



CERTIFICATION TEST REPORT

Report Number. : 4789754188-E5V1

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

Model : SCG10

FCC ID : A3LSMG996JPN

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

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

Date Of Issue:
February 05, 2021

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	02/05/21	Initial issue	Hyunsik Yun

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
4.1. METROLOGICAL TRACEABILITY.....	7
4.2. SAMPLE CALCULATION.....	7
4.3. DECISION RULES.....	7
4.4. MEASUREMENT UNCERTAINTY	7
5. EQUIPMENT UNDER TEST	8
5.1. EUT DESCRIPTION.....	8
5.2. MAXIMUM OUTPUT POWER.....	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
5.4. WORST-CASE CONFIGURATION AND MODE	9
5.5. DESCRIPTION OF TEST SETUP	10
6. TEST AND MEASUREMENT EQUIPMENT	12
7. TEST RESULTS SUMMARY	13
8. MEASUREMENT METHODS	14
9. ANTENNA PORT TEST RESULTS	15
9.1. ON TIME AND DUTY CYCLE	15
9.2. 20 dB AND 99% BANDWIDTH.....	16
9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	16
9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION.....	16
9.2.3. Bandwidth Plot.....	17
9.3. HOPPING FREQUENCY SEPARATION.....	19
9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	20
9.3.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION.....	20
9.4. NUMBER OF HOPPING CHANNELS	21
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	22
9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION.....	23
9.5. AVERAGE TIME OF OCCUPANCY.....	24
9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	25
9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION.....	27
9.6. OUTPUT POWER.....	29
9.6.1. BASIC DATA RATE GFSK MODULATION.....	29
9.6.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION	29

9.6.3.	ENHANCED DATA RATE 8PSK MODULATION	29
9.6.4.	OUTPUT POWER PLOTS.....	30
9.7.	AVERAGE POWER	32
9.7.1.	BASIC DATA RATE GFSK MODULATION.....	32
9.7.2.	ENHANCED DATA RATE PI/4-DQPSK MODULATION	32
9.7.3.	ENHANCED DATA RATE 8PSK MODULATION	32
9.8.	CONDUCTED SPURIOUS EMISSIONS	33
9.8.1.	BLUETOOTH BASIC DATA RATE GFSK MODULATION	34
9.8.2.	BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION.....	36
10.	RADIATED TEST RESULTS	38
10.1.	TRANSMITTER ABOVE 1 GHz	40
10.1.1.	BLUETOOTH BASIC DATA RATE GFSK MODULATION	40
10.1.2.	BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION	47
10.2.	WORST CASE BELOW 1 GHZ.....	54
11.	AC POWER LINE CONDUCTED EMISSIONS	55
11.1.1.	AC Power Line Host	56

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

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

MODEL NUMBER: SCG10

SERIAL NUMBER: R3CNA0BB96L (CONDUCTED);
R3CNC02XCVV (RADIATED);

DATE TESTED: DEC 04, 2020 – FEB 04, 2021;

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
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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	
☒	Chamber 1
☒	Chamber 2
☐	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. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.

4.4. 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	3.01 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.49 dB

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

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC. 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	16.036	40.142
		Peak	16.395	43.601
	Enhanced Pi/4-DPSK	Average	10.778	11.962
		Peak	13.490	22.336
	Enhanced 8PSK	Average	10.785	11.981
		Peak	13.980	25.003

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 antenna, with a maximum gain of -1.78 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X 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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA200	N/A	N/A
Data Cable	SAMSUNG	EP-DR140AWE	N/A	N/A

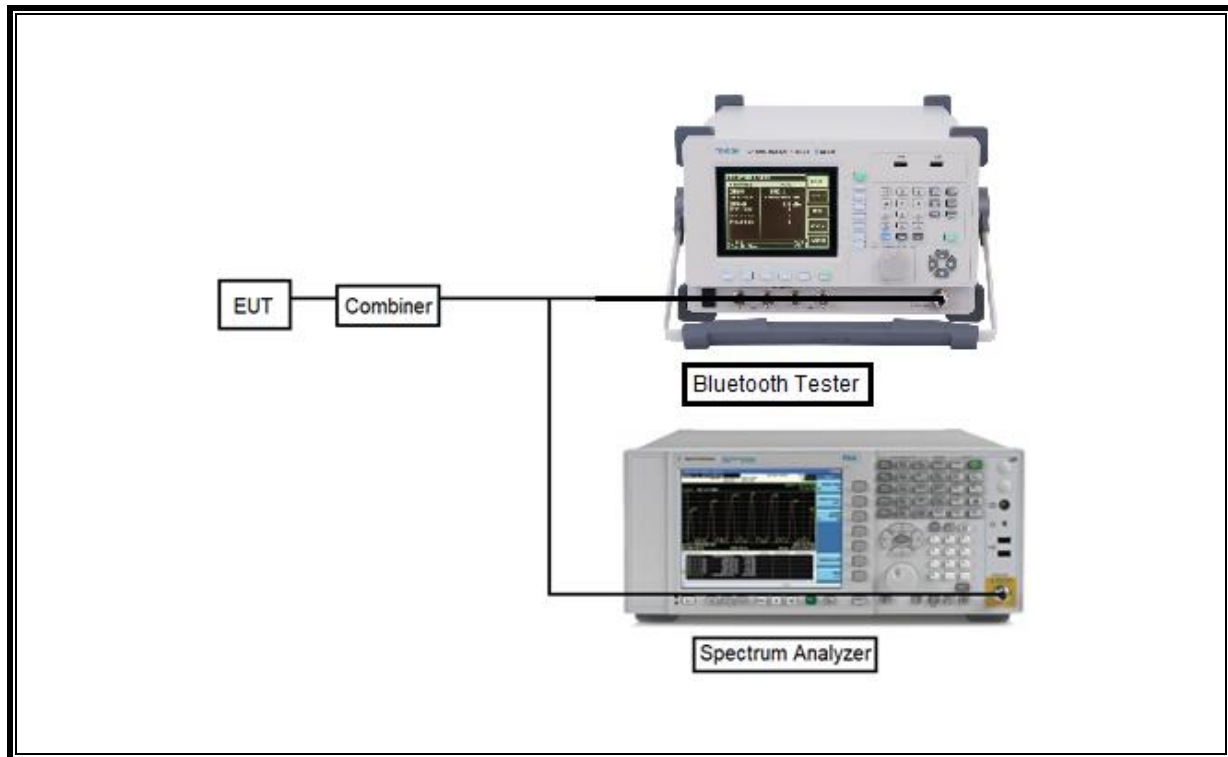
I/O CABLE

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

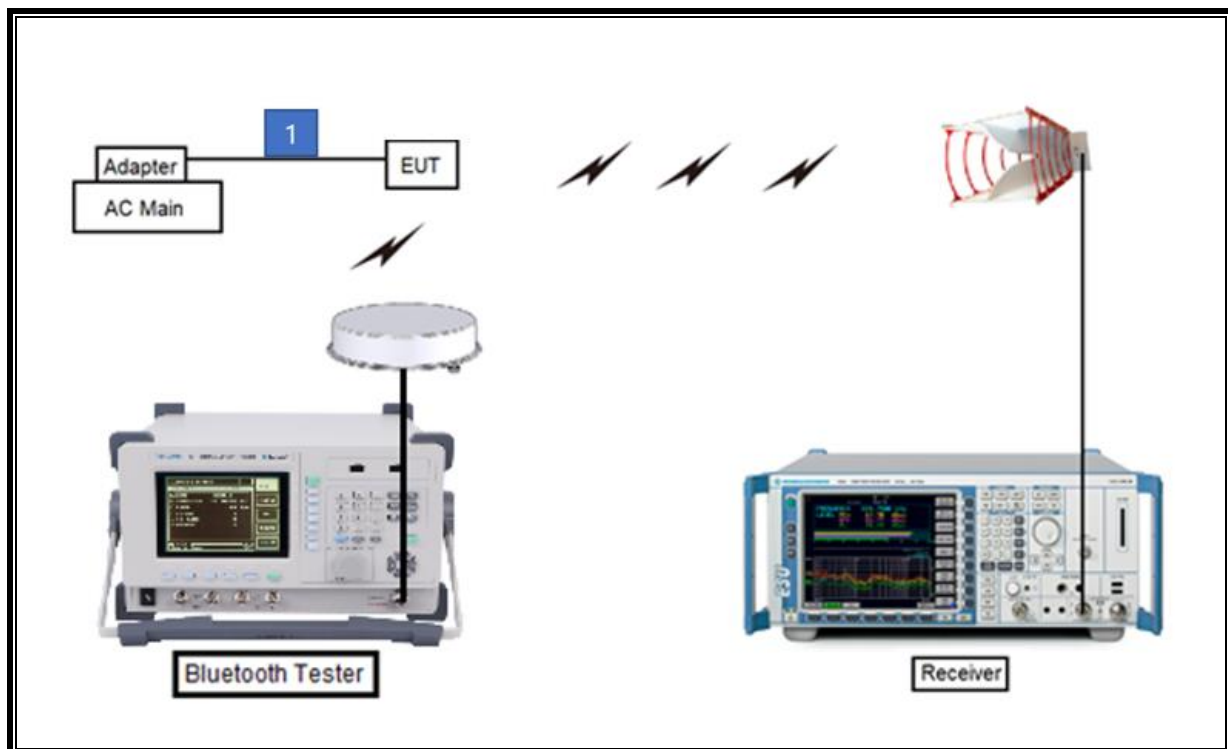
TEST SETUP

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	08-19-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-13-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-13-22
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
Antenna, Horn, 18 GHz	ETS	3115	00167211	07-27-22
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-15-22
Antenna, Horn, 18 GHz	ETS	3117	00168724	07-27-22
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-15-22
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-04-22
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-06-21
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	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-06-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-04-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-05-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-05-21
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-05-21
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-05-21
Power Splitter	MINI-CIRCUITS	WA1534	UL001	02-05-21
Attenuator	PASTERNAK	PE7087-10	A001	08-03-21
Attenuator	PASTERNAK	PE7087-10	A008	08-03-21
Attenuator	PASTERNAK	PE7004-10	2	08-04-21
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-03-21
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-04-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-04-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-04-21
LISN	R&S	ENV-216	101837	08-06-21
Termination	WEINSCHEL	M1406A	T01	08-05-21
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

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

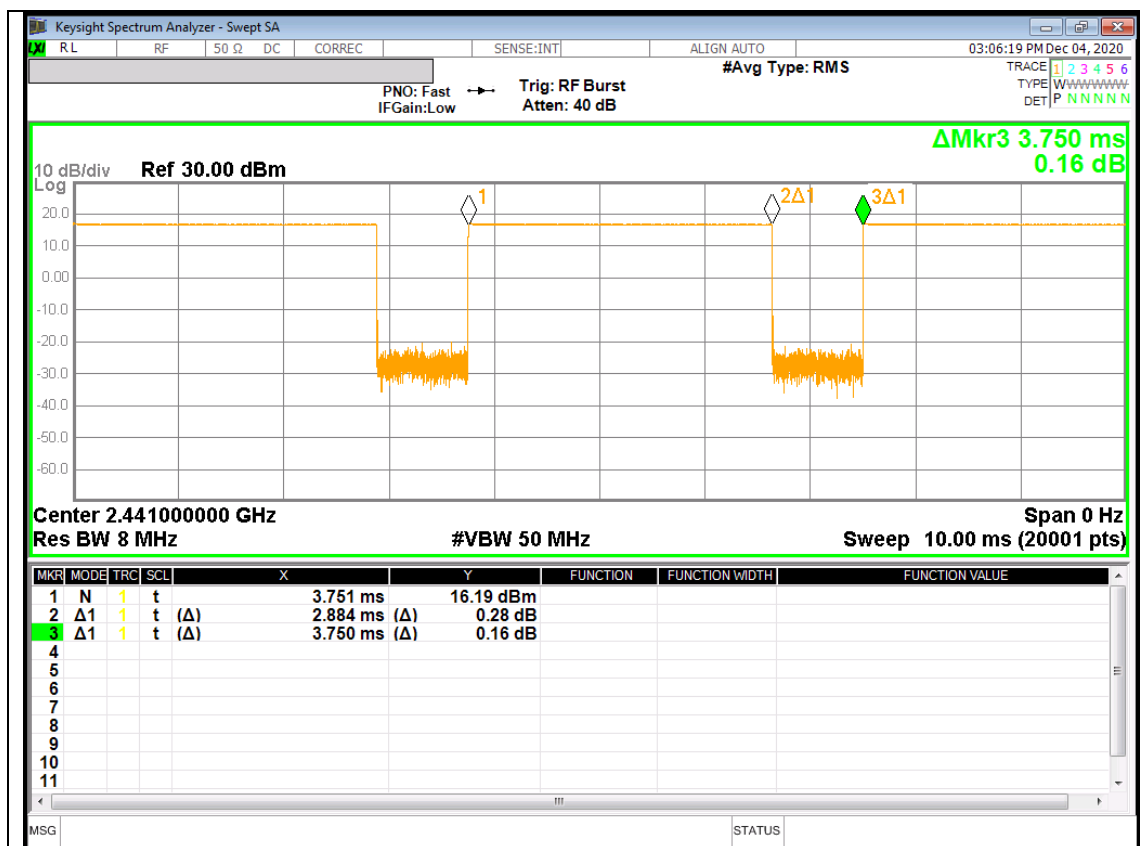
None; for reporting purposes only.

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]
2 400 ~ 2 483.5 MHz Band					
Bluetooth	2.884	3.750	76.91	1.14	0.35



9.2. 20 dB AND 99% 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

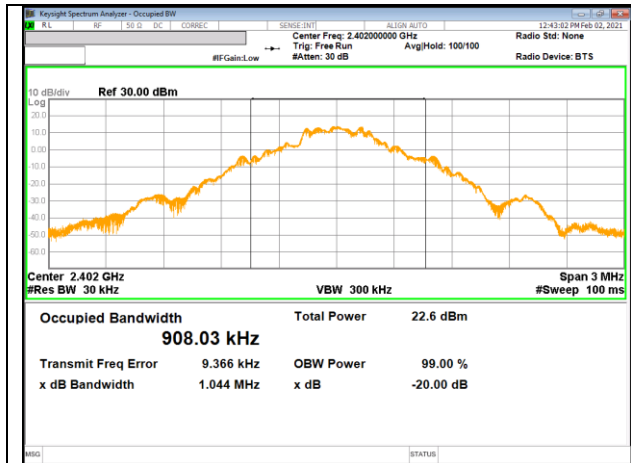
Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
0	2 402	1.044	0.867
39	2 441	1.045	0.892
78	2 480	1.045	0.866
Worst		1.045	0.892

9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

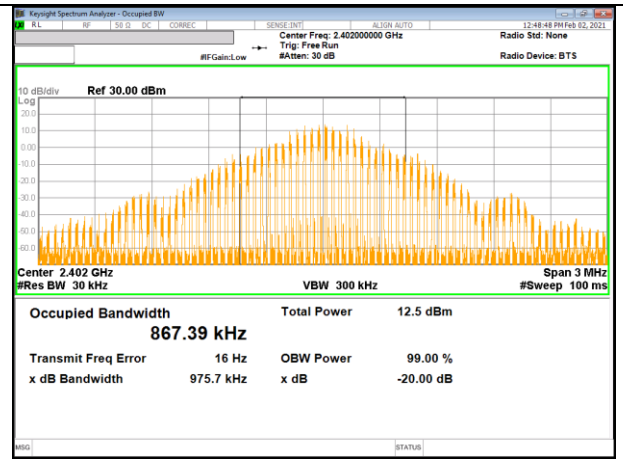
Channel	Frequency [MHz]	20 dB Bandwidth [MHz]	99% Bandwidth [MHz]
0	2 402	1.296	1.165
39	2 441	1.305	1.164
78	2 480	1.305	1.164
Worst		1.305	1.165

9.2.3. Bandwidth Plot

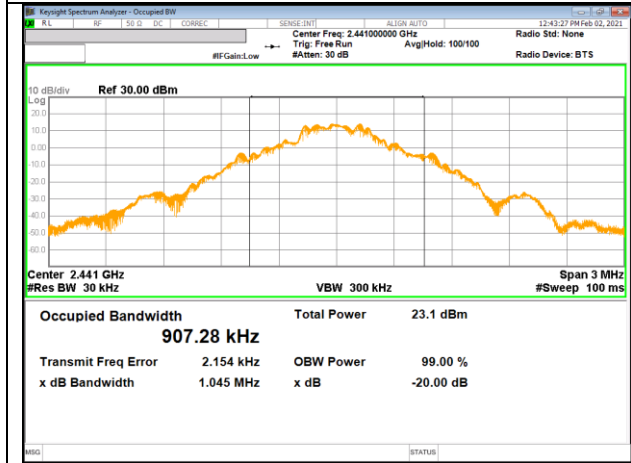
GFSK



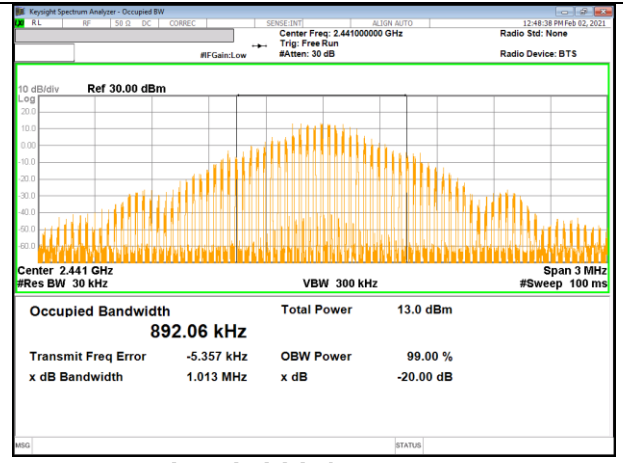
20 dB bandwidth / 0 CHANNEL



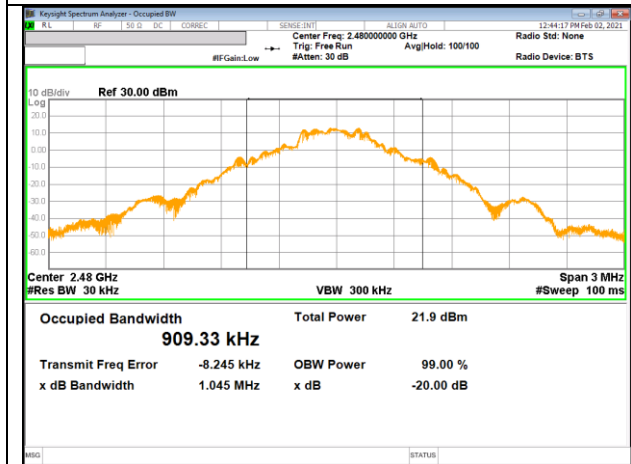
99% bandwidth / 0 CHANNEL



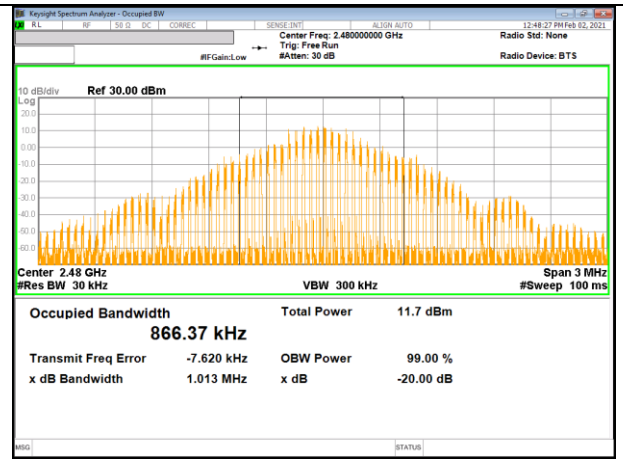
20 dB bandwidth / 39 CHANNEL



99% bandwidth / 39 CHANNEL

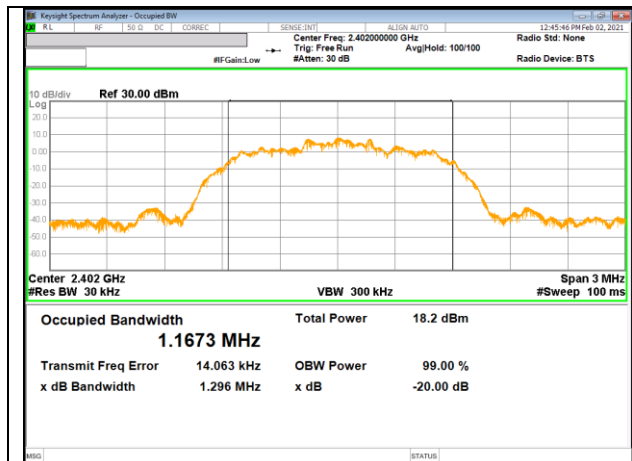


20 dB bandwidth / 78 CHANNEL

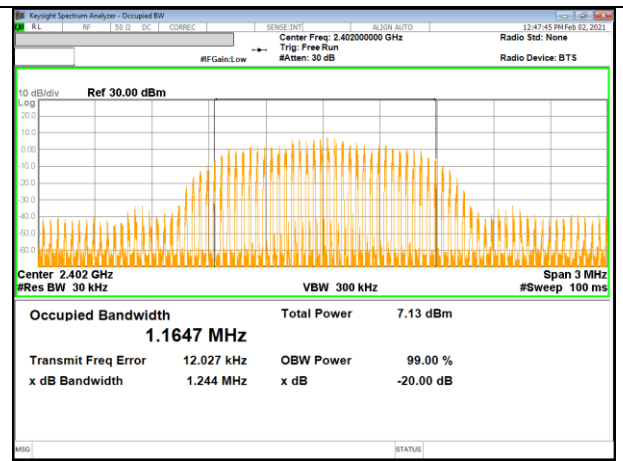


99% bandwidth / 78 CHANNEL

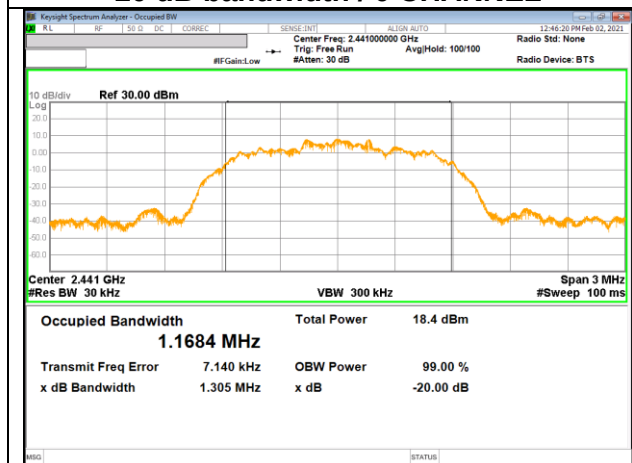
8PSK



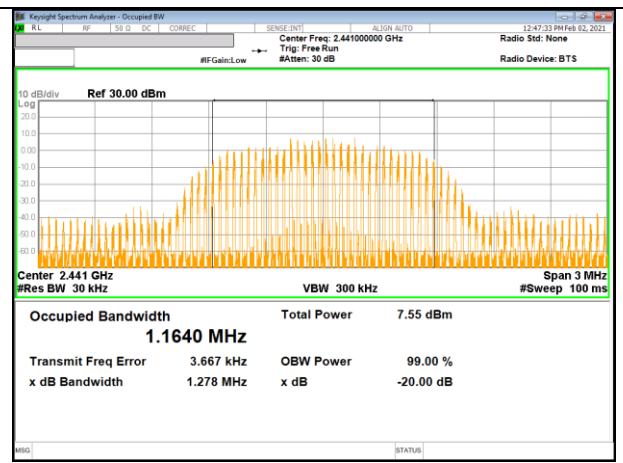
20 dB bandwidth / 0 CHANNEL



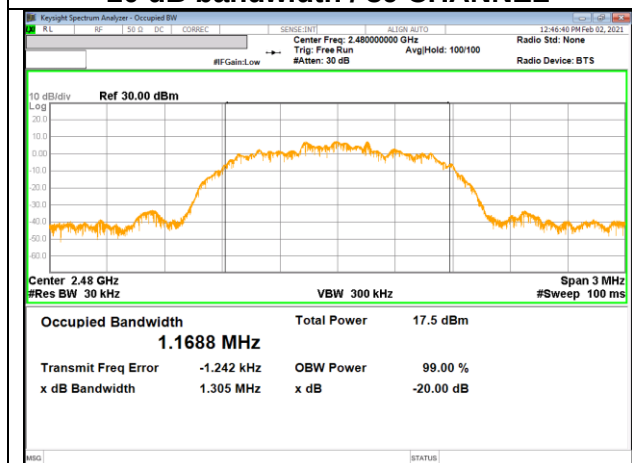
99% bandwidth / 0 CHANNEL



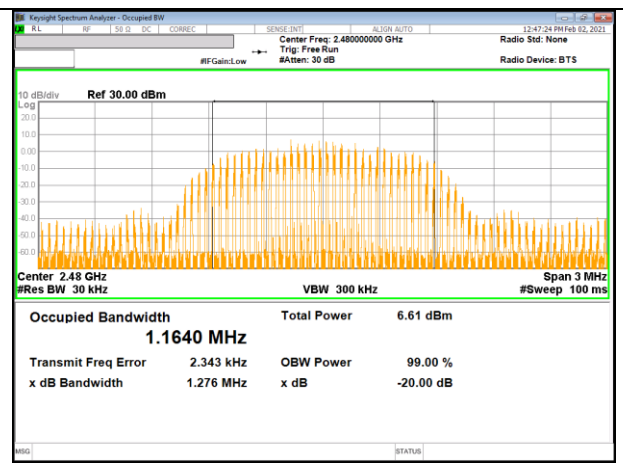
20 dB bandwidth / 39 CHANNEL



99% bandwidth / 39 CHANNEL



20 dB bandwidth / 78 CHANNEL



99% bandwidth / 78 CHANNEL

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.

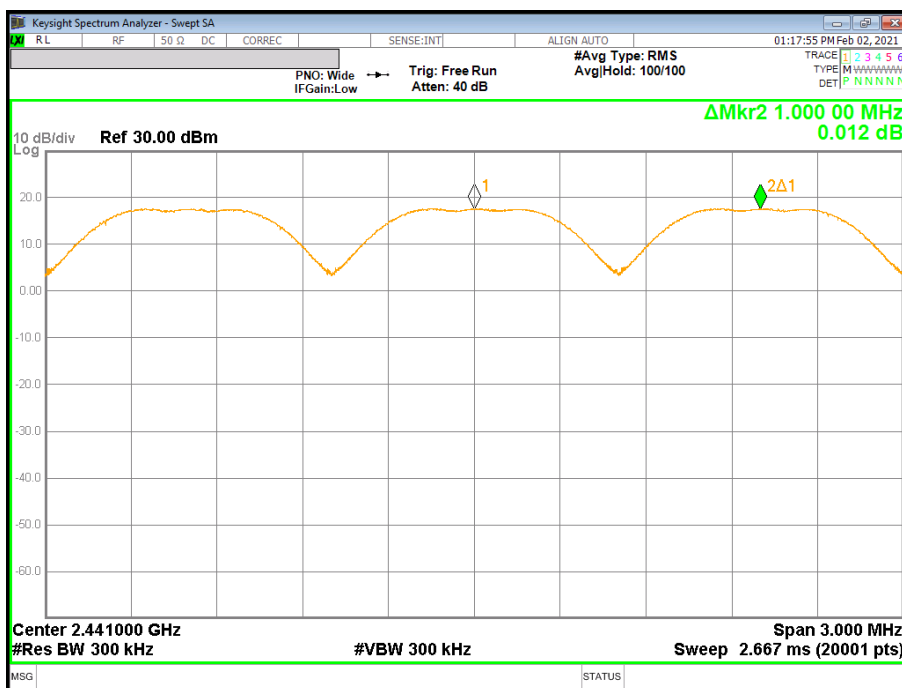
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

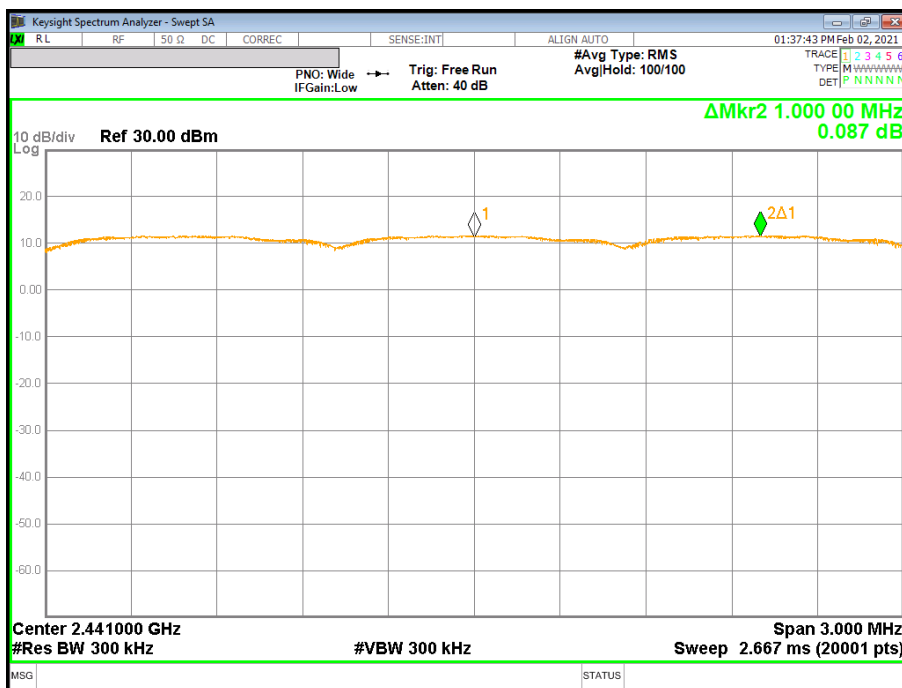
RESULTS

9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



HOPPING FREQUENCY SEPARATION PLOT

9.3.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



HOPPING FREQUENCY SEPARATION PLOT

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.

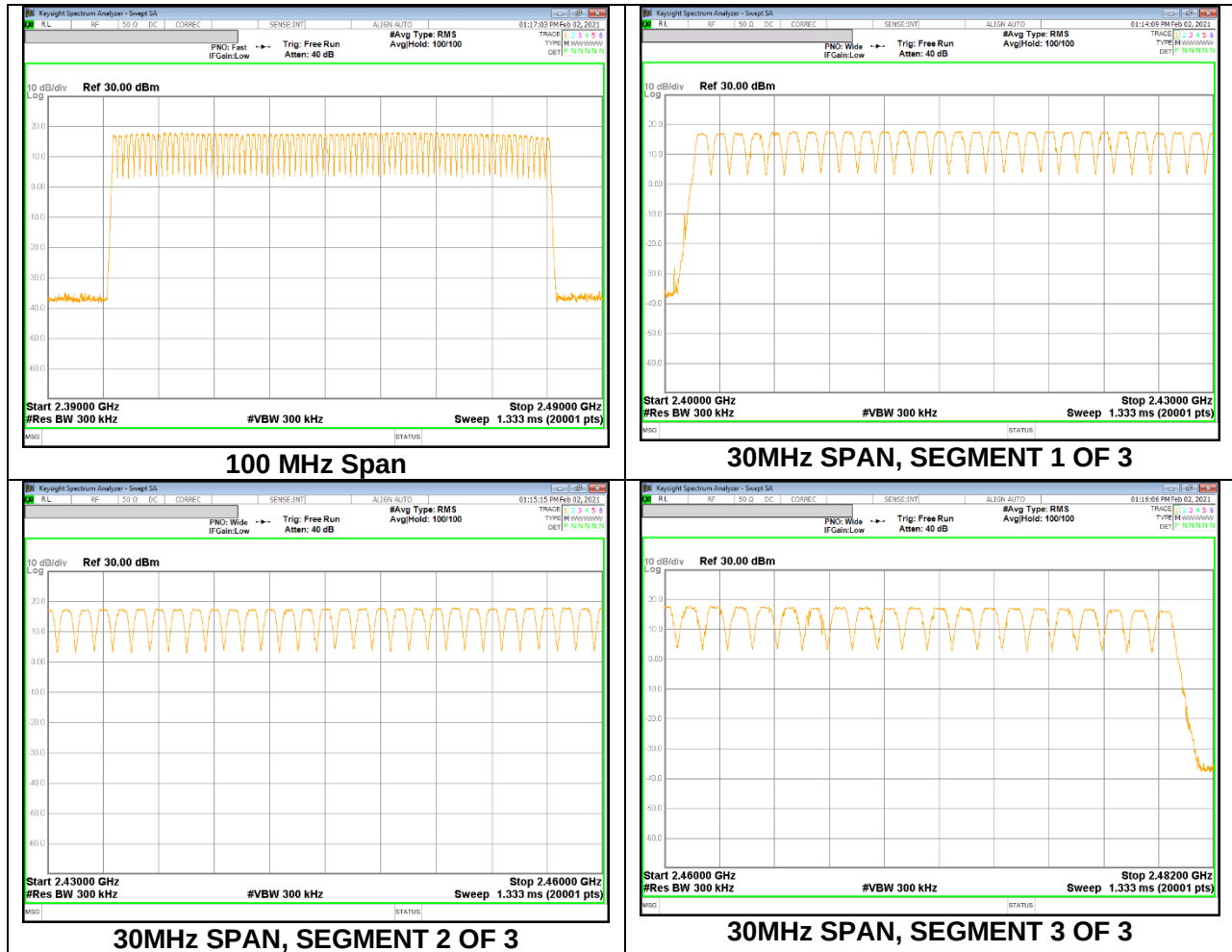
TEST PROCEDURE

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.

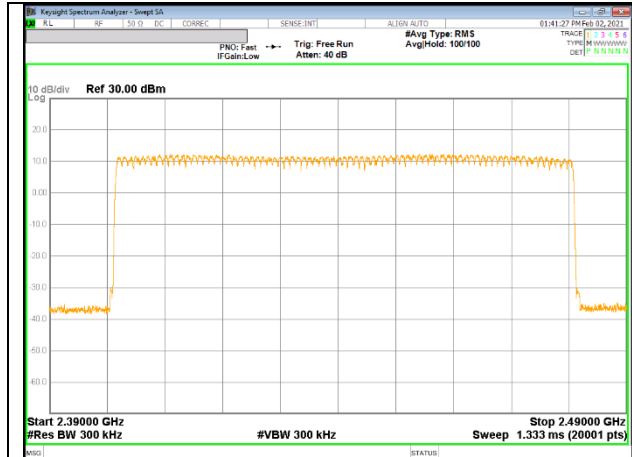
RESULTS

Normal Mode: All Channels Observed

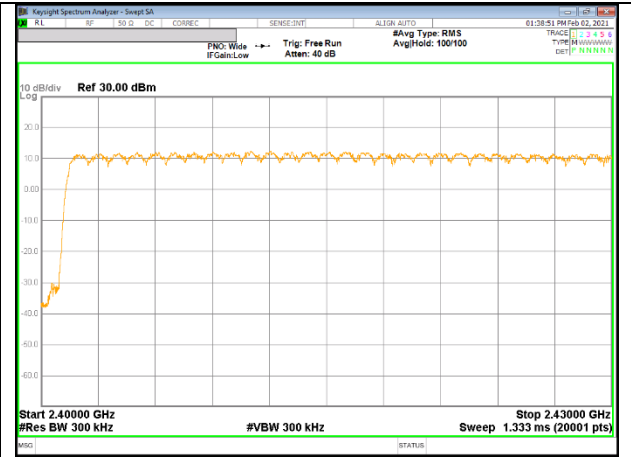
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



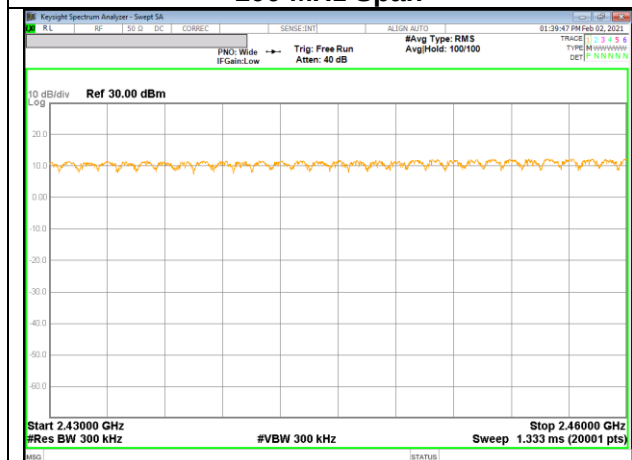
9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



100 MHz Span



30MHz SPAN, SEGMENT 1 OF 3



30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

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.

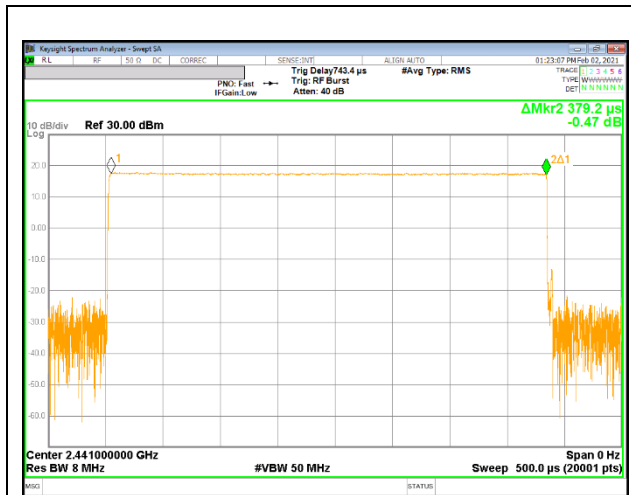
The average time of occupancy in the specified 3.16 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

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

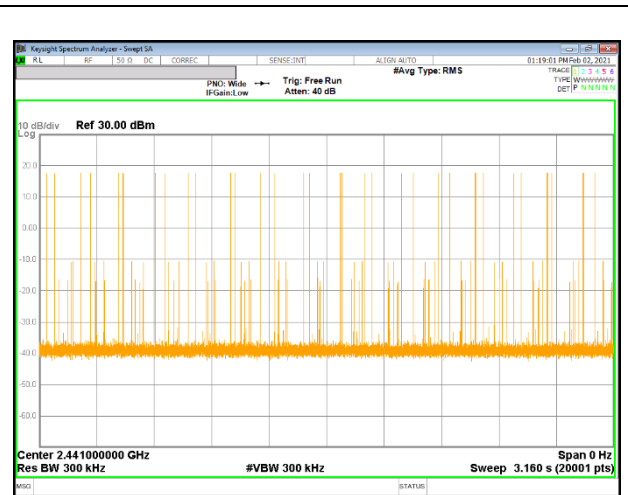
RESULTS

9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

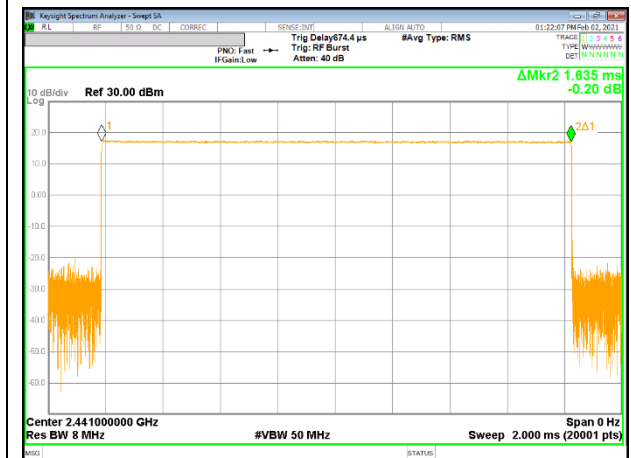
DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK Normal					
DH1	0.379	32	0.121	0.4	-0.279
DH3	1.635	16	0.262	0.4	-0.138
DH5	2.883	12	0.346	0.4	-0.054
GFSK AFH					
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
DH1	0.379	8	0.030	0.4	-0.370
DH3	1.635	4	0.065	0.4	-0.335
DH5	2.883	3	0.086	0.4	-0.314



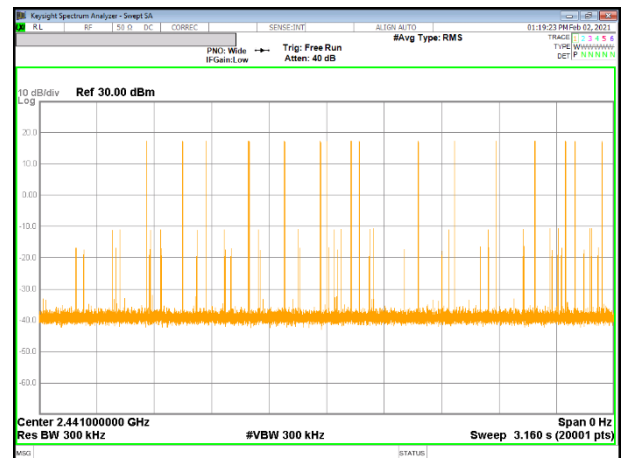
PULSE WIDTH – DH1



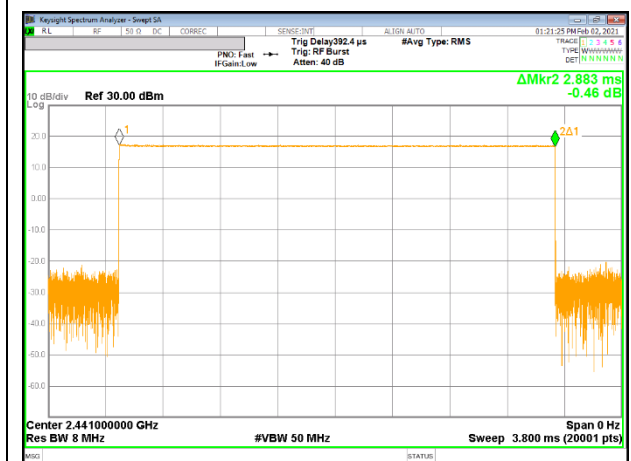
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



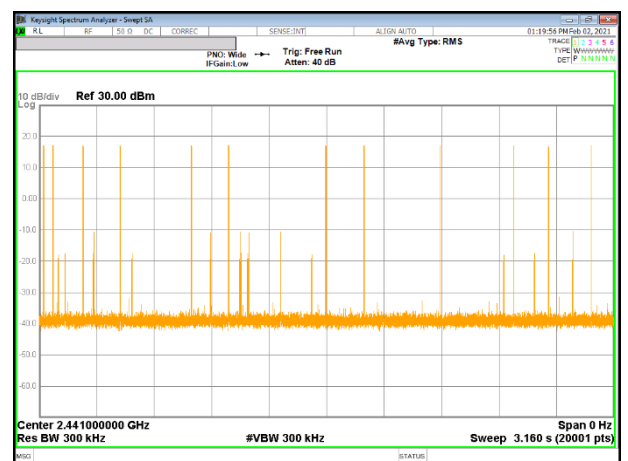
PULSE WIDTH – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



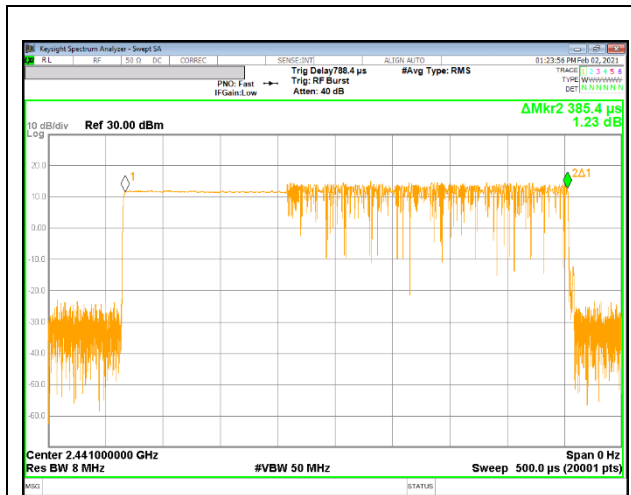
PULSE WIDTH – DH5



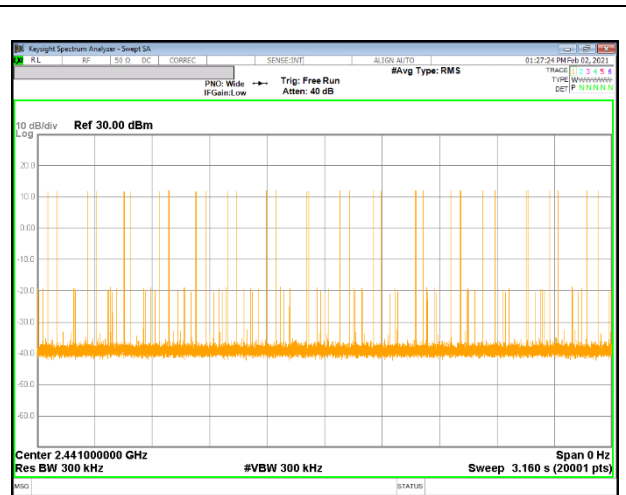
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

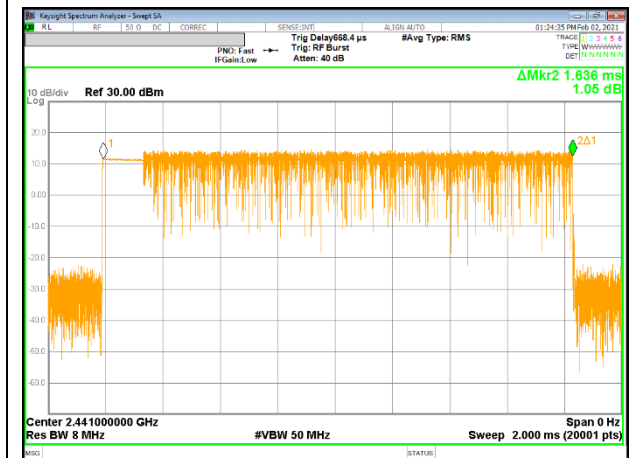
DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK Normal					
DH1	0.385	32	0.123	0.4	-0.277
DH3	1.636	16	0.262	0.4	-0.138
DH5	2.887	12	0.346	0.4	-0.054
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
8PSK AFH					
DH1	0.385	8	0.031	0.4	-0.369
DH3	1.636	4	0.065	0.4	-0.335
DH5	2.887	3	0.087	0.4	-0.313



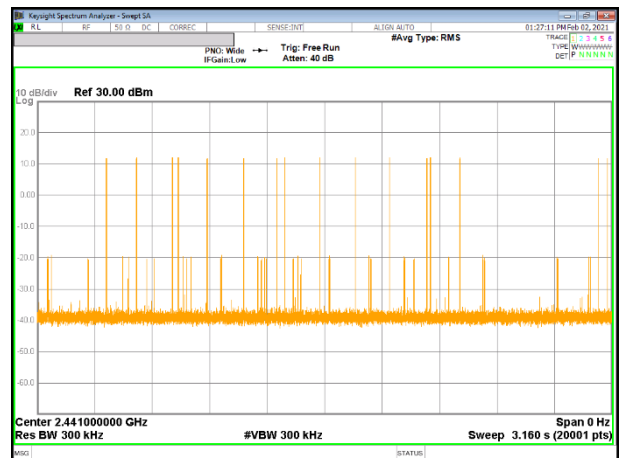
PULSE WIDTH – 3-DH1



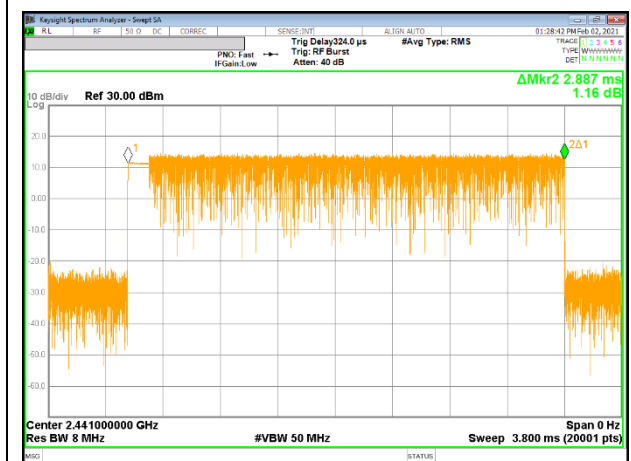
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3-DH1



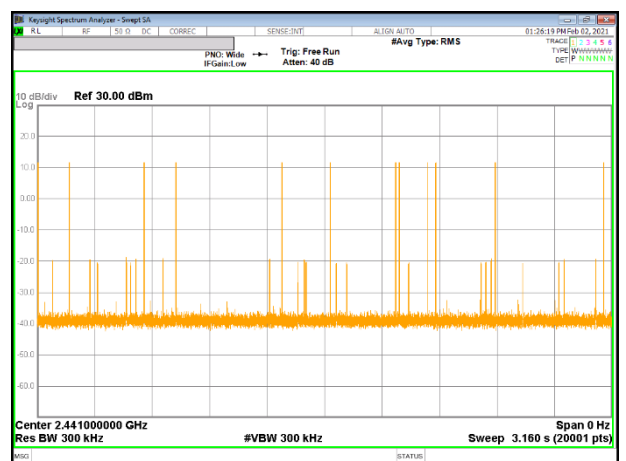
PULSE WIDTH – 3-DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3-DH3



PULSE WIDTH – 3-DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3-DH5

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]	Output Power [dBm]	Limit [dBm]	Margin [dBm]
0	2 402	15.988	21.000	-5.012
39	2 441	16.395	21.000	-4.605
78	2 480	15.274	21.000	-5.726
Worst		16.395	21.000	-4.605

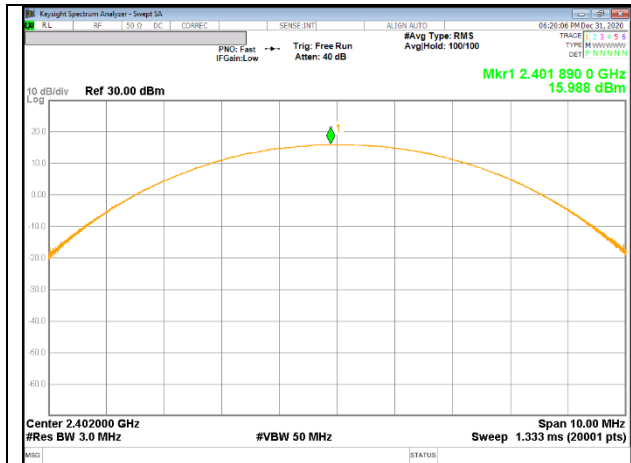
9.6.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dBm]
0	2 402	13.413	21.000	-7.587
39	2 441	13.490	21.000	-7.510
78	2 480	12.156	21.000	-8.844
Worst		13.490	21.000	-7.510

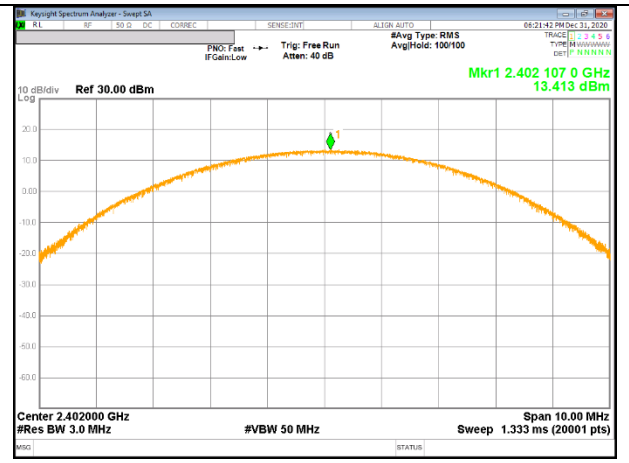
9.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	Output Power [dBm]	Limit [dBm]	Margin [dBm]
0	2 402	13.980	21.000	-7.020
39	2 441	13.934	21.000	-7.066
78	2 480	12.873	21.000	-8.127
Worst		13.980	21.000	-7.020

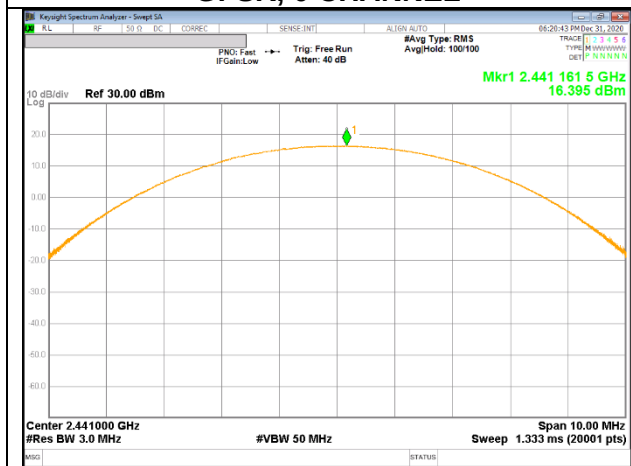
9.6.4. OUTPUT POWER PLOTS



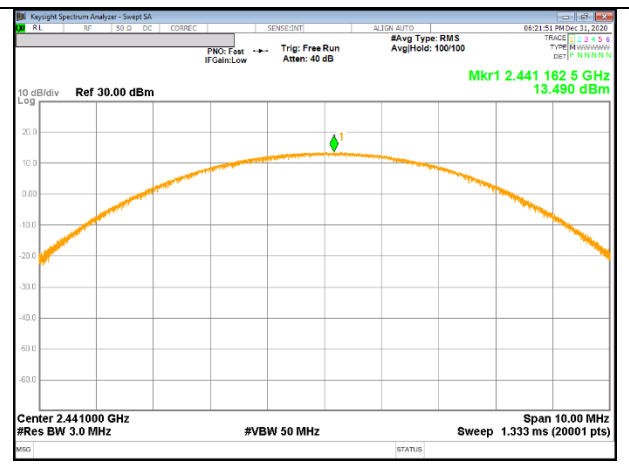
GFSK, 0 CHANNEL



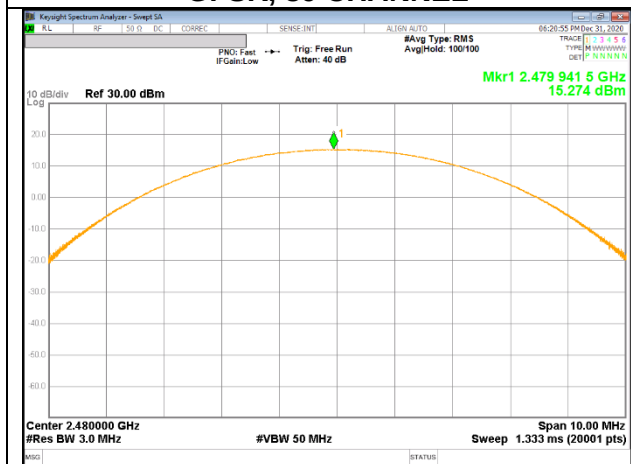
Pi/4-DPSK, 0 CHANNEL



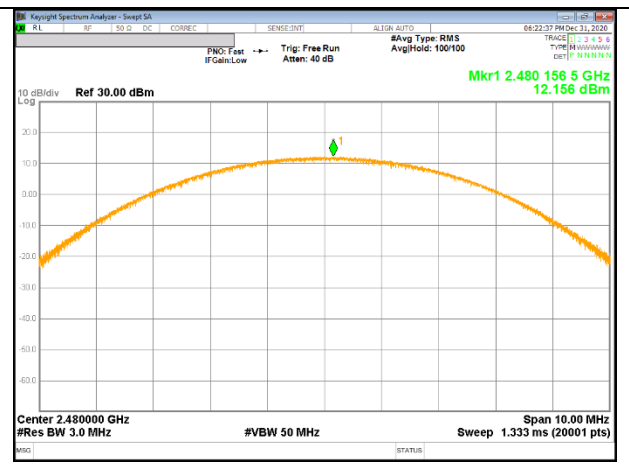
GFSK, 39 CHANNEL



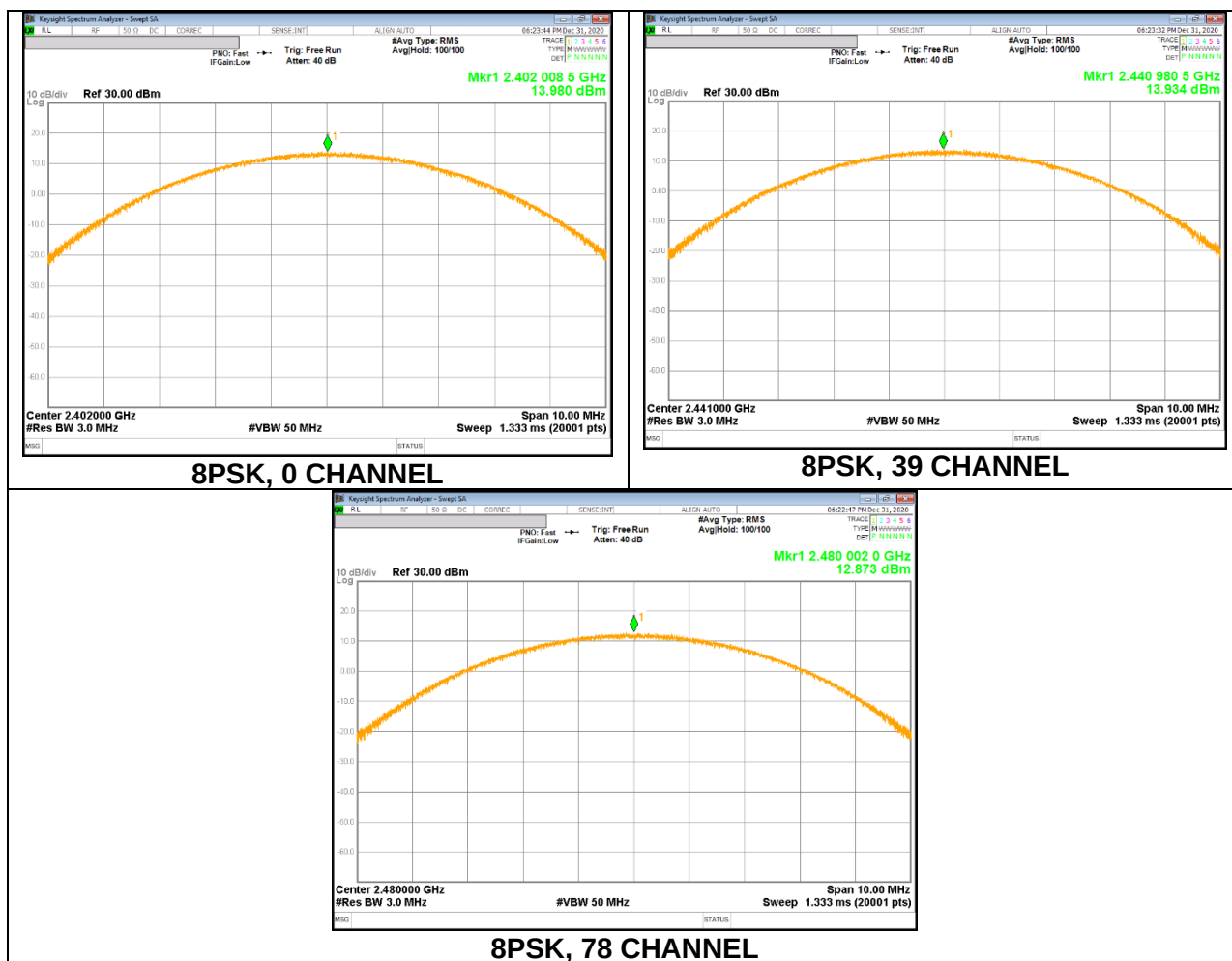
Pi/4-DPSK, 39 CHANNEL



GFSK, 78 CHANNEL



Pi/4-DPSK, 78 CHANNEL



9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor.
The cable assembly insertion loss and duty cycle correction factor was entered as an offset in the power sensor to allow for direct reading of power.

RESULTS

9.7.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
0	2 402	15.626	36.526
39	2 441	16.036	40.142
78	2 480	14.773	30.012

9.7.2. ENHANCED DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
0	2 402	10.738	11.852
39	2 441	10.778	11.962
78	2 480	9.465	8.840

9.7.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency [MHz]	AV power [dBm]	AV power [mW]
0	2 402	10.683	11.703
39	2 441	10.785	11.981
78	2 480	9.527	8.968

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.

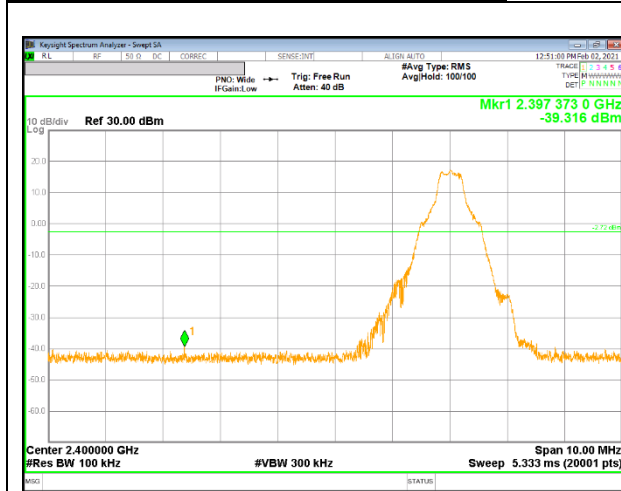
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

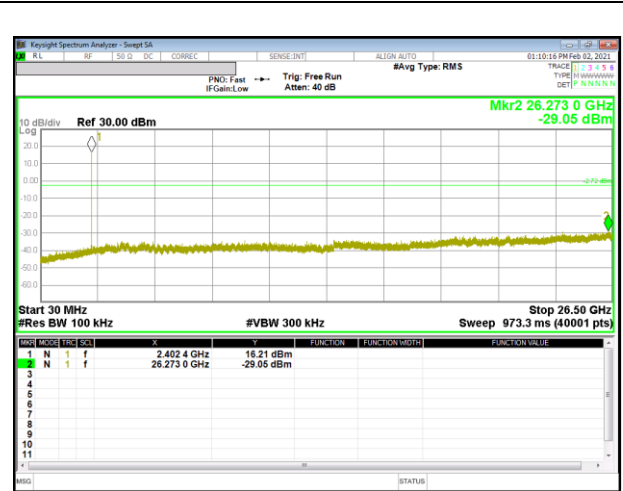
RESULTS

9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

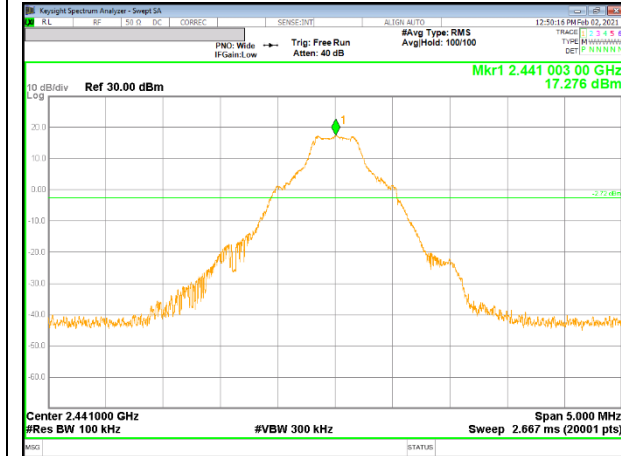
SPURIOUS EMISSIONS, NON-HOPPING



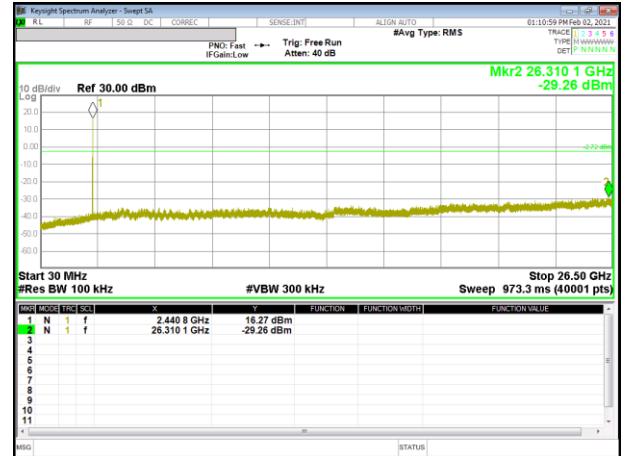
0 CHANNEL BANDEDGE



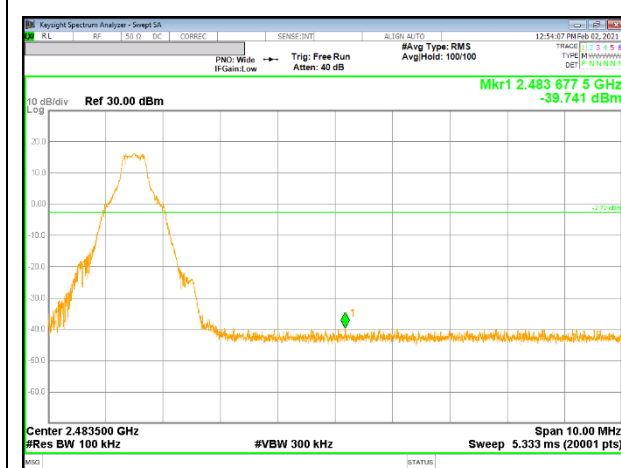
OUT-OF-BAND 0 CHANNEL



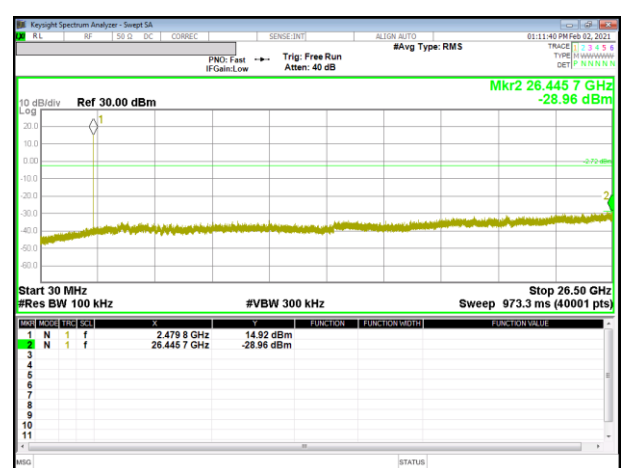
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 39 CHANNEL



78 CHANNEL BANDEDGE



OUT-OF-BAND 78 CHANNEL

The image displays two side-by-side screenshots of a Keysight Spectrum Analyzer interface, illustrating signal characteristics at different frequencies.

Left Screenshot (Low Bandedge):

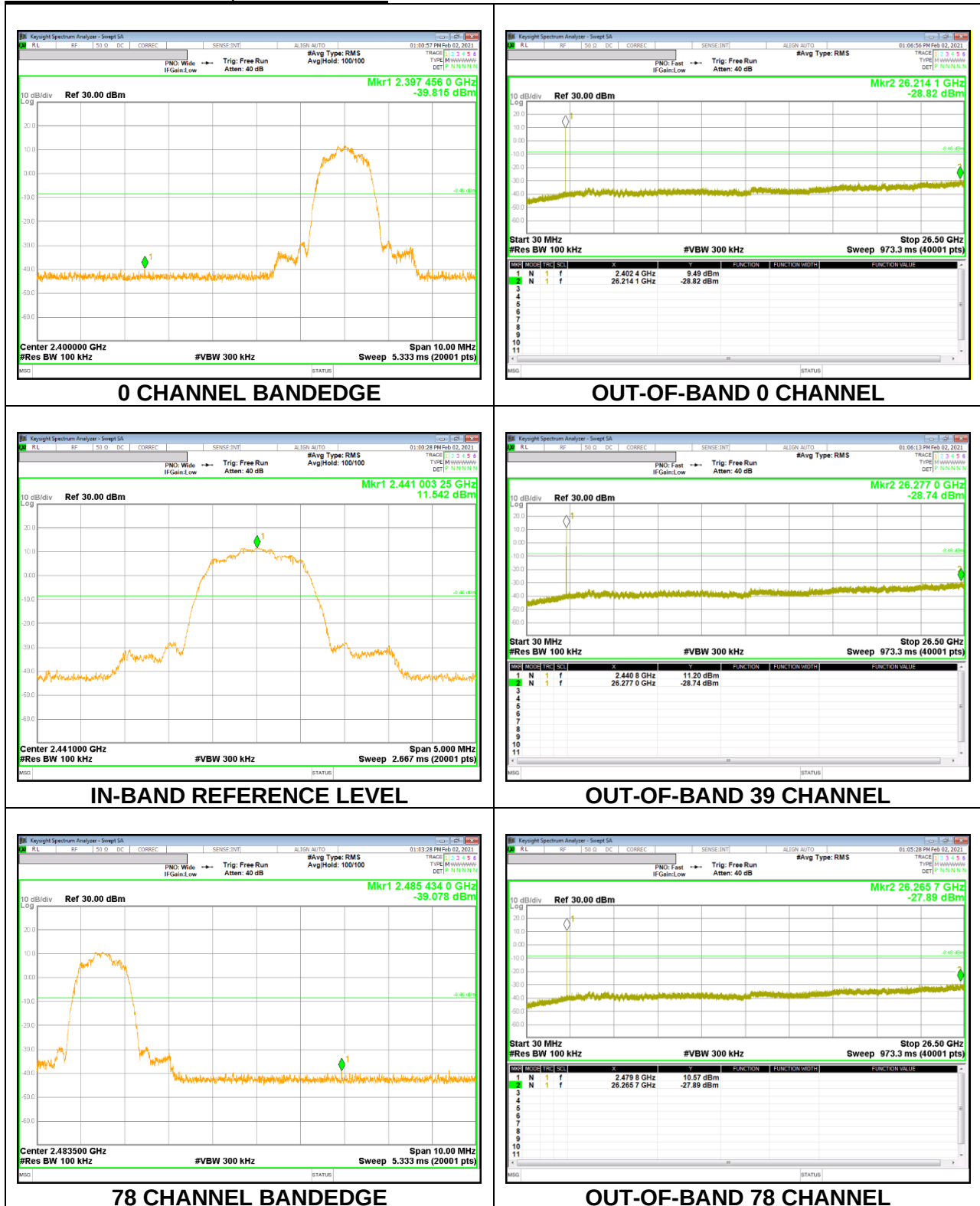
- Frequency:** Center 2.400000 GHz, Span 10.00 MHz.
- Signal:** A signal with a sharp rise (bandedge) is visible around 2.399 GHz.
- Marker:** Mkr1 2.399 625 5 GHz, -39.427 dBm.
- Settings:** #Avg Type: RMS, #Avg Hold: 100/100, #VBW 300 kHz, Sweep 5.333 ms (20001 pts).

Right Screenshot (High Bandedge):

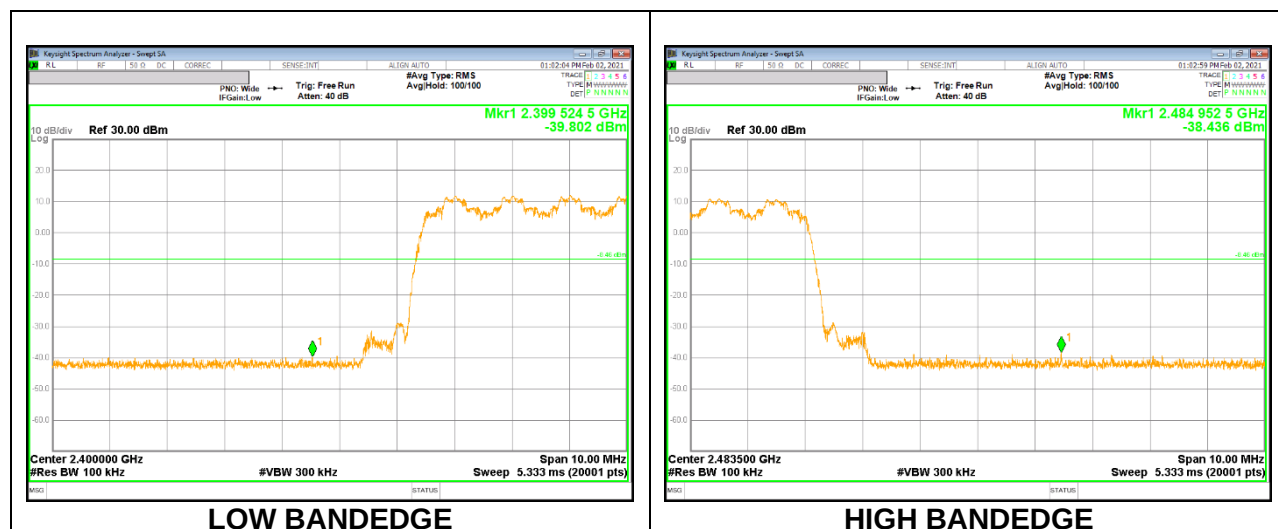
- Frequency:** Center 2.483500 GHz, Span 10.00 MHz.
- Signal:** A signal with a sharp fall (bandedge) is visible around 2.484 GHz.
- Marker:** Mkr1 2.484 007 0 GHz, -40.198 dBm.
- Settings:** #Avg Type: RMS, #Avg Hold: 100/100, #VBW 300 kHz, Sweep 5.333 ms (20001 pts).

9.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING



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.

$$\text{GFSK} = 1/T = 1 / 0.002884\text{S} = 347\text{Hz}.$$

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.

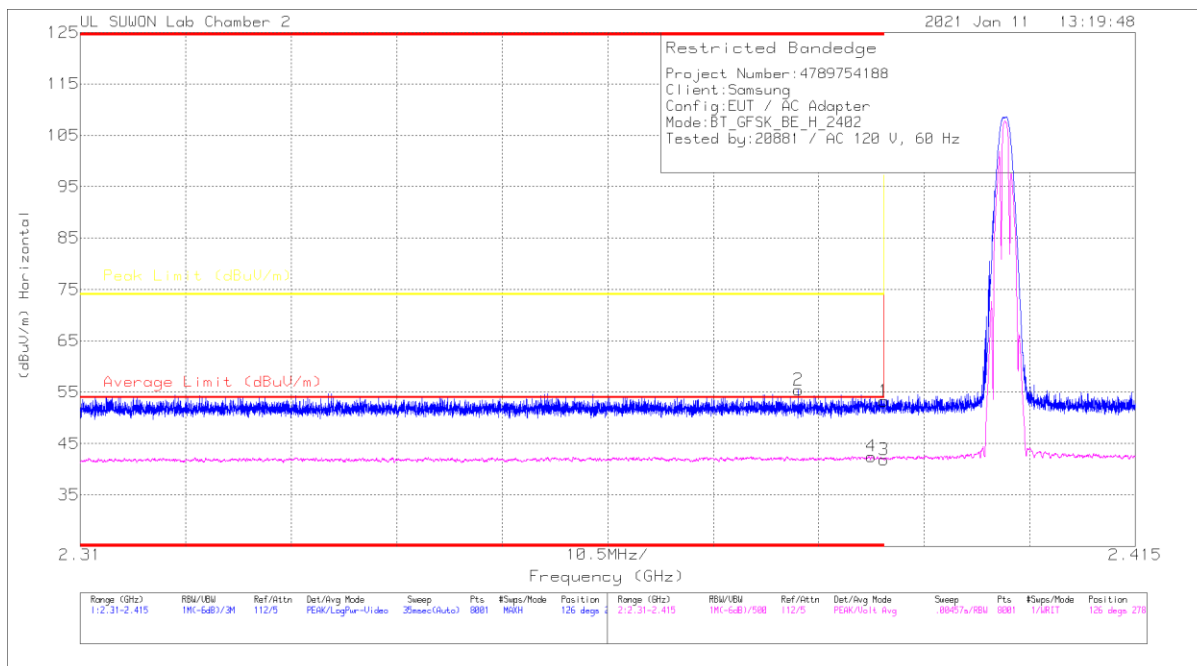
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

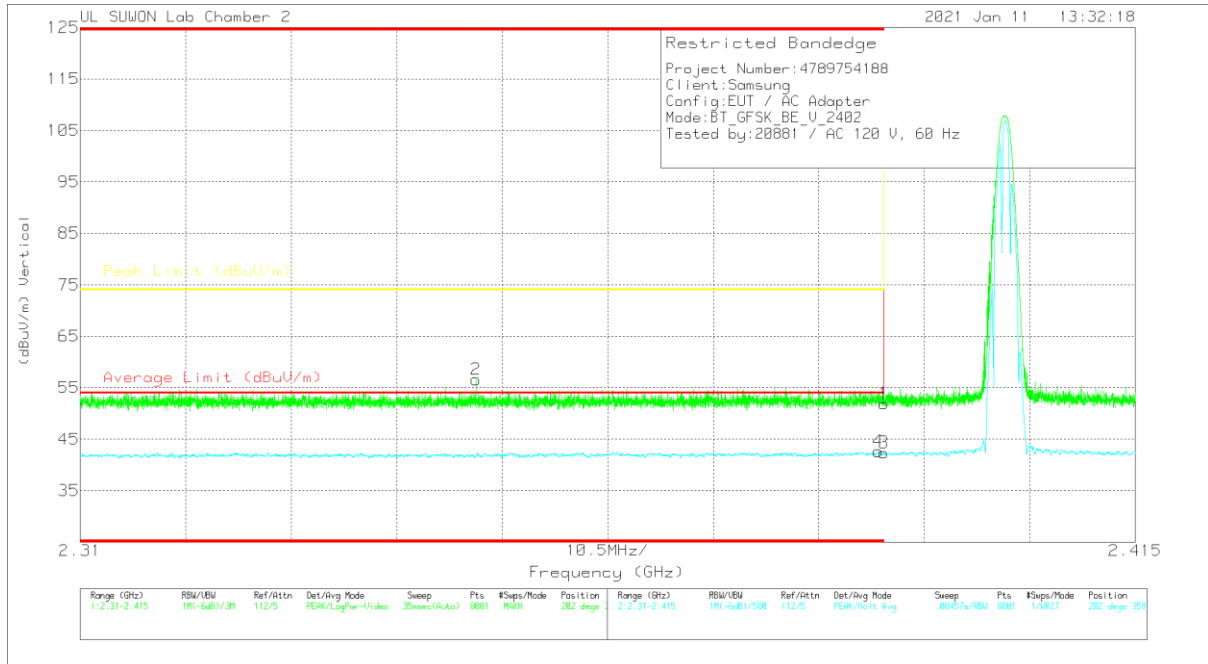
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.69	Pk	31.9	-20.3	53.29	-	-	74	-20.71	126	278	H
2	* 2.38145	43.96	Pk	31.9	-20.4	55.46	-	-	74	-18.54	126	278	H
3	* 2.39	30.26	VA1T	31.9	-20.3	41.86	54	-12.14	-	-	126	278	H
4	* 2.38875	30.91	VA1T	31.9	-20.3	42.51	54	-11.49	-	-	126	278	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

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.39	40.32	PK	31.9	-20.3	51.92	-	-	74	-22.08	202	359	V
2	* 2.34938	45.29	PK	31.8	-20.5	56.59	-	-	74	-17.41	202	359	V
3	* 2.39	30.76	VA1T	31.9	-20.3	42.36	54	-11.64	-	-	202	359	V
4	* 2.38942	31.06	VA1T	31.9	-20.3	42.66	54	-11.34	-	-	202	359	V

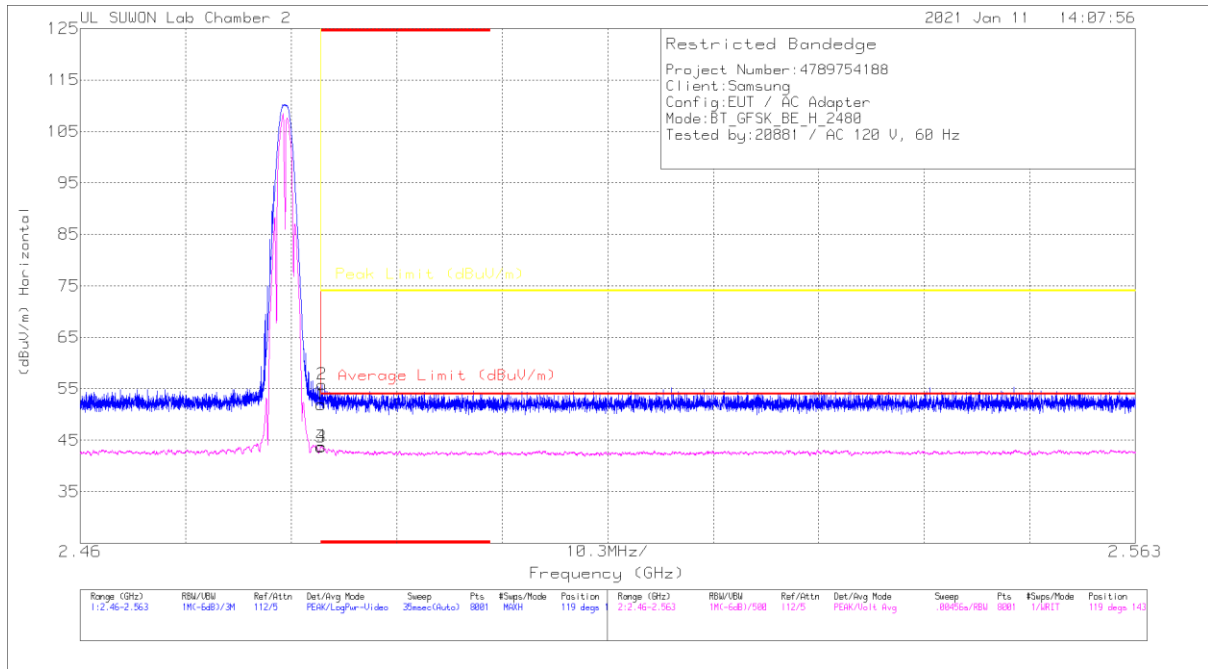
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

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

BANDEDGE (78 CHANNEL)

HORIZONTAL RESULT



Trace Markers

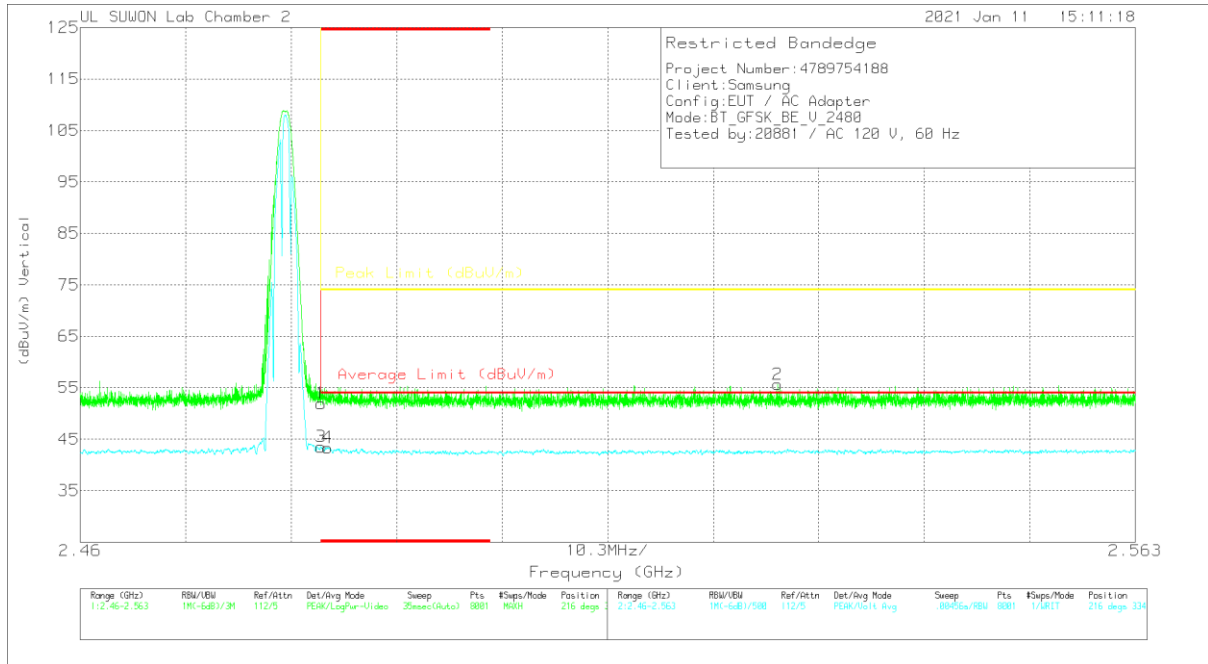
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	40.16	Pk	32	-20.2	51.96	-	-	74	-22.04	119	143	H
2	* 2.48359	44.04	Pk	32	-20.2	55.84	-	-	74	-18.16	119	143	H
3	* 2.48351	31.9	VA1T	32	-20.2	43.7	54	-10.3	-	-	119	143	H
4	* 2.48356	32.02	VA1T	32	-20.2	43.82	54	-10.18	-	-	119	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

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	40.14	Pk	32	-20.2	51.94	-	-	74	-22.06	216	334	V
2	2.5281	43.74	Pk	32.1	-20.2	55.64	-	-	74	-18.36	216	334	V
3	* 2.48351	31.72	VA1T	32	-20.2	43.52	54	-10.48	-	-	216	334	V
4	* 2.48418	31.56	VA1T	32	-20.2	43.36	54	-10.64	-	-	216	334	V

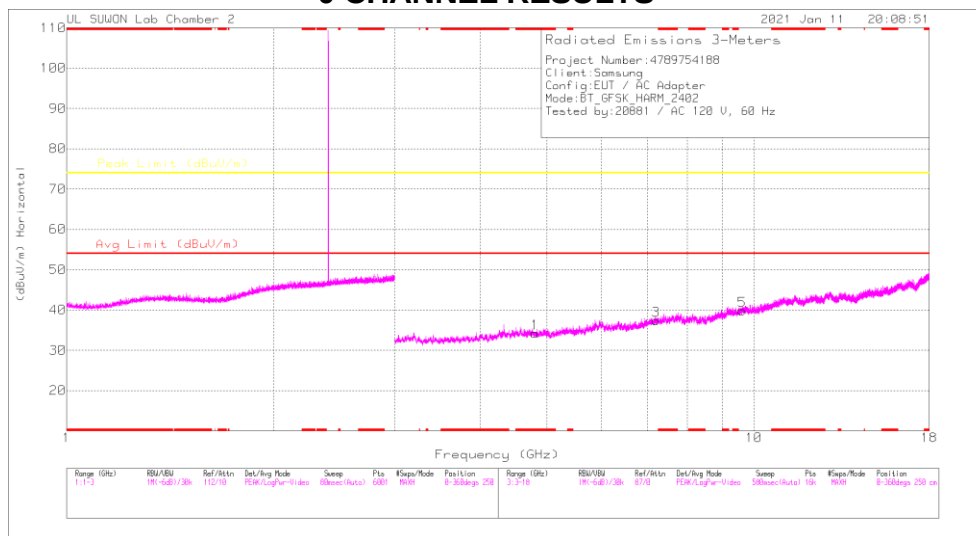
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

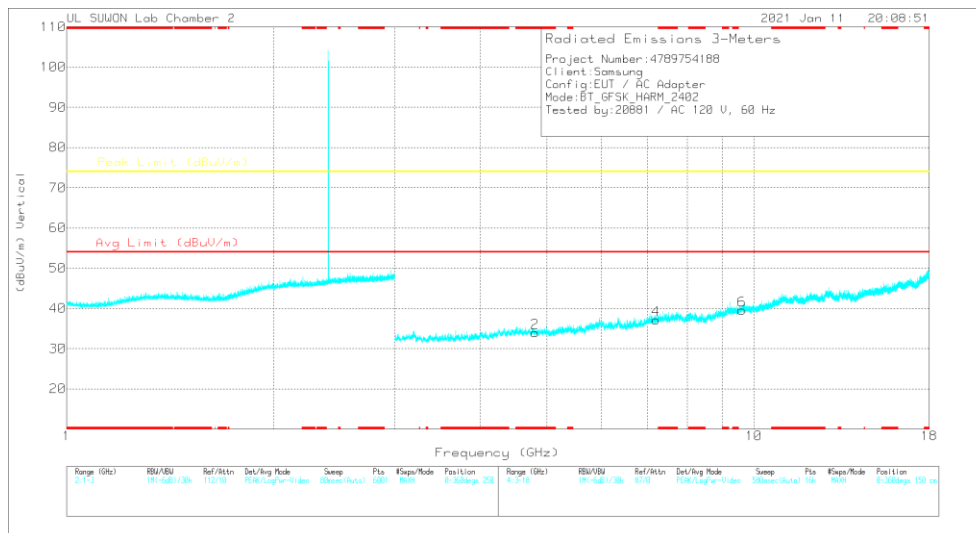
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

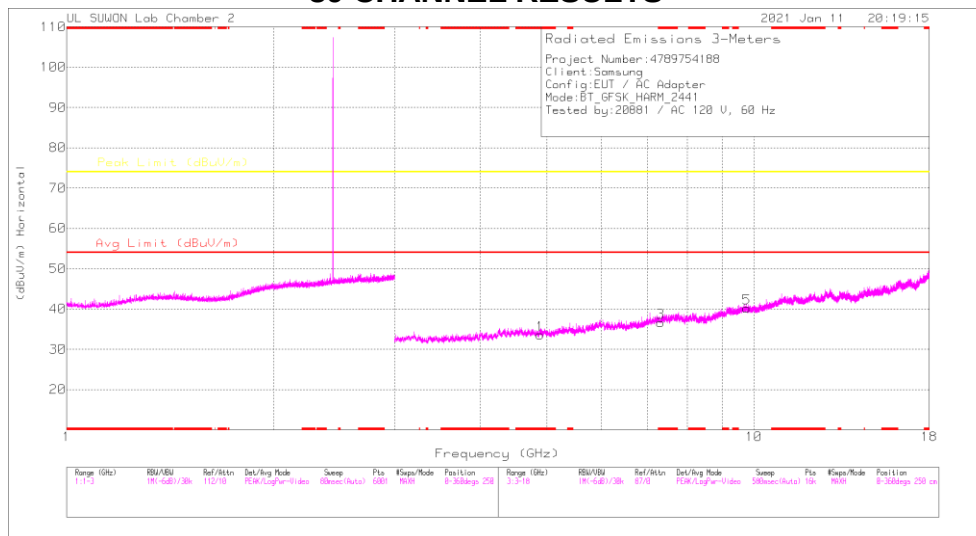
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80368	34.85	PKFH	34.1	-27.7	41.25	-	-	74	-32.75	360	100	H
* 4.80554	34.68	PKFH	34.1	-27.7	41.08	-	-	74	-32.92	360	100	V
7.20916	33.41	PKFH	36.2	-24.9	44.71	-	-	74	-29.29	360	100	H
7.20475	34.21	PKFH	36.2	-25	45.41	-	-	74	-28.59	360	100	V
9.60908	30.95	PKFH	37	-20.8	47.15	-	-	74	-26.85	360	100	H
9.61002	31.32	PKFH	37	-20.8	47.52	-	-	74	-26.48	360	100	V

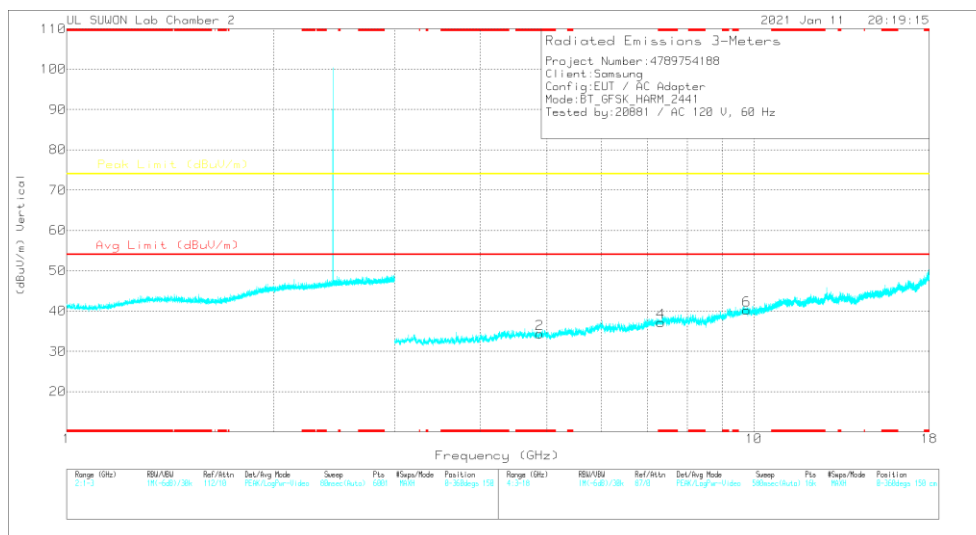
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

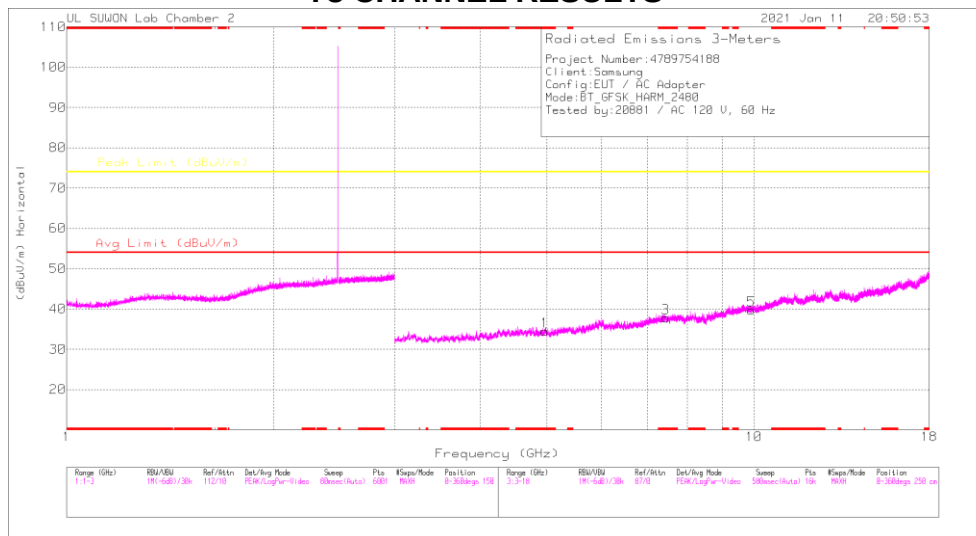
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88601	35.63	PKFH	34.1	-27.5	42.23	-	-	74	-31.77	360	100	H
* 4.88166	35.49	PKFH	34.1	-27.5	42.09	-	-	74	-31.91	360	100	V
* 7.3203	33.39	PKFH	36.1	-24.6	44.89	-	-	74	-29.11	360	100	H
* 7.32348	33.39	PKFH	36.1	-24.6	44.89	-	-	74	-29.11	360	100	V
9.76991	31.5	PKFH	37.2	-20.5	48.2	-	-	74	-25.8	360	100	H
9.7691	31.2	PKFH	37.2	-20.5	47.9	-	-	74	-26.1	360	100	V

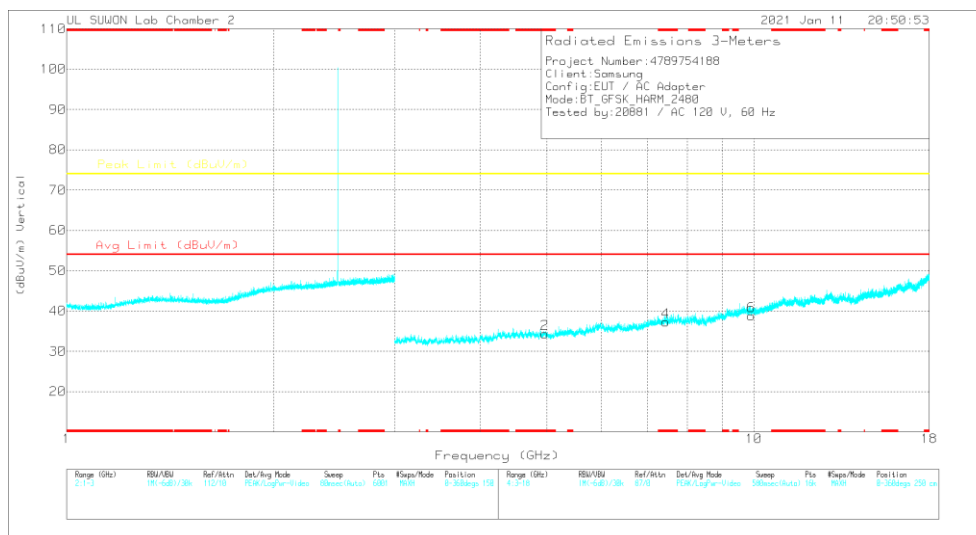
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

78 CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95925	35.19	PKFH	34.1	-26.8	42.49	-	-	74	-31.51	360	100	H
* 4.95873	34.35	PKFH	34.1	-26.8	41.65	-	-	74	-32.35	360	100	V
* 7.44059	34.18	PKFH	36	-23.6	46.58	-	-	74	-27.42	360	100	H
* 7.44216	32.99	PKFH	36	-23.7	45.29	-	-	74	-28.71	360	100	V
9.92055	30.3	PKFH	37.4	-20.2	47.5	-	-	74	-26.5	360	100	H
9.91927	30.16	PKFH	37.4	-20.4	47.16	-	-	74	-26.84	360	100	V

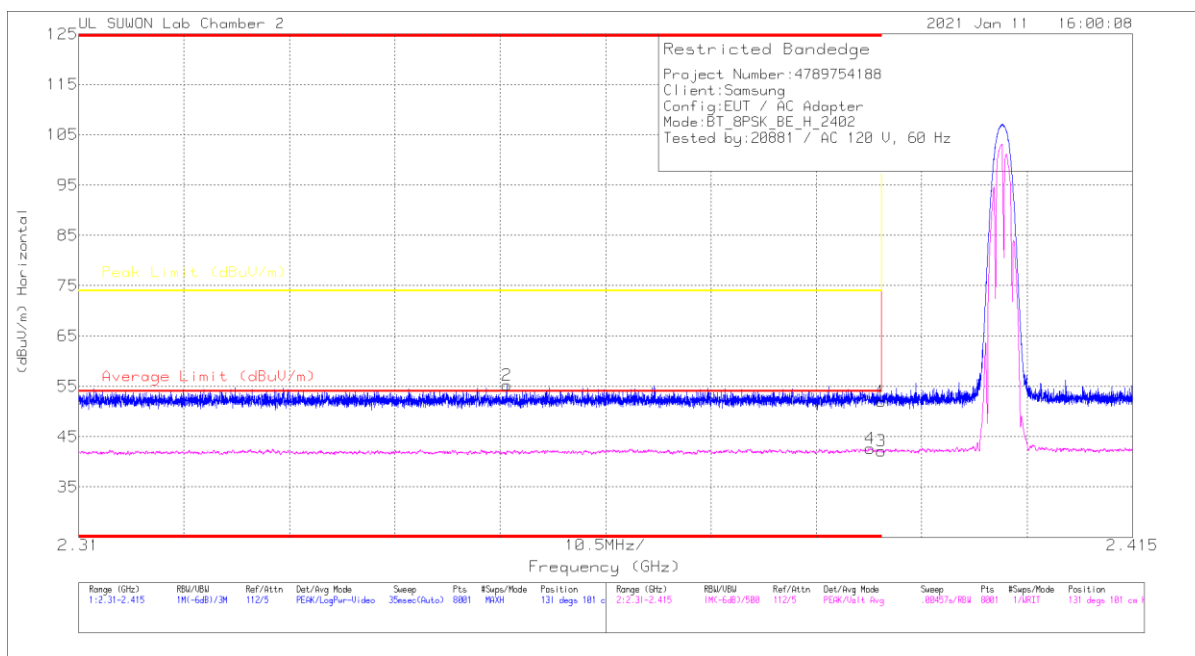
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

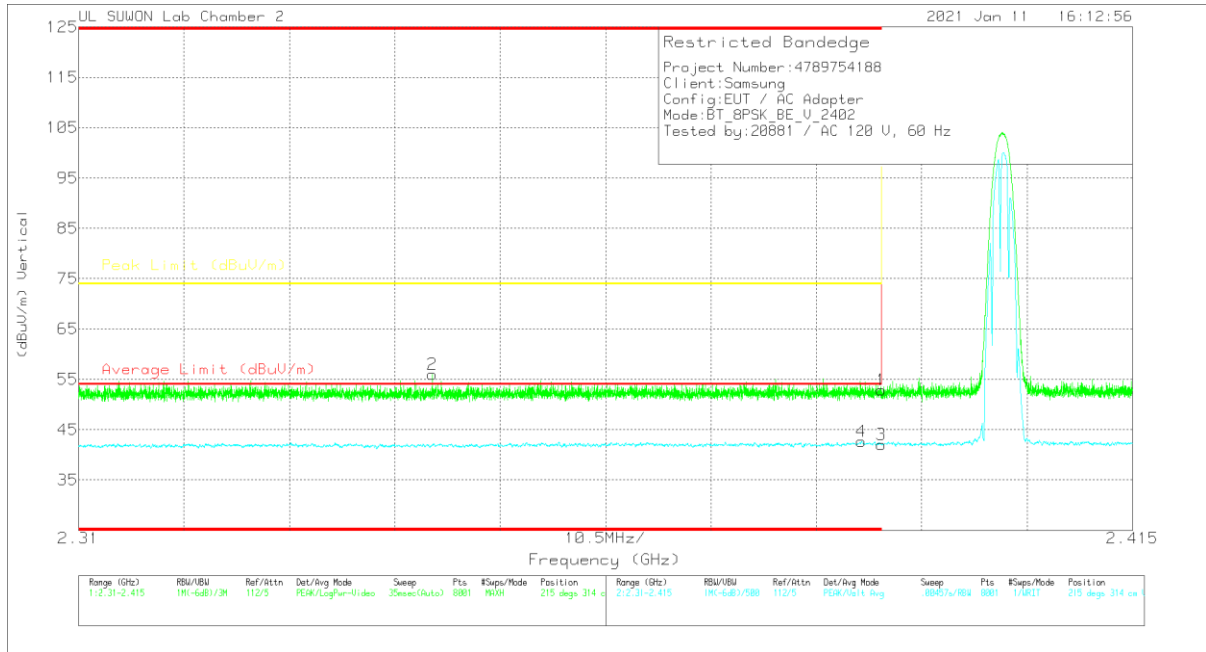
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.43	Pk	31.9	-20.3	52.03	-	-	74	-21.97	131	101	H
2	* 2.35267	43.84	Pk	31.8	-20.4	55.24	-	-	74	-18.76	131	101	H
3	* 2.39	30.51	VA1T	31.9	-20.3	42.11	54	-11.89	-	-	131	101	H
4	* 2.38887	31.1	VA1T	31.9	-20.3	42.7	54	-11.3	-	-	131	101	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

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.39	41.31	Pk	31.9	-20.3	52.91	-	-	74	-21.09	215	314	V
2	* 2.34523	44.65	Pk	31.8	-20.5	55.95	-	-	74	-18.05	215	314	V
3	* 2.39	30.4	VA1T	31.9	-20.3	42	54	-12	-	-	215	314	V
4	* 2.388	30.94	VA1T	31.9	-20.2	42.64	54	-11.36	-	-	215	314	V

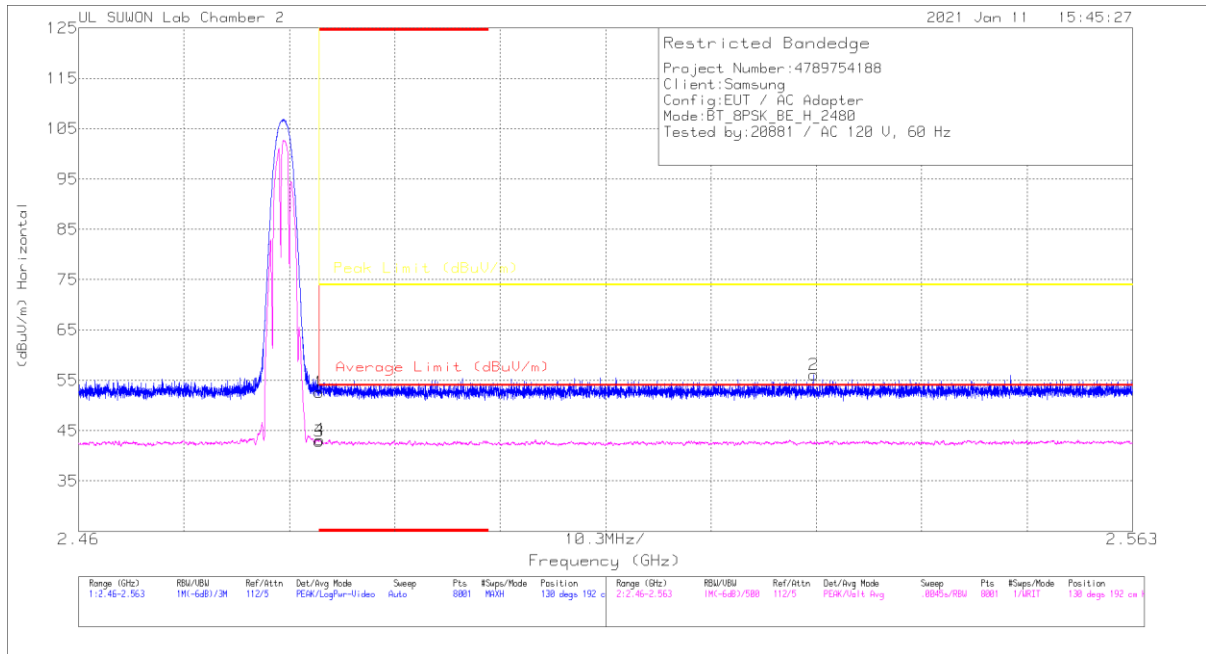
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

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

BANDEDGE (78 CHANNEL)

HORIZONTAL RESULT



Trace Markers

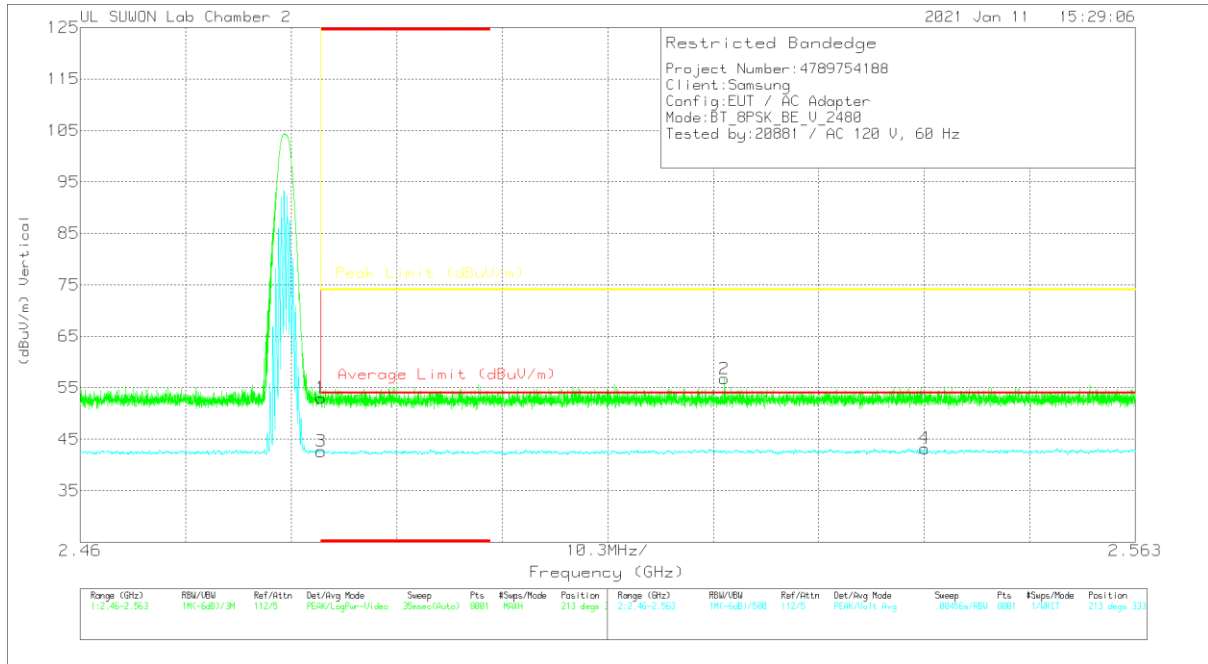
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	40.77	Pk	32	-20.2	52.57	-	-	74	-21.43	130	192	H
2	2.53183	44.18	Pk	32.1	-20.2	56.08	-	-	74	-17.92	130	192	H
3	* 2.48351	31.15	VA1T	32	-20.2	42.95	54	-11.05	-	-	130	192	H
4	* 2.48356	31.41	VA1T	32	-20.2	43.21	54	-10.79	-	-	130	192	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

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	41.2	Pk	32	-20.2	53	-	-	74	-21	213	333	V
2	2.52289	44.76	Pk	32.1	-20.1	56.76	-	-	74	-17.24	213	333	V
3	* 2.48351	30.85	VA1T	32	-20.2	42.65	54	-11.35	-	-	213	333	V
4	2.54246	31.23	VA1T	32.1	-20.1	43.23	54	-10.77	-	-	213	333	V

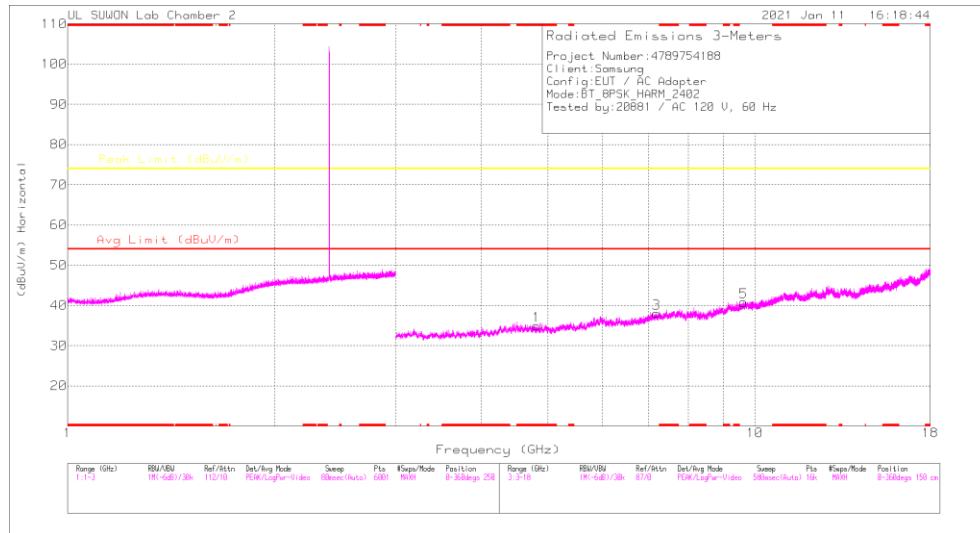
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

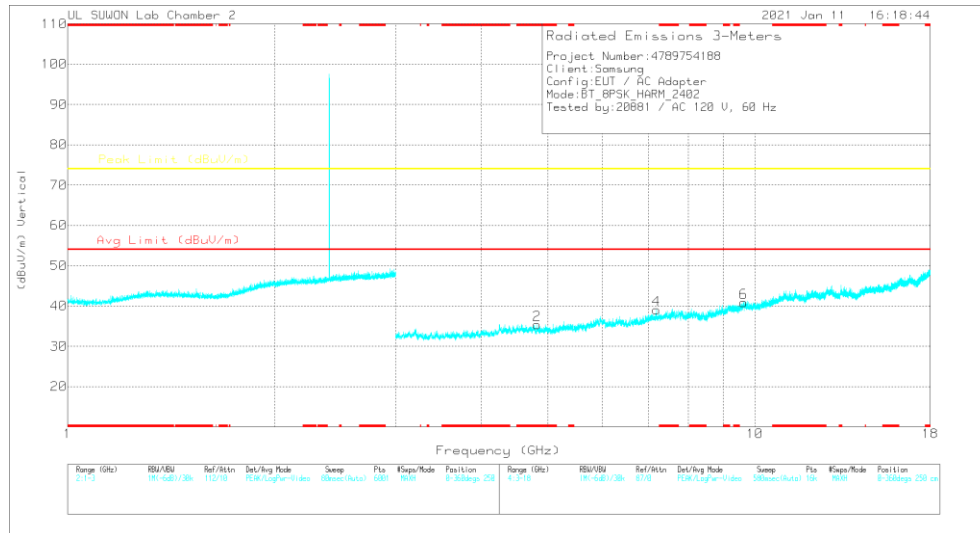
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

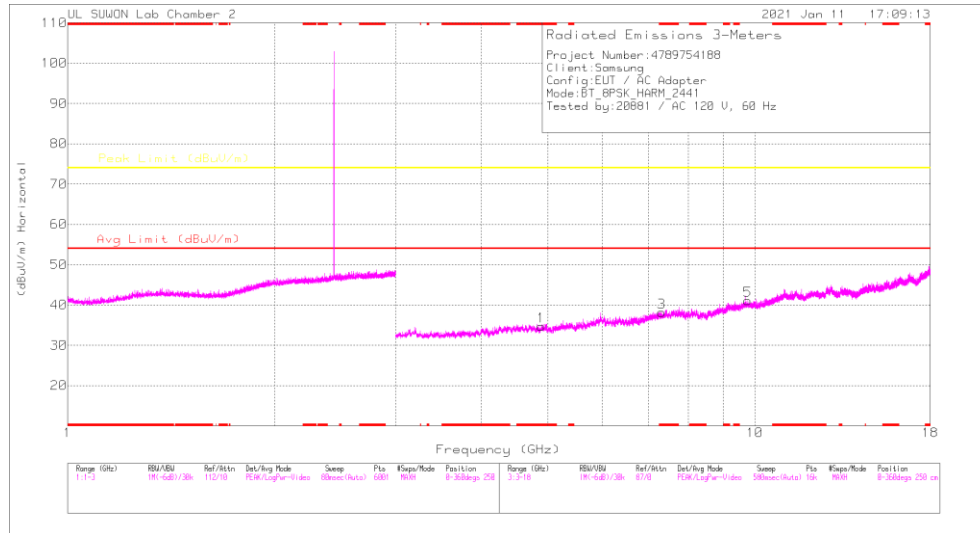
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.81393	34.82	PKFH	34.1	-27.8	41.12	-	-	74	-32.88	360	100	H
* 4.81683	34.88	PKFH	34.1	-27.9	41.08	-	-	74	-32.92	360	100	V
7.19083	33.74	PKFH	36.2	-24.9	45.04	-	-	74	-28.96	360	100	H
7.19293	34.11	PKFH	36.2	-24.9	45.41	-	-	74	-28.59	360	100	V
9.62444	31.18	PKFH	37	-20.8	47.38	-	-	74	-26.62	360	100	H
9.62301	31.86	PKFH	37	-20.8	48.06	-	-	74	-25.94	360	100	V

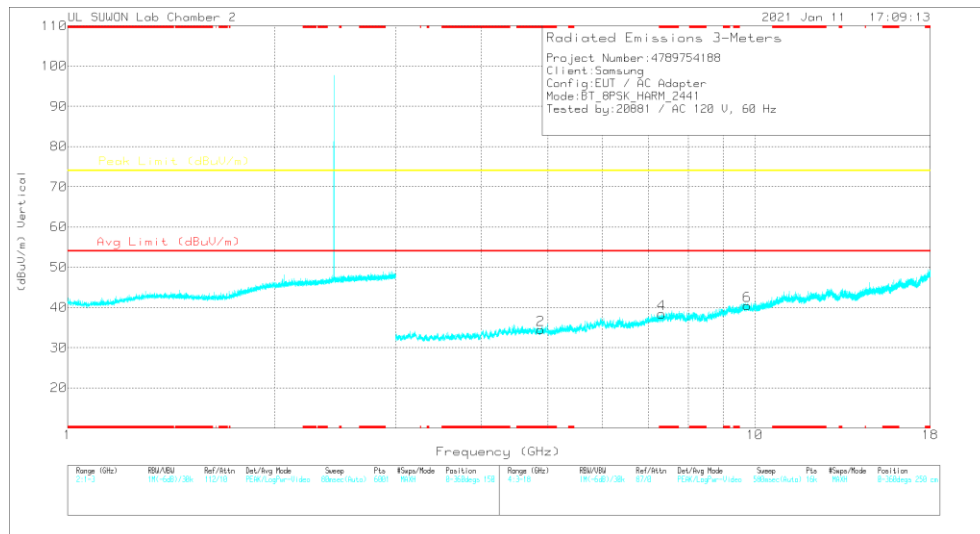
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

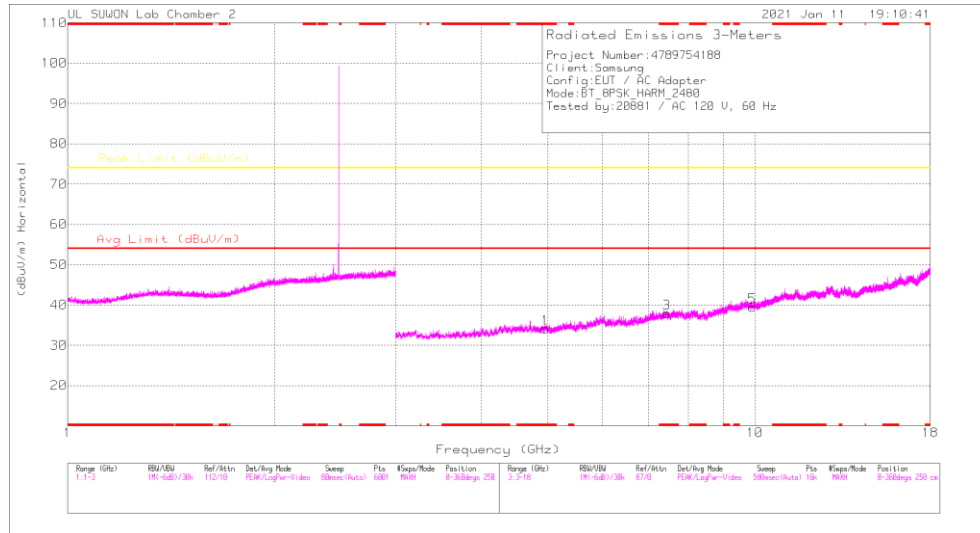
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88549	35.13	PKFH	34.1	-27.5	41.73	-	-	74	-32.27	360	100	H
* 4.87887	34.88	PKFH	34.1	-27.7	41.28	-	-	74	-32.72	360	100	V
* 7.32034	33.41	PKFH	36.1	-24.6	44.91	-	-	74	-29.09	360	100	H
* 7.32342	34.16	PKFH	36.1	-24.6	45.66	-	-	74	-28.34	360	100	V
9.76164	31.37	PKFH	37.2	-20.5	48.07	-	-	74	-25.93	360	100	H
9.76432	31.46	PKFH	37.2	-20.5	48.16	-	-	74	-25.84	360	100	V

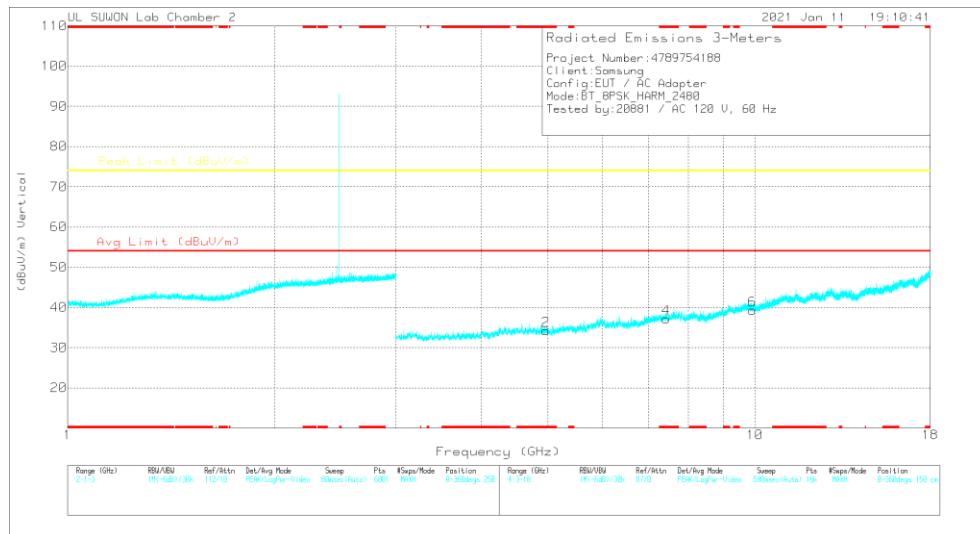
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

78 CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

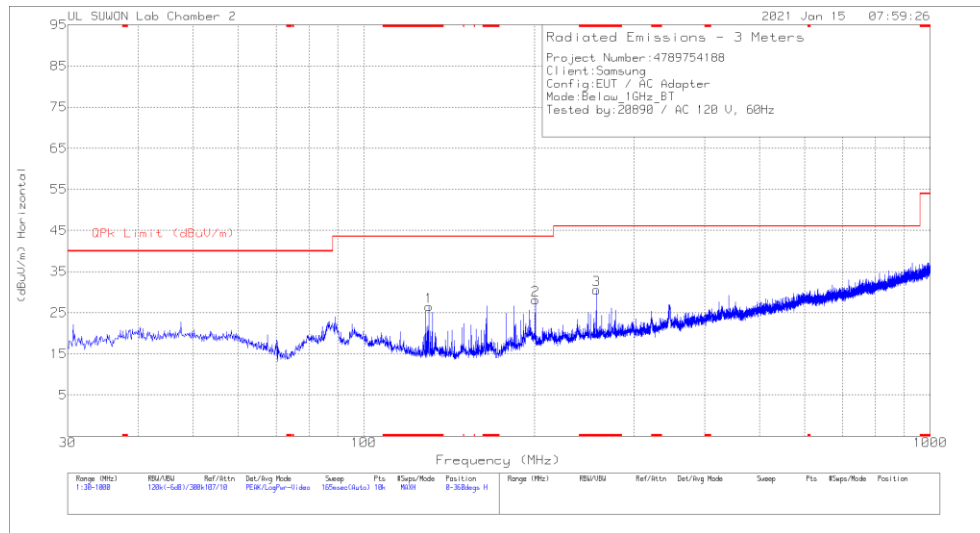
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95926	34.94	PKFH	34.1	-26.8	42.24	-	-	74	-31.76	360	100	H
* 4.95888	34.9	PKFH	34.1	-26.8	42.2	-	-	74	-31.8	360	100	V
* 7.44121	33.77	PKFH	36	-23.6	46.17	-	-	74	-27.83	360	100	H
* 7.43588	32.79	PKFH	36	-23.5	45.29	-	-	74	-28.71	360	100	V
9.92003	30.28	PKFH	37.4	-20.3	47.38	-	-	74	-26.62	360	100	H
9.91845	30.04	PKFH	37.4	-20.4	47.04	-	-	74	-26.96	360	100	V

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

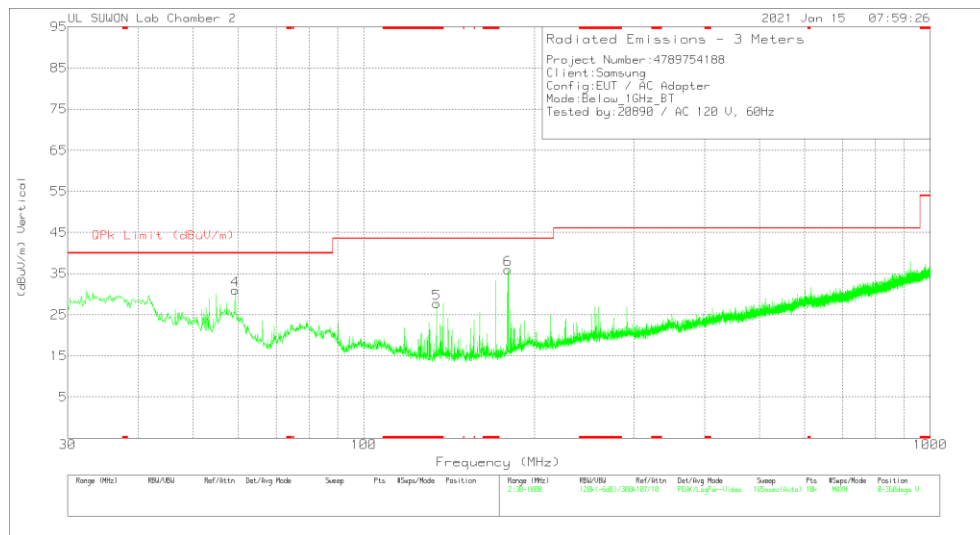
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

10.2. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

Below 1GHz Data

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	* 130.201	41.5	Pk	14.3	-29.3	26.5	43.52	-17.02	0-360	200	H
2	201.108	39.36	Pk	17.1	-28.4	28.06	43.52	-15.46	0-360	100	H
3	* 257.368	40.04	Pk	18.5	-28	30.54	46.02	-15.48	0-360	100	H
4	59.294	42.47	Pk	18.7	-30.2	30.97	40	-9.03	0-360	100	V
5	* 134.469	42.97	Pk	14	-29.2	27.77	43.52	-15.75	0-360	100	V
6	179.768	49.31	Pk	15.3	-28.7	35.91	43.52	-7.61	0-360	100	V

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

Pk - Peak detector

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

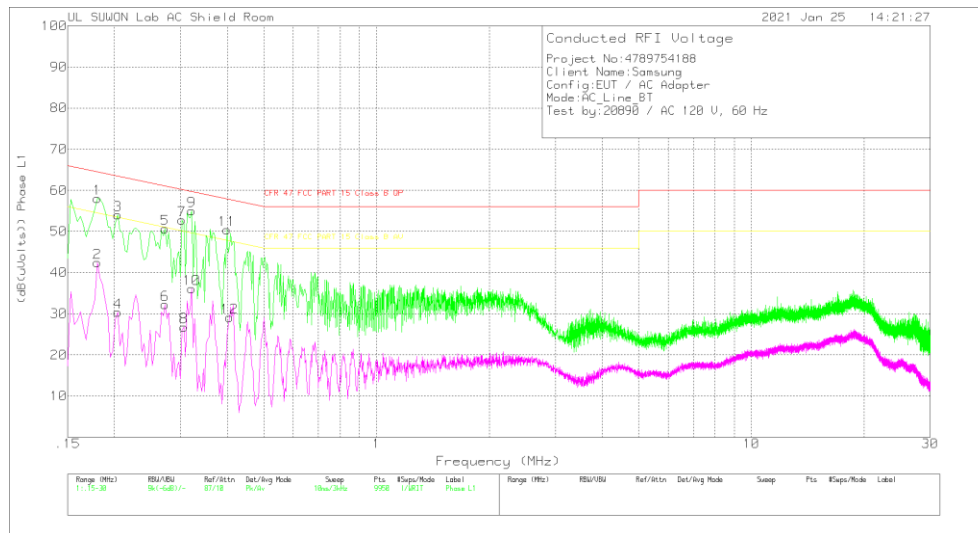
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1.1. AC Power Line Host

LINE 1 RESULTS



Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_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	.18	47.81	Pk	10	.2	58.01	64.49	-6.48	-	-
2	.18	32.27	Av	10	.2	42.47	-	-	54.49	-12.02
3	.204	43.92	Pk	9.9	.2	54.02	63.45	-9.43	-	-
4	.204	20.27	Av	9.9	.2	30.37	-	-	53.45	-23.08
5	.273	40.83	Pk	9.7	.2	50.73	61.03	-10.3	-	-
6	.273	22.34	Av	9.7	.2	32.24	-	-	51.03	-18.79
7	.303	42.82	Pk	9.8	.2	52.82	60.16	-7.34	-	-
8	.306	16.81	Av	9.8	.2	26.81	-	-	50.08	-23.27
9	.321	45	Pk	9.8	.2	55	59.68	-4.68	-	-
10	.321	26.12	Av	9.8	.2	36.12	-	-	49.68	-13.56
11	.399	40.3	Pk	9.9	.2	50.4	57.87	-7.47	-	-
12	.405	19.06	Av	9.9	.2	29.16	-	-	47.75	-18.59

Pk - Peak detector

Av - Average detection

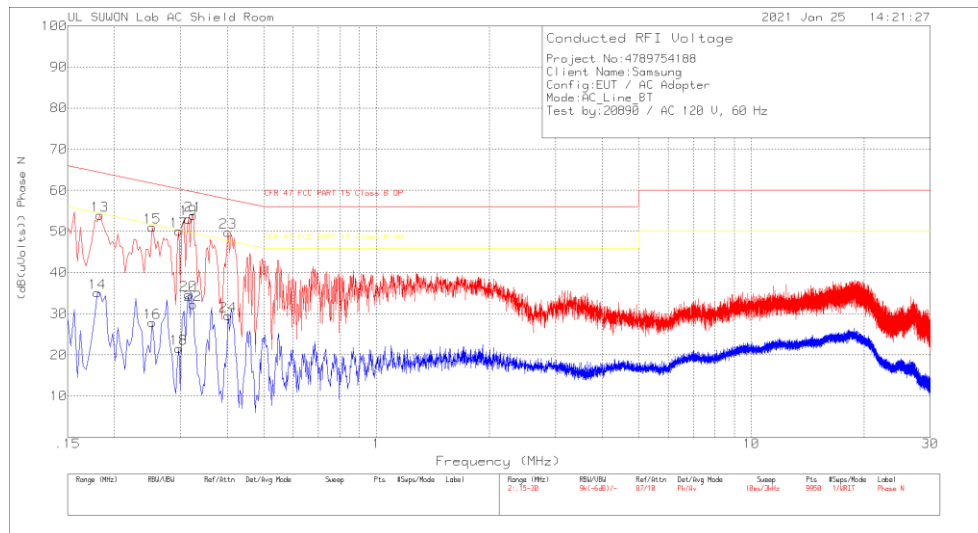
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_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)
.18075	32.65	Qp	10	.2	42.85	64.45	-21.6	-	-
.30375	30.62	Qp	9.8	.2	40.62	60.14	-19.52	-	-
.32175	39.1	Qp	9.8	.2	49.1	59.66	-10.56	-	-
.39975	26.75	Qp	9.9	.2	36.85	57.86	-21.01	-	-

Qp - Quasi-Peak detector

LINE 2 RESULTS



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_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	.183	43.7	Pk	10	.2	53.9	64.35	-10.45	-	-
14	.18	24.94	Av	10	.2	35.14	-	-	54.49	-19.35
15	.252	41.1	Pk	9.7	.2	51	61.69	-10.69	-	-
16	.252	17.93	Av	9.7	.2	27.83	-	-	51.69	-23.86
17	.297	40.19	Pk	9.7	.2	50.09	60.33	-10.24	-	-
18	.297	11.65	Av	9.7	.2	21.55	-	-	50.33	-28.78
19	.315	42.99	Pk	9.8	.2	52.99	59.84	-6.85	-	-
20	.315	24.59	Av	9.8	.2	34.59	-	-	49.84	-15.25
21	.324	43.89	Pk	9.8	.2	53.89	59.6	-5.71	-	-
22	.324	22.18	Av	9.8	.2	32.18	-	-	49.6	-17.42
23	.402	39.67	Pk	9.9	.2	49.77	57.81	-8.04	-	-
24	.402	19.37	Av	9.9	.2	29.47	-	-	47.81	-18.34

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_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)
.31575	36.18	Qp	9.8	.2	46.18	59.82	-13.64	-	-
.32475	40.13	Qp	9.8	.2	50.13	59.58	-9.45	-	-
.40275	31.1	Qp	9.9	.2	41.2	57.8	-16.6	-	-

Qp - Quasi-Peak detector

END OF TEST REPORT