FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM Phone + Bluetooth & DTS b/g/n + NFC

MODEL NUMBER: SM-G313HN

FCC ID: A3LSMG313HN

REPORT NUMBER: 14I17791-4

ISSUE DATE: JUNE 5, 2014

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/5/14	Initial Issue	P. Zhang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	**SAMSUNG ELECTRONICS CO., LTD.**
EUT DESCRIPTION:	**GSM Phone + Bluetooth & DTS b/g/n + NFC**
MODEL:	**SM-G313HN**
SERIAL NUMBER:	**FL-187-A (Radiated) & FL-187-D (Conducted)**
DATE TESTED:	**MAY 20 – JUNE 5, 2014**

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

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

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.
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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 C63.4-2009.

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

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

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Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM Phone + Bluetooth & DTS b/g/n + NFC

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 - 2462	802.11b	18.88	77.27
2412 - 2462	802.11g	21.32	135.52
2412 - 2462	802.11n HT20	20.15	103.51

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.6 dBi.

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5.4. 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,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20mode: MCS0

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	SAMSUNG	ETA1OU10EBE	N/A	N/A
Earphone	SAMSUNG	N/A	N/A	N/A

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

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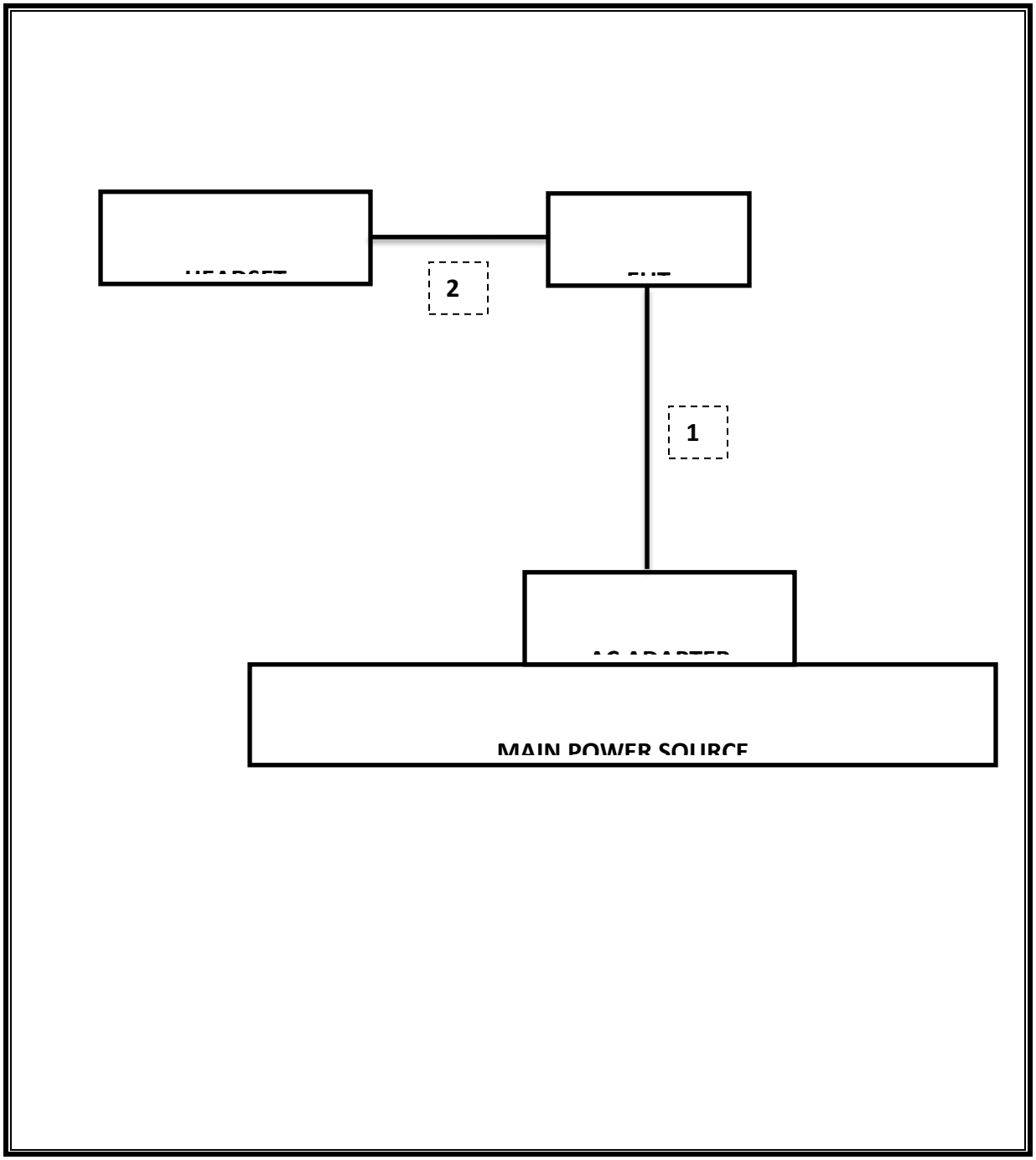
SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	4/1/2015
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	2/26/2015
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/8/2014
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	5/8/2015
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/2014
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	N/A	3/6/2015
Antenna, Horn, 18 GHz	ETS	3117	C01022	2/21/2015
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/2014
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2014
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/2014
LISN, 30 MHz	FCC	50/250-25-2	C00626	1/14/2015

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7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r01:Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

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8. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-210 A8.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	8.5 MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-32.94 dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	21.32 dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-3.42 dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	54.42 dBuV
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	49.73 dBuV

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9. ANTENNA PORT TEST RESULTS

9.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r01: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

RESULTS

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9.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.50	0.5
Mid	2437	9.04	0.5
High	2462	9.04	0.5
Worst		8.50	

9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	13.00	0.5
Mid	2437	16.00	0.5
High	2462	15.08	0.5
Worst		13.00	

9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.04	0.5
Mid	2437	15.17	0.5
High	2462	15.04	0.5
Worst		15.04	

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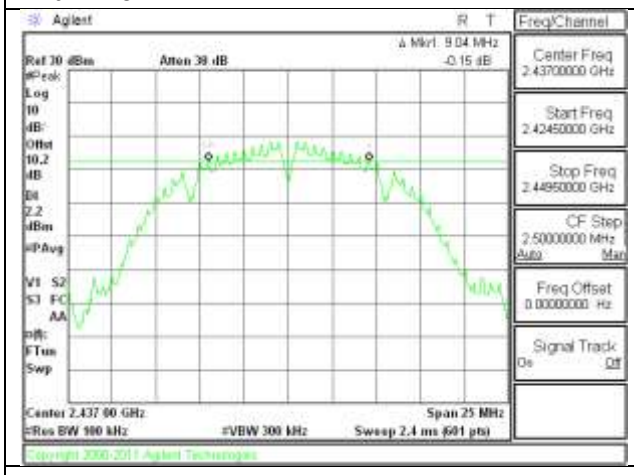
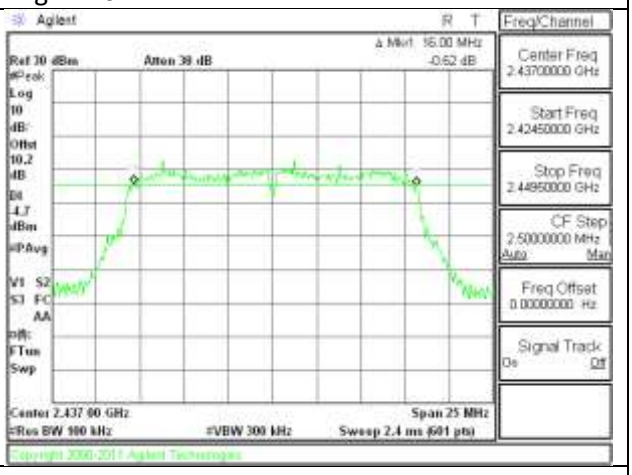
9.1.4. 6 dB BANDWIDTH MID CH PLOTS

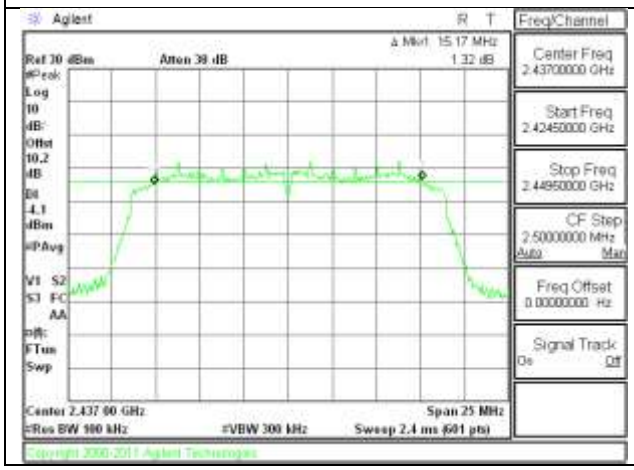
11b HT20 2.4



11g HT20 2.4



11n HT20 2.4



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9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

9.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.97
Mid	2437	13.92
High	2462	13.95
Worst		13.97

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.09
Mid	2437	16.19
High	2462	16.05
Worst		16.19

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.03
Mid	2437	17.35
High	2462	17.01
Worst		17.35

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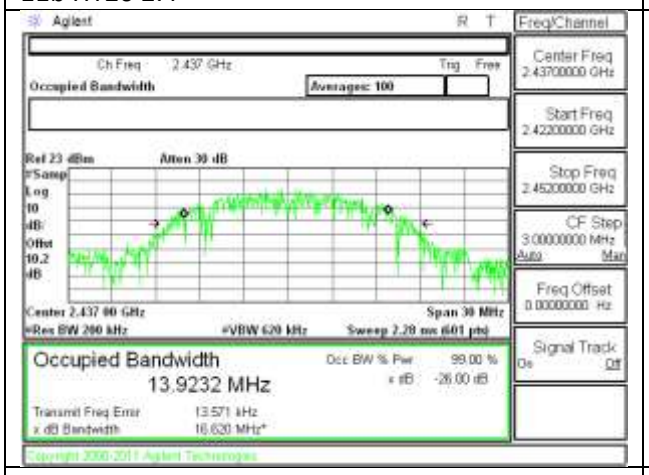
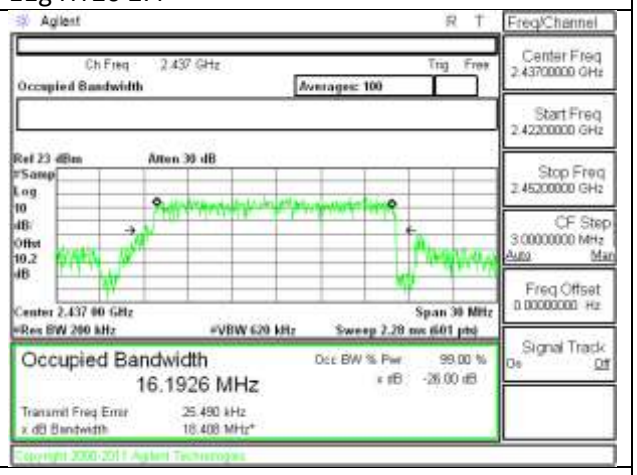
9.2.4. 99% BANDWIDTH MID CH PLOTS

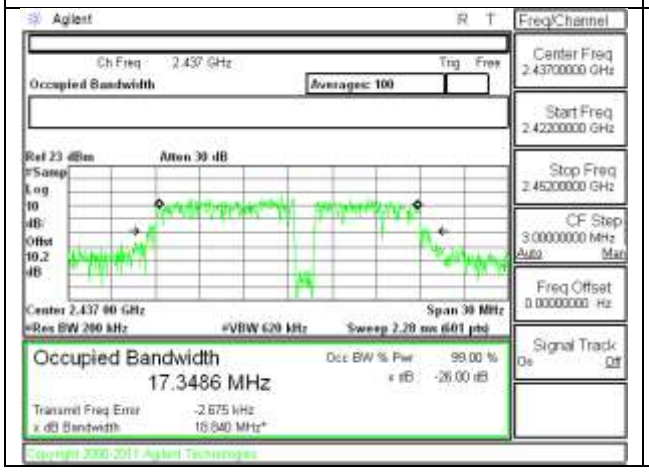
11b HT20 2.4



11g HT20 2.4



11n HT20 2.4



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9.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 0.2 dB (including 10 dB pad and 0.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

9.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	16.80
Mid	2437	17.00
High	2462	16.00
Worst		17.000

9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

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Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	13.60
Mid	2437	13.20
High	2462	13.40
Worst		13.600

9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	12.40
Mid	2437	12.20
High	2462	12.20
Worst		12.400

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9.4. OUTPUT POWER

LIMITS

FCC §15.247

IC RSS-210 A8.4

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

DIRECTIONAL ANTENNA GAIN

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

RESULTS

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9.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.60	30.00	30	36	30.00
Mid	2437	-1.60	30.00	30	36	30.00
High	2462	-1.60	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	18.88	18.88	30.00	-11.12
Mid	2437	18.80	18.80	30.00	-11.20
High	2462	18.81	18.81	30.00	-11.19
Worst			18.88		

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9.4.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.60	30.00	30	36	30.00
Mid	2437	-1.60	30.00	30	36	30.00
High	2462	-1.60	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	21.19	21.19	30.00	-8.81
Mid	2437	21.32	21.32	30.00	-8.68
High	2462	21.19	21.19	30.00	-8.81
Worst			21.32		

9.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-1.60	30.00	30	36	30.00
Mid	2437	-1.60	30.00	30	36	30.00
High	2462	-1.60	30.00	30	36	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	20.15	20.15	30.00	-9.85
Mid	2437	20.01	20.01	30.00	-9.99
High	2462	20.12	20.12	30.00	-9.88
Worst			20.15		

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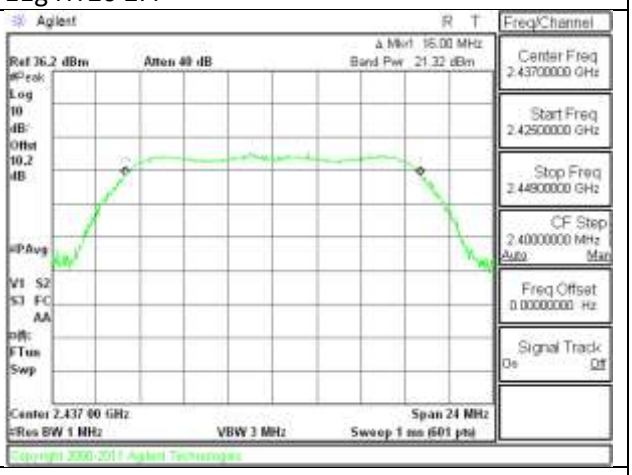
9.4.4. OUTPUT POWER CHAIN 0 MID CH PLOTS

11b HT20 2.4

11g HT20 2.4



11n HT20 2.4

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9.5. PSD

LIMITS

FCC §15.247

IC RSS-210 A8.2

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

RESULTS

9.5.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.42	8.0	-11.4
Mid	2437	-6.38	8.0	-14.4
High	2462	-6.39	8.0	-14.4

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9.5.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.60	8.0	-18.6
Mid	2437	-11.17	8.0	-19.2
High	2462	-10.72	8.0	-18.7

9.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.39	8.0	-18.4
Mid	2437	-12.65	8.0	-20.7
High	2462	-11.05	8.0	-19.1

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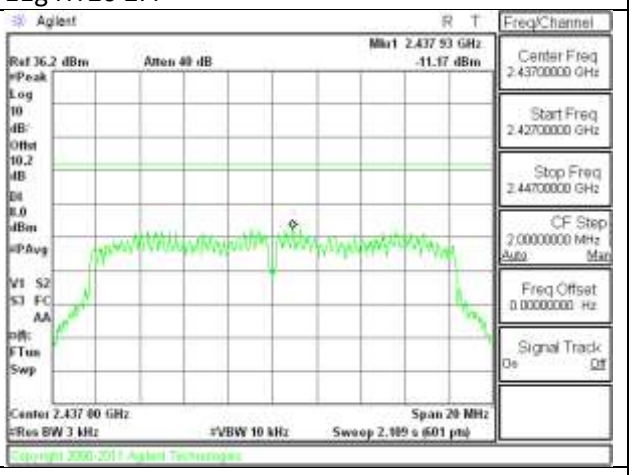
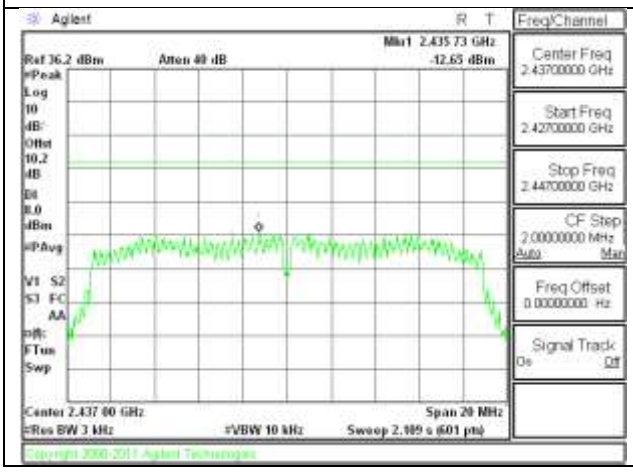
9.5.4. PSD Chain 0 MID CH PLOTS

11b HT20 2.4	11g HT20 2.4
	
11n HT20 2.4	
	

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9.6. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

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

TEST PROCEDURE

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

RESULTS

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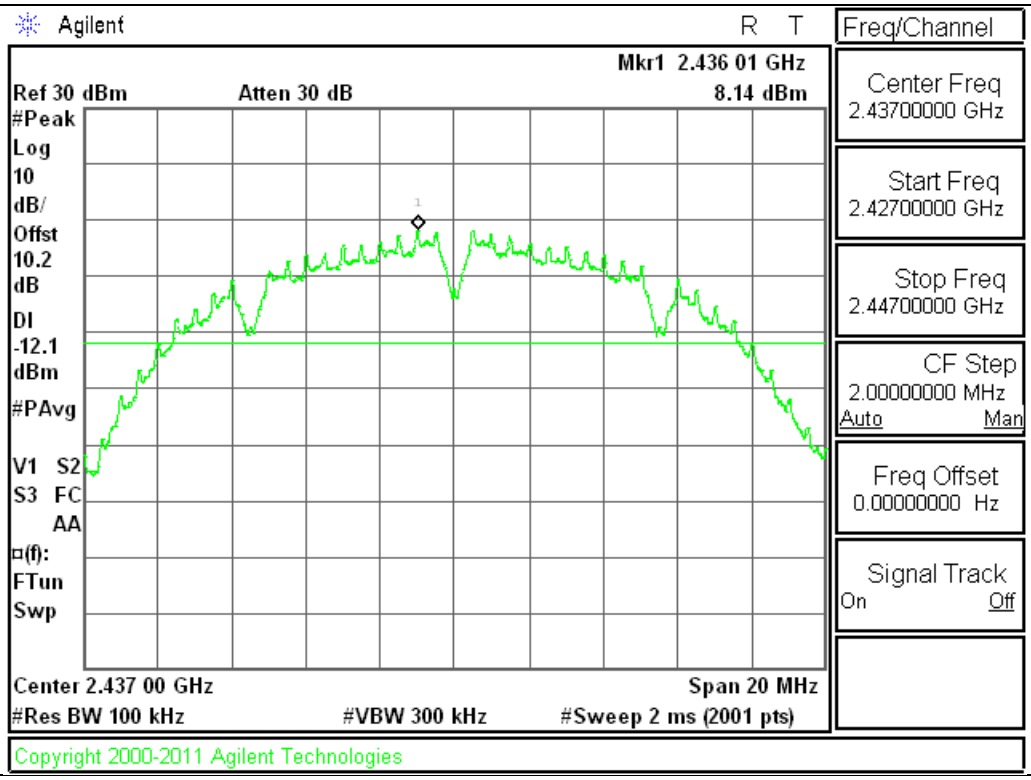
9.6.1. 802.11b MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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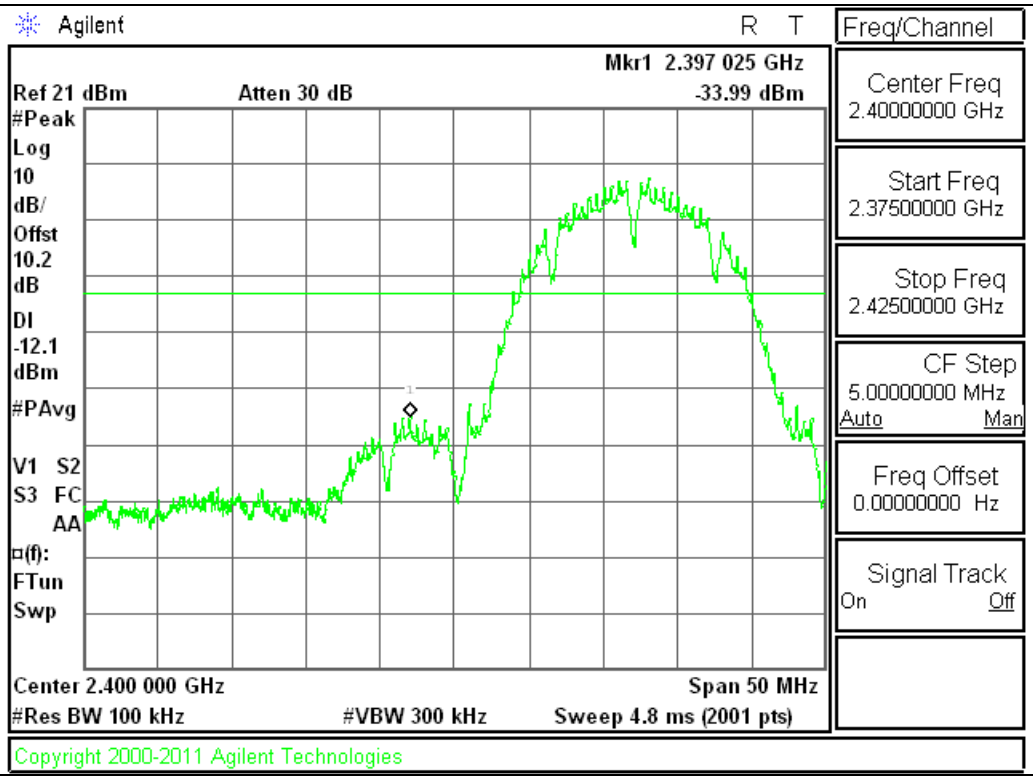
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



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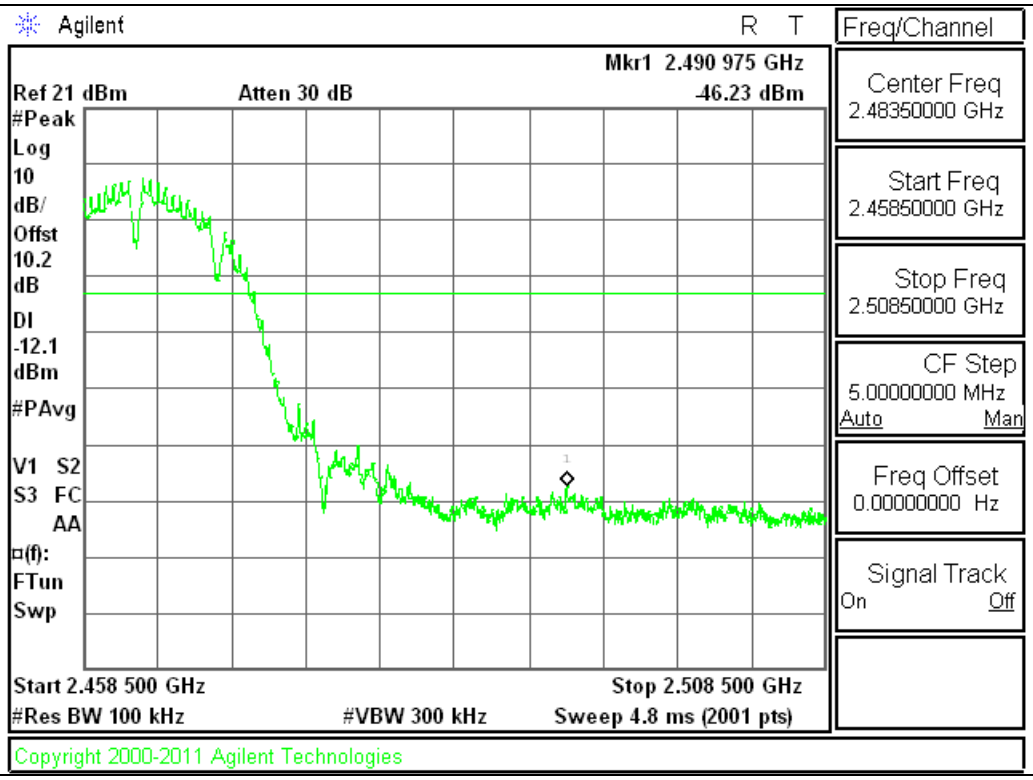
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH



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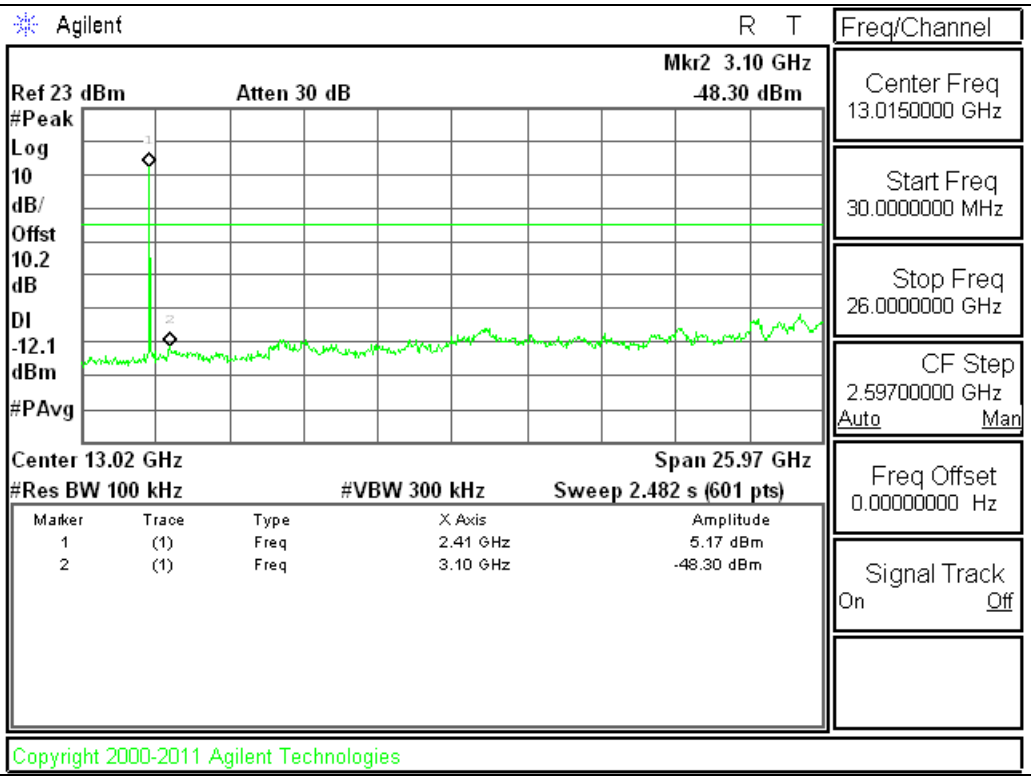
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



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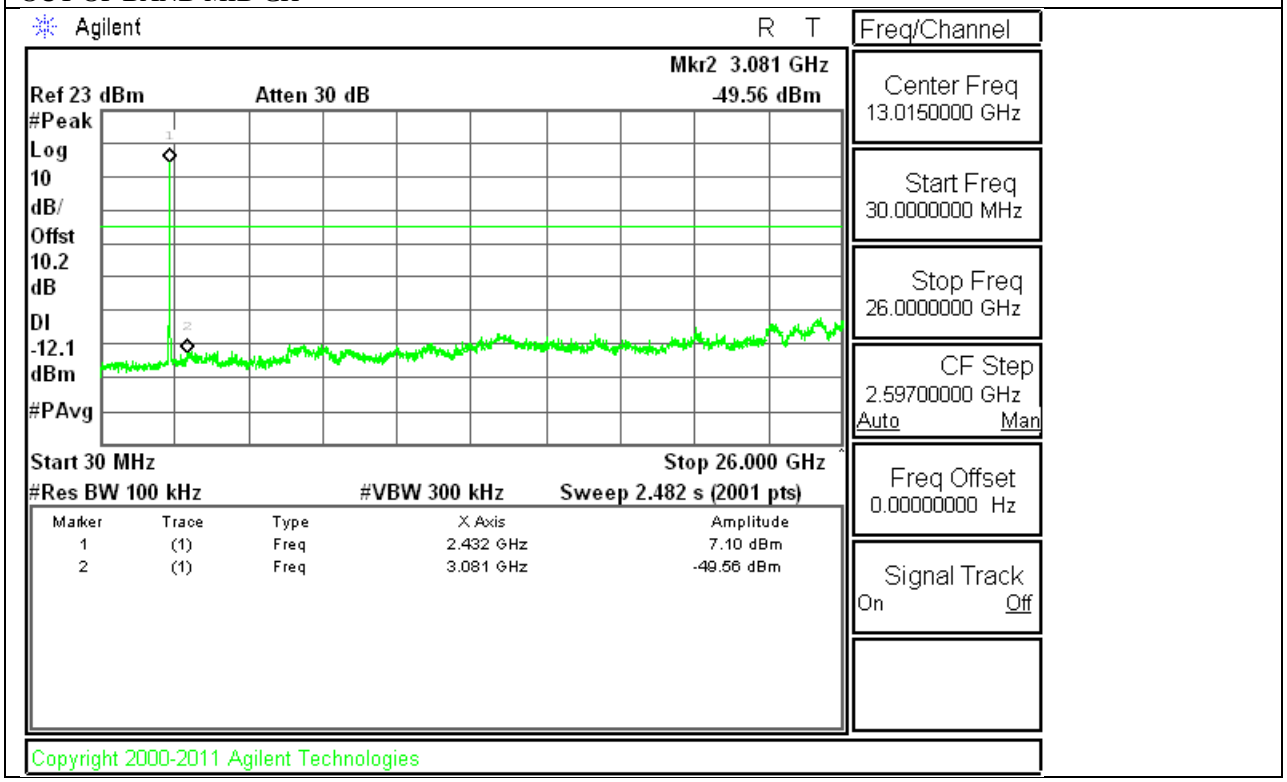
OUT OF BAND MID CH



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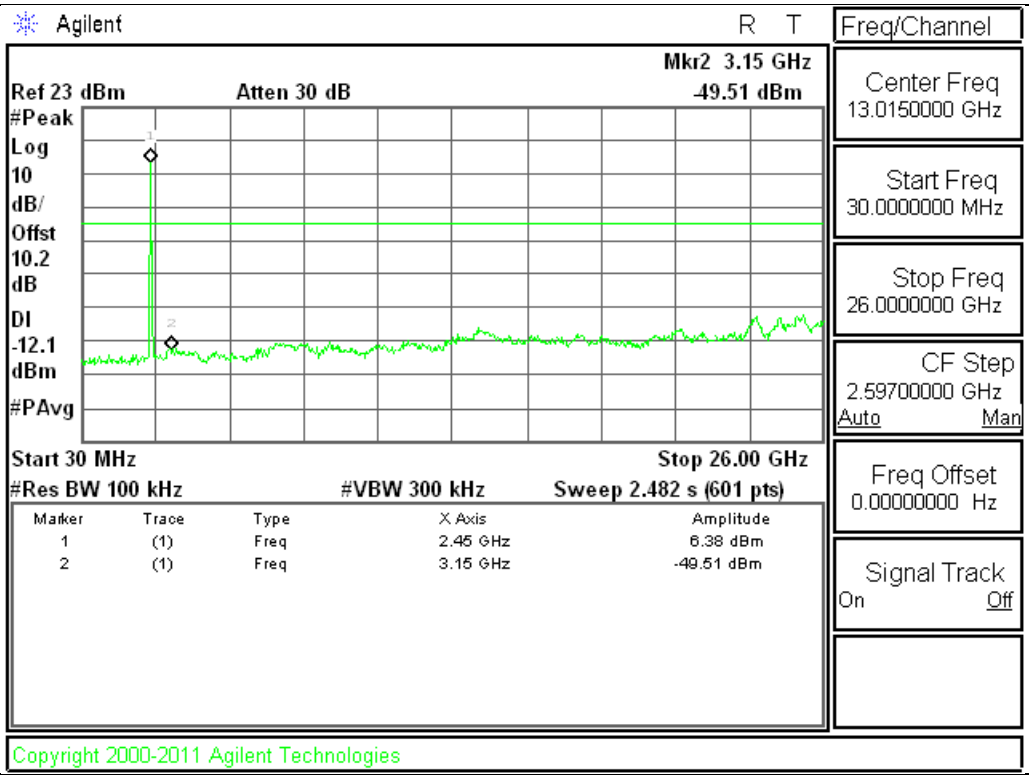
OUT OF BAND HIGH CH



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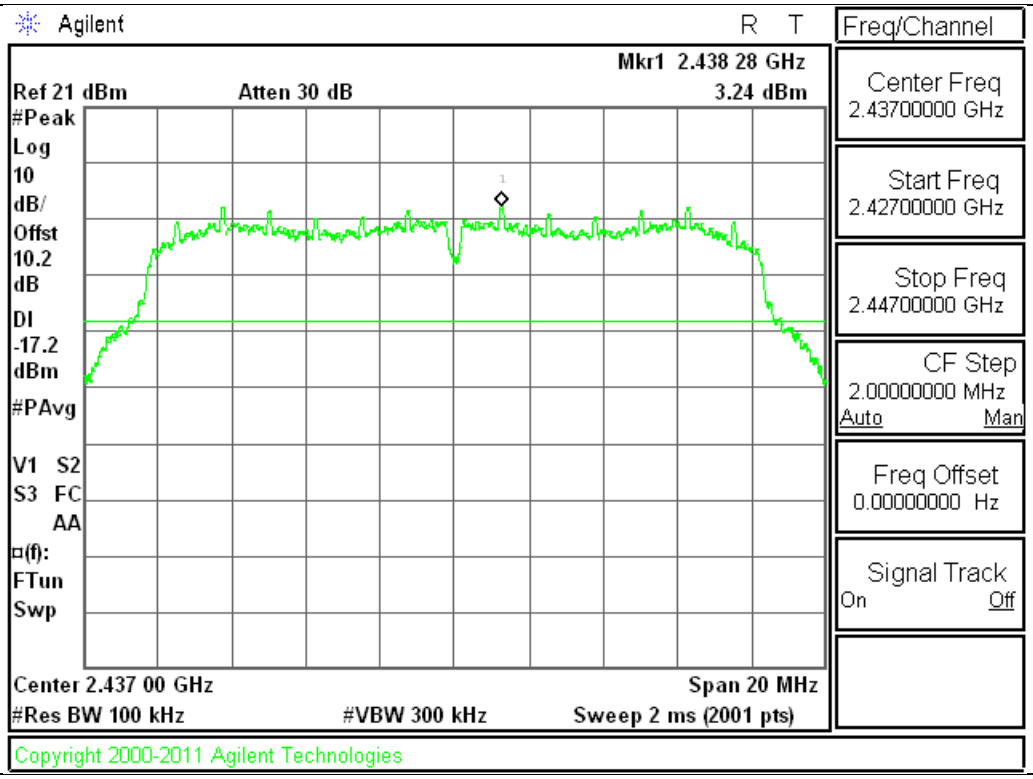
9.6.2. 802.11g MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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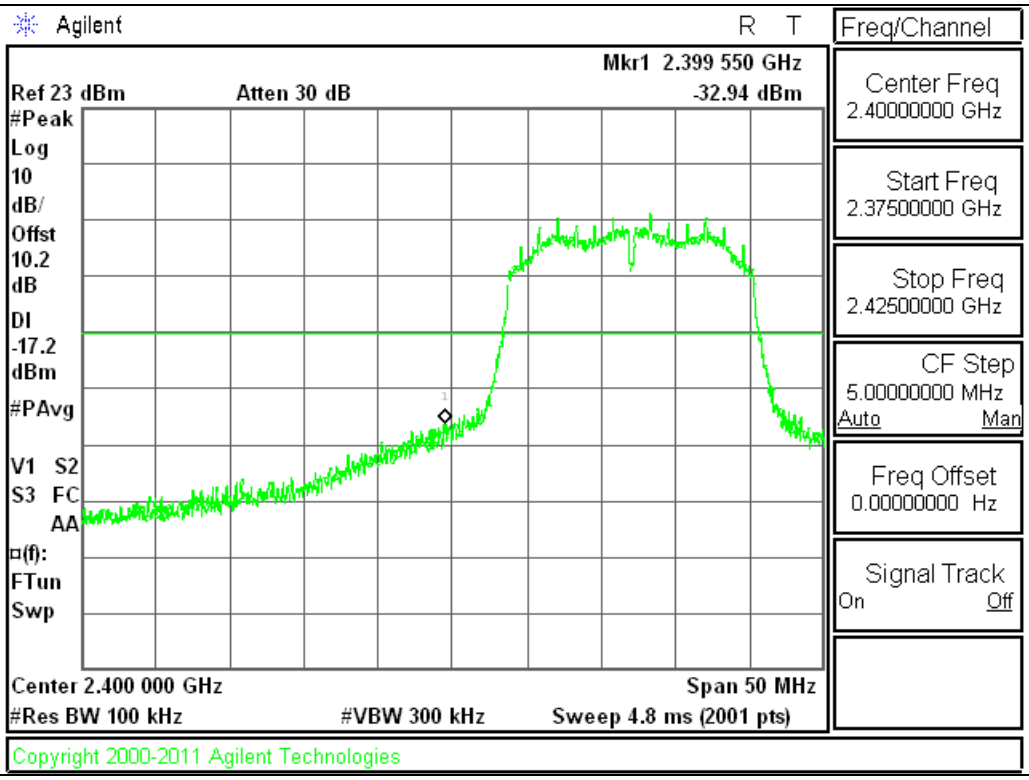
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



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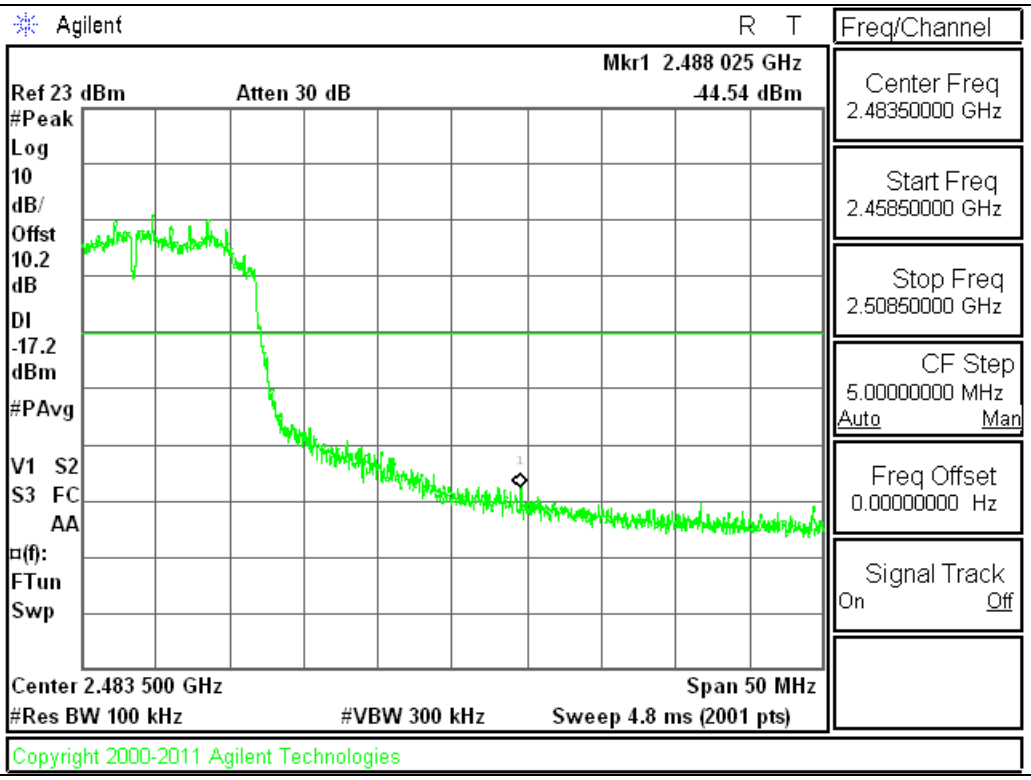
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH



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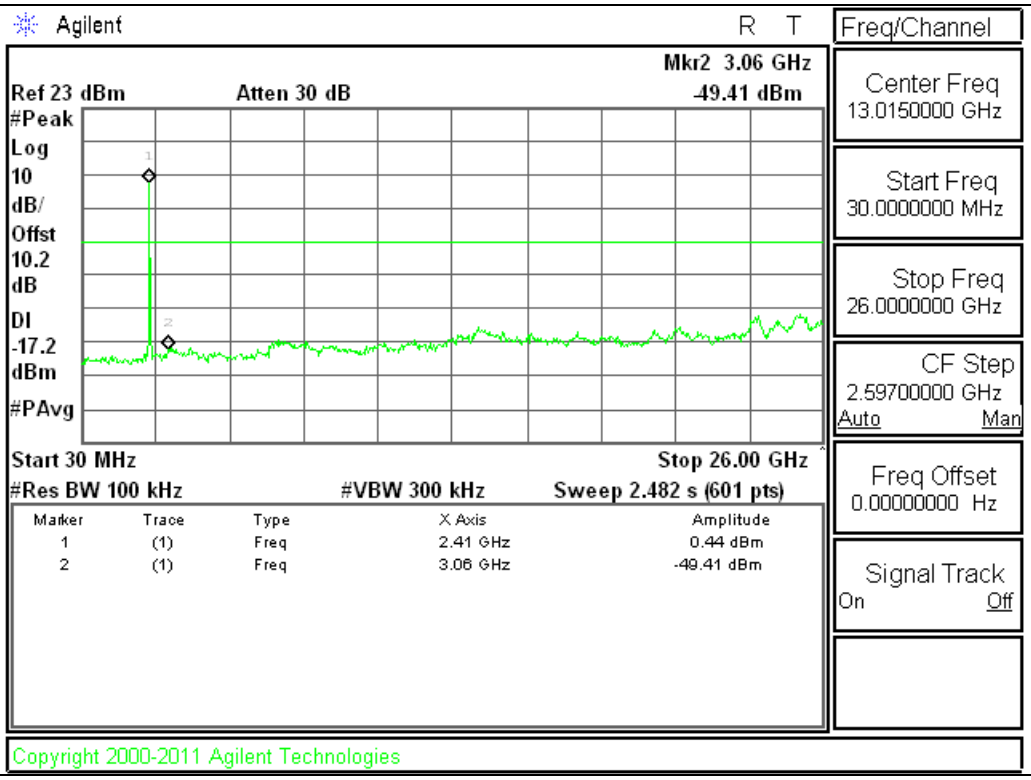
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



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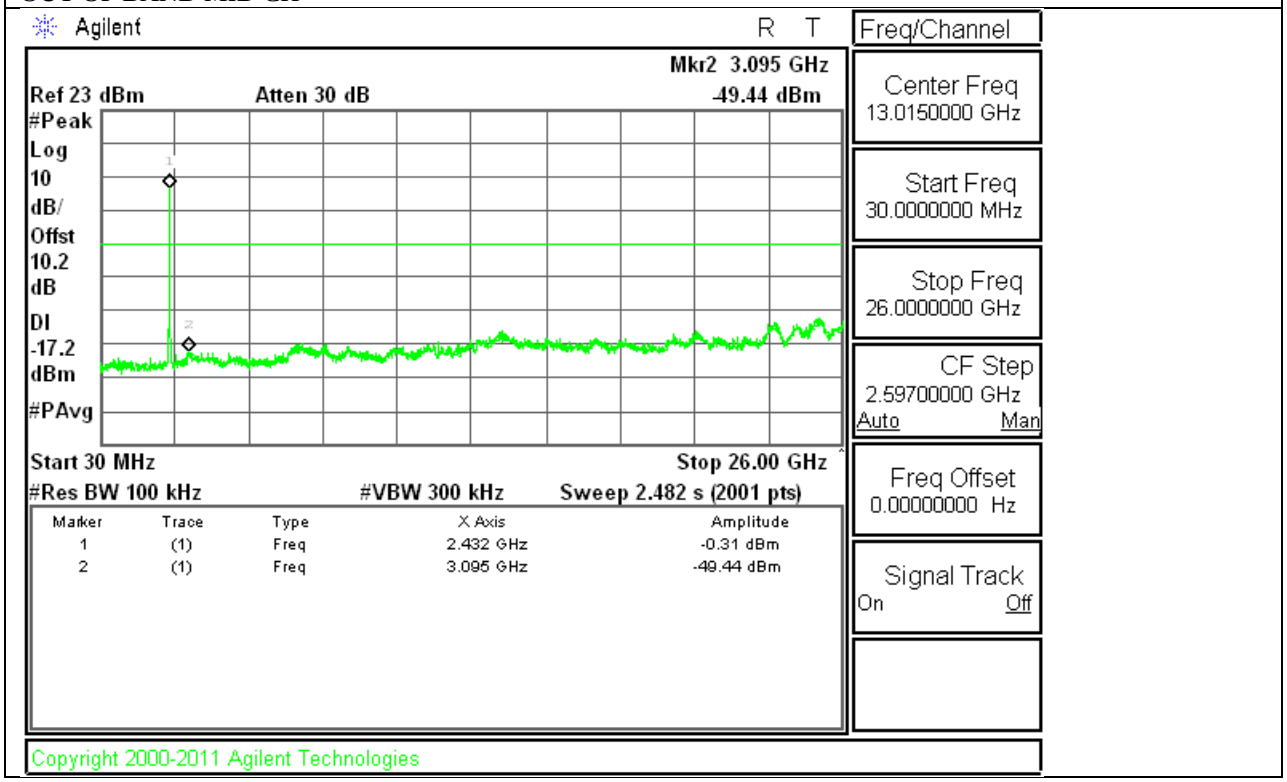
OUT OF BAND MID CH



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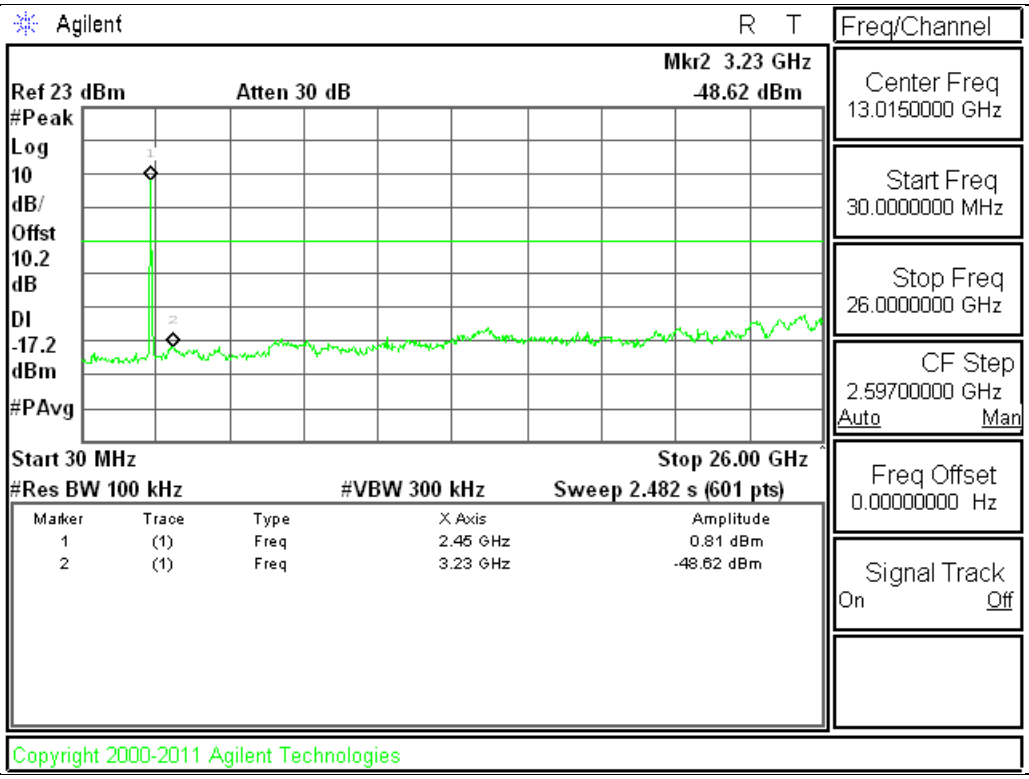
OUT OF BAND HIGH CH



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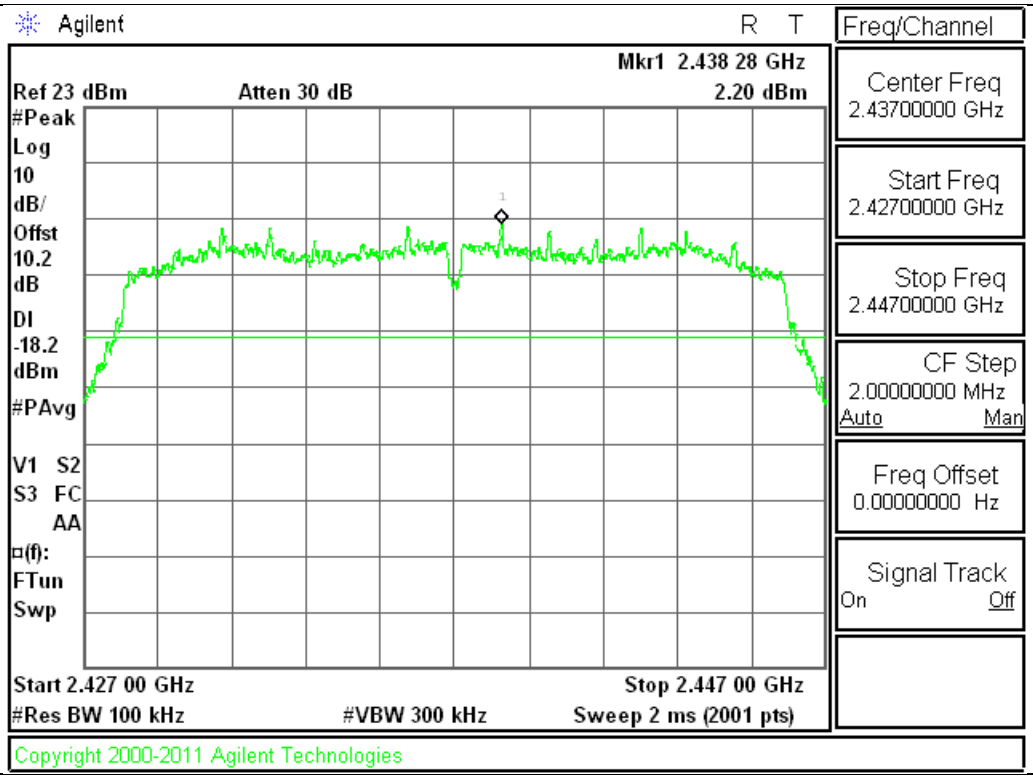
9.6.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



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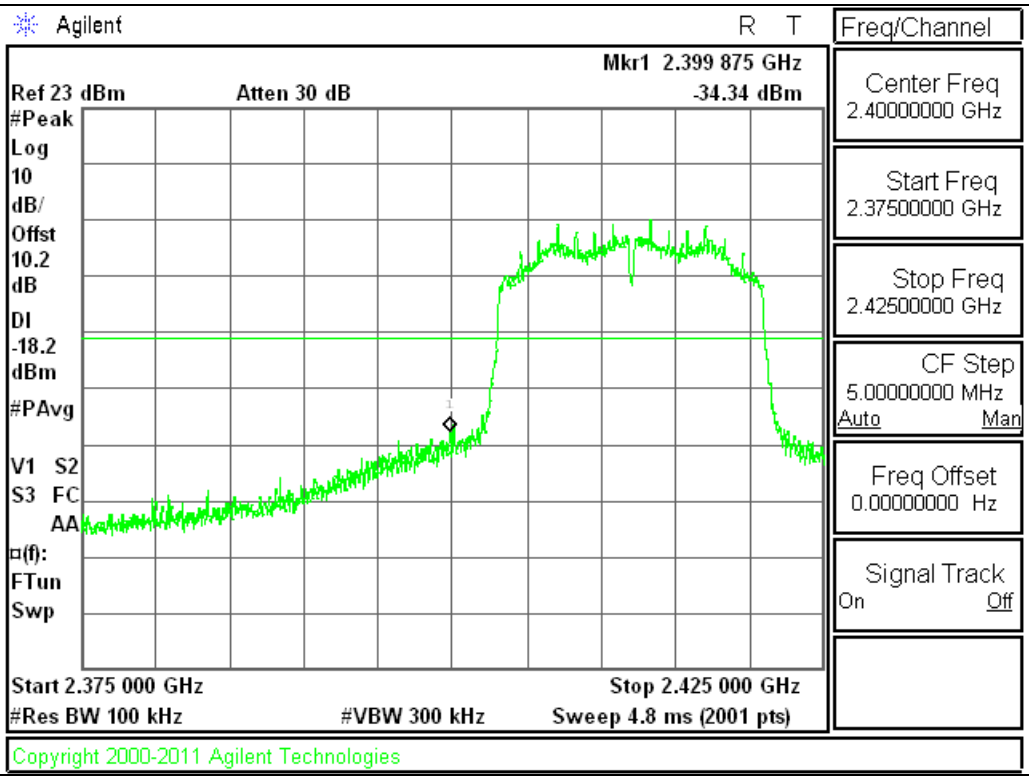
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



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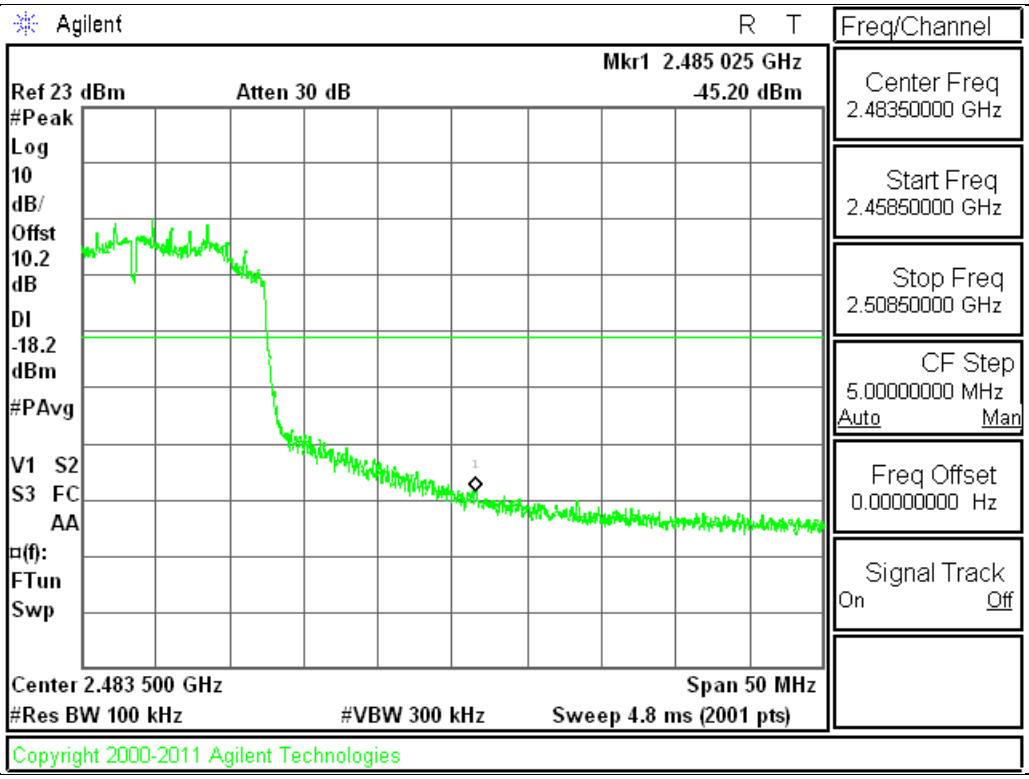
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH



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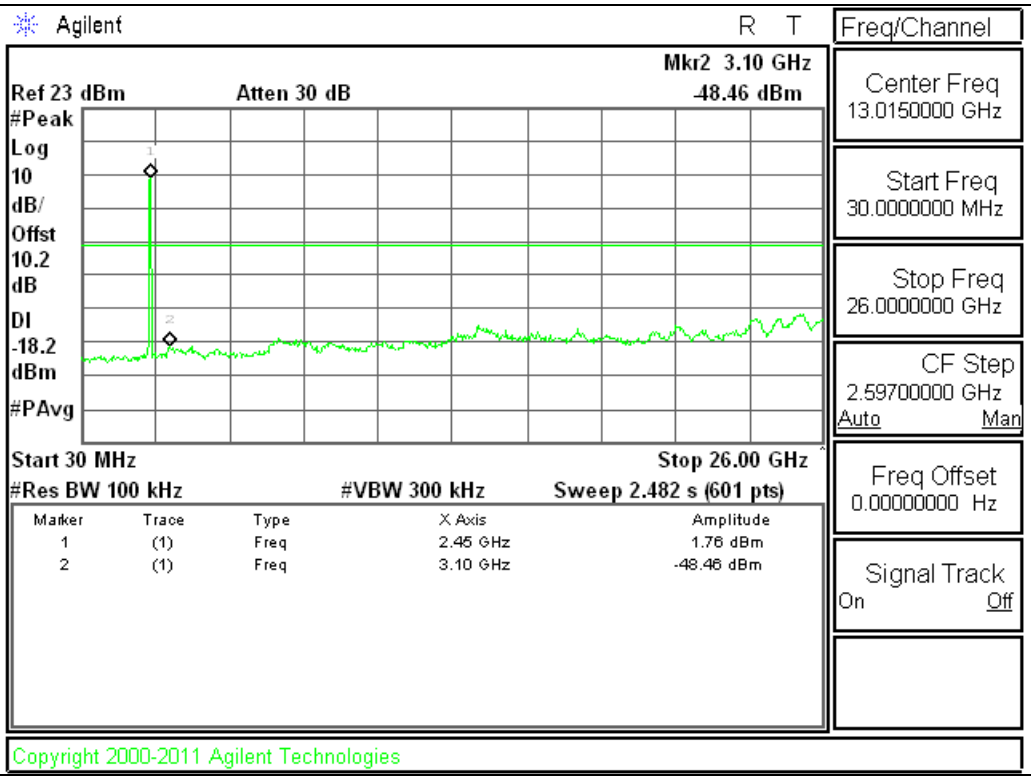
OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH



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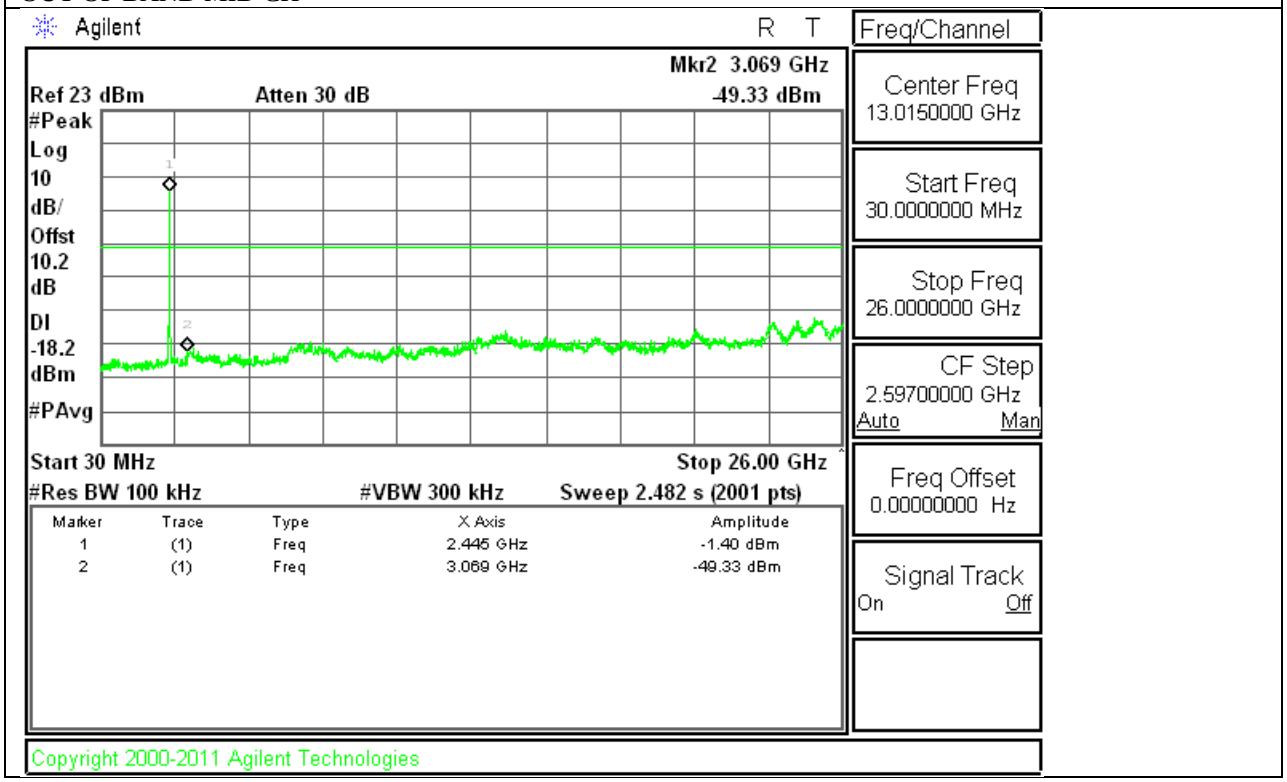
OUT OF BAND MID CH



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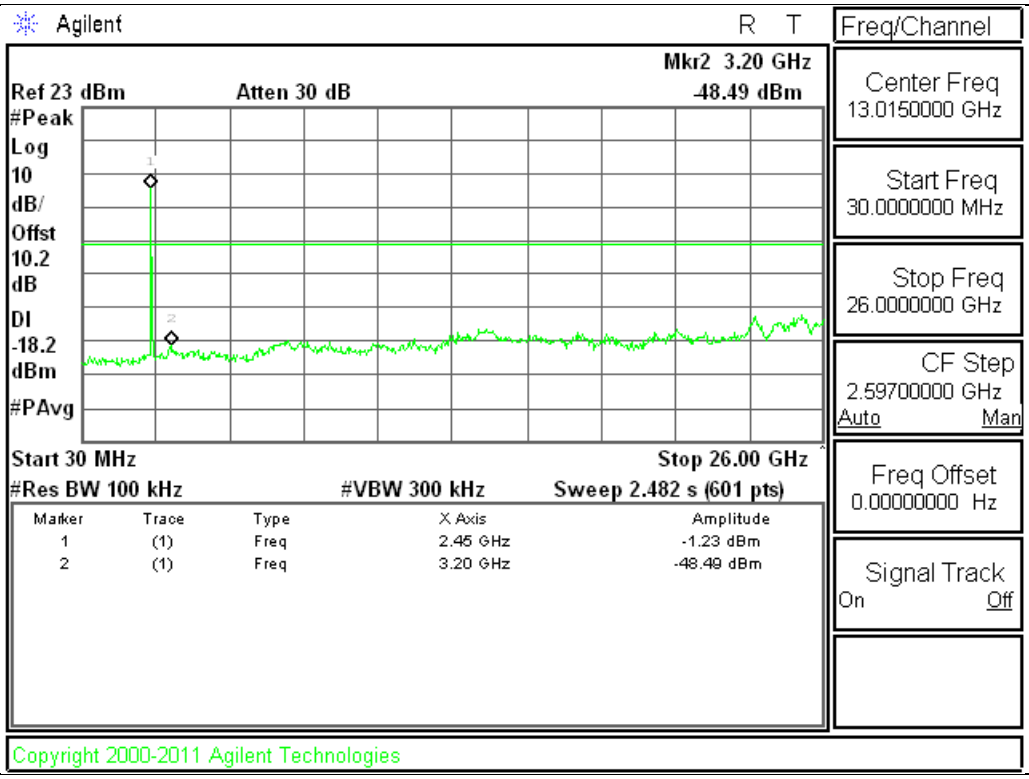
OUT OF BAND HIGH CH



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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

TEST PROCEDURE

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

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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 add duty cycle factor for average measurements. Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0.3dB; N mode = 0.32dB.

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

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

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10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 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 T136 (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	* 2.39	44.08	PK	32.2	-24.4	0	51.88	-	-	74	-22.12	337	235	H
2	* 2.384	46.46	PK	32.2	-23.8	0	54.86	-	-	74	-19.14	337	235	H
3	* 2.39	34.61	RMS	32.2	-24.4	0	42.41	54	-11.59	-	-	337	235	H
4	* 2.381	37.14	RMS	32.2	-23.6	0	45.74	54	-8.26	-	-	337	235	H

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

PK - Peak detector

RMS - RMS detection

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Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	41.74	PK	32.2	-24.4	0	49.54	-	-	74	-24.46	18	364	V
2	* 2.381	44.08	PK	32.2	-23.5	0	52.78	-	-	74	-21.22	18	364	V
3	* 2.39	32.59	RMS	32.2	-24.4	0	40.39	54	-13.61	-	-	18	364	V
4	* 2.382	35.04	RMS	32.2	-23.6	0	43.64	54	-10.36	-	-	18	364	V

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

PK - Peak detector

RMS - RMS detection

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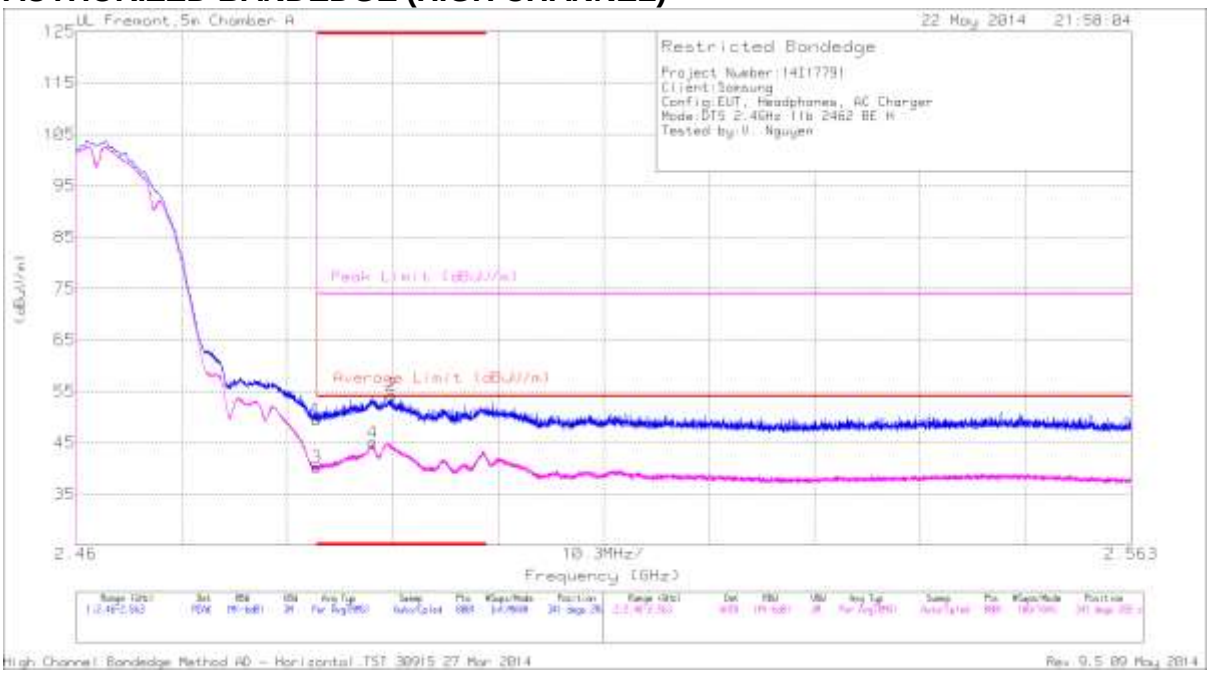
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	40.33	PK	32.7	-23.5	0	49.53	-	-	74	-24.47	341	282	H
2	* 2.491	44.74	PK	32.8	-23.4	0	54.14	-	-	74	-19.86	341	282	H
3	* 2.484	30.97	RMS	32.7	-23.5	0	40.17	54	-13.83	-	-	341	282	H
4	* 2.489	35.64	RMS	32.8	-23.4	0	45.04	54	-8.96	-	-	341	282	H

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

PK - Peak detector

RMS - RMS detection

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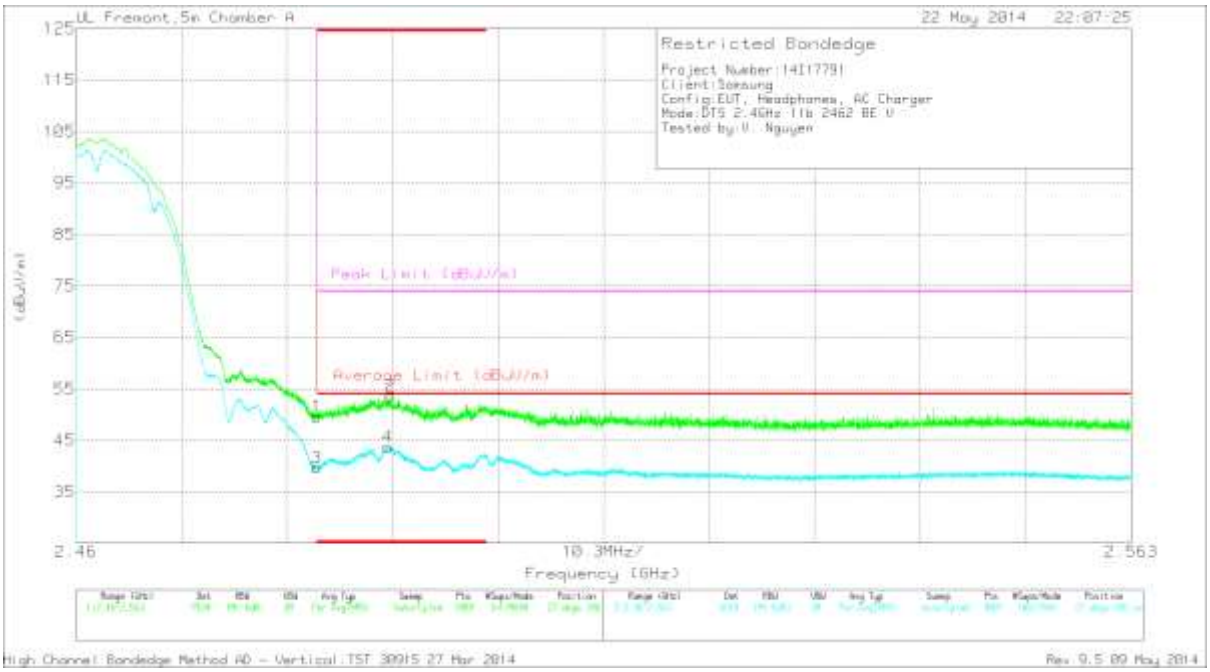

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.41	PK	32.7	-23.5	0	49.61	-	-	74	-24.39	27	346	V
2	* 2.491	44.23	PK	32.8	-23.4	0	53.63	-	-	74	-20.37	27	346	V
3	* 2.484	30.47	RMS	32.7	-23.5	0	39.67	54	-14.33	-	-	27	346	V
4	* 2.49	34.31	RMS	32.8	-23.4	0	43.71	54	-10.29	-	-	27	346	V

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

PK - Peak detector

RMS - RMS detection

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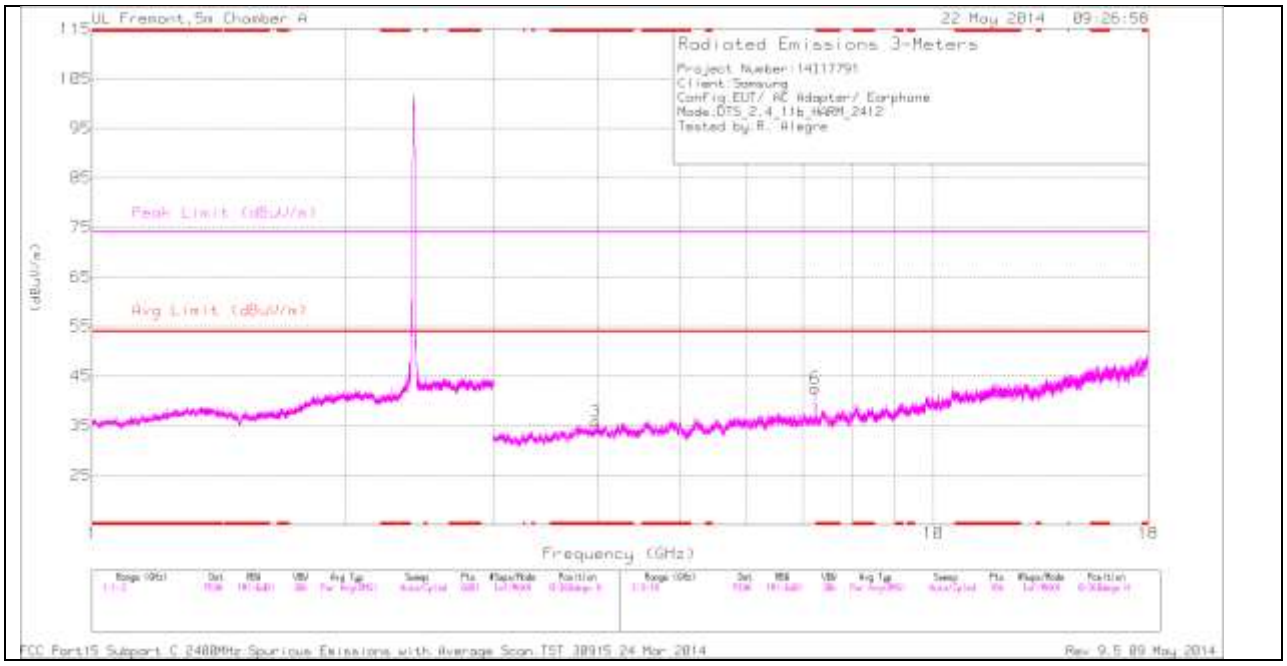
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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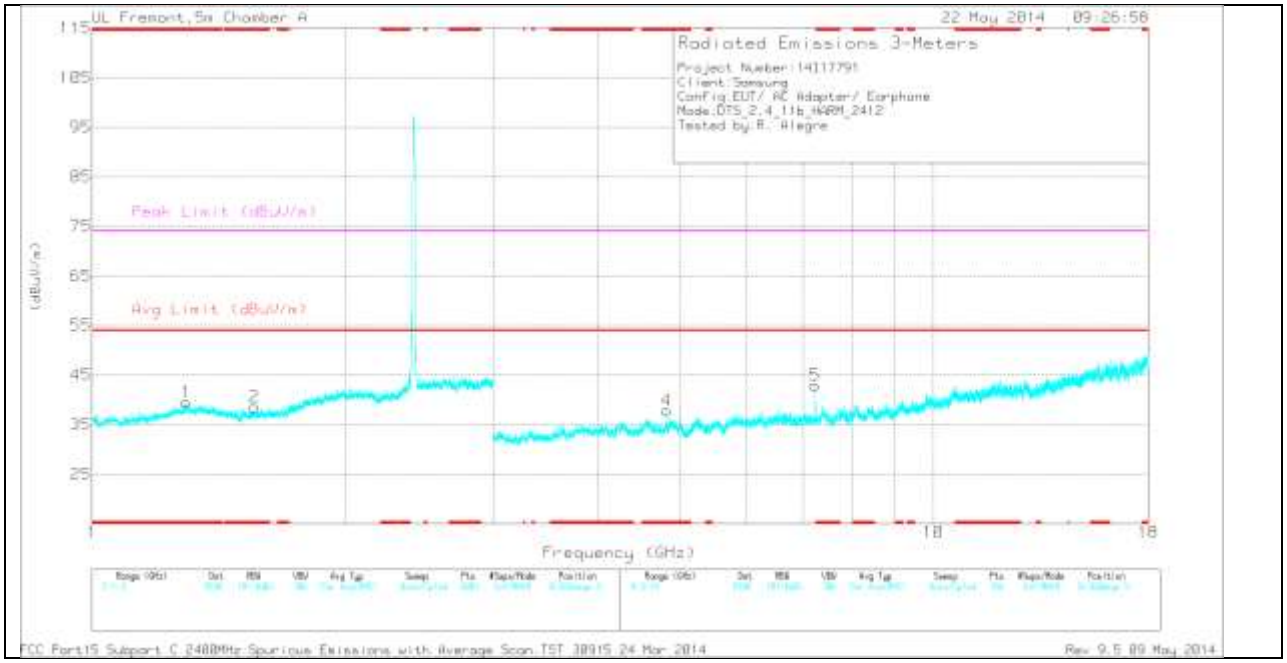
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.294	35.85	PK	30.2	-26.6	39.45	-	-	74	-34.55	0-360	100	V
2	* 1.561	36.16	PK	28.8	-26.4	38.56	-	-	74	-35.44	0-360	200	V
3	* 3.967	32.29	PK	33.7	-30.2	35.79	-	-	74	-38.21	0-360	100	H
4	* 4.824	33.26	PK	34	-29.4	37.86	-	-	74	-36.14	0-360	100	V
6	7.235	33.58	PK	35.2	-26.2	42.58	-	-	-	-	0-360	200	H
5	7.236	33.82	PK	35.2	-26.1	42.92	-	-	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.559	42.81	PK2	28.8	-26.3	45.31	-	-	74	-28.69	360	200	V
* 1.294	43.68	PK2	30.2	-26.6	47.28	-	-	74	-26.72	360	100	V
* 3.966	39.22	PK2	33.7	-30.2	42.72	-	-	74	-31.28	360	100	H
* 4.824	38.76	PK2	34	-29.5	43.26	-	-	74	-30.74	360	100	V
7.236	40.34	PK2	35.2	-26.1	49.44	-	-	-	-	360	201	H
7.236	40.23	PK2	35.2	-26.2	49.23	-	-	-	-	360	100	V
7.237	31.83	MAv1	35.2	-26.1	40.93	-	-	-	-	360	100	V

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

PK2 - KDB558074 Method: Maximum Peak

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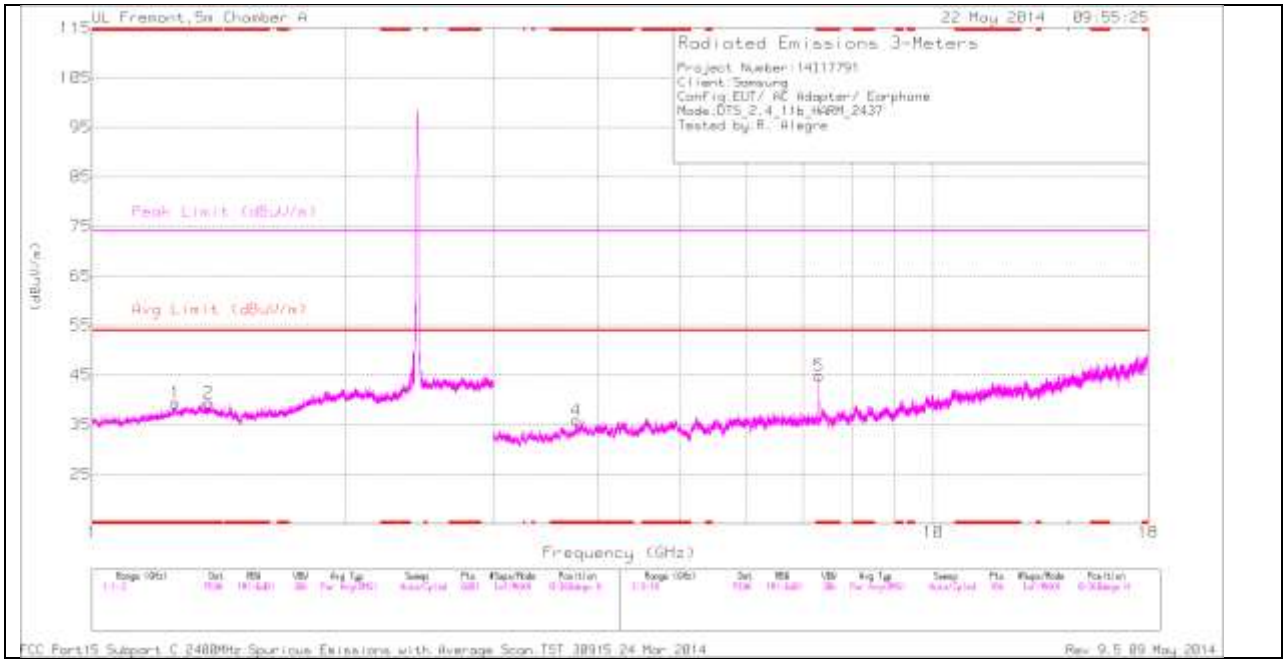
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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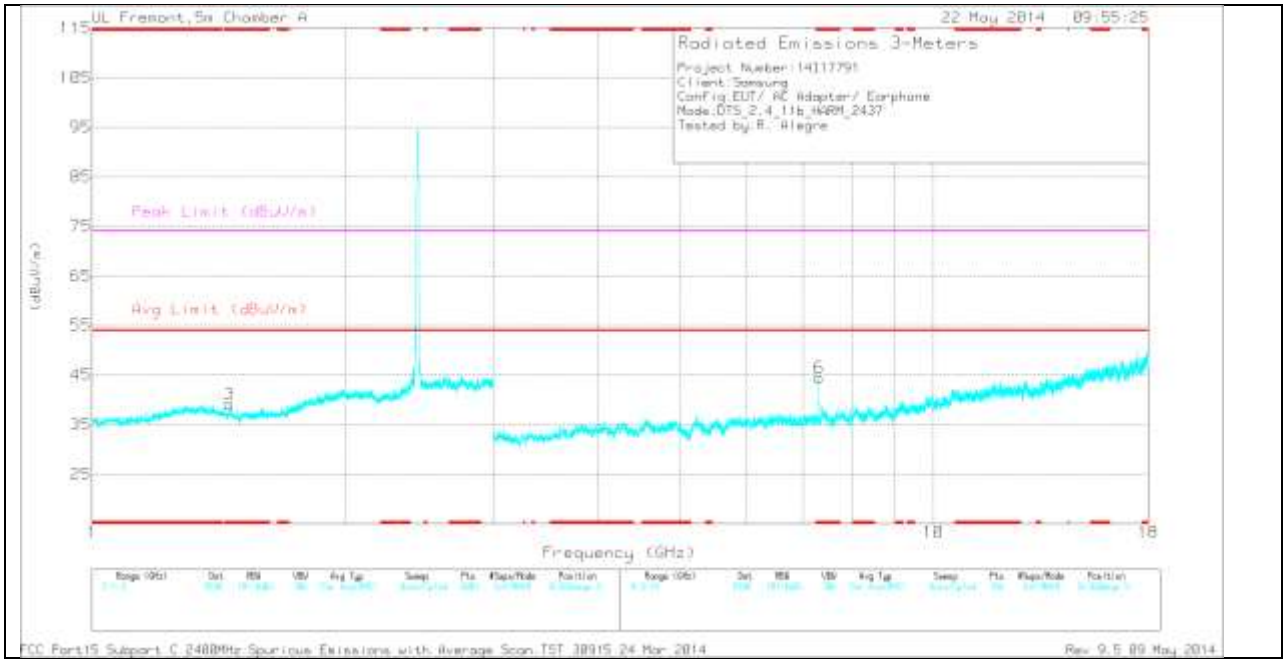
MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.256	36.15	PK	29.8	-26.6	0	39.35	-	-	74	-34.65	0-360	200	H
2	* 1.378	36.13	PK	29.9	-26.6	0	39.43	-	-	74	-34.57	0-360	200	H
3	* 1.457	35.79	PK	29.2	-25.9	0	39.09	-	-	74	-34.91	0-360	100	V
4	* 3.761	32.29	PK	33.5	-30	0	35.79	-	-	74	-38.21	0-360	200	H
5	* 7.311	36.84	PK	35.2	-27.2	0	44.84	-	-	74	-29.16	0-360	200	H
6	* 7.31	36.44	PK	35.2	-27.2	0	44.44	-	-	74	-29.56	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.379	43.47	PK2	29.9	-26.6	0	46.77	-	-	74	-27.23	279	201	H
* 1.455	43.6	PK2	29.2	-26.1	0	46.7	-	-	74	-27.3	279	100	V
* 7.311	43.89	PK2	35.2	-27.2	0	51.89	-	-	74	-22.11	279	237	H
* 7.31	37.64	MAv1	35.2	-27.2	0	45.64	54	-8.36	-	-	279	237	H
* 3.759	40	PK2	33.5	-30.2	0	43.3	-	-	74	-30.7	279	200	H
* 7.312	40.84	PK2	35.2	-27.2	0	48.84	-	-	74	-25.16	359	100	V

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

PK2 - KDB558074 Method: Maximum Peak

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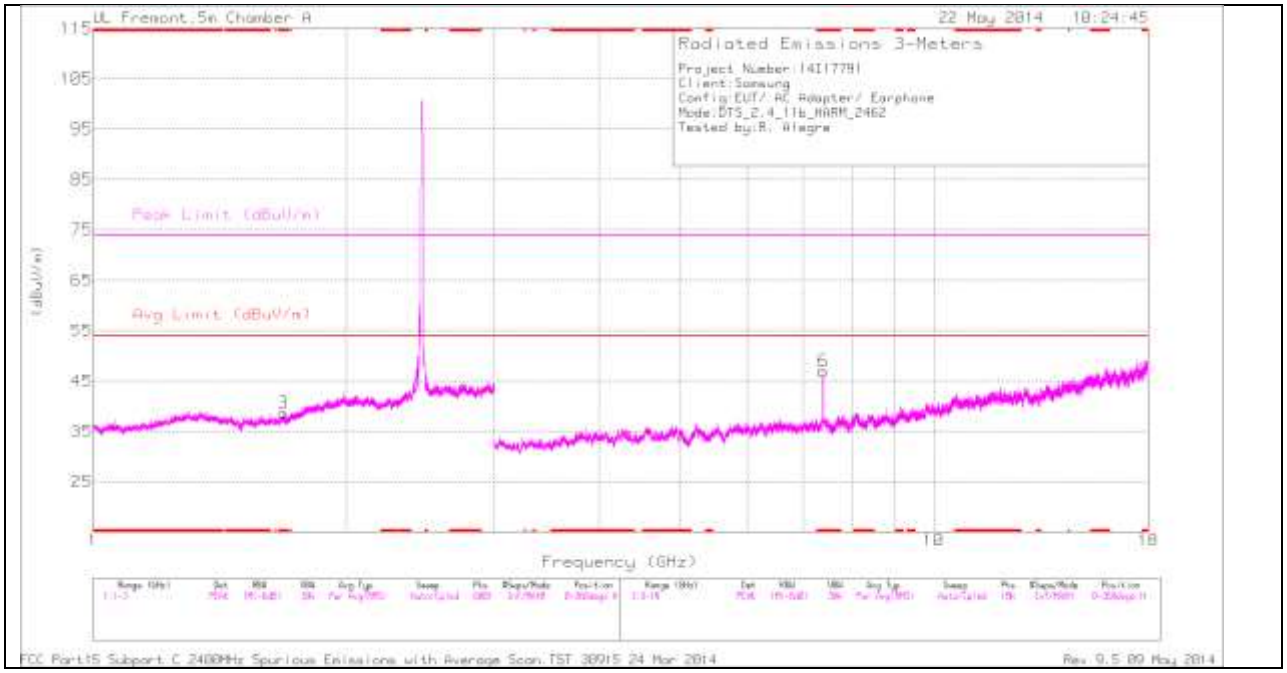
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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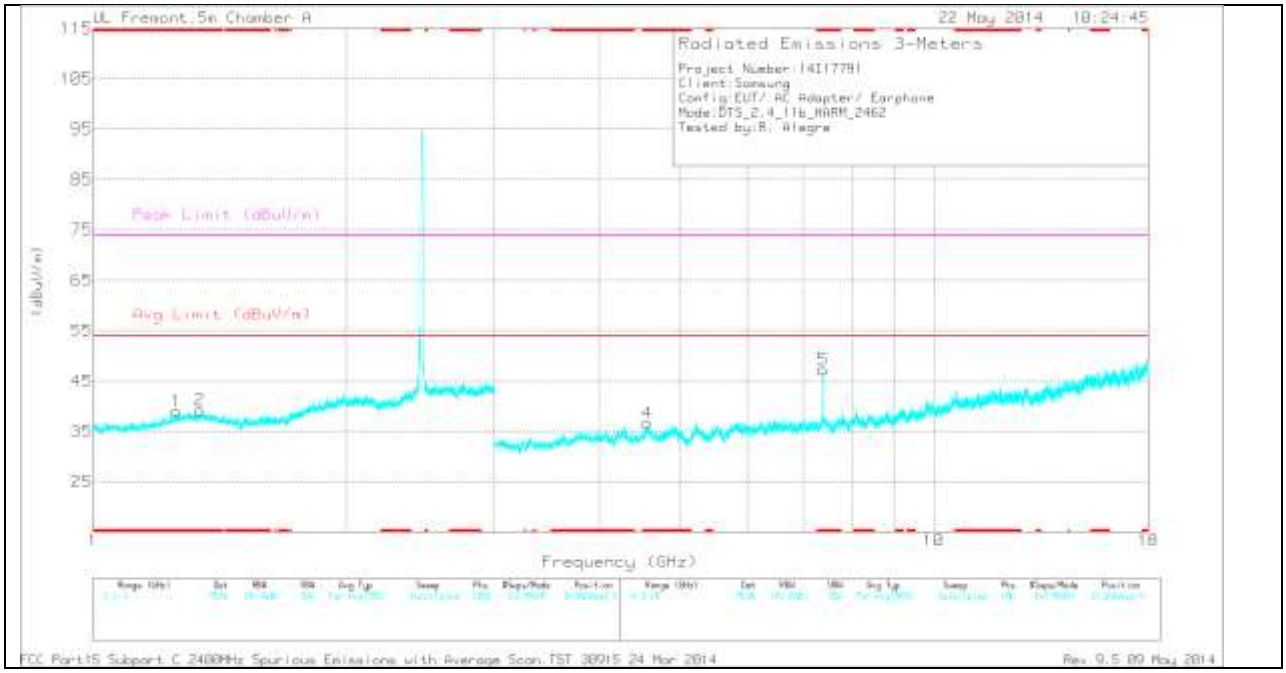
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
3	* 1.685	35.18	PK	29.1	-25.6	0	38.68	-	-	74	-35.32	0-360	100	H
1	* 1.256	35.82	PK	29.8	-26.6	0	39.02	-	-	74	-34.98	0-360	200	V
2	* 1.341	35.44	PK	30.1	-26.3	0	39.24	-	-	74	-34.76	0-360	200	V
6	* 7.386	35.98	PK	35.3	-24.3	0	46.98	-	-	74	-27.02	0-360	201	H
4	* 4.567	31.17	PK	33.9	-28.4	0	36.67	-	-	74	-37.33	0-360	200	V
5	* 7.386	36.28	PK	35.3	-24.3	0	47.28	-	-	74	-26.72	0-360	200	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.687	42.71	PK2	29.1	-25.7	0	46.11	-	-	74	-27.89	329	100	H
* 1.339	43.56	PK2	30.1	-26.3	0	47.36	-	-	74	-26.64	329	200	V
* 1.255	43.07	PK2	29.8	-26.6	0	46.27	-	-	74	-27.73	329	200	V
* 7.386	41.1	PK2	35.3	-24.3	0	52.1	-	-	74	-21.9	329	200	H
* 7.385	34.03	MAv1	35.3	-24.3	0	45.03	54	-8.97	-	-	329	200	H
* 7.387	44.63	PK2	35.3	-24.3	0	55.63	-	-	74	-18.37	329	247	V
* 7.385	37.93	MAv1	35.3	-24.3	0	48.93	54	-5.07	-	-	329	247	V
* 4.568	39.27	PK2	33.9	-28.4	0	44.77	-	-	74	-29.23	329	200	V

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

PK2 - KDB558074 Method: Maximum Peak

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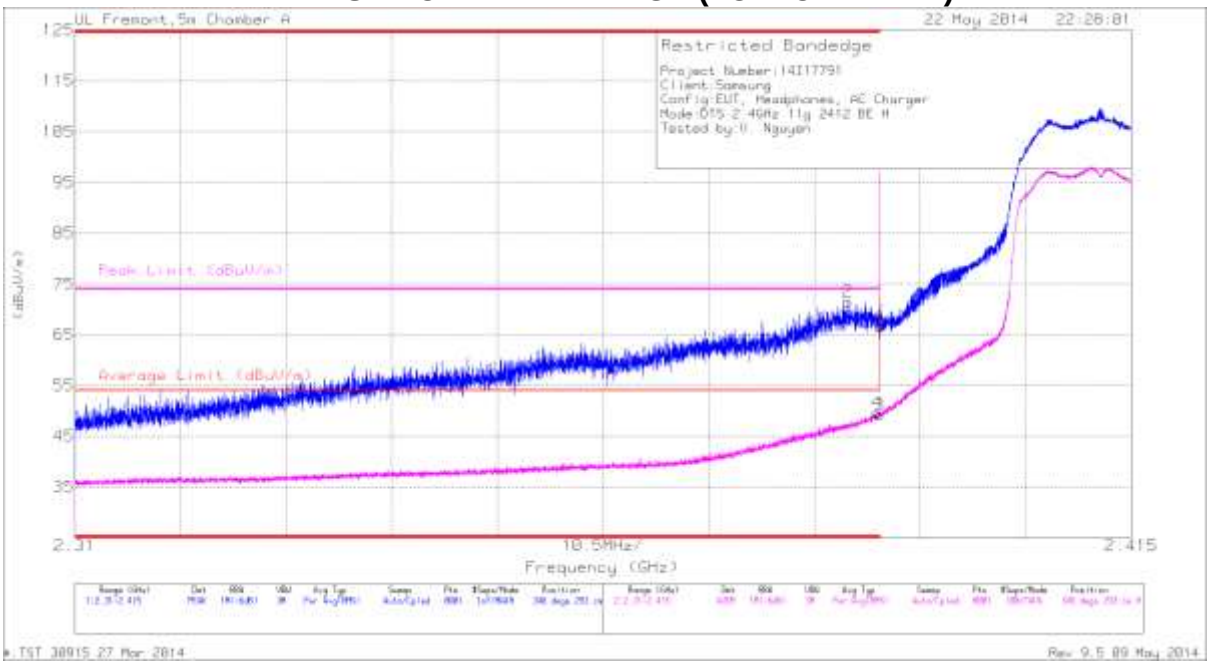
10.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 2.39	58.81	PK	32.2	-24.4	0	66.61	-	-	74	-7.39	346	293	H
2	* 2.387	63.44	PK	32.2	-24.1	0	71.54	-	-	74	-2.46	346	293	H
3	* 2.39	41.08	RMS	32.2	-24.4	.3	49.18	54	-4.82	-	-	346	293	H
4	* 2.39	41.61	RMS	32.2	-24.4	.3	49.71	54	-4.29	-	-	346	293	H

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

PK - Peak detector

RMS - RMS detection

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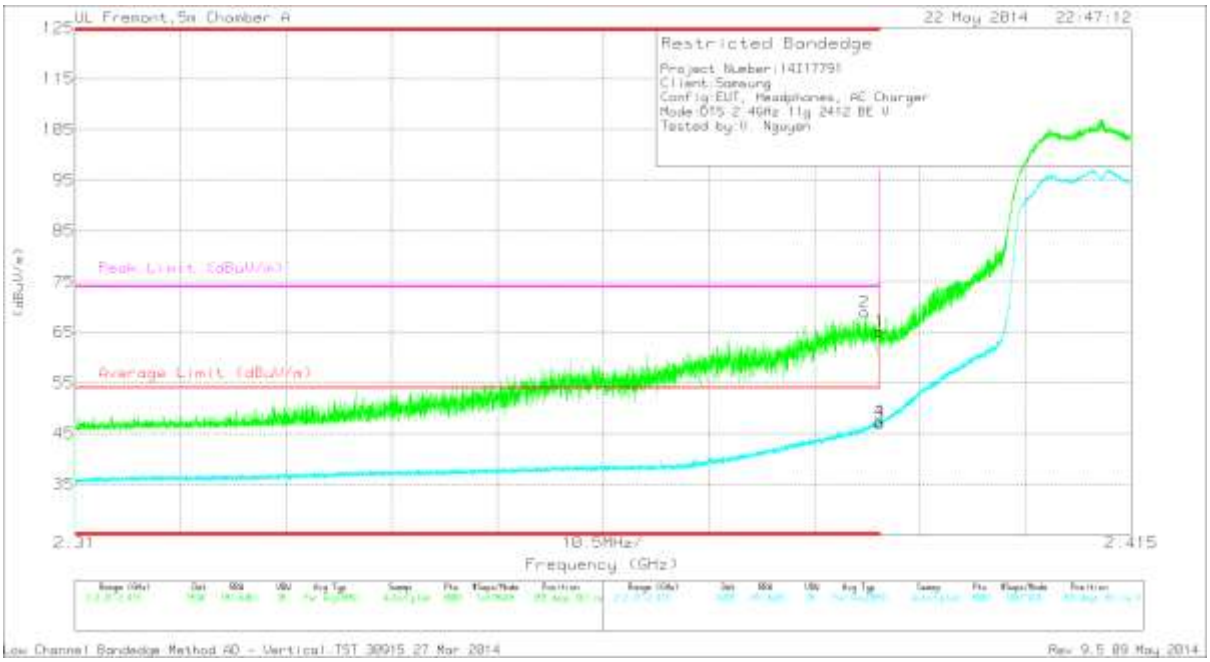

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	57.35	PK	32.2	-24.4	0	65.15	-	-	74	-8.85	359	361	V
2	* 2.389	60.98	PK	32.2	-24.3	0	68.88	-	-	74	-5.12	359	361	V
3	* 2.39	38.91	RMS	32.2	-24.4	.3	47.01	54	-6.99	-	-	359	361	V
4	* 2.39	39.27	RMS	32.2	-24.4	.3	47.37	54	-6.63	-	-	359	361	V

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

PK - Peak detector

RMS - RMS detection

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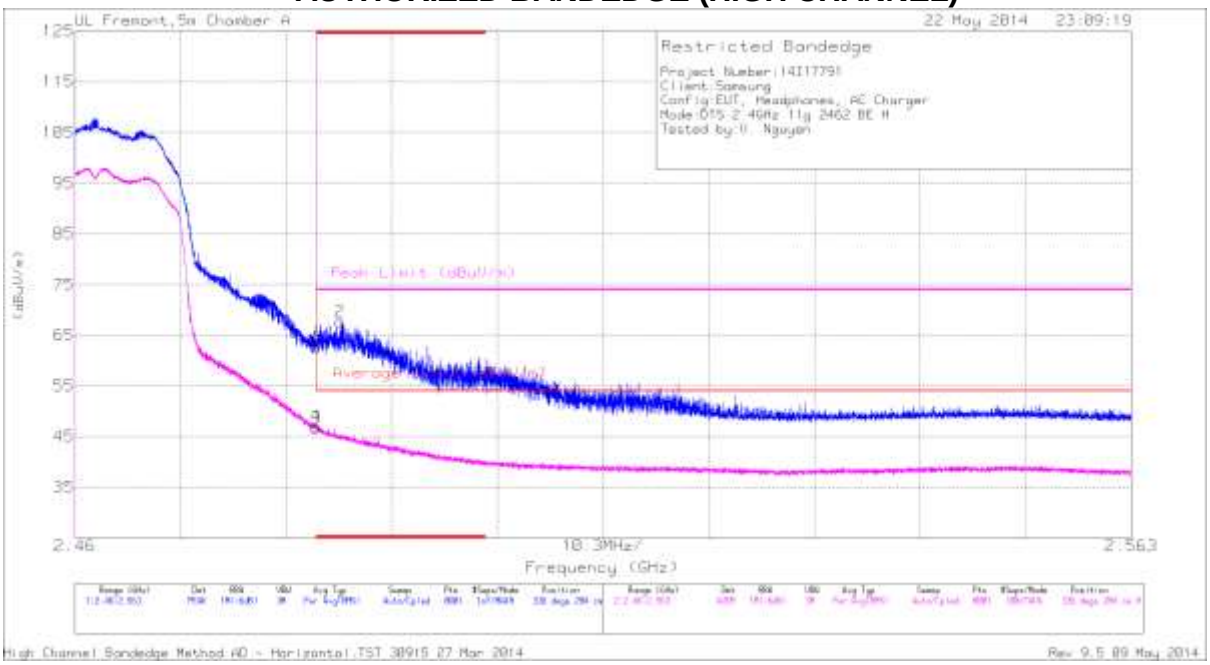
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	53.43	PK	32.7	-23.5	0	62.63	-	-	74	-11.37	336	284	H
2	* 2.486	58.31	PK	32.8	-23.4	0	67.71	-	-	74	-6.29	336	284	H
3	* 2.484	37.45	RMS	32.7	-23.5	.3	46.95	54	-7.05	-	-	336	284	H
4	* 2.484	37.84	RMS	32.7	-23.5	.3	47.34	54	-6.66	-	-	336	284	H

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

PK - Peak detector

RMS - RMS detection

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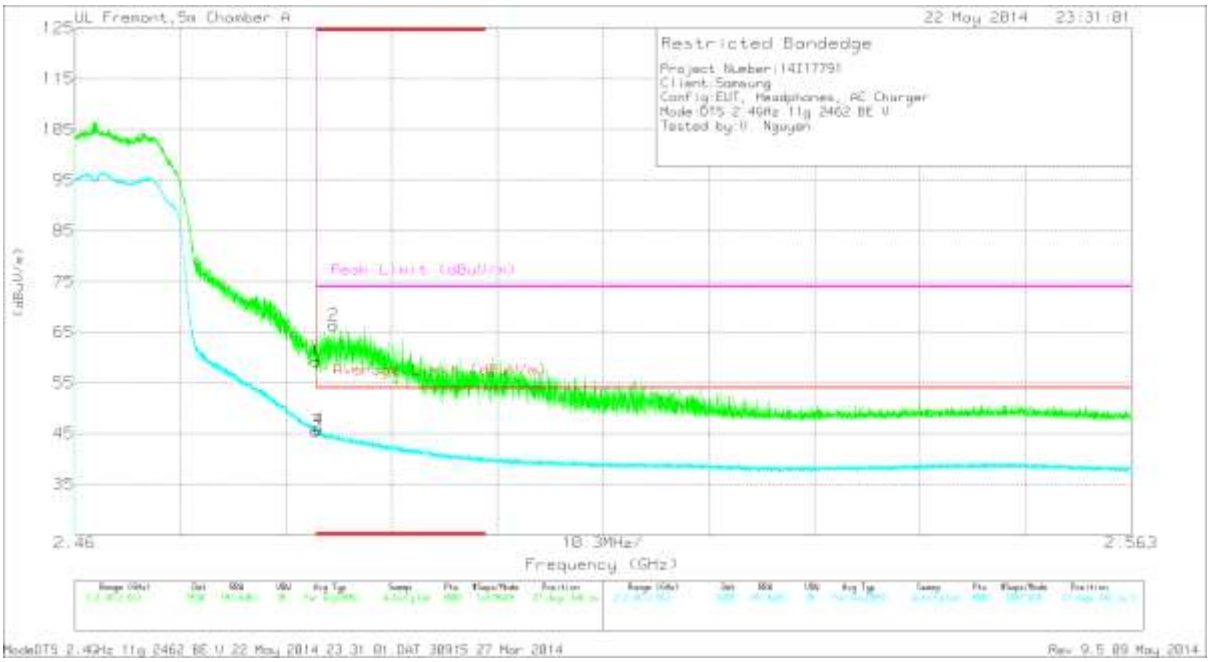

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.05	PK	32.7	-23.5	0	59.25	-	-	74	-14.75	27	346	V
2	* 2.485	57.21	PK	32.7	-23.5	0	66.41	-	-	74	-7.59	27	346	V
3	* 2.484	35.98	RMS	32.7	-23.5	.3	45.48	54	-8.52	-	-	27	346	V
4	* 2.484	36.36	RMS	32.7	-23.5	.3	45.86	54	-8.14	-	-	27	346	V

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

PK - Peak detector

RMS - RMS detection

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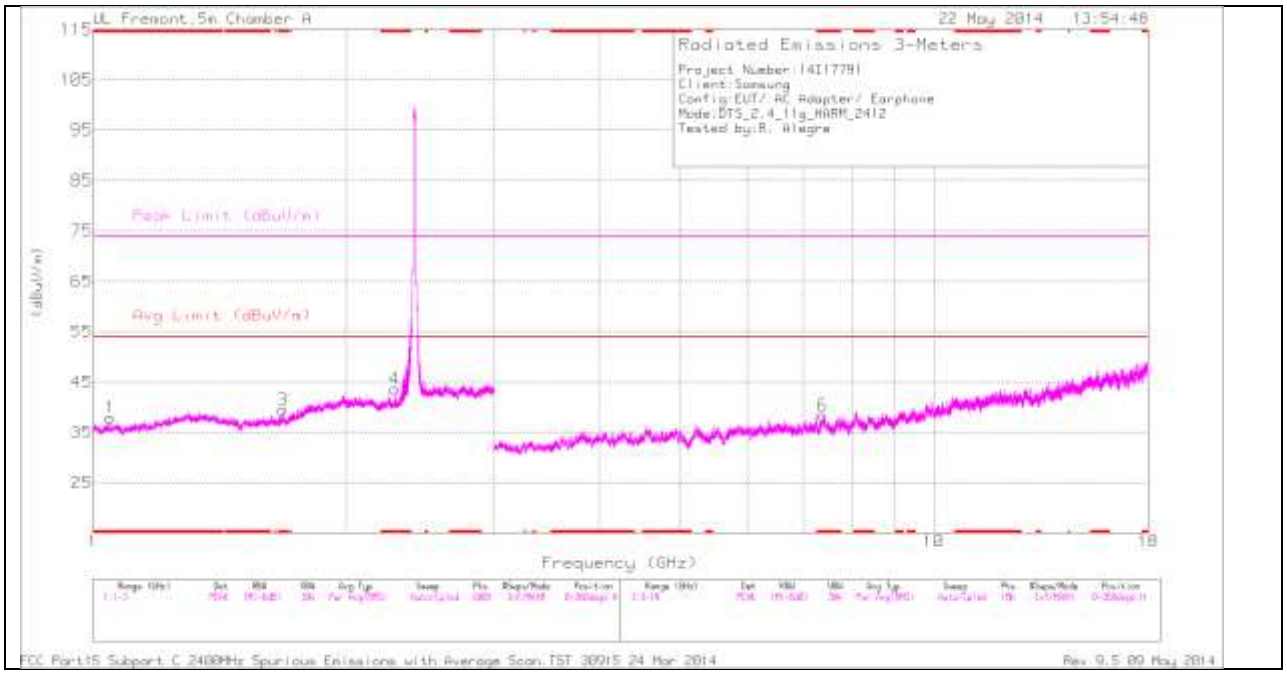
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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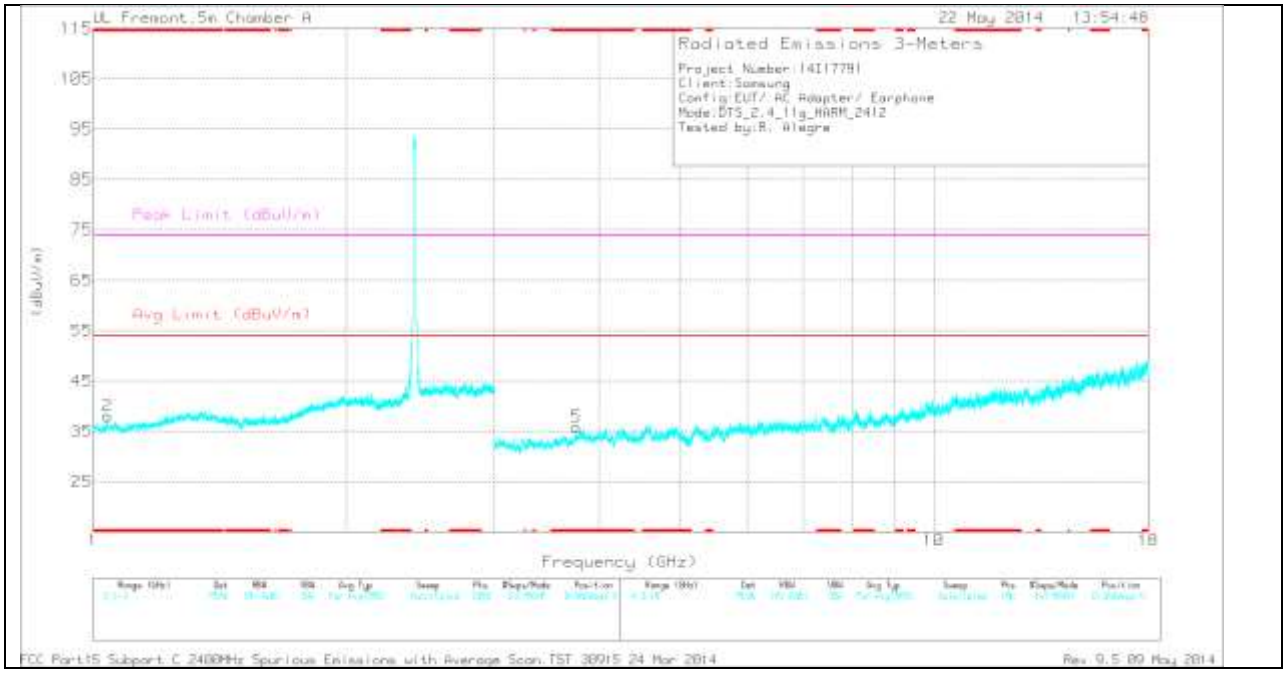
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.048	36.9	PK	28.5	-27.5	0	37.9	-	-	74	-36.1	0-360	100	H
3	* 1.682	36	PK	29	-25.5	0	39.5	-	-	74	-34.5	0-360	200	H
4	* 2.286	36.74	PK	31.4	-24.5	0	43.64	-	-	74	-30.36	0-360	200	H
2	* 1.04	36.99	PK	28.6	-27.5	0	38.09	-	-	74	-35.91	0-360	201	V
6	* 7.381	27.4	PK	35.3	-24.3	0	38.4	-	-	74	-35.6	0-360	200	H
5	* 3.759	32.53	PK	33.5	-30.2	0	35.83	-	-	74	-38.17	0-360	201	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 2.285	47.58	PK2	31.4	-24.5	0	54.48	-	-	74	-19.52	359	200	H
* 2.285	31.02	MAv1	31.4	-24.5	.3	38.22	54	-15.78	-	-	359	200	H
* 1.683	43.76	PK2	29.1	-25.5	0	47.36	-	-	74	-26.64	359	200	H
* 1.049	43.72	PK2	28.5	-27.5	0	44.72	-	-	74	-29.28	359	100	H
* 2.285	49.29	PK2	31.4	-24.5	0	56.19	-	-	74	-17.81	58	248	H
* 2.288	30.58	MAv1	31.4	-24.4	.3	37.88	54	-16.12	-	-	58	248	H
* 1.039	44.12	PK2	28.6	-27.5	0	45.22	-	-	74	-28.78	359	200	V
* 7.381	35.13	PK2	35.3	-24.3	0	46.13	-	-	74	-27.87	359	200	H
* 3.759	39.84	PK2	33.5	-30.3	0	43.04	-	-	74	-30.96	359	200	V

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

PK2 - KDB558074 Method: Maximum Peak

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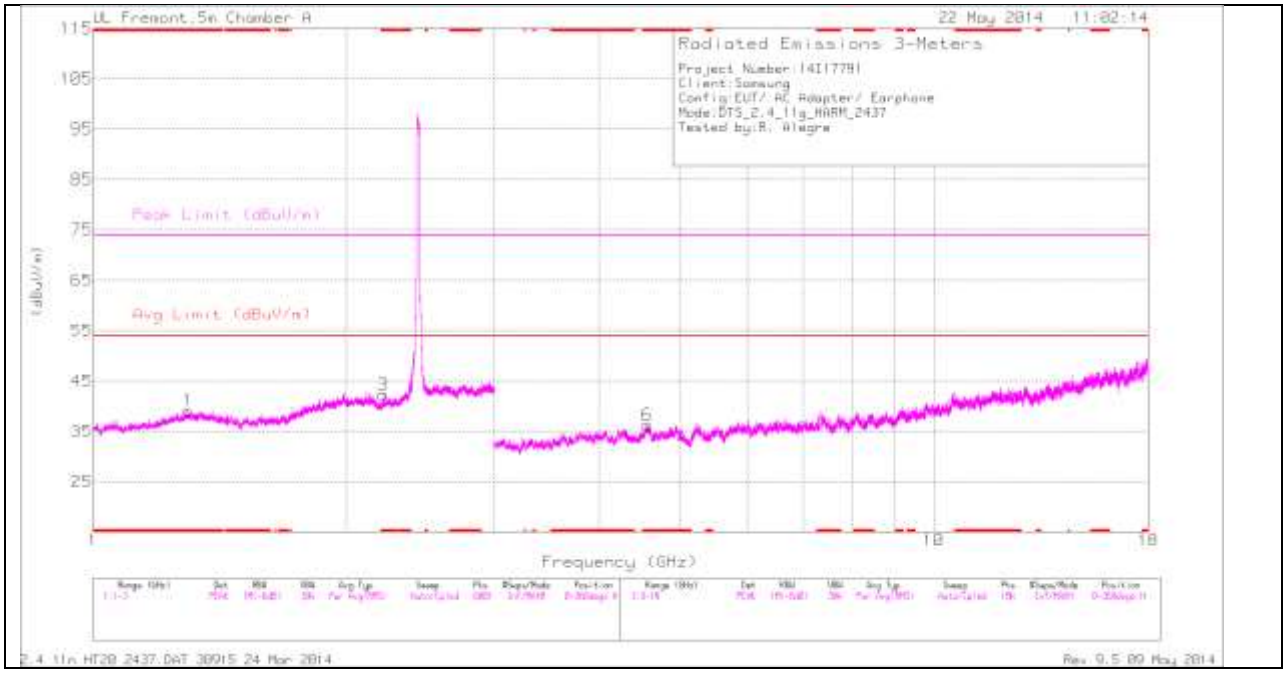
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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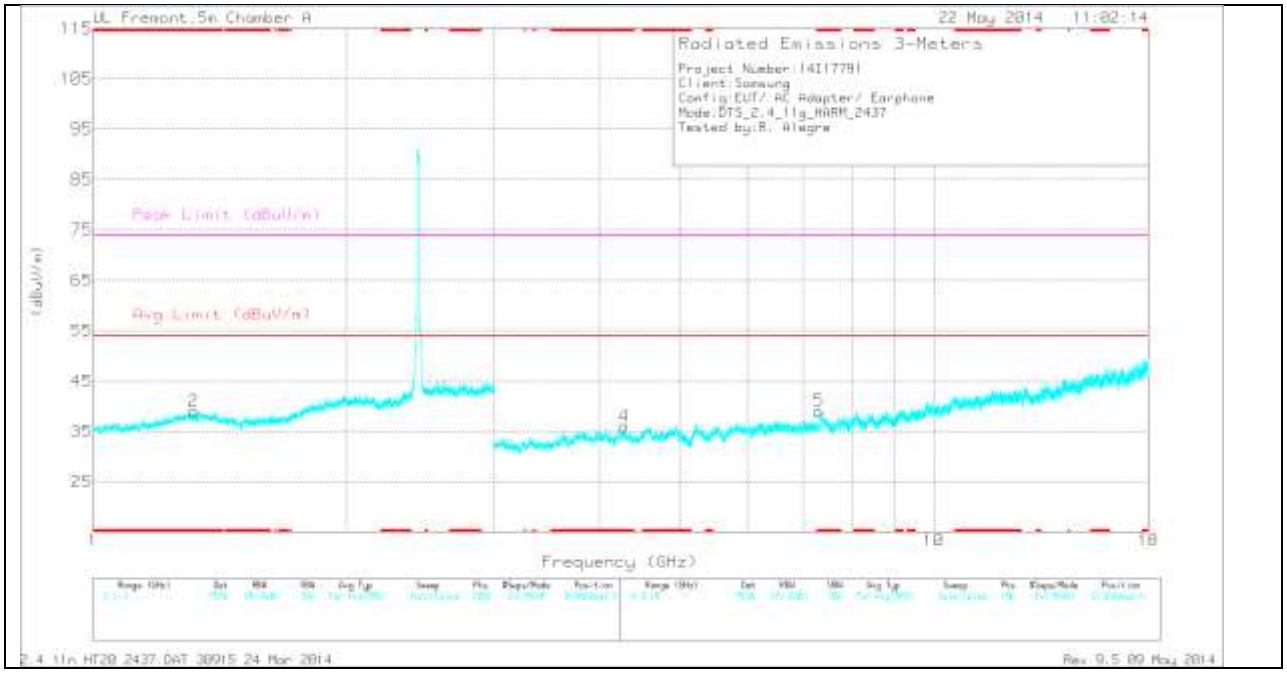
MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.298	35.56	PK	30.2	-26.6	0	39.16	-	-	74	-34.84	0-360	100	H
3	* 2.213	35.49	PK	31.3	-24.5	0	42.29	-	-	74	-31.71	0-360	100	H
2	* 1.318	35.44	PK	30.2	-26.6	0	39.04	-	-	74	-34.96	0-360	100	V
6	* 4.562	30.54	PK	33.9	-28.2	0	36.24	-	-	74	-37.76	0-360	200	H
4	* 4.284	31.72	PK	34	-29.7	0	36.02	-	-	74	-37.98	0-360	100	V
5	* 7.304	30.98	PK	35.2	-27.1	0	39.08	-	-	74	-34.92	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 2.214	42	PK2	31.3	-24.5	0	48.8	-	-	74	-25.2	359	100	H
* 1.298	44	PK2	30.2	-26.6	0	47.6	-	-	74	-26.4	359	100	H
* 2.285	49.29	PK2	31.4	-24.5	0	56.19	-	-	74	-17.81	58	248	H
* 2.288	30.58	MAv1	31.4	-24.4	.3	37.88	54	-16.12	-	-	58	248	H
* 1.318	43.83	PK2	30.2	-26.6	0	47.43	-	-	74	-26.57	359	100	V
* 4.563	38.83	PK2	33.9	-28.3	0	44.43	-	-	74	-29.57	359	200	H
* 7.303	39.73	PK2	35.2	-27.1	0	47.83	-	-	74	-26.17	359	100	V
* 7.306	27.6	MAv1	35.2	-27.1	.3	36	54	-18	-	-	359	100	V
* 4.283	31.73	PK2	34	-29.6	0	36.13	-	-	74	-37.87	359	100	V

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

PK2 - KDB558074 Method: Maximum Peak

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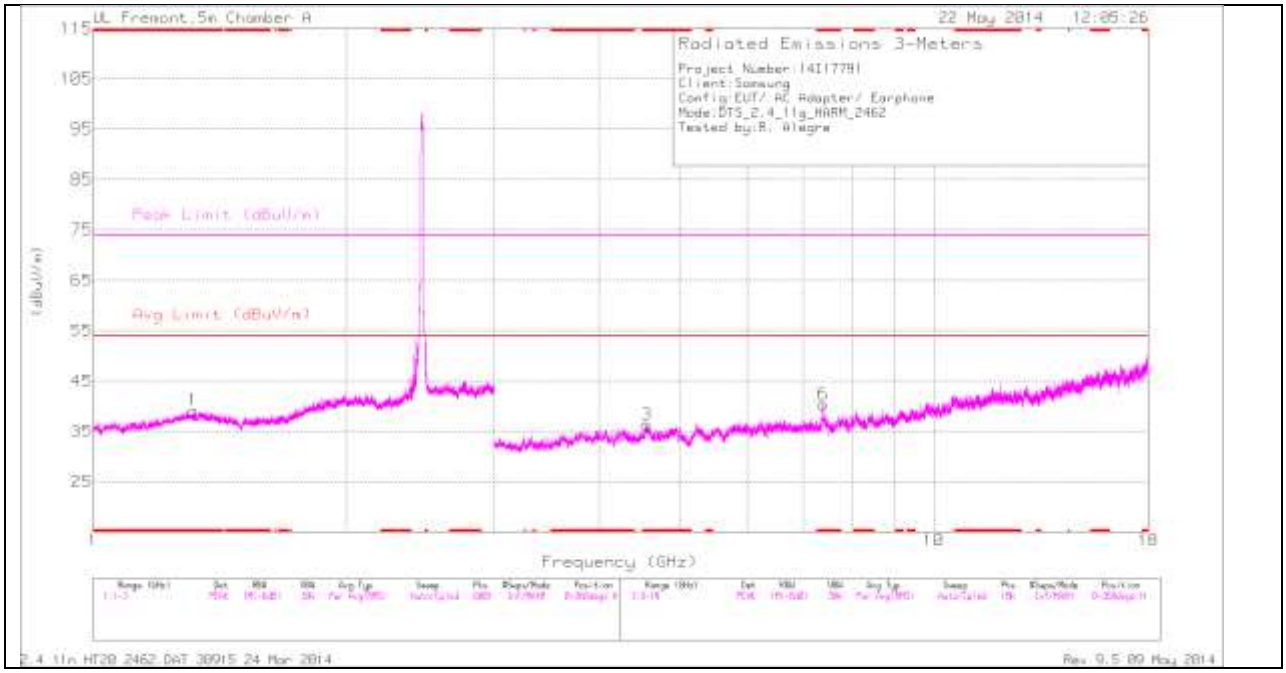
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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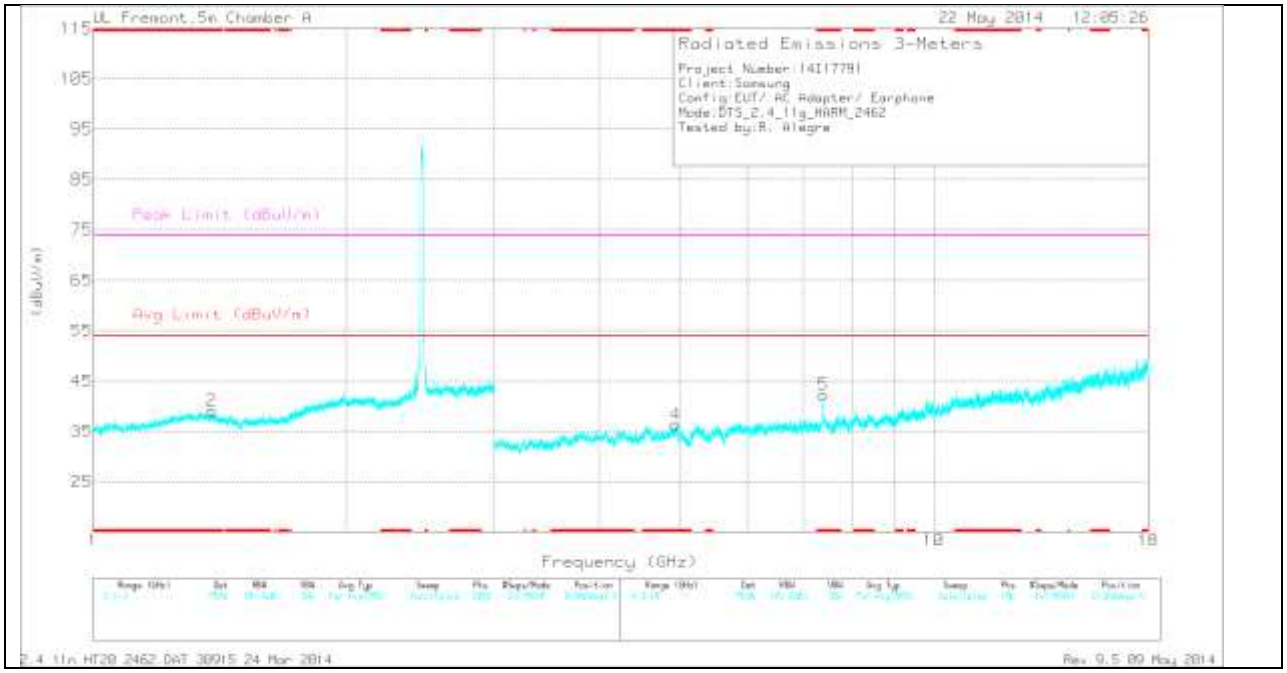
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.314	35.78	PK	30.2	-26.8	0	39.18	-	-	74	-34.82	0-360	100	H
2	* 1.386	35.76	PK	29.9	-26.5	0	39.16	-	-	74	-34.84	0-360	100	V
3	* 4.559	30.71	PK	33.9	-28.2	0	36.41	-	-	74	-37.59	0-360	201	H
6	* 7.384	29.44	PK	35.3	-24.3	0	40.44	-	-	74	-33.56	0-360	201	H
4	* 4.932	31.38	PK	33.9	-28.9	0	36.38	-	-	74	-37.62	0-360	201	V
5	* 7.389	31.37	PK	35.3	-24.4	0	42.27	-	-	74	-31.73	0-360	201	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.316	43.18	PK2	30.2	-26.7	0	46.68	-	-	74	-27.32	359	100	H
* 2.285	49.29	PK2	31.4	-24.5	0	56.19	-	-	74	-17.81	58	248	H
* 2.288	30.58	MAv1	31.4	-24.4	.3	37.88	54	-16.12	-	-	58	248	H
* 1.384	43.54	PK2	29.9	-26.5	0	46.94	-	-	74	-27.06	359	100	V
* 7.386	36.22	PK2	35.3	-24.2	0	47.32	-	-	74	-26.68	359	202	H
* 4.559	38.59	PK2	33.9	-28.2	0	44.29	-	-	74	-29.71	359	202	H
* 7.389	40.26	PK2	35.3	-24.4	0	51.16	-	-	74	-22.84	359	202	V
* 7.387	28.04	MAv1	35.3	-24.4	.3	39.24	54	-14.76	-	-	359	202	V
* 4.934	38.56	PK2	33.9	-28.9	0	43.56	-	-	74	-30.44	359	202	V

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

PK2 - KDB558074 Method: Maximum Peak

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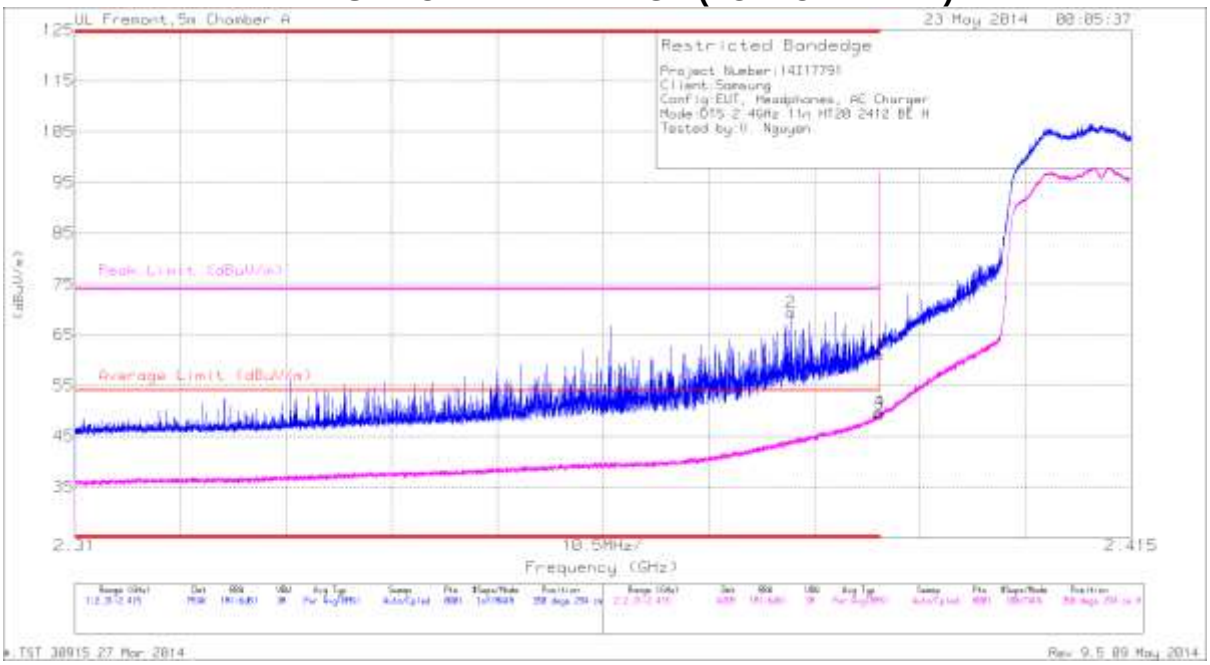
10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 2.39	53.28	PK	32.2	-24.4	0	61.08	-	-	74	-12.92	350	294	H
2	* 2.381	60.76	PK	32.2	-23.5	0	69.46	-	-	74	-4.54	350	294	H
3	* 2.39	41.27	RMS	32.2	-24.4	.3	49.37	54	-4.63	-	-	350	294	H
4	* 2.39	41.63	RMS	32.2	-24.4	.3	49.73	54	-4.27	-	-	350	294	H

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

PK - Peak detector

RMS - RMS detection

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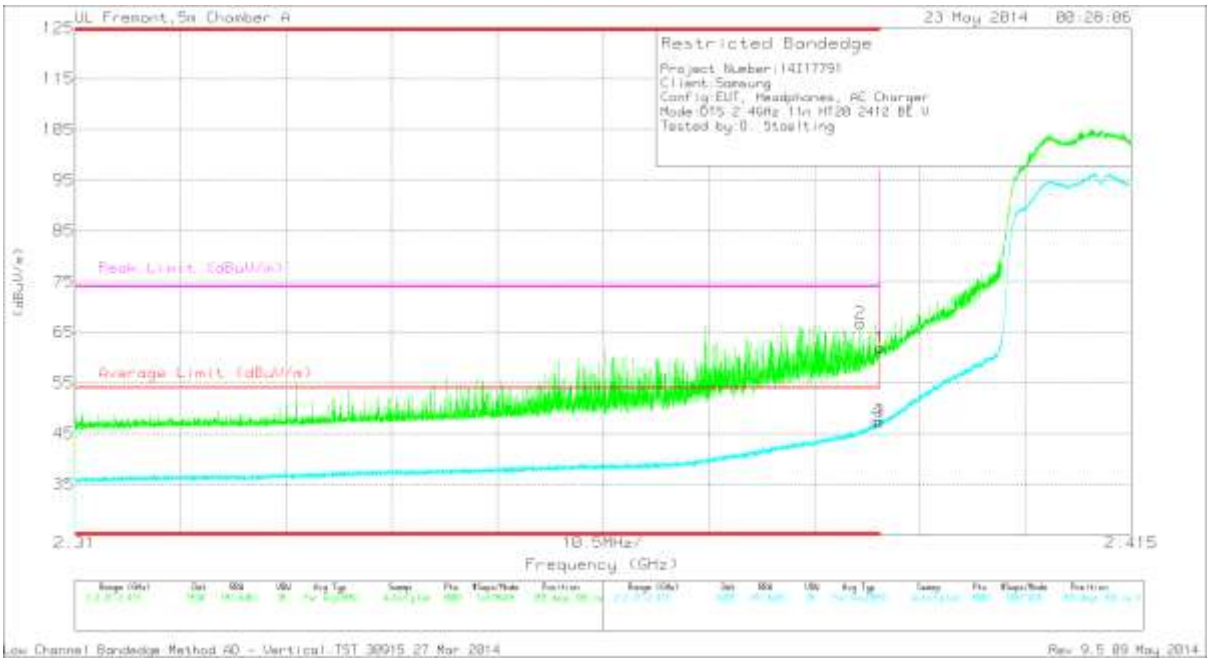

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	54.21	PK	32.2	-24.4	0	62.01	-	-	74	-11.99	359	365	V
2	* 2.388	58.82	PK	32.2	-24.2	0	66.82	-	-	74	-7.18	359	365	V
3	* 2.39	39.36	RMS	32.2	-24.4	.3	47.46	54	-6.54	-	-	359	365	V
4	* 2.39	39.29	RMS	32.2	-24.4	.3	47.39	54	-6.61	-	-	359	365	V

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

PK - Peak detector

RMS - RMS detection

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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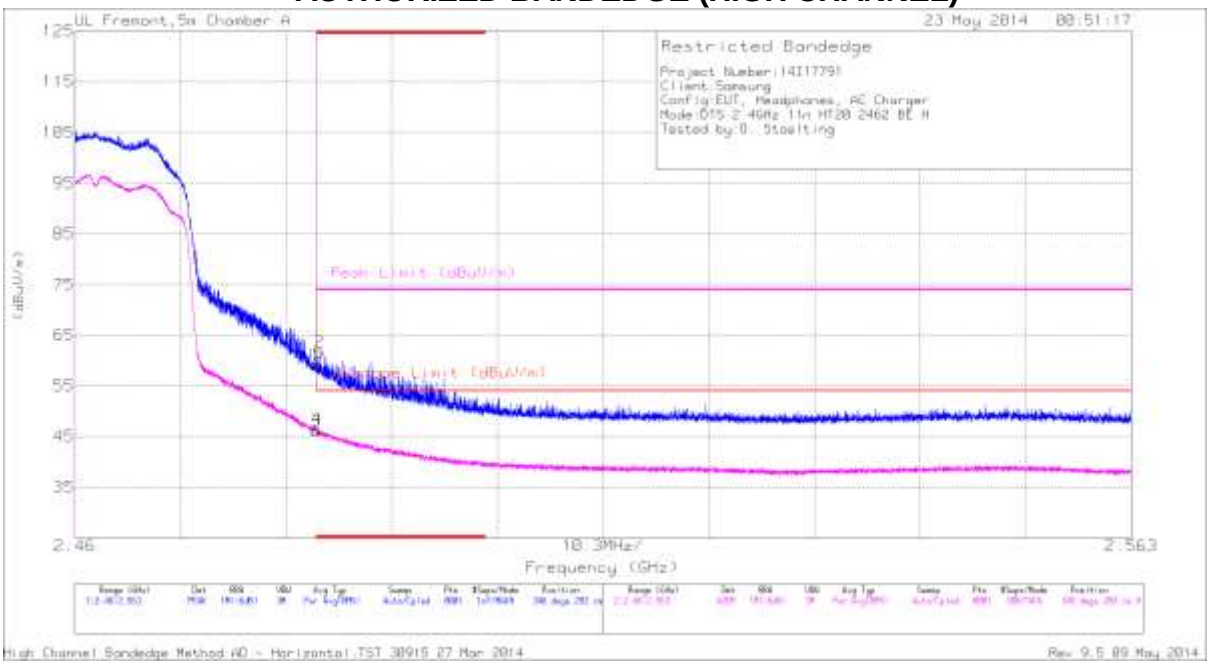
AUTHORIZED BANDEDGE (HIGH CHANNEL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	49.88	PK	32.7	-23.5	0	59.08	-	-	74	-14.92	346	283	H
2	* 2.484	52.54	PK	32.7	-23.5	0	61.74	-	-	74	-12.26	346	283	H
3	* 2.484	36.56	RMS	32.7	-23.5	.3	46.06	54	-7.94	-	-	346	283	H
4	* 2.484	36.95	RMS	32.7	-23.5	.3	46.45	54	-7.55	-	-	346	283	H

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

PK - Peak detector

RMS - RMS detection

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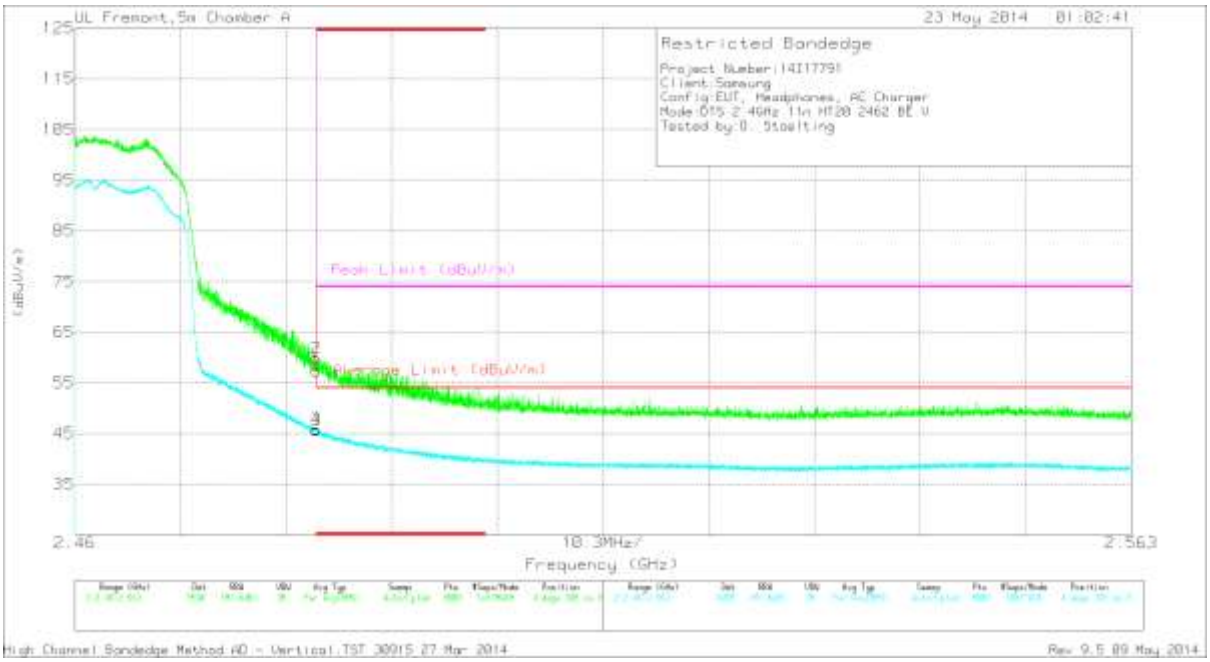

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	48.19	PK	32.7	-23.5	0	57.39	-	-	74	-16.61	4	345	V
2	* 2.484	50.67	PK	32.7	-23.5	0	59.87	-	-	74	-14.13	4	345	V
3	* 2.484	36.24	RMS	32.7	-23.5	.3	45.74	54	-8.26	-	-	4	345	V
4	* 2.484	36.38	RMS	32.7	-23.5	.3	45.88	54	-8.12	-	-	4	345	V

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

PK - Peak detector

RMS - RMS detection

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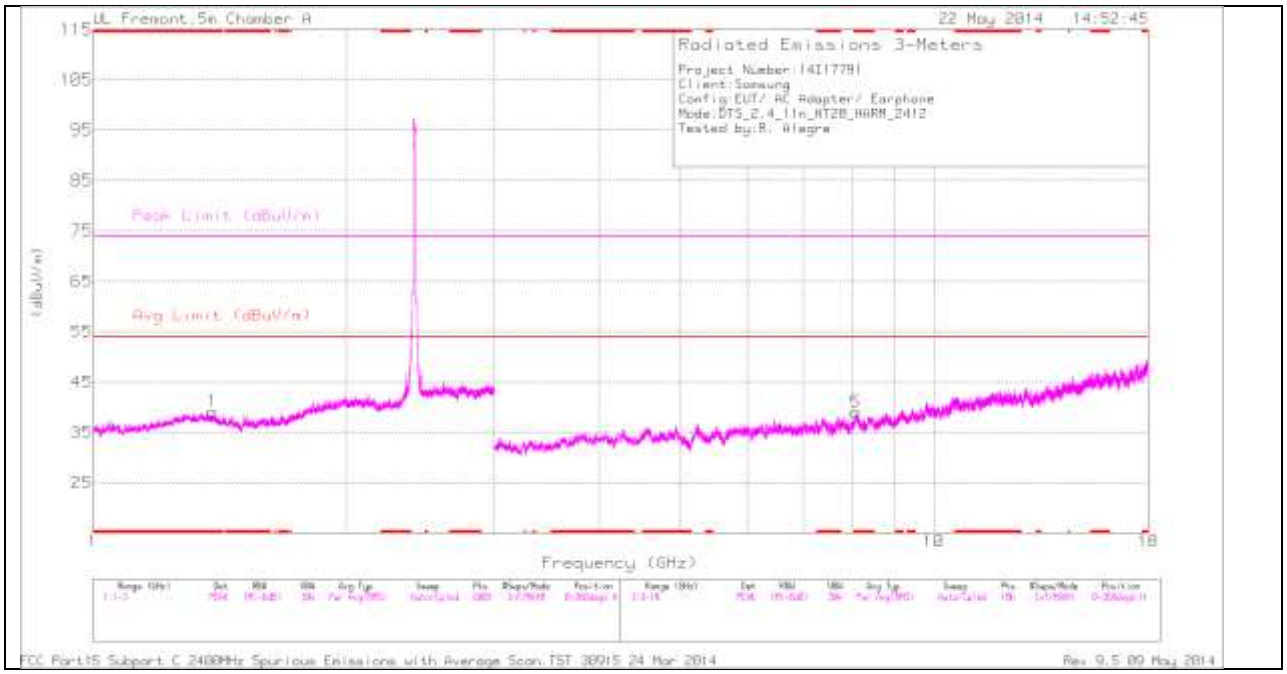
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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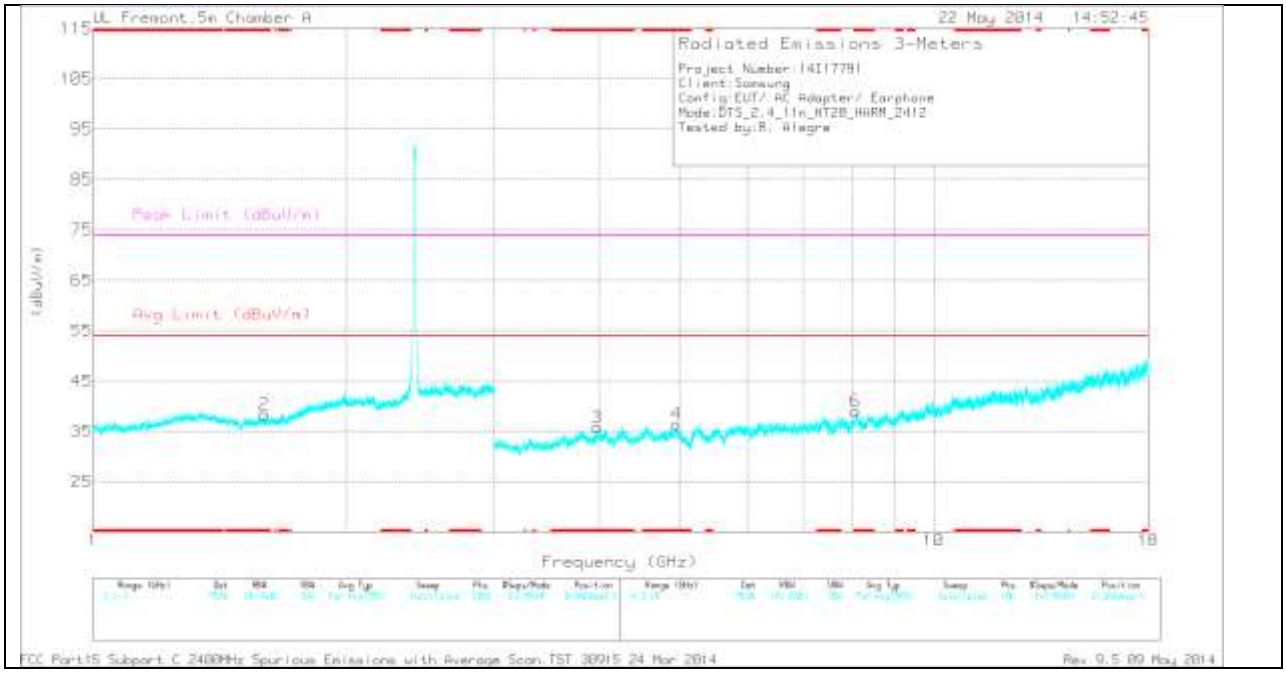
LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.387	35.64	PK	29.9	-26.4	0	39.14	-	-	74	-34.86	0-360	200	H
2	* 1.599	35.35	PK	28.8	-25.8	0	38.35	-	-	74	-35.65	0-360	100	V
5	* 8.076	26.92	PK	35.5	-23.4	0	39.02	-	-	74	-34.98	0-360	100	H
3	* 3.98	32.69	PK	33.7	-30.6	0	35.79	-	-	74	-38.21	0-360	201	V
4	* 4.942	31.36	PK	33.9	-28.8	0	36.46	-	-	74	-37.54	0-360	201	V
6	* 8.075	27	PK	35.5	-23.5	0	39	-	-	74	-35	0-360	201	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.385	43.35	PK2	29.9	-26.5	0	46.75	-	-	74	-27.25	1	201	H
* 1.6	43.42	PK2	28.8	-25.9	0	46.32	-	-	74	-27.68	1	100	V
* 8.075	35.86	PK2	35.5	-23.5	0	47.86	-	-	74	-26.14	1	100	H
* 8.075	24.5	MAv1	35.5	-23.5	.3	36.8	54	-17.2	-	-	1	100	H
* 8.073	35.11	PK2	35.5	-23.6	0	47.01	-	-	74	-26.99	1	202	V
* 4.944	38.44	PK2	33.9	-28.9	0	43.44	-	-	74	-30.56	1	202	V
* 3.98	40.02	PK2	33.7	-30.7	0	43.02	-	-	74	-30.98	1	202	V

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

PK2 - KDB558074 Method: Maximum Peak

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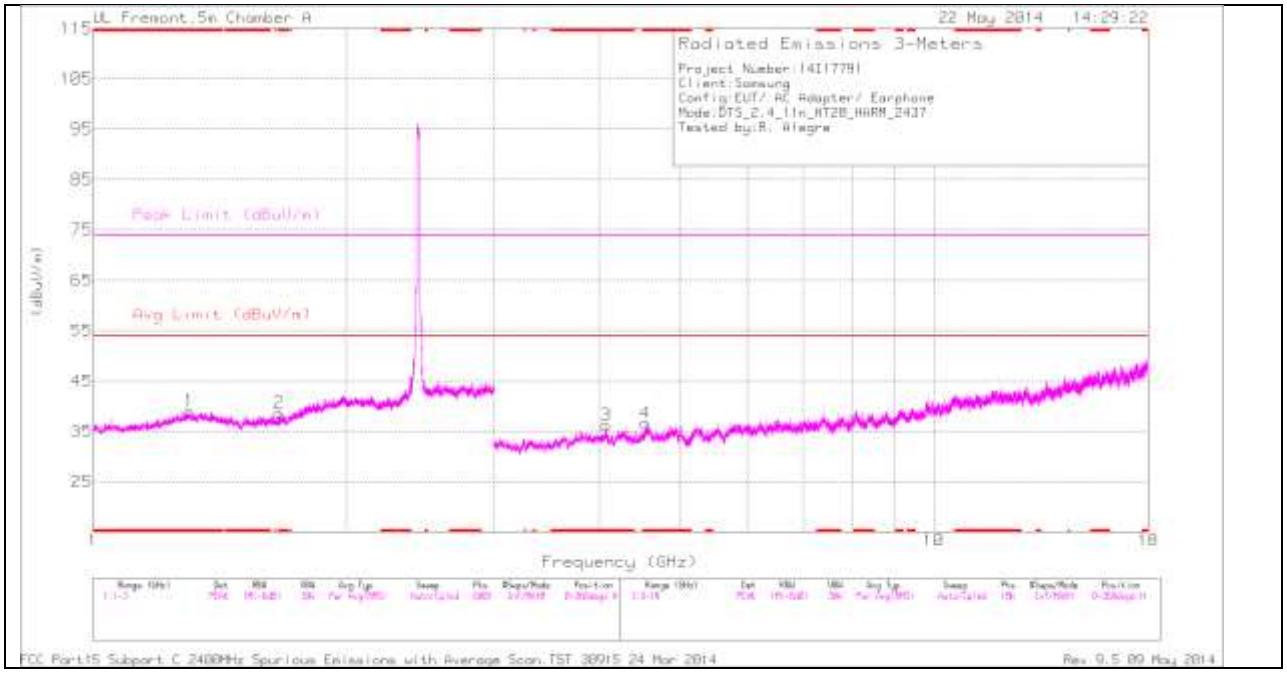
MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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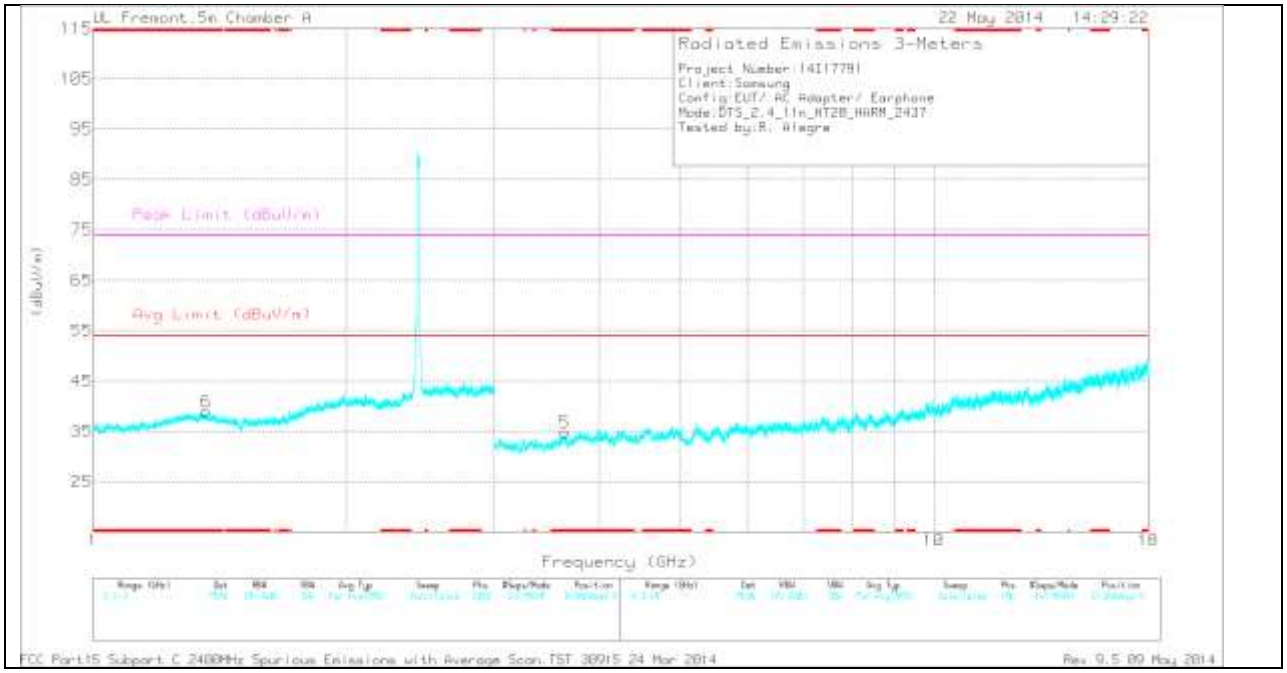
MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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MID CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.302	35.56	PK	30.2	-26.7	0	39.06	-	-	74	-34.94	0-360	100	H
2	* 1.664	35.68	PK	29	-26	0	38.68	-	-	74	-35.32	0-360	200	H
6	* 1.364	35.49	PK	30	-26.6	0	38.89	-	-	74	-35.11	0-360	100	V
3	* 4.077	32.53	PK	33.8	-30.1	0	36.23	-	-	74	-37.77	0-360	201	H
4	* 4.542	31.25	PK	33.9	-28.5	0	36.65	-	-	74	-37.35	0-360	100	H
5	* 3.646	32.38	PK	33.3	-30.9	0	34.78	-	-	74	-39.22	0-360	100	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.665	42.77	PK2	29	-26	0	45.77	-	-	74	-28.23	1	201	H
* 1.303	43.04	PK2	30.2	-26.8	0	46.44	-	-	74	-27.56	1	100	H
* 1.364	42.94	PK2	30	-26.6	0	46.34	-	-	74	-27.66	1	100	V
* 4.543	38.7	PK2	33.9	-28.5	0	44.1	-	-	74	-29.9	1	100	H
* 4.542	27.3	MAv1	33.9	-28.5	.3	33	54	-21	-	-	1	100	H
* 4.078	39.4	PK2	33.8	-30.1	0	43.1	-	-	74	-30.9	1	202	H
* 3.647	39.54	PK2	33.3	-30.9	0	41.94	-	-	74	-32.06	1	100	V

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

PK2 - KDB558074 Method: Maximum Peak

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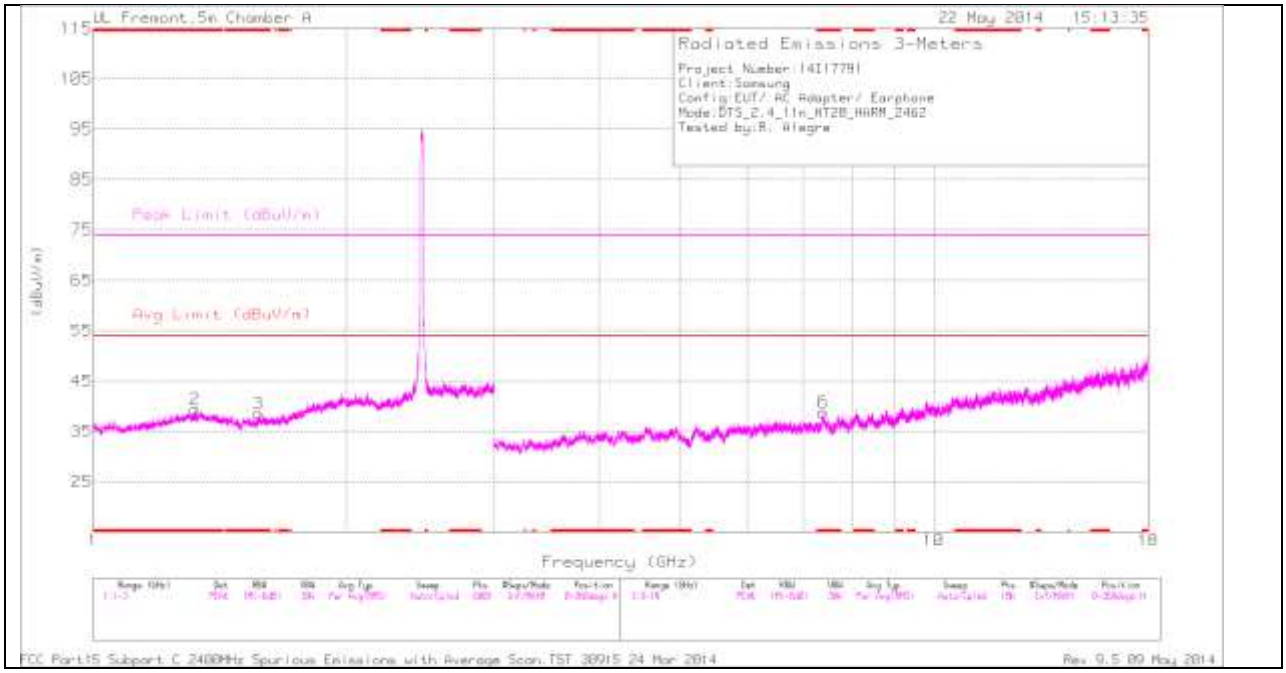
HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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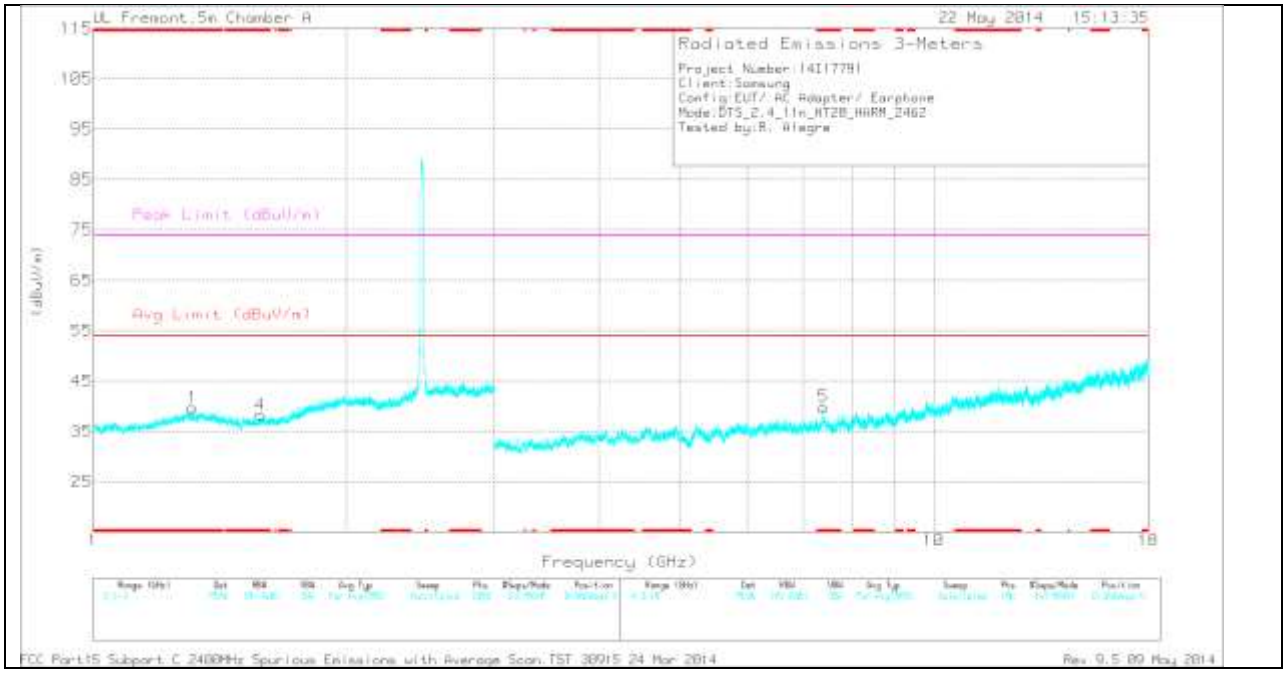
HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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HIGH CHANNEL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
2	* 1.323	36.06	PK	30.1	-26.8	0	39.36	-	-	74	-34.64	0-360	201	H
3	* 1.573	35.63	PK	28.8	-25.9	0	38.53	-	-	74	-35.47	0-360	201	H
1	* 1.312	36.37	PK	30.2	-26.9	0	39.67	-	-	74	-34.33	0-360	100	V
4	* 1.581	35.38	PK	28.8	-25.9	0	38.28	-	-	74	-35.72	0-360	100	V
6	* 7.386	27.83	PK	35.3	-24.3	0	38.83	-	-	74	-35.17	0-360	200	H
5	* 7.391	29.14	PK	35.3	-24.6	0	39.84	-	-	74	-34.16	0-360	200	V

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
* 1.571	43.62	PK2	28.8	-26	0	46.42	-	-	74	-27.58	1	202	H
* 1.581	43.31	PK2	28.8	-25.9	0	46.21	-	-	74	-27.79	1	100	V
* 1.311	42.88	PK2	30.2	-26.9	0	46.18	-	-	74	-27.82	1	100	V
* 7.387	36.43	PK2	35.3	-24.3	0	47.43	-	-	74	-26.57	1	201	H
* 7.391	36.73	PK2	35.3	-24.5	0	47.53	-	-	74	-26.47	1	201	V
* 7.39	25.98	MAv1	35.3	-24.5	.3	37.08	54	-16.92	-	-	1	201	V

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

PK2 - KDB558074 Method: Maximum Peak

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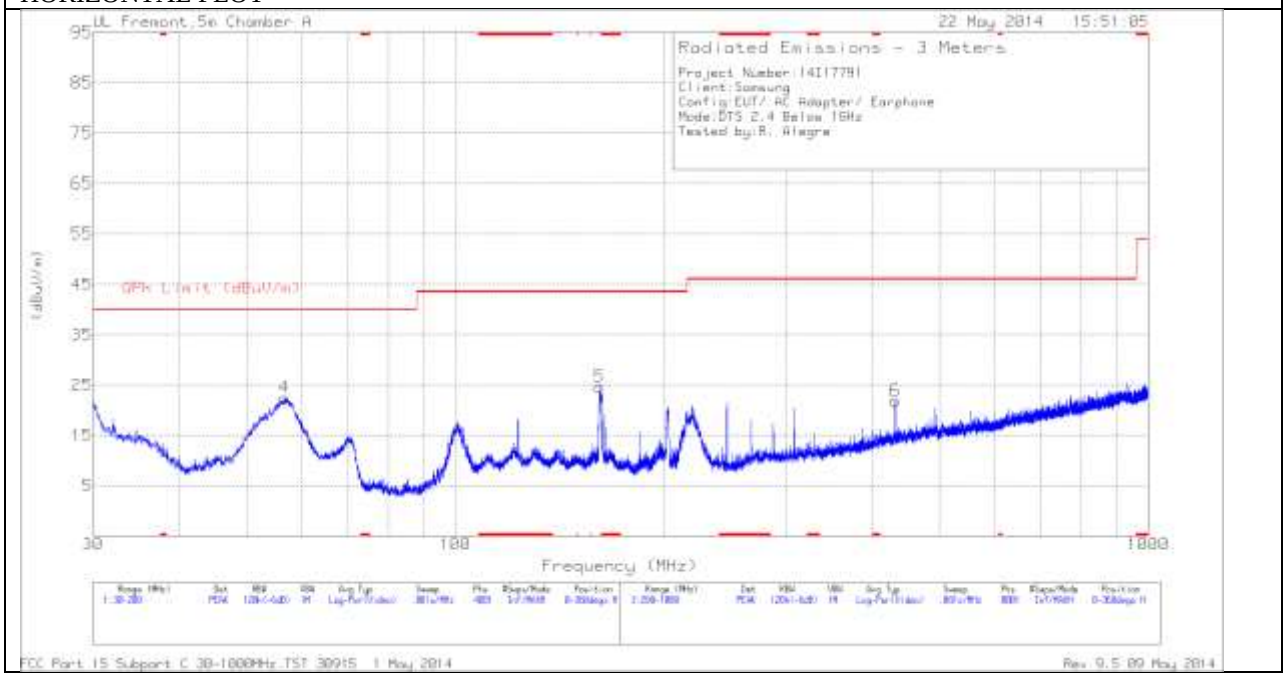
10.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



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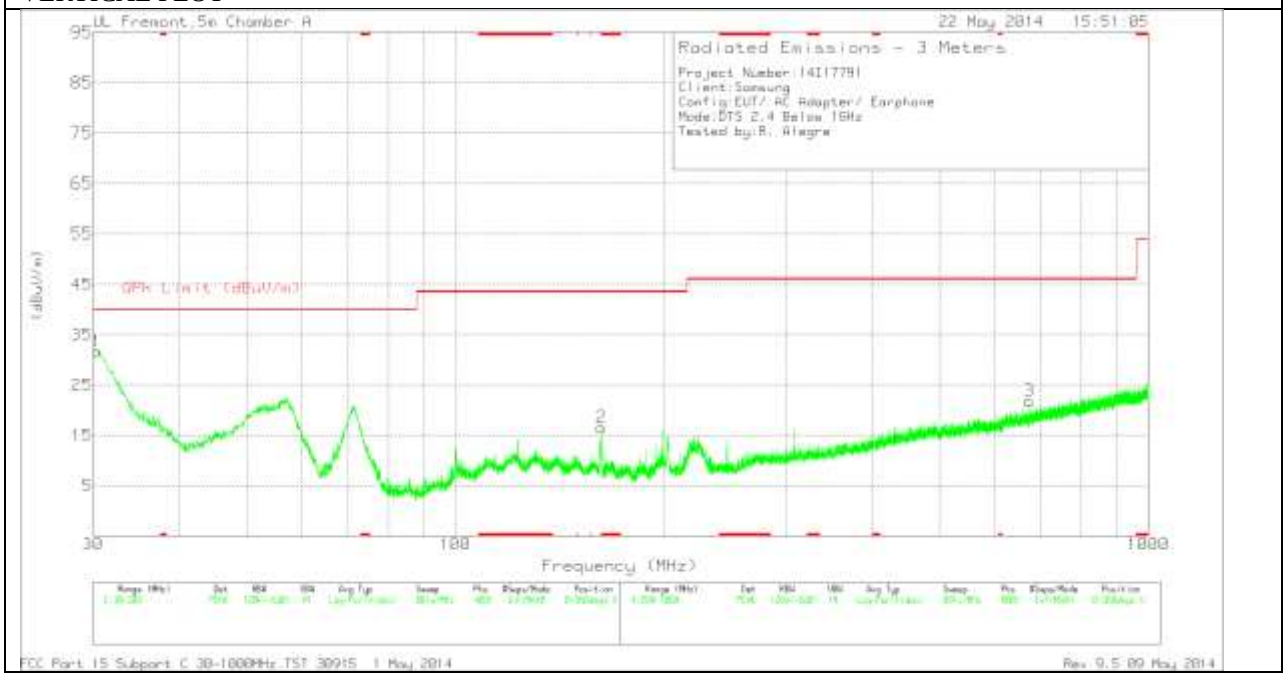
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 162.5575	34.57	PK	12.1	-30.1	16.57	43.52	-26.95	0-360	101	V
1	30.3825	41.74	PK	21.2	-31.3	31.64	40	-8.36	0-360	101	V
4	56.69	45.96	PK	7.4	-30.9	22.46	40	-17.54	0-360	400	H
5	161.5375	42.56	PK	12.2	-30.1	24.66	43.52	-18.86	0-360	200	H
6	431.4	34.31	PK	16.5	-28.9	21.91	46.02	-24.11	0-360	101	H
3	673.7	29.94	PK	19.8	-27.9	21.84	46.02	-24.18	0-360	101	V

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

PK - Peak detector

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4 2009.

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

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

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RESULTS

6 WORST EMISSIONS

LINE 1 PLOT

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LINE 1 RESULTS

Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.438	50.93	PK	.4	0	51.33	57.1	-5.77	-	-
2	.438	37.79	Av	.4	0	38.19	-	-	47.1	-8.91
3	2.8095	54.12	PK	.2	.1	54.42	56	-1.58	-	-
4	2.8095	38.14	Av	.2	.1	38.44	-	-	46	-7.56
5	5.01	50.32	PK	.2	.1	50.62	60	-9.38	-	-
6	5.01	34.15	Av	.2	.1	34.45	-	-	50	-15.55
7	13.416	40.37	PK	.2	.2	40.77	60	-19.23	-	-
8	13.416	23.1	Av	.2	.2	23.5	-	-	50	-26.5
9	16.125	44.55	PK	.3	.2	45.05	60	-14.95	-	-
10	16.125	25.64	Av	.3	.2	26.14	-	-	50	-23.86

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LINE 2 PLOT

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LINE 2 RESULTS

Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
11	.564	48.4	PK	.3	0	48.7	56	-7.3	-	-
12	.564	30.24	Av	.3	0	30.54	-	-	46	-15.46
13	2.805	52.27	PK	.2	.1	52.57	56	-3.43	-	-
14	2.805	35.1	Av	.2	.1	35.4	-	-	46	-10.6
15	4.893	48.33	PK	.2	.1	48.63	56	-7.37	-	-
16	4.893	30.02	Av	.2	.1	30.32	-	-	46	-15.68
17	15.936	36.65	PK	.3	.2	37.15	60	-22.85	-	-
18	15.936	20.08	Av	.3	.2	20.58	-	-	50	-29.42

PK - Peak detector

Av - average detection

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