FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

ARTIK-0530

MODEL NUMBER : SIP005AFS30

FCC ID: A3LSIP005AFS30
IC ID : 649E-SIP005AFS30

REPORT NUMBER: 16K23791-E1V3

ISSUE DATE: OCT 12, 2016

Prepared for

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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	09/29/16	Initial issue	Junwhan Lee
V2	10/06/16	Revised section 11.1	Junwhan Lee
V3	10/12/16	Added AC conducted emission data	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: ARTIK-0530

MODEL NUMBER: SIP005AFS30

SERIAL NUMBER: 530MWB8R00300078, 530MWB8R00300066 (RADIATED); 530MWB8R00300099 (CONDUCTED)

DATE TESTED: SEP 05, 2016 - OCT 12, 2016

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

UL 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 FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v03r05, ANSI C63.10-2013 for FCC and ANSI C63.10-2013, RSS-GEN Issue 4, RSS-247 Issue 1 for IC.

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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a ARTIK-0530.
This test report addresses the DTS (WLAN) operational mode.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]
2412 - 2462	802.11b	14.89	30.83
	802.11g	14.74	29.79
	802.11n HT20	12.97	19.82

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an dipole antennas, with a antenna's maximum gain of 1.43 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

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

5.5. DESCRIPTION OF TEST SETUP

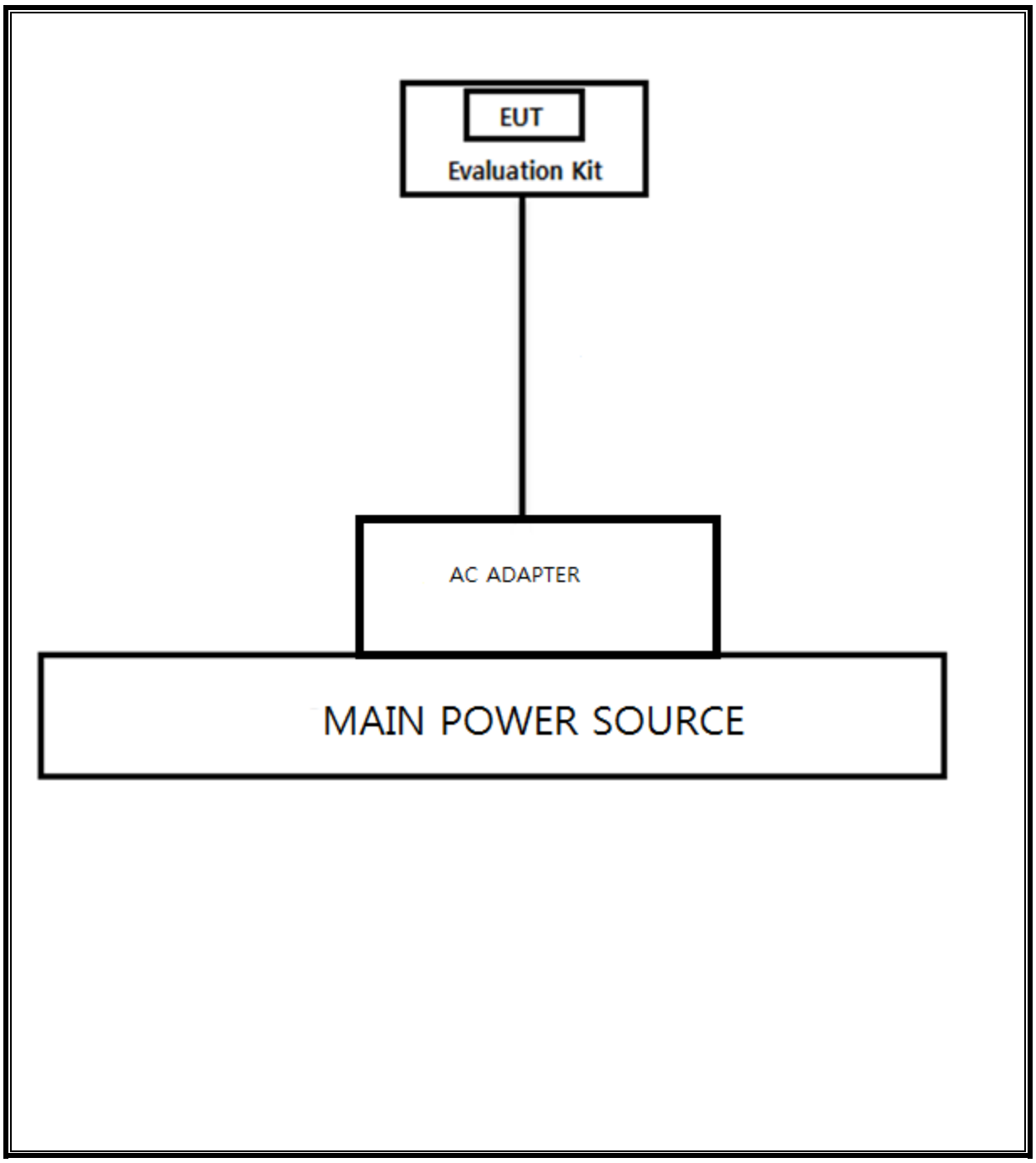
SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Evaluation Kit	SAMSUNG	SIPKITNXD00	N/A	N/A
ADAPTER	Shenzhen Fujia Appliance CO,. LTD	FJ-SW0505000T	N/A	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software exercised the EUT to enable DTS mode.

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	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
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	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
Average Power Sensor	R&S	NRZ-Z91	102681	08-16-17
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-17-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-16-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-17-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-16-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	009	08-17-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	016	08-16-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Attenuator	PASTERNACK	PE7087-10	A009	08-16-17
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-16-17

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r05: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §10.5 AVGPSD-1 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.

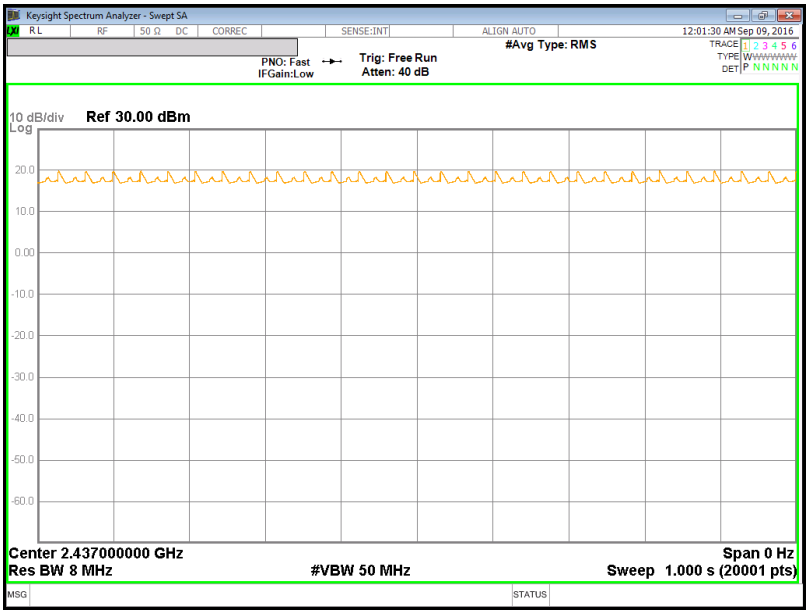
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

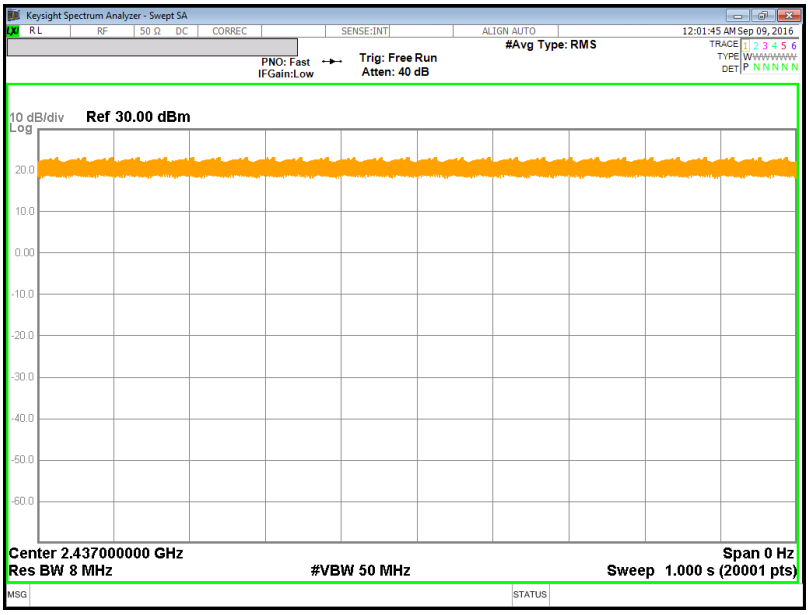
None; for reporting purposes only.

8.1. ON TIME AND DUTY CYCLE RESULTS

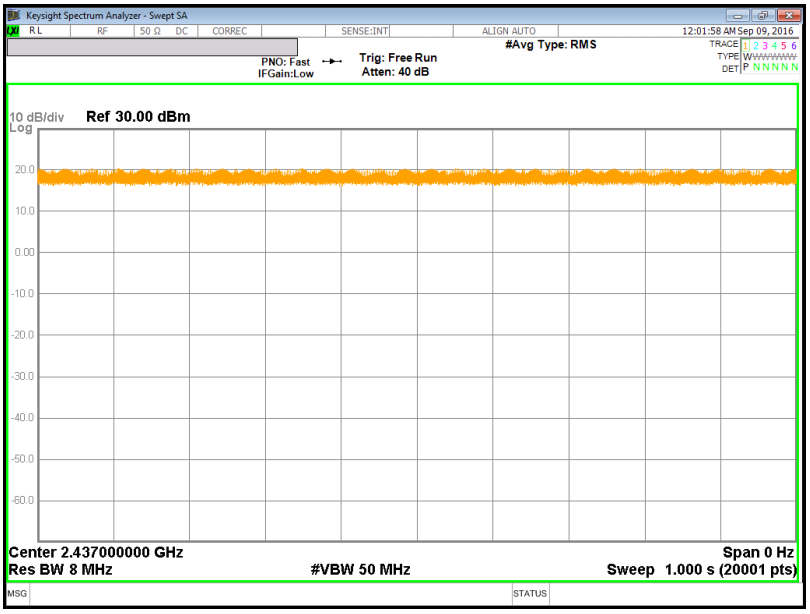
Mode	ON Time B [msec)	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	1000	1000	1.000	100.0%	0.00	0.010
802.11g	1000	1000	1.000	100.0%	0.00	0.010
802.11n HT20	1000	1000	1.000	100.0%	0.00	0.010



[802.11b]



[802.11g]



[802.11n]

9. SUMMARY TABLE

FCC Part Section	IC Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-247 5.2(1)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	10.048 MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-39.944 dBm
15.247	RSS-247 5.4(4)	TX conducted output power	<30dBm		Pass	14.89 dBm
15.247	RSS-247 5.2(2)	PSD	<8dBm		Pass	-14.87 dBm
15.205, 15.209	RSS-GEN Clause 7 & 8.9	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	46.93 dBuV/m (Av)

10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
IC RSS-247 §5.2 (1)

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

TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r05: 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	10.050	0.5
Mid	2437	10.048	0.5
High	2462	10.049	0.5
Worst		10.048	0.5

10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

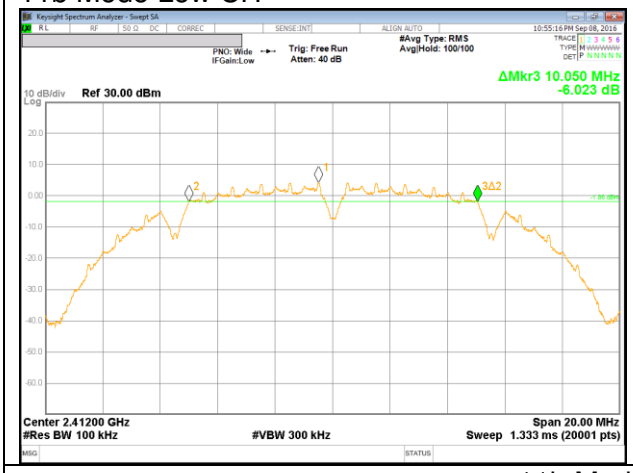
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	16.565	0.5
Mid	2437	16.571	0.5
High	2462	16.568	0.5
Worst		16.565	0.5

10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

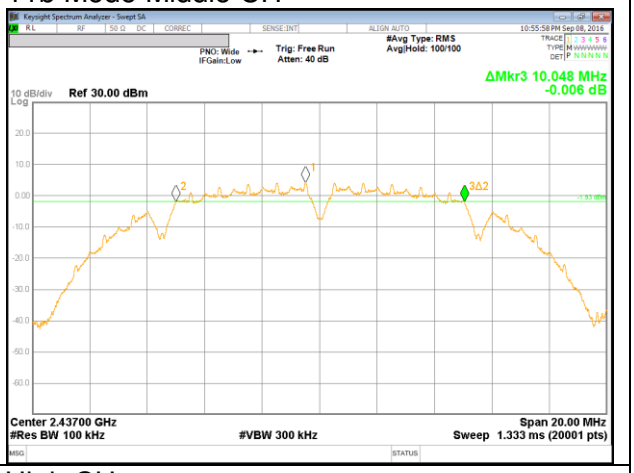
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	17.632	0.5
Mid	2437	17.633	0.5
High	2462	17.633	0.5
Worst		17.632	0.5

10.1.4. 6 dB BANDWIDTH PLOTS

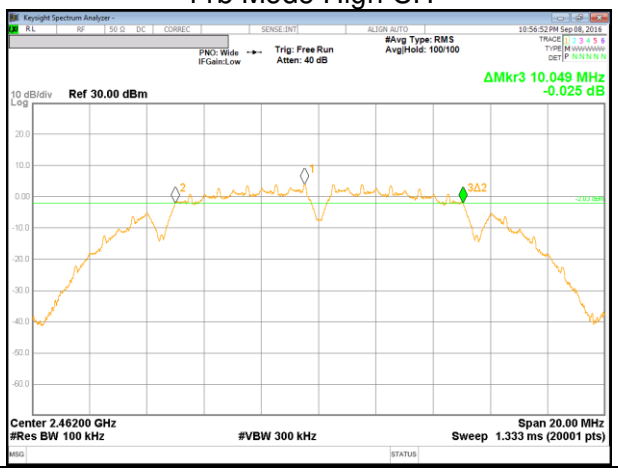
11b Mode Low CH



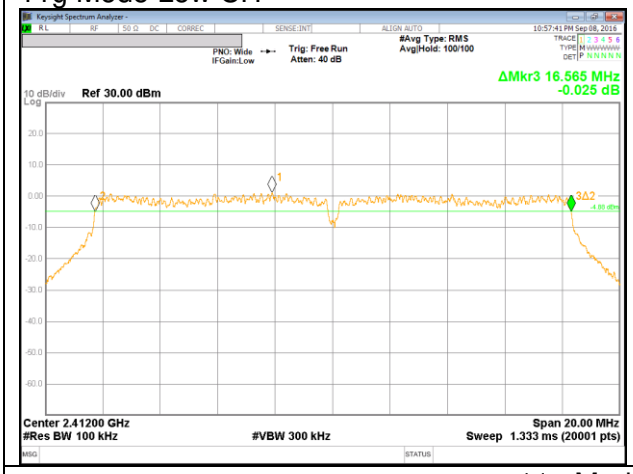
11b Mode Middle CH



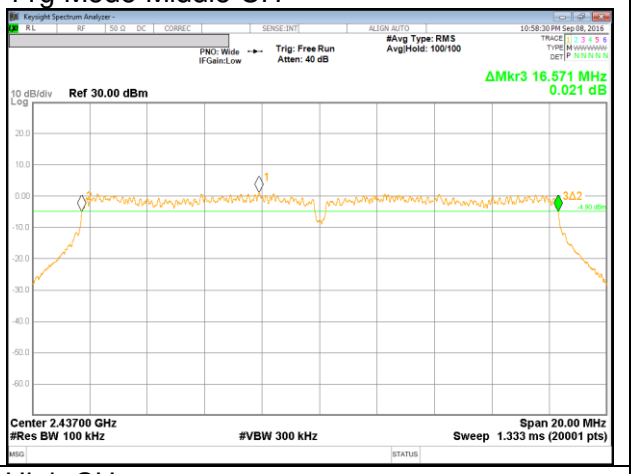
11b Mode High CH



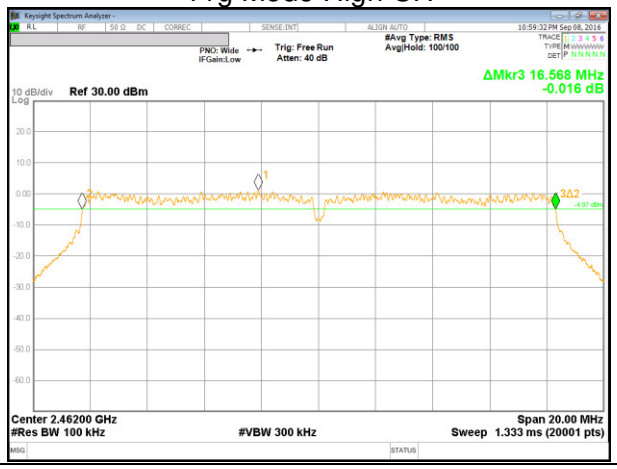
11g Mode Low CH



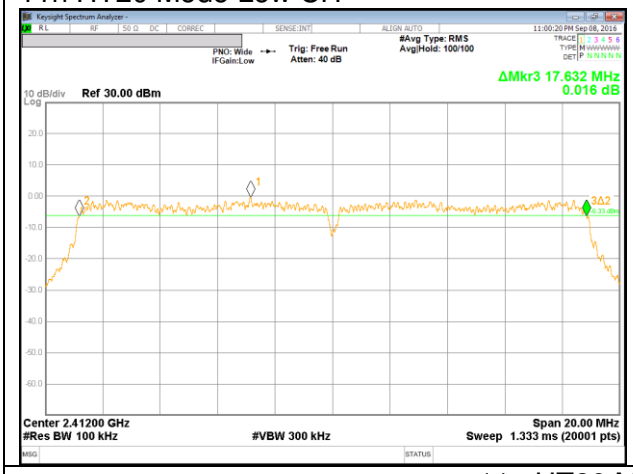
11g Mode Middle CH



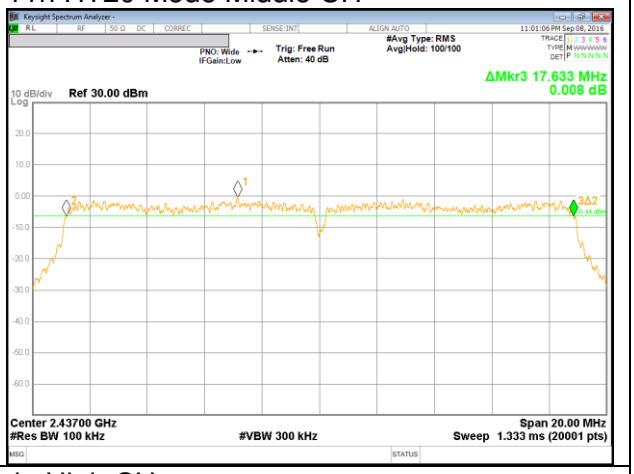
11g Mode High CH



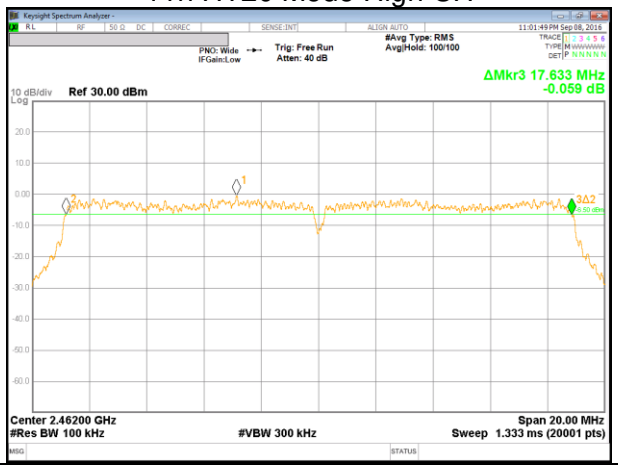
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 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	13.452
Mid	2437	13.440
High	2462	13.462
Worst		13.462

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.448
Mid	2437	16.507
High	2462	16.496
Worst		16.507

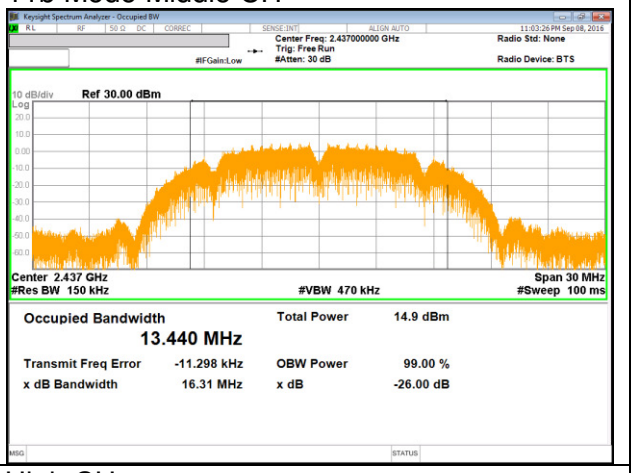
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.643
Mid	2437	17.656
High	2462	17.641
Worst		17.656

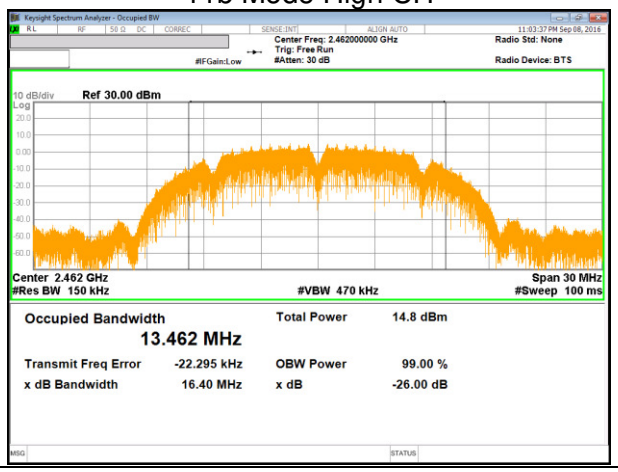
10.2.4. 99% BANDWIDTH PLOTS

11b Mode Low CH

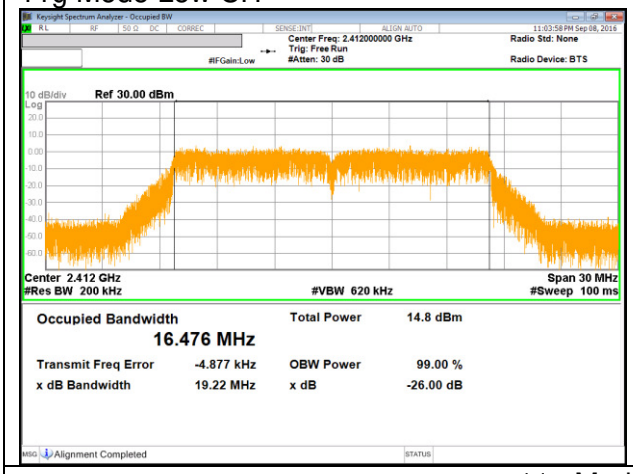
11b Mode Middle CH



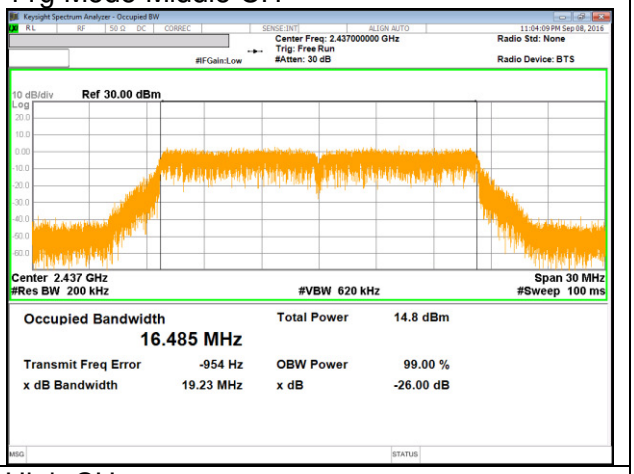
11b Mode High CH



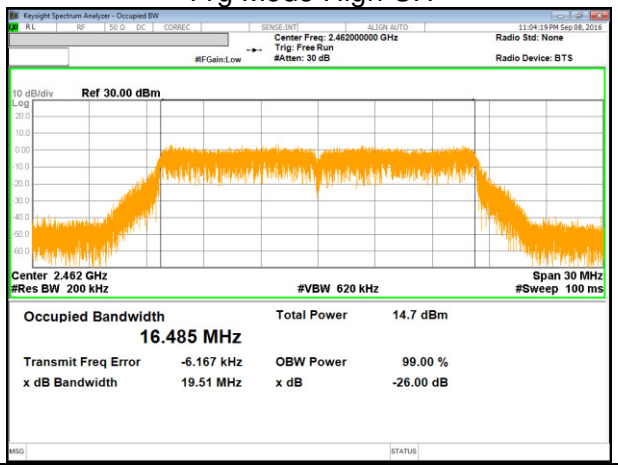
11g Mode Low CH



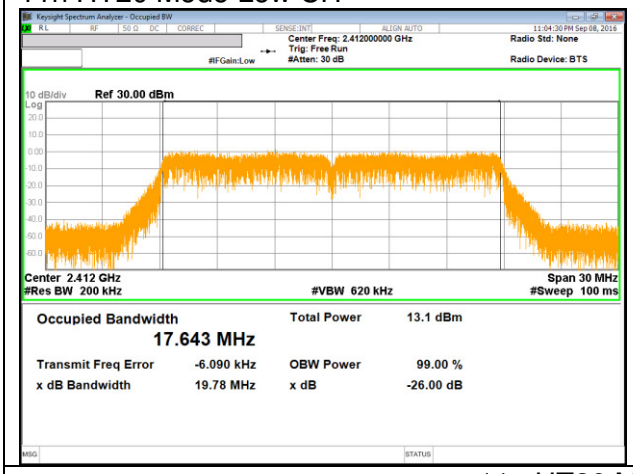
11g Mode Middle CH



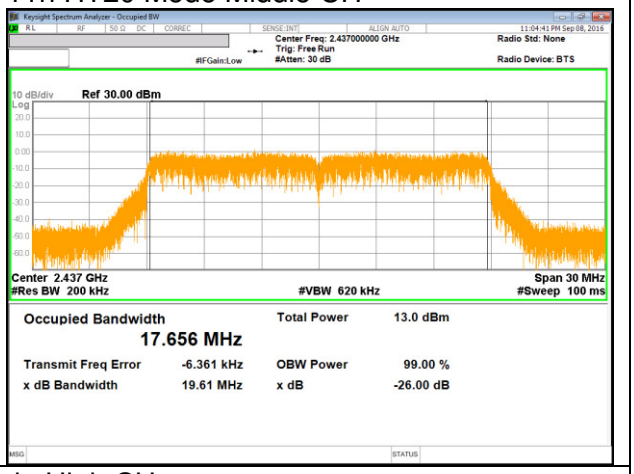
11g Mode High CH



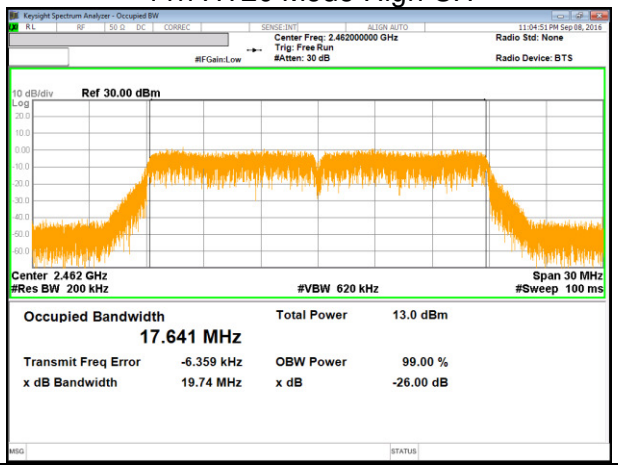
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



10.3. OUTPUT POWER

LIMITS

FCC §15.247
IC RSS-247 §5.4 (4)

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

DIRECTIONAL ANTENNA GAIN

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

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	1.43	30.00	30.00	36.00	30.00
Mid	2437	1.43	30.00	30.00	36.00	30.00
High	2462	1.43	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Meas Power [dBm]	Final Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	14.89	14.89	30.00	-15.11
Mid	2437	14.82	14.82	30.00	-15.18
High	2462	14.78	14.78	30.00	-15.22
Worst			14.89	30.00	-15.11

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	1.43	30.00	30.00	36.00	30.00
Mid	2437	1.43	30.00	30.00	36.00	30.00
High	2462	1.43	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Meas Power [dBm]	Final Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	14.74	14.74	30.00	-15.26
Mid	2437	14.68	14.68	30.00	-15.32
High	2462	14.62	14.62	30.00	-15.38
Worst			14.74	30.00	-15.26

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	1.43	30.00	30.00	36.00	30.00
Mid	2437	1.43	30.00	30.00	36.00	30.00
High	2462	1.43	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Meas Power [dBm]	Final Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	12.97	12.97	30.00	-17.03
Mid	2437	12.93	12.93	30.00	-17.07
High	2462	12.88	12.88	30.00	-17.12
Worst			12.97	30.00	-17.03

10.4. PSD

LIMITS

FCC §15.247
IC RSS-247 §5.2 (2)

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

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method AVGPSD-1” under KDB558074 D01 DTS Meas Guidance v03r05

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	-14.87	0.00	-14.870	8.00	-22.870
Mid	2437	-14.899	0.00	-14.899	8.00	-22.899
High	2462	-14.924	0.00	-14.924	8.00	-22.924

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	-17.549	0.00	-17.549	8.00	-25.549
Mid	2437	-17.430	0.00	-17.430	8.00	-25.430
High	2462	-17.397	0.00	-17.397	8.00	-25.397

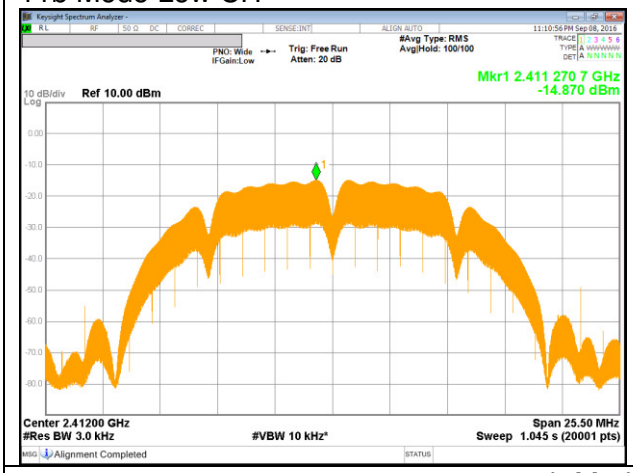
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

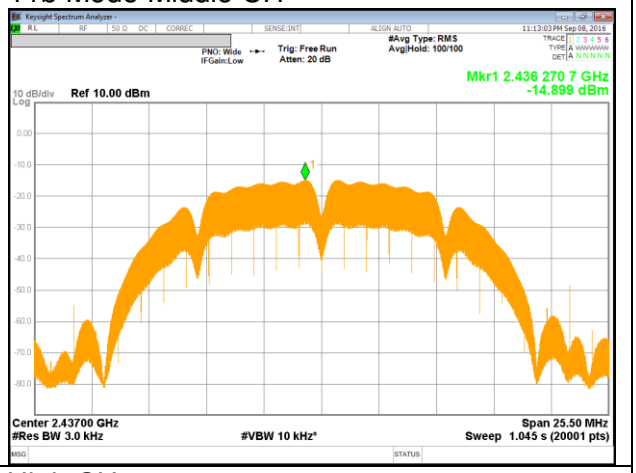
Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-19.876	0.00	-19.876	8.00	-27.876
Mid	2437	-19.860	0.00	-19.860	8.00	-27.860
High	2462	-20.135	0.00	-20.135	8.00	-28.135

10.4.4. PSD PLOTS

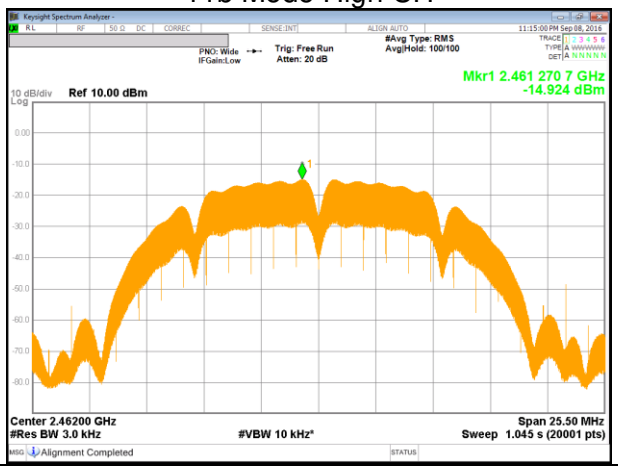
11b Mode Low CH



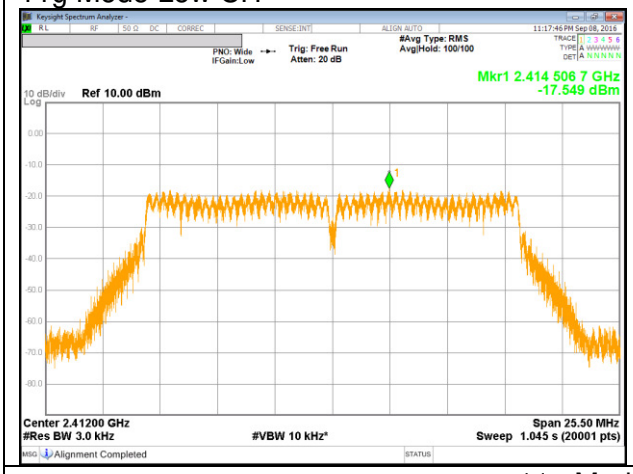
11b Mode Middle CH



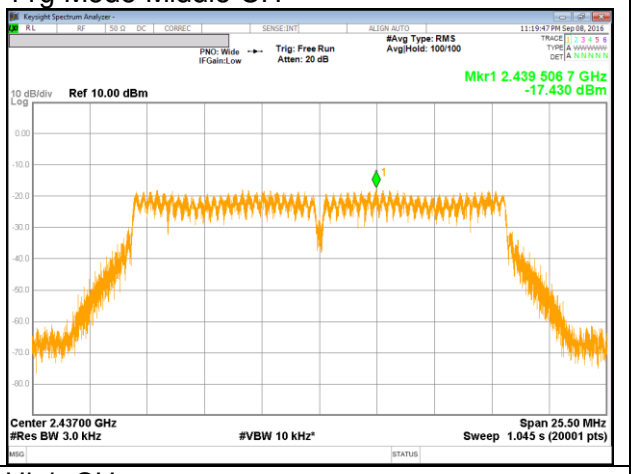
11b Mode High CH



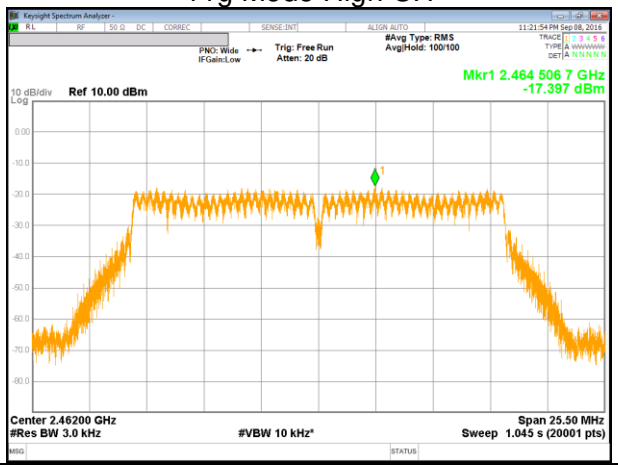
11g Mode Low CH



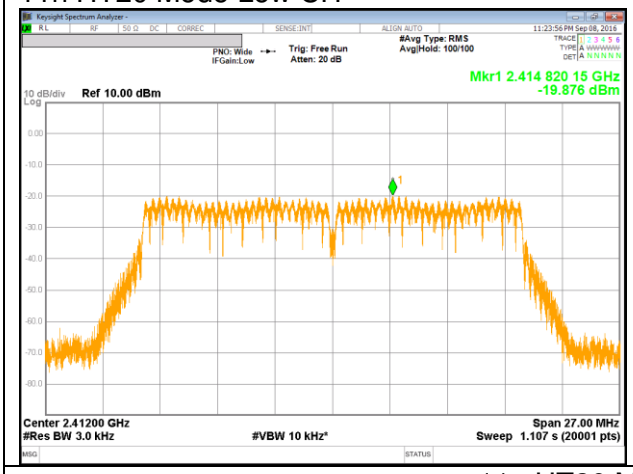
11g Mode Middle CH



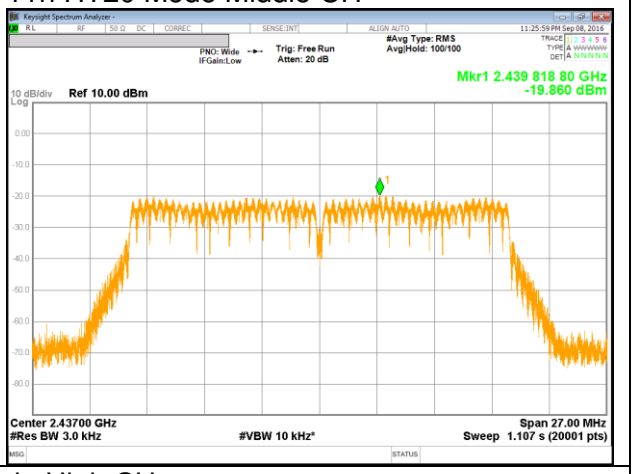
11g Mode High CH



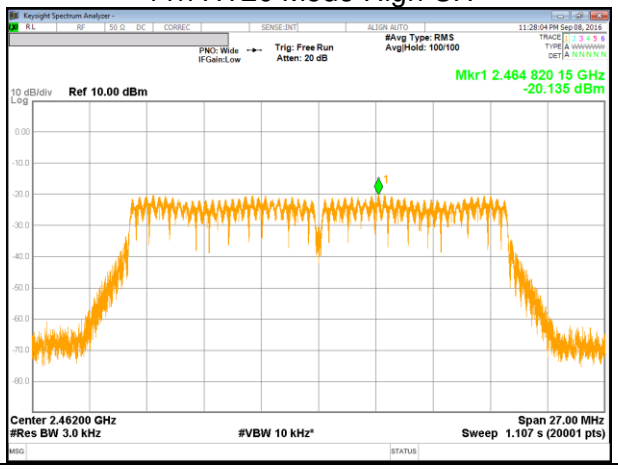
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)
IC RSS-247 §5.5

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

TEST PROCEDURE

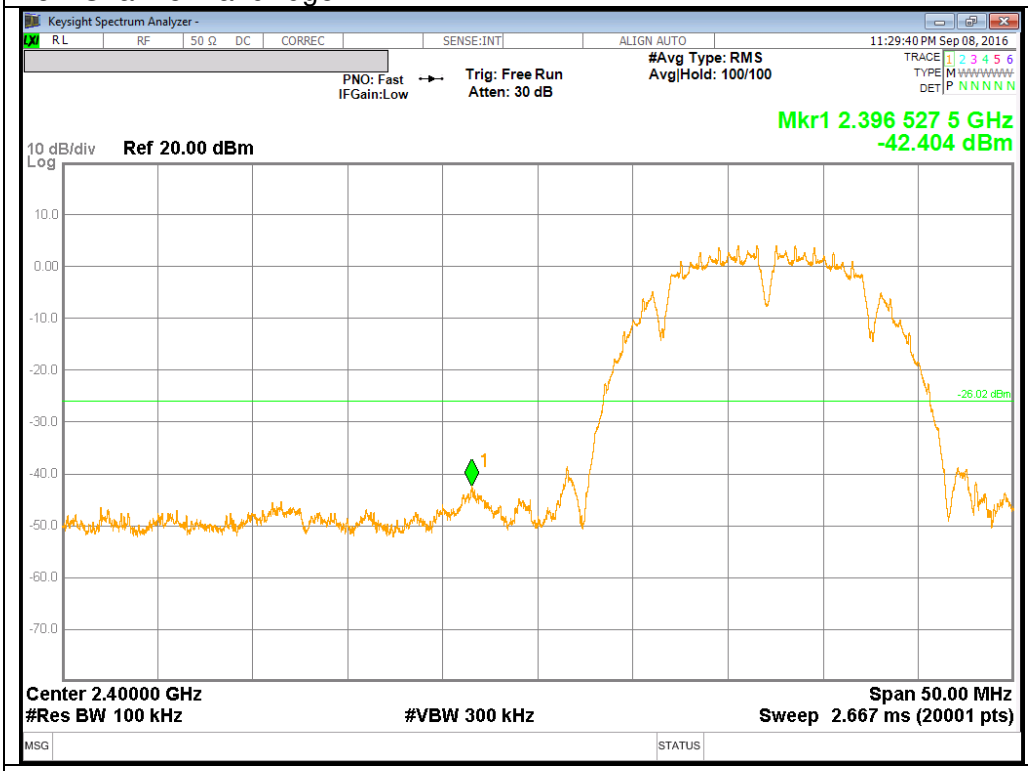
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

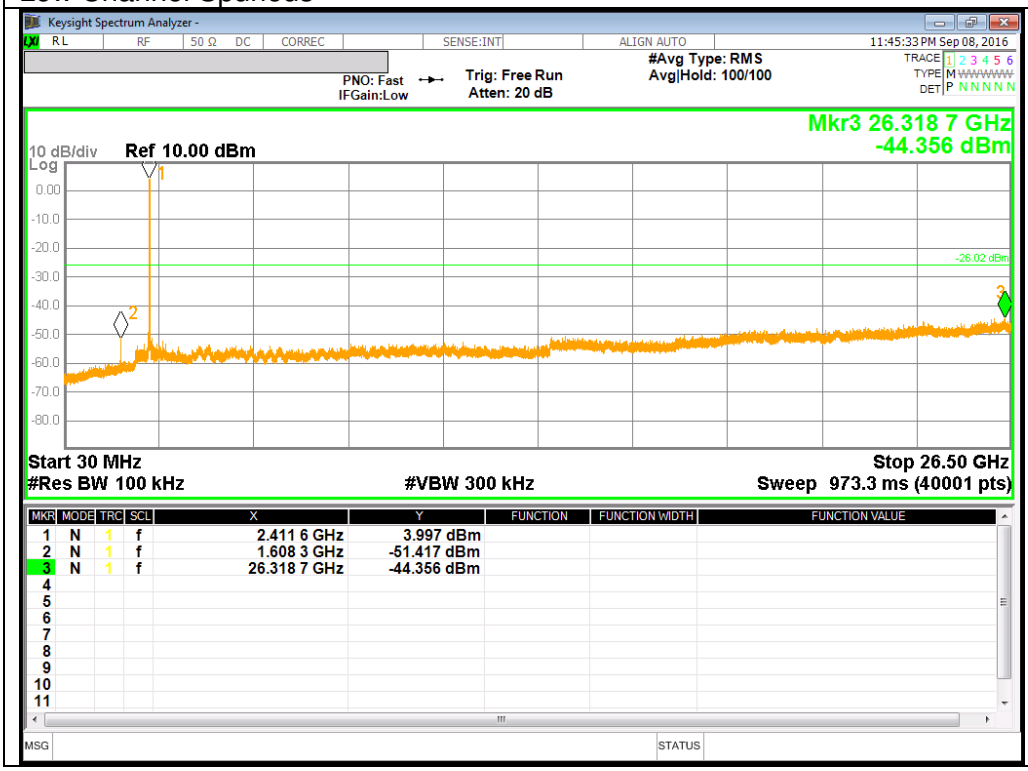
RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

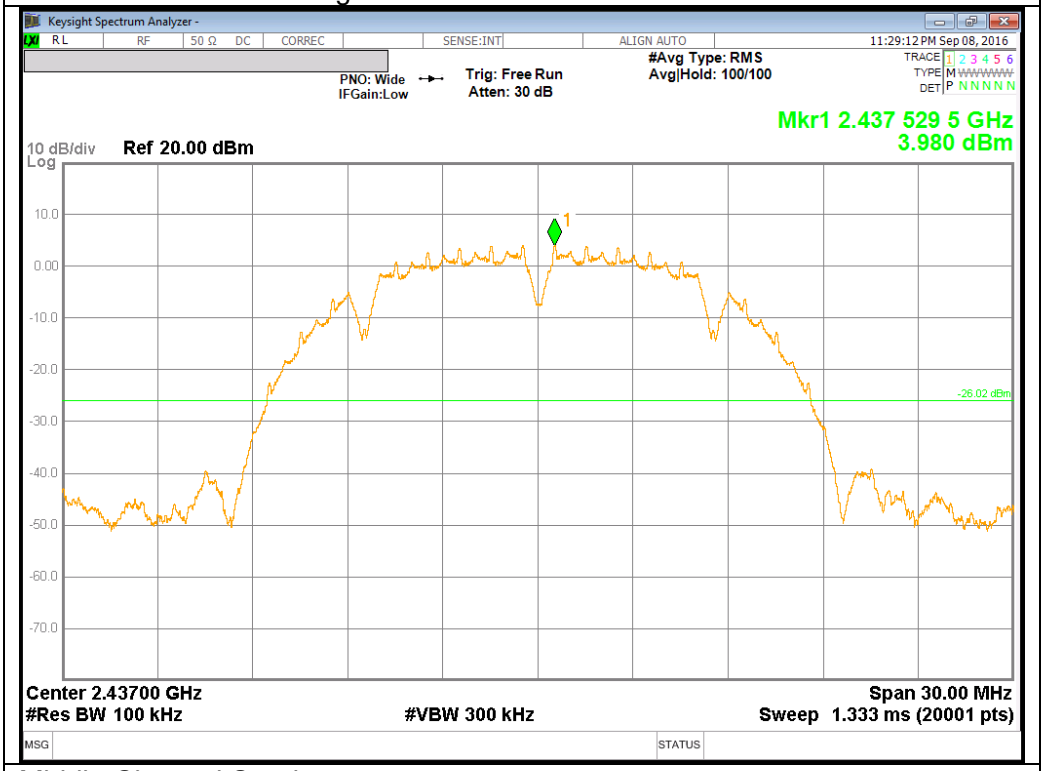
Low Channel BandEdge



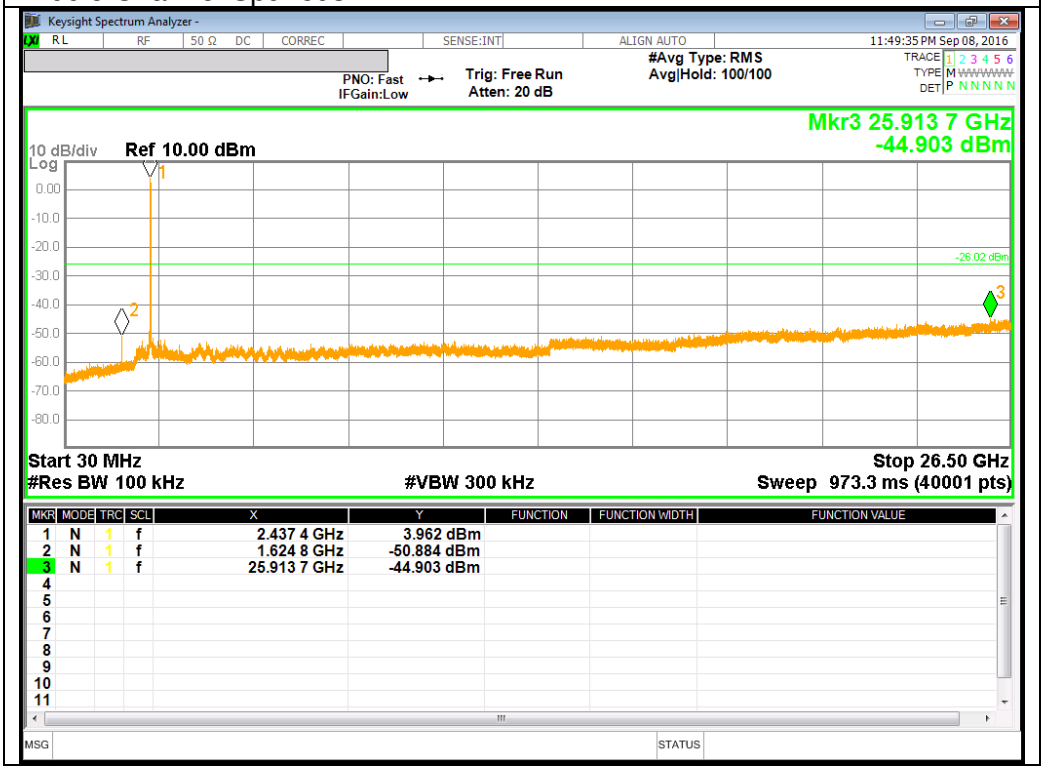
Low Channel Spurious



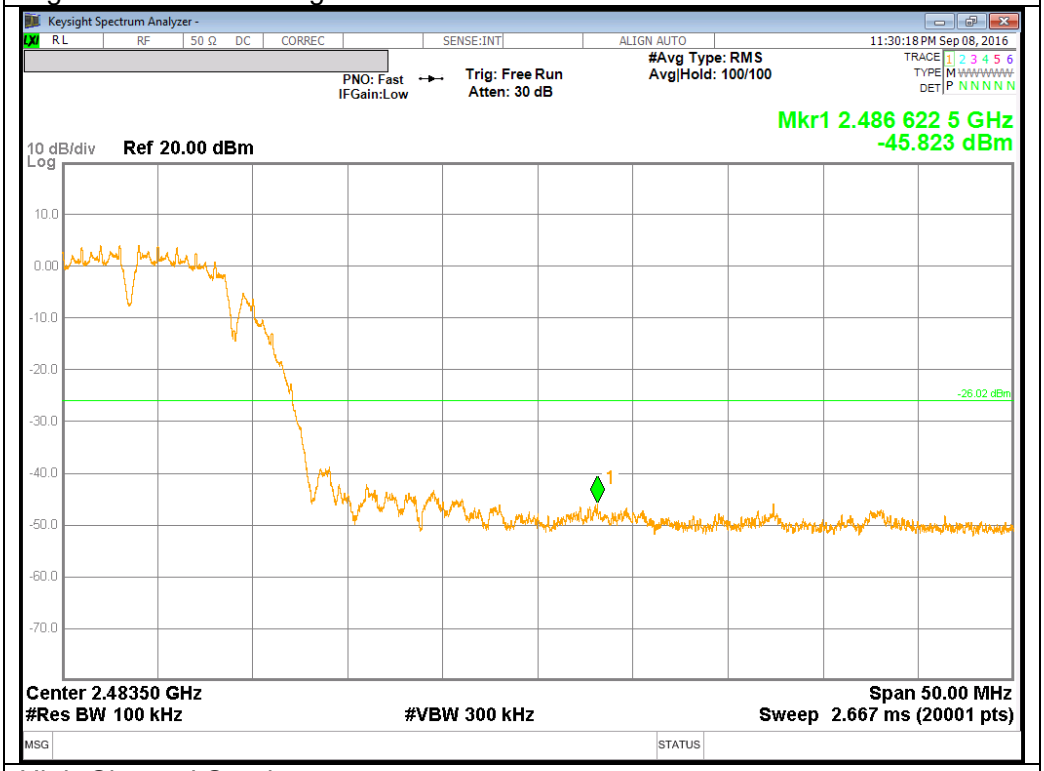
Middle Channel BandEdge



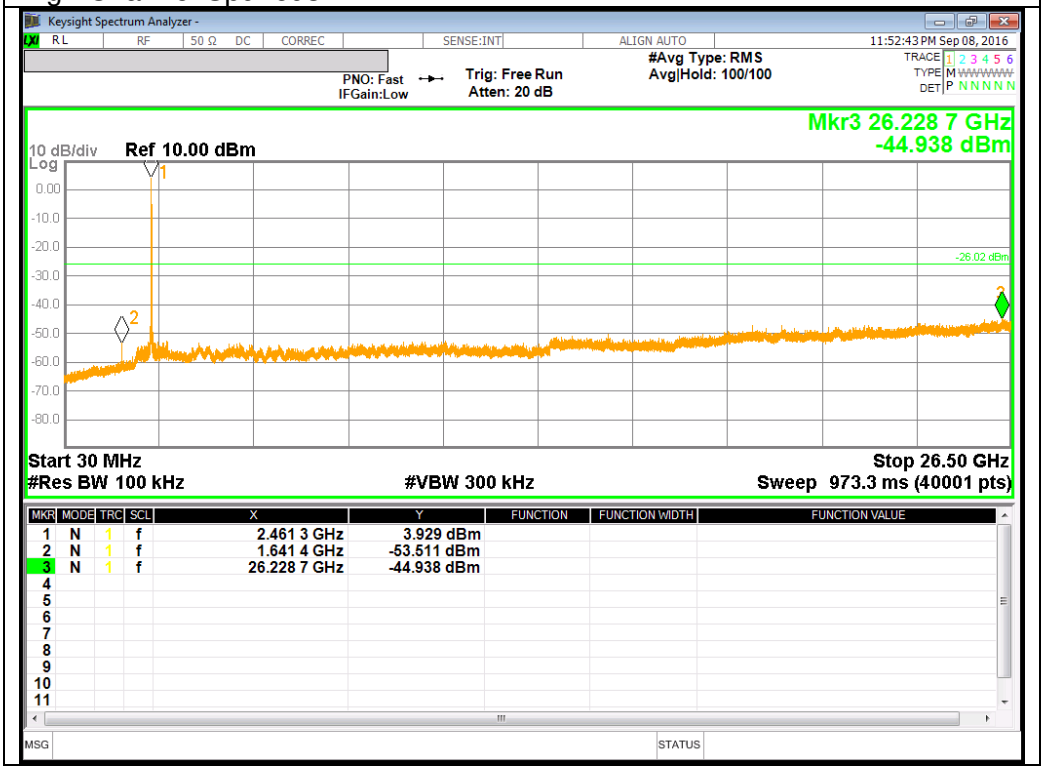
Middle Channel Spurious



High Channel BandEdge

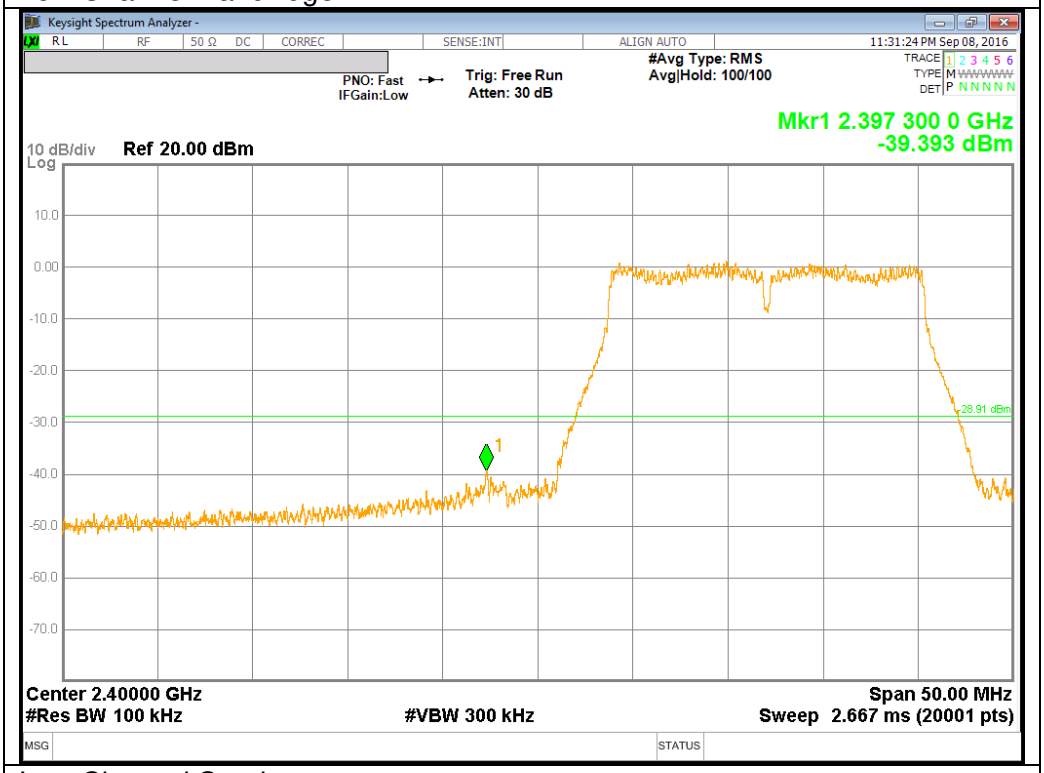


High Channel Spurious

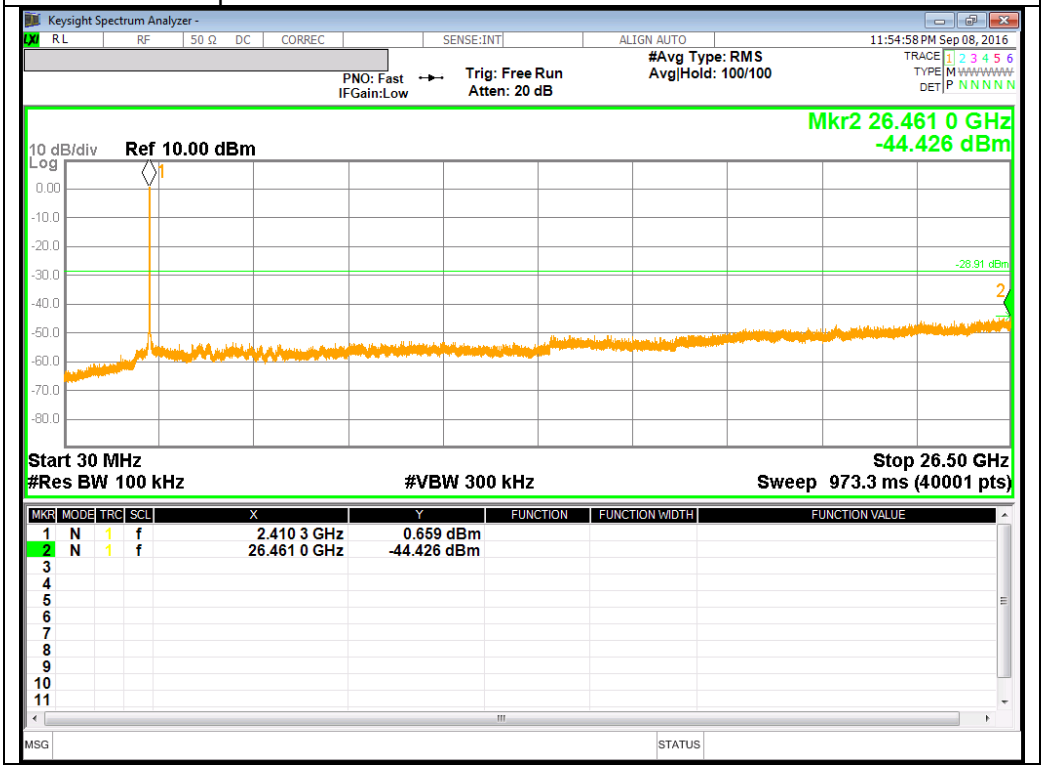


10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

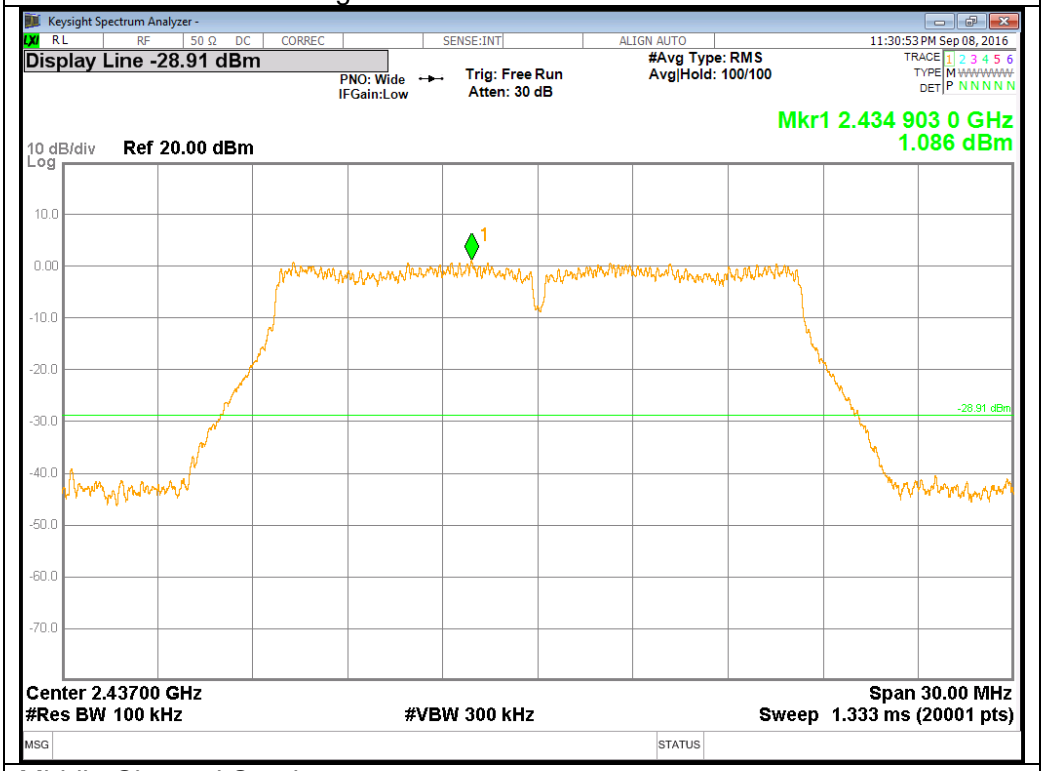
Low Channel BandEdge



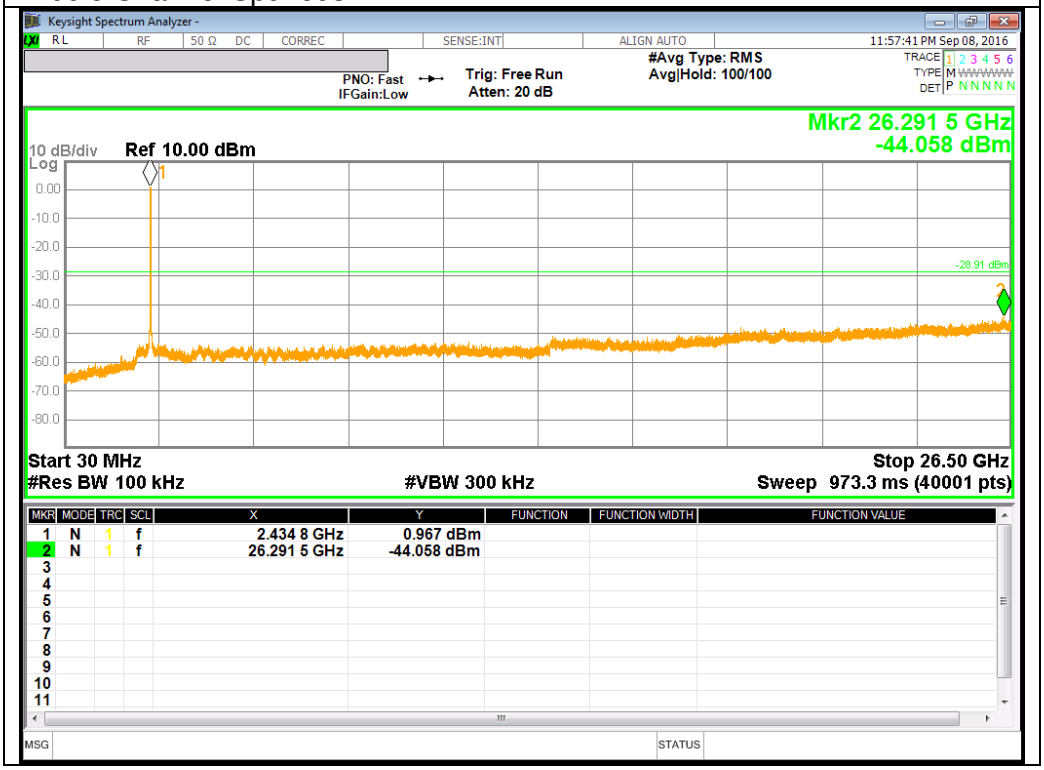
Low Channel Spurious



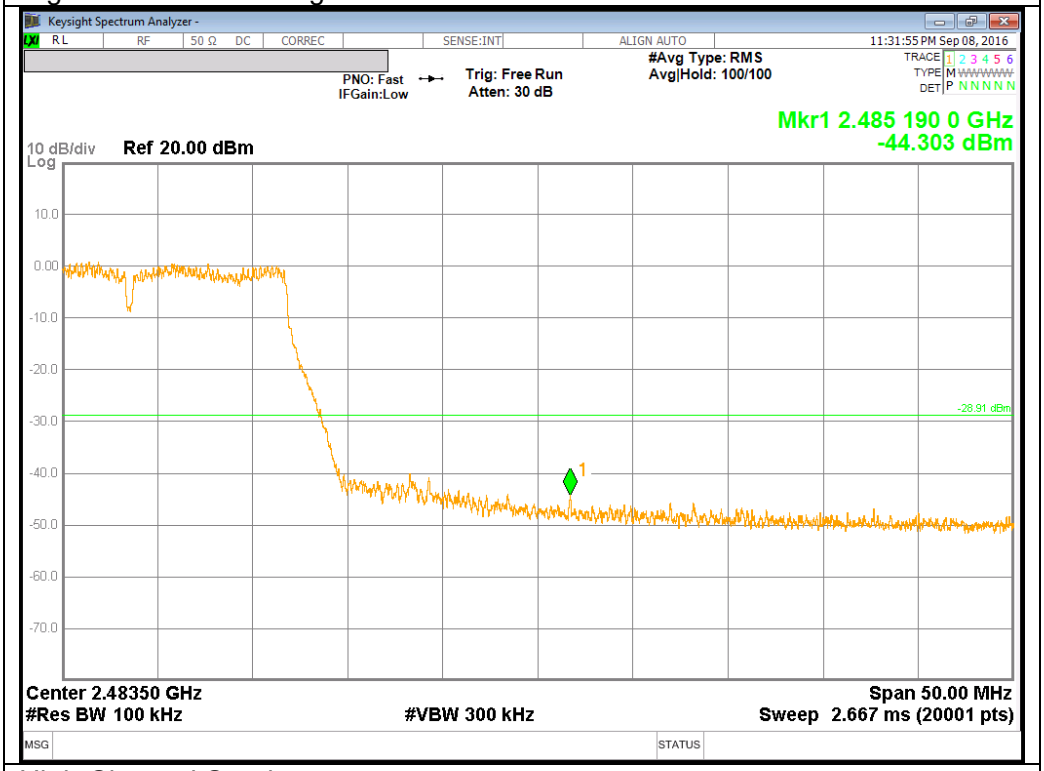
Middle Channel BandEdge



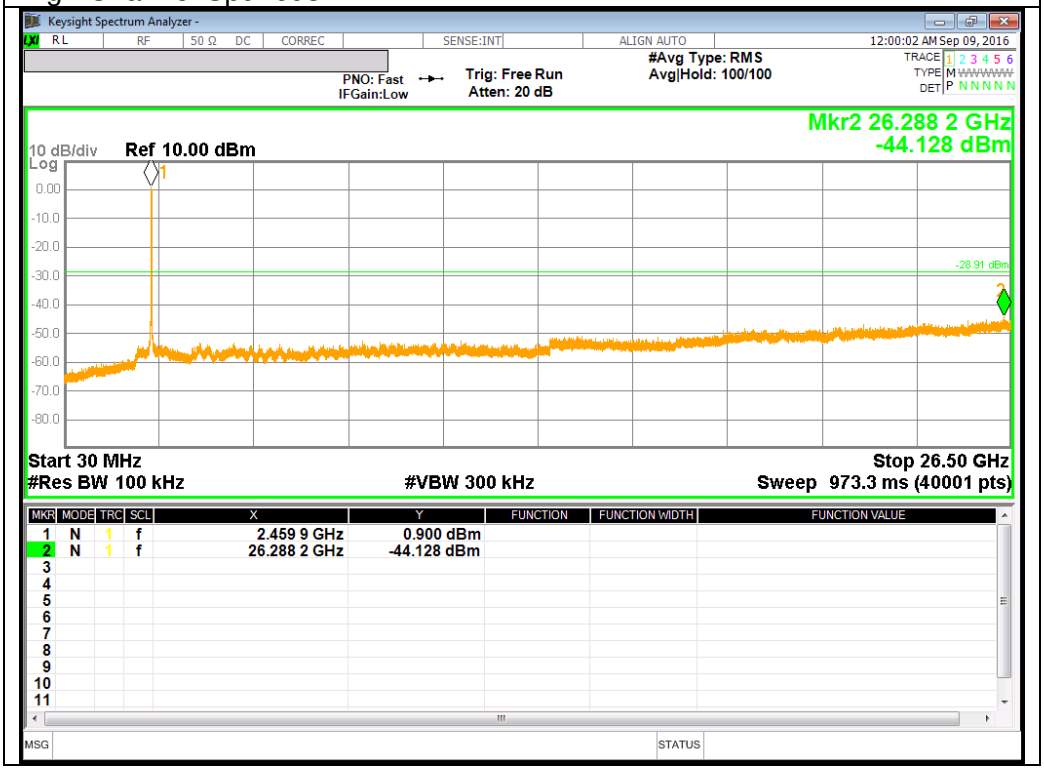
Middle Channel Spurious



High Channel BandEdge

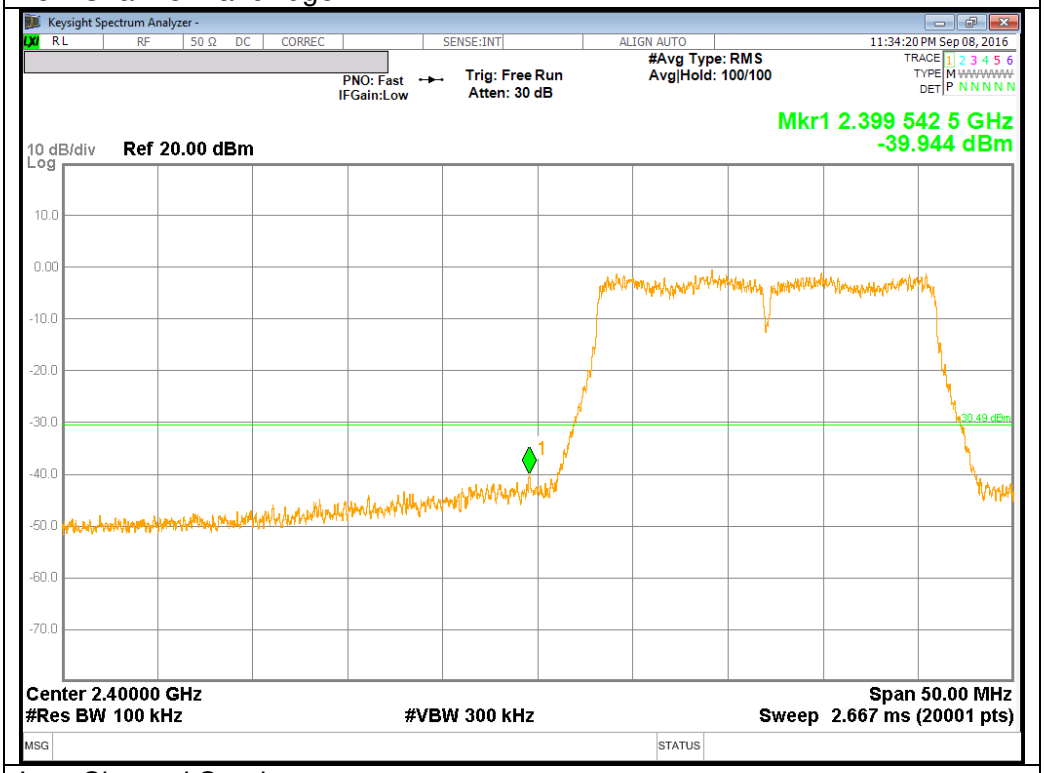


High Channel Spurious

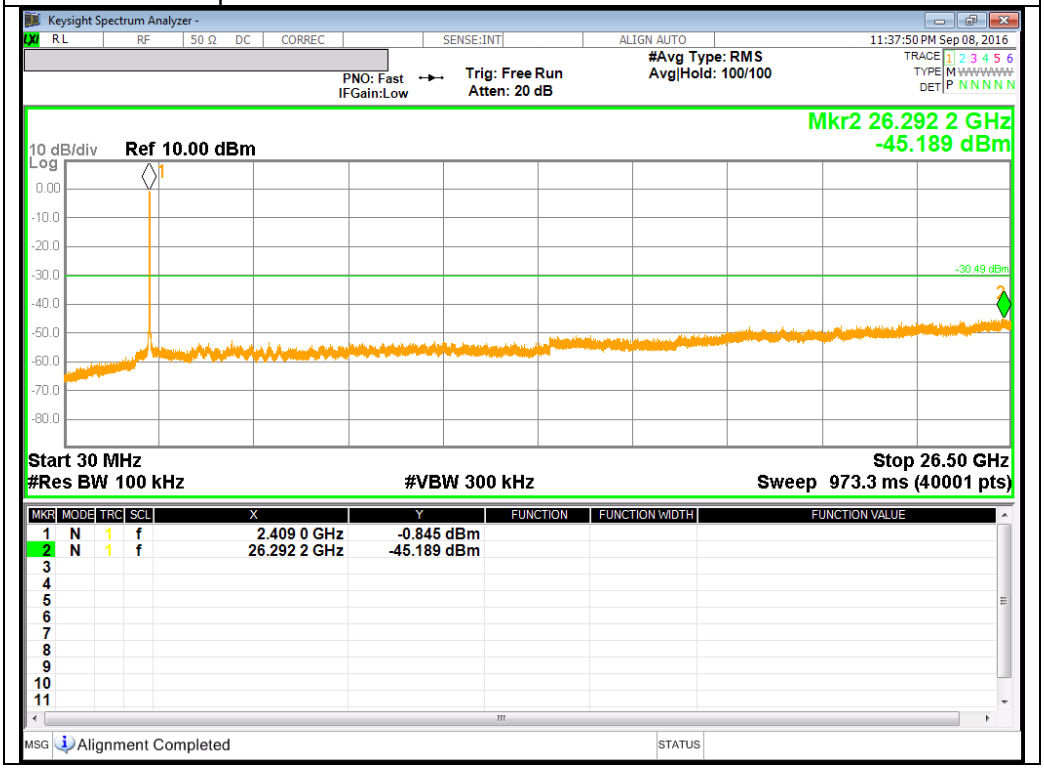


10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

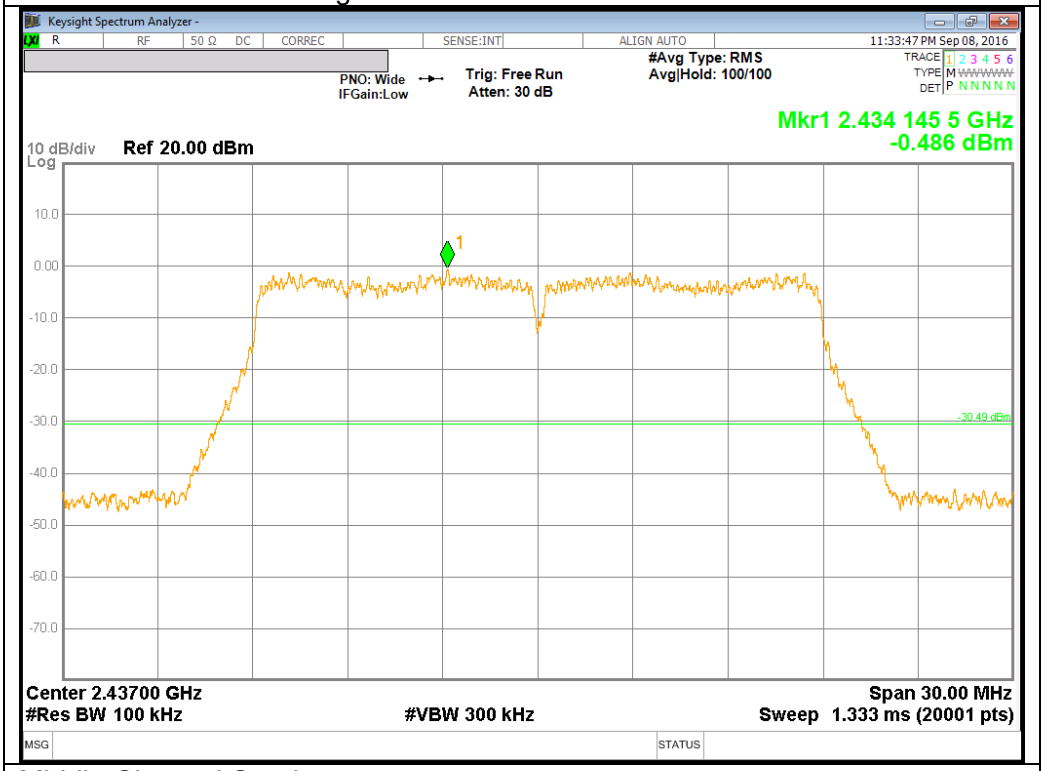
Low Channel BandEdge



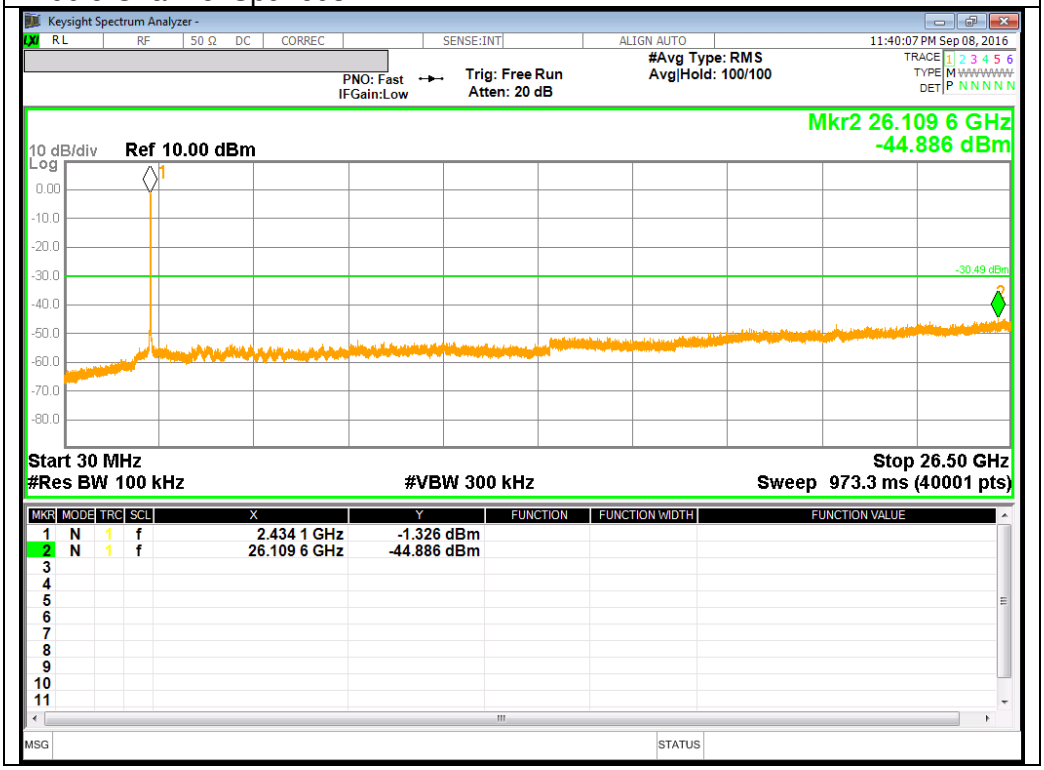
Low Channel Spurious



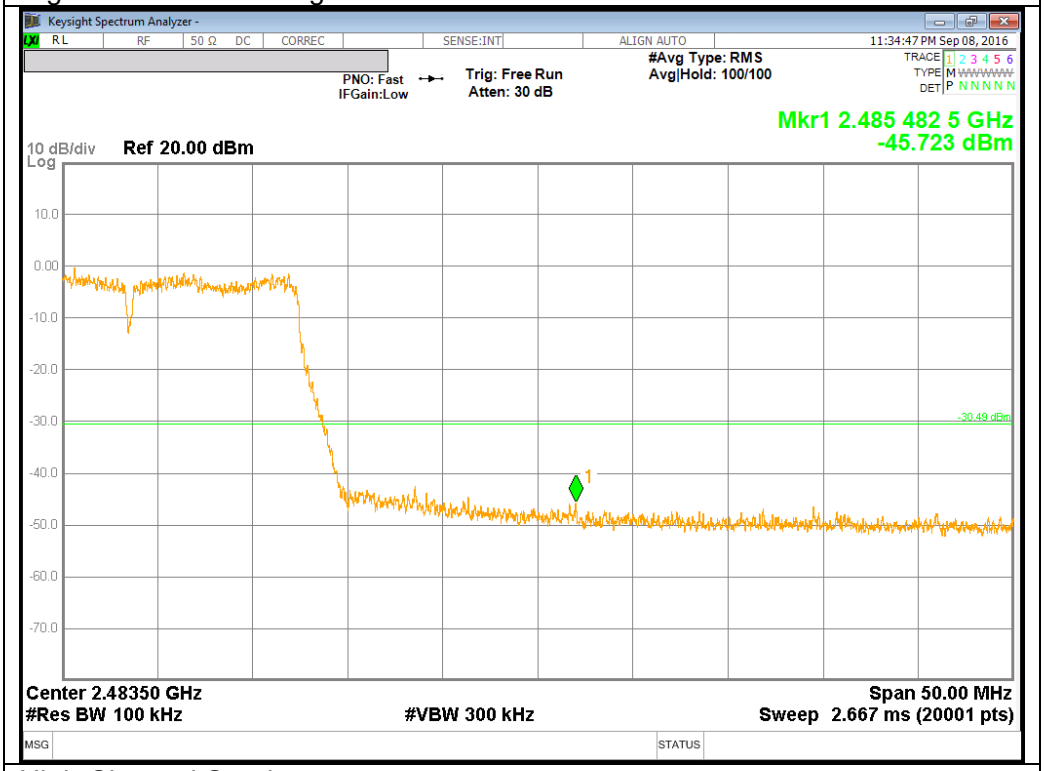
Middle Channel BandEdge



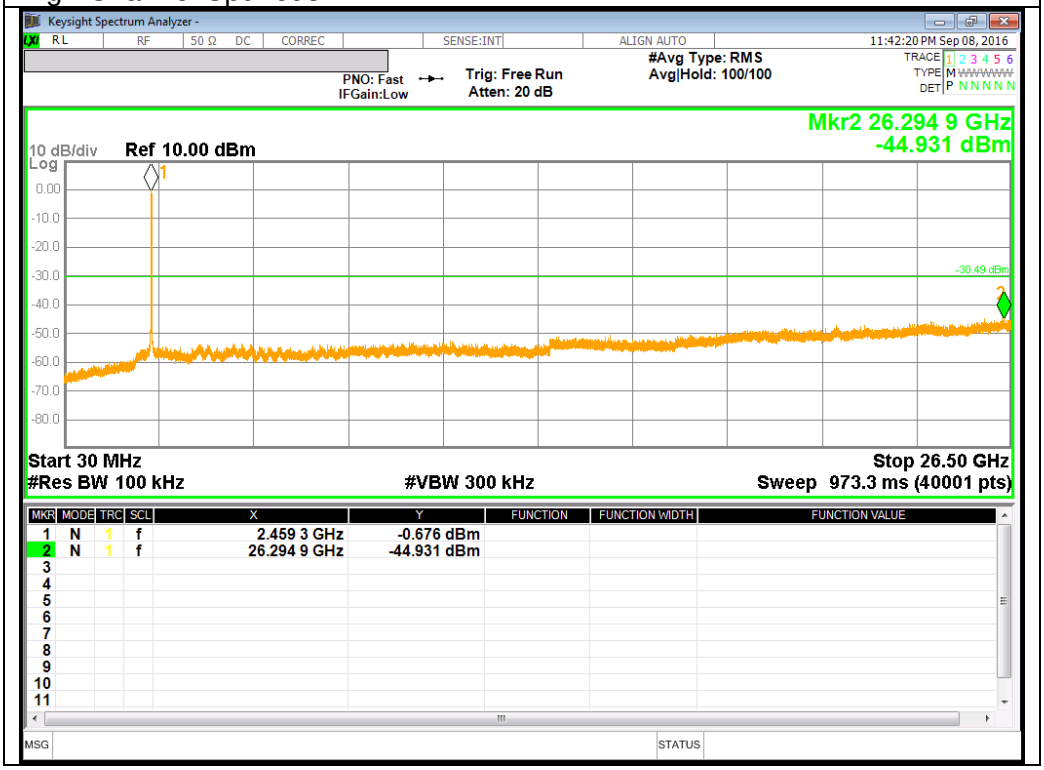
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN Clause 8.9 (Transmitter)
IC RSS-GEN Clause 7 (Receiver)

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restriced bandedge, Final detection of spurious harmonic emissions)
Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0dB; N mode = 0dB. (duty cycle >98%)

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

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

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

Formula for converting the filed strength from uV/m to dBuV/m is:
Limit (dBuV/m) = 20 log limit (uV/m)

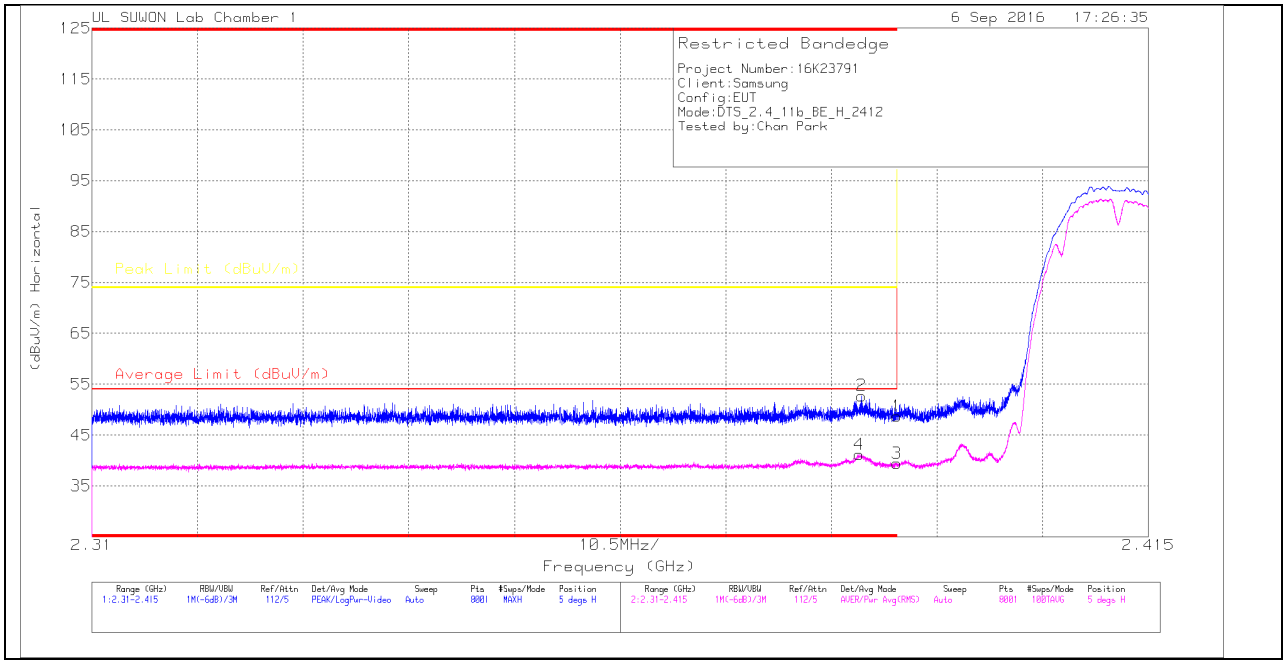
Radiated test of below 30MHz was performed inside anechoic chamber.
For check the correlation with open air site, comparison test was conducted between chamber and open site. The test results indicated that there is a close correlation.

11.2. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

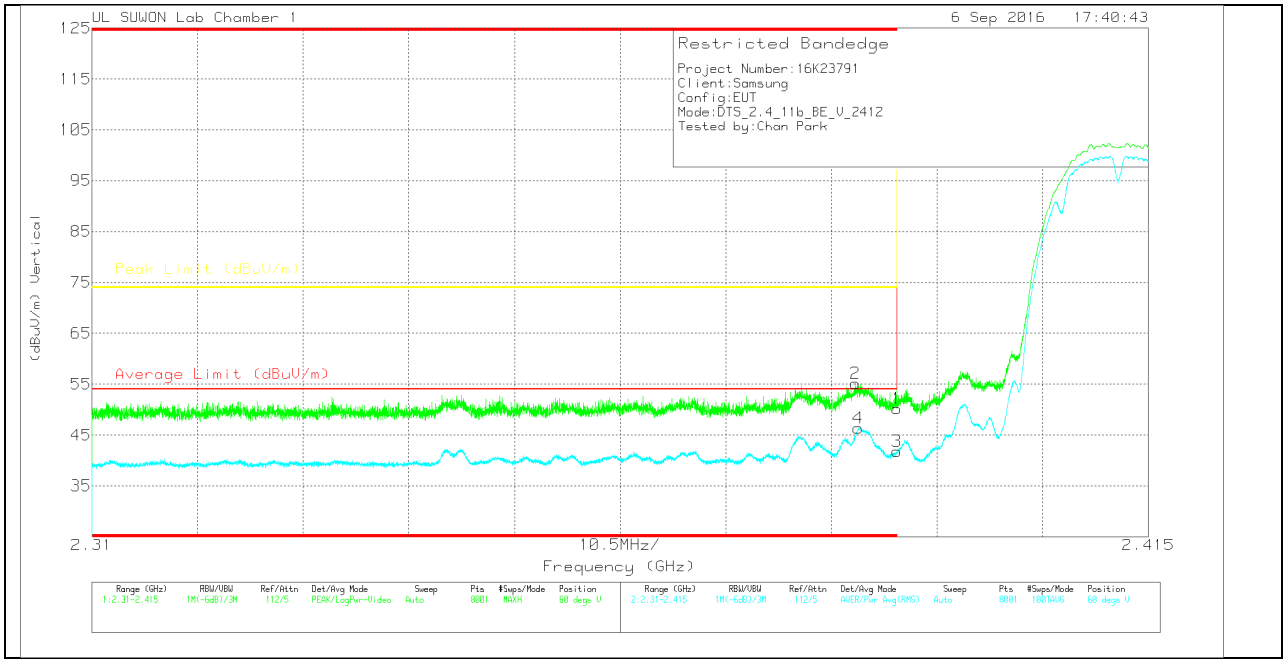
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	45.9	Pk	31.8	-29	48.7	-	-	74	-25.3	5	400	H
2	* 2.387	49.94	Pk	31.8	-29	52.74	-	-	74	-21.26	5	400	H
3	* 2.39	36.6	RMS	31.8	-29	39.4	54	-14.6	-	-	5	400	H
4	* 2.386	38.35	RMS	31.8	-29	41.15	54	-12.85	-	-	5	400	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(00168717)_150619	Path_2	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	47.44	Pk	31.8	-29	50.24	-	-	74	-23.76	60	299	V
2	* 2.386	52.39	Pk	31.8	-29	55.19	-	-	74	-18.81	60	299	V
3	* 2.39	38.96	RMS	31.8	-29	41.76	54	-12.24	-	-	60	299	V
4	* 2.386	43.59	RMS	31.8	-29	46.39	54	-7.61	-	-	60	299	V

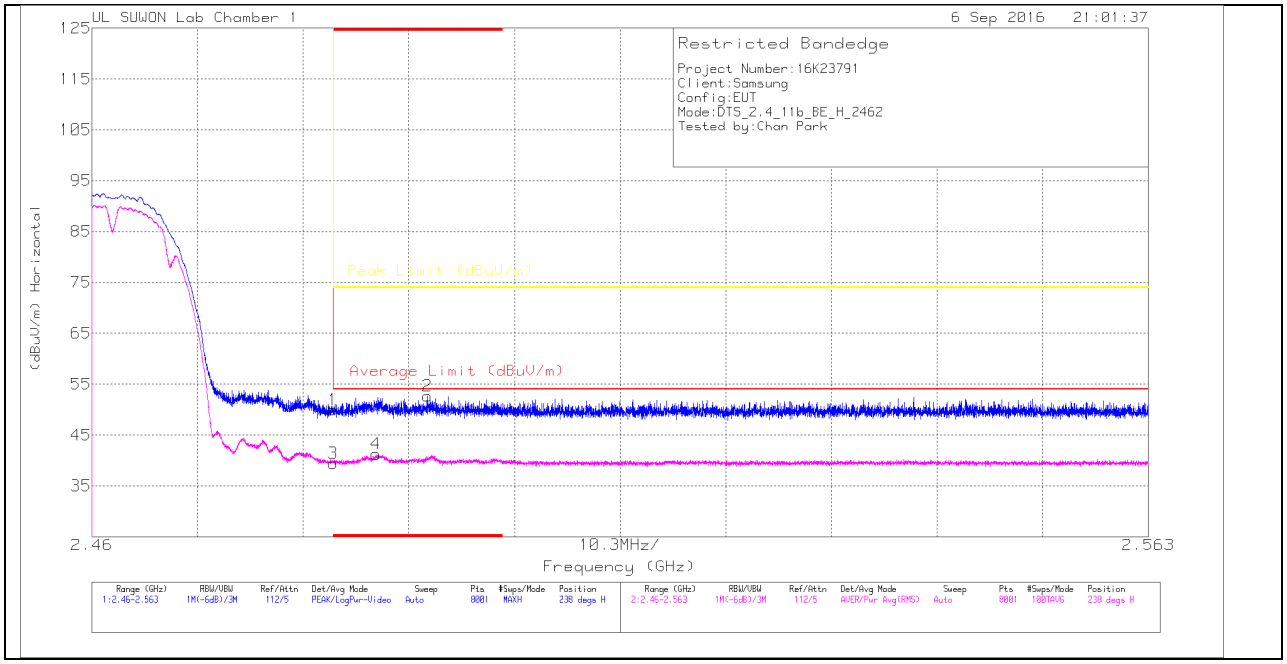
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

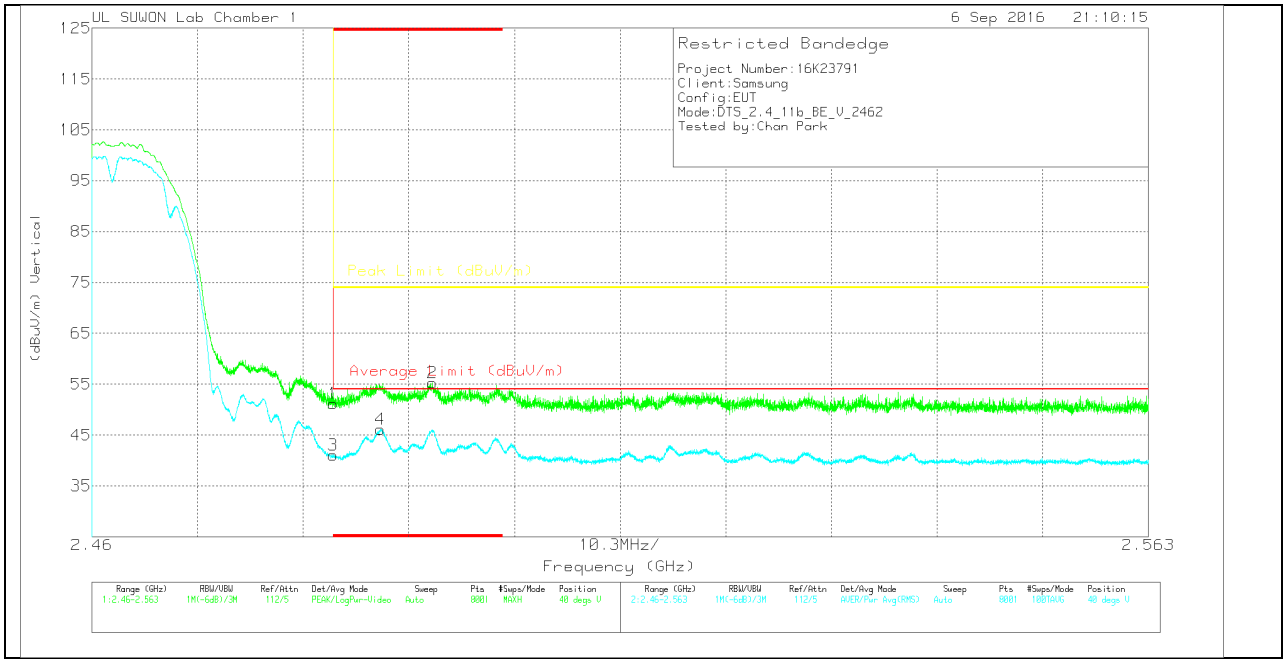
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	46.2	Pk	32	-28.3	49.9	-	-	74	-24.1	238	296	H
2	* 2.493	48.93	Pk	32	-28.3	52.63	-	-	74	-21.37	238	296	H
3	* 2.484	35.74	RMS	32	-28.3	39.44	54	-14.56	-	-	238	296	H
4	* 2.488	37.54	RMS	32	-28.3	41.24	54	-12.76	-	-	238	296	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(00168717)_150619	Path_2	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	47.44	Pk	32	-28.3	51.14	-	-	74	-22.86	40	231	V
2	* 2.493	51.53	Pk	32	-28.3	55.23	-	-	74	-18.77	40	231	V
3	* 2.484	37.35	RMS	32	-28.3	41.05	54	-12.95	-	-	40	231	V
4	* 2.488	42.47	RMS	32	-28.3	46.17	54	-7.83	-	-	40	231	V

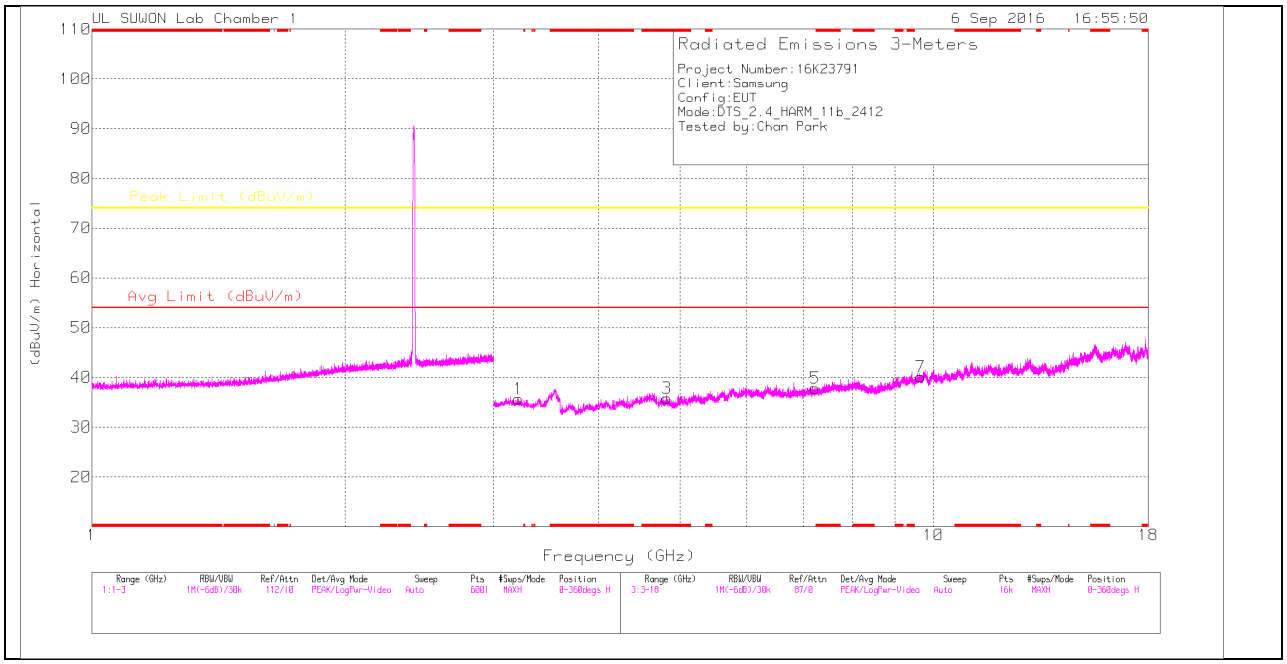
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

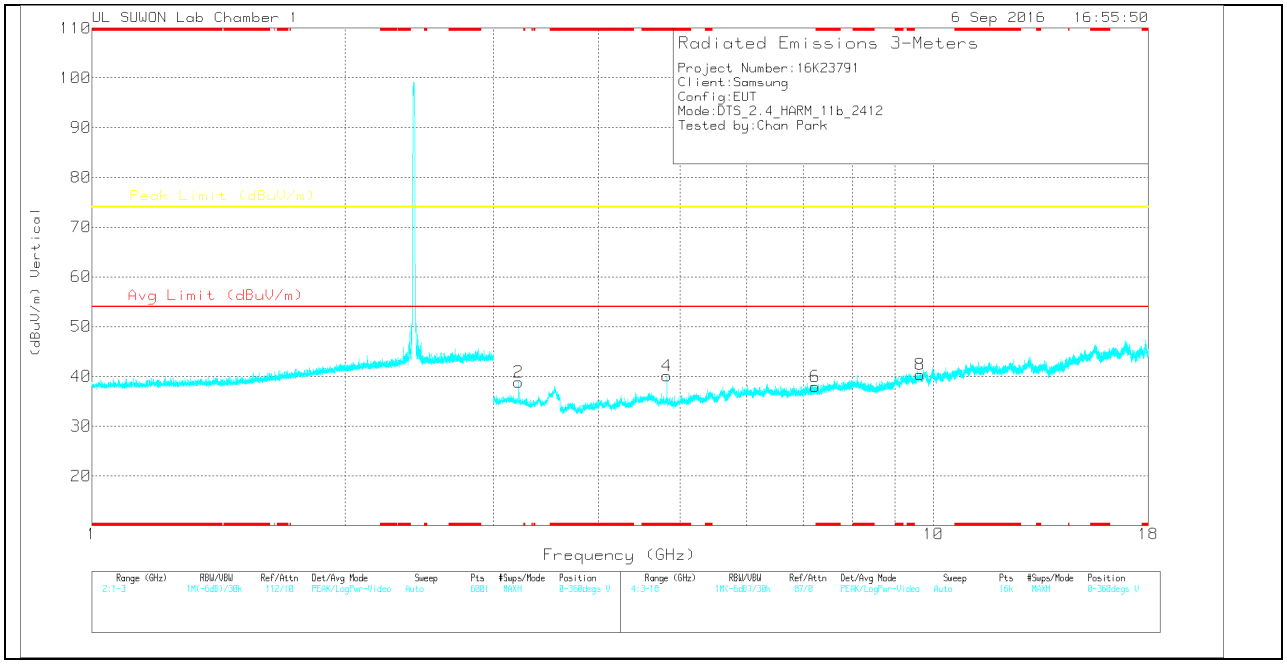
RMS - RMS detection

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(00168717)_150619	Path_3	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.216	39.8	PK	32.6	-36.7	35.7	-	-	74	-38.3	0-360	250	H
3	* 4.824	35.58	PK	34	-33.8	35.78	-	-	74	-38.22	0-360	150	H
5	7.234	33	PK	35.7	-30.9	37.8	-	-	74	-36.2	0-360	150	H
7	9.649	30.39	PK	37.1	-27.4	40.09	-	-	74	-33.91	0-360	150	H
2	3.216	42.97	PK	32.6	-36.7	38.87	-	-	74	-35.13	0-360	250	V
4	* 4.823	39.88	PK	34	-33.8	40.08	-	-	74	-33.92	0-360	250	V
6	7.236	33.16	PK	35.7	-30.9	37.96	-	-	74	-36.04	0-360	250	V
8	9.645	30.63	PK	37.1	-27.4	40.33	-	-	74	-33.67	0-360	150	V

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

PK – Peak detector

Radiated Emissions

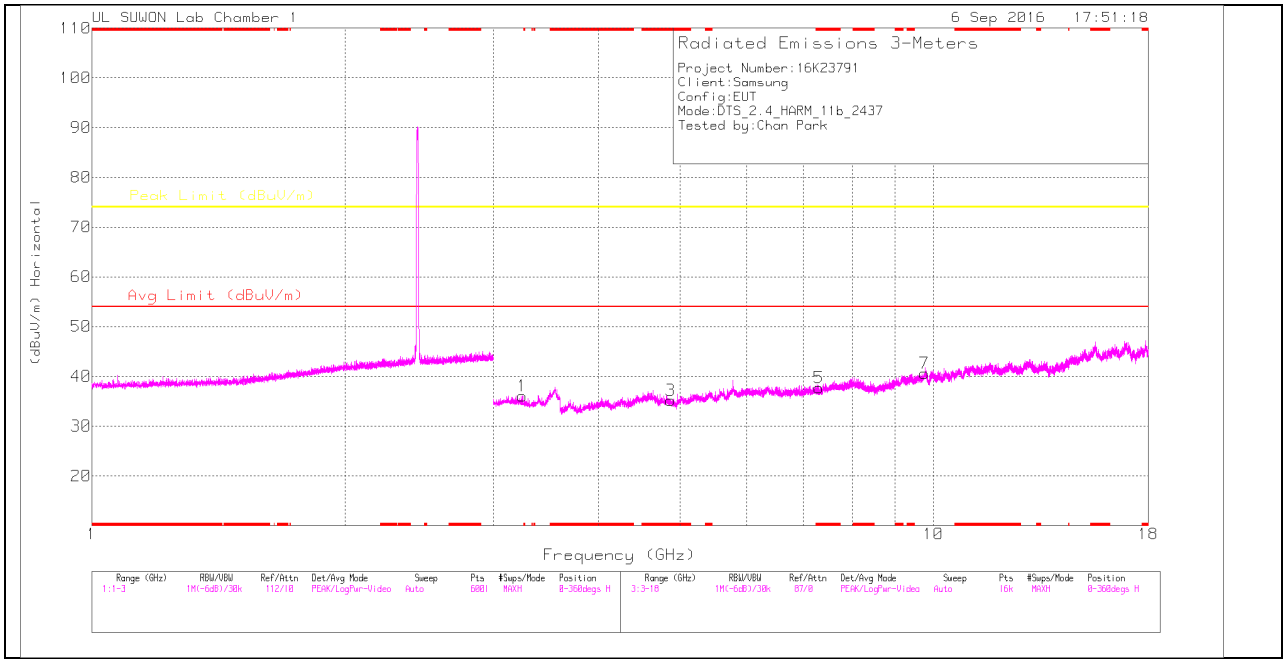
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3.216	52.16	PK2	32.6	-36.7	48.06	-	-	74	-25.94	109	264	V
* 4.817	47.04	PK2	34	-33.8	47.24	-	-	74	-26.76	354	173	V
* 4.824	36.72	MAv1	34	-33.8	36.92	54	-17.08	-	-	354	173	V

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

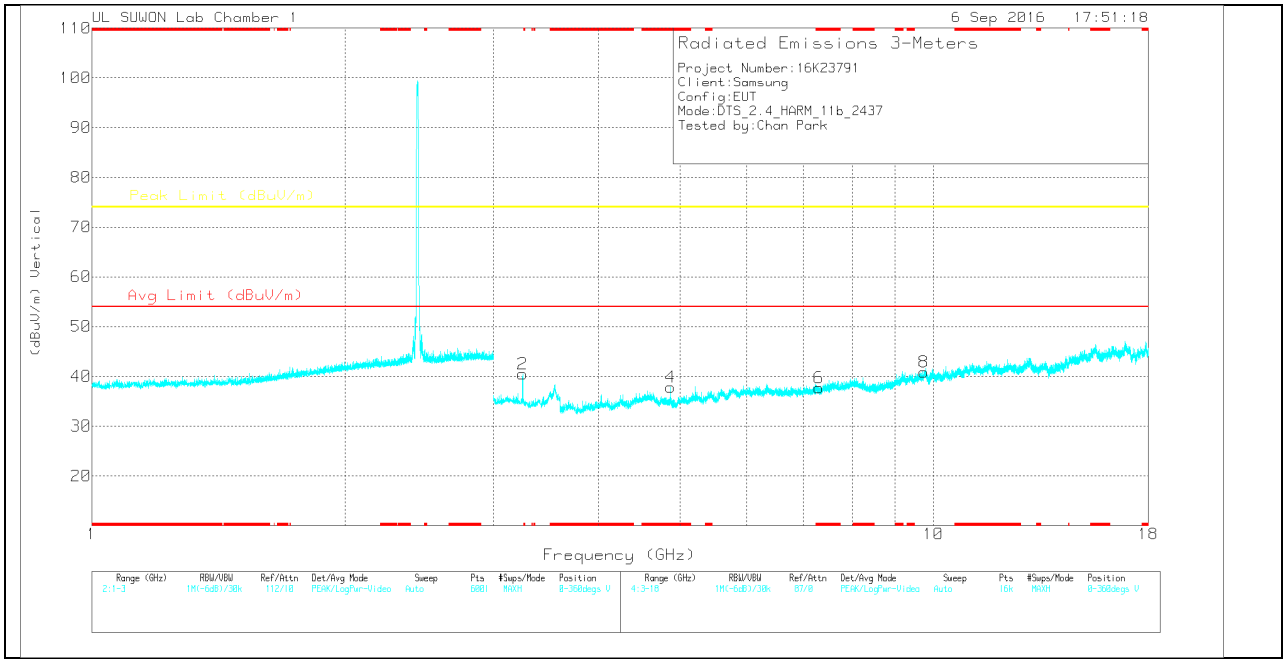
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.248	39.78	PK	32.6	-36.3	36.08	-	-	74	-37.92	0-360	250	H
3	* 4.874	35.18	PK	34	-34	35.18	-	-	74	-38.82	0-360	250	H
5	* 7.309	32.86	PK	35.7	-30.9	37.66	-	-	74	-36.34	0-360	250	H
7	9.751	30.16	PK	37.2	-26.8	40.56	-	-	74	-33.44	0-360	150	H
2	3.249	44.22	PK	32.6	-36.3	40.52	-	-	74	-33.48	0-360	250	V
4	* 4.874	37.88	PK	34	-34	37.88	-	-	74	-36.12	0-360	250	V
6	* 7.309	32.93	PK	35.7	-30.9	37.73	-	-	74	-36.27	0-360	250	V
8	9.747	30.58	PK	37.2	-26.9	40.88	-	-	74	-33.12	0-360	250	V

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

PK – Peak detector

Radiated Emissions

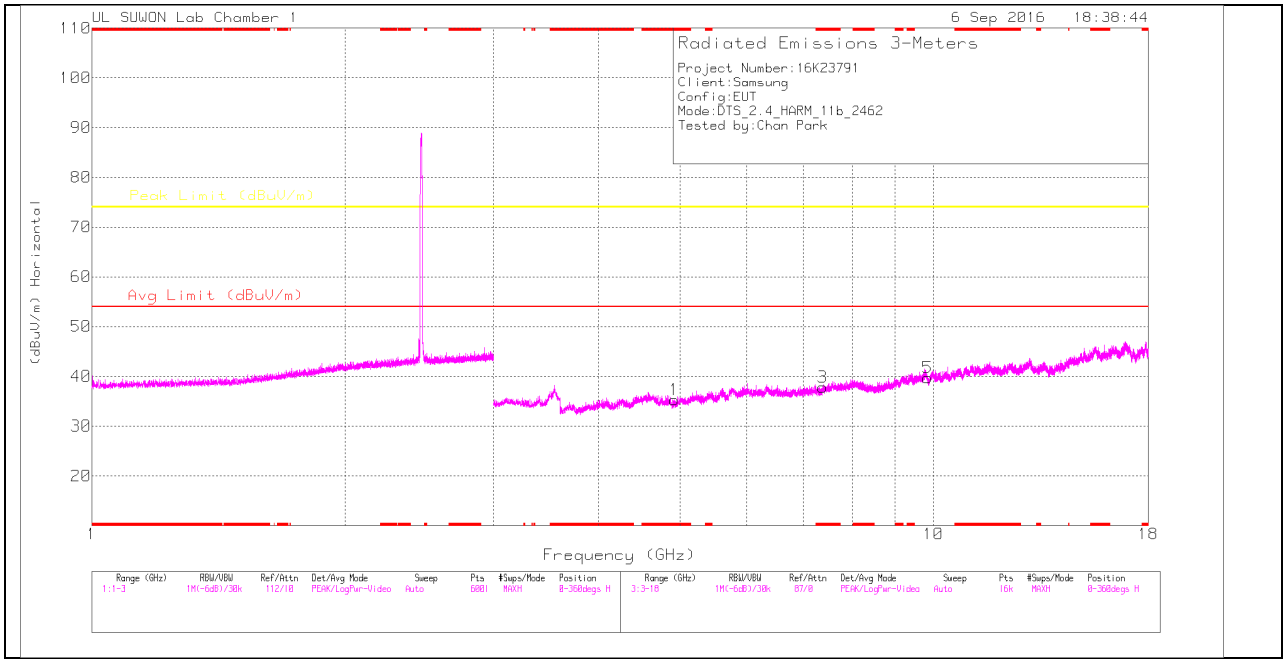
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3.249	51.27	PK2	32.6	-36.3	47.57	-	-	74	-26.43	104	286	V
* 4.874	47.75	PK2	34	-34	47.75	-	-	74	-26.25	114	296	V
* 4.874	38.6	MAv1	34	-34	38.6	54	-15.4	-	-	114	296	V

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

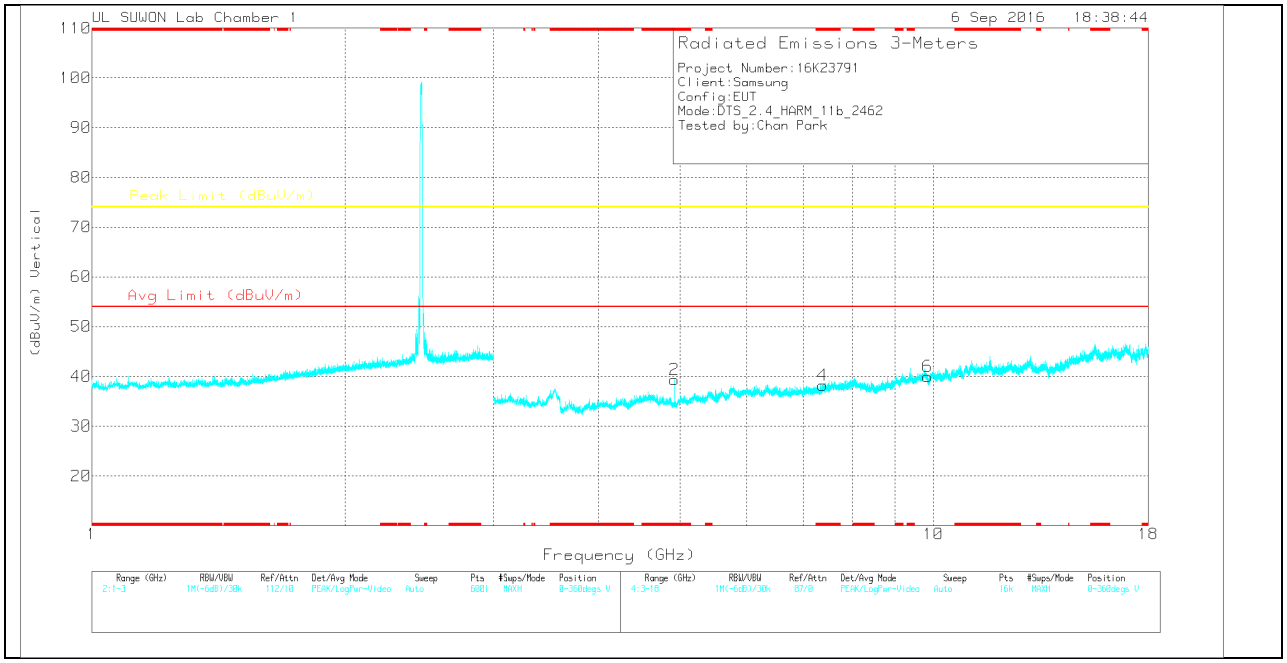
PK2 - KDB558074 Method: Maximum Peak

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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	35.31	PK	34	-34	35.31	-	-	74	-38.69	0-360	250	H
3	* 7.384	32.71	PK	35.8	-30.7	37.81	-	-	74	-36.19	0-360	250	H
5	9.848	30.01	PK	37.3	-27.6	39.71	-	-	74	-34.29	0-360	150	H
2	* 4.924	39.41	PK	34	-34	39.41	-	-	74	-34.59	0-360	250	V
4	* 7.387	33.13	PK	35.8	-30.7	38.23	-	-	74	-35.77	0-360	250	V
6	9.845	30.16	PK	37.3	-27.5	39.96	-	-	74	-34.04	0-360	250	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	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	46.2	PK2	34	-34	46.2	-	-	74	-27.8	331	182	V
* 4.924	35.43	MAv1	34	-34	35.43	54	-18.57	-	-	331	182	V

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

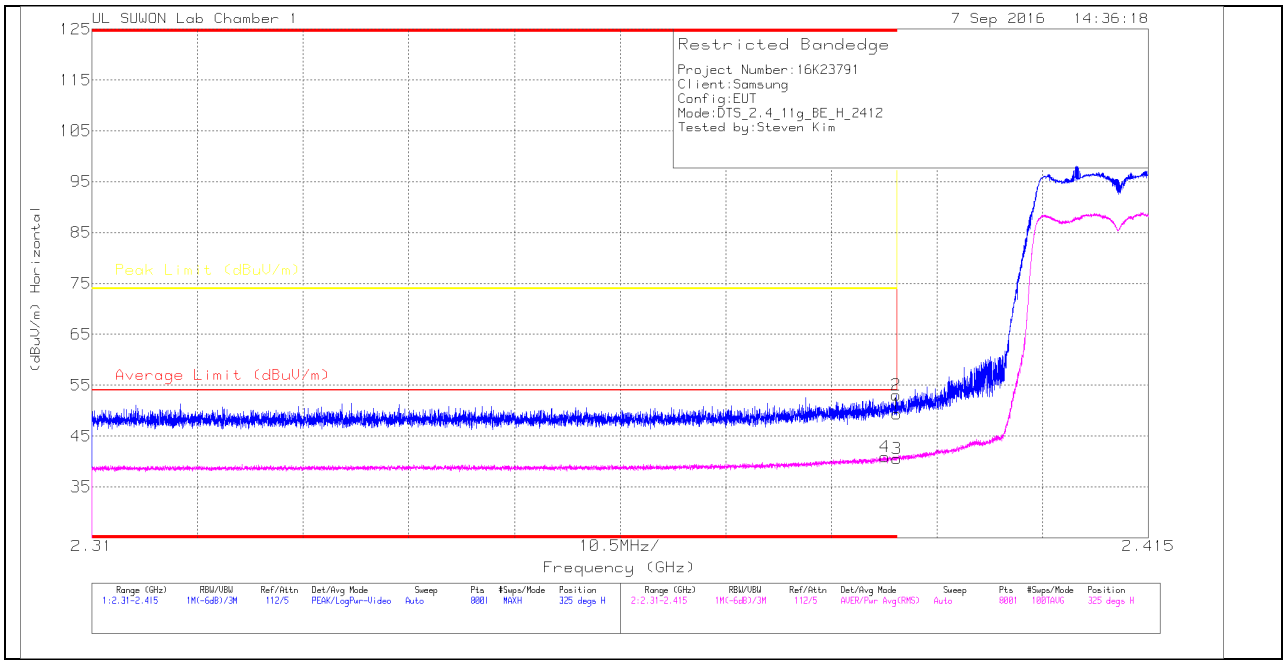
PK2 - KDB558074 Method: Maximum Peak

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

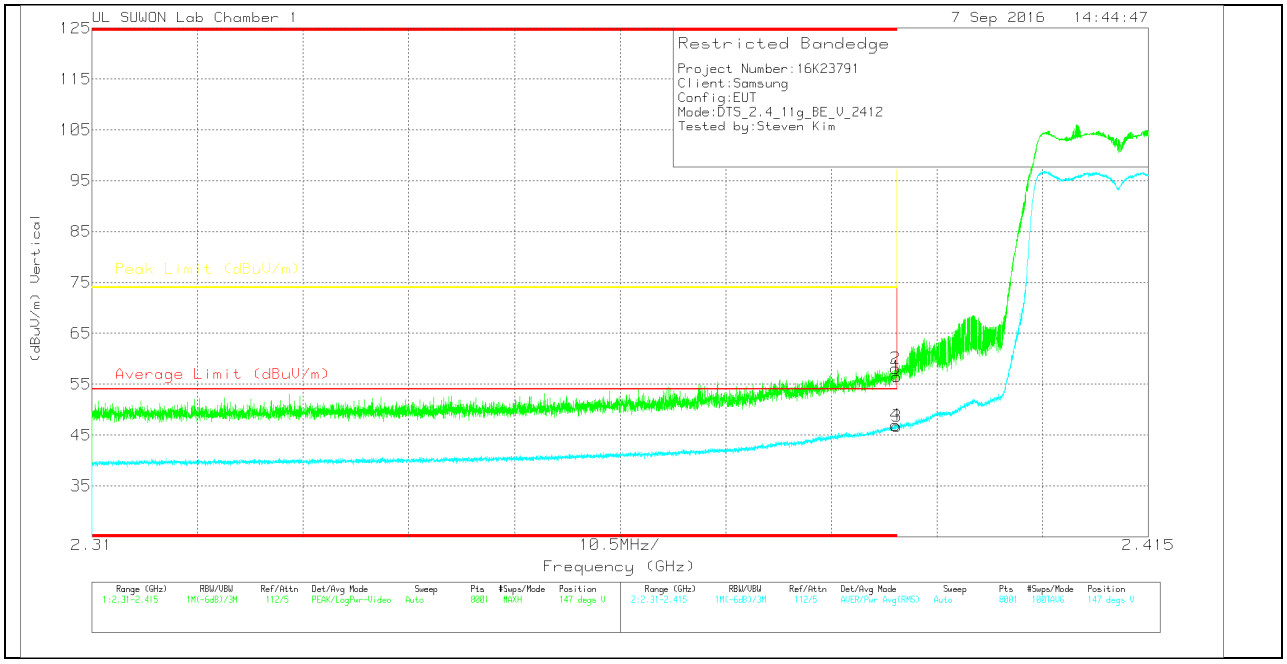
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.58	Pk	31.8	-29	0	49.38	-	-	74	-24.62	325	356	H
2	* 2.39	50.22	Pk	31.8	-29	0	53.02	-	-	74	-20.98	325	356	H
3	* 2.39	37.8	RMS	31.8	-29	0	40.6	54	-13.4	-	-	325	356	H
4	* 2.389	38.12	RMS	31.8	-29	0	40.92	54	-13.08	-	-	325	356	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(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	53.75	Pk	31.8	-29	0	56.55	-	-	74	-17.45	147	344	V
2	* 2.39	55.29	Pk	31.8	-29	0	58.09	-	-	74	-15.91	147	344	V
3	* 2.39	43.99	RMS	31.8	-29	0	46.79	54	-7.21	-	-	147	344	V
4	* 2.39	44.13	RMS	31.8	-29	0	46.93	54	-7.07	-	-	147	344	V

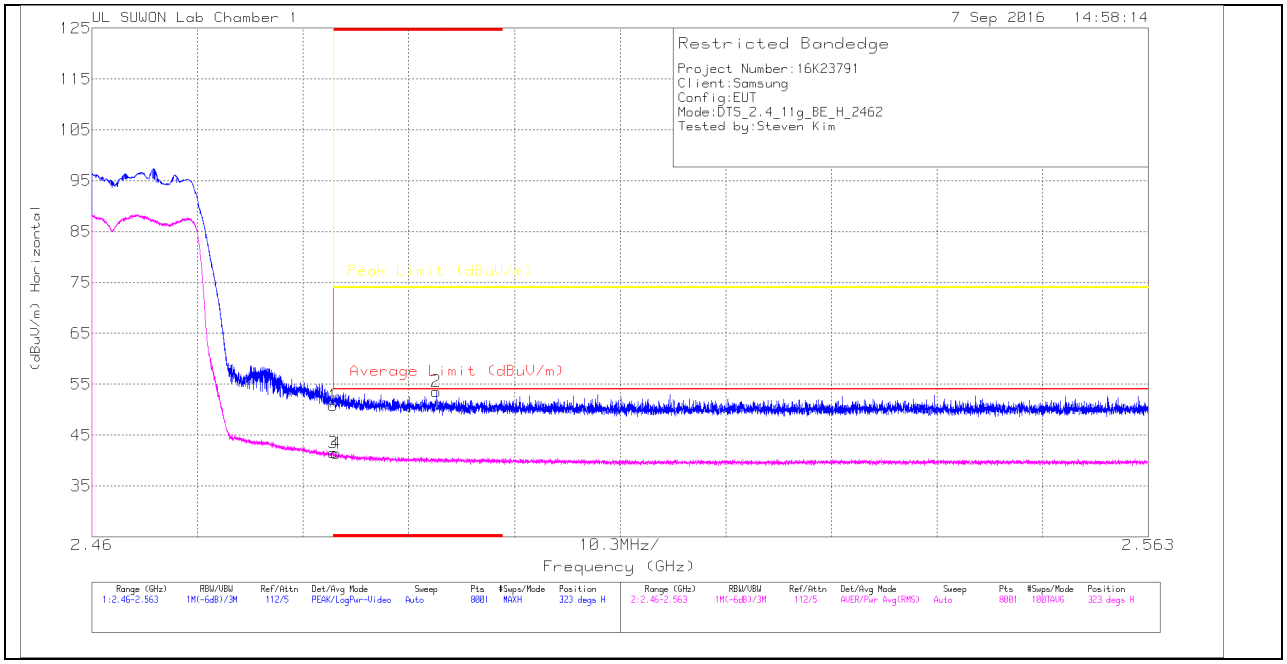
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

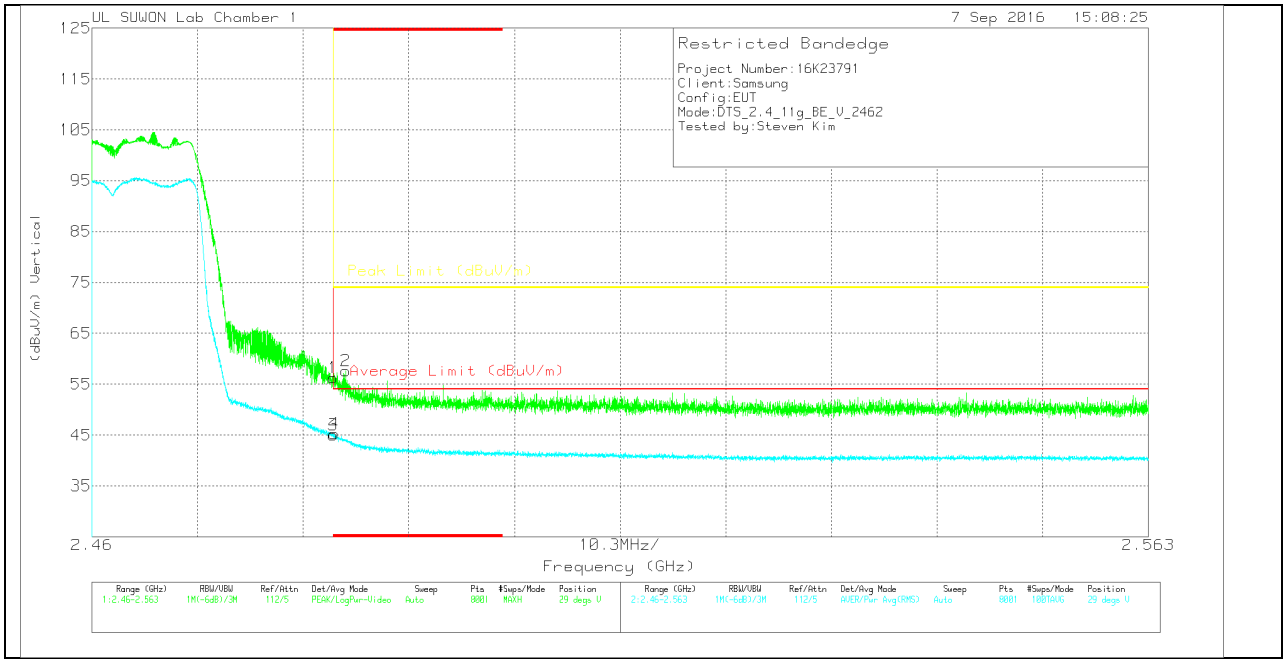
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.17	Pk	32	-28.3	0	50.87	-	-	74	-23.13	323	297	H
2	* 2.494	49.9	Pk	32	-28.3	0	53.6	-	-	74	-20.4	323	297	H
3	* 2.484	37.81	RMS	32	-28.3	0	41.51	54	-12.49	-	-	323	297	H
4	* 2.484	37.73	RMS	32	-28.3	0	41.43	54	-12.57	-	-	323	297	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(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	52.57	Pk	32	-28.3	0	56.27	-	-	74	-17.73	29	276	V
2	* 2.485	53.95	Pk	32	-28.3	0	57.65	-	-	74	-16.35	29	276	V
3	* 2.484	41.32	RMS	32	-28.3	0	45.02	54	-8.98	-	-	29	276	V
4	* 2.484	41.59	RMS	32	-28.3	0	45.29	54	-8.71	-	-	29	276	V

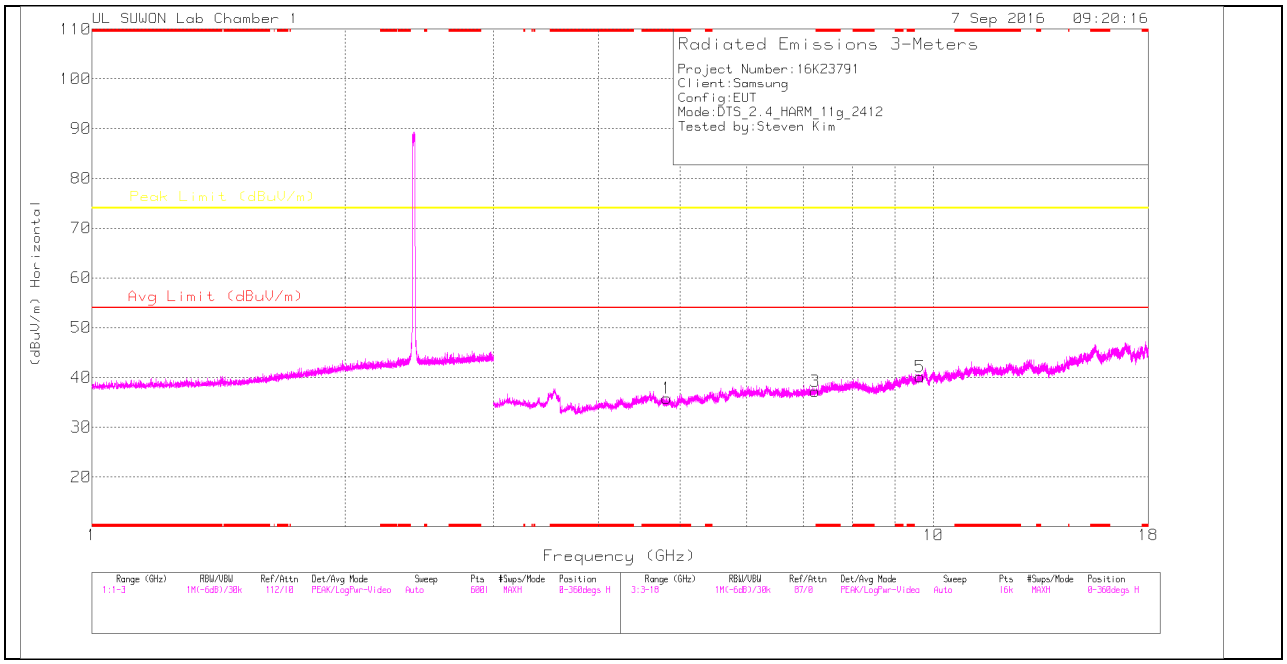
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

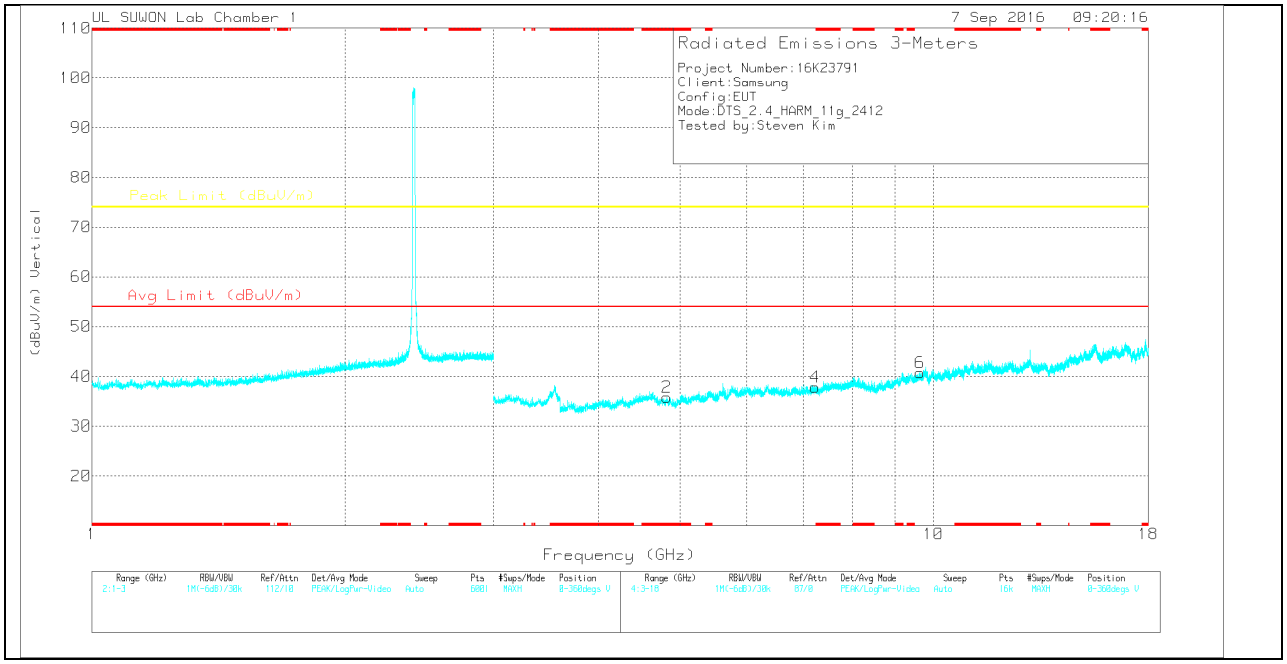
RMS - RMS detection

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

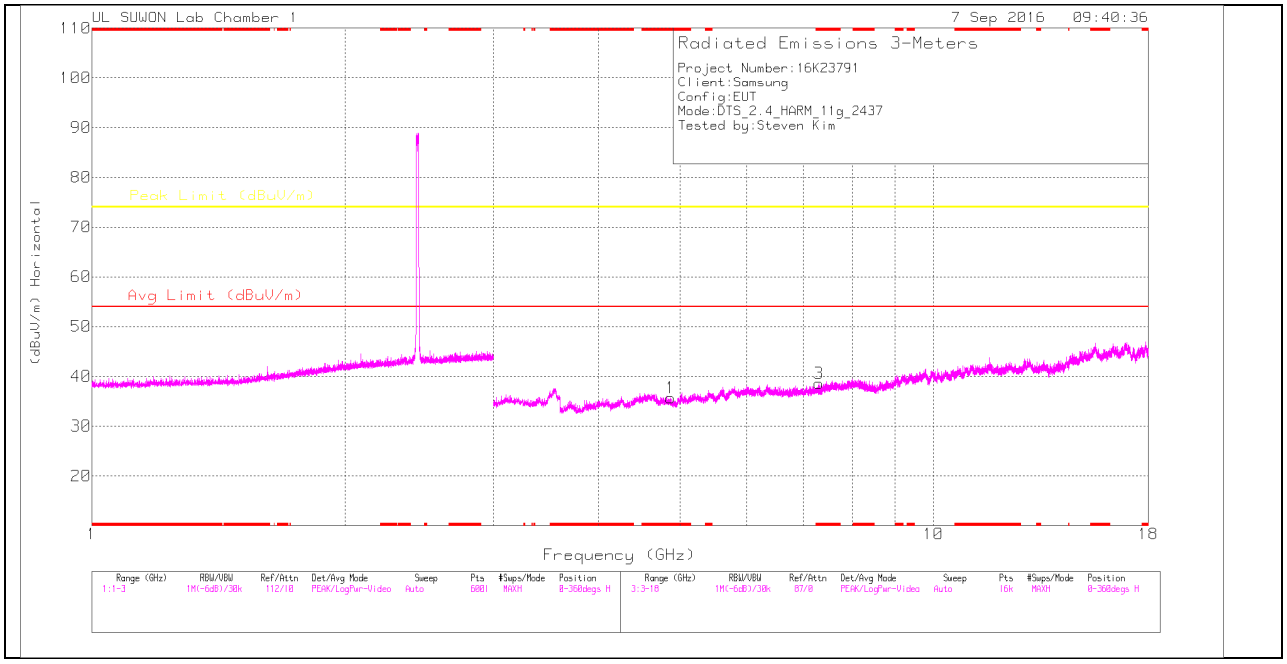
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.824	35.64	PK	34	-33.8	0	35.84	-	-	74	-38.16	0-360	150	H
3	7.239	32.44	PK	35.7	-30.9	0	37.24	-	-	74	-36.76	0-360	250	H
5	9.64	30.39	PK	37	-27.3	0	40.09	-	-	74	-33.91	0-360	150	H
2	* 4.82	35.63	PK	34	-33.8	0	35.83	-	-	74	-38.17	0-360	250	V
4	7.235	33	PK	35.7	-30.9	0	37.8	-	-	74	-36.2	0-360	250	V
6	9.643	31.02	PK	37.1	-27.4	0	40.72	-	-	74	-33.28	0-360	250	V

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

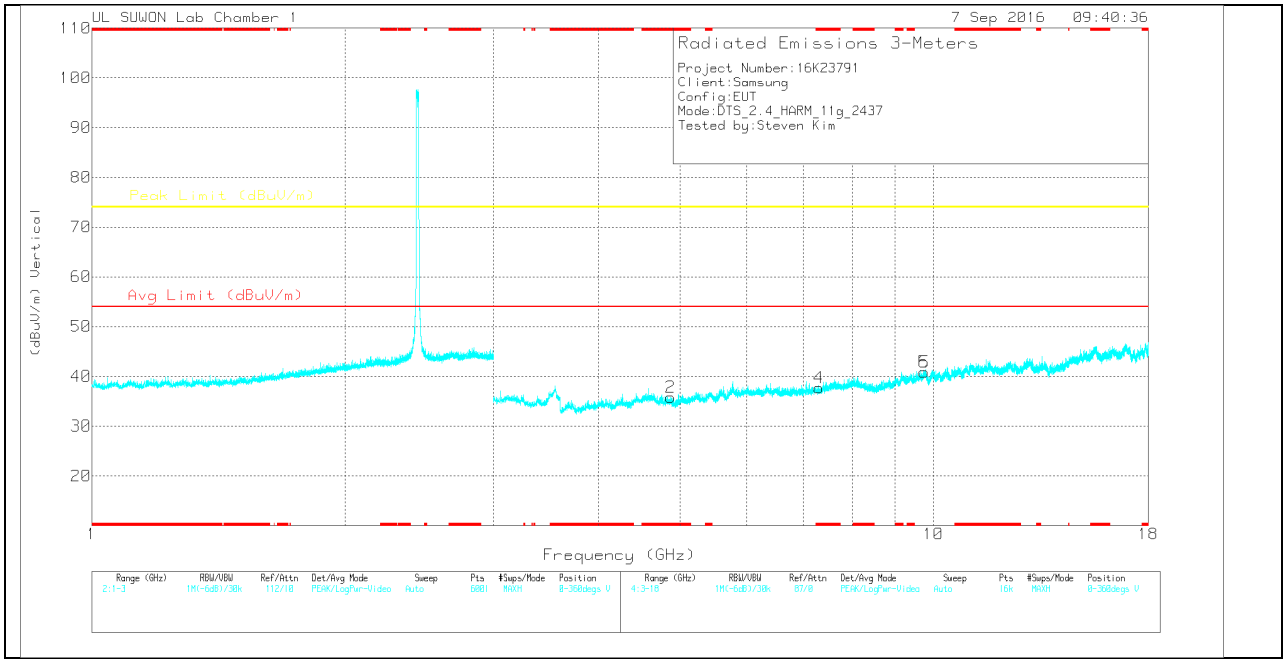
PK – Peak Detector

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

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.

MID CHANNEL DATA

Trace Markers

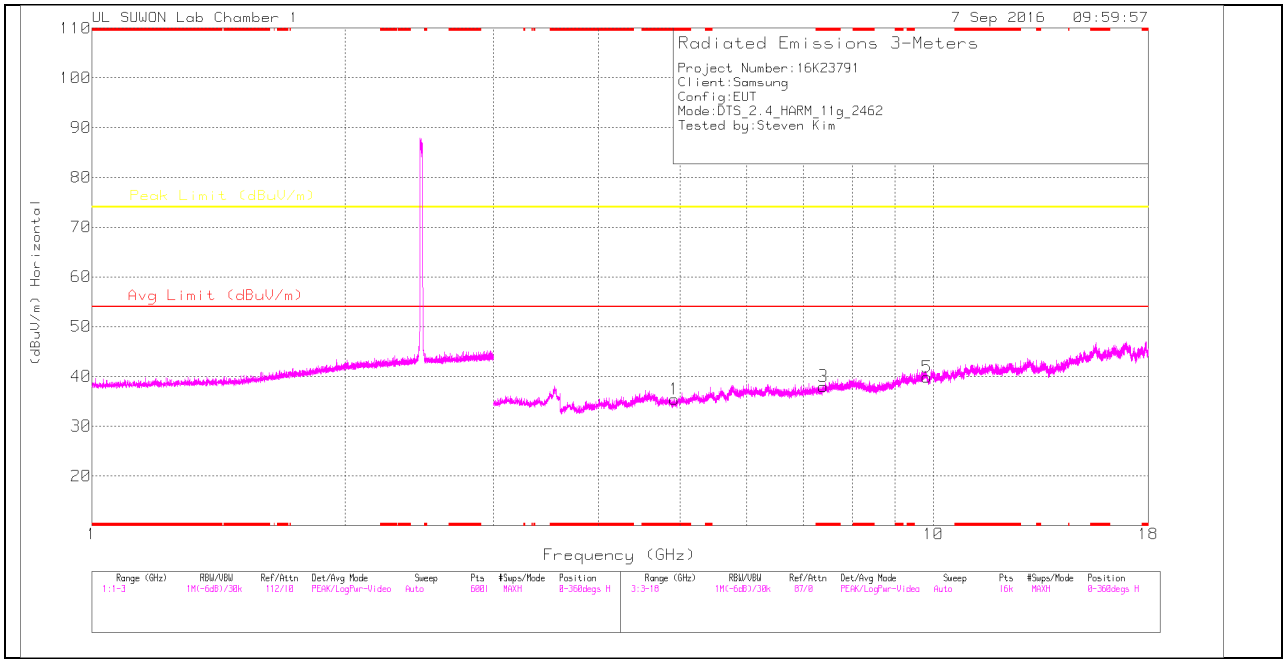
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.87	35.65	PK	34	-34	0	35.65	-	-	74	-38.35	0-360	150	H
3	* 7.306	33.84	PK	35.7	-30.9	0	38.64	-	-	74	-35.36	0-360	150	H
2	* 4.87	35.79	PK	34	-34	0	35.79	-	-	74	-38.21	0-360	250	V
4	* 7.306	32.9	PK	35.7	-30.9	0	37.7	-	-	74	-36.3	0-360	150	V
5	9.749	30.49	PK	37.2	-26.8	0	40.89	-	-	74	-33.11	0-360	150	V
6	9.749	30.49	PK	37.2	-26.8	0	40.89	-	-	74	-33.11	0-360	150	V

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

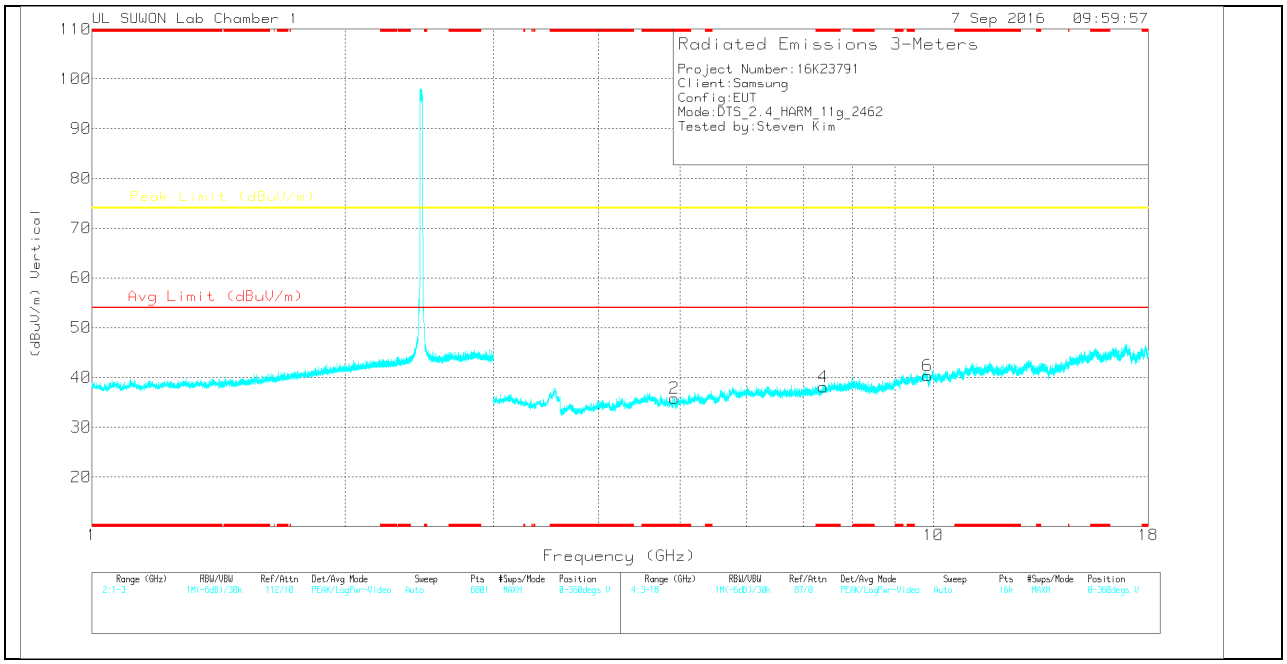
PK – Peak Detector

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

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.

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	35.39	PK	34	-34	0	35.39	-	-	74	-38.61	0-360	150	H
3	* 7.398	32.82	PK	35.8	-30.6	0	38.02	-	-	74	-35.98	0-360	150	H
5	9.831	29.78	PK	37.3	-27.2	0	39.88	-	-	74	-34.12	0-360	250	H
2	* 4.924	35.83	PK	34	-34	0	35.83	-	-	74	-38.17	0-360	250	V
4	* 7.394	32.94	PK	35.8	-30.6	0	38.14	-	-	74	-35.86	0-360	150	V
6	9.834	30.27	PK	37.3	-27.2	0	40.37	-	-	74	-33.63	0-360	250	V

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

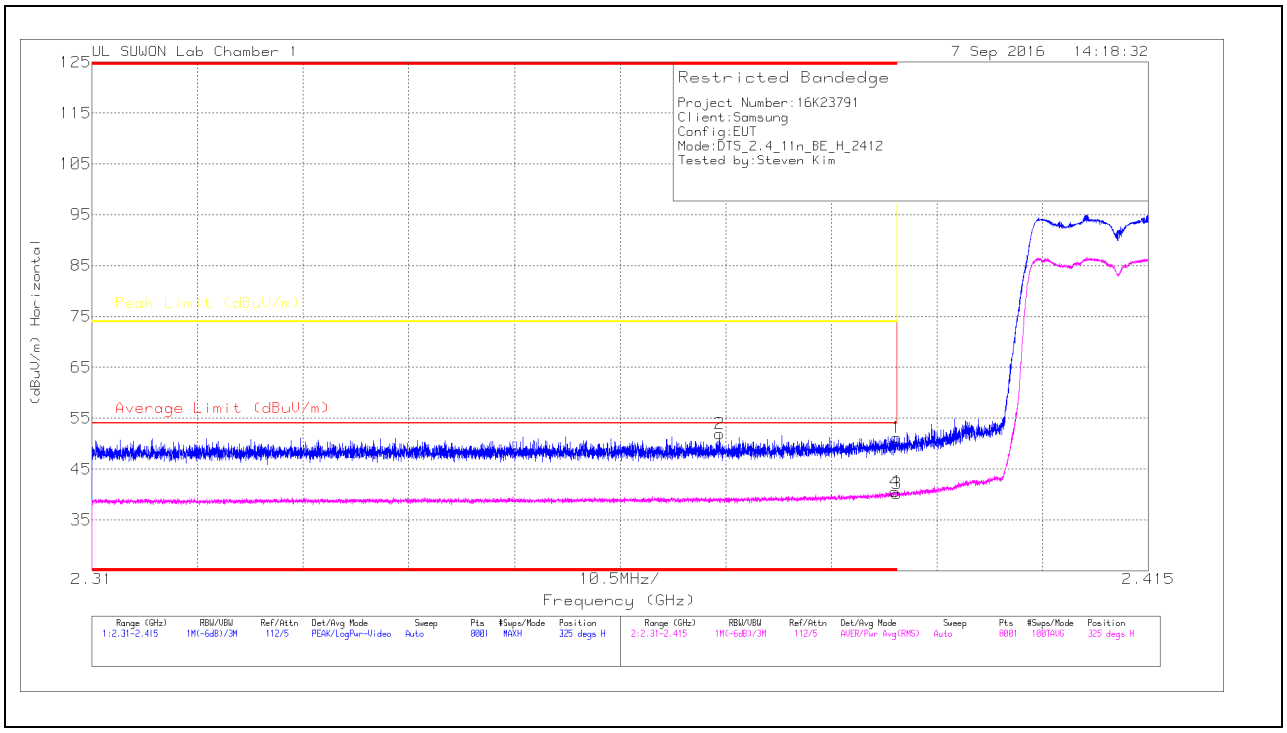
PK – Peak Detector

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

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

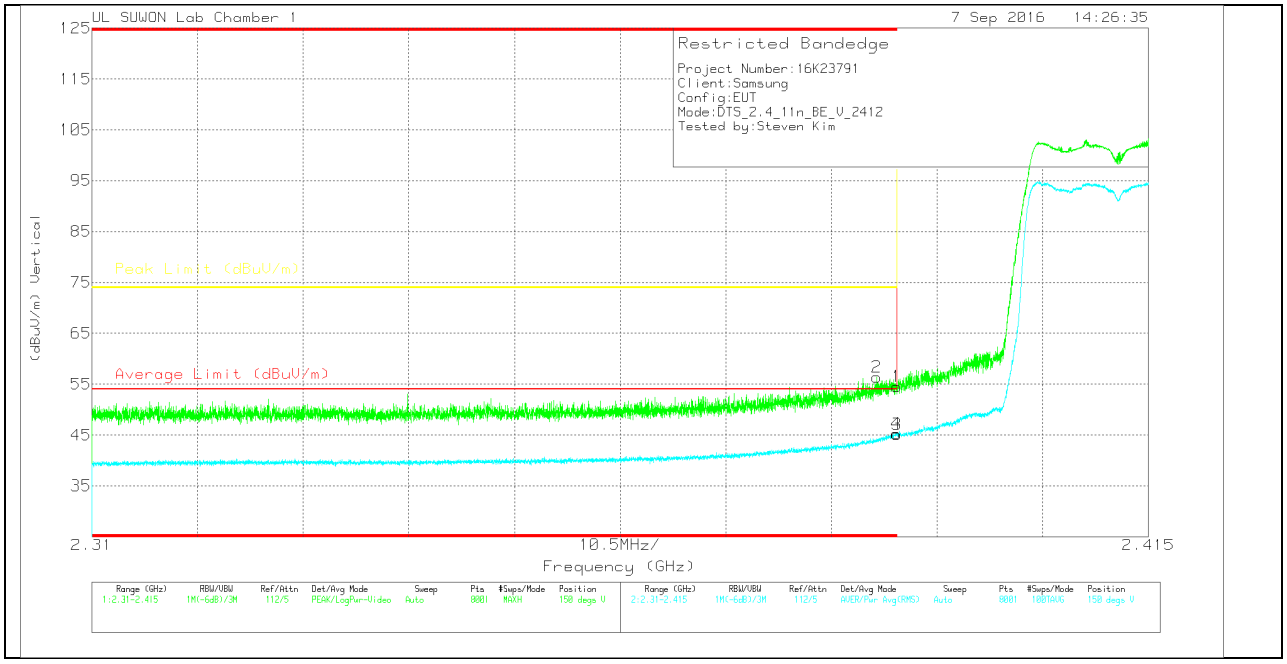
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.35	Pk	31.8	-29	0	51.15	-	-	74	-22.85	325	164	H
2	* 2.372	49.15	Pk	31.8	-29	0	51.95	-	-	74	-22.05	325	164	H
3	* 2.39	37.44	RMS	31.8	-29	0	40.24	54	-13.76	-	-	325	164	H
4	* 2.39	37.73	RMS	31.8	-29	0	40.53	54	-13.47	-	-	325	164	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(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	51.68	Pk	31.8	-29	0	54.48	-	-	74	-19.52	150	341	V
2	* 2.388	53.54	Pk	31.8	-29	0	56.34	-	-	74	-17.66	150	341	V
3	* 2.39	42.34	RMS	31.8	-29	0	45.14	54	-8.86	-	-	150	341	V
4	* 2.39	42.51	RMS	31.8	-29	0	45.31	54	-8.69	-	-	150	341	V

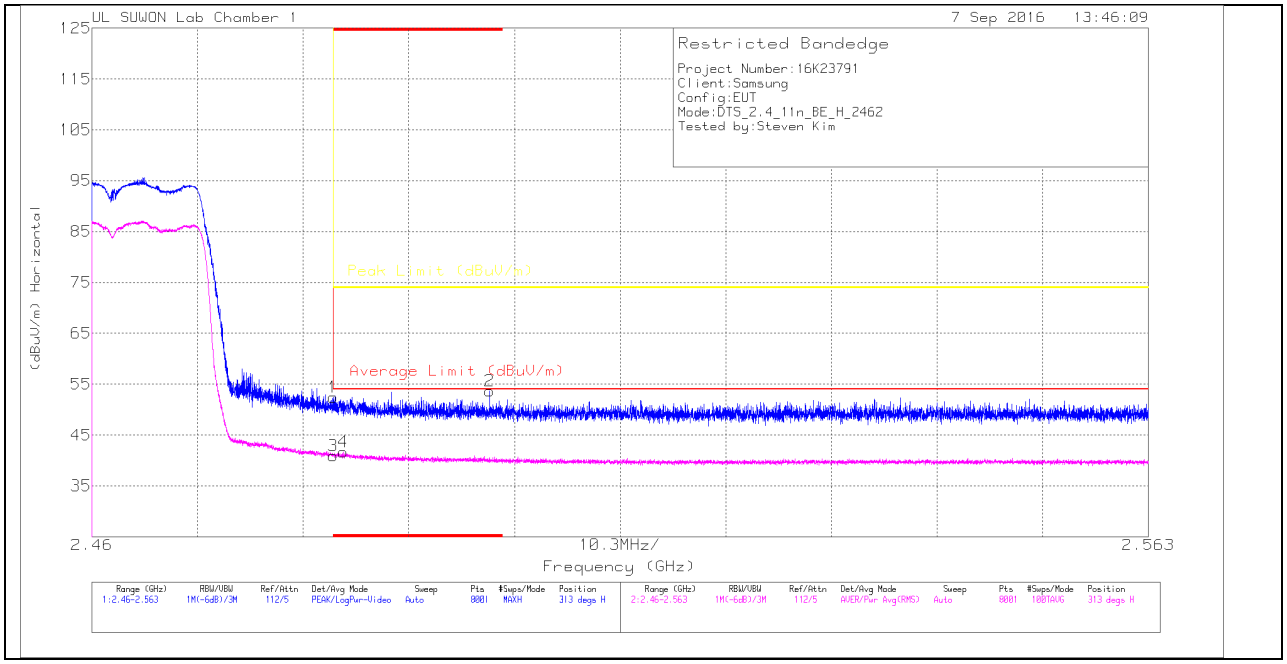
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

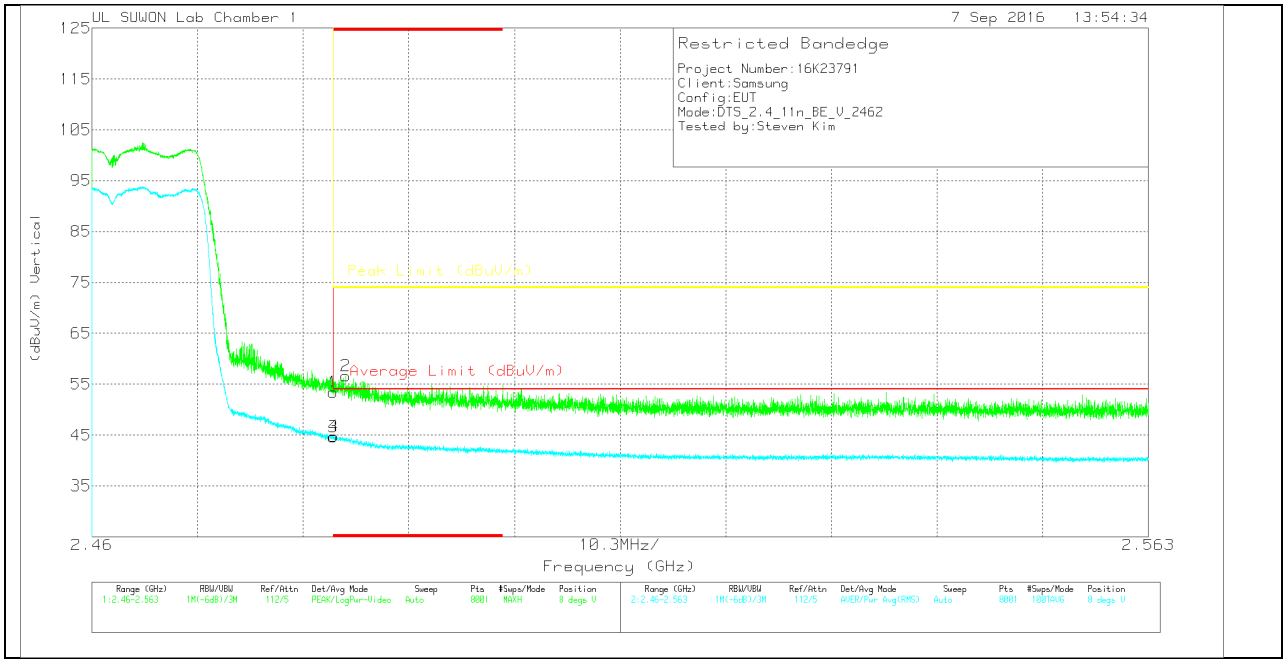
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	48.71	Pk	32	-28.3	0	52.41	-	-	74	-21.59	313	299	H
2	* 2.499	49.98	Pk	32	-28.3	0	53.68	-	-	74	-20.32	313	299	H
3	* 2.484	37.27	RMS	32	-28.3	0	40.97	54	-13.03	-	-	313	299	H
4	* 2.484	38.02	RMS	32	-28.3	0	41.72	54	-12.28	-	-	313	299	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(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	49.71	Pk	32	-28.3	0	53.41	-	-	74	-20.59	8	249	V
2	* 2.485	52.9	Pk	32	-28.3	0	56.6	-	-	74	-17.4	8	249	V
3	* 2.484	40.93	RMS	32	-28.3	0	44.63	54	-9.37	-	-	8	249	V
4	* 2.484	41.07	RMS	32	-28.3	0	44.77	54	-9.23	-	-	8	249	V

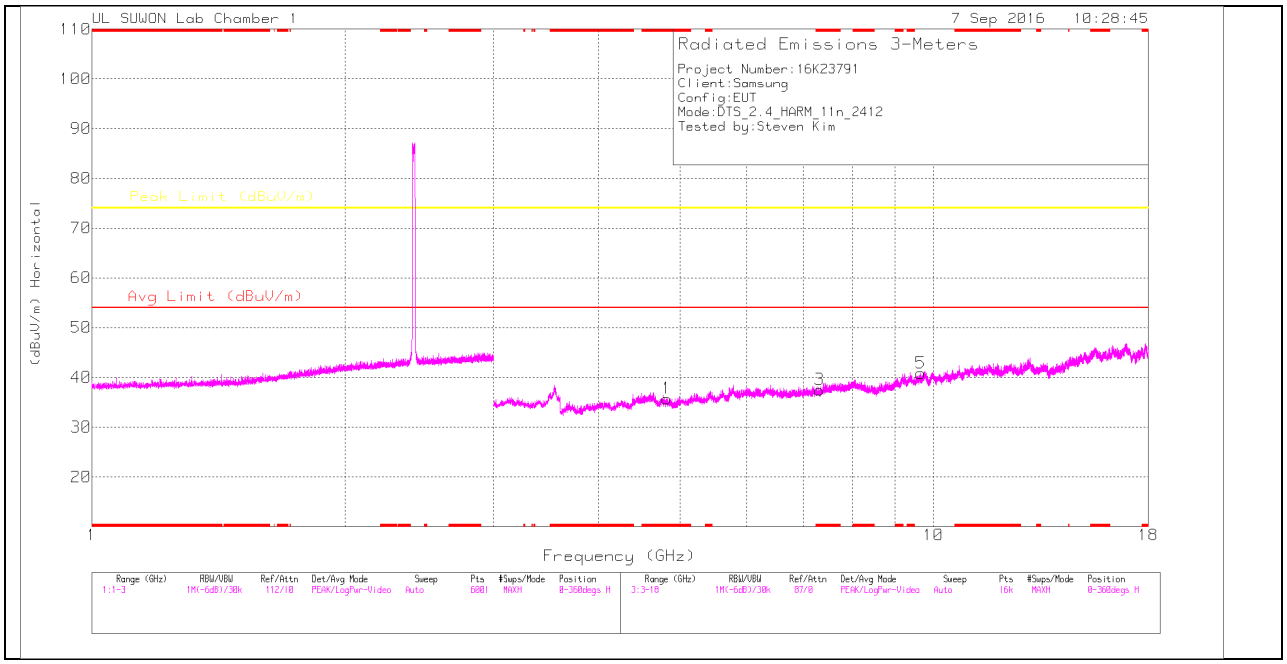
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

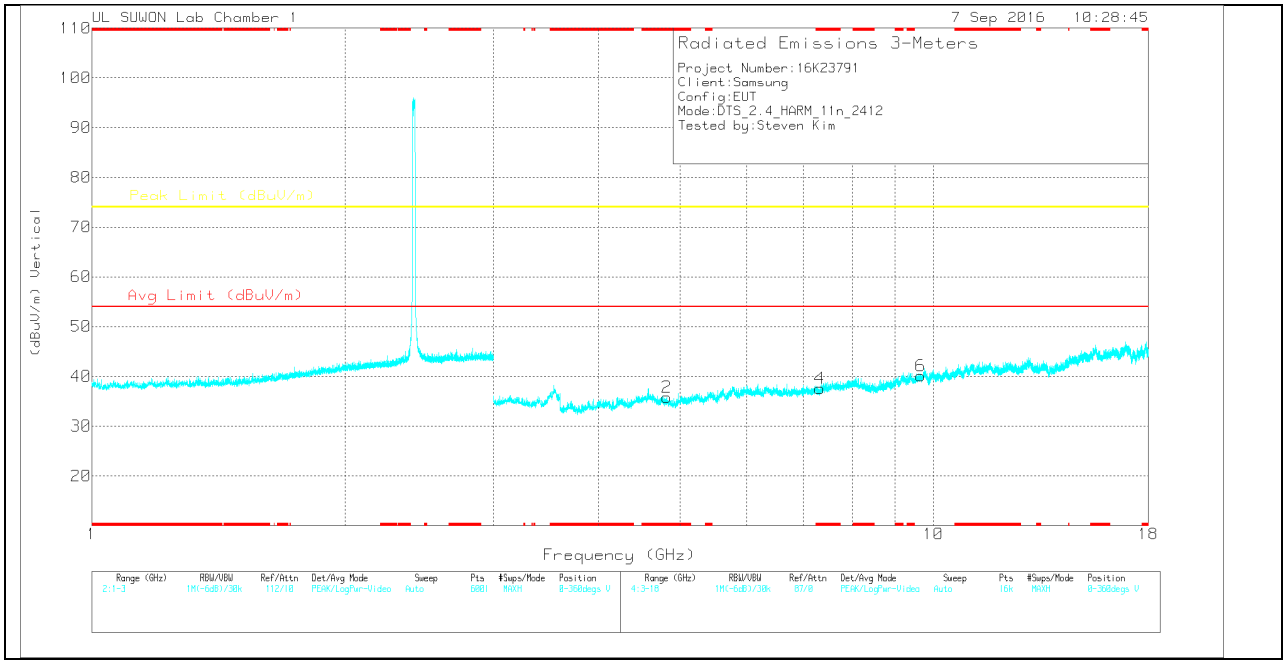
RMS - RMS detection

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

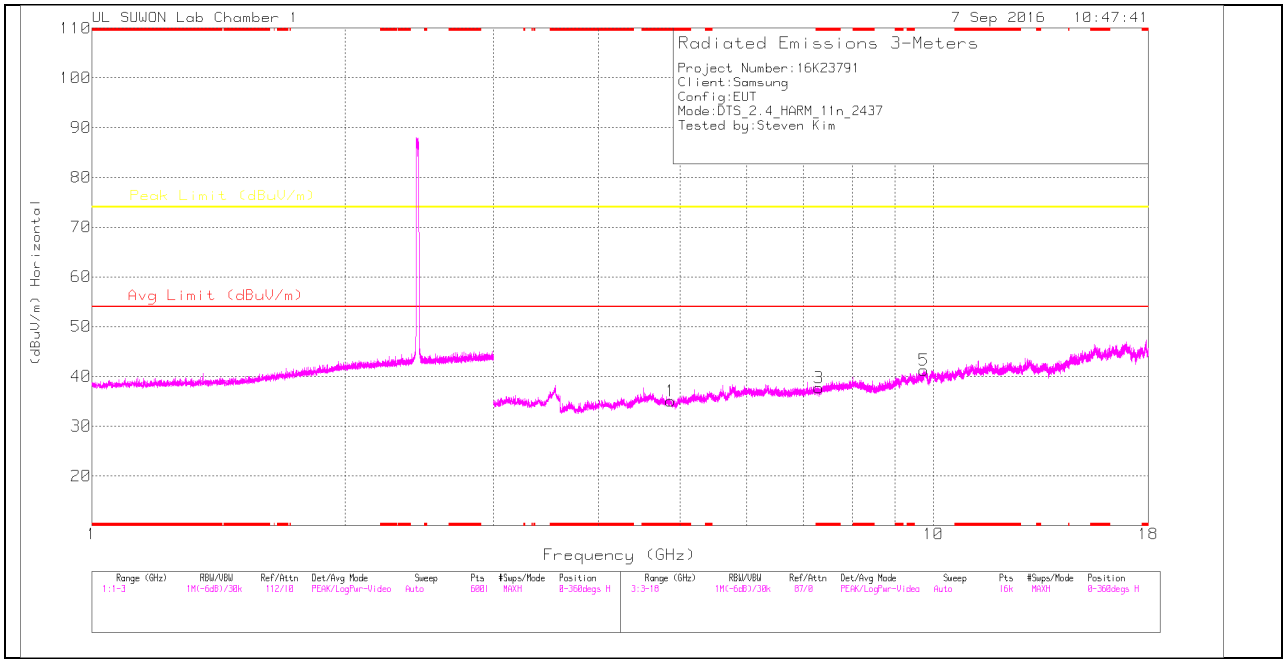
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.82	35.55	PK	34	-33.8	0	35.75	-	-	74	-38.25	0-360	250	H
3	* 7.324	32.62	PK	35.8	-30.9	0	37.52	-	-	74	-36.48	0-360	150	H
5	9.649	31.11	PK	37.1	-27.4	0	40.81	-	-	74	-33.19	0-360	250	H
2	* 4.82	35.61	PK	34	-33.8	0	35.81	-	-	74	-38.19	0-360	250	V
4	* 7.328	32.59	PK	35.8	-30.8	0	37.59	-	-	74	-36.41	0-360	250	V
6	9.649	30.45	PK	37.1	-27.4	0	40.15	-	-	74	-33.85	0-360	250	V

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

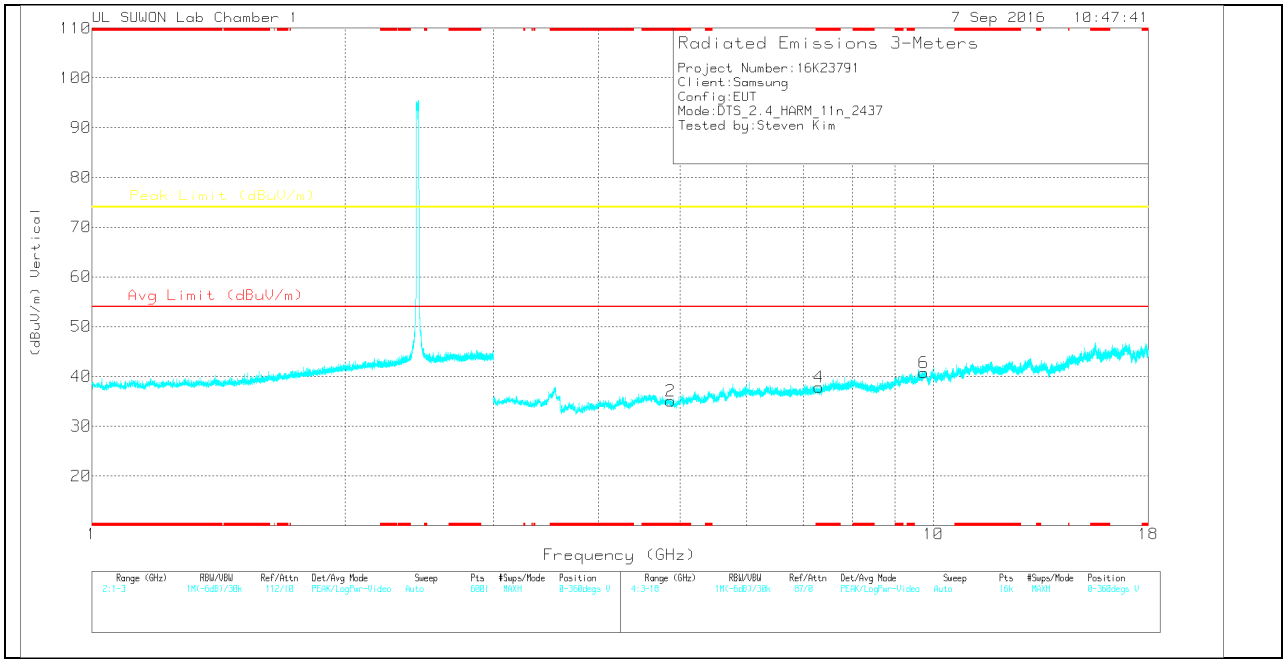
PK – Peak Detector

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

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.

MID CHANNEL DATA

Trace Markers

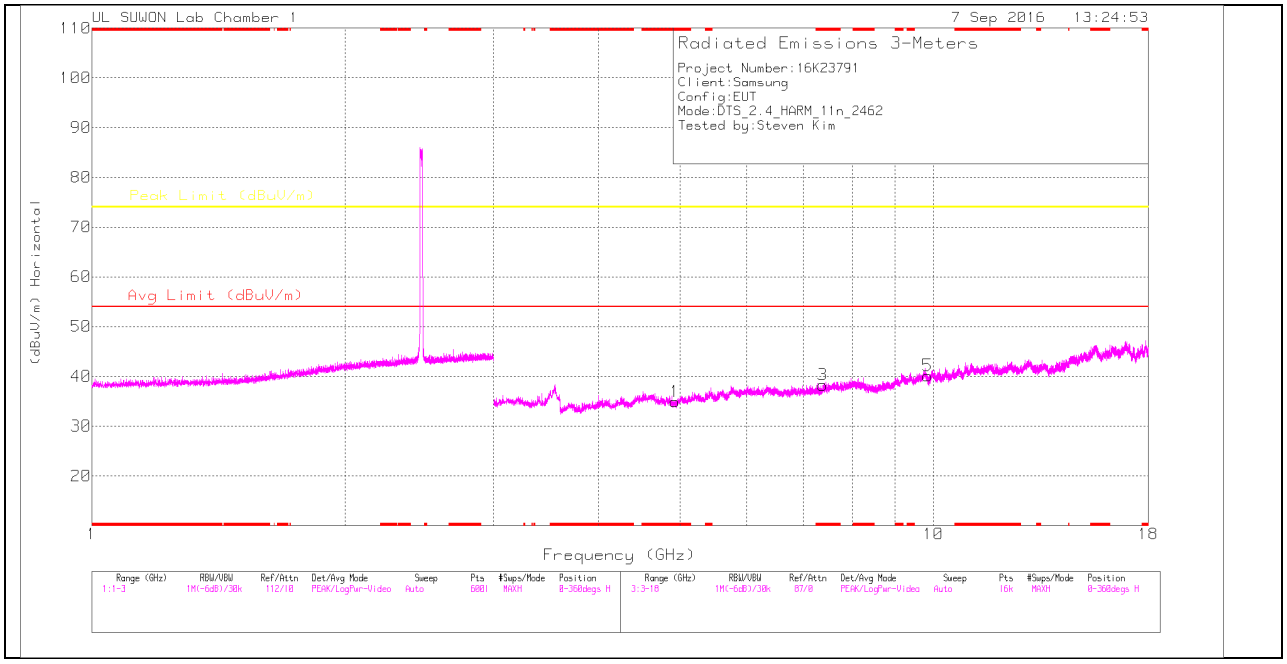
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.872	35.09	PK	34	-34	0	35.09	-	-	74	-38.91	0-360	150	H
3	* 7.311	32.88	PK	35.7	-30.9	0	37.68	-	-	74	-36.32	0-360	250	H
5	9.746	30.93	PK	37.2	-26.9	0	41.23	-	-	74	-32.77	0-360	150	H
2	* 4.868	35	PK	34	-34	0	35	-	-	74	-39	0-360	250	V
4	* 7.306	33.06	PK	35.7	-30.9	0	37.86	-	-	74	-36.14	0-360	150	V
6	9.746	30.48	PK	37.2	-26.9	0	40.78	-	-	74	-33.22	0-360	250	V

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

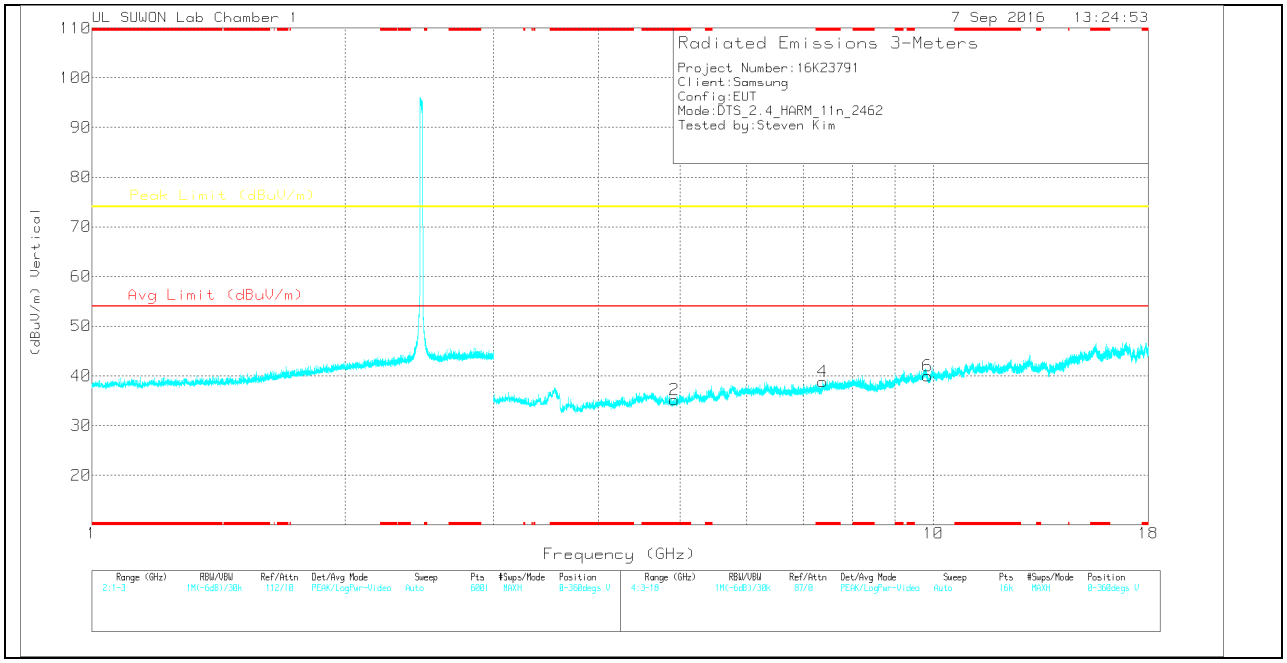
PK – Peak Detector

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

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	* 4.928	34.93	PK	34	-34	0	34.93	-	-	74	-39.07	0-360	150	H
3	* 7.385	33.18	PK	35.8	-30.7	0	38.28	-	-	74	-35.72	0-360	150	H
5	9.846	30.47	PK	37.3	-27.6	0	40.17	-	-	74	-33.83	0-360	150	H
2	* 4.925	35.16	PK	34	-34	0	35.16	-	-	74	-38.84	0-360	250	V
4	* 7.383	33.71	PK	35.8	-30.7	0	38.81	-	-	74	-35.19	0-360	150	V
6	9.847	30.33	PK	37.3	-27.6	0	40.03	-	-	74	-33.97	0-360	150	V

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

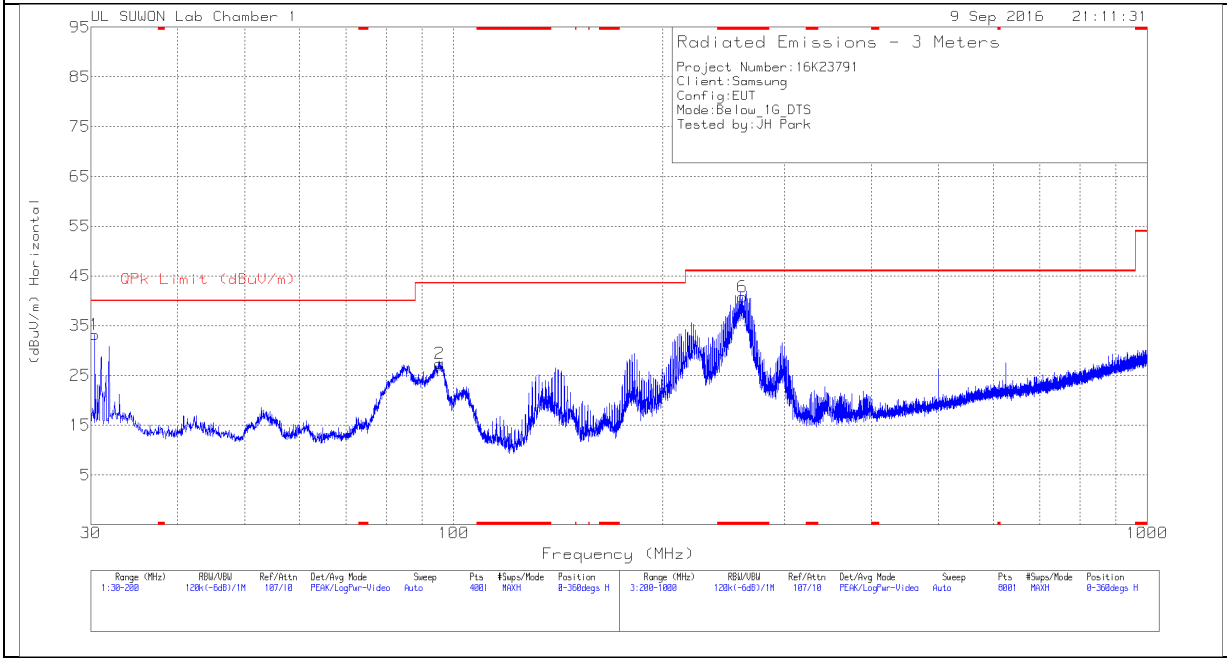
PK – Peak Detector

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

11.3. WORST-CASE BELOW 1 GHz

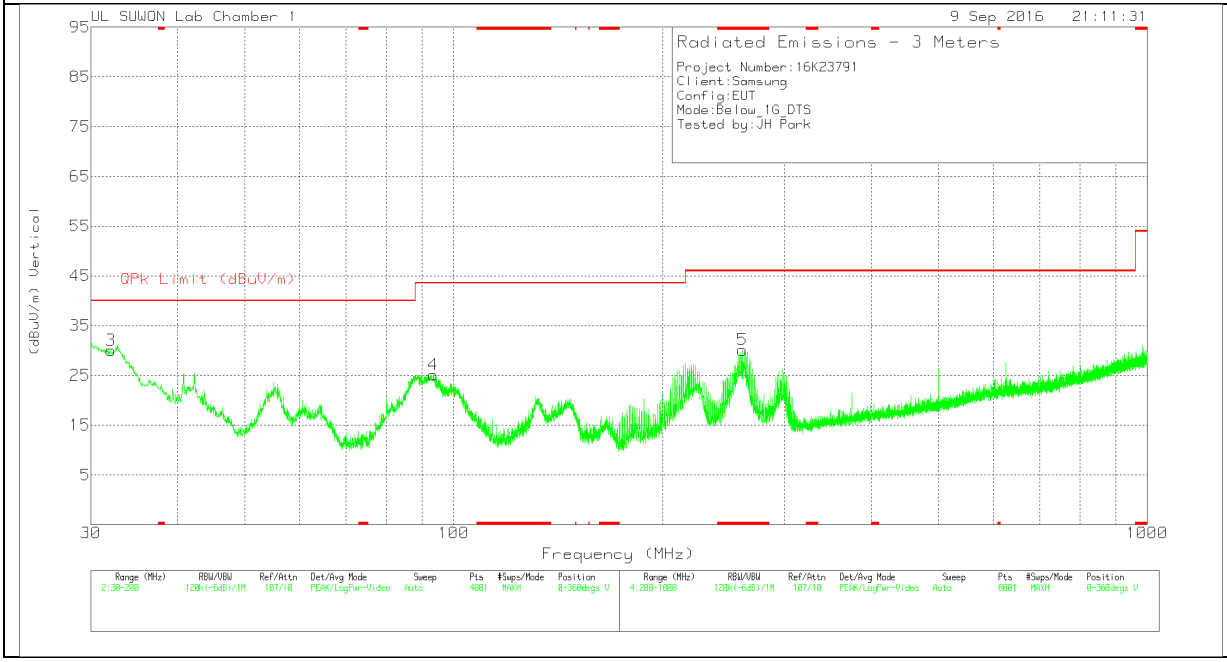
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



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	30.3825	53.38	Pk	10.3	-30.5	33.18	40	-6.82	0-360	100	H
2	95.535	46.14	Pk	10.6	-29.3	27.44	43.52	-16.08	0-360	300	H
3	32.0825	50.12	Pk	10.4	-30.5	30.02	40	-9.98	0-360	100	V
4	93.41	44.36	Pk	10.2	-29.4	25.16	43.52	-18.36	0-360	100	V
6	* 261	55.88	Pk	12.6	-27.7	40.78	46.02	-5.24	0-360	100	H
5	* 261	45.21	Pk	12.6	-27.7	30.11	46.02	-15.91	0-360	100	V

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

Pk - Peak detector

12. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
IC RSS-GEN Clause 8.8

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.

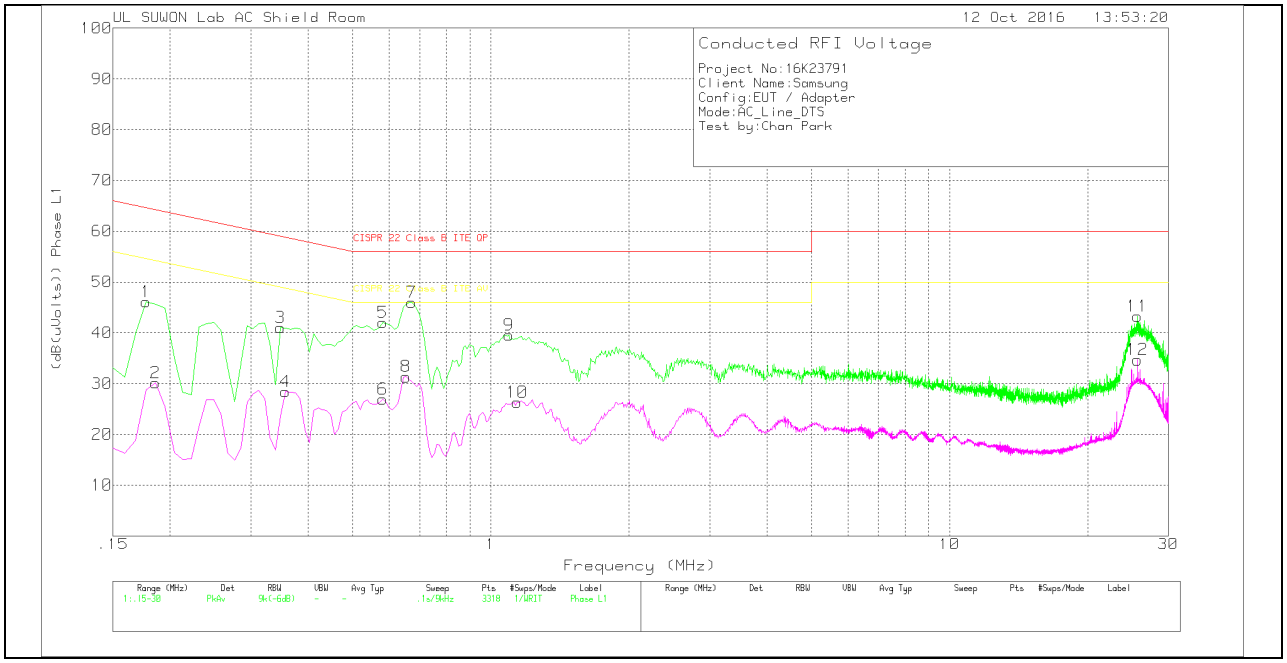
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

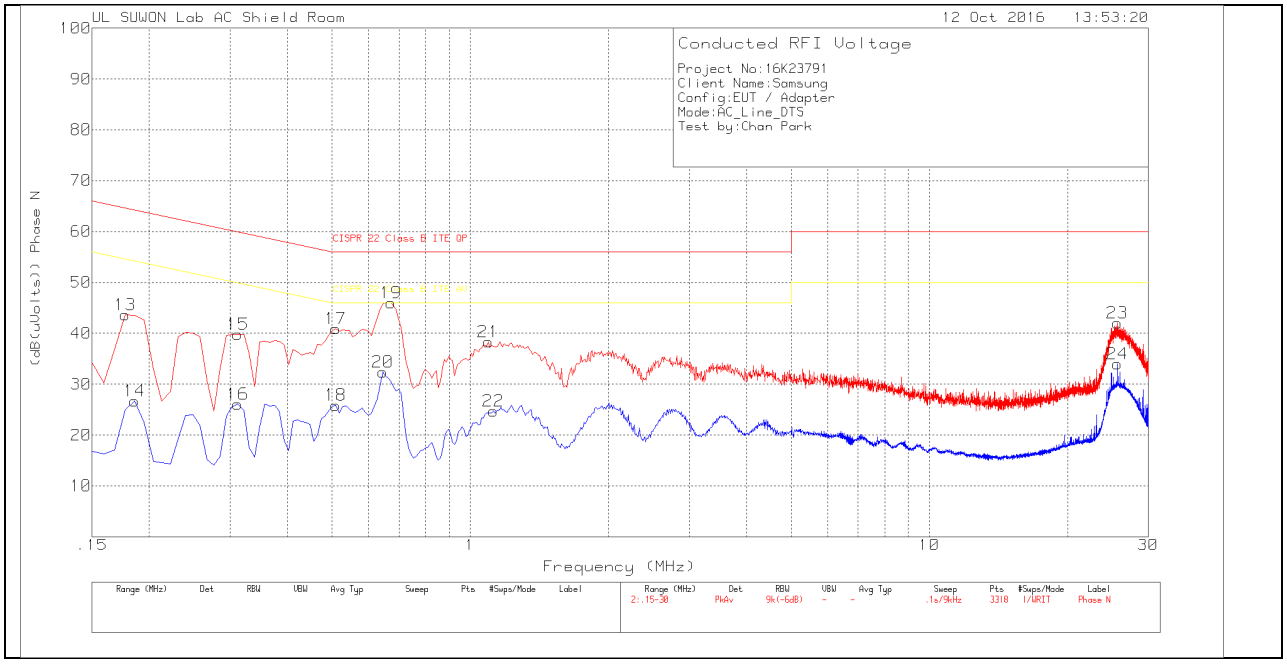
Phase L1 .15 - 30MHz

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	35.95	Pk	10.2	0	46.15	64.63	-18.48	-	-
2	.186	20.08	Av	10.1	0	30.18	-	-	54.21	-24.03
3	.348	30.9	Pk	10.1	0	41	59.01	-18.01	-	-
4	.357	18.28	Av	10.1	0	28.38	-	-	48.8	-20.42
5	.582	31.96	Pk	10.1	0	42.06	56	-13.94	-	-
6	.582	16.87	Av	10.1	0	26.97	-	-	46	-19.03
7	.672	35.91	Pk	10.1	0	46.01	56	-9.99	-	-
8	.654	21.23	Av	10.1	0	31.33	-	-	46	-14.67
9	1.095	29.69	Pk	9.9	0	39.59	56	-16.41	-	-
10	1.14	16.38	Av	9.9	0	26.28	-	-	46	-19.72
11	25.692	32.4	Pk	10.6	.3	43.3	60	-16.7	-	-
12	25.692	23.77	Av	10.6	.3	34.67	-	-	50	-15.33

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	.177	33.5	Pk	10.1	0	43.6	64.63	-21.03	-	-
14	.186	16.69	Av	10	0	26.69	-	-	54.21	-27.52
15	.312	29.9	Pk	9.9	0	39.8	59.92	-20.12	-	-
16	.312	16.17	Av	9.9	0	26.07	-	-	49.92	-23.85
17	.51	30.77	Pk	10.1	0	40.87	56	-15.13	-	-
18	.51	15.78	Av	10.1	0	25.88	-	-	46	-20.12
19	.672	36.02	Pk	10	0	46.02	56	-9.98	-	-
20	.645	22.38	Av	10	0	32.38	-	-	46	-13.62
21	1.095	28.44	Pk	9.9	0	38.34	56	-17.66	-	-
22	1.122	14.92	Av	9.8	0	24.72	-	-	46	-21.28
23	25.692	30.92	Pk	10.8	.3	42.02	60	-17.98	-	-
24	25.692	22.91	Av	10.8	.3	34.01	-	-	50	-15.99

Pk - Peak detector

Av - Average detection

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