FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-G531H, SM-G531H/DS

FCC ID: A3LSMG531H

REPORT NUMBER: 15K20806-E3

ISSUE DATE: JUN 03, 2015

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

Prepared by
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/03/15	Initial issue	SungGil Park

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA Phone + Bluetooth/BLE and DTS b/g/n
MODEL NUMBER:	SM-G531H, SM-G531H/DS
SERIAL NUMBER:	R31G401XZYL (RADIATED); R31G401XZZY (CONDUCTED)
DATE TESTED:	MAY 11 - JUN 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
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CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☐ Chamber 2

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA Phone + Bluetooth/BLE, DTS b/g/n.

SM-G531H and SM-G531H/DS are same hardware but for different number of SIM card slot. SM-G531H has one slot. SM-G531H/DS is dual SIM version.

This test report addresses the DSS (BT) operational mode.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2402 - 2480	Basic GFSK	Average	8.87	7.72
		Peak	9.57	9.06
	Enhanced Pi/4-DPSK	Average	5.46	3.51
		Peak	7.62	5.78
	Enhanced 8PSK	Average	5.54	3.58
		Peak	7.61	5.77

Note: GFSK, Pi/4-DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on this mode to showing compliance. For average power data please refer to section 8.6.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -2.68 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.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	ETA0U83EWE	N/A	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	EHS61ASFWE	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 continuously communicating to the Bluetooth tester during the tests.
EUT was set in the Hidden menu mode to enable BT communications.

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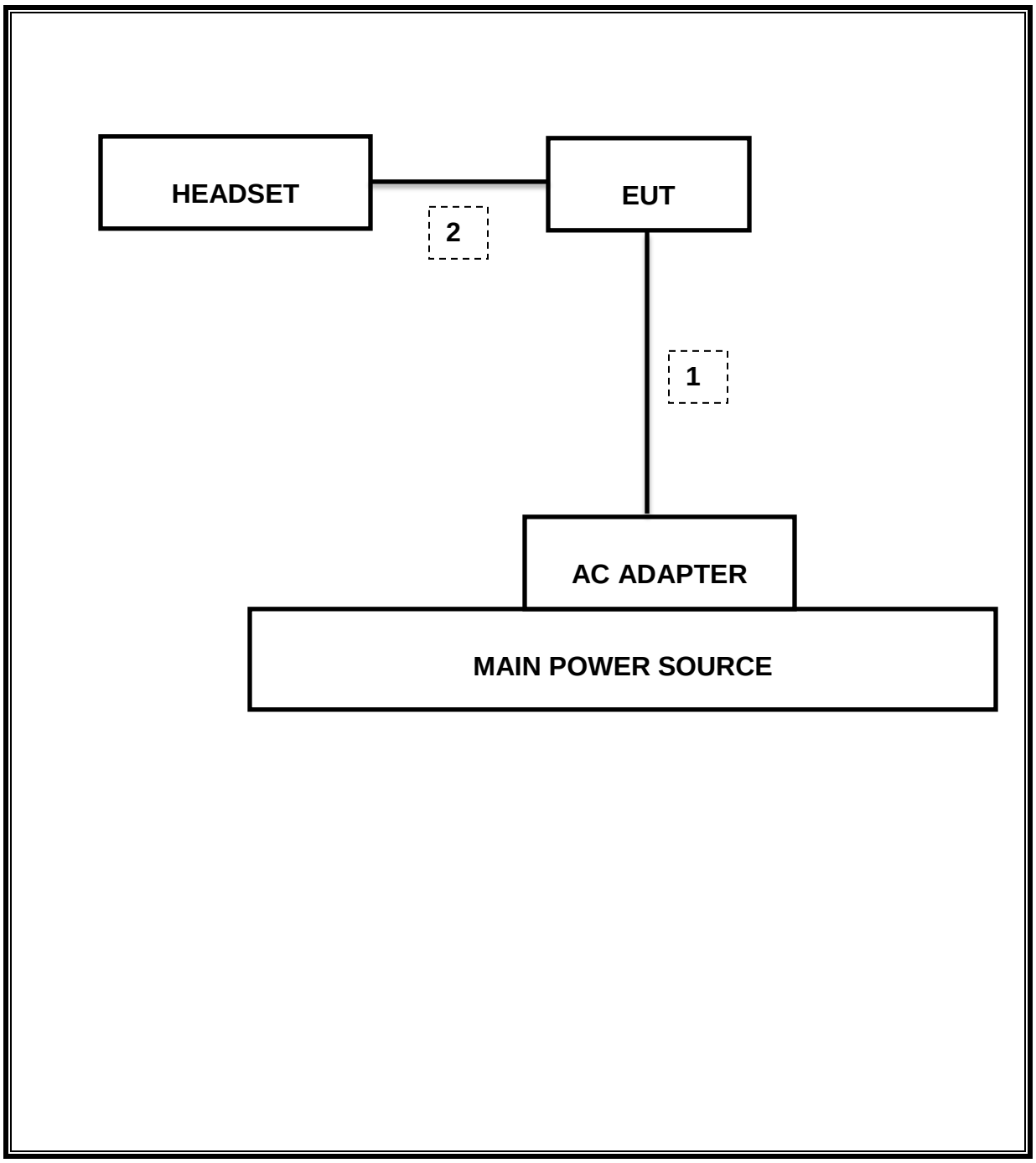
SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	950	11-17-15
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
Preamplifier, 1000 MHz	Sonoma	310N	341282	11-17-15
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	11-18-15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	09-23-15
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	11-17-15
Average Power Sensor	R&S	NRZ-Z91	102681	11-17-15
Average Power Sensor	Agilent / HP	U2000	MY54270007	09-23-15
EMI Test Receive, 40 GHz	R&S	ESU40	100439	11-17-15
EMI Test Receive, 3 GHz	R&S	ESR3	101832	11-17-15
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	11-17-15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	11-17-15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	11-17-15
LISN	R&S	ENV-216	101836	04-09-16
LISN	R&S	ENV-216	101837	04-09-16

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7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	Occupied Band width (99%)	N/A	Conducted	Pass	1.198 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-38.492 dBm
15.247 (b)(1)	TX conducted output power	<21dBm		Pass	9.570 dBm (Peak)
15.247 (a)(1)	Hopping frequency separation	> 25KHz		Pass	1 MHz
15.247 (a)(1)(iii)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	79
15.247 (a)(1)(iii)	Avg Time of Occupancy	< 0.4sec		Pass	0.317 sec
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	22.49 dBuV (AV)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	48.9 dBuV/m (AV)

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8. ANTENNA PORT TEST RESULTS

8.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

8.1.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.042	0.930
Mid	2441	1.061	0.904
High	2480	1.062	0.929
Worst		1.062	0.930

8.1.2. ENHANCED DATA RATE Pi/4-DQPSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.359	1.169
Mid	2441	1.361	1.168
High	2480	1.374	1.168
Worst		1.374	1.169

8.1.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.314	1.198
Mid	2441	1.318	1.168
High	2480	1.317	1.168
Worst		1.318	1.198

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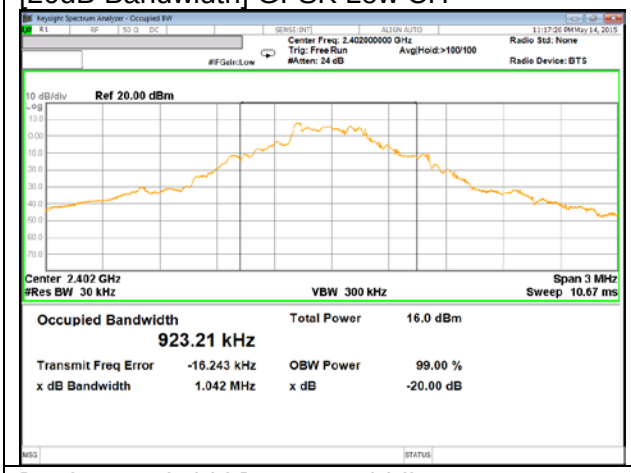
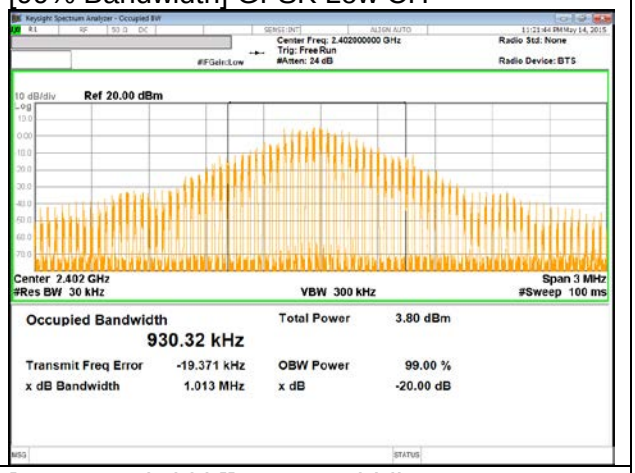
8.1.4. 20 dB AND 99% BANDWIDTH PLOTS

GFSK BANDWIDTH

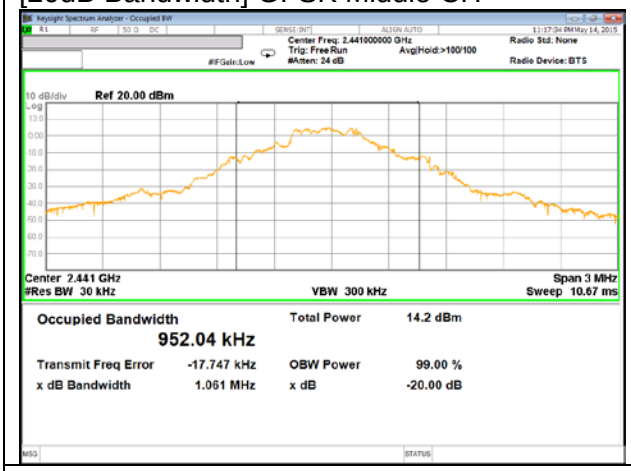
[20dB Bandwidth] GFSK Low CH



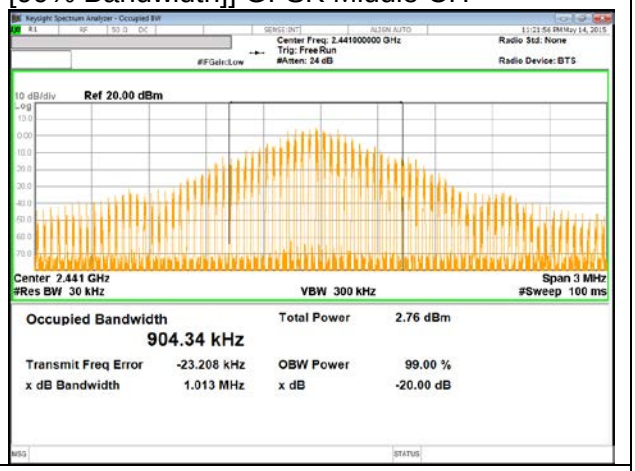
[99% Bandwidth] GFSK Low CH



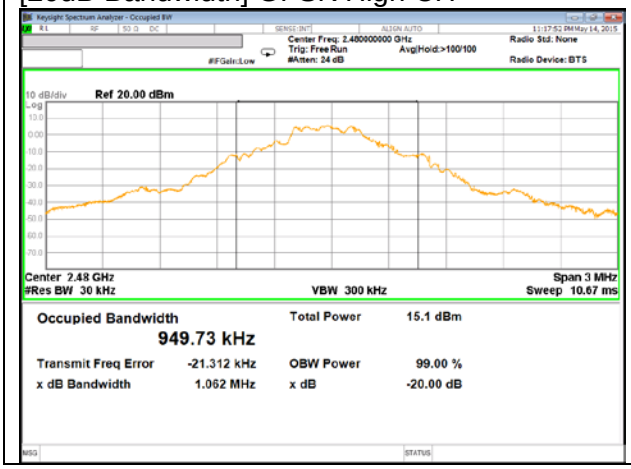
[20dB Bandwidth] GFSK Middle CH



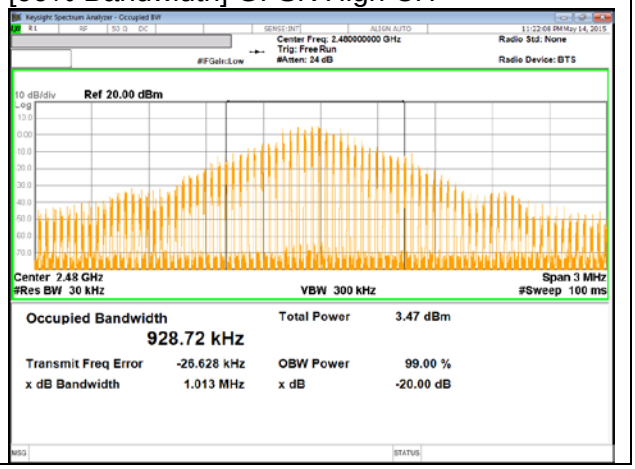
[99% Bandwidth]] GFSK Middle CH



[20dB Bandwidth] GFSK High CH



[99% Bandwidth] GFSK High CH



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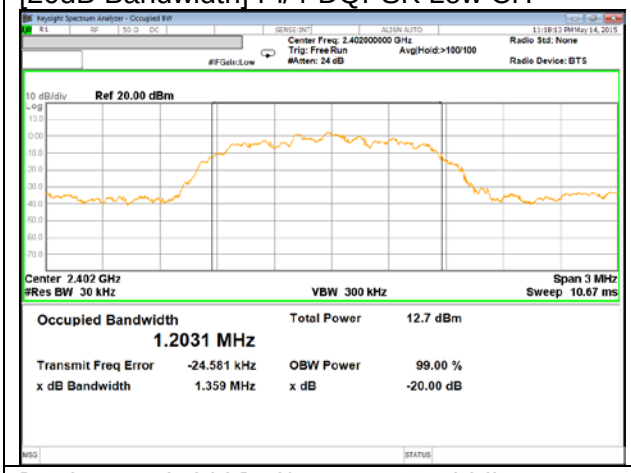
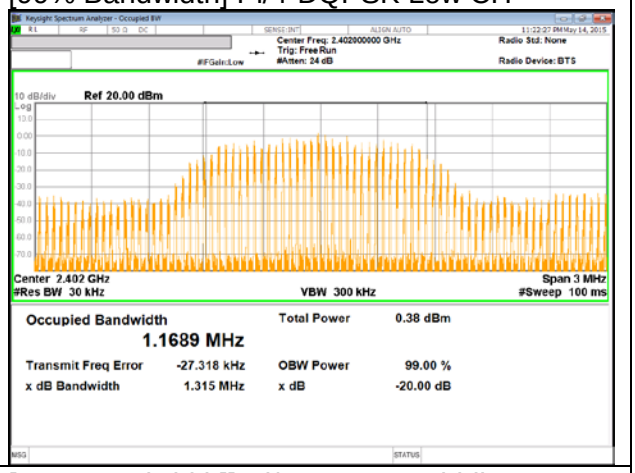
Pi/4-DQPSK BANDWIDTH

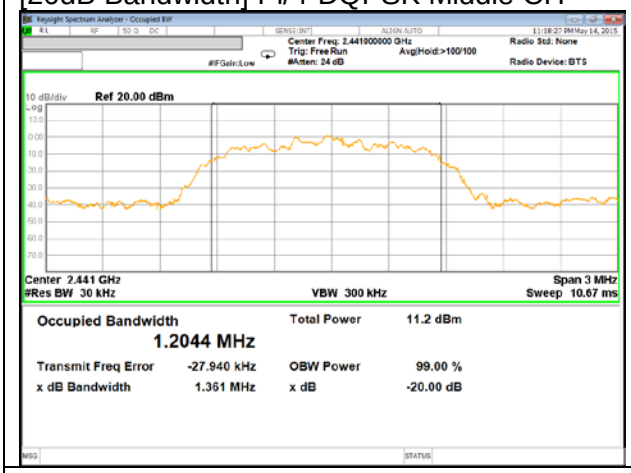
[20dB Bandwidth] Pi/4-DQPSK Low CH



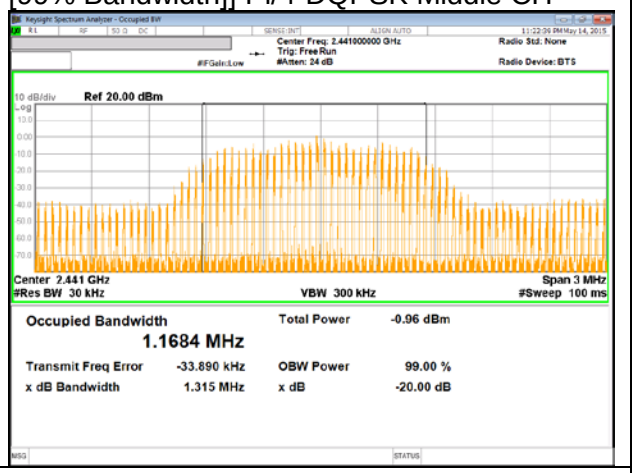
[99% Bandwidth] Pi/4-DQPSK Low CH



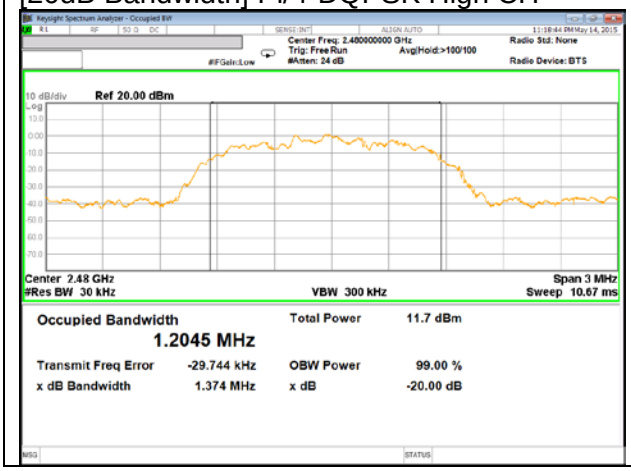
[20dB Bandwidth] Pi/4-DQPSK Middle CH



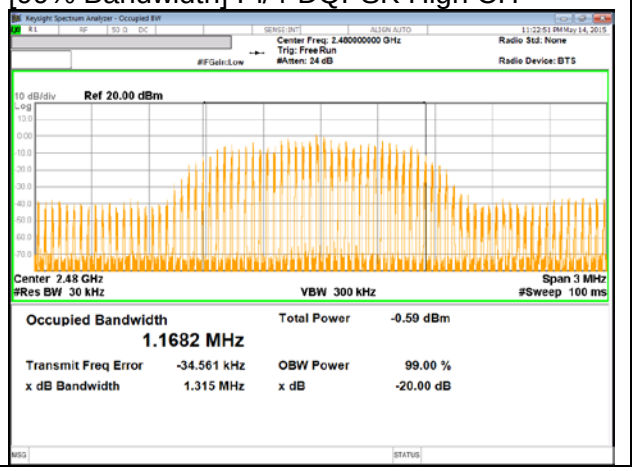
[99% Bandwidth]] Pi/4-DQPSK Middle CH



[20dB Bandwidth] Pi/4-DQPSK High CH



[99% Bandwidth] Pi/4-DQPSK High CH



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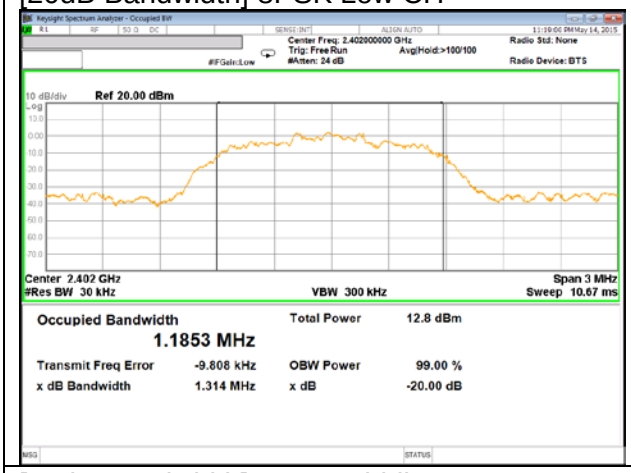
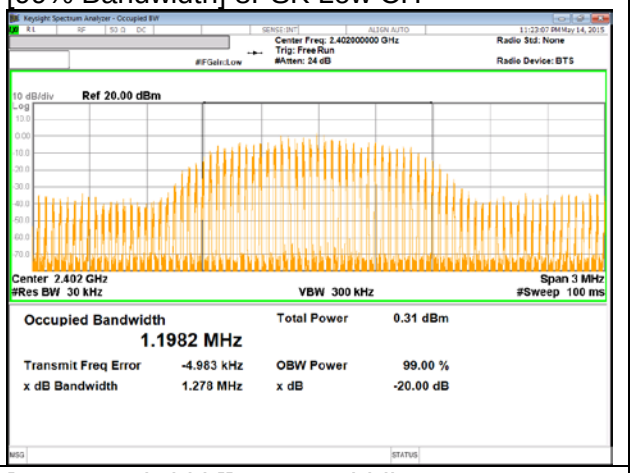
8PSK BANDWIDTH

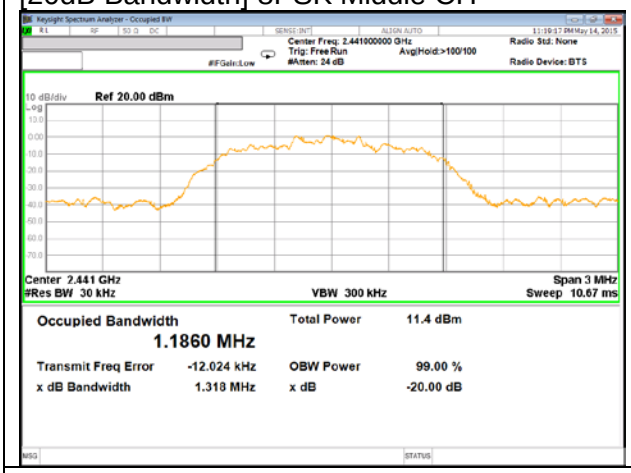
[20dB Bandwidth] 8PSK Low CH



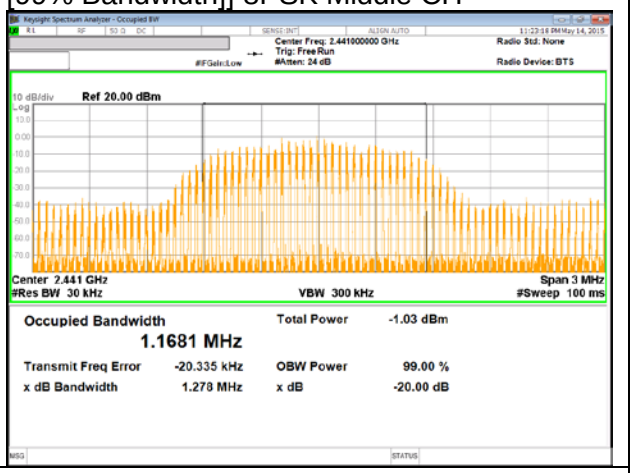
[99% Bandwidth] 8PSK Low CH



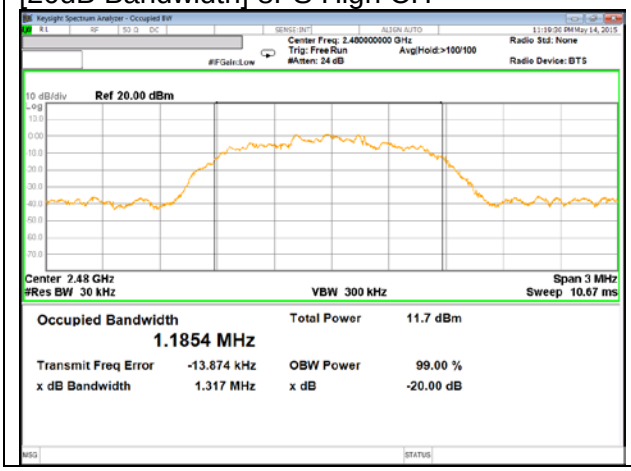
[20dB Bandwidth] 8PSK Middle CH



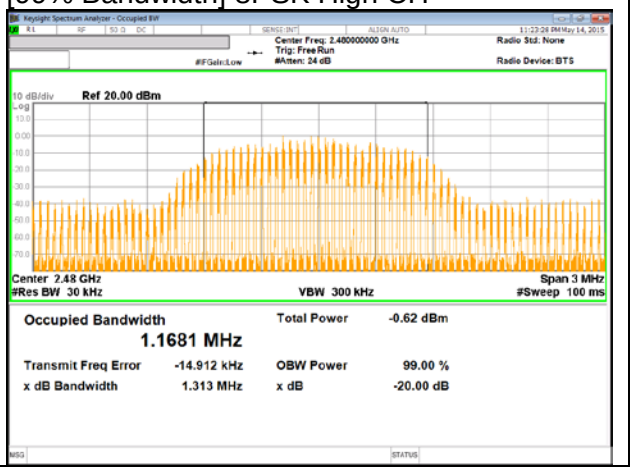
[99% Bandwidth]] 8PSK Middle CH



[20dB Bandwidth] 8PS High CH



[99% Bandwidth] 8PSK High CH



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8.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

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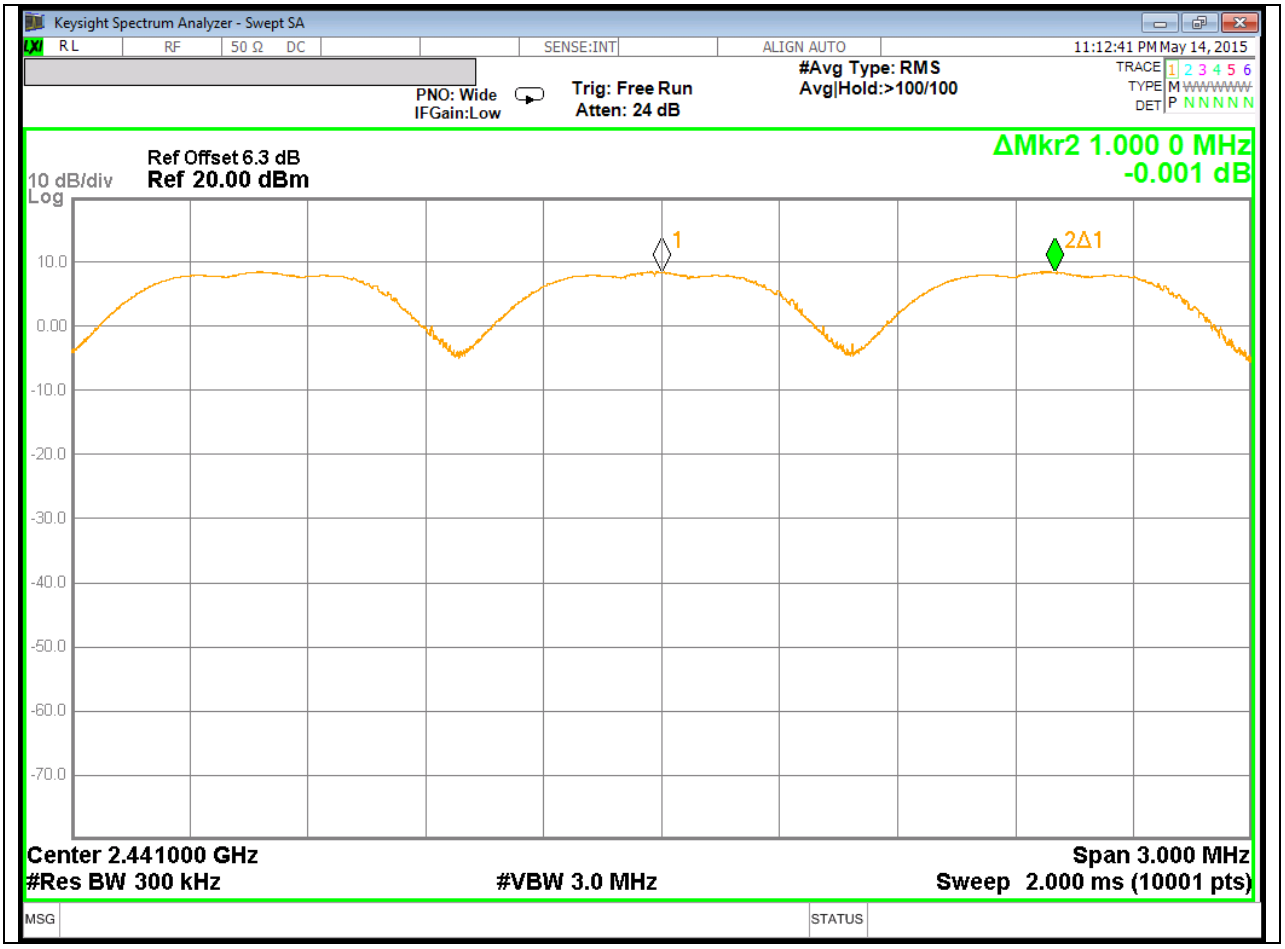
HOPPING FREQUENCY SEPARATION PLOT



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8.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed.

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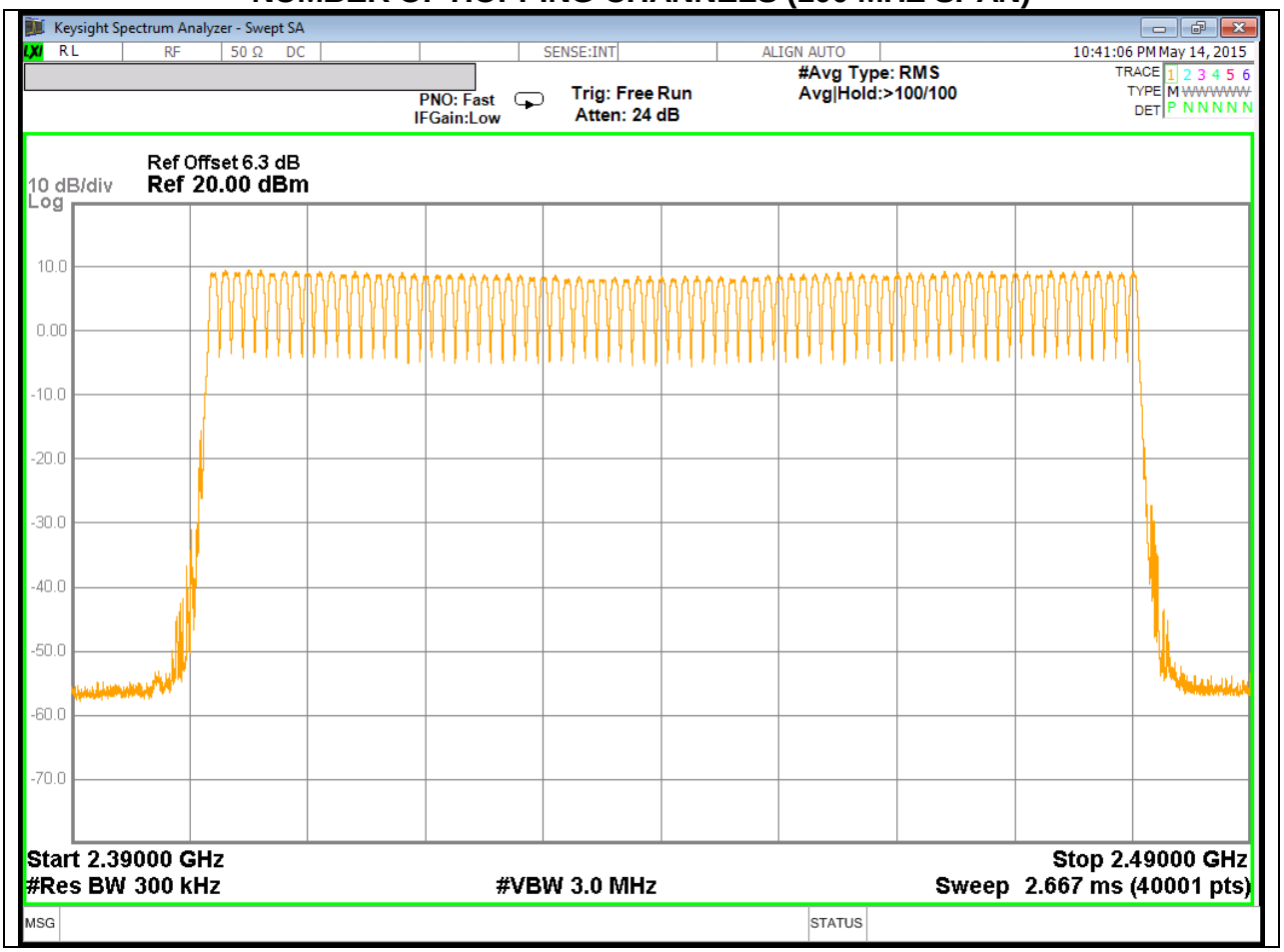
NUMBER OF HOPPING CHANNELS PLOTS

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



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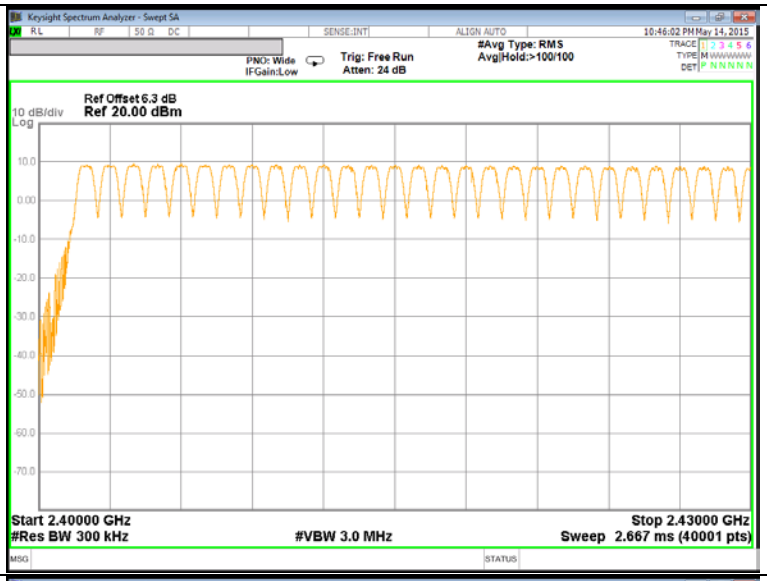
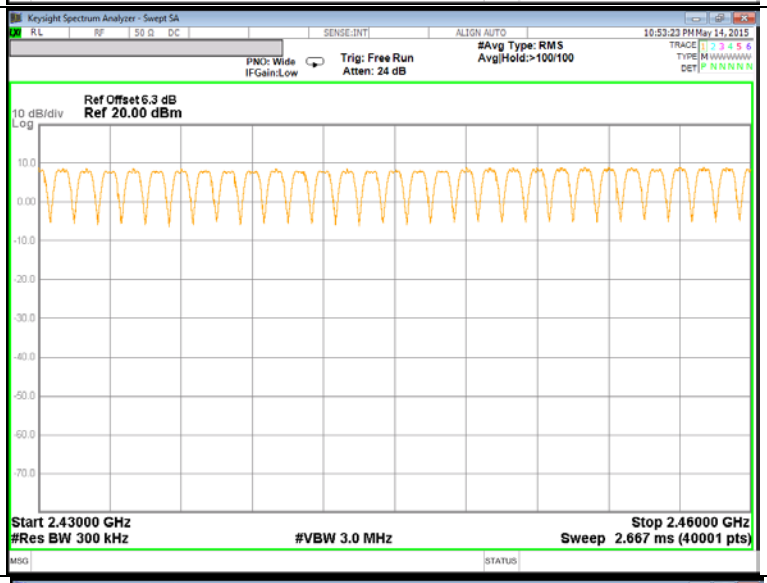
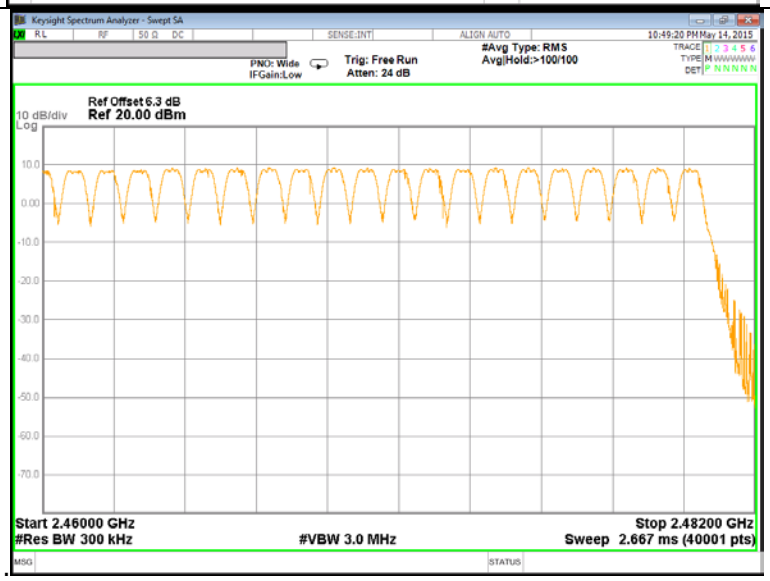
1st SEGMENT 2400 to 2430 MHz	
2nd SEGMENT 2430 to 2460 MHz	
3rd SEGMENT 2460 to 2482 MHz	

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8.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

RESULTS

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK Normal					
DH1	0.382	32	0.122240	0.4	-0.2778
DH3	1.637	17	0.278290	0.4	-0.1217
DH5	2.887	11	0.317570	0.4	-0.0824
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK AFH					
DH1	0.382	8	0.030560	0.4	-0.36944
DH3	1.637	4.25	0.069573	0.4	-0.33043
DH5	2.887	2.75	0.079393	0.4	-0.32061

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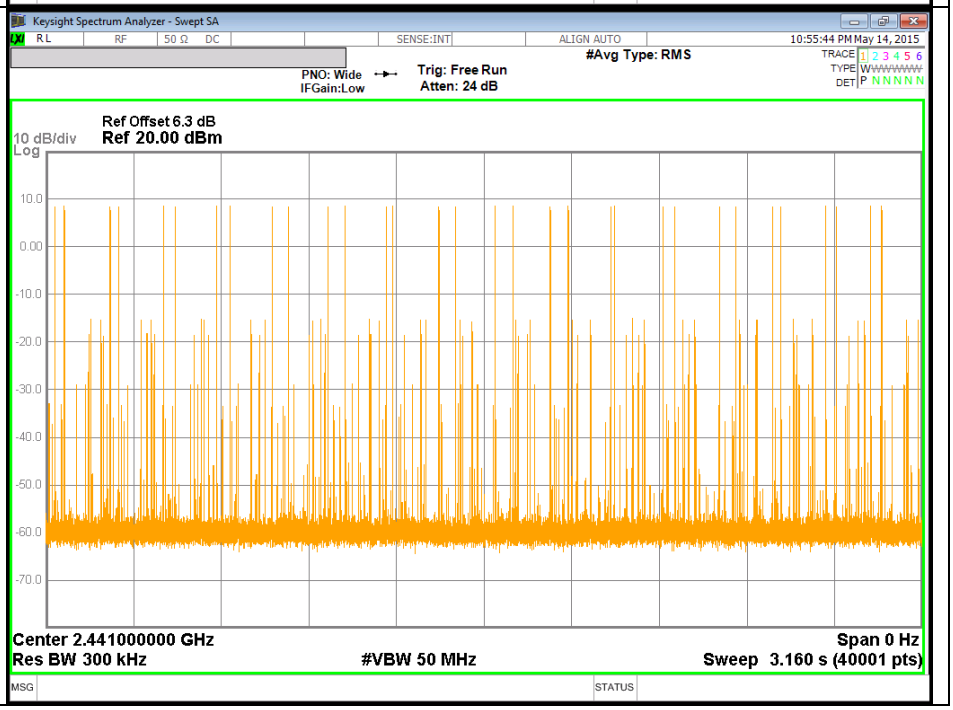
DH1

DH1 Pulse Width	
DH1 NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD	

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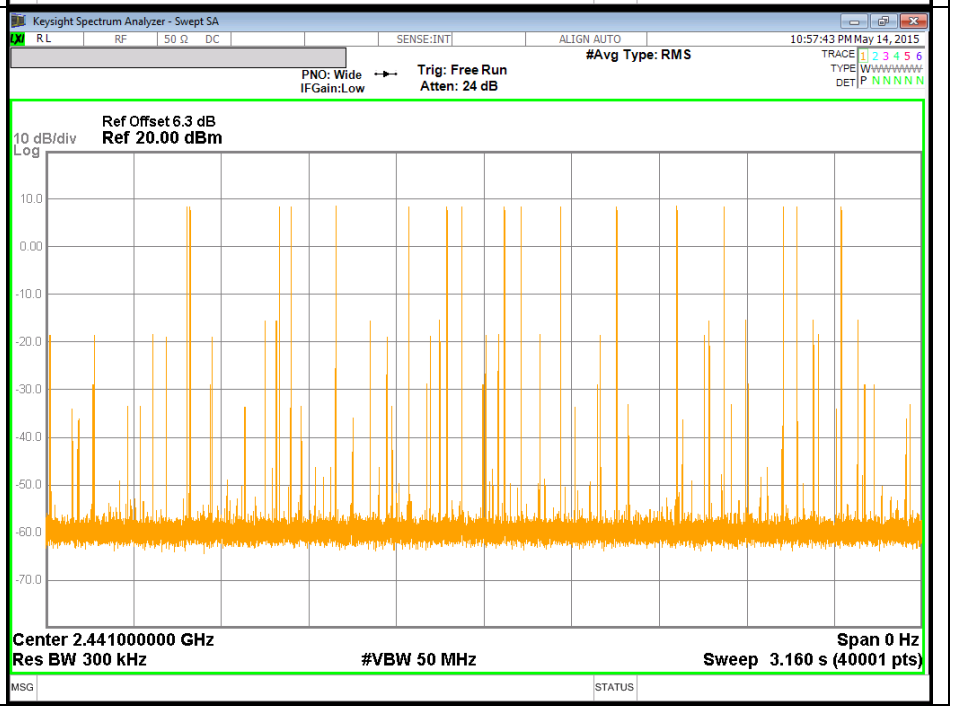
DH3

DH3 Pulse Width	
DH3 NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD	

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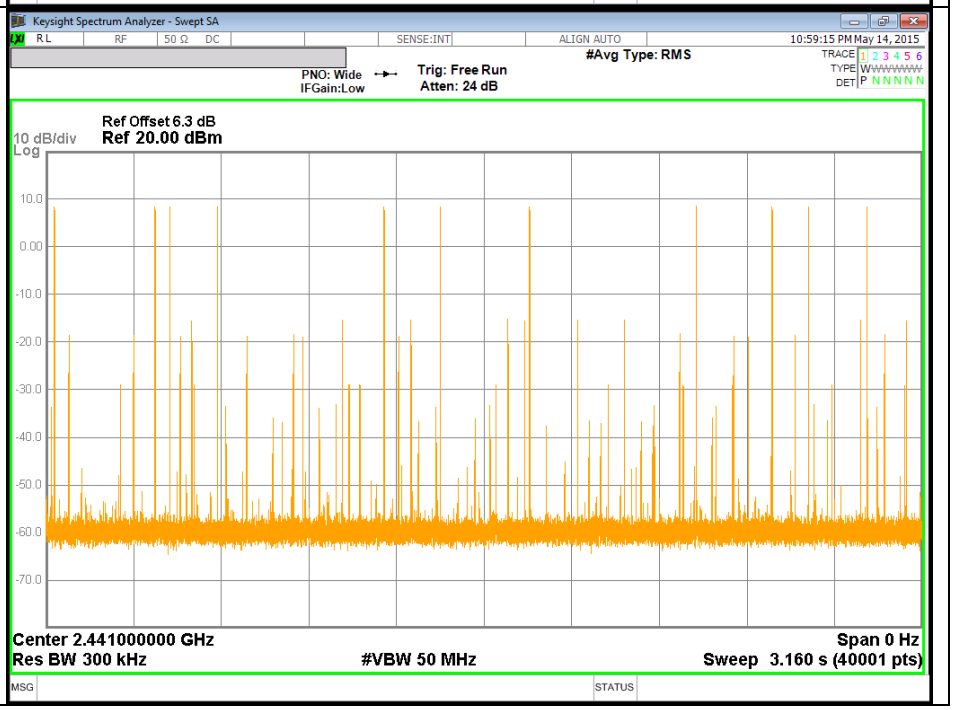
DH5

DH5 Pulse Width	
DH5 NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD	

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8.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

The maximum antenna gain is less than 6 dBi, therefore the limit is 21 dBm.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

8.5.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	9.570	21	-11.43
Middle	2441	8.675	21	-12.325
High	2480	9.440	21	-11.56
Worst		9.570	21	-11.43

8.5.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	7.616	21	-13.384
Middle	2441	6.240	21	-14.760
High	2480	6.627	21	-14.373
Worst		7.616	21	-13.384

8.5.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	7.610	21	-13.390
Middle	2441	6.229	21	-14.771
High	2480	6.630	21	-14.370
Worst		7.610	21	-13.390

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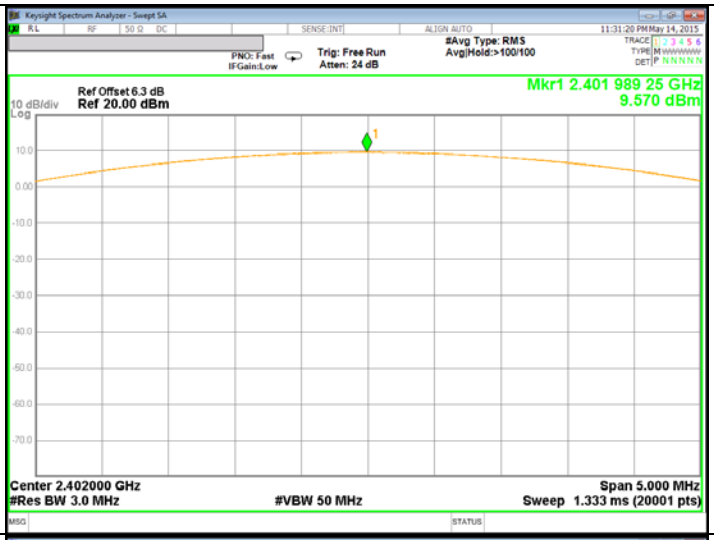
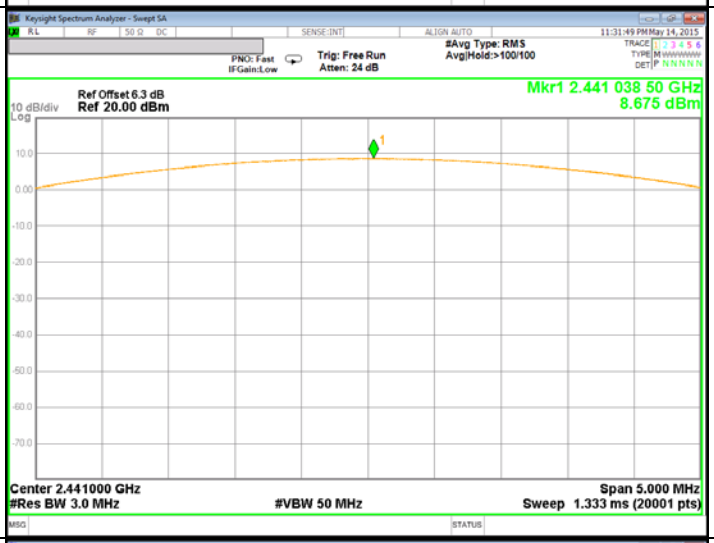
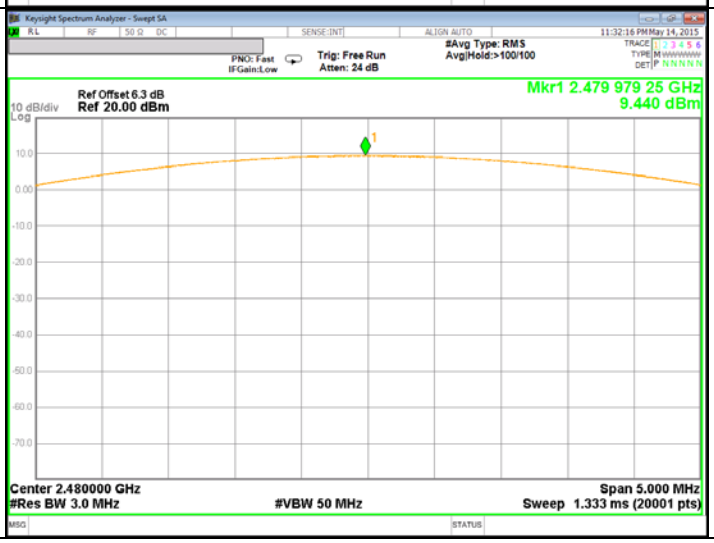
8.5.4. OUTPUT POWER PLOTS

GFSK OUTPUT POWER

GFSK Low CH			
GFSK Middle CH			
GFSK High CH			

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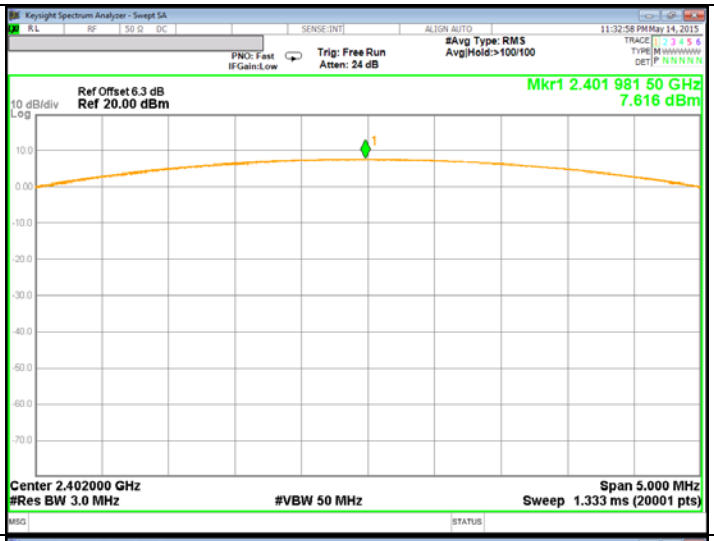
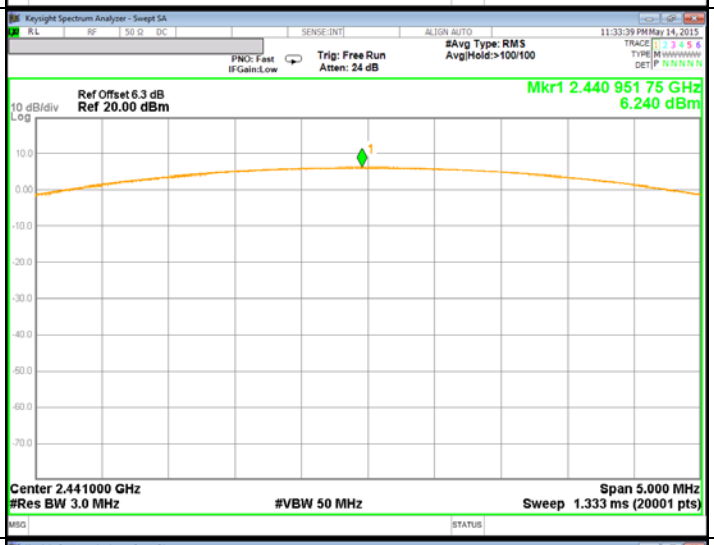
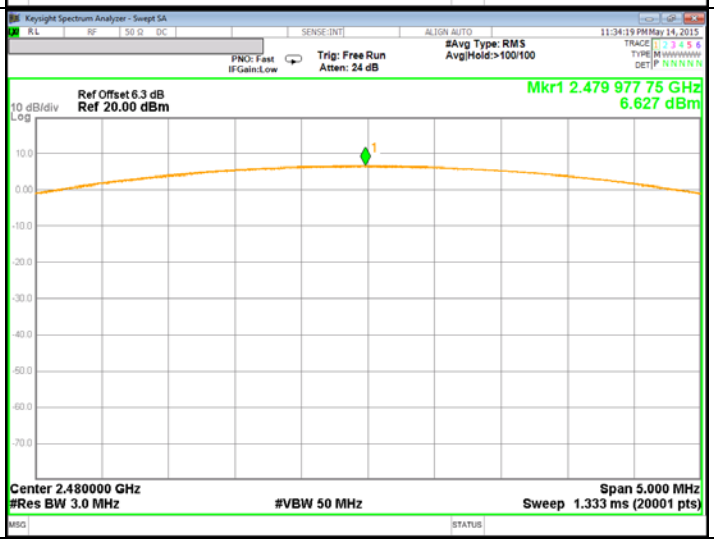
Pi/4-DPSK OUTPUT POWER

Pi/4-DPSK Low CH			
Pi/4-DPSK Middle CH			
Pi/4-DPSK High CH			

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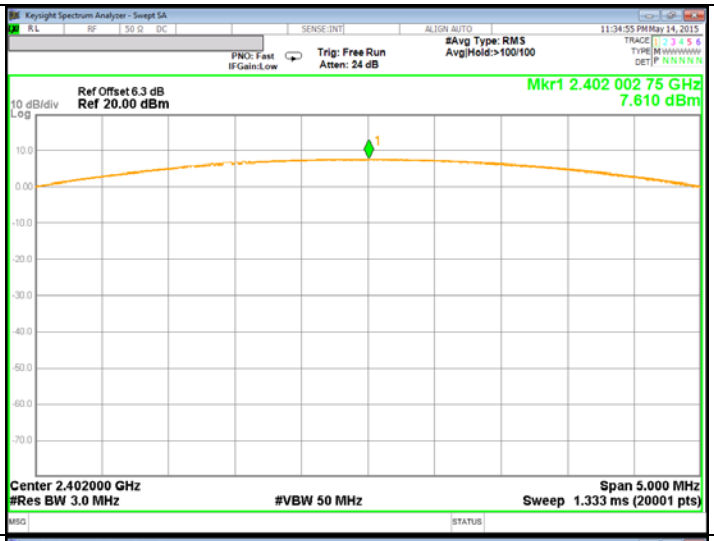
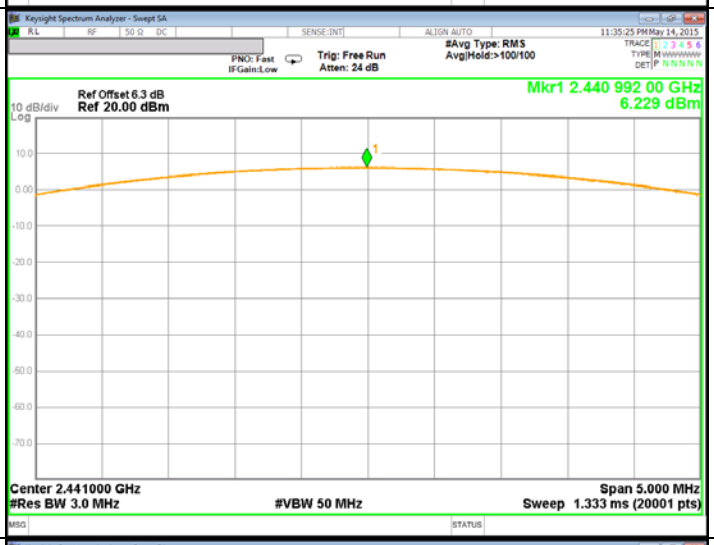
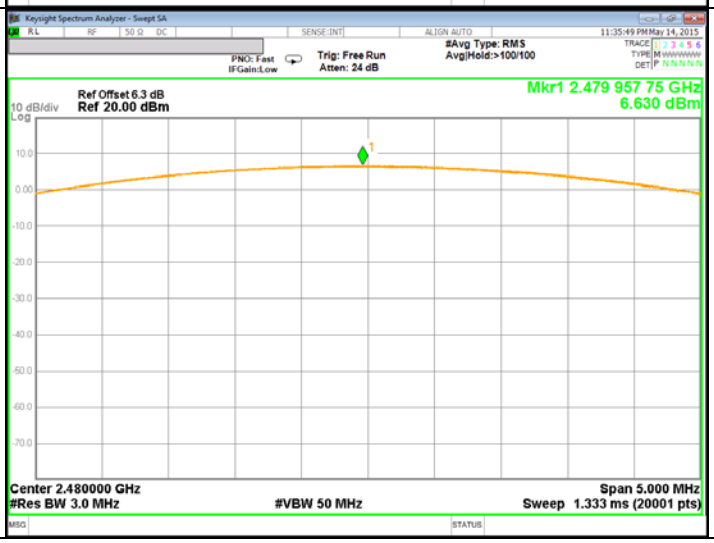
8PSK OUTPUT POWER

8PSK Low CH		
8PSK Middle CH		
8PSK High CH		

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8.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.7 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.

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	8.87	7.72
Middle	2441	7.84	6.08
High	2480	8.52	7.11

8.6.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	5.46	3.51
Middle	2441	4.08	2.56
High	2480	4.46	2.79

8.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	5.54	3.58
Middle	2441	4.17	2.61
High	2480	4.53	2.84

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8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

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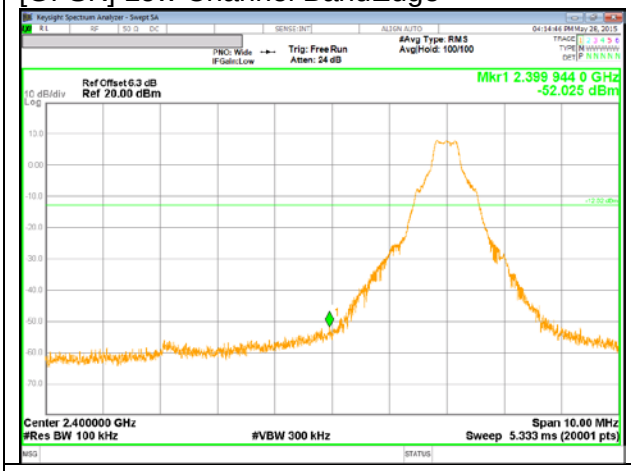
8.7.1. BASIC DATA RATE GFSK MODULATION

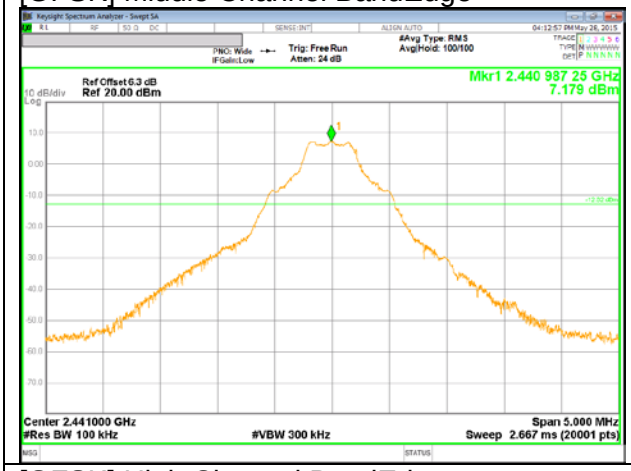
GFSK Mode

[GFSK] Low Channel BandEdge



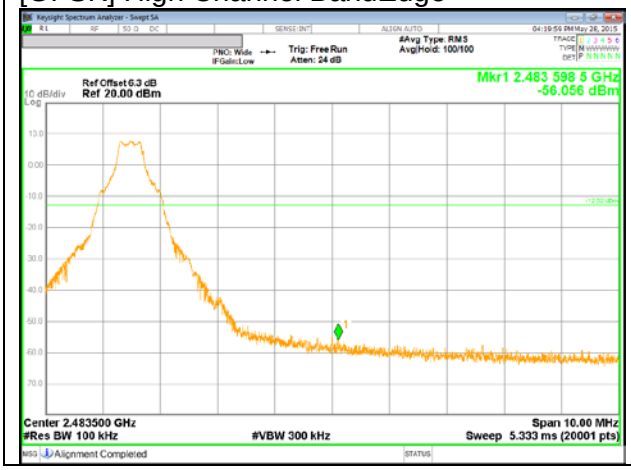
[GFSK] Low Channel Spurious

[GFSK] Middle Channel BandEdge



[GFSK] Middle Channel Spurious

[GFSK] High Channel BandEdge



[GFSK] High Channel Spurious

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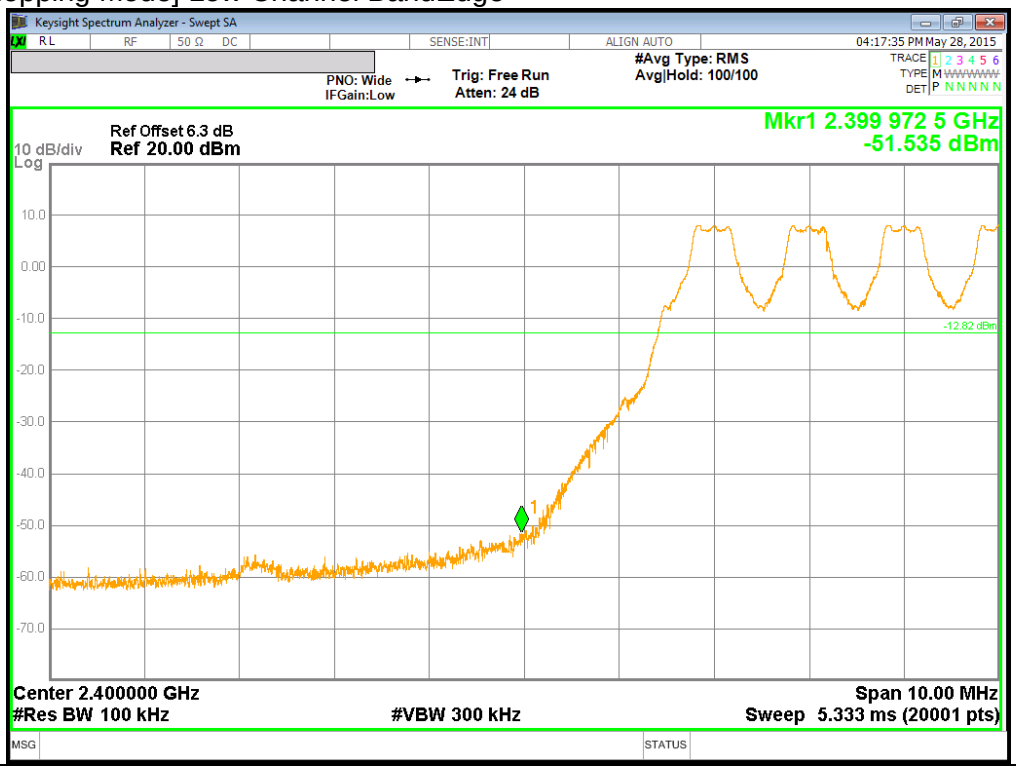
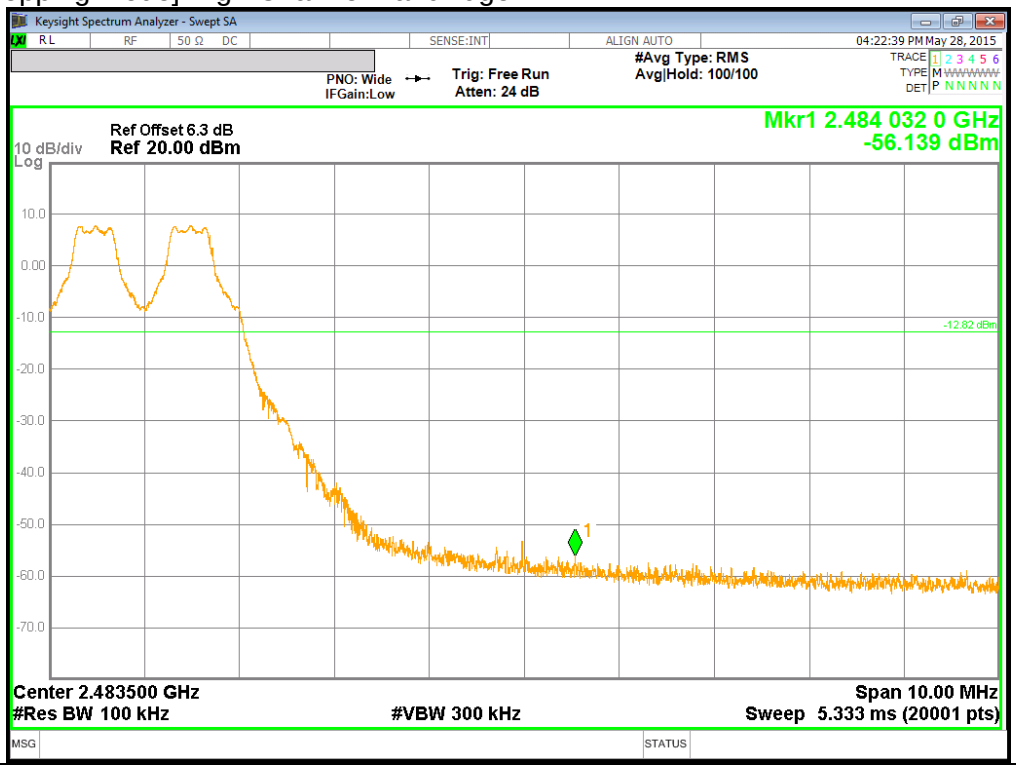
BandEdge Emission at GFSK Hopping Mode

[GFSK Hopping Mode] Low Channel BandEdge



[GFSK Hopping Mode] High Channel BandEdge



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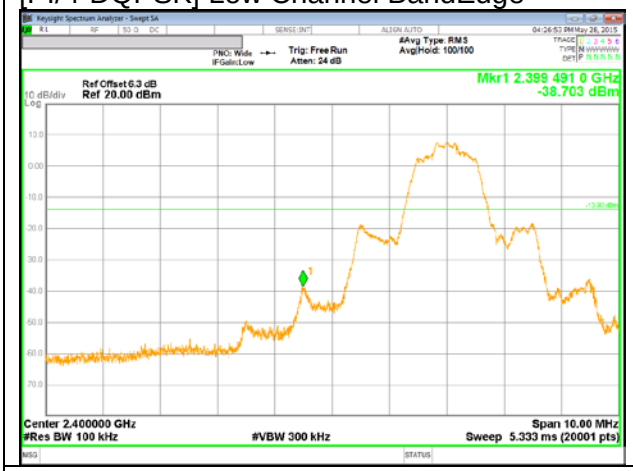
PI/4-DQPSK Mode

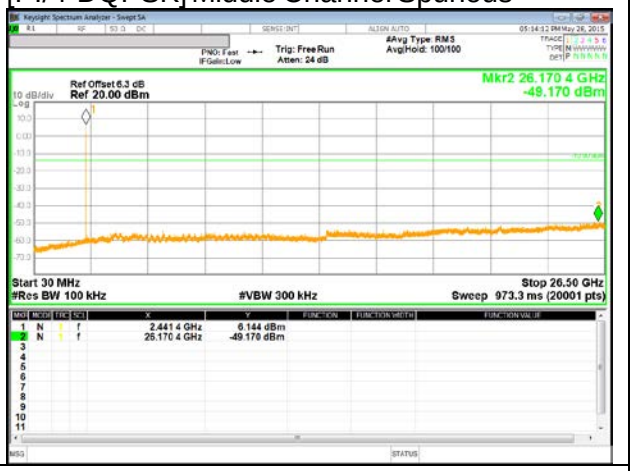
[PI/4-DQPSK] Low Channel BandEdge



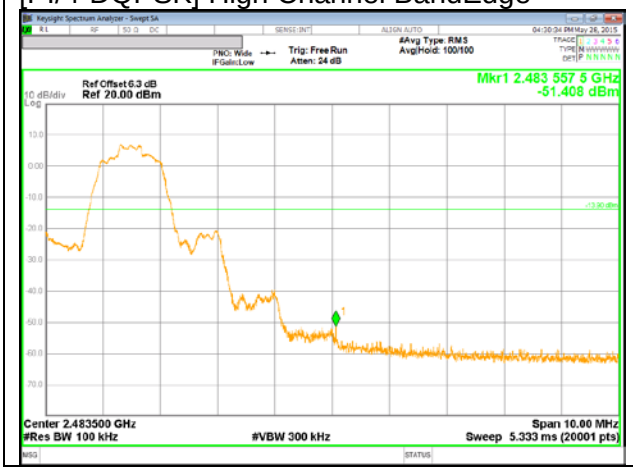
[PI/4-DQPSK] Low Channel Spurious

[PI/4-DQPSK] Middle Channel BandEdge

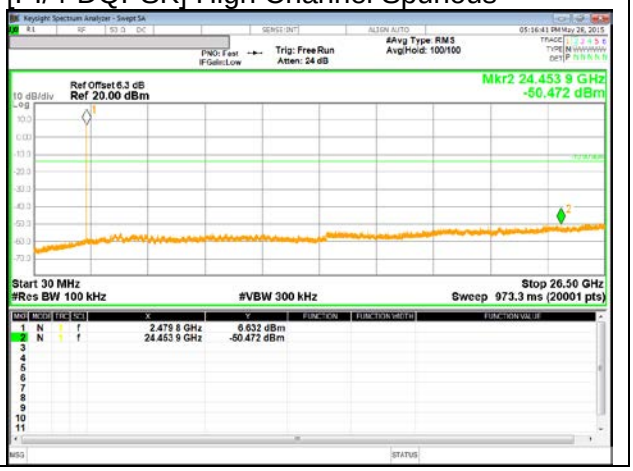
[PI/4-DQPSK] Middle Channel Spurious



[PI/4-DQPSK] High Channel BandEdge



[PI/4-DQPSK] High Channel Spurious



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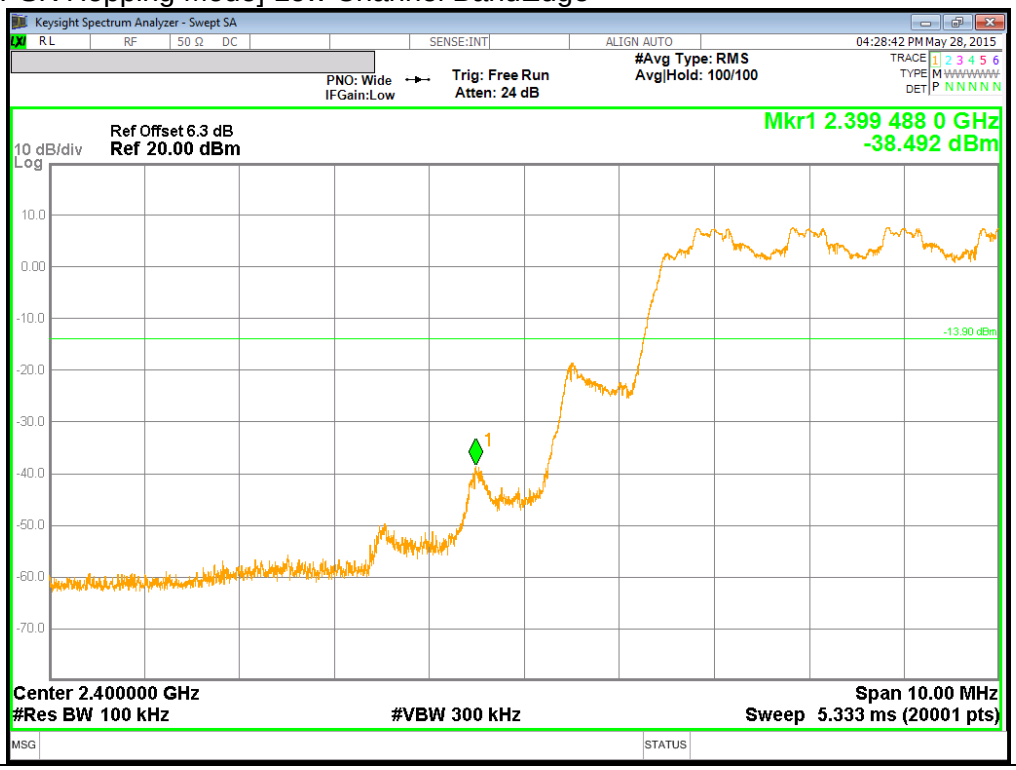
BandEdge Emission at PI/4-DQPSK Hopping Mode

[PI/4-DQPSK Hopping Mode] Low Channel BandEdge



[PI/4-DQPSK Hopping Mode] High Channel BandEdge

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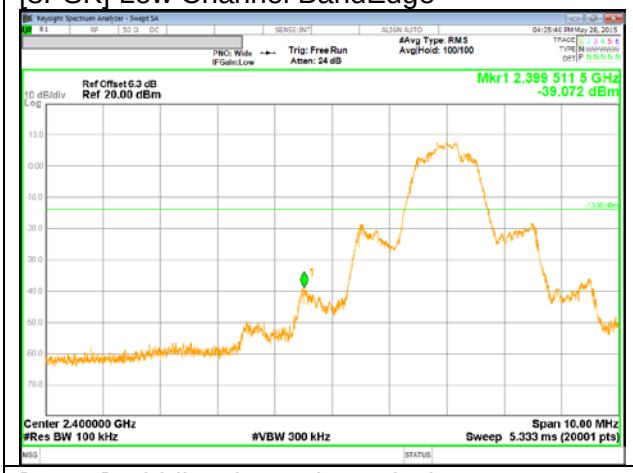
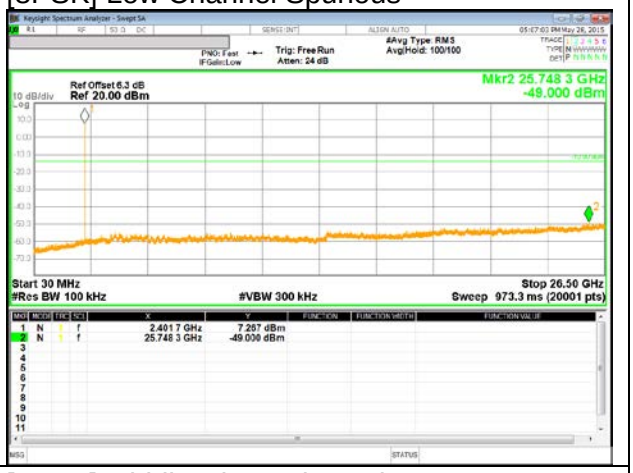
8PSK Mode

[8PSK] Low Channel BandEdge



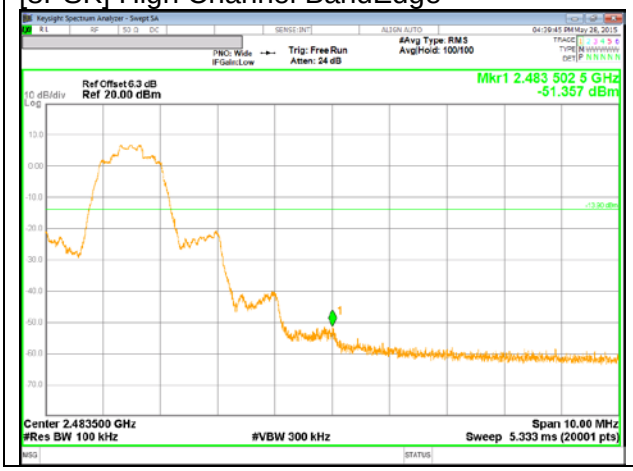
[8PSK] Low Channel Spurious



[8PSK] Middle Channel BandEdge

[8PSK] Middle Channel Spurious

[8PSK] High Channel BandEdge



[8PSK] High Channel Spurious

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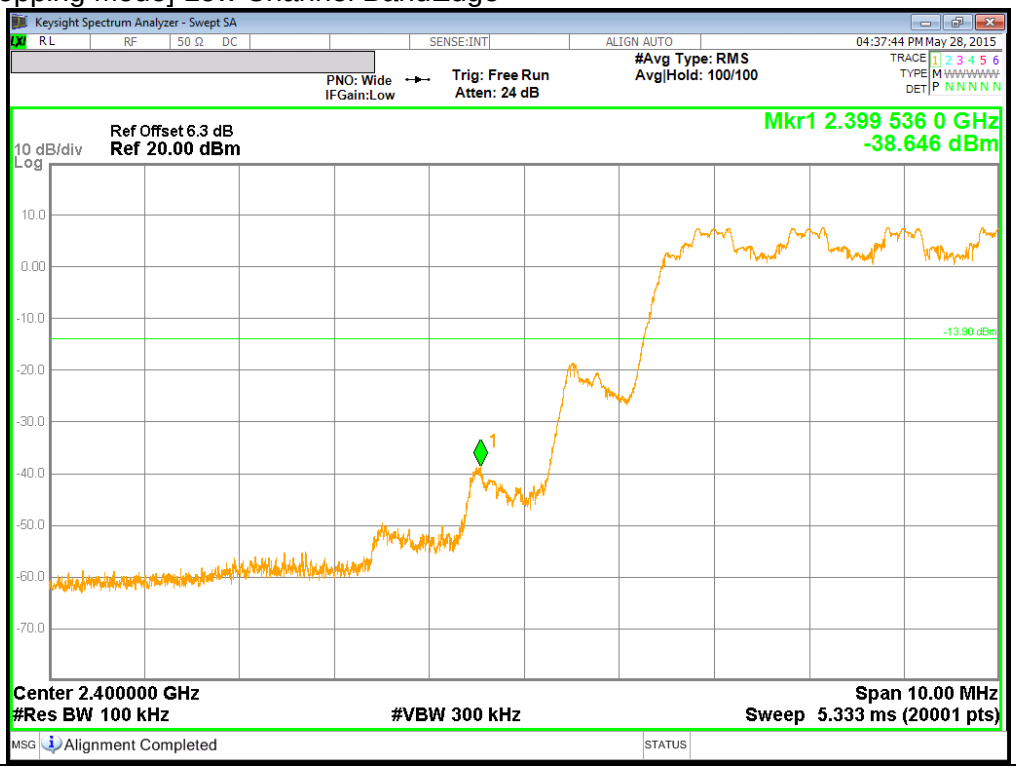
BandEdge Emission at 8PSK Hopping Mode

[8PSK Hopping Mode] Low Channel BandEdge



[8PSK Hopping Mode] High Channel BandEdge

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9. RADIATED TEST RESULTS

9.1. 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. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.

GFSK = 1/T = 1 / 0.0029S = 350Hz.

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz 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.

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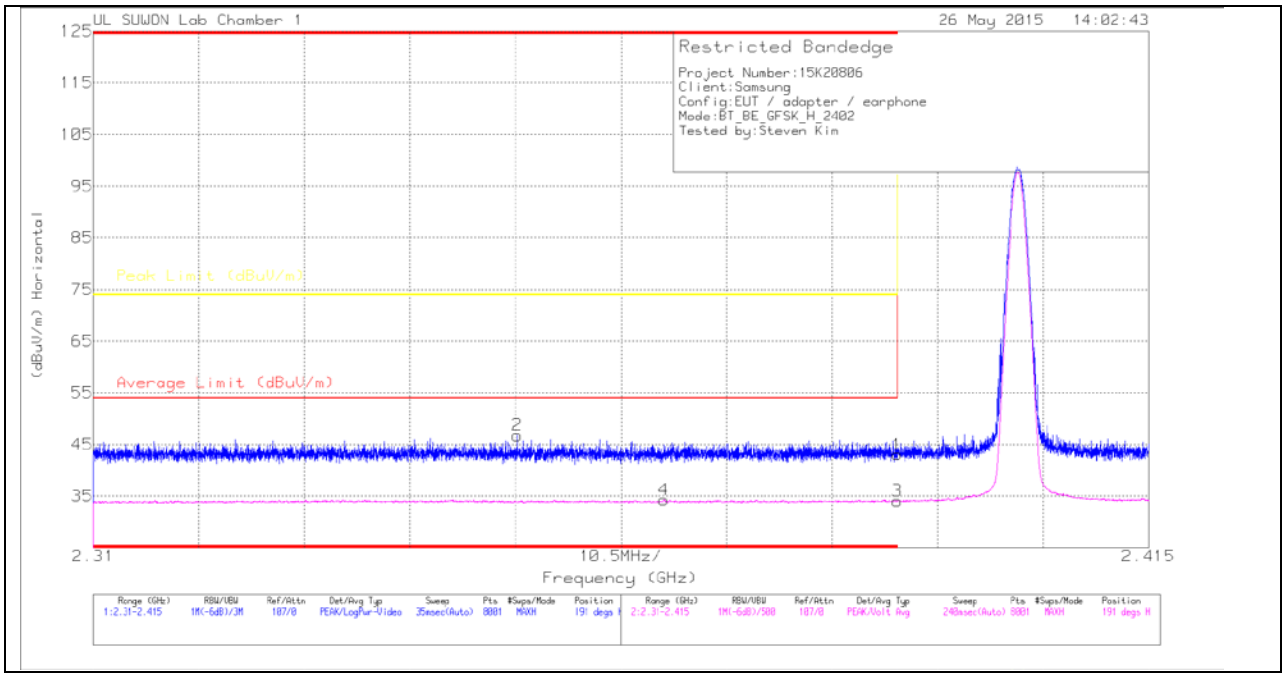
9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	37.96	Pk	27.9	-22.8	43.06	-	-	74	-30.94	191	113	H
2	* 2.352	41.89	Pk	27.8	-22.9	46.79	-	-	74	-27.21	191	113	H
3	* 2.39	28.98	VB1T	27.9	-22.8	34.08	54	-19.92	-	-	191	113	H
4	* 2.367	29.29	VB1T	27.8	-22.8	34.29	54	-19.71	-	-	191	113	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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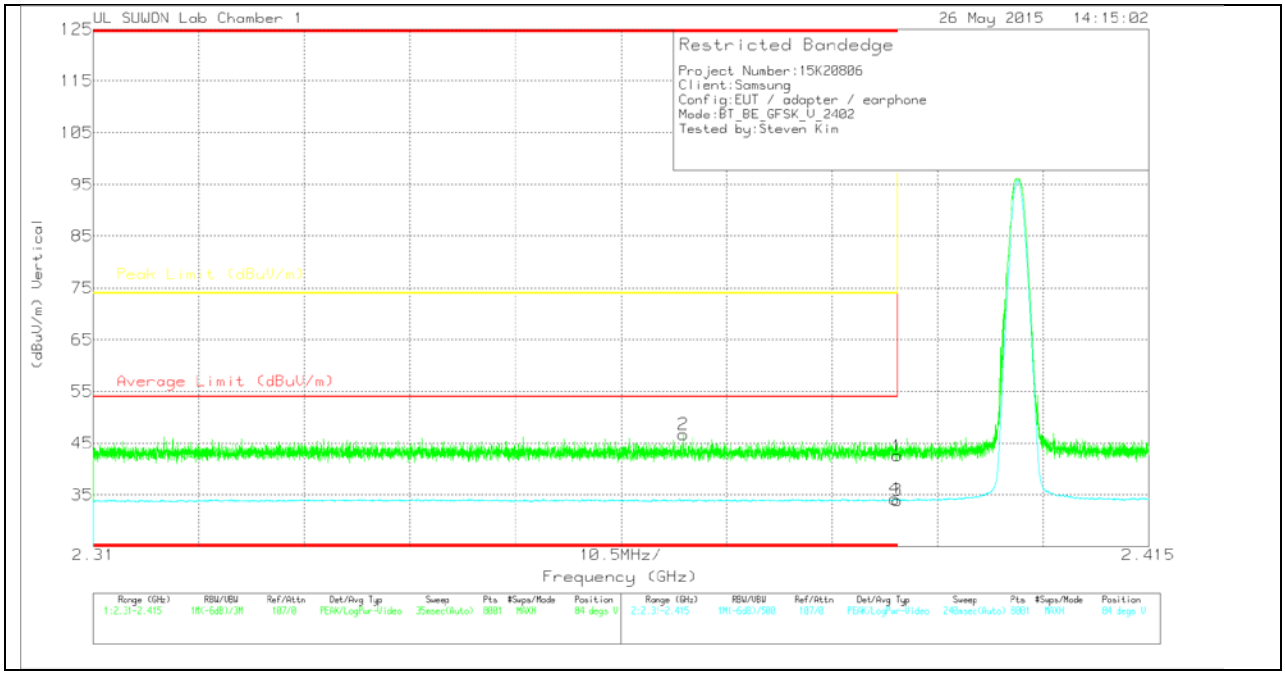
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	37.45	Pk	27.9	-22.8	42.55	-	-	74	-31.45	84	103	V
2	* 2.369	41.69	Pk	27.8	-22.8	46.69	-	-	74	-27.31	84	103	V
3	* 2.39	28.87	VB1T	27.9	-22.8	33.97	54	-20.03	-	-	84	103	V
4	* 2.39	29.15	VB1T	27.9	-22.8	34.25	54	-19.75	-	-	84	103	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted BandPk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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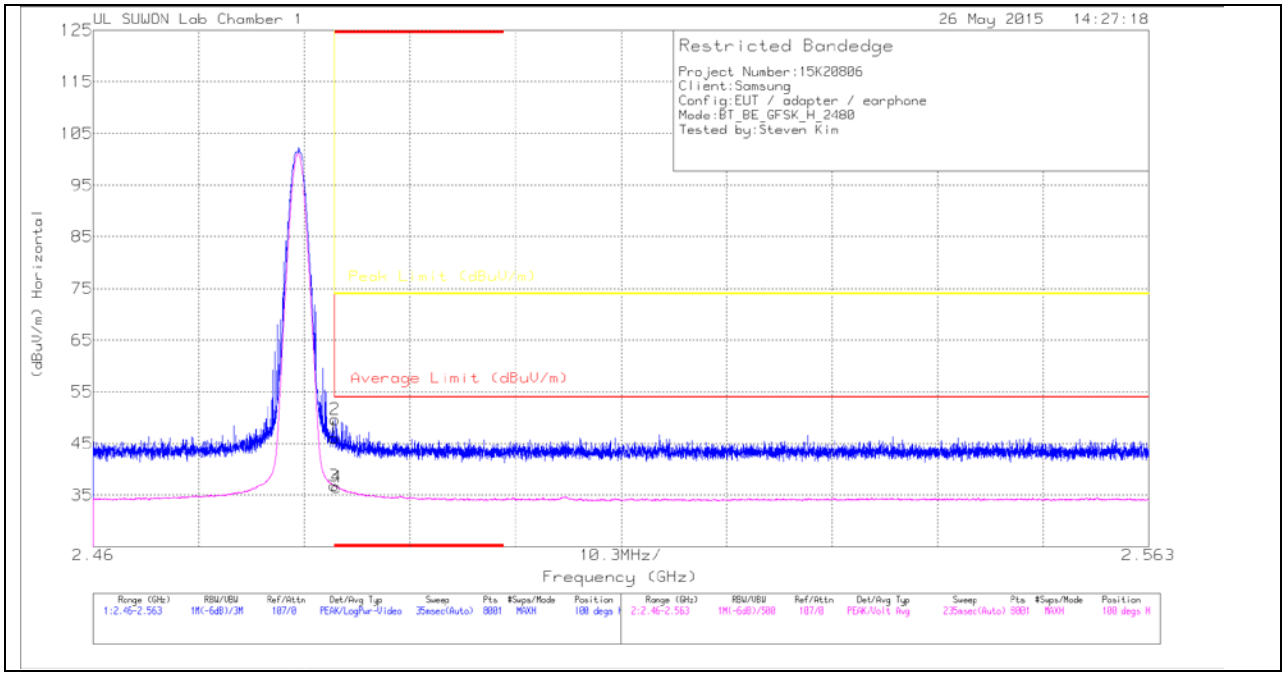
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	40.81	Pk	27.9	-22.6	46.11	-	-	74	-27.89	100	101	H
2	* 2.484	44.37	Pk	27.9	-22.6	49.67	-	-	74	-24.33	100	101	H
3	* 2.484	31.55	VB1T	27.9	-22.6	36.85	54	-17.15	-	-	100	101	H
4	* 2.484	31.24	VB1T	27.9	-22.6	36.54	54	-17.46	-	-	100	101	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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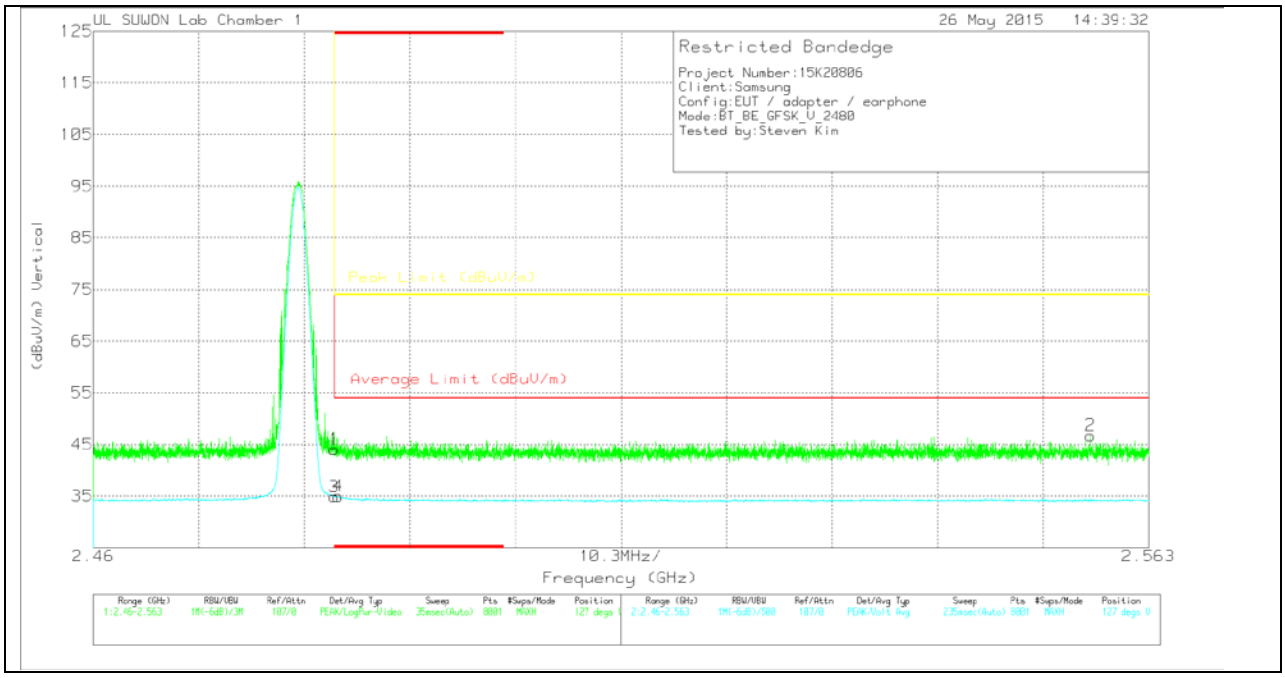
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	38.76	Pk	27.9	-22.6	44.06	-	-	74	-29.94	127	103	V
2	2.557	41.43	Pk	27.9	-22.6	46.73	-	-	74	-27.27	127	103	V
3	* 2.484	29.6	VB1T	27.9	-22.6	34.9	54	-19.1	-	-	127	103	V
4	* 2.484	29.67	VB1T	27.9	-22.6	34.97	54	-19.03	-	-	127	103	V

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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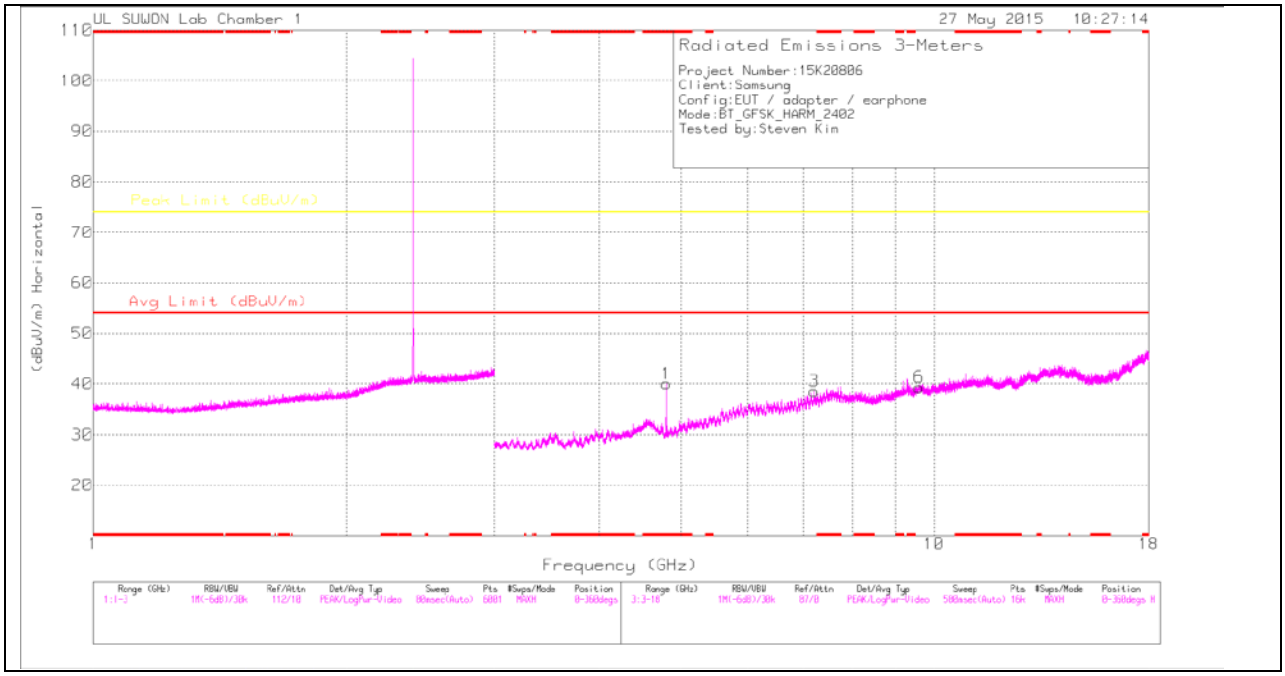
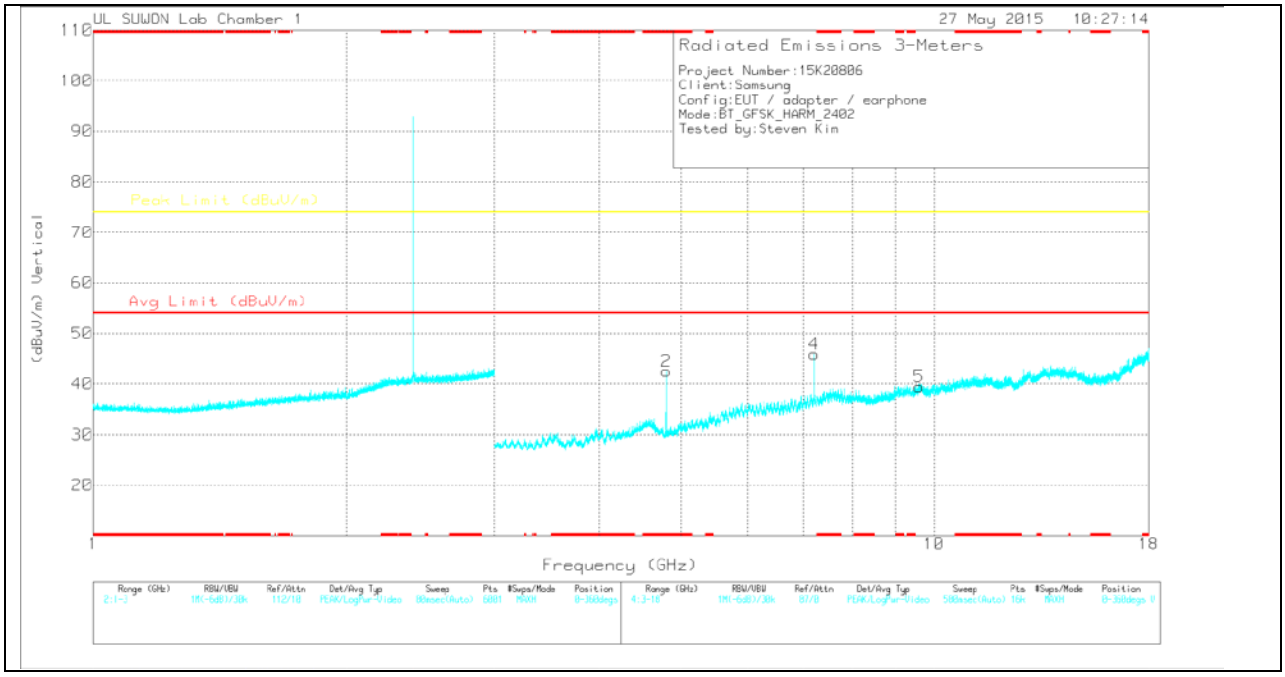
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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

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LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	37.94	PK	31.9	-29.8	40.04	-	-	74	-33.96	0-360	100	H
3	7.205	26.99	PK	37	-25.4	38.59	-	-	-	-	0-360	200	H
6	9.608	22.65	PK	37.7	-21	39.35	-	-	-	-	0-360	200	H
2	* 4.804	40.41	PK	31.9	-29.8	42.51	-	-	74	-31.49	0-360	100	V
4	7.205	34.27	PK	37	-25.4	45.87	-	-	-	-	0-360	100	V
5	9.608	22.75	PK	37.7	-21	39.45	-	-	-	-	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	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	45.36	PK2	31.9	-29.8	47.46	-	-	74	-26.54	150	108	H
* 4.804	37.35	MAv1	31.9	-29.8	39.45	54	-14.55	-	-	150	108	H
7.206	36.58	PK2	37	-25.4	48.18	-	-	-	-	335	180	H
7.206	24.71	MAv1	37	-25.4	36.31	-	-	-	-	335	180	H
9.606	33.84	PK2	37.7	-21	50.54	-	-	-	-	1	208	H
9.607	21.45	MAv1	37.7	-21	38.15	-	-	-	-	1	208	H
* 4.804	45.72	PK2	31.9	-29.8	47.82	-	-	74	-26.18	217	267	V
* 4.804	38.22	MAv1	31.9	-29.8	40.32	54	-13.68	-	-	217	267	V
7.206	42.61	PK2	37	-25.4	54.21	-	-	-	-	115	389	V
7.206	33.86	MAv1	37	-25.4	45.46	-	-	-	-	115	389	V
9.61	34.01	PK2	37.7	-21	50.71	-	-	-	-	1	100	V
9.609	20.82	MAv1	37.7	-21	37.52	-	-	-	-	1	100	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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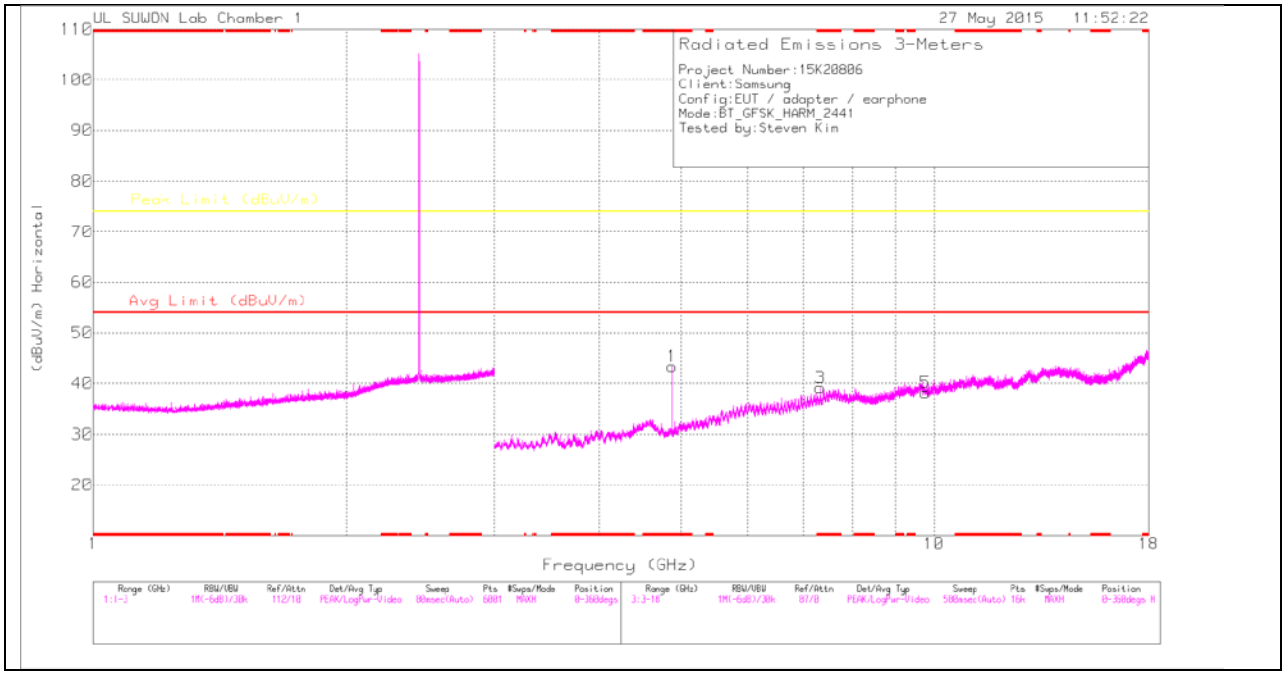
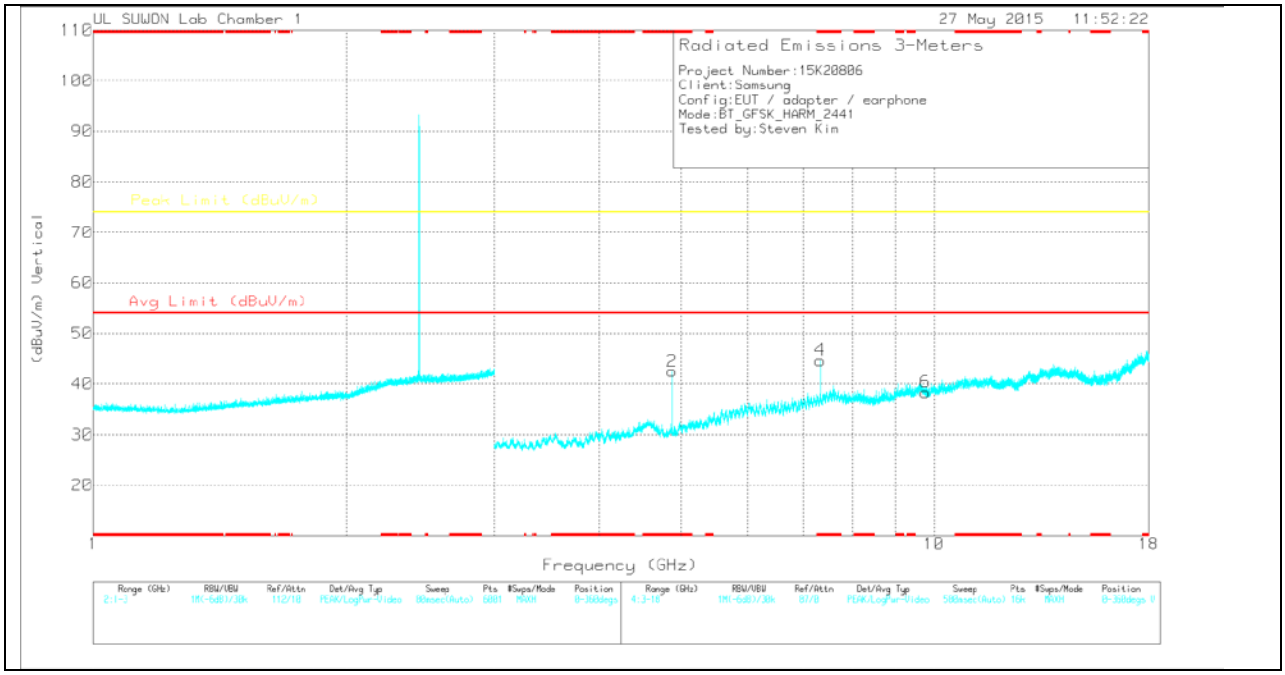
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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

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MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1	* 4.881	40.5	PK	32	-29.1	43.4	-	-	74	-30.6	0-360	100
4	3	* 7.323	27.56	PK	37.2	-25.6	39.16	-	-	74	-34.84	0-360	100
5	5	9.764	22.57	PK	37.6	-22	38.17	-	-	-	-	0-360	100
2	2	* 4.881	39.62	PK	32	-29.1	42.52	-	-	74	-31.48	0-360	200
3	4	* 7.323	33.09	PK	37.2	-25.6	44.69	-	-	74	-29.31	0-360	100
6	6	9.764	22.76	PK	37.6	-22	38.36	-	-	-	-	0-360	200

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

PK – Peak Detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	42.21	PK3	32	-29.1	45.11	-	-	74	-28.89	149	101	H
* 4.882	31.57	VB1T	32	-29.1	34.47	54	-19.53	-	-	149	101	H
* 7.323	34.09	PK3	37.2	-25.6	45.69	-	-	74	-28.31	0	221	H
* 7.323	23.31	VB1T	37.2	-25.6	34.91	54	-19.09	-	-	0	221	H
9.764	26.36	PK3	37.6	-22	41.96	-	-	-	-	132	100	H
9.765	18.73	VB1T	37.6	-22.1	34.23	-	-	-	-	132	100	H
* 4.882	46.44	PK3	32	-29.1	49.34	-	-	74	-24.66	257	351	V
* 4.882	32.43	VB1T	32	-29.1	35.33	54	-18.67	-	-	257	351	V
* 7.323	31.88	PK3	37.2	-25.6	43.48	-	-	74	-30.52	132	294	V
* 7.323	27.35	VB1T	37.2	-25.6	38.95	54	-15.05	-	-	132	294	V
9.762	27.99	PK3	37.6	-22	43.59	-	-	-	-	132	200	V
9.765	18.7	VB1T	37.6	-22.1	34.2	-	-	-	-	132	200	V

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

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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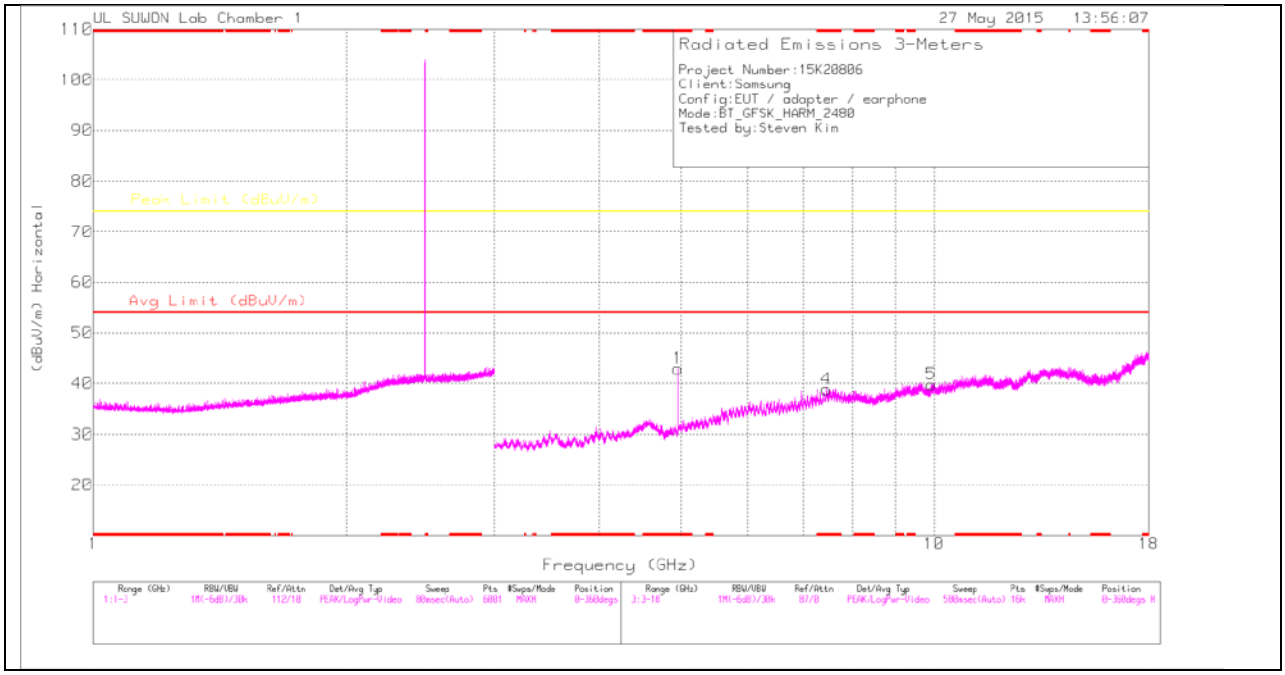
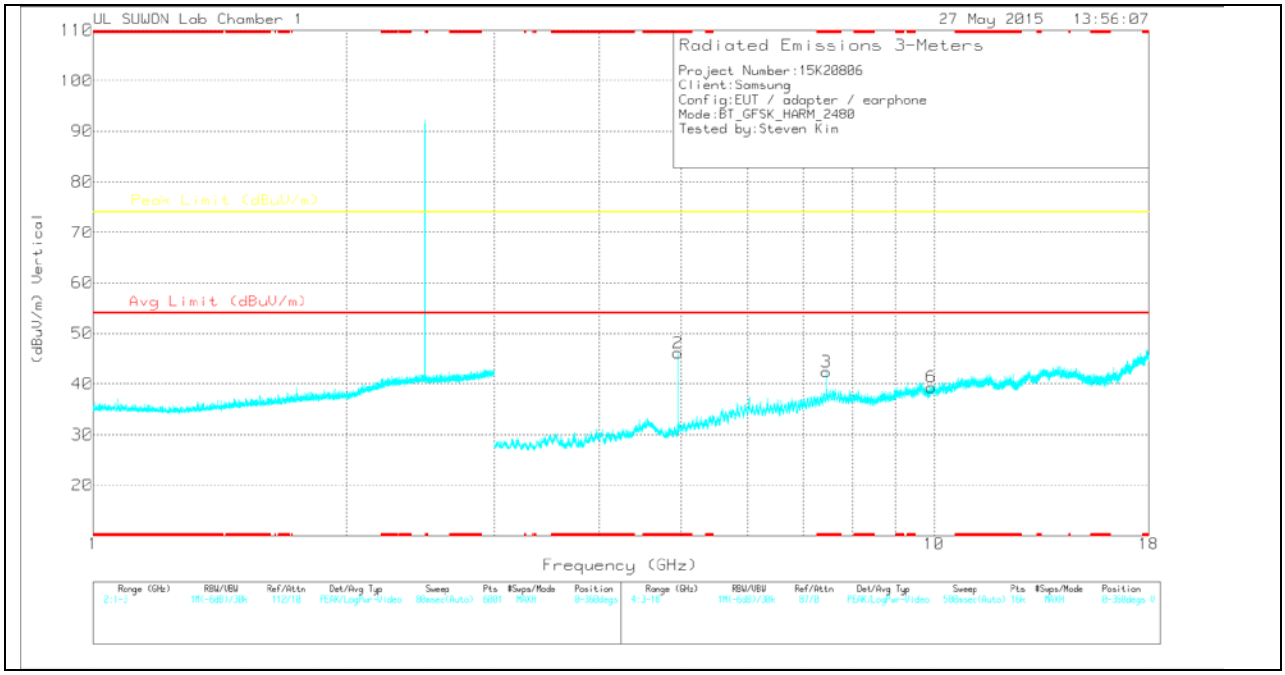
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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

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HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.959	39.78	PK	32.1	-28.9	42.98	-	-	74	-31.02	0-360	100	H
4	* 7.441	26.37	PK	37.3	-24.8	38.87	-	-	74	-35.13	0-360	200	H
5	9.919	22.36	PK	37.9	-20.4	39.86	-	-	-	-	0-360	200	H
2	* 4.959	42.92	PK	32.1	-28.9	46.12	-	-	74	-27.88	0-360	100	V
3	* 7.44	29.89	PK	37.3	-24.8	42.39	-	-	74	-31.61	0-360	100	V
6	9.92	21.86	PK	37.9	-20.4	39.36	-	-	-	-	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	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	44.02	PK3	32.1	-28.9	47.22	-	-	74	-26.78	152	102	H
* 4.96	31.02	VB1T	32.1	-28.9	34.22	54	-19.78	-	-	152	102	H
* 7.44	22.04	VB1T	37.3	-24.8	34.54	54	-19.46	-	-	130	175	H
* 7.44	36.53	PK3	37.3	-24.8	49.03	-	-	74	-24.97	130	175	H
9.92	33.17	PK3	37.9	-20.4	50.67	-	-	-	-	130	200	H
9.92	18.26	VB1T	37.9	-20.4	35.76	-	-	-	-	130	200	H
* 4.96	32.88	VB1T	32.1	-28.9	36.08	54	-17.92	-	-	95	101	V
* 4.96	46.85	PK3	32.1	-28.9	50.05	-	-	74	-23.95	95	101	V
* 7.44	37.88	PK3	37.3	-24.8	50.38	-	-	74	-23.62	210	290	V
* 7.44	24.26	VB1T	37.3	-24.8	36.76	54	-17.24	-	-	210	290	V
9.92	18.29	VB1T	37.9	-20.4	35.79	-	-	-	-	130	100	V
9.922	29.16	PK3	37.9	-20.4	46.66	-	-	-	-	130	100	V

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

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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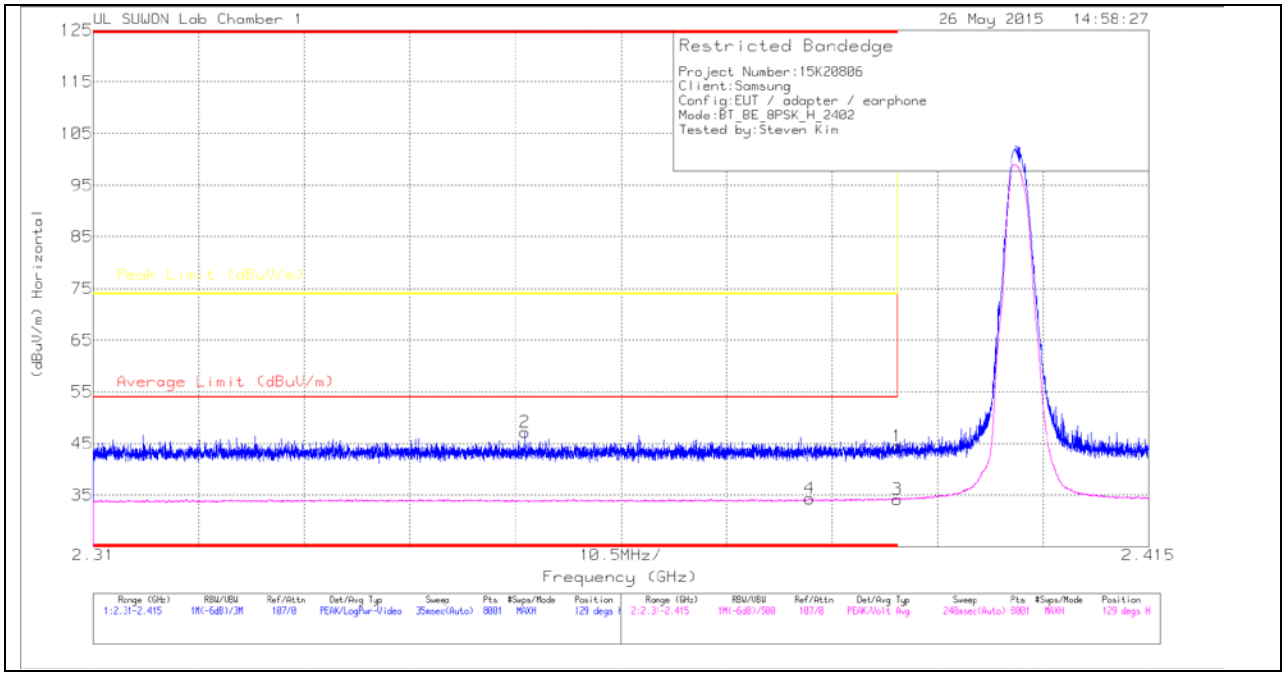
9.2.2. ENHANCED DATA RATE 8PSK MODULATION RESTRICTED BANDEDGE (LOW CHANNEL)



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	39.4	Pk	27.9	-22.8	44.5	-	-	74	-29.5	129	100	H
2	* 2.353	42.28	Pk	27.8	-22.9	47.18	-	-	74	-26.82	129	100	H
3	* 2.39	29.11	VB1T	27.9	-22.8	34.21	54	-19.79	-	-	129	100	H
4	* 2.381	29.28	VB1T	27.9	-22.8	34.38	54	-19.62	-	-	129	100	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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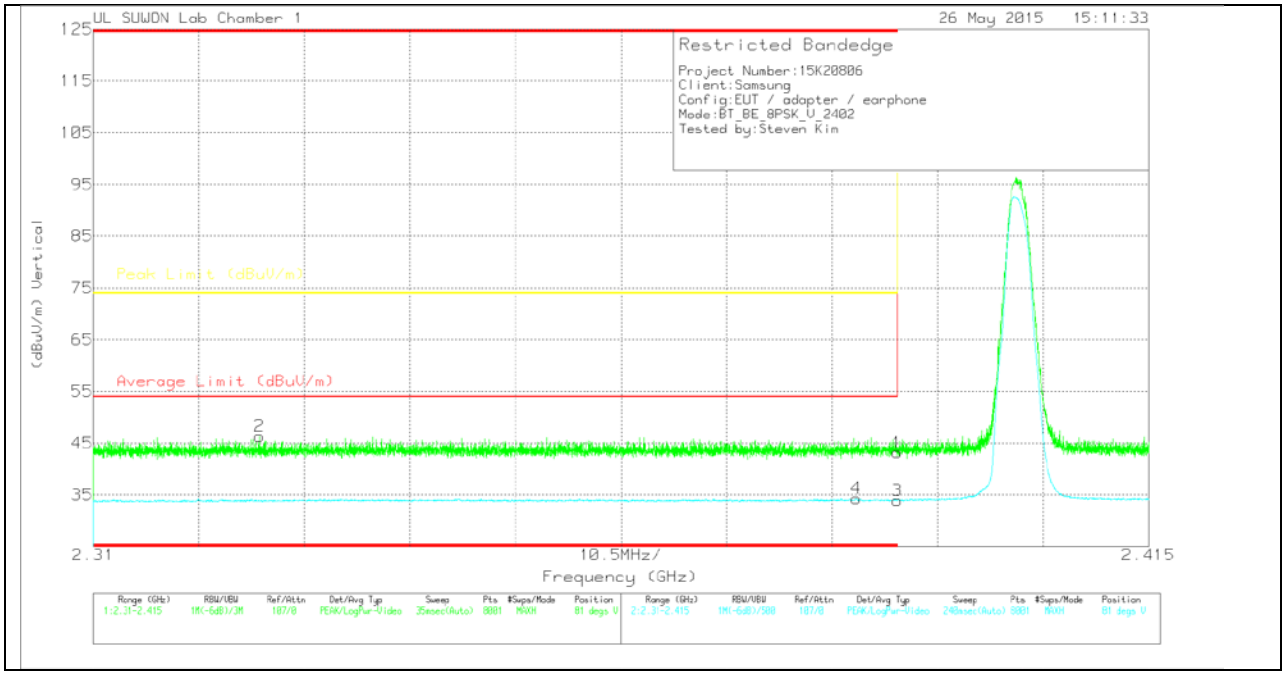
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	38.06	Pk	27.9	-22.8	43.16	-	-	74	-30.84	81	101	V
2	* 2.327	41.42	Pk	27.8	-22.9	46.32	-	-	74	-27.68	81	101	V
3	* 2.39	28.81	VB1T	27.9	-22.8	33.91	54	-20.09	-	-	81	101	V
4	* 2.386	29.22	VB1T	27.9	-22.8	34.32	54	-19.68	-	-	81	101	V

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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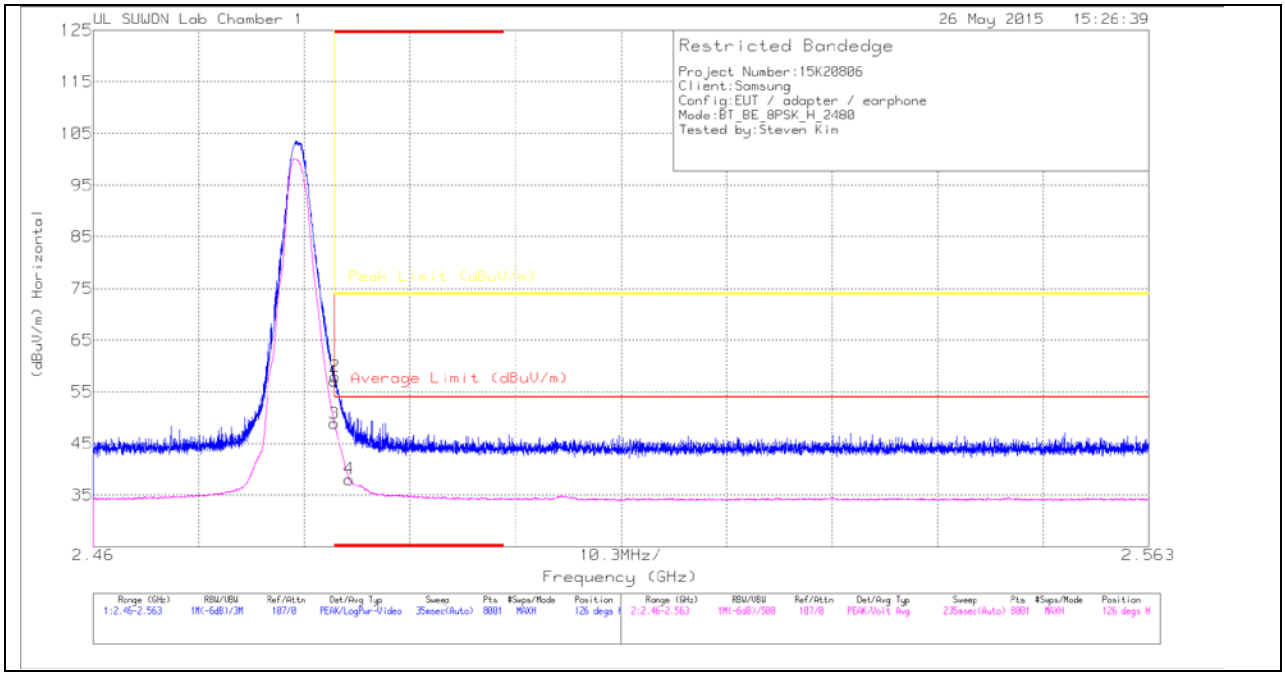
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	51.73	Pk	27.9	-22.6	57.03	-	-	74	-16.97	126	100	H
2	* 2.484	52.67	Pk	27.9	-22.6	57.97	-	-	74	-16.03	126	100	H
3	* 2.484	43.6	VB1T	27.9	-22.6	48.9	54	-5.1	-	-	126	100	H
4	* 2.485	32.82	VB1T	27.9	-22.6	38.12	54	-15.88	-	-	126	100	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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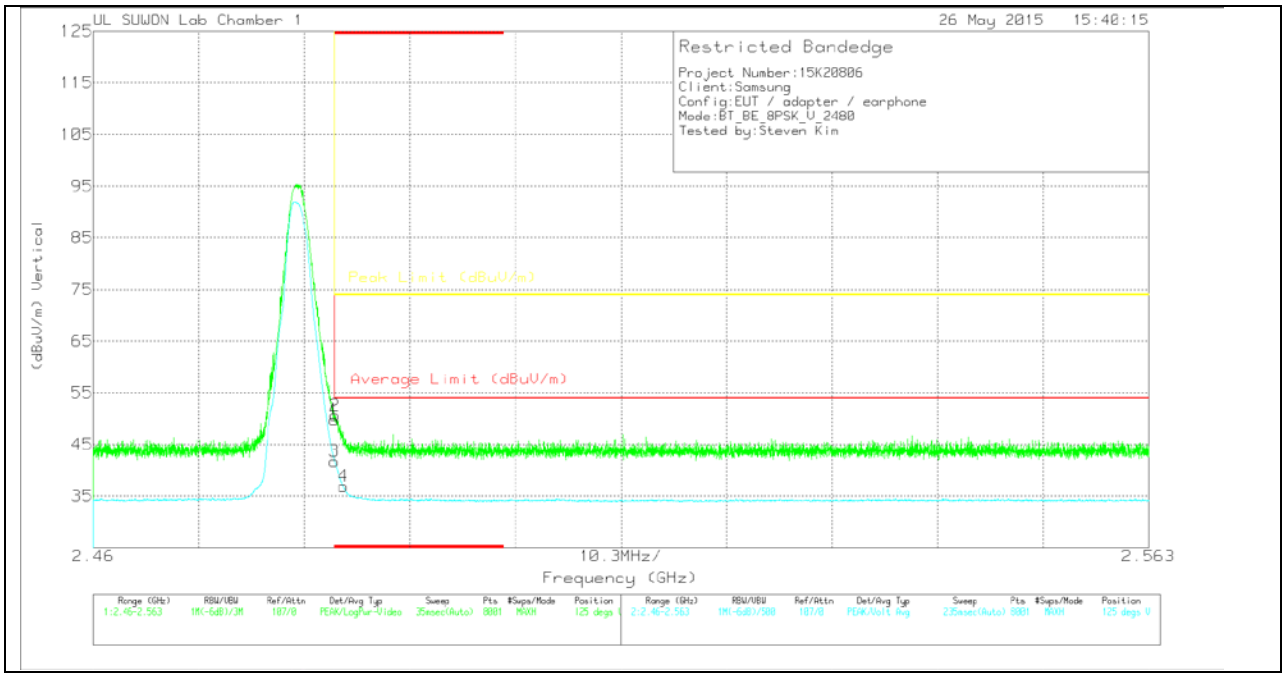
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_2_10 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	44.51	Pk	27.9	-22.6	49.81	-	-	74	-24.19	125	100	V
2	* 2.484	45.32	Pk	27.9	-22.6	50.62	-	-	74	-23.38	125	100	V
3	* 2.484	36.47	VB1T	27.9	-22.6	41.77	54	-12.23	-	-	125	100	V
4	* 2.484	31.63	VB1T	27.9	-22.6	36.93	54	-17.07	-	-	125	100	V

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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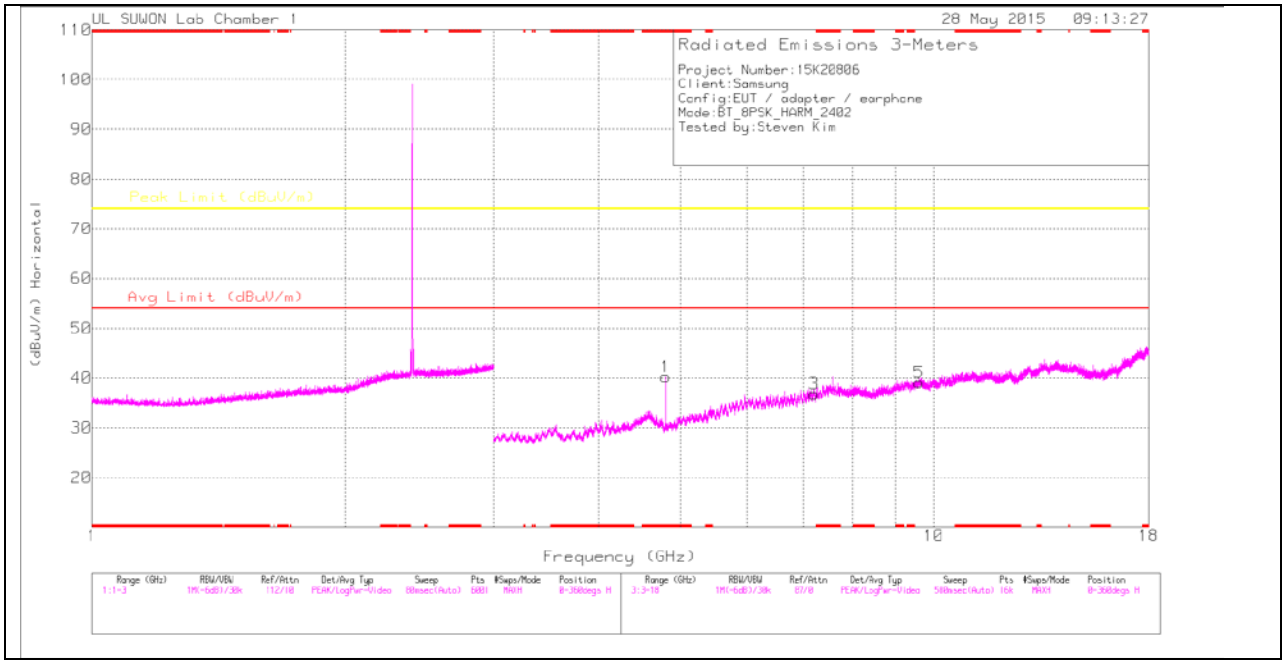
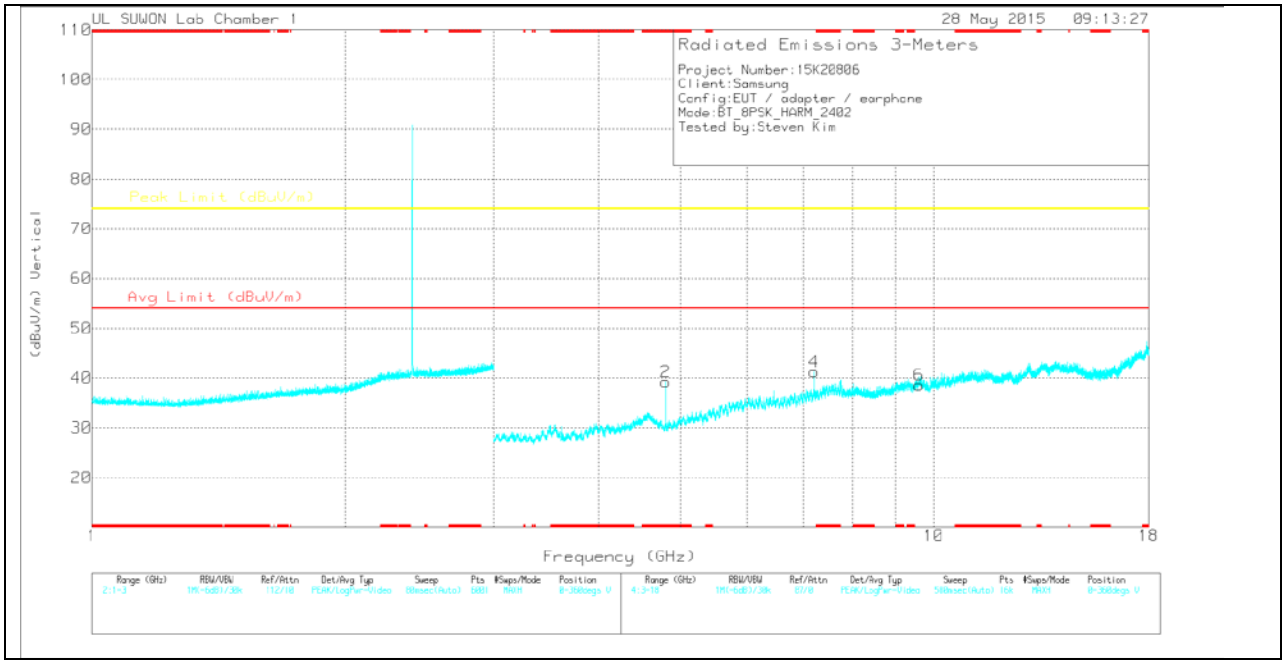
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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

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LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	38.19	PK	31.9	-29.8	40.29	-	-	74	-33.71	0-360	100	H
4	7.205	25.27	PK	37	-25.4	36.87	-	-	-	-	0-360	200	H
5	9.609	22.39	PK	37.7	-21	39.09	-	-	-	-	0-360	100	H
2	* 4.804	37.17	PK	31.9	-29.8	39.27	-	-	74	-34.73	0-360	100	V
3	7.205	29.7	PK	37	-25.4	41.3	-	-	-	-	0-360	100	V
6	9.609	21.89	PK	37.7	-21	38.59	-	-	-	-	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	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.803	41.49	PK3	31.9	-29.8	43.59	-	-	74	-30.41	148	314	H
* 4.804	30.21	VB1T	31.9	-29.8	32.31	54	-21.69	-	-	148	314	H
7.204	32.78	PK3	36.9	-25.4	44.28	-	-	-	-	122	144	H
7.206	22.11	VB1T	37	-25.4	33.71	-	-	-	-	122	144	H
9.611	27.03	PK3	37.7	-21	43.73	-	-	-	-	329	102	H
9.609	18.75	VB1T	37.7	-21	35.45	-	-	-	-	329	102	H
* 4.803	32.94	PK3	31.9	-29.8	35.04	-	-	74	-38.96	238	345	V
* 4.804	29.91	VB1T	31.9	-29.8	32.01	54	-21.99	-	-	238	345	V
7.207	31.61	PK3	37	-25.4	43.21	-	-	-	-	267	385	V
7.205	22.8	VB1T	37	-25.4	34.4	-	-	-	-	267	385	V
9.61	28.46	PK3	37.7	-21	45.16	-	-	-	-	48	149	V
9.609	18.89	VB1T	37.7	-21	35.59	-	-	-	-	48	149	V

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

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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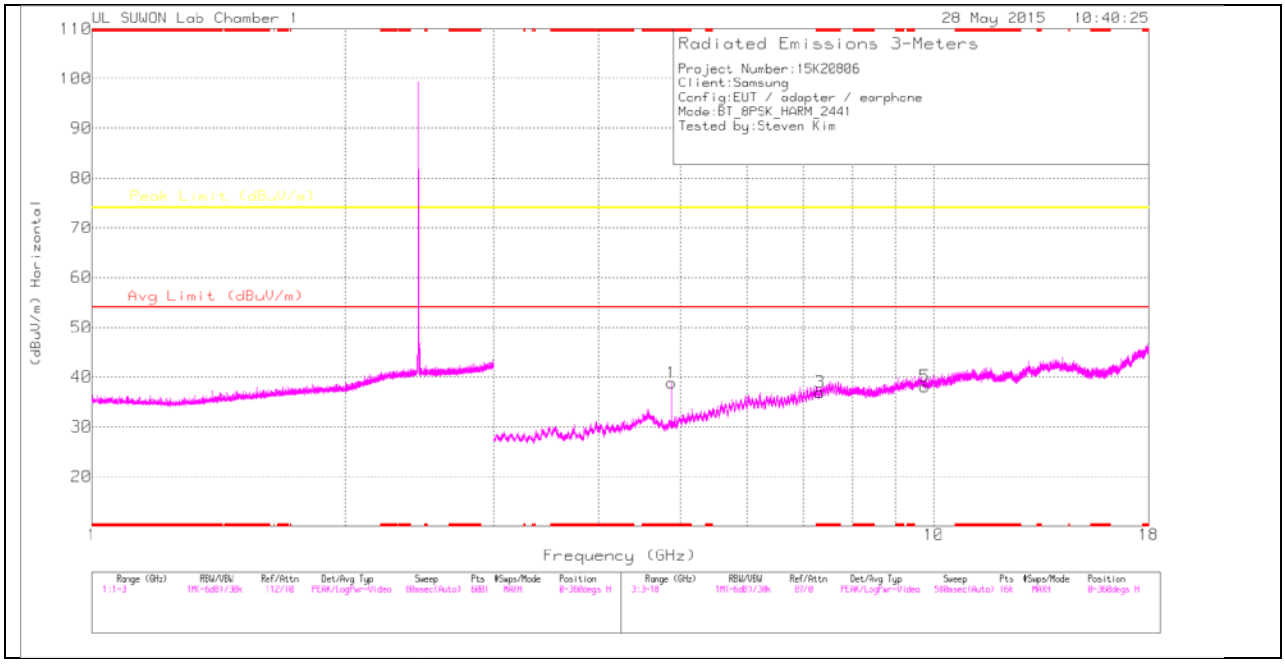
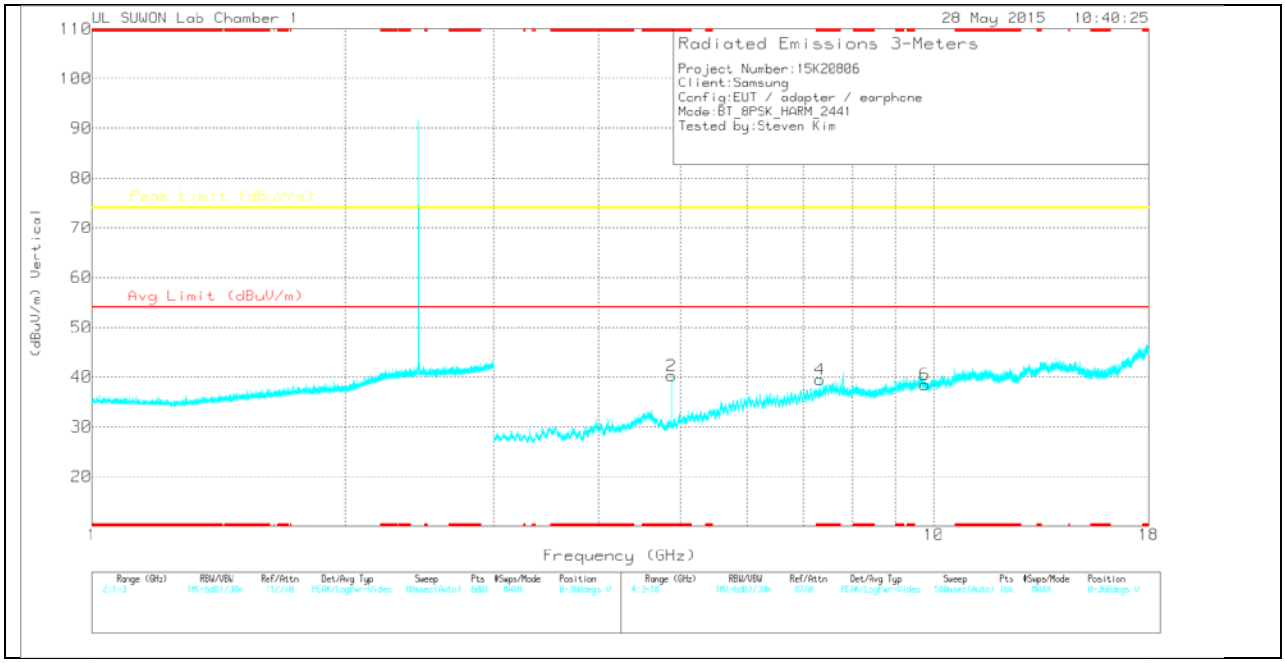
MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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

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MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881	35.93	PK	32	-29.1	38.83	-	-	74	-35.17	0-360	100	H
4	* 7.323	25.33	PK	37.2	-25.6	36.93	-	-	74	-37.07	0-360	100	H
5	9.765	22.49	PK	37.6	-22	38.09	-	-	-	-	0-360	100	H
2	* 4.881	37.33	PK	32	-29.1	40.23	-	-	74	-33.77	0-360	100	V
3	* 7.323	27.93	PK	37.2	-25.6	39.53	-	-	74	-34.47	0-360	100	V
6	9.765	22.92	PK	37.6	-22	38.52	-	-	-	-	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	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.881	31.12	PK3	32	-29.1	34.02	-	-	74	-39.98	161	102	H
* 4.882	29.1	VB1T	32	-29.1	32	54	-22	-	-	161	102	H
* 7.323	32.24	PK3	37.2	-25.6	43.84	-	-	74	-30.16	347	136	H
* 7.322	22.24	VB1T	37.2	-25.6	33.84	54	-20.16	-	-	347	136	H
9.763	28.33	PK3	37.6	-22	43.93	-	-	-	-	110	202	H
9.765	18.71	VB1T	37.6	-22	34.31	-	-	-	-	110	202	H
* 4.882	33.91	PK3	32	-29.1	36.81	-	-	74	-37.19	233	101	V
* 4.882	30.05	VB1T	32	-29.1	32.95	54	-21.05	-	-	233	101	V
* 7.323	31.46	PK3	37.2	-25.6	43.06	-	-	74	-30.94	114	351	V
* 7.322	25.62	VB1T	37.2	-25.6	37.22	54	-16.78	-	-	114	351	V
9.766	25.62	PK3	37.6	-22.1	41.12	-	-	-	-	110	100	V
9.765	18.7	VB1T	37.6	-22.1	34.2	-	-	-	-	110	100	V

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

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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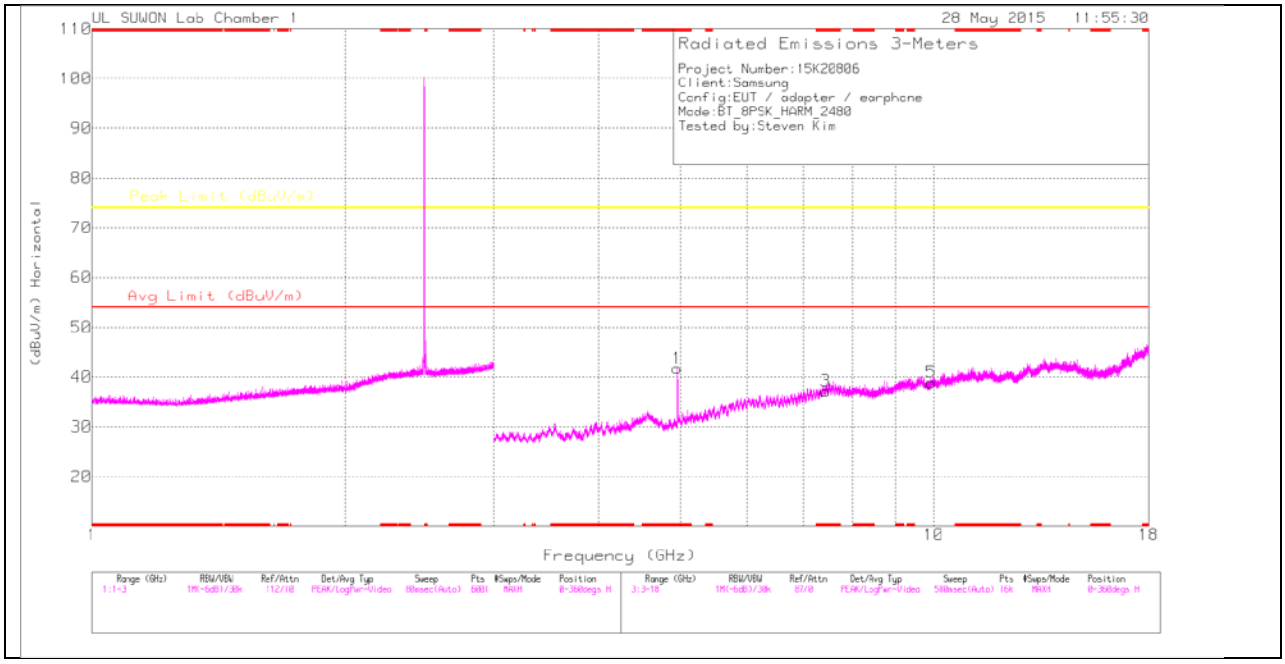
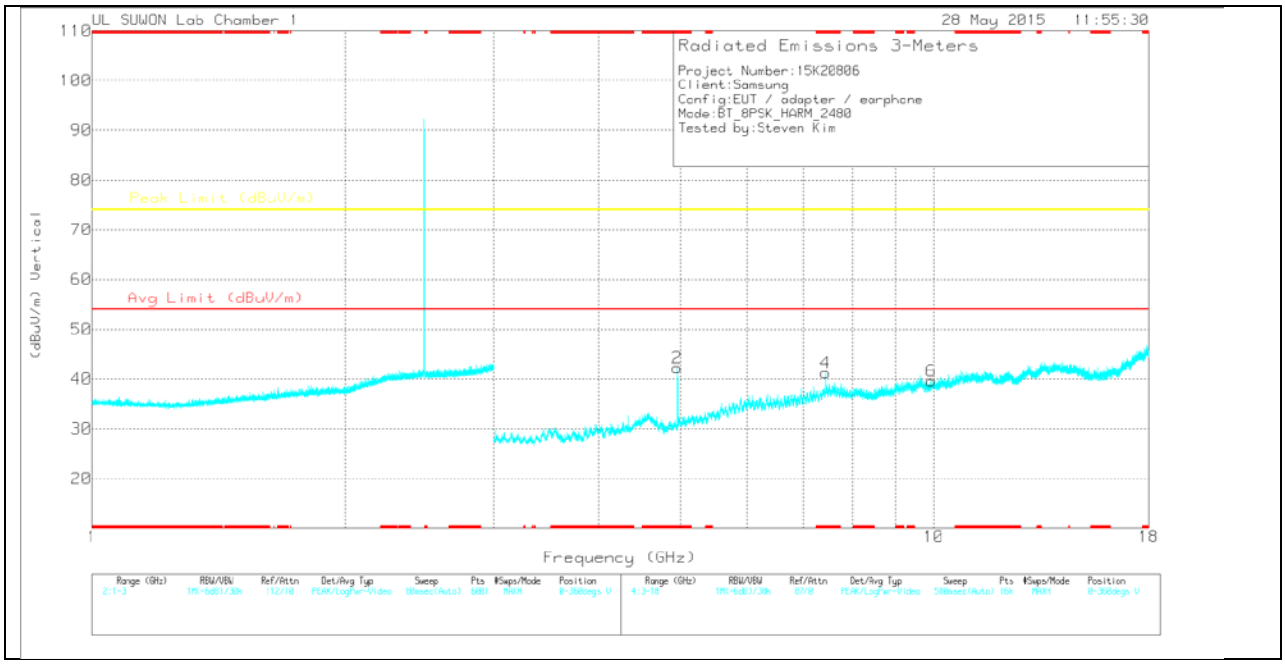
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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

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HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.959	38.57	PK	32.1	-28.9	41.77	-	-	74	-32.23	0-360	100	H
4	* 7.44	24.66	PK	37.3	-24.8	37.16	-	-	74	-36.84	0-360	200	H
5	9.92	21.41	PK	37.9	-20.4	38.91	-	-	-	-	0-360	100	H
2	* 4.959	39.01	PK	32.1	-28.9	42.21	-	-	74	-31.79	0-360	100	V
3	* 7.439	28.76	PK	37.3	-24.8	41.26	-	-	74	-32.74	0-360	100	V
6	9.92	22.09	PK	37.9	-20.4	39.59	-	-	-	-	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	3115D Factor	Path_3_3G HP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	30.87	PK3	32.1	-28.9	34.07	-	-	74	-39.93	66	100	H
* 4.96	30.45	VB1T	32.1	-28.9	33.65	54	-20.35	-	-	66	100	H
* 7.441	30.49	PK3	37.3	-24.8	42.99	-	-	74	-31.01	279	200	H
* 7.442	21.34	VB1T	37.3	-24.8	33.84	54	-20.16	-	-	279	200	H
9.922	29.13	PK3	37.9	-20.4	46.63	-	-	-	-	109	100	H
9.92	18.26	VB1T	37.9	-20.4	35.76	-	-	-	-	109	100	H
* 4.959	42.67	PK3	32.1	-28.9	45.87	-	-	74	-28.13	84	353	V
* 4.96	30.64	VB1T	32.1	-28.9	33.84	54	-20.16	-	-	84	353	V
* 7.439	29.98	PK3	37.3	-24.8	42.48	-	-	74	-31.52	352	104	V
* 7.439	24.03	VB1T	37.3	-24.8	36.53	54	-17.47	-	-	352	104	V
9.922	25.84	PK3	37.9	-20.4	43.34	-	-	-	-	109	100	V
9.92	18.25	VB1T	37.9	-20.4	35.75	-	-	-	-	109	100	V

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

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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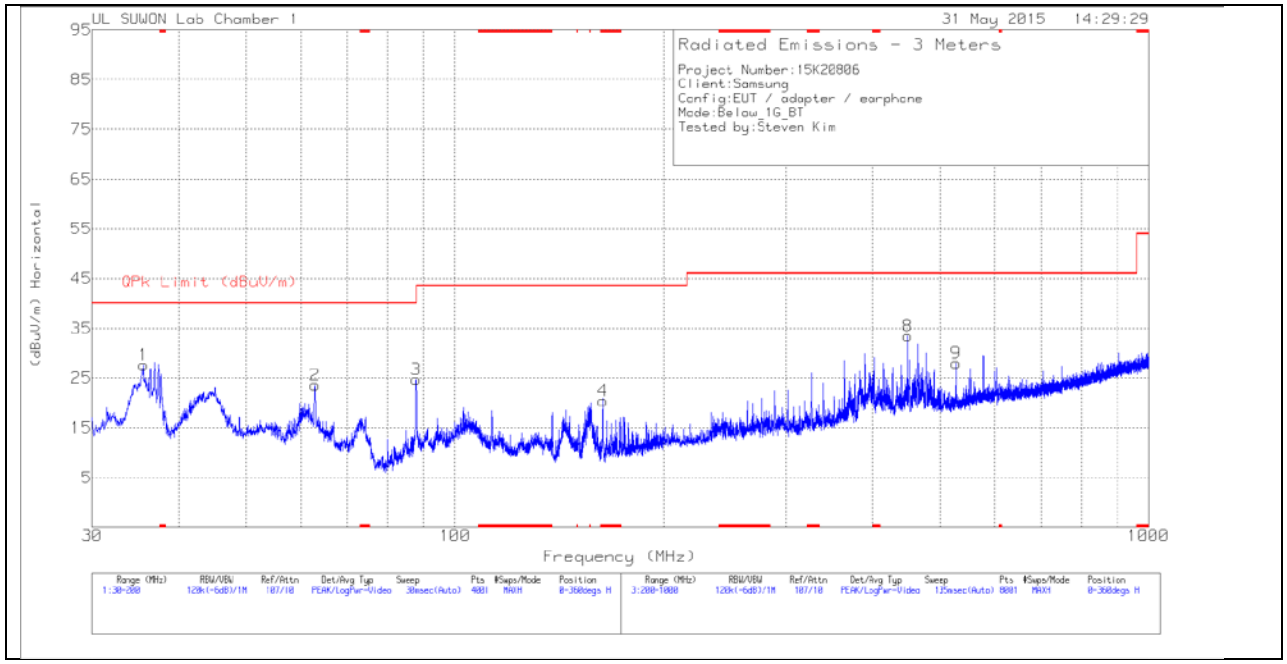
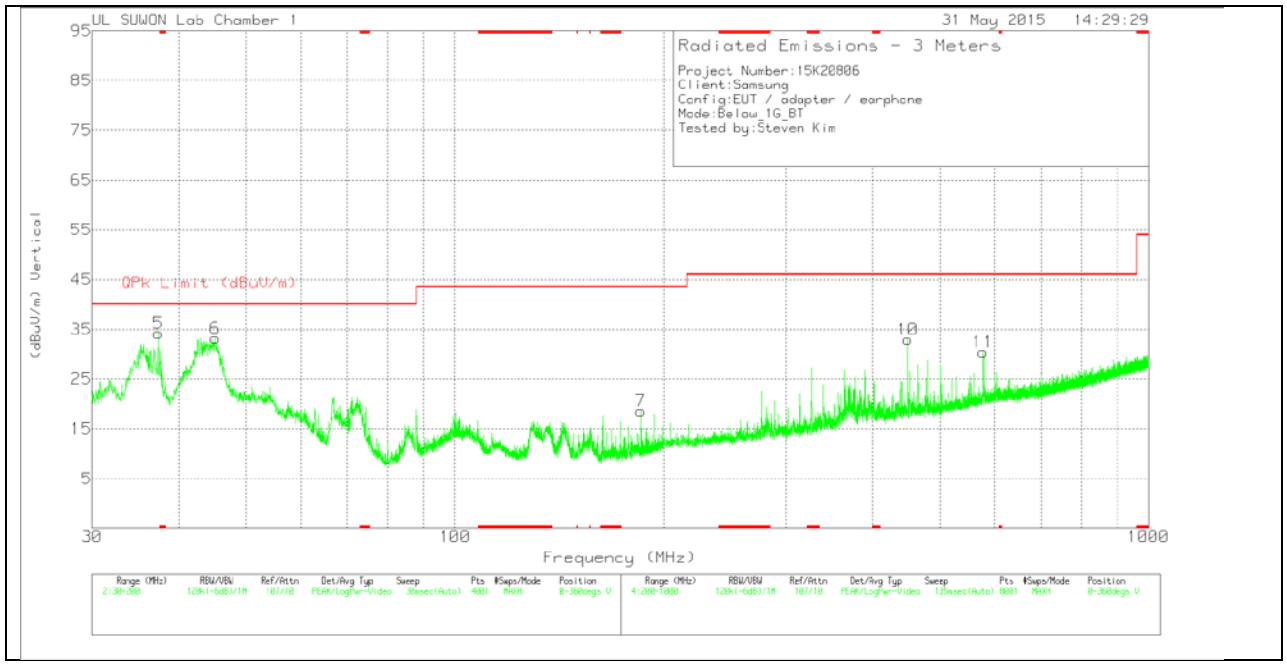
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



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BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)
1	35.5675	47.38	Pk	10.7	-30.4	0	27.68	40	-12.32	0-360	200
2	62.8525	41.64	Pk	11.8	-29.9	0	23.54	40	-16.46	0-360	400
3	87.97	45.18	Pk	9	-29.5	0	24.68	40	-15.32	0-360	400
4	* 163.365	40.29	Pk	8.6	-28.5	0	20.39	43.52	-23.13	0-360	200
5	37.3525	53.26	Pk	11.4	-30.4	0	34.26	40	-5.74	0-360	100
6	45.1725	49.82	Pk	13.6	-30.2	0	33.22	40	-6.78	0-360	100
7	185.465	37	Pk	9.9	-28.3	0	18.6	43.52	-24.92	0-360	100
8	450	43.61	Pk	16.3	-26.4	0	33.51	46.02	-12.51	0-360	300
9	527.6	36.52	Pk	17.6	-26.1	0	28.02	46.02	-18	0-360	200
10	450	43.04	Pk	16.3	-26.4	0	32.94	46.02	-13.08	0-360	100
11	577.9	37.65	Pk	18.7	-25.9	0	30.45	46.02	-15.57	0-360	100

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

Pk - Peak detector

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

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

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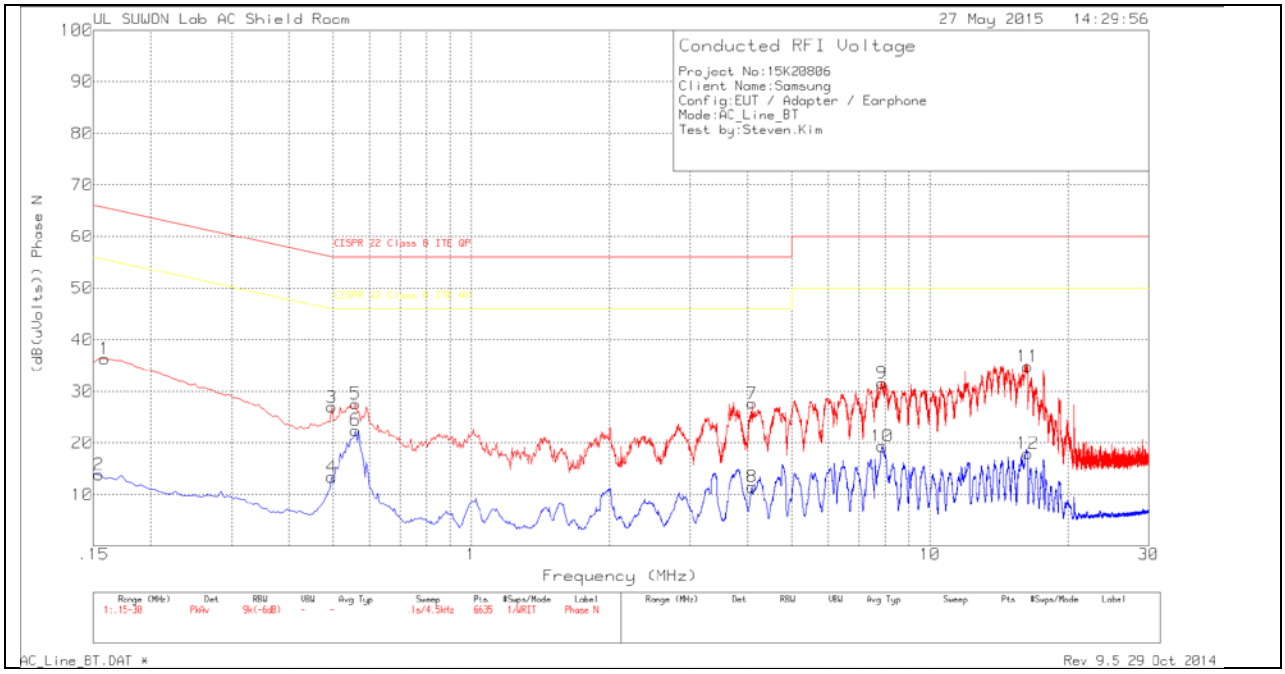
6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN HPF ON and Extension cord	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.159	26.32	Pk	10	0	36.32	65.52	-29.2	-	-
2	.1545	3.94	Av	9.9	0	13.84	-	-	55.75	-41.91
3	.4965	16.83	Pk	10.1	0	26.93	56.06	-29.13	-	-
4	.4965	3.29	Av	10.1	0	13.39	-	-	46.06	-32.67
5	.5595	17.49	Pk	10.1	0	27.59	56	-28.41	-	-
6	.5595	12.39	Av	10.1	0	22.49	-	-	46	-23.51
7	4.0965	17.76	Pk	9.8	.1	27.66	56	-28.34	-	-
8	4.092	1.55	Av	9.8	.1	11.45	-	-	46	-34.55
9	7.863	21.62	Pk	9.9	.1	31.62	60	-28.38	-	-
10	7.881	9.36	Av	9.9	.1	19.36	-	-	50	-30.64
11	16.3545	24.2	Pk	10.4	.2	34.8	60	-25.2	-	-
12	16.35	7.36	Av	10.4	.2	17.96	-	-	50	-32.04

Pk - Peak detector

Av - Average detection

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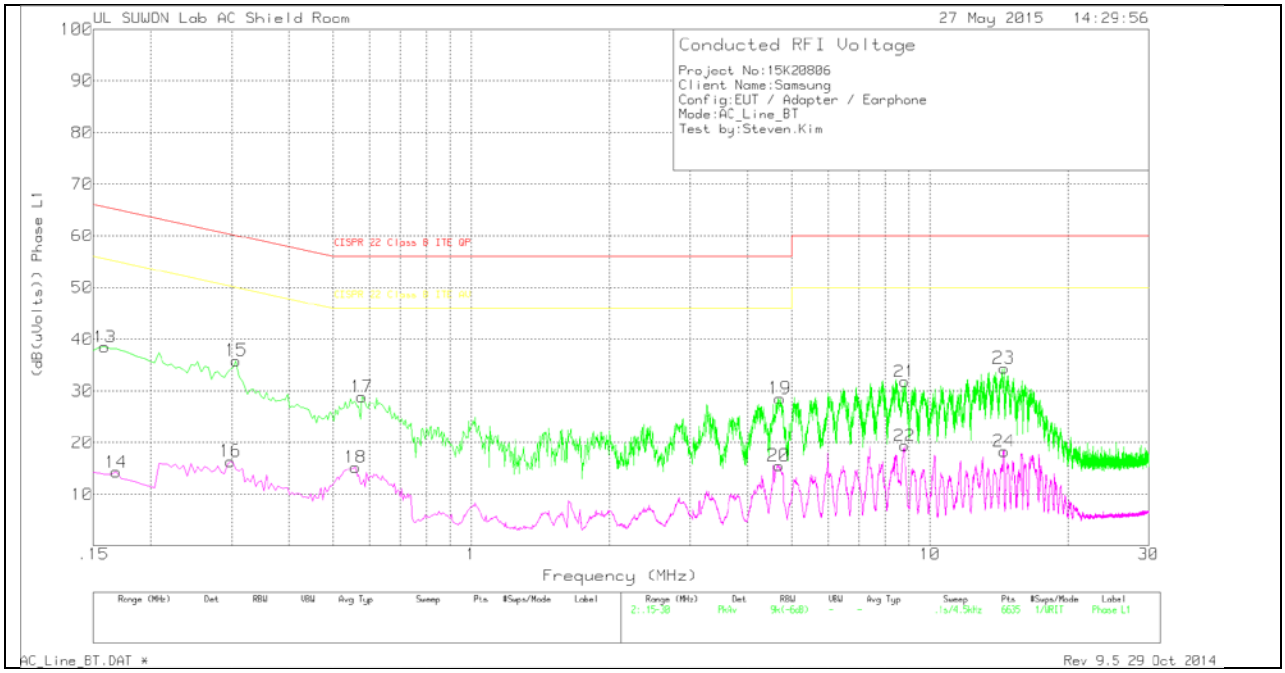
LINE 2 PLOT



LINE 2 RESULTS

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with extension cord_L1	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.159	28.51	Pk	10	0	38.51	65.52	-27.01	-	-
14	.168	4.08	Av	10.2	0	14.28	-	-	55.06	-40.78
15	.3075	25.98	Pk	9.9	0	35.88	60.04	-24.16	-	-
16	.2985	6.5	Av	9.9	0	16.4	-	-	50.28	-33.88
17	.5775	18.8	Pk	10.1	0	28.9	56	-27.1	-	-
18	.5595	5.11	Av	10.1	0	15.21	-	-	46	-30.79
19	4.713	18.66	Pk	9.8	.1	28.56	56	-27.44	-	-
20	4.686	5.63	Av	9.8	.1	15.53	-	-	46	-30.47
21	8.826	21.8	Pk	9.9	.1	31.8	60	-28.2	-	-
22	8.8215	9.38	Av	9.9	.1	19.38	-	-	50	-30.62
23	14.5005	24.11	Pk	10.1	.2	34.41	60	-25.59	-	-
24	14.514	8.03	Av	10.1	.2	18.33	-	-	50	-31.67

Pk - Peak detector

Av - Average detection

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