FCC CFR47 PART 15 SUBPART C

Bluetooth

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-G6000

FCC ID: A3LSMG6000

REPORT NUMBER: 15K21563-E3

ISSUE DATE: SEP 21, 2015

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by

UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	09/09/15	Initial issue	SungGil Park
A	09/21/15	Revised test result of section 9	SungGil Park

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 5

2. TEST METHODOLOGY 6

3. FACILITIES AND ACCREDITATION 6

4. CALIBRATION AND UNCERTAINTY 6

4.1. MEASURING INSTRUMENT CALIBRATION 6

4.2. SAMPLE CALCULATION 6

4.3. MEASUREMENT UNCERTAINTY 6

5. EQUIPMENT UNDER TEST 7

5.1. DESCRIPTION OF EUT 7

5.2. MAXIMUM OUTPUT POWER 7

5.3. DESCRIPTION OF AVAILABLE ANTENNAS 7

5.4. WORST-CASE CONFIGURATION AND MODE 7

5.5. DESCRIPTION OF TEST SETUP 8

6. TEST AND MEASUREMENT EQUIPMENT 10

7. SUMMARY TABLE 11

8. ANTENNA PORT TEST RESULTS 12

8.1. 20 dB AND 99% BANDWIDTH 12

8.1.1. BASIC DATA RATE GFSK MODULATION 12

8.1.2. ENHANCED DATA RATE Pi/4-DQPSK MODULATION 12

8.1.3. ENHANCED DATA RATE 8PSK MODULATION 12

8.1.4. 20 dB AND 99% BANDWIDTH PLOTS 13

8.2. HOPPING FREQUENCY SEPARATION 16

8.3. NUMBER OF HOPPING CHANNELS 18

8.4. AVERAGE TIME OF OCCUPANCY 21

8.5. OUTPUT POWER 25

8.5.1. BASIC DATA RATE GFSK MODULATION 25

8.5.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION 25

8.5.3. ENHANCED DATA RATE 8PSK MODULATION 25

8.5.4. OUTPUT POWER PLOTS 26

8.6. AVERAGE POWER 29

8.6.1. BASIC DATA RATE GFSK MODULATION 29

8.6.2. DATA RATE PI/4-DQPSK MODULATION 29

8.6.3. ENHANCED DATA RATE 8PSK MODULATION 29

8.7. CONDUCTED SPURIOUS EMISSIONS 30

8.7.1. BASIC DATA RATE GFSK MODULATION 31

9. RADIATED TEST RESULTS 37

9.1. LIMITS AND PROCEDURE 37

9.2. TRANSMITTER ABOVE 1 GHz 38

9.2.1. BASIC DATA RATE GFSK MODULATION 38

9.2.2. ENHANCED DATA RATE 8PSK MODULATION 48

9.3. WORST-CASE BELOW 1 GHz 58

10. AC POWER LINE CONDUCTED EMISSIONS 60

11. SETUP PHOTOS 63

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone + Bluetooth/BLE and DTS b/g/n
MODEL NUMBER:	SM-G6000
SERIAL NUMBER:	R28G8296GMW (RADIATED); R28G8296F5T (CONDUCTED)
DATE TESTED:	AUG 20, 2015 - SEP 09, 2015

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

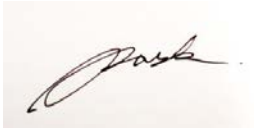
UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into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

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

Approved & Released For
UL Korea, Ltd. By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

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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:

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%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

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

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

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range [MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2402 - 2480	Basic GFSK	Average	9.31	8.53
		Peak	9.51	8.94
	Enhanced Pi/4-DPSK	Average	7.05	5.07
		Peak	9.47	8.85
	Enhanced 8PSK	Average	7.07	5.09
		Peak	10.07	10.17

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 -2.41 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.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	ETA0U83CBC	DW2G201BS/A-E	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
Earphone	SAMSUNG	GH59-11129M	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
1	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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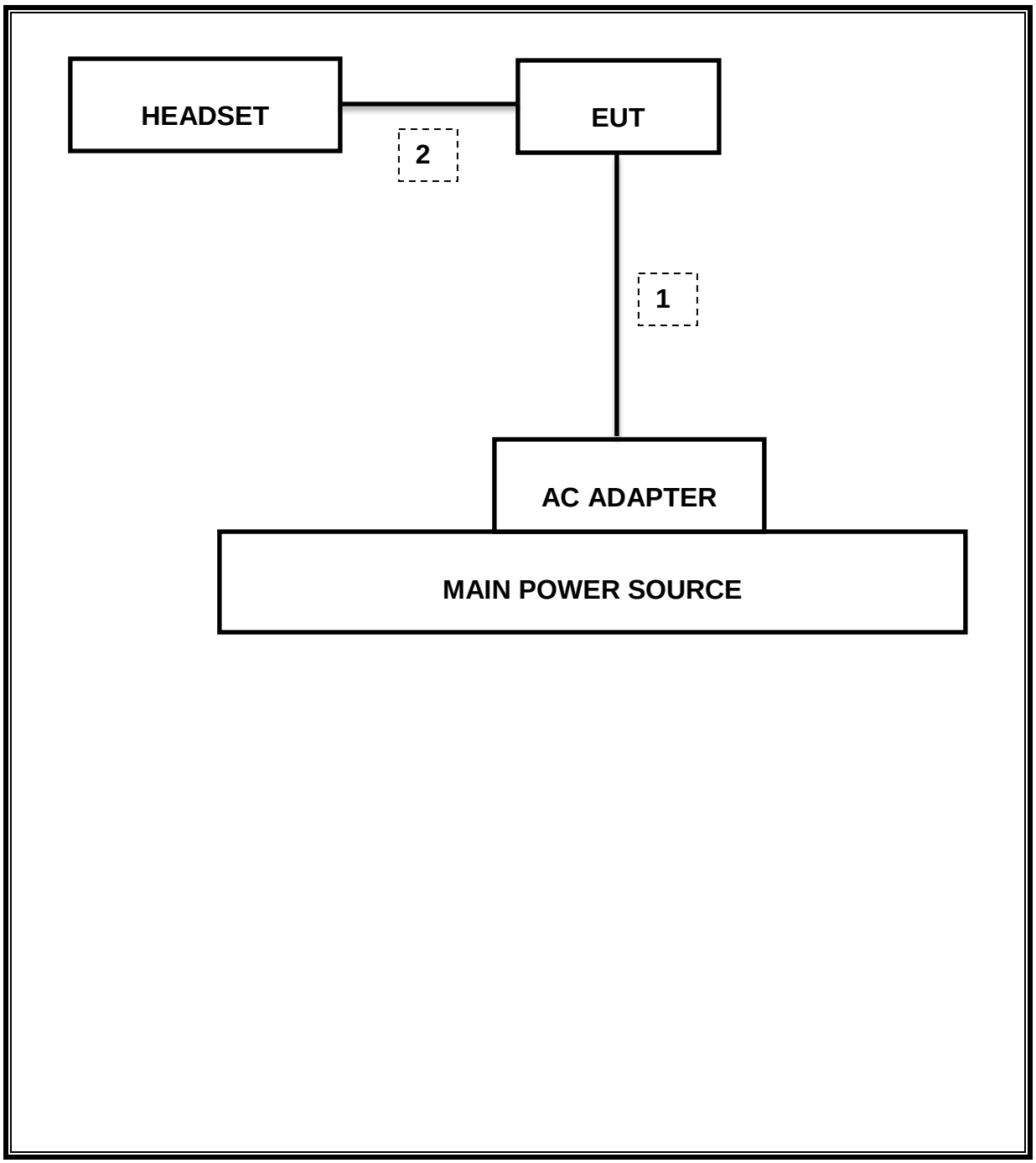
SETUP DIAGRAM FOR TESTS



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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	750	11-17-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-16
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16
Combiner	WEINSCHEL	1575	2153	08-20-16

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	1.193 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-31.311 dBm
15.247 (b)(1)	TX conducted output power	<21dBm		Pass	10.073 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	0.346 sec
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	40.27 dBuV (QP)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	51.78 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	1.001	0.902
Mid	2441	0.904	0.908
High	2480	0.946	0.896
Worst		1.001	0.908

8.1.2. ENHANCED DATA RATE Pi/4-DQPSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.227	1.162
Mid	2441	1.228	1.193
High	2480	1.228	1.166
Worst		1.228	1.193

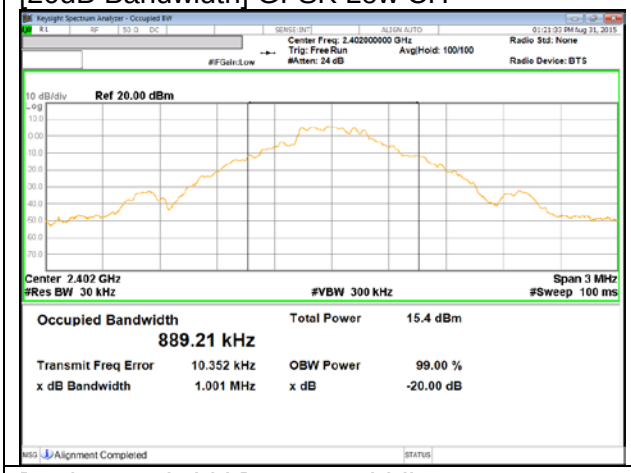
8.1.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.261	1.166
Mid	2441	1.266	1.164
High	2480	1.262	1.165
Worst		1.266	1.166

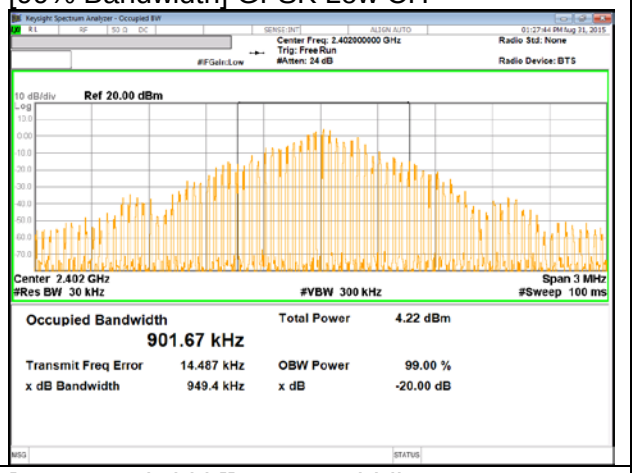
8.1.4. 20 dB AND 99% BANDWIDTH PLOTS

GFSK BANDWIDTH

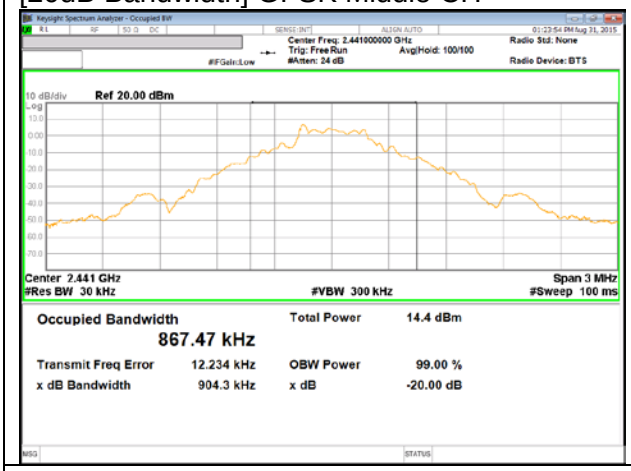
[20dB Bandwidth] GFSK Low CH



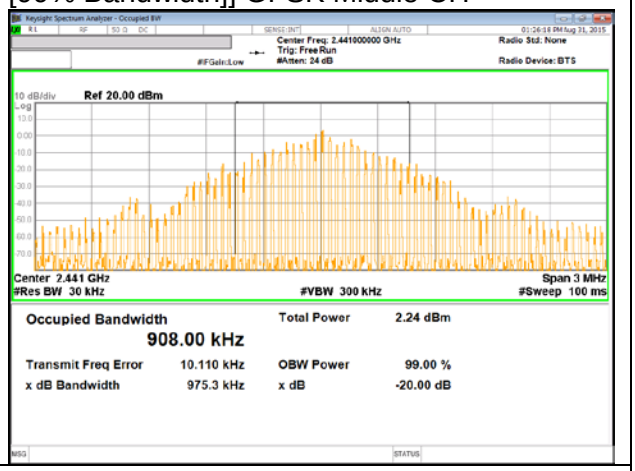
[99% Bandwidth] GFSK Low CH



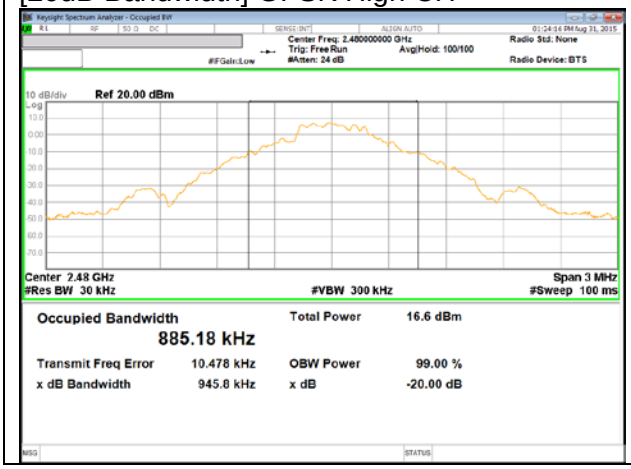
[20dB Bandwidth] GFSK Middle CH



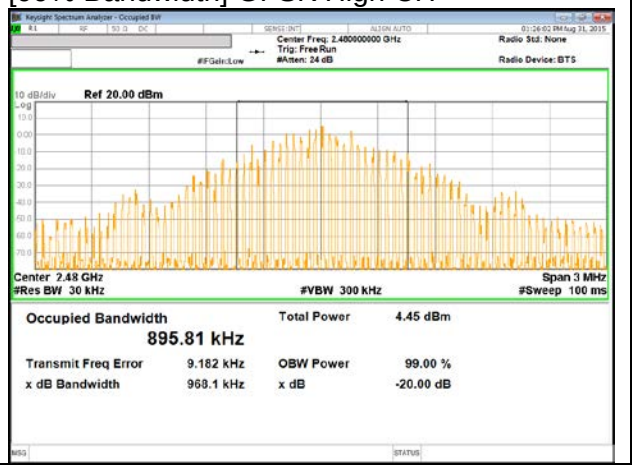
[99% Bandwidth]] GFSK Middle CH



[20dB Bandwidth] GFSK High CH

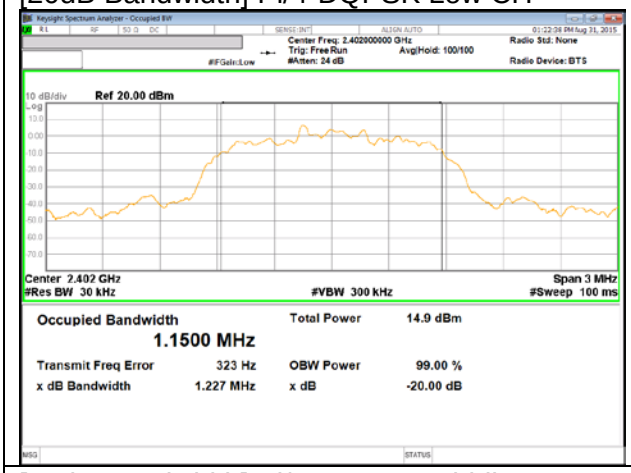


[99% Bandwidth] GFSK High CH

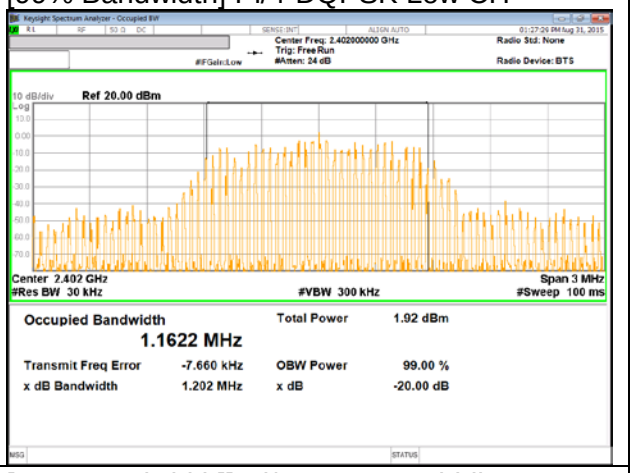


Pi/4-DQPSK BANDWIDTH

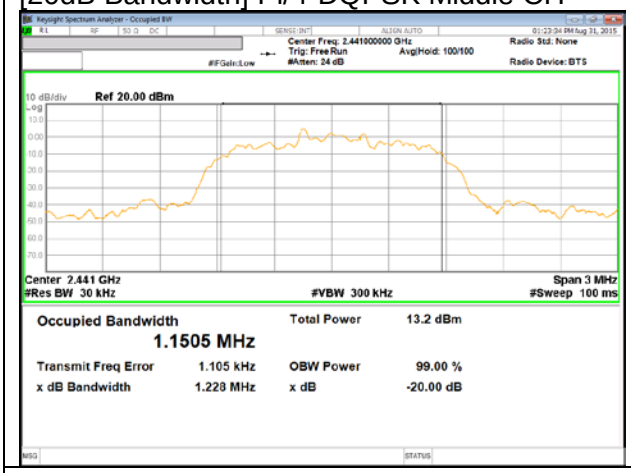
[20dB Bandwidth] Pi/4-DQPSK Low CH



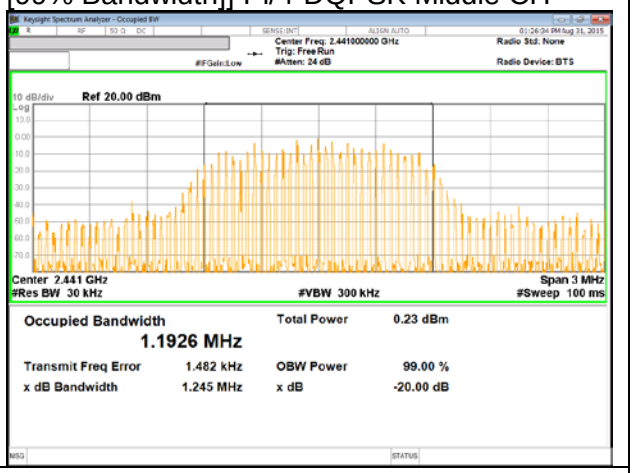
[99% Bandwidth] Pi/4-DQPSK Low CH



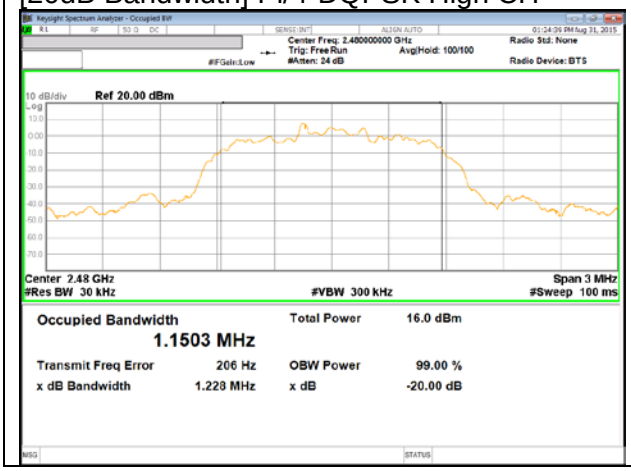
[20dB Bandwidth] Pi/4-DQPSK Middle CH



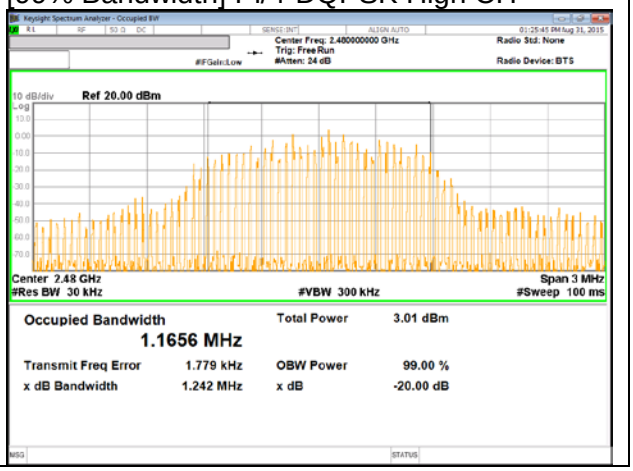
[99% Bandwidth]] Pi/4-DQPSK Middle CH



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



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



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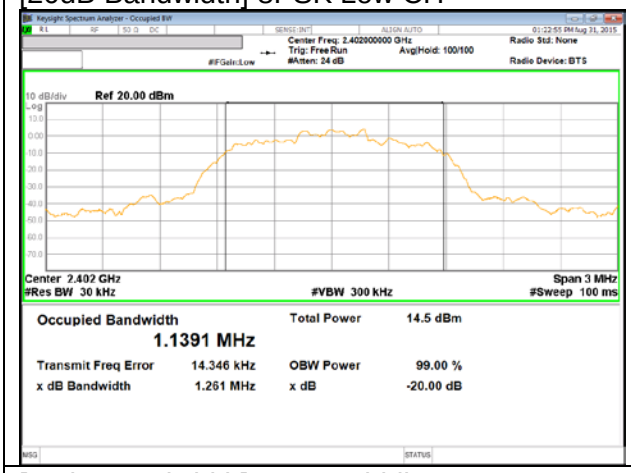
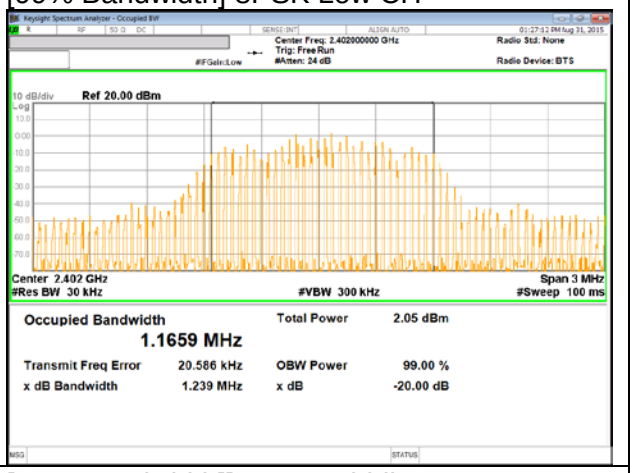
8PSK BANDWIDTH

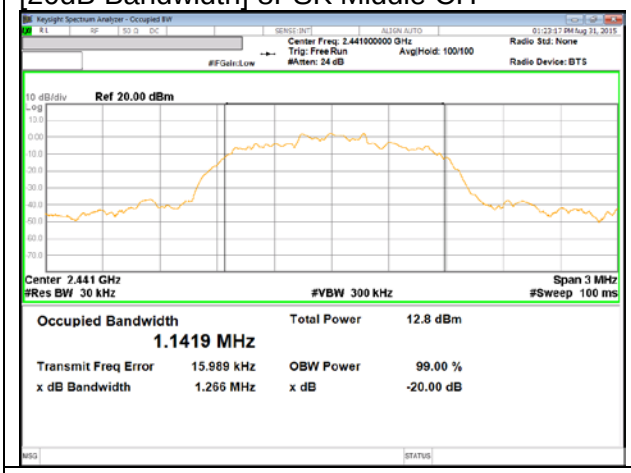
[20dB Bandwidth] 8PSK Low CH



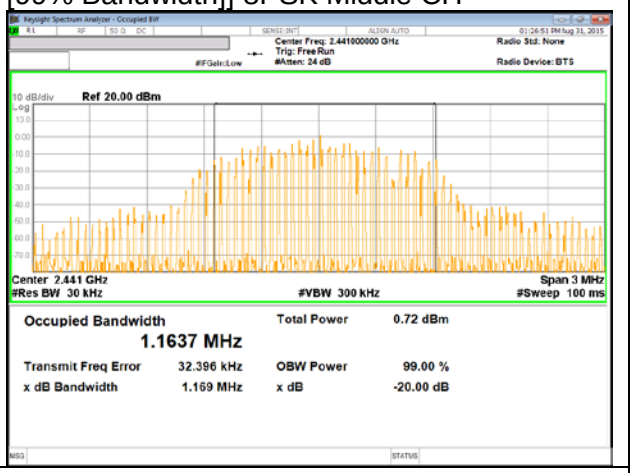
[99% Bandwidth] 8PSK Low CH



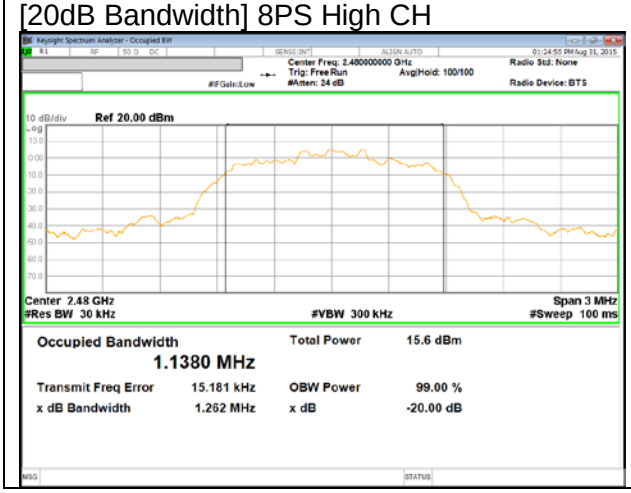
[20dB Bandwidth] 8PSK Middle CH



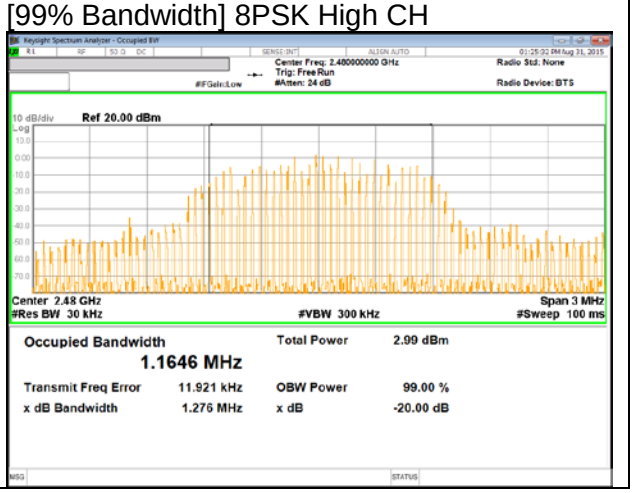
[99% Bandwidth]] 8PSK Middle CH



[20dB Bandwidth] 8PS High CH



[99% Bandwidth] 8PSK High CH



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

HOPPING FREQUENCY SEPARATION PLOT

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

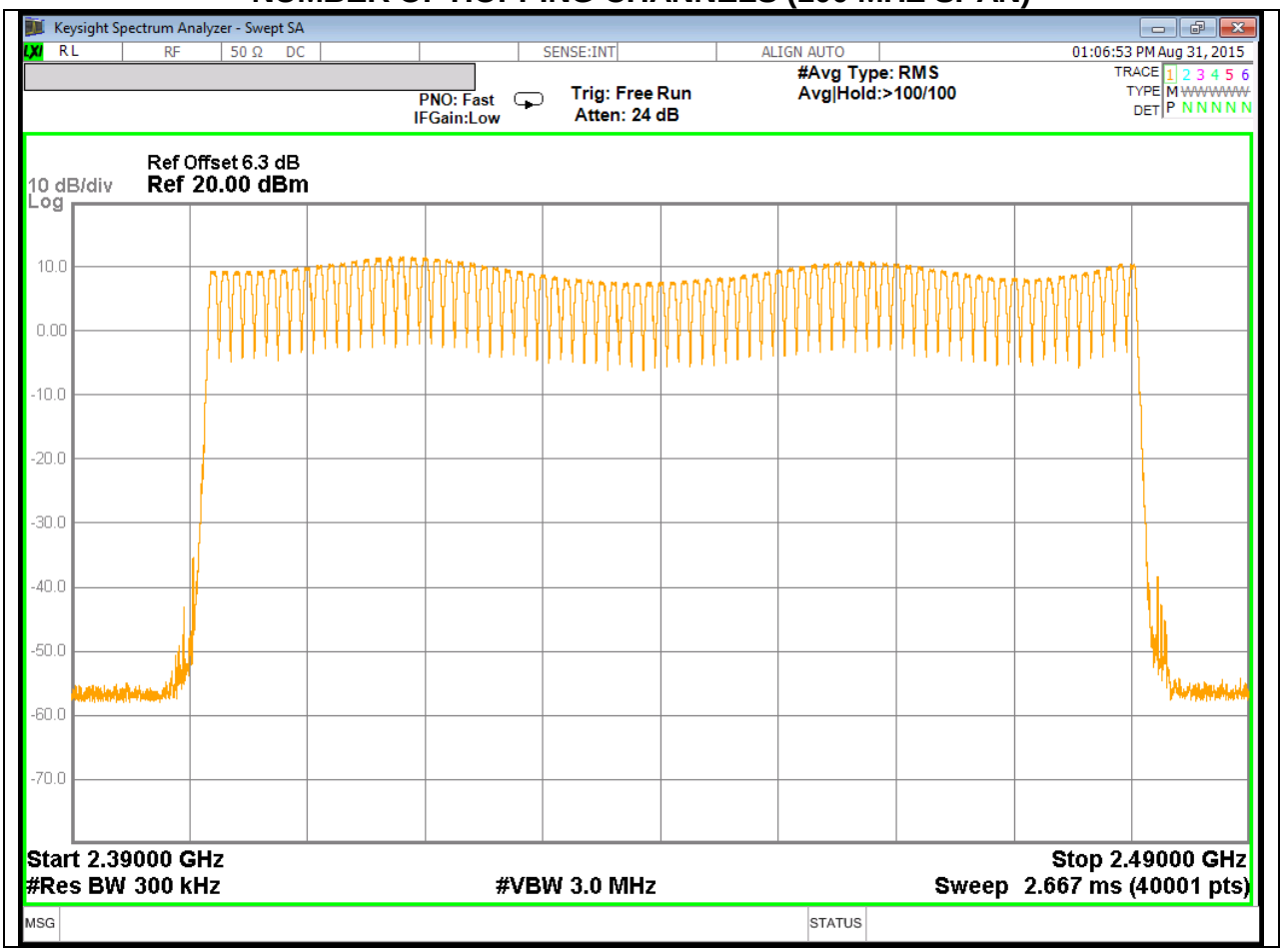
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

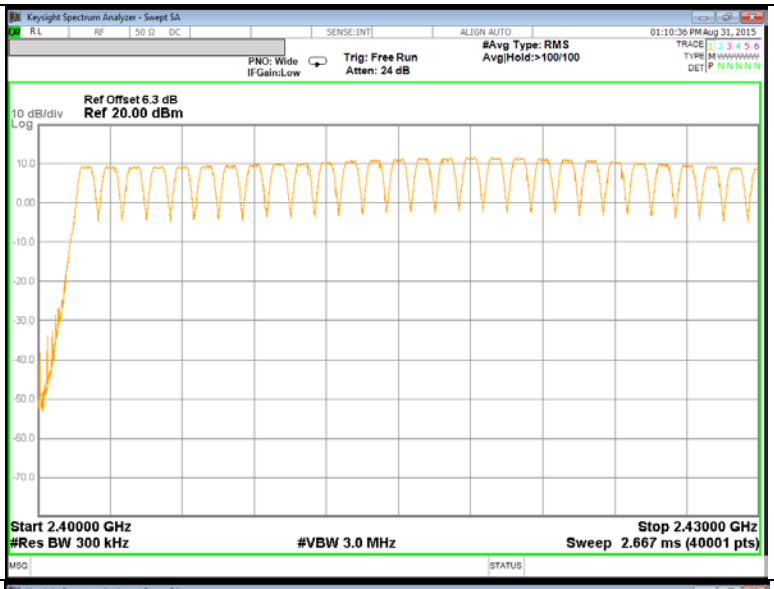
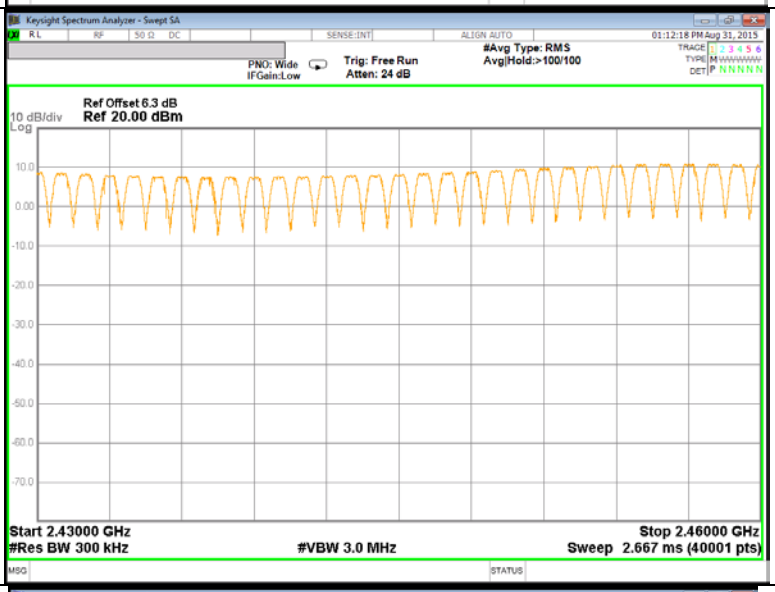
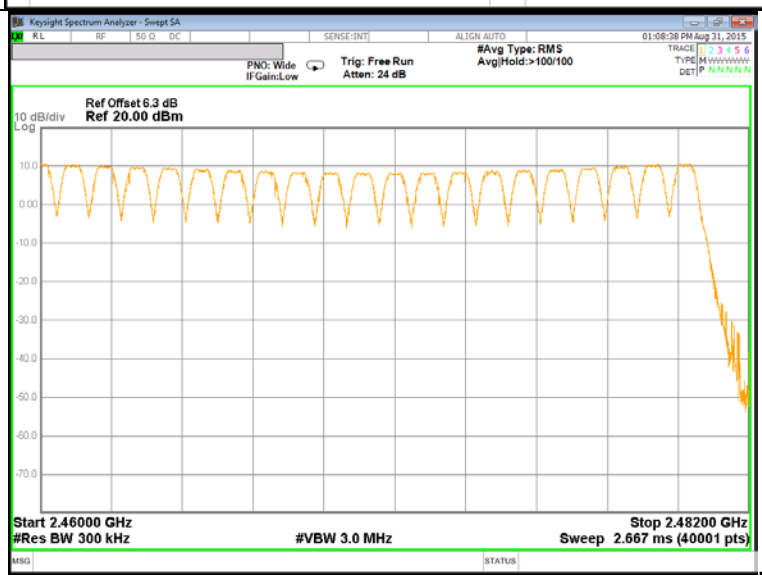
RESULTS

Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS PLOTS

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



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

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.

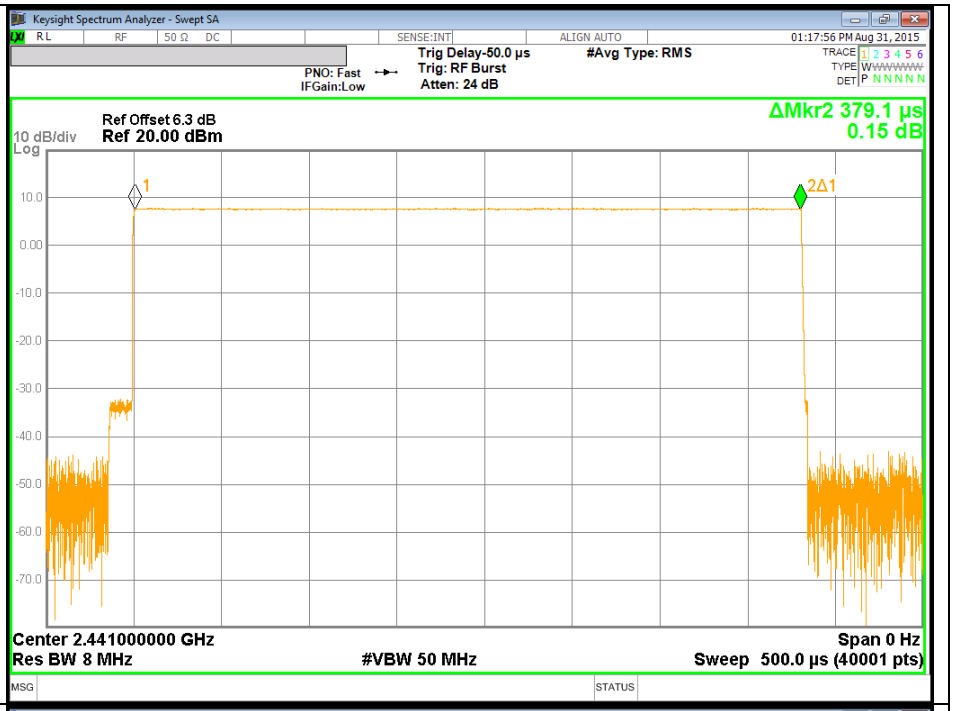
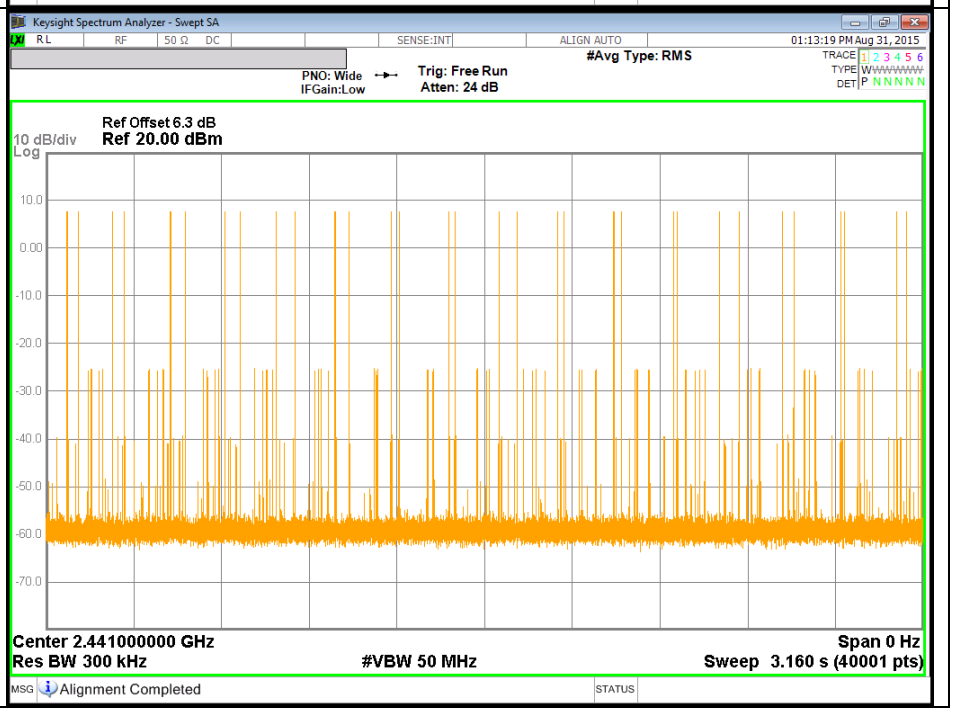
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

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.

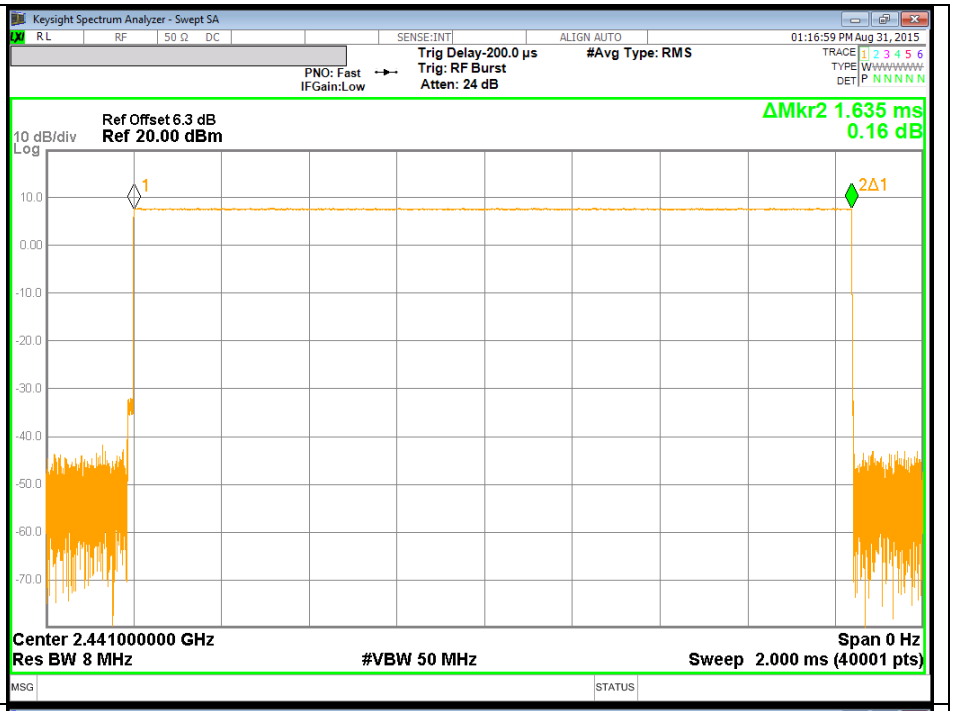
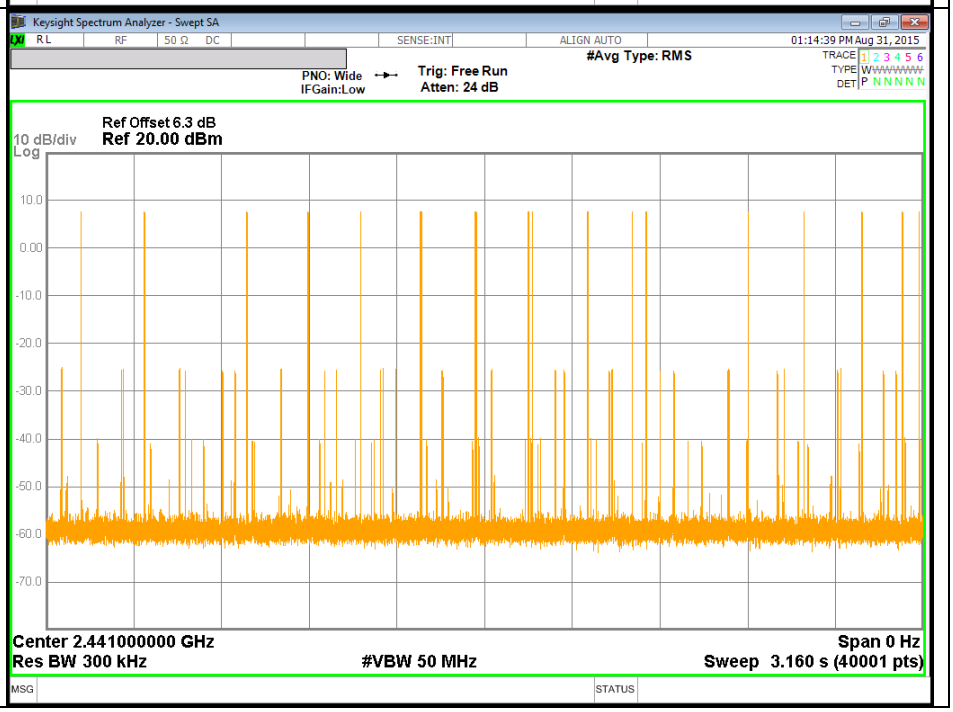
RESULTS

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK Normal					
DH1	0.378	32	0.120960	0.4	-0.2790
DH3	1.635	17	0.277950	0.4	-0.1221
DH5	2.883	12	0.345960	0.4	-0.0540
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK AFH					
DH1	0.378	8	0.030240	0.4	-0.36976
DH3	1.635	4.25	0.069488	0.4	-0.33051
DH5	2.883	3	0.086490	0.4	-0.31351

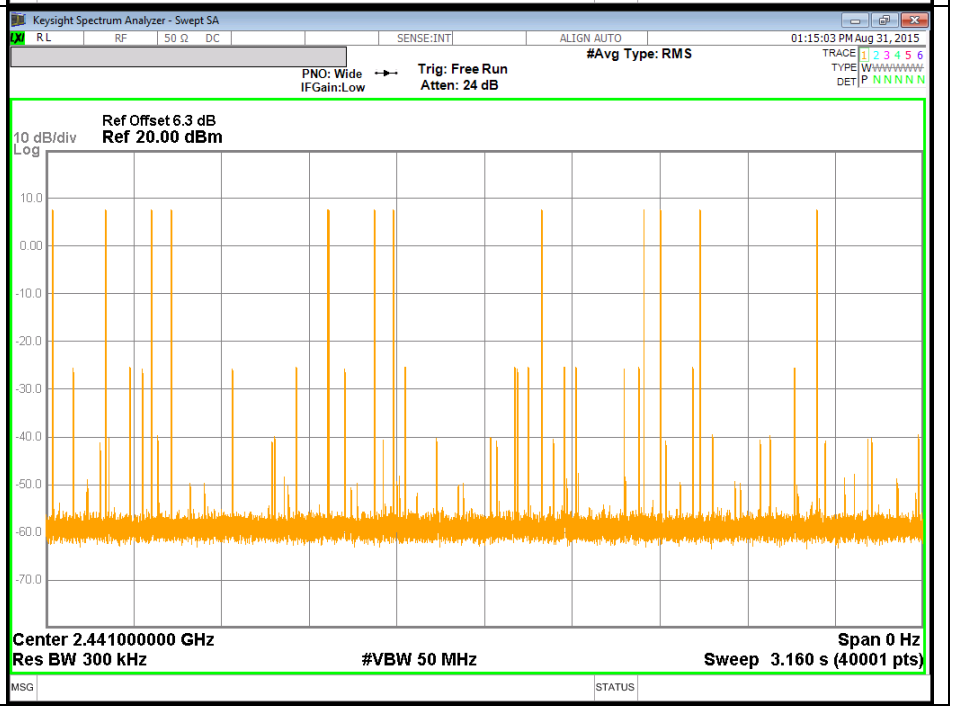
DH1

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

DH3

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

DH5

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

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	8.682	21	-12.318
Middle	2441	6.876	21	-14.124
High	2480	9.511	21	-11.489
Worst		9.511	21	-11.489

8.5.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION

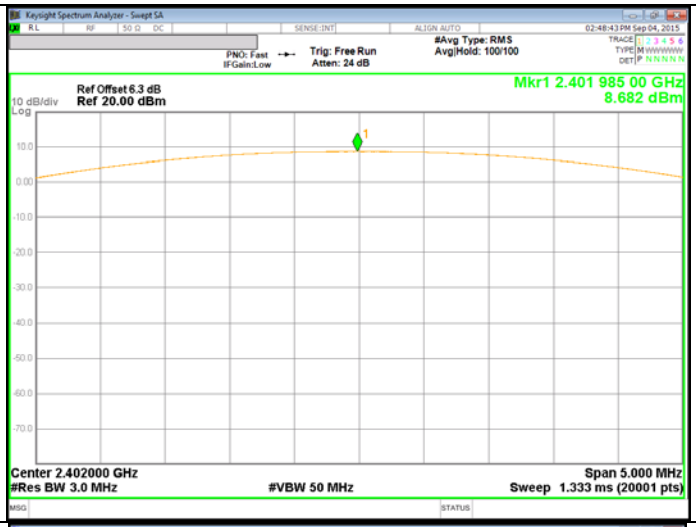
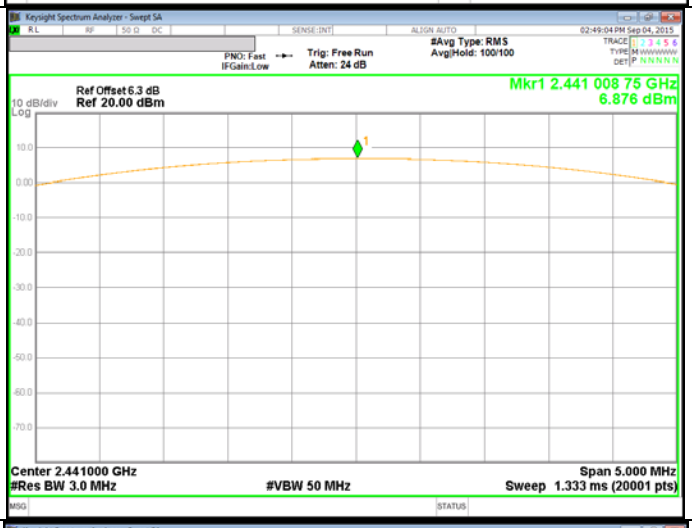
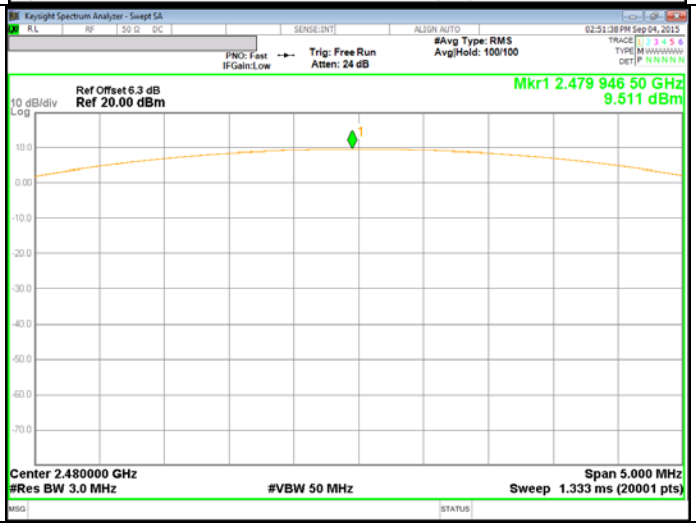
Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	8.641	21	-12.359
Middle	2441	6.853	21	-14.147
High	2480	9.468	21	-11.532
Worst		9.468	21	-11.532

8.5.3. ENHANCED DATA RATE 8PSK MODULATION

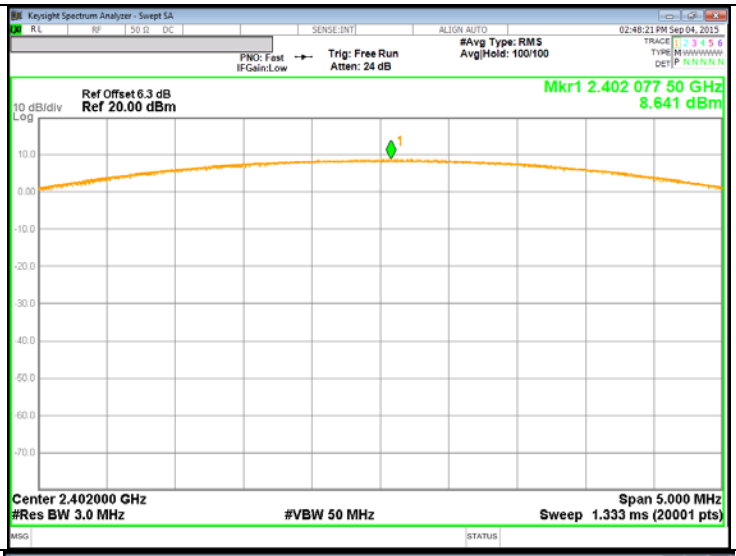
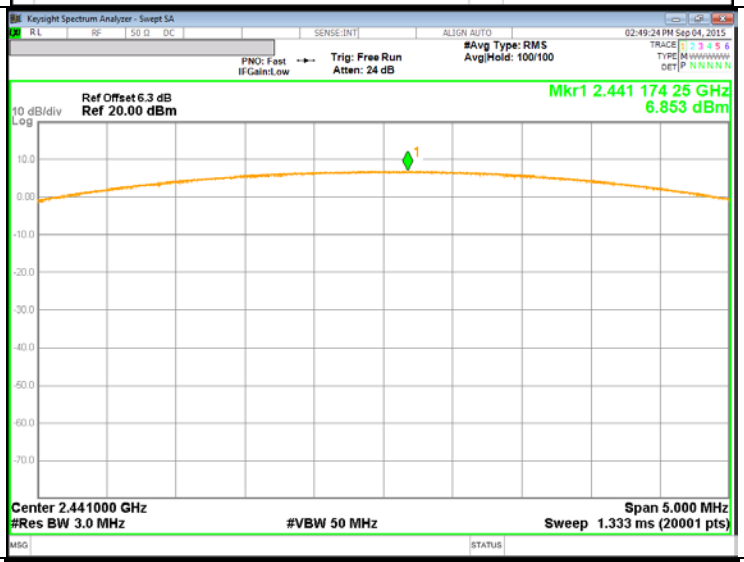
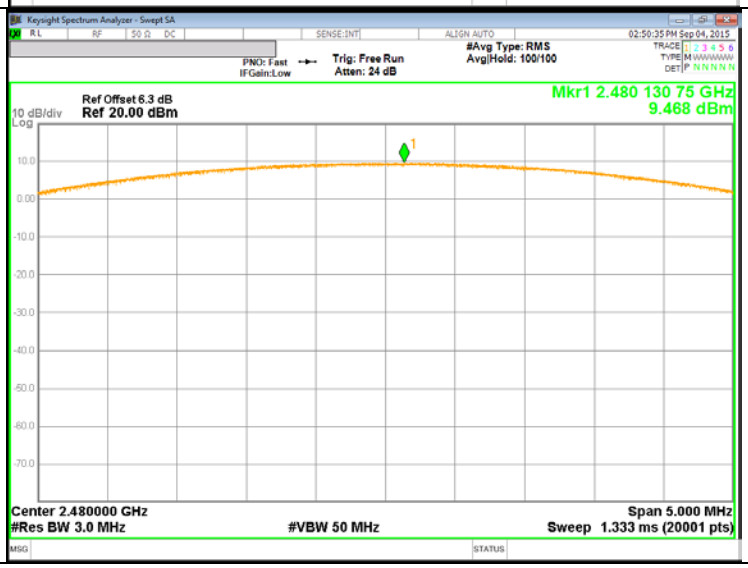
Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	9.238	21	-11.762
Middle	2441	7.431	21	-13.569
High	2480	10.073	21	-10.927
Worst		10.073	21	-10.927

8.5.4. OUTPUT POWER PLOTS

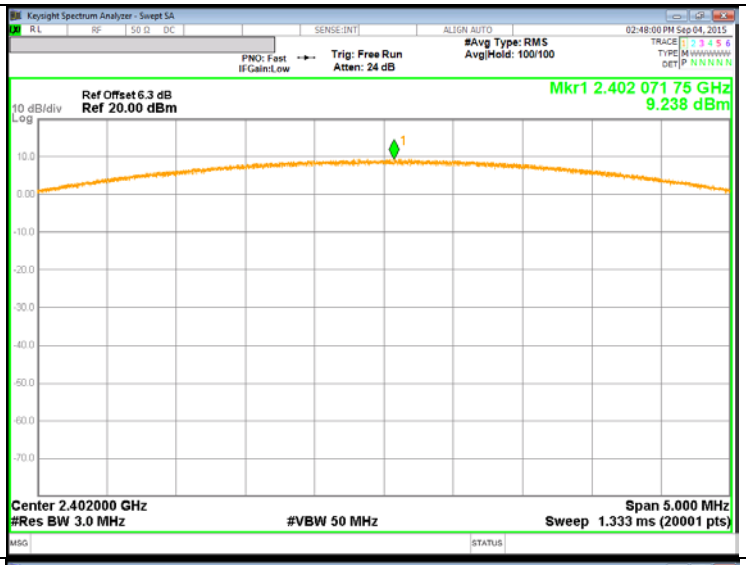
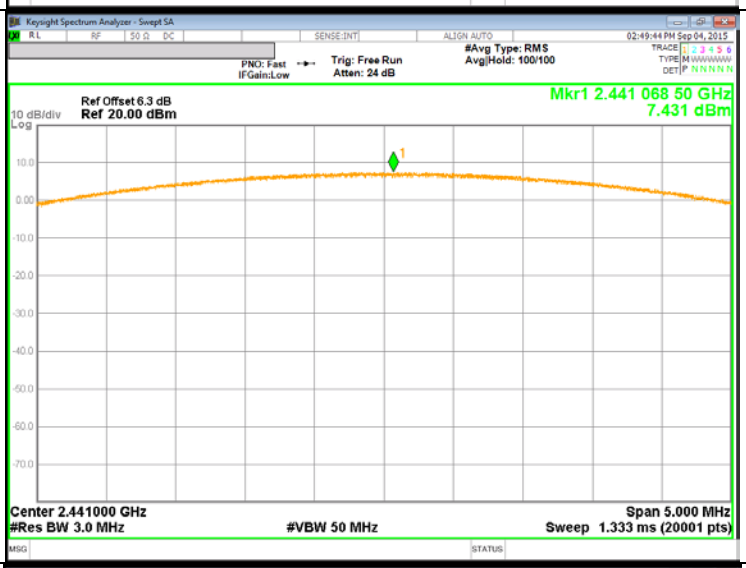
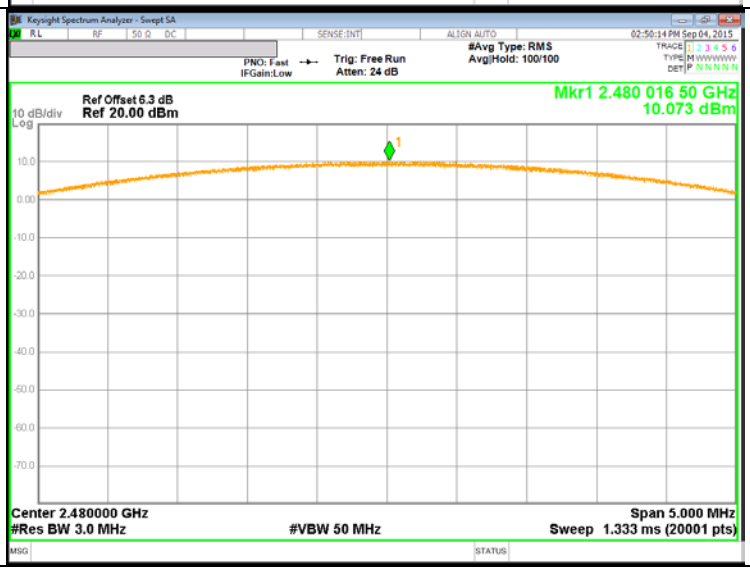
GFSK OUTPUT POWER

GFSK Low CH			
GFSK Middle CH			
GFSK High CH			

Pi/4-DPSK OUTPUT POWER

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

8PSK OUTPUT POWER

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

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 10.1 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.

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	8.48	7.04
Middle	2441	6.65	4.62
High	2480	9.31	8.53

8.6.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	6.24	4.20
Middle	2441	4.42	2.77
High	2480	7.05	5.07

8.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	6.25	4.22
Middle	2441	4.43	2.77
High	2480	7.06	5.09

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.

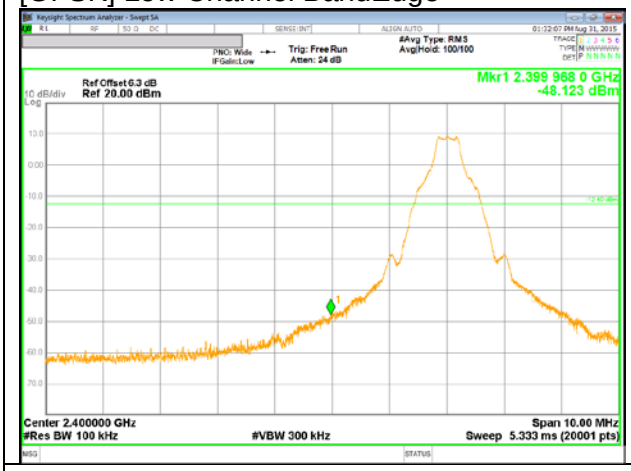
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

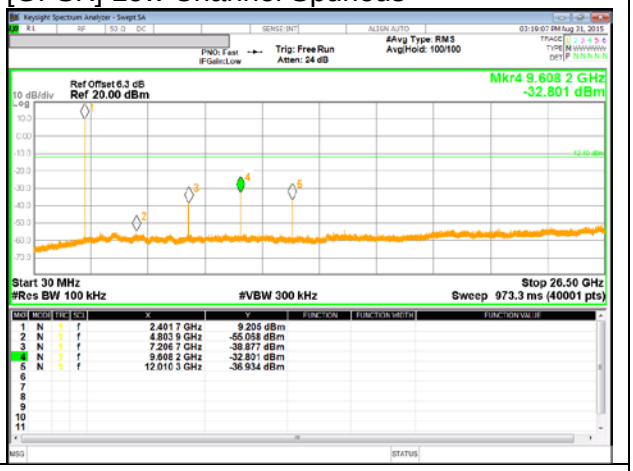
8.7.1. BASIC DATA RATE GFSK MODULATION

GFSK Mode

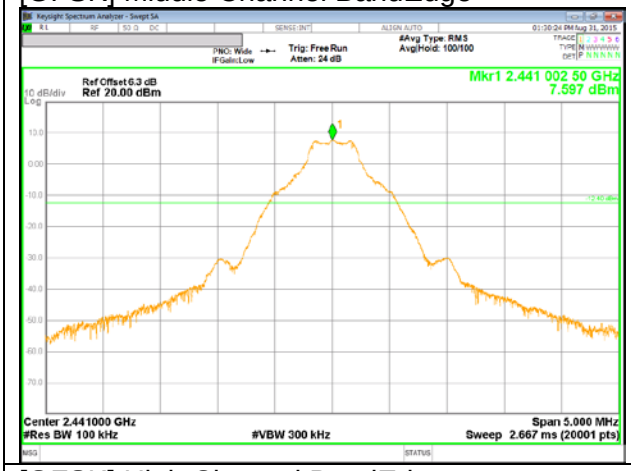
[GFSK] Low Channel BandEdge



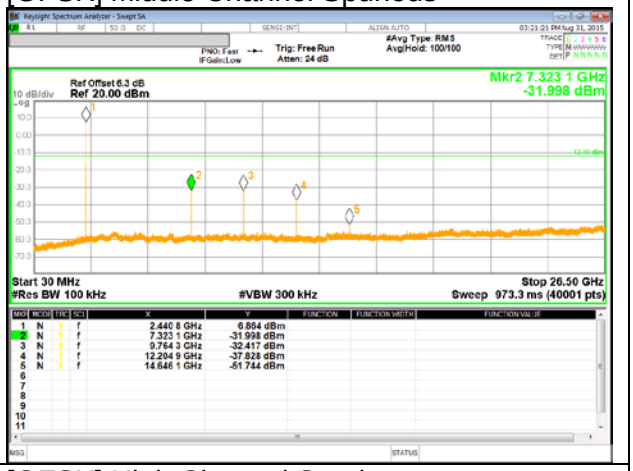
[GFSK] Low Channel Spurious



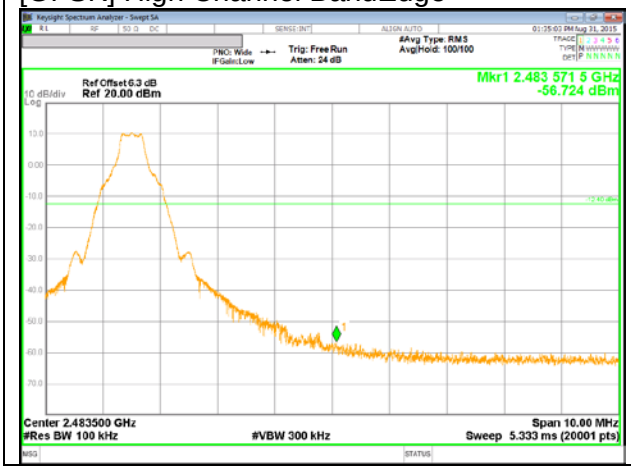
[GFSK] Middle Channel BandEdge



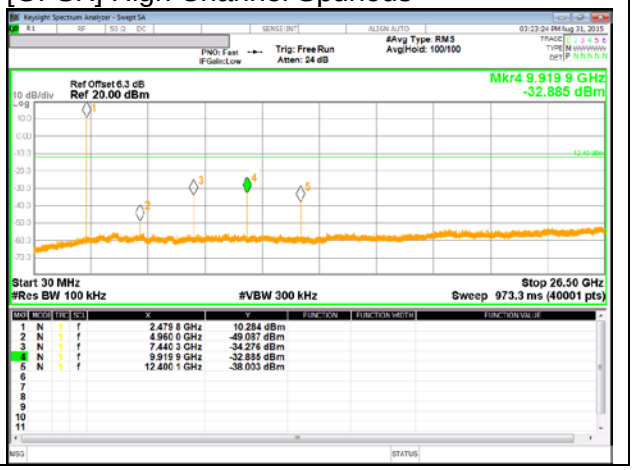
[GFSK] Middle Channel Spurious



[GFSK] High Channel BandEdge

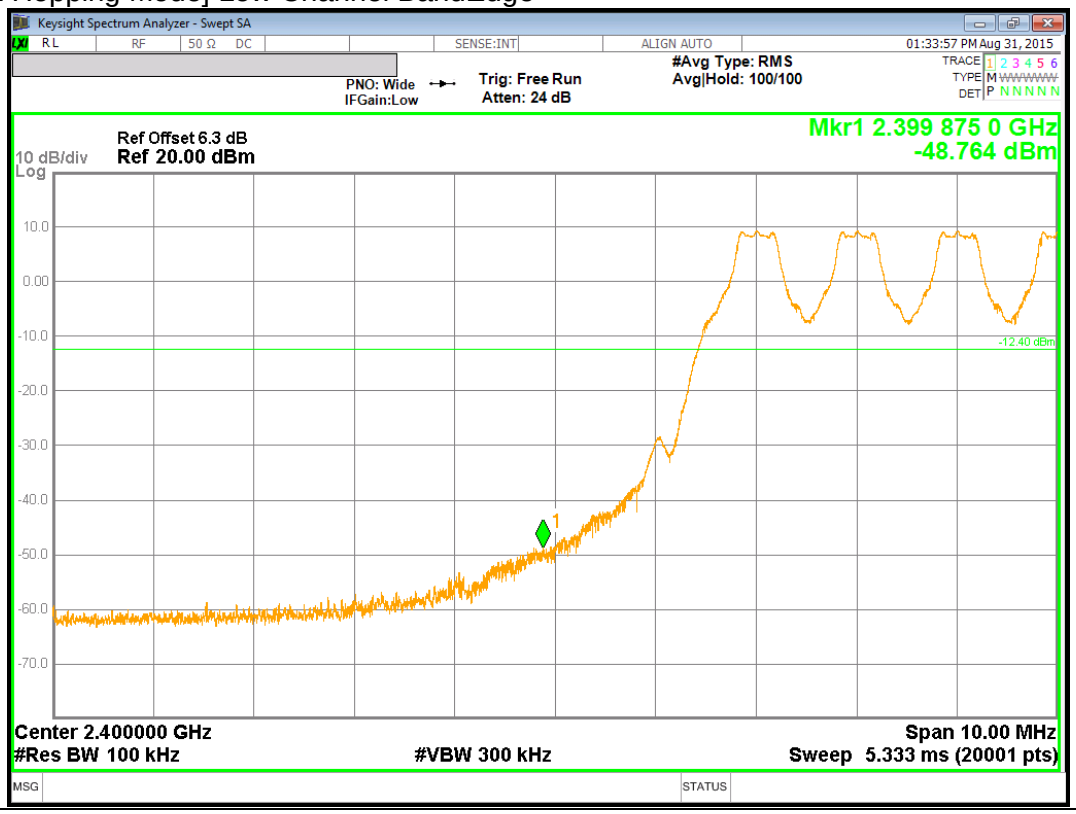


[GFSK] High Channel Spurious

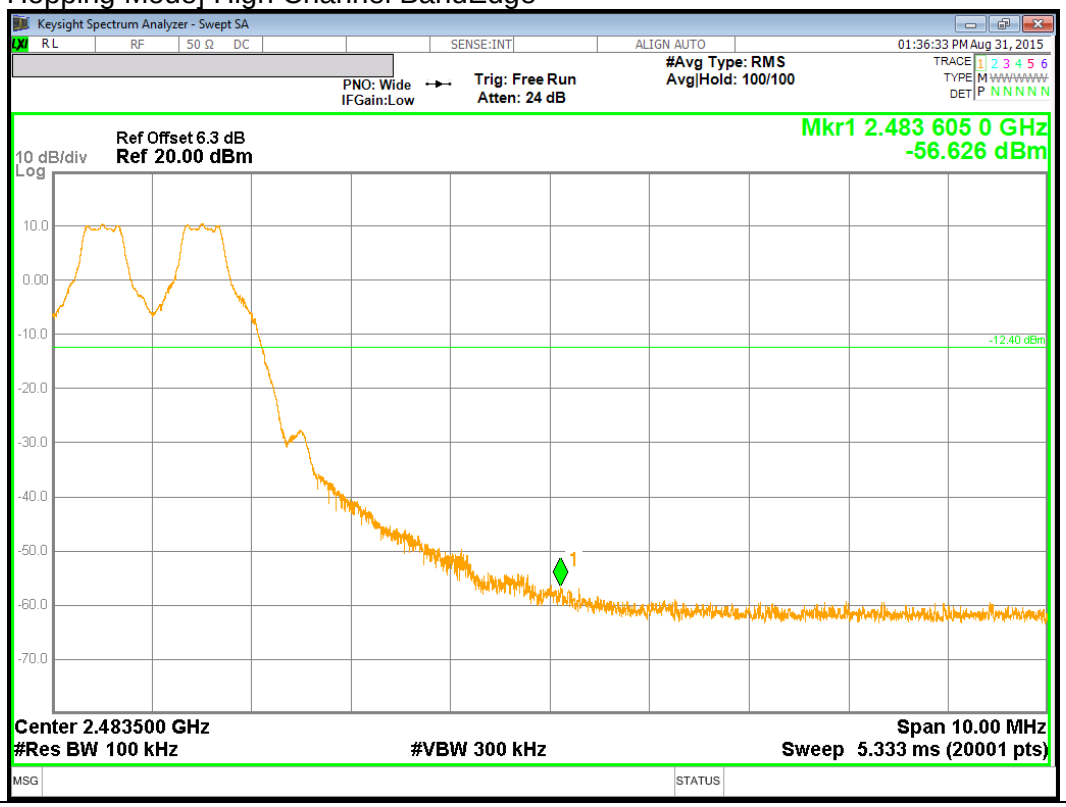


BandEdge Emission at GFSK Hopping Mode

[GFSK Hopping Mode] Low Channel BandEdge

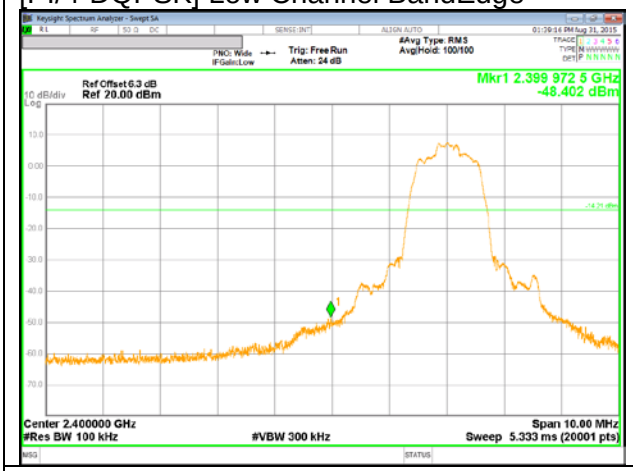


[GFSK Hopping Mode] High Channel BandEdge

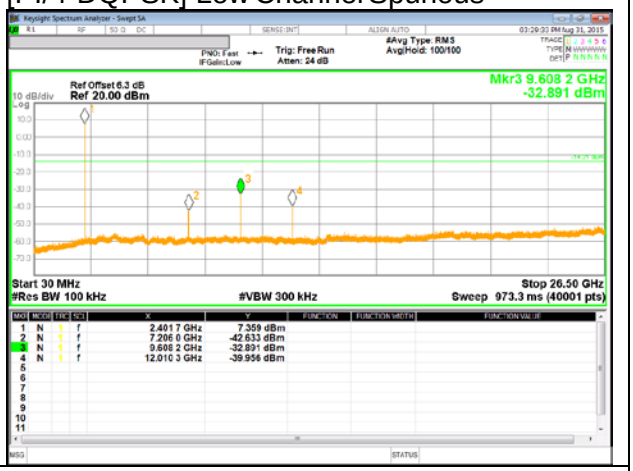


PI/4-DQPSK Mode

[PI/4-DQPSK] Low Channel BandEdge

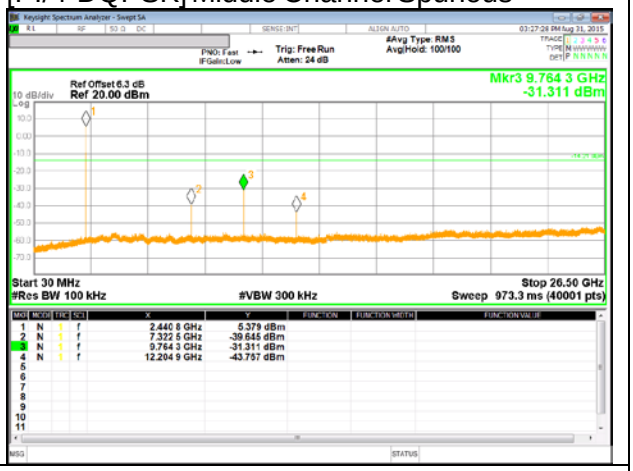


[PI/4-DQPSK] Low Channel Spurious

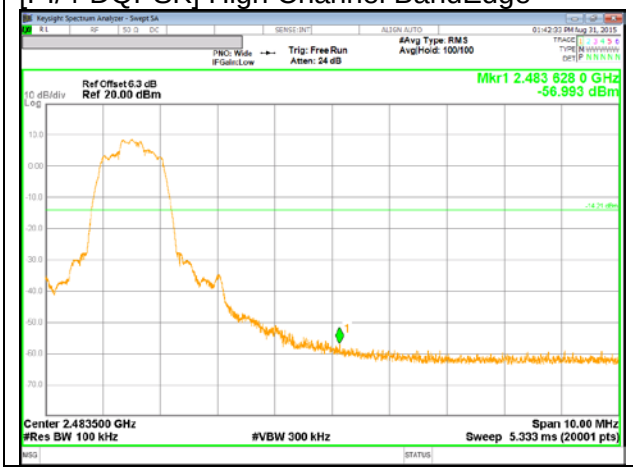


[PI/4-DQPSK] Middle Channel BandEdge

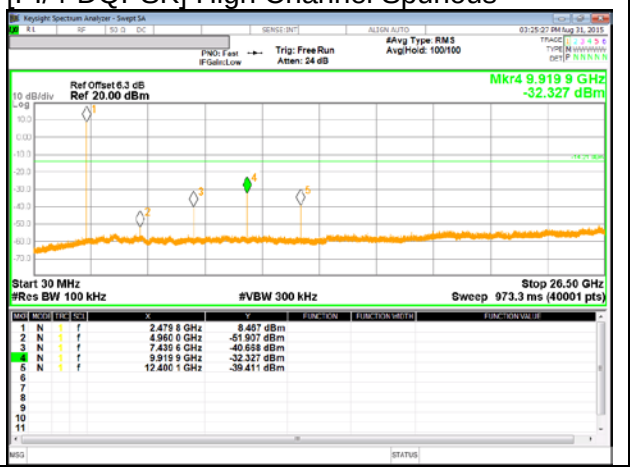
[PI/4-DQPSK] Middle Channel Spurious



[PI/4-DQPSK] High Channel BandEdge

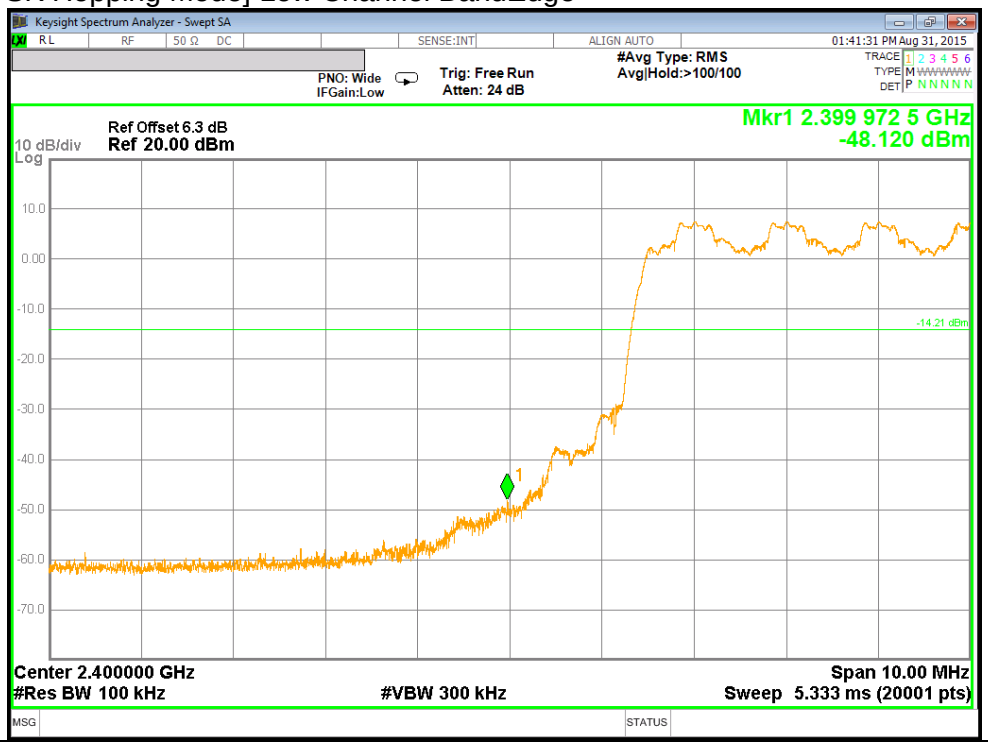


[PI/4-DQPSK] High Channel Spurious

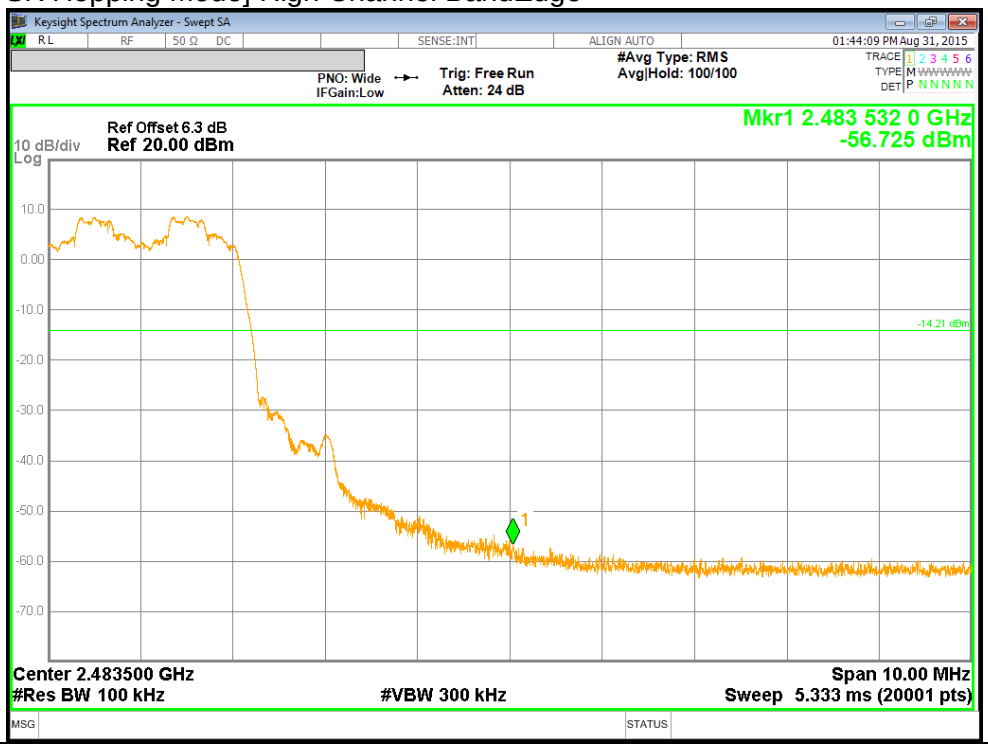


BandEdge Emission at PI/4-DQPSK Hopping Mode

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

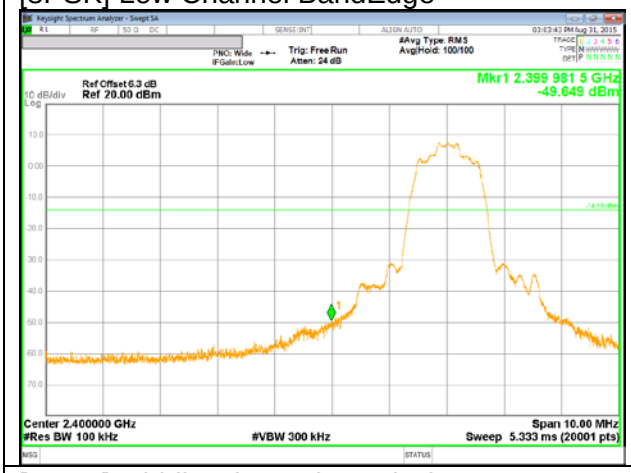


[PI/4-DQPSK Hopping Mode] High Channel BandEdge

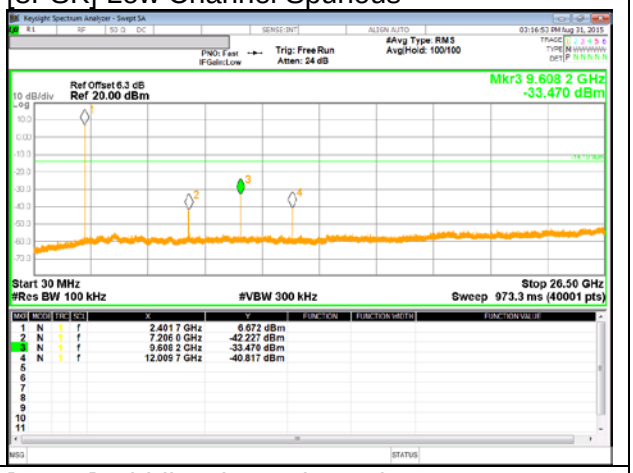


8PSK Mode

[8PSK] Low Channel BandEdge

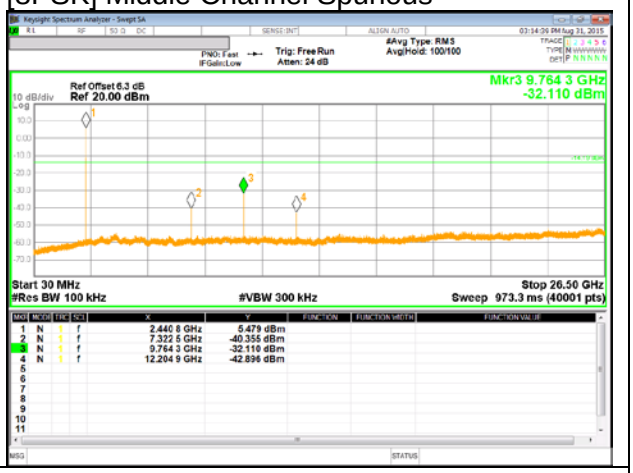


[8PSK] Low Channel Spurious

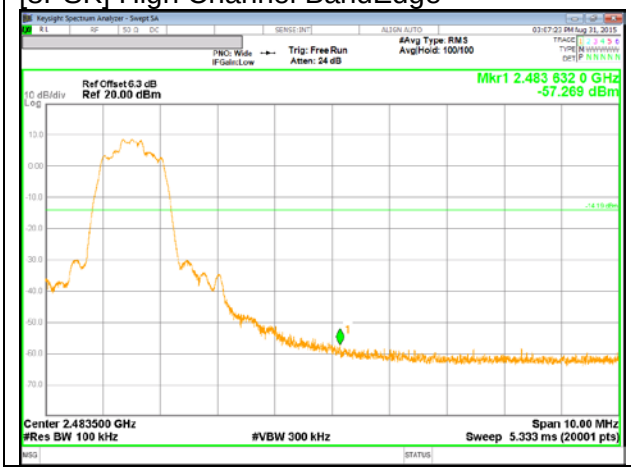


[8PSK] Middle Channel BandEdge

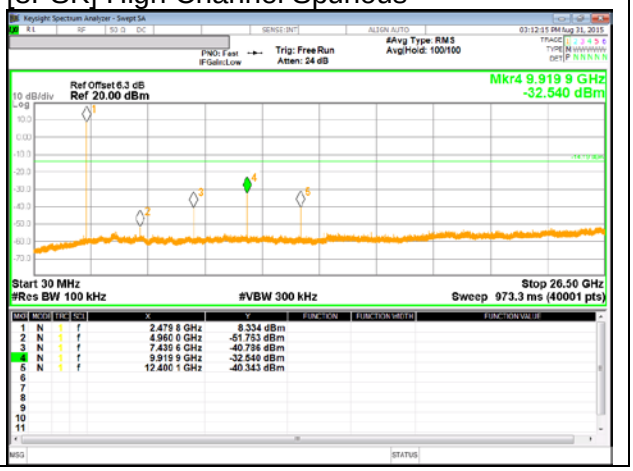
[8PSK] Middle Channel Spurious



[8PSK] High Channel BandEdge

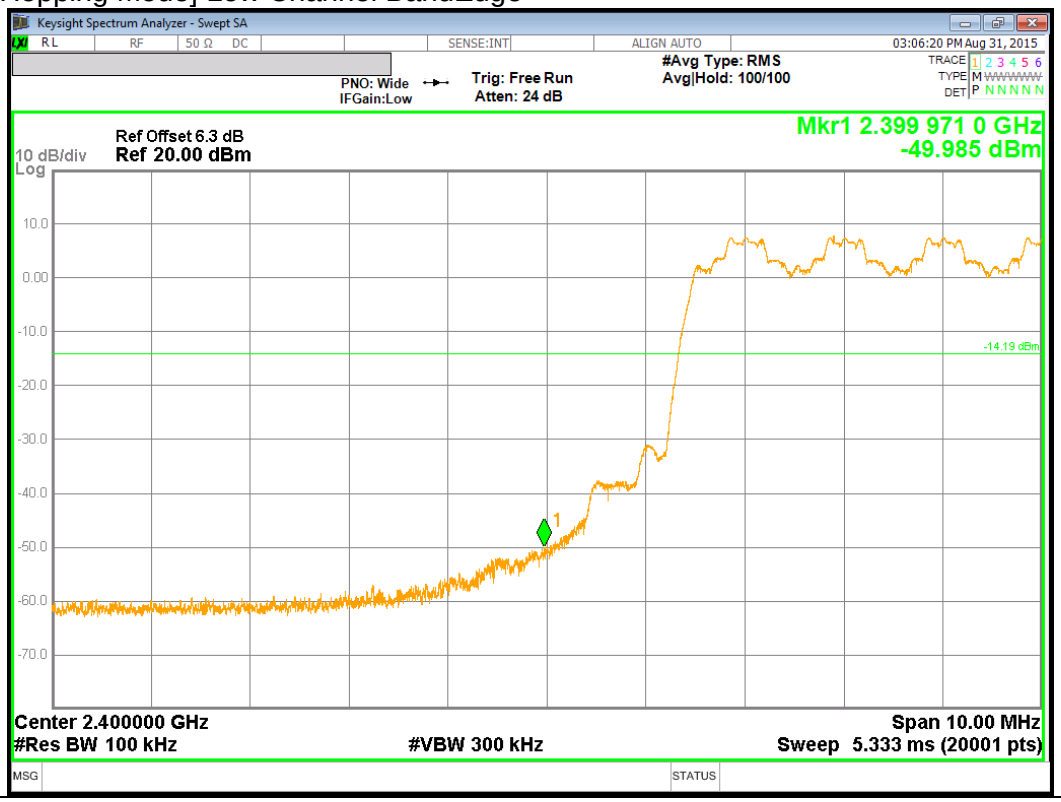


[8PSK] High Channel Spurious

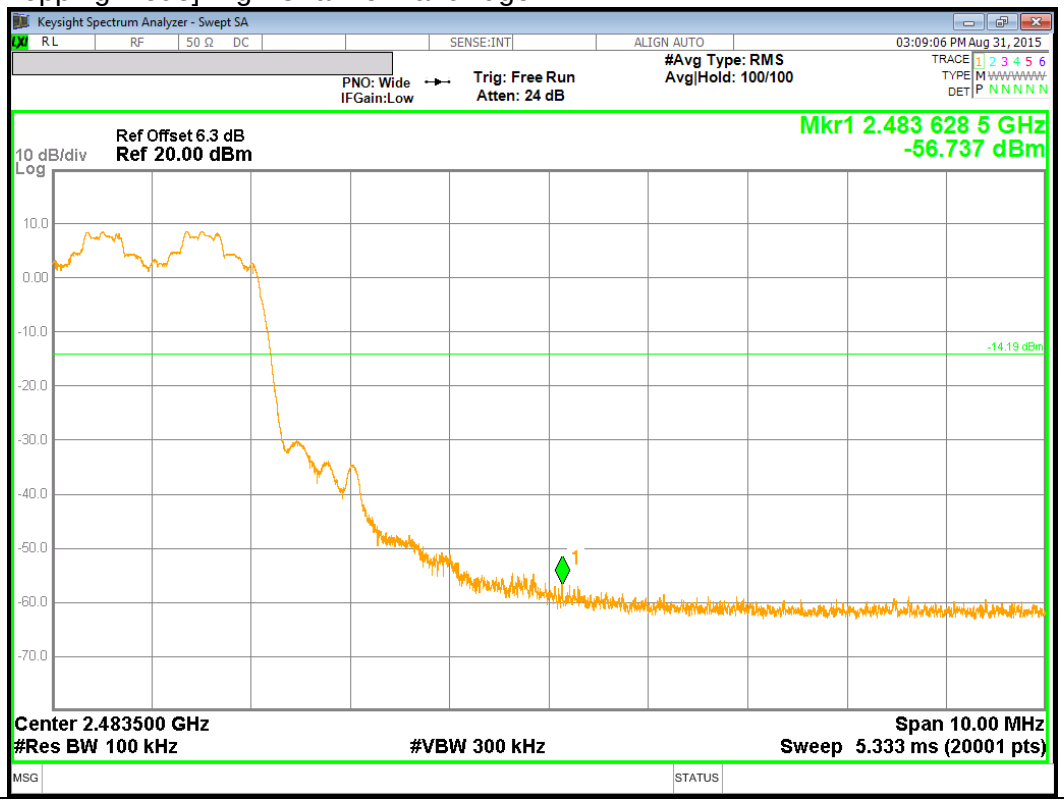


BandEdge Emission at 8PSK Hopping Mode

[8PSK Hopping Mode] Low Channel BandEdge



[8PSK Hopping Mode] High Channel BandEdge



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 C63.10. 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.

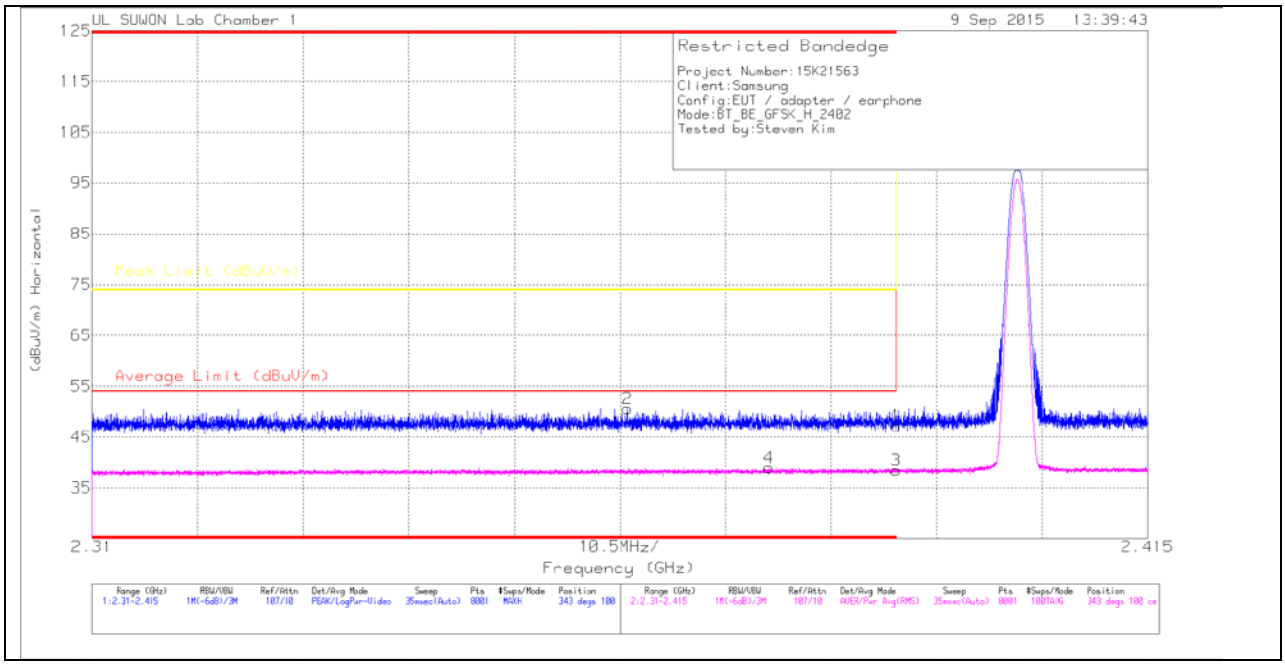
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

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

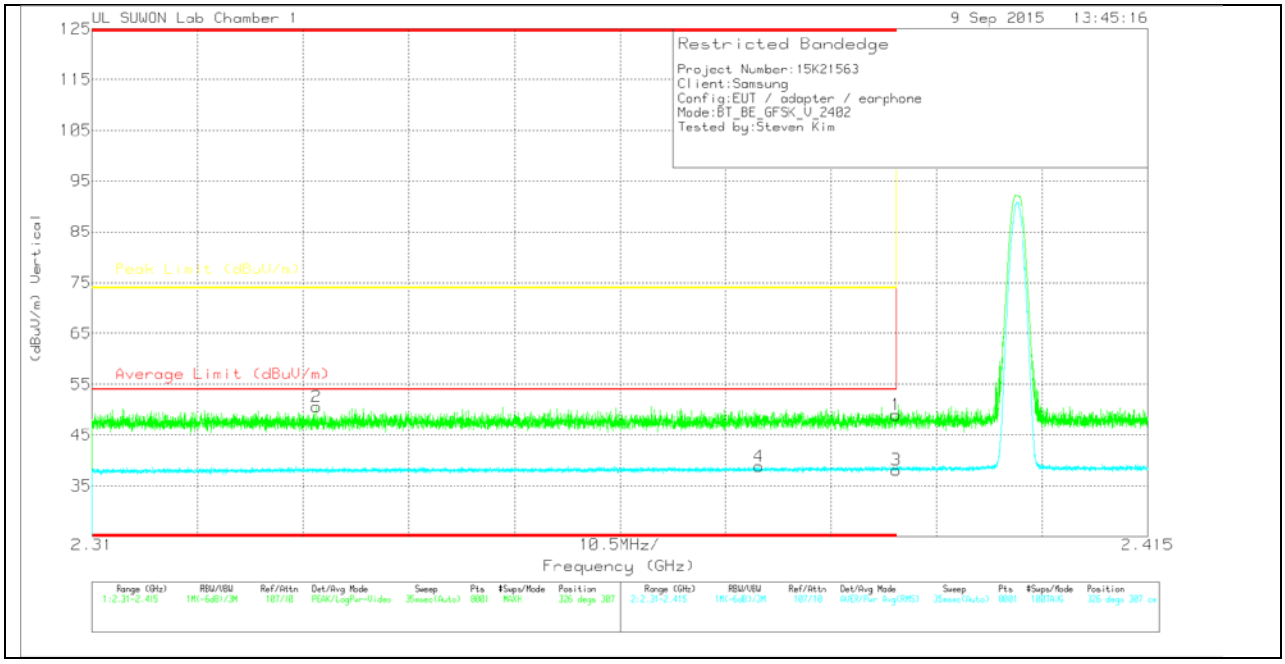
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	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	38.18	Pk	31.8	-22.8	47.18	-	-	74	-26.82	343	100	H
2	* 2.363	41.53	Pk	31.8	-22.8	50.53	-	-	74	-23.47	343	100	H
3	* 2.39	29.43	RMS	31.8	-22.8	38.43	54	-15.57	-	-	343	100	H
4	* 2.377	29.91	RMS	31.8	-22.8	38.91	54	-15.09	-	-	343	100	H

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

Pk - Peak detector

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	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	39.98	Pk	31.8	-22.8	48.98	-	-	74	-25.02	326	307	V
2	* 2.332	41.8	Pk	31.7	-22.9	50.6	-	-	74	-23.4	326	307	V
3	* 2.39	29.14	RMS	31.8	-22.8	38.14	54	-15.86	-	-	326	307	V
4	* 2.376	29.88	RMS	31.8	-22.8	38.88	54	-15.12	-	-	326	307	V

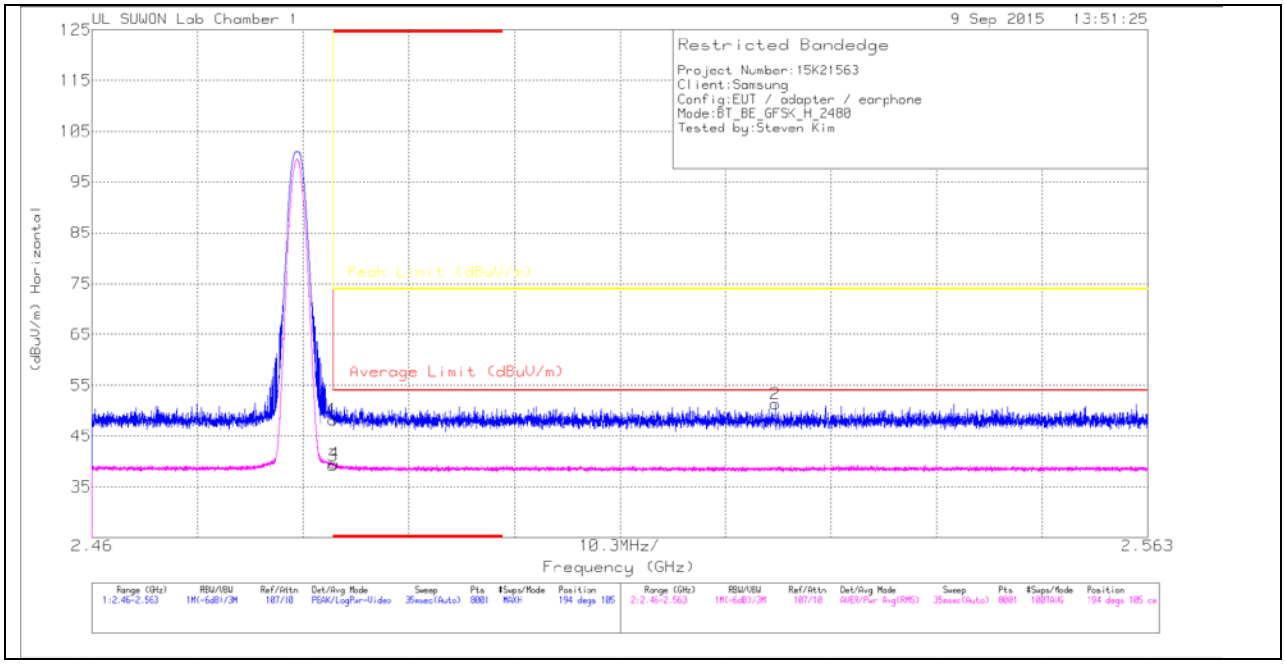
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

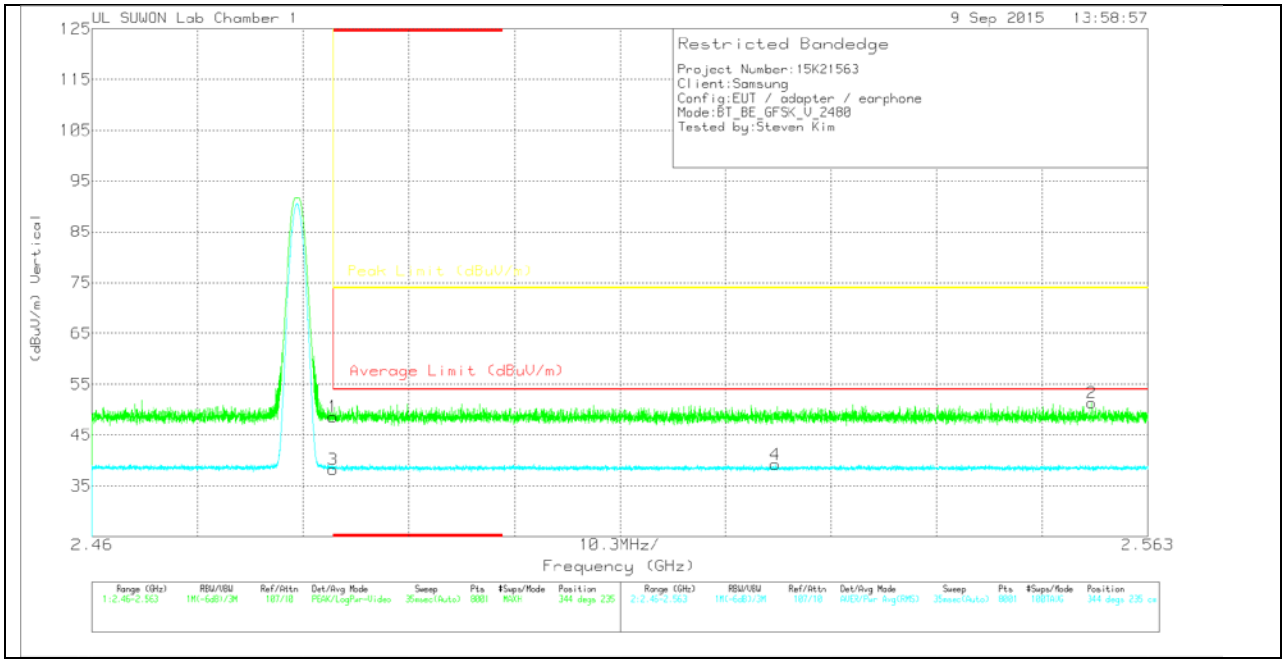
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	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	38.78	Pk	32	-22.6	48.18	-	-	74	-25.82	194	105	H
2	2.527	41.88	Pk	32	-22.6	51.28	-	-	74	-22.72	194	105	H
3	* 2.484	29.77	RMS	32	-22.6	39.17	54	-14.83	-	-	194	105	H
4	* 2.484	30.19	RMS	32	-22.6	39.59	54	-14.41	-	-	194	105	H

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

Pk - Peak detector

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.25	Pk	32	-22.6	48.65	-	-	74	-25.35	344	235	V
2	2.558	41.93	Pk	32	-22.6	51.33	-	-	74	-22.67	344	235	V
3	* 2.484	28.78	RMS	32	-22.6	38.18	54	-15.82	-	-	344	235	V
4	2.527	29.83	RMS	32	-22.6	39.23	54	-14.77	-	-	344	235	V

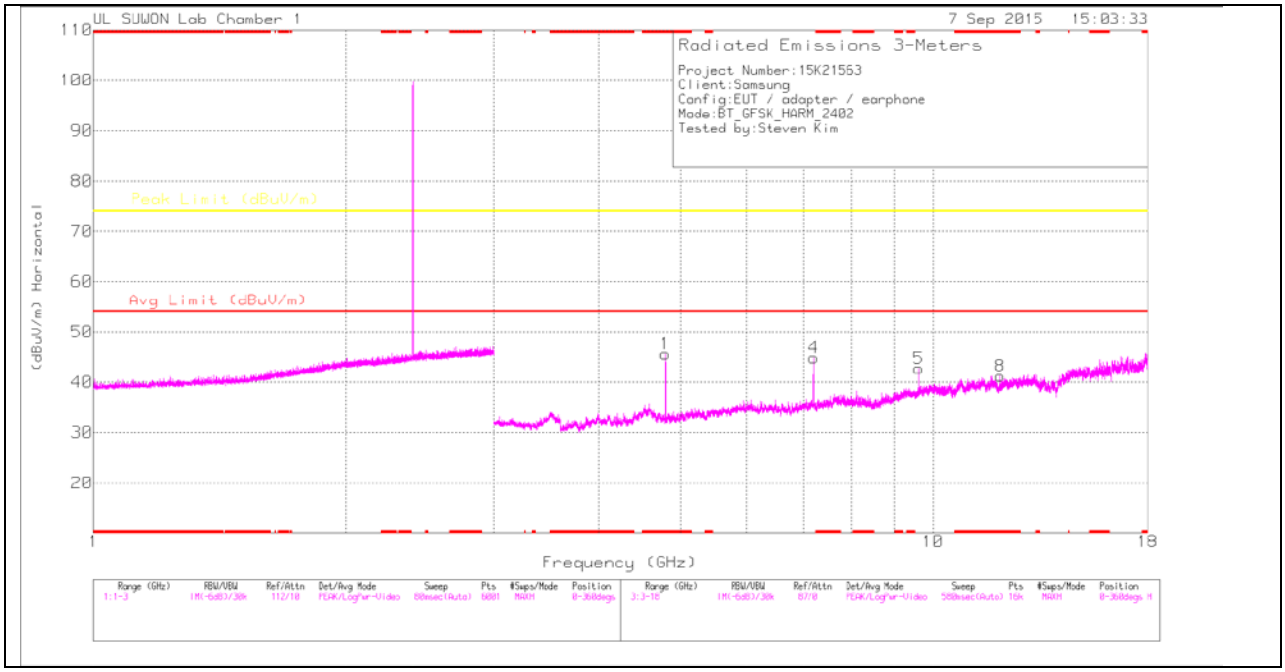
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

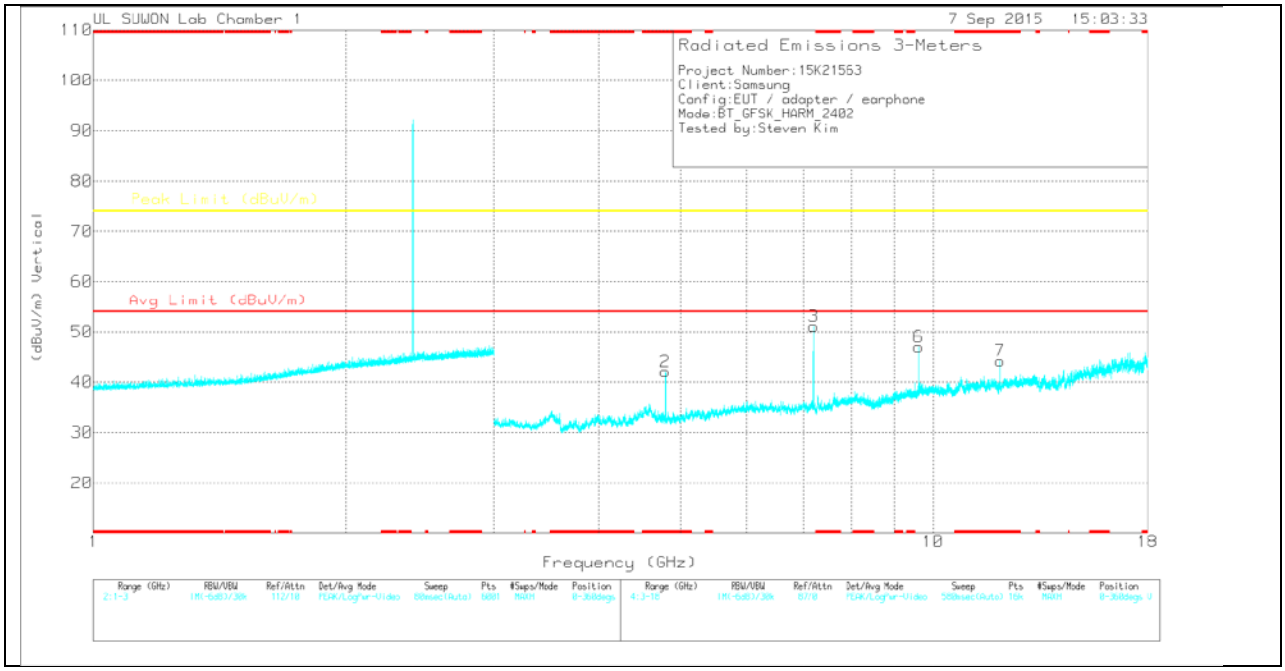
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



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

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	41.4	PK	34	-29.8	45.6	-	-	74	-28.4	0-360	100	H
4	7.205	34.55	PK	35.7	-25.4	44.85	-	-	74	-29.15	0-360	200	H
5	9.608	26.75	PK	37	-21	42.75	-	-	74	-31.25	0-360	200	H
8	* 12.011	23.07	PK	38.9	-20.7	41.27	-	-	74	-32.73	0-360	200	H
2	* 4.804	37.94	PK	34	-29.8	42.14	-	-	74	-31.86	0-360	200	V
3	7.206	40.84	PK	35.7	-25.4	51.14	-	-	74	-22.86	0-360	100	V
6	9.608	31.02	PK	37	-21	47.02	-	-	74	-26.98	0-360	100	V
7	* 12.01	26.05	PK	38.9	-20.7	44.25	-	-	74	-29.75	0-360	100	V

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

PK – Peak detector

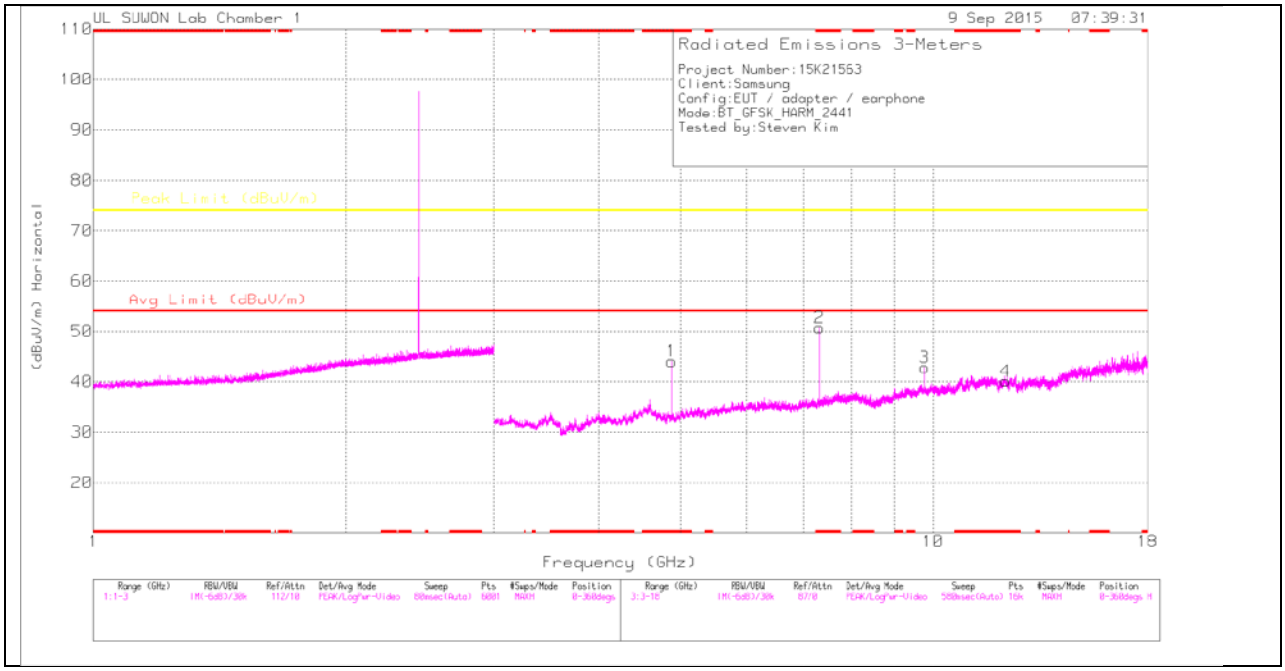
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	47.12	PK2	34	-29.8	51.32	-	-	74	-22.68	325	317	H
* 4.804	41.44	VA1T	34	-29.8	45.64	54	-8.36	-	-	325	317	H
* 4.804	46.96	PK2	34	-29.8	51.16	-	-	74	-22.84	244	347	V
* 4.804	42.49	VA1T	34	-29.8	46.69	54	-7.31	-	-	244	347	V
7.206	43.43	PK2	35.7	-25.4	53.73	-	-	74	-20.27	55	366	H
7.206	34.68	VA1T	35.7	-25.4	44.98	-	-	-	-	55	366	H
7.206	48.53	PK2	35.7	-25.4	58.83	-	-	74	-15.17	141	271	V
7.206	40.94	VA1T	35.7	-25.4	51.24	-	-	-	-	141	271	V
9.608	35.69	PK2	37	-21	51.69	-	-	74	-22.31	360	303	H
9.608	27.59	VA1T	37	-21	43.59	-	-	-	-	360	303	H
9.608	38.07	PK2	37	-21	54.07	-	-	74	-19.93	111	100	V
9.608	32.3	VA1T	37	-21	48.3	-	-	-	-	111	100	V
* 12.009	34.06	PK2	38.9	-20.7	52.26	-	-	74	-21.74	140	264	H
* 12.01	21.83	VA1T	38.9	-20.7	40.03	54	-13.97	-	-	140	264	H
* 12.01	33.83	PK2	38.9	-20.7	52.03	-	-	74	-21.97	234	215	V
* 12.01	24.5	VA1T	38.9	-20.7	42.7	54	-11.3	-	-	234	215	V

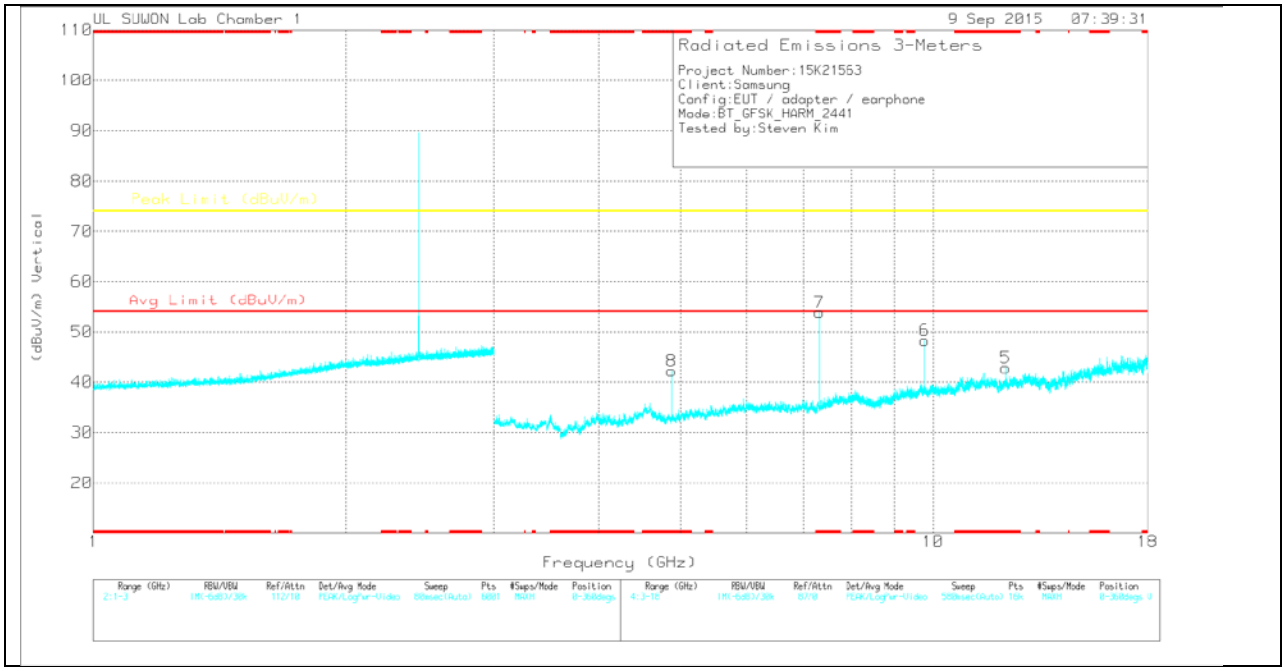
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881	39.17	PK	34	-29.1	44.07	-	-	74	-29.93	0-360	100	H
2	* 7.323	40.52	PK	35.8	-25.6	50.72	-	-	74	-23.28	0-360	200	H
3	9.764	27.69	PK	37.2	-22	42.89	-	-	74	-31.11	0-360	200	H
4	* 12.206	22.51	PK	38.9	-21.3	40.11	-	-	74	-33.89	0-360	200	H
5	* 12.206	25.28	PK	38.9	-21.3	42.88	-	-	74	-31.12	0-360	100	V
6	9.765	33.1	PK	37.2	-22	48.3	-	-	74	-25.7	0-360	100	V
7	* 7.323	43.65	PK	35.8	-25.6	53.85	-	-	74	-20.15	0-360	100	V
8	* 4.881	37.32	PK	34	-29.1	42.22	-	-	74	-31.78	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	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	44.48	PK2	34	-29.1	49.38	-	-	74	-24.62	328	310	H
* 4.882	37.66	VA1T	34	-29.1	42.56	54	-11.44	-	-	328	310	H
* 4.882	43.11	PK2	34	-29.1	48.01	-	-	74	-25.99	358	267	V
* 4.882	36.85	VA1T	34	-29.1	41.75	54	-12.25	-	-	358	267	V
* 7.323	49.99	PK2	35.8	-25.6	60.19	-	-	74	-13.81	144	260	V
* 7.323	47.98	PK2	35.8	-25.6	58.18	-	-	74	-15.82	25	359	H
* 7.323	41.58	VA1T	35.8	-25.6	51.78	54	-2.22	-	-	25	359	H
9.764	36.27	PK2	37.2	-22	51.47	-	-	74	-22.53	340	328	H
9.764	38.18	PK2	37.2	-22	53.38	-	-	74	-20.62	109	100	V
* 12.205	34.25	PK2	38.9	-21.3	51.85	-	-	74	-22.15	244	100	V
* 12.205	23.16	VA1T	38.9	-21.3	40.76	54	-13.24	-	-	244	100	V

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

For marker7, 7323MHz, used the following method to do averaging:

DCCF=20*Log(100ms/Ton)

Ton=2.88ms

DCCF=30.8

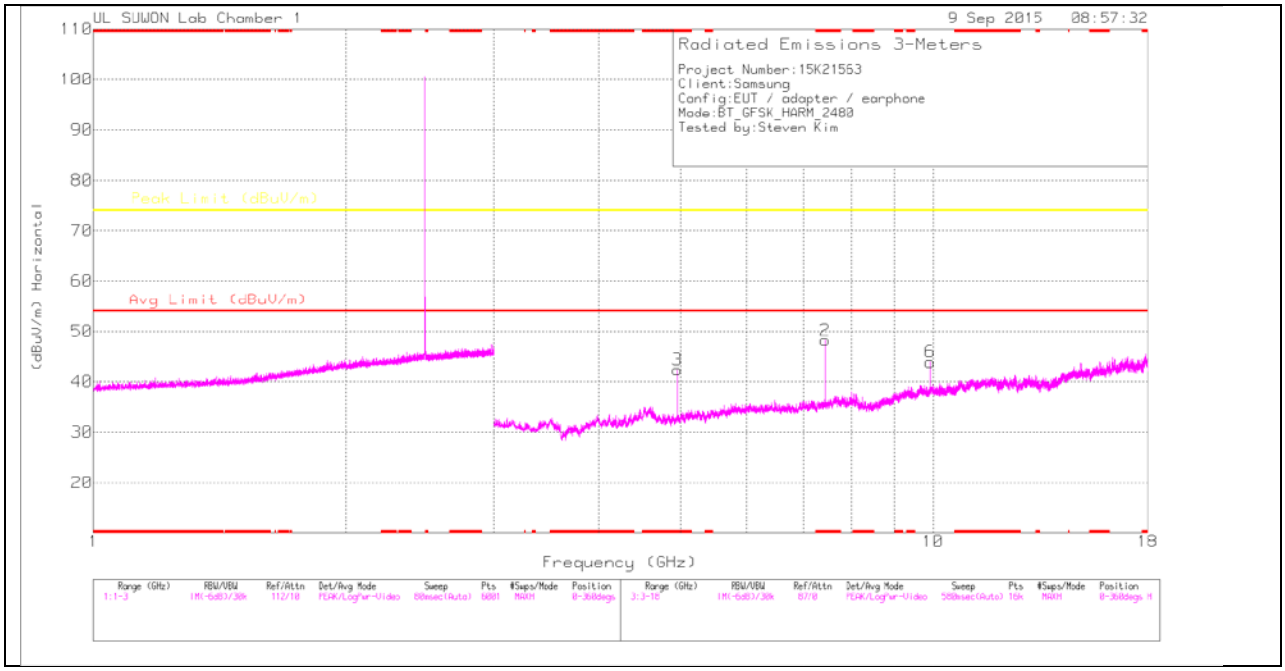
Corrected AV reading = Peak Reading – DCCF

=60.19 – 30.8 = 29.39dBuV/m

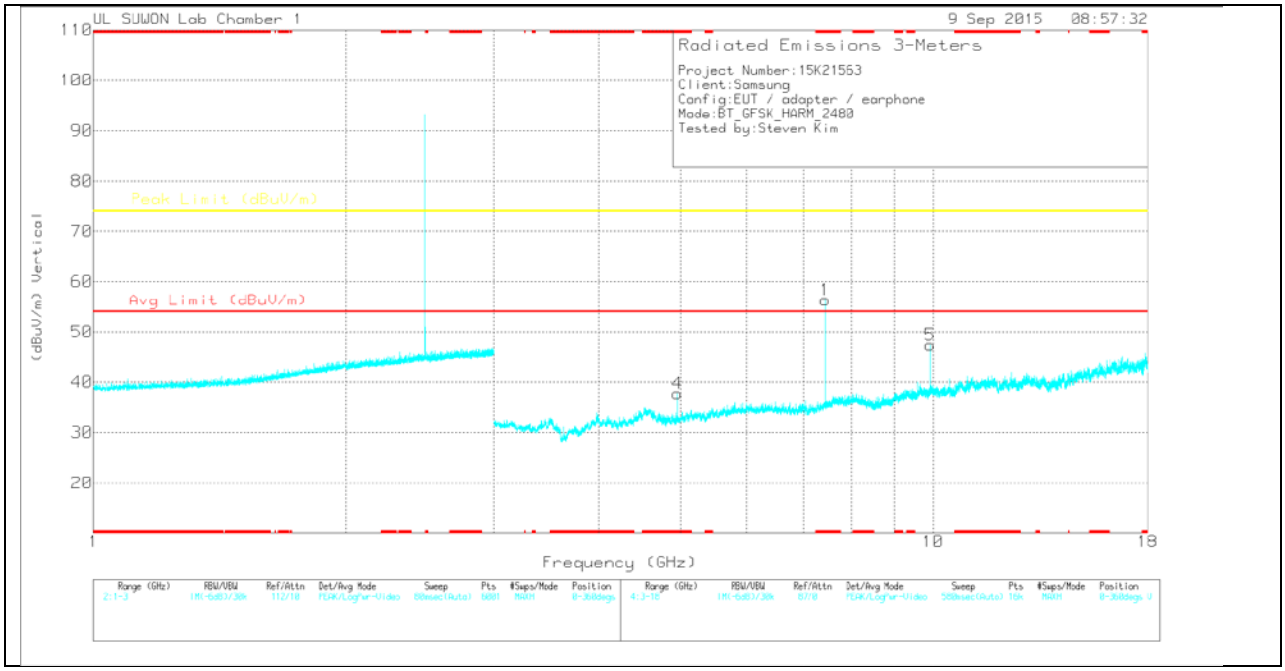
PK2 - KDB558074 Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 7.44	37.26	PK	35.8	-24.8	48.26	-	-	74	-25.74	0-360	100	H
3	* 4.959	37.3	PK	34	-28.9	42.4	-	-	74	-31.6	0-360	100	H
6	9.92	26.95	PK	37.4	-20.4	43.95	-	-	74	-30.05	0-360	200	H
1	* 7.44	45.37	PK	35.8	-24.8	56.37	-	-	74	-17.63	0-360	200	V
4	* 4.96	32.67	PK	34	-28.9	37.77	-	-	74	-36.23	0-360	100	V
5	9.92	30.4	PK	37.4	-20.4	47.4	-	-	74	-26.6	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	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	40.74	PK2	34	-28.9	45.84	-	-	74	-28.16	191	100	V
* 4.96	29.67	VA1T	34	-28.9	34.77	54	-19.23	-	-	191	100	V
* 4.96	42.58	PK2	34	-28.9	47.68	-	-	74	-26.32	344	301	H
* 4.96	32.92	VA1T	34	-28.9	38.02	54	-15.98	-	-	344	301	H
9.92	35.24	PK2	37.4	-20.4	52.24	-	-	74	-21.76	9	334	H
9.92	36.37	PK2	37.4	-20.4	53.37	-	-	74	-20.63	109	100	V
* 7.44	46.84	PK2	35.8	-24.8	57.84	-	-	74	-16.16	41	304	H
* 7.44	40.68	VA1T	35.8	-24.8	51.68	54	-2.32	-	-	41	304	H
* 7.44	51.09	PK2	35.8	-24.8	62.09	-	-	74	-11.91	121	309	V

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

For marker1, 7440MHz, used the following method to do averaging:

DCCF=20*Log(100ms/Ton)

Ton=2.88ms

DCCF=30.8

Corrected AV reading = Peak Reading – DCCF

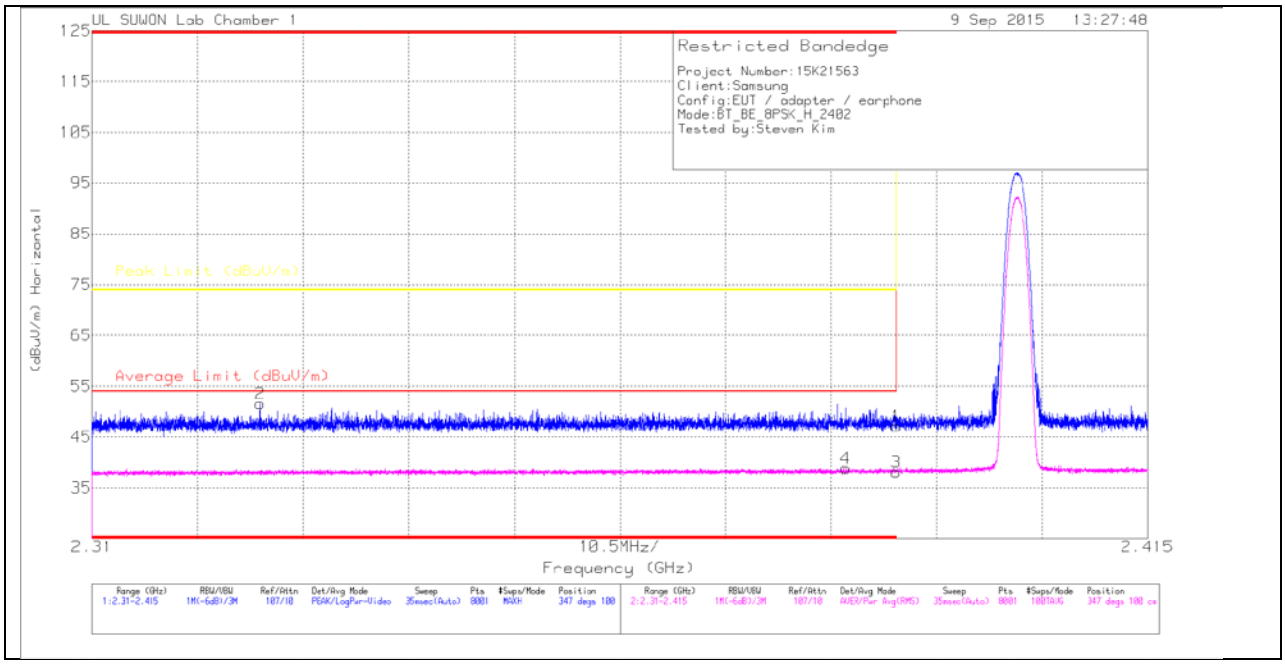
=62.09 – 30.8 = 31.29dBuV/m

PK2 - KDB558074 Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

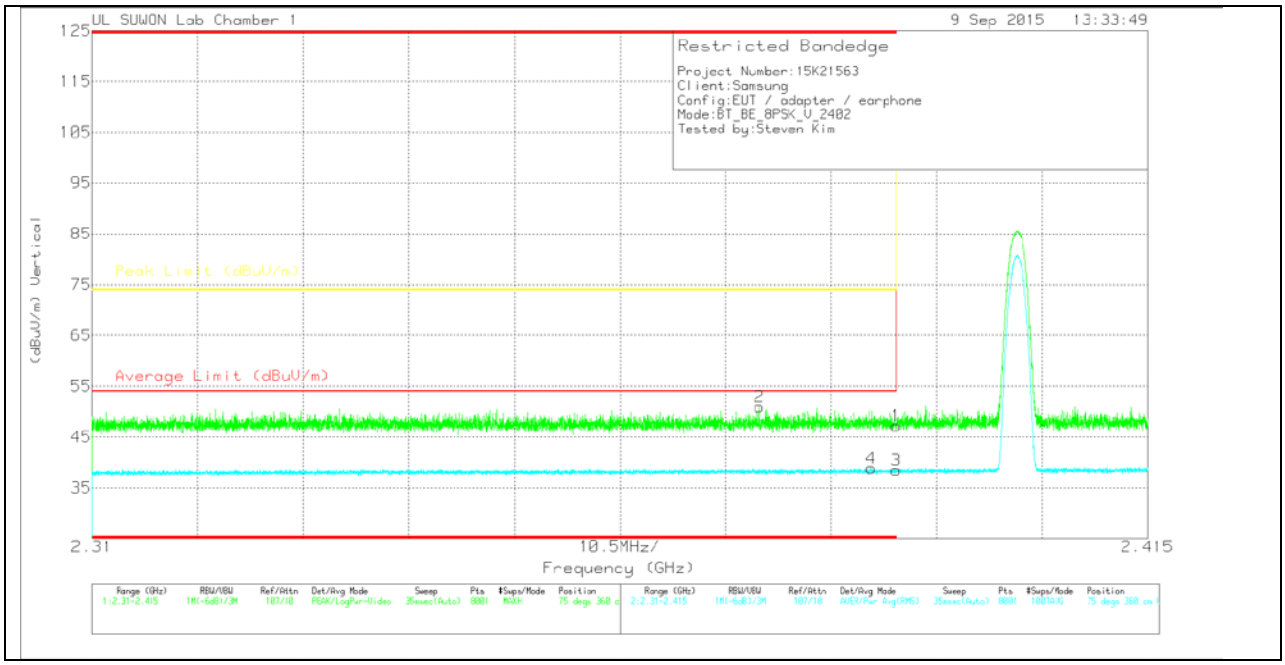
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	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	38.12	Pk	31.8	-22.8	47.12	-	-	74	-26.88	347	100	H
2	* 2.327	42.74	Pk	31.7	-22.9	51.54	-	-	74	-22.46	347	100	H
3	* 2.39	29.11	RMS	31.8	-22.8	38.11	54	-15.89	-	-	347	100	H
4	* 2.385	29.86	RMS	31.8	-22.8	38.86	54	-15.14	-	-	347	100	H

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

Pk - Peak detector

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

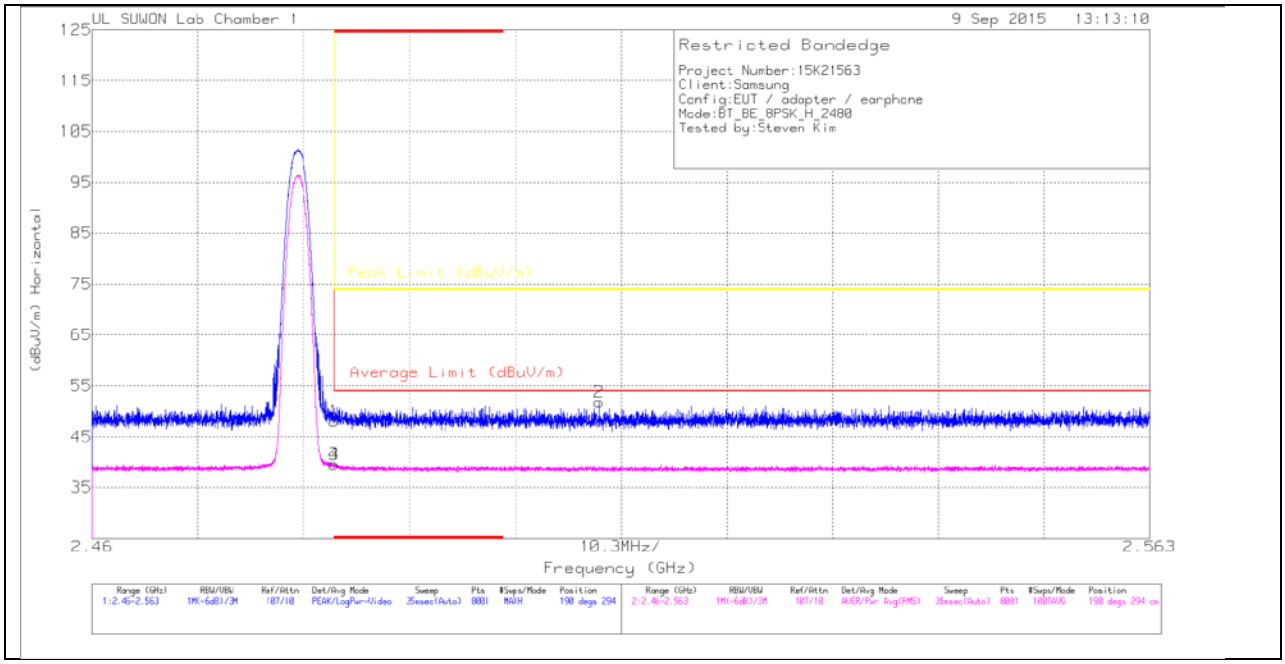
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.23	Pk	31.8	-22.8	47.23	-	-	74	-26.77	75	360	V
2	* 2.376	41.89	Pk	31.8	-22.8	50.89	-	-	74	-23.11	75	360	V
3	* 2.39	29.46	RMS	31.8	-22.8	38.46	54	-15.54	-	-	75	360	V
4	* 2.387	29.83	RMS	31.8	-22.8	38.83	54	-15.17	-	-	75	360	V

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

Pk - Peak detector

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

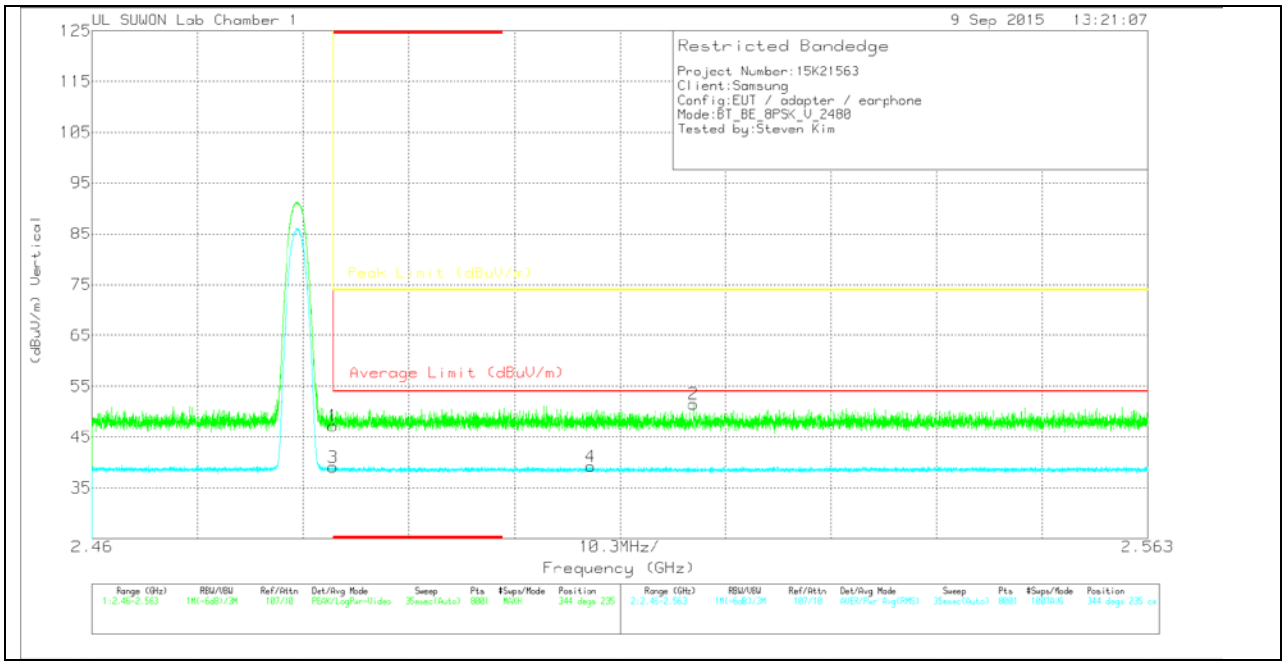
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.69	Pk	32	-22.6	48.09	-	-	74	-25.91	190	294	H
2	2.509	42.4	Pk	32	-22.6	51.8	-	-	74	-22.2	190	294	H
3	* 2.484	30.16	RMS	32	-22.6	39.56	54	-14.44	-	-	190	294	H
4	* 2.484	30.2	RMS	32	-22.6	39.6	54	-14.4	-	-	190	294	H

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

Pk - Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

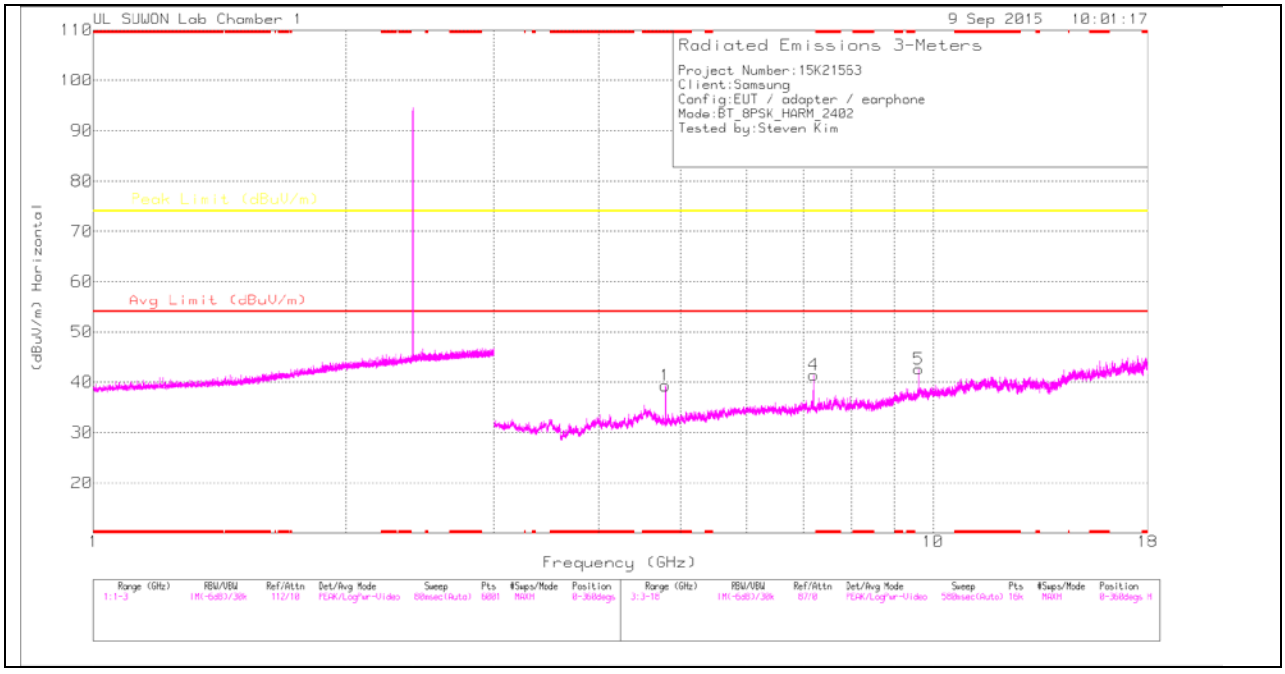
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.84	Pk	32	-22.6	47.24	-	-	74	-26.76	344	235	V
2	2.519	42.1	Pk	32	-22.6	51.5	-	-	74	-22.5	344	235	V
3	* 2.484	29.69	RMS	32	-22.6	39.09	54	-14.91	-	-	344	235	V
4	2.509	29.79	RMS	32	-22.6	39.19	54	-14.81	-	-	344	235	V

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

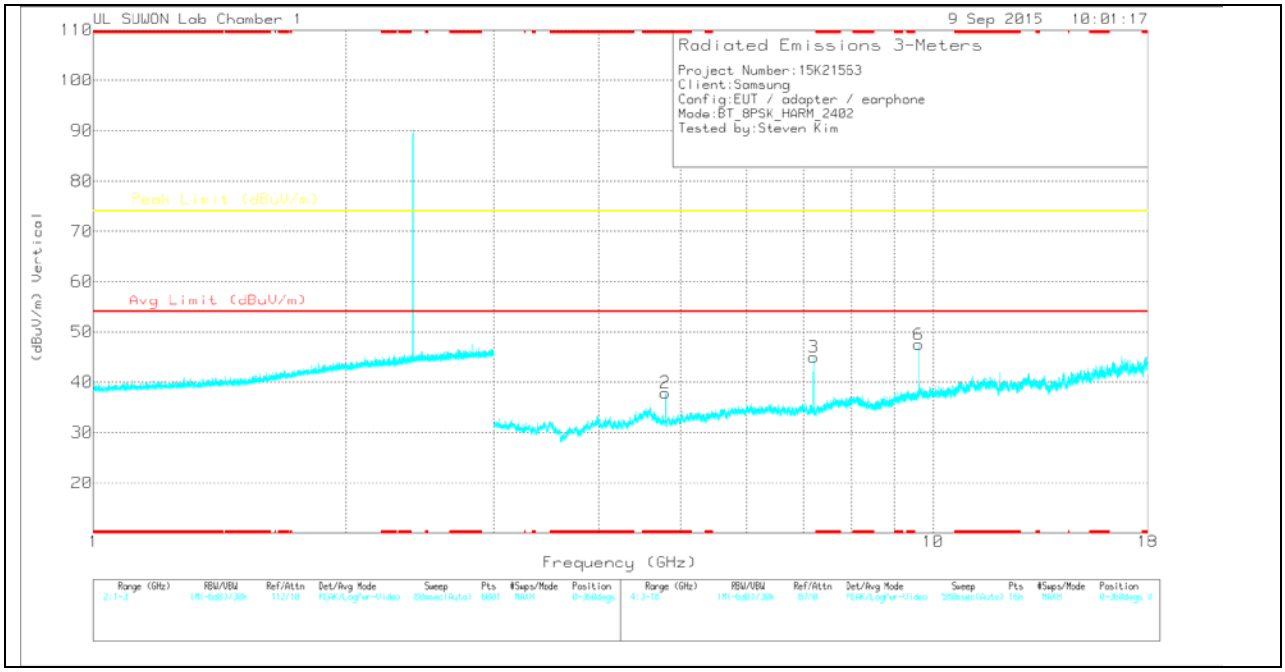
Pk - Peak detector

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	ANT Factor	Path_loss	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	* 4.804	35.13	PK	34	-29.8	39.33	-	-	74	-34.67	0-360	100	H	1
4	7.205	31.13	PK	35.7	-25.4	41.43	-	-	74	-32.57	0-360	200	H	4
5	9.608	26.6	PK	37	-21	42.6	-	-	74	-31.4	0-360	200	H	5
2	* 4.804	33.7	PK	34	-29.8	37.9	-	-	74	-36.1	0-360	200	V	2
3	7.205	34.71	PK	35.7	-25.4	45.01	-	-	74	-28.99	0-360	100	V	3
6	9.608	31.46	PK	37	-21	47.46	-	-	74	-26.54	0-360	100	V	6

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

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	44.08	PK2	34	-29.8	48.28	-	-	74	-25.72	304	344	H
* 4.804	33.08	VA1T	34	-29.8	37.28	54	-16.72	-	-	304	344	H
* 4.804	42.74	PK2	34	-29.8	46.94	-	-	74	-27.06	63	306	V
* 4.804	31.06	VA1T	34	-29.8	35.26	54	-18.74	-	-	63	306	V
7.206	46.76	PK2	35.7	-25.4	57.06	-	-	74	-16.94	125	349	V
7.206	44.84	PK2	35.7	-25.4	55.14	-	-	74	-18.86	26	400	H
9.608	35.28	PK2	37	-21	51.28	-	-	74	-22.72	287	259	H
9.608	37.12	PK2	37	-21	53.12	-	-	74	-20.88	115	366	V

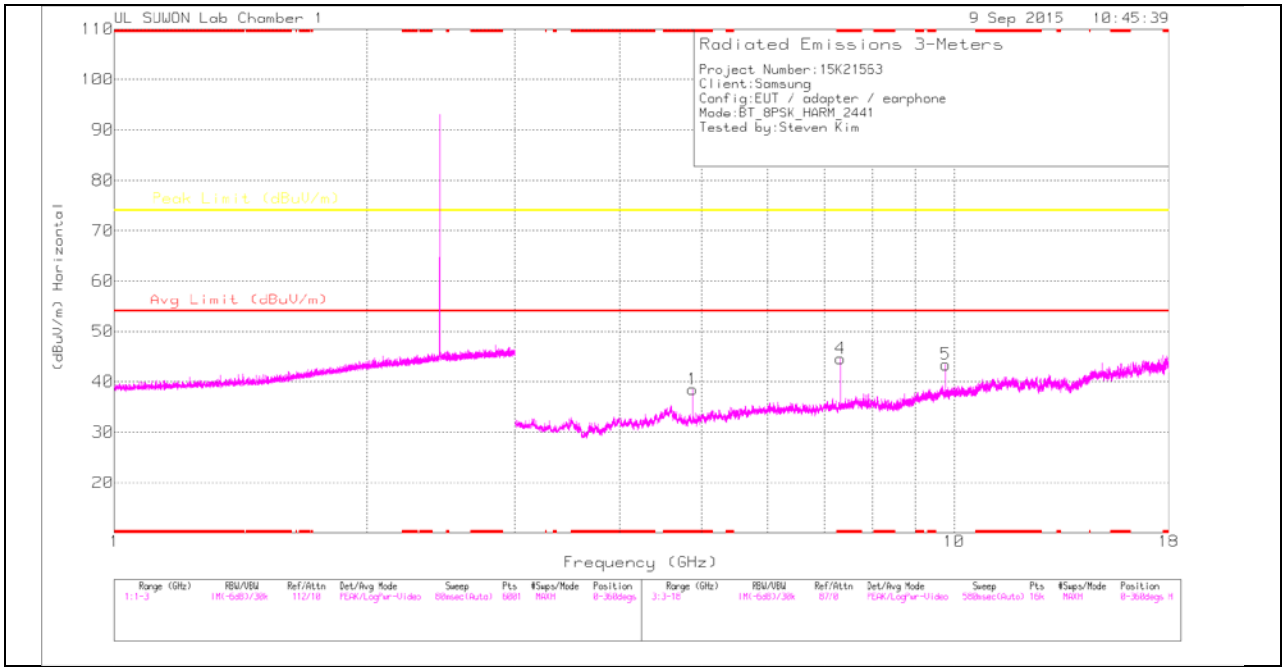
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

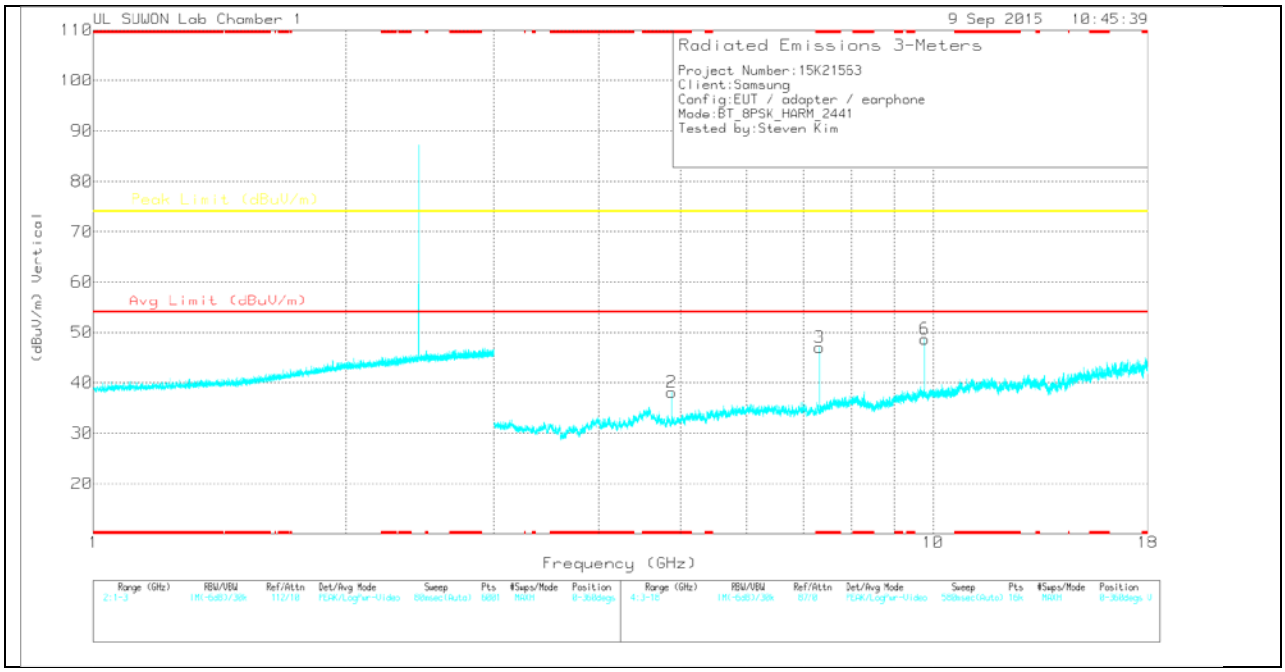
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



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

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881	33.57	PK	34	-29.1	38.47	-	-	74	-35.53	0-360	100	H
4	* 7.323	34.43	PK	35.8	-25.6	44.63	-	-	74	-29.37	0-360	200	H
5	9.764	28.25	PK	37.2	-22	43.45	-	-	74	-30.55	0-360	200	H
2	* 4.881	33.2	PK	34	-29.1	38.1	-	-	74	-35.9	0-360	100	V
3	* 7.323	36.83	PK	35.8	-25.6	47.03	-	-	74	-26.97	0-360	100	V
6	9.764	33.48	PK	37.2	-22	48.68	-	-	74	-25.32	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	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	44.41	PK2	34	-29.1	49.31	-	-	74	-24.69	328	310	H
* 4.882	32.45	VA1T	34	-29.1	37.35	54	-16.65	-	-	328	310	H
* 4.882	42.28	PK2	34	-29.1	47.18	-	-	74	-26.82	0	296	V
* 4.882	30.19	VA1T	34	-29.1	35.09	54	-18.91	-	-	0	296	V
* 7.323	50.38	PK2	35.8	-25.6	60.58	-	-	74	-13.42	121	297	V
* 7.323	38.76	VA1T	35.8	-25.6	48.96	54	-5.04	-	-	121	297	V
* 7.323	48.1	PK2	35.8	-25.6	58.3	-	-	74	-15.7	41	336	H
* 7.323	36.55	VA1T	35.8	-25.6	46.75	54	-7.25	-	-	41	336	H
9.764	35.29	PK2	37.2	-22	50.49	-	-	74	-23.51	219	257	H
9.764	37.26	PK2	37.2	-22	52.46	-	-	74	-21.54	109	263	V

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

PK2 - KDB558074 Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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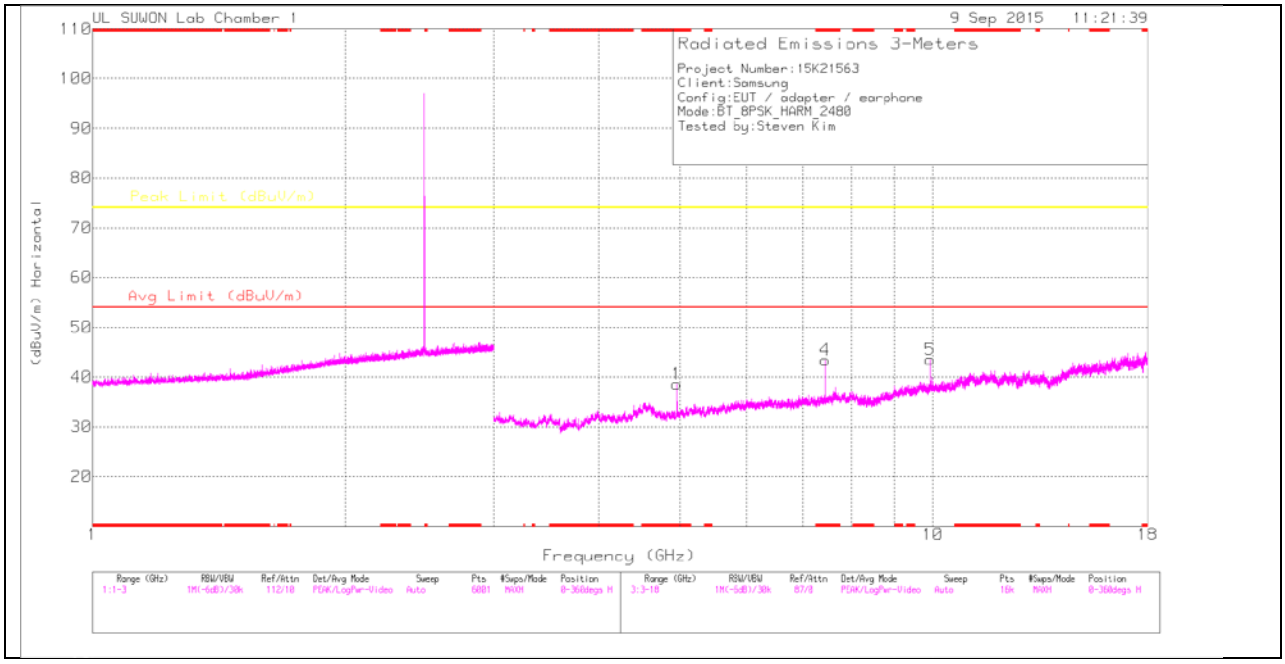
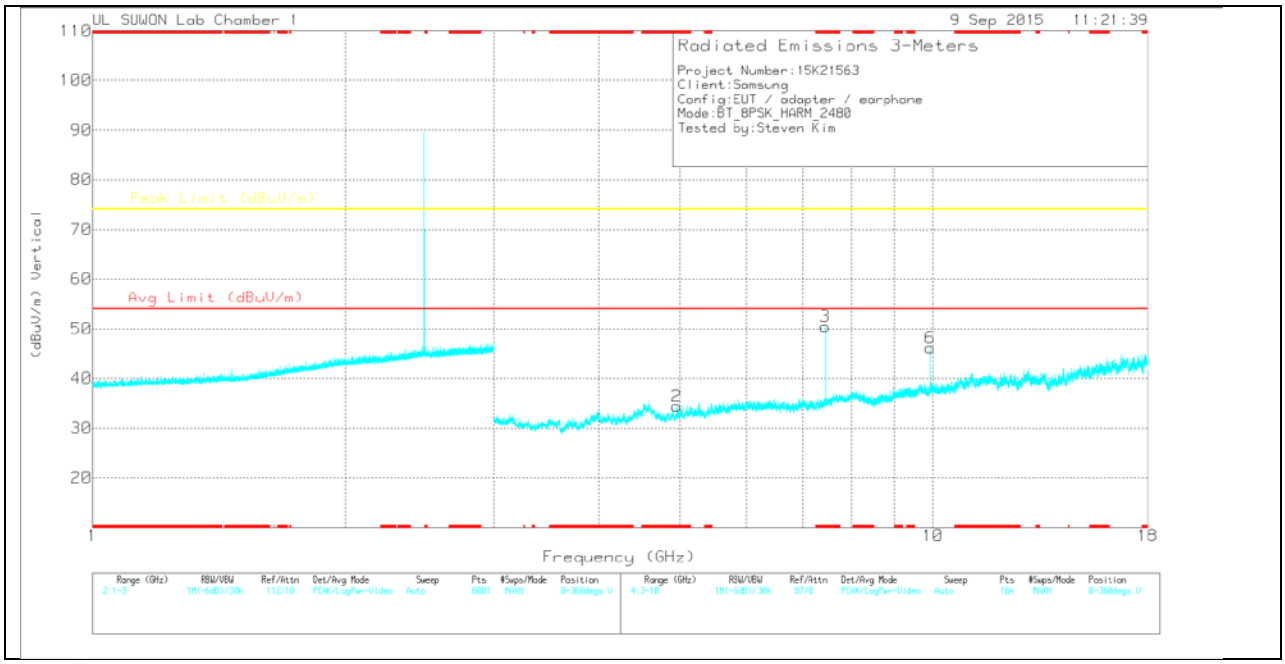
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



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

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	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	* 4.959	33.46	PK	34	-28.9	38.56	-	-	74	-35.44	0-360	100	H	1
4	* 7.44	32.46	PK	35.8	-24.8	43.46	-	-	74	-30.54	0-360	200	H	4
5	9.92	26.53	PK	37.4	-20.4	43.53	-	-	74	-30.47	0-360	200	H	5
2	* 4.96	29.37	PK	34	-28.9	34.47	-	-	74	-39.53	0-360	200	V	2
3	* 7.44	39.47	PK	35.8	-24.8	50.47	-	-	74	-23.53	0-360	200	V	3
6	9.92	29.14	PK	37.4	-20.4	46.14	-	-	74	-27.86	0-360	100	V	6

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

PK – Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	ANT Factor	Path_loss	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	41.61	PK2	34	-28.9	46.71	-	-	74	-27.29	343	109	H
* 4.96	29.83	VA1T	34	-28.9	34.93	54	-19.07	-	-	343	109	H
* 7.44	46.5	PK2	35.8	-24.8	57.5	-	-	74	-16.5	38	342	H
* 7.44	35.21	VA1T	35.8	-24.8	46.21	54	-7.79	-	-	38	342	H
* 7.44	48.71	PK2	35.8	-24.8	59.71	-	-	74	-14.29	122	253	V
* 7.44	37.58	VA1T	35.8	-24.8	48.58	54	-5.42	-	-	122	253	V
9.92	36.83	PK2	37.4	-20.4	53.83	-	-	74	-20.17	110	100	V
9.92	34.54	PK2	37.4	-20.4	51.54	-	-	74	-22.46	26	271	H

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

PK2 - KDB558074 Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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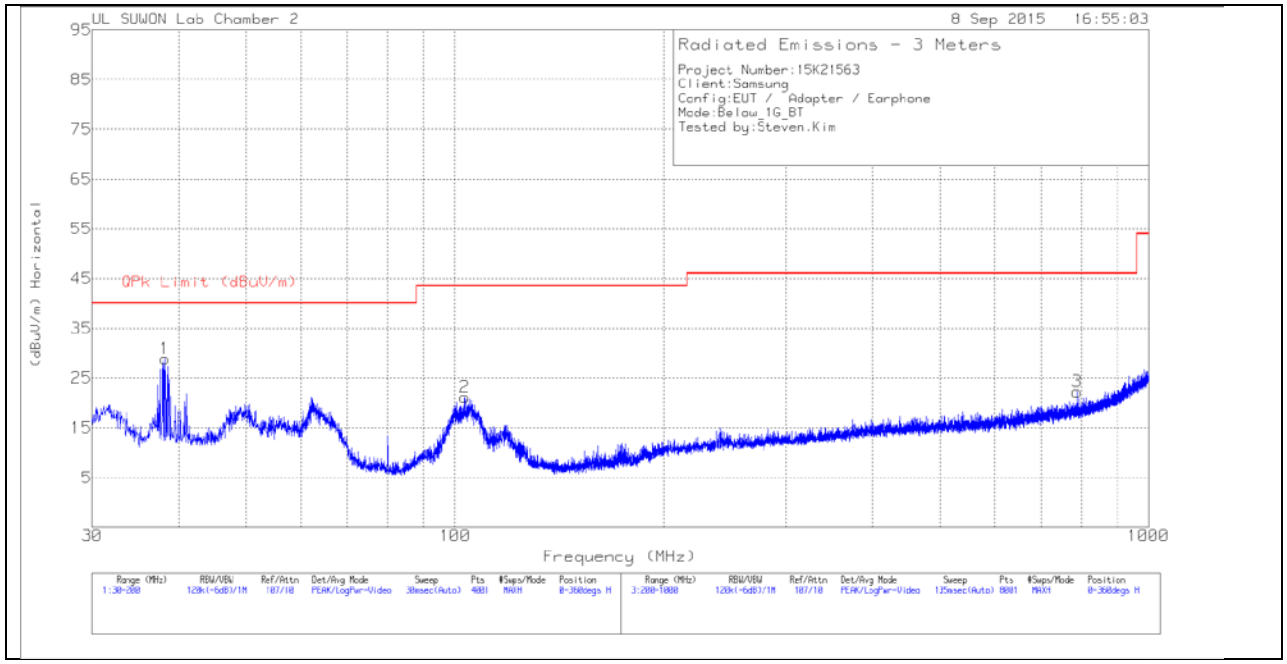
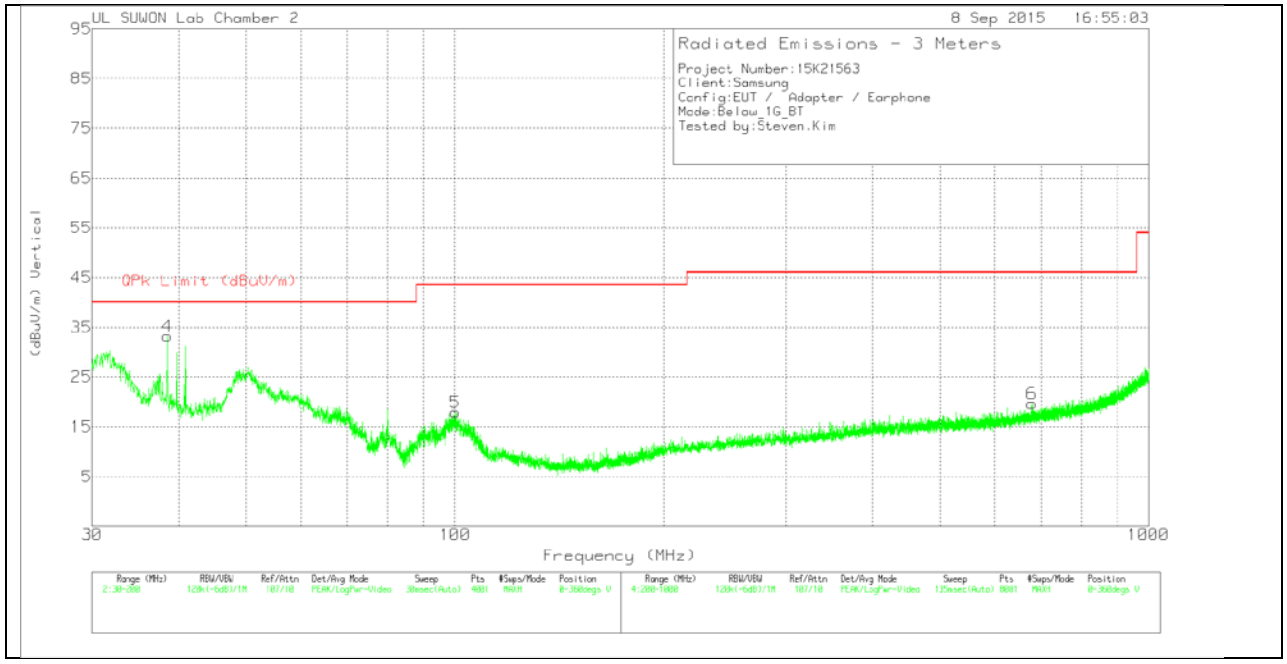
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT Factor	Below_1G	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	38.2025	47.73	Pk	12	-30.8	28.93	40	-11.07	0-360	200	H
2	103.2275	40.52	Pk	11.3	-30.6	21.22	43.52	-22.3	0-360	300	H
4	38.5	51.93	Pk	12.1	-30.8	33.23	40	-6.77	0-360	100	V
5	100.21	36.8	Pk	11.6	-30.5	17.9	43.52	-25.62	0-360	100	V
3	787.8	33.27	Pk	17.8	-28.8	22.27	46.02	-23.75	0-360	200	H
6	678.9	31.89	Pk	17	-29.2	19.69	46.02	-26.33	0-360	100	V
1	38.2025	47.73	Pk	12	-30.8	28.93	40	-11.07	0-360	200	H

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 C63.10.

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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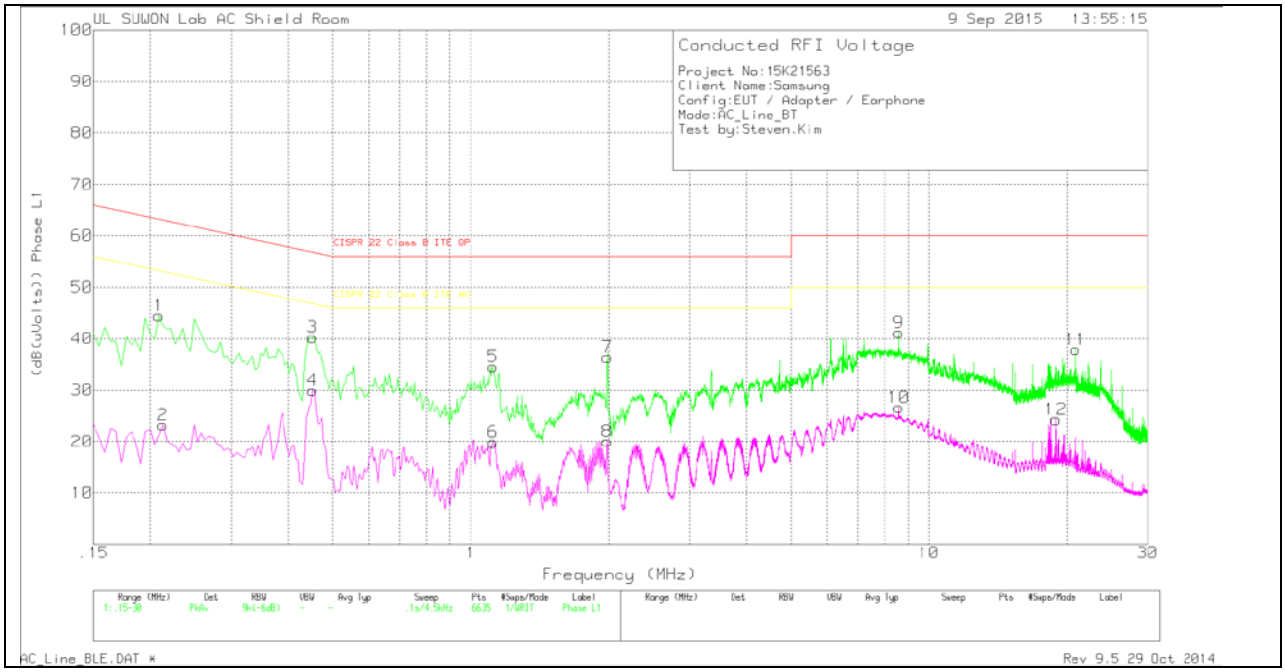
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

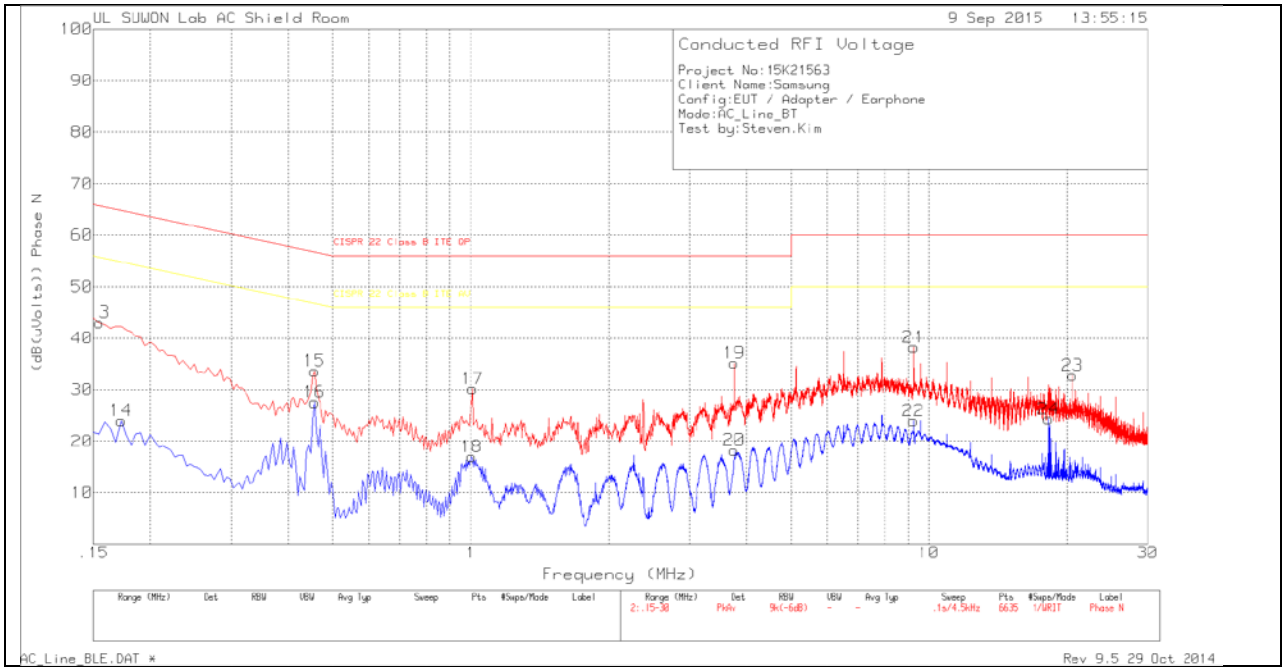
Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.2085	34.54	Pk	9.9	0	44.44	63.26	-18.82	-	-
2	.213	13.29	Av	9.9	0	23.19	-	-	53.09	-29.9
3	.4515	30.17	Pk	10.1	0	40.27	56.85	-16.58	-	-
4	.4515	19.8	Av	10.1	0	29.9	-	-	46.85	-16.95
5	1.1175	24.67	Pk	9.9	0	34.57	56	-21.43	-	-
6	1.1175	9.97	Av	9.9	0	19.87	-	-	46	-26.13
7	1.986	26.5	Pk	9.8	.1	36.4	56	-19.6	-	-
8	1.986	10.13	Av	9.8	.1	20.03	-	-	46	-25.97
9	8.592	31.2	Pk	9.9	.1	41.2	60	-18.8	-	-
10	8.5875	16.64	Av	9.9	.1	26.64	-	-	50	-23.36
11	20.922	27.25	Pk	10.4	.2	37.85	60	-22.15	-	-
12	18.915	13.77	Av	10.3	.2	24.27	-	-	50	-25.73

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.1545	33.15	Pk	9.9	0	43.05	65.75	-22.7	-	-
14	.1725	13.8	Av	10.2	0	24	-	-	54.84	-30.84
15	.456	23.54	Pk	10.1	0	33.64	56.77	-23.13	-	-
16	.456	17.47	Av	10.1	0	27.57	-	-	46.77	-19.2
17	1.0095	20.29	Pk	9.9	0	30.19	56	-25.81	-	-
18	1.005	7.07	Av	9.9	0	16.97	-	-	46	-29.03
19	3.759	25.31	Pk	9.8	.1	35.21	56	-20.79	-	-
20	3.759	8.36	Av	9.8	.1	18.26	-	-	46	-27.74
21	9.258	28.04	Pk	10	.2	38.24	60	-21.76	-	-
22	9.249	13.72	Av	10	.2	23.92	-	-	50	-26.08
23	20.562	21.97	Pk	10.6	.2	32.77	60	-27.23	-	-
24	18.2445	13.62	Av	10.5	.2	24.32	-	-	50	-25.68

Pk - Peak detector

Av - Average detection