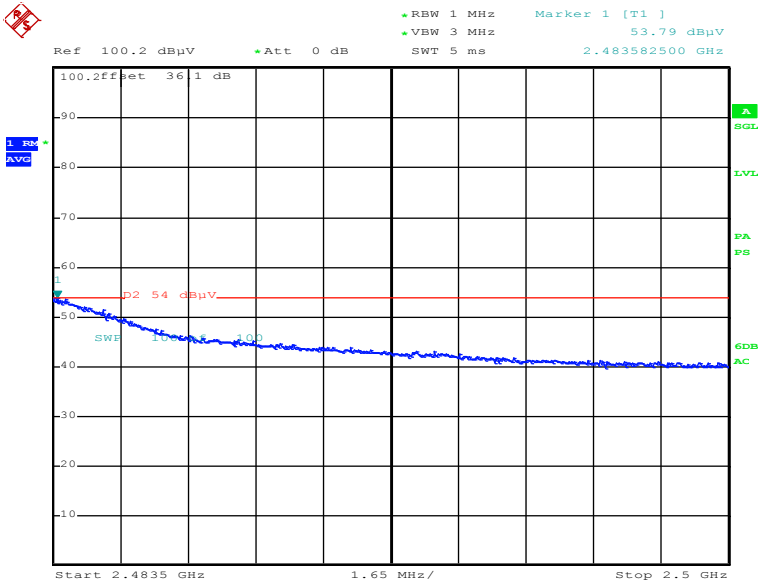
Date: 29.APR.2013 15:26:57

HIGH 11 CHANNEL BANDEDGE, PEAK, VERT



Date: 29.APR.2013 15:20:18

HIGH 11 CHANNEL BANDEDGE, AVERAGE, VERT



Date: 29.APR.2013 15:19:28

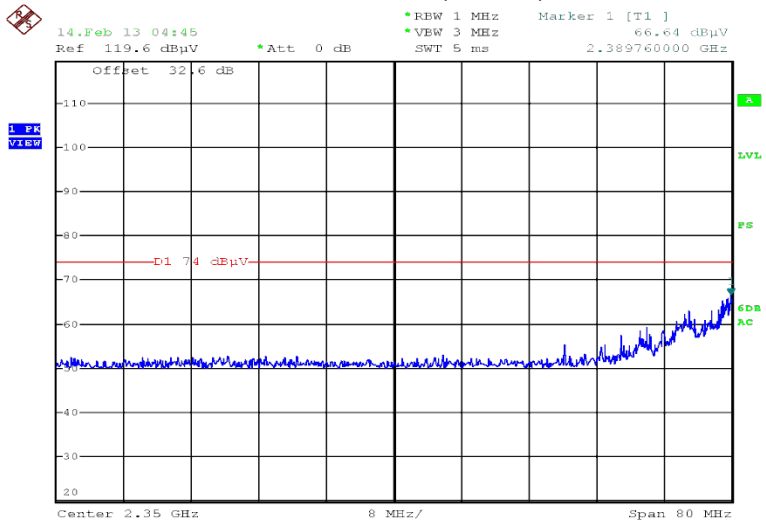
HARMONICS AND SPURIOUS EMISSIONS

Covered by worst case emissions testing to HT20 CDD MCS0 3TX at power levels, per transmit chain, greater than or equal to any 1TX, 2TX, and 3TX mode.

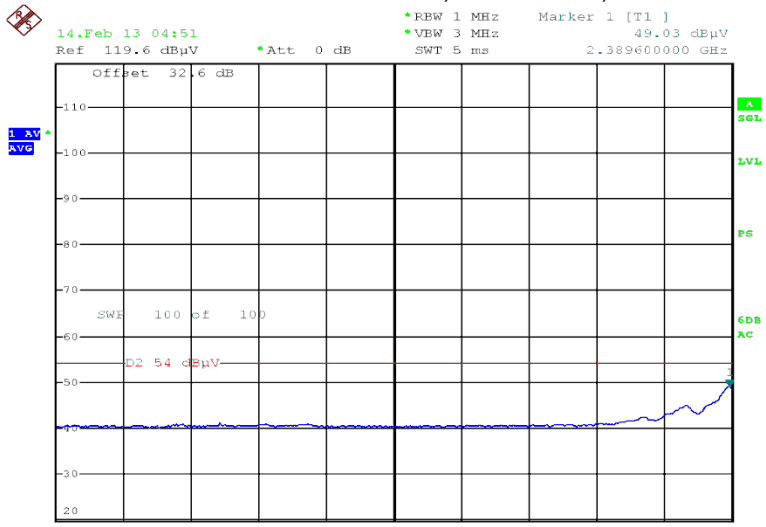
9.2.3. 802.11n HT20 CDD 3TX MODE, 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW 1 CHANNEL)

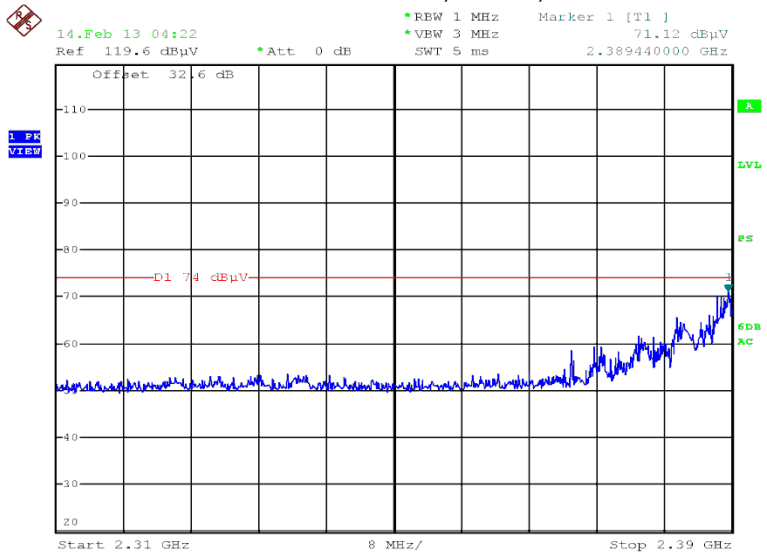
LOW 1 CHANNEL RESTRICTED, PEAK, HORIZ



LOW 1 CHANNEL RESTRICTED, AVERAGE, HORIZ

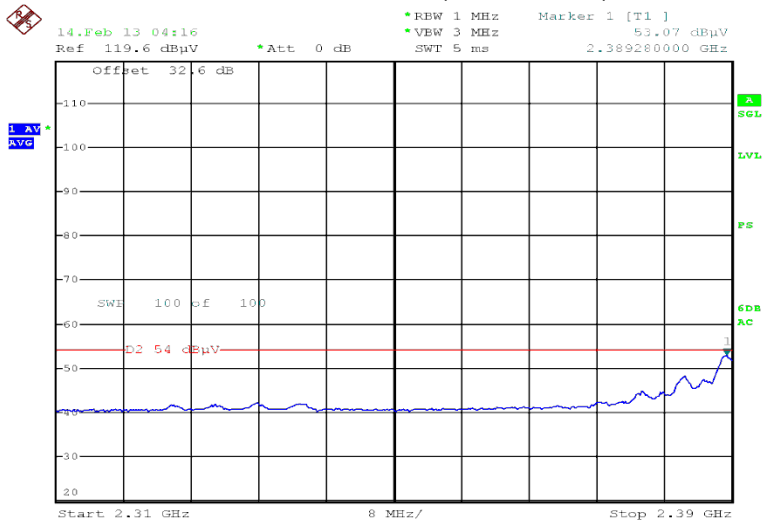


LOW 1 CHANNEL RESTRICTED, PEAK, VERT



Date: 14.FEB.2013 04:22:09

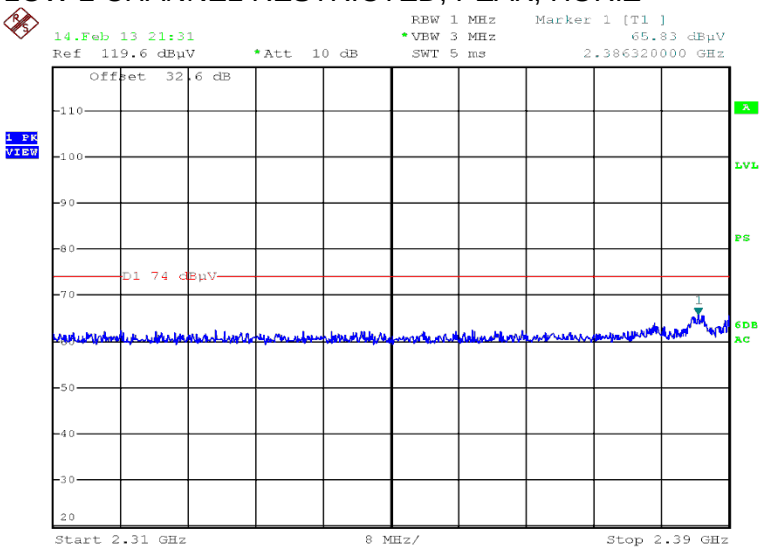
LOW 1 CHANNEL RESTRICTED, AVERAGE, VERT



Date: 14.FEB.2013 04:16:59

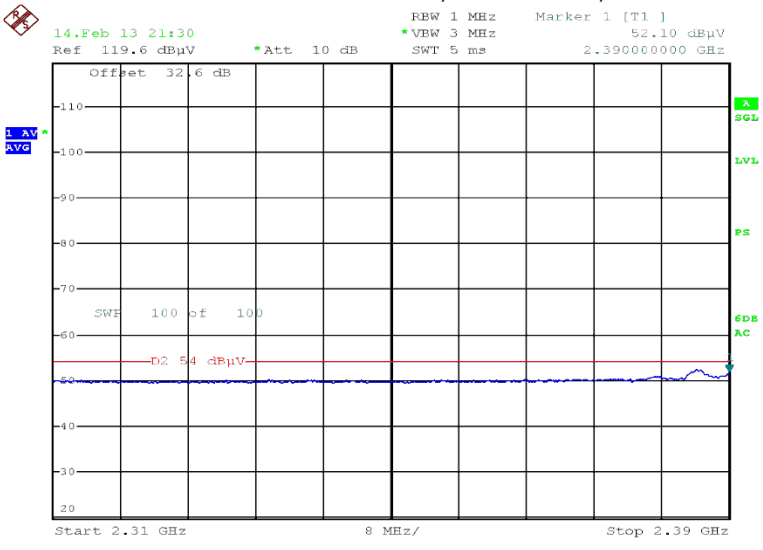
RESTRICTED BANDEDGE (LOW 2 CHANNEL)

LOW 2 CHANNEL RESTRICTED, PEAK, HORIZ



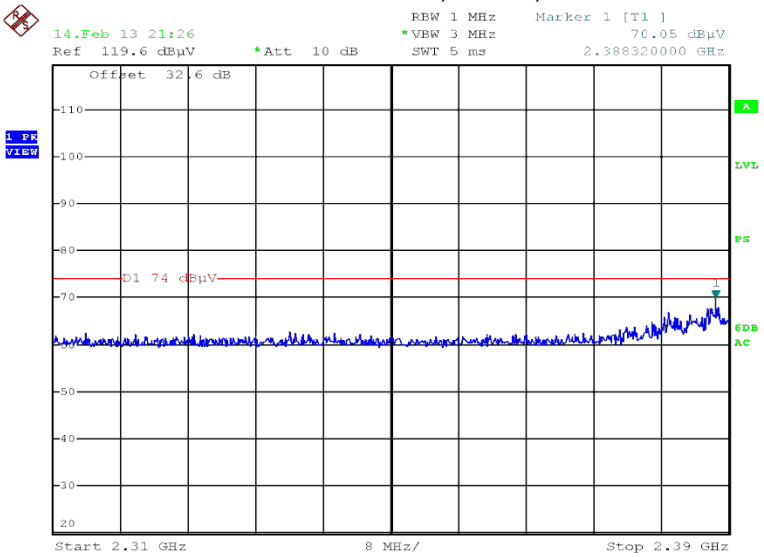
Date: 14.FEB.2013 21:31:28

LOW 2 CHANNEL RESTRICTED, AVERAGE, HORIZ



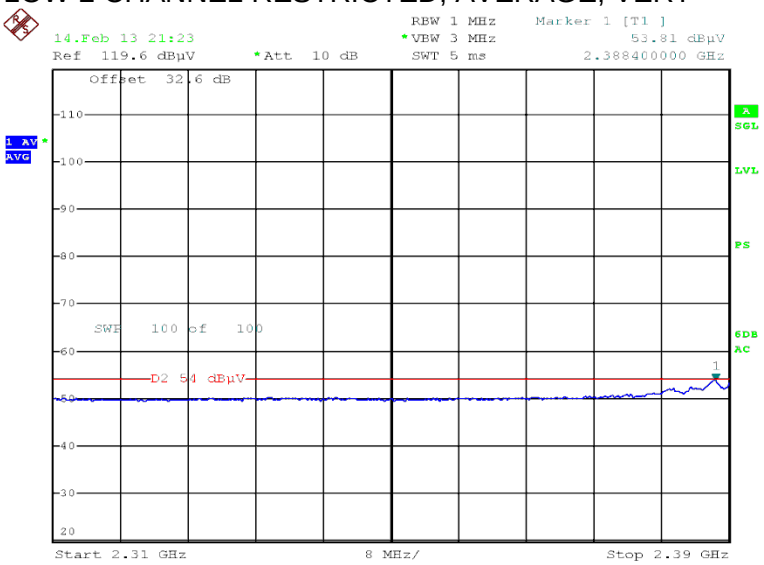
Date: 14.FEB.2013 21:30:44

LOW 2 CHANNEL RESTRICTED, PEAK, VERT



Date: 14.FEB.2013 21:26:00

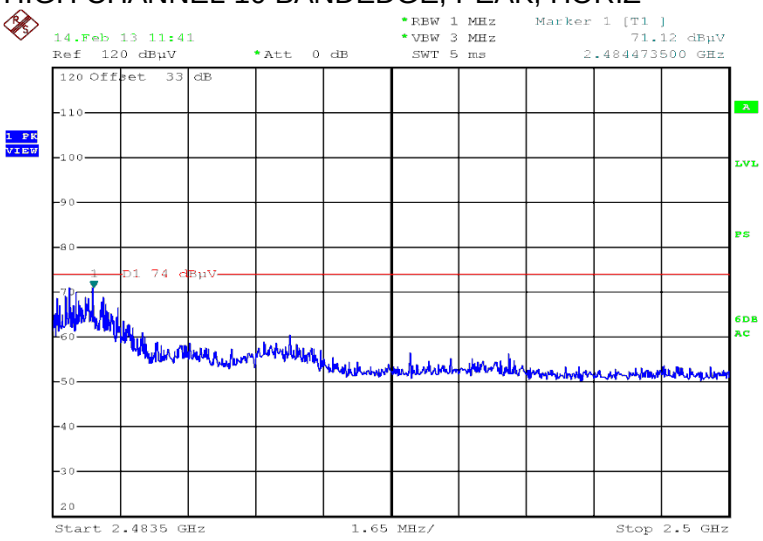
LOW 2 CHANNEL RESTRICTED, AVERAGE, VERT



Date: 14.FEB.2013 21:23:29

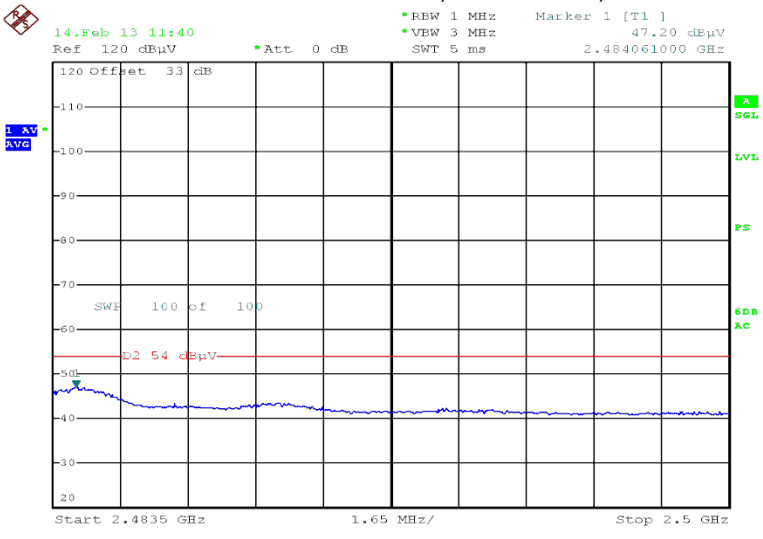
AUTHORIZED BANDEDGE (HIGH CHANNEL 10)

HIGH CHANNEL 10 BANDEDGE, PEAK, HORIZ



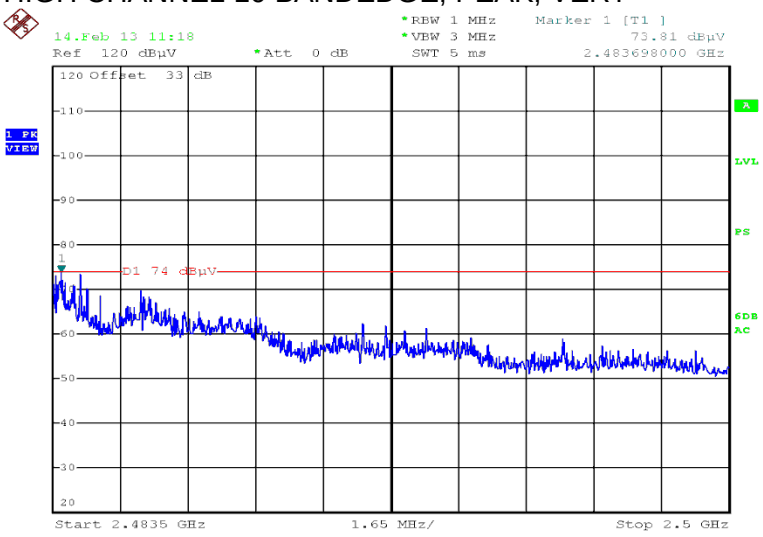
Date: 14.FEB.2013 11:41:36

HIGH CHANNEL 10 BANDEDGE, AVERAGE, HORIZ

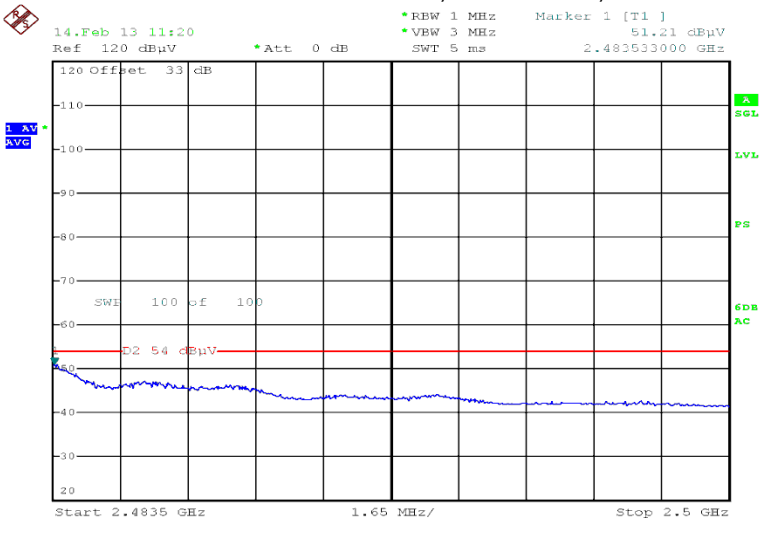


Date: 14.FEB.2013 11:40:55

HIGH CHANNEL 10 BANDEDGE, PEAK, VERT

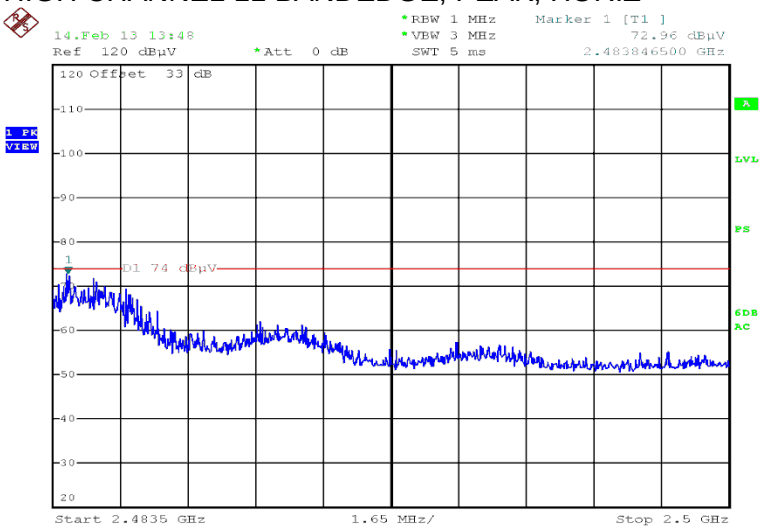


HIGH CHANNEL 10 BANDEDGE, AVERAGE, VERT



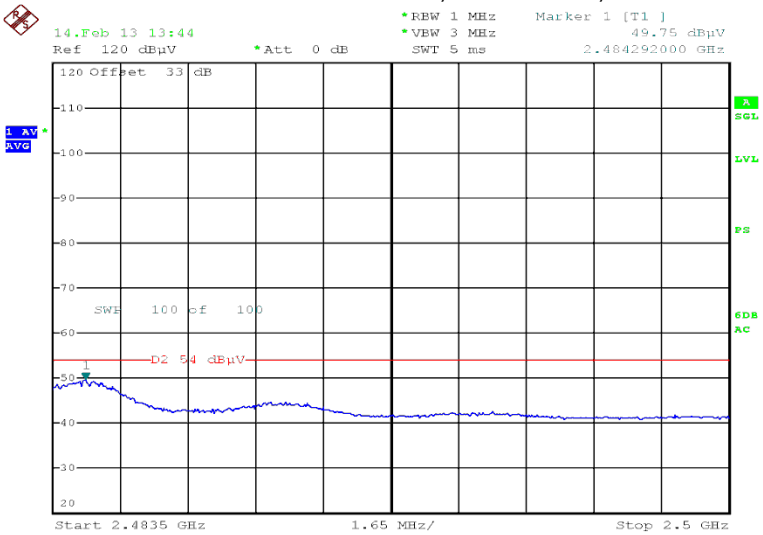
AUTHORIZED BANDEDGE (HIGH CHANNEL 11)

HIGH CHANNEL 11 BANDEDGE, PEAK, HORIZ



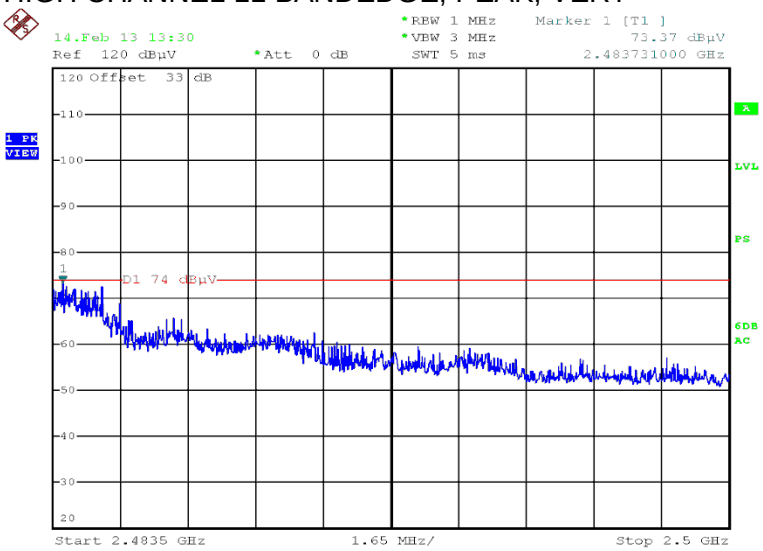
Date: 14.FEB.2013 13:48:57

HIGH CHANNEL 11 BANDEDGE, AVERAGE, HORIZ



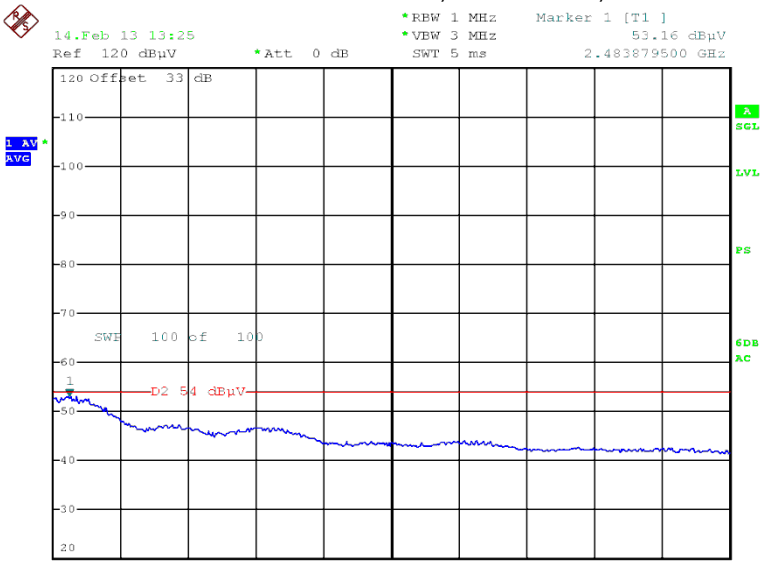
Date: 14.FEB.2013 13:44:18

HIGH CHANNEL 11 BANDEDGE, PEAK, VERT



Date: 14.FEB.2013 13:30:27

HIGH CHANNEL 11 BANDEDGE, AVERAGE, VERT



Date: 14.FEB.2013 13:25:15

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
UL Verification Services, Fremont 3m Chamber

Company: Broadcom
Project #: 13U14831
Date: 2/23/2013
Test Engineer: D. Garcia
Configuration: EUT, Adapter, laptop, Antenna
Mode: HT20 3TX CDD, 2.4GHz, Beam Forming

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T34 HP 8449B	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; 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 dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel: 2412 MHz															
2.261	3.0	58.6	43.5	28.2	4.3	-36.1	0.0	0.0	55.0	39.9	74	54	-19.0	-14.1	V
4.824	3.0	51.3	41.8	33.0	6.8	-34.1	0.0	0.0	57.0	47.4	74	54	-17.0	-6.6	V
2.261	3.0	46.6	42.9	28.2	4.3	-36.1	0.0	0.0	43.1	39.4	74	54	-30.9	-14.6	H
4.824	3.0	44.1	40.7	33.0	6.8	-34.1	0.0	0.0	49.8	46.4	74	54	-24.2	-7.6	V
Mid Channel: 2437 MHz															
2.200	3.0	55.9	53.8	28.1	4.3	-36.2	0.0	0.0	52.1	50.0	74	54	-21.9	-4.0	V
4.874	3.0	46.7	45.5	33.1	6.8	-34.1	0.0	0.0	52.5	51.3	74	54	-21.5	-2.7	V
7.311	3.0	43.3	33.7	36.2	9.1	-34.2	0.0	0.0	54.4	44.8	74	54	-19.6	-9.2	V
2.200	3.0	51.3	44.1	28.1	4.3	-36.2	0.0	0.0	47.5	40.3	74	54	-26.5	-13.7	H
4.874	3.0	42.4	39.6	33.1	6.8	-34.1	0.0	0.0	48.2	45.3	74	54	-25.8	-8.7	H
7.311	3.0	41.6	32.5	36.2	9.1	-34.2	0.0	0.0	52.7	43.6	74	54	-21.3	-10.4	H
High Channel: 2462 MHz															
4.924	3.0	48.5	46.9	33.1	6.8	-34.1	0.0	0.0	54.4	52.8	74	54	-19.6	-1.2	V
7.386	3.0	47.2	37.2	36.3	9.1	-34.2	0.0	0.0	58.4	48.3	74	54	-15.6	-5.7	V
4.924	3.0	47.4	46.3	33.1	6.8	-34.1	0.0	0.0	53.2	52.2	74	54	-20.8	-1.8	H
7.386	3.0	41.3	31.6	36.3	9.1	-34.2	0.0	0.0	52.5	42.8	74	54	-21.5	-11.2	H
															H

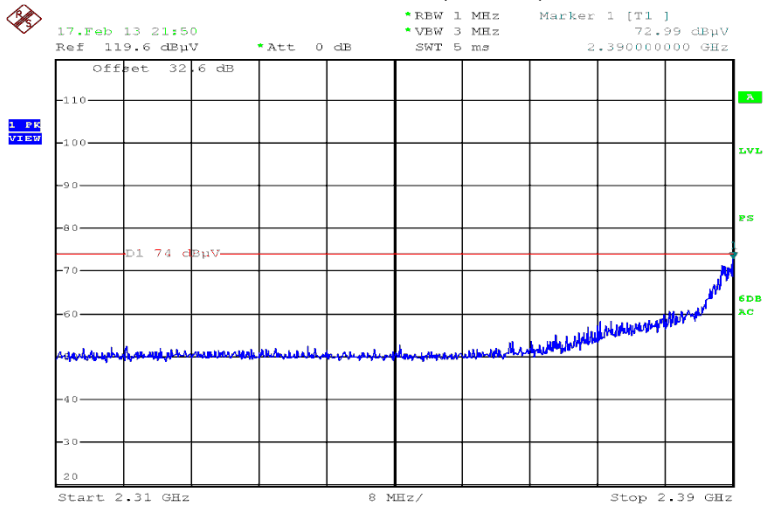
Rev. 01.30.13

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
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
CL	Cable Loss	HPF	High Pass Filter		

9.2.4. 802.11ac VHT20 3TX BF MODE, 2.4 GHz BAND

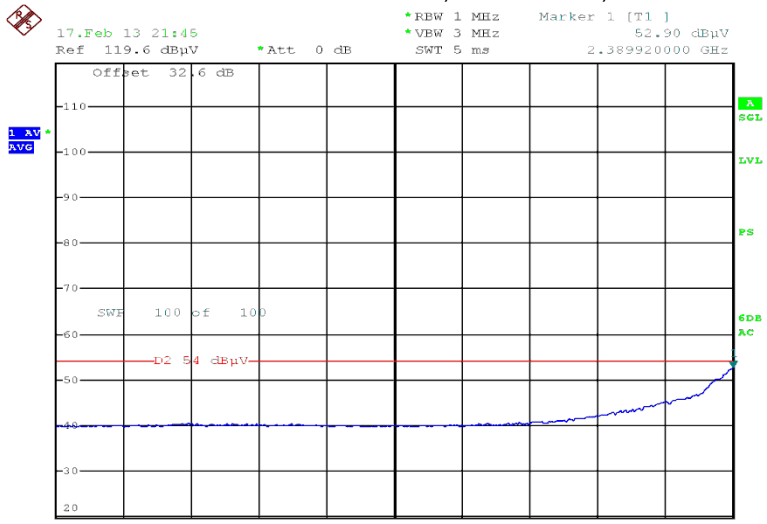
RESTRICTED BANDEDGE (LOW 1 CHANNEL)

LOW 1 CHANNEL RESTRICTED, PEAK, HORIZ



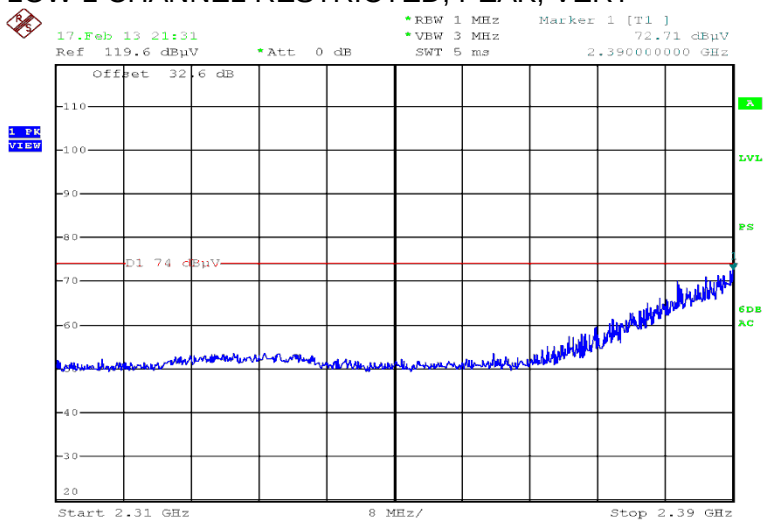
Date: 17.FEB.2013 21:50:48

LOW 1 CHANNEL RESTRICTED, AVERAGE, HORIZ



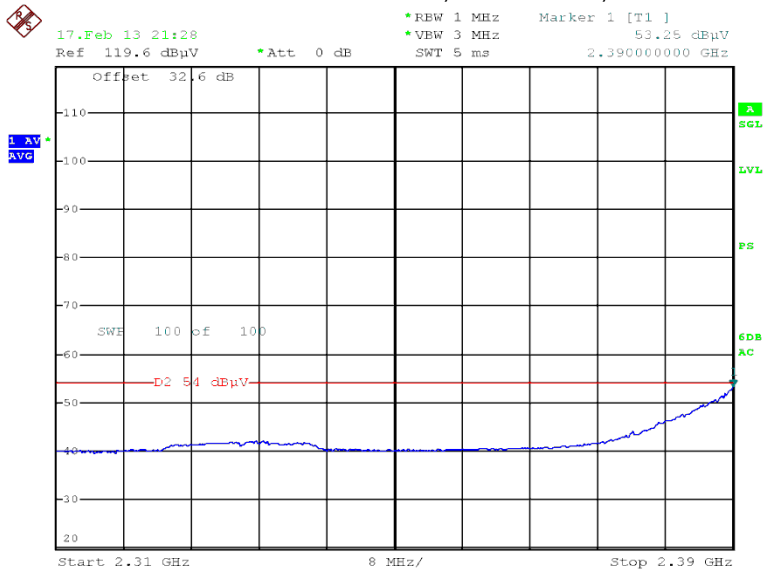
Date: 17.FEB.2013 21:45:50

LOW 1 CHANNEL RESTRICTED, PEAK, VERT



Date: 17.FEB.2013 21:31:27

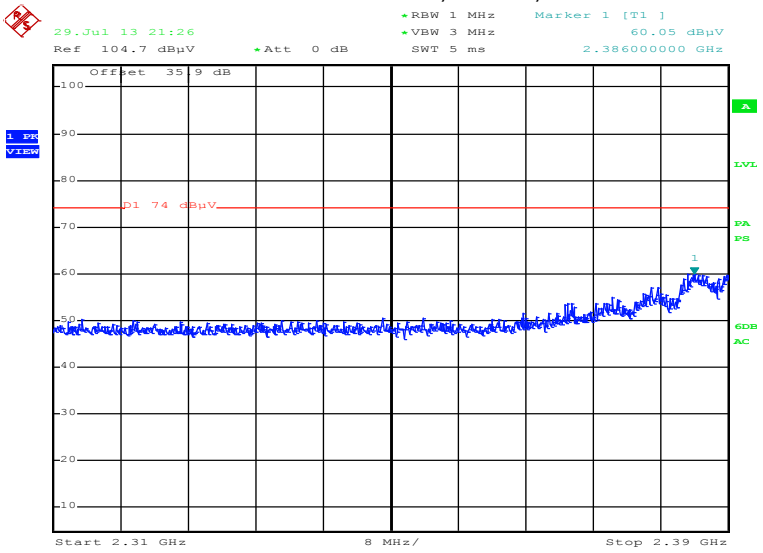
LOW 1 CHANNEL RESTRICTED, AVERAGE, VERT



Date: 17.FEB.2013 21:28:05

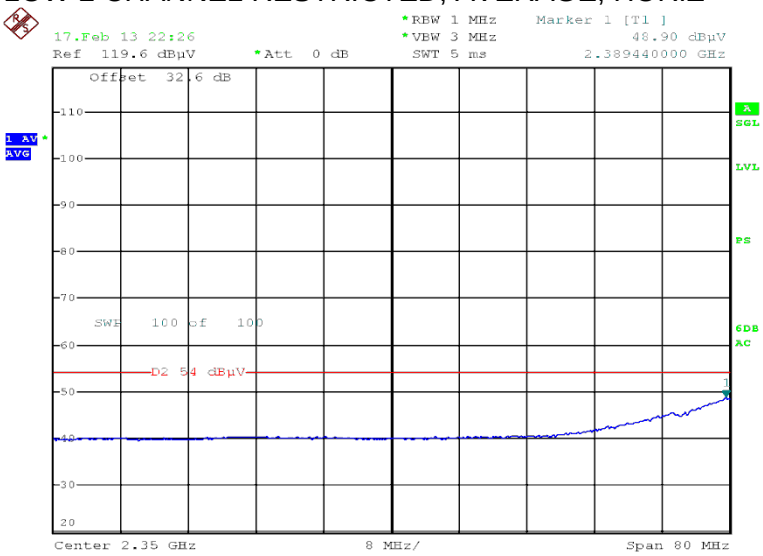
RESTRICTED BANDEDGE (LOW 2 CHANNEL)

LOW 2 CHANNEL RESTRICTED, PEAK, HORIZ



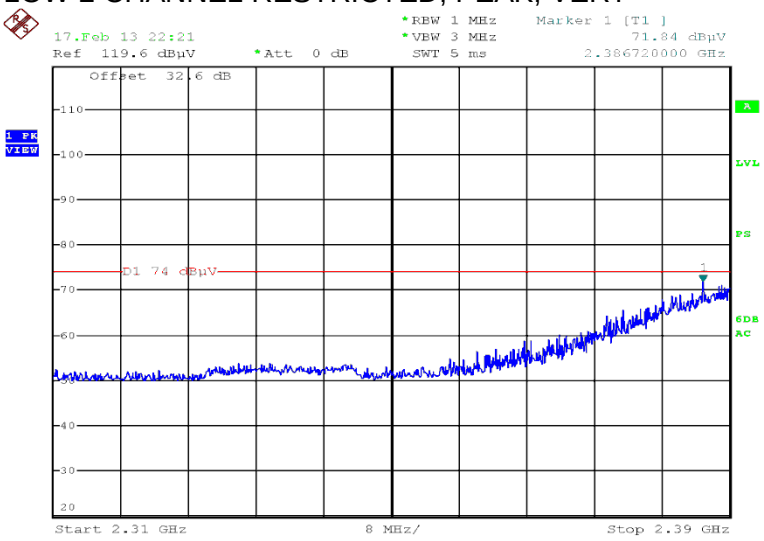
Date: 29.JUL.2013 21:26:25

LOW 2 CHANNEL RESTRICTED, AVERAGE, HORIZ

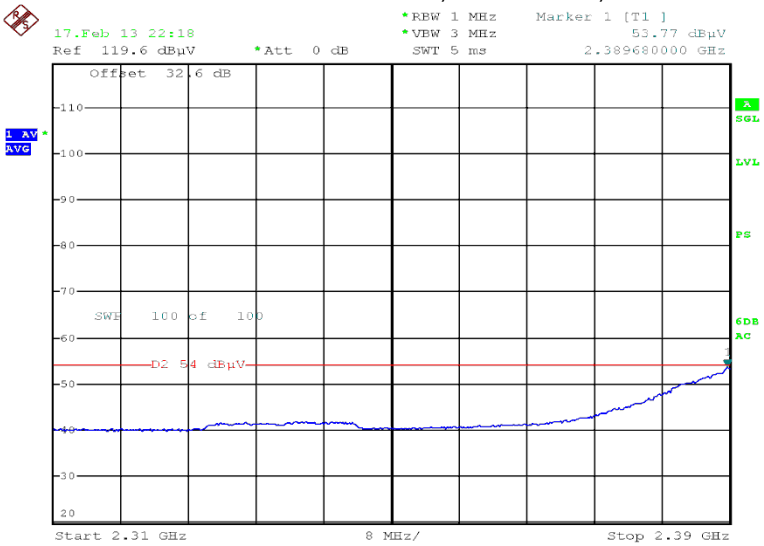


Date: 17.FEB.2013 22:26:24

LOW 2 CHANNEL RESTRICTED, PEAK, VERT

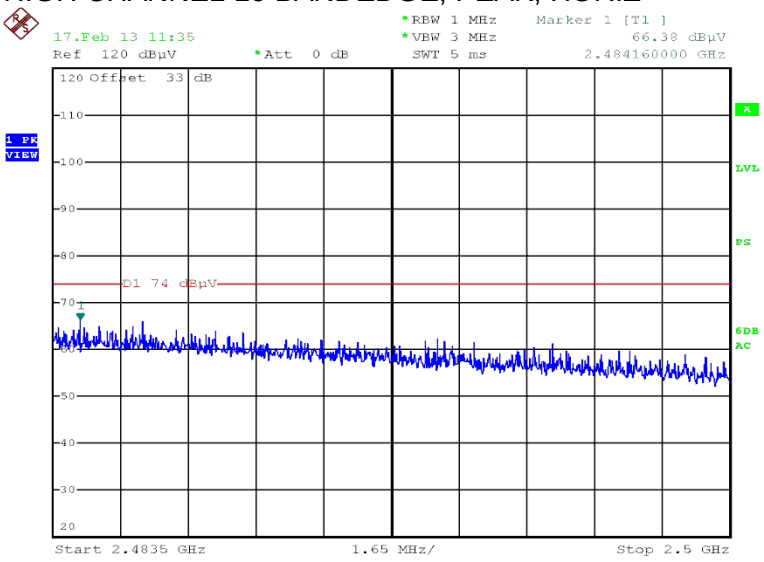


LOW 2 CHANNEL RESTRICTED, AVERAGE, VERT

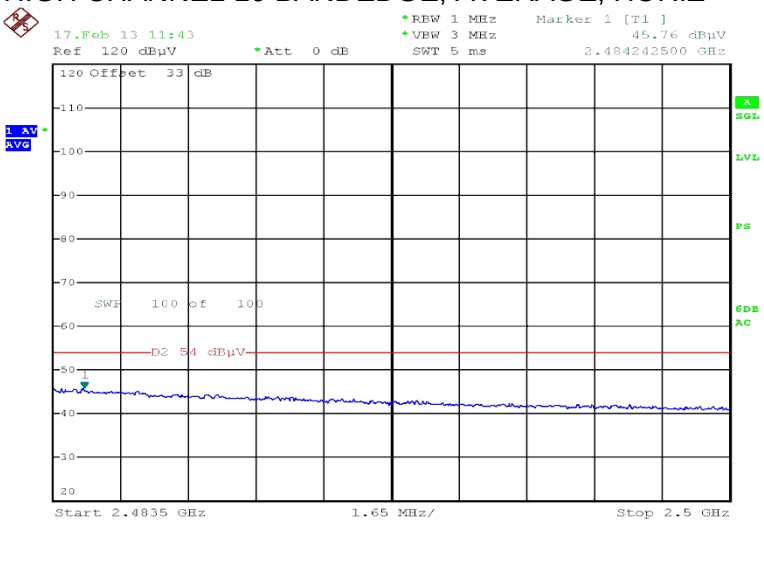


AUTHORIZED BANDEDGE (HIGH CHANNEL 10)

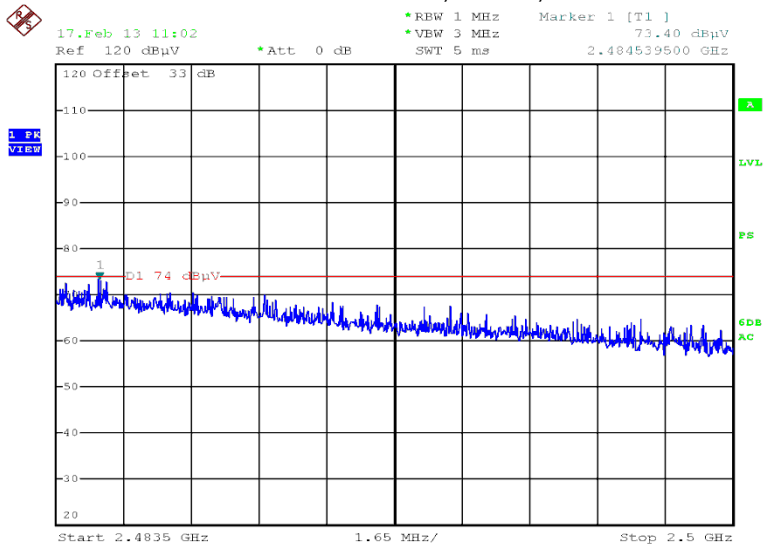
HIGH CHANNEL 10 BANDEDGE, PEAK, HORIZ



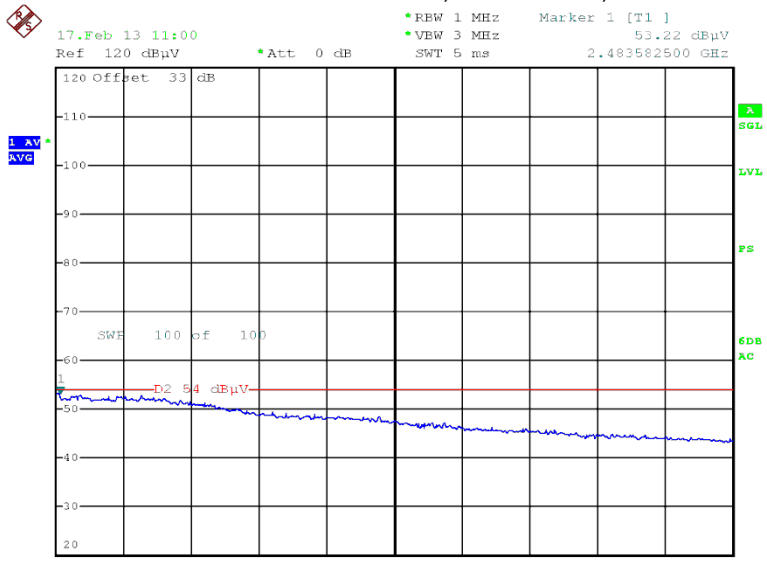
HIGH CHANNEL 10 BANDEDGE, AVERAGE, HORIZ



HIGH CHANNEL 10 BANDEDGE, PEAK, VERT

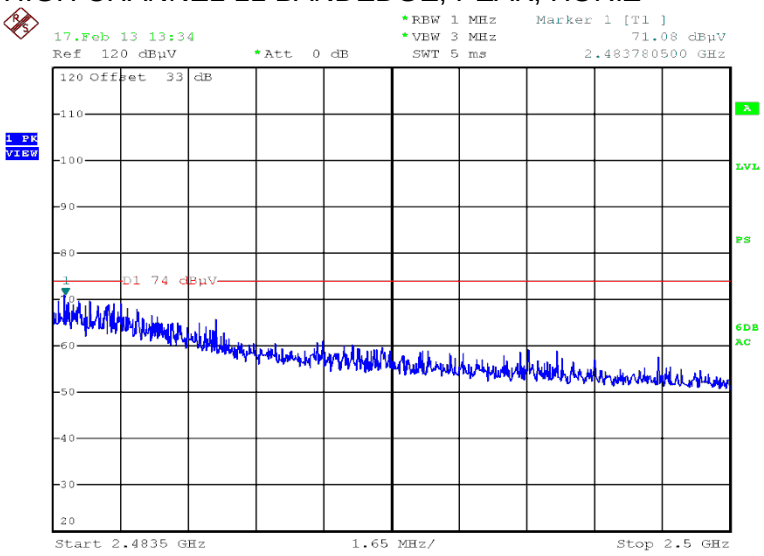


HIGH CHANNEL 10 BANDEDGE, AVERAGE, VERT

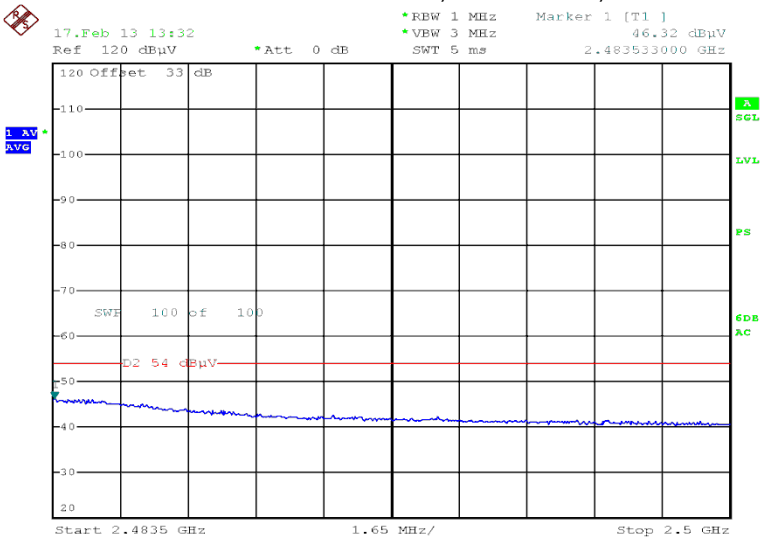


AUTHORIZED BANDEDGE (HIGH CHANNEL11)

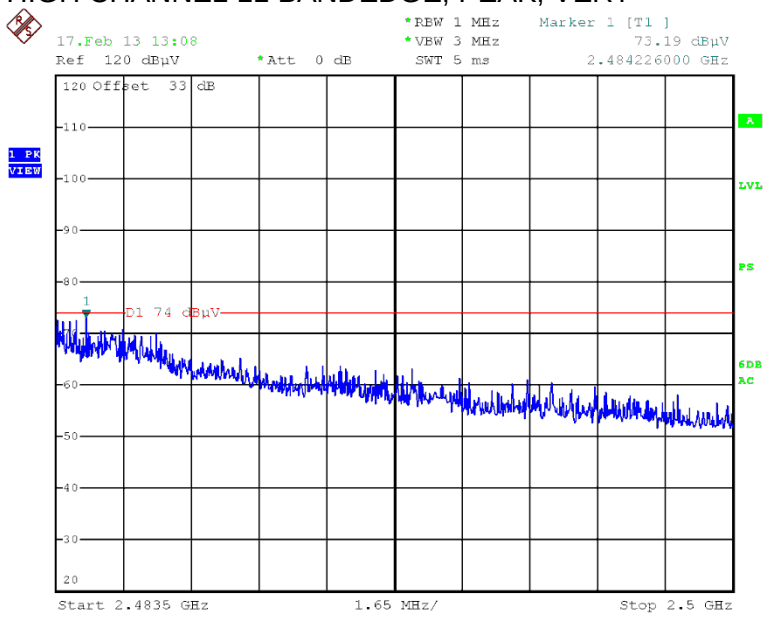
HIGH CHANNEL 11 BANDEDGE, PEAK, HORIZ



HIGH CHANNEL 11 BANDEDGE, AVERAGE, HORIZ

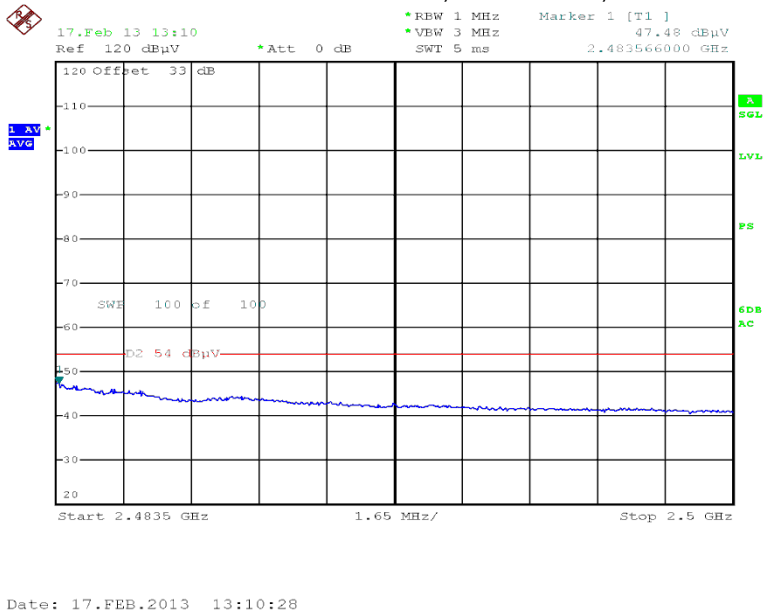


HIGH CHANNEL 11 BANDEDGE, PEAK, VERT



Date: 17.FEB.2013 13:08:15

HIGH CHANNEL 11 BANDEDGE, AVERAGE, VERT



Date: 17.FEB.2013 13:10:28

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-A

Company:	Broadcom
Project #:	12U14689
Date:	12/12/2012
Test Engineer:	David Garcia/Danny Vu
Configuration:	EUT,Adapter Board, Laptop, Beamformee laptop
Mode:	2.4 Ghz, HT20 3TX CDD, Beamforming

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931		T39; ARA 18-26GHz; S/N:1013	FCC 15.205

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; 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 dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Channel, 2412 MHz															
4.824	3.0	60.8	46.2	33.4	6.2	-35.5	0.0	0.0	64.9	50.4	74	54	-9.1	-3.6	V, q90
12.060	3.0	49.3	37.4	39.3	11.3	-35.4	0.0	0.0	64.5	52.6	74	54	-9.5	-1.4	V, q90
4.824	3.0	62.6	49.7	33.4	6.2	-35.5	0.0	0.0	66.7	53.9	74	54	-7.3	-0.1	H, q89
12.060	3.0	49.6	36.5	39.3	11.3	-35.4	0.0	0.0	64.8	51.8	74	54	-9.2	-2.2	H, q89
Mid Channel, 2437 MHz															
4.874	3.0	64.1	49.5	33.5	6.2	-35.5	0.0	0.0	68.4	53.7	74	54	-5.6	-0.3	H, q85
7.311	3.0	48.9	37.1	35.7	8.4	-35.4	0.0	0.0	57.5	45.8	74	54	-16.5	-8.2	H, q85
12.185	3.0	45.8	31.3	39.3	11.3	-35.3	0.0	0.0	61.1	46.6	74	54	-12.9	-7.4	H, q85
4.874	3.0	58.7	47.7	33.5	6.2	-35.5	0.0	0.0	63.0	51.9	74	54	-11.0	-2.1	V, q85
7.311	3.0	51.1	39.0	35.7	8.4	-35.4	0.0	0.0	59.7	47.7	74	54	-14.3	-6.3	V, q85
12.185	3.0	46.9	33.5	39.3	11.3	-35.3	0.0	0.0	62.2	48.8	74	54	-11.8	-5.2	V, q85
High Channel, 2462 MHz															
4.874	3.0	62.4	49.2	33.5	6.2	-35.5	0.0	0.0	66.7	53.5	74	54	-7.3	-0.5	H, q82
7.386	3.0	51.9	38.3	35.8	8.4	-35.5	0.0	0.0	60.7	47.1	74	54	-13.3	-6.9	H, q82
12.310	3.0	42.7	30.0	39.3	11.4	-35.3	0.0	0.0	58.1	45.4	74	54	-15.9	-8.6	H, q82
4.874	3.0	61.2	46.5	33.5	6.2	-35.5	0.0	0.0	65.4	50.7	74	54	-8.6	-3.3	V, q82
7.386	3.0	49.1	37.7	35.8	8.4	-35.5	0.0	0.0	57.8	46.4	74	54	-16.2	-7.6	V, q82
12.310	3.0	43.4	31.0	39.3	11.4	-35.3	0.0	0.0	58.8	46.4	74	54	-15.2	-7.6	V, q82

Rev. 11.10.11

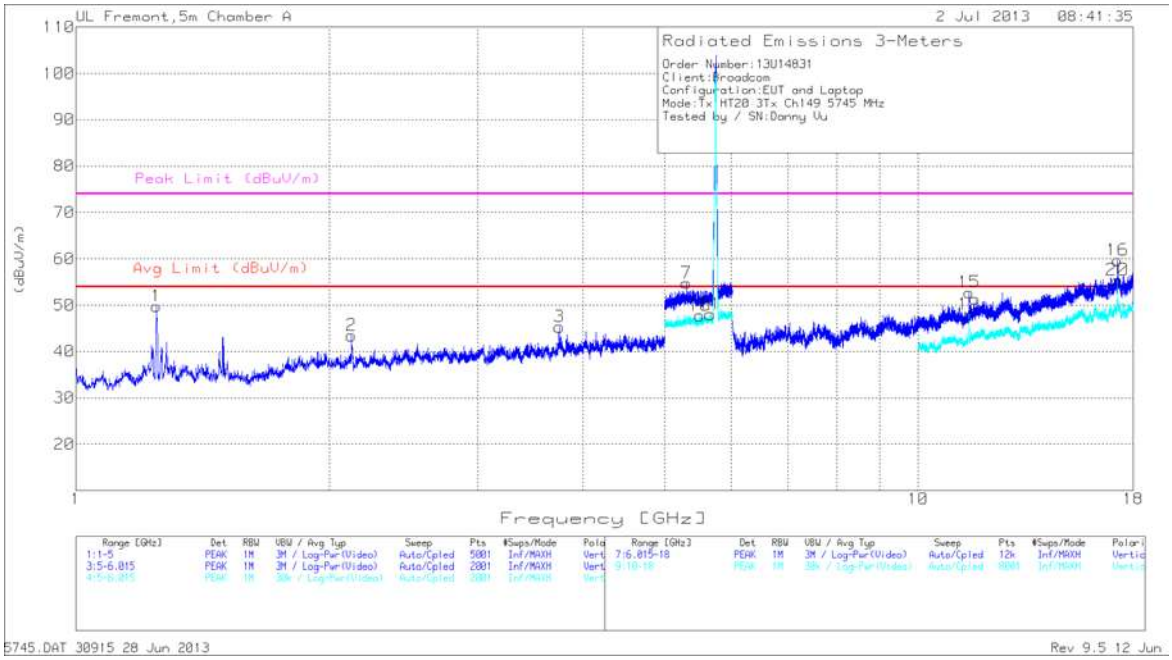
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

9.2.5. 802.11n HT20 CDD 3TX MODE, 5.8 GHz BAND

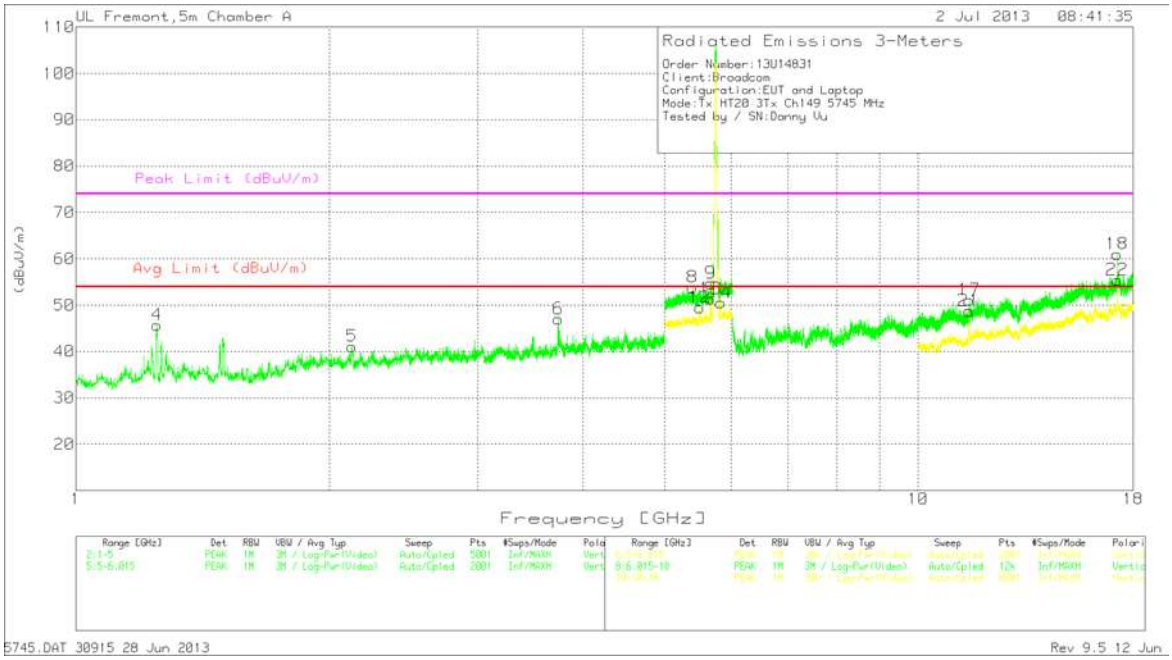
HARMONICS AND SPURIOUS EMISSIONS

Low Channel

HORIZONTAL PLOT LOW CHANNEL



VERTICAL PLOT LOW CHANNEL



HORIZONTAL AND VERTICAL DATA LOW CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.246	55.19	PK	29.9	-35.3	49.79	-	-	68.2	-18.41	0-360	100	H
2.124	45.05	PK	31.6	-33.2	43.45	53.97	-10.52	74	-30.55	0-360	200	H
3.75	41.33	PK	33.4	-29.4	45.33	53.97	-8.64	74	-28.67	0-360	200	H
1.249	51.13	PK	29.9	-35.3	45.73	53.97	-8.24	74	-28.27	0-360	200	V
2.128	42.72	PK	31.6	-33.2	41.12	53.97	-12.85	74	-32.88	0-360	100	V
3.738	43.51	PK	33.4	-29.9	47.01	53.97	-6.96	74	-26.99	0-360	200	V
5.307	38.56	PK	34.3	-18.1	54.76	-	-	74	-19.24	0-360	200	H
5.504	31.51	PK	34.4	-18.1	47.81	53.97	-6.16	74	-26.19	0-360	200	H
5.662	32.35	PK	34.5	-18.8	48.05	-	-	68.2	-20.15	0-360	100	H
5.396	37.75	PK	34.4	-18.3	53.85	53.97	-0.12	74	-20.15	0-360	100	V
5.673	38.9	PK	34.5	-18.7	54.7	-	-	74	-19.3	0-360	200	V
5.506	33.24	PK	34.4	-18.1	49.54	-	-	68.2	-18.66	0-360	200	V
5.667	35.66	PK	34.5	-18.8	51.36	-	-	68.2	-16.84	0-360	100	V
5.829	34.03	PK	34.9	-18.4	50.53	-	-	68.2	-17.67	0-360	100	V
11.493	36.37	PK	38.3	-21.9	52.77	53.97	-1.2	74	-21.23	0-360	100	H
17.241	38.99	PK	40.9	-20.2	59.69	-	-	74	-14.31	0-360	100	H
11.502	34.72	PK	38.3	-21.9	51.12	53.97	-2.85	74	-22.88	0-360	100	V
17.231	40.64	PK	40.9	-20.5	61.04	-	-	74	-12.96	0-360	100	V
11.49	31.59	PK	38.3	-21.9	47.99	53.97	-5.98	74	-26.01	0-360	100	H
17.24	34.72	PK	40.9	-20.2	55.42	-	-	74	-18.58	0-360	100	H
11.487	32.35	PK	38.3	-21.9	48.75	53.97	-5.22	74	-25.25	0-360	100	V
17.236	34.93	PK	40.9	-20.4	55.43	-	-	74	-18.57	0-360	100	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5.307	25.54	VB1	34.3	-18.2	41.64	53.97	-12.33	74	-32.36	3	148	H
5.673	32.7	VB1	34.5	-18.7	48.5	53.97	-5.47	74	-25.5	29	208	V

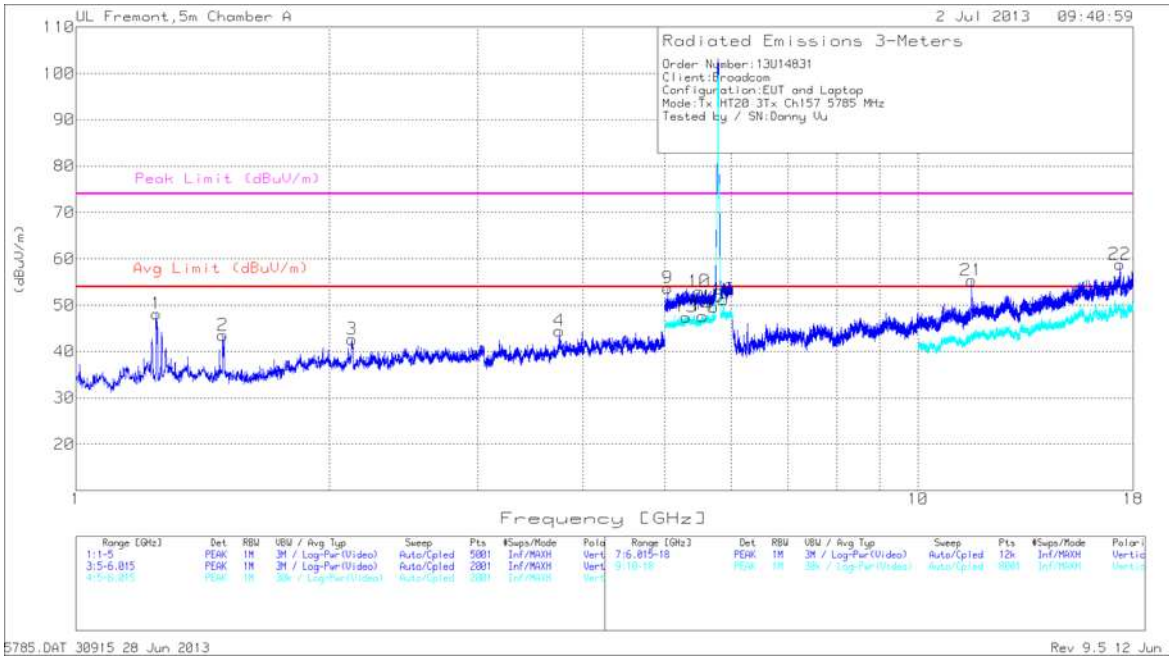
VB1 - KDB 789033 v01r02 Method: VB Alternative Reduced Video

5745.DAT 30915 28 Jun 2013 Rev 9.5 12 Jun 2013

Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

Mid Channel

HORIZONTAL PLOT MID CHANNEL



VERTICAL PLOT MID CHANNEL

HORIZONTAL AND VERTICAL DATA MID CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1246	53.56	PK	29.9	-35.3	48.16	-	-	68.2	-20.04	0-360	100	H
1494	48.59	PK	29	-34.1	43.49	53.97	-10.48	74	-30.51	0-360	200	H
2.127	44.25	PK	316	-33.2	42.65	53.97	-11.32	74	-31.35	0-360	200	H
3.748	40.55	PK	33.4	-29.5	44.45	53.97	-9.52	74	-29.55	0-360	200	H
125	51.55	PK	29.9	-35.3	46.15	53.97	-7.82	74	-27.85	0-360	100	V
1494	48.49	PK	29	-34.1	43.39	53.97	-10.58	74	-30.61	0-360	100	V
2.132	42.97	PK	316	-33.2	41.37	53.97	-12.6	74	-32.63	0-360	200	V
3.736	42.39	PK	33.4	-30	45.79	53.97	-8.18	74	-28.21	0-360	200	V
5.042	38.3	PK	33.9	-18.5	53.7	53.97	-0.27	74	-20.3	0-360	100	H
5.496	37.03	PK	34.4	-18.5	52.93	-	-	68.2	-15.27	0-360	200	H
5.302	31.29	PK	34.3	-18.1	47.49	53.97	-6.48	74	-26.51	0-360	100	H
5.545	31.66	PK	34.4	-18.4	47.66	53.97	-6.31	74	-26.34	0-360	100	H
5.713	33.6	PK	34.6	-18.5	49.7	-	-	68.2	-18.5	0-360	200	H
5.872	34.74	PK	35	-18.5	51.24	-	-	68.2	-16.96	0-360	200	H
5.044	37.26	PK	33.9	-18.5	52.66	53.97	-1.31	74	-21.34	0-360	200	V
5.542	38.34	PK	34.4	-18.4	54.34	-	-	68.2	-13.86	0-360	200	V
5.303	33.36	PK	34.3	-18.1	49.56	-	-	68.2	-18.64	0-360	200	V
5.544	34.37	PK	34.4	-18.4	50.37	-	-	68.2	-17.83	0-360	200	V
5.698	34.07	PK	34.6	-18.5	50.17	-	-	68.2	-18.03	0-360	200	V
5.864	36.53	PK	35	-18.6	52.93	-	-	68.2	-15.27	0-360	100	V
11.57	38.66	PK	38.4	-21.7	55.36	53.97	1.39	74	-18.64	0-360	100	H
17.353	37.13	PK	40.9	-19.2	58.83	-	-	68.2	-9.37	0-360	100	H
11.572	35.52	PK	38.4	-21.7	52.22	53.97	-1.75	74	-21.78	0-360	200	V
17.353	37.56	PK	40.9	-19.2	59.26	-	-	68.2	-8.94	0-360	200	V

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
11.572	26.97	VB1	38.4	-21.7	43.67	53.97	-10.3	-	-	62	172	H

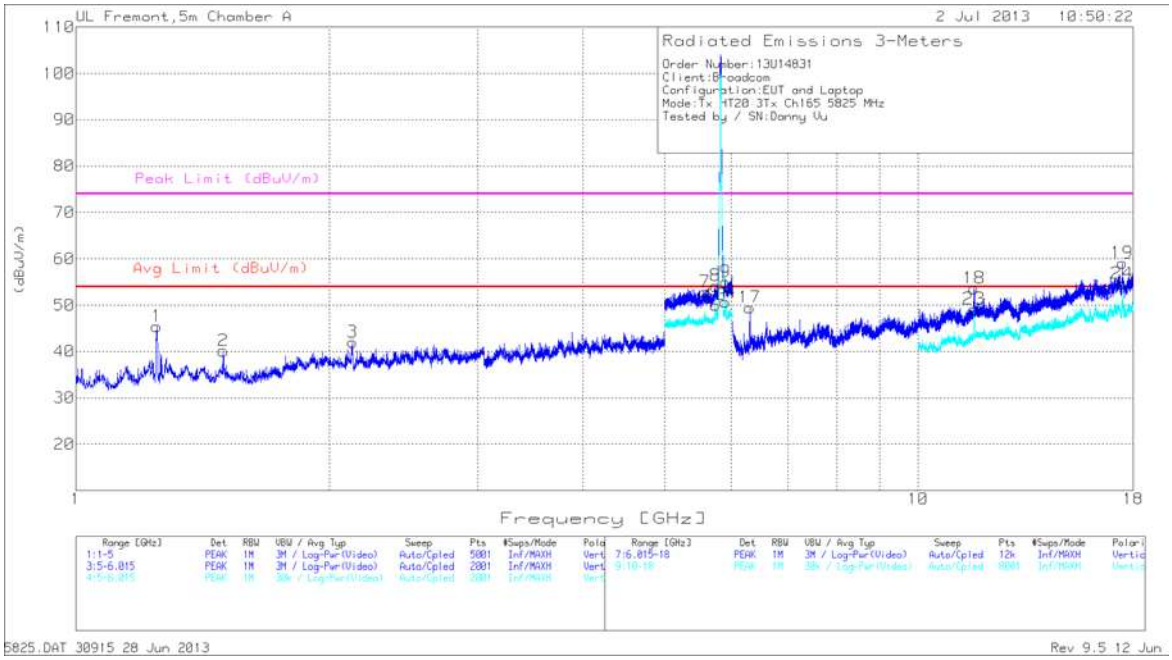
VB1 - KDB 789033 v01r02 Method: VB Alternative Reduced Video

5785.DAT 30915 28 Jun 2013 Rev 9.5 12 Jun 2013

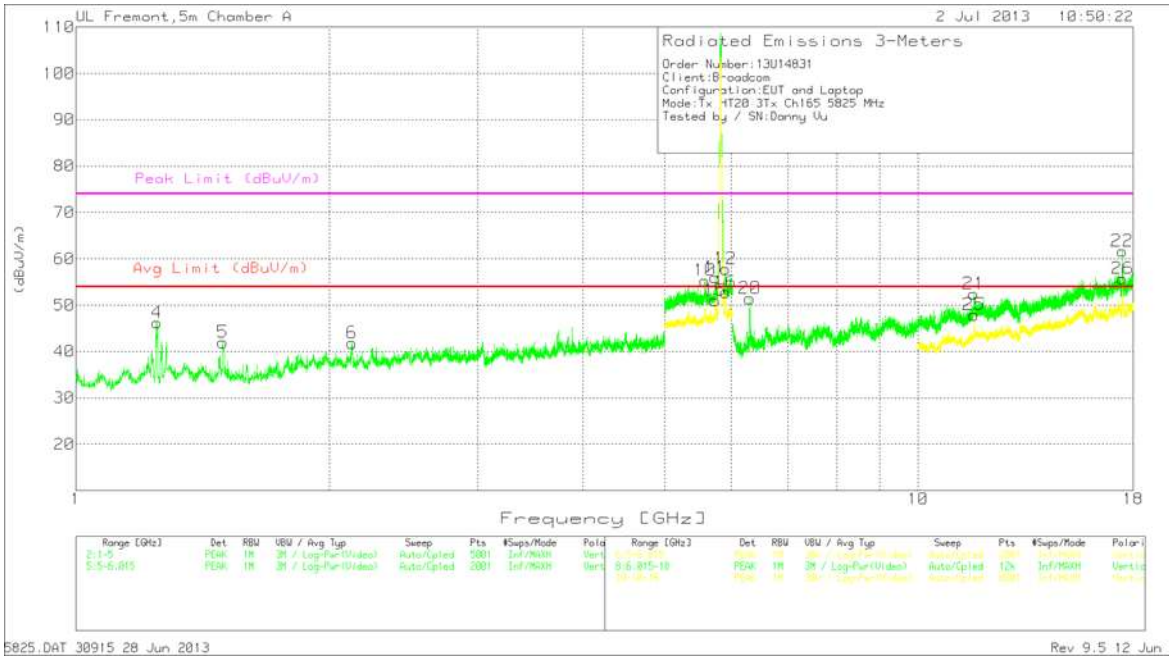
Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

High Channel

HORIZONTAL PLOT HIGH CHANNEL



VERTICAL PLOT HIGH CHANNEL



HORIZONTAL AND VERTICAL DATA HIGH CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.062	56.69	PK	28	-35.2	49.49	53.97	-4.48	74	-24.51	0-360	200	H
1.125	56.36	PK	28.3	-34.6	50.06	53.97	-3.91	74	-23.94	0-360	200	H
1.186	54.51	PK	29.3	-34.7	49.11	53.97	-4.86	74	-24.89	0-360	200	H
1.245	55.32	PK	29.9	-35.3	49.92	53.97	-4.05	74	-24.08	0-360	200	H
1.062	52.2	PK	28	-35.2	45	53.97	-8.97	74	-29	0-360	200	V
1.122	52.91	PK	28.2	-34.7	46.41	53.97	-7.56	74	-27.59	0-360	200	V
1.187	49.56	PK	29.3	-34.7	44.16	53.97	-9.81	74	-29.84	0-360	200	V
1.25	50.25	PK	29.9	-35.3	44.85	53.97	-9.12	74	-29.15	0-360	100	V
5.346	42.58	PK	34.3	-18.5	58.38	-	-	68.2	-9.82	0-360	200	H
5.173	53.54	PK	34.1	-18.1	69.54	-	-	68.2	-4.46	0-360	200	H
5.269	41.23	PK	34.3	-18.2	57.33	-	-	68.2	-16.67	0-360	100	H
5.505	42.28	PK	34.4	-18.1	58.58	-	-	68.2	-15.42	0-360	100	H
5.587	34.51	PK	34.4	-18.5	50.41	53.97	-3.56	74	-23.59	0-360	200	H
5.339	41.02	PK	34.3	-18.4	56.92	-	-	68.2	-11.28	0-360	200	V
5.586	38.86	PK	34.4	-18.5	54.76	-	-	68.2	-13.44	0-360	200	V
5.331	40.71	PK	34.3	-18.4	56.61	-	-	68.2	-11.59	0-360	200	V
5.579	34.06	PK	34.4	-18.5	49.96	53.97	-4.01	74	-24.04	0-360	200	V
6.313	44.44	PK	35.5	-27.6	52.34	53.97	-1.63	74	-21.66	0-360	200	H
11.639	35.71	PK	38.4	-21.7	52.41	53.97	-1.56	74	-21.59	0-360	200	H
17.482	35.8	PK	40.9	-19.8	54.68	-	-	68.2	-13.52	0-360	100	H
11.65	38.19	PK	38.5	-21.8	54.89	-	-	74	-19.11	0-360	200	V
17.463	38.13	PK	40.9	-20.2	58.83	-	-	68.2	-9.37	0-360	200	V
11.648	27.16	PK	38.4	-21.7	43.86	53.97	-10.11	74	-30.14	0-360	100	H
17.482	27.42	PK	40.9	-19.7	48.62	53.97	-5.35	74	-25.38	0-360	100	H
17.462	29.7	PK	40.9	-20.2	50.4	53.97	-3.57	74	-23.6	0-360	100	V

PK - Peak detector

Radiated Emissions

*.TST 30915 3 Jul 2013 Rev 9.5 12 Jun 2013

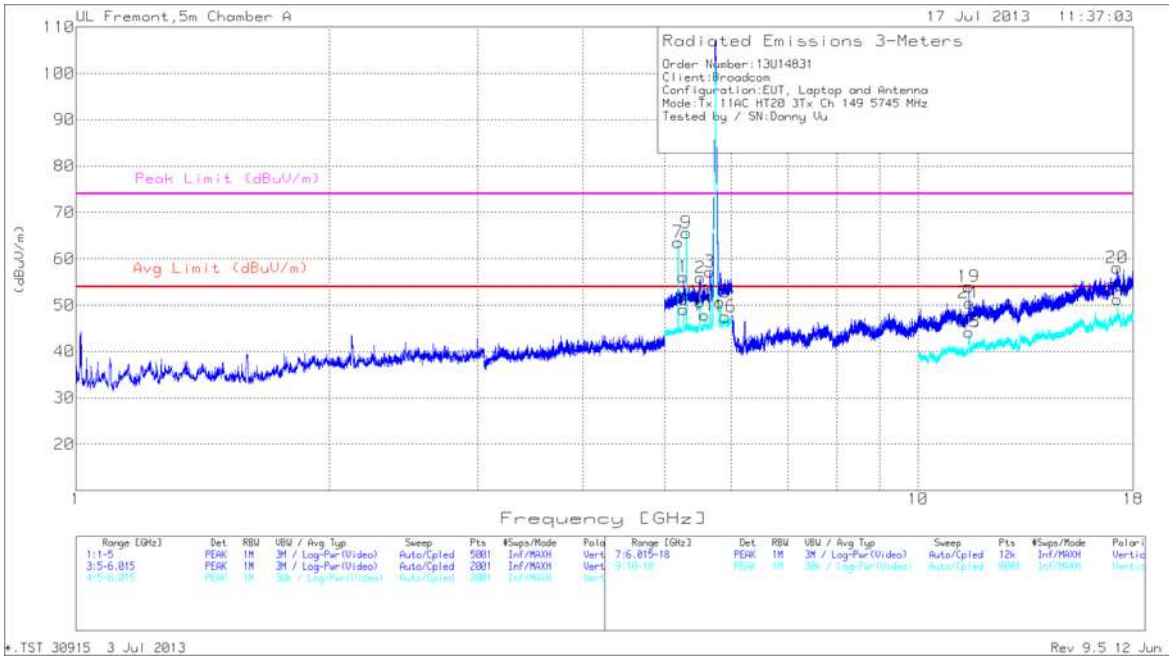
Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

9.2.6. 802.11ac VHT20 BF 3TX MODE, 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Low Channel

HORIZONTAL PLOT LOW CHANNEL



VERTICAL PLOT LOW CHANNEL

HORIZONTAL AND VERTICAL DATA LOW CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5.186	47.94	PK	34.2	-18.6	63.54	-	-	68.2	-4.66	0-360	200	H
5.26	40.2	PK	34.3	-18.4	56.1	-	-	68.2	-12.1	0-360	200	H
5.262	35.23	PK	34.3	-18.4	51.13	-	-	68.2	-17.07	0-360	200	V
5.304	49.42	PK	34.3	-18.1	65.62	-	-	68.2	-2.58	0-360	200	H
5.503	34.51	PK	34.4	-18.2	50.71	-	-	68.2	-17.49	0-360	200	H
5.508	42.33	PK	34.4	-18.2	58.53	-	-	68.2	-9.67	0-360	200	V
5.514	40.01	PK	34.4	-18.5	55.91	-	-	68.2	-12.29	0-360	200	H
5.514	35.86	PK	34.4	-18.5	51.76	-	-	68.2	-16.44	0-360	200	V
5.579	31.93	PK	34.4	-18.5	47.83	-	-	68.2	-20.37	0-360	200	H
5.584	32.79	PK	34.4	-18.5	48.69	-	-	68.2	-19.51	0-360	200	V
5.658	41.59	PK	34.5	-18.9	57.19	-	-	68.2	-11.01	0-360	200	H
5.662	42.77	PK	34.5	-18.8	58.47	-	-	68.2	-9.73	0-360	100	V
5.818	34.06	PK	34.9	-18.3	50.66	-	-	68.2	-17.54	0-360	200	H
5.819	37.48	PK	34.9	-18.2	54.18	-	-	68.2	-14.02	0-360	100	V
5.902	30.81	PK	35.1	-18.4	47.51	-	-	68.2	-20.69	0-360	200	H
5.906	34.16	PK	35.1	-18.3	50.96	-	-	68.2	-17.24	0-360	200	V
11.483	37.61	PK	38.3	-21.9	54.01	-	-	74	-19.99	0-360	100	H
11.49	28.69	PK	38.3	-21.9	45.09	53.97	-8.88	74	-28.91	0-360	100	V
11.491	27.84	PK	38.3	-21.9	44.24	53.97	-9.73	74	-29.76	0-360	100	H
17.222	37.57	PK	40.9	-20.4	58.07	-	-	68.2	-10.13	0-360	100	H
17.229	32.33	PK	40.9	-20.5	52.73	-	-	68.2	-15.47	0-360	100	V
17.235	30.81	PK	40.9	-20.5	51.21	-	-	68.2	-16.99	0-360	100	H
17.238	41.43	PK	40.9	-20.3	62.03	-	-	68.2	-6.17	0-360	100	V

PK - Peak detector

Radiated Emissions

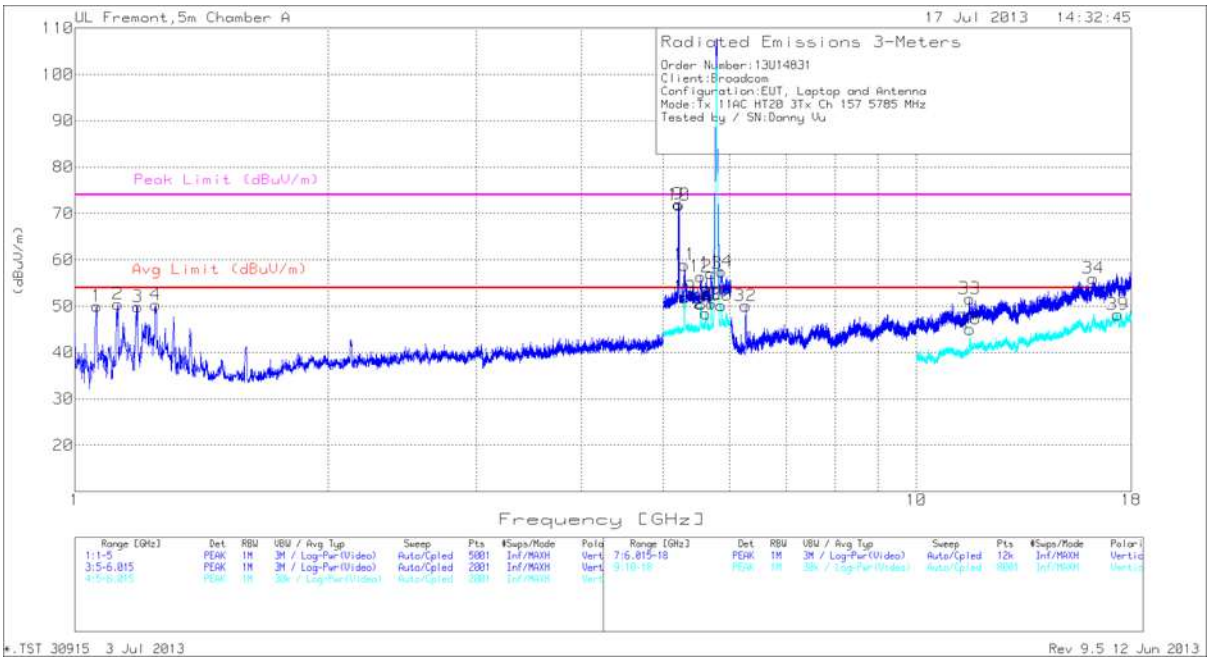
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
11.491	24.74	MAv	38.3	-21.9	41.14	53.97	-12.83	74	-32.86	129	164	H

VB1 - KDB 789033 v01r02 Method: VB Alternative Reduced Video

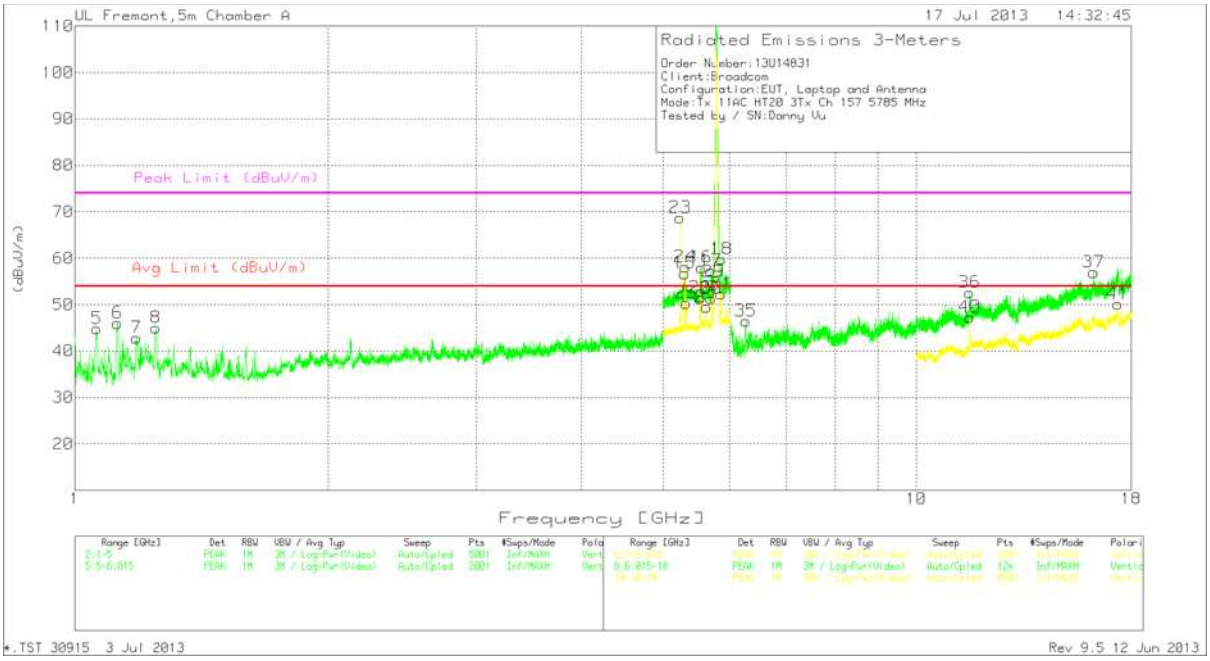
Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

Mid Channel

HORIZONTAL PLOT MID CHANNEL



VERTICAL PLOT MID CHANNEL



HORIZONTAL AND VERTICAL DATA MID CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.062	57.23	PK	28	-35.2	50.03	53.97	-3.94	74	-23.97	0-360	200	H
1.125	56.76	PK	28.3	-34.6	50.46	53.97	-3.51	74	-23.54	0-360	200	H
1.187	55.27	PK	29.3	-34.7	49.87	53.97	-4.1	74	-24.13	0-360	200	H
1.247	55.68	PK	29.9	-35.3	50.28	53.97	-3.69	74	-23.72	0-360	100	H
1.062	52.04	PK	28	-35.2	44.84	53.97	-9.13	74	-29.16	0-360	200	V
1.124	52.43	PK	28.3	-34.7	46.03	53.97	-7.94	74	-27.97	0-360	200	V
1.184	48.36	PK	29.2	-34.7	42.86	53.97	-11.11	74	-31.14	0-360	200	V
1.249	50.44	PK	29.9	-35.3	45.04	53.97	-8.93	74	-28.96	0-360	200	V
5.213	56.72	PK	34.2	-18.9	72.02	-	-	68.2	3.82	0-360	100	H
5.224	56.52	PK	34.2	-18.9	71.82	-	-	68.2	3.62	0-360	100	H
5.302	42.7	PK	34.3	-18.1	58.9	-	-	68.2	-9.3	0-360	200	H
5.543	40.4	PK	34.4	-18.4	56.4	-	-	68.2	-11.8	0-360	200	H
5.701	40.94	PK	34.6	-18.5	57.04	-	-	68.2	-11.16	0-360	200	H
5.866	41.07	PK	35	-18.6	57.47	-	-	68.2	-10.73	0-360	200	H
5.305	35.76	PK	34.3	-18.1	51.96	53.97	-2.01	74	-22.04	0-360	200	H
5.545	34.44	PK	34.4	-18.4	50.44	53.97	-3.53	74	-23.56	0-360	200	H
5.617	32.68	PK	34.4	-18.6	48.48	53.97	-5.49	74	-25.52	0-360	200	H
5.707	34.45	PK	34.6	-18.5	50.55	53.97	-3.42	74	-23.45	0-360	200	H
5.863	33.79	PK	35	-18.6	50.19	53.97	-3.78	74	-23.81	0-360	100	H
5.305	40.55	PK	34.3	-18.1	56.75	-	-	68.2	-11.45	0-360	200	V
5.551	42.16	PK	34.4	-18.5	58.06	-	-	68.2	-10.14	0-360	200	V
5.699	41.22	PK	34.6	-18.5	57.32	-	-	68.2	-10.88	0-360	200	V
5.866	43.4	PK	35	-18.6	59.8	-	-	68.2	-8.4	0-360	200	V
5.238	53.32	PK	34.2	-18.8	68.72	-	-	74	-5.28	0-360	200	V
5.313	41.96	PK	34.3	-18.1	58.16	-	-	68.2	-10.04	0-360	200	V
5.33	34.37	PK	34.3	-18.3	50.37	53.97	-3.6	74	-23.63	0-360	100	V
5.536	35.46	PK	34.4	-18.4	51.46	53.97	-2.51	74	-22.54	0-360	200	V
5.633	33.53	PK	34.5	-18.5	49.53	53.97	-4.44	74	-24.47	0-360	200	V
5.701	35.26	PK	34.6	-18.5	51.36	53.97	-2.61	74	-22.64	0-360	200	V
5.737	38.34	PK	34.7	-18.1	54.94	-	-	68.2	-13.26	0-360	100	V
5.859	35.79	PK	35	-18.5	52.29	53.97	-1.68	74	-21.71	0-360	200	V
6.267	42.28	PK	35.5	-27.7	50.08	53.97	-3.89	74	-23.92	0-360	200	H
11.564	35	PK	38.4	-21.8	51.6	53.97	-2.37	74	-22.4	0-360	100	H
16.222	34.73	PK	40.7	-19.4	56.03	-	-	68.2	-12.17	0-360	200	H
6.272	38.67	PK	35.5	-27.7	46.47	53.97	-7.5	74	-27.53	0-360	100	V
11.566	36.02	PK	38.4	-21.8	52.62	53.97	-1.35	74	-21.38	0-360	200	V
16.242	35.49	PK	40.7	-19.2	56.99	-	-	68.2	-11.21	0-360	100	V
11.575	28.46	PK	38.4	-21.8	45.06	53.97	-8.91	74	-28.94	0-360	200	H
17.349	26.51	PK	41	-19.3	48.21	53.97	-5.76	74	-25.79	0-360	100	H
11.572	30.62	PK	38.4	-21.7	47.32	53.97	-6.65	74	-26.68	0-360	200	V
17.357	28.42	PK	40.9	-19.2	50.12	53.97	-3.85	74	-23.88	0-360	100	V

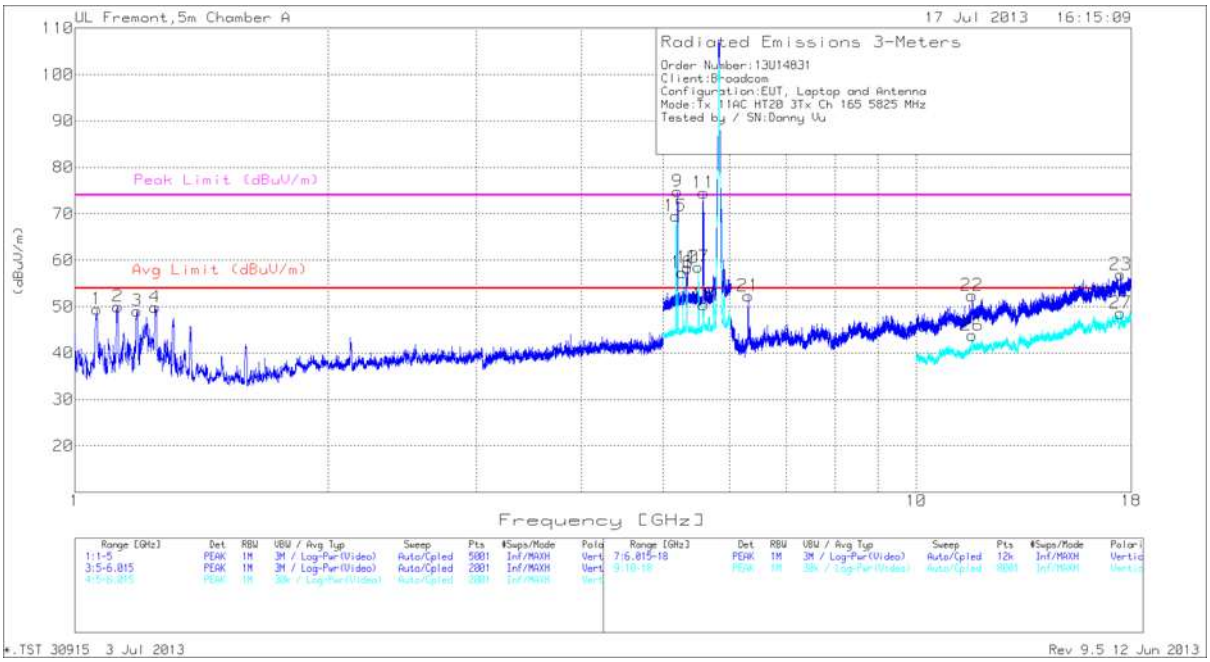
PK - Peak detector

Radiated Emissions

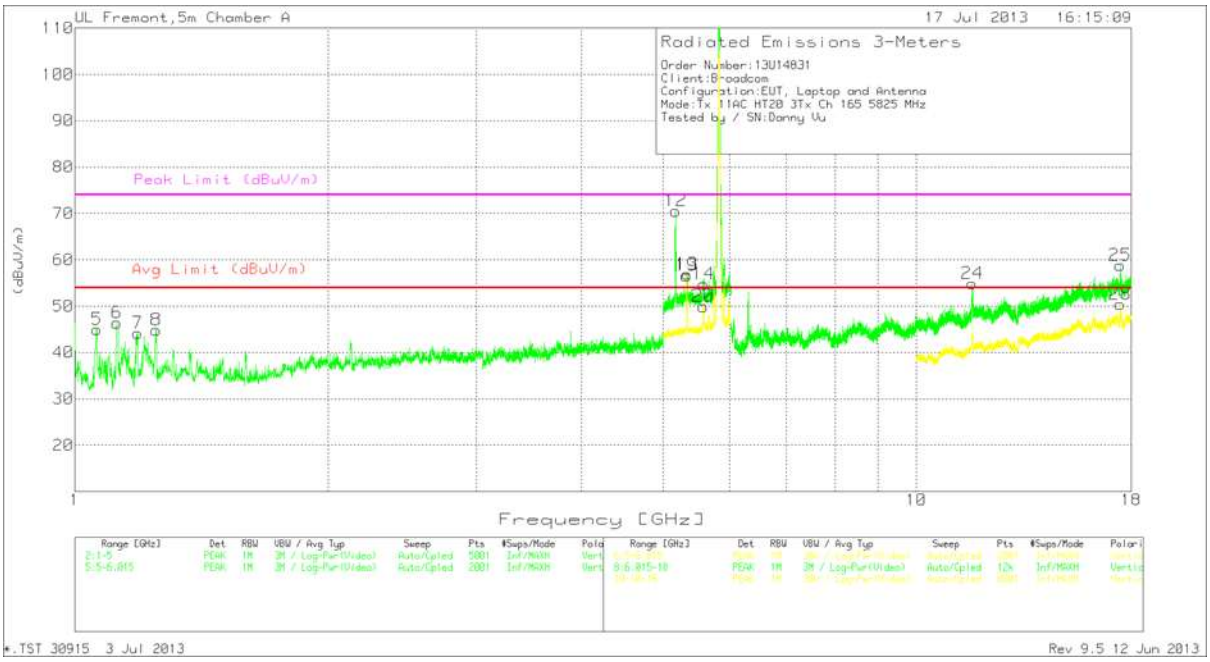
*.TST 30915 3 Jul 2013 Rev 9.5 12 Jun 2013

Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

HORIZONTAL PLOT HIGH CHANNEL



VERTICAL PLOT HIGH CHANNEL



HORIZONTAL AND VERTICAL DATA HIGH CHANNEL

Trace Markers

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.247	50.8	PK	29.9	-35.3	45.4	53.97	-8.57	74	-28.6	0-360	272	H
1.496	45.38	PK	28.9	-34.1	40.18	53.97	-13.79	74	-33.82	0-360	272	H
2.13	43.6	PK	31.6	-33.2	42	53.97	-11.97	74	-32	0-360	272	H
1.249	51.61	PK	29.9	-35.3	46.21	53.97	-7.76	74	-27.79	0-360	100	V
1.494	47.08	PK	29	-34.1	41.98	53.97	-11.99	74	-32.02	0-360	100	V
2.126	43.45	PK	31.6	-33.2	41.85	53.97	-12.12	74	-32.15	0-360	200	V
5.584	36.95	PK	34.4	-18.5	52.85	-	-	68.2	-15.35	0-360	100	H
5.746	37.67	PK	34.7	-18.2	54.17	-	-	68.2	-14.03	0-360	100	H
5.904	38.28	PK	35.1	-18.4	54.98	-	-	68.2	-13.22	0-360	200	H
5.747	33.66	PK	34.7	-18.3	50.06	-	-	68.2	-18.14	0-360	200	H
5.903	34.01	PK	35.1	-18.4	50.71	-	-	68.2	-17.49	0-360	200	H
5.582	39.45	PK	34.4	-18.5	55.35	-	-	68.2	-12.85	0-360	100	V
5.742	39.42	PK	34.7	-18.1	56.02	-	-	68.2	-12.18	0-360	100	V
5.904	41.13	PK	35.1	-18.4	57.83	-	-	68.2	-10.37	0-360	100	V
5.739	34.42	PK	34.7	-18.1	51.02	-	-	68.2	-17.18	0-360	100	V
5.904	36.09	PK	35.1	-18.4	52.79	-	-	68.2	-15.41	0-360	100	V
6.312	417	PK	35.5	-27.7	49.5	53.97	-4.47	74	-24.5	0-360	200	H
11.649	37.02	PK	38.4	-21.8	53.62	53.97	-0.35	74	-20.38	0-360	100	H
17.473	38.21	PK	40.9	-20	59.11	-	-	68.2	-9.09	0-360	100	H
6.311	43.74	PK	35.5	-27.8	51.44	53.97	-2.53	74	-22.56	0-360	200	V
11.641	35.77	PK	38.4	-21.7	52.47	53.97	-1.5	74	-21.53	0-360	100	V
17.472	40.87	PK	40.9	-20.1	61.67	-	-	68.2	-6.53	0-360	100	V
11.648	32.47	PK	38.4	-21.7	49.17	53.97	-4.8	74	-24.83	0-360	100	H
17.479	33.68	PK	40.9	-19.9	54.68	-	-	68.2	-19.32	0-360	100	H
11.648	31.24	PK	38.4	-21.7	47.94	53.97	-6.03	74	-26.06	0-360	200	V
17.482	34.54	PK	40.9	-19.7	55.74	-	-	68.2	-12.46	0-360	100	V

PK - Peak detector

Radiated Emissions

5825.DAT 30915 28 Jun 2013 Rev 9.5 12 Jun 2013

Note: A peak limit of 68.2 dBuV/m denotes a frequency found in a non-restricted band. These frequencies are exempt from the radiated limits.

9.2.7. 802.11n HT40 CDD 3TX MODE, 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Covered by worst case emissions testing of 802.11n HT20 CDD 3TX at power levels, per transmit chain, greater than or equal to any 40MHz and 80MHz 1TX, 2TX, and 3TX mode.

9.2.8. 802.11ac VHT40 BF 3TX MODE, 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Covered by worst case emissions testing of 802.11ac VHT20 CDD 3TX at power levels, per transmit chain, greater than or equal to any 40MHz and 80MHz 1TX, 2TX, and 3TX mode.

9.2.9. 802.11ac VHT80 CDD 3TX MODE, 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Covered by worst case emissions testing of 802.11n HT20 CDD 3TX at power levels, per transmit chain, greater than or equal to any 40MHz and 80MHz 1TX, 2TX, and 3TX mode.

9.2.10. 802.11ac VH80 BF 3TX MODE, 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Covered by worst case emissions testing of 802.11n HT20 CDD 3TX at power levels, per transmit chain, greater than or equal to any 40MHz and 80MHz 1TX, 2TX, and 3TX mode.

9.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL & VERTICAL DATA

Trace Markers

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
132.765	43.31	QP	13.4	-26.6	30.11	43.52	-13.41	0-360	200	H
99.5725	55.05	PK	10.2	-26.9	38.35	43.52	-5.17	0-360	100	V
132.765	48.37	PK	13.4	-26.6	35.17	43.52	-8.35	0-360	100	V
225.7	45.48	QP	10.7	-25.9	30.28	46.02	-15.74	0-360	100	H
263.3	45.95	PK	12.5	-25.8	32.65	46.02	-13.37	0-360	100	H
301	41.83	QP	13.2	-25.6	29.43	46.02	-16.59	0-360	100	H
530.8	42.37	PK	18.2	-24.1	36.47	46.02	-9.55	0-360	200	H
859.1	40.49	PK	21.2	-22.5	39.19	46.02	-6.83	0-360	100	H
225.7	51.3	PK	10.7	-25.9	36.1	46.02	-9.92	0-360	200	V
263.3	43.41	PK	12.5	-25.8	30.11	46.02	-15.91	0-360	200	V
301	46.95	PK	13.2	-25.6	34.55	46.02	-11.47	0-360	200	V
887.7	38.39	PK	21.7	-22.6	37.49	46.02	-8.53	0-360	200	V
859.1	37.4	PK	21.2	-22.5	36.1	46.02	-9.92	0-360	200	V

PK - Peak detector

QP - Quasi-Peak detector

11. ANNEX A (CH12 and CH13 DATA)

11.1. 802.11b 3TX CDD MODE CH 12 & 13, 2.4 GHz BAND

11.1.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	4.80	5.50	5.70

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High 12	2467	5.70	30.00	30	36	30.00
High 13	2472	5.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High 12	2467	19.21	19.24	19.07	23.95	30.00	-6.05
High 13	2472	13.82	13.54	13.52	18.40	30.00	-11.60

11.1.2. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

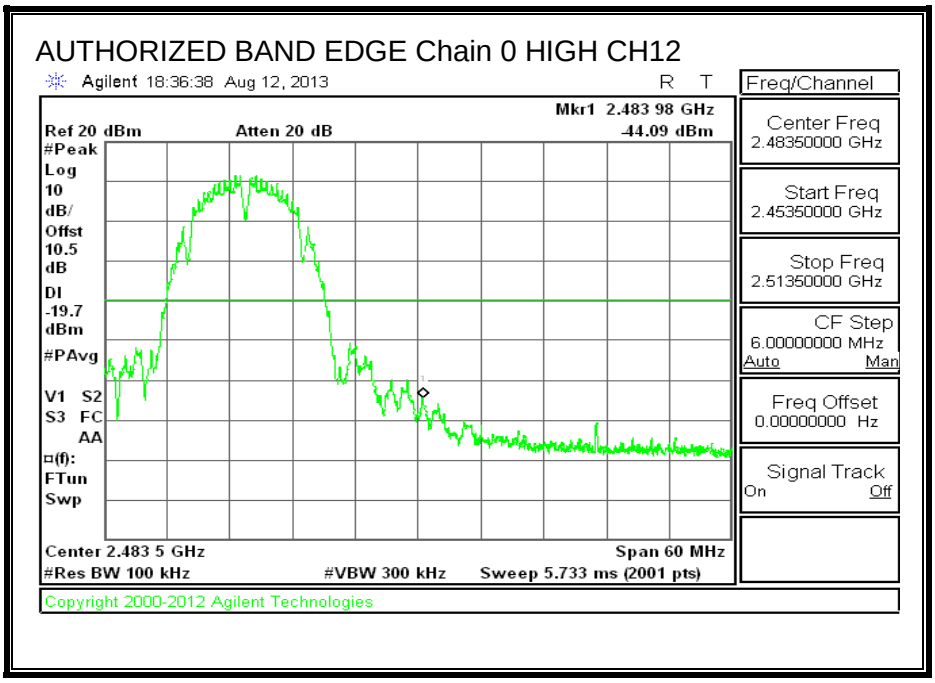
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

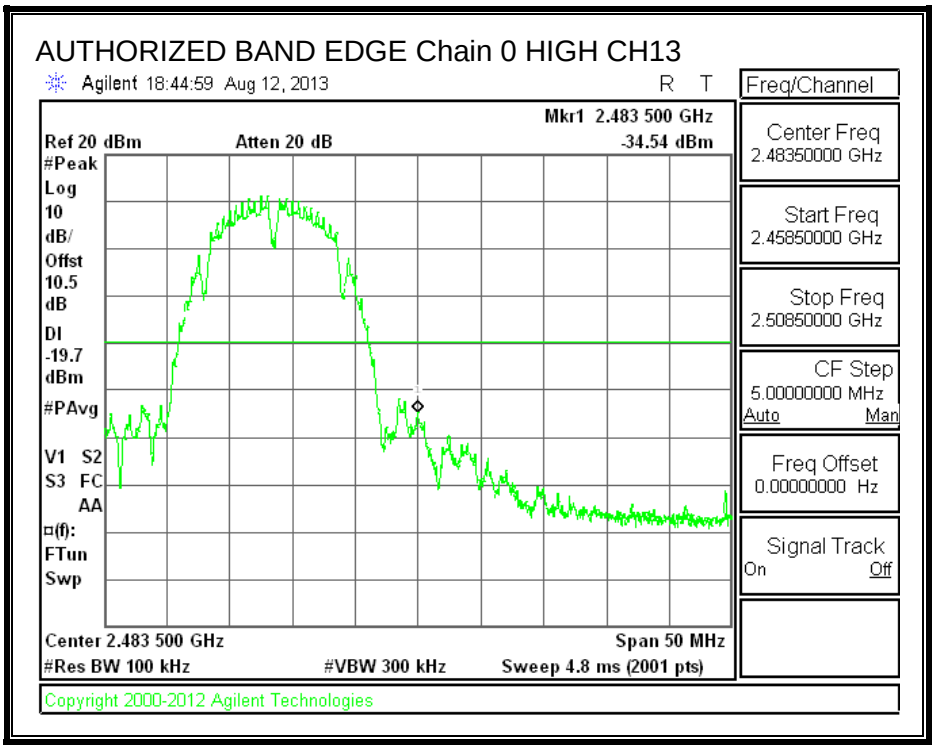
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

RESULTS

HIGH CHANNEL12 BANDEDGE, Chain 0

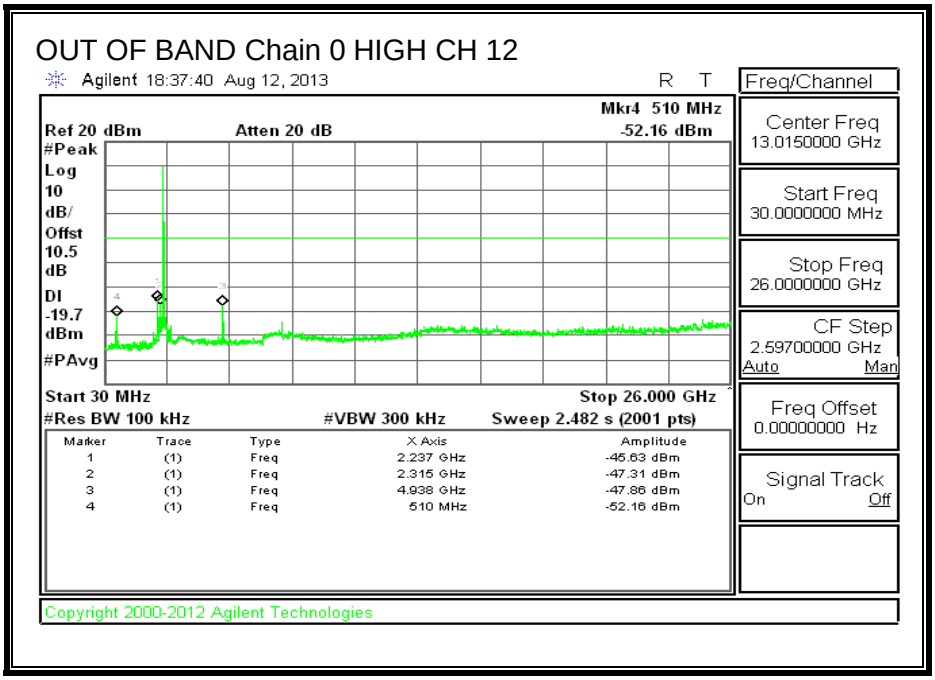


HIGH CHANNEL13 BANDEDGE, Chain 0

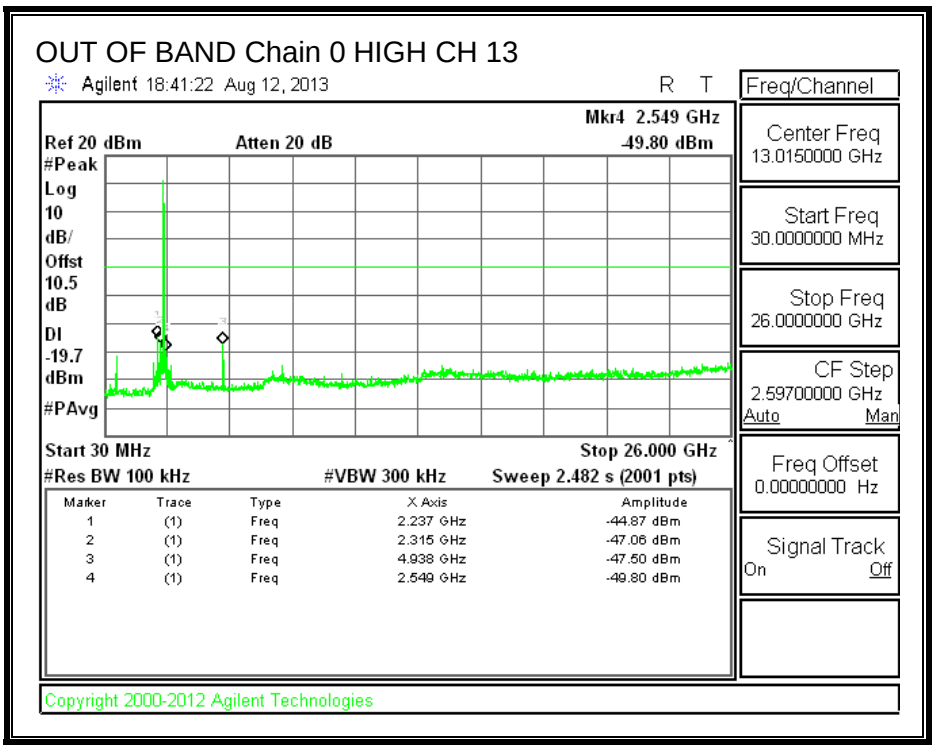


OUT-OF-BAND EMISSIONS, Chain 0

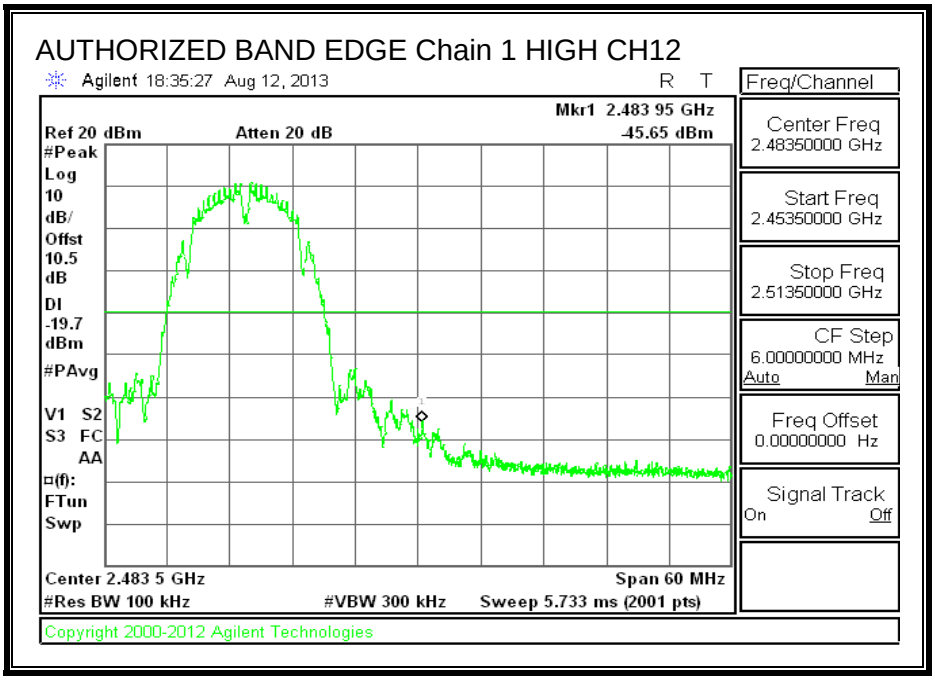
OUT OF BAND Chain 0 HIGH CH 12



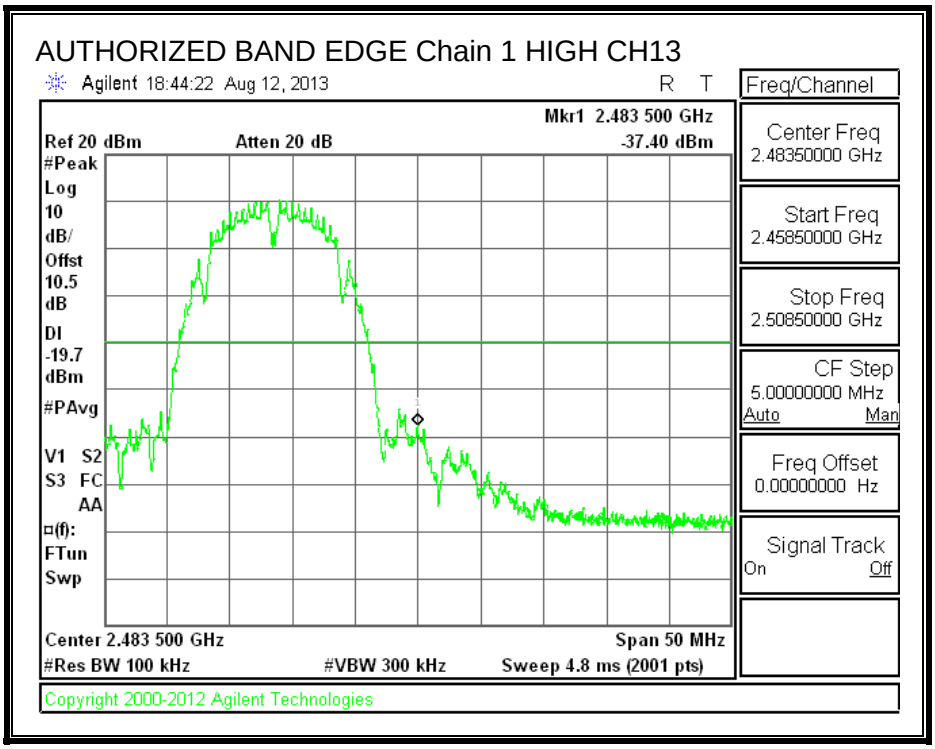
OUT OF BAND Chain 0 HIGH CH 13



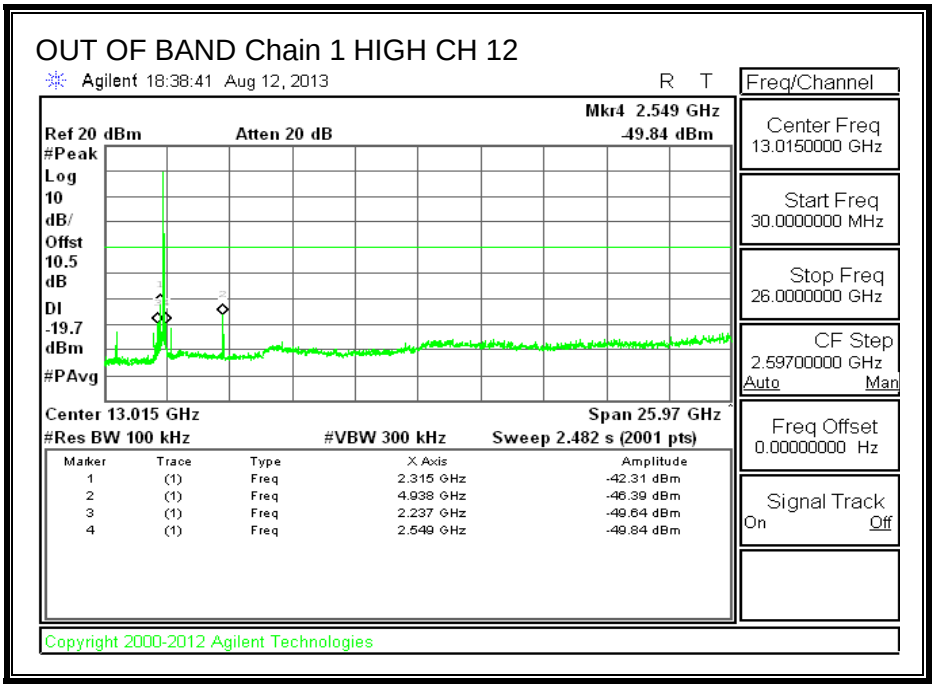
HIGH CHANNEL12 BANDEDGE, Chain 1

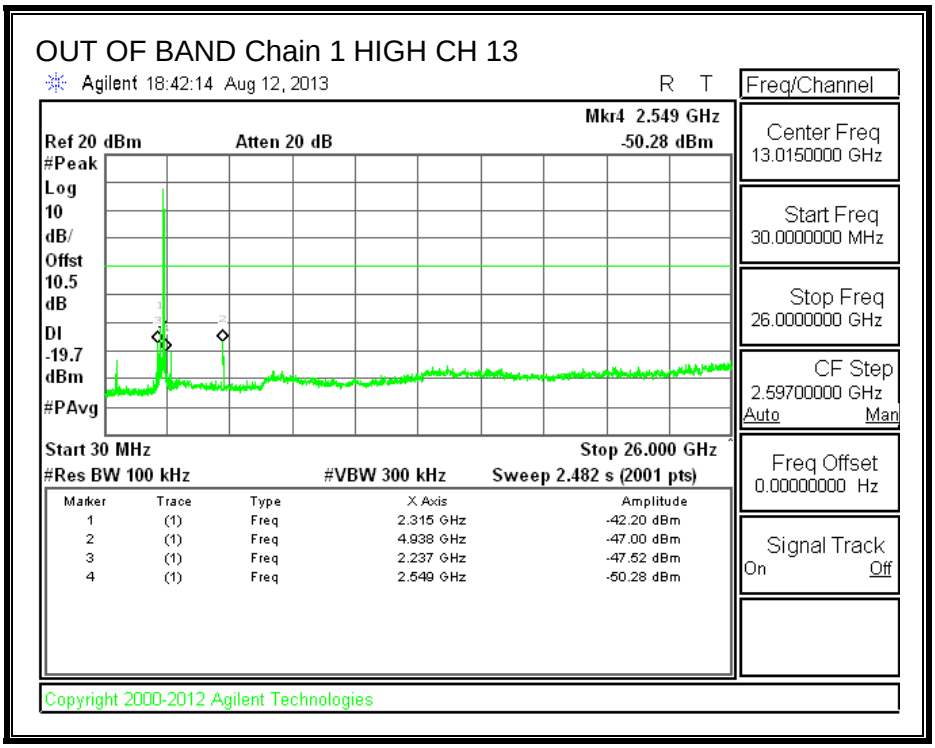


HIGH CHANNEL13 BANDEDGE, Chain 1

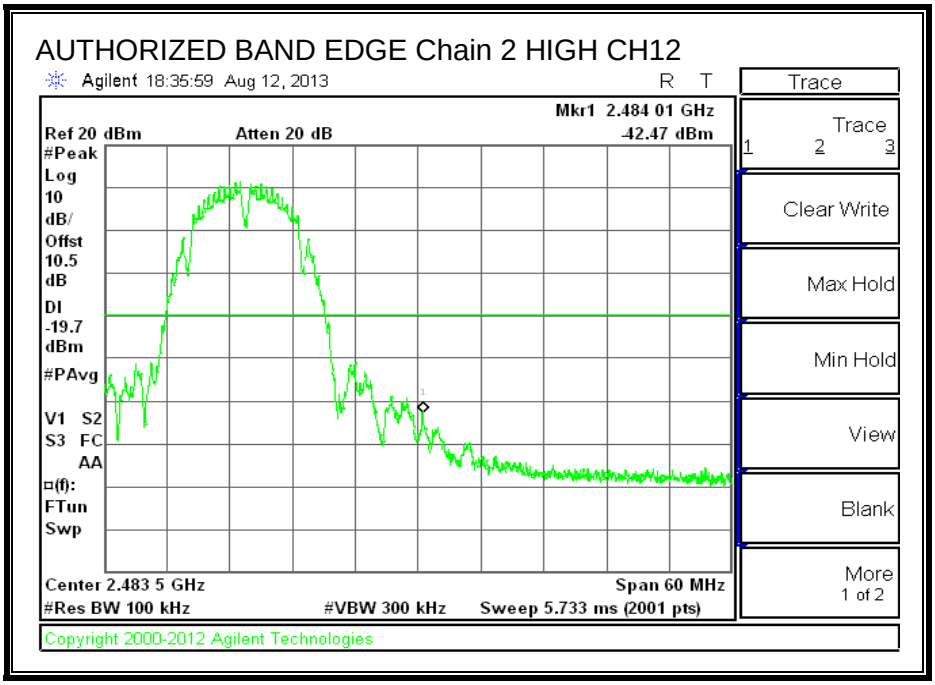


OUT-OF-BAND EMISSIONS, Chain 1

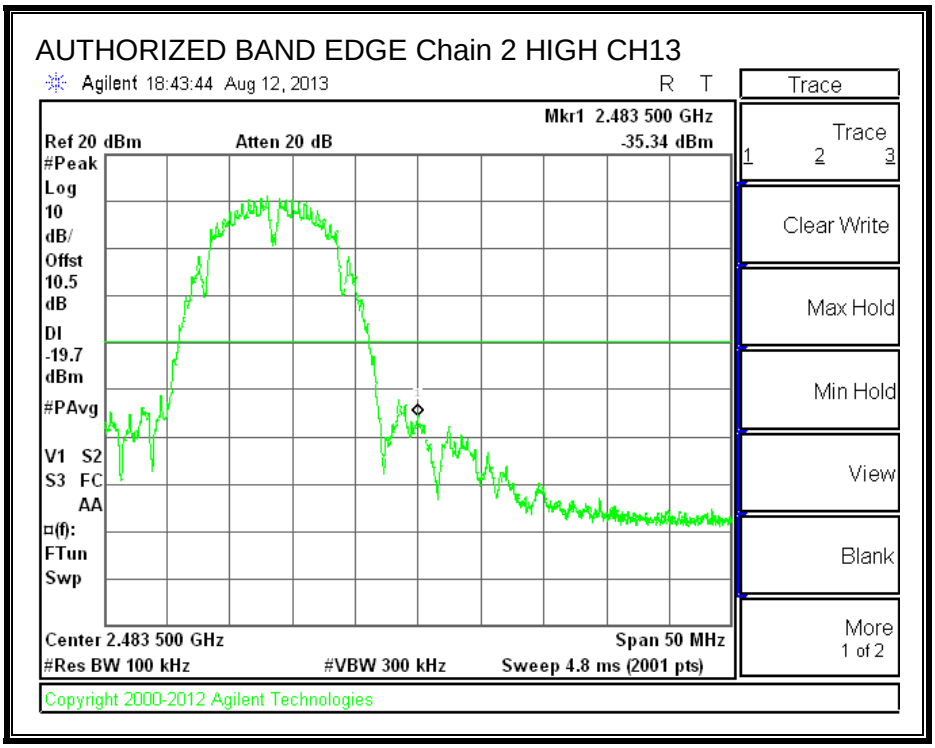




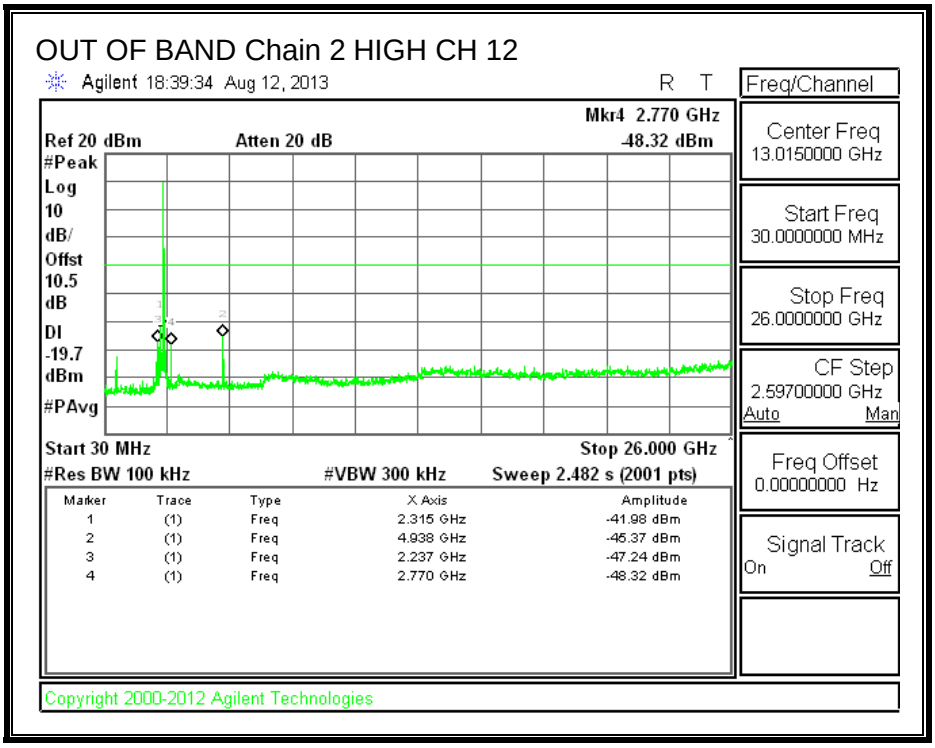
HIGH CHANNEL12 BANDEDGE, Chain 2

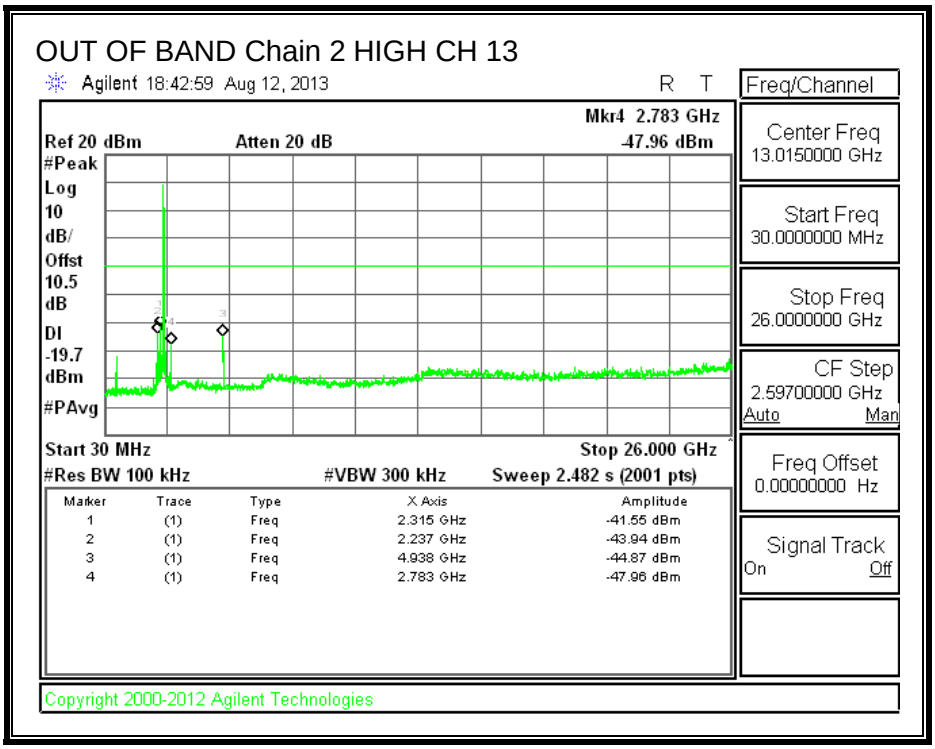


HIGH CHANNEL13 BANDEDGE, Chain 2



OUT-OF-BAND EMISSIONS, Chain 2





11.2. 802.11n HT20 CDD 3TX MODE CH 12 & 13 MODE, 2.4 GHz BAND

11.2.1. OUTPUT POWER

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 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)
6.60	4.80	5.50	5.70

RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High 12	2467	5.70	30.00	30	36	30.00
High 13	2472	5.70	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High 12	2467	13.55	13.13	13.20	18.07	30.00	-11.93
High 13	2472	10.19	9.69	9.62	14.61	30.00	-15.39

11.2.2. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

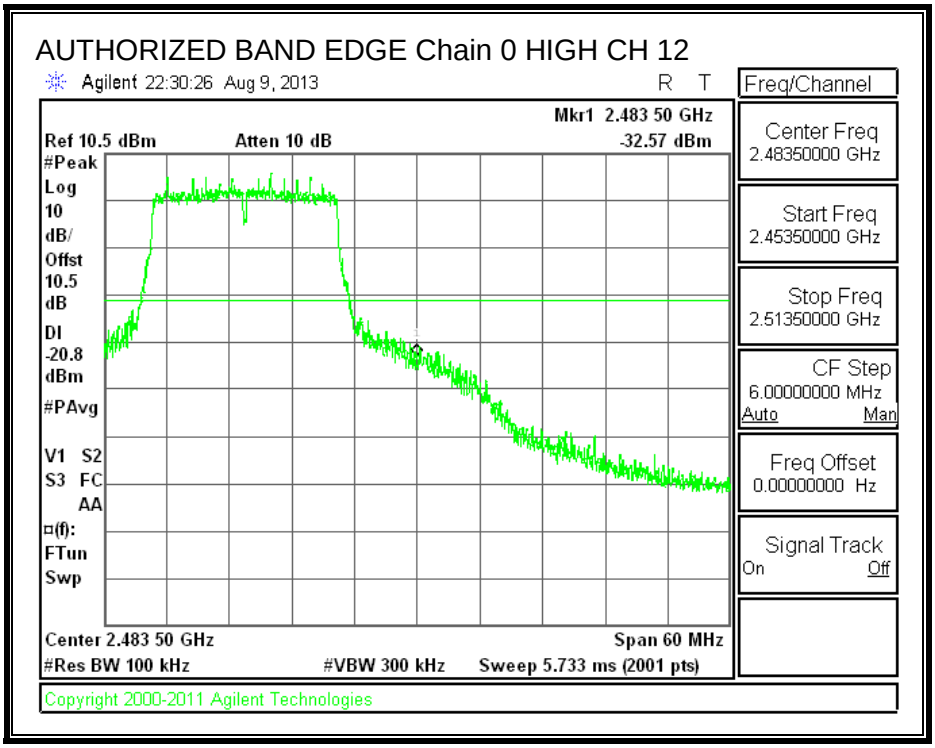
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

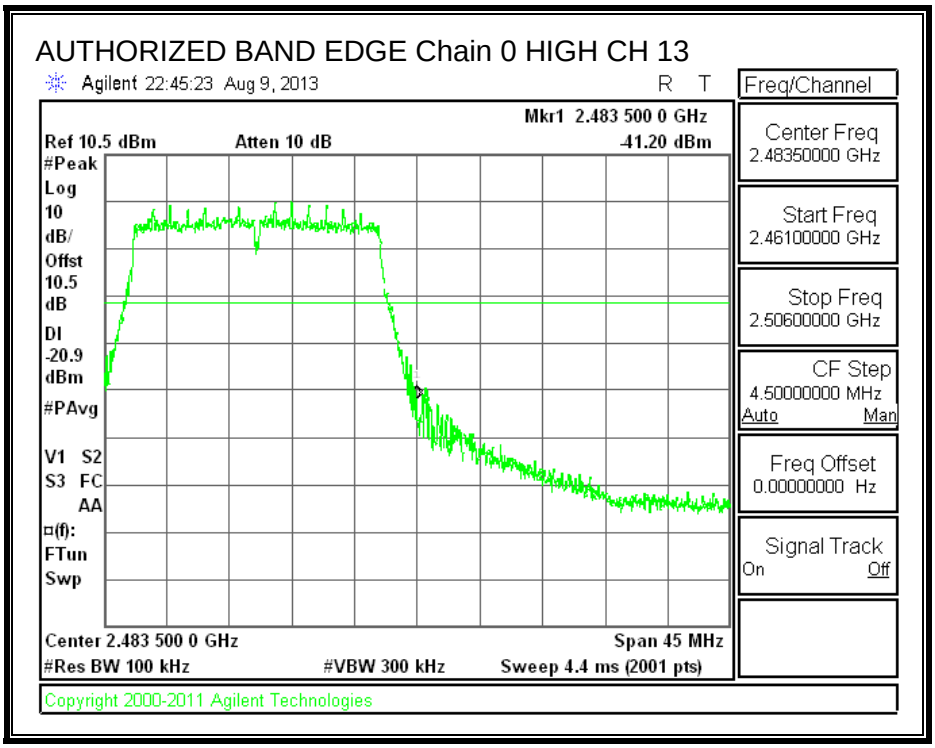
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

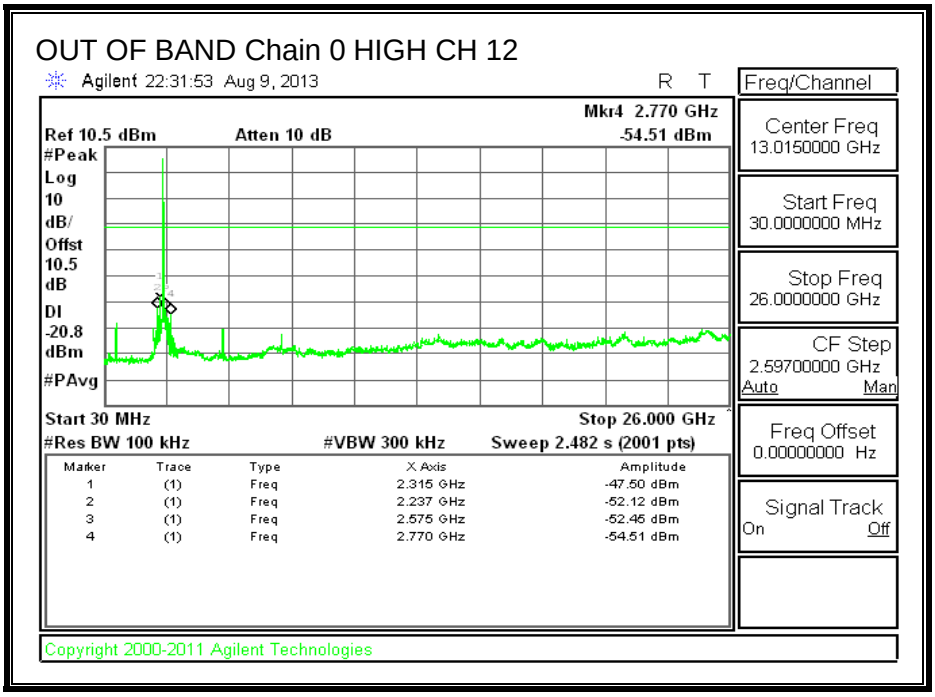
RESULTS

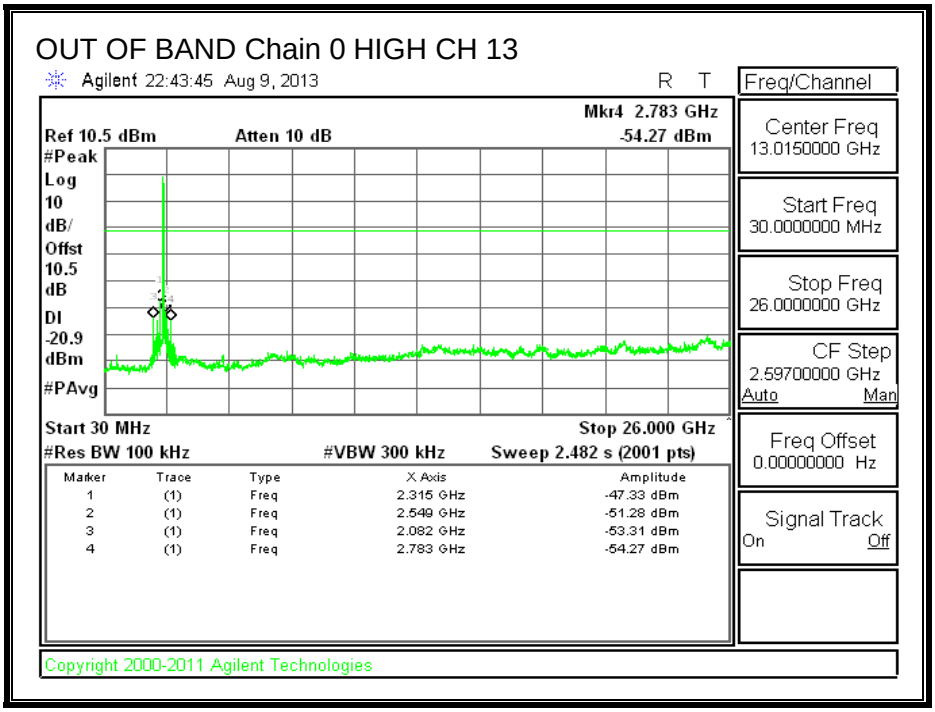
HIGH CHANNEL BANDEDGE, Chain 0



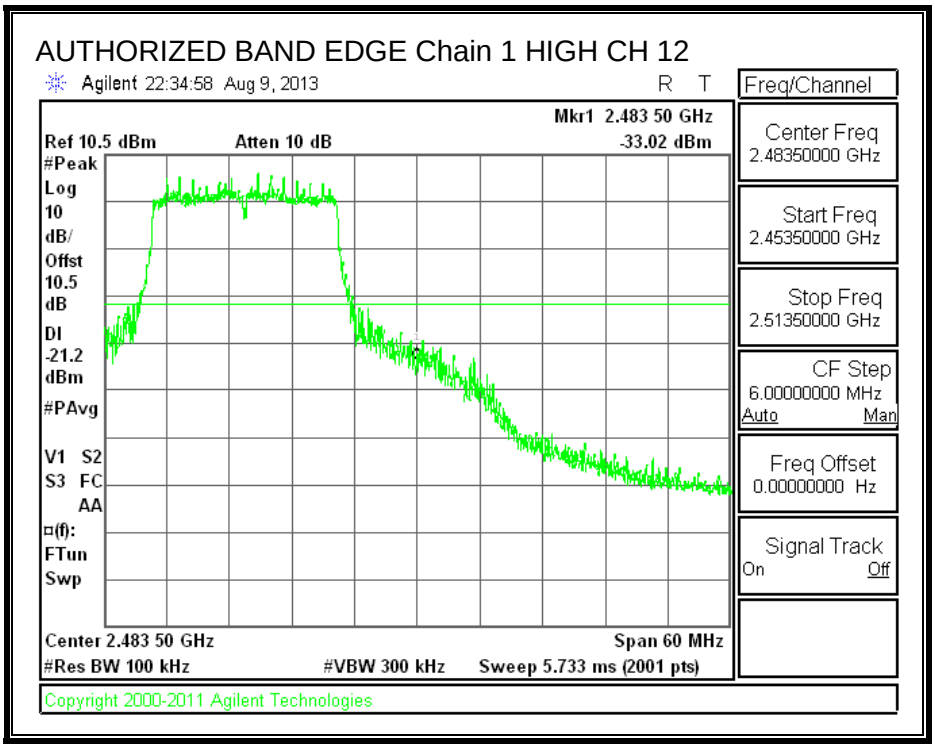


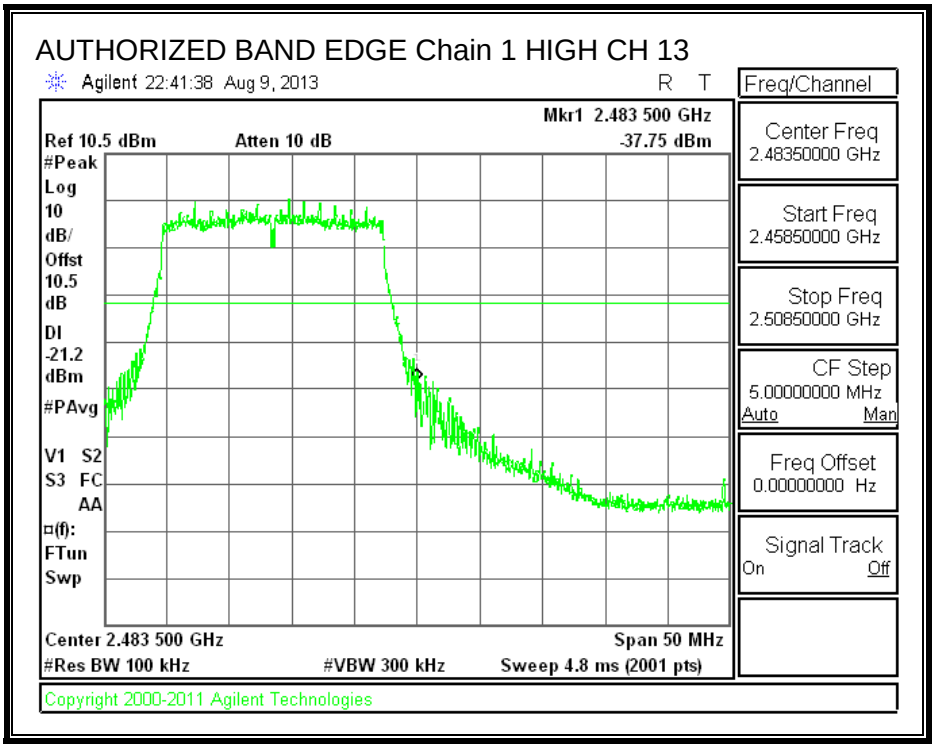
OUT-OF-BAND EMISSIONS, Chain 0



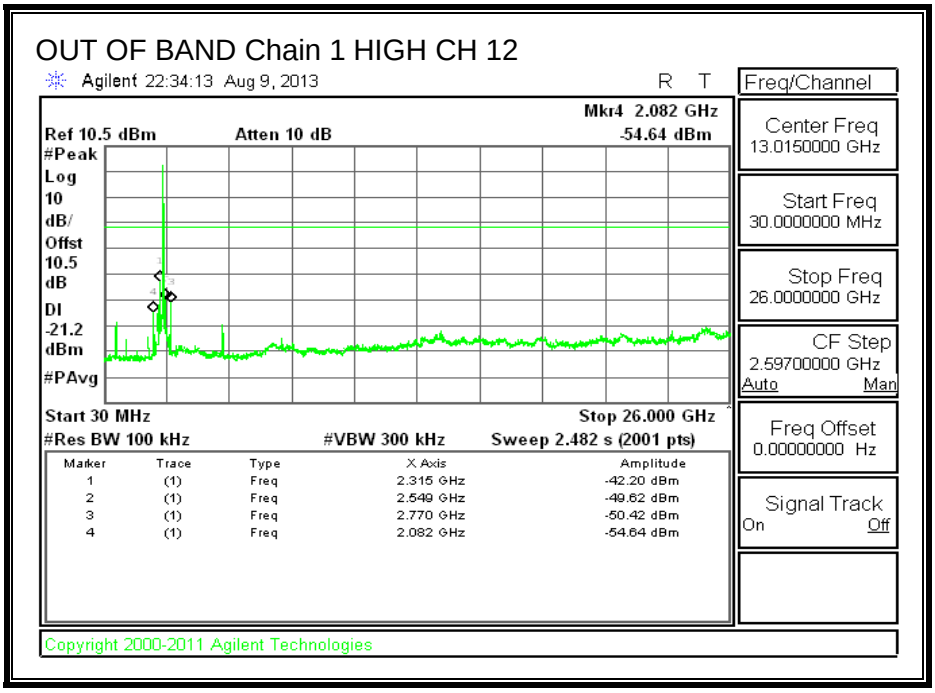


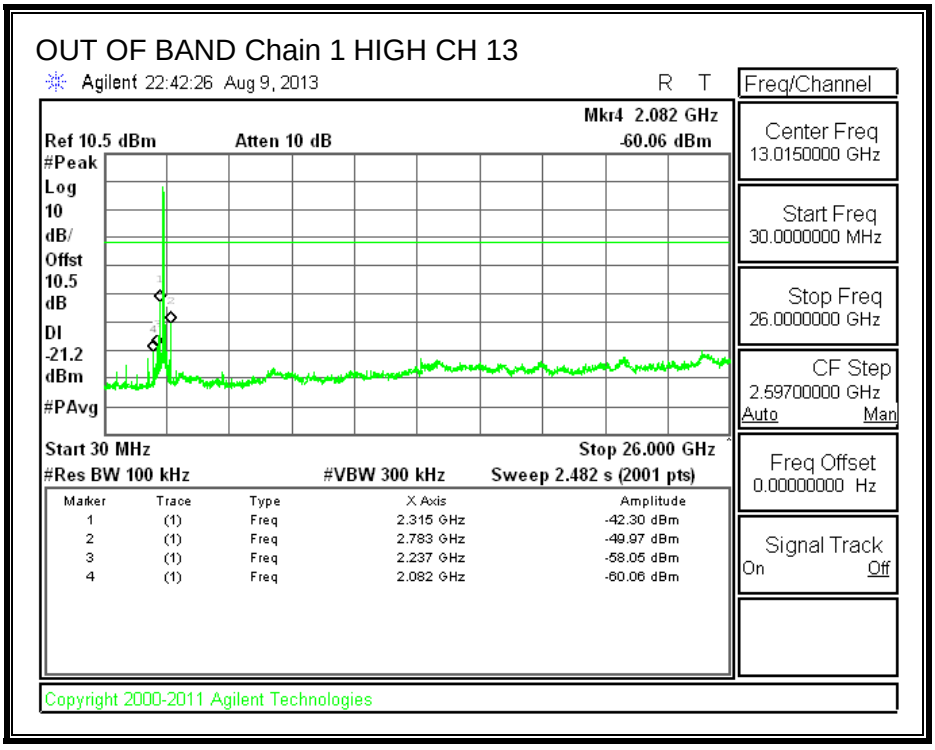
HIGH CHANNEL BANDEDGE, Chain 1



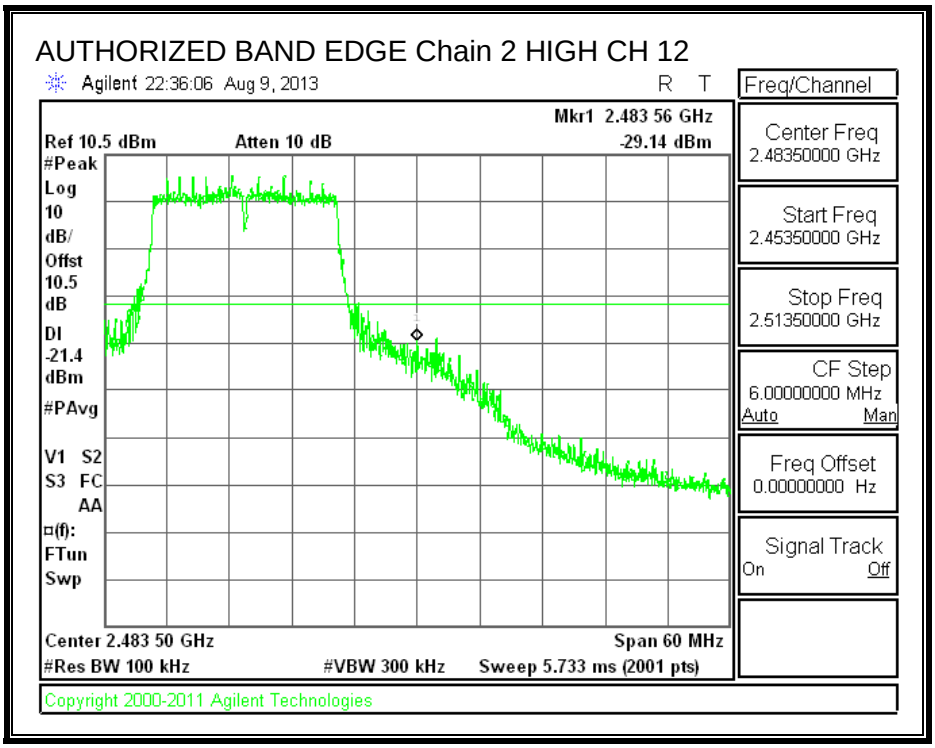


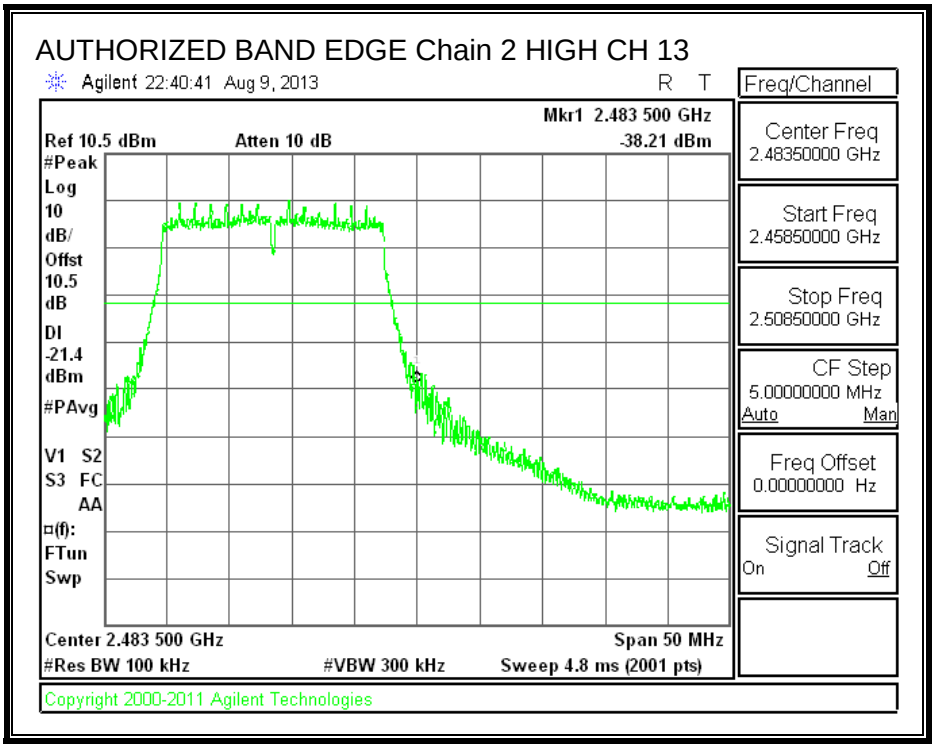
OUT-OF-BAND EMISSIONS, Chain 1



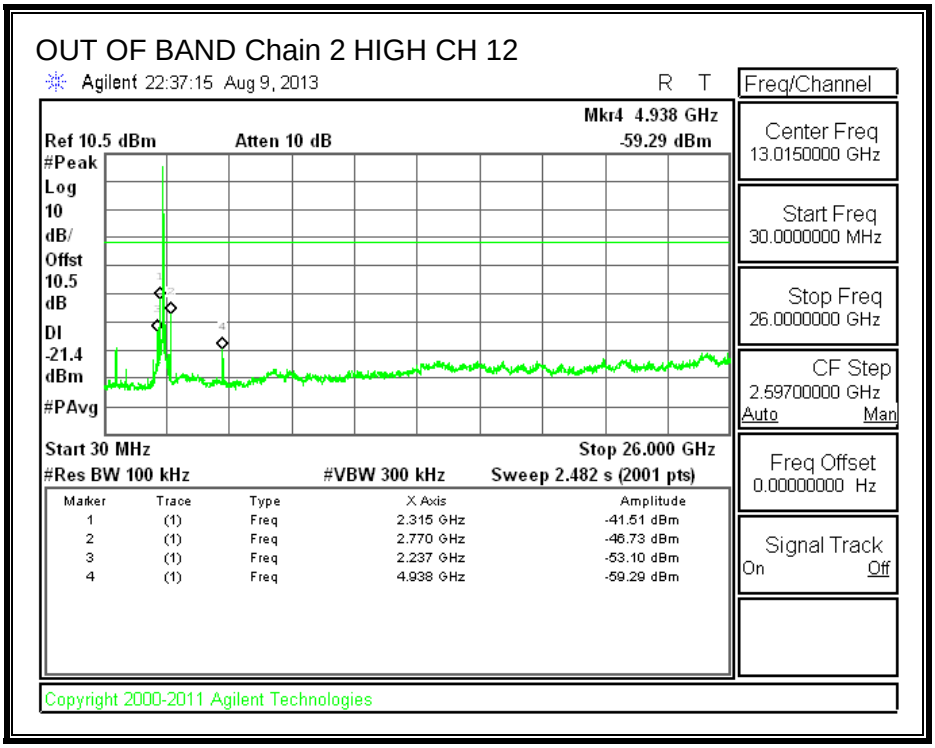


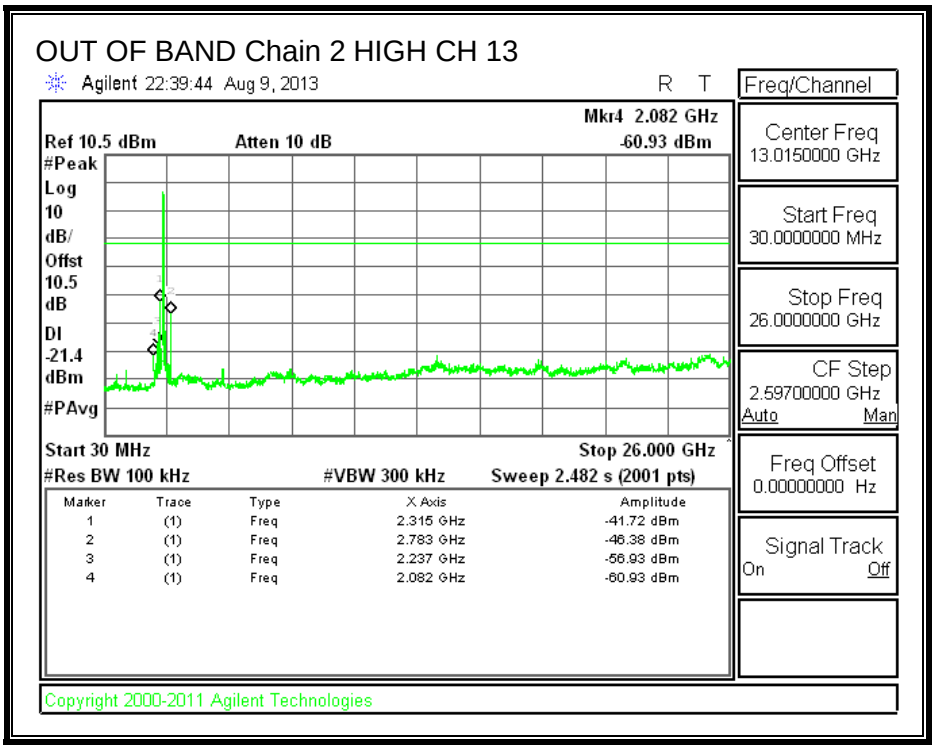
HIGH CHANNEL BANDEDGE, Chain 2





OUT-OF-BAND EMISSIONS, Chain 2





11.3. 802.11ac VHT20 3TX BF MODE, 2.4 GHz BAND

This mode has same antenna port results, except for output power, as documented in report 12U14669-1B FCC IC DTS WLAN Report.

11.3.1. OUTPUT POWER

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 for output power consideration, and the antenna gain is unequal among the chains. The directional gain is:

Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Chain 2 Antenna Gain (dBi)	Correlated Chains Directional Gain (dBi)
6.60	4.80	5.50	10.44

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
High 12	2467	10.44	25.56	30	36	25.56
High 13	2472	10.44	25.56	30	36	25.56

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Chain 2 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
High 12	2467	12.71	13.36	13.02	17.81	25.56	-7.75
High 13	2472	10.98	11.62	11.12	16.02	25.56	-9.54

11.3.2. OUT-OF-BAND EMISSIONS

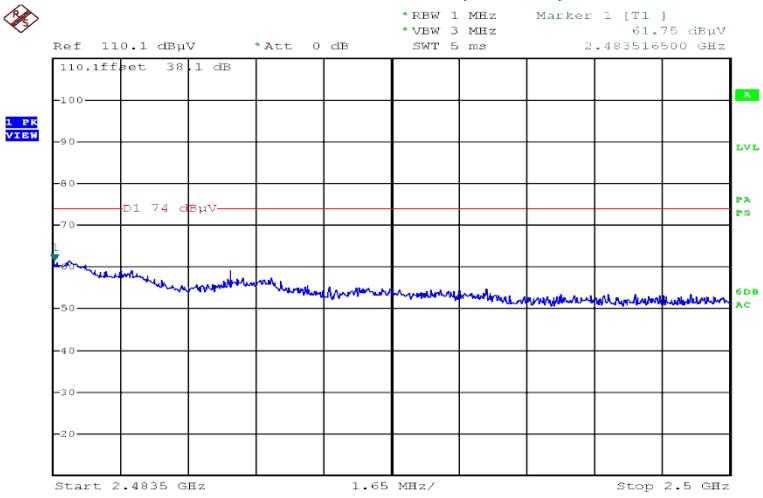
This mode has same OUT OF BAND EMISSIONS data as 802.11n HT20 CDD 3TX.

11.4. TRANSMITTER ABOVE 1 GHz

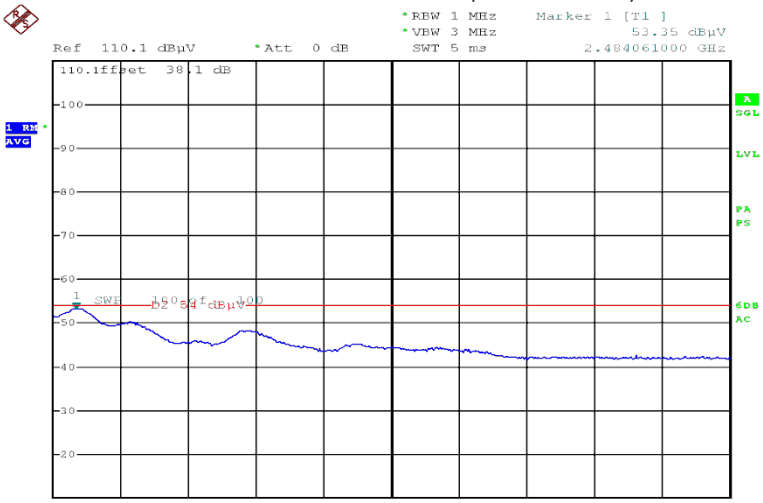
11.4.1. 802.11b 3TX CDD MODE, 2.4 GHz BAND

RESTRICTED BANDEDGE (HIGH CHANNEL 12)

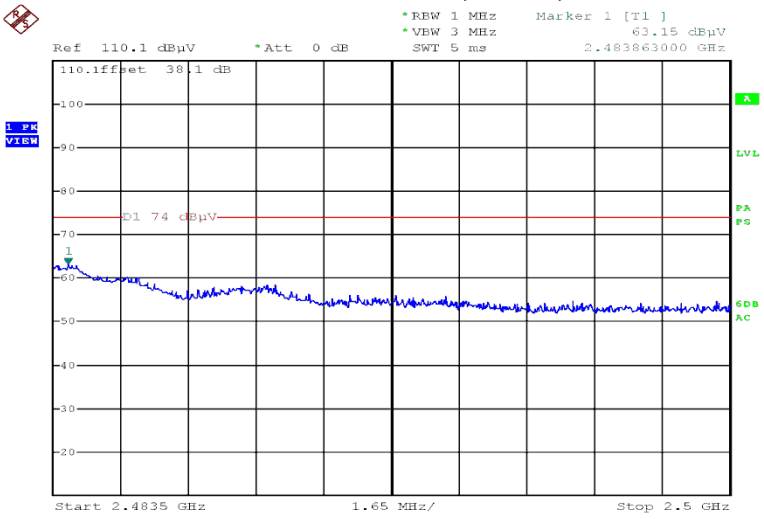
HIGH CHANNEL 12 RESTRICTED, PEAK, HORIZ



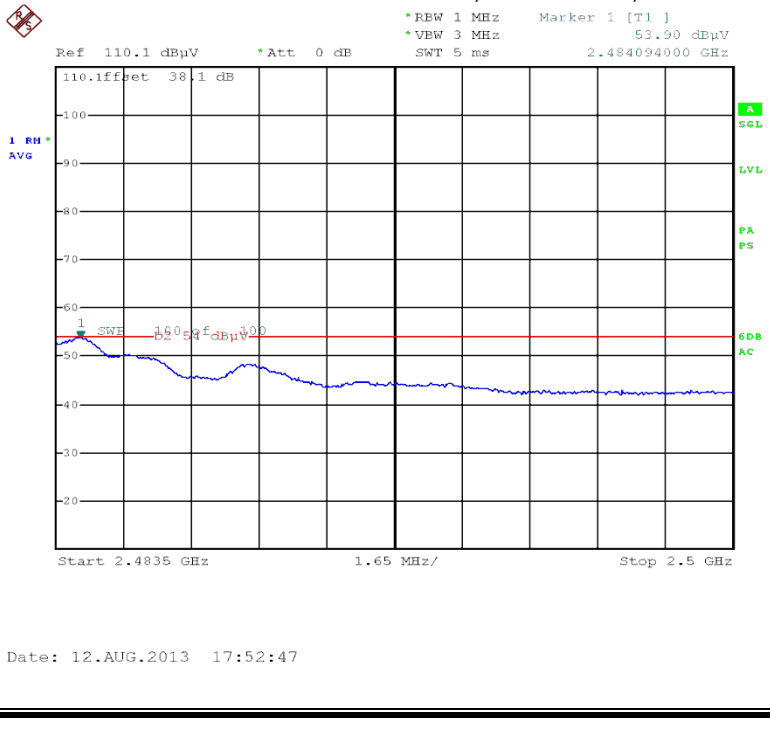
HIGH CHANNEL 12 RESTRICTED, AVERAGE, HORIZ



HIGH CHANNEL 12 RESTRICTED, PEAK, VERT

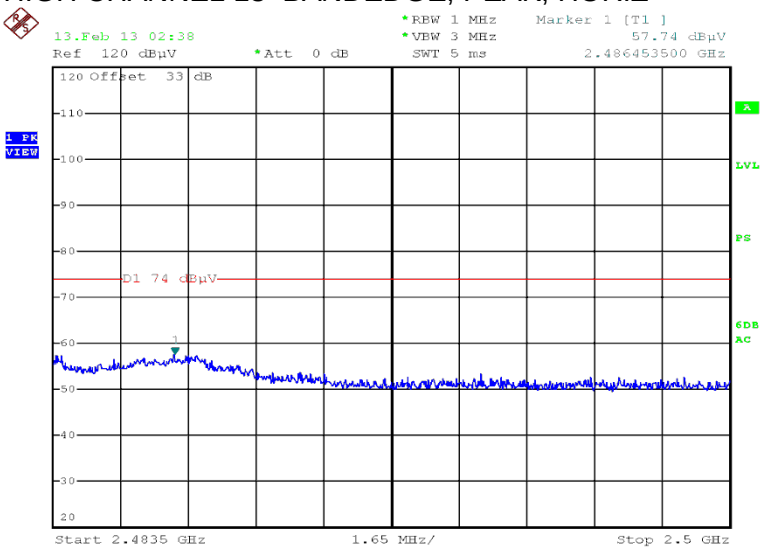


HIGH CHANNEL 12 RESTRICTED, AVERAGE, VERT



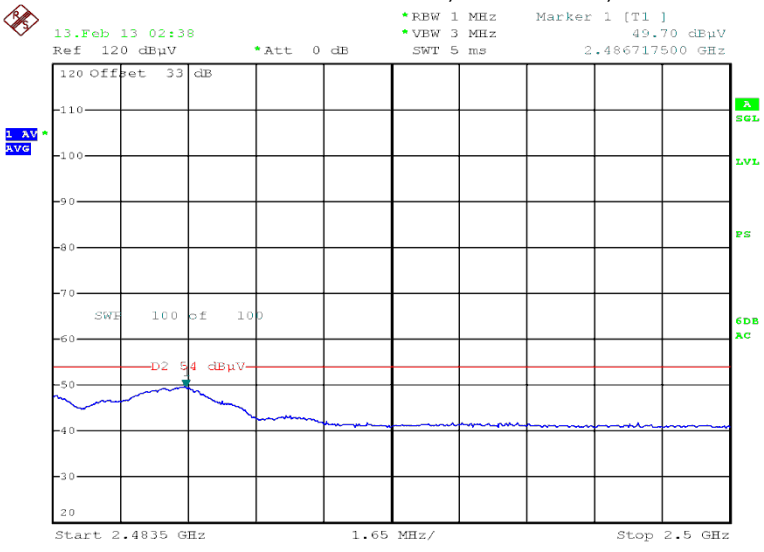
AUTHORIZED BANDEDGE (HIGH CHANNEL 13)

HIGH CHANNEL 13 BANDEDGE, PEAK, HORIZ



Date: 13.FEB.2013 02:38:45

HIGH CHANNEL 13 BANDEDGE, AVERAGE, HORIZ



Date: 13.FEB.2013 02:38:08

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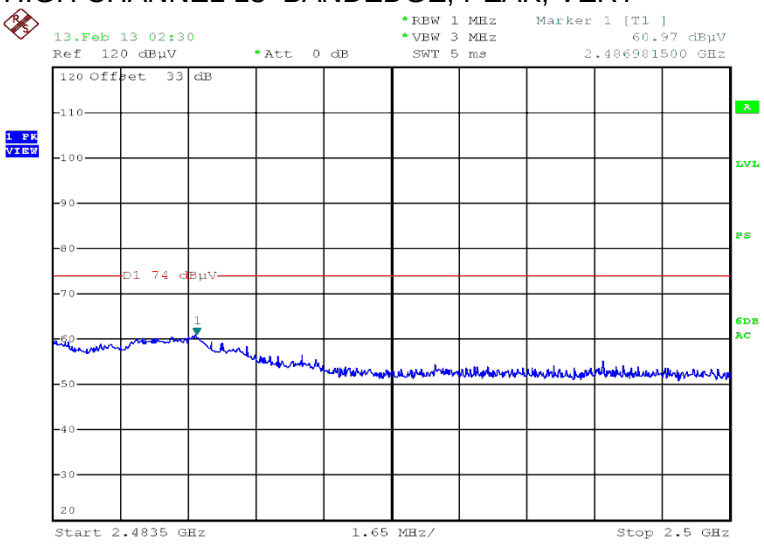
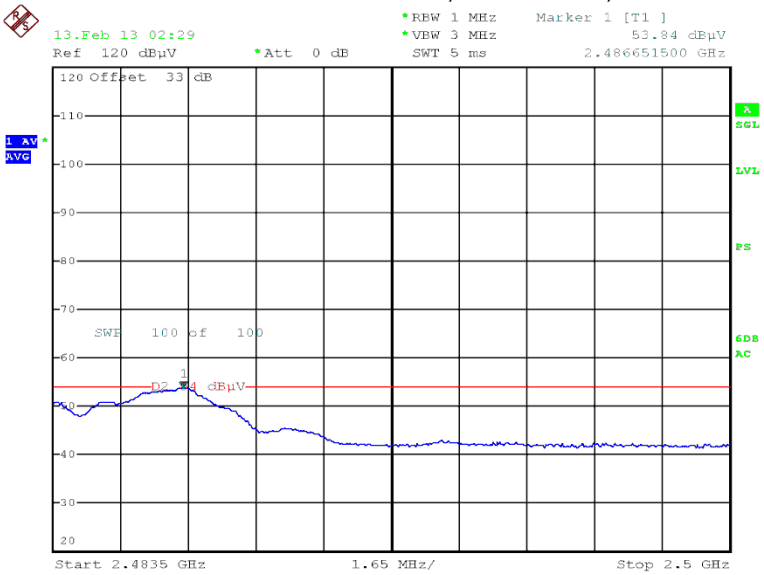


Date: 13.FEB.2013 02:30:35

HIGH CHANNEL 13 BANDEDGE, AVERAGE, VERT

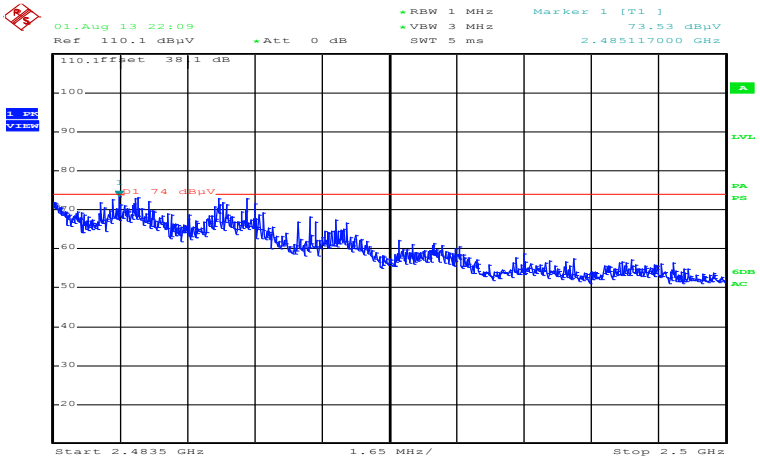


Date: 13.FEB.2013 02:29:12

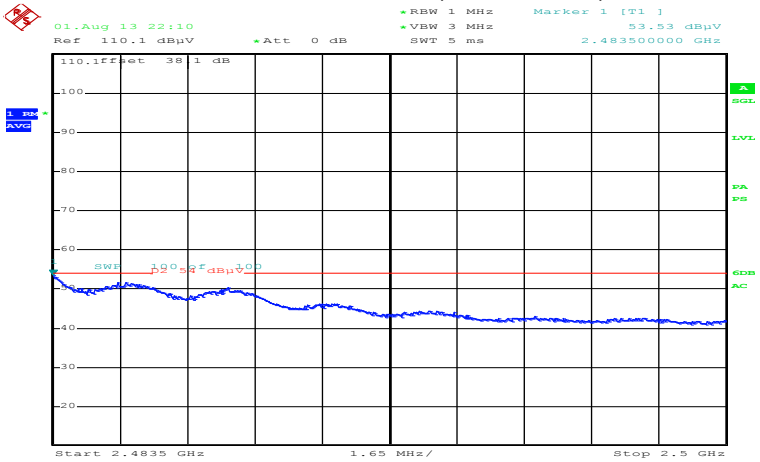
11.4.2. 802.11n HT20 CDD 3TX MODE, 2.4 GHz BAND

AUTHORIZED RADIATED BANDEDGE (HIGH CHANNEL 12)

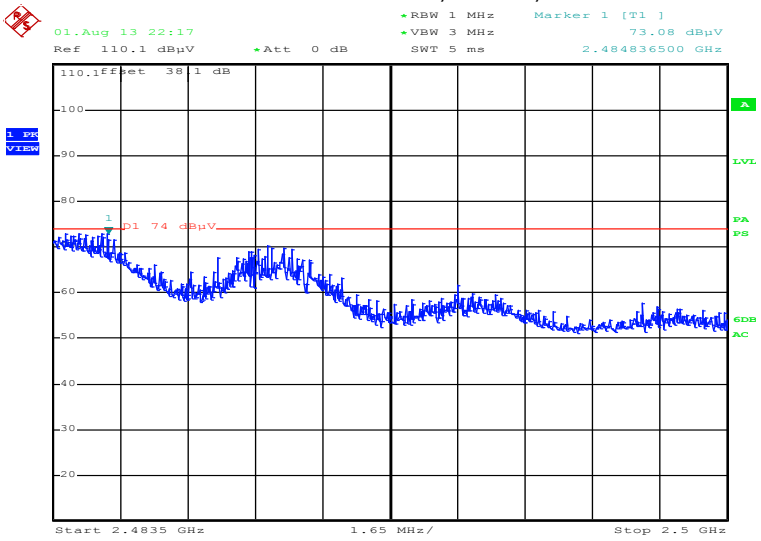
HIGH CHANNEL 12 BANDEDGE, PEAK, HORIZ



HIGH CHANNEL 12 BANDEDGE, AVERAGE, HORIZ

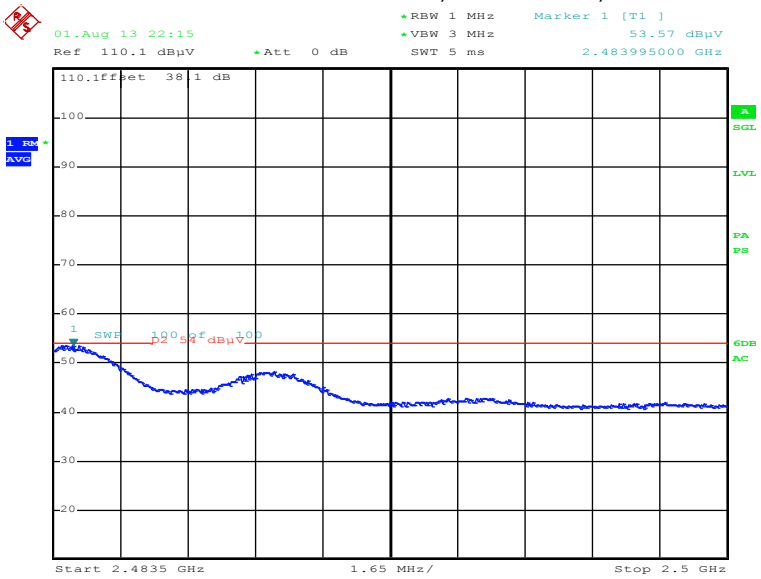


HIGH CHANNEL 12 BANDEDGE, PEAK, VERT



Date: 1.AUG.2013 22:17:26

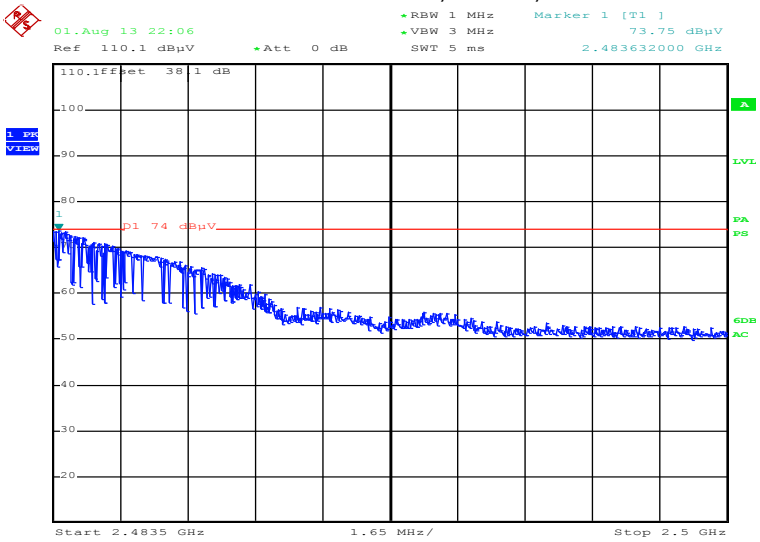
HIGH CHANNEL 12 BANDEDGE, AVERAGE, VERT



Date: 1.AUG.2013 22:15:52

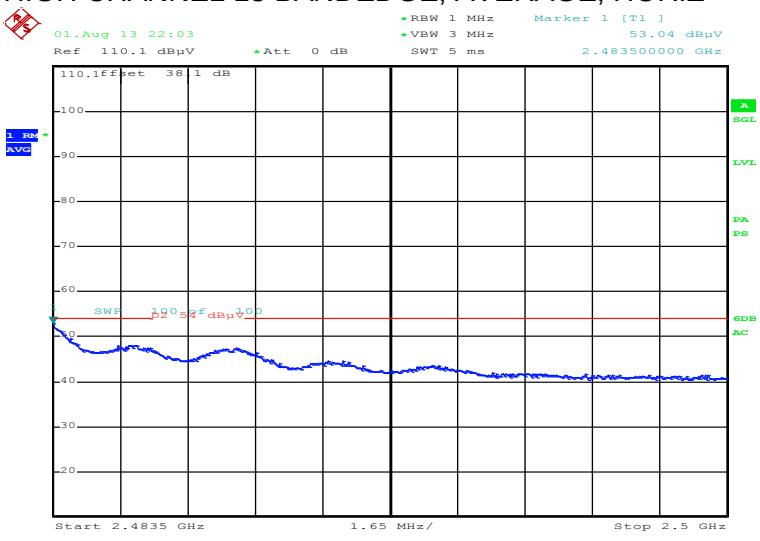
AUTHORIZED RADIATED BANDEDGE (HIGH CHANNEL 13)

HIGH CHANNEL 13 BANDEDGE, PEAK, HORIZ



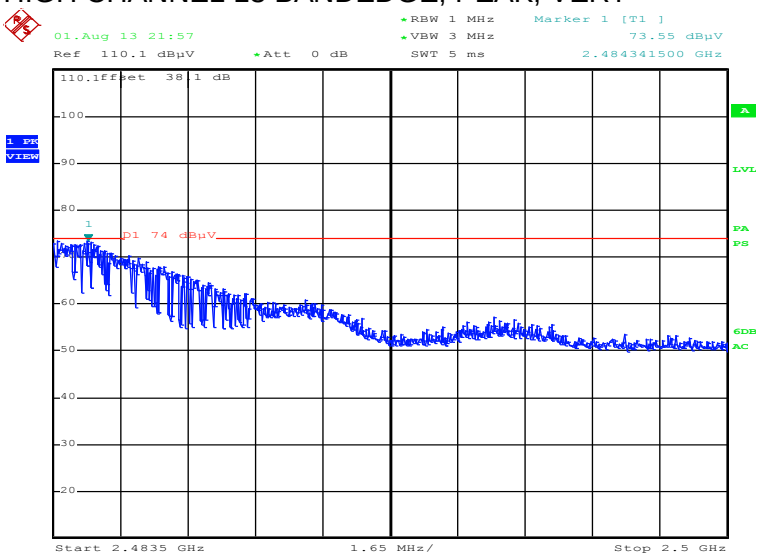
Date: 1.AUG.2013 22:06:38

HIGH CHANNEL 13 BANDEDGE, AVERAGE, HORIZ



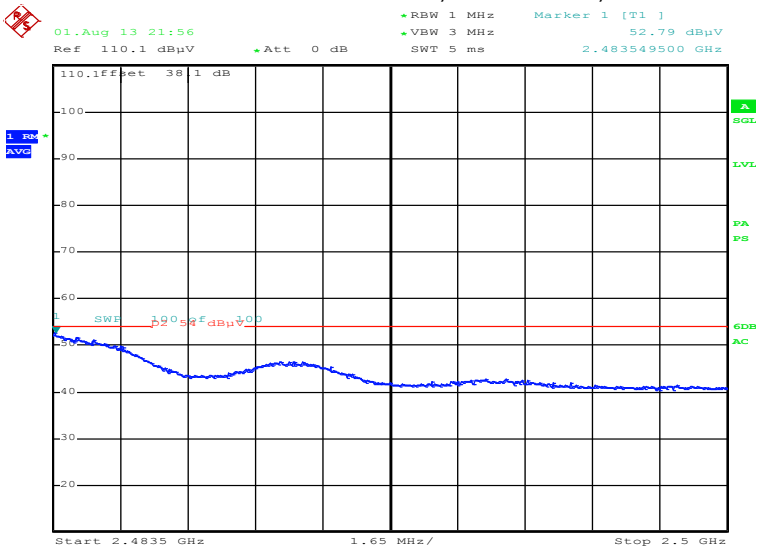
Date: 1.AUG.2013 22:03:51

HIGH CHANNEL 13 BANDEDGE, PEAK, VERT



Date: 1.AUG.2013 21:57:54

HIGH CHANNEL 13 BANDEDGE, AVERAGE, VERT

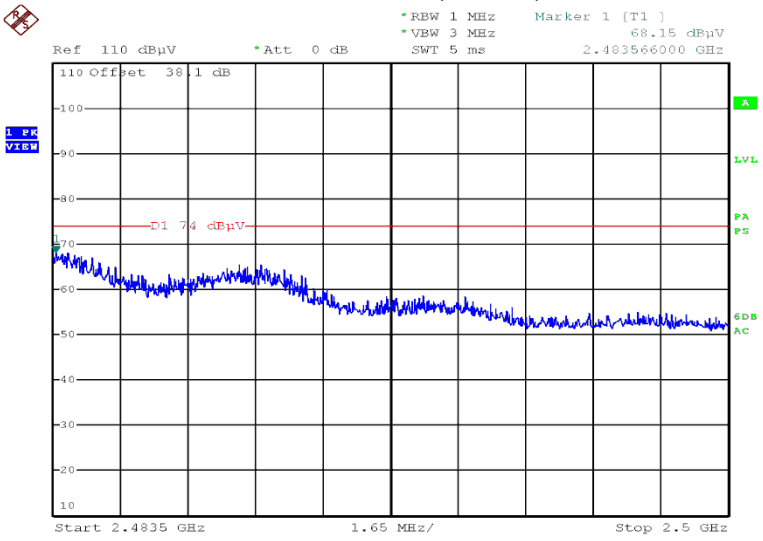


Date: 1.AUG.2013 21:56:59

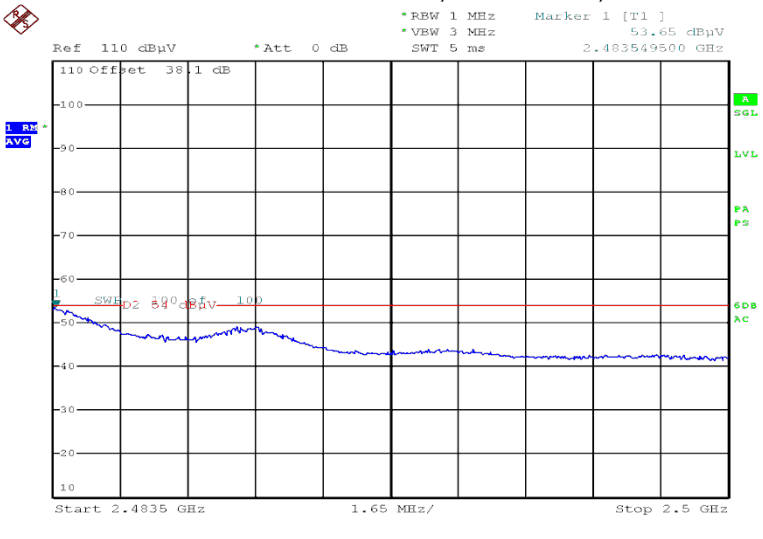
11.4.3. 802.11ac VHT20 3TX BF MODE, 2.4 GHz BAND

AUTHORIZED BANDEDGE (HIGH CHANNEL 12)

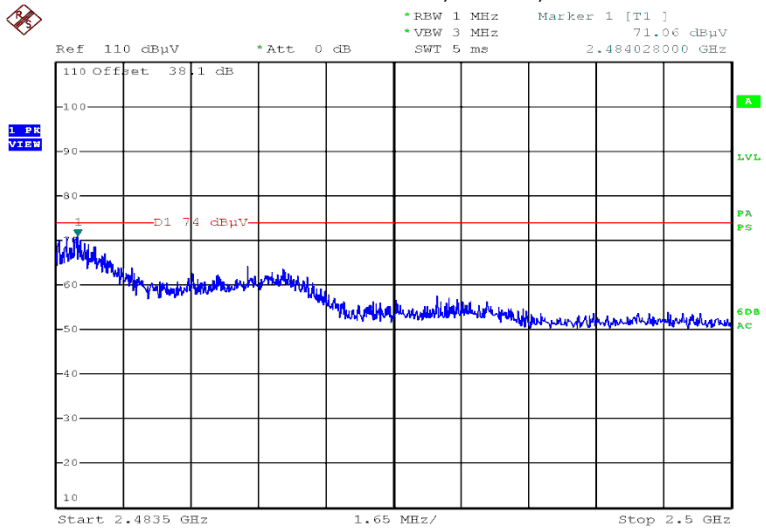
HIGH CHANNEL 12 BANDEDGE, PEAK, HORIZ



HIGH CHANNEL 12 BANDEDGE, AVERAGE, HORIZ

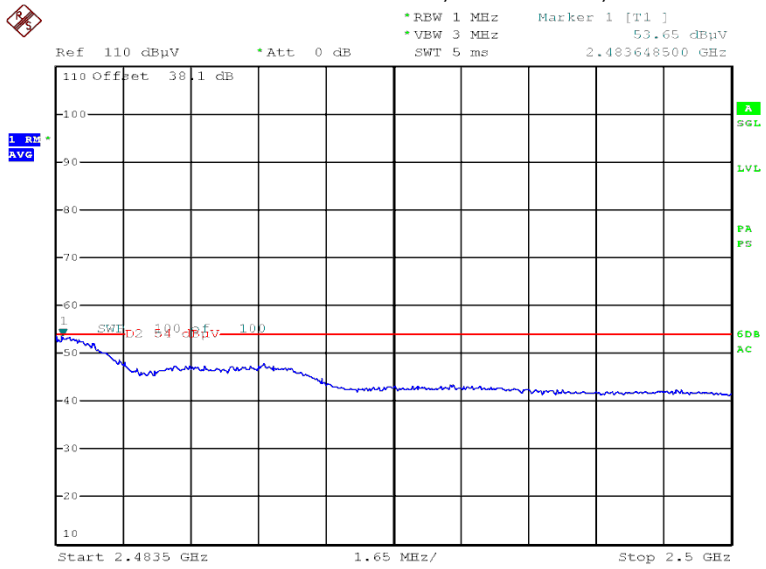


HIGH CHANNEL 12 BANDEDGE, PEAK, VERT



Date: 7.AUG.2013 22:16:39

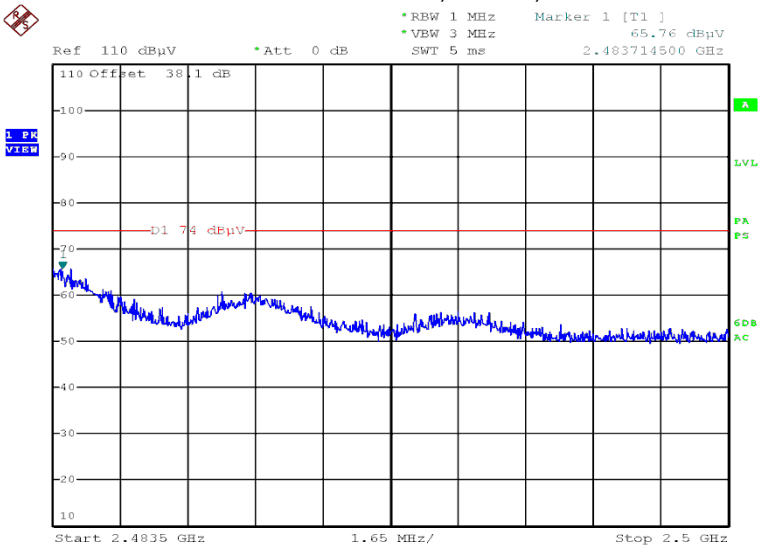
HIGH CHANNEL 12 BANDEDGE, AVERAGE, VERT



Date: 7.AUG.2013 22:15:45

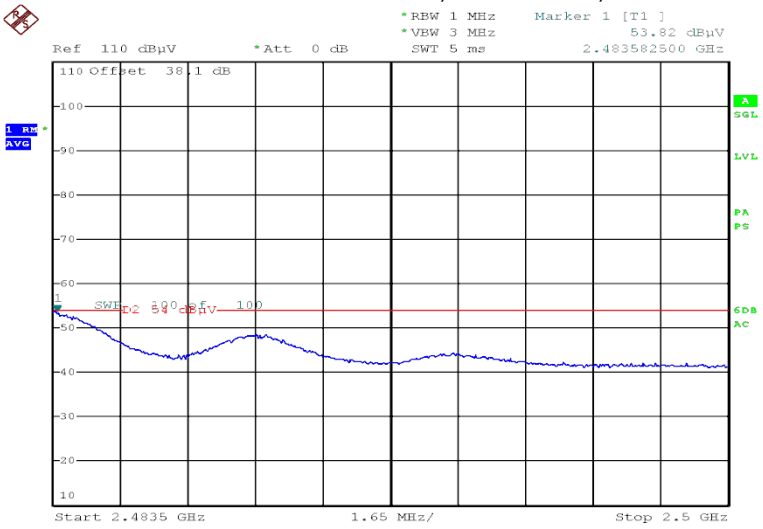
AUTHORIZED BANDEDGE (HIGH CHANNEL 13)

HIGH CHANNEL 13 BANDEDGE, PEAK, HORIZ



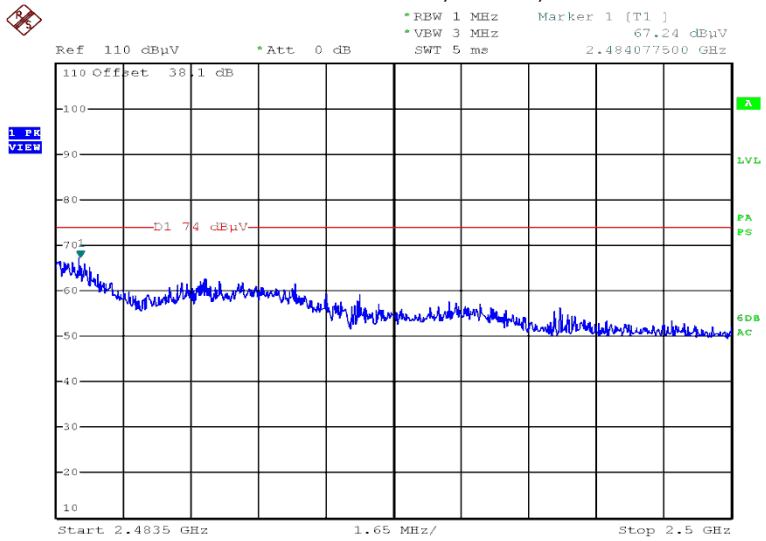
Date: 7.AUG.2013 22:05:16

HIGH CHANNEL 13 BANDEDGE, AVERAGE, HORIZ



Date: 7.AUG.2013 22:03:40

HIGH CHANNEL 13 BANDEDGE, PEAK, VERT



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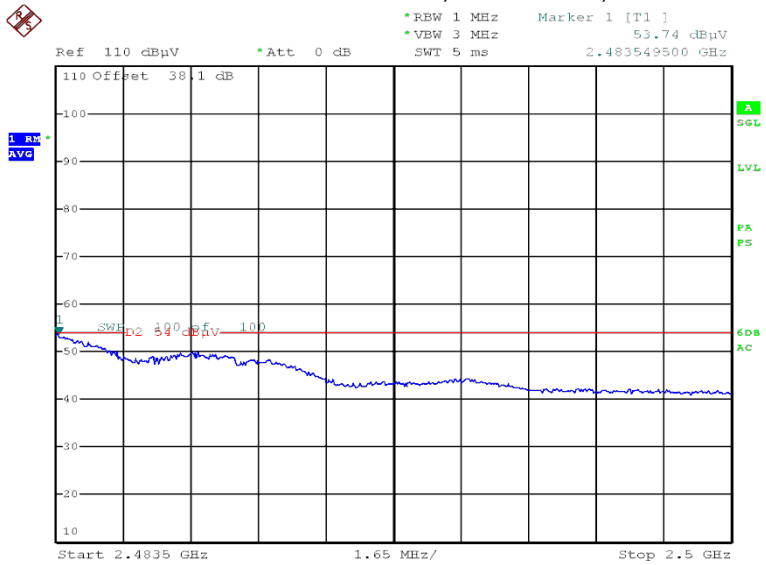
HIGH CHANNEL 13 BANDEDGE, AVERAGE, VERT



Date: 7.AUG.2013 22:12:27

END OF REPORT