



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-G600FY

FCC ID: A3LSMG600FY

REPORT NUMBER: 15K21555-E1

ISSUE DATE: SEP 03, 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, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433**



Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/03/15	Initial issue	SungGil Park

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION	6
4.3. MEASUREMENT UNCERTAINTY.....	7
5. EQUIPMENT UNDER TEST	8
5.1. DESCRIPTION OF EUT	8
5.2. MAXIMUM OUTPUT POWER.....	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
5.4. WORST-CASE CONFIGURATION AND MODE	8
5.5. DESCRIPTION OF TEST SETUP.....	9
6. TEST AND MEASUREMENT EQUIPMENT	11
7. MEASUREMENT METHODS	12
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS	12
8.1. ON TIME AND DUTY CYCLE RESULTS.....	12
9. SUMMARY TABLE	13
10. ANTENNA PORT TEST RESULTS	14
10.1. 6 dB BANDWIDTH	14
10.1.1. 802.11b MODE IN THE 2.4 GHz BAND	14
10.1.2. 802.11g MODE IN THE 2.4 GHz BAND	14
10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND.....	14
10.1.4. 6 dB BANDWIDTH PLOTS.....	15
10.2. 99% BANDWIDTH	18
10.2.1. 802.11b MODE IN THE 2.4 GHz BAND	18
10.2.2. 802.11g MODE IN THE 2.4 GHz BAND	18
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND.....	18
10.2.4. 99% BANDWIDTH PLOTS.....	19
10.3. OUTPUT POWER	22
10.3.1. 802.11b MODE IN THE 2.4 GHz BAND	22
10.3.2. 802.11g MODE IN THE 2.4 GHz BAND	23
10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND.....	23
10.4. PSD.....	24

10.4.1.	802.11b MODE IN THE 2.4 GHz BAND	24
10.4.2.	802.11g MODE IN THE 2.4 GHz BAND	24
10.4.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND.....	24
10.4.4.	PSD PLOTS	25
10.5.	OUT-OF-BAND EMISSIONS.....	28
10.5.1.	802.11b MODE IN THE 2.4 GHz BAND	29
10.5.2.	802.11g MODE IN THE 2.4 GHz BAND	30
10.5.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND.....	31
11.	RADIATED TEST RESULTS	32
11.1.	LIMITS AND PROCEDURE.....	32
11.2.	TRANSMITTER ABOVE 1 GHz.....	33
11.2.1.	TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND	33
11.2.2.	TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND	43
11.2.3.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND	53
11.3.	WORST-CASE BELOW 1 GHz	63
12.	AC POWER LINE CONDUCTED EMISSIONS	65
13.	SETUP PHOTOS	68

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth/BLE and DTS b/g/n
MODEL NUMBER: SM-G600FY
SERIAL NUMBER: R38G80J911J (RADIATED); R38G80J8ZDH (CONDUCTED)
DATE TESTED: AUG 14, 2015 - SEP 03, 2015

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

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

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

Approved & Released For
UL Korea, Ltd. By:



CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
☒	Chamber 1
☒	Chamber 2

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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 and DTS b/g/n.

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	17.38	54.70
	802.11g	14.37	27.35
	802.11n HT20	13.32	21.48

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of -2.41 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

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

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

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

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20 mode: MCS0

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA50IWE	DK1G316VS/A-E	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	GH59-11849A	N/A	N/A

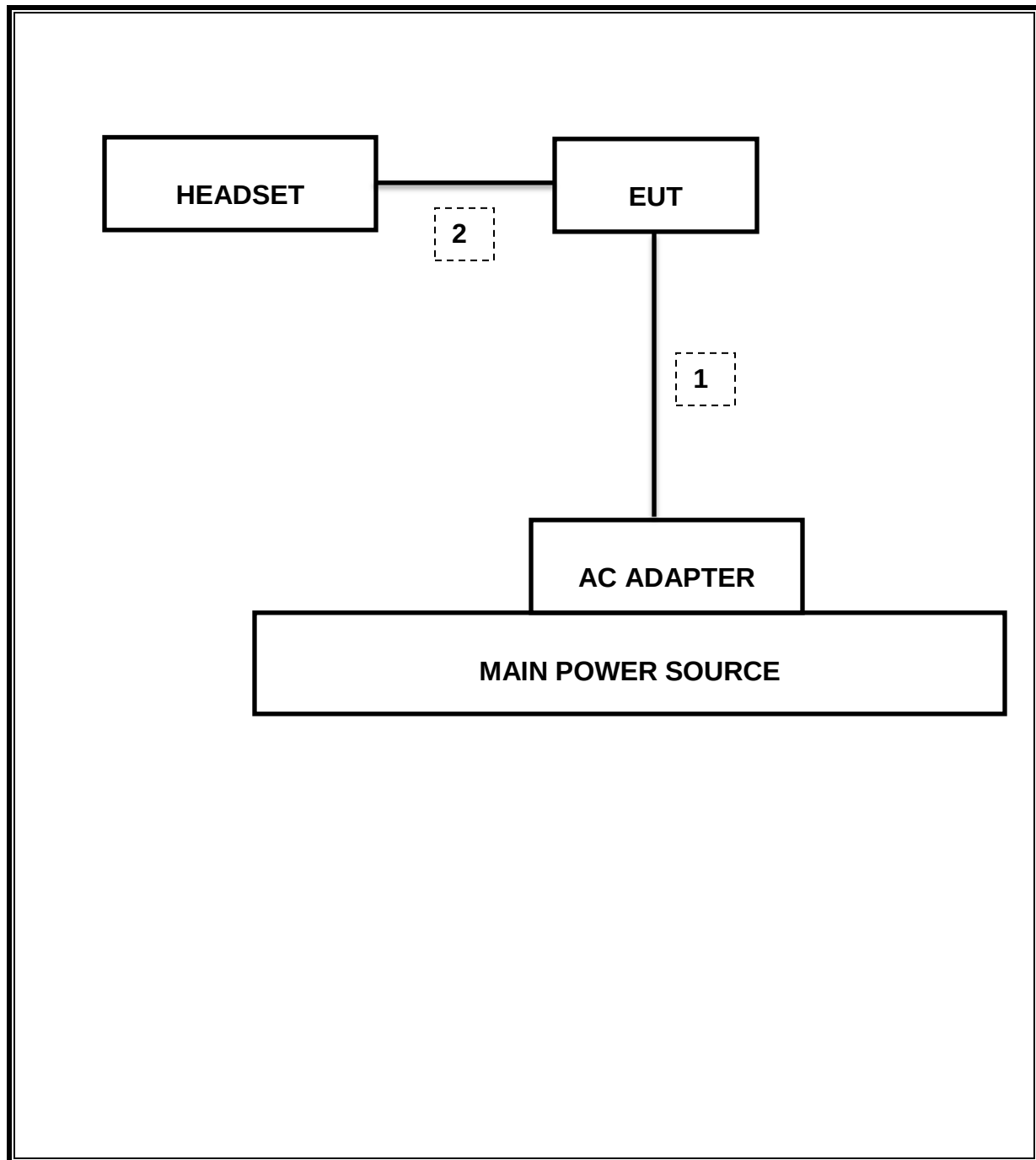
I/O CABLES

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.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	11-17-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-16
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r03: Measurement Procedure §9.2.3.1 AVGPM is used for power and §10.2 AVGPSD-2 is used for power spectral density.

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

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

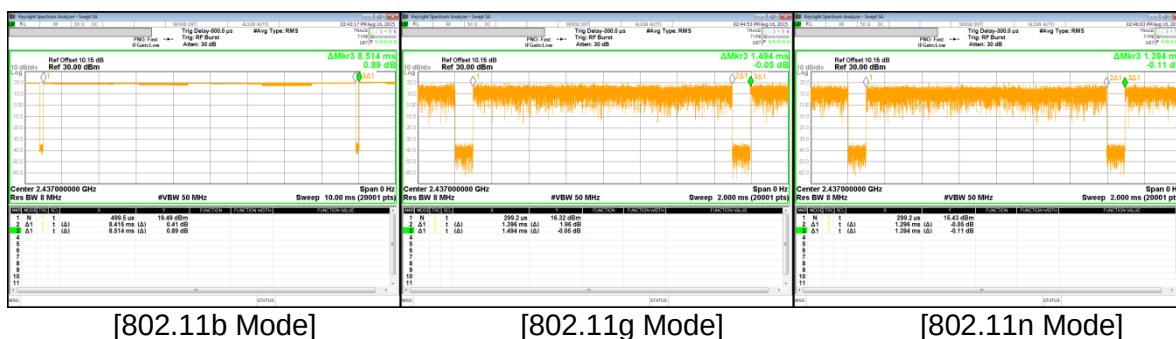
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B [msec]	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	8.415	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	1.394	0.930	93.0%	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	7.079 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-30.805 dBm
15.247	TX conducted output power	<30dBm		Pass	17.38 dBm
15.247	PSD	<8dBm		Pass	-13.673 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	45.29 dBuV (AV)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	46.8 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 v03r03: The transmitter output is connected to a spectrum analyzer with the RBW set to 100kHz, 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	7.085	0.5
Mid	2437	7.083	0.5
High	2462	7.079	0.5
Worst		7.079	0.5

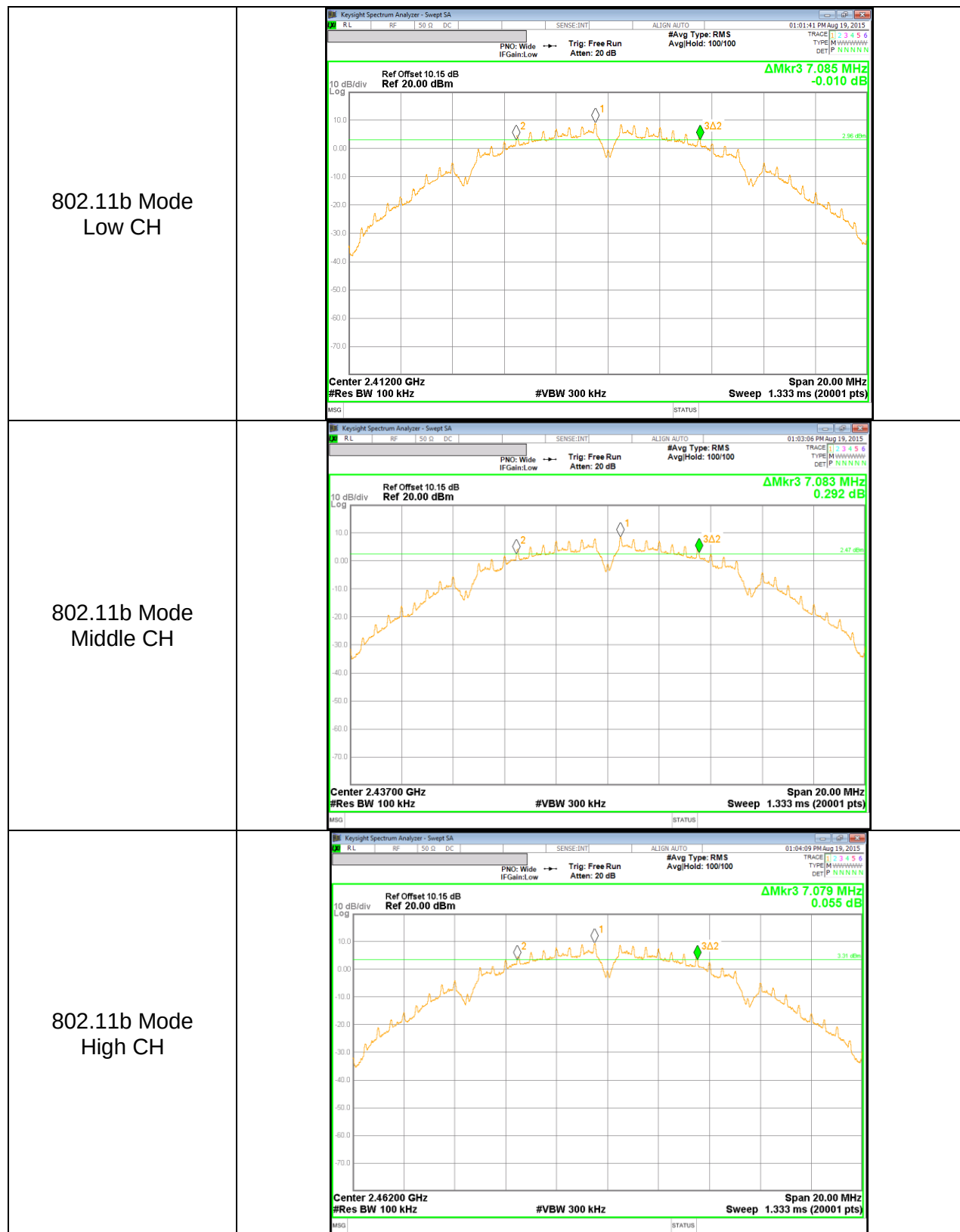
10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

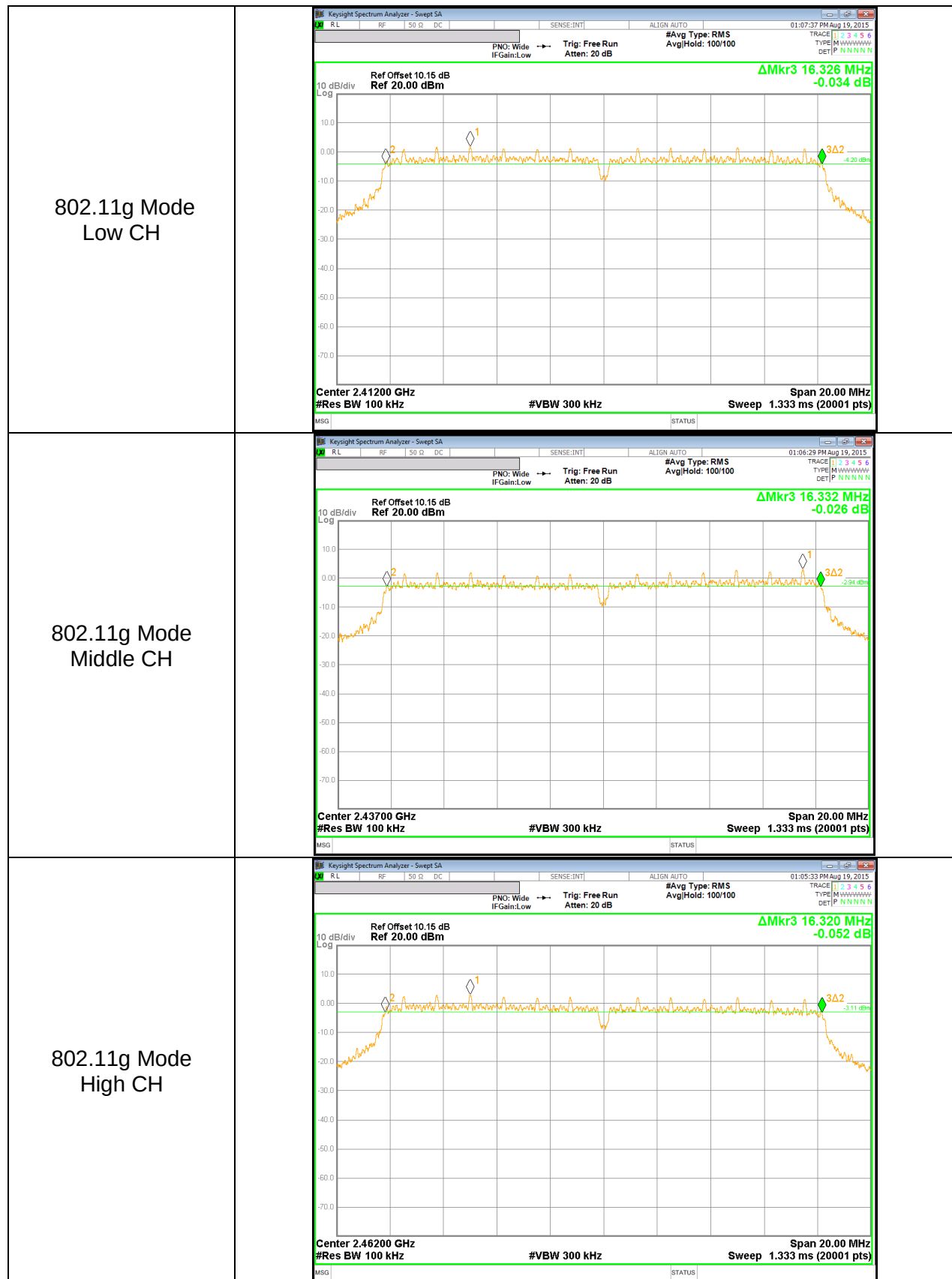
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
Low	2412	16.326	0.5
Mid	2437	16.332	0.5
High	2462	16.320	0.5
Worst		16.320	0.5

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	17.566	0.5
Mid	2437	17.591	0.5
High	2462	17.313	0.5
Worst		17.313	0.5

10.1.4. 6 dB BANDWIDTH PLOTS







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	12.609
Mid	2437	12.708
High	2462	12.641
Worst		12.708

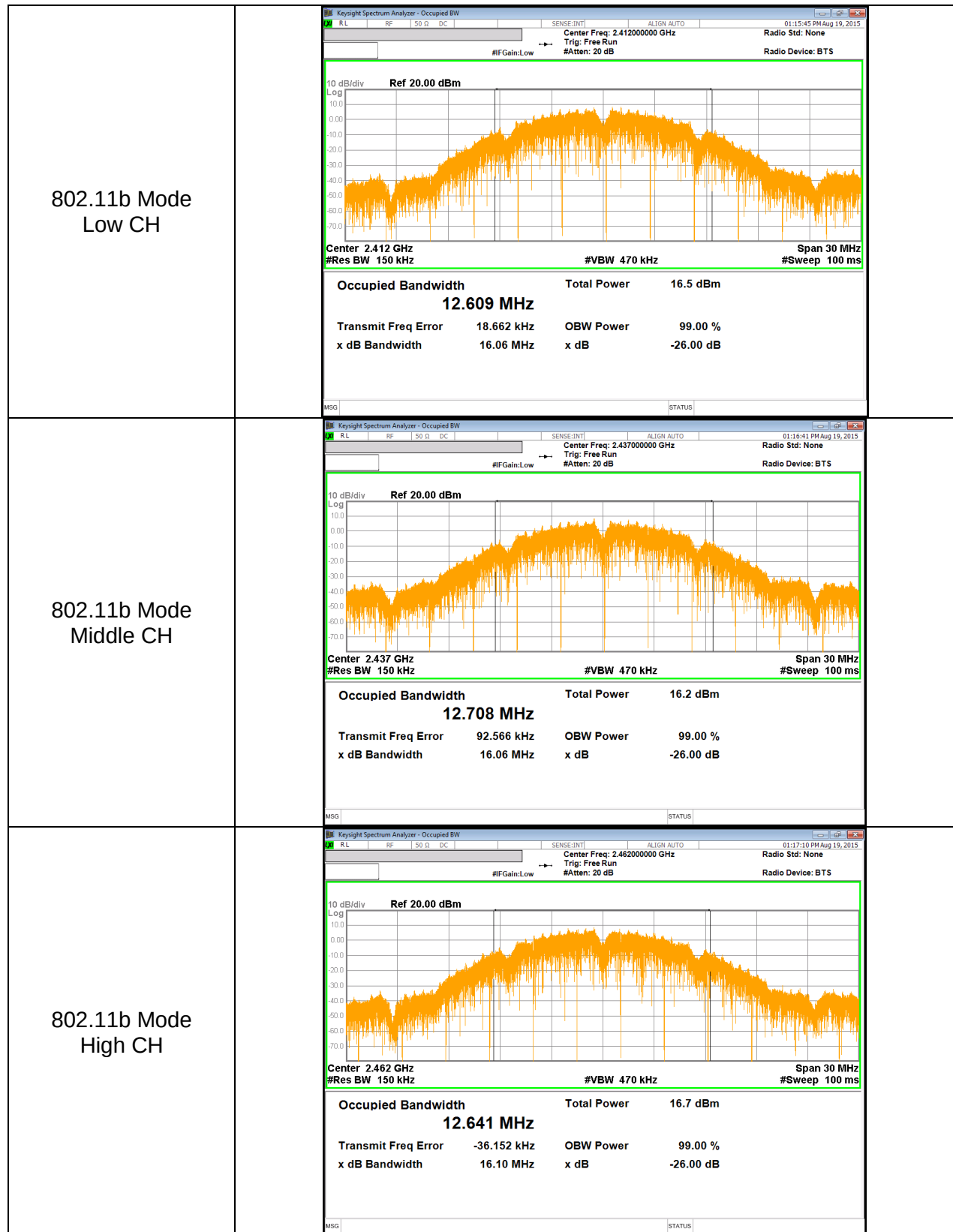
10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

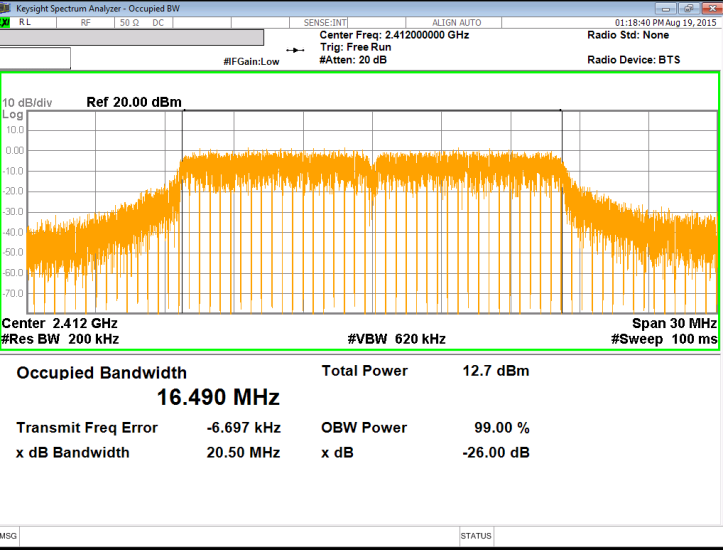
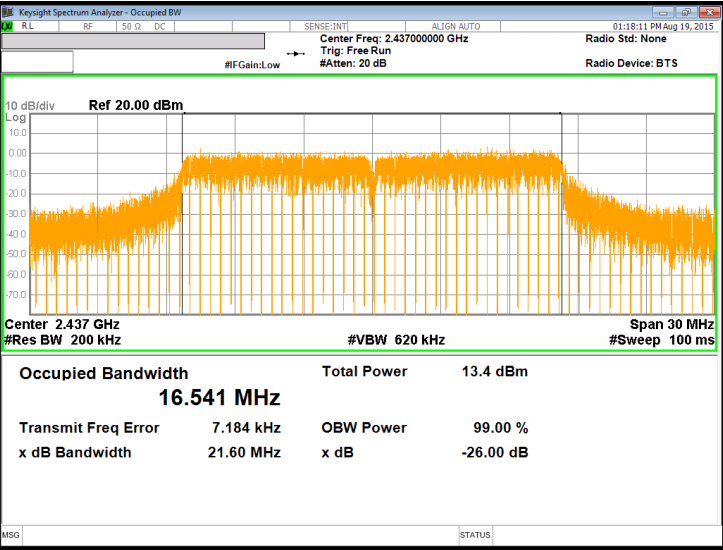
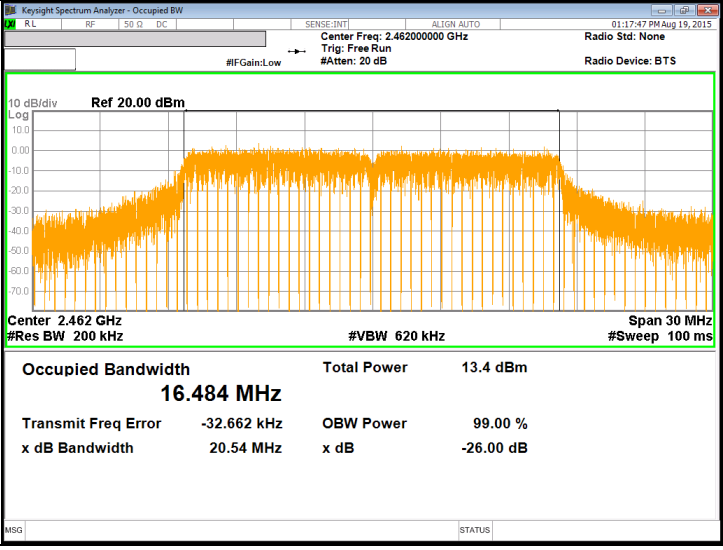
Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	16.490
Mid	2437	16.541
High	2462	16.484
Worst		16.541

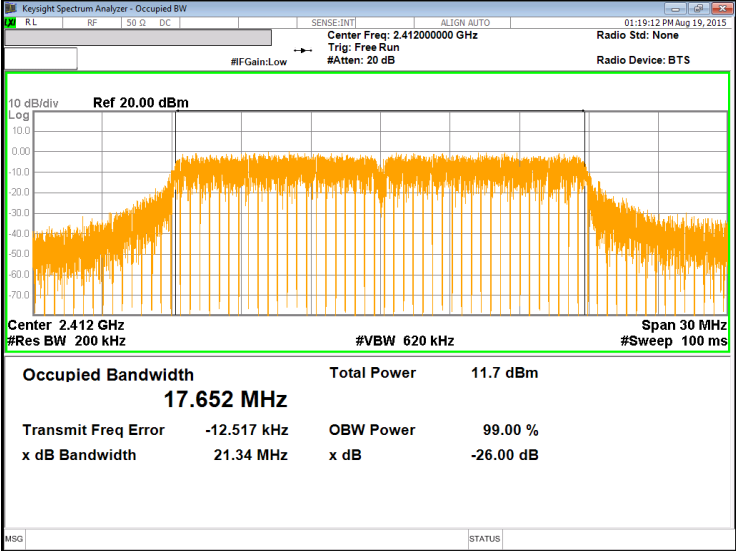
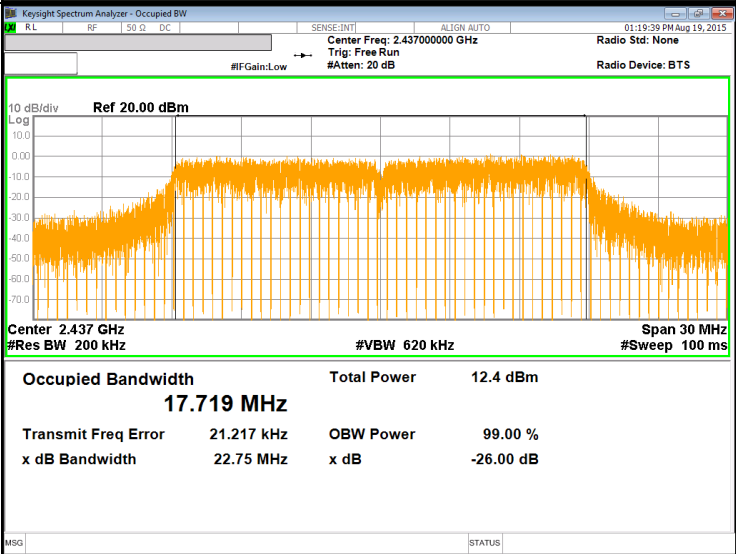
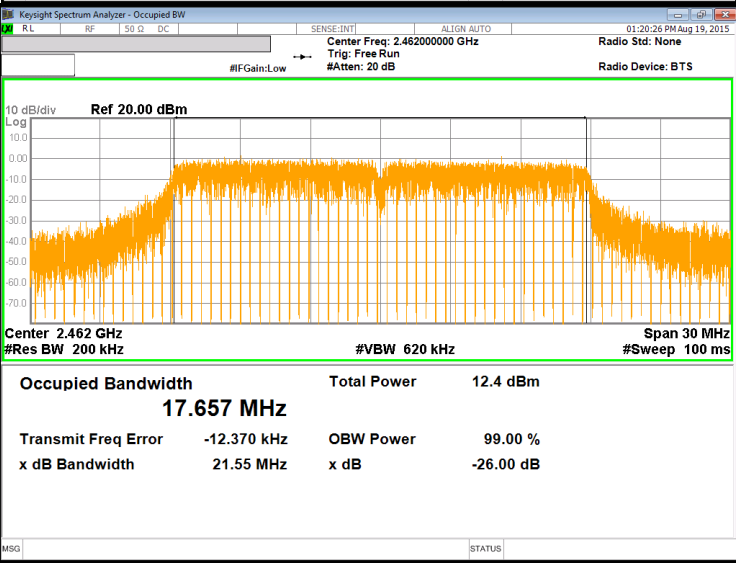
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2412	17.652
Mid	2437	17.719
High	2462	17.657
Worst		17.719

10.2.4. 99% BANDWIDTH PLOTS



802.11g Mode Low CH	 Center Freq: 2.41200000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.412 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.490 MHz Total Power 12.7 dBm Transmit Freq Error -6.697 kHz OBW Power 99.00 % x dB Bandwidth 20.50 MHz x dB -26.00 dB
802.11g Mode Middle CH	 Center Freq: 2.43700000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.437 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.541 MHz Total Power 13.4 dBm Transmit Freq Error 7.184 kHz OBW Power 99.00 % x dB Bandwidth 21.60 MHz x dB -26.00 dB
802.11g Mode High CH	 Center Freq: 2.46200000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.462 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 16.484 MHz Total Power 13.4 dBm Transmit Freq Error -32.662 kHz OBW Power 99.00 % x dB Bandwidth 20.54 MHz x dB -26.00 dB

802.11n Mode Low CH	 Center Freq: 2.41200000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.412 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.652 MHz Total Power 11.7 dBm Transmit Freq Error -12.517 kHz OBW Power 99.00 % x dB Bandwidth 21.34 MHz x dB -26.00 dB
802.11n Mode Middle CH	 Center Freq: 2.43700000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.437 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.719 MHz Total Power 12.4 dBm Transmit Freq Error 21.217 kHz OBW Power 99.00 % x dB Bandwidth 22.75 MHz x dB -26.00 dB
802.11n Mode High CH	 Center Freq: 2.46200000 GHz Trig: Free Run #Atten: 20 dB Radio Std: None Radio Device: BTS Ref 20.00 dBm Center 2.462 GHz #Res BW 200 kHz #VBW 620 kHz Span 30 MHz #Sweep 100 ms Occupied Bandwidth 17.657 MHz Total Power 12.4 dBm Transmit Freq Error -12.370 kHz OBW Power 99.00 % x dB Bandwidth 21.55 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.

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	-2.41	30.00	30.00	36.00	30.00
Mid	2437	-2.41	30.00	30.00	36.00	30.00
High	2462	-2.41	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	17.19	17.19	36.00	-18.81
Mid	2437	16.71	16.71	36.00	-19.29
High	2462	17.38	17.38	36.00	-18.62
Worst			17.38	36.00	-18.62

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	-2.41	30.00	30.00	36.00	30.00
Mid	2437	-2.41	30.00	30.00	36.00	30.00
High	2462	-2.41	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	13.62	13.62	36.00	-22.38
Mid	2437	14.37	14.37	36.00	-21.63
High	2462	14.36	14.36	36.00	-21.64
Worst			14.37	36.00	-21.63

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	-2.41	30.00	30.00	36.00	30.00
Mid	2437	-2.41	30.00	30.00	36.00	30.00
High	2462	-2.41	30.00	30.00	36.00	30.00

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	12.68	12.68	36.00	-23.32
Mid	2437	13.32	13.32	36.00	-22.68
High	2462	13.29	13.29	36.00	-22.71
Worst			13.32	36.00	-22.68

10.4. PSD

LIMITS

FCC §15.247

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

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method AVGPSD-2” under KDB558074 D01 DTS Meas Guidance v03r03

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-14.325	0.00	-14.33	8.00	-22.33
Mid	2437	-14.547	0.00	-14.55	8.00	-22.55
High	2462	-13.673	0.00	-13.67	8.00	-21.67

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

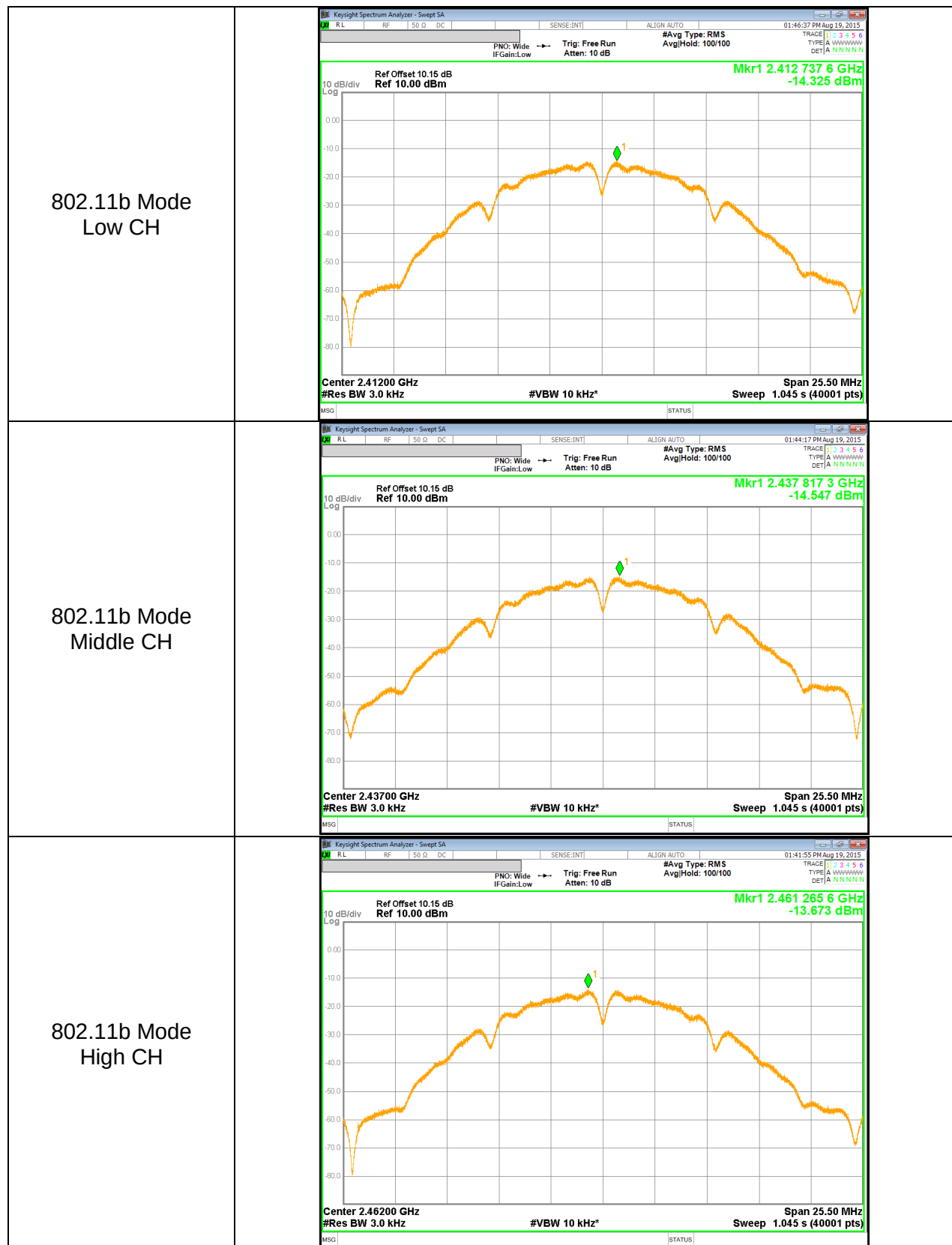
Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-21.32	0.29	-21.03	8.00	-29.32
Mid	2437	-20.446	0.29	-20.16	8.00	-28.45
High	2462	-20.318	0.29	-20.03	8.00	-28.32

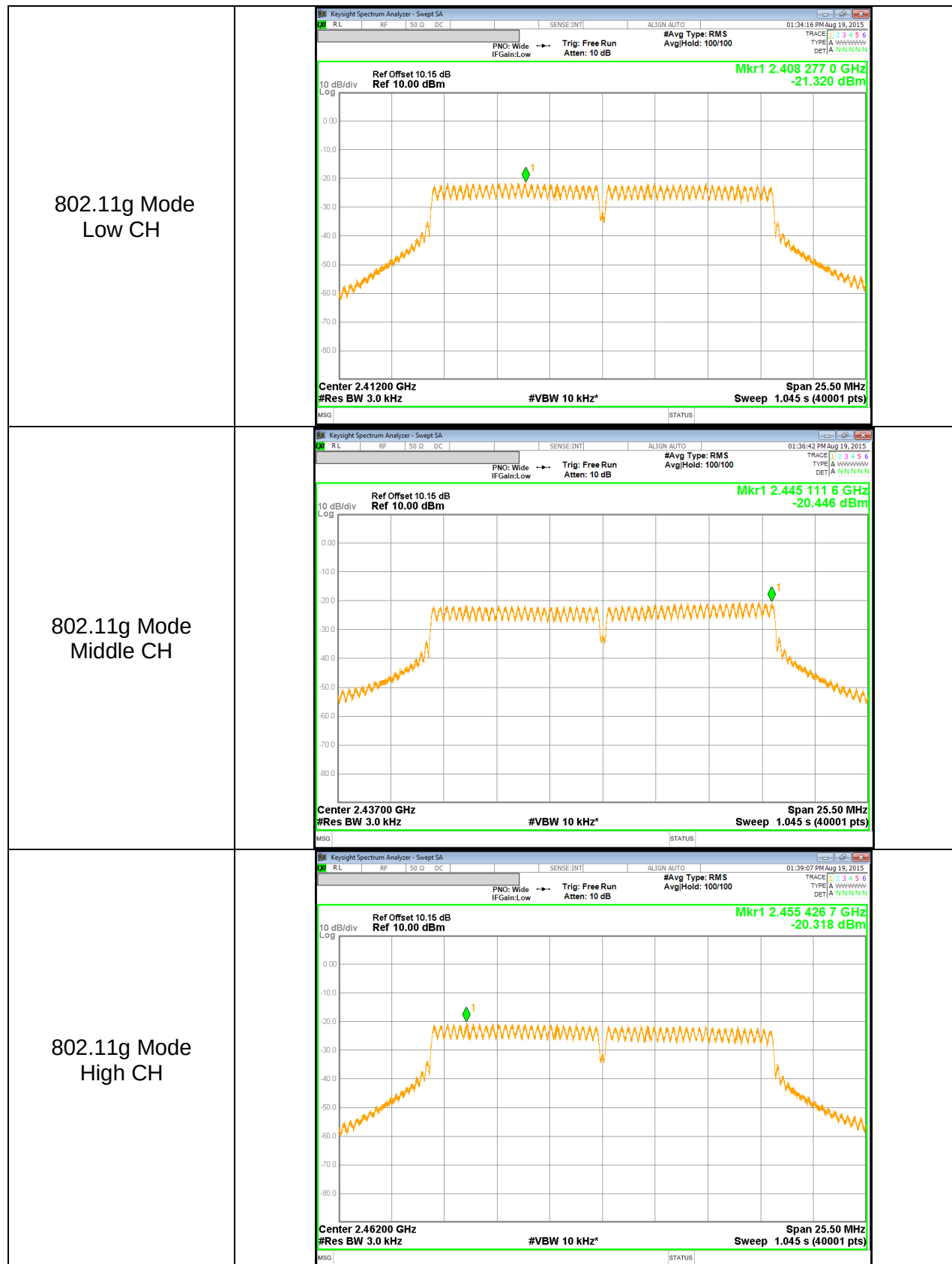
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

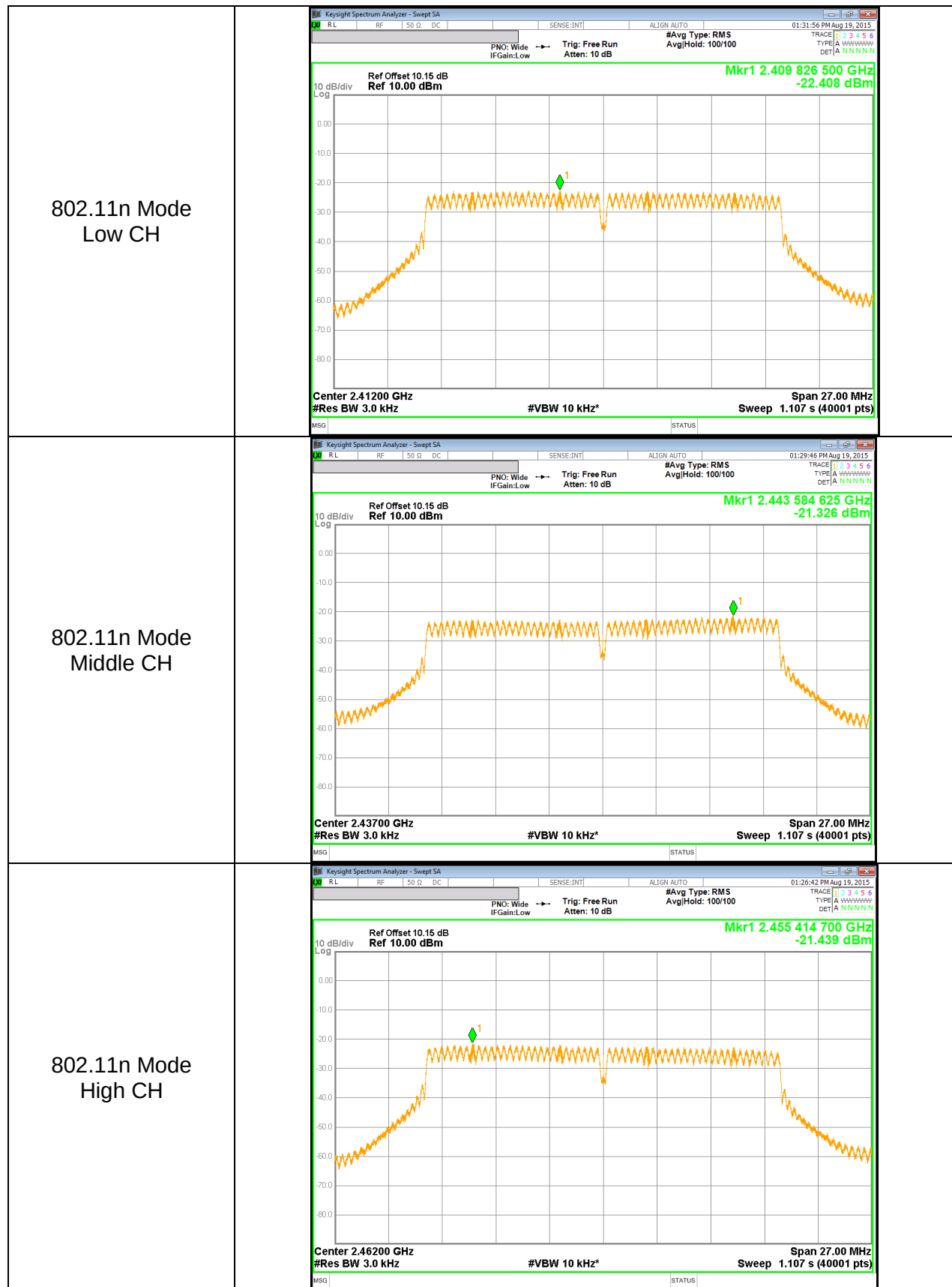
PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-22.408	0.32	-22.09	8.00	-30.41
Mid	2437	-21.326	0.32	-21.01	8.00	-29.33
High	2462	-21.439	0.32	-21.12	8.00	-29.44

10.4.4. PSD PLOTS







10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

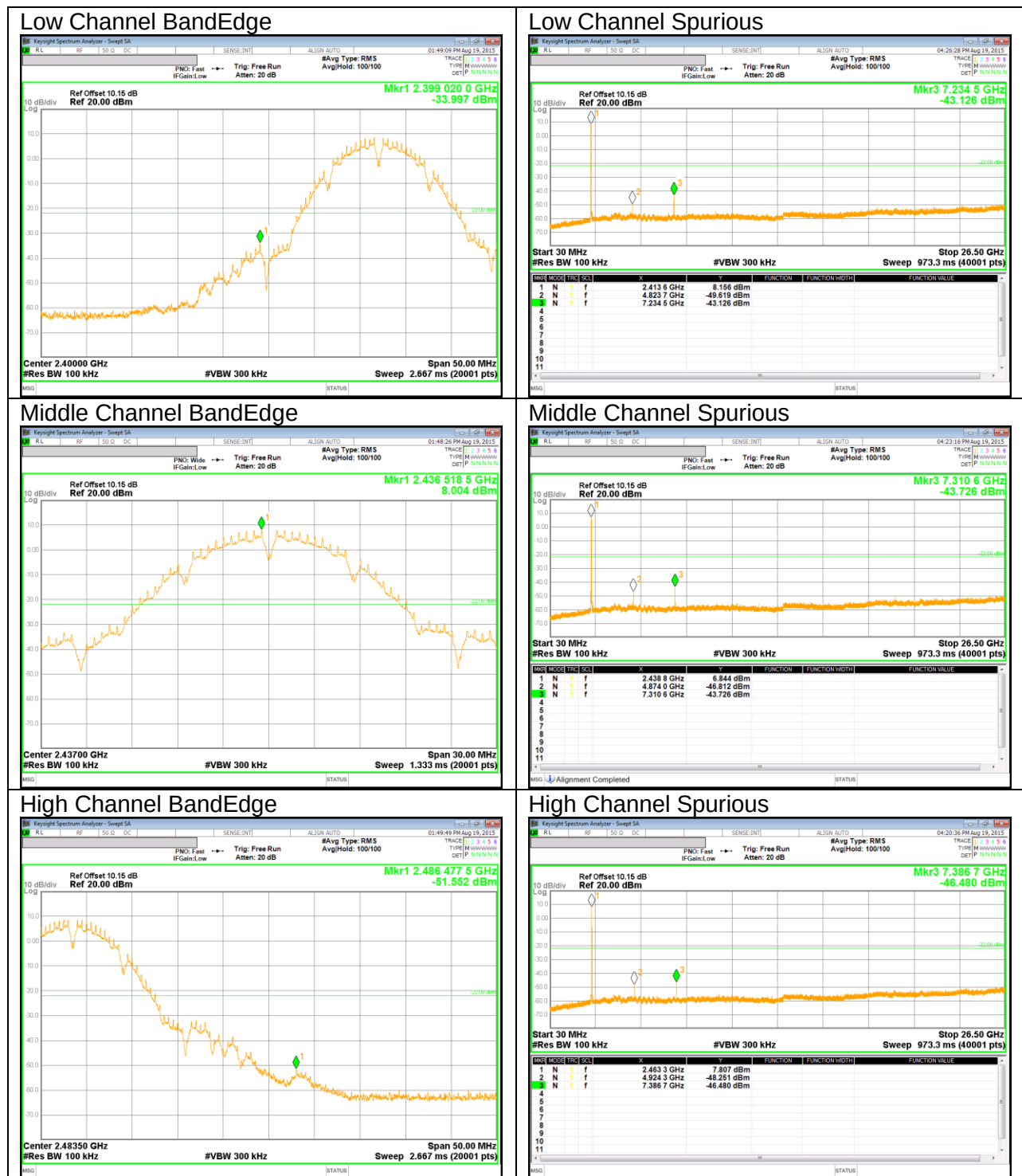
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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

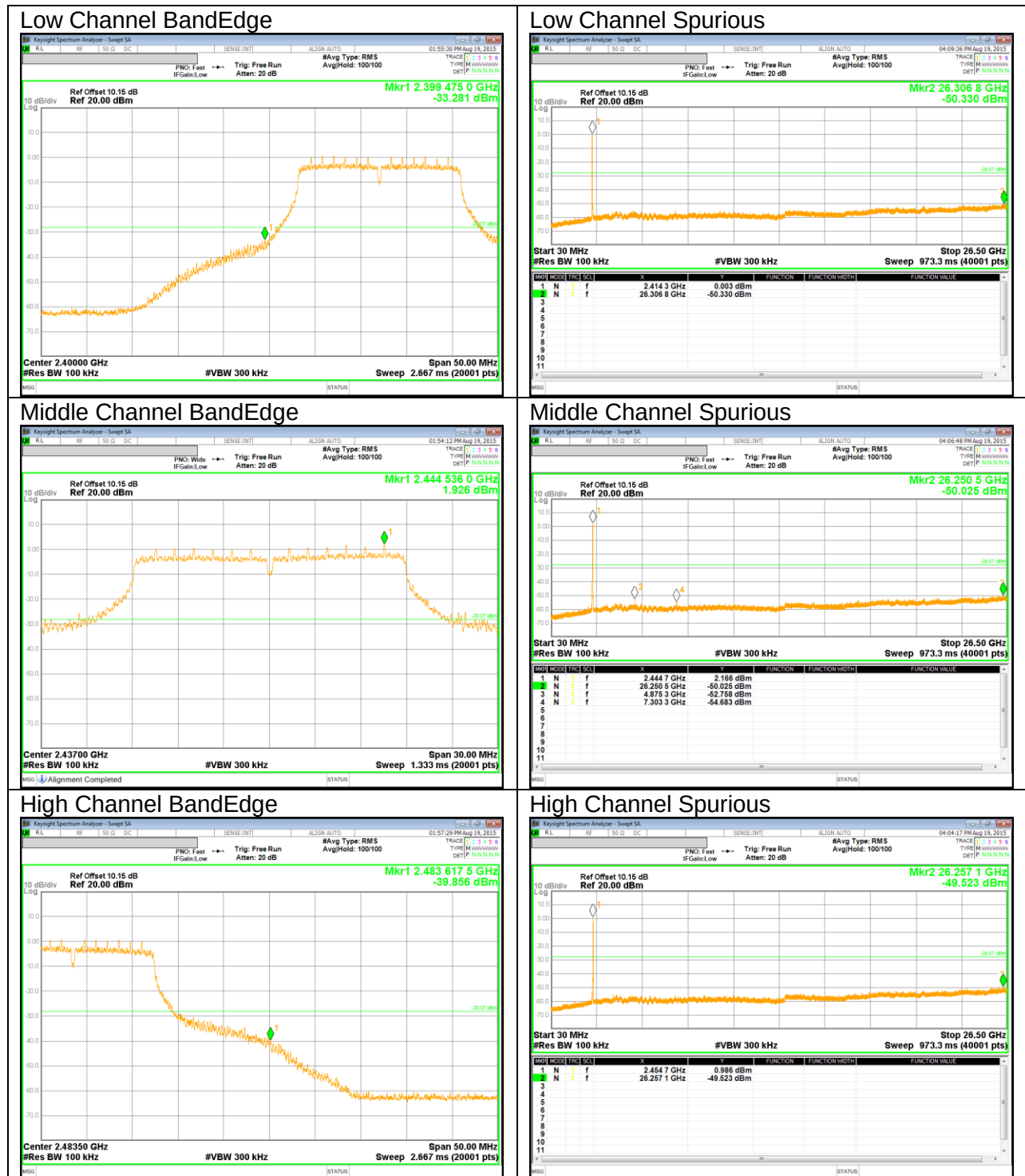
10.5.1. 802.11b MODE IN THE 2.4 GHZ BAND



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



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= $10\log(1/x)$ 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.

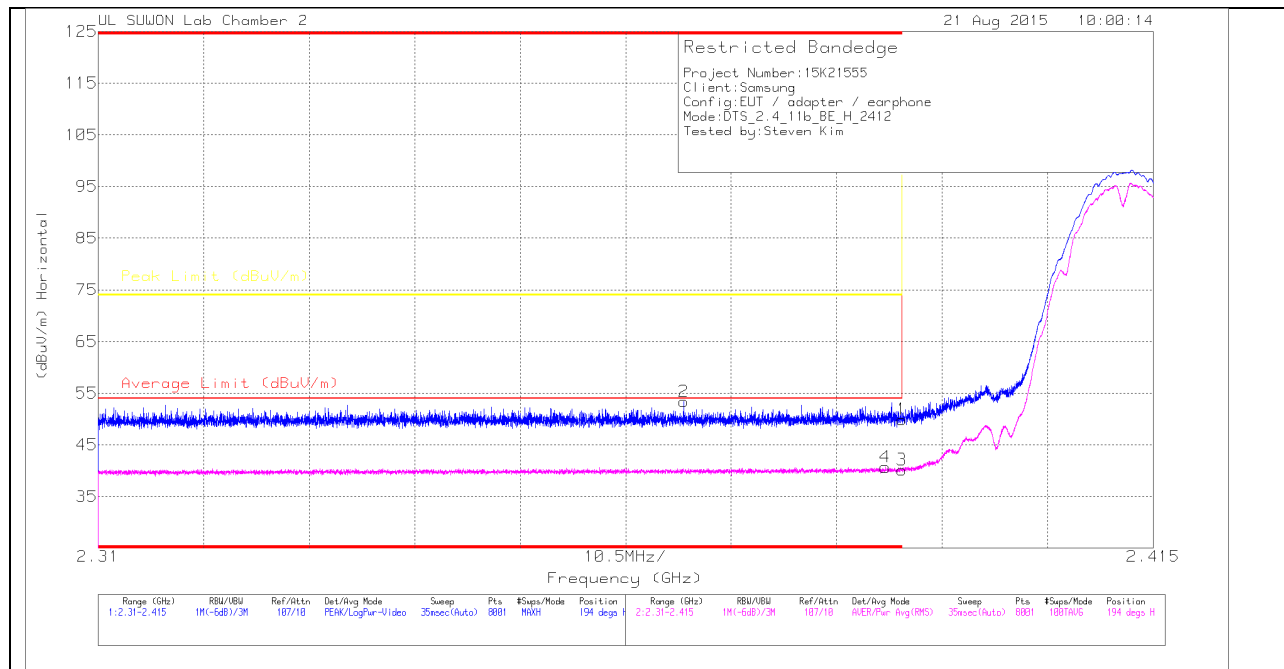
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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

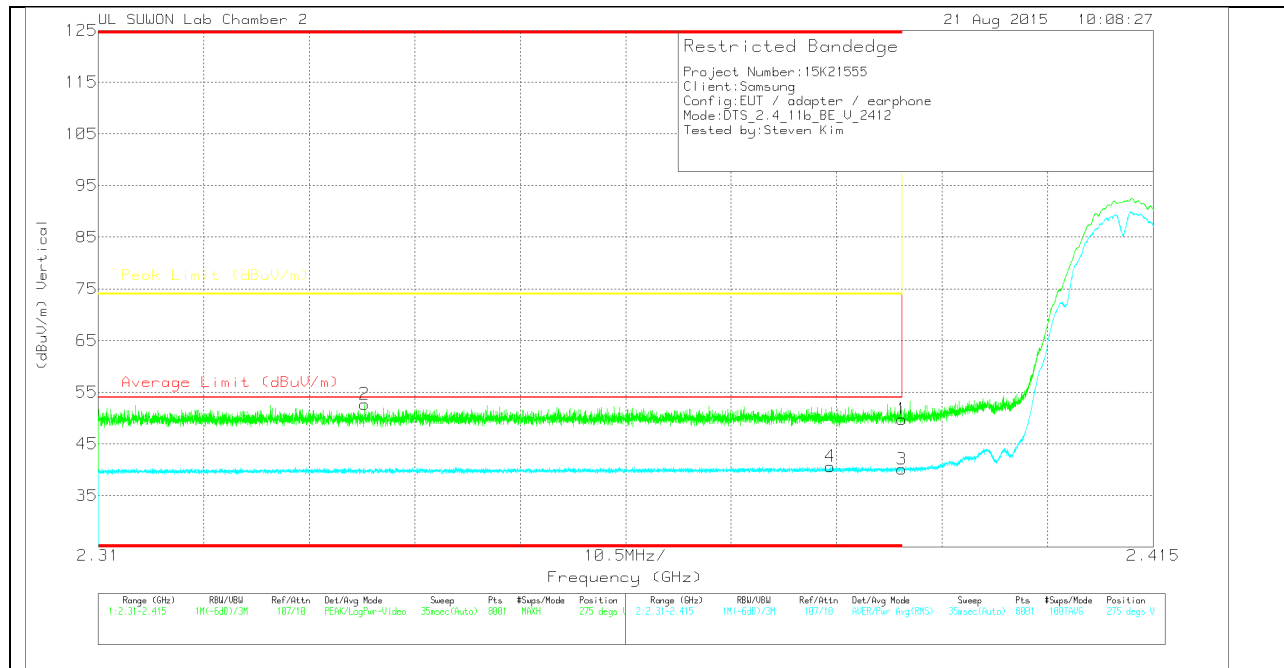
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	37.73	PK	31.7	-19.5	0	49.93	-	-	74	-24.07	194	310	H
2	* 2.368	41.27	PK	31.7	-19.6	0	53.37	-	-	74	-20.63	194	310	H
3	* 2.39	27.95	RMS	31.7	-19.5	0	40.15	54	-13.85	-	-	194	310	H
4	* 2.388	28.5	RMS	31.7	-19.5	0	40.7	54	-13.3	-	-	194	310	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	37.61	PK	31.7	-19.5	0	49.81	-	-	74	-24.19	275	371	V
2	* 2.337	40.71	PK	31.6	-19.6	0	52.71	-	-	74	-21.29	275	371	V
3	* 2.39	27.94	RMS	31.7	-19.5	0	40.14	54	-13.86	-	-	275	371	V
4	* 2.383	28.45	RMS	31.7	-19.5	0	40.65	54	-13.35	-	-	275	371	V

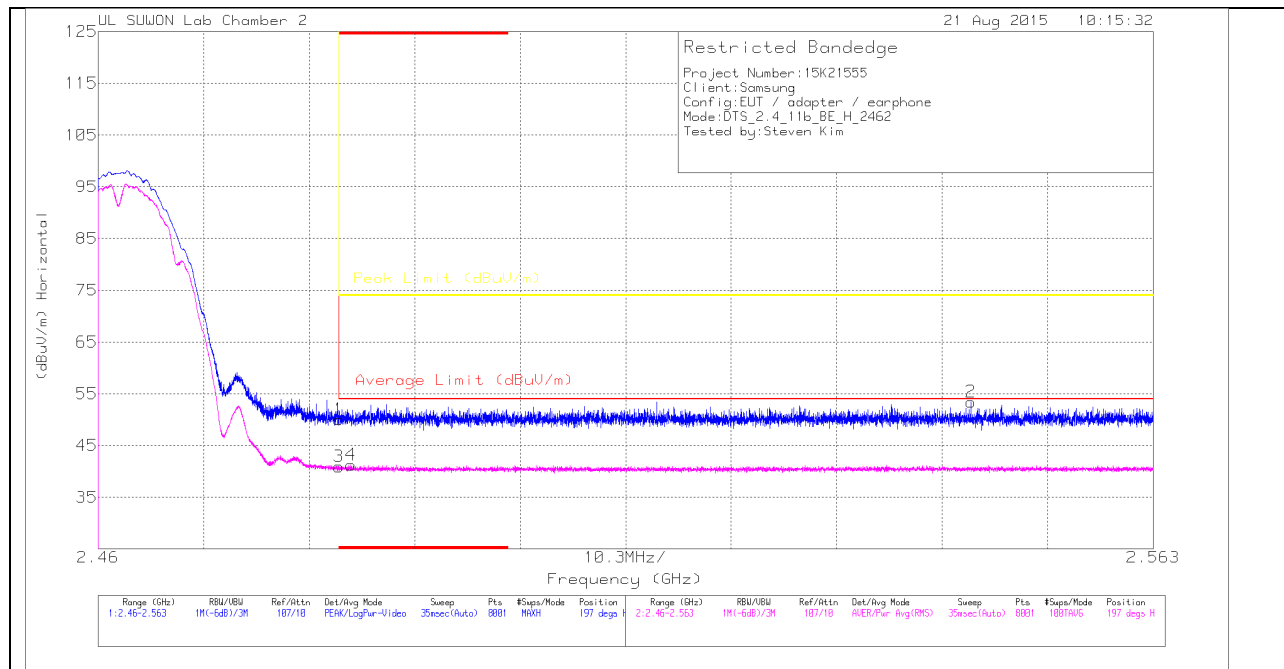
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

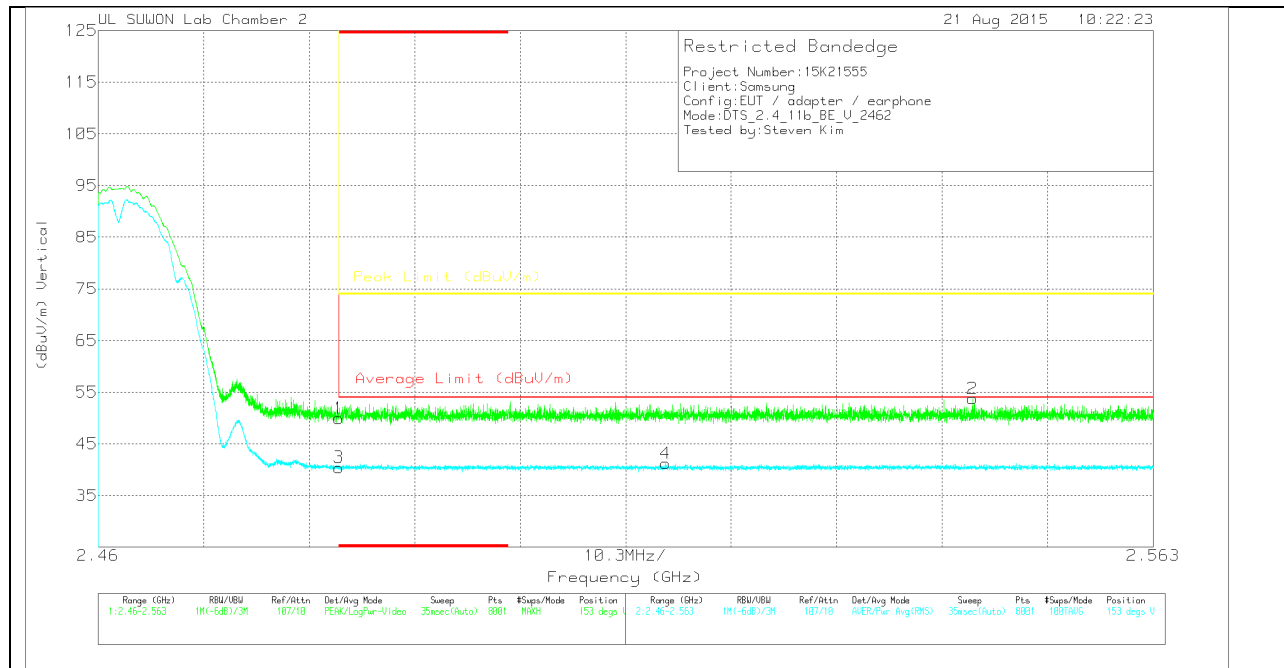
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.66	Pk	31.8	-19.4	0	50.06	-	-	74	-23.94	197	294	H
2	2.545	40.85	Pk	31.9	-19.3	0	53.45	-	-	74	-20.55	197	294	H
3	* 2.484	28.54	RMS	31.8	-19.4	0	40.94	54	-13.06	-	-	197	294	H
4	* 2.485	28.88	RMS	31.8	-19.4	0	41.28	54	-12.72	-	-	197	294	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	37.55	Pk	31.8	-19.4	0	49.95	-	-	74	-24.05	153	372	V
2	2.545	41.17	Pk	31.9	-19.3	0	53.77	-	-	74	-20.23	153	372	V
3	* 2.484	28.03	RMS	31.8	-19.4	0	40.43	54	-13.57	-	-	153	372	V
4	2.515	28.63	RMS	31.9	-19.3	0	41.23	54	-12.77	-	-	153	372	V

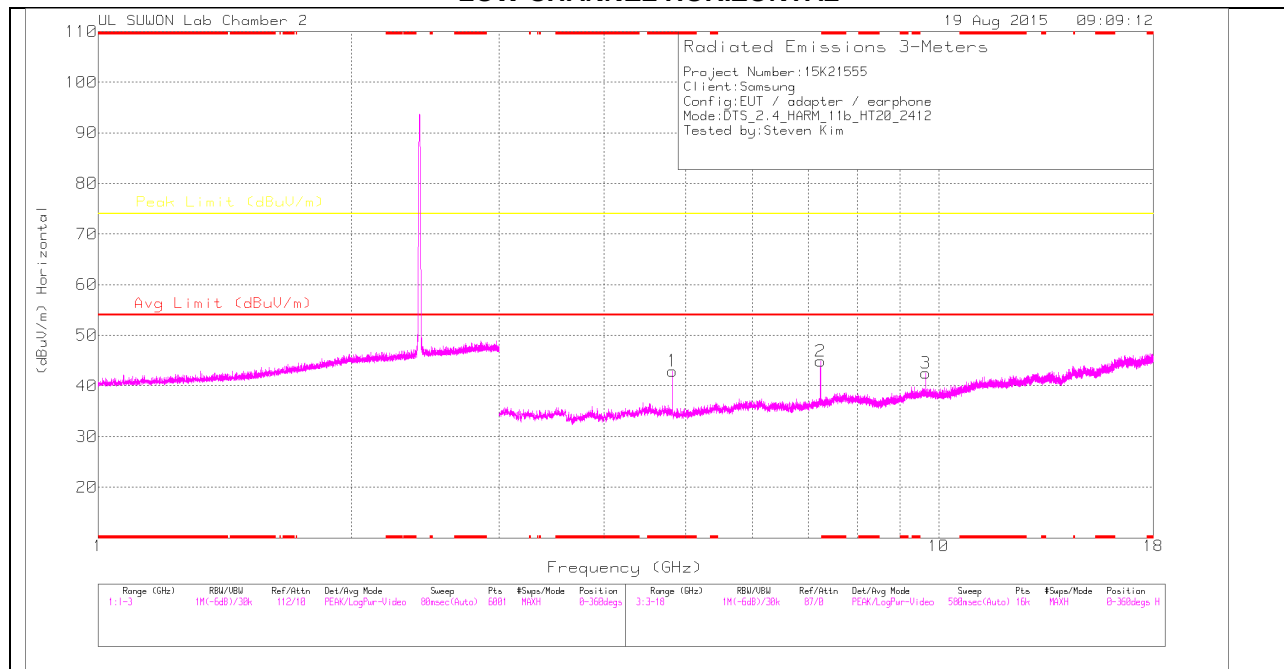
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

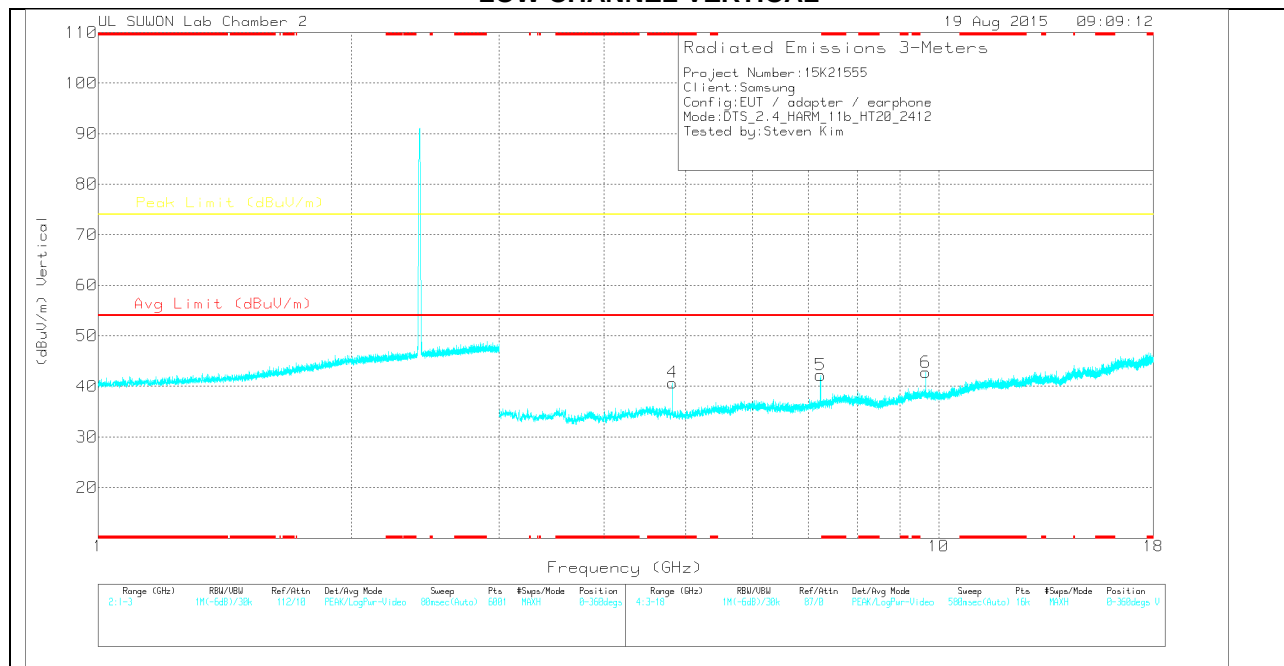
RMS - RMS detection

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	34.35	PK	33.9	-25.3	0	42.95	-	-	74	-31.05	0-360	200	H
2	7.235	32.1	PK	35.8	-23	0	44.9	-	-	74	-29.1	0-360	200	H
3	9.647	24.64	PK	36.9	-19	0	42.54	-	-	74	-31.46	0-360	200	H
4	* 4.823	32.13	PK	33.9	-25.3	0	40.73	-	-	74	-33.27	0-360	100	V
5	7.234	29.43	PK	35.8	-23	0	42.23	-	-	74	-31.77	0-360	100	V
6	9.648	24.85	PK	36.9	-19	0	42.75	-	-	74	-31.25	0-360	200	V

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

PK – Peak detector

Radiated Emissions

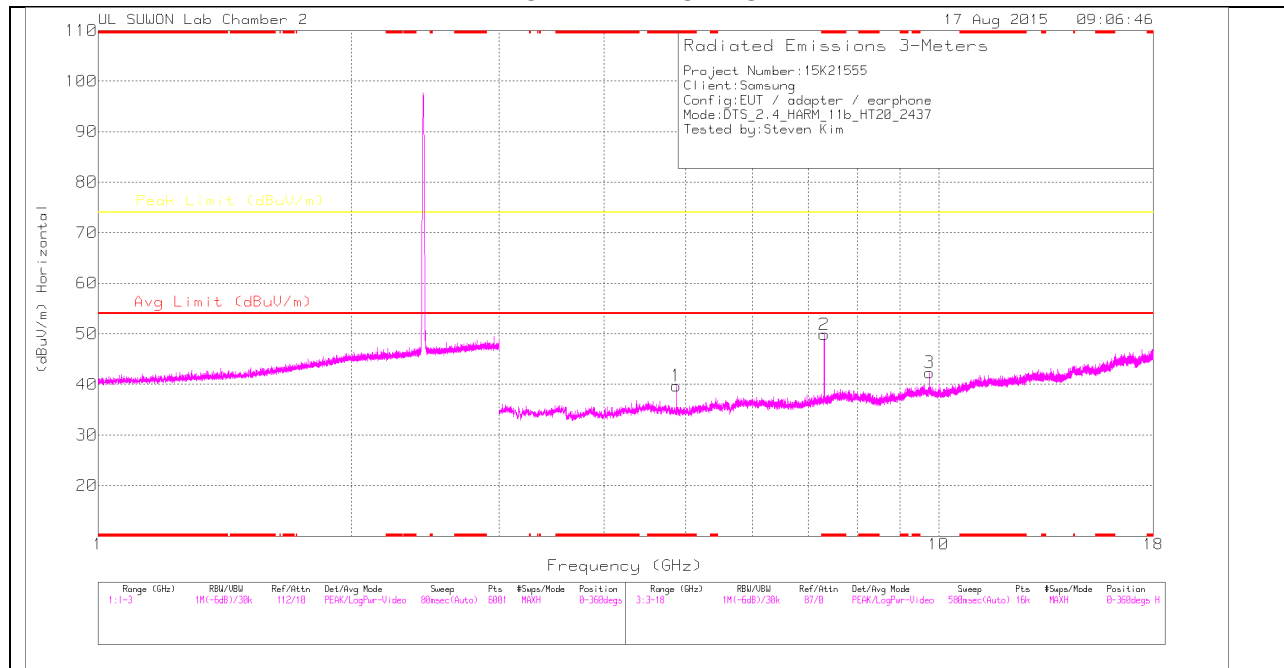
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	40.47	PK2	33.9	-25.3	0	49.07	-	-	74	-24.93	194	231	H
* 4.824	33.23	MAv1	33.9	-25.3	0	41.83	54	-12.17	-	-	194	231	H
7.235	39.81	PK2	35.8	-23	0	52.61	-	-	74	-21.39	5	293	H
9.648	33.52	PK2	36.9	-19	0	51.42	-	-	74	-22.58	5	323	H
* 4.824	40.45	PK2	33.9	-25.3	0	49.05	-	-	74	-24.95	352	340	V
* 4.824	33.92	MAv1	33.9	-25.3	0	42.52	54	-11.48	-	-	352	340	V
7.234	39.09	PK2	35.8	-23	0	51.89	-	-	74	-22.11	4	306	V
9.648	32.88	PK2	36.9	-19	0	50.78	-	-	74	-23.22	71	309	V

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

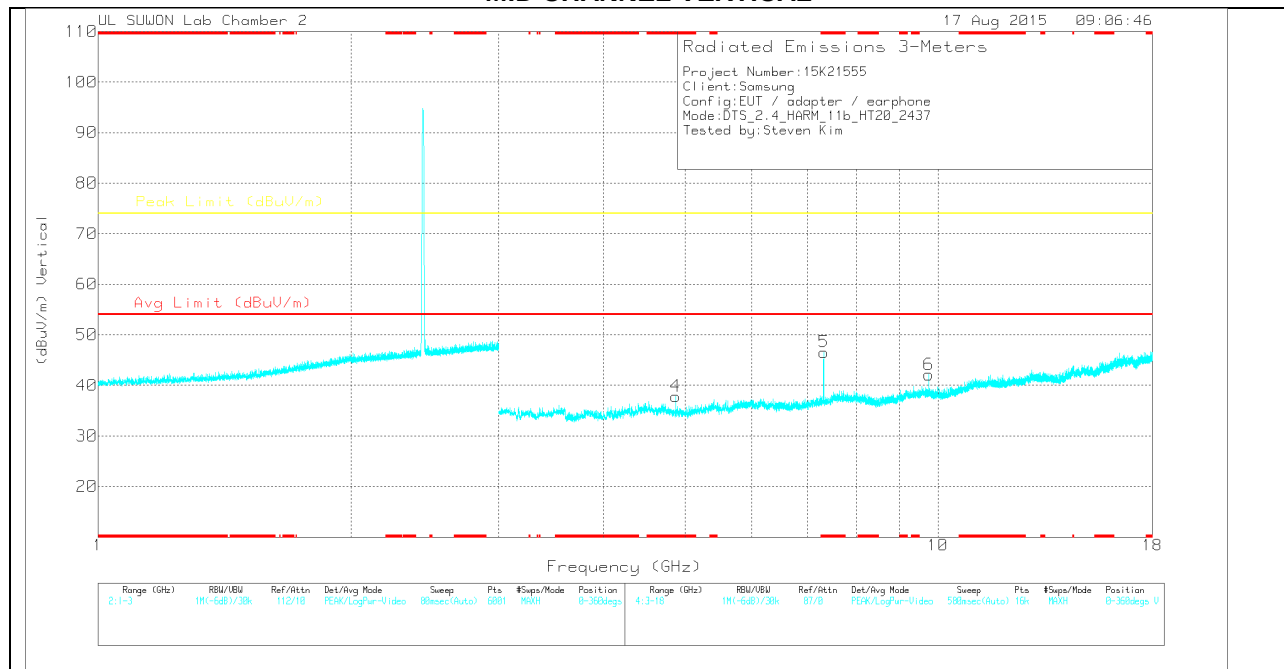
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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	* 4.874	31	PK	33.9	-25.2	0	39.7	-	-	74	-34.3	0-360	200	H
2	* 7.309	36.56	PK	35.9	-22.6	0	49.86	-	-	74	-24.14	0-360	200	H
3	9.748	24.63	PK	37	-19.3	0	42.33	-	-	74	-31.67	0-360	100	H
4	* 4.874	29.15	PK	33.9	-25.2	0	37.85	-	-	74	-36.15	0-360	200	V
5	* 7.311	33.27	PK	35.9	-22.6	0	46.57	-	-	74	-27.43	0-360	100	V
6	9.748	24.42	PK	37	-19.3	0	42.12	-	-	74	-31.88	0-360	200	V

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

PK – Peak detector

Radiated Emissions

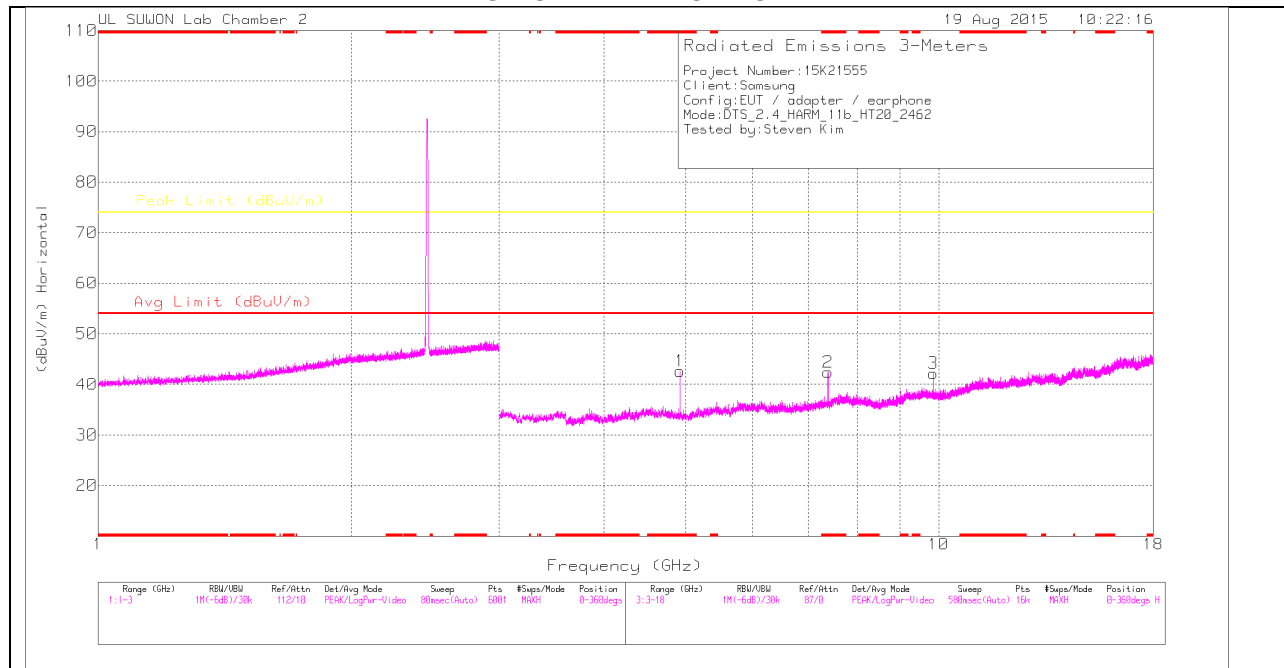
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	38.72	PK2	33.9	-25.2	0	47.42	-	-	74	-26.58	193	277	H
* 4.874	30.5	MAV1	33.9	-25.2	0	39.2	54	-14.8	-	-	193	277	H
* 7.312	43.38	PK2	35.9	-22.6	0	56.68	-	-	74	-17.32	23	388	H
* 7.31	36.84	MAV1	35.9	-22.6	0	50.14	54	-3.86	-	-	23	388	H
9.748	32.4	PK2	37	-19.3	0	50.1	-	-	74	-23.9	358	281	H
* 4.874	38.53	PK2	33.9	-25.2	0	47.23	-	-	74	-26.77	6	369	V
* 4.874	29.39	MAV1	33.9	-25.2	0	38.09	54	-15.91	-	-	6	369	V
* 7.312	41.08	PK2	35.9	-22.6	0	54.38	-	-	74	-19.62	345	322	V
* 7.312	33.51	MAV1	35.9	-22.6	0	46.81	54	-7.19	-	-	345	322	V
9.748	33.63	PK2	37	-19.3	0	51.33	-	-	74	-22.67	87	321	V

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

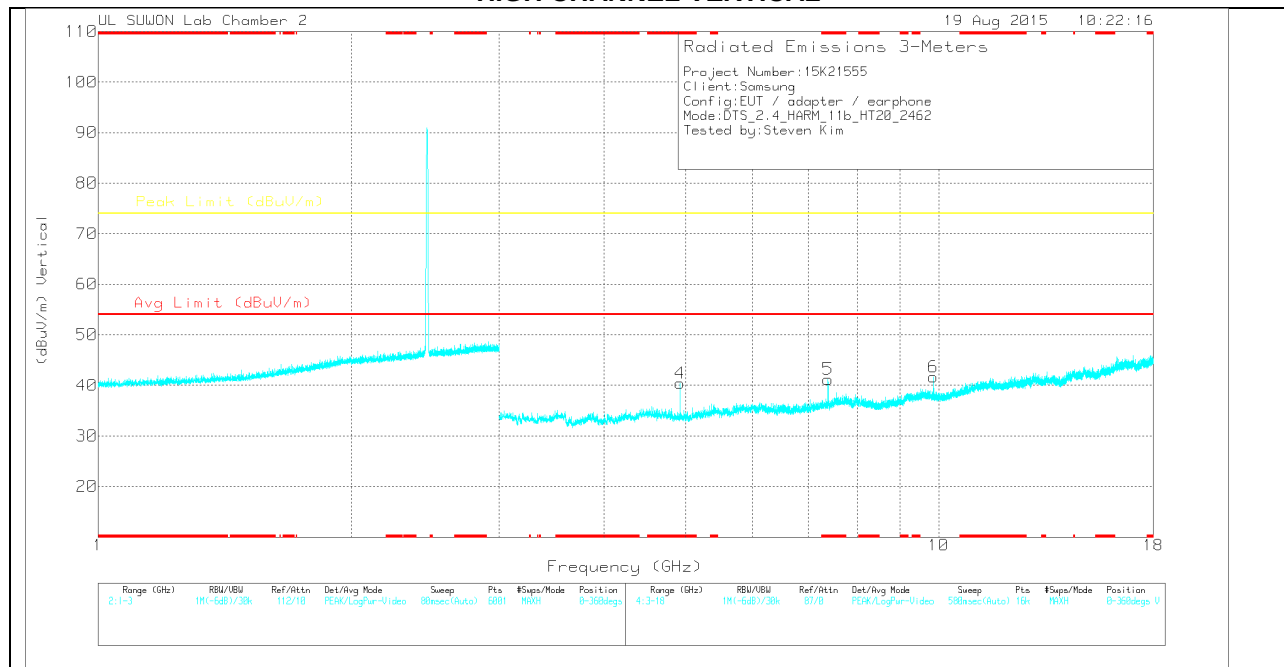
PK2 - KDB558074 Method: Maximum Peak

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	33.82	PK	33.9	-25.1	0	42.62	-	-	74	-31.38	0-360	200	H
2	* 7.385	28.72	PK	35.9	-22.2	0	42.42	-	-	74	-31.58	0-360	100	H
3	9.848	24.29	PK	37.1	-19.2	0	42.19	-	-	74	-31.81	0-360	100	H
4	* 4.924	31.63	PK	33.9	-25.1	0	40.43	-	-	74	-33.57	0-360	200	V
5	* 7.384	27.5	PK	35.9	-22.2	0	41.2	-	-	74	-32.8	0-360	100	V
6	9.848	23.75	PK	37.1	-19.2	0	41.65	-	-	74	-32.35	0-360	200	V

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

PK – Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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
* 4.924	39.03	PK2	33.9	-25.1	0	47.83	-	-	74	-26.17	193	244	H
* 4.924	31.22	MAV1	33.9	-25.1	0	40.02	54	-13.98	-	-	193	244	H
* 7.385	37.86	PK2	35.9	-22.2	0	51.56	-	-	74	-22.44	36	241	H
* 7.385	28.06	MAV1	35.9	-22.2	0	41.76	54	-12.24	-	-	36	241	H
9.848	34.05	PK2	37.1	-19.2	0	51.95	-	-	74	-22.05	358	331	H
* 4.924	40.96	PK2	33.9	-25.1	0	49.76	-	-	74	-24.24	0	356	V
* 4.924	33.85	MAV1	33.9	-25.1	0	42.65	54	-11.35	-	-	0	356	V
* 7.388	37.88	PK2	35.9	-22.2	0	51.58	-	-	74	-22.42	351	345	V
* 7.385	28.26	MAV1	35.9	-22.2	0	41.96	54	-12.04	-	-	351	345	V
9.848	32.89	PK2	37.1	-19.2	0	50.79	-	-	74	-23.21	266	155	V

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

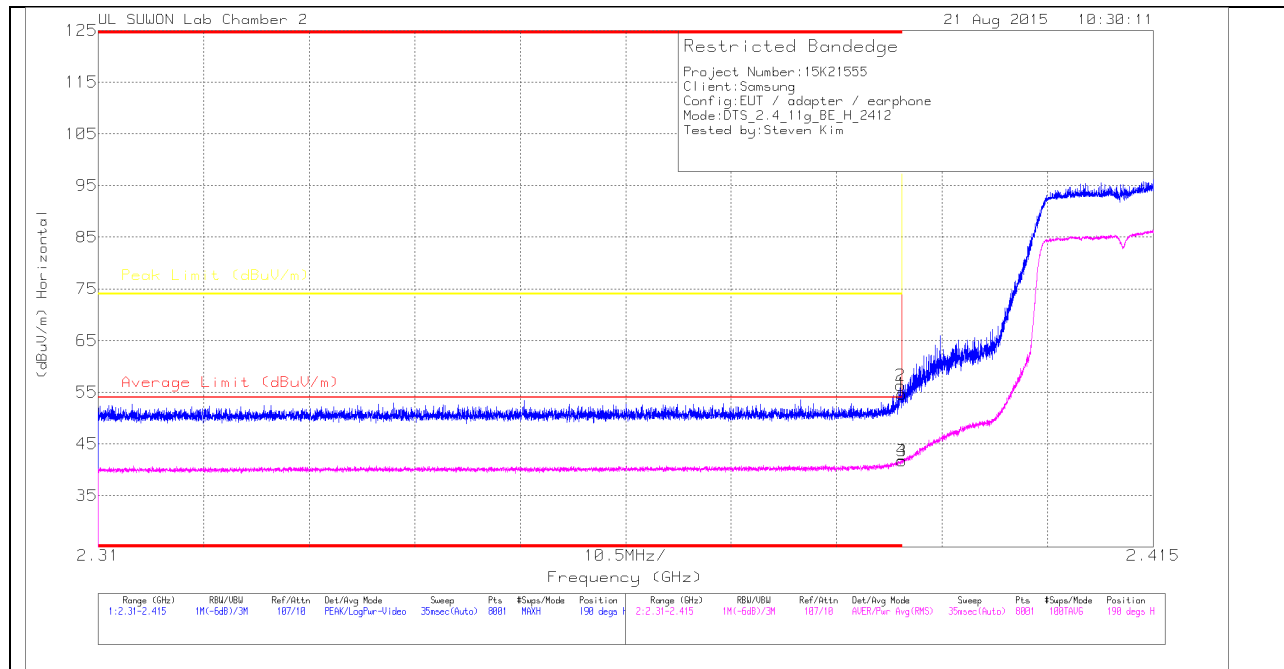
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

11.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

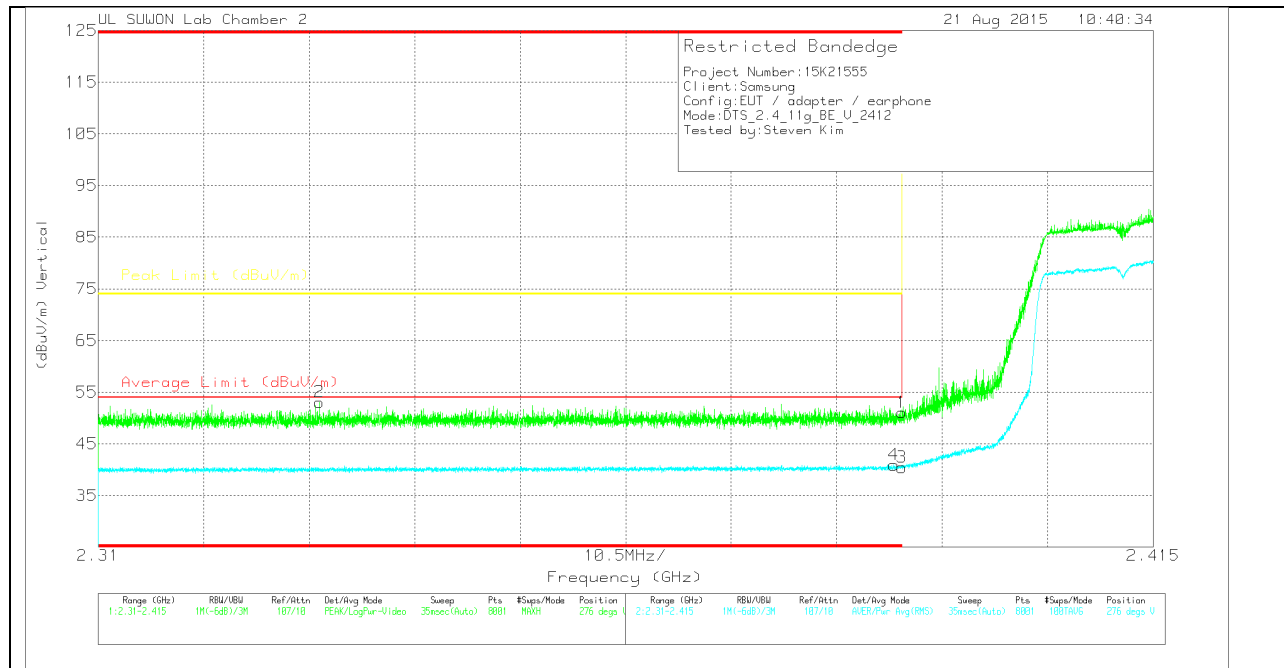
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.49	Pk	31.7	-19.5	0	54.69	-	-	74	-19.31	190	310	H
2	* 2.39	44.11	Pk	31.7	-19.5	0	56.31	-	-	74	-17.69	190	310	H
3	* 2.39	29.23	RMS	31.7	-19.5	.29	41.72	54	-12.28	-	-	190	310	H
4	* 2.39	29.3	RMS	31.7	-19.5	.29	41.79	54	-12.21	-	-	190	310	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	38.86	Pk	31.7	-19.5	0	51.06	-	-	74	-22.94	276	370	V
2	* 2.332	41.2	Pk	31.6	-19.7	0	53.1	-	-	74	-20.9	276	370	V
3	* 2.39	27.97	RMS	31.7	-19.5	.29	40.46	54	-13.54	-	-	276	370	V
4	* 2.389	28.45	RMS	31.7	-19.5	.29	40.94	54	-13.06	-	-	276	370	V

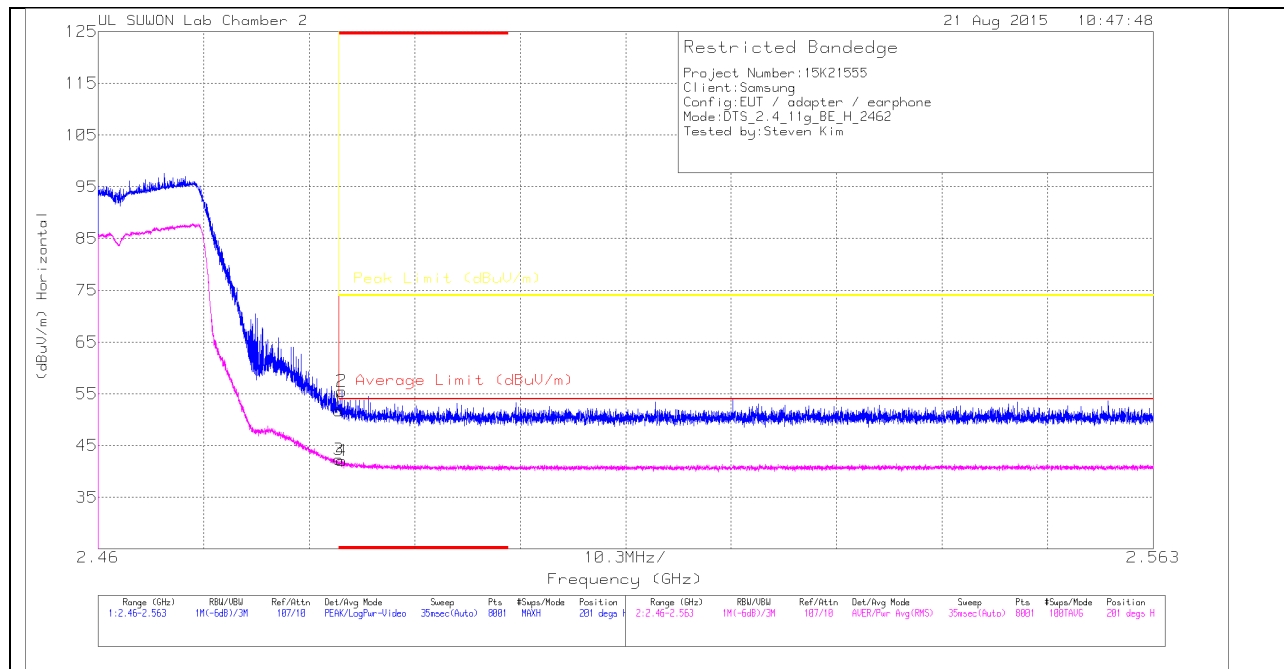
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

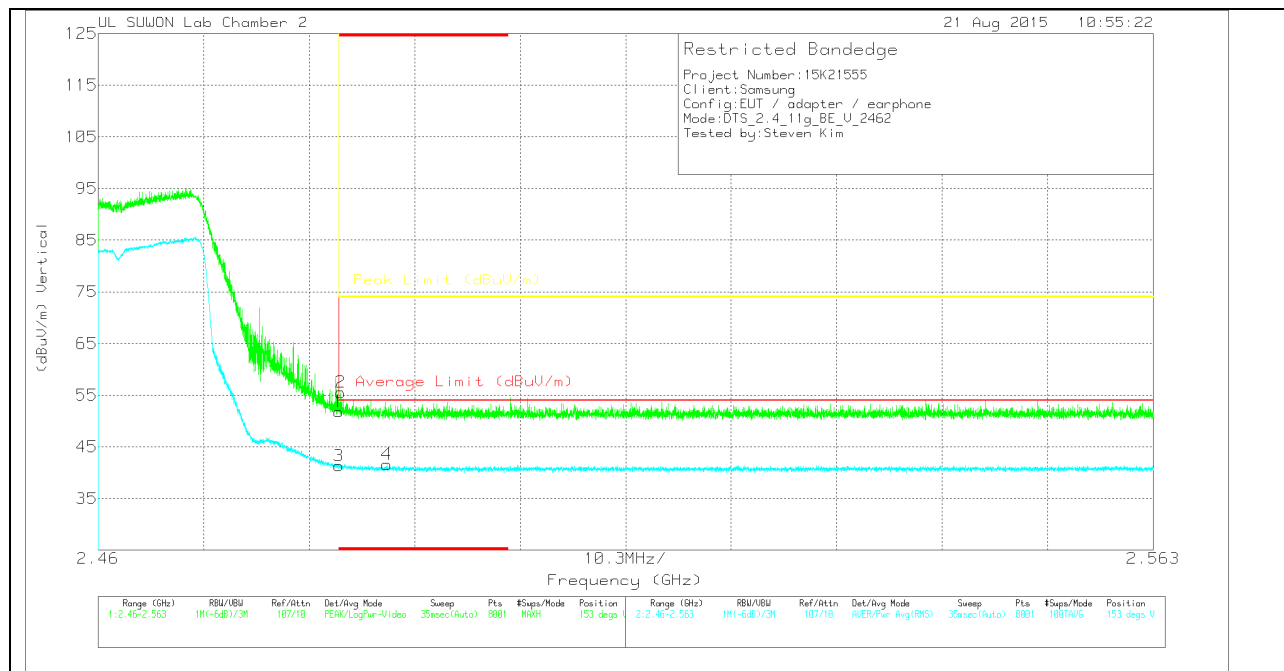
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.32	Pk	31.8	-19.4	0	51.72	-	-	74	-22.28	201	292	H
2	* 2.484	43.12	Pk	31.8	-19.4	0	55.52	-	-	74	-18.48	201	292	H
3	* 2.484	29.64	RMS	31.8	-19.4	.29	42.33	54	-11.67	-	-	201	292	H
4	* 2.484	29.38	RMS	31.8	-19.4	.29	42.07	54	-11.93	-	-	201	292	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	39.44	Pk	31.8	-19.4	0	51.84	-	-	74	-22.16	153	298	V
2	* 2.484	43.14	Pk	31.8	-19.4	0	55.54	-	-	74	-18.46	153	298	V
3	* 2.484	28.66	RMS	31.8	-19.4	.29	41.35	54	-12.65	-	-	153	298	V
4	* 2.488	28.93	RMS	31.8	-19.4	.29	41.62	54	-12.38	-	-	153	298	V

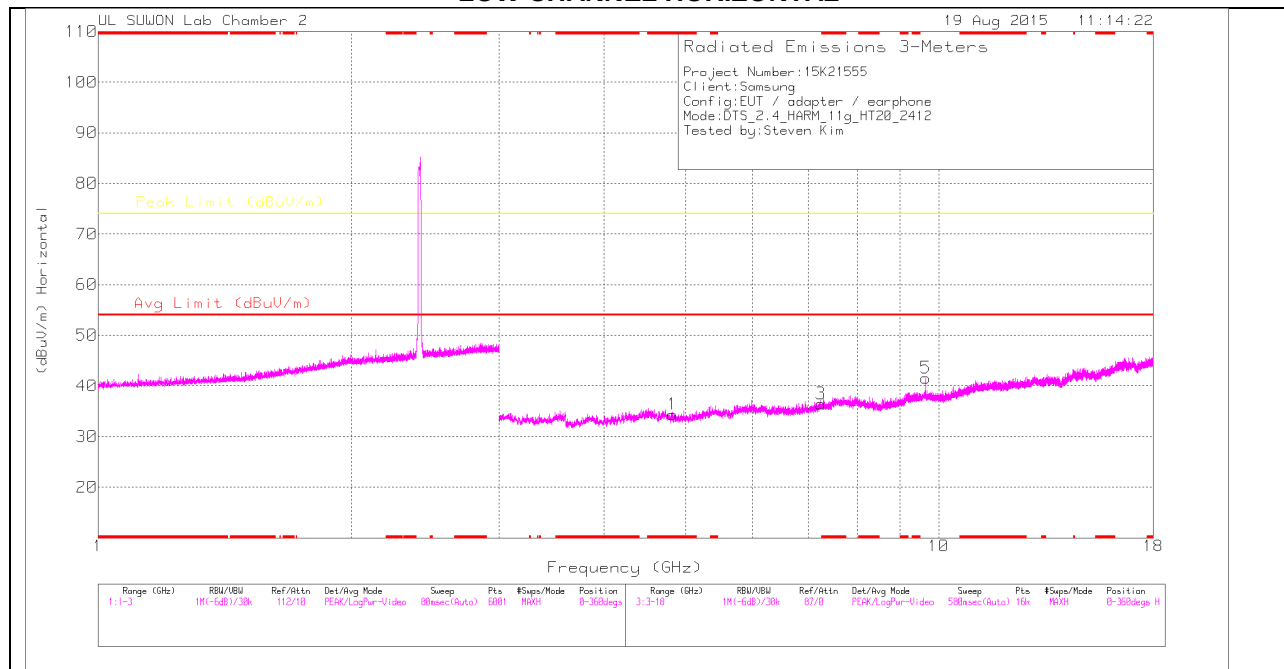
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

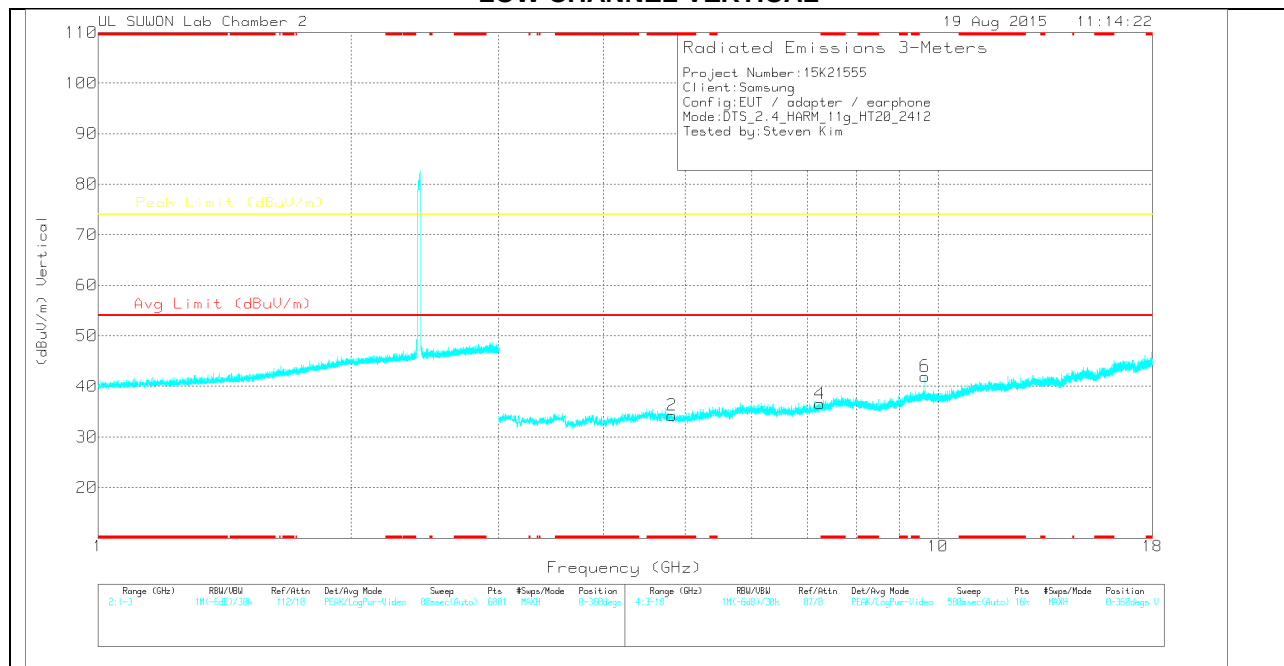
RMS - RMS detection

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	* 4.826	25.78	PK	33.9	-25.3	0	34.38	-	-	74	-39.62	0-360	200	H
3	7.238	23.68	PK	35.8	-23	0	36.48	-	-	74	-37.52	0-360	200	H
5	9.648	23.68	PK	36.9	-19	0	41.58	-	-	74	-32.42	0-360	100	H
2	* 4.822	25.65	PK	33.9	-25.3	0	34.25	-	-	74	-39.75	0-360	100	V
4	7.233	23.77	PK	35.8	-23	0	36.57	-	-	74	-37.43	0-360	100	V
6	9.648	24.05	PK	36.9	-19	0	41.95	-	-	74	-32.05	0-360	200	V

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

PK – Peak detector

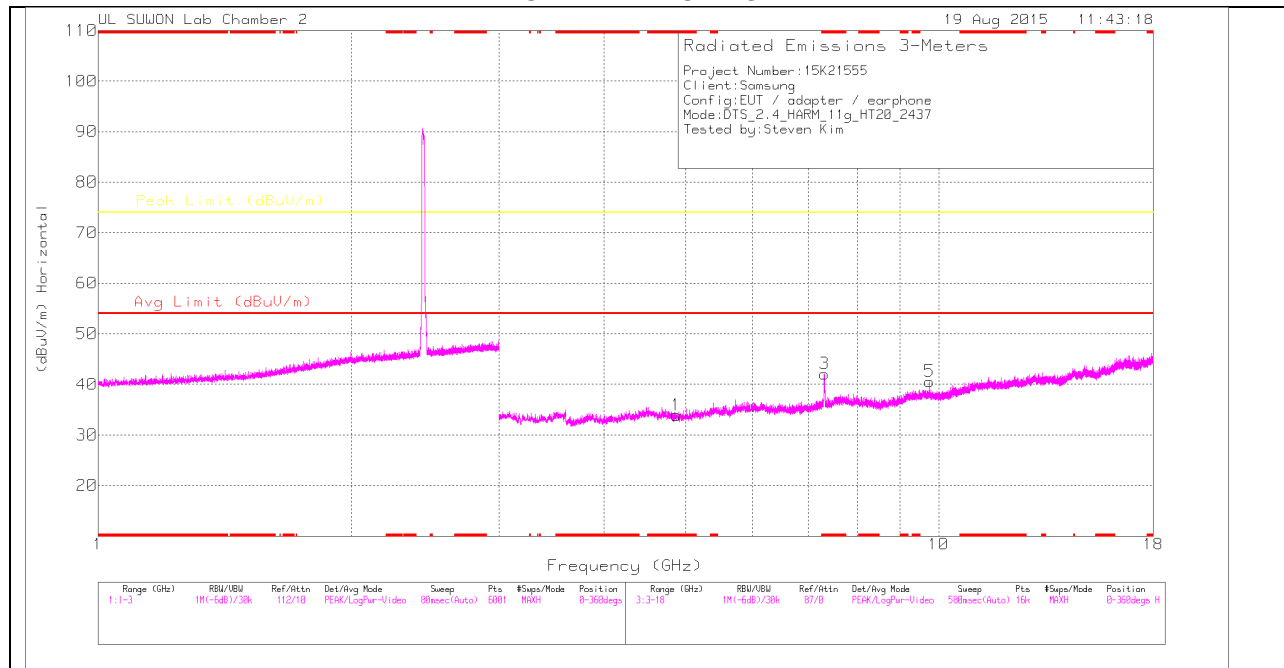
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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
9.646	31.69	PK2	36.9	-19	0	49.59	-	-	74	-24.41	8	317	H
9.648	32.93	PK2	36.9	-19	0	50.83	-	-	74	-23.17	172	104	V

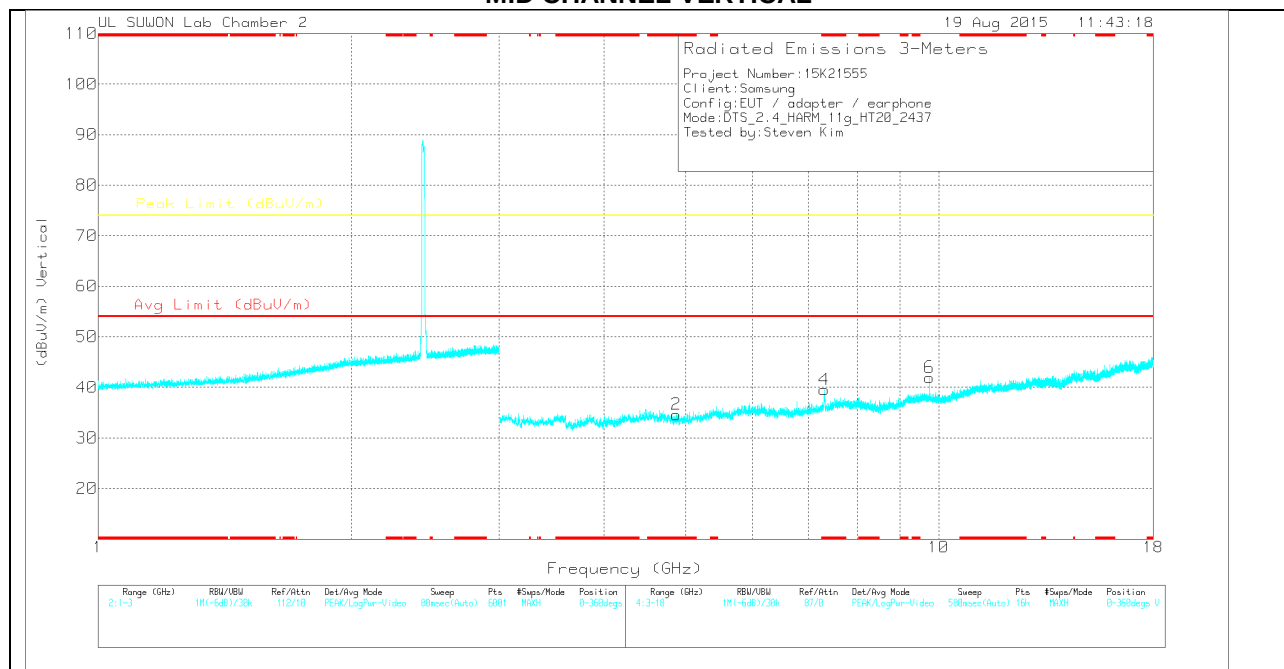
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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	* 4.87	25.21	PK	33.9	-25.2	0	33.91	-	-	74	-40.09	0-360	200	H
3	* 7.313	28.79	PK	35.9	-22.6	0	42.09	-	-	74	-31.91	0-360	200	H
5	9.748	22.88	PK	37	-19.3	0	40.58	-	-	74	-33.42	0-360	100	H
2	* 4.876	25.93	PK	33.9	-25.2	0	34.63	-	-	74	-39.37	0-360	100	V
4	* 7.309	26.24	PK	35.9	-22.6	0	39.54	-	-	74	-34.46	0-360	100	V
6	9.748	24.24	PK	37	-19.3	0	41.94	-	-	74	-32.06	0-360	100	V

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

PK – Peak detector

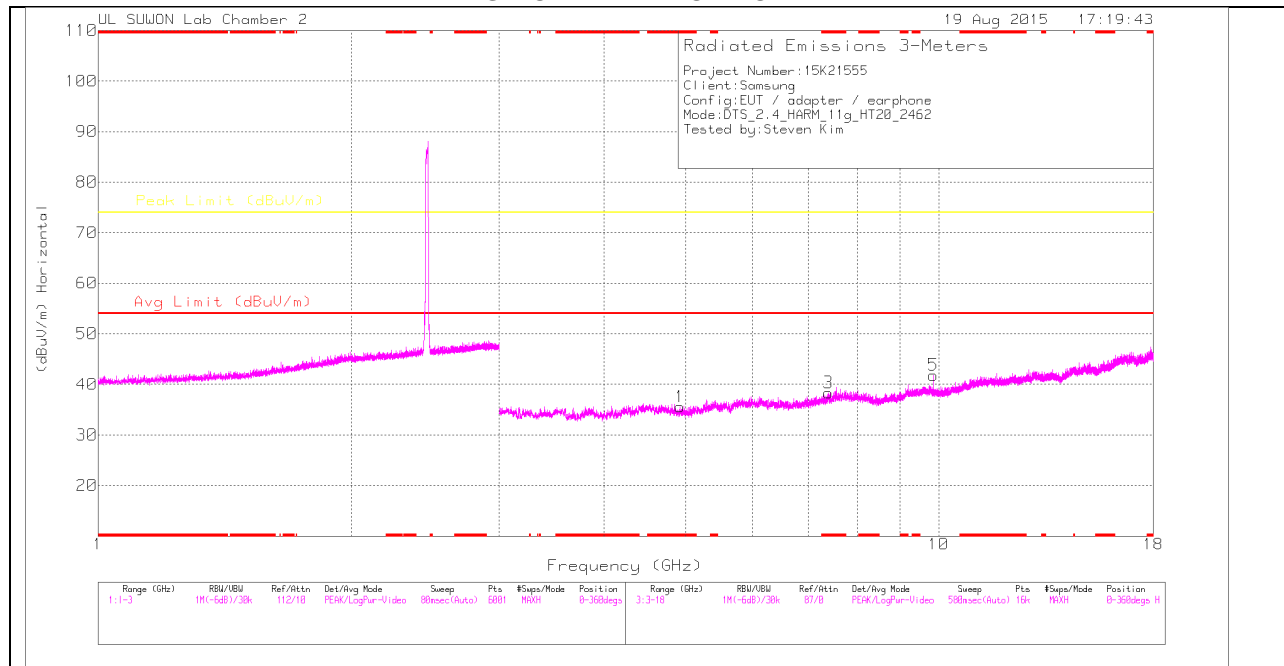
Radiated Emissions

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
* 7.317	44.13	PK2	35.9	-22.6	0	57.43	-	-	74	-16.57	4	332	H
* 7.314	27.79	MAV1	35.9	-22.6	.29	41.38	54	-12.62	-	-	4	332	H
9.748	34.57	PK2	37	-19.3	0	52.27	-	-	74	-21.73	6	400	H
* 7.309	43.44	PK2	35.9	-22.6	0	56.74	-	-	74	-17.26	125	316	V
* 7.313	26.78	MAV1	35.9	-22.6	.29	40.37	54	-13.63	-	-	125	316	V
9.747	31.48	PK2	37	-19.3	0	49.18	-	-	74	-24.82	68	168	V

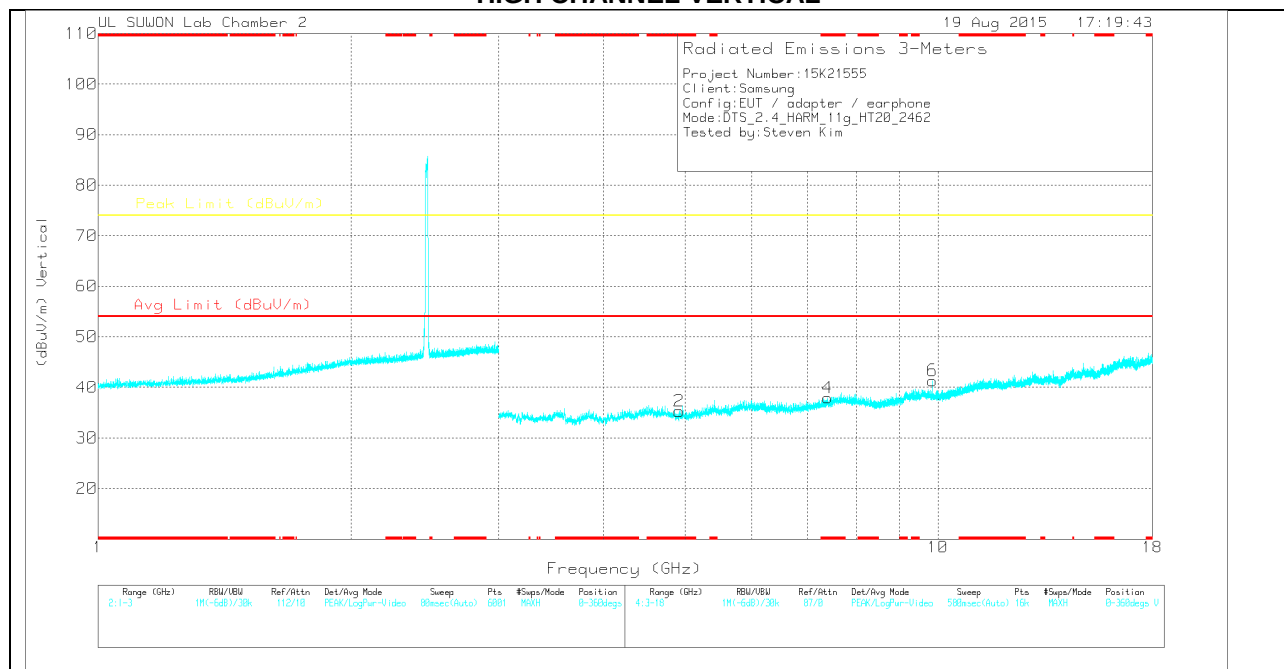
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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(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	* 4.923	26.75	PK	33.9	-25.1	0	35.55	-	-	74	-38.45	0-360	200	H
3	* 7.387	24.63	PK	35.9	-22.2	0	38.33	-	-	74	-35.67	0-360	200	H
5	9.848	23.93	PK	37.1	-19.2	0	41.83	-	-	74	-32.17	0-360	100	H
2	* 4.92	26.47	PK	33.9	-25.1	0	35.27	-	-	74	-38.73	0-360	200	V
4	* 7.391	24.23	PK	35.9	-22.2	0	37.93	-	-	74	-36.07	0-360	200	V
6	9.848	23.42	PK	37.1	-19.2	0	41.32	-	-	74	-32.68	0-360	100	V

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

PK – Peak detector

Radiated Emissions

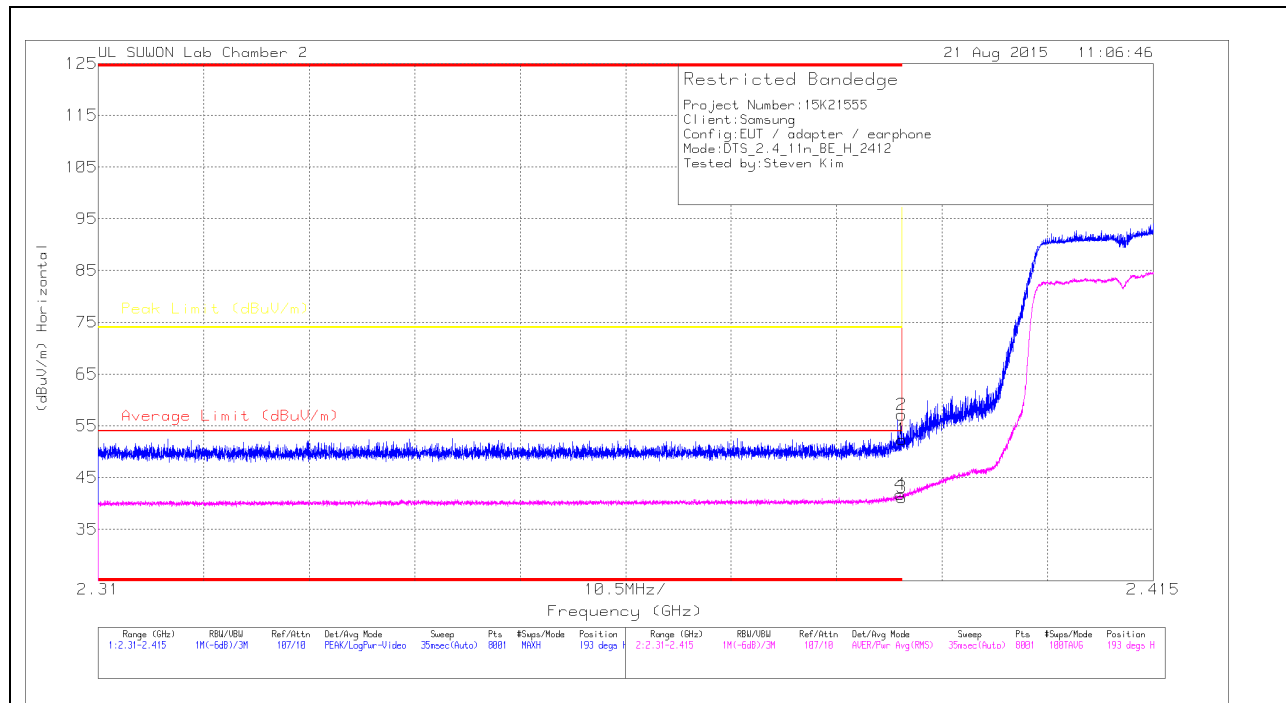
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.848	34.72	PK2	37.1	-19.2	0	52.62	-	-	74	-21.38	5	393	H
9.848	33.88	PK2	37.1	-19.2	0	51.78	-	-	74	-22.22	81	331	V

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

PK2 - KDB558074 Method: Maximum Peak

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

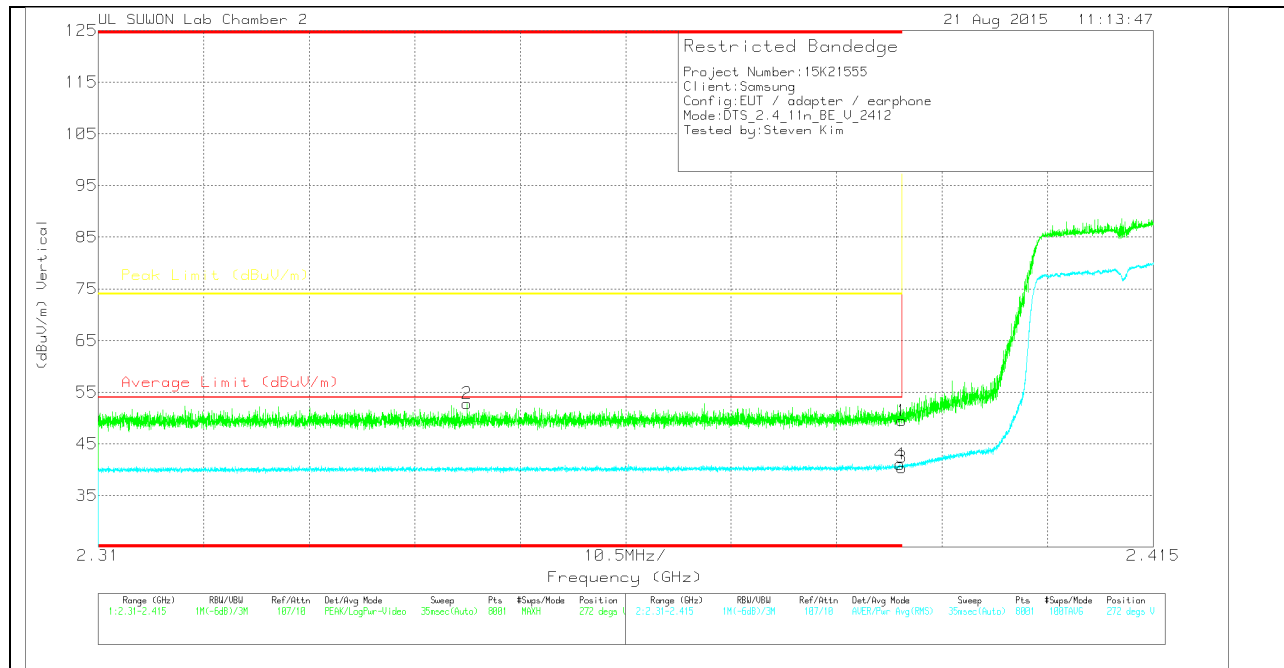
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.17	Pk	31.7	-19.5	0	52.37	-	-	74	-21.63	193	244	H
2	* 2.39	44.94	Pk	31.7	-19.5	0	57.14	-	-	74	-16.86	193	244	H
3	* 2.39	28.64	RMS	31.7	-19.5	-32	41.16	54	-12.84	-	-	193	244	H
4	* 2.39	29.17	RMS	31.7	-19.5	-32	41.69	54	-12.31	-	-	193	244	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	37.3	Pk	31.7	-19.5	0	49.5	-	-	74	-24.5	272	371	V
2	* 2.347	40.81	Pk	31.6	-19.6	0	52.81	-	-	74	-21.19	272	371	V
3	* 2.39	27.92	RMS	31.7	-19.5	.32	40.44	54	-13.56	-	-	272	371	V
4	* 2.39	28.54	RMS	31.7	-19.5	.32	41.06	54	-12.94	-	-	272	371	V

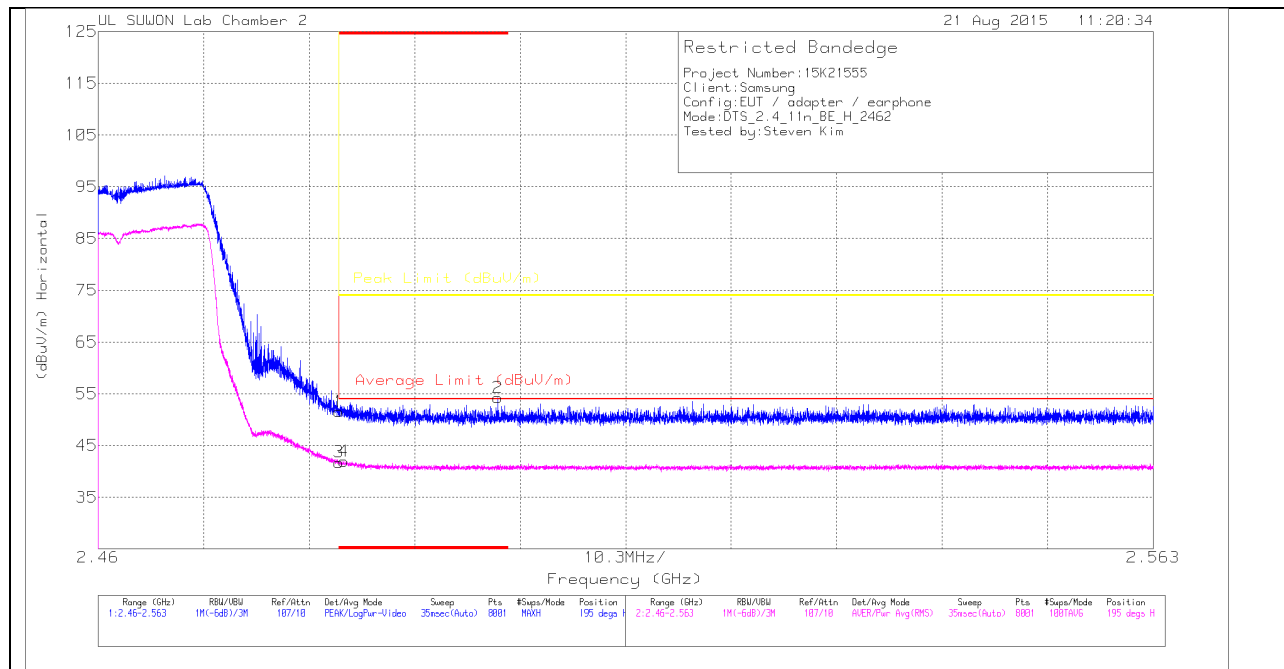
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

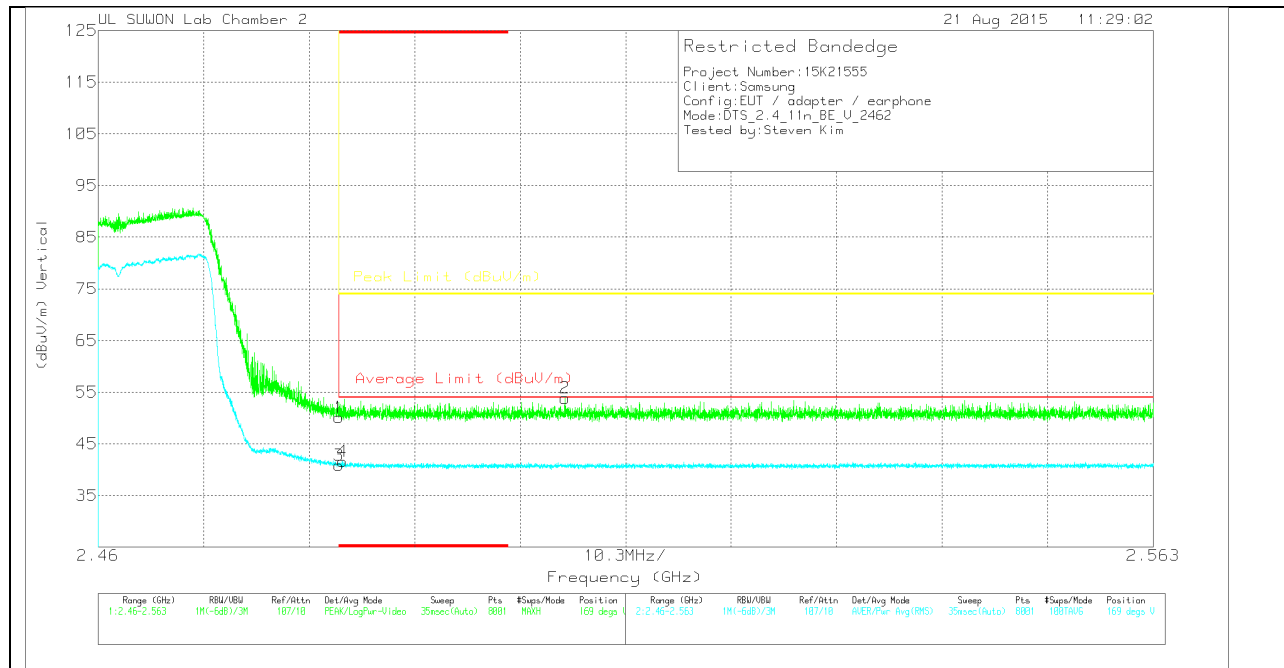
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.17	Pk			0	51.57	-	-	74	-22.43	195	292	H
2	* 2.499	41.76	Pk			0	54.26	-	-	74	-19.74	195	292	H
3	* 2.484	29.06	RMS			.32	41.78	54	-12.22	-	-	195	292	H
4	* 2.484	29.25	RMS			.32	41.97	54	-12.03	-	-	195	292	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	37.69	Pk	31.8	-19.4	0	50.09	-	-	74	-23.91	169	238	V
2	2.506	41.25	Pk	31.9	-19.3	0	53.85	-	-	74	-20.15	169	238	V
3	* 2.484	28.12	RMS	31.8	-19.4	.32	40.84	54	-13.16	-	-	169	238	V
4	* 2.484	28.87	RMS	31.8	-19.4	.32	41.59	54	-12.41	-	-	169	238	V

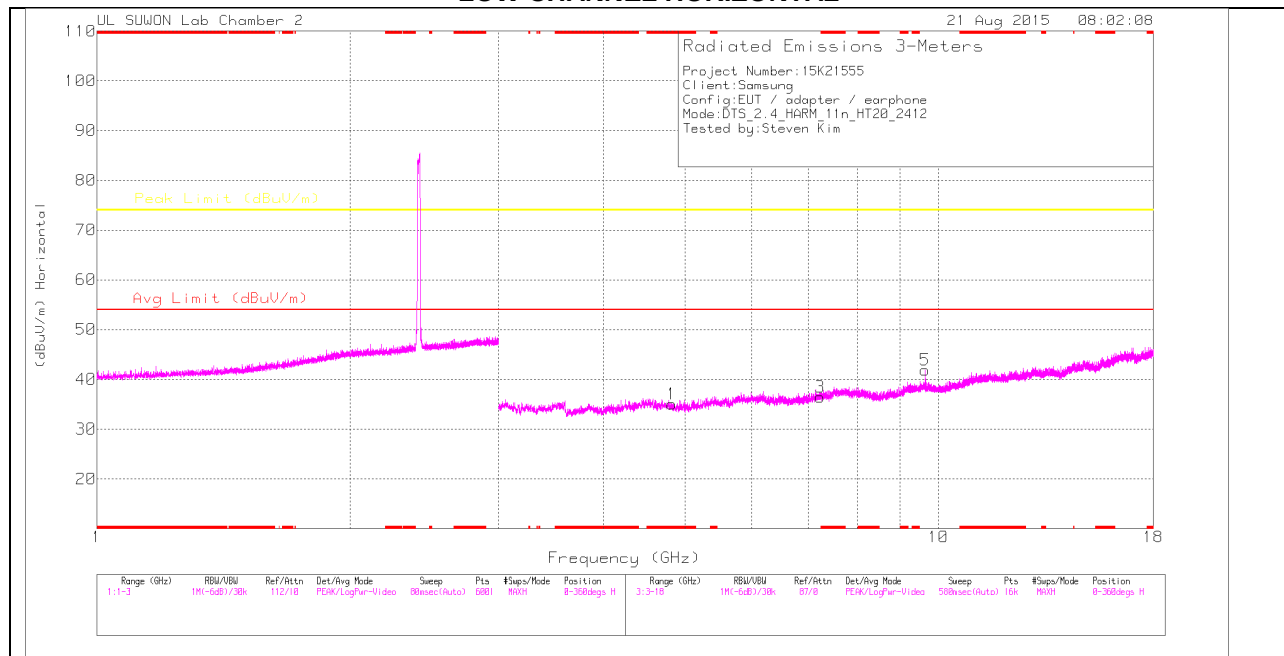
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

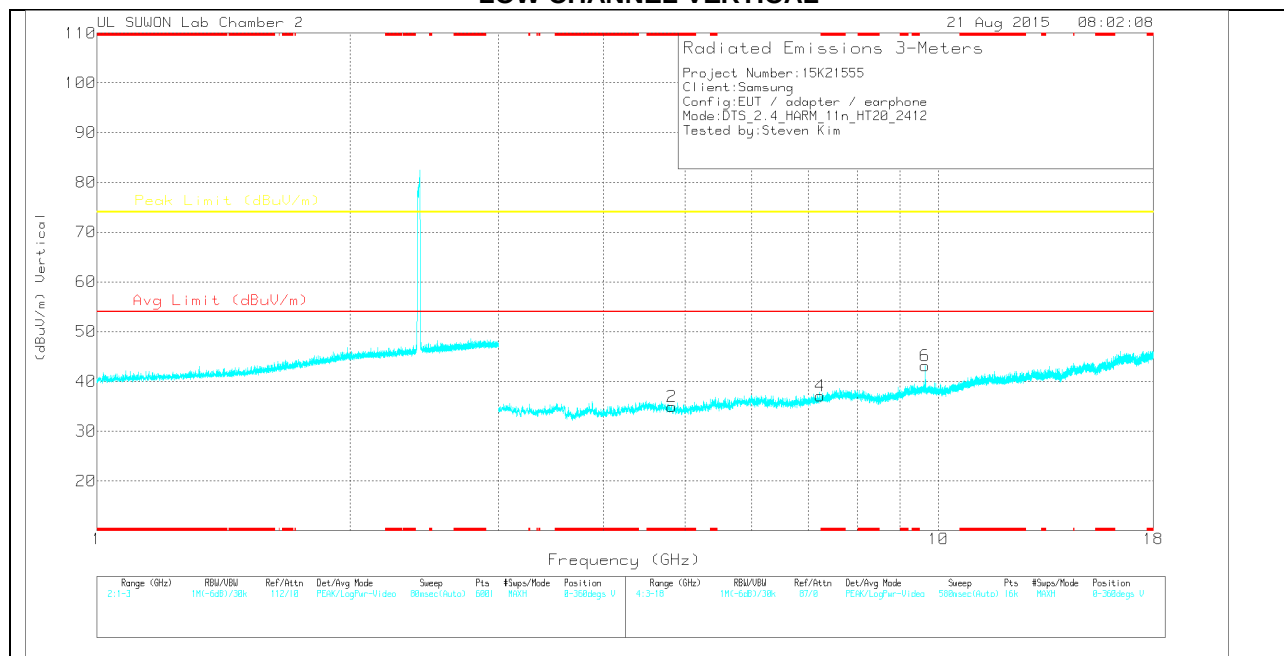
RMS - RMS detection

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	* 4.822	26.48	PK	33.9	-25.3	0	35.08	-	-	74	-38.92	0-360	100	H
3	7.236	23.67	PK	35.8	-23	0	36.47	-	-	74	-37.53	0-360	100	H
5	9.648	24.03	PK	36.9	-19	0	41.93	-	-	74	-32.07	0-360	100	H
2	* 4.823	26.34	PK	33.9	-25.3	0	34.94	-	-	74	-39.06	0-360	100	V
4	7.236	24.27	PK	35.8	-23	0	37.07	-	-	74	-36.93	0-360	100	V
6	9.647	25.26	PK	36.9	-19	0	43.16	-	-	74	-30.84	0-360	200	V

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

PK – Peak detector

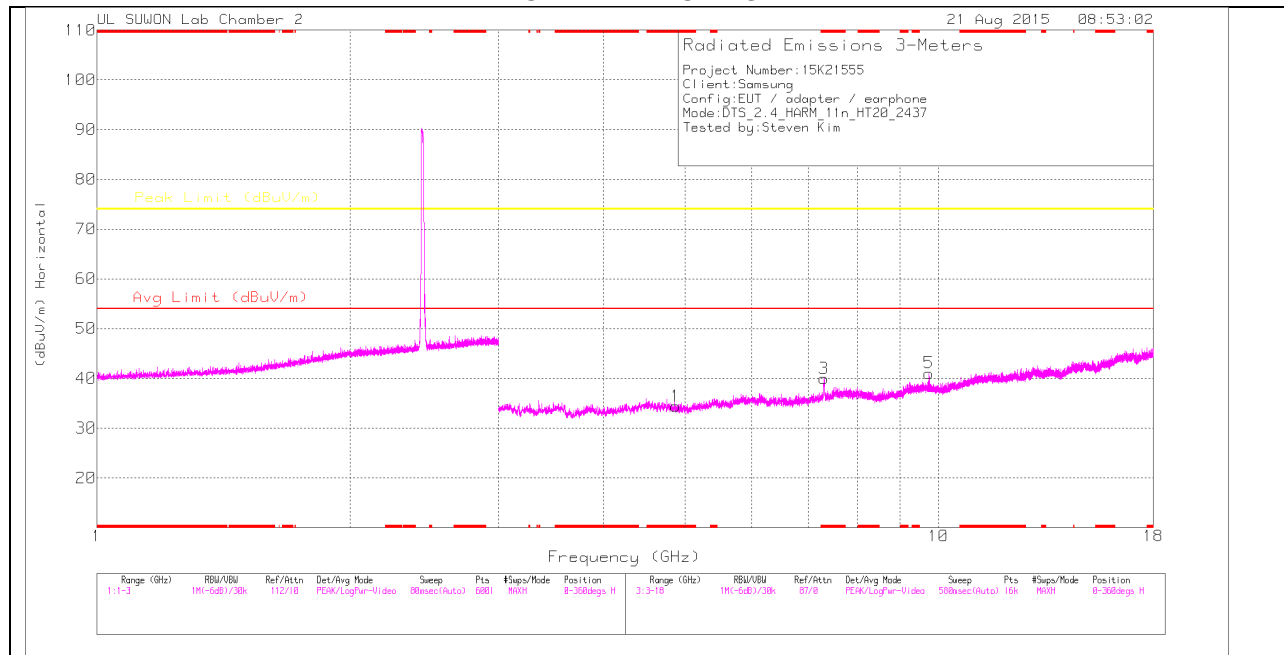
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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
9.648	33.35	PK2	36.9	-19	0	51.25	-	-	74	-22.75	18	337	H
9.648	33.46	PK2	36.9	-19	0	51.36	-	-	74	-22.64	175	326	V

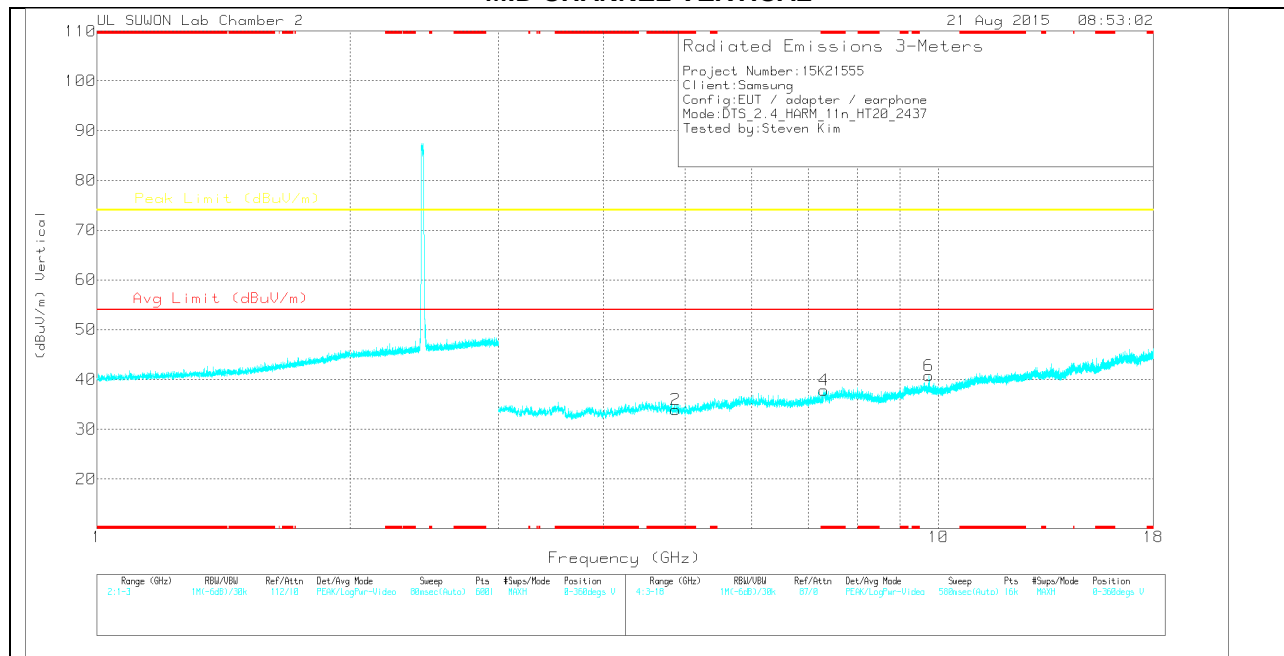
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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	* 4.874	25.76	PK	33.9	-25.2	0	34.46	-	-	74	-39.54	0-360	100	H
3	* 7.306	26.68	PK	35.9	-22.6	0	39.98	-	-	74	-34.02	0-360	200	H
5	9.748	23.36	PK	37	-19.3	0	41.06	-	-	74	-32.94	0-360	200	H
2	* 4.875	25.19	PK	33.9	-25.2	0	33.89	-	-	74	-40.11	0-360	200	V
4	* 7.31	24.56	PK	35.9	-22.6	0	37.86	-	-	74	-36.14	0-360	100	V
6	9.748	23.07	PK	37	-19.3	0	40.77	-	-	74	-33.23	0-360	200	V

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

PK – Peak detector

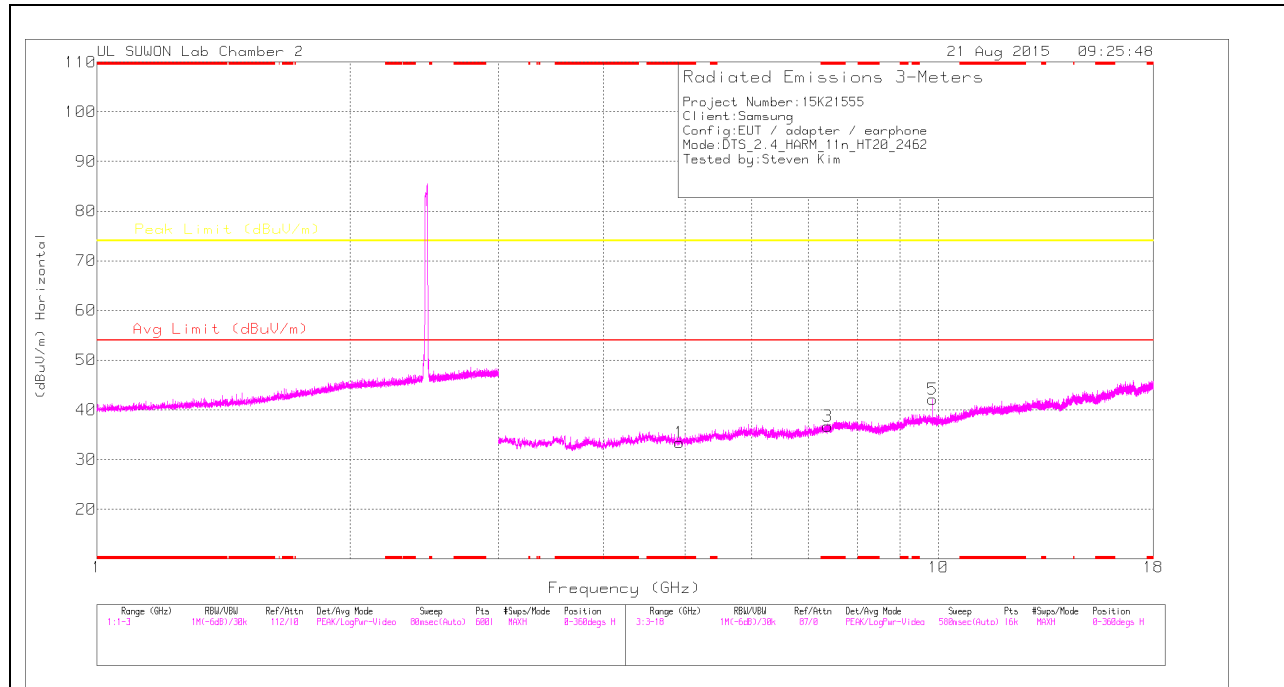
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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
* 7.316	42.54	PK2	35.9	-22.6	0	55.84	-	-	74	-18.16	360	330	H
* 7.313	25.11	MAV 1	35.9	-22.6	.32	38.73	54	-15.27	-	-	360	330	H
9.748	34.72	PK2	37	-19.3	0	52.42	-	-	74	-21.58	0	336	H
9.748	32.8	PK2	37	-19.3	0	50.5	-	-	74	-23.5	169	167	V

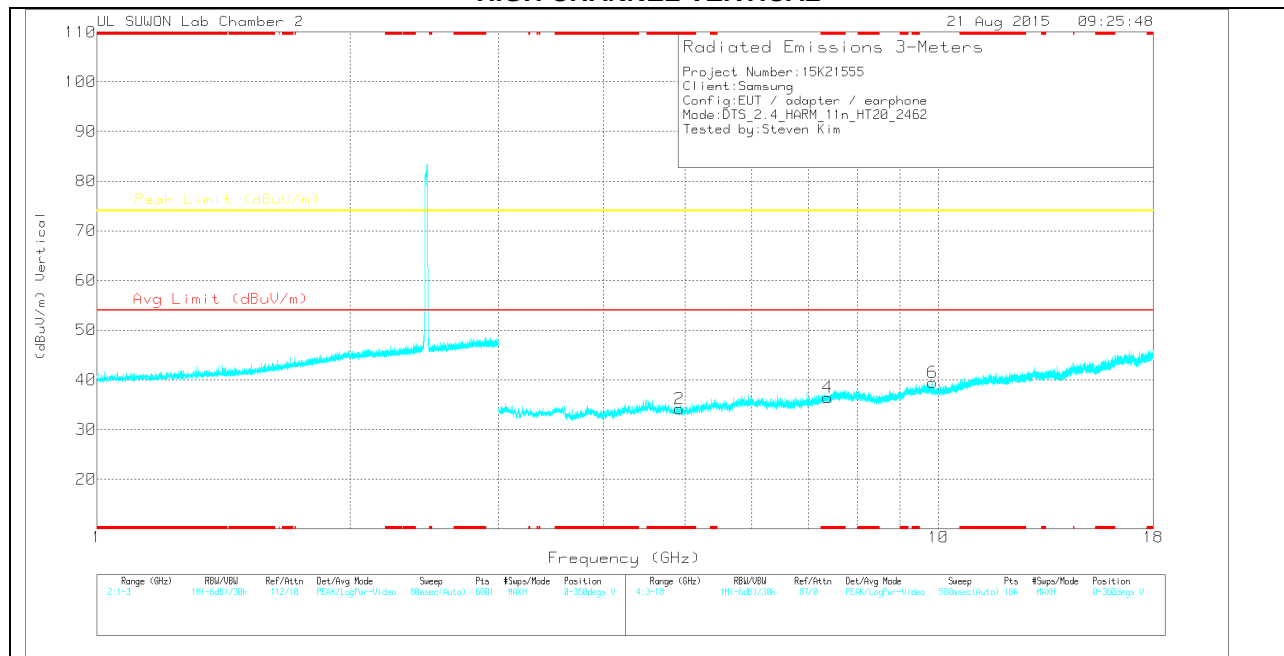
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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	24.58	PK	33.9	-25.1	0	33.38	-	-	74	-40.62	0-360	100	H
3	* 7.387	22.98	PK	35.9	-22.2	0	36.68	-	-	74	-37.32	0-360	100	H
5	9.848	24.22	PK	37.1	-19.2	0	42.12	-	-	74	-31.88	0-360	100	H
2	* 4.924	25.39	PK	33.9	-25.1	0	34.19	-	-	74	-39.81	0-360	200	V
4	* 7.388	22.77	PK	35.9	-22.2	0	36.47	-	-	74	-37.53	0-360	100	V
6	9.848	21.56	PK	37.1	-19.2	0	39.46	-	-	74	-34.54	0-360	200	V

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

PK – Peak detector

Radiated Emissions

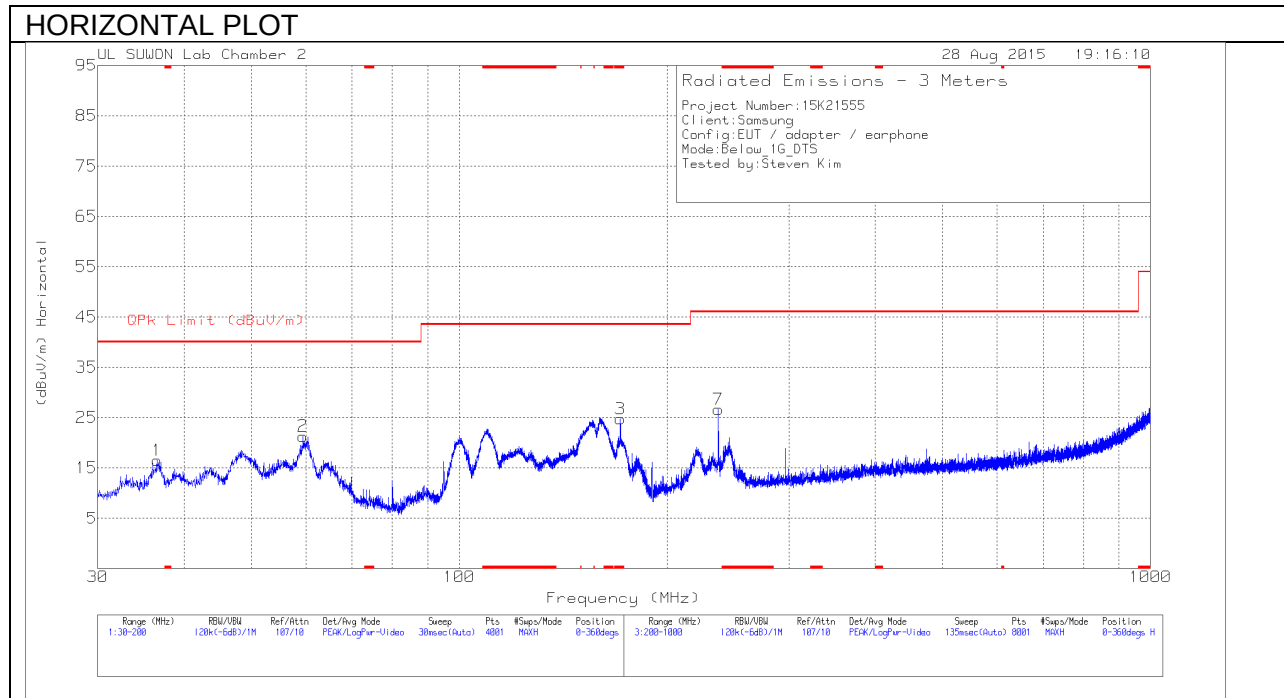
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9.85	31.45	PK2	37.1	-19.2	0	49.35	-	-	74	-24.65	102	231	H
9.848	33.53	PK2	37.1	-19.2	0	51.43	-	-	74	-22.57	90	335	V

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

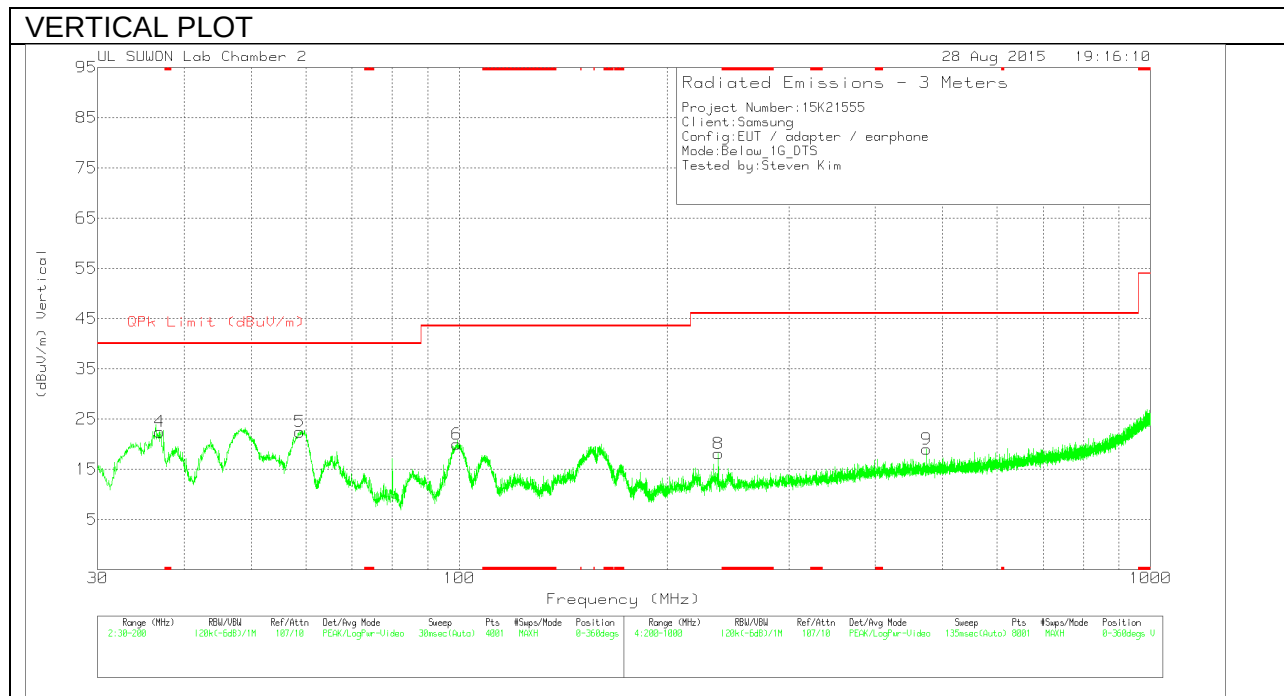
PK2 - KDB558074 Method: Maximum Peak

11.3. WORST-CASE BELOW 1 GHz

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



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



Below 1G Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-749	Below_1G	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	36.5875	35.87	Pk	11.4	-30.8	16.47	40	-23.53	0-360	300	H
2	59.4525	39.1	Pk	12.9	-30.7	21.3	40	-18.7	0-360	400	H
3	* 171.0575	45.91	Pk	9.1	-30.3	24.71	43.52	-18.81	0-360	200	H
4	36.885	41.75	Pk	11.5	-30.8	22.45	40	-17.55	0-360	100	V
5	58.815	40.25	Pk	12.9	-30.7	22.45	40	-17.55	0-360	100	V
6	99.1475	39.11	Pk	11.4	-30.5	20.01	43.52	-23.51	0-360	100	V
7	237.1	44.51	Pk	12.2	-30.1	26.61	46.02	-19.41	0-360	100	H
8	237.1	36.02	Pk	12.2	-30.1	18.12	46.02	-27.9	0-360	100	V
9	474.2	32.87	Pk	15.7	-29.6	18.97	46.02	-27.05	0-360	100	V

Pk - Peak detector

12. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 [*]	56 to 46 [*]
0.5-5	56	46
5-30	60	50

^{*} Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10 2009.

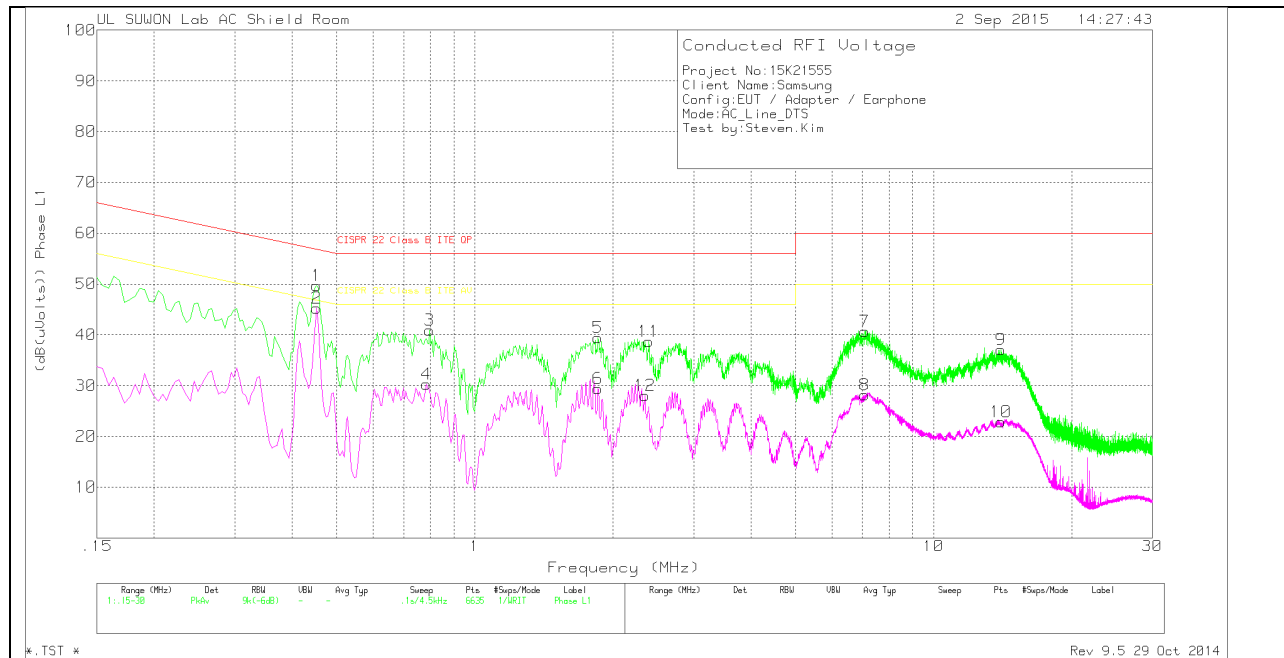
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

WORST EMISSIONS

LINE 1 PLOT



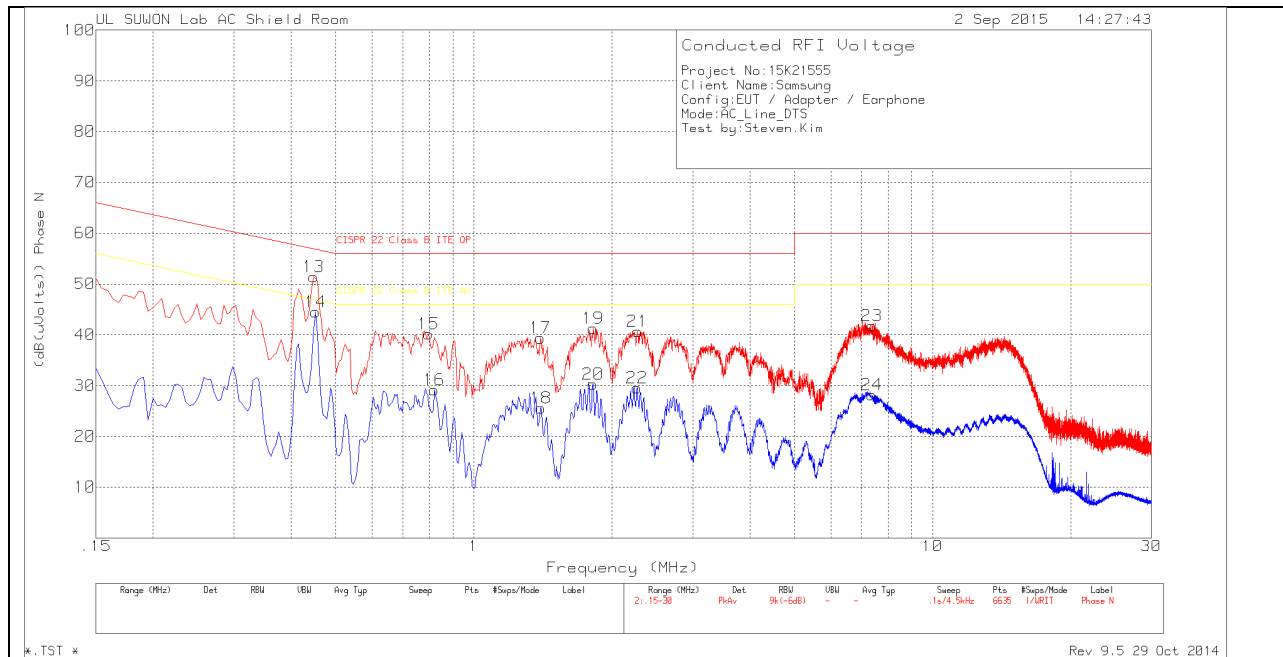
LINE 1 RESULTS

Phase L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.4515	39.61	Pk	10.1	0	49.71	56.85	-7.14	-	-
2	.4515	35.19	Av	10.1	0	45.29	-	-	46.85	-1.56
3	.798	30.91	Pk	10	0	40.91	56	-15.09	-	-
4	.7845	20.26	Av	10	0	30.26	-	-	46	-15.74
5	1.8555	29.5	Pk	9.8	.1	39.4	56	-16.6	-	-
6	1.8555	19.47	Av	9.8	.1	29.37	-	-	46	-16.63
7	7.0755	30.64	Pk	9.9	.1	40.64	60	-19.36	-	-
8	7.08	18.19	Av	9.9	.1	28.19	-	-	50	-21.81
9	14.019	26.8	Pk	10.1	.2	37.1	60	-22.9	-	-
10	14.0415	12.57	Av	10.1	.2	22.87	-	-	50	-27.13
11	2.3955	28.79	Pk	9.8	.1	38.69	56	-17.31	-	-
12	2.3505	18.1	Av	9.8	.1	28	-	-	46	-18

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.447	41.27	Pk	10.1	0	51.37	56.93	-5.56	-	-
14	.4515	34.39	Av	10.1	0	44.49	-	-	46.85	-2.36
15	.798	30.28	Pk	9.9	0	40.18	56	-15.82	-	-
16	.8205	19.27	Av	9.9	0	29.17	-	-	46	-16.83
17	1.3965	29.47	Pk	9.8	.1	39.37	56	-16.63	-	-
18	1.401	15.71	Av	9.8	.1	25.61	-	-	46	-20.39
19	1.8195	31.34	Pk	9.8	.1	41.24	56	-14.76	-	-
20	1.8195	20.35	Av	9.8	.1	30.25	-	-	46	-15.75
21	2.2785	30.73	Pk	9.8	.1	40.63	56	-15.37	-	-
22	2.27175	19.64	Av	9.8	.1	29.54	-	-	46	-16.46
23	7.3725	31.77	Pk	9.9	.1	41.77	60	-18.23	-	-
24	7.3725	18.14	Av	9.9	.1	28.14	-	-	50	-21.86

Pk - Peak detector

Av - Average detection