

CERTIFICATION TEST REPORT

Report Number. : S-4791427005-E7V2

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

Model : SM-A165M/DS, SM-A165M

FCC ID : A3LSMA165M

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

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

Date Of Issue:
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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2024-09-13	Initial issue	Myeongjun Kwon
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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. MEASUREMENT UNCERTAINTY	7
4.4. DECISION RULES	7
5. EQUIPMENT UNDER TEST	8
5.1. EUT DESCRIPTION	8
5.2. MAXIMUM OUTPUT POWER	8
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	9
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 BANDWIDTH	16
9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	16
9.2.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK MODULATION	16
9.3. HOPPING FREQUENCY SEPARATION	18
9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	19
9.3.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK MODULATION	19
9.4. NUMBER OF HOPPING CHANNELS	20
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	21
9.4.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK MODULATION	22
9.5. AVERAGE TIME OF OCCUPANCY	23
9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION	24
9.5.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK MODULATION	26
9.6. OUTPUT POWER	28
9.6.1. BASIC DATA RATE GFSK MODULATION	28

9.6.2.	ENHANCED DATA RATE PI/4-DPSK MODULATION	28
9.6.1.	ENHANCED DATA RATE 8PSK MODULATION	28
9.6.2.	OUTPUT POWER PLOTS.....	29
9.7.	AVERAGE POWER.....	31
9.7.1.	BASIC DATA RATE GFSK MODULATION.....	31
9.7.2.	ENHANCED DATA RATE PI/4-DQPSK MODULATION	31
9.7.3.	ENHANCED DATA RATE 8PSK MODULATION	31
9.8.	CONDUCTED SPURIOUS EMISSIONS.....	32
9.8.1.	BLUETOOTH BASIC DATA RATE GFSK MODULATION	33
9.8.2.	BLUETOOTH ENHANCED DATA RATE PI/4-DQPSK MODULATION	35
10.	RADIATED TEST RESULTS	37
10.1.	TRANSMITTER ABOVE 1 GHz.....	39
10.1.1.	BLUETOOTH BASIC DATA RATE GFSK MODULATION.....	39
10.1.2.	BLUETOOTH ENHANCED DATA RATE PI/4-DPSK MODULATION	46
10.2.	WORST CASE BELOW 1 GHz	53
11.	AC POWER LINE CONDUCTED EMISSIONS	54
11.1.	AC Power Line	55

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 and NFC.

MODEL NUMBER: SM-A165M/DS, SM-A165M

SERIAL NUMBER: R38X7005NNF, R38X7005NPM (CONDUCTED);
R38X7005NXA, R38X7005NWB (RADIATED)

DATE TESTED: 2024-08-12 - 2024-09-13;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
47 CFR 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
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Tested By:



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2. TEST METHODOLOGY

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

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 15.
3. KDB 558074 D01 15.247 Meas Guidance v05r02.
4. ANSI C63.10-2020.

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(3m semi-anechoic chamber)
☒	Chamber 2(3m semi-anechoic chamber)
☒	Chamber 3(3m semi-anechoic chamber)
☐	Chamber 4(3m Full-anechoic chamber)
☐	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:

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

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

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	2.79 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.69 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.07 dB
Radiated Disturbance, 1 GHz to 18 GHz	4.99 dB
Radiated Disturbance, Above 18 GHz	5.96 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 Clause 4.4.3 in IEC Guide 115:2023.

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 and NFC.
This test report addresses the DSS(Bluetooth) operational mode.

Representative model	Difference	Derivative model
		SM-A165M
SM-A165M/DS	Hardware	SIM tray is single SIM
	Software	Dual SIM not supported

The model SM-A165M/DS was used for final testing and is representative of the test results in this report.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range [MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	Basic GFSK	Peak	16.620	45.920
		Average	16.092	40.664
	Enhanced Pi/4-DPSK	Peak	15.830	38.282
		Average	12.715	18.683
	Enhanced 8PSK	Peak	15.670	36.898
		Average	12.568	18.064

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 a internal antenna, with a maximum gain of: -2.02 dBi

“Antenna A(WiFi)” as indicated in antenna specification are written as ANT1 in this report.

5.4. WORST-CASE CONFIGURATION AND MODE

The fundamentals of the EUT were investigated in three orthogonal orientations X, Y and Z. It was determined that below table's orientation was the worst-case orientation.

ANT1
X

Radiated and power line conducted tests were performed with EUT connected to AC power adapter as the worst-case configuration. Radiated harmonics spurious 1~18 GHz Low/Mid/High channels,18-26GHz were performed with the EUT set at the 1Tx 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.

For Radiated band-edge and spurious test, tests were performed on 1Tx mode. 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 & Pi/4-DQPSK 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	R37TC7A00JBDKA	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

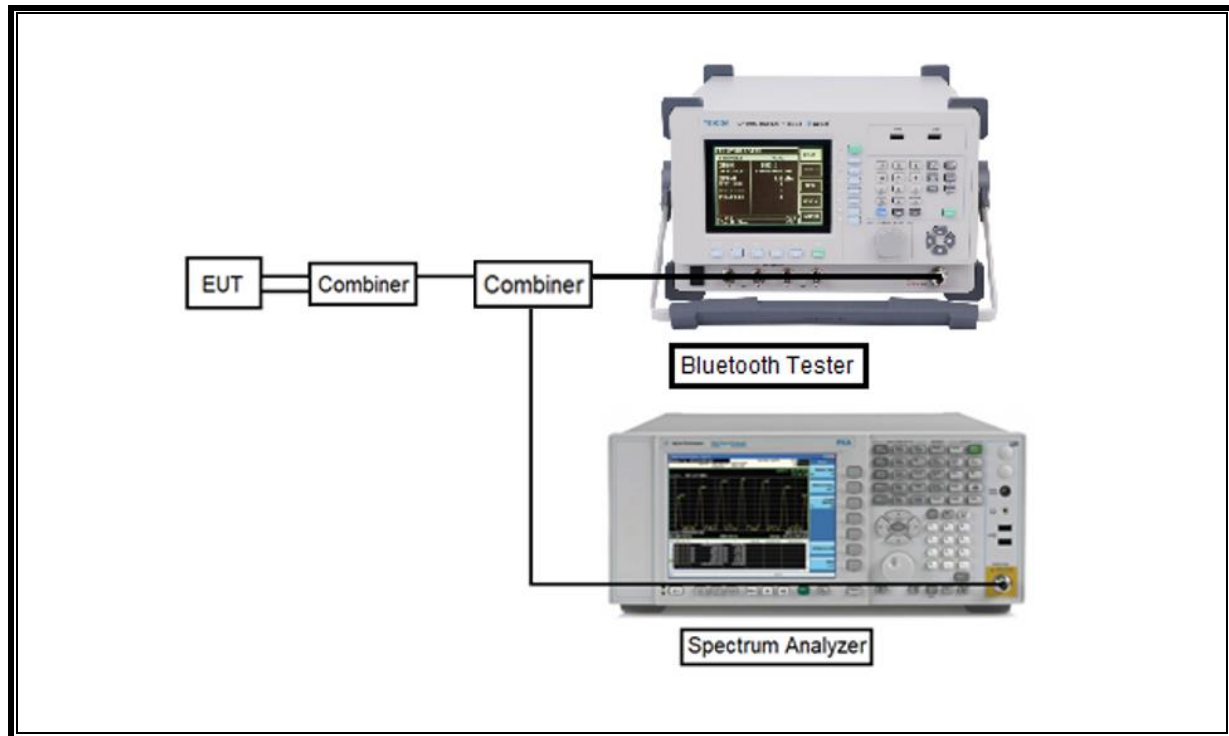
I/O CABLE

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

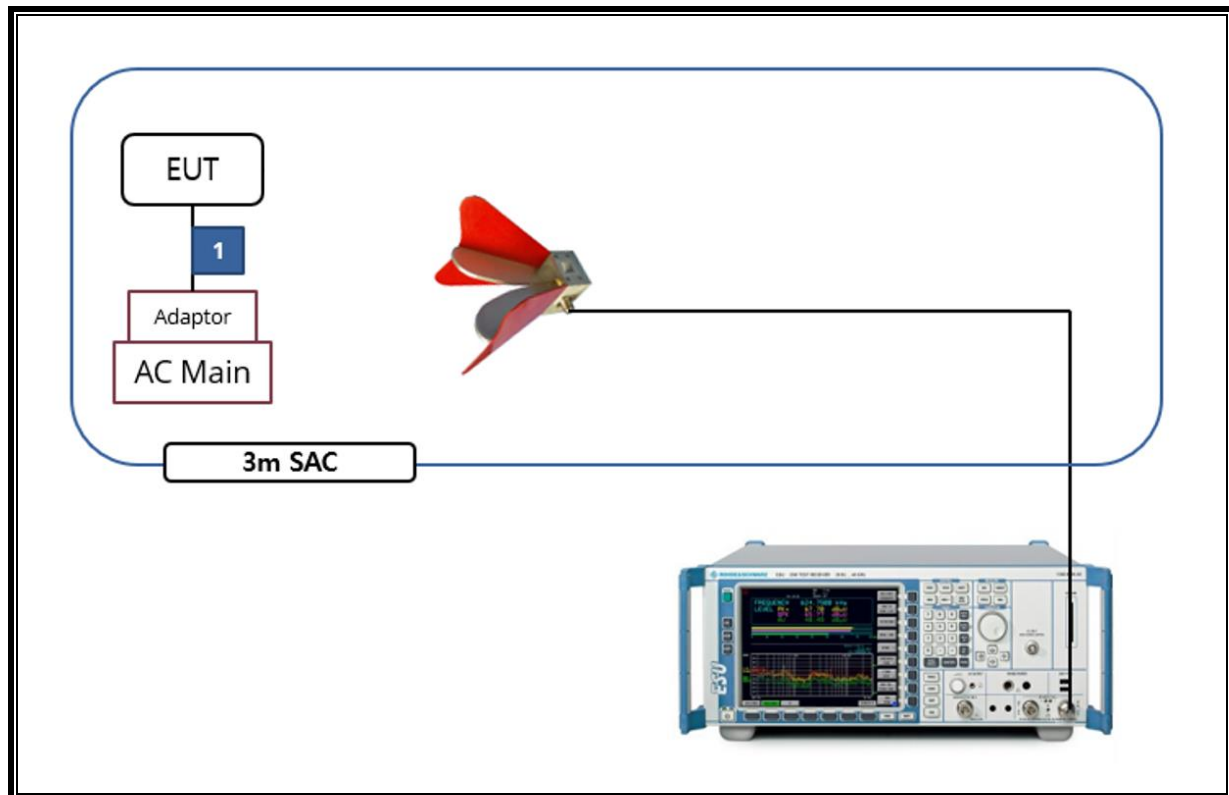
TEST SETUP

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	VULB 9163	750	2026-07-30
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-07
Antenna, Horn, 18 GHz	ETS	3117	00168724	2026-07-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	2026-07-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2026-07-23
Preamplifier	ETS	3116C-PA	00168841	2025-07-25
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	2025-07-22
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2025-07-23
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-182020	28451	2025-07-22
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-181515	23576	2025-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2025-07-24
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2025-01-03
RF Switching Unit	TA Engineering	TA-018S-16	SW-1	N/A
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2025-07-23
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2025-07-23
Bluetooth Tester	TESCOM	MTP300A	MTP300A010266	2025-07-23
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	2025-07-24
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2025-01-03
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2025-01-03
Attenuator	PASTERNAK	PE7087-10	A009	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A001	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2025-07-22
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2025-07-22
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2025-07-22
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2025-07-22
LISN	R&S	ENV216	101836	2025-07-22
Termination	WEINSCHEL	M1406A	T09	2025-07-23
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 7.8.7

Out-of-band EMISSIONS IN NON-RESTRICTED BANDS: ANSI C63.10, Section 7.8.8

Out-of-band EMISSIONS IN RESTRICTED BANDS : ANSI C63.10, Section 7.8.8

AC Power Line Conducted Emission : ANSI C63.10-2020, Section 6.2.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

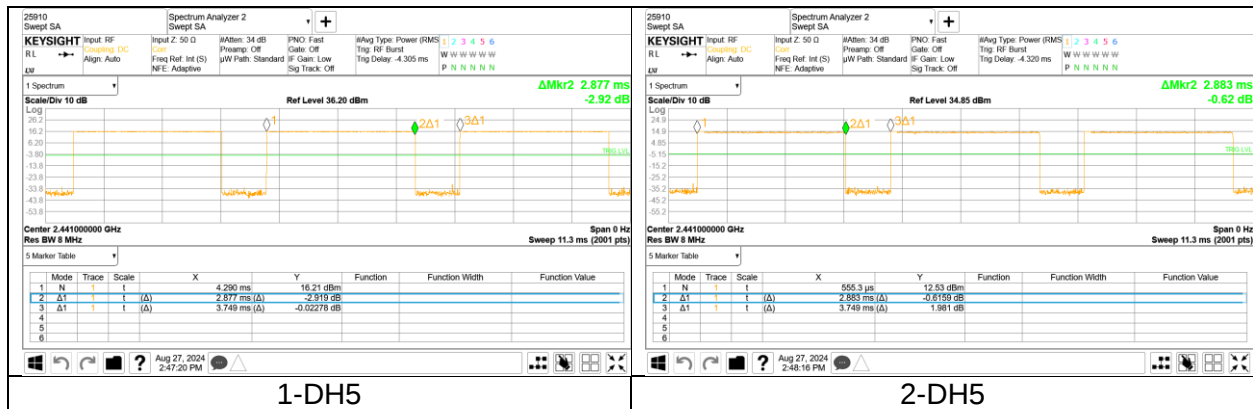
LIMITS

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]
2 400 ~ 2 483.5 MHz Band				
BDR	2.877	3.749	76.736	0.348
EDR	2.883	3.749	76.890	0.347

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.

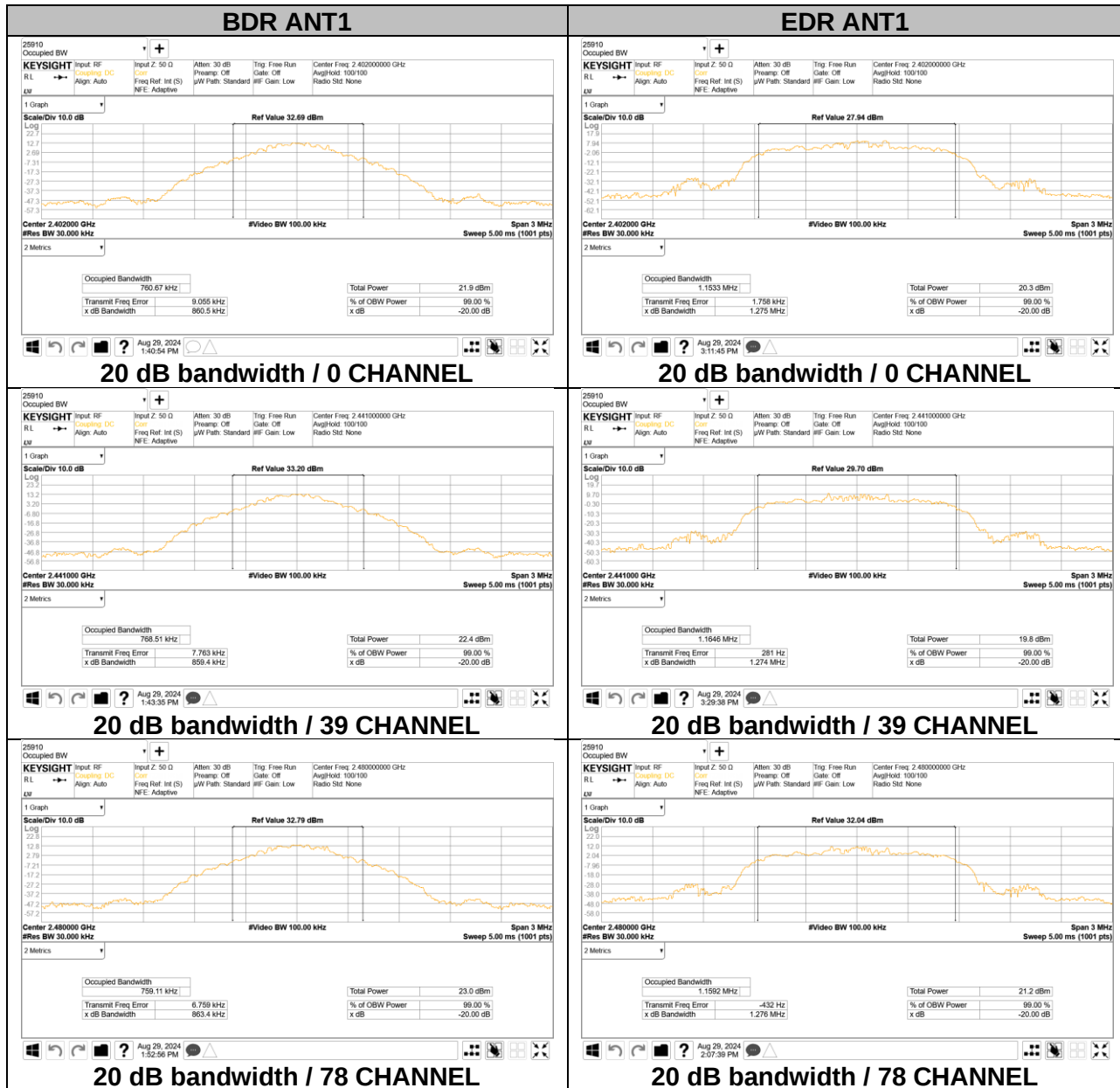
RESULTS

9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Antenna	Channel	Frequency [MHz]	20 dB Bandwidth [kHz]
ANT1	0	2 402	860.5
	39	2 441	859.4
	78	2 480	863.4
Worst			863.4

9.2.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK MODULATION

Antenna	Channel	Frequency [MHz]	20 dB Bandwidth [kHz]
ANT1	0	2 402	1275.0
	39	2 441	1274.0
	78	2 480	1276.0
Worst			1276.0



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.

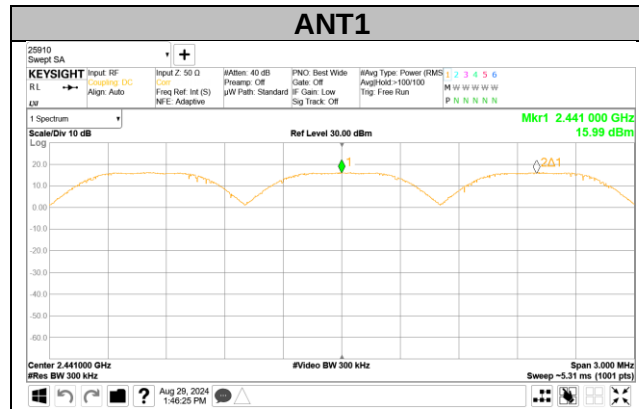
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

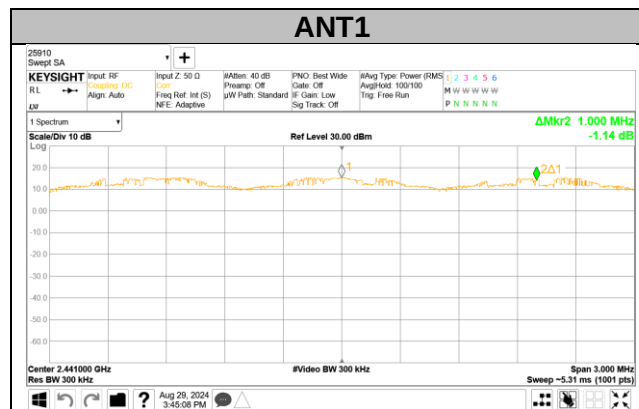
The transmitter output is connected to a spectrum analyzer. Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel. The VBW is set to $VBW \geq RBW$. The sweep time is coupled.

RESULTS

9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



9.3.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK 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.

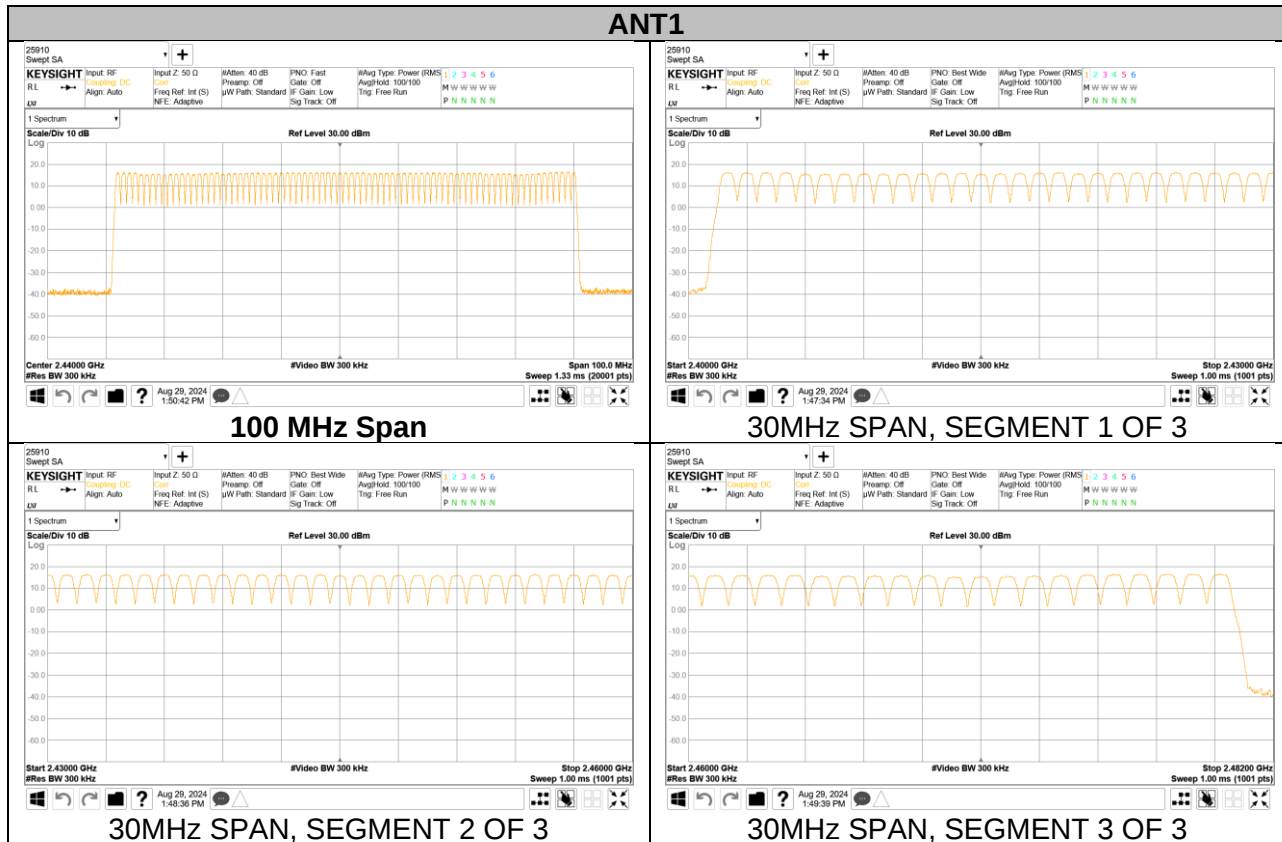
TEST PROCEDURE

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.

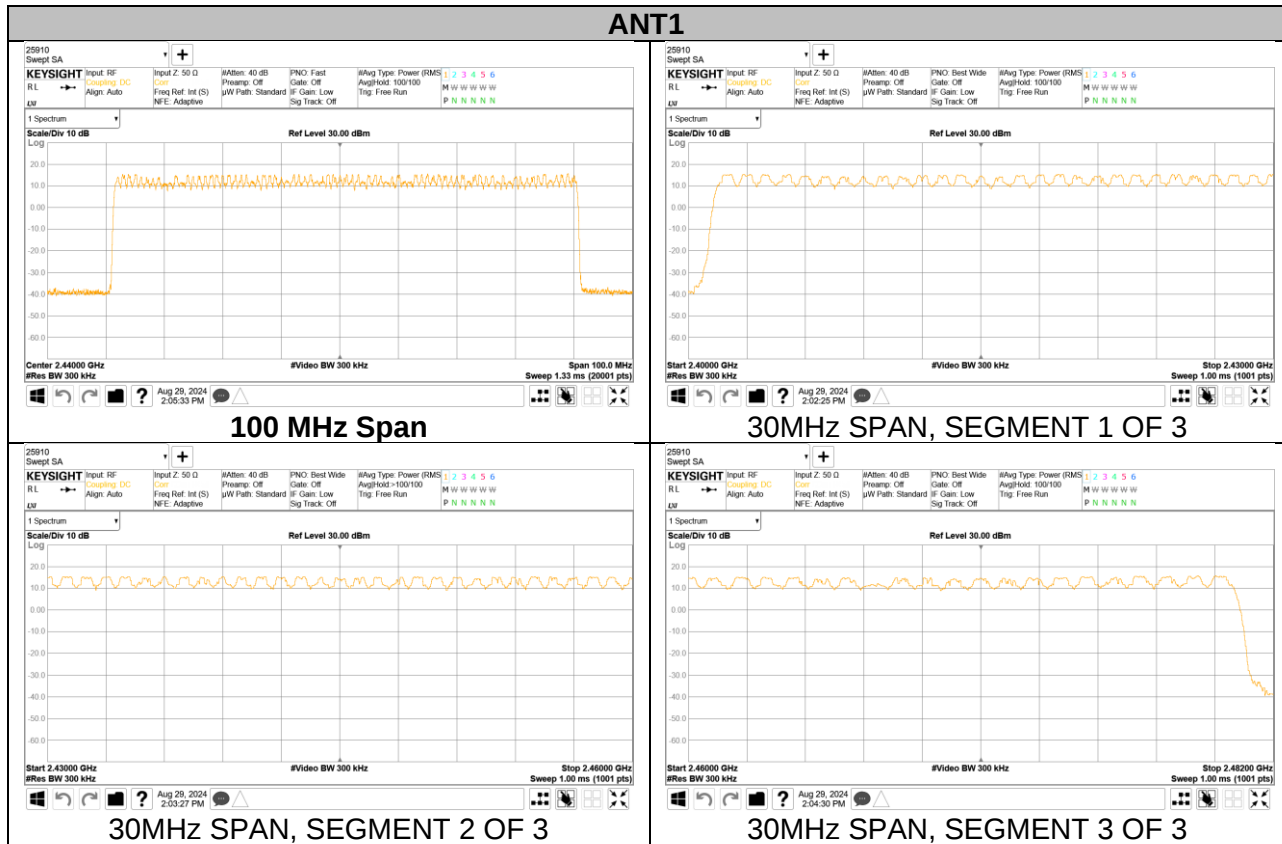
RESULTS

Normal Mode: All Channels Observed

9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



9.4.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK 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.

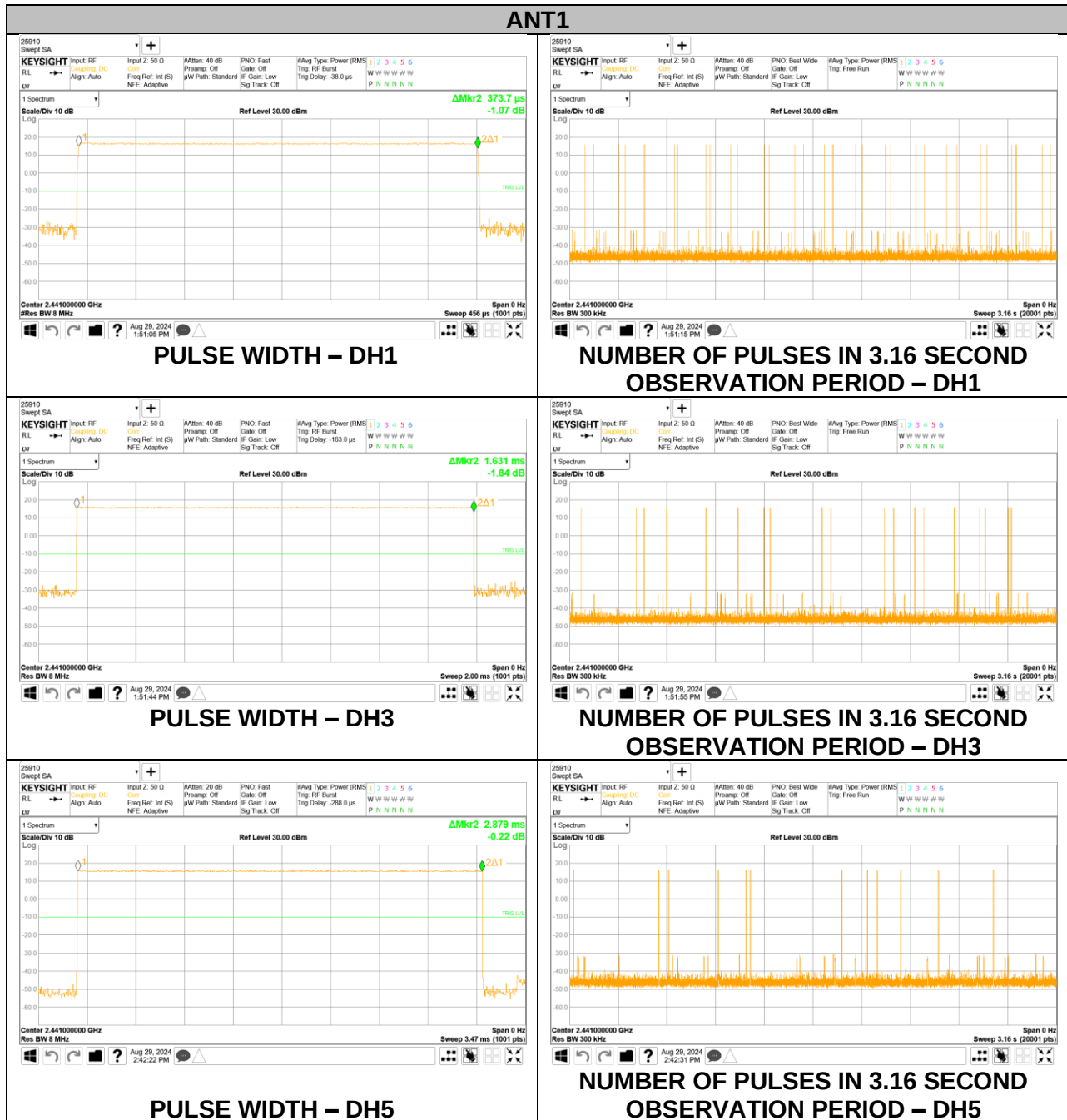
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

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

RESULTS

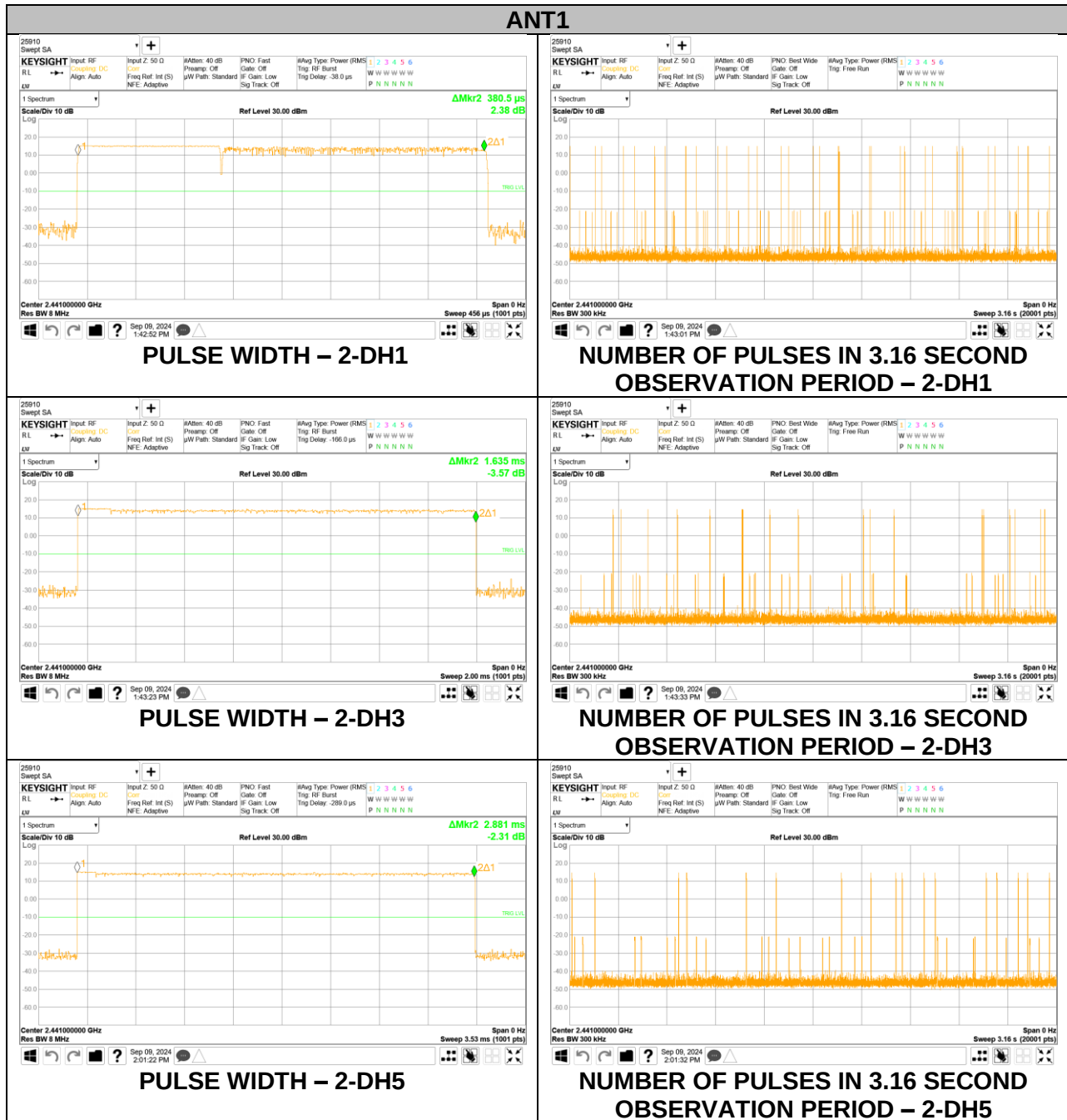
9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK Normal ANT1					
DH1	0.374	32	0.120	0.400	-0.280
DH3	1.631	19	0.310	0.400	-0.090
DH5	2.879	12	0.345	0.400	-0.055
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
GFSK AFH ANT1					
DH1	0.374	8	0.030	0.400	-0.370
DH3	1.631	5	0.082	0.400	-0.318
DH5	2.879	3	0.086	0.400	-0.314



9.5.2. BLUETOOTH ENHANCED DATA RATE $\pi/4$ -DPSK MODULATION

DH Packet	Pulse Width [msec]	Number of Pulses in 3.16 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
Pi/4-DPSK Normal ANT1					
DH1	0.381	32	0.122	0.400	-0.278
DH3	1.635	18	0.294	0.400	-0.106
DH5	2.881	17	0.490	0.400	0.090
DH Packet	Pulse Width [msec]	Number of Pulses in 0.8 seconds	Average Time of Occupancy [sec]	Limit [sec]	Margin [sec]
Pi/4-DPSK AFH ANT1					
DH1	0.381	8	0.030	0.400	-0.370
DH3	1.635	5	0.082	0.400	-0.318
DH5	2.881	4	0.115	0.400	-0.285



9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)

The correlated maximum antenna gain + Beamforming 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	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	0	2 402	15.92	21.00	-5.08
	39	2 441	16.49		-4.51
	78	2 480	16.62		-4.38
Worst			16.62		-4.38

9.6.2. ENHANCED DATA RATE Pi/4-DPSK MODULATION

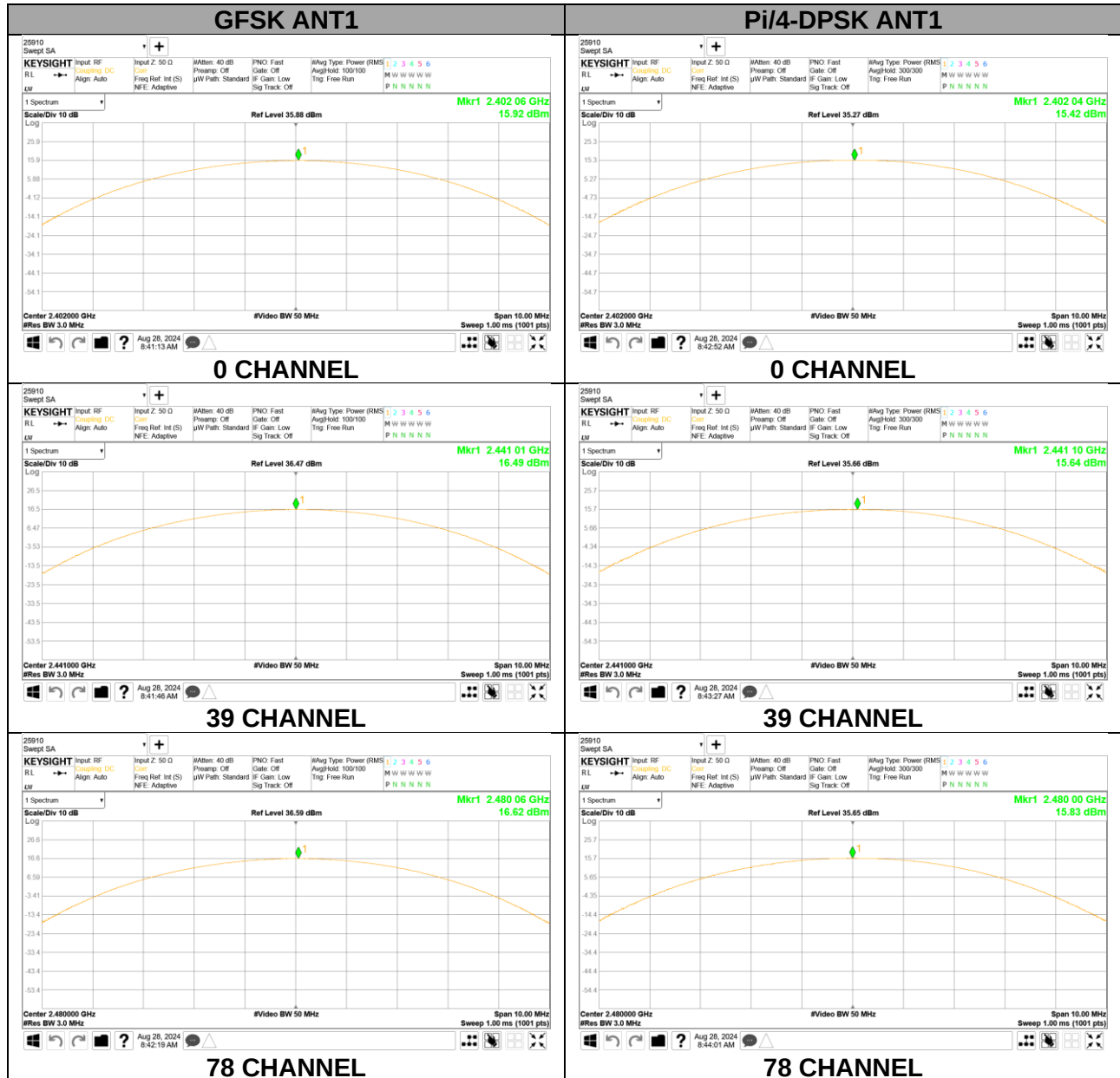
Antenna	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	0	2 402	15.42	21.00	-5.58
	39	2 441	15.64		-5.36
	78	2 480	15.83		-5.17
Worst			15.83		-5.17

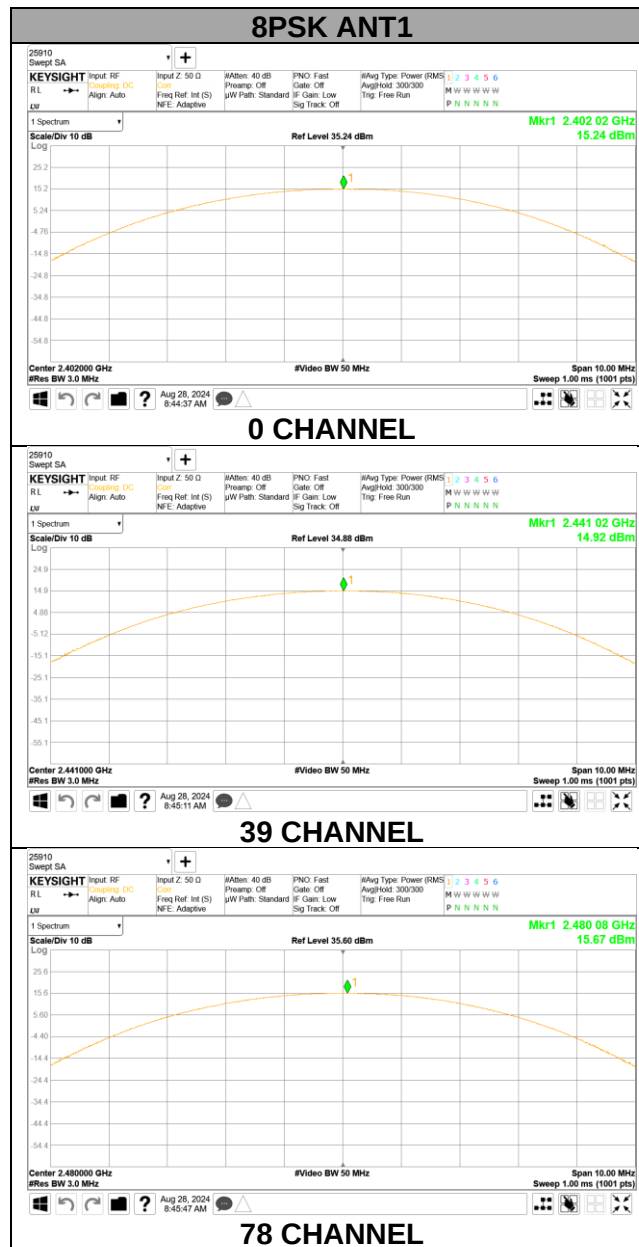
9.6.1. ENHANCED DATA RATE 8PSK MODULATION

Antenna	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	0	2 402	15.24	21.00	-5.76
	39	2 441	14.92		-6.08
	78	2 480	15.67		-5.33
Worst			15.67		-5.33

9.6.2. 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

Antenna	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	0	2 402	15.309	33.955
	39	2 441	15.988	39.699
	78	2 480	16.092	40.664

9.7.2. ENHANCED DATA RATE PI/4-DQPSK MODULATION

Antenna	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	0	2 402	12.308	17.013
	39	2 441	12.538	17.939
	78	2 480	12.715	18.683

9.7.3. ENHANCED DATA RATE 8PSK MODULATION

Antenna	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	0	2 402	11.678	14.715
	39	2 441	11.803	15.147
	78	2 480	12.568	18.064

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.

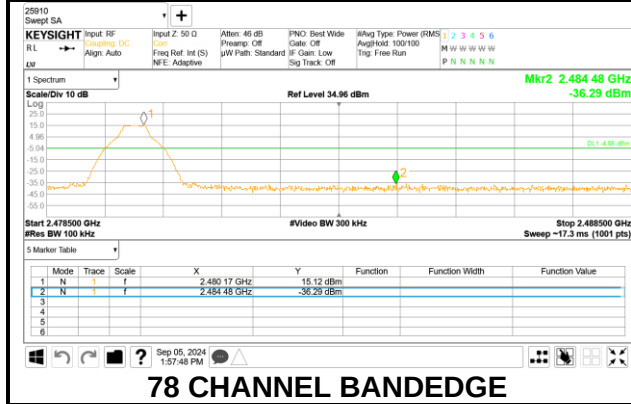
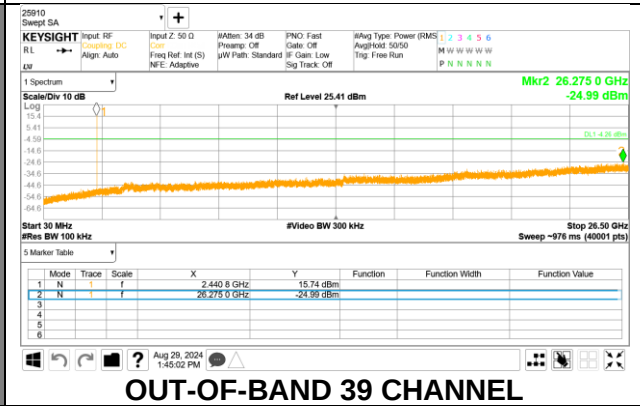
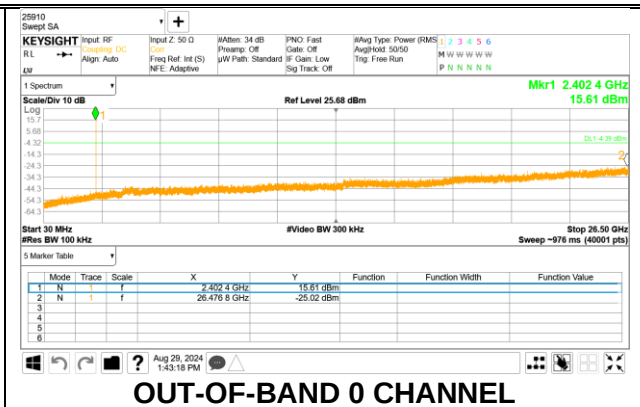
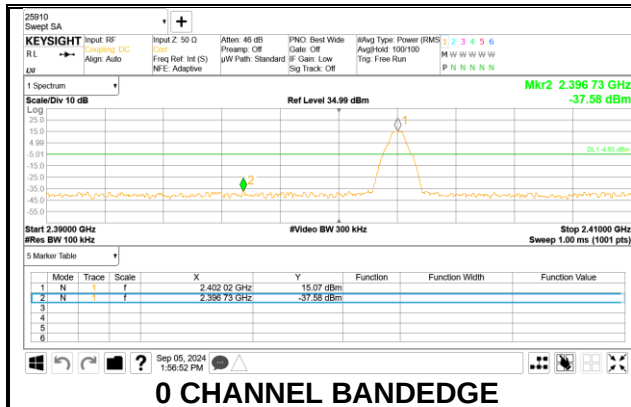
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

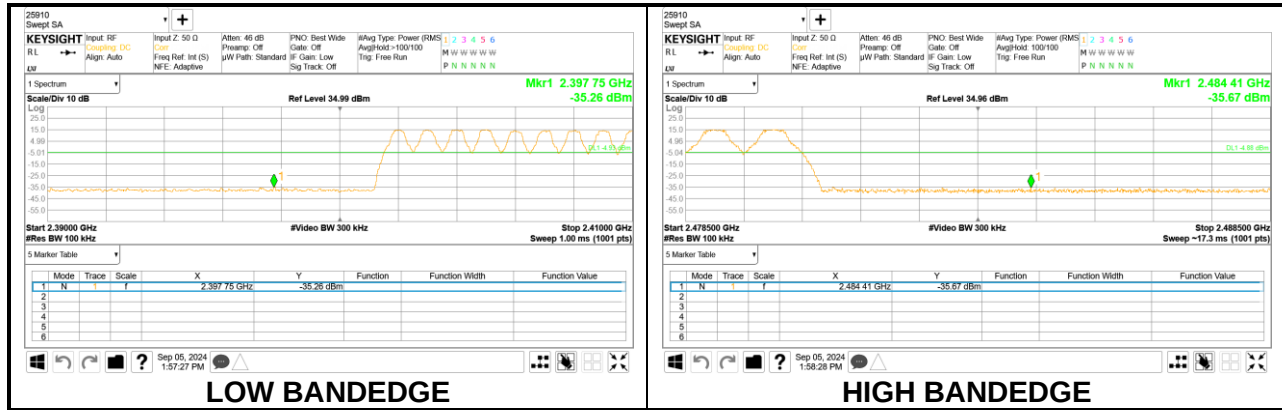
RESULTS

9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING – ANT1

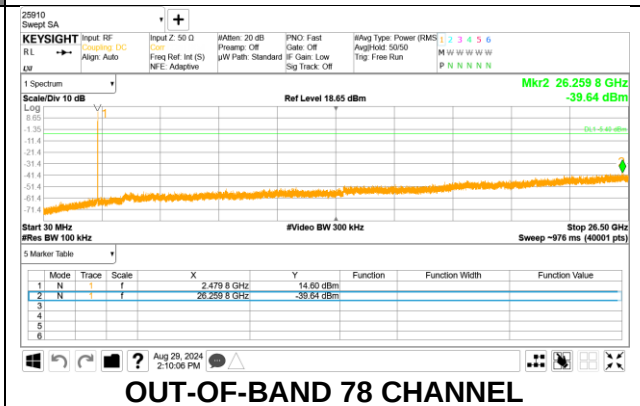
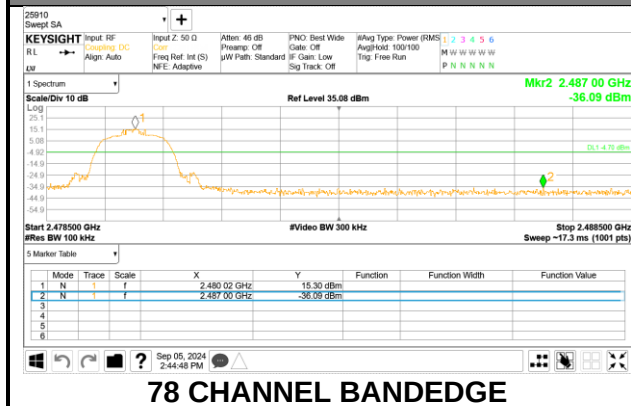
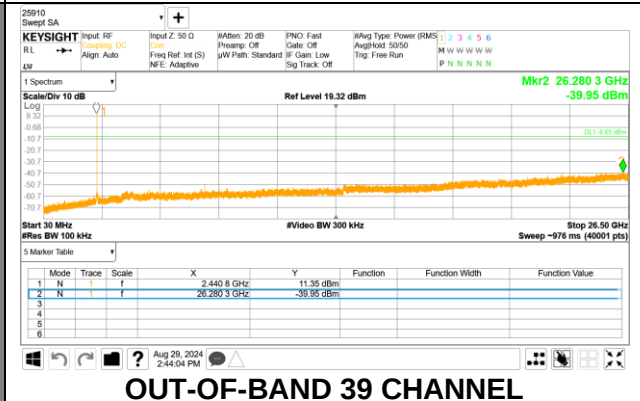
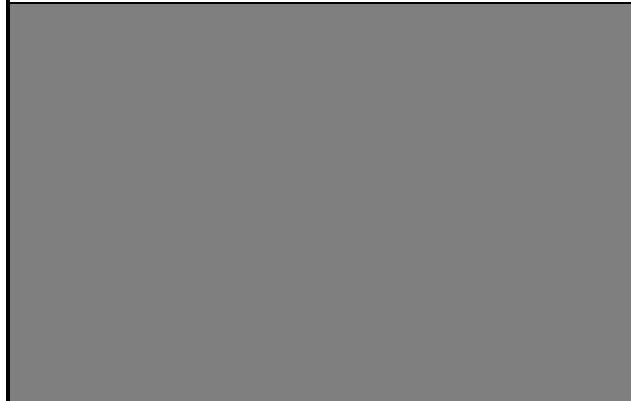
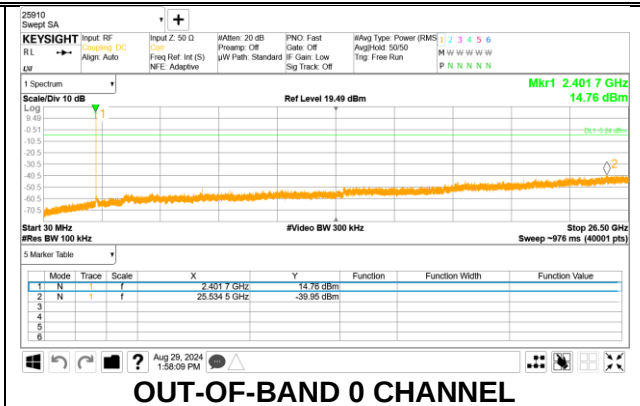
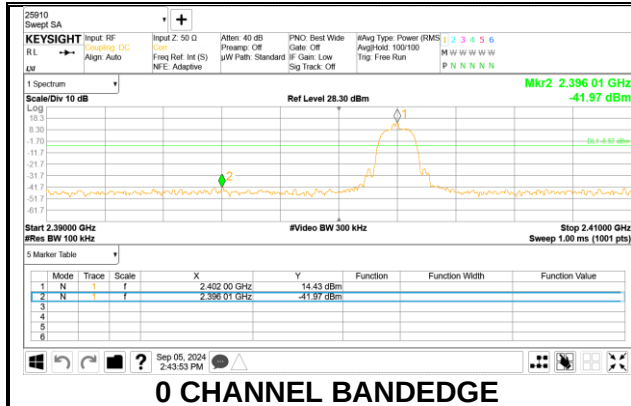


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON – ANT1

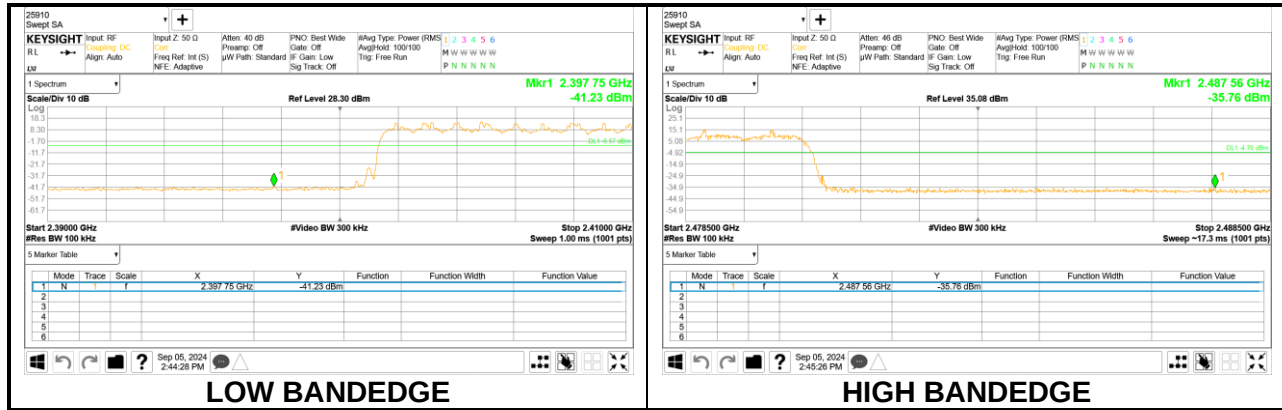


9.8.2. BLUETOOTH ENHANCED DATA RATE PI/4-DQPSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING – ANT1



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON – ANT1



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.

$$\text{GFSK} = 1/T = 1 / 0.00288\text{s} = 348\text{Hz}.$$

The minimum VBW was 348Hz, but test receiver(ESU40) couldn't set value 348Hz. 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.

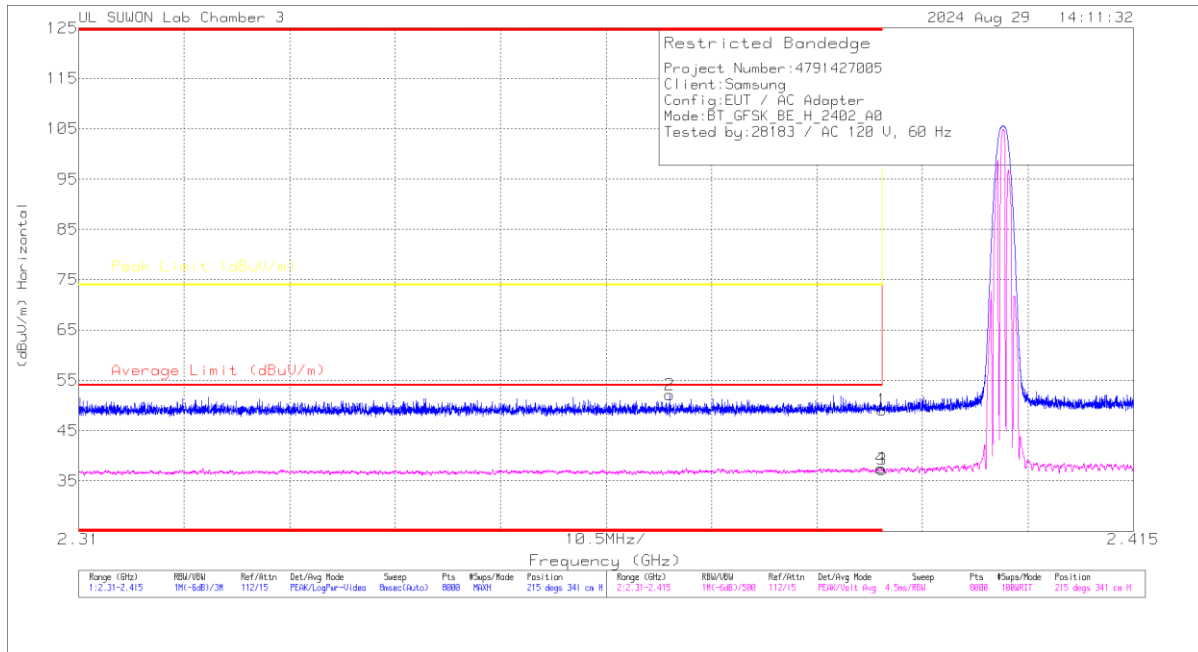
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open area test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

ANT1 BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

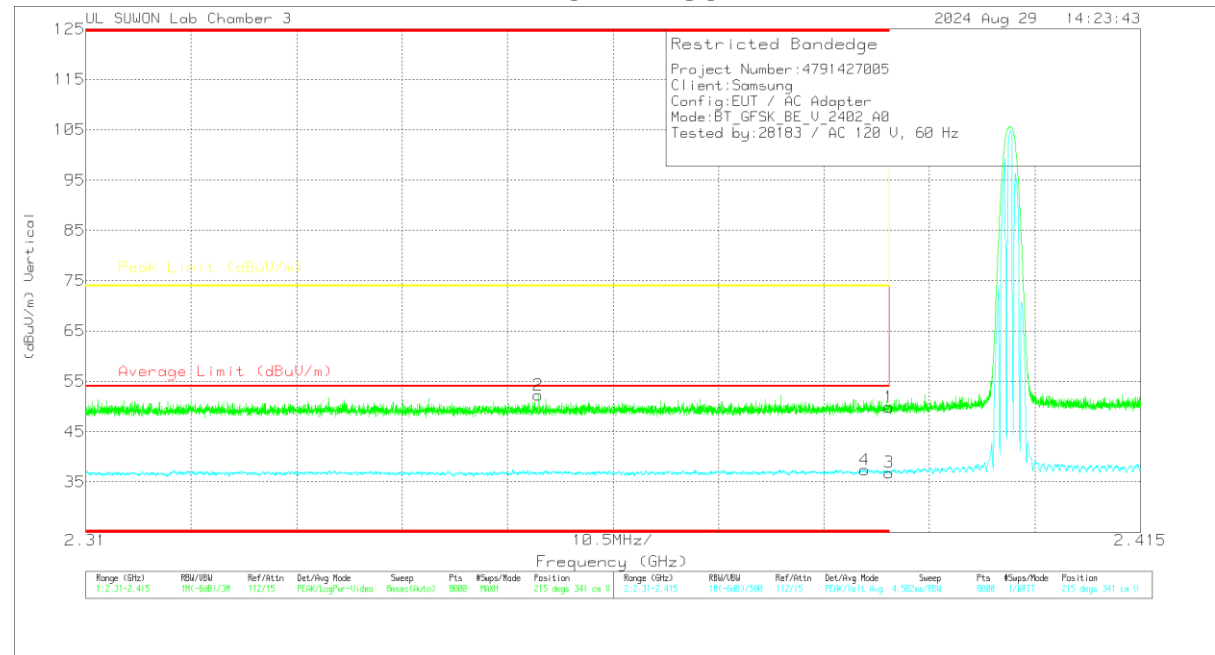
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor(dB/m)	10dB_Path Loss(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.81	Pk	32.1	-24.8	49.11	-	-	74	-24.89	215	341	H
2	* 2.36884	44.93	Pk	32	-24.8	52.13	-	-	74	-21.87	215	341	H
3	* 2.39	29.96	VA1T	32.1	-24.8	37.26	54	-16.74	-	-	215	341	H
4	* 2.38988	30.24	VA1T	32.1	-24.8	37.54	54	-16.46	-	-	215	341	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

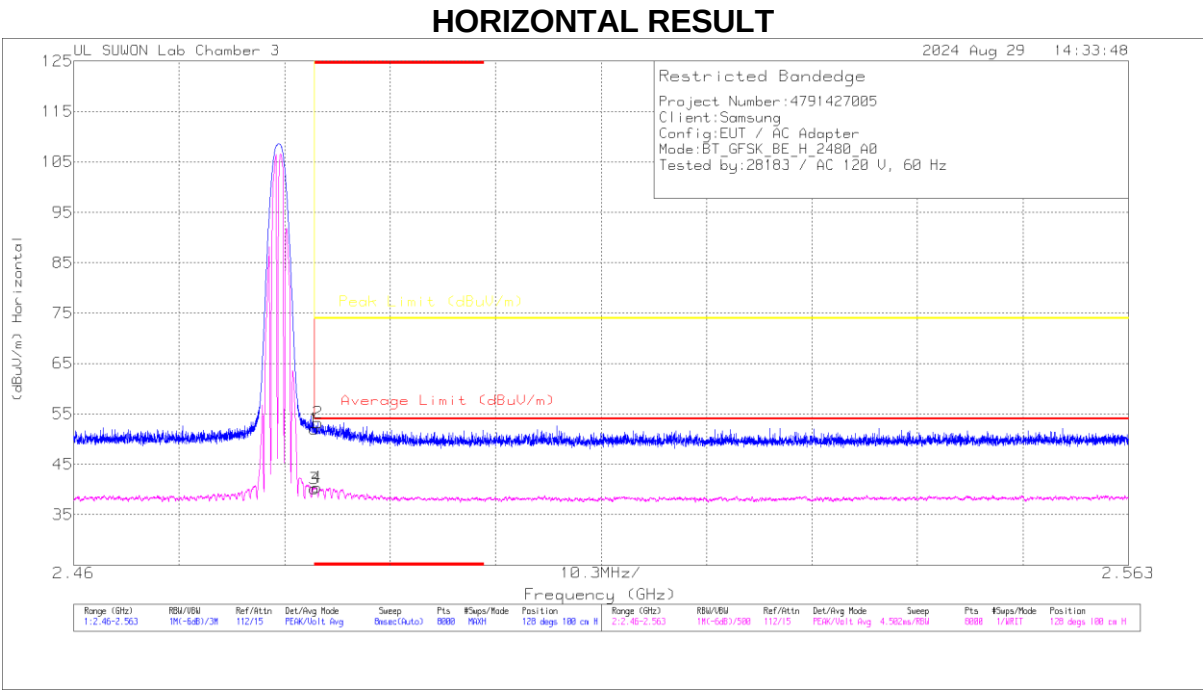


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor (dB/m)	10dB_Path Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.57	PK	32.1	-24.8	49.87	-	-	74	-24.13	215	341	V
2	* 2.35505	45.07	PK	32	-24.8	52.27	-	-	74	-21.73	215	341	V
3	* 2.39	29.56	VA1T	32.1	-24.8	36.86	54	-17.14	-	-	215	341	V
4	* 2.38757	30.16	VA1T	32.1	-24.8	37.46	54	-16.54	-	-	215	341	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)

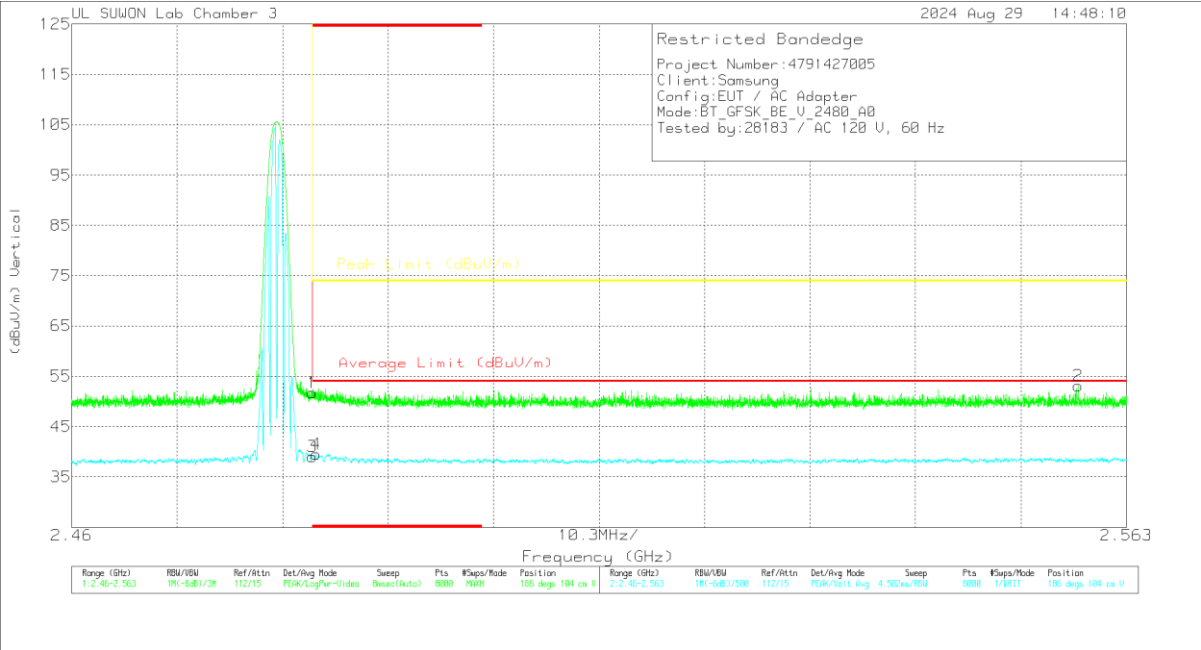


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor(dB/m)	10dB_Path Loss(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	44.43	Pk	32.4	-24.8	52.03	-	-	74	-21.97	128	100	H
2	* 2.48389	45.69	Pk	32.4	-24.8	53.29	-	-	74	-20.71	128	100	H
3	* 2.4835	32.52	VA1T	32.4	-24.8	40.12	54	-13.88	-	-	128	100	H
4	* 2.48373	32.77	VA1T	32.4	-24.8	40.37	54	-13.63	-	-	128	100	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



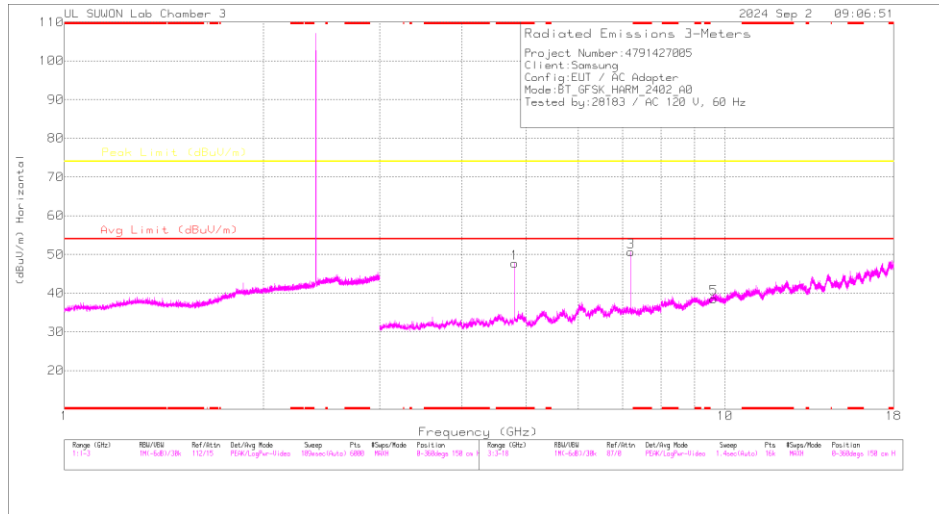
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor(dB/m)	10dB_Path Loss(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	44.2	PK	32.4	-24.8	51.8	-	-	74	-22.2	186	104	V
2	2.55826	45.4	PK	32.4	-24.7	53.1	-	-	74	-20.9	186	104	V
3	* 2.4835	31.43	VA1T	32.4	-24.8	39.03	54	-14.97	-	-	186	104	V
4	* 2.48385	31.9	VA1T	32.4	-24.8	39.5	54	-14.5	-	-	186	104	V

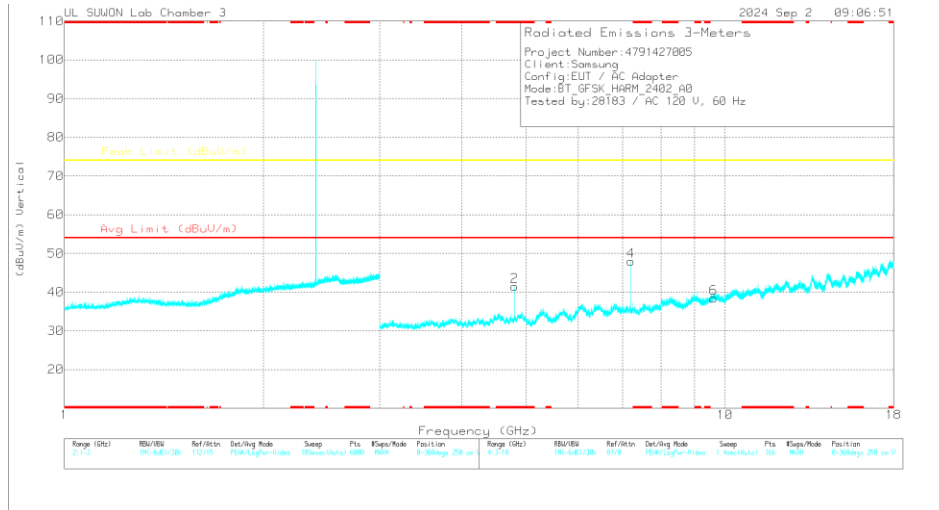
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

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

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957 Factor(dB/m)	3GHz_HP_Pat h Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80445	46.44	PKFH	34.3	-30.1	50.64	-	-	74	-23.36	359	118	H
* 4.80424	41.35	VA1T	34.3	-30.1	45.55	54	-8.45	-	-	359	118	H
* 4.80366	42.72	PKFH	34.3	-30.1	46.92	-	-	74	-27.08	79	380	V
* 4.80402	36.99	VA1T	34.3	-30.1	41.19	54	-12.81	-	-	79	380	V
7.20566	45.95	PKFH	35.8	-25.9	55.85	-	-	74	-18.15	104	101	H
7.20561	45.51	PKFH	35.8	-25.9	55.41	-	-	74	-18.59	235	100	V
9.60946	31.95	PKFH	36.7	-21.7	46.95	-	-	74	-27.05	0	100	H
9.61002	32.11	PKFH	36.7	-21.7	47.11	-	-	74	-26.89	0	100	V

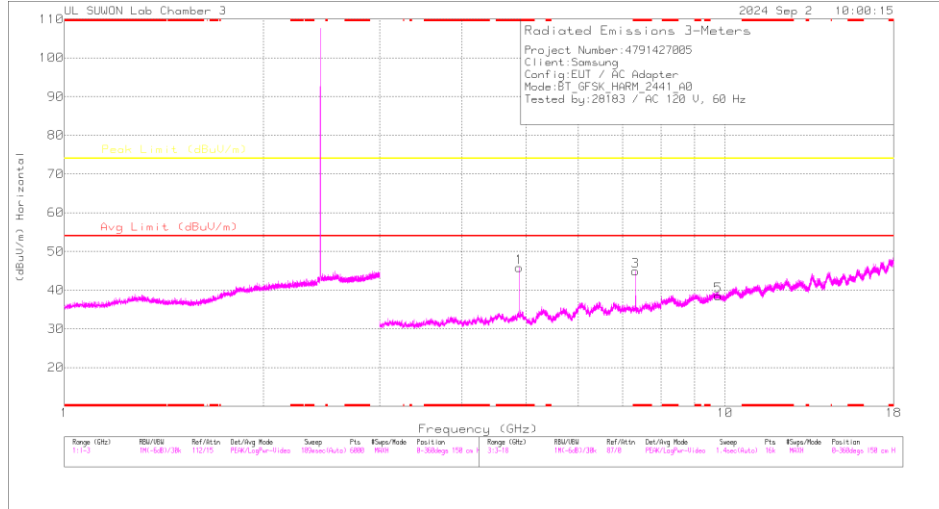
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

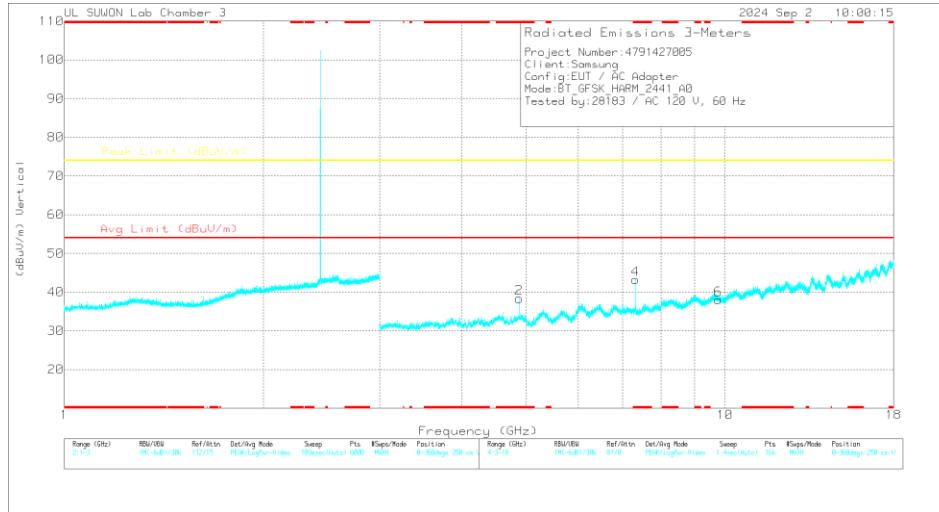
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

Mkr1 and 2, 3, 4 in above pre-scan graph were confirmed as in-band emissions.

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

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

Radiated Emissions

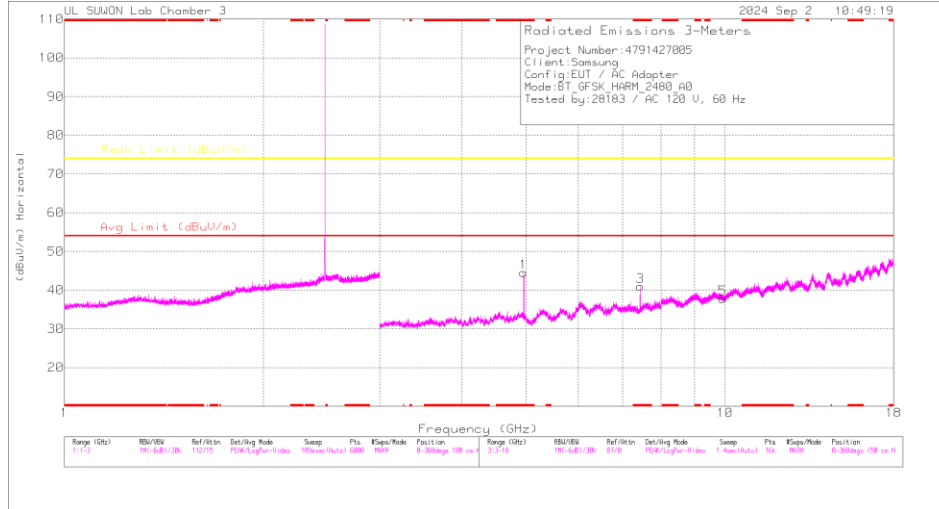
Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna 957 Factor (dB/m)	3GHz HP Pat h Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88191	45.25	PKFH	34.2	-30	49.45	-	-	74	-24.55	2	110	H
* 4.88207	40.89	VA1T	34.2	-30	45.09	54	-8.91	-	-	2	110	H
* 4.88158	40.94	PKFH	34.2	-29.9	45.24	-	-	74	-28.76	62	103	V
* 4.88211	33.19	VA1T	34.2	-30	37.39	54	-16.61	-	-	62	103	V
* 7.32327	41.56	PKFH	35.8	-25.5	51.86	-	-	74	-22.14	102	104	H
* 7.3233	33.18	VA1T	35.8	-25.5	43.48	54	-10.52	-	-	102	104	H
* 7.32326	40.35	PKFH	35.8	-25.5	50.65	-	-	74	-23.35	235	100	V
* 7.32291	33.6	VA1T	35.8	-25.5	43.9	54	-10.1	-	-	235	100	V
9.76301	31.73	PKFH	36.9	-21.5	47.13	-	-	74	-26.87	0	100	H
9.76594	31.27	PKFH	36.9	-21.5	46.67	-	-	74	-27.33	0	100	V

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

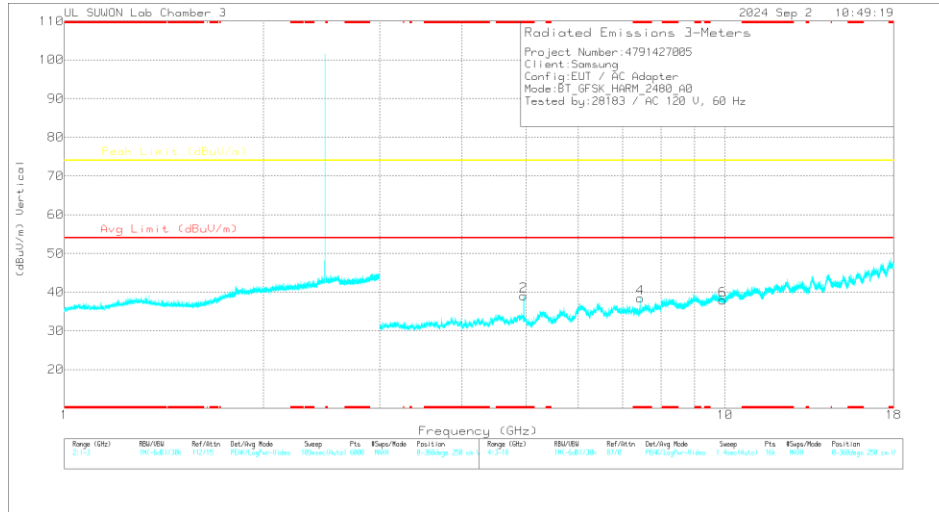
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

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

78 CHANNEL RESULTS



HORIZONTAL



VERTICAL

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

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna 957 Factor (dB/m)	3GHz HP Pat h Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96016	44.88	PKFH	34.3	-30	49.18	-	-	74	-24.82	0	133	H
* 4.96031	37.67	VA1T	34.3	-30	41.97	54	-12.03	-	-	0	133	H
* 4.96019	40.73	PKFH	34.3	-30	45.03	-	-	74	-28.97	115	113	V
* 4.95999	34.48	VA1T	34.3	-30	38.78	54	-15.22	-	-	115	113	V
* 7.43957	38.13	PKFH	35.7	-25.2	48.63	-	-	74	-25.37	87	106	H
* 7.44006	30.04	VA1T	35.7	-25.2	40.54	54	-13.46	-	-	87	106	H
* 7.43982	34.32	PKFH	35.7	-25.2	44.82	-	-	74	-29.18	197	116	V
* 7.44	24.49	VA1T	35.7	-25.2	34.99	54	-19.01	-	-	197	116	V
9.92183	32.54	PKFH	37.1	-21.3	48.34	-	-	74	-25.66	0	100	H
9.91951	30.9	PKFH	37.1	-21.4	46.6	-	-	74	-27.4	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

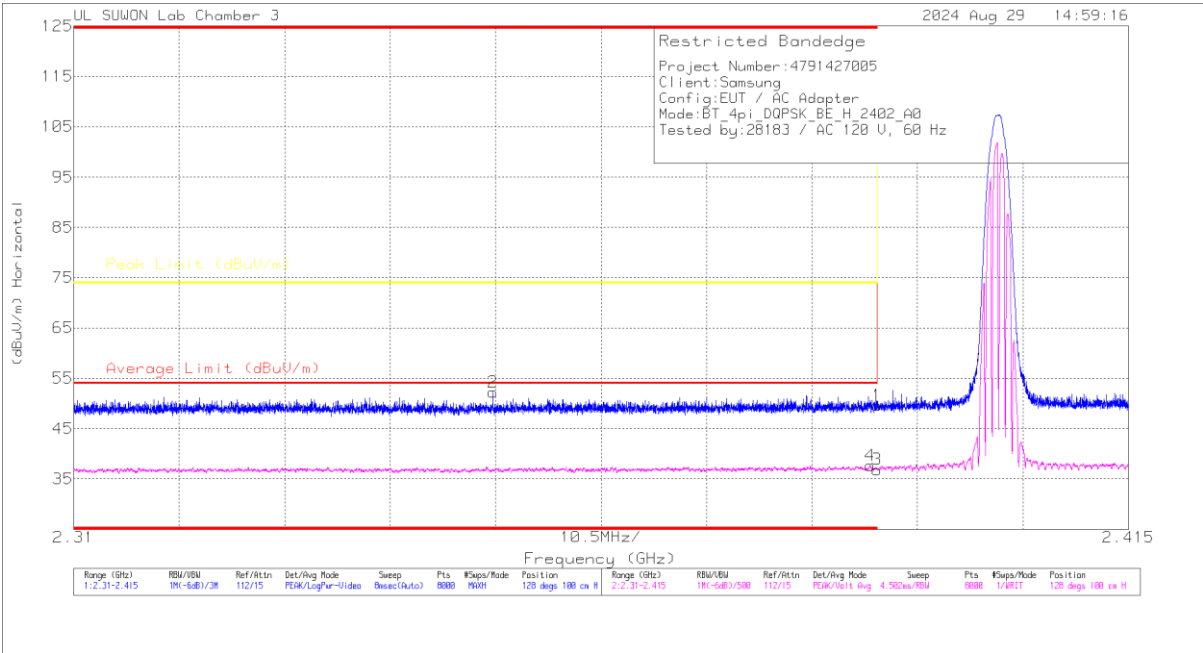
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration.

Mkr1 and 2 in above pre-scan graph were confirmed as in-band emissions.

10.1.2. BLUETOOTH ENHANCED DATA RATE Pi/4-DPSK
MODULATION

ANT1
BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

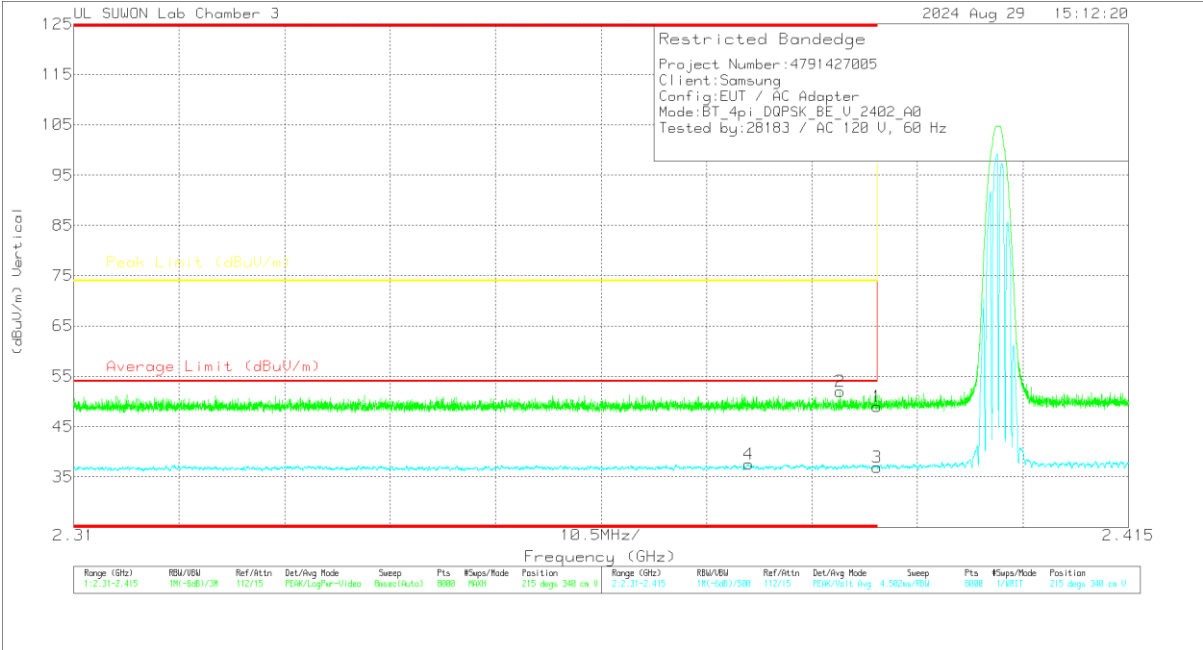


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor(dB/m)	10dB_Path Loss(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	42.34	Pk	32.1	-24.8	49.64	-	-	74	-24.36	128	100	H
2	* 2.35173	45	Pk	32	-24.8	52.2	-	-	74	-21.8	128	100	H
3	* 2.39	29.56	VA1T	32.1	-24.8	36.86	54	-17.14	-	-	128	100	H
4	* 2.3893	30.38	VA1T	32.1	-24.8	37.68	54	-16.32	-	-	128	100	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

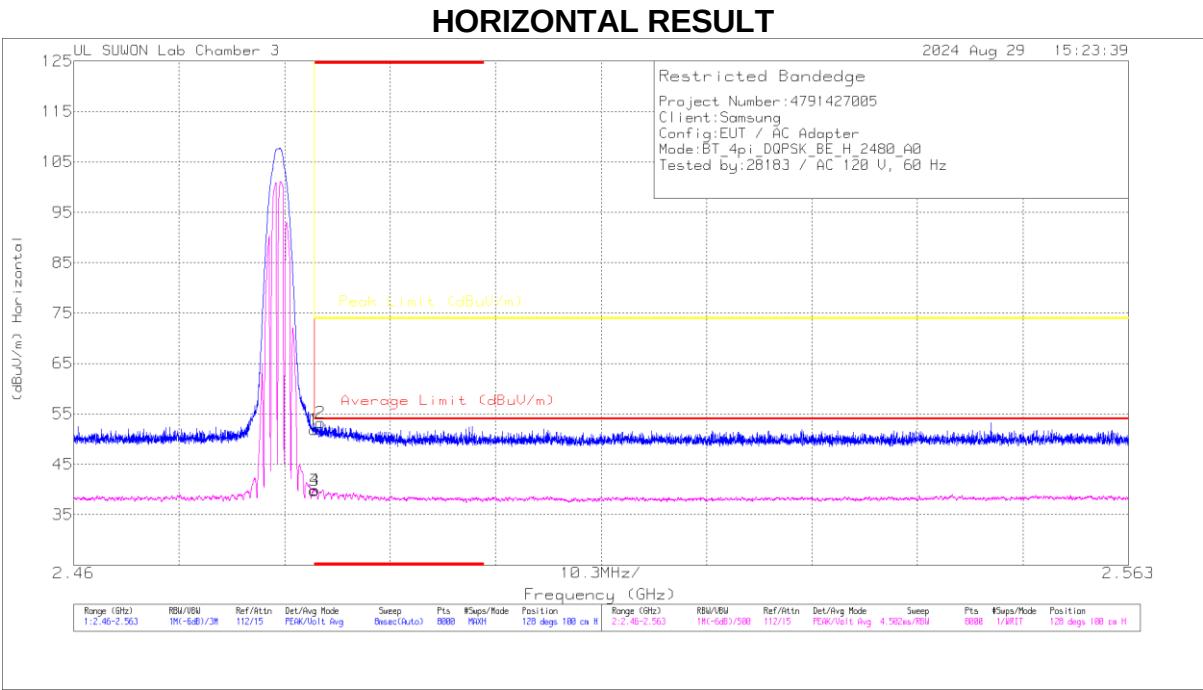


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna 957_F actor (dB/m)	10dB_Path Loss (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	41.67	PK	32.1	-24.8	48.97	-	-	74	-25.03	215	340	V
2	* 2.38632	44.71	PK	32.1	-24.8	52.01	-	-	74	-21.99	215	340	V
3	* 2.39	29.6	VA1T	32.1	-24.8	36.9	54	-17.1	-	-	215	340	V
4	* 2.37718	30.21	VA1T	32.1	-24.8	37.51	54	-16.49	-	-	215	340	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)

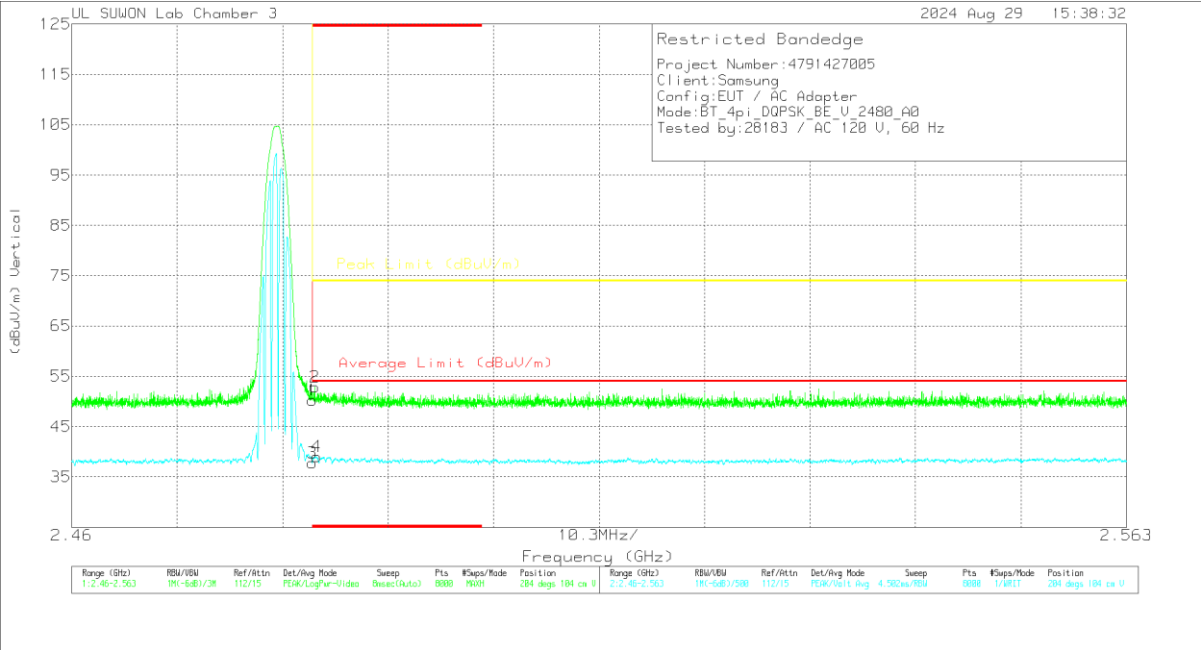


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_F actor(dB/m)	10dB_Path Loss(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	44.24	Pk	32.4	-24.8	51.84	-	-	74	-22.16	128	100	H
2	* 2.48408	45.65	Pk	32.4	-24.8	53.25	-	-	74	-20.75	128	100	H
3	* 2.4835	32.16	VA1T	32.4	-24.8	39.76	54	-14.24	-	-	128	100	H
4	* 2.48355	32.34	VA1T	32.4	-24.8	39.94	54	-14.06	-	-	128	100	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



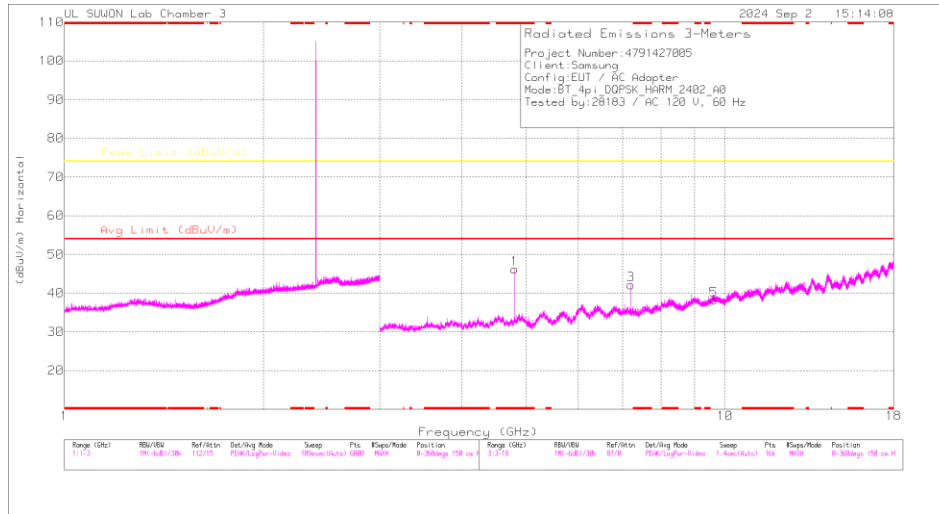
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna 957_F actor(dB/m)	10dB_Path Loss(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	42.7	Pk	32.4	-24.8	50.3	-	-	74	-23.7	204	104	V
2	* 2.48373	45.23	Pk	32.4	-24.8	52.83	-	-	74	-21.17	204	104	V
3	* 2.4835	30.17	VA1T	32.4	-24.8	37.77	54	-16.23	-	-	204	104	V
4	* 2.48391	31.48	VA1T	32.4	-24.8	39.08	54	-14.92	-	-	204	104	V

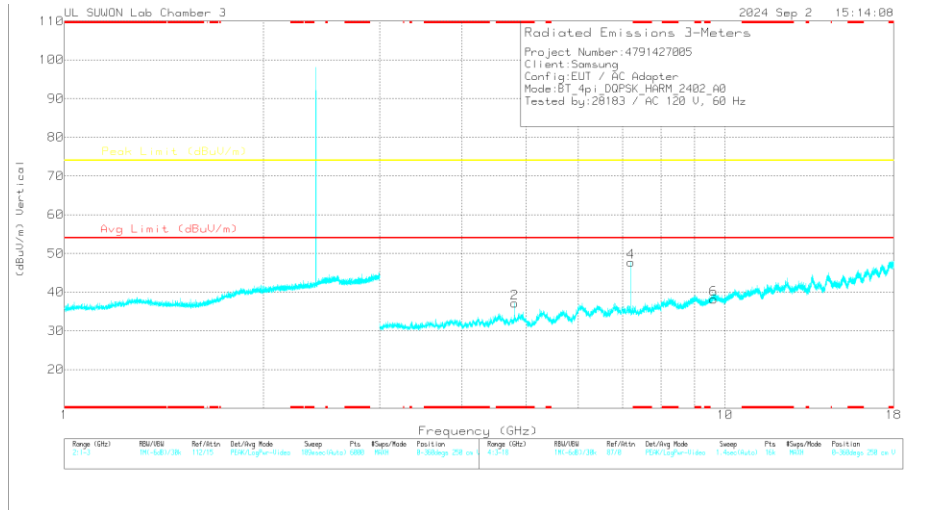
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

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

Radiated Emissions

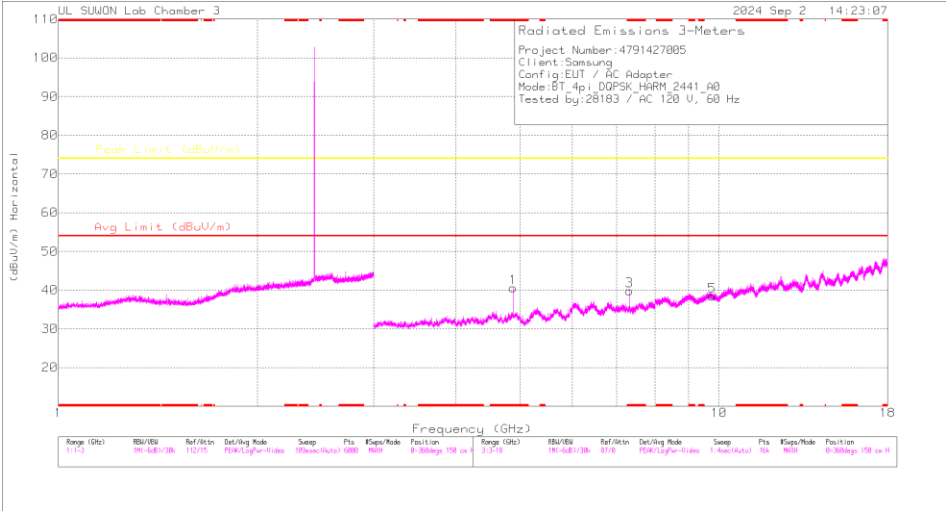
Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	3GHz_HP_Pat h Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80385	44.08	PKFH	34.3	-30.1	48.28	-	-	74	-25.72	2	105	H
* 4.8043	35.24	VA1T	34.3	-30.1	39.44	54	-14.56	-	-	2	105	H
* 4.80305	37.41	PKFH	34.3	-30.1	41.61	-	-	74	-32.39	248	267	V
* 4.80254	24.39	VA1T	34.3	-30.1	28.59	54	-25.41	-	-	248	267	V
7.2058	43.78	PKFH	35.8	-25.9	53.68	-	-	74	-20.32	100	103	H
7.20429	33	PKFH	35.8	-25.9	42.9	-	-	74	-31.1	23	267	V
9.60906	31.43	PKFH	36.7	-21.7	46.43	-	-	74	-27.57	0	100	H
9.61	31.91	PKFH	36.7	-21.7	46.91	-	-	74	-27.09	0	100	V

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

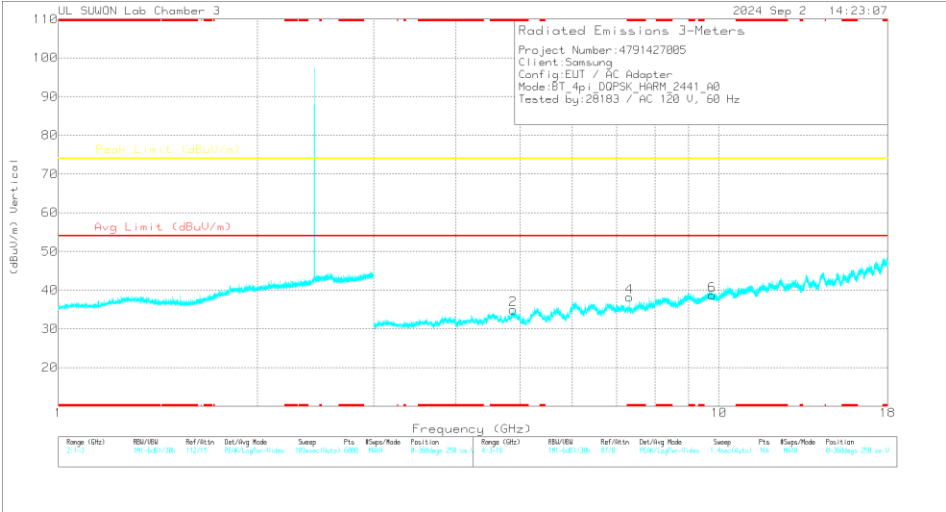
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

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

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

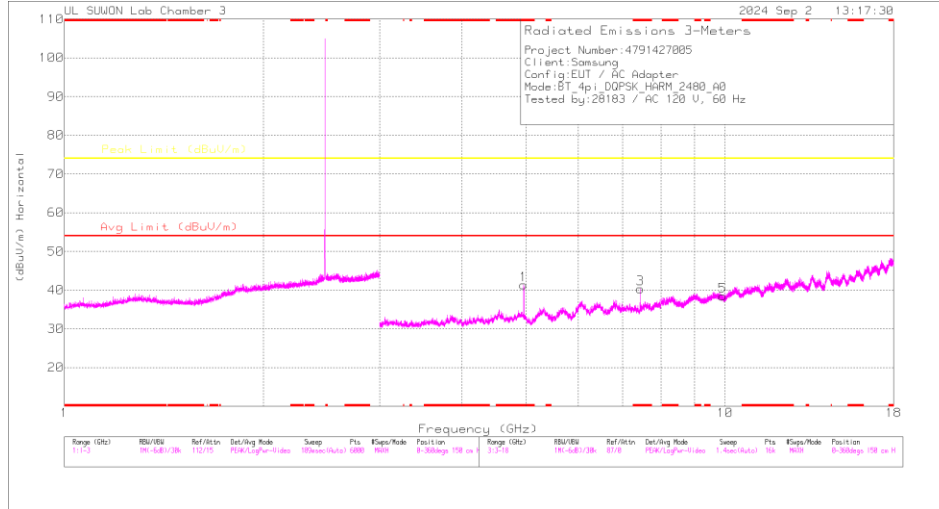
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

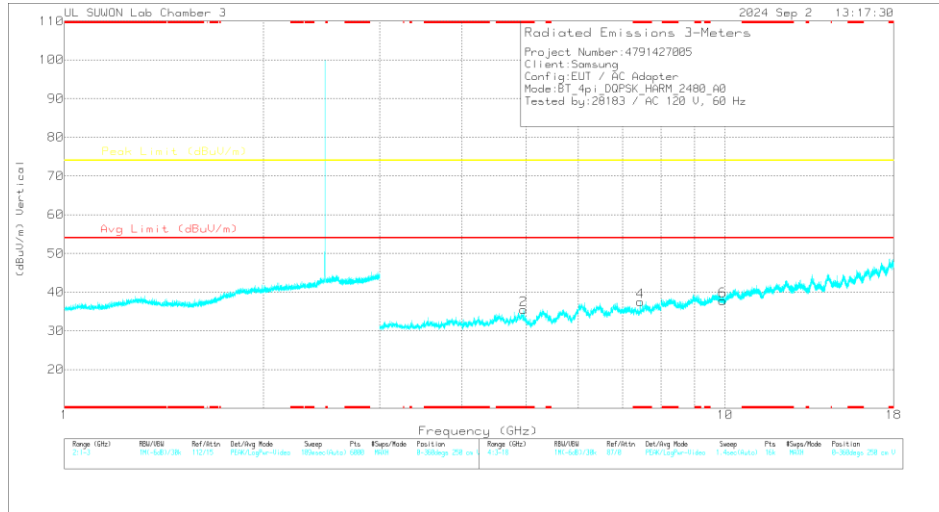
Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957 Factor(dB/m)	3GHz_HP_Pat h Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88185	43.07	PKFH	34.2	-30	47.27	-	-	74	-26.73	355	108	H
* 4.88159	32.87	VA1T	34.2	-29.9	37.17	54	-16.83	-	-	355	108	H
* 4.88164	39.83	PKFH	34.2	-29.9	44.13	-	-	74	-29.87	289	387	V
* 4.88223	29.3	VA1T	34.2	-30	33.5	54	-20.5	-	-	289	387	V
* 7.32257	37.89	PKFH	35.8	-25.5	48.19	-	-	74	-25.81	97	120	H
* 7.32305	25.54	VA1T	35.8	-25.5	35.84	54	-18.16	-	-	97	120	H
* 7.32259	38.94	PKFH	35.8	-25.5	49.24	-	-	74	-24.76	237	100	V
* 7.32295	26.09	VA1T	35.8	-25.5	36.39	54	-17.61	-	-	237	100	V
9.76278	31.23	PKFH	36.9	-21.5	46.63	-	-	74	-27.37	0	100	H
9.76656	29.98	PKFH	36.9	-21.5	45.38	-	-	74	-28.62	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

78 CHANNEL RESULTS



HORIZONTAL



VERTICAL

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

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957 Factor(dB/m)	3GHz_HP_Pat h Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95992	42.63	PKFH	34.3	-30	46.93	-	-	74	-27.07	8	169	H
* 4.95991	32.9	VA1T	34.3	-30	37.2	54	-16.8	-	-	8	169	H
* 4.95962	39.5	PKFH	34.3	-30	43.8	-	-	74	-30.2	285	346	V
* 4.95974	28.98	VA1T	34.3	-30	33.28	54	-20.72	-	-	285	346	V
* 7.44044	36.36	PKFH	35.7	-25.2	46.86	-	-	74	-27.14	92	113	H
* 7.44029	23.34	VA1T	35.7	-25.2	33.84	54	-20.16	-	-	92	113	H
* 7.44064	34.71	PKFH	35.7	-25.2	45.21	-	-	74	-28.79	247	103	V
* 7.43986	22.32	VA1T	35.7	-25.2	32.82	54	-21.18	-	-	247	103	V
9.91915	31.77	PKFH	37.1	-21.4	47.47	-	-	74	-26.53	0	100	H
9.91803	30.12	PKFH	37.1	-21.3	45.92	-	-	74	-28.08	0	100	V

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

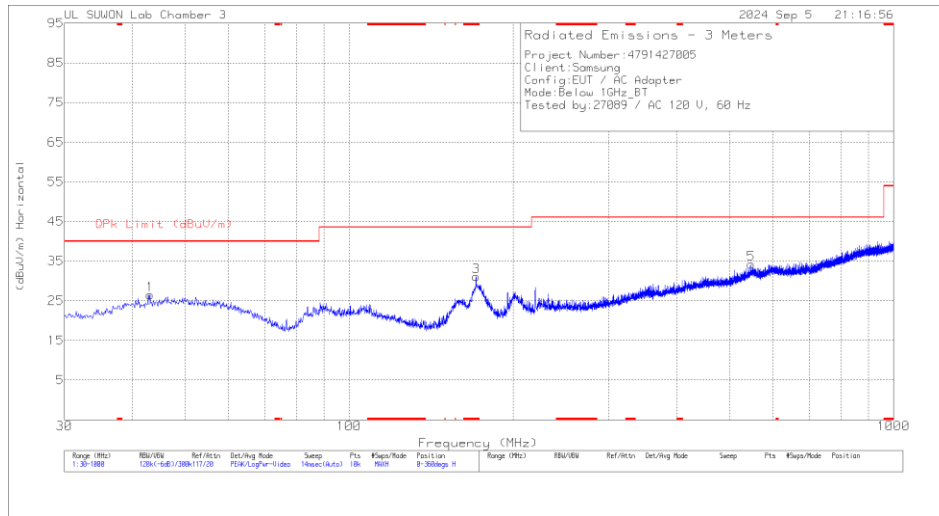
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

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

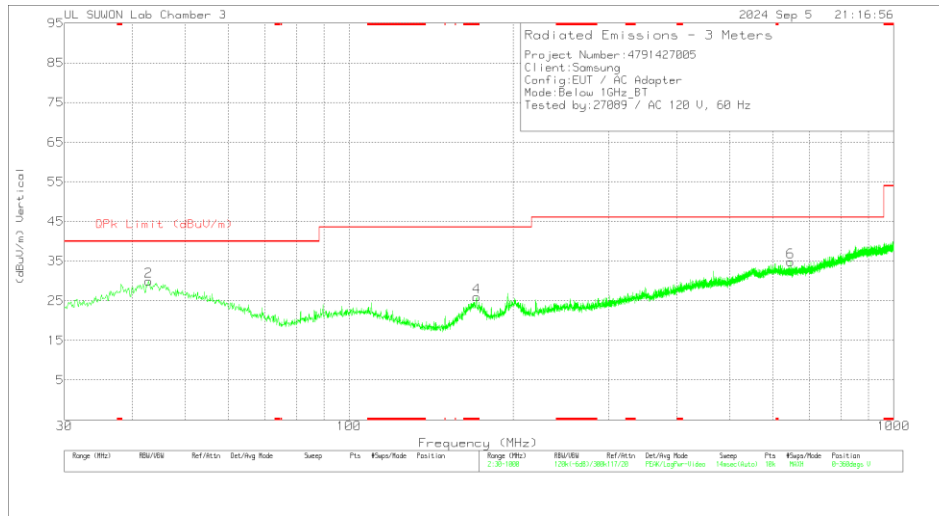
Mkr1 and 2 in above pre-scan graph were confirmed as in-band emissions.

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	Antenna_845_Factor(dB)	Below_1G_Path Loss(dB)	Corrected Reading (dBuV/m)	OPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	43.0964	39.06	Pk	19.4	-32	26.46	40	-13.54	0-360	300	H
3	* 171.0525	47.64	Pk	14.5	-31	31.14	43.52	-12.38	0-360	100	H
5	547.4513	40.91	Pk	23	-29.7	34.21	46.02	-11.81	0-360	200	H
2	42.8053	42.62	Pk	19.3	-32	29.92	40	-10.08	0-360	100	V
4	* 171.4406	42.5	Pk	14.5	-31	26	43.52	-17.52	0-360	100	V
6	646.6926	39.99	Pk	24.2	-29.4	34.79	46.02	-11.23	0-360	200	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)

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

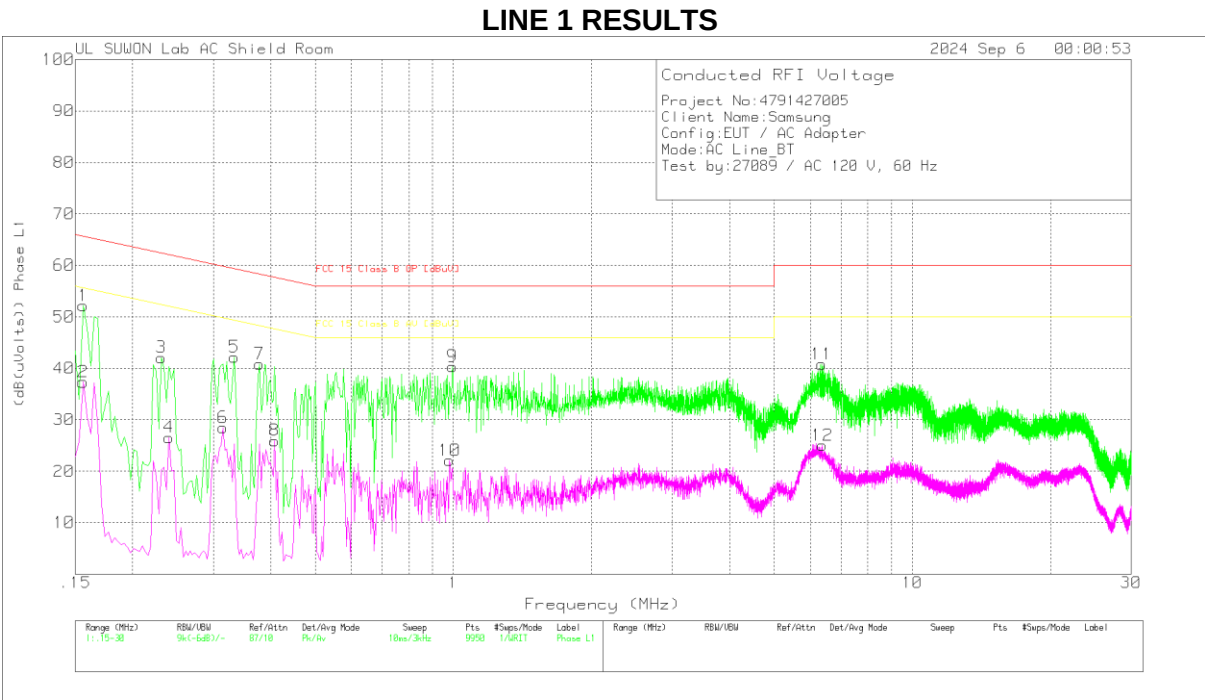
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10:2020.

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



Trace Markers

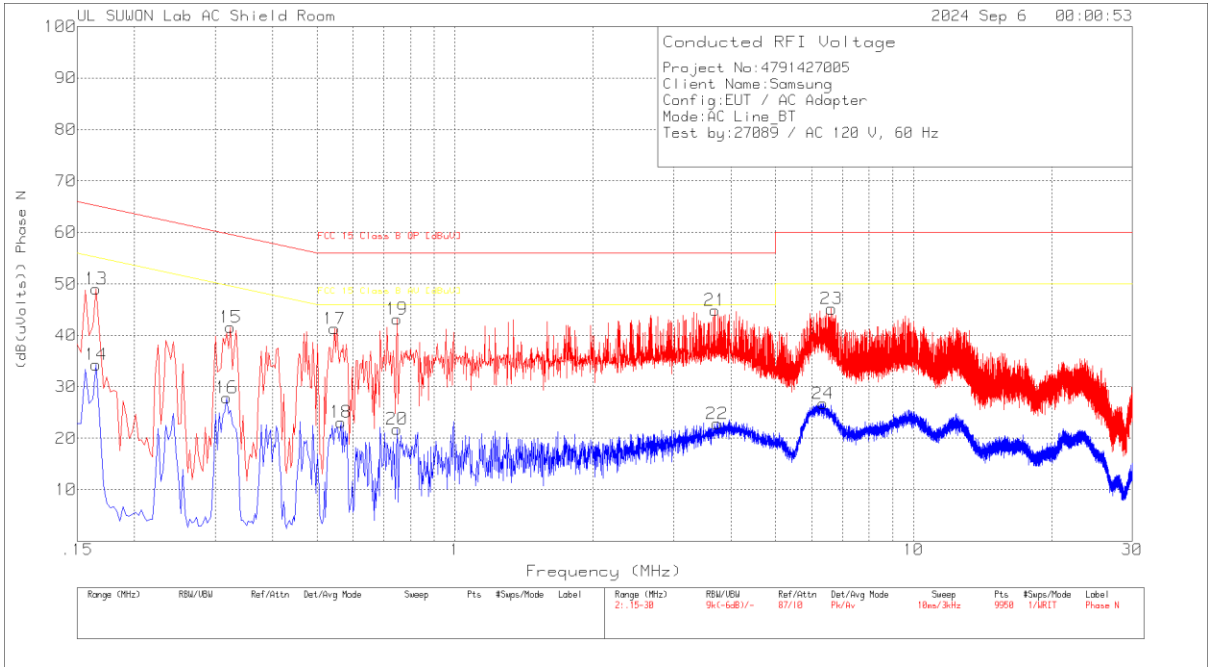
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
1	.156	42.25	Pk	9.8	.1	52.15	65.67	-13.52	-	-
2	.156	27.44	Av	9.8	.1	37.34	-	-	55.67	-18.33
3	.231	32.29	Pk	9.7	.1	42.09	62.41	-20.32	-	-
4	.24	16.77	Av	9.7	.1	26.57	-	-	52.1	-25.53
5	.333	32.39	Pk	9.7	.1	42.19	59.38	-17.19	-	-
6	.315	18.68	Av	9.7	.1	28.48	-	-	49.84	-21.36
7	.378	30.95	Pk	9.8	.1	40.85	58.32	-17.47	-	-
8	.408	16.05	Av	9.8	.1	25.95	-	-	47.69	-21.74
9	.996	30.45	Pk	9.8	.1	40.35	56	-15.65	-	-
10	.981	12.2	Av	9.8	.1	22.1	-	-	46	-23.9
11	6.354	30.77	Pk	9.8	.2	40.77	60	-19.23	-	-
12	6.366	15.04	Av	9.8	.2	25.04	-	-	50	-24.96

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_Wit h EX_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
13	.165	39.01	Pk	9.9	.1	49.01	65.21	-16.2	-	-
14	.165	24.29	Av	9.9	.1	34.29	-	-	55.21	-20.92
15	.324	31.75	Pk	9.7	.1	41.55	59.6	-18.05	-	-
16	.318	18.06	Av	9.7	.1	27.86	-	-	49.76	-21.9
17	.546	31.3	Pk	9.9	.1	41.3	56	-14.7	-	-
18	.564	13.2	Av	9.8	.1	23.1	-	-	46	-22.9
19	.747	33.24	Pk	9.8	.1	43.14	56	-12.86	-	-
20	.747	11.87	Av	9.8	.1	21.77	-	-	46	-24.23
21	3.69	35.05	Pk	9.7	.1	44.85	56	-11.15	-	-
22	3.729	13.03	Av	9.7	.1	22.83	-	-	46	-23.17
23	6.624	35.17	Pk	9.8	.2	45.17	60	-14.83	-	-
24	6.351	16.73	Av	9.8	.2	26.73	-	-	50	-23.27

Pk - Peak detector
Av - Average detection

END OF TEST REPORT