FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

GSM / WCDMA Watch + Bluetooth/BLE and DTS b/g/n

MODEL NUMBER : SM-R730A, SM-R730T

FCC ID: A3LSMR730G

REPORT NUMBER: 15K21679-E1

ISSUE DATE: SEP 16, 2015

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

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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/10/15	Initial issue	Junwhan Lee
--	09/16/15	Revised Section 5.2	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM / WCDMA Watch + Bluetooth/BLE and DTS b/g/n
MODEL NUMBER:	SM-R730A, SM-R730T
SERIAL NUMBER:	R31G601VRRT, R31G601VRVH (RADIATED); R31G7008J7P (CONDUCTED)
DATE TESTED:	AUG 31, 2015 - SEP 08, 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.

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.

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

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at http://www.iasonline.org/PDF/TL/TL-637.pdf.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	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 a GSM / WCDMA Watch + Bluetooth/BLE and DTS b/g/n.
This test report addresses the DTS (WLAN) operational mode.

SM-R730A and SM-R730T are same hardware and only difference is GPRS Class.
SM-R730A supports GPRS class 10 and SM-R730T supports GPRS class12.

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	17.07	50.93
	802.11g	14.05	25.41
	802.11n HT20	13.09	20.37

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of -5.4 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 Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z 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
Adapter	SAMSUNG	ETA0U60JBE	DK1G401HS/7-E	N/A
Data Cable	SAMSUNG	ECB-DU2EBE	N/A	N/A
Wireless Charger	SAMSUNG	EP-OR720	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

TEST SETUP

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

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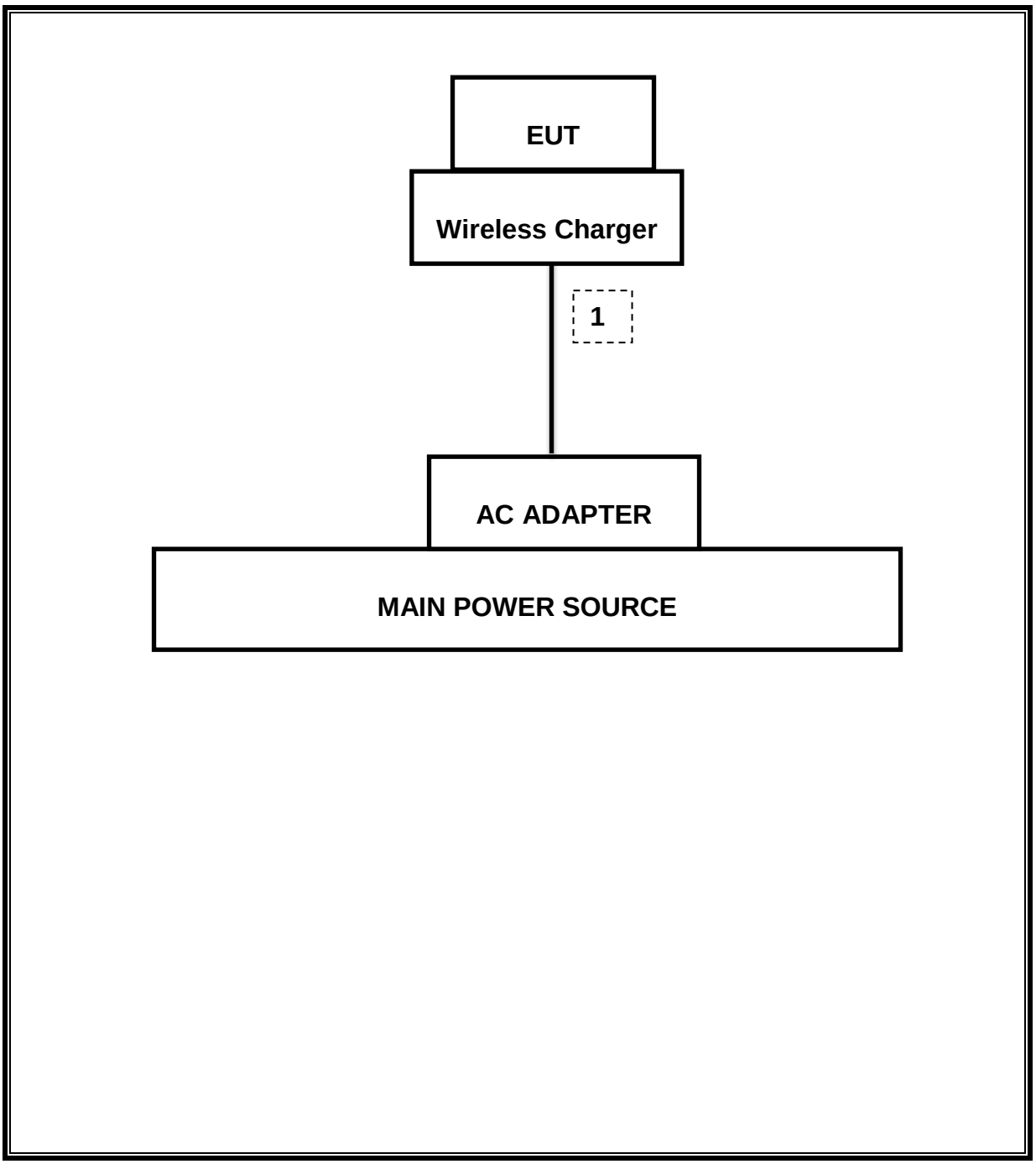
SETUP DIAGRAM FOR TESTS



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	11-17-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-16
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
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

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r03: Measurement Procedure §9.2.3.1 AVGPM is used for 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.

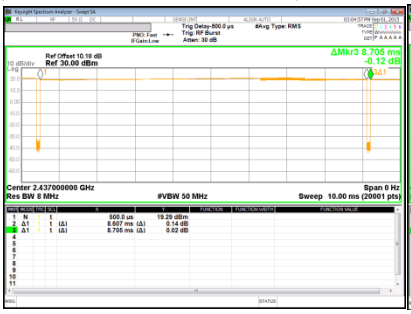
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

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	8.607	8.705	0.989	98.9%	0.00	0.010
802.11g	1.427	1.528	0.934	93.4%	0.30	0.701
802.11n HT20	1.336	1.437	0.930	93.0%	0.32	0.749



[802.11b Mode]

[802.11g Mode]

[802.11n Mode]

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	9.02 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-29.633 dBm
15.247	TX conducted output power	<30dBm		Pass	17.07 dBm
15.247	PSD	<8dBm		Pass	-13.826 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	38.82 dBuV (QP)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	34.47 dBuV/m (QP)

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	9.025	0.5
Mid	2437	9.020	0.5
High	2462	9.052	0.5
Worst		9.020	0.5

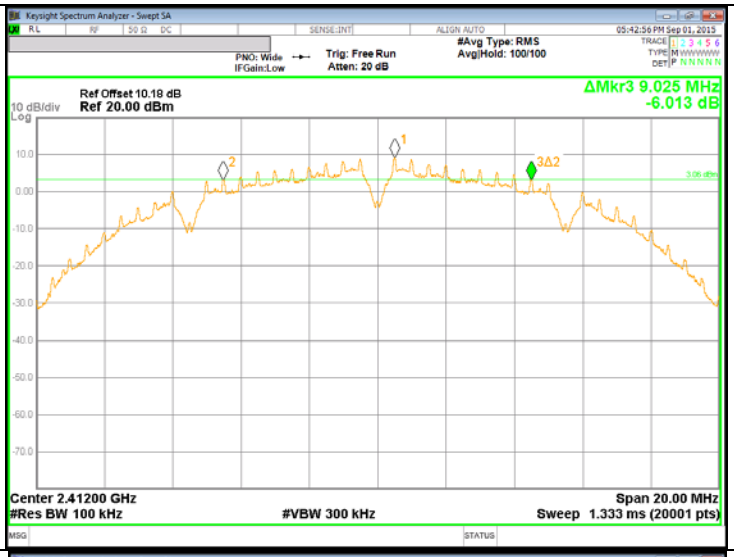
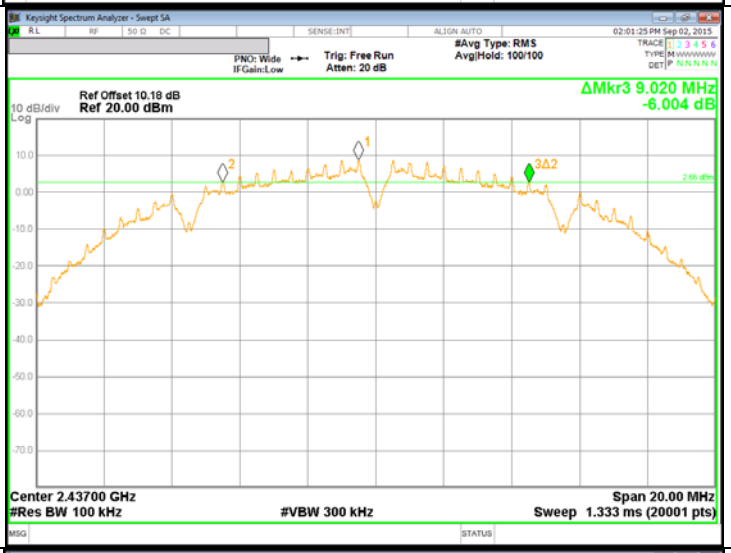
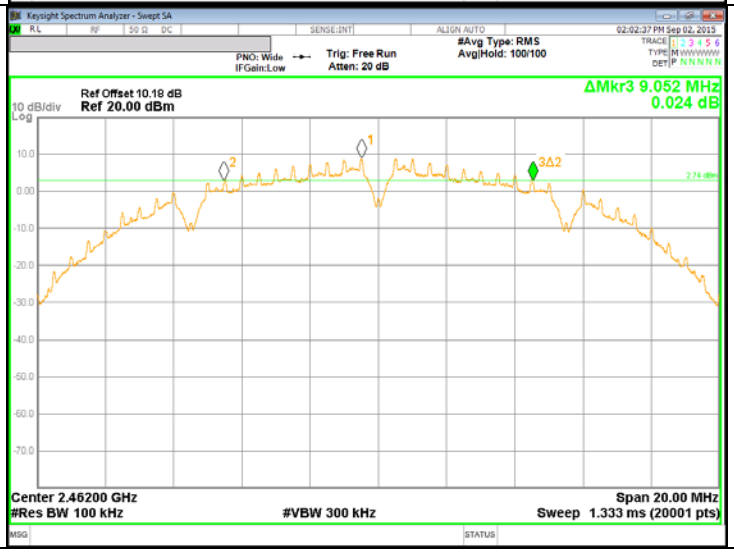
10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

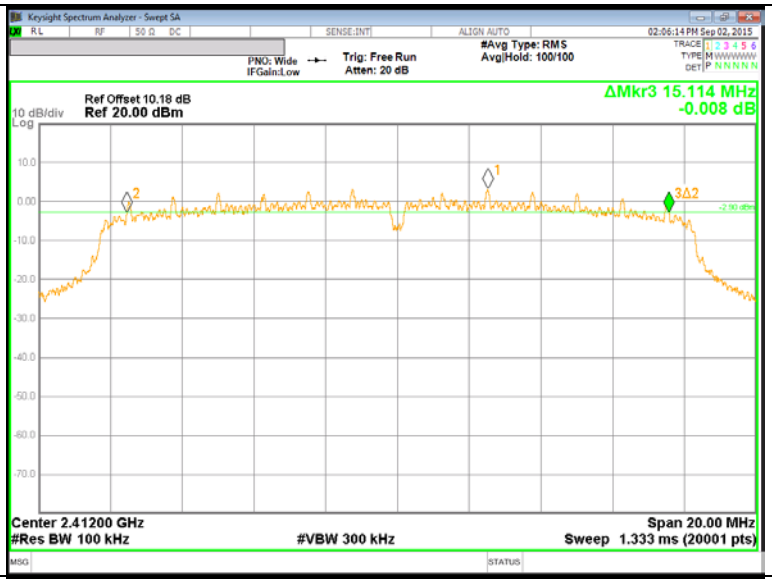
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	15.114	0.5
Mid	2437	15.110	0.5
High	2462	15.111	0.5
Worst		15.110	0.5

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	15.112	0.5
Mid	2437	15.109	0.5
High	2462	15.112	0.5
Worst		15.109	0.5

10.1.4. 6 dB BANDWIDTH PLOTS

802.11b Mode Low CH		
802.11b Mode Middle CH		
802.11b Mode High CH		

802.11g Mode Low CH		
802.11g Mode Middle CH		
802.11g Mode High CH		

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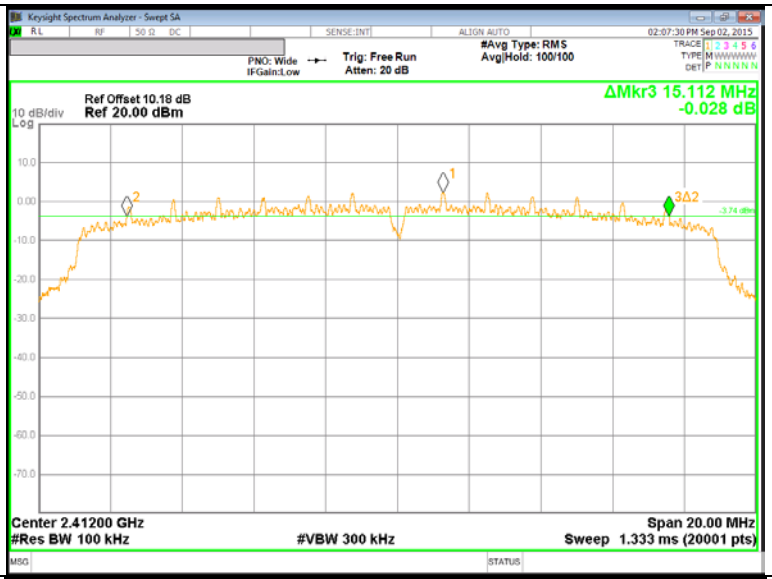
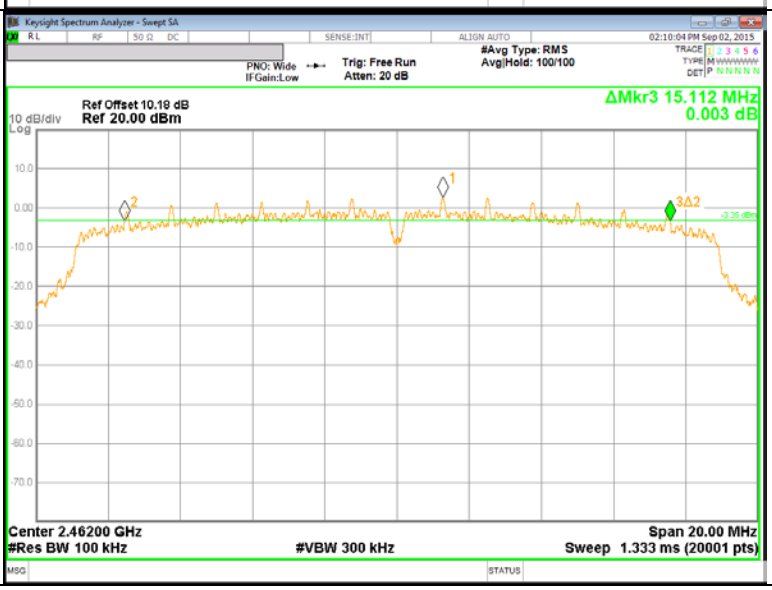
802.11n Mode Low CH		
802.11n Mode Middle CH		
802.11n Mode High CH		

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	14.388
Mid	2437	14.372
High	2462	14.285
Worst		14.388

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.301
Mid	2437	16.284
High	2462	16.326
Worst		16.326

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.512
Mid	2437	17.445
High	2462	17.465
Worst		17.512

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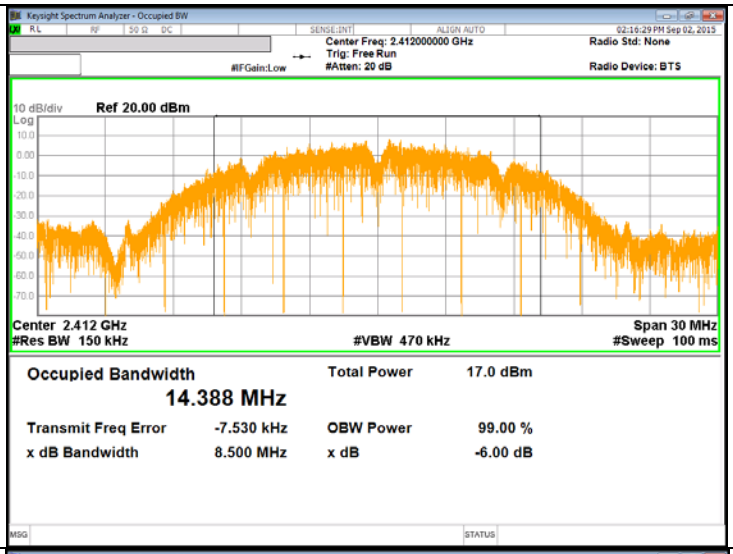
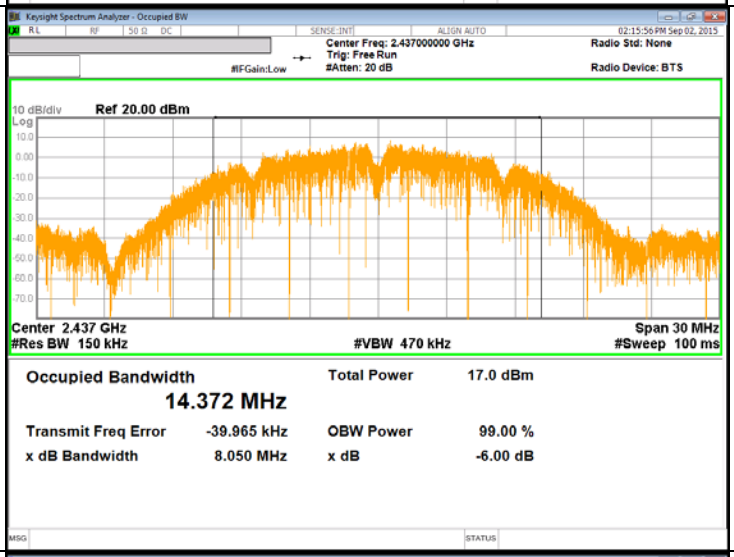
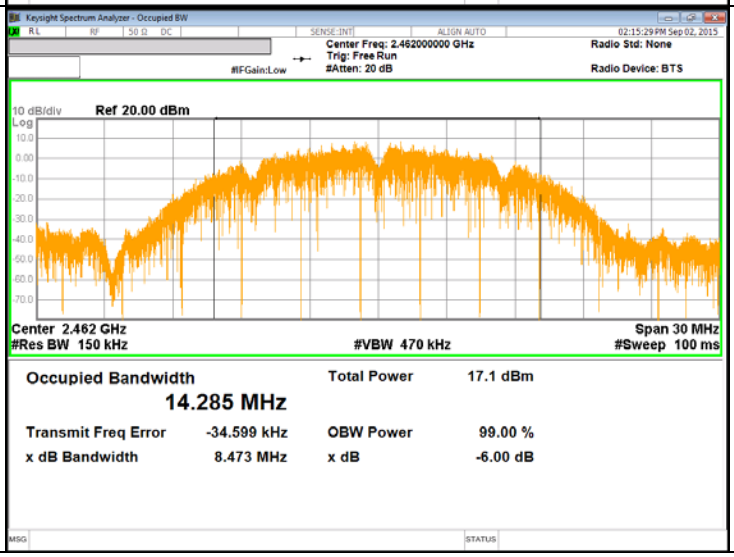
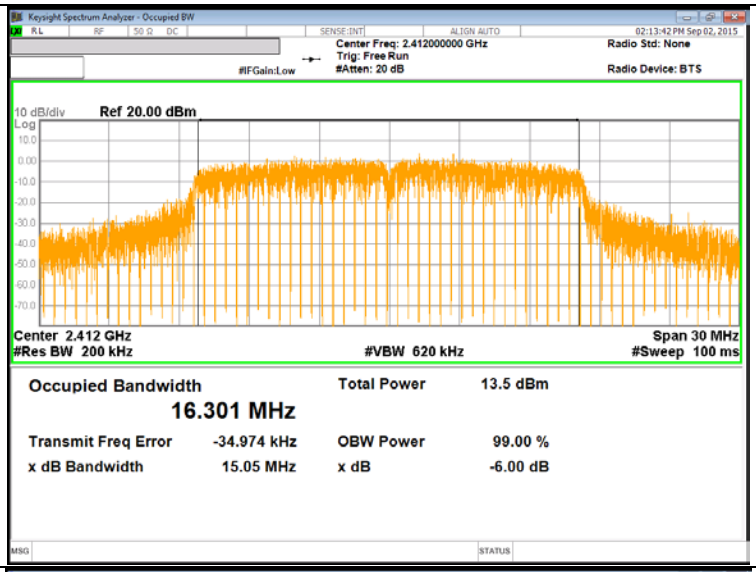
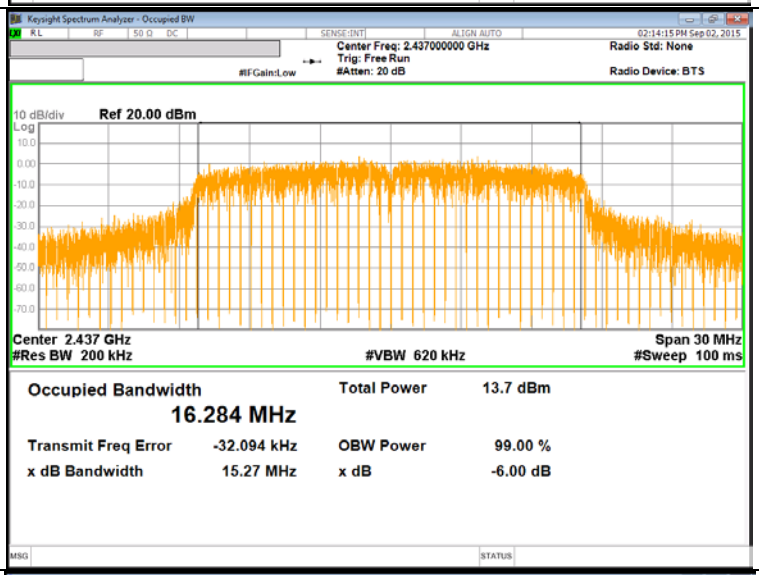
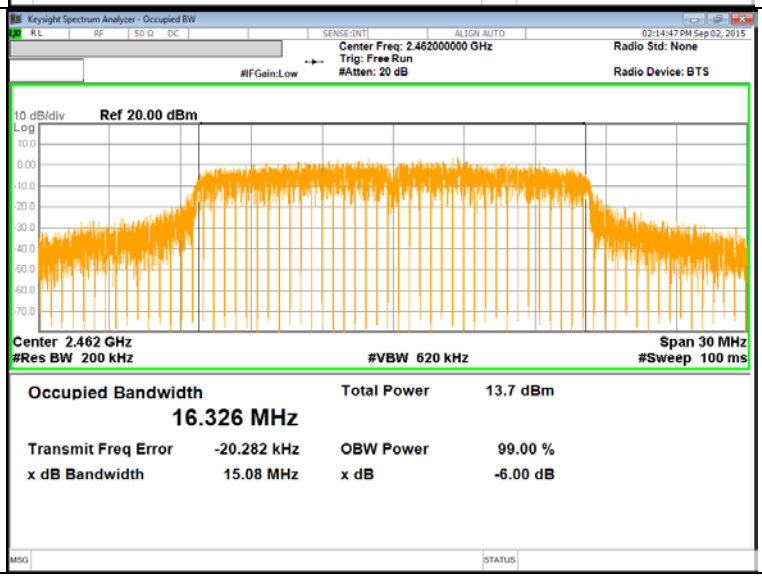
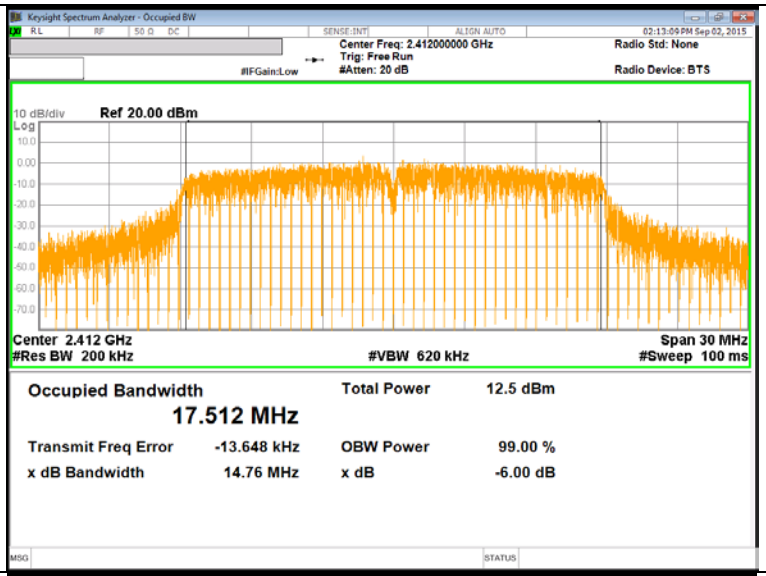
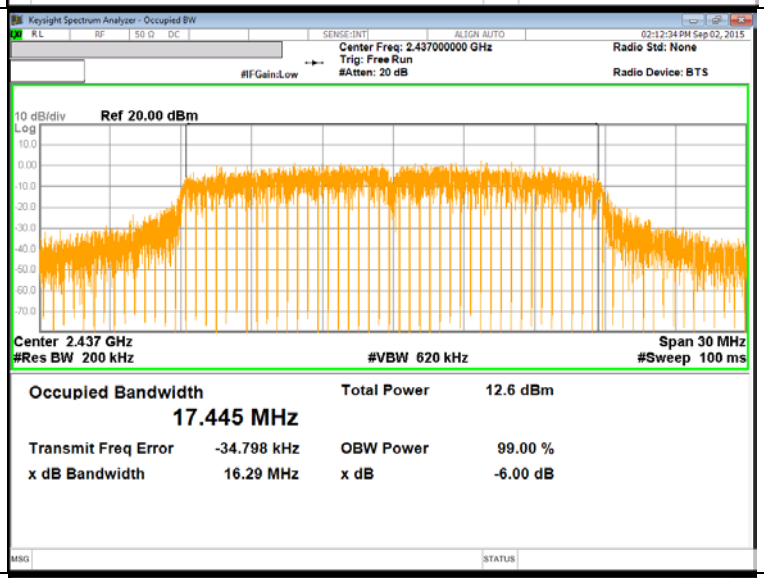
10.2.4. 99% BANDWIDTH PLOTS

802.11b Mode Low CH		
802.11b Mode Middle CH		
802.11b Mode High CH		

802.11g Mode Low CH	
802.11g Mode Middle CH	
802.11g Mode High CH	

802.11n Mode Low CH	
802.11n Mode Middle CH	
802.11n 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	-5.40	30.00	30.00	36.00	30.00
Mid	2437	-5.40	30.00	30.00	36.00	30.00
High	2462	-5.40	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	16.95	16.95	36.00	-19.05
Mid	2437	17	17.00	36.00	-19.00
High	2462	17.07	17.07	36.00	-18.93
Worst			17.07	36.00	-18.93

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	-5.40	30.00	30.00	36.00	30.00
Mid	2437	-5.40	30.00	30.00	36.00	30.00
High	2462	-5.40	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	13.86	13.86	36.00	-22.14
Mid	2437	13.94	13.94	36.00	-22.06
High	2462	14.05	14.05	36.00	-21.95
Worst			14.05	36.00	-21.95

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	-5.40	30.00	30.00	36.00	30.00
Mid	2437	-5.40	30.00	30.00	36.00	30.00
High	2462	-5.40	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	12.94	12.94	36.00	-23.06
Mid	2437	12.85	12.85	36.00	-23.15
High	2462	13.09	13.09	36.00	-22.91
Worst			13.09	36.00	-22.91

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

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	-14.347	0.00	-14.35	8.00	-22.35
Mid	2437	-14.444	0.00	-14.44	8.00	-22.44
High	2462	-13.826	0.00	-13.83	8.00	-21.83

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

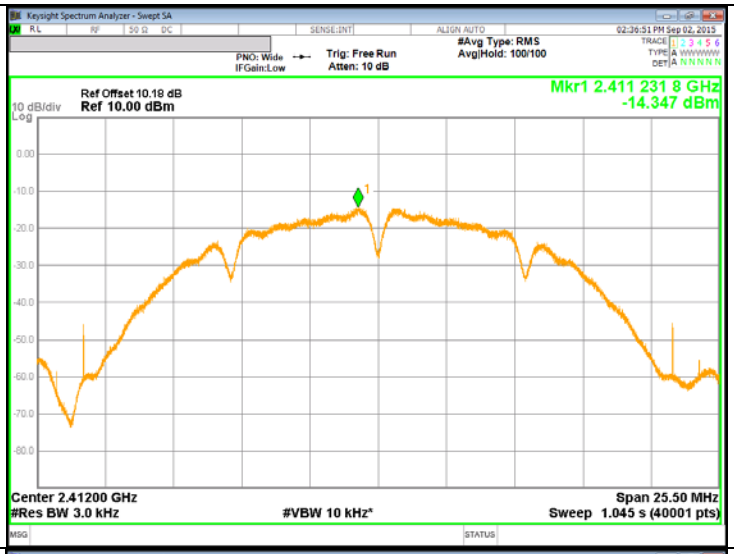
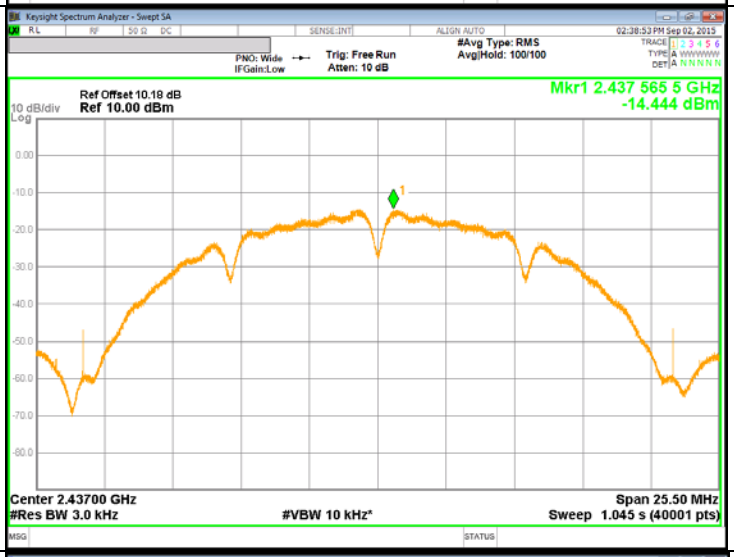
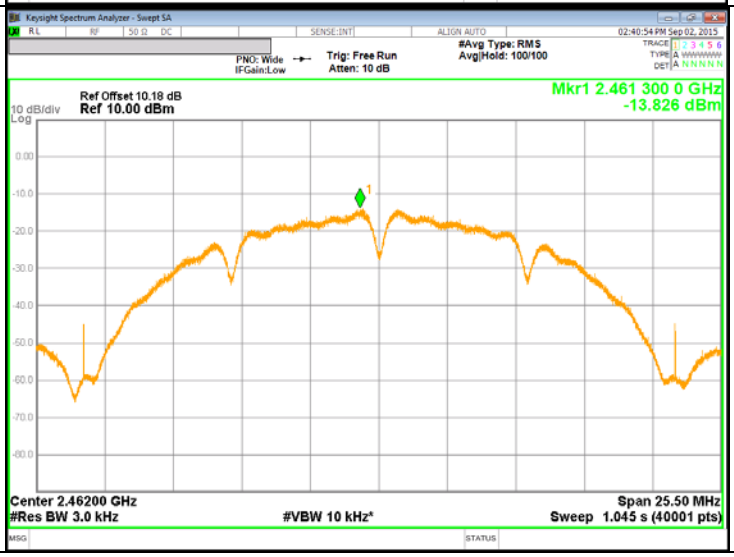
Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-19.72	0.30	-19.42	8.00	-27.72
Mid	2437	-19.511	0.30	-19.21	8.00	-27.51
High	2462	-19.753	0.30	-19.45	8.00	-27.75

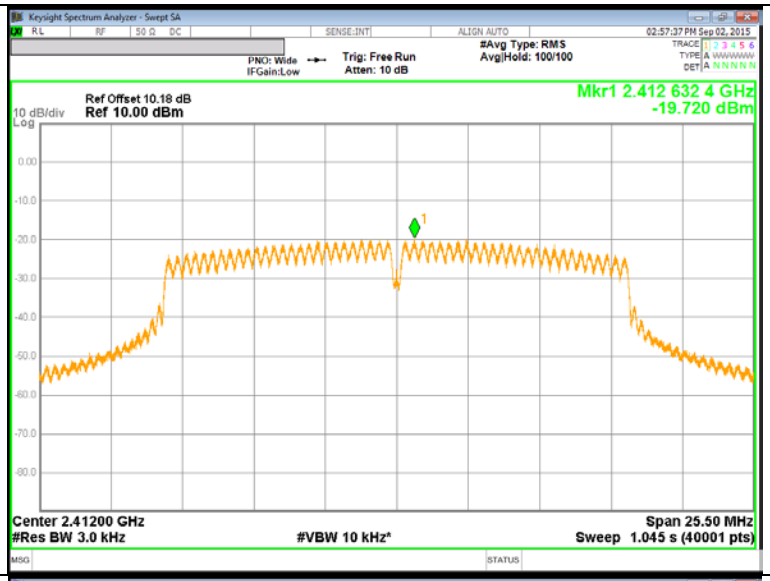
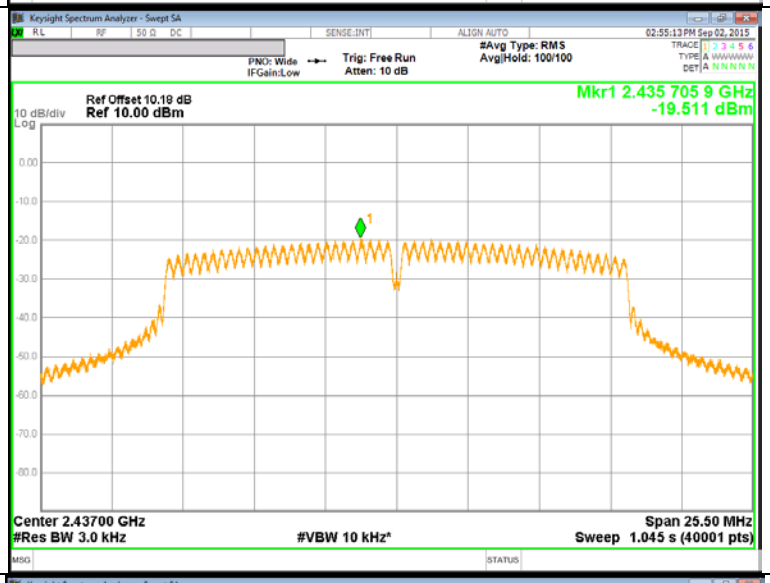
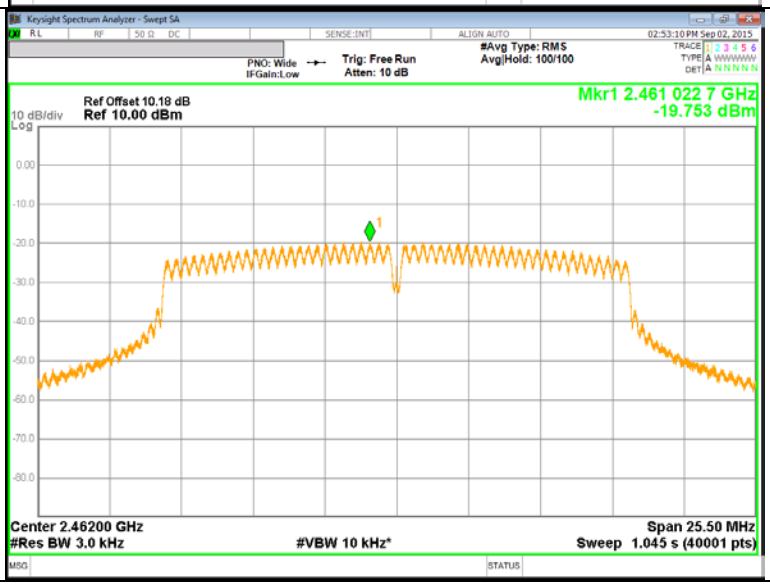
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-20.923	0.32	-20.60	8.00	-28.92
Mid	2437	-20.72	0.32	-20.40	8.00	-28.72
High	2462	-20.547	0.32	-20.23	8.00	-28.55

10.4.4. PSD PLOTS

802.11b Mode Low CH		
802.11b Mode Middle CH		
802.11b Mode High CH		

802.11g Mode Low CH	
802.11g Mode Middle CH	
802.11g Mode High CH	

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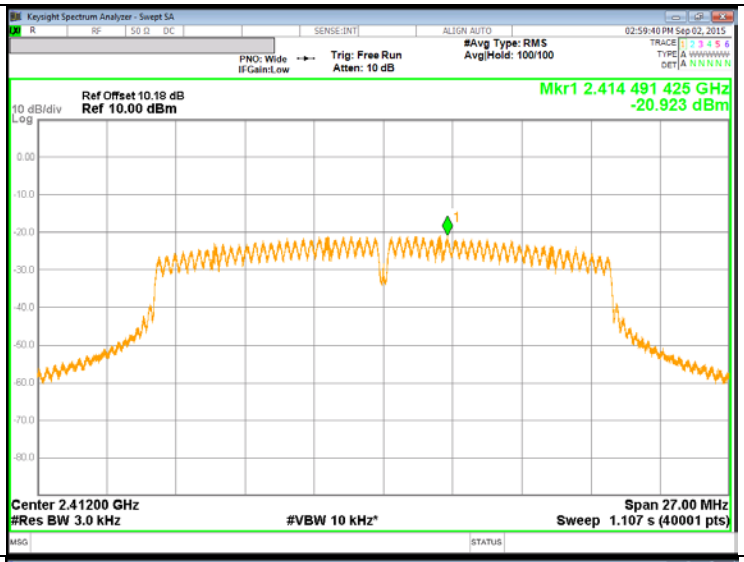
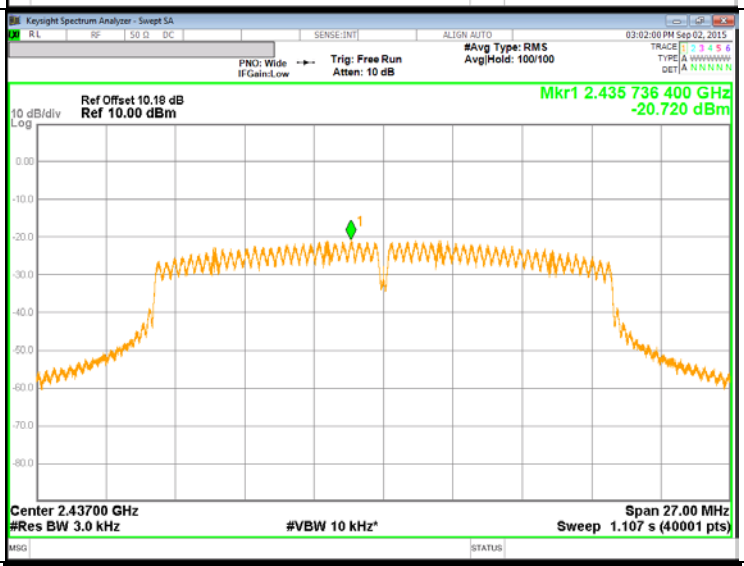
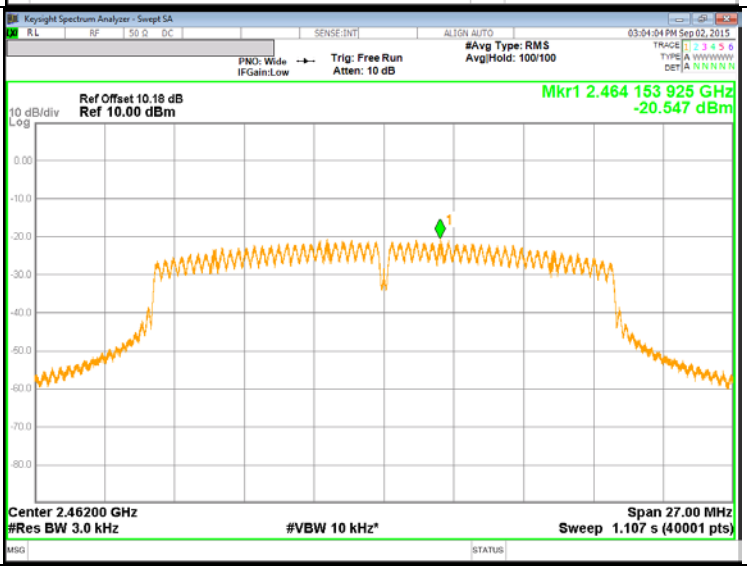
802.11n Mode Low CH		
802.11n Mode Middle CH		
802.11n Mode High CH		

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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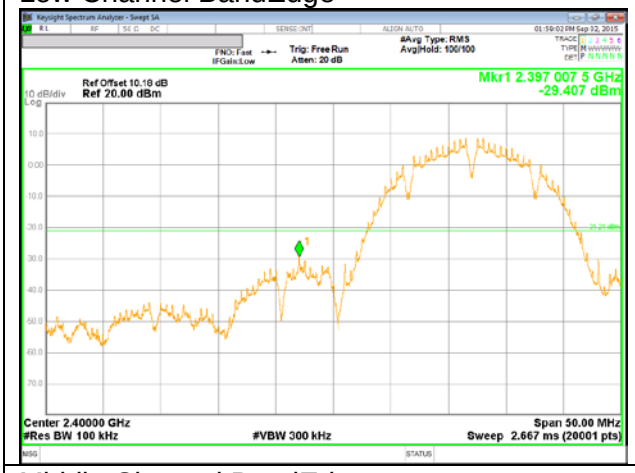
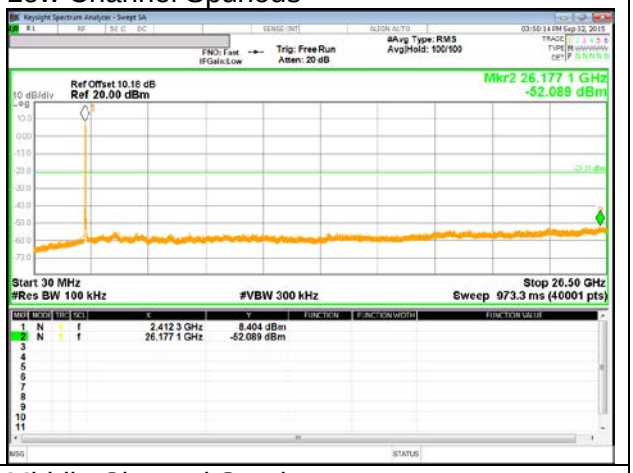
RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

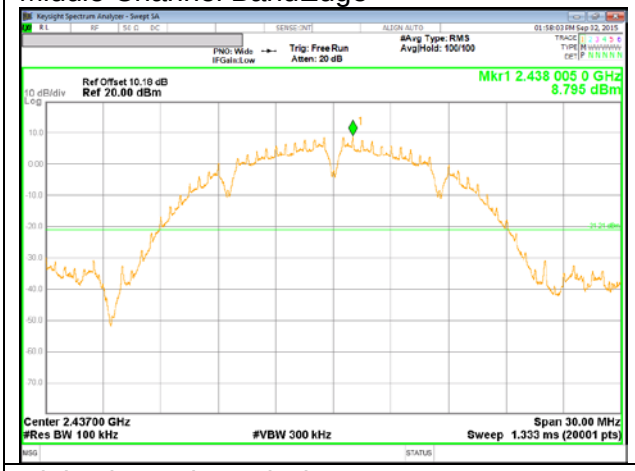
Low Channel BandEdge



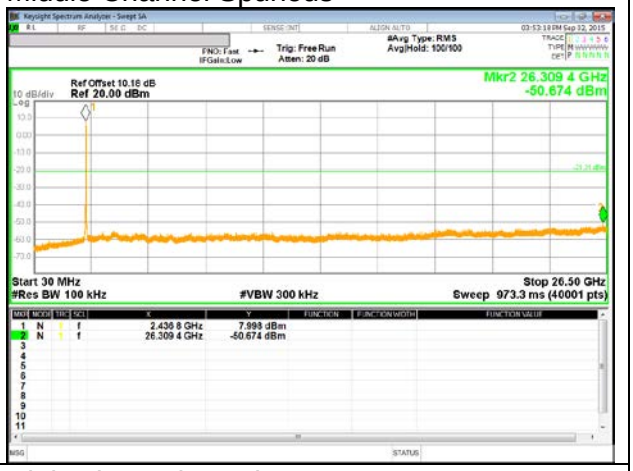
Low Channel Spurious



Middle Channel BandEdge

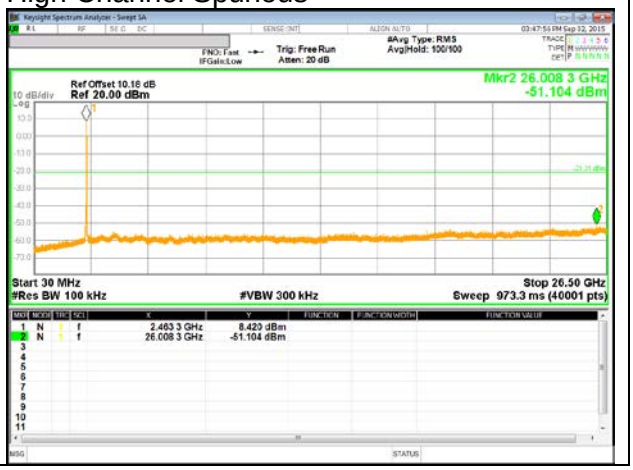


Middle Channel Spurious



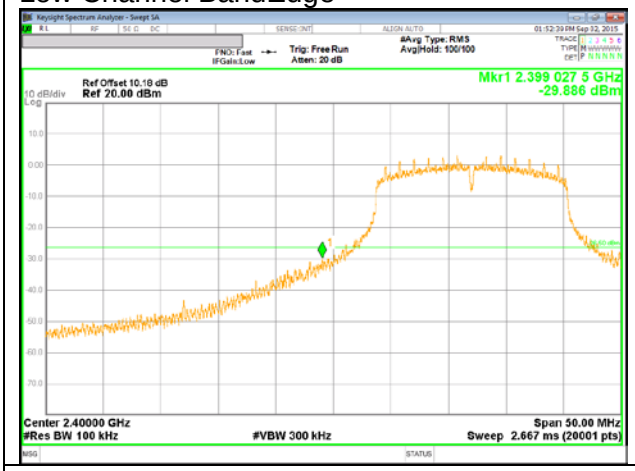
High Channel BandEdge

High Channel Spurious



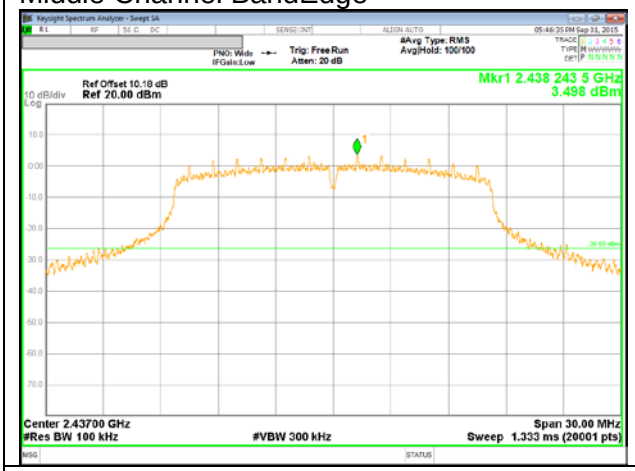
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

Low Channel BandEdge

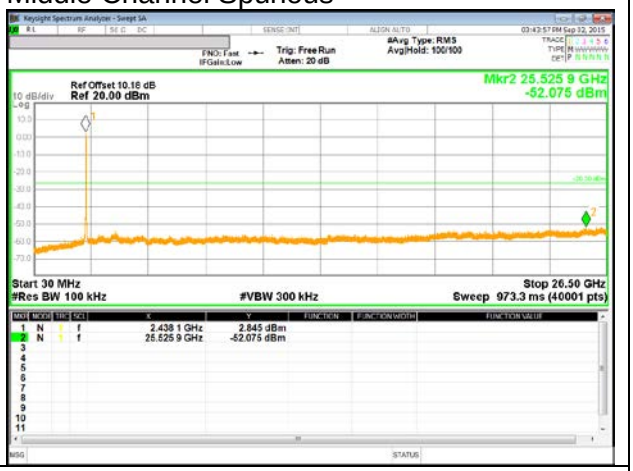


Low Channel Spurious

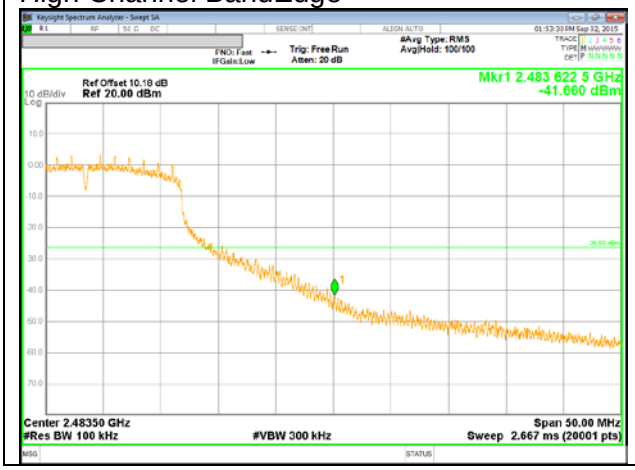
Middle Channel BandEdge



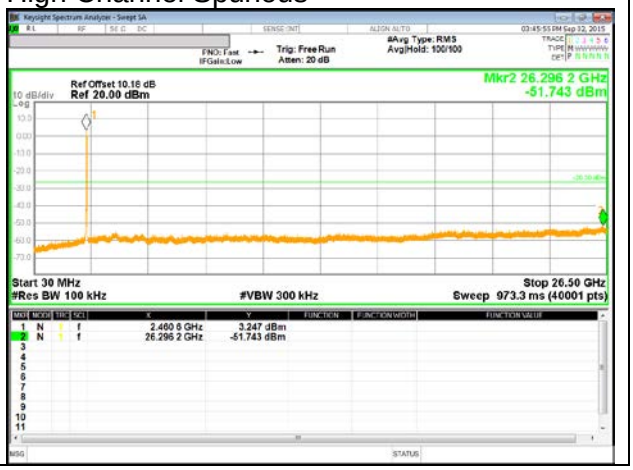
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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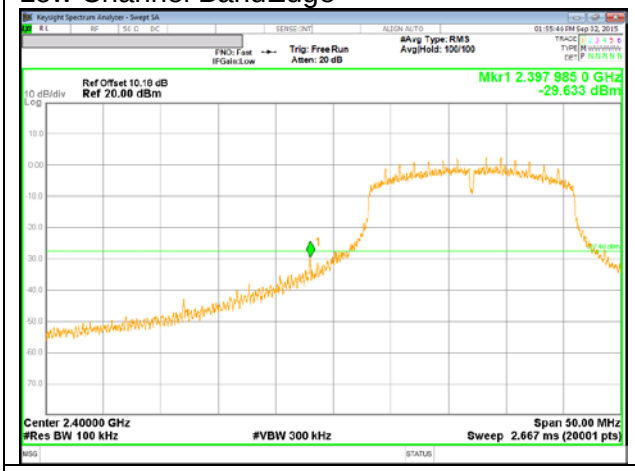
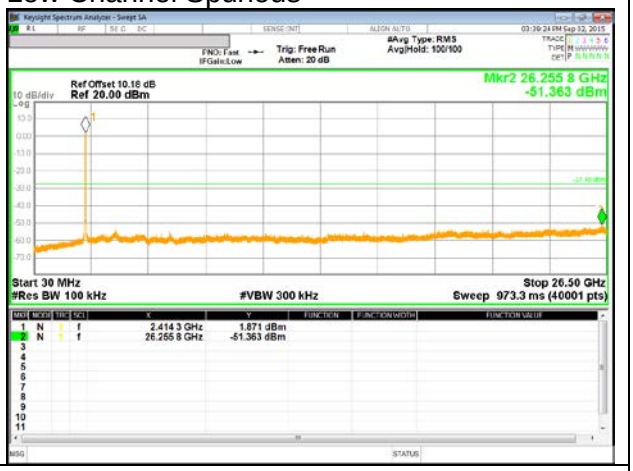
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

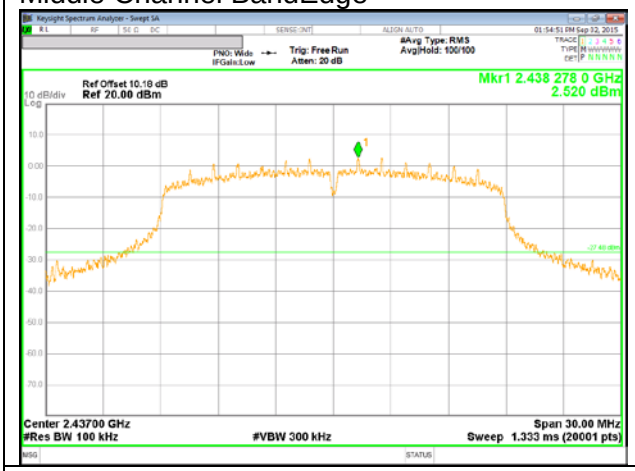
Low Channel BandEdge



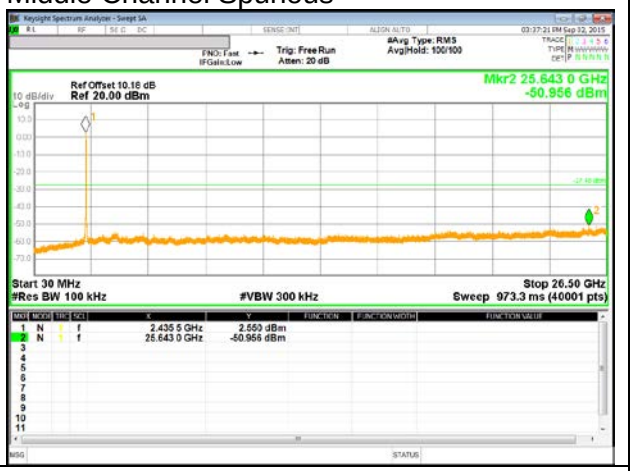
Low Channel Spurious



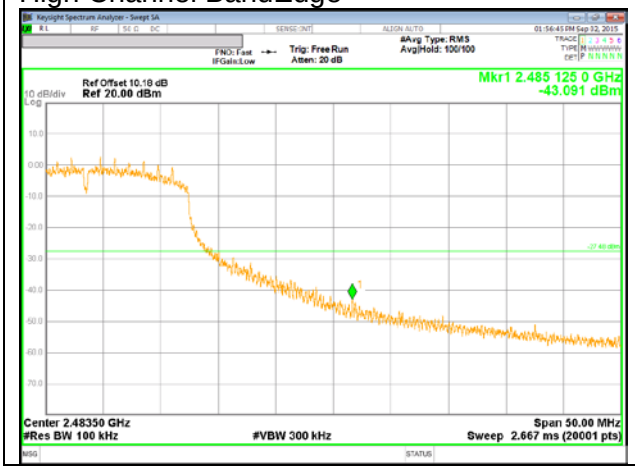
Middle Channel BandEdge



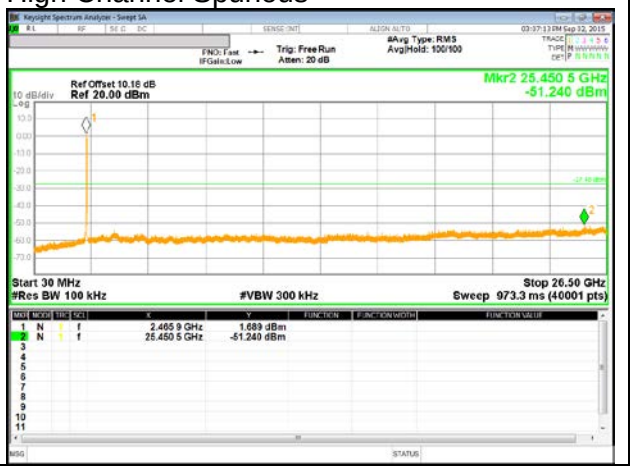
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



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.

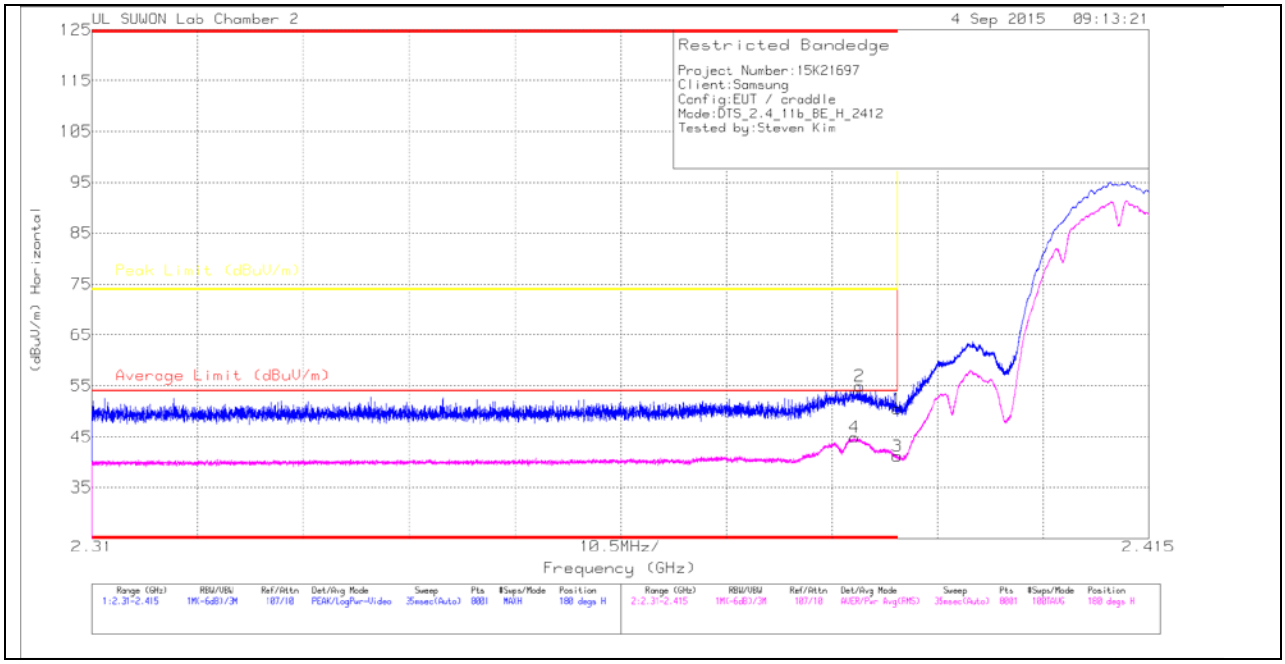
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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

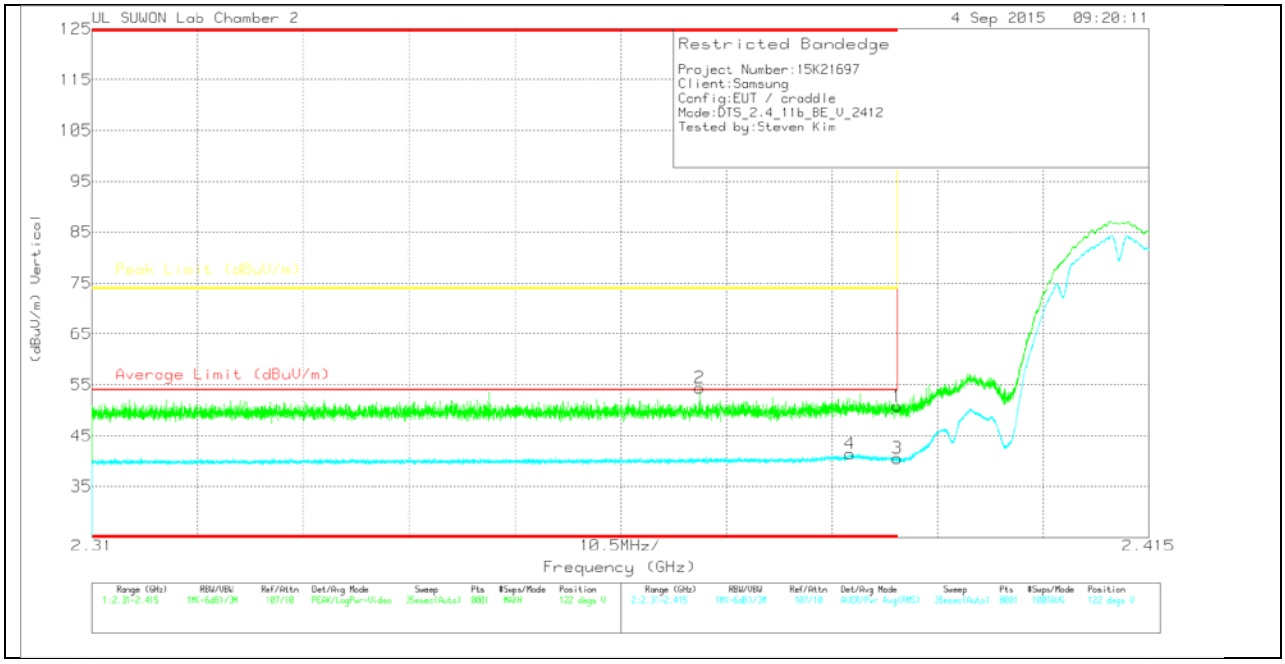
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.25	Pk	31.7	-19.5	0	50.45	-	-	74	-23.55	180	141	H
2	* 2.386	42.69	Pk	31.7	-19.5	0	54.89	-	-	74	-19.11	180	141	H
3	* 2.39	29.01	RMS	31.7	-19.5	0	41.21	54	-12.79	-	-	180	141	H
4	* 2.386	32.67	RMS	31.7	-19.5	0	44.87	54	-9.13	-	-	180	141	H

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

Pk - Peak detector

RMS - RMS detection

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	38.58	Pk	31.7	-19.5	0	50.78	-	-	74	-23.22	122	100	V
2	* 2.37	42.28	Pk	31.7	-19.6	0	54.38	-	-	74	-19.62	122	100	V
3	* 2.39	28.34	RMS	31.7	-19.5	0	40.54	54	-13.46	-	-	122	100	V
4	* 2.385	29.28	RMS	31.7	-19.5	0	41.48	54	-12.52	-	-	122	100	V

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

Pk - Peak detector

RMS - RMS detection

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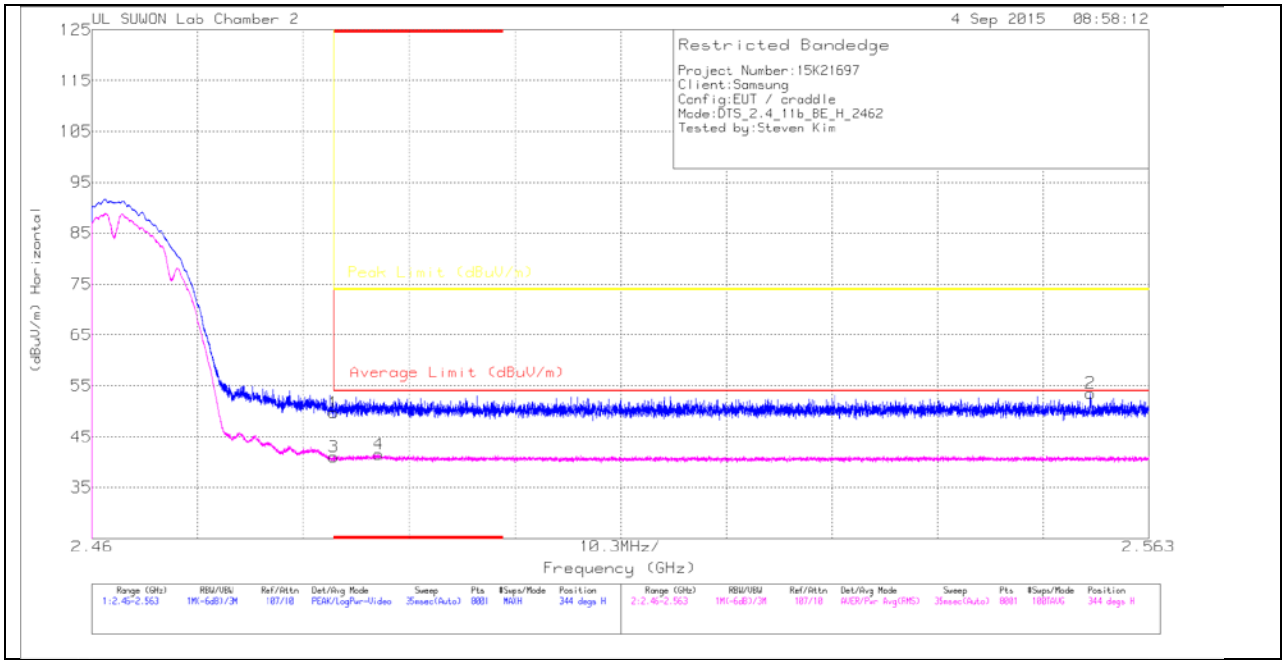
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

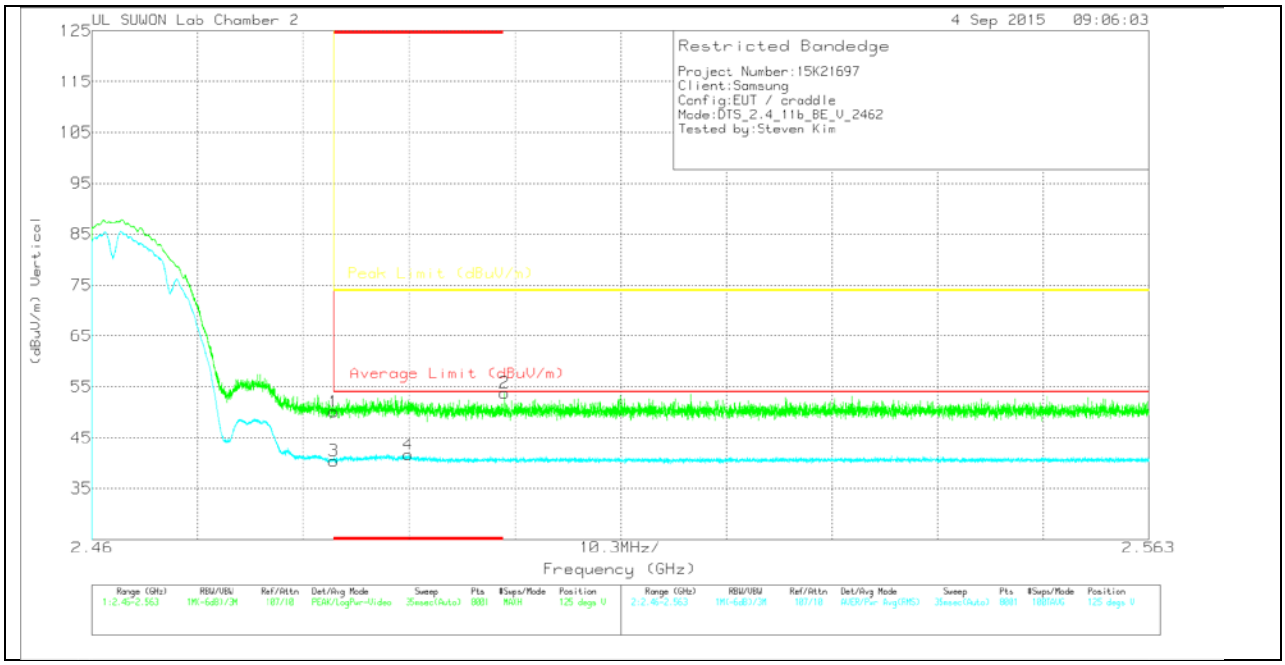
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.32	Pk	31.8	-19.4	0	49.72	-	-	74	-24.28	344	348	H
2	2.557	40.9	Pk	31.9	-19.3	0	53.5	-	-	74	-20.5	344	348	H
3	* 2.484	28.69	RMS	31.8	-19.4	0	41.09	54	-12.91	-	-	344	348	H
4	* 2.488	29.12	RMS	31.8	-19.4	0	41.52	54	-12.48	-	-	344	348	H

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

Pk - Peak detector

RMS - RMS detection

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	37.64	Pk	31.8	-19.4	0	50.04	-	-	74	-23.96	125	331	V
2	2.5	41.22	Pk	31.9	-19.3	0	53.82	-	-	74	-20.18	125	331	V
3	* 2.484	27.98	RMS	31.8	-19.4	0	40.38	54	-13.62	-	-	125	331	V
4	* 2.491	29.29	RMS	31.8	-19.4	0	41.69	54	-12.31	-	-	125	331	V

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

Pk - Peak detector

RMS - RMS detection

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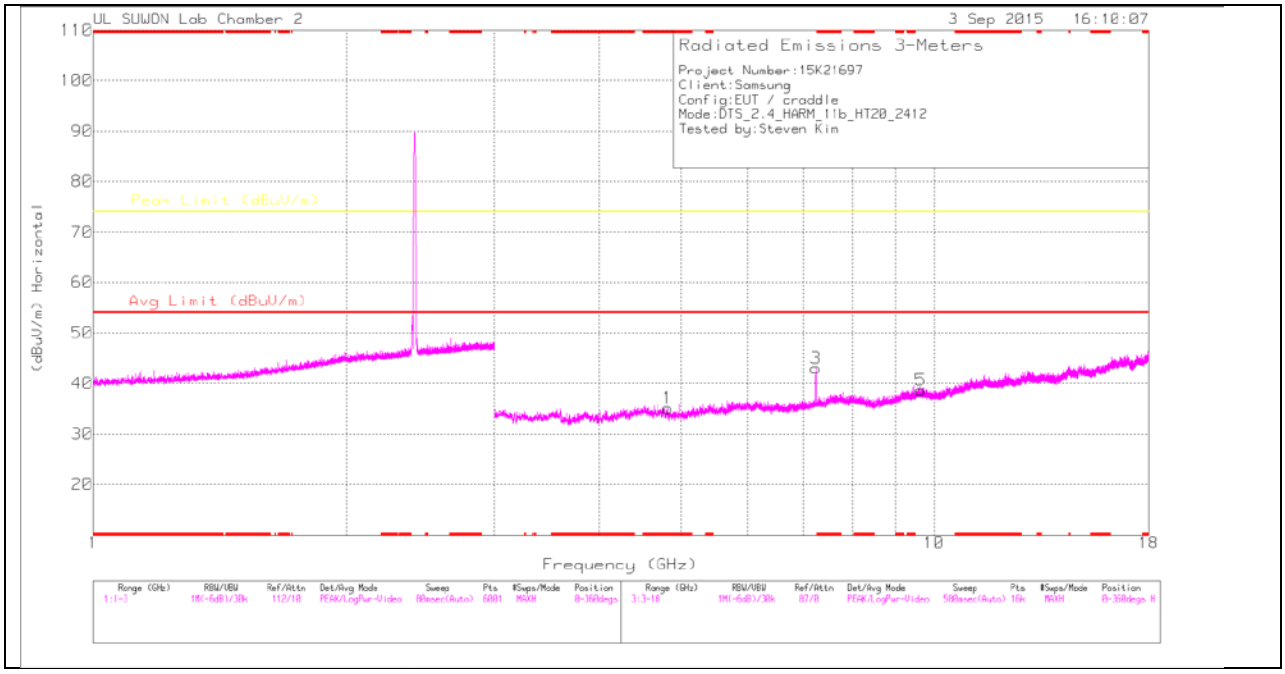
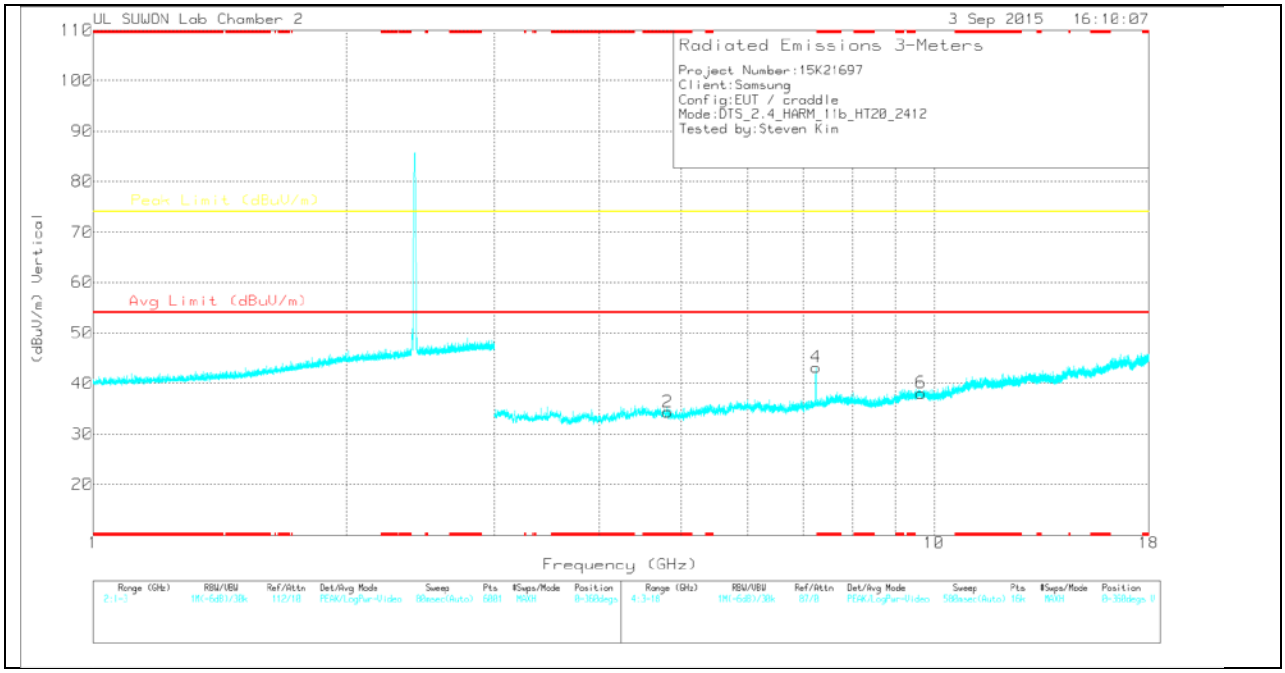
HARMONICS AND SPURIOUS EMISSIONS

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.

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	26.5	PK	33.9	-25.3	0	35.1	-	-	74	-38.9	0-360	200	H
3	7.235	30.22	PK	35.8	-23	0	43.02	-	-	74	-30.98	0-360	200	H
5	9.645	20.78	PK	36.9	-19	0	38.68	-	-	74	-35.32	0-360	100	H
2	* 4.824	25.74	PK	33.9	-25.3	0	34.34	-	-	74	-39.66	0-360	200	V
4	7.237	30.42	PK	35.8	-23	0	43.22	-	-	74	-30.78	0-360	200	V
6	9.649	20.22	PK	36.9	-19	0	38.12	-	-	74	-35.88	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
7.237	39.94	PK2	35.8	-23	0	52.74	-	-	74	-21.26	9	173	H
7.237	39.79	PK2	35.8	-23	0	52.59	-	-	74	-21.41	197	321	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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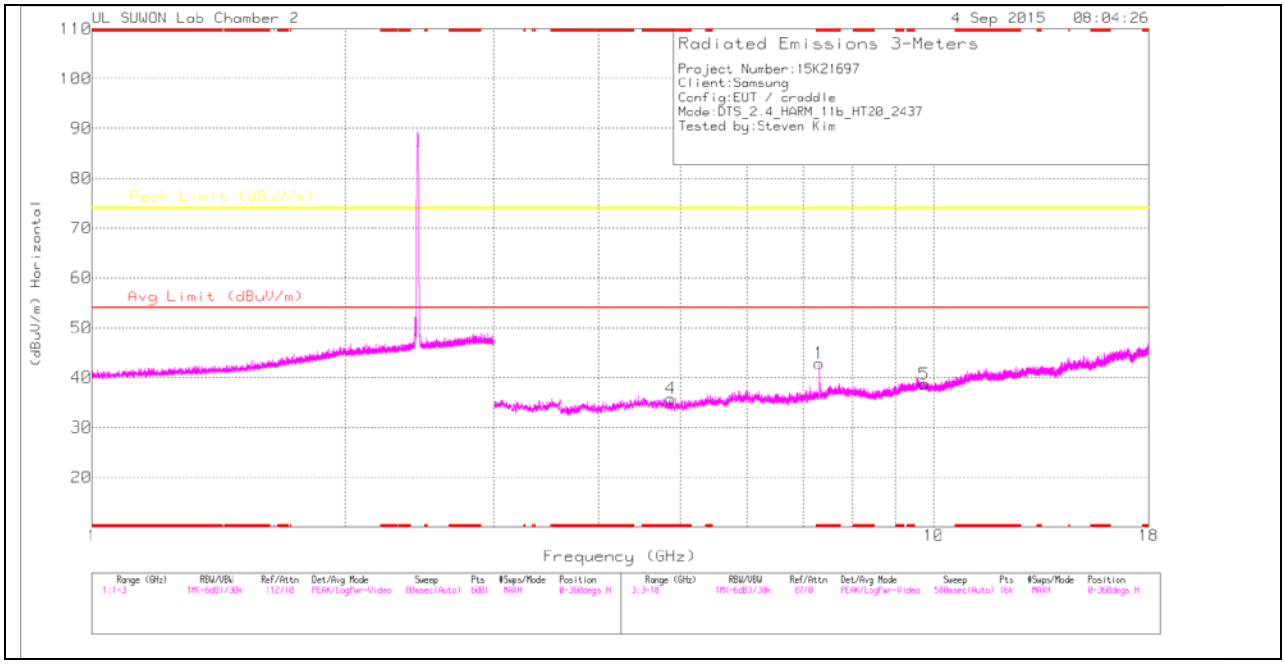
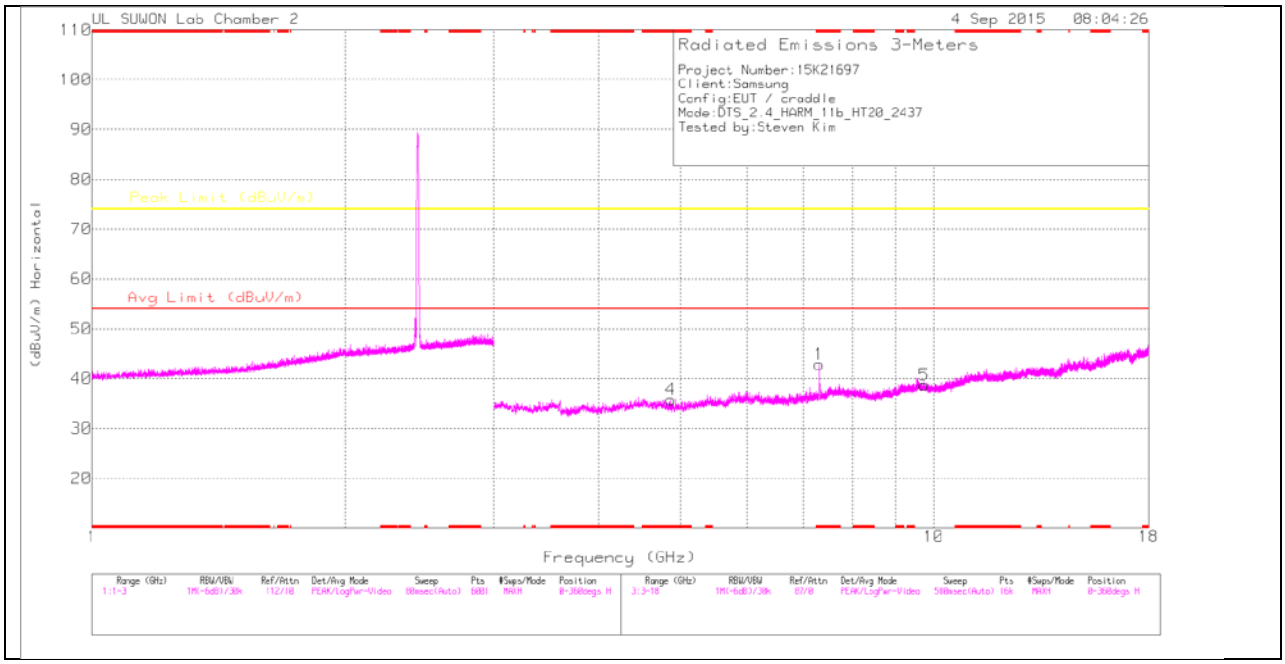
MID CHANNEL HORIZONTAL



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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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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	* 7.311	29.57	PK	35.9	-22.6	0	42.87	-	-	74	-31.13	0-360	200	H
4	* 4.874	27.08	PK	33.9	-25.2	0	35.78	-	-	74	-38.22	0-360	200	H
5	9.748	21.01	PK	37	-19.3	0	38.71	-	-	74	-35.29	0-360	200	H
2	* 7.31	28.57	PK	35.9	-22.6	0	41.87	-	-	74	-32.13	0-360	100	V
3	* 4.876	26.3	PK	33.9	-25.2	0	35	-	-	74	-39	0-360	200	V
6	9.744	20.95	PK	37	-19.3	0	38.65	-	-	74	-35.35	0-360	100	V

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

PK – Peak detector

Radiated Emissions

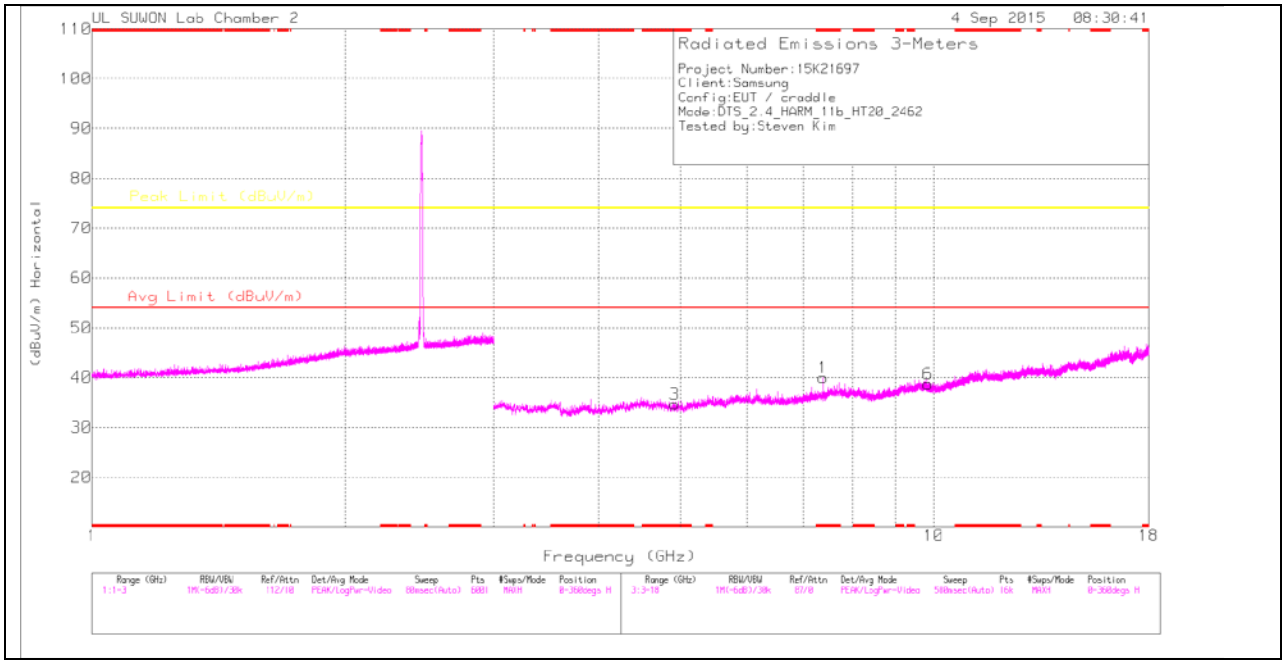
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.311	38.75	PK2	35.9	-22.6	0	52.05	-	-	74	-21.95	15	188	H
* 7.312	29.36	MAv1	35.9	-22.6	0	42.66	54	-11.34	-	-	15	188	H
* 7.313	37.51	PK2	35.9	-22.6	0	50.81	-	-	74	-23.19	201	143	V
* 7.311	28.19	MAv1	35.9	-22.6	0	41.49	54	-12.51	-	-	201	143	V

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

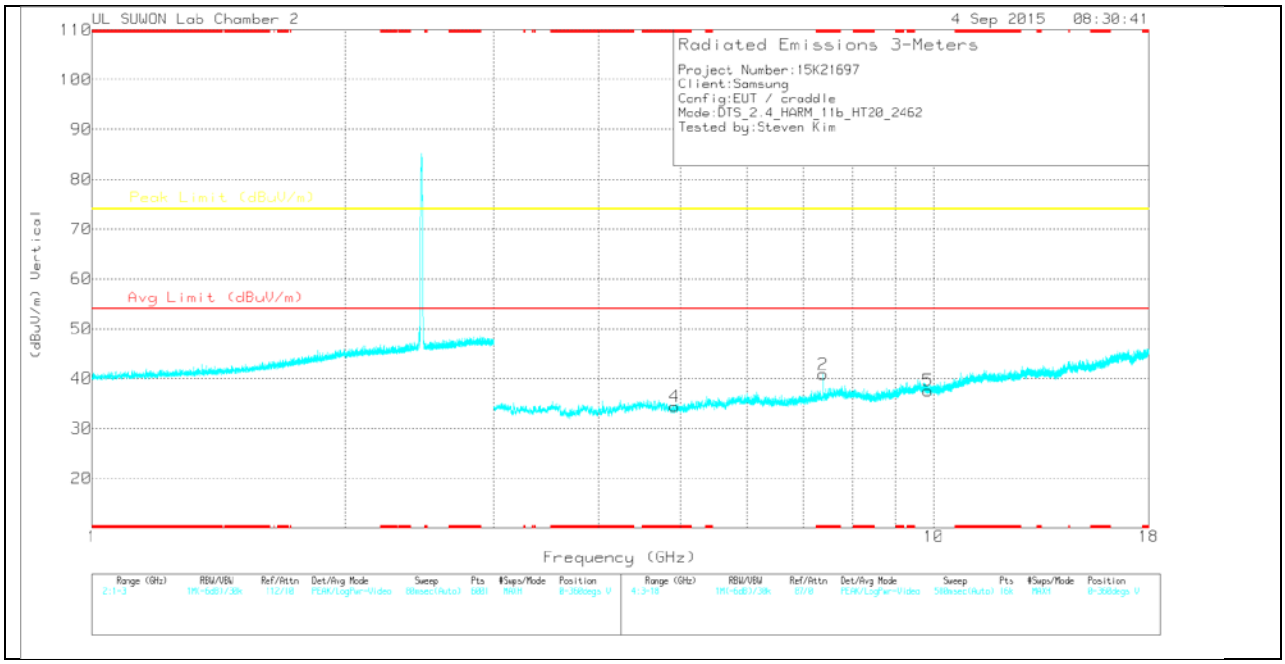
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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	* 7.387	26.26	PK	35.9	-22.2	0	39.96	-	-	74	-34.04	0-360	200	H
3	* 4.924	25.93	PK	33.9	-25.1	0	34.73	-	-	74	-39.27	0-360	100	H
6	9.848	20.8	PK	37.1	-19.2	0	38.7	-	-	74	-35.3	0-360	200	H
2	* 7.387	27.22	PK	35.9	-22.2	0	40.92	-	-	74	-33.08	0-360	200	V
4	* 4.924	25.57	PK	33.9	-25.1	0	34.37	-	-	74	-39.63	0-360	100	V
5	9.848	19.73	PK	37.1	-19.2	0	37.63	-	-	74	-36.37	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
* 7.388	35.09	PK2	35.9	-22.2	0	48.79	-	-	74	-25.21	275	178	H
* 7.387	24.05	MAv1	35.9	-22.2	0	37.75	54	-16.25	-	-	275	178	H
* 7.386	36.23	PK2	35.9	-22.2	0	49.93	-	-	74	-24.07	214	143	V
* 7.387	26.14	MAv1	35.9	-22.2	0	39.84	54	-14.16	-	-	214	143	V

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

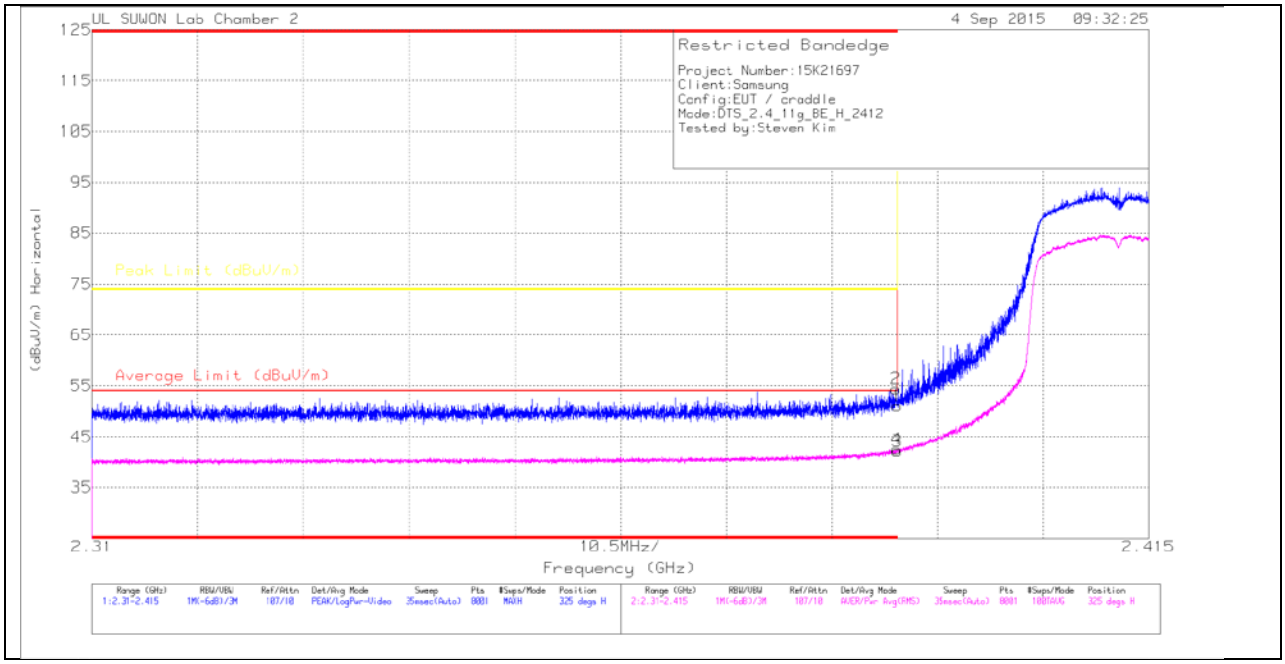
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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

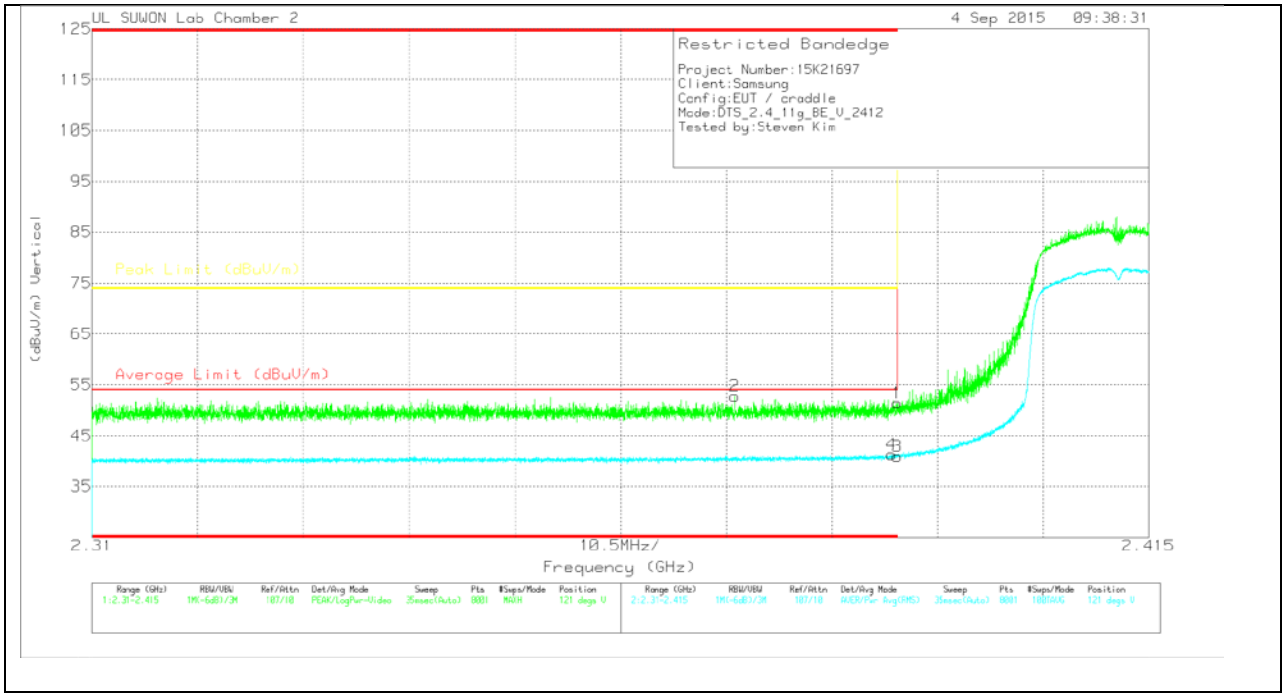
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.87	Pk	31.7	-19.5	0	51.07	-	-	74	-22.93	325	132	H
2	* 2.39	42.17	Pk	31.7	-19.5	0	54.37	-	-	74	-19.63	325	132	H
3	* 2.39	29.64	RMS	31.7	-19.5	.3	42.14	54	-11.86	-	-	325	132	H
4	* 2.39	30.01	RMS	31.7	-19.5	.3	42.51	54	-11.49	-	-	325	132	H

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

Pk - Peak detector

RMS - RMS detection

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	39.24	Pk	31.7	-19.5	0	51.44	-	-	74	-22.56	121	103	V
2	* 2.374	40.68	Pk	31.7	-19.6	0	52.78	-	-	74	-21.22	121	103	V
3	* 2.39	28.46	RMS	31.7	-19.5	.3	40.96	54	-13.04	-	-	121	103	V
4	* 2.389	28.79	RMS	31.7	-19.5	.3	41.29	54	-12.71	-	-	121	103	V

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

Pk - Peak detector

RMS - RMS detection

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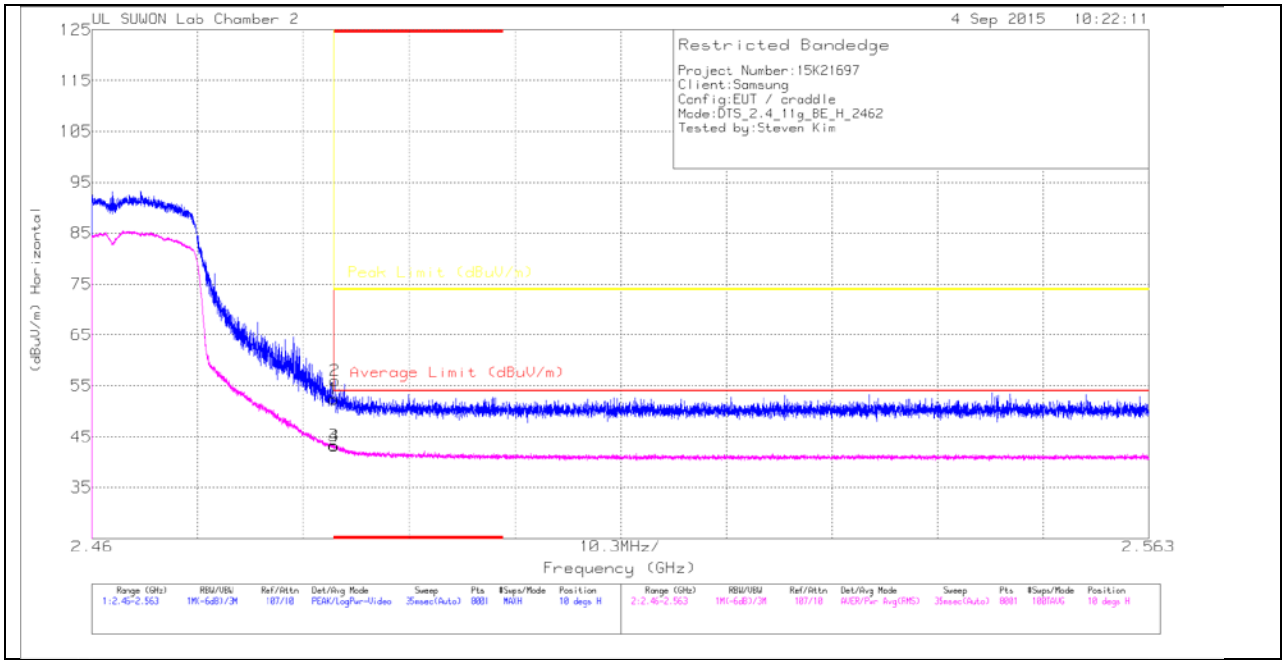
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

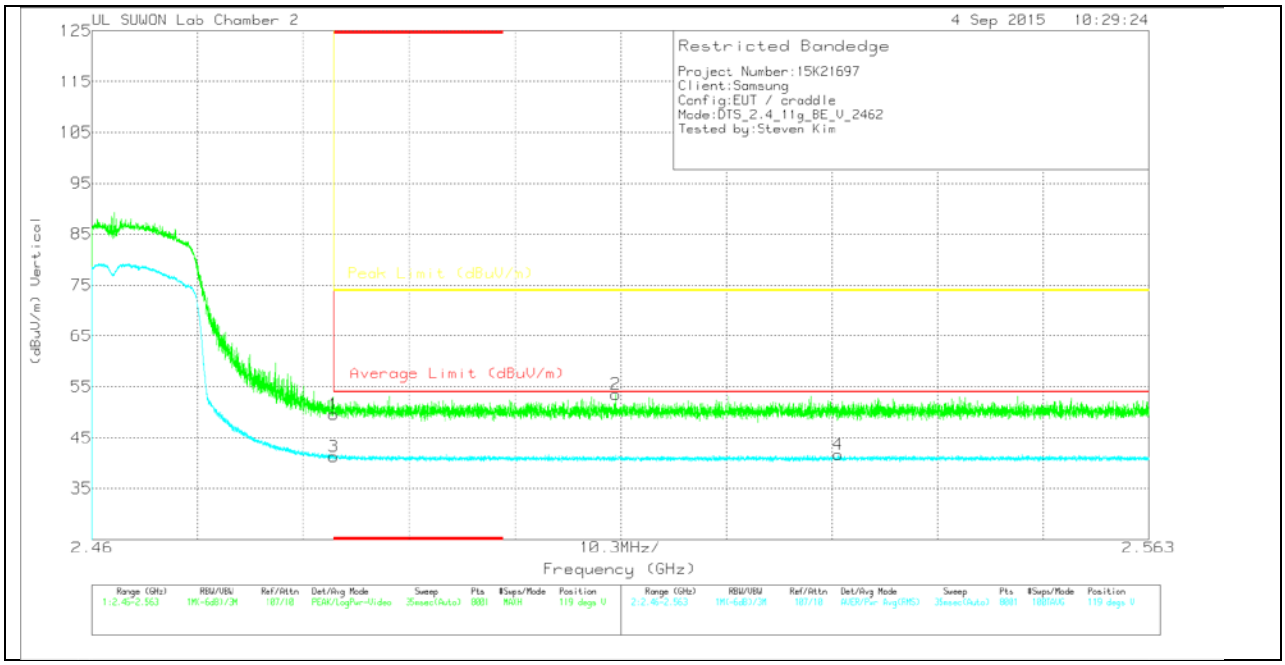
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.03	Pk	31.8	-19.4	0	52.43	-	-	74	-21.57	10	216	H
2	* 2.484	43.62	Pk	31.8	-19.4	0	56.02	-	-	74	-17.98	10	216	H
3	* 2.484	30.57	RMS	31.8	-19.4	.3	43.27	54	-10.73	-	-	10	216	H
4	* 2.484	30.45	RMS	31.8	-19.4	.3	43.15	54	-10.85	-	-	10	216	H

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

Pk - Peak detector

RMS - RMS detection

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	37.23	Pk	31.8	-19.4	0	49.63	-	-	74	-24.37	119	100	V
2	2.511	40.93	Pk	31.9	-19.3	0	53.53	-	-	74	-20.47	119	100	V
3	* 2.484	28.58	RMS	31.8	-19.4	.3	41.28	54	-12.72	-	-	119	100	V
4	2.533	28.81	RMS	31.9	-19.3	.3	41.71	54	-12.29	-	-	119	100	V

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

Pk - Peak detector

RMS - RMS detection

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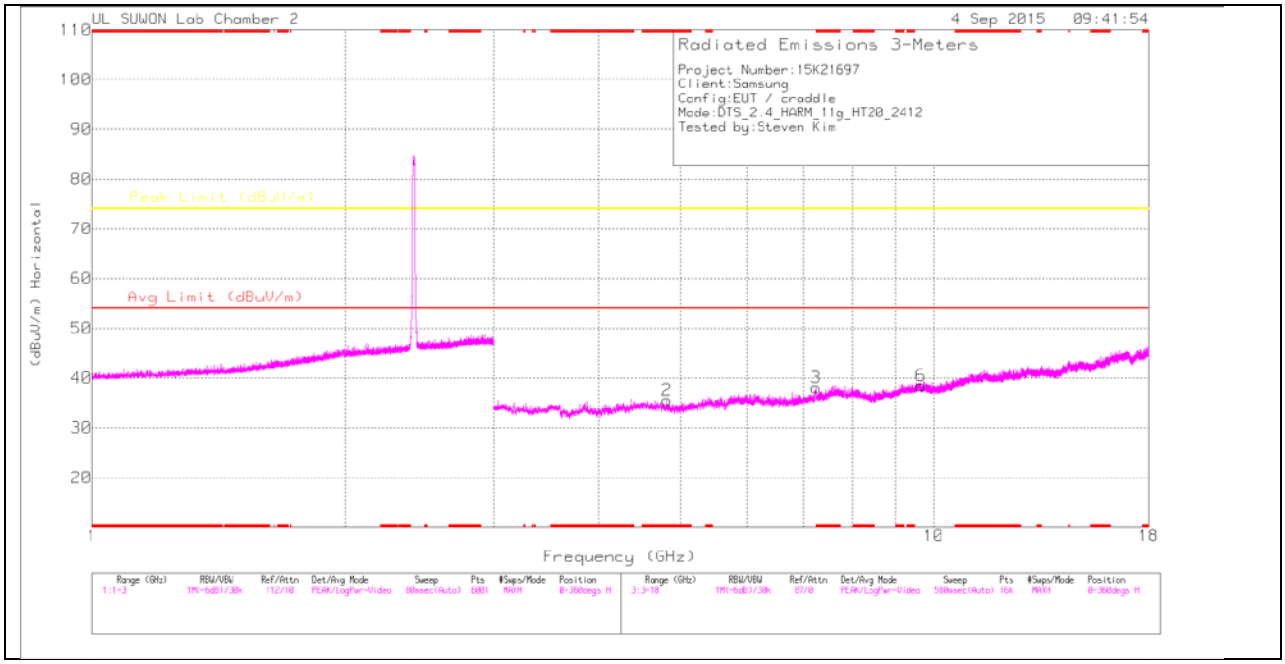
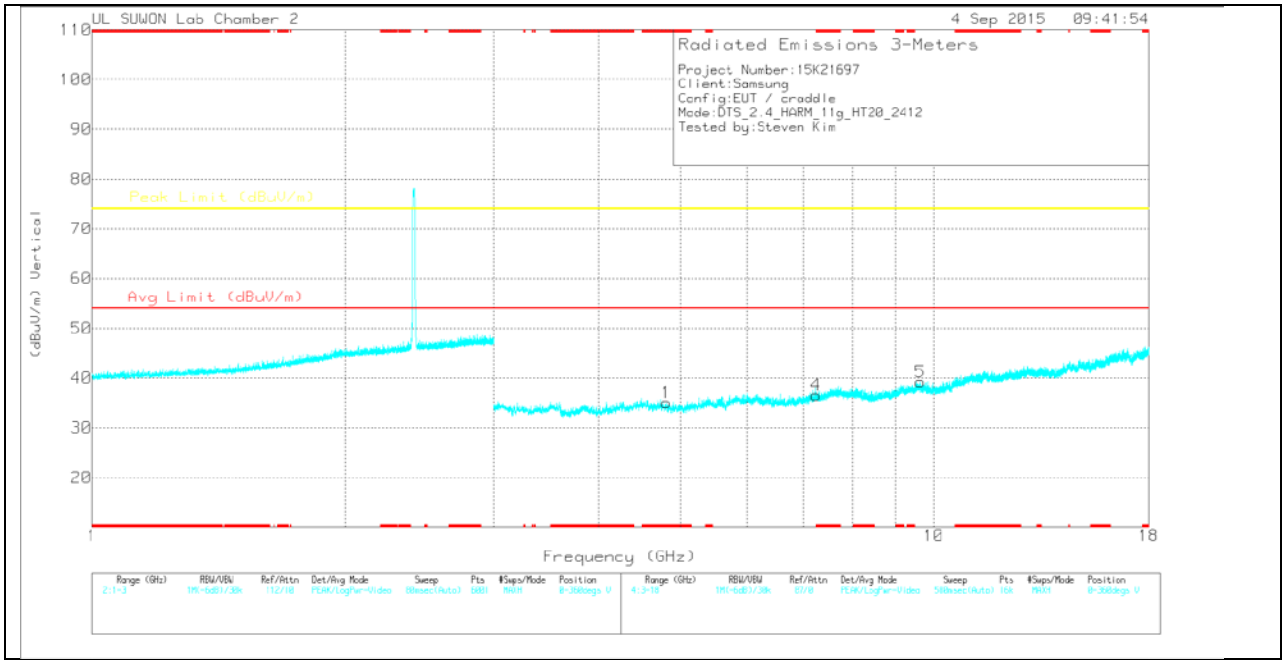
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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.

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
2	* 4.821	26.95	PK	33.9	-25.3	0	35.55	-	-	74	-38.45	0-360	100	H
3	7.242	25.32	PK	35.8	-23	0	38.12	-	-	74	-35.88	0-360	200	H
6	9.652	20.53	PK	36.9	-19	0	38.43	-	-	74	-35.57	0-360	200	H
1	* 4.814	26.51	PK	33.9	-25.3	0	35.11	-	-	74	-38.89	0-360	200	V
4	7.243	23.73	PK	35.8	-23	0	36.53	-	-	74	-37.47	0-360	100	V
5	9.642	21.4	PK	36.9	-19.1	0	39.2	-	-	74	-34.8	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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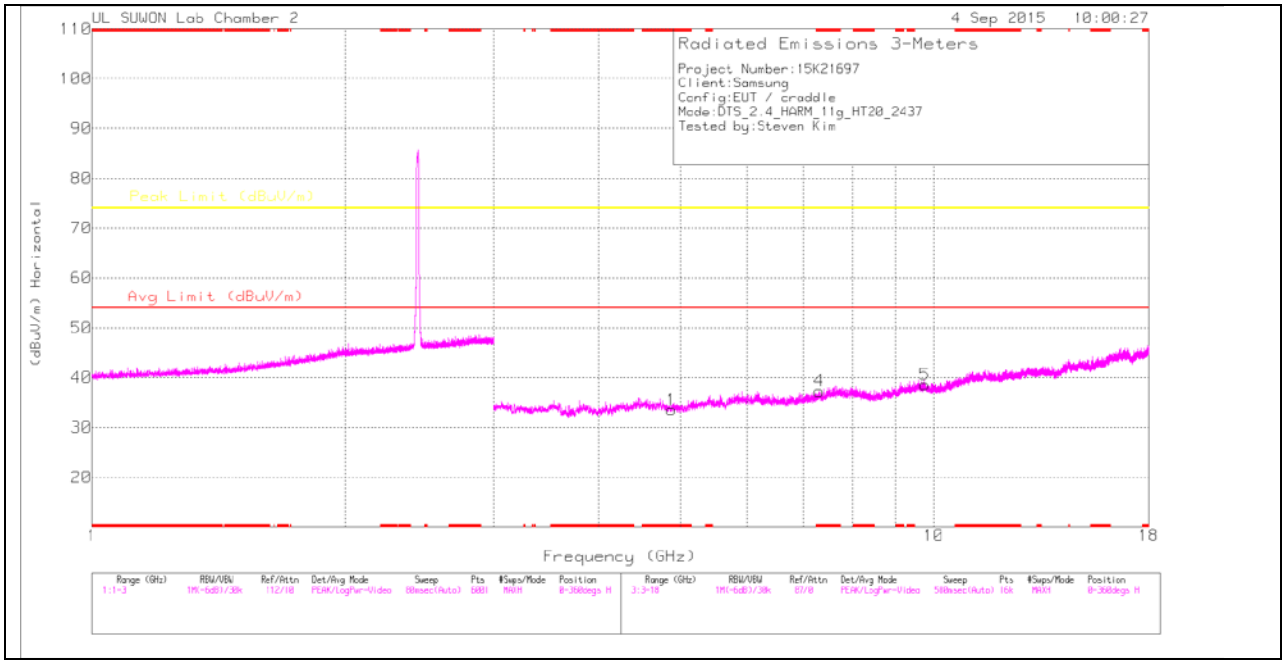
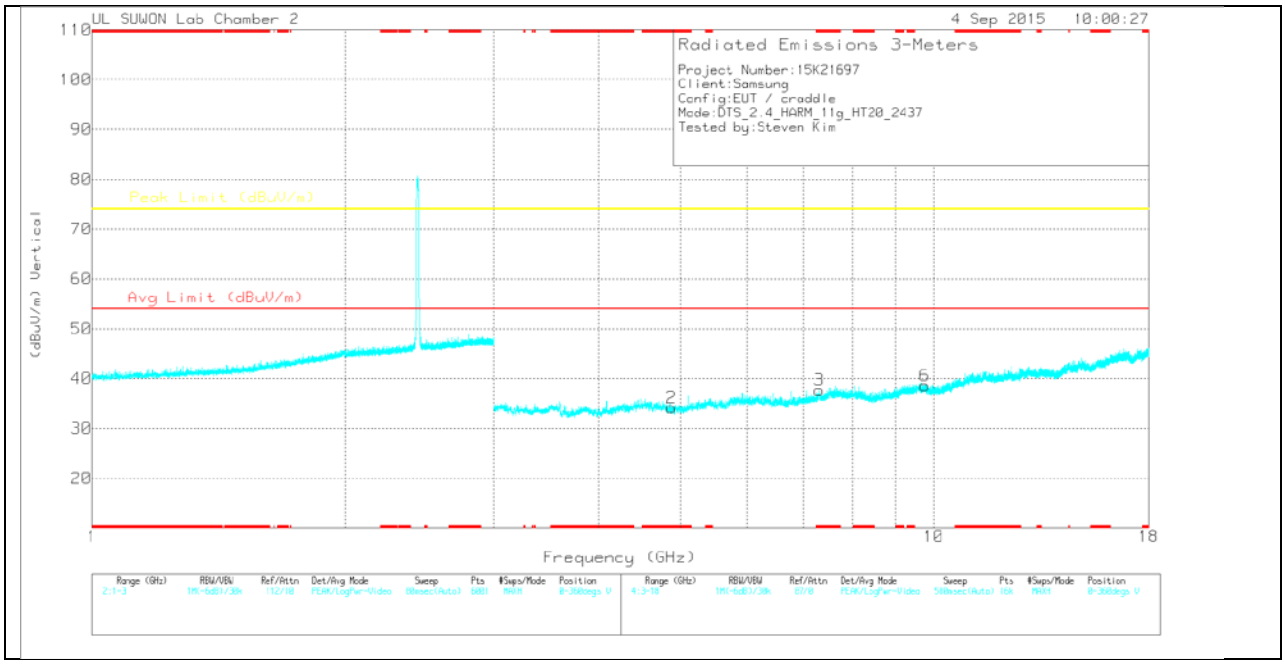
MID CHANNEL HORIZONTAL



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	* 4.877	24.88	PK	33.9	-25.2	0	33.58	-	-	74	-40.42	0-360	100	H
4	* 7.314	23.97	PK	35.9	-22.6	0	37.27	-	-	74	-36.73	0-360	200	H
5	9.751	20.85	PK	37	-19.3	0	38.55	-	-	74	-35.45	0-360	100	H
2	* 4.881	25.45	PK	33.9	-25.2	0	34.15	-	-	74	-39.85	0-360	100	V
3	* 7.31	24.41	PK	35.9	-22.6	0	37.71	-	-	74	-36.29	0-360	200	V
6	9.752	20.87	PK	37	-19.3	0	38.57	-	-	74	-35.43	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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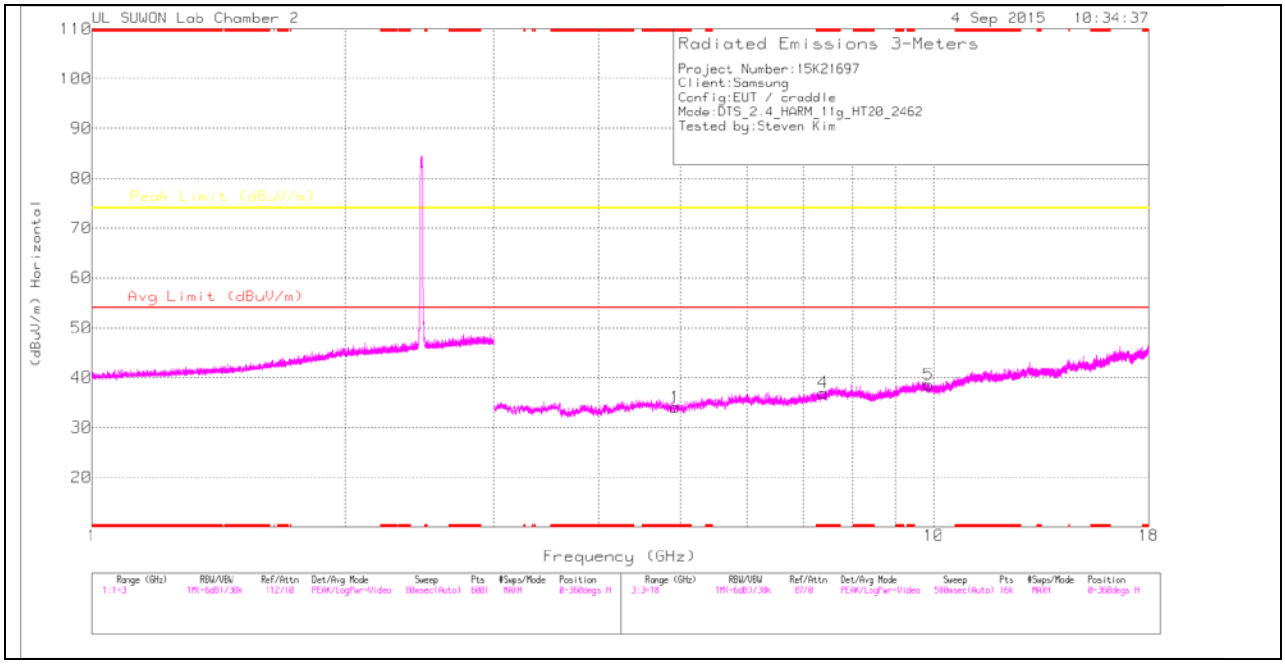
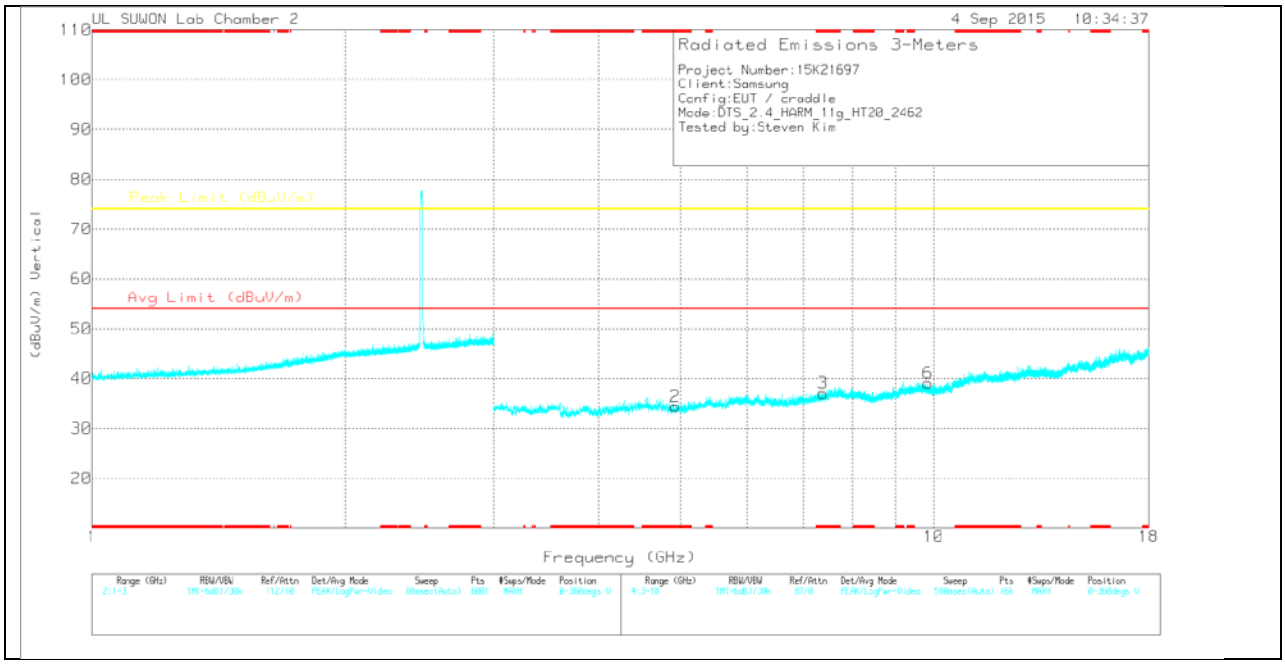
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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	* 4.928	25.27	PK	33.9	-25.1	0	34.07	-	-	74	-39.93	0-360	200	H
4	* 7.385	23.26	PK	35.9	-22.2	0	36.96	-	-	74	-37.04	0-360	200	H
5	9.851	20.75	PK	37.1	-19.2	0	38.65	-	-	74	-35.35	0-360	200	H
2	* 4.929	25.58	PK	33.9	-25.1	0	34.38	-	-	74	-39.62	0-360	100	V
3	* 7.383	23.33	PK	35.9	-22.2	0	37.03	-	-	74	-36.97	0-360	200	V
6	9.847	21.22	PK	37.1	-19.2	0	39.12	-	-	74	-34.88	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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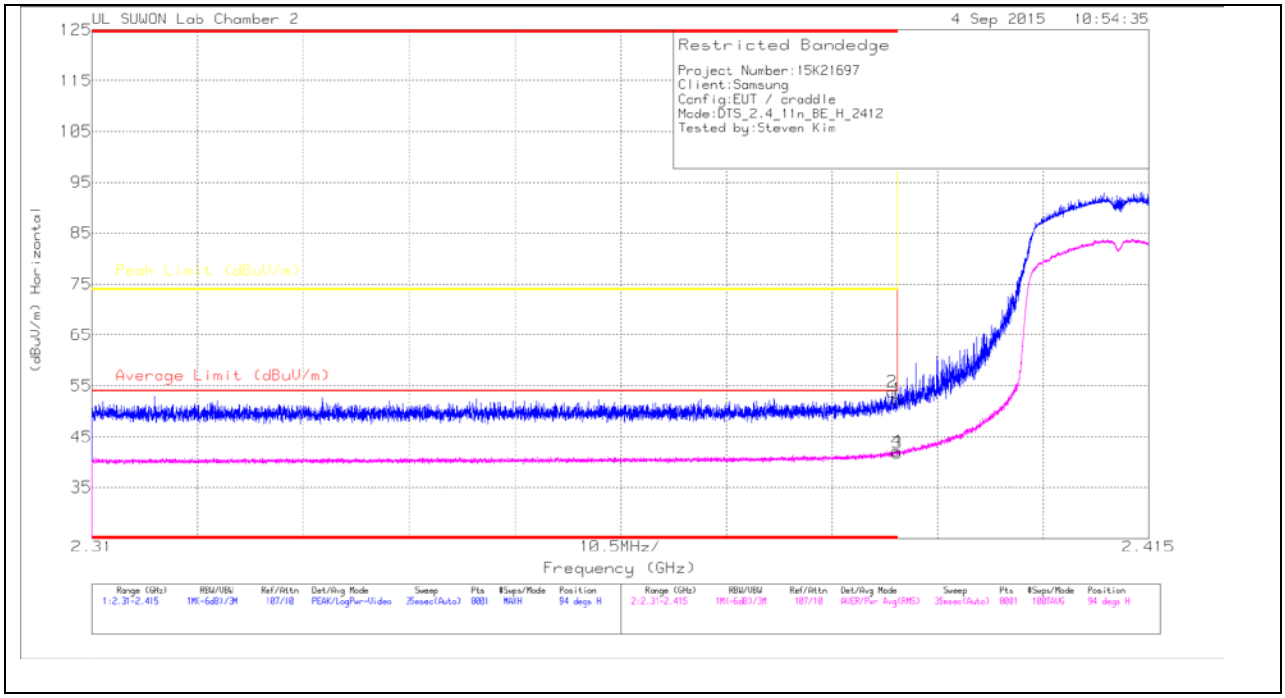
11.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

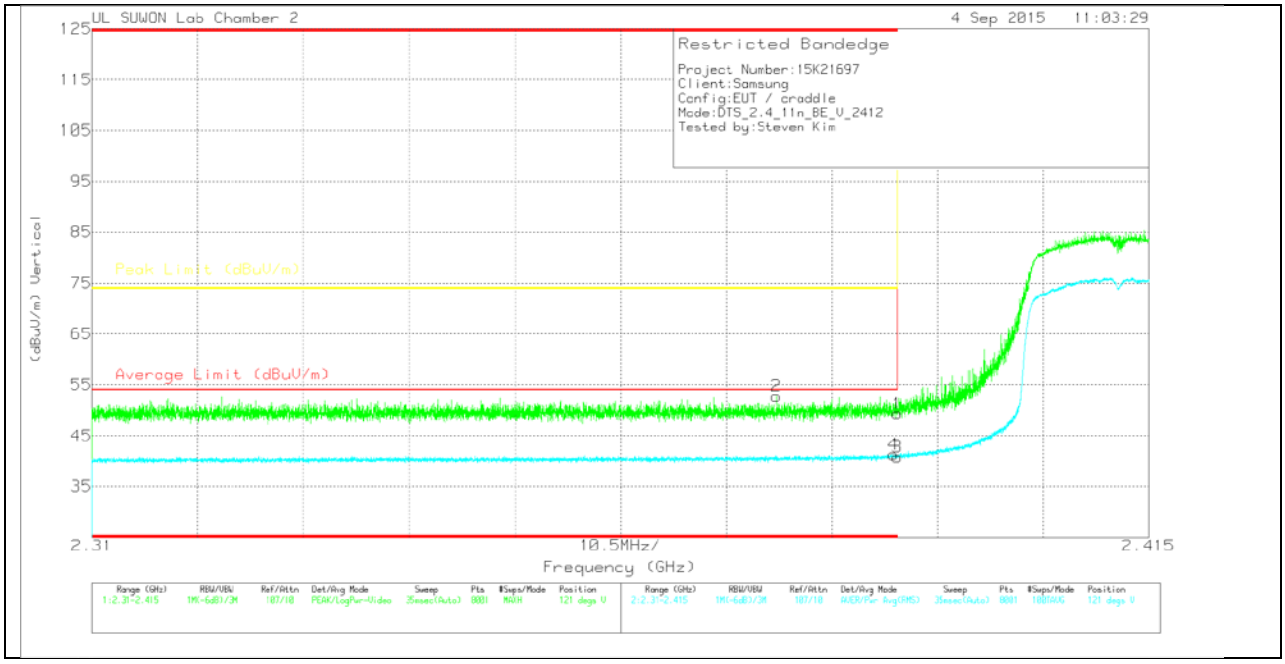
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.28	Pk	31.7	-19.5	0	52.48	-	-	74	-21.52	94	290	H
2	* 2.39	41.64	Pk	31.7	-19.5	0	53.84	-	-	74	-20.16	94	290	H
3	* 2.39	29.23	RMS	31.7	-19.5	.32	41.75	54	-12.25	-	-	94	290	H
4	* 2.39	29.69	RMS	31.7	-19.5	.32	42.21	54	-11.79	-	-	94	290	H

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

Pk - Peak detector

RMS - RMS detection

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	37.14	Pk	31.7	-19.5	0	49.34	-	-	74	-24.66	121	356	V
2	* 2.378	40.72	Pk	31.7	-19.6	0	52.82	-	-	74	-21.18	121	356	V
3	* 2.39	28.34	RMS	31.7	-19.5	.32	40.86	54	-13.14	-	-	121	356	V
4	* 2.39	28.83	RMS	31.7	-19.5	.32	41.35	54	-12.65	-	-	121	356	V

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

Pk - Peak detector

RMS - RMS detection

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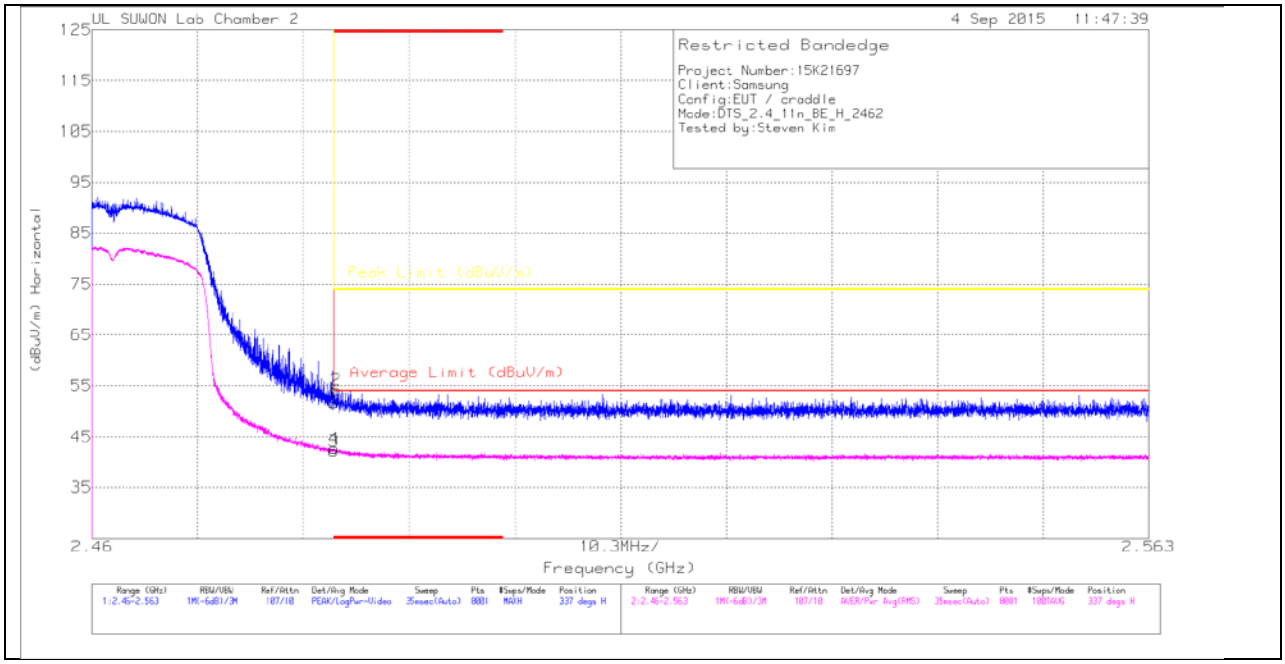
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

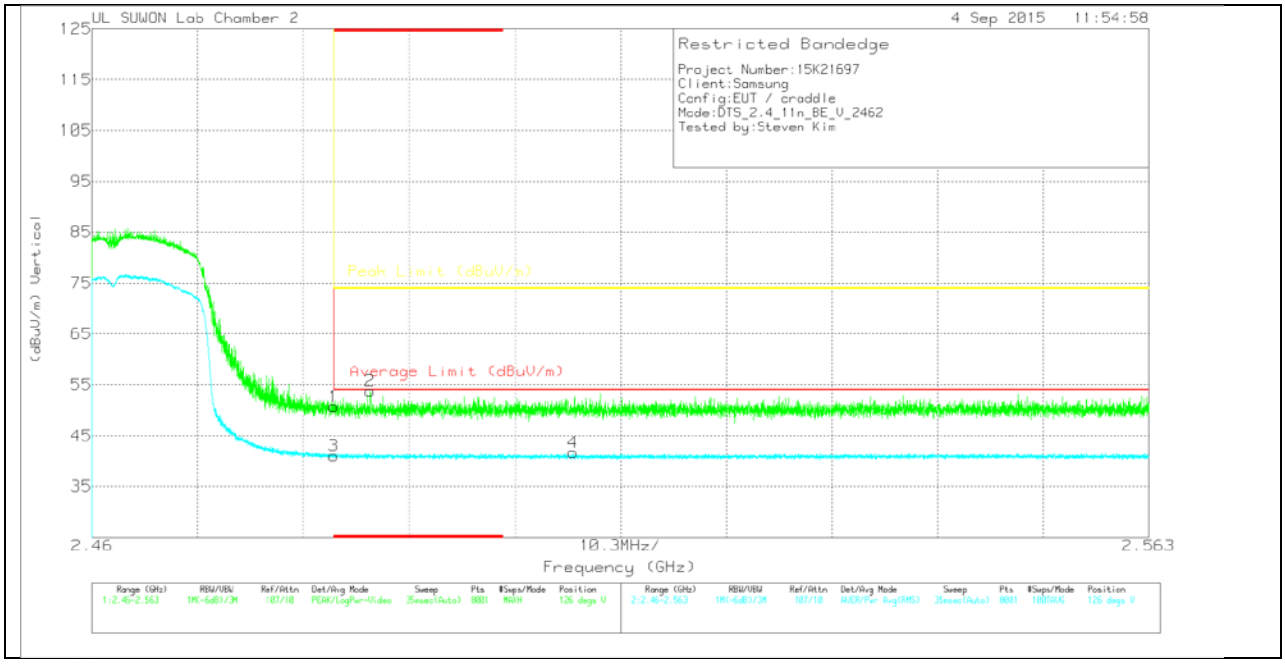
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.16	Pk	31.8	-19.4	0	51.56	-	-	74	-22.44	337	271	H
2	* 2.484	41.8	Pk	31.8	-19.4	0	54.2	-	-	74	-19.8	337	271	H
3	* 2.484	29.46	RMS	31.8	-19.4	.32	42.18	54	-11.82	-	-	337	271	H
4	* 2.484	29.92	RMS	31.8	-19.4	.32	42.64	54	-11.36	-	-	337	271	H

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

Pk - Peak detector

RMS - RMS detection

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	38.27	Pk	31.8	-19.4	0	50.67	-	-	74	-23.33	126	332	V
2	* 2.487	41.43	Pk	31.8	-19.4	0	53.83	-	-	74	-20.17	126	332	V
3	* 2.484	28.36	RMS	31.8	-19.4	.32	41.08	54	-12.92	-	-	126	332	V
4	2.507	28.75	RMS	31.9	-19.3	.32	41.67	54	-12.33	-	-	126	332	V

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

Pk - Peak detector

RMS - RMS detection

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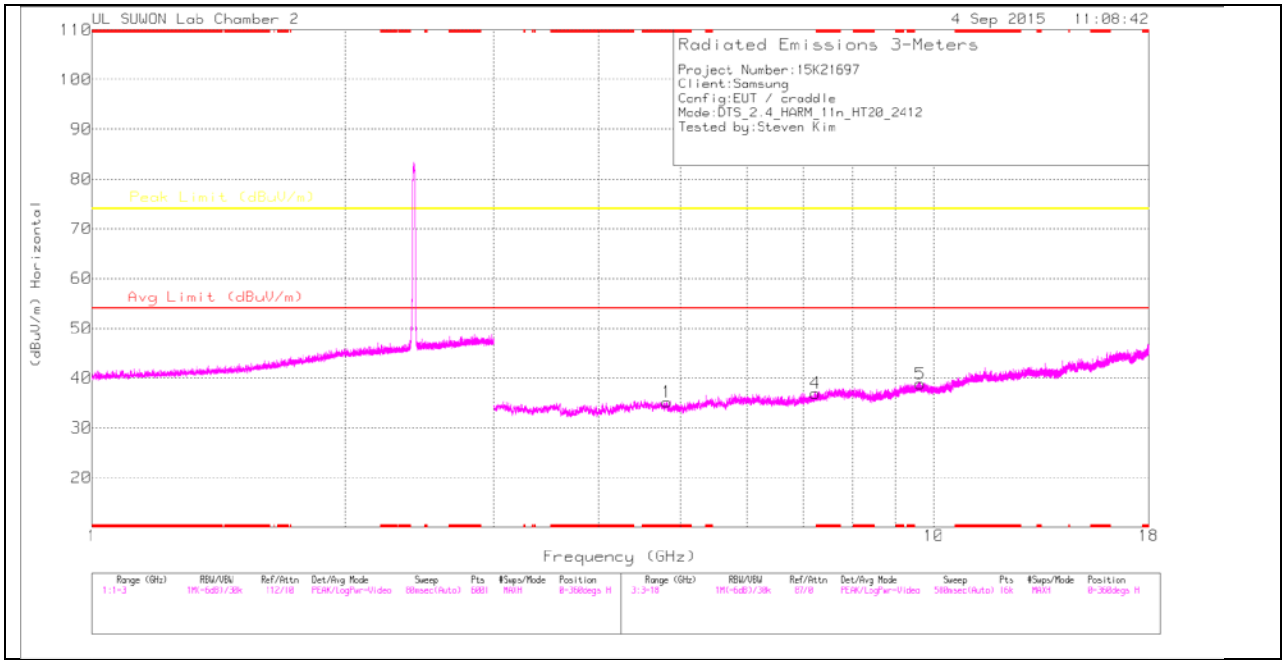
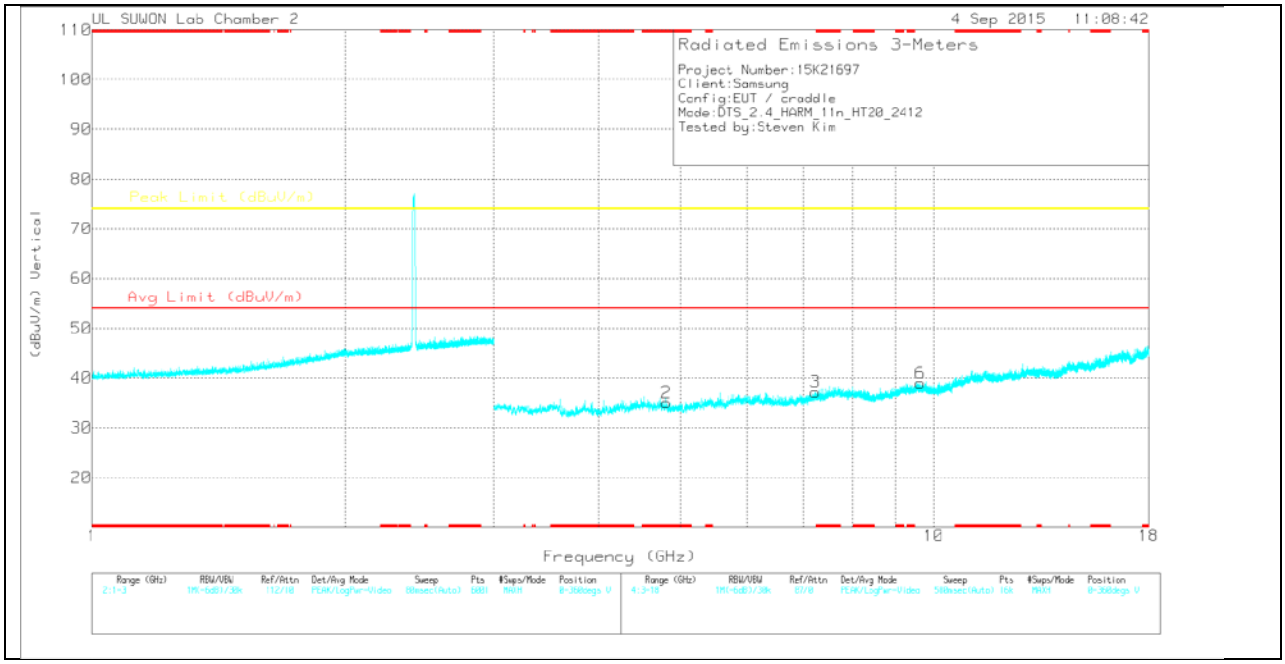
HARMONICS AND SPURIOUS EMISSIONS

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.

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	* 4.82	26.6	PK	33.9	-25.3	0	35.2	-	-	74	-38.8	0-360	100	H
4	7.23	24.19	PK	35.8	-23	0	36.99	-	-	74	-37.01	0-360	200	H
5	9.646	20.94	PK	36.9	-19	0	38.84	-	-	74	-35.16	0-360	100	H
2	* 4.817	26.47	PK	33.9	-25.3	0	35.07	-	-	74	-38.93	0-360	200	V
3	7.235	24.44	PK	35.8	-23	0	37.24	-	-	74	-36.76	0-360	200	V
6	9.642	21.23	PK	36.9	-19.1	0	39.03	-	-	74	-34.97	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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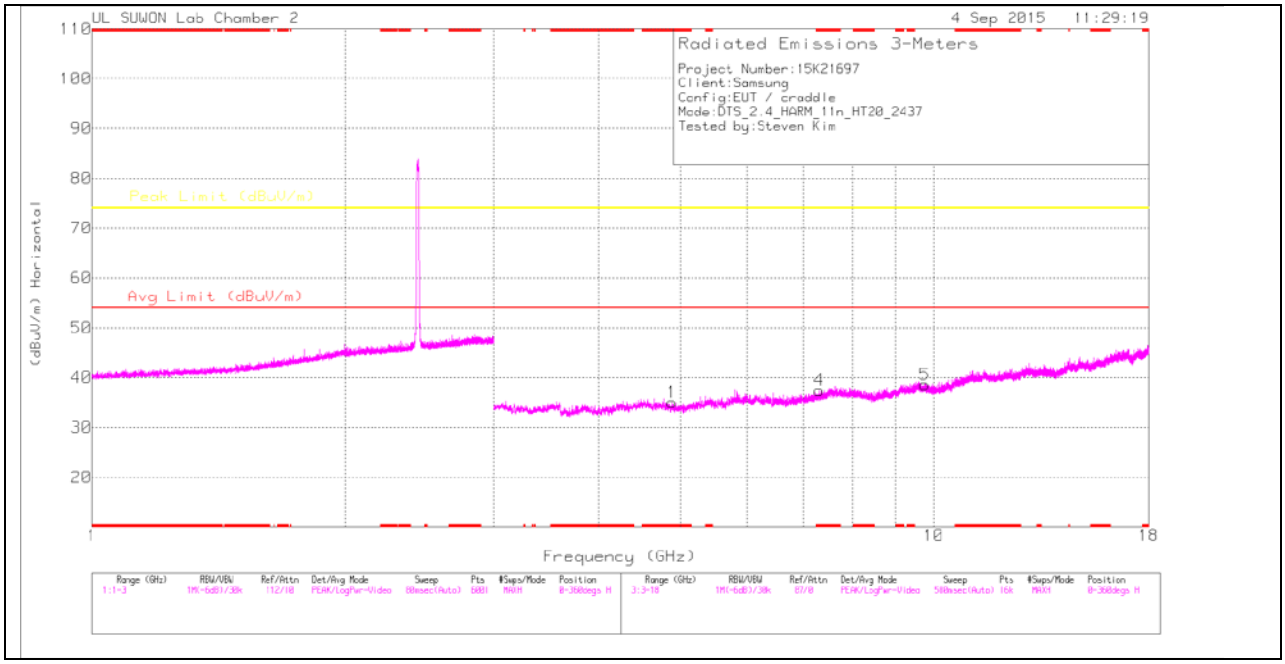
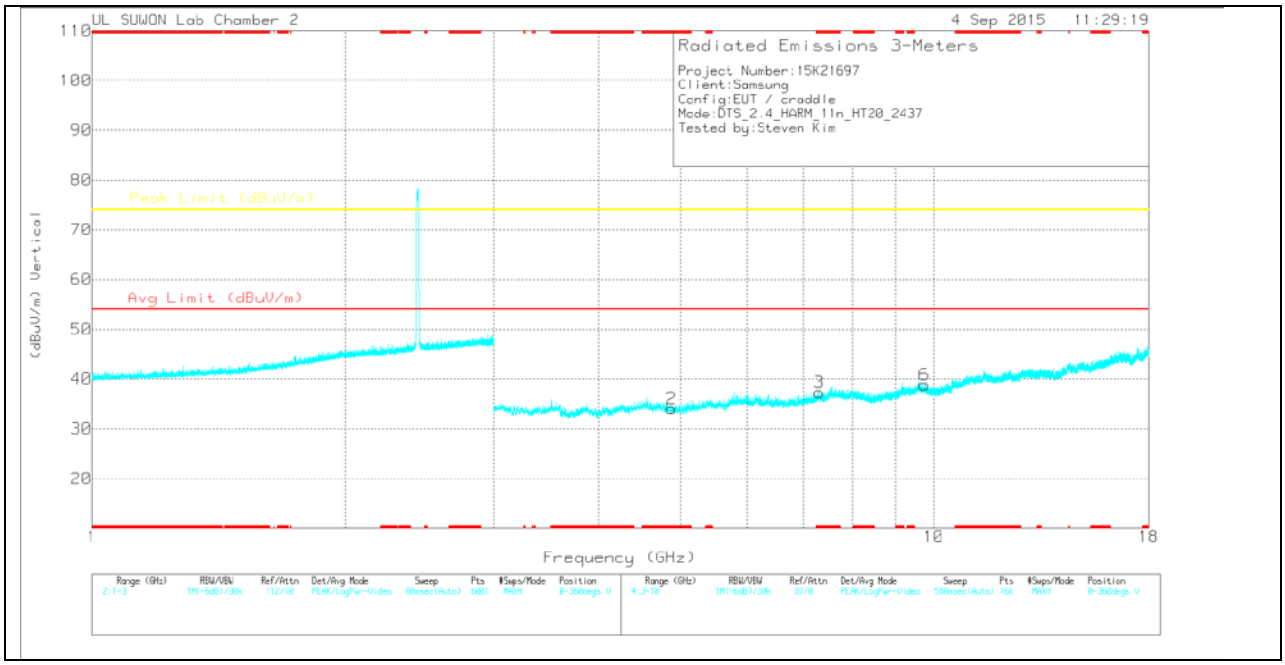
MID CHANNEL HORIZONTAL



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
1	* 4.886	26.34	PK	33.9	-25.2	0	35.04	-	-	74	-38.96	0-360	200	H
4	* 7.311	24.1	PK	35.9	-22.6	0	37.4	-	-	74	-36.6	0-360	100	H
5	9.75	20.86	PK	37	-19.3	0	38.56	-	-	74	-35.44	0-360	100	H
2	* 4.883	25.33	PK	33.9	-25.2	0	34.03	-	-	74	-39.97	0-360	200	V
3	* 7.313	24.05	PK	35.9	-22.6	0	37.35	-	-	74	-36.65	0-360	200	V
6	9.749	21.14	PK	37	-19.3	0	38.84	-	-	74	-35.16	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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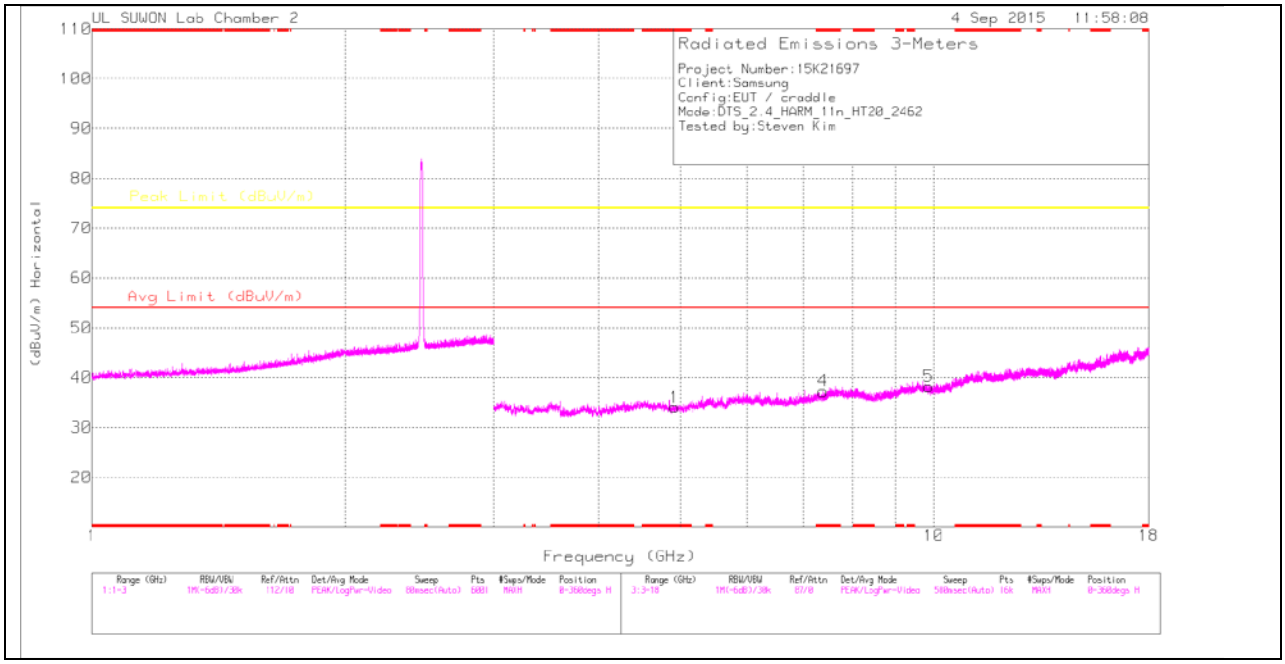
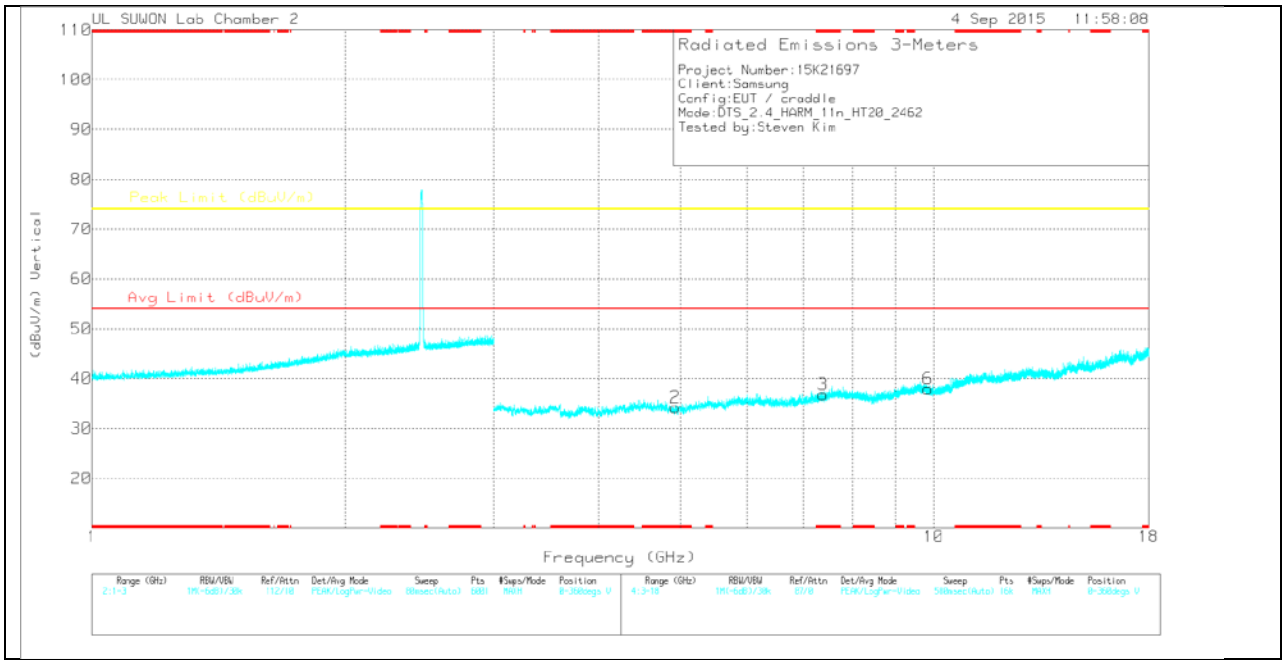
HIGH CHANNEL HORIZONTAL



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	* 4.925	25.22	PK	33.9	-25.1	0	34.02	-	-	74	-39.98	0-360	200	H
4	* 7.388	23.57	PK	35.9	-22.2	0	37.27	-	-	74	-36.73	0-360	100	H
5	9.851	20.34	PK	37.1	-19.2	0	38.24	-	-	74	-35.76	0-360	200	H
2	* 4.929	25.43	PK	33.9	-25.1	0	34.23	-	-	74	-39.77	0-360	100	V
3	* 7.384	23.15	PK	35.9	-22.2	0	36.85	-	-	74	-37.15	0-360	100	V
6	9.845	20.06	PK	37.1	-19.2	0	37.96	-	-	74	-36.04	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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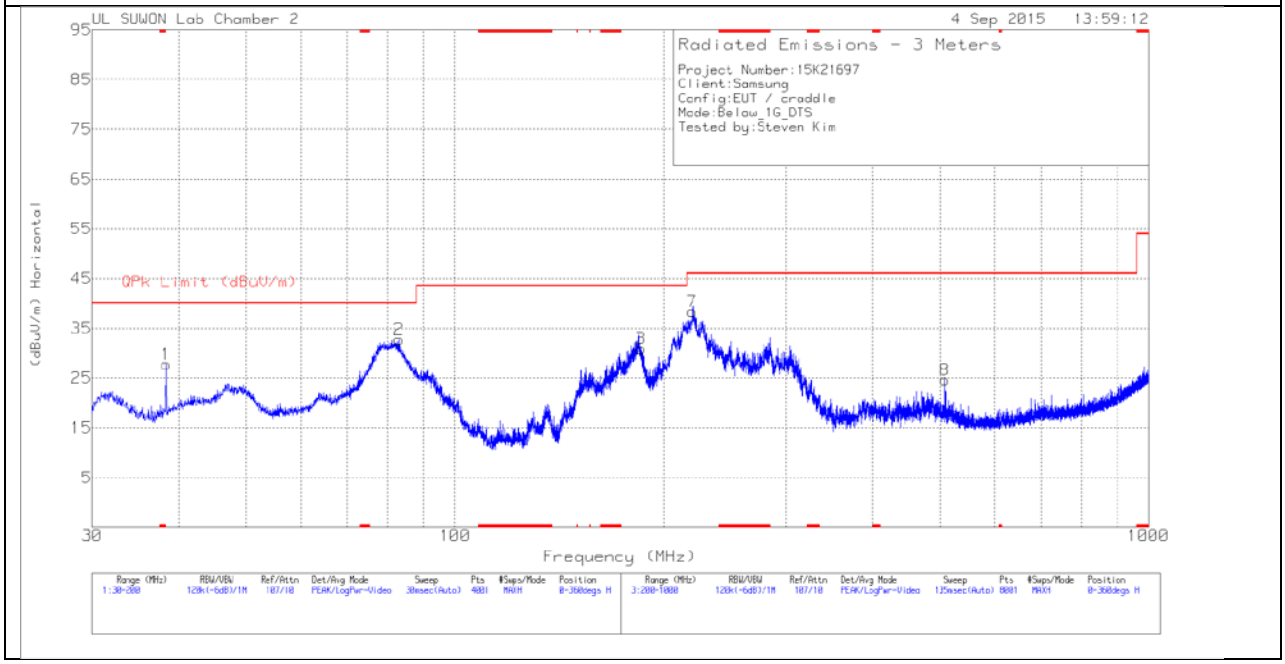
11.3. WORST-CASE BELOW 1 GHz

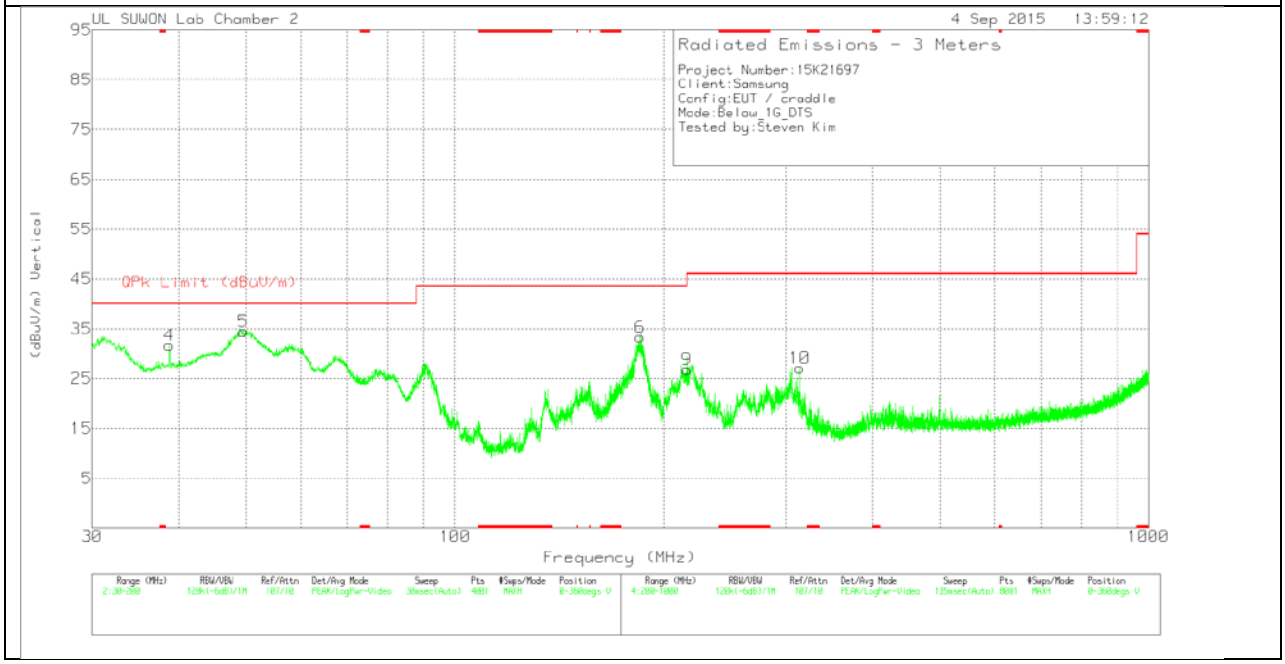
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



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Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-749	Below_1G	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	38.33	46.42	Pk	12.1	-30.8	27.72	40	-12.28	0-360	400	H
2	82.9975	55.56	Pk	7.8	-30.6	32.76	40	-7.24	0-360	200	H
3	185.465	51.37	Pk	10	-30.4	30.97	43.52	-12.55	0-360	200	H
4	38.7975	50.2	Pk	12.3	-30.8	31.7	40	-8.3	0-360	100	V
5	49.5925	51.07	Pk	14.1	-30.7	34.47	40	-5.53	0-360	100	V
6	184.87	53.85	Pk	9.9	-30.4	33.35	43.52	-10.17	0-360	100	V
7	219.9	56.78	Pk	11.8	-30.2	38.38	46.02	-7.64	0-360	100	H
8	508.9	38.25	Pk	15.8	-29.5	24.55	46.02	-21.47	0-360	200	H
9	215.6	45.49	Pk	11.7	-30.3	26.89	43.52	-16.63	0-360	200	V
10	314	43.43	Pk	13.7	-30	27.13	46.02	-18.89	0-360	100	V

Pk - Peak detector

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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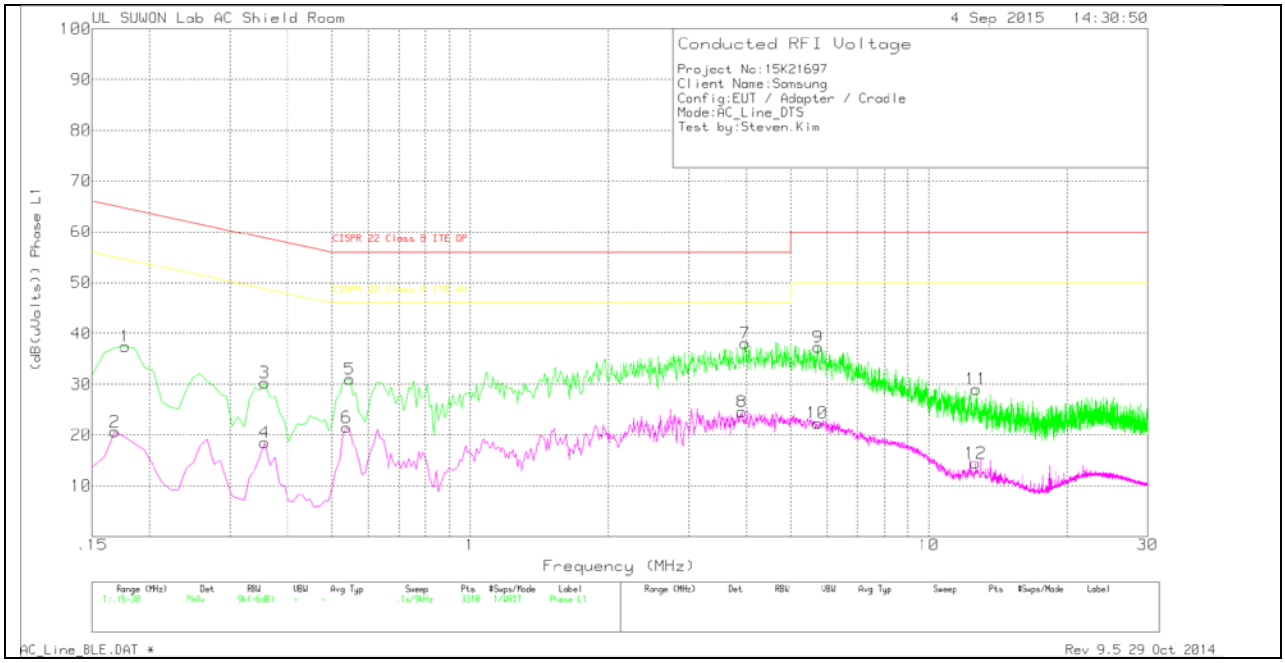
RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

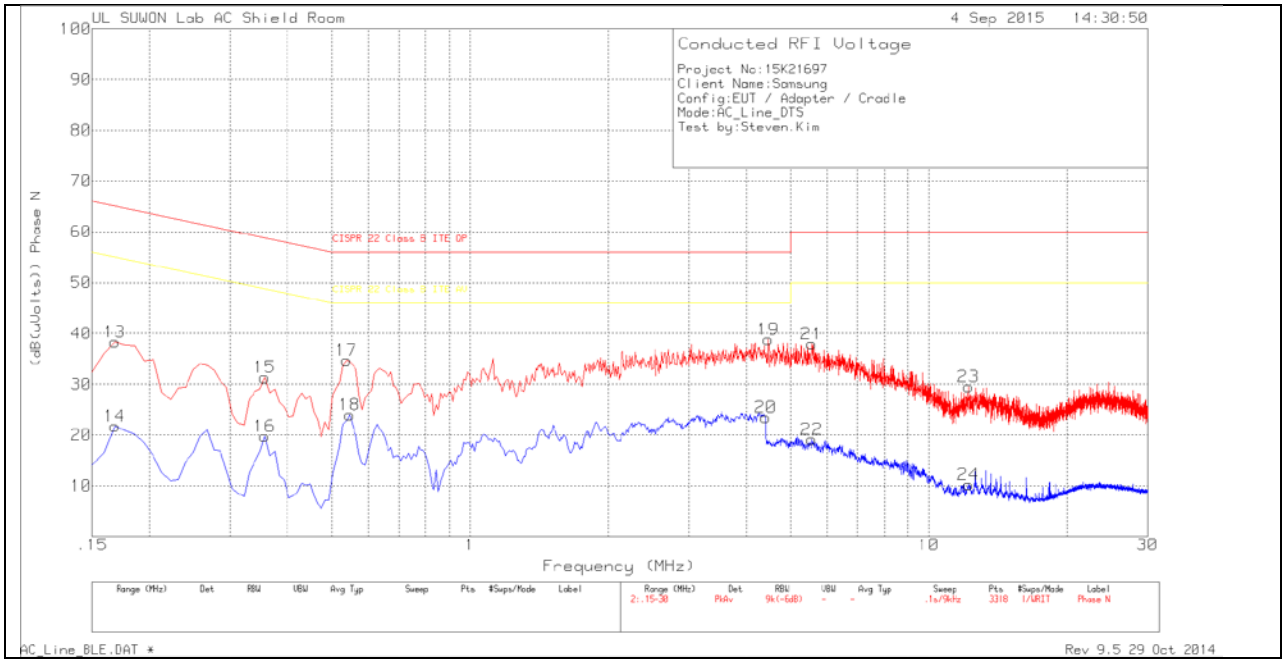
Phase L1 .15 - 30MHz

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	.177	27.27	Pk	10.2	0	37.47	64.63	-27.16	-	-
2	.168	10.41	Av	10.2	0	20.61	-	-	55.06	-34.45
3	.357	20.26	Pk	10	0	30.26	58.8	-28.54	-	-
4	.357	8.5	Av	10	0	18.5	-	-	48.8	-30.3
5	.546	20.91	Pk	10.1	0	31.01	56	-24.99	-	-
6	.537	11.4	Av	10.1	0	21.5	-	-	46	-24.5
7	3.975	28.13	Pk	9.8	.1	38.03	56	-17.97	-	-
8	3.912	14.73	Av	9.8	.1	24.63	-	-	46	-21.37
9	5.739	27.44	Pk	9.8	.1	37.34	60	-22.66	-	-
10	5.712	12.44	Av	9.8	.1	22.34	-	-	50	-27.66
11	12.678	18.69	Pk	10.1	.2	28.99	60	-31.01	-	-
12	12.642	4.09	Av	10.1	.2	14.39	-	-	50	-35.61

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



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	28.25	Pk	10.1	0	38.35	65.06	-26.71	-	-
14	.168	11.63	Av	10.1	0	21.73	-	-	55.06	-33.33
15	.357	21.33	Pk	10	0	31.33	58.8	-27.47	-	-
16	.357	9.8	Av	10	0	19.8	-	-	48.8	-29
17	.537	24.57	Pk	10.1	0	34.67	56	-21.33	-	-
18	.546	13.91	Av	10.1	0	24.01	-	-	46	-21.99
19	4.47	28.92	Pk	9.8	.1	38.82	56	-17.18	-	-
20	4.407	13.56	Av	9.8	.1	23.46	-	-	46	-22.54
21	5.559	28.02	Pk	9.8	.1	37.92	60	-22.08	-	-
22	5.559	9.2	Av	9.8	.1	19.1	-	-	50	-30.9
23	12.21	19.15	Pk	10.2	.2	29.55	60	-30.45	-	-
24	12.21	-.11	Av	10.2	.2	10.29	-	-	50	-39.71

Pk - Peak detector

Av - Average detection

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