FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

SMART WATCH with 802.11b/g/n, Bluetooth and BLE

MODEL NUMBER: SAR8A80

FCC ID: 2AB8ZND11

IC: 1000X-ND11

REPORT NUMBER: 15U21865-E3V2

ISSUE DATE: OCTOBER 16, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	10/13/2015	Initial Issue	C. Pang
V2	10/16/2015	Add Channel 12 and 13	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: INTEL CORPORATION
2200 MISSION COLLEGE BOULEVARD
SANTA CLARA, CA 95052, U.S.A.

EUT DESCRIPTION: SMART WATCH with 802.11b/g/n, Bluetooth and BLE

MODEL: SAR8A80

SERIAL NUMBER: GLDPD1FZ535008P(Conducted);
GLDPD1FZ535009V(Radiated)

DATE TESTED: September 30th – October 16th 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

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

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

Approved & Released For
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WiSE PROJECT LEADER
UL VERIFICATION SERVICES INC.

Tested By:

CLIFFORD SUSA
EMC ENGINEER
UL VERIFICATION SERVICES INC.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 4, RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

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

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

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

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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
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a smart watch with SMART WATCH with 802.11b/g/n, Bluetooth and BLE

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2472	802.11b	15.68	36.98
2412 - 2472	802.11g	15.82	38.19
2412 - 2472	802.11n HT20	15.73	37.41

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a trace antenna, with a maximum gain of 0 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was DVT Eng. Build.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	Yoga 2 11	YB04282152	N/A
AC adapter	Lenovo	ADLX45NCC3A	11S45N0297Z1ZSH443G0XE	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	3-Prong	Un-Shielded	1.8	N/A
2	DC	1	DC	Un-Shielded	1	N/A
3	USB	1	USB	Un-Shielded	0.9	Laptop to EUT
4	Antenna	1	SMA	Shielded	0.3	EUT to spectrum Analyzer
5	AC/DC	1	USB Micro	Un-Shielded	0.9	

TEST SETUP

Test software exercised the radio card.

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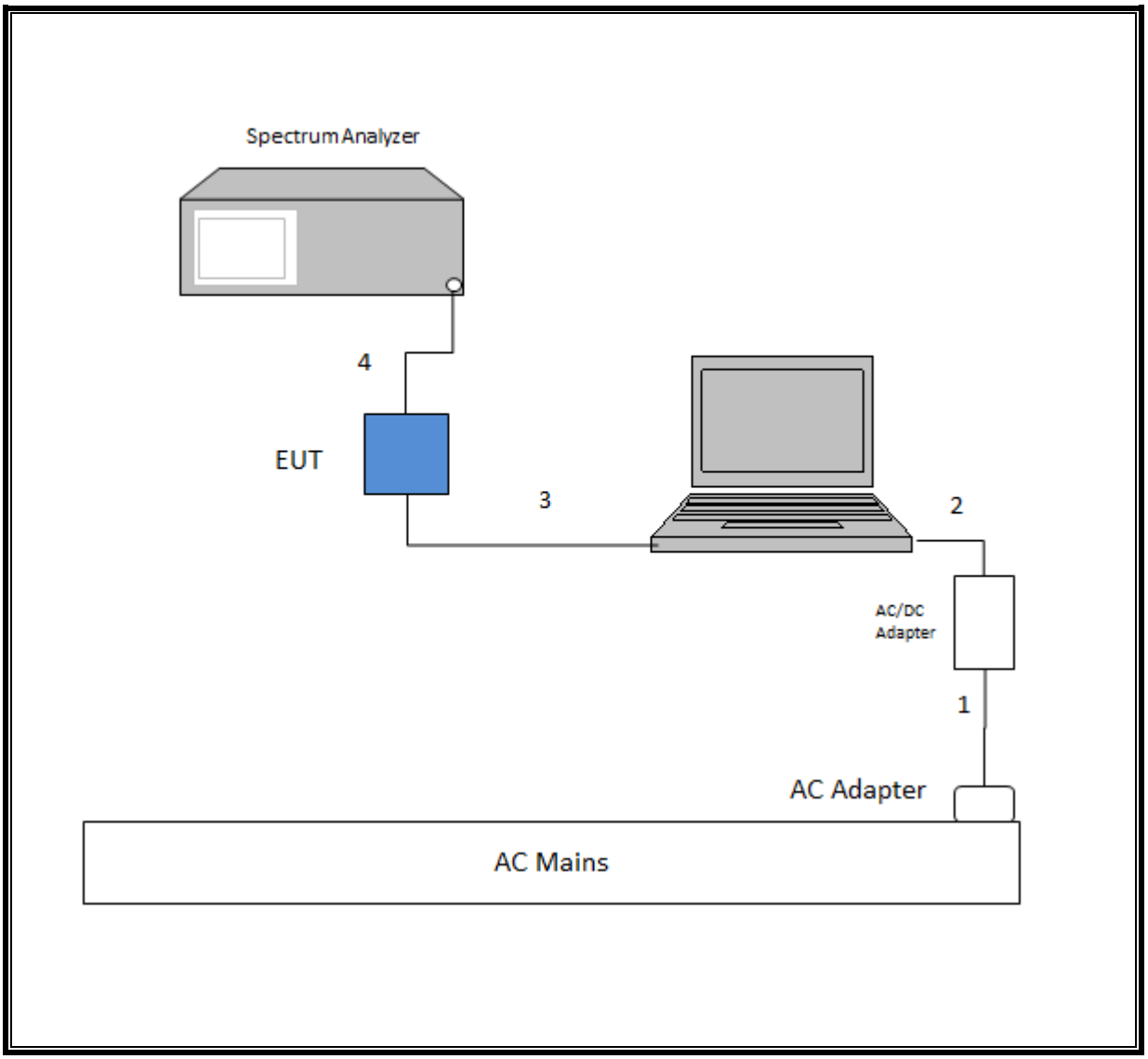
SETUP DIAGRAM FOR CONDUCTED TESTS



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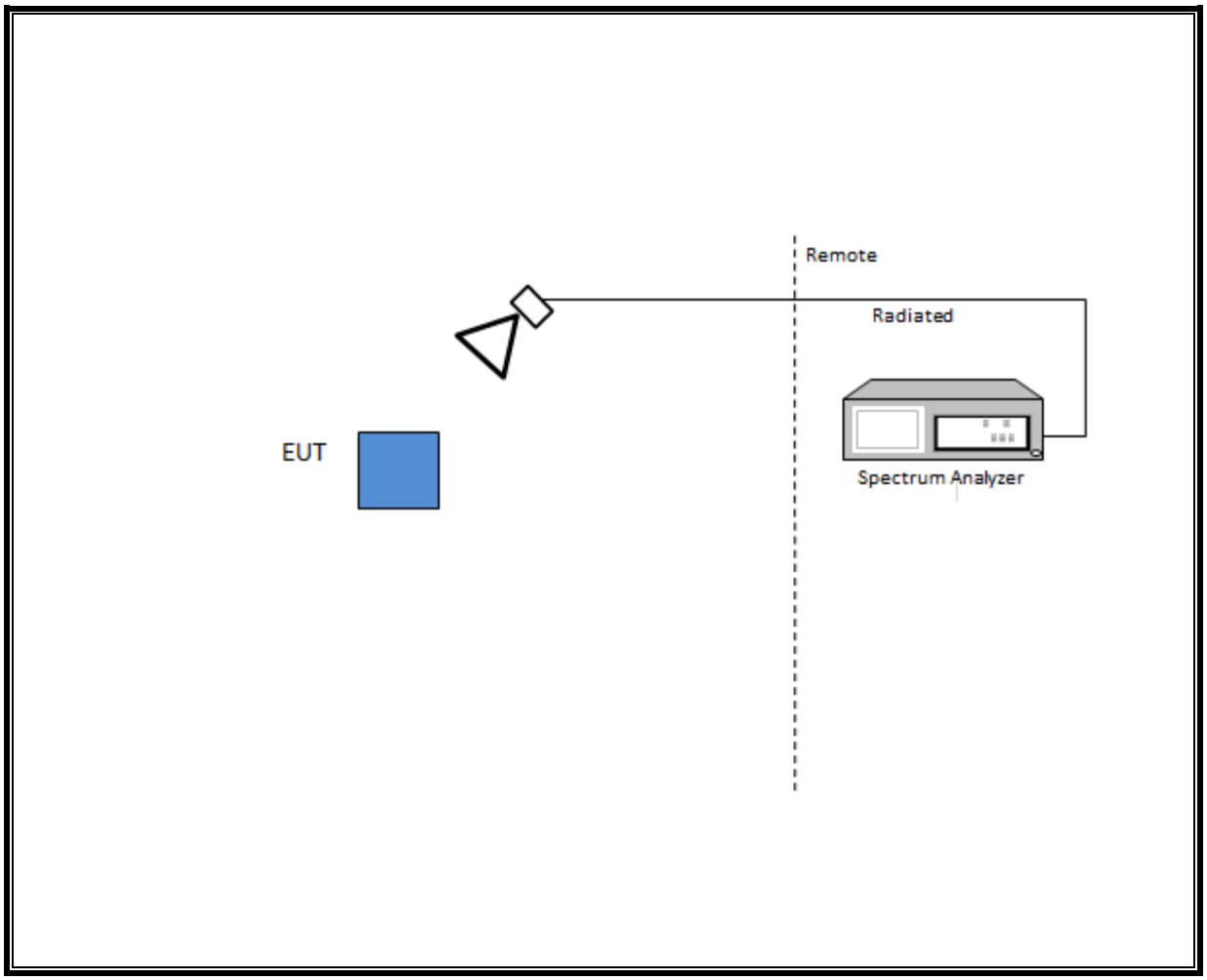
SETUP DIAGRAM FOR RADIATED TESTS



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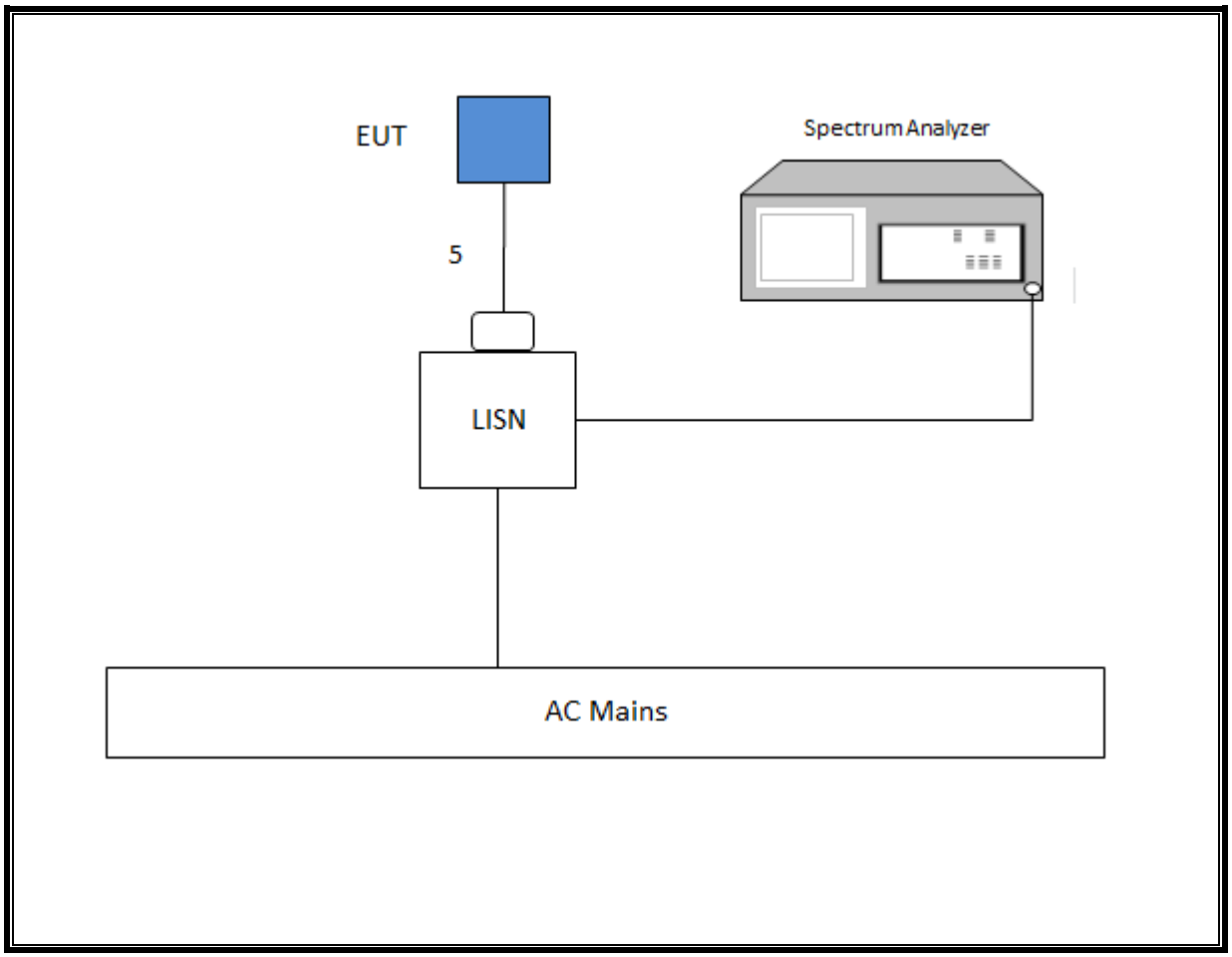
SETUP DIAGRAM 1 FOR LINE CONDUCTED TEST



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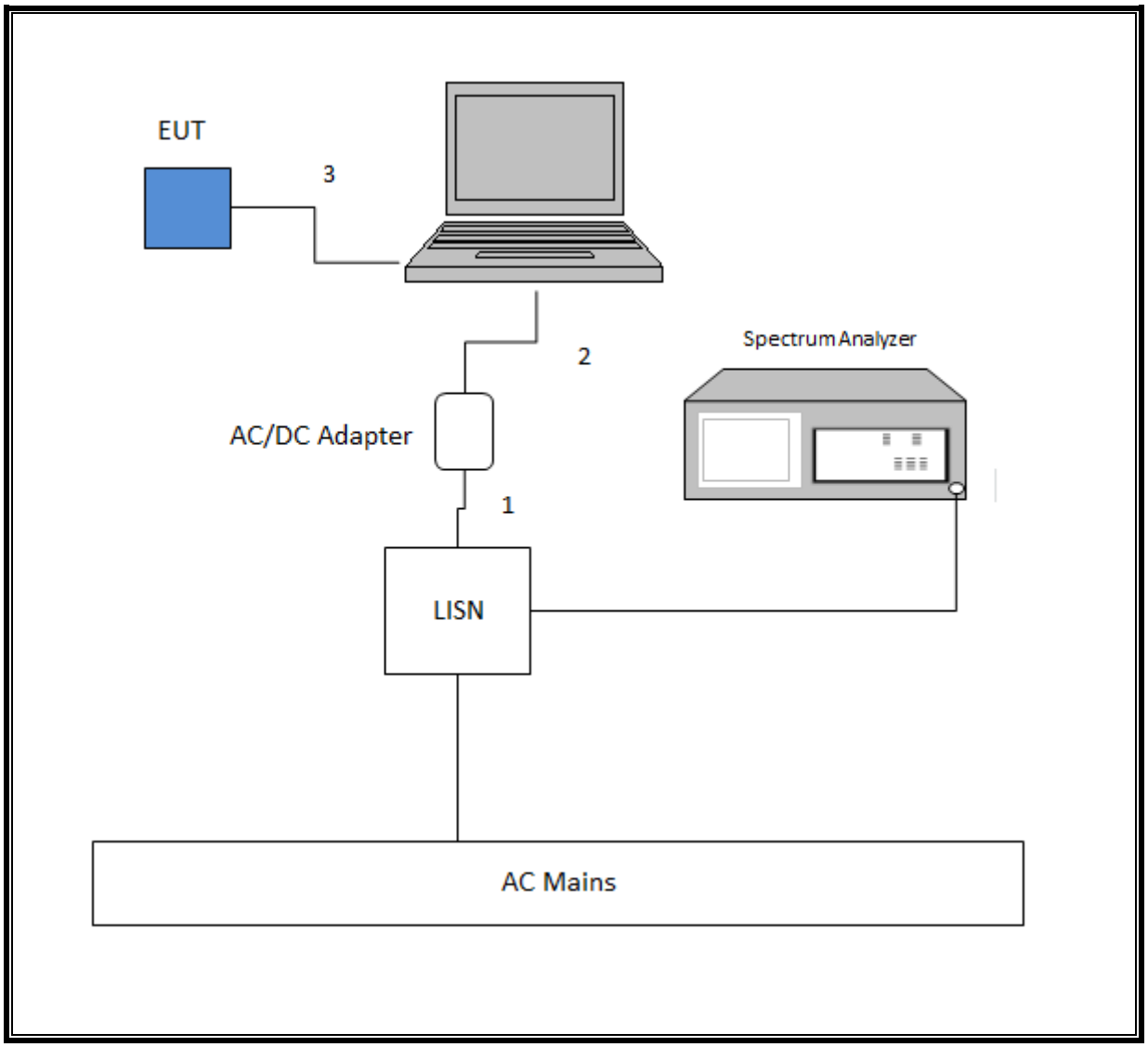
SETUP DIAGRAM 2 FOR LINE CONDUCTED TEST



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List					
Description	**Manufacturer**	**Model**	**T No.**	**Cal Date**	**Cal Due**
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015		
Conducted Software	UL	UL EMC	Ver 3.5		
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	342	06/29/15	06/29/16
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	905	06/16/15	05/26/16
Antenna, Horn 1-18GHz	ETS Lindgren	3117	862	04/10/15	04/10/16
Antenna, Broadband Hybrid, 30 to 2000MHz	Sunol Sciences	JB3	899	04/30/15	04/30/16
Filter, HPF, 3.0GHz	Micro-Tronics	HPM17543	898	04/25/15	04/25/16
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	491	04/25/15	04/25/16
Amplifier, 10kHz to 1GHz, 32dB	Sonoma	310N	834	06/08/15	06/08/16
Power Meter	Keysight	N1911A	1244	07/02/15	07/02/16
Power Sensor	Keysight	N1921A	1228	07/06/15	07/06/16
EMI Test Receiver 9Khz-7GH	Rohde & Schwarz	ESCI7	212	08/07/15	08/07/16
LISN for Conducted Emissio	FCC	50/250-25-2	114	01/16/15	01/16/16
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	123	10/28/14	10/28/15

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7. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r03, Section 8.1.

Output Power: KDB 558074 D01 v03r03, Section 9.2.3.1.

Power Spectral Density: KDB 558074 D01 v03r03, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r03, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r03, Section 12.1.

Band-edge: KDB 558074 D01 v03r03, Section 12.1

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.11b 1TX	8.600	8.701	0.988	98.84%	0.00	0.010
802.11g 1TX	1.425	1.526	0.934	93.38%	0.30	0.702
802.11n HT20 1TX	1.336	1.438	0.929	92.91%	0.32	0.749

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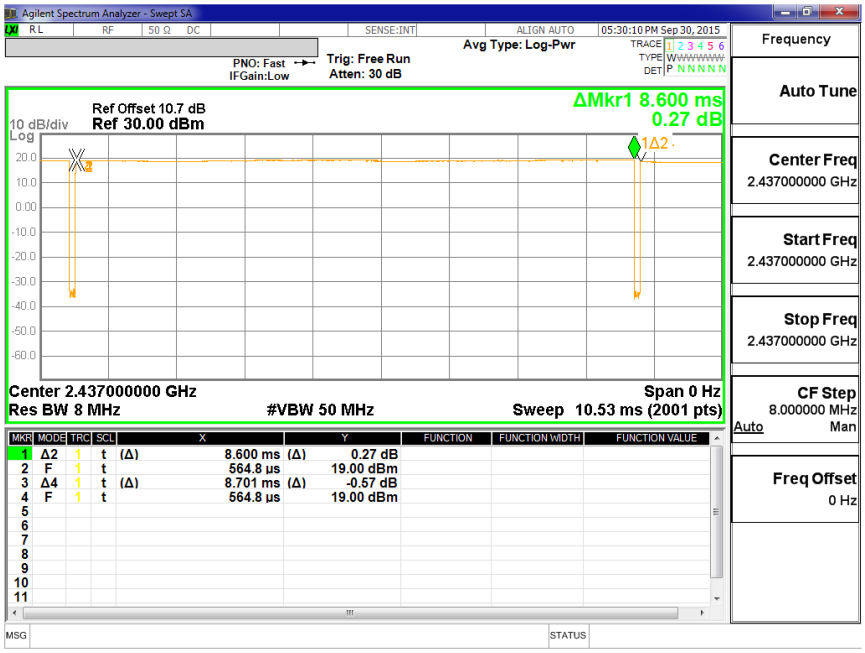
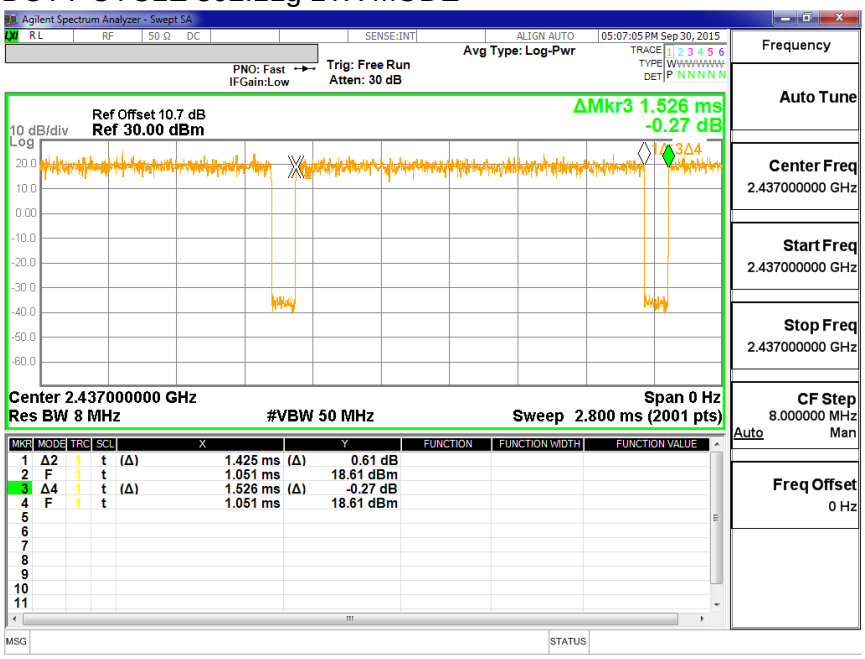
DUTY CYCLE PLOTS

DUTY CYCLE 802.11b 1TX MODE



DUTY CYCLE 802.11g 1TX MODE



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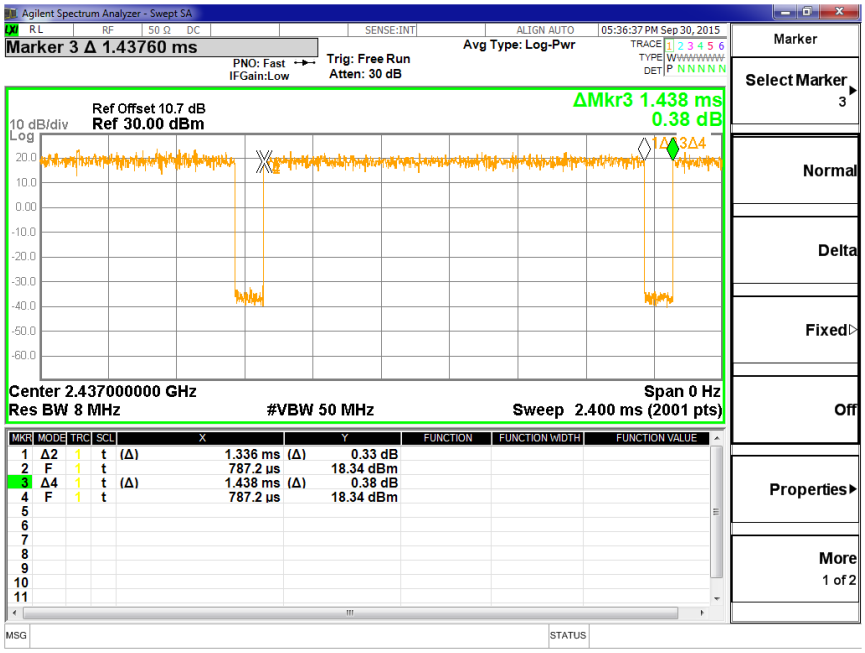
DUTY CYCLE 802.11n HT20 1TX MODE



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8.2. 802.11b MODE IN THE 2.4 GHz BAND

8.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	9.058	0.5
Mid	2437	9.058	0.5
High	2462	9.072	0.5
13	2472	9.030	0.5

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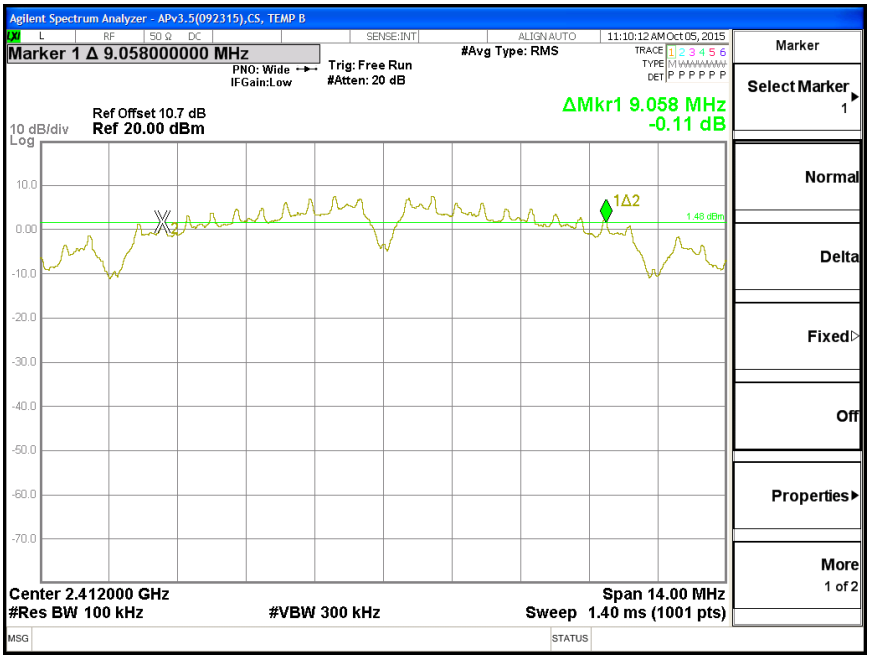
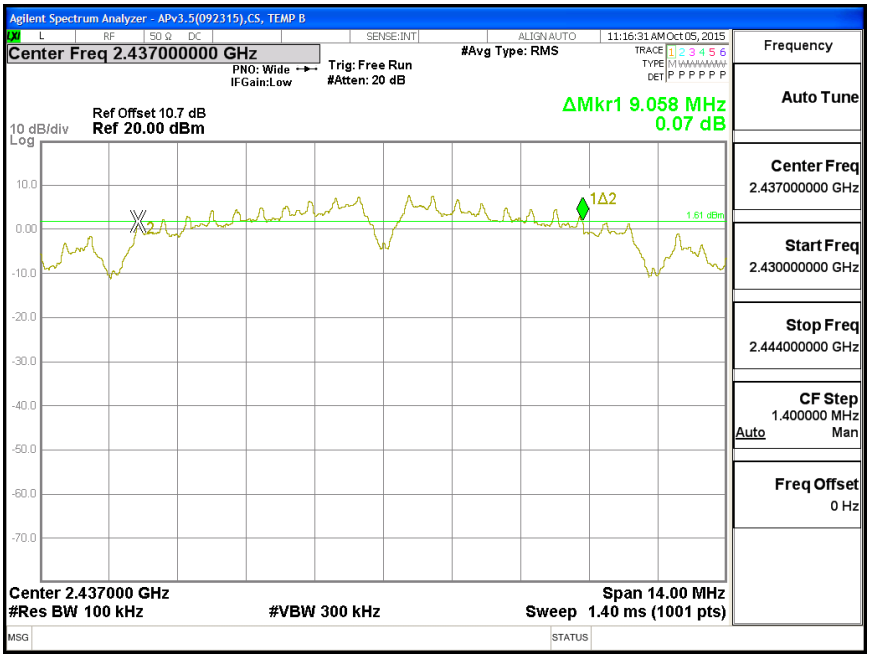
6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



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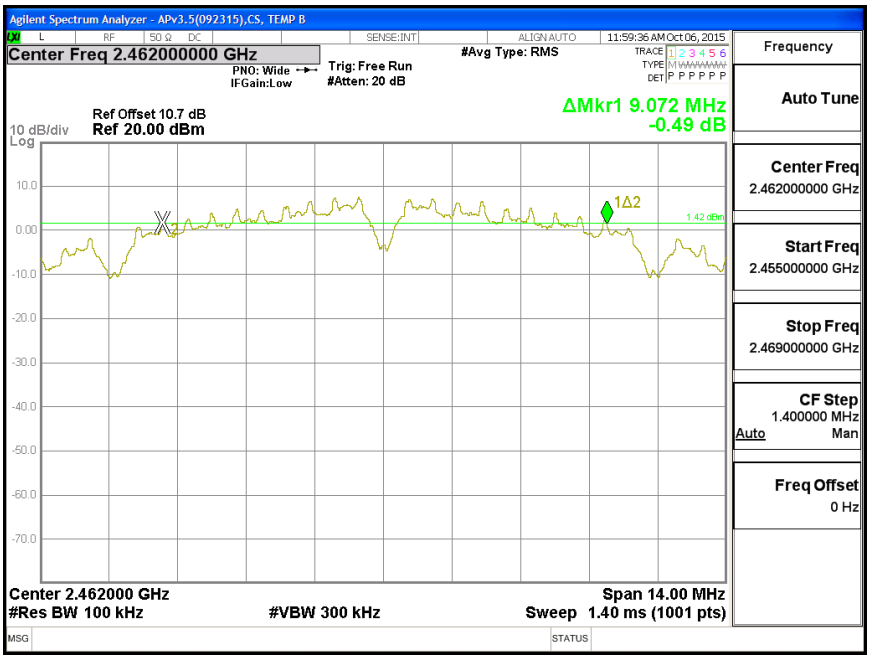
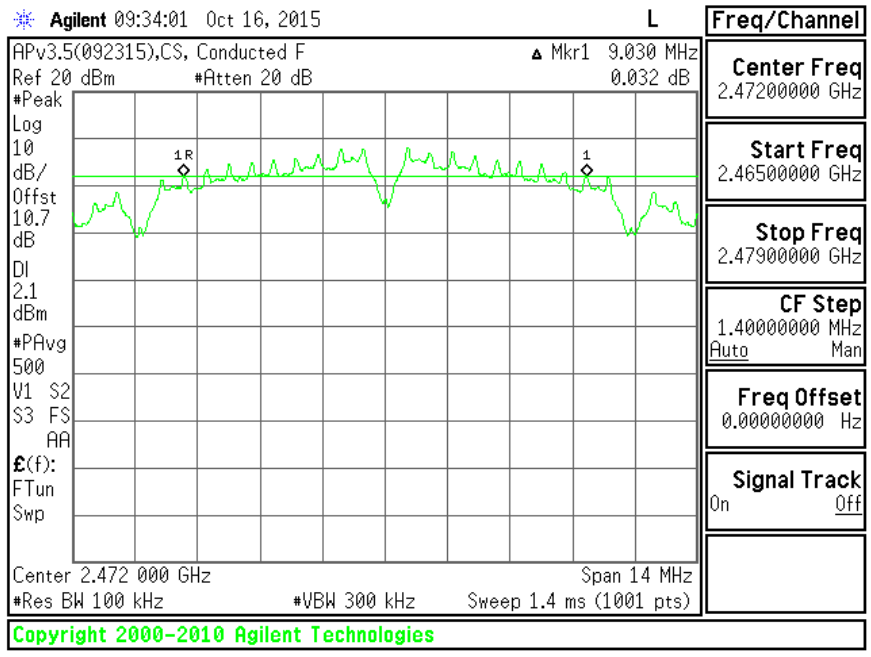
6 dB BANDWIDTH HIGH CH



6 dB BANDWIDTH HIGH CH



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8.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.937
Mid	2437	14.280
High	2462	14.250
13	2472	14.039

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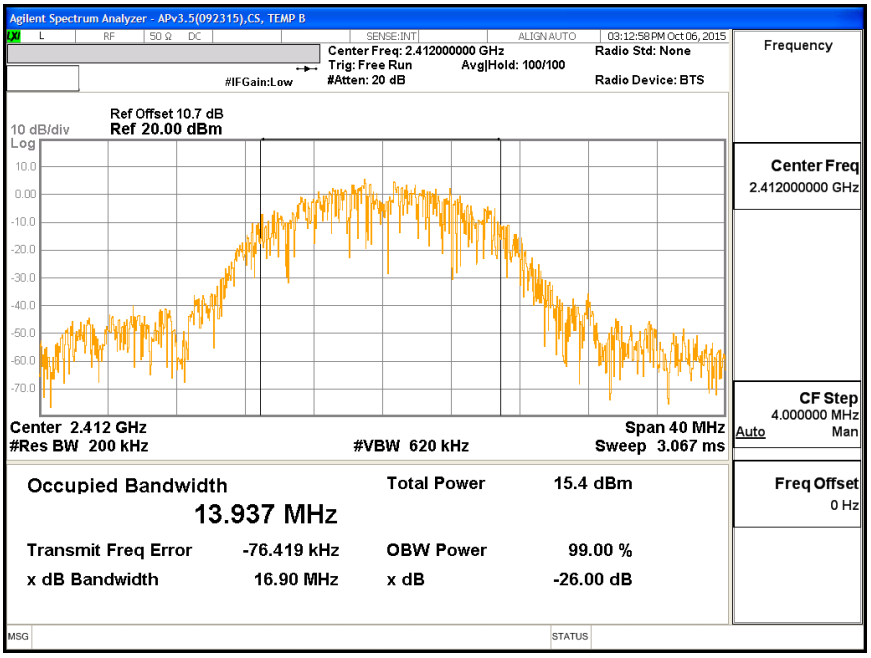
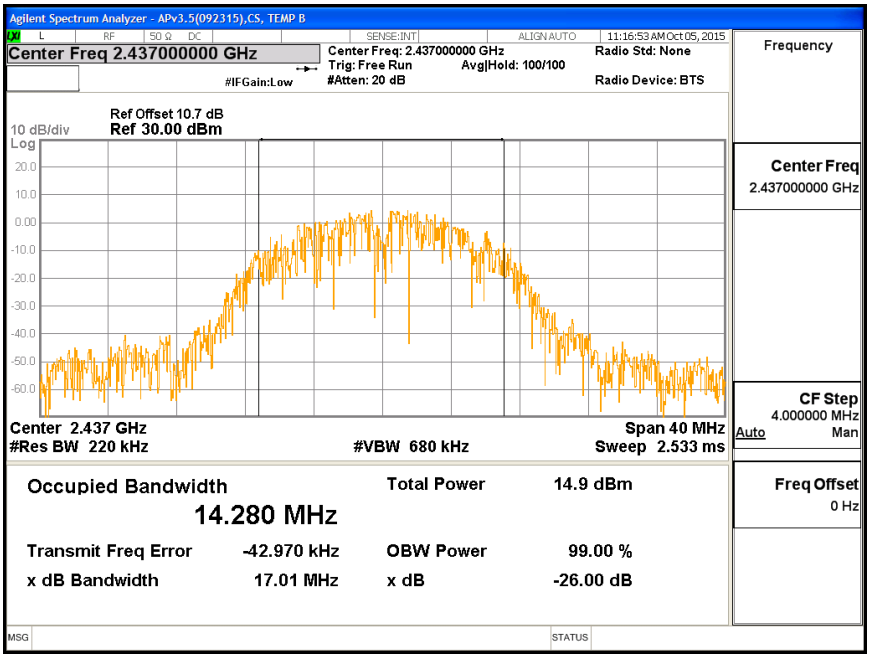
99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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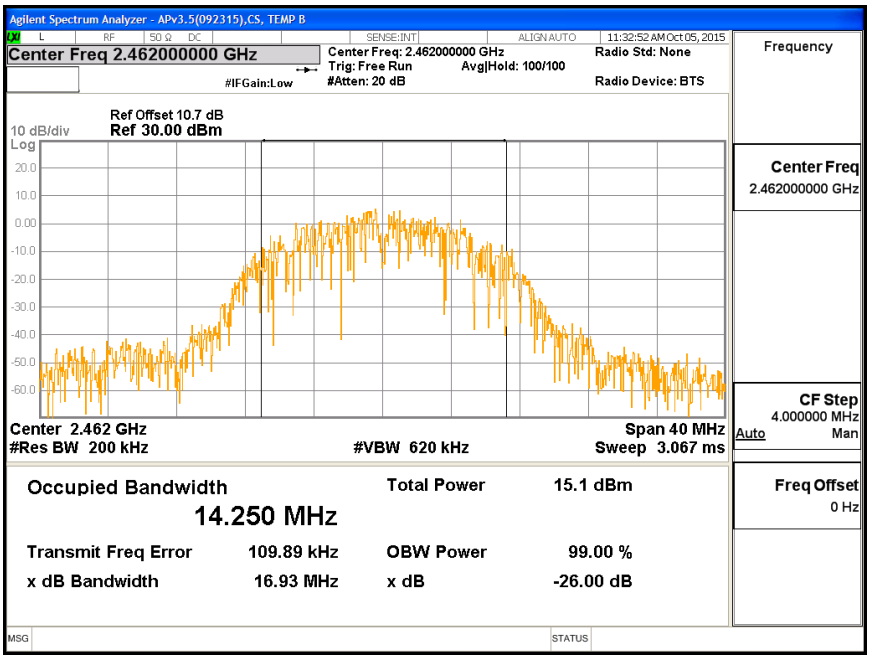
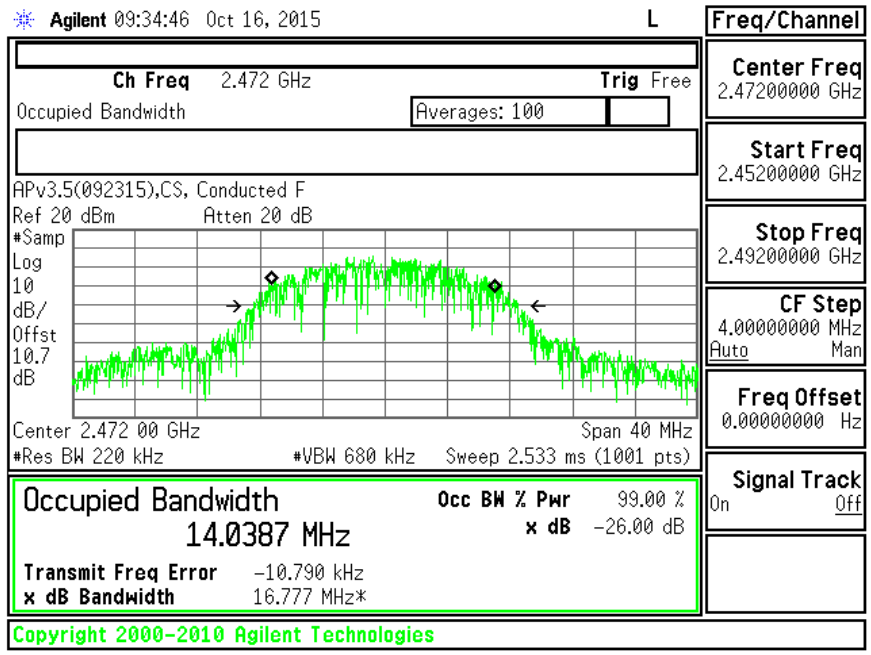
BANDWIDTH HIGH CH



BANDWIDTH HIGH CH



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8.2.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (4)

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

DIRECTIONAL ANTENNA GAIN

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

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RESULTS

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00
High	2472	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.61	15.61	30.00	-14.39
Mid	2437	15.55	15.55	30.00	-14.45
High	2462	15.57	15.57	30.00	-14.43
13	2472	15.68	15.68	30.00	-14.32

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8.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

RESULTS

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-5.80	-5.80	8.0	-13.8
Mid	2437	-5.47	-5.47	8.0	-13.5
High	2462	-6.28	-6.28	8.0	-14.3
13	2472	-5.90	-5.90	8.0	-13.9

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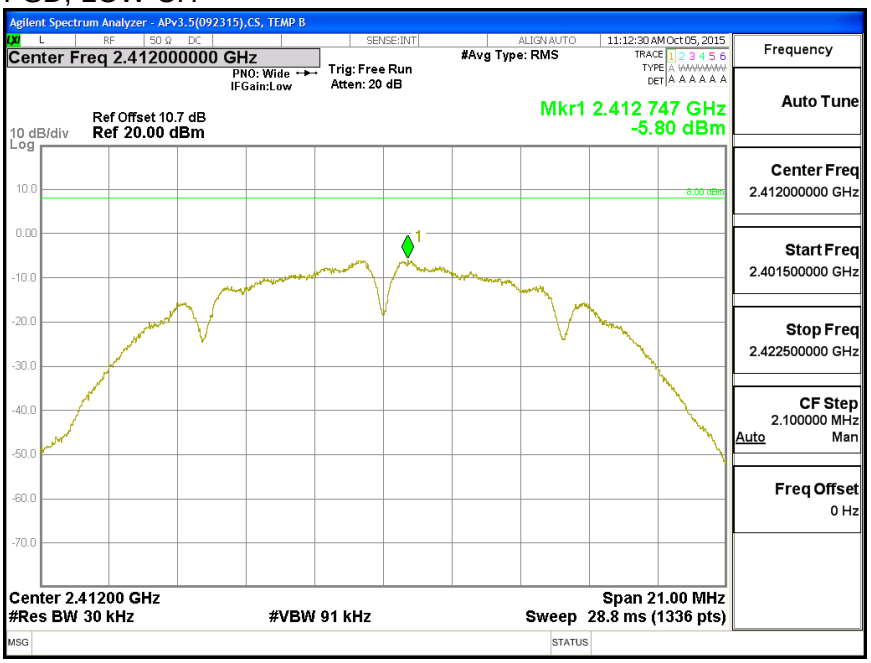
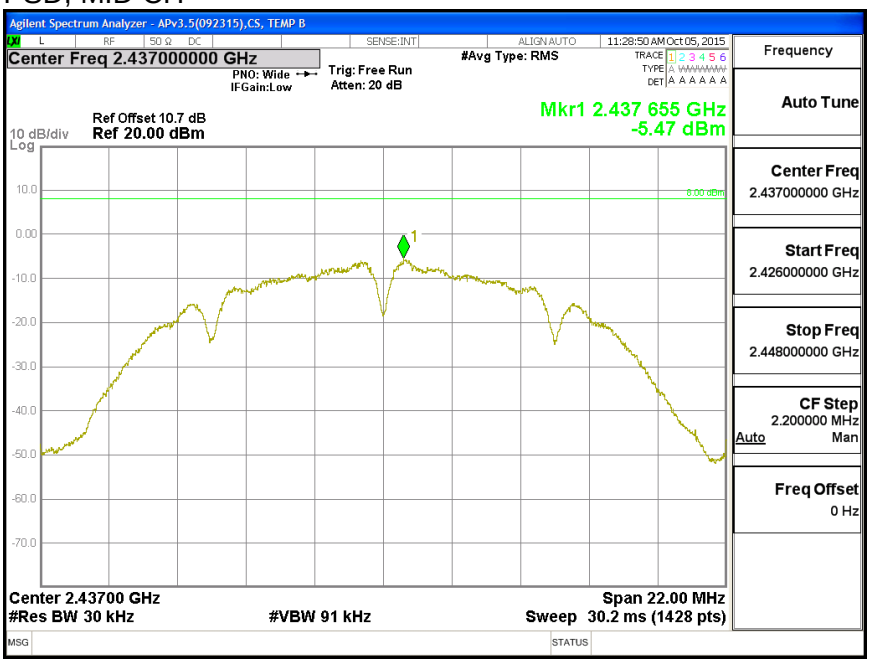
PSD

PSD, LOW CH



PSD, MID CH



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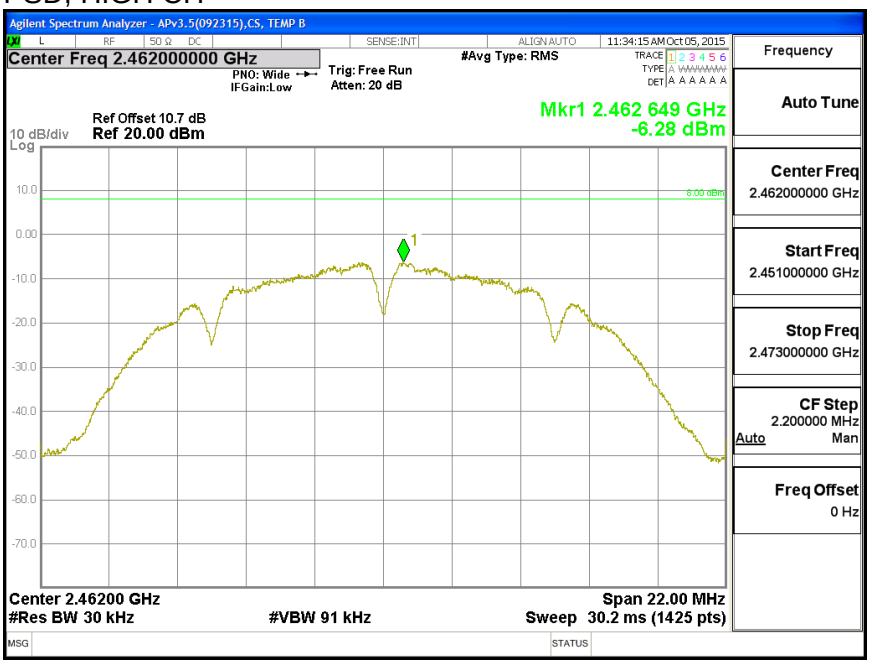
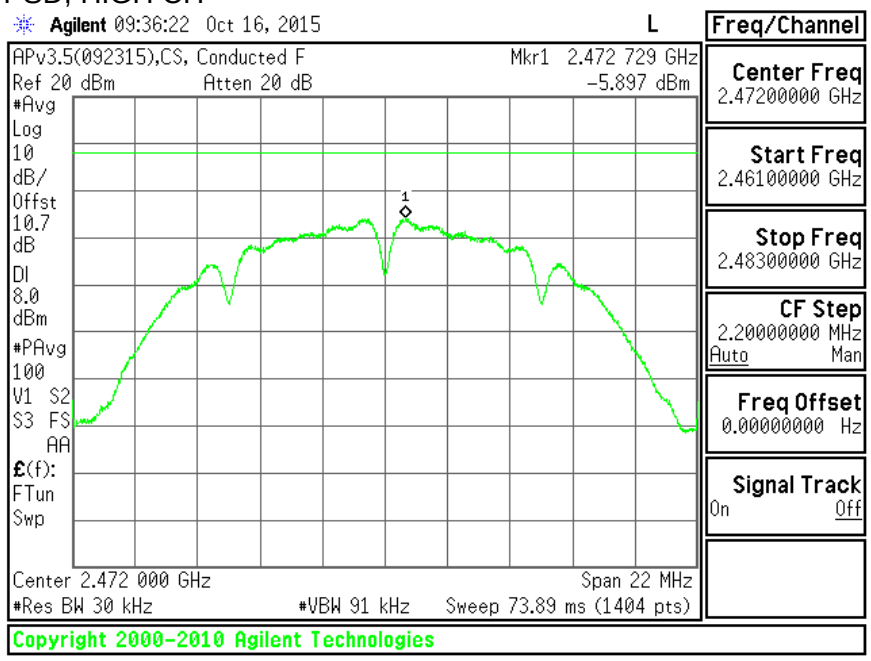
PSD, HIGH CH



PSD, HIGH CH



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8.2.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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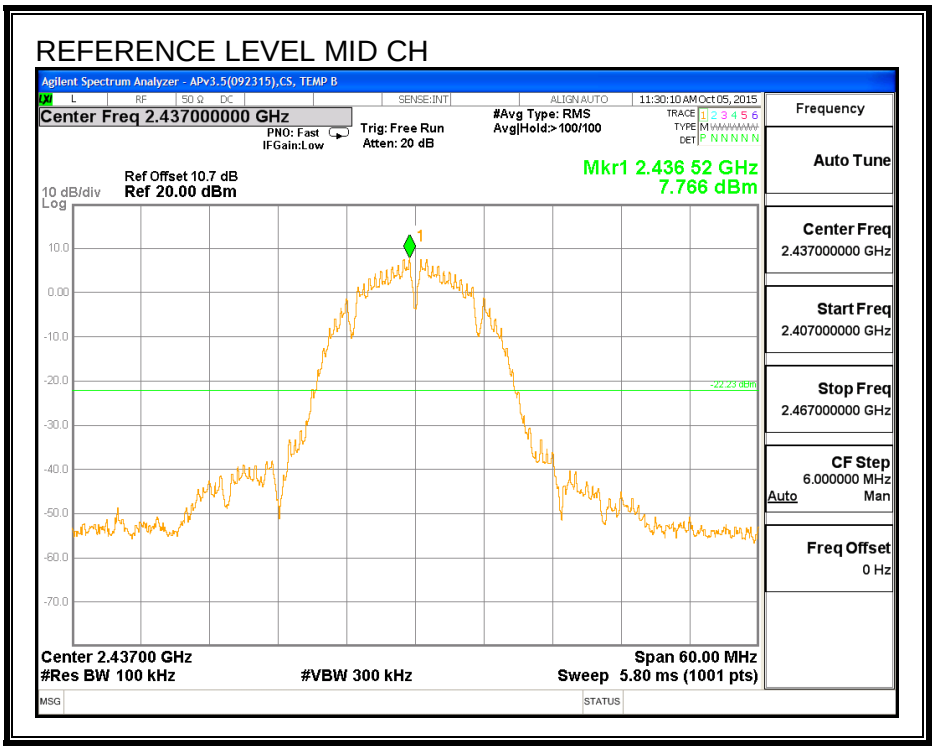
IN-BAND REFERENCE LEVEL



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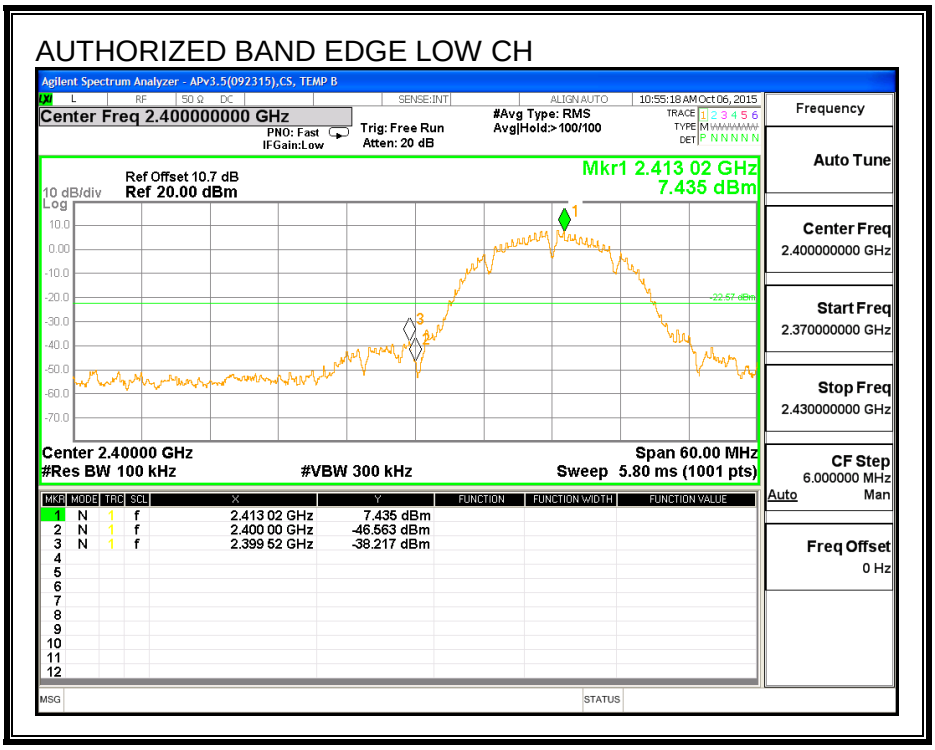
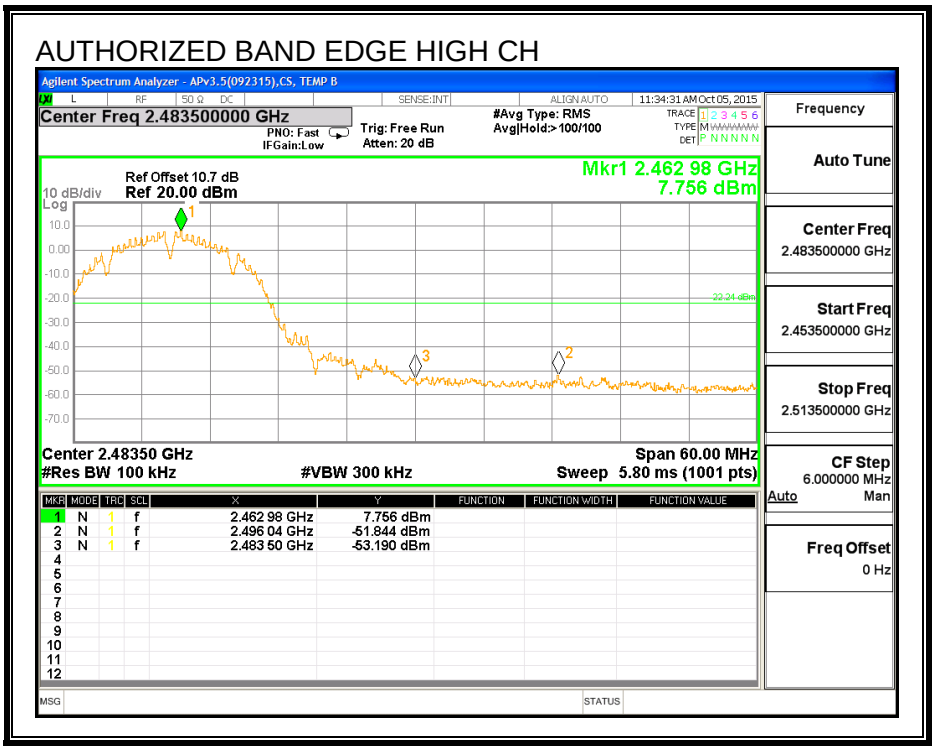
LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



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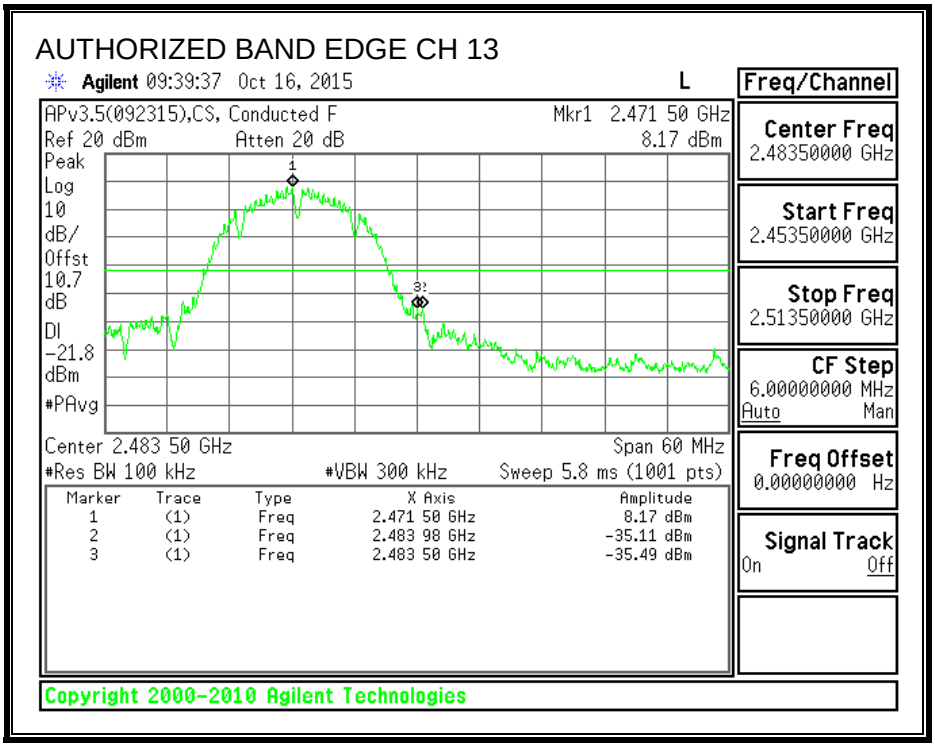
CHANNEL 13 BANDEDGE



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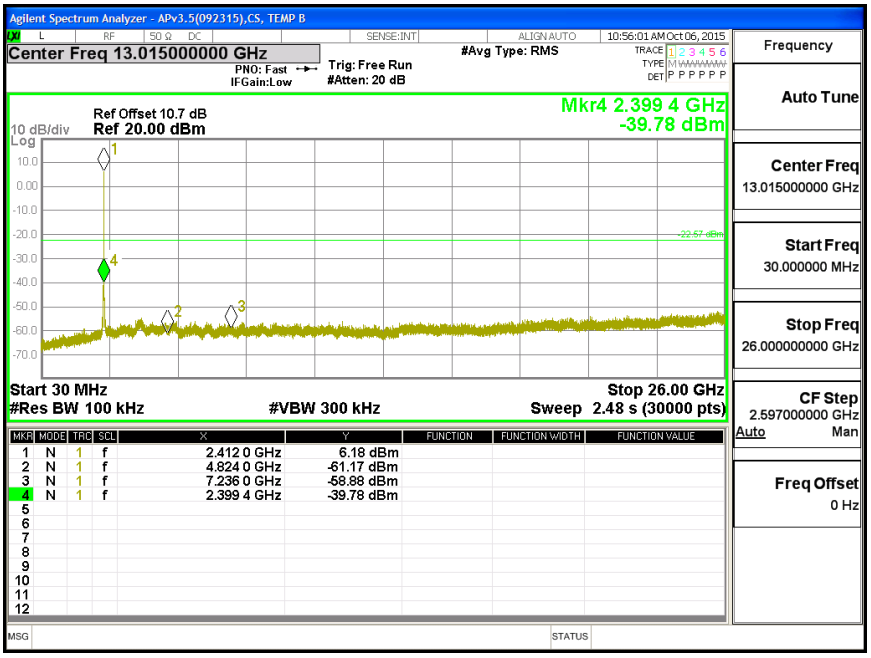
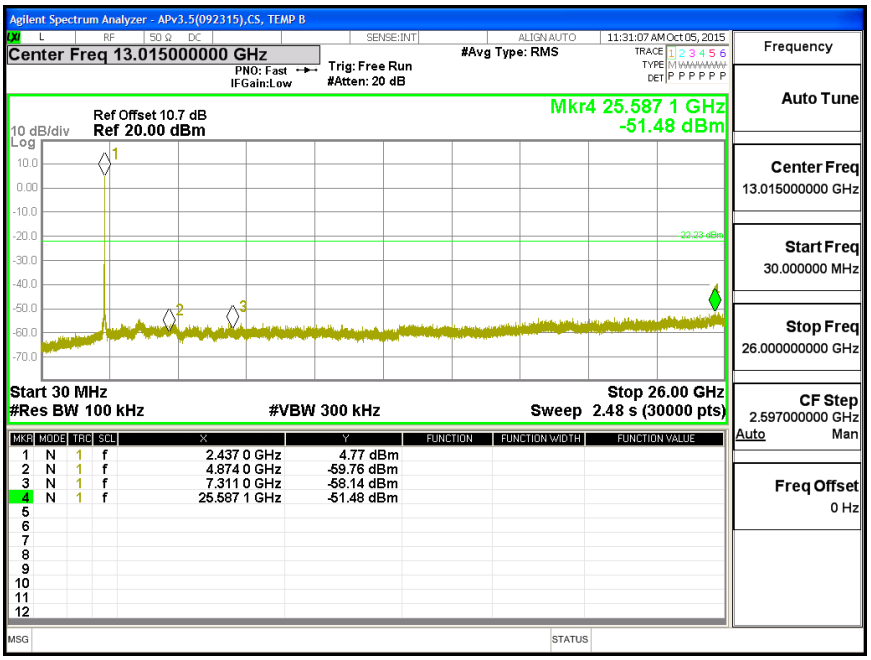
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH



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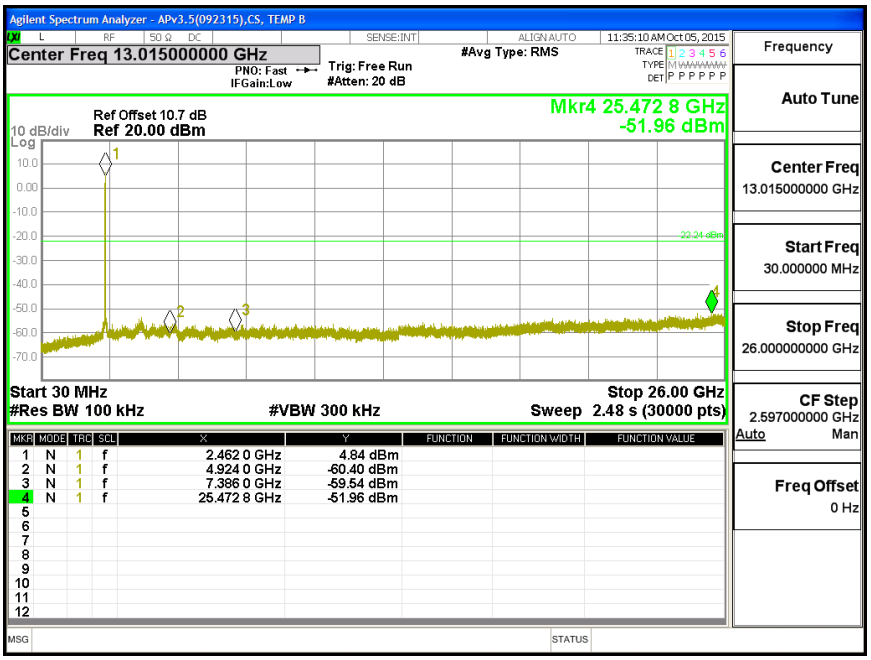
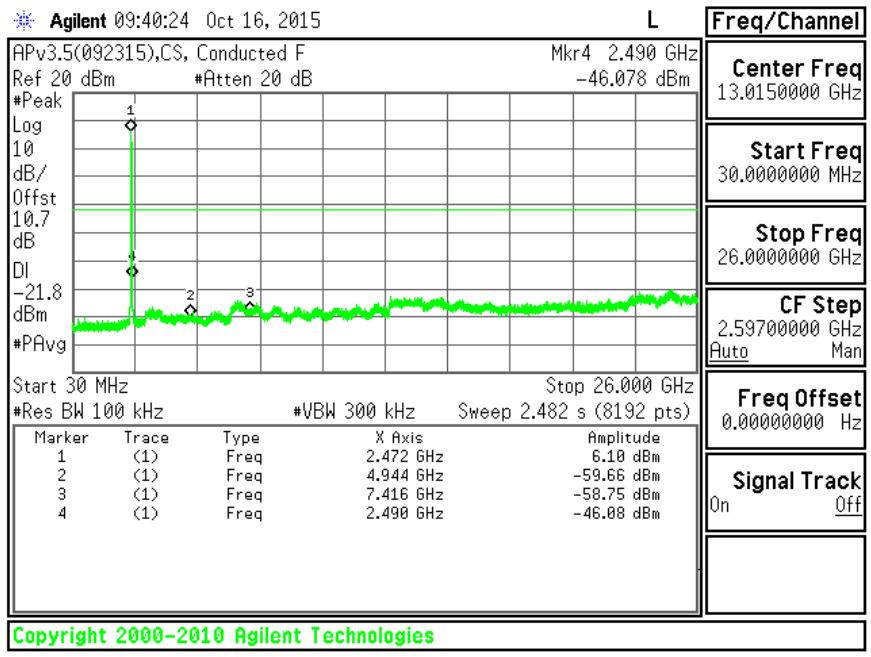
OUT OF BAND HIGH CH



OUT OF BAND CH 13



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8.3. 802.11g MODE IN THE 2.4 GHz BAND

8.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (1)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.111	0.5
Mid	2437	15.134	0.5
High	2462	15.134	0.5
12	2467	15.111	0.5
13	2472	15.111	0.5

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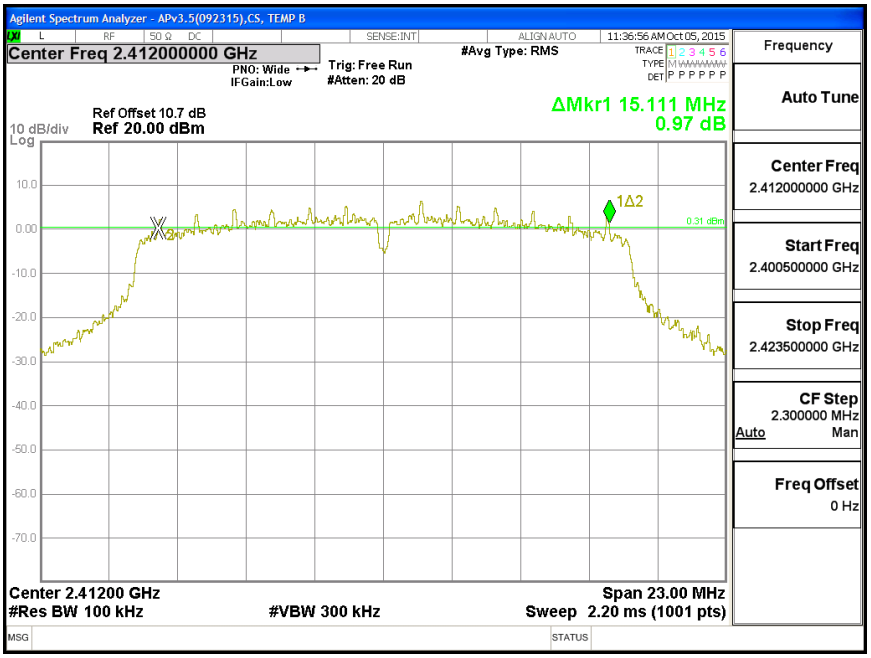
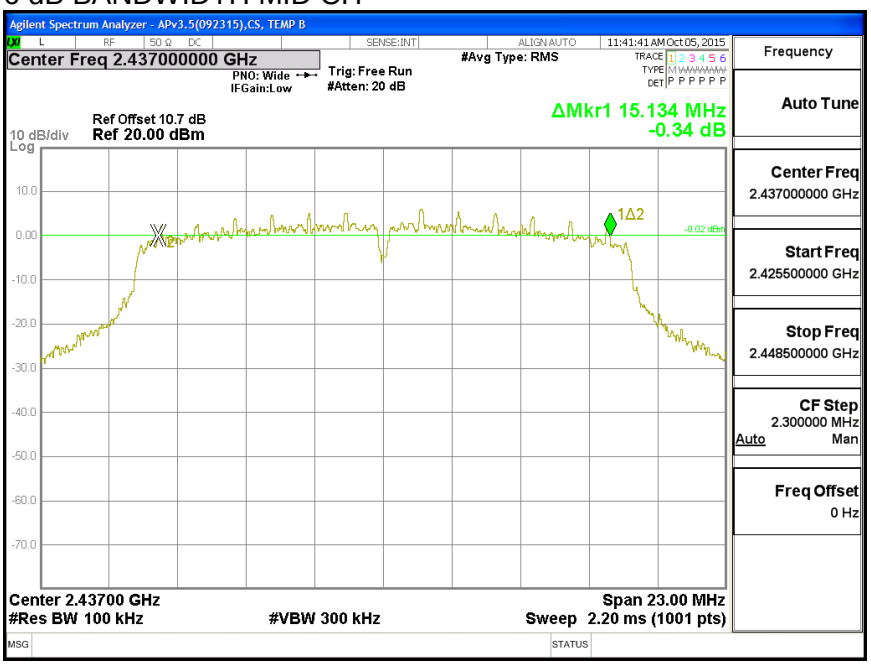
6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



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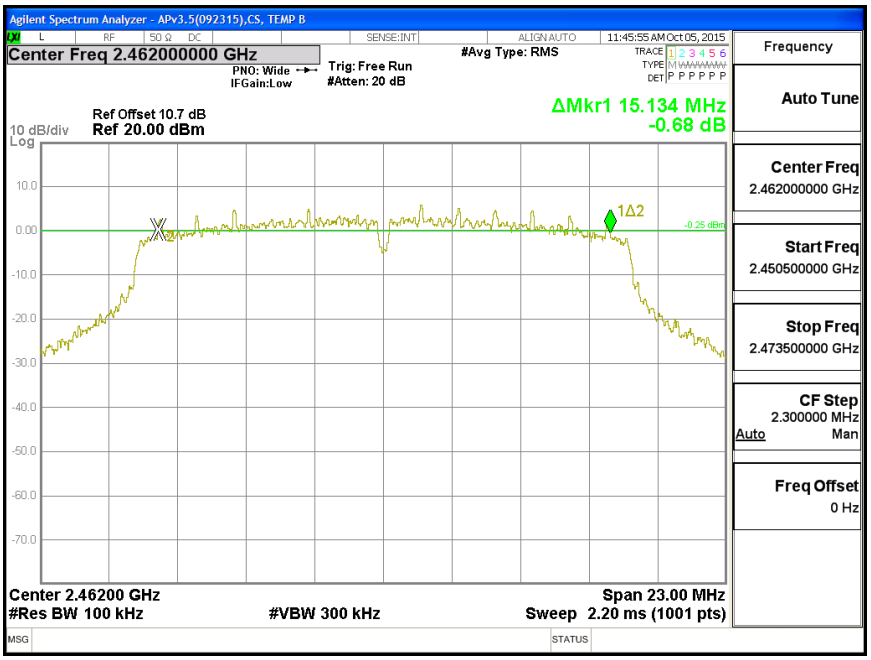
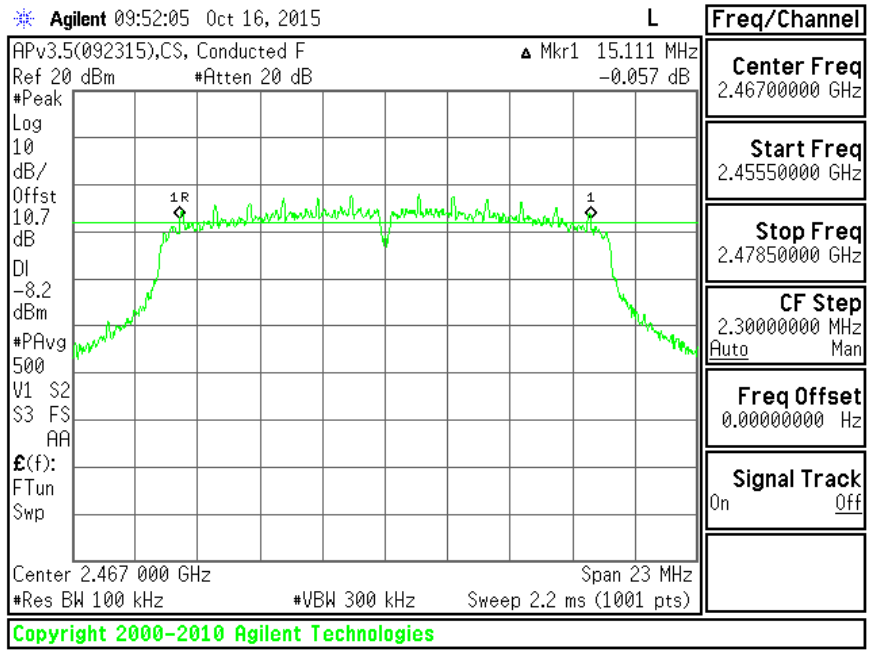
6 dB BANDWIDTH HIGH CH



6 dB BANDWIDTH CH 12



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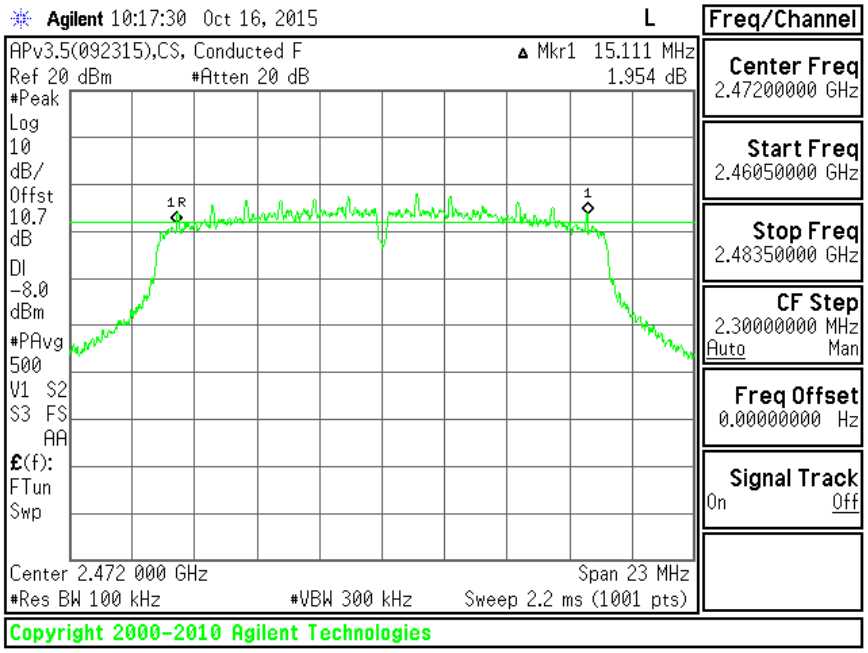
6 dB BANDWIDTH CH 13



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8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.192
Mid	2437	16.329
High	2462	16.312
High	2467	16.097
High	2472	16.131

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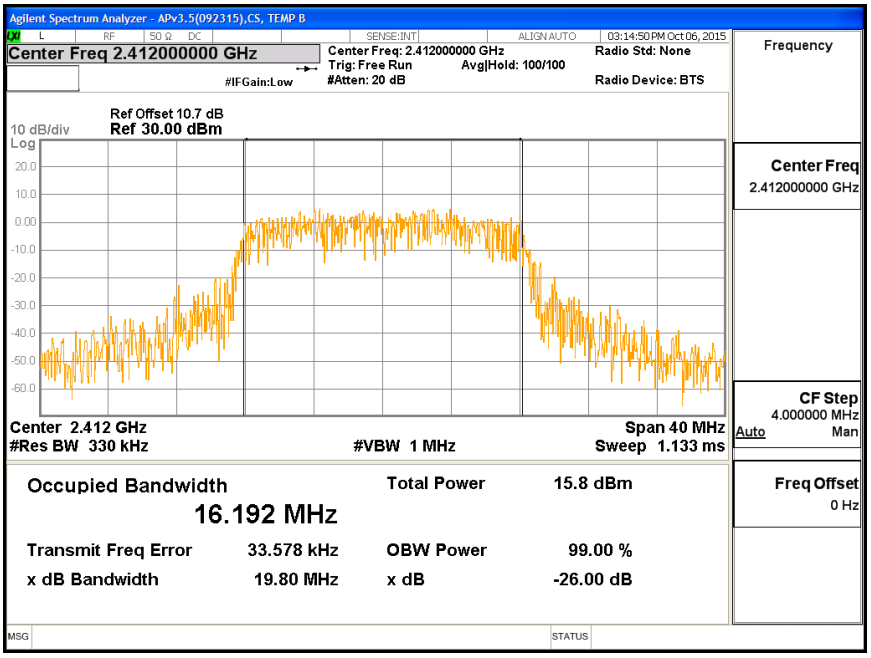
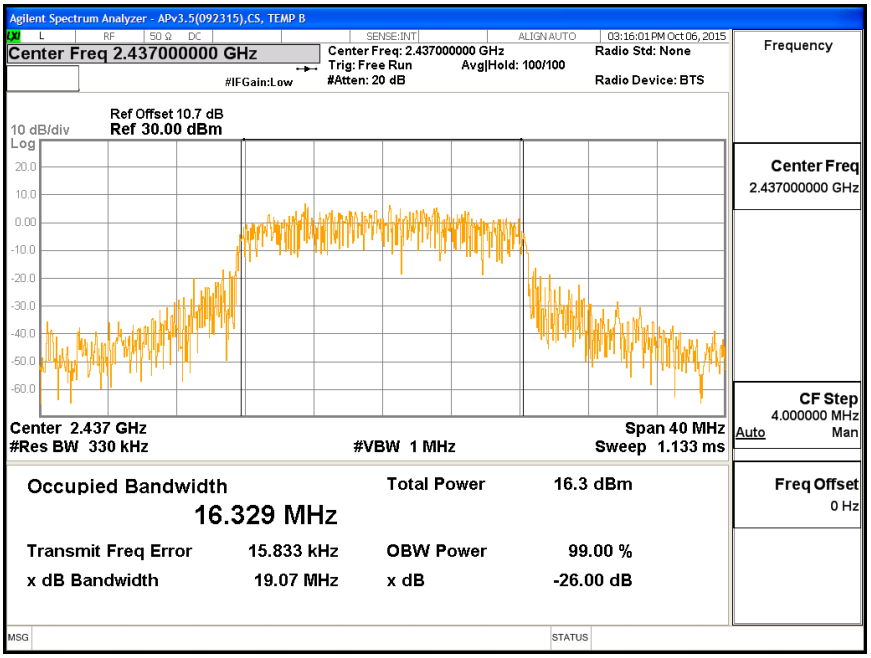
99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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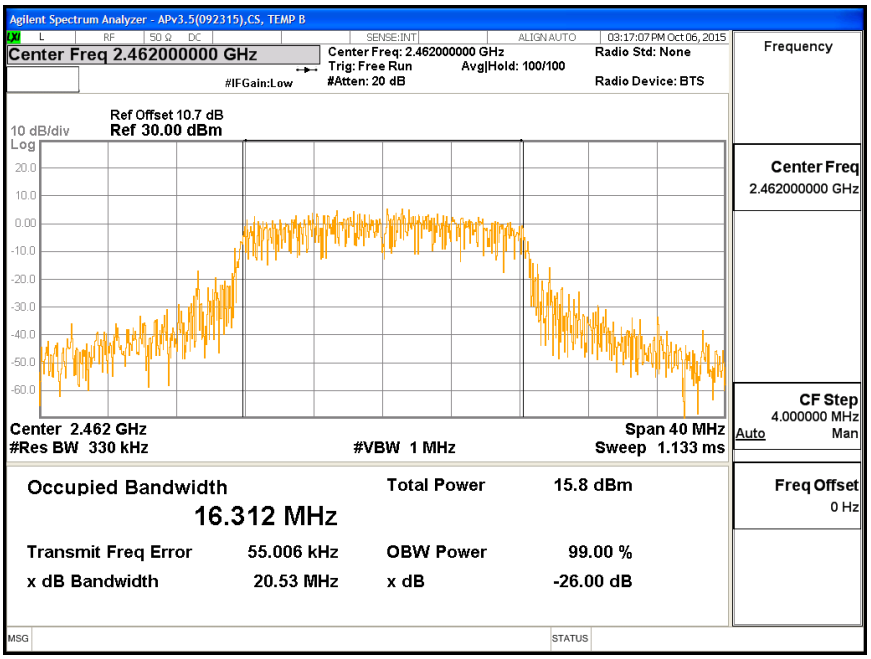
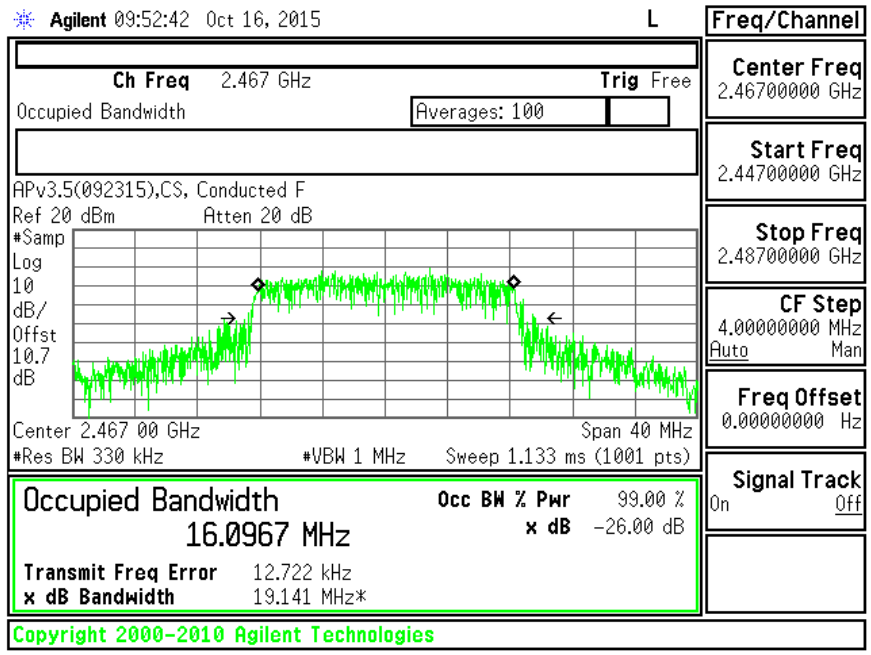
BANDWIDTH HIGH CH



BANDWIDTH CH 12



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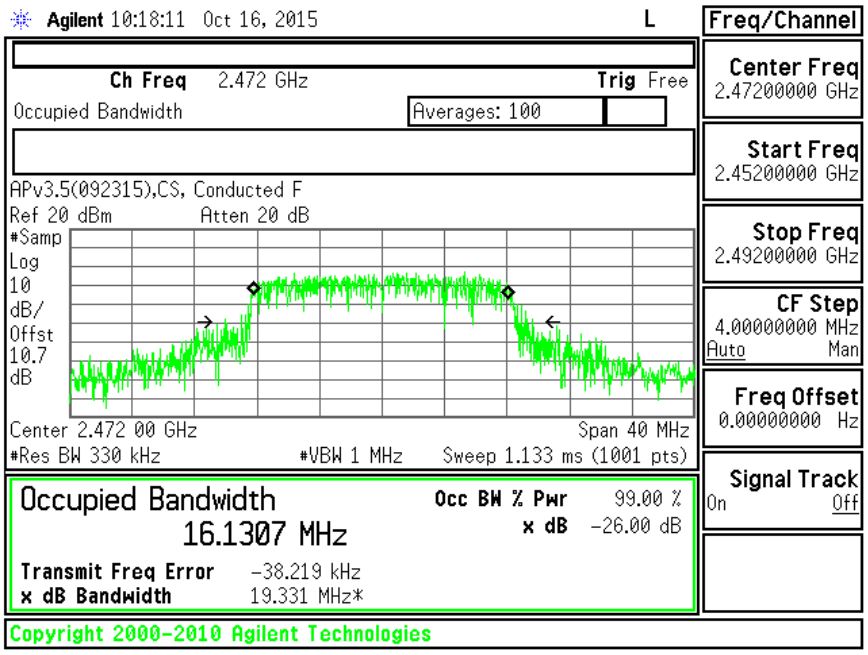
BANDWIDTH HIGH CH 13



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8.3.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (4)

For systems using digital modulation in the 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	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00
12	2467	0.00	30.00	30	36	30.00
13	2472	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.30	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.51	15.81	30.00	-14.19
Mid	2437	15.45	15.75	30.00	-14.25
High	2462	15.52	15.82	30.00	-14.18
12	2467	7.28	7.58	30.00	-22.42
13	2472	7.27	7.57	30.00	-22.43

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8.3.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions

RESULTS

Duty Cycle CF (dB)	0.30	Included in Calculations of Corr'd PSD

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-8.00	-7.70	8.0	-15.7
Mid	2437	-8.01	-7.71	8.0	-15.7
High	2462	-7.76	-7.46	8.0	-15.5
12	2467	-16.09	-15.79	8.0	-23.8
13	2472	-15.60	-15.30	8.0	-23.3

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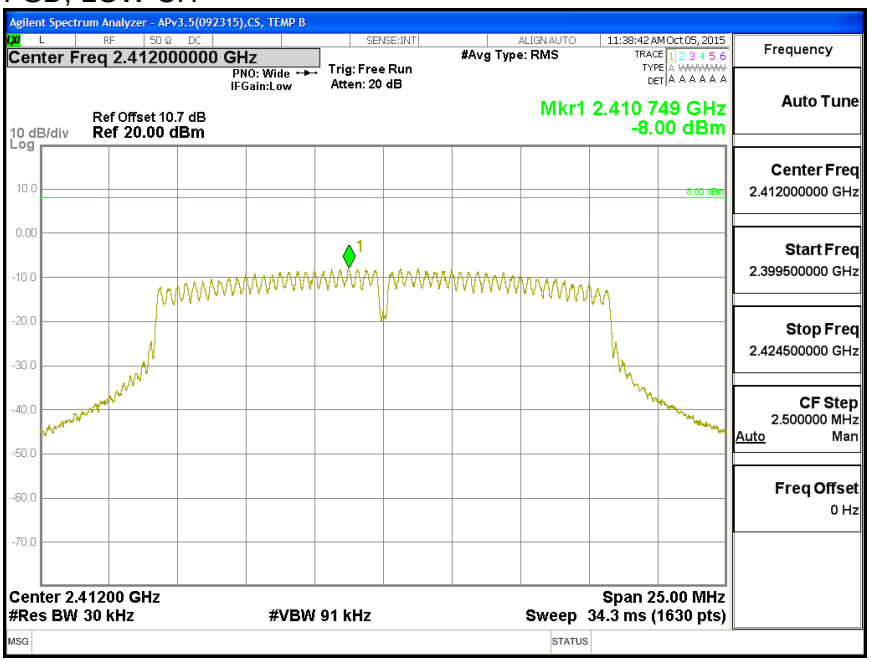
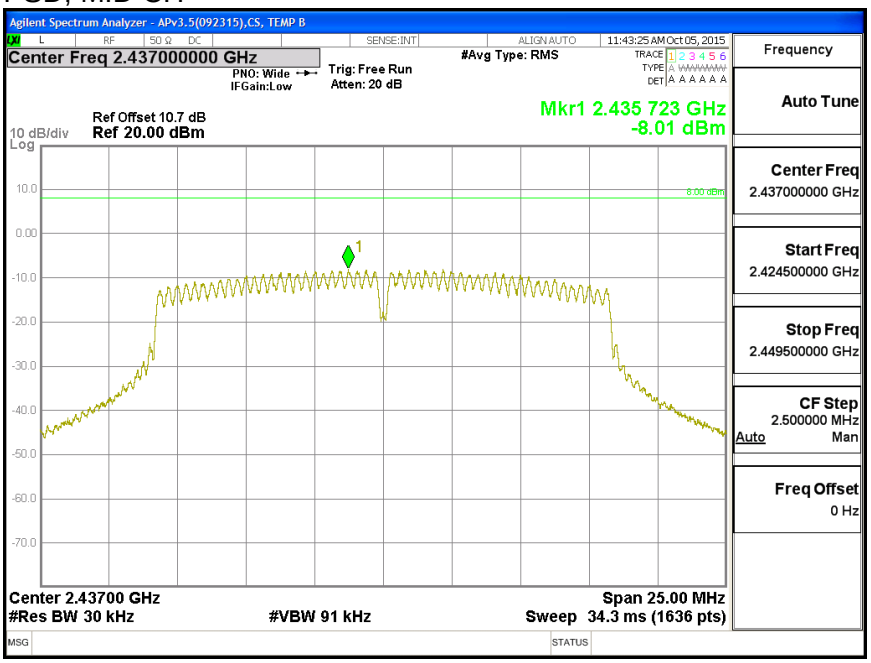
PSD

PSD, LOW CH



PSD, MID CH



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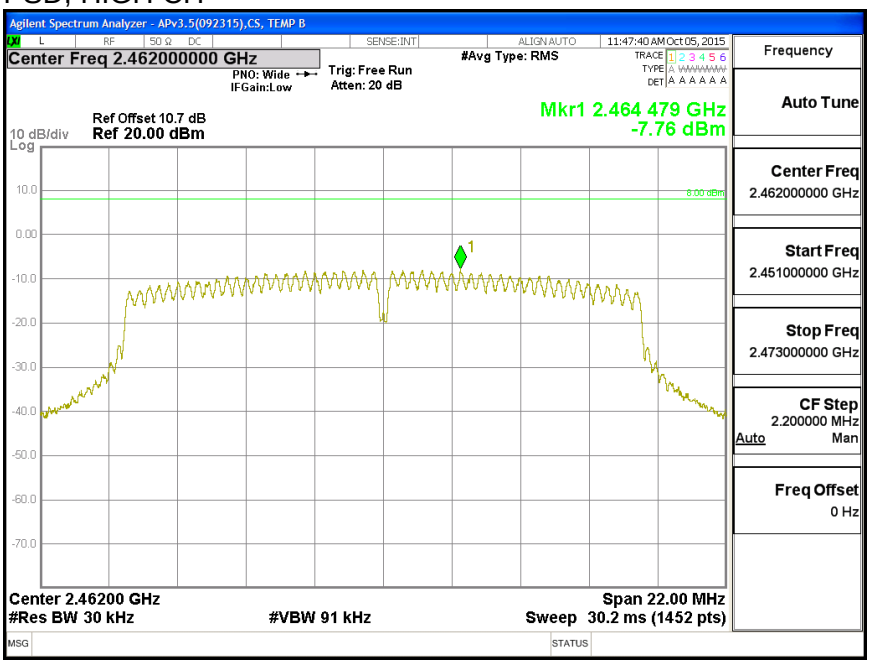
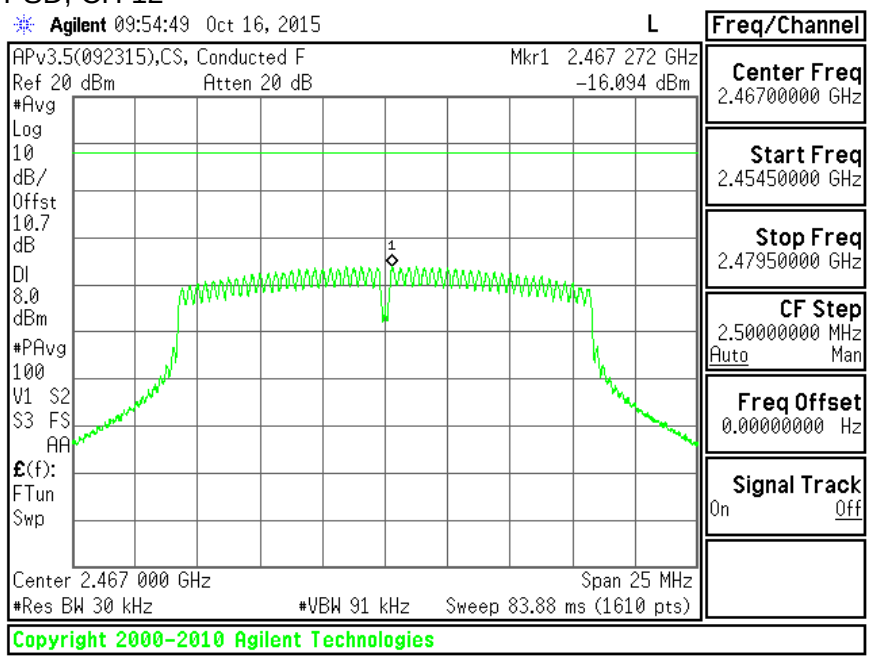
PSD, HIGH CH



PSD, CH 12



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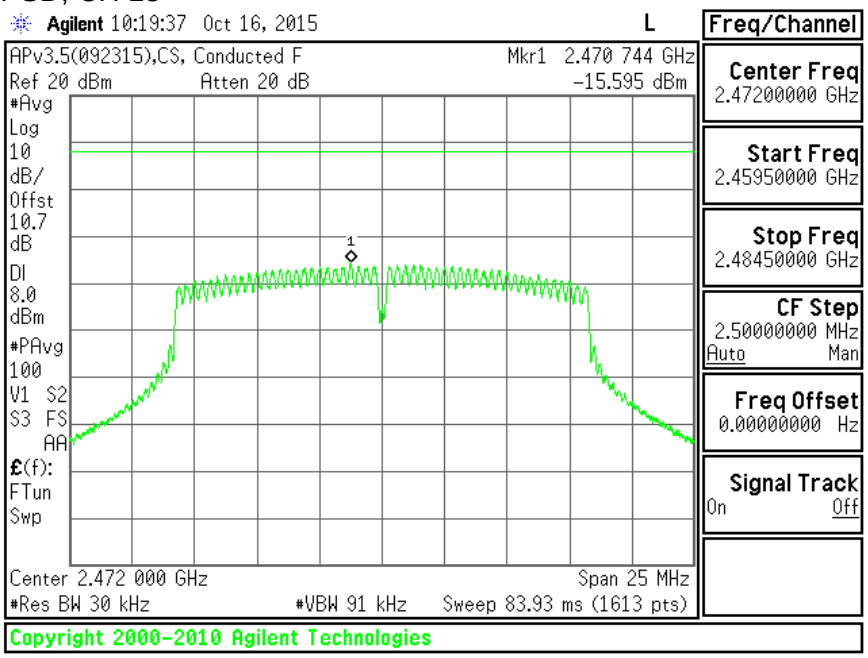
PSD, CH 13



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8.3.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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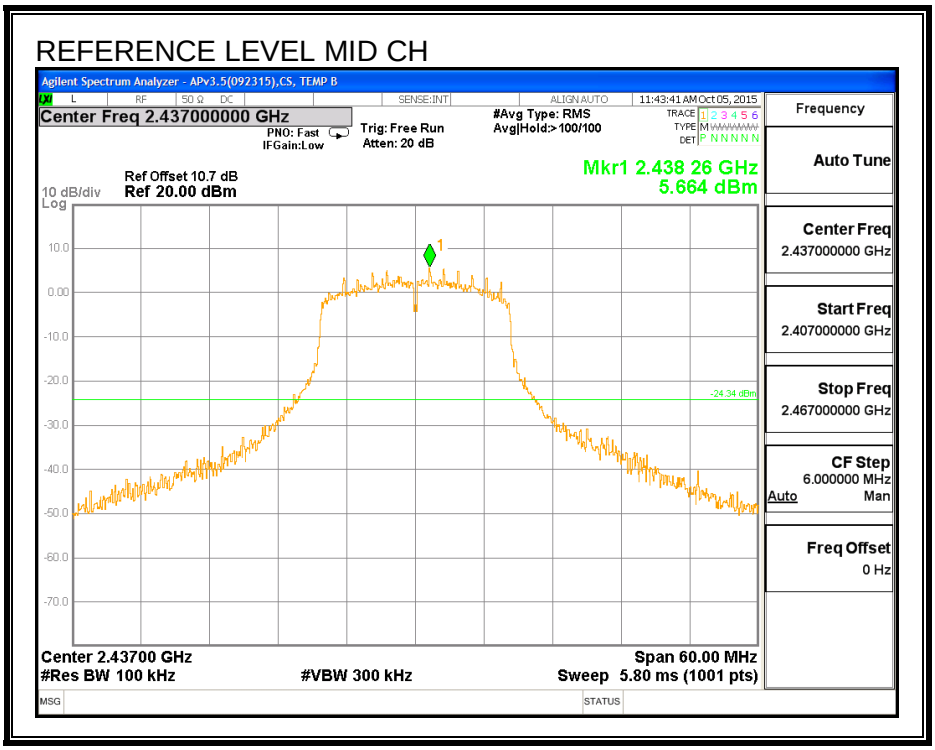
IN-BAND REFERENCE LEVEL



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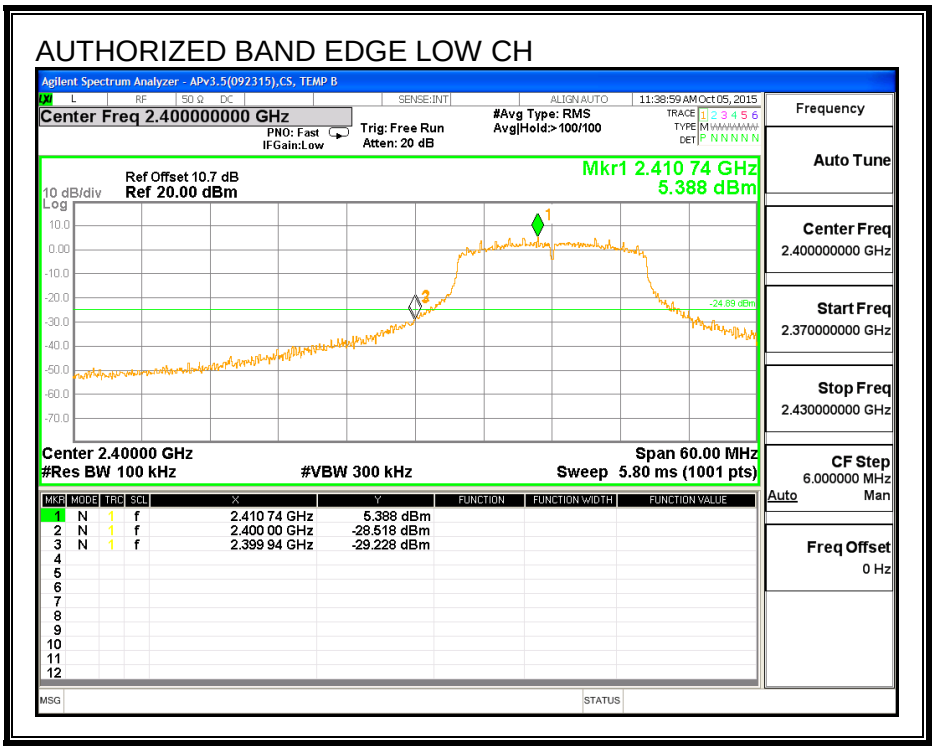
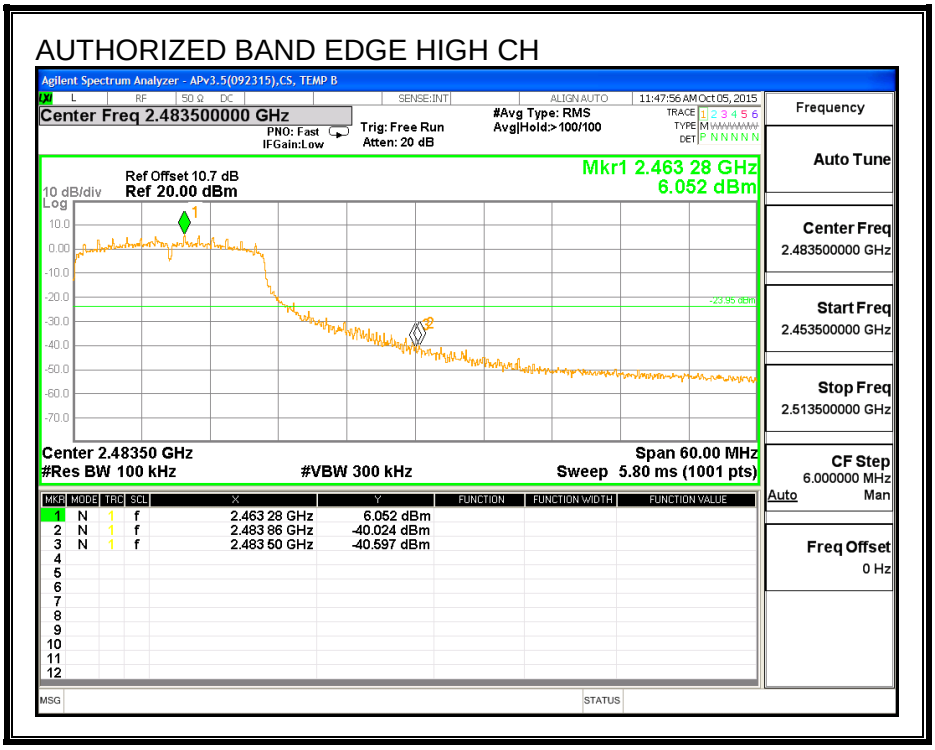
LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



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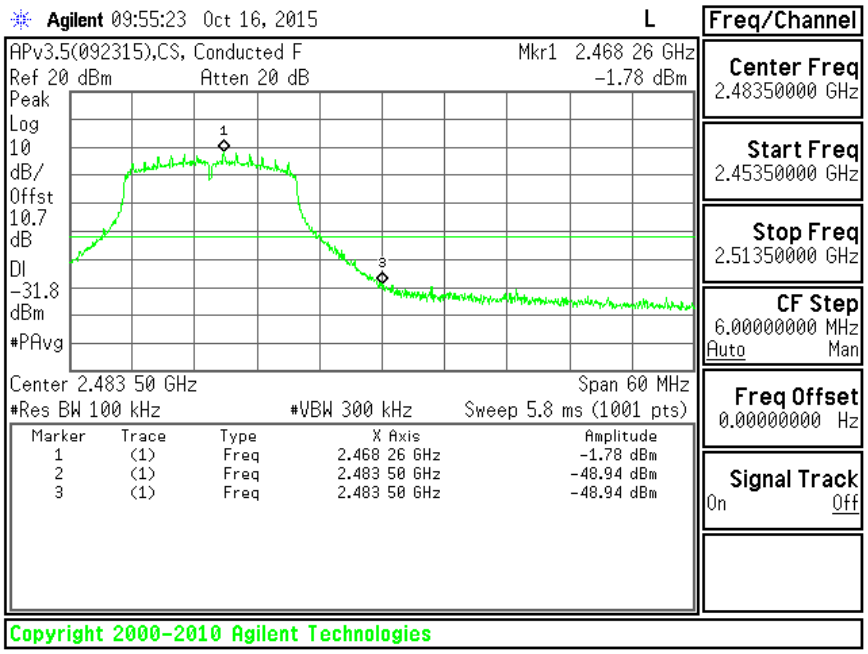
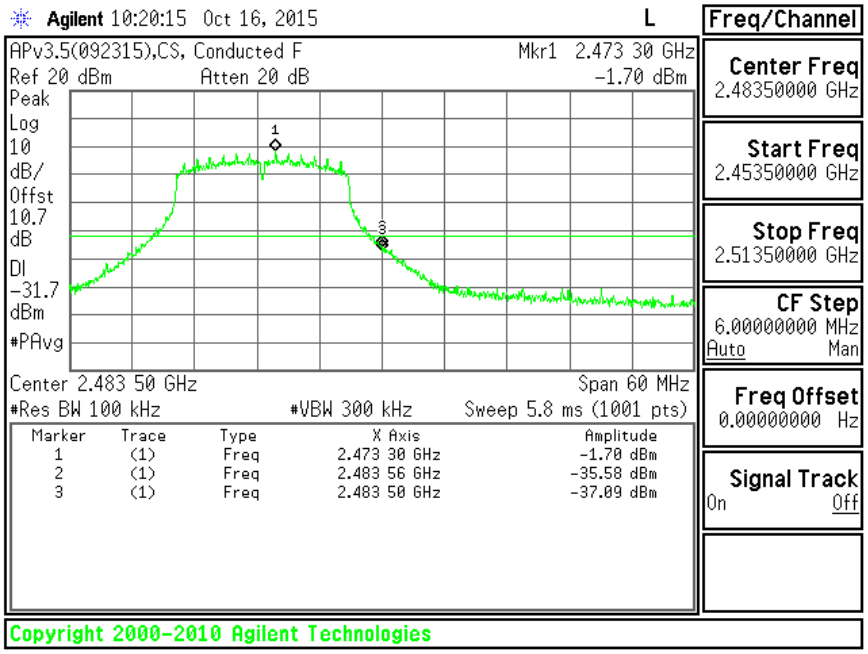
AUTHORIZED BAND EDGE CH 12



AUTHORIZED BAND EDGE CH 13



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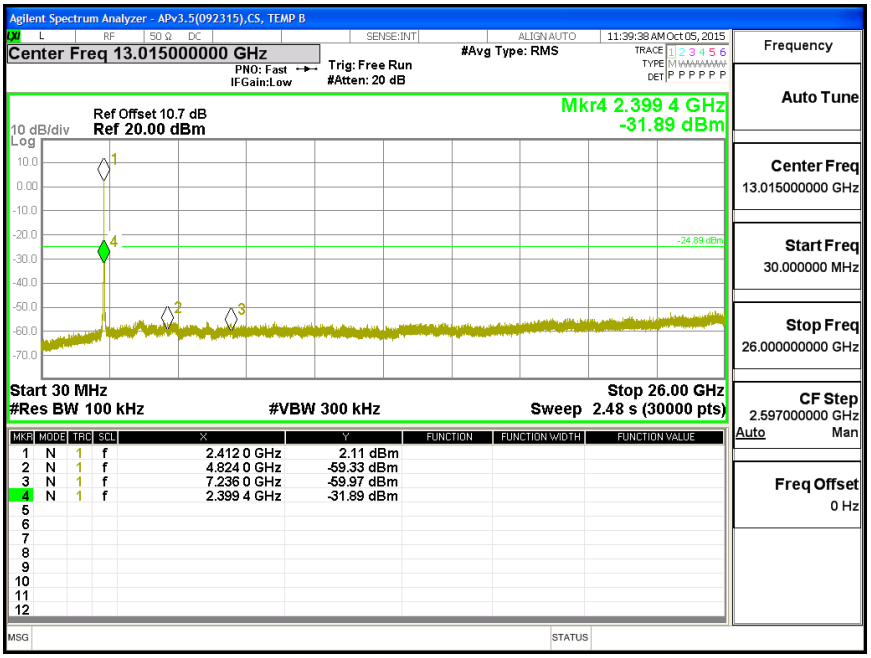
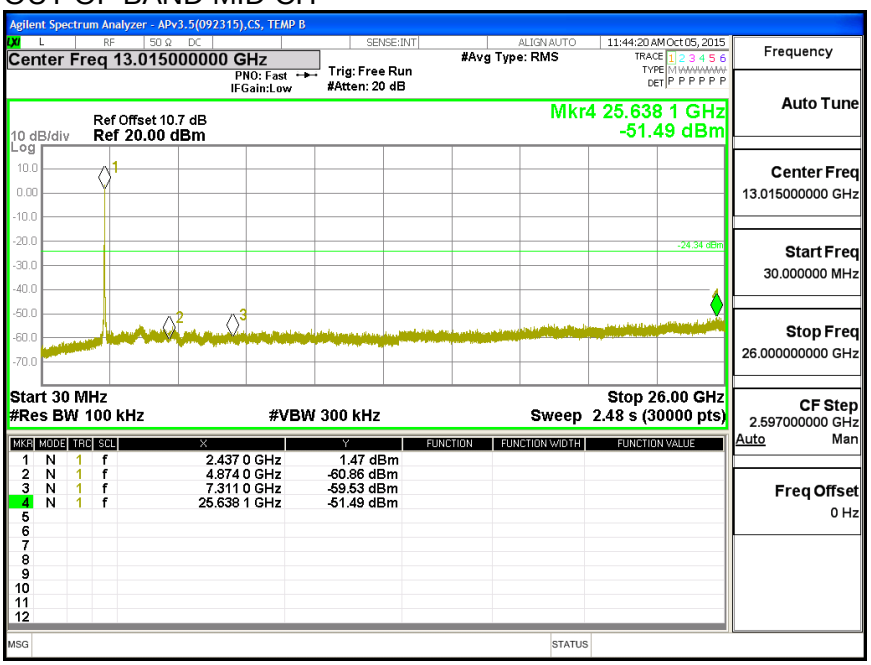
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH



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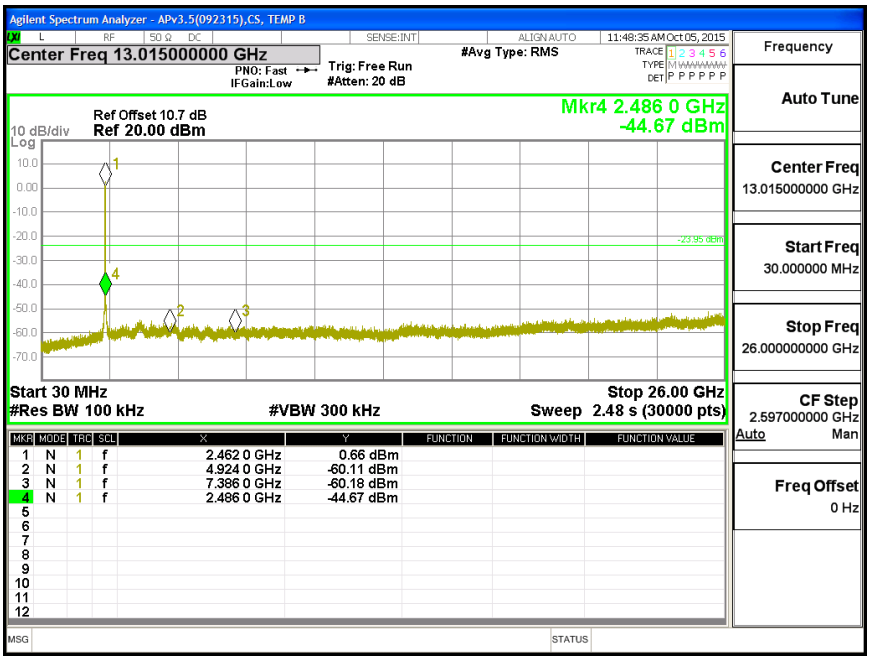
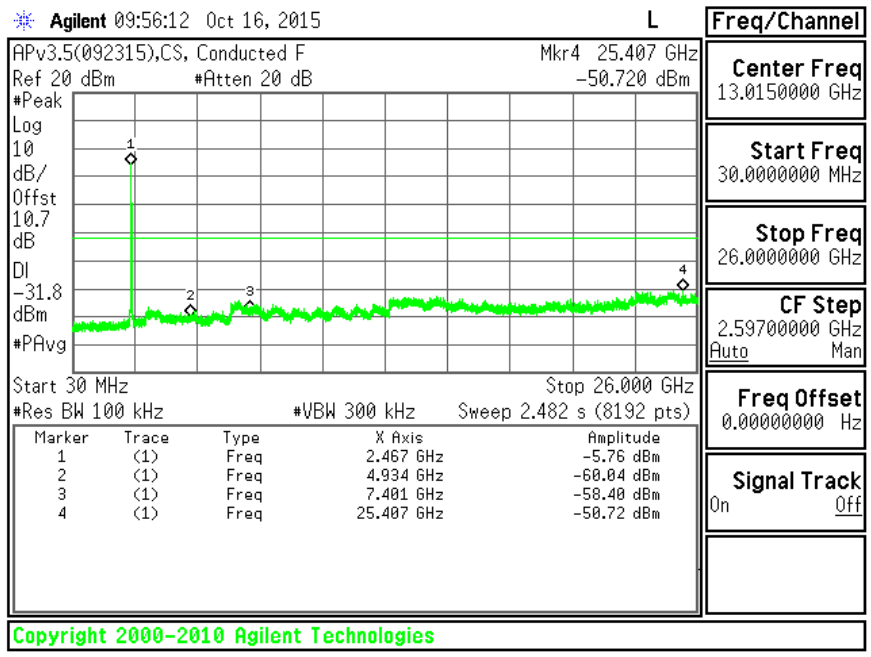
OUT OF BAND HIGH CH



OUT OF BAND CH 12



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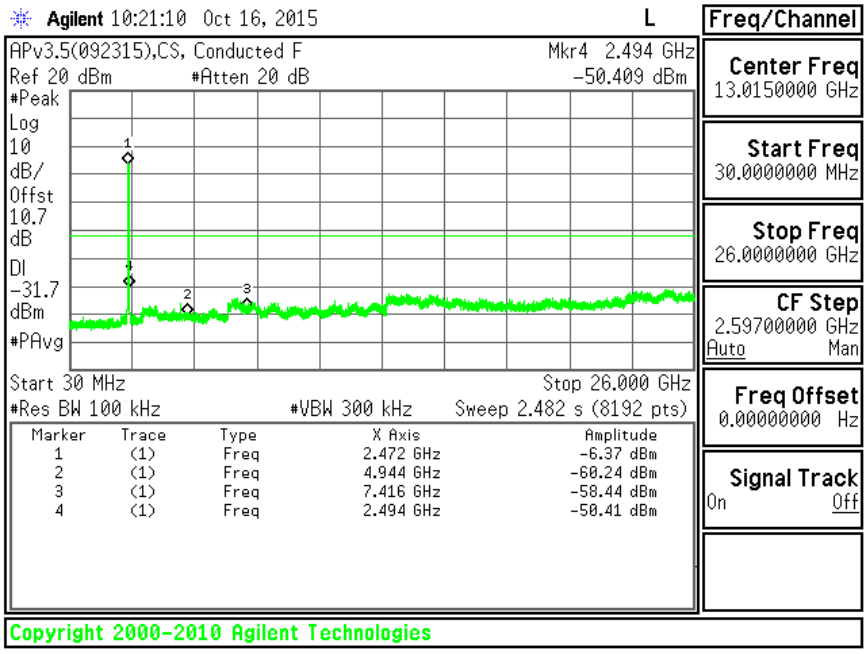
OUT OF BAND CH 13



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8.4. 802.11n HT20 MODE IN THE 2.4 GHz BAND

8.4.1. 6 dB BANDWIDTH

LIMITS

I FCC §15.247 (a) (2)

C RSS-247 (5.2) (1)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.111	0.5
Mid	2437	15.134	0.5
High	2462	15.111	0.5
12	2467	15.134	0.5
13	2472	15.134	0.5

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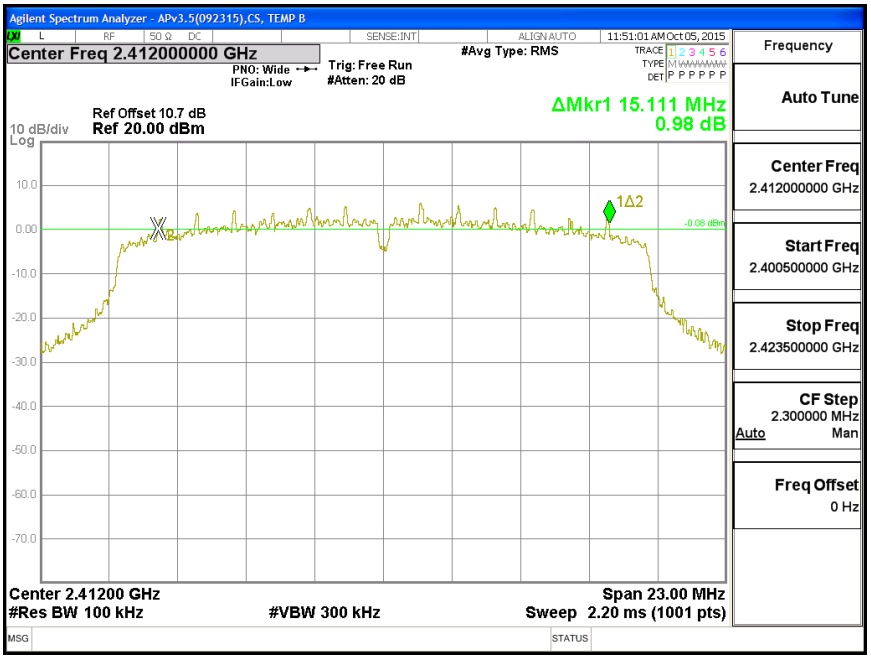
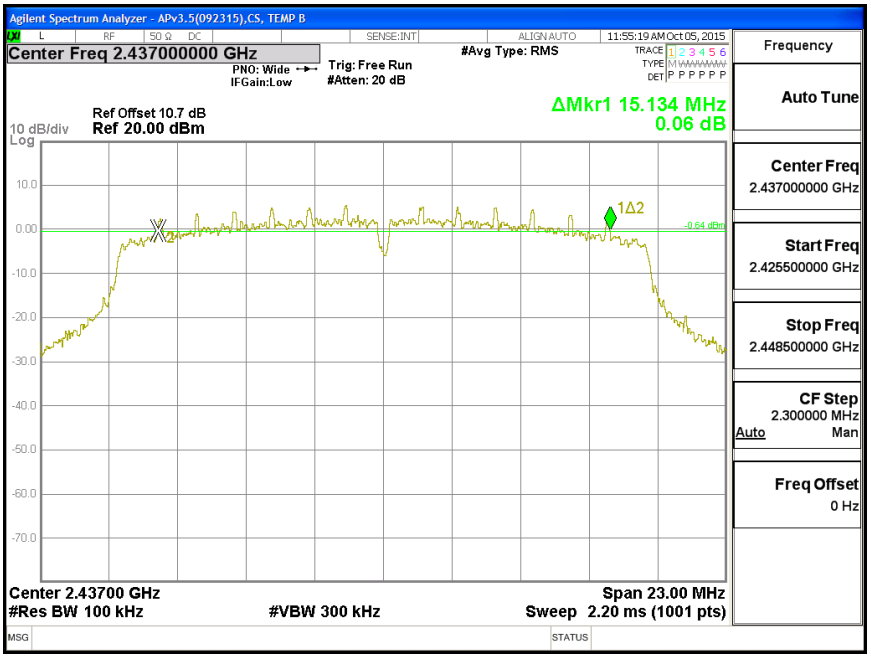
6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH



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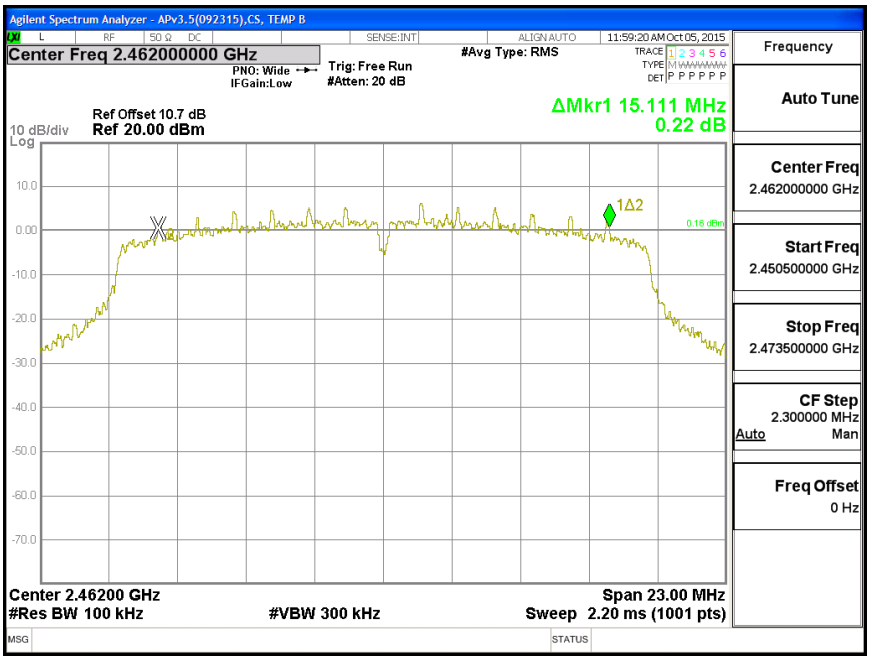
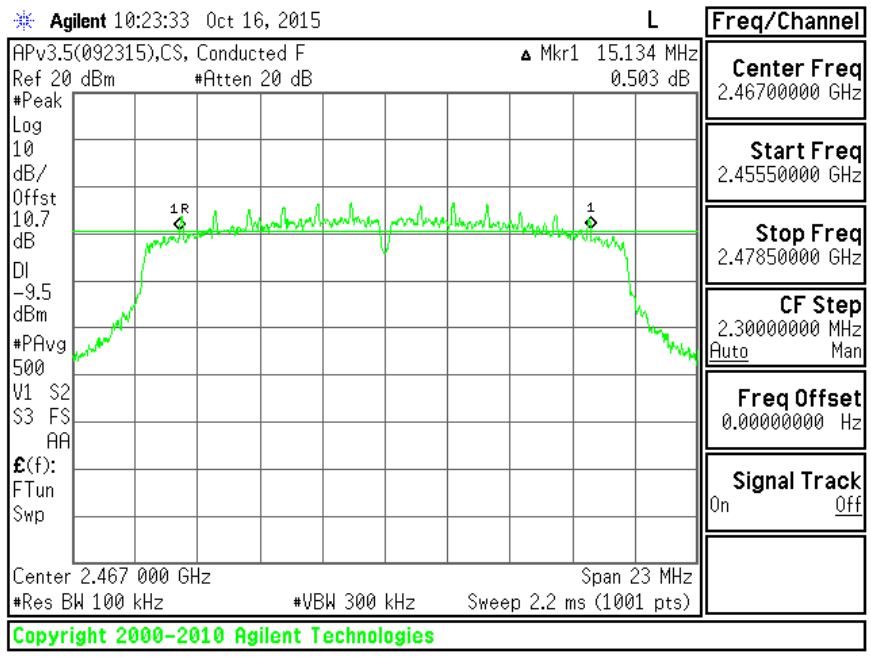
6 dB BANDWIDTH HIGH CH



6 dB BANDWIDTH HIGH CH



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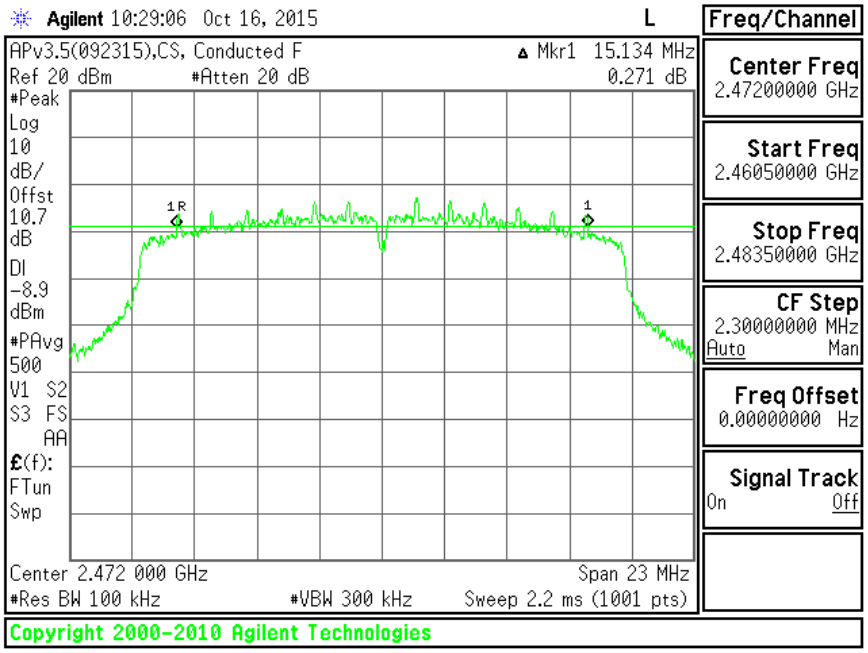
6 dB BANDWIDTH HIGH CH



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8.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.441
Mid	2437	17.558
High	2462	17.524
12	2467	17.094
13	2472	17.141

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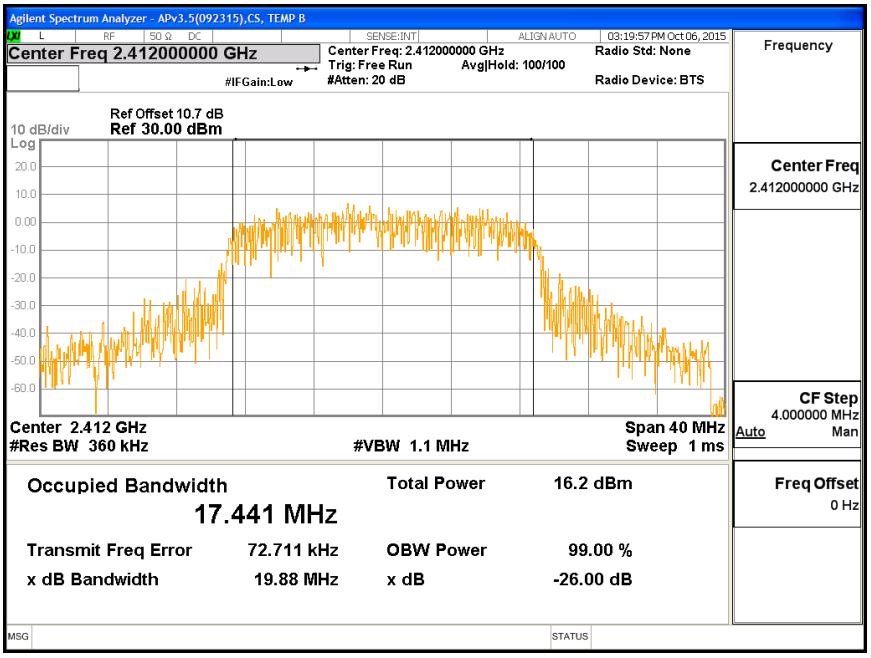
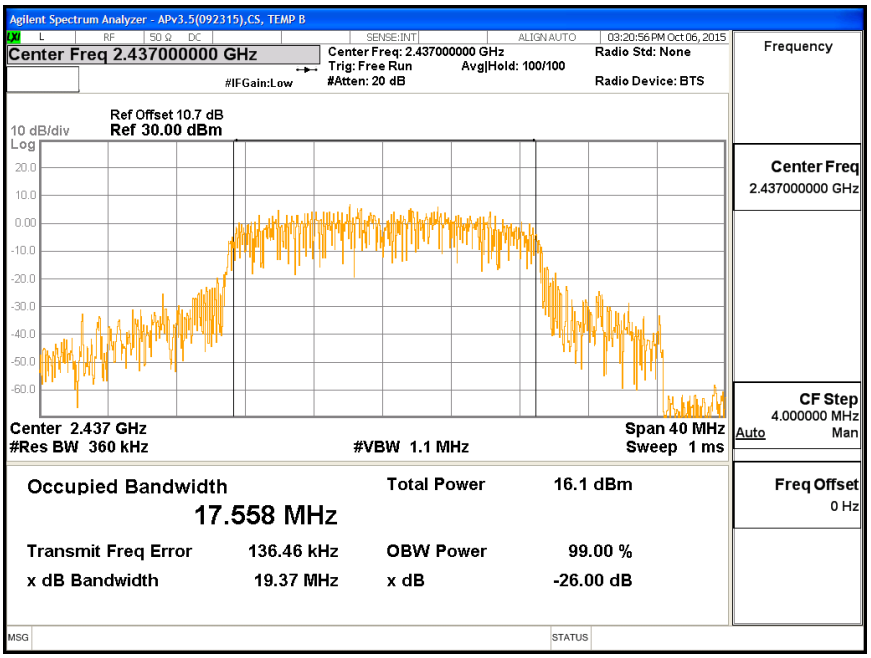
99% BANDWIDTH

BANDWIDTH LOW CH



BANDWIDTH MID CH



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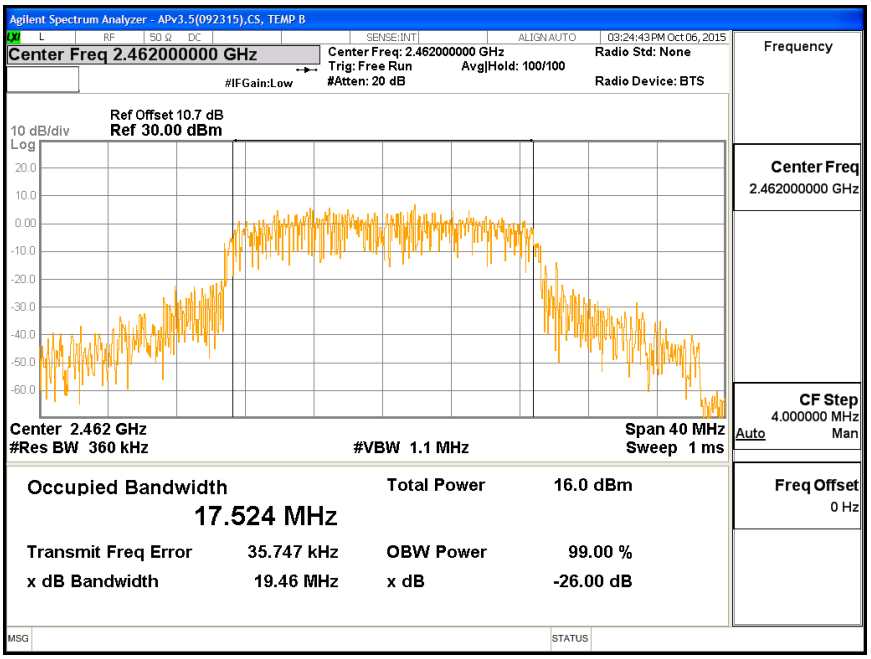
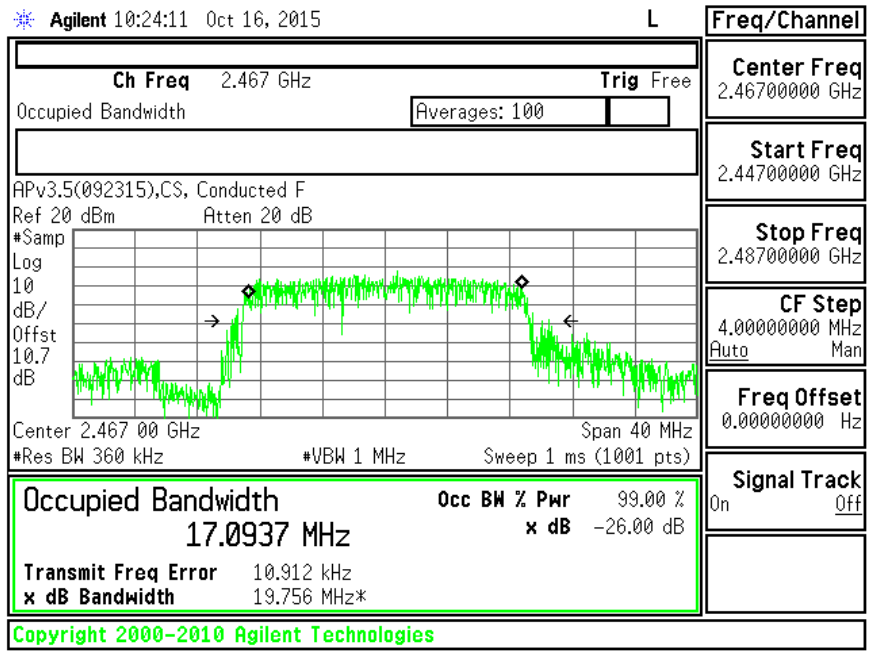
BANDWIDTH HIGH CH



BANDWIDTH HIGH CH



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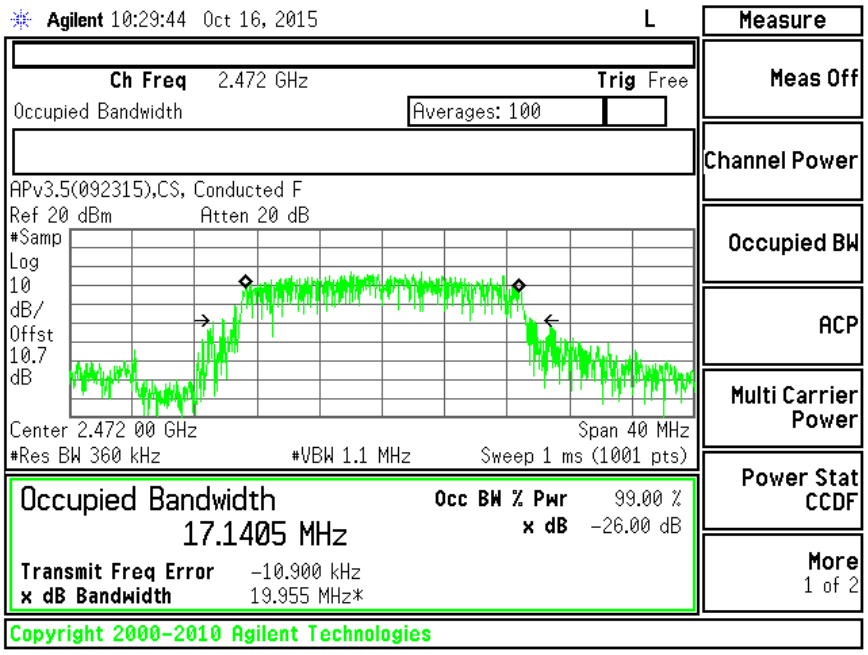
BANDWIDTH HIGH CH



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8.4.3. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-247 (5.4) (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	2412	0.00	30.00	30	36	30.00
Mid	2437	0.00	30.00	30	36	30.00
High	2462	0.00	30.00	30	36	30.00
12	2467	0.00	30.00	30	36	30.00
13	2472	0.00	30.00	30	36	30.00

Duty Cycle CF (dB)	0.32	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.41	15.73	30.00	-14.27
Mid	2437	15.38	15.70	30.00	-14.30
High	2462	15.39	15.71	30.00	-14.29
12	2467	6.12	6.44	30.00	-23.56
13	2472	6.11	6.43	30.00	-23.57

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8.4.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247

IC RSS-247 (5.2) (2)

For digitally modulated systems, the power spectral density conducted form the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmissions.

RESULTS

Duty Cycle CF (dB)	0.32	Included in Calculations of Corr'd PSD

PSD Results

Channel	Frequency (MHz)	Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-8.46	-8.14	8.0	-16.1
Mid	2437	-7.92	-7.60	8.0	-15.6
High	2462	-8.28	-7.96	8.0	-16.0
12	2467	-17.09	-16.77	8.0	-24.8
13	2472	-17.20	-16.88	8.0	-24.9

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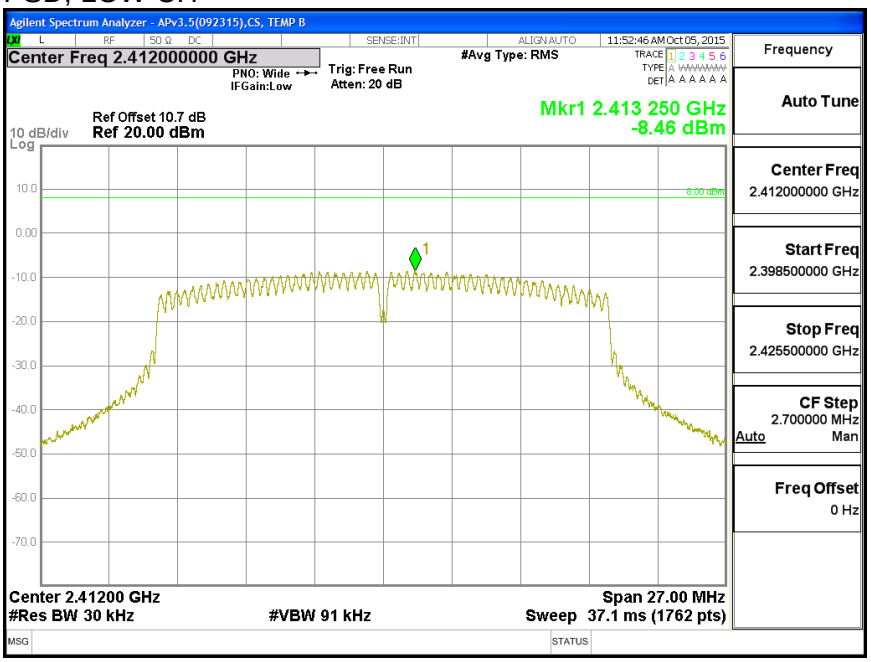
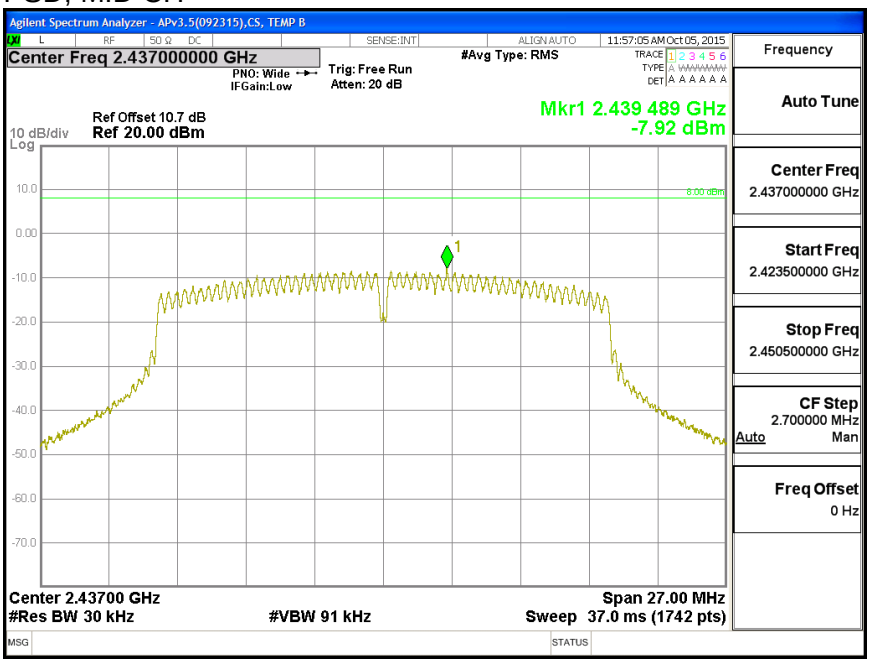
PSD

PSD, LOW CH



PSD, MID CH



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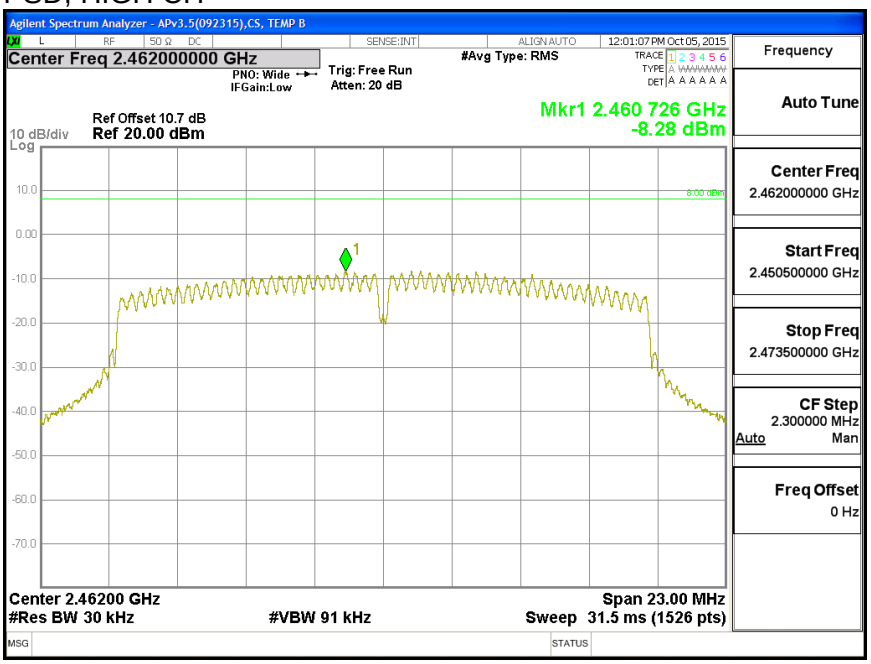
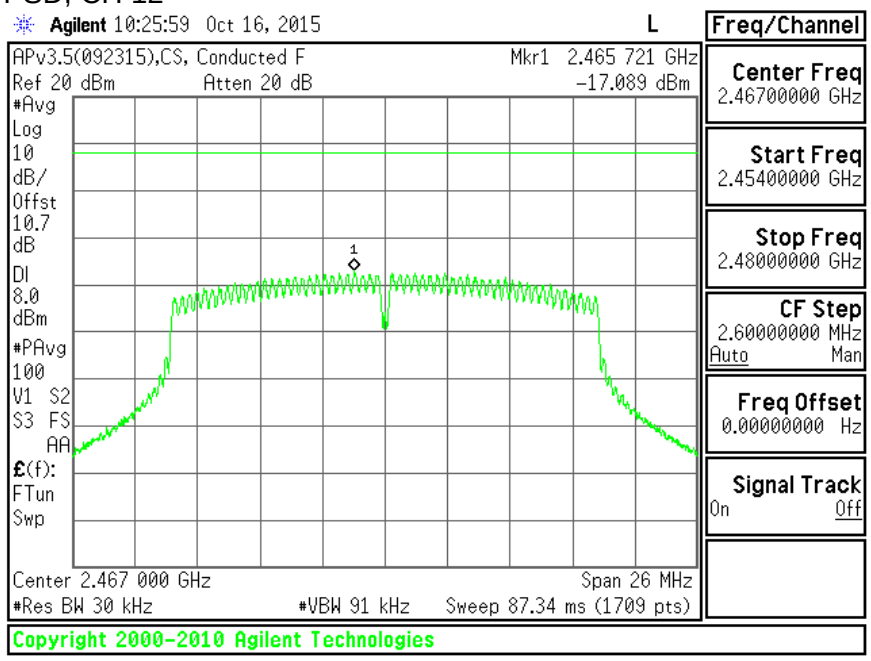
PSD, HIGH CH



PSD, CH 12



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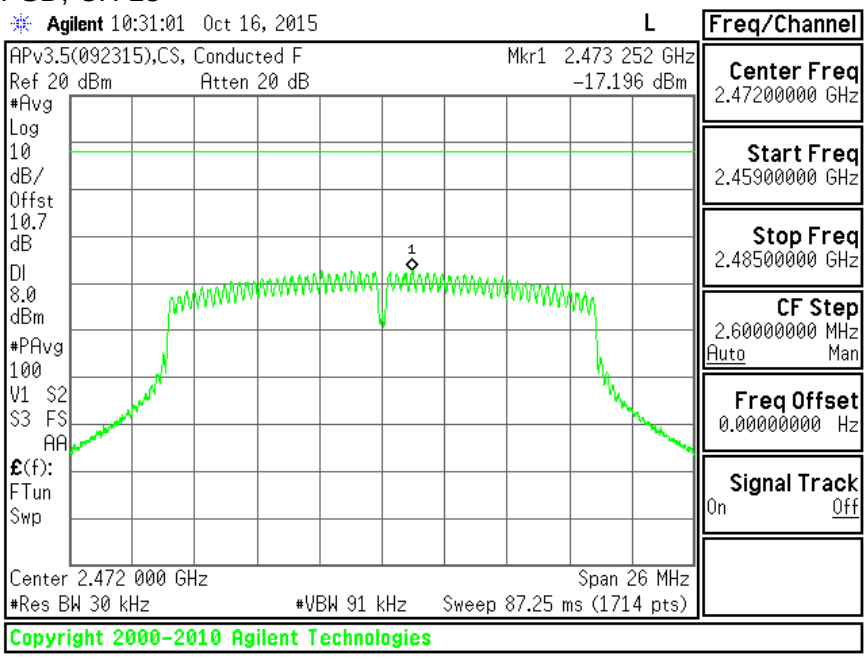
PSD, CH 13



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8.4.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

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

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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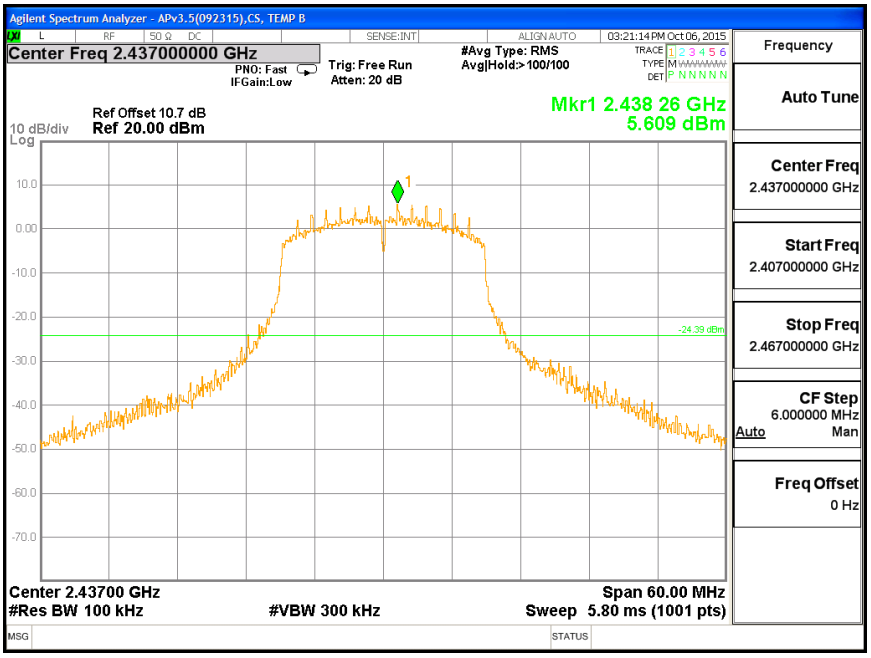
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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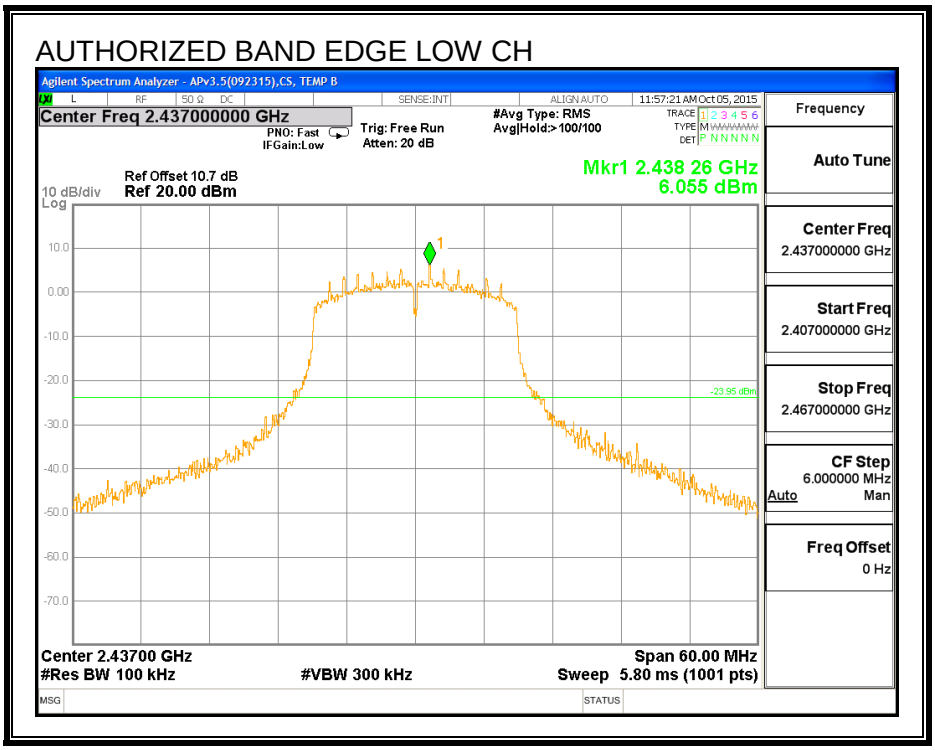
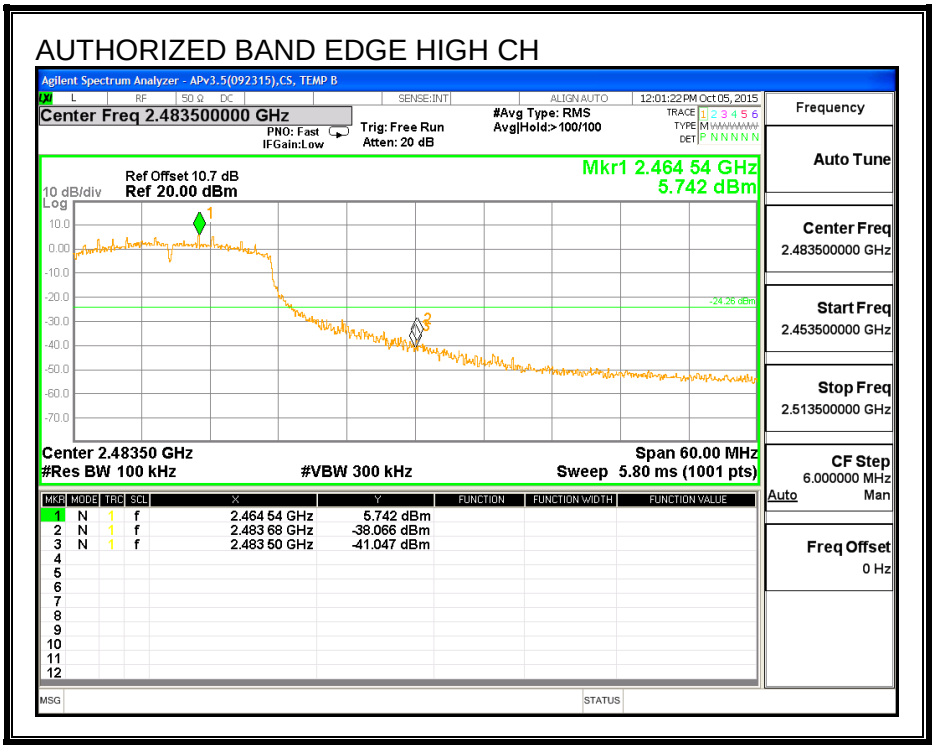
LOW CHANNEL BANDEDGE



HIGH CHANNEL BANDEDGE



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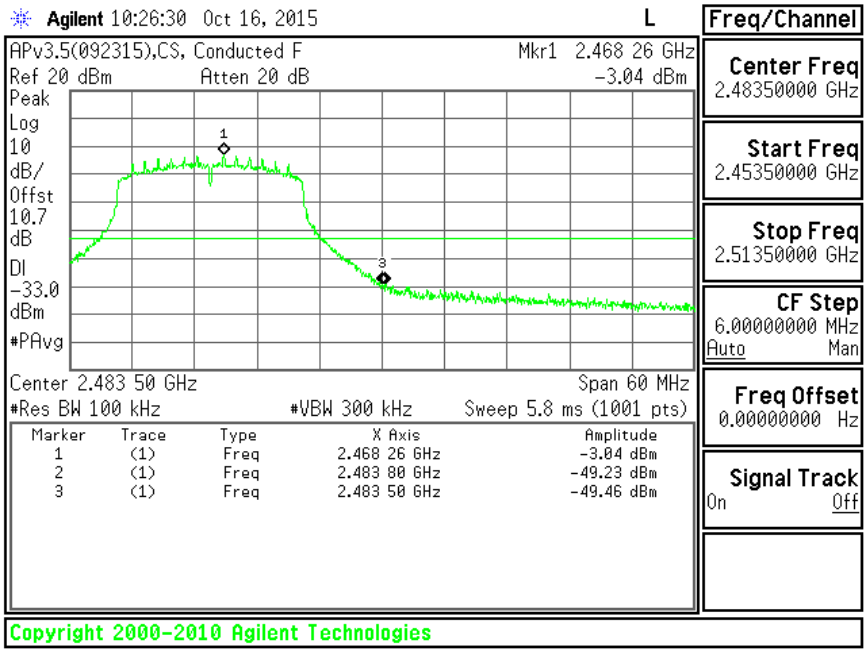
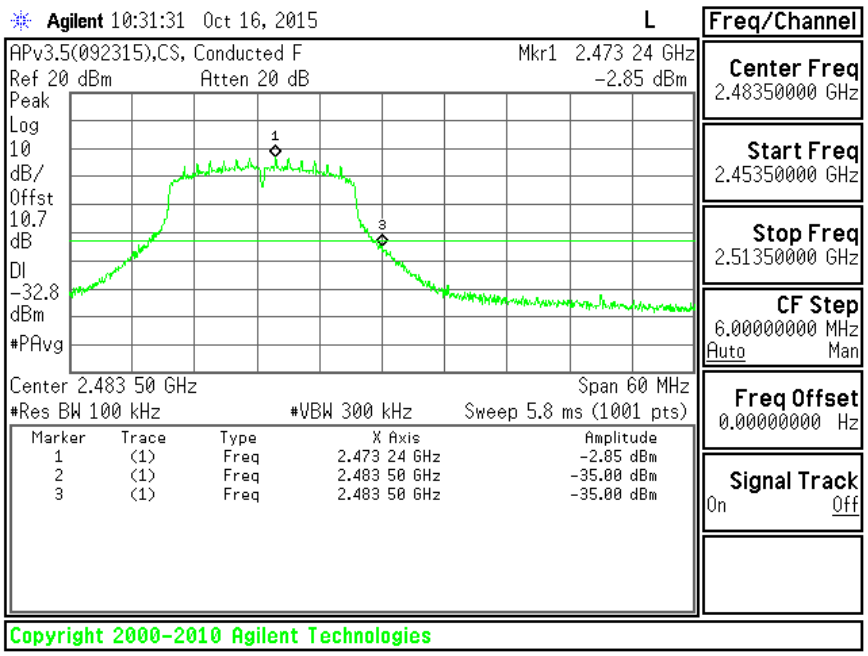
AUTHORIZED BAND EDGE CH 12



AUTHORIZED BAND EDGE CH 13



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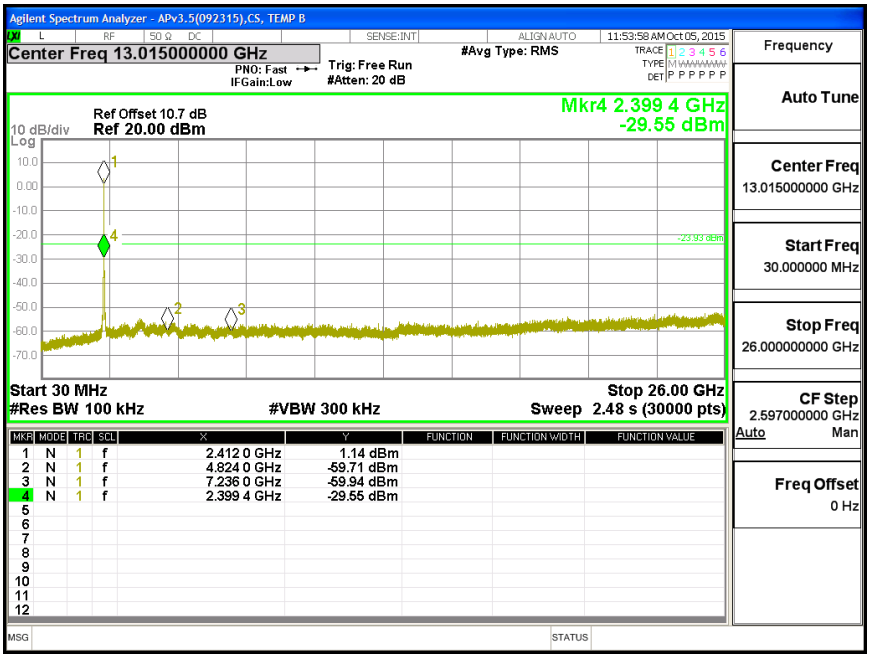
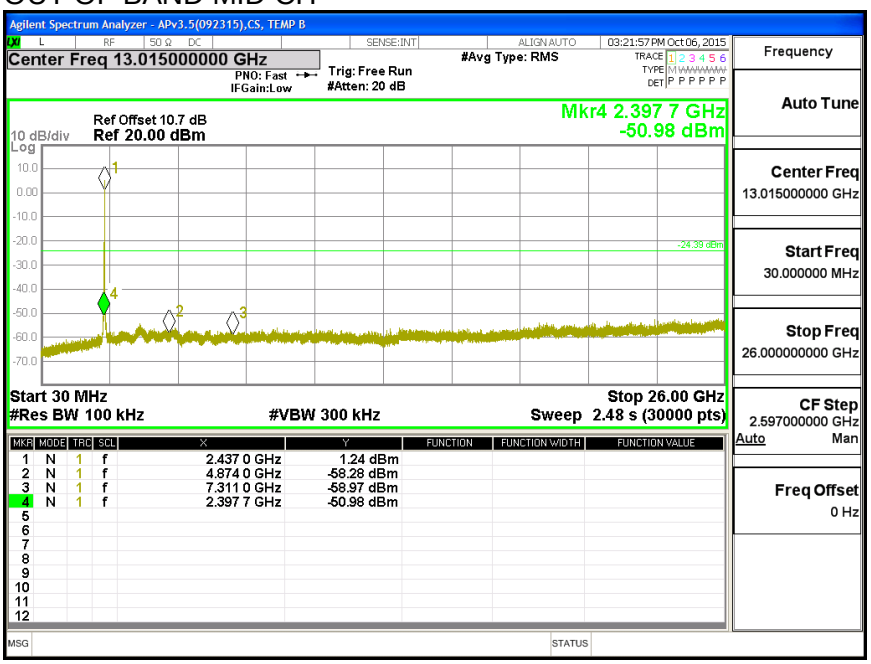
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



OUT OF BAND MID CH



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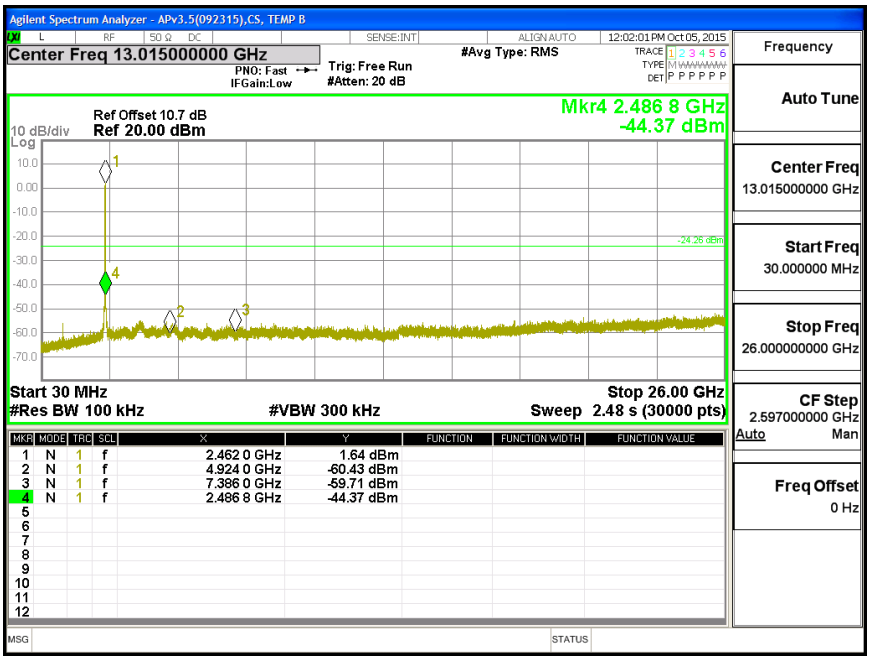
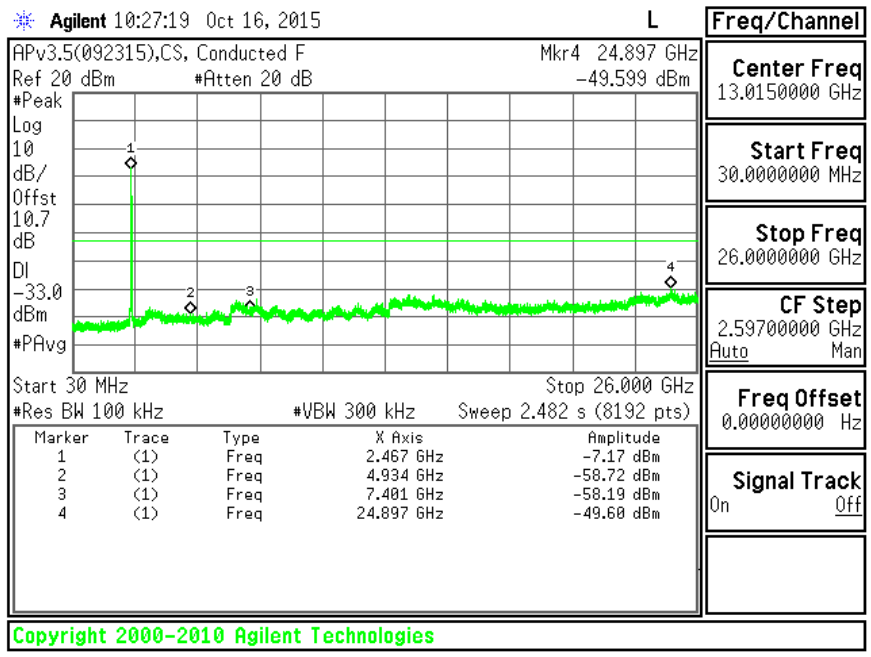
OUT OF BAND HIGH CH



OUT OF BAND CH 12



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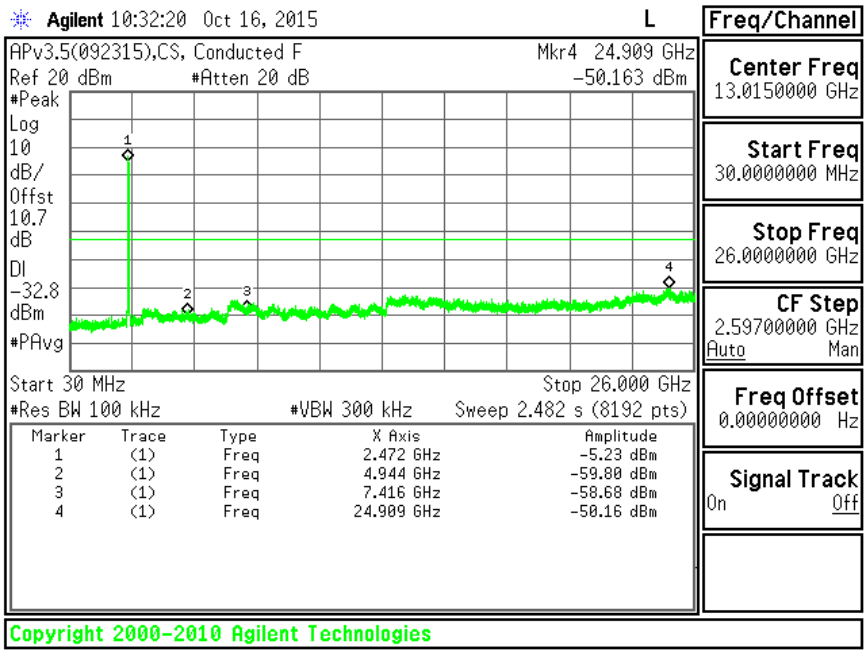
OUT OF BAND CH 13



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9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

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

TEST PROCEDURE

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

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

For 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.

For 2.4 GHz band, the spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

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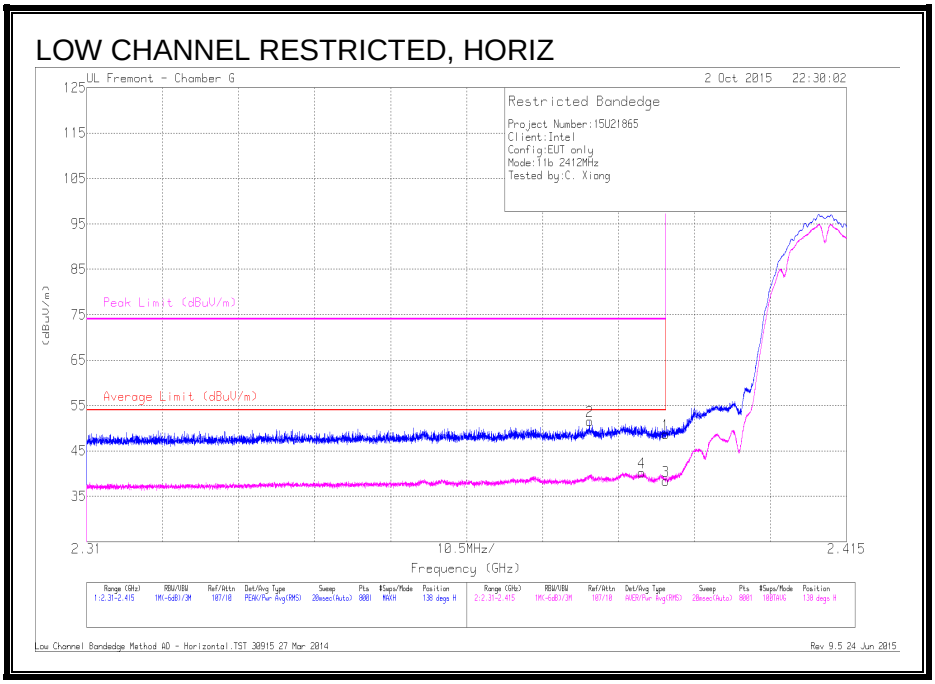
9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.26	Pk	31.9	-24.5	48.66	-	-	74	-25.34	138	209	H
2	* 2.38	44.18	Pk	31.8	-24.5	51.48	-	-	74	-22.52	138	209	H
3	* 2.39	31.01	RMS	31.9	-24.5	38.41	54	-15.59	-	-	138	209	H
4	* 2.387	32.92	RMS	31.8	-24.5	40.22	54	-13.78	-	-	138	209	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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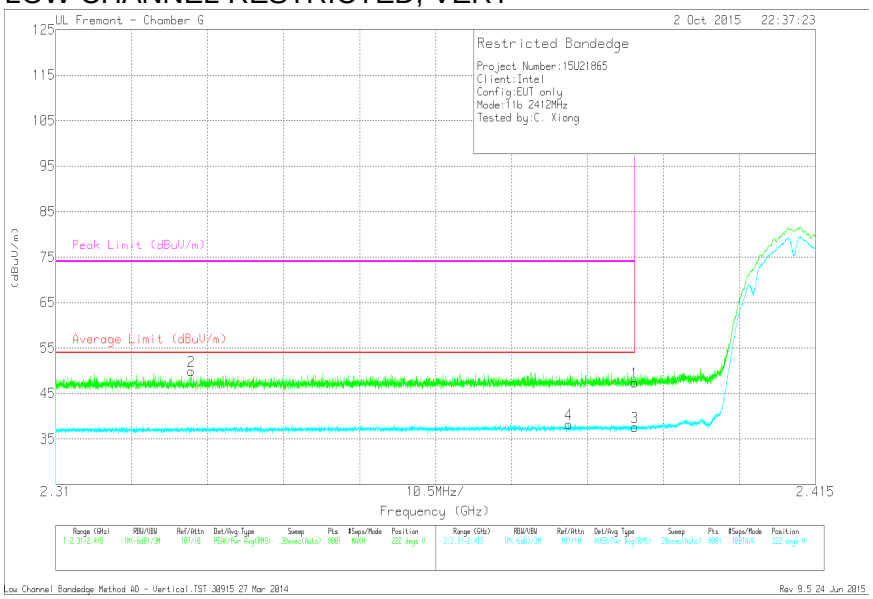
LOW CHANNEL RESTRICTED, VERT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.02	Pk	31.9	-24.5	47.42	-	-	74	-26.58	222	117	V
2	* 2.329	42.87	Pk	31.6	-24.6	49.87	-	-	74	-24.13	222	117	V
3	* 2.39	30.28	RMS	31.9	-24.5	37.68	54	-16.32	-	-	222	117	V
4	* 2.381	30.93	RMS	31.8	-24.5	38.23	54	-15.77	-	-	222	117	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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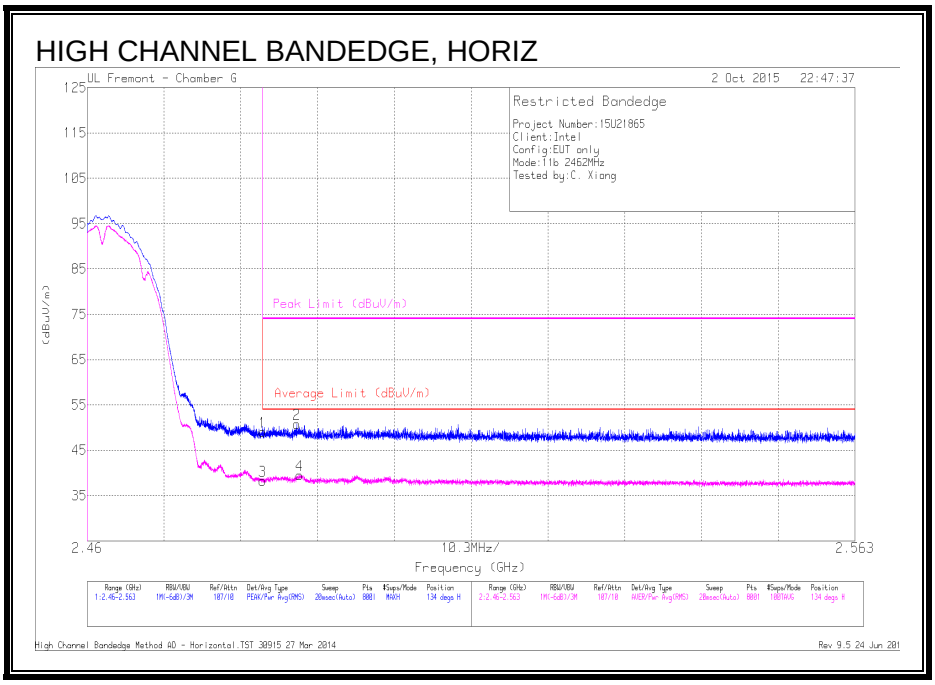
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.25	Pk	32.3	-24.5	49.05	-	-	74	-24.95	134	125	H
2	* 2.488	43.03	Pk	32.3	-24.5	50.83	-	-	74	-23.17	134	125	H
3	* 2.484	30.42	RMS	32.3	-24.5	38.22	54	-15.78	-	-	134	125	H
4	* 2.488	31.72	RMS	32.3	-24.5	39.52	54	-14.48	-	-	134	125	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector

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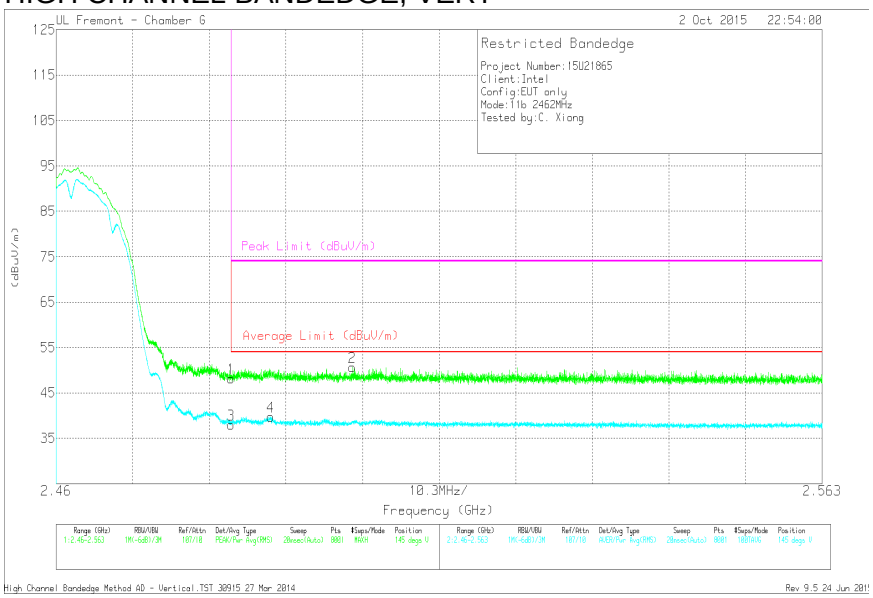
HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.42	Pk	32.3	-24.5	48.22	-	-	74	-25.78	145	123	V
2	* 2.5	42.87	Pk	32.3	-24.5	50.67	-	-	74	-23.33	145	123	V
3	* 2.484	30.25	RMS	32.3	-24.5	38.05	54	-15.95	-	-	145	123	V
4	* 2.489	31.93	RMS	32.3	-24.5	39.73	54	-14.27	-	-	145	123	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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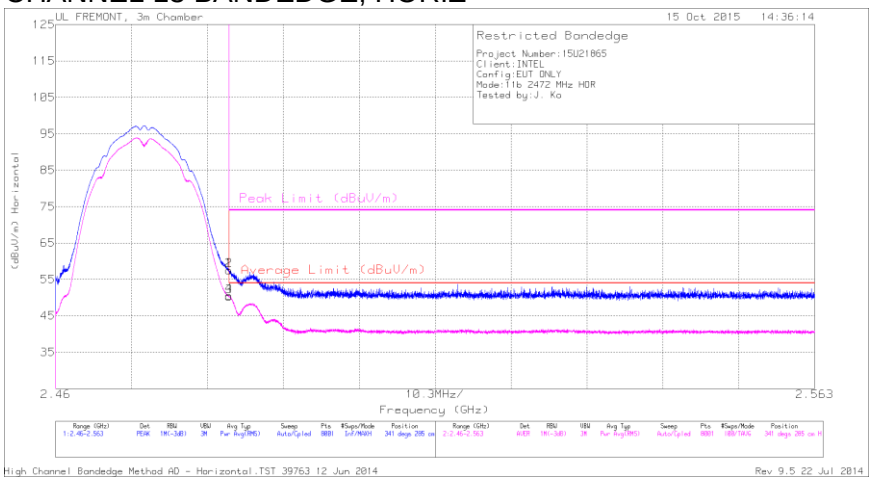
AUTHORIZED BANDEDGE (CHANNEL 13)

CHANNEL 13 BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	47.25	PK	32.3	-22.1	0	57.45	-	-	74	-16.55	341	285	H
2	2.484	47.31	PK	32.3	-22.1	0	57.51	-	-	74	-16.49	341	285	H
3	2.484	40.1	RMS	32.3	-22.1	0	50.3	54	-3.7	-	-	341	285	H
4	2.484	40.33	RMS	32.3	-22.1	0	50.53	54	-3.47	-	-	341	285	H

PK - Peak detector

RMS - RMS detection

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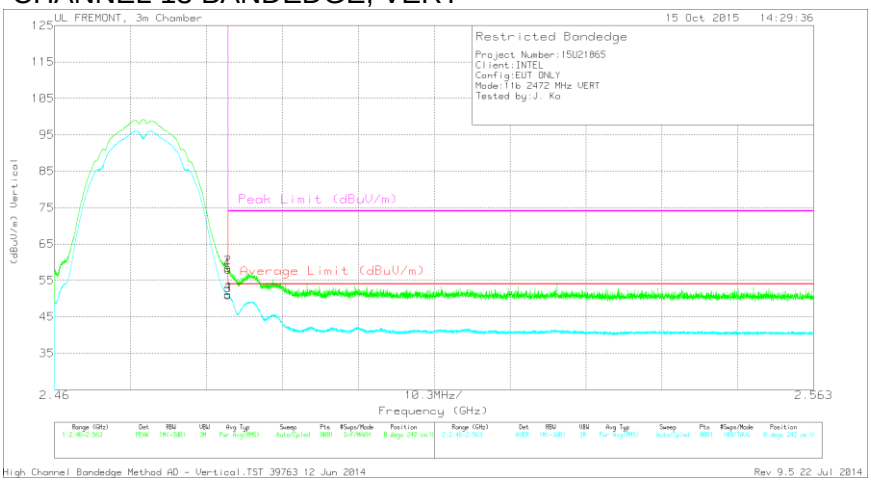
CHANNEL 13 BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	47.84	PK	32.3	-22.1	0	58.04	-	-	74	-15.96	0	242	V
2	2.484	48.3	PK	32.3	-22.1	0	58.5	-	-	74	-15.5	0	242	V
3	2.484	40.76	RMS	32.3	-22.1	0	50.96	54	-3.04	-	-	0	242	V
4	2.484	40.92	RMS	32.3	-22.1	0	51.12	54	-2.88	-	-	0	242	V

PK - Peak detector

RMS - RMS detection

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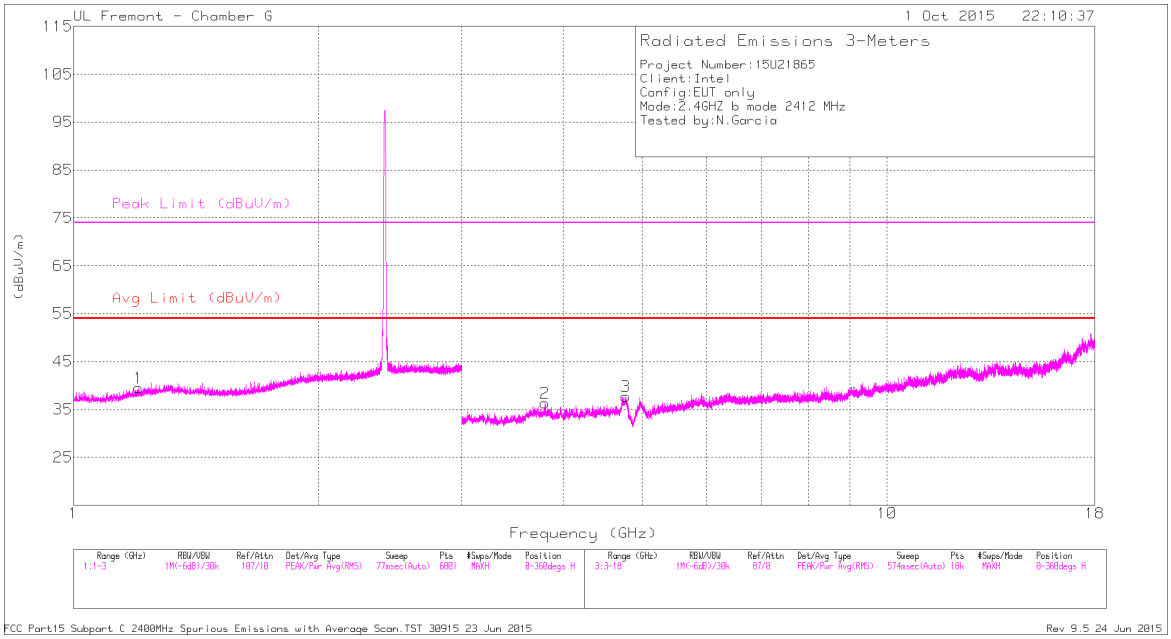
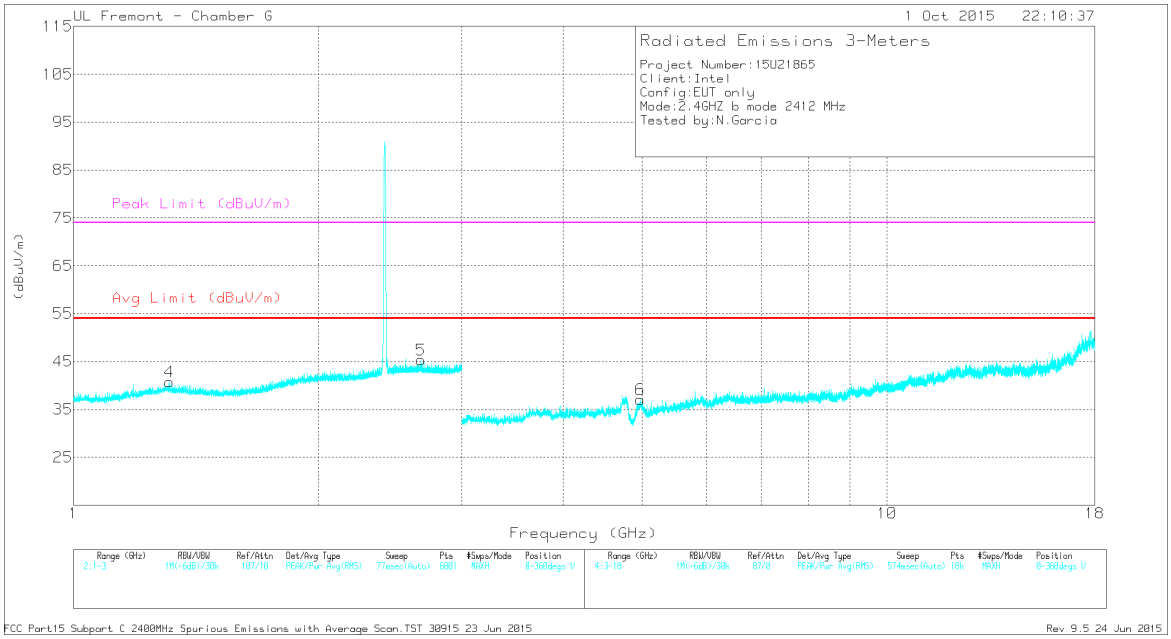
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL

HORIZTONAL



VERTICAL



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DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.202	44.15	PK2	28.4	-25.7	0	46.85	-	-	74	-27.15	296	120	H
	* 1.201	32.61	MAv1	28.4	-25.7	0	35.31	54	-18.69	-	-	296	120	H
4	* 1.314	44.56	PK2	29.3	-25.6	0	48.26	-	-	74	-25.74	252	116	V
	* 1.314	32.67	MAv1	29.3	-25.6	0	36.37	54	-17.63	-	-	252	116	V
5	* 2.675	44.6	PK2	32.4	-24.3	0	52.7	-	-	74	-21.3	288	162	V
	* 2.674	32.29	MAv1	32.4	-24.3	0	40.39	54	-13.61	-	-	288	162	V
2	* 3.797	42.62	PK2	33.1	-32.4	0	43.32	-	-	74	-30.68	19	117	H
	* 3.797	31.18	MAv1	33.1	-32.4	0	31.88	54	-22.12	-	-	19	117	H
3	* 4.772	43.79	PK2	34	-32.5	0	45.29	-	-	74	-28.71	34	120	H
	* 4.774	32.93	MAv1	34	-32.5	0	34.43	54	-19.57	-	-	34	120	H
6	* 4.975	43.06	PK2	34.2	-32.4	0	44.86	-	-	74	-29.14	41	167	V
	* 4.975	32.02	MAv1	34.2	-32.4	0	33.82	54	-20.18	-	-	41	167	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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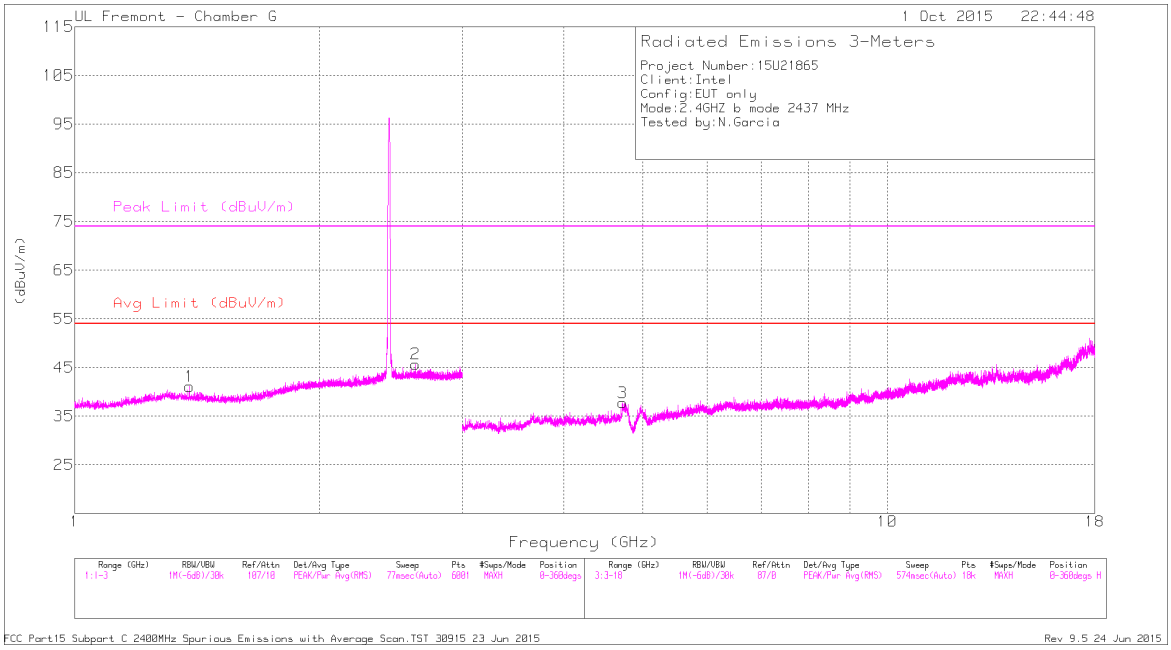
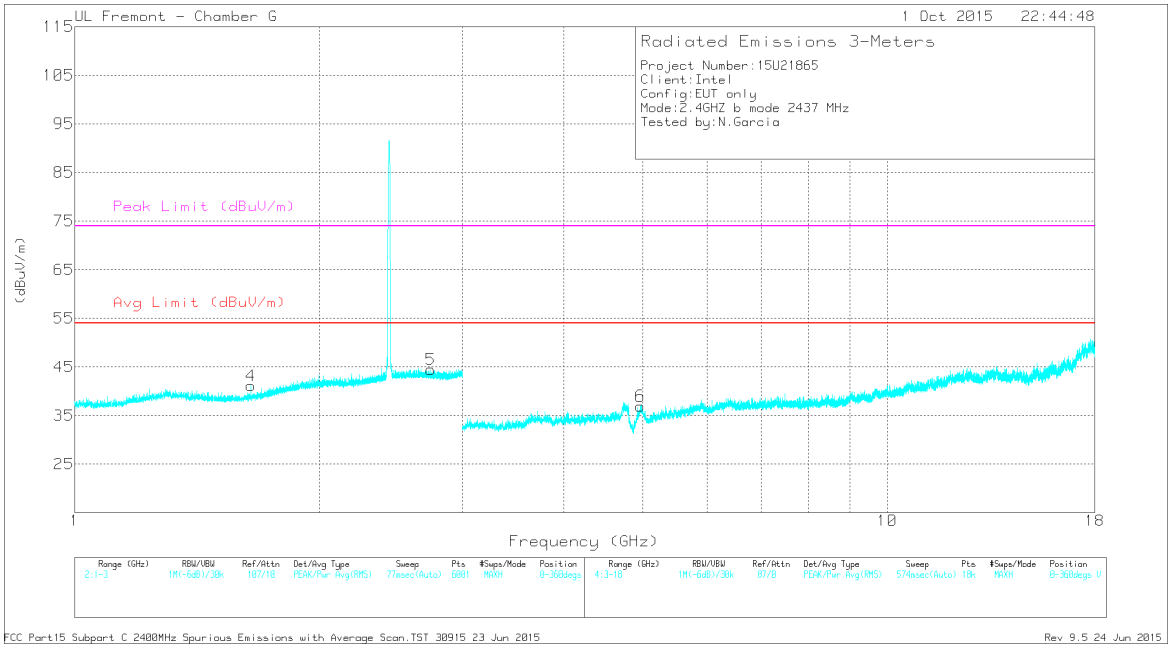
MID CHANNEL

HORIZTONAL



VERTICAL



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DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.383	45.01	PK2	28.9	-25.5	0	48.41	-	-	74	-25.59	29	160	H
	* 1.386	32.33	MAv1	28.9	-25.5	0	35.73	54	-18.27	-	-	29	160	H
5	* 2.743	43.54	PK2	32.3	-24.4	0	51.44	-	-	74	-22.56	20	114	V
	* 2.744	32.01	MAv1	32.3	-24.4	0	39.91	54	-14.09	-	-	20	114	V
3	* 4.729	43.71	PK2	33.9	-32.3	0	45.31	-	-	74	-28.69	67	160	H
	* 4.728	32.48	MAv1	33.9	-32.3	0	34.08	54	-19.92	-	-	67	160	H
6	* 4.968	44.13	PK2	34.2	-32.4	0	45.93	-	-	74	-28.07	67	203	V
	* 4.966	32.18	MAv1	34.2	-32.4	0	33.98	54	-20.02	-	-	67	203	V
4	1.648	44.57	PK2	28.6	-25.1	0	48.07	-	-	74	-25.93	35	200	V
2	2.625	43.75	PK2	32.4	-24.4	0	51.75	-	-	74	-22.25	19	179	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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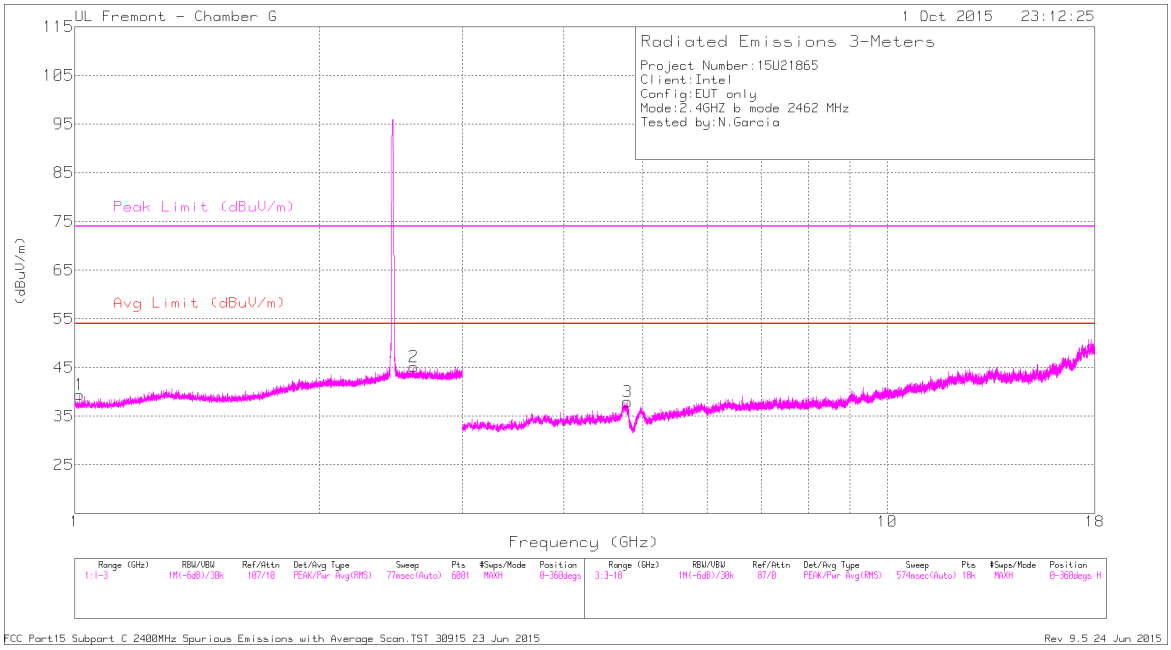
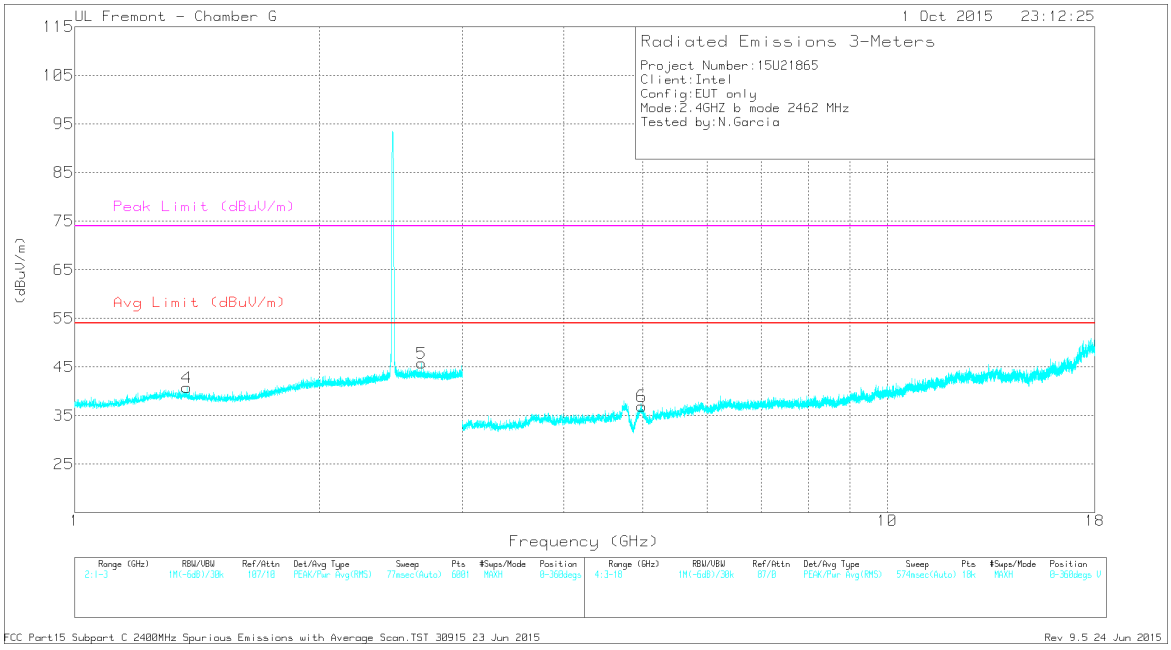
HIGH CHANNEL

HORIZTONAL



VERTICAL



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DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.015	44.81	PK2	27.4	-25.8	0	46.41	-	-	74	-27.59	13	177	H
	* 1.014	32.86	MAv1	27.4	-25.8	0	34.46	54	-19.54	-	-	13	177	H
4	* 1.375	44.46	PK2	28.9	-25.5	0	47.86	-	-	74	-26.14	80	166	V
	* 1.374	32.78	MAv1	28.9	-25.5	0	36.18	54	-17.82	-	-	80	166	V
5	* 2.67	43.81	PK2	32.4	-24.3	0	51.91	-	-	74	-22.09	60	175	V
	* 2.669	32.2	MAv1	32.4	-24.3	0	40.3	54	-13.7	-	-	60	175	V
3	* 4.792	43.92	PK2	34	-32.6	0	45.32	-	-	74	-28.68	41	202	H
	* 4.791	32.59	MAv1	34	-32.6	0	33.99	54	-20.01	-	-	41	202	H
6	* 4.986	43.75	PK2	34.2	-32.4	0	45.55	-	-	74	-28.45	36	159	V
	* 4.988	31.84	MAv1	34.2	-32.4	0	33.64	54	-20.36	-	-	36	159	V
2	2.612	43.4	PK2	32.4	-24.4	0	51.4	-	-	74	-22.6	48	192	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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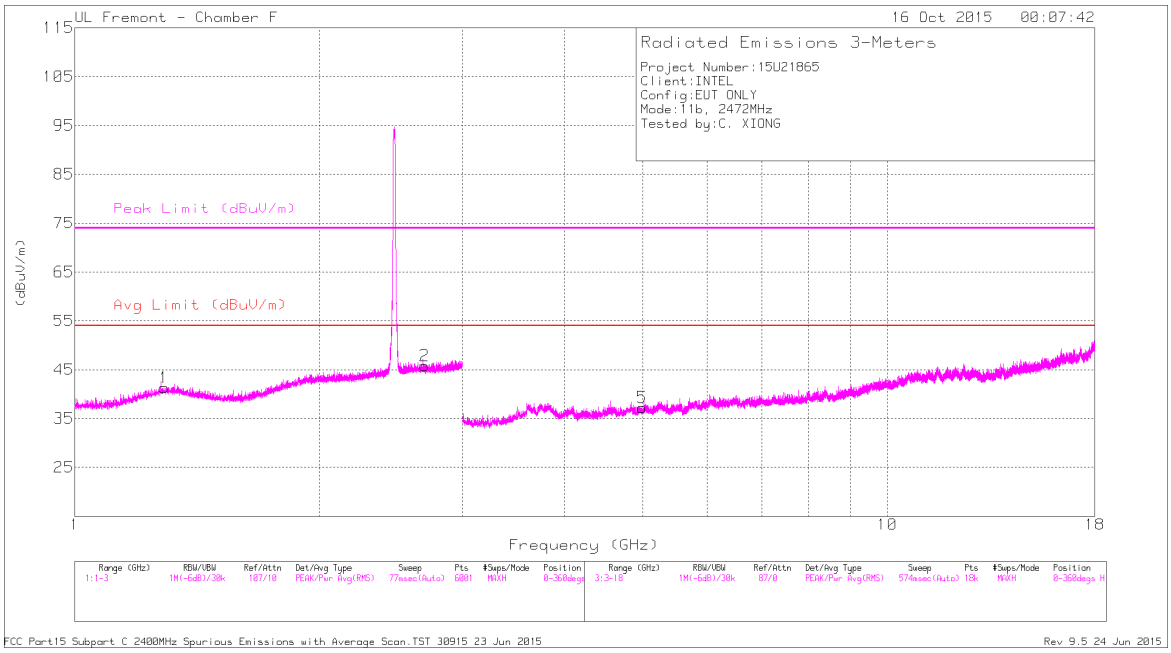
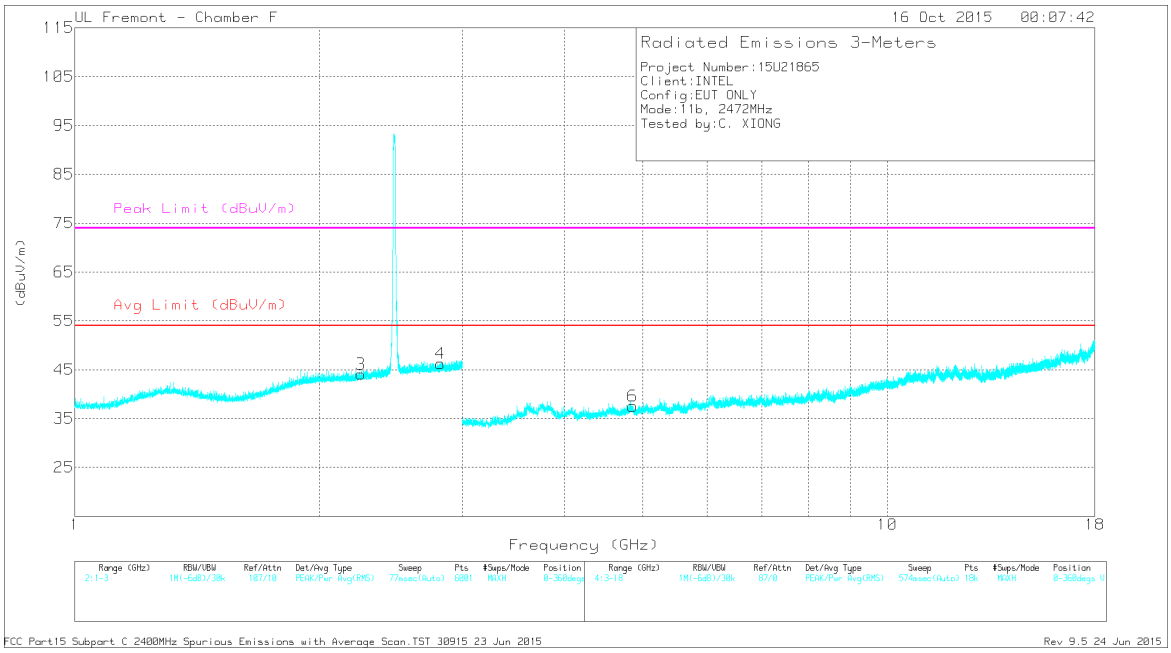
CHANNEL 13

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.289	42.93	PK2	29.9	-22.3	0	50.53	-	-	74	-23.47	360	100	H
	* 1.288	30.49	MAv1	29.9	-22.3	0	38.09	54	-15.91	-	-	360	100	H
2	* 2.696	41.88	PK2	32.7	-20.8	0	53.78	-	-	74	-20.22	360	100	H
	* 2.695	30.49	MAv1	32.7	-20.8	0	42.39	54	-11.61	-	-	360	100	H
3	* 2.249	41.35	PK2	31.6	-21.2	0	51.75	-	-	74	-22.25	360	100	V
	* 2.25	30.42	MAv1	31.6	-21.2	0	40.82	54	-13.18	-	-	360	100	V
4	* 2.818	41.76	PK2	32.7	-20.5	0	53.96	-	-	74	-20.04	360	100	V
	* 2.818	30.26	MAv1	32.7	-20.5	0	42.46	54	-11.54	-	-	360	100	V
5	* 4.99	40.87	PK2	34.1	-28.9	0	46.07	-	-	74	-27.93	360	100	H
	* 4.991	29.57	MAv1	34.1	-28.9	0	34.77	54	-19.23	-	-	360	100	H
6	* 4.859	39.17	PK2	34.1	-27.6	0	45.67	-	-	74	-28.33	360	100	V
	* 4.858	27.66	MAv1	34.1	-27.6	0	34.16	54	-19.84	-	-	360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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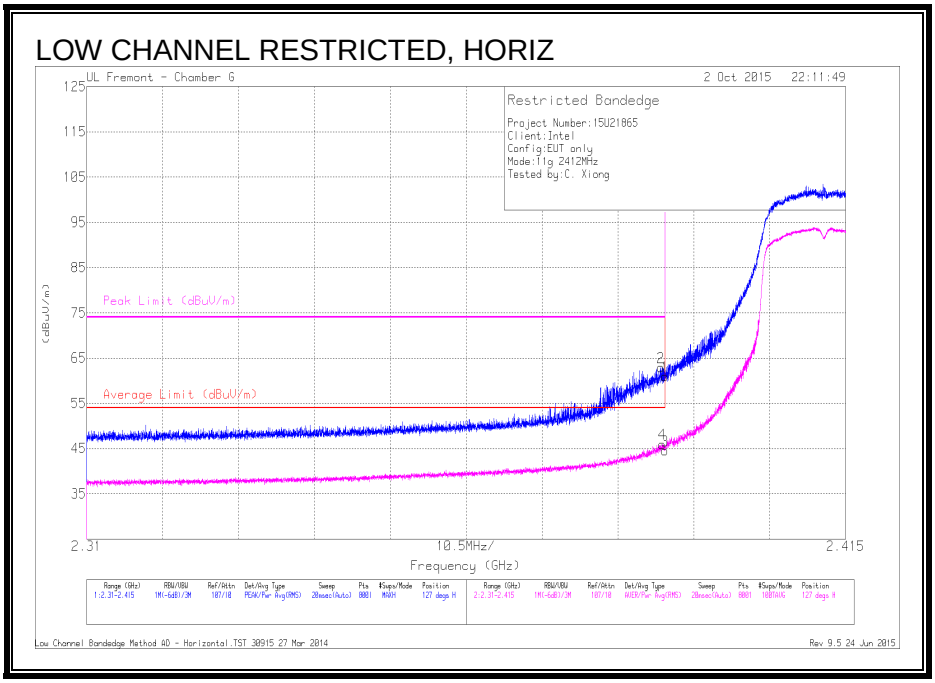
9.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	53.53	Pk	31.9	-24.5	0	60.93	-	-	74	-13.07	127	121	H
2	* 2.389	55.55	Pk	31.9	-24.5	0	62.95	-	-	74	-11.05	127	121	H
3	* 2.39	36.92	RMS	31.9	-24.5	.3	44.62	54	-9.38	-	-	127	121	H
4	* 2.39	38.31	RMS	31.9	-24.5	.3	46.01	54	-7.99	-	-	127	121	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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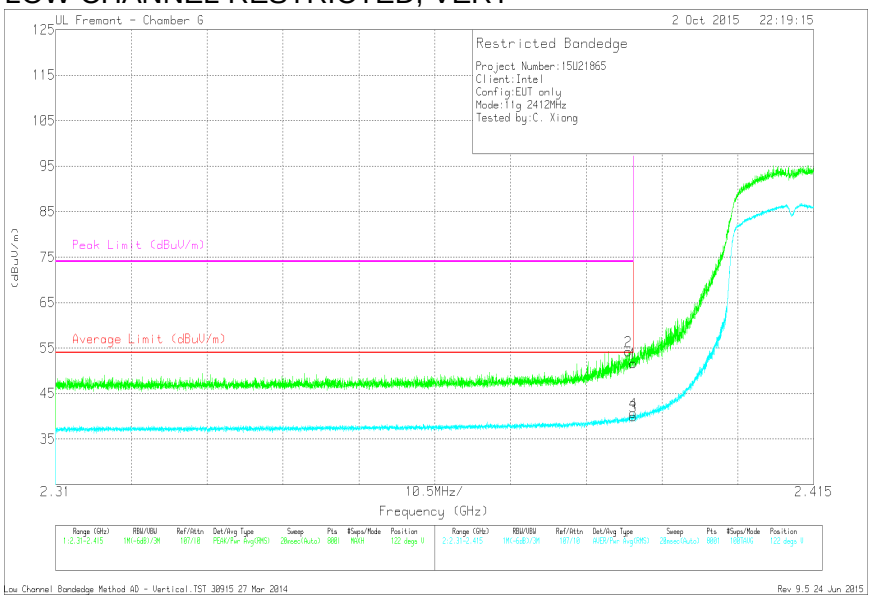
LOW CHANNEL RESTRICTED, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	44.27	Pk	31.9	-24.5	0	51.67	-	-	74	-22.33	122	126	V
2	* 2.389	46.89	Pk	31.9	-24.5	0	54.29	-	-	74	-19.71	122	126	V
3	* 2.39	32.27	RMS	31.9	-24.5	.3	39.97	54	-14.03	-	-	122	126	V
4	* 2.39	32.98	RMS	31.9	-24.5	.3	40.68	54	-13.32	-	-	122	126	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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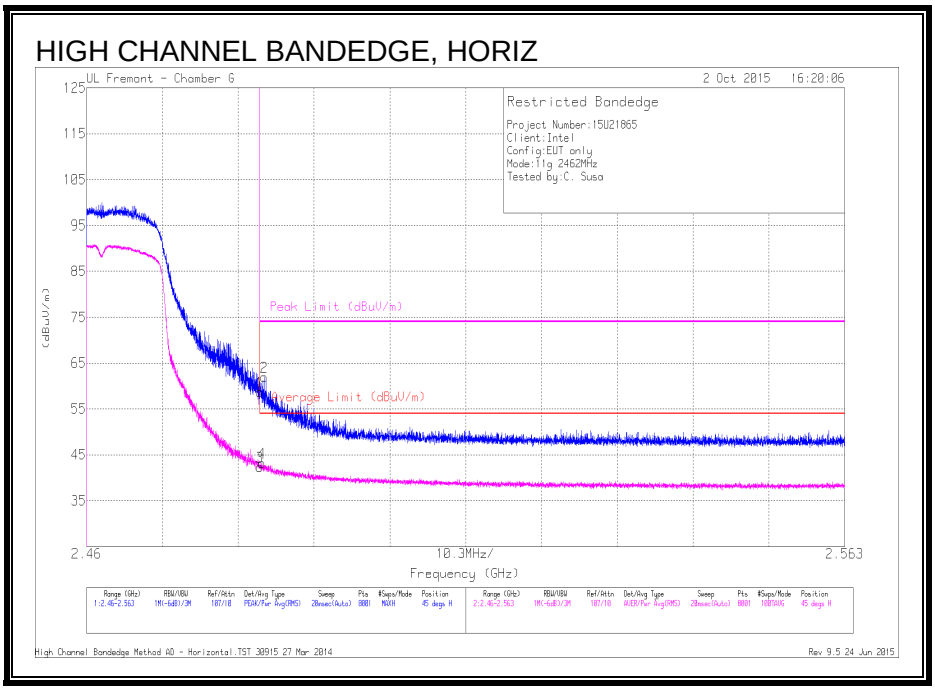
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.96	Pk	32.3	-24.5	0	58.76	-	-	74	-15.24	45	222	H
2	* 2.484	54.2	Pk	32.3	-24.5	0	62	-	-	74	-12	45	222	H
3	* 2.484	34.23	RMS	32.3	-24.5	.3	42.33	54	-11.67	-	-	45	222	H
4	* 2.484	35.16	RMS	32.3	-24.5	.3	43.26	54	-10.74	-	-	45	222	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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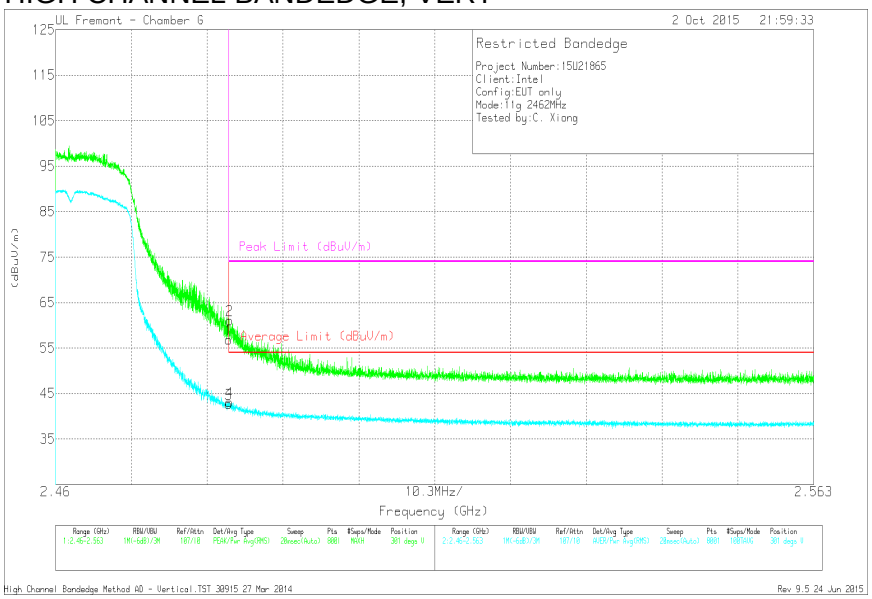
HIGH CHANNEL BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.1	Pk	32.3	-24.5	0	56.9	-	-	74	-17.1	301	122	V
2	* 2.484	53.25	Pk	32.3	-24.5	0	61.05	-	-	74	-12.95	301	122	V
3	* 2.484	34.67	RMS	32.3	-24.5	.3	42.77	54	-11.23	-	-	301	122	V
4	* 2.484	35.03	RMS	32.3	-24.5	.3	43.13	54	-10.87	-	-	301	122	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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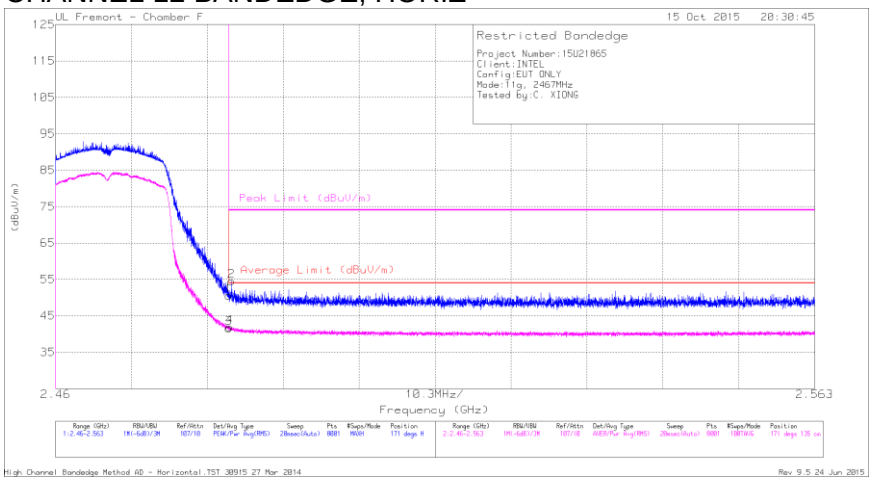
AUTHORIZED BANDEDGE (CHANNEL 12)

CHANNEL 12 BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.43	Pk	32.2	-21.1	0	50.53	-	-	74	-23.47	171	135	H
2	* 2.484	43.38	Pk	32.2	-21.1	0	54.48	-	-	74	-19.52	171	135	H
3	* 2.484	30.5	RMS	32.2	-21.1	.3	41.9	54	-12.1	-	-	171	135	H
4	* 2.484	30.75	RMS	32.2	-21.1	.3	42.15	54	-11.85	-	-	171	135	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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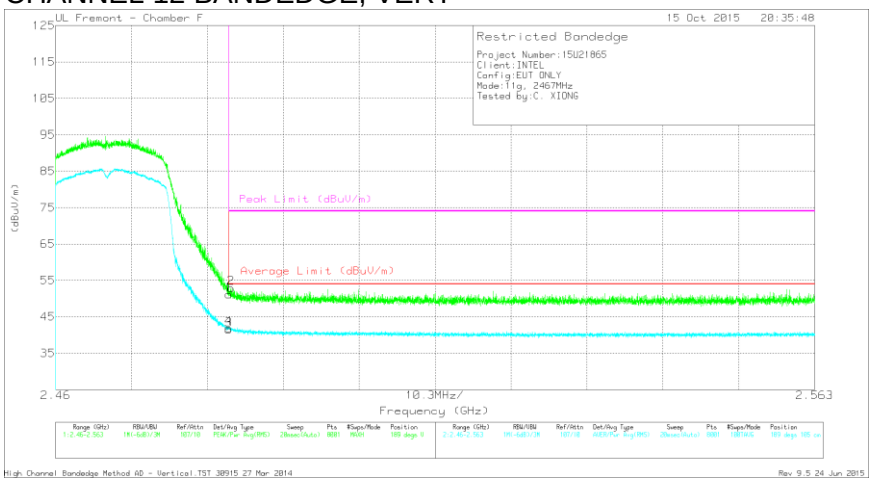
CHANNEL 12 BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.11	Pk	32.2	-21.1	0	51.21	-	-	74	-22.79	189	105	V
2	* 2.484	41.84	Pk	32.2	-21.1	0	52.94	-	-	74	-21.06	189	105	V
3	* 2.484	30.37	RMS	32.2	-21.1	.3	41.77	54	-12.23	-	-	189	105	V
4	* 2.484	30.77	RMS	32.2	-21.1	.3	42.17	54	-11.83	-	-	189	105	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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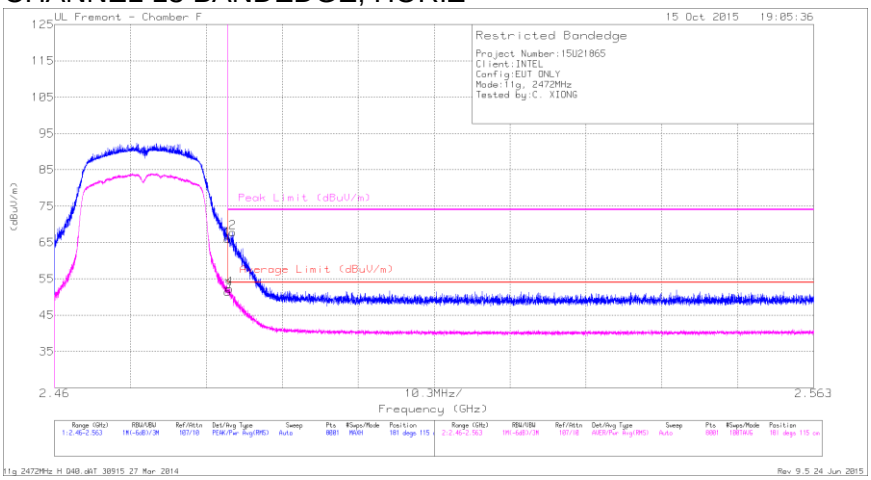
AUTHORIZED BANDEDGE (CHANNEL 13)

CHANNEL 13 BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	54.89	Pk	32.2	-21.1	0	65.99	-	-	74	-8.01	181	115	H
2	* 2.484	56.7	Pk	32.2	-21.1	0	67.8	-	-	74	-6.2	181	115	H
3	* 2.484	39.98	RMS	32.2	-21.1	.3	51.38	54	-2.62	-	-	181	115	H
4	* 2.484	40.93	RMS	32.2	-21.1	.3	52.33	54	-1.67	-	-	181	115	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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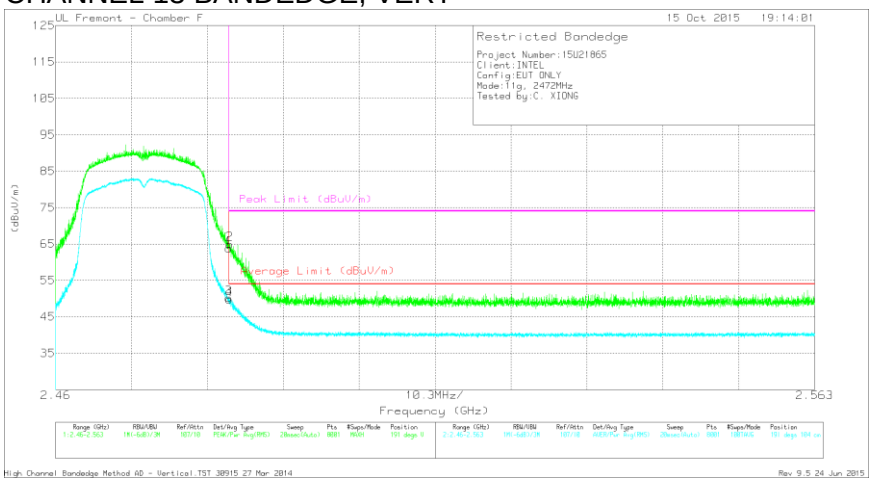
CHANNEL 13 BANDEDGE, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	52.75	Pk	32.2	-21.1	0	63.85	-	-	74	-10.15	191	104	V
2	* 2.484	53.9	Pk	32.2	-21.1	0	65	-	-	74	-9	191	104	V
3	* 2.484	39.04	RMS	32.2	-21.1	.3	50.44	54	-3.56	-	-	191	104	V
4	* 2.484	38.71	RMS	32.2	-21.1	.3	50.11	54	-3.89	-	-	191	104	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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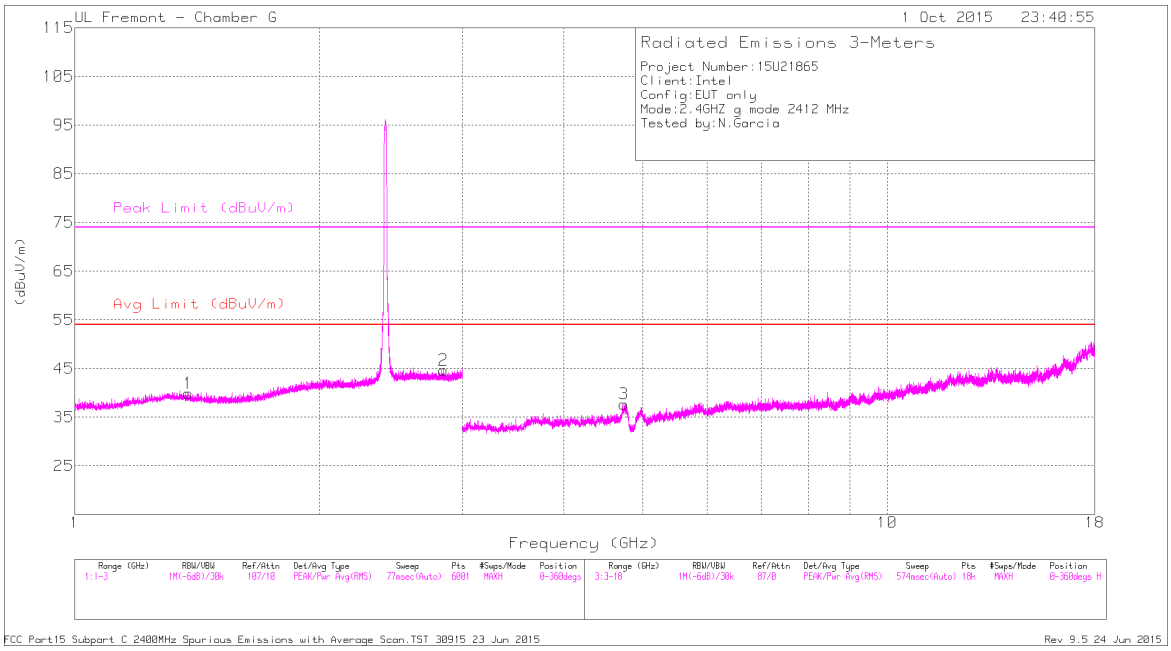
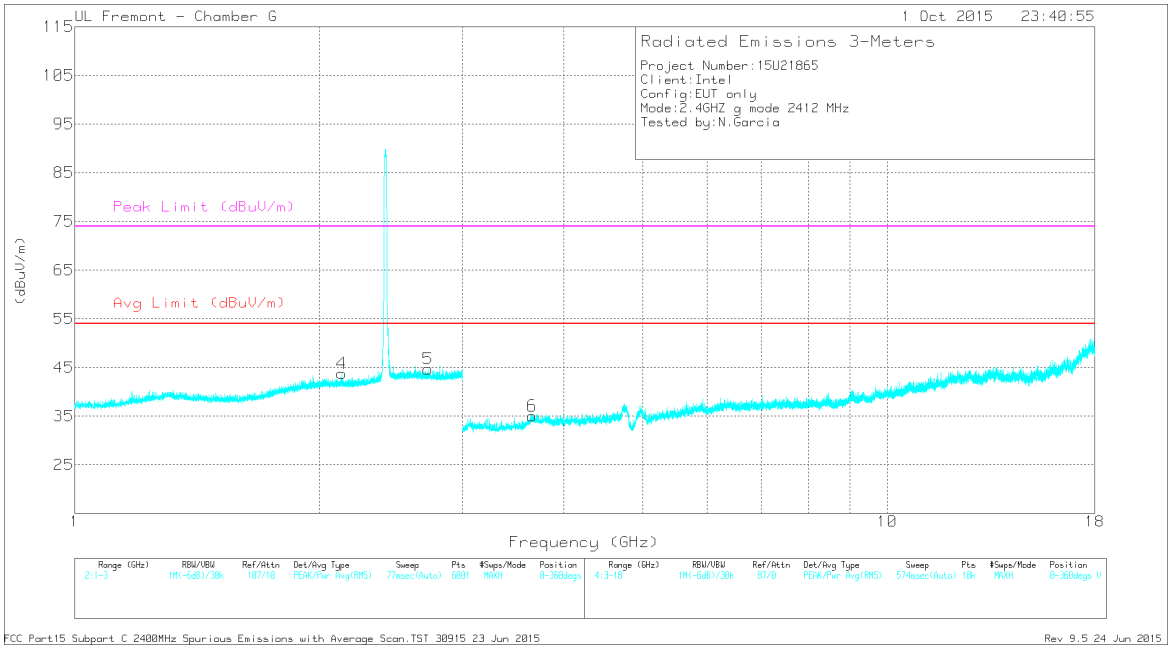
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL

HORIZTONAL



VERTICAL



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DATA

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.382	44.01	PK2	28.9	-25.5	0	47.41	-	-	74	-26.59	38	141	H
	* 1.379	32.81	MAv1	28.9	-25.5	.3	36.51	54	-17.49	-	-	38	141	H
2	* 2.844	43.57	PK2	32.2	-24.4	0	51.37	-	-	74	-22.63	42	173	H
	* 2.844	32.05	MAv1	32.2	-24.4	.3	40.15	54	-13.85	-	-	42	173	H
5	* 2.722	43.97	PK2	32.3	-24.4	0	51.87	-	-	74	-22.13	74	173	V
	* 2.72	32.16	MAv1	32.3	-24.4	.3	40.36	54	-13.64	-	-	74	173	V
3	* 4.74	44.66	PK2	33.9	-32.3	0	46.26	-	-	74	-27.74	111	215	H
	* 4.739	33.22	MAv1	33.9	-32.3	.3	35.12	54	-18.88	-	-	111	215	H
6	* 3.659	42.06	PK2	33.1	-31.8	0	43.36	-	-	74	-30.64	130	120	V
	* 3.656	30.9	MAv1	33.1	-31.9	.3	32.4	54	-21.6	-	-	130	120	V
4	2.13	44.1	PK2	31.2	-24.7	0	50.6	-	-	74	-23.4	67	146	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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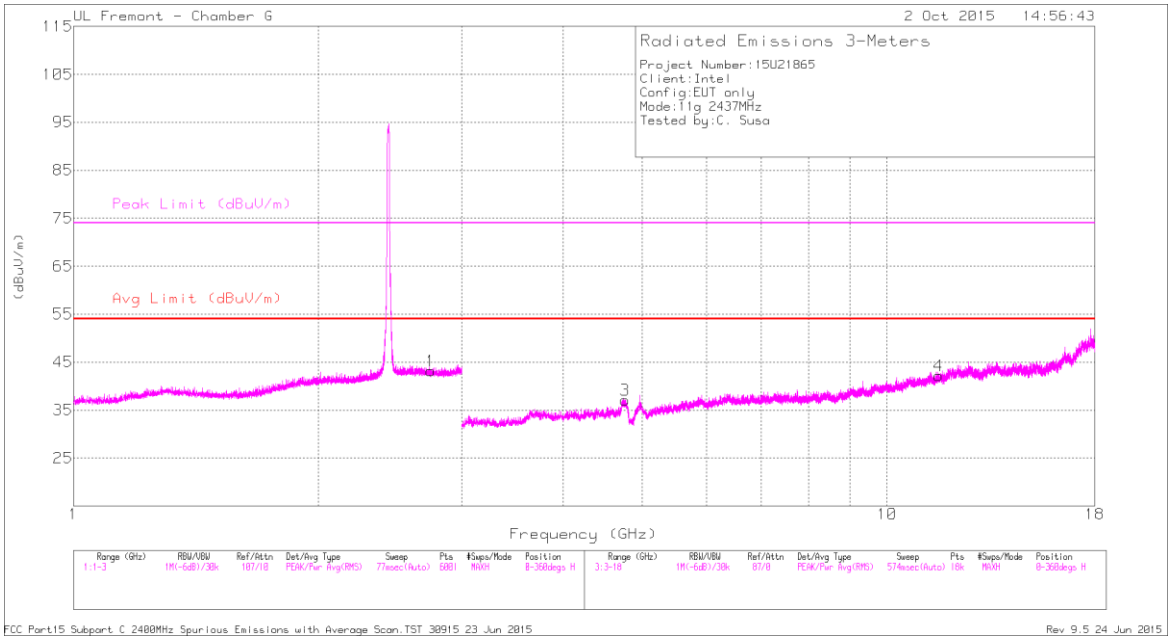
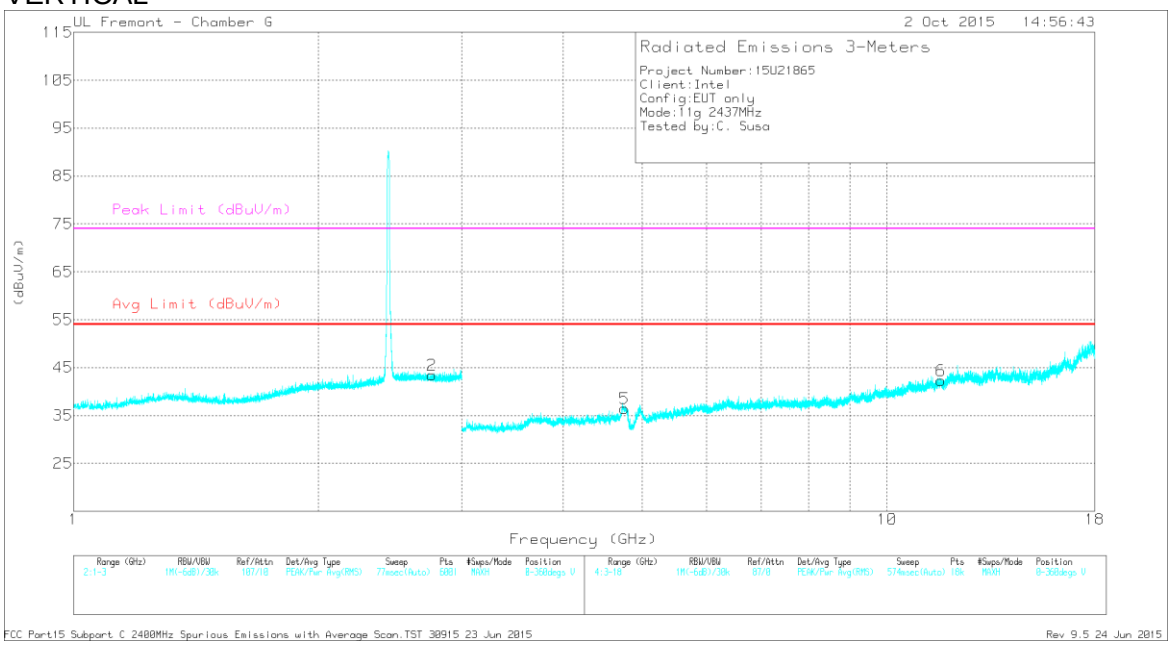
MID CHANNEL

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.749	44.03	PK2	32.3	-24.4	0	51.93	-	-	74	-22.07	234	107	H
	* 2.746	31.74	MAv1	32.3	-24.4	.3	39.94	54	-14.06	-	-	234	107	H
2	* 2.756	43.53	PK2	32.3	-24.4	0	51.43	-	-	74	-22.57	117	256	V
	* 2.758	32	MAv1	32.3	-24.4	.3	40.2	54	-13.8	-	-	117	256	V
3	* 4.765	43.49	PK2	34	-32.5	0	44.99	-	-	74	-29.01	152	194	H
	* 4.765	32.9	MAv1	34	-32.5	.3	34.7	54	-19.3	-	-	152	194	H
4	* 11.569	37.61	PK2	38.3	-25.6	0	50.31	-	-	74	-23.69	289	134	H
	* 11.57	26.75	MAv1	38.3	-25.7	.3	39.65	54	-14.35	-	-	289	134	H
5	* 4.755	43.75	PK2	33.9	-32.5	0	45.15	-	-	74	-28.85	207	207	V
	* 4.753	32.58	MAv1	33.9	-32.5	.3	34.28	54	-19.72	-	-	207	207	V
6	* 11.648	38.04	PK2	38.4	-25.6	0	50.84	-	-	74	-23.16	315	103	V
	* 11.649	26.91	MAv1	38.4	-25.7	.3	39.91	54	-14.09	-	-	315	103	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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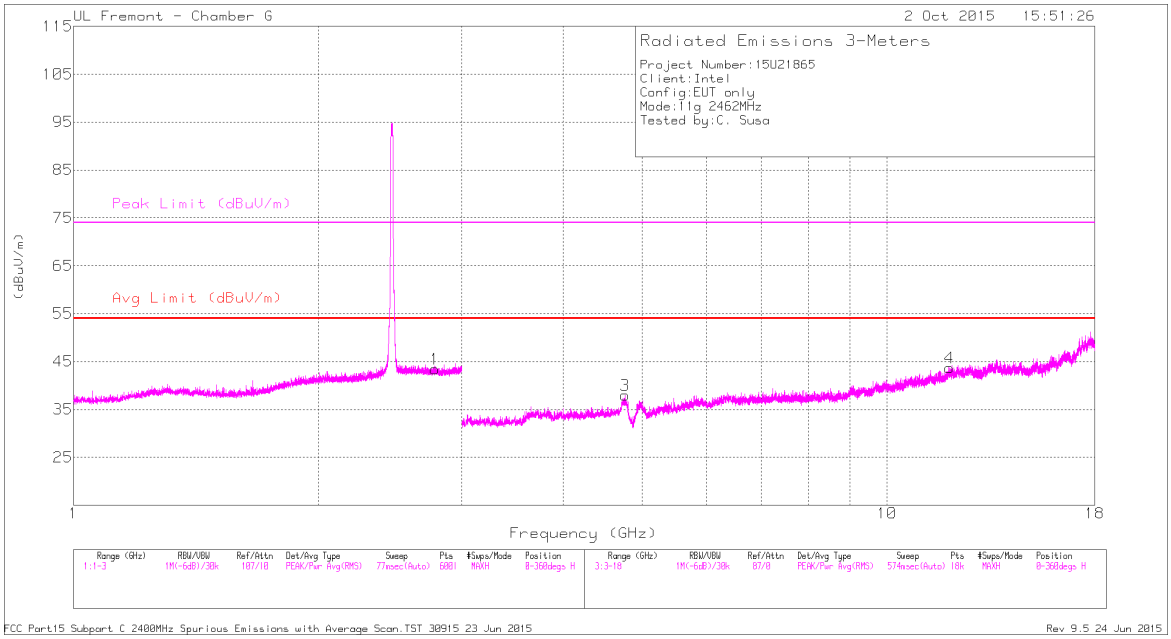
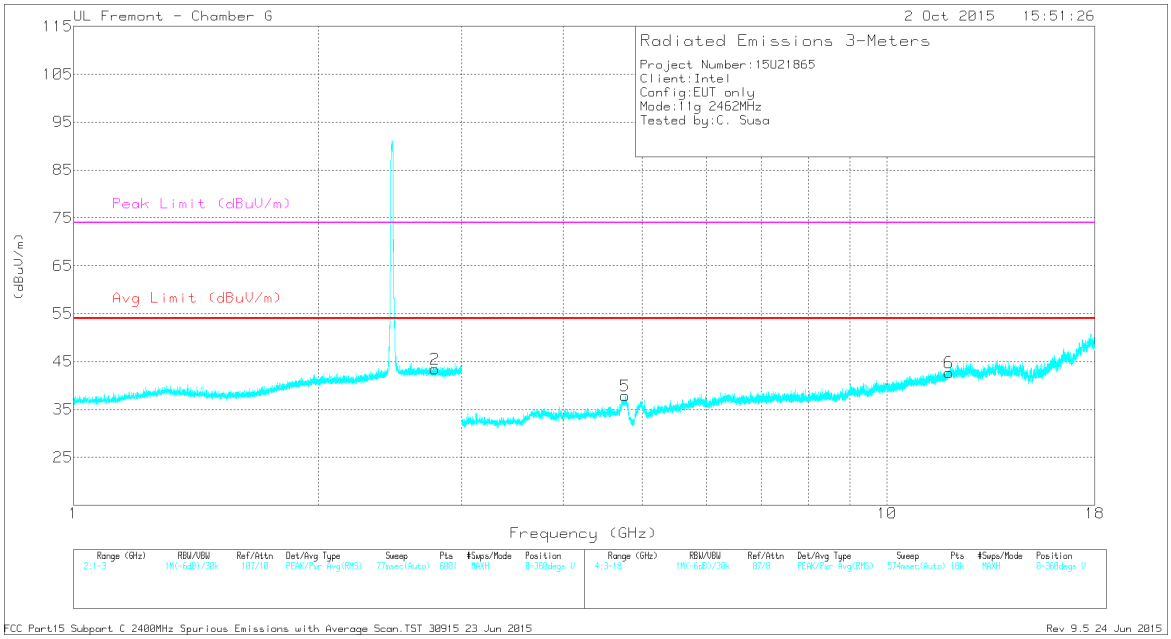
HIGH CHANNEL

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.778	42.99	PK2	32.3	-24.4	0	50.89	-	-	74	-23.11	205	123	H
	* 2.782	31.8	MAv1	32.3	-24.4	.3	40	54	-14	-	-	205	123	H
2	* 2.781	43.46	PK2	32.3	-24.4	0	51.36	-	-	74	-22.64	176	107	V
	* 2.78	32.08	MAv1	32.3	-24.4	.3	40.28	54	-13.72	-	-	176	107	V
4	* 11.932	37.84	PK2	38.8	-25.3	0	51.34	-	-	74	-22.66	304	226	H
	* 11.933	26.62	MAv1	38.8	-25.3	.3	40.42	54	-13.58	-	-	304	226	H
3	* 4.758	43.9	PK2	33.9	-32.5	0	45.3	-	-	74	-28.7	15	202	H
	* 4.761	33.03	MAv1	34	-32.5	.3	34.83	54	-19.17	-	-	15	202	H
5	* 4.761	43.87	PK2	34	-32.5	0	45.37	-	-	74	-28.63	126	154	V
	* 4.763	32.78	MAv1	34	-32.5	.3	34.58	54	-19.42	-	-	126	154	V
6	* 11.912	37.75	PK2	38.7	-25.4	0	51.05	-	-	74	-22.95	278	245	V
	* 11.913	26.71	MAv1	38.7	-25.5	.3	40.21	54	-13.79	-	-	278	245	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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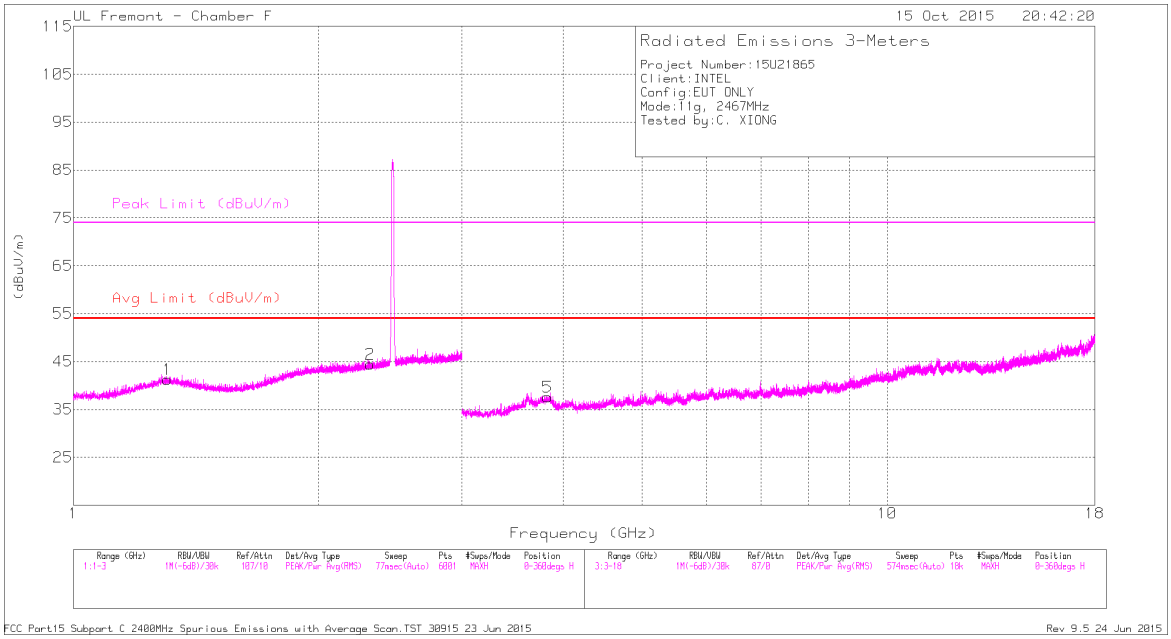
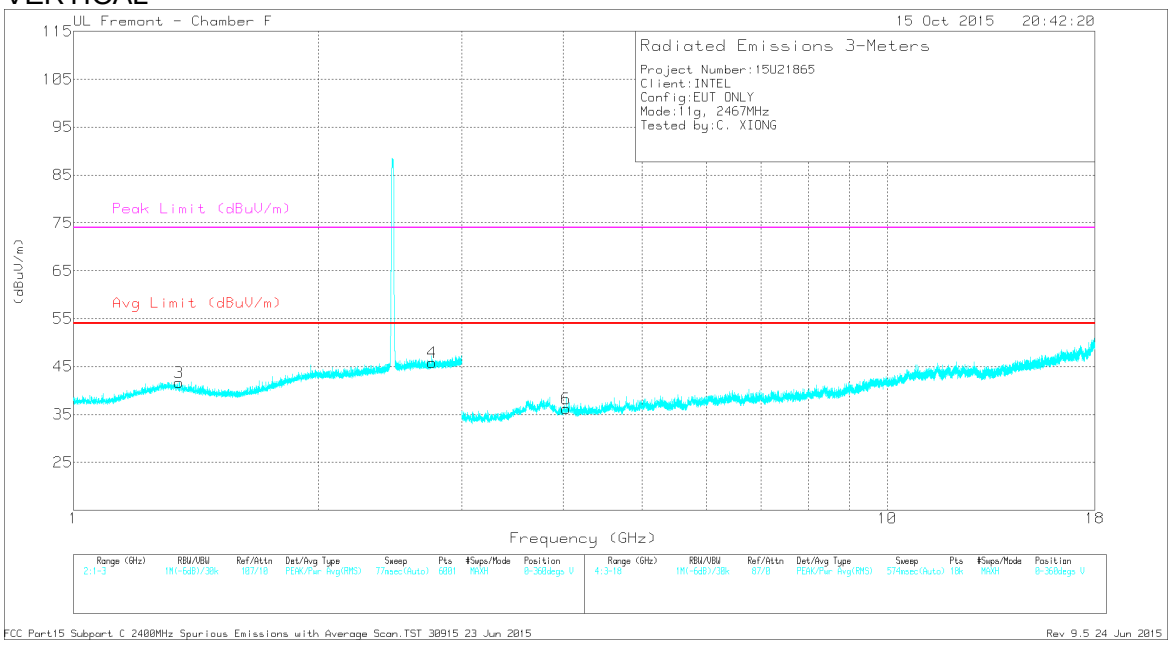
CHANNEL 12

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.303	42.49	PK2	30	-22.2	0	50.29	-	-	74	-23.71	360	100	H
	* 1.303	30.37	MAv1	30	-22.2	.3	38.47	54	-15.53	-	-	360	100	H
2	* 2.317	42.01	PK2	31.8	-21.1	0	52.71	-	-	74	-21.29	360	100	H
	* 2.317	30.32	MAv1	31.8	-21.1	.3	41.32	54	-12.68	-	-	360	100	H
3	* 1.347	42	PK2	29.6	-22.2	0	49.4	-	-	74	-24.6	360	100	V
	* 1.348	30.5	MAv1	29.6	-22.2	.3	38.2	54	-15.8	-	-	360	100	V
4	* 2.758	42.34	PK2	32.7	-20.8	0	54.24	-	-	74	-19.76	360	100	V
	* 2.759	30.34	MAv1	32.7	-20.8	.3	42.54	54	-11.46	-	-	360	100	V
5	* 3.827	40.82	PK2	34.1	-28.4	0	46.52	-	-	74	-27.48	360	100	H
	* 3.827	29.56	MAv1	34.1	-28.4	.3	35.56	54	-18.44	-	-	360	100	H
6	* 4.03	41.32	PK2	33.6	-29.1	0	45.82	-	-	74	-28.18	360	100	V
	* 4.031	29.69	MAv1	33.6	-29.1	.3	34.49	54	-19.51	-	-	360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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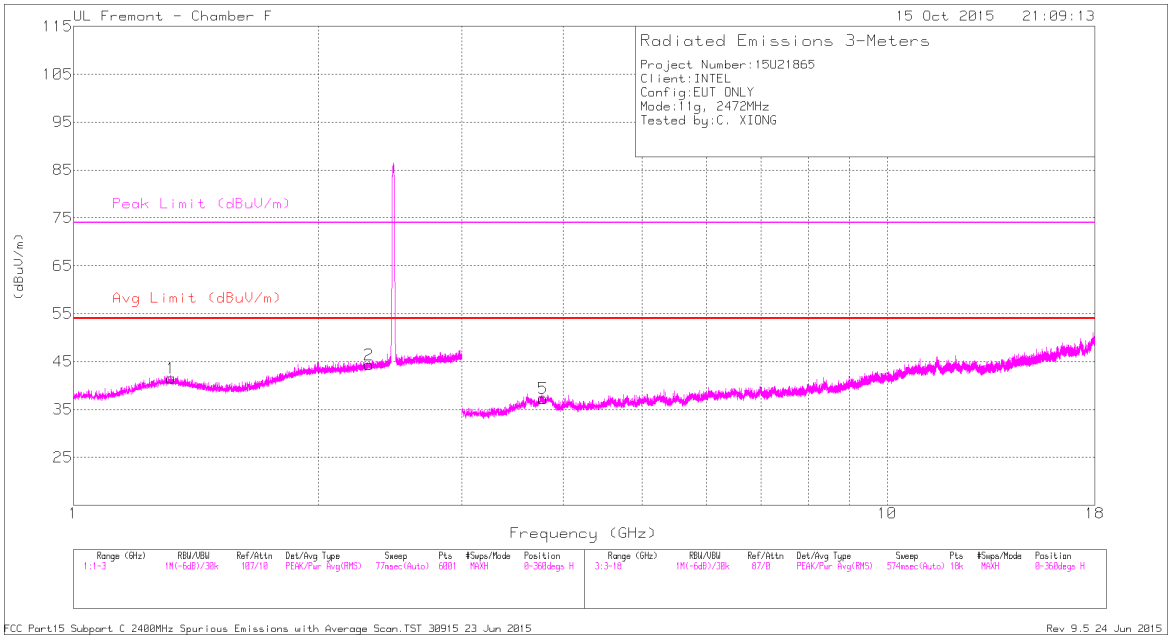
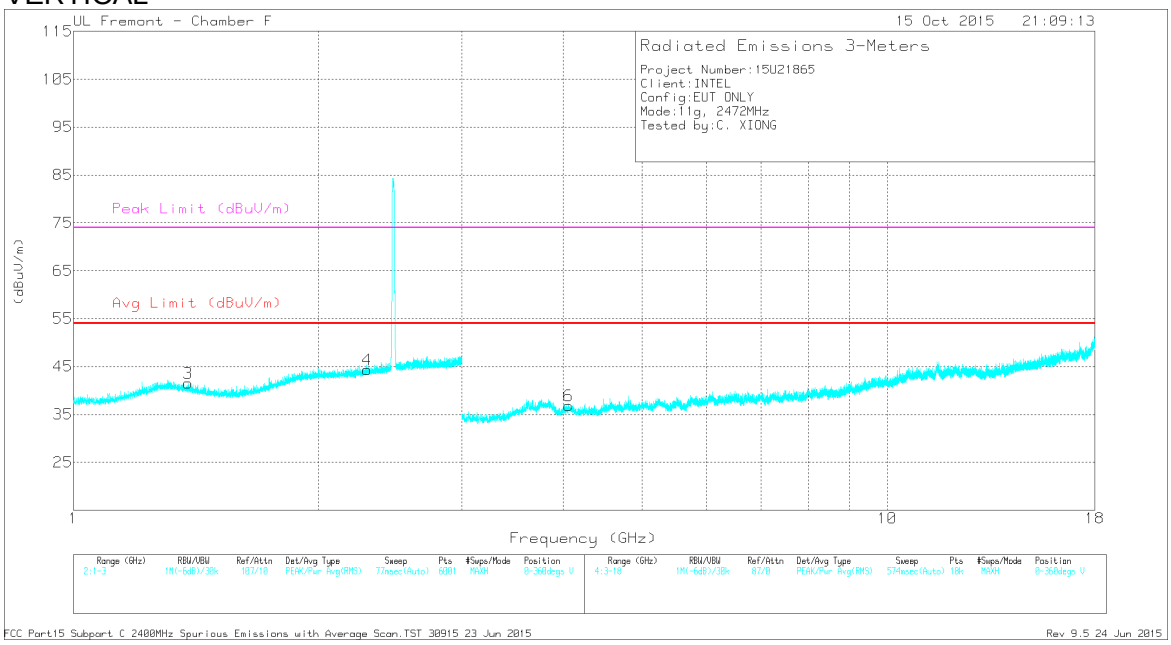
CHANNEL 13

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.32	41.84	PK2	29.9	-22.2	0	49.54	-	-	74	-24.46	360	151	H
	* 1.319	30.47	MAv1	29.9	-22.2	.3	38.47	54	-15.53	-	-	360	151	H
2	2.307	42.06	PK2	31.8	-21.1	0	52.76	-	-	74	-21.24	360	151	H
	2.308	30.26	MAv1	31.8	-21.1	.3	41.26	54	-12.74	-	-	360	151	H
3	* 1.384	42.04	PK2	29.2	-22.1	0	49.14	-	-	74	-24.86	360	151	V
	* 1.384	30.44	MAv1	29.2	-22.1	.3	37.84	54	-16.16	-	-	360	151	V
4	* 2.295	42.37	PK2	31.8	-21.1	0	53.07	-	-	74	-20.93	360	151	V
	* 2.295	30.36	MAv1	31.8	-21.1	.3	41.36	54	-12.64	-	-	360	151	V
5	* 3.775	40.68	PK2	34.3	-29	0	45.98	-	-	74	-28.02	360	151	H
	* 3.775	29.26	MAv1	34.3	-29	.3	34.86	54	-19.14	-	-	360	151	H
6	* 4.058	41.24	PK2	33.6	-29.1	0	45.74	-	-	74	-28.26	360	151	V
	* 4.059	29.8	MAv1	33.6	-29.1	.3	34.6	54	-19.4	-	-	360	151	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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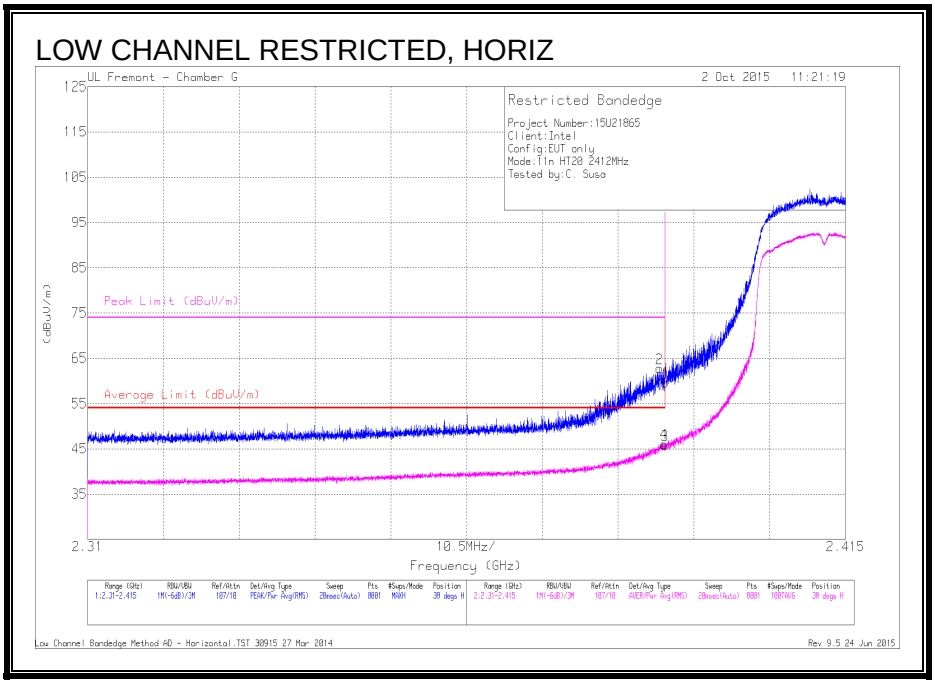
9.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	52.23	Pk	31.9	-24.5	0	59.63	-	-	74	-14.37	38	171	H
2	* 2.389	55.39	Pk	31.9	-24.5	0	62.79	-	-	74	-11.21	38	171	H
3	* 2.39	38.09	RMS	31.9	-24.5	.32	45.81	54	-8.19	-	-	38	171	H
4	* 2.39	38.39	RMS	31.9	-24.5	.32	46.11	54	-7.89	-	-	38	171	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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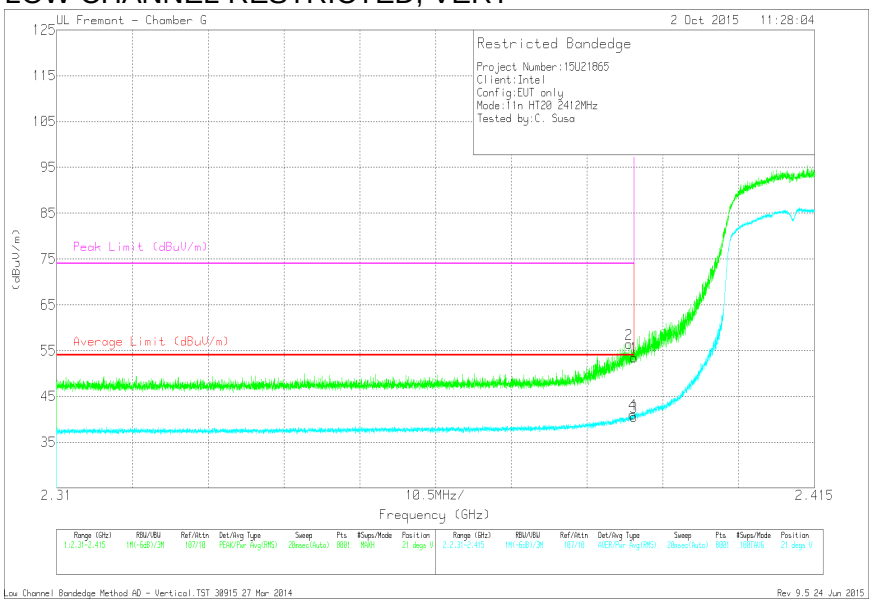
LOW CHANNEL RESTRICTED, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.16	Pk	31.9	-24.5	0	53.56	-	-	74	-20.44	21	125	V
2	* 2.389	49.04	Pk	31.9	-24.5	0	56.44	-	-	74	-17.56	21	125	V
3	* 2.39	32.82	RMS	31.9	-24.5	.32	40.54	54	-13.46	-	-	21	125	V
4	* 2.39	33.35	RMS	31.9	-24.5	.32	41.07	54	-12.93	-	-	21	125	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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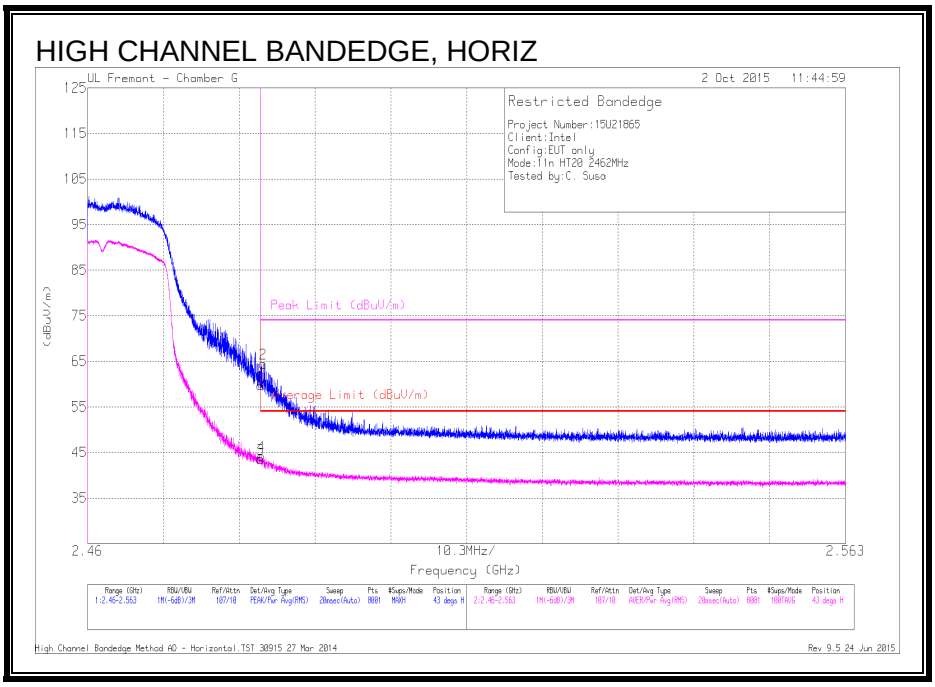
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	51.93	Pk	32.3	-24.5	0	59.73	-	-	74	-14.27	43	194	H
2	* 2.484	56.65	Pk	32.3	-24.5	0	64.45	-	-	74	-9.55	43	194	H
3	* 2.484	35.5	RMS	32.3	-24.5	.32	43.62	54	-10.38	-	-	43	194	H
4	* 2.484	36.11	RMS	32.3	-24.5	.32	44.23	54	-9.77	-	-	43	194	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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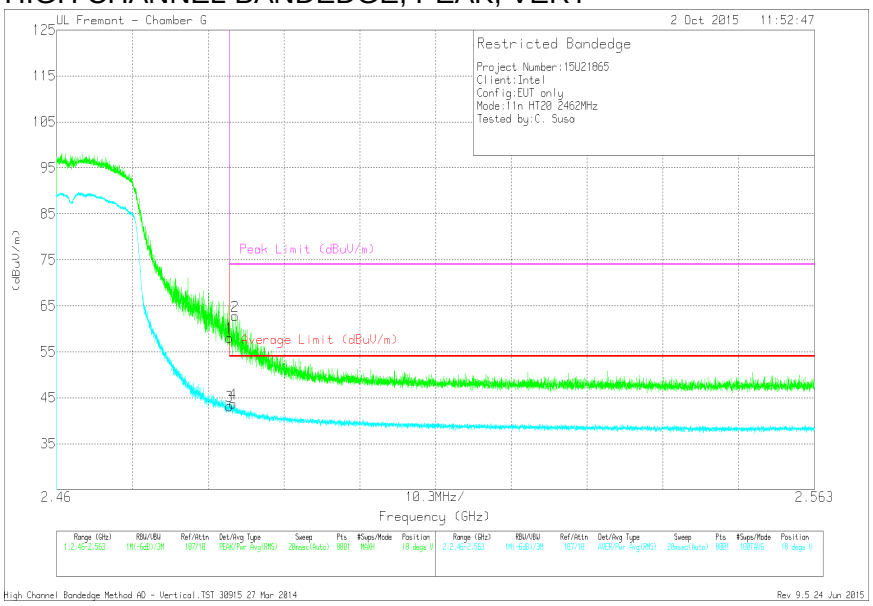
HIGH CHANNEL BANDEDGE, PEAK, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.25	Pk	32.3	-24.5	0	58.05	-	-	74	-15.95	18	125	V
2	* 2.484	54.97	Pk	32.3	-24.5	0	62.77	-	-	74	-11.23	18	125	V
3	* 2.484	35.08	RMS	32.3	-24.5	.32	43.2	54	-10.8	-	-	18	125	V
4	* 2.484	35.61	RMS	32.3	-24.5	.32	43.73	54	-10.27	-	-	18	125	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector
RMS - RMS detection

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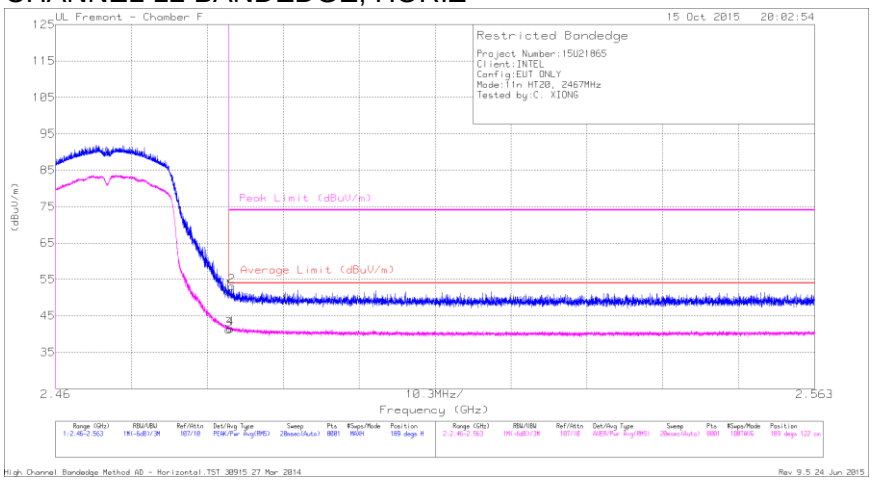
AUTHORIZED BANDEDGE (CHANNEL 12)

CHANNEL 12 BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.57	Pk	32.2	-21.1	0	51.67	-	-	74	-22.33	189	122	H
2	* 2.484	42.01	Pk	32.2	-21.1	0	53.11	-	-	74	-20.89	189	122	H
3	* 2.484	30.15	RMS	32.2	-21.1	.32	41.57	54	-12.43	-	-	189	122	H
4	* 2.484	30.38	RMS	32.2	-21.1	.32	41.8	54	-12.2	-	-	189	122	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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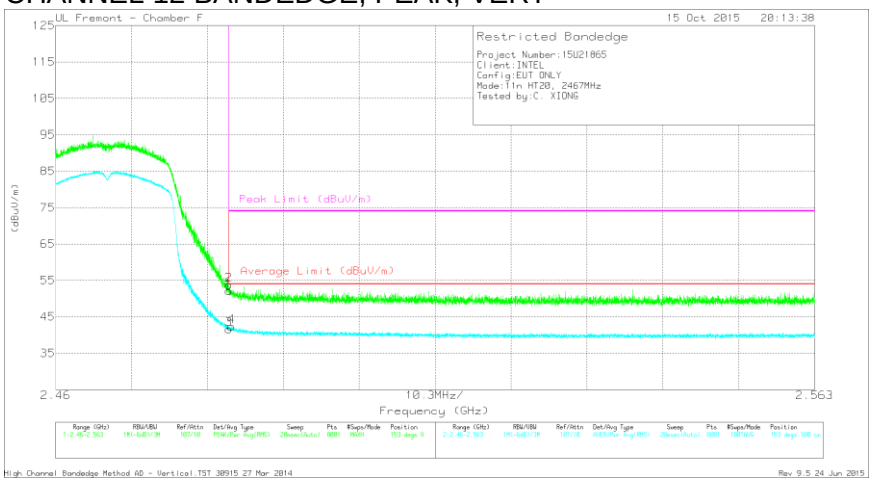
CHANNEL 12 BANDEDGE, PEAK, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41	Pk	32.2	-21.1	0	52.1	-	-	74	-21.9	153	100	V
2	* 2.484	42.72	Pk	32.2	-21.1	0	53.82	-	-	74	-20.18	153	100	V
3	* 2.484	30.47	RMS	32.2	-21.1	.32	41.89	54	-12.11	-	-	153	100	V
4	* 2.484	31.19	RMS	32.2	-21.1	.32	42.61	54	-11.39	-	-	153	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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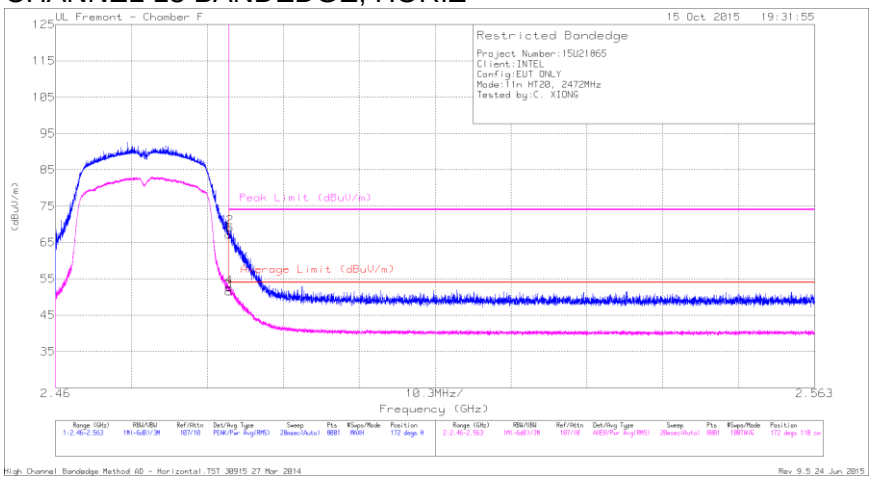
AUTHORIZED BANDEDGE (CHANNEL 13)

CHANNEL 13 BANDEDGE, HORIZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	56.05	Pk	32.2	-21.1	0	67.15	-	-	74	-6.85	172	110	H
2	* 2.484	58.05	Pk	32.2	-21.1	0	69.15	-	-	74	-4.85	172	110	H
3	* 2.484	40.48	RMS	32.2	-21.1	.32	51.9	54	-2.1	-	-	172	110	H
4	* 2.484	41.54	RMS	32.2	-21.1	.32	52.96	54	-1.04	-	-	172	110	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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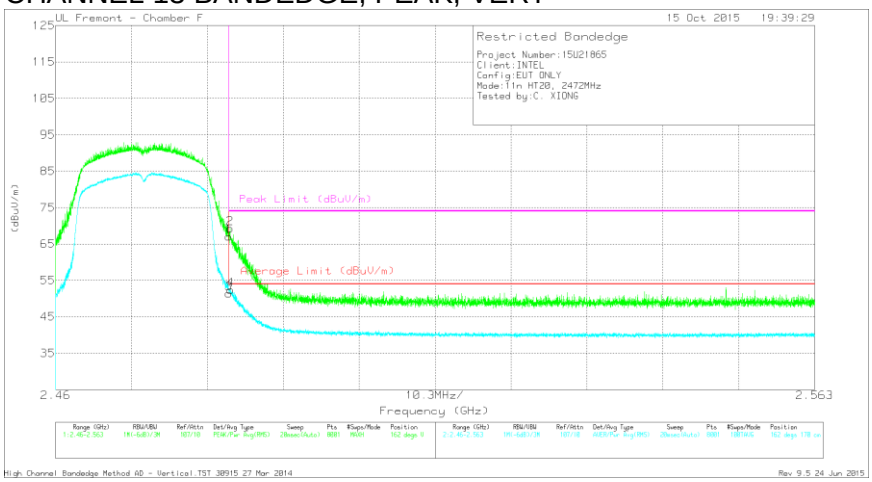
CHANNEL 13 BANDEDGE, PEAK, VERT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	55.98	Pk	32.2	-21.1	0	67.08	-	-	74	-6.92	162	170	V
2	* 2.484	58.15	Pk	32.2	-21.1	0	69.25	-	-	74	-4.75	162	170	V
3	* 2.484	40.3	RMS	32.2	-21.1	.32	51.72	54	-2.28	-	-	162	170	V
4	* 2.484	41.29	RMS	32.2	-21.1	.32	52.71	54	-1.29	-	-	162	170	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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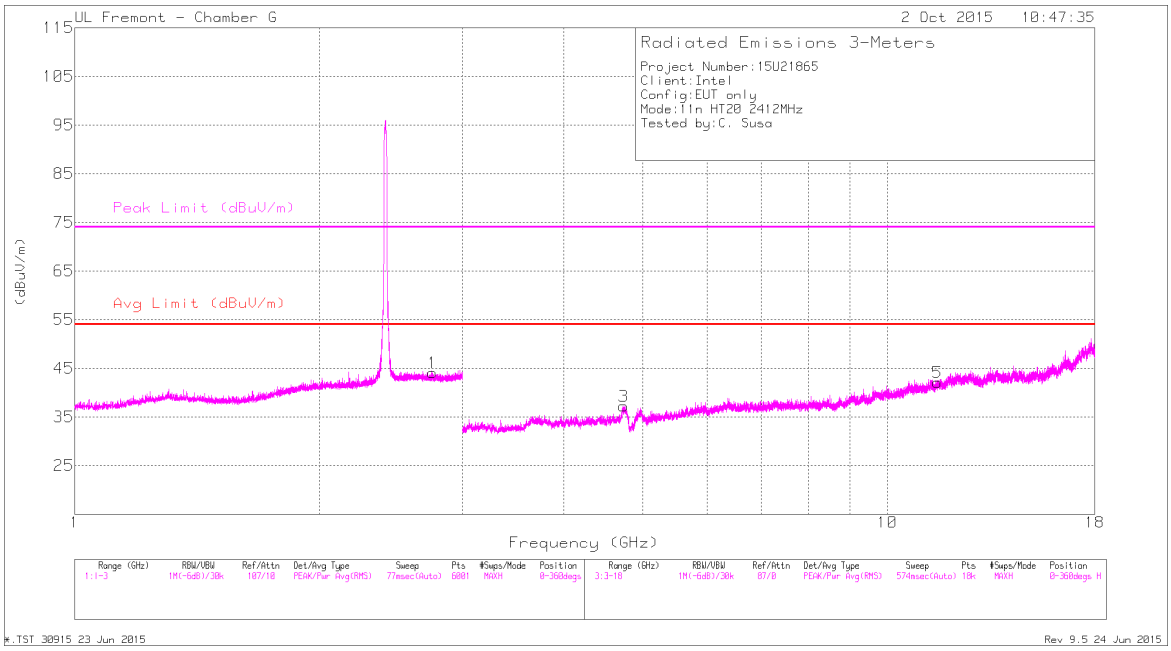
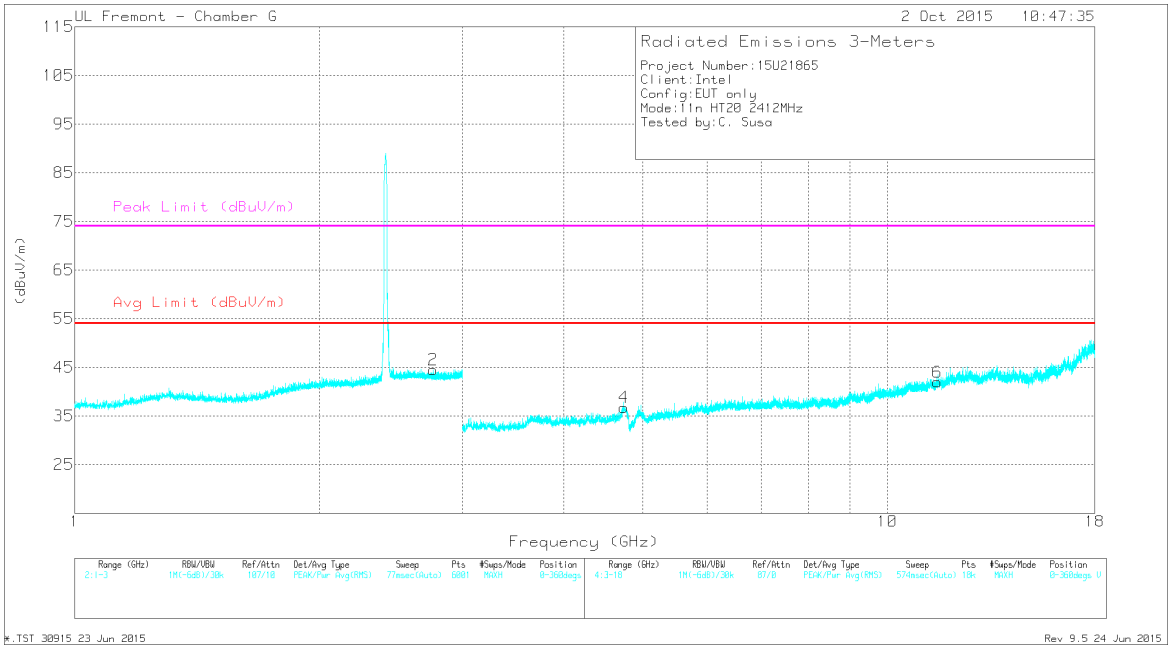
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.754	44.25	PK2	32.3	-24.4	0	52.15	-	-	74	-21.85	360	202	H
	* 2.755	32.25	MAv1	32.3	-24.4	.32	40.47	54	-13.53	-	-	360	202	H
2	* 2.762	43.95	PK2	32.3	-24.3	0	51.95	-	-	74	-22.05	283	153	V
	* 2.765	32.23	MAv1	32.3	-24.4	.32	40.45	54	-13.55	-	-	283	153	V
3	* 4.738	44.13	PK2	33.9	-32.4	0	45.63	-	-	74	-28.37	217	189	H
	* 4.739	32.89	MAv1	33.9	-32.3	.32	34.81	54	-19.19	-	-	217	189	H
5	* 11.525	38.06	PK2	38.2	-26.1	0	50.16	-	-	74	-23.84	258	105	H
	* 11.527	26.99	MAv1	38.2	-26.1	.32	39.41	54	-14.59	-	-	258	105	H
4	* 4.744	43.37	PK2	33.9	-32.4	0	44.87	-	-	74	-29.13	169	320	V
	* 4.742	32.6	MAv1	33.9	-32.4	.32	34.42	54	-19.58	-	-	169	320	V
6	* 11.525	38.85	PK2	38.2	-26.1	0	50.95	-	-	74	-23.05	102	248	V
	* 11.526	27.04	MAv1	38.2	-26.1	.32	39.46	54	-14.54	-	-	102	248	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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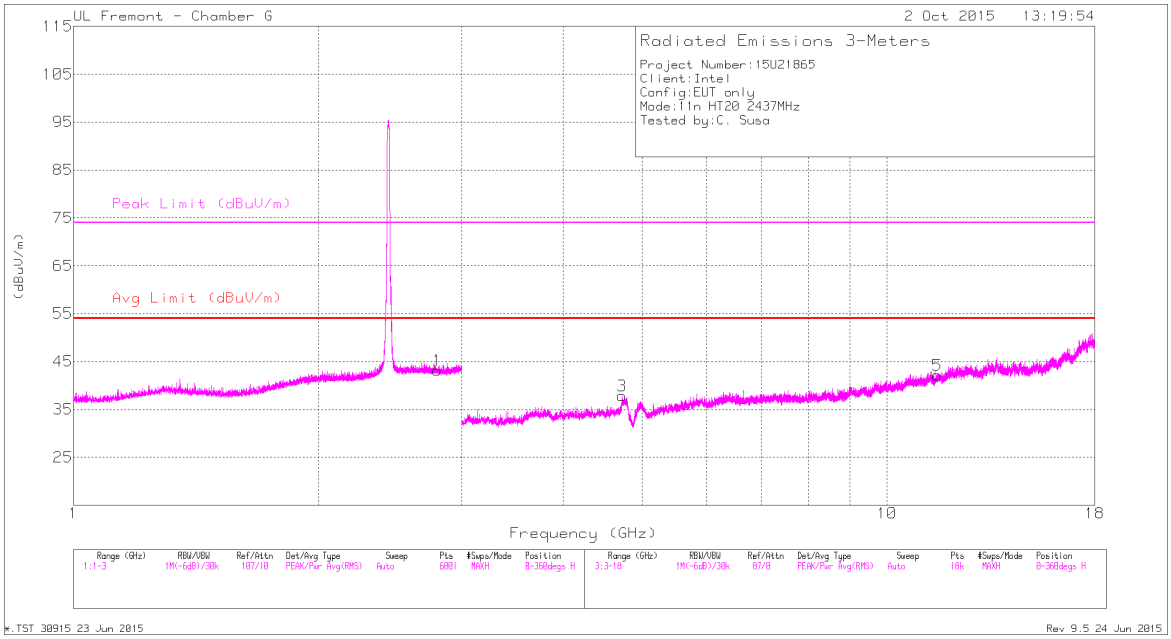
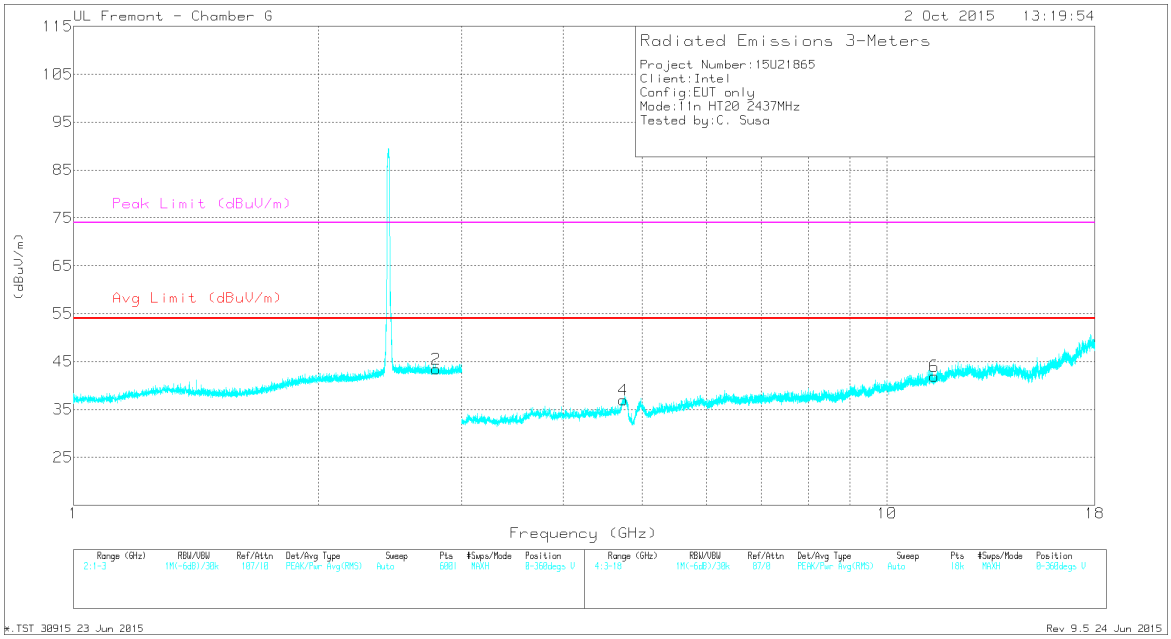
MID CHANNEL

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.799	43.85	PK2	32.3	-24.4	0	51.75	-	-	74	-22.25	113	126	H
	* 2.799	32.11	MAv1	32.3	-24.4	.32	40.33	54	-13.67	-	-	113	126	H
2	* 2.79	43.88	PK2	32.3	-24.4	0	51.78	-	-	74	-22.22	135	203	V
	* 2.792	32.26	MAv1	32.3	-24.4	.32	40.48	54	-13.52	-	-	135	203	V
3	* 4.725	43.91	PK2	33.9	-32.3	0	45.51	-	-	74	-28.49	223	132	H
	* 4.727	32.62	MAv1	33.9	-32.3	.32	34.54	54	-19.46	-	-	223	132	H
5	* 11.518	37.89	PK2	38.2	-26.1	0	49.99	-	-	74	-24.01	311	108	H
	* 11.52	27.05	MAv1	38.2	-26	.32	39.57	54	-14.43	-	-	311	108	H
4	* 4.741	43.94	PK2	33.9	-32.4	0	45.44	-	-	74	-28.56	289	225	V
	* 4.741	33.03	MAv1	33.9	-32.3	.32	34.95	54	-19.05	-	-	289	225	V
6	* 11.43	38.72	PK2	38.2	-26.7	0	50.22	-	-	74	-23.78	234	251	V
	* 11.429	27.6	MAv1	38.2	-26.7	.32	39.42	54	-14.58	-	-	234	251	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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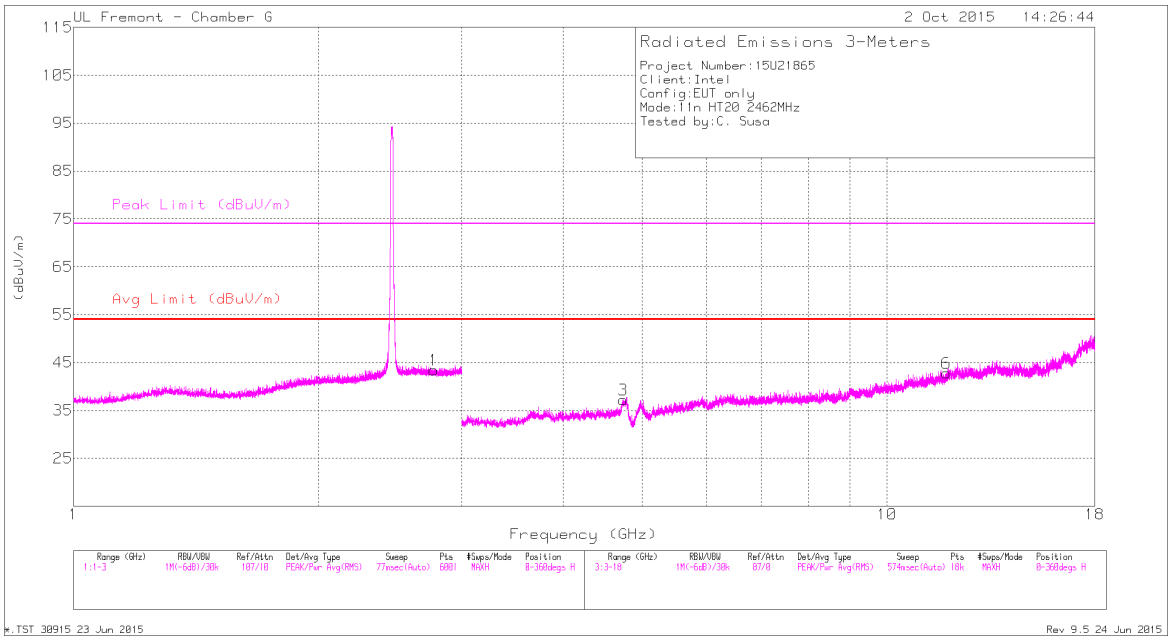
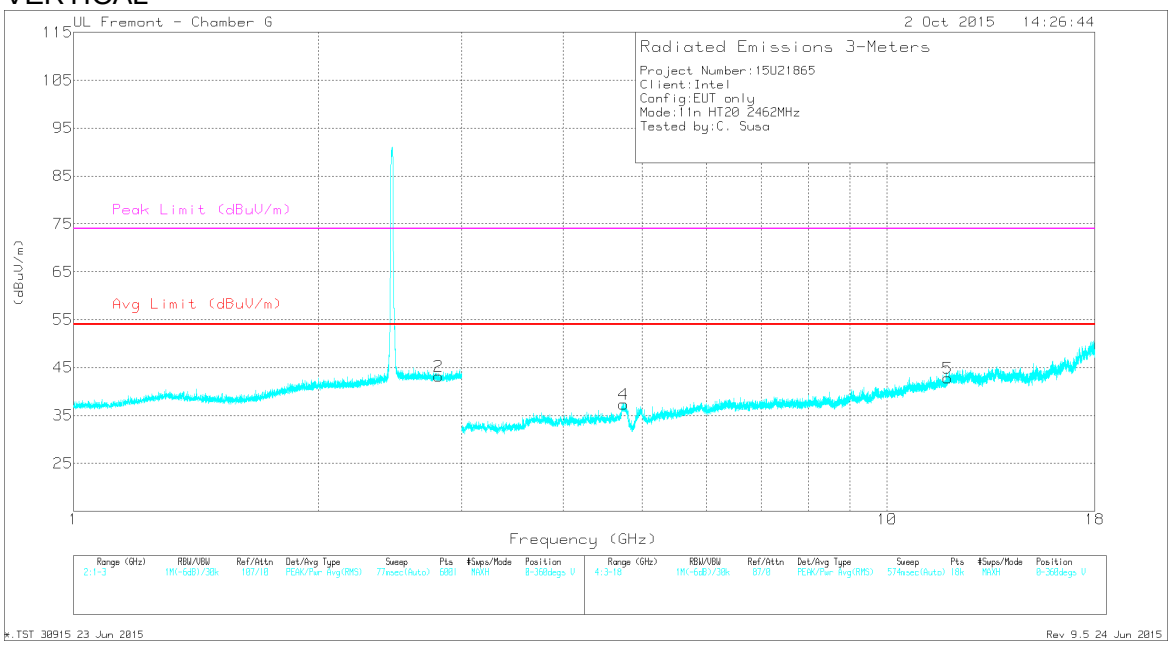
HIGH CHANNEL

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl /Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.769	43.89	PK2	32.3	-24.4	0	51.79	-	-	74	-22.21	302	141	H
	* 2.768	31.97	MAv1	32.3	-24.4	.32	40.19	54	-13.81	-	-	302	141	H
2	* 2.812	44.15	PK2	32.3	-24.4	0	52.05	-	-	74	-21.95	258	115	V
	* 2.81	32.24	MAv1	32.3	-24.4	.32	40.46	54	-13.54	-	-	258	115	V
3	* 4.737	44.28	PK2	33.9	-32.4	0	45.78	-	-	74	-28.22	181	178	H
	* 4.738	32.83	MAv1	33.9	-32.4	.32	34.65	54	-19.35	-	-	181	178	H
6	* 11.825	38.05	PK2	38.6	-26	0	50.65	-	-	74	-23.35	230	111	H
	* 11.827	27.11	MAv1	38.6	-26	.32	40.03	54	-13.97	-	-	230	111	H
4	* 4.743	43.99	PK2	33.9	-32.4	0	45.49	-	-	74	-28.51	199	254	V
	* 4.742	32.68	MAv1	33.9	-32.4	.32	34.5	54	-19.5	-	-	199	254	V
5	* 11.87	38.04	PK2	38.7	-25.6	0	51.14	-	-	74	-22.86	150	175	V
	* 11.872	26.96	MAv1	38.7	-25.5	.32	40.48	54	-13.52	-	-	150	175	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

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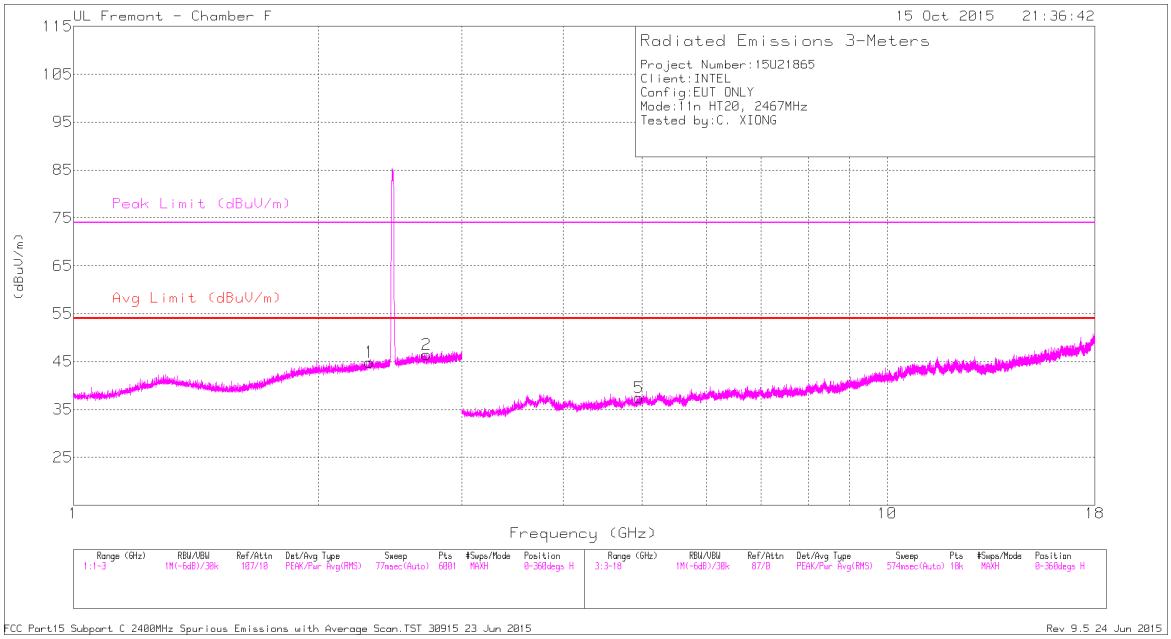
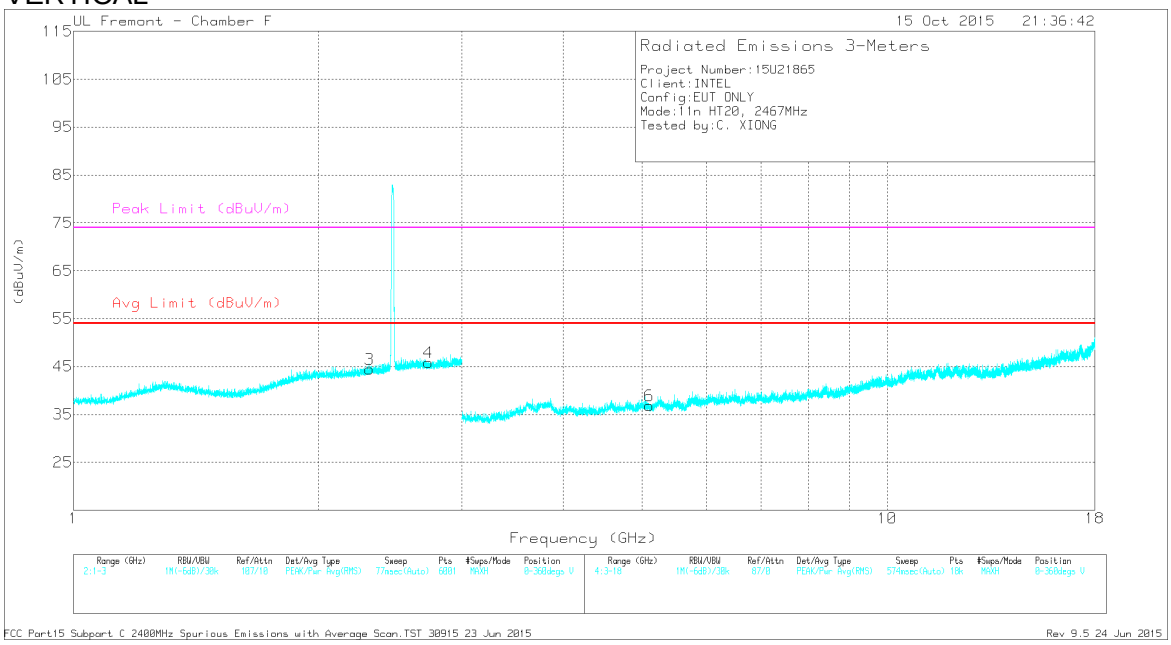
CHANNEL 12

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.311	41.93	PK2	31.8	-21.1	0	52.63	-	-	74	-21.37	360	100	H
	* 2.312	30.39	MAv1	31.8	-21.1	.32	41.41	54	-12.59	-	-	360	100	H
2	* 2.716	41.97	PK2	32.7	-20.7	0	53.97	-	-	74	-20.03	360	100	H
	* 2.717	30.3	MAv1	32.7	-20.7	.32	42.62	54	-11.38	-	-	360	100	H
3	* 2.312	41.86	PK2	31.8	-21.1	0	52.56	-	-	74	-21.44	360	100	V
	* 2.313	30.37	MAv1	31.8	-21.1	.32	41.39	54	-12.61	-	-	360	100	V
4	* 2.731	41.58	PK2	32.7	-20.7	0	53.58	-	-	74	-20.42	360	100	V
	* 2.732	30.25	MAv1	32.7	-20.7	.32	42.57	54	-11.43	-	-	360	100	V
5	* 4.952	41.06	PK2	34.1	-28.7	0	46.46	-	-	74	-27.54	360	100	H
	* 4.951	28.88	MAv1	34.1	-28.6	.32	34.7	54	-19.3	-	-	360	100	H
6	* 5.1	38.91	PK2	34.2	-27.4	0	45.71	-	-	74	-28.29	360	100	V
	* 5.101	27.7	MAv1	34.2	-27.4	.32	34.82	54	-19.18	-	-	360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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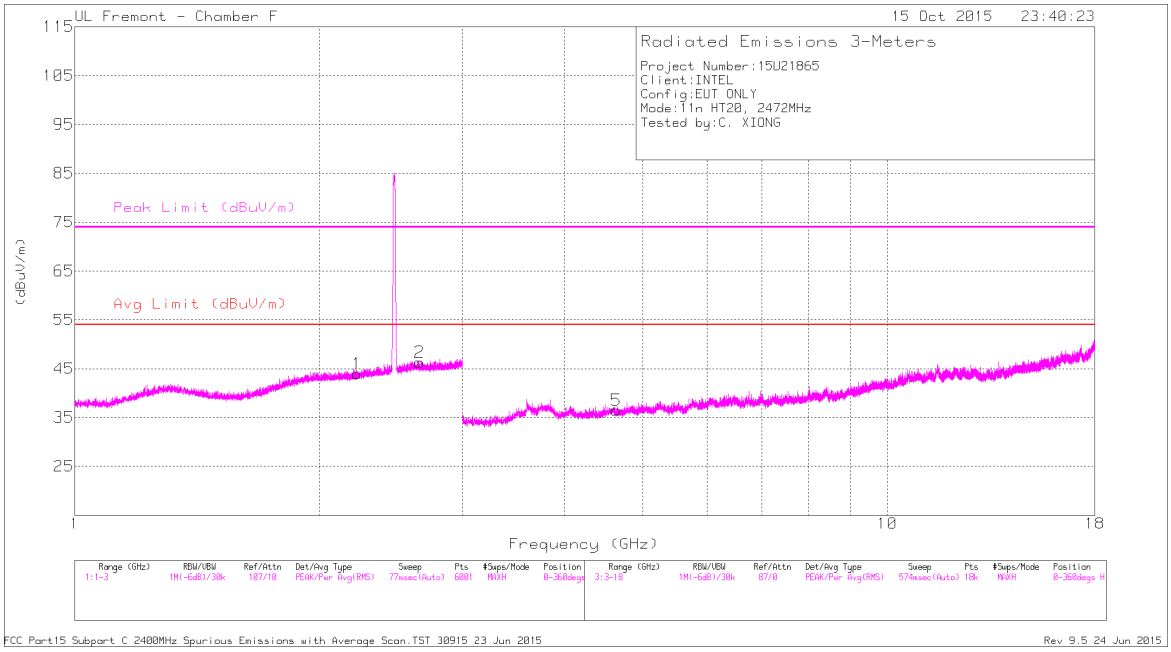
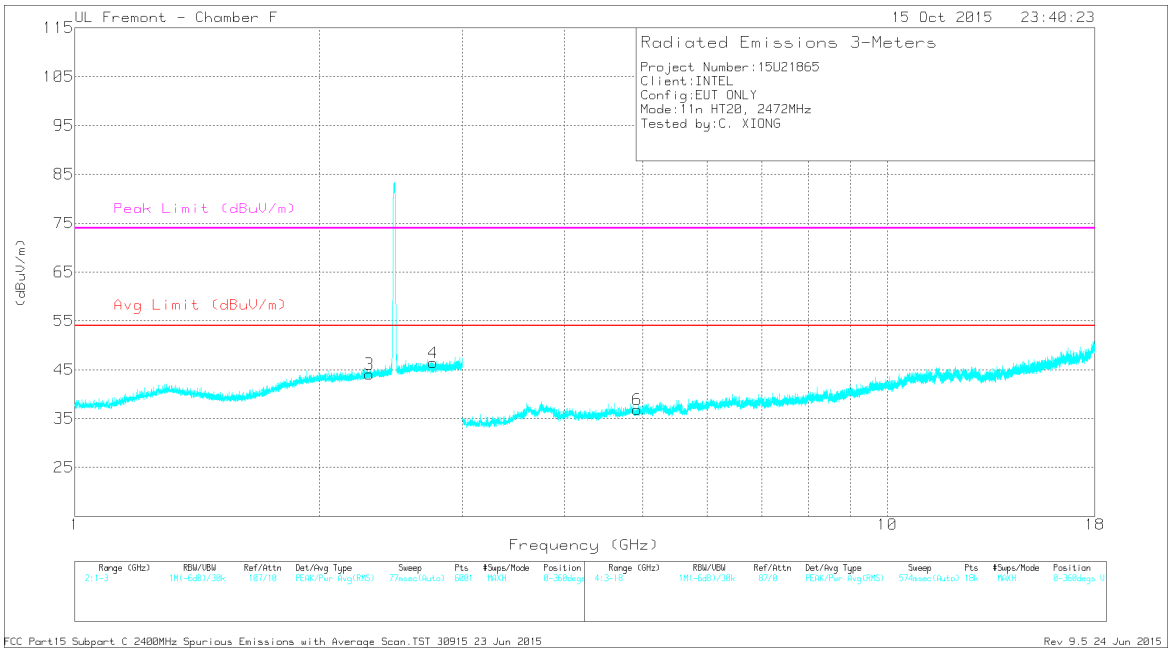
CHANNEL 13

HORIZTONAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.226	41.83	PK2	31.5	-21.1	0	52.23	-	-	74	-21.77	360	101	H
	* 2.225	30.26	MAv1	31.5	-21.1	.32	40.98	54	-13.02	-	-	360	101	H
2	* 2.655	41.92	PK2	32.7	-20.9	0	53.72	-	-	74	-20.28	360	101	H
	* 2.656	30.57	MAv1	32.7	-20.8	.32	42.79	54	-11.21	-	-	360	101	H
3	2.303	41.91	PK2	31.8	-21.1	0	52.61	-	-	74	-21.39	360	101	V
	2.303	30.35	MAv1	31.8	-21.1	.32	41.37	54	-12.63	-	-	360	101	V
4	* 2.76	41.88	PK2	32.7	-20.7	0	53.88	-	-	74	-20.12	360	101	V
	* 2.759	30.46	MAv1	32.7	-20.7	.32	42.78	54	-11.22	-	-	360	101	V
5	* 4.638	40.54	PK2	34	-28.8	0	45.74	-	-	74	-28.26	360	101	H
	* 4.638	28.7	MAv1	34	-28.8	.32	34.22	54	-19.78	-	-	360	101	H
6	* 4.924	40.39	PK2	34.1	-28.6	0	45.89	-	-	74	-28.11	360	101	V
	* 4.926	28.65	MAv1	34.1	-28.6	.32	34.47	54	-19.53	-	-	360	101	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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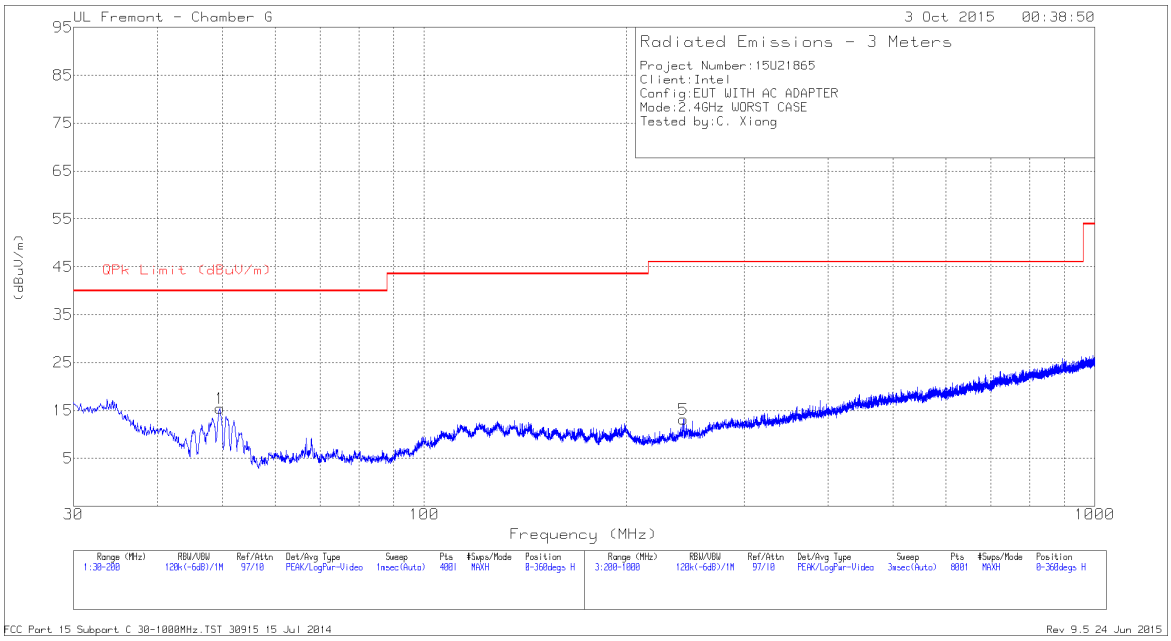
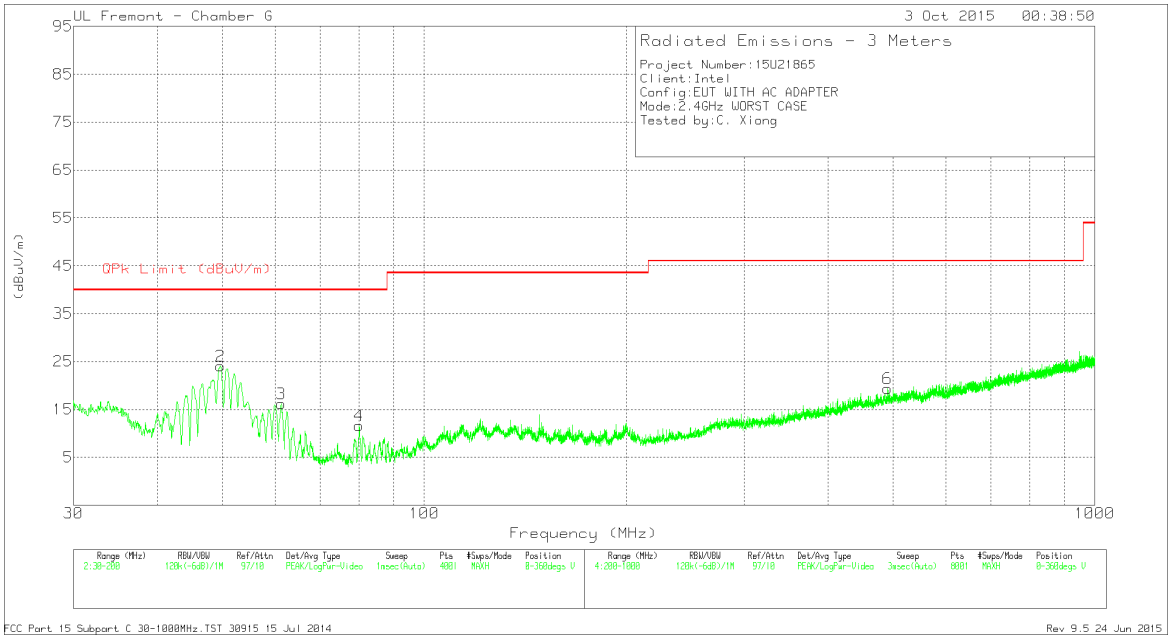
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL



VERTICAL



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DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 243.7	31.17	Pk	11.3	-29.3	13.17	46.02	-32.85	0-360	100	H
1	49.5925	38.66	Pk	7.8	-31	15.46	40	-24.54	0-360	401	H
2	49.6775	47.34	Pk	7.7	-31	24.04	40	-15.96	0-360	100	V
3	61.195	39.05	Pk	8.1	-30.9	16.25	40	-23.75	0-360	100	V
4	80.0225	34.77	Pk	7.6	-30.7	11.67	40	-28.33	0-360	100	V
6	490.6	29.75	Pk	17.6	-28	19.35	46.02	-26.67	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band
Pk - Peak detector

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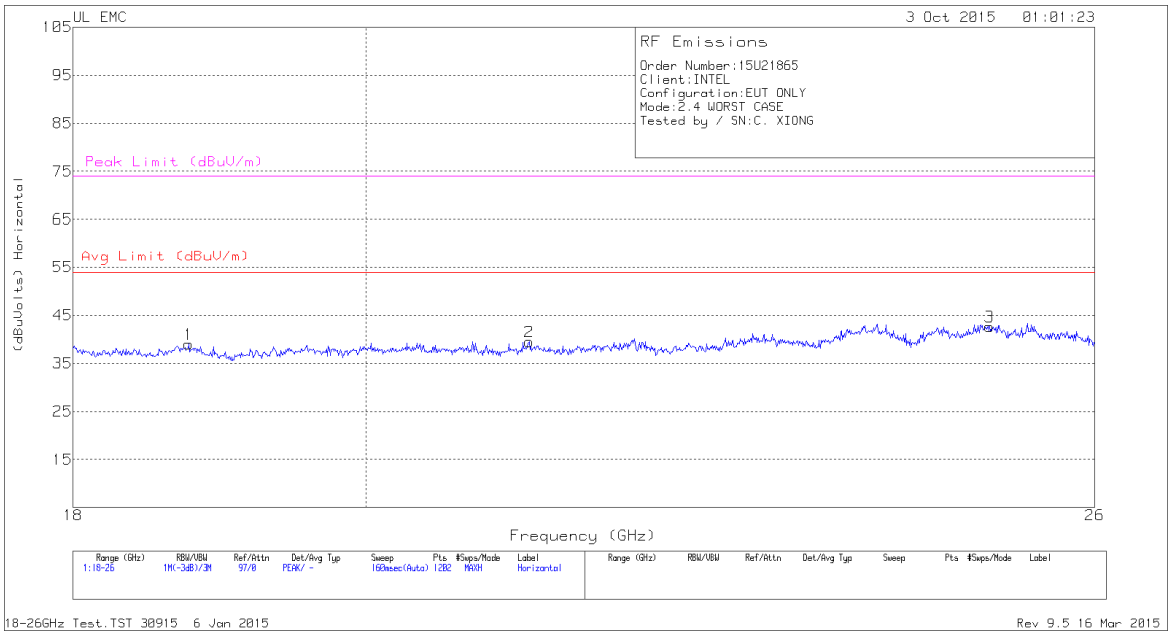
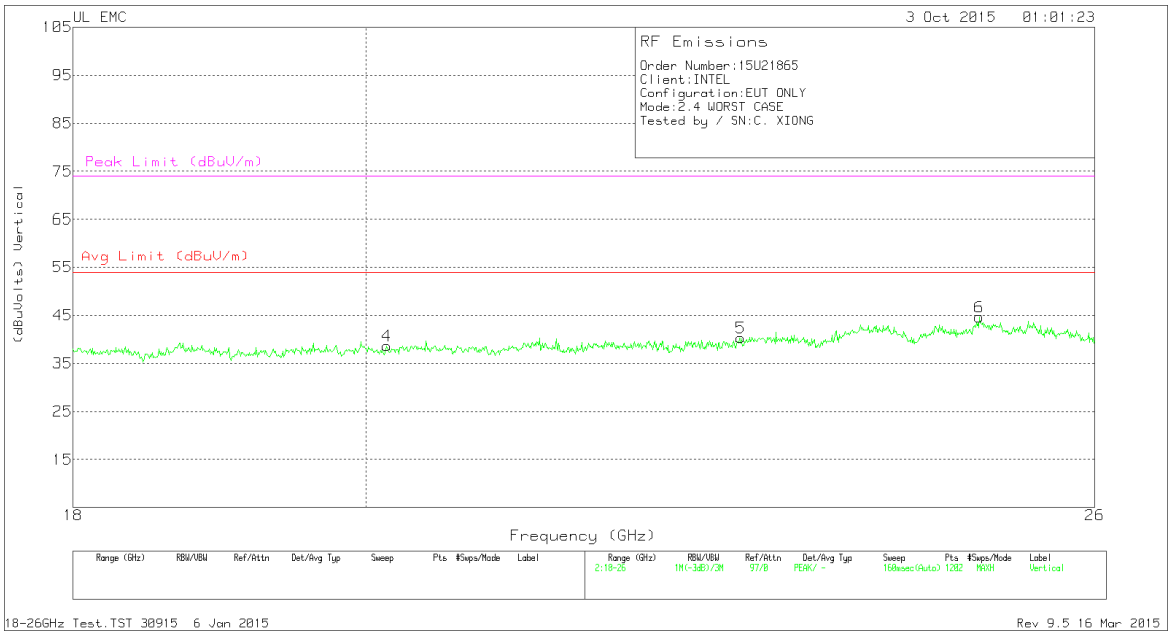
9.4. WORST-CASE ABOVE 18 GHz

SPURIOUS EMISSIONS 18 TO 26 GHz (WORST-CASE CONFIGURATION)

HORIZONTAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.766	40.9	Pk	32.5	-24.9	-9.5	39	54	-15	74	-35
2	21.211	40.6	Pk	33.1	-24.7	-9.5	39.5	54	-14.5	74	-34.5
3	25.034	42.87	Pk	34.1	-24.8	-9.5	42.67	54	-11.33	74	-31.33
4	20.152	40.67	Pk	32.7	-25.2	-9.5	38.67	54	-15.33	74	-35.33
5	22.889	41.43	Pk	33.4	-25	-9.5	40.33	54	-13.67	74	-33.67
6	24.941	44.57	Pk	34.1	-24.5	-9.5	44.67	54	-9.33	74	-29.33

Pk - Peak detector

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

TEST PROCEDURE

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

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

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

RESULTS

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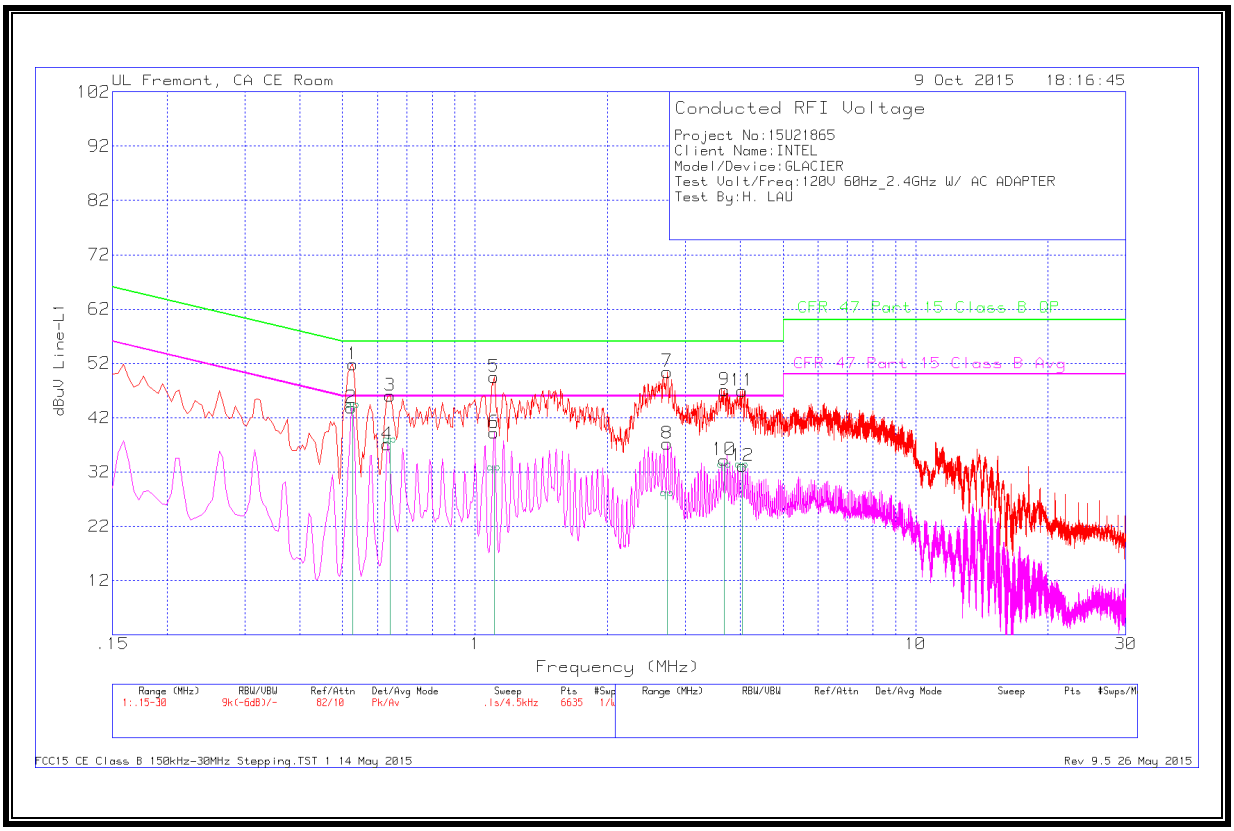
10.1. EUT WITH AC ADAPTER

LINE 1 RESULTS



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DATA

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.528	51.5	Pk	.3	0	51.8	56	-4.2	-	-
	.528	42.96	Qp	.3	0	43.26	56	-12.74	-	-
2	.5235	43.52	Av	.3	0	43.82	-	-	46	-2.18
	.528	39.2	Ca	.3	0	39.5	-	-	46	-6.5
3	.6405	45.76	Pk	.3	0	46.06	56	-9.94	-	-
	.6405	36.6	Qp	.3	0	36.9	56	-19.1	-	-
4	.6315	36.77	Av	.3	0	37.07	-	-	46	-8.93
	.6405	27.16	Ca	.3	0	27.46	-	-	46	-18.54
5	1.104	49.35	Pk	.2	0	49.55	56	-6.45	-	-
	1.104	31.55	Qp	.2	0	31.75	56	-24.25	-	-
6	1.104	39.02	Av	.2	0	39.22	-	-	46	-6.78
	1.104	14.82	Ca	.2	0	15.02	-	-	46	-30.98
7	2.7285	50.15	Pk	.2	.1	50.45	56	-5.55	-	-
	2.7285	26.72	Qp	.2	.1	27.02	56	-28.98	-	-
8	2.733	36.92	Av	.2	.1	37.22	-	-	46	-8.78
	2.7285	12.66	Ca	.2	.1	12.96	-	-	46	-33.04
9	3.6825	46.81	Pk	.2	.1	47.11	56	-8.89	-	-
	3.6825	31.98	Qp	.2	.1	32.28	56	-23.72	-	-
10	3.678	33.91	Av	.2	.1	34.21	-	-	46	-11.79
	3.6825	18.41	Ca	.2	.1	18.71	-	-	46	-27.29
11	4.038	46.66	Pk	.2	.1	46.96	56	-9.04	-	-
	4.038	31.98	Qp	.2	.1	32.28	56	-23.72	-	-
12	4.047	32.83	Av	.2	.1	33.13	-	-	46	-12.87
	4.038	16.39	Ca	.2	.1	16.69	-	-	46	-29.31

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

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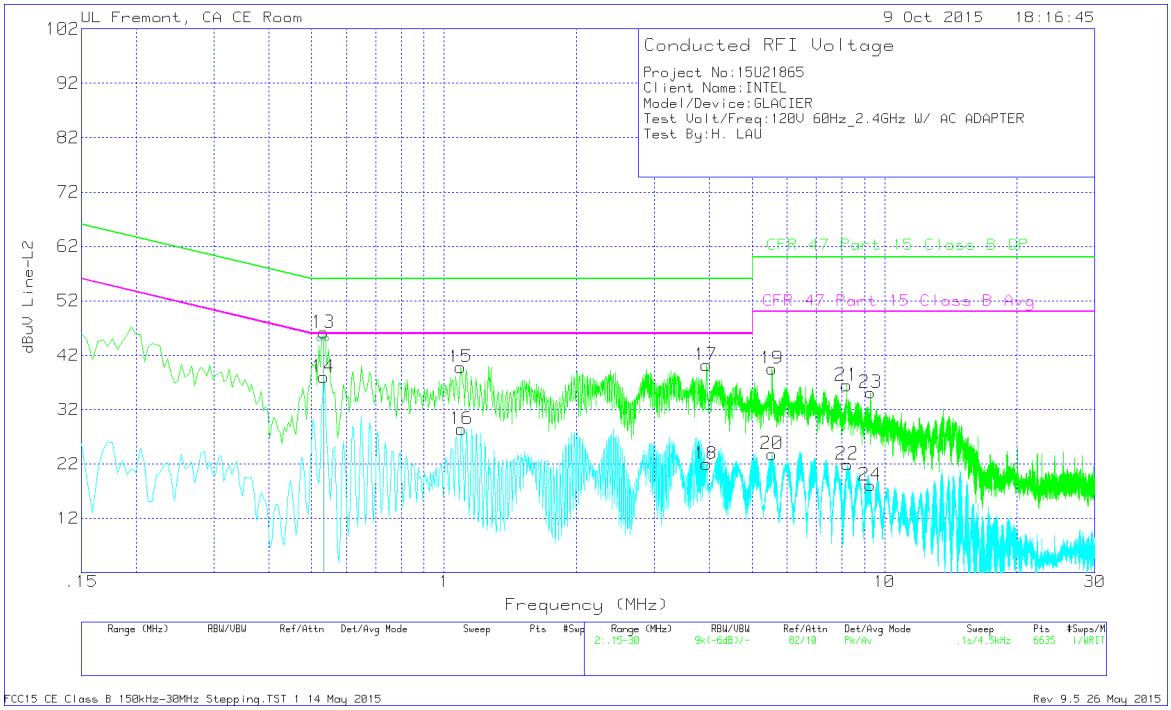
LINE 2 RESULTS



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DATA

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
13	.5325	45.86	Pk	.3	0	46.16	56	-9.84	-	-
	.5325	43.82	Qp	.3	0	44.12	56	-11.88	-	-
14	.5325	37.65	Av	.3	0	37.95	-	-	46	-8.05
	.5325	38.87	Ca	.3	0	39.17	-	-	46	-6.83
15	1.0905	39.5	Pk	.3	0	39.8	56	-16.2	-	-
16	1.095	28.11	Av	.3	0	28.41	-	-	46	-17.59
17	3.9345	39.87	Pk	.2	.1	40.17	56	-15.83	-	-
18	3.9345	21.69	Av	.2	.1	21.99	-	-	46	-24.01
19	5.55	39.21	Pk	.2	.1	39.51	60	-20.49	-	-
20	5.55	23.52	Av	.2	.1	23.82	-	-	50	-26.18
21	8.196	36.11	Pk	.2	.1	36.41	60	-23.59	-	-
22	8.2275	21.61	Av	.2	.1	21.91	-	-	50	-28.09
23	9.294	34.81	Pk	.2	.1	35.11	60	-24.89	-	-
24	9.2715	17.78	Av	.2	.1	18.08	-	-	50	-31.92

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

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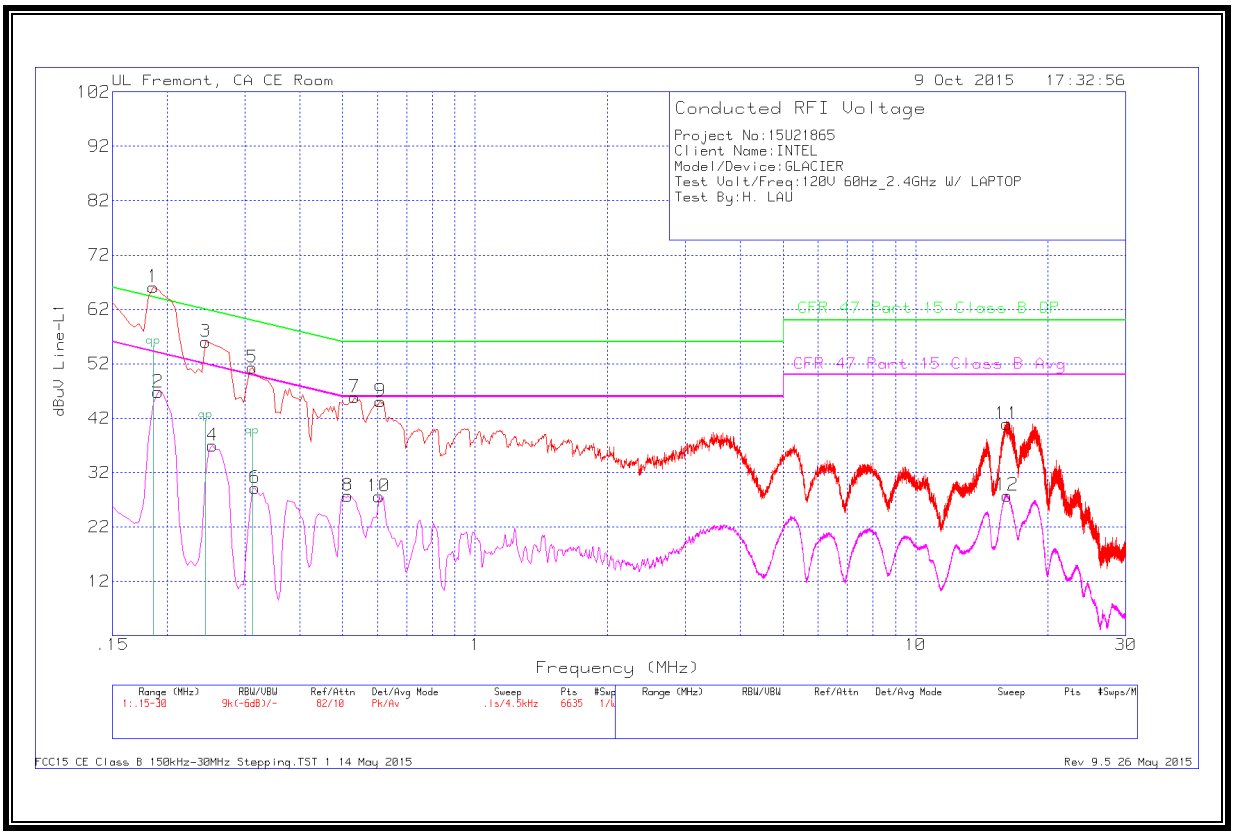
10.2. EUT WITH USB LAPTOP

LINE 1 RESULTS



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DATA

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.186	54.2	Qp	1	0	55.2	64.21	-9.01	-	-
2	.1905	45.8	Av	1	0	46.8	-	-	54.01	-7.21
3	.2445	55.36	Pk	.7	0	56.06	61.94	-5.88	-	-
	.2445	40.91	Qp	.7	0	41.61	61.94	-20.33	-	-
4	.2535	36.25	Av	.7	0	36.95	-	-	51.64	-14.69
5	.312	50.82	Pk	.5	0	51.32	59.92	-8.6	-	-
	.312	38.18	Qp	.5	0	38.68	59.92	-21.24	-	-
6	.3165	28.69	Av	.5	0	29.19	-	-	49.8	-20.61
7	.5325	45.57	Pk	.3	0	45.87	56	-10.13	-	-
8	.5145	27.47	Av	.3	0	27.77	-	-	46	-18.23
9	.609	44.79	Pk	.3	0	45.09	56	-10.91	-	-
10	.6045	27.3	Av	.3	0	27.6	-	-	46	-18.4
11	16.1205	40.44	Pk	.3	.2	40.94	60	-19.06	-	-
12	16.1385	27.29	Av	.3	.2	27.79	-	-	50	-22.21

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector

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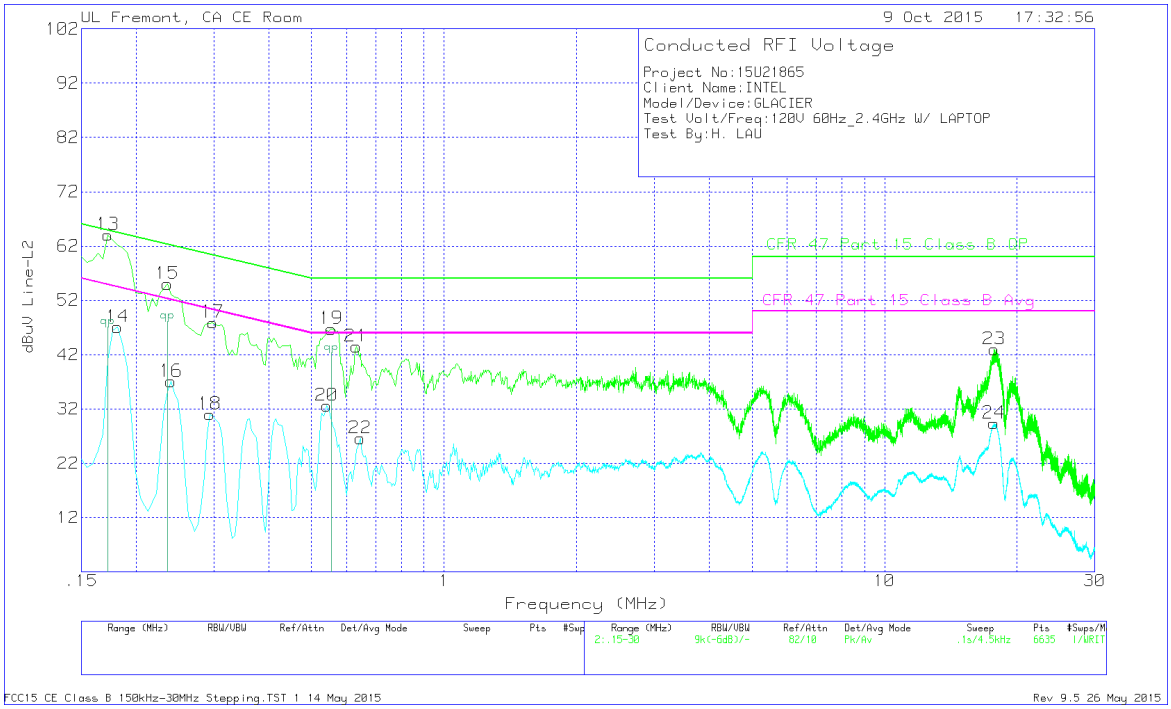
LINE 2 RESULTS



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DATA

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
13	.1725	62.84	Pk	1.2	0	64.04	64.84	-.8	-	-
	.1725	45.92	Qp	1.2	0	47.12	64.84	-17.72	-	-
14	.1815	45.89	Av	1.2	0	47.09	-	-	54.42	-7.33
	.1725	23	Ca	1.2	0	24.2	-	-	54.84	-30.64
15	.2355	54.24	Pk	.8	0	55.04	62.25	-7.21	-	-
	.2355	47.31	Qp	.8	0	48.11	62.25	-14.14	-	-
16	.24	36.25	Av	.8	0	37.05	-	-	52.1	-15.05
17	.2985	47.3	Pk	.6	0	47.9	60.28	-12.38	-	-
18	.294	30.41	Av	.6	0	31.01	-	-	50.41	-19.4
19	.555	46.44	Pk	.3	0	46.74	56	-9.26	-	-
	.555	42.04	Qp	.3	0	42.34	56	-13.66	-	-
20	.5415	32.31	Av	.3	0	32.61	-	-	46	-13.39
21	.6315	43.21	Pk	.3	0	43.51	56	-12.49	-	-
22	.645	26.28	Av	.3	0	26.58	-	-	46	-19.42
23	17.7405	42.46	Pk	.3	.2	42.96	60	-17.04	-	-
24	17.727	28.86	Av	.3	.2	29.36	-	-	50	-20.64

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