FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-J111F/DS, SM-J111F

FCC ID: A3LSMJ111F

REPORT NUMBER: 15K22514-E1

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Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by
UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/11/16	Initial issue	Junwhan Lee
2	01/15/16	Removed test data of DTS Ch. 12,13	Junwhan Lee
3	01/18/16	Revised test data of DTS 802.11b mode	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone + BT/BLE and DTS b/g/n
MODEL NUMBER:	SM-J111F/DS, SM-J111F
SERIAL NUMBER:	R38GB1417CR (RADIATED); R38GB1416ZE (CONDUCTED)
DATE TESTED:	DEC 17, 2015 - JAN 18, 2016

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.

Approved & Released For
UL Korea, Ltd. By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

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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/LTE Phone + BT/BLE and DTS b/g/n.
This test report addresses the DTS (WLAN) operational mode.

SM-J111F and SM-J111F/DS are same hardware but for different number of SIM card slot.
SM-J111F has one slot. SM-J111F/DS is dual SIM version.
SM-J111F/DS was used for the test.

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	16.14	41.11
	802.11g	14.28	26.79
	802.11n HT20	14.20	26.30

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of 1.28 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	EP-TA60EBE	R37G95117W1RT3	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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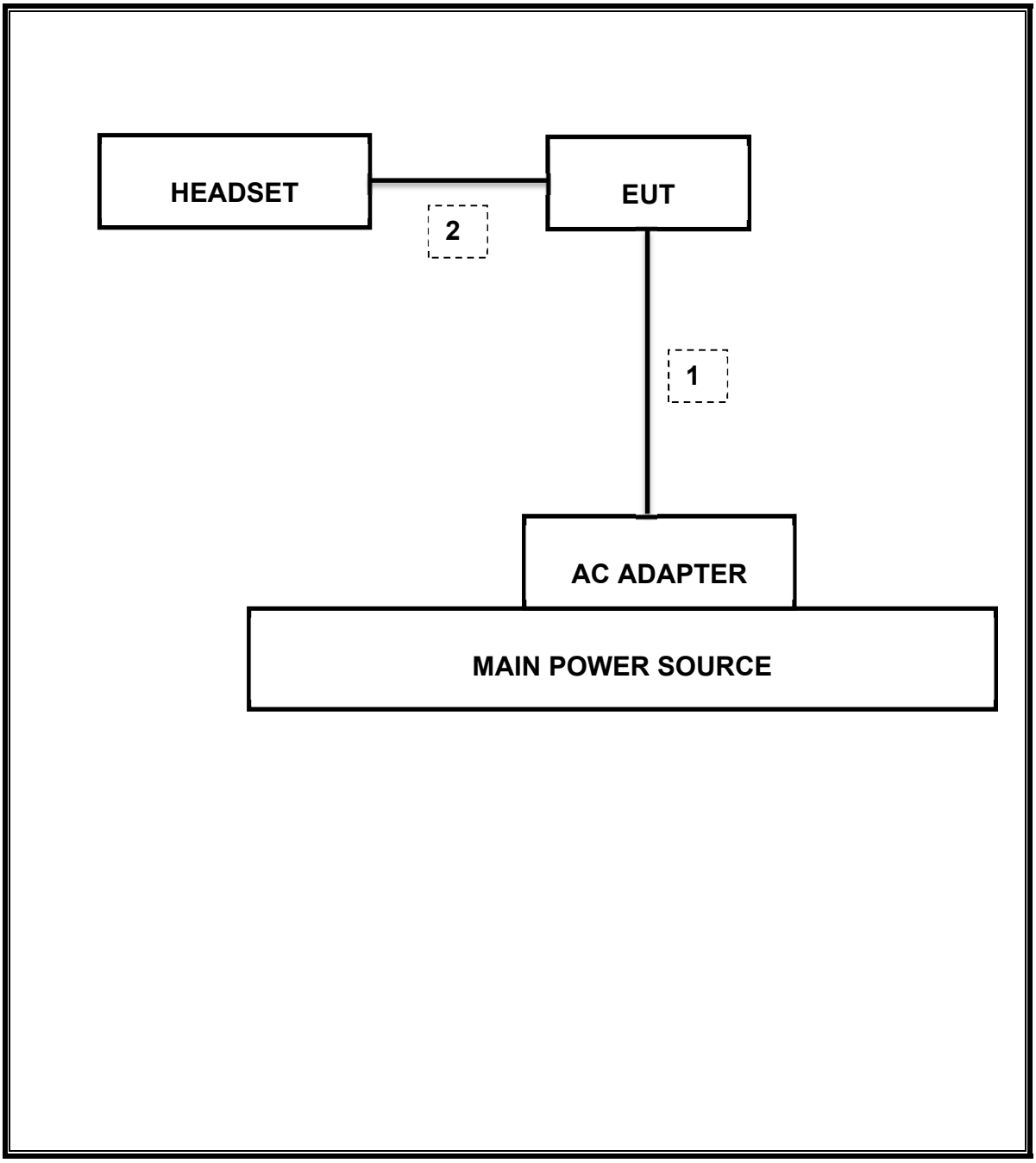
SETUP DIAGRAM FOR TESTS



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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, 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 v03r04: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §10.5 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.

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8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

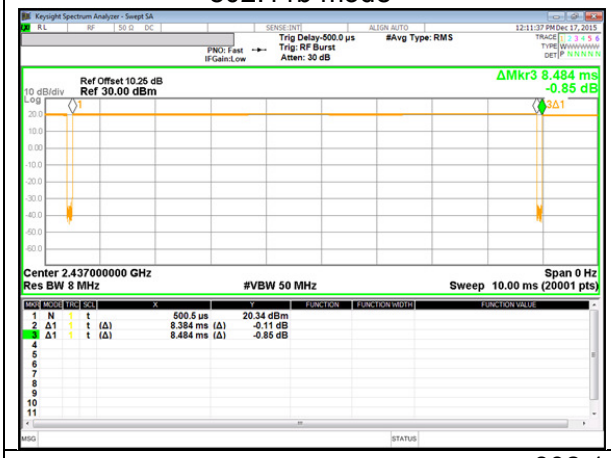
LIMITS

None; for reporting purposes only.

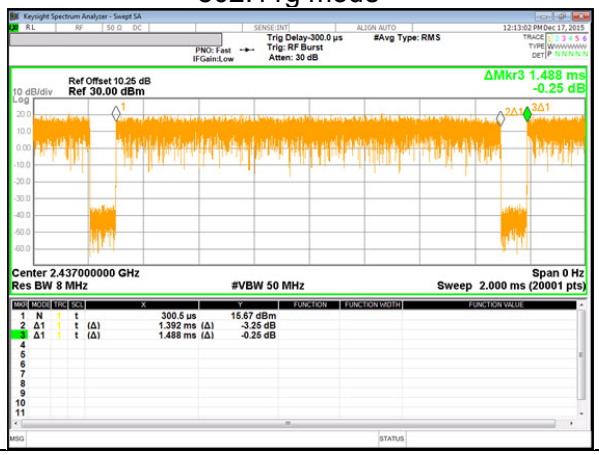
8.1. ON TIME AND DUTY CYCLE RESULTS

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	8.384	8.484	0.988	98.8%	0.00	0.010
802.11g	1.392	1.488	0.935	93.5%	0.29	0.718
802.11n HT20	1.173	1.269	0.924	92.4%	0.34	0.853

802.11b mode



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	8.582 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass	-30.653 dBm
15.247	TX conducted output power	<30dBm		Pass	16.14 dBm
15.247	PSD	<8dBm		Pass	-12.317 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	44.03 dBuV (QP)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	50.41 dBuV/m (AV)

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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 v03r04: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

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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	9.519	0.5
Mid	2437	8.582	0.5
High	2462	9.534	0.5
Worst		8.582	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	15.728	0.5
Mid	2437	15.113	0.5
High	2462	15.714	0.5
Worst		15.113	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	16.222	0.5
Mid	2437	15.747	0.5
High	2462	16.334	0.5
Worst		15.747	0.5

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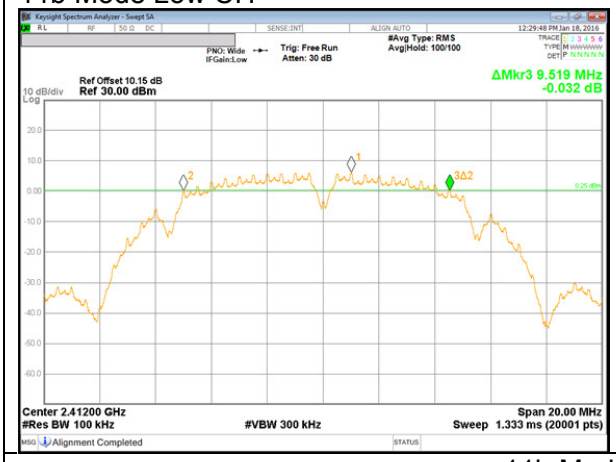
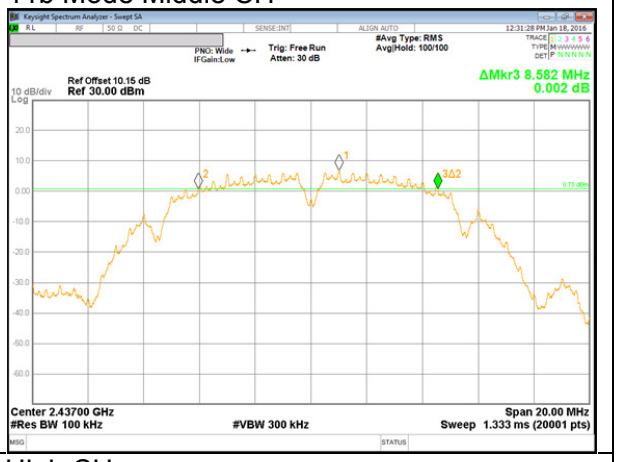
10.1.4. 6 dB BANDWIDTH PLOTS

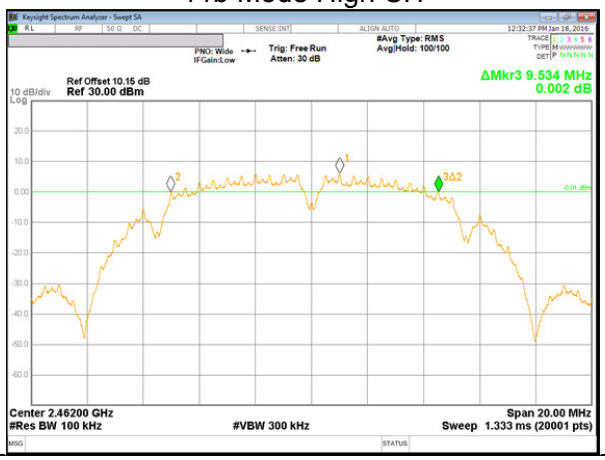
11b Mode Low CH



11b Mode Middle CH



11b Mode High CH



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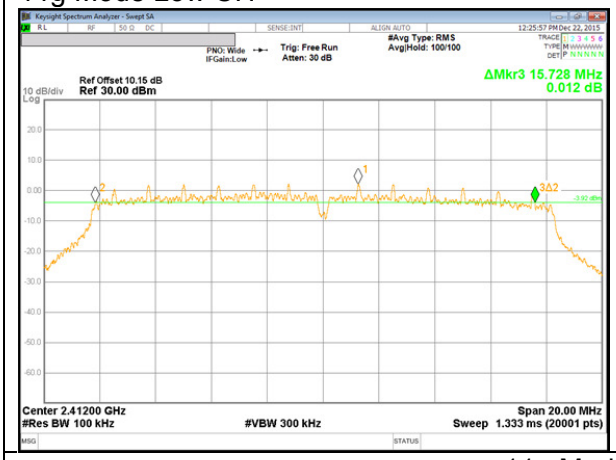
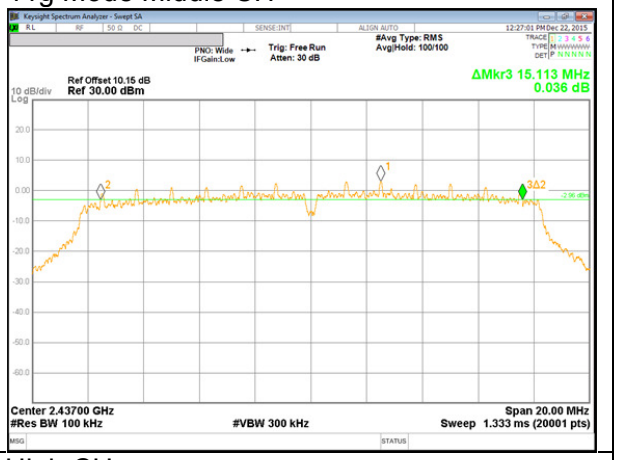
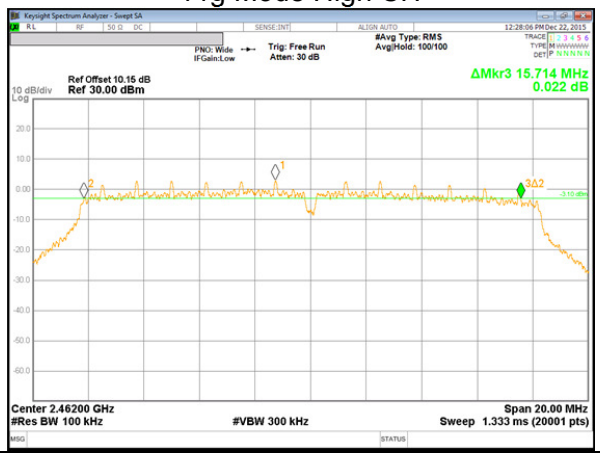
11g Mode Low CH



11g Mode Middle CH



11g Mode High CH



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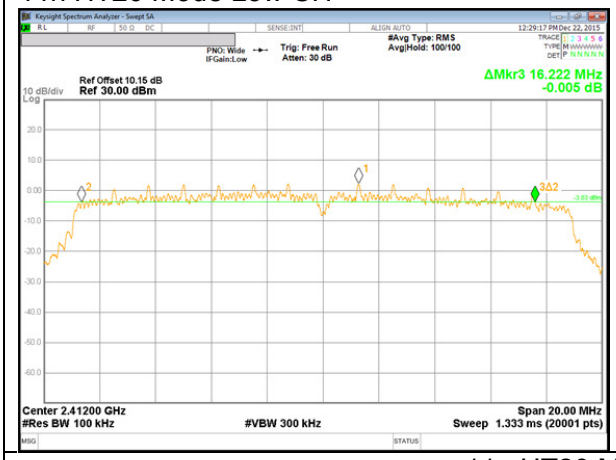
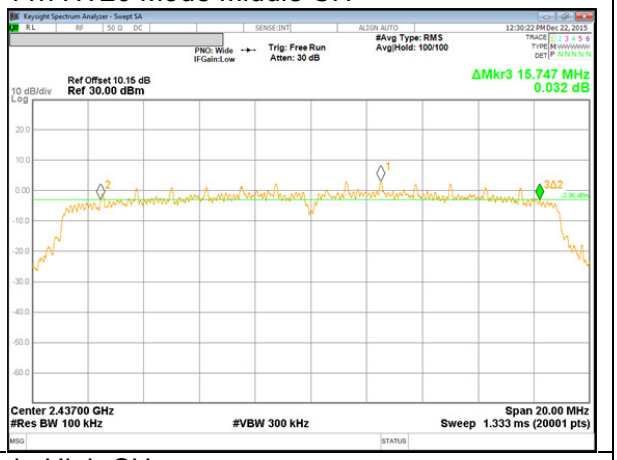
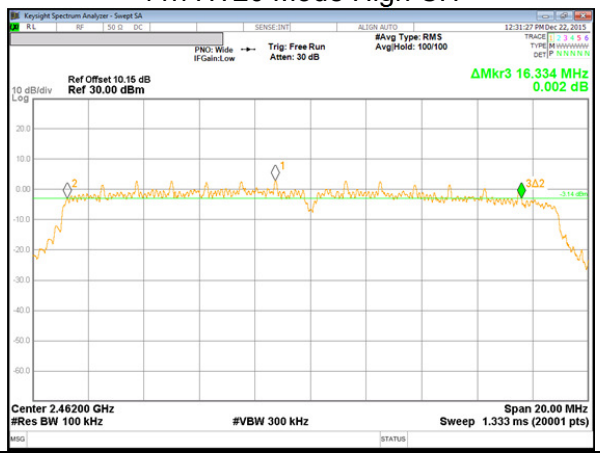
11n HT20 Mode Low CH



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	11.553
Mid	2437	11.175
High	2462	11.413
Worst		11.553

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.405
Mid	2437	16.357
High	2462	16.421
Worst		16.421

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.563
Mid	2437	17.536
High	2462	17.576
Worst		17.576

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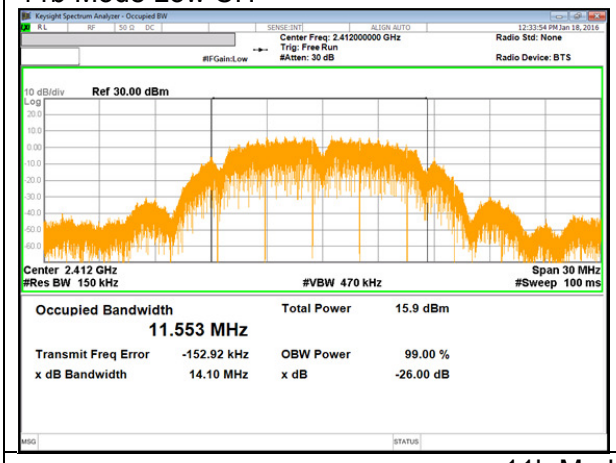
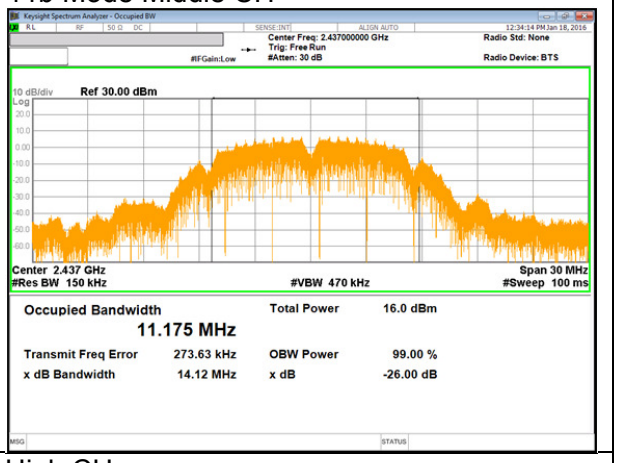
10.2.4. 99% BANDWIDTH PLOTS

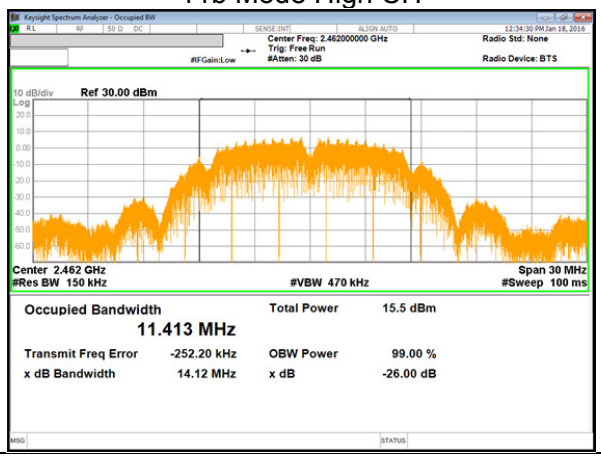
11b Mode Low CH



11b Mode Middle CH



11b Mode High CH



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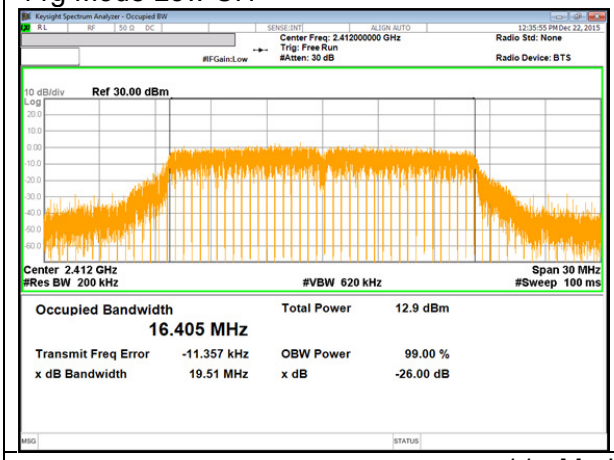
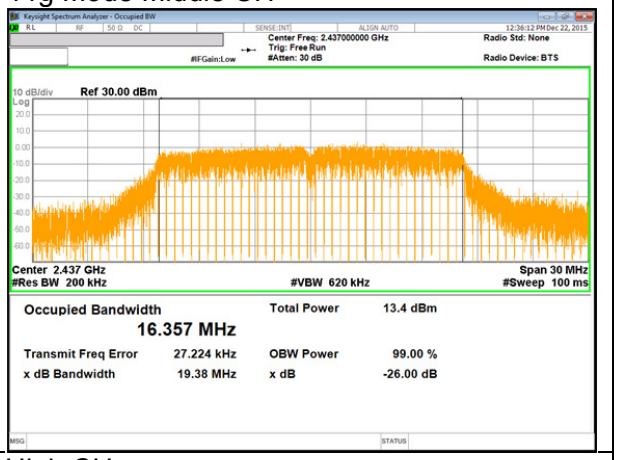
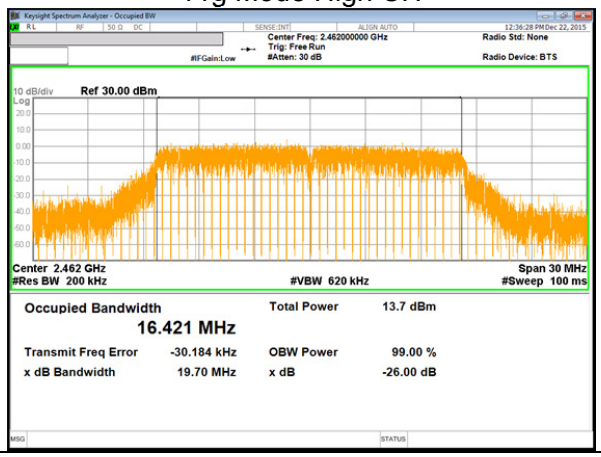
11g Mode Low CH



11g Mode Middle CH



11g Mode High CH



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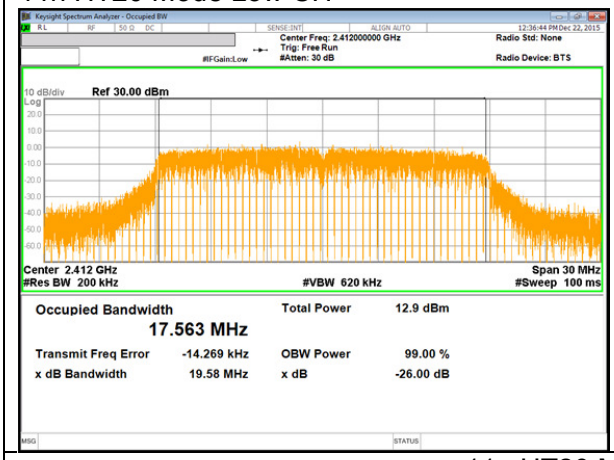
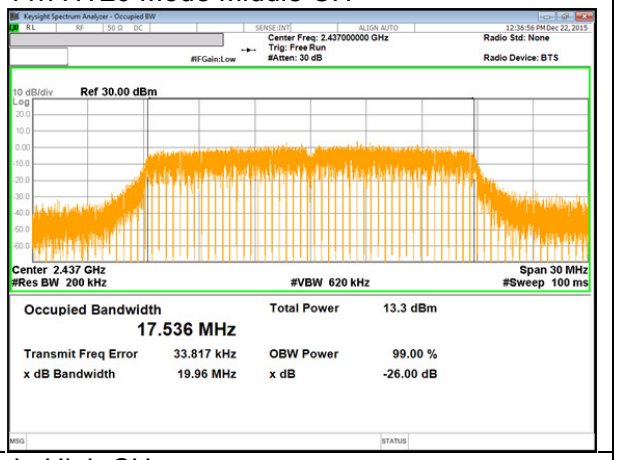
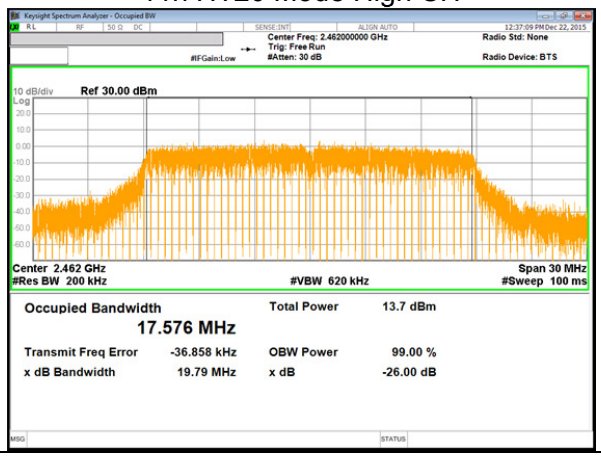
11n HT20 Mode Low CH



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	1.28	30.00	30.00	36.00	30.00
Mid	2437	1.28	30.00	30.00	36.00	30.00
High	2462	1.28	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	16.14	16.14	30.00	-13.86
Mid	2437	16.09	16.09	30.00	-13.91
High	2462	15.7	15.70	30.00	-14.30
Worst			16.14	30.00	-13.86

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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	1.28	30.00	30.00	36.00	30.00
Mid	2437	1.28	30.00	30.00	36.00	30.00
High	2462	1.28	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	13.48	13.48	30.00	-16.52
Mid	2437	13.99	13.99	30.00	-16.01
High	2462	14.28	14.28	30.00	-15.72
Worst			14.28	30.00	-15.72

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	1.28	30.00	30.00	36.00	30.00
Mid	2437	1.28	30.00	30.00	36.00	30.00
High	2462	1.28	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	13.35	13.35	30.00	-16.65
Mid	2437	13.89	13.89	30.00	-16.11
High	2462	14.20	14.20	30.00	-15.80
Worst			14.20	30.00	-15.80

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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 v03r04

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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	-12.317	0.00	-12.317	8.00	-20.317
Mid	2437	-13.262	0.00	-13.262	8.00	-21.262
High	2462	-14.442	0.00	-14.442	8.00	-22.442

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	-19.235	0.29	-18.945	8.00	-27.235
Mid	2437	-18.921	0.29	-18.631	8.00	-26.921
High	2462	-18.533	0.29	-18.243	8.00	-26.533

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	-19.653	0.34	-19.313	8.00	-27.653
Mid	2437	-18.95	0.34	-18.610	8.00	-26.950
High	2462	-19.139	0.34	-18.799	8.00	-27.139

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10.4.4. PSD PLOTS

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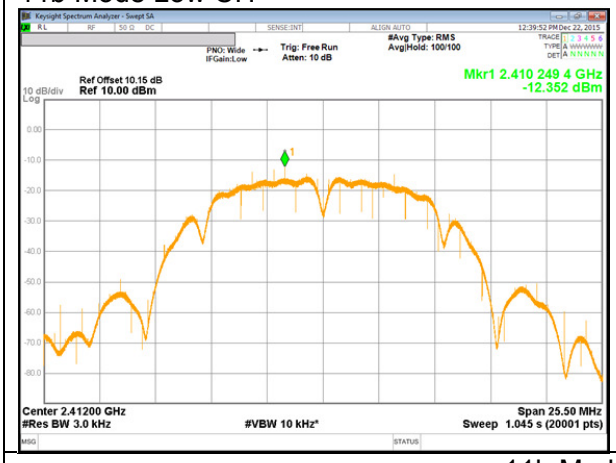
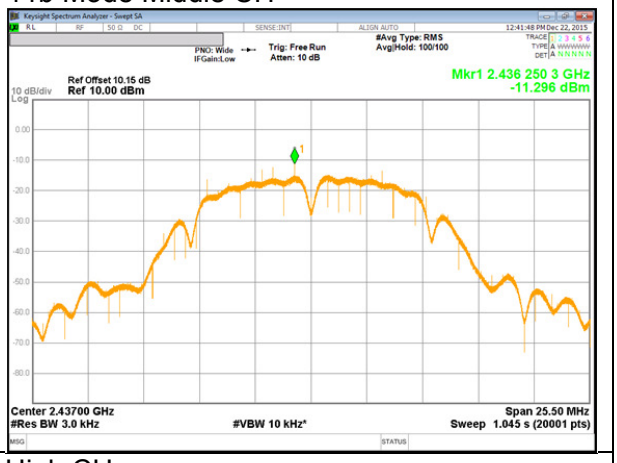
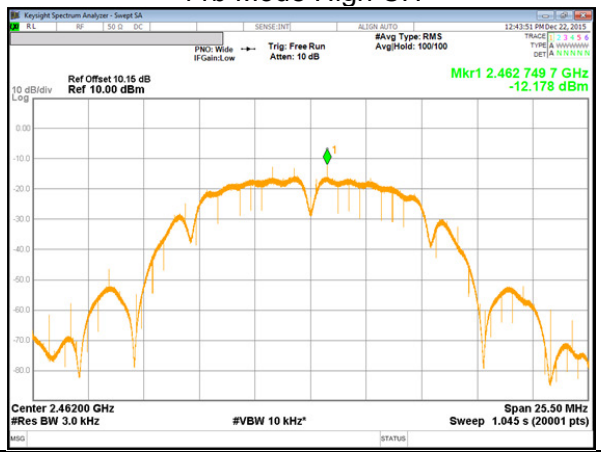


11b Mode Middle CH



11b Mode High CH



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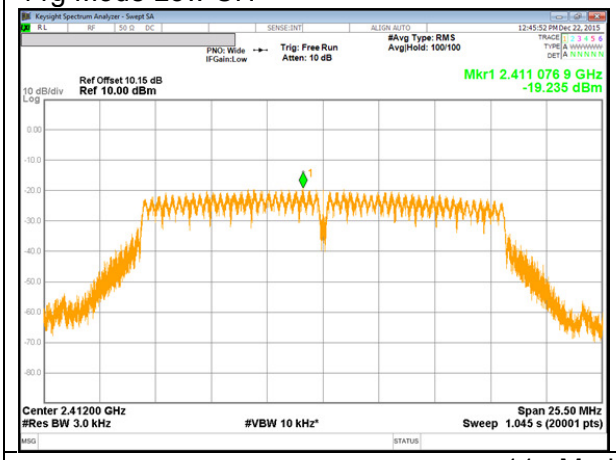
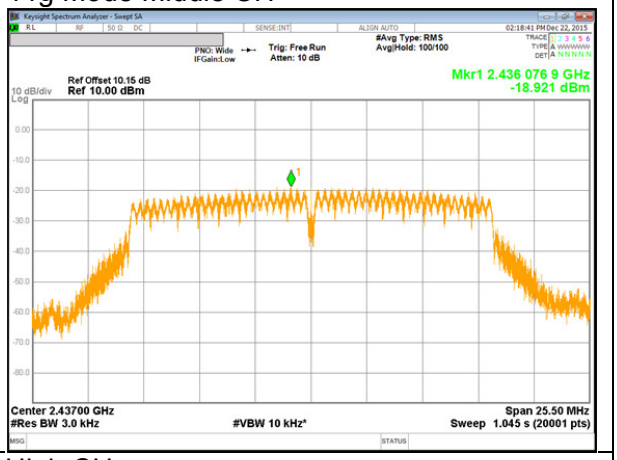
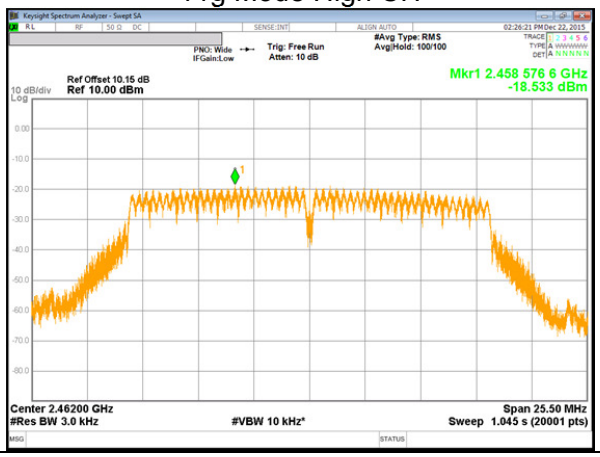
11g Mode Low CH



11g Mode Middle CH



11g Mode High CH



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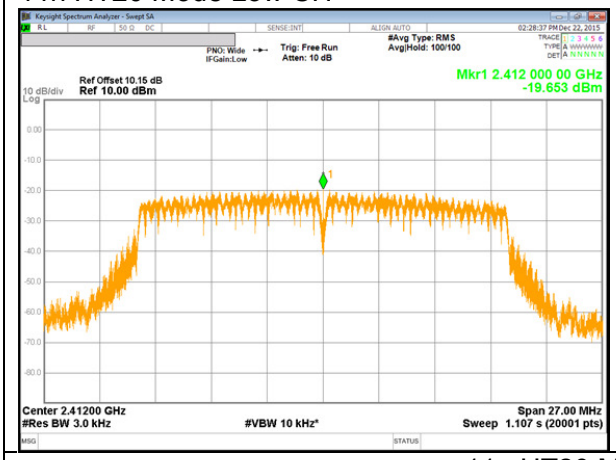
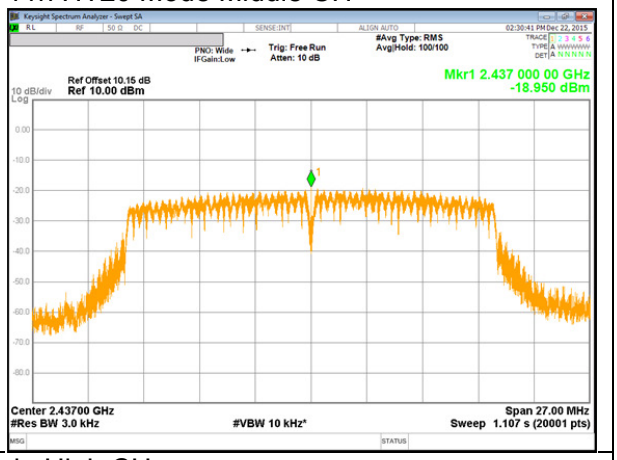
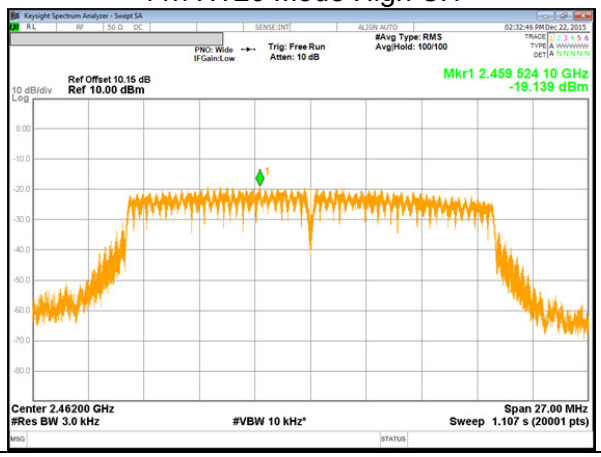
11n HT20 Mode Low CH



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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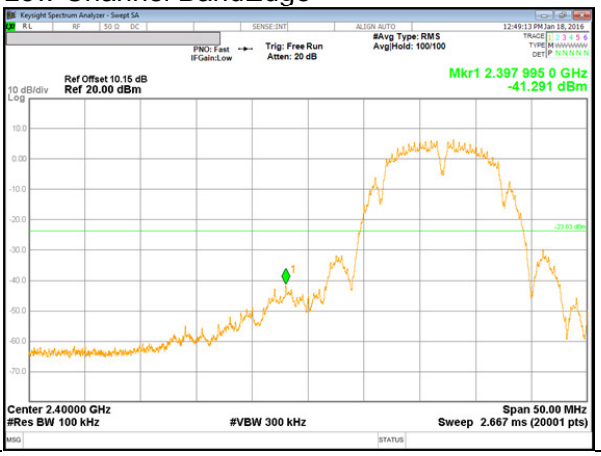
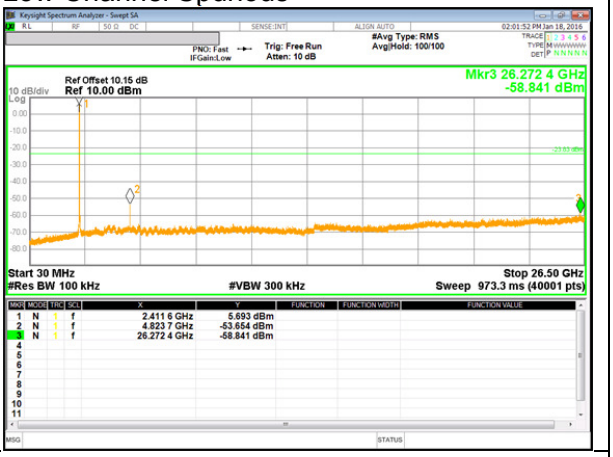
RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

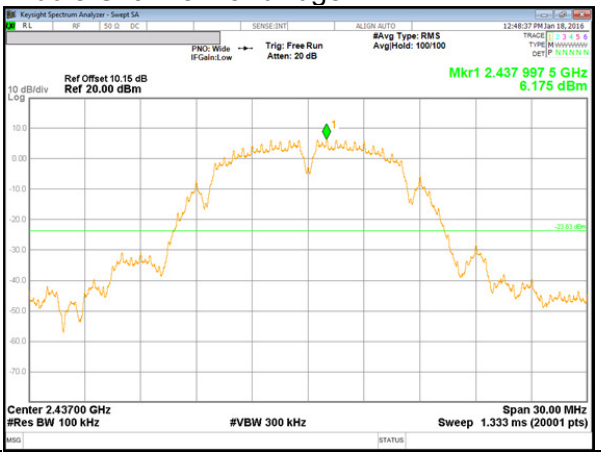
Low Channel BandEdge



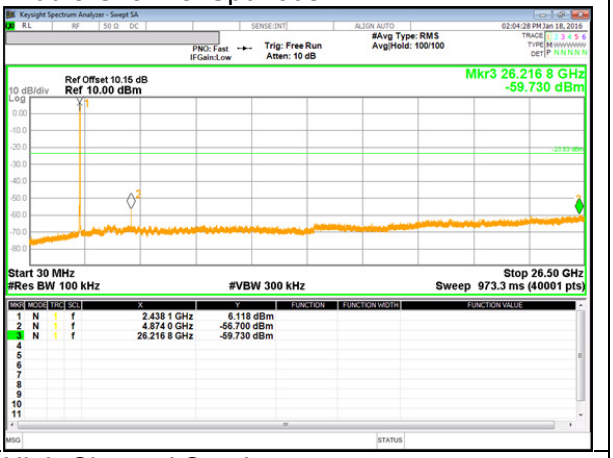
Low Channel Spurious



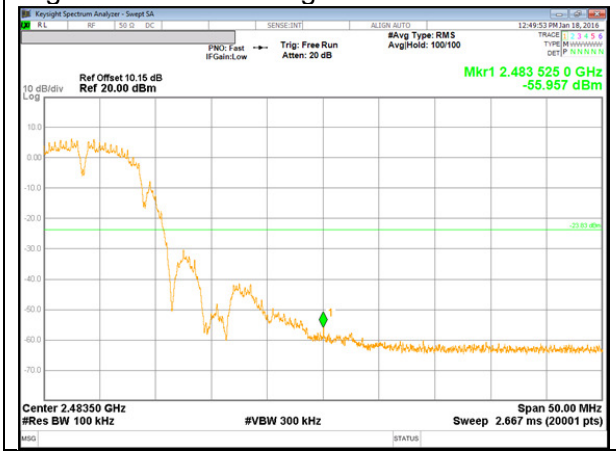
Middle Channel BandEdge



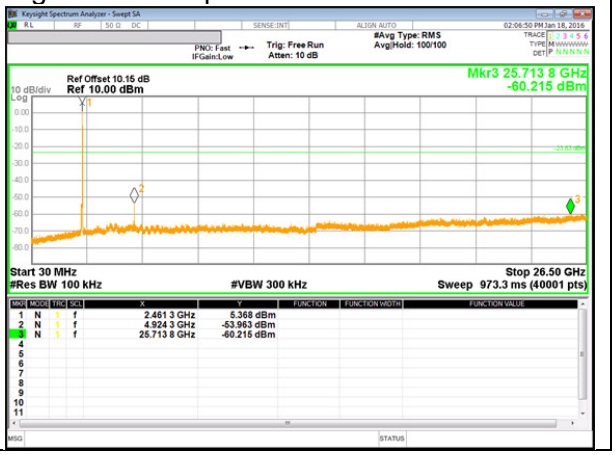
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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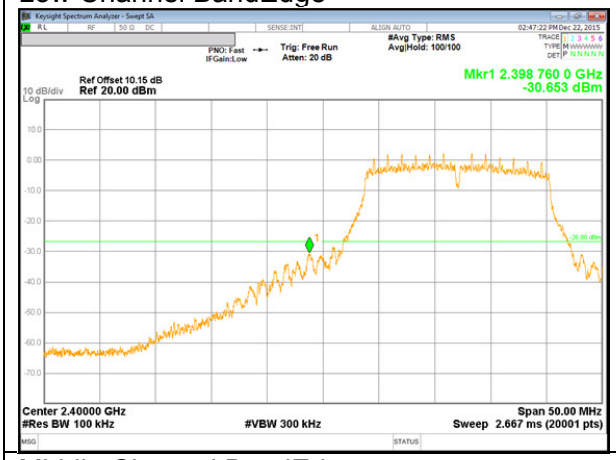
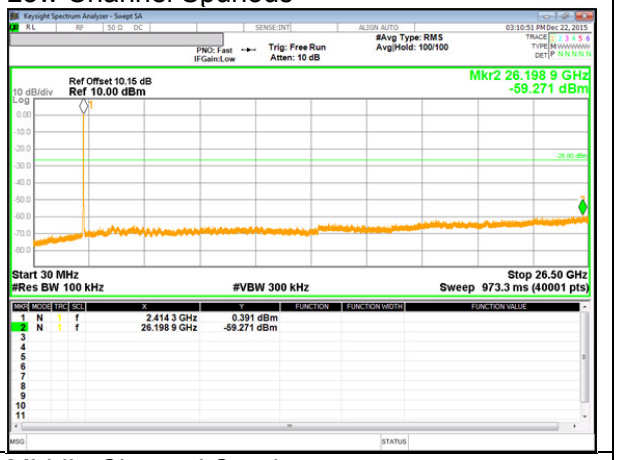
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

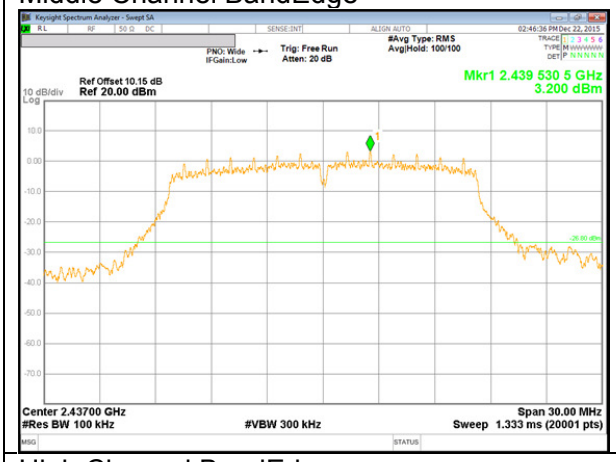
Low Channel BandEdge



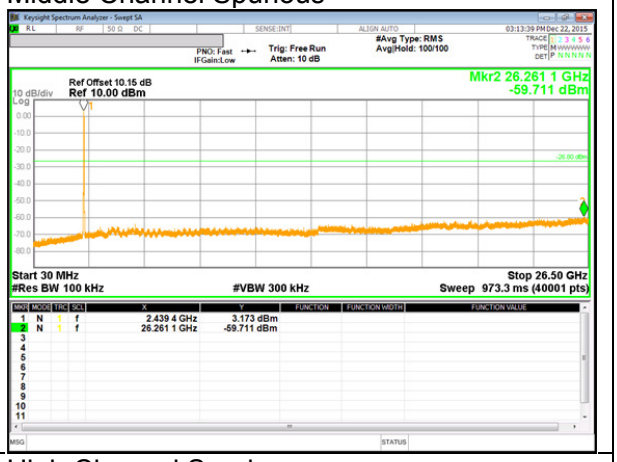
Low Channel Spurious



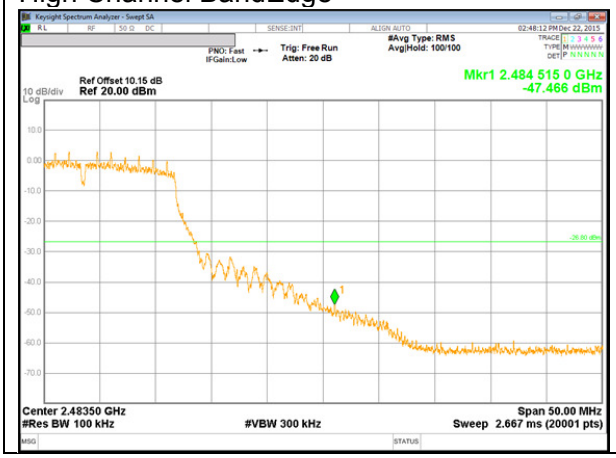
Middle Channel BandEdge



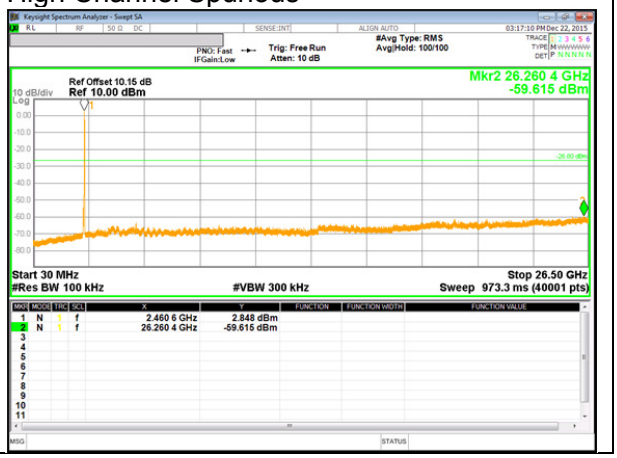
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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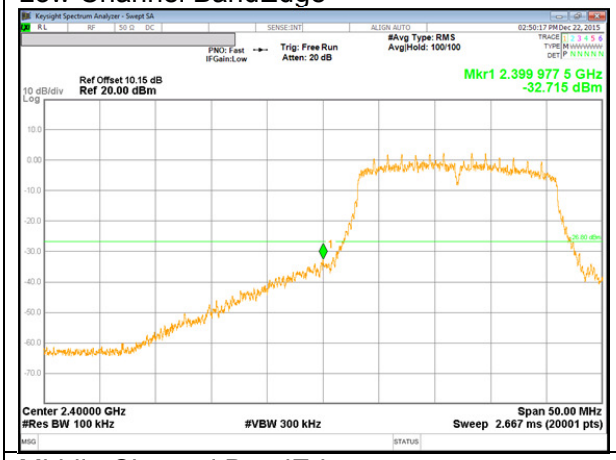
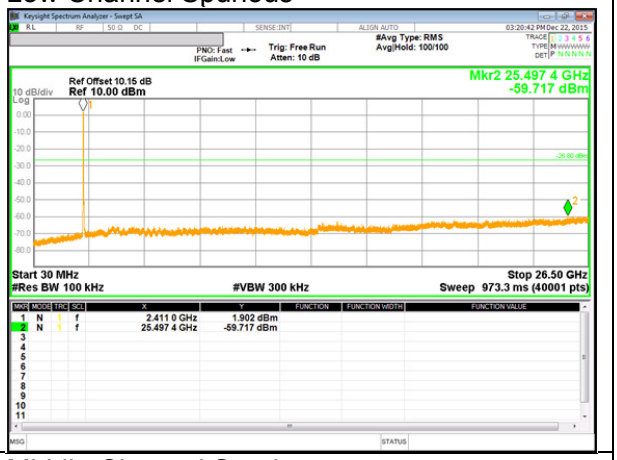
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

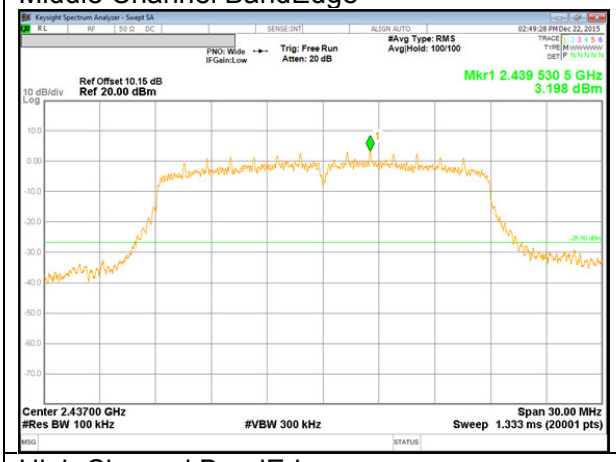
Low Channel BandEdge



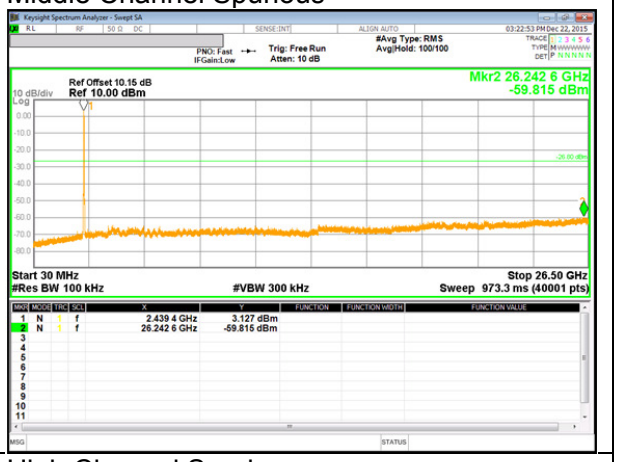
Low Channel Spurious



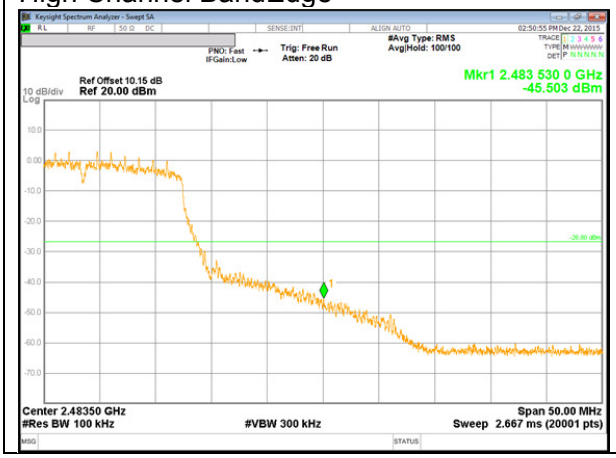
Middle Channel BandEdge



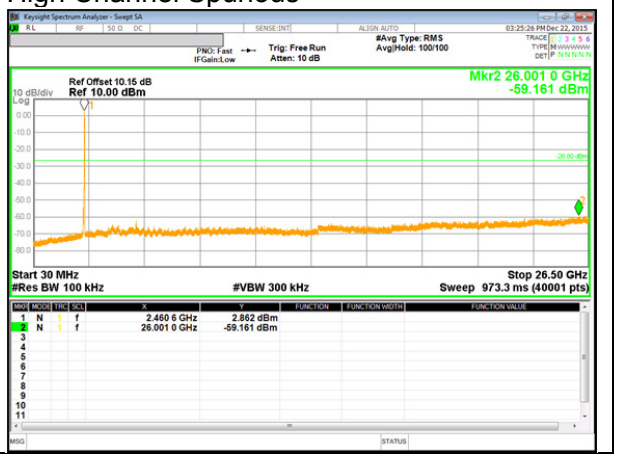
Middle Channel Spurious



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 = 0.34dB.

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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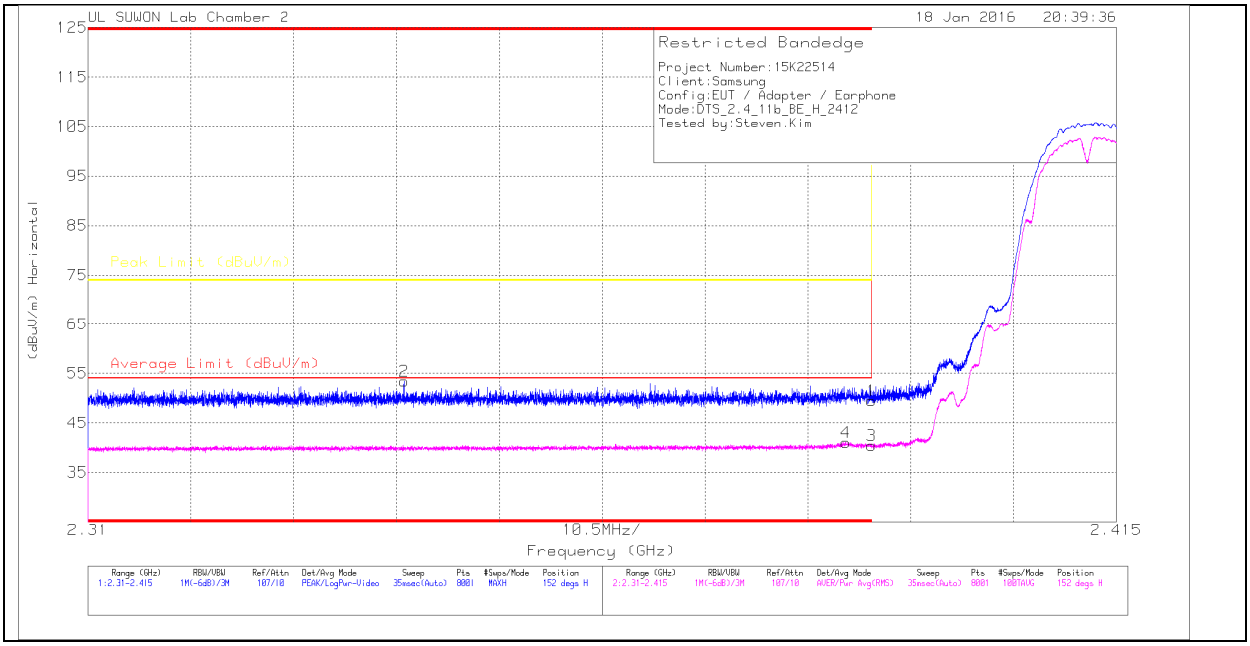
11.2. TRANSMITTER ABOVE 1 GHz

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(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	37.3	Pk	31.7	-19.5	0	49.5	-	-	74	-24.5	152	249	H
2	* 2.342	41.45	Pk	31.6	-19.6	0	53.45	-	-	74	-20.55	152	249	H
3	* 2.39	28.26	RMS	31.7	-19.5	0	40.46	54	-13.54	-	-	152	249	H
4	* 2.387	28.89	RMS	31.7	-19.5	0	41.09	54	-12.91	-	-	152	249	H

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

Pk - Peak detector

RMS - RMS detection

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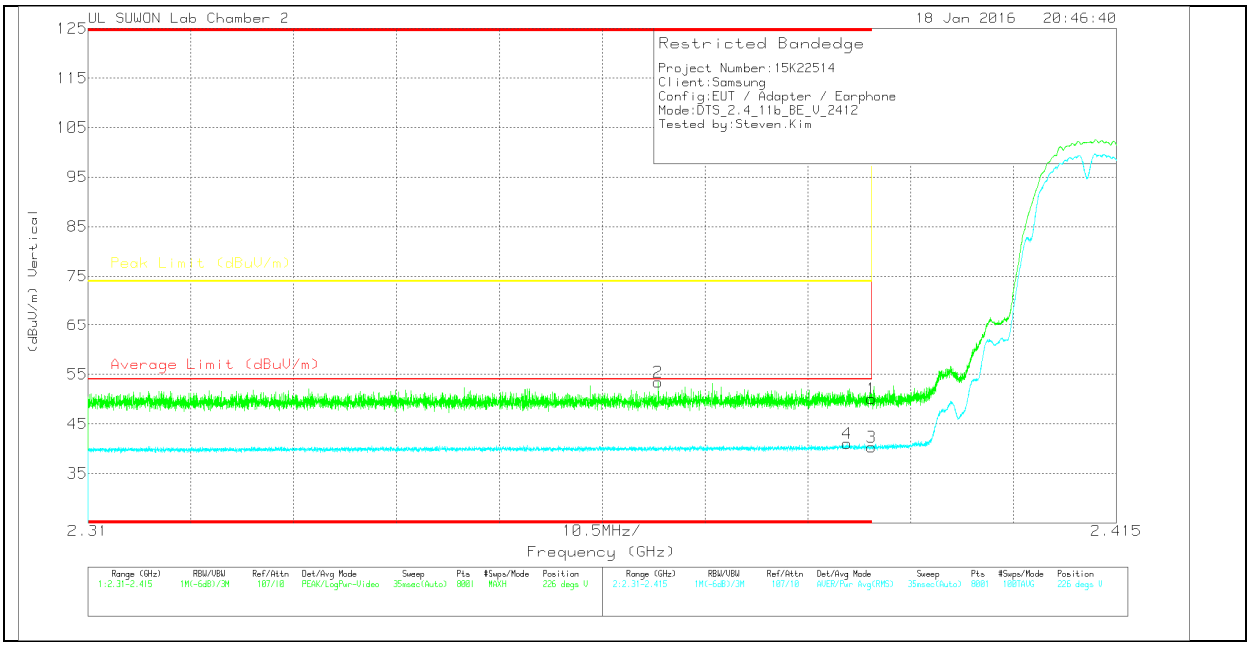
VERTICAL PEAK AND AVERAGE PLOT



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	37.9	Pk	31.7	-19.5	0	50.1	-	-	74	-23.9	226	378	V
2	* 2.368	41.29	Pk	31.7	-19.6	0	53.39	-	-	74	-20.61	226	378	V
3	* 2.39	28.06	RMS	31.7	-19.5	0	40.26	54	-13.74	-	-	226	378	V
4	* 2.388	28.89	RMS	31.7	-19.5	0	41.09	54	-12.91	-	-	226	378	V

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

Pk - Peak detector

RMS - RMS detection

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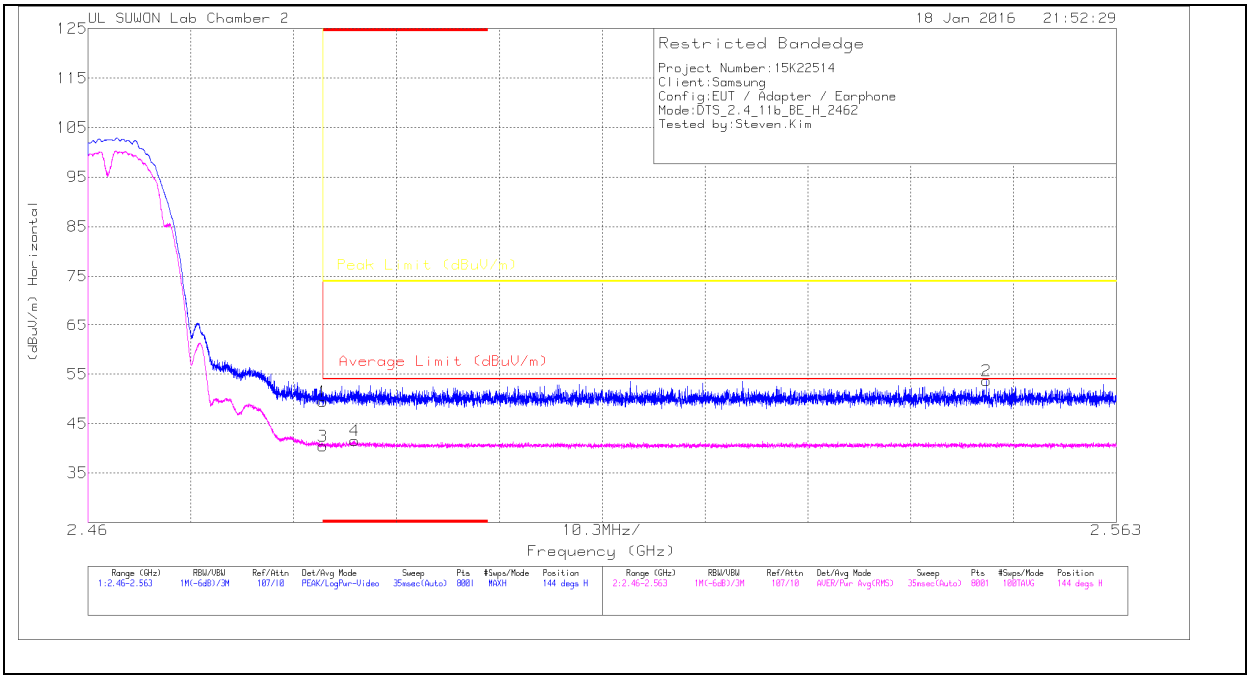
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

e 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	37.11	Pk	31.8	-19.4	0	49.51	-	-	74	-24.49	144	100	H
2	2.55	41.08	Pk	31.9	-19.3	0	53.68	-	-	74	-20.32	144	100	H
3	* 2.484	27.99	RMS	31.8	-19.4	0	40.39	54	-13.61	-	-	144	100	H
4	* 2.487	29.14	RMS	31.8	-19.4	0	41.54	54	-12.46	-	-	144	100	H

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

Pk - Peak detector

RMS - RMS detection

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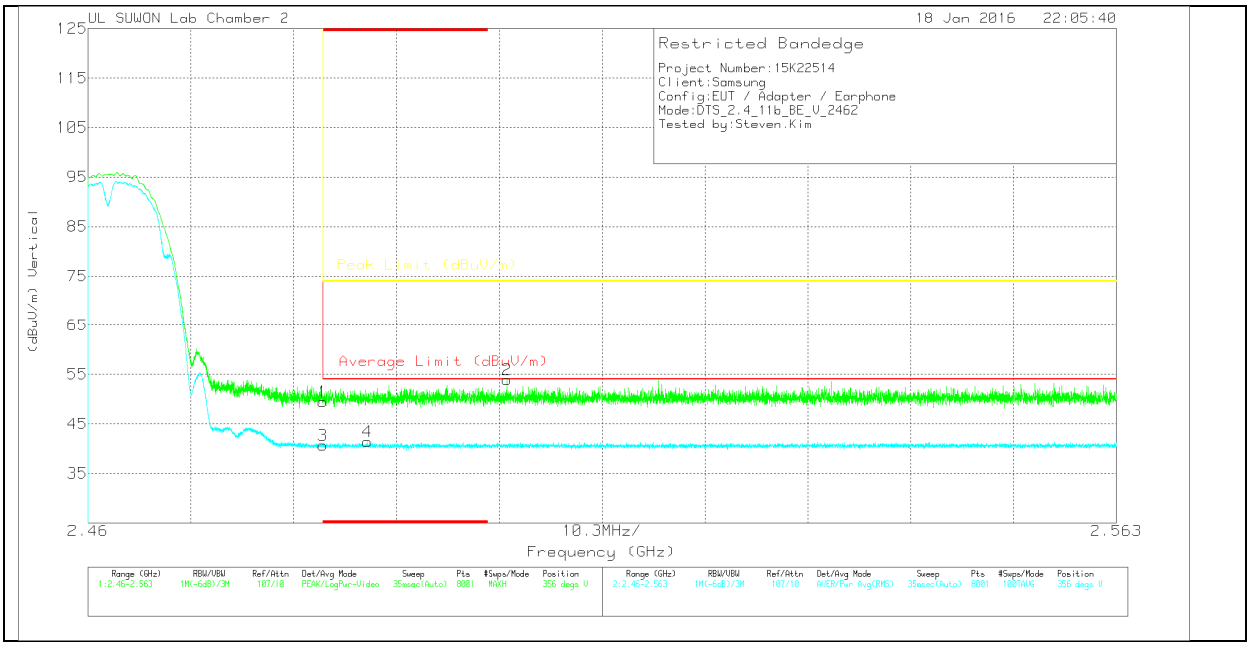
VERTICAL PEAK AND AVERAGE PLOT



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	37.1	Pk	31.8	-19.4	0	49.5	-	-	74	-24.5	356	228	V
2	2.502	41.27	Pk	31.9	-19.3	0	53.87	-	-	74	-20.13	356	228	V
3	* 2.484	28.27	RMS	31.8	-19.4	0	40.67	54	-13.33	-	-	356	228	V
4	* 2.488	29.06	RMS	31.8	-19.4	0	41.46	54	-12.54	-	-	356	228	V

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

Pk - Peak detector

RMS - RMS detection

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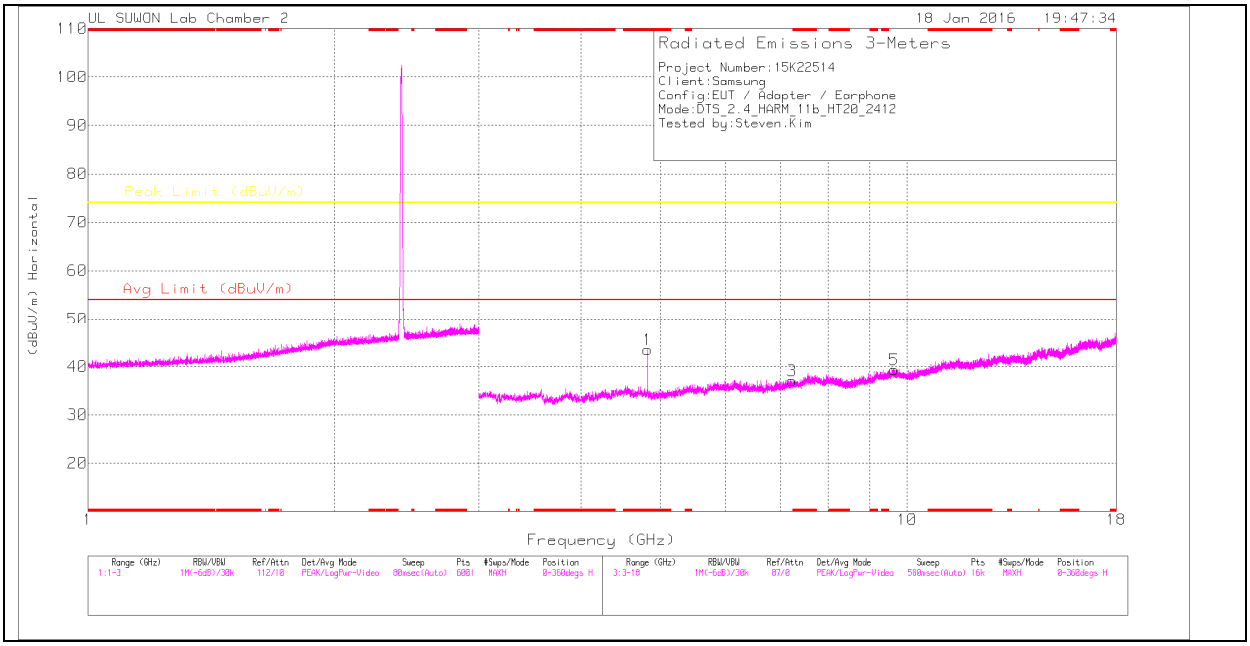
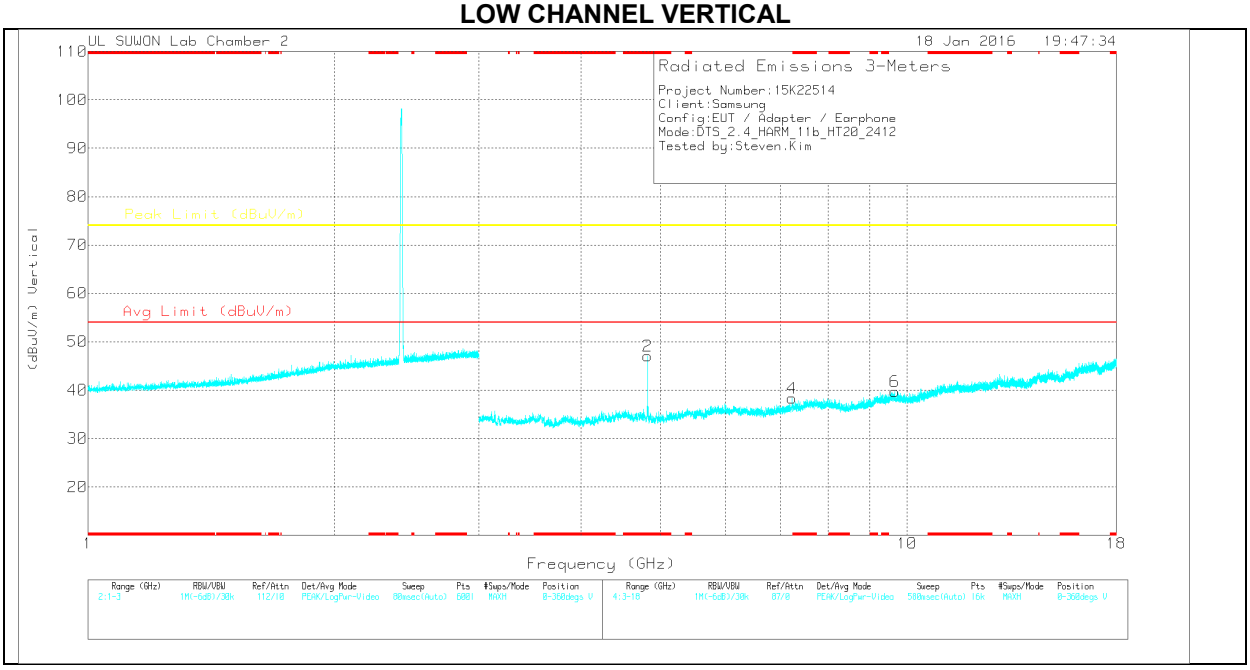
HARMONICS AND SPURIOUS EMISSIONS

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	34.93	PK	33.9	-25.3	0	43.53	-	-	74	-30.47	0-360	200	H
3	7.238	24.31	PK	35.8	-23	0	37.11	-	-	74	-36.89	0-360	100	H
5	9.648	21.41	PK	36.9	-19	0	39.31	-	-	74	-34.69	0-360	100	H
2	* 4.823	38.5	PK	33.9	-25.3	0	47.1	-	-	74	-26.9	0-360	100	V
4	7.238	25.51	PK	35.8	-23	0	38.31	-	-	74	-35.69	0-360	100	V
6	9.65	21.85	PK	36.9	-19	0	39.75	-	-	74	-34.25	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
* 4.824	39.51	PK2	33.9	-25.3	0	48.11	-	-	74	-25.89	172	121	H
* 4.824	32.7	MAv1	33.9	-25.3	0	41.3	54	-12.7	-	-	172	121	H
* 4.824	42.13	PK2	33.9	-25.3	0	50.73	-	-	74	-23.27	354	100	V
* 4.824	37.56	MAv1	33.9	-25.3	0	46.16	54	-7.84	-	-	354	100	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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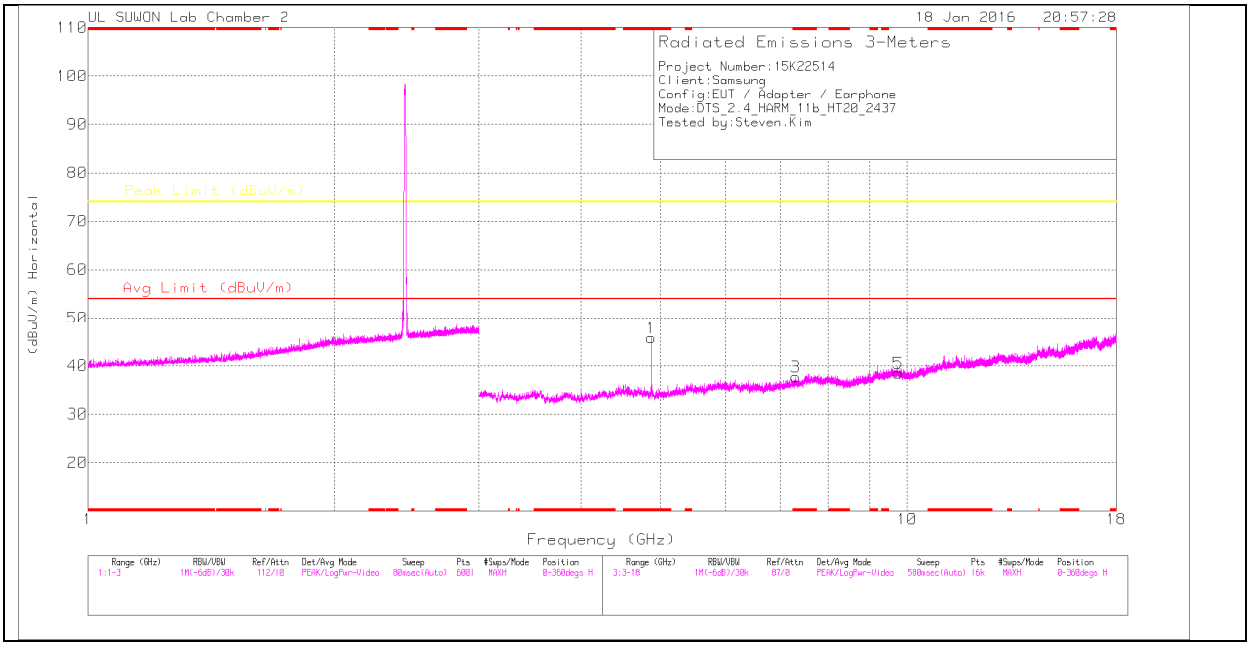
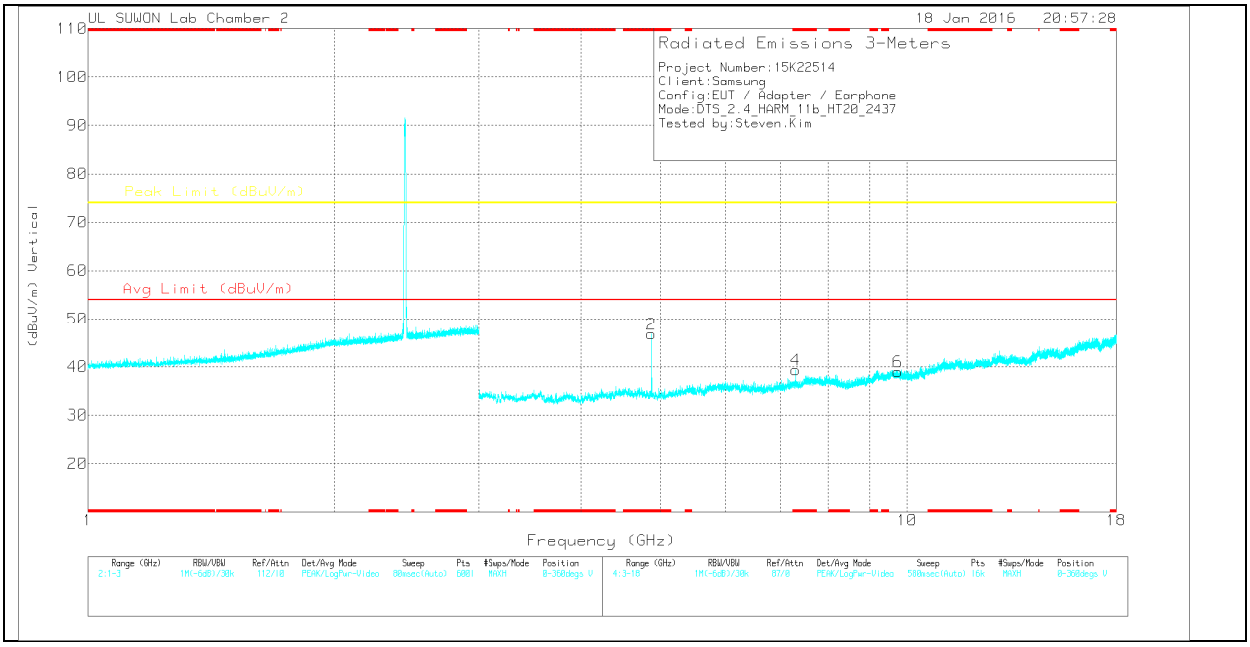
MID CHANNEL HORIZONTAL



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	* 4.874	37.05	Avg	33.9	-25.2	0	45.75	-	-	74	-28.25	0-360	200	H
3	* 7.31	24.43	Avg	35.9	-22.6	0	37.73	-	-	74	-36.27	0-360	100	H
5	9.749	20.78	Avg	37	-19.3	0	38.48	-	-	74	-35.52	0-360	200	H
2	* 4.874	38.13	Avg	33.9	-25.2	0	46.83	-	-	74	-27.17	0-360	200	V
4	* 7.311	26	Avg	35.9	-22.6	0	39.3	-	-	74	-34.7	0-360	100	V
6	9.746	21.27	Avg	37	-19.3	0	38.97	-	-	74	-35.03	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(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
* 4.874	42.21	PK2	33.9	-25.2	0	50.91	-	-	74	-23.09	168	111	H
* 4.874	37.37	MAv1	33.9	-25.2	0	46.07	54	-7.93	-	-	168	111	H
* 4.874	43.44	PK2	33.9	-25.2	0	52.14	-	-	74	-21.86	192	282	V
* 4.874	38.78	MAv1	33.9	-25.2	0	47.48	54	-6.52	-	-	192	282	V
* 7.31	36.51	PK2	35.9	-22.6	0	49.81	-	-	74	-24.19	360	315	V
* 7.312	25.88	MAv1	35.9	-22.6	0	39.18	54	-14.82	-	-	360	315	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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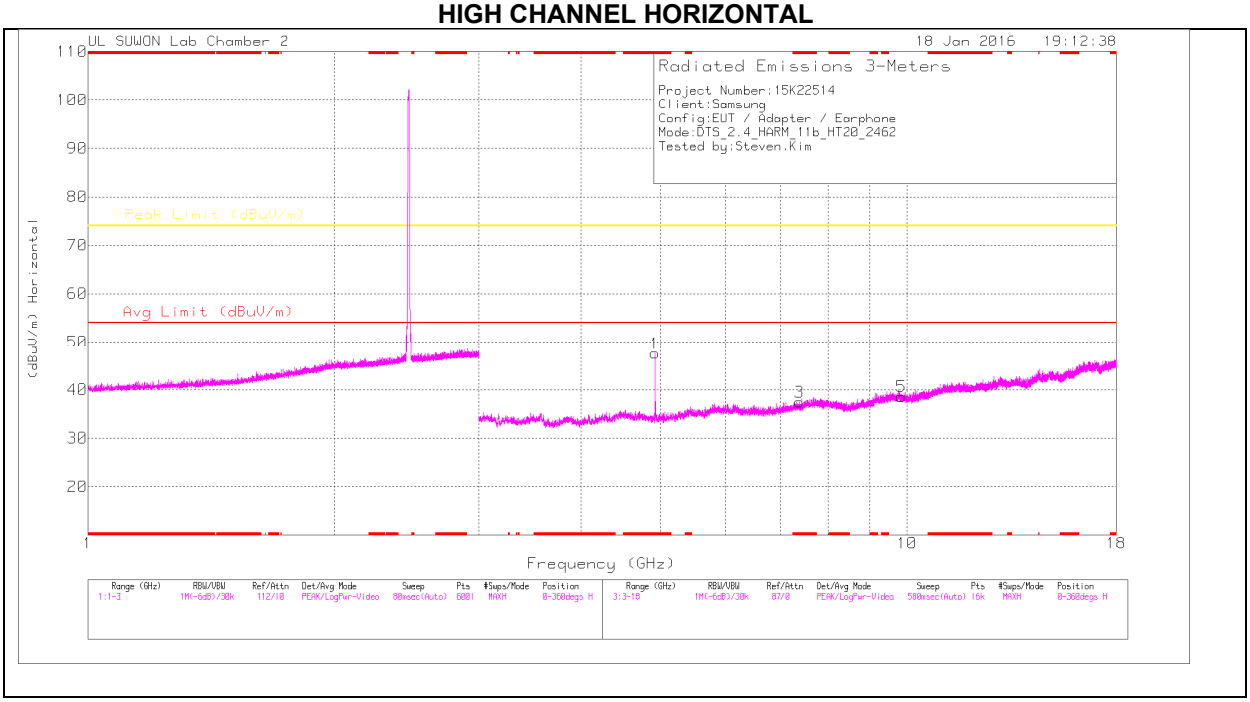
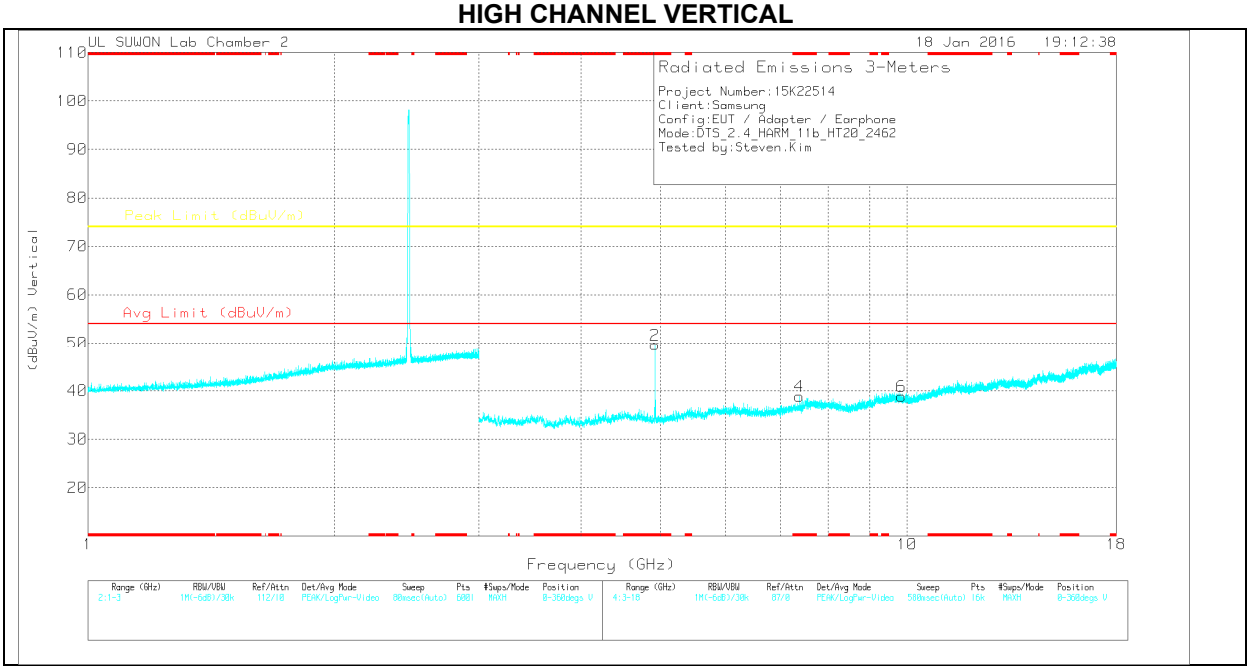
HIGH CHANNEL HORIZONTAL



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(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	38.73	PK	33.9	-25.1	0	47.53	-	-	74	-26.47	0-360	200	H
3	* 7.385	23.75	PK	35.9	-22.2	0	37.45	-	-	74	-36.55	0-360	200	H
5	9.846	20.67	PK	37.1	-19.2	0	38.57	-	-	74	-35.43	0-360	100	H
2	* 4.924	40.83	PK	33.9	-25.1	0	49.63	-	-	74	-24.37	0-360	100	V
4	* 7.385	25.14	PK	35.9	-22.2	0	38.84	-	-	74	-35.16	0-360	100	V
6	9.847	21	PK	37.1	-19.2	0	38.9	-	-	74	-35.1	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
* 4.924	42.78	PK2	33.9	-25.1	0	51.58	-	-	74	-22.42	300	368	H
* 4.924	37.25	MAv1	33.9	-25.1	0	46.05	54	-7.95	-	-	300	368	H
* 4.924	45.35	PK2	33.9	-25.1	0	54.15	-	-	74	-19.85	354	322	V
* 4.924	41.61	MAv1	33.9	-25.1	0	50.41	54	-3.59	-	-	354	322	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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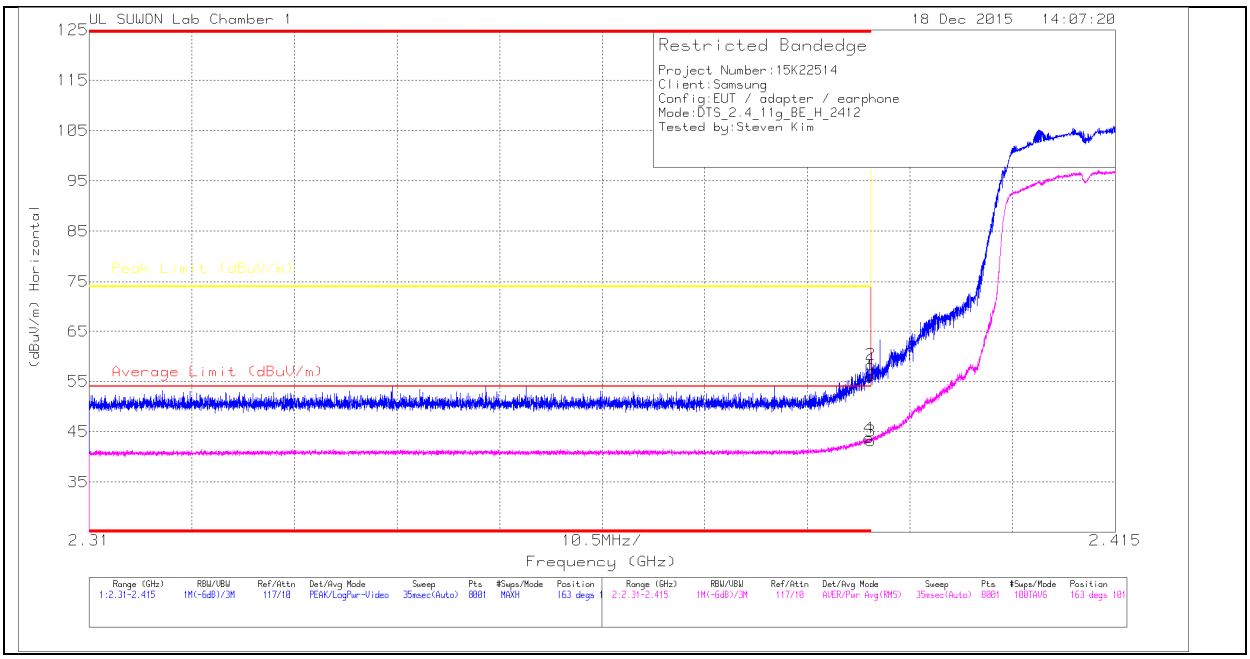
11.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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	53.25	Pk	31.8	-29	0	56.05	-	-	74	-17.95	163	101	H
2	* 2.39	55.53	Pk	31.8	-29	0	58.33	-	-	74	-15.67	163	101	H
3	* 2.39	40.07	RMS	31.8	-29	.29	43.16	54	-10.84	-	-	163	101	H
4	* 2.39	40.7	RMS	31.8	-29	.29	43.79	54	-10.21	-	-	163	101	H

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

Pk - Peak detector

RMS - RMS detection

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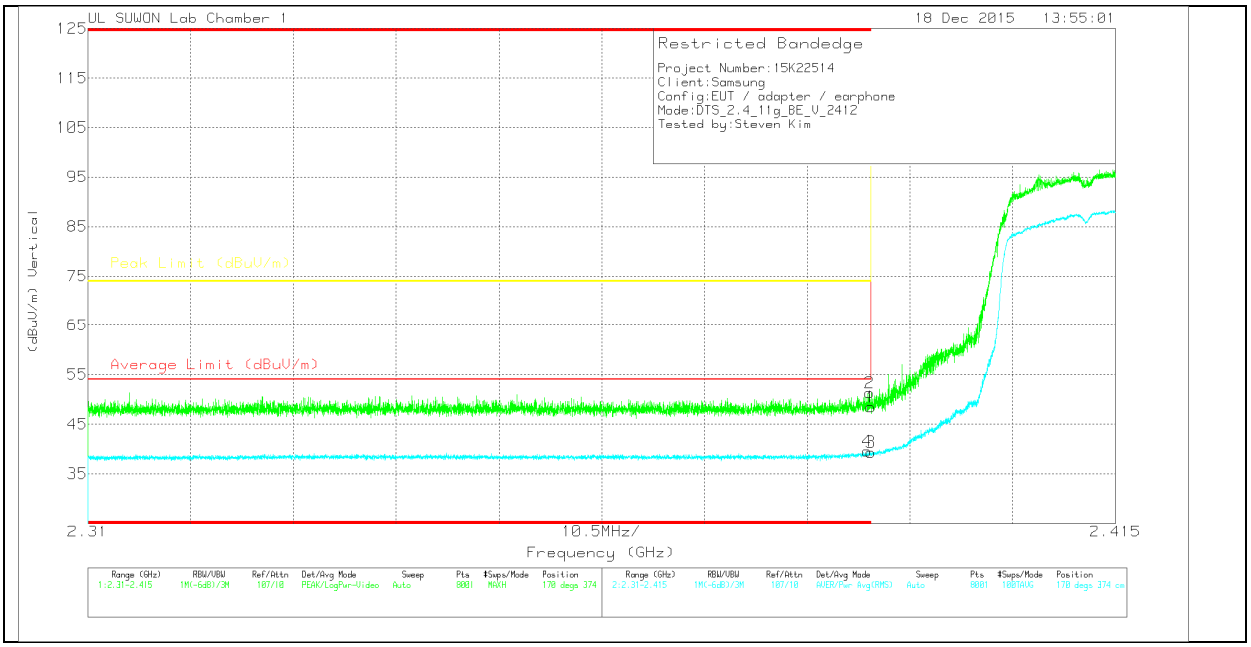
VERTICAL PEAK AND AVERAGE PLOT



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	45.72	Pk	31.8	-29	0	48.52	-	-	74	-25.48	170	374	V
2	* 2.39	48.5	Pk	31.8	-29	0	51.3	-	-	74	-22.7	170	374	V
3	* 2.39	36.29	RMS	31.8	-29	.29	39.38	54	-14.62	-	-	170	374	V
4	* 2.39	36.42	RMS	31.8	-29	.29	39.51	54	-14.49	-	-	170	374	V

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

Pk - Peak detector

RMS - RMS detection

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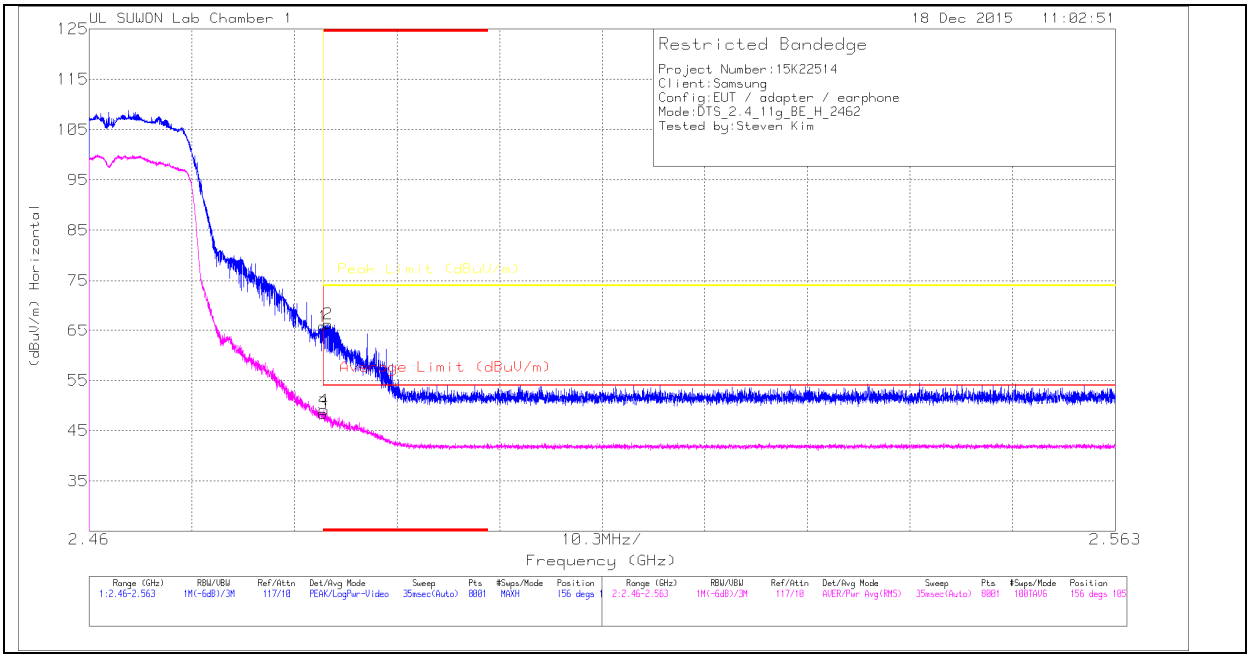
AUTHORIZED BANDEDGE (HIGH CHANNEL)

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	62.23	Pk	32	-28.3	0	65.93	-	-	74	-8.07	156	105	H
2	* 2.484	62.66	Pk	32	-28.3	0	66.36	-	-	74	-7.64	156	105	H
3	* 2.484	44.47	RMS	32	-28.3	.29	48.46	54	-5.54	-	-	156	105	H
4	* 2.484	45.13	RMS	32	-28.3	.29	49.12	54	-4.88	-	-	156	105	H

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

Pk - Peak detector

RMS - RMS detection

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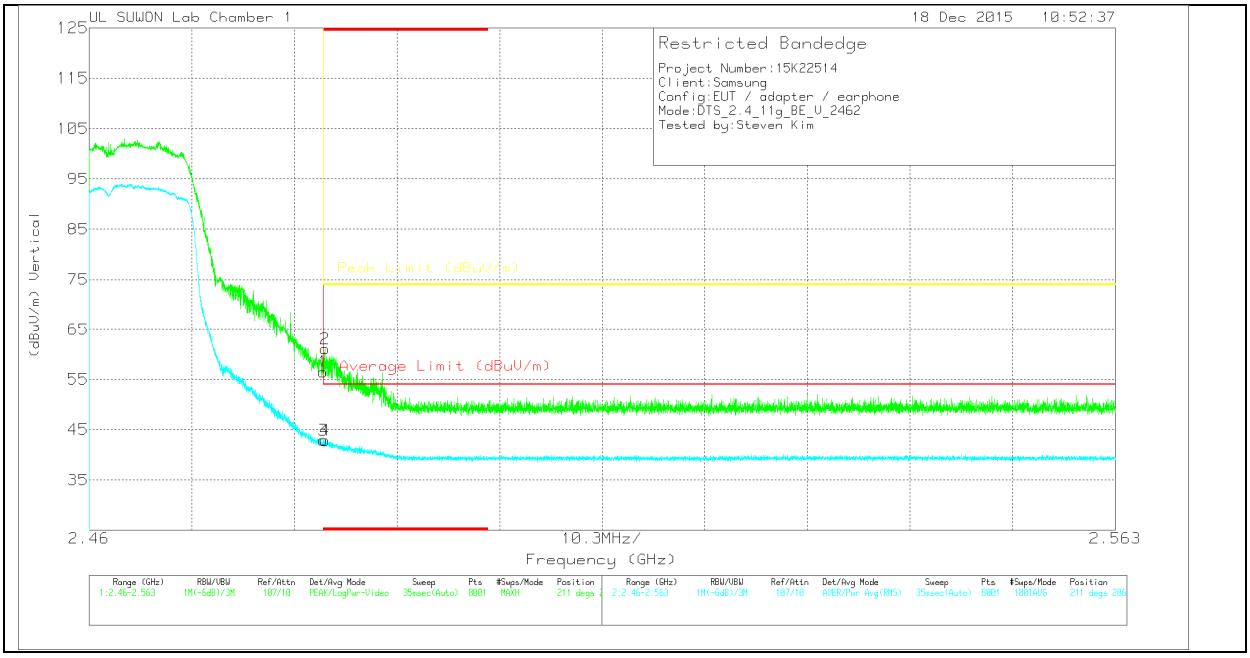
VERTICAL PEAK AND AVERAGE PLOT



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	52.8	Pk	32	-28.3	0	56.5	-	-	74	-17.5	211	286	V
2	* 2.484	57.37	Pk	32	-28.3	0	61.07	-	-	74	-12.93	211	286	V
3	* 2.484	38.94	RMS	32	-28.3	.29	42.93	54	-11.07	-	-	211	286	V
4	* 2.484	38.9	RMS	32	-28.3	.29	42.89	54	-11.11	-	-	211	286	V

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

Pk - Peak detector

RMS - RMS detection

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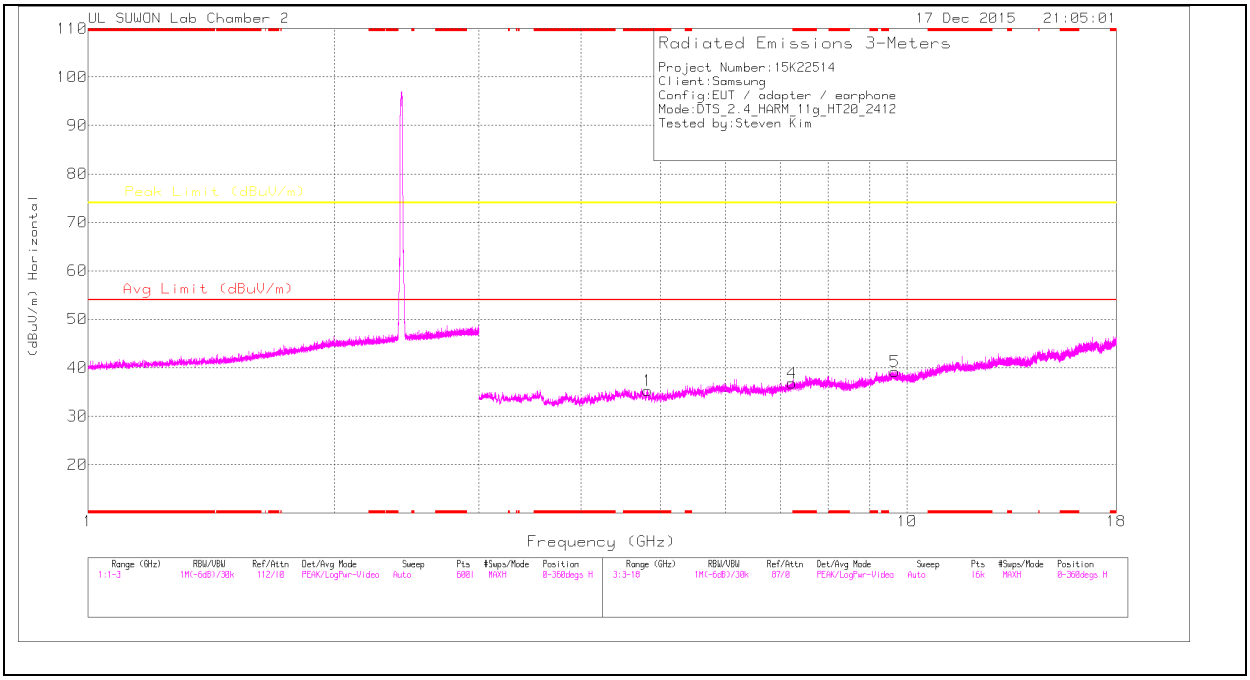
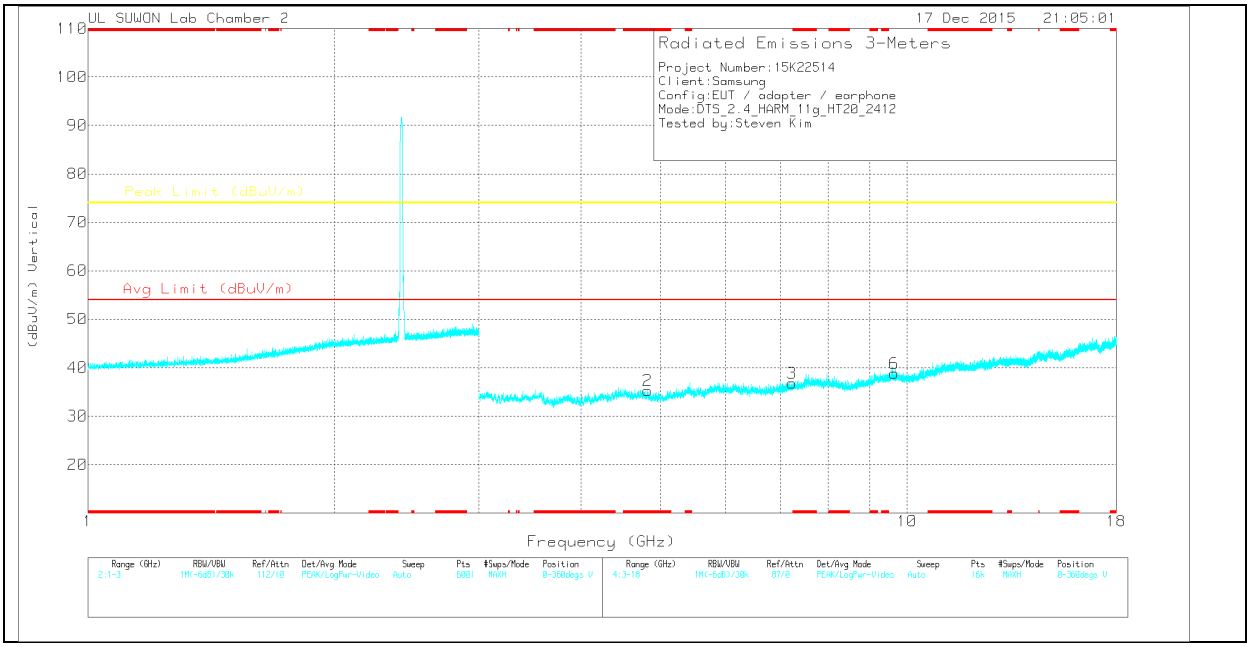
HARMONICS AND SPURIOUS EMISSIONS

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	26.68	Pk	33.9	-25.3	0	35.28	-	-	74	-38.72	0-360	100	H
4	7.237	24.06	Pk	35.8	-23	0	36.86	-	-	74	-37.14	0-360	200	H
5	9.649	21.28	Pk	36.9	-19	0	39.18	-	-	74	-34.82	0-360	100	H
2	* 4.821	26.66	Pk	33.9	-25.3	0	35.26	-	-	74	-38.74	0-360	100	V
3	7.234	24.01	Pk	35.8	-23	0	36.81	-	-	74	-37.19	0-360	100	V
6	9.646	20.98	Pk	36.9	-19	0	38.88	-	-	74	-35.12	0-360	100	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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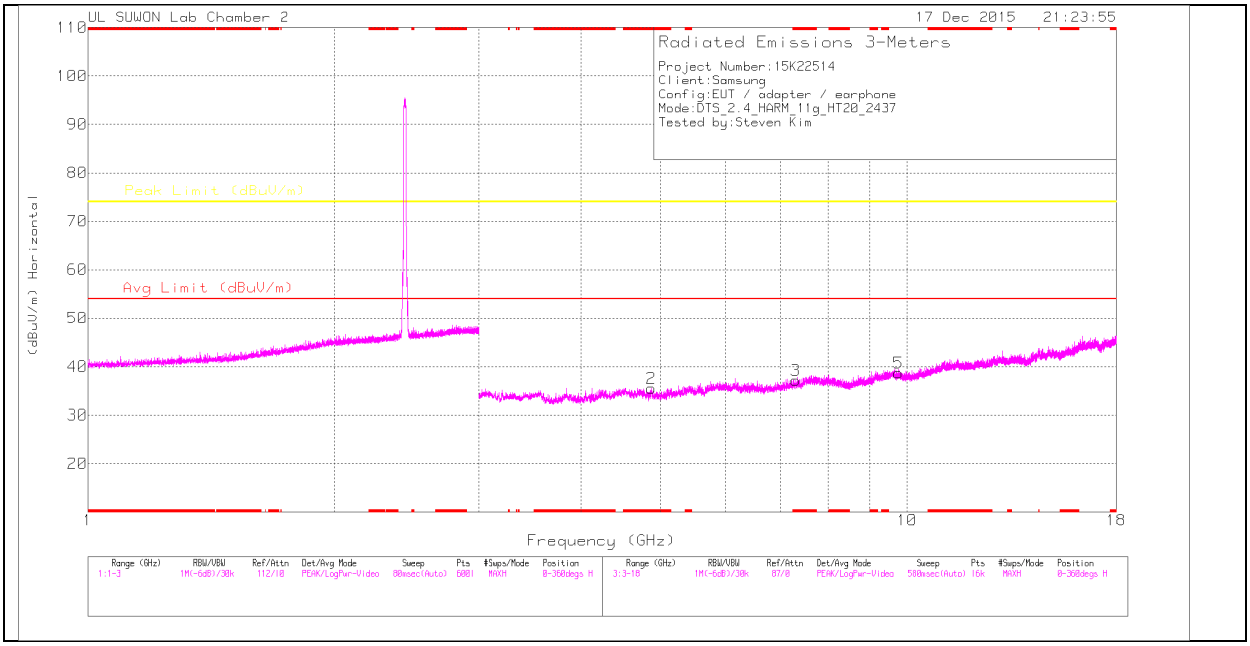
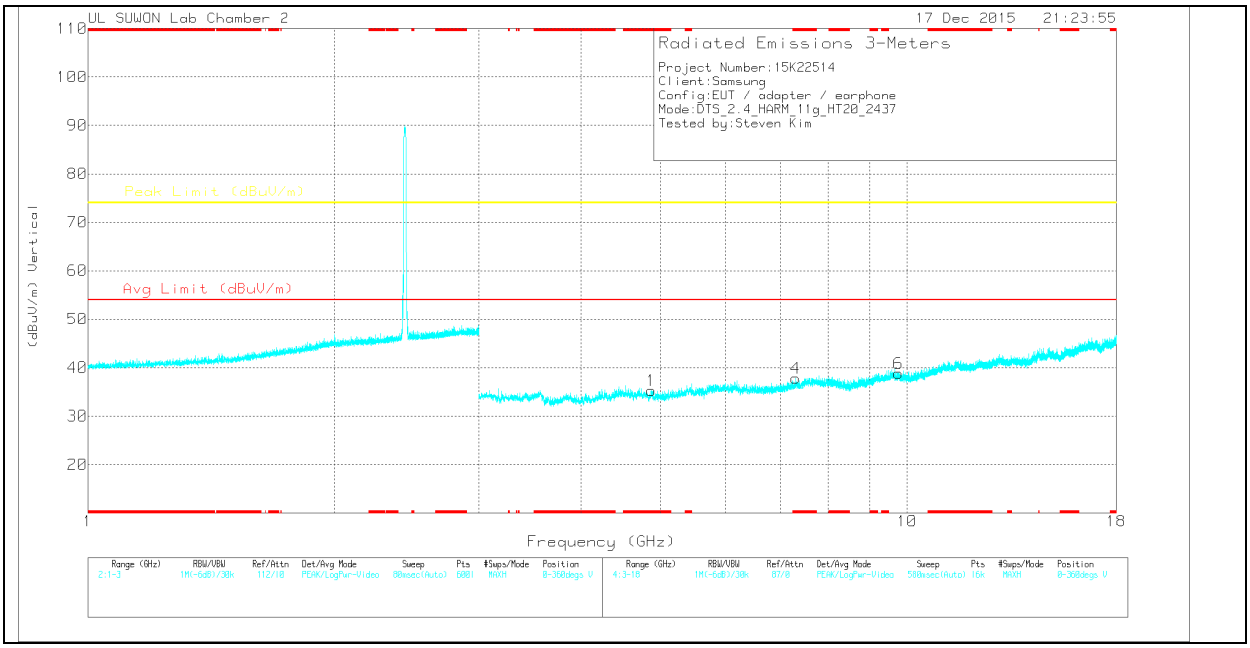
MID CHANNEL HORIZONTAL



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
2	* 4.875	26.81	Pk	33.9	-25.2	0	35.51	-	-	74	-38.49	0-360	100	H
3	* 7.315	23.92	Pk	35.9	-22.6	0	37.22	-	-	74	-36.78	0-360	200	H
5	9.751	21.03	Pk	37	-19.3	0	38.73	-	-	74	-35.27	0-360	200	H
1	* 4.872	26.59	Pk	33.9	-25.2	0	35.29	-	-	74	-38.71	0-360	100	V
4	* 7.313	24.49	Pk	35.9	-22.6	0	37.79	-	-	74	-36.21	0-360	100	V
6	9.751	21.17	Pk	37	-19.3	0	38.87	-	-	74	-35.13	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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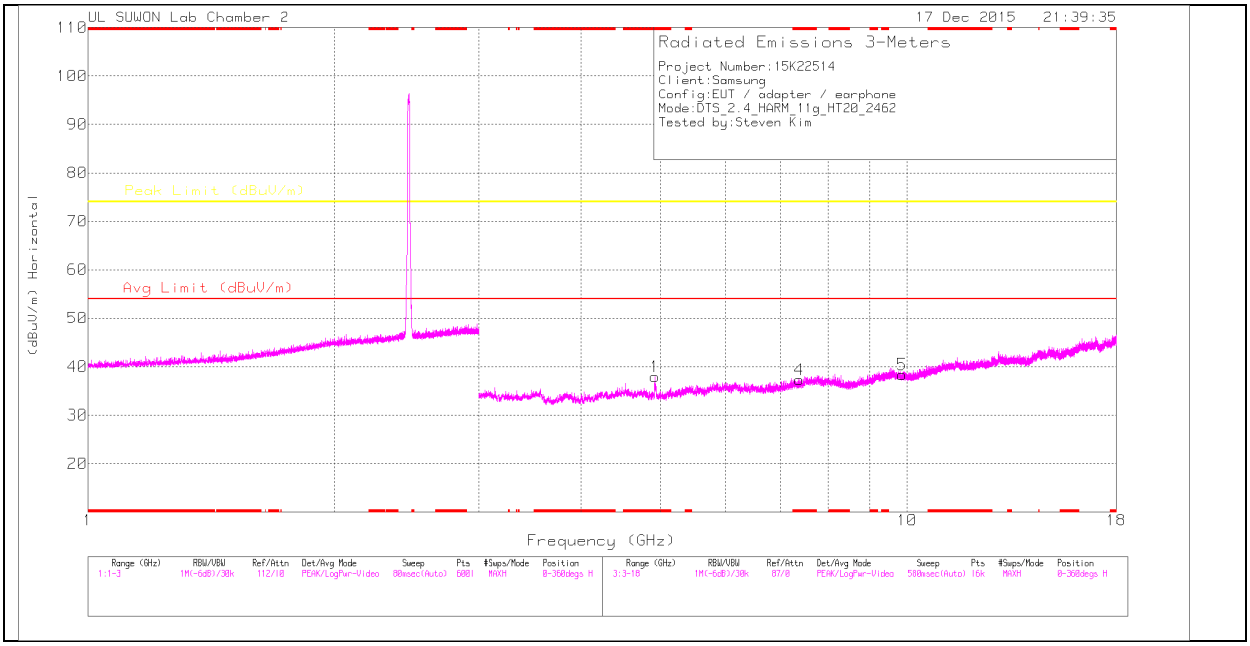
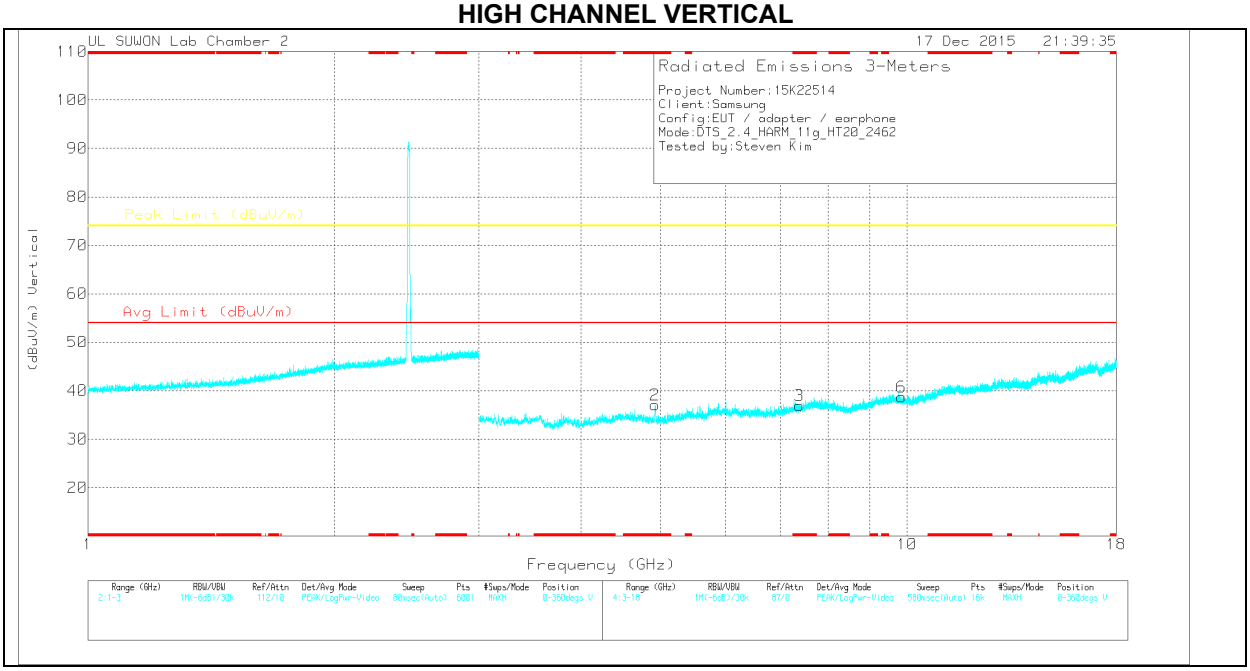
HIGH CHANNEL HORIZONTAL



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	29.18	Pk	33.9	-25.1	0	37.98	-	-	74	-36.02	0-360	100	H
4	* 7.389	23.61	Pk	35.9	-22.2	0	37.31	-	-	74	-36.69	0-360	100	H
5	9.852	20.5	Pk	37.1	-19.2	0	38.4	-	-	74	-35.6	0-360	100	H
2	* 4.924	28.32	Pk	33.9	-25.1	0	37.12	-	-	74	-36.88	0-360	99	V
3	* 7.384	23.22	Pk	35.9	-22.2	0	36.92	-	-	74	-37.08	0-360	99	V
6	9.848	20.85	Pk	37.1	-19.2	0	38.75	-	-	74	-35.25	0-360	99	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
* 4.925	40.39	PK2	33.9	-25.1	0	49.19	-	-	74	-24.81	360	128	H
* 4.926	25.67	MAv1	33.9	-25.1	.29	34.76	54	-19.24	-	-	360	128	H
* 4.923	40.51	PK2	33.9	-25.1	0	49.31	-	-	74	-24.69	197	300	V
* 4.926	27.81	MAv1	33.9	-25.1	.29	36.9	54	-17.1	-	-	197	300	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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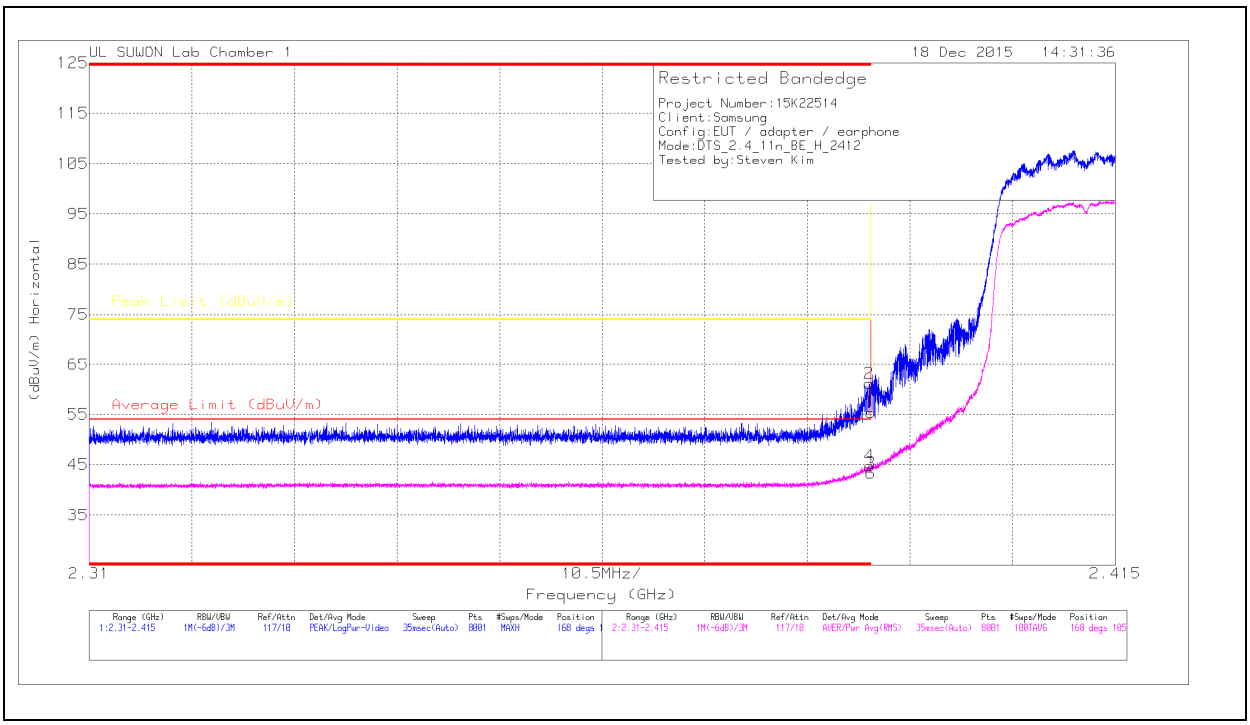
11.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

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	52.59	Pk	31.8	-29	0	55.39	-	-	74	-18.61	168	105	H
2	* 2.39	58.33	Pk	31.8	-29	0	61.13	-	-	74	-12.87	168	105	H
3	* 2.39	40.19	RMS	31.8	-29	.34	43.33	54	-10.67	-	-	168	105	H
4	* 2.39	41.65	RMS	31.8	-29	.34	44.79	54	-9.21	-	-	168	105	H

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

Pk - Peak detector

RMS - RMS detection

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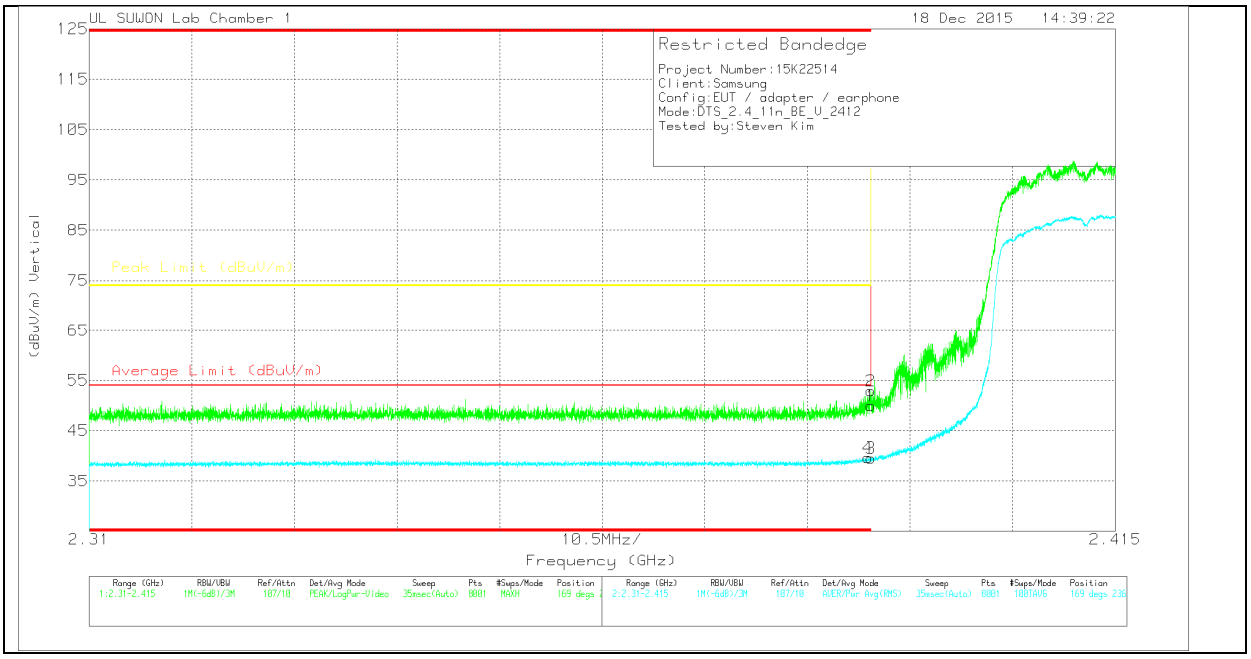
VERTICAL PEAK AND AVERAGE PLOT



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	47.19	Pk	31.8	-29	0	49.99	-	-	74	-24.01	169	236	V
2	* 2.39	50.09	Pk	31.8	-29	0	52.89	-	-	74	-21.11	169	236	V
3	* 2.39	36.41	RMS	31.8	-29	.34	39.55	54	-14.45	-	-	169	236	V
4	* 2.39	36.51	RMS	31.8	-29	.34	39.65	54	-14.35	-	-	169	236	V

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

Pk - Peak detector

RMS - RMS detection

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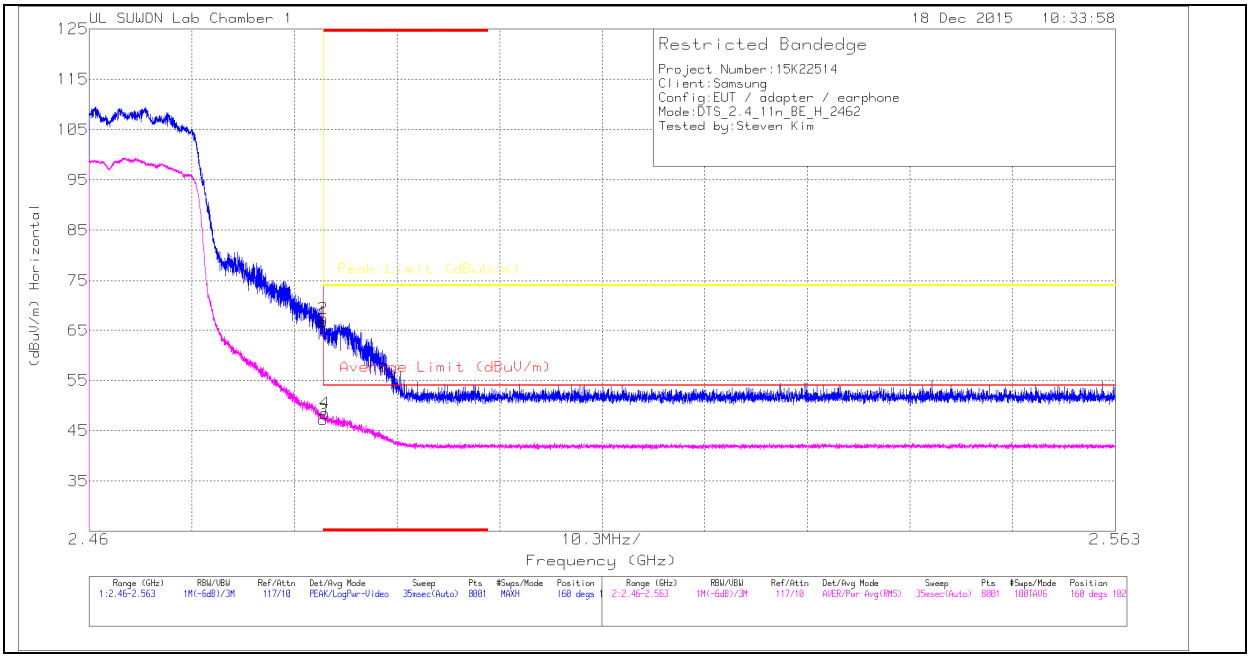
AUTHORIZED BANDEDGE (HIGH CHANNEL)

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	63.07	Pk	32	-28.3	0	66.77	-	-	74	-7.23	160	102	H
2	* 2.484	63.81	Pk	32	-28.3	0	67.51	-	-	74	-6.49	160	102	H
3	* 2.484	43.14	RMS	32	-28.3	.34	47.18	54	-6.82	-	-	160	102	H
4	* 2.484	44.44	RMS	32	-28.3	.34	48.48	54	-5.52	-	-	160	102	H

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

Pk - Peak detector

RMS - RMS detection

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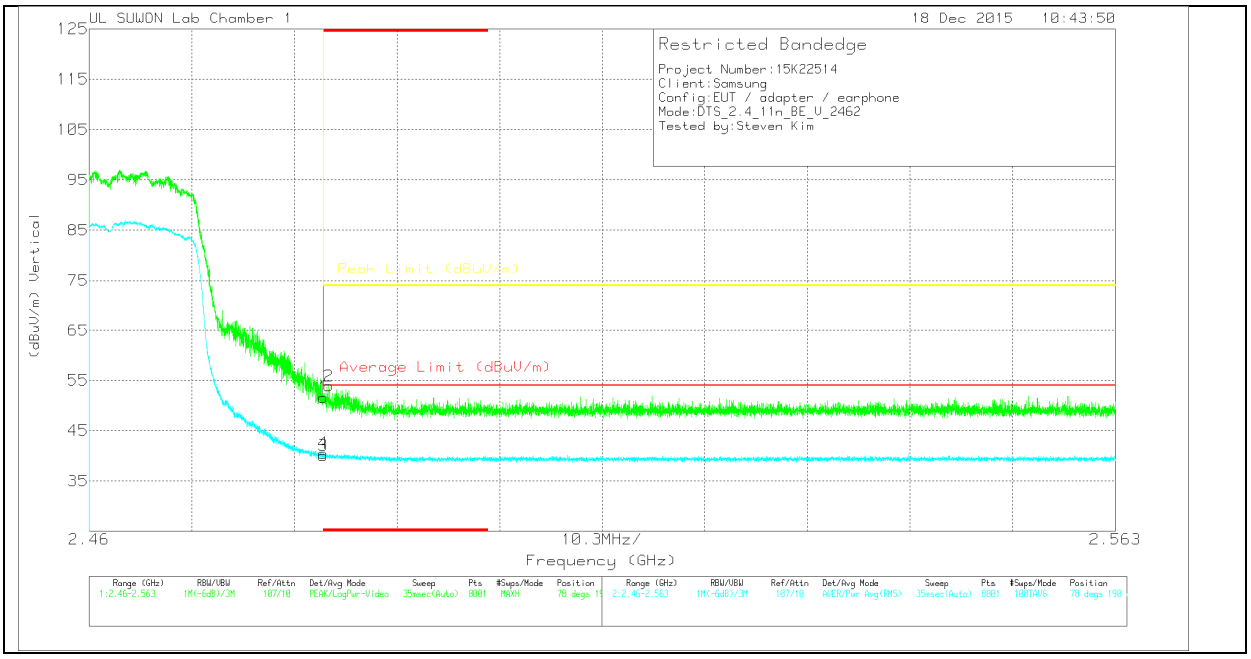
VERTICAL PEAK AND AVERAGE PLOT



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	* 2.484	47.93	Pk	32	-28.3	0	51.63	-	-	74	-22.37	78	190	V
2	* 2.484	50.2	Pk	32	-28.3	0	53.9	-	-	74	-20.1	78	190	V
3	* 2.484	36.04	RMS	32	-28.3	.34	40.08	54	-13.92	-	-	78	190	V
4	* 2.484	36.48	RMS	32	-28.3	.34	40.52	54	-13.48	-	-	78	190	V

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

Pk - Peak detector

RMS - RMS detection

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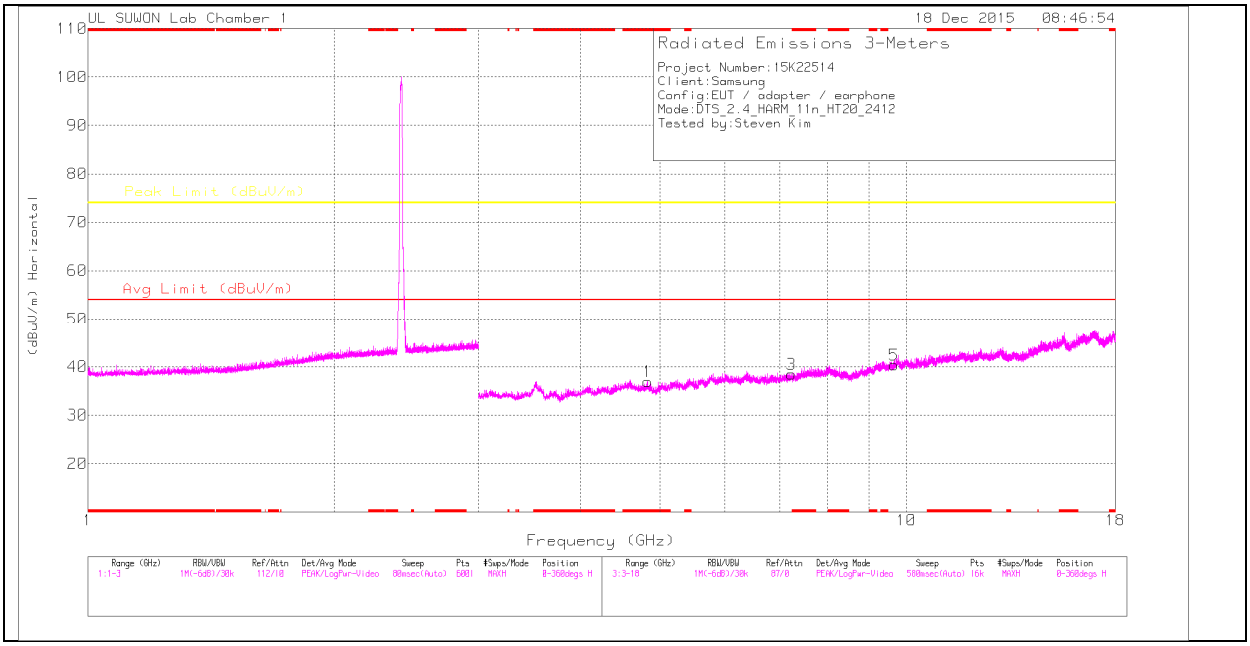
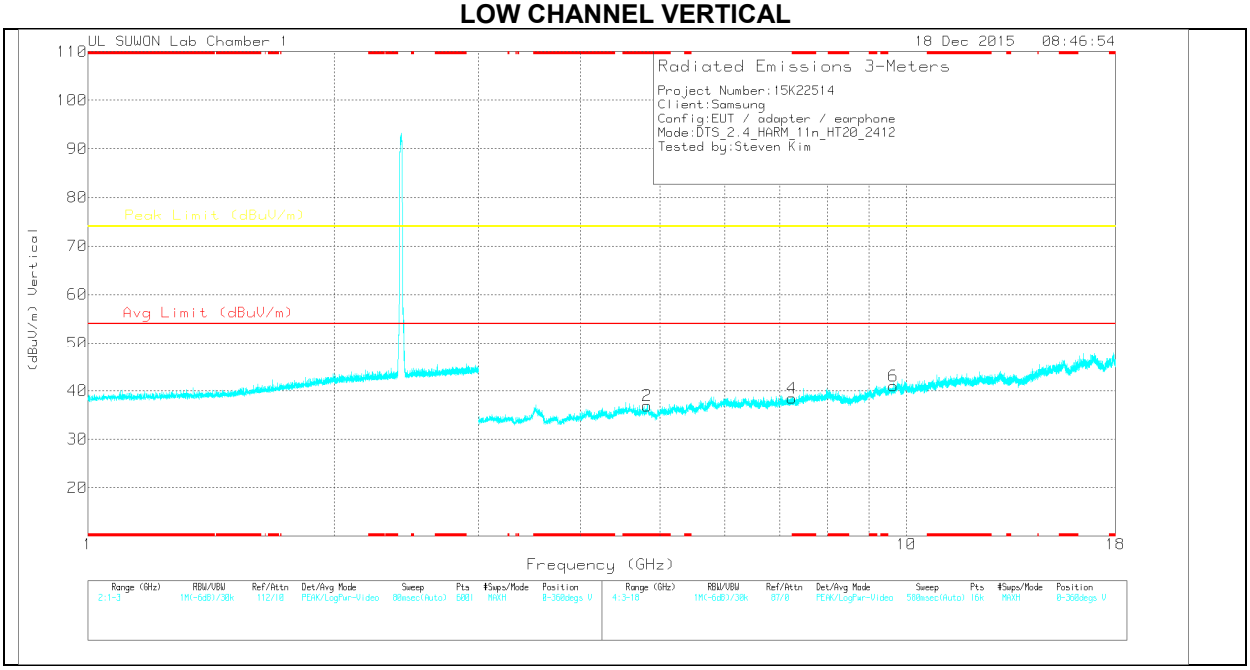
HARMONICS AND SPURIOUS EMISSIONS

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	* 4.826	36.78	PK	34	-33.8	0	36.98	-	-	74	-37.02	0-360	100	H
3	7.238	33.68	PK	35.7	-30.9	0	38.48	-	-	74	-35.52	0-360	200	H
5	9.649	30.7	PK	37.1	-27.4	0	40.4	-	-	74	-33.6	0-360	100	H
2	* 4.824	36.69	PK	34	-33.8	0	36.89	-	-	74	-37.11	0-360	100	V
4	7.241	33.71	PK	35.7	-30.9	0	38.51	-	-	74	-35.49	0-360	200	V
6	9.645	31.31	PK	37.1	-27.4	0	41.01	-	-	74	-32.99	0-360	100	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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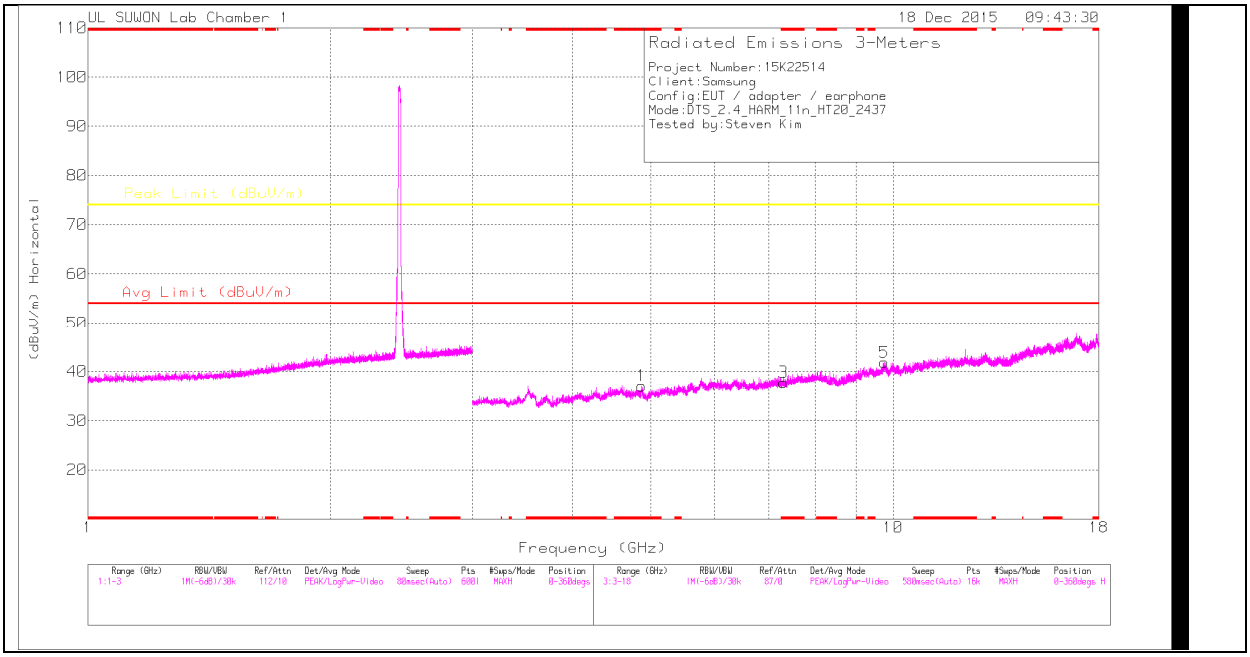
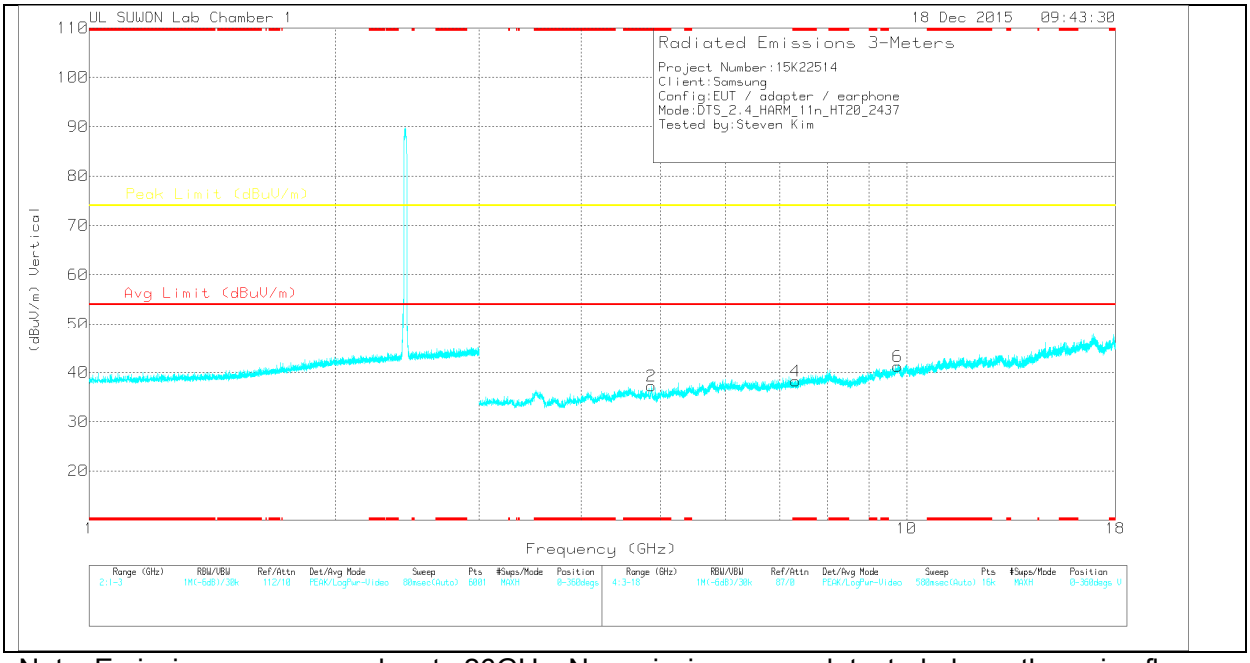
MID CHANNEL HORIZONTAL



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	* 4.87	37.07	PK	34	-34	0	37.07	-	-	74	-36.93	0-360	100	H
3	* 7.308	32.98	PK	35.7	-30.9	0	37.78	-	-	74	-36.22	0-360	100	H
5	9.746	31.56	PK	37.2	-26.9	0	41.86	-	-	74	-32.14	0-360	100	H
2	* 4.873	37.24	PK	34	-34	0	37.24	-	-	74	-36.76	0-360	100	V
4	* 7.311	33.44	PK	35.7	-30.9	0	38.24	-	-	74	-35.76	0-360	200	V
6	9.752	30.71	PK	37.2	-26.7	0	41.21	-	-	74	-32.79	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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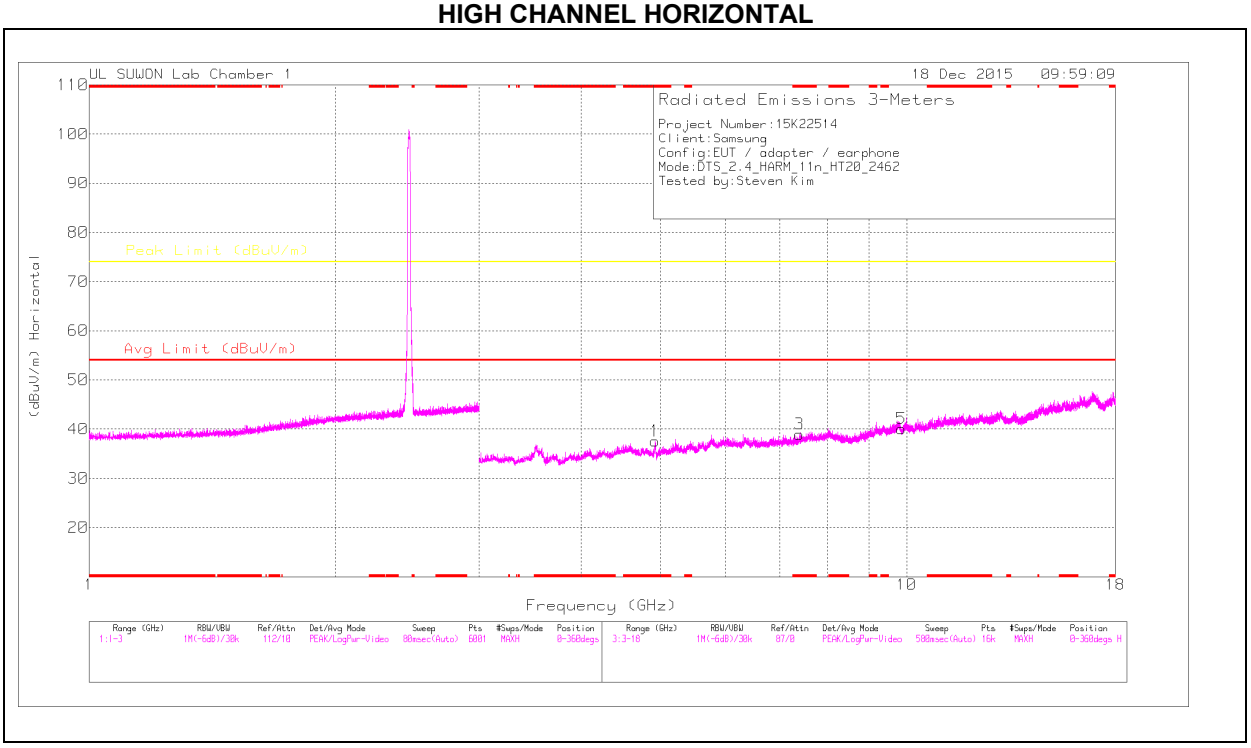
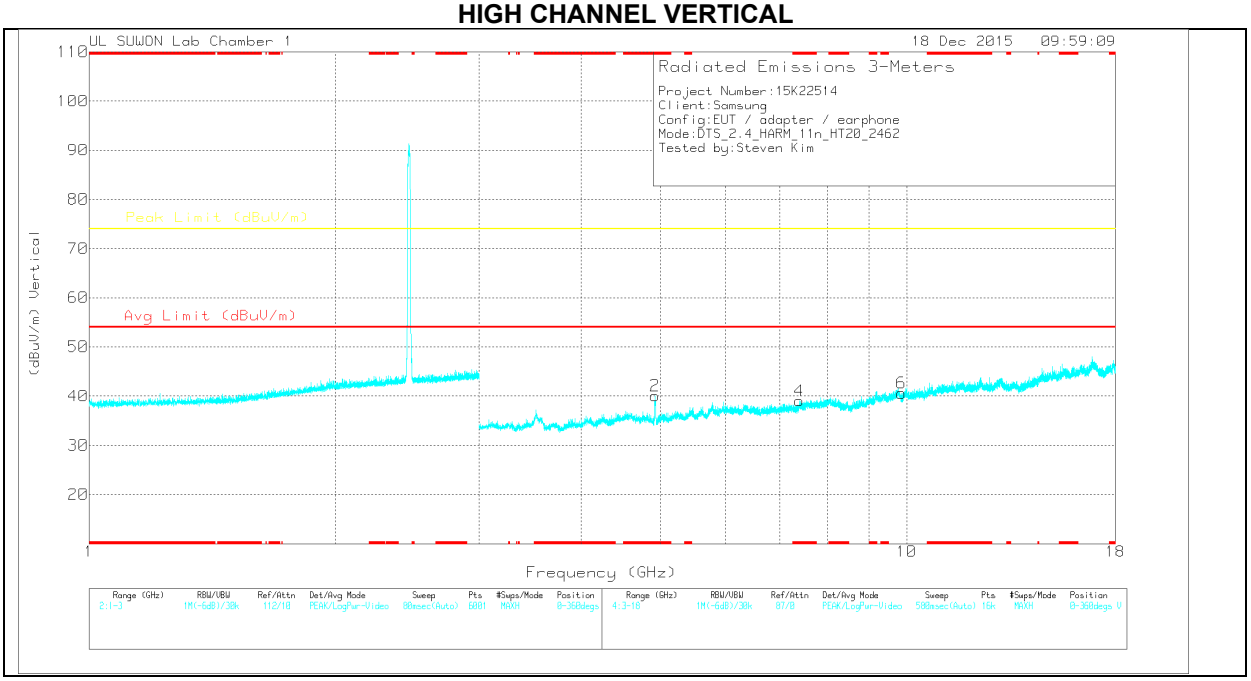
HIGH CHANNEL HORIZONTAL



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(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	* 4.925	37.58	PK	34	-34	0	37.58	-	-	74	-36.42	0-360	100	H
3	* 7.388	33.89	PK	35.8	-30.7	0	38.99	-	-	74	-35.01	0-360	100	H
5	9.85	30.5	PK	37.3	-27.7	0	40.1	-	-	74	-33.9	0-360	100	H
2	* 4.924	40.09	PK	34	-34	0	40.09	-	-	74	-33.91	0-360	100	V
4	* 7.389	33.92	PK	35.8	-30.7	0	39.02	-	-	74	-34.98	0-360	100	V
6	9.853	31.01	PK	37.3	-27.7	0	40.61	-	-	74	-33.39	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
* 4.924	49.09	PK2	34	-34	0	49.09	-	-	74	-24.91	326	313	H
* 4.924	36.23	MAv1	34	-34	.34	36.57	54	-17.43	-	-	326	313	H
* 4.925	52.94	PK2	34	-34	0	52.94	-	-	74	-21.06	337	102	V
* 4.924	39.59	MAv1	34	-34	.34	39.93	54	-14.07	-	-	337	102	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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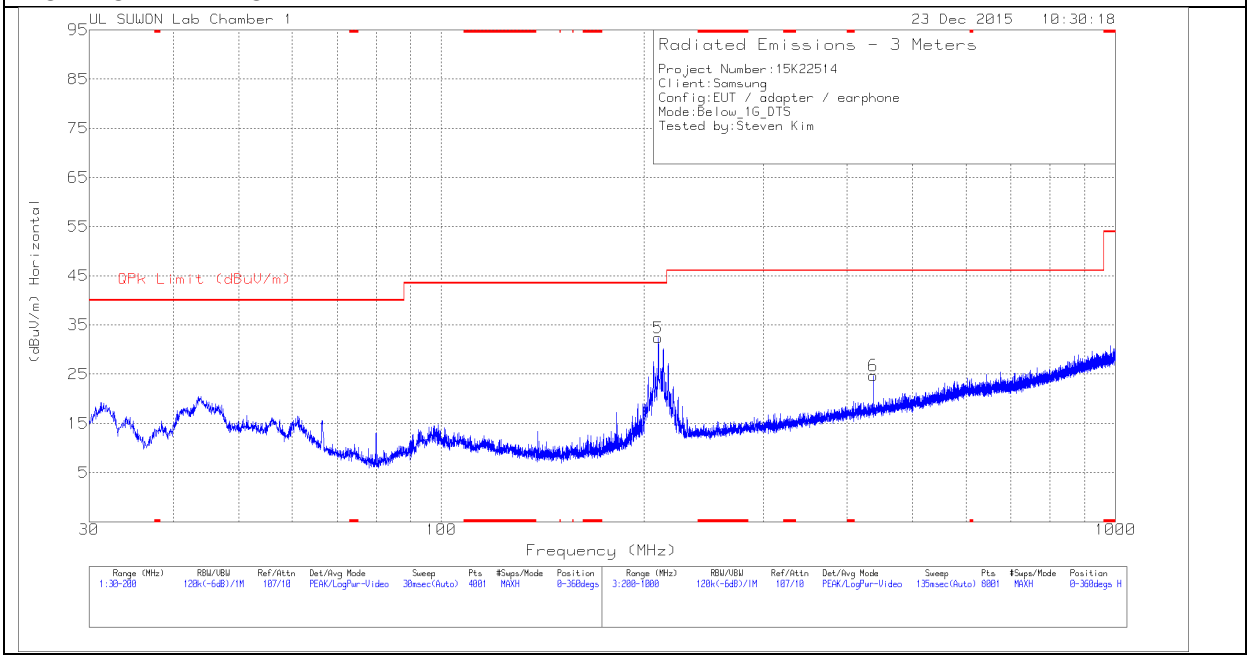
11.3. WORST-CASE BELOW 1 GHz

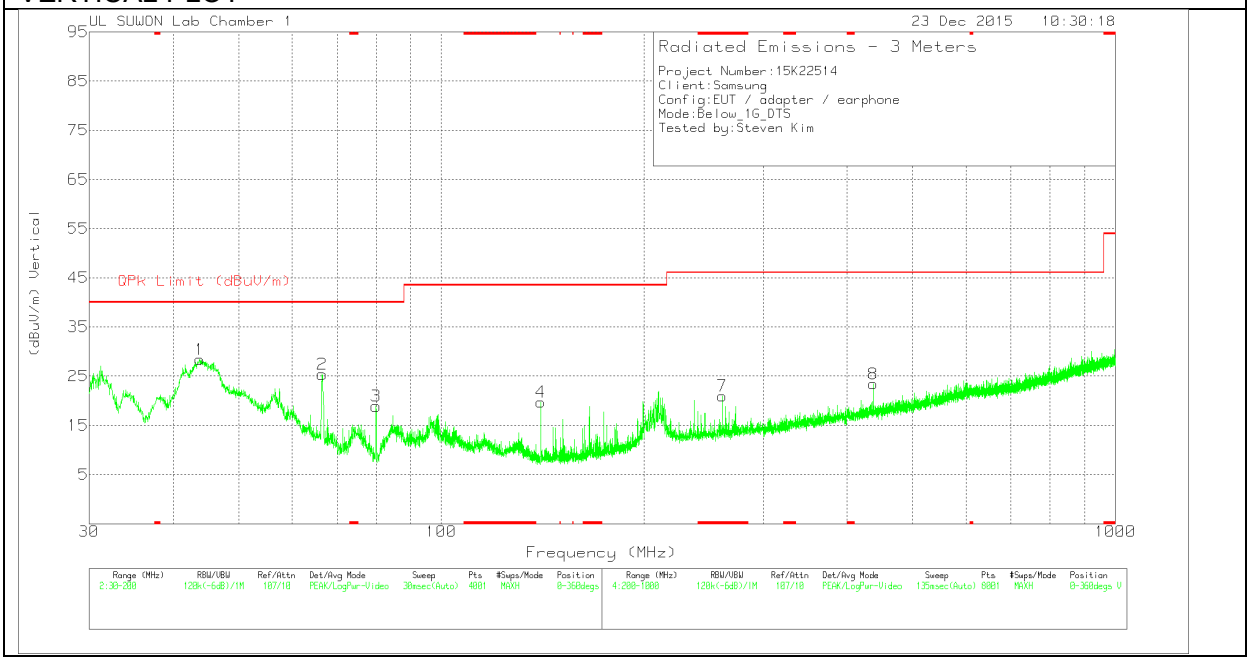
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

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	43.77	45.31	Pk	13.3	-30.2	28.41	40	-11.59	0-360	100	V
2	66.55	44.47	Pk	10.7	-29.8	25.37	40	-14.63	0-360	100	V
3	79.98	41.6	Pk	6.9	-29.6	18.9	40	-21.1	0-360	200	V
4	140.4575	40.62	Pk	7.9	-28.8	19.72	43.52	-23.8	0-360	100	V
5	209.8	48.97	Pk	11.5	-28.1	32.37	43.52	-11.15	0-360	101	H
6	437.5	35.19	Pk	16.1	-26.6	24.69	46.02	-21.33	0-360	200	H
7	* 261.1	36.07	Pk	12.6	-27.7	20.97	46.02	-25.05	0-360	300	V
8	437.5	33.93	Pk	16.1	-26.6	23.43	46.02	-22.59	0-360	101	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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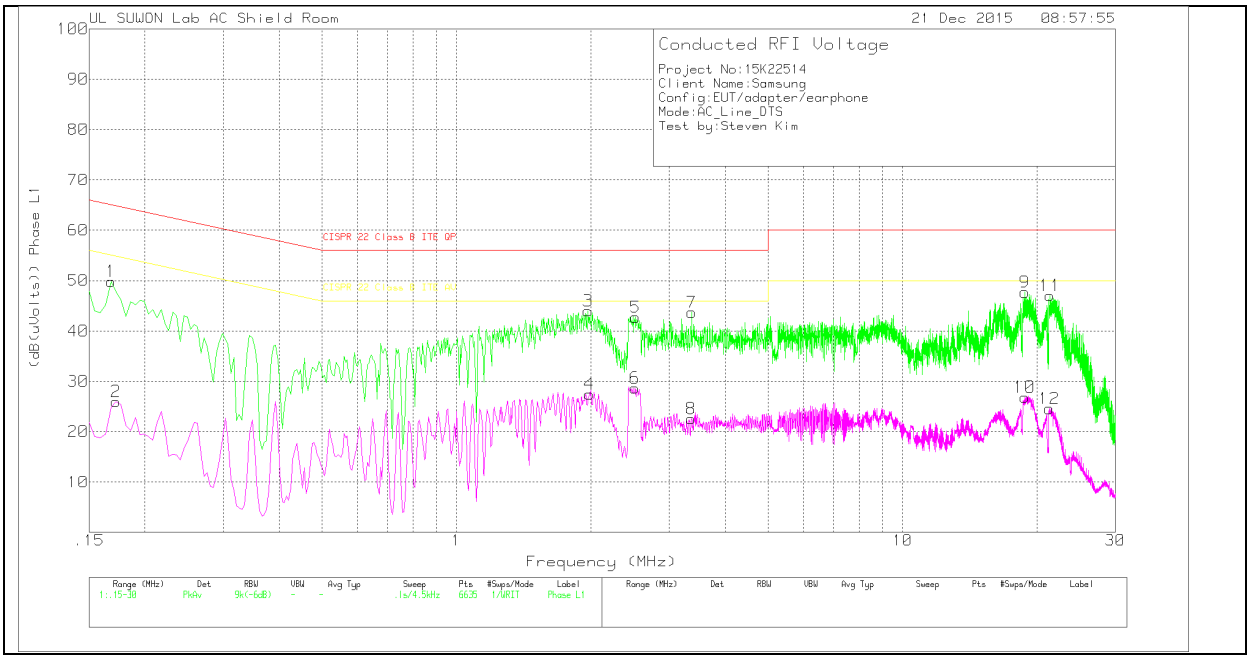
RESULTS

WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

Trace Markers

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	.168	39.66	Pk	10.2	0	49.86	65.06	-15.2	-	-
2	.1725	15.79	Av	10.2	0	25.99	-	-	54.84	-28.85
3	1.9725	34.13	Pk	9.8	.1	44.03	56	-11.97	-	-
4	1.986	17.58	Av	9.8	.1	27.48	-	-	46	-18.52
5	2.517	32.82	Pk	9.8	.1	42.72	56	-13.28	-	-
6	2.5125	18.78	Av	9.8	.1	28.68	-	-	46	-17.32
7	3.3675	33.8	Pk	9.8	.1	43.7	56	-12.3	-	-
8	3.3585	12.68	Av	9.8	.1	22.58	-	-	46	-23.42
9	18.78	37.21	Pk	10.3	.2	47.71	60	-12.29	-	-
10	18.78	16.37	Av	10.3	.2	26.87	-	-	50	-23.13
11	21.4215	36.34	Pk	10.5	.2	47.04	60	-12.96	-	-
12	21.3225	13.88	Av	10.5	.2	24.58	-	-	50	-25.42

Pk - Peak detector

Av - Average detection

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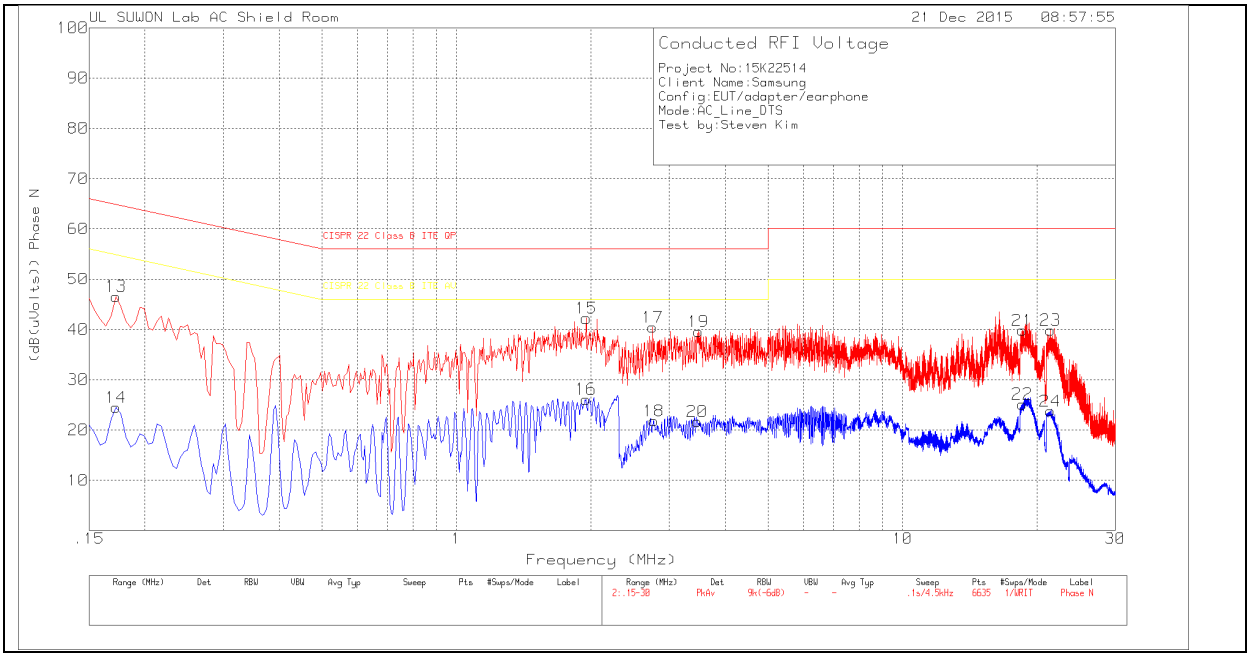
LINE 2 PLOT



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LINE 2 RESULTS

Trace Markers

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	.1725	36.39	Pk	10.2	0	46.59	64.84	-18.25	-	-
14	.1725	14.3	Av	10.2	0	24.5	-	-	54.84	-30.34
15	1.9545	32.34	Pk	9.8	.1	42.24	56	-13.76	-	-
16	1.95	16.23	Av	9.8	.1	26.13	-	-	46	-19.87
17	2.7555	30.53	Pk	9.8	.1	40.43	56	-15.57	-	-
18	2.769	11.93	Av	9.8	.1	21.83	-	-	46	-24.17
19	3.489	29.67	Pk	9.8	.1	39.57	56	-16.43	-	-
20	3.4665	11.79	Av	9.8	.1	21.69	-	-	46	-24.31
21	18.5775	29.15	Pk	10.5	.2	39.85	60	-20.15	-	-
22	18.5775	14.45	Av	10.5	.2	25.15	-	-	50	-24.85
23	21.471	28.96	Pk	10.7	.2	39.86	60	-20.14	-	-
24	21.4485	12.88	Av	10.7	.2	23.78	-	-	50	-26.22

Pk - Peak detector

Av - Average detection

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