



FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-G600S

FCC ID: A3LSMG600S

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	05/31/16	Initial issue	Junwhan Lee
V2	06/02/16	Added Note on section 11	Junwhan Lee

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	13
8.1. ON TIME AND DUTY CYCLE RESULTS	13
9. SUMMARY TABLE	14
10. ANTENNA PORT TEST RESULTS	15
10.1. 6 dB BANDWIDTH	15
10.1.1. 802.11b MODE IN THE 2.4 GHz BAND	16
10.1.2. 802.11g MODE IN THE 2.4 GHz BAND	16
10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	16
10.1.4. 6 dB BANDWIDTH PLOTS	17
10.2. 99% BANDWIDTH	20
10.2.1. 802.11b MODE IN THE 2.4 GHz BAND	20
10.2.2. 802.11g MODE IN THE 2.4 GHz BAND	20
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	20
10.2.4. 99% BANDWIDTH PLOTS	21
10.3. OUTPUT POWER	24
10.3.1. 802.11b MODE IN THE 2.4 GHz BAND	24
10.3.2. 802.11g MODE IN THE 2.4 GHz BAND	25
10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND	26
10.4. PSD	27

10.4.1.	802.11b MODE IN THE 2.4 GHz BAND	28
10.4.2.	802.11g MODE IN THE 2.4 GHz BAND	28
10.4.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	28
10.4.4.	PSD PLOTS	29
10.5.	OUT-OF-BAND EMISSIONS	32
10.5.1.	802.11b MODE IN THE 2.4 GHz BAND	33
10.5.2.	802.11g MODE IN THE 2.4 GHz BAND	34
10.5.3.	802.11n HT20 MODE IN THE 2.4 GHz BAND	36
11.	RADIATED TEST RESULTS	38
11.1.	LIMITS AND PROCEDURE	38
11.2.	TRANSMITTER ABOVE 1 GHz	39
11.2.1.	TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND	39
11.2.2.	TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND	49
11.2.3.	TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND	67
11.3.	WORST-CASE BELOW 1 GHz	85
12.	AC POWER LINE CONDUCTED EMISSIONS	87
13.	SETUP PHOTOS	92

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

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

MODEL NUMBER: SM-G600S

SAMPLE IMEI NUMBER: 3599 3607 0010 94, 3599 3607 0010 97 (RADIATED);
3599 3607 0010 96 (CONDUCTED)

DATE TESTED: MAY 11, 2016 - MAY 30, 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
UL Korea, Ltd. By:



CY Choi
Suwon Lab Engineer
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Tested By:



Junwhan Lee
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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 GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n, ANT+ and NFC .
This test report addresses the DTS (WLAN) operational mode.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]
2412 - 2462	802.11b	18.10	64.57
	802.11g	16.27	42.36
	802.11n HT20	16.25	42.17

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-TA50KWK	DK1GB23VS/A-E	N/A
Data Cable	SAMSUNG	EP-DG920UWE	N/A	N/A
Earphone	SAMSUNG	EHS64AVFWE	N/A	N/A

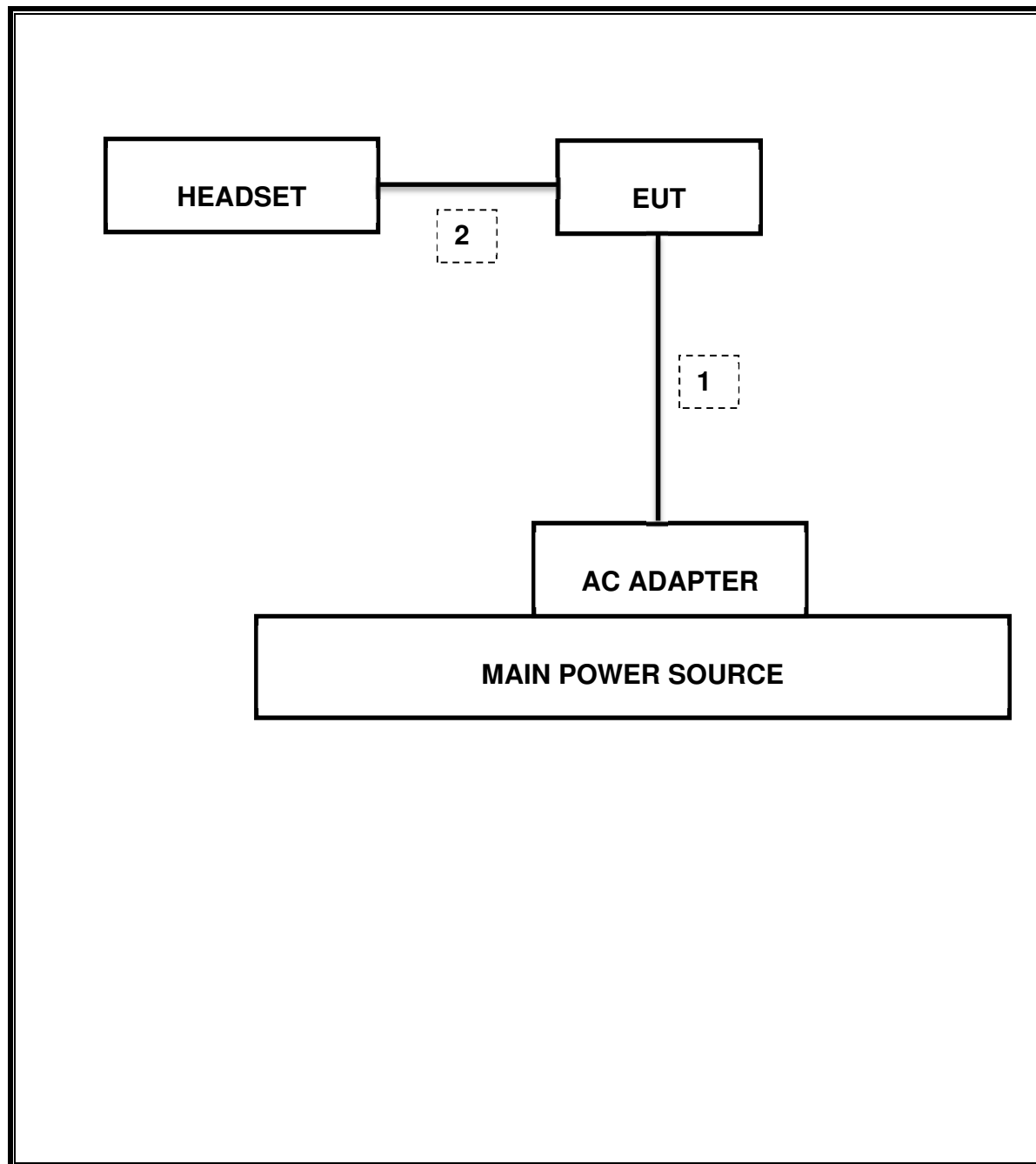
I/O CABLES

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.

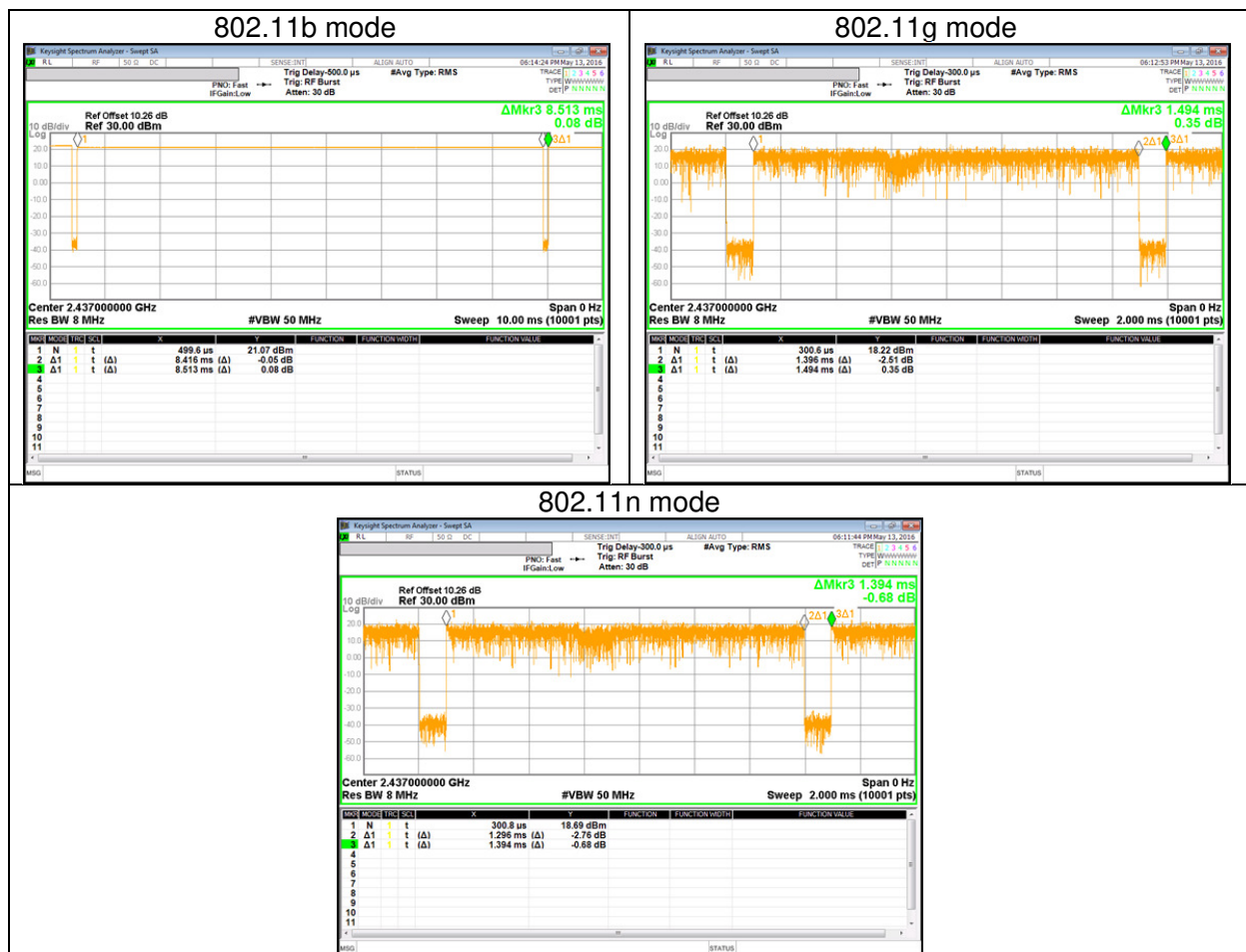
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

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	8.416	8.513	0.989	98.9%	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	7.088 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass	-29.13 dBm
15.247	TX conducted output power	<30dBm		Pass	18.1 dBm
15.247	PSD	<8dBm		Pass	-12.095 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	44.09 dBuV (PK)
15.205, 15.209	Radiated Spurious Emission	< 74dBuV/m	Radiated	Pass	71.62 dBuV/m (PK)

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 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	7.092	0.5
Mid	2437	7.089	0.5
High	2462	7.088	0.5
Worst		7.088	0.5

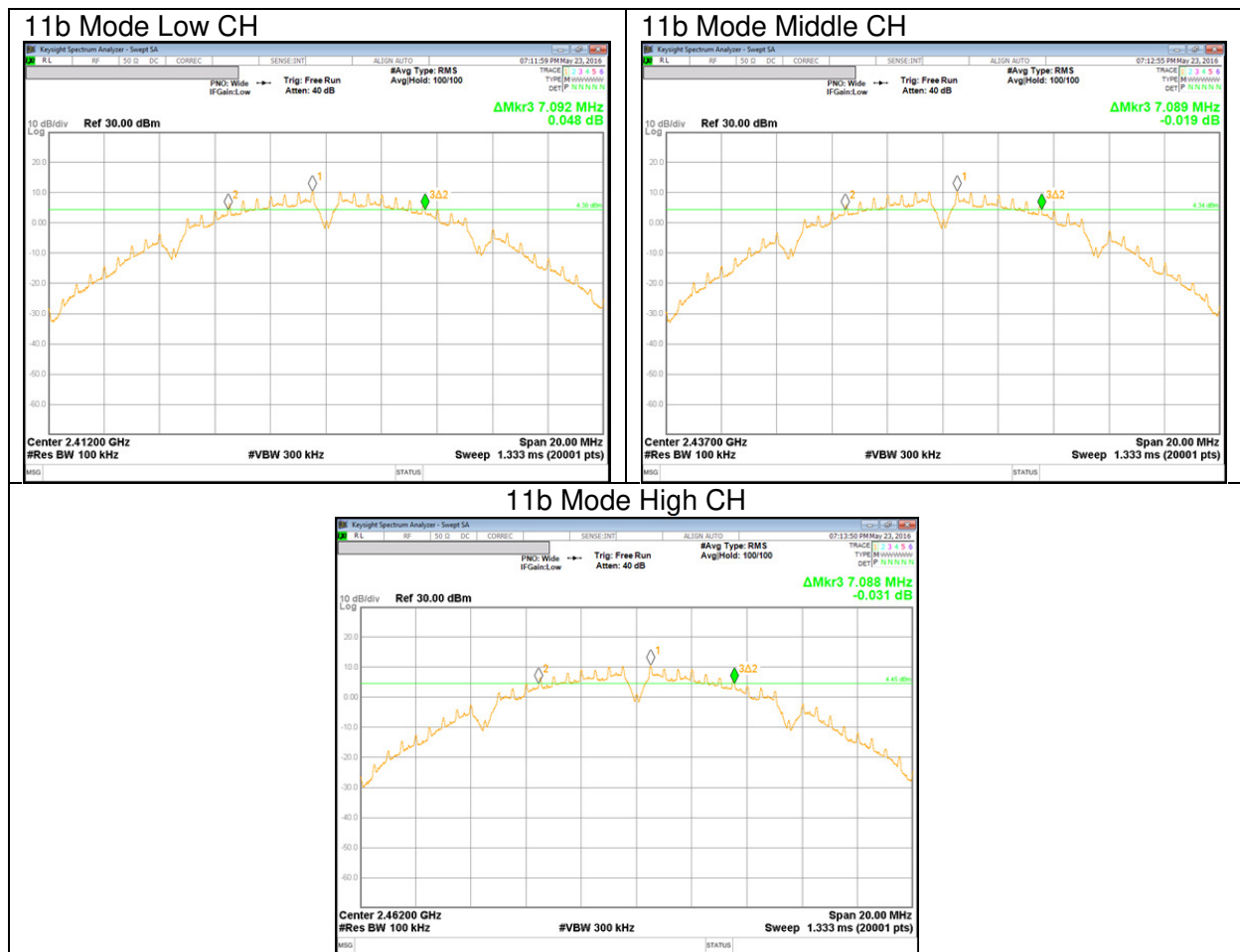
10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

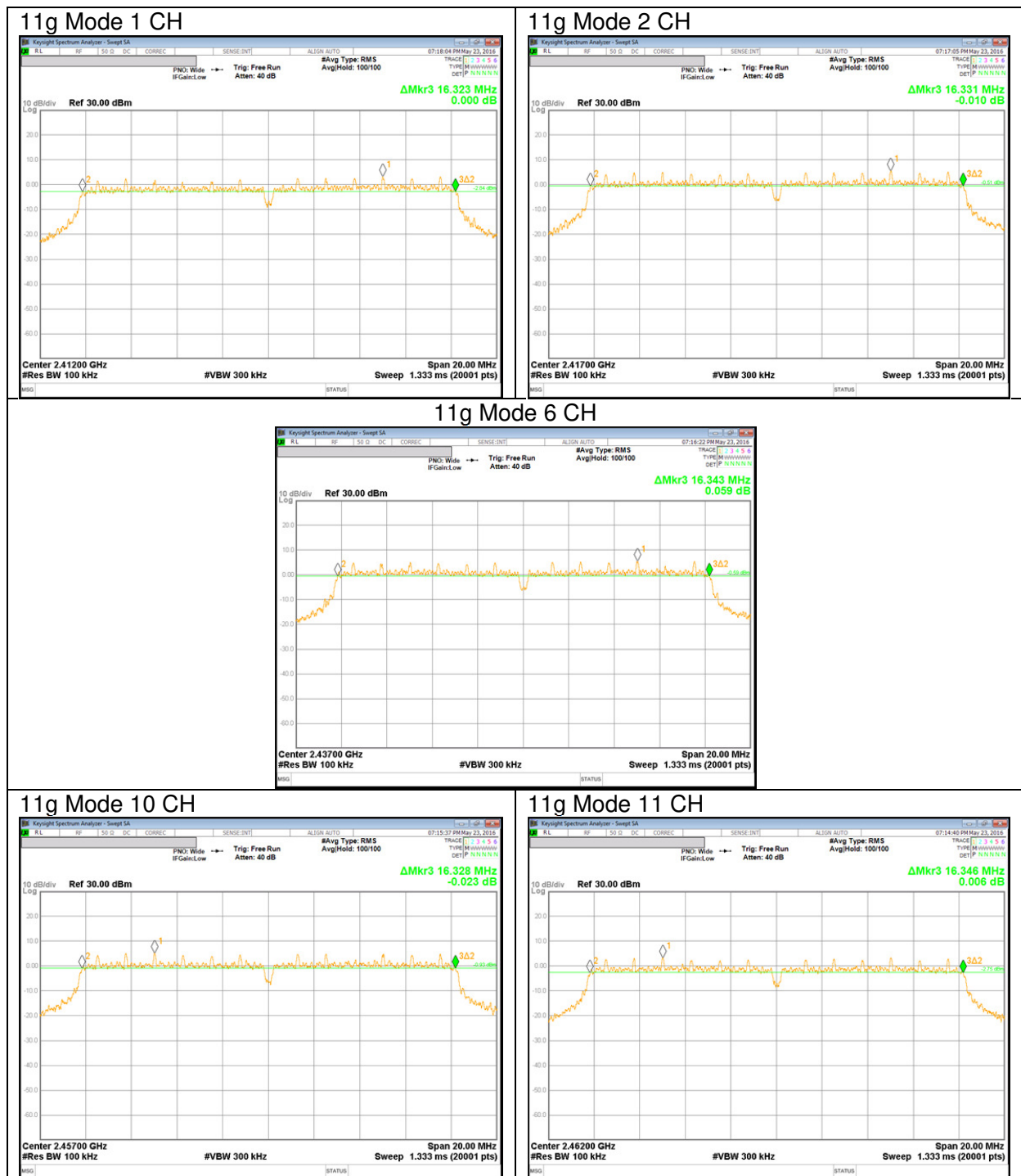
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
1	2412	16.323	0.5
2	2417	16.331	0.5
6	2437	16.343	0.5
10	2457	16.328	0.5
11	2462	16.346	0.5
Worst		16.323	0.5

10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
1	2412	17.543	0.5
2	2417	17.544	0.5
6	2437	17.562	0.5
10	2457	17.546	0.5
11	2462	17.567	0.5
Worst		17.543	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	12.821
Mid	2437	12.647
High	2462	13.111
Worst		13.111

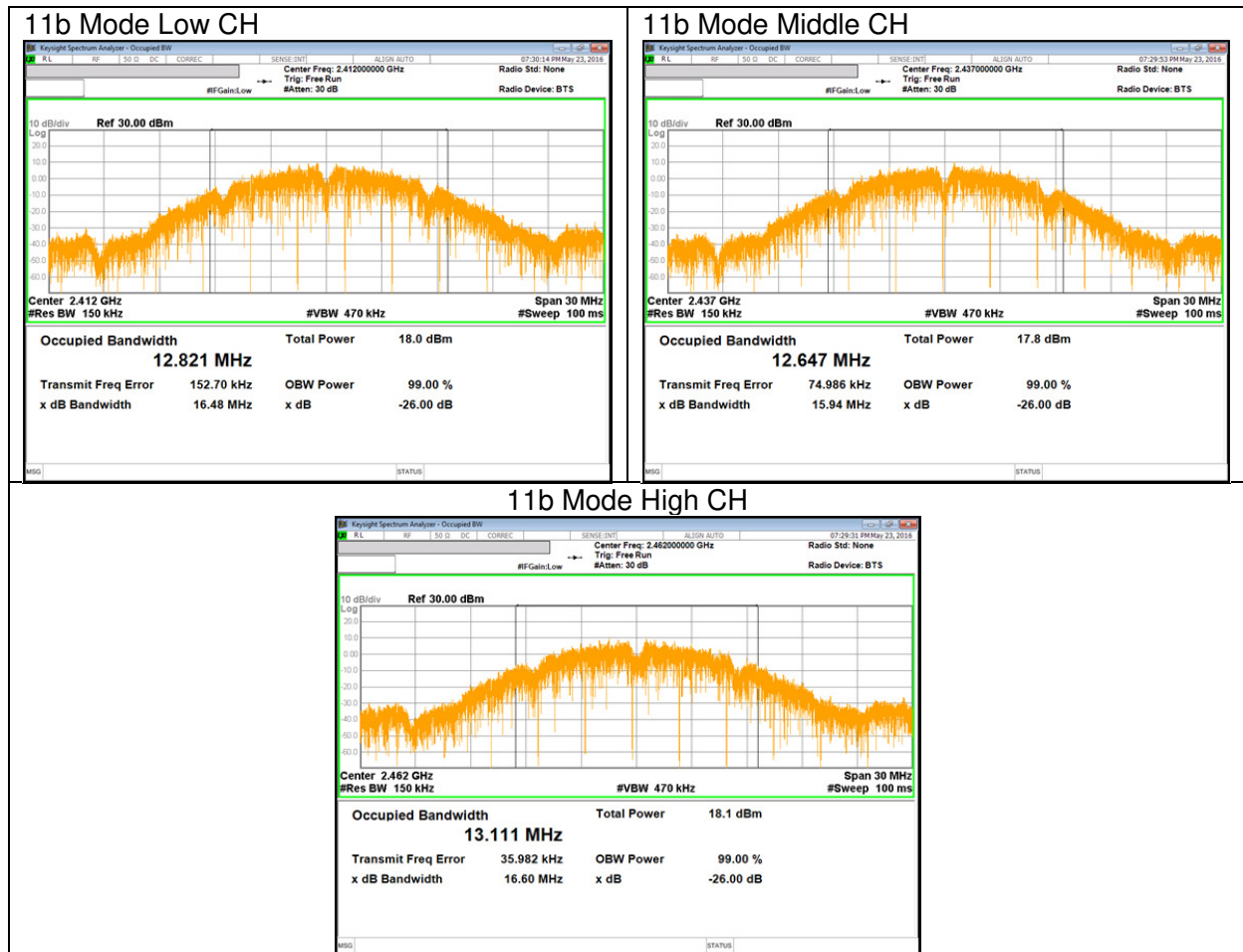
10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

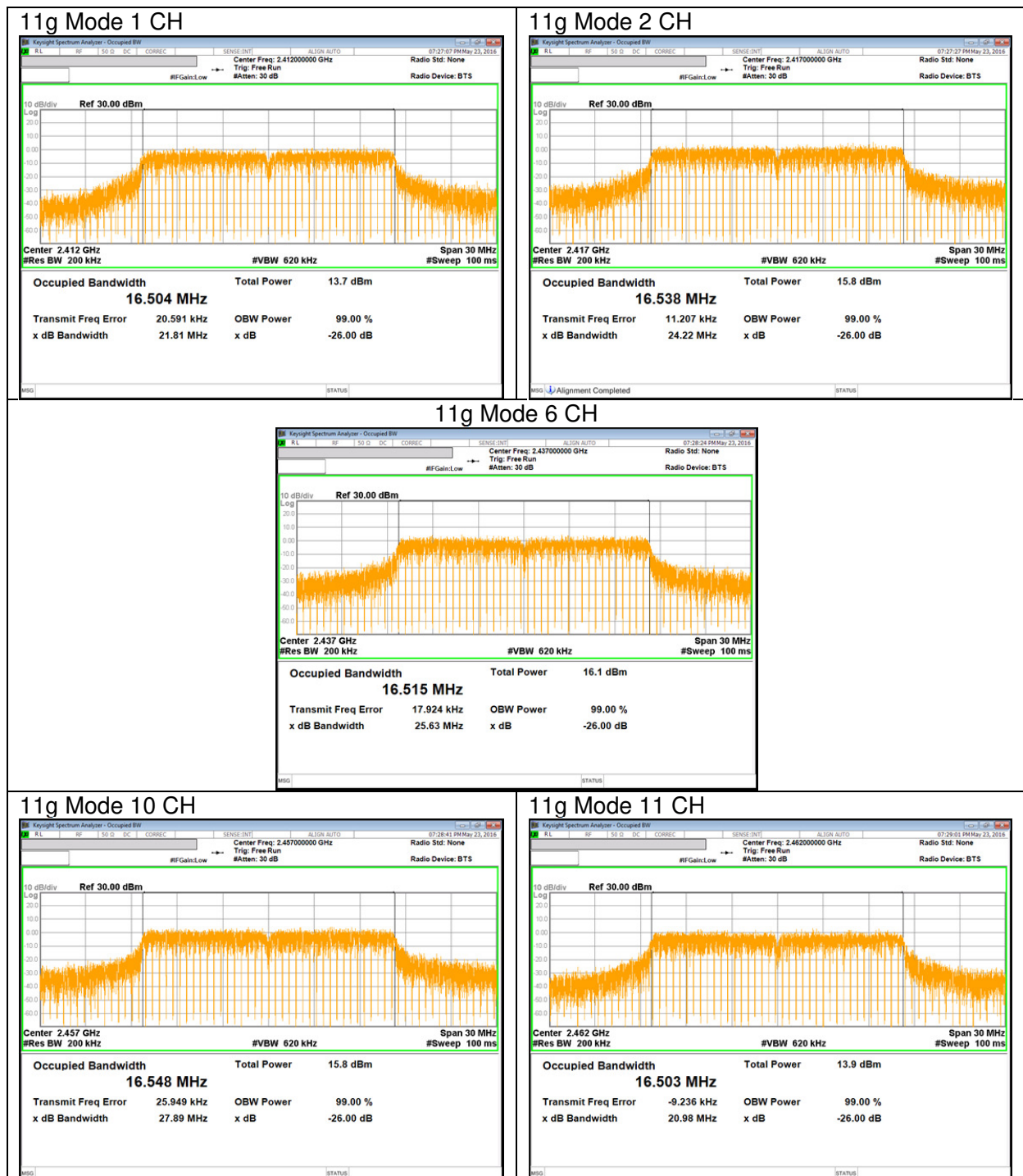
Channel	Frequency [MHz]	99% Bandwidth [MHz]
1	2412	16.504
2	2417	16.538
6	2437	16.515
10	2457	16.548
11	2462	16.503
Worst		16.548

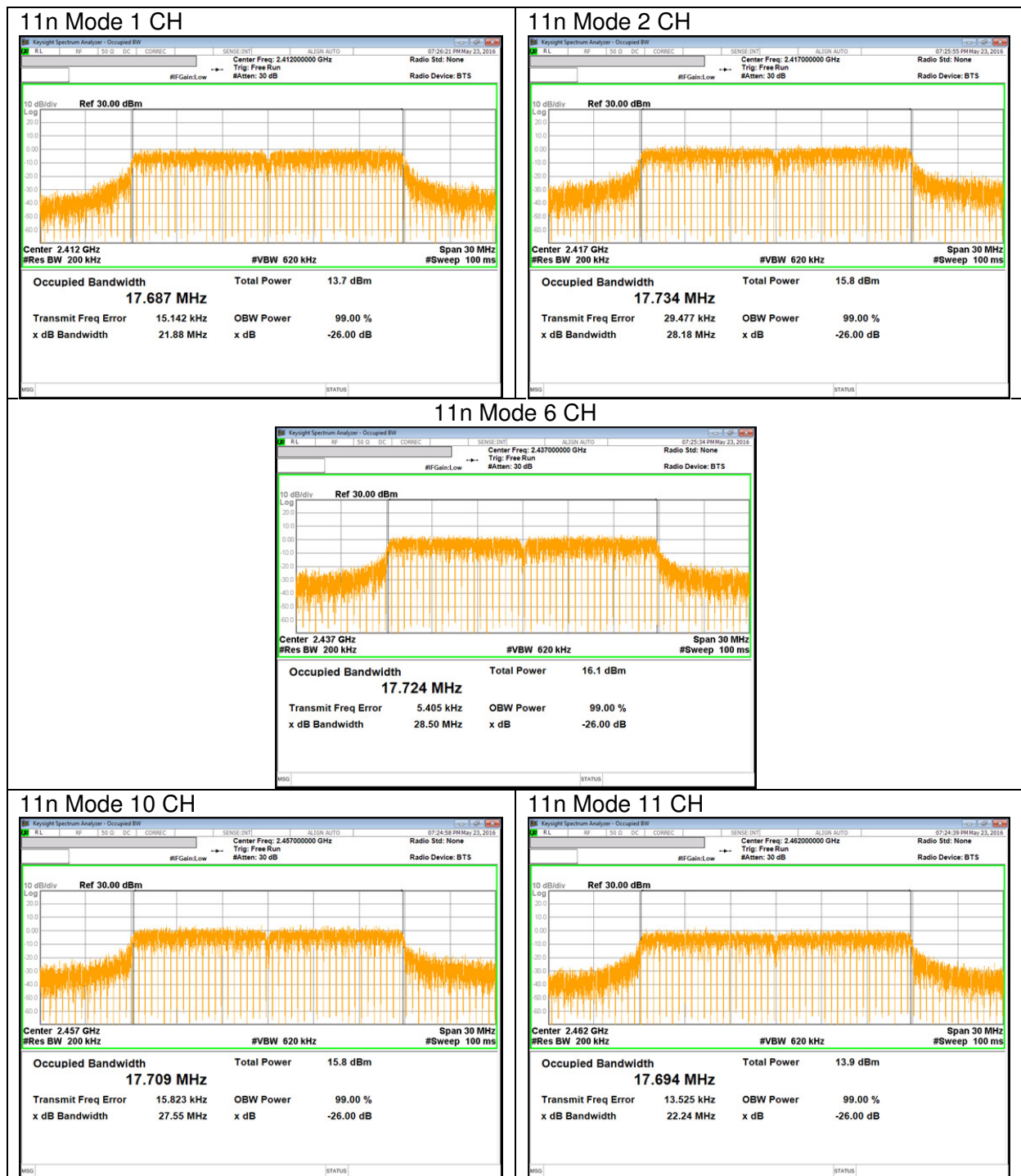
10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]
1	2412	17.687
2	2417	17.734
6	2437	17.724
10	2457	17.709
11	2462	17.694
Worst		17.734

10.2.4. 99% BANDWIDTH PLOTS







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	-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	17.76	17.76	30.00	-12.24
Mid	2437	17.66	17.66	30.00	-12.34
High	2462	18.1	18.10	30.00	-11.90
Worst			18.10	30.00	-11.90

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]
1	2412	-2.41	30.00	30.00	36.00	30.00
2	2417	-2.41	30.00	30.00	36.00	30.00
6	2437	-2.41	30.00	30.00	36.00	30.00
10	2457	-2.41	30.00	30.00	36.00	30.00
11	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]
1	2412	13.70	13.70	30.00	-16.30
2	2417	15.80	15.80	30.00	-14.20
6	2437	16.27	16.27	30.00	-13.73
10	2457	15.89	15.89	30.00	-14.11
11	2462	14.04	14.04	30.00	-15.96
Worst			16.27	30.00	-13.73

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]
1	2412	-2.41	30.00	30.00	36.00	30.00
2	2417	-2.41	30.00	30.00	36.00	30.00
6	2437	-2.41	30.00	30.00	36.00	30.00
10	2457	-2.41	30.00	30.00	36.00	30.00
11	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]
1	2412	13.71	13.71	30.00	-16.29
2	2417	15.86	15.86	30.00	-14.14
6	2437	16.25	16.25	30.00	-13.75
10	2457	15.86	15.86	30.00	-14.14
11	2462	14.07	14.07	30.00	-15.93
Worst			16.25	30.00	-13.75

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-2" under KDB558074 D01 DTS Meas Guidance v03r05

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-12.761	0.00	-12.761	8.00	-20.761
Mid	2437	-12.095	0.00	-12.095	8.00	-20.095
High	2462	-12.935	0.00	-12.935	8.00	-20.935

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

PSD Results

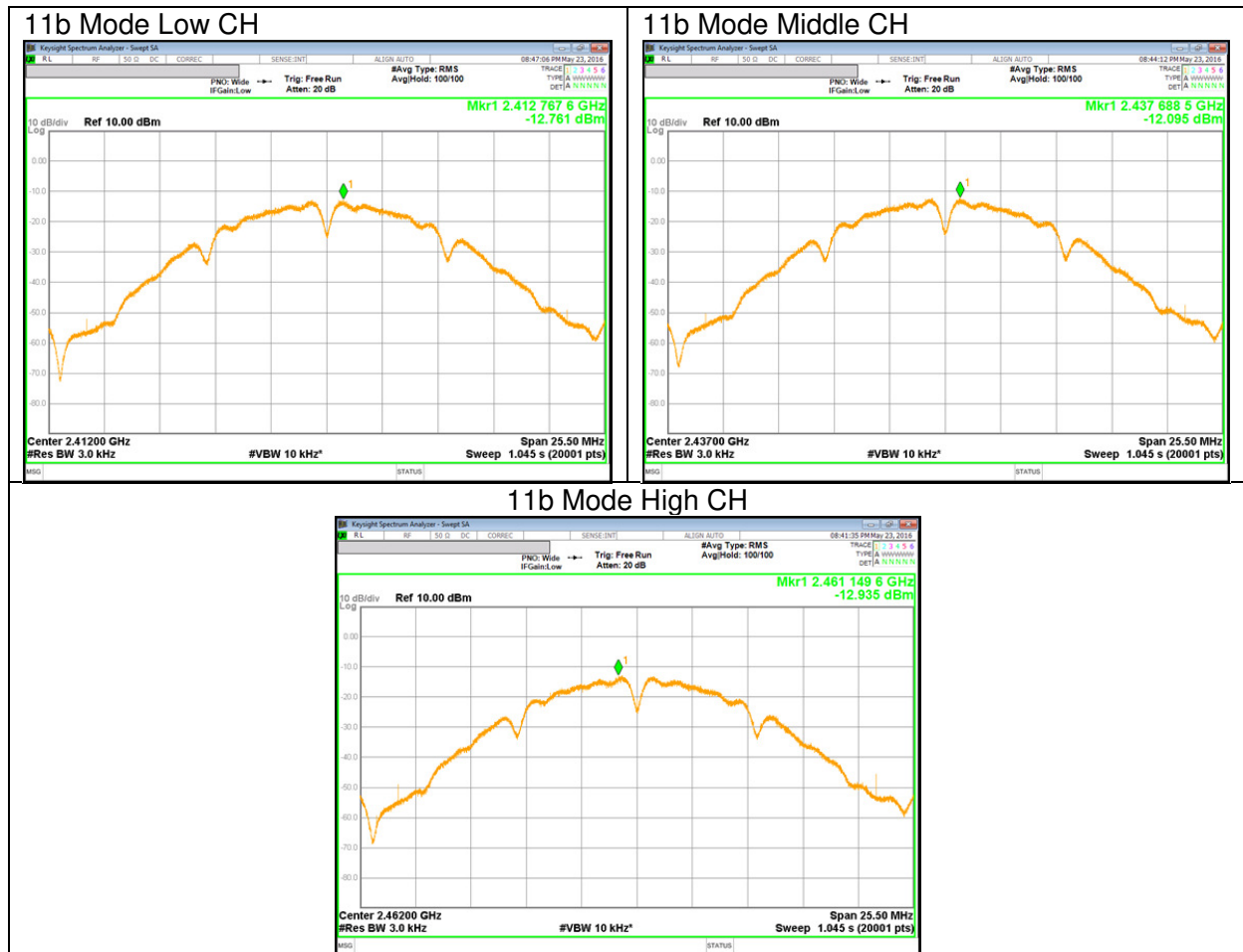
Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
1	2412	-19.775	0.29	-19.485	8.00	-27.775
2	2417	-18.502	0.29	-18.212	8.00	-26.502
6	2437	-17.903	0.29	-17.613	8.00	-25.903
10	2457	-18.497	0.29	-18.207	8.00	-26.497
11	2462	-20.27	0.29	-19.980	8.00	-28.270

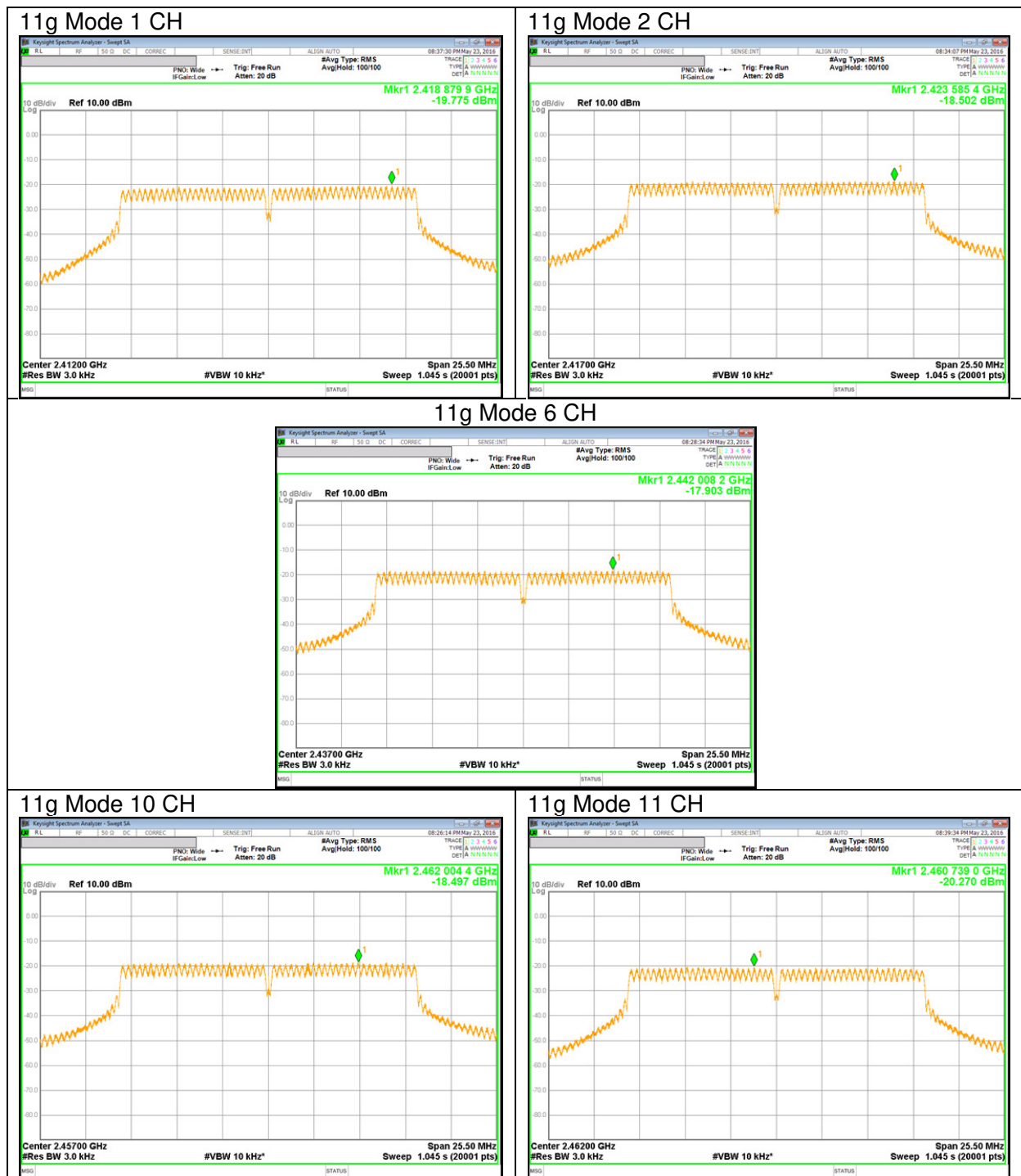
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

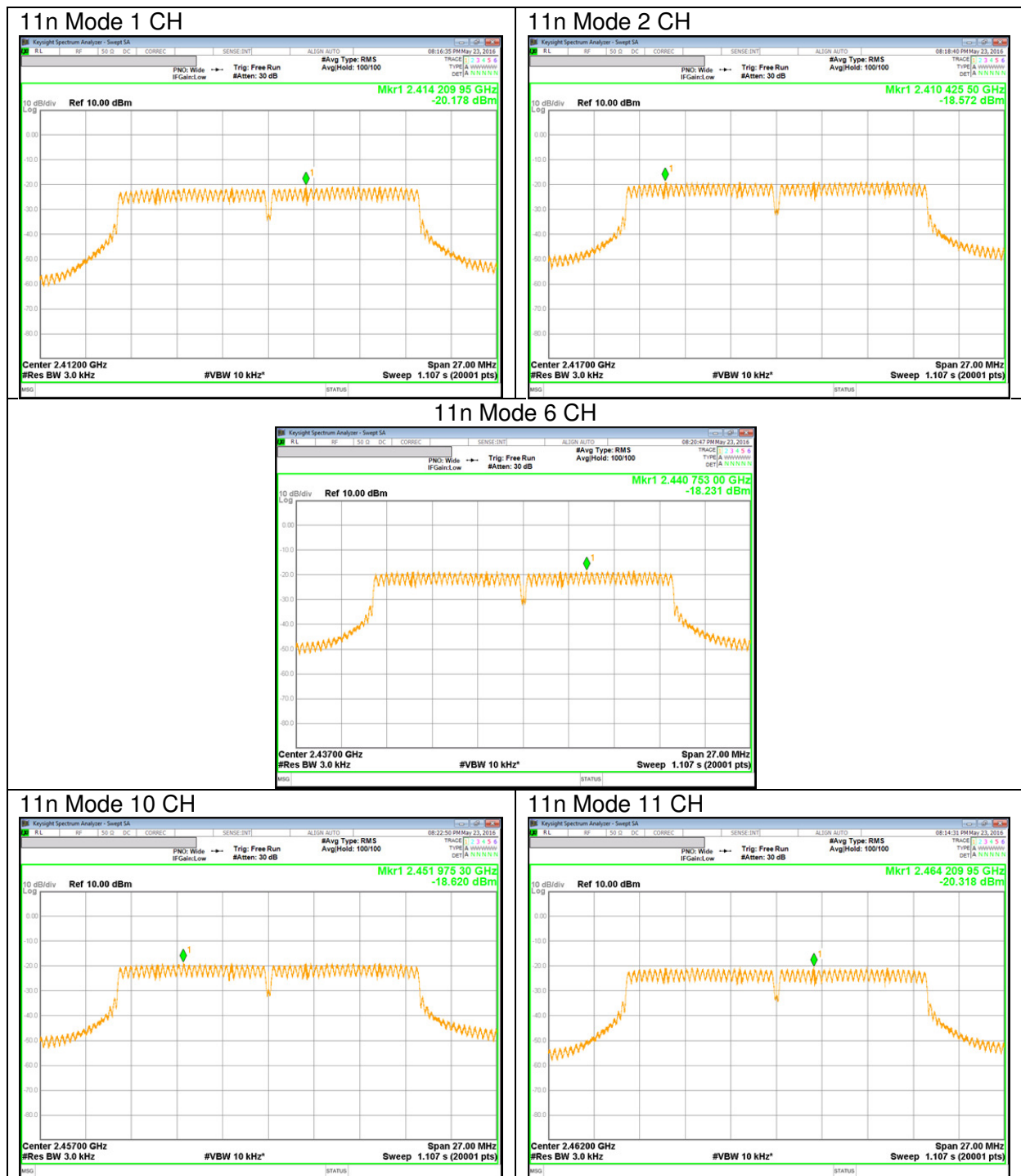
PSD Results

Channel	Frequency [MHz]	PSD Meas [dBm]	Duty Factor [dB]	Final PSD [dBm]	Limit [dBm]	Margin [dB]
1	2412	-20.178	0.32	-19.858	8.00	-28.178
2	2417	-18.572	0.32	-18.252	8.00	-26.572
6	2437	-18.231	0.32	-17.911	8.00	-26.231
10	2457	-18.62	0.32	-18.300	8.00	-26.620
11	2462	-20.318	0.32	-19.998	8.00	-28.318

10.4.4. PSD PLOTS







10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

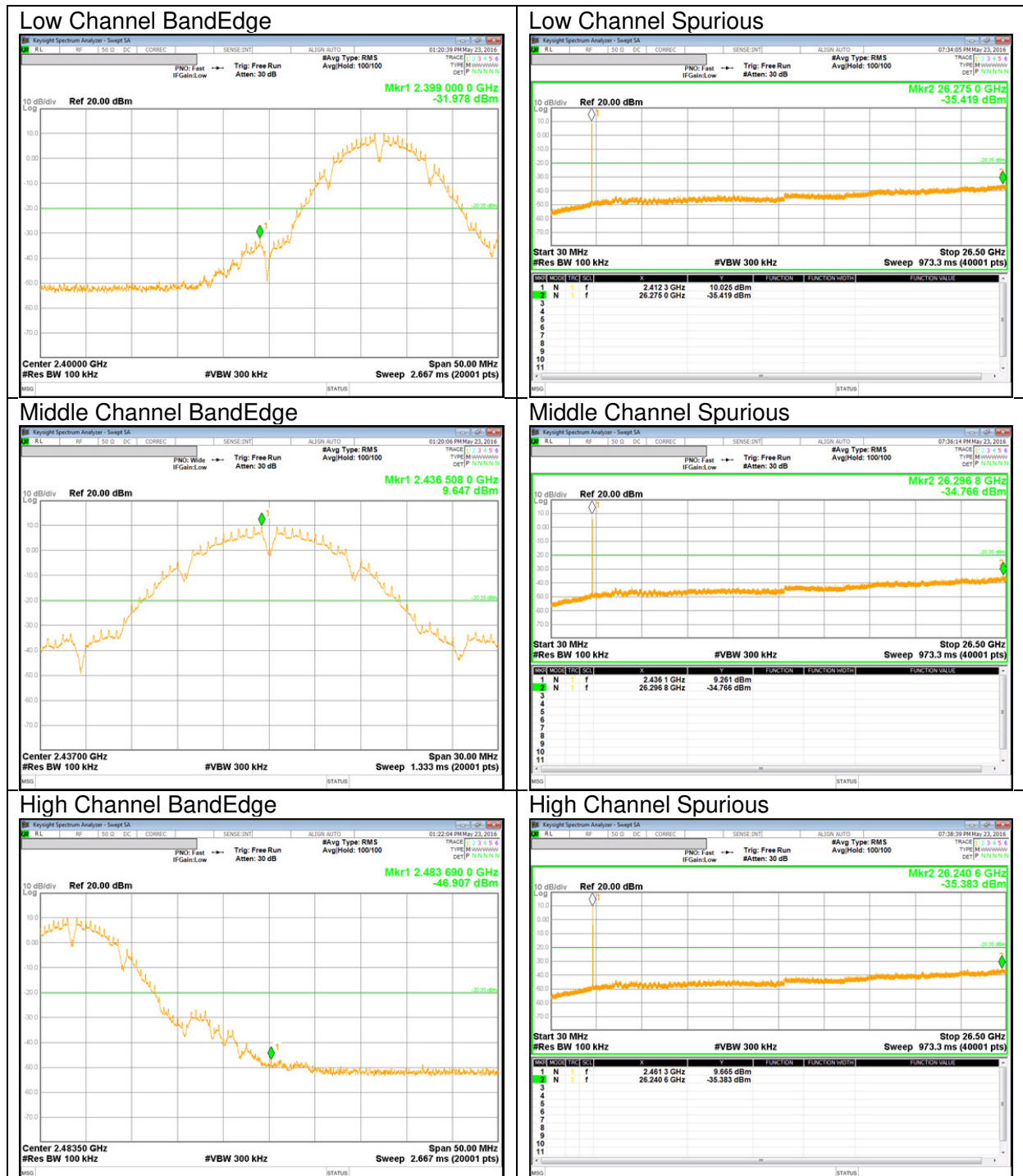
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

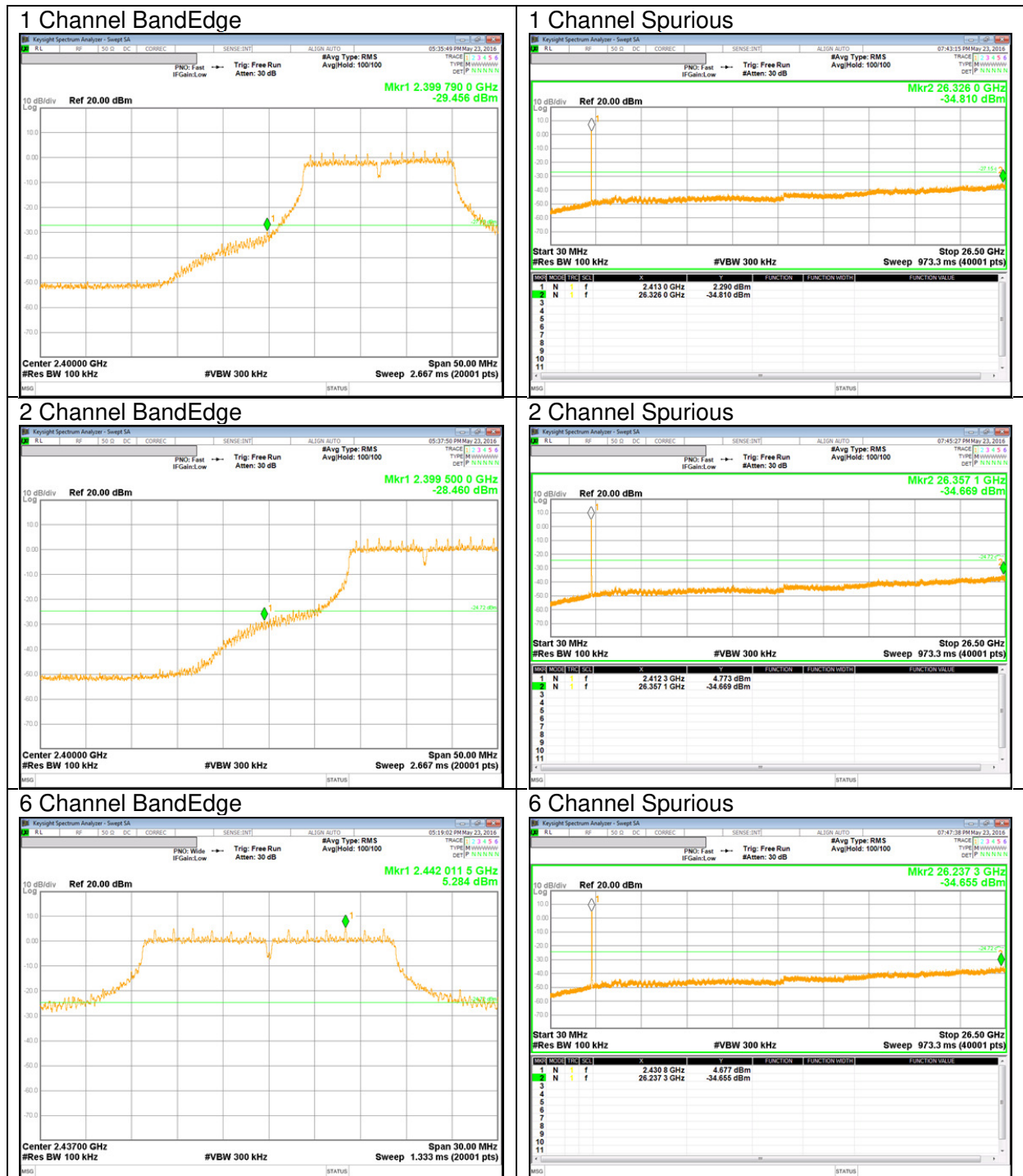
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

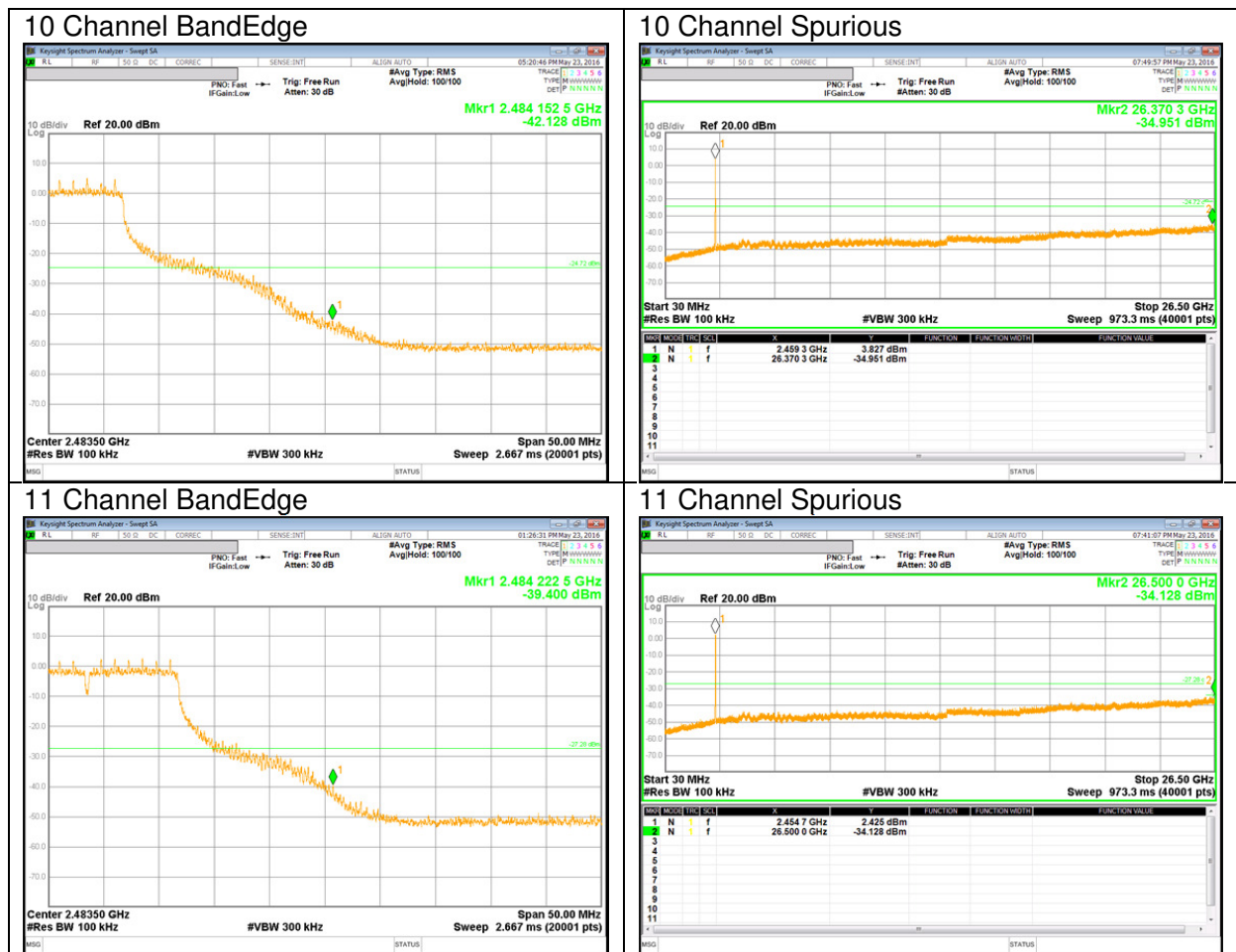
RESULTS

10.5.1. 802.11b MODE IN THE 2.4 GHz BAND



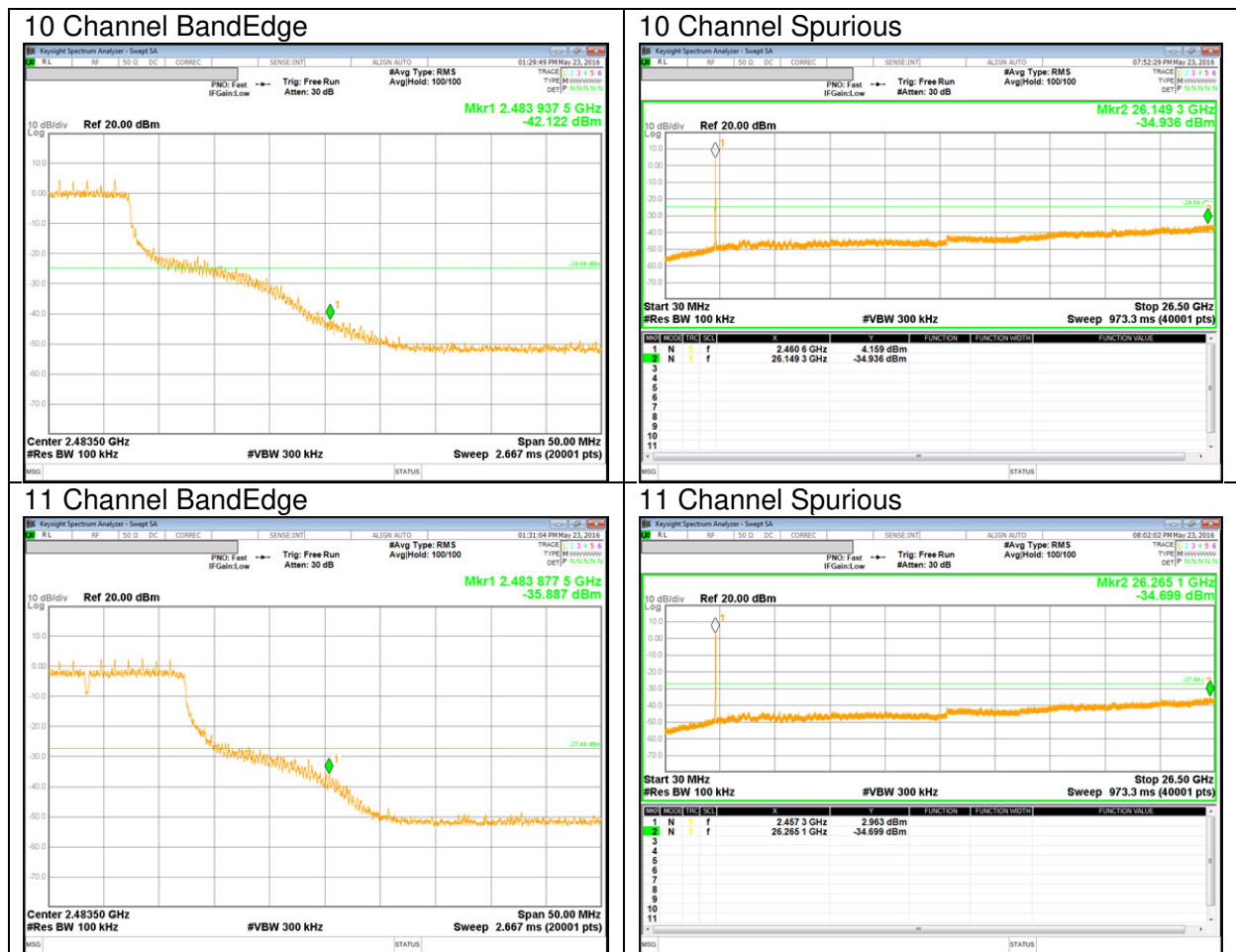
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND





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.

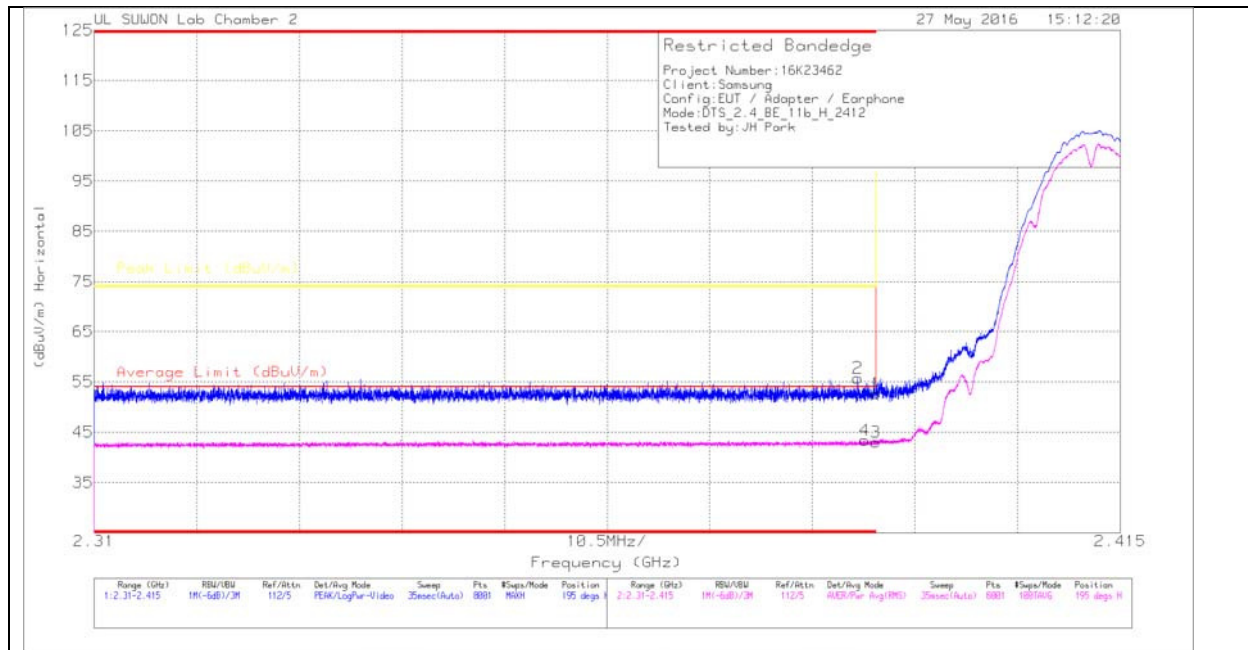
Note : Emission was pre-scanned from 9KHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit. Per FCC part 15.31(o), test results were not reported.

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

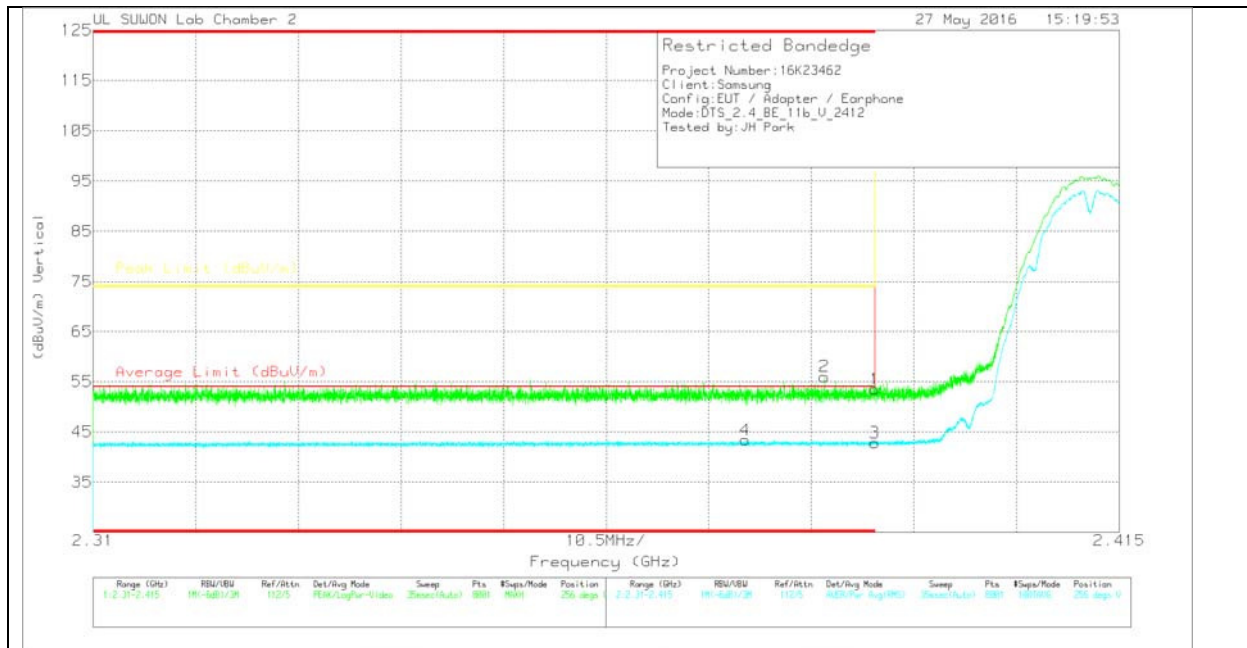
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.46	Pk	31.7	-19.5	0	52.66	-	-	74	-21.34	195	297	H
2	* 2.388	43.54	Pk	31.7	-19.5	0	55.74	-	-	74	-18.26	195	297	H
3	* 2.39	30.85	RMS	31.7	-19.5	0	43.05	54	-10.95	-	-	195	297	H
4	* 2.389	31.21	RMS	31.7	-19.5	0	43.41	54	-10.59	-	-	195	297	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(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	41.32	Pk	31.7	-19.5	0	53.52	-	-	74	-20.48	256	299	V
2	* 2.385	43.82	Pk	31.7	-19.5	0	56.02	-	-	74	-17.98	256	299	V
3	* 2.39	30.66	RMS	31.7	-19.5	0	42.86	54	-11.14	-	-	256	299	V
4	* 2.377	31.29	RMS	31.7	-19.6	0	43.39	54	-10.61	-	-	256	299	V

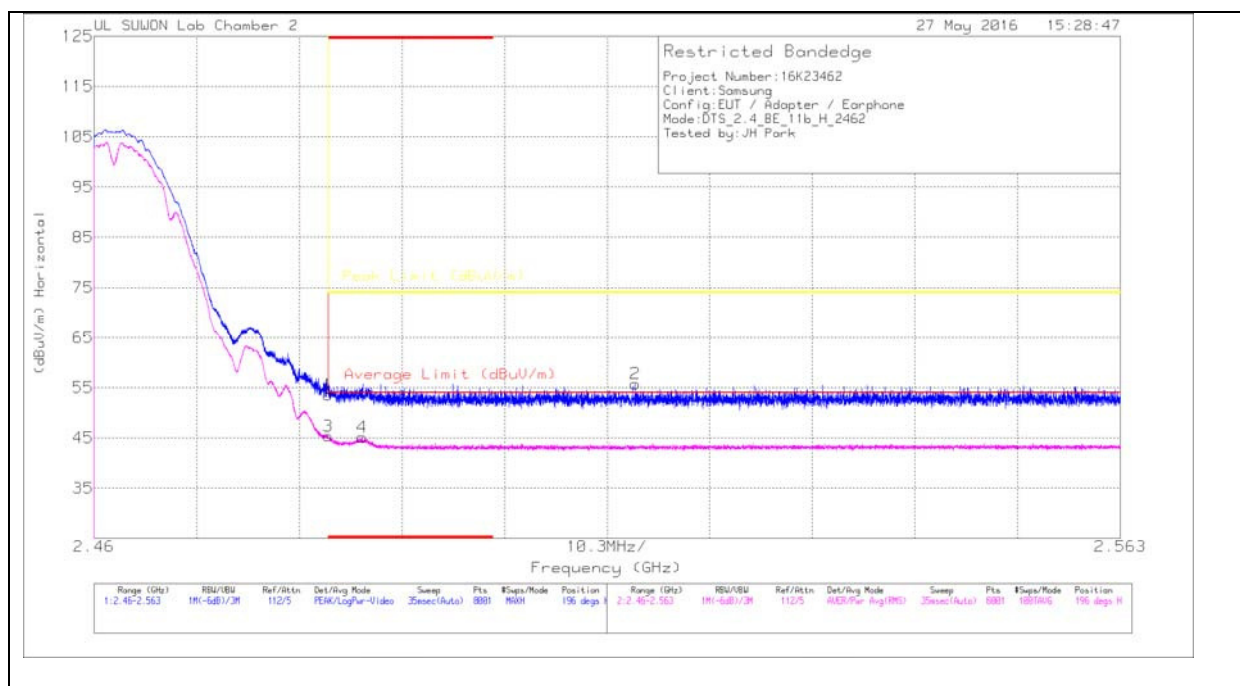
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

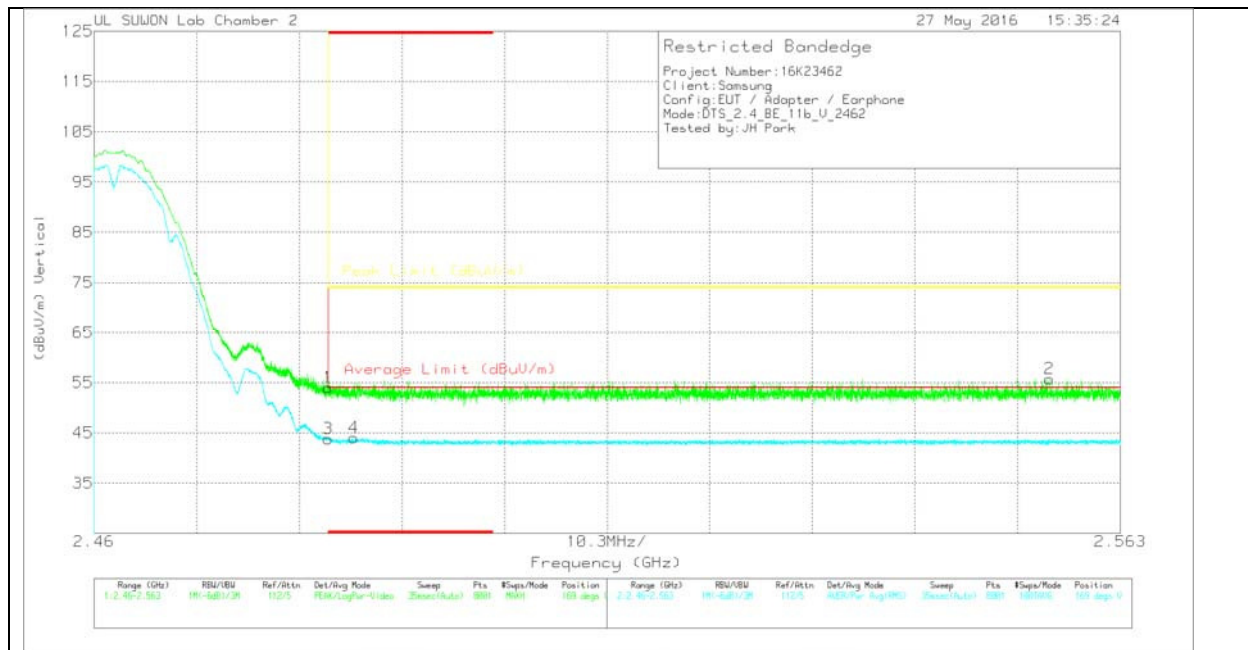
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 24)_150619	Path_2_10dB	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.2	Pk	31.8	-19.4	0	53.6	-	-	74	-20.4	196	291	H
2	2.514	43.17	Pk	31.9	-19.3	0	55.77	-	-	74	-18.23	196	291	H
3	* 2.484	32.94	RMS	31.8	-19.4	0	45.34	54	-8.66	-	-	196	291	H
4	* 2.487	32.76	RMS	31.8	-19.4	0	45.16	54	-8.84	-	-	196	291	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	41.65	Pk	31.8	-19.4	0	54.05	-	-	74	-19.95	169	363	V
2	2.556	43.17	Pk	31.9	-19.3	0	55.77	-	-	74	-18.23	169	363	V
3	* 2.484	31.45	RMS	31.8	-19.4	0	43.85	54	-10.15	-	-	169	363	V
4	* 2.486	31.65	RMS	31.8	-19.4	0	44.05	54	-9.95	-	-	169	363	V

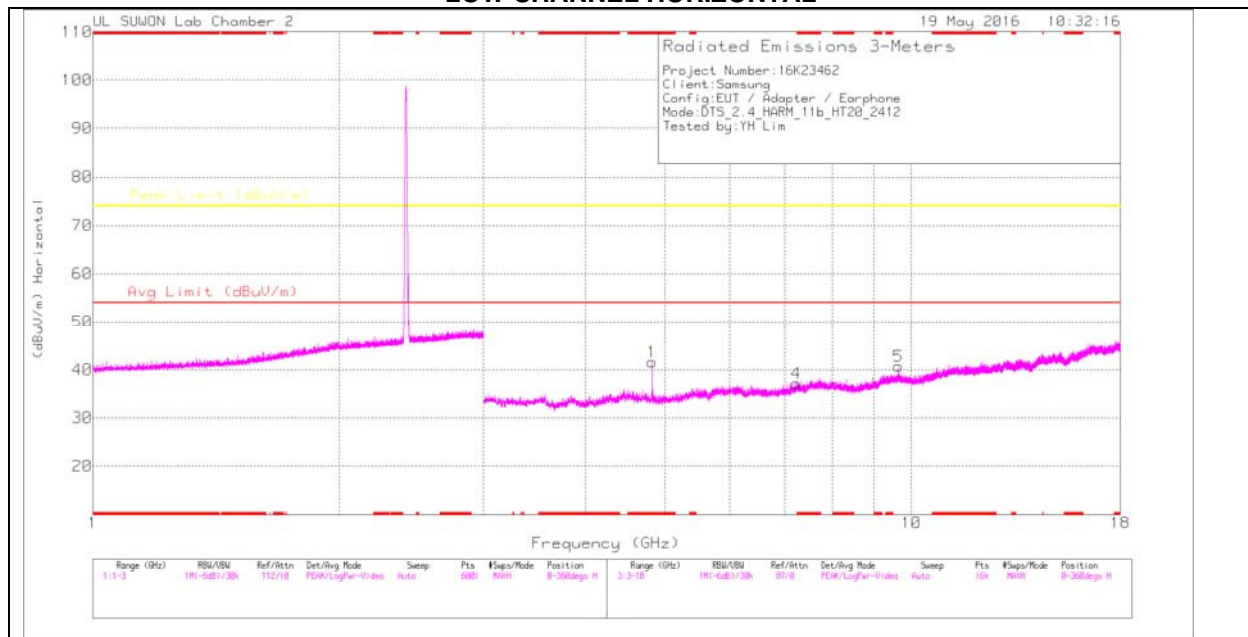
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

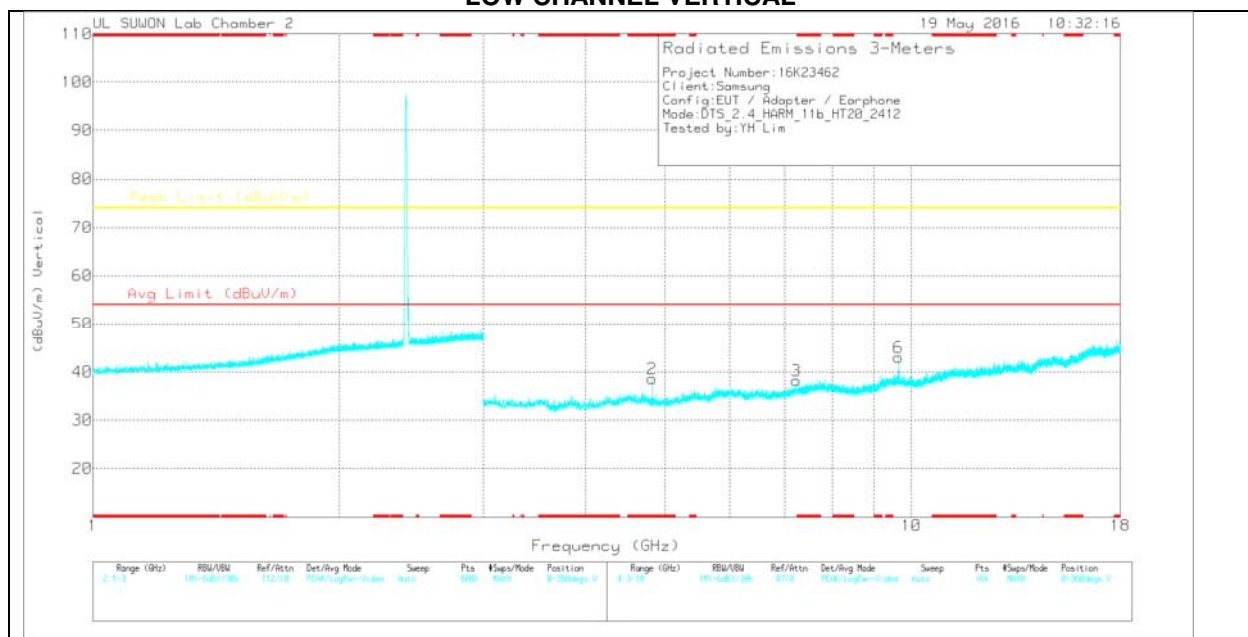
RMS - RMS detection

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	33.07	Pk	33.9	-25.3	0	41.67	-	-	74	-32.33	0-360	100	H
4	7.234	24.46	Pk	35.8	-23	0	37.26	-	-	74	-36.74	0-360	100	H
5	9.648	22.86	Pk	36.9	-19	0	40.76	-	-	74	-33.24	0-360	100	H
2	* 4.823	29.94	Pk	33.9	-25.3	0	38.54	-	-	74	-35.46	0-360	200	V
3	7.235	25.38	Pk	35.8	-23	0	38.18	-	-	74	-35.82	0-360	200	V
6	9.648	25.09	Pk	36.9	-19	0	42.99	-	-	74	-31.01	0-360	100	V

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

Pk – Peak detector

Radiated Emissions

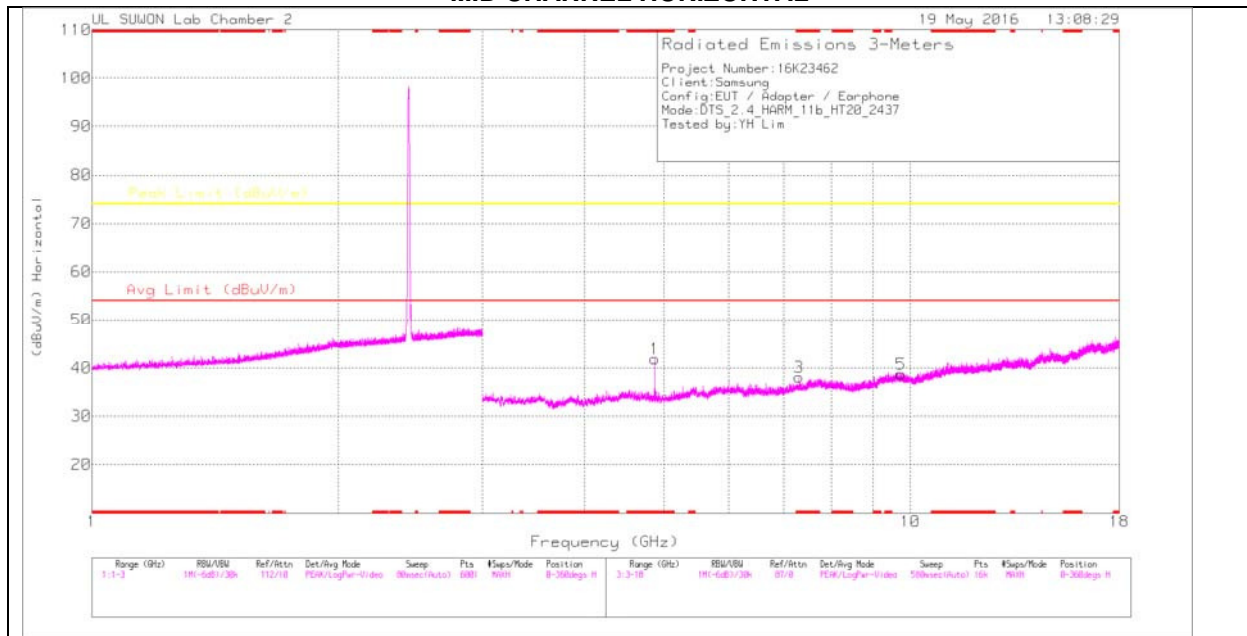
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	40.75	PK2	33.9	-25.3	0	49.35	-	-	74	-24.65	342	337	H
* 4.824	34.93	MAv1	33.9	-25.3	0	43.53	54	-10.47	-	-	342	337	H
* 4.824	38.48	PK2	33.9	-25.3	0	47.08	-	-	74	-26.92	339	163	V
* 4.824	28.78	MAv1	33.9	-25.3	0	37.38	54	-16.62	-	-	339	163	V
9.647	31.46	PK2	36.9	-19	0	49.36	-	-	74	-24.64	183	364	V
9.647	32.05	PK2	36.9	-19	0	49.95	-	-	74	-24.05	347	107	H

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

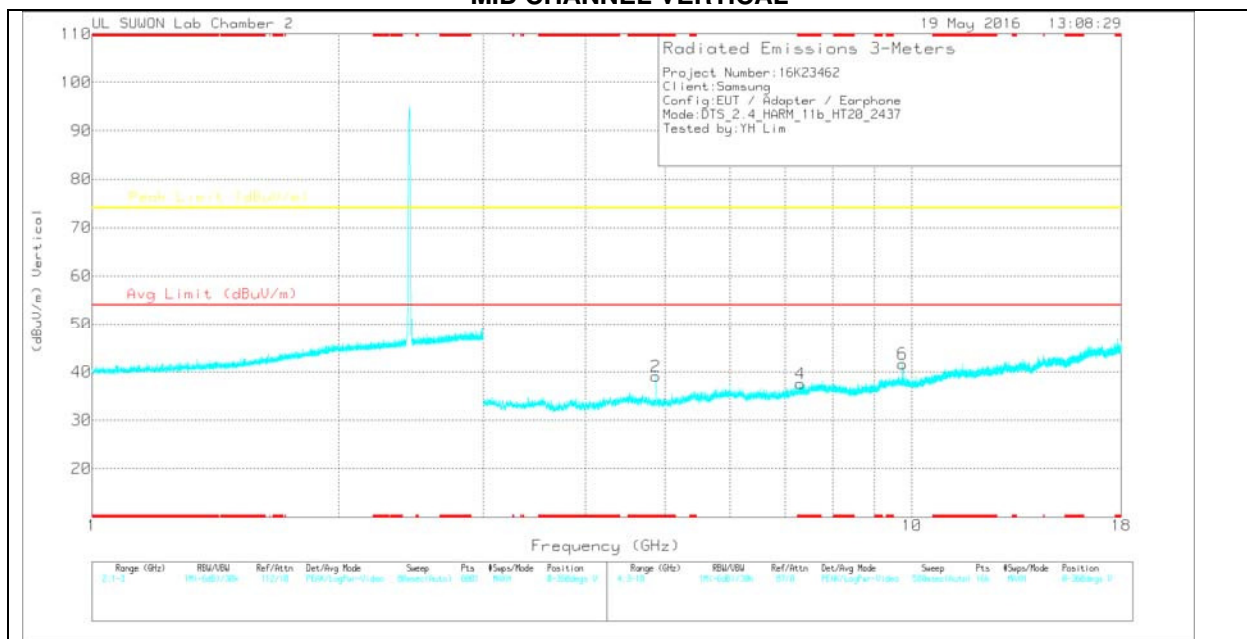
PK2 - KDB558074 Method: Maximum Peak

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(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	33.18	Pk	33.9	-25.2	0	41.88	-	-	74	-32.12	0-360	100	H
3	* 7.309	24.77	Pk	35.9	-22.6	0	38.07	-	-	74	-35.93	0-360	100	H
5	9.748	21.03	Pk	37	-19.3	0	38.73	-	-	74	-35.27	0-360	200	H
2	* 4.874	30.4	Pk	33.9	-25.2	0	39.1	-	-	74	-34.9	0-360	200	V
4	* 7.31	24.27	Pk	35.9	-22.6	0	37.57	-	-	74	-36.43	0-360	100	V
6	9.748	23.99	Pk	37	-19.3	0	41.69	-	-	74	-32.31	0-360	200	V

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

Pk – Peak detector

Radiated Emissions

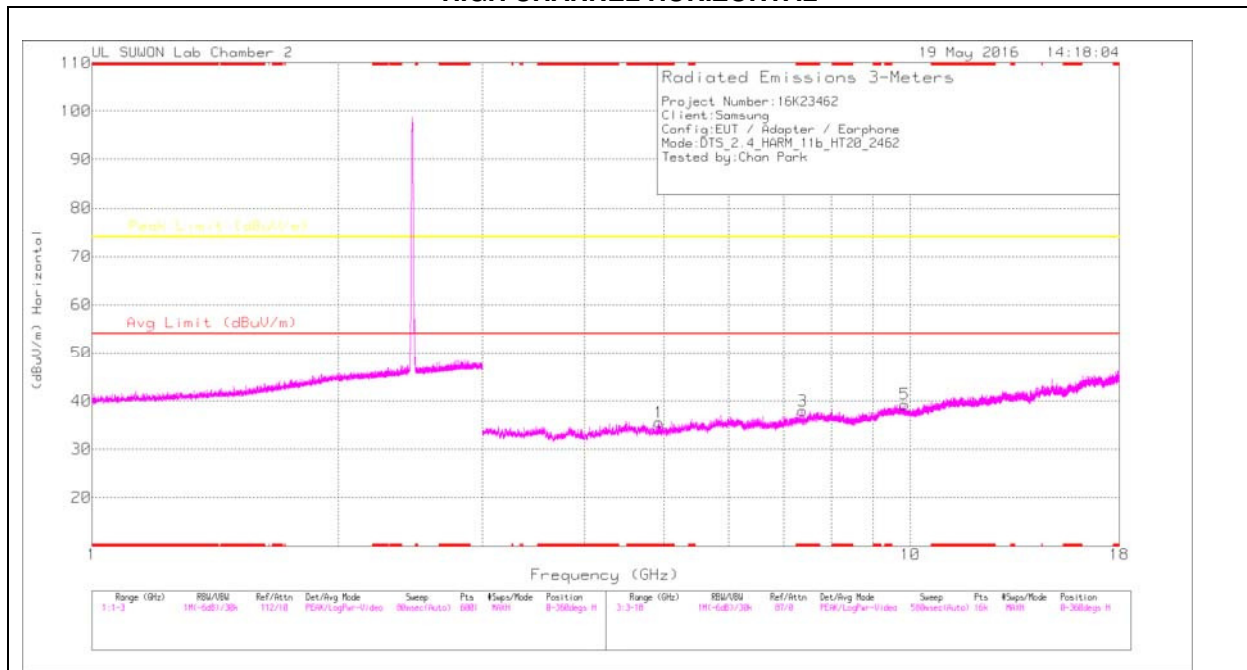
Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	39.39	PK2	33.9	-25.2	0	48.09	-	-	74	-25.91	347	291	H
* 4.874	32.33	MAv1	33.9	-25.2	0	41.03	54	-12.97	-	-	347	291	H
* 4.874	37.85	PK2	33.9	-25.2	0	46.55	-	-	74	-27.45	337	158	V
* 4.874	28.2	MAv1	33.9	-25.2	0	36.9	54	-17.1	-	-	337	158	V
9.748	32.56	PK2	37	-19.3	0	50.26	-	-	74	-23.74	276	142	V

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

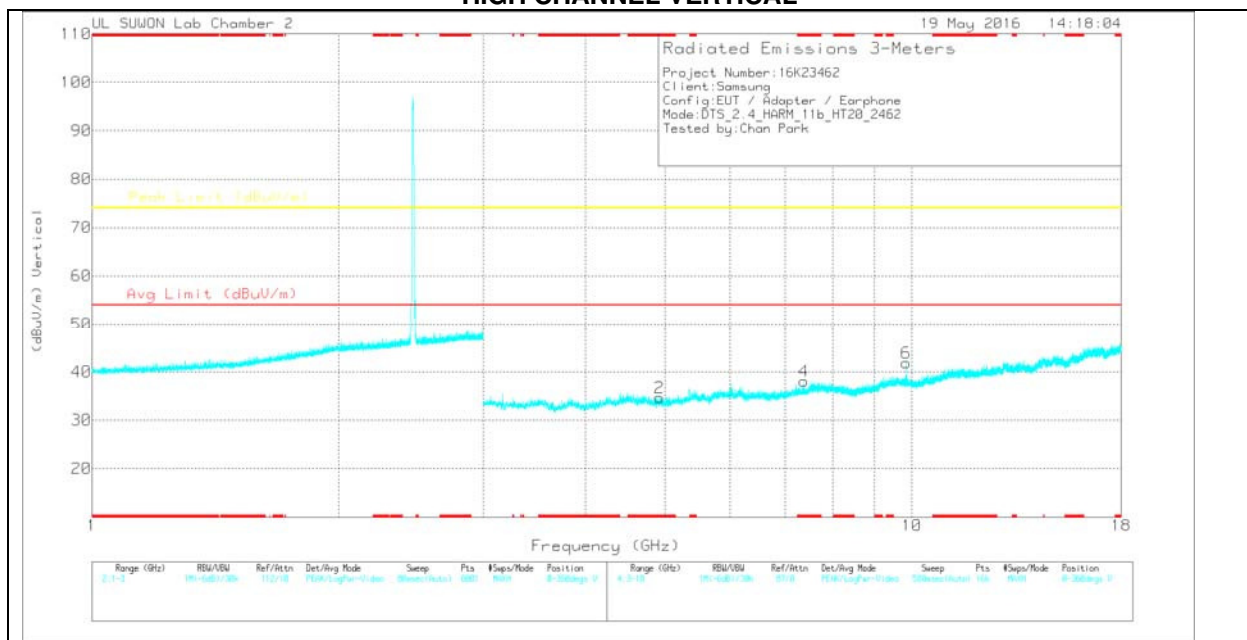
PK2 - KDB558074 Method: Maximum Peak

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	* 4.926	26.79	Pk	33.9	-25.1	0	35.59	-	-	74	-38.41	0-360	100	H
3	* 7.386	24.28	Pk	35.9	-22.2	0	37.98	-	-	74	-36.02	0-360	100	H
5	9.848	21.39	Pk	37.1	-19.2	0	39.29	-	-	74	-34.71	0-360	200	H
2	* 4.924	25.9	Pk	33.9	-25.1	0	34.7	-	-	74	-39.3	0-360	100	V
4	* 7.387	24.33	Pk	35.9	-22.2	0	38.03	-	-	74	-35.97	0-360	200	V
6	9.848	23.99	Pk	37.1	-19.2	0	41.89	-	-	74	-32.11	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
9.848	31.82	PK2	37.1	-19.2	0	49.72	-	-	74	-24.28	341	364	H
9.848	32.73	PK2	37.1	-19.2	0	50.63	-	-	74	-23.37	273	245	V

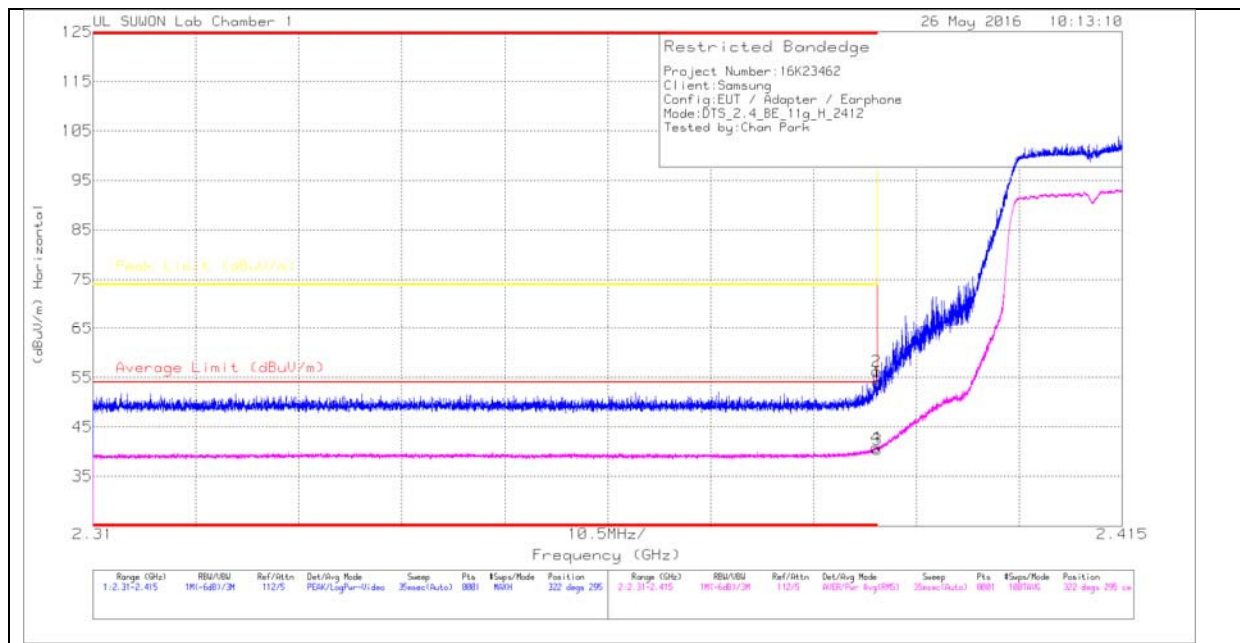
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

RESTRICTED BANDEDGE (1 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

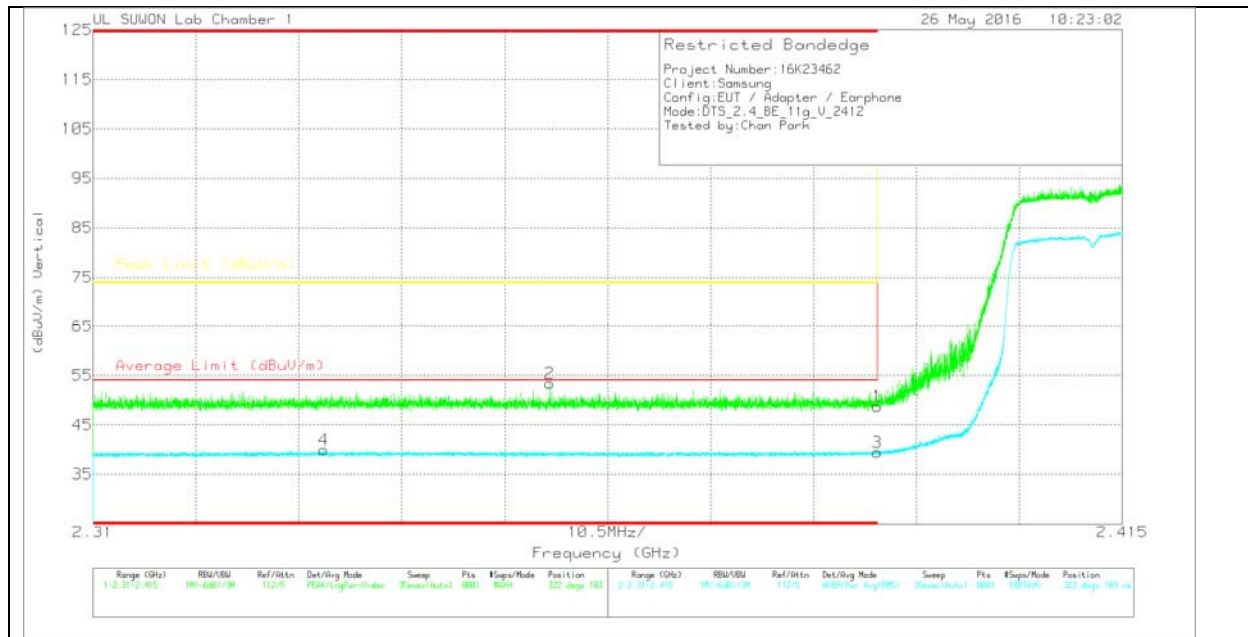
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	51.27	PK	31.8	-29	0	54.07	-	-	74	-19.93	322	295	H
2	* 2.39	53.5	PK	31.8	-29	0	56.3	-	-	74	-17.7	322	295	H
3	* 2.39	37.36	RMS	31.8	-29	.29	40.45	54	-13.55	-	-	322	295	H
4	* 2.39	37.75	RMS	31.8	-29	.29	40.84	54	-13.16	-	-	322	295	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 17)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	45.98	Pk	31.8	-29	0	48.78	-	-	74	-25.22	322	183	V
2	* 2.357	50.74	Pk	31.7	-29	0	53.44	-	-	74	-20.56	322	183	V
3	* 2.39	36.39	RMS	31.8	-29	.29	39.48	54	-14.52	-	-	322	183	V
4	* 2.334	36.99	RMS	31.7	-29	.29	39.98	54	-14.02	-	-	322	183	V

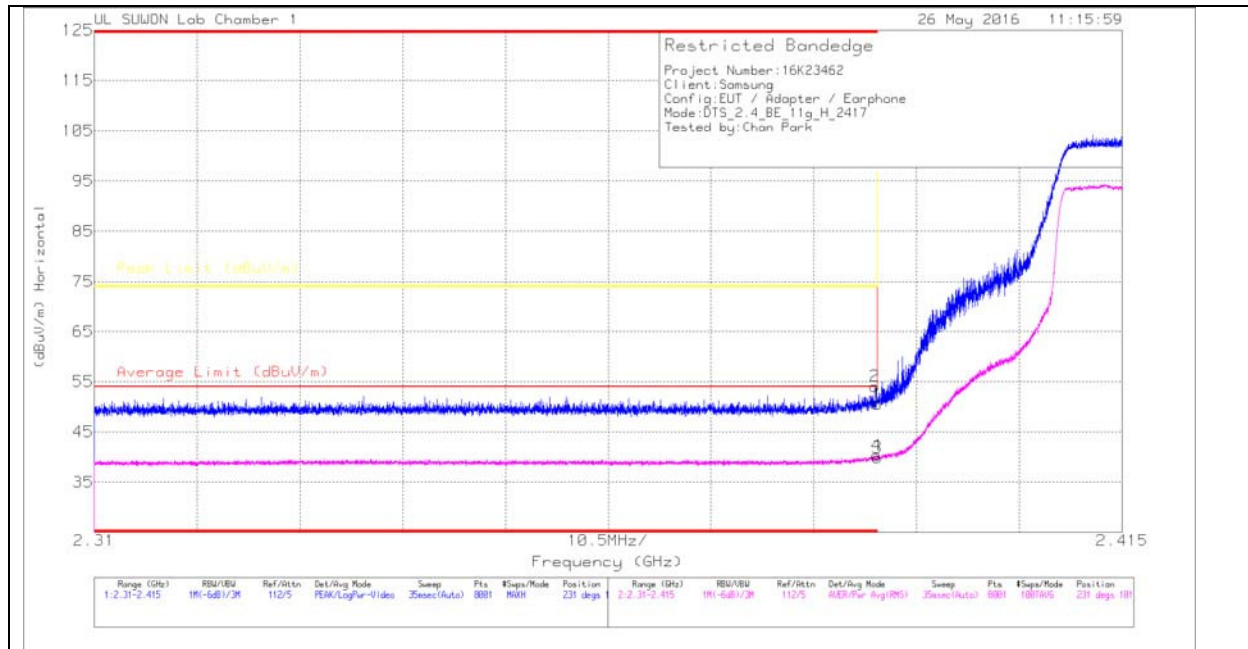
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (2 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

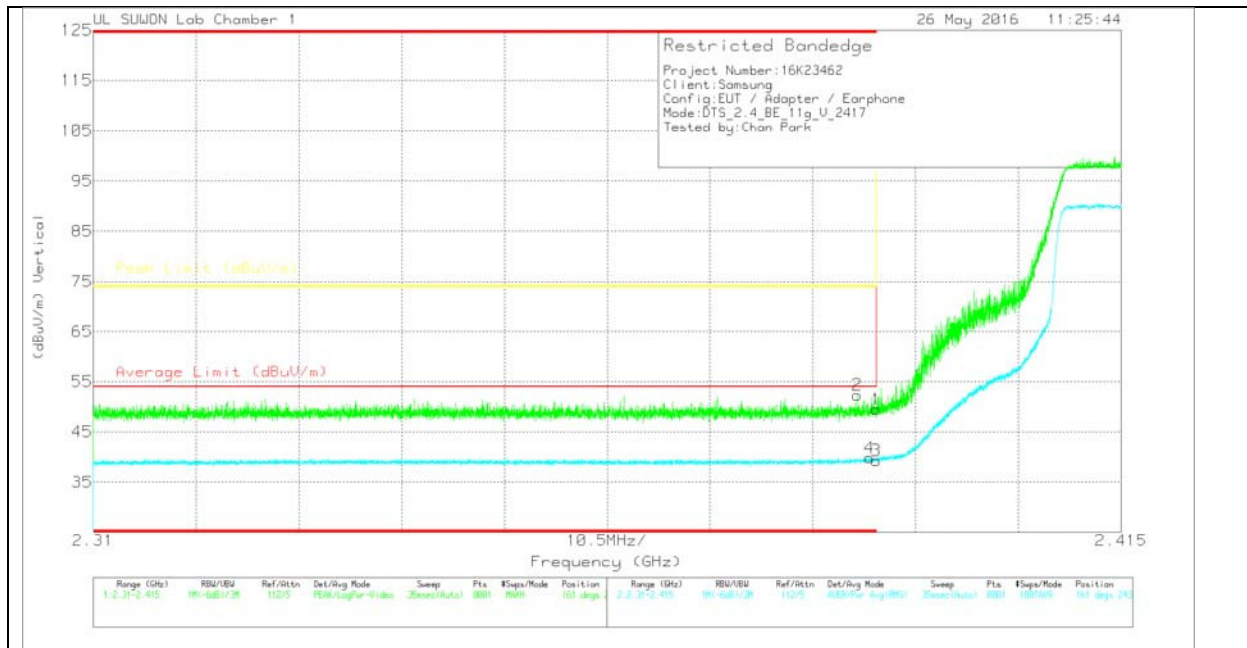
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17_150619)	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.75	Pk	31.8	-29	0	50.55	-	-	74	-23.45	231	101	H
2	* 2.39	51.27	Pk	31.8	-29	0	54.07	-	-	74	-19.93	231	101	H
3	* 2.39	36.83	RMS	31.8	-29	.29	39.92	54	-14.08	-	-	231	101	H
4	* 2.39	37.29	RMS	31.8	-29	.29	40.38	54	-13.62	-	-	231	101	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.69	PK	31.8	-29	0	49.49	-	-	74	-24.51	161	243	V
2	* 2.388	49.56	PK	31.8	-29	0	52.36	-	-	74	-21.64	161	243	V
3	* 2.39	36.24	RMS	31.8	-29	.29	39.33	54	-14.67	-	-	161	243	V
4	* 2.389	36.8	RMS	31.8	-29	.29	39.89	54	-14.11	-	-	161	243	V

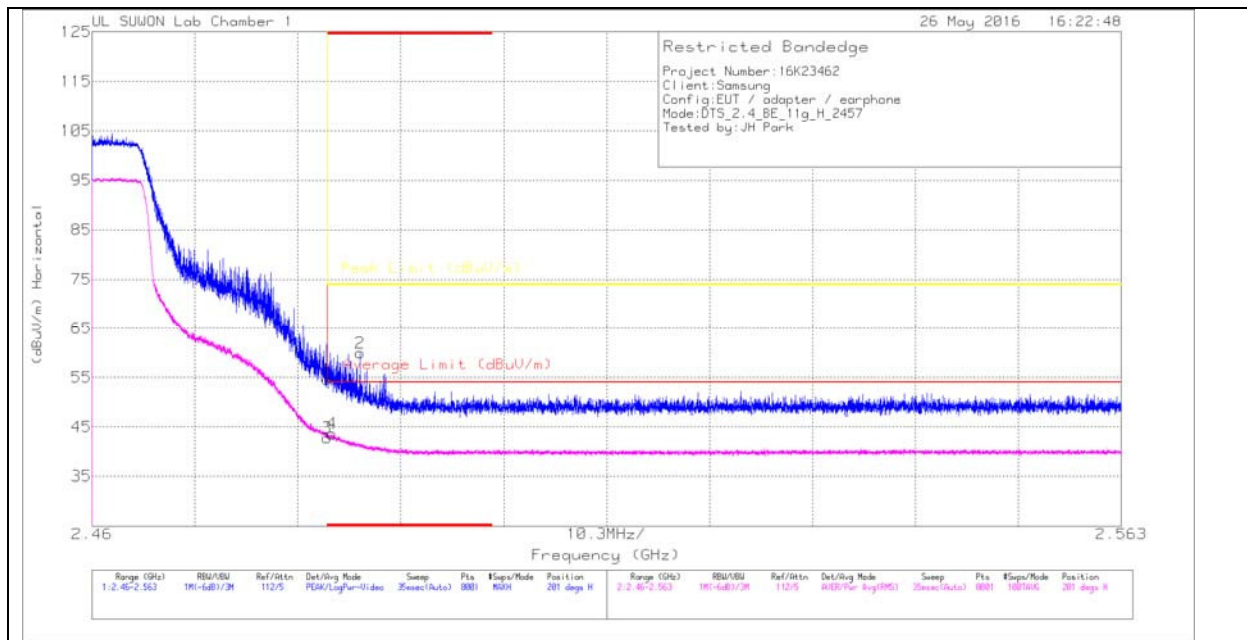
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (10 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

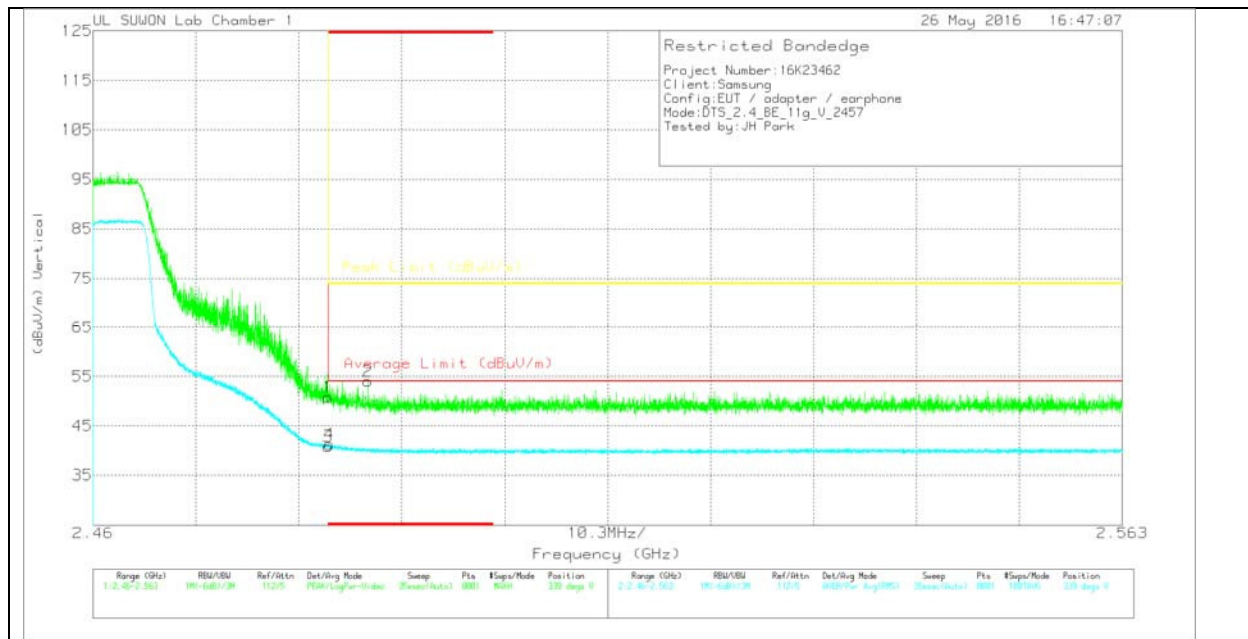
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117/001687 17_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.484	50.96	Pk	32	-28.3	0	54.66	-	-	74	-19.34	201	290	H
2	* 2.487	56.25	Pk	32	-28.3	0	59.95	-	-	74	-14.05	201	290	H
3	* 2.484	38.83	RMS	32	-28.3	.29	42.82	54	-11.18	-	-	201	290	H
4	* 2.484	39.6	RMS	32	-28.3	.29	43.59	54	-10.41	-	-	201	290	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(001687 17)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	47.11	Pk	32	-28.3	0	50.81	-	-	74	-23.19	339	363	V
2	* 2.488	50.32	Pk	32	-28.3	0	54.02	-	-	74	-19.98	339	363	V
3	* 2.484	36.87	RMS	32	-28.3	.29	40.86	54	-13.14	-	-	339	363	V
4	* 2.484	37.25	RMS	32	-28.3	.29	41.24	54	-12.76	-	-	339	363	V

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

Pk - Peak detector

RMS - RMS detection