

TEST REPORT

Report Number: R15872942-E2

Applicant : Samsung Electronics Co., Ltd.
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Republic of Korea

Model : SM-A175F / SM-A175F/DS

FCC ID : A3LSMA175F

EUT Description : Smartphone

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C: 2025

Date Of Issue:

2025-07-29

Prepared by:

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
1	2025-07-16	Initial Issue	B. Kiewra
2	2025-07-23	Added additional model number	B. Kiewra
3	2025-07-29	Revised note in section 6.6 to clarify how EUT was operated during testing.	B. Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Samsung Electronics Co., Ltd.
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Republic of Korea

EUT DESCRIPTION: Smartphone

MODEL: SM-A175F / SM-A175F/DS

SERIAL NUMBER: R38Y500BA5H, R38Y50033YM

SAMPLE RECEIPT DATE: 2025-06-20

DATE TESTED: 2025-06-27 to 2025-07-11

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C: 2025	Refer to Section 2

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.

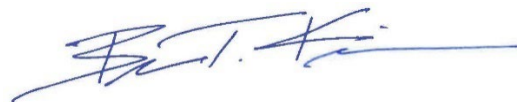
This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released
For UL LLC By:



Jeff Moser
Operations Manager
Consumer, Medical and IT Segment
UL LLC

Prepared By:



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

2. TEST RESULTS SUMMARY

This report contains data/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)

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	Hopping Frequency Separation	Compliant	None
15.247 (a)(1)(iii)	Number of Hopping Channels		
15.247 (a)(1)(iii)	Average Time of Occupancy		
15.247 (b)(1)	Output Power		
See Comment	Average Power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (d)	Conducted Spurious Emissions	Compliant	None
15.209, 15.205	Radiated Emissions		
15.207	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 3.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited 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
☐	Building: 12 Laboratory Dr Durham, NC 27713, U.S.A	US0067	2180C	825374
☒	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 a smartphone. This report covers the emissions testing of 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	16.38	43.45
2402 - 2480	Enhanced DQPSK	15.45	35.08
2402 - 2480	Enhanced 8PSK	15.41	34.75

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna gain and type, as provided by the manufacturer' are as follows:

Frequency (MHz)	Gain (dBi)	Type
2400-2483.5	-3.8	PIFA

6.4. SOFTWARE AND FIRMWARE

Manufacturer will disclose upon request.

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz and above 18GHz and AC Mains emissions were performed with the EUT set to transmit at the mode and channel with the highest power as a worst-case mode.

Band edge was performed with the EUT set to transmit at the highest power on low and high channels. Radiated spurious emissions between 1GHz and 18GHz were performed with the EUT set to transmit on low, mid, and high channels.

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

Worst-case data rates and packet sizes as determined by power measurements were:

GFSK mode: DH5
QPSK mode : 2-DH5
8PSK mode: 3-DH5

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adaptor	Samsung	EP-T2510	R3738S0231SEA	n/a

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB-C	1	USB-C	Shielded	<3m	Connects to AC adaptor

TEST SETUP

The EUT BT operation was controlled by use of a CMW500.

SETUP DIAGRAMS

Please refer to R15872942-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 - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
135144	Active Loop Antenna	ETS-Lindgren	6502	2024-10-02	2025-10-02
30-1000 MHz					
90628	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-02	2026-01-02
1-18 GHz					
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-04-09	2026-04-09
18-26 GHz					
91186	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2024-05-16	2026-05-16
Gain-Loss Chains					
207638	Gain-loss string: 0.009-30MHz	Various	Various	2025-06-13	2026-06-13
207639	Gain-loss string: 25-1000MHz	Various	Various	2025-06-13	2026-06-13
207640	Gain-loss string: 1-18GHz	Various	Various	2025-06-13	2026-06-13
225795	Gain-loss string: 18-40GHz	Various	Various	2025-06-13	2026-06-13
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-04-21	2026-04-21
81018	Spectrum Analyzer	Agilent	E4446A	2024-07-31	2025-07-31
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2023-06-05	2024-06-05
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
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					
91979	Gain-loss string: 1-18GHz	Various	Various	2025-05-31	2026-05-31
Receiver & Software					
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-05-12	2026-05-12
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2023-06-05	2024-06-05
241205	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.
70374	EMI Test Receiver	ROHDE & SCHWARZ	ESC17	2024-07-30	2025-07-30
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
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2025-04-17	2026-04-17
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
208721	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2024-08-14	2025-08-14
236852	CW-AC Power Source	Ametek	CW2501	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
214284	Spectrum Analyzer	Rohde & Schwarz	FSW50	2025-03-14	2026-03-14
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA
SOFTEMI	Antenna Port Software	UL	Version 2024.2.23		
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0		
CBL010	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB293C-0-2400-300300	2025-06-06	2026-06-06
CBL036	N-Type Cable	NA	NA	2025-04-1	2026-04-01
Pad II	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C27S-10	2025-05-20	2026-05-20
238018 (CPL003-SAR)	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2025-04-16	2026-04-16

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

Peak 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 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

AC Mains Emissions: ANSI C63.10-2020 Sections 6.2

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

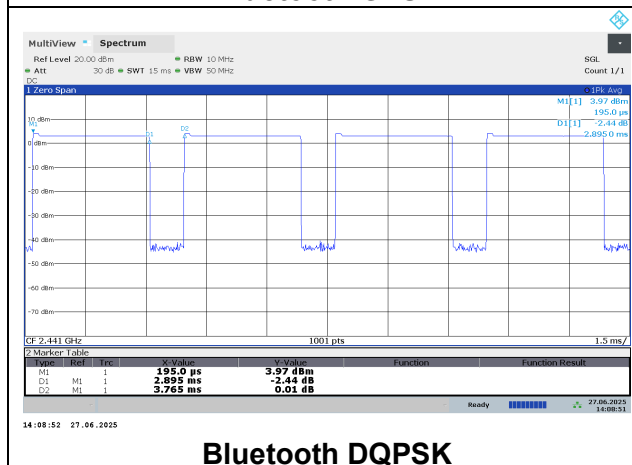
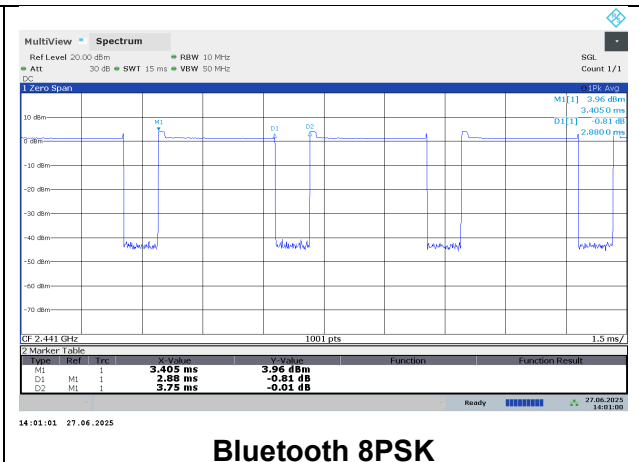
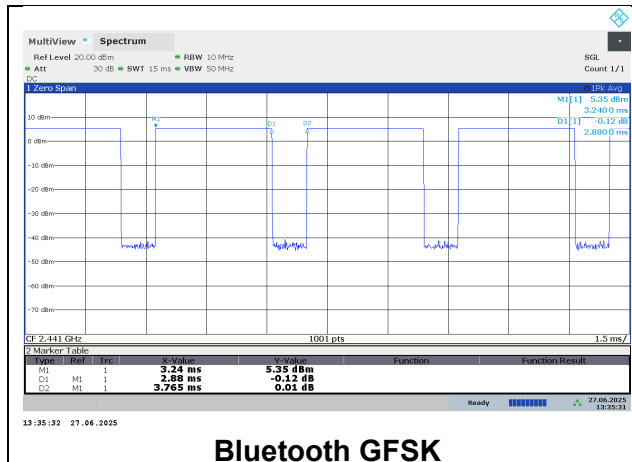
None; for reporting purposes only.

PROCEDURE

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

Tested By: 104463/85502 Date: 6/27/2025

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	1/T Minimum VBW (kHz)
Bluetooth GFSK	2.880	3.765	0.765	76.49	0.347
Bluetooth 8PSK	2.880	3.750	0.768	76.80	0.347
Bluetooth DQPSK	2.895	3.765	0.769	76.89	0.345



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9.2. 20 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

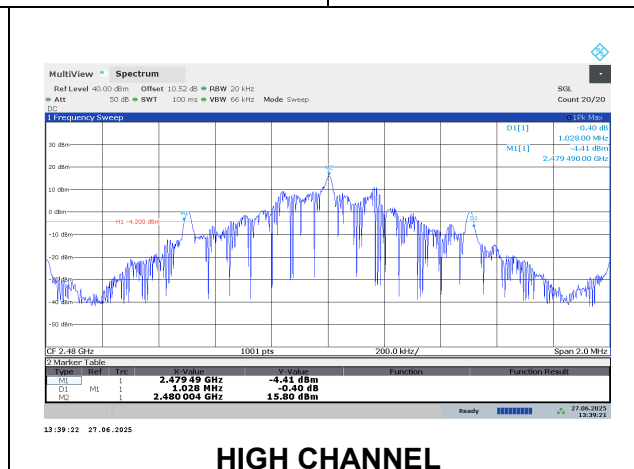
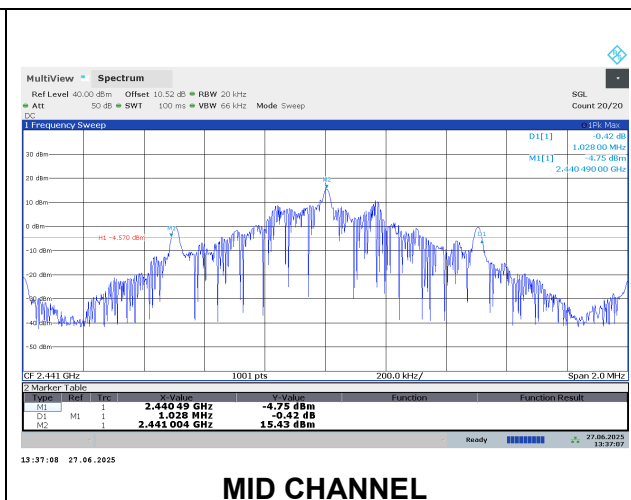
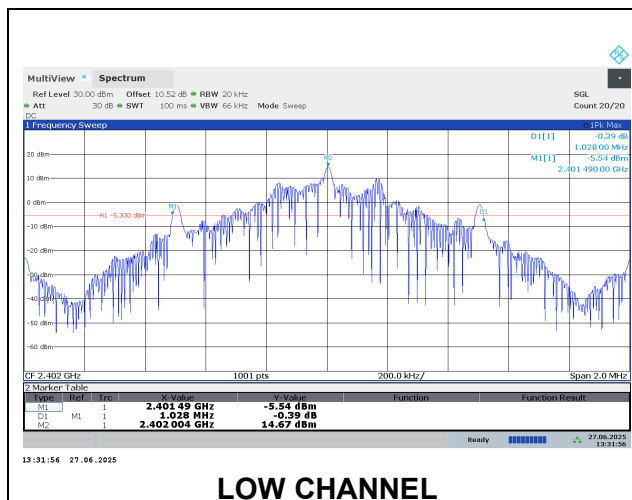
TEST PROCEDURE

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

Tested By: Date
104463/85502 6/27/2025

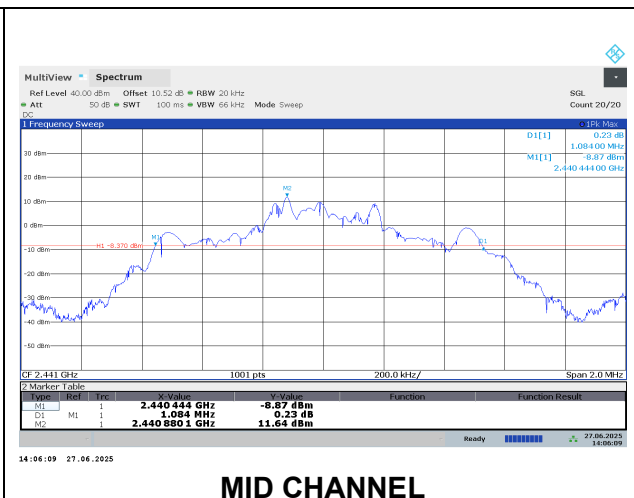
9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	1.028
Mid	2441	1.028
High	2480	1.028



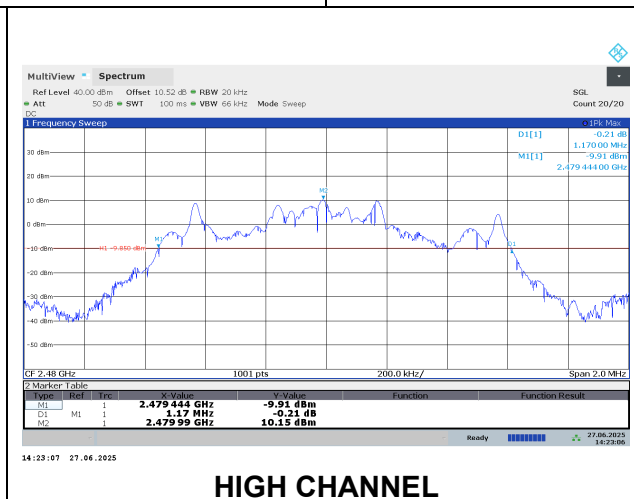
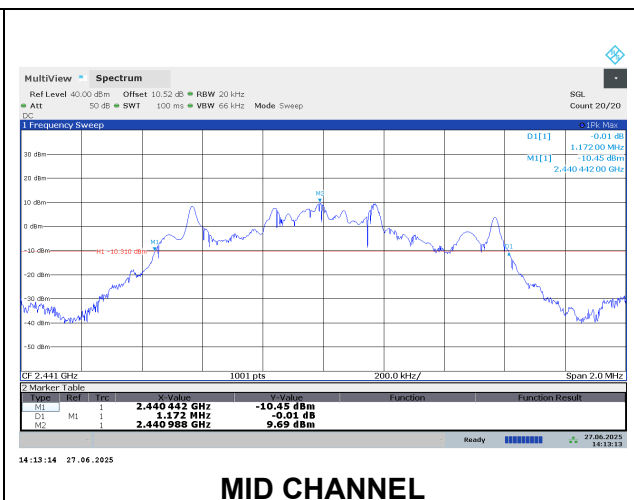
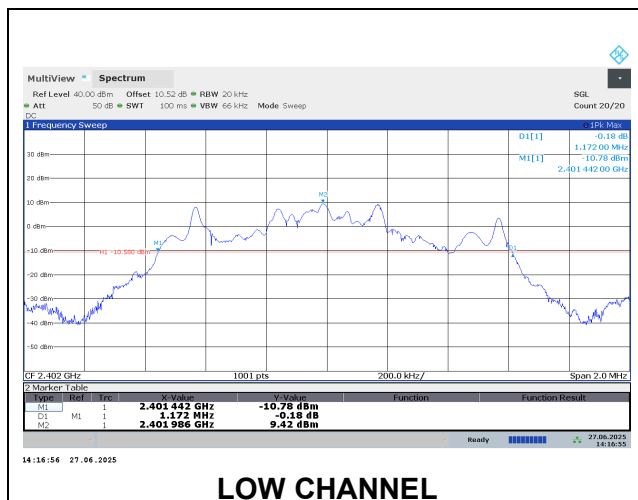
9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	1.084
Mid	2441	1.084
High	2480	1.086



9.2.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	1.172
Mid	2441	1.172
High	2480	1.17



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.

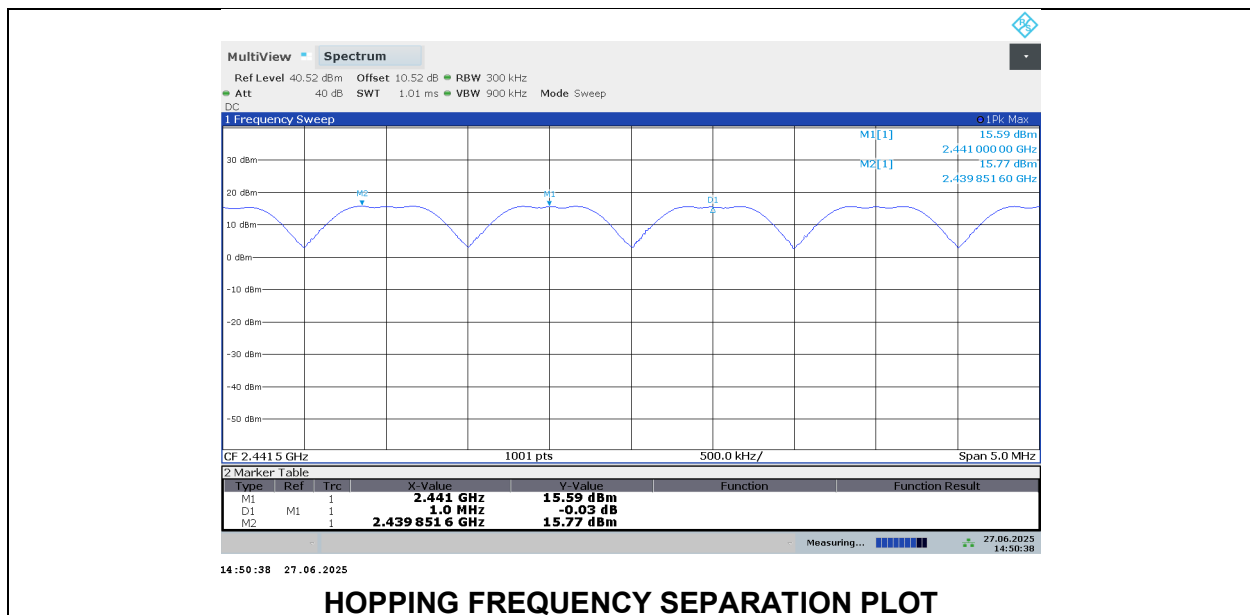
TEST PROCEDURE

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

RESULTS

Tested By: 104463/85502
Date: 6/27/2025

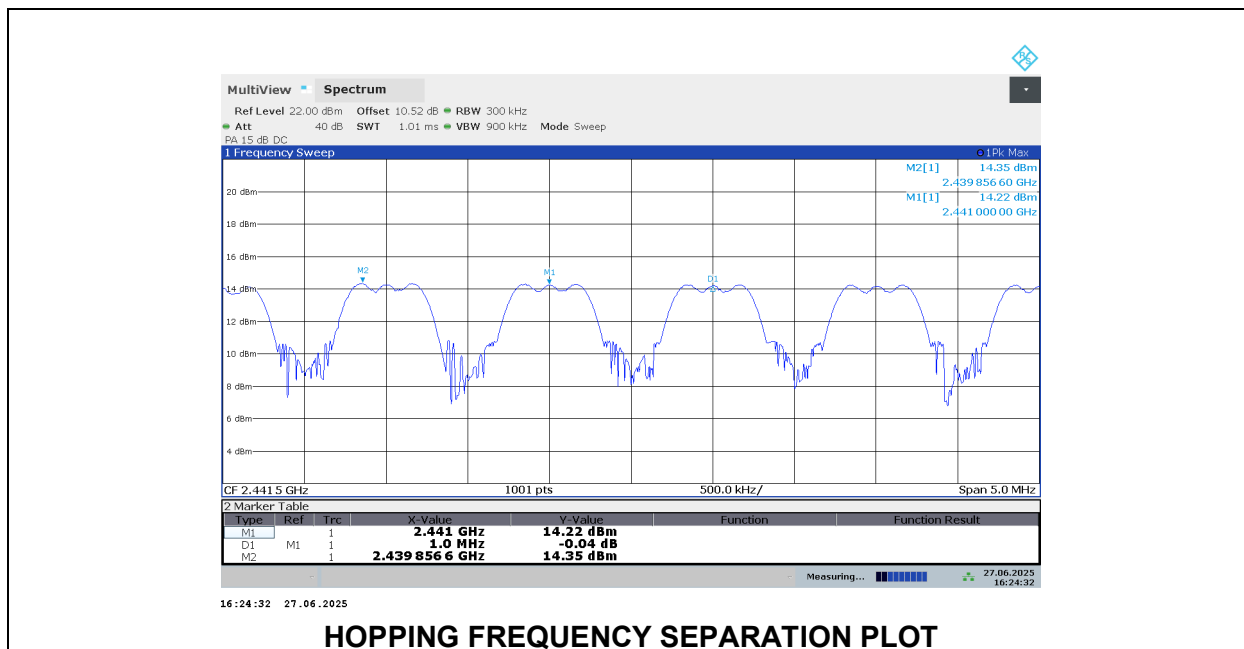
9.3.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION



Since output power is <125mW (21dBm), Separation can be > 2/3 20dB BW

Output Power (dBm)	Separation (MHz)	20dB BW (MHz)	2/3 dB BW (MHz)	Margin (MHz)
16.38	1.000	1.028	0.685	-0.315

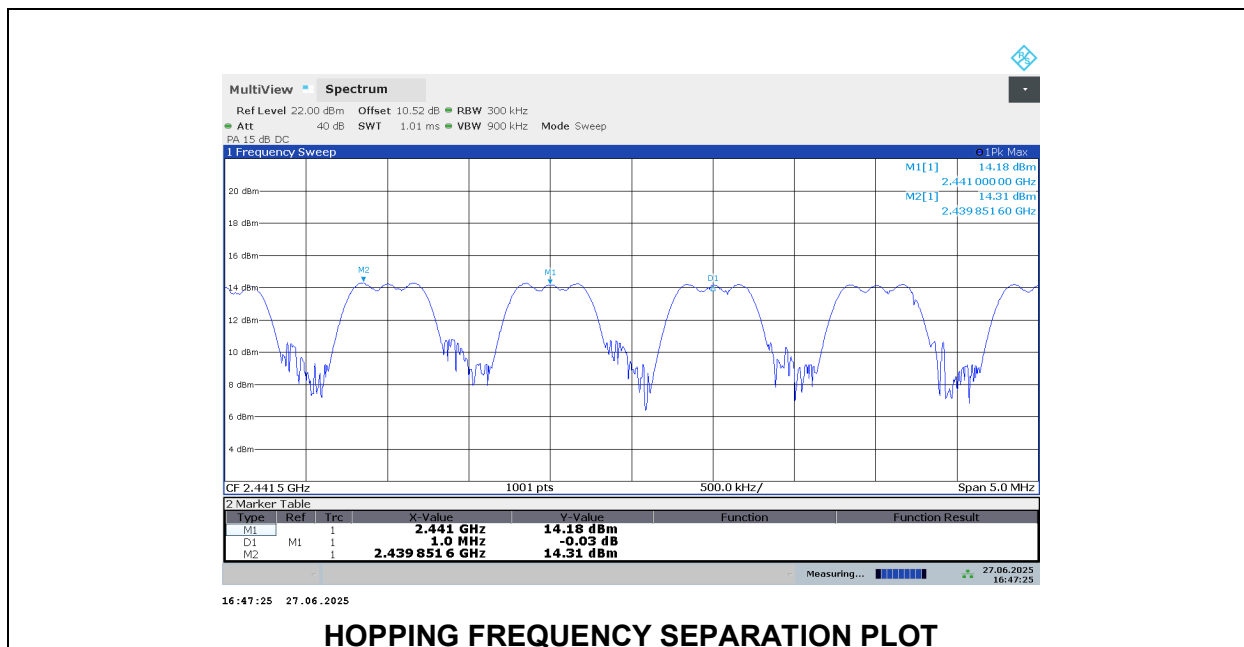
9.3.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



Since output power is <125mW (21dBm), Separation can be > 2/3 20dB BW

Output Power (dBm)	Separation (MHz)	20dB BW (MHz)	2/3 dB BW (MHz)	Margin (MHz)
15.41	1.000	1.084	0.723	-0.277

9.3.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION



Since output power is <125mW (21dBm), Separation can be > 2/3 20dB BW

Output Power (dBm)	Separation (MHz)	20dB BW (MHz)	2/3 dB BW (MHz)	Margin (MHz)
15.45	1.000	1.17	0.780	-0.220

9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)
RSS-247 (5.1) (d)

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

TEST PROCEDURE

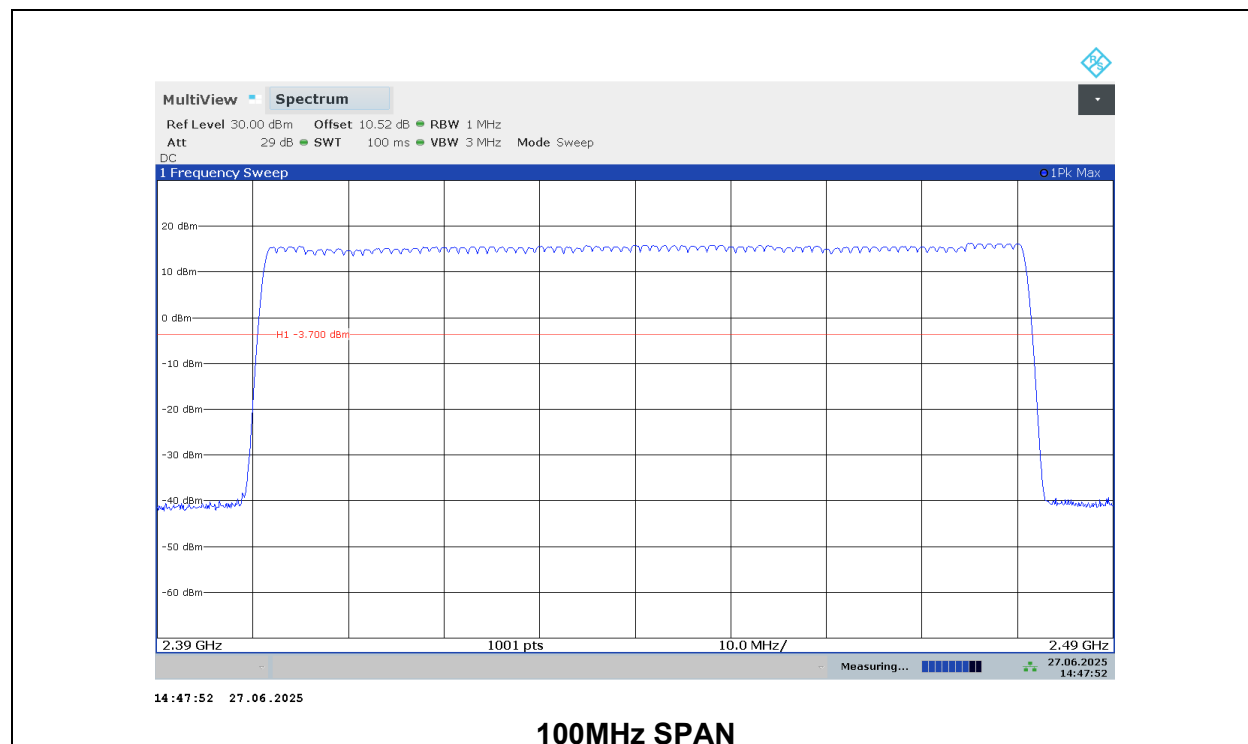
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

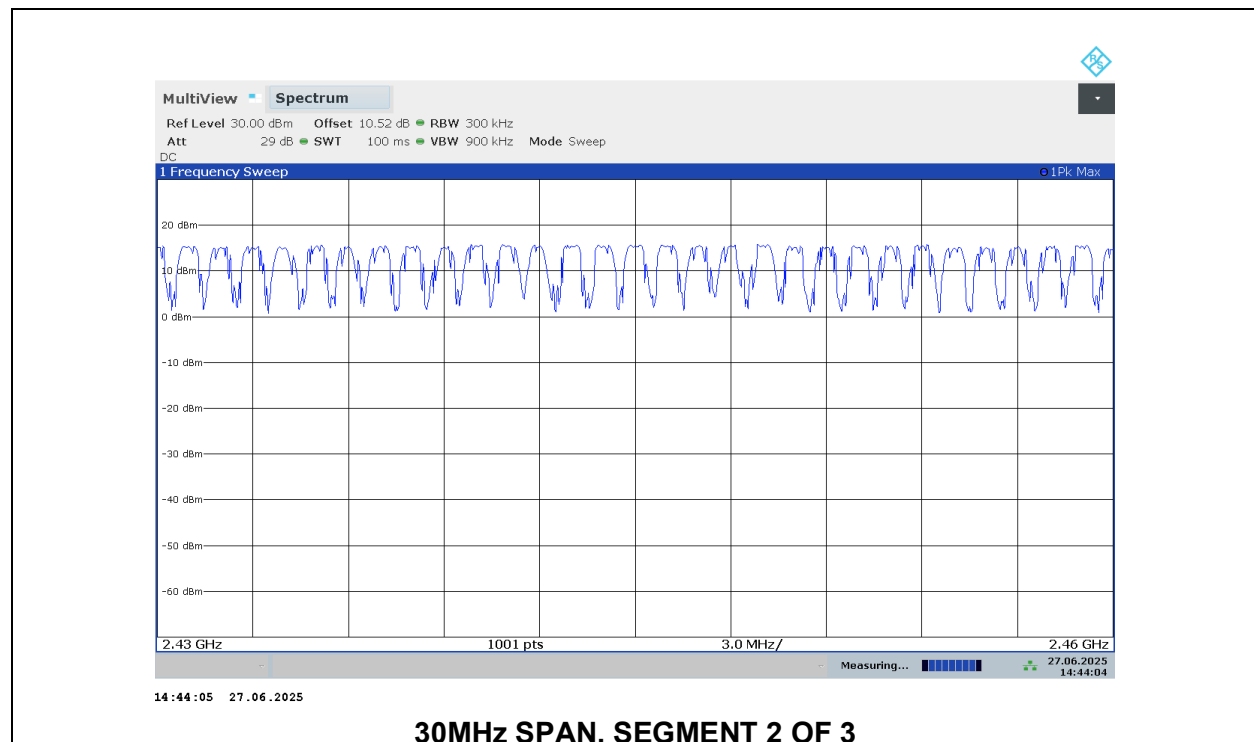
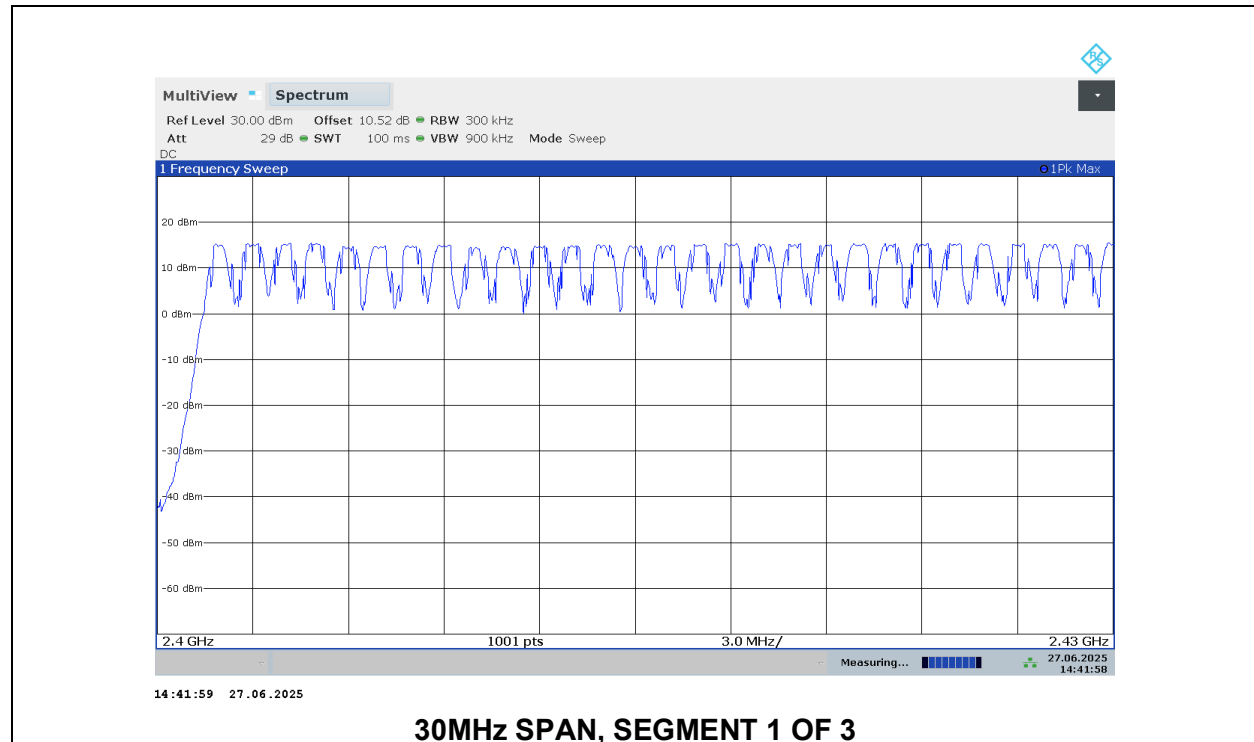
RESULTS

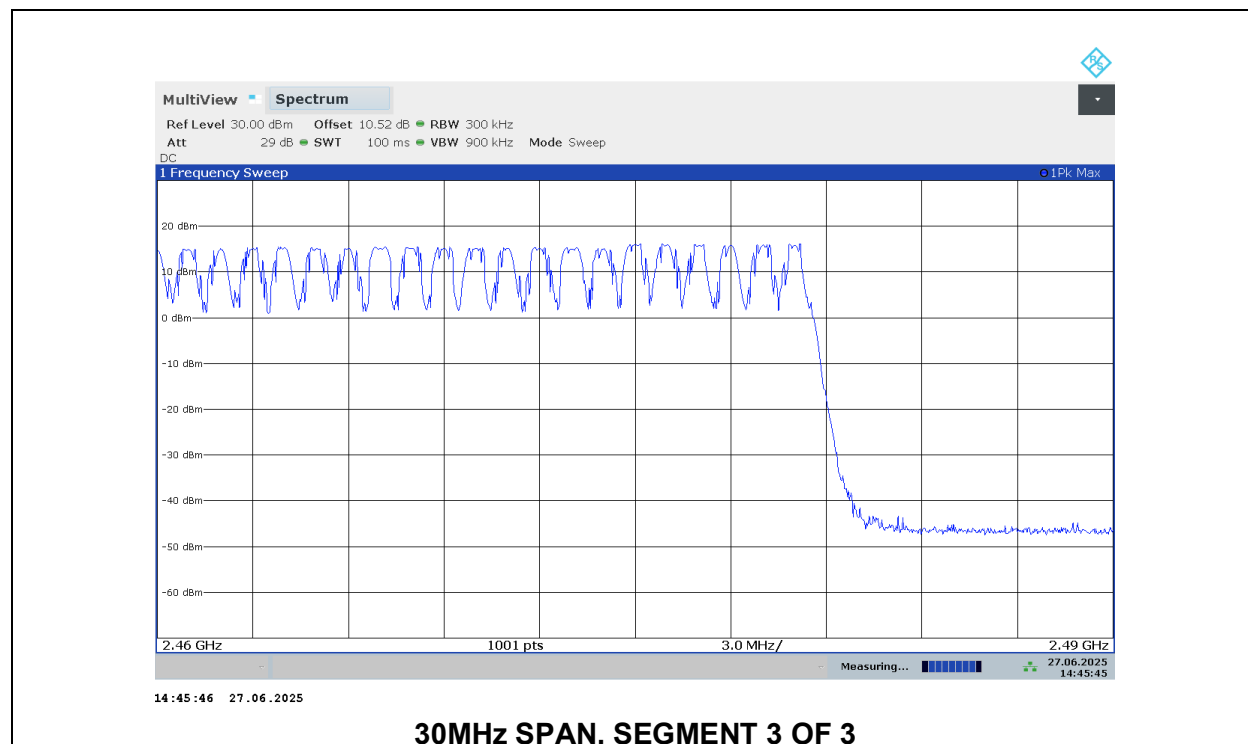
Tested By: Date
104463/85502 6/27/2025

Normal Mode: 79 Channels Observed

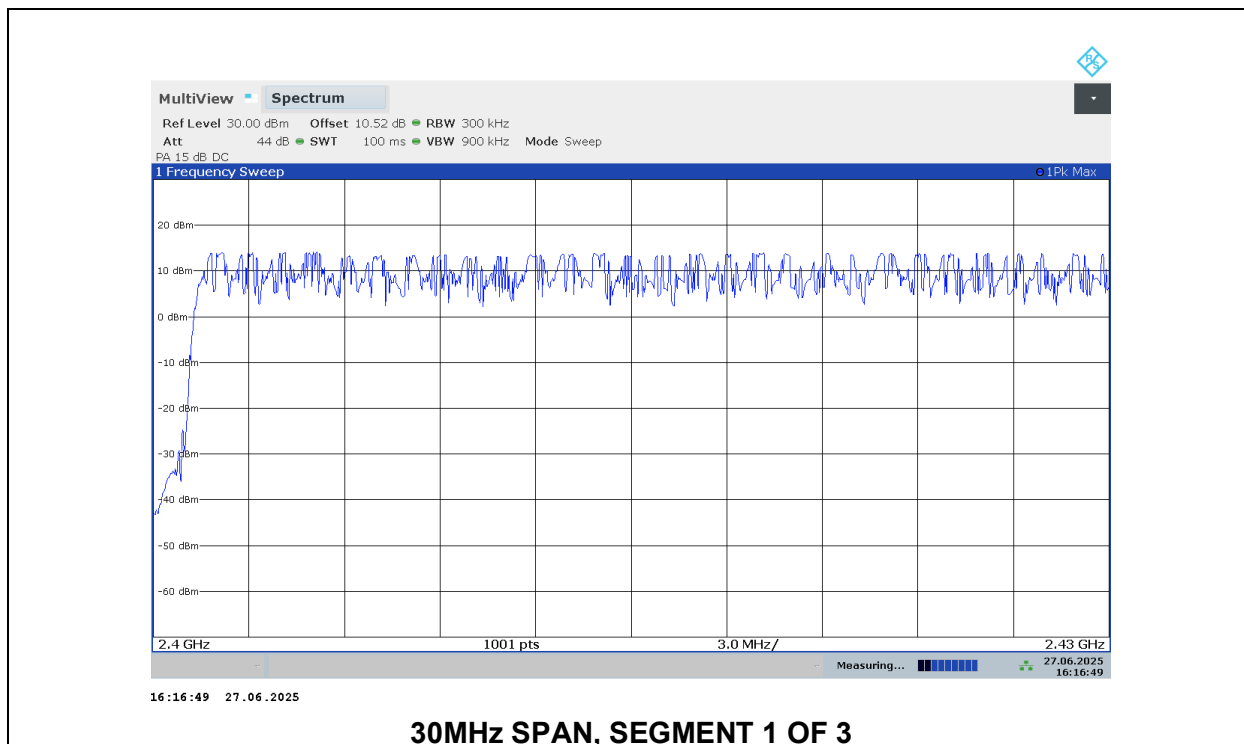
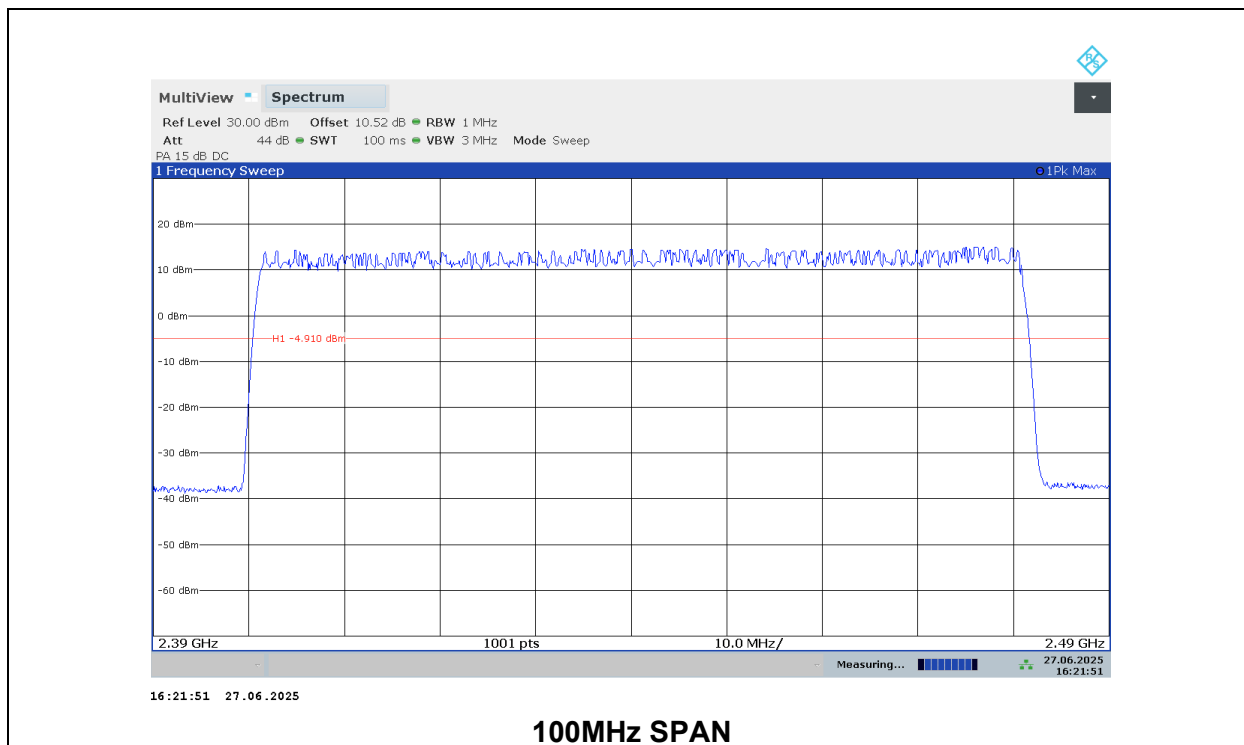
9.4.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

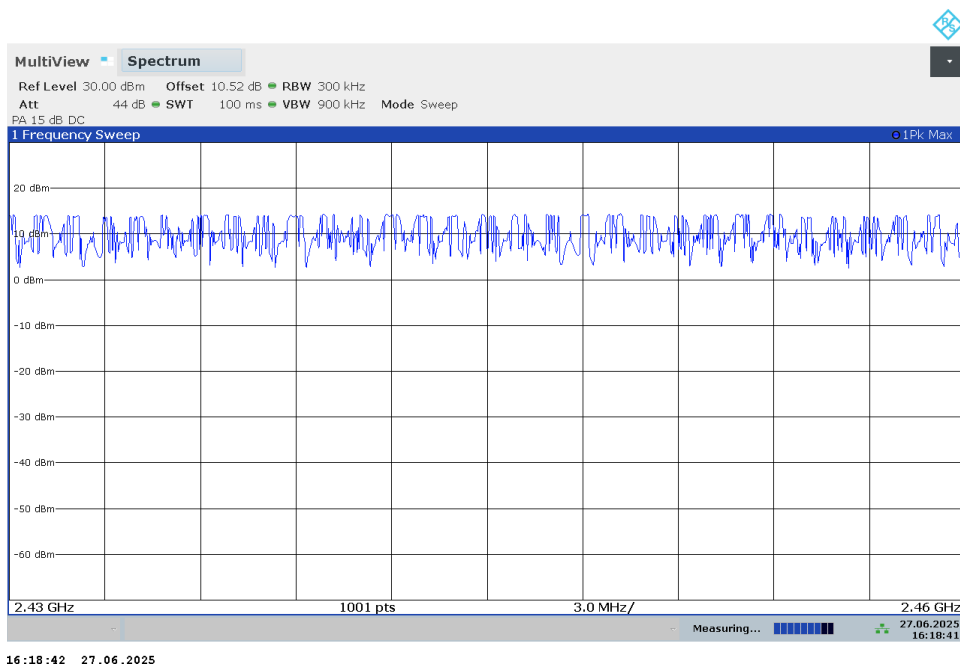




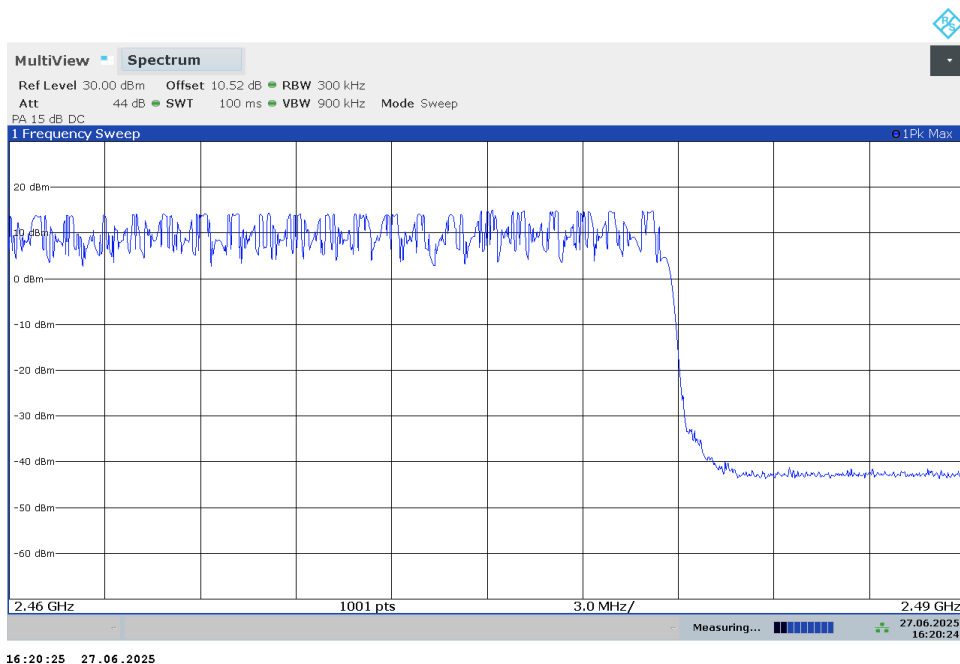


9.4.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION



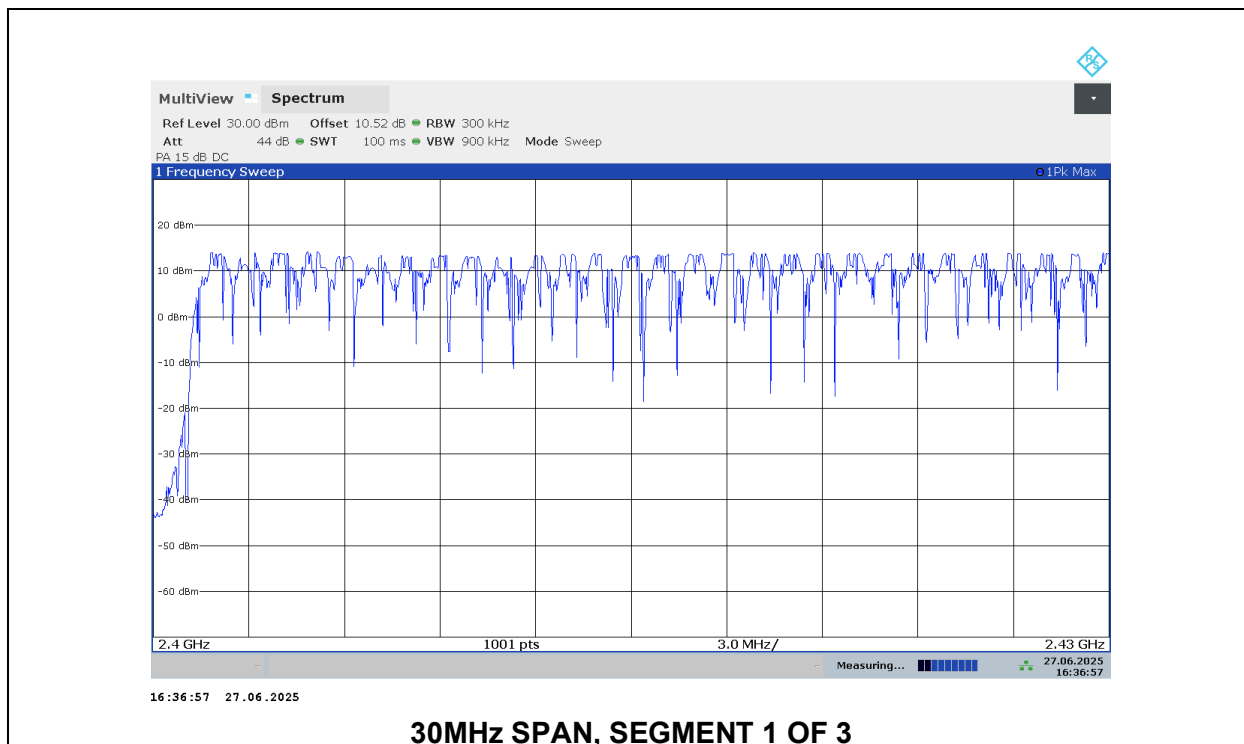
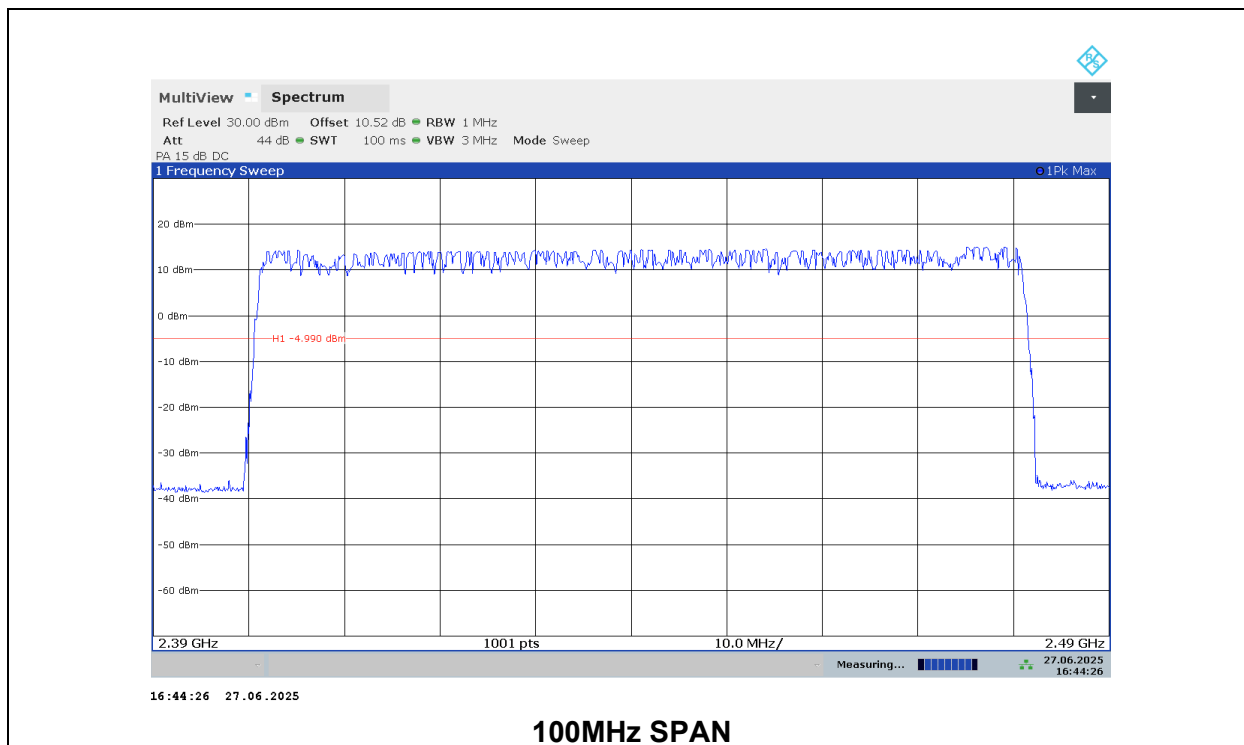


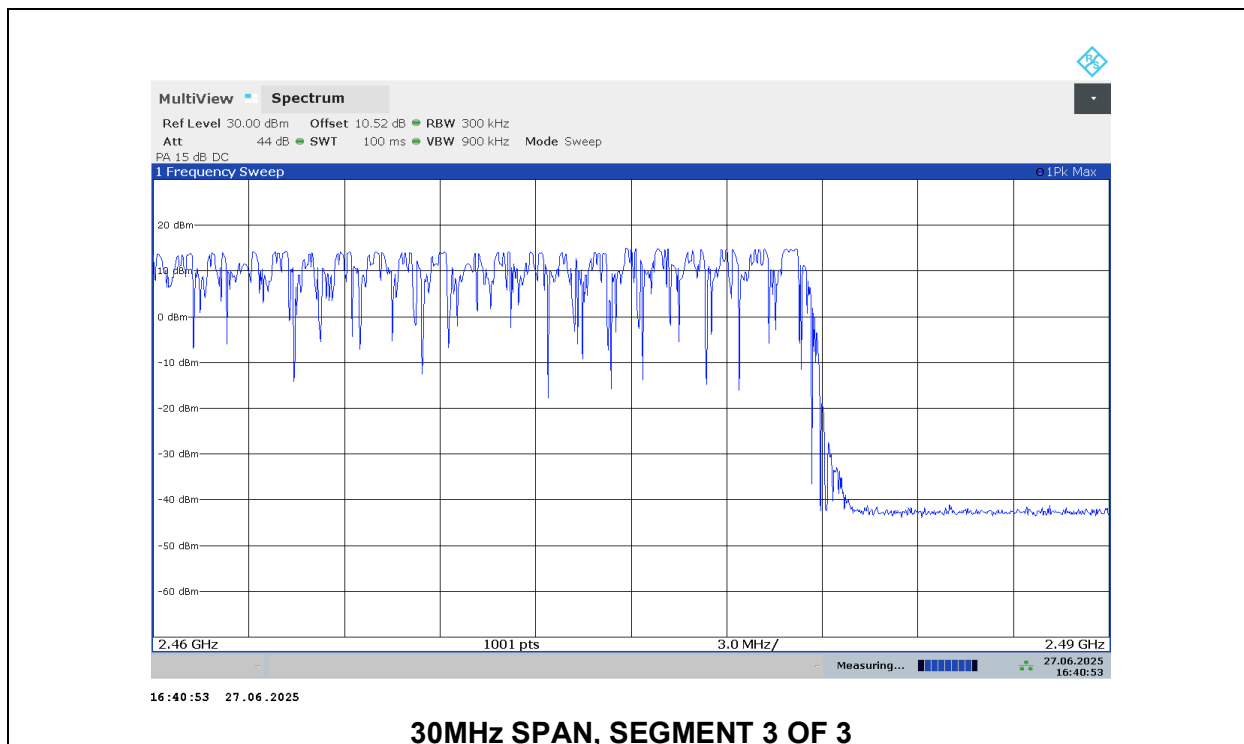
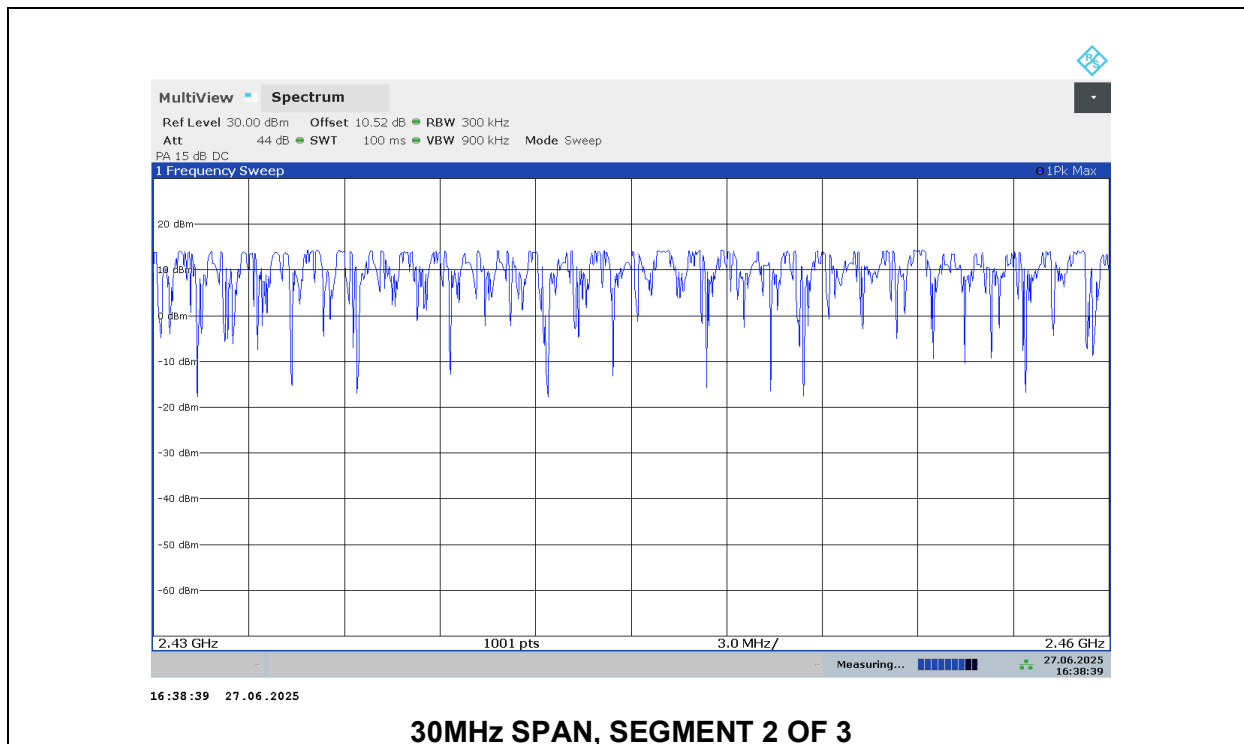
30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

9.4.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION





9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)
RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

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

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

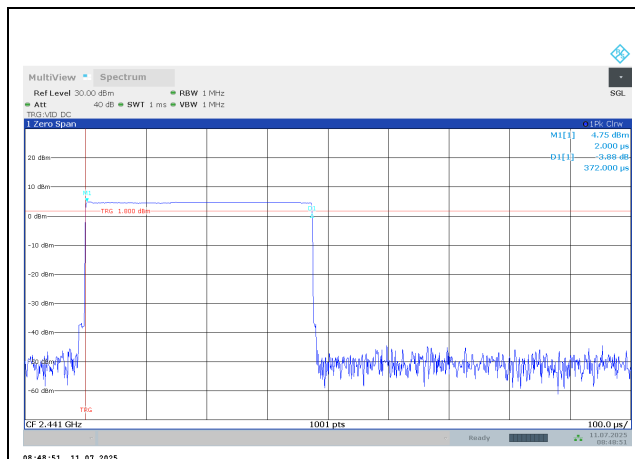
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

RESULTS

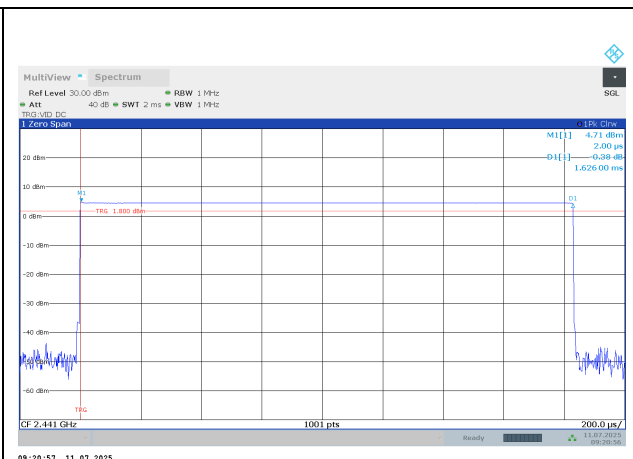
Tested By:	Date
104463/85502	7/11/2025
104463/85502	6/27/2025

9.5.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

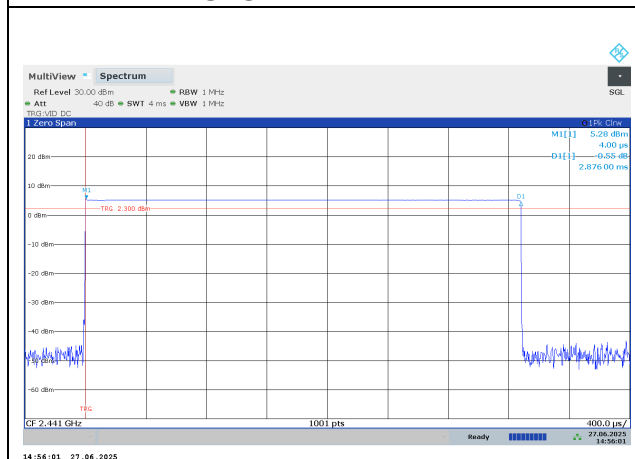
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.372	30	0.1116	0.4	-0.2884
DH3	1.626	17	0.2764	0.4	-0.1236
DH5	2.876	11	0.3164	0.4	-0.0836
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.372	7.5	0.02790	0.4	-0.3721
DH3	1.626	4.25	0.06911	0.4	-0.3309
DH5	2.876	2.75	0.07909	0.4	-0.3209



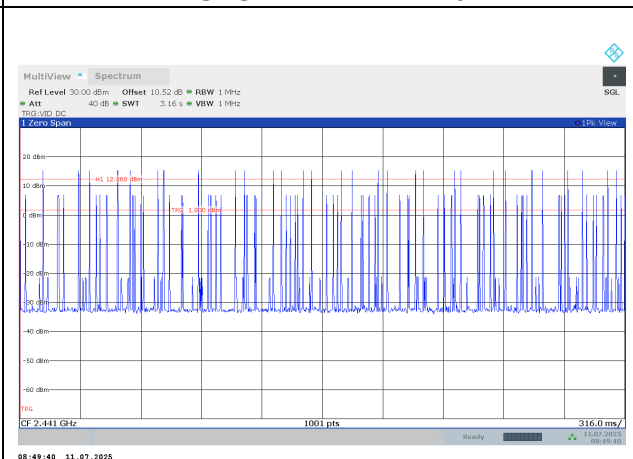
PULSE WIDTH – DH1



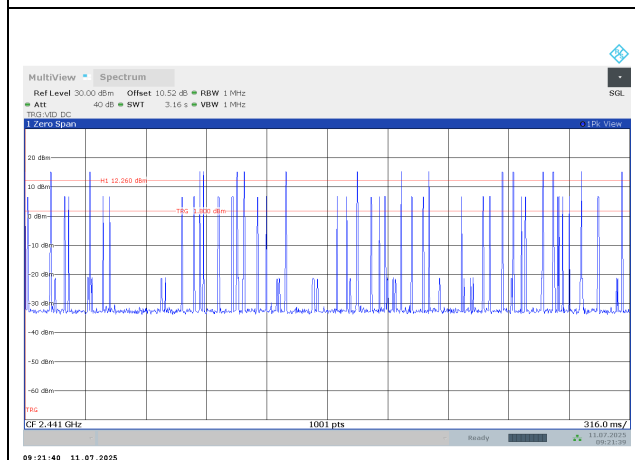
PULSE WIDTH – DH3



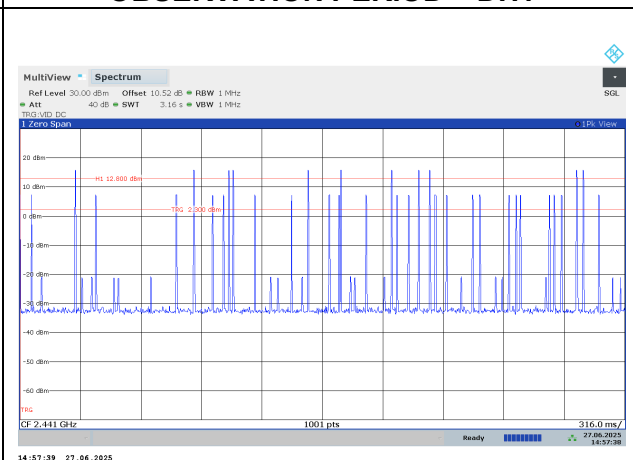
PULSE WIDTH – DH5



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



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

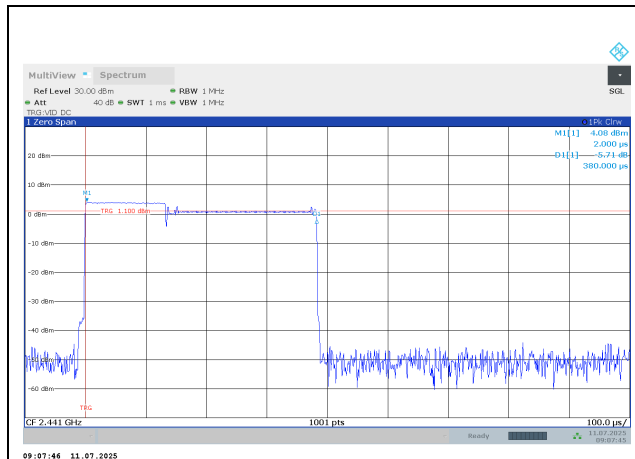


**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5**

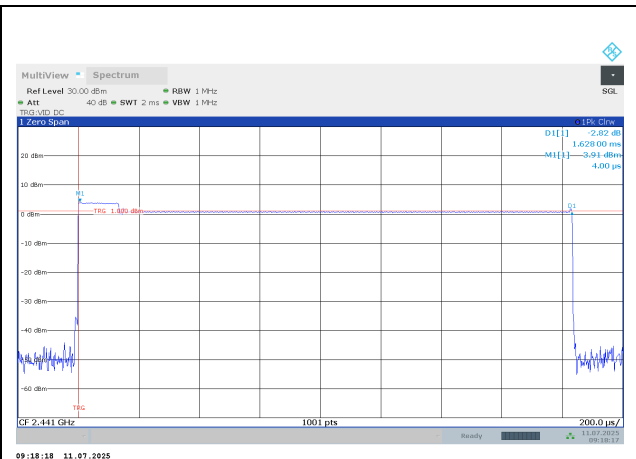
9.5.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.380	33	0.1254	0.4	-0.2746
3DH3	1.628	17	0.27676	0.4	-0.12324
3DH5	2.884	9	0.25956	0.4	-0.14044

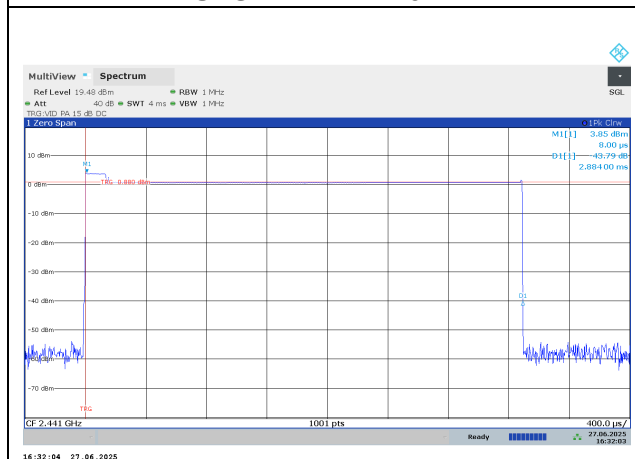
Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



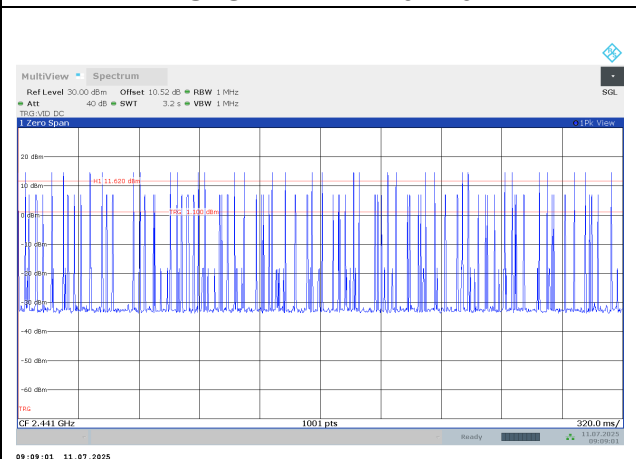
PULSE WIDTH - 3DH1



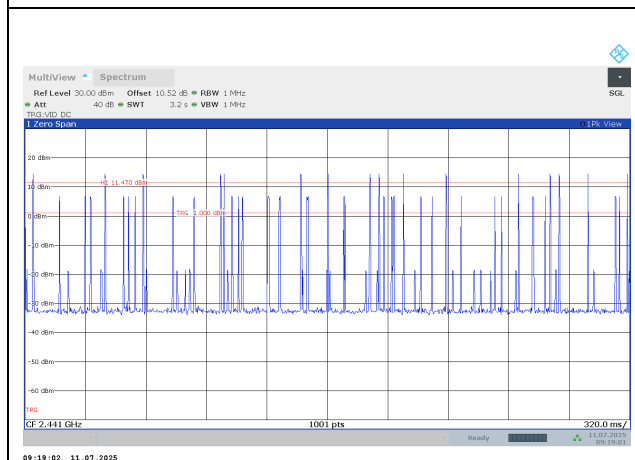
PULSE WIDTH - 3DH3



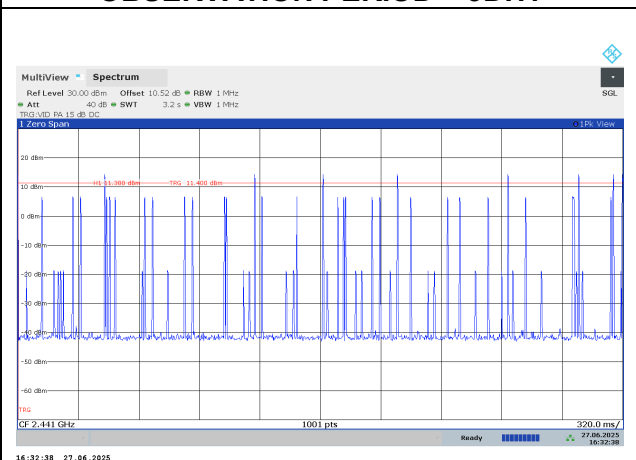
PULSE WIDTH - 3DH5



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



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

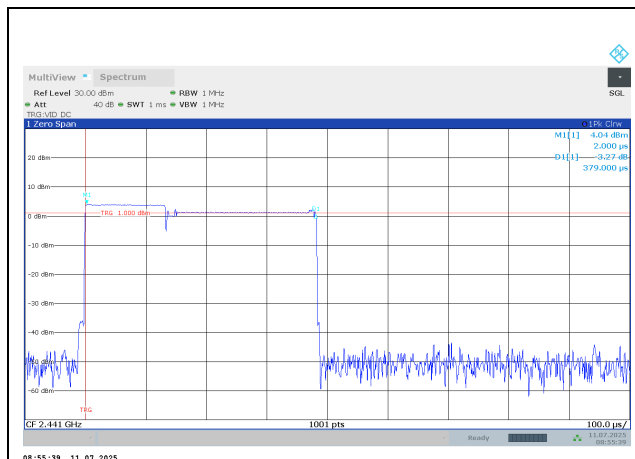


**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD - 3DH5**

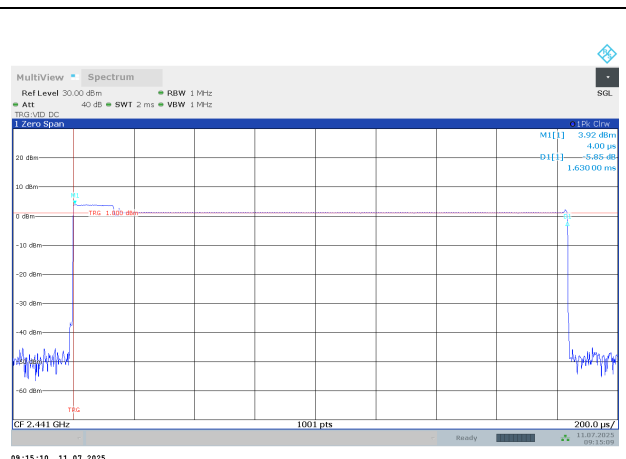
9.5.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DQPSK Normal Mode					
3DH1	0.379	33	0.12507	0.4	-0.27493
3DH3	1.63	15	0.2445	0.4	-0.1555
3DH5	2.876	13	0.37388	0.4	-0.02612

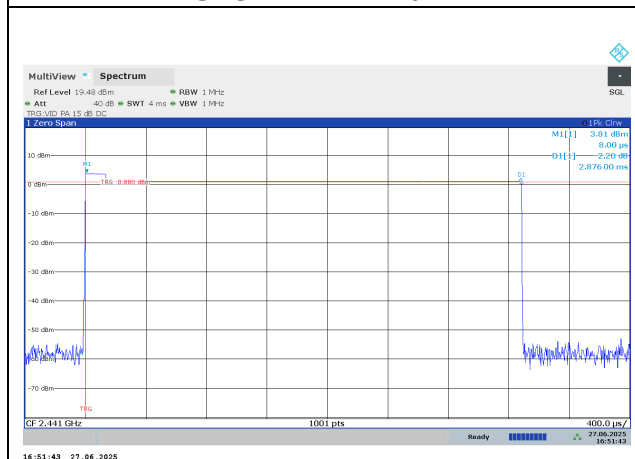
Note: for AFH(DQPSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



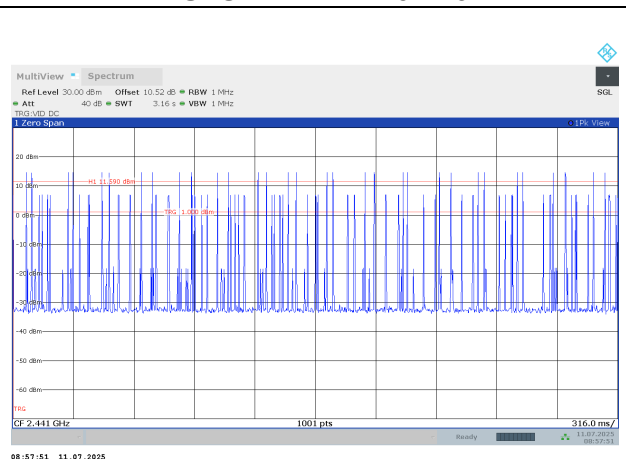
PULSE WIDTH – 3DH1



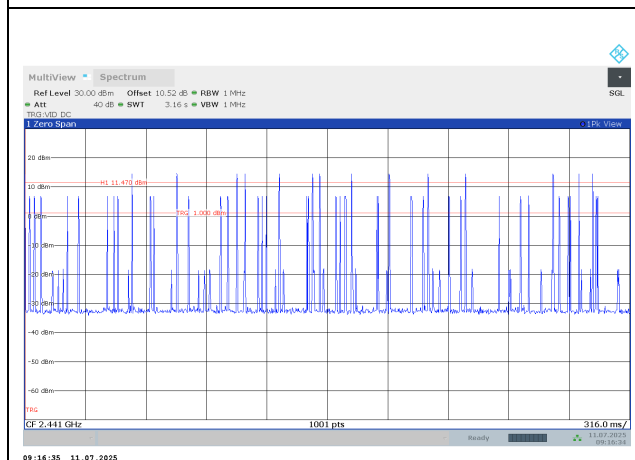
PULSE WIDTH – 3DH3



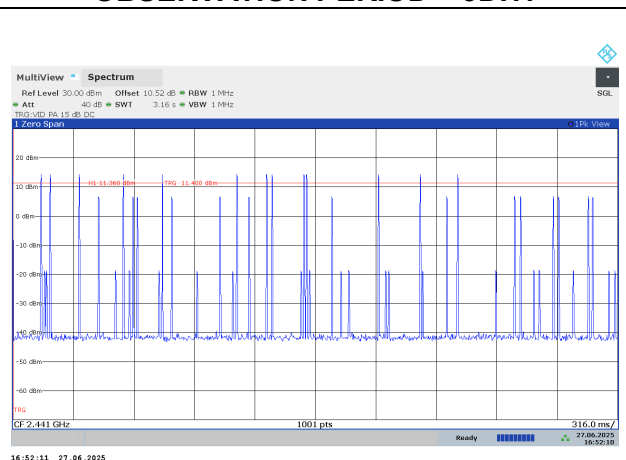
PULSE WIDTH – 3DH5



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



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



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

9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)
RSS-247 (5.4) (b)

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

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. The EUT supports AFH thus the limit used is 125 mW for all modes.

TEST PROCEDURE

The transmitter output is connected to a wideband RF power meter.

9.6.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Tested By:	104463
Date:	2025-06-27

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	15.67	21	-5.33
Middle	2441	16.02	21	-4.98
High	2480	16.38	21	-4.62

9.6.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Tested By:	104463
Date:	2025-06-27

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	14.91	21	-6.09
Middle	2441	15.02	21	-5.98
High	2480	15.41	21	-5.59

9.6.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

Tested By:	104463
Date:	2025-06-27

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	14.92	21	-6.08
Middle	2441	15.05	21	-5.95
High	2480	15.45	21	-5.55

9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

The transmitter output is connected to a wideband gated RF power meter.

RESULTS

9.7.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

Tested By:	104463
Date	2025-06-27

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	15.29
Middle	2441	15.63
High	2480	15.98

9.7.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

Tested By:	104463
Date	2025-06-27

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.76
Middle	2441	11.90
High	2480	12.32

9.7.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

Tested By:	104463
Date	2025-06-27

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	12.03
Middle	2441	12.19
High	2480	12.62

9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

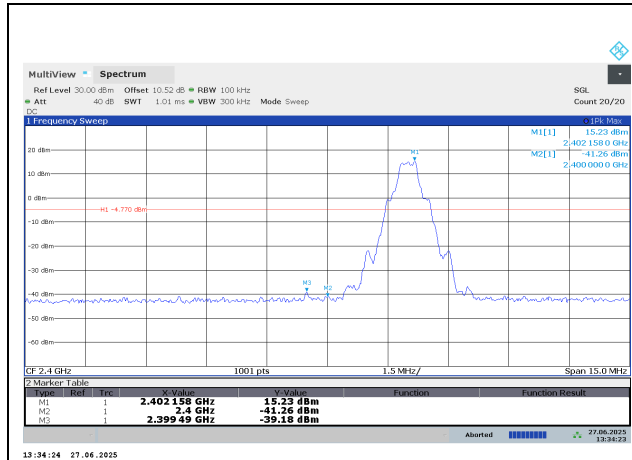
FCC §15.247 (d)
RSS-247 5.5

Output power was measured based on the use of peak measurements, so the required attenuation is -20 dBc.

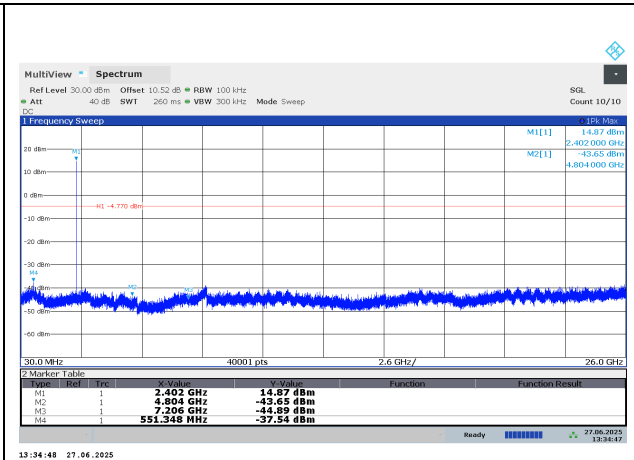
Tested By:	Date
104463/85502	6/27/2025

9.8.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

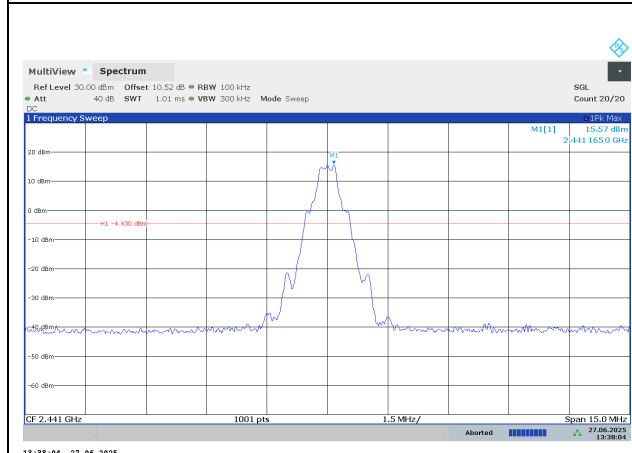
SPURIOUS EMISSIONS, NON-HOPPING



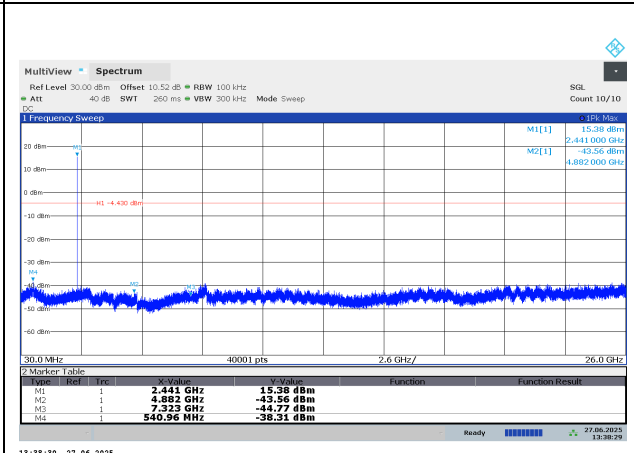
LOW CHANNEL BANDEDGE



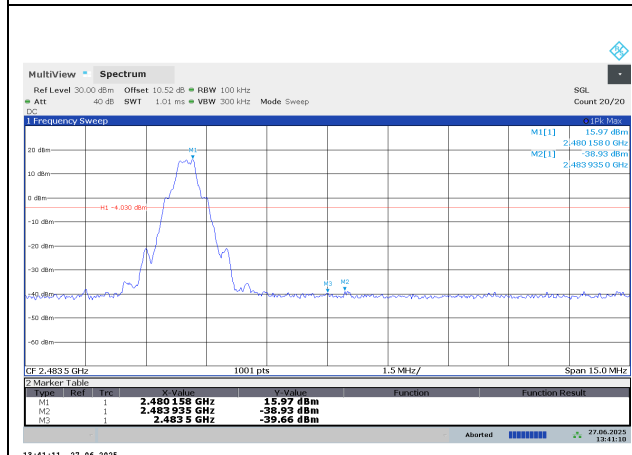
OUT-OF-BAND LOW CHANNEL



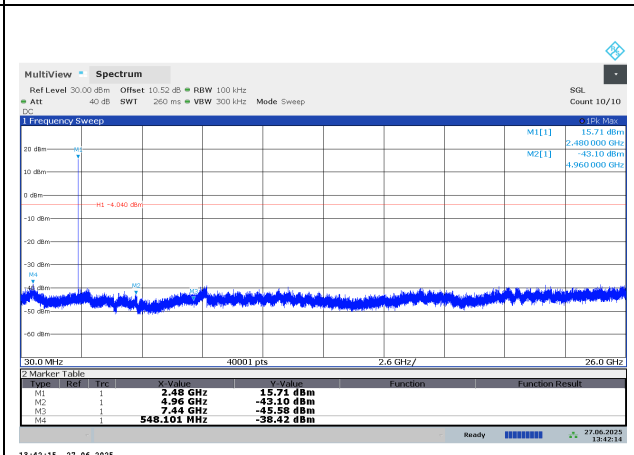
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

LOW BANDEDGE

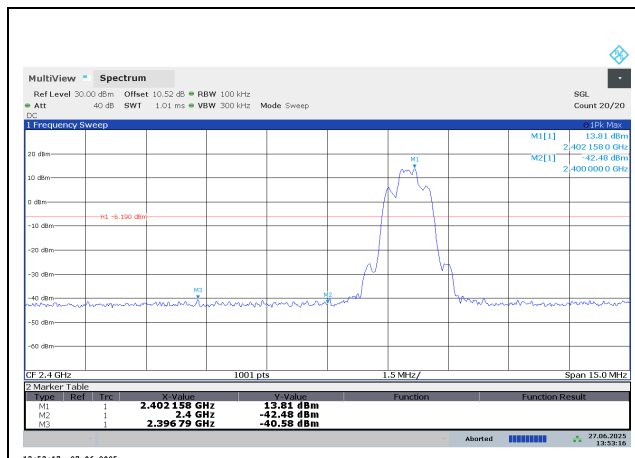
Type	Ref	Freq	Power	Function	Function Result
M1	1	2.405155 GHz	15.30 dBm		
M2	1	2.4 GHz	-41.48 dBm		
M3	1	2.39421 GHz	-40.10 dBm		

HIGH BANDEDGE

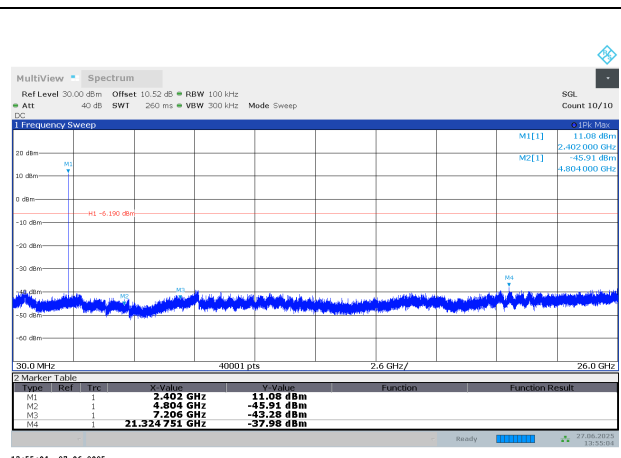
Type	Ref	Freq	Power	Function	Function Result
M1	1	2.476157 GHz	16.00 dBm		
M2	1	2.486365 GHz	-38.79 dBm		
M3	1	2.4835 GHz	-40.55 dBm		

9.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

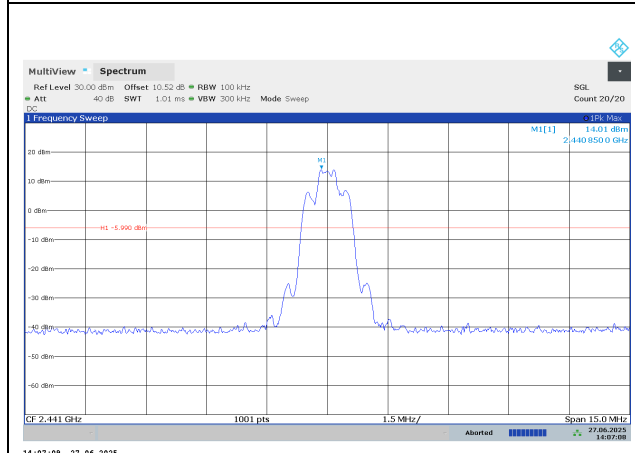
SPURIOUS EMISSIONS, NON-HOPPING



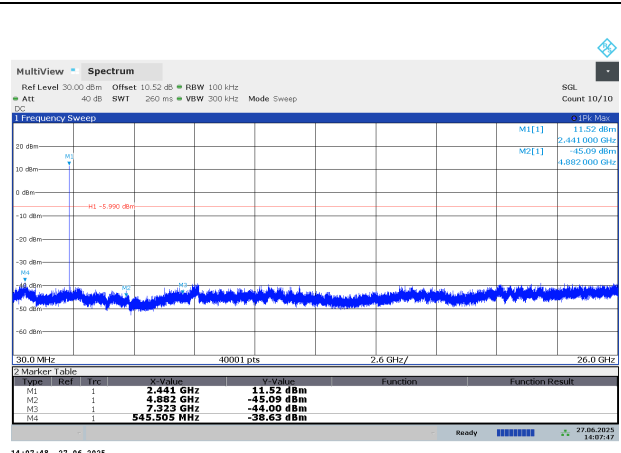
LOW CHANNEL BANDEDGE



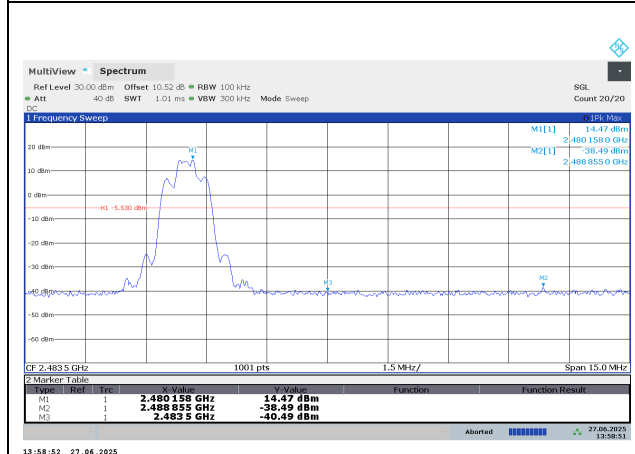
OUT-OF-BAND LOW CHANNEL



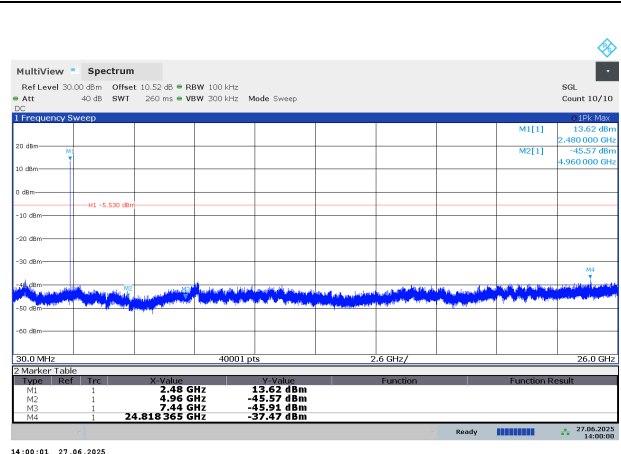
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

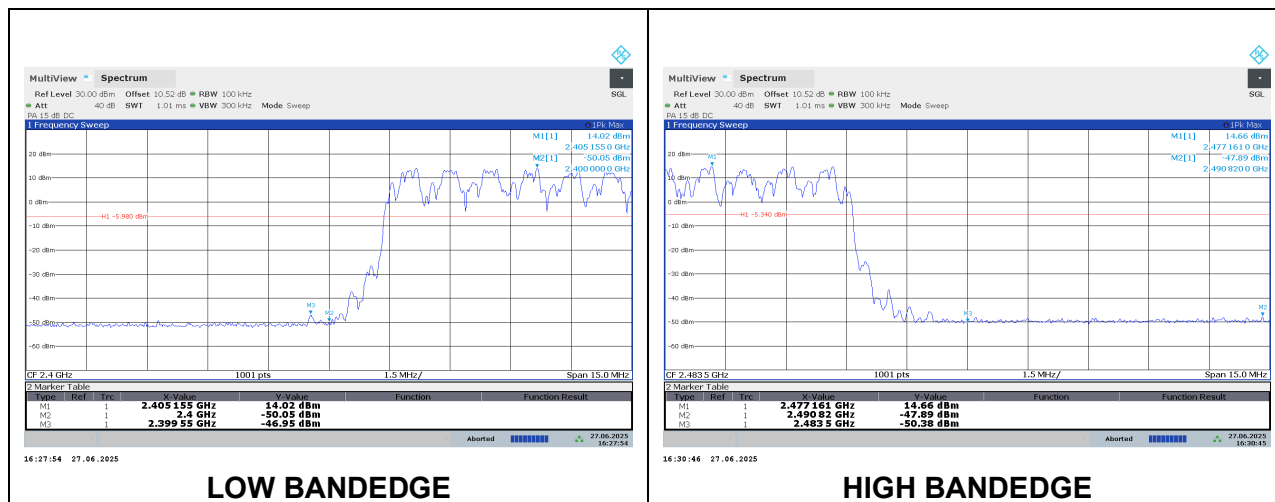


HIGH CHANNEL BANDEDGE



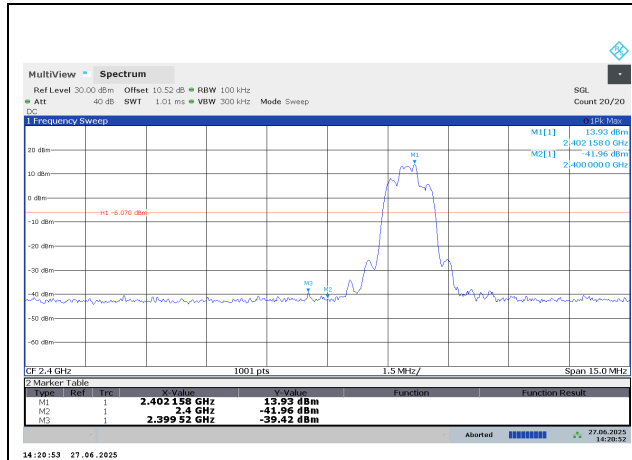
OUT-OF-BAND HIGH CHANNEL

SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

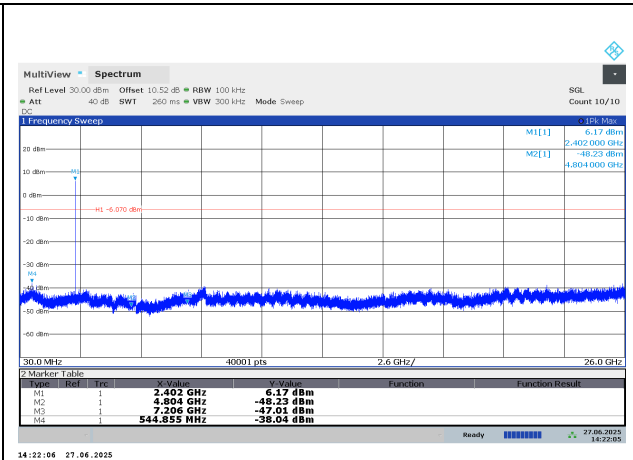


9.8.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

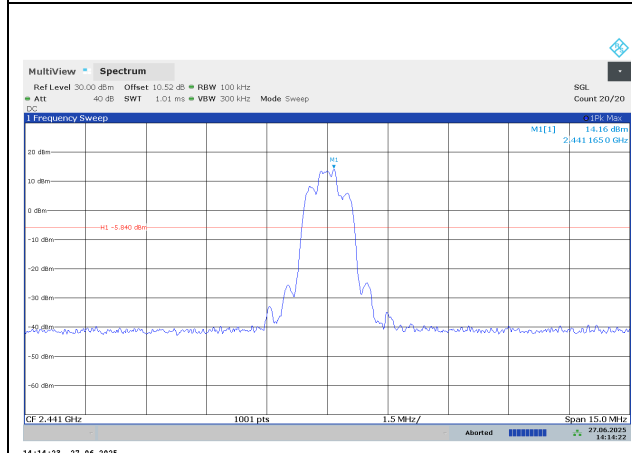
SPURIOUS EMISSIONS, NON-HOPPING



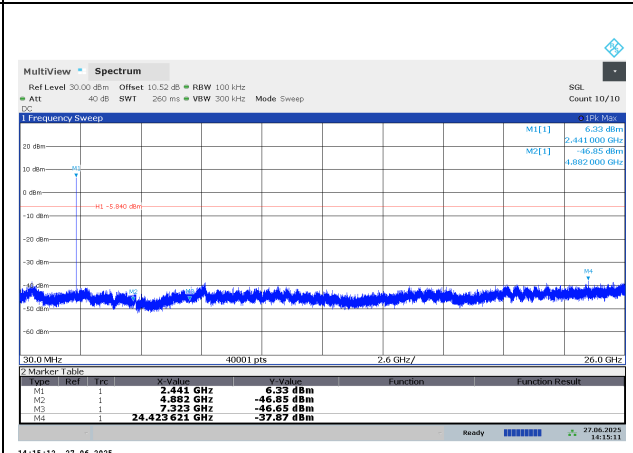
LOW CHANNEL BANDEDGE



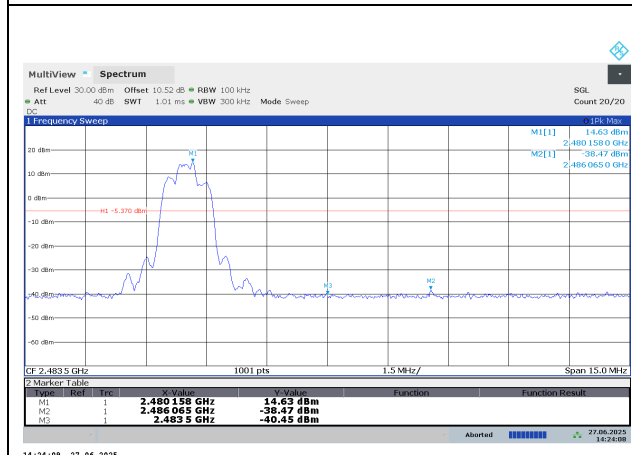
OUT-OF-BAND LOW CHANNEL



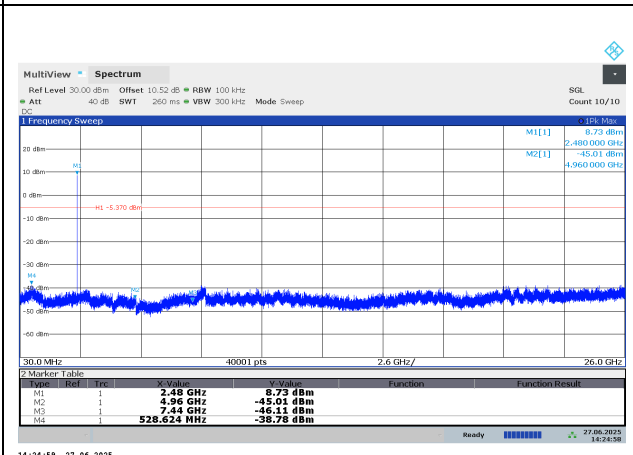
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

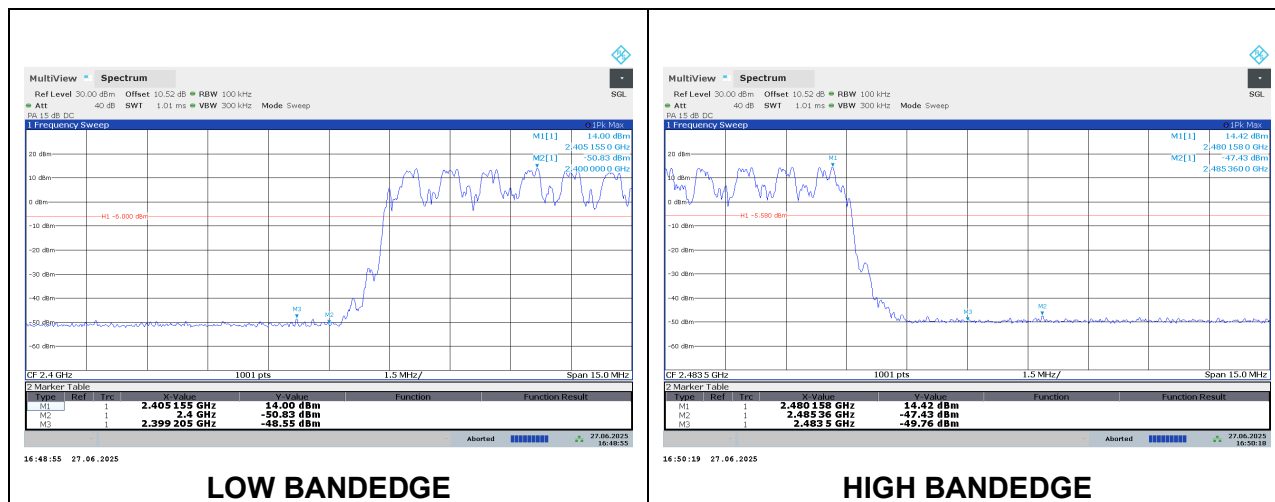


HIGH CHANNEL BANDEDGE



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

RSS-GEN, Section 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 and final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. Averaging used in this report is reduced VBW, where VBW = 1/Ton.

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 average 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.

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

Based 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

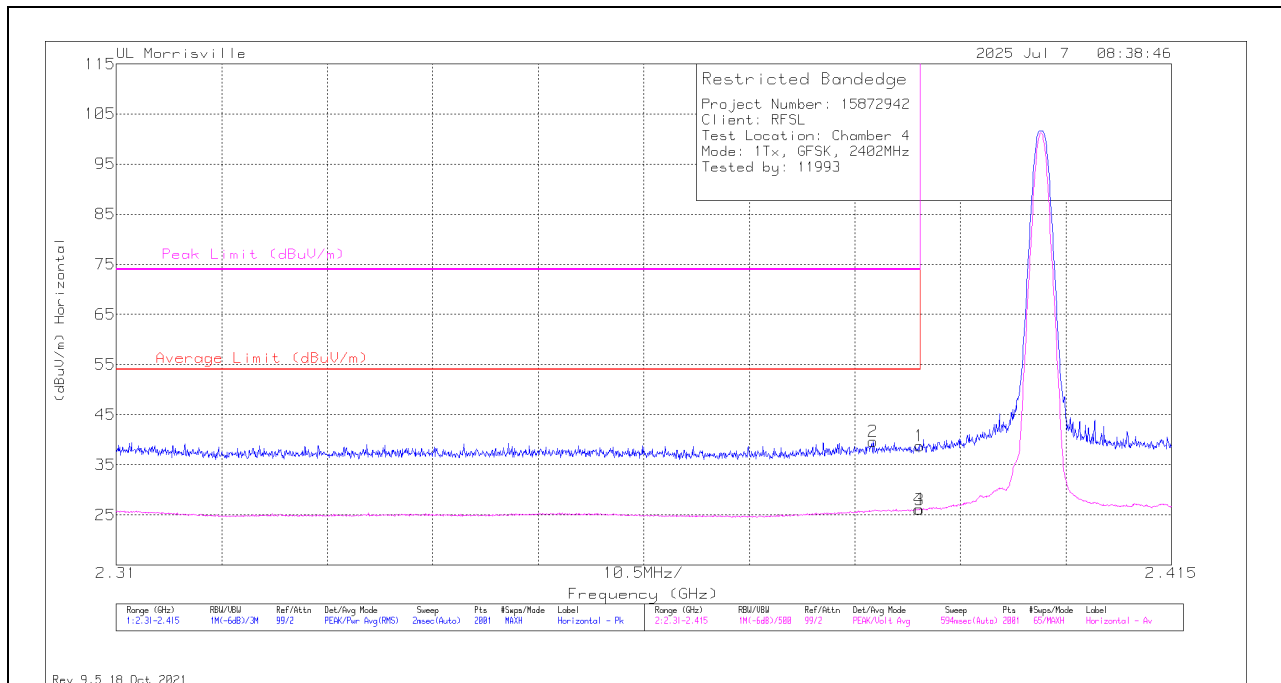
OFS and chamber correlation testing had been performed and the chamber measured test result is the worst-case test result.

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	206211 (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	29.78	Pk	32	-23	38.78	-	-	74	-35.22	335	361	H
2	* ** 2.38534	30.58	Pk	32	-22.9	39.68	-	-	74	-34.32	335	361	H
3	* ** 2.38996	17.07	V1TV	32	-23	26.07	54	-27.93	-	-	335	361	H
4	* ** 2.38985	17.15	V1TV	32	-23	26.15	54	-27.85	-	-	335	361	H

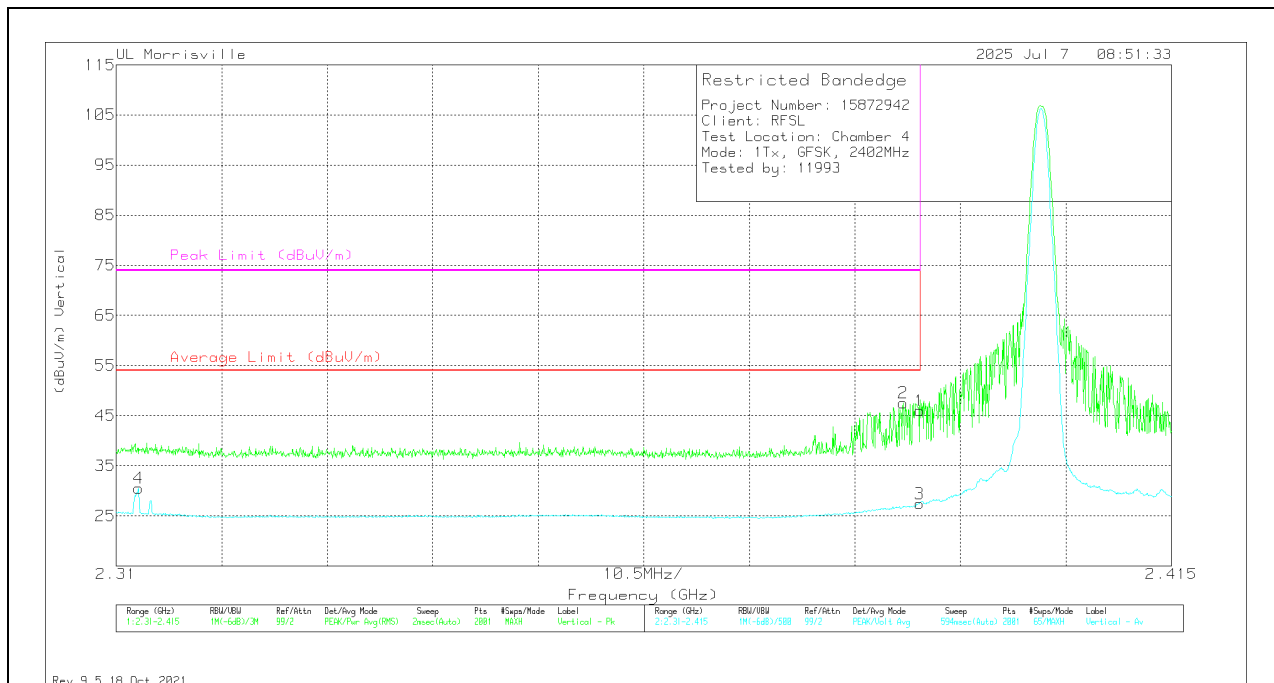
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	36.98	Pk	32	-23	45.98	-	-	74	-28.02	95	125	V
2	* ** 2.38828	38.43	Pk	32	-22.9	47.53	-	-	74	-26.47	95	125	V
3	* ** 2.38996	18.44	V1TV	32	-23	27.44	54	-26.56	-	-	95	125	V
4	* ** 2.31221	21.59	V1TV	31.9	-23	30.49	54	-23.51	-	-	95	125	V

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

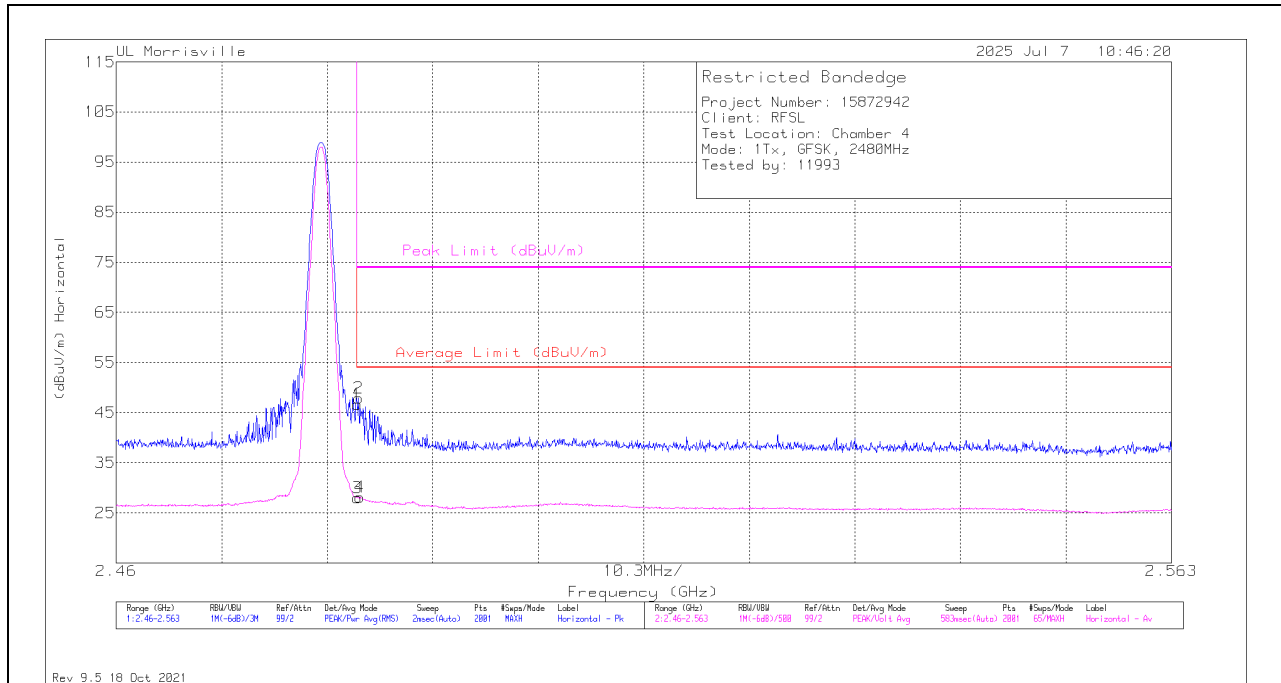
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	37.52	Pk	32.3	-23.2	46.62	-	-	74	-27.38	39	381	H
2	* ** 2.48364	38.8	Pk	32.3	-23.2	47.9	-	-	74	-26.1	39	381	H
3	* ** 2.48354	18.94	V1TV	32.3	-23.2	28.04	54	-25.96	-	-	39	381	H
4	* ** 2.48379	19.03	V1TV	32.3	-23.2	28.13	54	-25.87	-	-	39	381	H

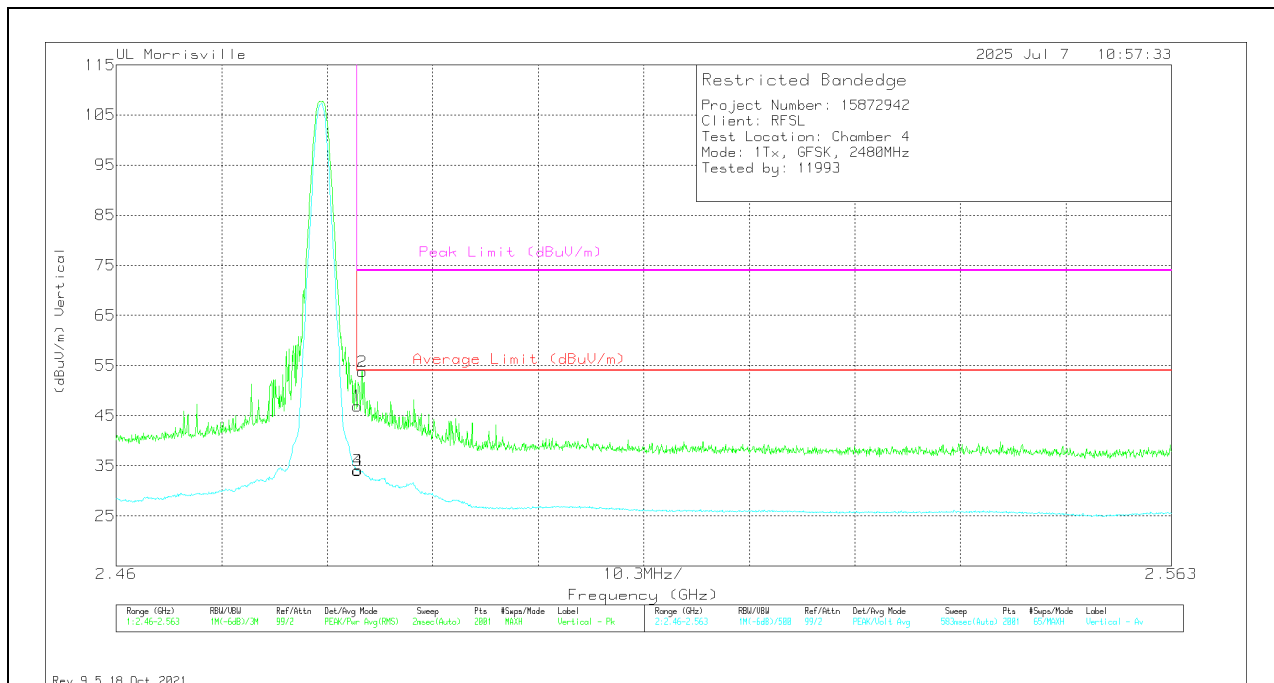
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	37.82	Pk	32.3	-23.2	46.92	-	-	74	-27.08	108	131	V
2	* ** 2.484	44.64	Pk	32.3	-23.2	53.74	-	-	74	-20.26	108	131	V
3	* ** 2.48354	24.92	V1TV	32.3	-23.2	34.02	54	-19.98	-	-	108	131	V
4	* ** 2.48359	24.98	V1TV	32.3	-23.2	34.08	54	-19.92	-	-	108	131	V

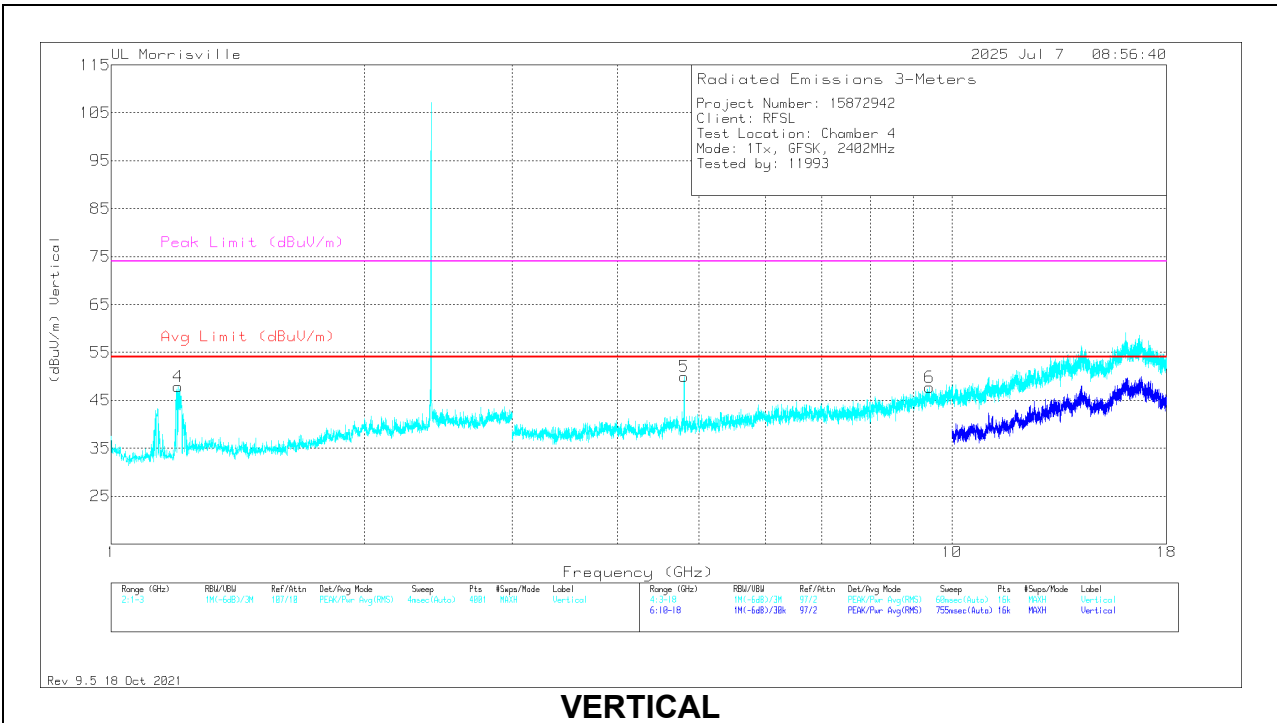
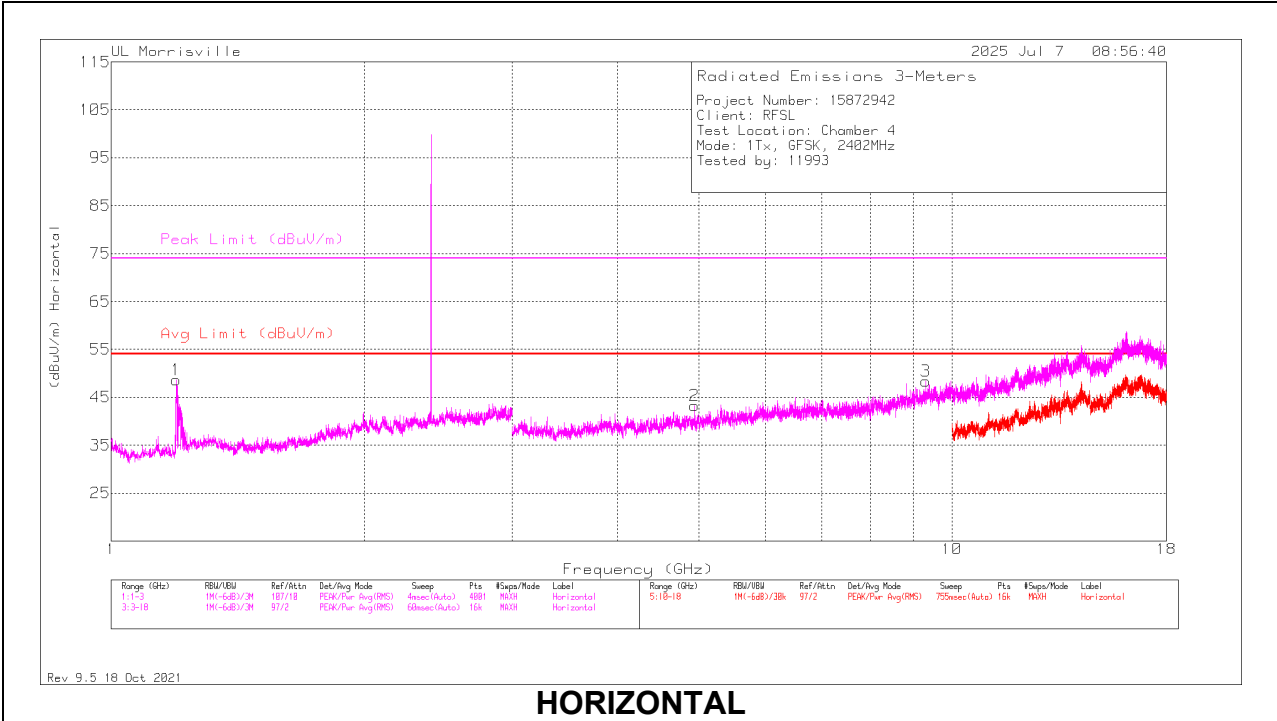
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS
LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 1.19701	49.87	PK2	28.1	-25.4	52.57	-	-	74	-21.43	41	375	H
	* ** 1.19495	19.85	V1TV	28.1	-25.5	22.45	54	-31.55	-	-	41	375	H
4	* ** 1.2015	44.98	Pk	28.2	-25.3	47.88	54	-6.12	74	-26.12	0-360	200	V
2	* ** 4.94156	41.32	Pk	33.8	-31.8	43.32	54	-10.68	74	-30.68	0-360	100	H
3	* ** 9.31273	35.82	PK2	36.3	-24.3	47.82	-	-	74	-26.18	235	223	H
	* ** 9.31282	22.14	V1TV	36.3	-24.3	34.14	54	-19.86	-	-	235	223	H
5	* ** 4.80377	46.59	PK2	33.9	-32.5	47.99	-	-	74	-26.01	133	202	V
	* ** 4.804	41.53	V1TV	33.9	-32.5	42.93	54	-11.07	-	-	133	202	V
6	* ** 9.40219	35.27	Pk	36.5	-24.1	47.67	54	-6.33	74	-26.33	0-360	200	V

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

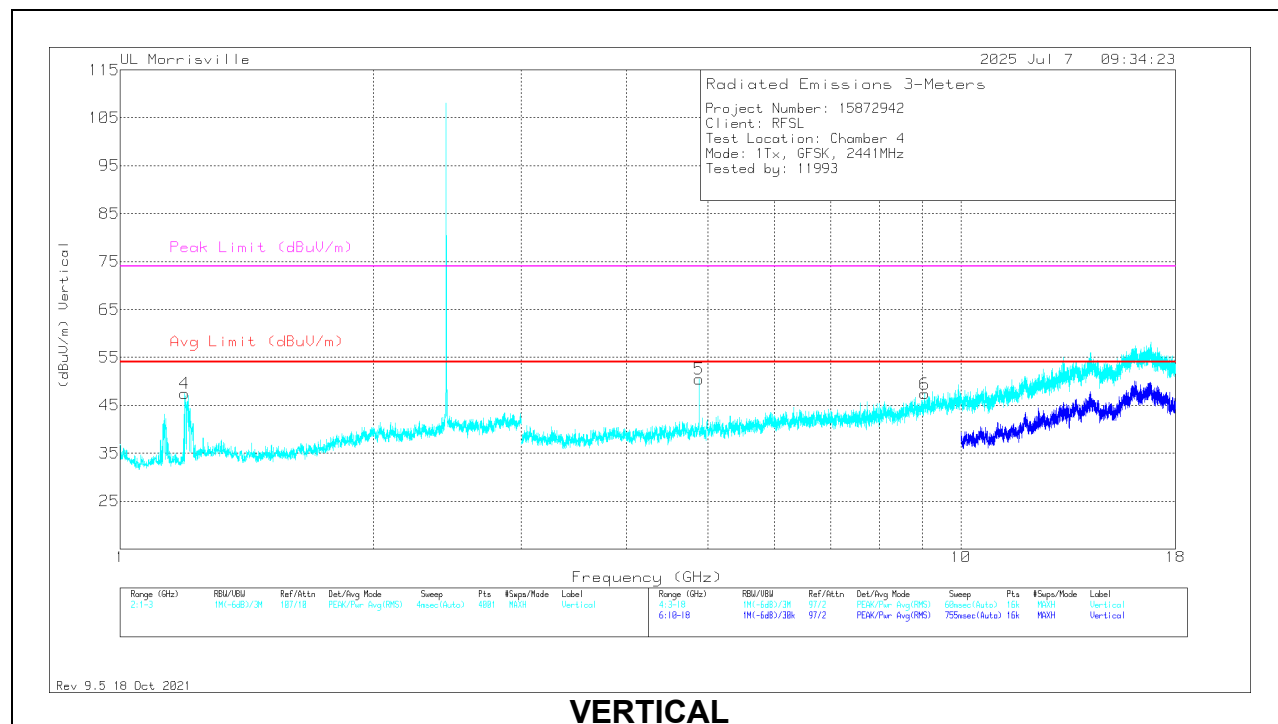
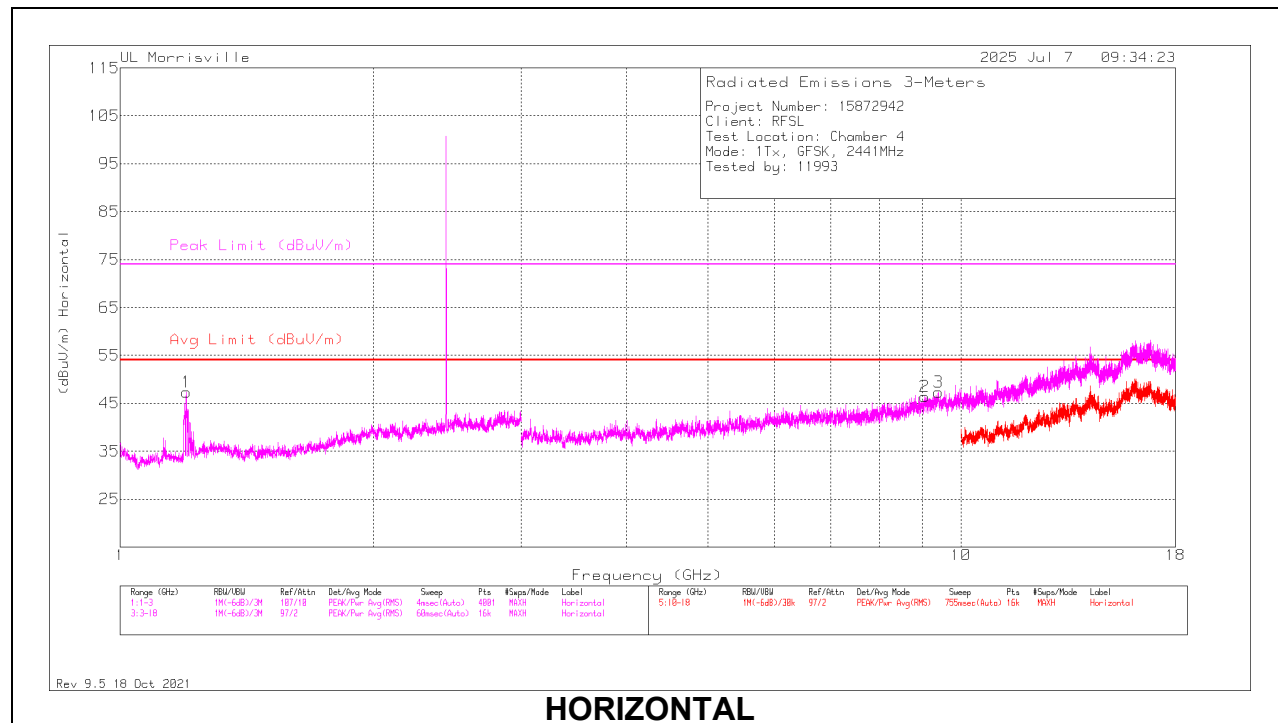
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 1.1995	44.49	Pk	28.2	-25.4	47.29	54	-6.71	74	-26.71	0-360	100	H
4	* ** 1.1935	44.81	Pk	28.1	-25.5	47.41	54	-6.59	74	-26.59	0-360	200	V
2	* ** 9.05625	33.99	Pk	36	-23.6	46.39	54	-7.61	74	-27.61	0-360	100	H
3	* ** 9.40313	34.95	Pk	36.5	-24.1	47.35	54	-6.65	74	-26.65	0-360	100	H
5	* ** 4.88218	46.98	PK2	33.9	-31.7	49.18	-	-	74	-24.82	131	179	V
	* ** 4.882	41.9	V1TV	33.9	-31.7	44.1	54	-9.9	-	-	131	179	V
6	* ** 9.05344	34.89	Pk	36	-23.5	47.39	54	-6.61	74	-26.61	0-360	200	V

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

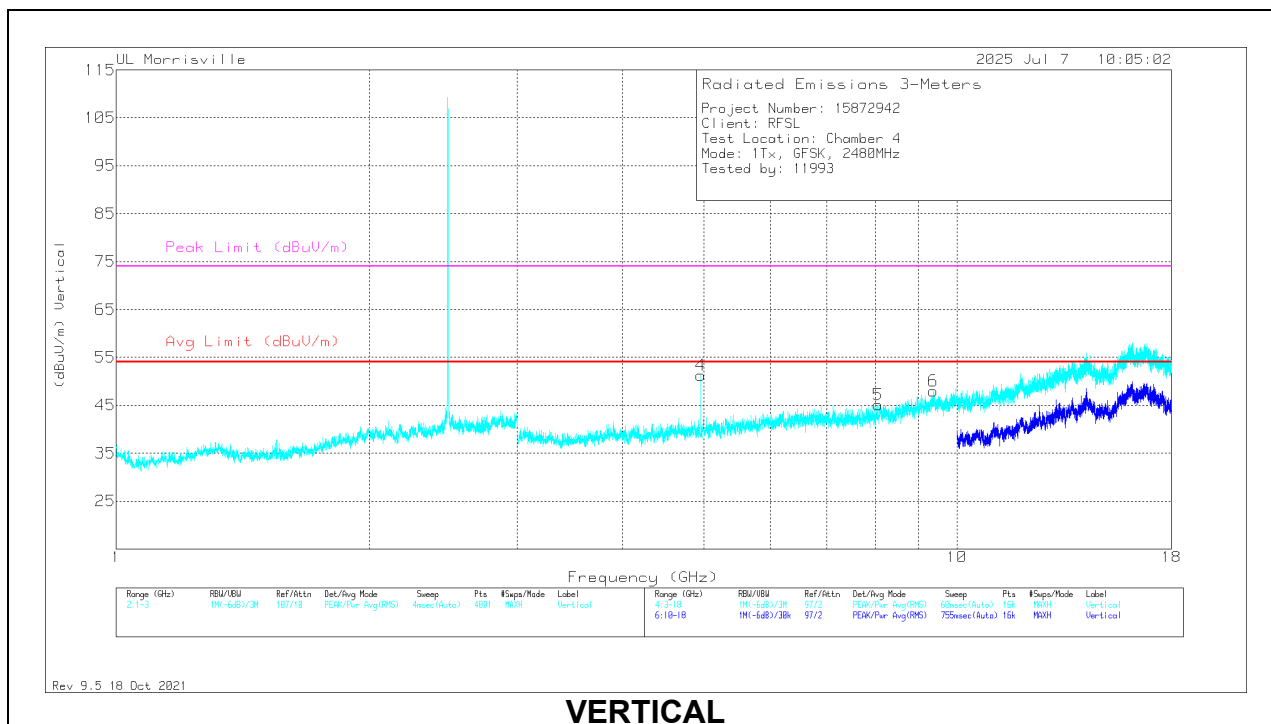
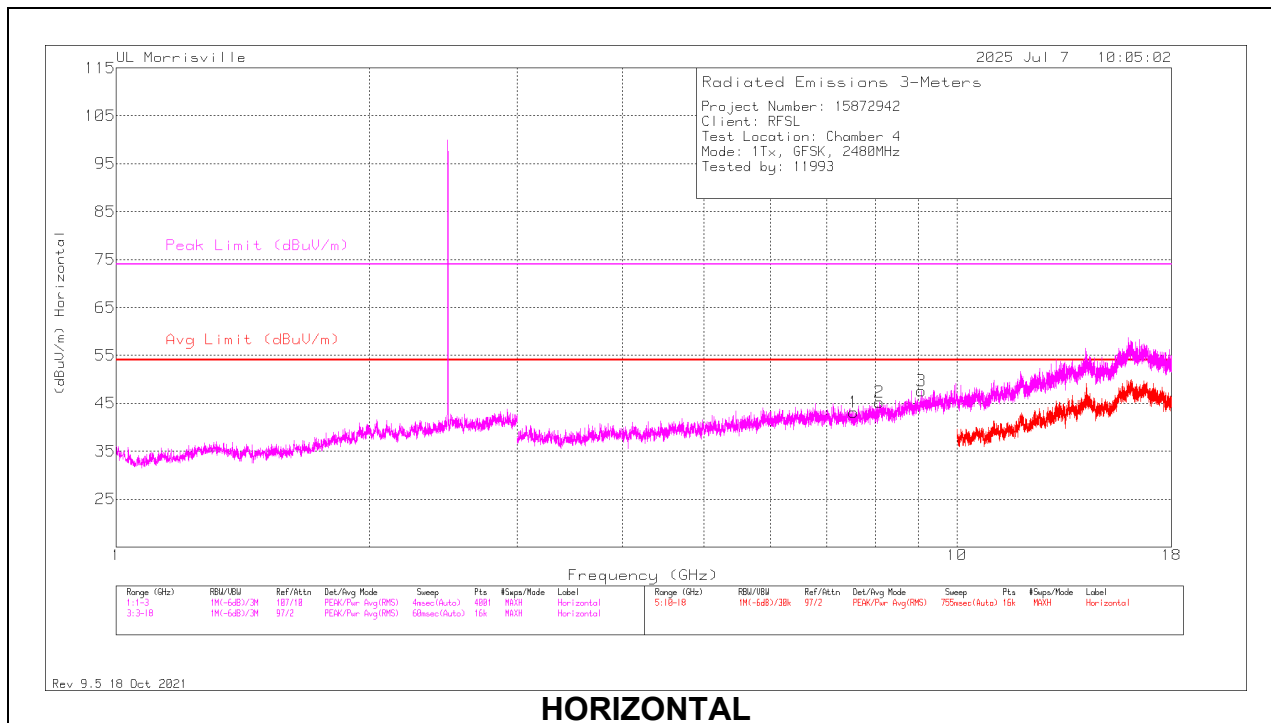
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

V1TV - $V_B = 1/T_{on}$, Linear Voltage Average where: T_{on} is packet duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 7.54031	35.51	Pk	35.5	-27.9	43.11	54	-10.89	74	-30.89	0-360	100	H
2	* ** 8.08875	36.84	Pk	35.6	-27.2	45.24	54	-8.76	74	-28.76	0-360	100	H
3	* ** 9.07594	35.62	Pk	36	-24	47.62	54	-6.38	74	-26.38	0-360	100	H
4	* ** 4.96015	47.46	PK2	33.8	-31.8	49.46	-	-	74	-24.54	127	221	V
	* ** 4.96001	43.09	V1TV	33.8	-31.8	45.09	54	-8.91	-	-	127	221	V
5	* ** 8.05688	36.61	Pk	35.6	-27.1	45.11	54	-8.89	74	-28.89	0-360	200	V
6	* ** 9.37615	36.69	PK2	36.5	-24.4	48.79	-	-	74	-25.21	7	263	V
	* ** 9.37434	22.21	V1TV	36.4	-24.3	34.31	54	-19.69	-	-	7	263	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

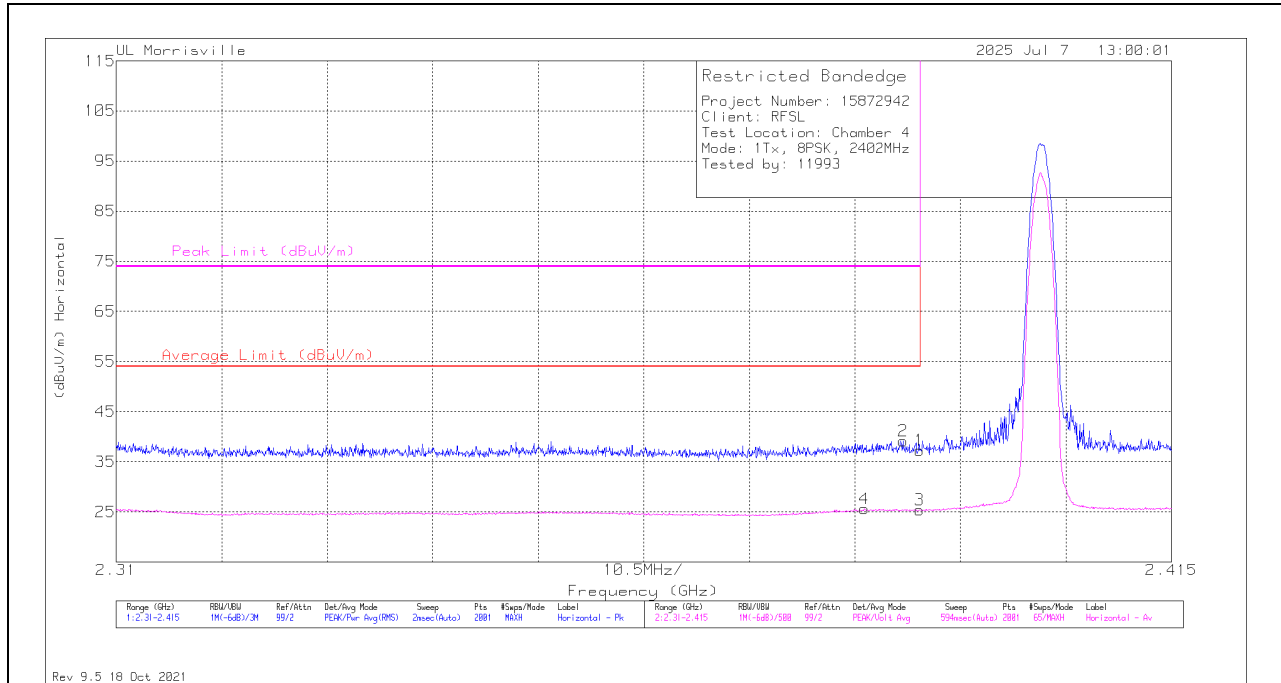
PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	28.31	Pk	32	-23	37.31	-	-	74	-36.69	352	370	H
2	* ** 2.38828	30.1	Pk	32	-22.9	39.2	-	-	74	-34.8	352	370	H
3	* ** 2.38996	16.34	V1TV	32	-23	25.34	54	-28.66	-	-	352	370	H
4	* ** 2.38445	16.48	V1TV	32	-22.9	25.58	54	-28.42	-	-	352	370	H

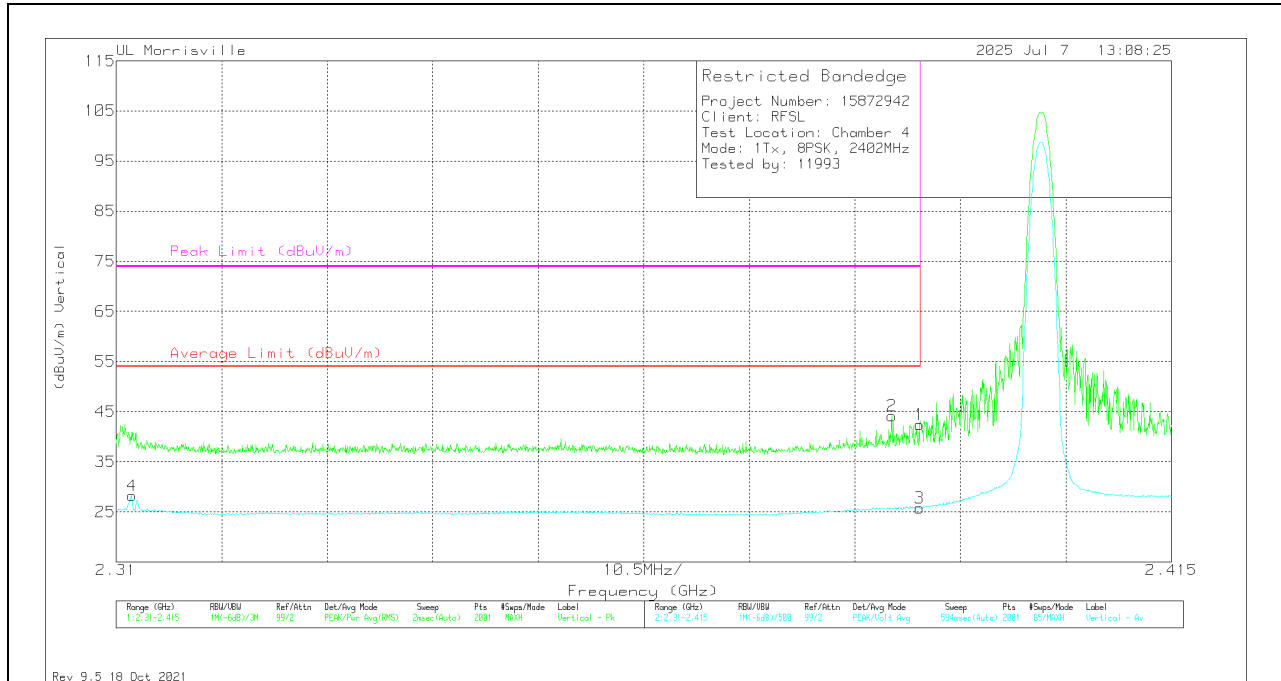
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	33.43	Pk	32	-23	42.43	-	-	74	-31.57	29	137	V
2	* ** 2.38718	35.06	Pk	32	-22.9	44.16	-	-	74	-29.84	29	137	V
3	* ** 2.38996	16.75	V1TV	32	-23	25.75	54	-28.25	-	-	29	137	V
4	* ** 2.31158	19.31	V1TV	31.9	-23	28.21	54	-25.79	-	-	29	137	V

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

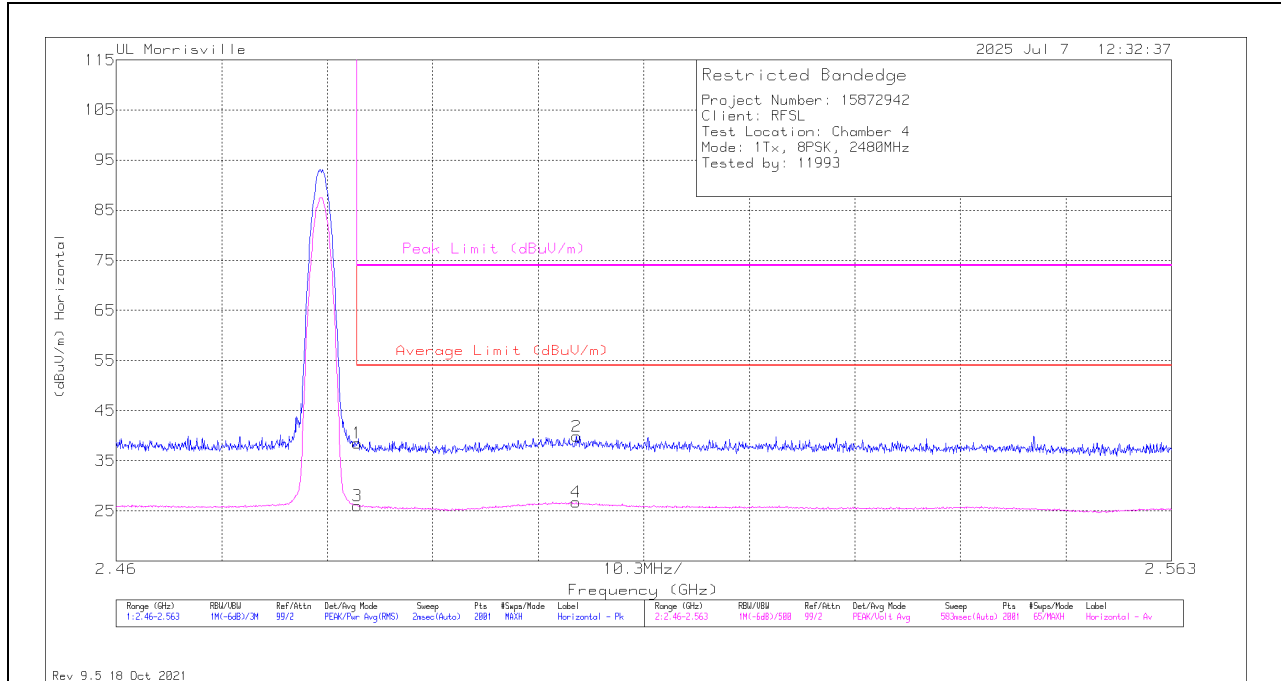
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	29.4	Pk	32.3	-23.2	38.5	-	-	74	-35.5	146	156	H
2	** 2.50496	29.75	Pk	32.4	-22.3	39.85	-	-	74	-34.15	146	156	H
3	* ** 2.48354	16.96	V1TV	32.3	-23.2	26.06	54	-27.94	-	-	146	156	H
4	** 2.50491	16.63	V1TV	32.4	-22.3	26.73	54	-27.27	-	-	146	156	H

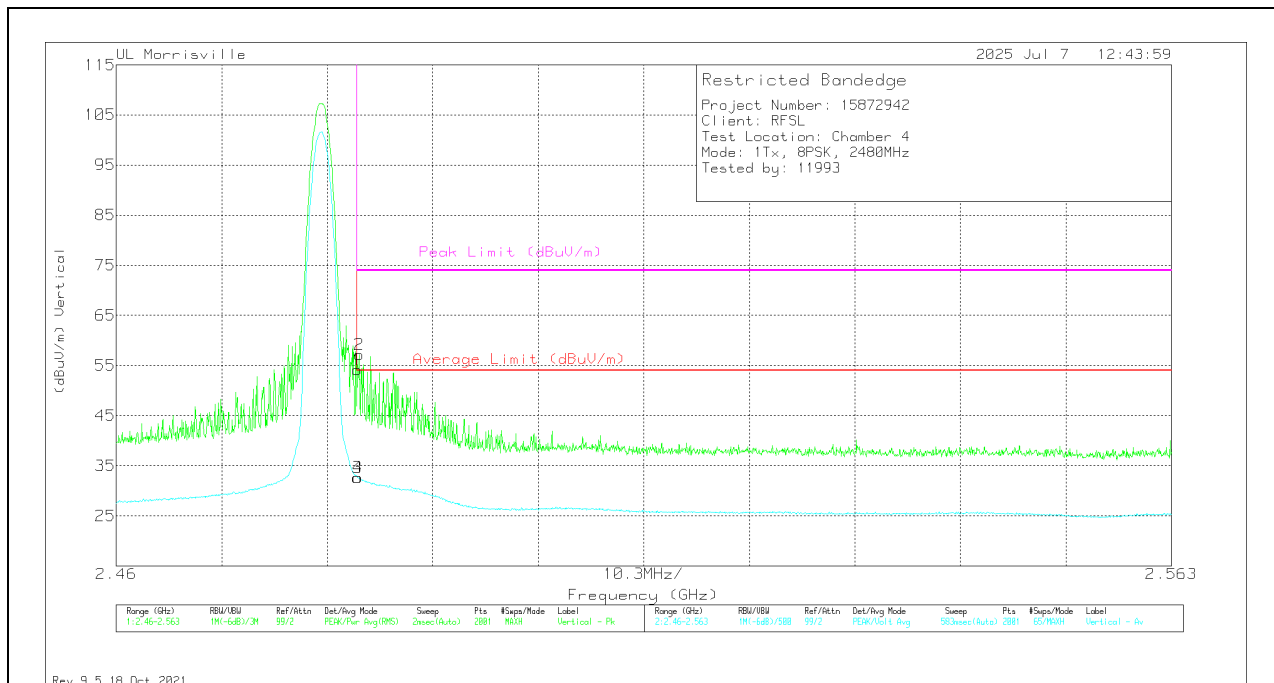
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	45.09	Pk	32.3	-23.2	54.19	-	-	74	-19.81	47	125	V
2	* ** 2.48374	48.12	Pk	32.3	-23.2	57.22	-	-	74	-16.78	47	125	V
3	* ** 2.48354	23.53	V1TV	32.3	-23.2	32.63	54	-21.37	-	-	47	125	V
4	* ** 2.48359	23.57	V1TV	32.3	-23.2	32.67	54	-21.33	-	-	47	125	V

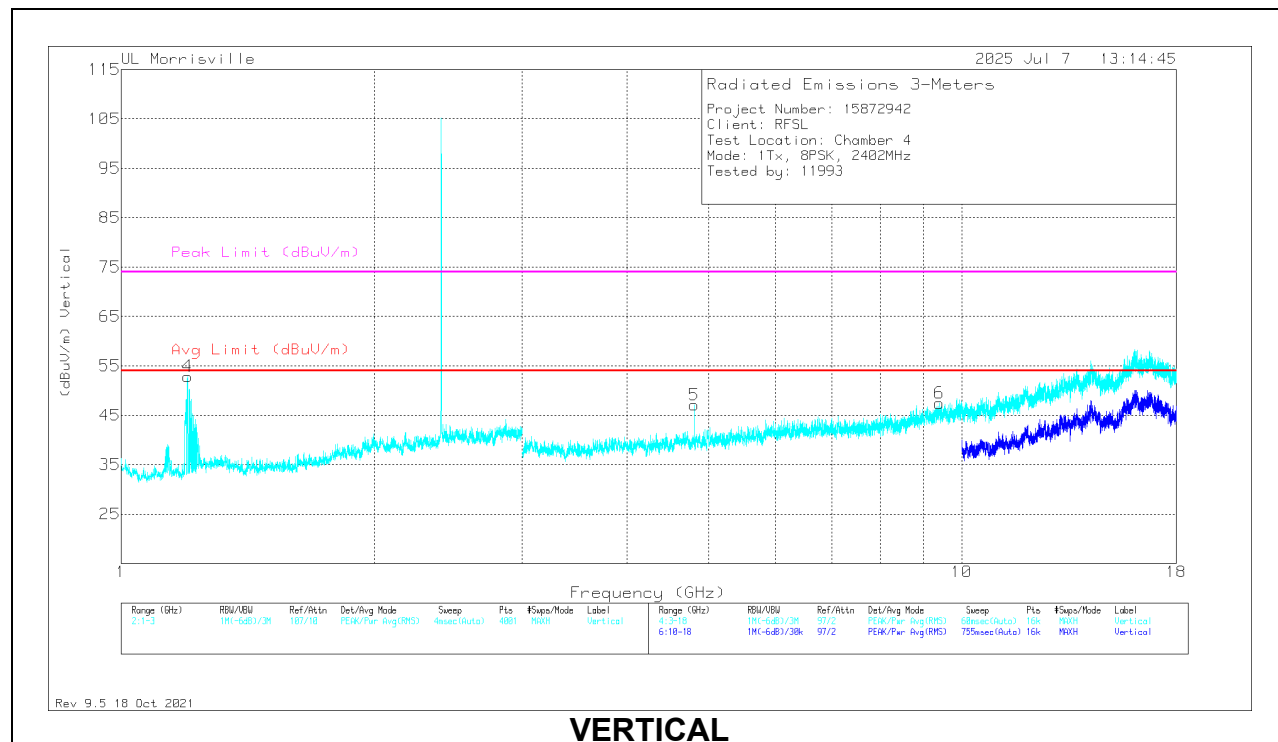
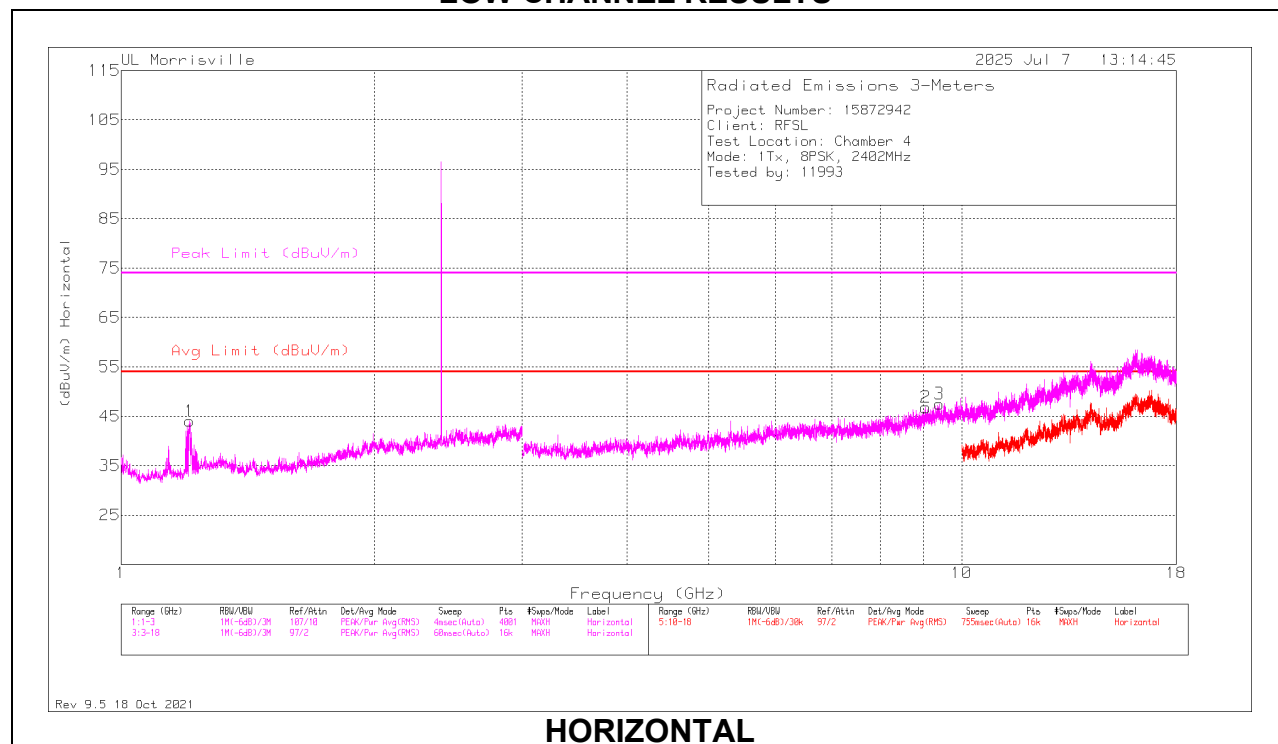
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 1.206	41.02	Pk	28.3	-25.3	44.02	54	-9.98	74	-29.98	0-360	100	H
4	* ** 1.19942	53.53	PK2	28.2	-25.4	56.33	-	-	74	-17.67	162	307	V
	* ** 1.20194	19.71	V1TV	28.2	-25.3	22.61	54	-31.39	-	-	162	307	V
2	* ** 9.06188	34.9	Pk	36	-24.1	46.8	54	-7.2	74	-27.2	0-360	100	H
3	* ** 9.40219	35.09	Pk	36.5	-24.1	47.49	54	-6.51	74	-26.51	0-360	100	H
5	* ** 4.80375	45.68	Pk	33.9	-32.5	47.08	54	-6.92	74	-26.92	0-360	200	V
6	* ** 9.40031	35.03	Pk	36.5	-24.1	47.43	54	-6.57	74	-26.57	0-360	200	V

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

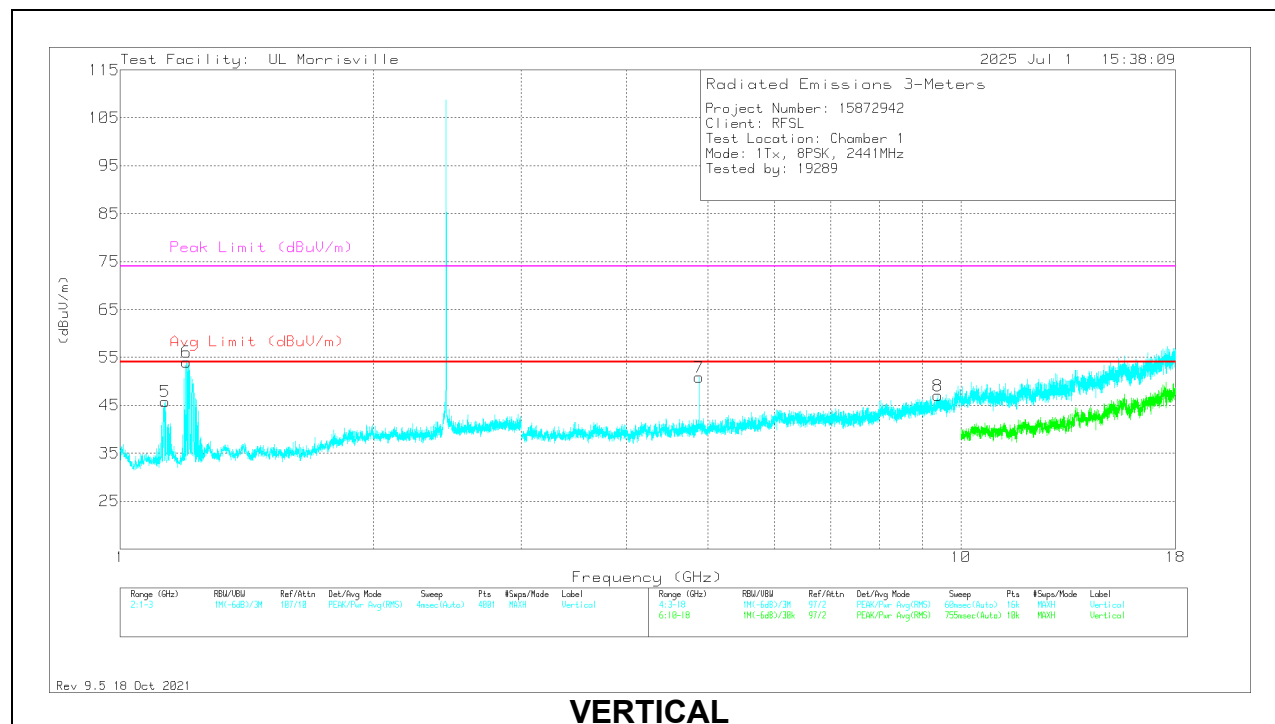
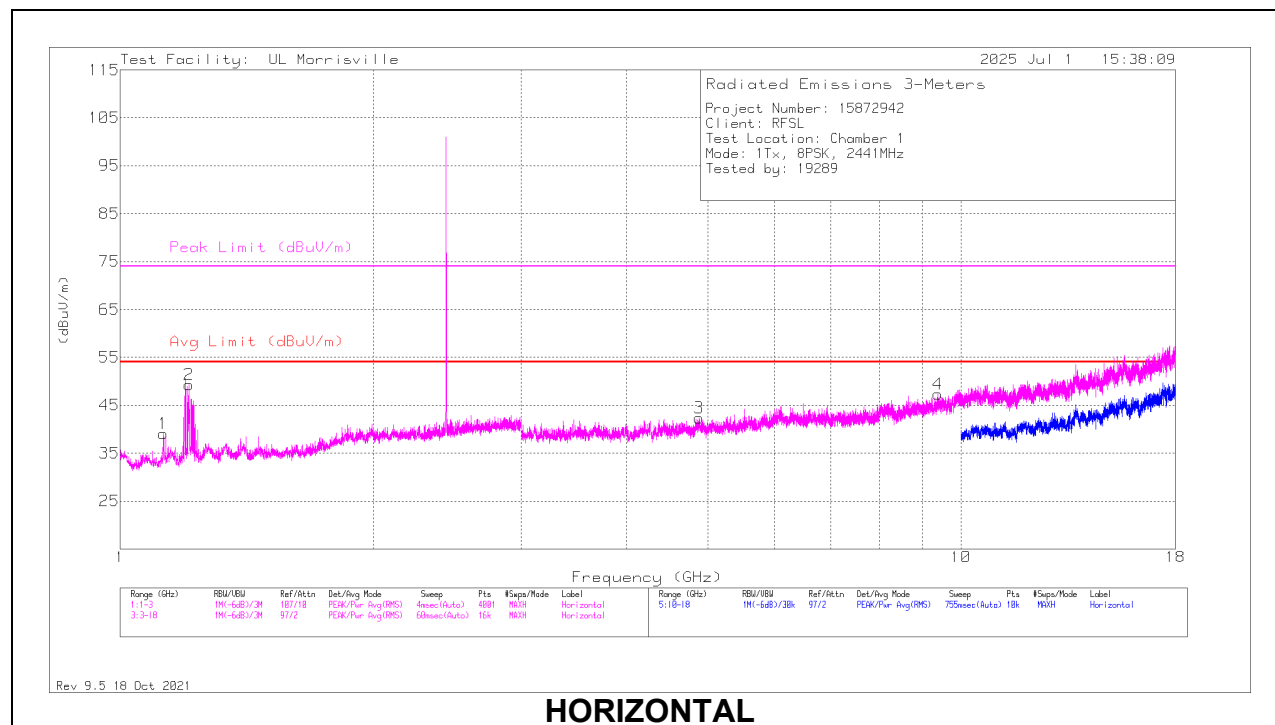
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

MID CHANNEL RESULTS



RADIATED EMISSIONS

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	*** 1.126	37.28	Pk	28	-26.2	39.08	54	-14.92	74	-34.92	0-360	200	H
2	*** 1.19706	52.42	PK2	28.7	-25.9	55.22	-	-	74	-18.78	294	328	H
	*** 1.20735	21.59	V1TV	28.8	-26	24.39	54	-29.61	-	-	294	328	H
5	*** 1.1315	44.07	Pk	28.1	-26.4	45.77	54	-8.23	74	-28.23	0-360	101	V
6	*** 1.19575	54.06	PK2	28.7	-25.9	56.86	-	-	74	-17.14	44	171	V
	*** 1.20919	21.47	V1TV	28.8	-25.9	24.37	54	-29.63	-	-	44	171	V
3	*** 4.88016	53.1	Pk	34	-44.7	42.4	54	-11.6	74	-31.6	0-360	101	H
4	*** 9.39188	51.14	Pk	36.3	-40.1	47.34	54	-6.66	74	-26.66	0-360	101	H
7	*** 4.88166	65.26	PK2	34	-44.7	54.56	-	-	74	-19.44	42	105	V
	*** 4.88161	57.75	V1TV	34	-44.7	47.05	54	-6.95	-	-	42	105	V
8	*** 9.39469	50.7	Pk	36.3	-40	47	54	-7	74	-27	0-360	200	V

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

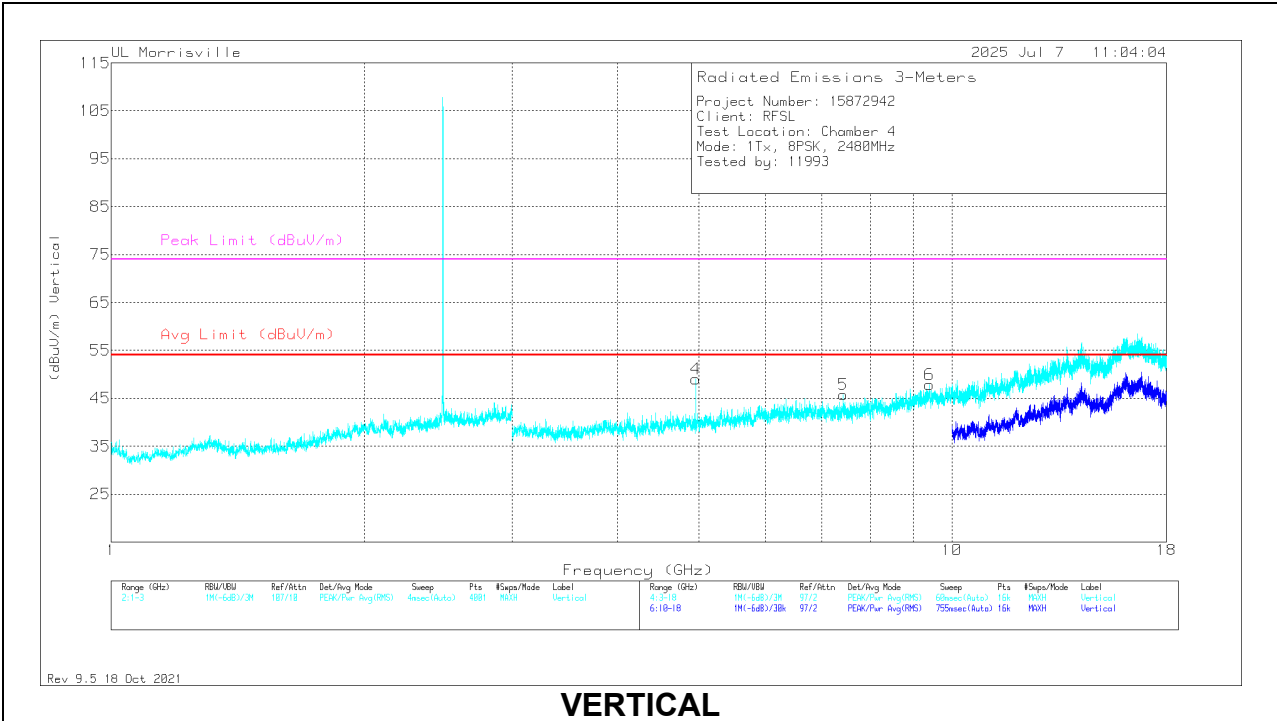
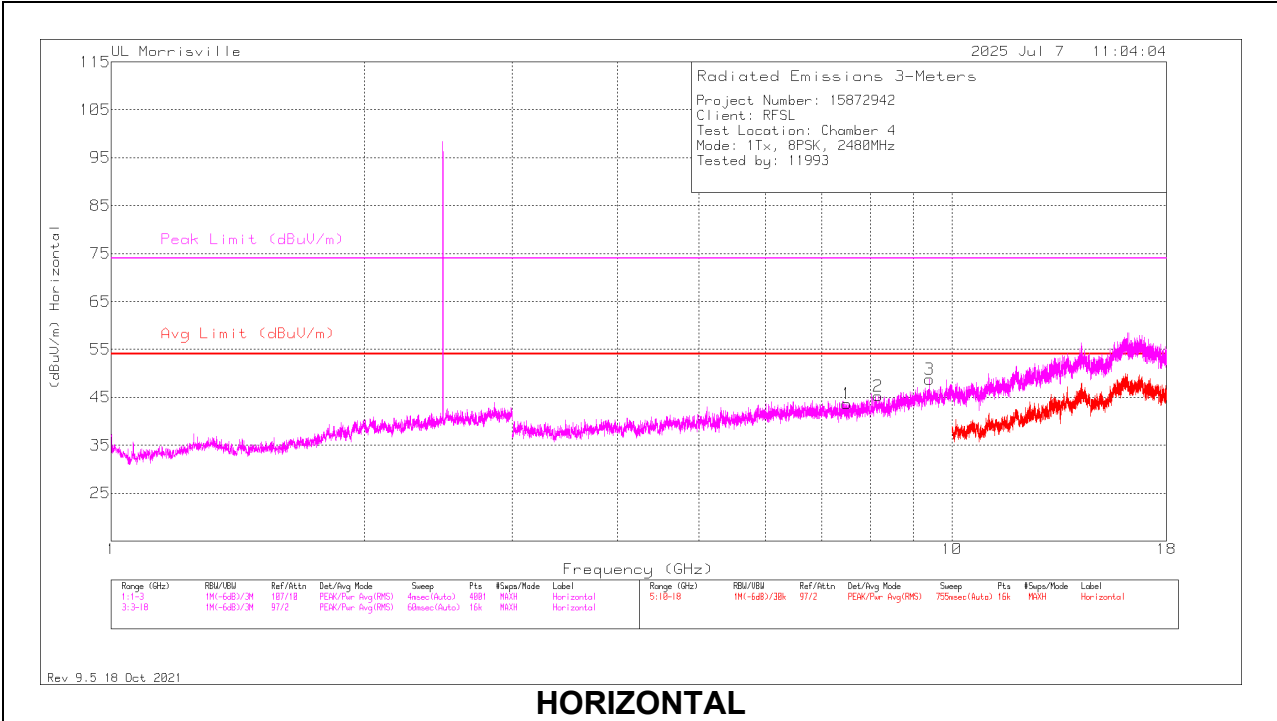
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 7.50094	36.22	Pk	35.6	-28.2	43.62	54	-10.38	74	-30.38	0-360	100	H
2	* ** 8.17125	36.69	Pk	35.6	-27	45.29	54	-8.71	74	-28.71	0-360	100	H
3	* ** 9.41413	36.74	PK2	36.5	-25	48.24	-	-	74	-25.76	319	220	H
	* ** 9.41434	22.71	V1TV	36.5	-25.1	34.11	54	-19.89	-	-	319	220	H
4	* ** 4.95985	46.08	PK2	33.8	-31.8	48.08	-	-	74	-25.92	146	127	V
	* ** 4.95997	30.69	V1TV	33.8	-31.8	32.69	54	-21.31	-	-	146	127	V
5	* ** 7.42875	37.8	Pk	35.6	-27.6	45.8	54	-8.2	74	-28.2	0-360	200	V
6	* ** 9.40688	35.44	Pk	36.5	-24.1	47.84	54	-6.16	74	-26.16	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

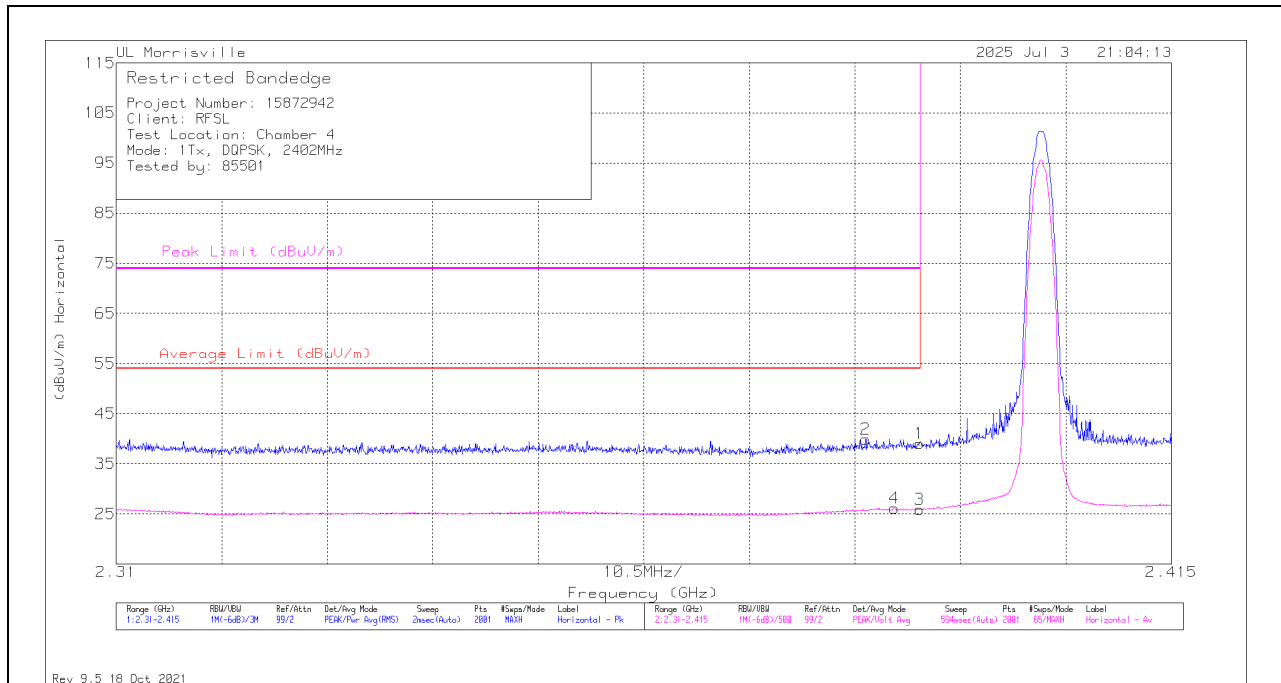
PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

10.1.3. BLUETOOTH ENHANCED DATA RATE DQPSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	30.07	Pk	32	-23	39.07	-	-	74	-34.93	85	361	H
2	* ** 2.38455	30.8	Pk	32	-22.9	39.9	-	-	74	-34.1	85	361	H
3	* ** 2.38996	16.9	V1TV	32	-23	25.9	54	-28.1	-	-	85	361	H
4	* ** 2.38744	17.03	V1TV	32	-22.9	26.13	54	-27.87	-	-	85	361	H

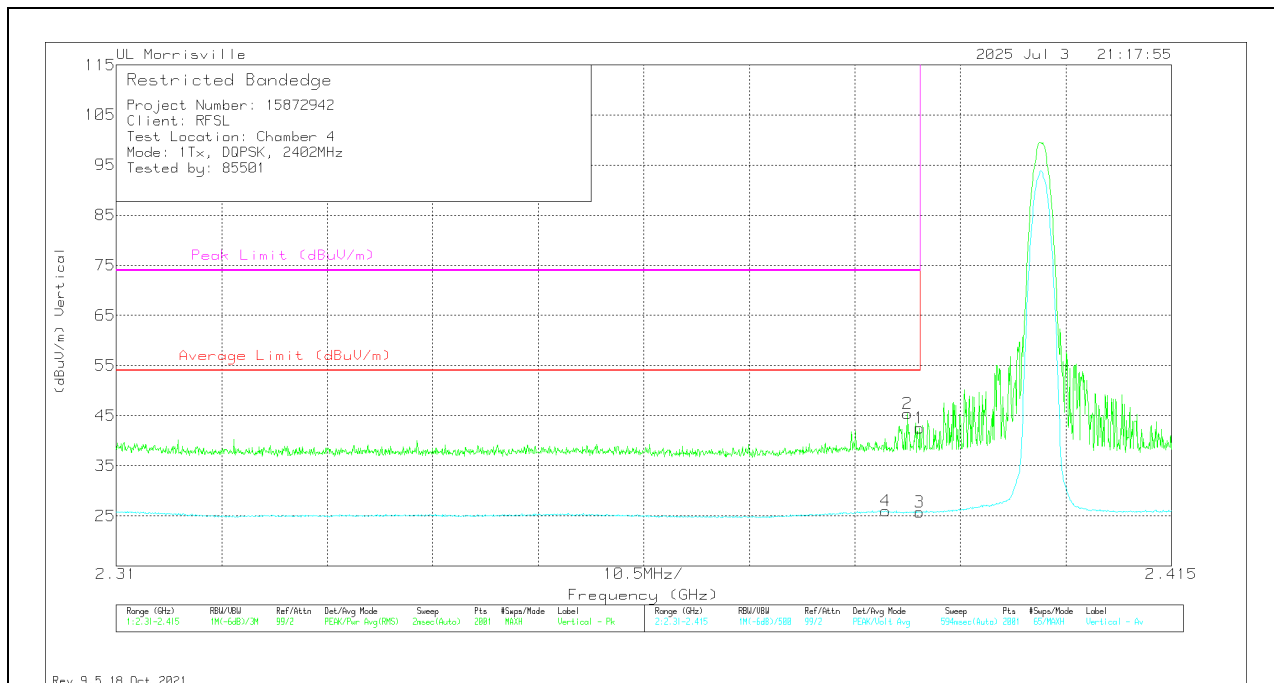
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	33.5	Pk	32	-23	42.5	-	-	74	-31.5	354	372	V
2	* ** 2.38875	36.43	Pk	32	-23	45.43	-	-	74	-28.57	354	372	V
3	* ** 2.38996	16.77	V1TV	32	-23	25.77	54	-28.23	-	-	354	372	V
4	* ** 2.38655	16.93	V1TV	32	-22.9	26.03	54	-27.97	-	-	354	372	V

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

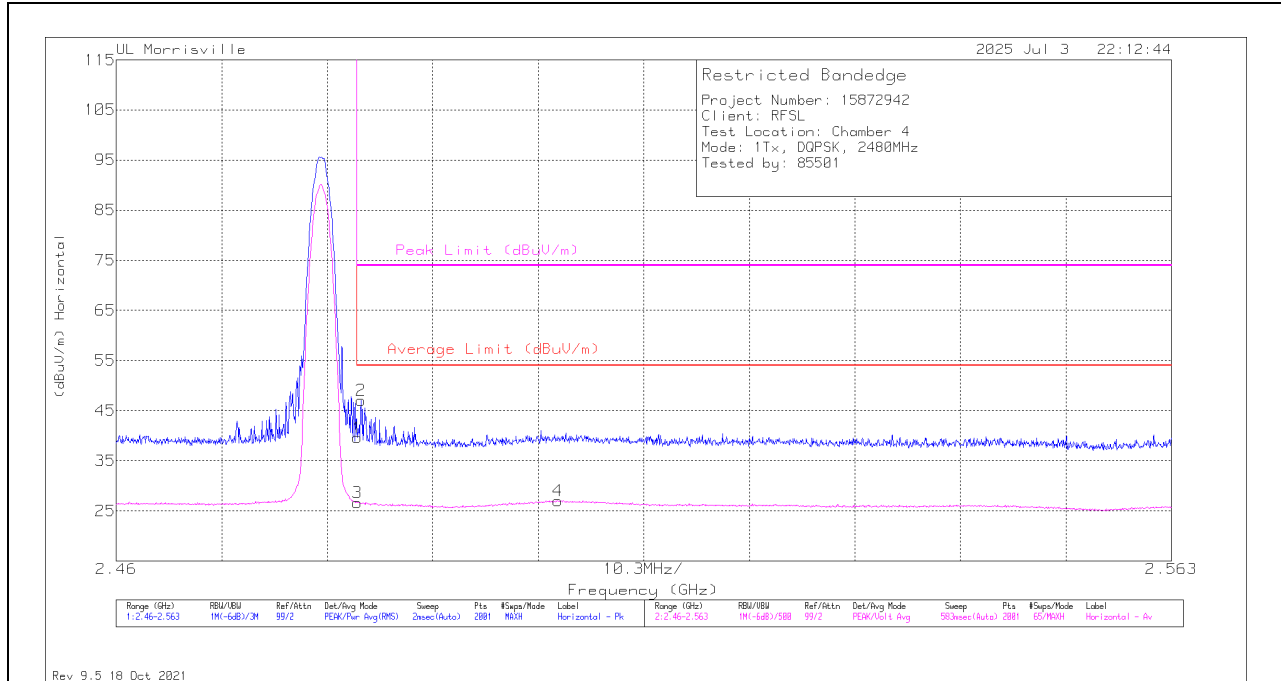
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	30.49	Pk	32.3	-23.2	39.59	-	-	74	-34.41	79	134	H
2	* ** 2.4839	37.92	Pk	32.3	-23.2	47.02	-	-	74	-26.98	79	134	H
3	* ** 2.48354	17.49	V1TV	32.3	-23.2	26.59	54	-27.41	-	-	79	134	H
4	* ** 2.50311	16.81	V1TV	32.4	-22.2	27.01	54	-26.99	-	-	79	134	H

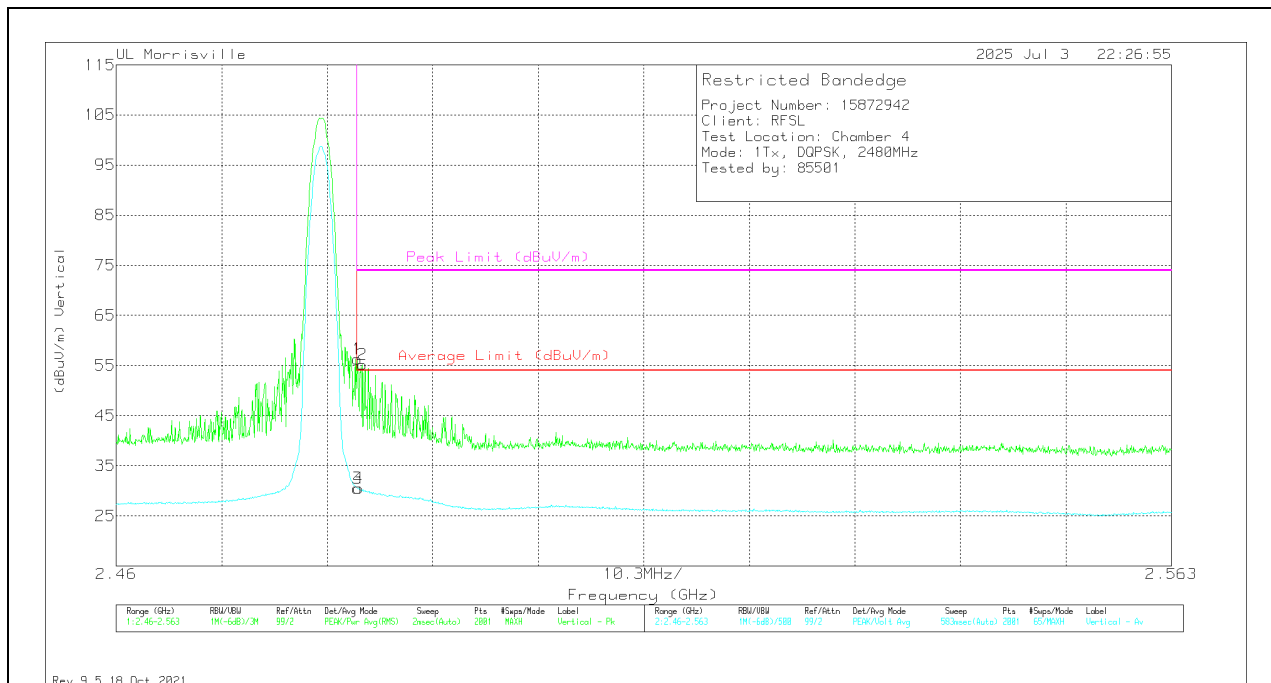
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	47.22	Pk	32.3	-23.2	56.32	-	-	74	-17.68	310	151	V
2	* ** 2.48405	46.13	Pk	32.3	-23.2	55.23	-	-	74	-18.77	310	151	V
3	* ** 2.48354	21.44	V1TV	32.3	-23.2	30.54	54	-23.46	-	-	310	151	V
4	* ** 2.48364	21.38	V1TV	32.3	-23.2	30.48	54	-23.52	-	-	310	151	V

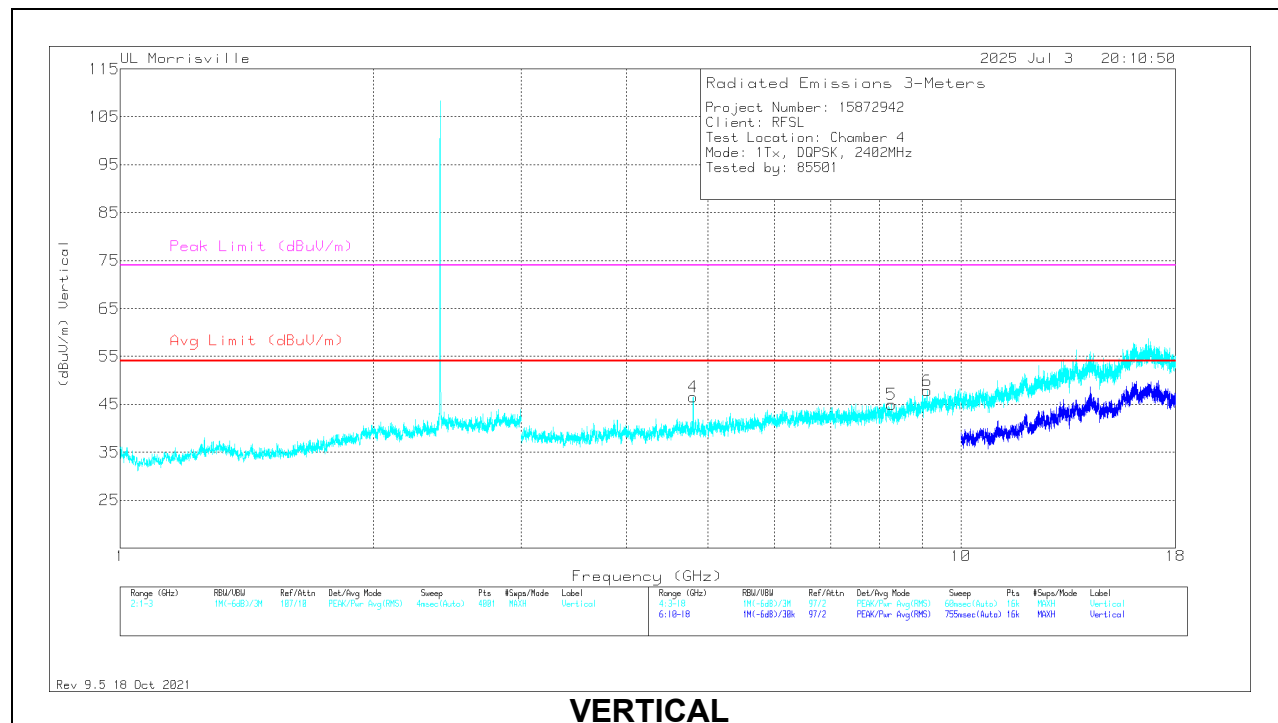
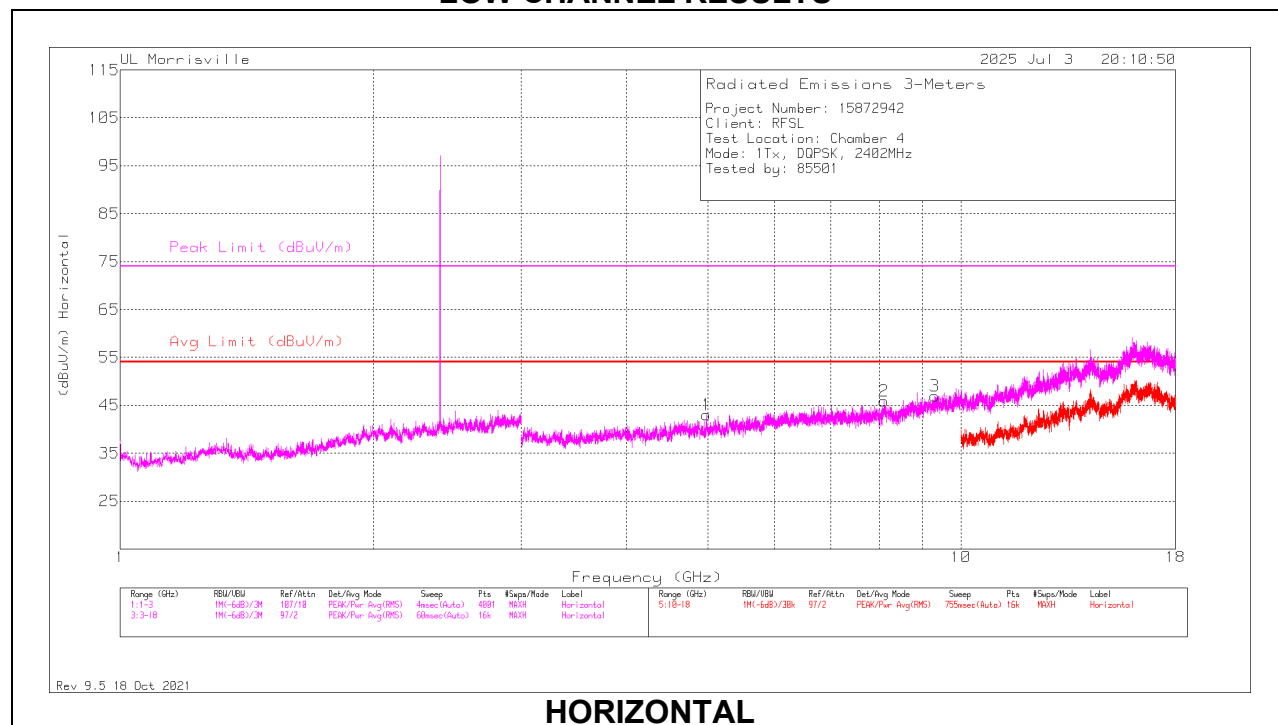
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS LOW CHANNEL RESULTS



RADIATED EMISSIONS

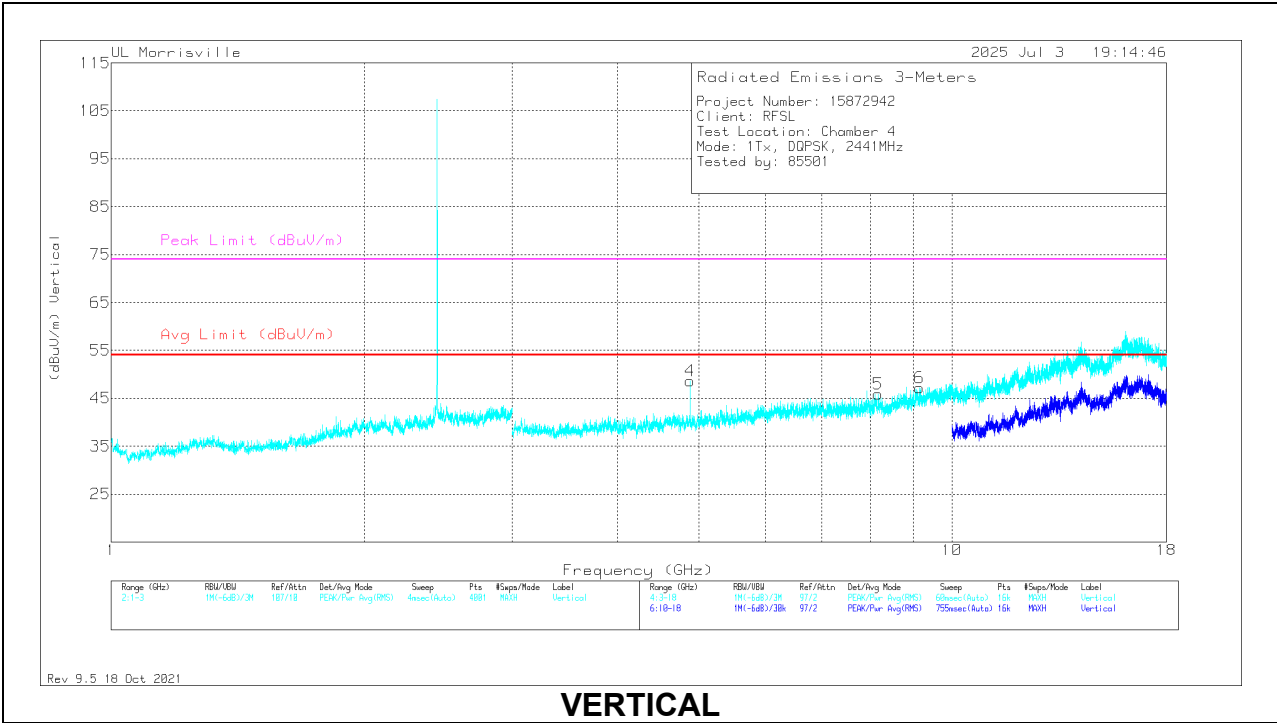
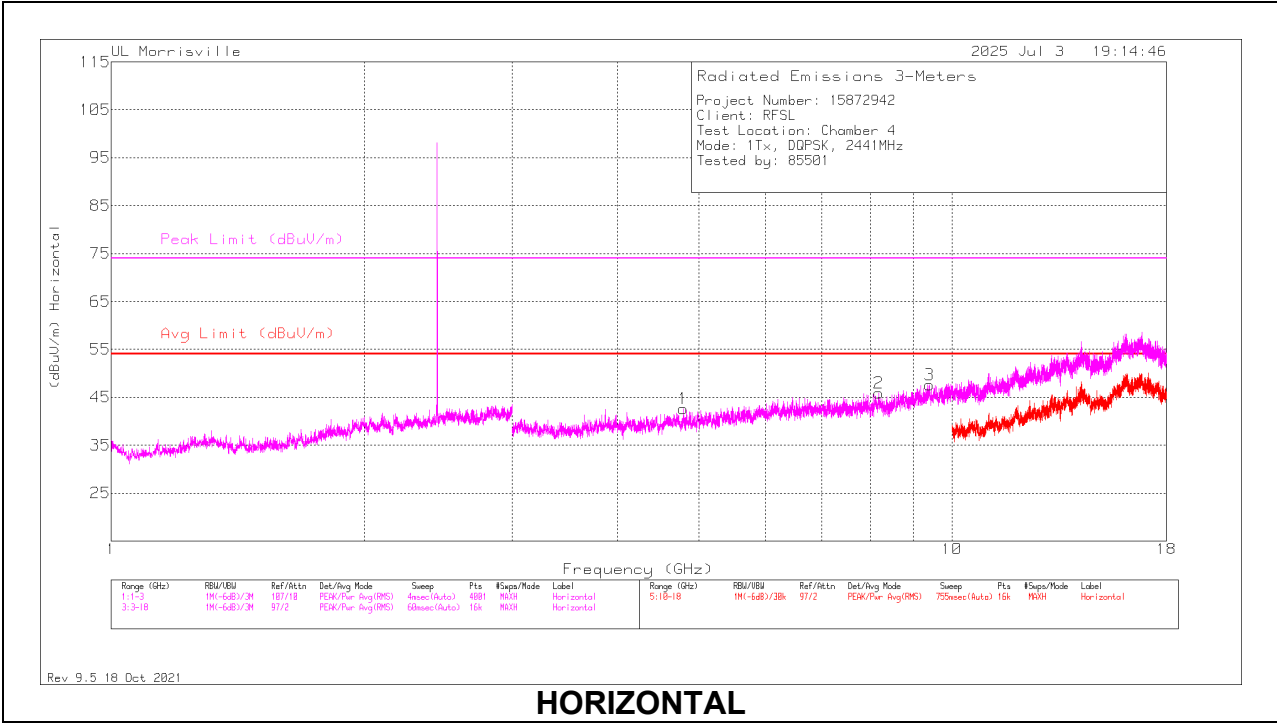
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.98	40.39	Pk	33.9	-31.3	42.99	54	-11.01	74	-31.01	0-360	100	H
2	* ** 8.10656	36.81	Pk	35.6	-26.5	45.91	54	-8.09	74	-28.09	0-360	100	H
3	* ** 9.31125	34.77	Pk	36.3	-24.1	46.97	54	-7.03	74	-27.03	0-360	100	H
4	* ** 4.80375	45.16	Pk	33.9	-32.5	46.56	54	-7.44	74	-27.44	0-360	200	V
5	* ** 8.27438	36.24	Pk	35.7	-27	44.94	54	-9.06	74	-29.06	0-360	200	V
6	* ** 9.11531	36.49	Pk	36.1	-24.8	47.79	54	-6.21	74	-26.21	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



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 4.79063	40.04	Pk	33.9	-31.3	42.64	54	-11.36	74	-31.36	0-360	100	H
2	* ** 8.18438	37.43	Pk	35.7	-27.2	45.93	54	-8.07	74	-28.07	0-360	100	H
3	* ** 9.40594	35.2	Pk	36.5	-24.1	47.6	54	-6.4	74	-26.4	0-360	100	H
4	* ** 4.88097	40.91	PK2	33.9	-31.6	43.21	-	-	74	-30.79	1	321	V
	* ** 4.88277	26.6	V1TV	33.9	-31.8	28.7	54	-25.3	-	-	1	321	V
5	* ** 8.17688	37.15	Pk	35.7	-27	45.85	54	-8.15	74	-28.15	0-360	200	V
6	* ** 9.15469	35.49	Pk	36.2	-24.5	47.19	54	-6.81	74	-26.81	0-360	200	V

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

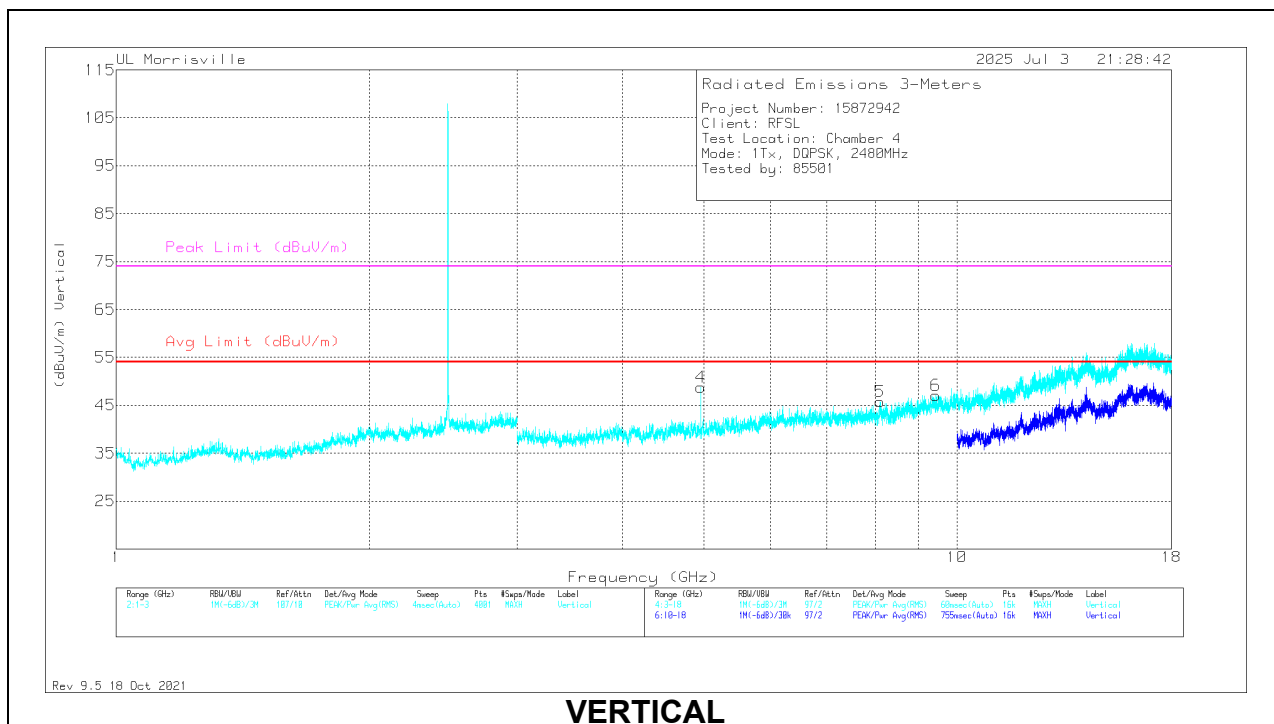
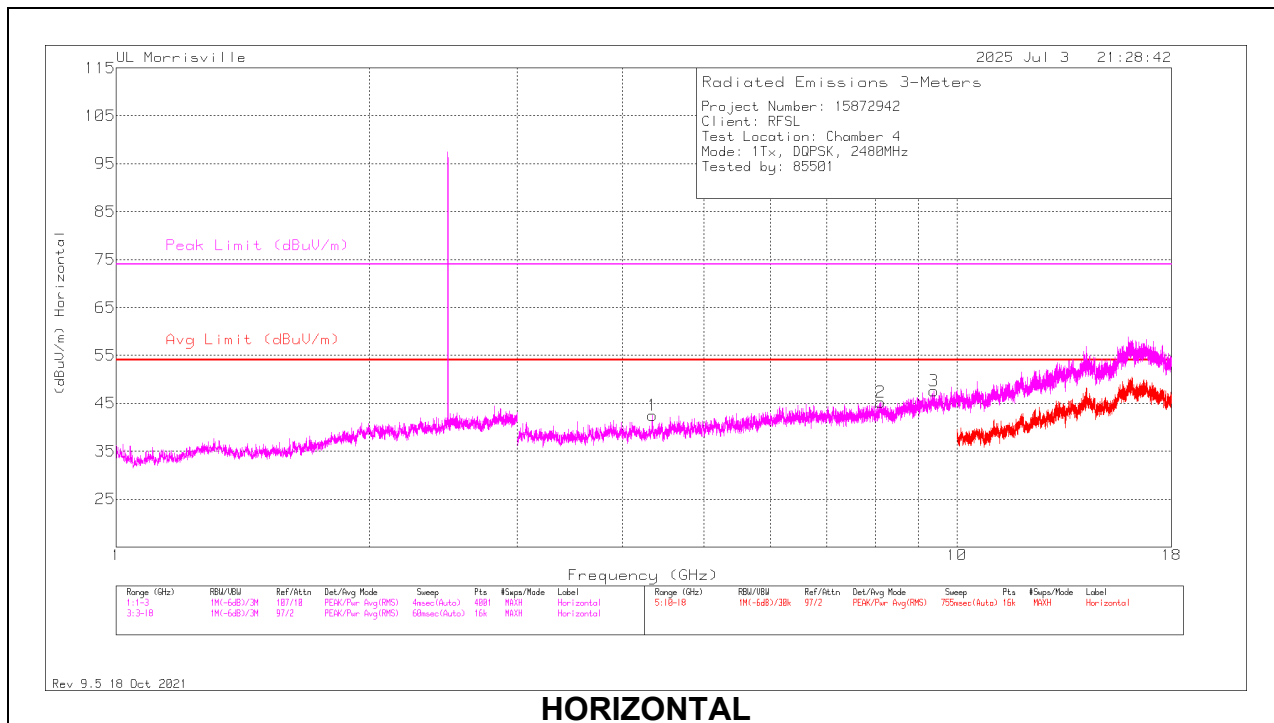
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	206211 (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	* ** 4.34344	40.86	Pk	33.5	-31.9	42.46	54	-11.54	74	-31.54	0-360	100	H
2	* ** 8.11875	36.39	Pk	35.6	-26.8	45.19	54	-8.81	74	-28.81	0-360	100	H
3	* ** 9.3975	35.07	Pk	36.5	-24	47.57	54	-6.43	74	-26.43	0-360	100	H
4	* ** 4.9601	49.37	PK2	33.8	-31.8	51.37	-	-	74	-22.63	350	215	V
	* ** 4.96001	39.31	V1TV	33.8	-31.8	41.31	54	-12.69	-	-	350	215	V
5	* ** 8.10188	36.65	Pk	35.6	-26.5	45.75	54	-8.25	74	-28.25	0-360	200	V
6	* ** 9.44531	35.86	Pk	36.5	-25.3	47.06	54	-6.94	74	-26.94	0-360	200	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

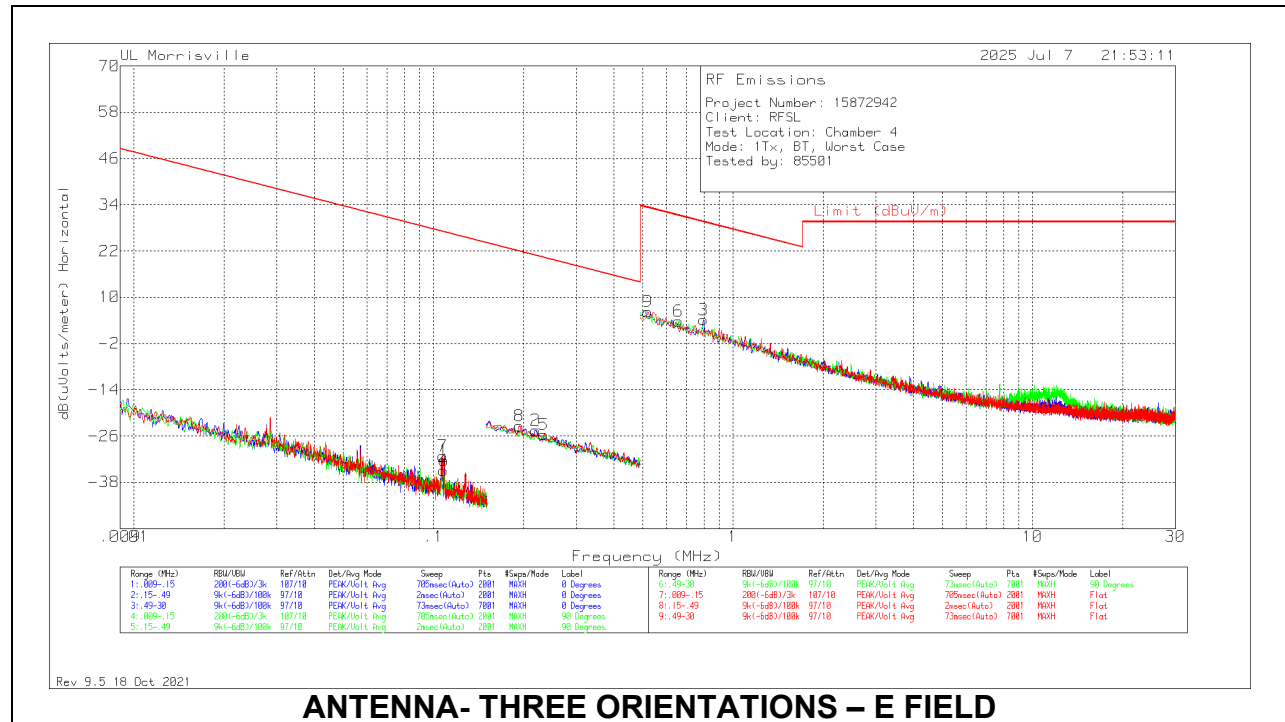
Pk - Peak detector

PK2 - Maximum Peak

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

10.2. BELOW 30MHZ (WORST-CASE CONFIGURATION)

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).

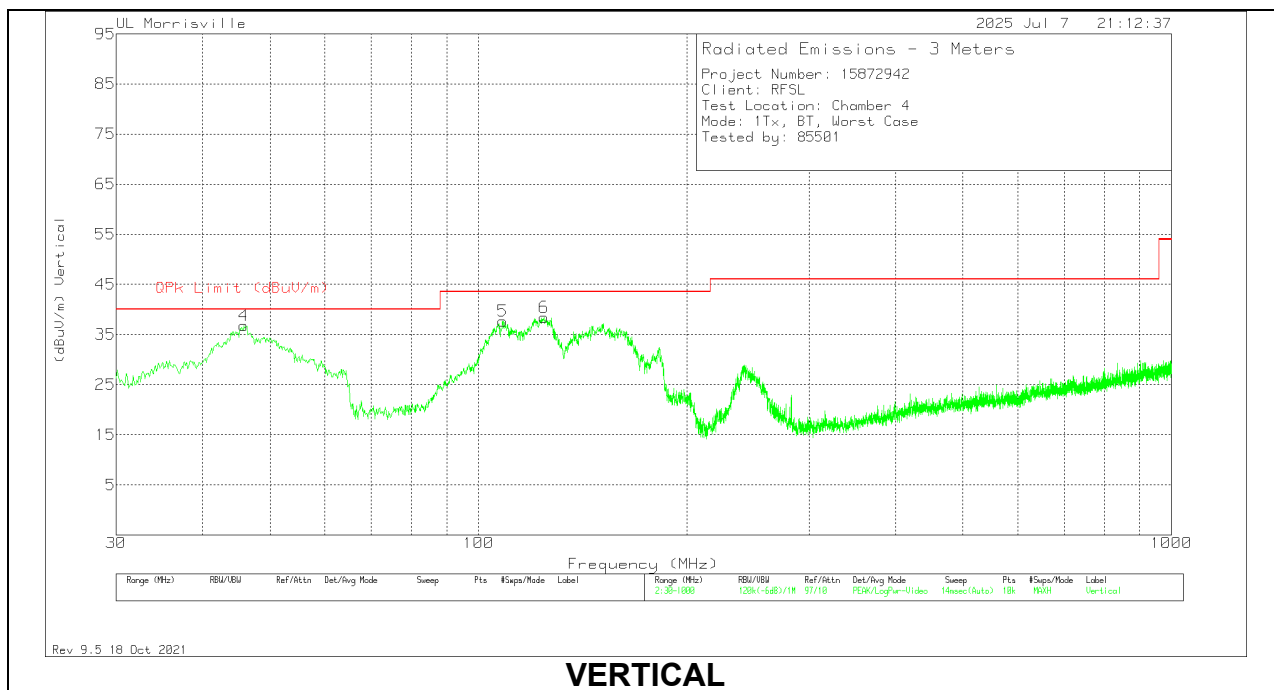
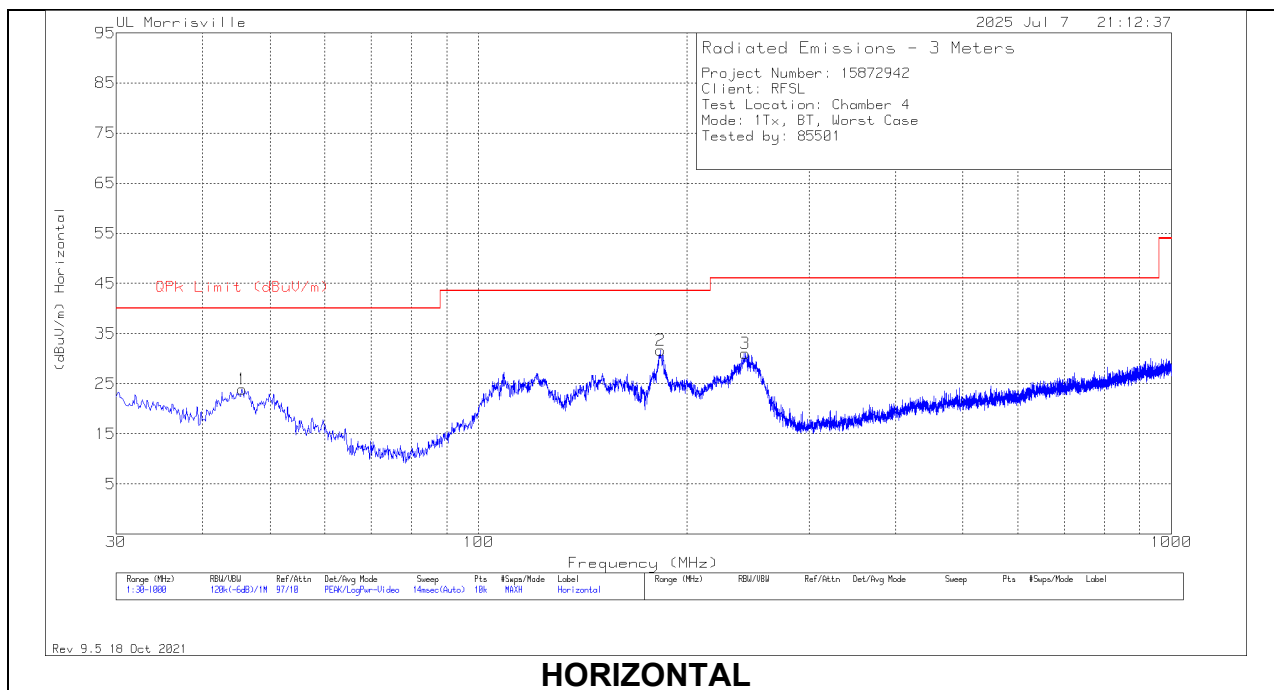


ANTENNA- THREE ORIENTATIONS – E FIELD

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 (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.10726	37.73	Pk	11.1	0	-80	-31.17	27	-	-58.17	0-360	Flat
4	.10776	33.93	Pk	11.1	0	-80	-34.97	26.96	-	-61.93	0-360	90 degs
1	.10847	36.54	Pk	11.1	0	-80	-32.36	26.9	-	-59.26	0-360	0 degs
8	.19378	45.66	Pk	11	0	-80	-23.34	21.86	41.86	-45.2	0-360	Flat
2	.21911	44.54	Pk	10.9	.1	-80	-24.46	20.79	40.79	-45.25	0-360	0 degs
5	.23339	43.3	Pk	10.9	.1	-80	-25.7	20.24	40.24	-45.94	0-360	90 degs
9	.51951	35.17	Pk	11	.1	-40	6.27	33.29	-	-27.02	0-360	Flat
6	.65864	32.73	Pk	11	.1	-40	3.83	31.23	-	-27.4	0-360	90 degs
3	.79777	33.1	Pk	11	.1	-40	4.2	29.57	-	-25.37	0-360	0 degs

Pk - Peak detector

10.3. BELOW 1 GHZ (WORST-CASE CONFIGURATION)

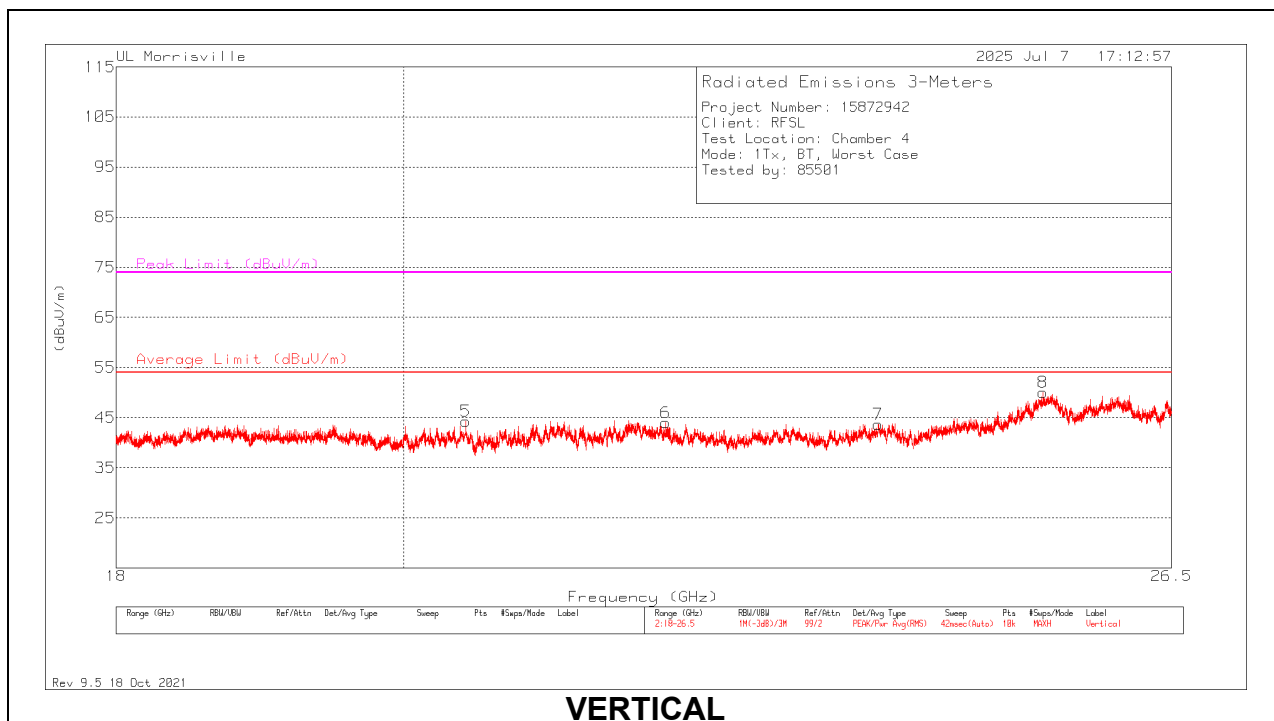
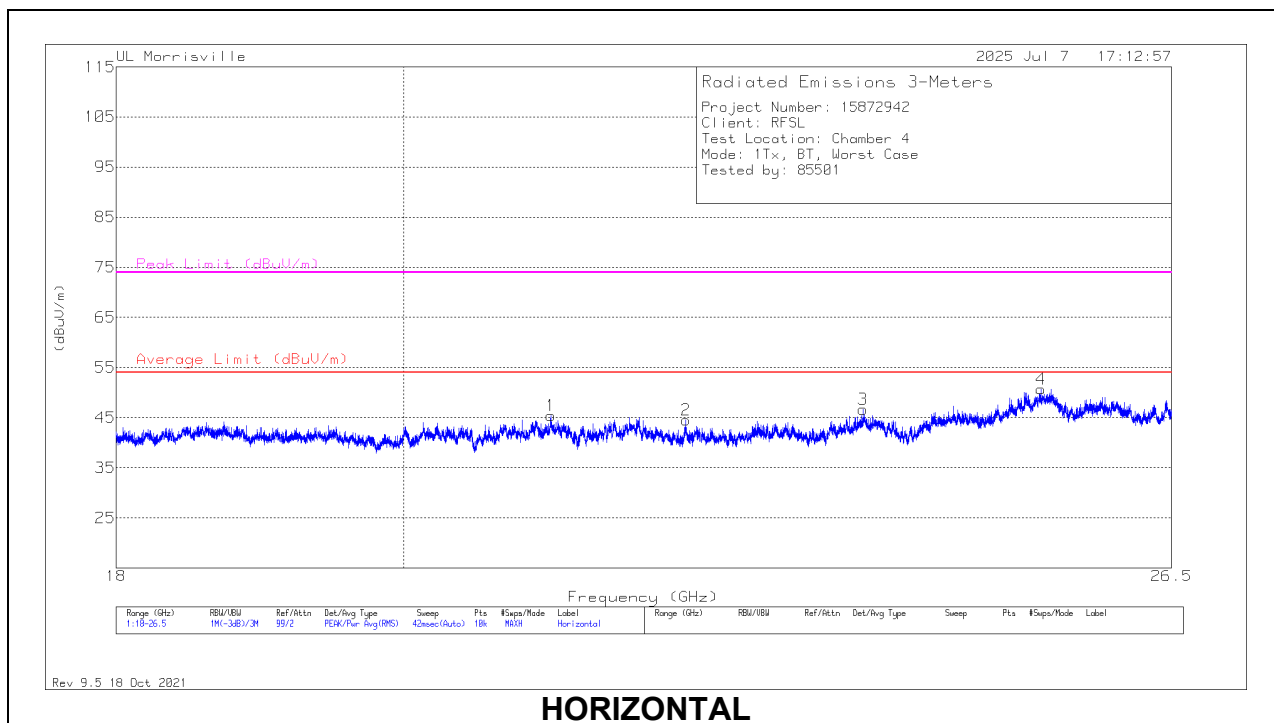


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90628 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	45.617	39.31	Pk	16.1	-31.5	23.91	40	-16.09	0-360	300	H
4	45.6273	48.91	Qp	16.1	-31.5	33.51	40	-6.49	37	105	V
5	108.2795	46	Qp	18.5	-30.5	34	43.52	-9.52	315	102	V
6	124.1153	46.47	Qp	20.1	-30.5	36.07	43.52	-7.45	357	102	V
2	183.26	44.58	Pk	17.1	-30	31.68	43.52	-11.84	0-360	100	H
3	242.624	42.78	Pk	17.7	-29.4	31.08	46.02	-14.94	0-360	100	H

Pk - Peak detector

Qp - Quasi-Peak detector

10.4. 18-26 GHZ (WORST-CASE CONFIGURATION)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	91186 (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	* ** 21.10729	51.64	Pk	32.8	-39	45.44	54	-8.56	74	-28.56	0-360	250	H
2	* ** 22.18073	48.82	Pk	33.4	-37.7	44.52	54	-9.48	74	-29.48	0-360	250	H
3	* ** 23.66893	50.67	Pk	33.8	-37.8	46.67	54	-7.33	74	-27.33	0-360	100	H
5	* ** 20.46135	50.15	Pk	32.8	-38.7	44.25	54	-9.75	74	-29.75	0-360	300	V
6	* ** 22.01585	49.98	Pk	33.4	-39.4	43.98	54	-10.02	74	-30.02	0-360	300	V
7	* ** 23.80067	47.43	Pk	34	-37.8	43.63	54	-10.37	74	-30.37	0-360	300	V
4	25.26422	49.82	Pk	34.3	-33.4	50.72	-	-	-	-	0-360	250	H
8	25.28292	48.91	Pk	34.3	-33.2	50.01	-	-	-	-	0-360	300	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.

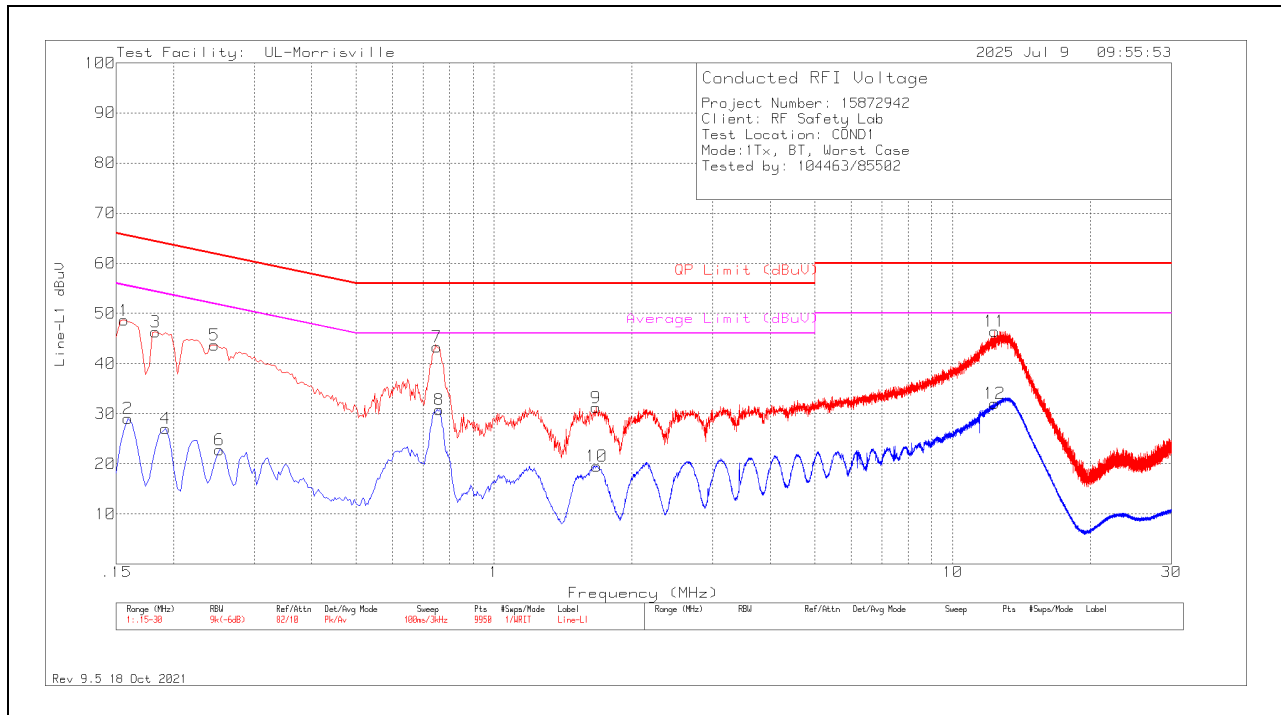
TEST PROCEDURE

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.

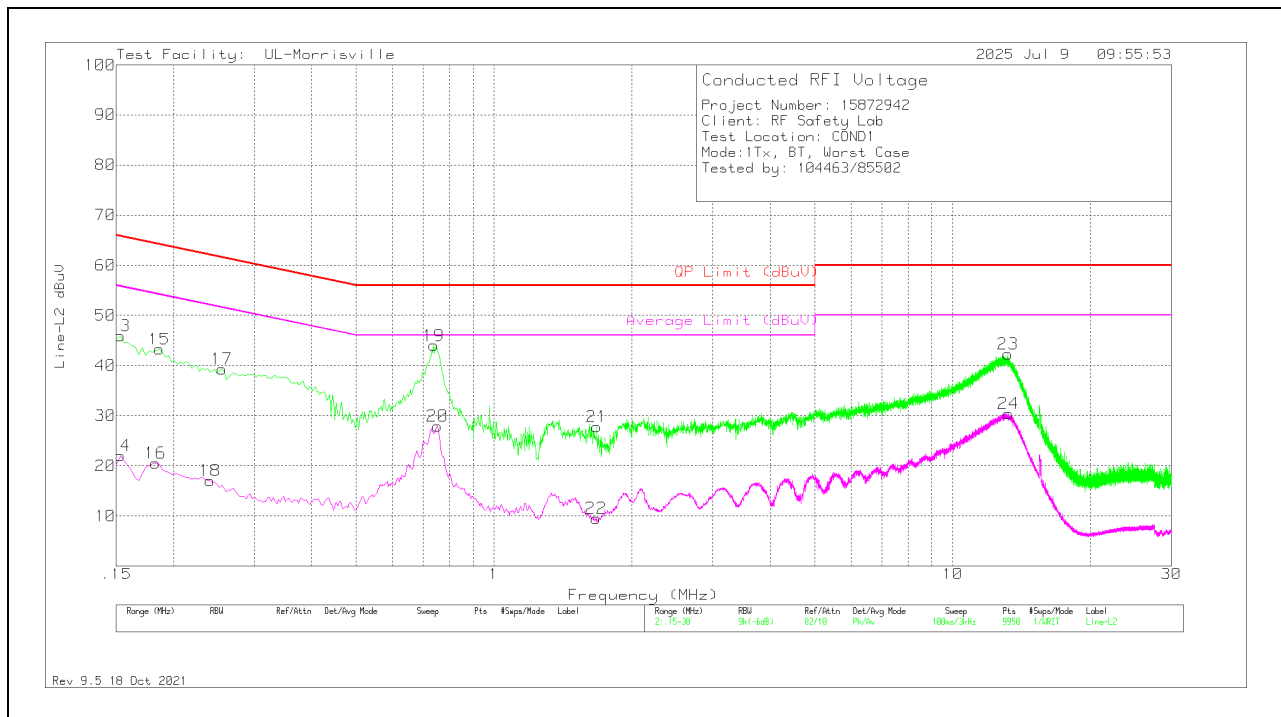
LINE 1 RESULTS



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	.156	38.72	Pk	.2	9.7	48.62	65.67	-17.05	-	-
2	.159	19.11	Av	.2	9.7	29.01	-	-	55.52	-26.51
3	.183	36.36	Pk	.2	9.7	46.26	64.35	-18.09	-	-
4	.192	17.16	Av	.2	9.7	27.06	-	-	53.95	-26.89
5	.246	33.93	Pk	.1	9.7	43.73	61.89	-18.16	-	-
6	.252	12.94	Av	.1	9.7	22.74	-	-	51.69	-28.95
7	.75	33.62	Pk	0	9.7	43.32	56	-12.68	-	-
8	.759	21.09	Av	0	9.7	30.79	-	-	46	-15.21
9	1.668	21.52	Pk	0	9.7	31.22	56	-24.78	-	-
10	1.674	9.84	Av	0	9.7	19.54	-	-	46	-26.46
11	12.339	36.49	Pk	.1	9.8	46.39	60	-13.61	-	-
12	12.348	22.14	Av	.1	9.8	32.04	-	-	50	-17.96

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	.153	36.01	Pk	.2	9.7	45.91	65.84	-19.93	-	-
14	.153	12.13	Av	.2	9.7	22.03	-	-	55.84	-33.81
16	.183	10.59	Av	.2	9.7	20.49	-	-	54.35	-33.86
15	.186	33.35	Pk	.2	9.7	43.25	64.21	-20.96	-	-
18	.24	7.19	Av	.1	9.7	16.99	-	-	52.1	-35.11
17	.255	29.49	Pk	.1	9.7	39.29	61.59	-22.3	-	-
19	.738	34.29	Pk	0	9.7	43.99	56	-12.01	-	-
20	.753	18.2	Av	0	9.7	27.9	-	-	46	-18.1
22	1.668	-.2	Av	0	9.7	9.5	-	-	46	-36.5
21	1.677	18.06	Pk	0	9.7	27.76	56	-28.24	-	-
23	13.212	32.39	Pk	.1	9.8	42.29	60	-17.71	-	-
24	13.233	20.51	Av	.1	9.8	30.41	-	-	50	-19.59

Pk - Peak detector
Av - Average detection

12. SETUP PHOTOS

Please refer to R15872942-EP1 for setup photos.

END OF TEST REPORT