FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA Phone + BT/BLE, DTS b/g/n and NFC

MODEL NUMBER : SM-J320YZ

FCC ID: A3LSMJ320YZ

REPORT NUMBER: 15K22477-E1

ISSUE DATE: DEC 30, 2015

Prepared for
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	12/23/15	Initial issue	Junwhan Lee
2	12/30/15	Revised section 11	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA Phone + BT/BLE, DTS b/g/n and NFC
MODEL NUMBER:	SM-J320YZ
SERIAL NUMBER:	d6d2d642 (RADIATED); d6cdd626 (CONDUCTED)
DATE TESTED:	DEC 11, 2015 - DEC 30, 2015

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

UL Korea, Ltd. 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 Korea, Ltd. 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 Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, 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 ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 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.

218 Maeyeong-ro
☒ Chamber 1
☒ Chamber 2

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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	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 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 GSM/WCDMA Phone + BT/BLE, DTS b/g/n and NFC.
This test report addresses the DTS (WLAN) operational mode.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]
2412 - 2462	802.11b	15.32	34.04
	802.11g	12.41	17.42
	802.11n HT20	10.39	10.94

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of -5.39 dBi.

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 and 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 HT20 mode: MCS0

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	ETA0U61JWE	DK1GA12HS/A-E	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	EHS61ASFWE	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	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

TEST SETUP

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

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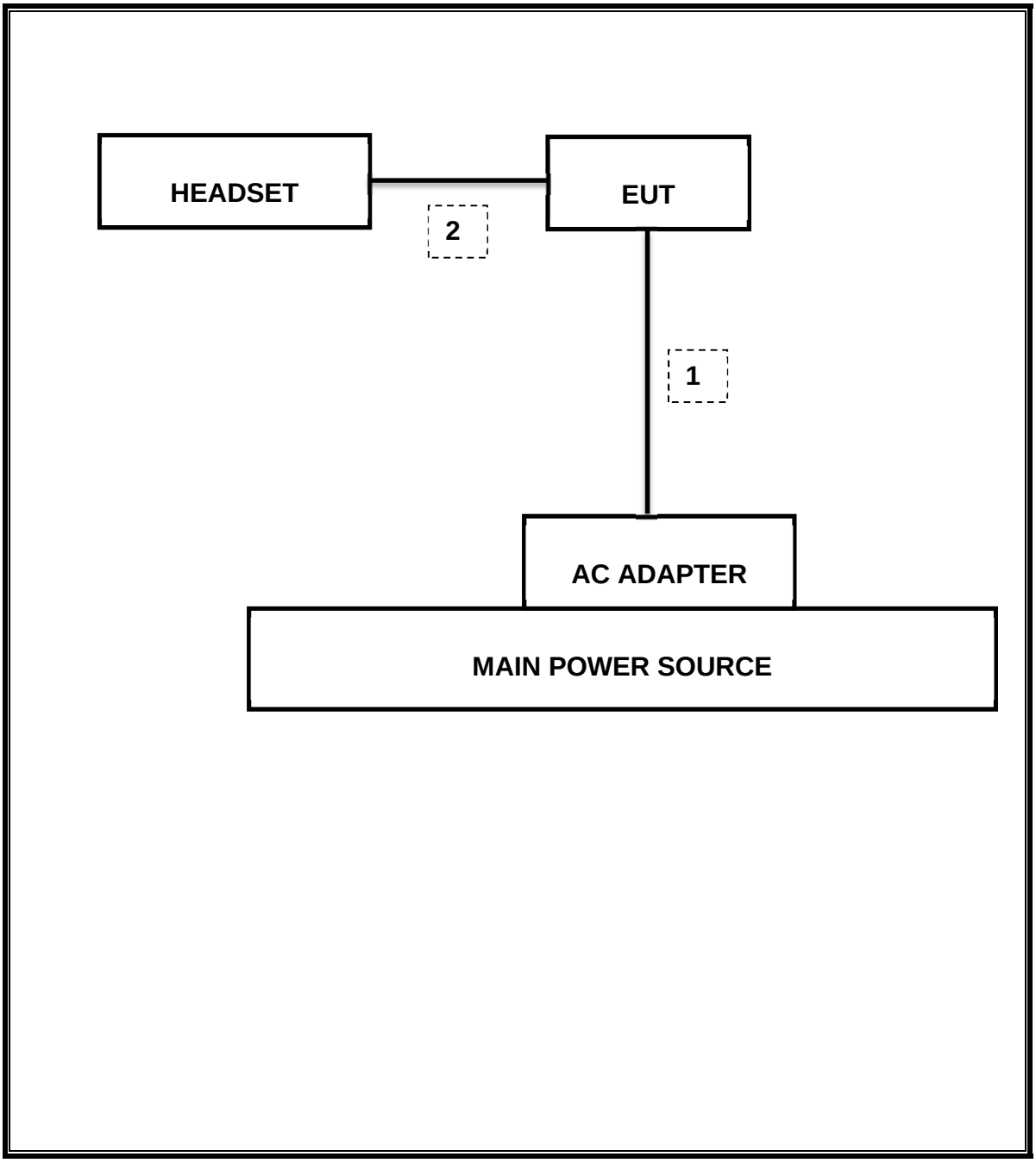
SETUP DIAGRAM FOR TESTS



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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**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-26-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	09-23-16
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	08-24-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

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7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r03: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §10.2 AVGPSD-2 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.

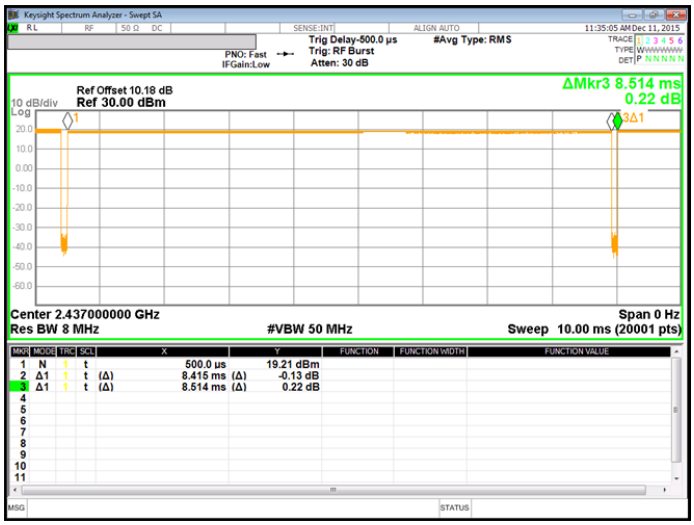
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B [msec)	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	8.415	8.514	0.988	98.8%	0.00	0.010
802.11g	1.396	1.494	0.934	93.4%	0.29	0.716
802.11n HT20	1.296	1.394	0.930	93.0%	0.32	0.772



[802.11b Mode]

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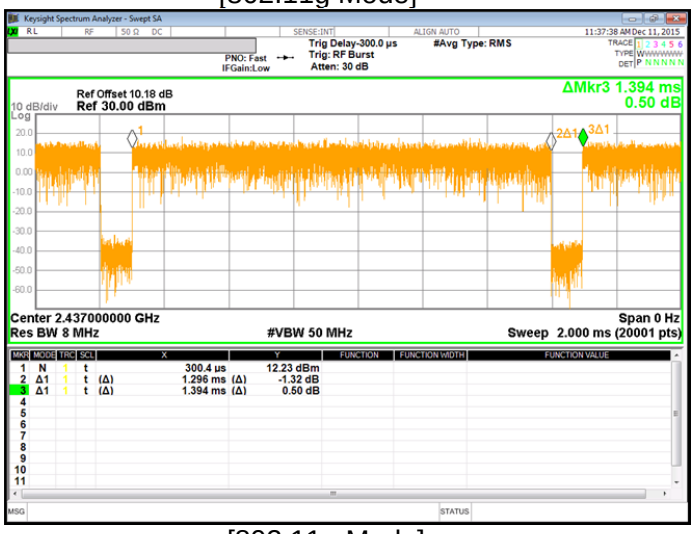
[802.11g Mode]



[802.11n Mode]

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9. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	8.063 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass	-34.639 dBm
15.247	TX conducted output power	<30dBm		Pass	15.32 dBm
15.247	PSD	<8dBm		Pass	-16.475 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	48.19 dBuV (AV)
15.205, 15.209	Radiated Spurious Emission	< 40dBuV/m	Radiated	Pass	34.72 dBuV/m (PK)

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10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r03: 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

10.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	8.559	0.5
Mid	2437	8.063	0.5
High	2462	8.556	0.5
Worst		8.063	0.5

10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	16.341	0.5
Mid	2437	16.343	0.5
High	2462	16.350	0.5
Worst		16.341	0.5

10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	17.554	0.5
Mid	2437	17.567	0.5
High	2462	17.573	0.5
Worst		17.554	0.5

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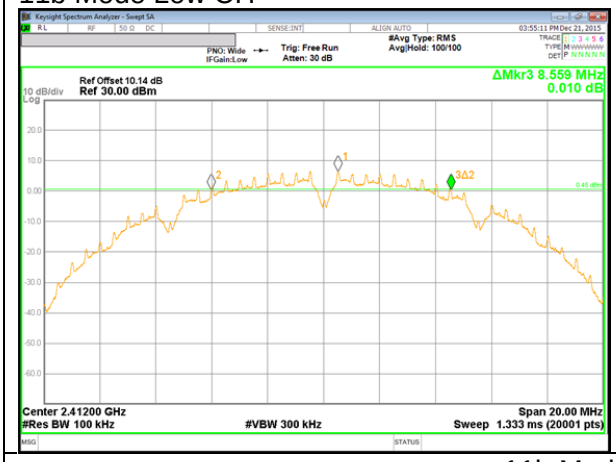
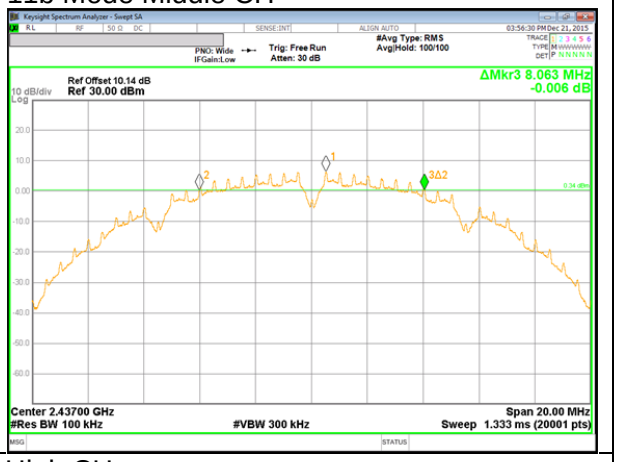
10.1.4. 6 dB BANDWIDTH PLOTS

11b Mode Low CH



11b Mode Middle CH



11b Mode High CH

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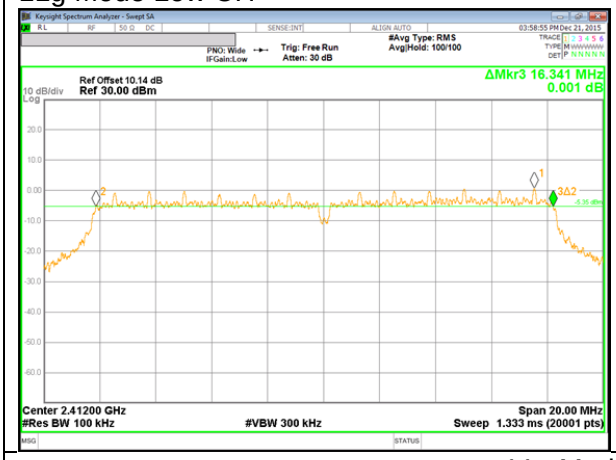
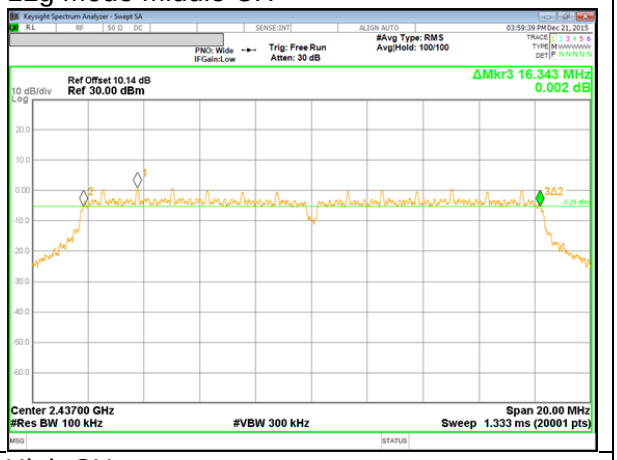
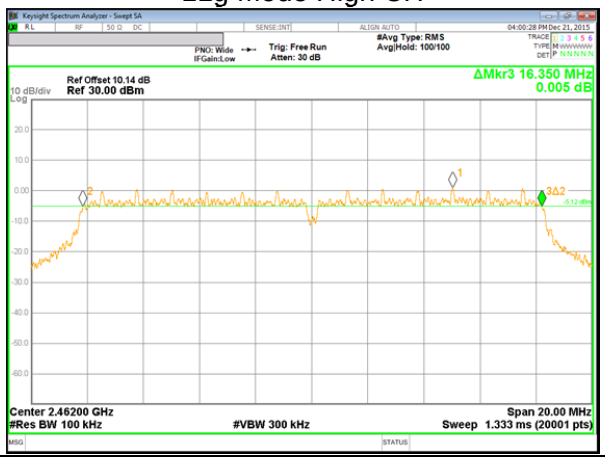
11g Mode Low CH



11g Mode Middle CH



11g Mode High CH



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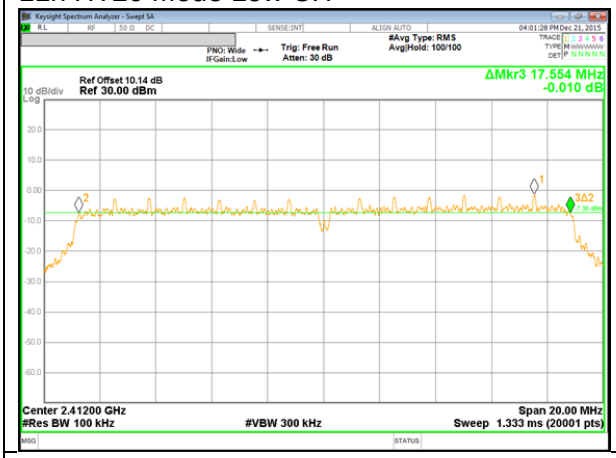
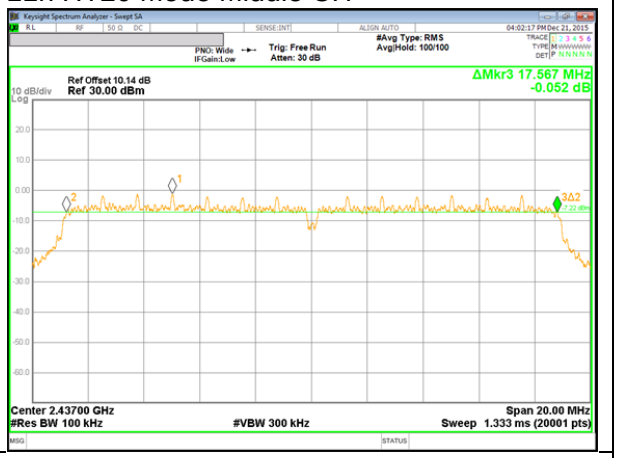
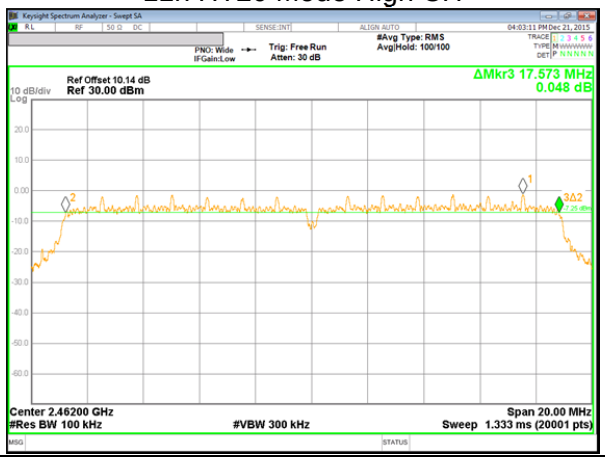
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



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10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	13.382
Mid	2437	13.327
High	2462	13.204
Worst		13.382

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.509
Mid	2437	16.462
High	2462	16.493
Worst		16.509

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.710
Mid	2437	17.703
High	2462	17.673
Worst		17.710

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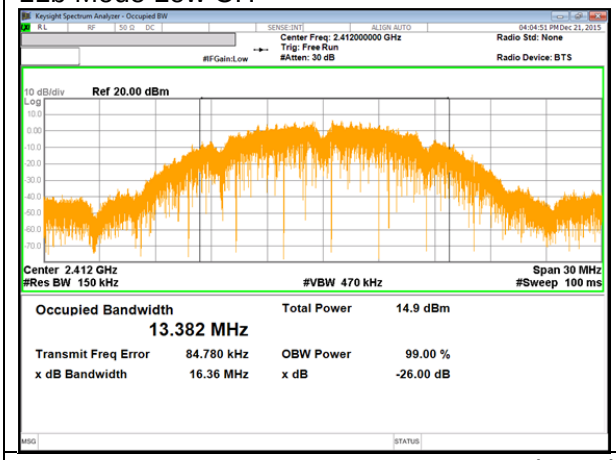
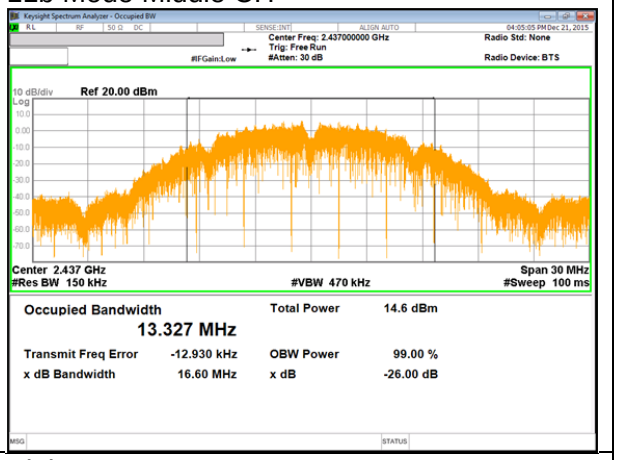
10.2.4. 99% BANDWIDTH PLOTS

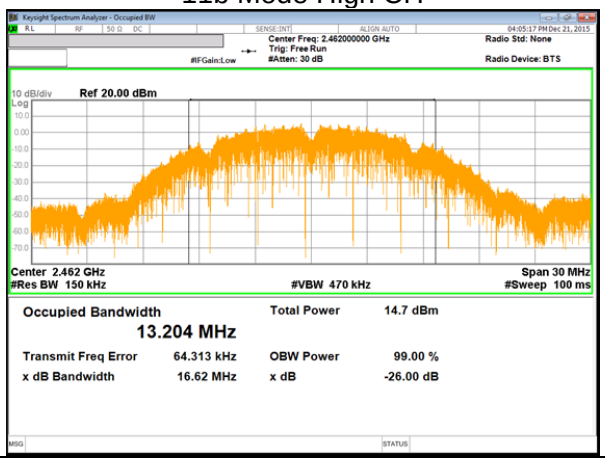
11b Mode Low CH



11b Mode Middle CH



11b Mode High CH



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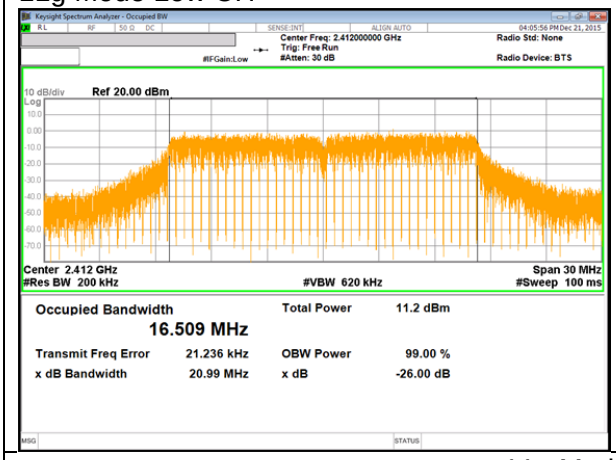
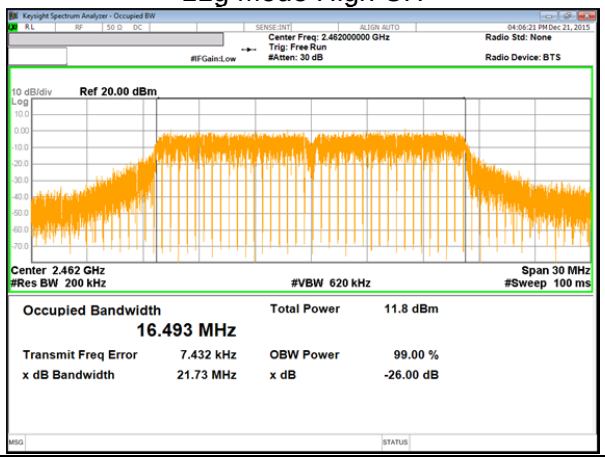
11g Mode Low CH



11g Mode Middle CH

11g Mode High CH



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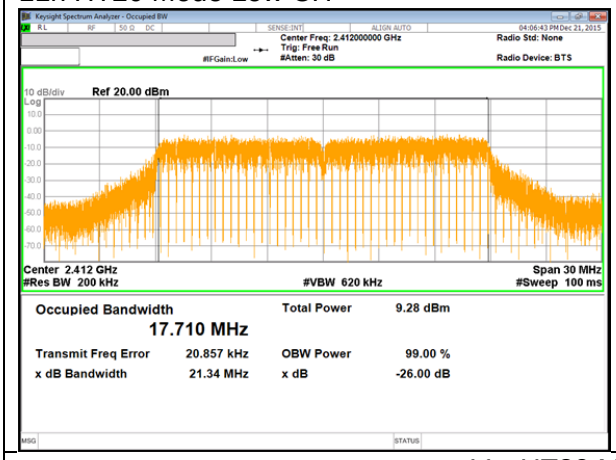
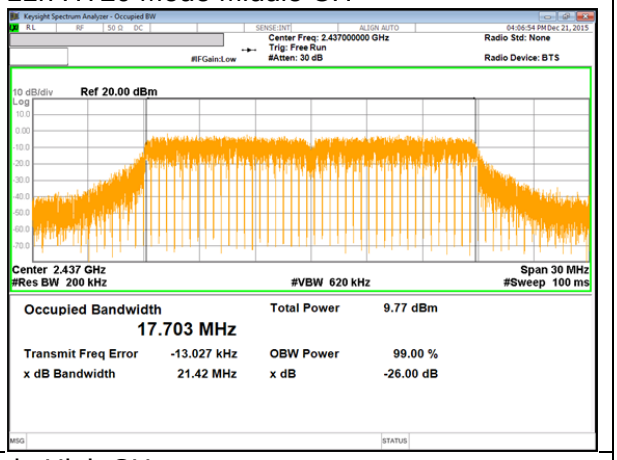
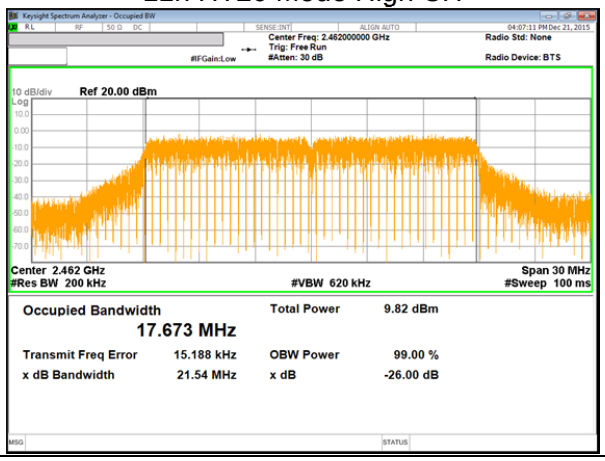
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



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10.3. OUTPUT POWER

LIMITS

FCC §15.247

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.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.1 dB (including 10 dB pad and 0.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

10.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-5.39	30.00	30.00	36.00	30.00
Mid	2437	-5.39	30.00	30.00	36.00	30.00
High	2462	-5.39	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	15.32	15.32	36.00	-20.68
Mid	2437	14.98	14.98	36.00	-21.02
High	2462	15.07	15.07	36.00	-20.93
Worst			15.32	36.00	-20.68

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10.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-5.39	30.00	30.00	36.00	30.00
Mid	2437	-5.39	30.00	30.00	36.00	30.00
High	2462	-5.39	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	11.70	11.70	36.00	-24.30
Mid	2437	12.21	12.21	36.00	-23.79
High	2462	12.41	12.41	36.00	-23.59
Worst			12.41	36.00	-23.59

10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-5.39	30.00	30.00	36.00	30.00
Mid	2437	-5.39	30.00	30.00	36.00	30.00
High	2462	-5.39	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	9.70	9.70	36.00	-26.30
Mid	2437	10.22	10.22	36.00	-25.78
High	2462	10.39	10.39	36.00	-25.61
Worst			10.39	36.00	-25.61

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10.4. PSD

LIMITS

FCC §15.247

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.

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method AVGPSD-2” under KDB558074 D01 DTS Meas Guidance v03r03

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RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-16.551	0.00	-16.551	8.00	-24.551
Mid	2437	-16.716	0.00	-16.716	8.00	-24.716
High	2462	-16.475	0.00	-16.475	8.00	-24.475

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-22.623	0.29	-22.333	8.00	-30.623
Mid	2437	-22.5	0.29	-22.210	8.00	-30.500
High	2462	-22.504	0.29	-22.214	8.00	-30.504

10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-24.461	0.32	-24.141	8.00	-32.461
Mid	2437	-24.521	0.32	-24.201	8.00	-32.521
High	2462	-24.326	0.32	-24.006	8.00	-32.326

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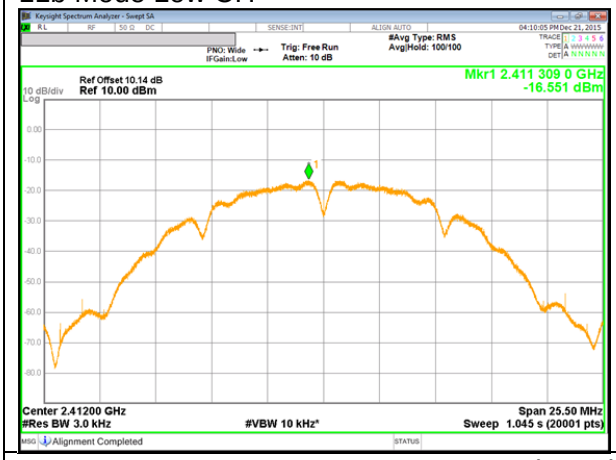
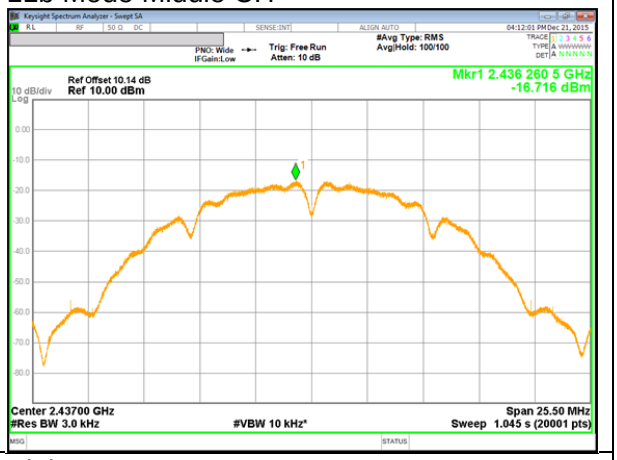
10.4.4. PSD PLOTS

11b Mode Low CH



11b Mode Middle CH



11b Mode High CH

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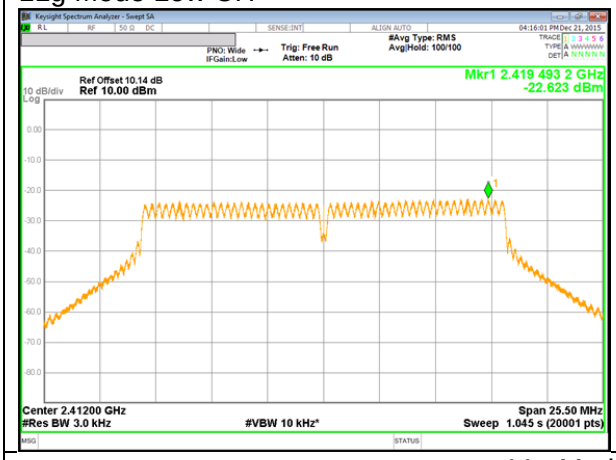
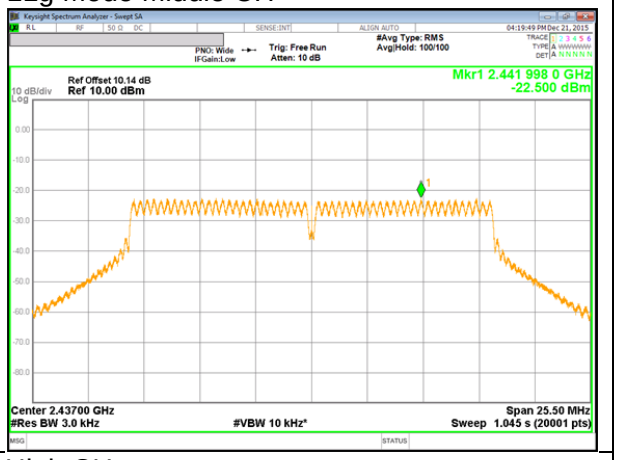
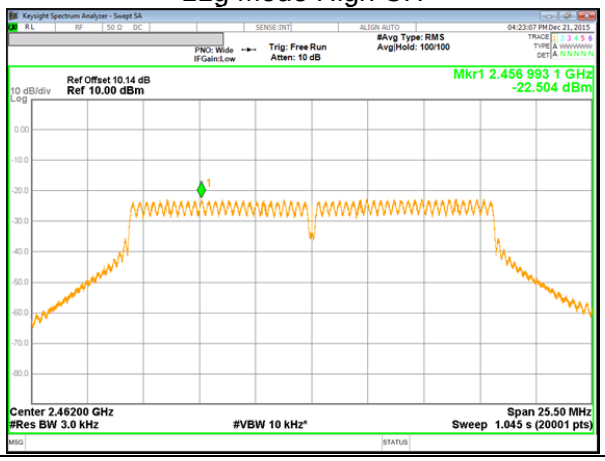
11g Mode Low CH



11g Mode Middle CH



11g Mode High CH



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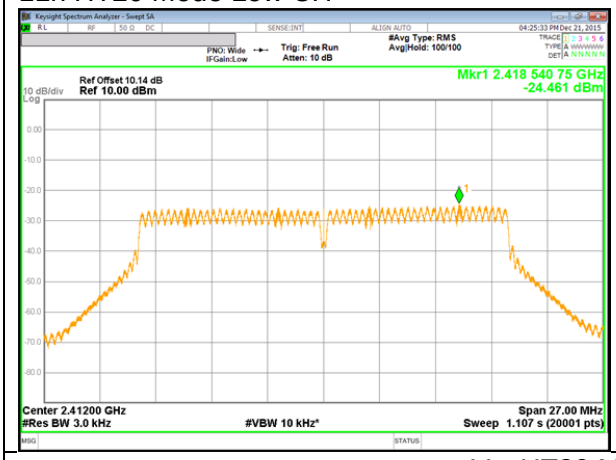
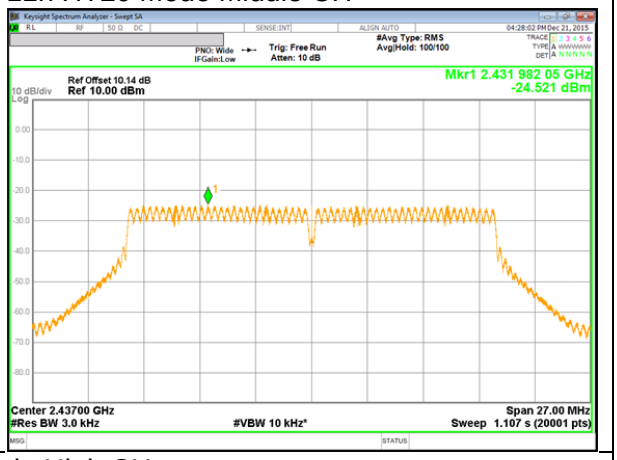
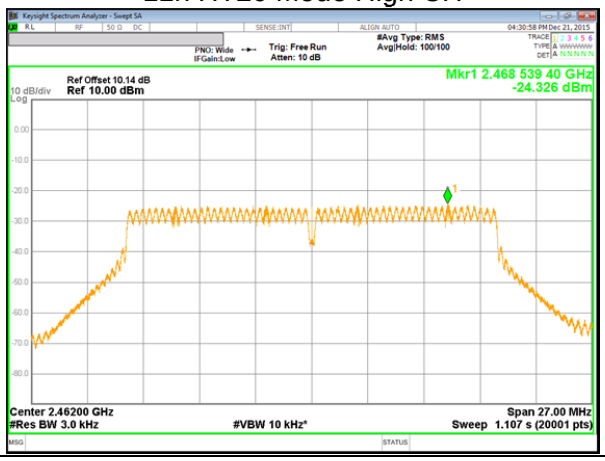
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



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10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

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.

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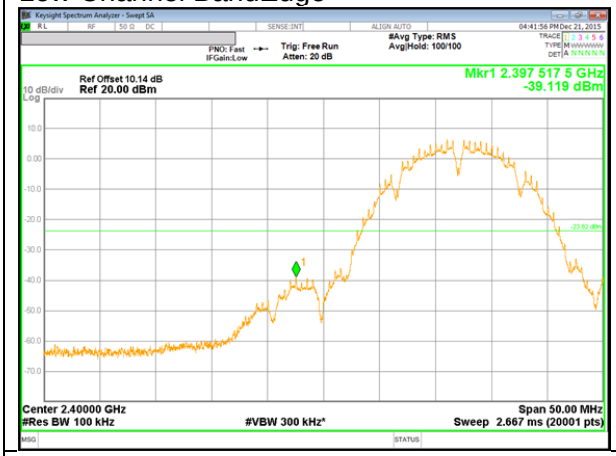
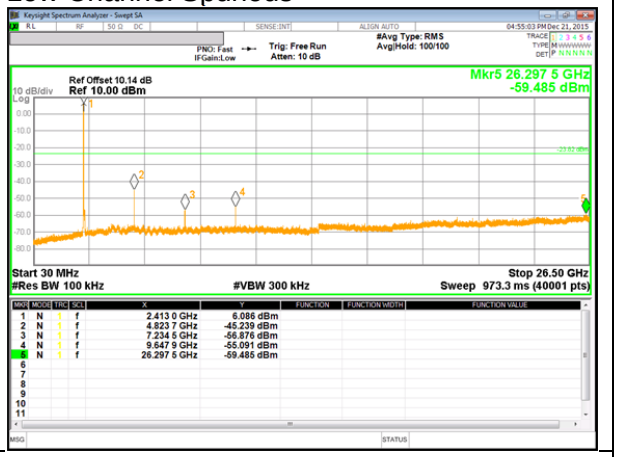
RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

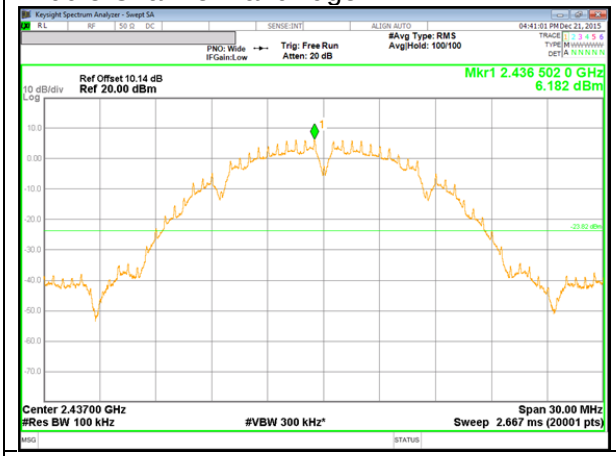
Low Channel BandEdge



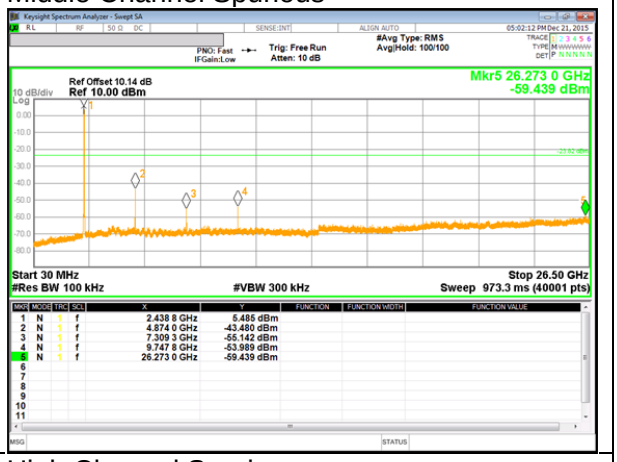
Low Channel Spurious



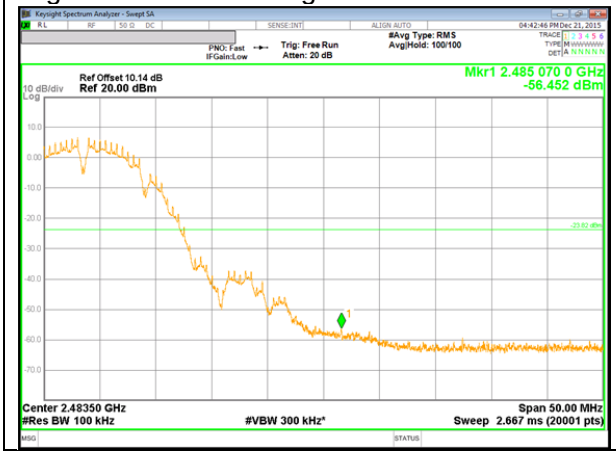
Middle Channel BandEdge



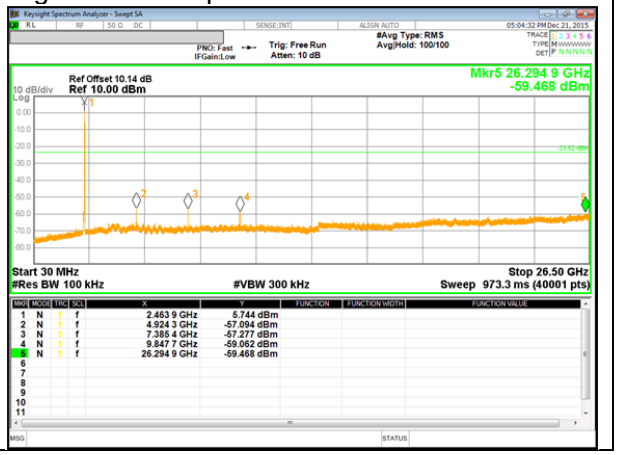
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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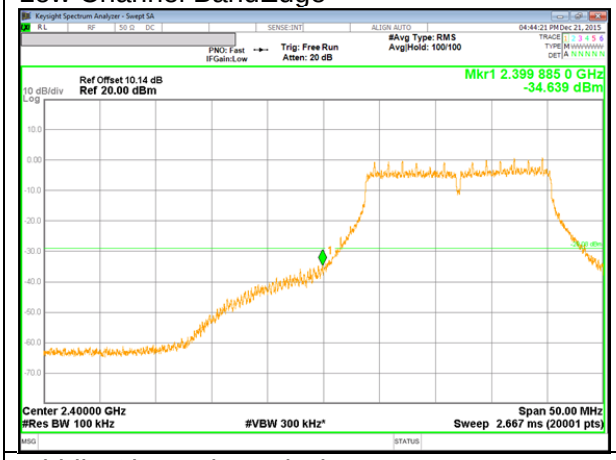
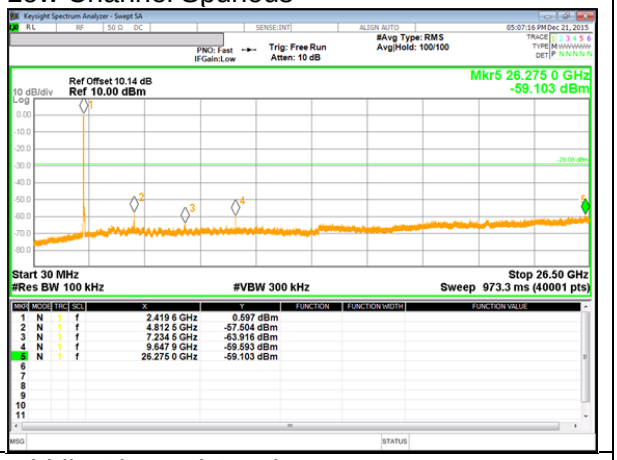
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

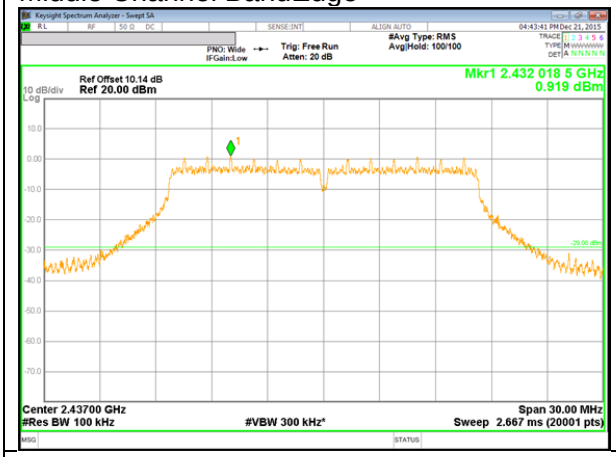
Low Channel BandEdge



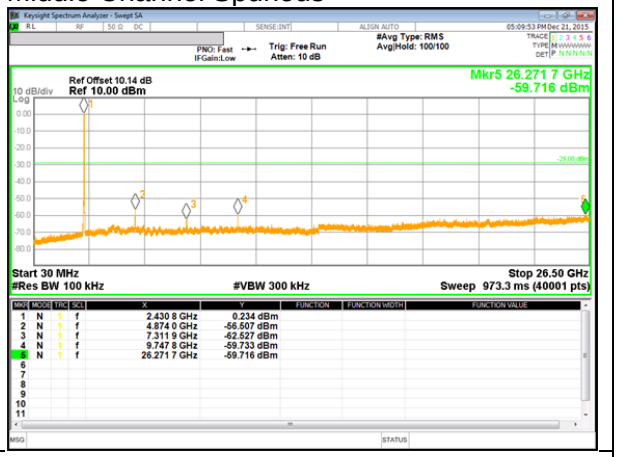
Low Channel Spurious



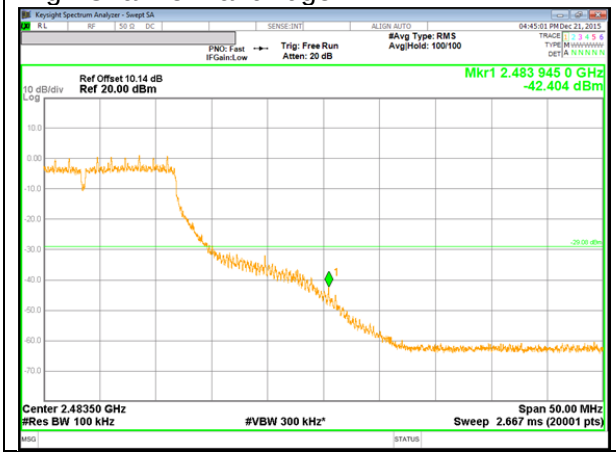
Middle Channel BandEdge



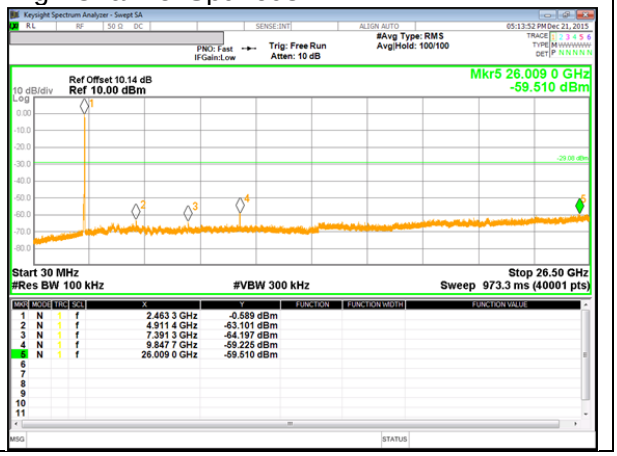
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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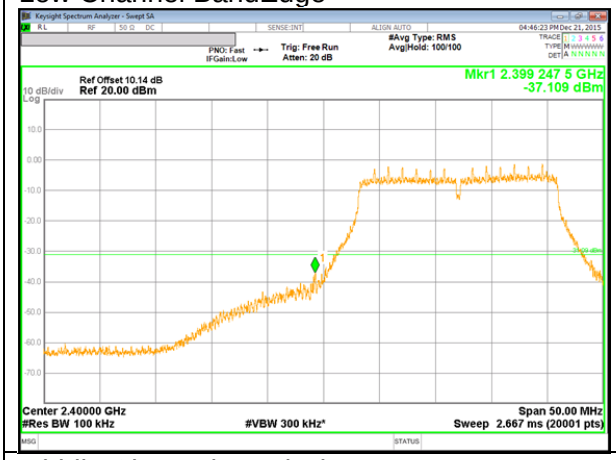
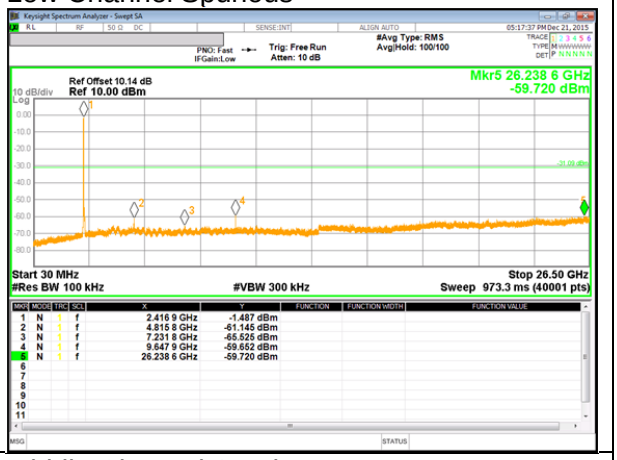
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

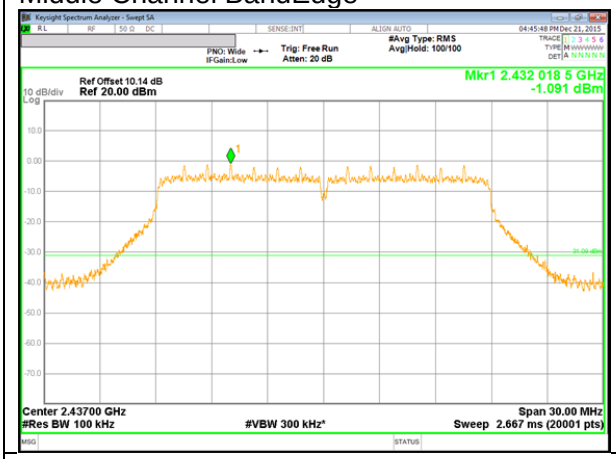
Low Channel BandEdge



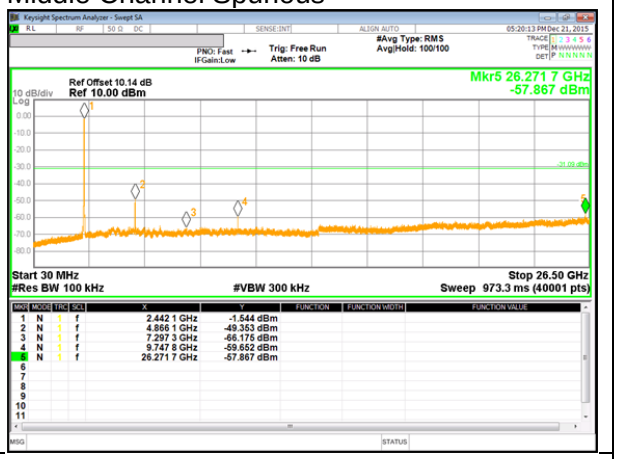
Low Channel Spurious



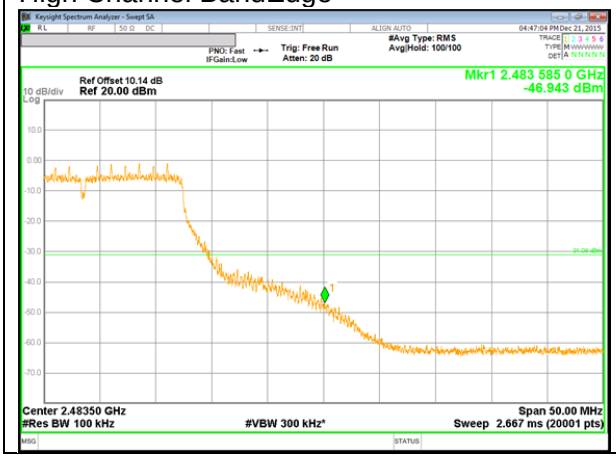
Middle Channel BandEdge



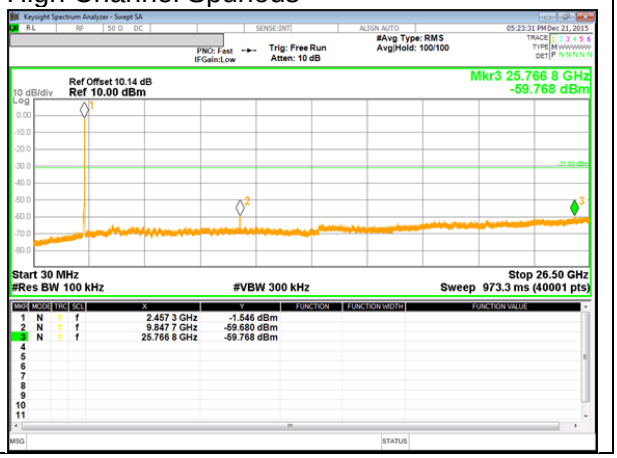
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

TEST PROCEDURE

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

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0.29dB; 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.

Note : Emission was pre-scanned from 9KHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit. Per FCC part 15.31(o), test results were not reported.

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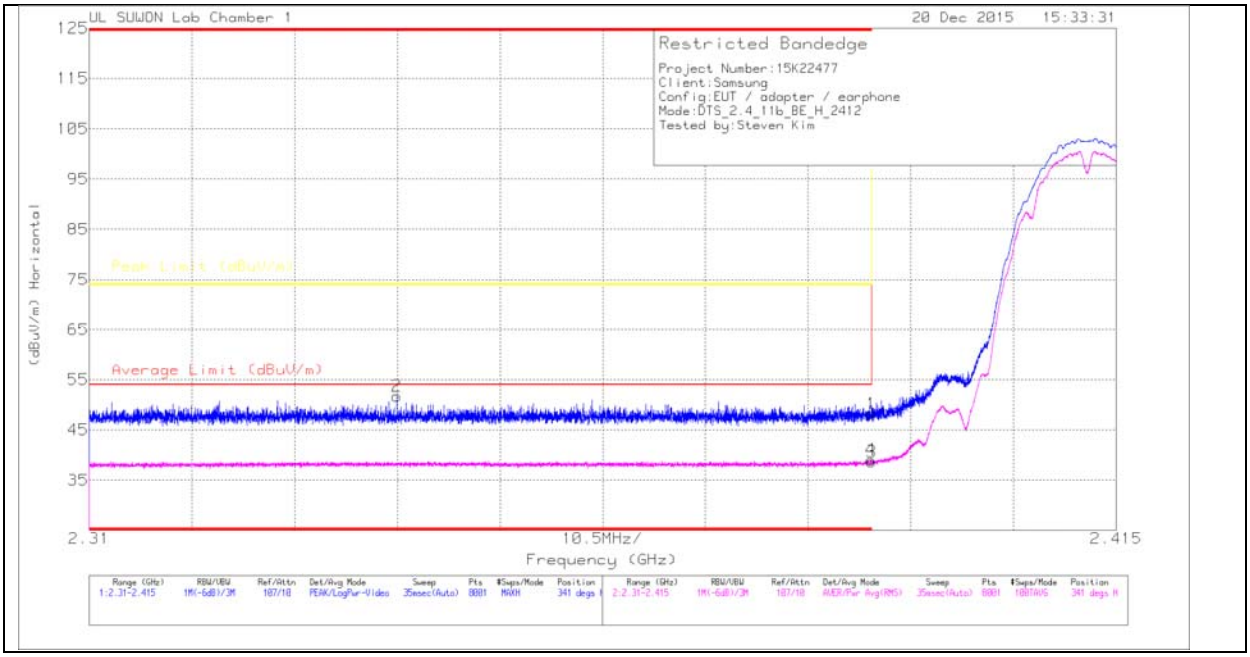
11.2. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	45.49	Pk	31.8	-29	0	48.29	-	-	74	-25.71	341	101	H
2	* 2.341	49.05	Pk	31.7	-29	0	51.75	-	-	74	-22.25	341	101	H
3	* 2.39	35.9	RMS	31.8	-29	0	38.7	54	-15.3	-	-	341	101	H
4	* 2.39	36.28	RMS	31.8	-29	0	39.08	54	-14.92	-	-	341	101	H

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

Pk - Peak detector

RMS - RMS detection

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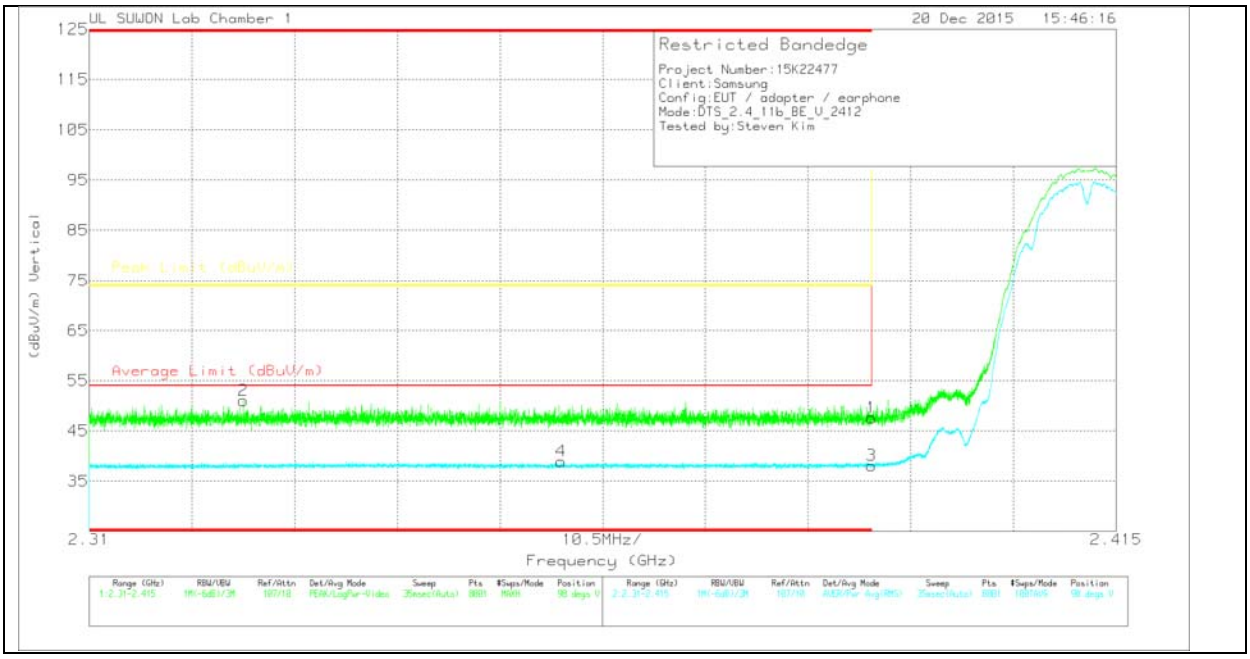
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	44.83	Pk	31.8	-29	0	47.63	-	-	74	-26.37	98	366	V
2	* 2.326	48.35	Pk	31.7	-29	0	51.05	-	-	74	-22.95	98	366	V
3	* 2.39	35.33	RMS	31.8	-29	0	38.13	54	-15.87	-	-	98	366	V
4	* 2.358	36.28	RMS	31.7	-29	0	38.98	54	-15.02	-	-	98	366	V

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

Pk - Peak detector

RMS - RMS detection

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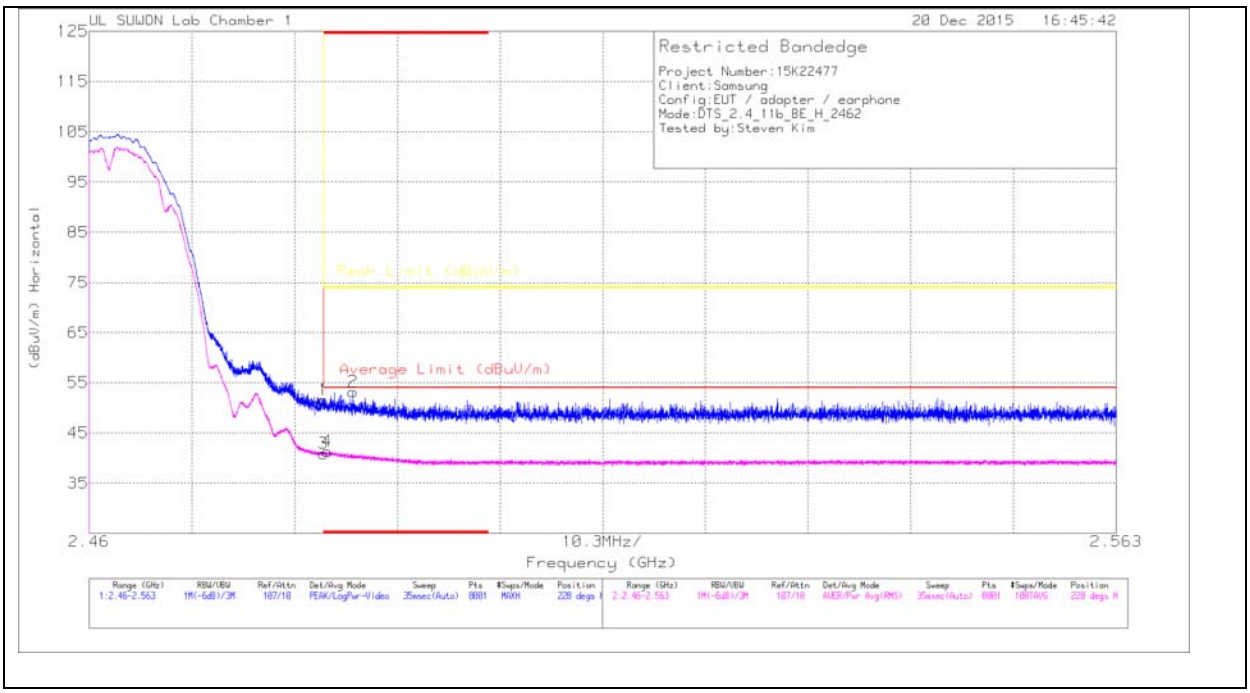
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	47.9	Pk	32	-28.3	0	51.6	-	-	74	-22.4	228	101	H
2	* 2.486	49.5	Pk	32	-28.3	0	53.2	-	-	74	-20.8	228	101	H
3	* 2.484	37.22	RMS	32	-28.3	0	40.92	54	-13.08	-	-	228	101	H
4	* 2.484	37.67	RMS	32	-28.3	0	41.37	54	-12.63	-	-	228	101	H

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

Pk - Peak detector

RMS - RMS detection

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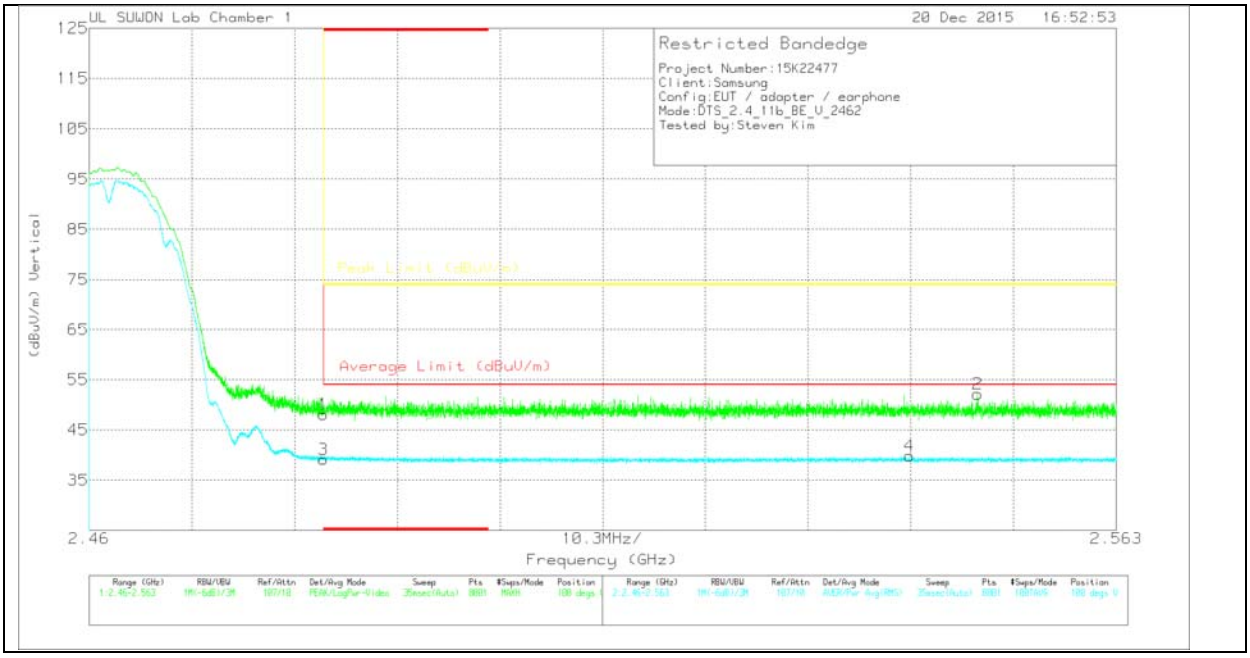
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	44.4	Pk	32	-28.3	0	48.1	-	-	74	-25.9	100	348	V
2	2.549	48.34	Pk	32	-28.2	0	52.14	-	-	74	-21.86	100	348	V
3	* 2.484	35.45	RMS	32	-28.3	0	39.15	54	-14.85	-	-	100	348	V
4	2.542	36.04	RMS	32	-28.2	0	39.84	54	-14.16	-	-	100	348	V

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

Pk - Peak detector

RMS - RMS detection

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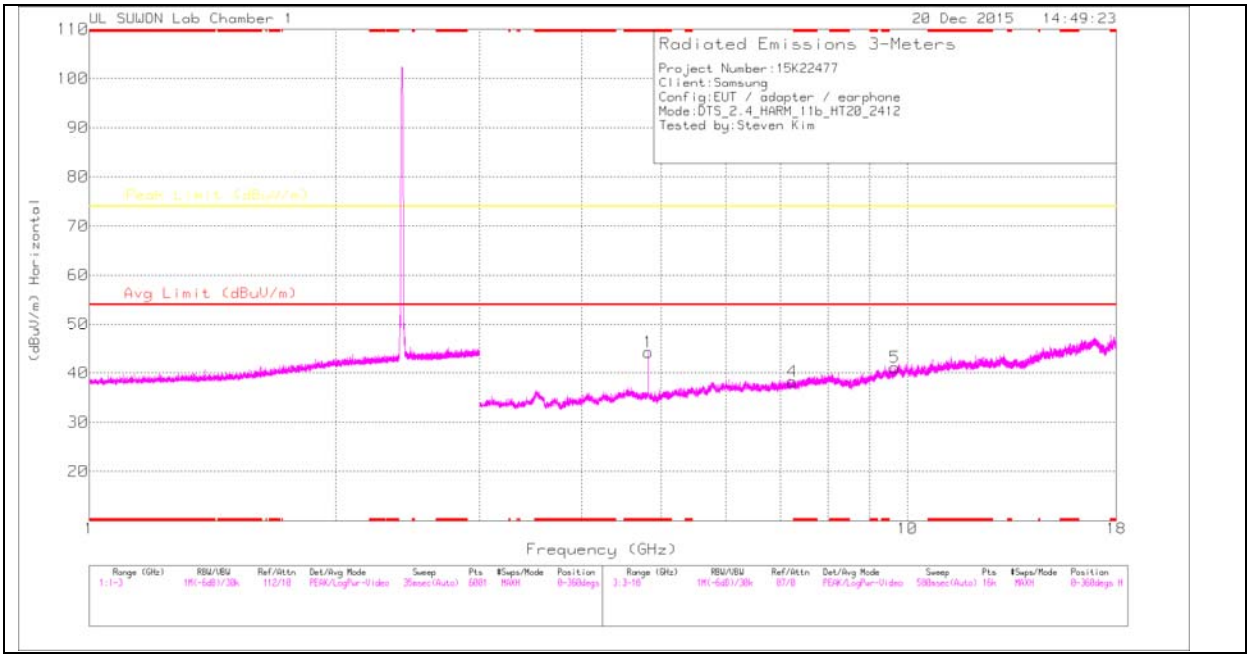
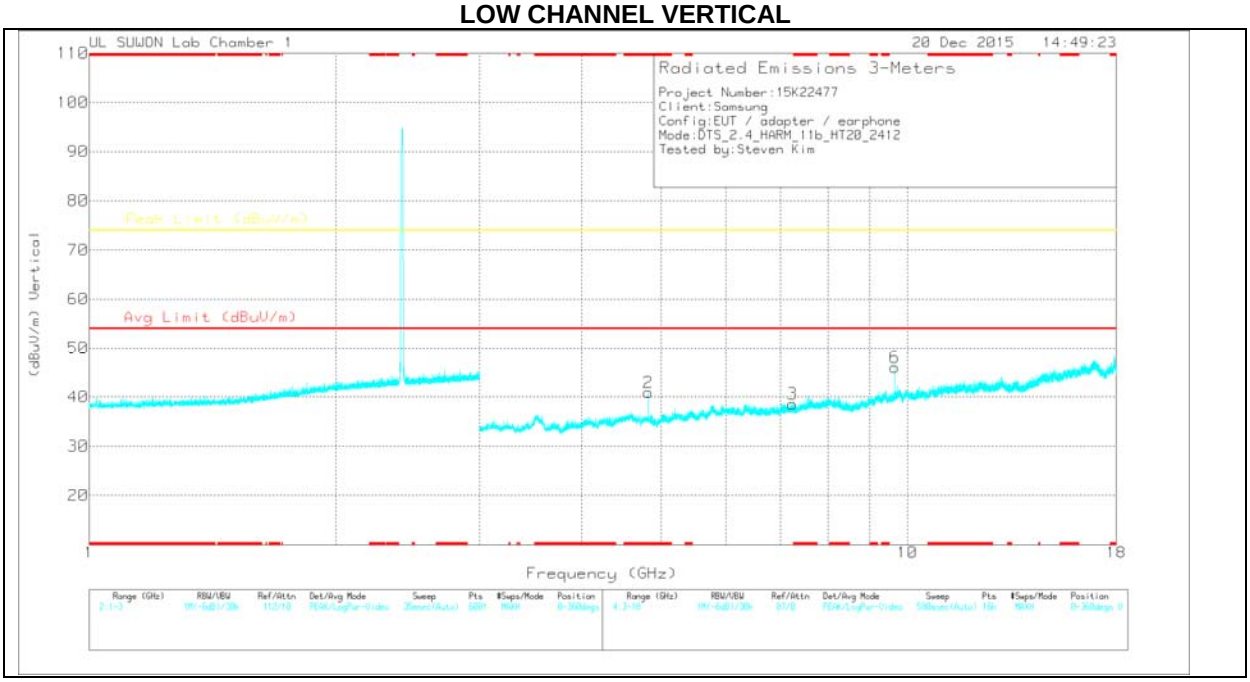
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.823	44.02	PK	34	-33.8	0	44.22	-	-	74	-29.78	0-360	100	H
4	7.238	33.46	PK	35.7	-30.9	0	38.26	-	-	74	-35.74	0-360	200	H
5	9.647	31.41	PK	37.1	-27.4	0	41.11	-	-	74	-32.89	0-360	200	H
2	* 4.823	40.71	PK	34	-33.8	0	40.91	-	-	74	-33.09	0-360	100	V
3	7.236	33.8	PK	35.7	-30.9	0	38.6	-	-	74	-35.4	0-360	100	V
6	9.648	36.35	PK	37.1	-27.4	0	46.05	-	-	74	-27.95	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	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	50.05	PK2	34	-33.8	0	50.25	-	-	74	-23.75	316	196	H
* 4.824	43.15	MAv1	34	-33.8	0	43.35	54	-10.65	-	-	316	196	H
* 4.824	49.38	PK2	34	-33.8	0	49.58	-	-	74	-24.42	171	101	V
* 4.824	41.84	MAv1	34	-33.8	0	42.04	54	-11.96	-	-	171	101	V
9.648	43.01	PK2	37.1	-27.4	0	52.71	-	-	74	-21.29	29	108	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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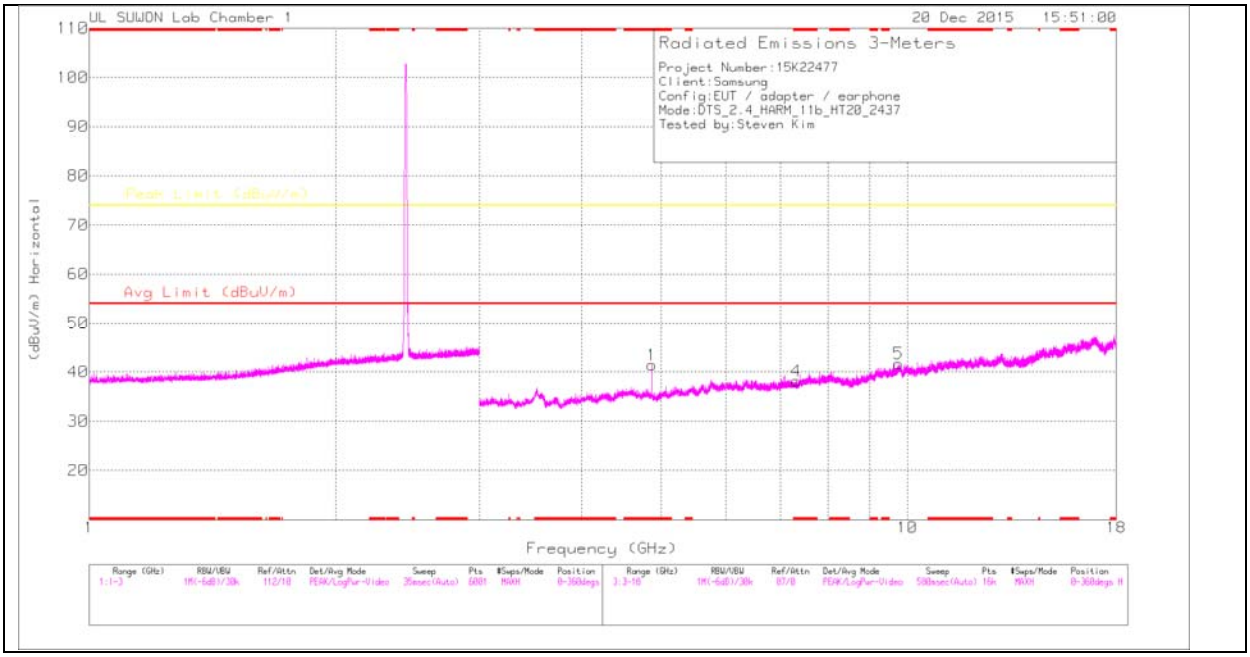
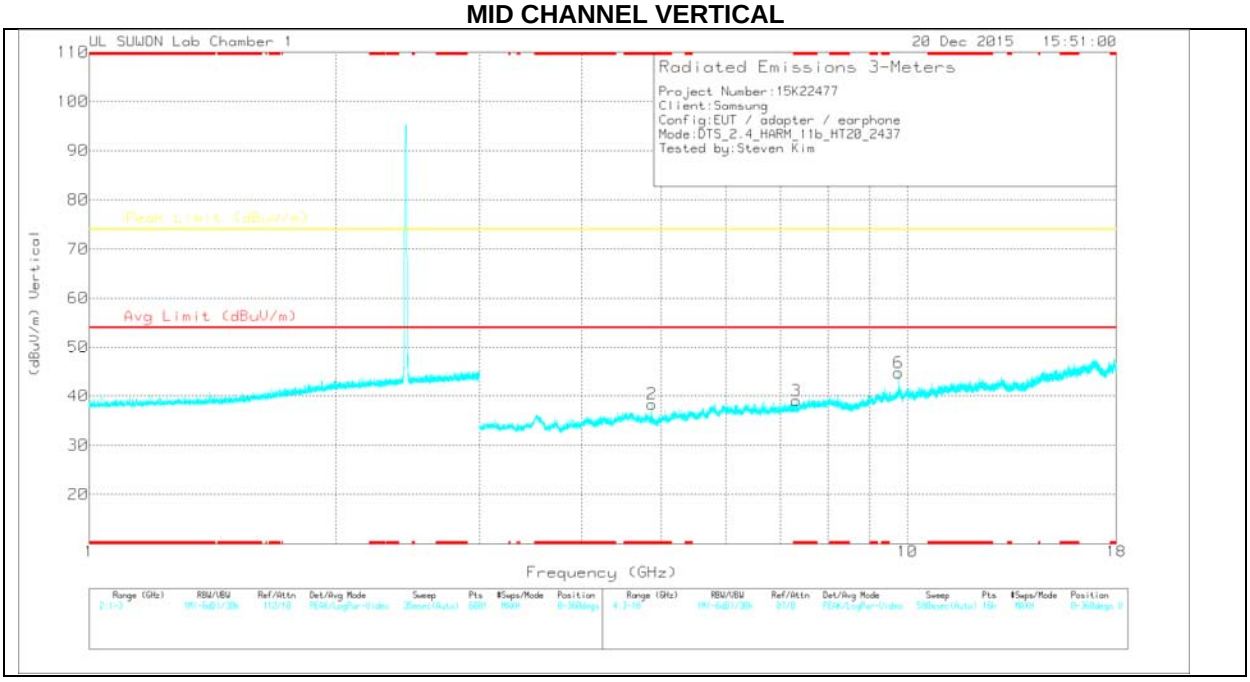
MID CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	41.4	PK	34	-34	0	41.4	-	-	74	-32.6	0-360	100	H
4	* 7.313	33.25	PK	35.8	-30.9	0	38.15	-	-	74	-35.85	0-360	200	H
5	9.755	31.21	PK	37.2	-26.7	0	41.71	-	-	74	-32.29	0-360	100	H
2	* 4.874	38.36	PK	34	-34	0	38.36	-	-	74	-35.64	0-360	100	V
3	* 7.313	34.16	PK	35.8	-30.9	0	39.06	-	-	74	-34.94	0-360	100	V
6	9.748	34.32	PK	37.2	-26.8	0	44.72	-	-	74	-29.28	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	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	48.7	PK2	34	-34	0	48.7	-	-	74	-25.3	303	146	H
* 4.874	40.56	MAv1	34	-34	0	40.56	54	-13.44	-	-	303	146	H
* 4.874	48.58	PK2	34	-34	0	48.58	-	-	74	-25.42	271	376	V
* 4.874	40.64	MAv1	34	-34	0	40.64	54	-13.36	-	-	271	376	V
9.748	42.4	PK2	37.2	-26.8	0	52.8	-	-	74	-21.2	309	258	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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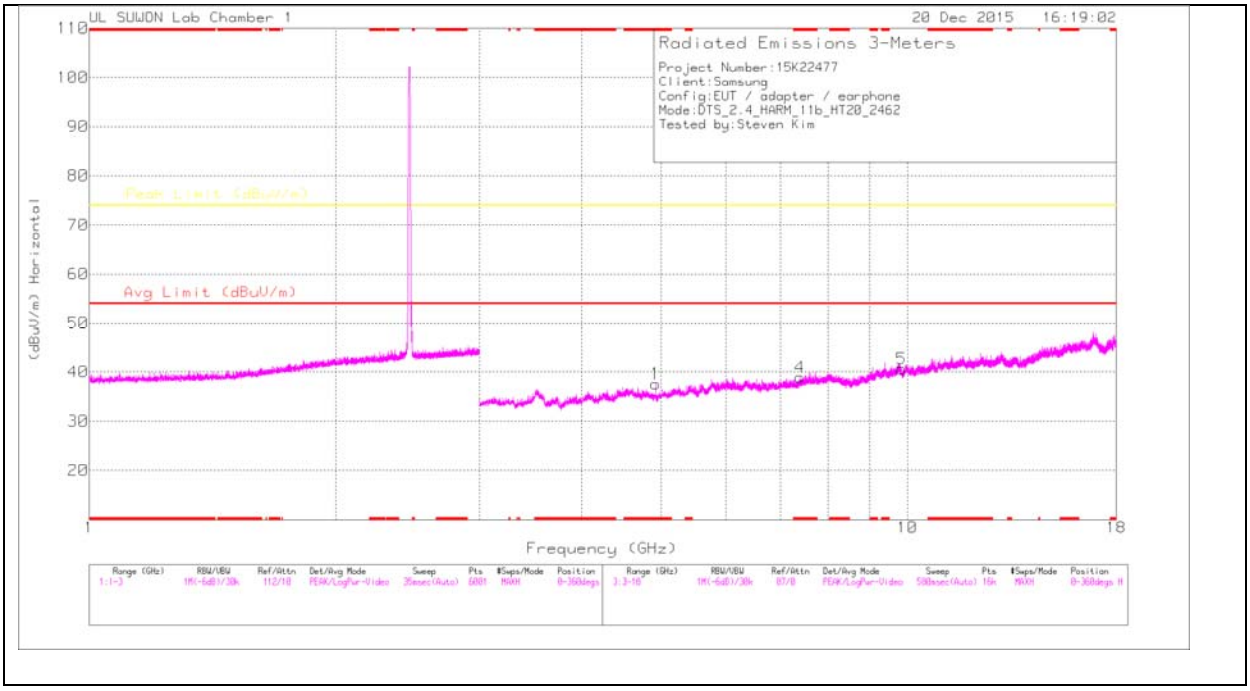
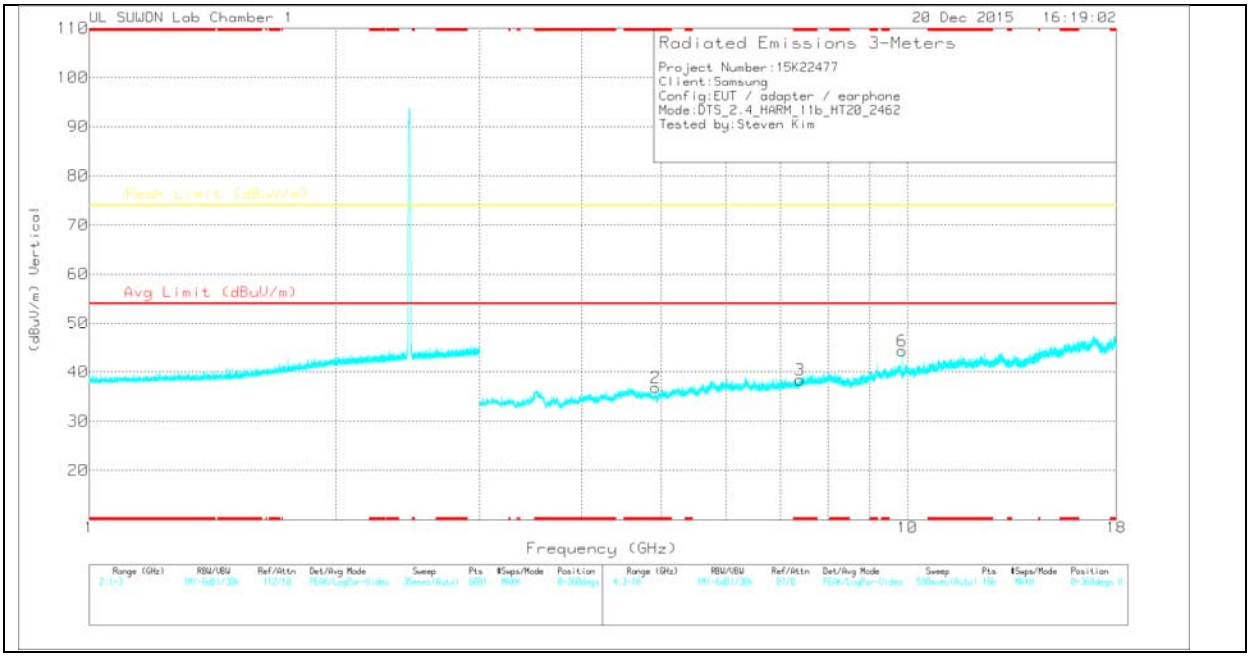
HIGH CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	37.58	PK	34	-34	0	37.58	-	-	74	-36.42	0-360	100	H
4	* 7.388	33.79	PK	35.8	-30.7	0	38.89	-	-	74	-35.11	0-360	100	H
5	9.834	30.53	PK	37.3	-27.2	0	40.63	-	-	74	-33.37	0-360	200	H
2	* 4.924	36.79	PK	34	-34	0	36.79	-	-	74	-37.21	0-360	100	V
3	* 7.387	33.28	PK	35.8	-30.7	0	38.38	-	-	74	-35.62	0-360	100	V
6	9.848	34.55	PK	37.3	-27.6	0	44.25	-	-	74	-29.75	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	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.858	41.37	PK2	37.3	-27.8	0	50.87	-	-	74	-23.13	333	309	H

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

PK2 - KDB558074 Method: Maximum Peak

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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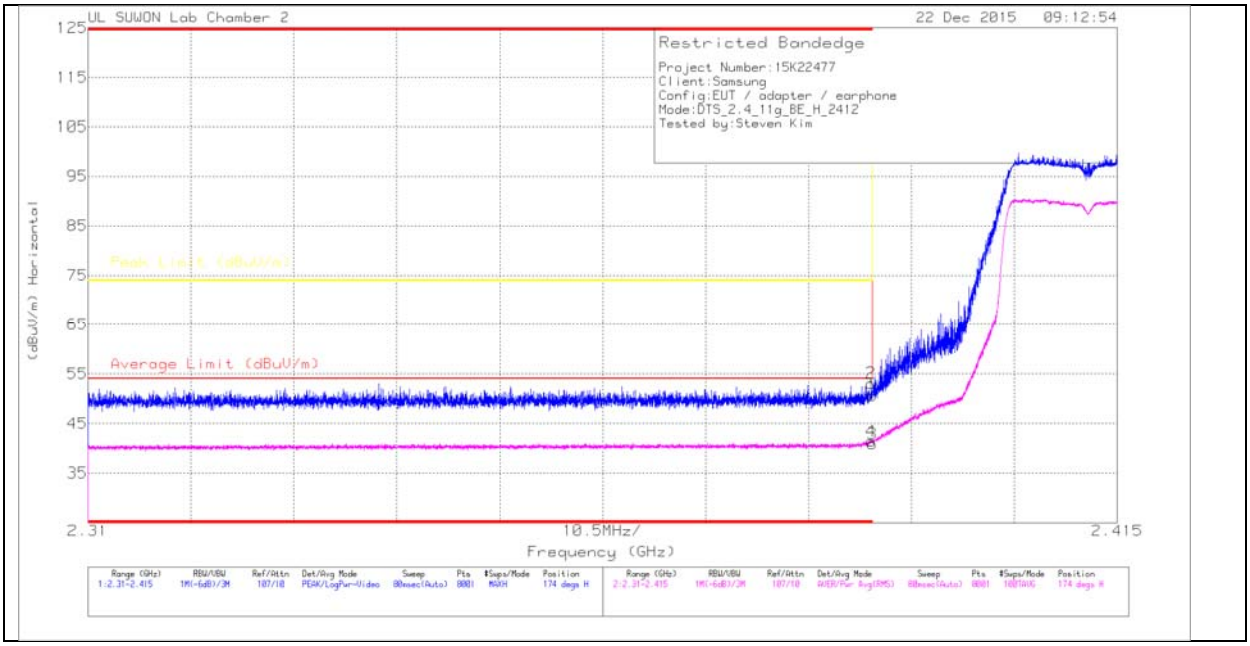
11.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	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	38.39	Pk	31.7	-19.5	0	50.59	-	-	74	-23.41	174	148	H
2	* 2.39	40.91	Pk	31.7	-19.5	0	53.11	-	-	74	-20.89	174	148	H
3	* 2.39	28.68	RMS	31.7	-19.5	.29	41.17	54	-12.83	-	-	174	148	H
4	* 2.39	29.24	RMS	31.7	-19.5	.29	41.73	54	-12.27	-	-	174	148	H

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

Pk - Peak detector

RMS - RMS detection

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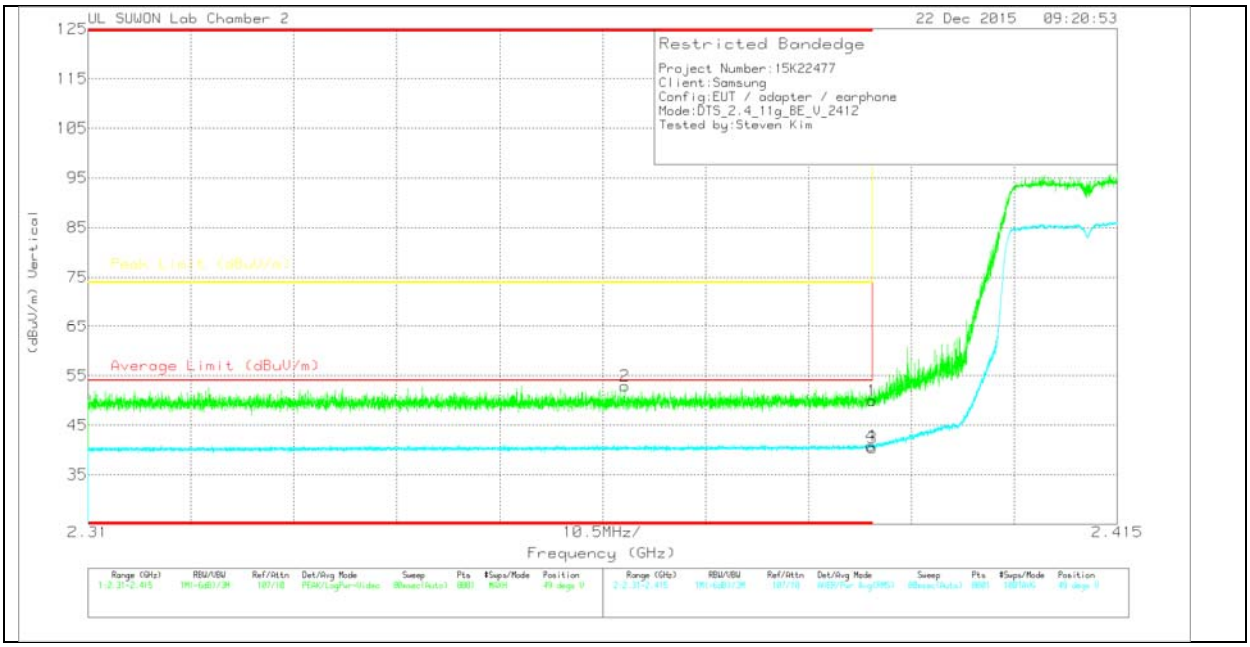
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	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	37.71	Pk	31.7	-19.5	0	49.91	-	-	74	-24.09	49	377	V
2	* 2.365	40.87	Pk	31.7	-19.6	0	52.97	-	-	74	-21.03	49	377	V
3	* 2.39	28.28	RMS	31.7	-19.5	.29	40.77	54	-13.23	-	-	49	377	V
4	* 2.39	28.6	RMS	31.7	-19.5	.29	41.09	54	-12.91	-	-	49	377	V

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

Pk - Peak detector

RMS - RMS detection

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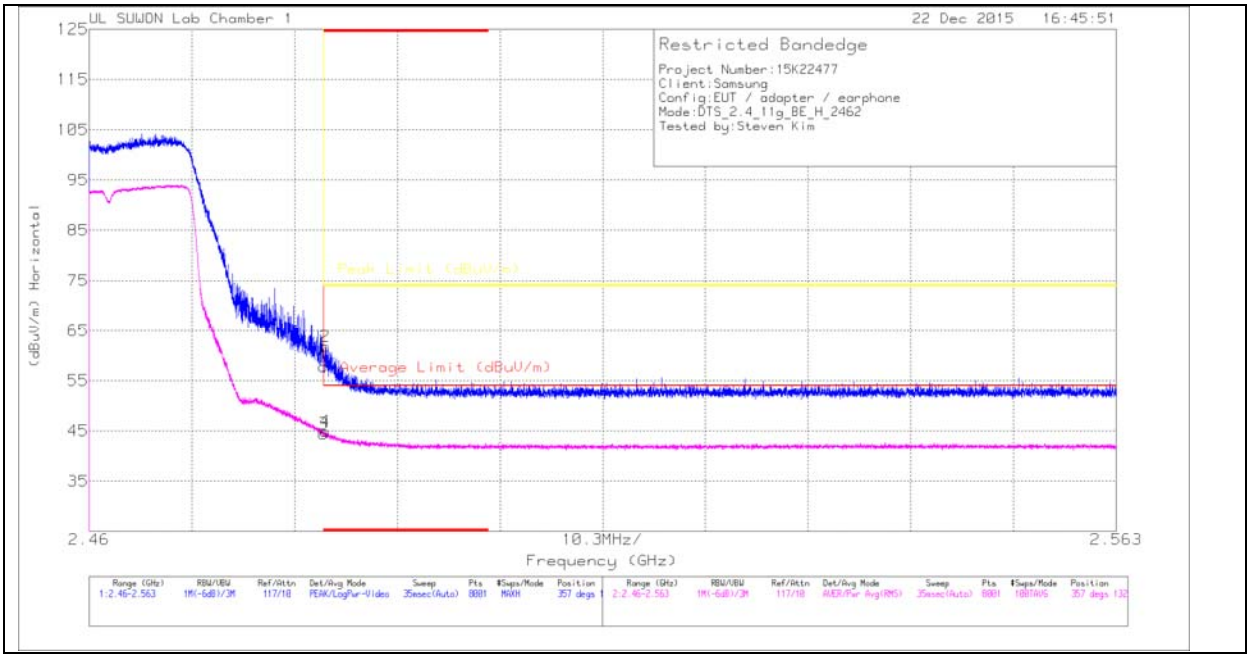
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	54.13	Pk	32	-28.3	0	57.83	-	-	74	-16.17	357	132	H
2	* 2.484	58.07	Pk	32	-28.3	0	61.77	-	-	74	-12.23	357	132	H
3	* 2.484	40.45	RMS	32	-28.3	.29	44.44	54	-9.56	-	-	357	132	H
4	* 2.484	40.91	RMS	32	-28.3	.29	44.9	54	-9.1	-	-	357	132	H

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

Pk - Peak detector

RMS - RMS detection

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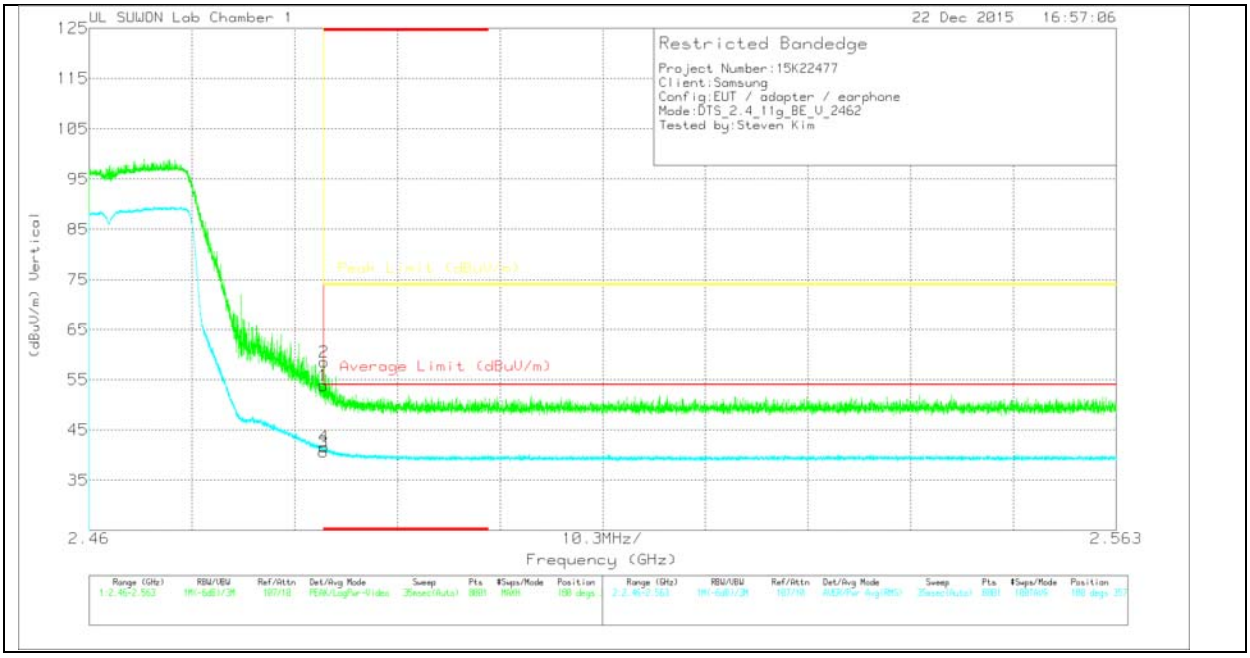
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	50.14	Pk	32	-28.3	0	53.84	-	-	74	-20.16	180	357	V
2	* 2.484	54.81	Pk	32	-28.3	0	58.51	-	-	74	-15.49	180	357	V
3	* 2.484	36.6	RMS	32	-28.3	.29	40.59	54	-13.41	-	-	180	357	V
4	* 2.484	37.63	RMS	32	-28.3	.29	41.62	54	-12.38	-	-	180	357	V

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

Pk - Peak detector

RMS - RMS detection

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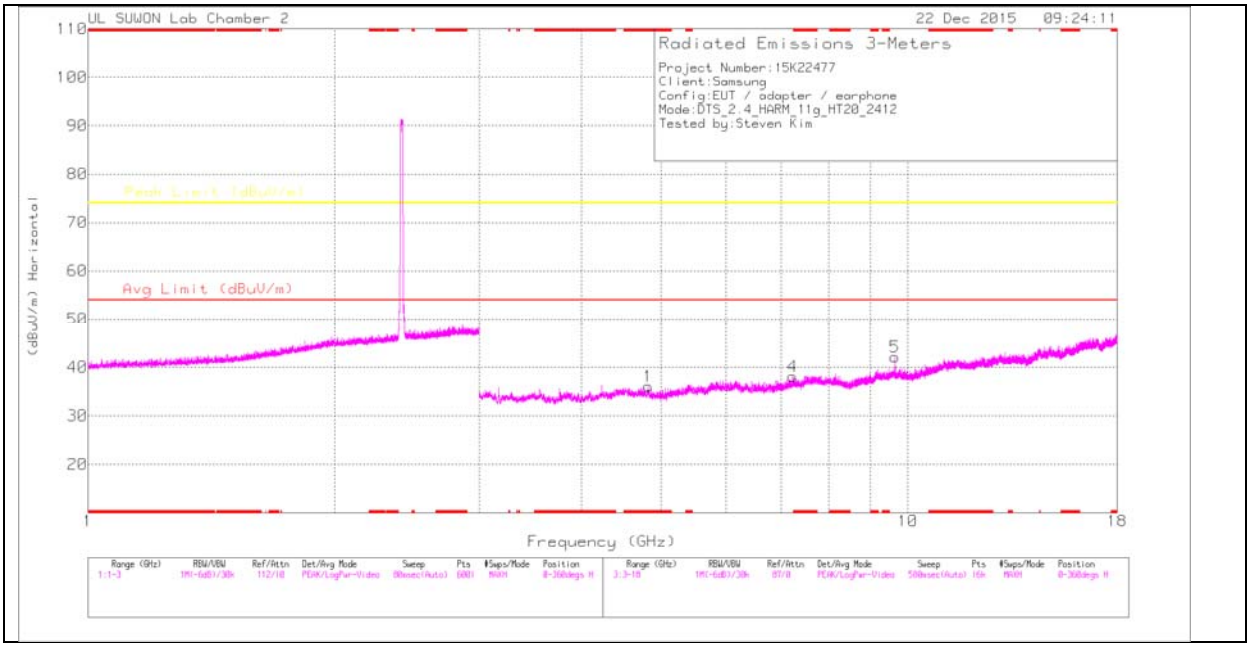
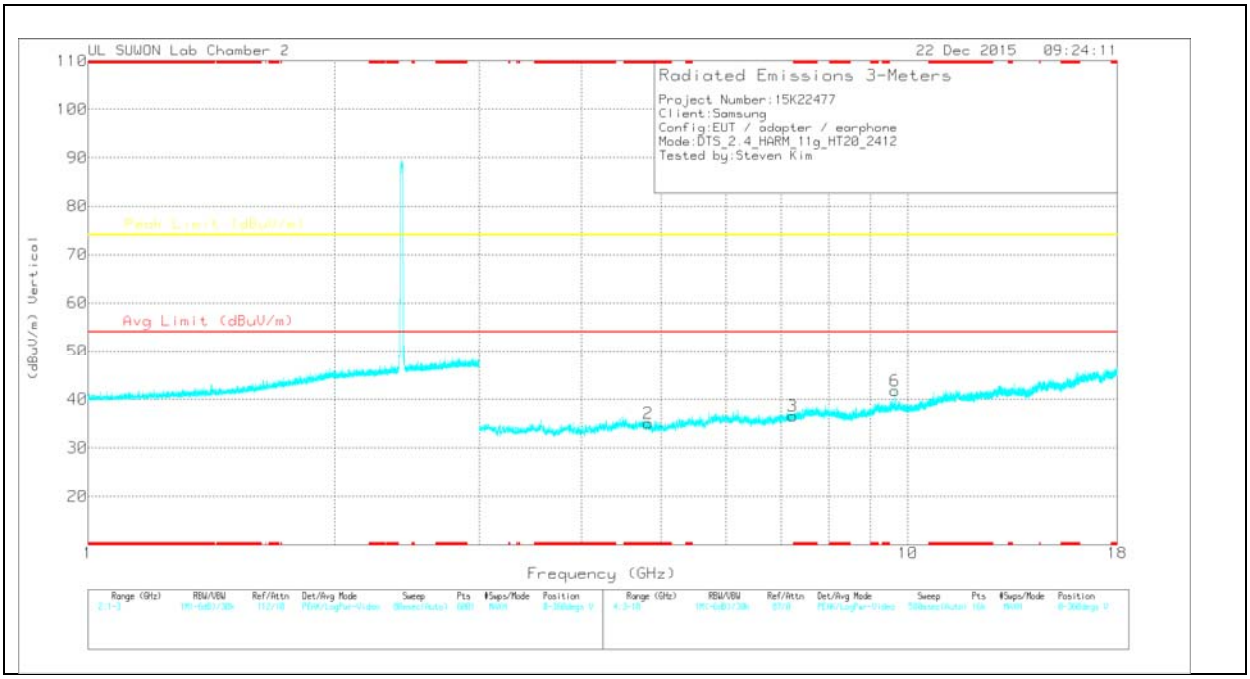
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.825	27.42	PK	33.9	-25.3	0	36.02	-	-	74	-37.98	0-360	200	H
4	7.232	25.23	PK	35.8	-23	0	38.03	-	-	74	-35.97	0-360	200	H
5	9.648	24.23	PK	36.9	-19	0	42.13	-	-	74	-31.87	0-360	100	H
2	* 4.822	26.43	PK	33.9	-25.3	0	35.03	-	-	74	-38.97	0-360	200	V
3	7.238	23.79	PK	35.8	-23	0	36.59	-	-	74	-37.41	0-360	100	V
6	9.647	23.83	PK	36.9	-19	0	41.73	-	-	74	-32.27	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	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.648	32.66	PK2	36.9	-19	0	50.56	-	-	74	-23.44	333	204	H
9.638	32.53	PK2	36.9	-19.1	0	50.33	-	-	74	-23.67	317	293	V

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

PK2 - KDB558074 Method: Maximum Peak

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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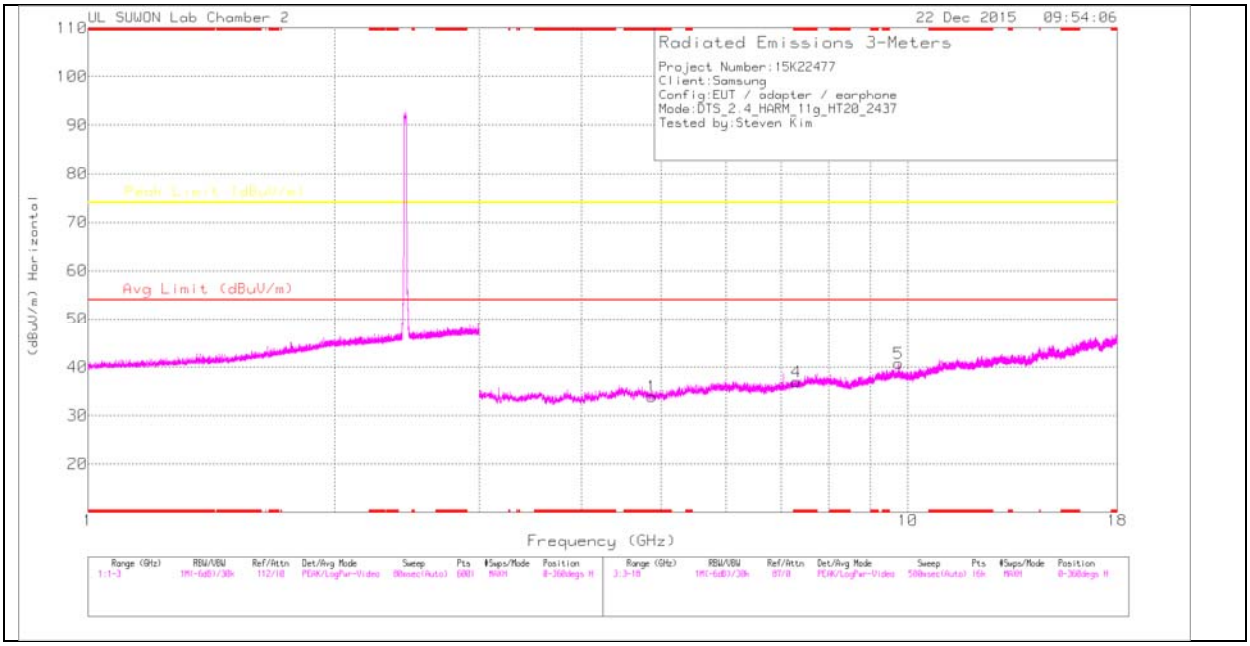
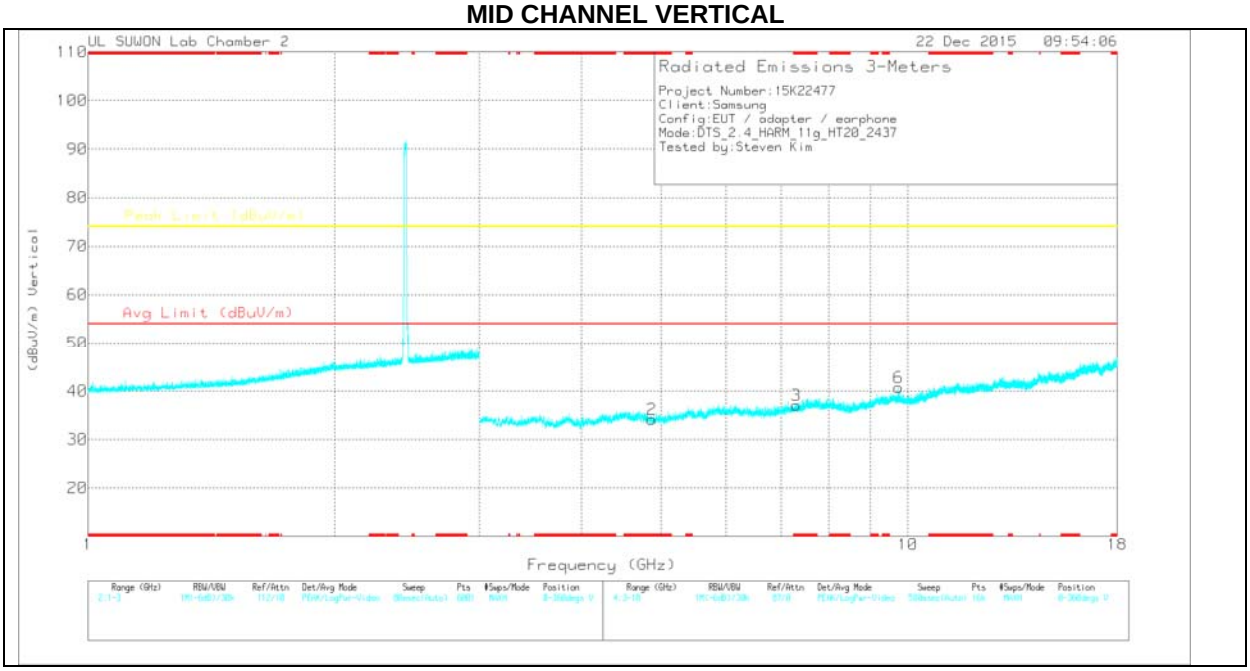
MID CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.872	25.23	PK	33.9	-25.2	0	33.93	-	-	74	-40.07	0-360	200	H
4	* 7.307	23.68	PK	35.9	-22.6	0	36.98	-	-	74	-37.02	0-360	200	H
5	9.748	23.01	PK	37	-19.3	0	40.71	-	-	74	-33.29	0-360	100	H
2	* 4.872	25.45	PK	33.9	-25.2	0	34.15	-	-	74	-39.85	0-360	200	V
3	* 7.311	23.74	PK	35.9	-22.6	0	37.04	-	-	74	-36.96	0-360	100	V
6	9.748	23.03	PK	37	-19.3	0	40.73	-	-	74	-33.27	0-360	200	V

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

PK – Peak detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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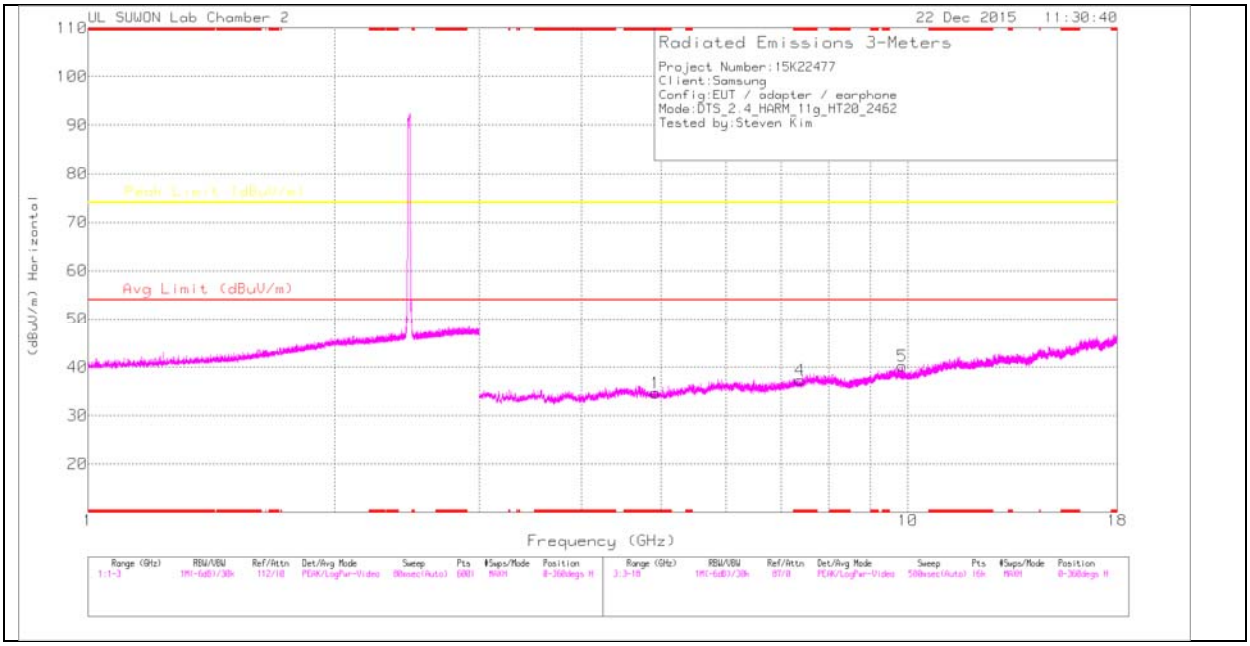
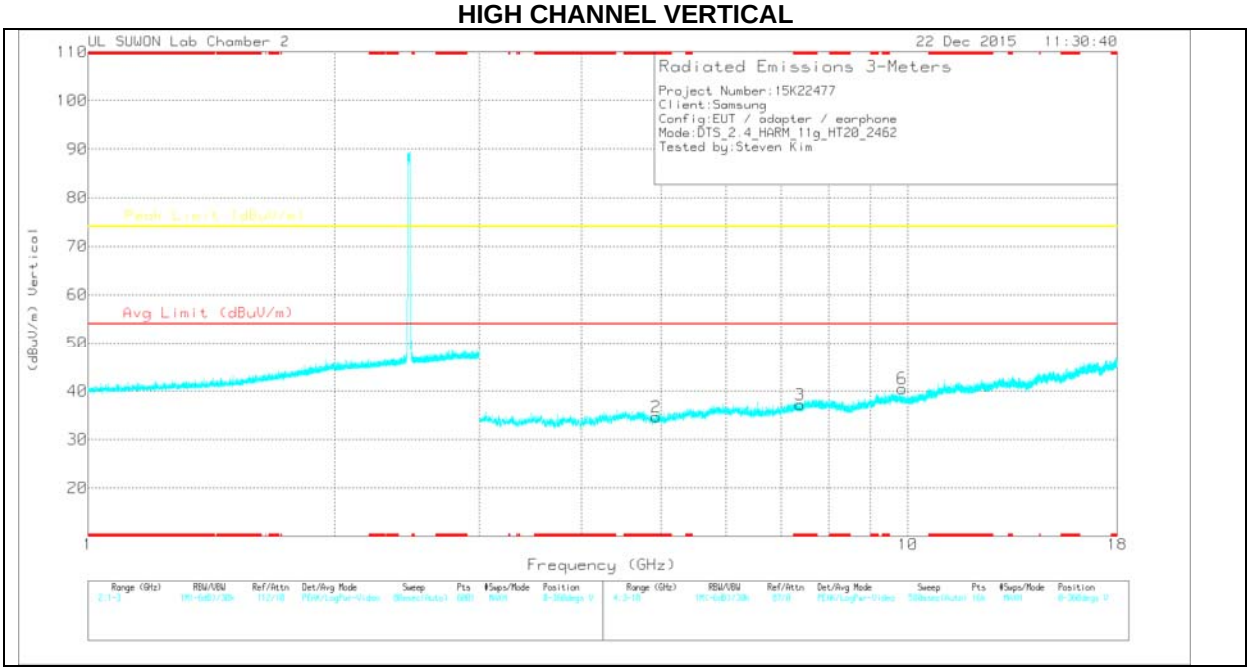
HIGH CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	25.87	PK	33.9	-25.1	0	34.67	-	-	74	-39.33	0-360	100	H
4	* 7.383	23.59	PK	35.9	-22.2	0	37.29	-	-	74	-36.71	0-360	100	H
5	9.848	22.31	PK	37.1	-19.2	0	40.21	-	-	74	-33.79	0-360	100	H
2	* 4.928	25.91	PK	33.9	-25.1	0	34.71	-	-	74	-39.29	0-360	200	V
3	* 7.387	23.52	PK	35.9	-22.2	0	37.22	-	-	74	-36.78	0-360	100	V
6	9.848	22.65	PK	37.1	-19.2	0	40.55	-	-	74	-33.45	0-360	200	V

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

PK – Peak detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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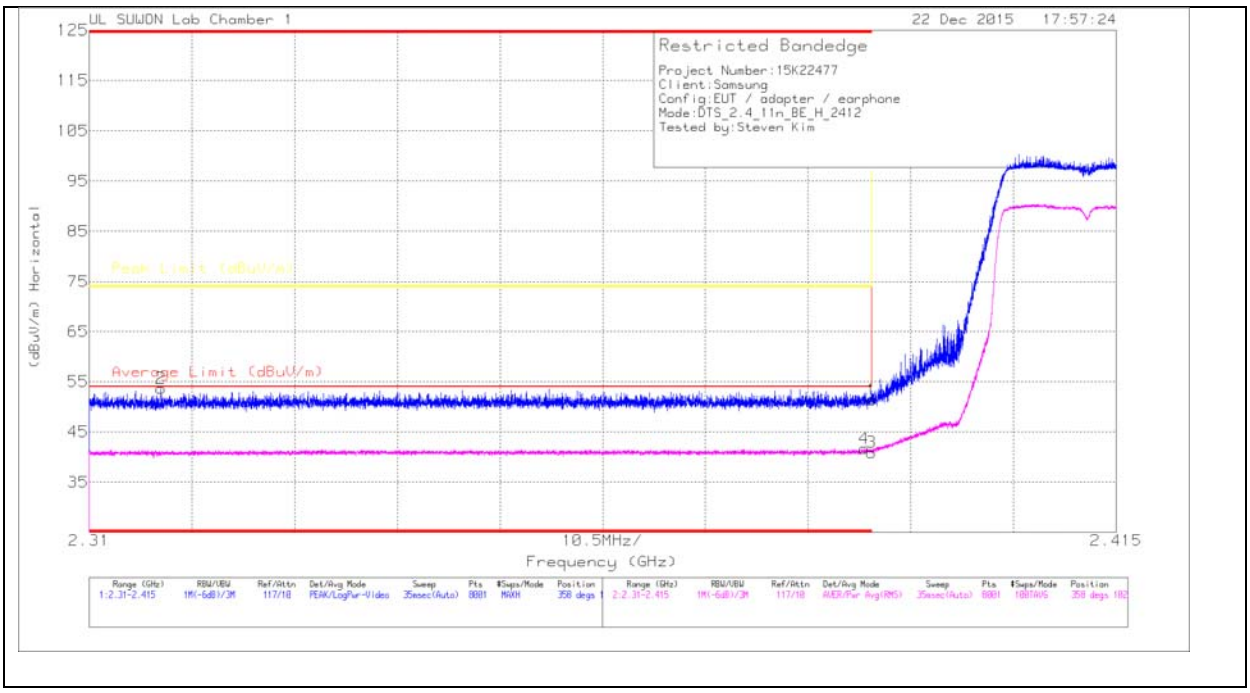
11.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	48.55	Pk	31.8	-29	0	51.35	-	-	74	-22.65	358	102	H
2	* 2.317	51.09	Pk	31.7	-29.1	0	53.69	-	-	74	-20.31	358	102	H
3	* 2.39	37.81	RMS	31.8	-29	.32	40.93	54	-13.07	-	-	358	102	H
4	* 2.389	38.6	RMS	31.8	-29	.32	41.72	54	-12.28	-	-	358	102	H

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

Pk - Peak detector

RMS - RMS detection

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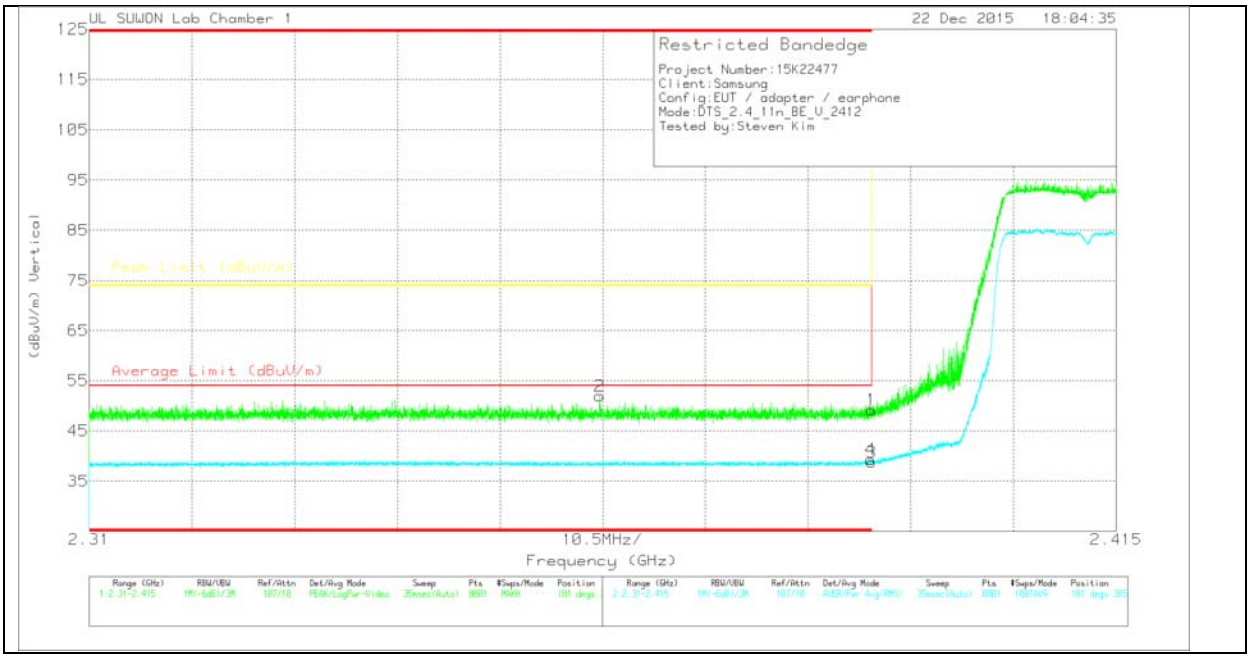
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	46.39	Pk	31.8	-29	0	49.19	-	-	74	-24.81	181	385	V
2	* 2.362	49.11	Pk	31.8	-29	0	51.91	-	-	74	-22.09	181	385	V
3	* 2.39	35.65	RMS	31.8	-29	.32	38.77	54	-15.23	-	-	181	385	V
4	* 2.39	36.18	RMS	31.8	-29	.32	39.3	54	-14.7	-	-	181	385	V

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

Pk - Peak detector

RMS - RMS detection

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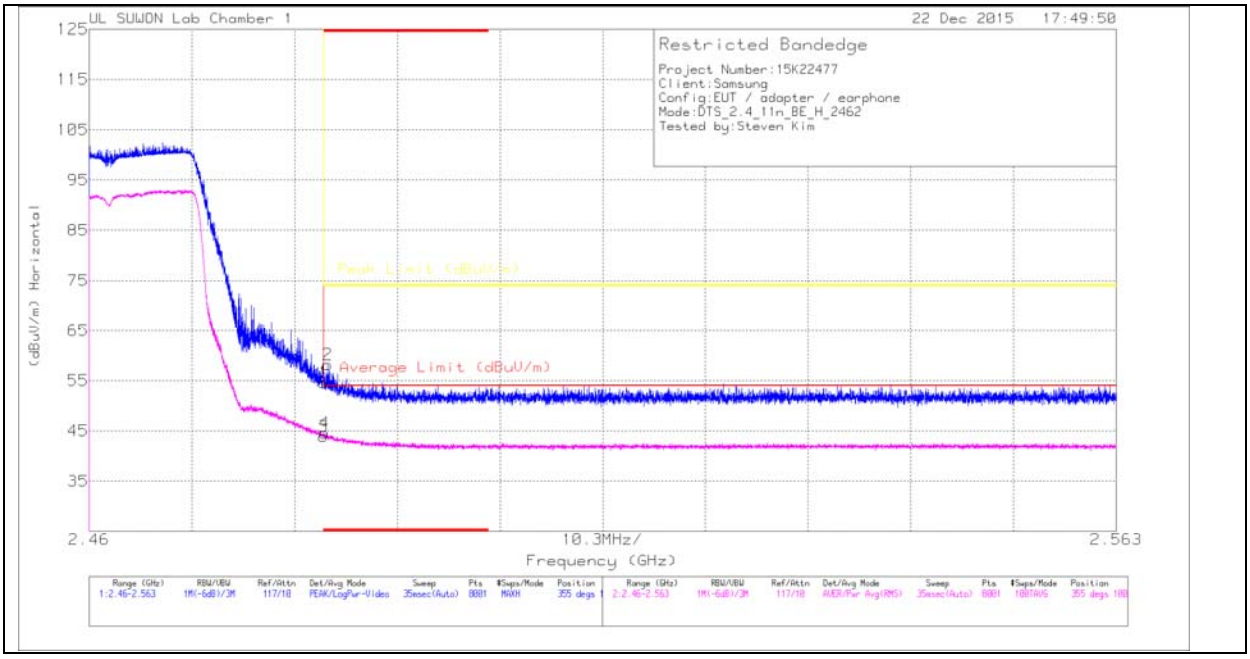
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	50.94	Pk	32	-28.3	0	54.64	-	-	74	-19.36	355	100	H
2	* 2.484	54.49	Pk	32	-28.3	0	58.19	-	-	74	-15.81	355	100	H
3	* 2.484	39.89	RMS	32	-28.3	.32	43.91	54	-10.09	-	-	355	100	H
4	* 2.484	40.58	RMS	32	-28.3	.32	44.6	54	-9.4	-	-	355	100	H

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

Pk - Peak detector

RMS - RMS detection

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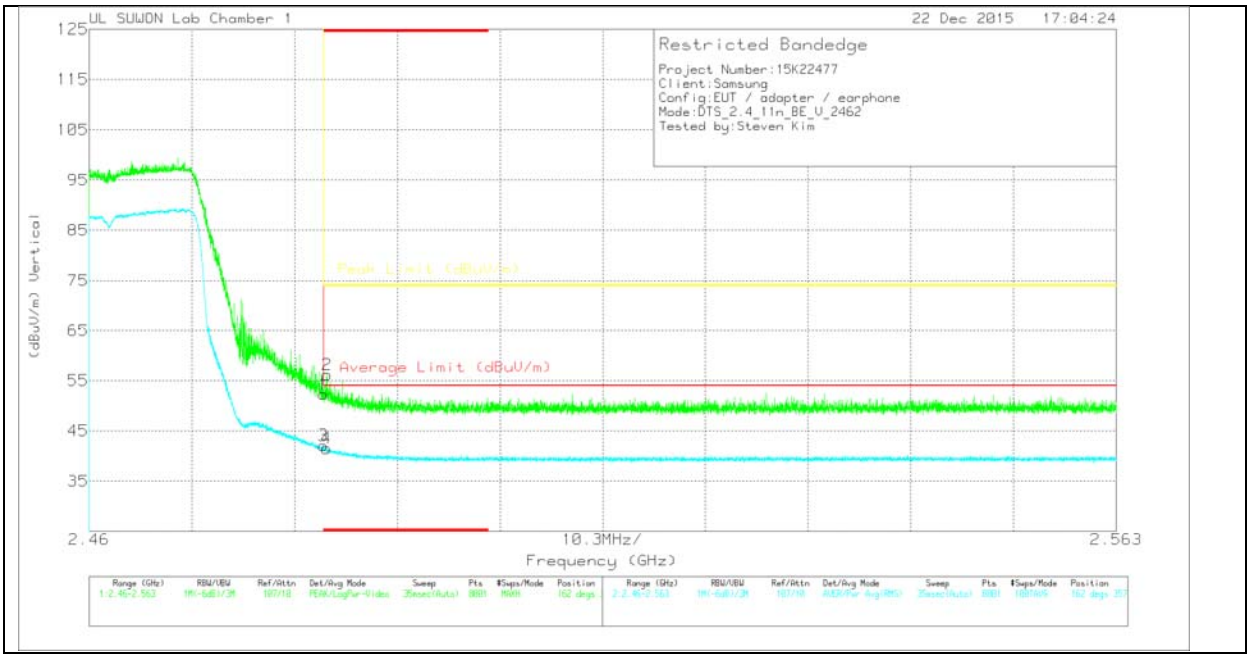
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	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	56.06	Pk	32	-28.3	0	59.76	-	-	74	-14.24	199	357	V
2	* 2.484	58.63	Pk	32	-28.3	0	62.33	-	-	74	-11.67	199	357	V
3	* 2.484	40.88	RMS	32	-28.3	.32	44.9	54	-9.1	-	-	199	357	V
4	* 2.484	42.06	RMS	32	-28.3	.32	46.08	54	-7.92	-	-	199	357	V

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

Pk - Peak detector

RMS - RMS detection

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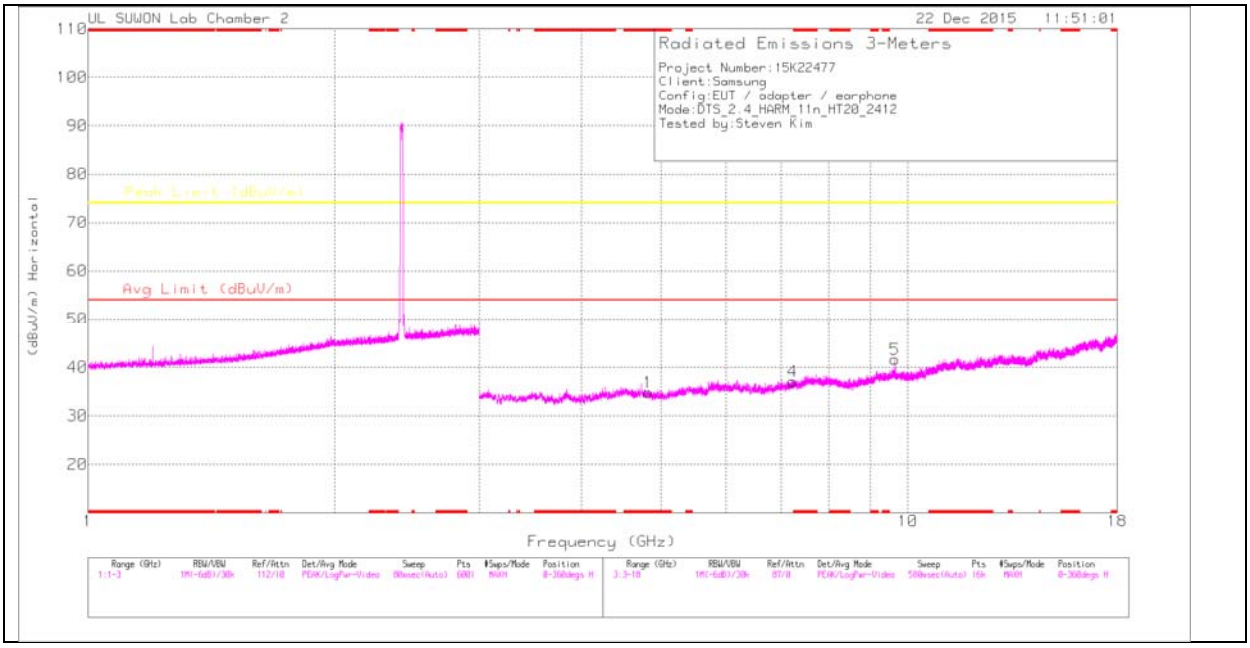
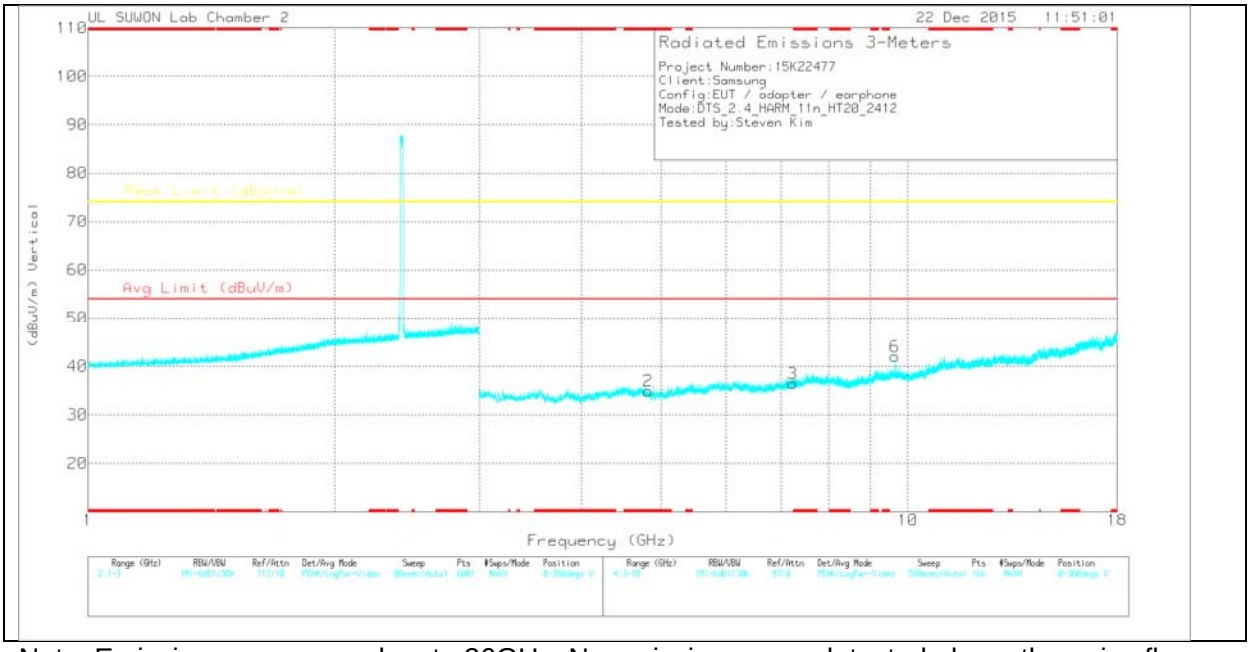
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.823	26.25	PK	33.9	-25.3	0	34.85	-	-	74	-39.15	0-360	100	H
4	7.234	24.27	PK	35.8	-23	0	37.07	-	-	74	-36.93	0-360	100	H
5	9.648	23.73	PK	36.9	-19	0	41.63	-	-	74	-32.37	0-360	100	H
2	* 4.82	26.28	PK	33.9	-25.3	0	34.88	-	-	74	-39.12	0-360	100	V
3	7.236	23.61	PK	35.8	-23	0	36.41	-	-	74	-37.59	0-360	100	V
6	9.648	24.07	PK	36.9	-19	0	41.97	-	-	74	-32.03	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	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.648	33.09	PK2	36.9	-19	0	50.99	-	-	74	-23.01	328	179	H
9.648	32.7	PK2	36.9	-19	0	50.6	-	-	74	-23.4	27	100	V

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

PK2 - KDB558074 Method: Maximum Peak

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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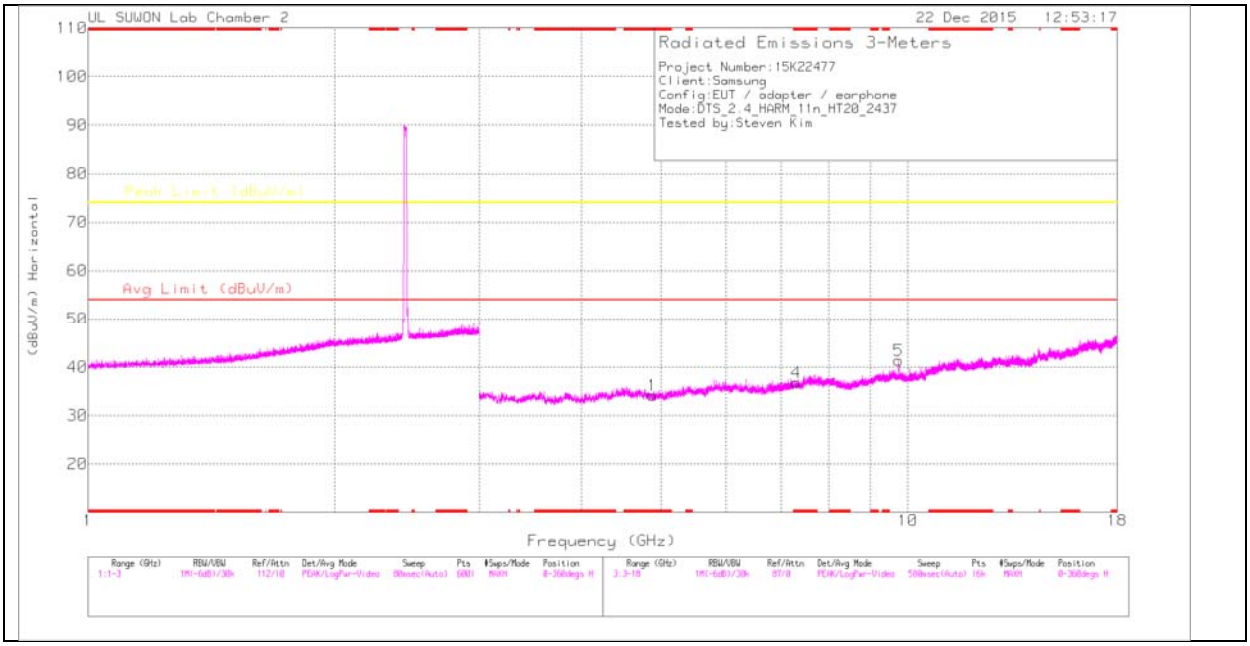
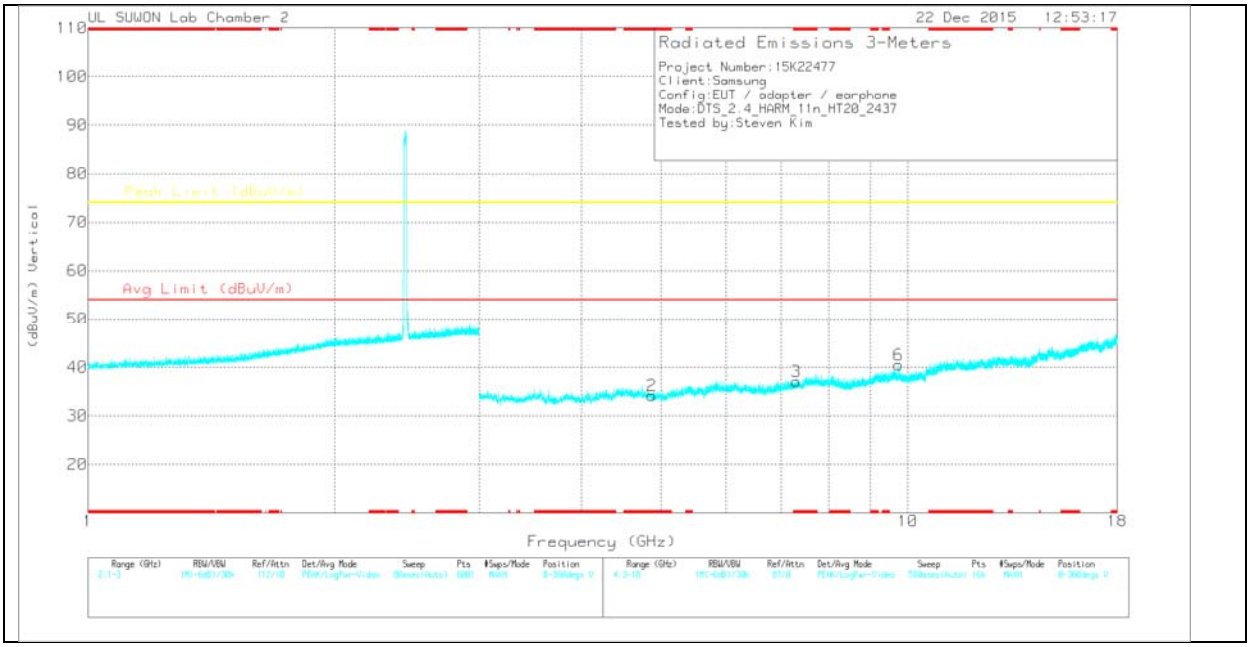
MID CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.876	25.42	PK	33.9	-25.2	0	34.12	-	-	74	-39.88	0-360	200	H
4	* 7.308	23.48	PK	35.9	-22.6	0	36.78	-	-	74	-37.22	0-360	100	H
5	9.748	23.73	PK	37	-19.3	0	41.43	-	-	74	-32.57	0-360	200	H
2	* 4.874	25.42	PK	33.9	-25.2	0	34.12	-	-	74	-39.88	0-360	200	V
3	* 7.311	23.78	PK	35.9	-22.6	0	37.08	-	-	74	-36.92	0-360	100	V
6	9.748	22.8	PK	37	-19.3	0	40.5	-	-	74	-33.5	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	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.742	32.02	PK2	37	-19.3	0	49.72	-	-	74	-24.28	336	162	H
9.748	31.86	PK2	37	-19.3	0	49.56	-	-	74	-24.44	31	398	V

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

PK2 - KDB558074 Method: Maximum Peak

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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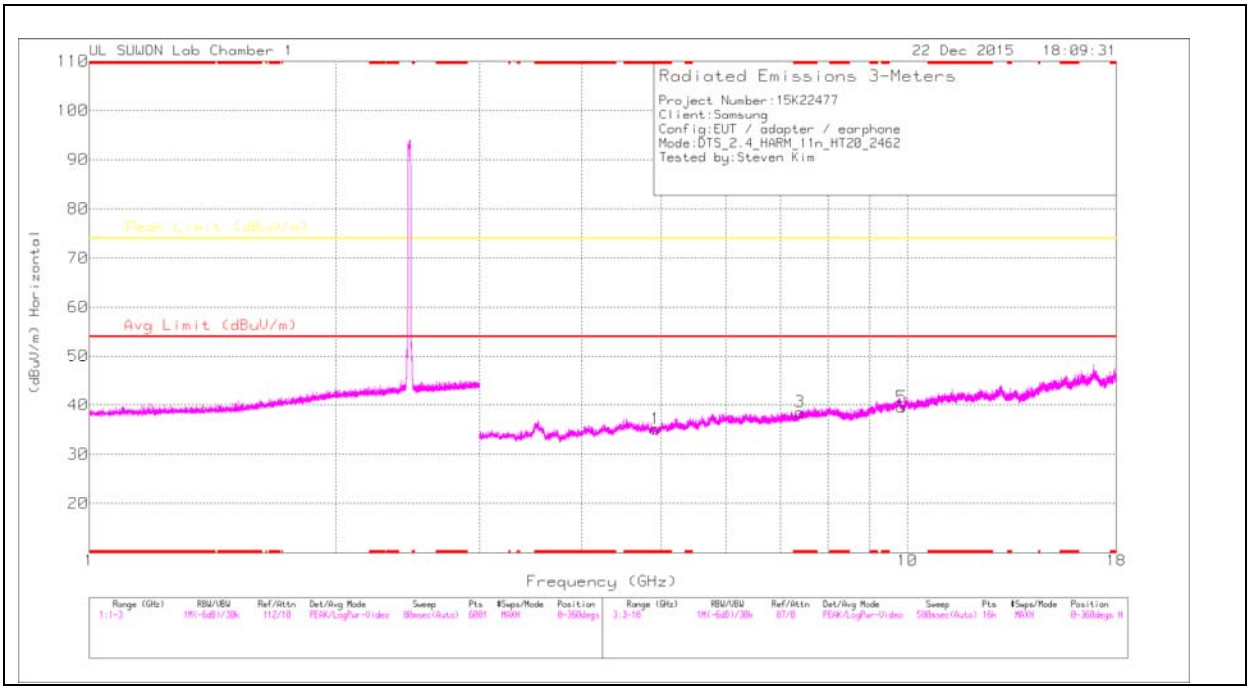
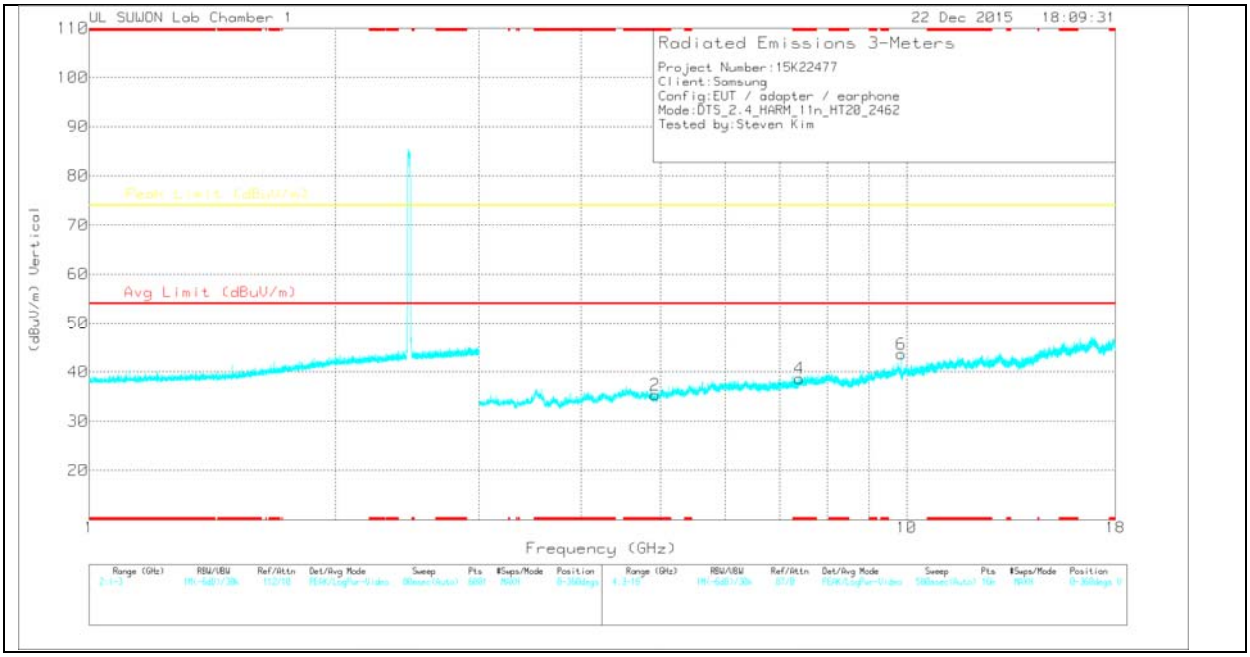
HIGH CHANNEL HORIZONTAL



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

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	35.14	Avg	34	-34	0	35.14	-	-	74	-38.86	0-360	200	H
3	* 7.387	33.51	Avg	35.8	-30.7	0	38.61	-	-	74	-35.39	0-360	200	H
5	9.845	29.77	Avg	37.3	-27.5	0	39.57	-	-	74	-34.43	0-360	200	H
2	* 4.922	35.33	Avg	34	-34	0	35.33	-	-	74	-38.67	0-360	100	V
4	* 7.391	33.61	Avg	35.8	-30.7	0	38.71	-	-	74	-35.29	0-360	100	V
6	9.848	33.96	Avg	37.3	-27.6	0	43.66	-	-	74	-30.34	0-360	100	V

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

Avg - Video bandwidth < Resolution bandwidth

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.848	42.82	PK2	37.3	-27.6	0	52.52	-	-	74	-21.48	34	100	V

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

PK2 - KDB558074 Method: Maximum Peak

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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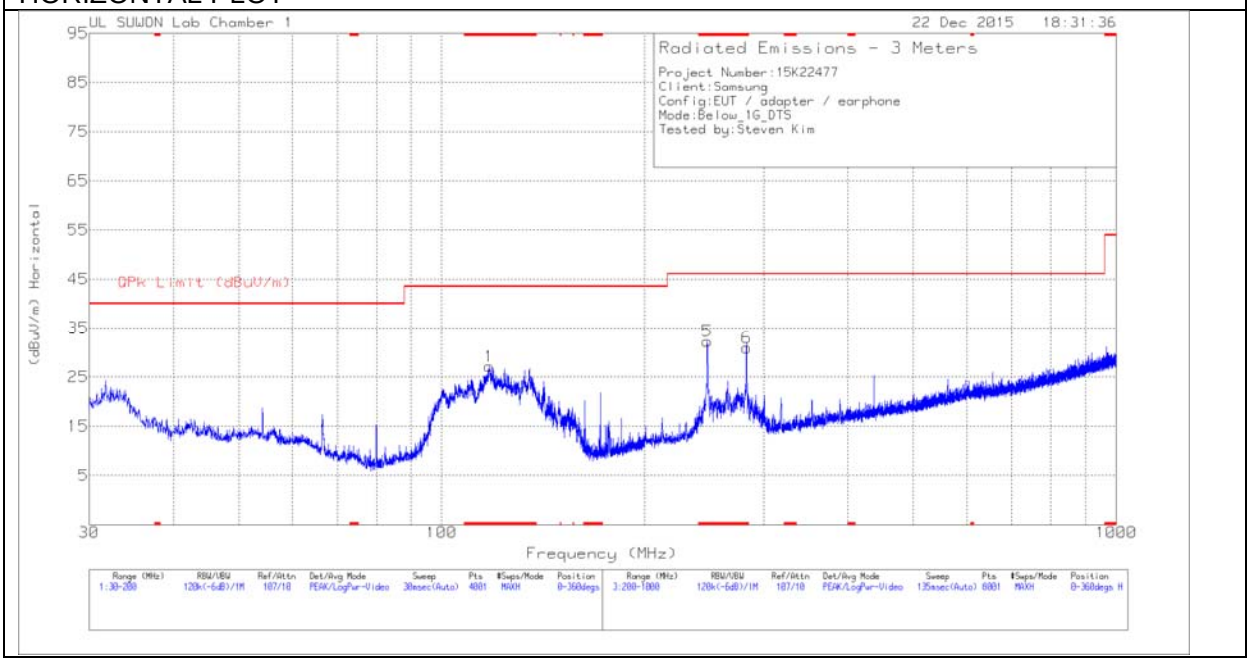
11.3. WORST-CASE BELOW 1 GHz

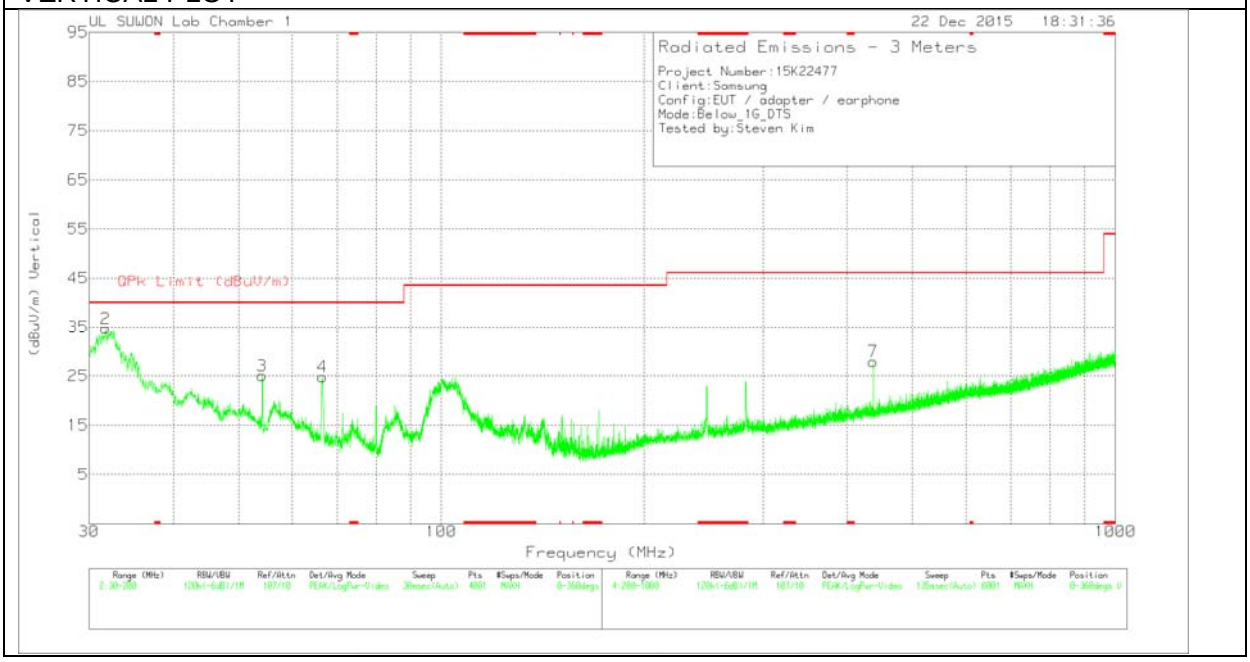
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



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Below 1G Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 117.635	45.96	Pk	10.2	-29	27.16	43.52	-16.36	0-360	300	H
2	31.7425	54.92	Pk	10.3	-30.5	34.72	40	-5.28	0-360	100	V
3	54.225	41.74	Pk	13.3	-30	25.04	40	-14.96	0-360	200	V
4	66.5925	43.92	Pk	10.7	-29.8	24.82	40	-15.18	0-360	100	V
5	* 247.5	47.82	Pk	12.3	-27.8	32.32	46.02	-13.7	0-360	100	H
6	* 283.3	45.57	Pk	13	-27.6	30.97	46.02	-15.05	0-360	100	H
7	437.5	38.43	Pk	16.1	-26.6	27.93	46.02	-18.09	0-360	100	V

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

Pk - Peak detector

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12. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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 C63.10 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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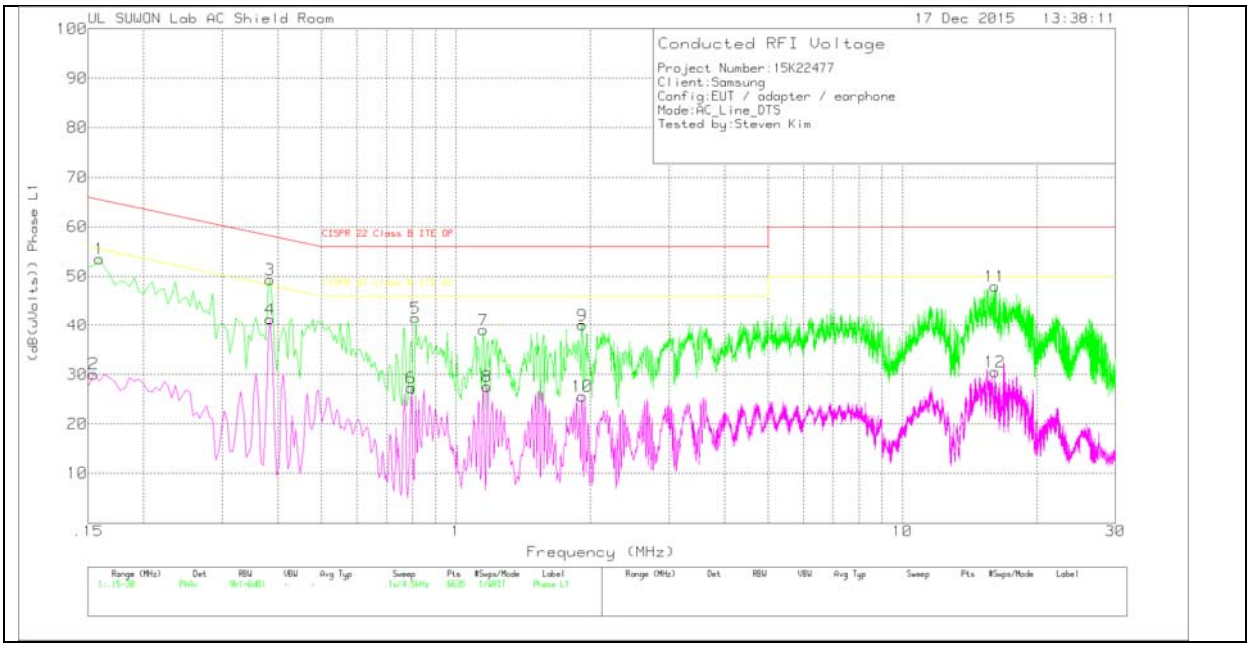
RESULTS

WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.159	43.5	Pk	10	0	53.5	65.52	-12.02	-	-
2	.1545	20.19	Av	9.9	0	30.09	-	-	55.75	-25.66
3	.384	39.22	Pk	10.1	0	49.32	58.19	-8.87	-	-
4	.384	31.15	Av	10.1	0	41.25	-	-	48.19	-6.94
5	.8115	31.58	Pk	10	0	41.58	56	-14.42	-	-
6	.7935	17.26	Av	10	0	27.26	-	-	46	-18.74
7	1.1535	29.15	Pk	9.9	0	39.05	56	-16.95	-	-
8	1.176	17.62	Av	9.9	0	27.52	-	-	46	-18.48
9	1.9185	30.16	Pk	9.8	.1	40.06	56	-15.94	-	-
10	1.9185	15.66	Av	9.8	.1	25.56	-	-	46	-20.44
11	16.134	37.55	Pk	10.2	.2	47.95	60	-12.05	-	-
12	16.134	20.16	Av	10.2	.2	30.56	-	-	50	-19.44

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
.1608	39.89	Qp	10	0	49.89	65.42	-15.53	-	-
.1518	38.86	Qp	9.9	0	48.76	65.9	-17.14	-	-
.3831	38.21	Qp	10.1	0	48.31	58.21	-9.9	-	-

Qp - Quasi-Peak detector

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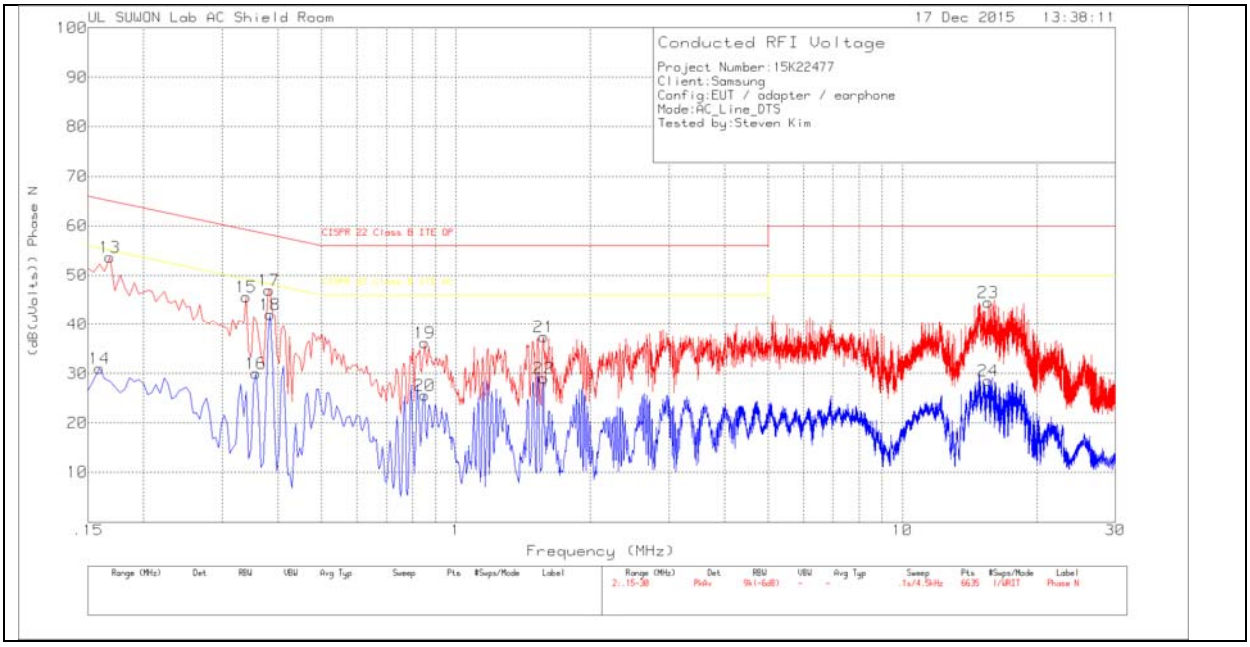
LINE 2 PLOT



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LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.168	43.41	Pk	10.2	0	53.61	65.06	-11.45	-	-
14	.159	21.03	Av	10	0	31.03	-	-	55.52	-24.49
15	.339	35.59	Pk	10	0	45.59	59.23	-13.64	-	-
16	.357	20.03	Av	10	0	30.03	-	-	48.8	-18.77
17	.38175	36.9	Pk	10.1	0	47	58.24	-11.24	-	-
18	.384	31.93	Av	10.1	0	42.03	-	-	48.19	-6.16
19	.852	26.34	Pk	9.9	0	36.24	56	-19.76	-	-
20	.852	15.66	Av	9.9	0	25.56	-	-	46	-20.44
21	1.572	27.56	Pk	9.8	.1	37.46	56	-18.54	-	-
22	1.572	19.11	Av	9.8	.1	29.01	-	-	46	-16.99
23	15.558	33.94	Pk	10.4	.2	44.54	60	-15.46	-	-
24	15.558	17.97	Av	10.4	.2	28.57	-	-	50	-21.43

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
.1635	36.89	Qp	10.1	0	46.99	65.28	-18.29	-	-
.1545	37.26	Qp	9.9	0	47.16	65.75	-18.59	-	-
.38265	36.49	Qp	10.1	0	46.59	58.22	-11.63	-	-
.3831	36.07	Qp	10.1	0	46.17	58.21	-12.04	-	-

Qp - Quasi-Peak detector

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