



**FCC CFR47 PART 15 SUBPART C**

**Bluetooth**

**CERTIFICATION TEST REPORT**

**FOR**

**LTE Watch + BT/BLE and DTS b/g/n**

**MODEL NUMBER : SM-R765V**

**FCC ID: A3LSMR765V**

**REPORT NUMBER: 4787821625-E3V3**

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	02/03/17	Initial issue	Junwhan Lee
V2	02/09/17	Revised section 2 and note on section 9. Test result of OBW moved to new section 7 (Reference measurement results)	Junwhan Lee
V3	02/10/17	Revised section 5.4	Junwhan Lee

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.  
**EUT DESCRIPTION:** LTE Watch + BT/BLE and DTS b/g/n  
**MODEL NUMBER:** SM-R765V  
**SERIAL NUMBER:** R3AH8008D4T, R3AH8008L9F, R3AH8008H6J,  
R3AH8008GVV, R3AH8008H2R (RADIATED);  
R3AH8008DPT (CONDUCTED)  
**DATE TESTED:** JAN 12, 2017 - JAN 18, 2017

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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Tested By:



SungGil Park  
Suwon Lab Engineer  
UL Korea, Ltd.



Junwhan Lee  
Suwon Lab Engineer  
UL Korea, Ltd.

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. FCC DA 00-705 Filling and measurement guidelines for FHSS systems
4. ANSI C63.10-2013.

## 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	
<input checked="" type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2

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

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

### 4.3. MEASUREMENT UNCERTAINTY

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

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

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a LTE Watch + BT/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	14.782	30.075
		Peak	14.971	31.412
	Enhanced Pi/4-DPSK	Average	8.601	7.246
		Peak	11.323	13.561
	Enhanced 8PSK	Average	8.604	7.251
		Peak	11.890	15.453

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -4.5 dBi.

### 5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

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

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 9.5.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Adapter	SAMSUNG	ETA0U60JBE	DK2H202VS/7 -E	N/A
Data Cable	SAMSUNG	ECB-DU2EBE	N/A	N/A
Wireless Charger	SAMSUNG	EP-YO760	RF7HC1KGZSVCIS	A3LEPYO760

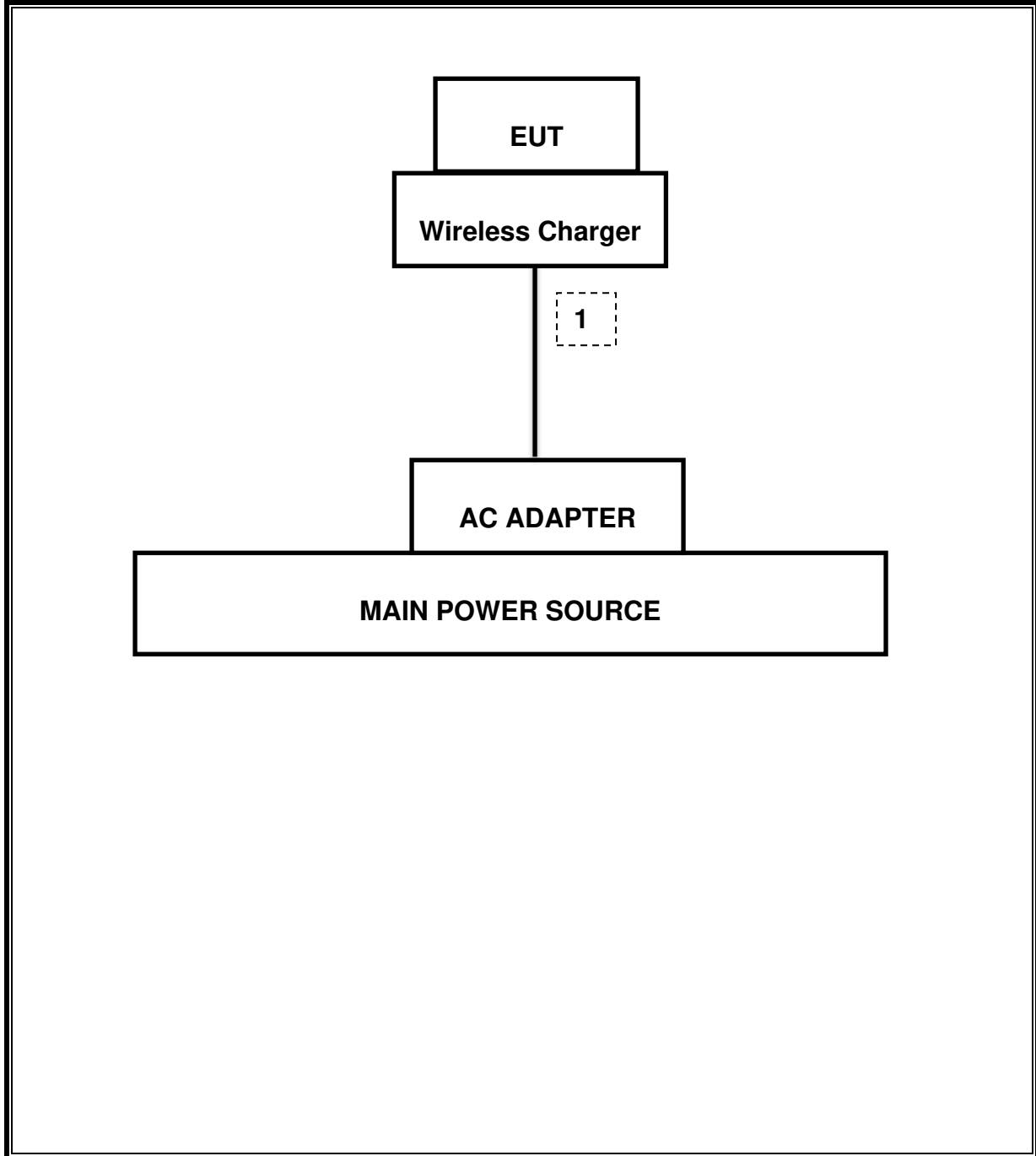
### I/O CABLES

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

### 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.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	10-14-18
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	10-14-18
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-17
Average Power Sensor	R&S	NRP-Z91	102681	08-16-17
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-17-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-16-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-17-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-16-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	009	08-17-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	016	08-16-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Attenuator	PASTERNAK	PE7087-10	A009	08-16-17
Combiner	WEINSCHL	1575	2151	08-17-17
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

## 7. REFERENCE MEASUREMENT RESULTS

### 7.1. 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  $\geq$  1% of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

#### RESULTS

##### 7.1.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [KHz]
Low	2402	1.047	898.060
Mid	2441	1.046	899.000
High	2480	1.045	900.000
Worst		1.047	900.000

##### 7.1.2. ENHANCED DATA RATE Pi/4-DQPSK MODULATION

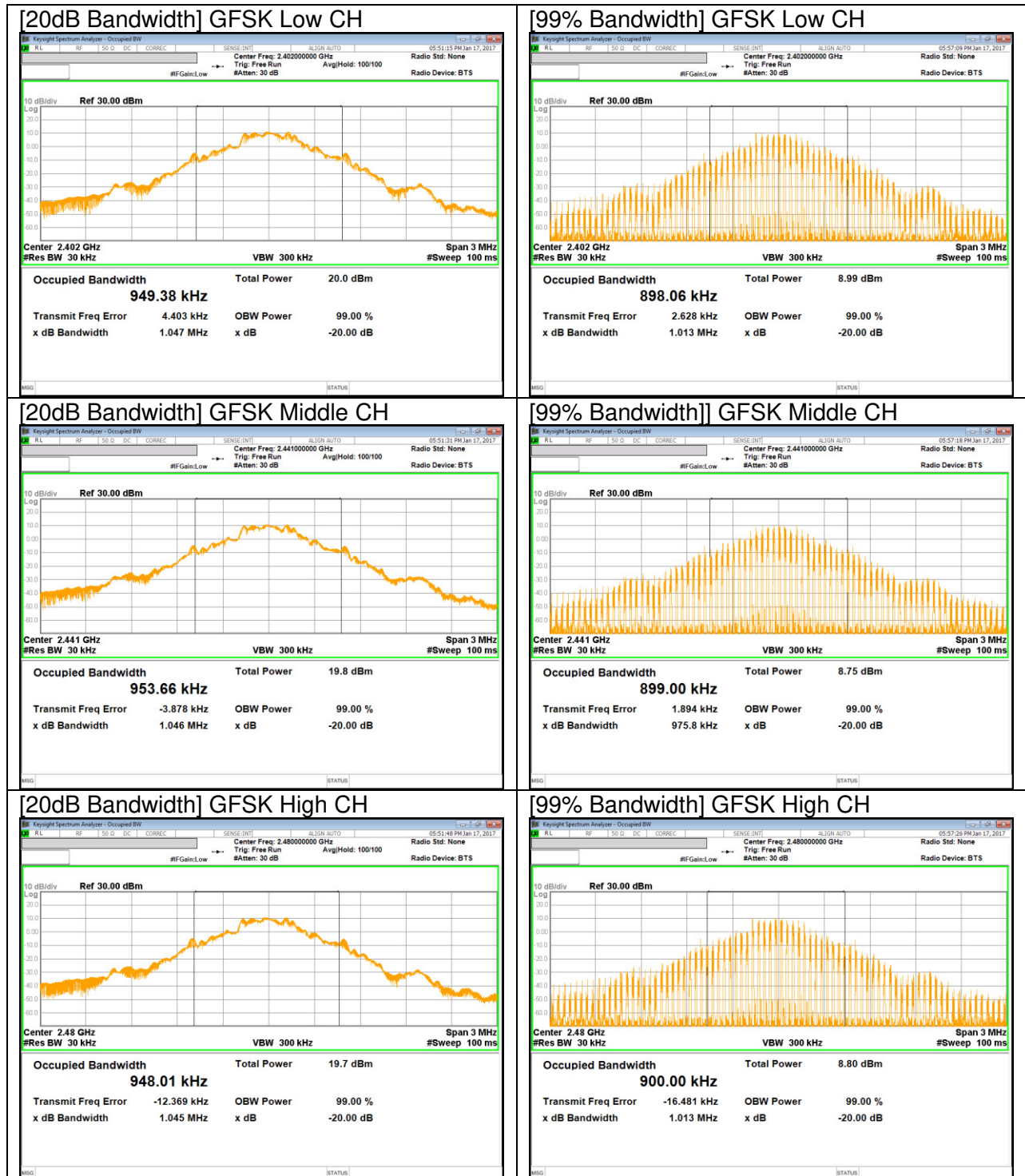
Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.347	1.164
Mid	2441	1.349	1.165
High	2480	1.348	1.167
Worst		1.349	1.167

##### 7.1.3. ENHANCED DATA RATE 8PSK MODULATION

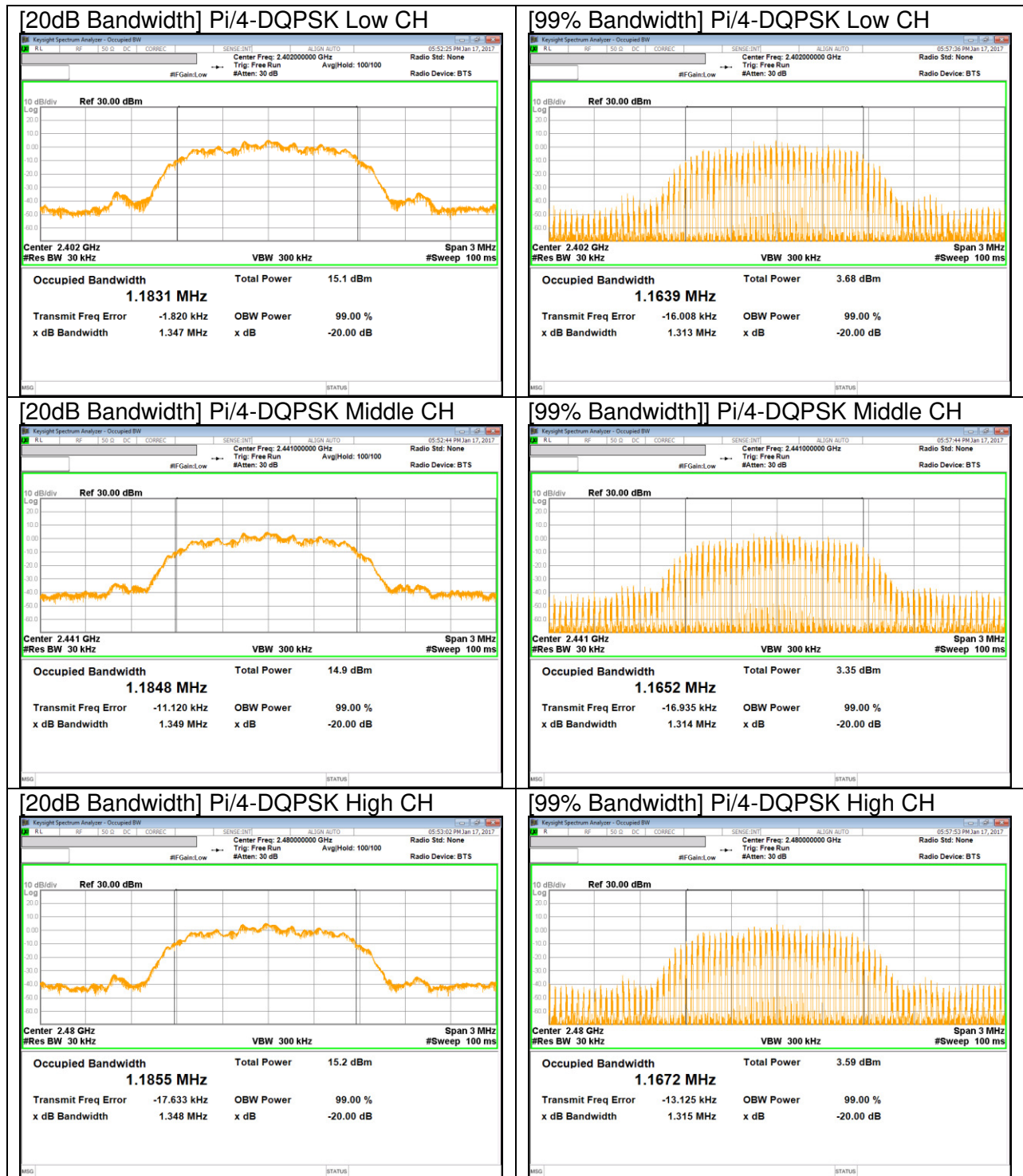
Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
Low	2402	1.306	1.165
Mid	2441	1.310	1.165
High	2480	1.308	1.164
Worst		1.310	1.165

### 7.1.4. 20 dB AND 99% BANDWIDTH PLOTS

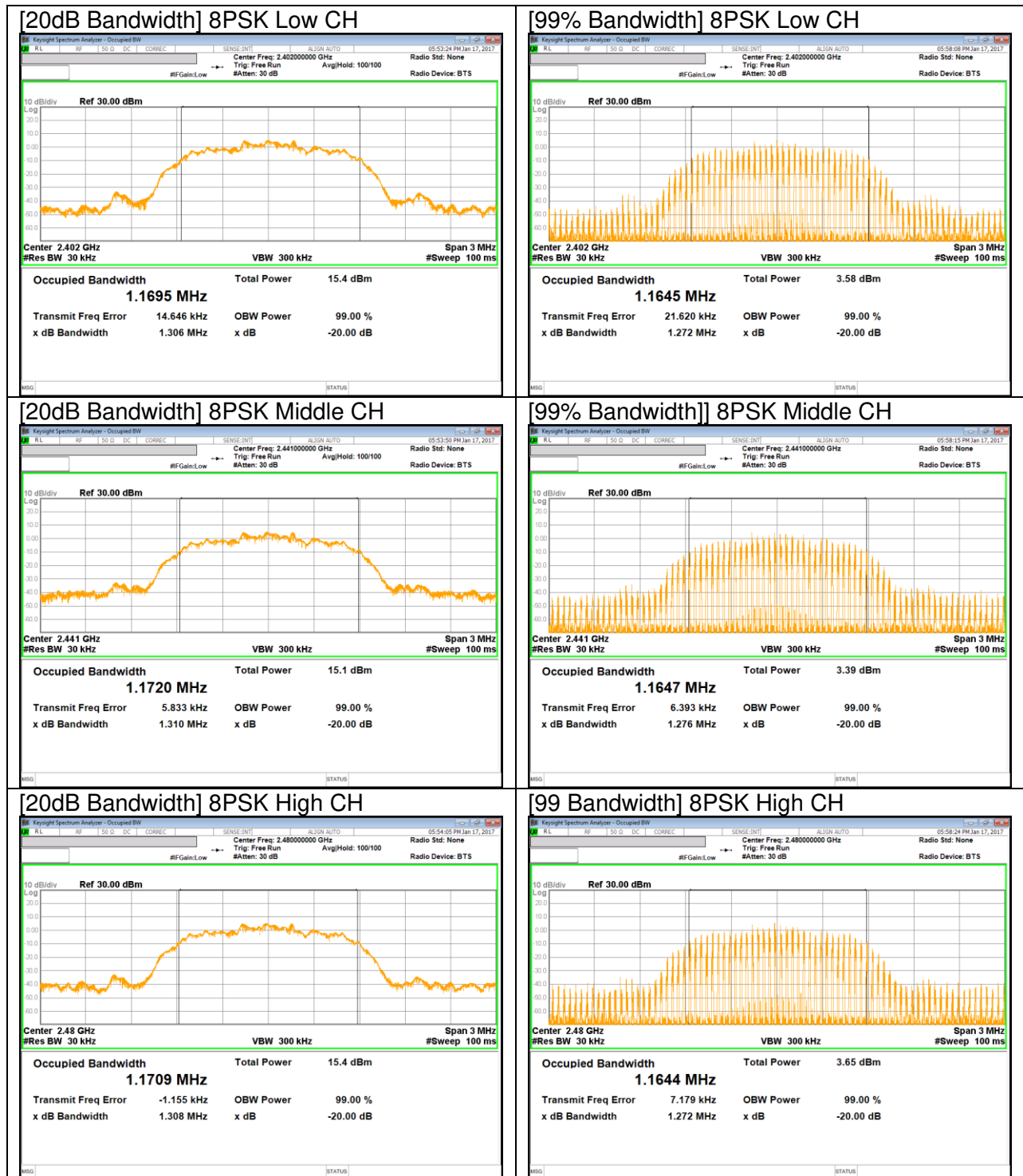
#### GFSK BANDWIDTH



**Pi/4-DQPSK BANDWIDTH**



**8PSK BANDWIDTH**



## 8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-37.561 dBm
15.247 (b)(1)	TX conducted output power	<21dBm		Pass	14.971 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	0.37453 sec
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	40.04 dBuV (Pk)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	45.09 dBuV/m (Av)

## 9. ANTENNA PORT TEST RESULTS

### 9.1. 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 hopping channel, whichever is greater.

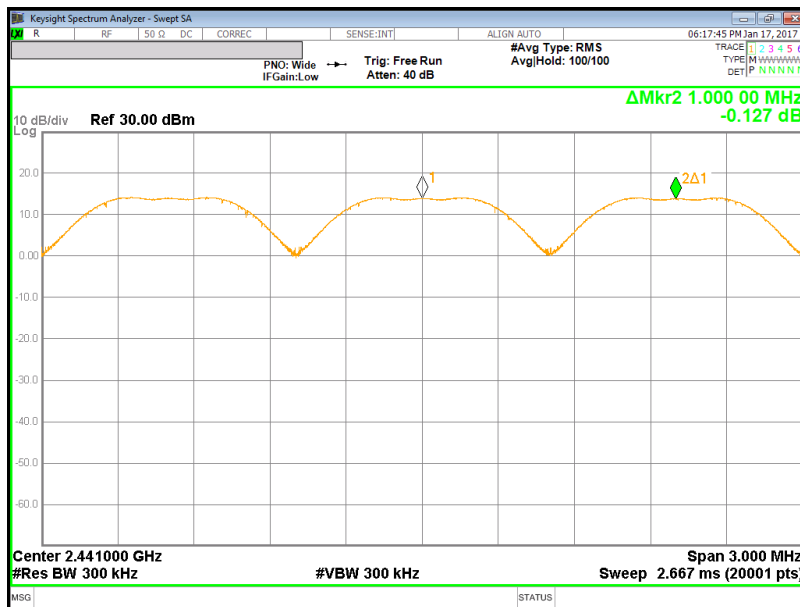
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



## 9.2. 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

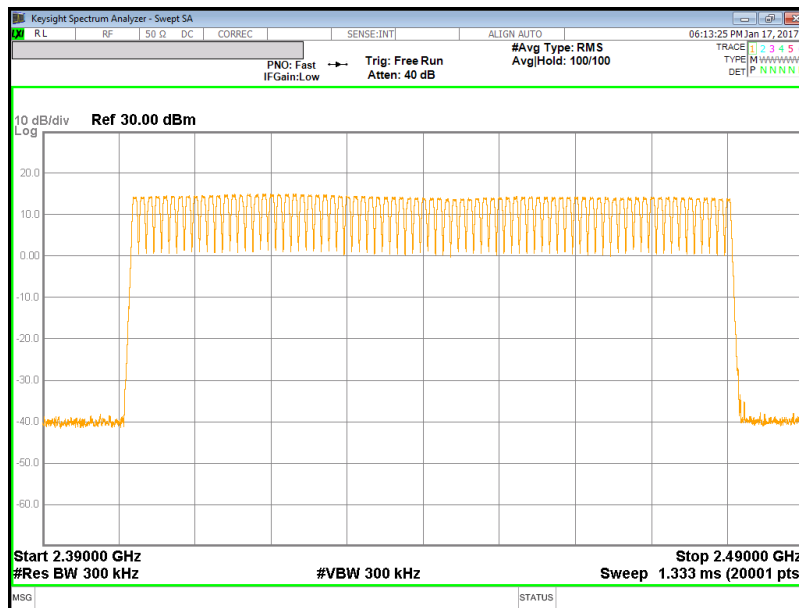
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

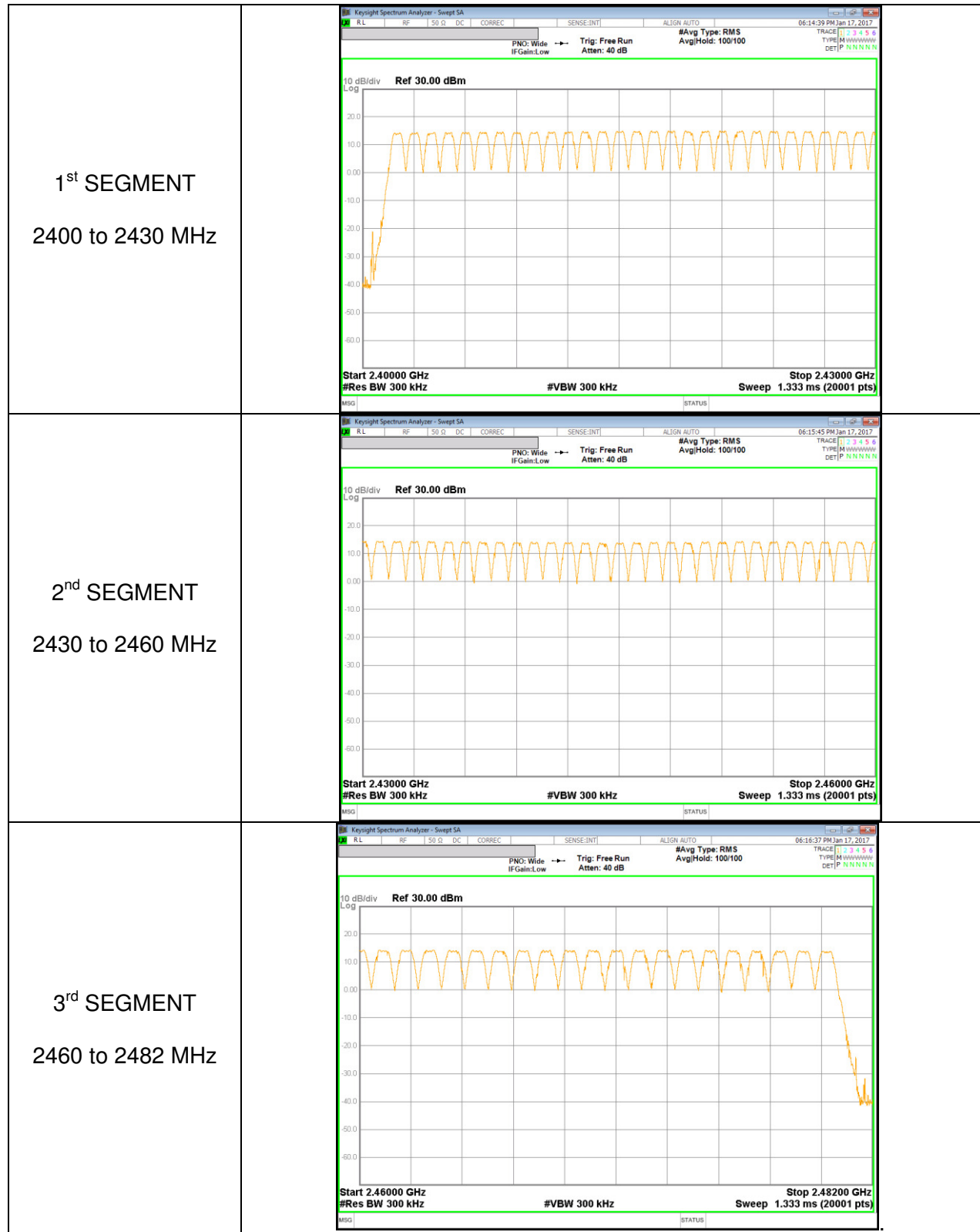
### RESULTS

Normal Mode: 79 Channels observed.

### NUMBER OF HOPPING CHANNELS PLOTS

#### NUMBER OF HOPPING CHANNELS (100 MHz SPAN)





### 9.3. 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.

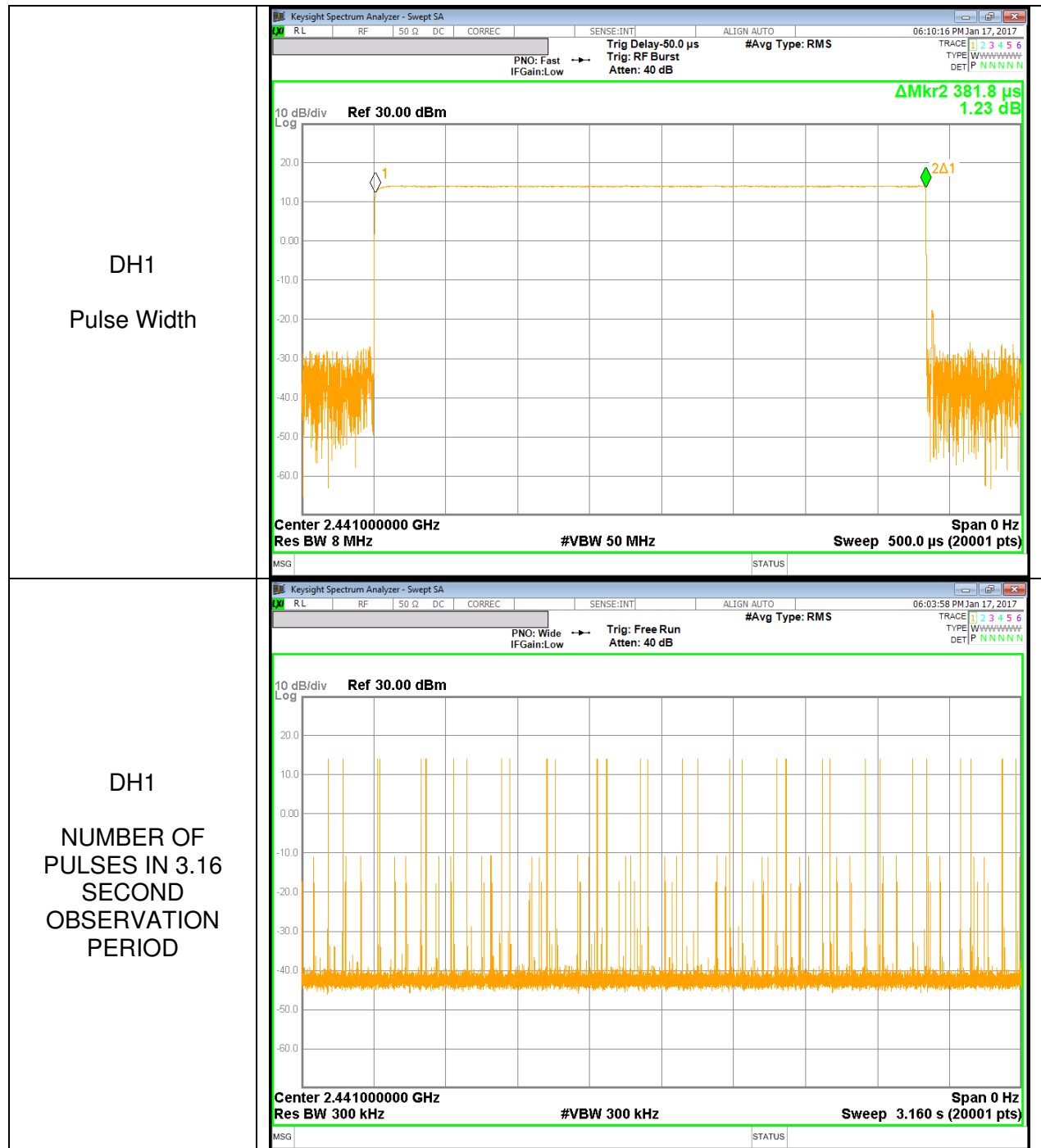
The average time of occupancy in the specified 31.6 second period (79 channels \* 0.4 s) is equal to  $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$ .

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

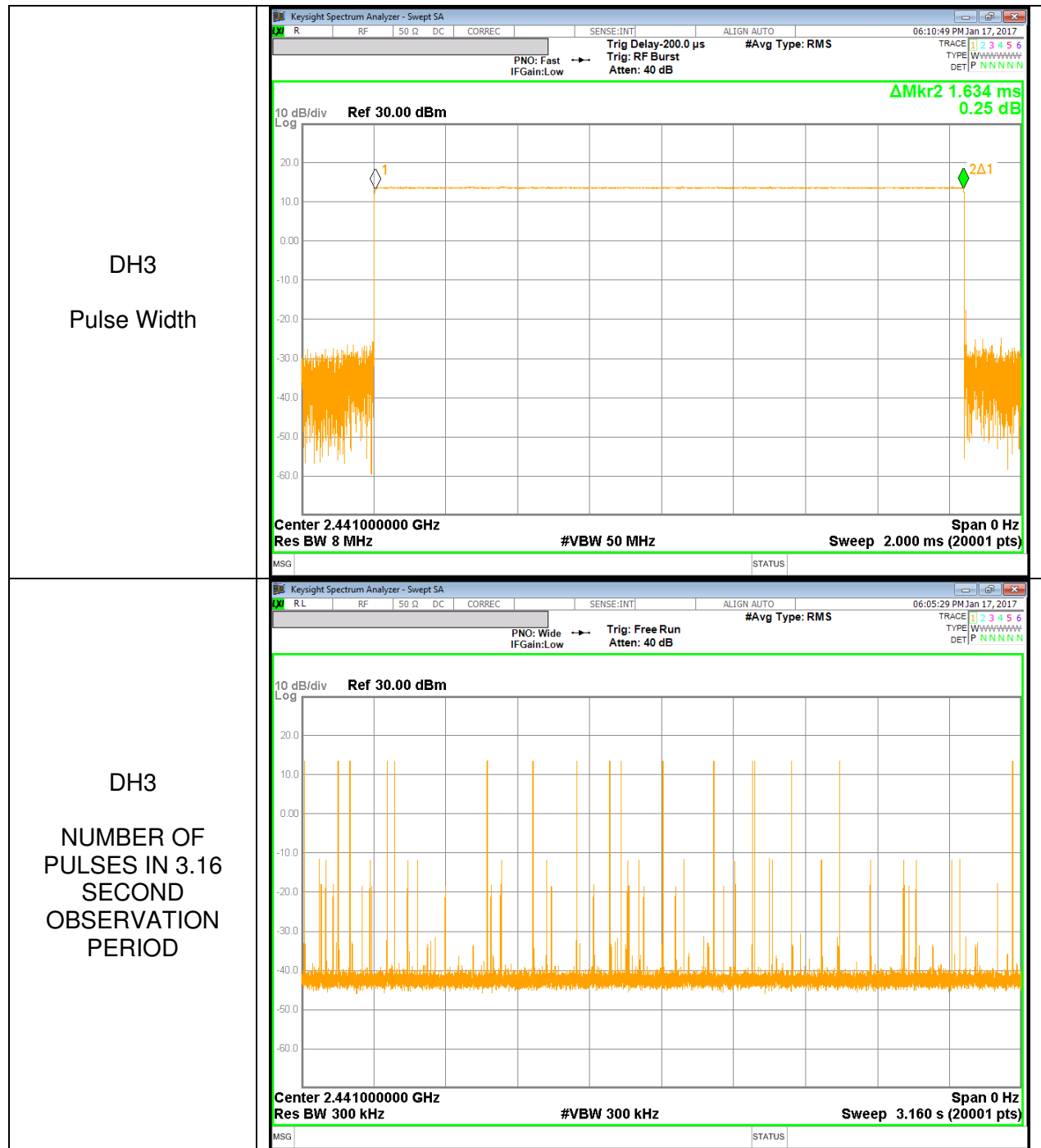
#### RESULTS

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	0.122176	0.4	-0.2778
DH3	1.634	17	0.277780	0.4	-0.1222
DH5	2.881	13	0.374530	0.4	-0.0255
GFSK AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
DH1	0.382	8	0.030544	0.4	-0.36946
DH3	1.634	4.25	0.069445	0.4	-0.33056
DH5	2.881	3.25	0.093633	0.4	-0.30637

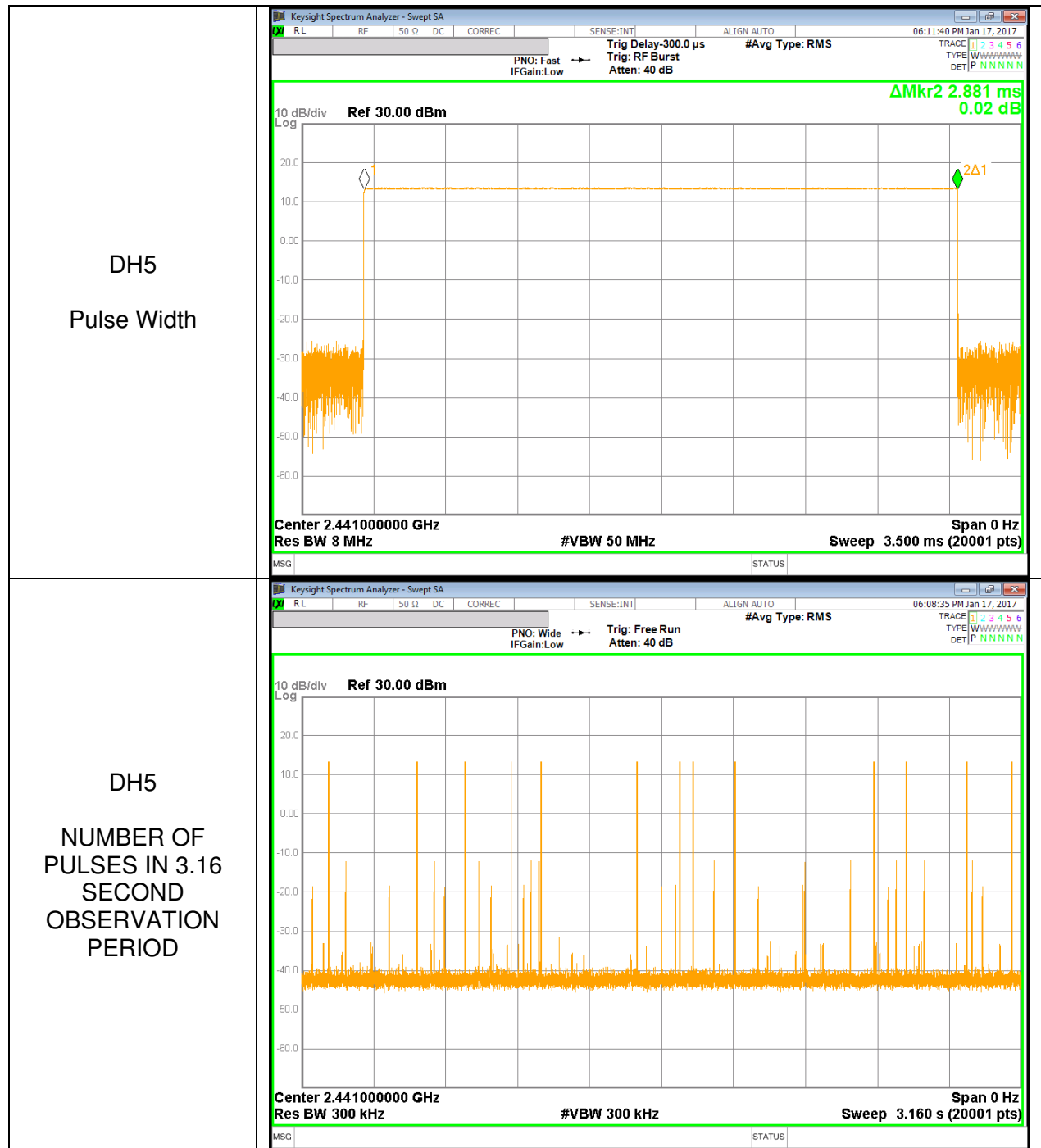
**DH1**



**DH3**



**DH5**



## 9.4. 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

#### 9.4.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	14.859	21	-6.141
Middle	2441	14.730	21	-6.27
High	2480	14.971	21	-6.029
Worst		14.971	21	-6.029

#### 9.4.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	11.323	21	-9.677
Middle	2441	11.017	21	-9.983
High	2480	11.179	21	-9.821
Worst		11.323	21	-9.677

#### 9.4.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	11.890	21	-9.110
Middle	2441	11.546	21	-9.454
High	2480	11.534	21	-9.466
Worst		11.890	21	-9.110

### 9.4.4. OUTPUT POWER PLOTS

#### GFSK OUTPUT POWER

<p>GFSK Low CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          PNO: Fast IF Gain: Low Trig: Free Run Atten: 40 dB #Avg Type: RMS AvgHold: 100/100          Mkr1 2.402 042 0 GHz 14.859 dBm          Ref 30.00 dBm          Center 2.402000 GHz #Res BW 3.0 MHz #VBW 50 MHz Span 10.00 MHz Sweep 1.333 ms (20001 pts)</p>
<p>GFSK Middle CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          PNO: Fast IF Gain: Low Trig: Free Run Atten: 40 dB #Avg Type: RMS AvgHold: 100/100          Mkr1 2.440 936 5 GHz 14.730 dBm          Ref 30.00 dBm          Center 2.441000 GHz #Res BW 3.0 MHz #VBW 50 MHz Span 10.00 MHz Sweep 1.333 ms (20001 pts)</p>
<p>GFSK High CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          PNO: Fast IF Gain: Low Trig: Free Run Atten: 40 dB #Avg Type: RMS AvgHold: 100/100          Mkr1 2.479 831 5 GHz 14.971 dBm          Ref 30.00 dBm          Center 2.480000 GHz #Res BW 3.0 MHz #VBW 50 MHz Span 10.00 MHz Sweep 1.333 ms (20001 pts)</p>

**Pi/4-DPSK OUTPUT POWER**

<p>Pi/4-DPSK Low CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          05:43:18 PM Jan 17, 2017          #Avg Type: RMS          AvgHold: 100/100          Mkr1 2.402 148 0 GHz          11.323 dBm          Ref 30.00 dBm          Center 2.402000 GHz          #Res BW 3.0 MHz          #VBW 50 MHz          Span 10.00 MHz          Sweep 1.333 ms (20001 pts)</p>
<p>Pi/4-DPSK Middle CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          05:43:38 PM Jan 17, 2017          #Avg Type: RMS          AvgHold: 100/100          Mkr1 2.441 234 5 GHz          11.017 dBm          Ref 30.00 dBm          Center 2.441000 GHz          #Res BW 3.0 MHz          #VBW 50 MHz          Span 10.00 MHz          Sweep 1.333 ms (20001 pts)</p>
<p>Pi/4-DPSK High CH</p>	<p>KeySight Spectrum Analyzer - Swept SA          11:42:32 AM Jan 18, 2017          #Avg Type: RMS          AvgHold: 100/100          Mkr1 2.480 282 5 GHz          11.179 dBm          Ref 30.00 dBm          Center 2.480000 GHz          #Res BW 3.0 MHz          #VBW 50 MHz          Span 10.00 MHz          Sweep 1.333 ms (20001 pts)          Alignment Completed</p>

**8PSK OUTPUT POWER**

<p>8PSK Low CH</p>	<p>KeySight Spectrum Analyzer - Swept SA              Ref 30.00 dBm              Mkr1 2.401 943 5 GHz              11.890 dBm              Center 2.402000 GHz              #Res BW 3.0 MHz              #VBW 50 MHz              Span 10.00 MHz              Sweep 1.333 ms (20001 pts)</p>
<p>8PSK Middle CH</p>	<p>KeySight Spectrum Analyzer - Swept SA              Ref 30.00 dBm              Mkr1 2.441 177 5 GHz              11.546 dBm              Center 2.441000 GHz              #Res BW 3.0 MHz              #VBW 50 MHz              Span 10.00 MHz              Sweep 1.333 ms (20001 pts)</p>
<p>8PSK High CH</p>	<p>KeySight Spectrum Analyzer - Swept SA              Ref 30.00 dBm              Mkr1 2.480 029 0 GHz              11.534 dBm              Center 2.480000 GHz              #Res BW 3.0 MHz              #VBW 50 MHz              Span 10.00 MHz              Sweep 1.333 ms (20001 pts)</p>

## 9.5. 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.

#### 9.5.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	14.641	29.11
Middle	2441	14.506	28.22
High	2480	14.782	30.07

#### 9.5.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	8.601	7.25
Middle	2441	8.323	6.80
High	2480	8.549	7.16

#### 9.5.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
Low	2402	8.604	7.25
Middle	2441	8.376	6.88
High	2480	8.550	7.16

## 9.6. 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.

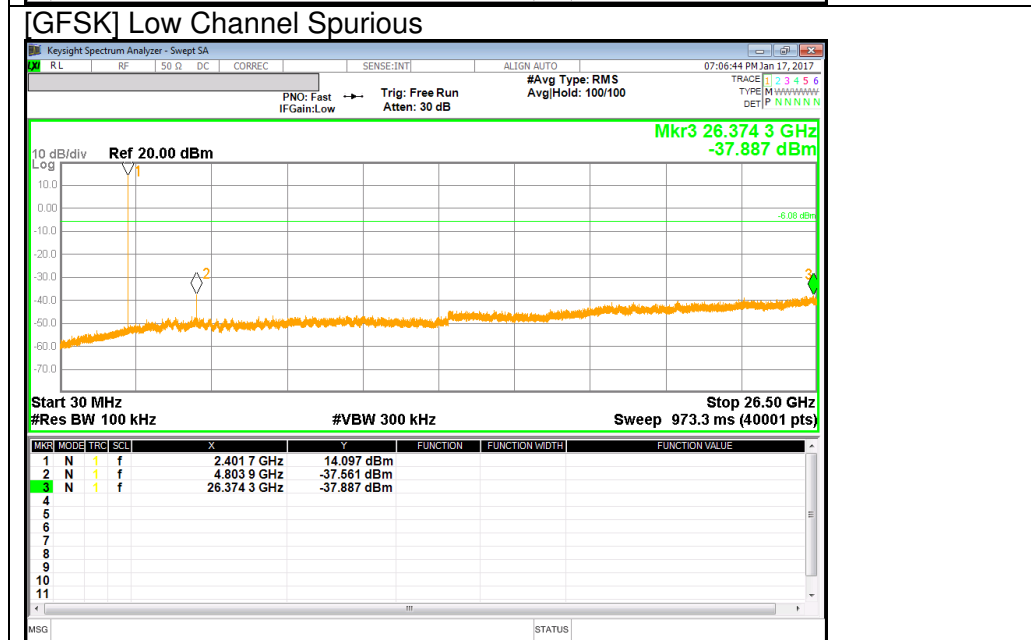
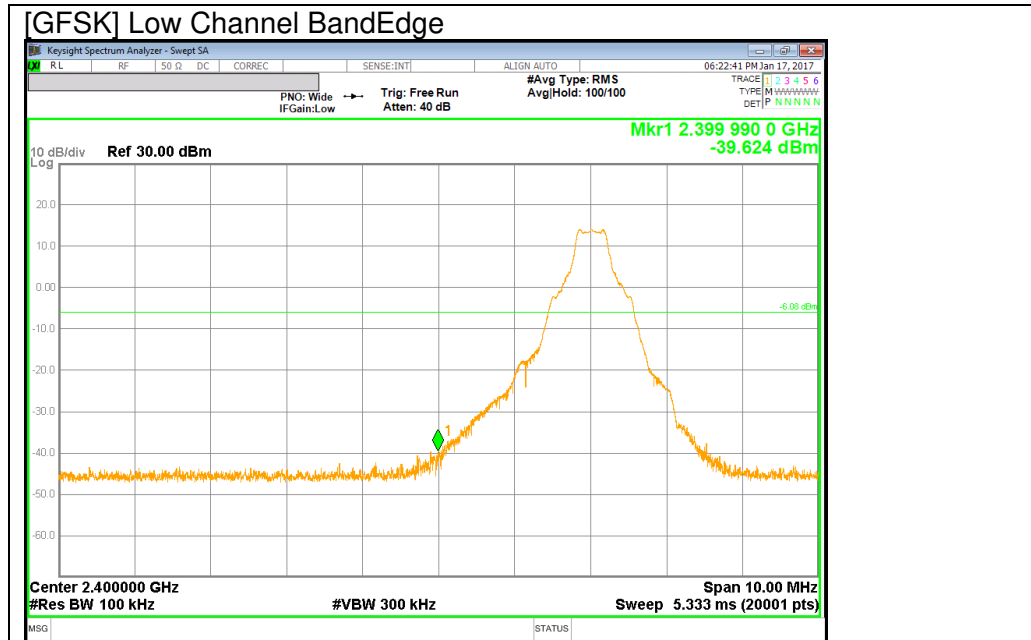
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

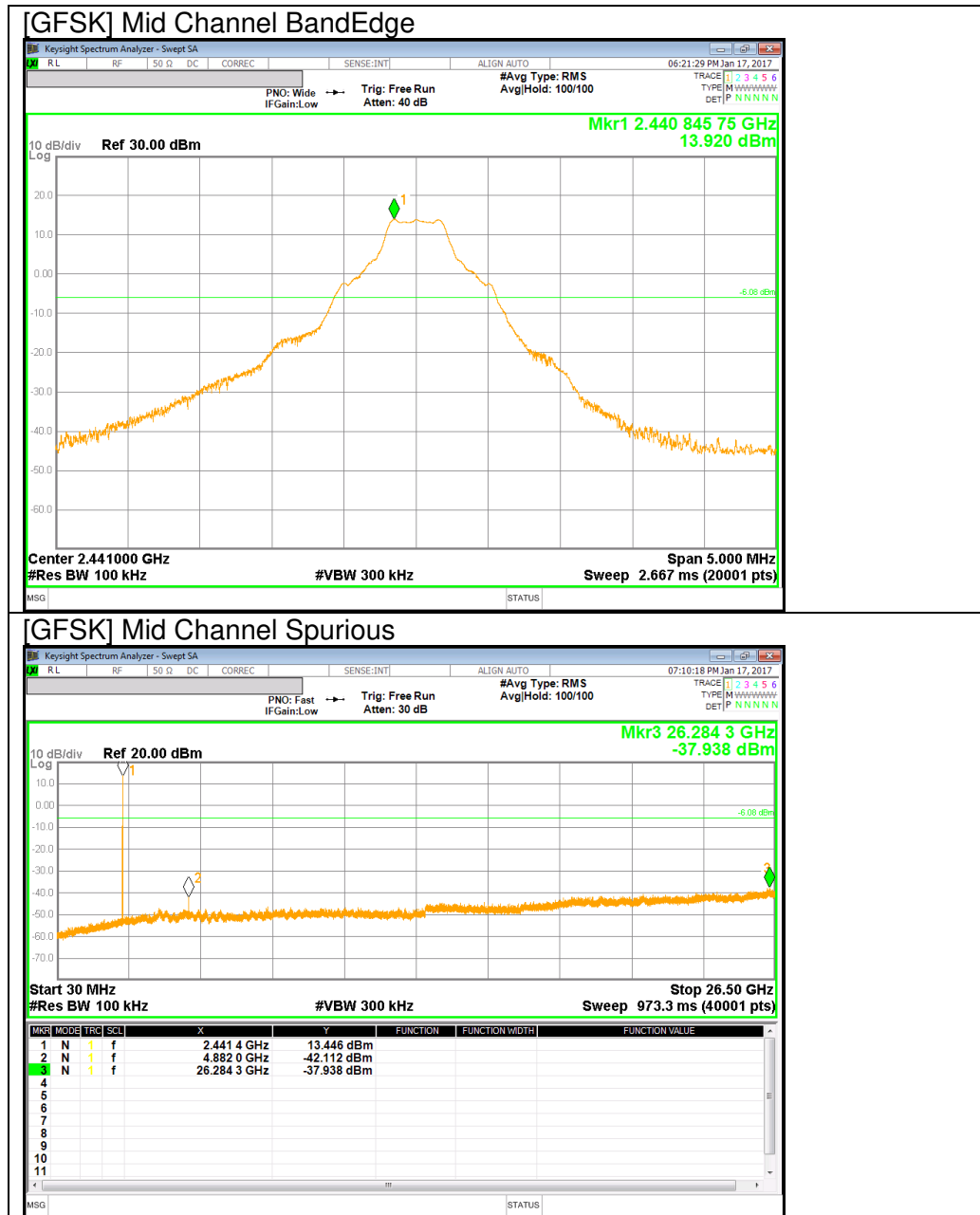
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

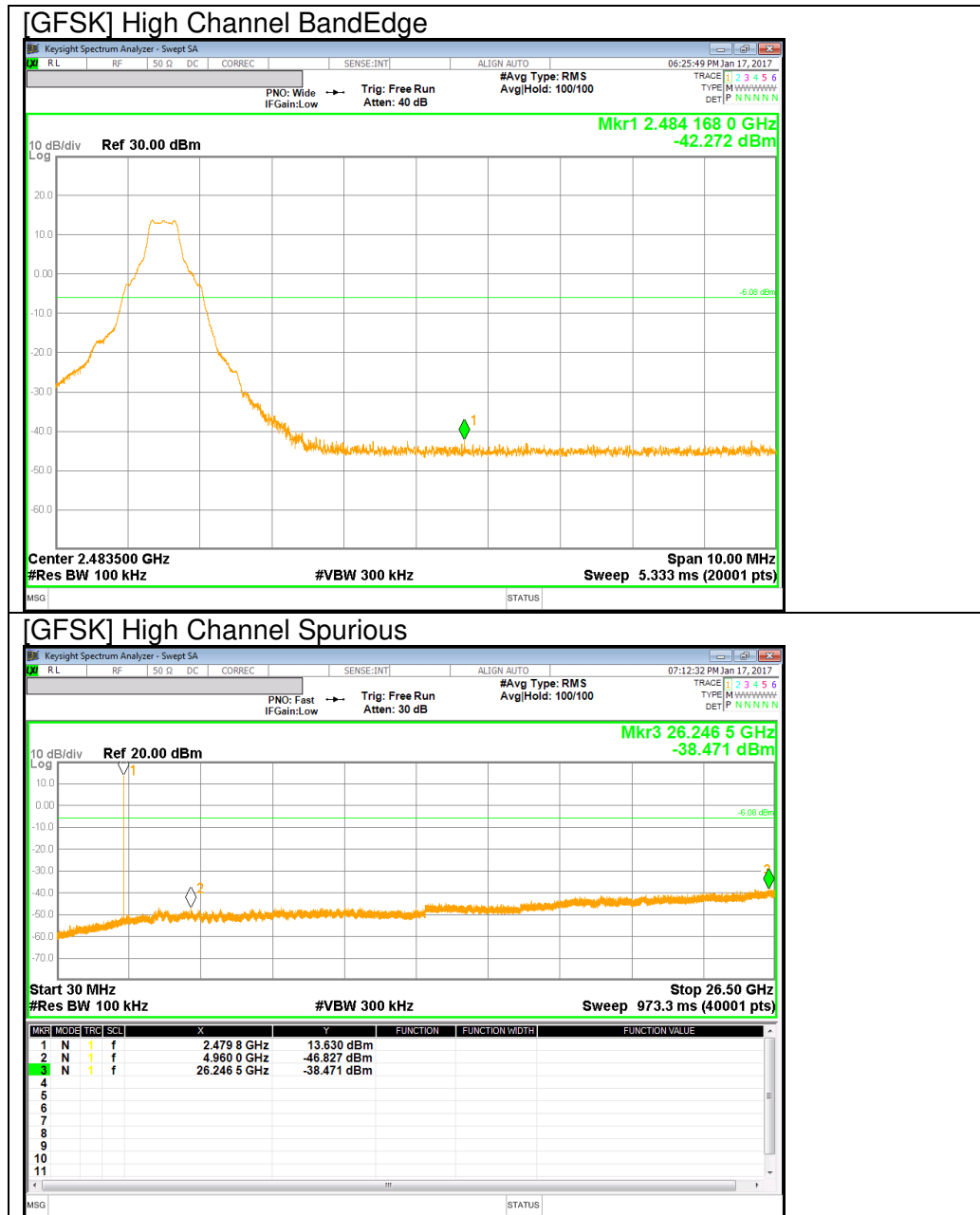
### RESULTS

### 9.6.1. BASIC DATA RATE GFSK MODULATION

#### GFSK Mode

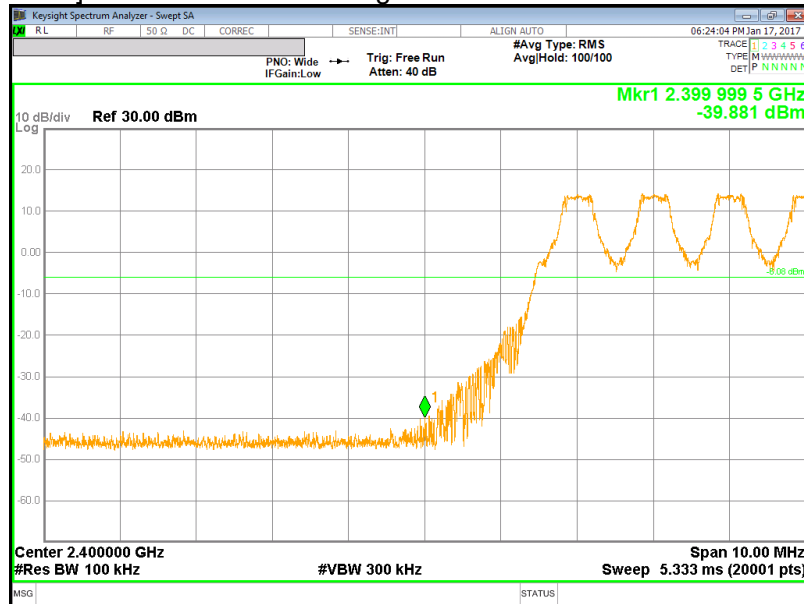




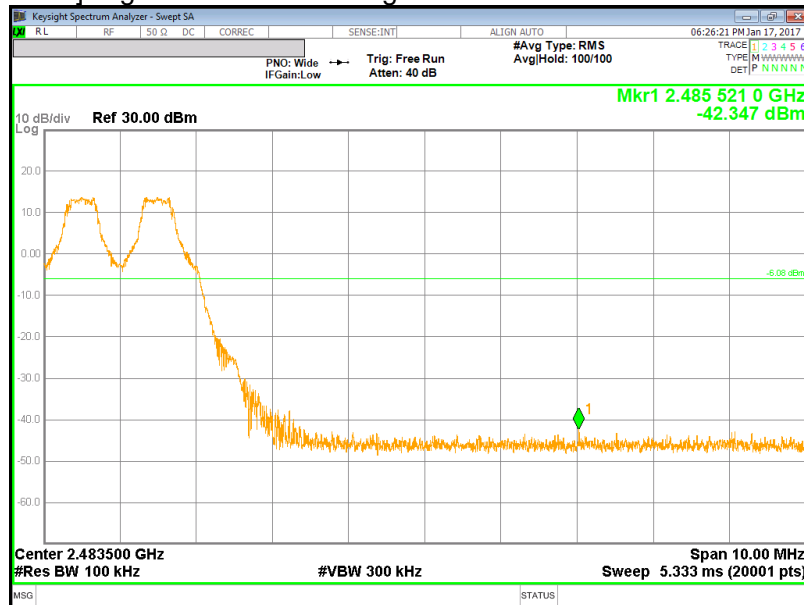


**BandEdge Emission at GFSK Hopping Mode**

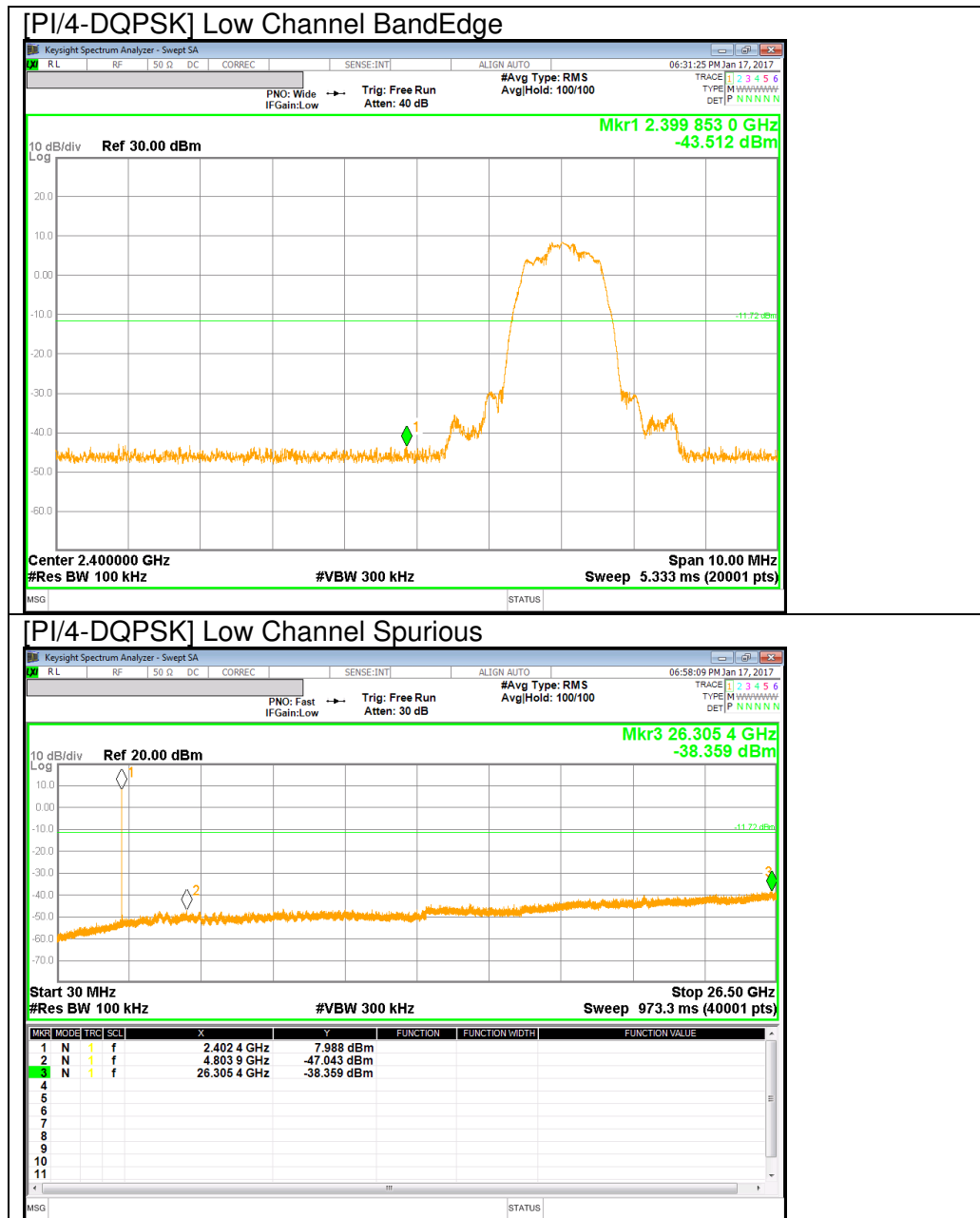
[GFSK Hopping Mode] Low Channel BandEdge

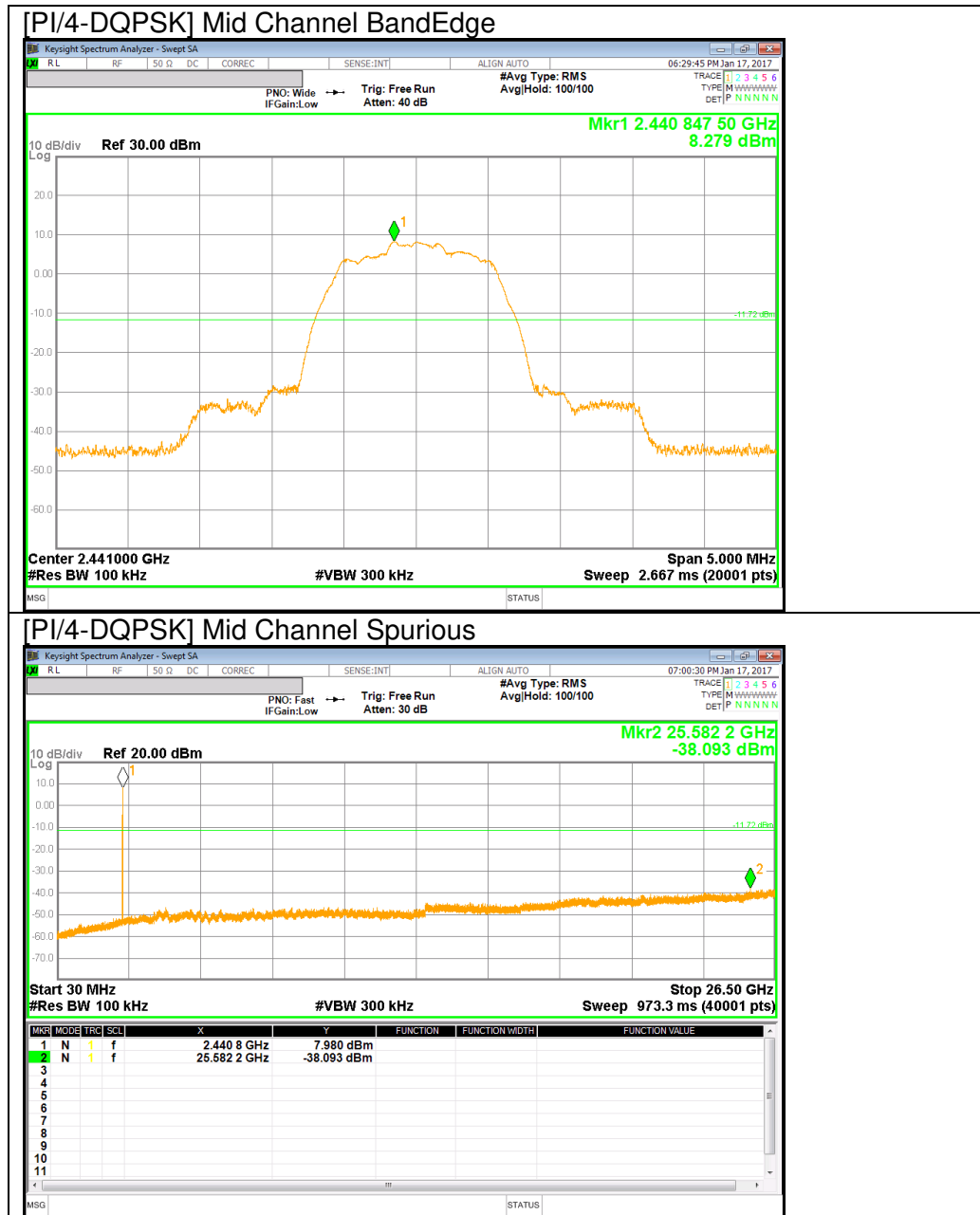


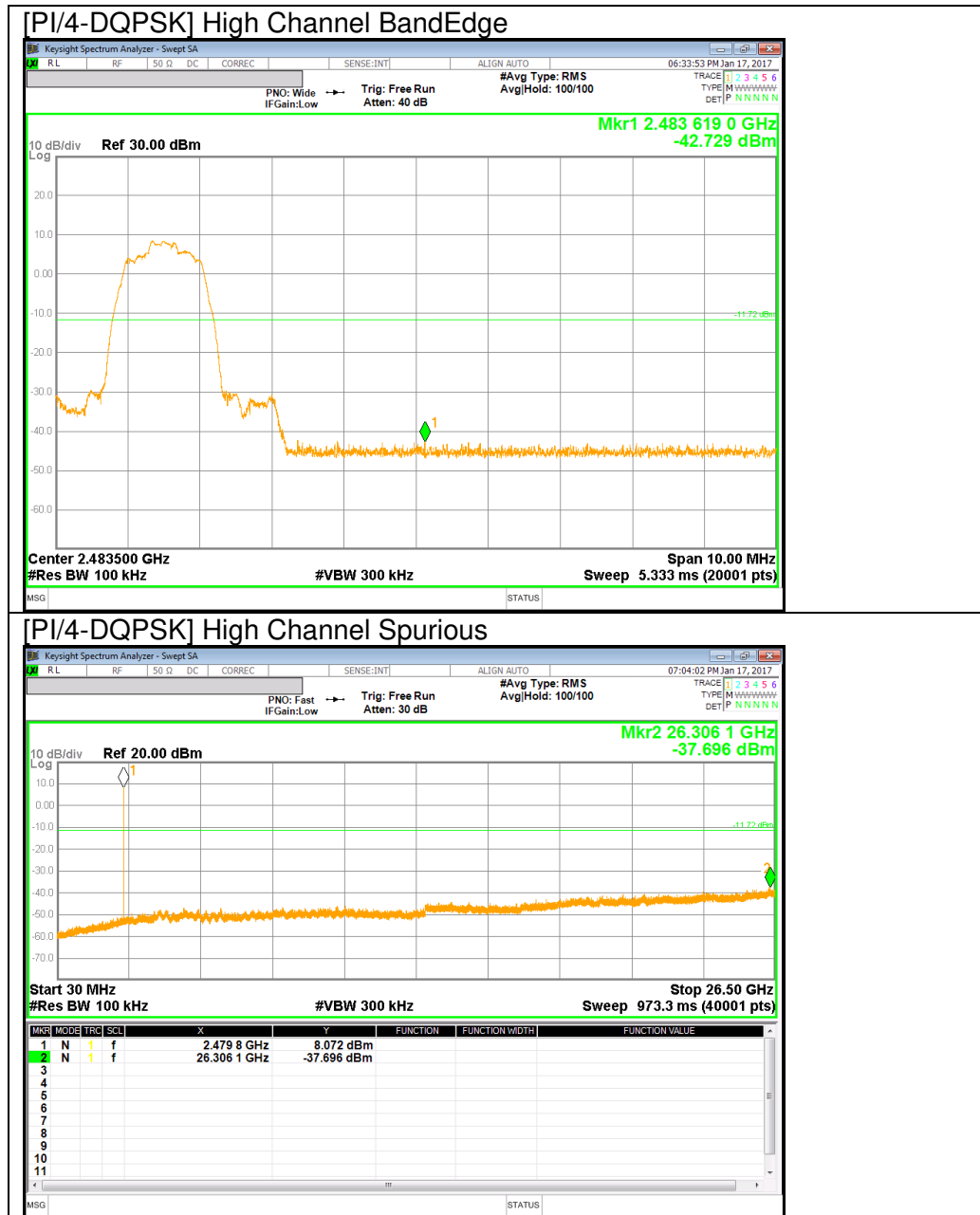
[GFSK Hopping Mode] High Channel BandEdge



**PI/4-DQPSK Mode**

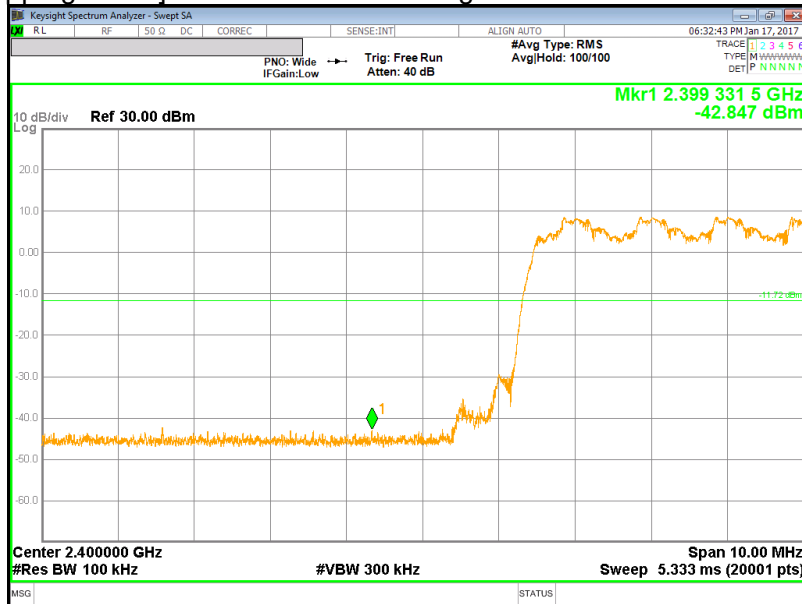




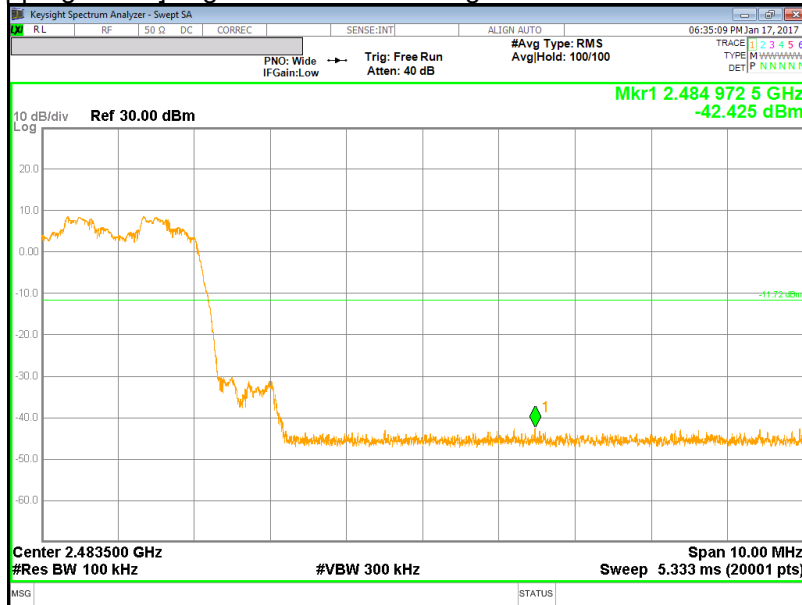


**BandEdge Emission at PI/4-DQPSK Hopping Mode**

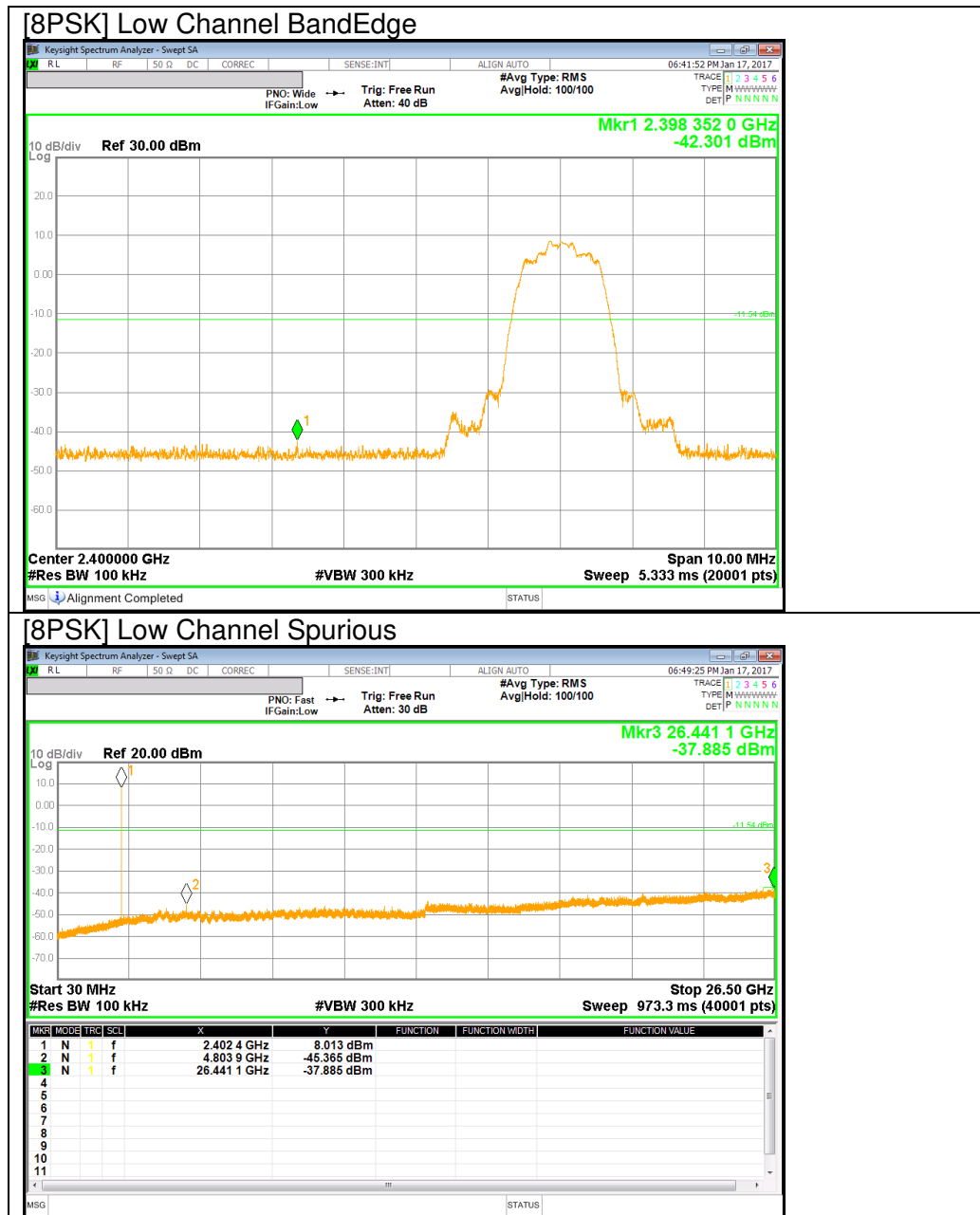
[PI/4-DQPSK Hopping Mode] Low Channel BandEdge

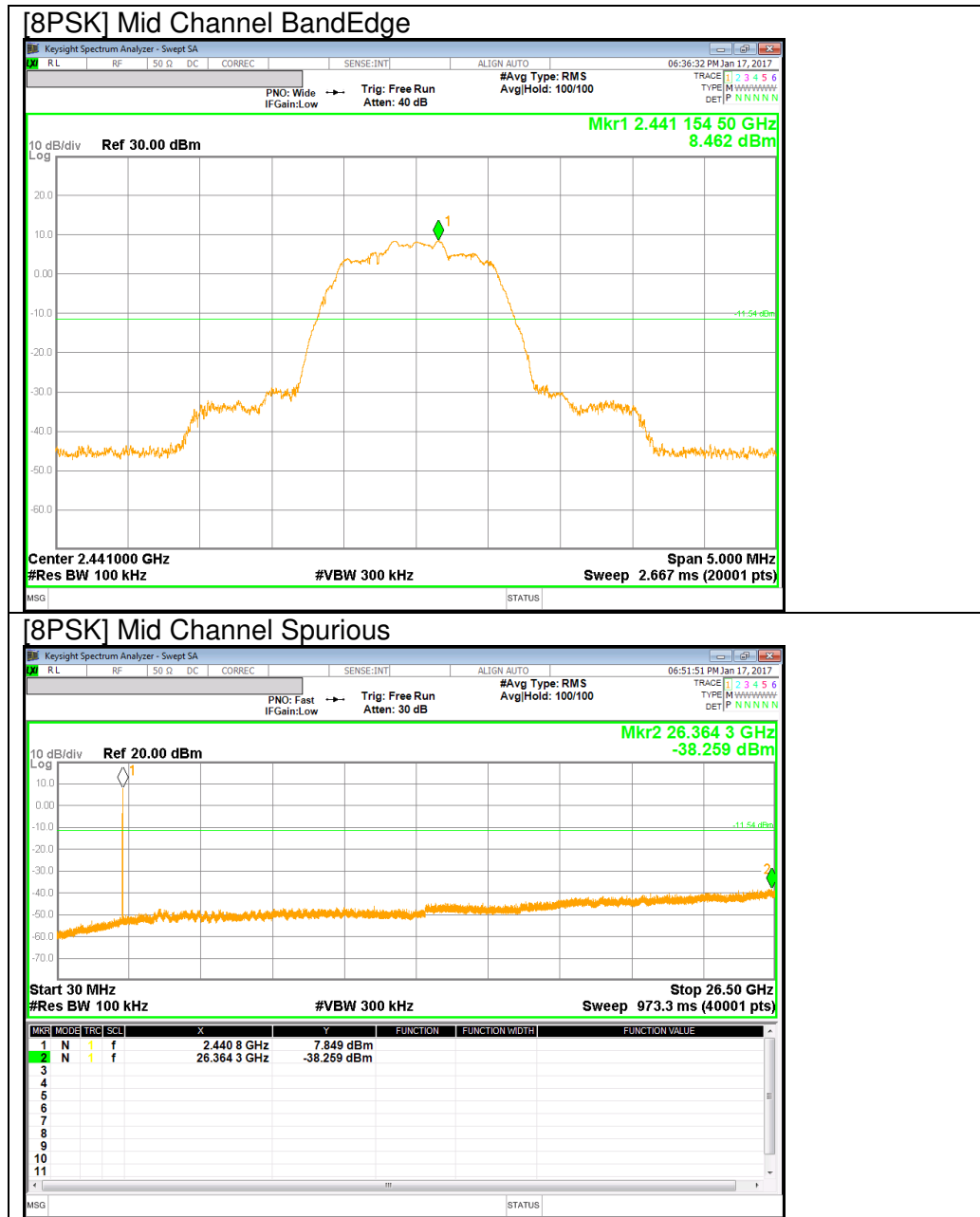


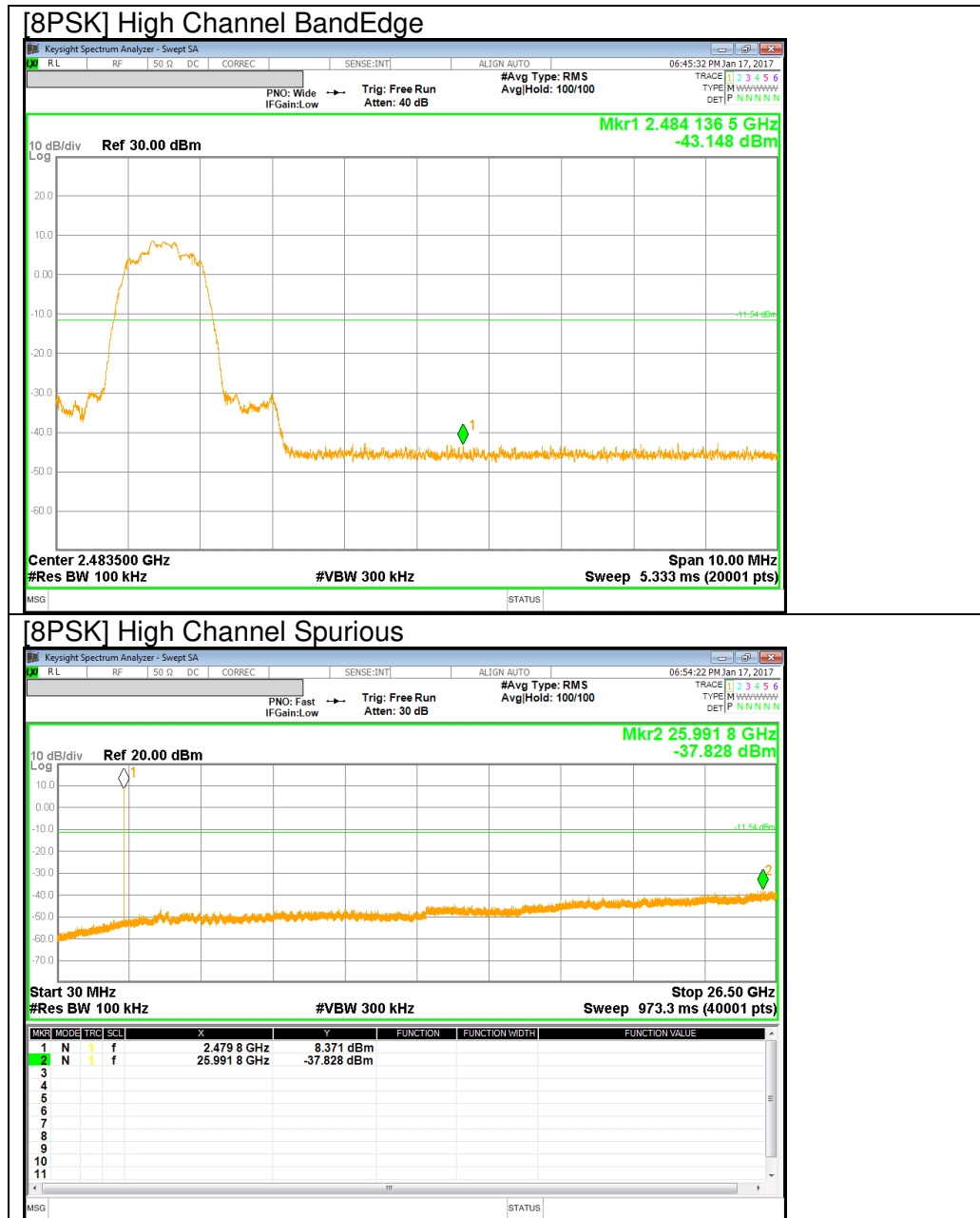
[PI/4-DQPSK Hopping Mode] High Channel BandEdge



**8PSK Mode**

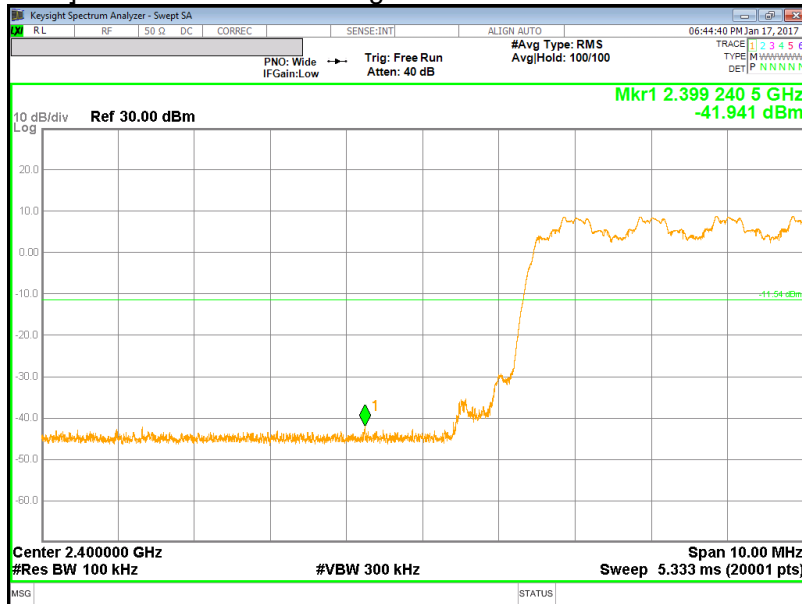




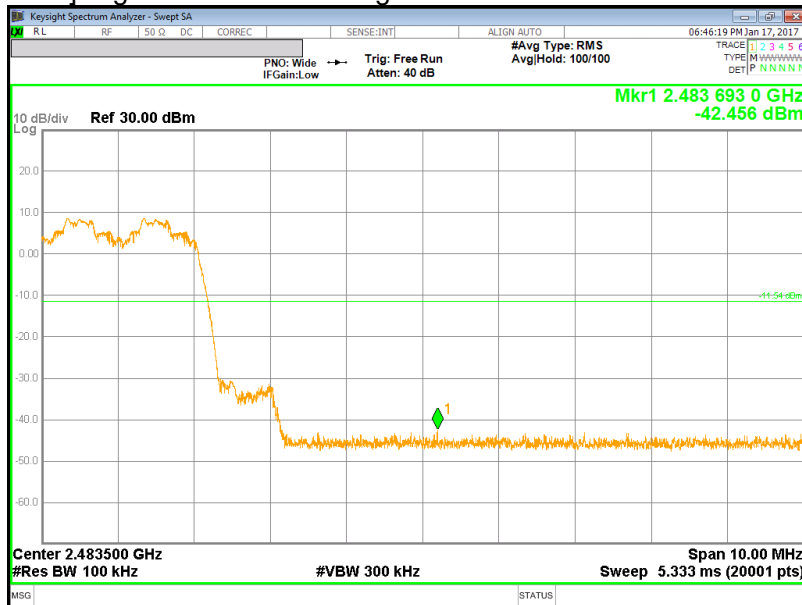


**BandEdge Emission at 8PSK Hopping Mode**

[8PSK Hopping Mode] Low Channel BandEdge



[8PSK Hopping Mode] High Channel BandEdge



## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. 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 measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements.(Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.)

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.

$$\text{GFSK} = 1/T = 1 / 0.0029\text{S} = 350\text{Hz}.$$

The minimum VBW was 350Hz, but test receiver(ESU40) couldn't set value 350Hz. Due to this reason, testing VBW was set to 500Hz(Worst cases).

The spectrum from 1GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.  
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

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

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

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

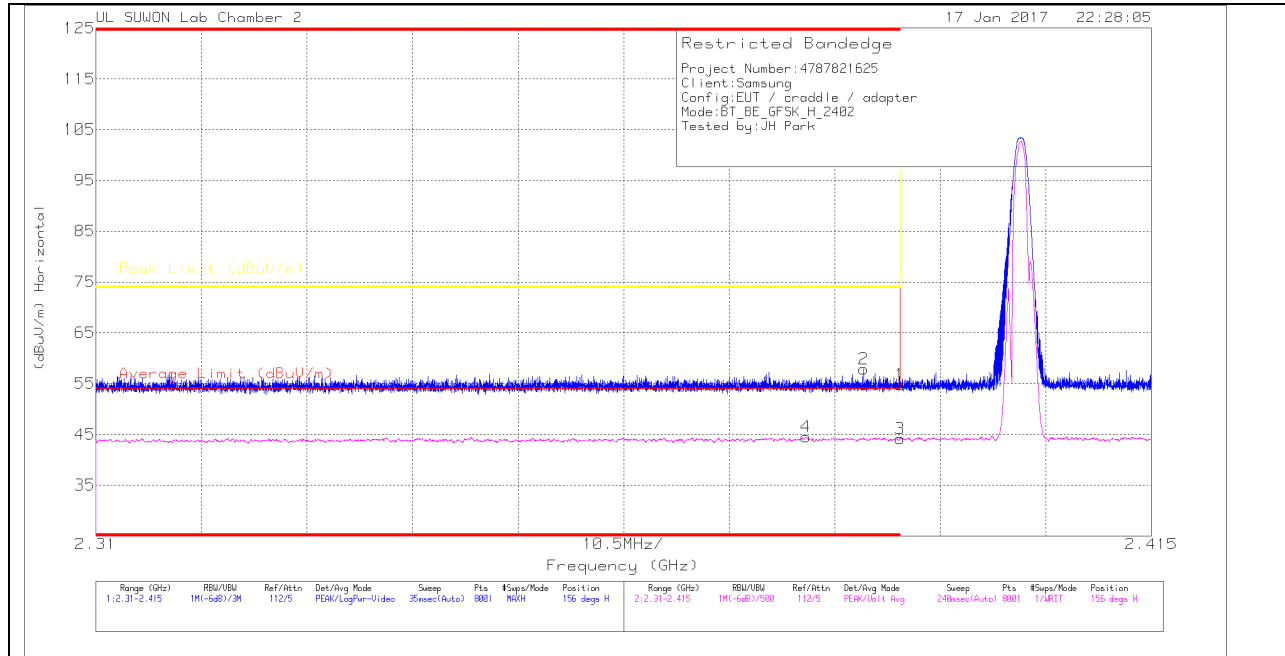
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.  
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 937606.

## 10.2. TRANSMITTER ABOVE 1 GHz

### 10.2.1. BASIC DATA RATE GFSK MODULATION

#### RESTRICTED BANDEDGE (LOW CHANNEL)

##### HORIZONTAL PEAK AND AVERAGE PLOT



##### HORIZONTAL DATA

###### Trace Markers

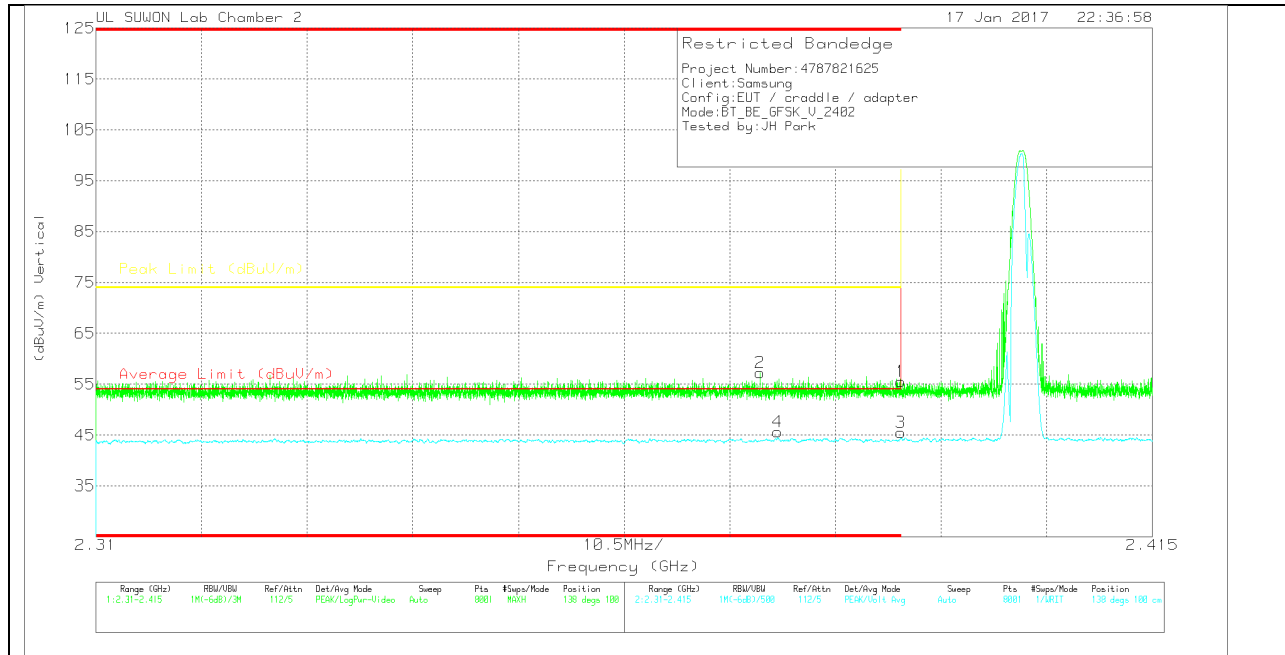
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.29	Pk		-18.2	54.79	-	-	74	-19.21	156	103	H
2	* 2.386	44.35	Pk		-18.2	57.85	-	-	74	-16.15	156	103	H
3	* 2.39	30.64	VA1T		-18.2	44.14	54	-9.86	-	-	156	103	H
4	* 2.381	31.08	VA1T		-18.3	44.48	54	-9.52	-	-	156	103	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average  $V_B=1/T_{on}$  where:  $T_{on}$  is transmit duration

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.07	Pk	31.7	-18.2	55.57	-	-	74	-18.43	138	100	V
2	* 2.376	43.8	Pk	31.7	-18.3	57.2	-	-	74	-16.8	138	100	V
3	* 2.39	30.83	VA1T	31.7	-18.2	44.33	54	-9.67	-	-	138	100	V
4	* 2.378	31.08	VA1T	31.7	-18.3	44.48	54	-9.52	-	-	138	100	V

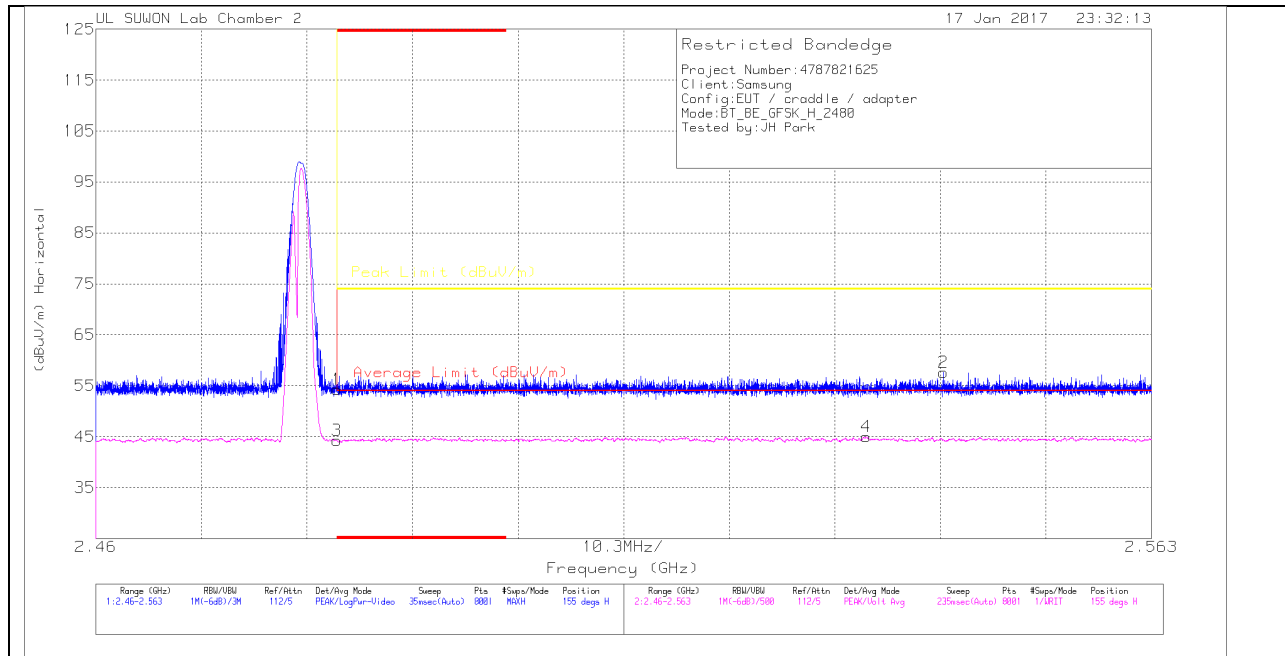
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

### AUTHORIZED BANDEDGE (HIGH CHANNEL)

#### HORIZONTAL PEAK AND AVERAGE PLOT



#### HORIZONTAL DATA

##### Trace Markers

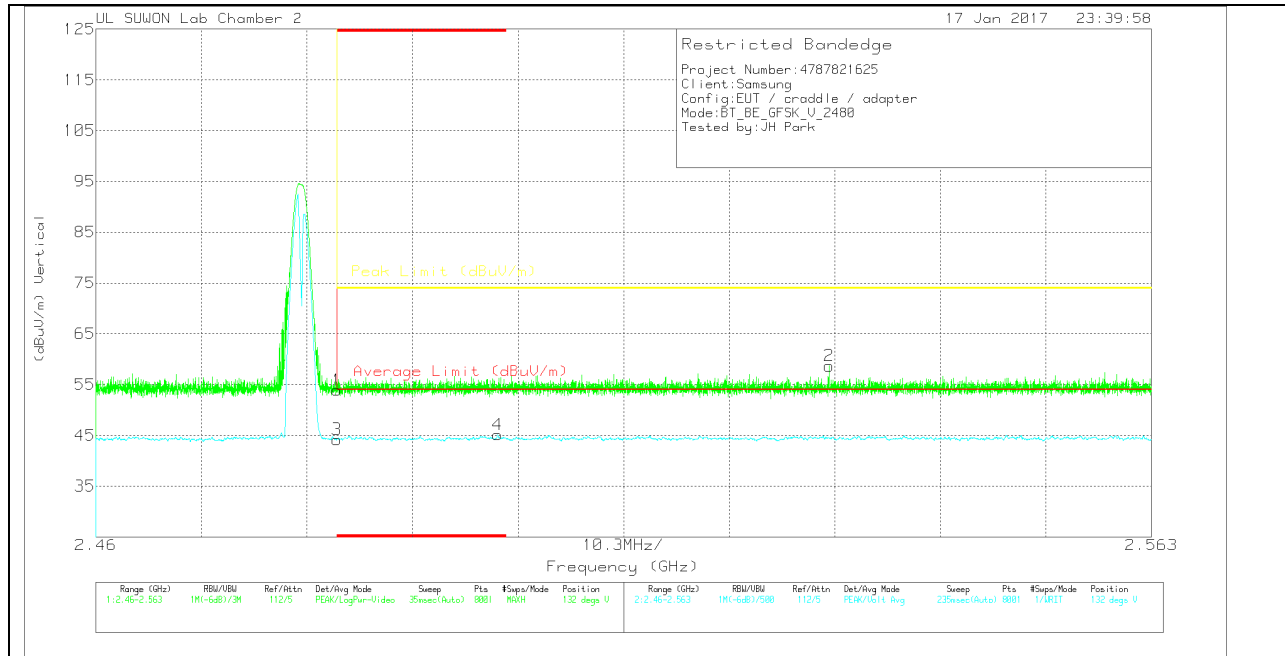
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.44	Pk		-18	54.24	-	-	74	-19.76	155	159	H
2	2.543	43.78	Pk		-18	57.68	-	-	74	-16.32	155	159	H
3	* 2.484	30.5	VA1T		-18	44.3	54	-9.7	-	-	155	159	H
4	2.535	31.09	VA1T		-18	44.99	54	-9.01	-	-	155	159	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average  $V_B=1/T_{on}$  where:  $T_{on}$  is transmit duration

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

**Trace Markers**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[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	40.15	Pk		-18	53.95	-	-	74	-20.05	132	169	V
2	2.532	44.78	Pk		-18	58.68	-	-	74	-15.32	132	169	V
3	* 2.484	30.4	VA1T		-18	44.2	54	-9.8	-	-	132	169	V
4	* 2.499	31.29	VA1T		-18	45.09	54	-8.91	-	-	132	169	V

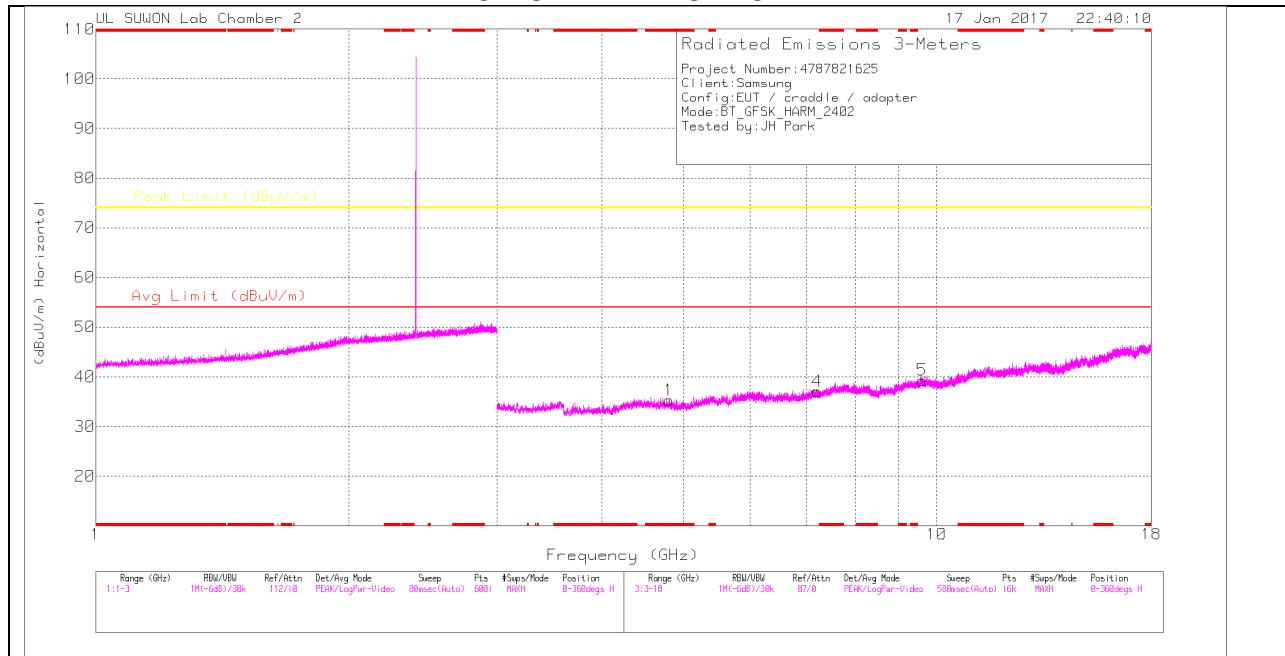
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

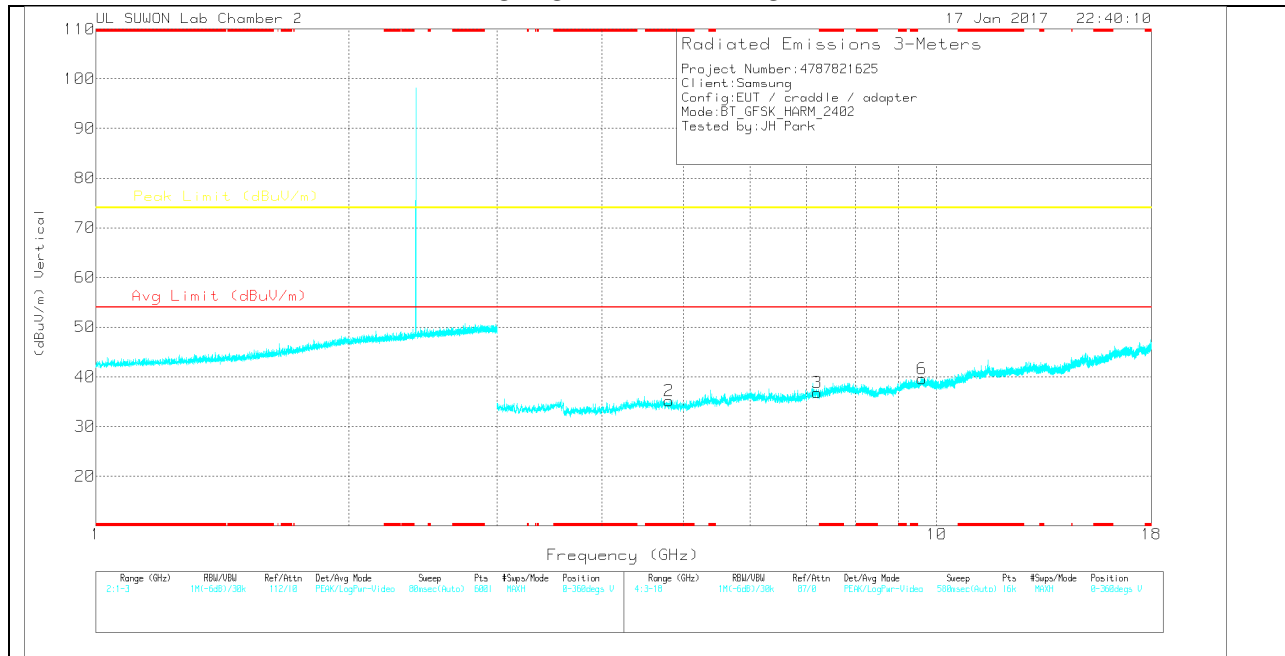
VA1T - FHSS: Linear Voltage Average  $VB=1/T_{on}$  where:  $T_{on}$  is transmit duration

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL HORIZONTAL



### LOW CHANNEL VERTICAL



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

**LOW CHANNEL DATA**

Trace Markers

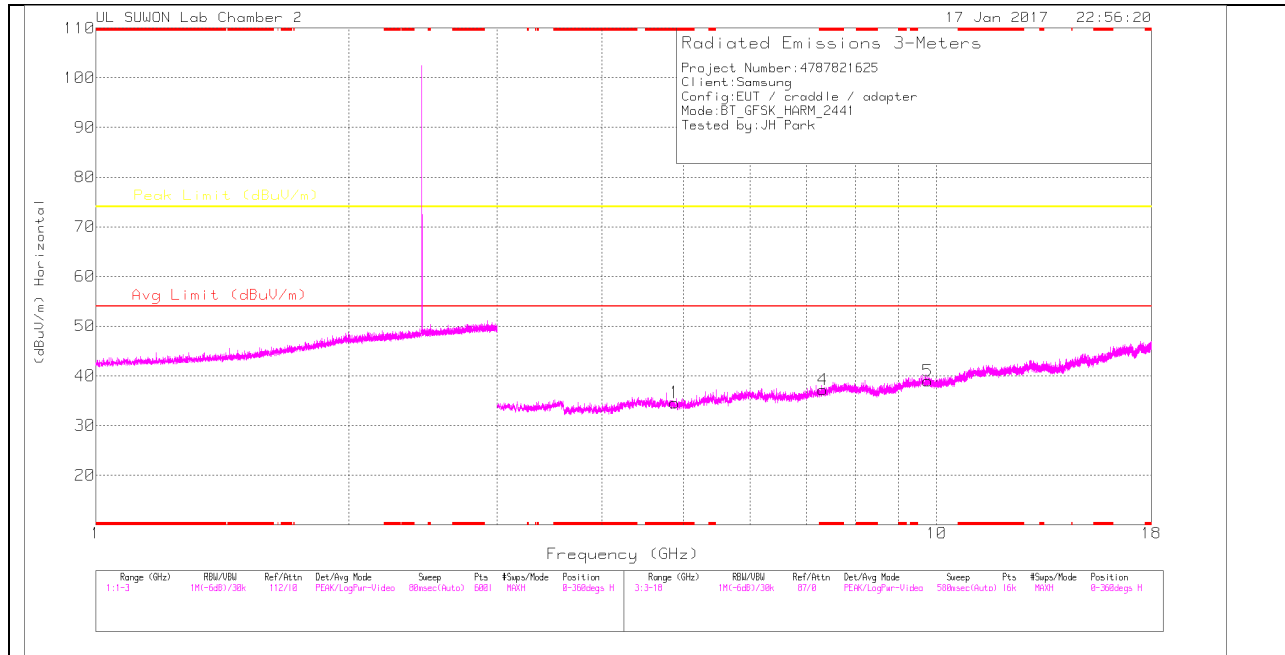
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	25.72	PK	33.9	-24.3	35.32	-	-	74	-38.68	0-360	250	H
4	7.204	22.94	PK	35.8	-21.7	37.04	-	-	74	-36.96	0-360	250	H
5	9.607	20.79	PK	36.9	-18.4	39.29	-	-	74	-34.71	0-360	150	H
2	* 4.806	25.62	PK	33.9	-24.3	35.22	-	-	74	-38.78	0-360	150	V
3	7.206	22.77	PK	35.8	-21.7	36.87	-	-	74	-37.13	0-360	250	V
6	9.605	21.08	PK	36.9	-18.4	39.58	-	-	74	-34.42	0-360	150	V

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

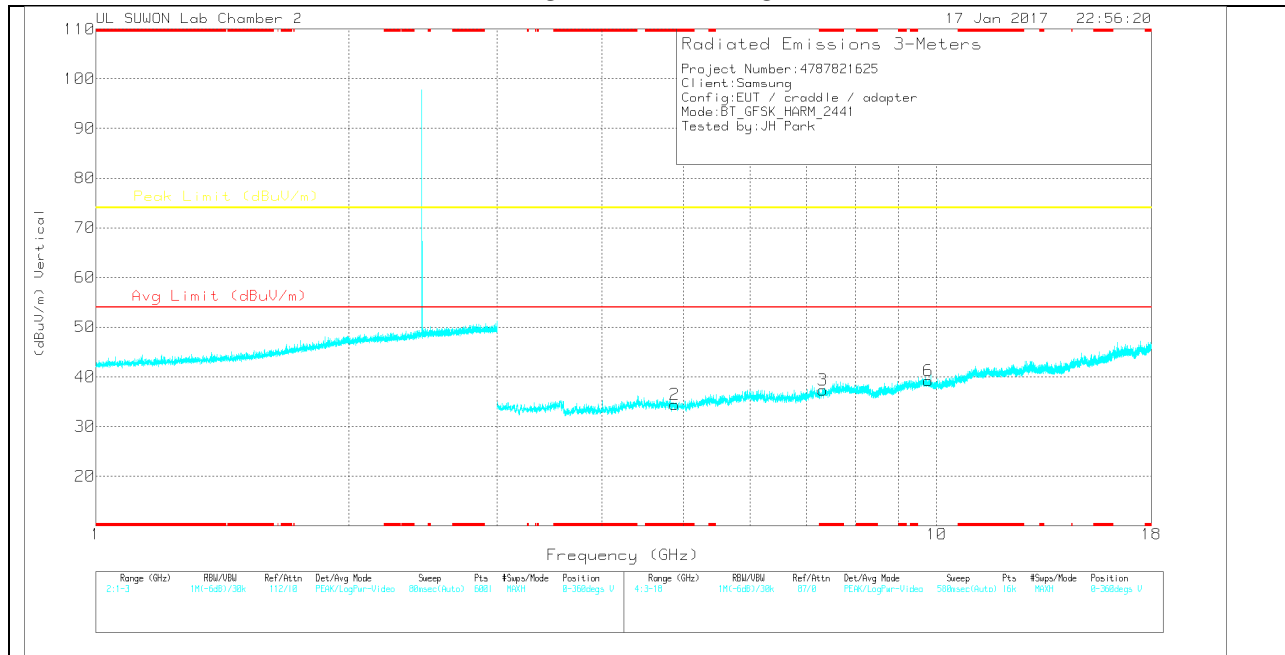
PK – Peak Detector

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

**MID CHANNEL HORIZONTAL**



**MID CHANNEL VERTICAL**



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

**MID CHANNEL DATA**

Trace Markers

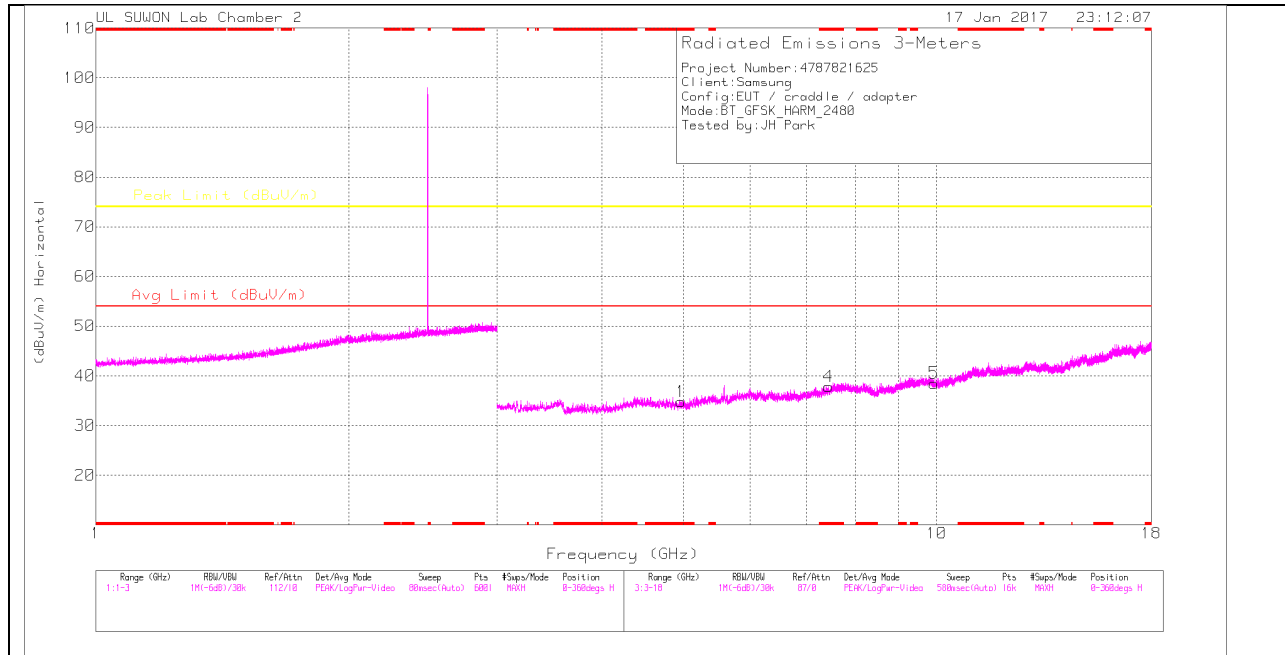
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881	25.31	PK	33.9	-24.6	34.61	-	-	74	-39.39	0-360	250	H
4	* 7.323	23.15	PK	35.9	-21.9	37.15	-	-	74	-36.85	0-360	150	H
5	9.763	20.01	PK	37	-18	39.01	-	-	74	-34.99	0-360	150	H
2	* 4.877	25.07	PK	33.9	-24.5	34.47	-	-	74	-39.53	0-360	250	V
3	* 7.322	23.28	PK	35.9	-21.9	37.28	-	-	74	-36.72	0-360	250	V
6	9.767	20.26	PK	37	-18	39.26	-	-	74	-34.74	0-360	150	V

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

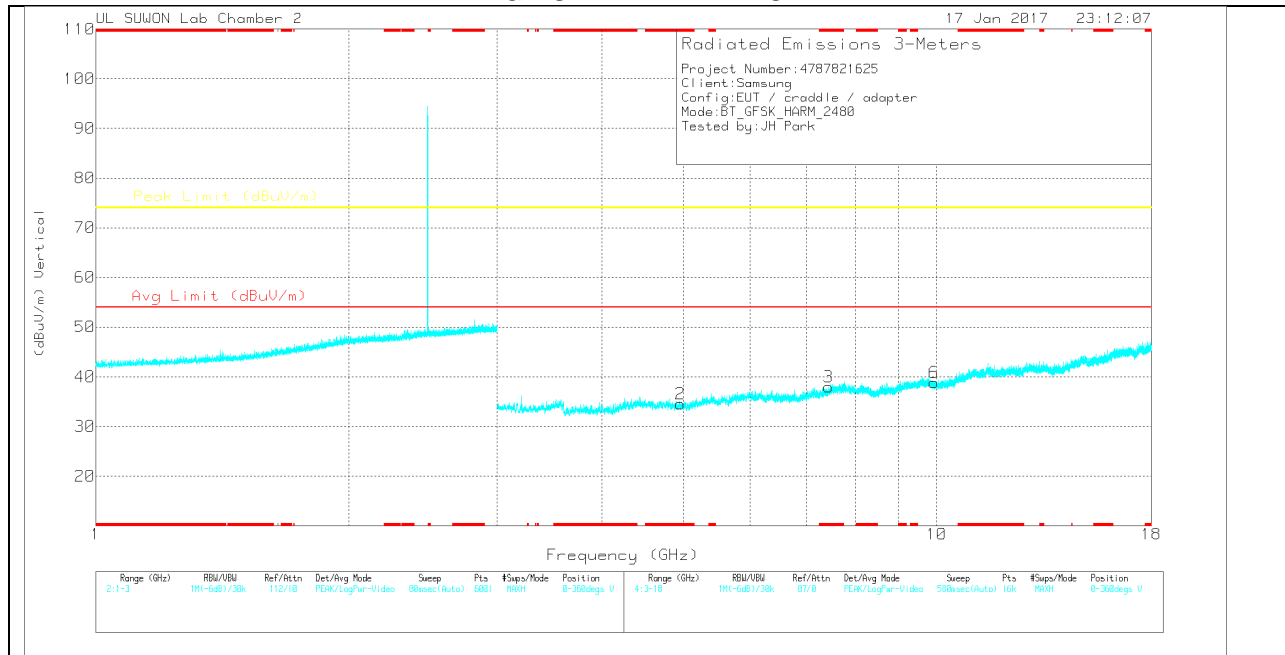
PK – Peak Detector

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

### HIGH CHANNEL HORIZONTAL



### HIGH CHANNEL VERTICAL



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

**HIGH CHANNEL DATA**

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.962	25.65	PK	33.9	-24.7	34.85	-	-	74	-39.15	0-360	250	H
4	* 7.44	22.83	PK	36	-21	37.83	-	-	74	-36.17	0-360	150	H
5	9.919	19.43	PK	37.1	-18	38.53	-	-	74	-35.47	0-360	150	H
2	* 4.958	25.33	PK	33.9	-24.7	34.53	-	-	74	-39.47	0-360	250	V
3	* 7.439	22.91	PK	36	-21	37.91	-	-	74	-36.09	0-360	150	V
6	9.92	19.7	PK	37.1	-18	38.8	-	-	74	-35.2	0-360	250	V

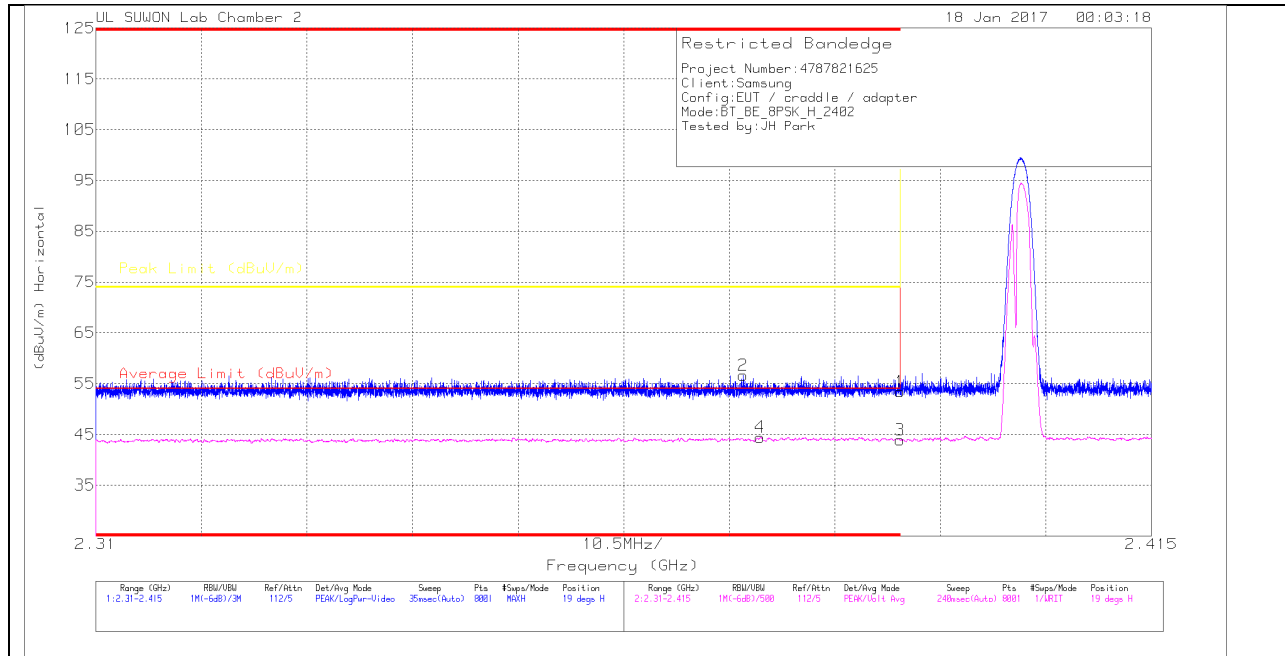
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK – Peak Detector

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

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

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

#### Trace Markers

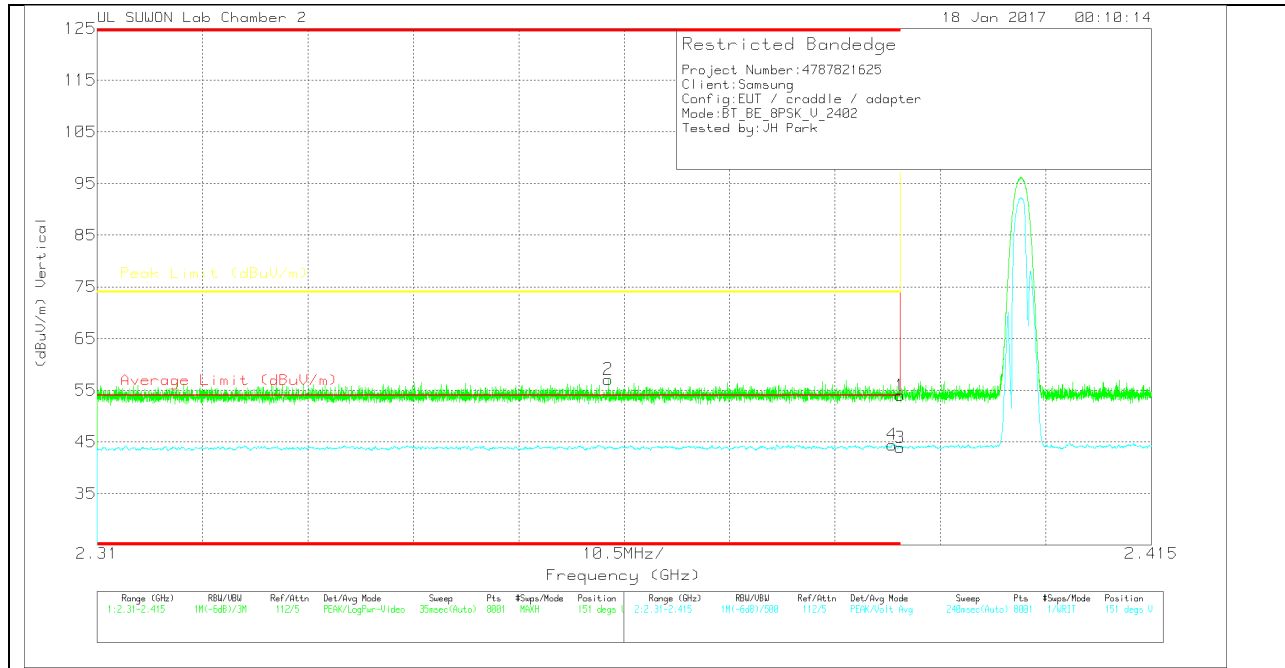
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.97	Pk		-18.2	53.47	-	-	74	-20.53	19	151	H
2	* 2.374	43.19	Pk		-18.3	56.59	-	-	74	-17.41	19	151	H
3	* 2.39	30.37	VA1T		-18.2	43.87	54	-10.13	-	-	19	151	H
4	* 2.376	31.05	VA1T		-18.3	44.45	54	-9.55	-	-	19	151	H

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

Pk - Peak detector

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

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

**Trace Markers**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.51	Pk	31.7	-18.2	54.01	-	-	74	-19.99	151	102	V
2	* 2.361	43.69	Pk	31.7	-18.3	57.09	-	-	74	-16.91	151	102	V
3	* 2.39	30.4	VA1T	31.7	-18.2	43.9	54	-10.1	-	-	151	102	V
4	* 2.389	30.95	VA1T	31.7	-18.2	44.45	54	-9.55	-	-	151	102	V

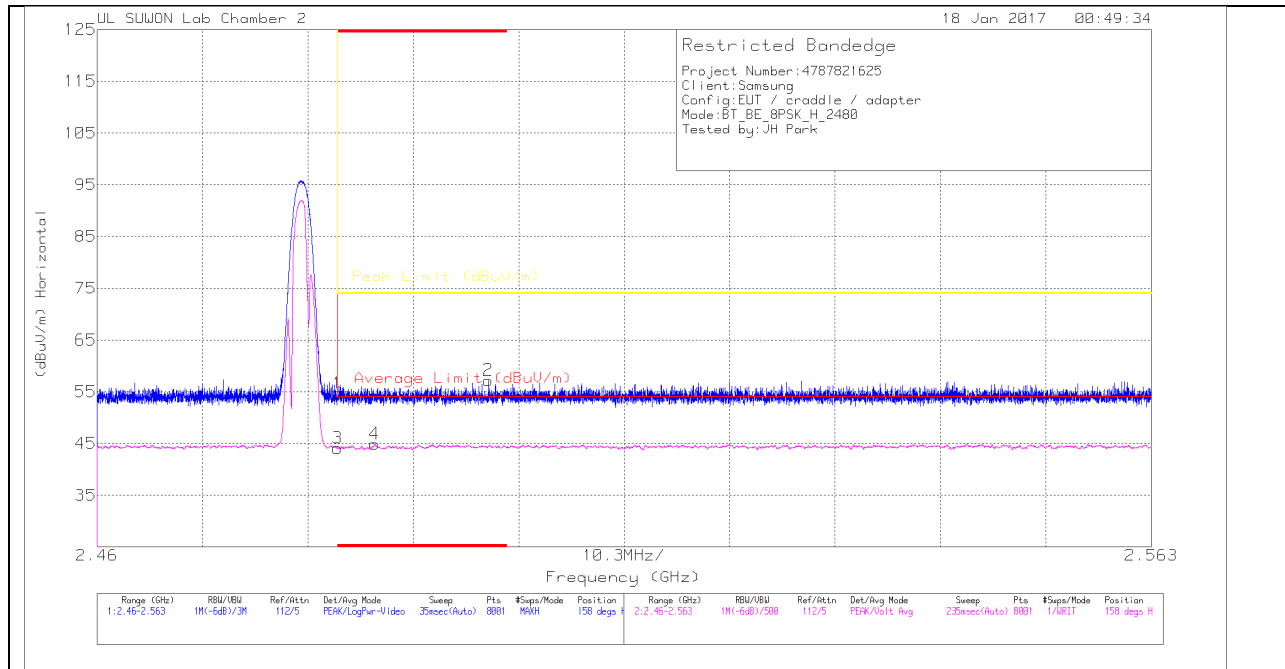
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

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

**AUTHORIZED BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL PEAK AND AVERAGE PLOT**



**HORIZONTAL DATA**

**Trace Markers**

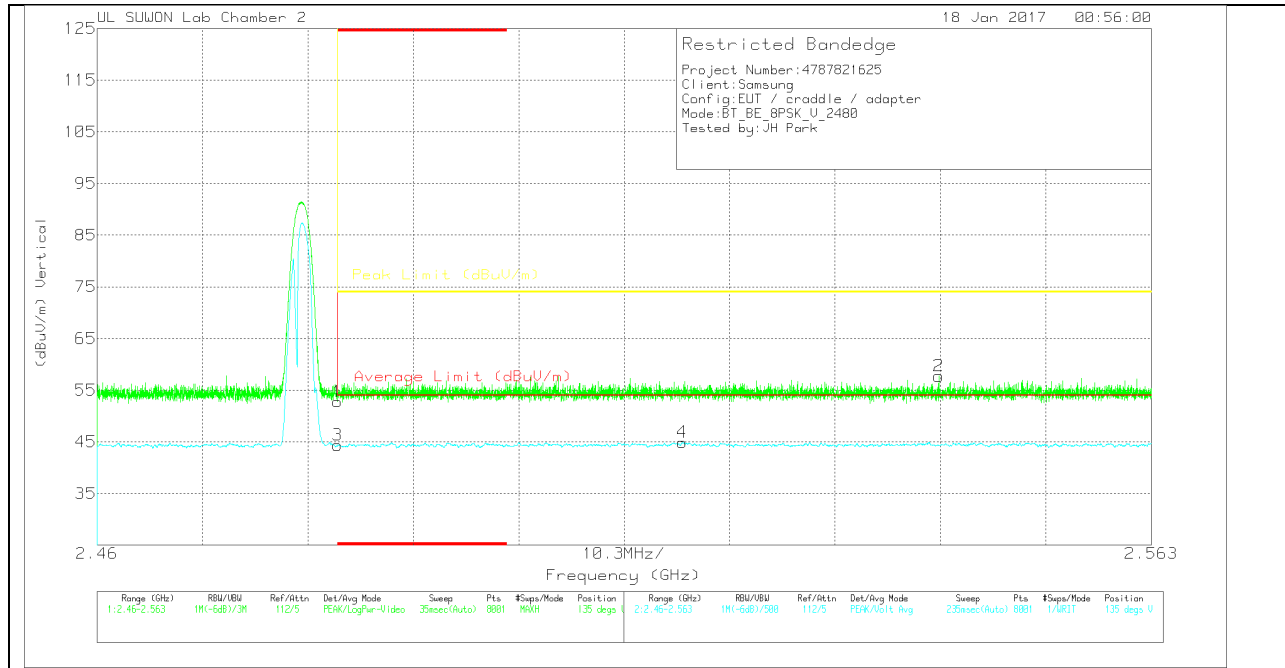
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.9	Pk		-18	54.7	-	-	74	-19.3	158	234	H
2	* 2.498	43.42	Pk		-18	57.22	-	-	74	-16.78	158	234	H
3	* 2.484	30.31	VA1T		-18	44.11	54	-9.89	-	-	158	234	H
4	* 2.487	31.1	VA1T		-18	44.9	54	-9.1	-	-	158	234	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average  $V_B=1/T_{on}$  where:  $T_{on}$  is transmit duration

**VERTICAL PEAK AND AVERAGE PLOT**



**VERTICAL DATA**

**Trace Markers**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[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	38.97	Pk		-18	52.77	-	-	74	-21.23	135	176	V
2	2.542	43.84	Pk		-18	57.74	-	-	74	-16.26	135	176	V
3	* 2.484	30.56	VA1T		-18	44.36	54	-9.64	-	-	135	176	V
4	2.517	31.02	VA1T		-18	44.92	54	-9.08	-	-	135	176	V

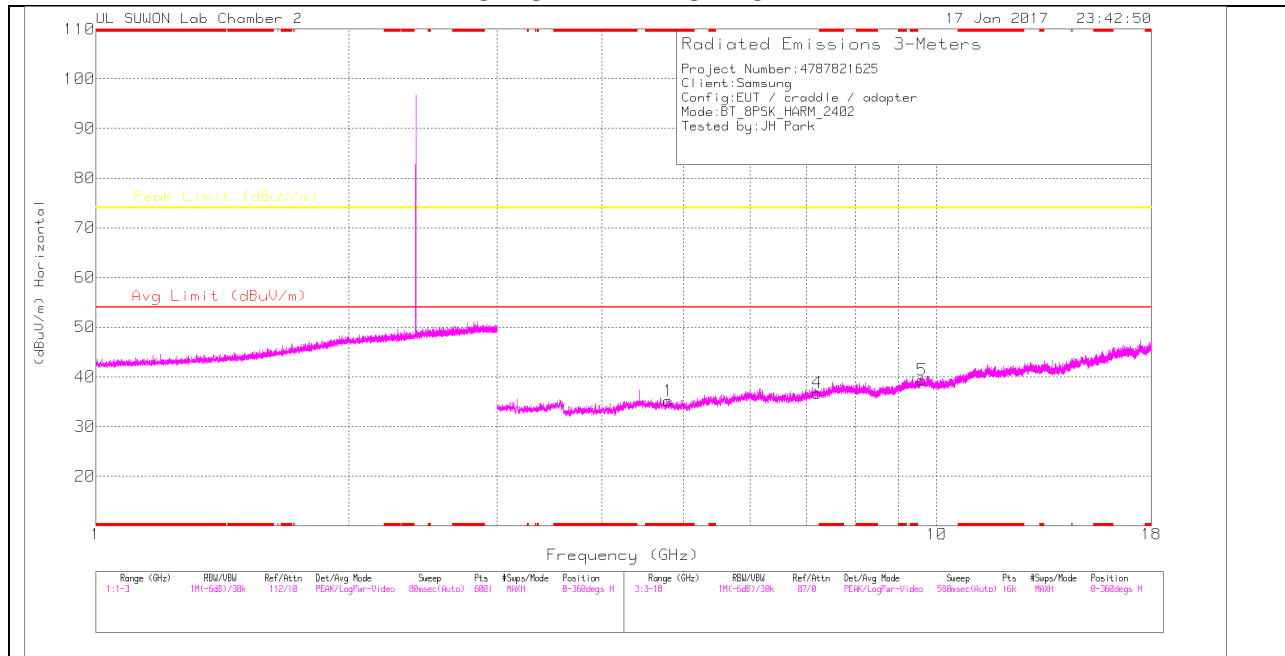
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

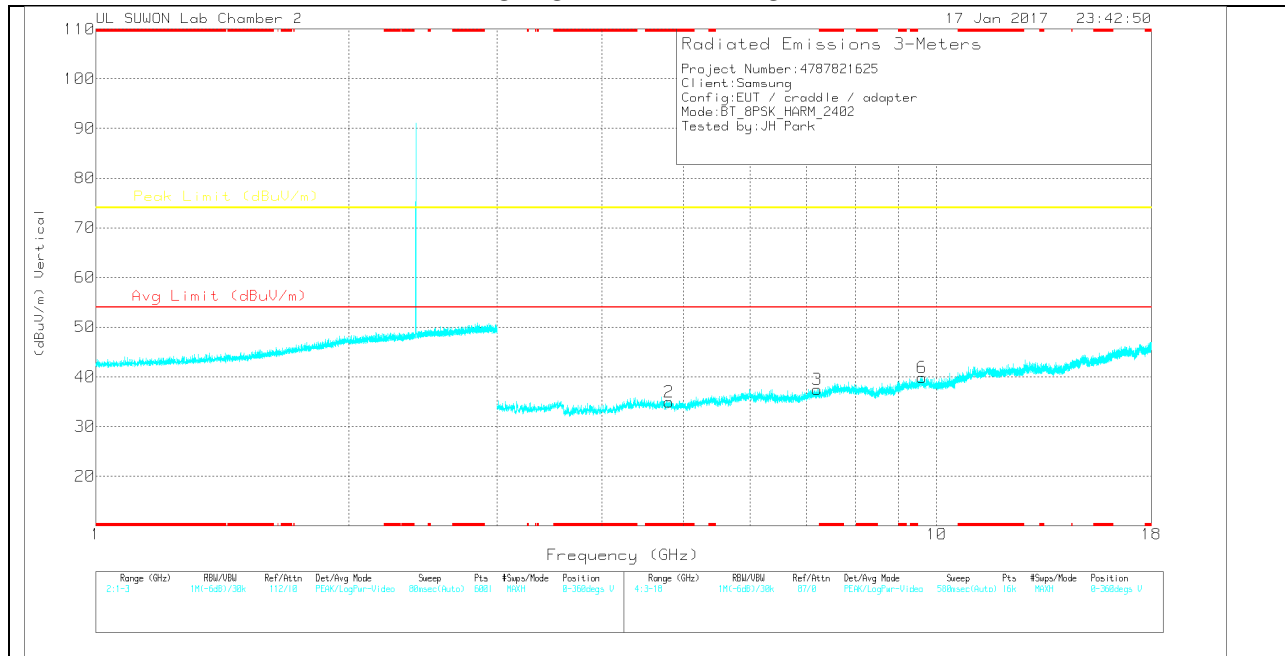
VA1T - FHSS: Linear Voltage Average  $V_B=1/T_{on}$  where:  $T_{on}$  is transmit duration

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL HORIZONTAL



### LOW CHANNEL VERTICAL



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

**LOW CHANNEL DATA**

Trace Markers

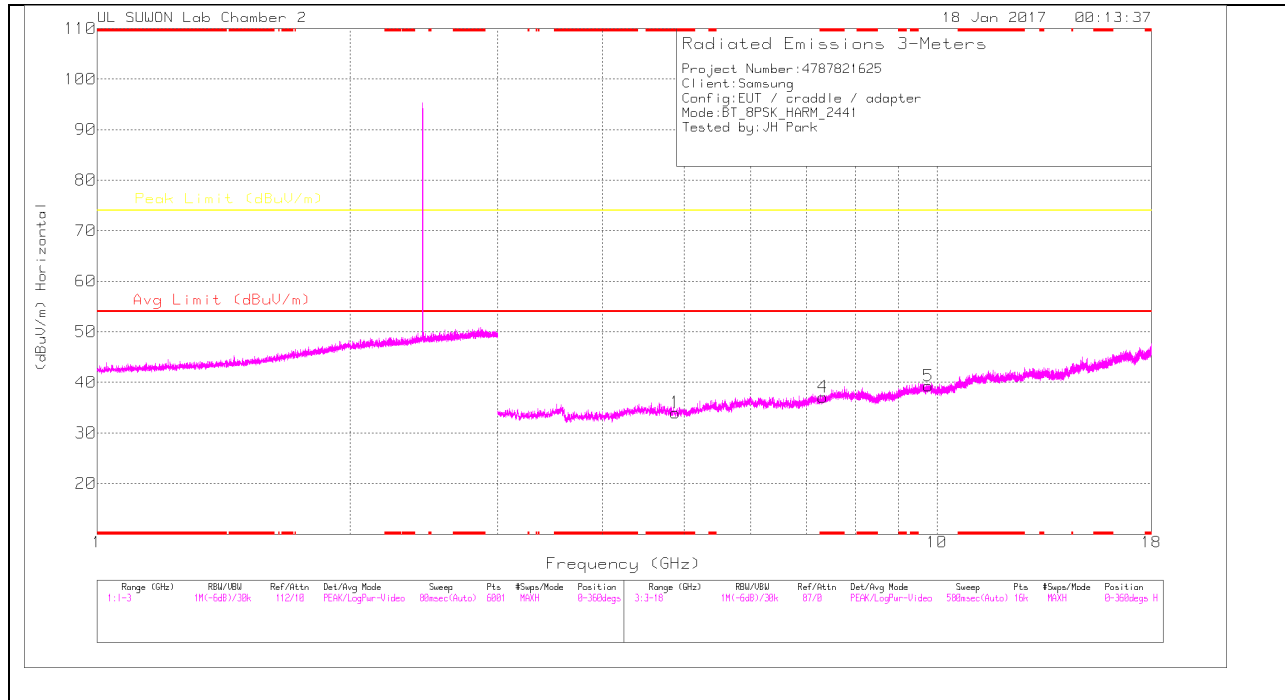
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.8	25.54	PK	33.9	-24.3	35.14	-	-	74	-38.86	0-360	150	H
4	7.208	22.66	PK	35.8	-21.7	36.76	-	-	74	-37.24	0-360	250	H
5	9.606	20.91	PK	36.9	-18.4	39.41	-	-	74	-34.59	0-360	150	H
2	* 4.802	25.37	PK	33.9	-24.3	34.97	-	-	74	-39.03	0-360	150	V
3	7.207	23.39	PK	35.8	-21.7	37.49	-	-	74	-36.51	0-360	150	V
6	9.603	21.4	PK	36.9	-18.4	39.9	-	-	74	-34.1	0-360	150	V

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

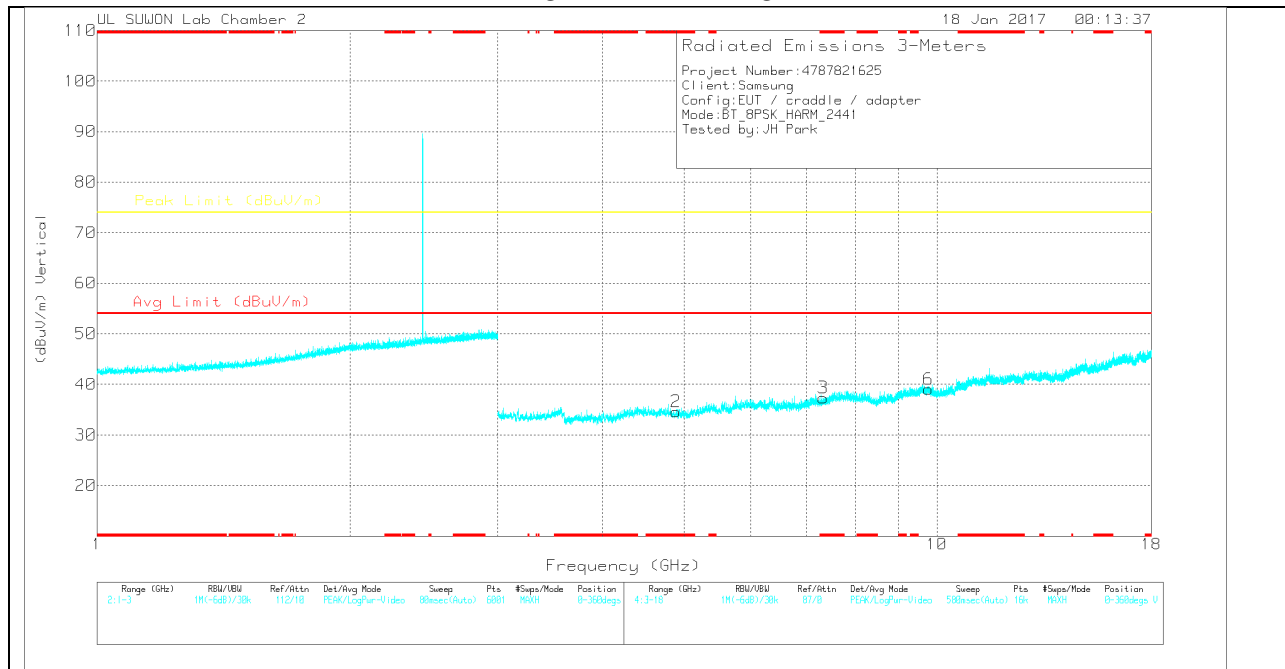
PK – Peak Detector

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

**MID CHANNEL HORIZONTAL**



**MID CHANNEL VERTICAL**



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

**MID CHANNEL DATA**

Trace Markers

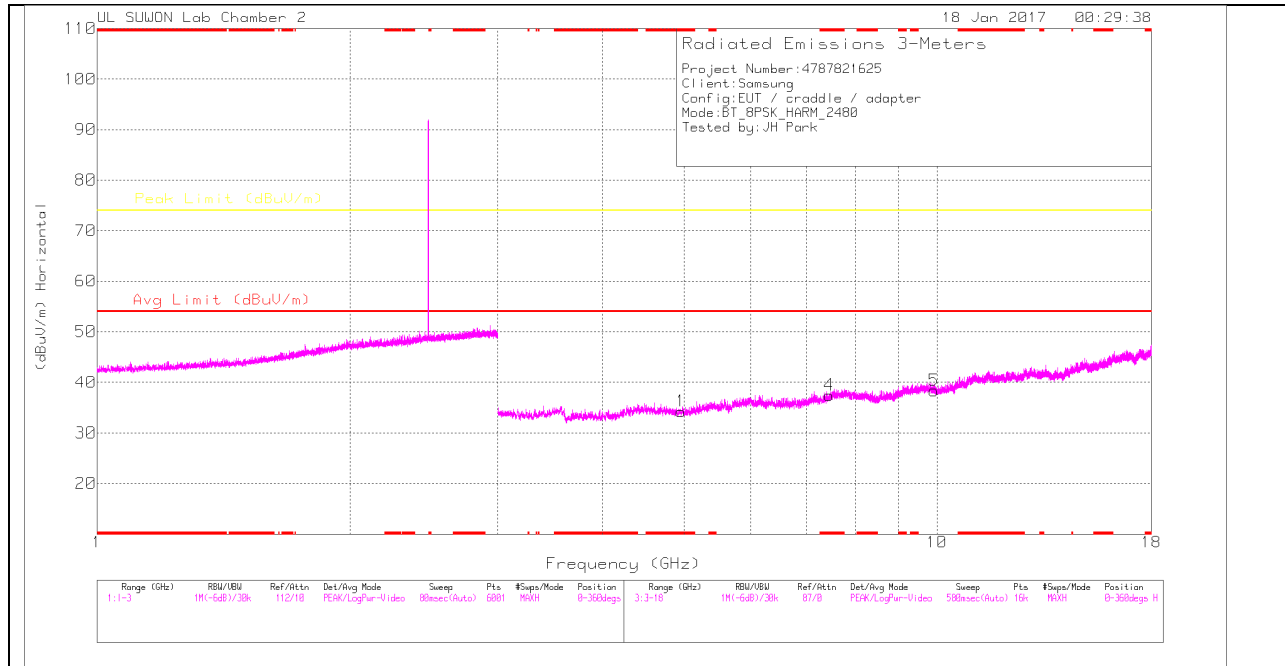
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.883	24.69	PK	33.9	-24.6	33.99	-	-	74	-40.01	0-360	250	H
4	* 7.318	23.21	PK	35.9	-22	37.11	-	-	74	-36.89	0-360	150	H
5	9.766	20.27	PK	37	-18	39.27	-	-	74	-34.73	0-360	250	H
2	* 4.887	25.29	PK	33.9	-24.6	34.59	-	-	74	-39.41	0-360	250	V
3	* 7.321	23.43	PK	35.9	-22	37.33	-	-	74	-36.67	0-360	250	V
6	9.764	20.05	PK	37	-18	39.05	-	-	74	-34.95	0-360	250	V

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

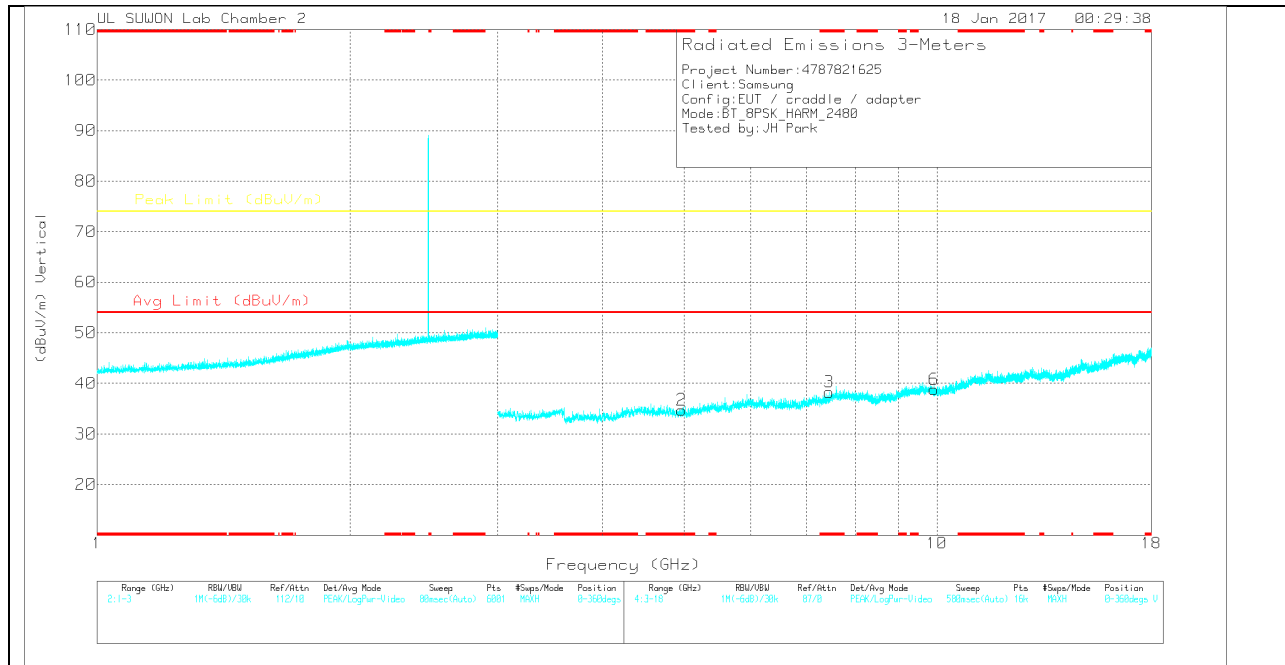
PK – Peak Detector

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

### HIGH CHANNEL HORIZONTAL



### HIGH CHANNEL VERTICAL



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

**HIGH CHANNEL DATA**

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	3GHz_HP[d B]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.959	25.05	PK	33.9	-24.7	34.25	-	-	74	-39.75	0-360	250	H
4	* 7.443	22.45	PK	36	-21	37.45	-	-	74	-36.55	0-360	250	H
5	9.919	19.27	PK	37.1	-18	38.37	-	-	74	-35.63	0-360	250	H
2	* 4.965	25.51	PK	33.9	-24.7	34.71	-	-	74	-39.29	0-360	150	V
3	* 7.443	23.26	PK	36	-21	38.26	-	-	74	-35.74	0-360	250	V
6	9.918	19.71	PK	37.1	-18	38.81	-	-	74	-35.19	0-360	250	V

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

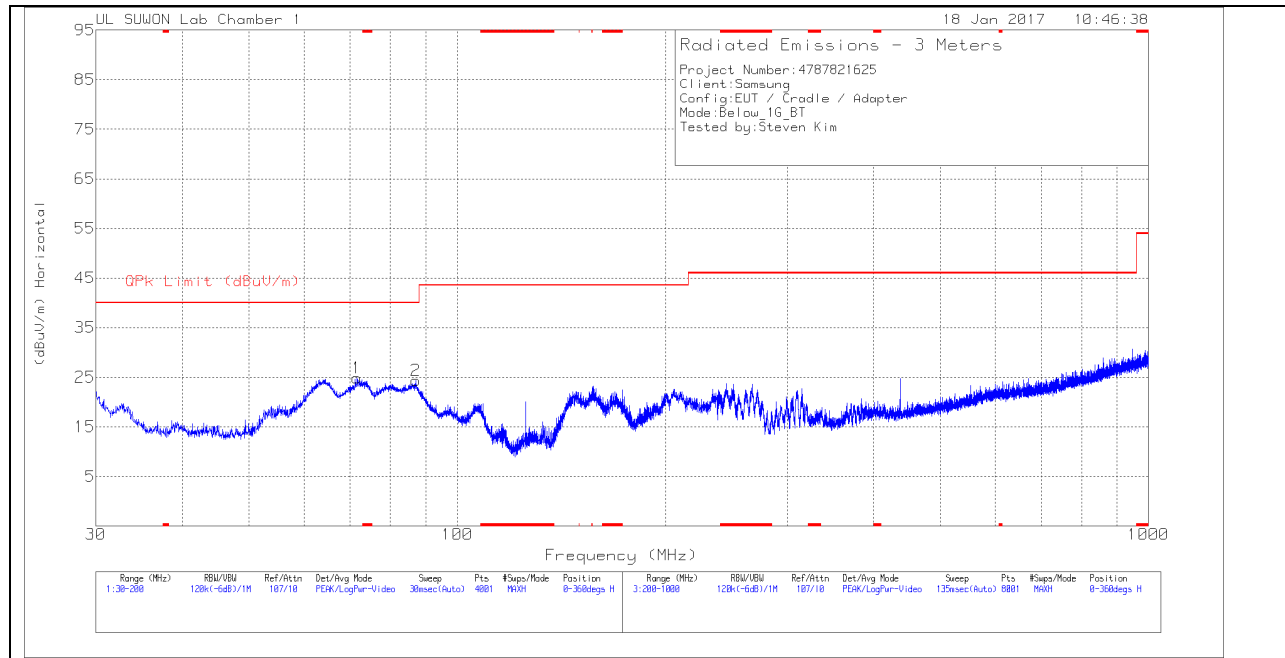
PK – Peak Detector

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

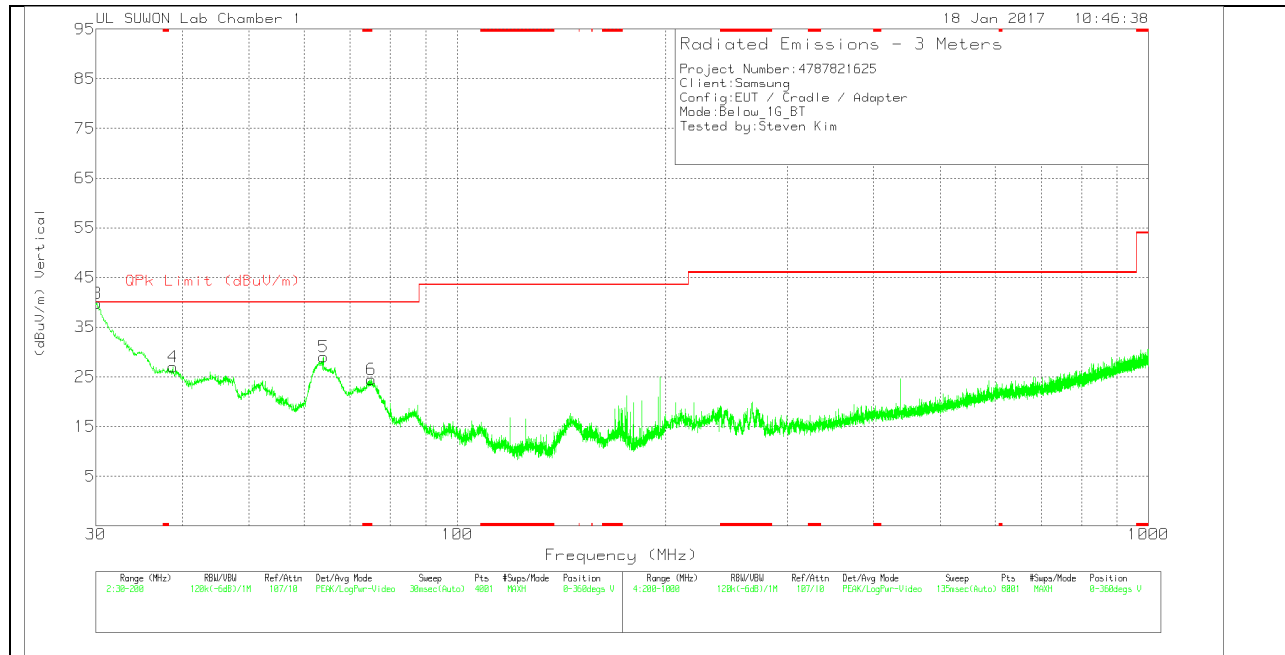
### 10.3. WORST-CASE BELOW 1 GHz

#### 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	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.565	45.35	Pk	9.2	-29.7	24.85	40	-15.15	0-360	300	H
2	87.035	45.15	Pk	8.7	-29.5	24.35	40	-15.65	0-360	200	H
3	30.1275	59.93	Pk	10.3	-30.5	39.73	40	-.27	0-360	100	V
4	38.755	45.31	Pk	12	-30.3	27.01	40	-12.99	0-360	100	V
5	64	47.48	Pk	11.4	-29.9	28.98	40	-11.02	0-360	100	V
6	* 75.135	45.94	Pk	8.2	-29.7	24.44	40	-15.56	0-360	200	V

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

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.03463	57.23	Qp	10.3	-30.5	37.03	40	-2.97	255	100	V

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

Qp - Quasi-Peak detector

## 11. 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.

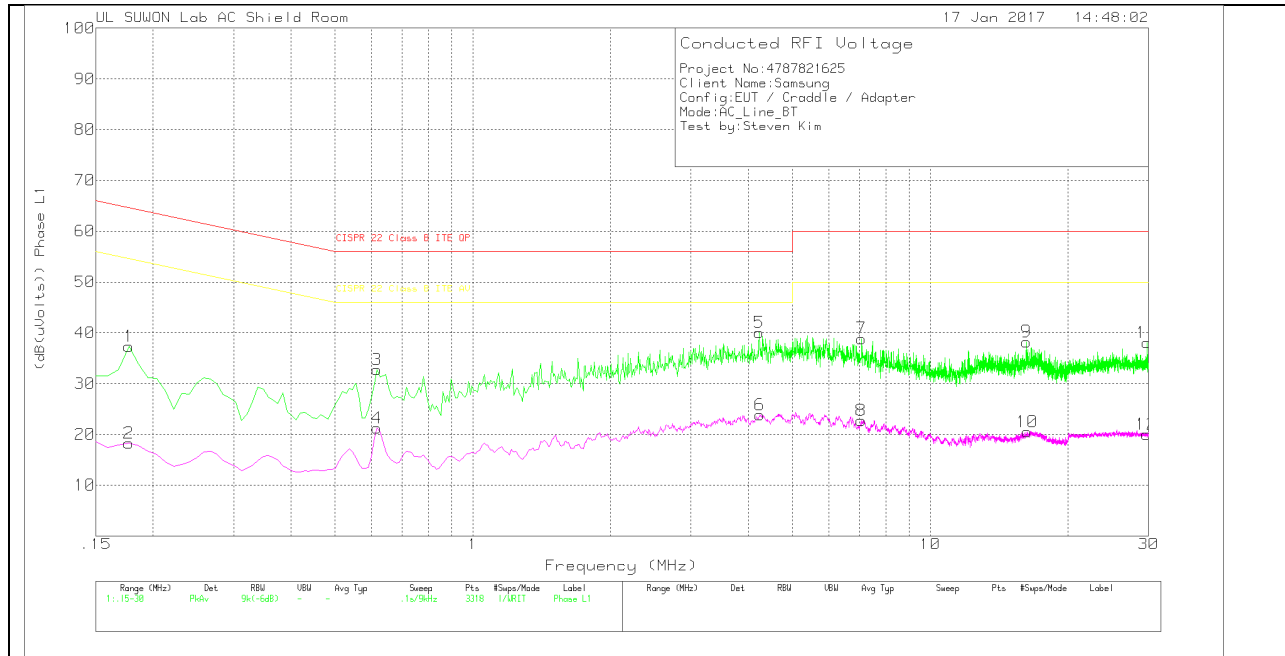
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

### RESULTS

**6 WORST EMISSIONS**

**LINE 1 PLOT**



**LINE 1 RESULTS**

Trace Markers

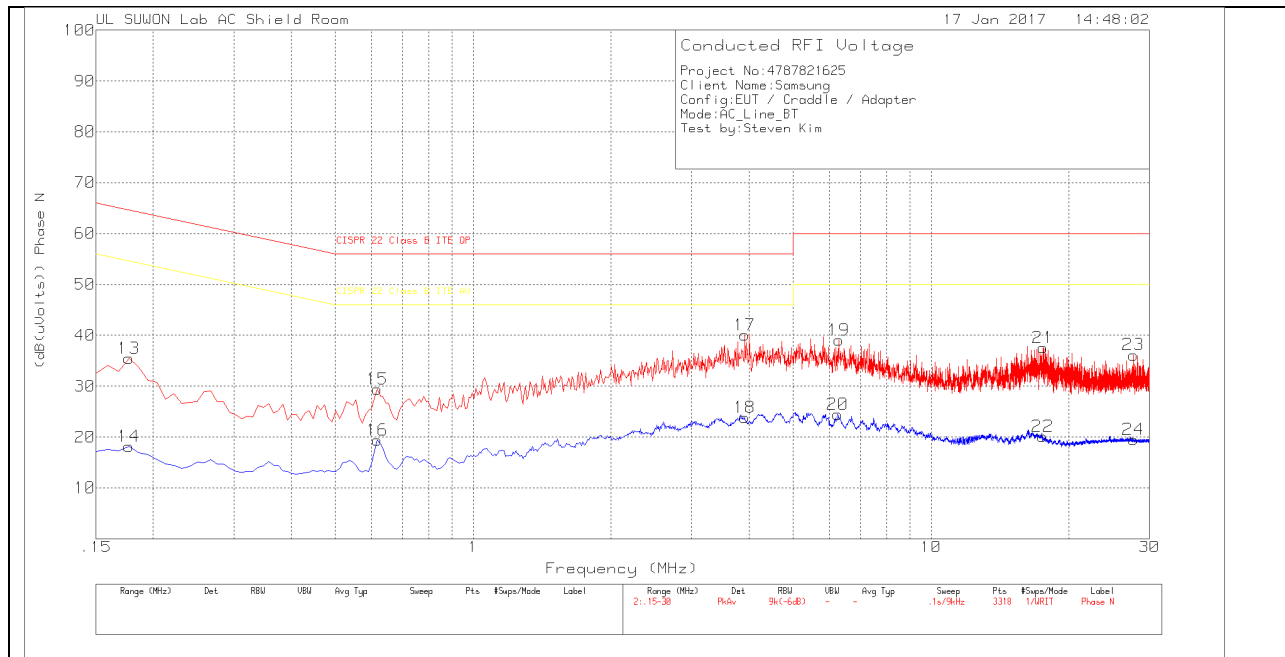
Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.177	27.37	Pk	10	0	37.37	64.63	-27.26	-	-
2	.177	8.25	Av	10	0	18.25	-	-	54.63	-36.38
3	.618	22.87	Pk	9.9	0	32.77	56	-23.23	-	-
4	.618	11.31	Av	9.9	0	21.21	-	-	46	-24.79
5	4.227	30.14	Pk	9.8	.1	40.04	56	-15.96	-	-
6	4.245	13.97	Av	9.8	.1	23.87	-	-	46	-22.13
7	7.071	28.87	Pk	9.9	.1	38.87	60	-21.13	-	-
8	7.062	12.69	Av	9.9	.1	22.69	-	-	50	-27.31
9	16.215	27.85	Pk	10.2	.2	38.25	60	-21.75	-	-
10	16.269	10.08	Av	10.2	.2	20.48	-	-	50	-29.52
11	29.742	27.01	Pk	10.7	.3	38.01	60	-21.99	-	-
12	29.715	8.97	Av	10.7	.3	19.97	-	-	50	-30.03

Pk - Peak detector

Av - Average detection

### LINE 2 PLOT



**LINE 2 RESULTS**

Trace Markers

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.177	25.5	Pk	10	0	35.5	64.63	-29.13	-	-
14	.177	8.15	Av	10	0	18.15	-	-	54.63	-36.48
15	.618	19.53	Pk	9.9	0	29.43	56	-26.57	-	-
16	.618	9.52	Av	9.9	0	19.42	-	-	46	-26.58
17	3.921	30.1	Pk	9.8	.1	40	56	-16	-	-
18	3.921	13.96	Av	9.8	.1	23.86	-	-	46	-22.14
19	6.288	29.06	Pk	9.9	.1	39.06	60	-20.94	-	-
20	6.252	14.51	Av	9.9	.1	24.51	-	-	50	-25.49
21	17.556	26.83	Pk	10.5	.2	37.53	60	-22.47	-	-
22	17.538	9.39	Av	10.5	.2	20.09	-	-	50	-29.91
23	27.645	24.95	Pk	10.9	.3	36.15	60	-23.85	-	-
24	27.645	8.35	Av	10.9	.3	19.55	-	-	50	-30.45

Pk - Peak detector

Av - Average detection