



# **CERTIFICATION TEST REPORT**

**Report Number.** : 4790089631-E5V1

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

**Model** : SM-S908B/DS

**FCC ID** : A3LSMS908B

**EUT Description** : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,  
NFC, WPT and UWB

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

**Date Of Issue:**

2021-10-29

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Revision History

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V1	2021-10-29	Initial issue	Hyunsik Yun

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.

**EUT DESCRIPTION:** GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB

**MODEL:** SM-S908B/DS

**SERIAL NUMBER:** R3CR80AAZER (CONDUCTED);  
R3CR80AB9PK, R3CR706LYYK (RADIATED);

**DATE TESTED:** 2021-09-27 ~ 2021-10-29

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:



Junwhan Lee  
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
<input checked="" type="checkbox"/> Chamber 2
<input checked="" type="checkbox"/> Chamber 3

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:

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

### 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	3.02 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.58 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 115:2007.

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB. 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	Average	18.970	78.886
		Peak	19.885	97.387
	Enhanced Pi/4-DPSK	Average	17.814	60.451
		Peak	20.501	112.228
	Enhanced 8PSK	Average	17.854	61.010
		Peak	20.810	120.504

### 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 ANT 1's maximum gain of -7.85 dBi and ANT 2's maximum gain of -4.04 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.

For Antenna 1, 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.

For Antenna 2, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

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.

- Supported PA modes:

ANT. Pre-Amp.	ANT1	ANT2	Bluetooth-Dual
ePA	O	O	
iPA			O

Since the summed target power of Bluetooth-Dual mode is lower than the target power of ePA SISO, the test was performed in ePA SISO mode.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N9BV0382HM3	N/A
Data Cable	SAMSUNG	EP-DN980BBE	N/A	N/A

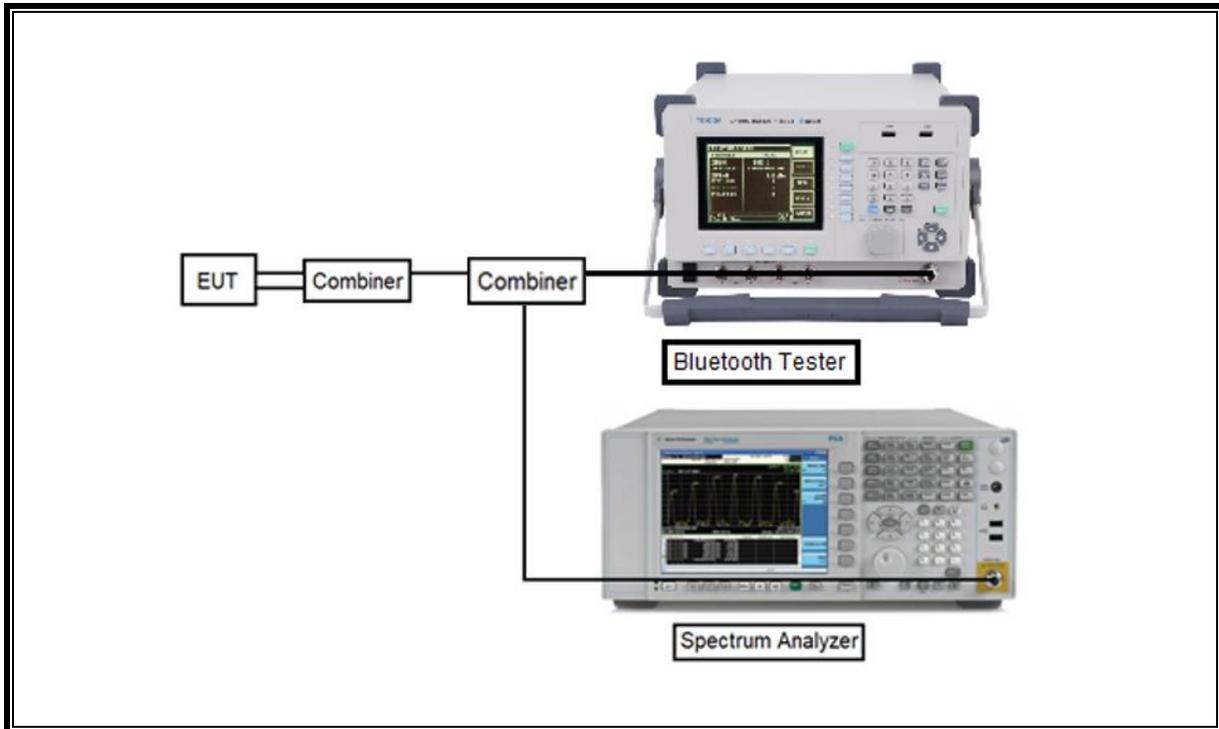
### I/O CABLE

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

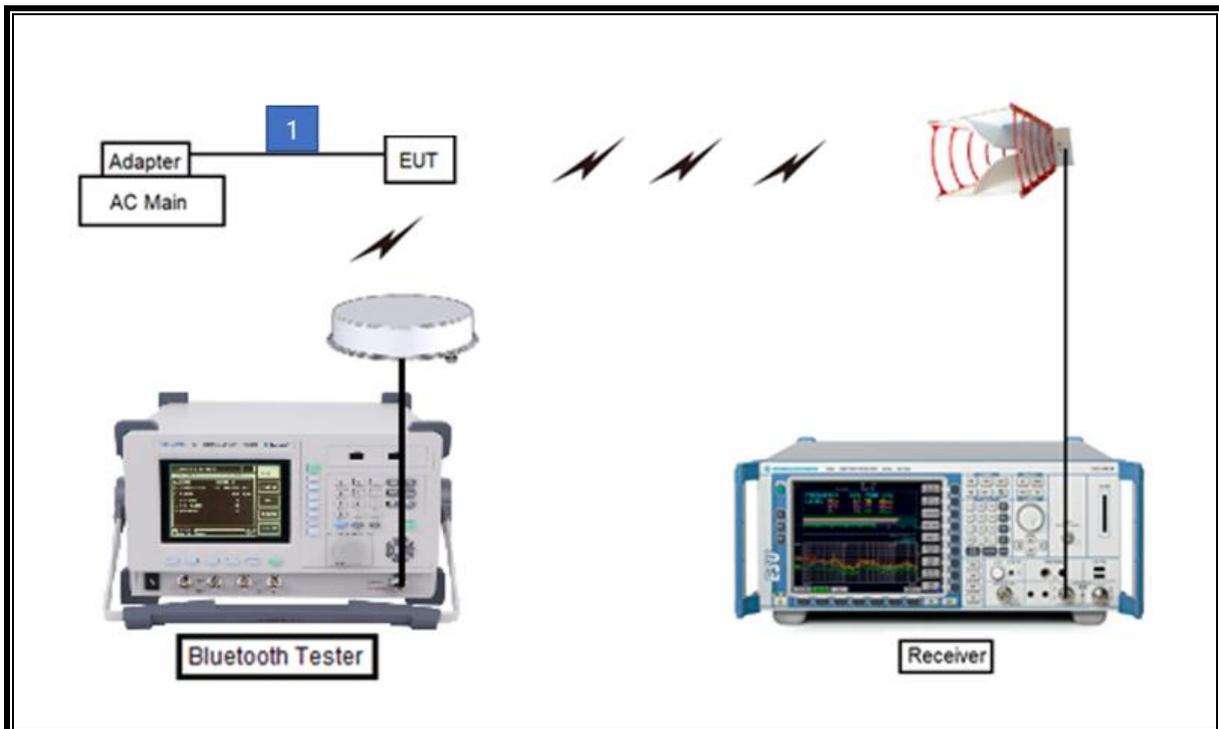
### TEST SETUP

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	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022-08-04
Preamplifier	ETS	3116C-PA	00168841	2022-08-04
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	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022-08-02
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022-08-04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022-08-04
Average Power Sensor	Agilent / HP	U2000	MY54270007	2022-08-04
Average Power Sensor	Agilent / HP	U2000	MY54260010	2022-08-04
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	2022-08-04
Power Splitter	MINI-CIRCUITS	WA1534	UL001	2022-01-27
Power Splitter	MINI-CIRCUITS	WA1534	UL002	2022-01-27
Attenuator	PASTERNAK	PE7087-10	A009	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2022-08-03
Attenuator	PASTERNAK	PE7004-10	2	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	019	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	020	2022-08-02
LISN	R&S	ENV-216	101837	2022-08-05
Termination	WEINSCHEL	M1406A	T09	2022-08-03
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	PASS
15.247 (b)(1)	TX conducted output power	< 21 dBm		PASS
15.247 (a)(1)	Hopping frequency separation	> two-thirds of the 20 dB bandwidth		PASS
15.247 (a)(1)(iii)	Number of Hopping channels	More than 15 non-overlapping channels		PASS
15.247 (a)(1)(iii)	Avg Time of Occupancy	< 8 dBm		PASS
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	PASS
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	PASS

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## 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

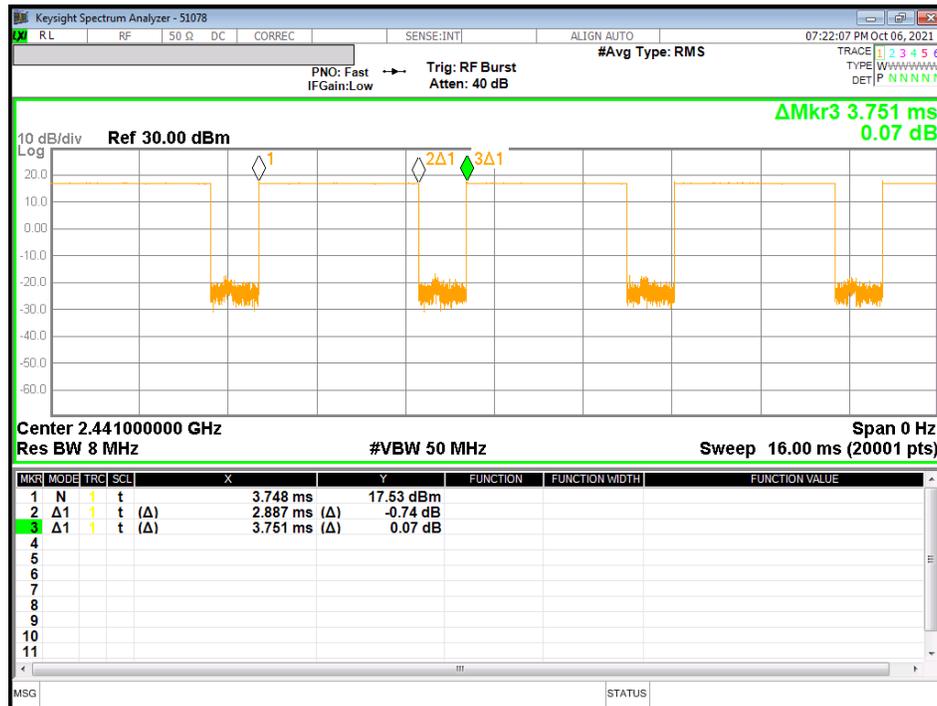
None; for reporting purposes only.

#### 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 [%]	Duty Cycle Correction Factor[dB]	1/T Minimum VBW [kHz]
<b>2 400 ~ 2 483.5 MHz Band</b>					
Bluetooth	2.887	3.751	76.97	1.14	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 RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

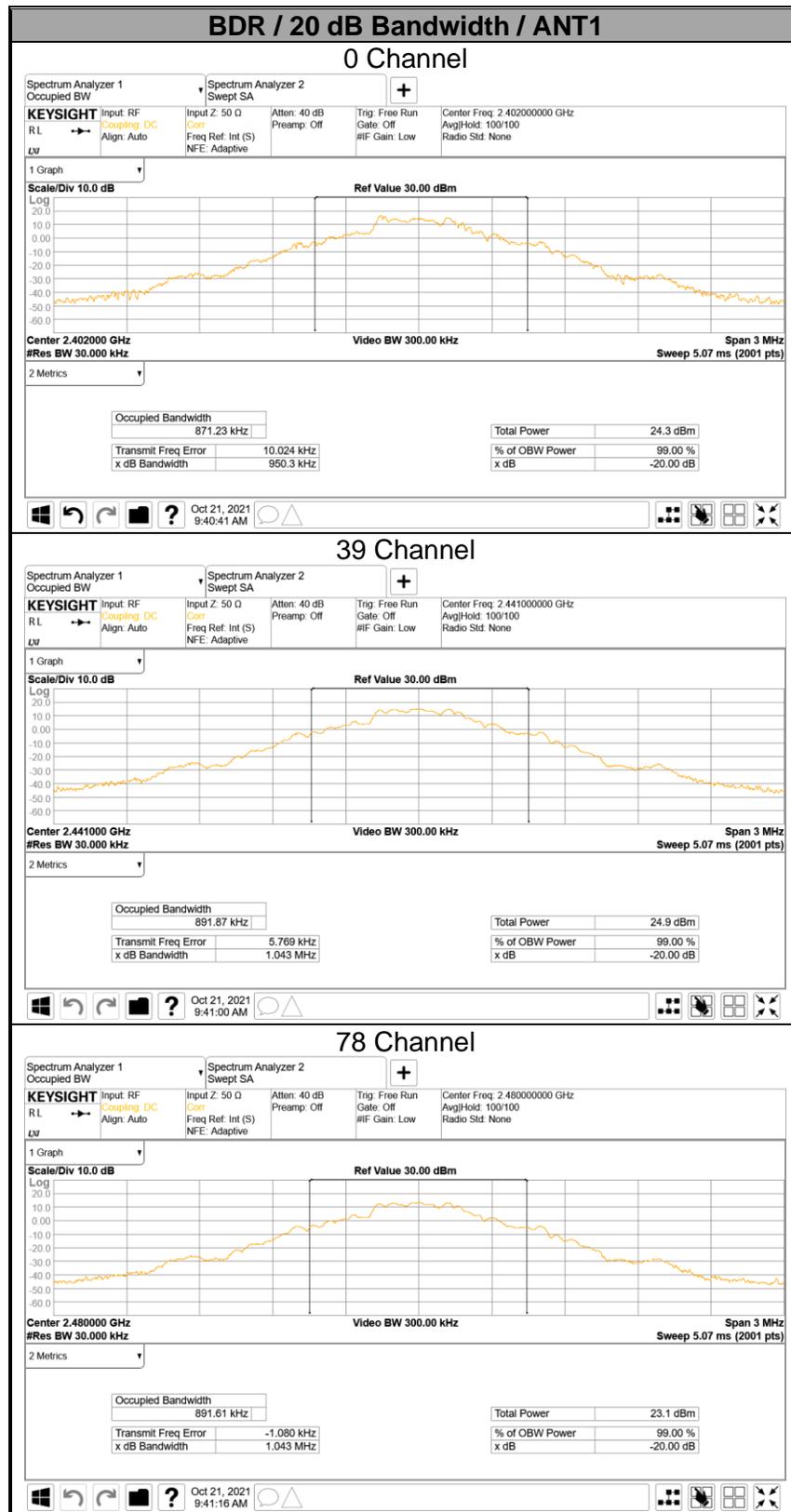
**RESULTS**

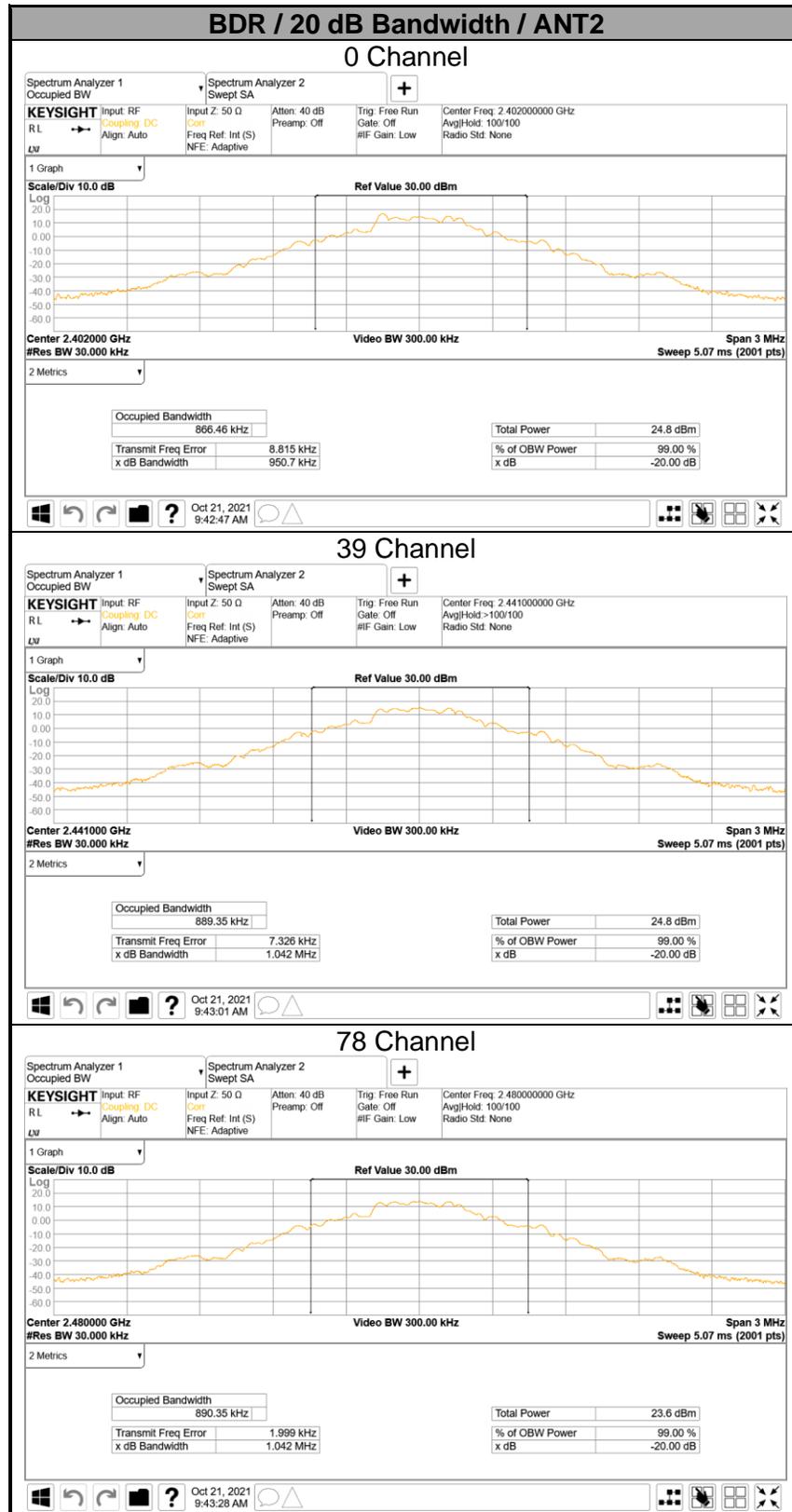
**9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION**

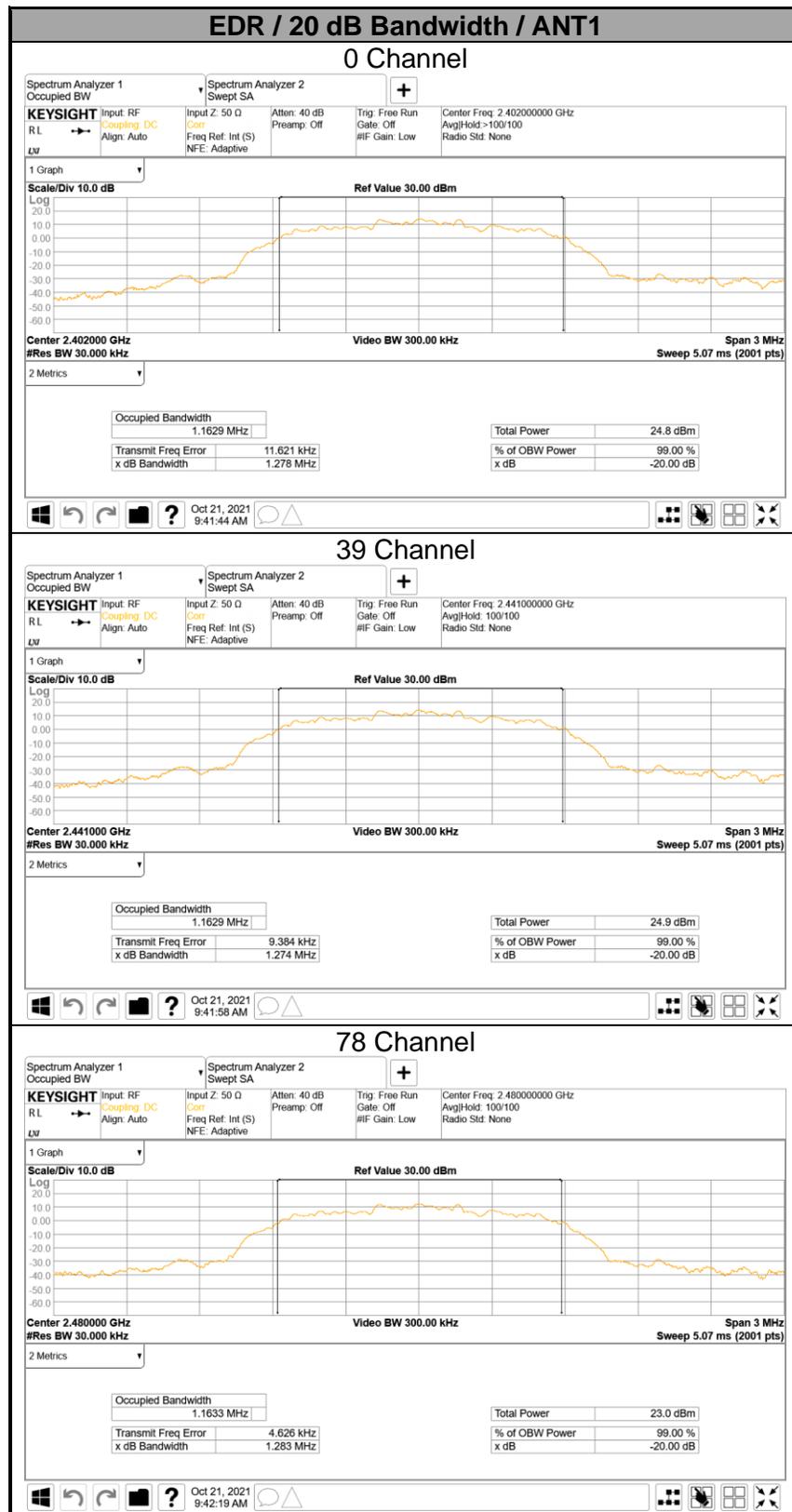
Ant.	Channel	Frequency [MHz]	20 dB Bandwidth [kHz]
ANT1	0	2 402	950.3
	39	2 441	1043.0
	78	2 480	1043.0
ANT2	0	2 402	950.7
	39	2 441	1042.0
	78	2 480	1042.0
<b>Worst</b>			<b>1043.0</b>

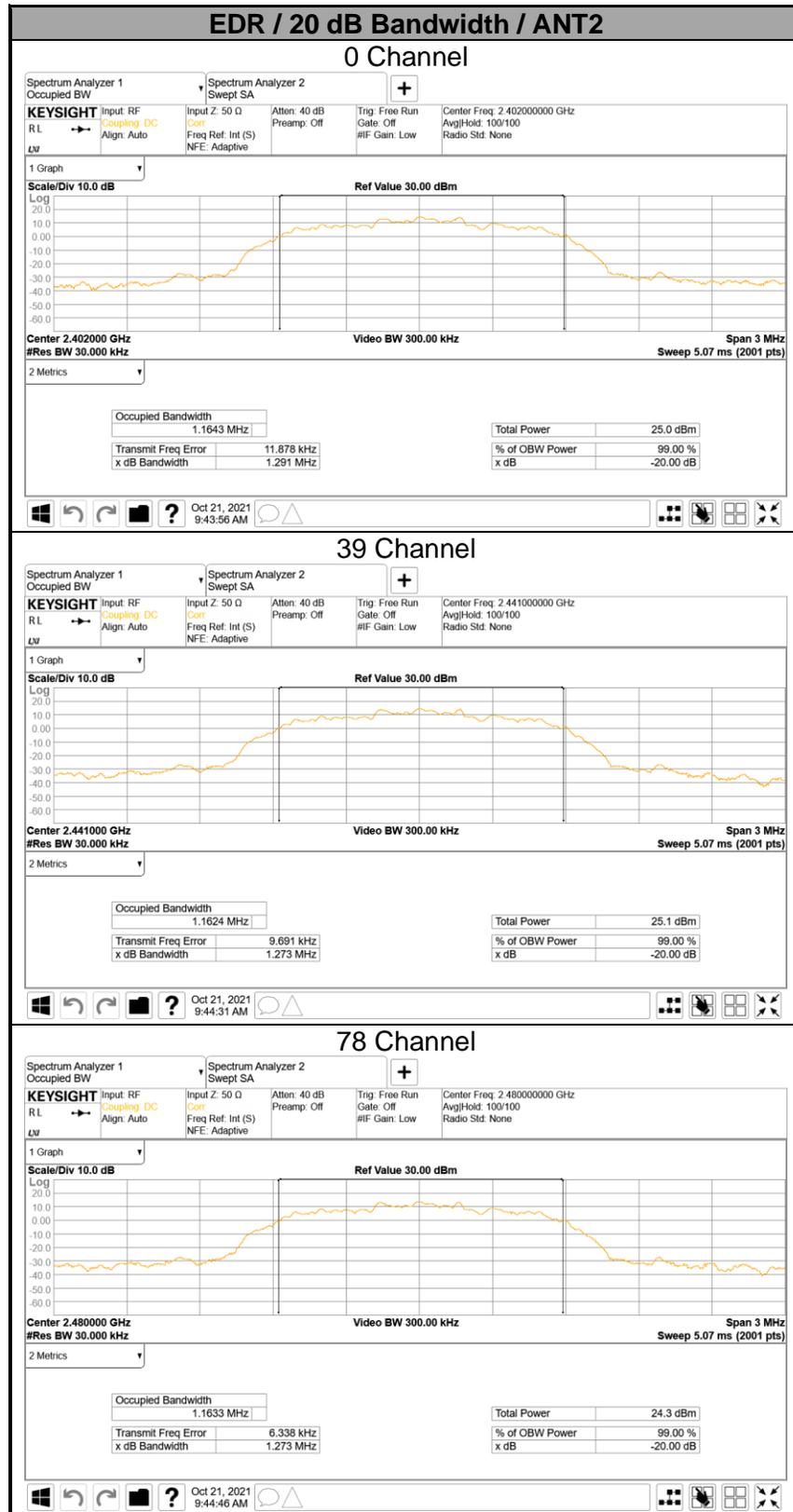
**9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION**

Ant.	Channel	Frequency [MHz]	20 dB Bandwidth [kHz]
ANT1	0	2 402	1278.0
	39	2 441	1274.0
	78	2 480	1283.0
ANT2	0	2 402	1291.0
	39	2 441	1273.0
	78	2 480	1273.0
<b>Worst</b>			<b>1291.0</b>









### **9.3. HOPPING FREQUENCY SEPARATION**

#### **LIMITS**

FCC §15.247 (a) (1)

RSS-247 (5.1) (b)

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.

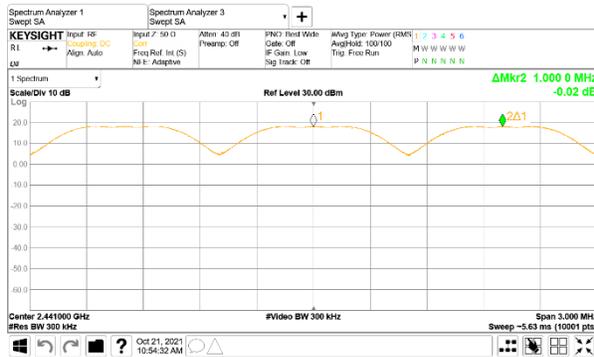
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

#### **TEST PROCEDURE**

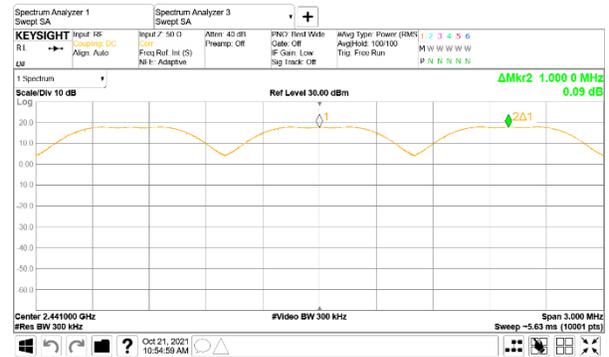
The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to  $VBW \geq RBW$ . The sweep time is coupled.

#### **RESULTS**

### 9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

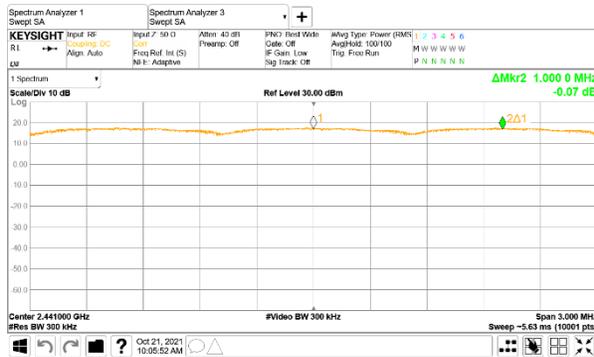


ANT1 SEPARATION

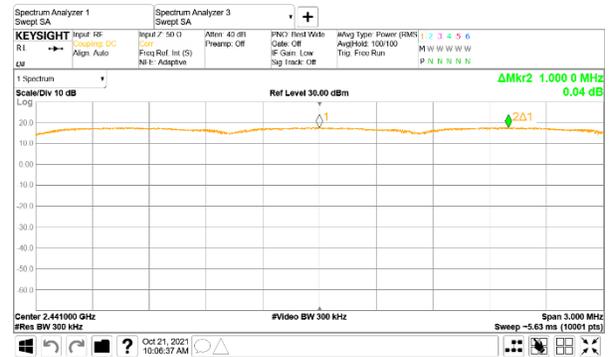


ANT2 SEPARATION

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



ANT1 SEPARATION



ANT2 SEPARATION

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## **9.4. NUMBER OF HOPPING CHANNELS**

### **LIMITS**

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

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

### **TEST PROCEDURE**

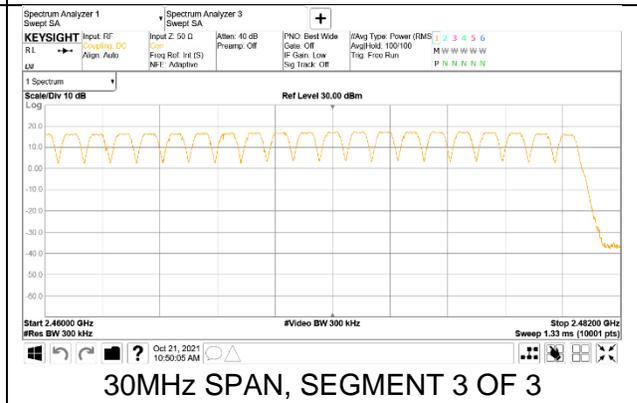
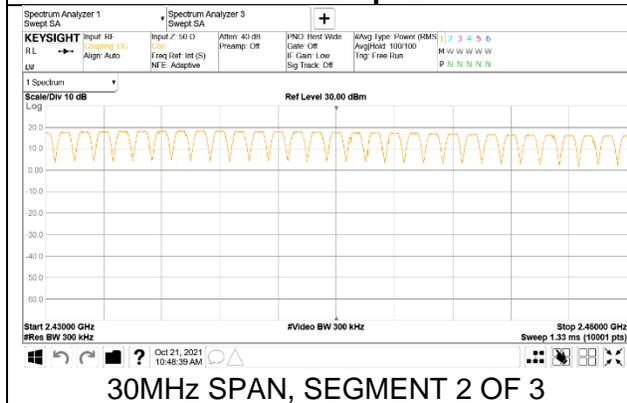
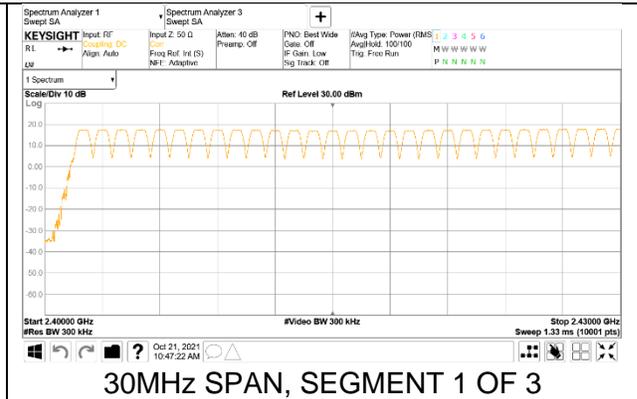
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

### **RESULTS**

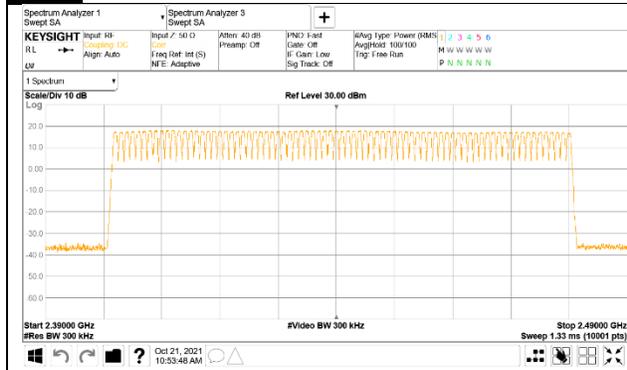
Normal Mode: All Channels Observed

### 9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

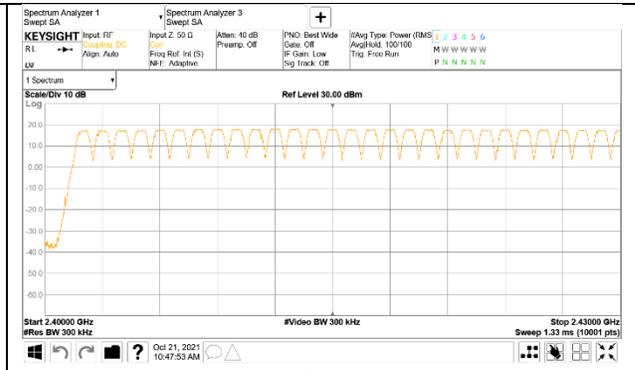
ANT1



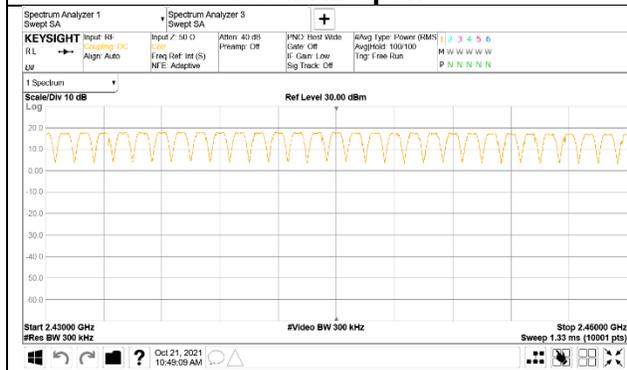
ANT2



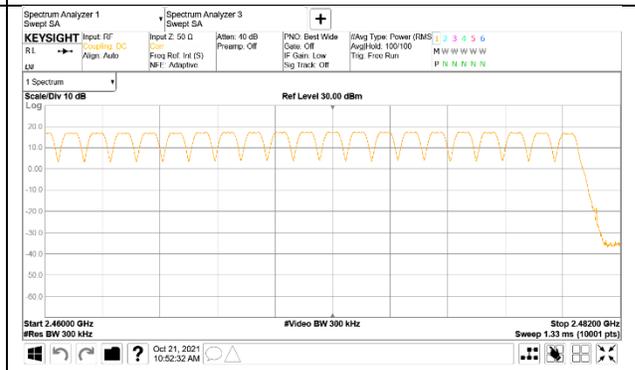
100 MHz Span



30MHz SPAN, SEGMENT 1 OF 3



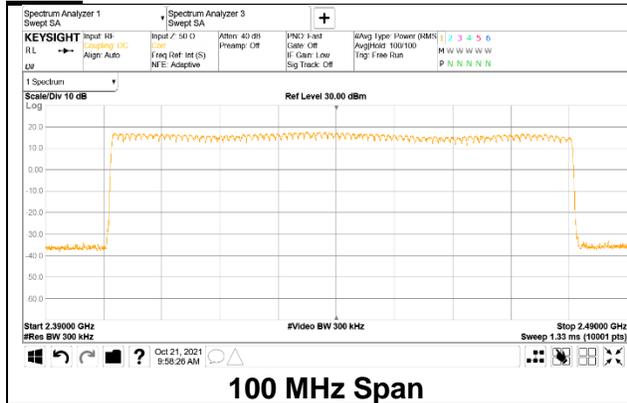
30MHz SPAN, SEGMENT 2 OF 3



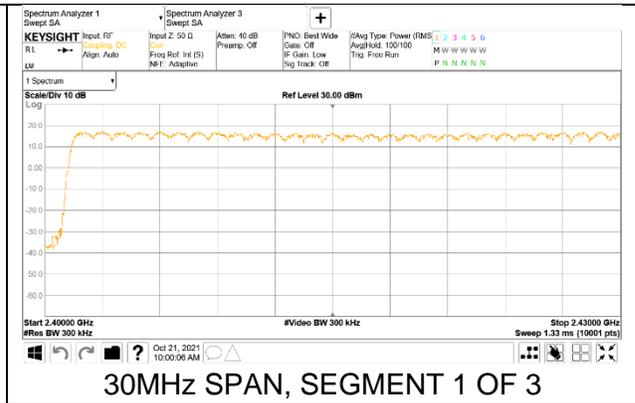
30MHz SPAN, SEGMENT 3 OF 3

## 9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

### ANT1



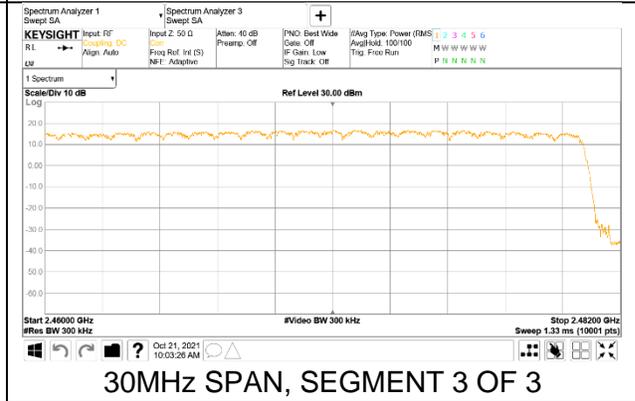
100 MHz Span



30MHz SPAN, SEGMENT 1 OF 3

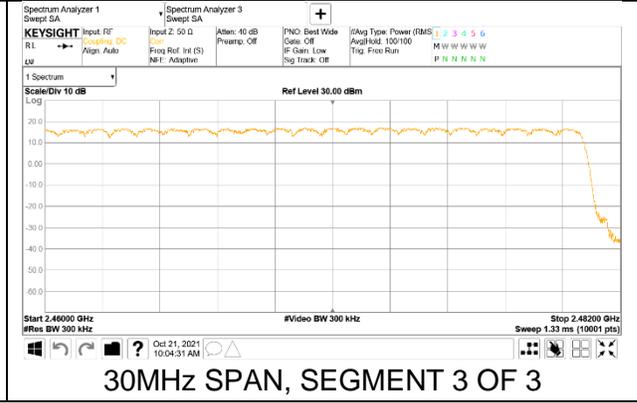
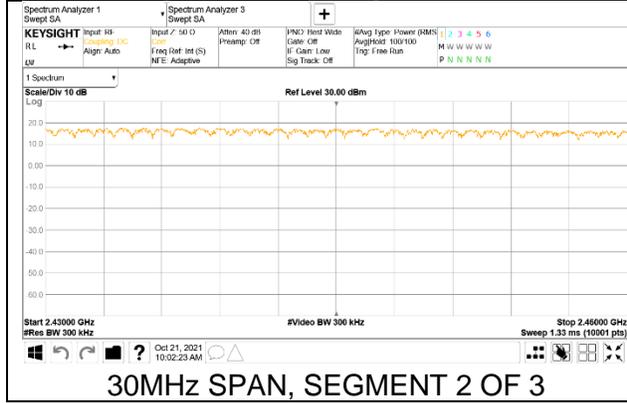
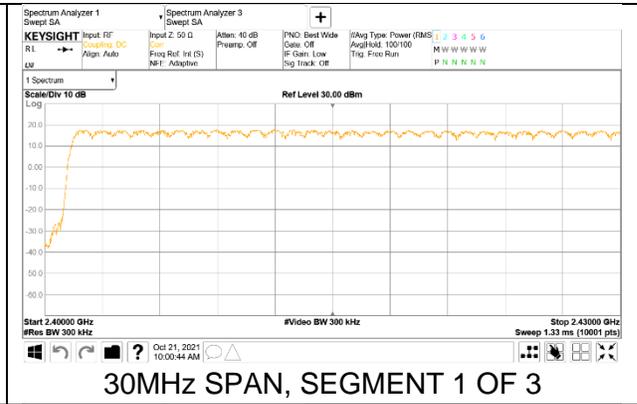
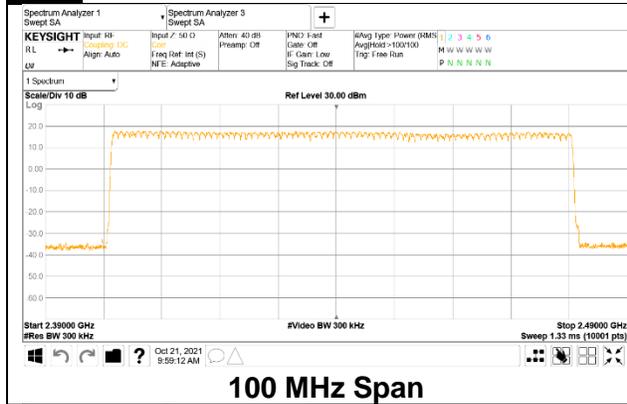


30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

**ANT2**



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## 9.5. AVERAGE TIME OF OCCUPANCY

### LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

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.

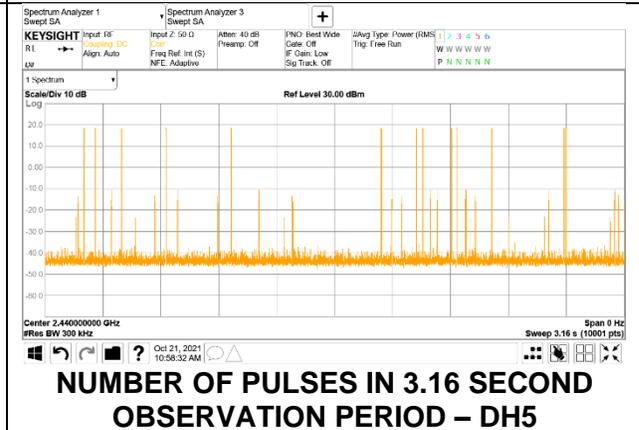
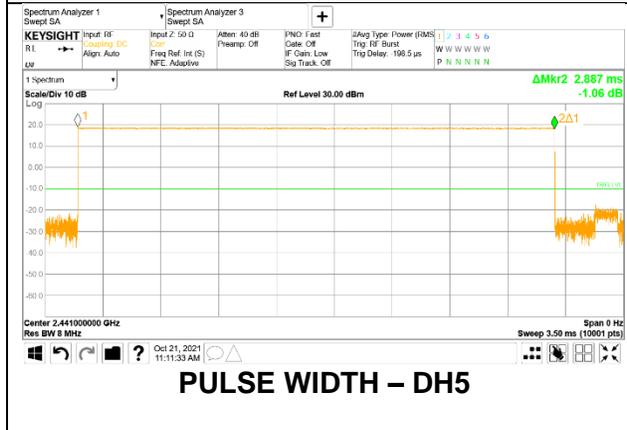
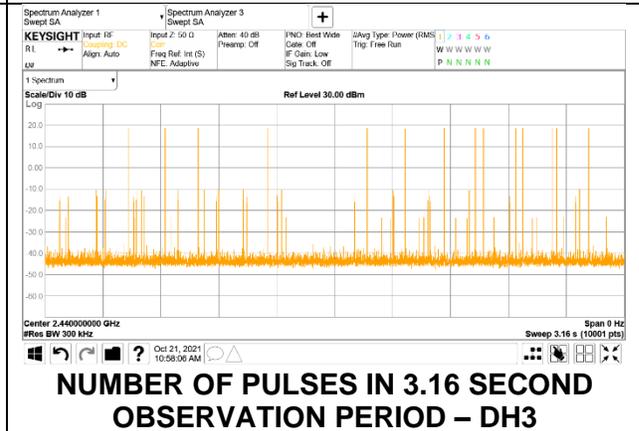
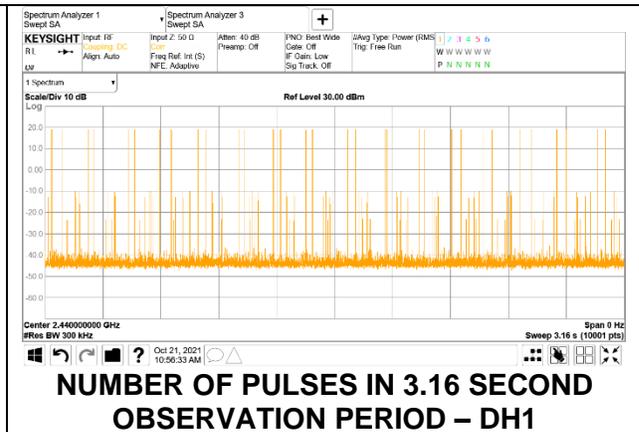
The average time of occupancy in the specified 3.16 second period (79 channels \* 0.4 s) is equal to  $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$ .

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

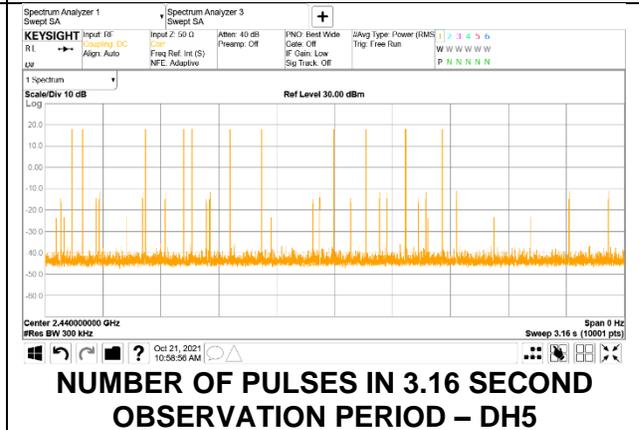
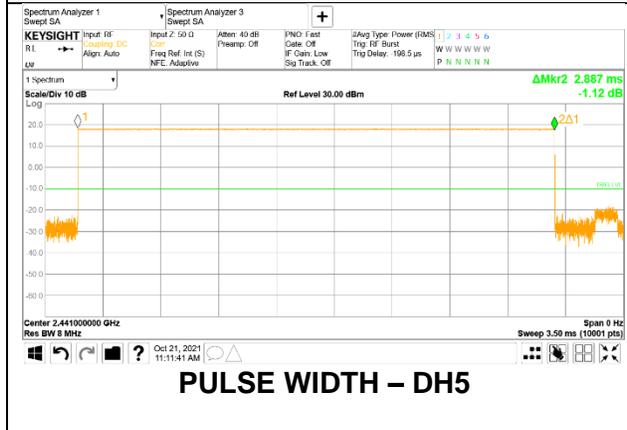
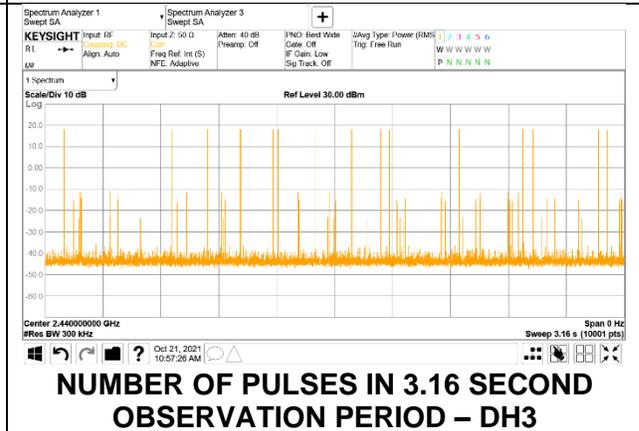
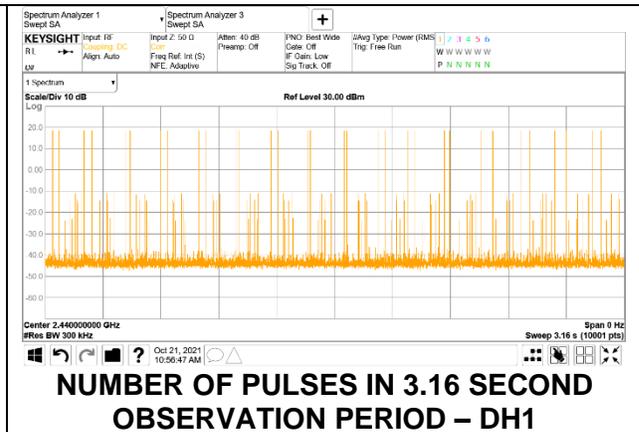
### RESULTS

### 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 ANT1 Normal					
DH1	0.382	32	0.122	0.4	-0.278
DH3	1.638	14	0.229	0.4	-0.171
DH5	2.887	13	0.375	0.4	-0.025
GFSK ANT1 AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK ANT1 AFH					
DH1	0.382	8	0.031	0.4	-0.369
DH3	1.638	3.5	0.057	0.4	-0.343
DH5	2.887	3.25	0.094	0.4	-0.306

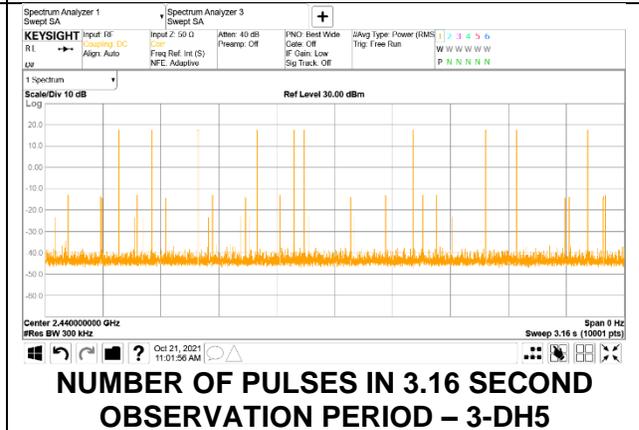
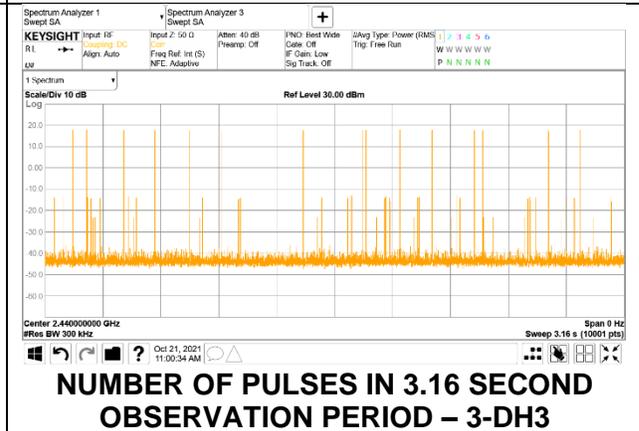
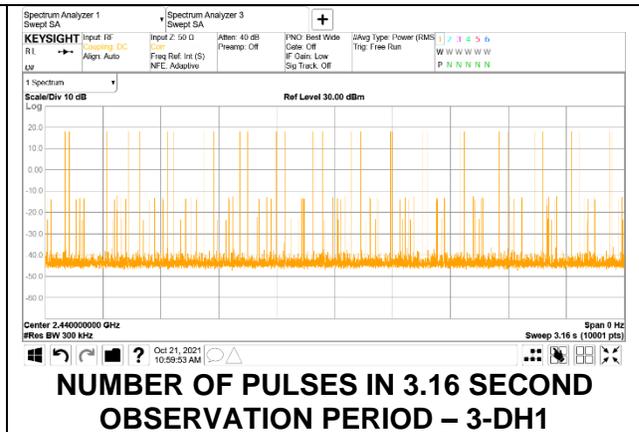
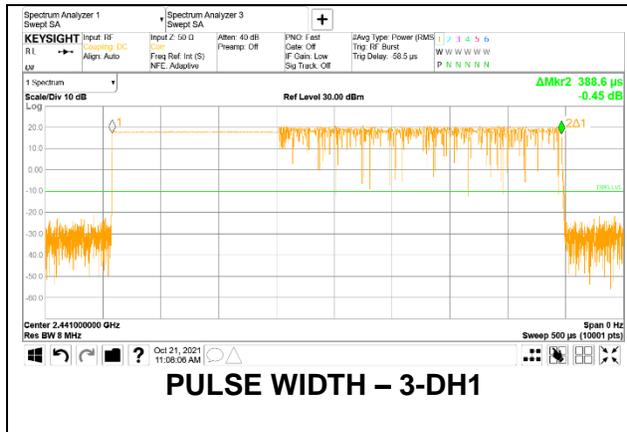


DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK ANT2 Normal					
DH1	0.382	32	0.122	0.4	-0.278
DH3	1.638	15	0.246	0.4	-0.154
DH5	2.887	11	0.318	0.4	-0.082
GFSK ANT2 AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK ANT2 AFH					
DH1	0.382	8	0.031	0.4	-0.369
DH3	1.638	3.75	0.061	0.4	-0.339
DH5	2.887	2.75	0.079	0.4	-0.321

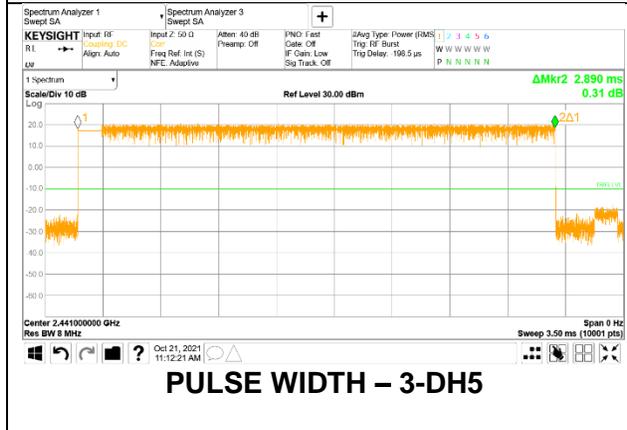
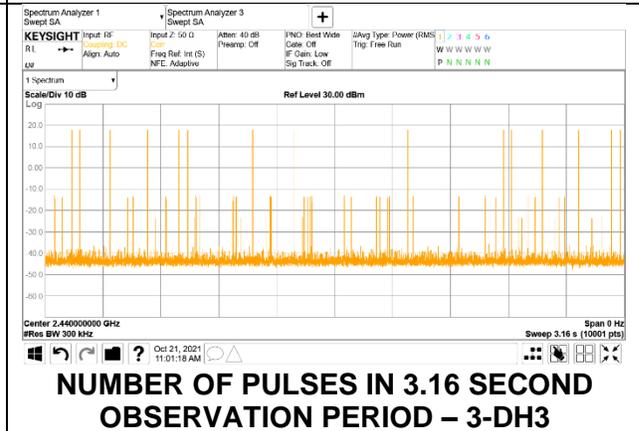
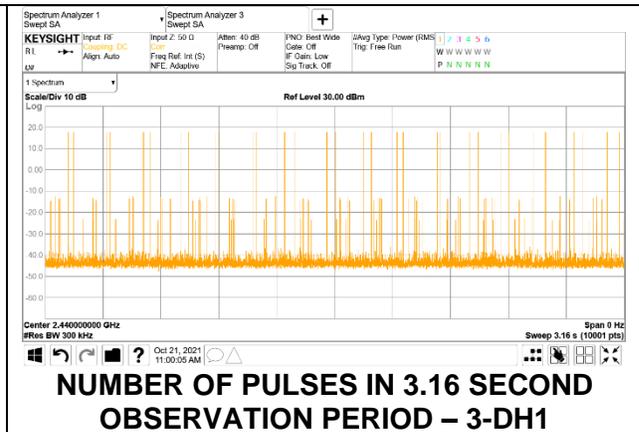
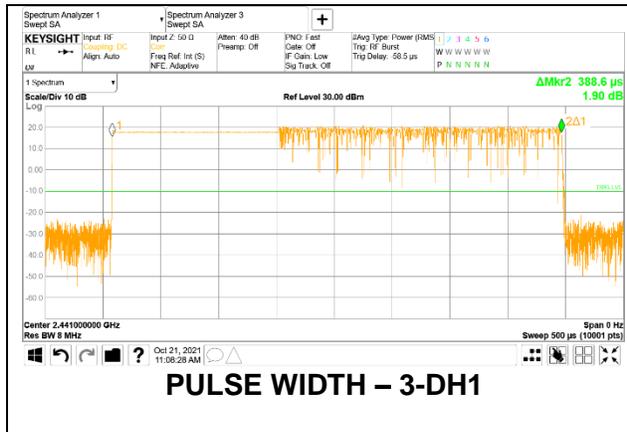


### 9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK ANT1 Normal					
DH1	0.389	32	0.124	0.4	-0.276
DH3	1.639	15	0.246	0.4	-0.154
DH5	2.890	10	0.289	0.4	-0.111
8PSK ANT1 AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK ANT1 AFH					
DH1	0.389	8	0.031	0.4	-0.369
DH3	1.639	3.75	0.061	0.4	-0.339
DH5	2.890	2.5	0.072	0.4	-0.328



DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK ANT2 Normal					
DH1	0.389	32	0.124	0.4	-0.276
DH3	1.639	15	0.246	0.4	-0.154
DH5	2.89	13	0.376	0.4	-0.024
8PSK ANT2 AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK ANT2 AFH					
DH1	0.389	8	0.031	0.4	-0.369
DH3	1.639	3.75	0.061	0.4	-0.339
DH5	2.890	3.25	0.094	0.4	-0.306



## 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

Antenna	PA.	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]	
ANT1	ePA	0	2 402	18.570	21.000	-2.430	
		39	2 441	<b>19.885</b>		<b>-1.115</b>	
		78	2 480	18.856		-2.144	
ANT2		0	2 402	17.859		-3.141	
		39	2 441	18.015		-2.985	
		78	2 480	17.221		-3.779	
DUAL-BT		iPA	0	2 402		15.020	-5.980
			39	2 441		15.260	-5.740
			78	2 480		16.030	-4.970
Worst				<b>19.885</b>		<b>-1.115</b>	

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

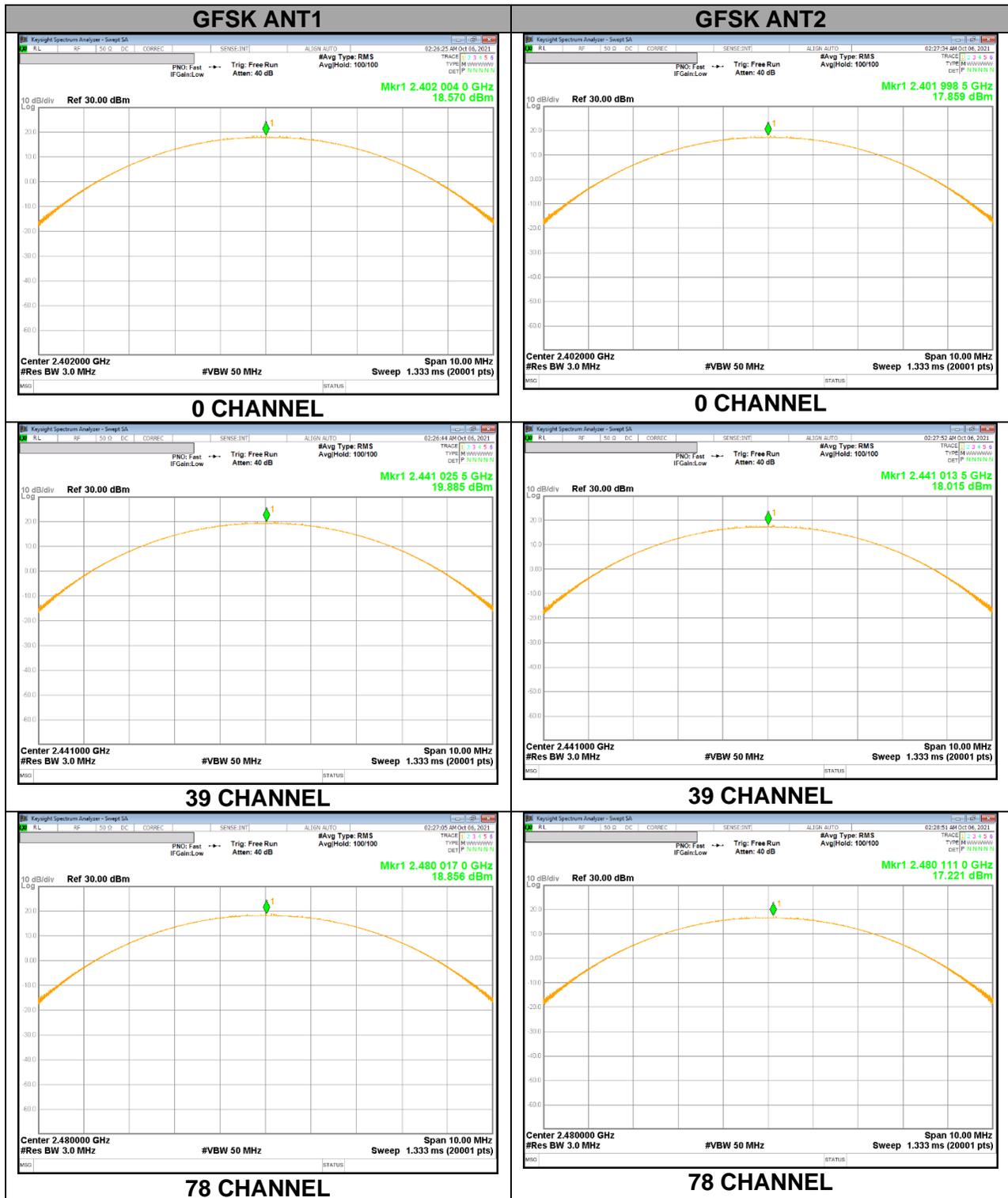
Antenna	PA.	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]	
ANT1	ePA	0	2 402	19.790	21.000	-1.210	
		39	2 441	<b>20.501</b>		<b>-0.499</b>	
		78	2 480	19.575		-1.425	
ANT2		0	2 402	19.431		-1.569	
		39	2 441	19.532		-1.468	
		78	2 480	18.553		-2.447	
DUAL-BT		iPA	0	2 402		14.120	-6.880
			39	2 441		14.540	-6.460
			78	2 480		15.020	-5.980
Worst				<b>20.501</b>		<b>-0.499</b>	

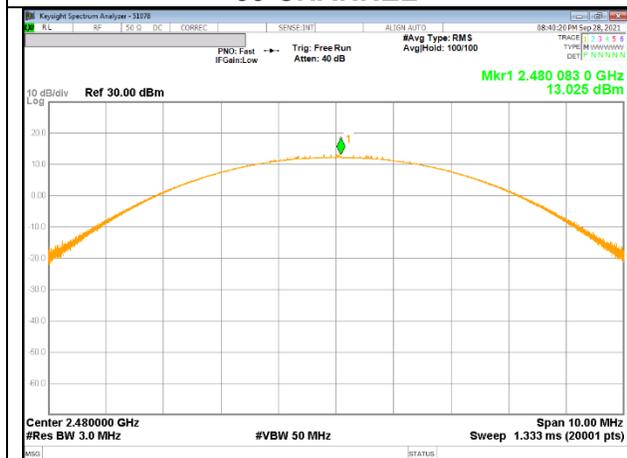
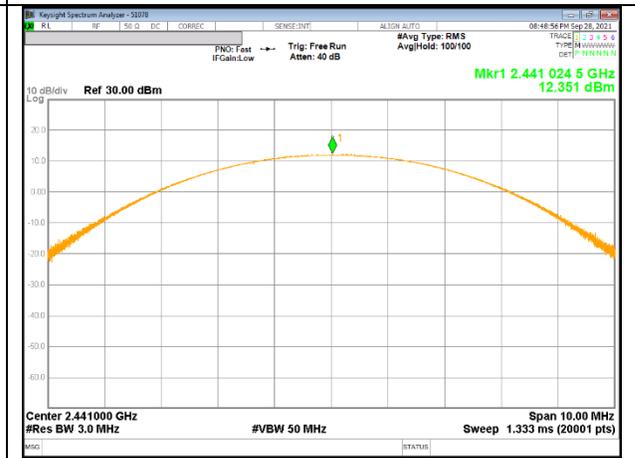
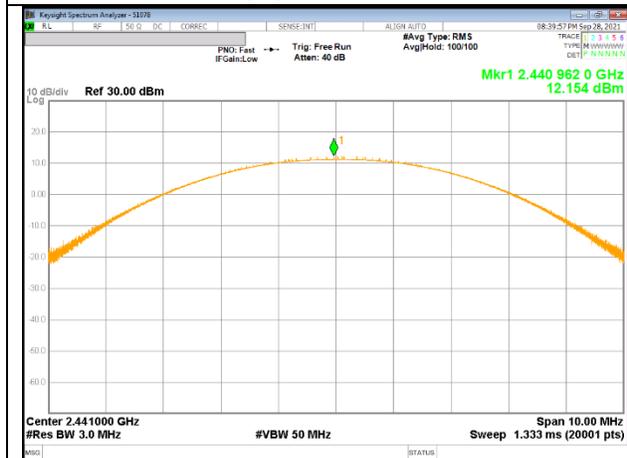
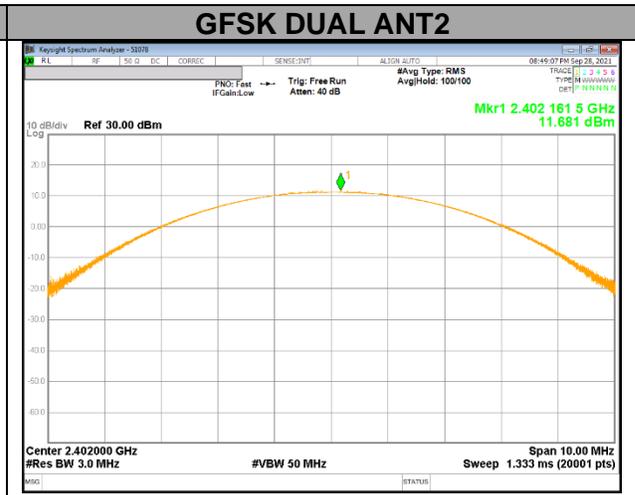
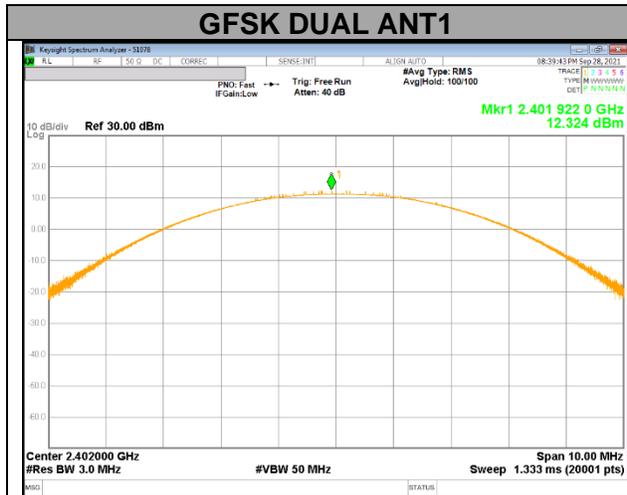
**9.6.3. ENHANCED DATA RATE 8PSK MODULATION**

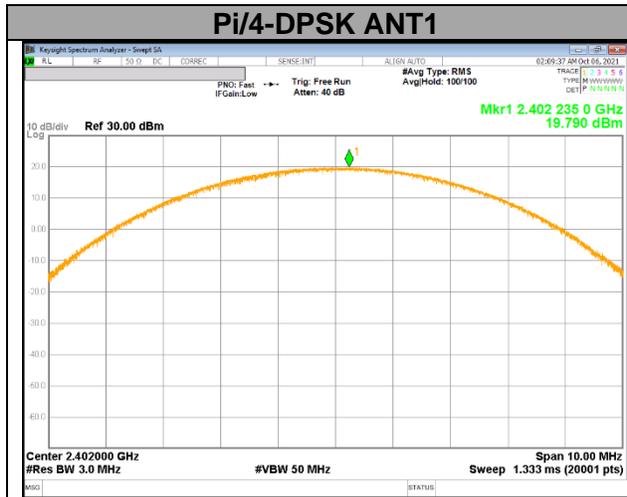
Antenna	PA.	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	ePA	0	2 402	20.271	21.000	-0.729
		39	2 441	<b>20.810</b>		<b>-0.190</b>
		78	2 480	20.125		-0.875
ANT2		0	2 402	19.880		-1.120
		39	2 441	20.066		-0.934
		78	2 480	19.122		-1.878
DUAL-BT	iPA	0	2 402	14.370		-6.630
		39	2 441	14.920		-6.080
		78	2 480	15.390		-5.610
Worst				<b>20.810</b>		<b>-0.190</b>

### 9.6.4. OUTPUT POWER PLOTS

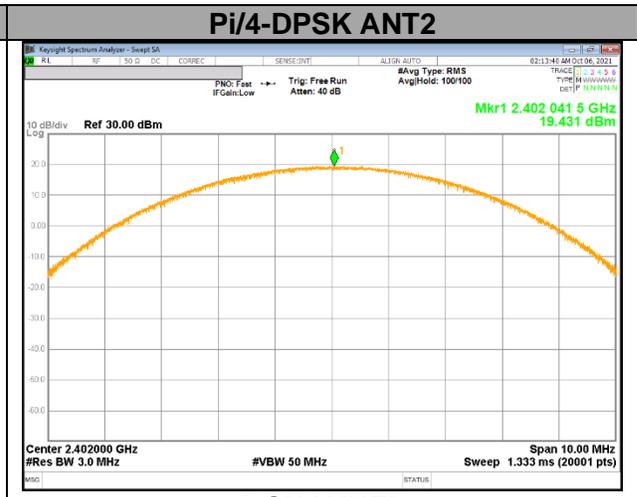
#### PEAK OUTPUT POWER







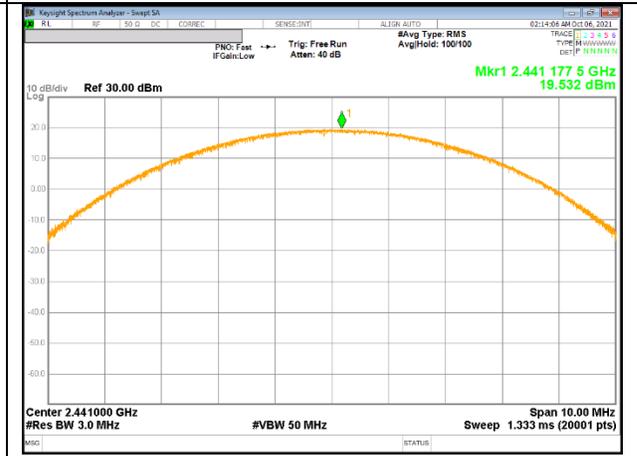
**0 CHANNEL**



**0 CHANNEL**



**39 CHANNEL**



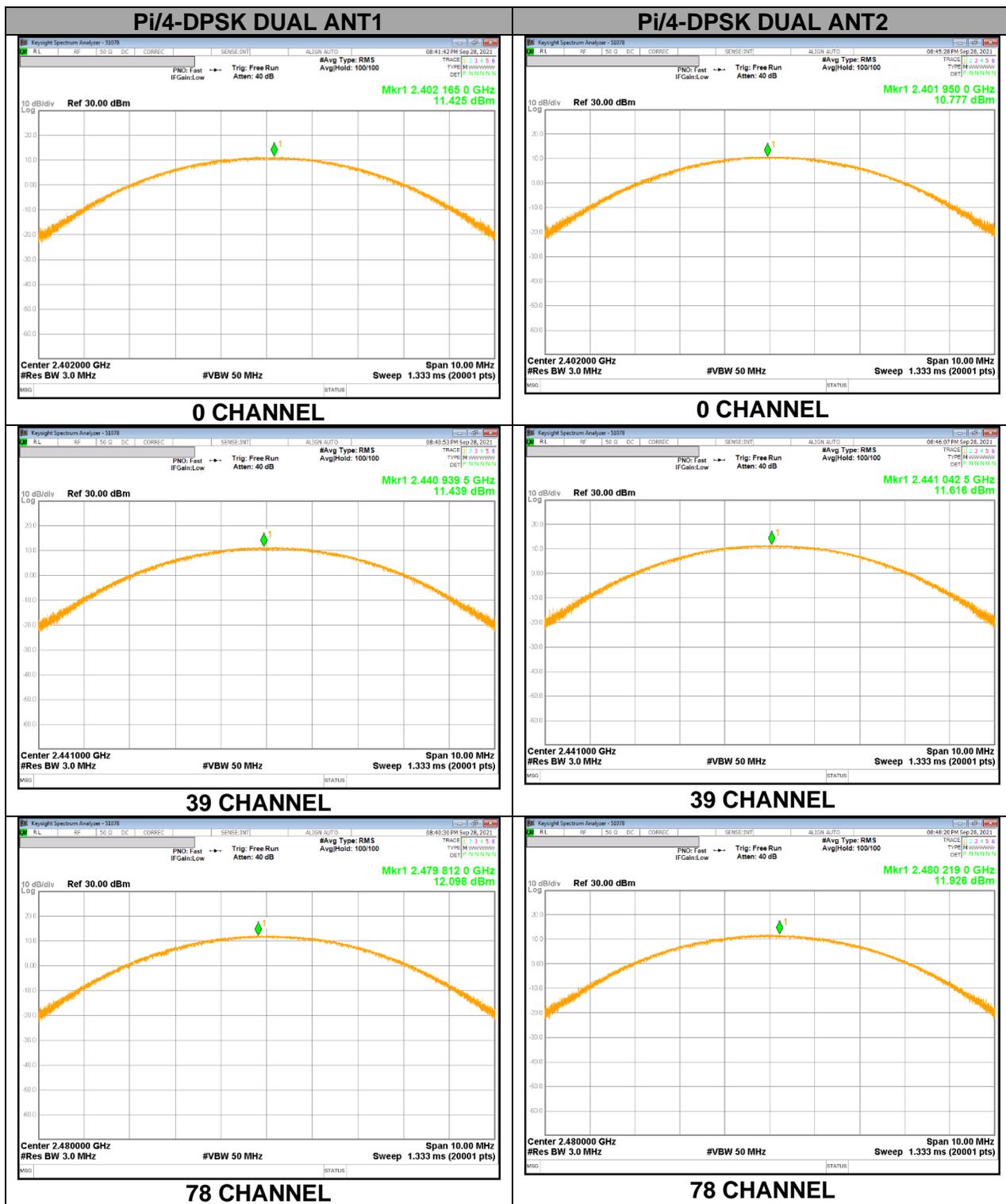
**39 CHANNEL**

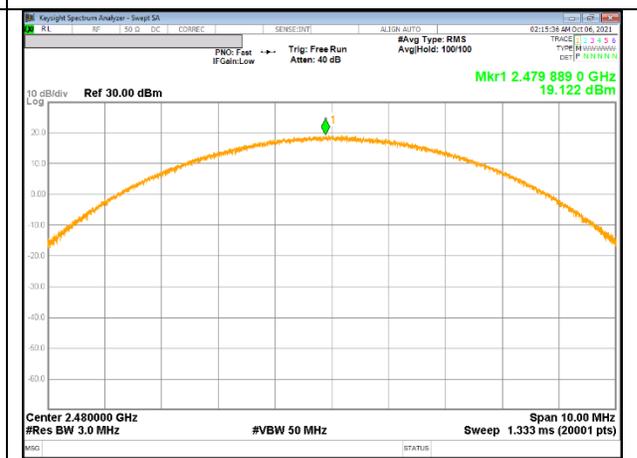
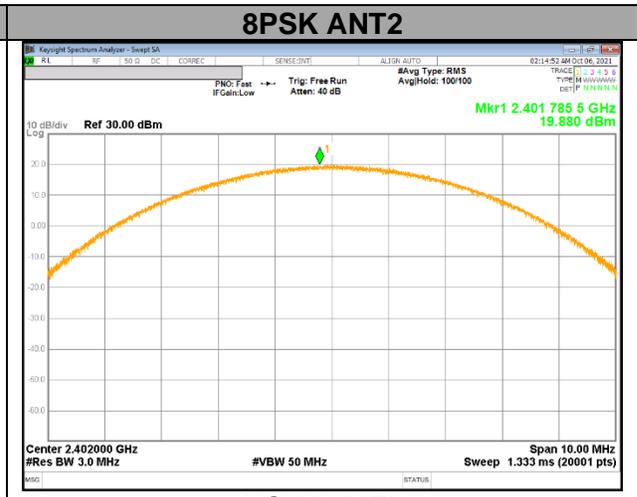
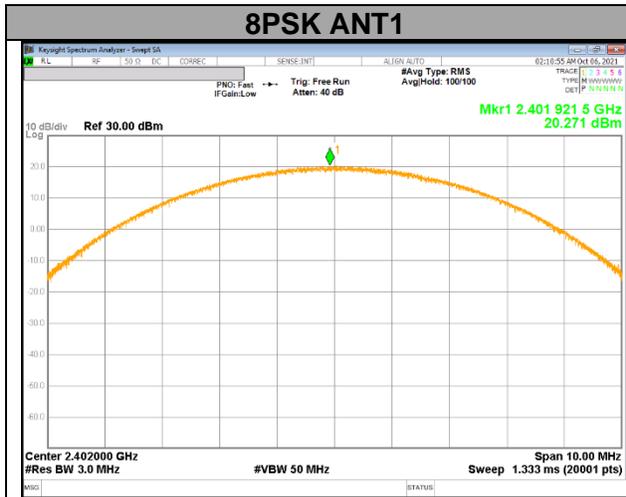


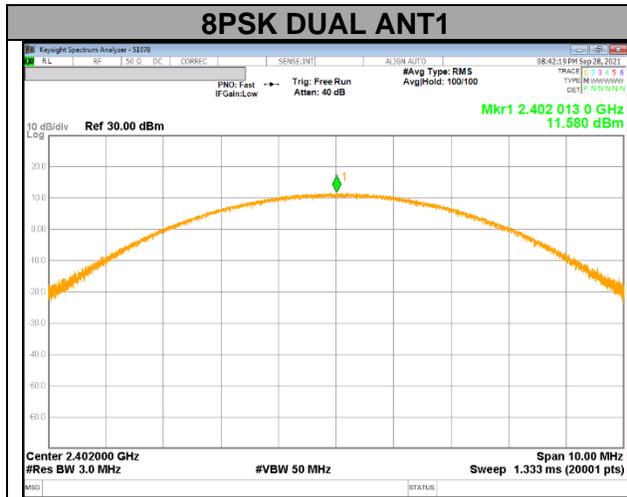
**78 CHANNEL**



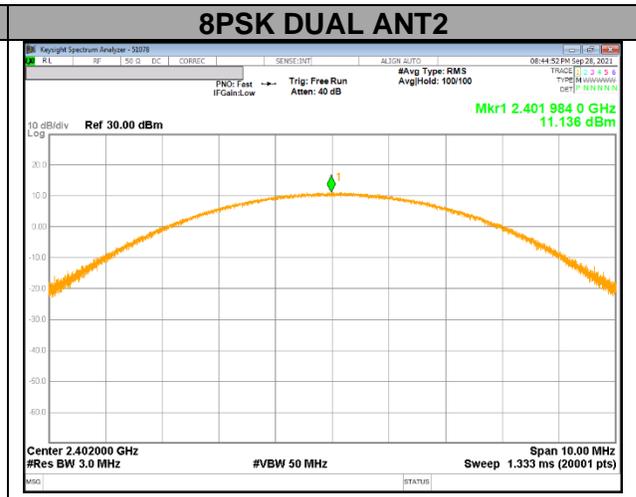
**78 CHANNEL**







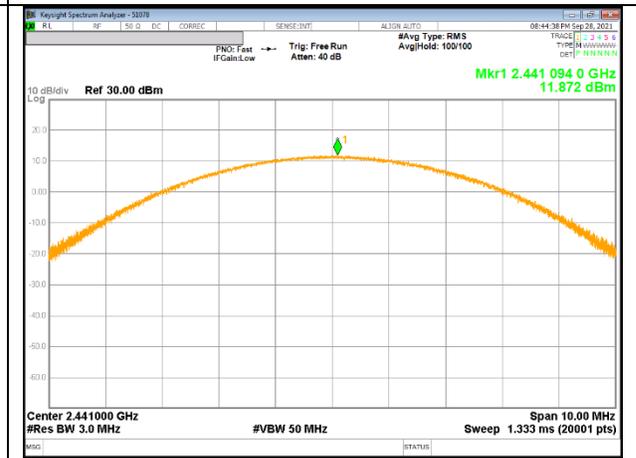
**0 CHANNEL**



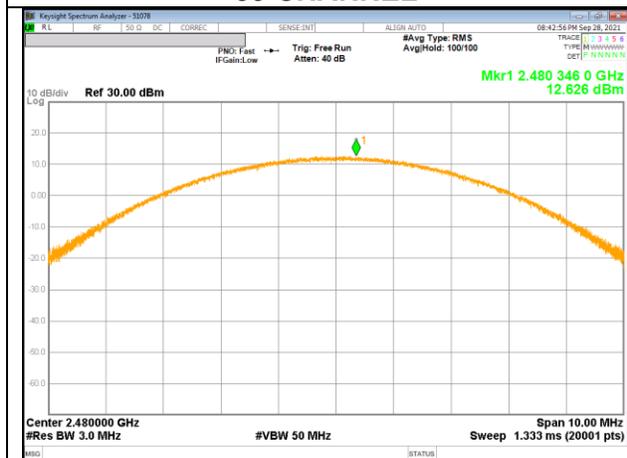
**0 CHANNEL**



**39 CHANNEL**



**39 CHANNEL**



**78 CHANNEL**



**78 CHANNEL**

## 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

Antenna	PA.	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	ePA	0	2 402	17.600	57.544
		39	2 441	18.970	78.886
		78	2 480	17.911	61.816
ANT2		0	2 402	16.940	49.431
		39	2 441	17.062	50.839
		78	2 480	16.287	42.530
DUAL-BT	iPA	0	2 402	13.810	24.044
		39	2 441	14.320	27.040
		78	2 480	15.060	32.063

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

Antenna	PA.	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	ePA	0	2 402	17.080	51.050
		39	2 441	17.814	60.451
		78	2 480	16.904	49.023
ANT2		0	2 402	16.724	47.033
		39	2 441	16.794	47.797
		78	2 480	15.847	38.433
DUAL-BT	iPA	0	2 402	11.720	14.859
		39	2 441	12.110	16.255
		78	2 480	12.580	18.113

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

Antenna	PA.	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	ePA	0	2 402	17.145	51.820
		39	2 441	17.854	61.010
		78	2 480	16.891	48.876
ANT2		0	2 402	16.722	47.011
		39	2 441	16.795	47.808
		78	2 480	15.852	38.477
DUAL-BT	iPA	0	2 402	11.720	14.859
		39	2 441	12.110	16.255
		78	2 480	12.610	18.239

## **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.

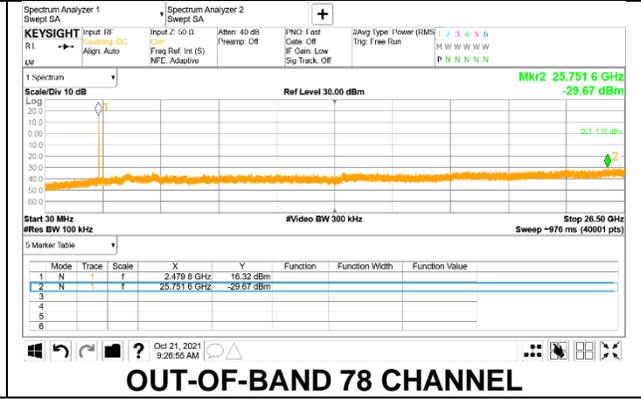
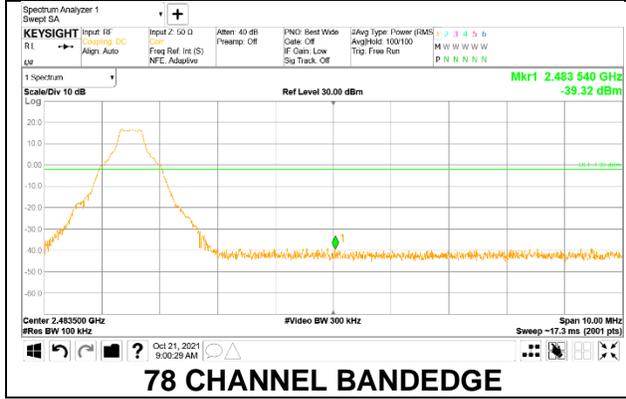
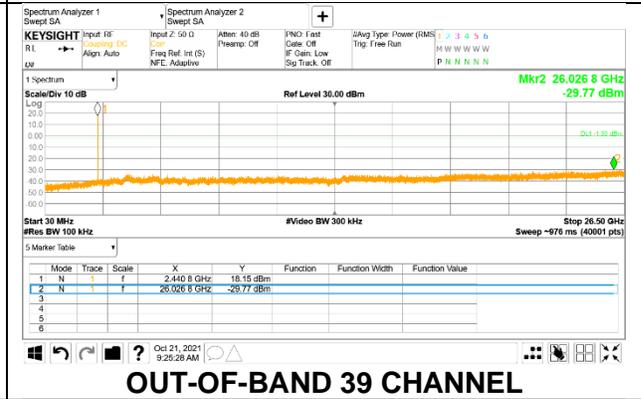
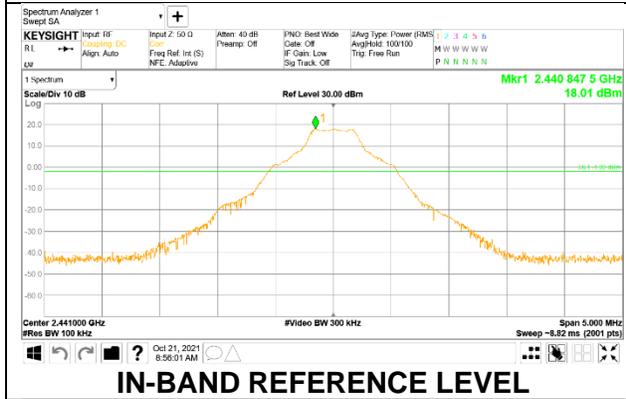
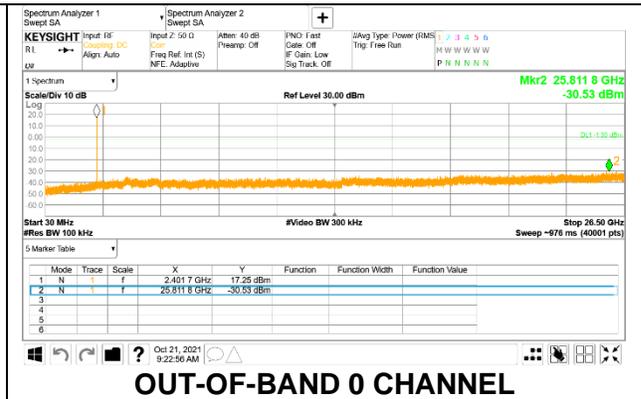
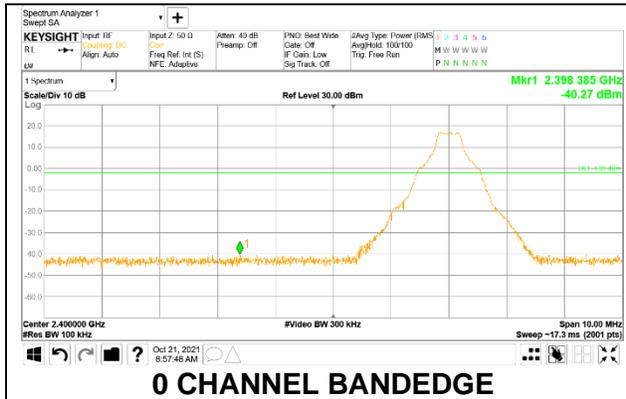
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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 - ANT1



**SPURIOUS BANDEGE EMISSIONS WITH HOPPING ON**

