FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

Bluetooth, DTS b/g/n Tablet

MODEL NUMBER : SM-T5610

FCC ID: A3LSMT560

REPORT NUMBER: 15K20423-E1

ISSUE DATE: APRIL 24, 2015

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 443-742, KOREA

Prepared by
UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-823, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/24/15	Initial issue	CY Choi

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	Bluetooth and DTS b/g/n Tablet
MODEL NUMBER:	SM-T560
SERIAL NUMBER:	R32G301WP2N (RADIATED); R32G301WPDV (CONDUCTED)
DATE TESTED:	MARCH 11 - APRIL 20, 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:

Ji Ho Choi
Suwon Lab Manager
UL Korea, Ltd.

Tested By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, 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, 443-823, 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%.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth and DTS b/g/n Tablet.
This test report addresses the DTS (WLAN) operational mode.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	15.60	36.31
2412 - 2462	802.11g	14.30	26.92
2412 - 2462	802.11n HT20	13.10	20.42

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a maximum gain of -0.19 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA12EWE	N/A	N/A
Data Cable	SAMSUNG	ECB-DU68WC	N/A	N/A
Earphone	SAMSUNG	GH59-11129H	N/A	N/A

I/O CABLES

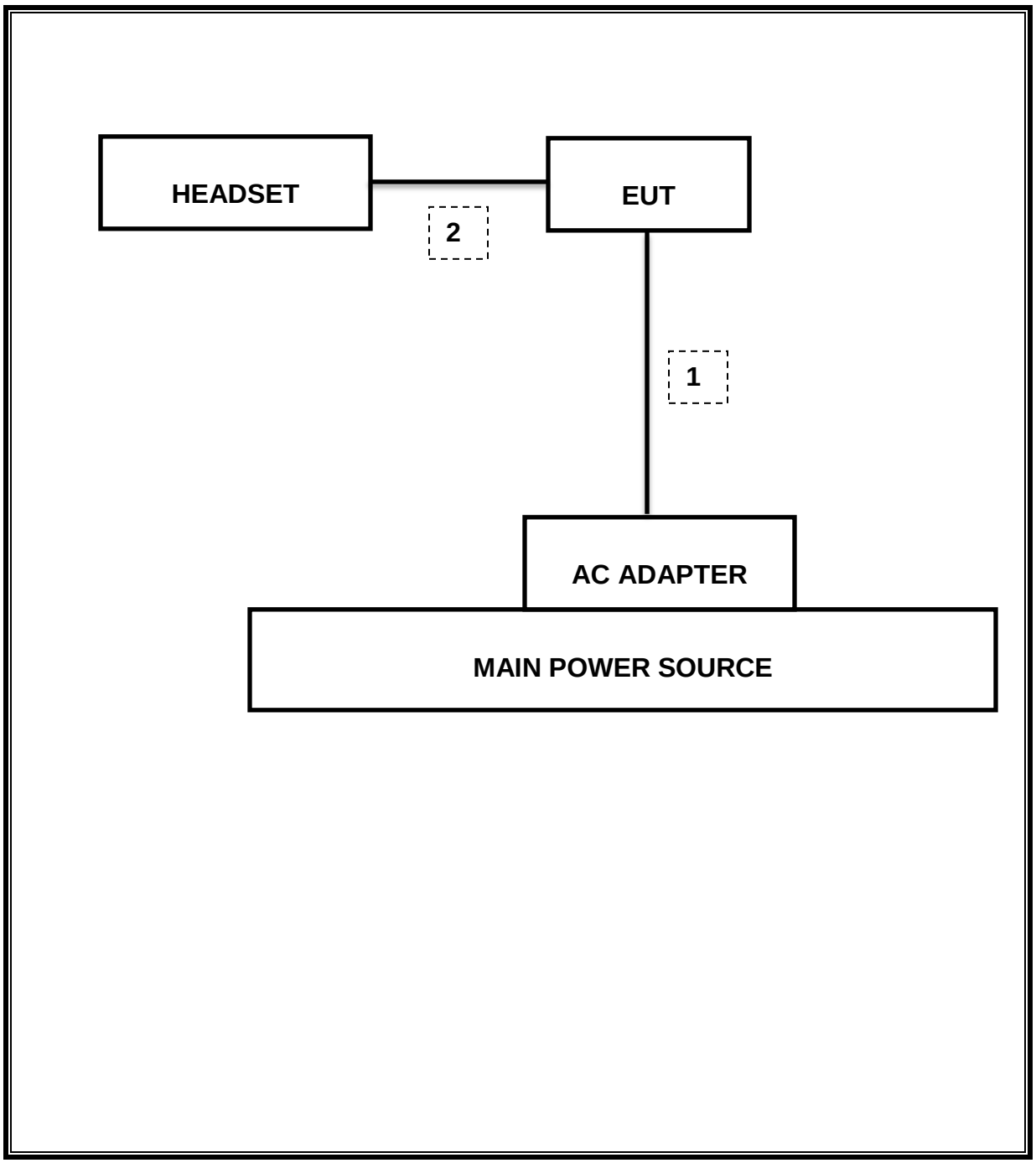
I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

TEST SETUP

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

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

SETUP DIAGRAM FOR TESTS



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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	950	11-17-15
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
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	11-17-15
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	11-18-15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	09-23-15
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	11-17-15
Average Power Sensor	R&S	NRZ-Z91	102681	11-17-15
Average Power Sensor	Agilent / HP	U2000	MY54270007	09-23-15
EMI Test Receive, 40 GHz	R&S	ESU40	100439	11-17-15
EMI Test Receive, 3 GHz	R&S	ESR3	101832	11-17-15
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	11-17-15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	11-17-15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	11-17-15

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r02: Measurement Procedure AVGPM-G is used for power and AVGPSD-3 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.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

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	8.381	8.453	0.991	99.1%	0.00	0.010
802.11g	1.390	1.446	0.961	96.1%	0.17	0.719
802.11n HT20	1.169	1.247	0.937	93.7%	0.28	0.855

9. SUMMARY TABLE

The FCC ID: A3LSMT560 shares the same enclosure and circuit board as FCC ID: A3LSMT561Y. The WLAN circuitry and layout, including antennas, are almost identical between the two units. The WLAN antennas and surrounding circuitry are the same between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMT560 remains representative of FCC ID: A3LSMT561Y, test data for FCC ID: A3LSMT561Y is being submitted for this application to cover WLAN features.

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	9.984 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-29.914 dBm
15.247	TX conducted output power	<30dBm		Pass	15.60 dBm
15.247	PSD	<8dBm		Pass	-15.43 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	40.86 dBuV (AV)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	42.4 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 v03r02: 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	9.994	0.5
Mid	2437	9.984	0.5
High	2462	10.011	0.5
Worst		9.984	

10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.316	0.5
Mid	2437	15.753	0.5
High	2462	15.628	0.5
Worst		15.316	

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	15.448	0.5
Mid	2437	15.120	0.5
High	2462	15.616	0.5
Worst		15.120	

10.1.4. 6 dB BANDWIDTH PLOTS

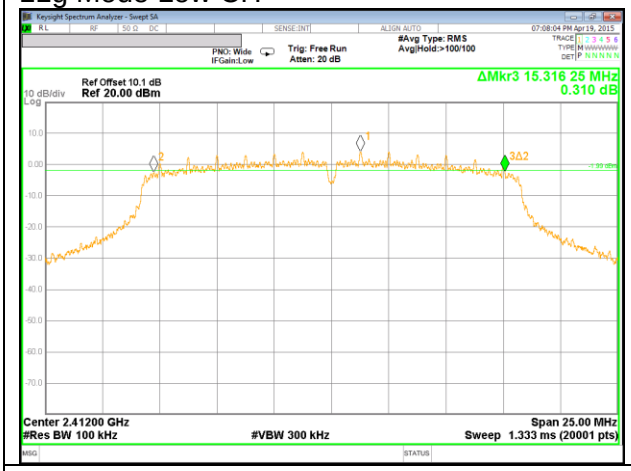
11b Mode Low CH

11b Mode Middle CH

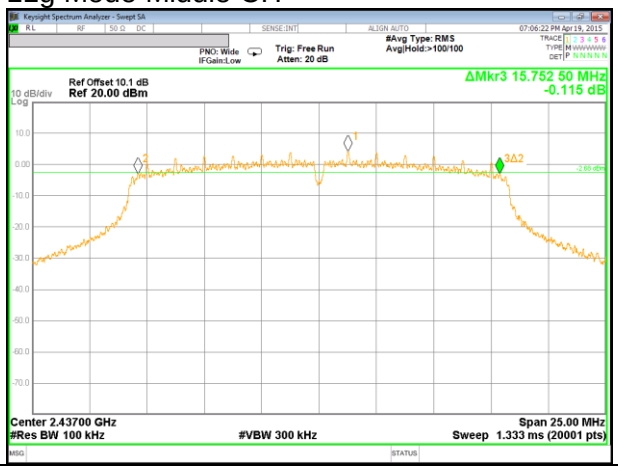
11b Mode High CH

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

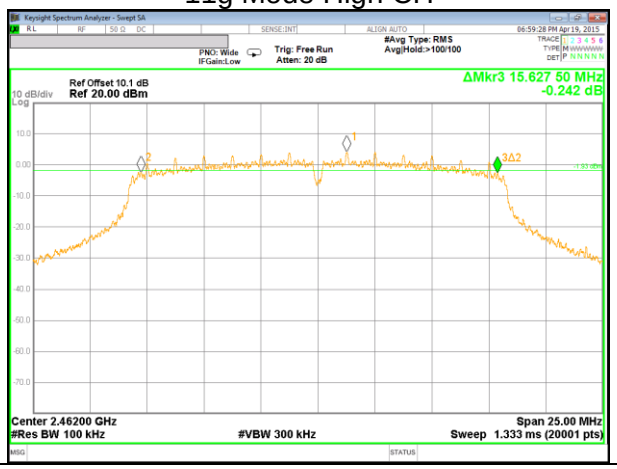
11g Mode Low CH



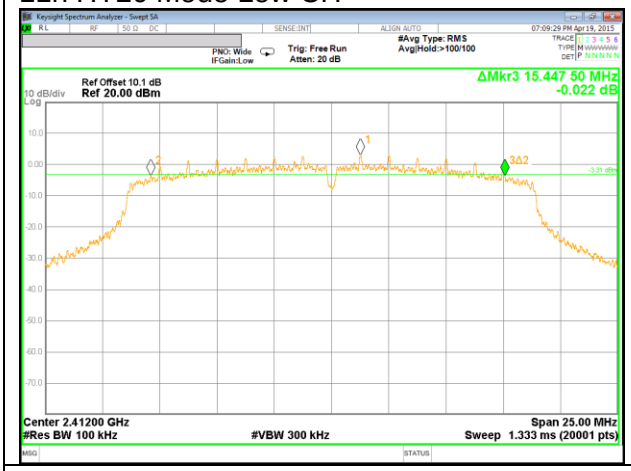
11g Mode Middle CH



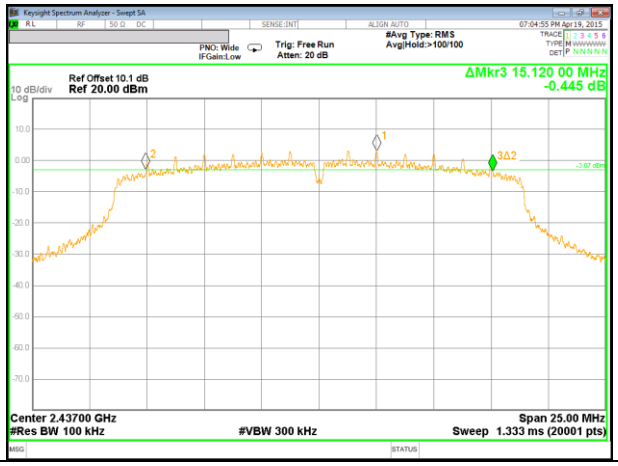
11g Mode High CH



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	14.073
Mid	2437	14.130
High	2462	14.231
Worst		14.231

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

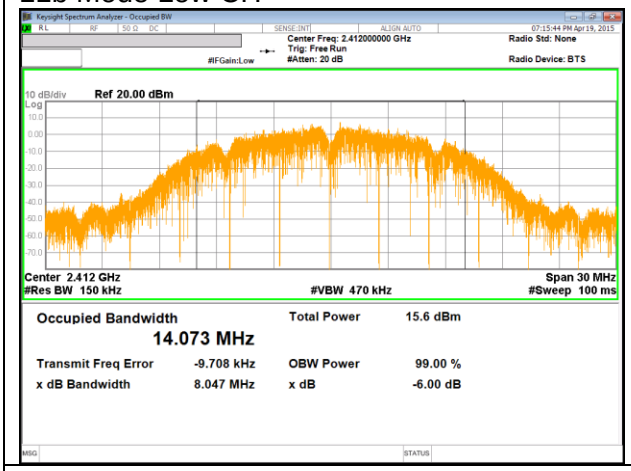
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.254
Mid	2437	16.301
High	2462	16.296
Worst		16.301

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

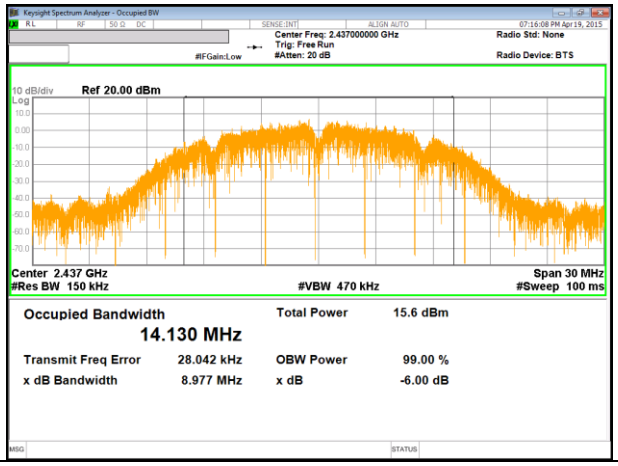
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.494
Mid	2437	17.427
High	2462	17.486
Worst		17.494

10.2.4. 99% BANDWIDTH PLOTS

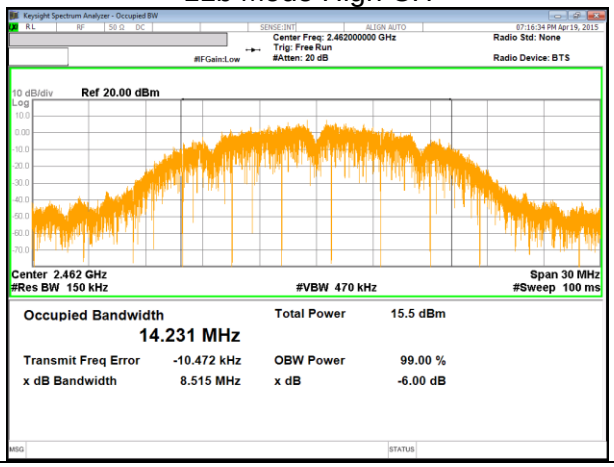
11b Mode Low CH



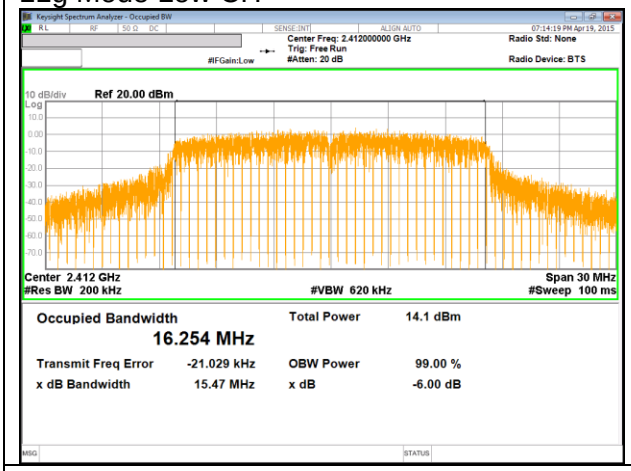
11b Mode Middle CH



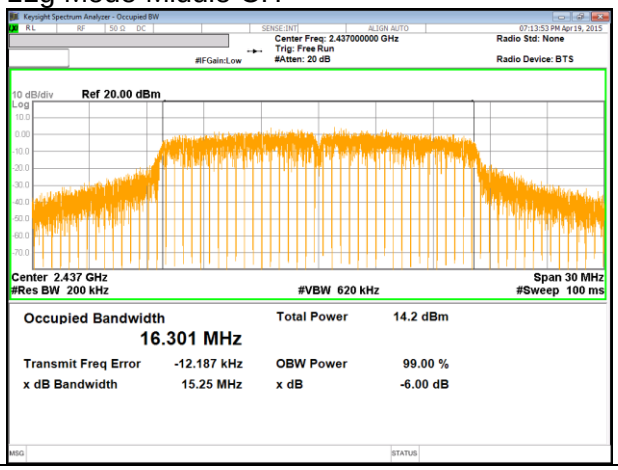
11b Mode High CH



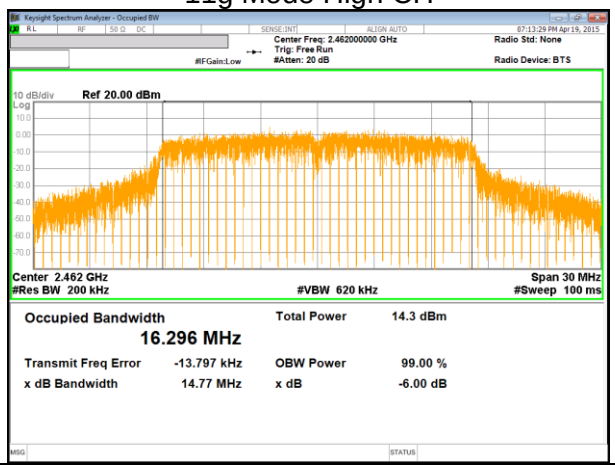
11g Mode Low CH



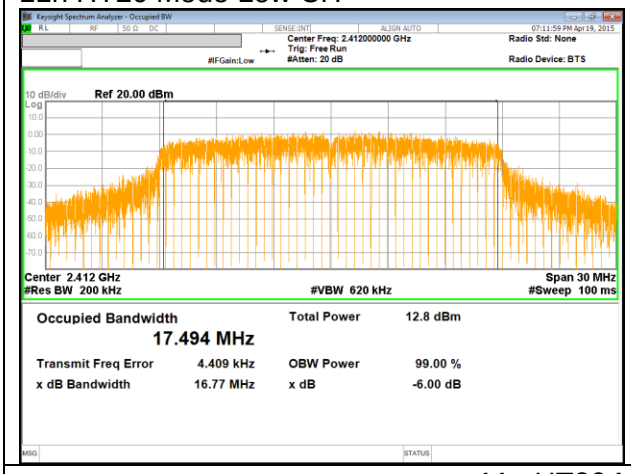
11g Mode Middle CH



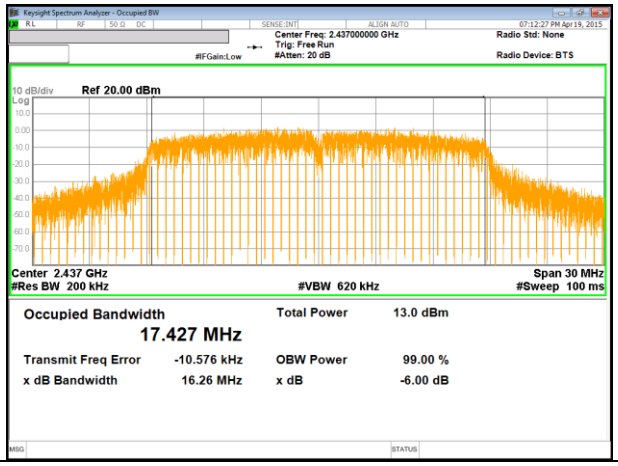
11g Mode High CH



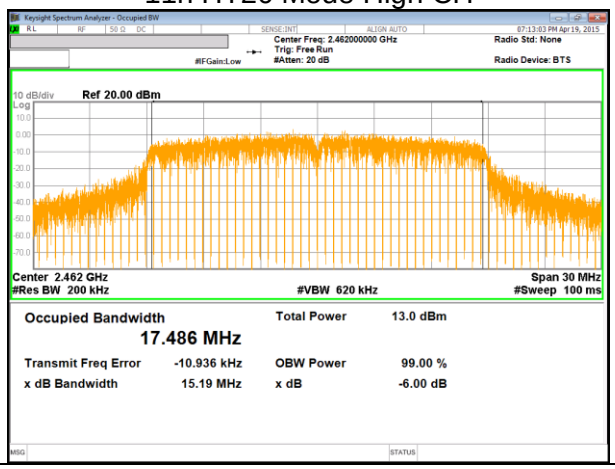
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



10.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 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

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	15.50
Mid	2437	15.50
High	2462	15.60
Worst		15.60

10.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	14.20
Mid	2437	14.20
High	2462	14.30
Worst		14.30

10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	2412	12.90
Mid	2437	13.10
High	2462	13.10
Worst		13.10

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.4. 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.

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.35	30.00	30.00	36.00	30.00
Mid	2437	-0.27	30.00	30.00	36.00	30.00
High	2462	-0.61	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	15.50	15.50	30.00	-14.50
Mid	2437	15.50	15.50	30.00	-14.50
High	2462	15.60	15.60	30.00	-14.40
Worst			15.60		

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.35	30.00	30.00	36.00	30.00
Mid	2437	-0.27	30.00	30.00	36.00	30.00
High	2462	-0.61	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	14.20	14.20	30.00	-15.80
Mid	2437	14.20	14.20	30.00	-15.80
High	2462	14.30	14.30	30.00	-15.70
Worst			14.30		

10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412	-2.35	30.00	30.00	36.00	30.00
Mid	2437	-0.27	30.00	30.00	36.00	30.00
High	2462	-0.61	30.00	30.00	36.00	30.00

Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412	12.90	12.90	30.00	-17.10
Mid	2437	13.10	13.10	30.00	-16.90
High	2462	13.10	13.10	30.00	-16.90
Worst			13.10		

10.5. 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.

RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-16.08	8.00	-24.08
Mid	2437	-15.66	8.00	-23.66
High	2462	-15.43	8.00	-23.43

10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-19.35	8.00	-27.35
Mid	2437	-19.04	8.00	-27.04
High	2462	-19.58	8.00	-27.58

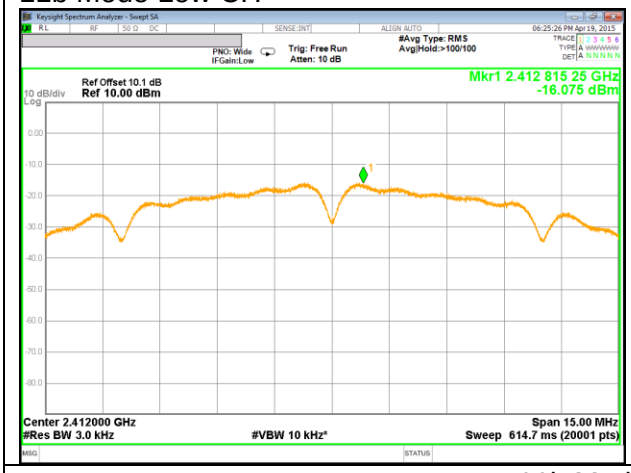
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

PSD Results

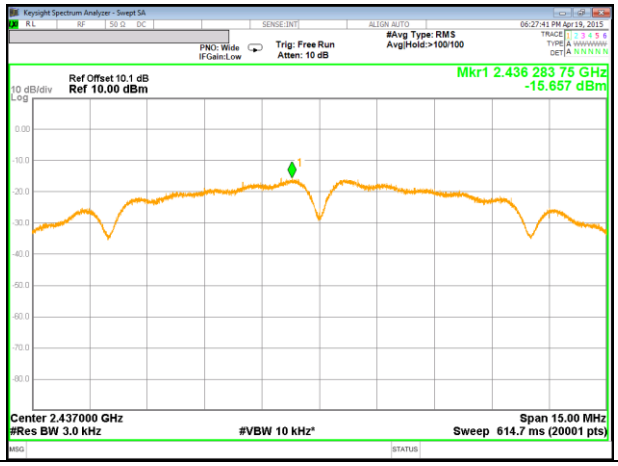
Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-20.45	8.00	-28.45
Mid	2437	-20.32	8.00	-28.32
High	2462	-20.33	8.00	-28.33

10.5.4. PSD PLOTS

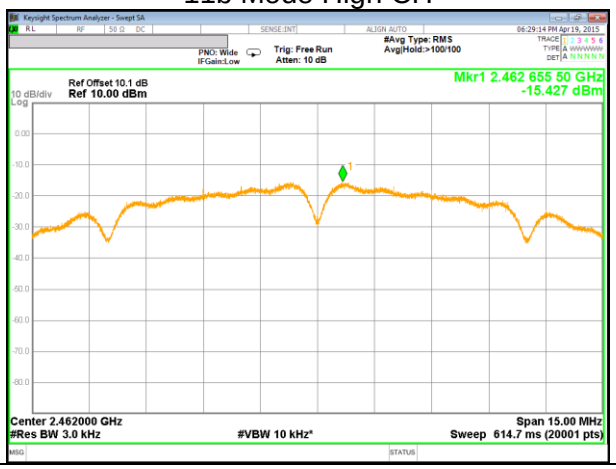
11b Mode Low CH



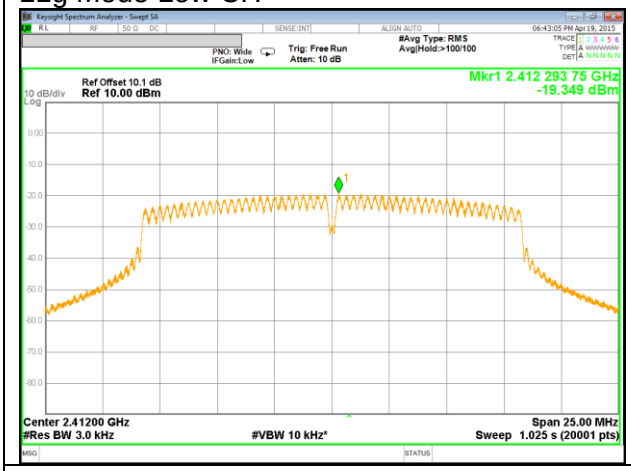
11b Mode Middle CH



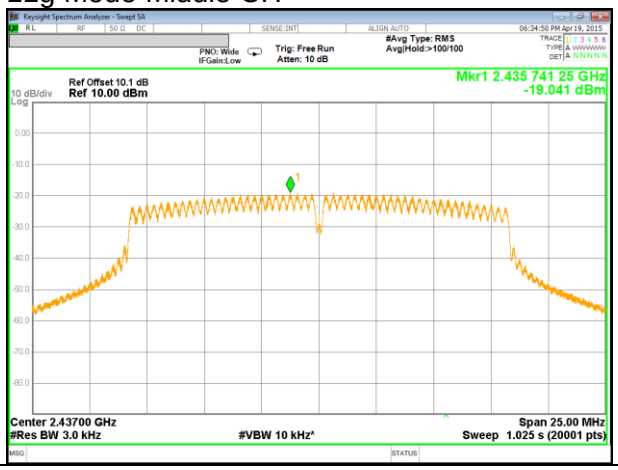
11b Mode High CH



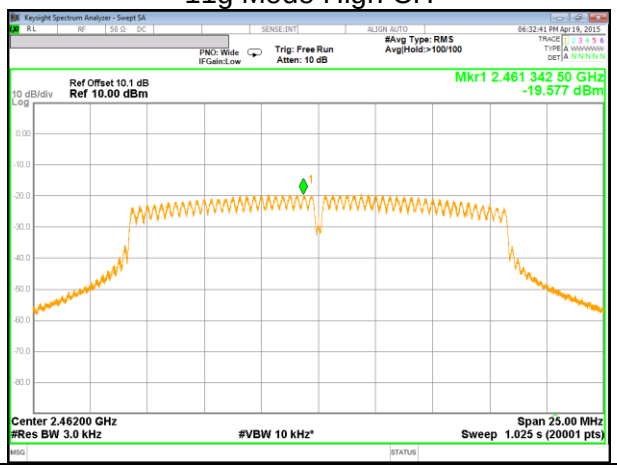
11g Mode Low CH



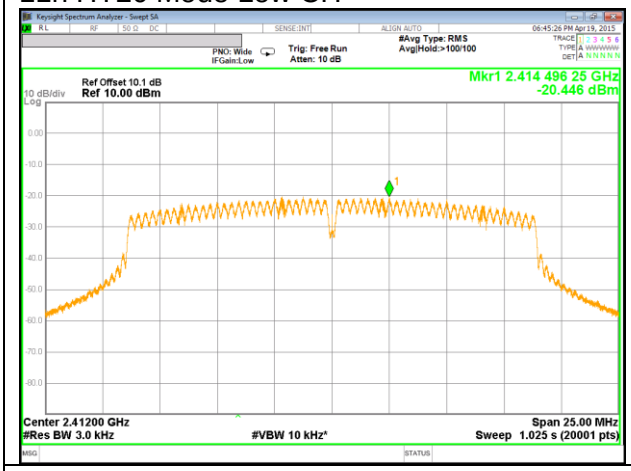
11g Mode Middle CH



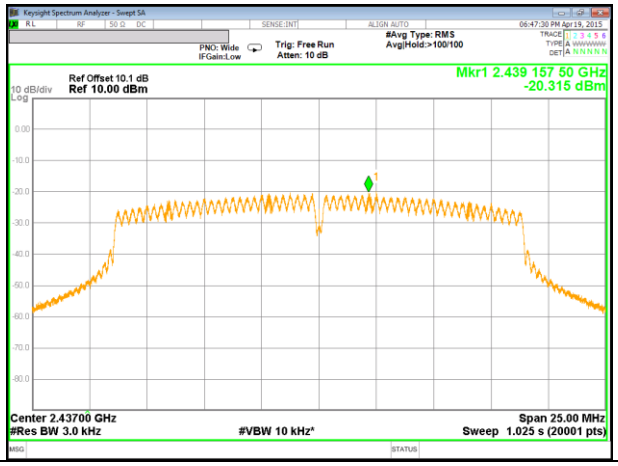
11g Mode High CH



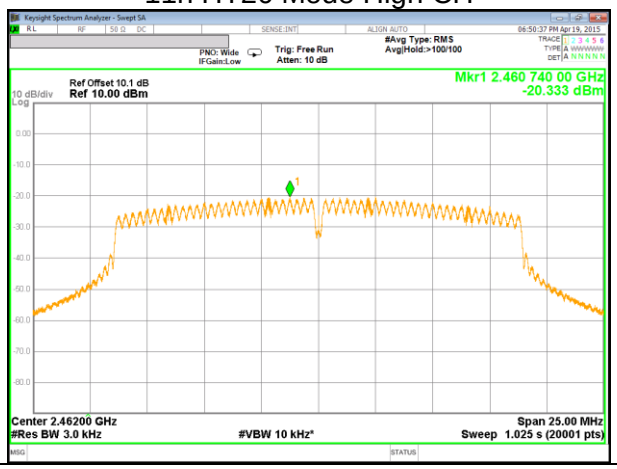
11n HT20 Mode Low CH



11n HT20 Mode Middle CH



11n HT20 Mode High CH



10.6. 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.

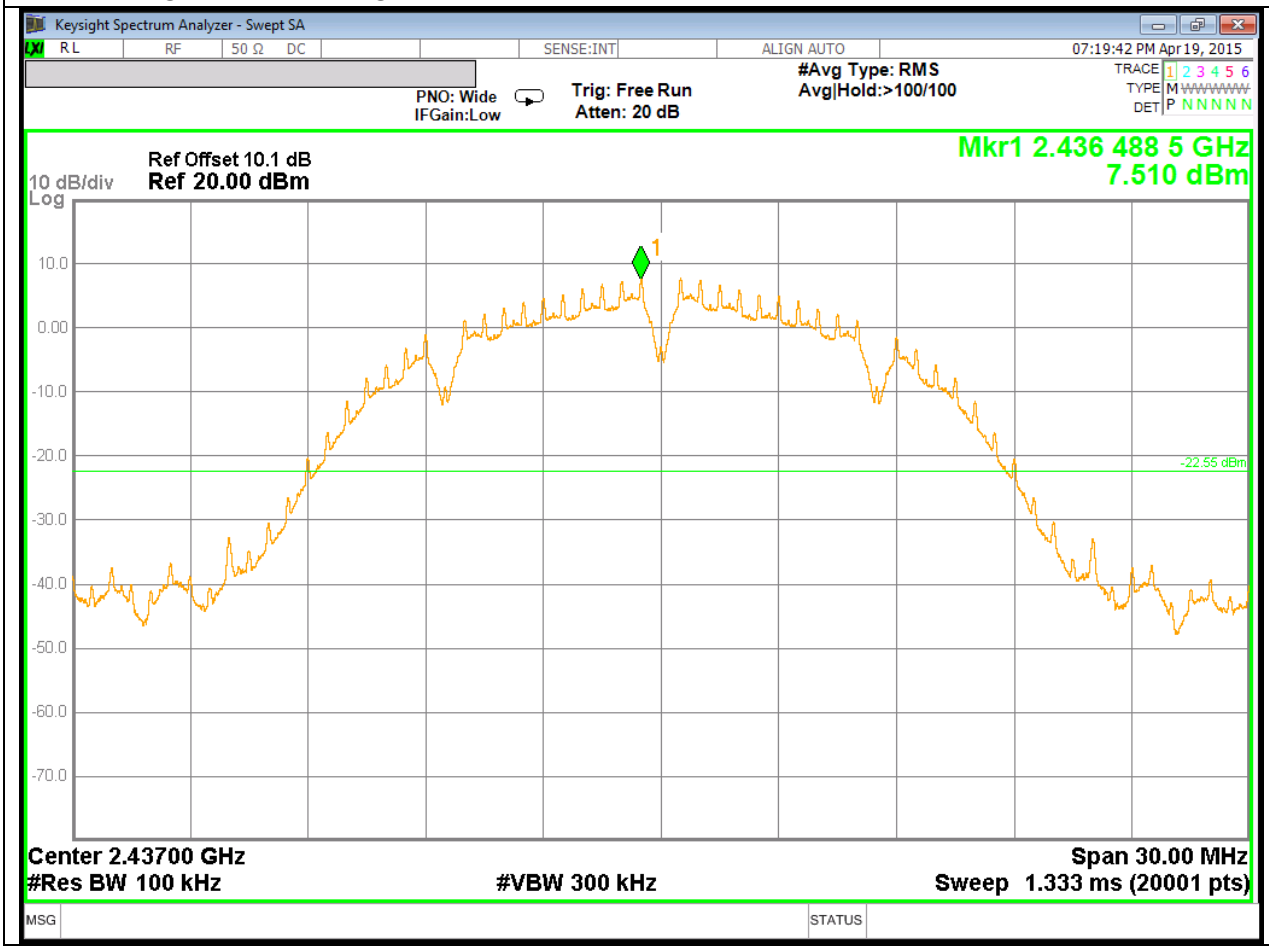
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

RESULTS

10.6.1. 802.11b MODE IN THE 2.4 GHz BAND

IN-BAND REFERENCE LEVEL

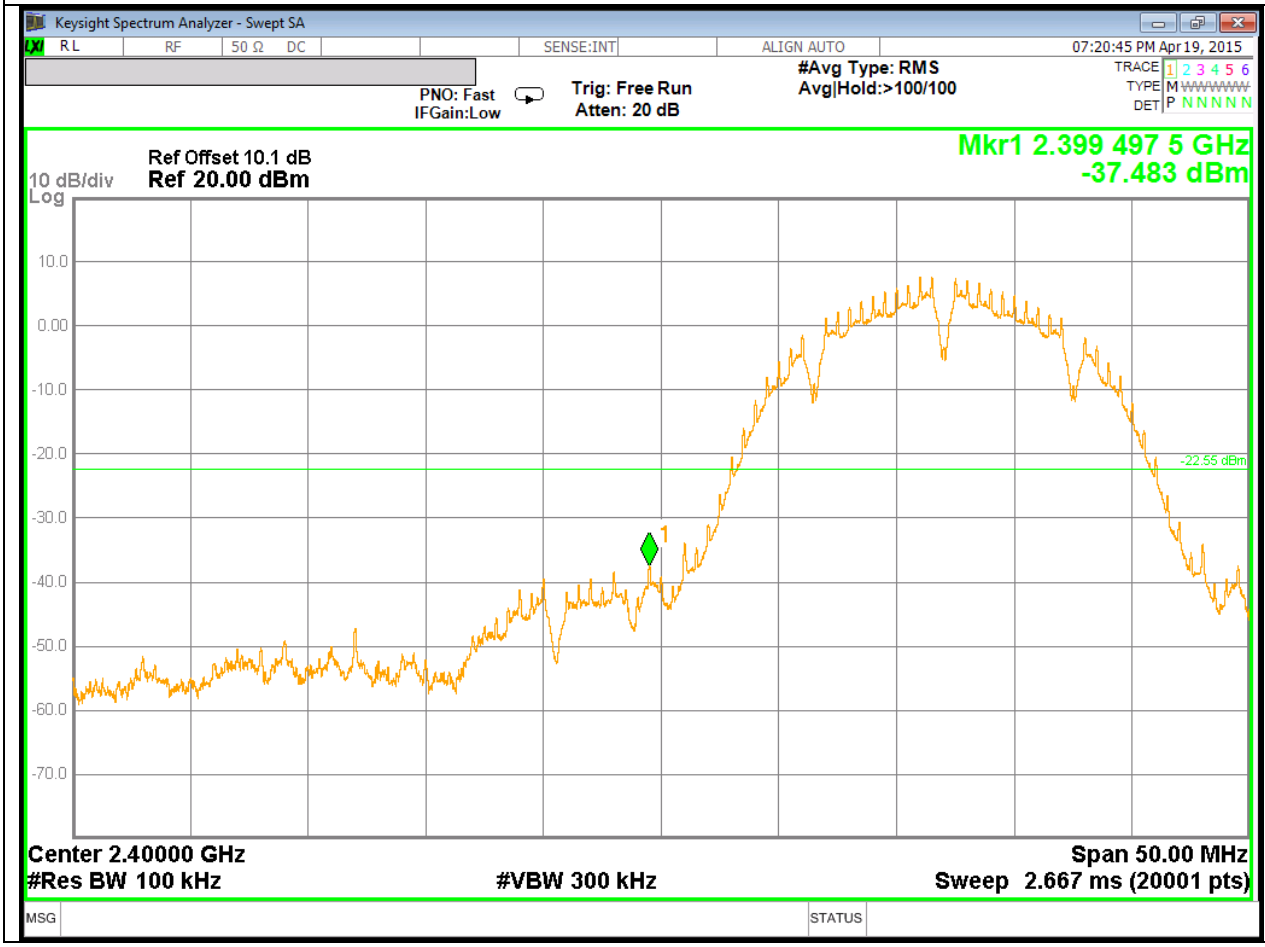
REFERENCE LEVEL MID CH



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH

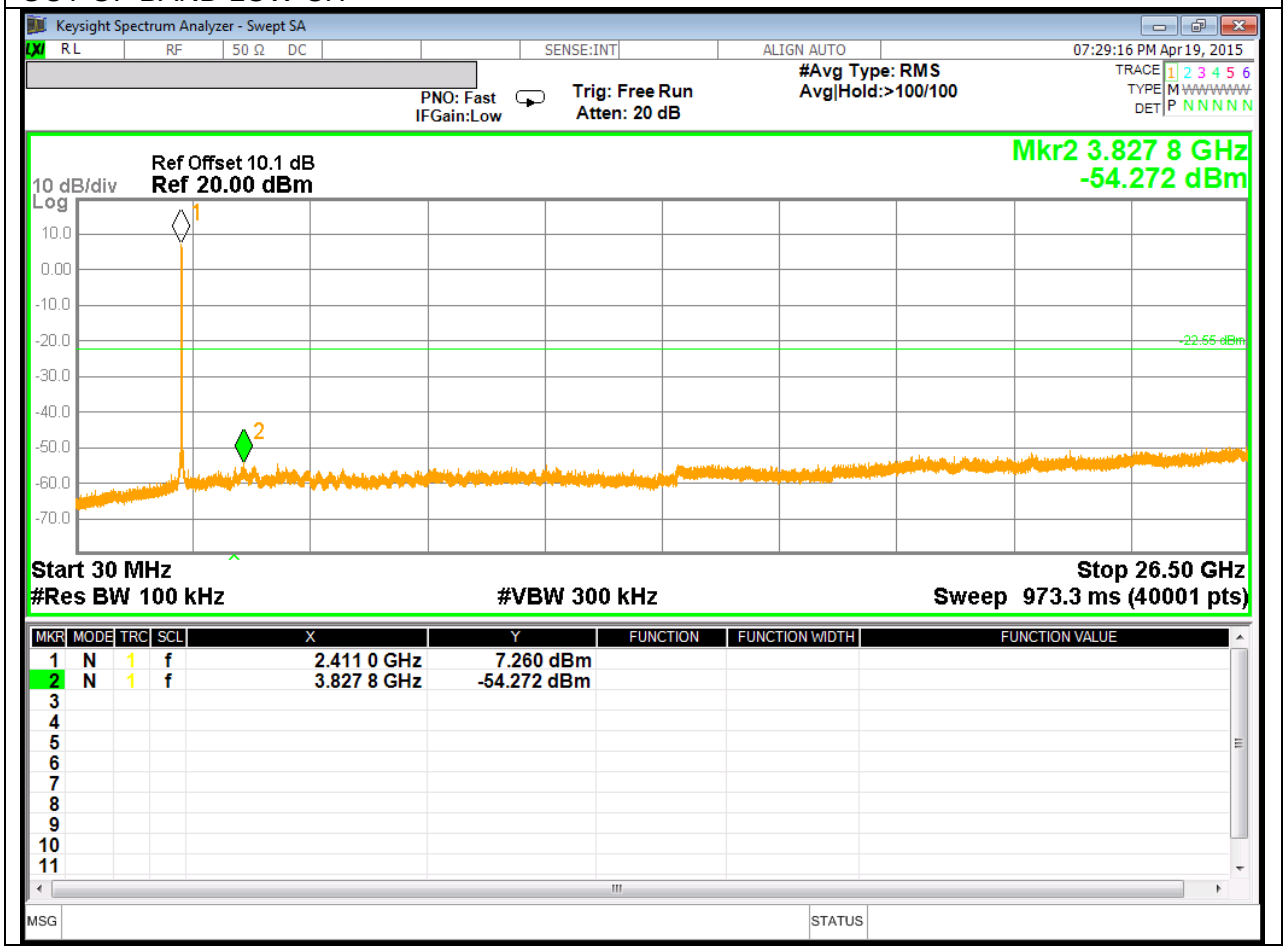


HIGH CHANNEL BANDEDGE

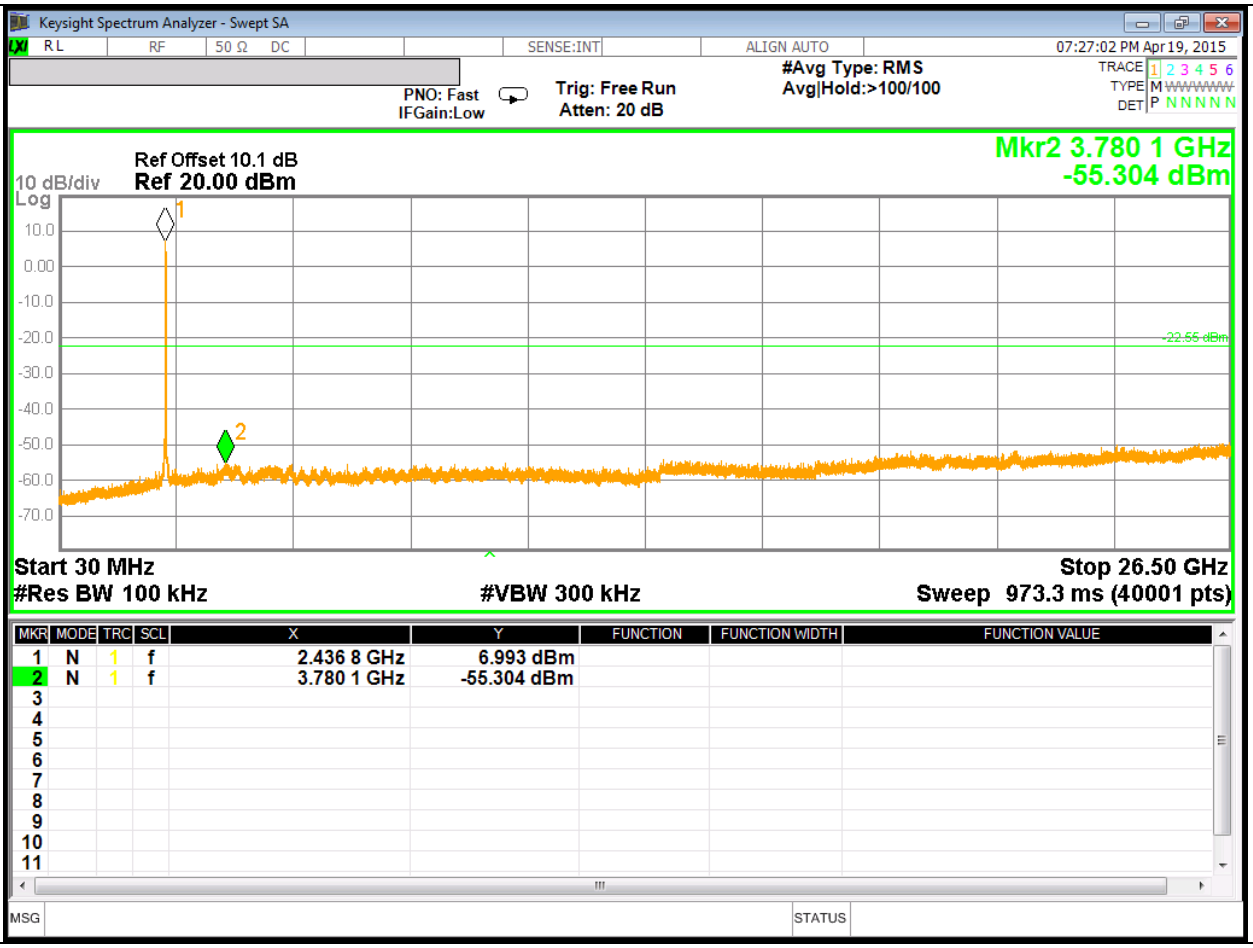
AUTHORIZED BAND EDGE HIGH CH

OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH

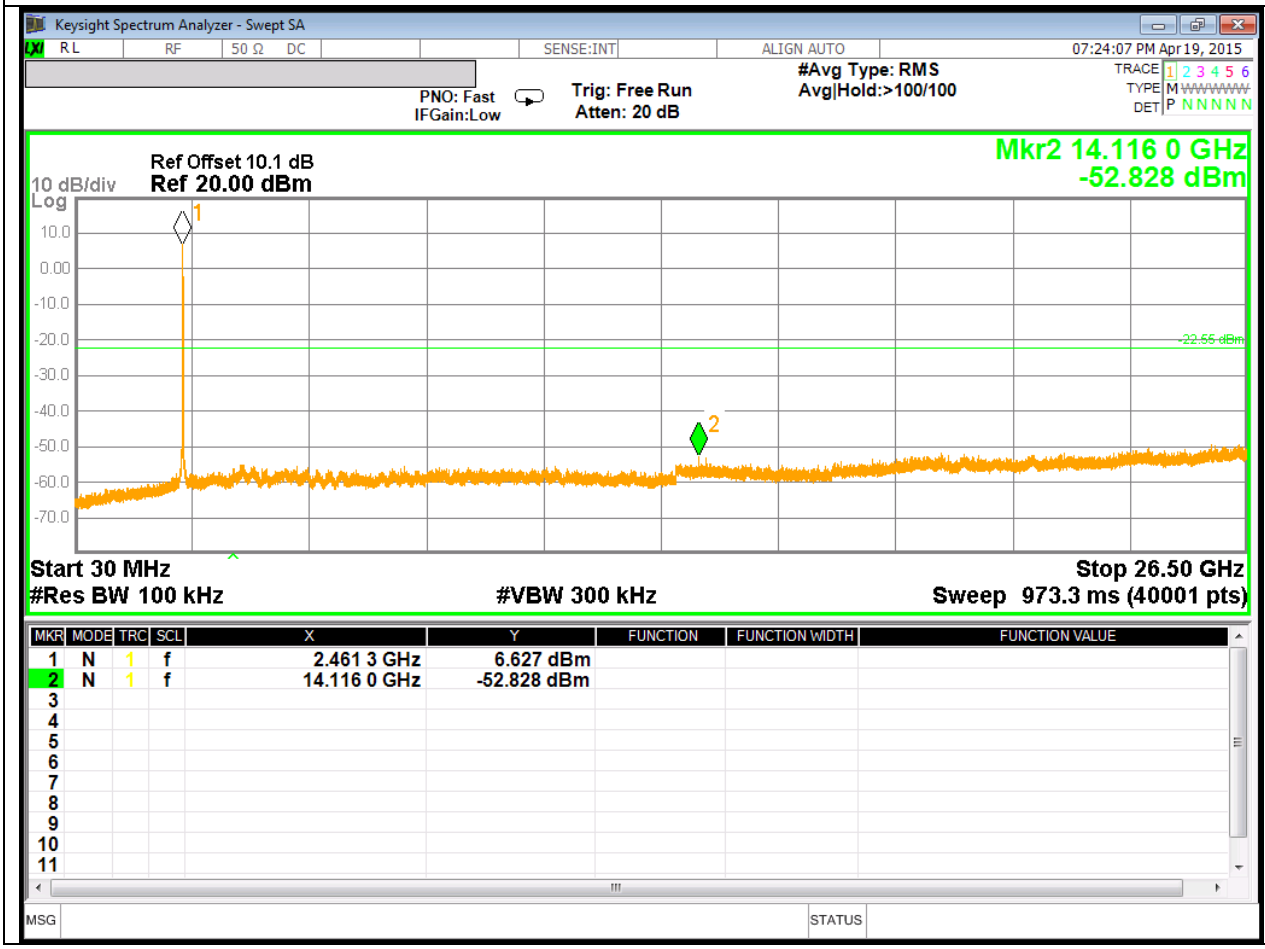


OUT OF BAND MID CH



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

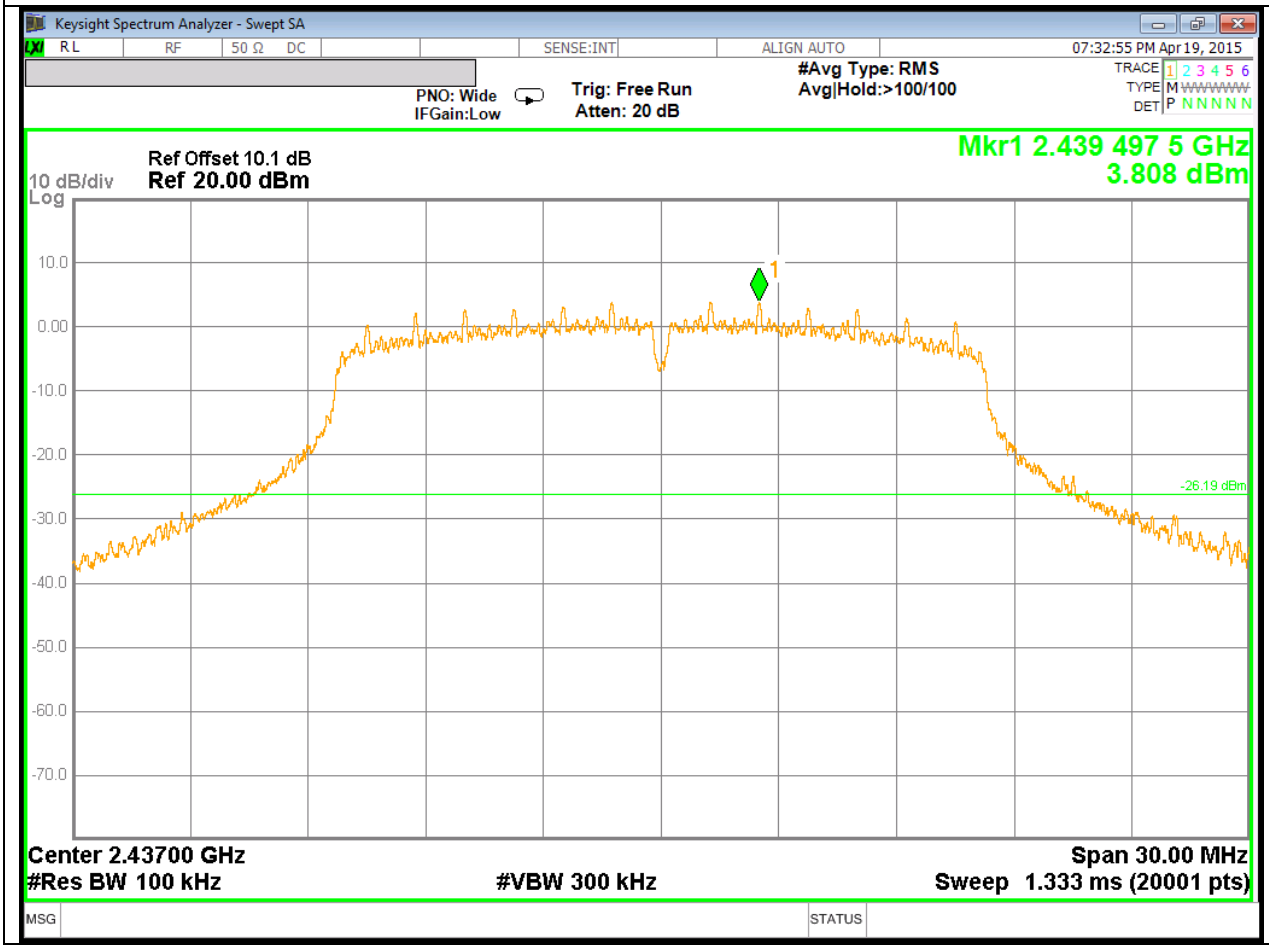
OUT OF BAND HIGH CH



10.6.2. 802.11g MODE IN THE 2.4 GHz BAND

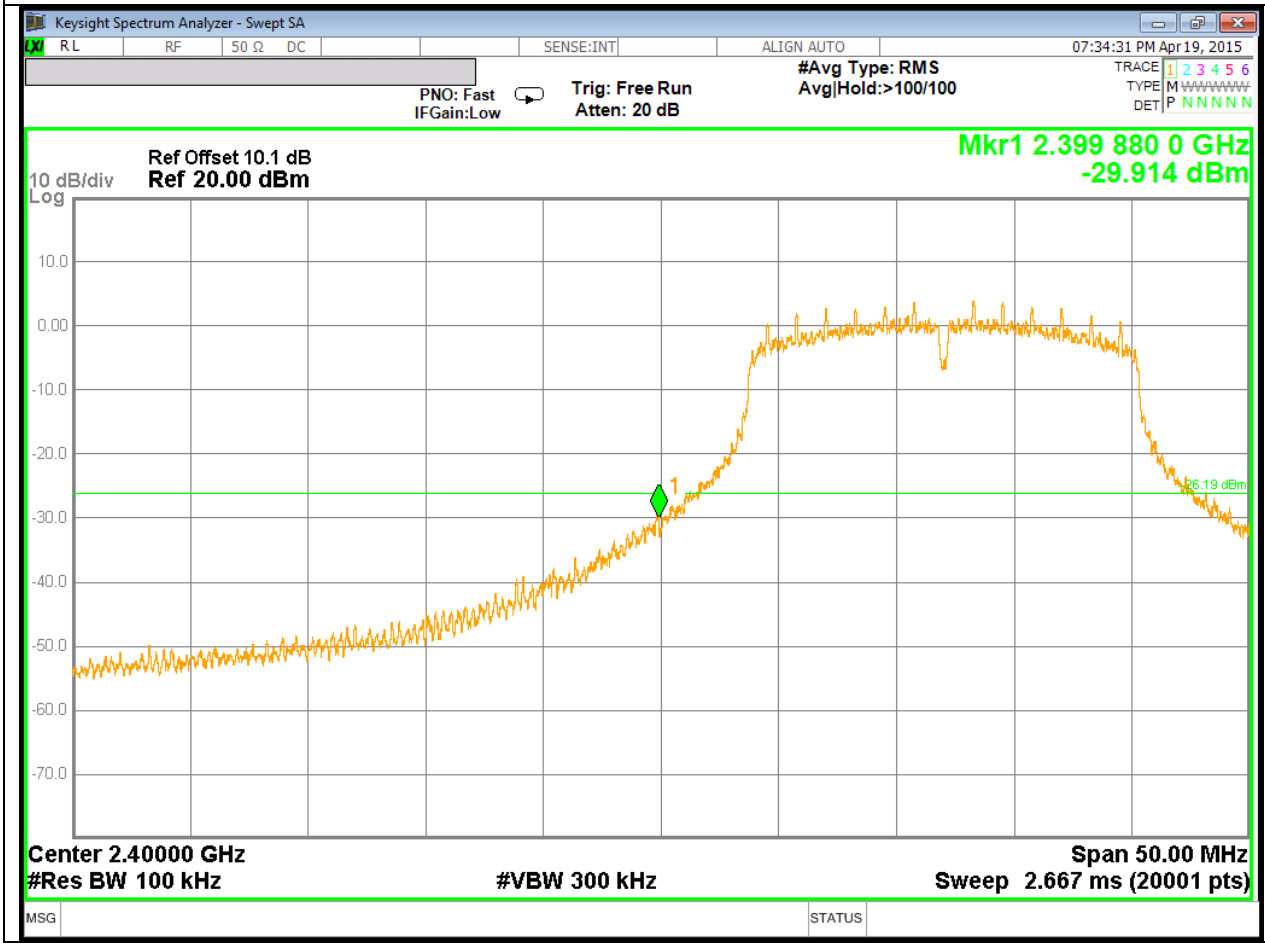
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



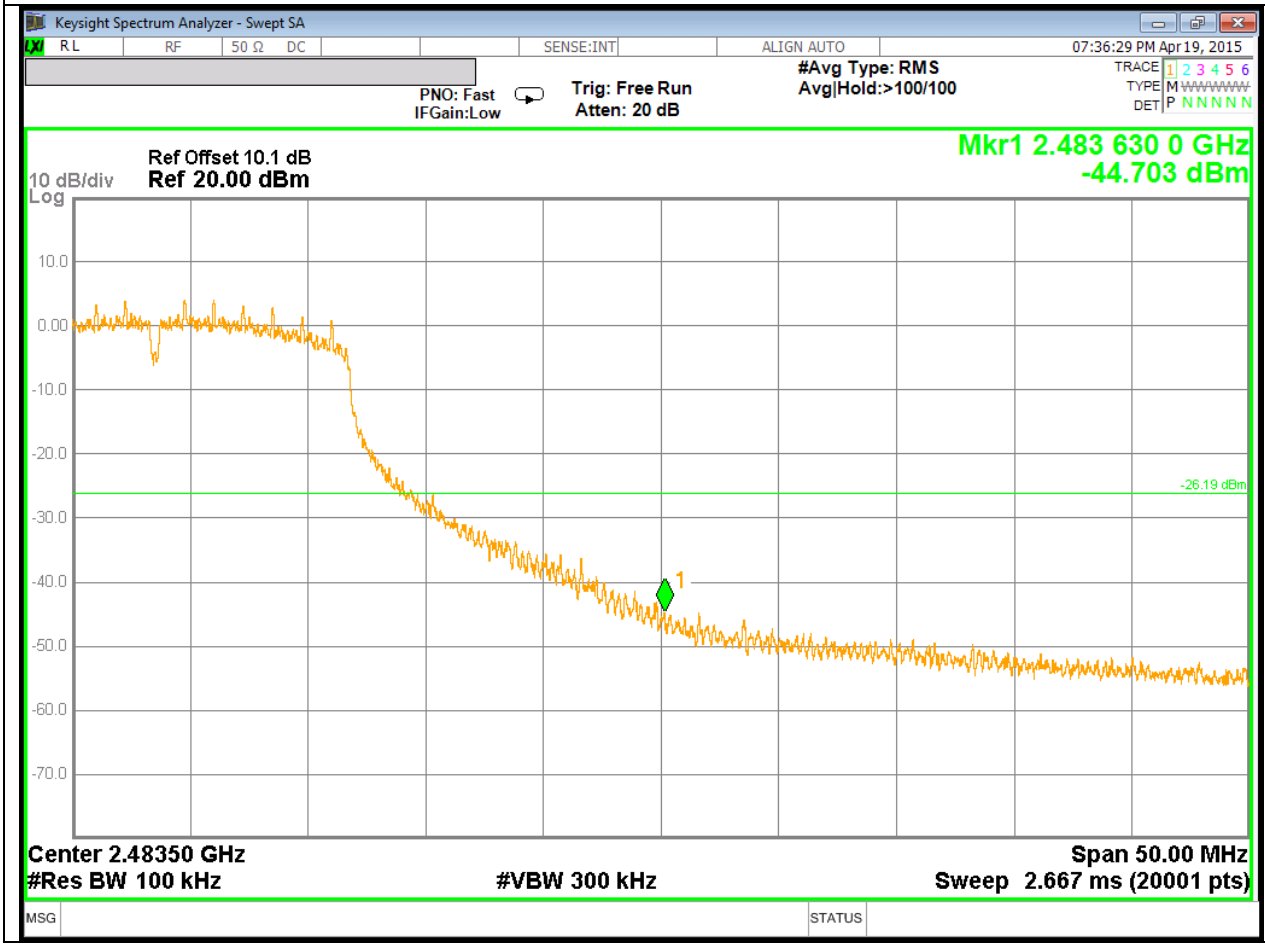
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



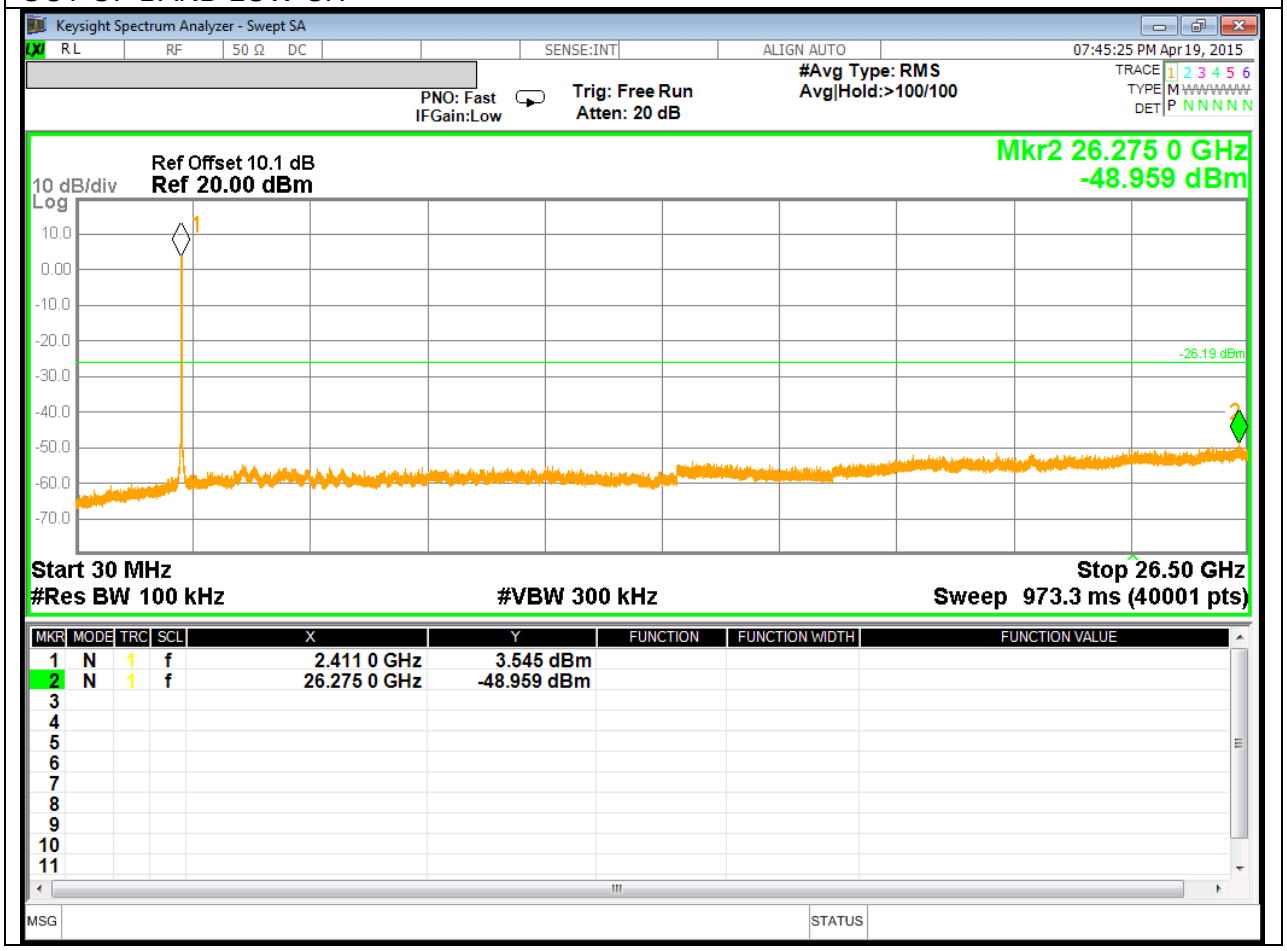
HIGH CHANNEL BANDEDGE

AUTHORIZED BAND EDGE HIGH CH

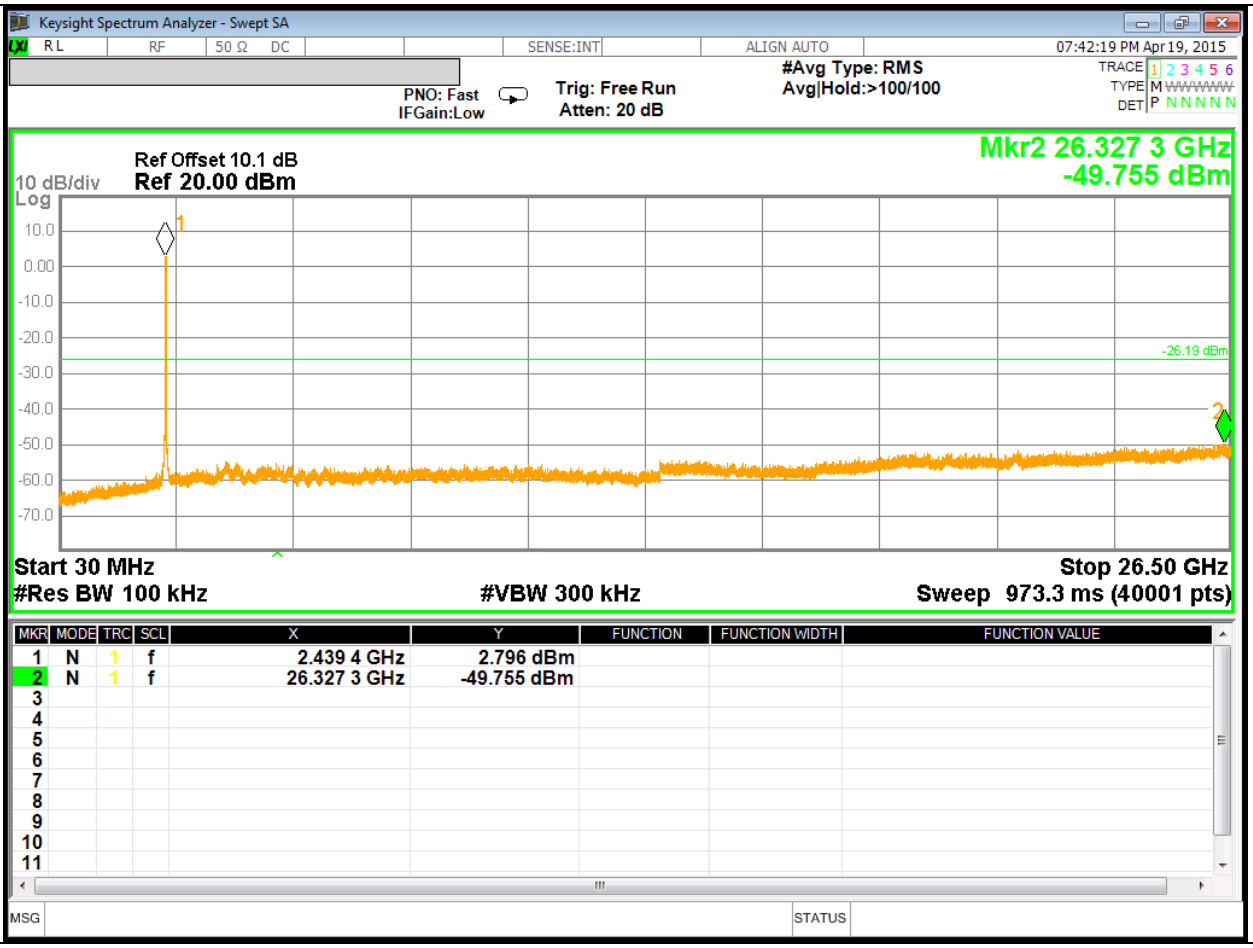


OUT-OF-BAND EMISSIONS

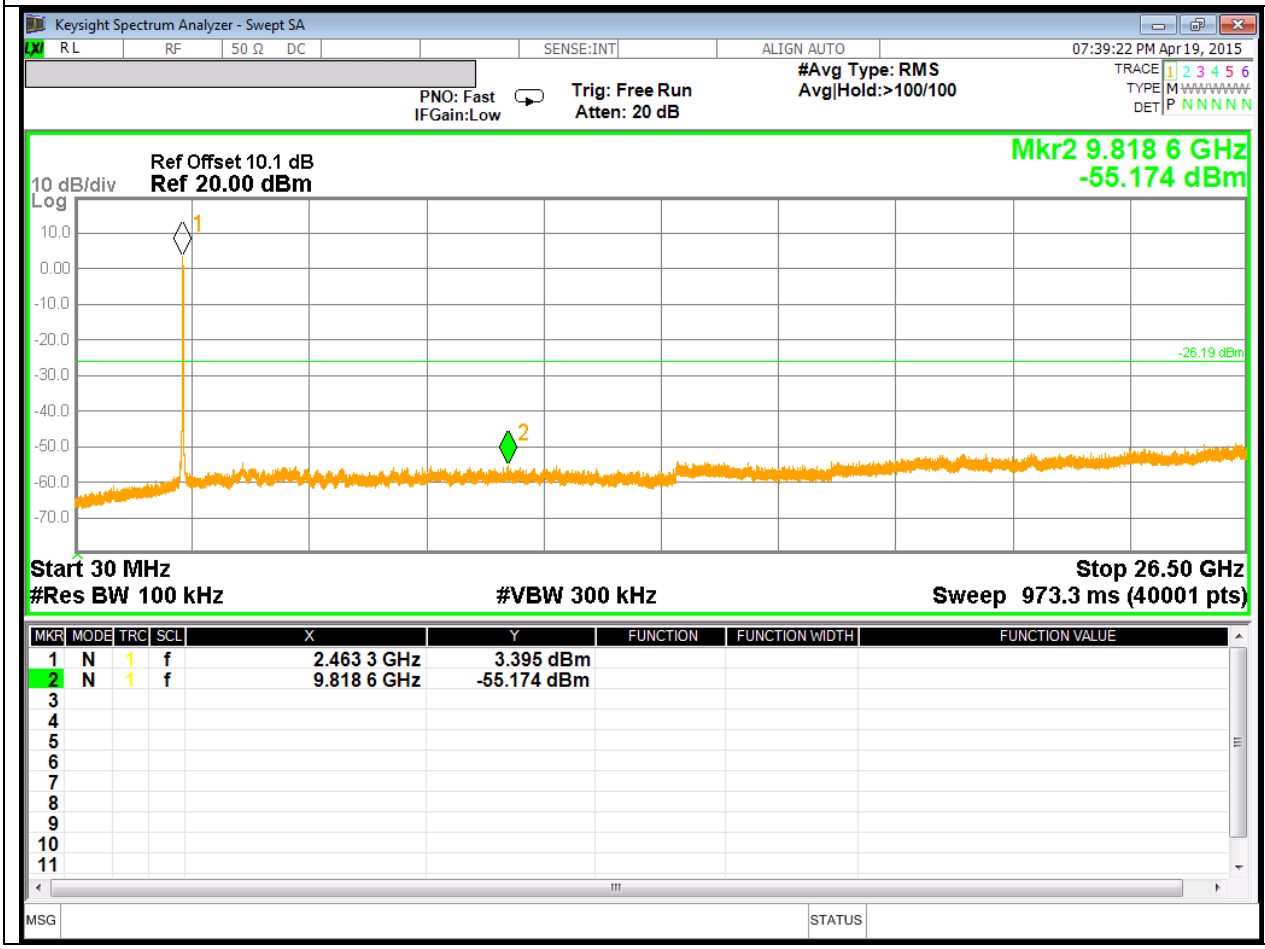
OUT OF BAND LOW CH



OUT OF BAND MID CH



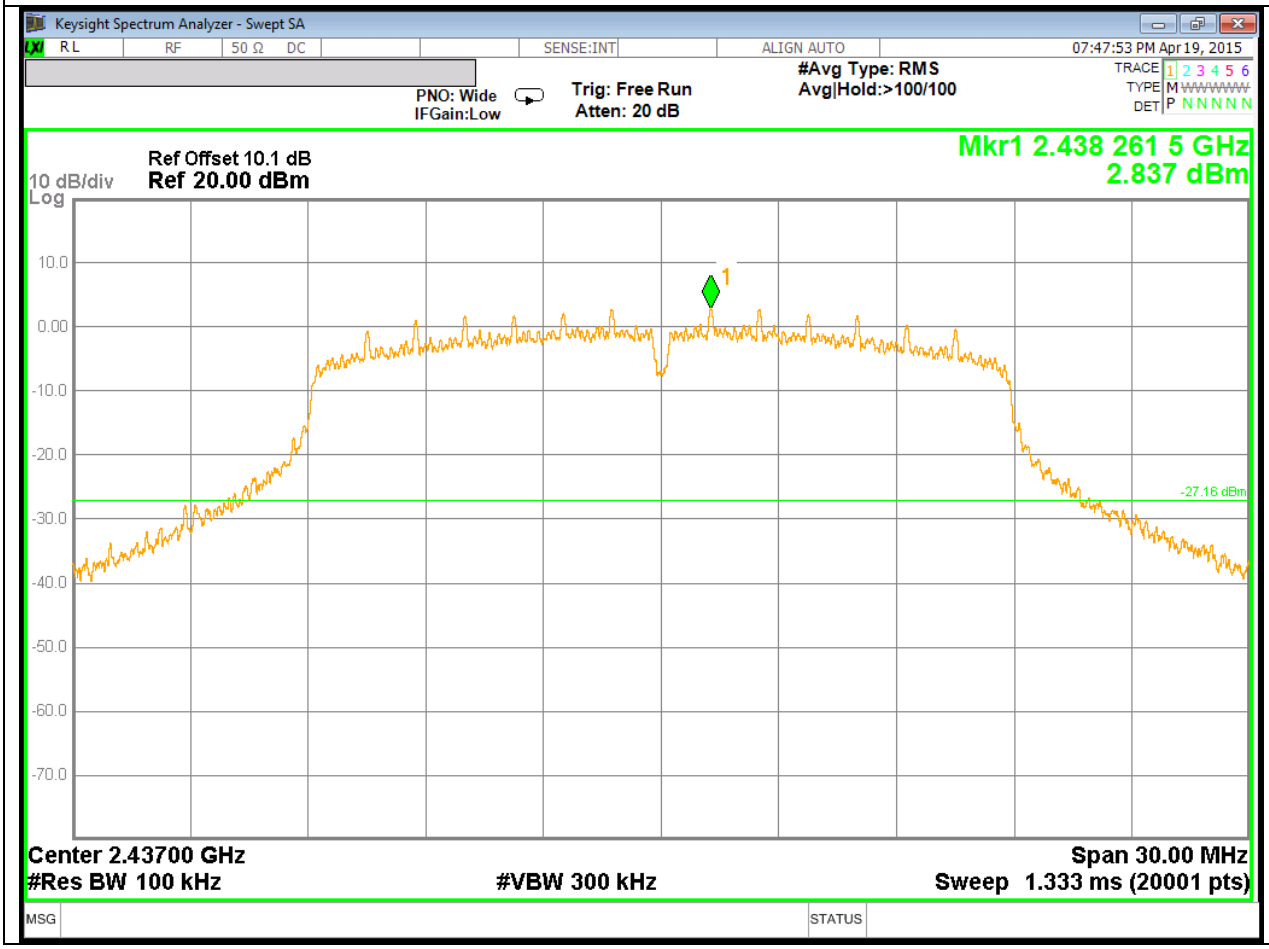
OUT OF BAND HIGH CH



10.6.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

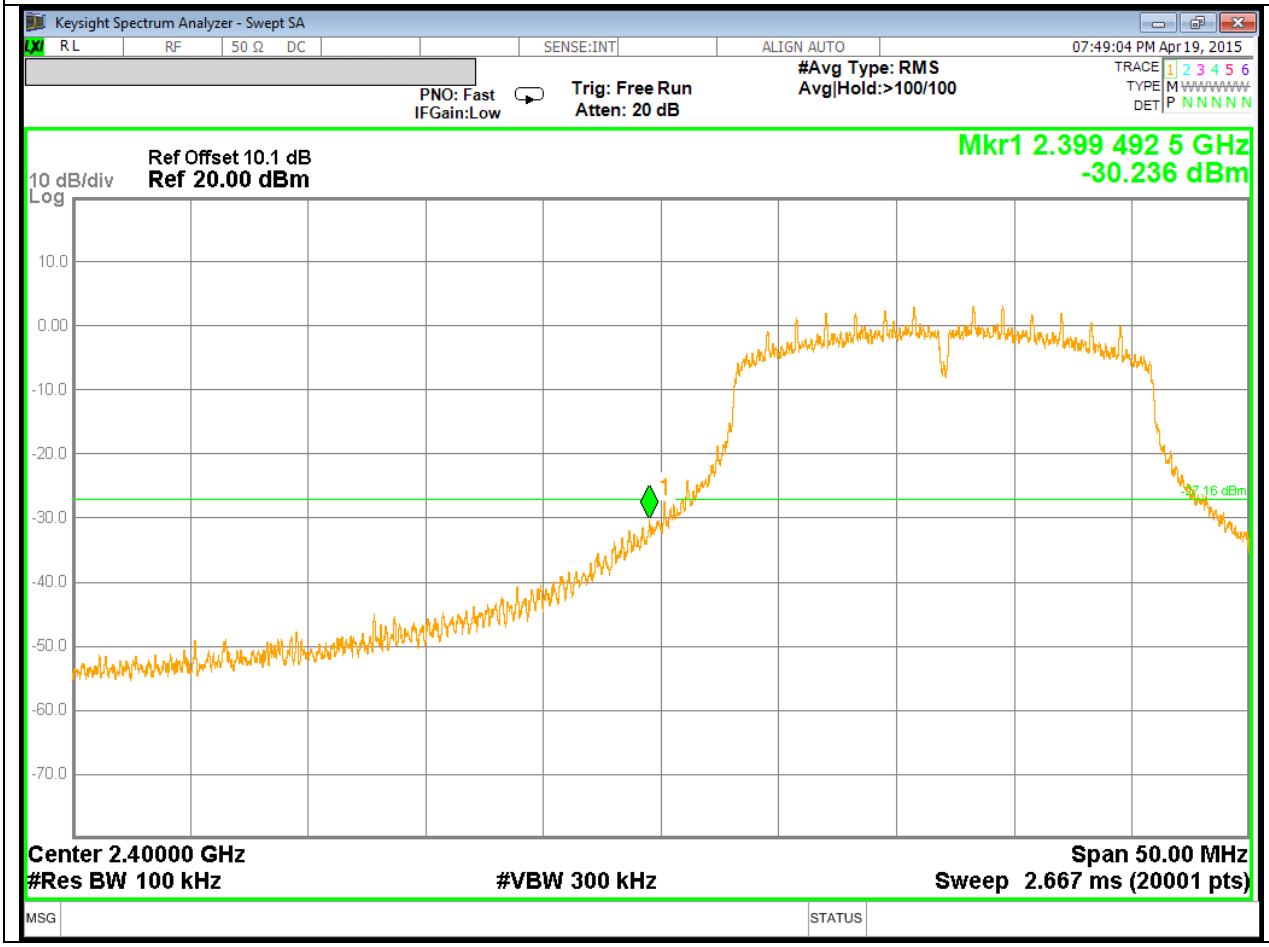
IN-BAND REFERENCE LEVEL

REFERENCE LEVEL MID CH



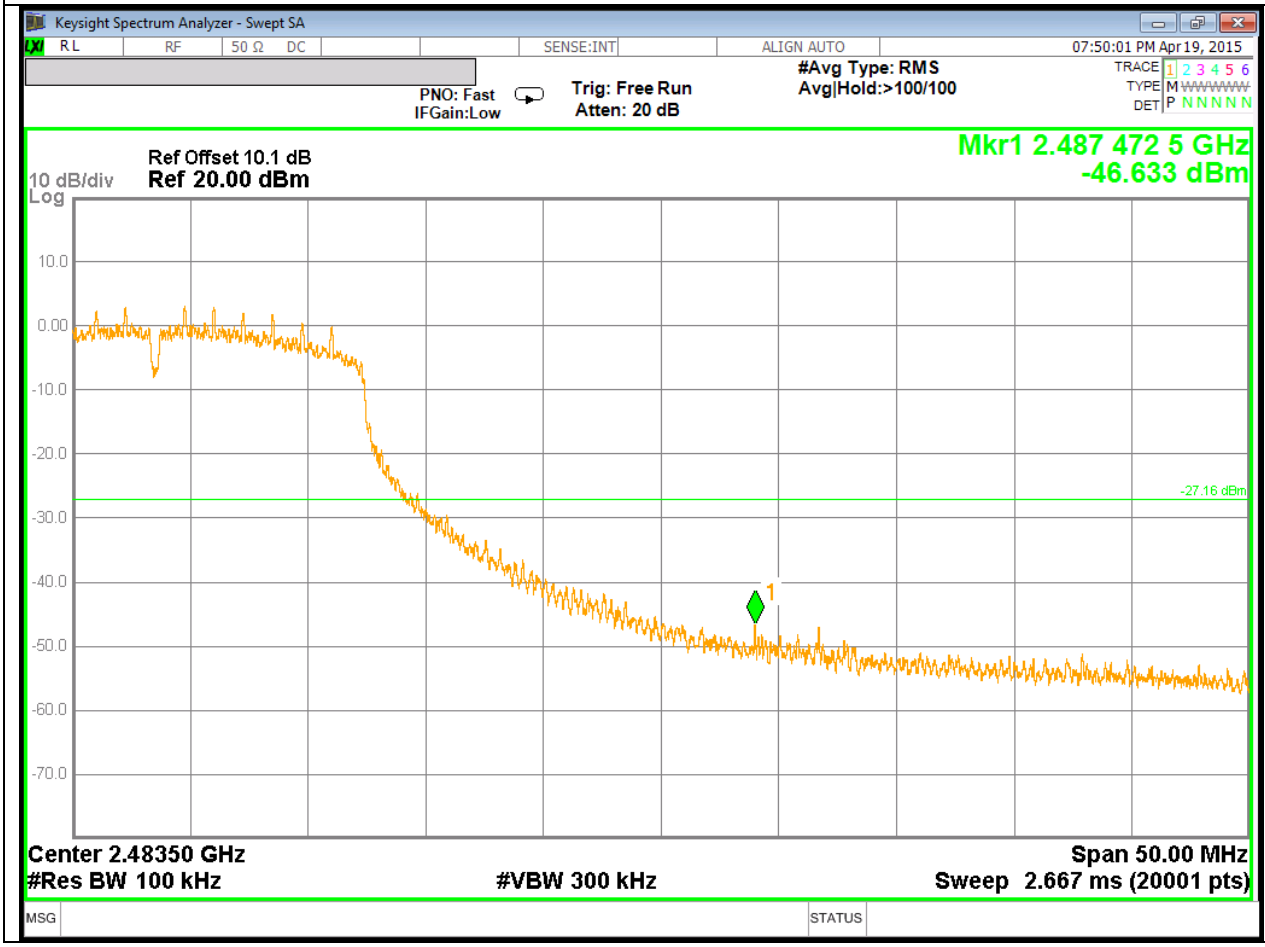
LOW CHANNEL BANDEDGE

AUTHORIZED BAND EDGE LOW CH



HIGH CHANNEL BANDEDGE

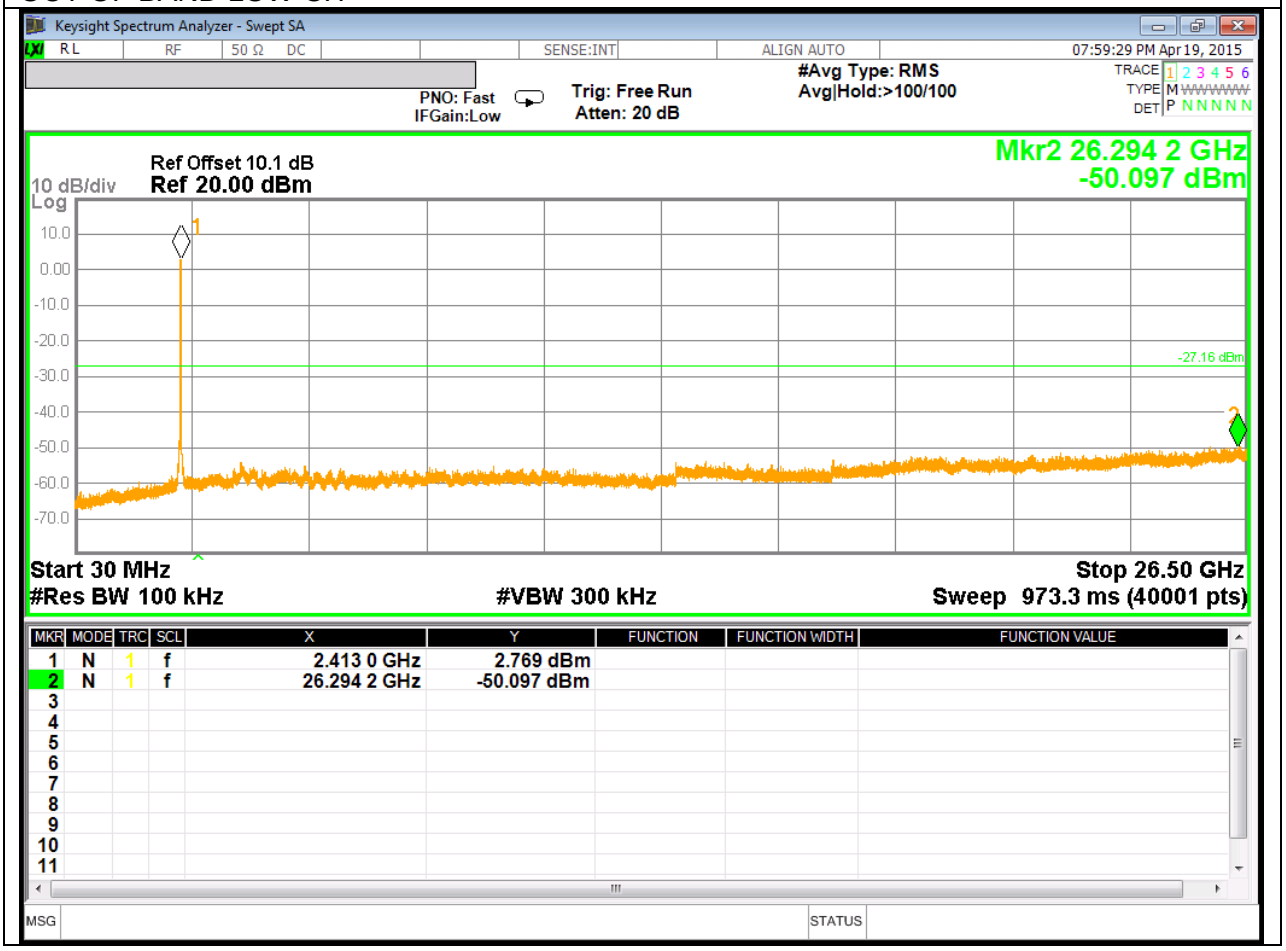
AUTHORIZED BAND EDGE HIGH CH



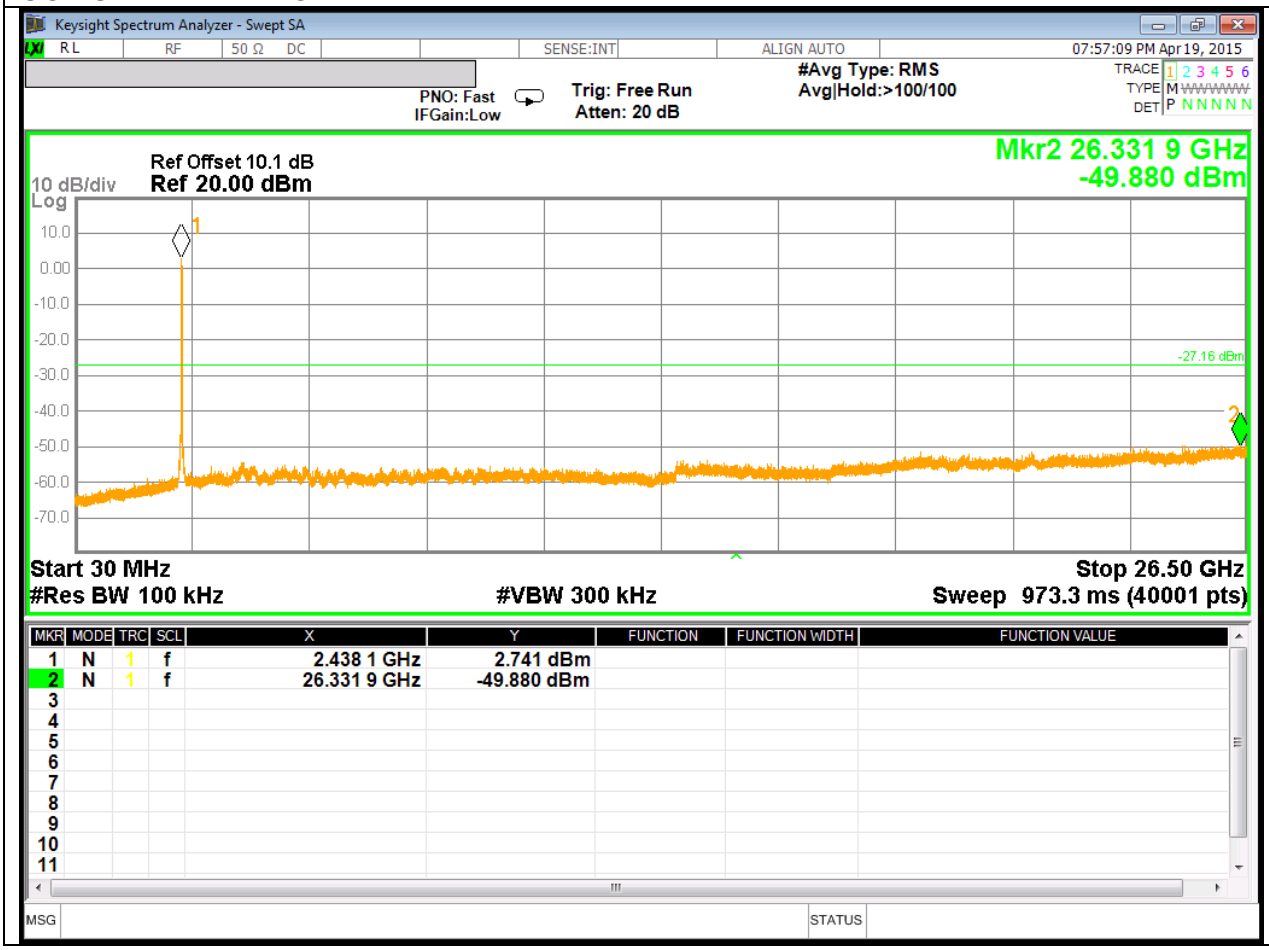
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

OUT-OF-BAND EMISSIONS

OUT OF BAND LOW CH

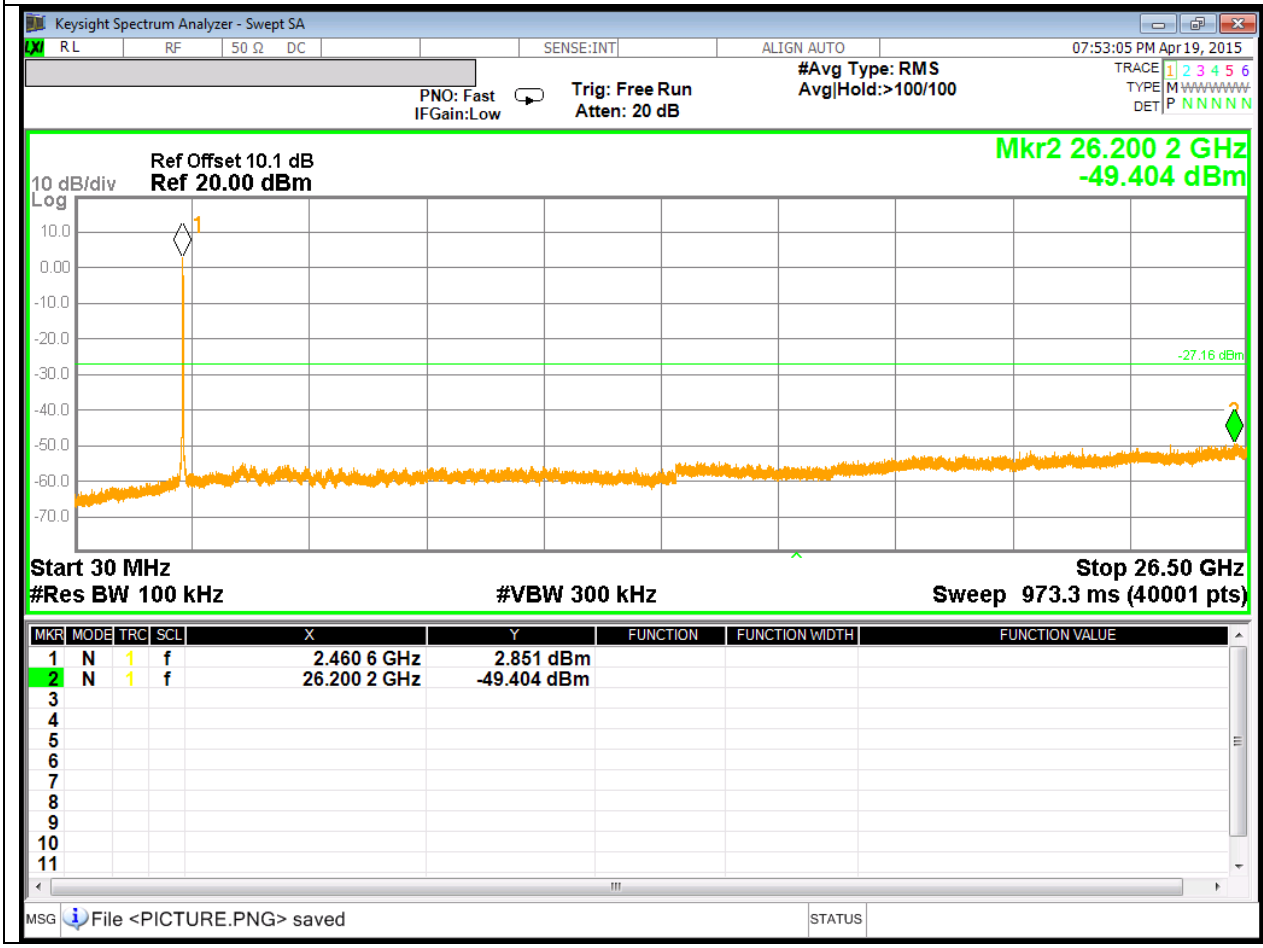


OUT OF BAND MID CH



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

OUT OF BAND HIGH CH



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 = 0.17dB; N mode = 0.28dB.

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.

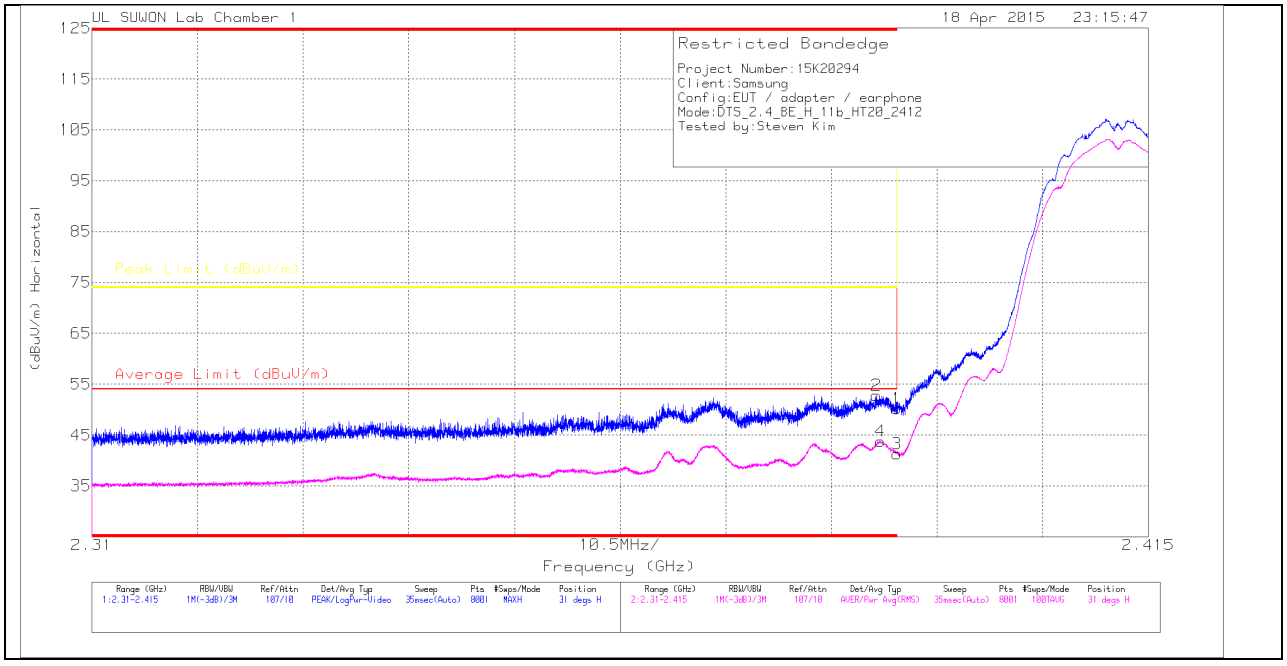
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

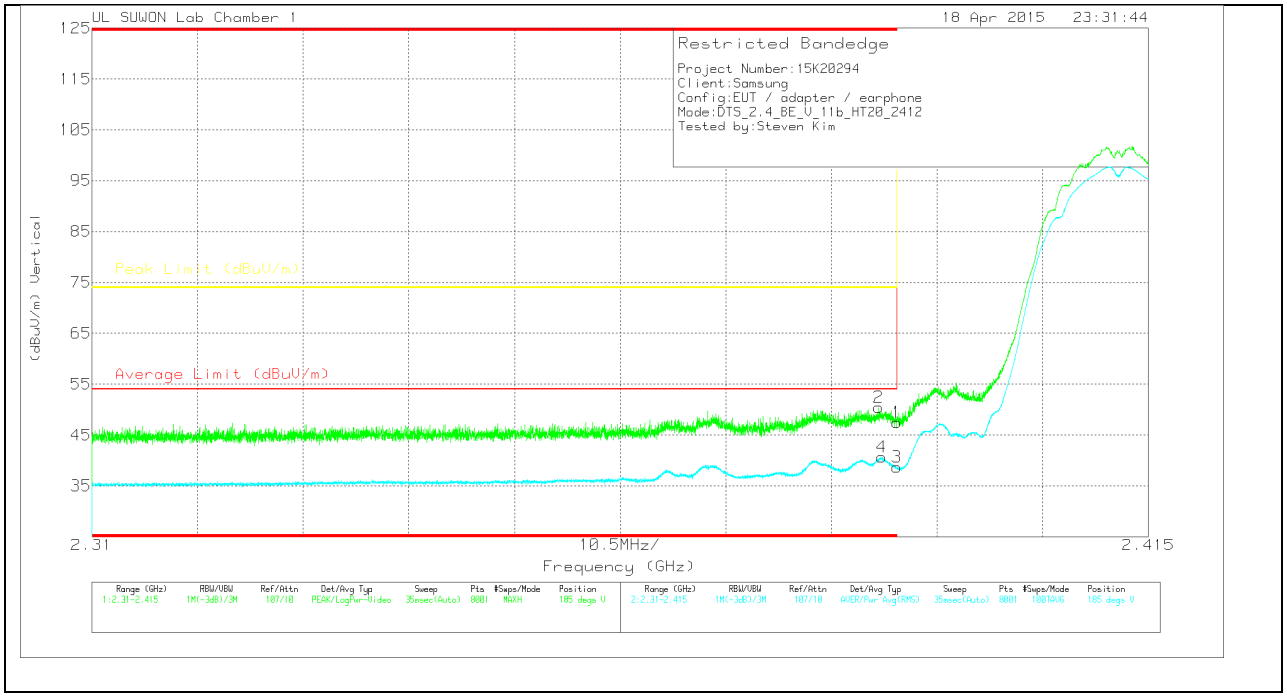
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	45.14	Pk	27.9	-22.8	0	50.24	-	-	74	-23.76	31	106	H
2	* 2.388	47.74	Pk	27.9	-22.8	0	52.84	-	-	74	-21.16	31	106	H
3	* 2.39	36.19	RMS	27.9	-22.8	0	41.29	54	-12.71	-	-	31	106	H
4	* 2.388	38.71	RMS	27.9	-22.8	0	43.81	54	-10.19	-	-	31	106	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	42.36	Pk	27.9	-22.8	0	47.46	-	-	74	-26.54	185	371	V
2	* 2.388	45.29	Pk	27.9	-22.8	0	50.39	-	-	74	-23.61	185	371	V
3	* 2.39	33.53	RMS	27.9	-22.8	0	38.63	54	-15.37	-	-	185	371	V
4	* 2.389	35.52	RMS	27.9	-22.8	0	40.62	54	-13.38	-	-	185	371	V

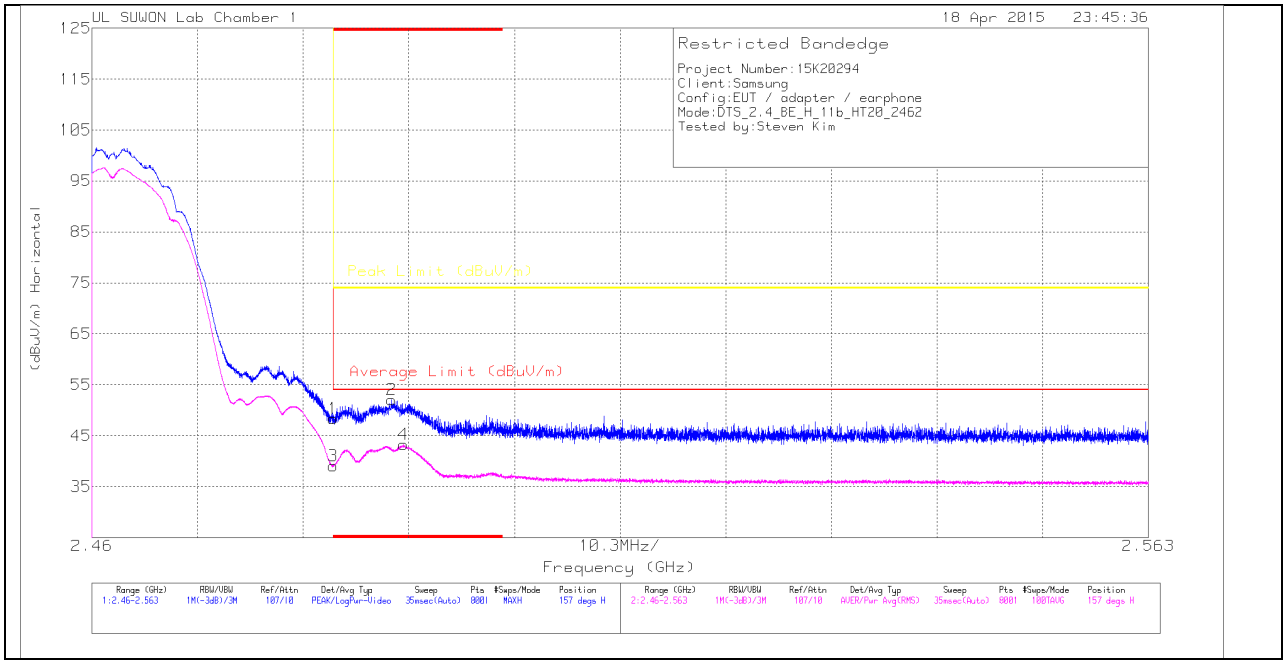
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

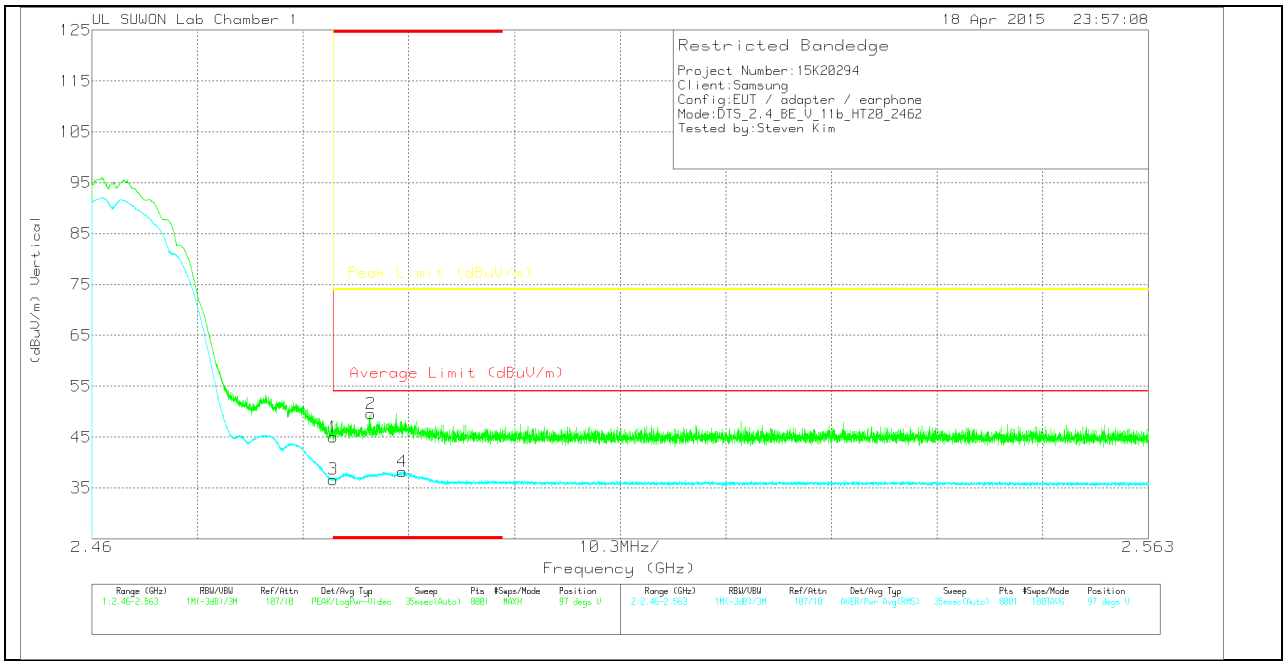
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.04	Pk	27.9	-22.6	0	48.34	-	-	74	-25.66	157	347	H
2	* 2.489	46.74	Pk	27.9	-22.6	0	52.04	-	-	74	-21.96	157	347	H
3	* 2.484	33.73	RMS	27.9	-22.6	0	39.03	54	-14.97	-	-	157	347	H
4	* 2.49	37.93	RMS	27.9	-22.6	0	43.23	54	-10.77	-	-	157	347	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	39.67	Pk	27.9	-22.6	0	44.97	-	-	74	-29.03	97	110	V
2	* 2.487	44.27	Pk	27.9	-22.6	0	49.57	-	-	74	-24.43	97	110	V
3	* 2.484	31.36	RMS	27.9	-22.6	0	36.66	54	-17.34	-	-	97	110	V
4	* 2.49	32.89	RMS	27.9	-22.6	0	38.19	54	-15.81	-	-	97	110	V

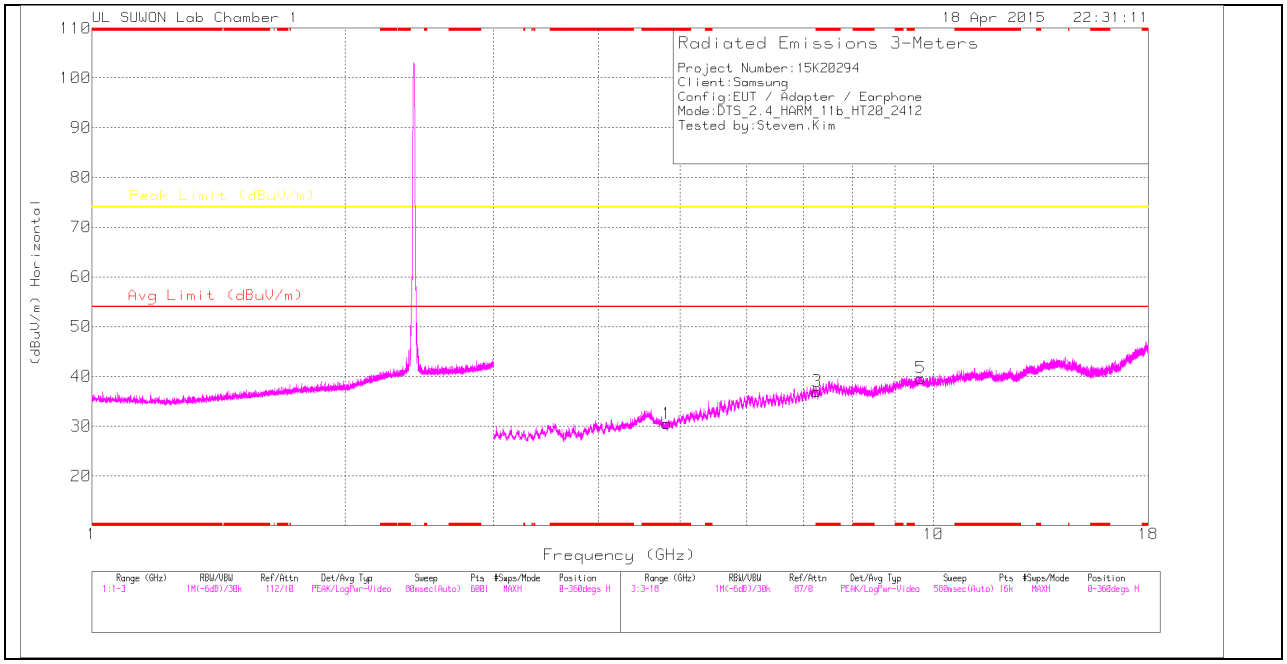
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

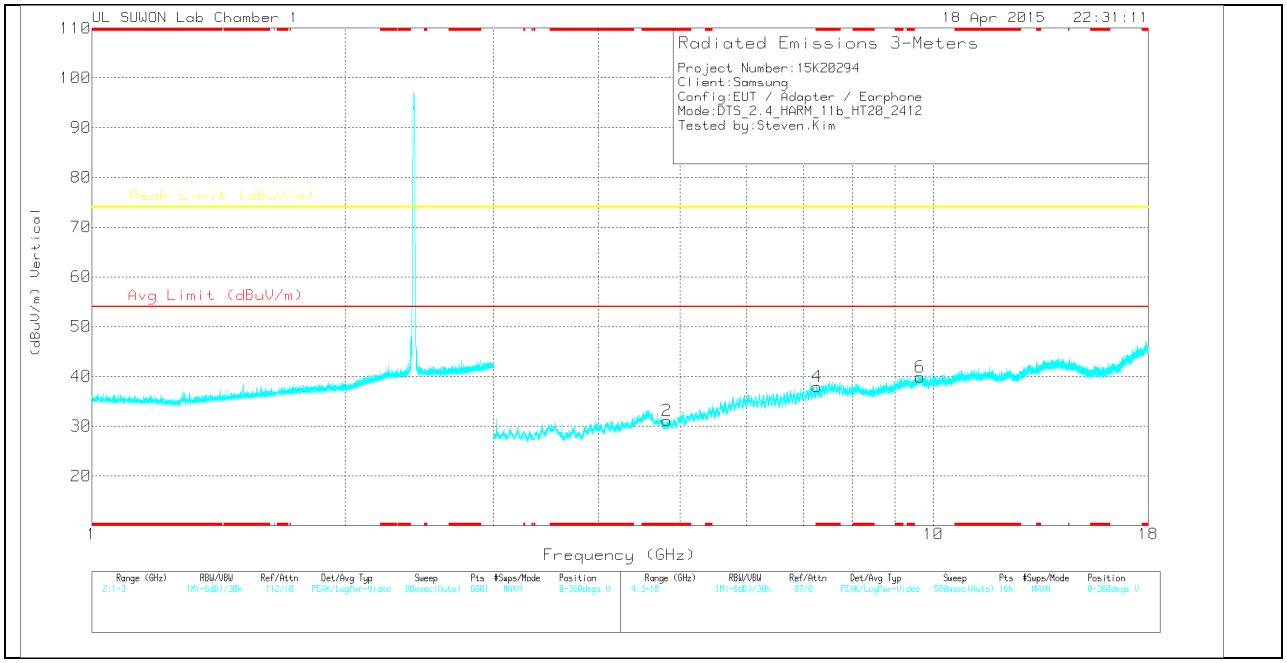
RMS - RMS detection

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

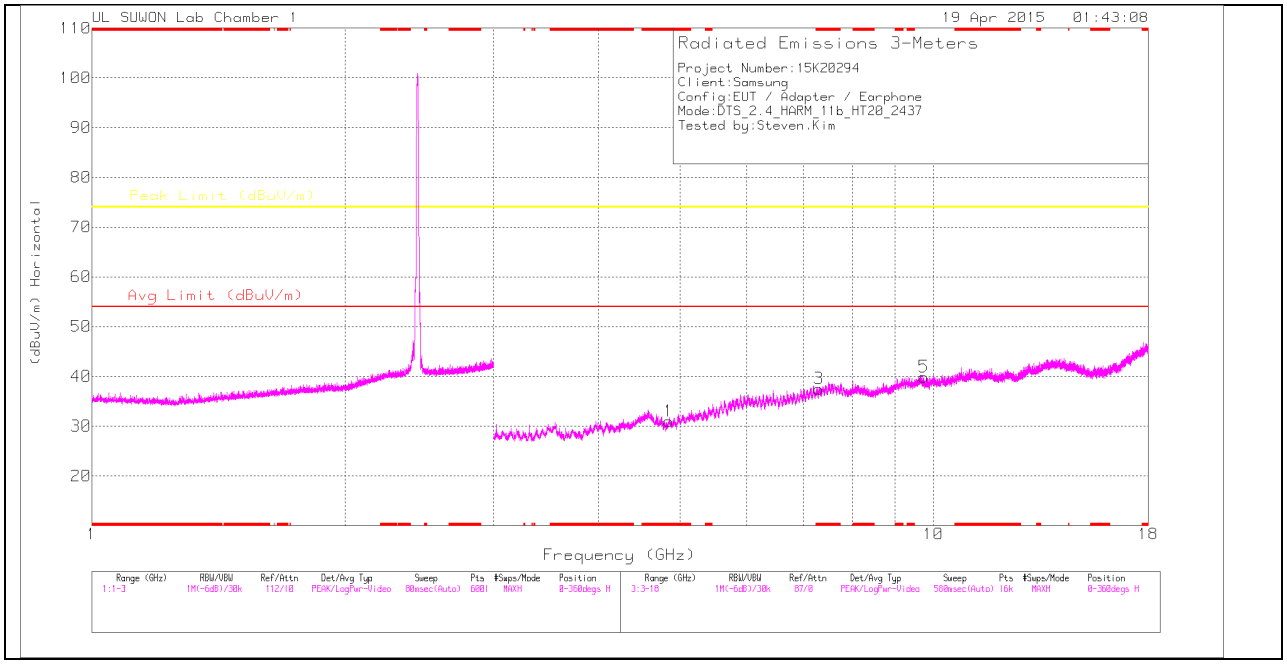
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.823	28.22	PK	31.9	-29.6	0	30.52	-	-	74	-43.48	0-360	100	H
3	* 7.273	25.51	PK	37.1	-25.6	0	37.01	-	-	74	-36.99	0-360	100	H
5	9.649	22.87	PK	37.6	-20.8	0	39.67	-	-	-	-	0-360	200	H
2	* 4.822	28.83	PK	31.9	-29.6	0	31.13	-	-	74	-42.87	0-360	200	V
4	* 7.269	26.49	PK	37.1	-25.6	0	37.99	-	-	74	-36.01	0-360	200	V
6	9.647	23.01	PK	37.6	-20.8	0	39.81	-	-	-	-	0-360	200	V

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

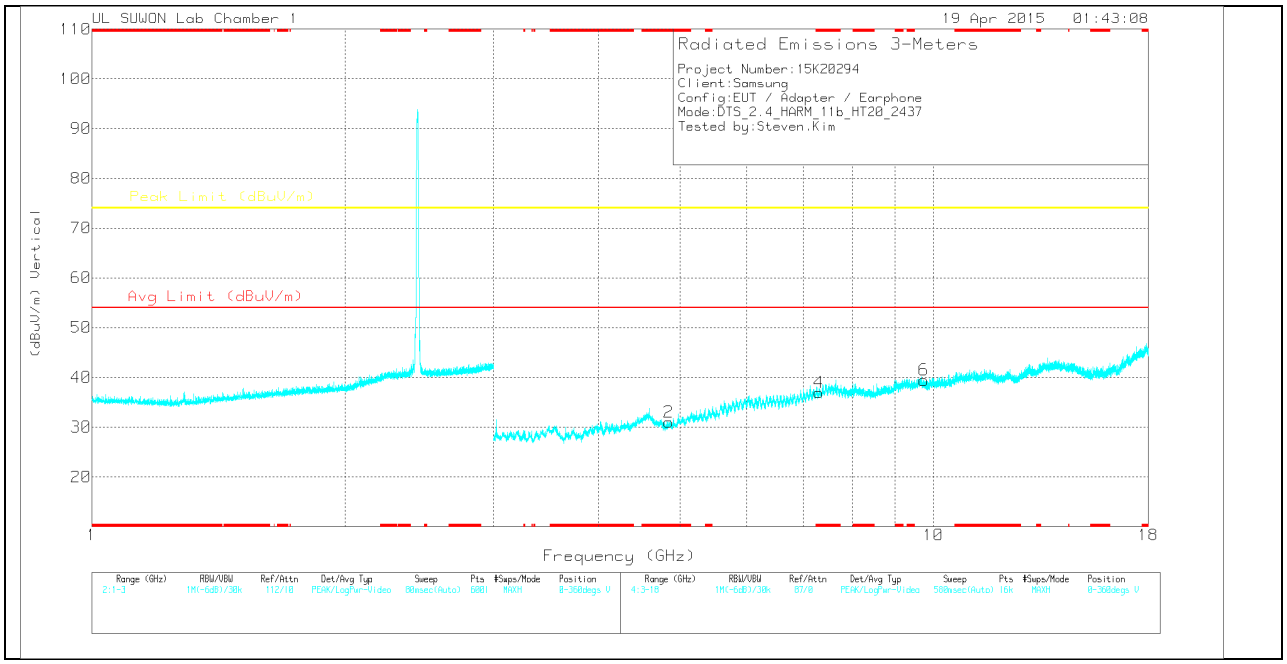
PK – Peak Detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

MID CHANNEL DATA

TRACE MARKERS

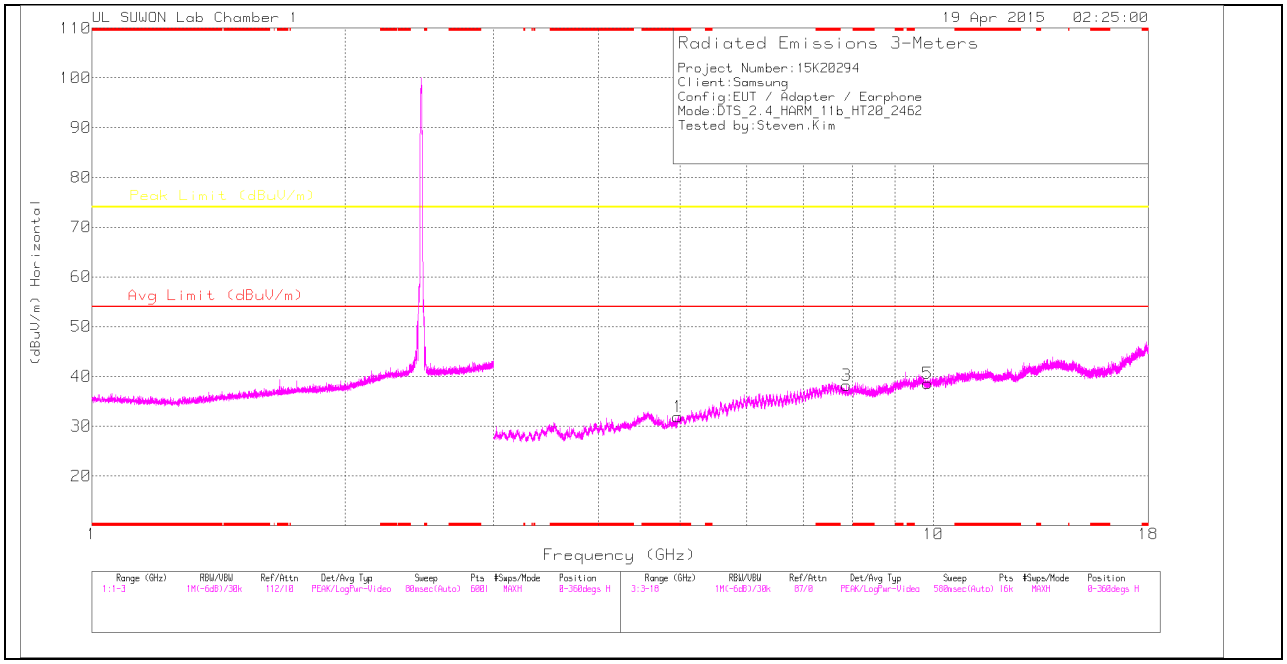
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.848	28.29	PK	32	-29.3	0	30.99	-	-	74	-43.01	0-360	100	H
3	* 7.313	26.12	PK	37.1	-25.7	0	37.52	-	-	74	-36.48	0-360	200	H
5	9.742	24.12	PK	37.6	-21.8	0	39.92	-	-	-	-	0-360	200	H
2	* 4.845	28.34	PK	32	-29.3	0	31.04	-	-	74	-42.96	0-360	200	V
4	* 7.308	25.54	PK	37.1	-25.7	0	36.94	-	-	74	-37.06	0-360	200	V
6	9.735	23.52	PK	37.6	-21.7	0	39.42	-	-	-	-	0-360	100	V

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

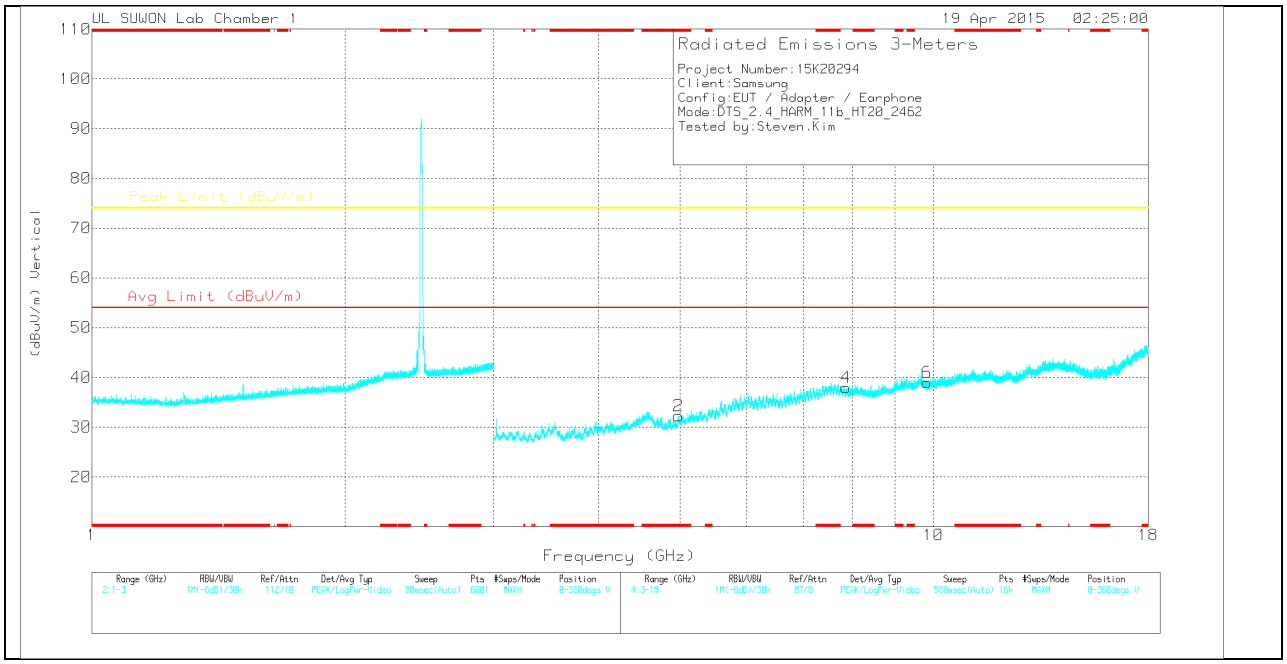
PK – Peak Detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, 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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	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	* 4.969	28.55	PK	32.1	-28.8	0	31.85	-	-	74	-42.15	0-360	200	H
3	7.881	25.59	PK	37	-24.4	0	38.19	-	-	-	-	0-360	100	H
5	9.835	22.65	PK	37.7	-21.8	0	38.55	-	-	-	-	0-360	100	H
2	* 4.977	28.77	PK	32.2	-28.7	0	32.27	-	-	74	-41.73	0-360	200	V
4	7.877	25.32	PK	37	-24.4	0	37.92	-	-	-	-	0-360	100	V
6	9.826	23.14	PK	37.7	-21.9	0	38.94	-	-	-	-	0-360	100	V

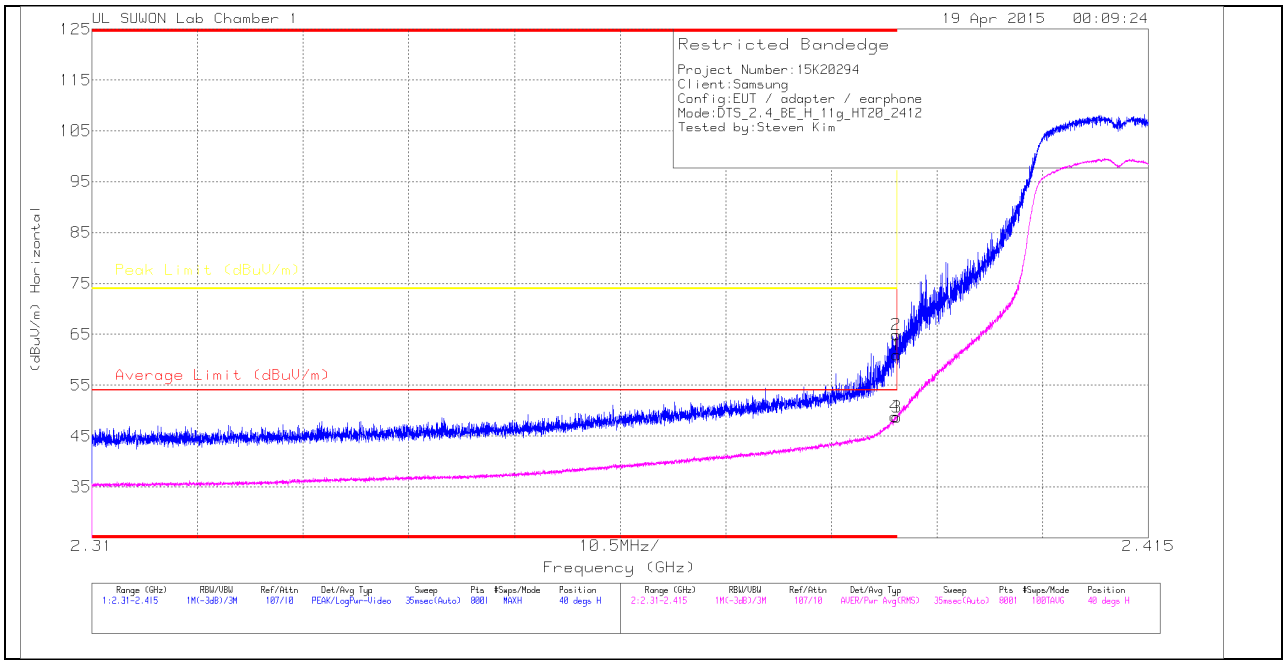
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

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

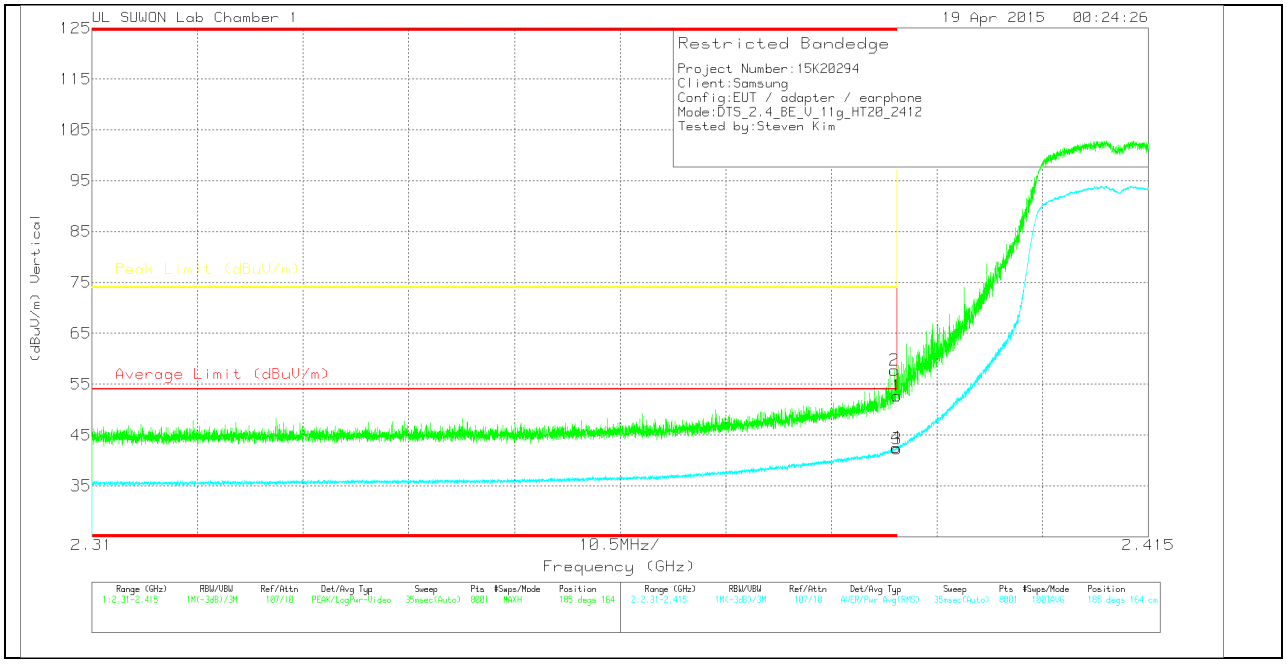
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	55.9	Pk	27.9	-22.8	0	61	-	-	74	-13	40	101	H
2	* 2.39	59.87	Pk	27.9	-22.8	0	64.97	-	-	74	-9.03	40	101	H
3	* 2.39	43.47	RMS	27.9	-22.8	.17	48.74	54	-5.26	-	-	40	101	H
4	* 2.39	43.6	RMS	27.9	-22.8	.17	48.87	54	-5.13	-	-	40	101	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	47.56	Pk	27.9	-22.8	0	52.66	-	-	74	-21.34	185	164	V
2	* 2.39	52.62	Pk	27.9	-22.8	0	57.72	-	-	74	-16.28	185	164	V
3	* 2.39	37.03	RMS	27.9	-22.8	.17	42.3	54	-11.7	-	-	185	164	V
4	* 2.39	37.32	RMS	27.9	-22.8	.17	42.59	54	-11.41	-	-	185	164	V

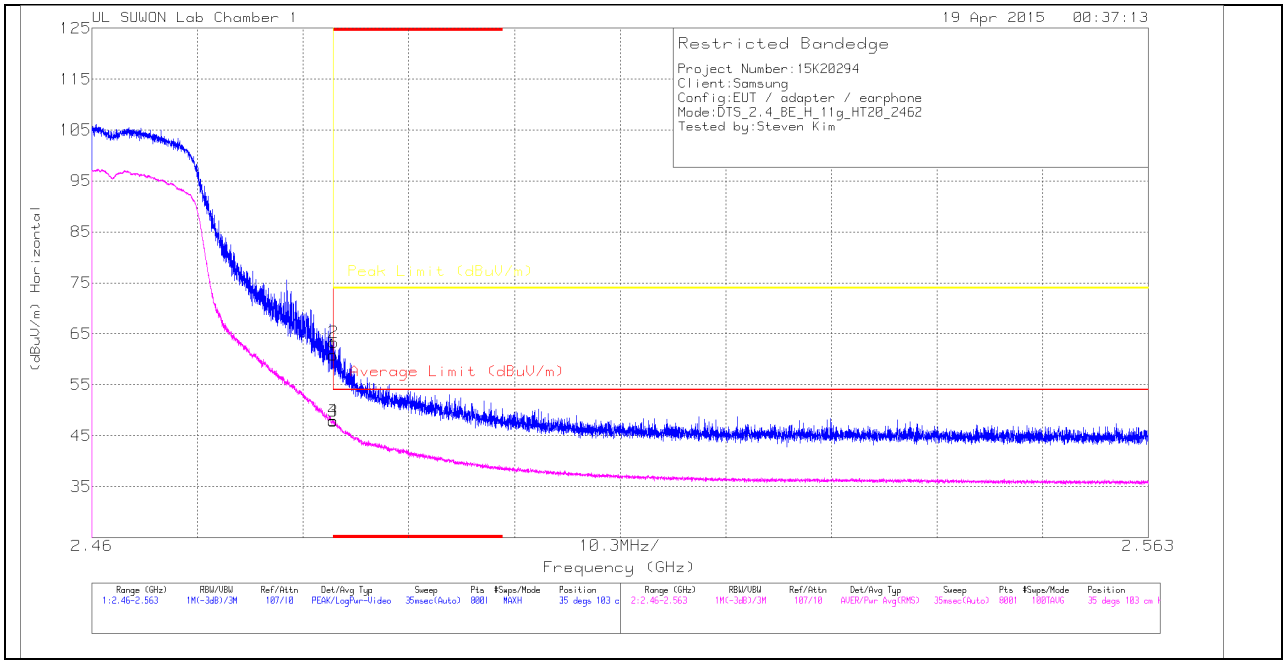
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

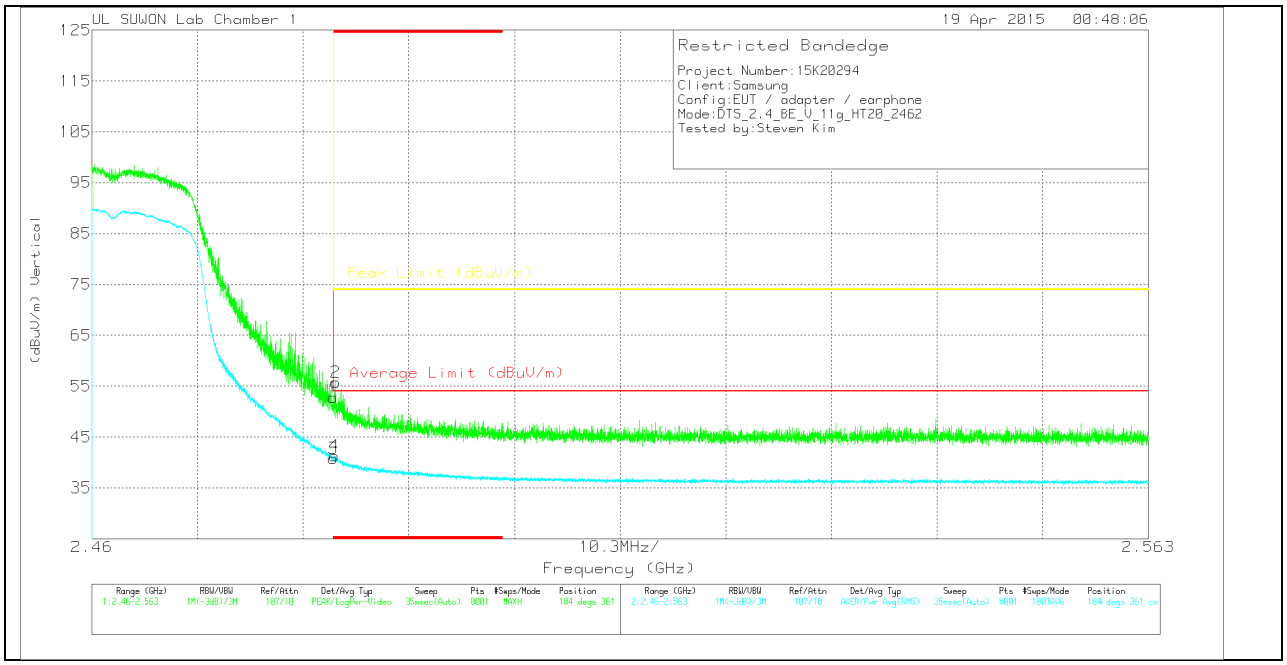
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	55.54	Pk	27.9	-22.6	0	60.84	-	-	74	-13.16	35	103	H
2	* 2.484	57.97	Pk	27.9	-22.6	0	63.27	-	-	74	-10.73	35	103	H
3	* 2.484	42.36	RMS	27.9	-22.6	.17	47.83	54	-6.17	-	-	35	103	H
4	* 2.484	42.56	RMS	27.9	-22.6	.17	48.03	54	-5.97	-	-	35	103	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	47.47	Pk	27.9	-22.6	0	52.77	-	-	74	-21.23	184	361	V
2	* 2.484	50.46	Pk	27.9	-22.6	0	55.76	-	-	74	-18.24	184	361	V
3	* 2.484	35.09	RMS	27.9	-22.6	.17	40.56	54	-13.44	-	-	184	361	V
4	* 2.484	35.67	RMS	27.9	-22.6	.17	41.14	54	-12.86	-	-	184	361	V

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

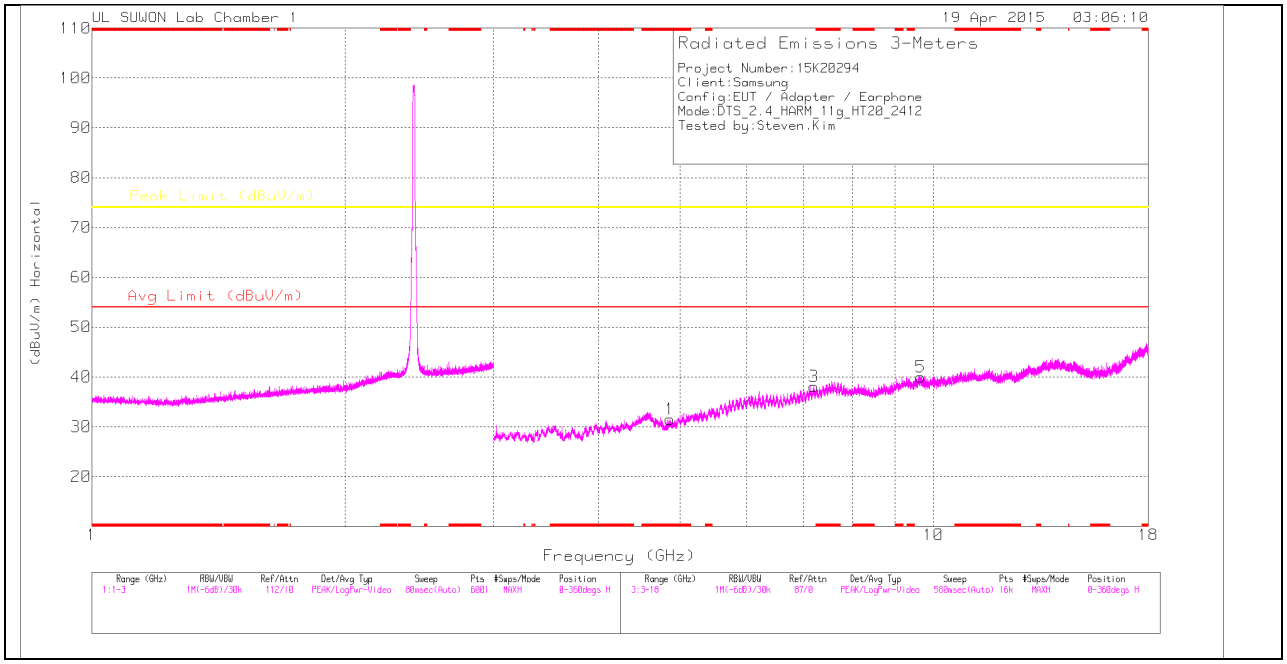
Pk - Peak detector

RMS - RMS detection

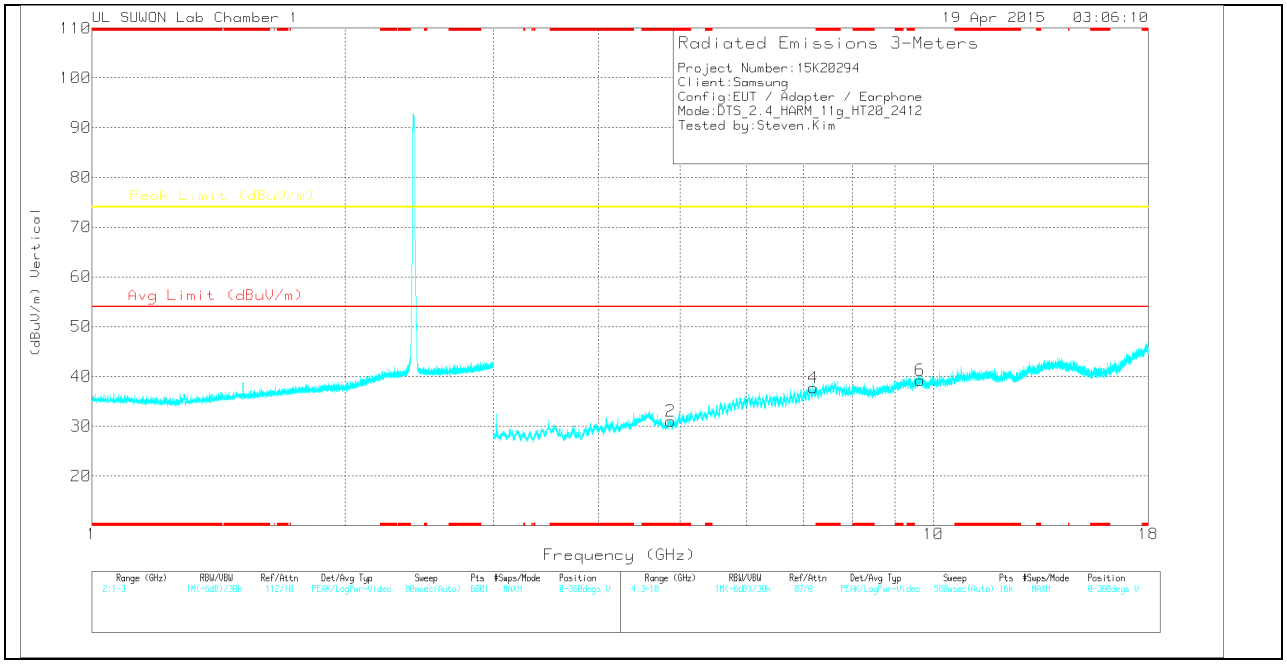
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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

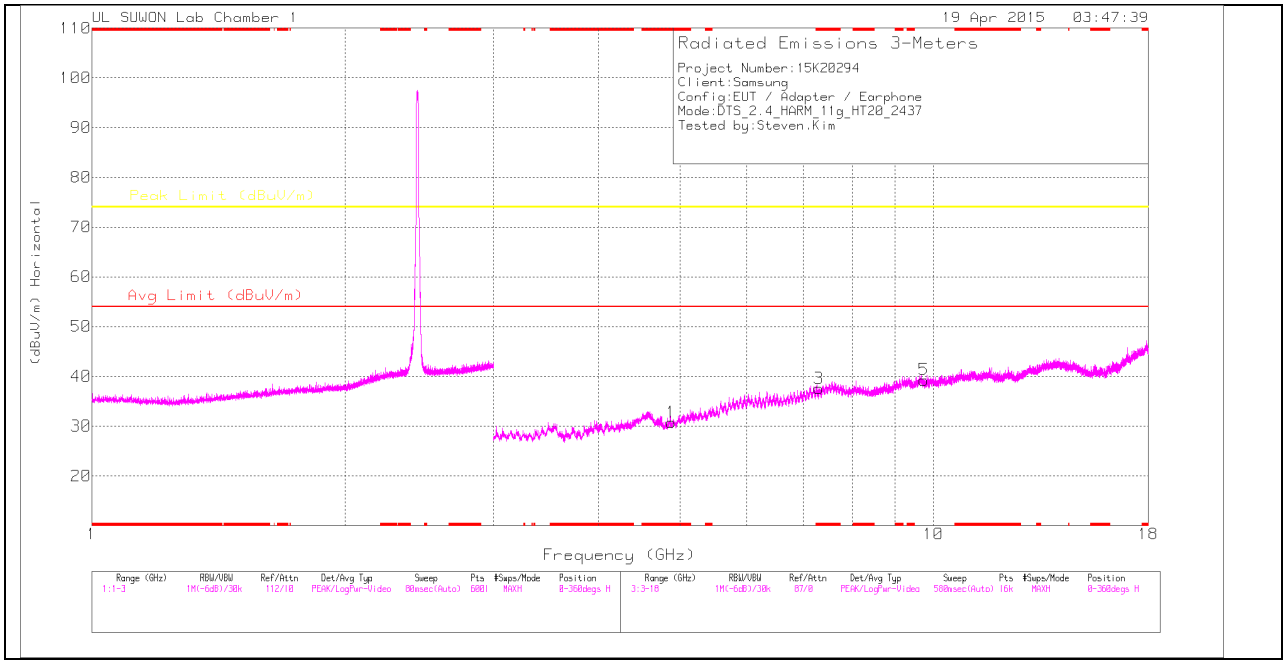
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.866	28.71	PK	32	-29.2	0	31.51	-	-	74	-42.49	0-360	100	H
3	7.207	26.48	PK	37	-25.4	0	38.08	-	-	-	-	0-360	100	H
5	9.655	23.22	PK	37.6	-20.8	0	40.02	-	-	-	-	0-360	100	H
2	* 4.868	28.23	PK	32	-29.2	0	31.03	-	-	74	-42.97	0-360	100	V
4	7.203	26.25	PK	36.9	-25.4	0	37.75	-	-	-	-	0-360	200	V
6	9.638	22.39	PK	37.6	-20.8	0	39.19	-	-	-	-	0-360	200	V

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

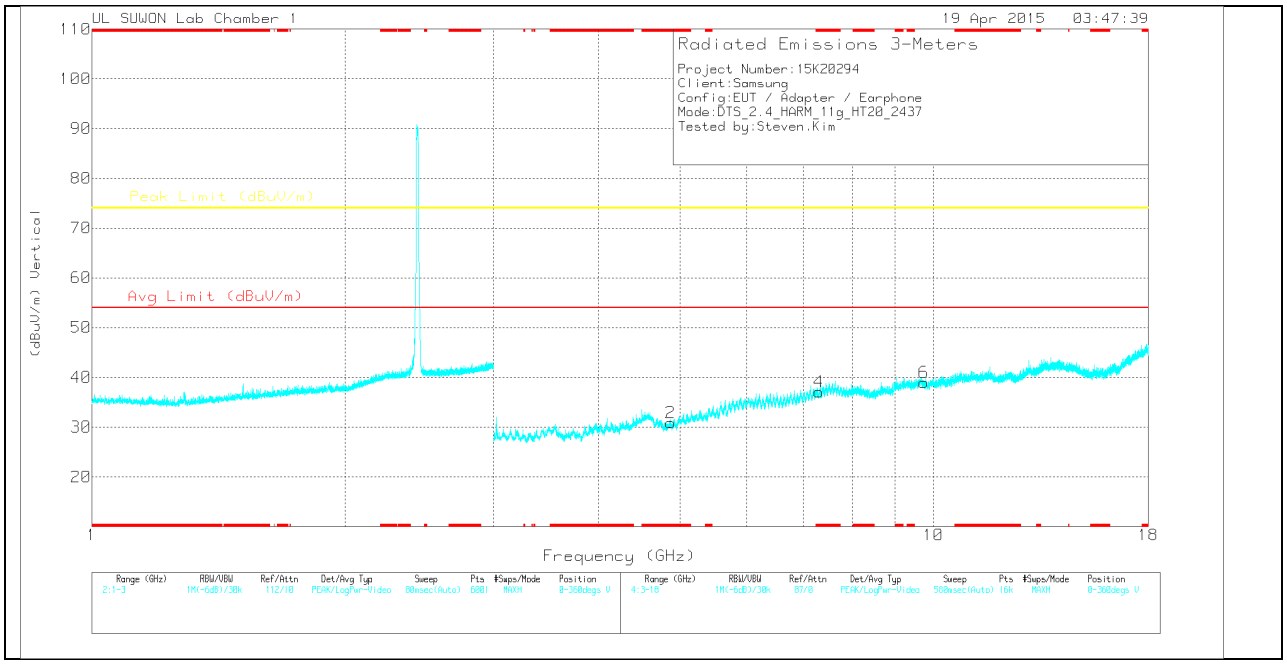
PK – Peak Detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

MID CHANNEL DATA

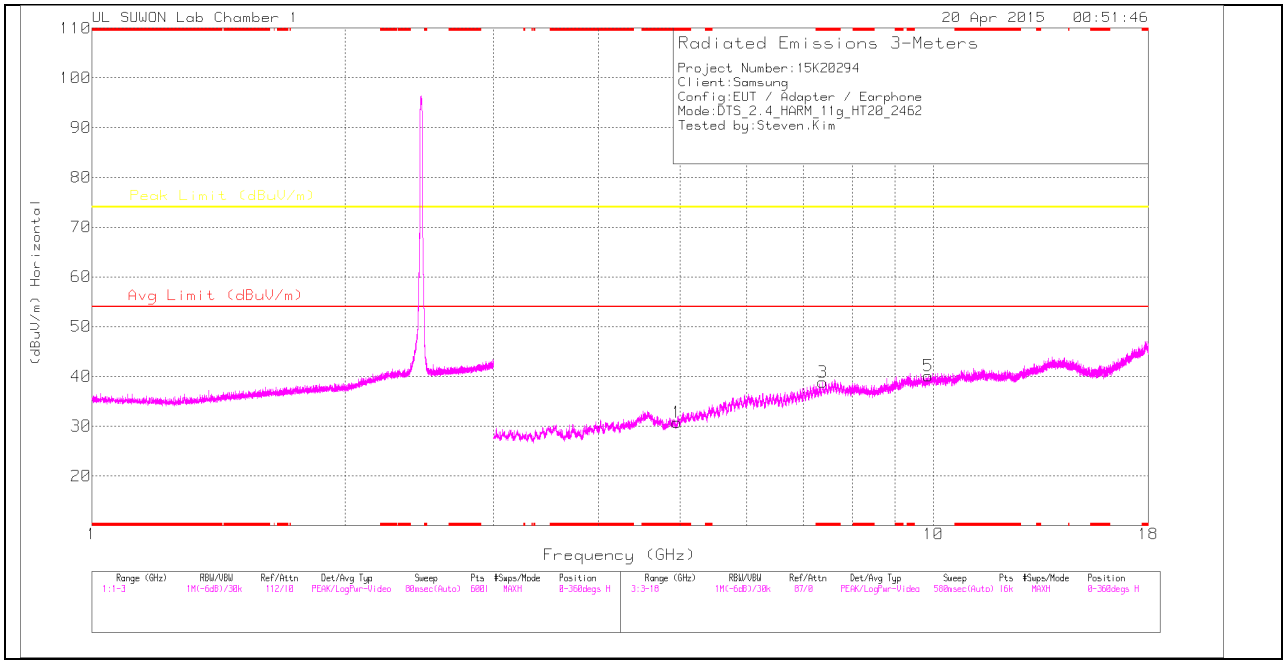
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	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	* 4.88	27.83	PK	32	-29.1	0	30.73	-	-	74	-43.27	0-360	200	H
3	* 7.313	26.2	PK	37.1	-25.7	0	37.6	-	-	74	-36.4	0-360	100	H
5	9.741	23.49	PK	37.6	-21.8	0	39.29	-	-	-	-	0-360	100	H
2	* 4.871	28.08	PK	32	-29.2	0	30.88	-	-	74	-43.12	0-360	100	V
4	* 7.311	25.71	PK	37.1	-25.7	0	37.11	-	-	74	-36.89	0-360	100	V
6	9.737	23.16	PK	37.6	-21.8	0	38.96	-	-	-	-	0-360	100	V

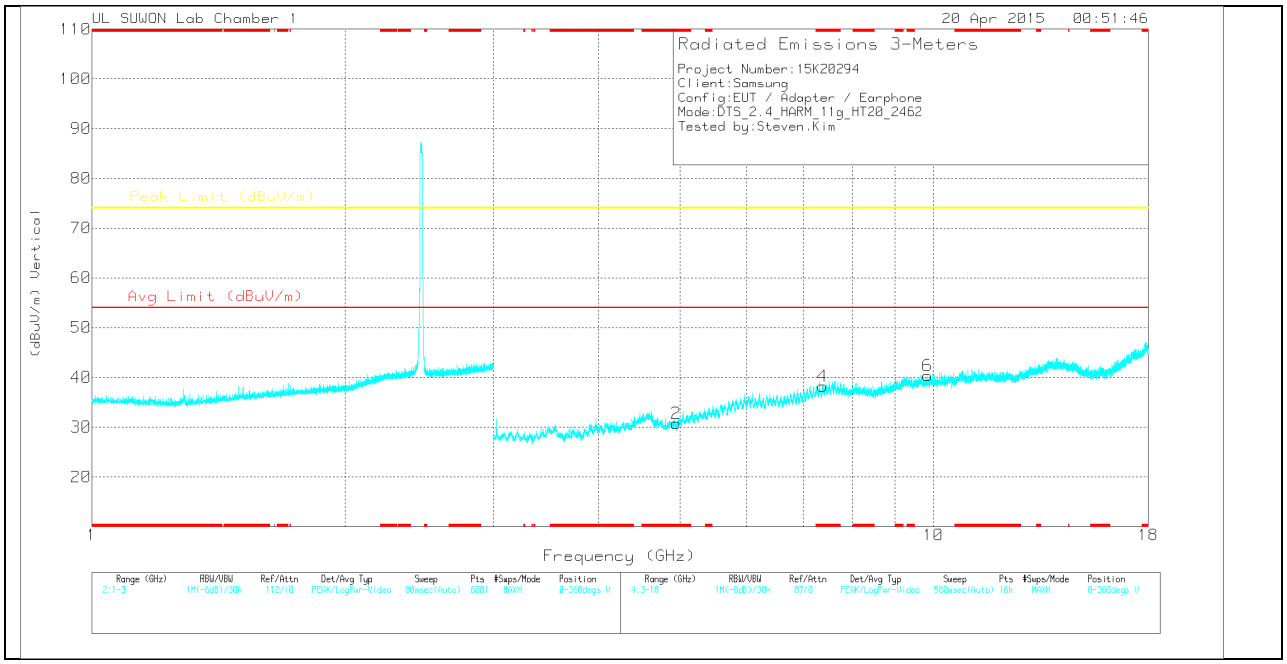
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	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	* 4.955	27.68	PK	32.1	-29	0	30.78	-	-	74	-43.22	0-360	100	H
3	* 7.39	26.67	PK	37.3	-25.1	0	38.87	-	-	74	-35.13	0-360	200	H
5	9.858	23.68	PK	37.8	-21.4	0	40.08	-	-	-	-	0-360	100	H
2	* 4.949	27.69	PK	32.1	-29	0	30.79	-	-	74	-43.21	0-360	200	V
4	* 7.391	26.06	PK	37.3	-25.1	0	38.26	-	-	74	-35.74	0-360	200	V
6	9.848	24.17	PK	37.8	-21.6	0	40.37	-	-	-	-	0-360	200	V

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

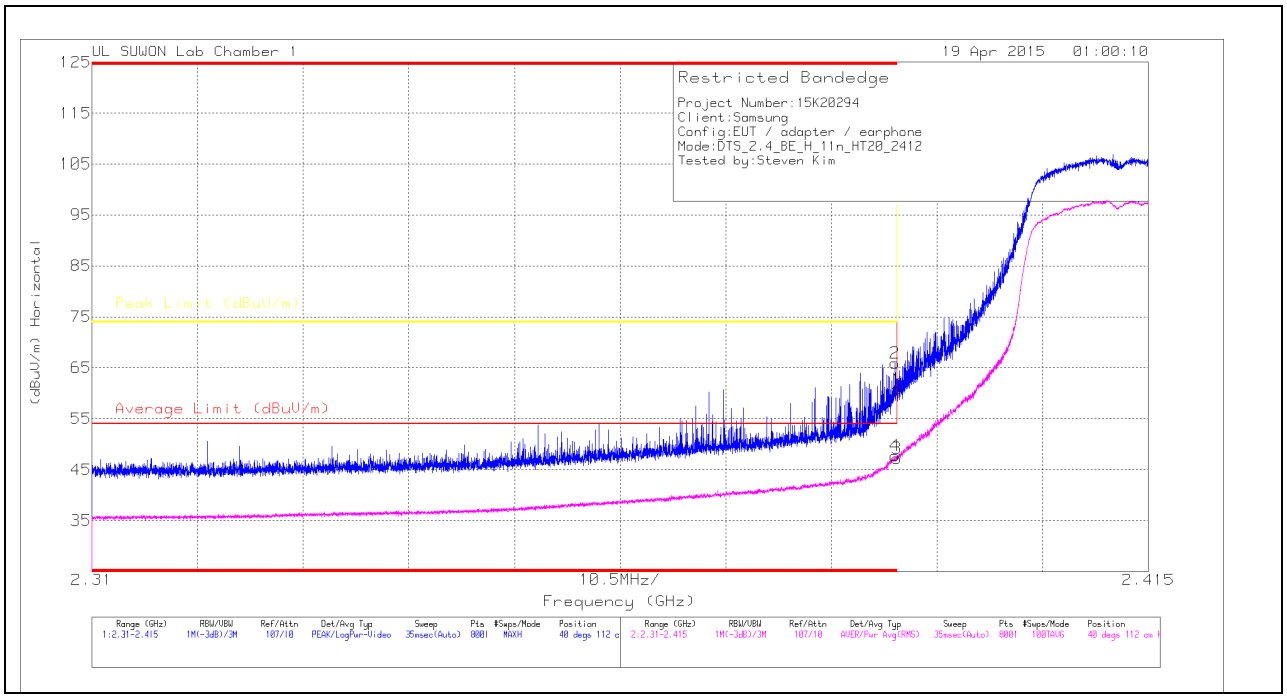
PK – Peak Detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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

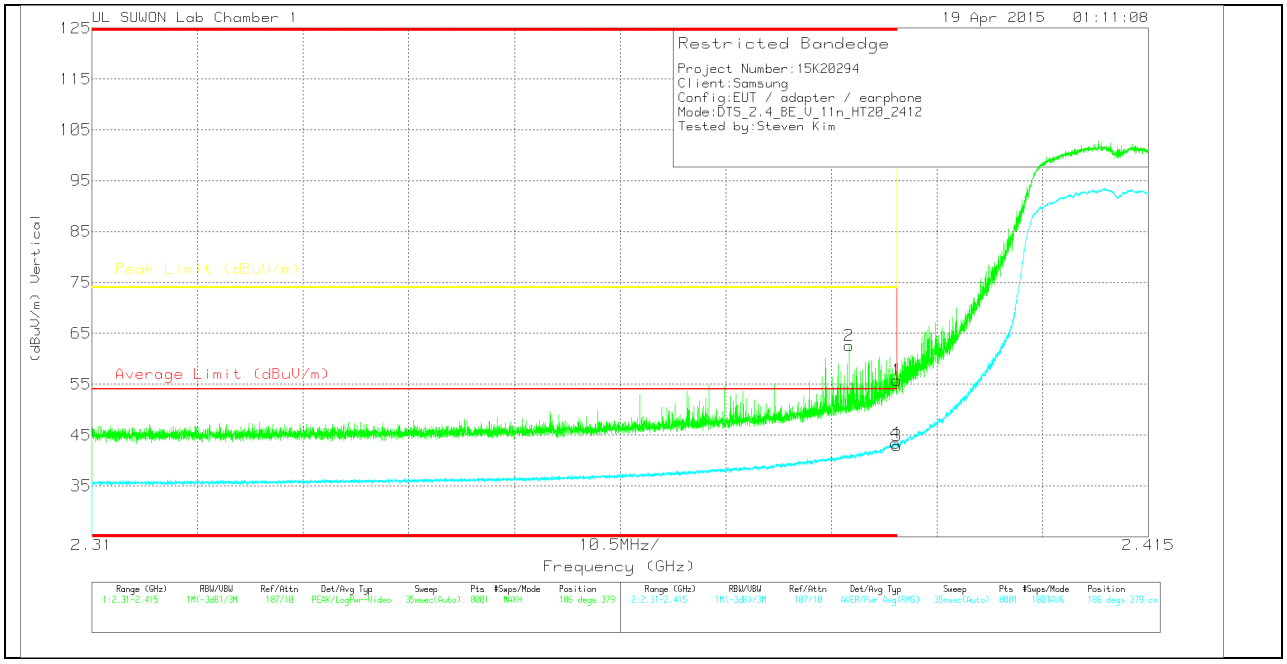
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	55.73	Pk	27.9	-22.8	0	60.83	-	-	74	-13.17	40	112	H
2	* 2.39	60.83	Pk	27.9	-22.8	0	65.93	-	-	74	-8.07	40	112	H
3	* 2.39	41.89	RMS	27.9	-22.8	.28	47.27	54	-6.73	-	-	40	112	H
4	* 2.39	42.35	RMS	27.9	-22.8	.28	47.73	54	-6.27	-	-	40	112	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	50.7	Pk	27.9	-22.8	0	55.8	-	-	74	-18.2	186	379	V
2	* 2.385	57.44	Pk	27.9	-22.8	0	62.54	-	-	74	-11.46	186	379	V
3	* 2.39	37.48	RMS	27.9	-22.8	.28	42.86	54	-11.14	-	-	186	379	V
4	* 2.39	38.07	RMS	27.9	-22.8	.28	43.45	54	-10.55	-	-	186	379	V

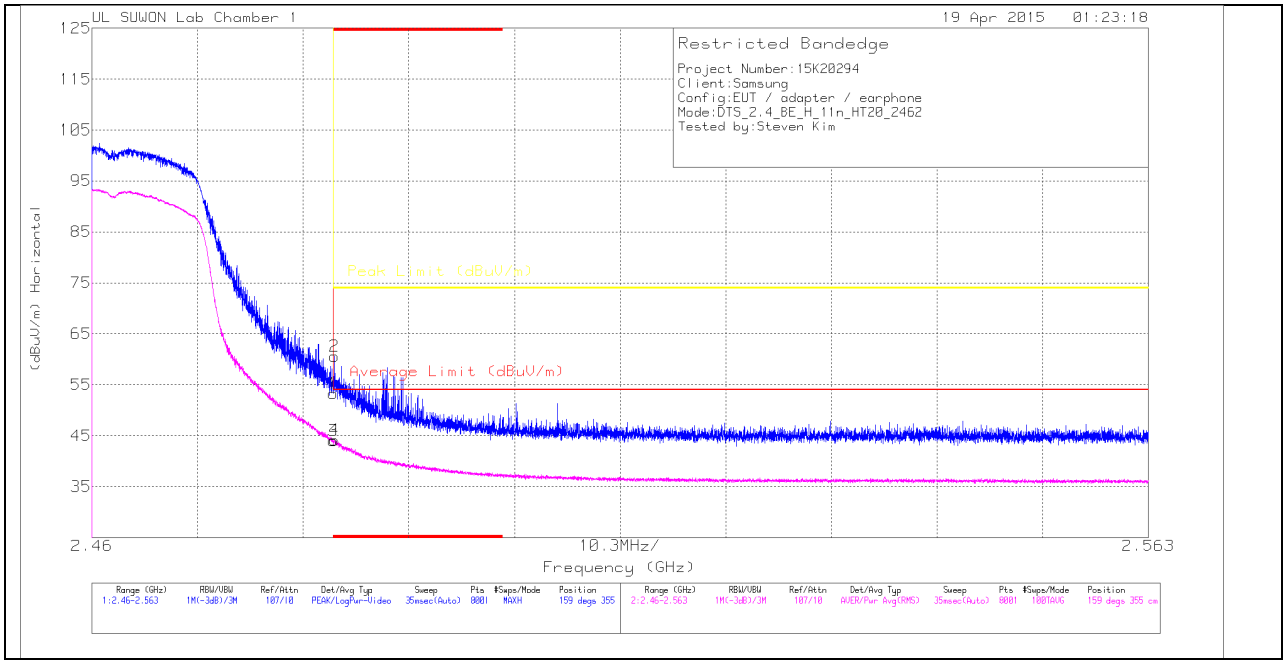
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

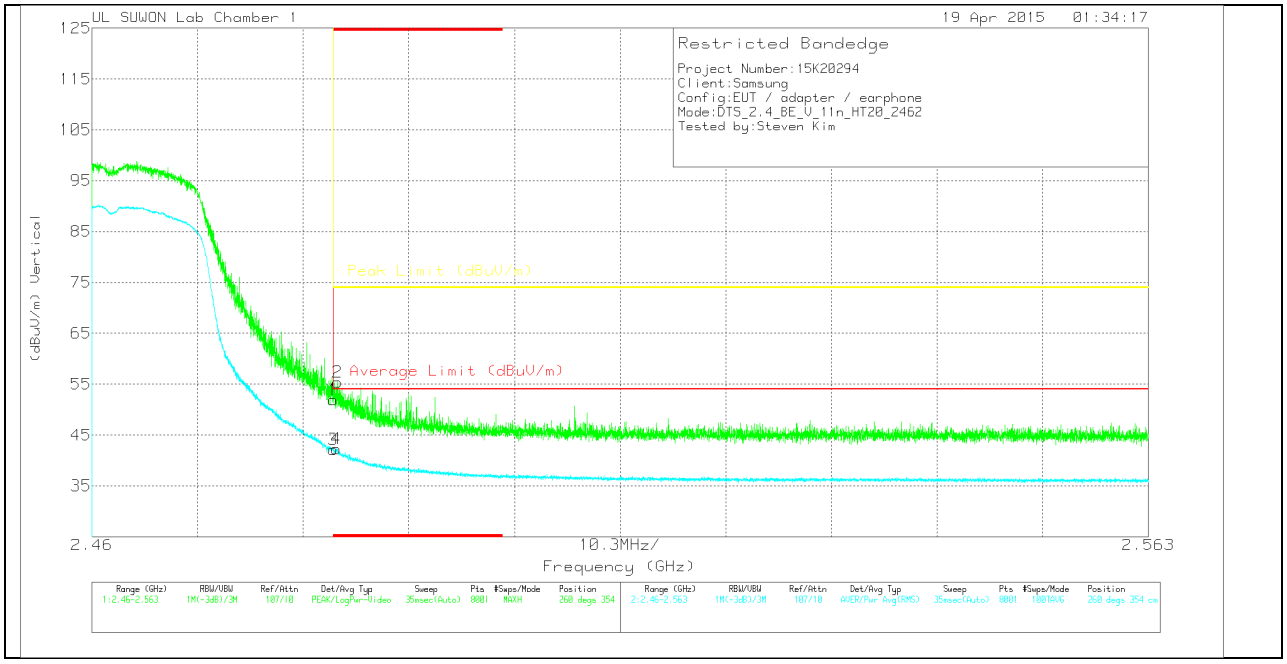
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.97	Pk	27.9	-22.6	0	53.27	-	-	74	-20.73	159	355	H
2	* 2.484	55.3	Pk	27.9	-22.6	0	60.6	-	-	74	-13.4	159	355	H
3	* 2.484	38.4	RMS	27.9	-22.6	.28	43.98	54	-10.02	-	-	159	355	H
4	* 2.484	38.59	RMS	27.9	-22.6	.28	44.17	54	-9.83	-	-	159	355	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	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	46.66	Pk	27.9	-22.6	0	51.96	-	-	74	-22.04	260	354	V
2	* 2.484	50.11	Pk	27.9	-22.6	0	55.41	-	-	74	-18.59	260	354	V
3	* 2.484	36.59	RMS	27.9	-22.6	.28	42.17	54	-11.83	-	-	260	354	V
4	* 2.484	36.69	RMS	27.9	-22.6	.28	42.27	54	-11.73	-	-	260	354	V

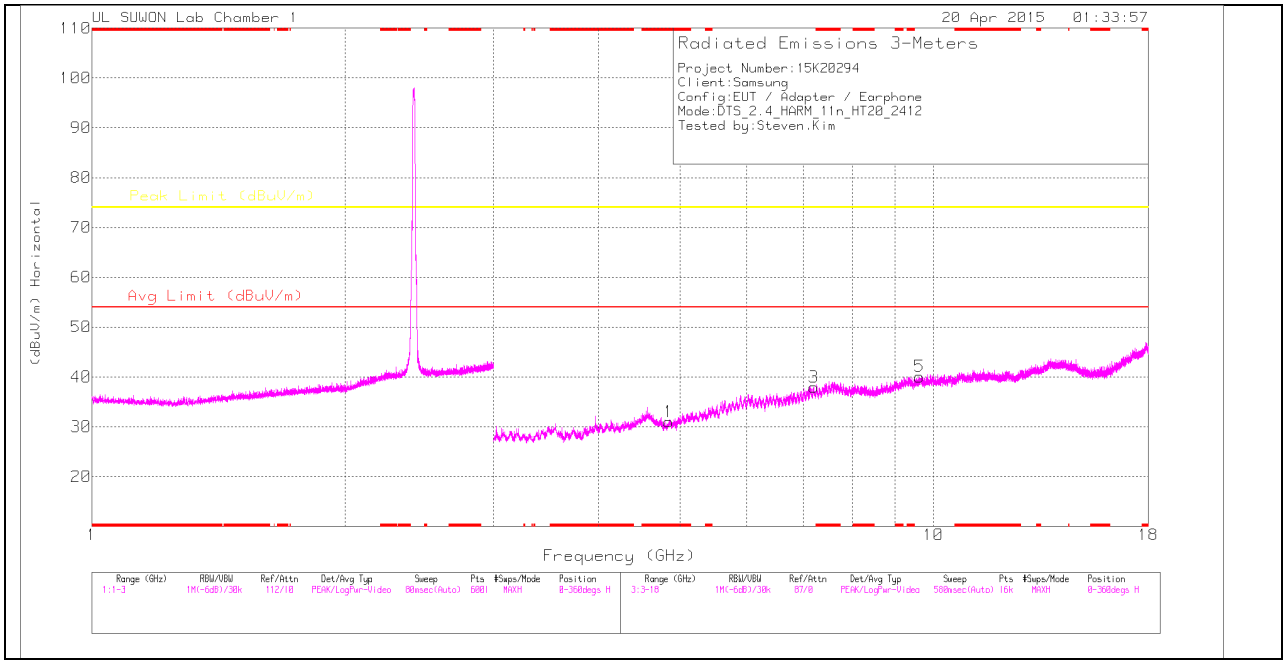
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

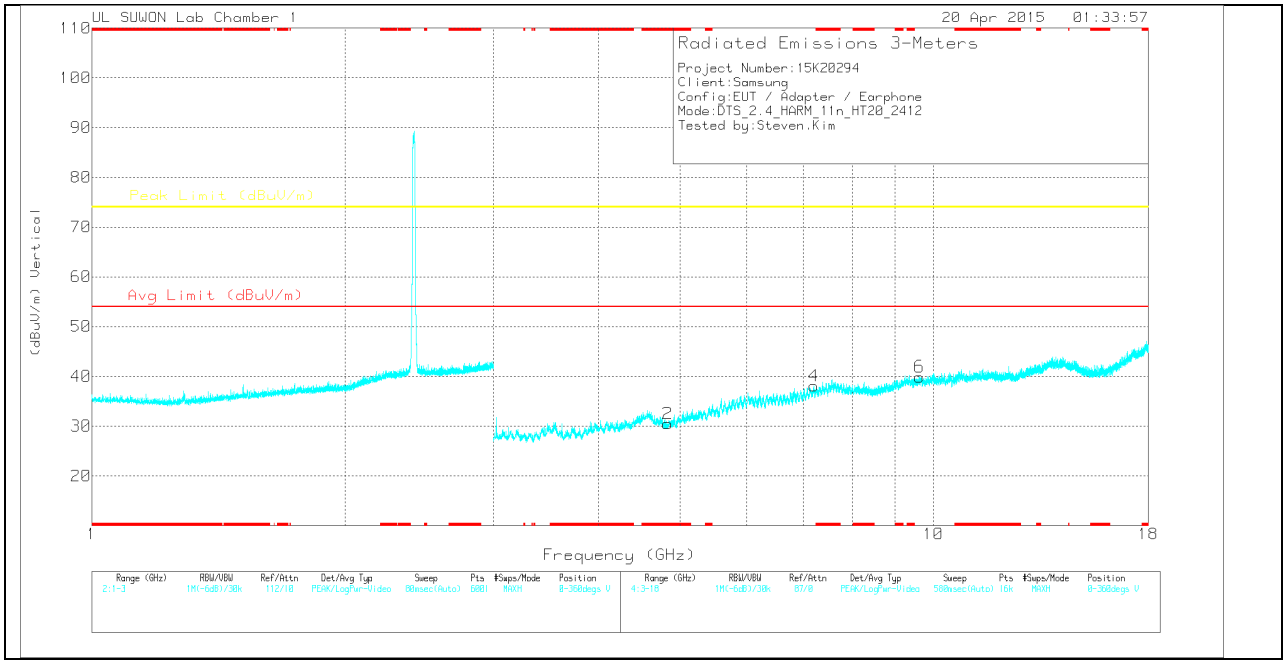
RMS - RMS detection

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

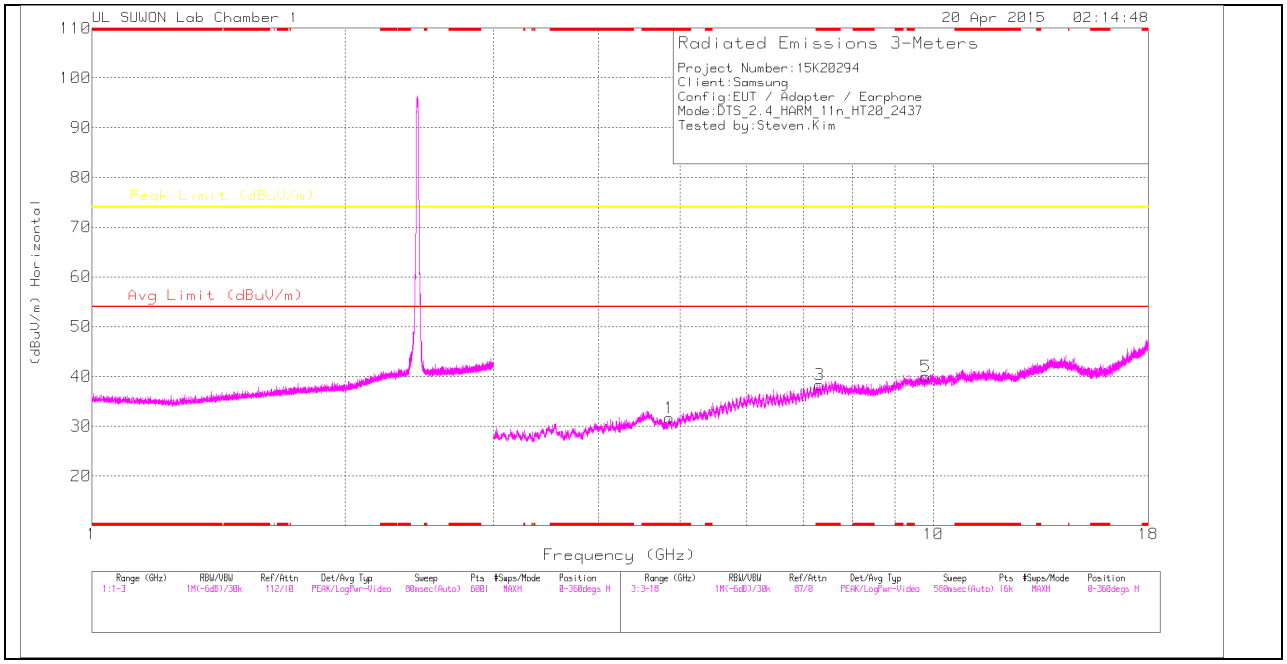
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.847	28.34	PK	32	-29.3	0	31.04	-	-	74	-42.96	0-360	200	H
3	7.208	26.33	PK	37	-25.4	0	37.93	-	-	-	-	0-360	100	H
5	9.631	23.35	PK	37.6	-20.9	0	40.05	-	-	-	-	0-360	200	H
2	* 4.834	28.03	PK	31.9	-29.4	0	30.53	-	-	74	-43.47	0-360	100	V
4	7.206	26.43	PK	37	-25.4	0	38.03	-	-	-	-	0-360	200	V
6	9.631	23.22	PK	37.6	-20.9	0	39.92	-	-	-	-	0-360	100	V

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

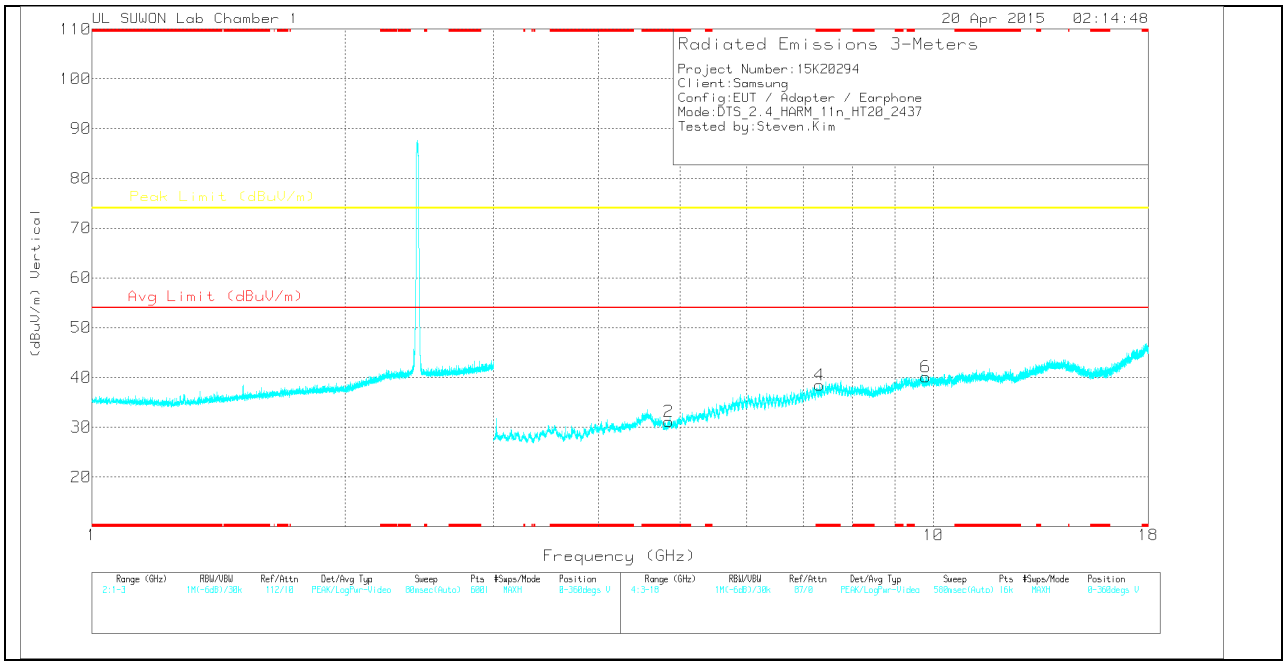
PK – Peak Detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

MID CHANNEL DATA

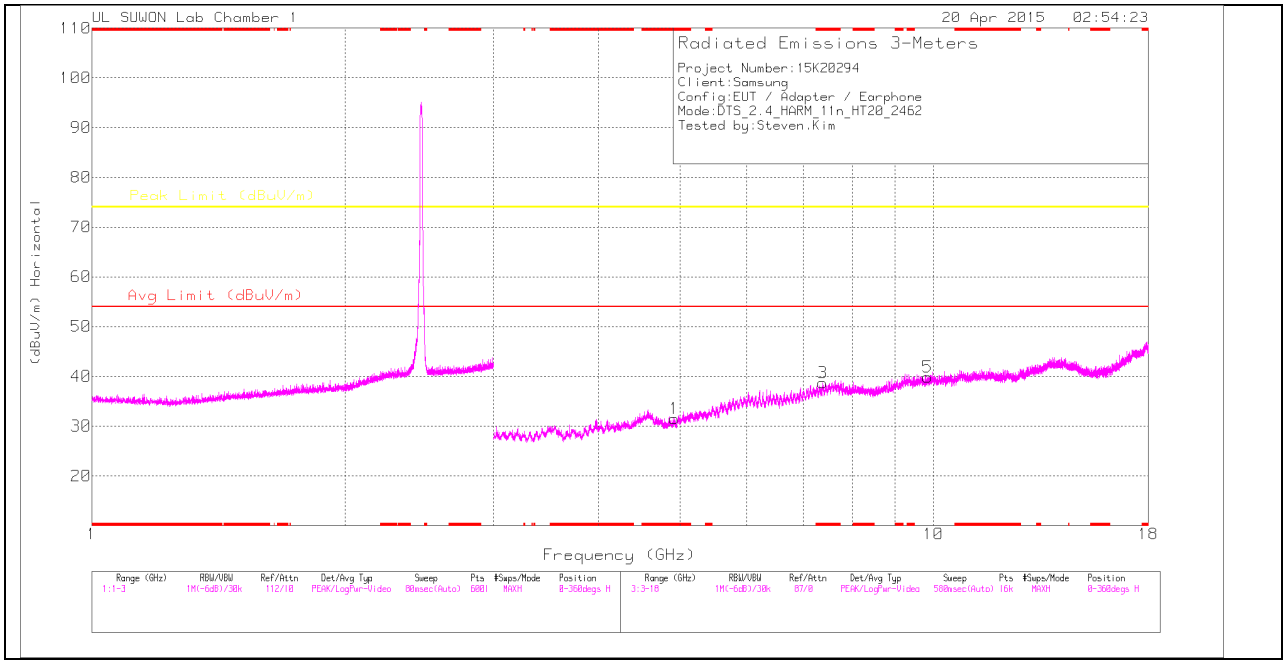
TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	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	* 4.854	28.89	PK	32	-29.2	0	31.69	-	-	74	-42.31	0-360	100	H
3	* 7.327	26.76	PK	37.2	-25.6	0	38.36	-	-	74	-35.64	0-360	200	H
5	9.79	24.44	PK	37.7	-22.2	0	39.94	-	-	-	-	0-360	100	H
2	* 4.85	28.35	PK	32	-29.2	0	31.15	-	-	74	-42.85	0-360	200	V
4	* 7.325	26.89	PK	37.2	-25.6	0	38.49	-	-	74	-35.51	0-360	100	V
6	9.783	24.63	PK	37.7	-22.2	0	40.13	-	-	-	-	0-360	100	V

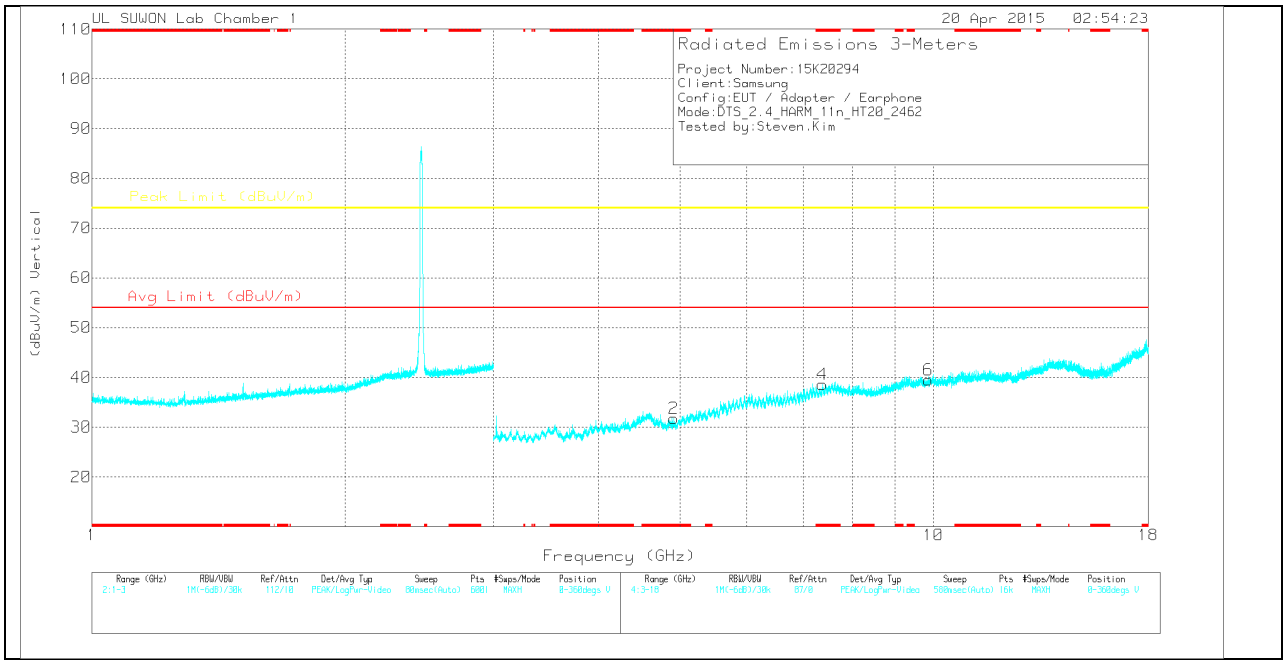
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3GHP	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	* 4.919	28.49	PK	32.1	-29.1	0	31.49	-	-	74	-42.51	0-360	200	H
3	* 7.387	26.63	PK	37.2	-25.1	0	38.73	-	-	74	-35.27	0-360	100	H
5	9.848	23.68	PK	37.8	-21.6	0	39.88	-	-	-	-	0-360	200	H
2	* 4.916	28.73	PK	32.1	-29.1	0	31.73	-	-	74	-42.27	0-360	200	V
4	* 7.379	26.58	PK	37.2	-25.2	0	38.58	-	-	74	-35.42	0-360	100	V
6	9.852	23.31	PK	37.8	-21.6	0	39.51	-	-	-	-	0-360	200	V

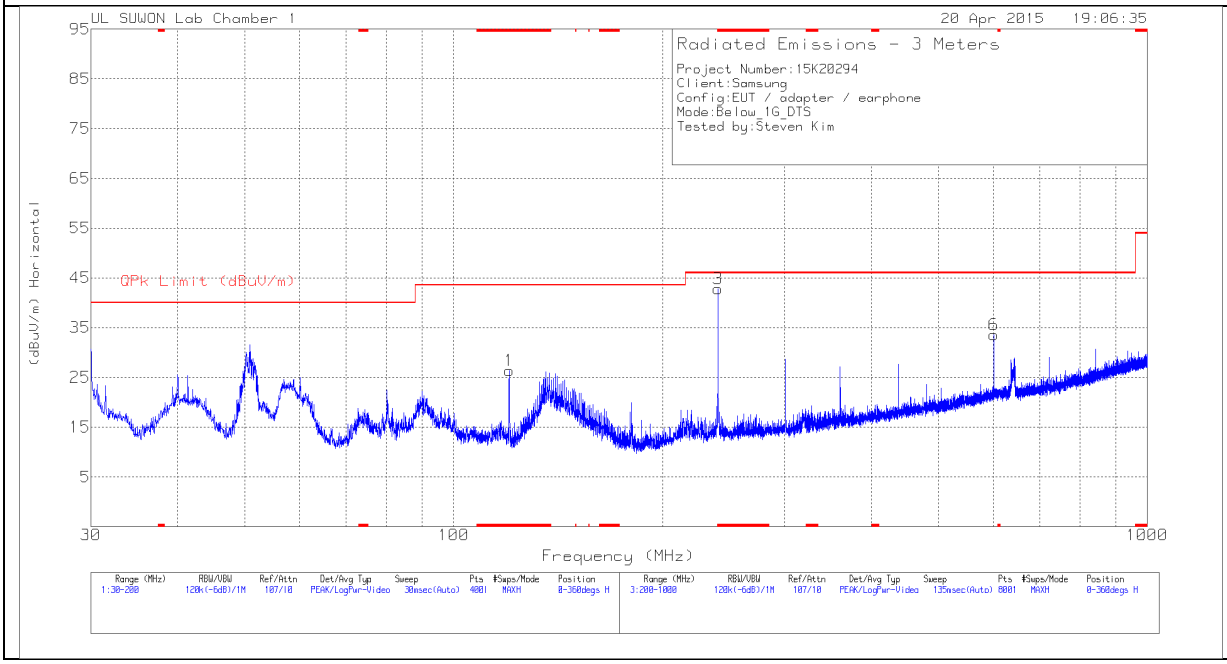
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

11.3. WORST-CASE BELOW 1 GHz

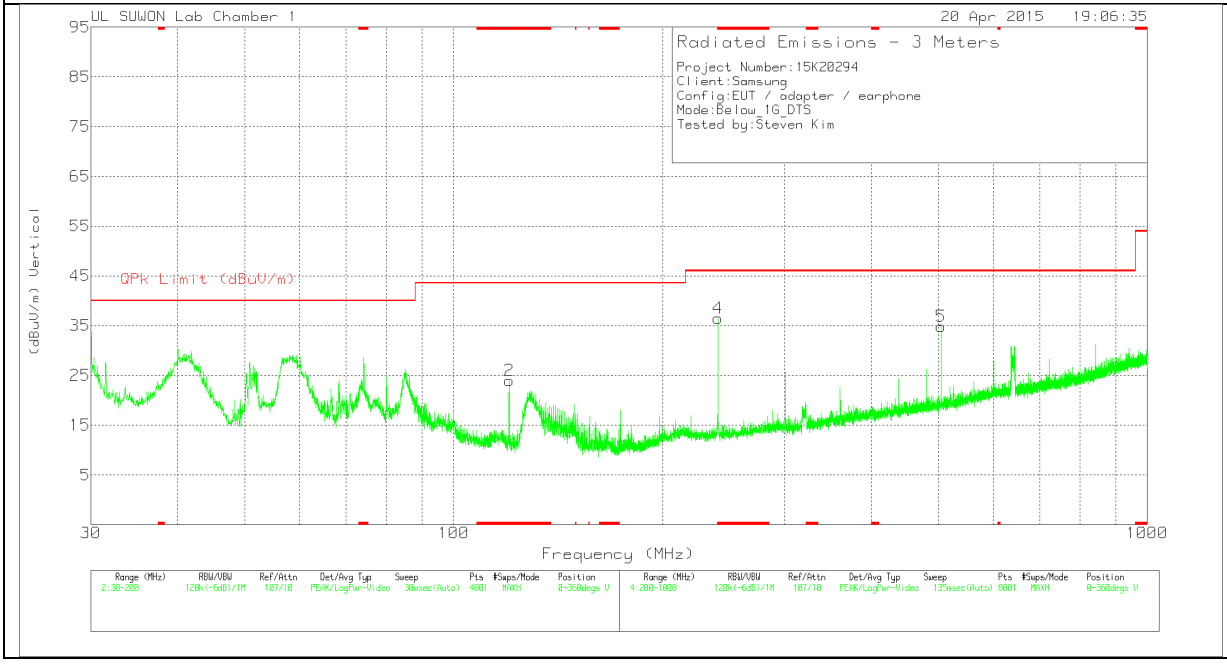
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 120.27	45.37	Pk	10	-29	0	26.37	43.52	-17.15	0-360	300	H
2	* 120.27	43.03	Pk	10	-29	0	24.03	43.52	-19.49	0-360	100	V
3	* 240.5	58.54	Pk	12.1	-27.8	0	42.84	46.02	-3.18	0-360	100	H
6	601.3	40.22	Pk	19.1	-25.7	0	33.62	46.02	-12.4	0-360	300	H
4	* 240.5	52.23	Pk	12.1	-27.8	0	36.53	46.02	-9.49	0-360	200	V
5	504	44	Pk	17.1	-26.2	0	34.9	46.02	-11.12	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 240.5008	58.1	Qp	12.1	-27.8	0	42.4	46.02	-3.62	202	105	H

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

Qp - Quasi-Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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 C63.4 2009.

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

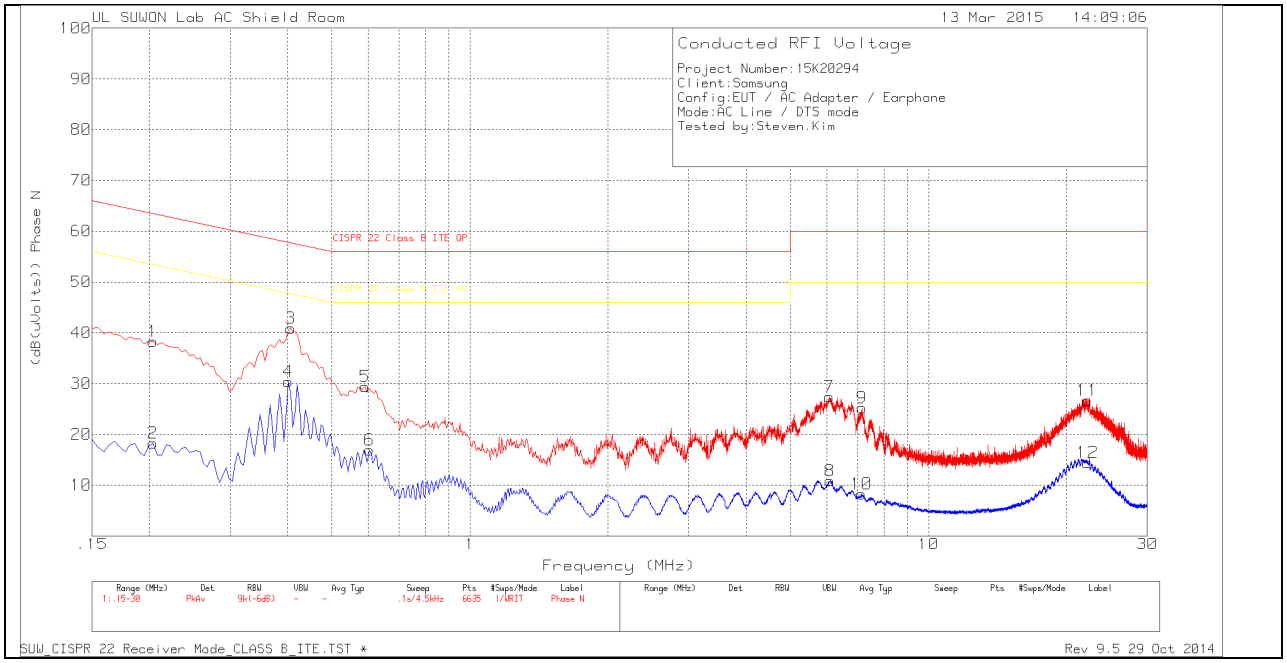
Line conducted data is recorded for both NEUTRAL and HOT lines.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

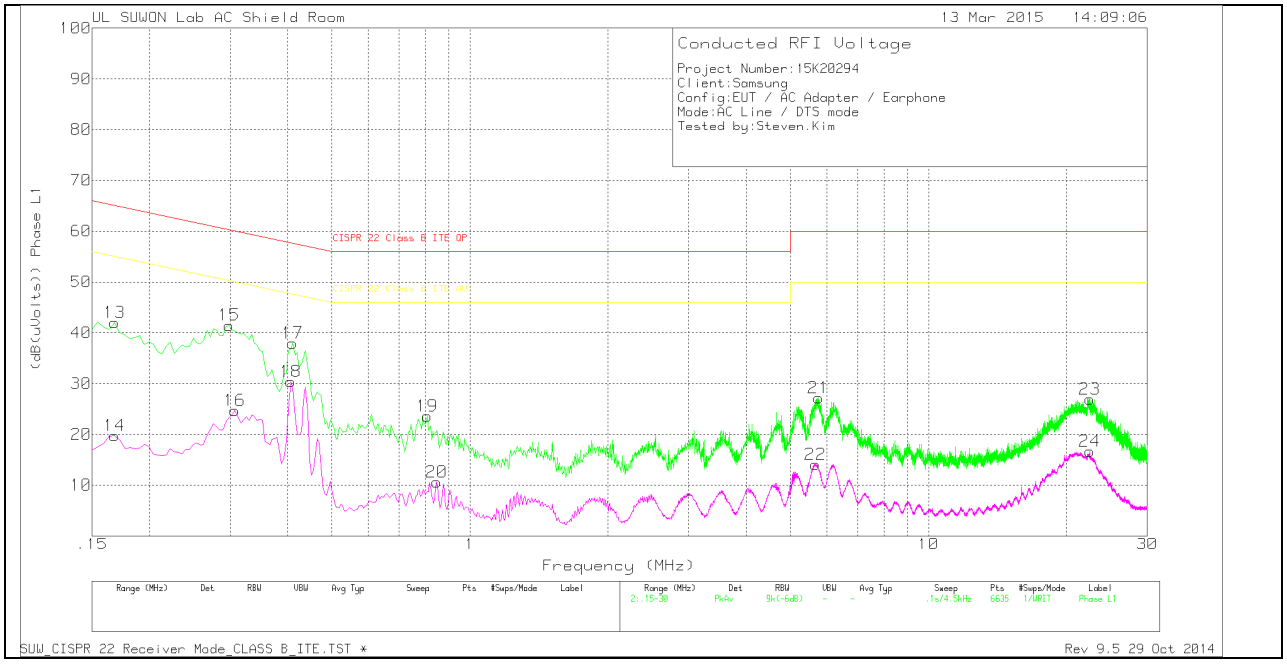
Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_N	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.204	28.37	Pk	9.9	0	38.27	63.45	-25.18	-	-
2	.204	8.36	Av	9.9	0	18.26	-	-	53.45	-35.19
3	.4065	30.86	Pk	10	0	40.86	57.72	-16.86	-	-
4	.402	20.37	Av	10	0	30.37	-	-	47.81	-17.44
5	.591	19.26	Pk	10.1	0	29.36	56	-26.64	-	-
6	.6045	6.83	Av	10.1	0	16.93	-	-	46	-29.07
7	6.0765	17.63	Pk	9.7	.1	27.43	60	-32.57	-	-
8	6.0945	1.06	Av	9.7	.1	10.86	-	-	50	-39.14
9	7.17	15.42	Pk	9.7	.1	25.22	60	-34.78	-	-
10	7.1475	-1.52	Av	9.7	.1	8.28	-	-	50	-41.72
11	22.227	16.7	Pk	9.8	.2	26.7	60	-33.3	-	-
12	22.227	4.45	Av	9.8	.2	14.45	-	-	50	-35.55

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_L 1	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.168	32.19	Pk	9.8	0	41.99	65.06	-23.07	-	-
14	.168	9.91	Av	9.8	0	19.71	-	-	55.06	-35.35
15	.2985	31.77	Pk	9.7	0	41.47	60.28	-18.81	-	-
16	.3075	14.89	Av	9.8	0	24.69	-	-	50.04	-25.35
17	.411	28.1	Pk	9.9	0	38	57.63	-19.63	-	-
18	.4065	20.45	Av	9.9	0	30.35	-	-	47.72	-17.37
19	.807	13.89	Pk	9.7	0	23.59	56	-32.41	-	-
20	.8475	.98	Av	9.6	0	10.58	-	-	46	-35.42
21	5.7525	17.71	Pk	9.4	.1	27.21	60	-32.79	-	-
22	5.6715	4.6	Av	9.4	.1	14.1	-	-	50	-35.9
23	22.44975	17.34	Pk	9.4	.2	26.94	60	-33.06	-	-
24	22.452	7.08	Av	9.4	.2	16.68	-	-	50	-33.32

Pk - Peak detector

Av - Average detection