

TEST REPORT

Report Number: R15701621-E1d

Applicant : HID Global Corp
611 Center Ridge Dr.
Austin, TX 78753, USA

Model : 40KV2

FCC ID : JQ6-SIGNO40KV2

IC : 2236B-SIGNO40KV2

EUT Description : Signo V2 Reader

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 3
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2025-06-24

Prepared by:
UL LLC
12 Laboratory Dr.
Research Triangle Park, NC 27709 U.S.A.
TEL: (919) 549-1400



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-06-12	Initial Issue	Chandler Stanley
V2	2025-06-24	Revised Section 6.5	Chandler Stanley

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	5
2. TEST RESULTS SUMMARY	6
3. TEST METHODOLOGY	6
4. FACILITIES AND ACCREDITATION	6
5. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
5.1. METROLOGICAL TRACEABILITY	7
5.2. DECISION RULES	7
5.3. MEASUREMENT UNCERTAINTY	7
5.4. SAMPLE CALCULATION	7
6. EQUIPMENT UNDER TEST	8
6.1. EUT DESCRIPTION	8
6.2. MAXIMUM OUTPUT POWER	8
6.3. DESCRIPTION OF AVAILABLE ANTENNAS	8
6.4. SOFTWARE AND FIRMWARE	8
6.5. WORST-CASE CONFIGURATION AND MODE	8
6.6. DESCRIPTION OF TEST SETUP	9
7. MEASUREMENT METHOD	10
8. TEST AND MEASUREMENT EQUIPMENT	11
9. ANTENNA PORT TEST RESULTS	13
9.1. ON TIME AND DUTY CYCLE	13
9.2. 99% BANDWIDTH	15
9.2.1. BLE (1Mbps)	15
9.2.2. BLE (2Mbps)	16
9.3. 6 dB BANDWIDTH	17
9.3.1. BLE (1Mbps)	17
9.3.2. BLE (2Mbps)	18
9.4. OUTPUT POWER	19
9.4.1. BLE (1Mbps)	19
9.4.2. BLE (2Mbps)	19
9.5. AVERAGE POWER	20

9.5.1.	BLE (1Mbps).....	20
9.5.2.	BLE (2Mbps).....	20
9.6.	<i>POWER SPECTRAL DENSITY</i>	21
9.6.1.	BLE (1Mbps).....	21
9.6.2.	BLE (2Mbps).....	22
9.7.	<i>CONDUCTED SPURIOUS EMISSIONS</i>	23
9.7.1.	BLE (1Mbps).....	24
9.7.2.	BLE (2Mbps).....	25
10.	RADIATED TEST RESULTS	26
10.1.	<i>LIMITS AND PROCEDURE</i>	26
10.2.	<i>TRANSMITTER ABOVE 1 GHz</i>	28
10.2.1.	BLE (1Mbps).....	28
10.2.2.	BLE (2Mbps).....	38
10.3.	<i>WORST CASE BELOW 30MHZ</i>	48
10.4.	<i>WORST CASE BELOW 1 GHZ</i>	50
10.5.	<i>WORST CASE 18-26 GHZ</i>	52
11.	AC POWER LINE CONDUCTED EMISSIONS	54
11.1.1.	AC Power Line Host.....	55
12.	SETUP PHOTOS	57

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HID Global Corp
611 Center Ridge Dr.
Austin, TX 78753, USA

EUT DESCRIPTION: Signo V2 Reader

MODEL: 40KV2

SERIAL NUMBER: FL0P0U013XWO40KTKF8087 / FL0P0U013NWO40KTKF8087

SAMPLE RECEIPT DATE: 2025-03-10

DATE TESTED: 2025-03-12 TO 2025-03-24

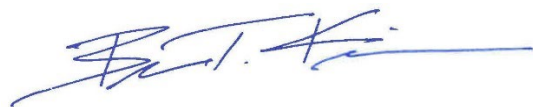
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	See Section 2
ISED RSS-247 Issue 3	See Section 2
ISED RSS-GEN Issue 5 + A1 + A2	See Section 2

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:



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

Prepared By:



Chandler Stanley
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	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Compliant	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power		None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Compliant	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions		None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions		None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions		None.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024, 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 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 RTP, NC 27709, 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 a smartcard reader typically installed near doorway as part of physical access system, to control access to that door, and it contains BLE, 13.56 MHz RFID, and 125 kHz RFID radios. This report covers full testing of the BLE 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	BLE	0.45	1.11

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

The radio utilizes an inverted F antenna, with a maximum gain of -2.65 dBi.

6.4. SOFTWARE AND FIRMWARE

Firmware Version: 10.1
Hardware Version: Rev H

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emissions were performed with the EUT set to transmit at the channel and data-rate with highest PSD as worst-case scenario. The EUT supports 1 and 2 Mbps.

The EUT is meant to be powered via an auxiliary device (access controller) that does not come with the product. Therefore, for AC Lines, the scan was run using a DC power supply as representative. There are two power cables that can be used to power the EUT, a terminal and pigtail cable. Through pretesting, the terminal cable was found to be worst-case and was therefore used for all testing.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit on low, middle and high channels for all data-rates.

The EUT is meant to be installed and operated in one orientation; therefore, all testing was performed with the EUT in its intended orientation.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	Yoga 7 16IAP7	PF49WDF9	-
USB to Type C cable	ANKER	-	-	-
Data Module	HID	-	PCB-00476	-
Laptop	Lenovo	IdeaPad Flex 5 14IAU7	PW0DWR8R	TX2-RTL8852BE

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	Type C	Unshielded	<6m	Programing cable
2	Power	1	Proprietary	Unshielded	<3m	Supplies Power

TEST SETUP

Test software exercised the radio card. For final testing, the EUT and laptop are disconnected, and the laptop is removed from the chamber.

SETUP DIAGRAMS

Please refer to R15701621-EP1d for setup diagrams

7. MEASUREMENT METHOD

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

6 dB BW: ANSI C63.10-2020 Subclause -11.8.2

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

Output Power: ANSI C63.10-2020 Subclause -11.9.1.2 Method PKPM1 Peak-reading power meter
ANSI C63.10-2020 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10-2020 Subclause -11.10.2 Method PKPSD (peak PSD)

Conducted emissions non-restricted frequency bands: ANSI C63.10-2020 Subclause -11.11 and 6.10.4

Radiated emissions restricted frequency bands: ANSI C63.10-2020 Subclause -11.12.1 and 6.10.5

General radiated emissions: ANSI C63.10 Subclause - 6.3-6.6

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

8. 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.
Common Equipment					
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
211056	Real-Time Peak Power Sensor 50MHz to 8GHz	Boonton	RTP5000	2024-08-01	2025-08-01
207726	Temp/Humid Chamber	Thermotron	SM-32-8200	2025-01-15	2026-01-15
91212	True RMS Multimeter	Agilent	U1232A	2024-08-01	2025-08-01
-	DC Power Supply	Keysight Technologies	E3633A	-	-
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
SOFTEMI	Antenna Port Software	UL	Version 2024.2.23	NA	NA
Attenuators/Cables					
246811	SMA Coaxial 10dB Attenuator	CentricRF	C18S2-20	2024-03-07	2025-03-31
CBL105	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB-197C-0-0160-300300	2024-03-01	2025-03-31

Note*: All equipment was within calibration at the time of use.

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	2024-04-04	2025-04-04
179892	Environmental Meter	Fisher Scientific	15-077-963	2024-08-12	2025-08-12
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
52859	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2024-04-04	2025-04-04
236852	CW-AC Power Source	Ametek	CW2501	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

Note*: All equipment was within calibration at the time of use.

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. 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					
159203	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-03-05	2026-03-05
1-18 GHz					
86408	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-06-19	2025-06-19
18-26.5 GHz					
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-826	2023-07-20	2025-07-20
Gain-Loss Chains					
91975	Gain-loss string: 0.009-30MHz	Various	Various	2024-05-10	2025-05-10
91978	Gain-loss string: 25-1000MHz	Various	Various	2024-05-10	2025-05-10
91977	Gain-loss string: 1-18GHz	Various	Various	2024-07-17	2025-07-17
136042	Gain-loss string: 18-40GHz	Various	Various	2024-05-10	2025-05-10
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-03-05	2025-03-31
81018	Spectrum Analyzer	Agilent	E4446A	2024-07-31	2025-07-31
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
200540	Environmental Meter	Fisher Scientific	15-077-963	2023-07-19	2025-07-19

Note*: All equipment was within calibration at the time of use.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

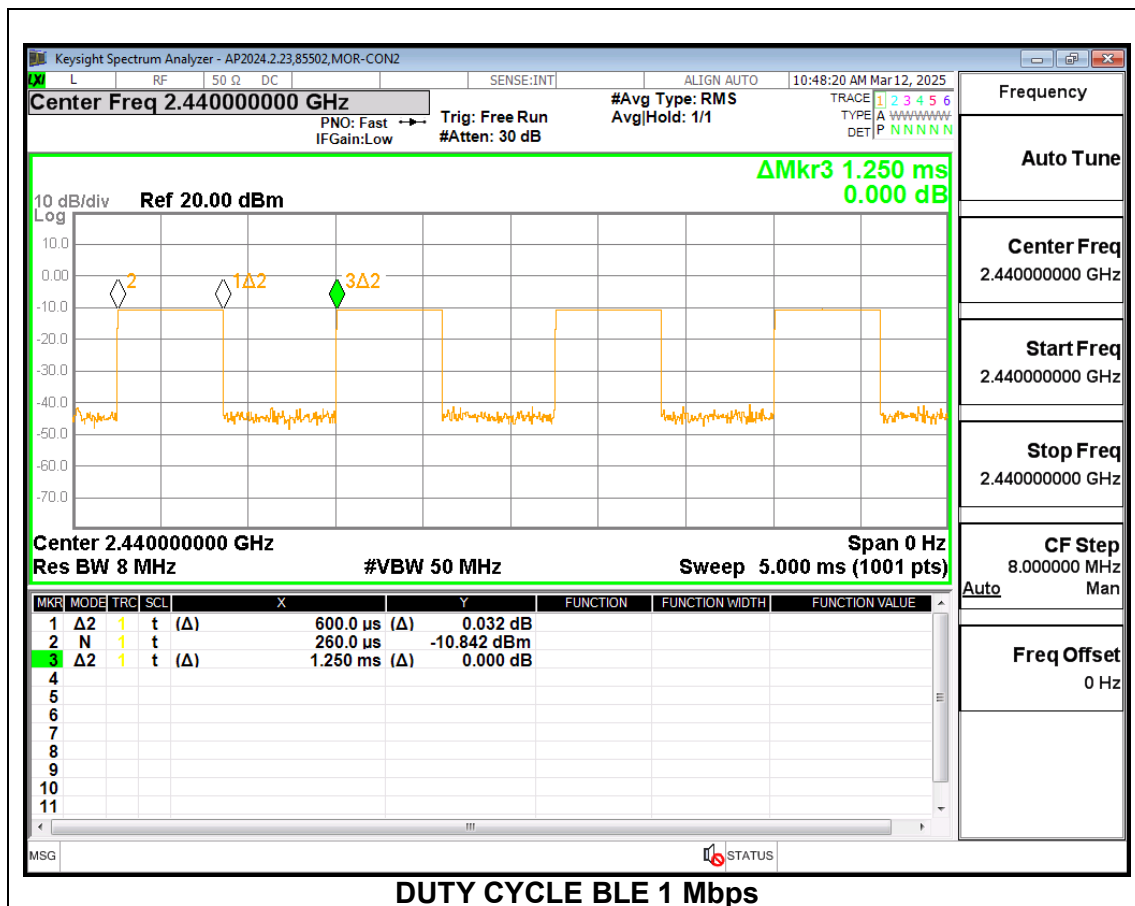
None; for reporting purposes only.

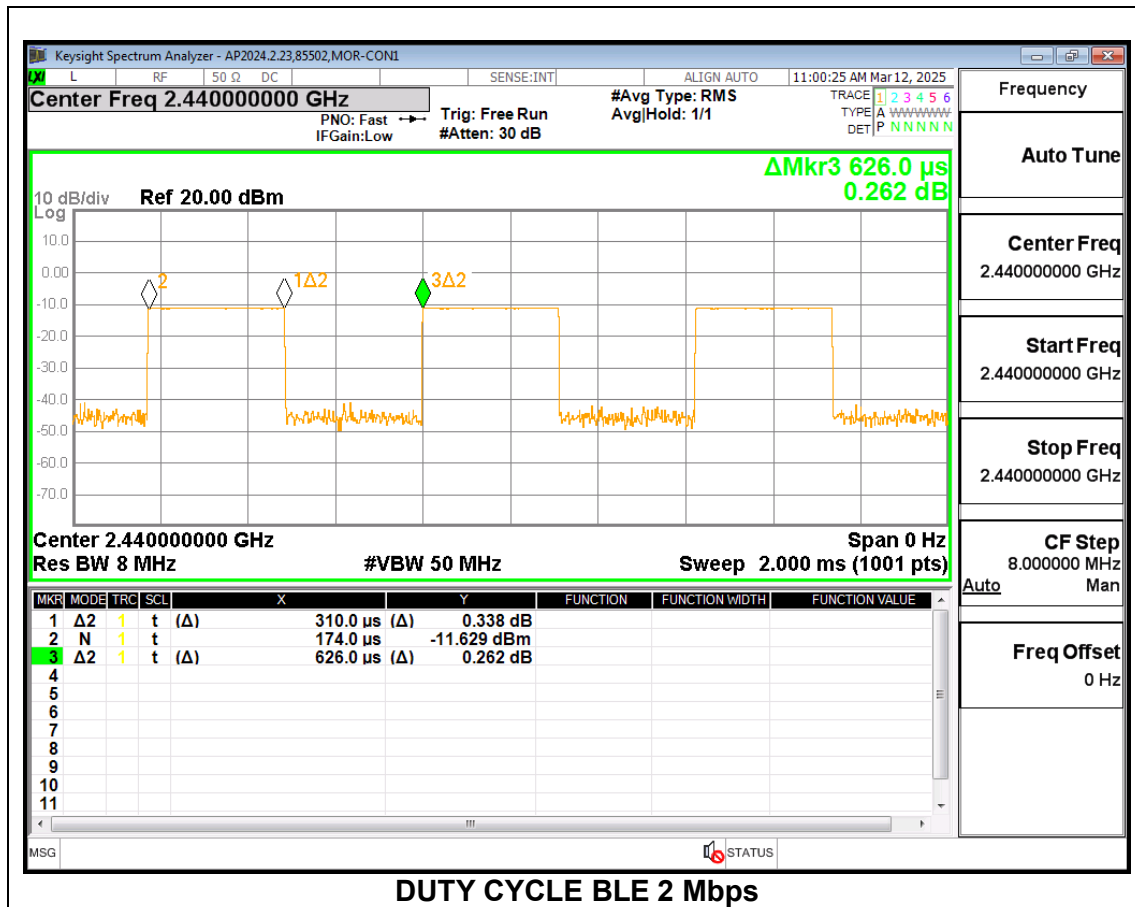
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
BLE 1 Mbps	0.600	1.250	0.480	48.00%	6.38	1.667
BLE 2 Mbps	0.310	0.626	0.495	49.52	6.10	3.226





9.2. 99% BANDWIDTH

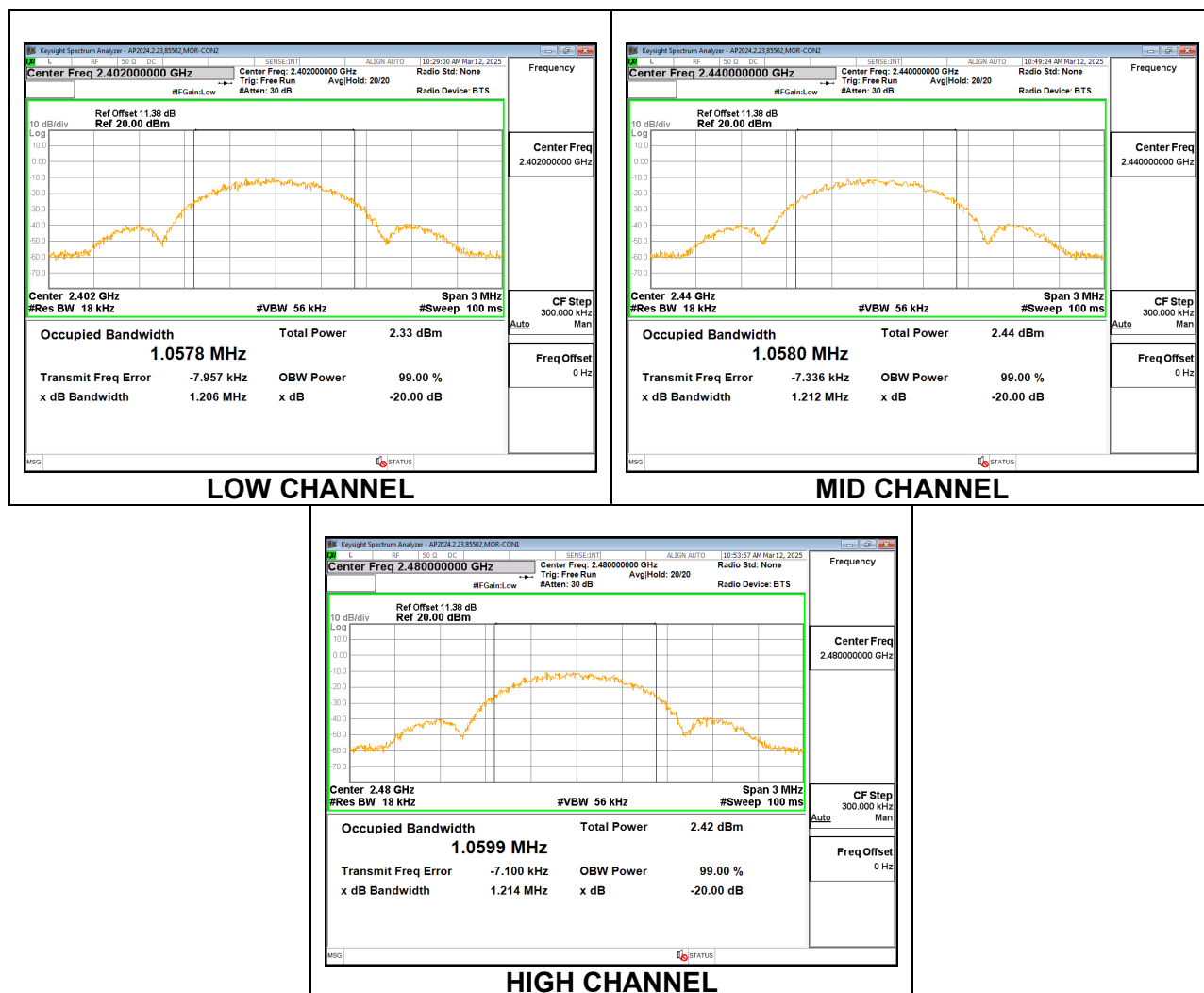
LIMITS

None; for reporting purposes only.

RESULTS

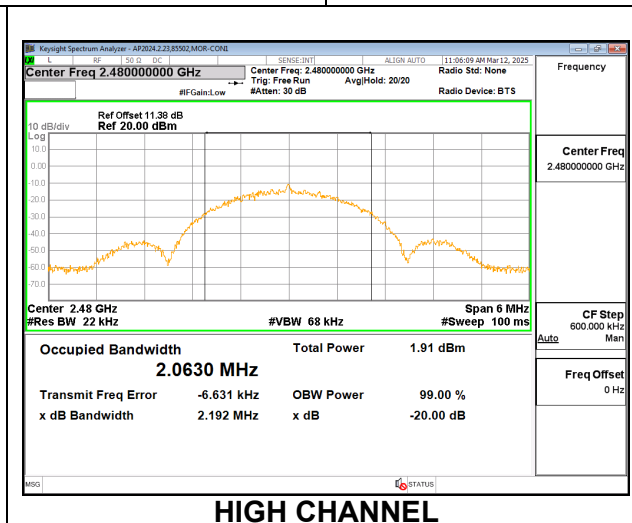
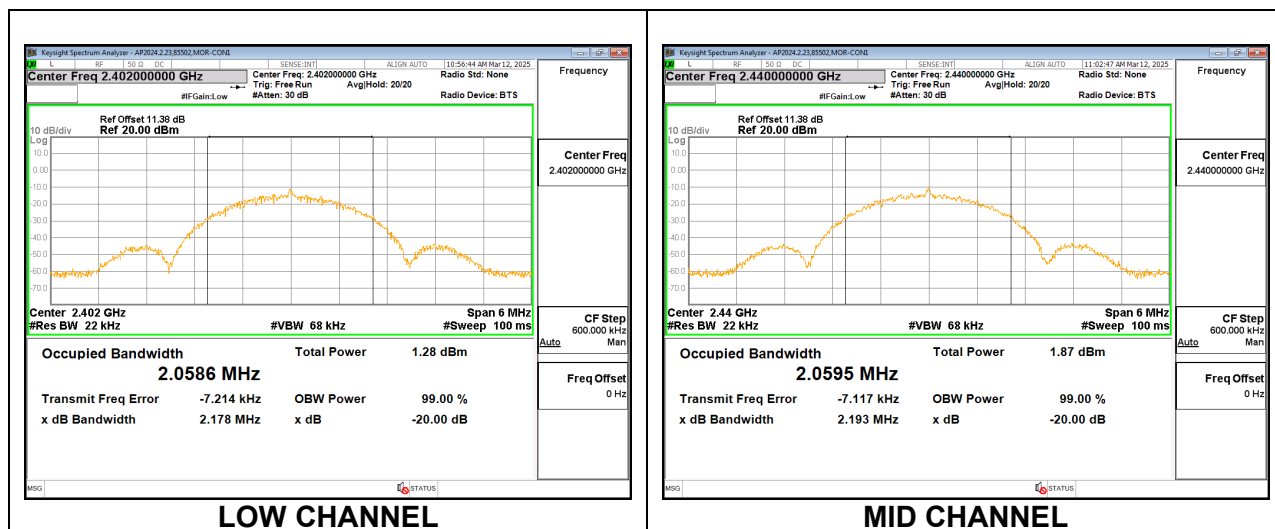
9.2.1. BLE (1Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0578
Middle	2440	1.0580
High	2480	1.0599



9.2.2. BLE (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0586
Middle	2440	2.0595
High	2480	2.0630



9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

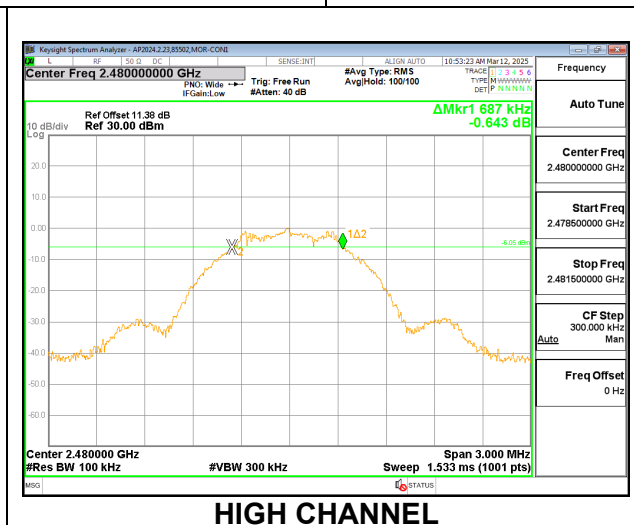
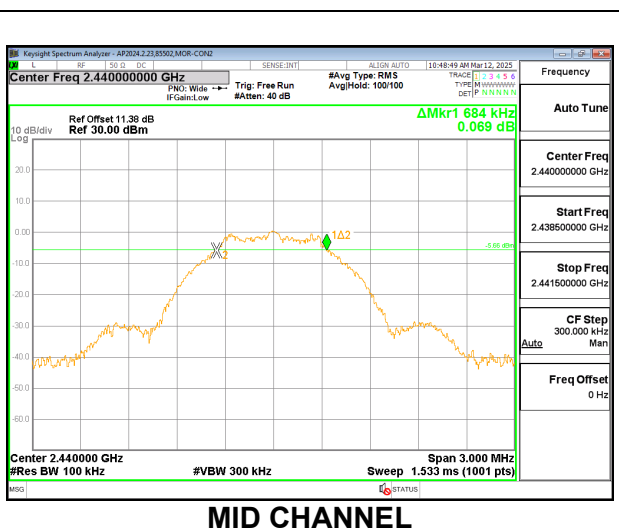
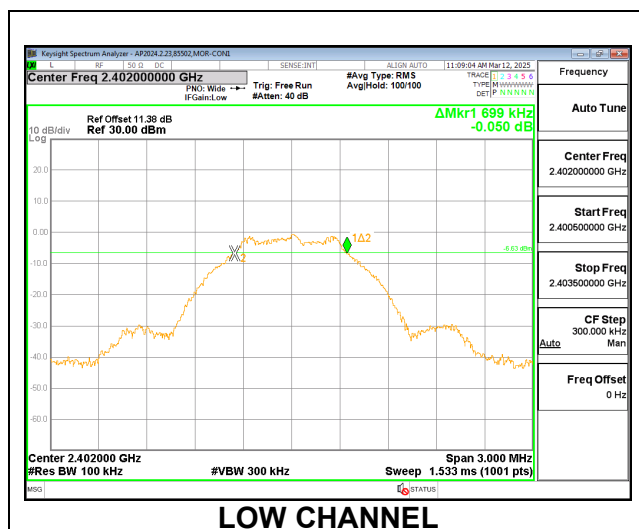
RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

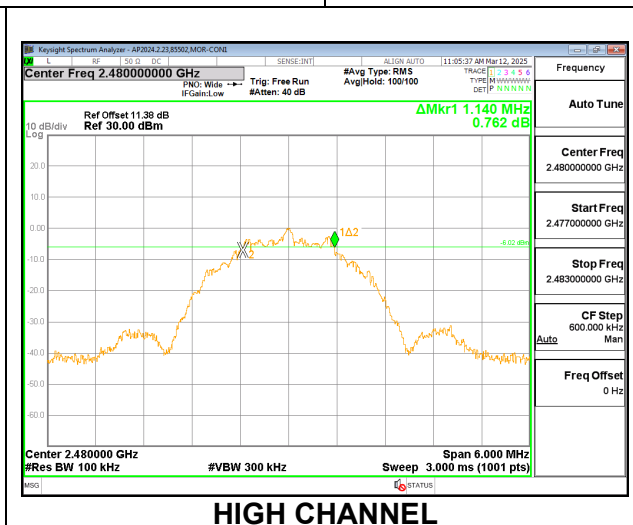
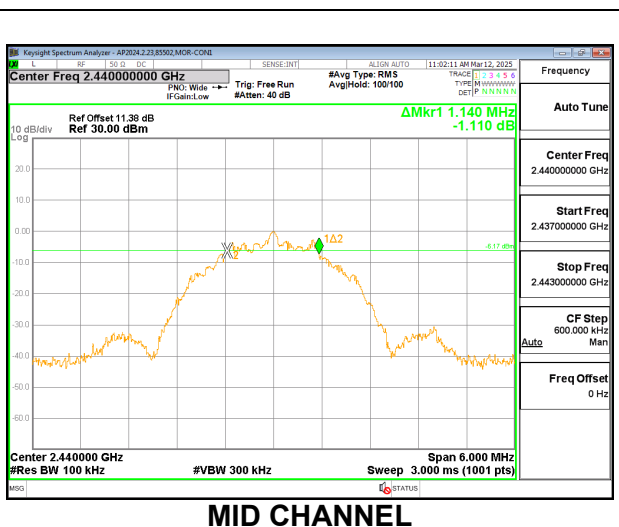
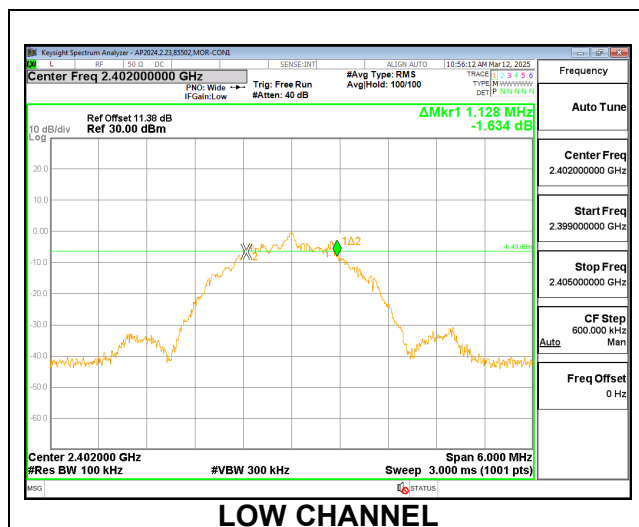
9.3.1. BLE (1Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6990	0.5
Middle	2440	0.6840	0.5
High	2480	0.6870	0.5



9.3.2. BLE (2Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.1280	0.5
Middle	2440	1.1400	0.5
High	2480	1.1400	0.5



9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

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

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.38 dB (including 10.16 dB pad and 1.22 dB cable) was entered as an offset in the power.

The power output was measured on the EUT antenna port using an SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.

RESULTS

9.4.1. BLE (1Mbps)

Tested By:	85502
Date:	2025-03-12

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.050	30	-30.050
Middle	2440	0.180	30	-29.820
High	2480	0.400	30	-29.600

9.4.2. BLE (2Mbps)

Tested By:	85502
Date:	2025-03-12

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.110	30	-30.110
Middle	2440	0.190	30	-29.810
High	2480	0.450	30	-29.550

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.38 dB (including 10.16 dB pad and 1.22 dB cable) was entered as an offset in the power meter.

The power output was measured on the EUT antenna port using an SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

RESULTS

9.5.1. BLE (1Mbps)

Tested By:	85502
Date:	2025-03-12

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	-0.44
Middle	2440	-0.18
High	2480	0.01

9.5.2. BLE (2Mbps)

Tested By:	85502
Date:	2025-03-12

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	-0.40
Middle	2440	-0.14
High	2480	0.05

9.6. POWER SPECTRAL DENSITY

LIMITS

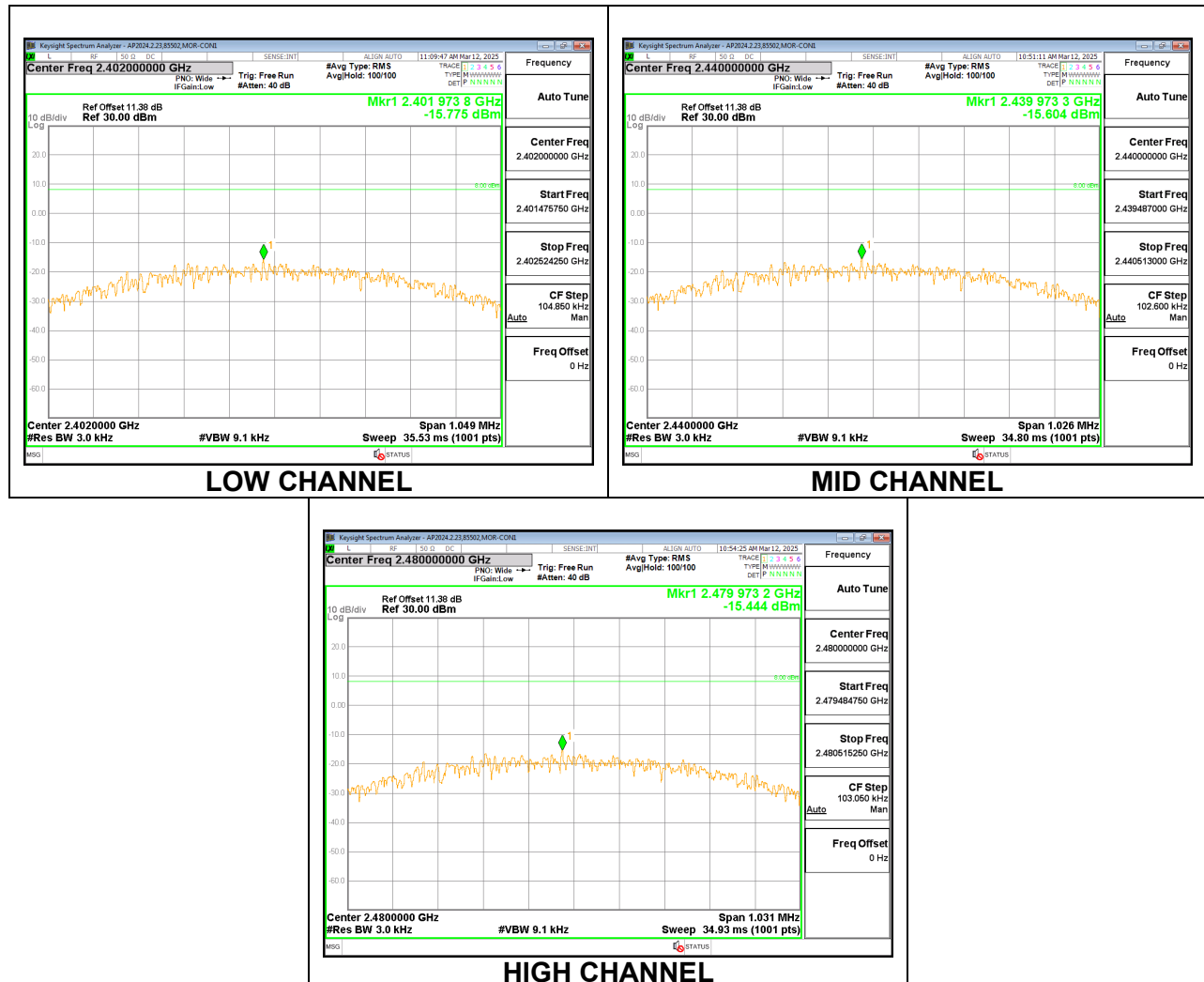
FCC §15.247 (e)
RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

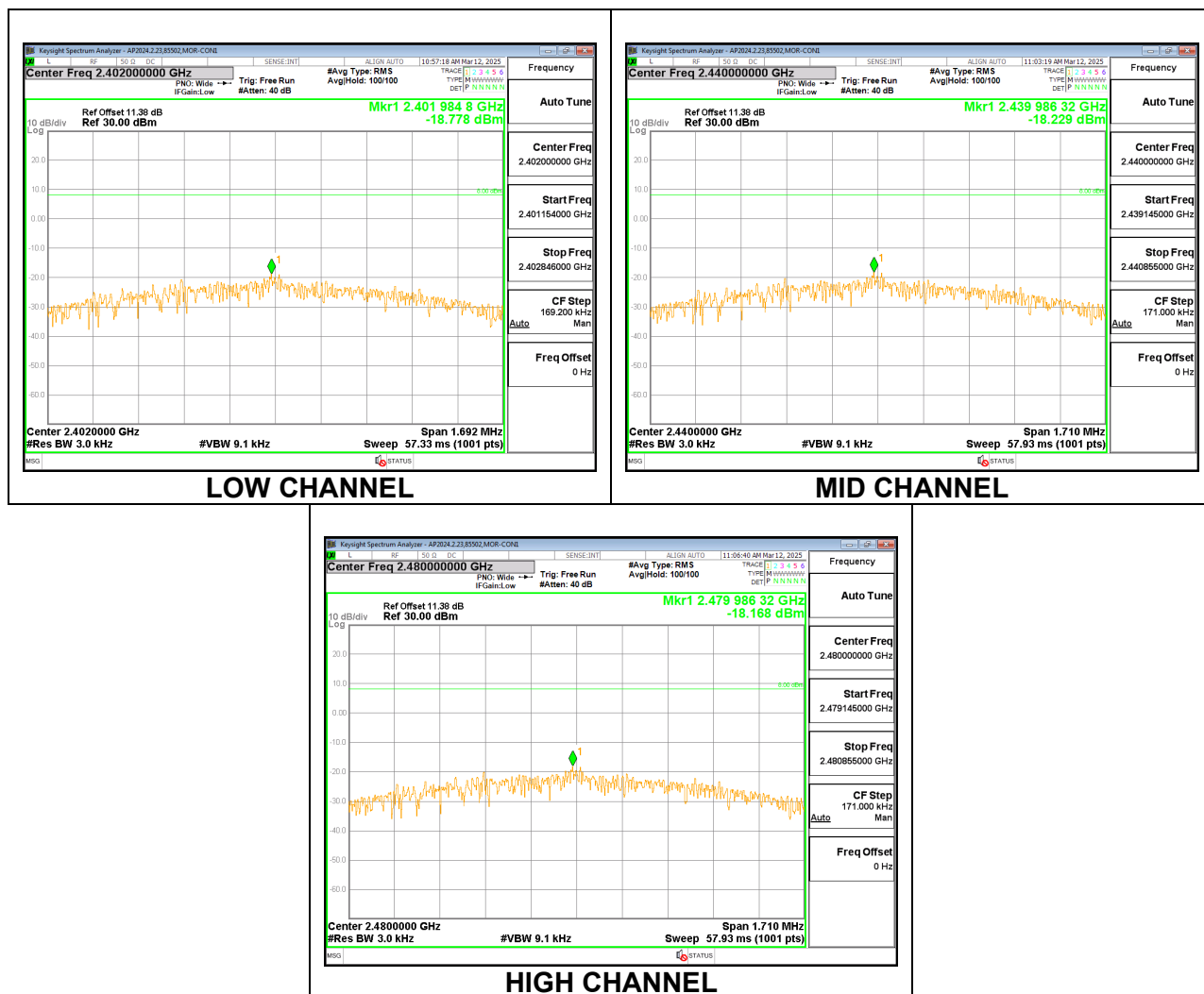
9.6.1. BLE (1Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-15.775	8	-23.775
Middle	2440	-15.604	8	-23.604
High	2480	-15.444	8	-23.444



9.6.2. BLE (2Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-18.778	8	-26.778
Middle	2440	-18.229	8	-26.229
High	2480	-18.168	8	-26.168



9.7. CONDUCTED SPURIOUS EMISSIONS

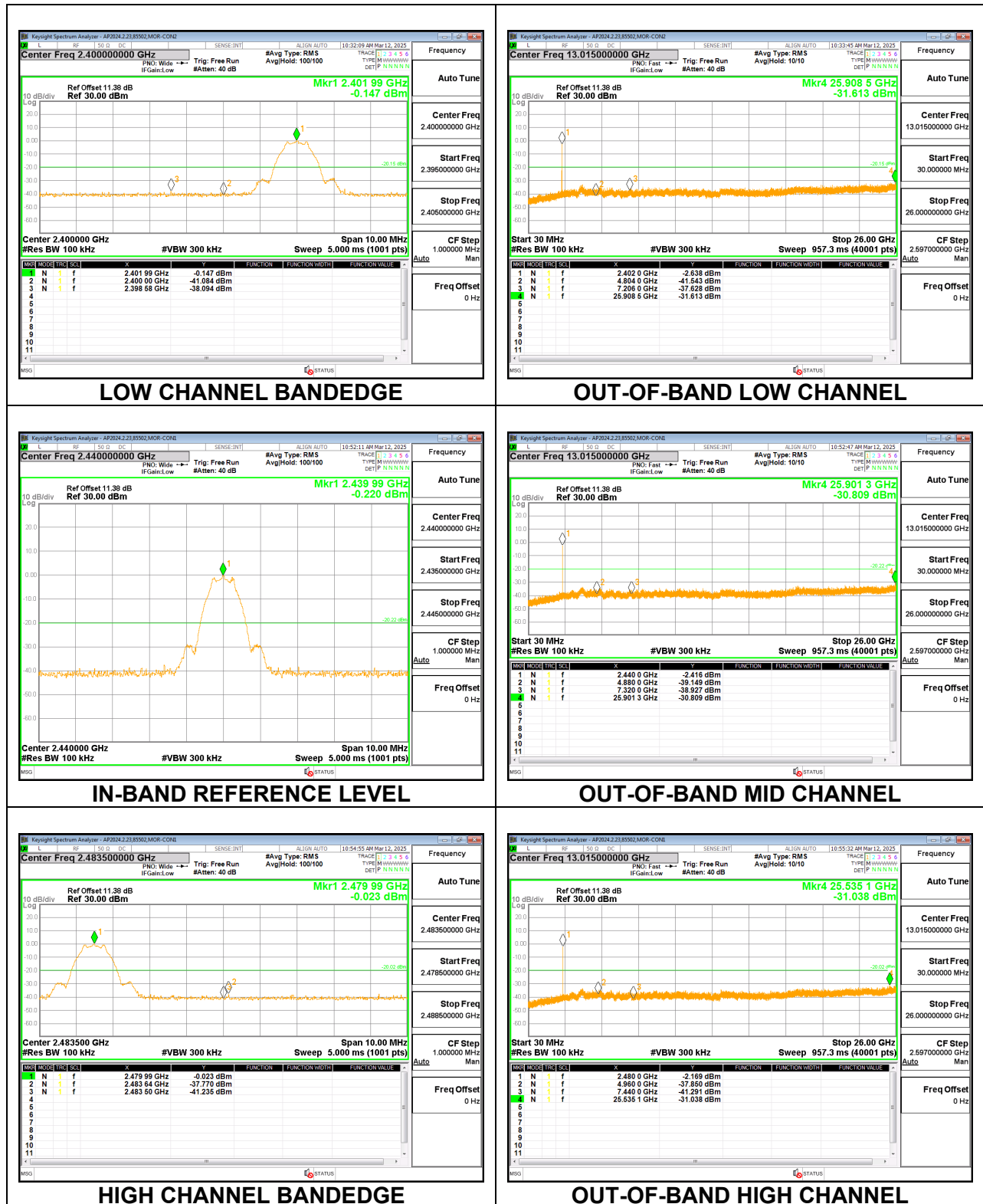
LIMITS

FCC §15.247 (d)
RSS-247 5.5

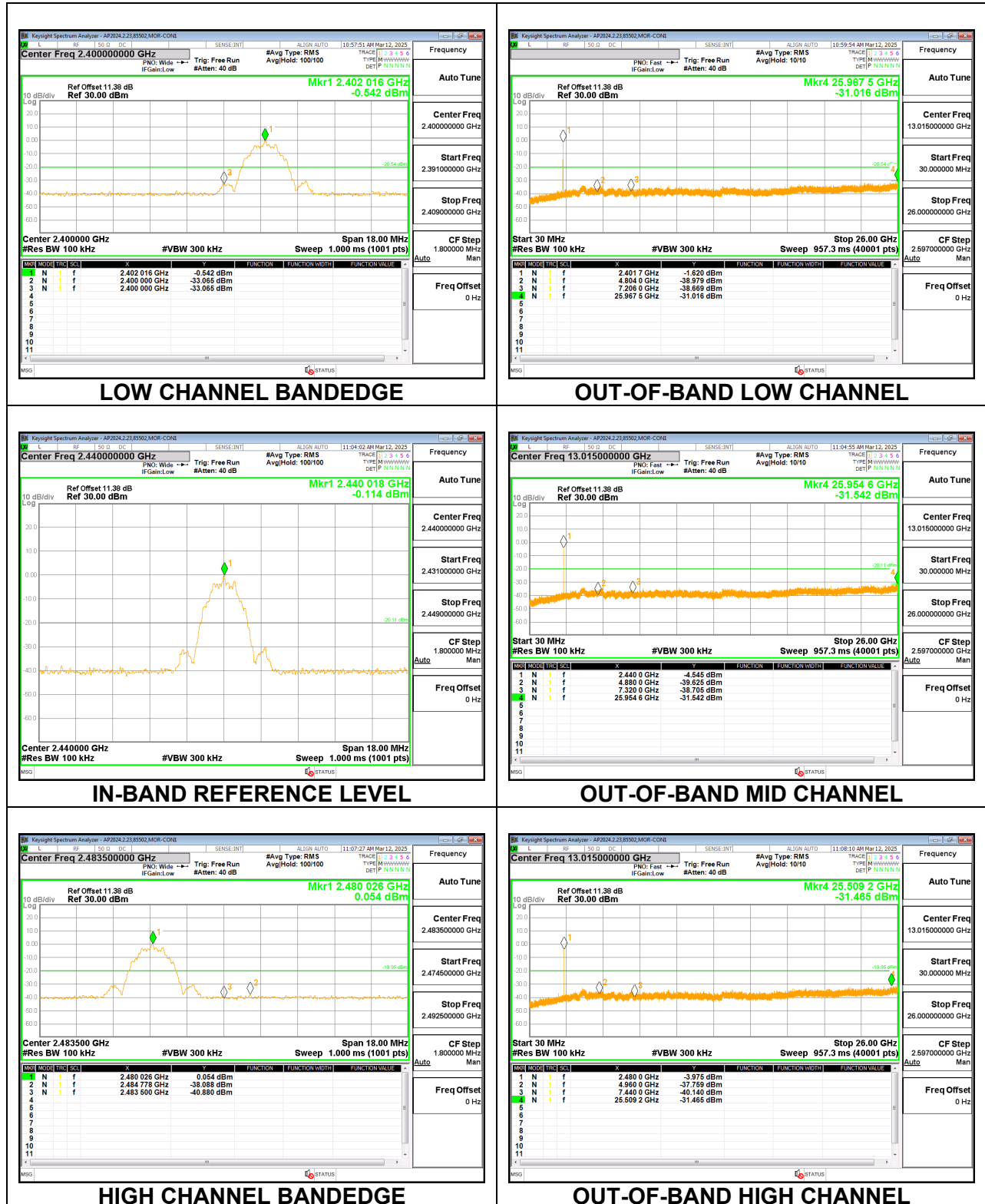
Output power was measured based on the use of a peak measurement, therefore the required attenuation is -20 dBc.

RESULTS

9.7.1. BLE (1Mbps)



9.7.2. BLE (2Mbps)



10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

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 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 30 KHz 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 and as applicable for average measurements. For average measurements, linear voltage averaging was used.

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

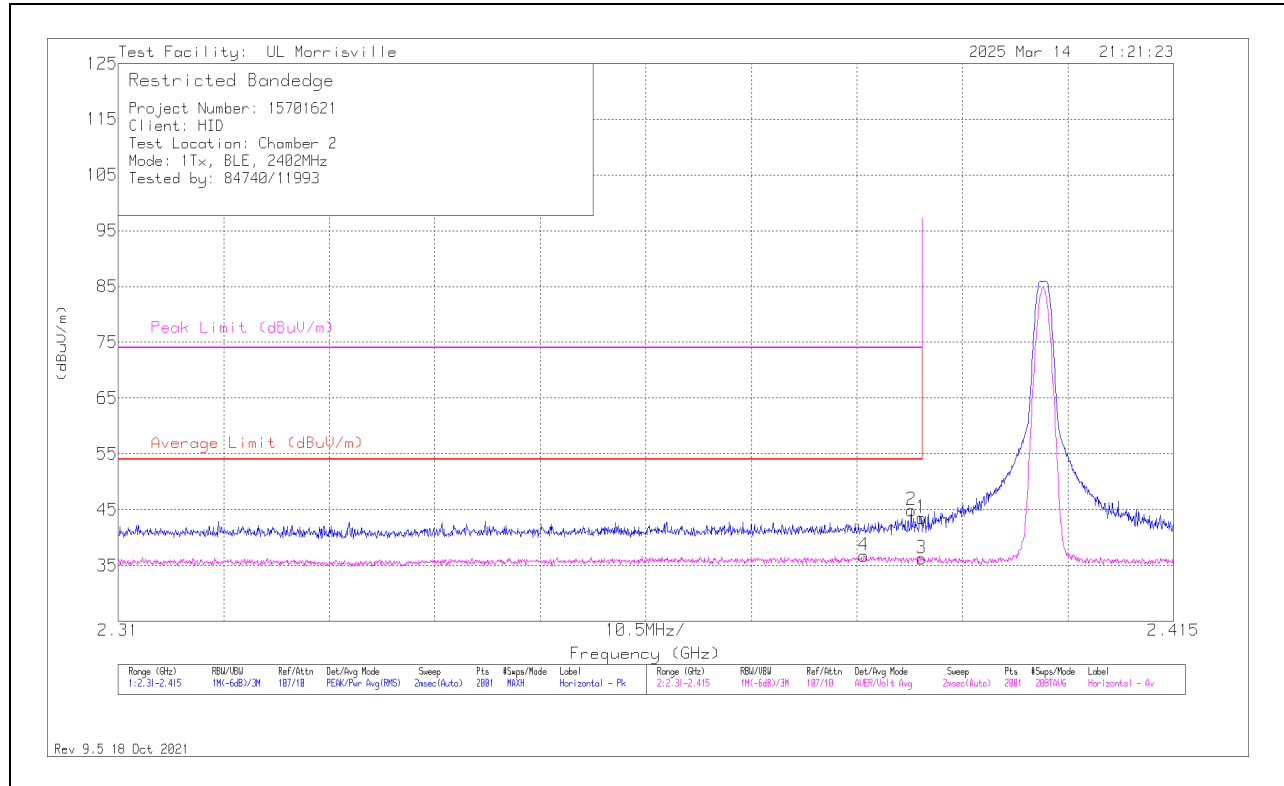
OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	34.82	Pk	32.3	-23.6	0	43.52	-	-	74	-30.48	70	124	H
2	* ** 2.38891	36.13	Pk	32.3	-23.5	0	44.93	-	-	74	-29.07	70	124	H
3	* ** 2.38996	21.15	ADV	32.3	-23.6	6.38	36.23	54	-17.77	-	-	70	124	H
4	* ** 2.38418	21.71	ADV	32.2	-23.5	6.38	36.79	54	-17.21	-	-	70	124	H

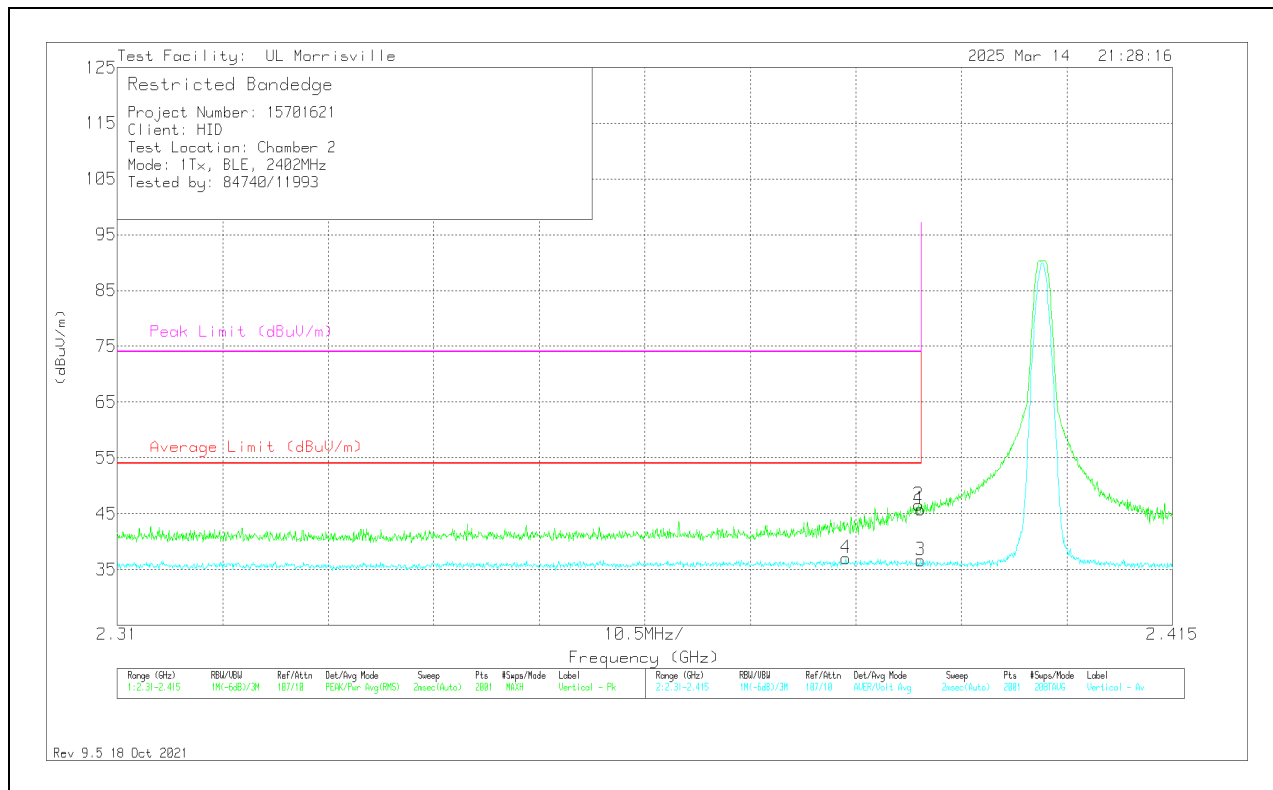
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	37.09	Pk	32.3	-23.6	0	45.79	-	-	74	-28.21	109	110	V
2	* ** 2.38975	37.78	Pk	32.3	-23.5	0	46.58	-	-	74	-27.42	109	110	V
3	* ** 2.38996	21.52	ADV	32.3	-23.6	6.38	36.6	54	-17.4	-	-	109	110	V
4	* ** 2.3825	21.88	ADV	32.2	-23.5	6.38	36.96	54	-17.04	-	-	109	110	V

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

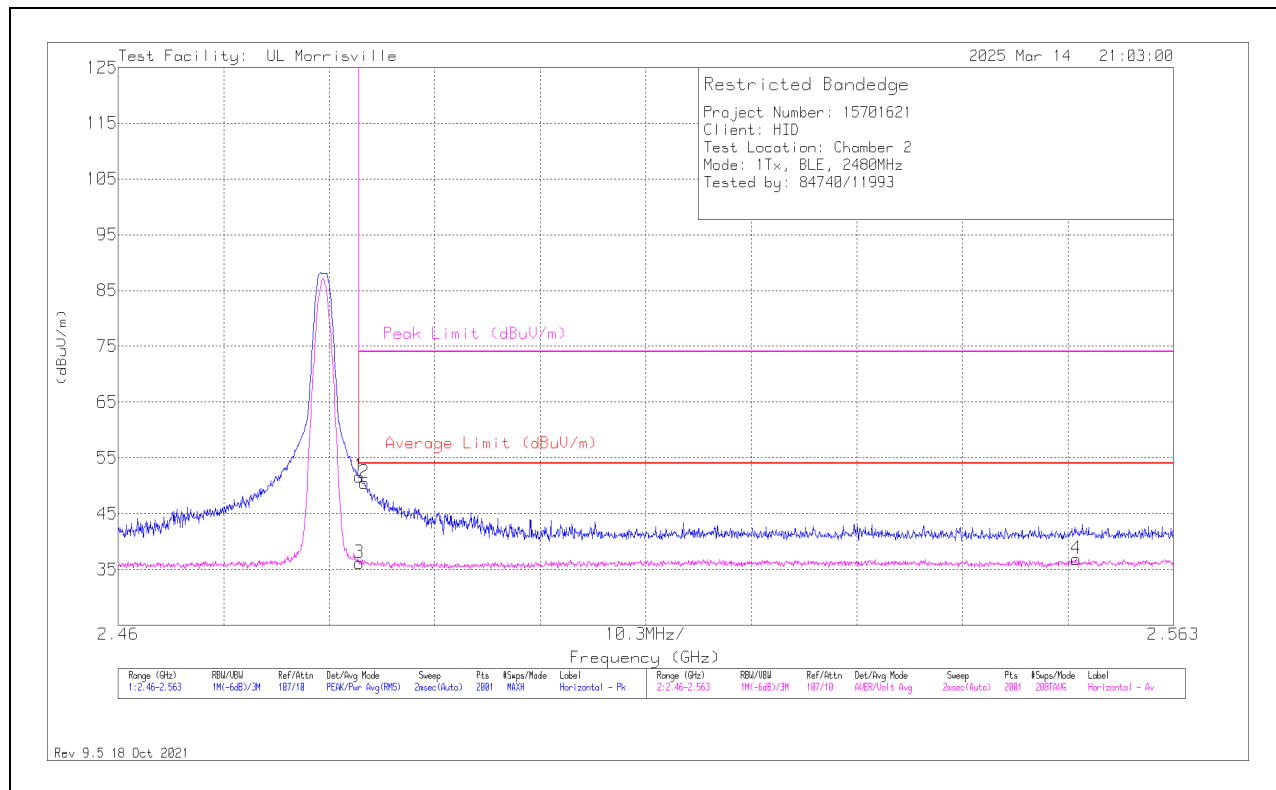
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	43.3	Pk	32.5	-24.1	0	51.7	-	-	74	-22.3	78	108	H
2	* ** 2.48405	42.23	Pk	32.5	-24.2	0	50.53	-	-	74	-23.47	78	108	H
3	* ** 2.48354	21.4	ADV	32.5	-24.1	6.38	36.18	54	-17.82	-	-	78	108	H
4	** 2.55352	22.49	ADV	32.5	-24.5	6.38	36.87	54	-17.13	-	-	78	108	H

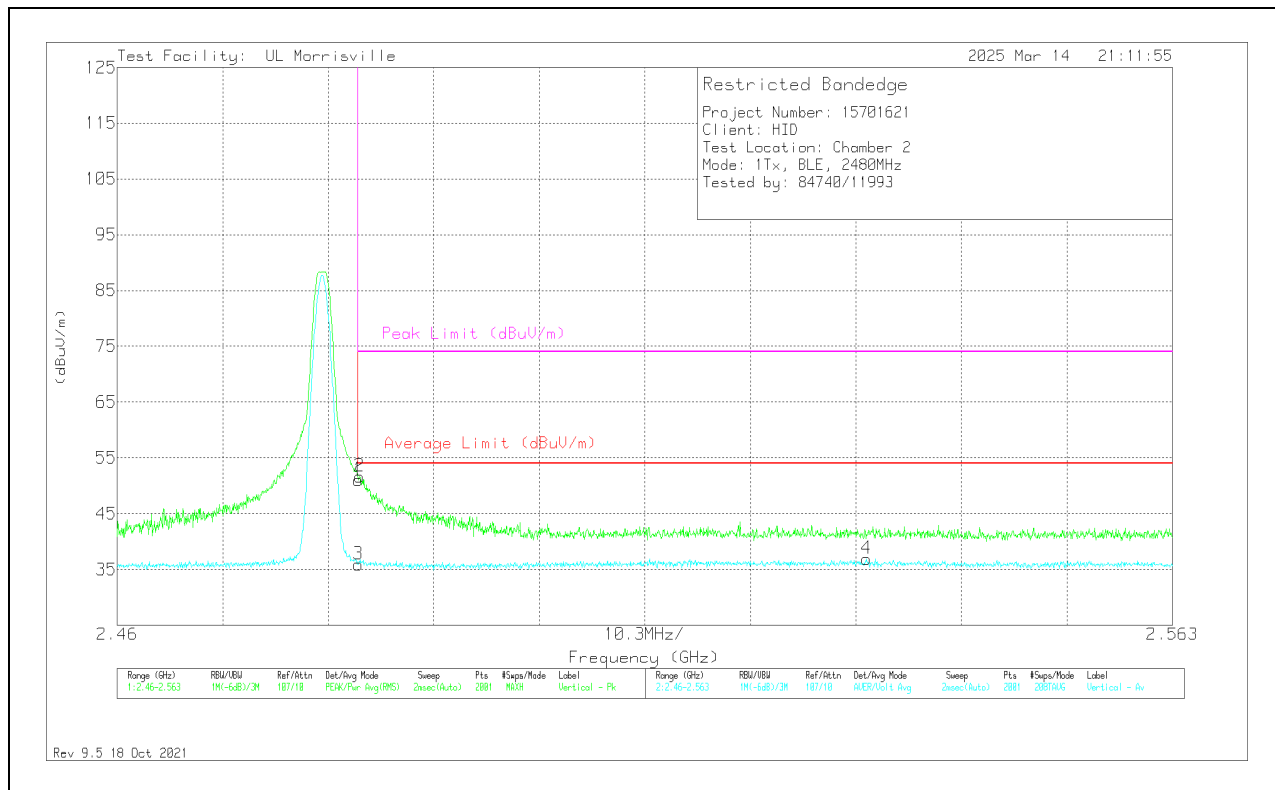
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	42.62	Pk	32.5	-24.1	0	51.02	-	-	74	-22.98	112	120	V
2	* ** 2.48364	43.26	Pk	32.5	-24.1	0	51.66	-	-	74	-22.34	112	120	V
3	* ** 2.48354	21.09	ADV	32.5	-24.1	6.38	35.87	54	-18.13	-	-	112	120	V
4	** 2.53313	22.65	ADV	32.5	-24.6	6.38	36.93	54	-17.07	-	-	112	120	V

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

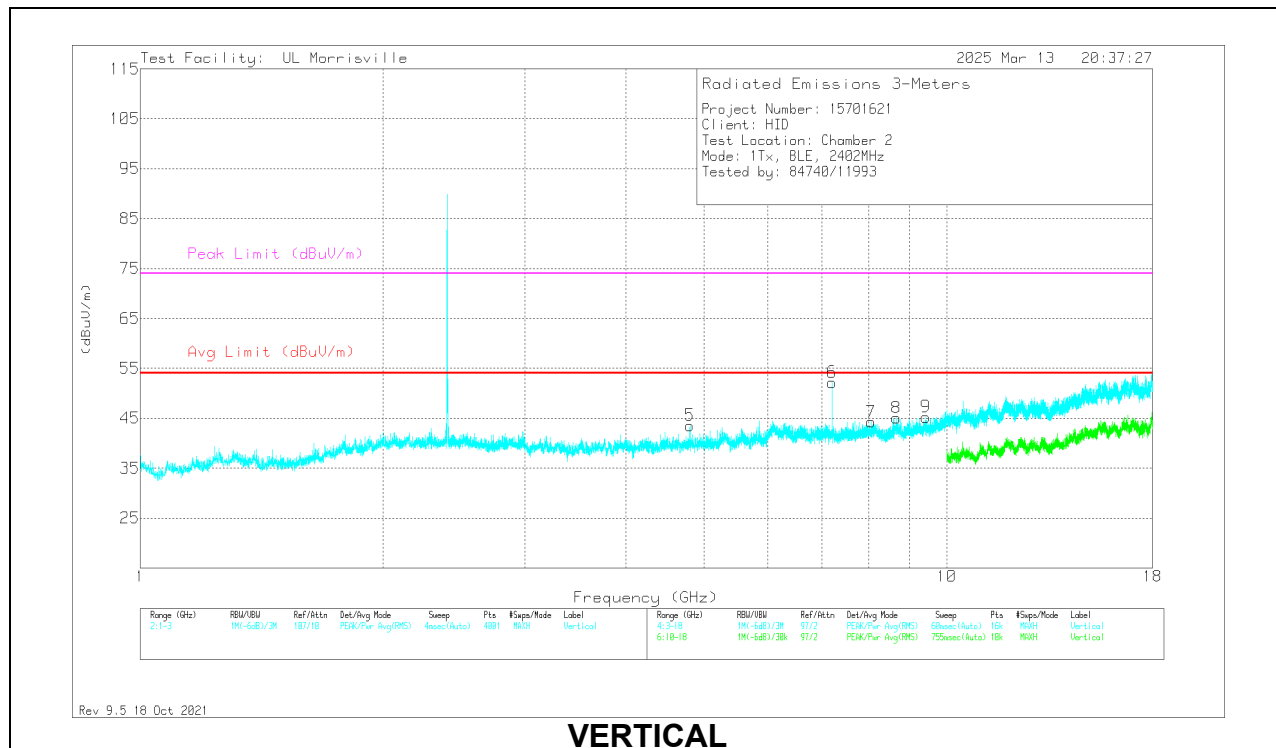
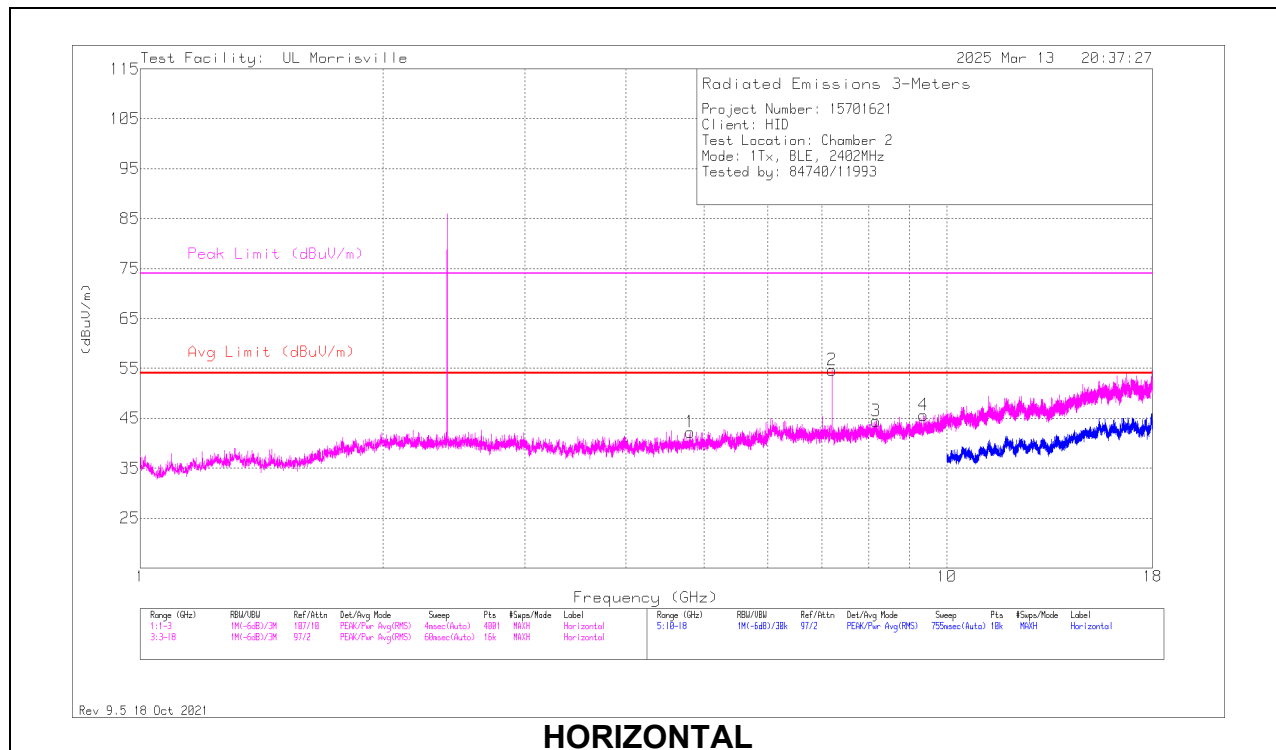
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

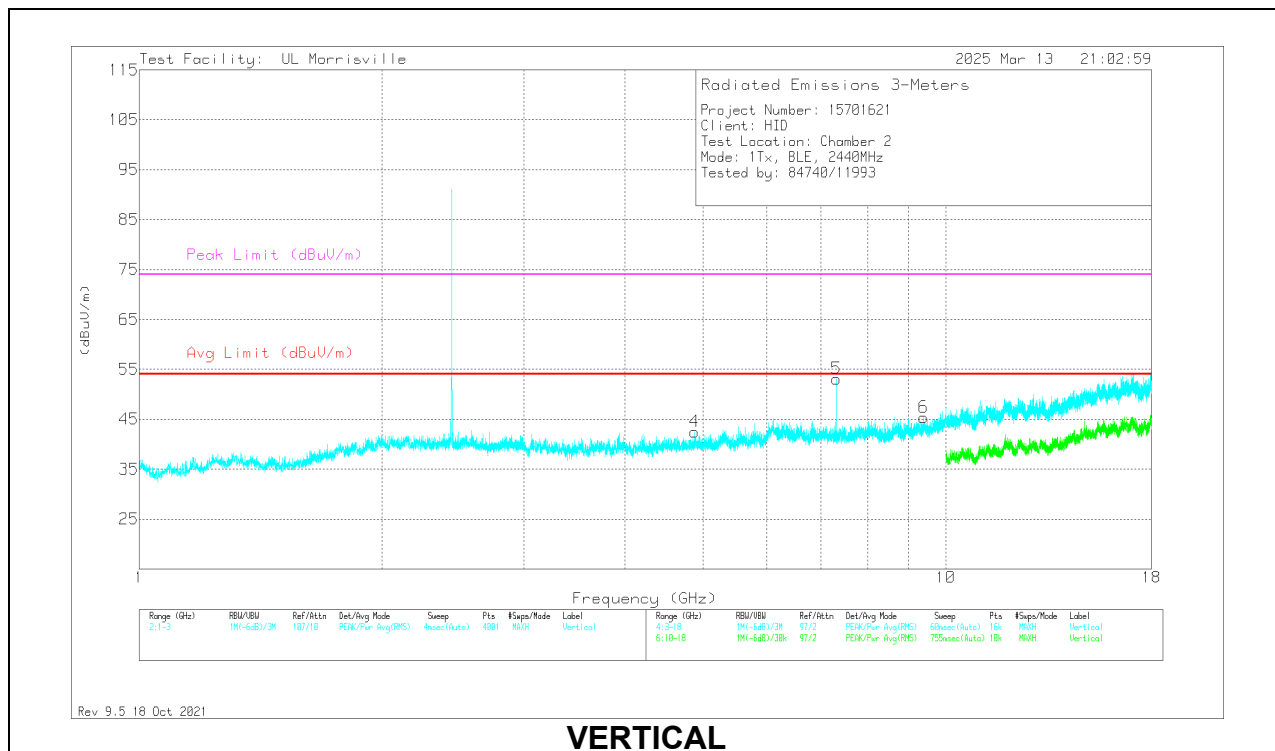
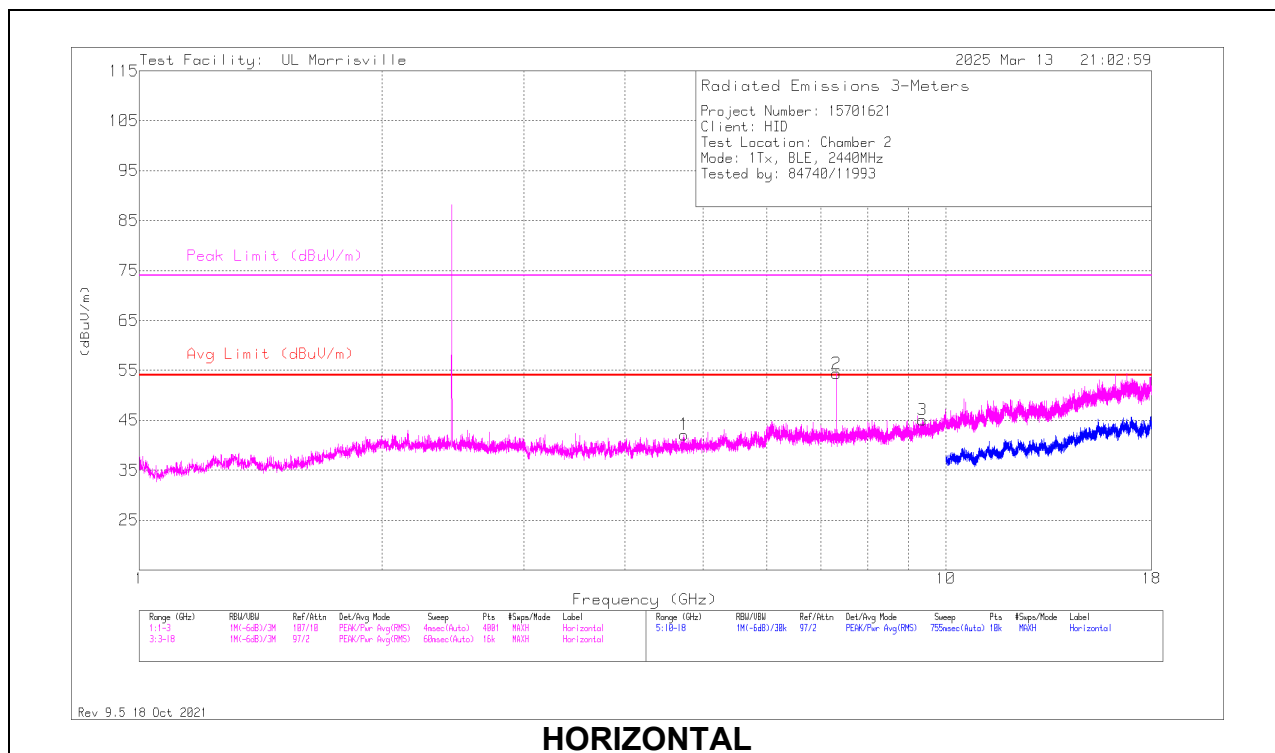
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80469	51.92	Pk	34.2	-43.9	42.22	54	-11.78	74	-31.78	0-360	200	H
3	* ** 8.16938	49.04	Pk	35.8	-40.4	44.44	54	-9.56	74	-29.56	0-360	200	H
4	* ** 9.36188	49.18	Pk	36.1	-39.6	45.68	54	-8.32	74	-28.32	0-360	101	H
5	* ** 4.80375	53.19	Pk	34.2	-43.9	43.49	54	-10.51	74	-30.51	0-360	200	V
7	* ** 8.06531	49.45	Pk	35.8	-41	44.25	54	-9.75	74	-29.75	0-360	101	V
9	* ** 9.42844	48.92	Pk	36.3	-40	45.22	54	-8.78	74	-28.78	0-360	200	V
6	7.20469	58.26	Pk	35.6	-41.7	52.16	-	-	-	-	0-360	101	V
2	7.20656	60.81	Pk	35.6	-41.7	54.71	-	-	-	-	0-360	101	H
8	8.66906	49.64	Pk	35.8	-40.4	45.04	-	-	-	-	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

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.73813	51.75	Pk	34.2	-43.9	0	42.05	54	-11.95	74	-31.95	0-360	101	H
2	* ** 7.31923	63.66	PK2	35.6	-41.8	0	57.46	-	-	74	-16.54	239	134	H
	* ** 7.31925	51.93	ADV	35.6	-41.8	6.38	52.11	54	-1.89	-	-	239	134	H
3	* ** 9.36	48.54	Pk	36.1	-39.6	0	45.04	54	-8.96	74	-28.96	0-360	199	H
4	* ** 4.87969	52.09	Pk	34.1	-43.7	0	42.49	54	-11.51	74	-31.51	0-360	200	V
5	* ** 7.31917	61.15	PK2	35.6	-41.8	0	54.95	-	-	74	-19.05	274	333	V
	* ** 7.32067	49.84	ADV	35.6	-41.8	6.38	50.02	54	-3.98	-	-	274	333	V
6	* ** 9.39	48.82	Pk	36.2	-39.7	0	45.32	54	-8.68	74	-28.68	0-360	200	V

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

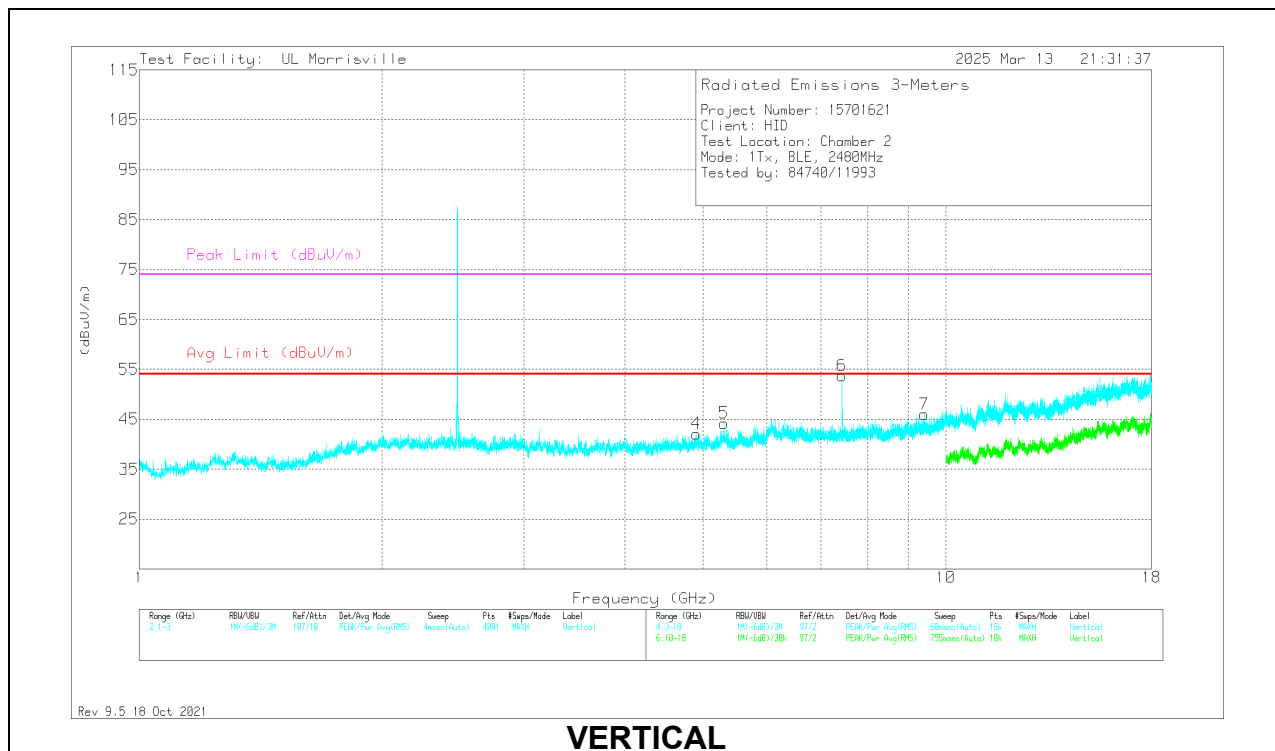
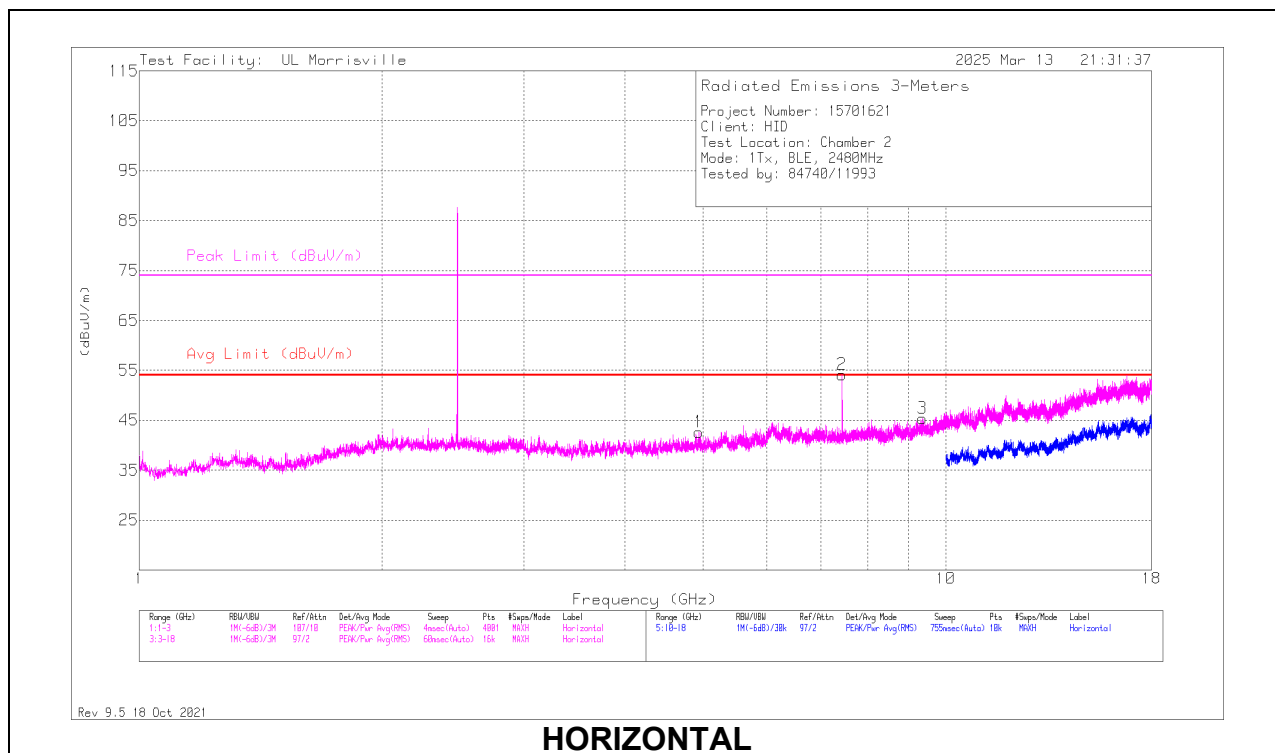
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.93969	52.36	Pk	34	-43.7	0	42.66	54	-11.34	74	-31.34	0-360	101	H
2	* ** 7.43928	61.57	PK2	35.6	-41.1	0	56.07	-	-	74	-17.93	271	101	H
	* ** 7.43926	50.4	ADV	35.6	-41.1	6.38	51.28	54	-2.72	-	-	271	101	H
3	* ** 9.36563	48.82	Pk	36.1	-39.6	0	45.32	54	-8.68	74	-28.68	0-360	200	H
4	* ** 4.90875	51.99	Pk	34.1	-44	0	42.09	54	-11.91	74	-31.91	0-360	199	V
6	* ** 7.43931	62.92	PK2	35.6	-41.1	0	57.42	-	-	74	-16.58	311	351	V
	* ** 7.43932	51.57	ADV	35.6	-41.1	6.38	52.45	54	-1.55	-	-	311	351	V
7	* ** 9.39938	49.46	Pk	36.2	-39.7	0	45.96	54	-8.04	74	-28.04	0-360	101	V
5	5.30719	52.69	Pk	34.3	-42.8	0	44.19	54	-9.81	74	-29.81	0-360	199	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

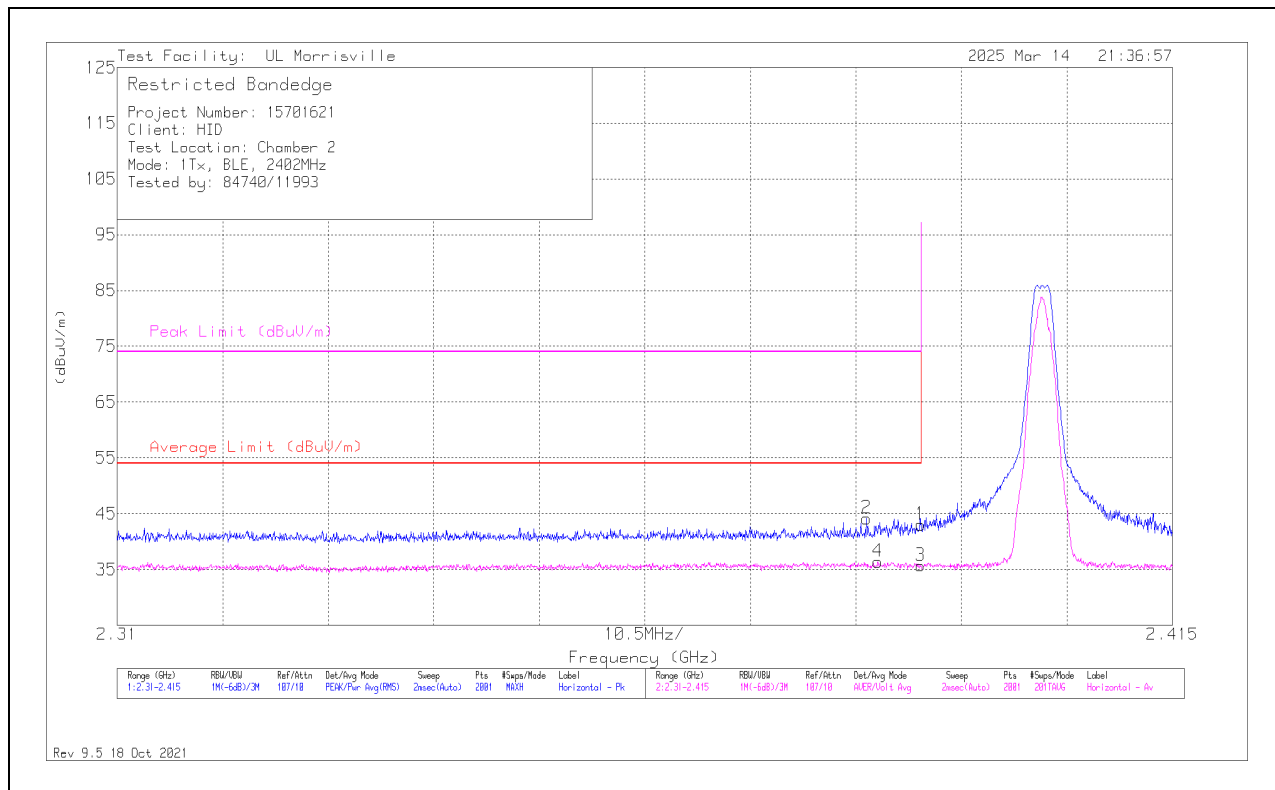
PK2 - Maximum Peak

ADV - Linear Voltage Average

10.2.2. BLE (2Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	34.34	Pk	32.3	-23.6	0	43.04	-	-	74	-30.96	72	124	H
2	** * 2.38455	35.43	Pk	32.2	-23.5	0	44.13	-	-	74	-29.87	72	124	H
3	* ** 2.38996	20.89	ADV	32.3	-23.6	6.1	35.69	54	-18.31	-	-	72	124	H
4	* ** 2.38571	21.46	ADV	32.2	-23.4	6.1	36.36	54	-17.64	-	-	72	124	H

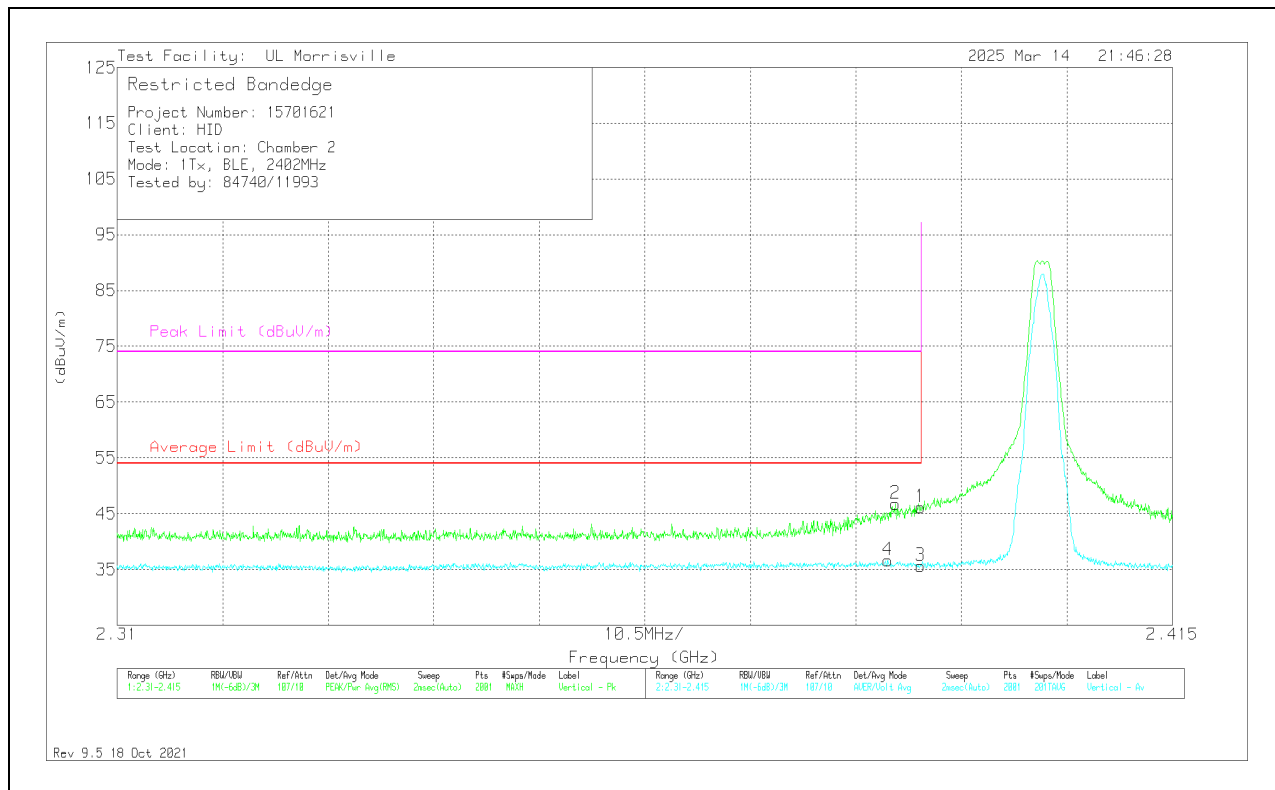
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	37.47	Pk	32.3	-23.6	0	46.17	-	-	74	-27.83	111	110	V
2	* ** 2.38744	37.98	Pk	32.2	-23.4	0	46.78	-	-	74	-27.22	111	110	V
3	* ** 2.38996	20.83	ADV	32.3	-23.6	6.1	35.63	54	-18.37	-	-	111	110	V
4	* ** 2.3867	21.72	ADV	32.2	-23.4	6.1	36.62	54	-17.38	-	-	111	110	V

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

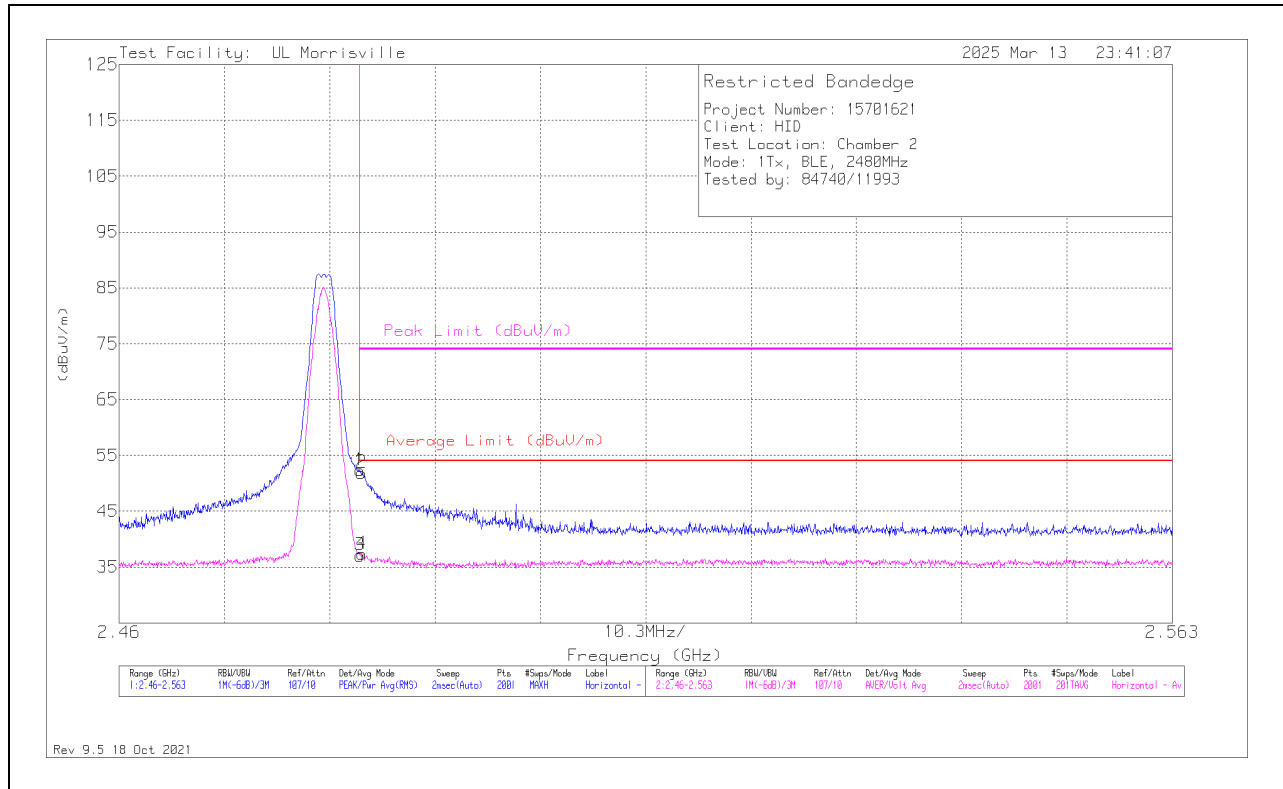
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	43.92	Pk	32.5	-24.1	0	52.32	-	-	74	-21.68	79	103	H
2	* ** 2.48369	43.46	Pk	32.5	-24.1	0	51.86	-	-	74	-22.14	79	103	H
3	* ** 2.48354	22.6	ADV	32.5	-24.1	6.1	37.1	54	-16.9	-	-	79	103	H
4	* ** 2.48374	22.85	ADV	32.5	-24.1	6.1	37.35	54	-16.65	-	-	79	103	H

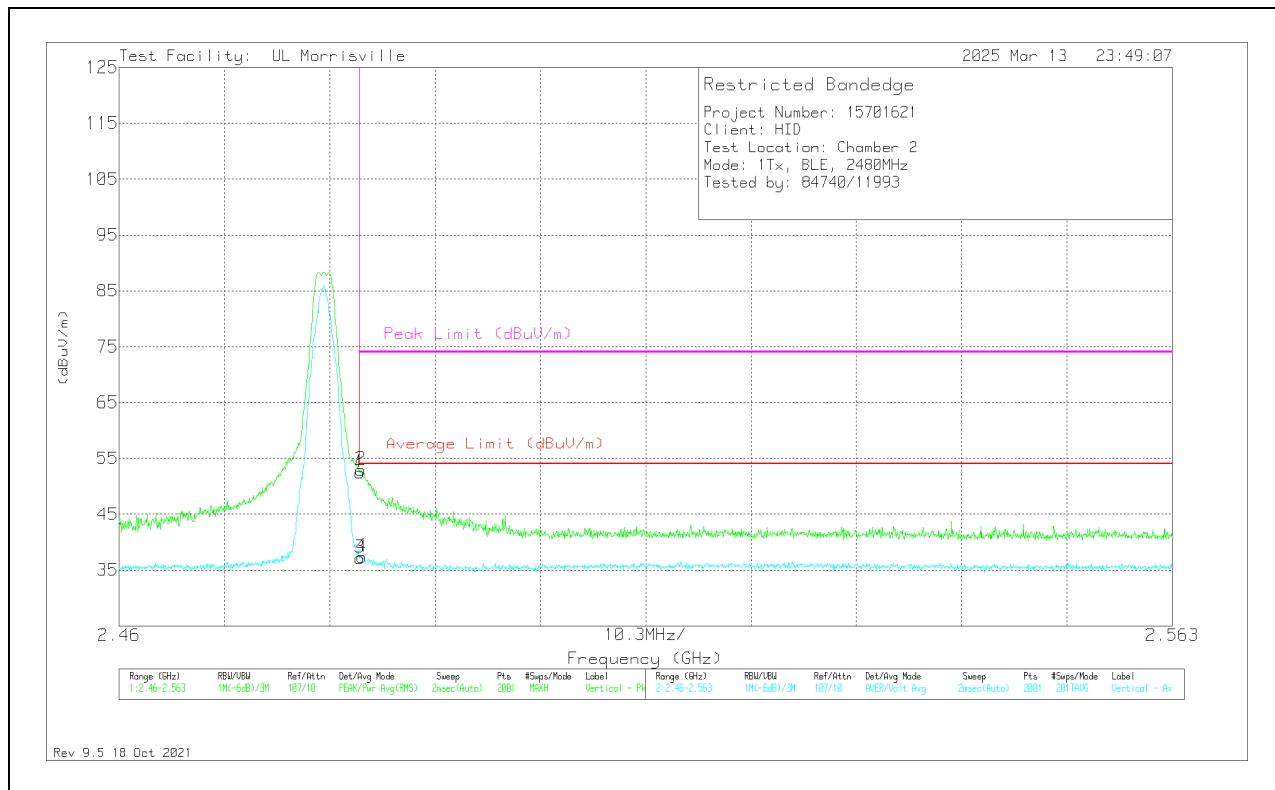
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (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	44.07	Pk	32.5	-24.1	0	52.47	-	-	74	-21.53	110	112	V
2	* ** 2.48364	44.6	Pk	32.5	-24.1	0	53	-	-	74	-21	110	112	V
3	* ** 2.48354	22.69	ADV	32.5	-24.1	6.1	37.19	54	-16.81	-	-	110	112	V
4	* ** 2.48374	22.88	ADV	32.5	-24.1	6.1	37.38	54	-16.62	-	-	110	112	V

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

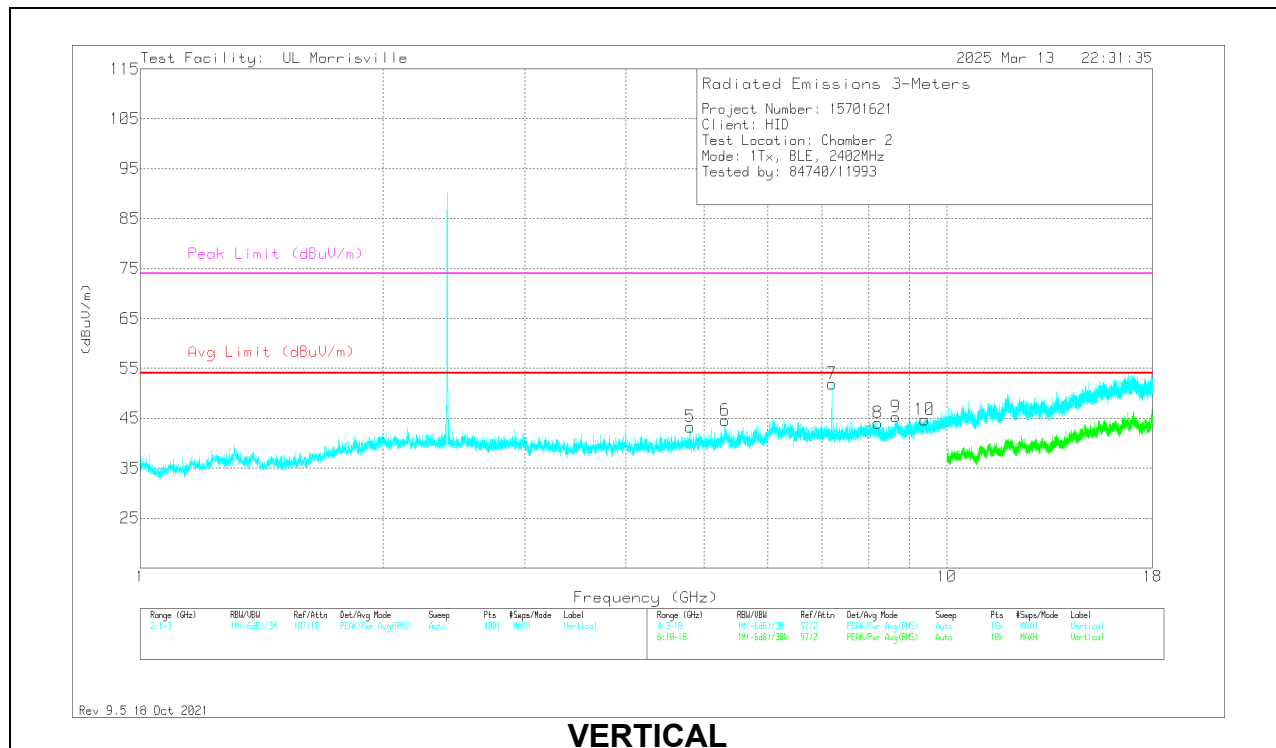
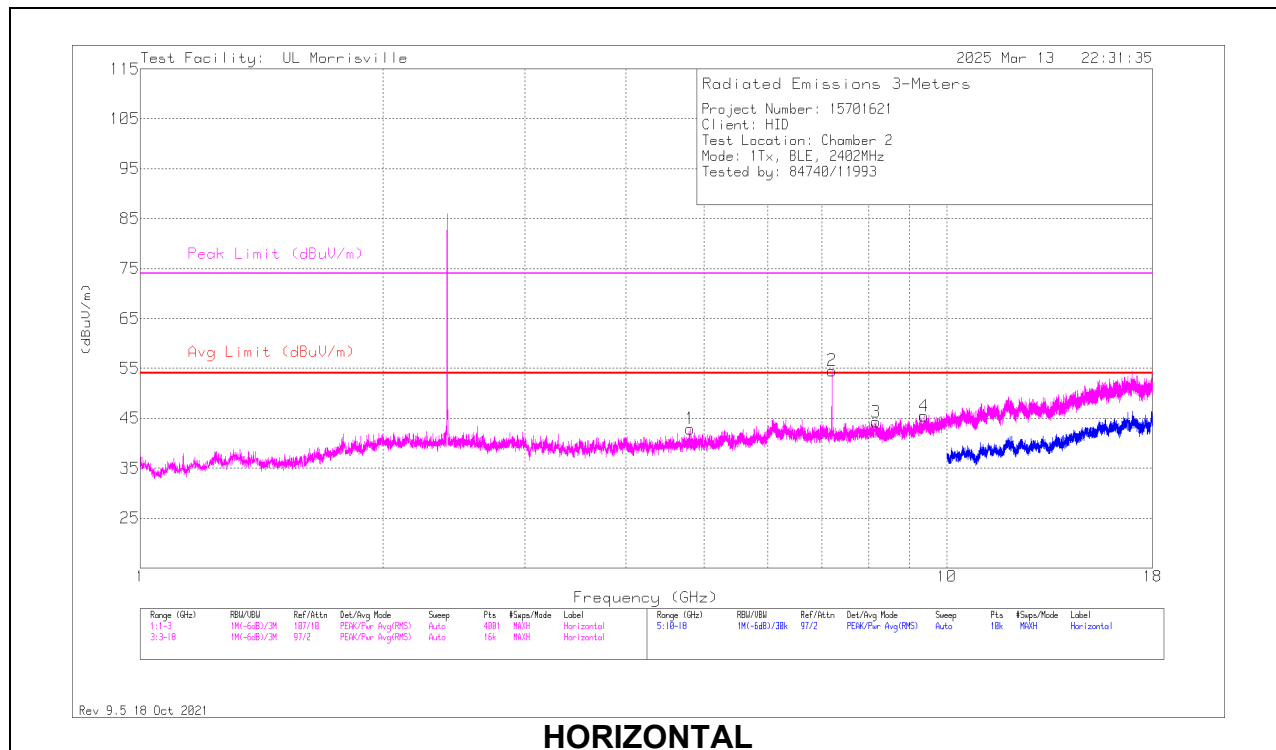
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

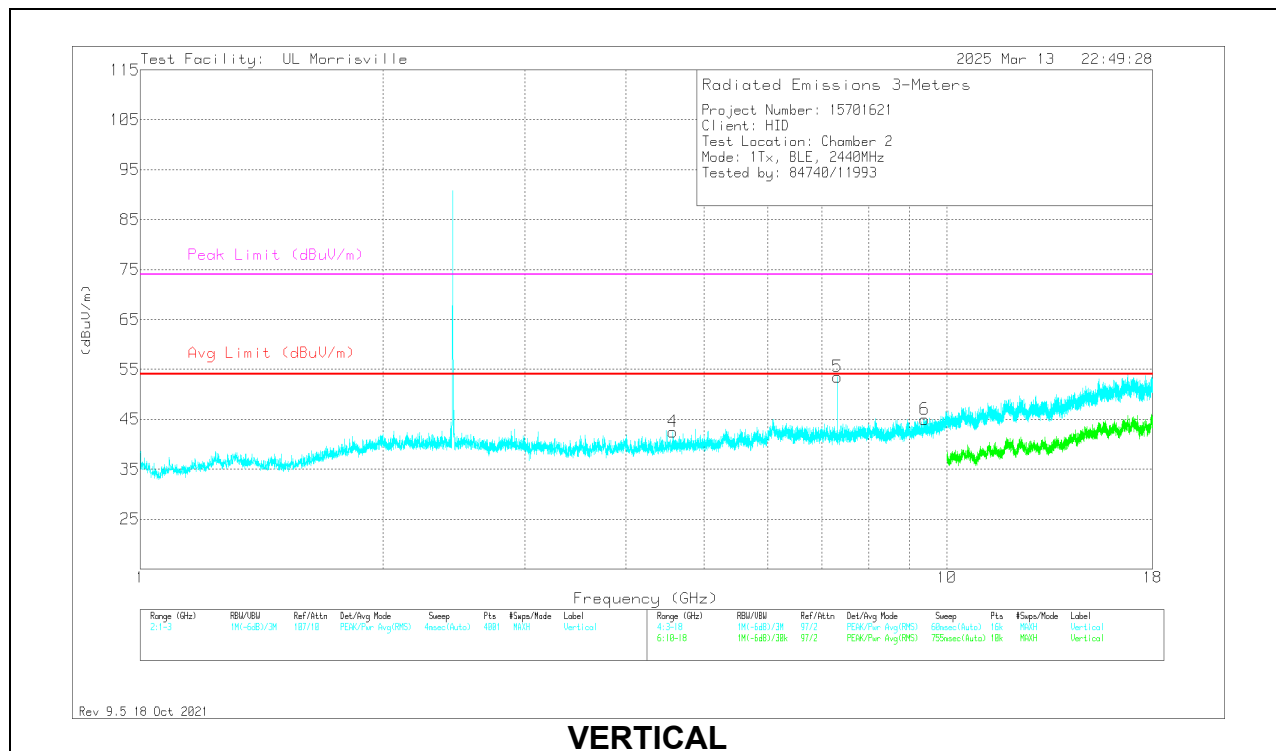
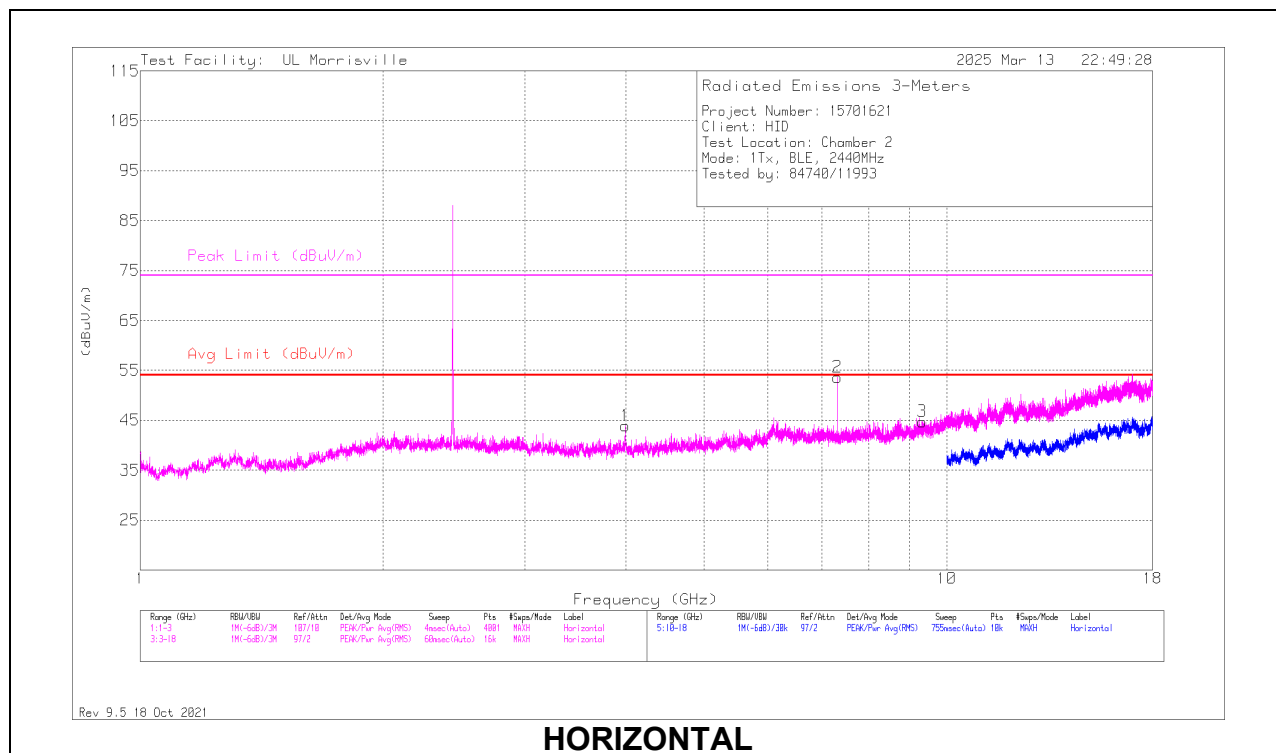
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.80469	52.61	Pk	34.2	-43.9	42.91	54	-11.09	74	-31.09	0-360	200	H
3	* ** 8.16656	48.85	Pk	35.8	-40.4	44.25	54	-9.75	74	-29.75	0-360	101	H
4	* ** 9.37406	49.23	Pk	36.1	-39.9	45.43	54	-8.57	74	-28.57	0-360	101	H
5	* ** 4.80469	53	Pk	34.2	-43.9	43.3	54	-10.7	74	-30.7	0-360	101	V
8	* ** 8.22	48.9	Pk	35.8	-40.6	44.1	54	-9.9	74	-29.9	0-360	200	V
10	* ** 9.38344	48.52	Pk	36.2	-40	44.72	54	-9.28	74	-29.28	0-360	101	V
6	5.31375	52.95	Pk	34.3	-42.7	44.55	-	-	-	-	0-360	200	V
2	7.20469	60.61	Pk	35.6	-41.7	54.51	-	-	-	-	0-360	101	H
7	7.20469	58.06	Pk	35.6	-41.7	51.96	-	-	-	-	0-360	101	V
9	8.64844	49.39	Pk	35.8	-39.9	45.29	-	-	-	-	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



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 3.99563	54.87	Pk	33.4	-44.4	0	43.87	54	-10.13	74	-30.13	0-360	101	H
2	* ** 7.31849	63.83	PK2	35.6	-41.8	0	57.63	-	-	74	-16.37	241	137	H
	* ** 7.31872	51.53	ADV	35.6	-41.8	6.1	51.43	54	-2.57	-	-	241	137	H
3	* ** 9.3225	48.66	Pk	36.1	-40.1	0	44.66	54	-9.34	74	-29.34	0-360	199	H
4	* ** 4.57406	52.7	Pk	34	-44.2	0	42.5	54	-11.5	74	-31.5	0-360	101	V
5	* ** 7.31859	61.24	PK2	35.6	-41.8	0	55.04	-	-	74	-18.96	270	101	V
	* ** 7.31863	49	ADV	35.6	-41.8	6.1	48.9	54	-5.1	-	-	270	101	V
6	* ** 9.39469	48.27	Pk	36.2	-39.5	0	44.97	54	-9.03	74	-29.03	0-360	101	V

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

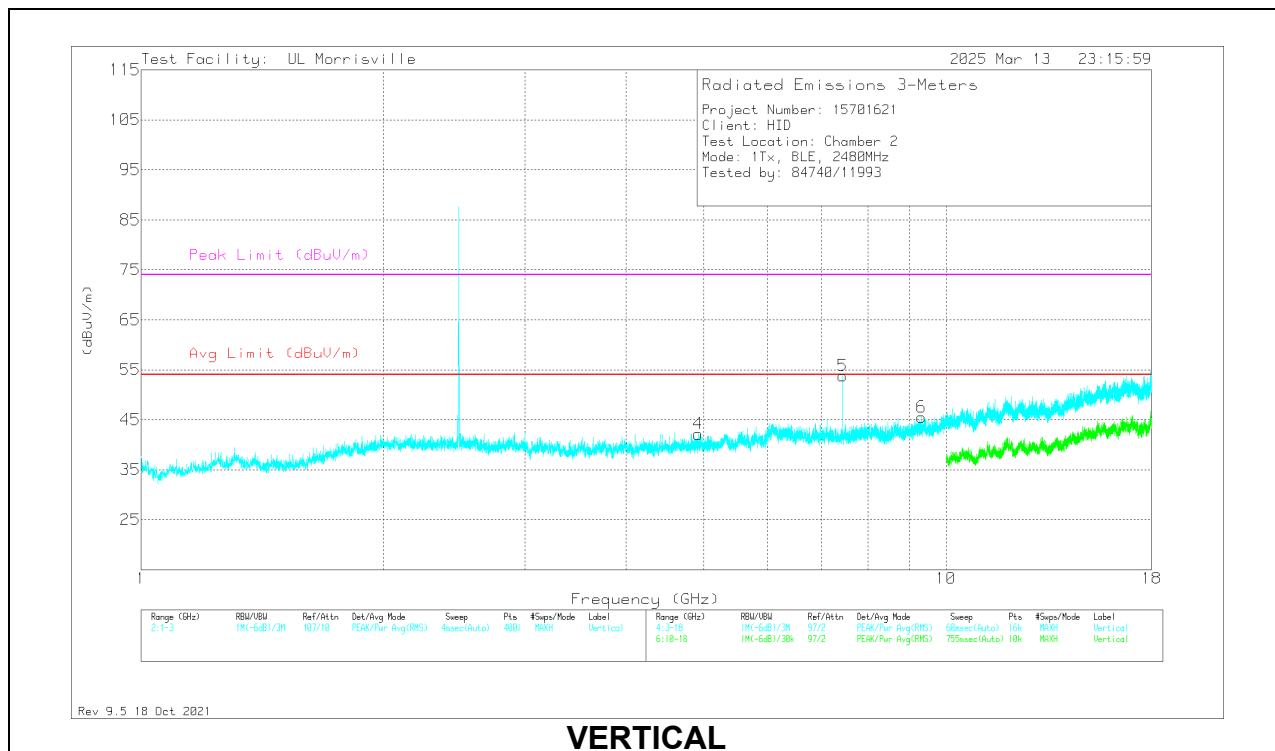
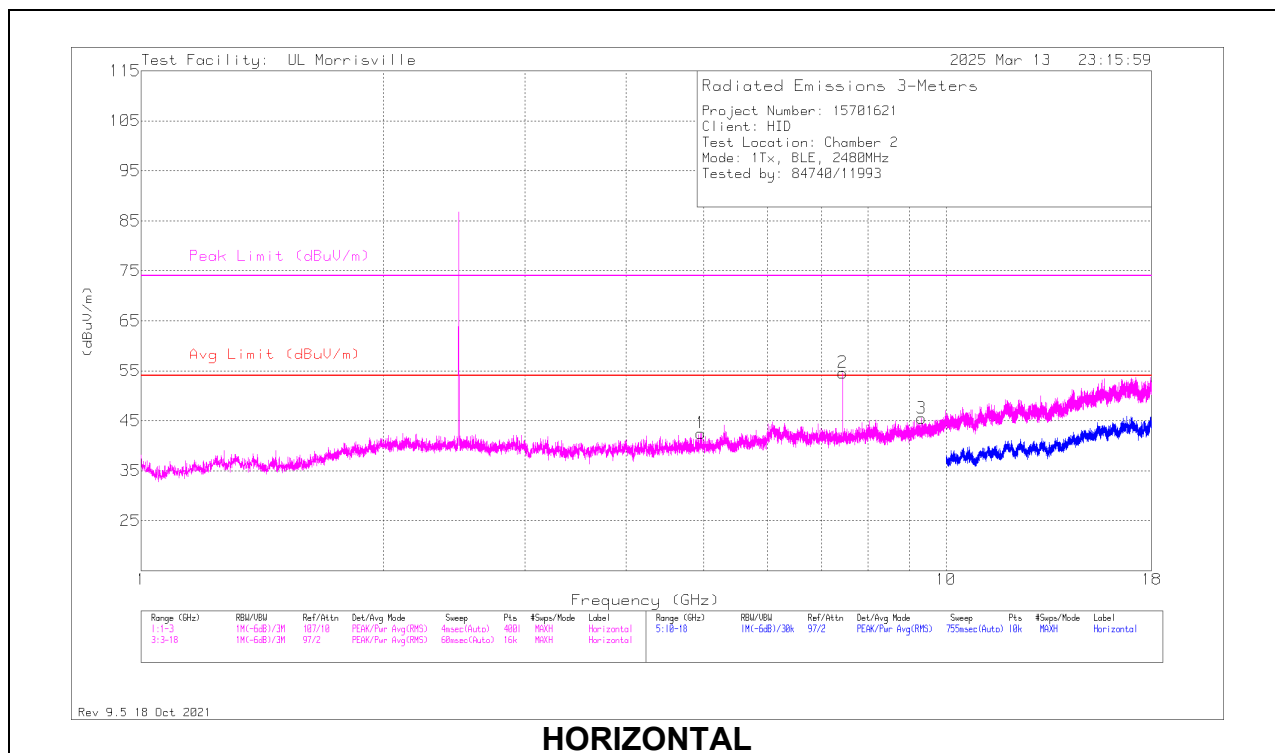
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	86408 (dB/m)	Gain/Loss (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95844	52.31	Pk	34	-43.8	0	42.51	54	-11.49	74	-31.49	0-360	101	H
2	* ** 7.44	61.32	PK2	35.6	-41.1	0	55.82	-	-	74	-18.18	262	119	H
	*** 7.43873	49.54	ADV	35.6	-41	6.1	50.24	54	-3.76	-	-	262	119	H
3	* ** 9.32063	49.4	Pk	36.1	-40	0	45.5	54	-8.5	74	-28.5	0-360	200	H
4	* ** 4.92	51.86	Pk	34.1	-43.8	0	42.16	54	-11.84	74	-31.84	0-360	101	V
5	* ** 7.43994	60.89	PK2	35.6	-41.1	0	55.39	-	-	74	-18.61	265	103	V
	* ** 7.43884	48.08	ADV	35.6	-41.1	6.1	48.68	54	-5.32	-	-	265	103	V
6	* ** 9.3225	49.5	Pk	36.1	-40.1	0	45.5	54	-8.5	74	-28.5	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

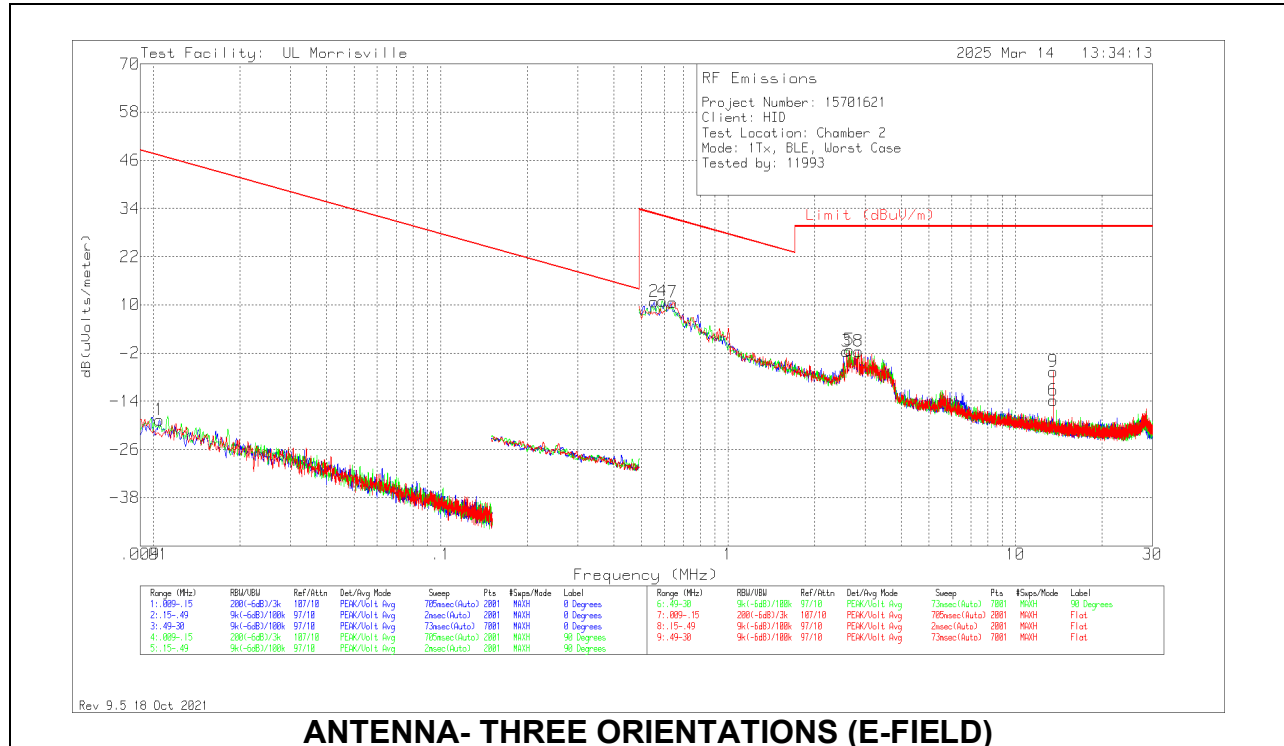
PK2 - Maximum Peak

ADV - Linear Voltage Average

10.3. WORST CASE 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).

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

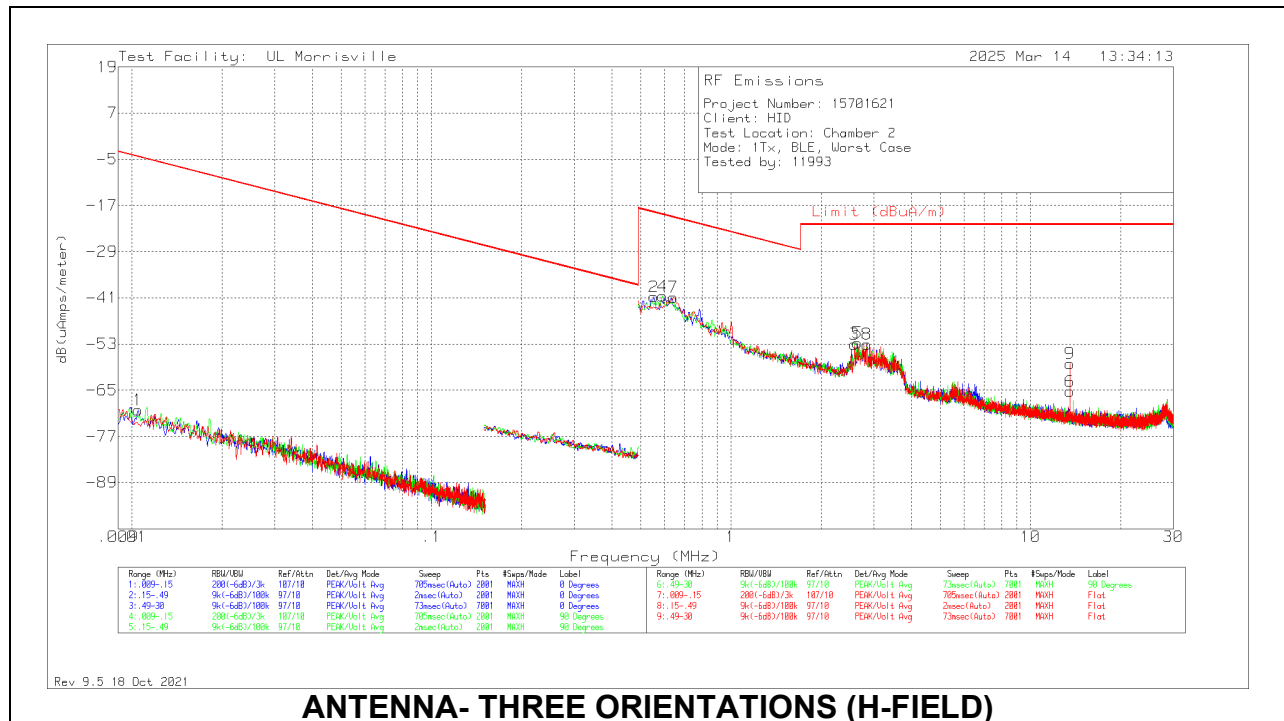


ANTENNA- THREE ORIENTATIONS (E-FIELD)

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (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
1	.01049	43.29	Pk	18	.1	-80	-18.61	47.19	67.19	-65.8	0-360	0 degs
2	.55324	39.63	Pk	11	.1	-40	10.73	32.75	-	-22.02	0-360	0 degs
4	.59118	39.79	Pk	11	.1	-40	10.89	32.17	-	-21.28	0-360	90 degs
7	.64178	39.57	Pk	11	.1	-40	10.67	31.46	-	-20.79	0-360	Flat
3	2.58535	27.14	Pk	11.1	.2	-40	-1.56	29.54	-	-31.1	0-360	0 degs
5	2.64438	27.41	Pk	11.1	.2	-40	-1.29	29.54	-	-30.83	0-360	90 degs
8	2.83831	27.19	Pk	11.1	.2	-40	-1.51	29.54	-	-31.05	0-360	Flat
6	13.5596	15.77	Pk	9.8	.6	-40	-13.83	29.54	-	-43.37	0-360	90 degs
9	13.5596	22.96	Pk	9.8	.6	-40	-6.64	29.54	-	-36.18	0-360	Flat

Pk - Peak detector



ANTENNA- THREE ORIENTATIONS (H-FIELD)

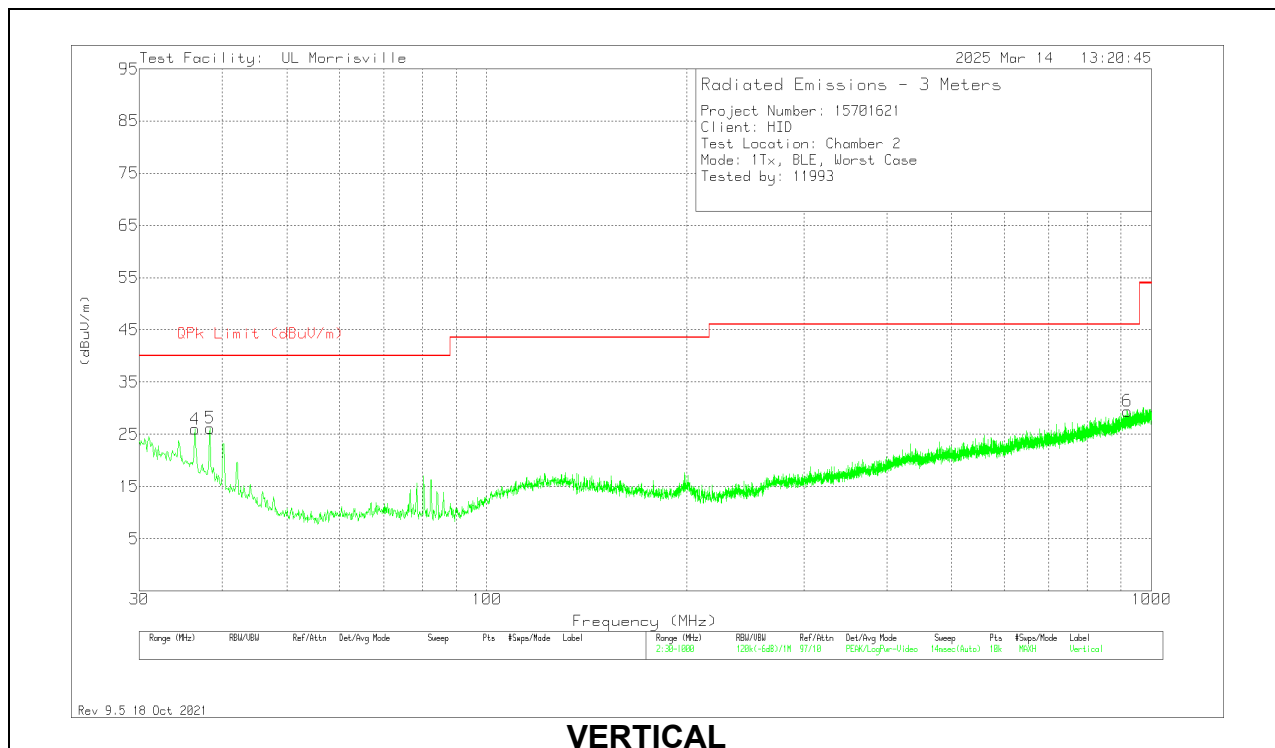
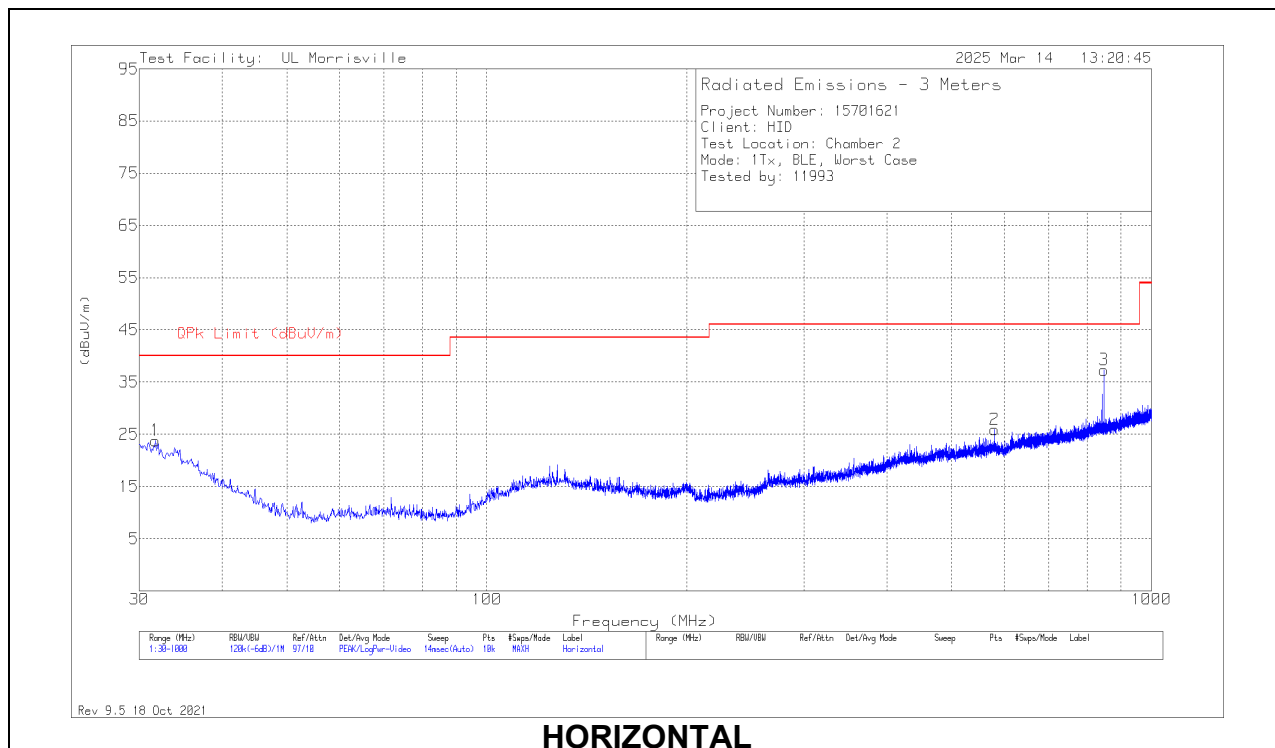
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (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
1	.01049	43.29	Pk	-33.5	.1	-80	-70.11	-4.31	15.69	-65.8	0-360	0 degs
2	.55324	39.63	Pk	-40.5	.1	-40	-40.77	-18.75	-	-22.02	0-360	0 degs
4	.59118	39.79	Pk	-40.5	.1	-40	-40.61	-19.33	-	-21.28	0-360	90 degs
7	.64178	39.57	Pk	-40.5	.1	-40	-40.83	-20.04	-	-20.79	0-360	Flat
3	2.58535	27.14	Pk	-40.4	.2	-40	-53.06	-21.96	-	-31.1	0-360	0 degs
5	2.64438	27.41	Pk	-40.4	.2	-40	-52.79	-21.96	-	-30.83	0-360	90 degs
8	2.83831	27.19	Pk	-40.4	.2	-40	-53.01	-21.96	-	-31.05	0-360	Flat
6	13.5596	15.77	Pk	-41.7	.6	-40	-65.33	-21.96	-	-43.37	0-360	90 degs
9	13.5596	22.96	Pk	-41.7	.6	-40	-58.14	-21.96	-	-36.18	0-360	Flat

Pk - Peak detector

10.4. WORST CASE BELOW 1 GHZ

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



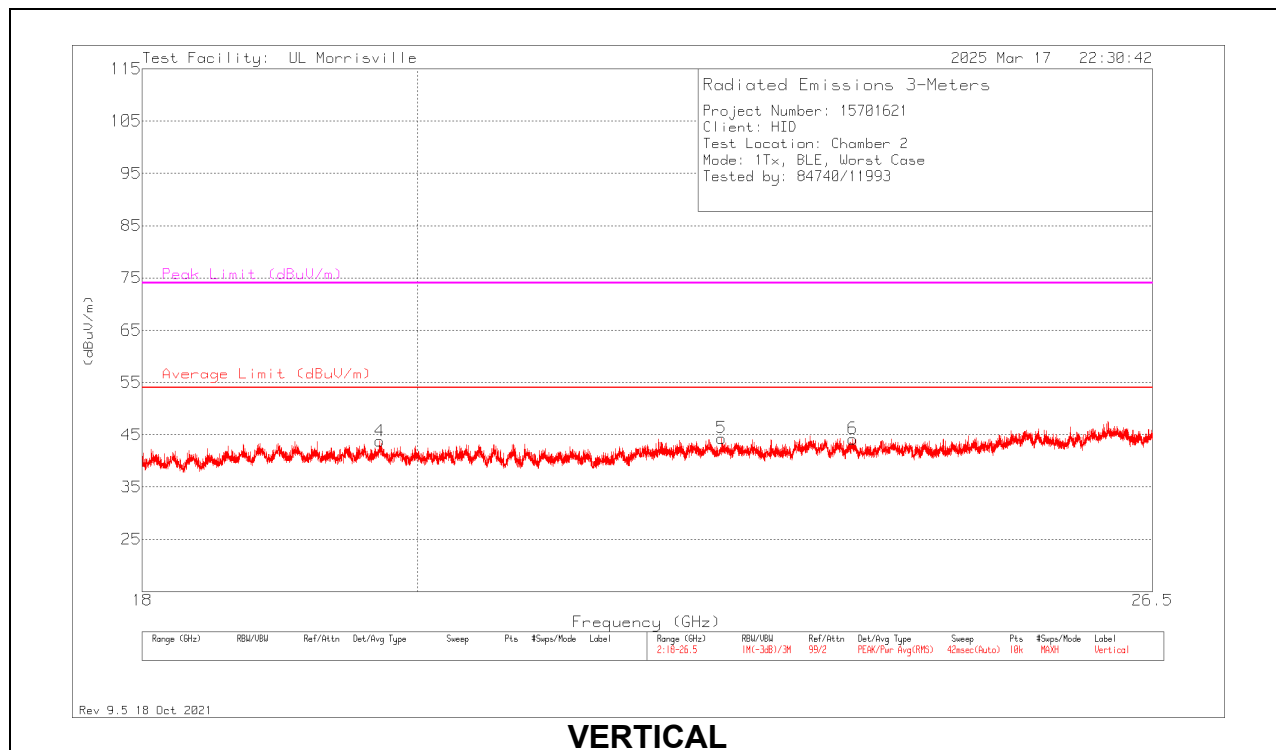
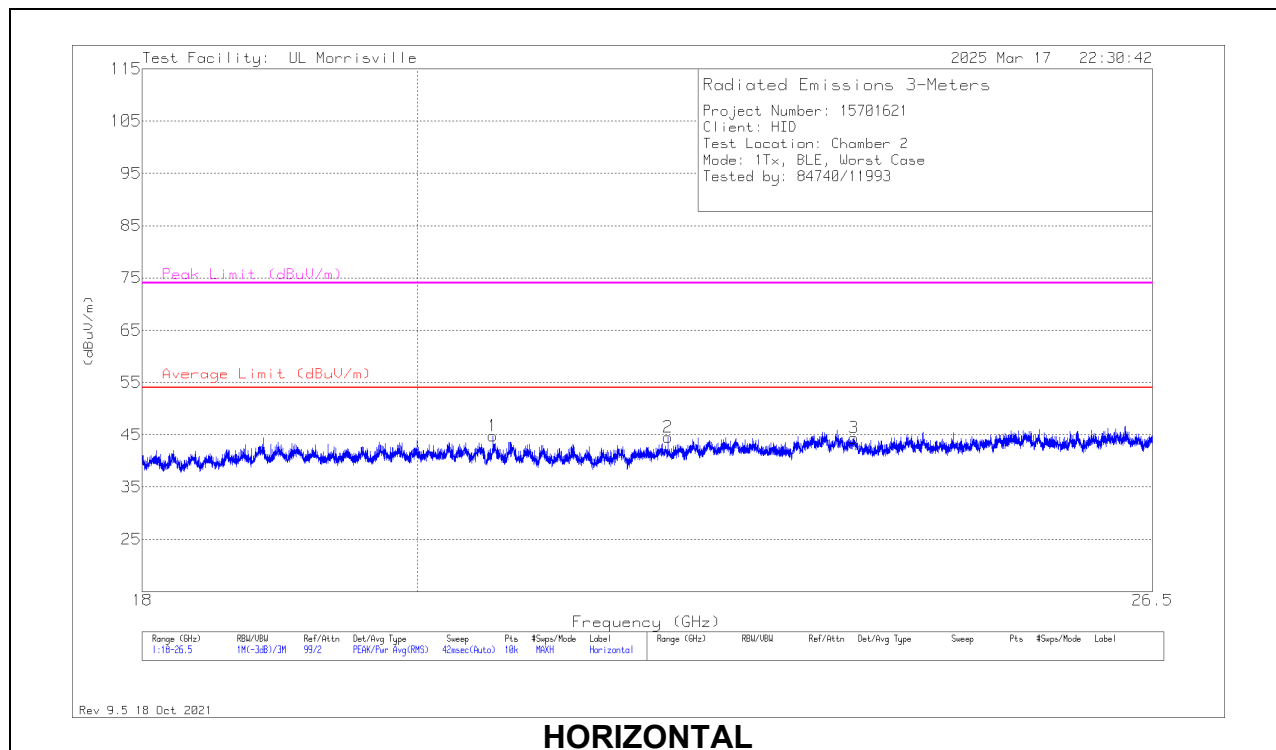
Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	159203 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.746	29.18	Pk	26.2	-31.6	23.78	40	-16.22	0-360	199	H
4	36.402	34.57	Pk	23	-31.6	25.97	40	-14.03	0-360	101	V
5	38.342	36.3	Pk	21.5	-31.6	26.2	40	-13.8	0-360	101	V
2	580.572	28.86	Pk	25.1	-28.1	25.86	46.02	-20.16	0-360	399	H
3	848.098	35.63	Pk	28.4	-26.7	37.33	46.02	-8.69	0-360	199	H
6	920.4115	26.28	Pk	29.1	-26	29.38	46.02	-16.64	0-360	299	V

Pk - Peak detector

10.5. WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHZ (WORST-CASE CONFIGURATION)



18 – 26GHz Data

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	* ** 20.58714	48.96	Pk	33.7	-37.9	44.76	54	-9.24	74	-29.24	0-360	101	H
2	* ** 22.01415	48.41	Pk	34.2	-38.1	44.51	54	-9.49	74	-29.49	0-360	250	H
3	* ** 23.63919	47.18	Pk	34.6	-37.4	44.38	54	-9.62	74	-29.62	0-360	149	H
4	* ** 19.71343	48.3	Pk	33.2	-37.7	43.8	54	-10.2	74	-30.2	0-360	300	V
5	* ** 22.46885	47.94	Pk	34.2	-37.8	44.34	54	-9.66	74	-29.66	0-360	300	V
6	* ** 23.62559	47.12	Pk	34.6	-37.5	44.22	54	-9.78	74	-29.78	0-360	150	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.

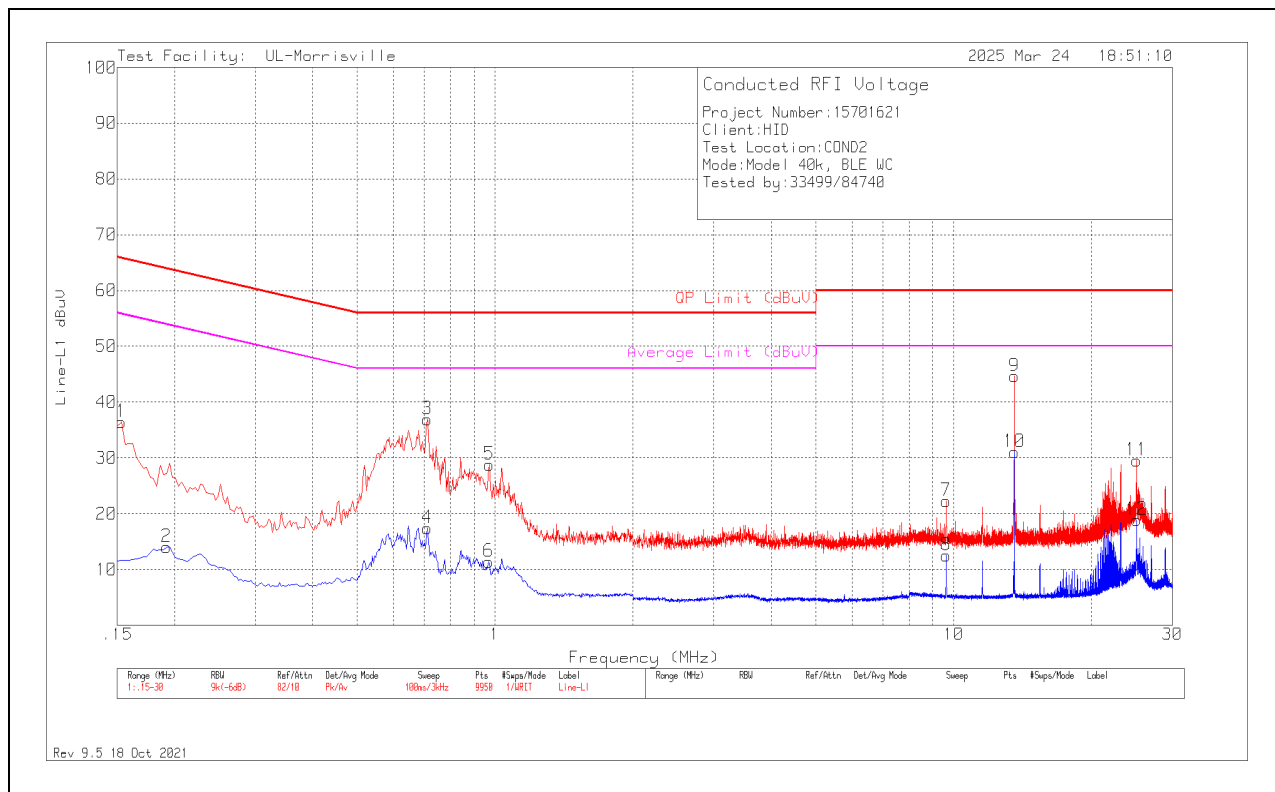
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both lines.

RESULTS

11.1.1. AC Power Line Host

LINE 1 RESULTS



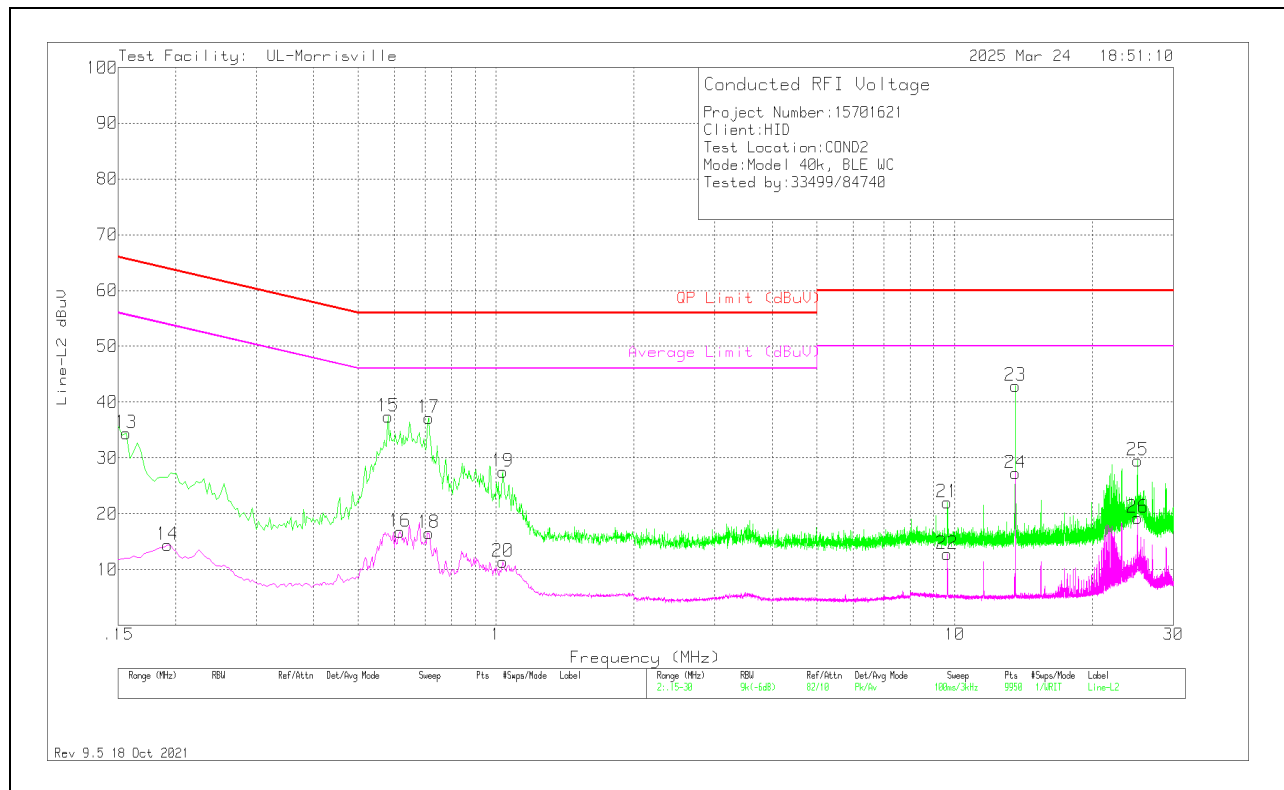
Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	26.39	Pk	.2	9.8	36.39	65.84	-29.45	-	-
2	.192	4.02	Av	.2	9.8	14.02	-	-	53.95	-39.93
3	.711	27.13	Pk	0	9.8	36.93	56	-19.07	-	-
4	.711	7.62	Av	0	9.8	17.42	-	-	46	-28.58
6	.969	1.56	Av	0	9.8	11.36	-	-	46	-34.64
5	.972	18.99	Pk	0	9.8	28.79	56	-27.21	-	-
7	9.636	12.18	Pk	.1	10	22.28	60	-37.72	-	-
8	9.639	2.43	Av	.1	10	12.53	-	-	50	-37.47
9	13.563	34.52	Pk	.1	10	44.62	60	-15.38	-	-
10	13.563	20.96	Av	.1	10	31.06	-	-	50	-18.94
11	25.077	18.97	Pk	.4	10.2	29.57	60	-30.43	-	-
12	25.077	8.3	Av	.4	10.2	18.9	-	-	50	-31.1

Pk - Peak detector

Av - Average detection

Markers 9 and 10 are from badge readers in the lab.

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	24.42	Pk	.2	9.8	34.42	65.67	-31.25	-	-
14	.192	4.44	Av	.2	9.8	14.44	-	-	53.95	-39.51
15	.582	27.6	Pk	0	9.8	37.4	56	-18.6	-	-
16	.618	7	Av	0	9.8	16.8	-	-	46	-29.2
17	.714	27.33	Pk	0	9.8	37.13	56	-18.87	-	-
18	.714	6.74	Av	0	9.8	16.54	-	-	46	-29.46
19	1.035	17.7	Pk	0	9.8	27.5	56	-28.5	-	-
20	1.035	1.57	Av	0	9.8	11.37	-	-	46	-34.63
21	9.642	11.95	Pk	.1	10	22.05	60	-37.95	-	-
22	9.642	2.67	Av	.1	10	12.77	-	-	50	-37.23
23	13.56	32.79	Pk	.1	10	42.89	60	-17.11	-	-
24	13.56	17.13	Av	.1	10	27.23	-	-	50	-22.77
25	25.071	18.95	Pk	.4	10.2	29.55	60	-30.45	-	-
26	25.071	8.66	Av	.4	10.2	19.26	-	-	50	-30.74

Pk - Peak detector

Av - Average detection

Markers 23 and 24 are from badge readers in the lab.

12. SETUP PHOTOS

Please refer to R15701621-EP1d for setup photos

END OF TEST REPORT