

# CERTIFICATION TEST REPORT

**Report Number.** : 4790841154-E7V1

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

**Model** : SM-X518U

**FCC ID** : A3LSMX518U

**EUT Description** : WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax  
and Digitizer

**Test Standard(s)** : FCC 47 CFR PART 15 SUBPART C

**Date Of Issue:**

2023-07-19

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Revision History

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.  
**EUT DESCRIPTION:** WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and Digitizer  
**MODEL:** SM-X518U  
**SERIAL NUMBER:** R32W6007EKK, R32W6007D9W (CONDUCTED);  
R32W6007DWJ, R32W5012DQT (RADIATED);  
**DATE TESTED:** 2023-06-21 ~ 2023-07-19;

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

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:



Seokhwan Hong  
Suwon Lab Engineer  
UL KOREA LTD.

Tested By:



Dexter(Hyunsik) Yun  
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. KDB 558074 D01 15.247 Meas Guidance v05r02.
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(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 4(3m Full-anechoic chamber)
<input type="checkbox"/>	Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. METROLOGICAL TRACEABILITY

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:

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

$$\begin{aligned} \text{AC Corrected Reading (dBuV)} &= \text{Measured Voltage (dBuV)} + \text{Extension Cord} \\ &\text{Loss (dB)} + \text{Cable Loss (dB)} \\ 44.72 \text{ dBuV} &= 34.72 \text{ dBuV} + 9.9 \text{ dB} + 0.1 \text{ dB} \end{aligned}$$

### 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	2.80 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.06 dB
Radiated Disturbance, 18 GHz to 40 GHz	6.02 dB

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

### 4.4. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and Digitizer. This test report addresses the BT(DSS) operational mode.

### 5.2. MAXIMUM OUTPUT POWER

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

Frequency Range [MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	Basic GFSK	Peak	14.110	25.763
		Average	13.853	24.283
	Enhanced Pi/4-DPSK	Peak	12.730	18.750
		Average	10.440	11.066
	Enhanced 8PSK	Peak	13.320	21.478
		Average	10.451	11.094

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

**The internal antenna was Permanently attached.  
Therefore this E.U.T Complies with the requirement of §15.203.**

The radio utilizes an internal antennas with ANT1's maximum gain of -4.80 dBi.



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## 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.

Worst case of antenna axis: X

All radiated and power line conducted tests were performed attached with travel adapter for the worst-case condition mode.

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.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37M9KN2LV2DK3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

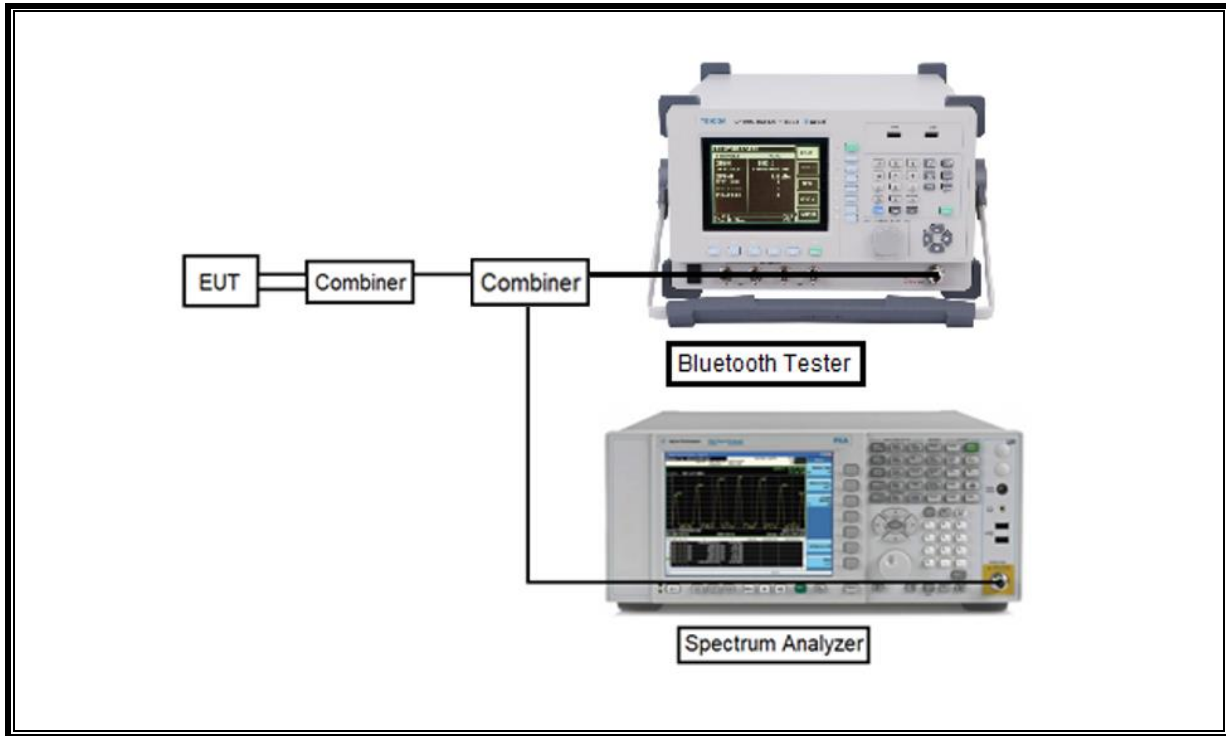
### I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

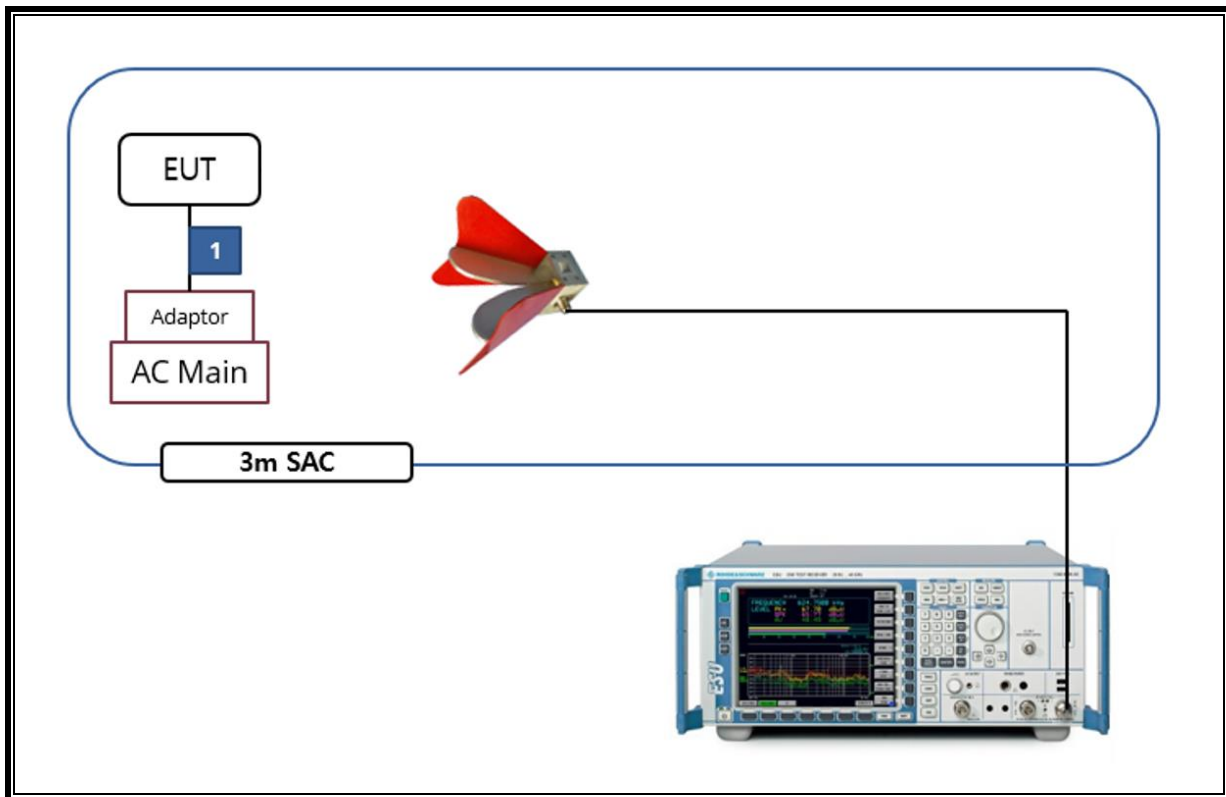
### TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests.  
Test software enable BT communications.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



## 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	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06
Antenna, Horn, 18 GHz	ETS	3115	00167211	2024-08-04
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168724	2024-08-04
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2024-08-02
Preamplifier	ETS	3115-PA	00167475	2023-08-04
Preamplifier	ETS	3116C-PA	00168841	2023-08-04
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Preamplifier, 1000 MHz	Sonoma	310N	341282	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2023-08-01
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2023-08-01
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2023-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2023-08-01
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2024-01-09
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2024-01-09
Average Power Sensor	Agilent / HP	U2000	MY54270007	2023-08-03
Average Power Sensor	Agilent / HP	U2000	MY54260010	2023-08-03
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	2023-08-02
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2024-01-09
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2024-01-09
Attenuator	PASTERNAK	PE7087-10	A009	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2023-08-03
Attenuator	PASTERNAK	PE7004-10	2	2023-08-01
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2023-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2023-07-29
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2023-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2023-08-01
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	2023-08-01
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2023-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2023-08-01
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2023-08-01
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2023-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2023-08-01
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2023-08-01
LISN	R&S	ENV-216	101837	2023-08-04
Termination	WEINSCHEL	M1406A	T09	2023-08-03
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. TEST RESULTS SUMMARY

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-20 dBc	Conducted	Complies
15.247 (b)(1)	TX conducted output power	< 21 dBm		Complies
15.247 (a)(1)	Hopping frequency separation	> two-thirds of the 20 dB bandwidth		Complies
15.247 (a)(1)(iii)	Number of Hopping channels	More than 15 non-overlapping channels		Complies
15.247 (a)(1)(iii)	Avg Time of Occupancy	< 8 dBm		Complies
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	Complies
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Complies

## 8. MEASUREMENT METHODS

20dB BW : ANSI C63.10, Section 6.9.2

99% BW : ANSI C63.10, Section 6.9.3

HOPPING FREQUENCY SEPARATION : ANSI C63.10, Section 7.8.2

NUMBER OF HOPPING CHANNELS : ANSI C63.10, Section 7.8.3

AVERAGE TIME OF OCCUPANCY : ANSI C63.10, Section 7.8.4

OUTPUT POWER : ANSI C63.10, Section 7.8.5.

Out-of-band EMISSIONS (Conducted) : ANSI C63.10, Section 7.8.6, 7.8.8

Out-of-band EMISSIONS IN NON-RESTRICTED BANDS: ANSI C63.10, Section 6.

Out-of-band EMISSIONS IN RESTRICTED BANDS : ANSI C63.10, Section 6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

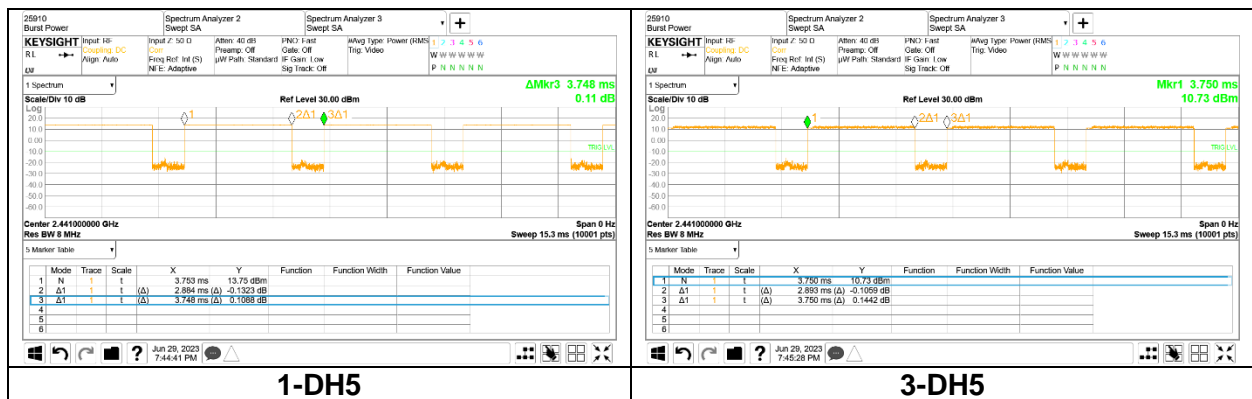
#### LIMITS

None; for reporting purposes only.

#### PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS



Mode	On time [msec]	Period [msec]	Duty Cycle [%]	1/T Minimum VBW [kHz]
<b>2 400 ~ 2 483.5 MHz Band</b>				
BDR	2.884	3.748	76.948	0.35
EDR	2.893	3.750	77.147	0.35

## 9.2. 20 dB BANDWIDTH

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. The sweep time is coupled.

### RESULTS

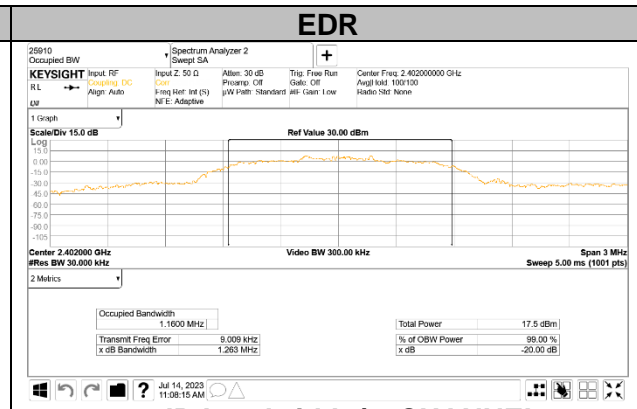
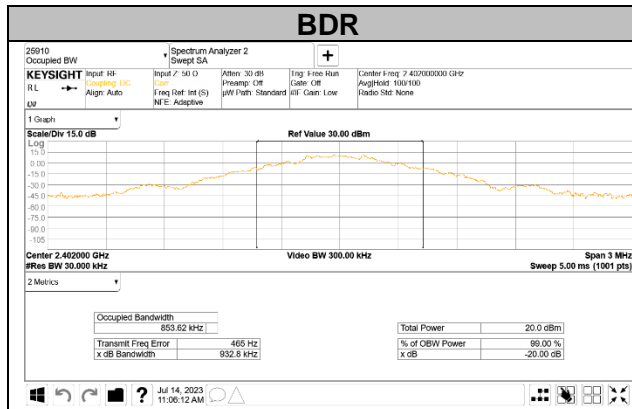
#### 9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	20 dB Bandwidth [MHz]
0	2 402	0.933
39	2 441	0.916
78	2 480	0.931
<b>Worst</b>		<b>0.933</b>

#### 9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

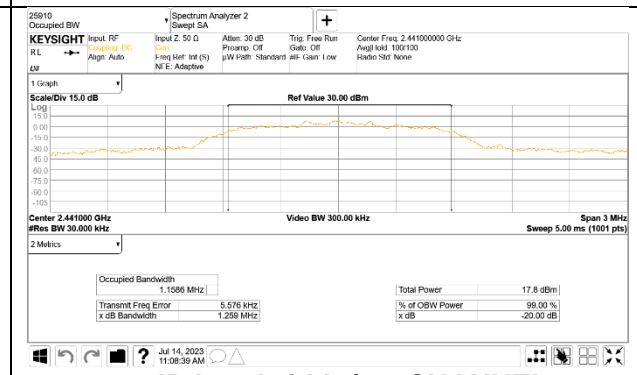
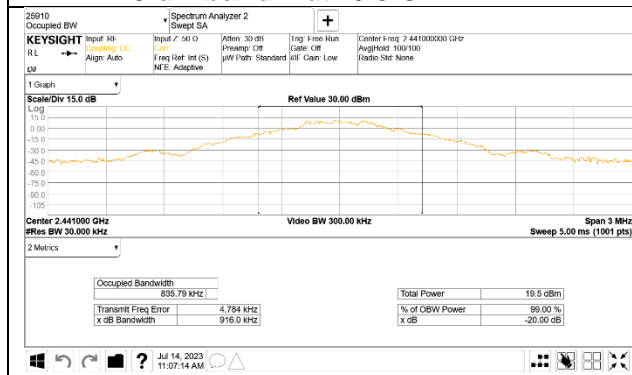
Channel	Frequency [MHz]	20 dB Bandwidth [MHz]
0	2 402	1.263
39	2 441	1.259
78	2 480	1.254
<b>Worst</b>		<b>1.263</b>





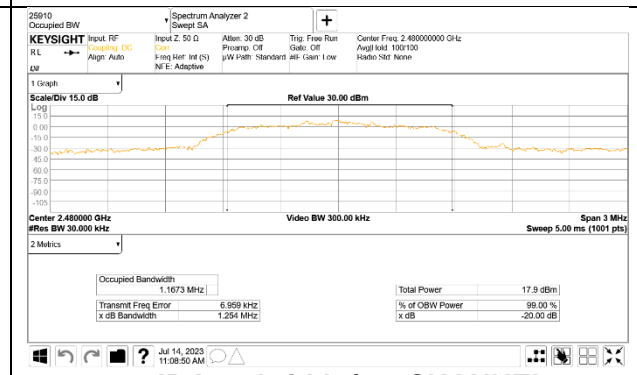
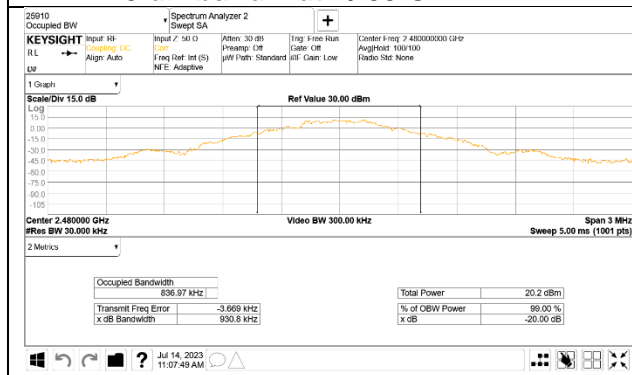
**20 dB bandwidth / 0 CHANNEL**

**20 dB bandwidth / 0 CHANNEL**



**20 dB bandwidth / 39 CHANNEL**

**20 dB bandwidth / 39 CHANNEL**



**20 dB bandwidth / 78 CHANNEL**

**20 dB bandwidth / 78 CHANNEL**

### 9.3. HOPPING FREQUENCY SEPARATION

#### LIMITS

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.

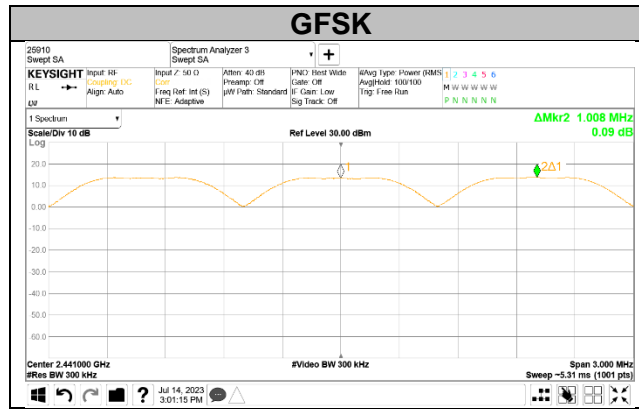
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

#### TEST PROCEDURE

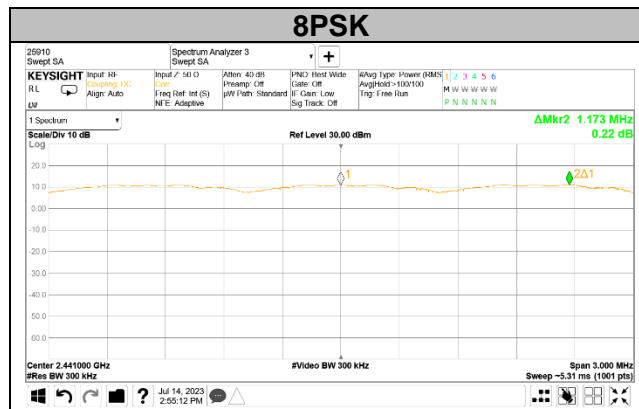
The transmitter output is connected to a spectrum analyzer. Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel. The VBW is set to  $VBW \geq RBW$ . The sweep time is coupled.

#### RESULTS

### 9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



### 9.3.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



## 9.4. NUMBER OF HOPPING CHANNELS

### LIMITS

FCC §15.247 (a) (1) (iii)

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

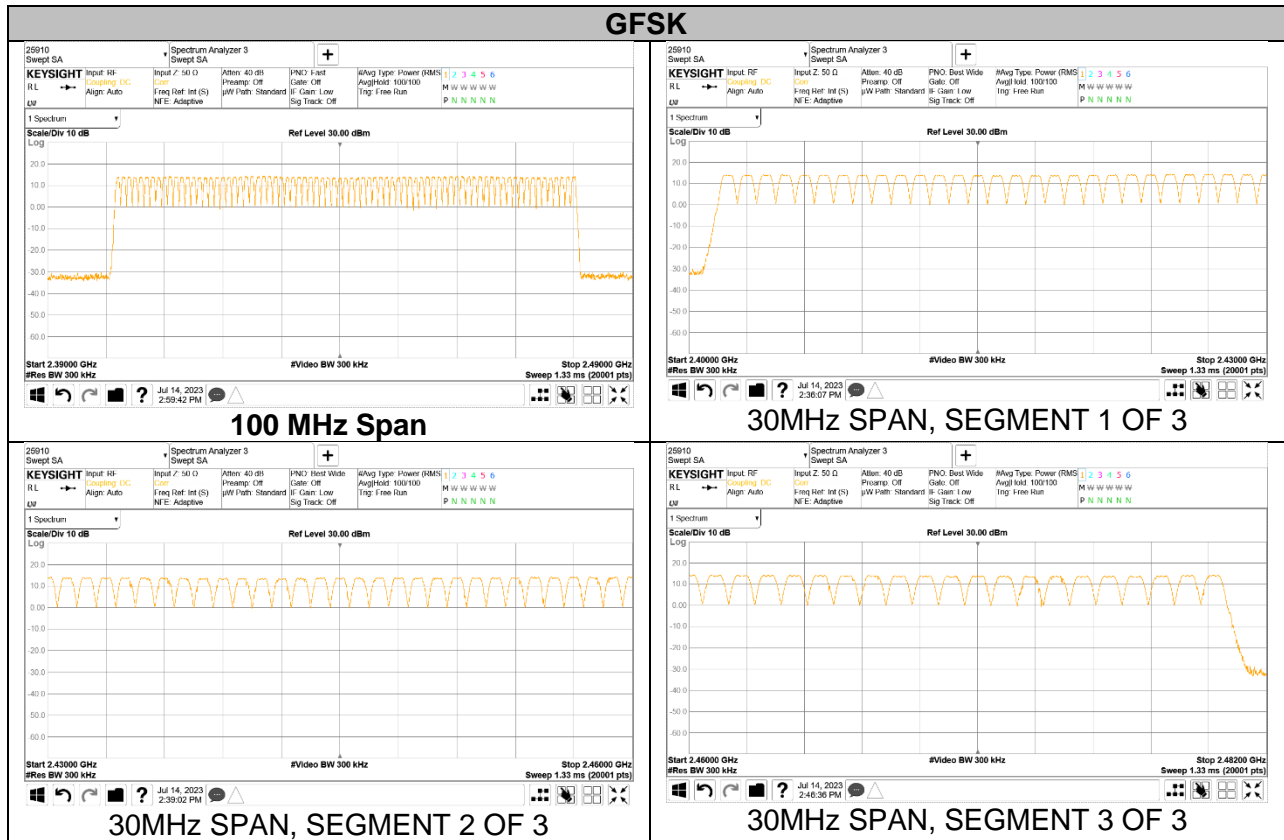
### TEST PROCEDURE

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. To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. The analyzer is set to Max Hold.

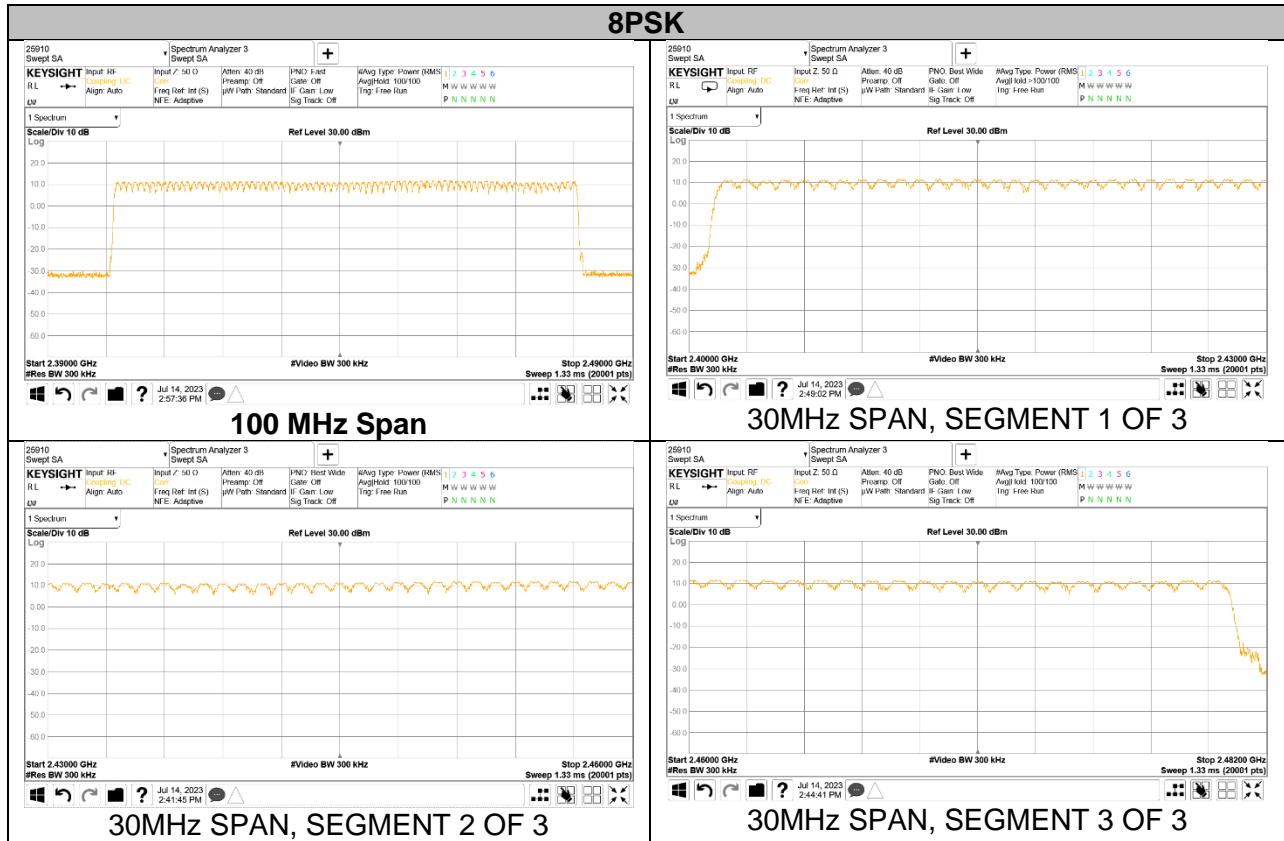
### RESULTS

Normal Mode: All Channels Observed

### 9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



## 9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



## 9.5. AVERAGE TIME OF OCCUPANCY

### LIMITS

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 3.16 second period (79 channels \* 0.4 s) is equal to  $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$ .

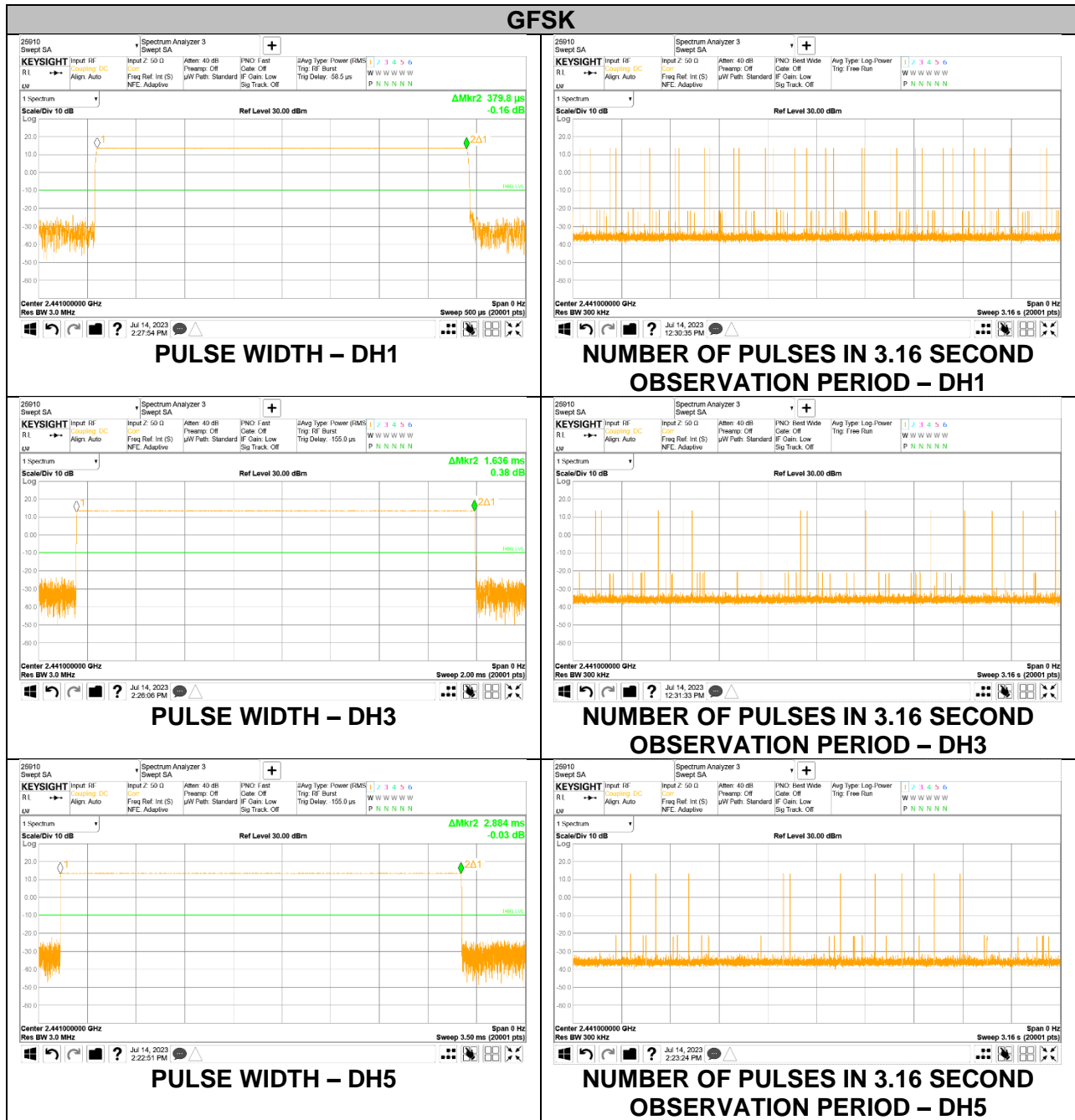
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels \* 0.4 seconds) is equal to  $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{ pulse width}$ .

### RESULTS

### 9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

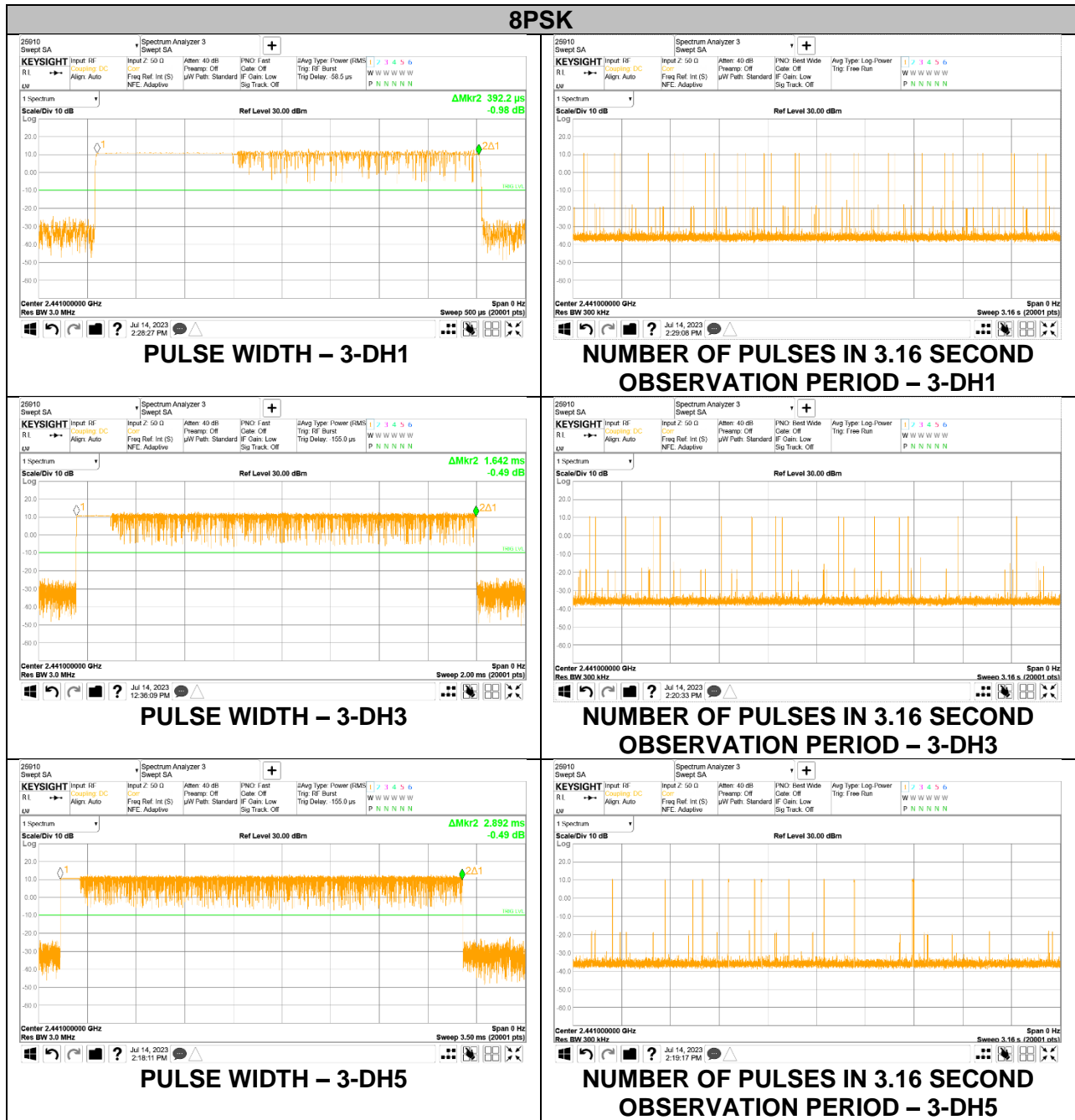
DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK Normal					
DH1	0.380	32	0.122	0.4	-0.278
DH3	1.636	14	0.229	0.4	-0.171
DH5	2.884	10	0.288	0.4	-0.112
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK AFH					
DH1	0.380	8	0.030	0.4	-0.370
DH3	1.636	4	0.065	0.4	-0.335
DH5	2.884	3	0.087	0.4	-0.313





### 9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK Normal					
DH1	0.392	31	0.122	0.4	-0.278
DH3	1.642	16	0.263	0.4	-0.137
DH5	2.892	11	0.318	0.4	-0.082
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK AFH					
DH1	0.392	8	0.031	0.4	-0.369
DH3	1.642	4	0.066	0.4	-0.334
DH5	2.892	3	0.087	0.4	-0.313



## 9.6. OUTPUT POWER

### LIMITS

§15.247 (b) (1)

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

### TEST PROCEDURE

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

#### 9.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
0	2 402	14.05	21.00	-6.95
39	2 441	14.00		-7.00
78	2 480	14.11		-6.89
Worst		<b>14.11</b>		<b>-6.89</b>

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

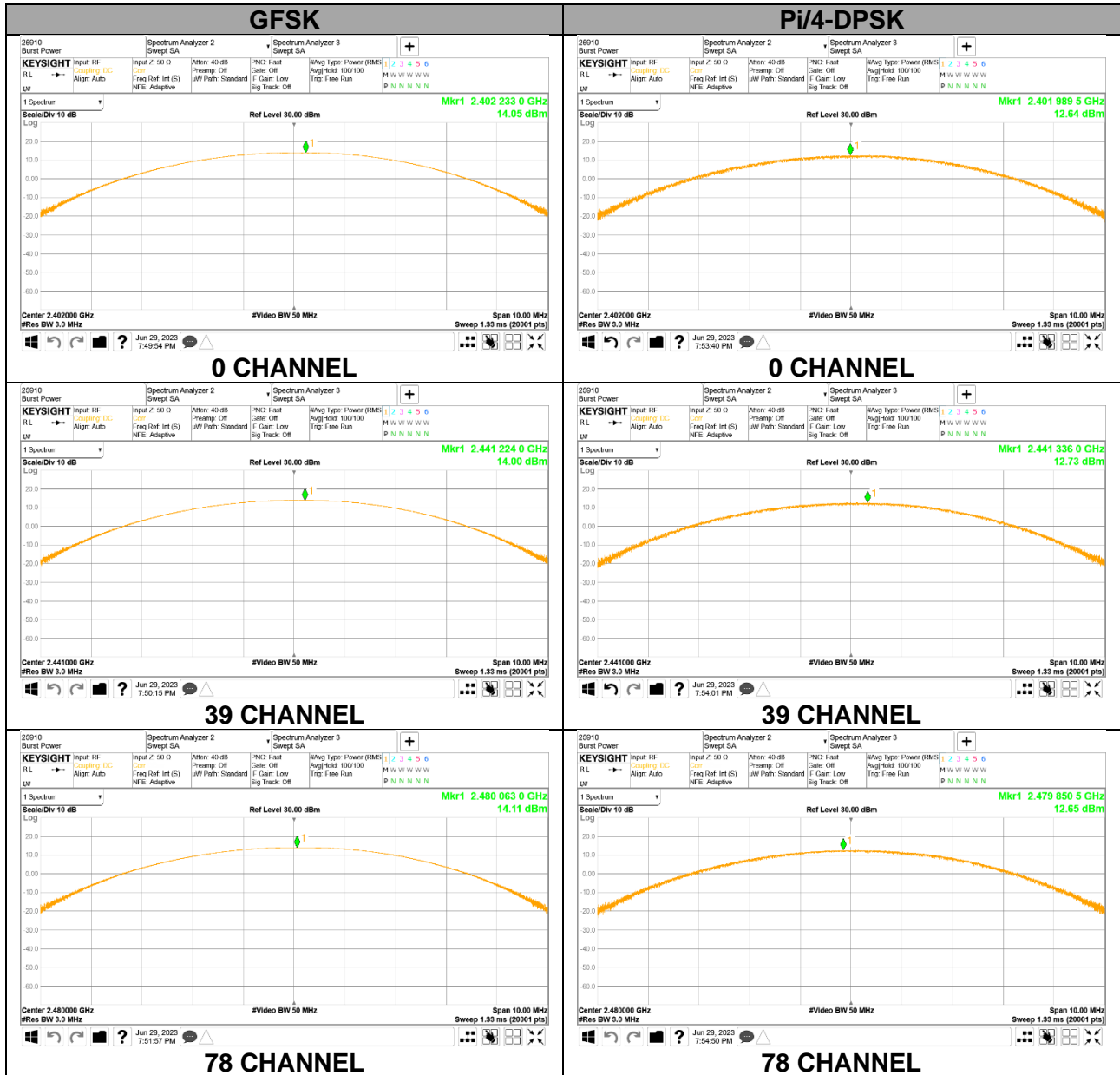
Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
0	2 402	12.64	21.00	-8.36
39	2 441	12.73		-8.27
78	2 480	12.65		-8.35
Worst		<b>12.73</b>		<b>-8.27</b>

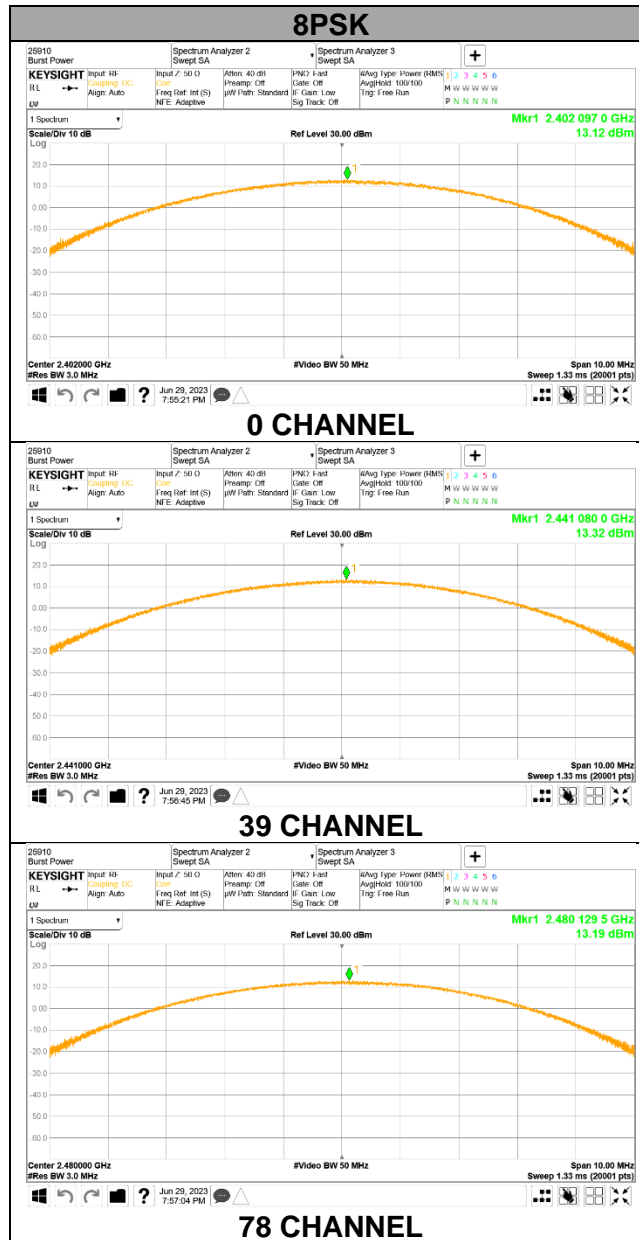
#### 9.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
0	2 402	13.12	21.00	-7.88
39	2 441	13.32		-7.68
78	2 480	13.19		-7.81
Worst		<b>13.32</b>		<b>-7.68</b>

### 9.6.4. OUTPUT POWER PLOTS

#### PEAK OUTPUT POWER





## 9.7. AVERAGE POWER

### LIMITS

None; for reporting purposes only

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.  
 The cable assembly insertion loss was entered as an offset in the power meter to allow for direct reading of power.

### RESULTS

#### 9.7.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
0	2 402	13.806	24.021
39	2 441	13.735	23.632
78	2 480	13.853	24.283

#### 9.7.2. ENHANCED DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
0	2 402	10.239	10.566
39	2 441	10.440	11.066
78	2 480	10.382	10.919

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

Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
0	2 402	10.244	10.578
39	2 441	10.451	11.094
78	2 480	10.384	10.924

## **9.8. 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.

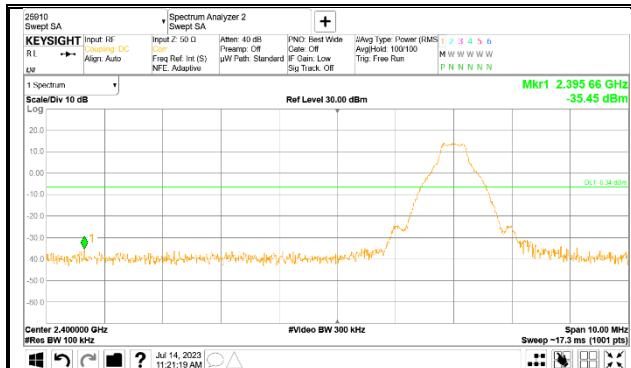
The band-edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

### **RESULTS**

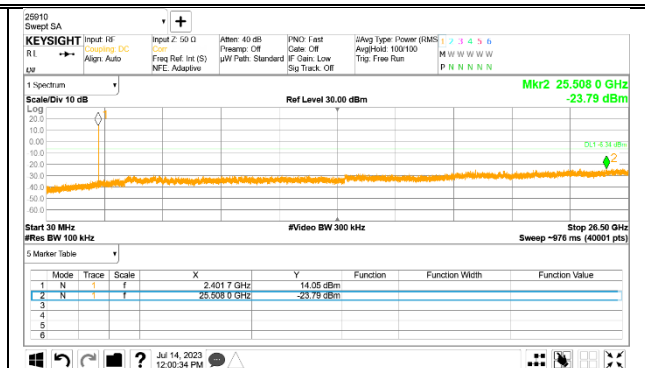


## 9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

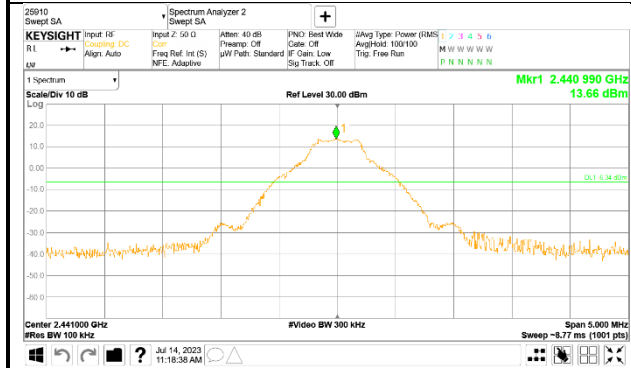
### SPURIOUS EMISSIONS, NON-HOPPING



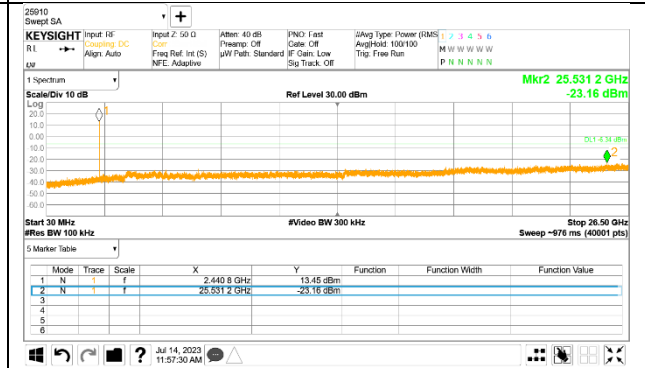
**0 CHANNEL BANDEDGE**



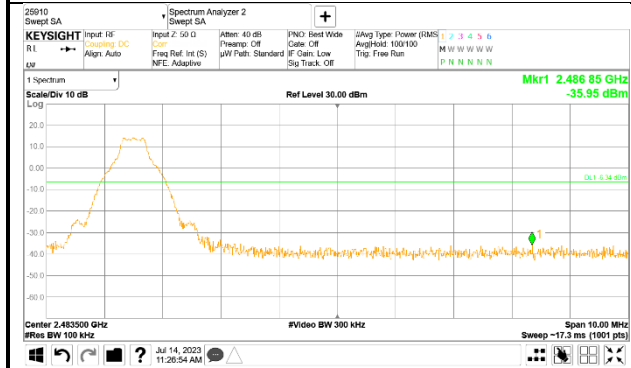
**OUT-OF-BAND 0 CHANNEL**



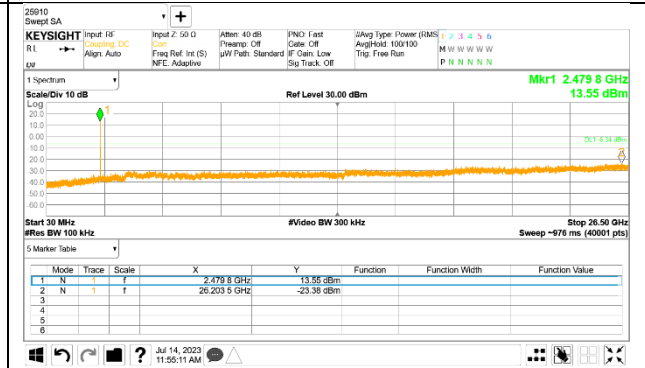
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND 39 CHANNEL**

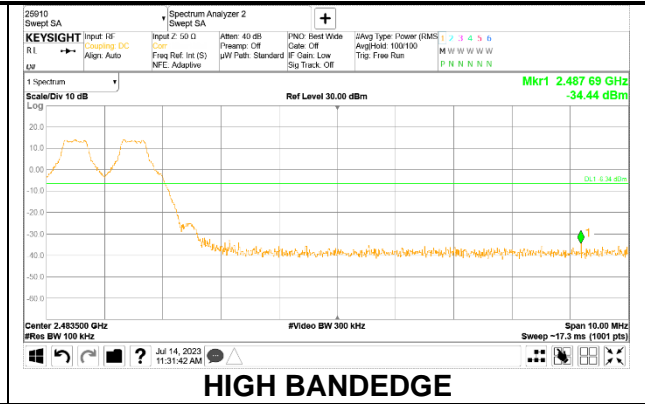
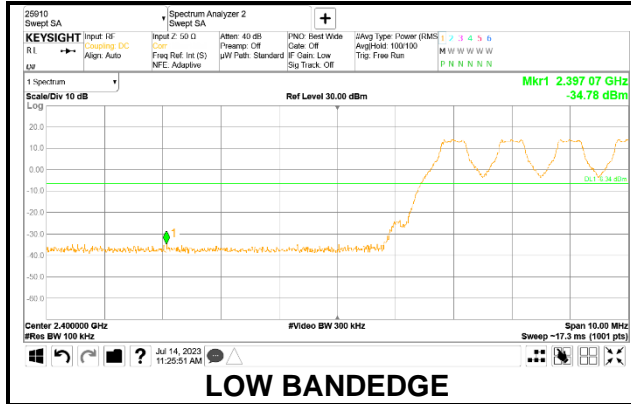


**78 CHANNEL BANDEDGE**



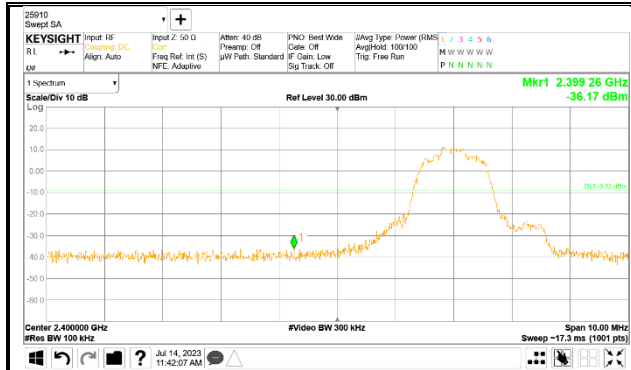
**OUT-OF-BAND 78 CHANNEL**

**SPURIOUS BANDEGE EMISSIONS WITH HOPPING ON**

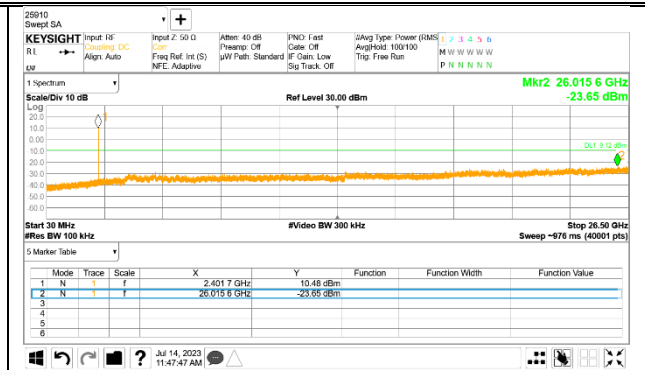


## 9.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

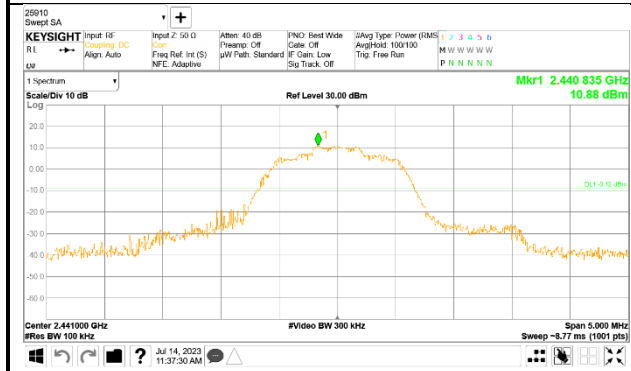
### SPURIOUS EMISSIONS, NON-HOPPING



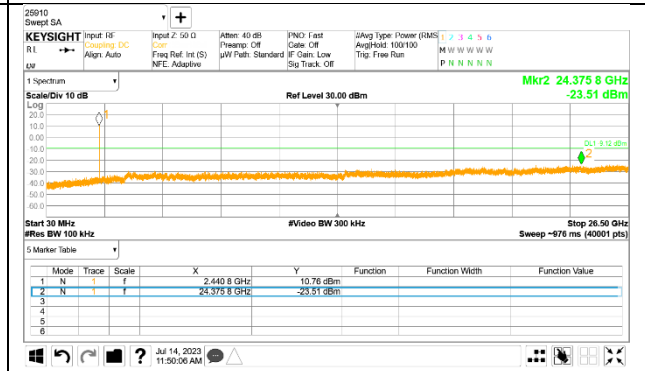
**0 CHANNEL BANDEDGE**



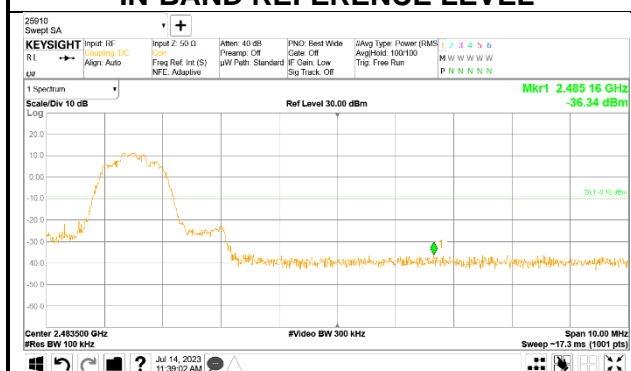
**OUT-OF-BAND 0 CHANNEL**



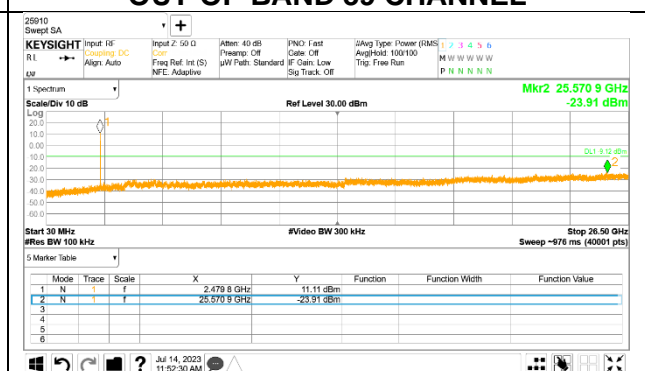
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND 39 CHANNEL**

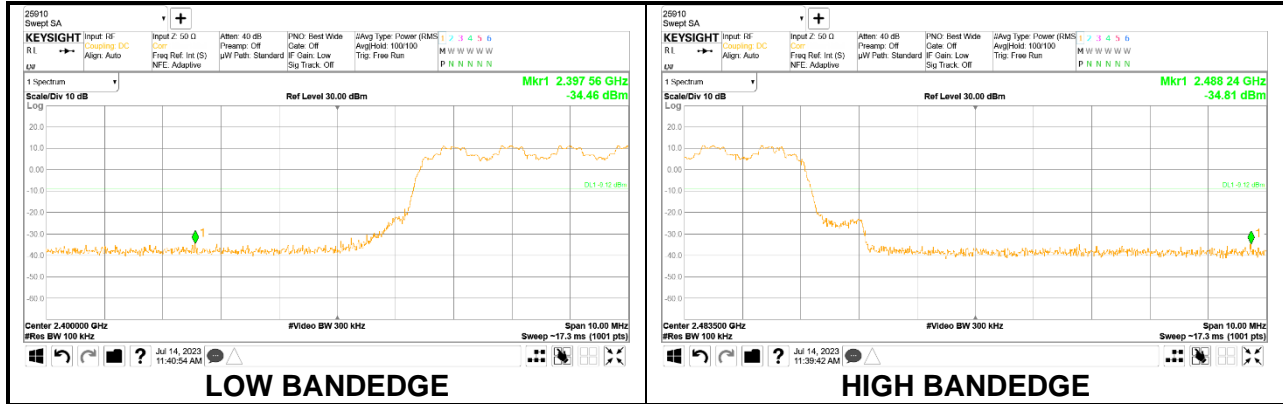


**78 CHANNEL BANDEDGE**



**OUT-OF-BAND 78 CHANNEL**

**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**



## 10. RADIATED TEST RESULTS

### 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.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 – 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 – 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.17	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	167.72 ~ 173.2	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	240 ~ 285	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	322 ~ 335.4	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	399.90 ~ 410	3345.8 ~ 3358		
		608 ~ 614	3600 ~ 4400		
		960 ~ 1240			

▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

## **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 3 MHz for peak measurements and 1/T (on time) for average measurement.

$$\text{GFSK} = 1/T = 1 / 0.00289\text{s} = 346\text{Hz}.$$

The minimum VBW was 347Hz, but test receiver(ESU40) couldn't set value 347Hz. 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.

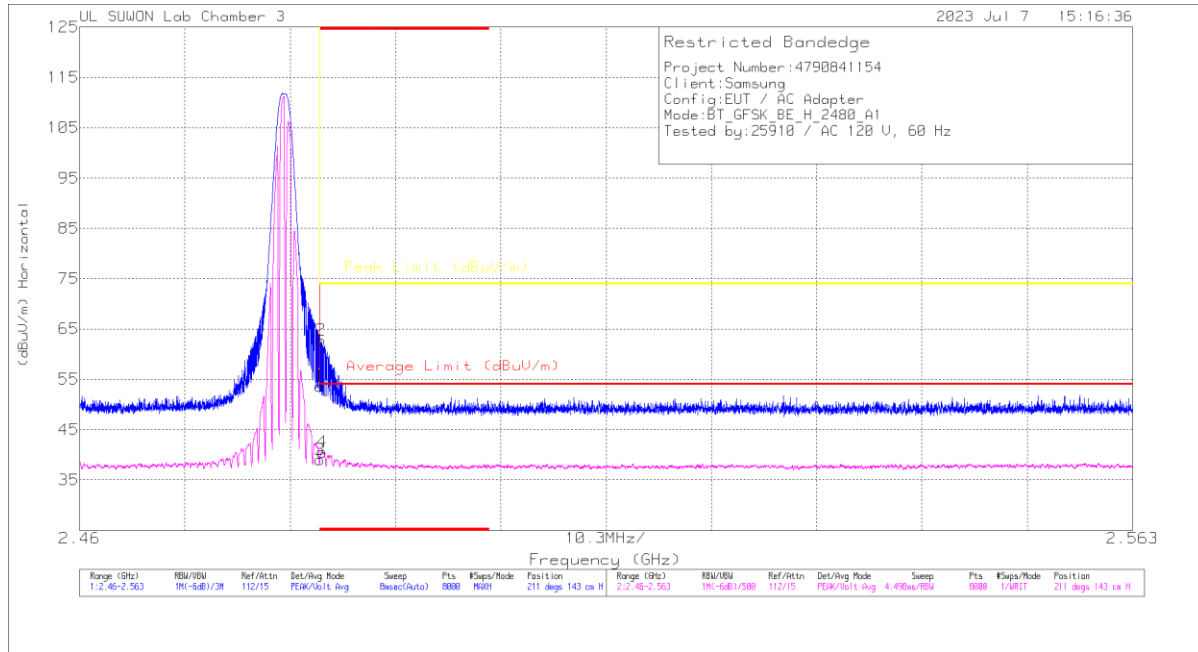
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.  
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

## 10.1. TRANSMITTER ABOVE 1 GHz

### 10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

#### BANDEDGE (WORST CASE: 78 CHANNEL)

#### HORIZONTAL RESULT



#### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	46.19	Pk	32.4	-25	53.59	-	-	74	-20.41	211	143	H
2	* 2.48363	55.38	Pk	32.4	-25	62.78	-	-	74	-11.22	211	143	H
3	* 2.4835	31.65	VA1T	32.4	-25	39.05	54	-14.95	-	-	211	143	H
4	* 2.48373	33.11	VA1T	32.4	-25	40.51	54	-13.49	-	-	211	143	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

**BANEDGE TEST DATA**

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2402	ANT1	* 2.39	41.88	Pk	32.10	-25.10	0.00	48.88	-	-	74.00	-25.12	212	104	H	
		* 2.32972	45.33	Pk	31.90	-25.20	0.00	52.03	-	-	74.00	-21.97	212	104	H	
		* 2.39	29.45	VA1T	32.10	-25.10	0.00	36.45	54.00	-17.55	-	-	-	212	104	H
		* 2.3899	30.09	VA1T	32.10	-25.10	0.00	37.09	54.00	-16.91	-	-	-	212	104	H
		* 2.39	40.48	Pk	32.10	-25.10	0.00	47.48	-	-	74.00	-26.52	158	319	V	
		* 2.34511	44.74	Pk	32.00	-25.10	0.00	51.64	-	-	74.00	-22.36	158	319	V	
		* 2.39	29.48	VA1T	32.10	-25.10	0.00	36.48	54.00	-17.52	-	-	-	158	319	V
		* 2.36924	30.36	VA1T	32.00	-25.20	0.00	37.16	54.00	-16.84	-	-	-	158	319	V
		* 2.4835	46.19	Pk	32.40	-25.00	0.00	53.59	-	-	74.00	-20.41	211	143	H	
2480	ANT1	* 2.48363	55.38	Pk	32.40	-25.00	0.00	62.78	-	-	74.00	-11.22	211	143	H	
		* 2.4835	31.65	VA1T	32.40	-25.00	0.00	39.05	54.00	-14.95	-	-	211	143	H	
		* 2.48373	33.11	VA1T	32.40	-25.00	0.00	40.51	54.00	-13.49	-	-	211	143	H	
		* 2.4835	45.17	Pk	32.40	-25.00	0.00	52.57	-	-	74.00	-21.43	158	335	V	
		* 2.48355	53.18	Pk	32.40	-25.00	0.00	60.58	-	-	74.00	-13.42	158	335	V	
		* 2.4835	32.31	VA1T	32.40	-25.00	0.00	39.71	54.00	-14.29	-	-	158	335	V	
		* 2.48355	32.78	VA1T	32.40	-25.00	0.00	40.18	54.00	-13.82	-	-	158	335	V	

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

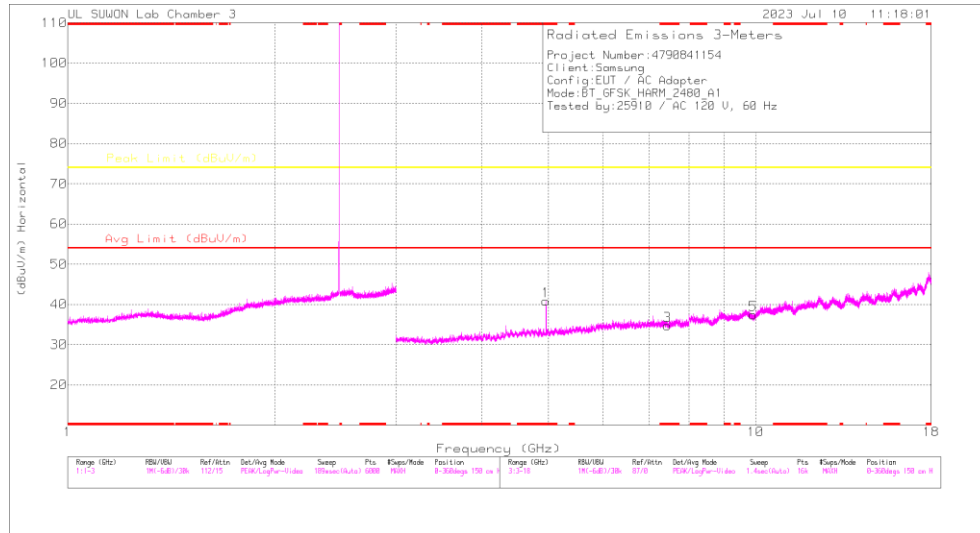
Pk - Peak detector

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

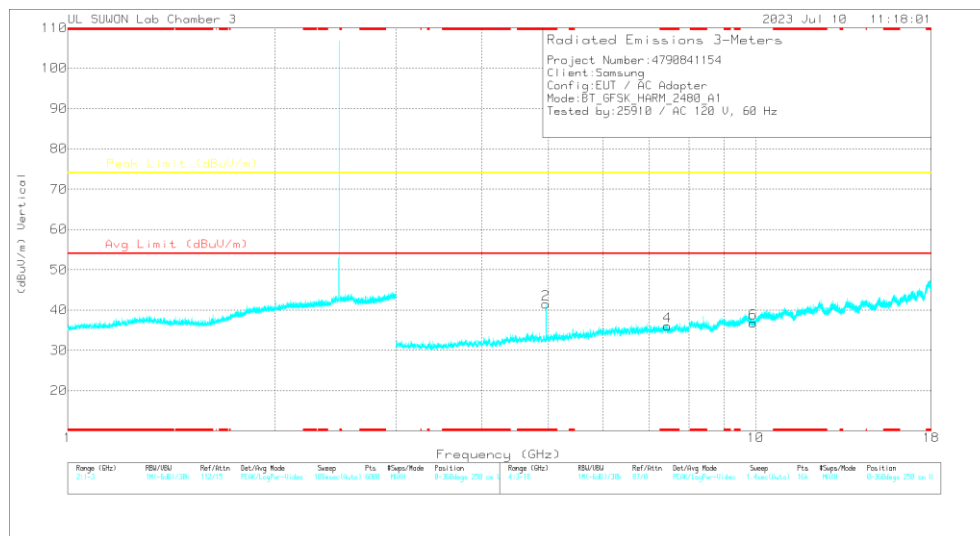


## HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 78 CHANNEL)

### 78 CHANNEL RESULTS



### HORIZONTAL



### VERTICAL

### Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	3GHz_HP(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
<b>GFSK</b>												
* 4.96047	43.42	PKFH	34.3	-30.5	47.22	-	-	74	-26.78	202	108	H
* 4.96003	37.75	VA1T	34.3	-30.5	41.55	54	-12.45	-	-	202	108	H
* 4.95988	40.47	PKFH	34.3	-30.5	44.27	-	-	74	-29.73	154	100	V
* 4.96007	32.7	VA1T	34.3	-30.5	36.5	54	-17.5	-	-	154	100	V
* 7.44216	32.51	PKFH	35.7	-25.1	43.11	-	-	74	-30.89	0	100	H
* 7.43921	33.02	PKFH	35.7	-25.1	43.62	-	-	74	-30.38	0	100	V
9.91954	30.35	PKFH	37.1	-21.3	46.15	-	-	74	-27.85	0	100	H
9.92061	30.97	PKFH	37.1	-21.4	46.67	-	-	74	-27.33	0	100	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak  
 VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

**HARMONICS AND SPURIOUS EMISSIONS TEST DATA**

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 4.80431	43.68	PKFH	34.30	-30.10	0.00	47.88	-	-	74.00	-26.12	199	122	H
		* 4.80416	37.26	VA1T	34.30	-30.10	0.00	41.46	54.00	-12.54	-	-	199	122	H
		* 4.80347	40.05	PKFH	34.30	-30.10	0.00	44.25	-	-	74.00	-29.75	151	100	V
		* 4.80388	31.65	VA1T	34.30	-30.10	0.00	35.85	54.00	-18.15	-	-	151	100	V
		7.206	33.85	PKFH	35.80	-25.70	0.00	43.95	-	-	74.00	-30.05	192	100	H
		7.206	34.43	PKFH	35.80	-25.70	0.00	44.53	-	-	74.00	-29.47	337	117	V
		9.606	30.61	PKFH	36.70	-21.60	0.00	45.71	-	-	74.00	-28.29	0	100	H
		9.608	30.38	PKFH	36.70	-21.70	0.00	45.38	-	-	74.00	-28.62	0	100	V
2441	ANT1	* 4.88163	41.79	PKFH	34.20	-30.90	0.00	45.09	-	-	74.00	-28.91	199	106	H
		* 4.88203	34.36	VA1T	34.20	-30.90	0.00	37.66	54.00	-16.34	-	-	199	106	H
		* 4.88198	39.26	PKFH	34.20	-30.90	0.00	42.56	-	-	74.00	-31.44	150	100	V
		* 4.88207	29.94	VA1T	34.20	-30.90	0.00	33.24	54.00	-20.76	-	-	150	100	V
		* 7.32157	32.98	PKFH	35.80	-25.40	0.00	43.38	-	-	74.00	-30.62	0	100	H
		* 7.32496	32.13	PKFH	35.80	-25.30	0.00	42.63	-	-	74.00	-31.37	0	100	V
		9.764	29.91	PKFH	36.90	-21.20	0.00	45.61	-	-	74.00	-28.39	0	100	H
		9.764	30.11	PKFH	36.90	-21.20	0.00	45.81	-	-	74.00	-28.19	0	100	V
2480	ANT1	* 4.96047	43.42	PKFH	34.30	-30.50	0.00	47.22	-	-	74.00	-26.78	202	108	H
		* 4.96003	37.75	VA1T	34.30	-30.50	0.00	41.55	54.00	-12.45	-	-	202	108	H
		* 4.95988	40.47	PKFH	34.30	-30.50	0.00	44.27	-	-	74.00	-29.73	154	100	V
		* 4.96007	32.70	VA1T	34.30	-30.50	0.00	36.50	54.00	-17.50	-	-	154	100	V
		* 7.44216	32.51	PKFH	35.70	-25.10	0.00	43.11	-	-	74.00	-30.89	0	100	H
		* 7.43921	33.02	PKFH	35.70	-25.10	0.00	43.62	-	-	74.00	-30.38	0	100	V
		9.920	30.35	PKFH	37.10	-21.30	0.00	46.15	-	-	74.00	-27.85	0	100	H
		9.921	30.97	PKFH	37.10	-21.40	0.00	46.67	-	-	74.00	-27.33	0	100	V

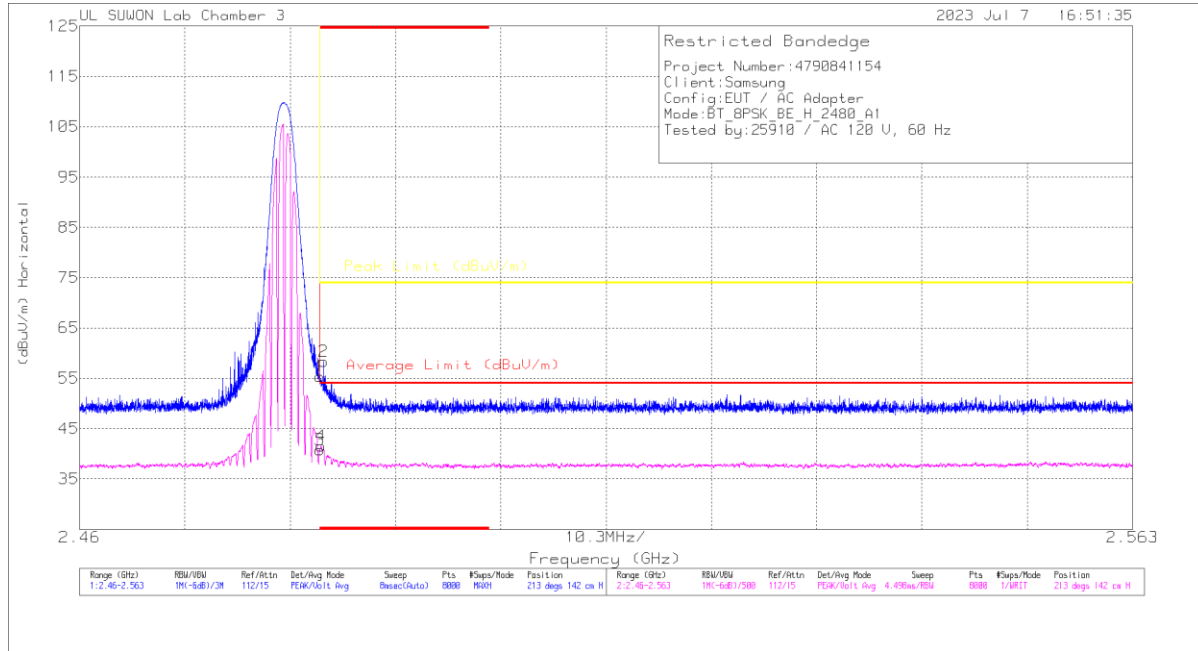
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak  
 VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

## 10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

### BANDEDGE (WORST CASE: 78 CHANNEL)

#### HORIZONTAL RESULT



#### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	47.95	Pk	32.4	-25	55.35	-	-	74	-18.65	213	142	H
2	* 2.48389	50.99	Pk	32.4	-25	58.39	-	-	74	-15.61	213	142	H
3	* 2.4835	33.37	VA1T	32.4	-25	40.77	54	-13.23	-	-	213	142	H
4	* 2.4836	34.16	VA1T	32.4	-25	41.56	54	-12.44	-	-	213	142	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

**BANEDGE TEST DATA**

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2402	ANT1	* 2.39	40.72	Pk	32.10	-25.10	0.00	47.72	-	-	74.00	-26.28	211	104	H	
		* 2.37615	44.34	Pk	32.10	-25.10	0.00	51.34	-	-	74.00	-22.66	211	104	H	
		* 2.39	29.54	VA1T	32.10	-25.10	0.00	36.54	54.00	-17.46	-	-	-	211	104	H
		* 2.37319	30.15	VA1T	32.00	-25.10	0.00	37.05	54.00	-16.95	-	-	-	211	104	H
		* 2.39	41.36	Pk	32.10	-25.10	0.00	48.36	-	-	74.00	-25.64	160	318	V	
		* 2.37823	44.38	Pk	32.10	-25.10	0.00	51.38	-	-	74.00	-22.62	160	318	V	
		* 2.39	29.24	VA1T	32.10	-25.10	0.00	36.24	54.00	-17.76	-	-	-	160	318	V
		* 2.375	30.03	VA1T	32.10	-25.10	0.00	37.03	54.00	-16.97	-	-	-	160	318	V
		* 2.4835	47.95	Pk	32.40	-25.00	0.00	55.35	-	-	74.00	-18.65	213	142	H	
		* 2.48389	50.99	Pk	32.40	-25.00	0.00	58.39	-	-	74.00	-15.61	213	142	H	
2480	ANT1	* 2.4835	33.37	VA1T	32.40	-25.00	0.00	40.77	54.00	-13.23	-	-	213	142	H	
		* 2.4836	34.16	VA1T	32.40	-25.00	0.00	41.56	54.00	-12.44	-	-	213	142	H	
		* 2.4835	46.02	Pk	32.40	-25.00	0.00	53.42	-	-	74.00	-20.58	158	298	V	
		* 2.48441	49.15	Pk	32.40	-25.00	0.00	56.55	-	-	74.00	-17.45	158	298	V	
		* 2.4835	33.39	VA1T	32.40	-25.00	0.00	40.79	54.00	-13.21	-	-	158	298	V	
		* 2.48354	33.46	VA1T	32.40	-25.00	0.00	40.86	54.00	-13.14	-	-	158	298	V	

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

**HARMONICS AND SPURIOUS EMISSIONS TEST DATA**

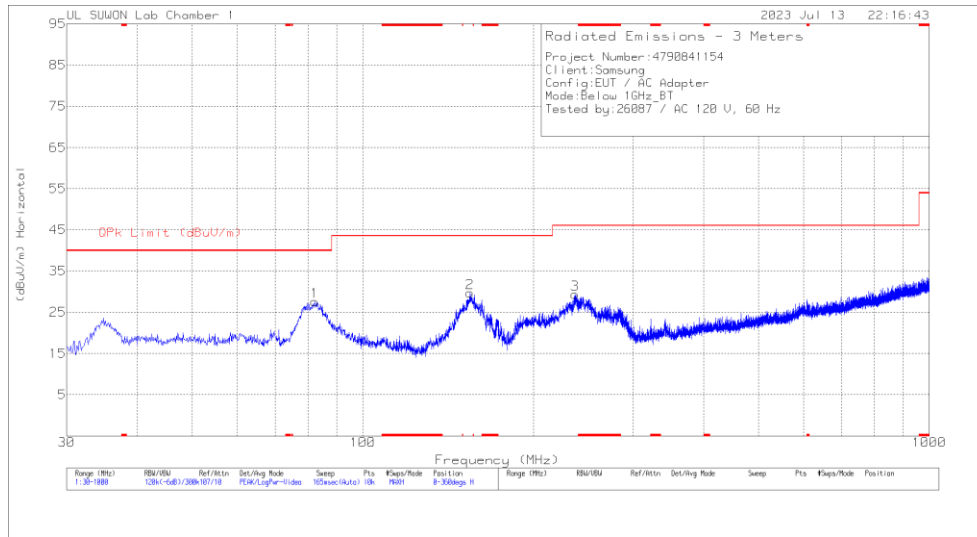
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 4.80397	41.08	PKFH	34.30	-30.10	0.00	45.28	-	-	74.00	-28.72	199	122	H
		* 4.80389	31.59	VA1T	34.30	-30.10	0.00	35.79	54.00	-18.21	-	-	199	122	H
		* 4.80363	38.68	PKFH	34.30	-30.10	0.00	42.88	-	-	74.00	-31.12	151	100	V
		* 4.80374	26.92	VA1T	34.30	-30.10	0.00	31.12	54.00	-22.88	-	-	151	100	V
		7.208	32.90	PKFH	35.80	-25.90	0.00	42.80	-	-	74.00	-31.20	192	100	H
		7.207	33.22	PKFH	35.80	-25.80	0.00	43.22	-	-	74.00	-30.78	337	117	V
		9.608	30.54	PKFH	36.70	-21.70	0.00	45.54	-	-	74.00	-28.46	0	100	H
		9.607	30.83	PKFH	36.70	-21.70	0.00	45.83	-	-	74.00	-28.17	0	100	V
2441	ANT1	* 4.88163	40.49	PKFH	34.20	-30.90	0.00	43.79	-	-	74.00	-30.21	199	106	H
		* 4.88183	29.14	VA1T	34.20	-30.90	0.00	32.44	54.00	-21.56	-	-	199	106	H
		* 4.88252	38.67	PKFH	34.20	-30.90	0.00	41.97	-	-	74.00	-32.03	150	100	V
		* 4.88161	26.44	VA1T	34.20	-30.90	0.00	29.74	54.00	-24.26	-	-	150	100	V
		* 7.32454	32.95	PKFH	35.80	-25.30	0.00	43.45	-	-	74.00	-30.55	0	100	H
		* 7.32218	32.58	PKFH	35.80	-25.40	0.00	42.98	-	-	74.00	-31.02	0	100	V
		9.765	30.01	PKFH	36.90	-21.20	0.00	45.71	-	-	74.00	-28.29	0	100	H
		9.765	30.19	PKFH	36.90	-21.20	0.00	45.89	-	-	74.00	-28.11	0	100	V
2480	ANT1	* 4.95973	41.07	PKFH	34.30	-30.50	0.00	44.87	-	-	74.00	-29.13	202	108	H
		* 4.95979	31.78	VA1T	34.30	-30.50	0.00	35.58	54.00	-18.42	-	-	202	108	H
		* 4.96004	38.79	PKFH	34.30	-30.50	0.00	42.59	-	-	74.00	-31.41	154	100	V
		* 4.96005	28.02	VA1T	34.30	-30.50	0.00	31.82	54.00	-22.18	-	-	154	100	V
		* 7.43957	32.13	PKFH	35.70	-25.10	0.00	42.73	-	-	74.00	-31.27	0	100	H
		* 7.43835	32.39	PKFH	35.70	-25.10	0.00	42.99	-	-	74.00	-31.01	0	100	V
		9.920	29.01	PKFH	37.10	-21.40	0.00	44.71	-	-	74.00	-29.29	0	100	H
		9.919	29.56	PKFH	37.10	-21.30	0.00	45.36	-	-	74.00	-28.64	0	100	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

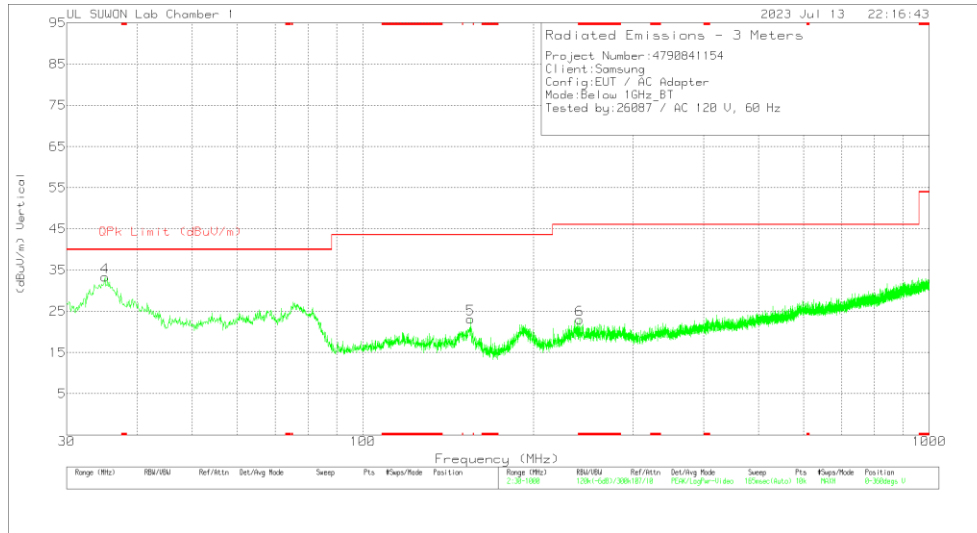
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

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

## 10.2. WORST CASE BELOW 1 GHz SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



**HORIZONTAL**



**VERTICAL**

### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	82.283	44.77	Pk	13.3	-30.5	27.57	40	-12.43	0-360	100	H
2	154.451	45.39	Pk	14	-29.7	29.69	43.52	-13.83	0-360	100	H
3	237.192	40.59	Pk	17.8	-29	29.39	46.02	-16.63	0-360	100	H
4	35.044	47.96	Pk	16.5	-31.1	33.36	40	-6.64	0-360	200	V
5	154.936	38.78	Pk	14	-29.6	23.18	43.52	-20.34	0-360	200	V
6	* 241.266	34.09	Pk	17.9	-29	22.99	46.02	-23.03	0-360	300	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector

### Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
35.044	43.19	Qp	16.5	-31.1	28.59	40	-11.41	351	100	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-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 C63.10:2013.

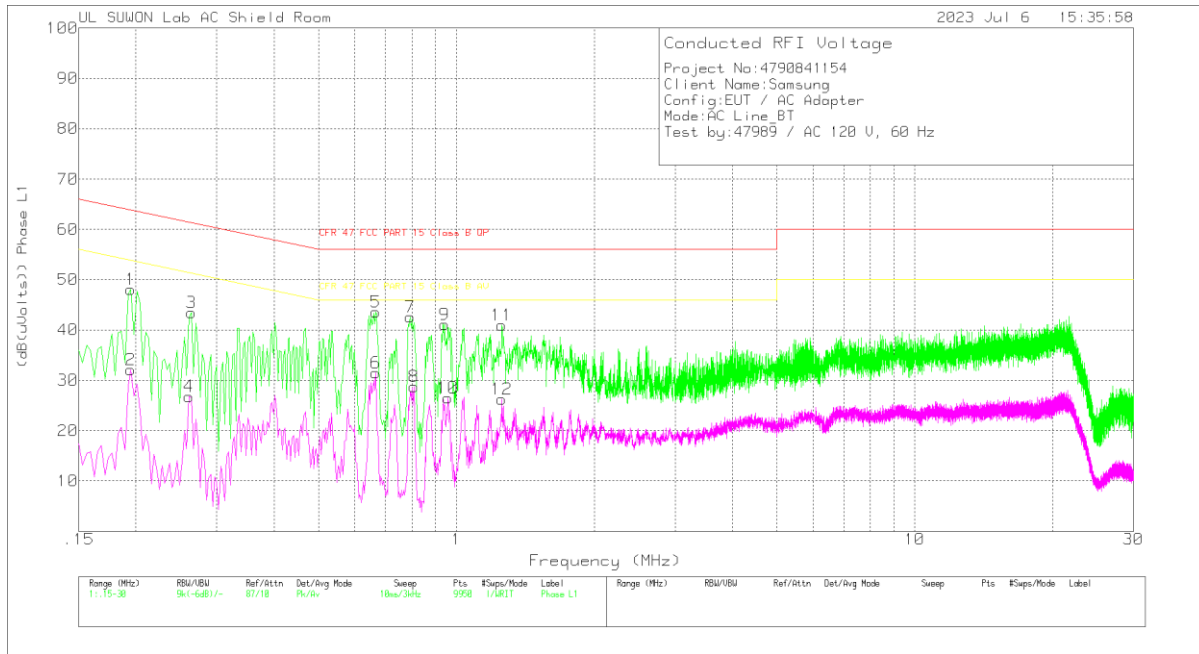
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

### RESULTS

### 11.1. AC Power Line

#### LINE 1 RESULTS



#### Trace Markers

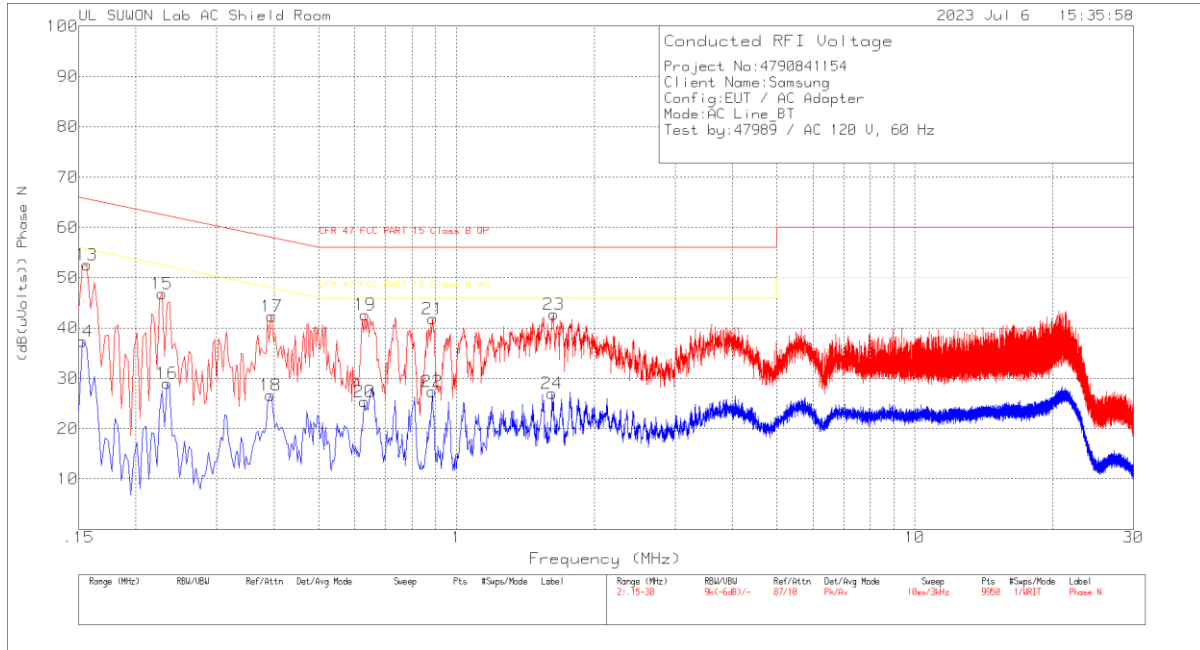
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_AU TO_With EX_L1[dB]	CABLELOS S[dB]	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.195	38.39	Pk	9.5	.2	48.09	63.82	-15.73	-	-
2	.195	22.45	Av	9.5	.2	32.15	-	-	53.82	-21.67
3	.264	33.7	Pk	9.5	.2	43.4	61.3	-17.9	-	-
4	.261	17.11	Av	9.5	.2	26.81	-	-	51.4	-24.59
5	.666	33.8	Pk	9.6	.2	43.6	56	-12.4	-	-
6	.666	21.71	Av	9.6	.2	31.51	-	-	46	-14.49
7	.792	32.81	Pk	9.6	.2	42.61	56	-13.39	-	-
8	.807	18.89	Av	9.6	.2	28.69	-	-	46	-17.31
9	.942	31.2	Pk	9.6	.3	41.1	56	-14.9	-	-
10	.957	16.56	Av	9.6	.3	26.46	-	-	46	-19.54
11	1.257	31.07	Pk	9.6	.3	40.97	56	-15.03	-	-
12	1.257	16.3	Av	9.6	.3	26.2	-	-	46	-19.8

Pk - Peak detector  
 Av - Average detection



### LINE 2 RESULTS



#### Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_AU TO_With EX_N[dB]	CABLELOS S[dB]	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.156	42.95	Pk	9.5	.1	52.55	65.67	-13.12	-	-
14	.153	27.74	Av	9.5	.1	37.34	-	-	55.84	-18.5
15	.228	37.16	Pk	9.5	.2	46.86	62.52	-15.66	-	-
16	.234	19.33	Av	9.5	.2	29.03	-	-	52.31	-23.28
17	.396	32.68	Pk	9.5	.2	42.38	57.94	-15.56	-	-
18	.393	16.94	Av	9.5	.2	26.64	-	-	48	-21.36
19	.633	32.84	Pk	9.6	.2	42.64	56	-13.36	-	-
20	.63	15.63	Av	9.6	.2	25.43	-	-	46	-20.57
21	.888	31.94	Pk	9.6	.3	41.84	56	-14.16	-	-
22	.885	17.49	Av	9.6	.3	27.39	-	-	46	-18.61
23	1.629	32.85	Pk	9.6	.3	42.75	56	-13.25	-	-
24	1.617	17.14	Av	9.6	.3	27.04	-	-	46	-18.96

Pk - Peak detector  
 Av - Average detection

## END OF TEST REPORT