

TEST REPORT

Report Number: R15626916-E1

Applicant : Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

Model : A05001

FCC ID : IPH-05001

IC : 1792A-05001

EUT Description : Portable Digital Transceiver

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 4
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2025-08-15

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-08-15	Initial Issue	Manish Baral

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

EUT DESCRIPTION: Portable Digital Transceiver

MODEL: A05001

SERIAL NUMBER: 603763011, 603759933

SAMPLE RECEIPT DATE: 2025-05-12

DATE TESTED: 2025-05-06 to 2025-06-03

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	
ISED RSS-247 Issue 4	Refer to Section 2
ISED RSS-GEN Issue 5 + A1 + A2	

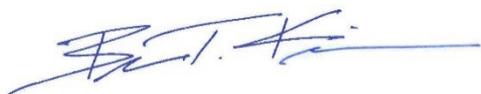
UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:

Prepared By:



Brian Kiewra
Project Engineer
Consumer, Medical and IT Segment
UL LLC

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Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contains info provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

Below is a list of the data/info provided by the customer:

- 1) Antenna gain and type (see section 6.3)
- 2) Worst-case data rates (see section 6.5)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	RSS-GEN 6.7	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	RSS-247 (6.2.3.1) (a)	Hopping Frequency Separation	Compliant	None
15.247 (a)(1)(iii)	RSS-247 (6.2.3.1) (b)	Number of Hopping Channels		
15.247 (a)(1)(iii)	RSS-247 (6.2.3.1) (b)	Average Time of Occupancy		
15.247 (b)(1)	RSS-247 (6.2.3.2) (b)	Output Power		
See Comment		Average Power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (d)	RSS-247 (6.6)	Conducted Spurious Emissions	Compliant	None
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions		
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions		

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, ANSI C63.10-2020, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 4.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
<input type="checkbox"/>	Building: 12 Laboratory Dr Durham, NC 27713, U.S.A	US0067	2180C	825374
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%
Time	3.39%

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is an portable digital transceiver with BT, BLE, 802.11b/g/n 2.4GHz WLAN, 802.11a 5GHz WLAN, LTE Cat M1, and Global Navigation Satellite System (GNSS) receiver. This report covers testing on the BT radio.

6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	9.93	9.84
2402 - 2480	Enhanced DQPSK	9.78	9.51
2402 - 2480	Enhanced 8PSK	8.54	7.14

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:
The radio utilizes an antenna with the following type and maximum gain:

Type	Frequency Range (MHz)	Maximum Gain (dBi)
Inverted F	2402-2480	1.27

6.4. SOFTWARE AND FIRMWARE

EUT FW Version: 63.23

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel and mode with the highest average output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle (spurious only) and high channels.

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

Note: To reduce size of report only representative plots are included for some conducted testing.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Switching Power Supply	PHIHONG	AQ27A-59CFA	Na	Na

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Proprietary	1	USB-C	Shielded	<3m	Program/Charge EUT

TEST SETUP

EUT was configured using its own built-in push buttons prior to testing. For final emissions testing, the EUT was connected to AC mains.

SETUP DIAGRAMS

Please refer to R15626916-EP1 for setup diagrams

7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Conducted Room 1					
90411	Spectrum Analyzer	Keysight Technologies	N9030A	2024-08-01	2025-08-01
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
SOFTEMI	Antenna Port Software	UL	Version 2024.2.23	NA	NA
207726	Temp/Humid Chamber	Thermotron	SM-32-8200	2025-01-15	2026-01-15
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
226561	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2025-04-01	2026-04-01
Additional Equipment used					
86441	EMPower USB RF Power Sensor, 10MHz to 6GHz (USB ID: 1.47.238.189.27.0.0.80)	ETS Lindgren	7002-006	2024-11-18	2025-11-18
Cables					
CBL091	Micro-Coax UTIFLEX Cable Assembly, Low Loss,40Ghz	Carlisle Interconnect Technologies	UFA147A-2-0360-200200	2025-03-07	2026-03-07

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
65682	Active Loop Antenna	ETS-Lindgren	6502	2023-10-03	2025-10-03
30-1000 MHz					
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-30	2026-01-30
1-18 GHz					
135143	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-02-07	2026-02-07
Gain-Loss Chains					
91974	Gain-loss string: 0.009-30MHz	Various	Various	2024-05-08	2025-05-30
91976	Gain-loss string: 25-1000MHz	Various	Various	2024-05-08	2025-05-30
91979	Gain-loss string: 1-18GHz	Various	Various	2024-05-08	2025-05-30
Receiver & Software					
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-08-29	2025-08-29
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
241205	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	30-1000 MHz				
90628	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-02	2026-01-02
	Gain-Loss Chains				
207639	Gain-loss string: 25-1000MHz	Various	Various	2024-05-22	2025-05-30
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-04-21	2026-04-21
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2025-04-17	2026-04-17
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
72095	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2024-08-01	2025-08-01
80391	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2024-08-01	2025-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2024-08-01	2025-08-01
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2025-04-17	2026-04-17
236852	AC Power Source	California Instruments	NA	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

8. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2020 Section 11.6

Occupied BW (20dB): ANSI C63.10-2020 Section 6.9.2

Occupied BW (99%): ANSI C63.10-2020 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10-2020 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2020 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2020 Section 7.8.4

Output Power: ANSI C63.10-2020 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10-2020 Section 7.8.7

Conducted Band-Edge: ANSI C63.10-2020 Section 7.8.7.2 and 6.10.4

Radiated Band-edge: ANSI C63.10-2020 Section 6.10.5

Radiated Spurious Emissions: ANSI C63.10-2020 Sections 6.3 to 6.6 and 7.8.8

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

9. ANTENNA PORT TEST RESULTS

9.1. 20 dB AND 99% BANDWIDTH

LIMITS

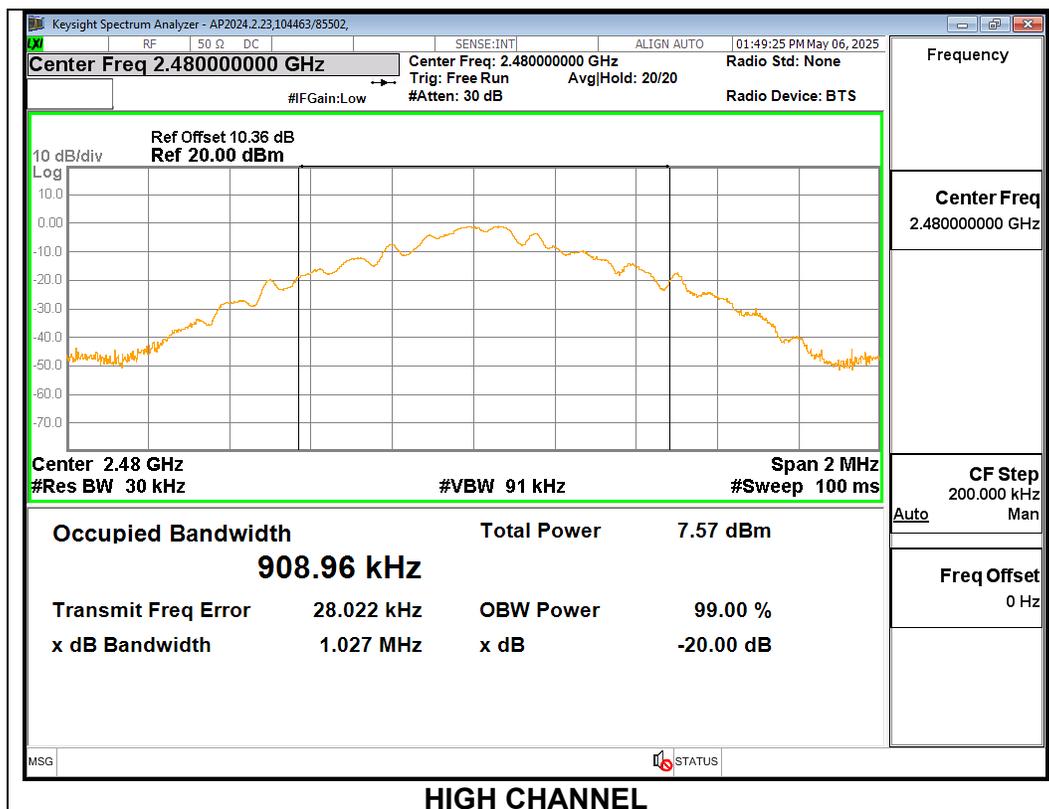
None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1-5% of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

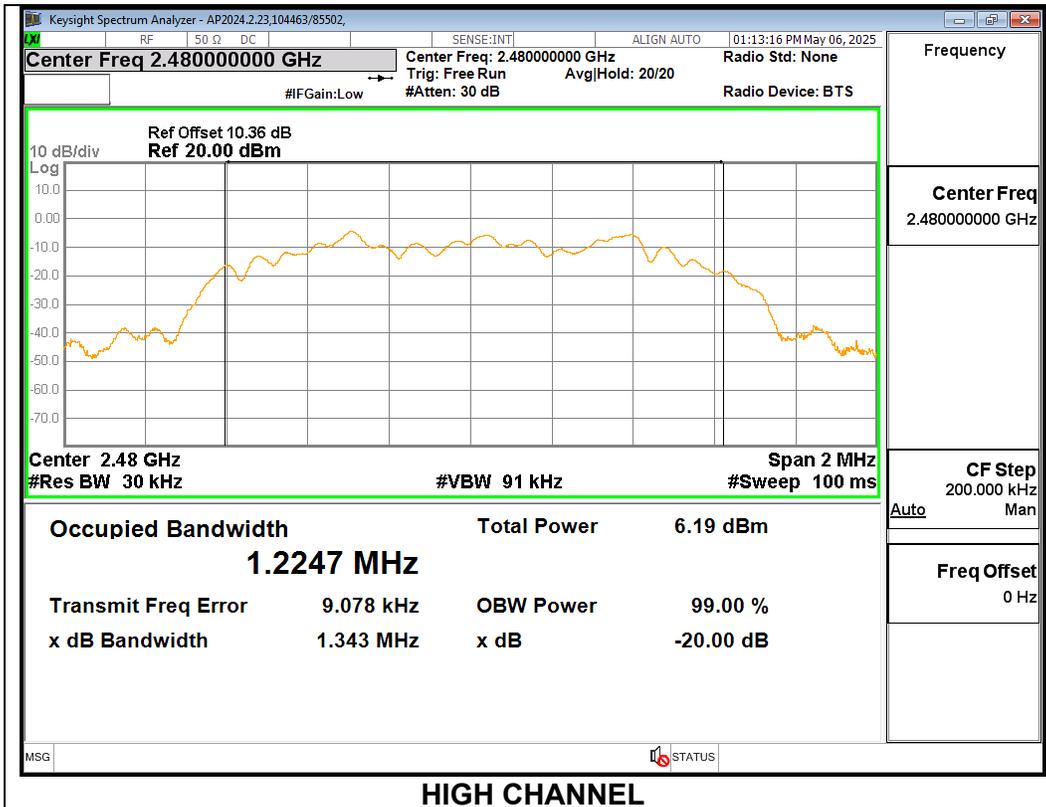
9.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.028	0.907
Mid	2441	1.028	0.899
High	2480	1.027	0.909



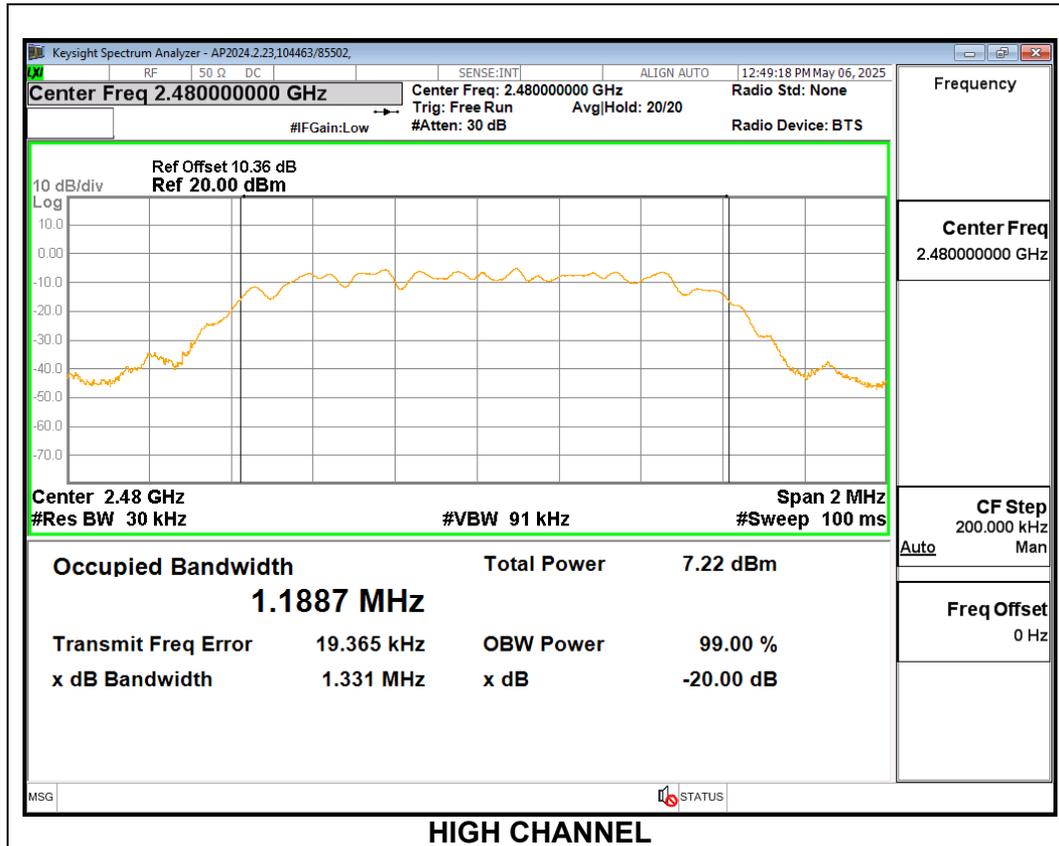
9.1.2. BLUETOOTH BASIC DATA RATE QPSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.227	1.346
Mid	2441	1.225	1.343
High	2480	1.225	1.343



9.1.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.190	1.3360
Mid	2441	1.189	1.3350
High	2480	1.189	1.3310



9.2. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

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

Mode	ON Time B (ms)	Period (ms)	Duty Cycle x (lineari)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
GFSK	100.00	100.00	1.000	100.00	0.00	0.010
QPSK	100.00	100.00	1.000	100.00	0.00	0.010
8PSK	100.00	100.00	1.000	100.00	0.00	0.010



9.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)
RSS-247 (6.2.3.1) (a)

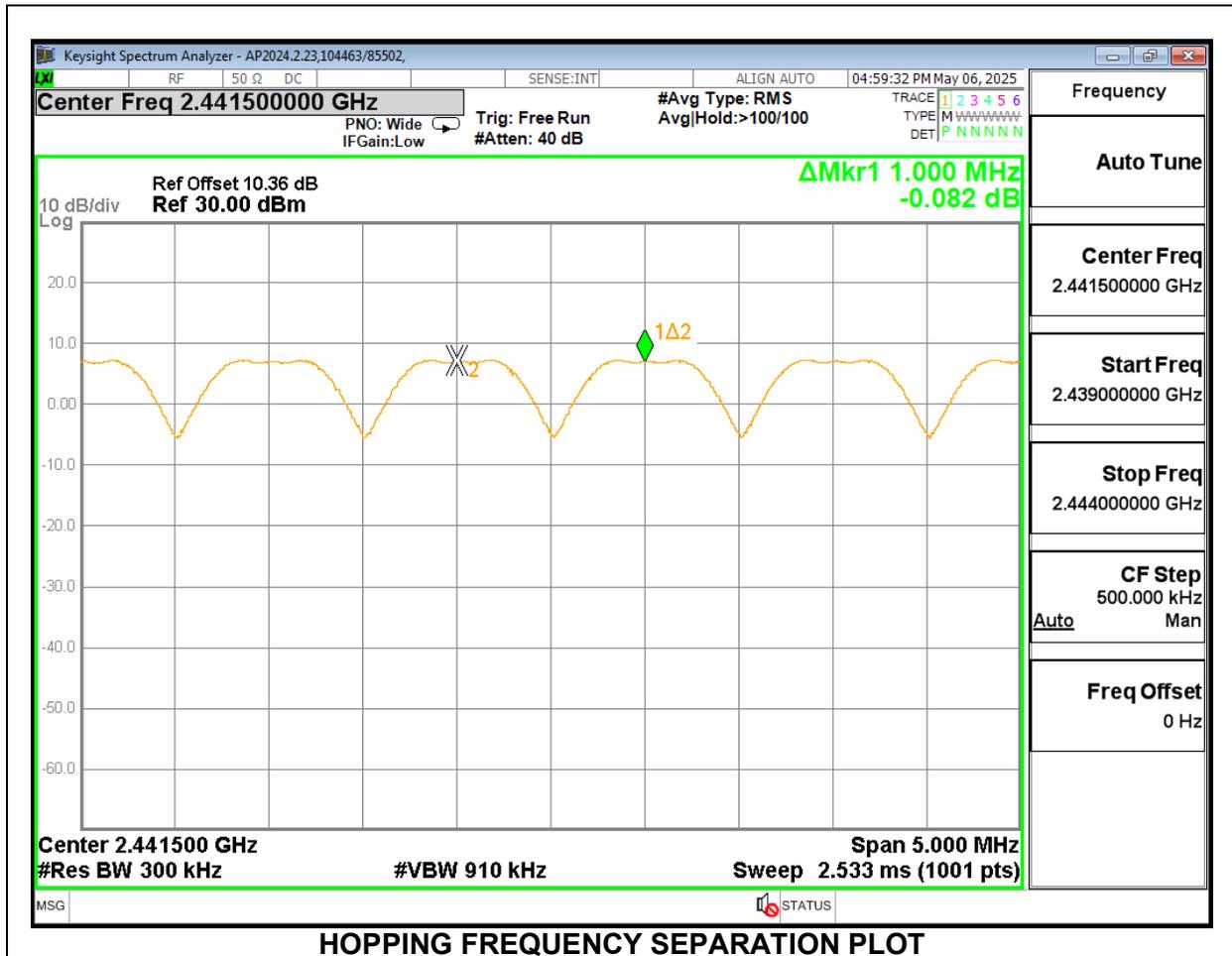
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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.

9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



$(20\text{dB BW}) \times (2/3) = (1.028 \text{ MHz}) \times (2/3) = 0.685 \text{ MHz}$
 $0.685 \text{ MHz} < 1 \text{ MHz}$

9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)
RSS-247 (6.2.3.1) (b)

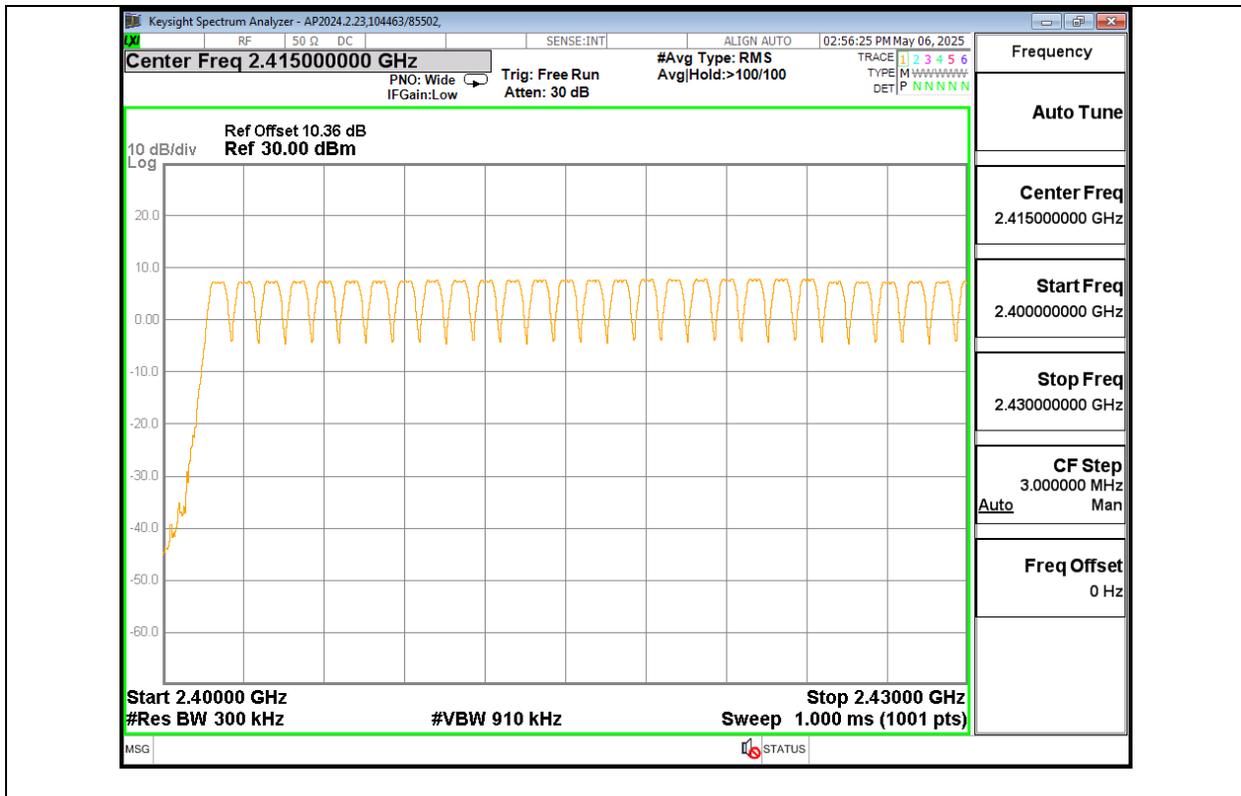
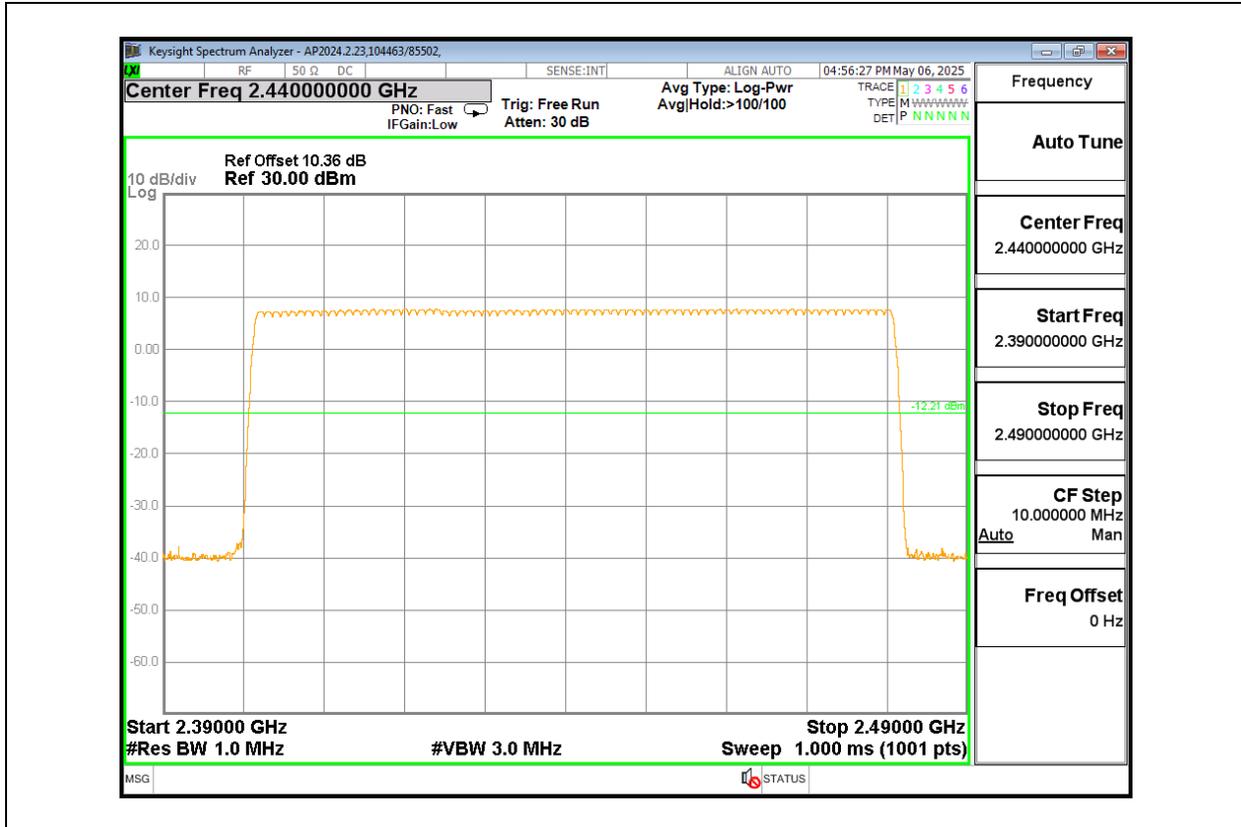
Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

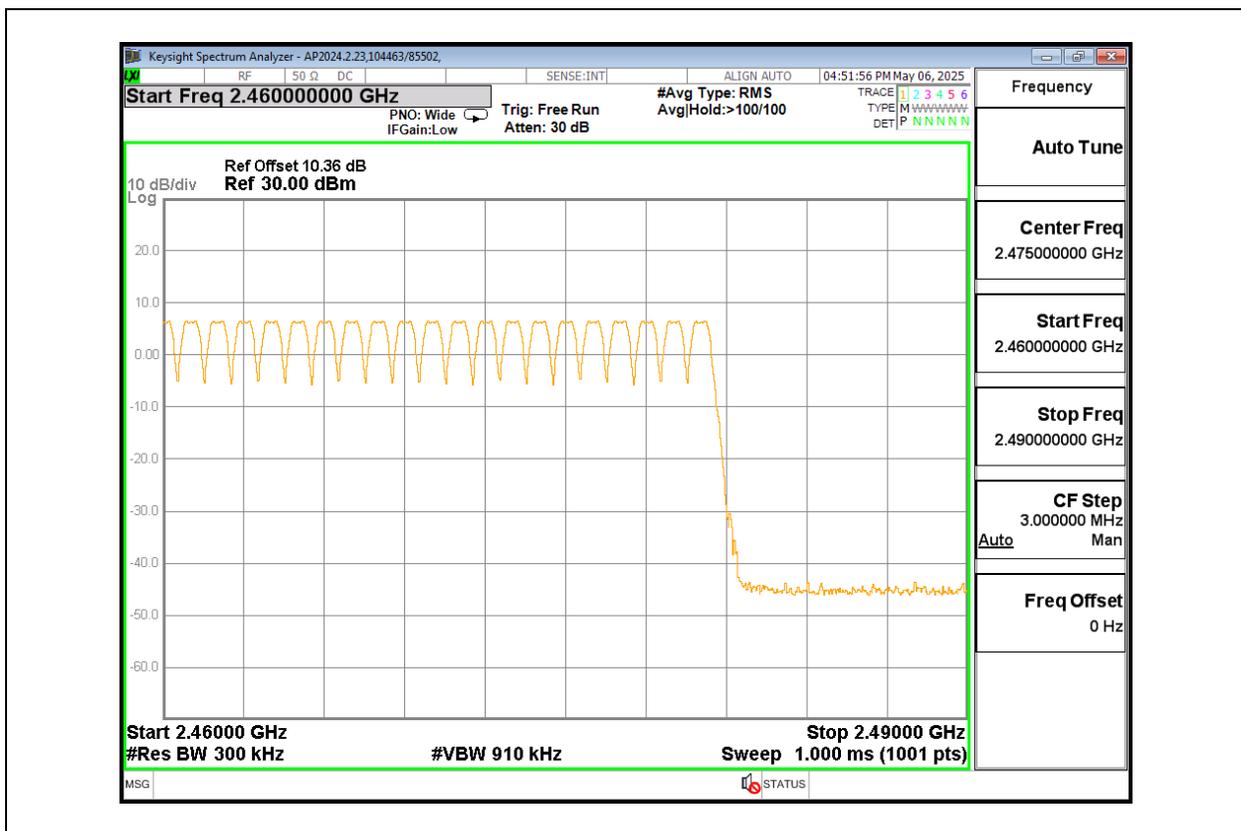
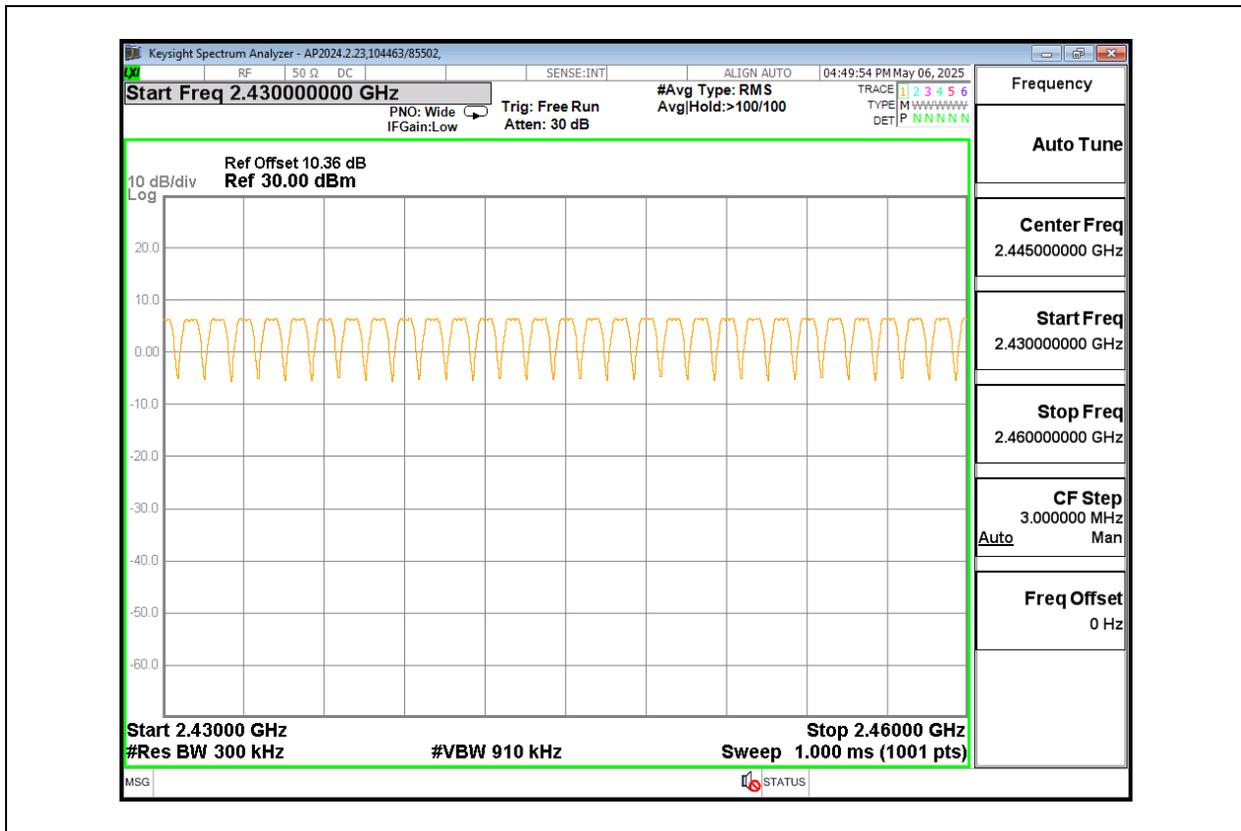
TEST PROCEDURE

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.

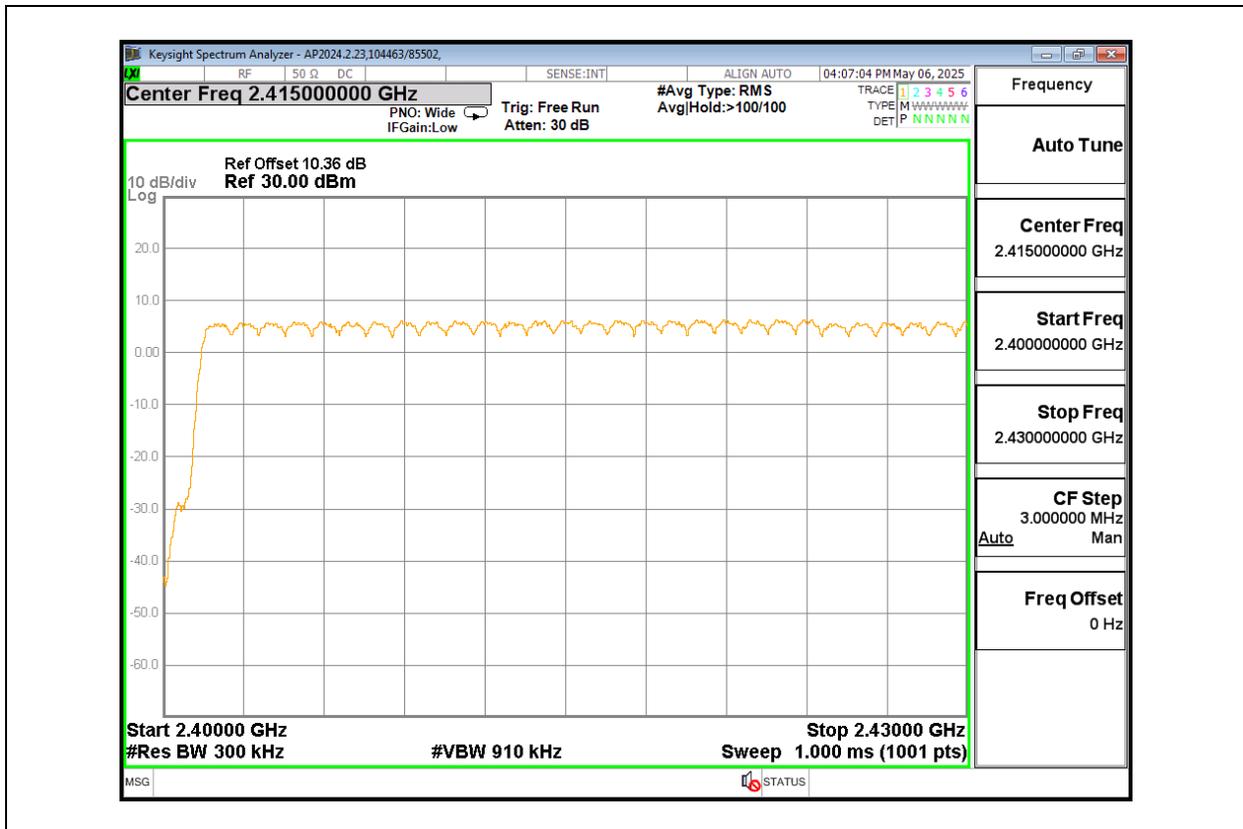
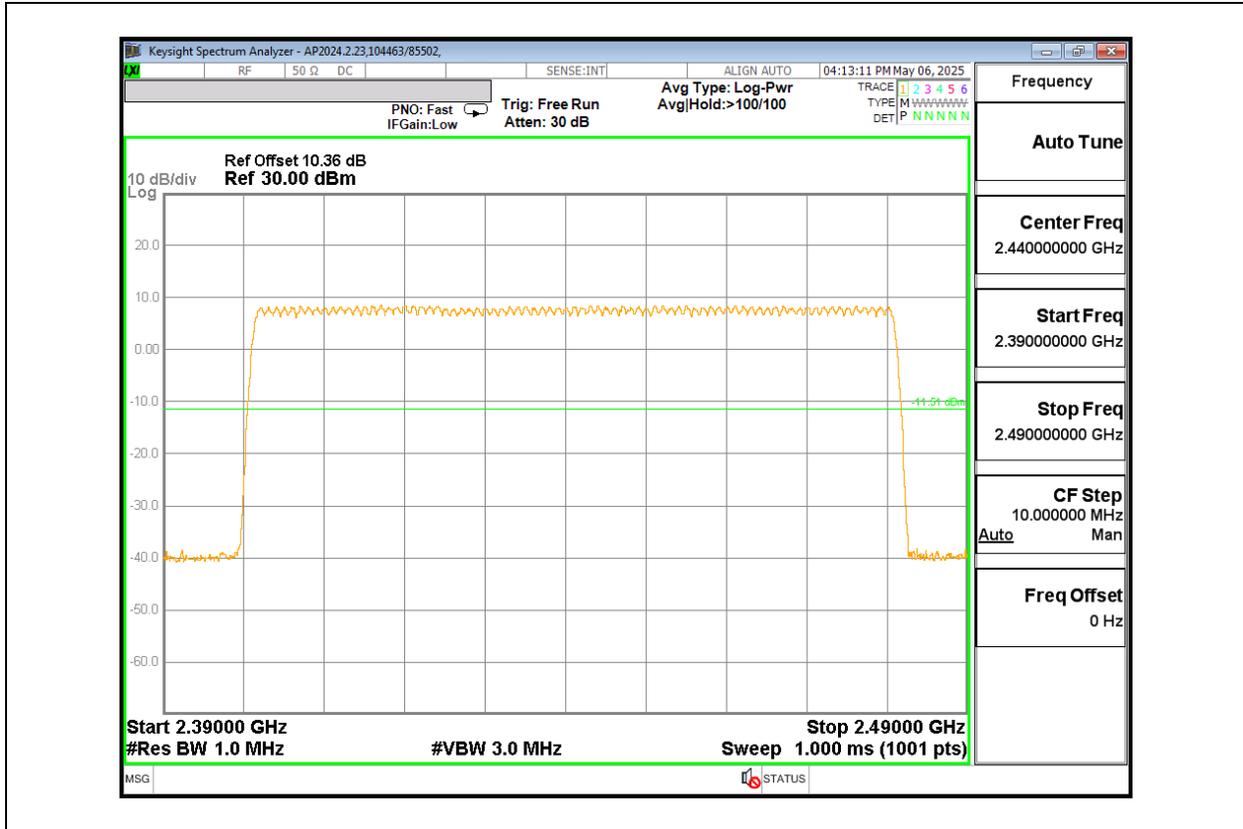
Normal Mode: 79 Channels Observed

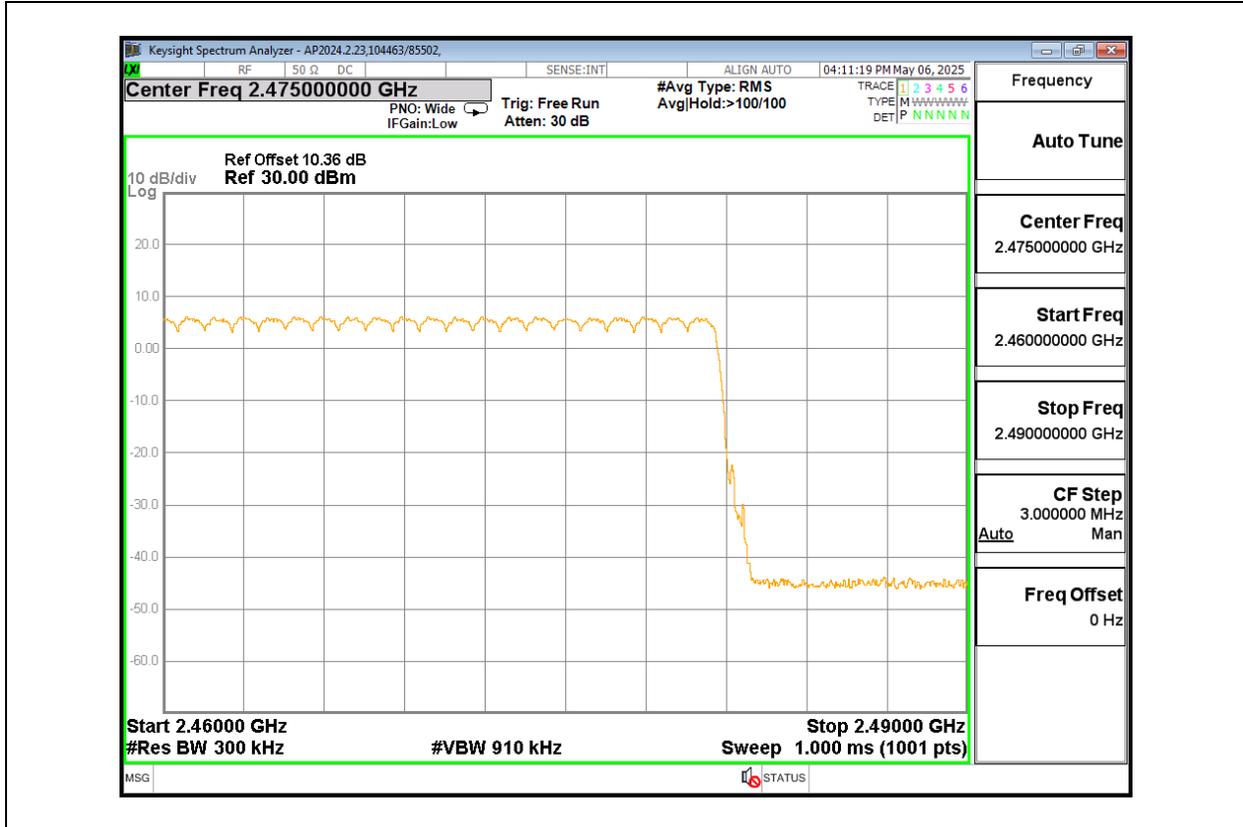
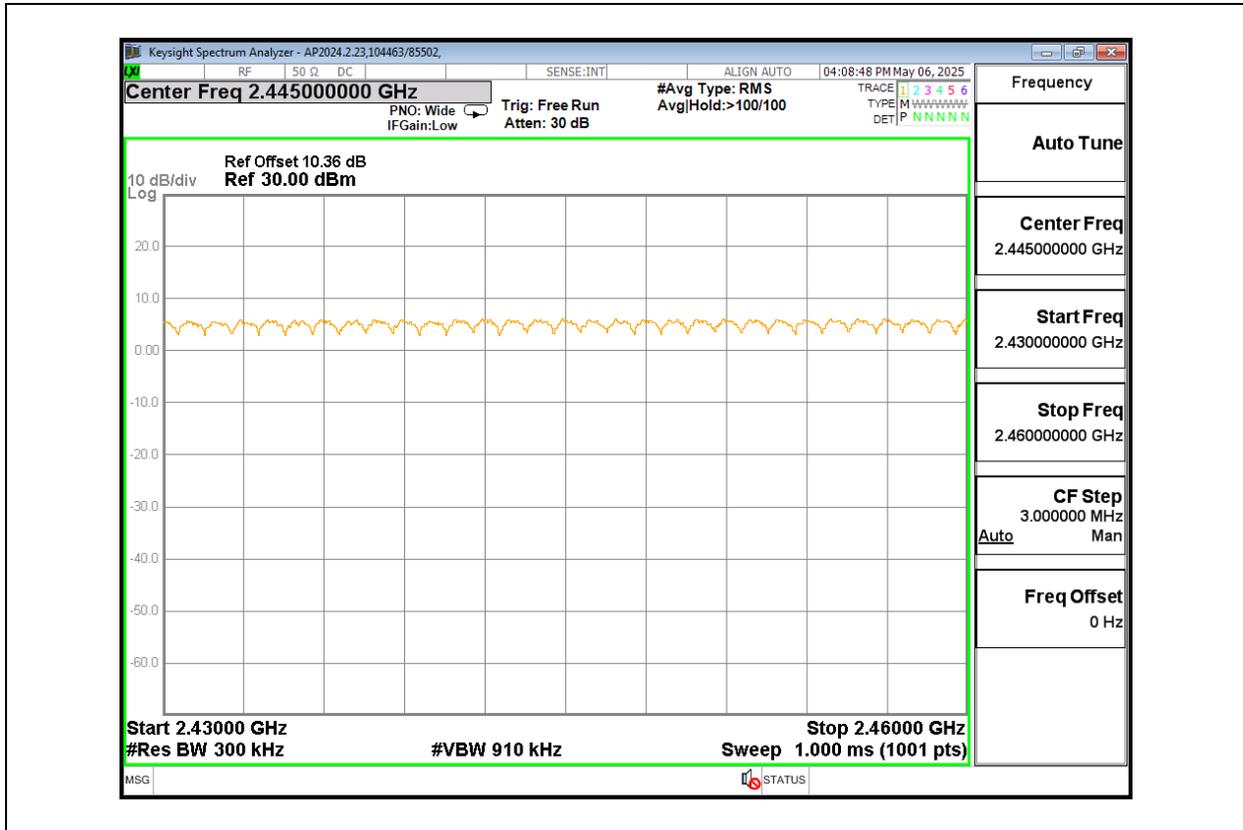
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



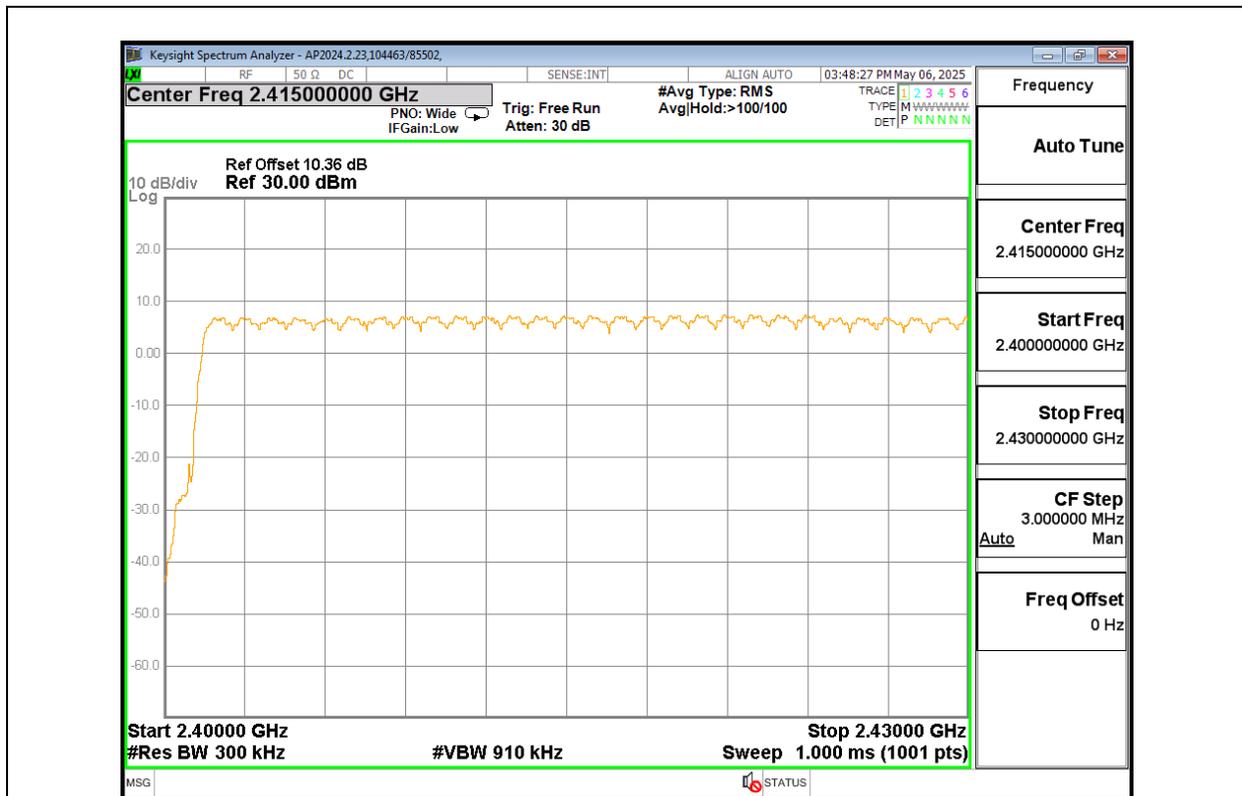
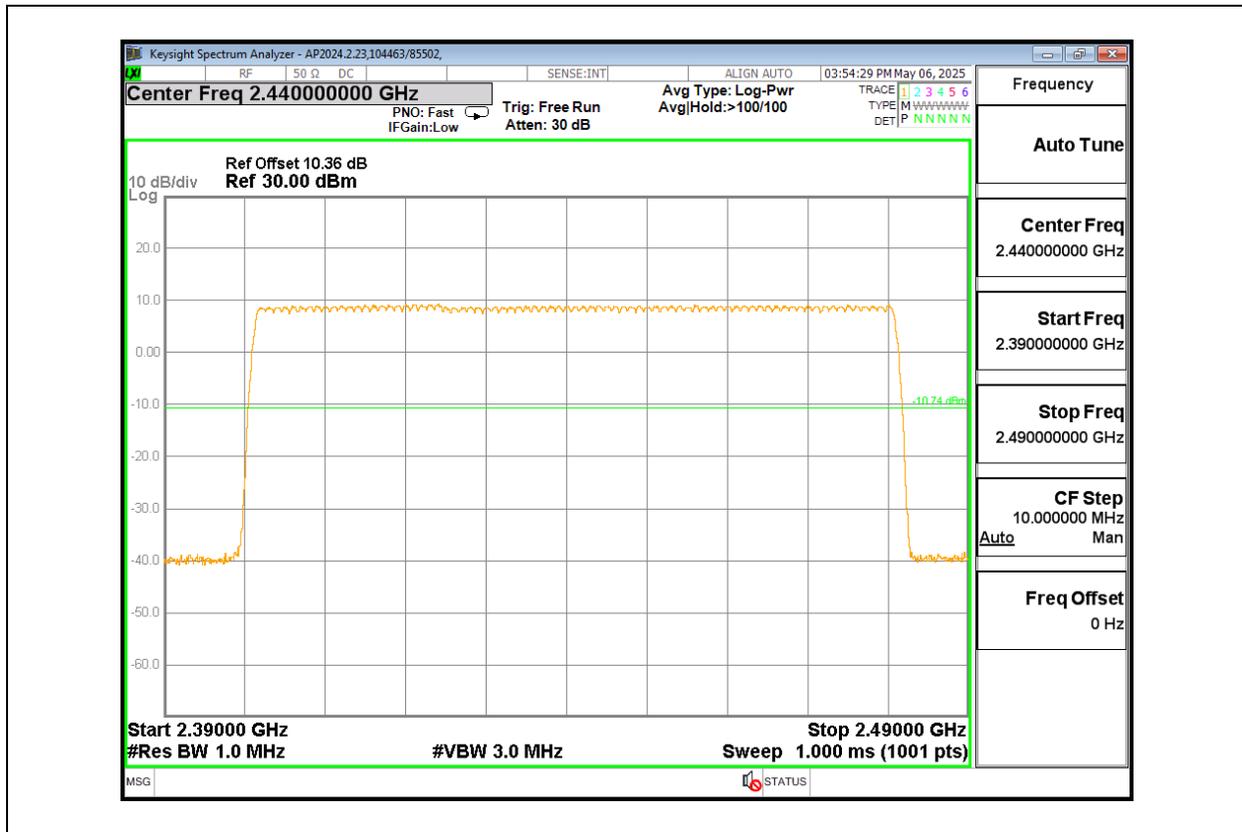


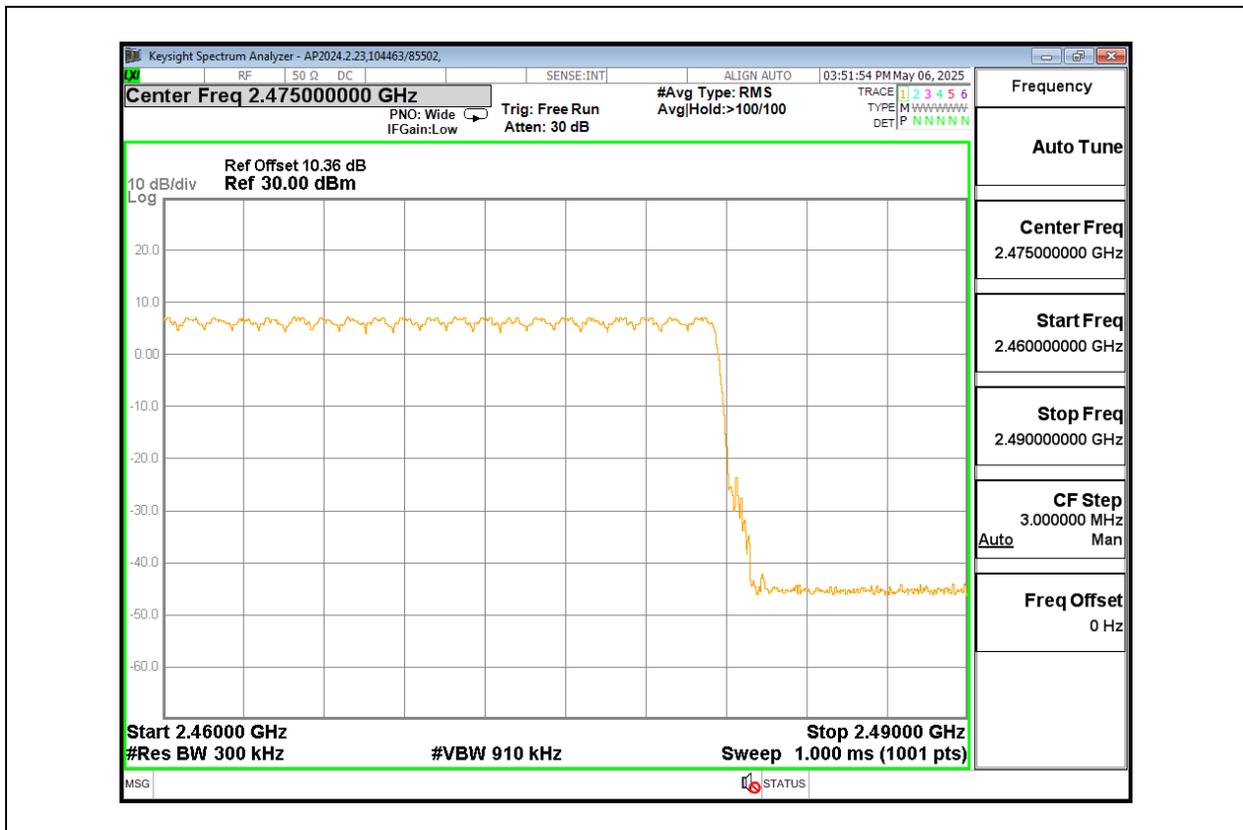
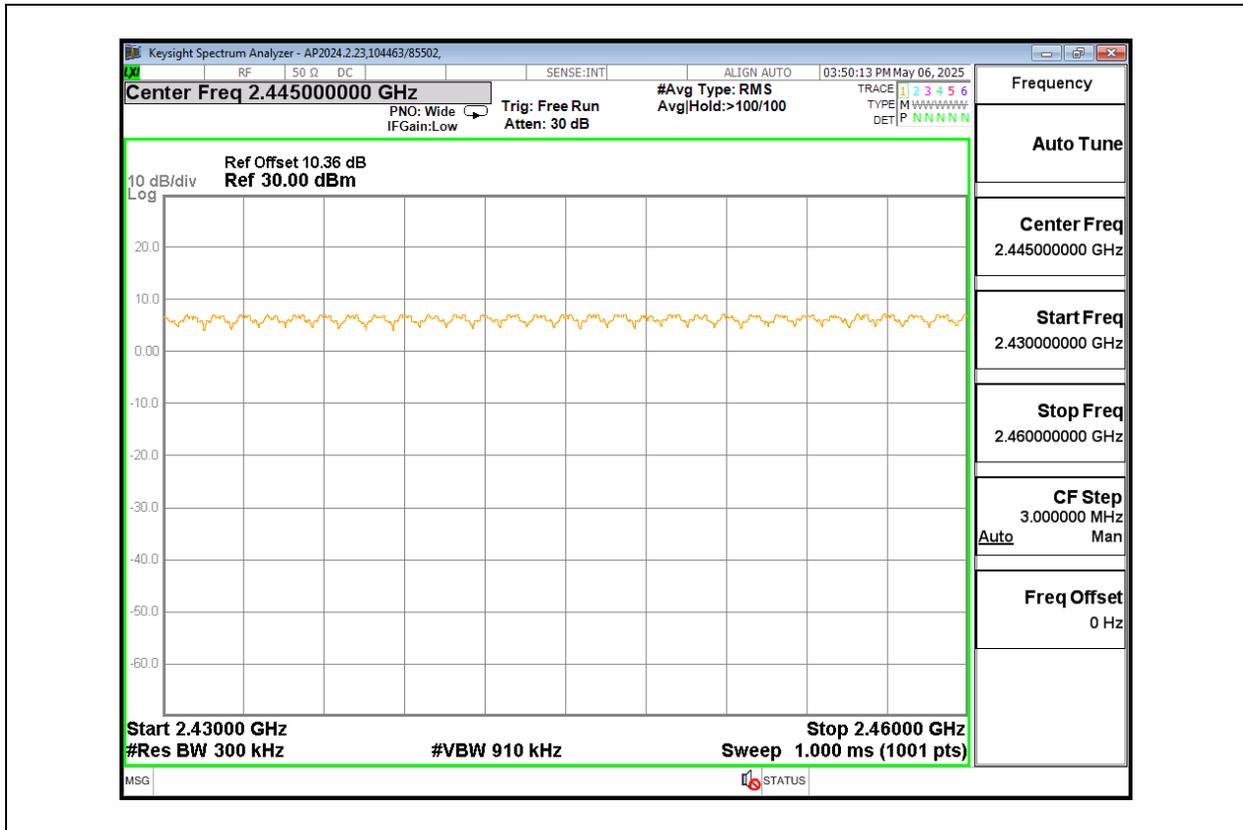
9.4.2. BLUETOOTH BASIC DATA RATE QPSK MODULATION





9.4.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION





9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)
 RSS-247 (6.2.3.1) (b)

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

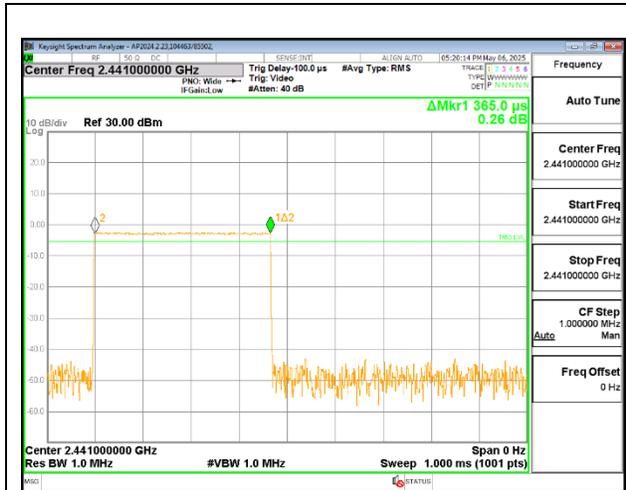
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

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

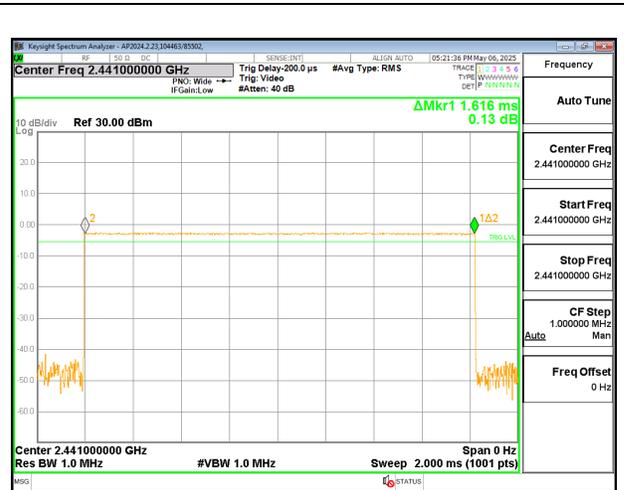
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{ pulse width}$.

9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

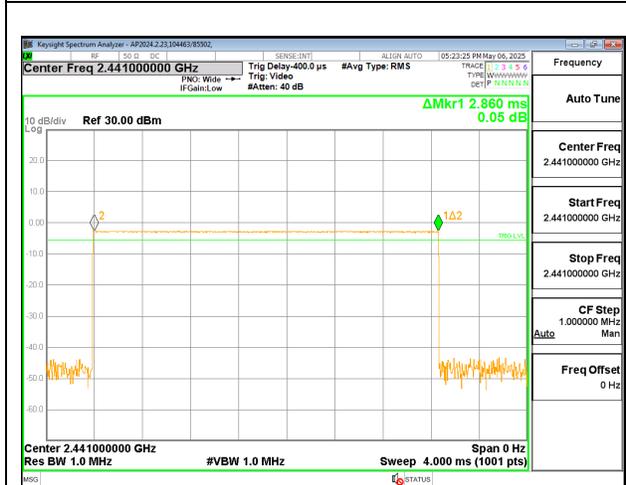
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.365	32	0.1168	0.4	-0.2832
DH3	1.616	13	0.2101	0.4	-0.1899
DH5	2.86	13	0.3718	0.4	-0.0282
GFSK AFH Mode					
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.365	8	0.02920	0.4	-0.3708
DH3	1.616	3.25	0.05252	0.4	-0.3475
DH5	2.86	3.25	0.09295	0.4	-0.3071



PULSE WIDTH – DH1



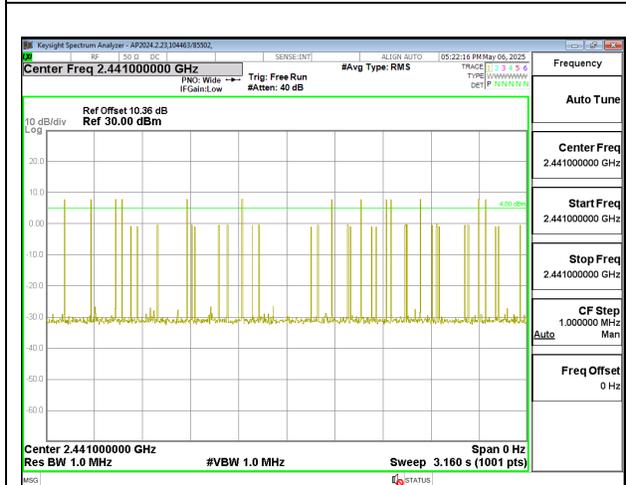
PULSE WIDTH – DH3



PULSE WIDTH – DH5



**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH1**



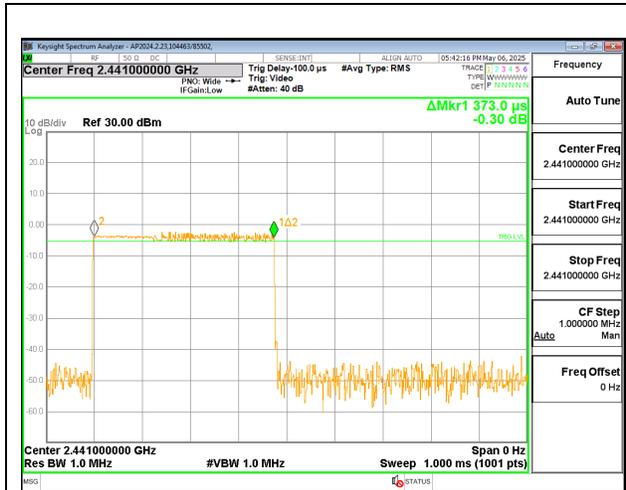
**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH3**



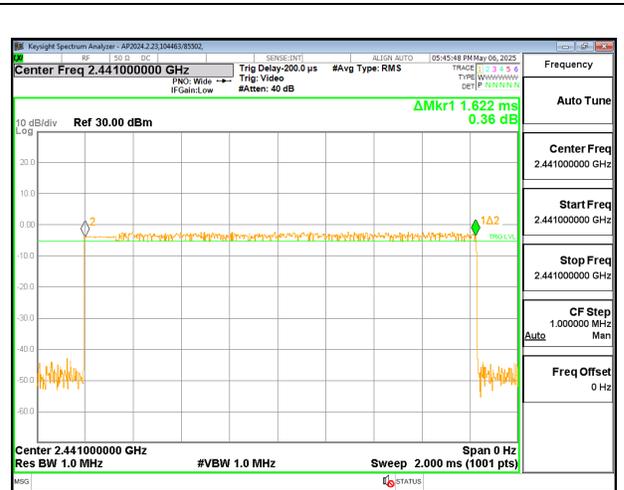
**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH5**

9.5.2. BLUETOOTH BASIC DATA RATE QPSK MODULATION

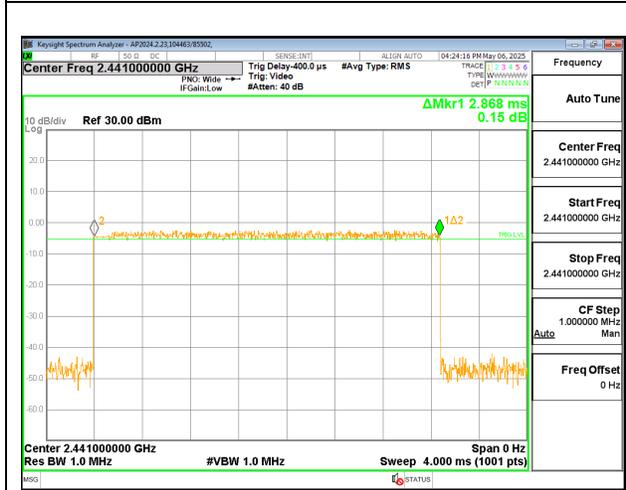
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.373	30	0.1119	0.4	-0.2881
DH3	1.622	14	0.2271	0.4	-0.1729
DH5	2.868	11	0.3155	0.4	-0.0845
GFSK AFH Mode					
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.373	7.5	0.02798	0.4	-0.3720
DH3	1.622	3.5	0.05677	0.4	-0.3432
DH5	2.868	2.75	0.07887	0.4	-0.3211



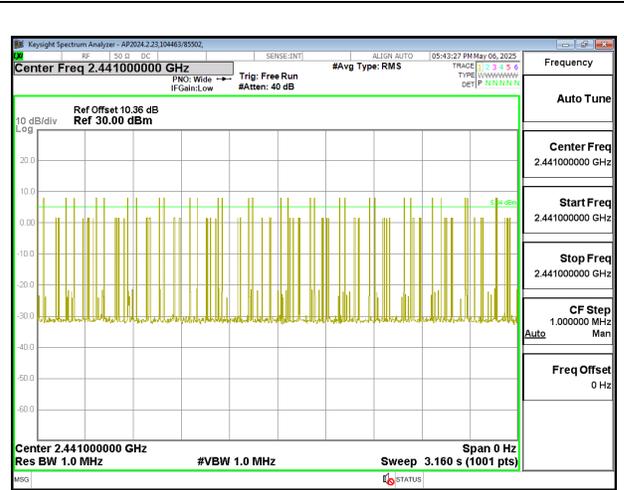
PULSE WIDTH – DH1



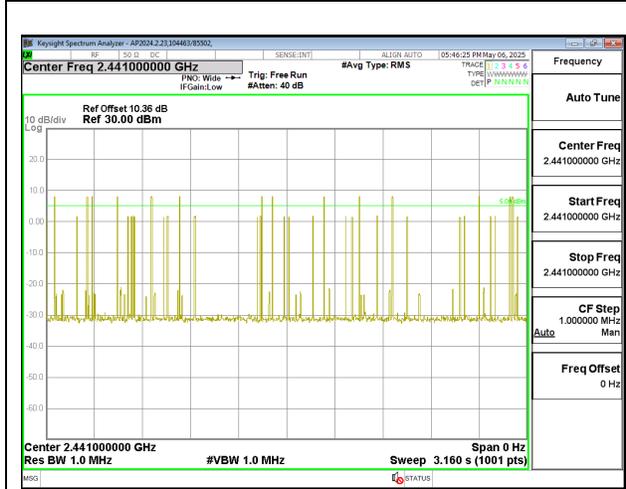
PULSE WIDTH – DH3



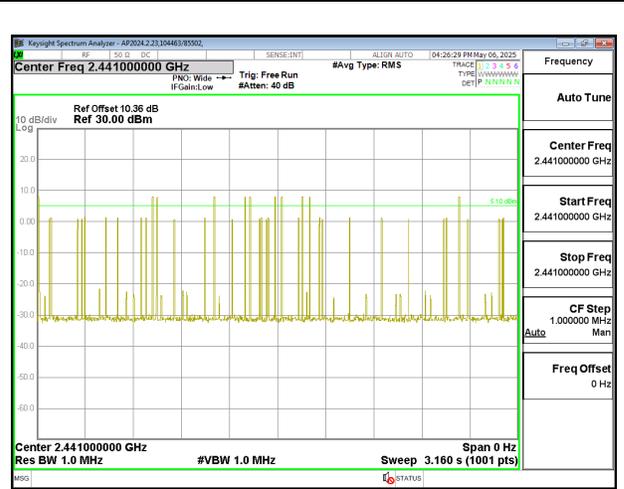
PULSE WIDTH – DH5



**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH1**



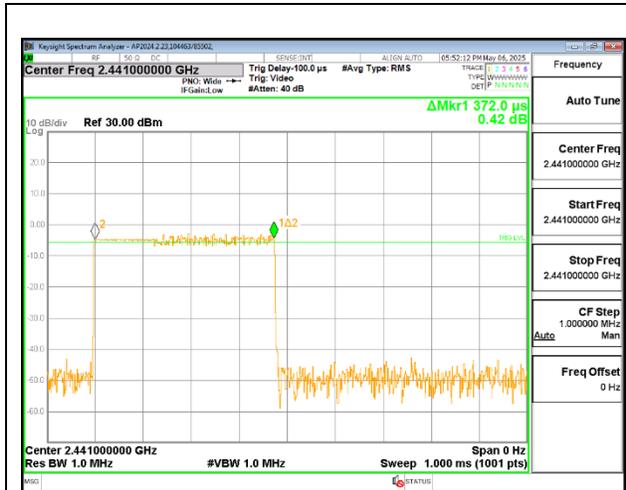
**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH3**



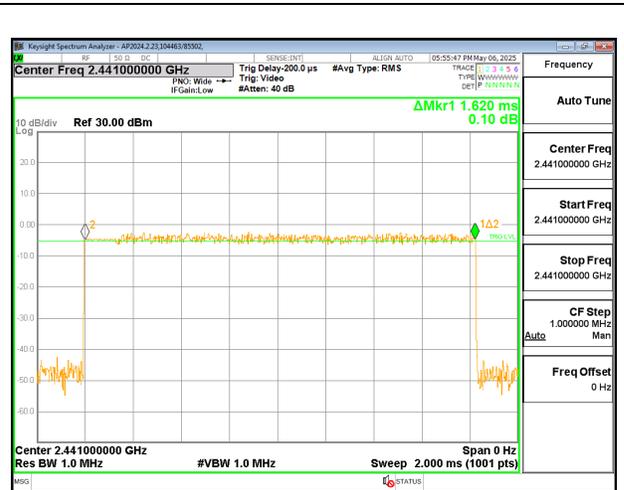
**NUMBER OF PULSES IN 3.16 SECOND
 OBSERVATION PERIOD – DH5**

9.5.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

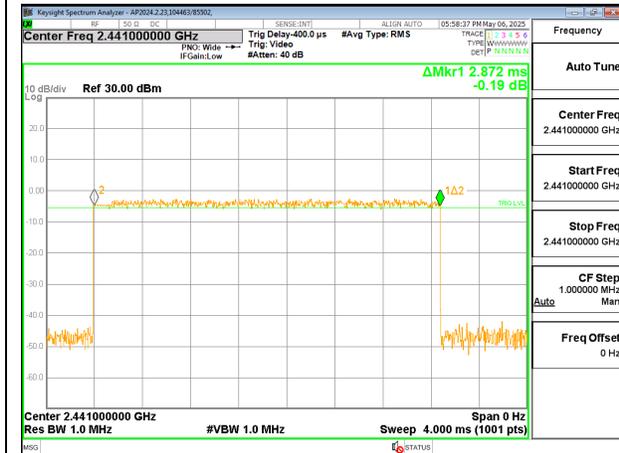
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
DH1	0.372	32	0.1190	0.4	-0.2810
DH3	1.62	13	0.2106	0.4	-0.1894
DH5	2.872	13	0.3734	0.4	-0.0266
8PSK AFH Mode					
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.372	8	0.02976	0.4	-0.3702
DH3	1.62	3.25	0.05265	0.4	-0.3474
DH5	2.872	3.25	0.09334	0.4	-0.3067



PULSE WIDTH – DH1



PULSE WIDTH – DH3



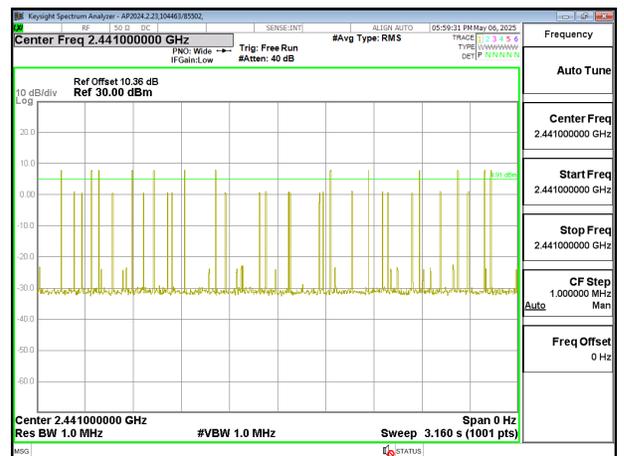
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)
RSS-247 (6.2.3.2) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm. 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.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

TEST PROCEDURE

Measurements performed using a wideband gated RF power meter.

The cable assembly insertion loss of 11.18 dB (including 0.80 dB cable loss, 0.71 dB test cable loss, and a 9.67 dB pad) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using SMA cable connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.

9.6.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Tested By:	104463/85502
Date:	2025-05-14

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.3	30	-21.7
Middle	2441	8.95	30	-21.05
High	2480	9.93	30	-20.07

9.6.2. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

Tested By:	104463/85502
Date:	2025-05-14

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.952	30	-21.048
Middle	2441	9.59	30	-20.41
High	2480	9.78	30	-20.22

9.6.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Tested By:	104463/85502
Date:	2025-05-14

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.76	20.969	-13.209
Middle	2441	8.45	20.969	-12.519
High	2480	8.54	20.969	-12.429

9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements performed using a wideband gated RF power meter.

The cable assembly insertion loss of 11.18 dB (including 0.80 dB cable loss, 0.71 dB test cable loss, and a 9.67 dB pad) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using SMA cable connected to a power meter via wideband power sensor. Gated average output power was read directly from power meter.

9.7.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Tested By:	104463/85502
Date	2025-05-14

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.631
Middle	2441	8.252
High	2480	9.191

9.7.2. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

Tested By:	104463/85502
Date	2025-05-14

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.218
Middle	2441	8.932
High	2480	8.938

9.7.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Tested By:	104463/85502
Date	2025-05-14

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.913
Middle	2441	7.657
High	2480	7.704

9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)
RSS-247 6.6

Limit = -20 dBc

TEST PROCEDURE

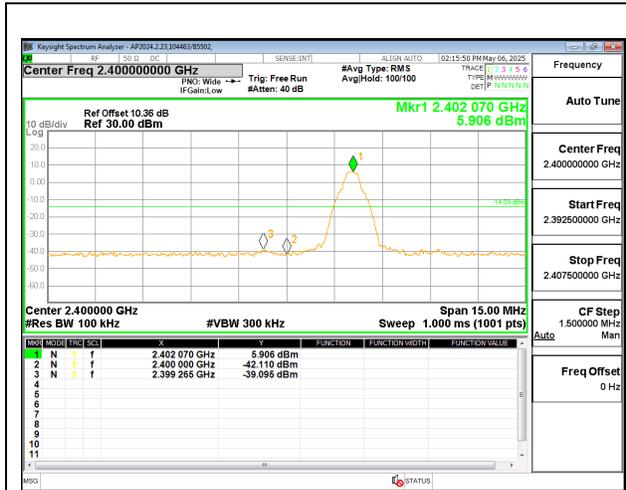
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

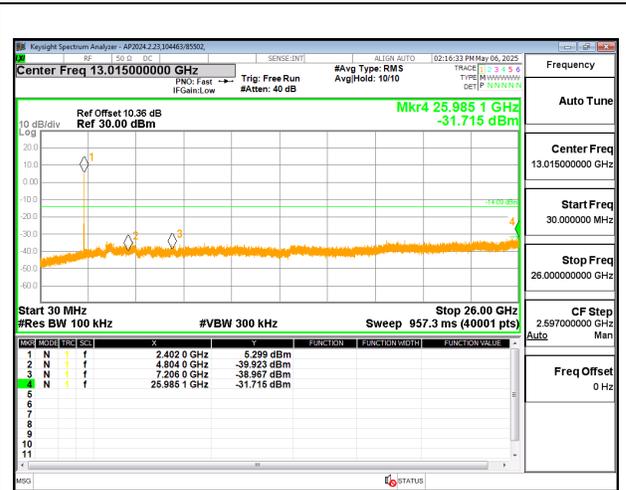
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping and hopping modes.

9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

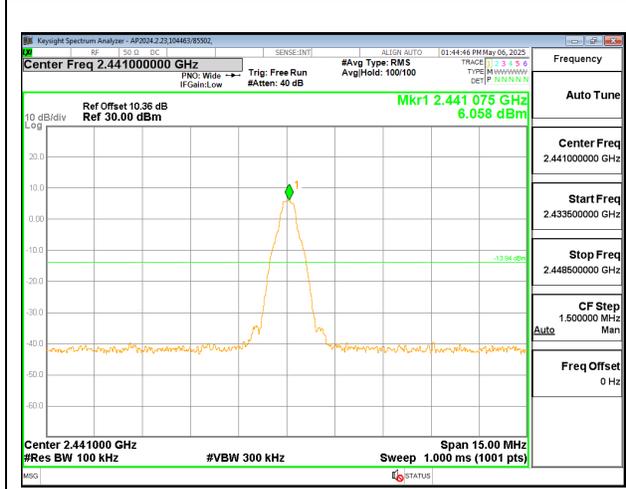
SPURIOUS EMISSIONS, NON-HOPPING



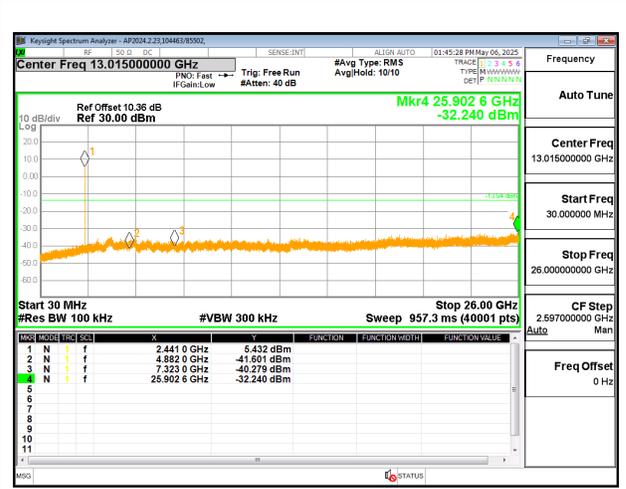
LOW CHANNEL BANDEDGE



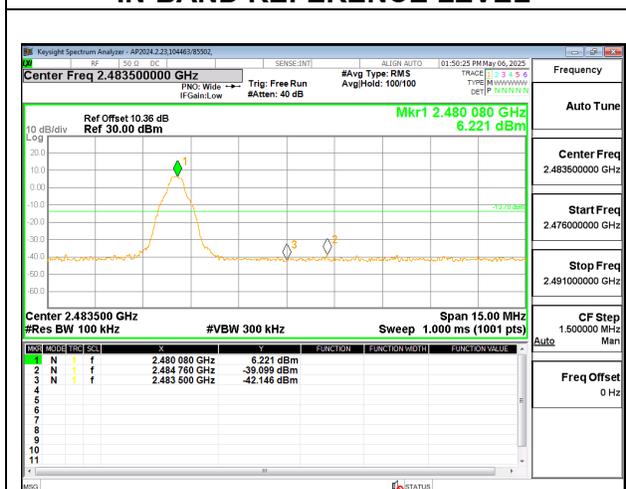
OUT-OF-BAND LOW CHANNEL



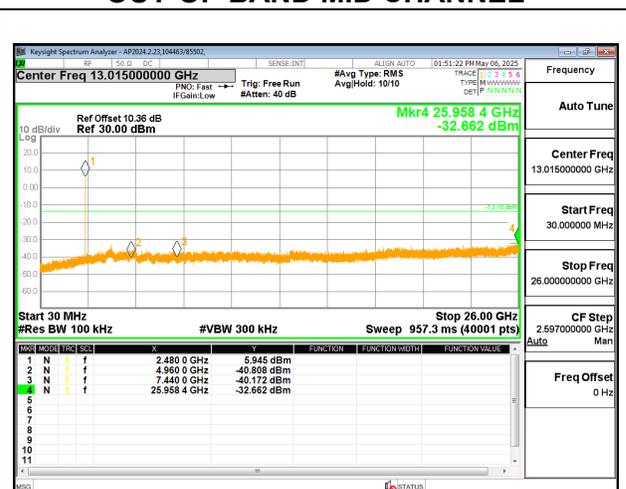
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

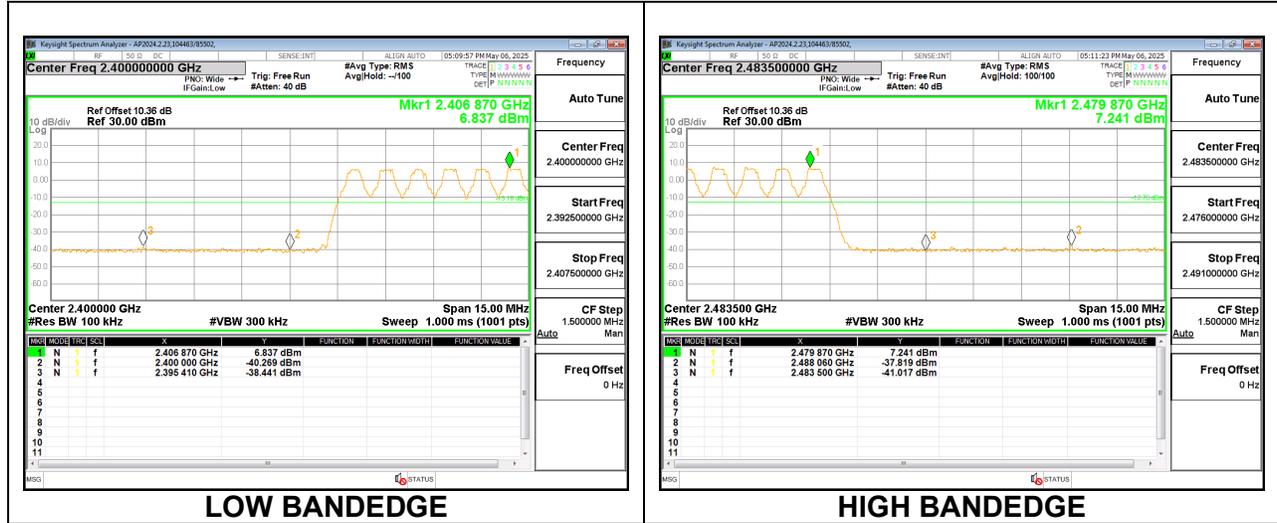


HIGH CHANNEL BANDEDGE



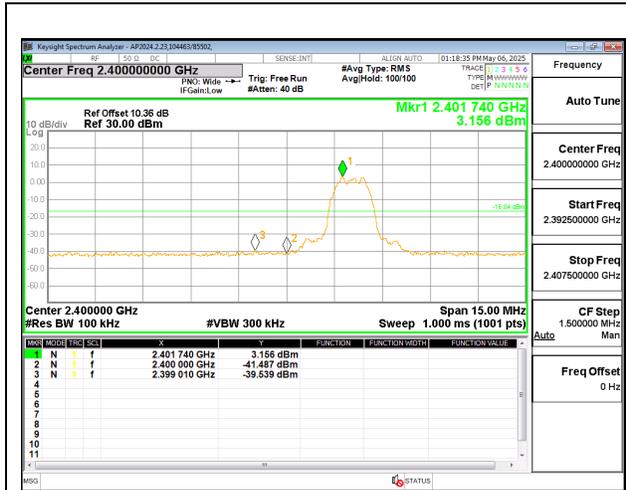
OUT-OF-BAND HIGH CHANNEL

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

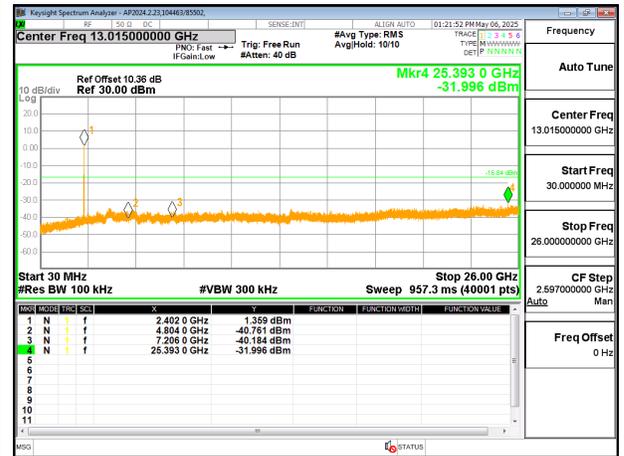


9.8.2. BLUETOOTH BASIC DATA RATE QPSK MODULATION

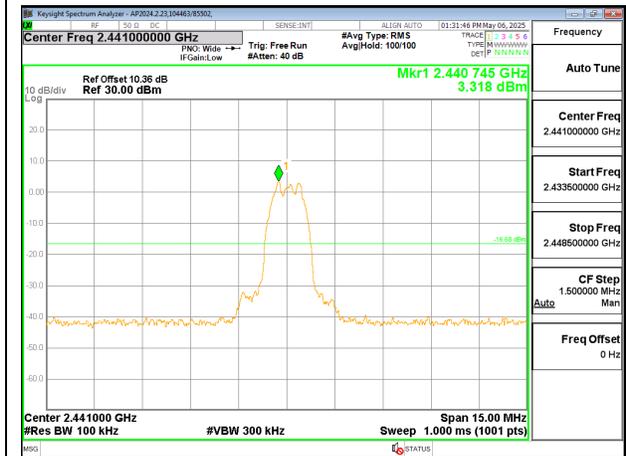
SPURIOUS EMISSIONS, NON-HOPPING



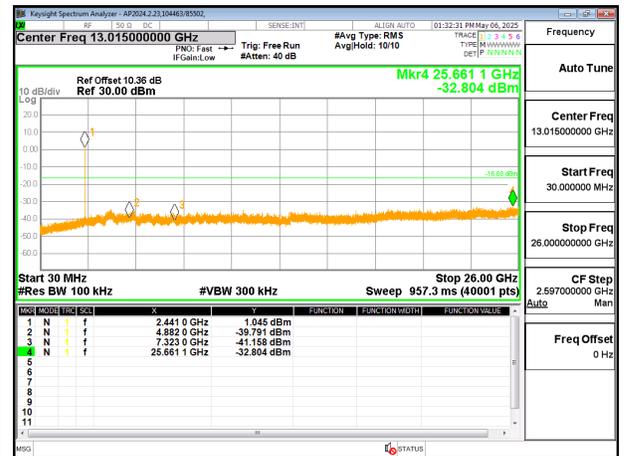
LOW CHANNEL BANDEDGE



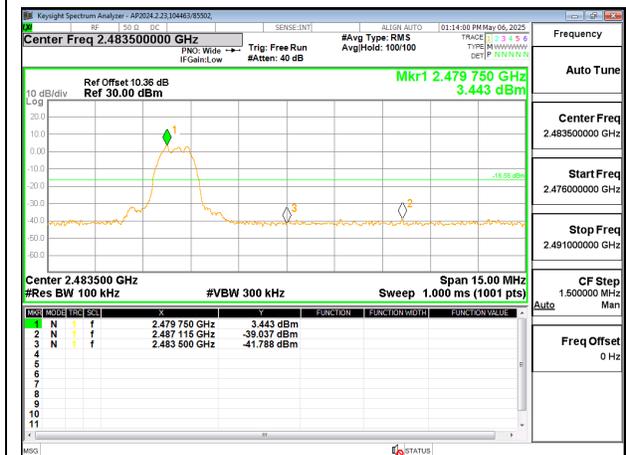
OUT-OF-BAND LOW CHANNEL



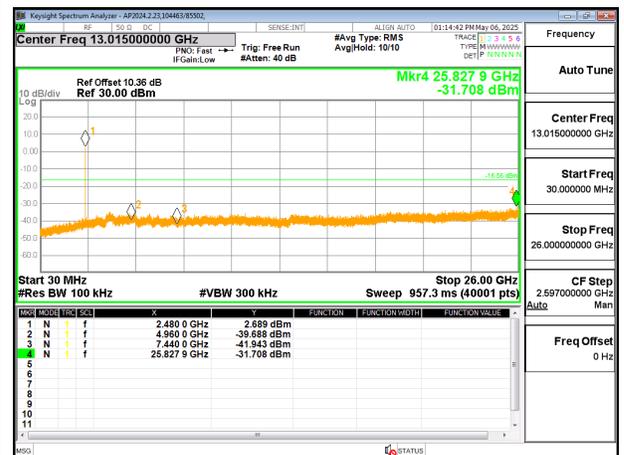
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



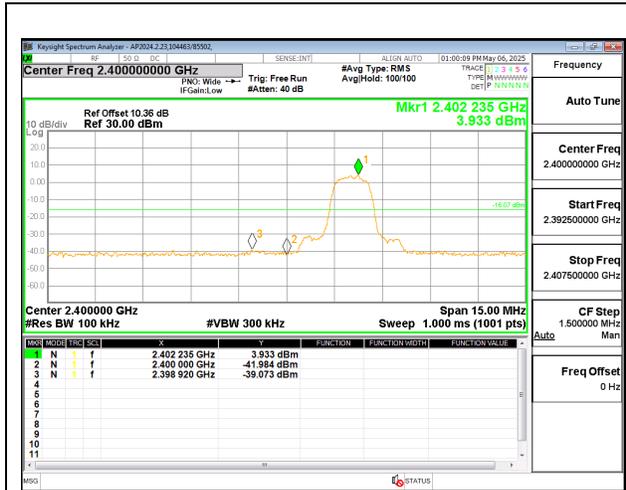
HIGH CHANNEL BANDEDGE



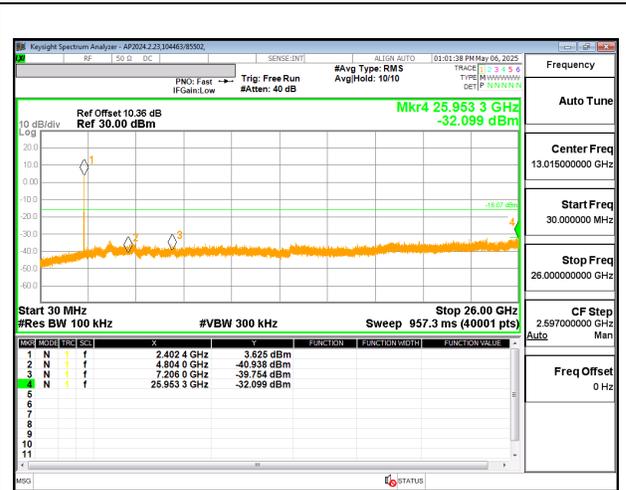
OUT-OF-BAND HIGH CHANNEL

9.8.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

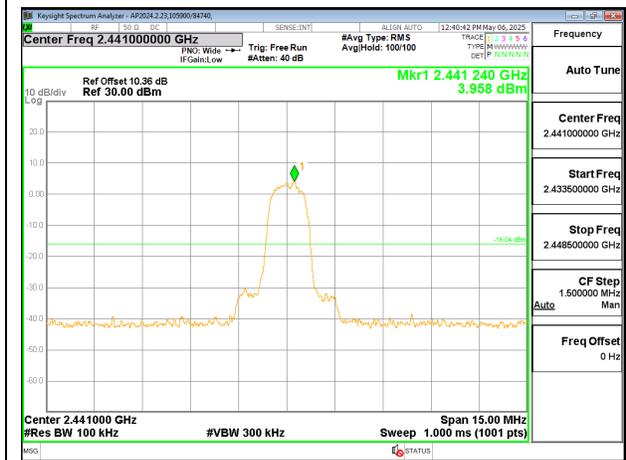
SPURIOUS EMISSIONS, NON-HOPPING



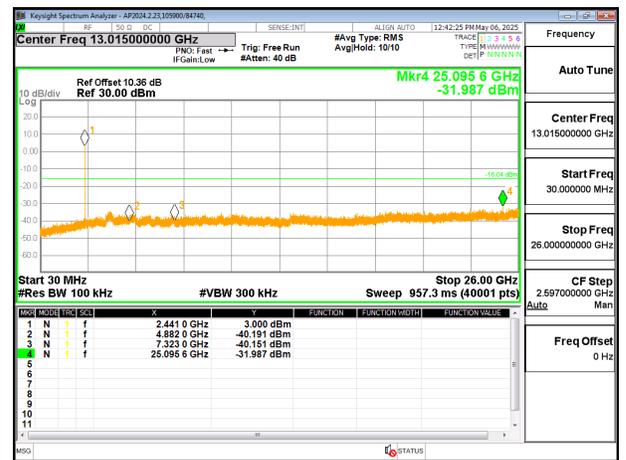
LOW CHANNEL BANDEDGE



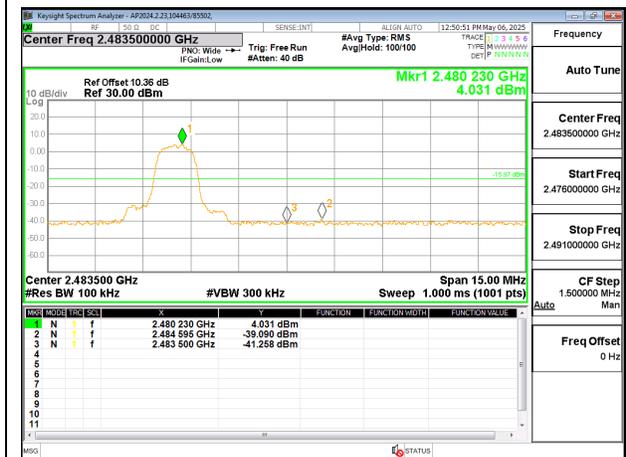
OUT-OF-BAND LOW CHANNEL



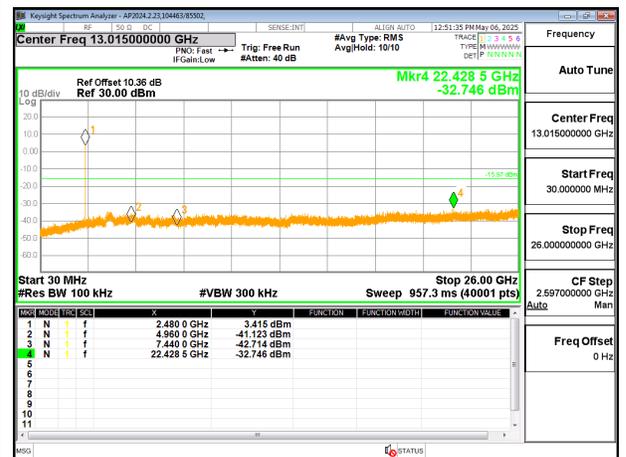
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

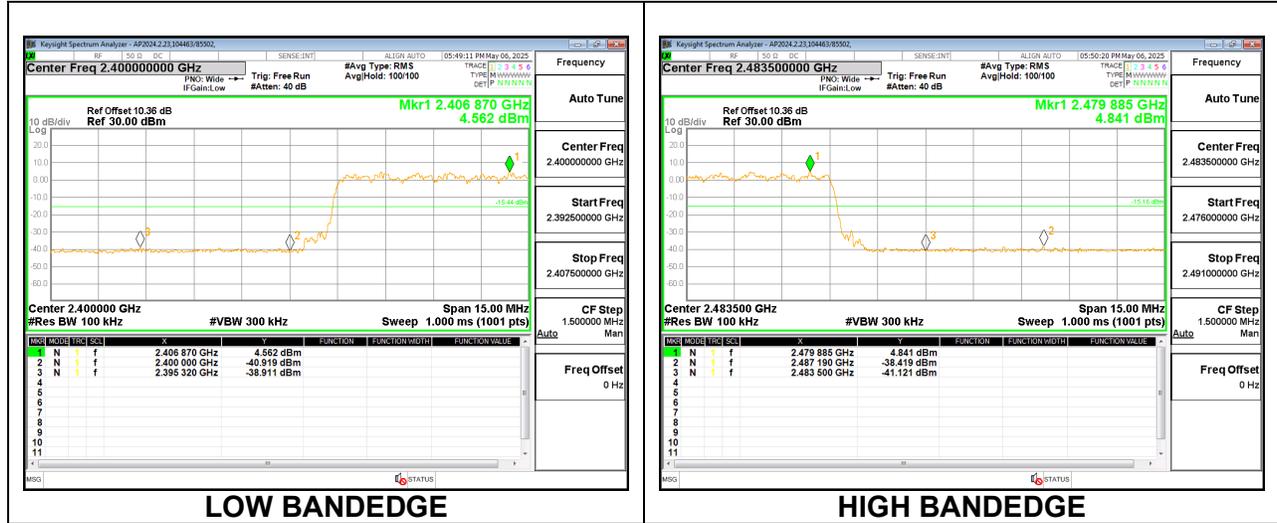


HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

IC RSS-GEN Clause 8.9 and 8.10

Frequency Range (kHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. 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 in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements. Average measurements are calculated based on KDB 558074 D01 15.247 Meas Guidance v05r02.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

KDB 414788 Open Field Site (OFS) and Chamber Correlation Justification

OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

KDB 558074 D01 15.247 Meas Guidance v05r02

Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector.

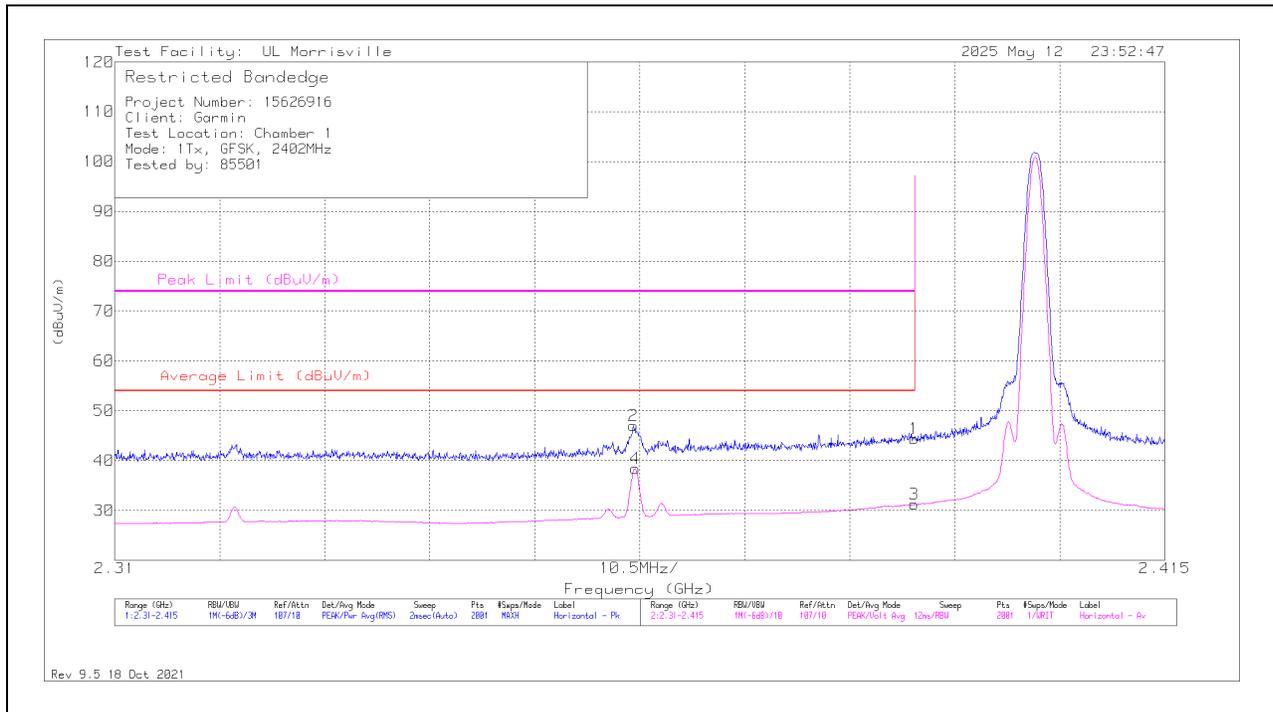
Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	*** 2.38996	36.5	Pk	31.9	-24	44.4	-	-	74	-29.6	248	195	H
2	*** 2.36187	39.58	Pk	31.9	-24.4	47.08	-	-	74	-26.92	248	195	H
3	*** 2.38996	23.31	VA1T	31.9	-24	31.21	54	-22.79	-	-	248	195	H
4	*** 2.36203	30.85	VA1T	31.9	-24.4	38.35	54	-15.65	-	-	248	195	H

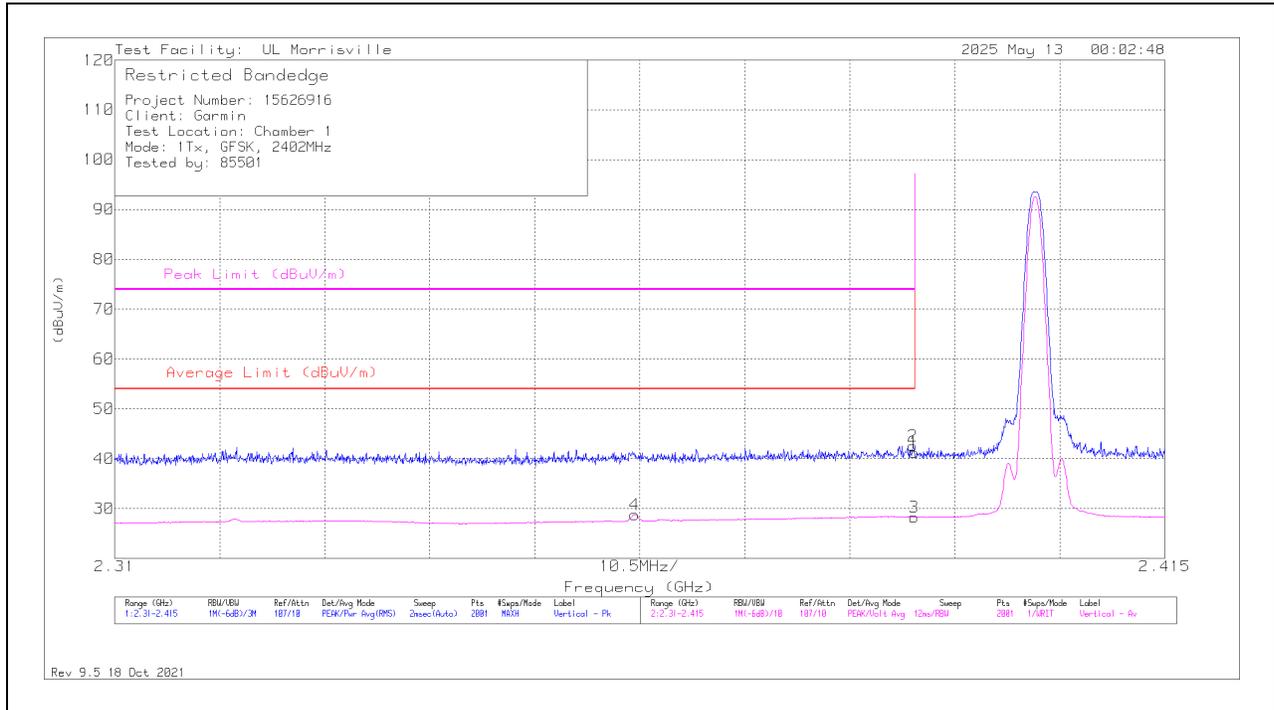
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

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

VERTICAL RESULT

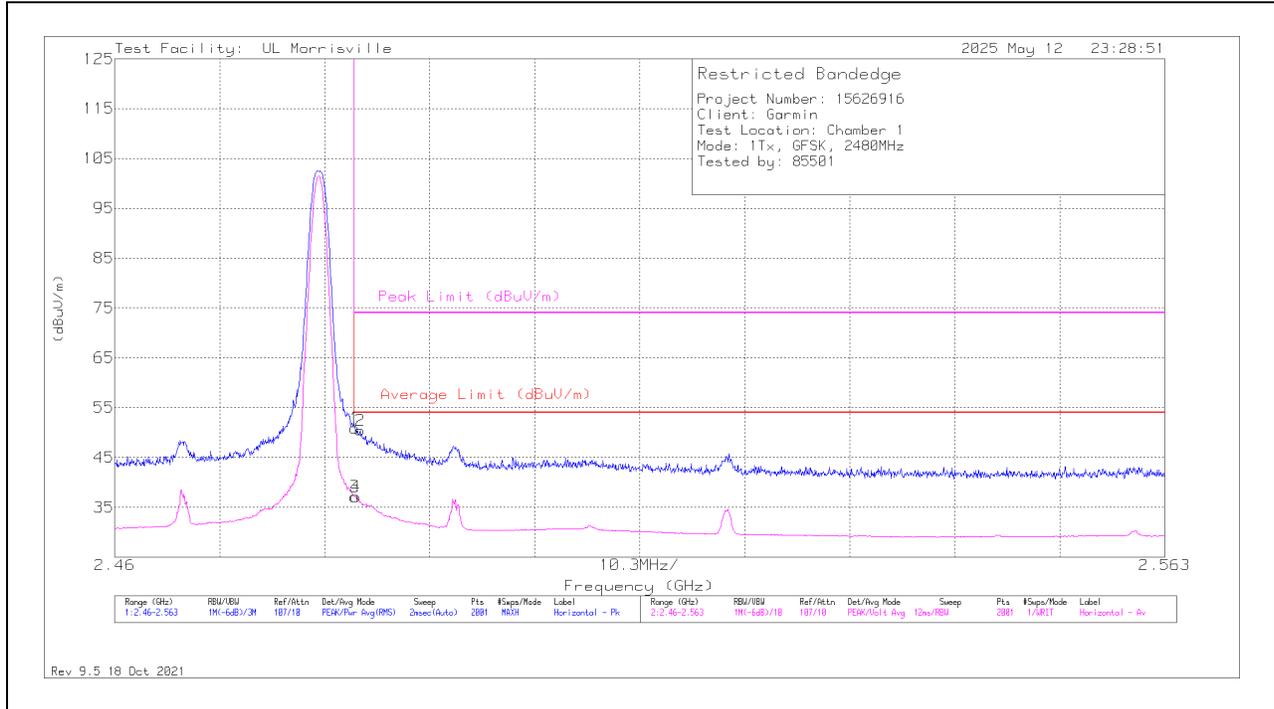


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	33.42	Pk	31.9	-24	41.32	-	-	74	-32.68	129	230	V
2	*** 2.3898	34.68	Pk	31.9	-24	42.58	-	-	74	-31.42	129	230	V
3	*** 2.38996	20.35	VA1T	31.9	-24	28.25	54	-25.75	-	-	129	230	V
4	** 2.36198	21.28	VA1T	31.9	-24.4	28.78	54	-25.22	-	-	129	230	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)

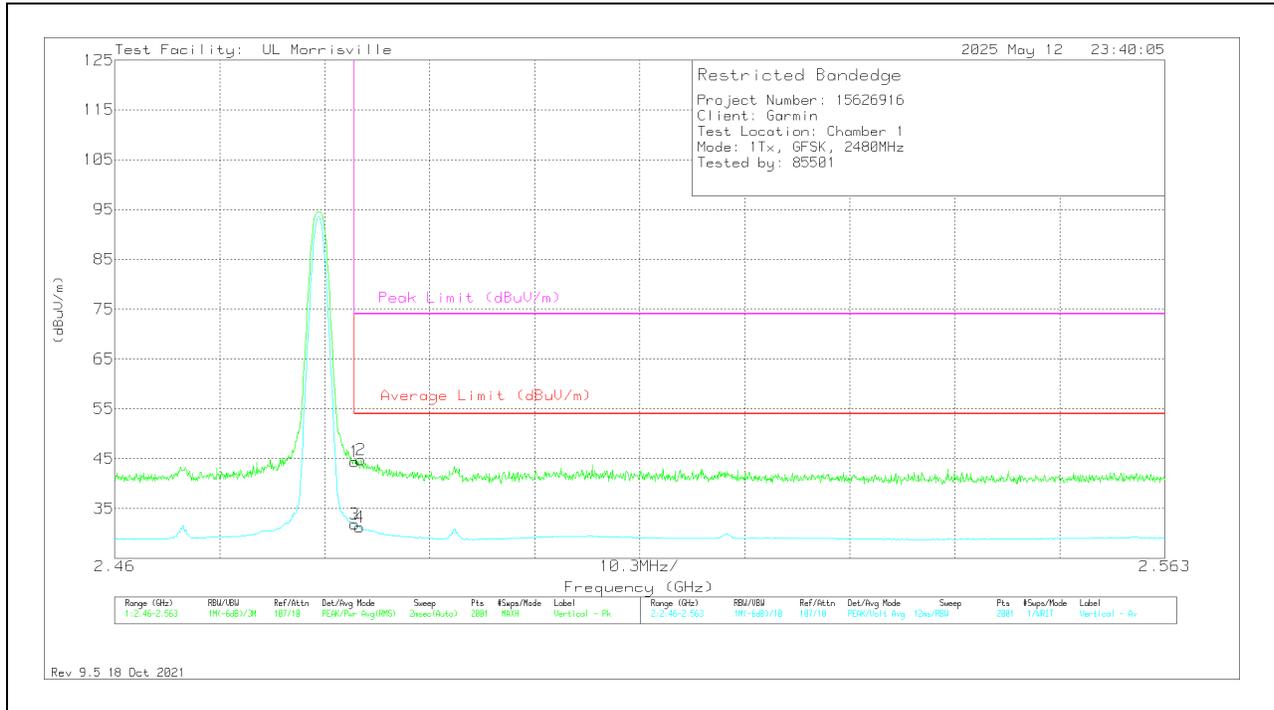
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	* ** 2.48354	42.45	Pk	32.2	-23.7	50.95	-	-	74	-23.05	244	259	H
2	* ** 2.4841	42.06	Pk	32.2	-23.8	50.46	-	-	74	-23.54	244	259	H
3	* ** 2.48354	28.67	VA1T	32.2	-23.7	37.17	54	-16.83	-	-	244	259	H
4	* ** 2.48364	28.62	VA1T	32.2	-23.7	37.12	54	-16.88	-	-	244	259	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

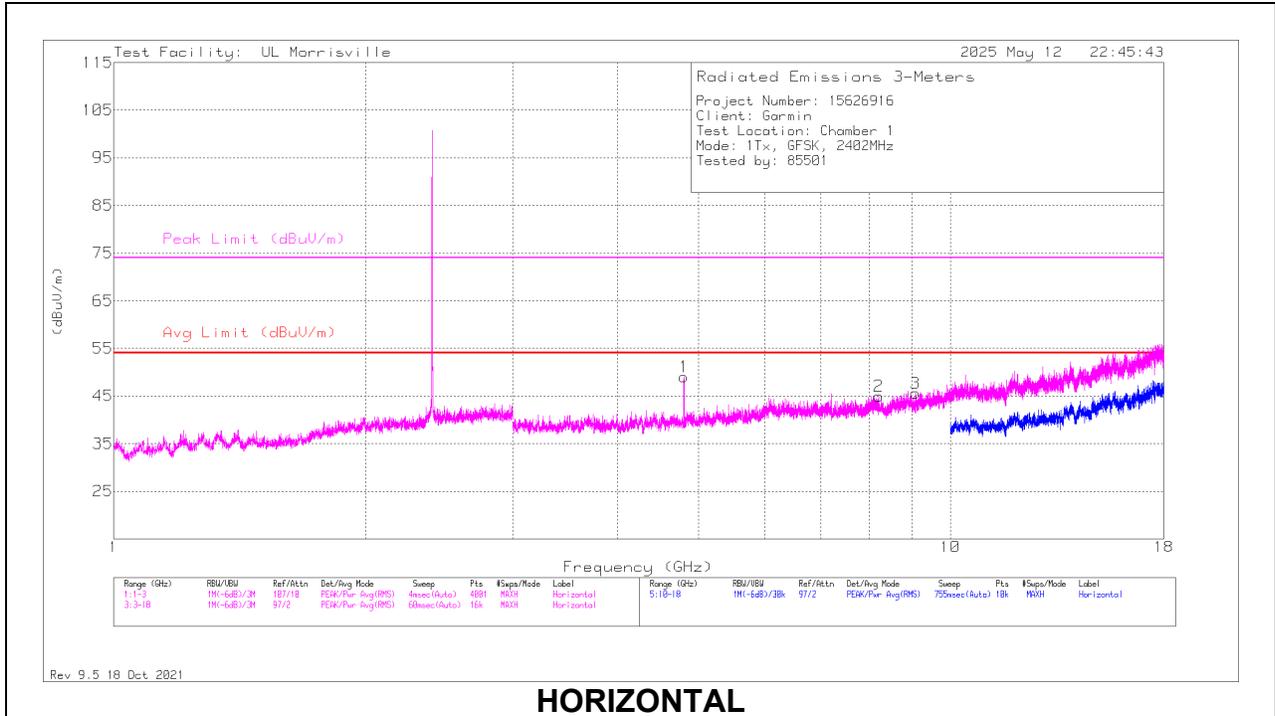


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	35.91	Pk	32.2	-23.7	44.41	-	-	74	-29.59	130	251	V
2	*** 2.48415	36.37	Pk	32.2	-23.8	44.77	-	-	74	-29.23	130	251	V
3	*** 2.48354	23.36	VA1T	32.2	-23.7	31.86	54	-22.14	-	-	130	251	V
4	*** 2.48405	22.85	VA1T	32.2	-23.8	31.25	54	-22.75	-	-	130	251	V

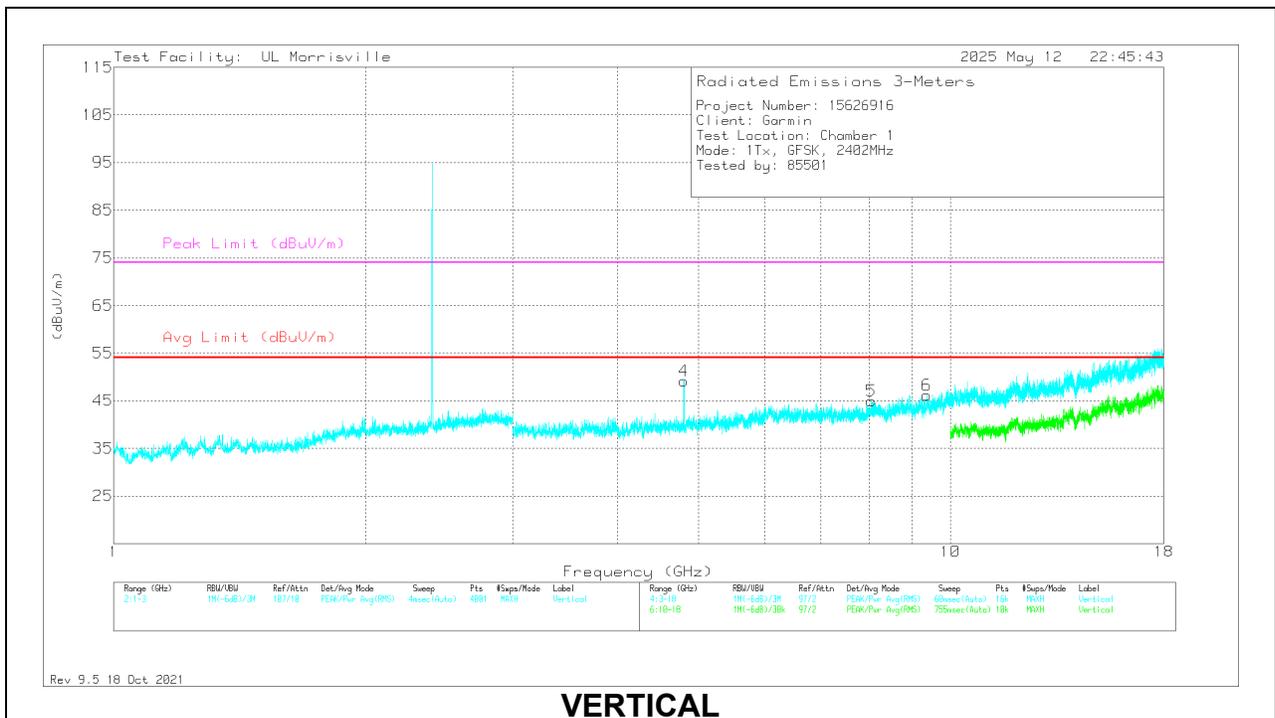
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL

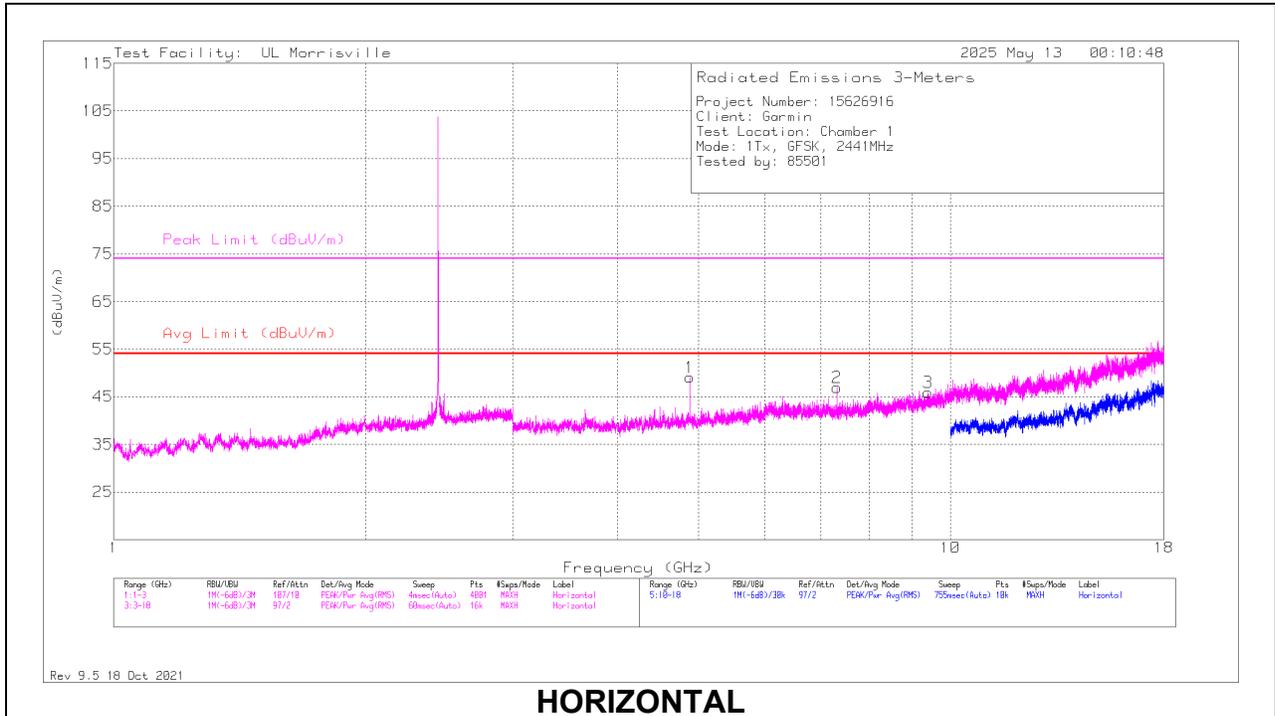


VERTICAL

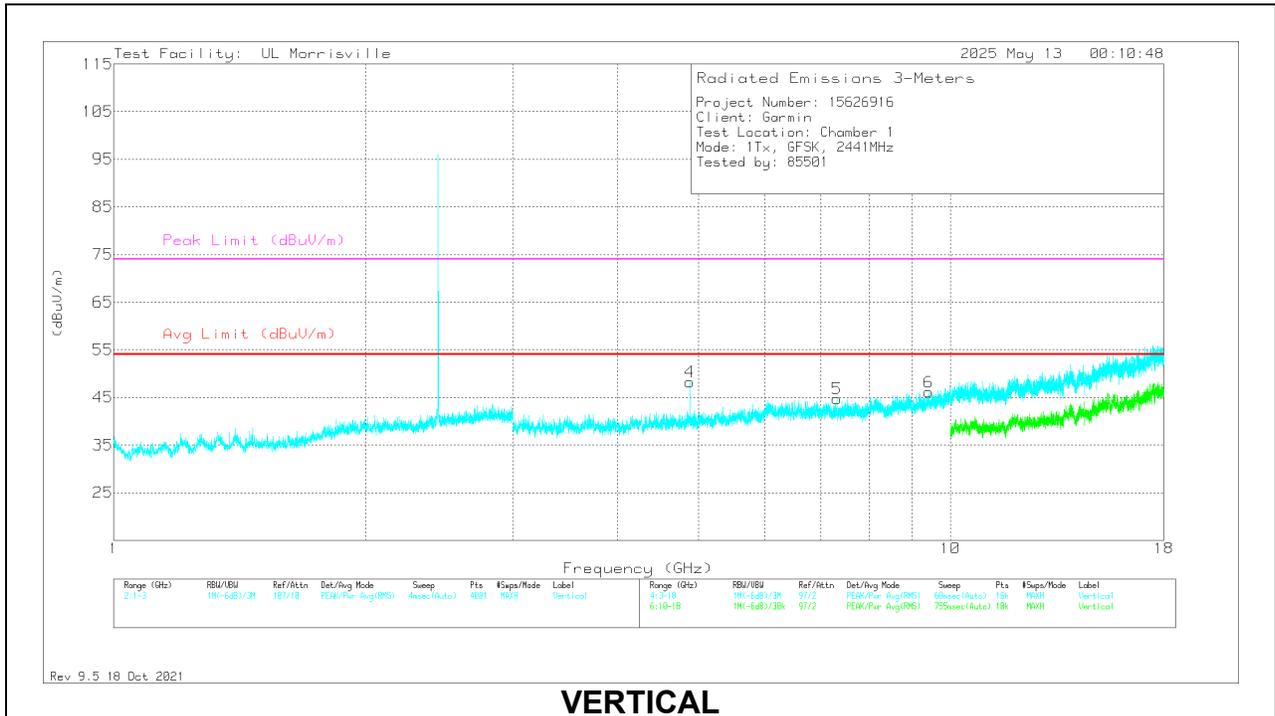
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80374	58.66	PK2	33.9	-45.6	46.96	-	-	74	-27.04	18	351	H
	* ** 4.80402	50.08	V1TV	33.9	-45.6	38.38	54	-15.62	-	-	18	351	H
2	* ** 8.21719	49.99	Pk	35.9	-40.9	44.99	54	-9.01	74	-29.01	0-360	101	H
3	* ** 9.09469	49.87	Pk	35.9	-40.2	45.57	54	-8.43	74	-28.43	0-360	101	H
4	* ** 4.80384	61.27	PK2	33.9	-45.6	49.57	-	-	74	-24.43	119	256	V
	* ** 4.80402	54.26	V1TV	33.9	-45.6	42.56	54	-11.44	-	-	119	256	V
5	* ** 8.04656	50	Pk	35.9	-40.9	45	54	-9	74	-29	0-360	101	V
6	* ** 9.37219	50.23	Pk	36.2	-40.3	46.13	54	-7.87	74	-27.87	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 PK2 - Maximum Peak
 V1TV - $V_B=1/T_{on}$, Linear Voltage Average where: T_{on} is packet duration

MID CHANNEL RESULTS



HORIZONTAL

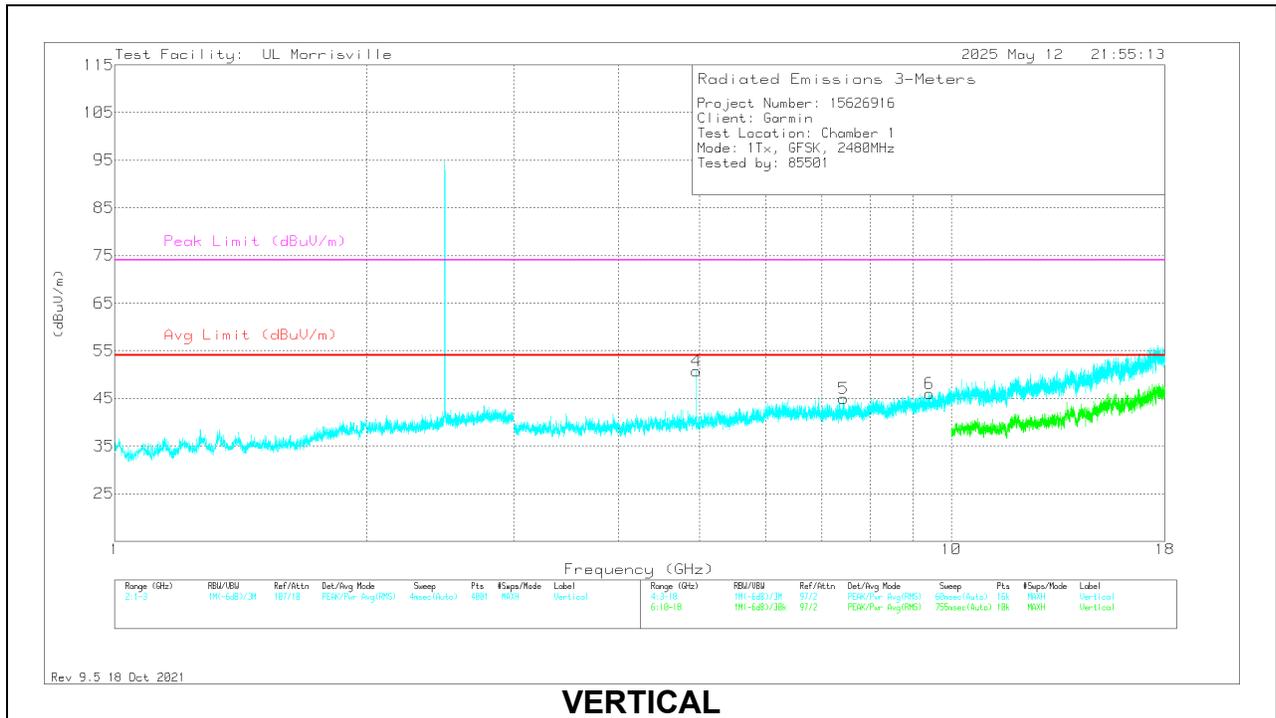
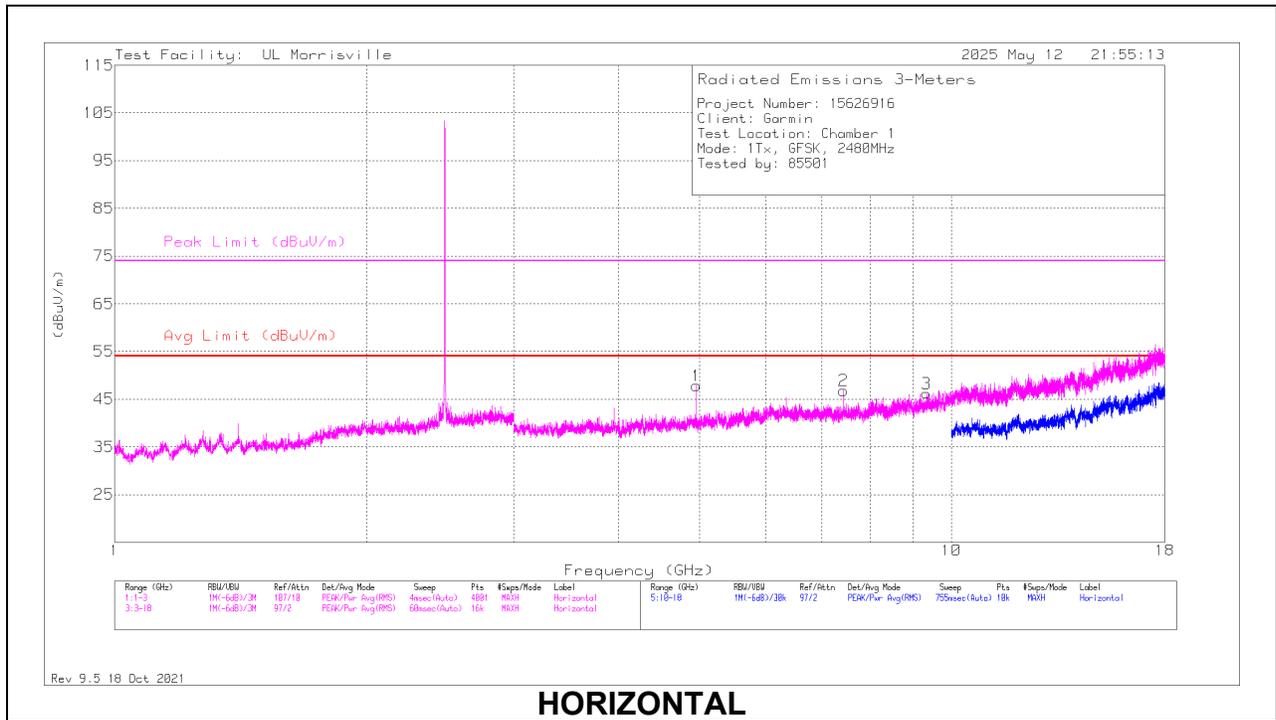


VERTICAL

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.88198	59.87	PK2	34	-44.7	49.17	-	-	74	-24.83	44	106	H
	* ** 4.88201	53.55	V1TV	34	-44.7	42.85	54	-11.15	-	-	44	106	H
2	* ** 7.32281	53.41	Pk	35.4	-41.9	46.91	54	-7.09	74	-27.09	0-360	101	H
3	* ** 9.41063	49.91	Pk	36.3	-40.3	45.91	54	-8.09	74	-28.09	0-360	101	H
4	* ** 4.88183	62.06	PK2	34	-44.7	51.36	-	-	74	-22.64	240	114	V
	* ** 4.88203	57.06	V1TV	34	-44.7	46.36	54	-7.64	-	-	240	114	V
5	* ** 7.32375	51.33	Pk	35.4	-42	44.73	54	-9.27	74	-29.27	0-360	200	V
6	* ** 9.41719	49.49	Pk	36.3	-39.7	46.09	54	-7.91	74	-27.91	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 PK2 - Maximum Peak
 V1TV - Linear Voltage Average where: Ton is packet duration

HIGH CHANNEL RESULTS



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95938	58.39	Pk	34.2	-44.8	47.79	54	-6.21	74	-26.21	0-360	101	H
2	* ** 7.44	52.53	Pk	35.4	-41.1	46.83	54	-7.17	74	-27.17	0-360	199	H
3	* ** 9.34219	51.01	Pk	36.2	-41	46.21	54	-7.79	74	-27.79	0-360	199	H
4	* ** 4.96024	63.97	PK2	34.2	-44.8	53.37	-	-	74	-20.63	253	114	V
	* ** 4.96002	59.71	V1TV	34.2	-44.8	49.11	54	-4.89	-	-	253	114	V
5	* ** 7.43906	50.58	Pk	35.4	-41	44.98	54	-9.02	74	-29.02	0-360	200	V
6	* ** 9.41438	49.54	Pk	36.3	-39.8	46.04	54	-7.96	74	-27.96	0-360	101	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

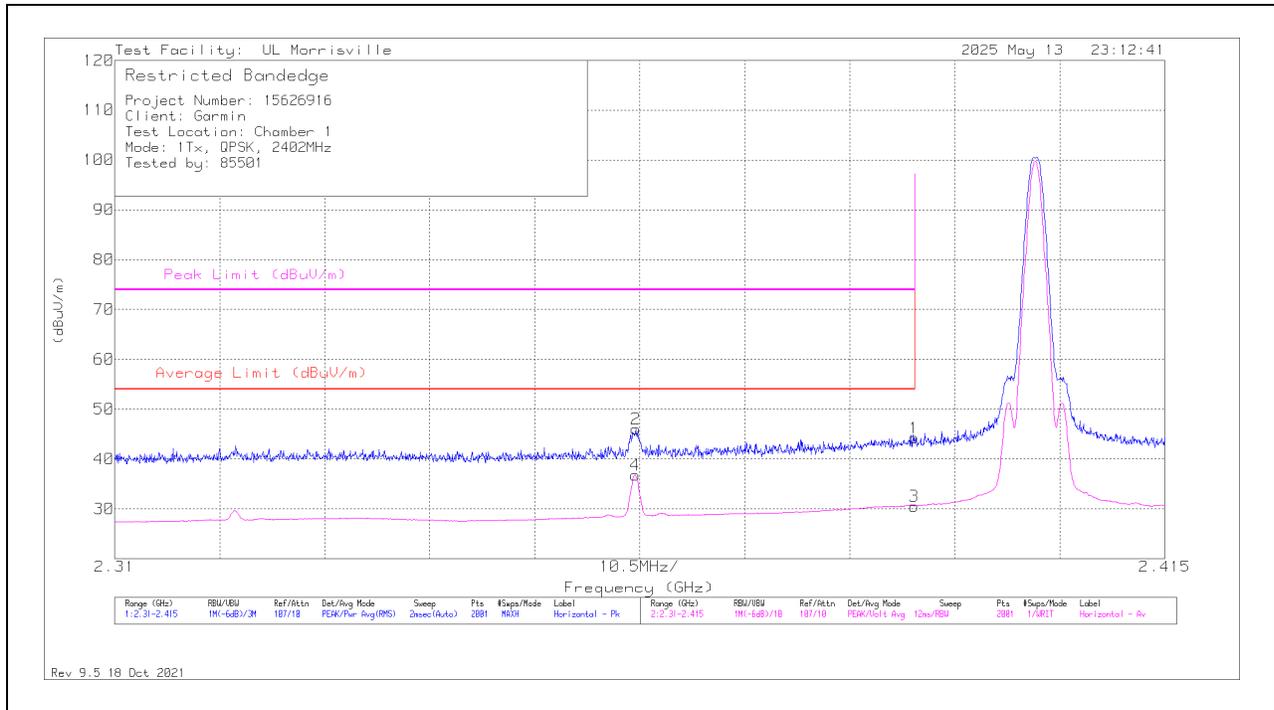
PK2 - Maximum Peak

V1TV - Linear Voltage Average where: Ton is packet duration

10.1.2. BLUETOOTH BASIC DATA RATE QPSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	*** 2.38996	36.32	Pk	31.9	-24	44.22	-	-	74	-29.78	145	140	H
2	*** 2.36213	38.57	PK	31.9	-24.4	46.07	-	-	74	-27.93	145	140	H
3	*** 2.38996	22.65	VA1T	31.9	-24	30.55	54	-23.45	-	-	145	140	H
4	*** 2.36203	29.23	VA1T	31.9	-24.4	36.73	54	-17.27	-	-	145	140	H

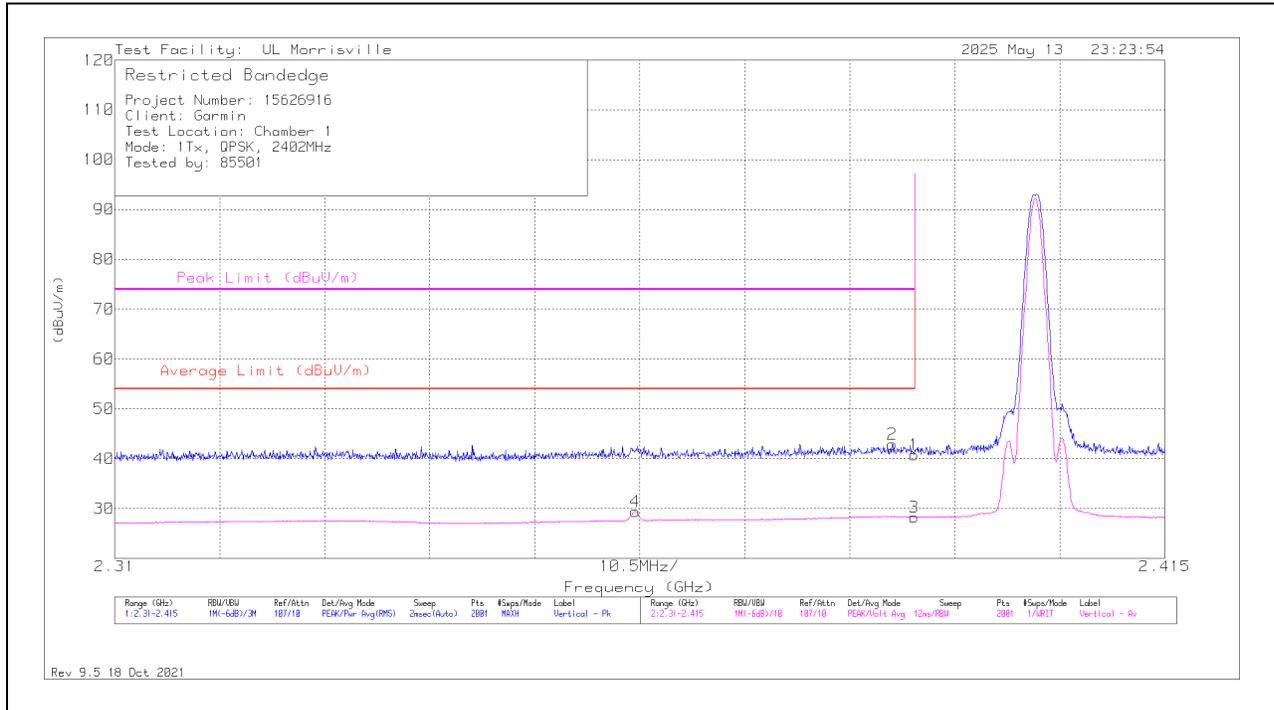
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

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

VERTICAL RESULT

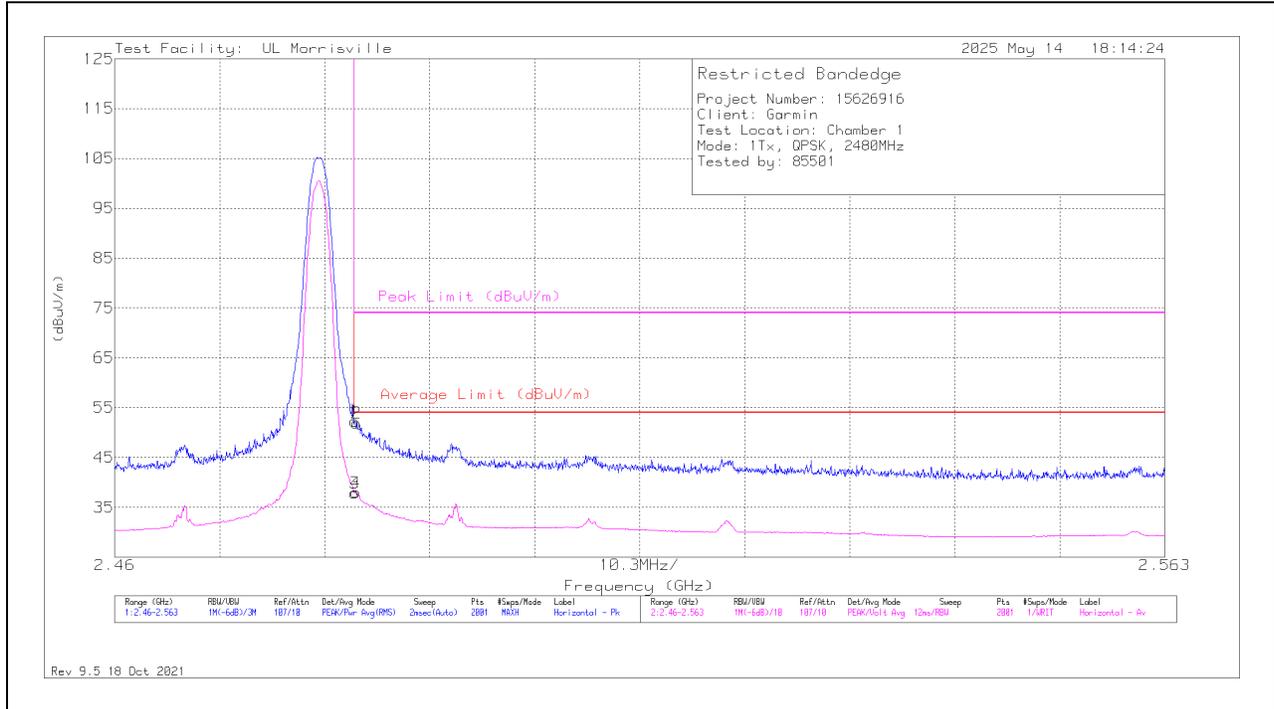


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	32.89	Pk	31.9	-24	40.79	-	-	74	-33.21	333	137	V
2	*** 2.38775	34.95	Pk	31.9	-23.9	42.95	-	-	74	-31.05	333	137	V
3	*** 2.38996	20.36	VA1T	31.9	-24	28.26	54	-25.74	-	-	333	137	V
4	*** 2.36203	21.93	VA1T	31.9	-24.4	29.43	54	-24.57	-	-	333	137	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)

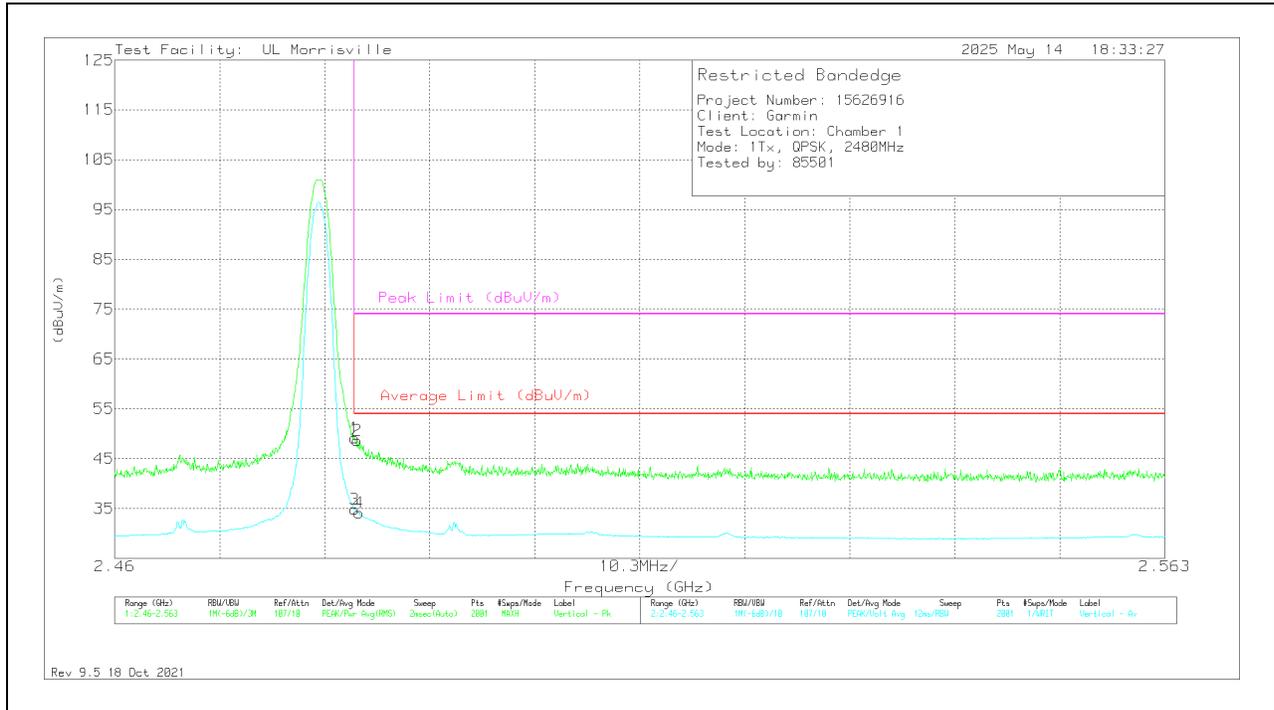
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	* ** 2.48354	43.75	Pk	32.2	-23.7	52.25	-	-	74	-21.75	258	322	H
2	* ** 2.48374	43.41	Pk	32.2	-23.7	51.91	-	-	74	-22.09	258	322	H
3	* ** 2.48354	29.43	VA1T	32.2	-23.7	37.93	54	-16.07	-	-	258	322	H
4	* ** 2.48364	29.45	VA1T	32.2	-23.7	37.95	54	-16.05	-	-	258	322	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

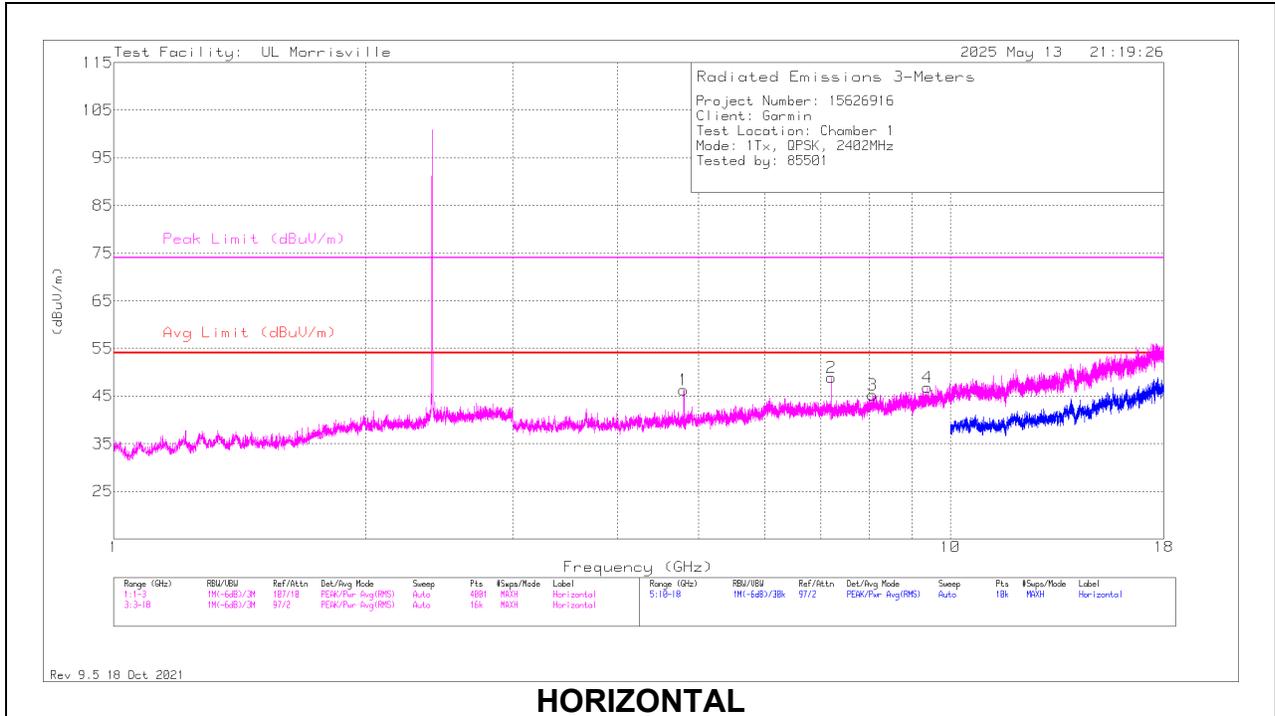


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	40.61	Pk	32.2	-23.7	49.11	-	-	74	-24.89	202	369	V
2	*** 2.48379	40.15	Pk	32.2	-23.7	48.65	-	-	74	-25.35	202	369	V
3	*** 2.48354	26.32	VA1T	32.2	-23.7	34.82	54	-19.18	-	-	202	369	V
4	*** 2.48395	25.68	VA1T	32.2	-23.7	34.18	54	-19.82	-	-	202	369	V

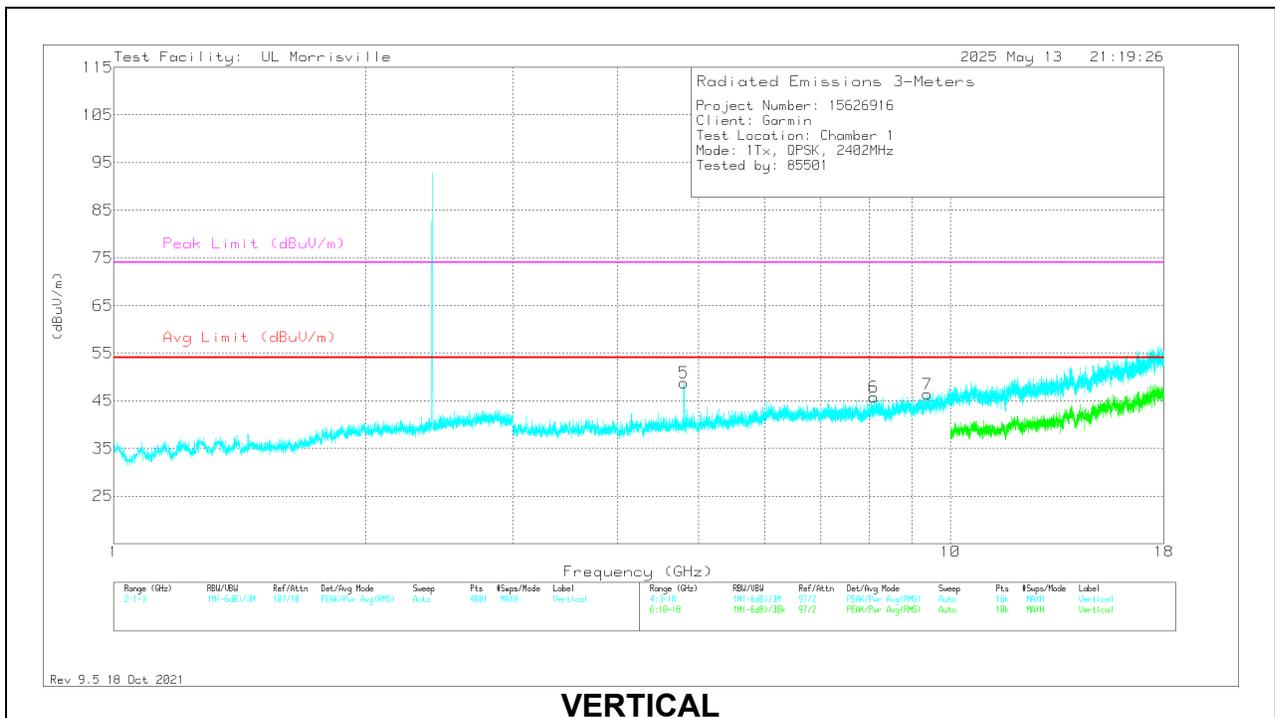
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80281	57.98	Pk	33.9	-45.6	46.28	54	-7.72	74	-27.72	0-360	199	H
3	* ** 8.06813	50.6	Pk	35.9	-41.3	45.2	54	-8.8	74	-28.8	0-360	100	H
4	* ** 9.38906	50.81	Pk	36.2	-40.2	46.81	54	-7.19	74	-27.19	0-360	199	H
5	* ** 4.80428	63.2	PK2	33.9	-45.6	51.5	-	-	74	-22.5	255	107	V
	* ** 4.80405	57.44	V1TV	33.9	-45.6	45.74	54	-8.26	-	-	255	107	V
6	* ** 8.10281	50.93	Pk	35.9	-41.1	45.73	54	-8.27	74	-28.27	0-360	199	V
7	* ** 9.39563	50.15	Pk	36.3	-40.1	46.35	54	-7.65	74	-27.65	0-360	101	V
2	7.20563	55.73	Pk	35.4	-42.2	48.93	-	-	-	-	0-360	100	H

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

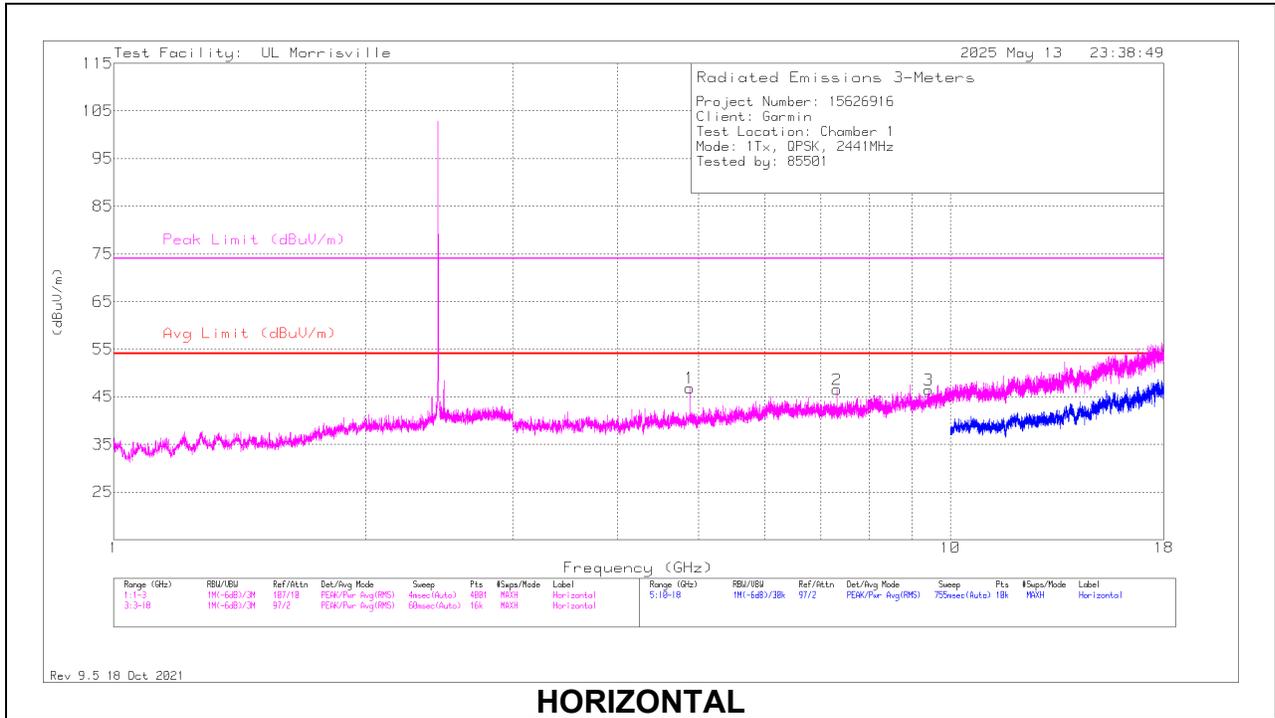
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

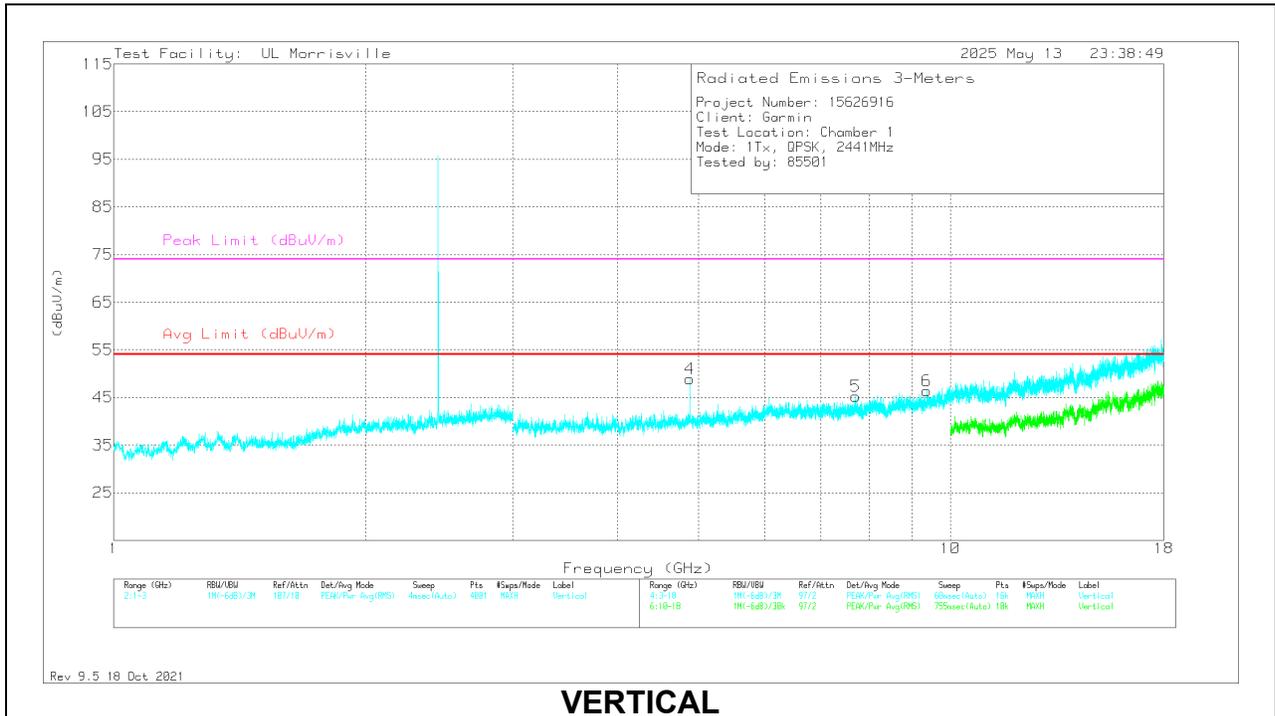
PK2 - Maximum Peak

V1TV - Linear Voltage Average where: Ton is packet duration

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.8825	57.58	Pk	34	-44.8	46.78	54	-7.22	74	-27.22	0-360	200	H
2	* ** 7.32281	52.98	Pk	35.4	-41.9	46.48	54	-7.52	74	-27.52	0-360	100	H
3	* ** 9.41625	49.77	Pk	36.3	-39.6	46.47	54	-7.53	74	-27.53	0-360	200	H
4	* ** 4.88233	57.49	PK2	34	-44.7	46.79	-	-	74	-27.21	238	115	V
	* ** 4.88205	55.91	V1TV	34	-44.7	45.21	54	-8.79	-	-	238	115	V
5	* ** 7.7025	50.59	Pk	35.6	-41	45.19	54	-8.81	74	-28.81	0-360	200	V
6	* ** 9.36844	50.59	Pk	36.2	-40.4	46.39	54	-7.61	74	-27.61	0-360	100	V

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

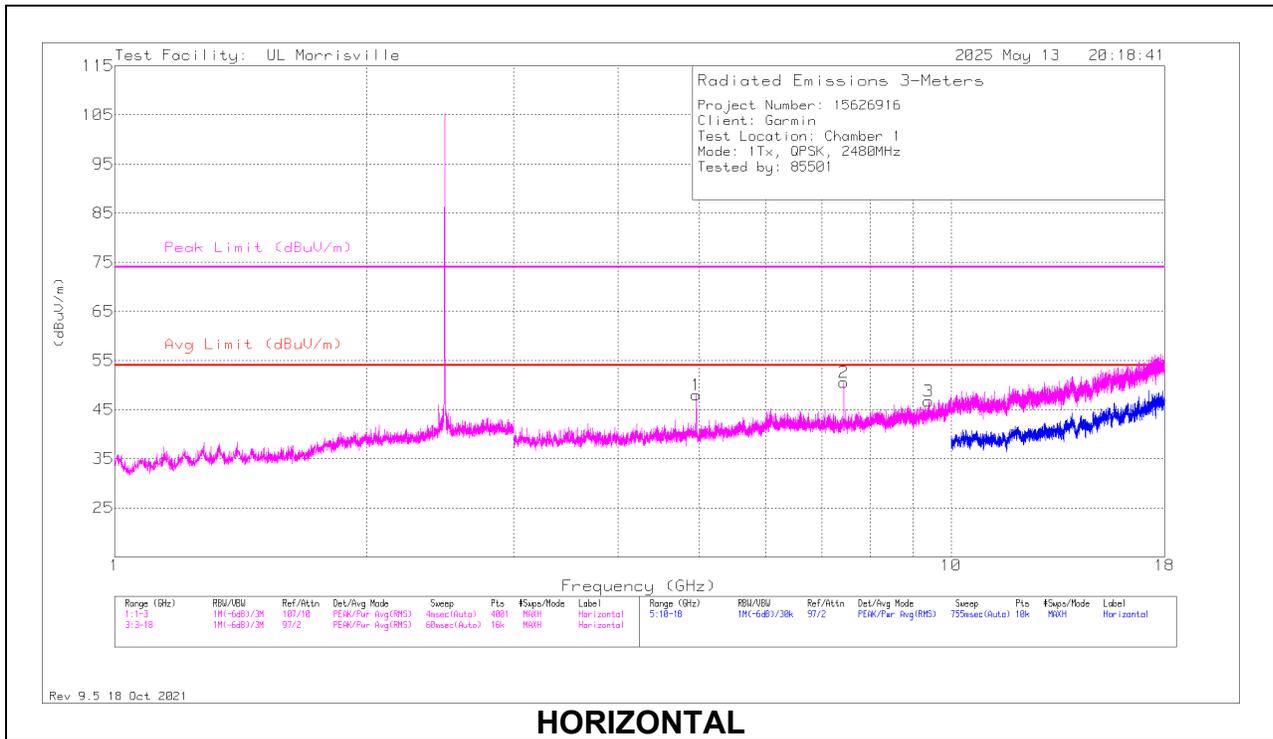
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

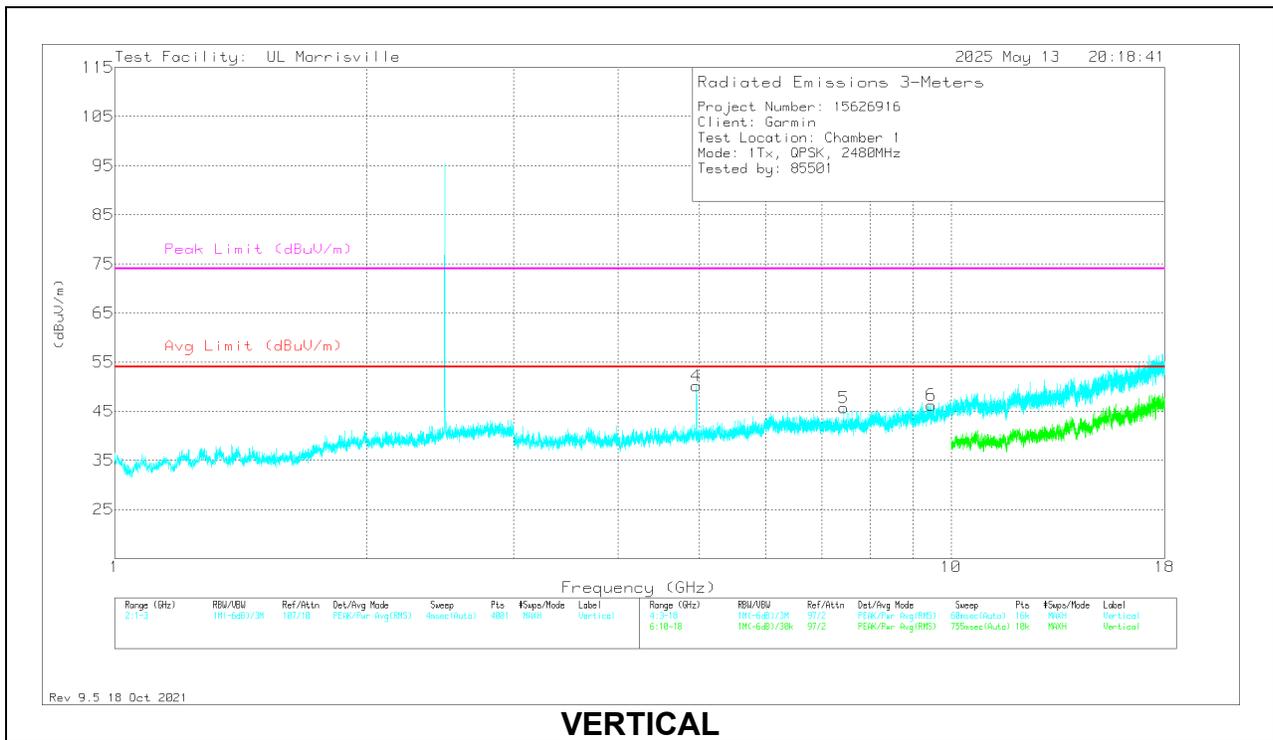
PK2 - Maximum Peak

V1TV - Linear Voltage Average where: Ton is packet duration

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95938	58.57	Pk	34.2	-44.8	47.97	54	-6.03	74	-26.03	0-360	200	H
2	* ** 7.44056	59.87	PK2	35.4	-41.1	54.17	-	-	74	-19.83	189	117	H
	* ** 7.44007	47.96	V1TV	35.4	-41.1	42.26	54	-11.74	-	-	189	117	H
3	* ** 9.3975	50.6	Pk	36.3	-40.2	46.7	54	-7.3	74	-27.3	0-360	200	H
4	* ** 4.95971	65.03	PK2	34.2	-44.8	54.43	-	-	74	-19.57	242	111	V
	* ** 4.96003	57.44	V1TV	34.2	-44.8	46.84	54	-7.16	-	-	242	111	V
5	* ** 7.44	51.37	Pk	35.4	-41.1	45.67	54	-8.33	74	-28.33	0-360	100	V
6	* ** 9.4725	50.63	Pk	36.4	-40.8	46.23	54	-7.77	74	-27.77	0-360	100	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

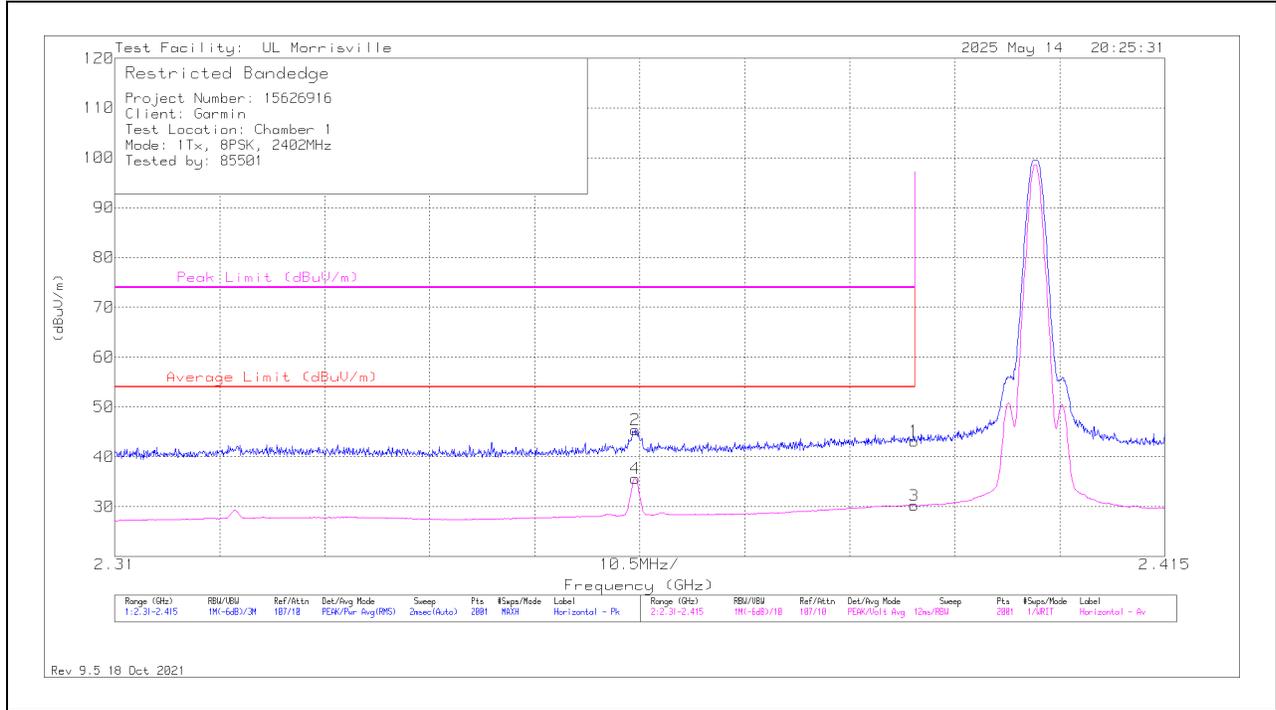
PK2 - Maximum Peak

V1TV - Linear Voltage Average where: Ton is packet duration

10.1.3. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

BANDEDGE (LOW CHANNEL)

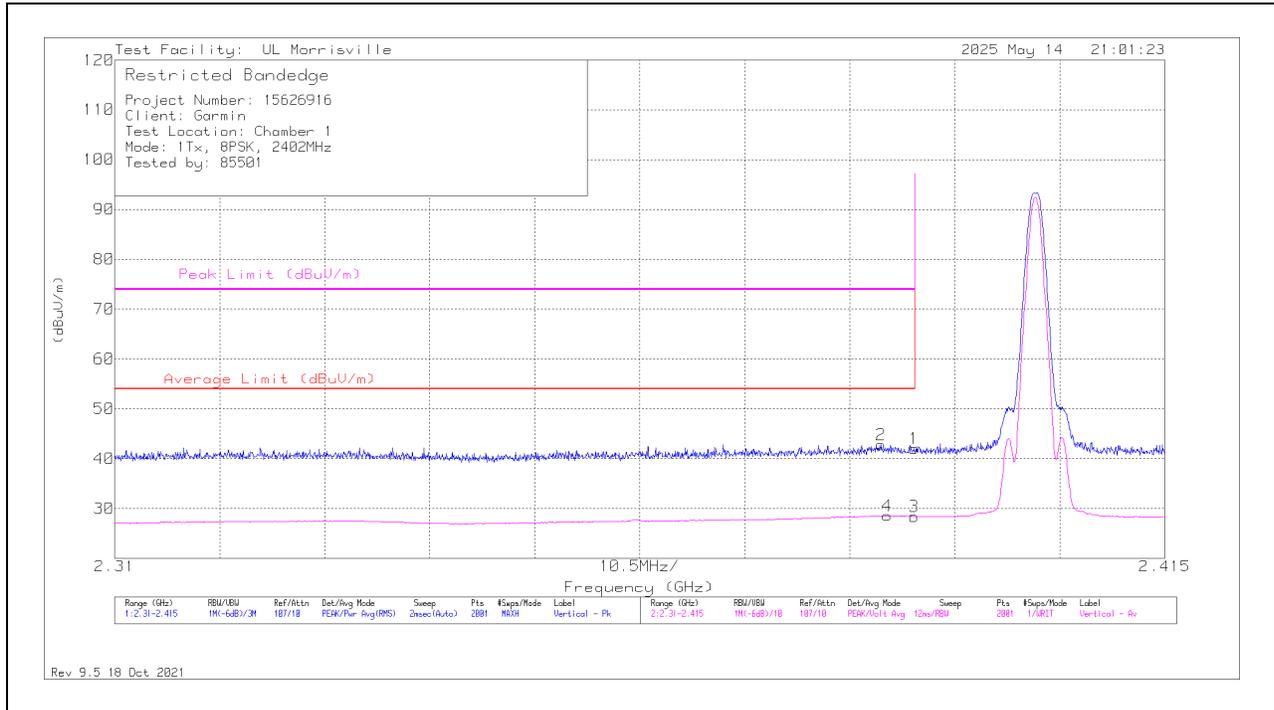
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	*** 2.38996	35.25	Pk	31.9	-24	43.15	-	-	74	-30.85	263	104	H
2	*** 2.36208	37.93	Pk	31.9	-24.4	45.43	-	-	74	-28.57	263	104	H
3	*** 2.38996	22.3	VA1T	31.9	-24	30.2	54	-23.8	-	-	263	104	H
4	*** 2.36203	28.15	VA1T	31.9	-24.4	35.65	54	-18.35	-	-	263	104	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

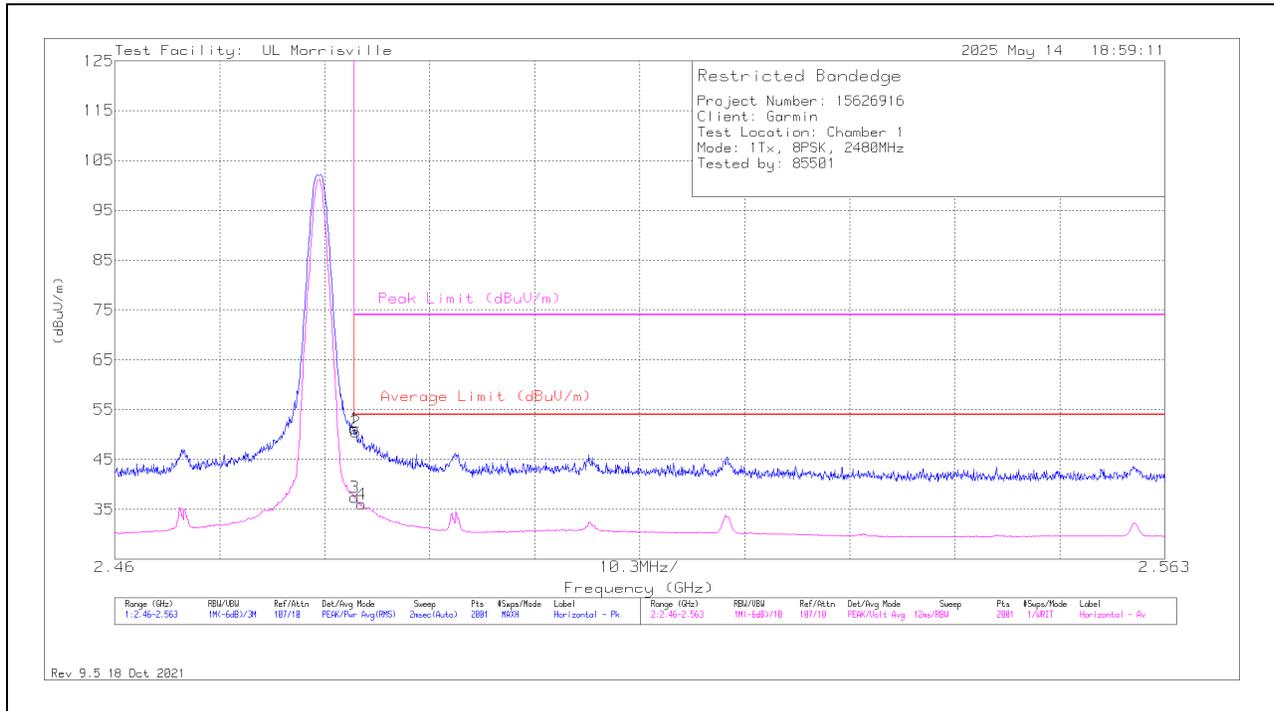


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	34.11	Pk	31.9	-24	42.01	-	-	74	-31.99	27	391	V
2	*** 2.38665	34.82	Pk	31.9	-23.9	42.82	-	-	74	-31.18	27	391	V
3	*** 2.38996	20.52	VA1T	31.9	-24	28.42	54	-25.58	-	-	27	391	V
4	*** 2.38723	20.56	VA1T	31.9	-23.9	28.56	54	-25.44	-	-	27	391	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)

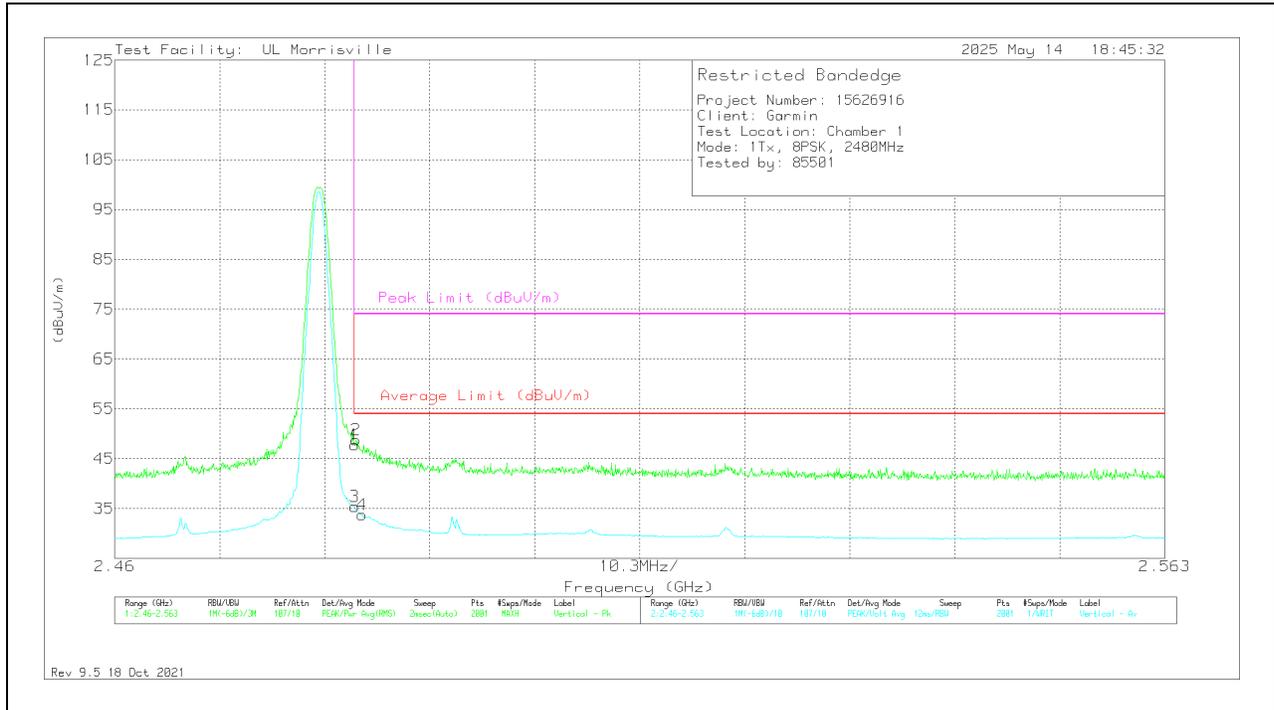
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/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	* ** 2.48354	42.61	Pk	32.2	-23.7	51.11	-	-	74	-22.89	261	108	H
2	* ** 2.48364	42.01	Pk	32.2	-23.7	50.51	-	-	74	-23.49	261	108	H
3	* ** 2.48354	28.88	VA1T	32.2	-23.7	37.38	54	-16.62	-	-	261	108	H
4	* ** 2.48421	27.56	VA1T	32.2	-23.8	35.96	54	-18.04	-	-	261	108	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

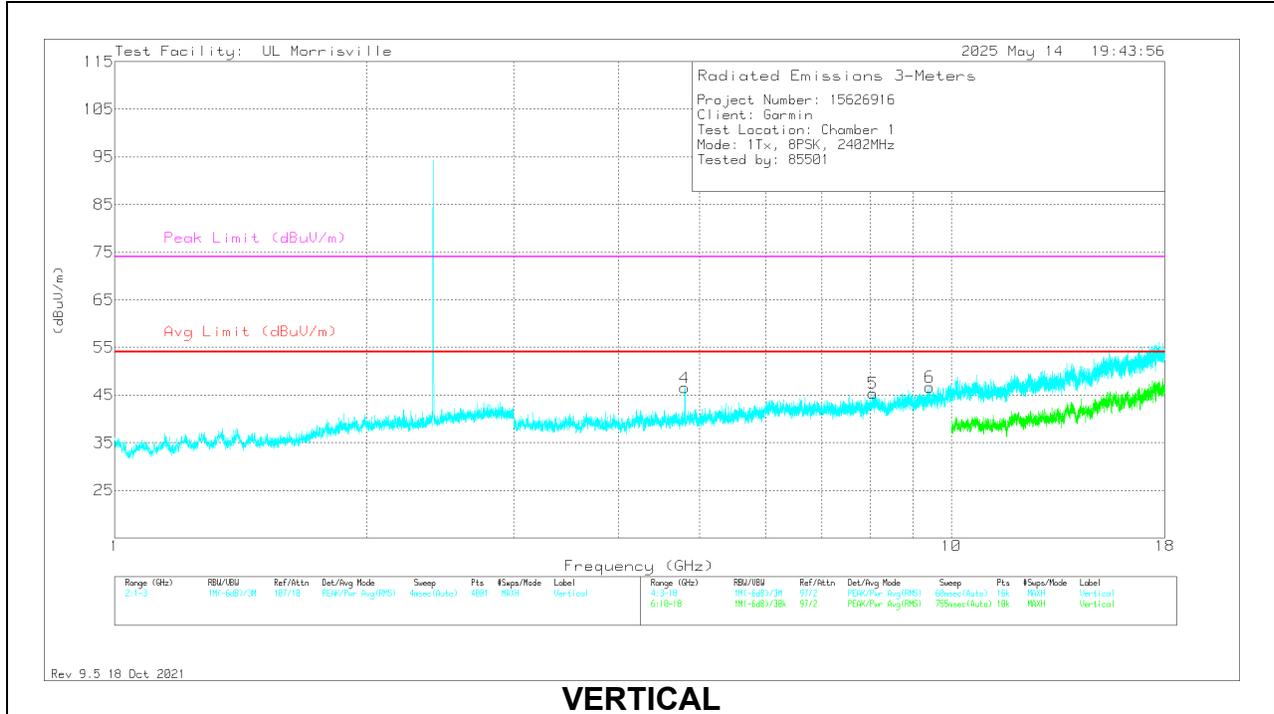
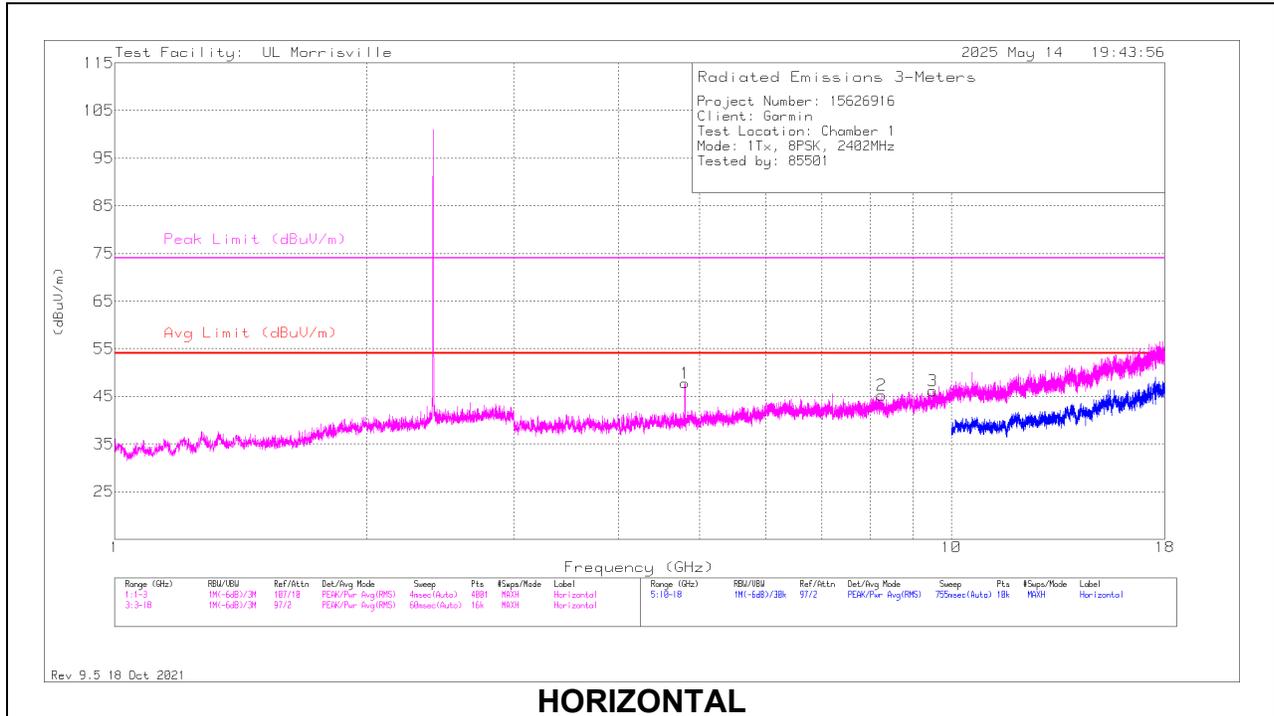


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	39.25	Pk	32.2	-23.7	47.75	-	-	74	-26.25	208	363	V
2	*** 2.48364	40.24	Pk	32.2	-23.7	48.74	-	-	74	-25.26	208	363	V
3	*** 2.48354	26.91	VA1T	32.2	-23.7	35.41	54	-18.59	-	-	208	363	V
4	*** 2.48426	25.38	VA1T	32.2	-23.8	33.78	54	-20.22	-	-	208	363	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 VA1T - Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



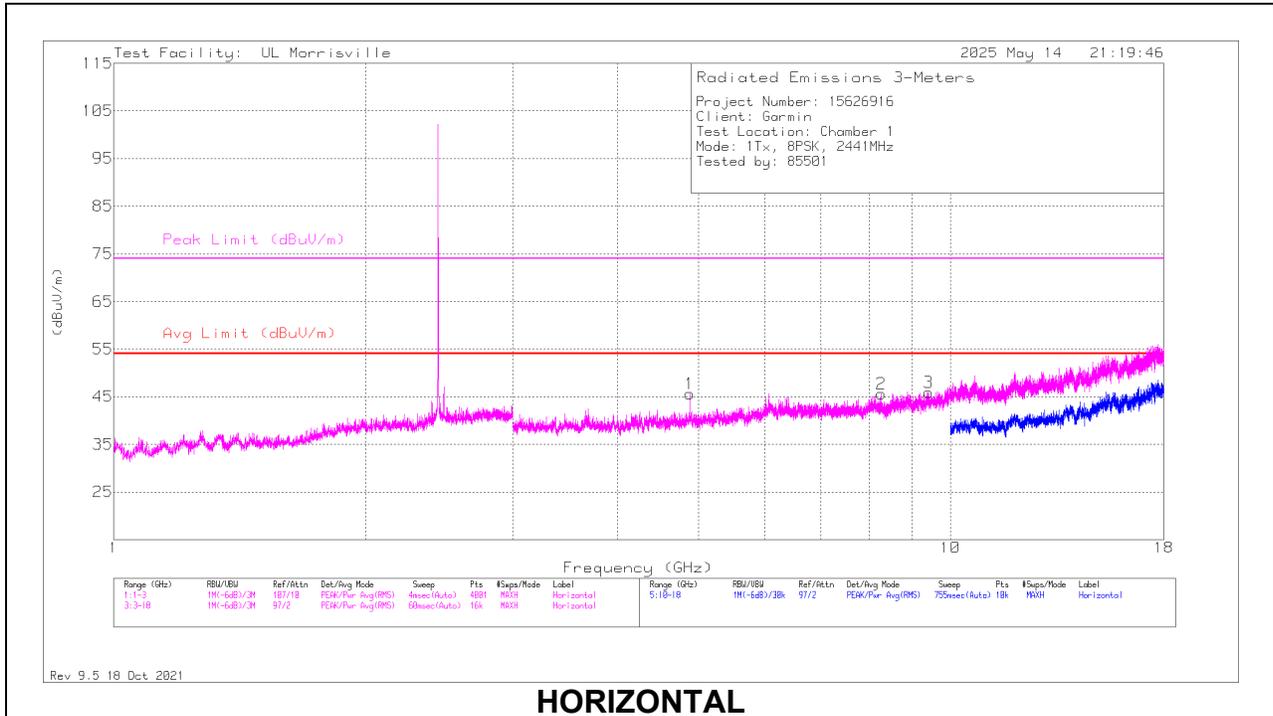
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80375	59.48	Pk	33.9	-45.6	47.78	54	-6.22	74	-26.22	0-360	199	H
2	* ** 8.26125	49.97	Pk	35.9	-40.6	45.27	54	-8.73	74	-28.73	0-360	199	H
3	* ** 9.49969	50.1	Pk	36.4	-40.4	46.1	54	-7.9	74	-27.9	0-360	199	H
4	* ** 4.80281	58.18	Pk	33.9	-45.6	46.48	54	-7.52	74	-27.52	0-360	101	V
5	* ** 8.06063	50.56	Pk	35.9	-41.1	45.36	54	-8.64	74	-28.64	0-360	200	V
6	* ** 9.41719	50.11	Pk	36.3	-39.7	46.71	54	-7.29	74	-27.29	0-360	200	V

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

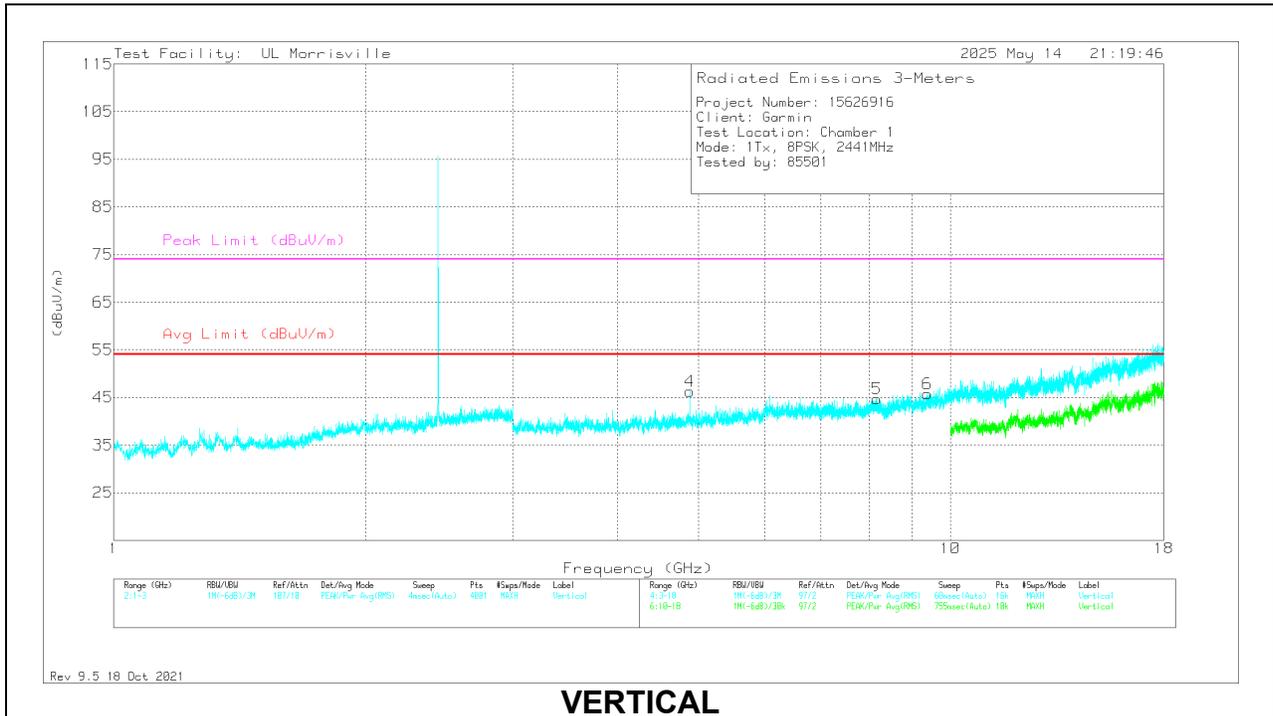
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL

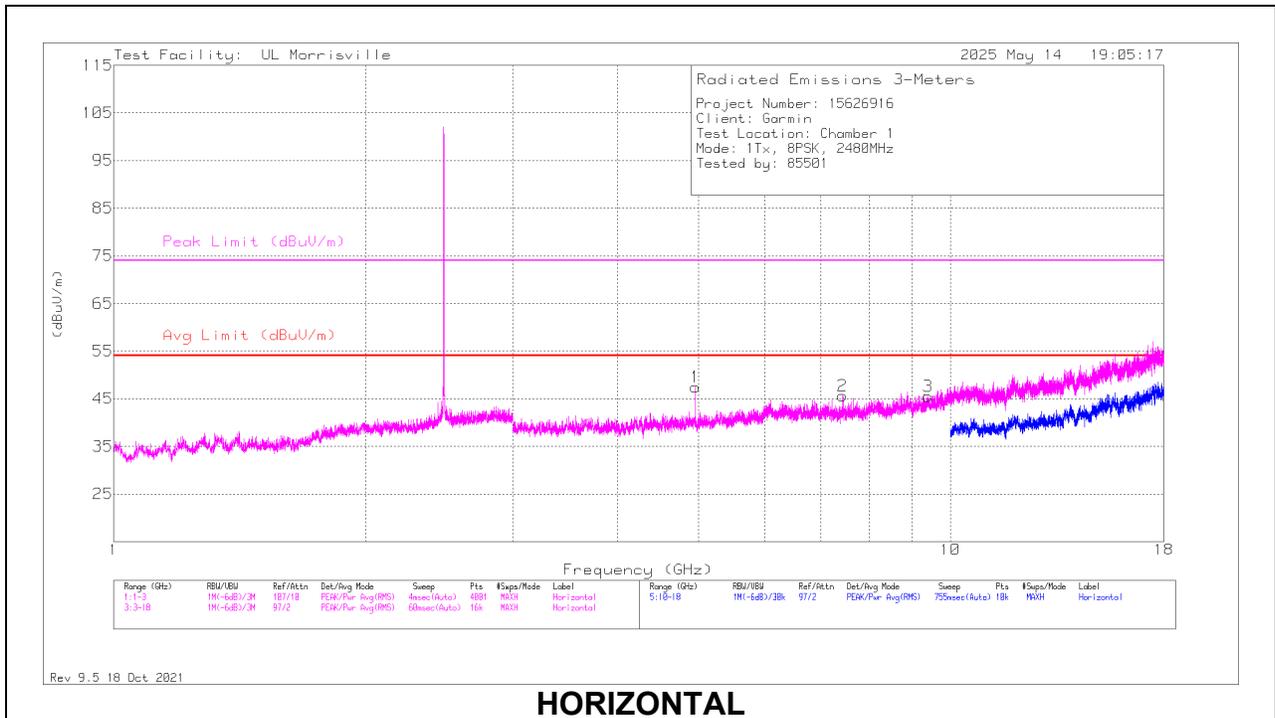


VERTICAL

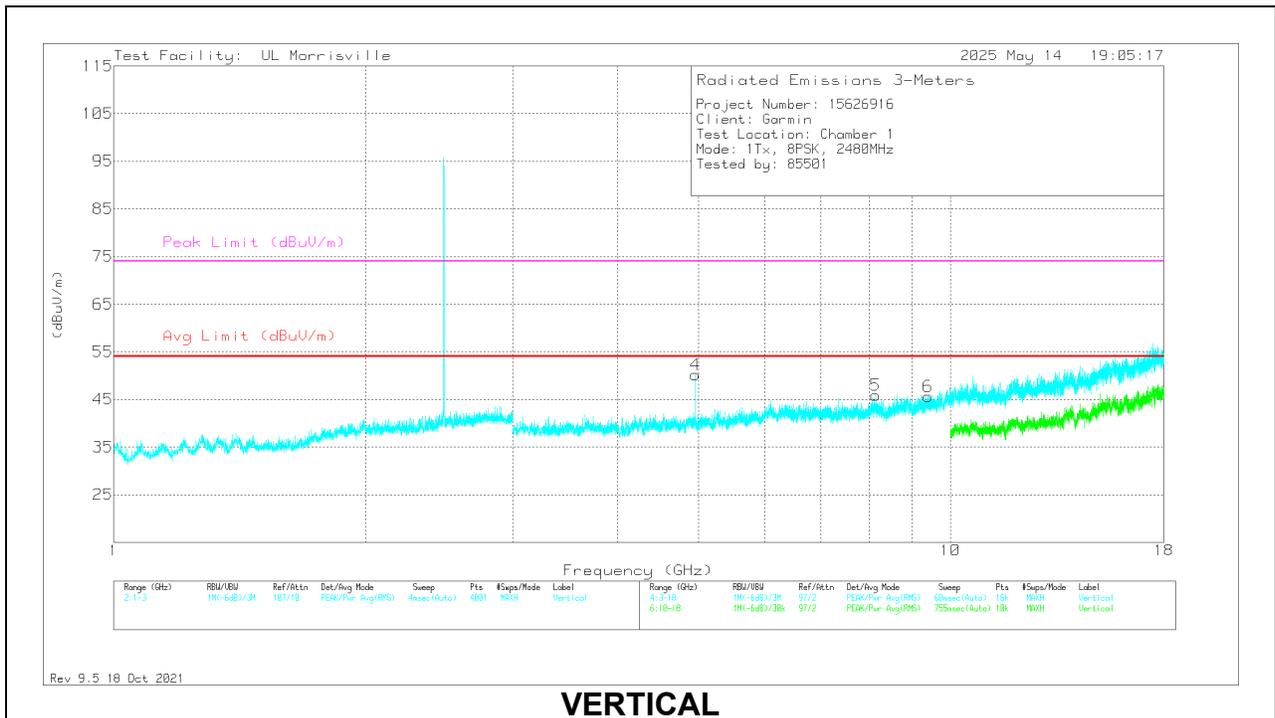
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.8825	56.4	Pk	34	-44.8	45.6	54	-8.4	74	-28.4	0-360	200	H
2	* ** 8.2725	50.43	Pk	35.9	-40.7	45.63	54	-8.37	74	-28.37	0-360	101	H
3	* ** 9.41813	49.43	Pk	36.3	-39.8	45.93	54	-8.07	74	-28.07	0-360	101	H
4	* ** 4.88156	56.98	Pk	34	-44.7	46.28	54	-7.72	74	-27.72	0-360	101	V
5	* ** 8.17406	49.71	Pk	35.9	-40.9	44.71	54	-9.29	74	-29.29	0-360	200	V
6	* ** 9.39281	49.53	Pk	36.3	-40.1	45.73	54	-8.27	74	-28.27	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95938	58.09	Pk	34.2	-44.8	47.49	54	-6.51	74	-26.51	0-360	199	H
2	* ** 7.44	51.29	Pk	35.4	-41.1	45.59	54	-8.41	74	-28.41	0-360	101	H
3	* ** 9.40125	49.76	Pk	36.3	-40.6	45.46	54	-8.54	74	-28.54	0-360	101	H
4	* ** 4.95986	52.61	PK2	34.2	-44.8	42.01	-	-	74	-31.99	259	108	V
	* ** 4.96006	58.05	V1TV	34.2	-44.8	47.45	54	-6.55	-	-	259	108	V
5	* ** 8.14781	50.94	Pk	35.9	-41	45.84	54	-8.16	74	-28.16	0-360	200	V
6	* ** 9.4125	49.46	Pk	36.3	-40.1	45.66	54	-8.34	74	-28.34	0-360	200	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

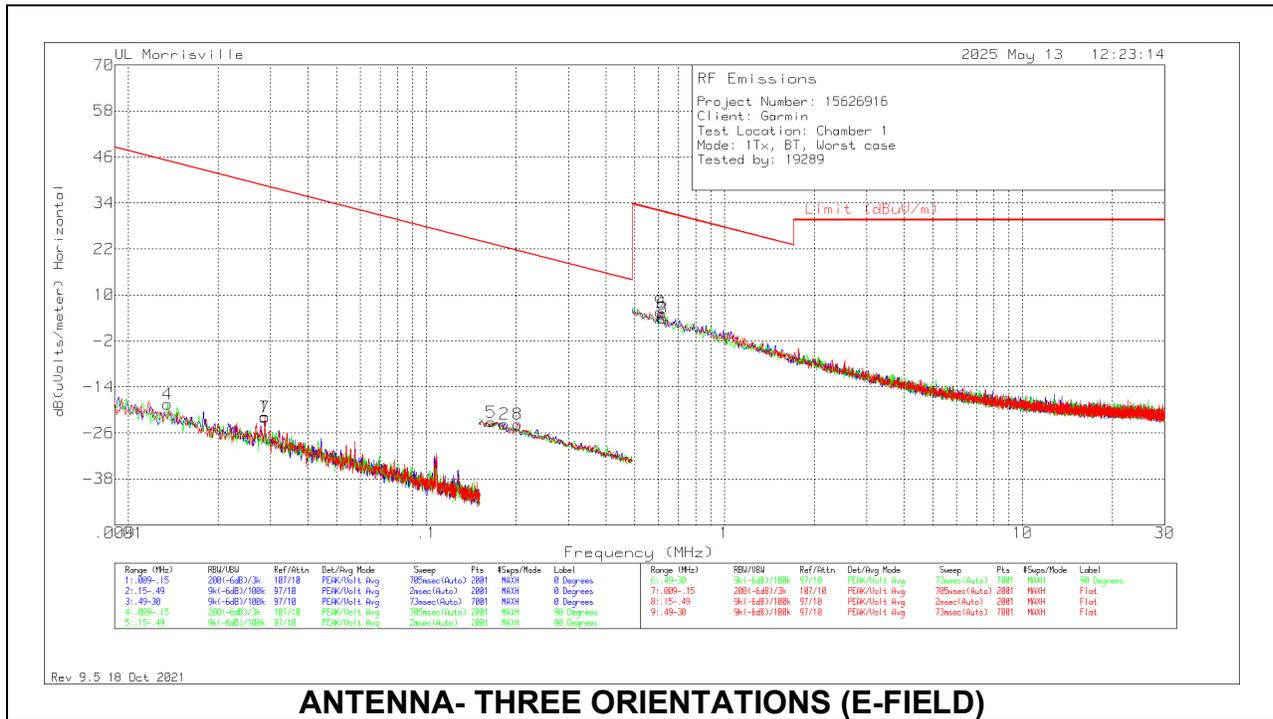
Pk - Peak detector

PK2 - Maximum Peak

V1TV - Linear Voltage Average where: Ton is packet duration

10.2. WORST CASE SPURIOUS BELOW 30MHZ

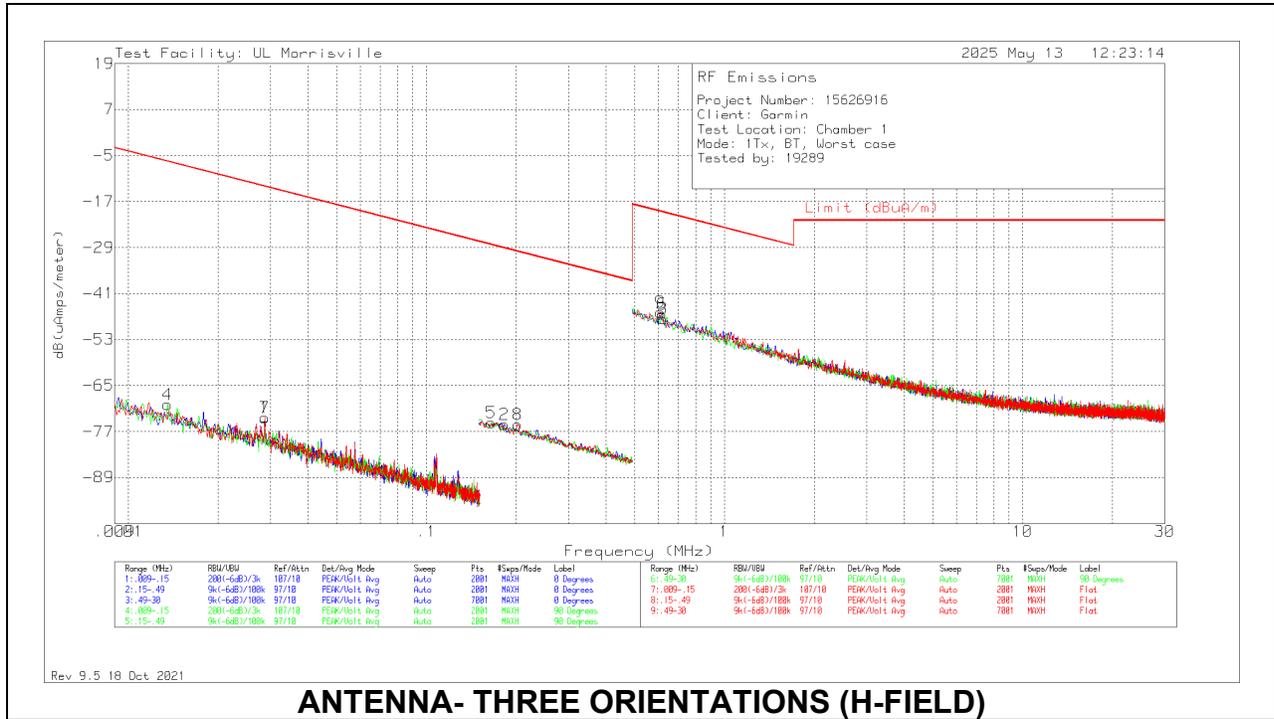
Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).



ANTENNA- THREE ORIENTATIONS (E-FIELD)

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.01354	44.23	Pk	17.2	.1	-80	-18.47	44.97	64.97	-63.44	0-360	90 degs
7	.02867	44.85	Pk	13.2	.1	-80	-21.85	38.46	58.46	-60.31	0-360	Flat
1	.02874	44.88	Pk	13.2	.1	-80	-21.82	38.44	58.44	-60.26	0-360	0 degs
5	.1653	45.77	Pk	11	.1	-80	-23.13	23.24	43.24	-46.37	0-360	90 degs
2	.18273	45.18	Pk	11	.1	-80	-23.72	22.37	42.37	-46.09	0-360	0 degs
8	.20245	45.35	Pk	10.9	.1	-80	-23.65	21.48	41.48	-45.13	0-360	Flat
9	.60805	34.44	Pk	11	.1	-40	5.54	31.93	-	-26.39	0-360	Flat
6	.61648	34.02	Pk	11	.1	-40	5.12	31.81	-	-26.69	0-360	90 degs
3	.6207	32.82	Pk	11	.1	-40	3.92	31.75	-	-27.83	0-360	0 degs

Pk - Peak detector

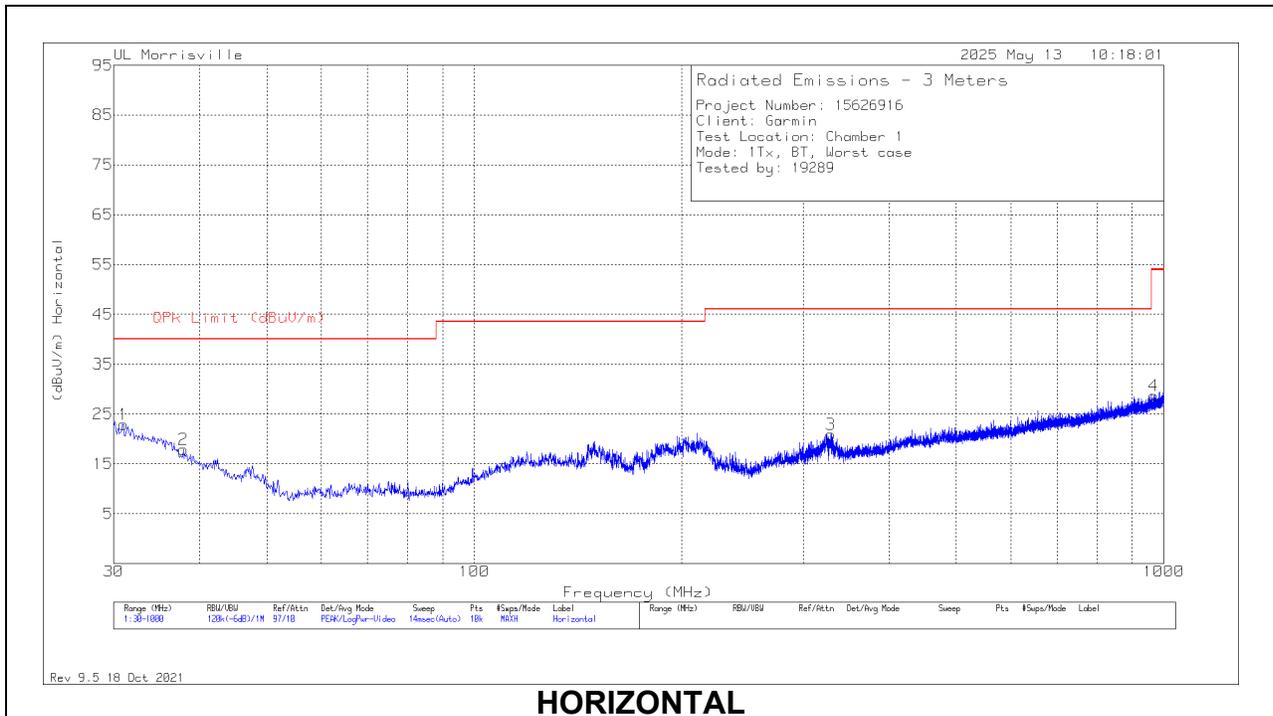


ANTENNA- THREE ORIENTATIONS (H-FIELD)

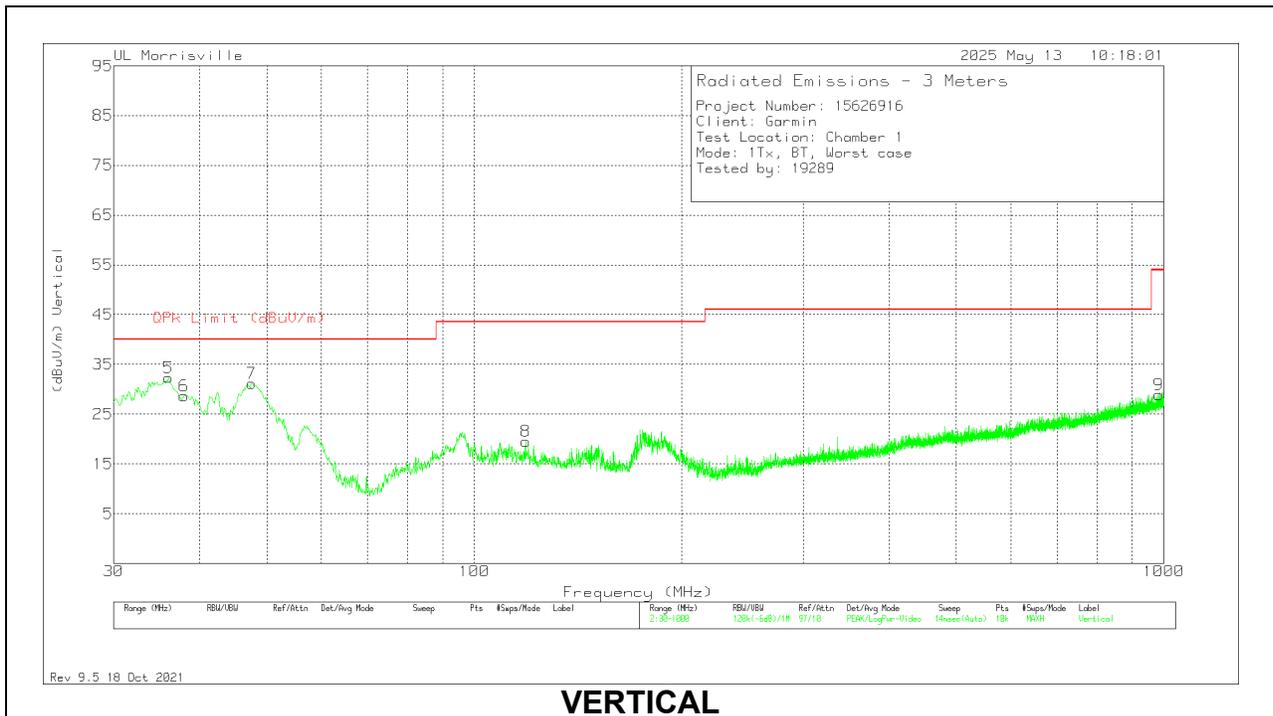
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.01354	44.23	Pk	-34.3	.1	-80	-69.97	-6.53	13.57	-63.44	0-360	90 degs
7	.02867	44.85	Pk	-38.3	.1	-80	-73.35	-13.04	6.96	-60.31	0-360	Flat
1	.02874	44.88	Pk	-38.3	.1	-80	-73.32	-13.06	6.94	-60.26	0-360	0 degs
5	.1653	45.77	Pk	-40.5	.1	-80	-74.63	-28.26	-8.26	-46.37	0-360	90 degs
2	.18273	45.18	Pk	-40.5	.1	-80	-75.22	-29.13	-9.13	-46.09	0-360	0 degs
8	.20245	45.35	Pk	-40.6	.1	-80	-75.15	-30.02	-10.02	-45.13	0-360	Flat
9	.60805	34.44	Pk	-40.5	.1	-40	-45.96	-19.57	-	-26.39	0-360	Flat
6	.61648	34.02	Pk	-40.5	.1	-40	-46.38	-19.69	-	-26.69	0-360	90 degs
3	.6207	32.82	Pk	-40.5	.1	-40	-47.58	-19.75	-	-27.83	0-360	0 degs

Pk - Peak detector

10.3. WORST CASE SPURIOUS 30-1000MHZ



HORIZONTAL



VERTICAL

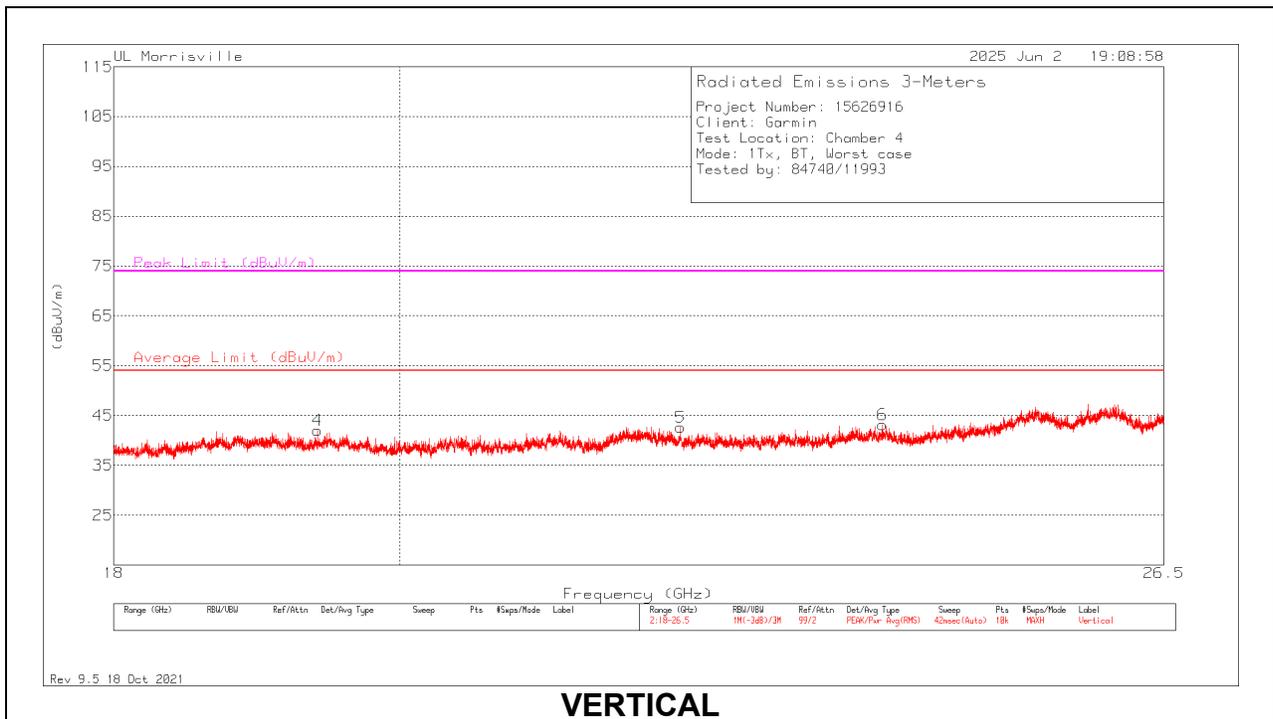
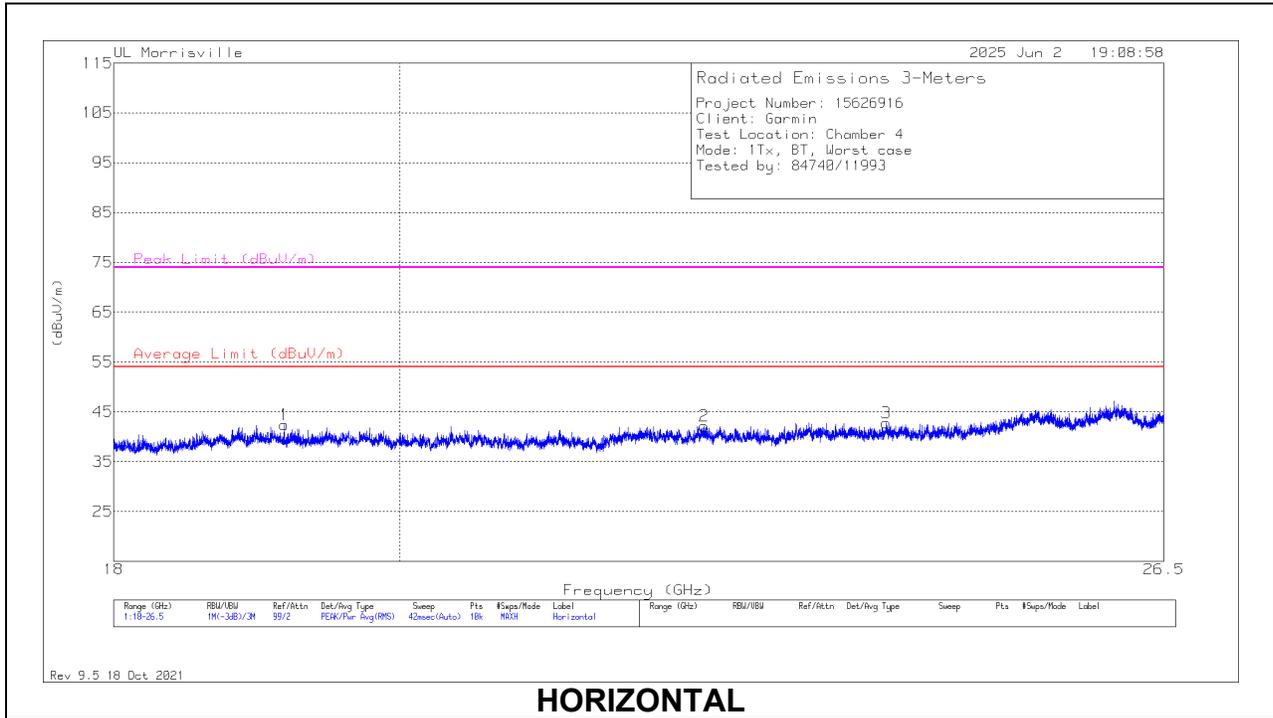
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90628 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* ** 37.857	28.37	Pk	21.6	-32.1	17.87	40	-22.13	0-360	300	H
3	* ** 328.663	31.04	Pk	20	-30.1	20.94	46.02	-25.08	0-360	100	H
4	* ** 967.796	26.22	Pk	28.9	-26.4	28.72	53.97	-25.25	0-360	100	H
6	* ** 37.954	39.31	Pk	21.5	-32.1	28.71	40	-11.29	0-360	100	V
8	* ** 118.658	30.8	Pk	20	-31.3	19.5	43.52	-24.02	0-360	100	V
9	* ** 983.025	26.06	Pk	29.1	-26.2	28.96	53.97	-25.01	0-360	200	V
1	30.97	28.84	Pk	26.2	-32.1	22.94	-	-	0-360	300	H
5	36.014	41.55	Pk	22.9	-32.1	32.35	-	-	0-360	100	V
7	47.557	48.02	Pk	15.1	-31.9	31.22	-	-	0-360	100	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.4. WORST CASE SPURIOUS 18-26GHz



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	204704 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 19.16608	49.66	Pk	33.6	-40.9	42.36	54	-11.64	74	-31.64	0-360	250	H
2	* ** 22.37196	48.36	Pk	34.1	-40.3	42.16	54	-11.84	74	-31.84	0-360	100	H
3	* ** 23.92476	46.06	Pk	34.4	-37.7	42.76	54	-11.24	74	-31.24	0-360	250	H
4	* ** 19.40406	49.75	Pk	33.3	-41	42.05	54	-11.95	74	-31.95	0-360	300	V
5	* ** 22.17903	47.8	Pk	34.3	-39.5	42.6	54	-11.4	74	-31.4	0-360	250	V
6	* ** 23.88991	47.27	Pk	34.4	-38.5	43.17	54	-10.83	74	-30.83	0-360	250	V

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

** - indicates frequency in Taiwan NCC LP0002 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

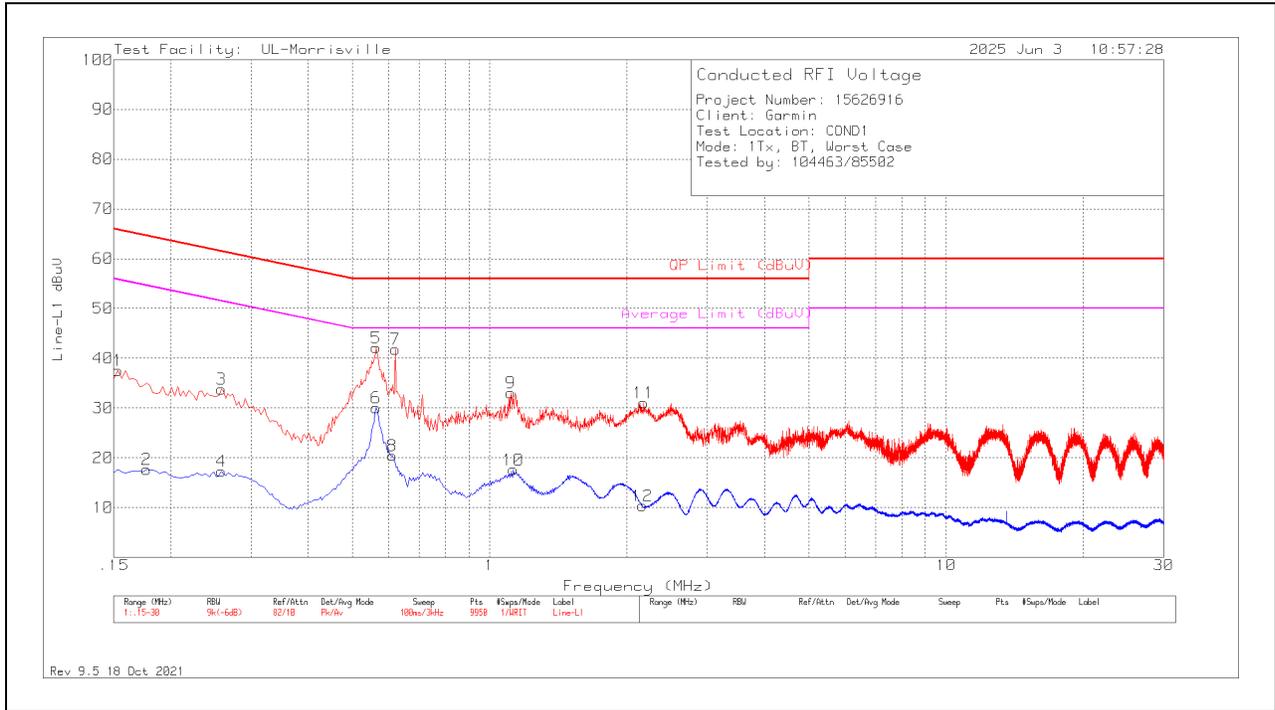
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

Line conducted data is recorded for both lines.

11.1. AC POWER LINE

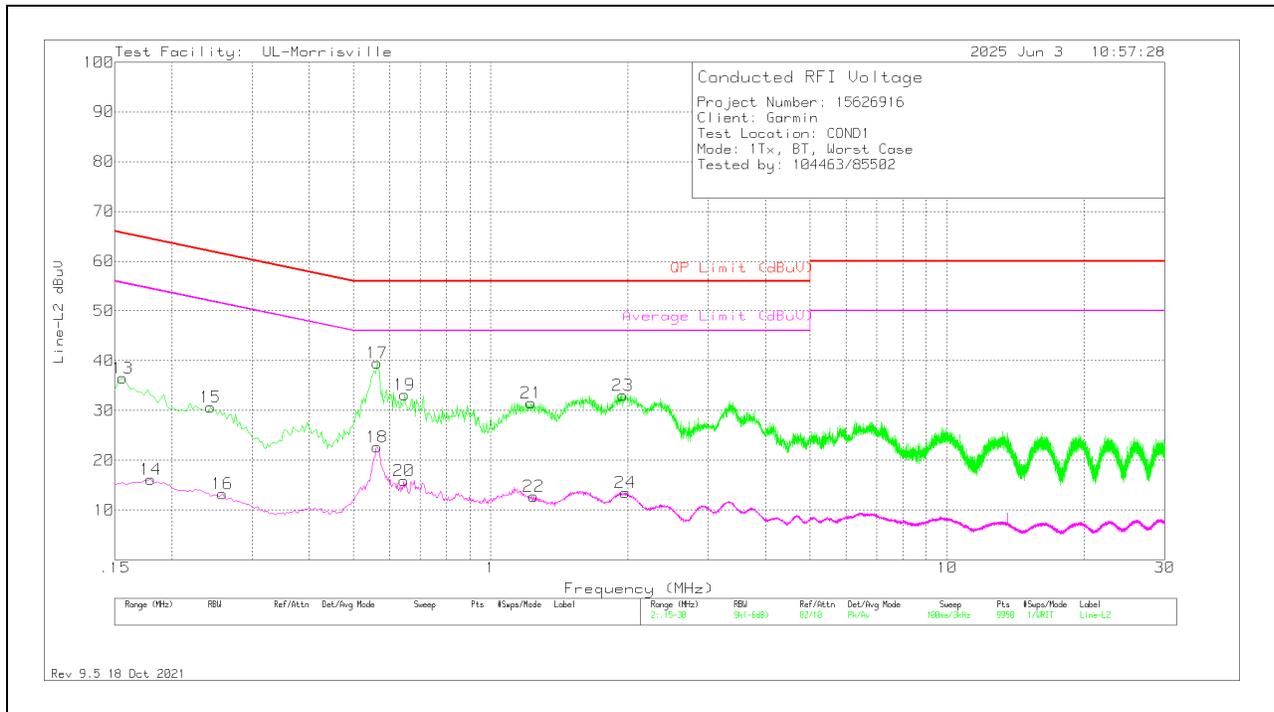
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	27.62	Pk	.2	9.7	37.52	65.84	-28.32	-	-
2	.177	7.78	Av	.2	9.7	17.68	-	-	54.63	-36.95
3	.258	23.94	Pk	.1	9.7	33.74	61.5	-27.76	-	-
4	.258	7.45	Av	.1	9.7	17.25	-	-	51.5	-34.25
5	.564	32.41	Pk	0	9.7	42.11	56	-13.89	-	-
6	.564	20.3	Av	0	9.7	30	-	-	46	-16
8	.612	10.75	Av	0	9.7	20.45	-	-	46	-25.55
7	.621	32.06	Pk	0	9.7	41.76	56	-14.24	-	-
9	1.113	23.39	Pk	0	9.7	33.09	56	-22.91	-	-
10	1.128	7.88	Av	0	9.7	17.58	-	-	46	-28.42
12	2.16	.63	Av	0	9.7	10.33	-	-	46	-35.67
11	2.175	21.32	Pk	0	9.7	31.02	56	-24.98	-	-

Pk - Peak detector
 Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.156	26.59	Pk	.2	9.7	36.49	65.67	-29.18	-	-
14	.18	6.29	Av	.2	9.7	16.19	-	-	54.49	-38.3
15	.243	20.85	Pk	.1	9.7	30.65	61.99	-31.34	-	-
16	.258	3.48	Av	.1	9.7	13.28	-	-	51.5	-38.22
17	.564	29.87	Pk	0	9.7	39.57	56	-16.43	-	-
18	.564	12.98	Av	0	9.7	22.68	-	-	46	-23.32
20	.645	6.15	Av	0	9.7	15.85	-	-	46	-30.15
19	.648	23.47	Pk	0	9.7	33.17	56	-22.83	-	-
21	1.227	21.88	Pk	0	9.7	31.58	56	-24.42	-	-
22	1.242	3.03	Av	0	9.7	12.73	-	-	46	-33.27
23	1.95	23.34	Pk	0	9.7	33.04	56	-22.96	-	-
24	1.974	3.8	Av	0	9.7	13.5	-	-	46	-32.5

Pk - Peak detector
 Av - Average detection

12. SETUP PHOTOS

Please refer to R15626916-EP1 for setup photos.

END OF TEST REPORT