



FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + Bluetooth/BLE, DTS b/g/n and ANT+

MODEL NUMBER : SM-G1600

FCC ID: A3LSMG1600

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Prepared for

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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth/BLE, DTS b/g/n and ANT+

MODEL NUMBER: SM-G1600

SERIAL NUMBER: R38H50RX02E (RADIATED);
R38H50RX09F (CONDUCTED)

DATE TESTED: JUN 03, 2016 - JUN 09, 2016

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

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
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CY Choi
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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 and ANSI C63.10-2009.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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 GSM/WCDMA/LTE Phone + Bluetooth/BLE, DTS b/g/n and ANT+. 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	17.48	55.98
	802.11g	14.47	27.99
	802.11n HT20	13.49	22.34

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of -3.61 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

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

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

Also, Test results of flip cover open configuration were more worst cases in comparison with test results of flip cover closed configuration. Therefore, all radiated and power line conducted tests were conducted in the condition of flip cover open configuration.

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
Charger	SAMSUNG	ETA0U83CBC	DK2H506HS/A	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	EHS64UCFBE	N/A	N/A

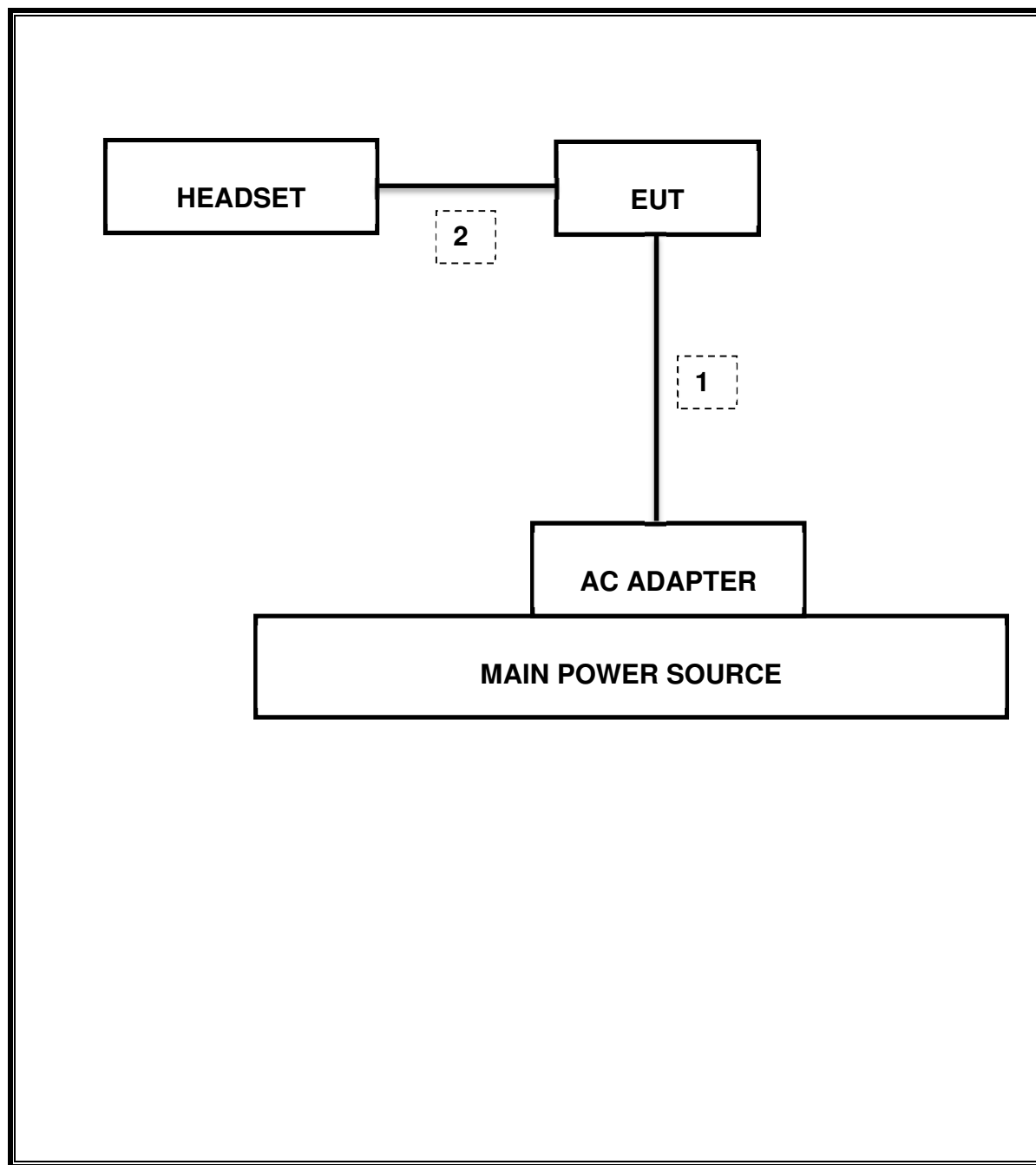
I/O CABLES

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 in hidden menu 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	00167211	09-20-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16
Attenuator	PASTERNAK	PE7087-10	A009	08-19-16

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 AVGPS-2 is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B [msec]	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	8.415	8.514	0.988	98.8%	0.00	0.010
802.11g	1.396	1.494	0.934	93.4%	0.29	0.716
802.11n HT20	1.296	1.395	0.929	92.9%	0.32	0.772



9. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	9.534 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-31.049 dBm
15.247	TX conducted output power	<30dBm		Pass	17.48 dBm
15.247	PSD	<8dBm		Pass	-14.97 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	42.58 dBuV (PK)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	50.52 dBuV/m (Av)

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 v03r05: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, the VBW $\geq 3 \times$ 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	10.045	0.5
Mid	2437	10.035	0.5
High	2462	9.534	0.5
Worst		9.534	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	16.353	0.5
Mid	2437	16.351	0.5
High	2462	16.346	0.5
Worst		16.346	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	17.575	0.5
Mid	2437	17.576	0.5
High	2462	17.581	0.5
Worst		17.575	0.5

10.1.4. 6 dB BANDWIDTH PLOTS

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

802.11g Mode Low CH	 KeySight Spectrum Analyzer - Sweep SA RL RF 50 D DC CORREC SENSE:INTI ALIGN: AUTO 01:02:31 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide Trig: Free Run Atten: 30 dB IF Gain: Low 10 dB/div Log Ref 20.00 dBm Center 2.41200 GHz Span 20.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.333 ms (20001 pts) MSG STATUS ΔMkr3 16.353 MHz 0.003 dB 3Δ2 -3.00 dBm
802.11g Mode Middle CH	 KeySight Spectrum Analyzer - Sweep SA RL RF 50 D DC CORREC SENSE:INTI ALIGN: AUTO 01:02:30 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide Trig: Free Run Atten: 30 dB IF Gain: Low 10 dB/div Log Ref 20.00 dBm Center 2.43700 GHz Span 20.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.333 ms (20001 pts) MSG STATUS ΔMkr3 16.351 MHz -0.050 dB 3Δ2 -4.42 dBm
802.11g Mode High CH	 KeySight Spectrum Analyzer - Sweep SA RL RF 50 D DC CORREC SENSE:INTI ALIGN: AUTO 01:03:24 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide Trig: Free Run Atten: 30 dB IF Gain: Low 10 dB/div Log Ref 20.00 dBm Center 2.46200 GHz Span 20.00 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.333 ms (20001 pts) MSG STATUS ΔMkr3 16.346 MHz 0.023 dB 3Δ2 -3.66 dBm



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	14.120
Mid	2437	14.075
High	2462	14.053
Worst		14.120

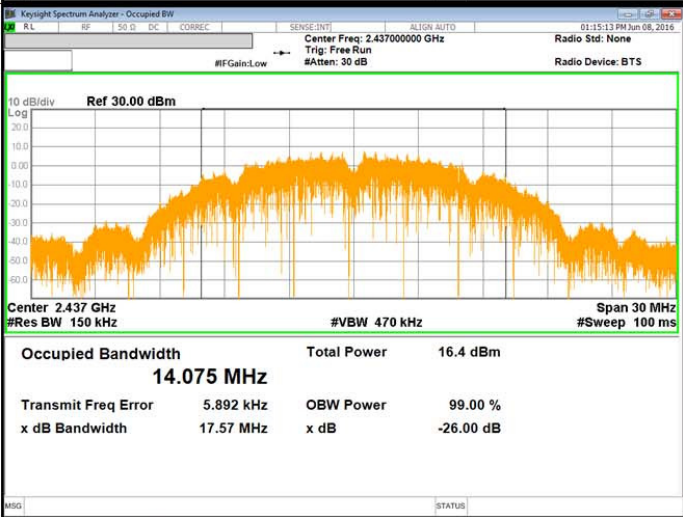
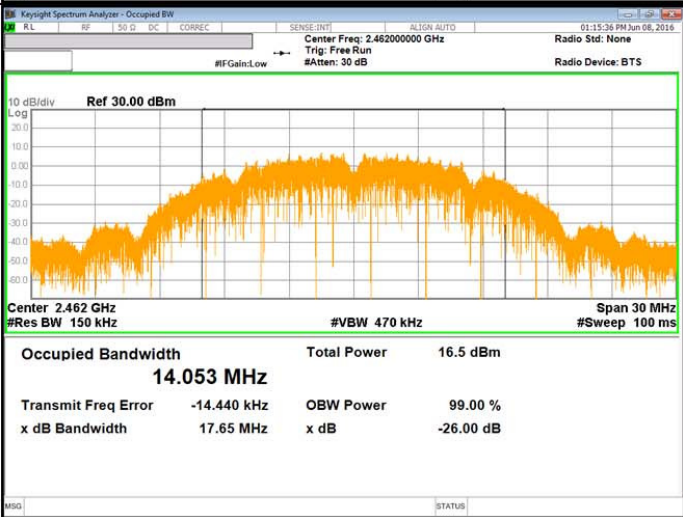
10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

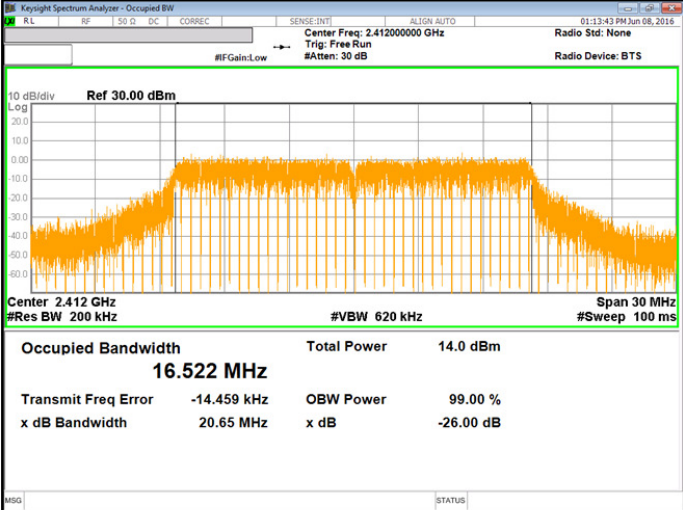
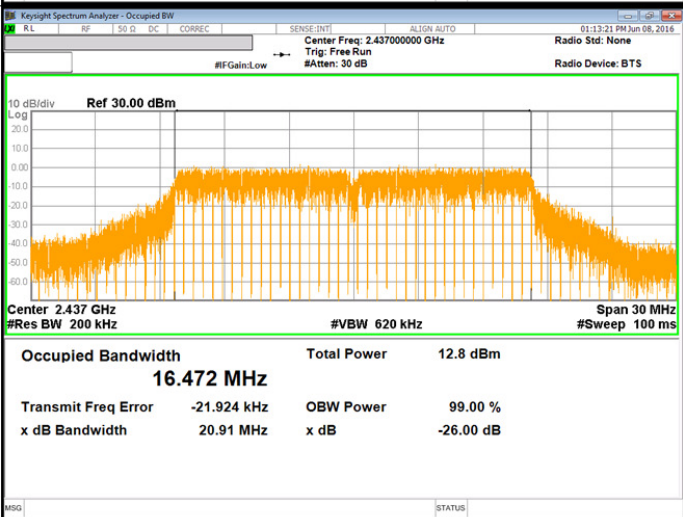
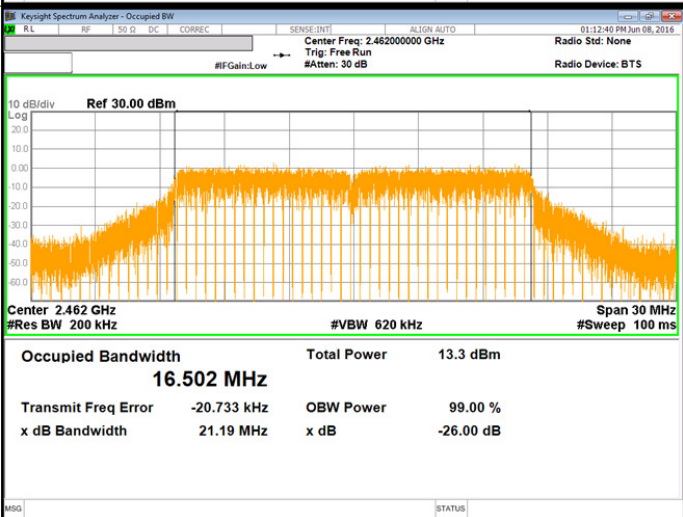
Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.522
Mid	2437	16.472
High	2462	16.502
Worst		16.522

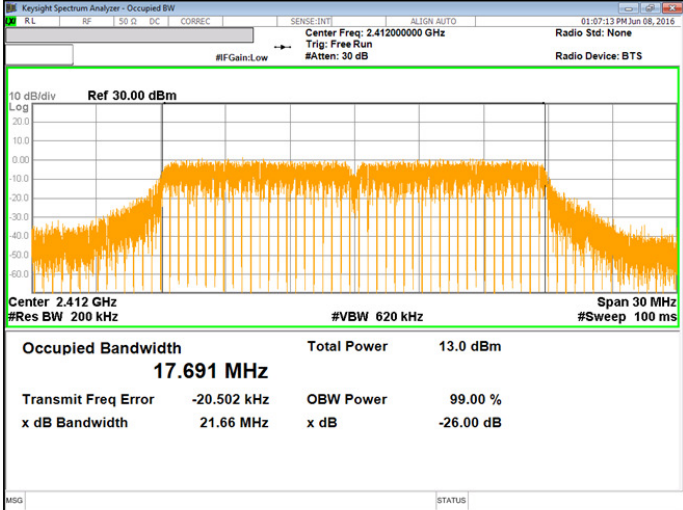
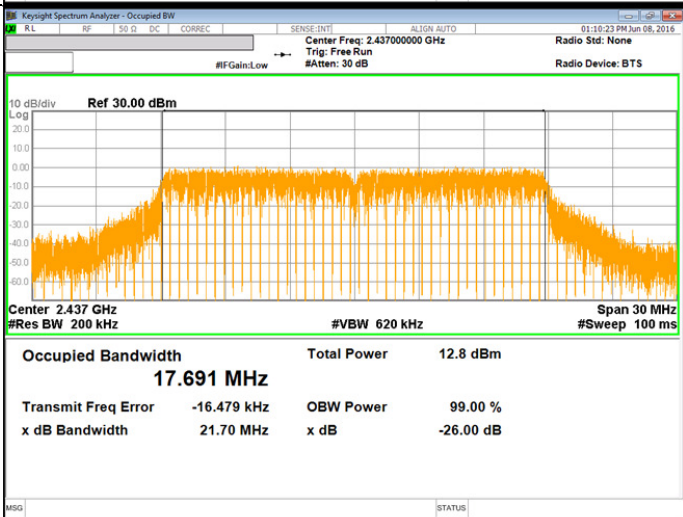
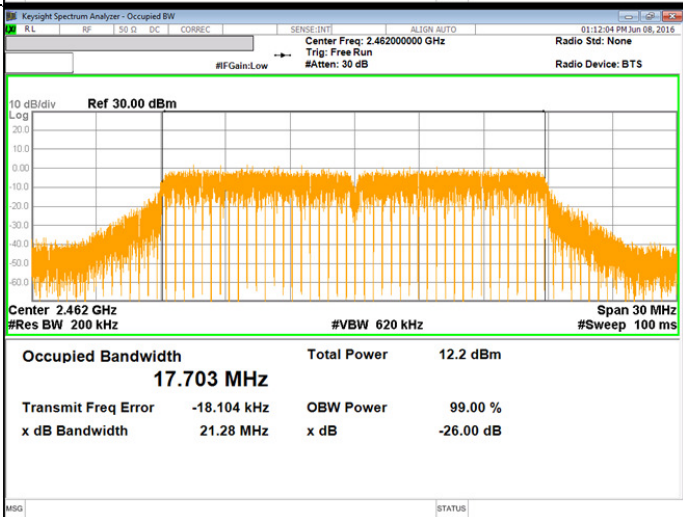
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.691
Mid	2437	17.691
High	2462	17.703
Worst		17.703

10.2.4. 99% BANDWIDTH PLOTS

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

802.11g Mode Low CH	 KeySight Spectrum Analyzer - Occupied BW Center Freq: 2.412000000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.412 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.522 MHz Total Power 14.0 dBm Transmit Freq Error -14.459 kHz OBW Power 99.00 % x dB Bandwidth 20.65 MHz x dB -26.00 dB
802.11g Mode Middle CH	 KeySight Spectrum Analyzer - Occupied BW Center Freq: 2.437000000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.437 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.472 MHz Total Power 12.8 dBm Transmit Freq Error -21.924 kHz OBW Power 99.00 % x dB Bandwidth 20.91 MHz x dB -26.00 dB
802.11g Mode High CH	 KeySight Spectrum Analyzer - Occupied BW Center Freq: 2.462000000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.462 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.502 MHz Total Power 13.3 dBm Transmit Freq Error -20.733 kHz OBW Power 99.00 % x dB Bandwidth 21.19 MHz x dB -26.00 dB

802.11n Mode Low CH	 Center Freq: 2.41200000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.412 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.691 MHz Total Power 13.0 dBm Transmit Freq Error -20.502 kHz OBW Power 99.00 % x dB Bandwidth 21.66 MHz x dB -26.00 dB
802.11n Mode Middle CH	 Center Freq: 2.43700000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.437 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.691 MHz Total Power 12.8 dBm Transmit Freq Error -16.479 kHz OBW Power 99.00 % x dB Bandwidth 21.70 MHz x dB -26.00 dB
802.11n Mode High CH	 Center Freq: 2.46200000 GHz Trig: Free Run #Atten: 30 dB Radio Std: None Radio Device: BTS Ref 30.00 dBm Center 2.462 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.703 MHz Total Power 12.2 dBm Transmit Freq Error -18.104 kHz OBW Power 99.00 % x dB Bandwidth 21.28 MHz x dB -26.00 dB

10.3. OUTPUT POWER

LIMITS

FCC §15.247

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

DIRECTIONAL ANTENNA GAIN

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

TEST PROCEDURE

The transmitter output is connected to a power meter.

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

Duty cycle correction factor is already added to the average output power results for duty cycle factor < 98%. (802.11g, 802.11n mode)

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	-3.61	30.00	30.00	36.00	30.00
Mid	2437	-3.61	30.00	30.00	36.00	30.00
High	2462	-3.61	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	17.48	17.48	36.00	-18.52
Mid	2437	17.04	17.04	36.00	-18.96
High	2462	16.76	16.76	36.00	-19.24
Worst			17.48	36.00	-18.52

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	-3.61	30.00	30.00	36.00	30.00
Mid	2437	-3.61	30.00	30.00	36.00	30.00
High	2462	-3.61	30.00	30.00	36.00	30.00
Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]	
Low	2412	14.47	14.47	36.00	-21.53	
Mid	2437	13.66	13.66	36.00	-22.34	
High	2462	13.95	13.95	36.00	-22.05	
Worst			14.47	36.00	-21.53	

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	-3.61	30.00	30.00	36.00	30.00
Mid	2437	-3.61	30.00	30.00	36.00	30.00
High	2462	-3.61	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	13.46	13.46	36.00	-22.54
Mid	2437	13.49	13.49	36.00	-22.51
High	2462	12.85	12.85	36.00	-23.15
Worst			13.49	36.00	-22.51

10.4. PSD

LIMITS

FCC §15.247

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

TEST PROCEDURE

Power Spectral Density was performed utilizing the "Method AVGPS-1" under KDB558074 D01 DTS Meas Guidance v03r05

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-14.97	0.00	-14.97	8.00	-22.97
Mid	2437	-15.99	0.00	-15.99	8.00	-23.99
High	2462	-15.409	0.00	-15.41	8.00	-23.41

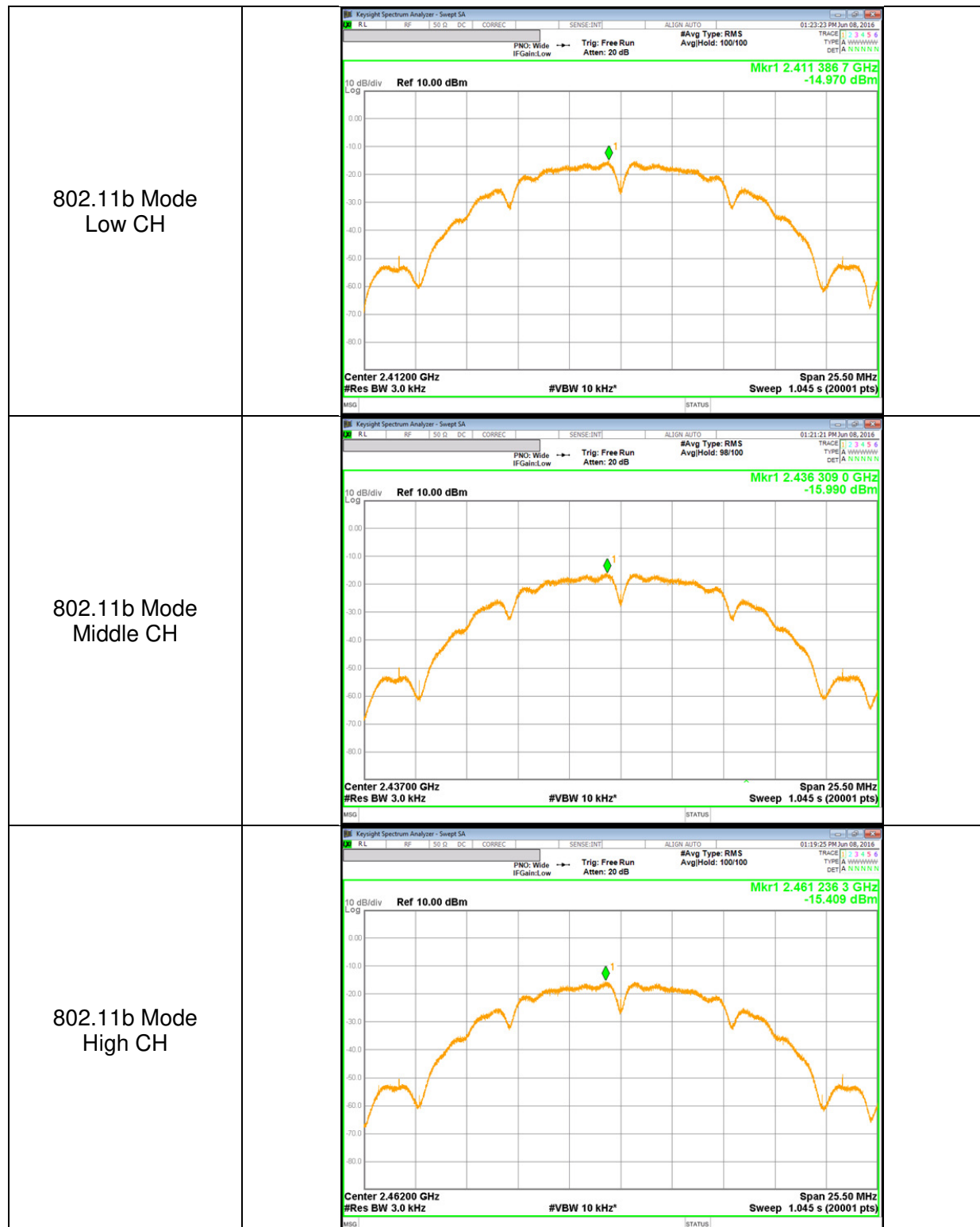
10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

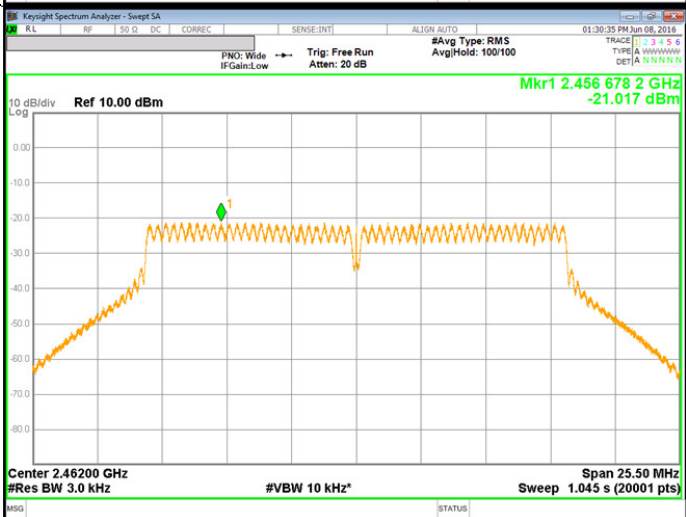
Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-20.095	0.29	-19.81	8.00	-28.10
Mid	2437	-21.692	0.29	-21.40	8.00	-29.69
High	2462	-21.017	0.29	-20.73	8.00	-29.02

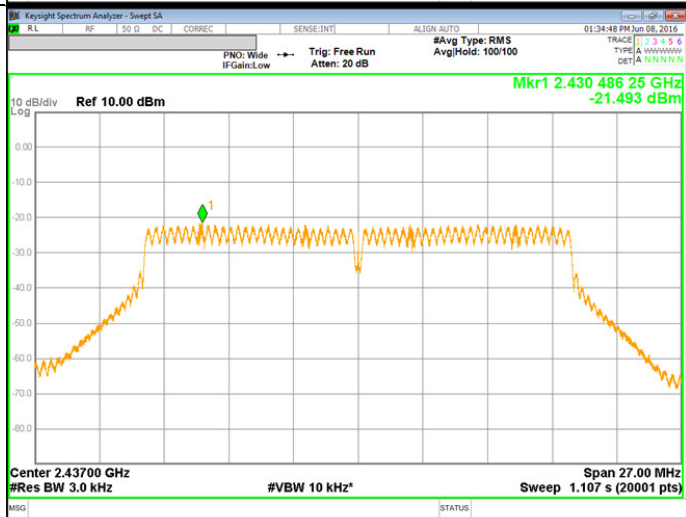
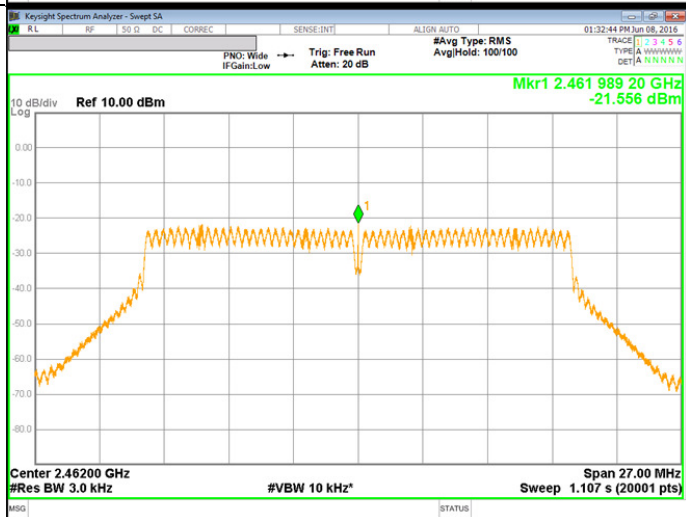
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-21.484	0.32	-21.16	8.00	-29.48
Mid	2437	-21.493	0.32	-21.17	8.00	-29.49
High	2462	-21.556	0.32	-21.24	8.00	-29.56

10.4.4. PSD PLOTS



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

802.11n Mode Low CH	 Key: Keysight Spectrum Analyzer - Sweep SA RL RF 50 Ω DC CORREC SENSE:INTI ALIGN: AUTO 01:34:53 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide IF Gain: Low Trig: Free Run Atten: 20 dB Mkr1 2.407 935 15 GHz -21.484 dBm 10 dB/div Log Ref 10.00 dBm Center 2.41200 GHz Span 27.00 MHz #Res BW 3.0 kHz #VBW 10 kHz* Sweep 1.107 s (20001 pts) MSG [STATUS]
802.11n Mode Middle CH	 Key: Keysight Spectrum Analyzer - Sweep SA RL RF 50 Ω DC CORREC SENSE:INTI ALIGN: AUTO 01:34:48 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide IF Gain: Low Trig: Free Run Atten: 20 dB Mkr1 2.430 486 25 GHz -21.493 dBm 10 dB/div Log Ref 10.00 dBm Center 2.43700 GHz Span 27.00 MHz #Res BW 3.0 kHz #VBW 10 kHz* Sweep 1.107 s (20001 pts) MSG [STATUS]
802.11n Mode High CH	 Key: Keysight Spectrum Analyzer - Sweep SA RL RF 50 Ω DC CORREC SENSE:INTI ALIGN: AUTO 01:32:44 PM Jun 08, 2016 #Avg Type: RMS AvgHold: 100/100 PNO: Wide IF Gain: Low Trig: Free Run Atten: 20 dB Mkr1 2.461 989 20 GHz -21.556 dBm 10 dB/div Log Ref 10.00 dBm Center 2.46200 GHz Span 27.00 MHz #Res BW 3.0 kHz #VBW 10 kHz* Sweep 1.107 s (20001 pts) MSG [STATUS]

10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

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

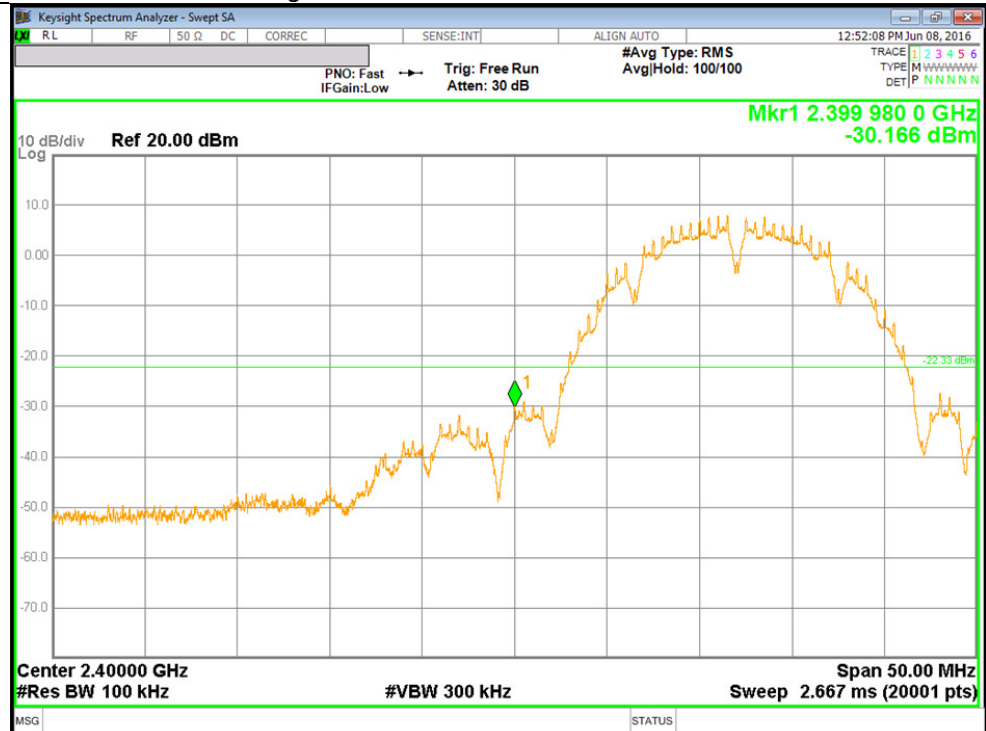
TEST PROCEDURE

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

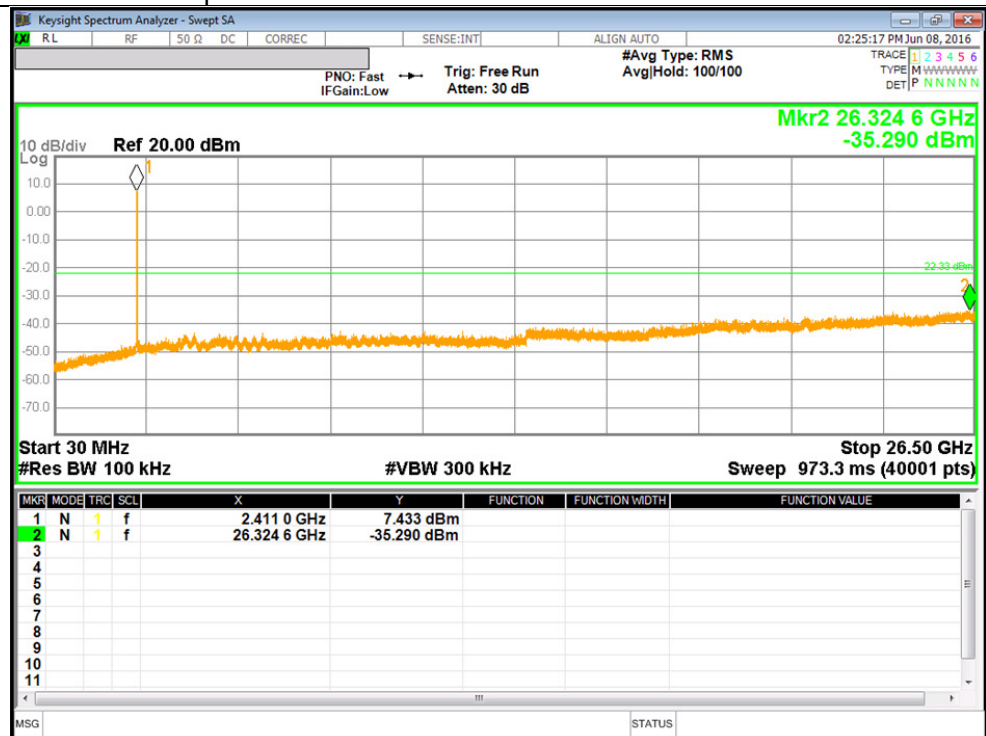
RESULTS

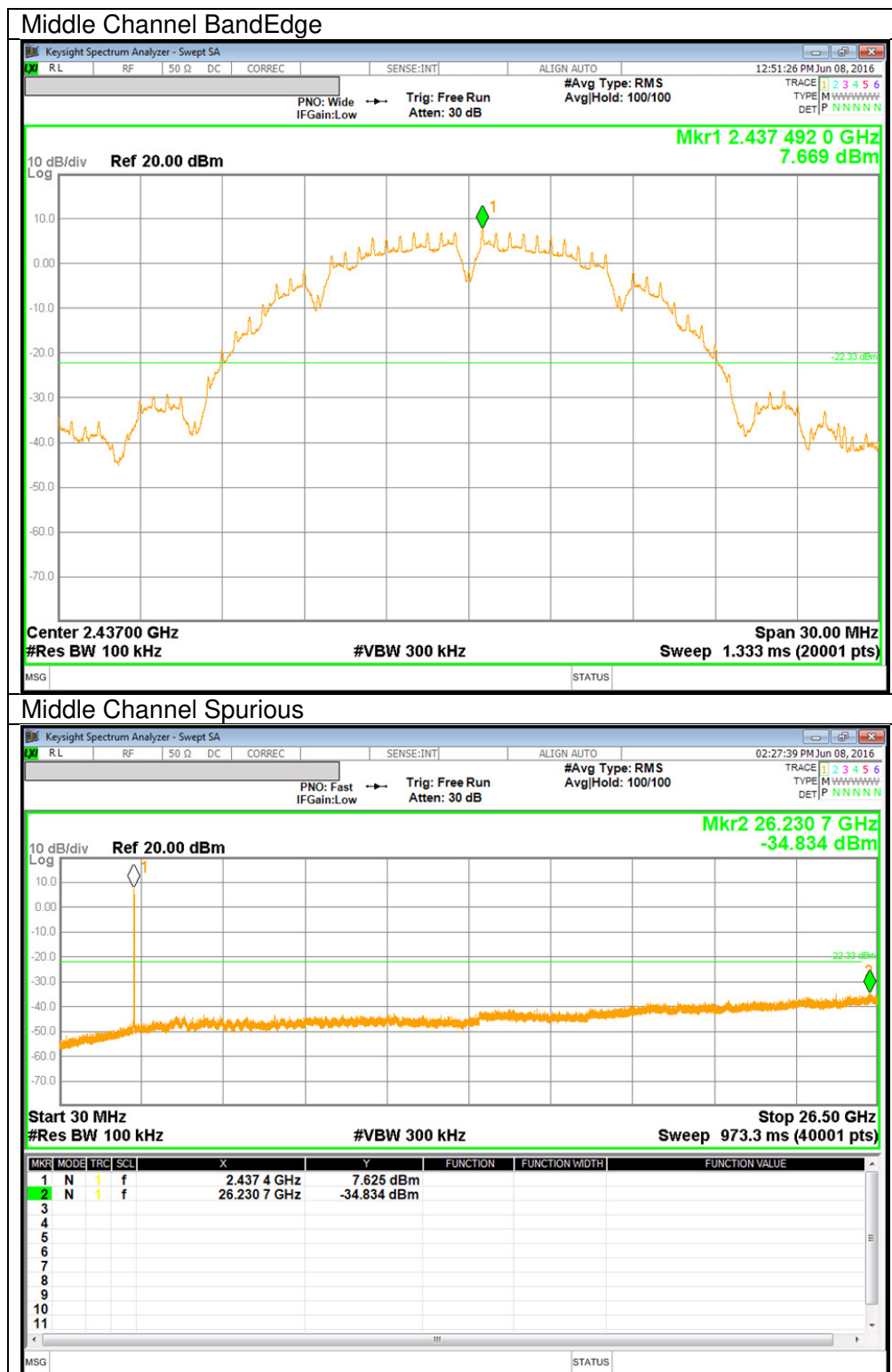
10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

Low Channel BandEdge



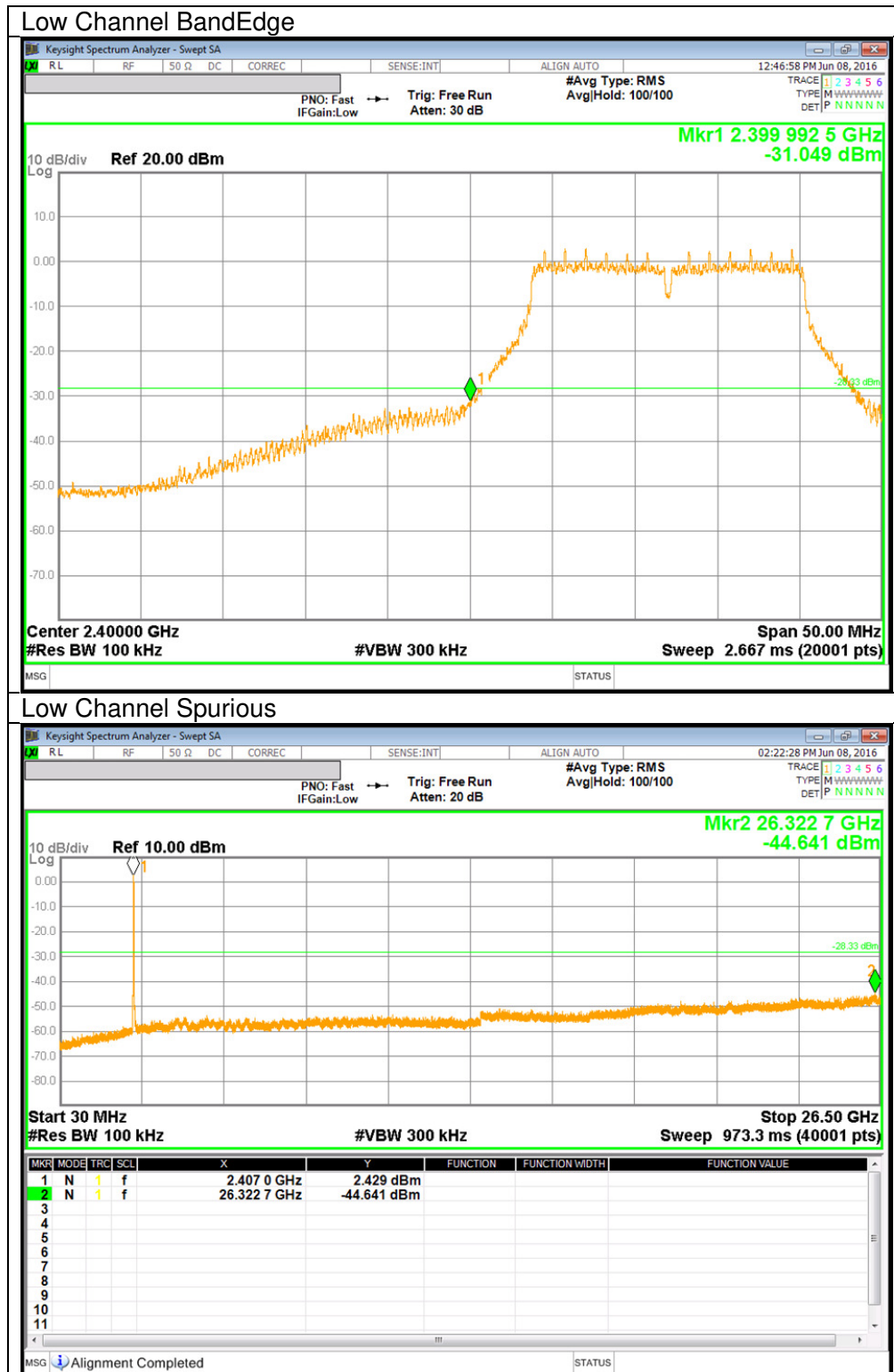
Low Channel Spurious

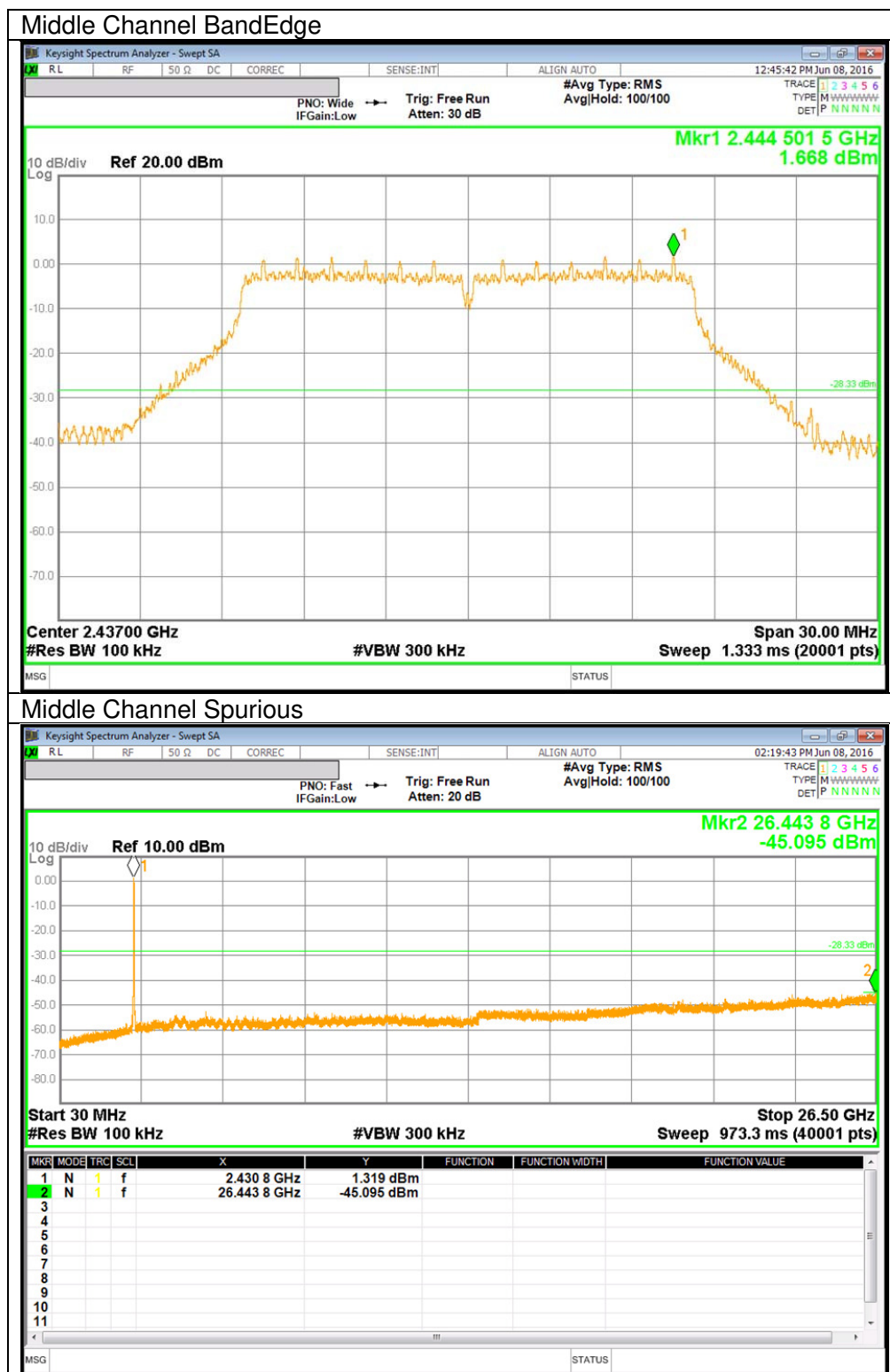


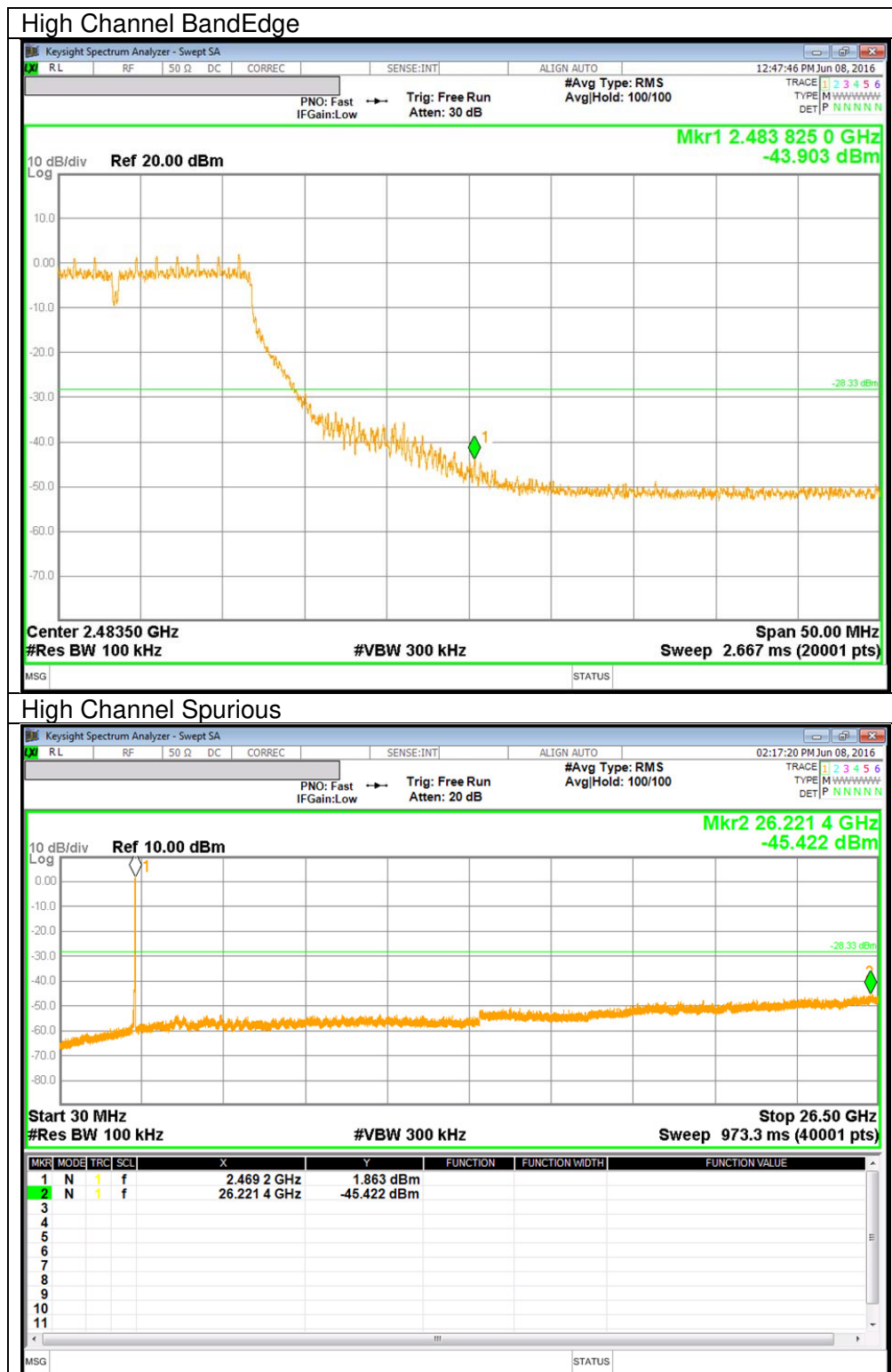




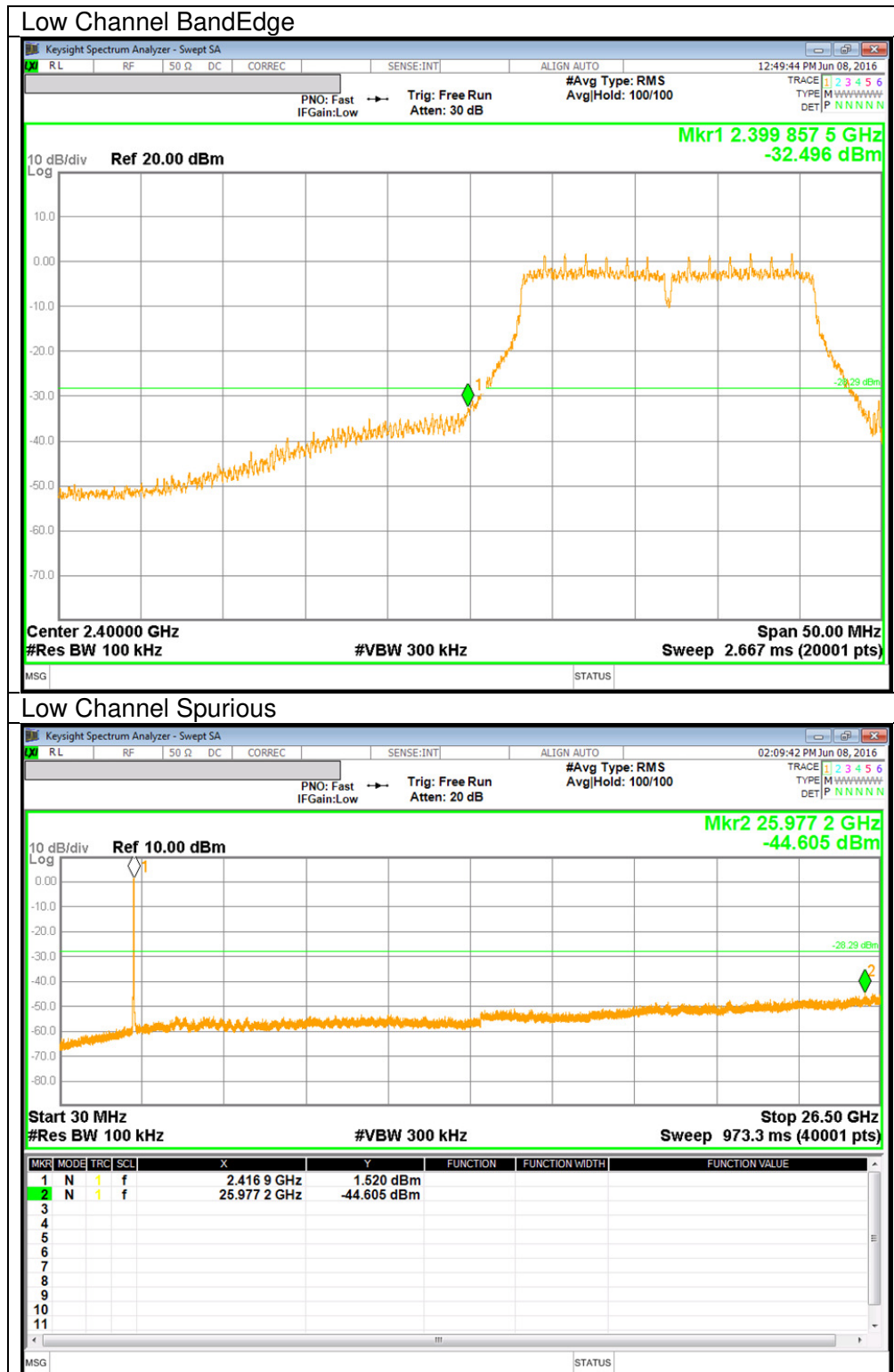
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND







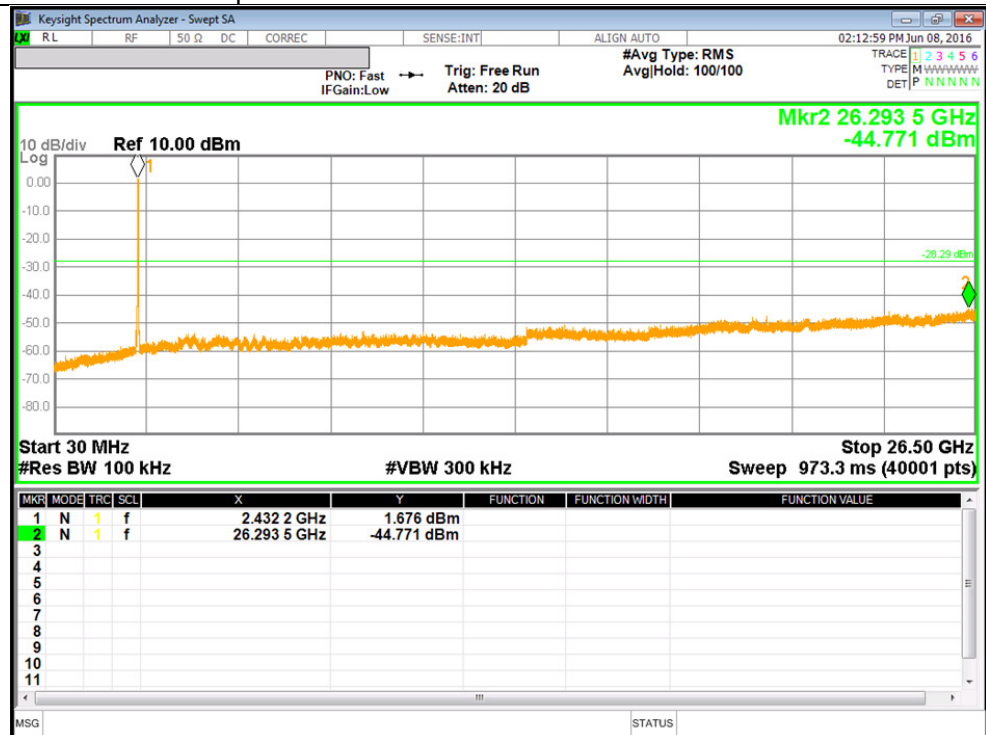
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND



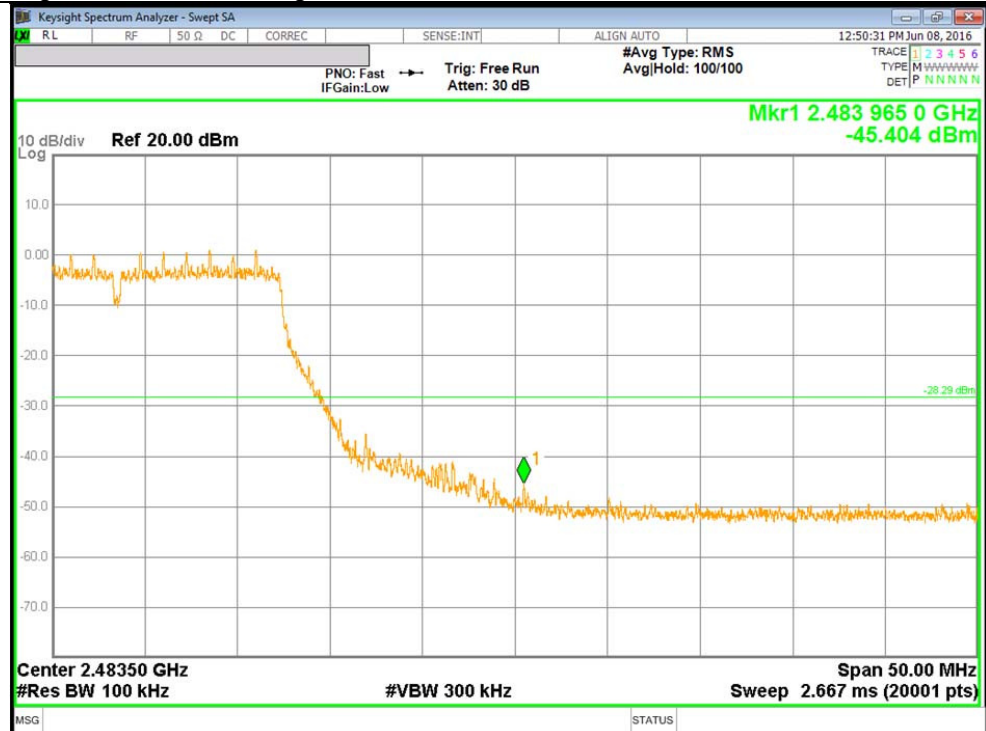
Middle Channel BandEdge



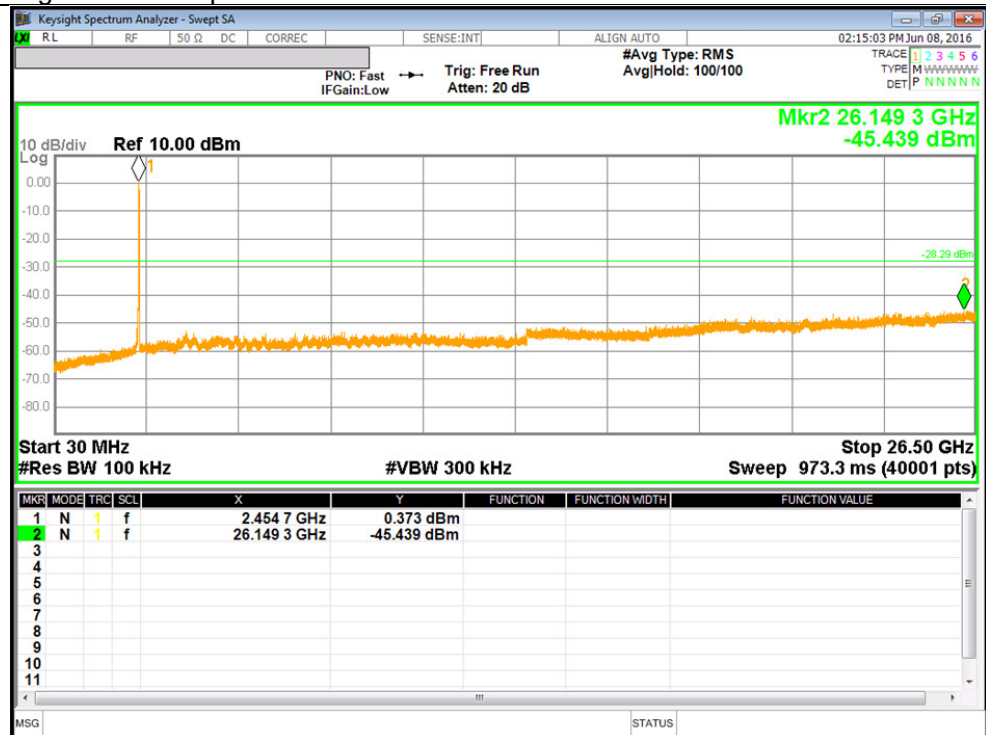
Middle Channel Spurious



High Channel BandEdge



High Channel Spurious



11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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. 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 = $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.29dB; N mode = 0.32dB.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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

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

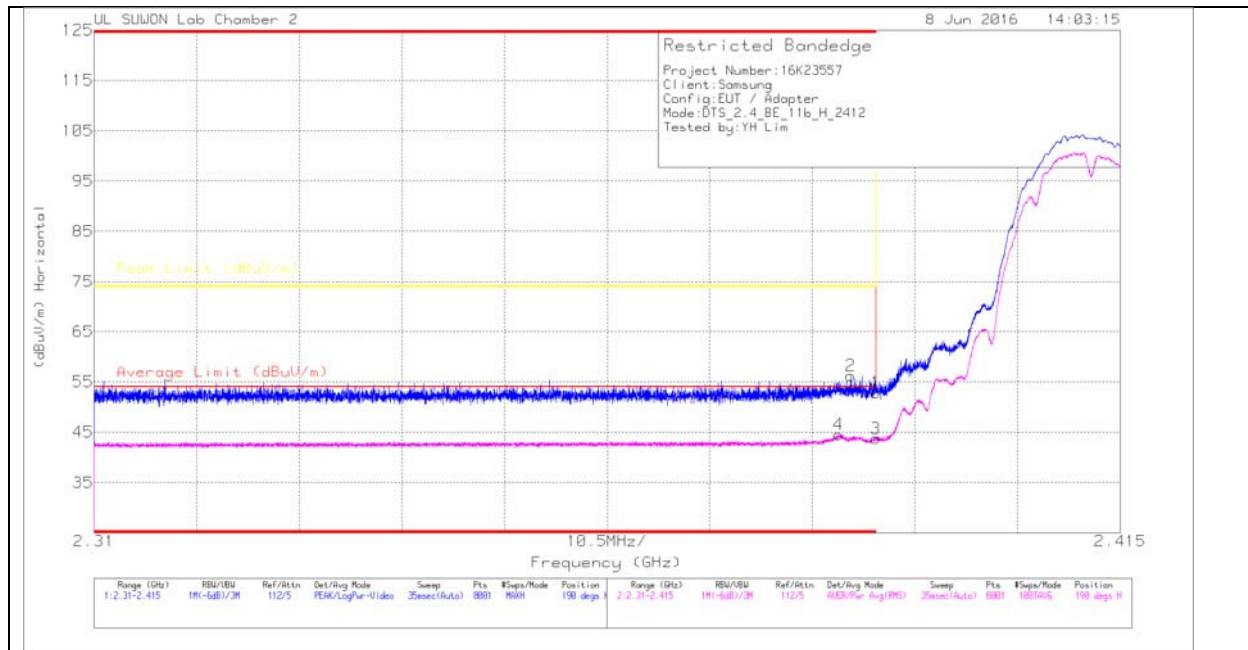
Formula for converting the filed strength from uV/m to dBuV/m is:
 $\text{Limit (dBuV/m)} = 20 \log \text{limit (uV/m)}$

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

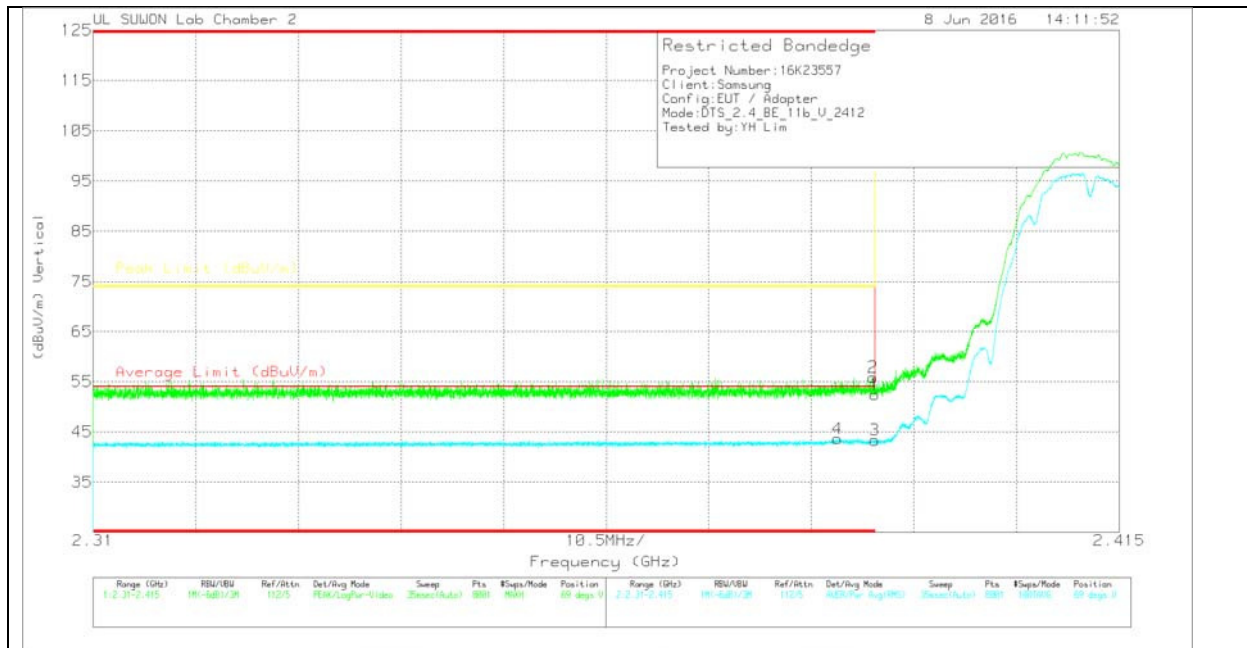
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.62	Pk	31.7	-19.5	0	52.82	-	-	74	-21.18	190	386	H
2	* 2.387	44.02	Pk	31.7	-19.5	0	56.22	-	-	74	-17.78	190	386	H
3	* 2.39	31.57	RMS	31.7	-19.5	0	43.77	54	-10.23	-	-	190	386	H
4	* 2.386	32.34	RMS	31.7	-19.5	0	44.54	54	-9.46	-	-	190	386	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(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.28	Pk	31.7	-19.5	0	52.48	-	-	74	-21.52	69	322	V
2	* 2.39	43.66	Pk	31.7	-19.5	0	55.86	-	-	74	-18.14	69	322	V
3	* 2.39	31.17	RMS	31.7	-19.5	0	43.37	54	-10.63	-	-	69	322	V
4	* 2.386	31.46	RMS	31.7	-19.5	0	43.66	54	-10.34	-	-	69	322	V

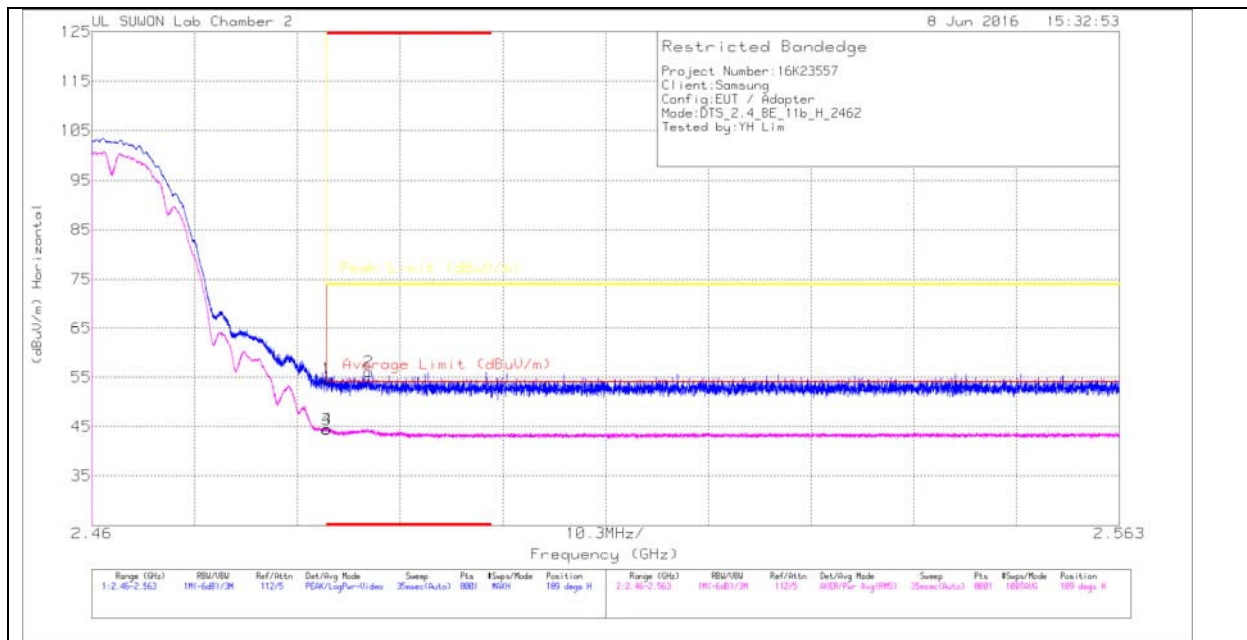
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

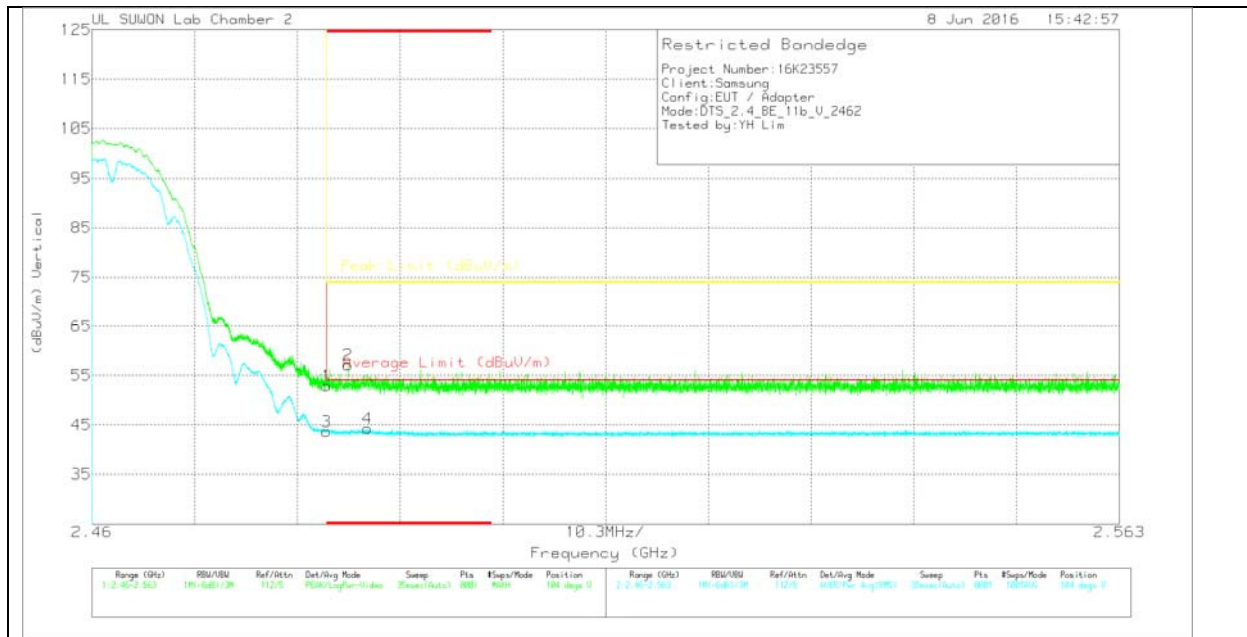
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.35	Pk	31.8	-19.4	0	54.75	-	-	74	-19.25	189	308	H
2	* 2.488	43.71	Pk	31.8	-19.4	0	56.11	-	-	74	-17.89	189	308	H
3	* 2.484	31.96	RMS	31.8	-19.4	0	44.36	54	-9.64	-	-	189	308	H
4	* 2.484	32.15	RMS	31.8	-19.4	0	44.55	54	-9.45	-	-	189	308	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(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.49	Pk	31.8	-19.4	0	52.89	-	-	74	-21.11	104	308	V
2	* 2.486	44.74	Pk	31.8	-19.4	0	57.14	-	-	74	-16.86	104	308	V
3	* 2.484	31.28	RMS	31.8	-19.4	0	43.68	54	-10.32	-	-	104	308	V
4	* 2.488	31.86	RMS	31.8	-19.4	0	44.26	54	-9.74	-	-	104	308	V

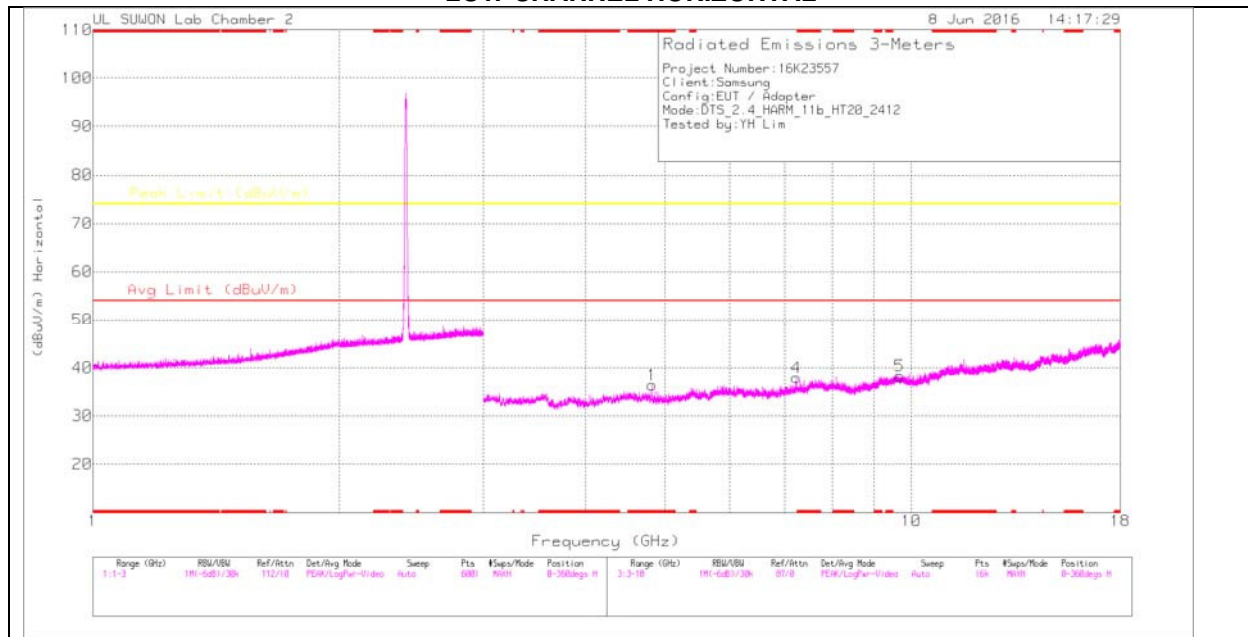
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

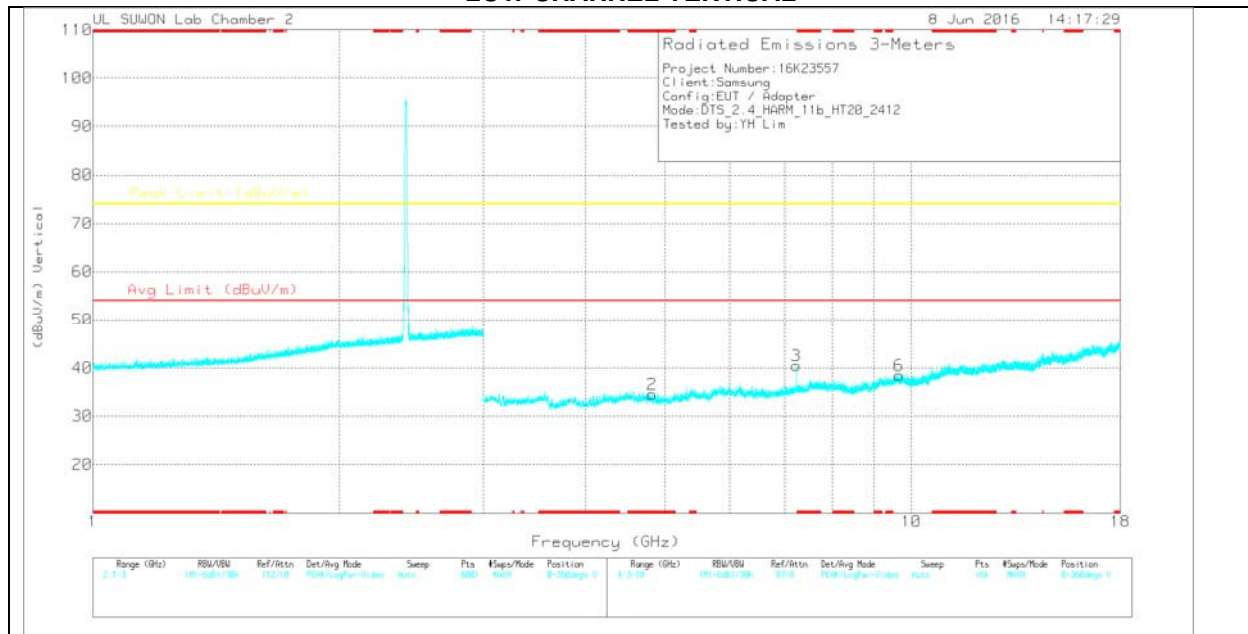
RMS - RMS detection

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(0016872 4)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.823	27.89	Pk	33.9	-25.3	0	36.49	-	-	74	-37.51	0-360	100	H
4	7.234	25.21	Pk	35.8	-23	0	38.01	-	-	74	-35.99	0-360	200	H
5	9.666	20.48	Pk	36.9	-19.1	0	38.28	-	-	74	-35.72	0-360	200	H
2	* 4.823	25.9	Pk	33.9	-25.3	0	34.5	-	-	74	-39.5	0-360	200	V
3	7.234	27.66	Pk	35.8	-23	0	40.46	-	-	74	-33.54	0-360	200	V
6	9.652	20.6	Pk	36.9	-19	0	38.5	-	-	74	-35.5	0-360	100	V

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

Pk – Peak detector

Radiated Emissions

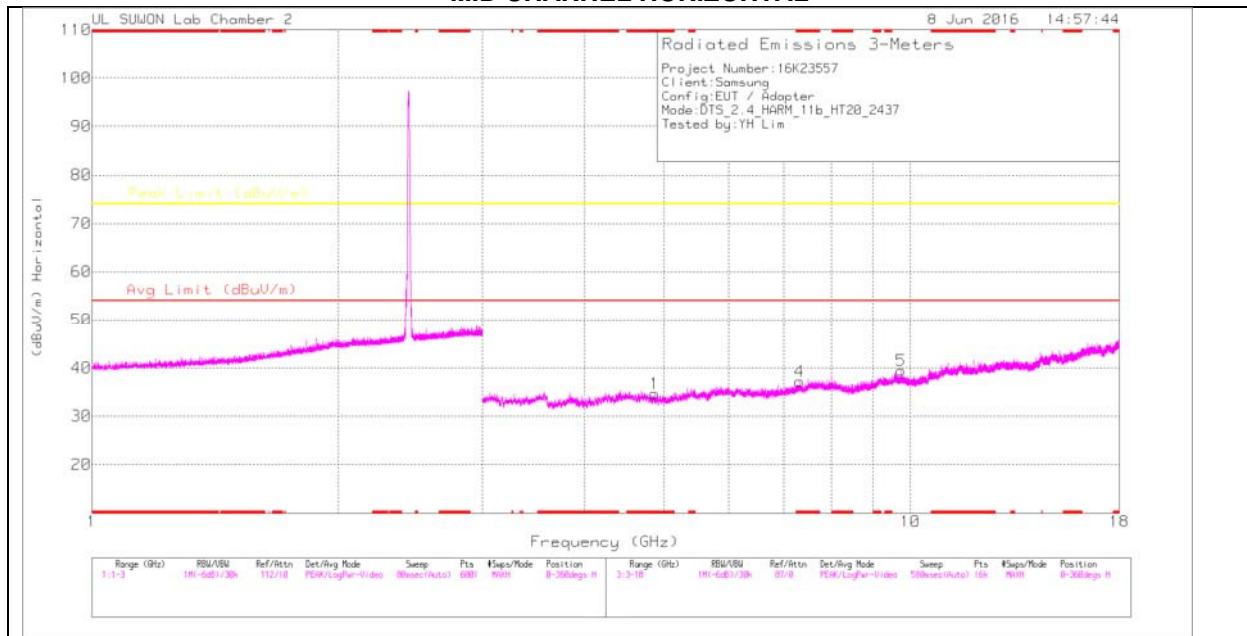
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	36.6	PK2	33.9	-25.3	0	45.2	-	-	74	-28.8	199	100	H
* 4.824	28.01	MAv1	33.9	-25.3	0	36.61	54	-17.39	-	-	199	100	H
* 4.824	36.37	PK2	33.9	-25.3	0	44.97	-	-	74	-29.03	5	110	V
* 4.824	24.46	MAv1	33.9	-25.3	0	33.06	54	-20.94	-	-	5	110	V
7.234	37.8	PK2	35.8	-23	0	50.6	-	-	74	-23.4	192	161	V
7.236	34.81	PK2	35.8	-23	0	47.61	-	-	74	-26.39	5	189	H

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

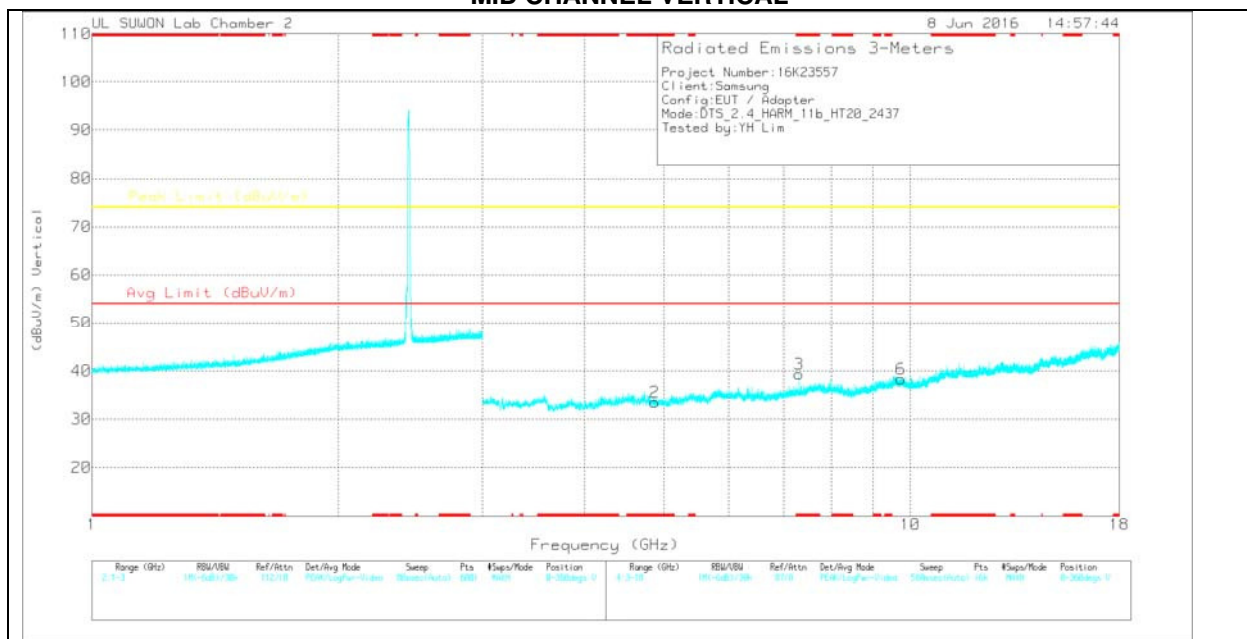
PK2 - KDB558074 Method: Maximum Peak

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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	25.97	Pk	33.9	-25.2	0	34.67	-	-	74	-39.33	0-360	200	H
4	* 7.32	23.77	Pk	35.9	-22.5	0	37.17	-	-	74	-36.83	0-360	100	H
5	9.737	21.76	Pk	37	-19.3	0	39.46	-	-	74	-34.54	0-360	100	H
2	* 4.871	24.89	Pk	33.9	-25.2	0	33.59	-	-	74	-40.41	0-360	100	V
3	* 7.309	26.07	Pk	35.9	-22.6	0	39.37	-	-	74	-34.63	0-360	100	V
6	9.734	20.68	Pk	37	-19.3	0	38.38	-	-	74	-35.62	0-360	100	V

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

Pk – Peak detector

Radiated Emissions

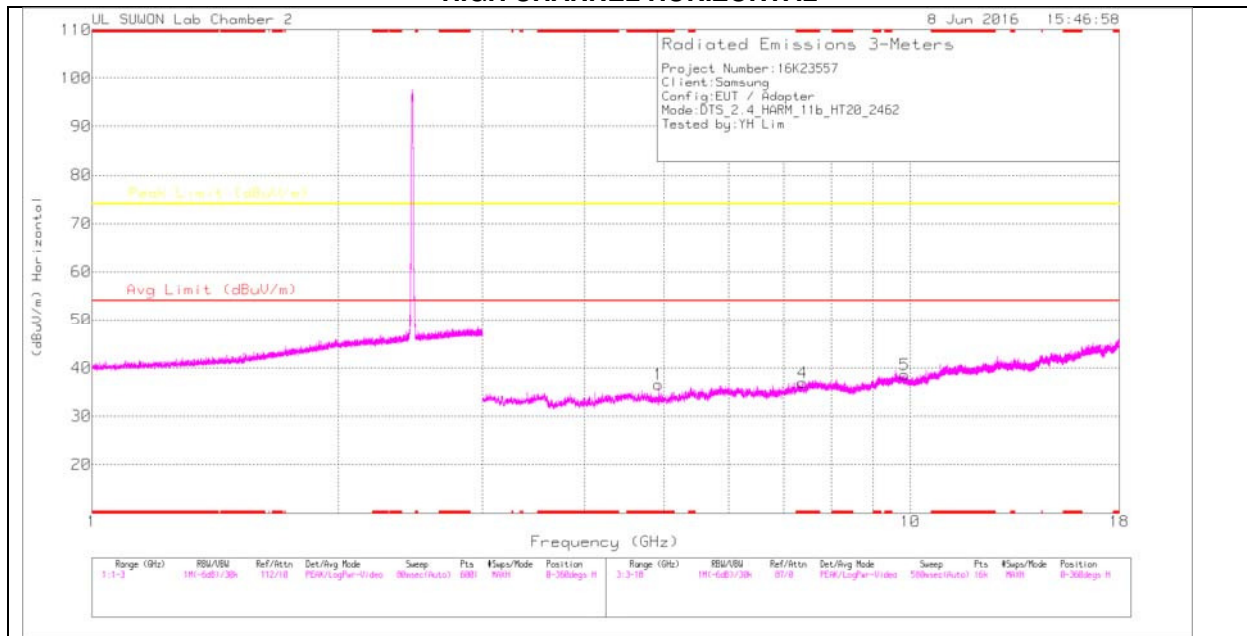
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 7.313	35.14	PK2	35.9	-22.6	0	48.44	-	-	74	-25.56	213	394	H
* 7.31	22.63	MAv1	35.9	-22.6	0	35.93	54	-18.07	-	-	213	394	H
* 7.309	37.4	PK2	35.9	-22.6	0	50.7	-	-	74	-23.3	189	142	V
* 7.312	27.49	MAv1	35.9	-22.6	0	40.79	54	-13.21	-	-	189	142	V

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

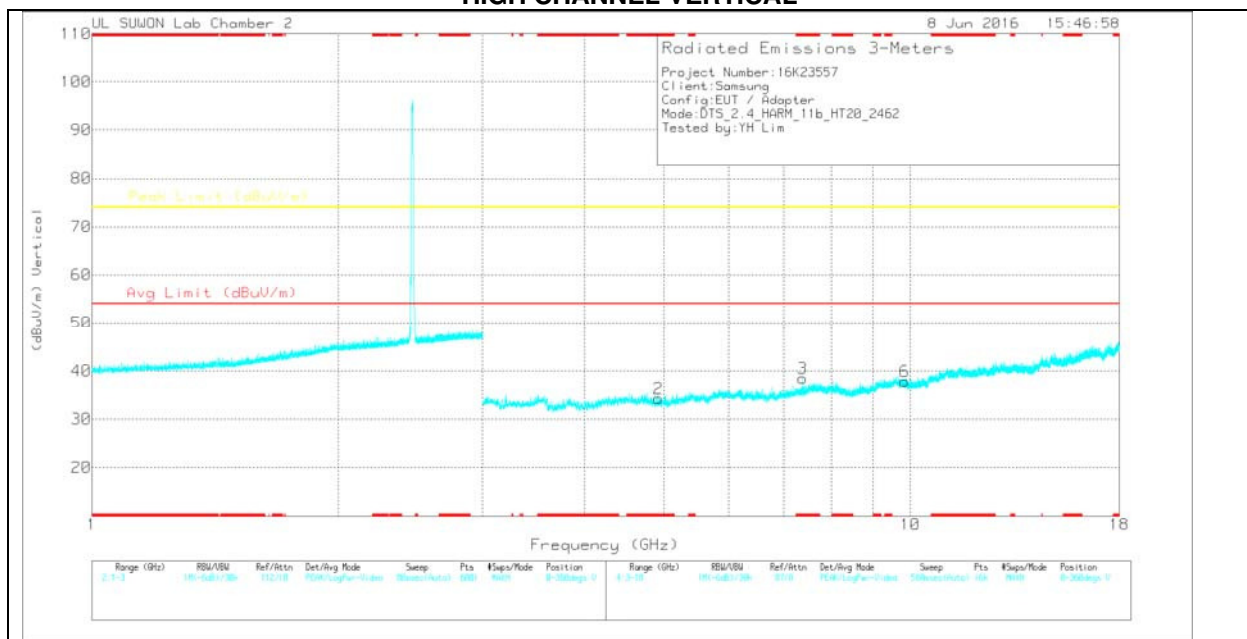
PK2 - KDB558074 Method: Maximum Peak

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(0016872 4)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	27.82	Pk	33.9	-25.1	0	36.62	-	-	74	-37.38	0-360	100	H
4	* 7.383	23.23	Pk	35.9	-22.2	0	36.93	-	-	74	-37.07	0-360	200	H
5	9.835	20.66	Pk	37.1	-19.2	0	38.56	-	-	74	-35.44	0-360	200	H
2	* 4.924	25.47	Pk	33.9	-25.1	0	34.27	-	-	74	-39.73	0-360	100	V
3	* 7.384	24.75	Pk	35.9	-22.2	0	38.45	-	-	74	-35.55	0-360	100	V
6	9.848	19.9	Pk	37.1	-19.2	0	37.8	-	-	74	-36.2	0-360	100	V

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

Pk – Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.923	37.53	PK2	33.9	-25.1	0	46.33	-	-	74	-27.67	196	126	H
* 4.924	28.64	MAV1	33.9	-25.1	0	37.44	54	-16.56	-	-	196	126	H
* 4.924	36.48	PK2	33.9	-25.1	0	45.28	-	-	74	-28.72	8	295	V
* 4.924	26.26	MAV1	33.9	-25.1	0	35.06	54	-18.94	-	-	8	295	V
* 7.387	35.19	PK2	35.9	-22.2	0	48.89	-	-	74	-25.11	192	174	V
* 7.385	24.55	MAV1	35.9	-22.2	0	38.25	54	-15.75	-	-	192	174	V
* 7.389	34.86	PK2	35.9	-22.2	0	48.56	-	-	74	-25.44	215	138	H
* 7.385	22.48	MAV1	35.9	-22.2	0	36.18	54	-17.82	-	-	215	138	H

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

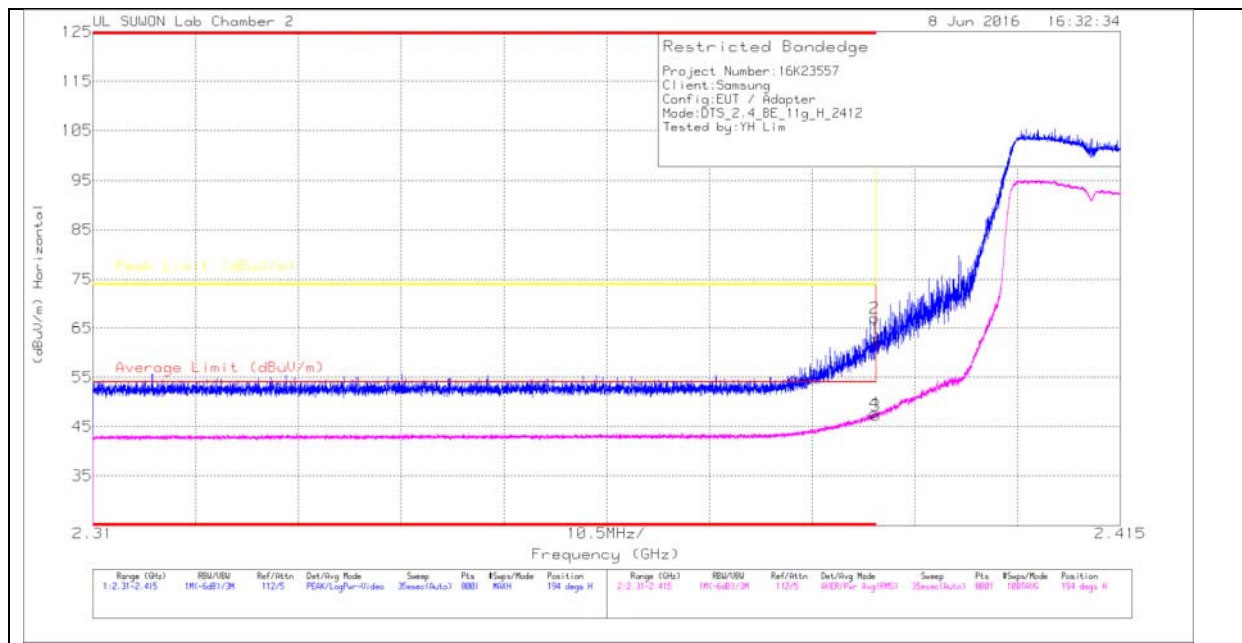
PK2 - KDB558074 Method: Maximum Peak

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

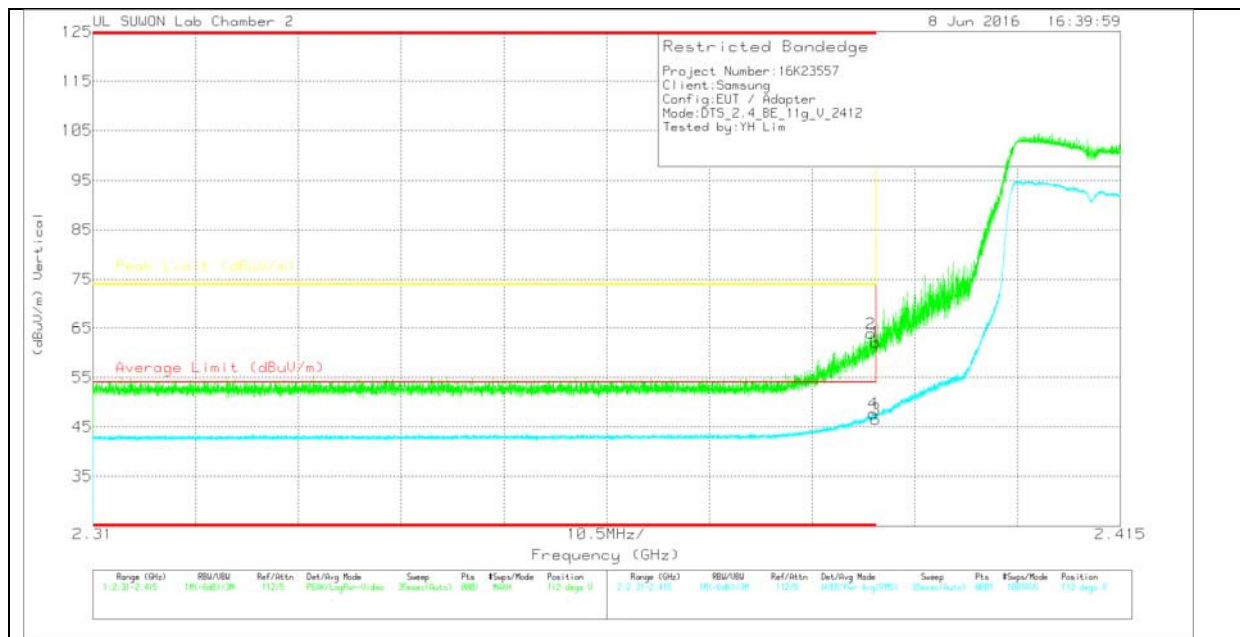
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	50.6	Pk	31.7	-19.5	0	62.8	-	-	74	-11.2	194	323	H
2	* 2.39	54.91	Pk	31.7	-19.5	0	67.11	-	-	74	-6.89	194	323	H
3	* 2.39	34.8	RMS	31.7	-19.5	.29	47.29	54	-6.71	-	-	194	323	H
4	* 2.39	35.29	RMS	31.7	-19.5	.29	47.78	54	-6.22	-	-	194	323	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	3117/001687 24_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.39	49.93	Pk	31.7	-19.5	0	62.13	-	-	74	-11.87	112	392	V
2	* 2.389	51.75	Pk	31.7	-19.5	0	63.95	-	-	74	-10.05	112	392	V
3	* 2.39	34.06	RMS	31.7	-19.5	.29	46.55	54	-7.45	-	-	112	392	V
4	* 2.39	35.25	RMS	31.7	-19.5	.29	47.74	54	-6.26	-	-	112	392	V

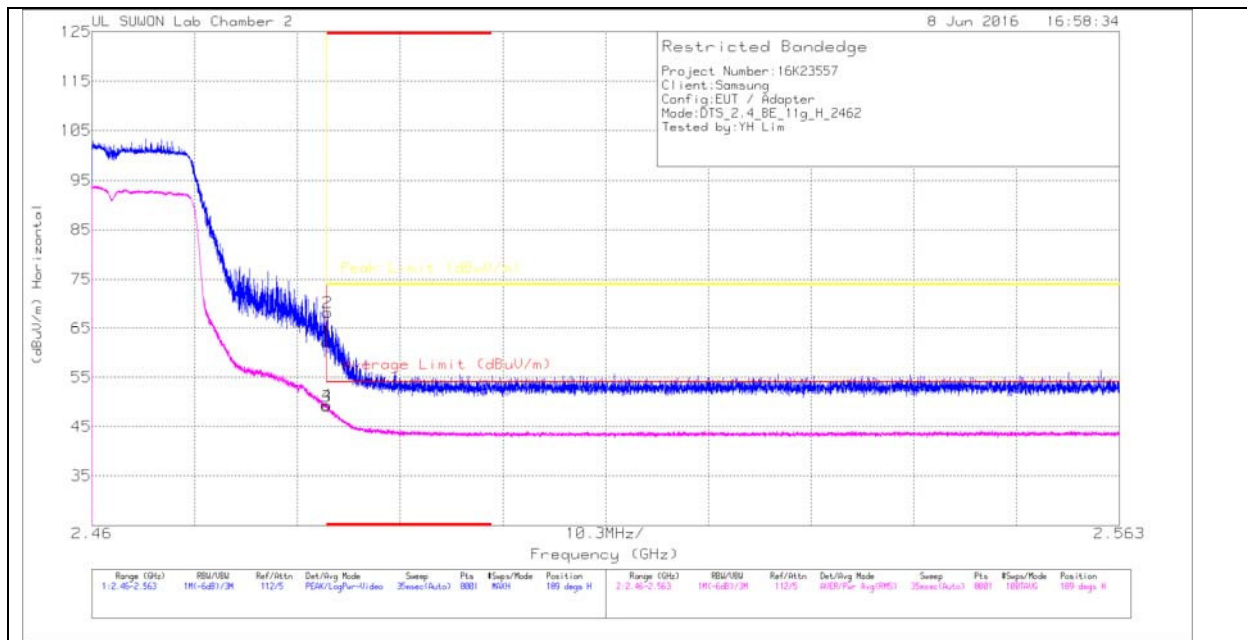
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

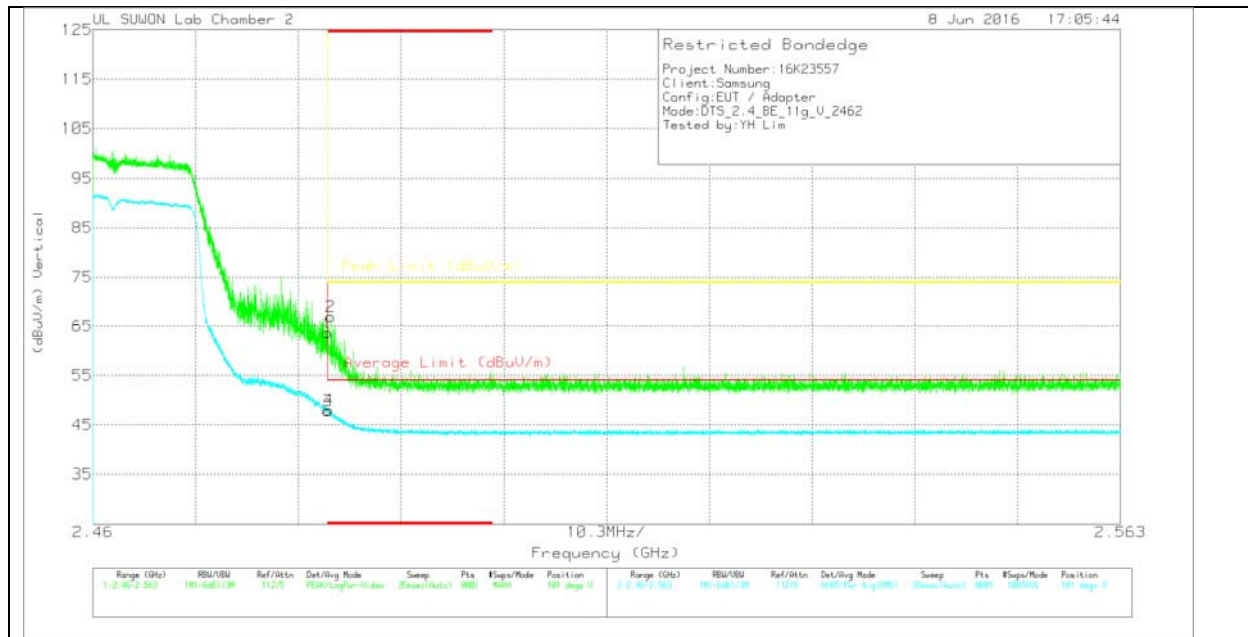
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.76	Pk	31.8	-19.4	0	62.16	-	-	74	-11.84	189	311	H
2	* 2.484	55.81	Pk	31.8	-19.4	0	68.21	-	-	74	-5.79	189	311	H
3	* 2.484	36.37	RMS	31.8	-19.4	.29	49.06	54	-4.94	-	-	189	311	H
4	* 2.484	36.62	RMS	31.8	-19.4	.29	49.31	54	-4.69	-	-	189	311	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(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.484	51.27	Pk	31.8	-19.4	0	63.67	-	-	74	-10.33	101	366	V
2	* 2.484	54.57	Pk	31.8	-19.4	0	66.97	-	-	74	-7.03	101	366	V
3	* 2.484	35.11	RMS	31.8	-19.4	.29	47.8	54	-6.2	-	-	101	366	V
4	* 2.484	35.32	RMS	31.8	-19.4	.29	48.01	54	-5.99	-	-	101	366	V

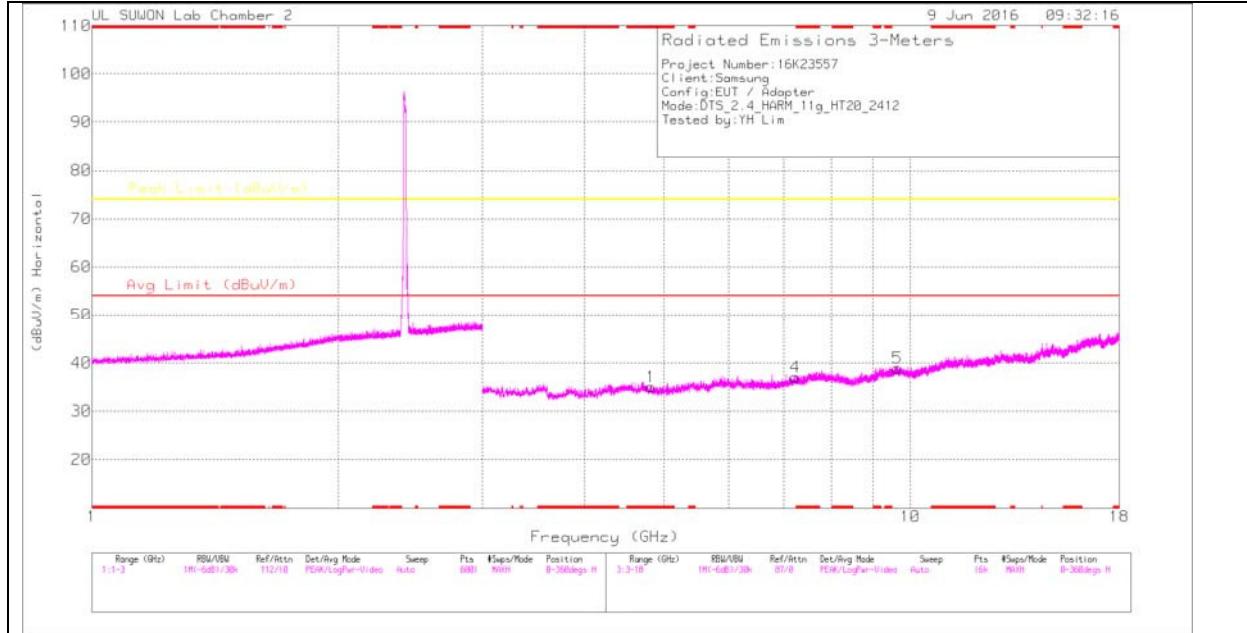
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

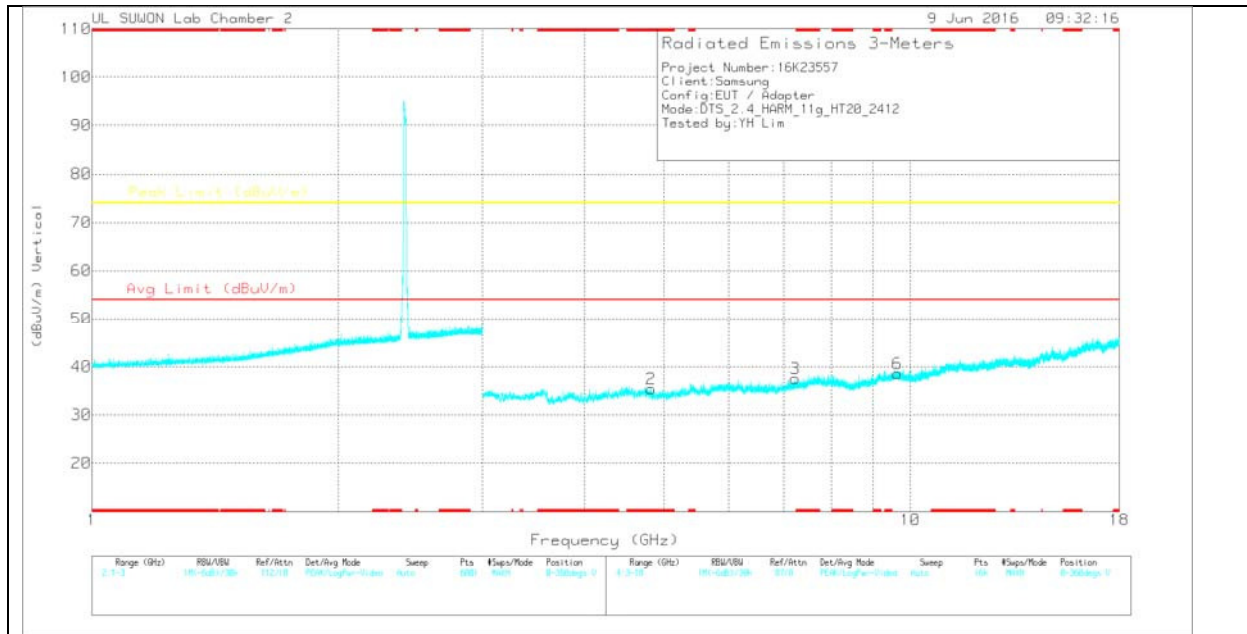
RMS - RMS detection

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

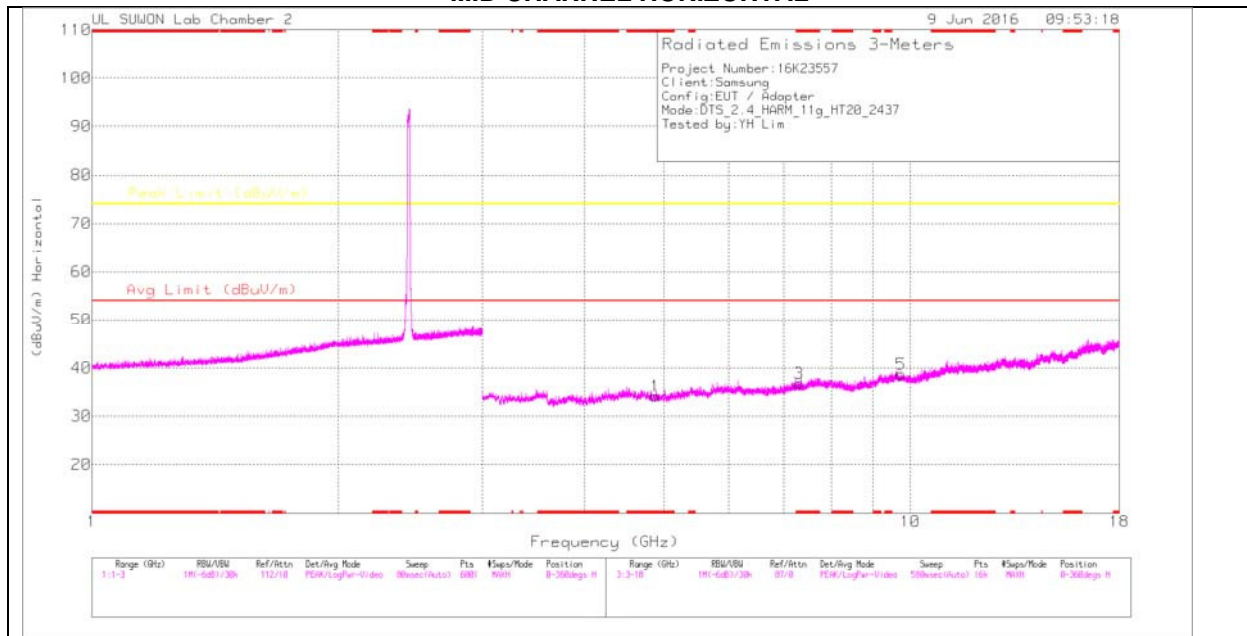
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016872 4)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.821	26.51	Pk	33.9	-25.3	0	35.11	-	-	74	-38.89	0-360	200	H
4	7.229	24.24	Pk	35.8	-23	0	37.04	-	-	74	-36.96	0-360	200	H
5	9.637	21.17	Pk	36.9	-19.1	0	38.97	-	-	74	-35.03	0-360	100	H
2	* 4.819	26.85	Pk	33.9	-25.3	0	35.45	-	-	74	-38.55	0-360	200	V
3	7.231	24.75	Pk	35.8	-23	0	37.55	-	-	74	-36.45	0-360	200	V
6	9.642	20.75	Pk	36.9	-19.1	0	38.55	-	-	74	-35.45	0-360	100	V

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

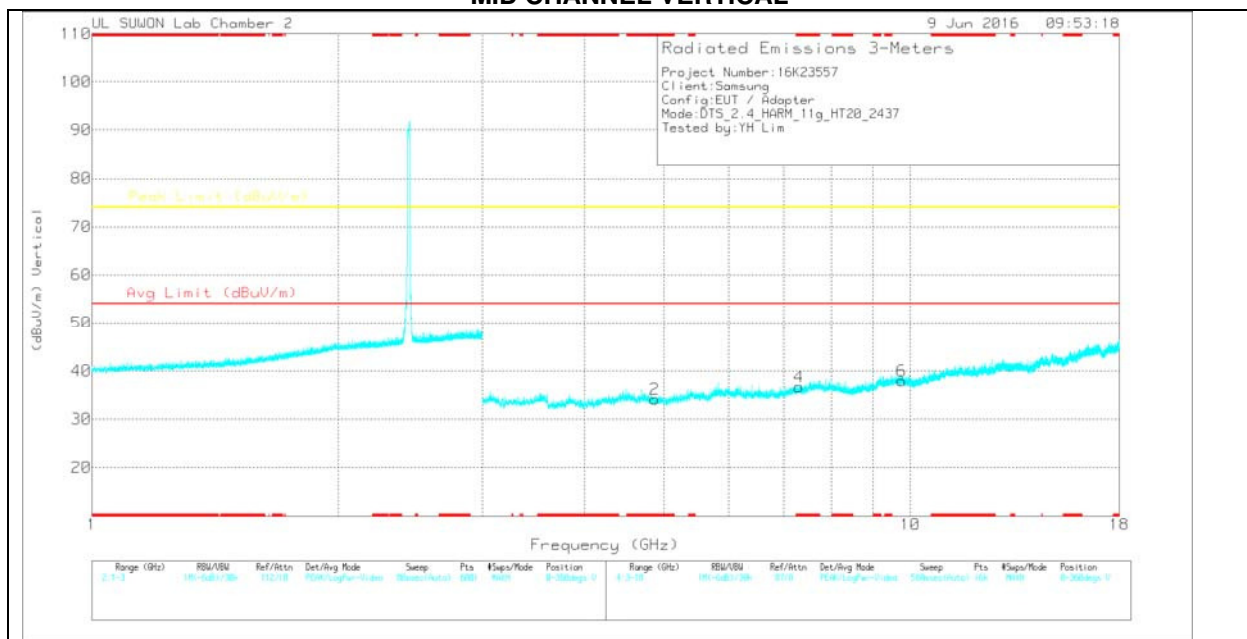
Pk – Peak detector

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

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

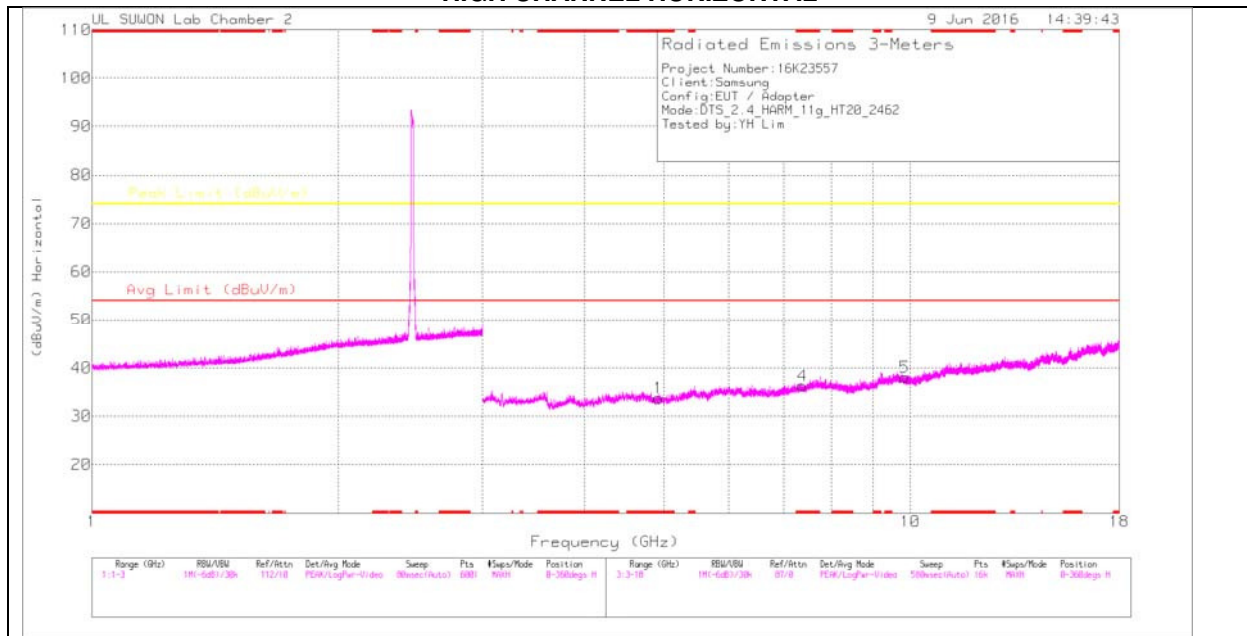
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016872 4)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.877	25.42	PK	33.9	-25.2	0	34.12	-	-	74	-39.88	0-360	200	H
3	* 7.313	23.51	PK	35.9	-22.6	0	36.81	-	-	74	-37.19	0-360	200	H
5	9.747	20.97	PK	37	-19.3	0	38.67	-	-	74	-35.33	0-360	100	H
2	* 4.872	25.49	PK	33.9	-25.2	0	34.19	-	-	74	-39.81	0-360	100	V
4	* 7.311	23.45	PK	35.9	-22.6	0	36.75	-	-	74	-37.25	0-360	200	V
6	9.751	20.28	PK	37	-19.3	0	37.98	-	-	74	-36.02	0-360	200	V

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

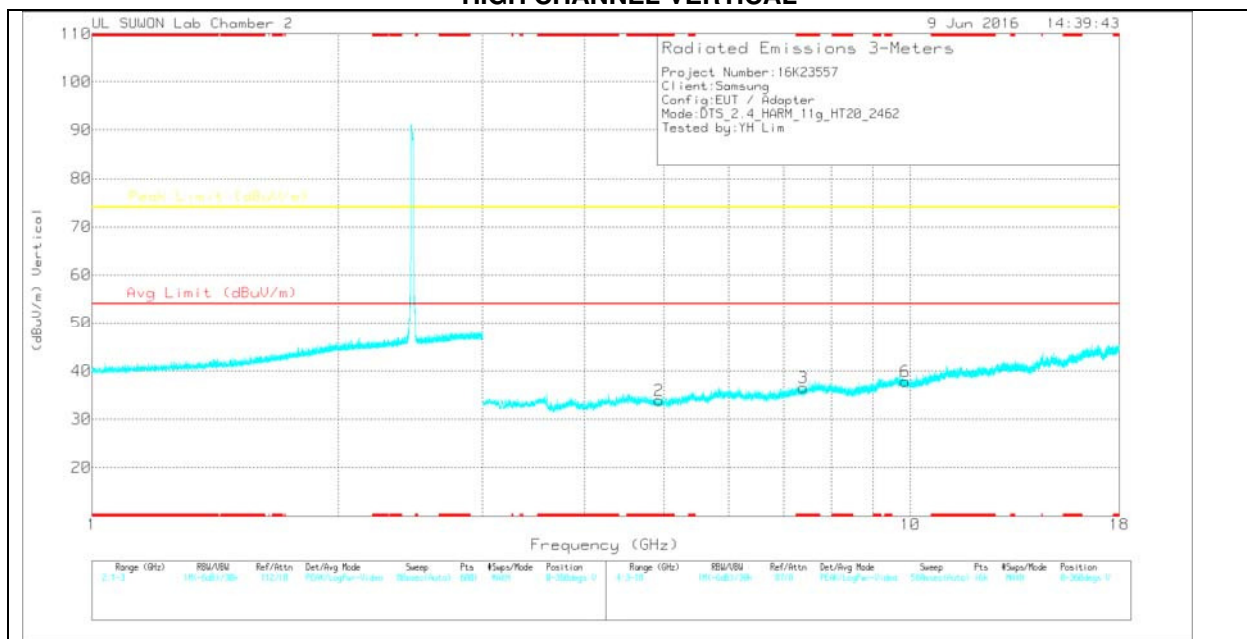
PK – Peak detector

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

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(0016872 4)_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	* 4.918	24.93	PK	33.9	-25.1	0	33.73	-	-	74	-40.27	0-360	200	H
4	* 7.391	22.6	PK	35.9	-22.2	0	36.3	-	-	74	-37.7	0-360	200	H
5	9.849	20.19	PK	37.1	-19.2	0	38.09	-	-	74	-35.91	0-360	200	H
2	* 4.928	25.13	PK	33.9	-25.1	0	33.93	-	-	74	-40.07	0-360	200	V
3	* 7.392	22.79	PK	35.9	-22.1	0	36.59	-	-	74	-37.41	0-360	200	V
6	9.853	19.93	PK	37.1	-19.2	0	37.83	-	-	74	-36.17	0-360	200	V

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

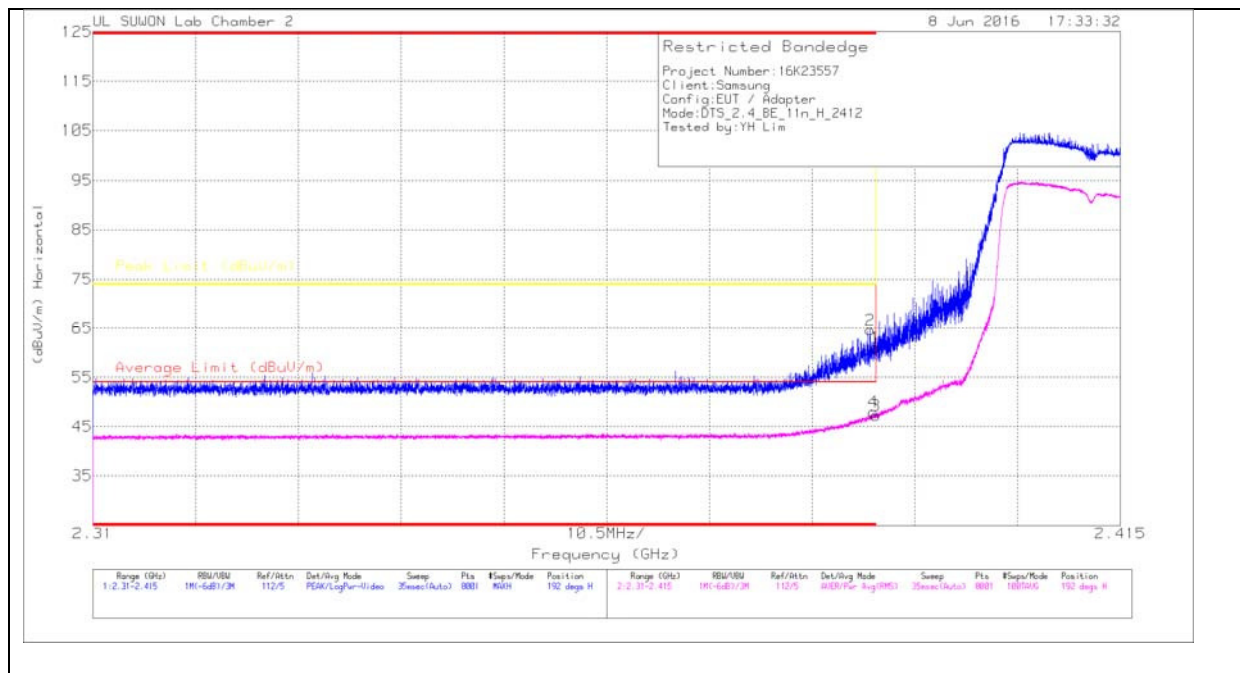
PK – Peak detector

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

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

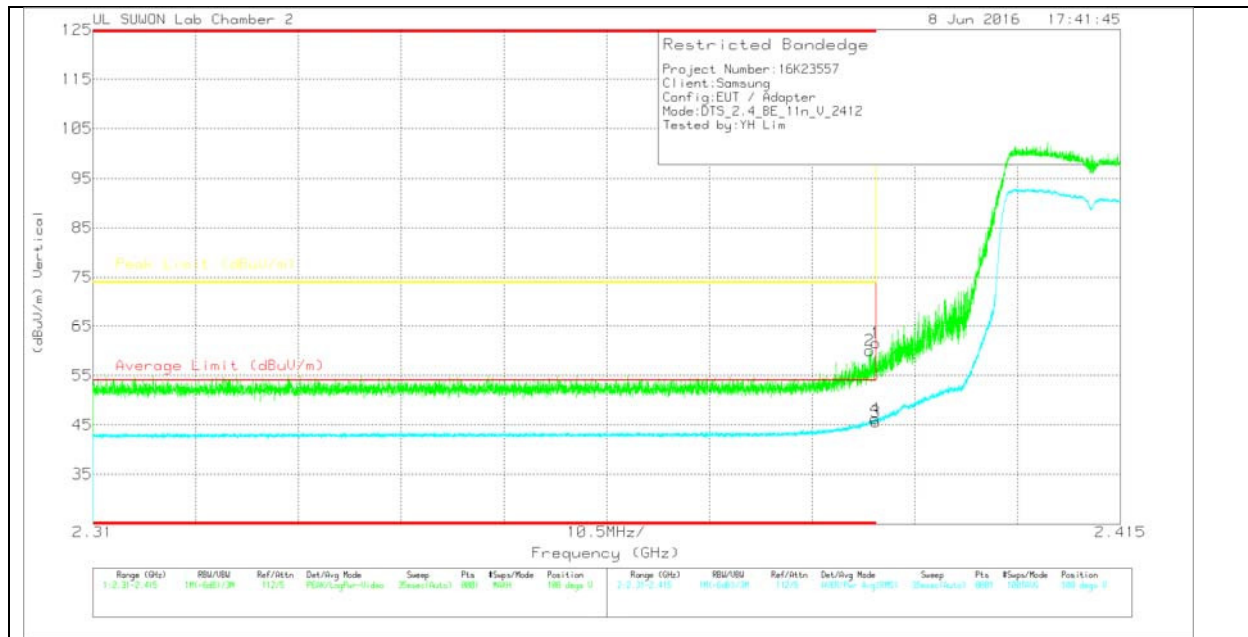
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.86	Pk	31.7	-19.5	0	61.06	-	-	74	-12.94	192	326	H
2	* 2.389	52.42	Pk	31.7	-19.5	0	64.62	-	-	74	-9.38	192	326	H
3	* 2.39	34.7	RMS	31.7	-19.5	.32	47.22	54	-6.78	-	-	192	326	H
4	* 2.39	35.42	RMS	31.7	-19.5	.32	47.94	54	-6.06	-	-	192	326	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(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.39	49.33	Pk	31.7	-19.5	0	61.53	-	-	74	-12.47	108	386	V
2	* 2.389	47.84	Pk	31.7	-19.5	0	60.04	-	-	74	-13.96	108	386	V
3	* 2.39	33.11	RMS	31.7	-19.5	.32	45.63	54	-8.37	-	-	108	386	V
4	* 2.39	33.7	RMS	31.7	-19.5	.32	46.22	54	-7.78	-	-	108	386	V

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

Pk - Peak detector

RMS - RMS detection