

TEST REPORT

Report Number: R15502834-E1

Applicant : Lutron Electronics Co. Inc.
7200 Suter Road
Coopersburg, PA 18036-1249, USA

Model : HWL-RD4WH-TW, HWL-RD6WH-TW

FCC ID : JPZ0156

IC : 2851A-JPZ0156

EUT Description : LED Downlight

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C: 2025
ISED RSS-247 ISSUE 3: 2023
ISED RSS-GEN ISSUE 5 + A1 + A2: 2021

Date Of Issue:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-04-22	Initial Issue	Charles Moody
V2	2025-05-21	Editorial revisions in sections 8, 9.1, and 9.2	B. Kiewra
V3	2025-06-24	Editorial revisions in section 8 and 10	Charles Moody

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Lutron Electronics Co. Inc.
7200 Suter Road
Coopersburg, PA 18036-1249, USA

EUT DESCRIPTION: LED Downlight

MODEL: HWL-RD4WH-TW, HWL-RD6WH-TW

SERIAL NUMBER: 02F258AF, 02F258ED

SAMPLE RECEIPT DATE: 2025-03-10, 2025-03-19, 2025-03-25

DATE TESTED: 2025-03-07 TO 2025-03-26

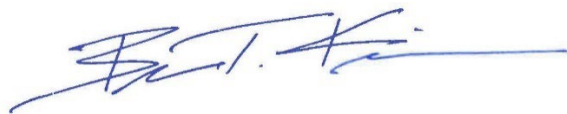
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C: 2025	Refer to Section 2
ISED RSS-247 Issue 3: 2023	Refer to Section 2
ISED RSS-GEN Issue 5 + A1 + A2: 2021	Refer to Section 2

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:



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

Prepared By:



Charles Moody
Lead Project Engineer
Consumer, Medical and IT Segment
UL LLC

2. TEST RESULTS SUMMARY

This report contains data 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 provided by the customer:

- 1) Antenna gain and type (Section 6.3)
- 2) Software, Firmware Information (Section 6.4)
- 3) Supported Data-Rates, Power Settings, Orientation of Operation (Section 6.5)
- 4) Worst-case emissions model (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, Certificate Number 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 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374
☐	Building 12 Laboratory Dr RTP, NC 27709, U.S.A.		2180C	

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 line voltage, tunable, and dimmable LED-based downlight with integrated wireless communication. The EUT contains an RF transceiver and antenna that cannot be changed by the user. This report covers the full emissions testing of the EUT, which uses an RF transceiver that can switch between BLE type and 802.15.4 modes of operation.

The models tested represent all of the following models: HWL-RD4WH-TW, HWL-RD4BL-TW, HWL-RD6WH-TW, HWL-RD6BL-TW, RRL-RD4WH-TW, RRL -RD4BL-TW, RRL -RD6WH-TW, RRL -RD6BL-TW, HWL-CD4WH-TW, HWL-CD4BL-TW, HWL-CD6WH-TW, HWL-CD6BL-TW, RRL-CD4WH-TW, RRL -CD4BL-TW, RRL -CD6WH-TW, RRL -CD6BL-TW. All models are identical in terms of radio circuitry and electrical construction. The difference between the models may include different sized or colored front-end mechanicals and use in different Lutron systems for marketing purposes. Models xxx-CD include a wiring compartment for hard wiring, Models xxx-RD include a connector for attaching to an E26 or GU24 socket.

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 Type - 1Mbps	9.91	9.79
2402 - 2480	BLE Type - 2Mbps	10.29	10.69
2405 - 2480	802.15.4	20.44	110.66

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

The radio utilizes a monopole antenna, with a maximum gain of 0.87 dBi.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 003.005.002r01.

The test utility software used during testing was LutronRadioCertificatoinGUIv1.1.4.

6.5. WORST-CASE CONFIGURATION AND MODE

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

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low and high channels for band edge, as well as the middle channel for harmonic emissions.

The fundamental of the EUT was investigated in its only two orthogonal orientations, as declared by the client, horizontal and vertical. It was determined that the horizontal orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in its horizontal orientation.

The BLE Type radio was tested in its only support data rates, 1 and 2 Mbps. Band edge was only performed on 2Mbps as this is the widest bandwidth mode and has the same power as the narrower bandwidth data rate.

The 802.15.4 radio was tested on its only supported data rate.

All intentional emissions testing was performed on the HWL-RD6WH-TW model as this was declared the worst-case fixture by the client. The HWL-RD6WH-TW and HWL-RD4WH-TW are fully identical in terms of radio circuitry, and the HWL-RD6WH-TW was declared to be the worst-case enclosure by the client. The differences between the two models are different sized front-end mechanicals, but everything else is the same.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	Yoga 7 16IAP7	PF49WDF9	-
Light Fixture	Halo	H5R1CAT	n/a	n/a

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	1	Quick Connect	Single Conductor	<3m	Connects to AC Power

TEST SETUP

The EUT is connected to a test laptop prior to testing to configure the radio. All support equipment used to configure the radio was disconnected prior to testing.

SETUP DIAGRAMS

Please refer to R15502834-EP1 for setup diagrams

7. MEASUREMENT METHOD

6 dB BW: ANSI C63.10 Subclause -11.8.2

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

Output Power: ANSI C63.10 Subclause -11.9.1.3 Method PKPM1 Peak-reading power meter
Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

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

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

Radiated emissions restricted & unrestricted frequency bands: ANSI C63.10 Subclause -11.12.1 and 6.10.5, 6.3 to 6.6.

AC Power-line conducted emissions: ANSI C63.10, 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
SOFTEMI	Antenna Port Software	UL	Version 2024.2.23	NA	NA
Power Software	Boonton Power Analyzer	Boonton	Version 3.0.13.0	NA	NA
	Attenuators				
226551	SMA Coaxial 20dB Attenuator	CentricRF	C18S2-20	2024-04-05	2025-04-05
CBL105	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB-197C-0-0160-300300	2025-03-07	2026-03-07

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	ESCI7	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)		

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
	18-40 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 in calibration at the time of testing.

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

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	Gain-Loss Chains				
207640	Gain-loss string: 1-18GHz	Various	Various	2024-05-22	2025-05-22
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2024-04-16	2025-04-16
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05

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 Type - 1Mbps	100.000	100.000	1.000	100.00	0.00	0.010
BLE Type - 2Mbps	100.000	100.000	1.000	100.00	0.00	0.010
802.15.4	100.000	100.000	1.000	100.00	NA	0.010

The client has declared an operational duty cycle of 32% for the 802.15.4 radio, resulting in a DCCF of -9.89dB.

$$\text{DCCF} = 20\log(0.32) = -9.89\text{dB}$$



9.2. 99% BANDWIDTH

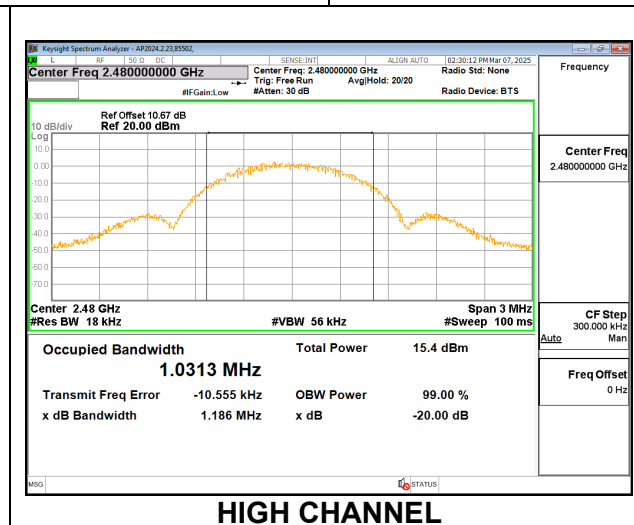
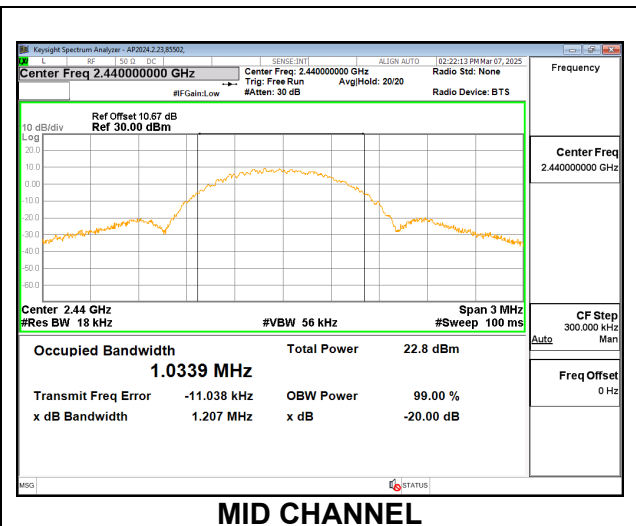
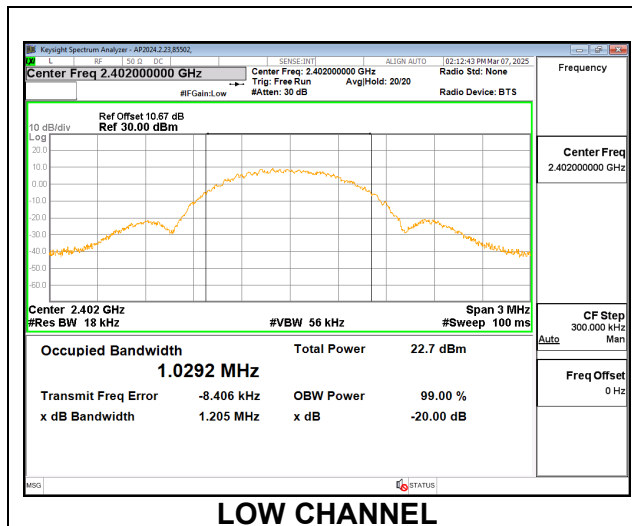
LIMITS

None; for reporting purposes only.

RESULTS

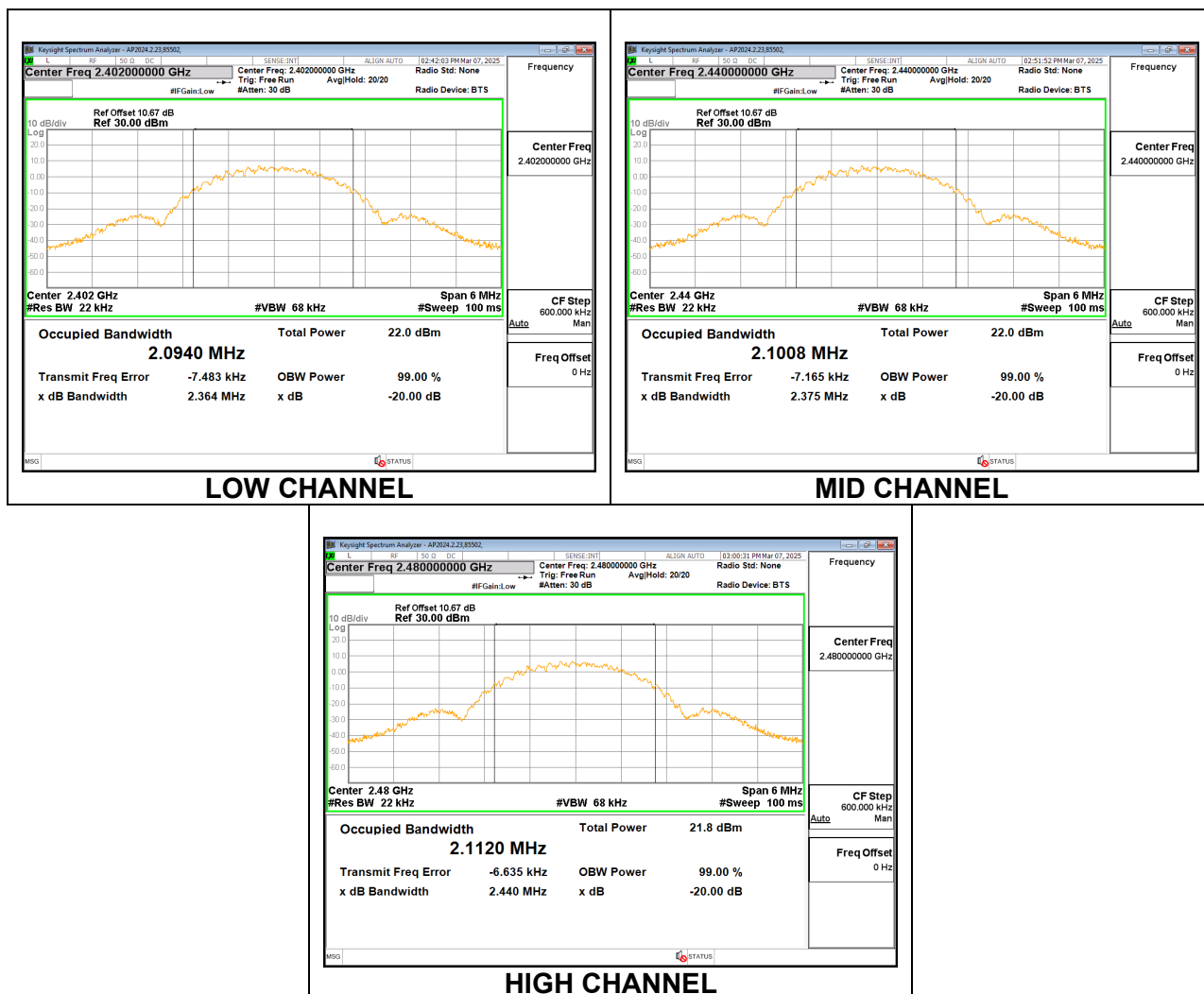
9.2.1. BLE TYPE (1Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0292
Middle	2440	1.0339
High	2480	1.0313



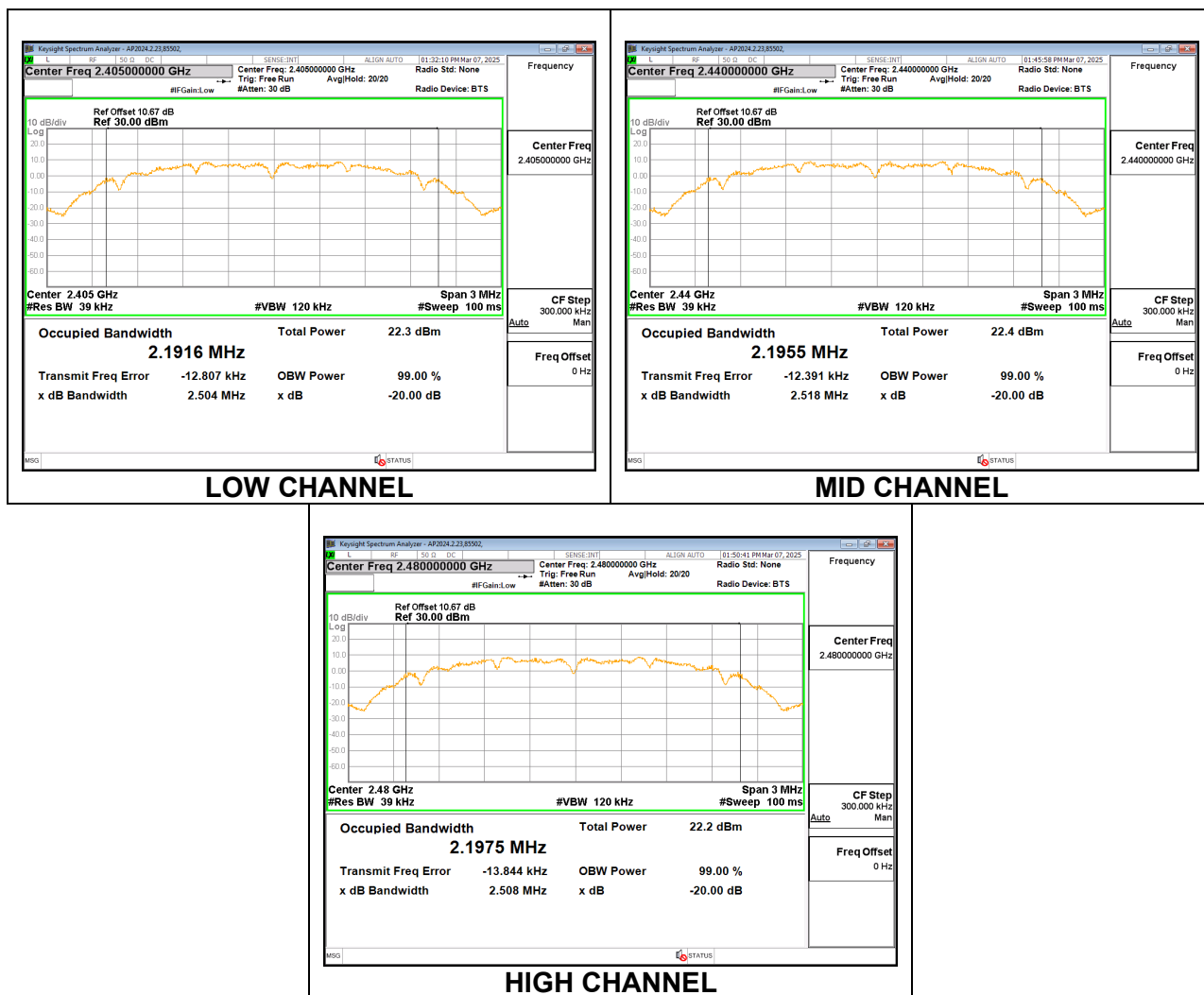
9.2.2. BLE TYPE (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0940
Middle	2440	2.1008
High	2480	2.1120



9.2.3. 802.15.4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.1916
Middle	2440	2.1955
High	2480	2.1975



9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

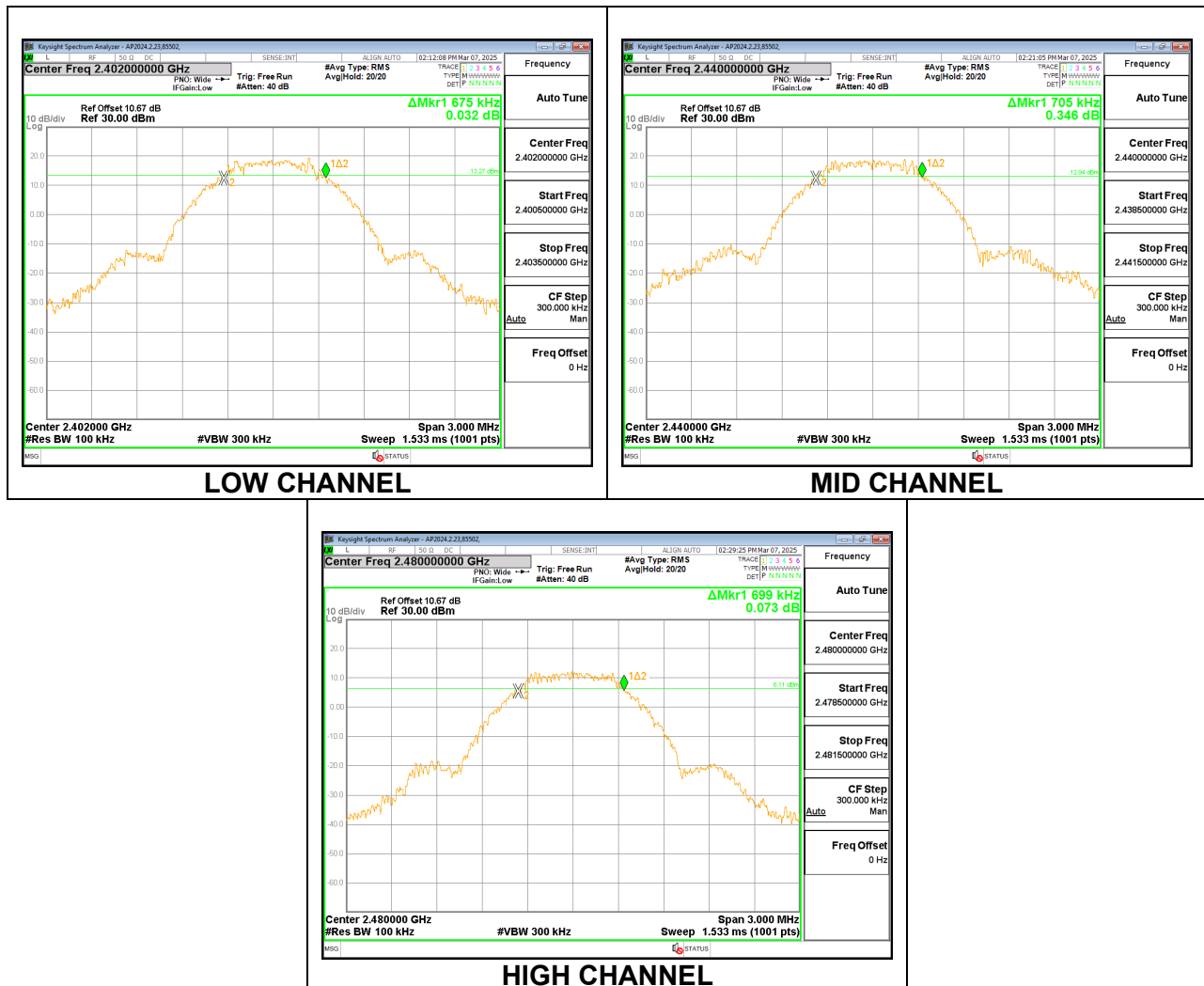
RSS-247 5.2 (a)

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

RESULTS

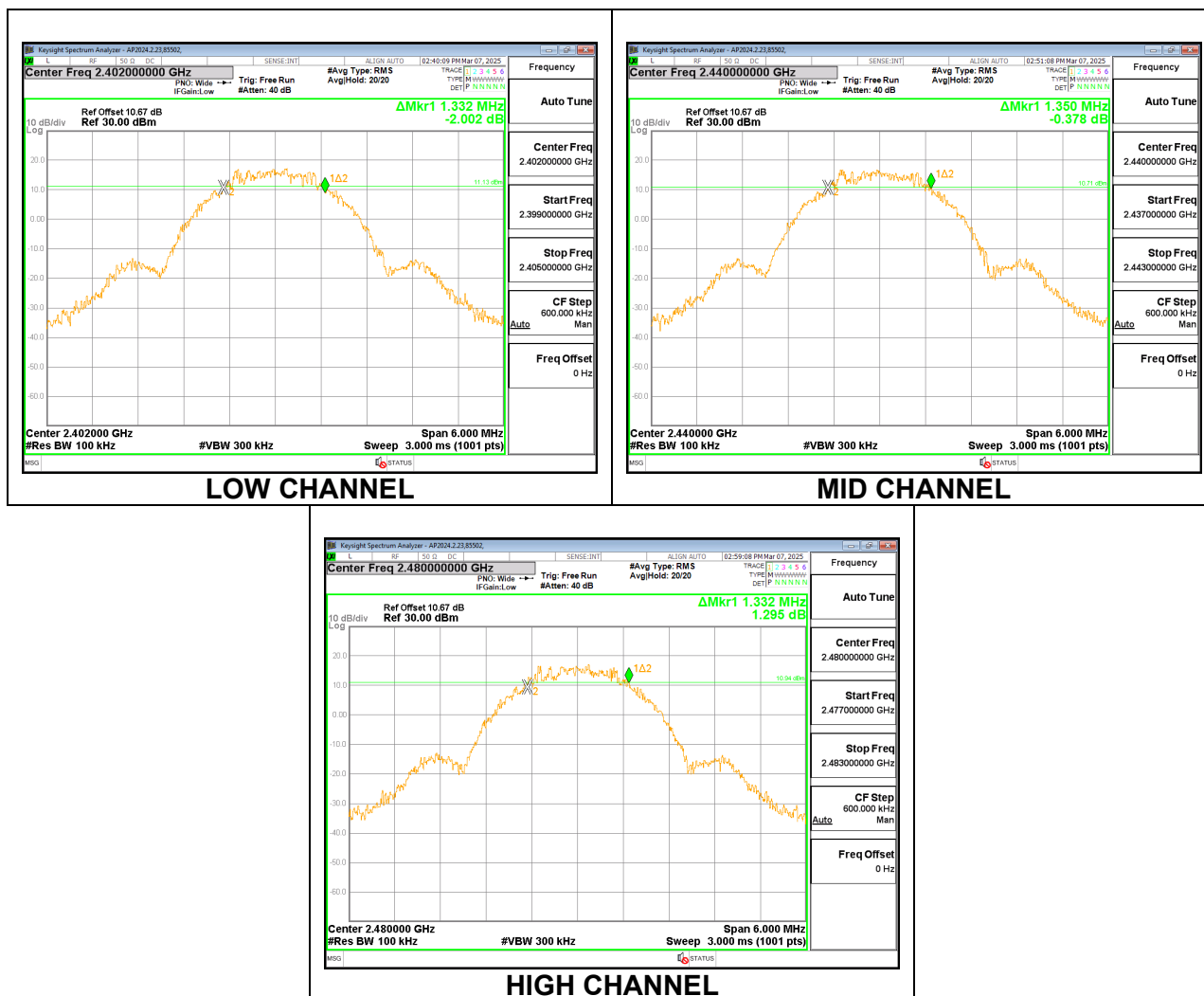
9.3.1. BLE TYPE (1Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6750	0.5
Middle	2440	0.7050	0.5
High	2480	0.6990	0.5



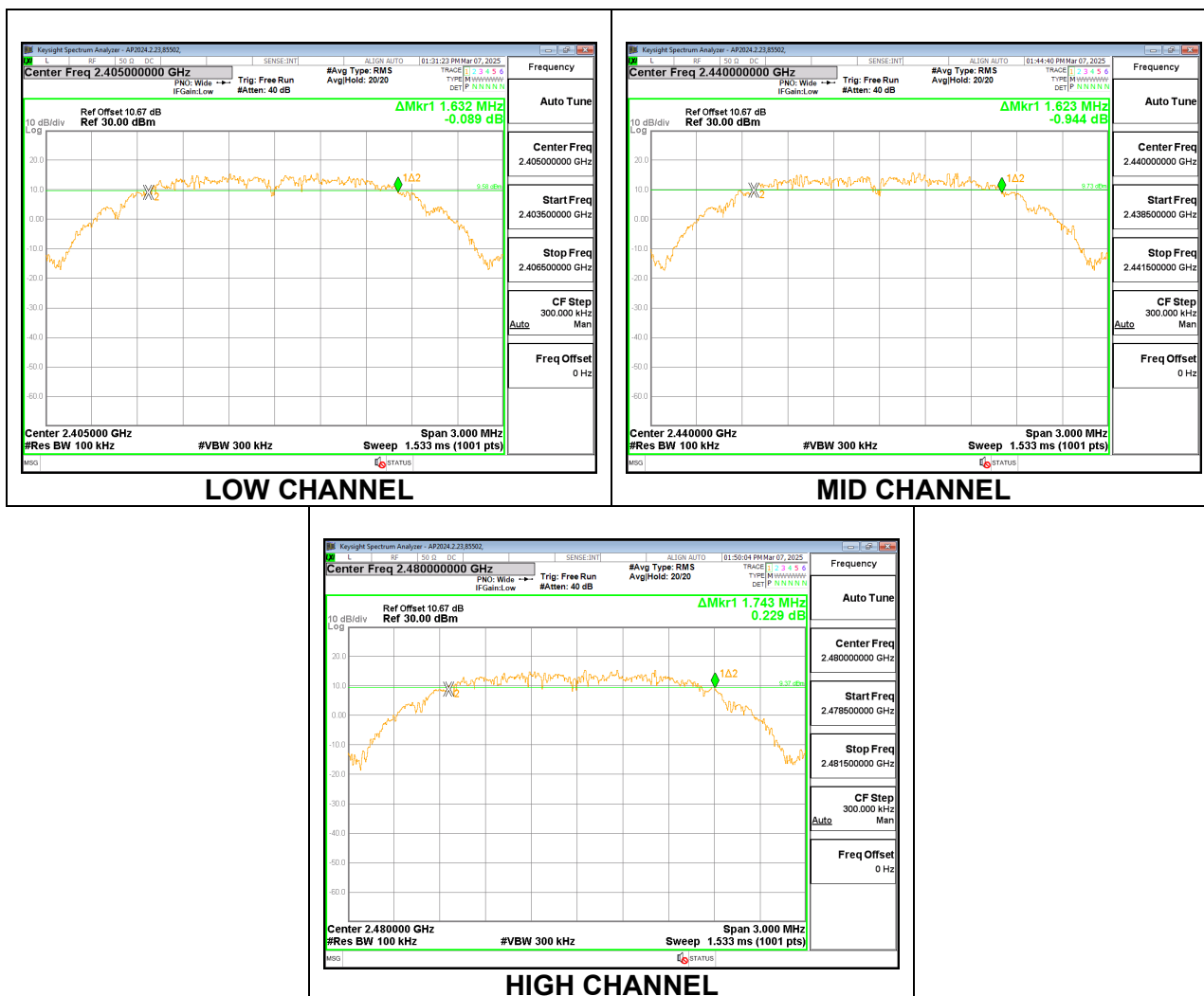
9.3.2. BLE TYPE (2Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.3320	0.5
Middle	2440	1.3500	0.5
High	2480	1.3320	0.5



9.3.3. 802.15.4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.6320	0.5
Middle	2440	1.6230	0.5
High	2480	1.7430	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 10.67 dB (including 10.16 dB pad and 0.51dB cable) was entered as an offset in the wideband power meter.

RESULTS

9.4.1. BLE TYPE (1Mbps)

Tested By:	85502
Date:	2025-03-10

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.76	30	-20.240
Middle	2440	9.91	30	-20.090
High	2480	9.41	30	-20.590

9.4.2. BLE TYPE (2Mbps)

Tested By:	85502
Date:	2025-03-10

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.29	30	-19.710
Middle	2440	9.91	30	-20.090
High	2480	9.47	30	-20.530

9.4.3. 802.15.4

Tested By:	85502
Date:	2025-03-07

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	20.44	30	-9.560
Middle	2440	20.31	30	-9.690
High	2480	20.25	30	-9.750

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 10.67 dB (including 10.16 dB pad and 0.51dB cable) was entered as an offset in the wideband power meter.

RESULTS

9.5.1. BLE TYPE (1Mbps)

Tested By:	85502
Date:	2025-03-10

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	9.54
Middle	2440	9.68
High	2480	9.17

9.5.2. BLE TYPE (2Mbps)

Tested By:	85502
Date:	2025-03-10

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	10.09
Middle	2440	9.69
High	2480	9.21

9.5.3. 802.15.4

Tested By:	85502
Date:	2025-03-07

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	20.23
Middle	2440	20.08
High	2480	20.04

9.6. POWER SPECTRAL DENSITY

LIMITS

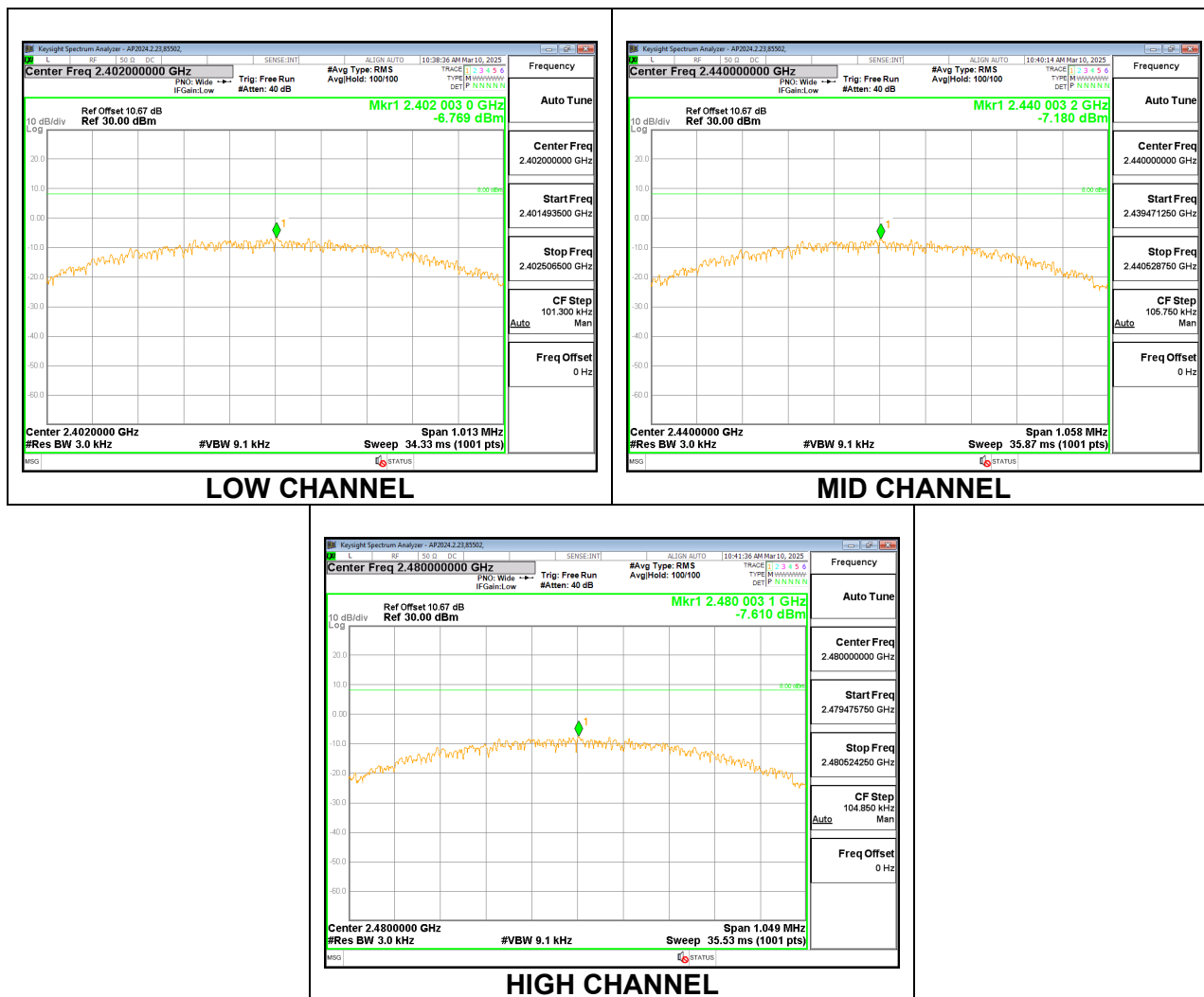
FCC §15.247 (e)
RSS-247 (5.2) (b)

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

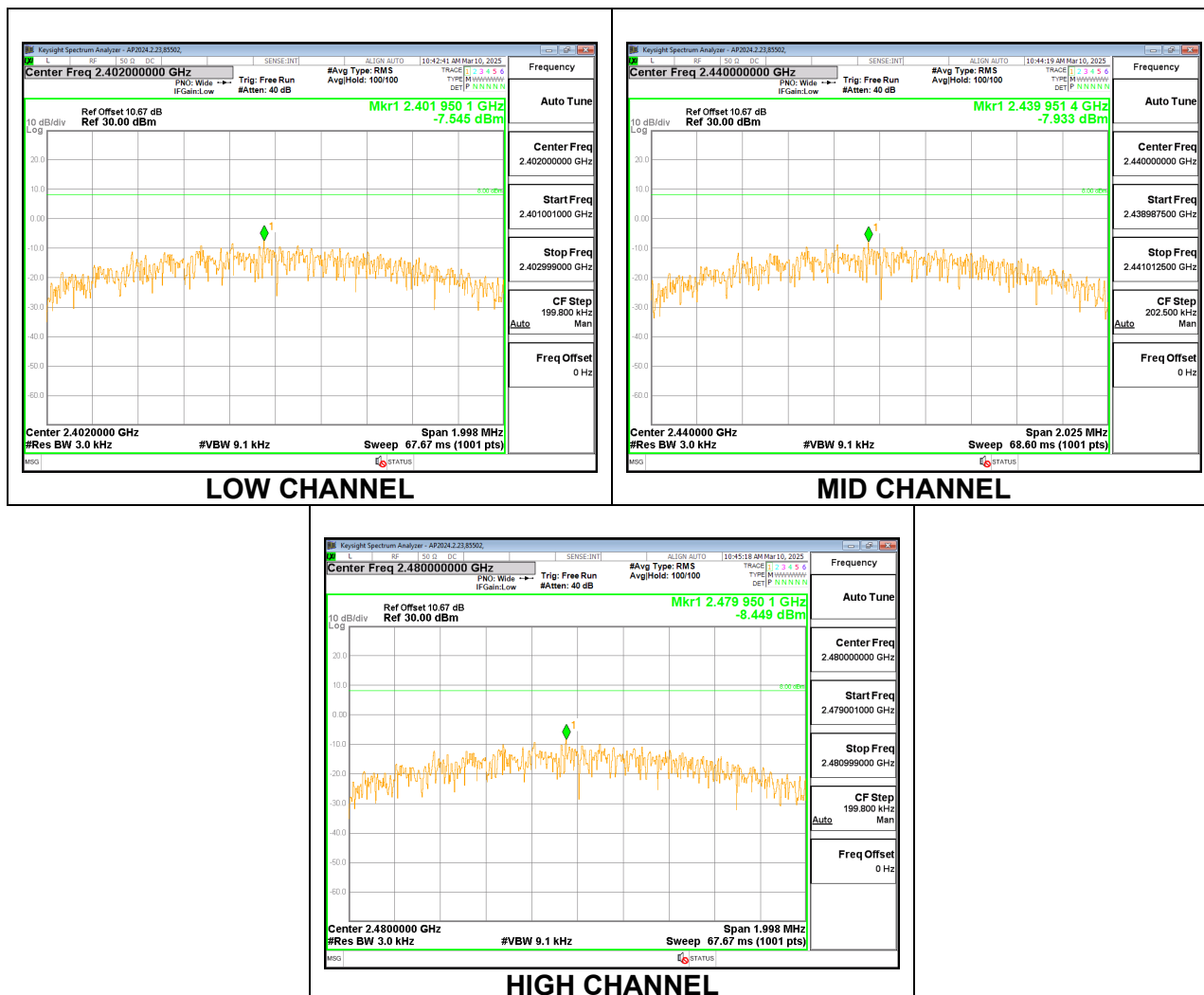
9.6.1. BLE TYPE (1Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-6.77	8	-14.77
Middle	2440	-7.18	8	-15.18
High	2480	-7.61	8	-15.61



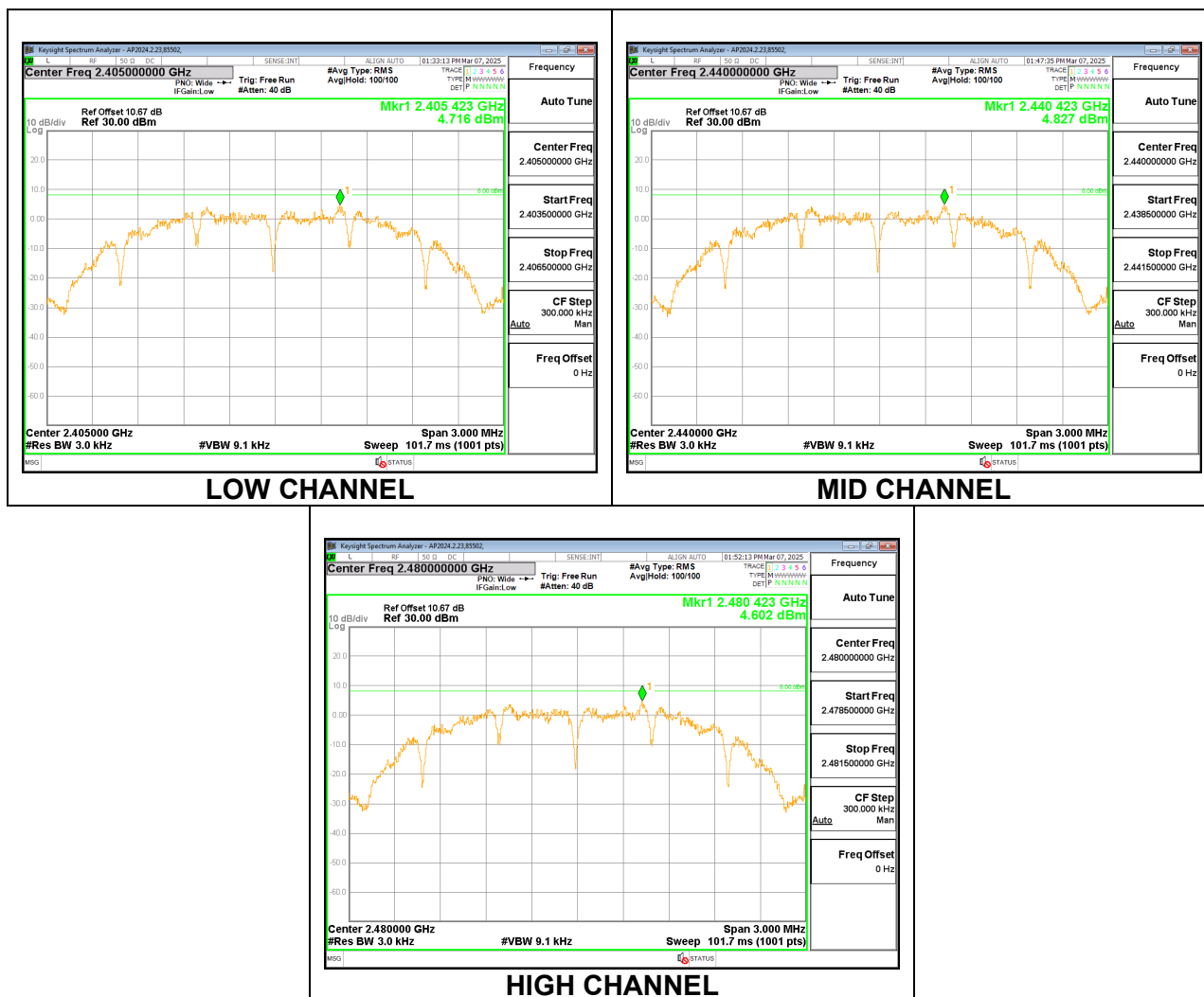
9.6.2. BLE TYPE (2Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-7.55	8	-15.55
Middle	2440	-7.93	8	-15.93
High	2480	-8.45	8	-16.45



9.6.3. 802.15.4

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2405	4.72	8	-3.28
Middle	2440	4.83	8	-3.17
High	2480	4.60	8	-3.40



9.7. CONDUCTED SPURIOUS EMISSIONS

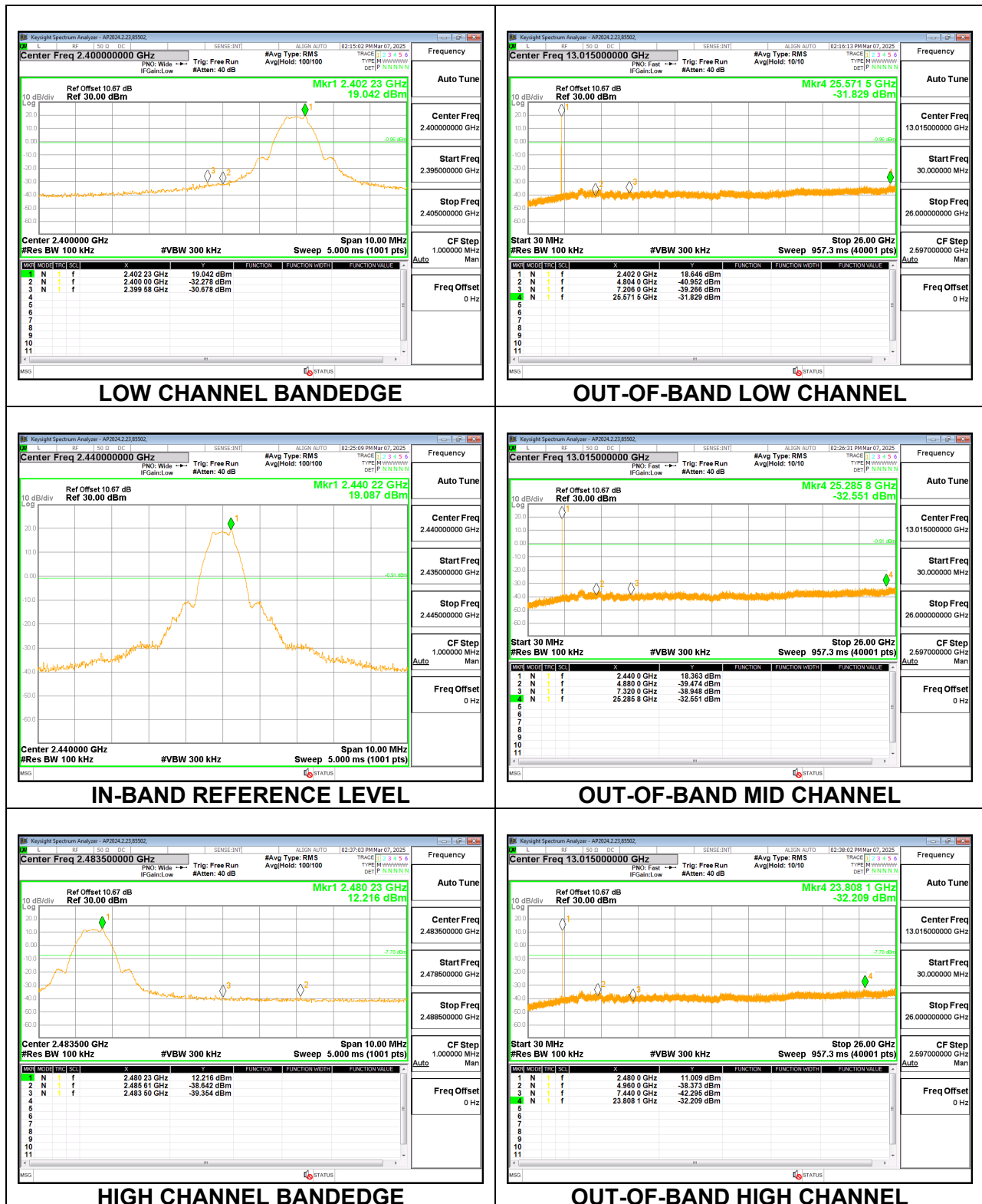
LIMITS

FCC §15.247 (d)
RSS-247 5.5

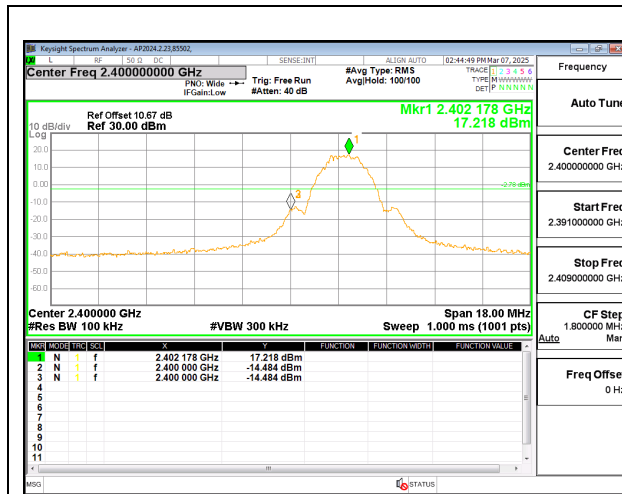
Output power was measured based on the use of a peak measurement, therefore the required attenuation is -20 dBc.

RESULTS

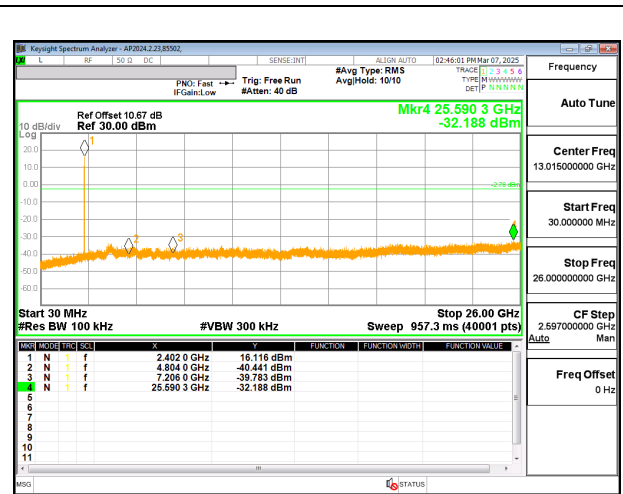
9.7.1. BLE TYPE (1Mbps)



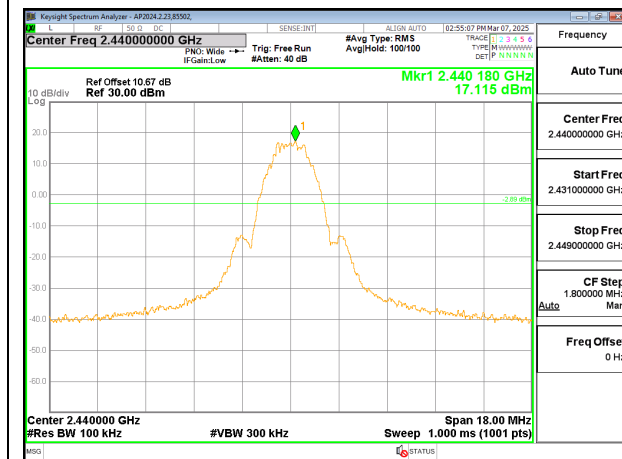
9.7.2. BLE TYPE (2Mbps)



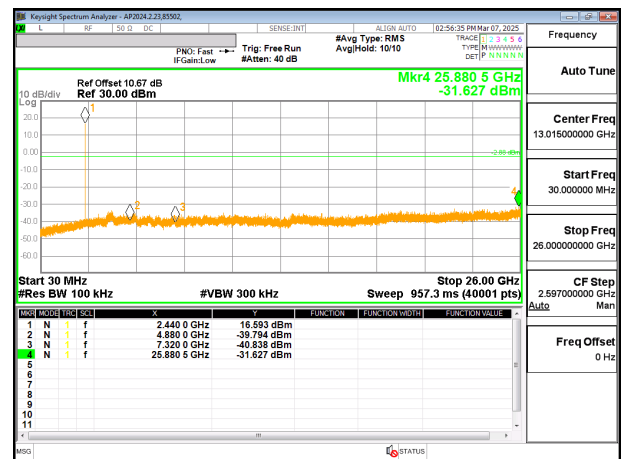
LOW CHANNEL BANDEDGE



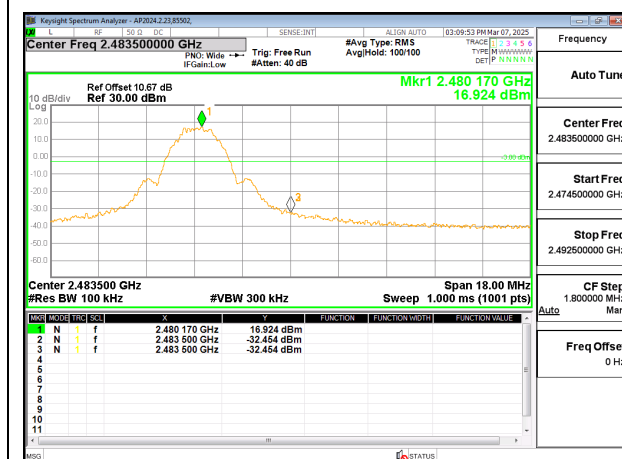
OUT-OF-BAND LOW CHANNEL



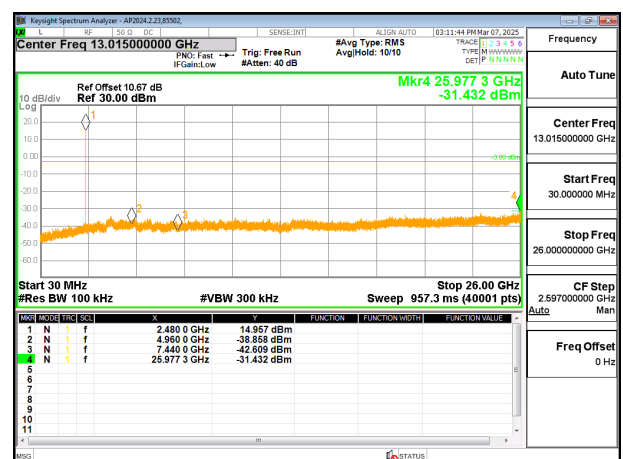
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

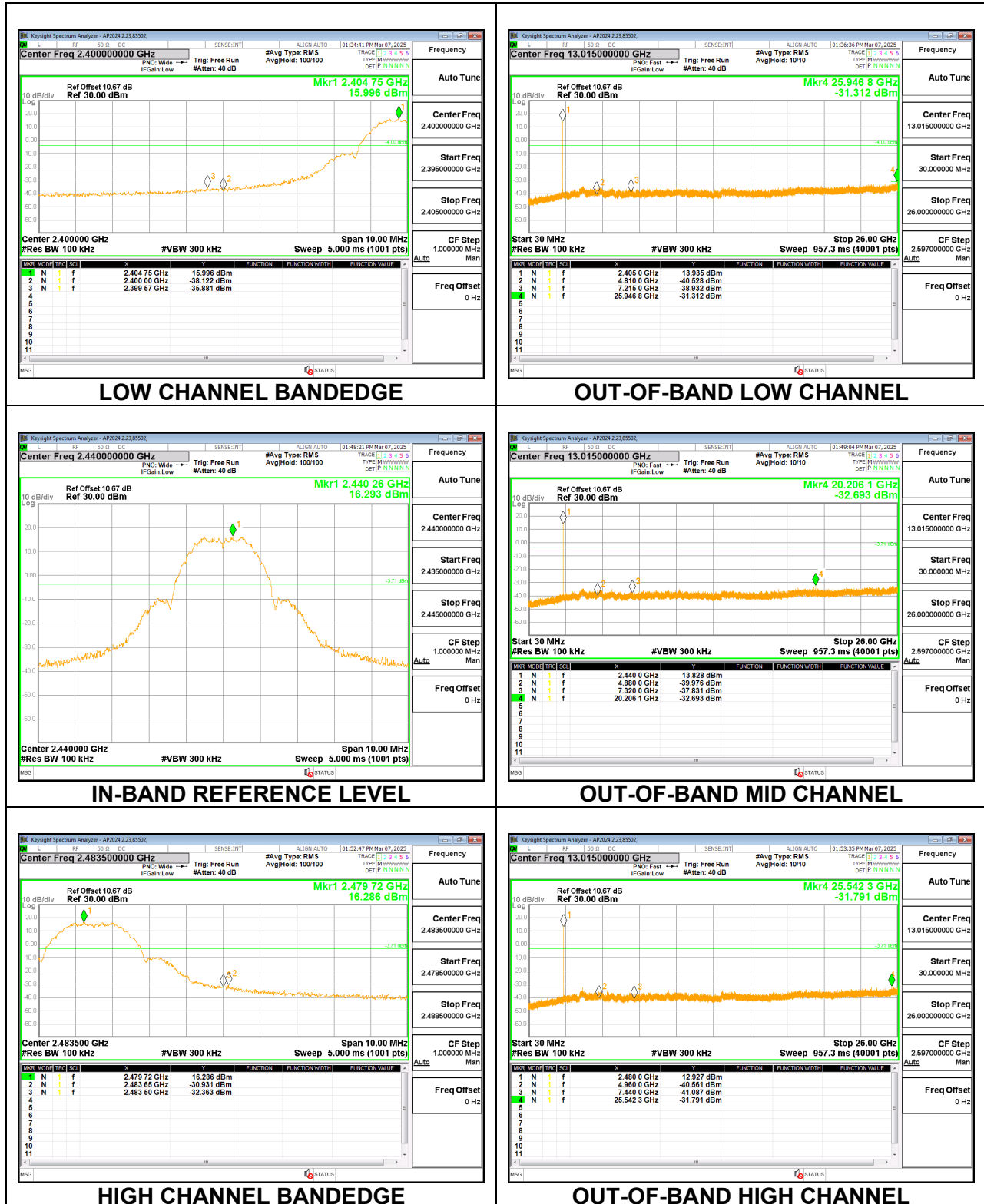


HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

9.7.3. 802.15.4



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

IC RSS-GEN Clause 8.9 and 8.10

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

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

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements. Linear voltage averaging was used for all the measurements on the BLE TYPE radio. For the 802.15.4 radio, the operational duty cycle correction factor was subtracted from the average measurement.

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 power spectral density 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

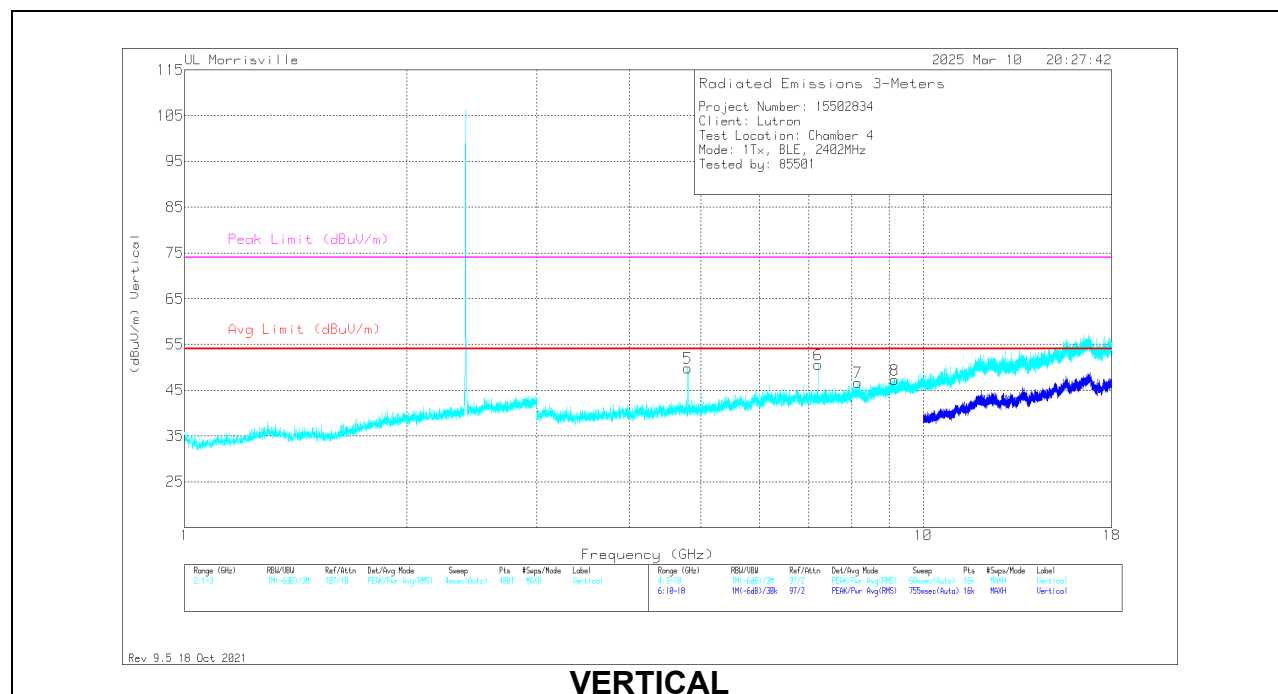
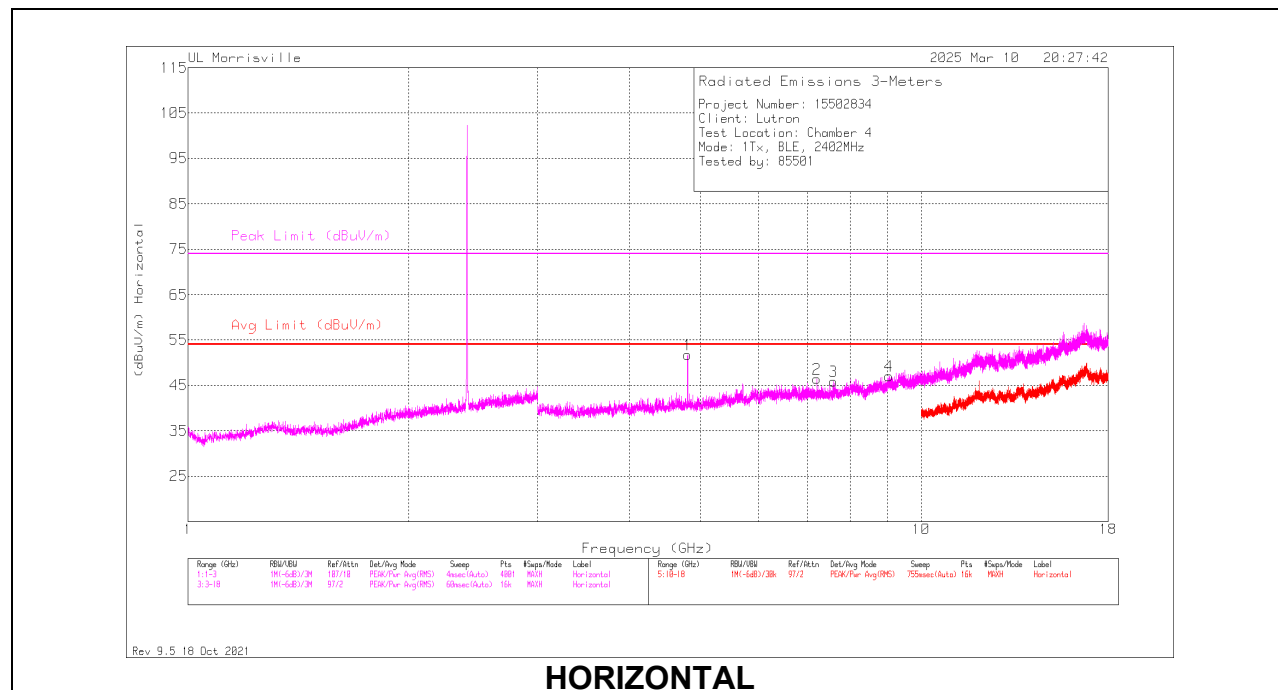
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. BLE TYPE (1Mbps)

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	* ** 4.80448	52.1	PK2	34.1	-31.4	54.8	-	-	74	-19.2	22	213	H
	* ** 4.80413	46.38	ADV	34.1	-31.4	49.08	54	-4.92	-	-	22	213	H
3	* ** 7.59656	37.47	Pk	35.7	-27.3	45.87	54	-8.13	74	-28.13	0-360	100	H
4	* ** 9.03563	35.16	Pk	36.2	-24.3	47.06	54	-6.94	74	-26.94	0-360	100	H
5	* ** 4.80233	40.94	PK2	34.1	-31.4	43.64	-	-	74	-30.36	20	223	V
	* ** 4.80354	28.76	ADV	34.1	-31.4	31.46	54	-22.54	-	-	20	223	V
7	* ** 8.16188	37.44	Pk	35.8	-26.6	46.64	54	-7.36	74	-27.36	0-360	200	V
8	* ** 9.14906	35.86	Pk	36.3	-24.9	47.26	54	-6.74	74	-26.74	0-360	200	V
2	7.20563	38.57	Pk	35.6	-27.7	46.47	-	-	-	-	0-360	100	H
6	7.20563	42.64	Pk	35.6	-27.7	50.54	-	-	-	-	0-360	200	V

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

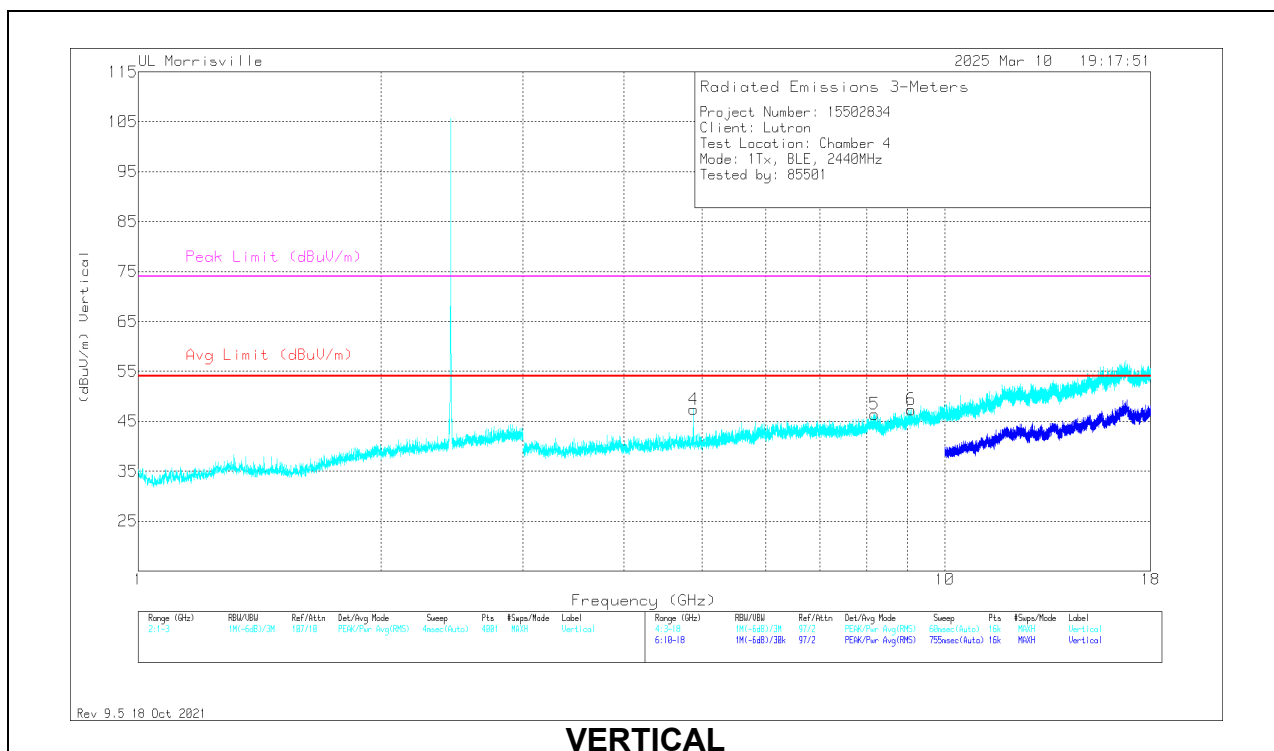
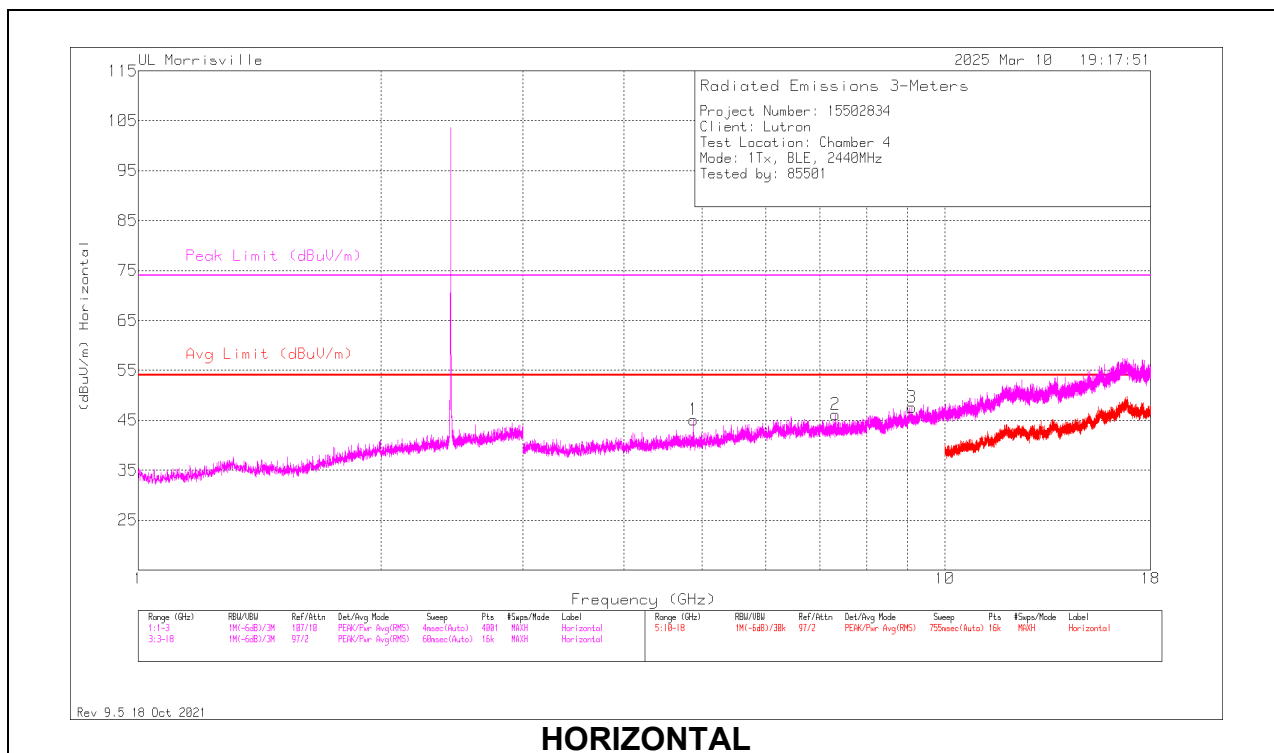
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

MID CHANNEL RESULTS



RADIATED EMISSIONS

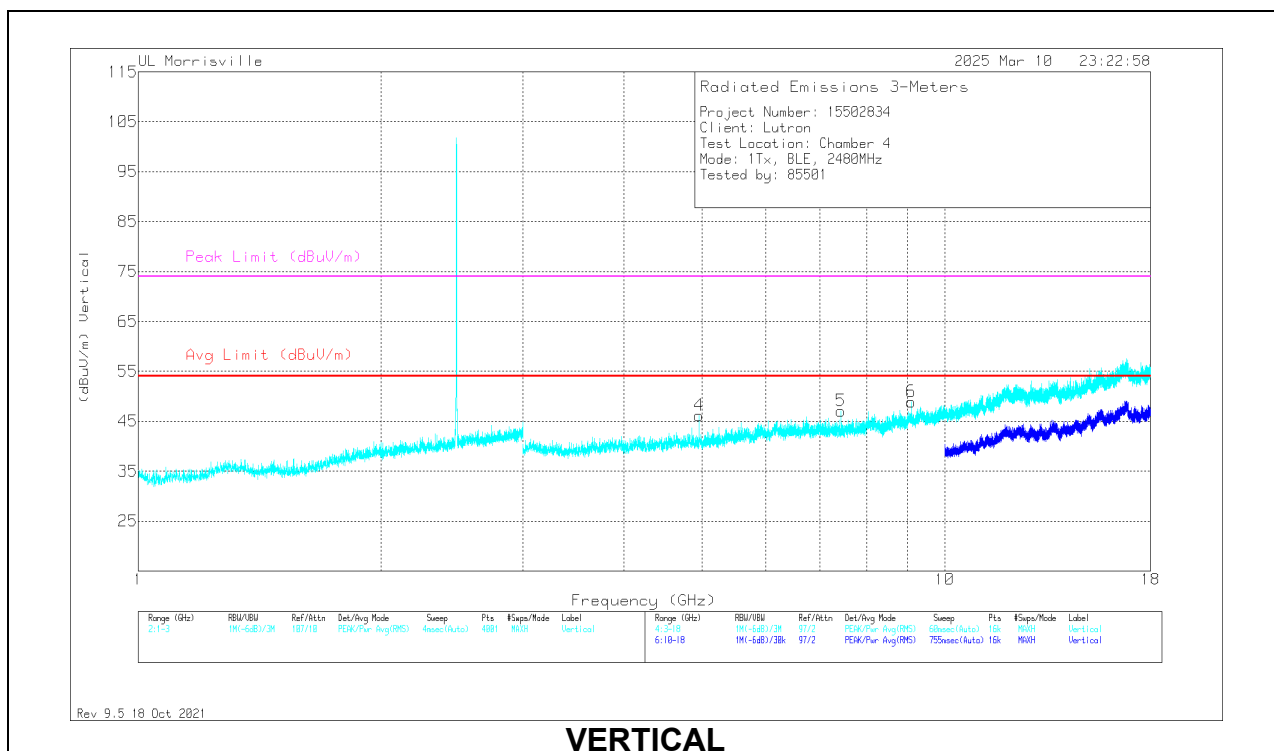
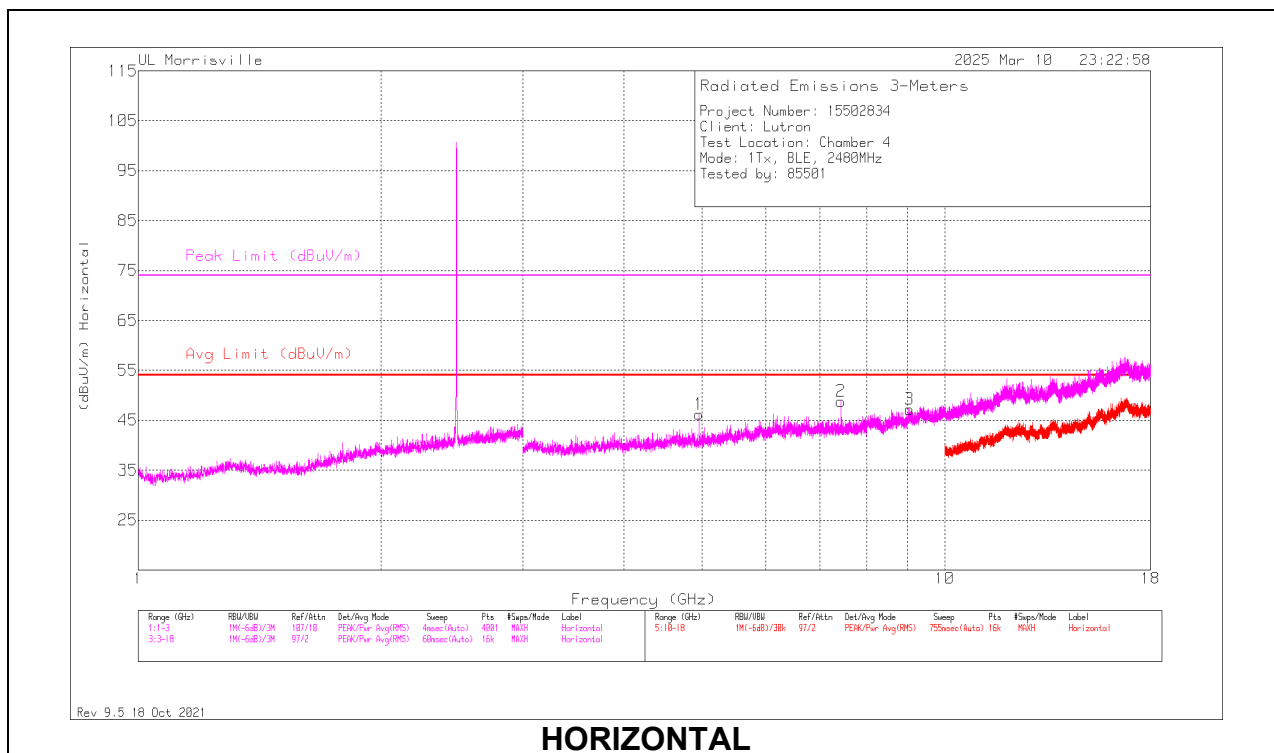
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.87969	42.1	Pk	34	-31	45.1	54	-8.9	74	-28.9	0-360	100	H
2	* ** 7.31906	38.29	Pk	35.6	-27.7	46.19	54	-7.81	74	-27.81	0-360	100	H
3	* ** 9.10219	35.76	Pk	36.3	-24.5	47.56	54	-6.44	74	-26.44	0-360	100	H
4	* ** 4.88063	44.39	Pk	34	-31	47.39	54	-6.61	74	-26.61	0-360	200	V
5	* ** 8.19188	36.77	Pk	35.8	-26.2	46.37	54	-7.63	74	-27.63	0-360	200	V
6	* ** 9.09	35.69	Pk	36.3	-24.7	47.29	54	-6.71	74	-26.71	0-360	200	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	* ** 4.96031	43.11	Pk	33.9	-30.8	46.21	54	-7.79	74	-27.79	0-360	100	H
2	* ** 7.4392	43.71	PK2	35.7	-27.9	51.51	-	-	74	-22.49	341	183	H
	* ** 7.4407	34.42	ADV	35.7	-27.9	42.22	54	-11.78	-	-	341	183	H
3	*** 9.04969	34.95	Pk	36.2	-24	47.15	54	-6.85	74	-26.85	0-360	100	H
4	* ** 4.95938	43.02	Pk	33.9	-30.8	46.12	54	-7.88	74	-27.88	0-360	200	V
5	* ** 7.44094	39.32	Pk	35.7	-27.9	47.12	54	-6.88	74	-26.88	0-360	200	V
6	* ** 9.09742	37.25	PK2	36.3	-24.7	48.85	-	-	74	-25.15	256	206	V
	* ** 9.09715	24.48	ADV	36.3	-24.7	36.08	54	-17.92	-	-	256	206	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

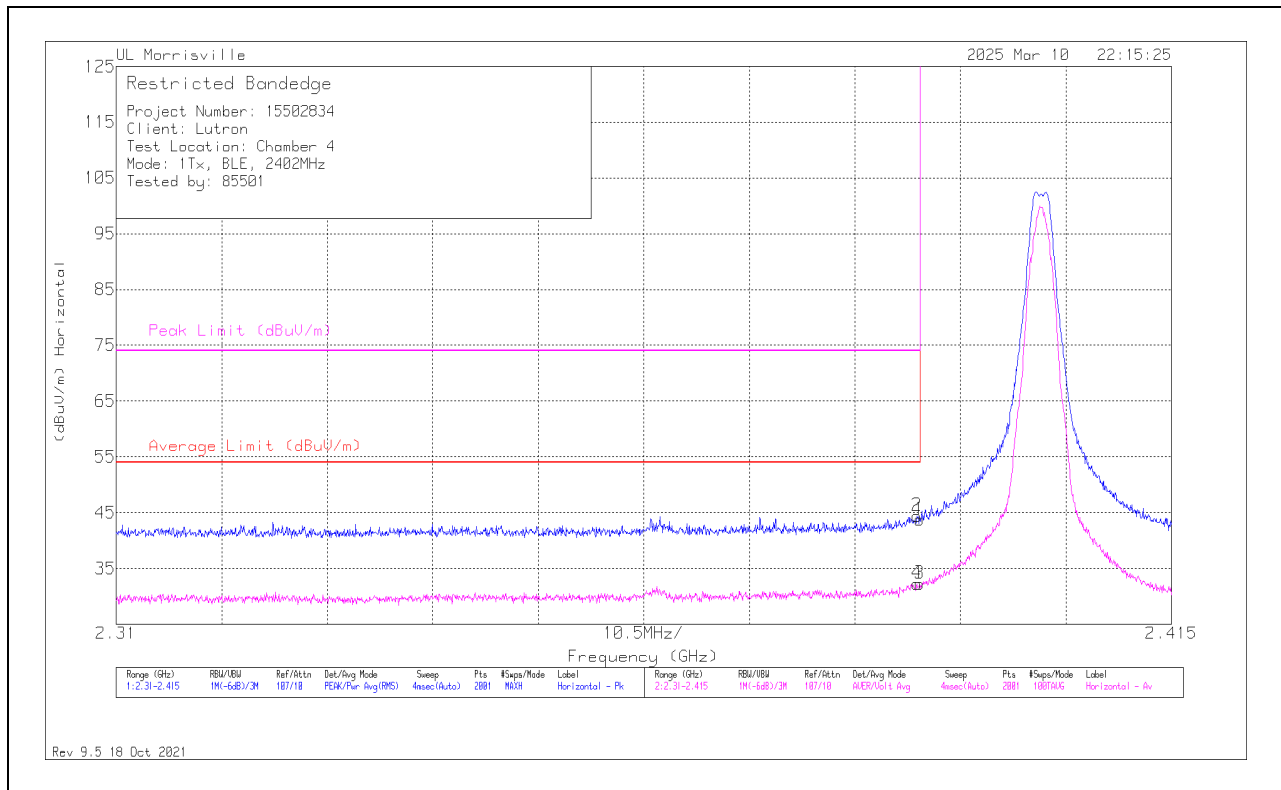
PK2 - Maximum Peak

ADV - Linear Voltage Average

10.2.2. BLE TYPE (2Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	34.91	Pk	32	-23.2	43.71	-	-	74	-30.29	83	152	H
2	* ** 2.3897	35.56	Pk	32	-23.2	44.36	-	-	74	-29.64	83	152	H
3	* ** 2.38996	23.42	ADV	32	-23.2	32.22	54	-21.78	-	-	83	152	H
4	* ** 2.3897	23.46	ADV	32	-23.2	32.26	54	-21.74	-	-	83	152	H

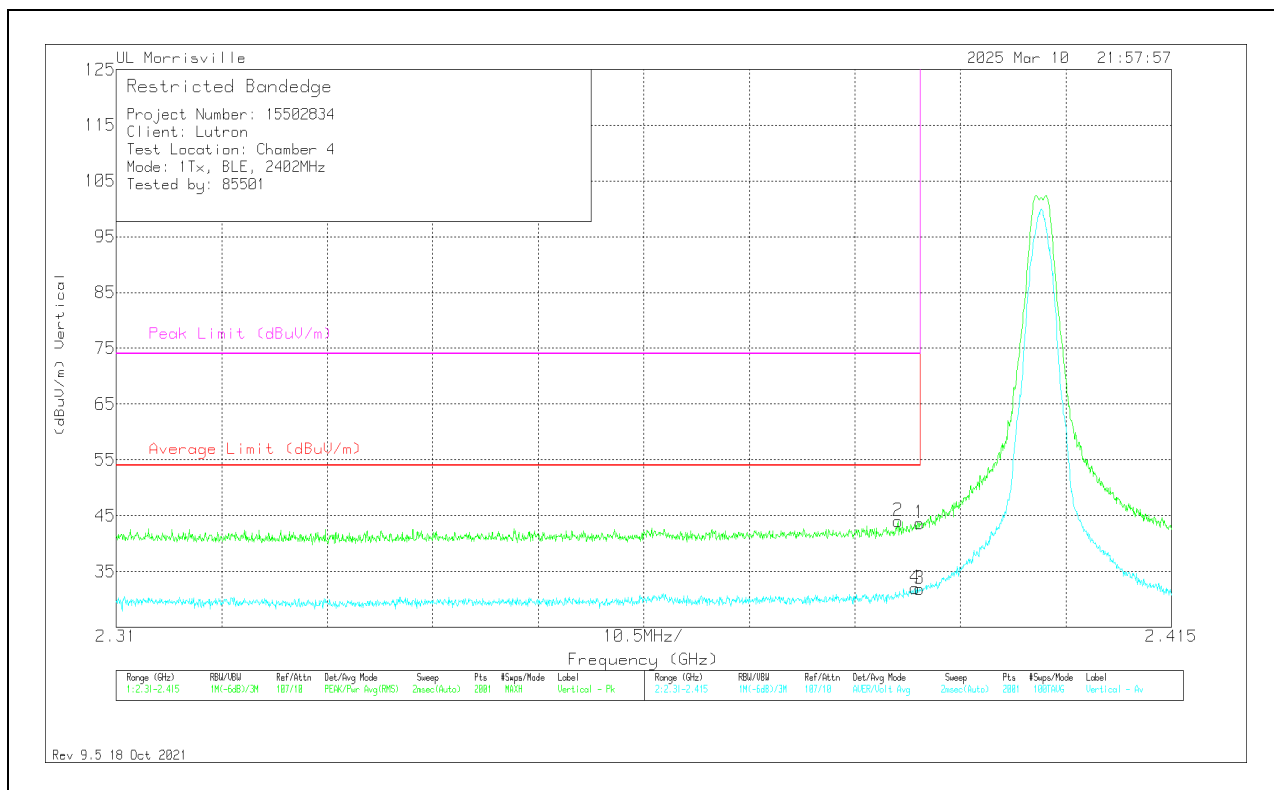
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	34.81	Pk	32	-23.2	43.61	-	-	74	-30.39	62	112	V
2	* ** 2.38781	35.36	Pk	32	-23.3	44.06	-	-	74	-29.94	62	112	V
3	* ** 2.38996	23.05	ADV	32	-23.2	31.85	54	-22.15	-	-	62	112	V
4	* ** 2.38949	23.17	ADV	32	-23.2	31.97	54	-22.03	-	-	62	112	V

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

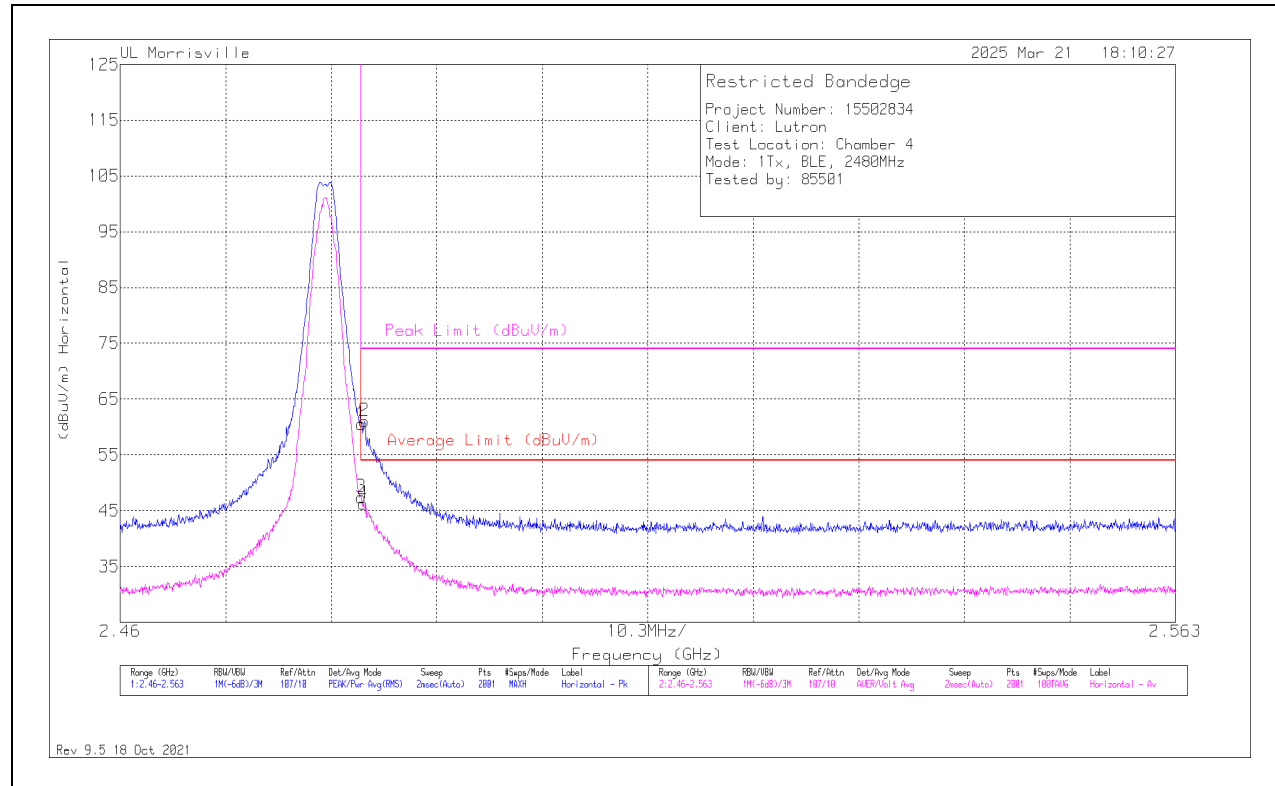
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

BANDEGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	51.06	Pk	32.3	-22.8	60.56	-	-	74	-13.44	354	118	H
2	* ** 2.48384	51.53	Pk	32.3	-22.8	61.03	-	-	74	-12.97	354	118	H
3	* ** 2.48354	37.95	ADV	32.3	-22.8	47.45	54	-6.55	-	-	354	118	H
4	* ** 2.48374	36.79	ADV	32.3	-22.8	46.29	54	-7.71	-	-	354	118	H

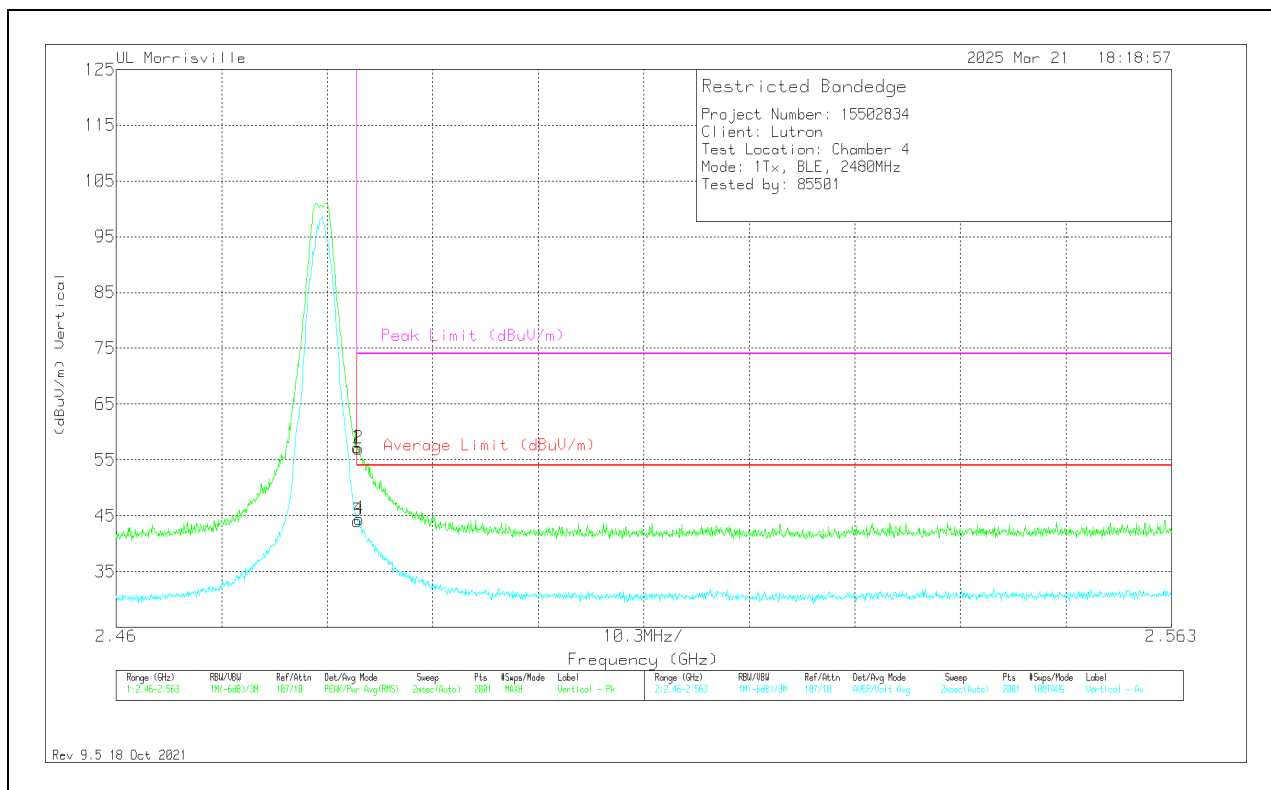
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	47.72	Pk	32.3	-22.8	57.22	-	-	74	-16.78	6	345	V
2	* ** 2.48364	47.5	Pk	32.3	-22.8	57	-	-	74	-17	6	345	V
3	* ** 2.48354	34.55	ADV	32.3	-22.8	44.05	54	-9.95	-	-	6	345	V
4	* ** 2.48374	34.85	ADV	32.3	-22.8	44.35	54	-9.65	-	-	6	345	V

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

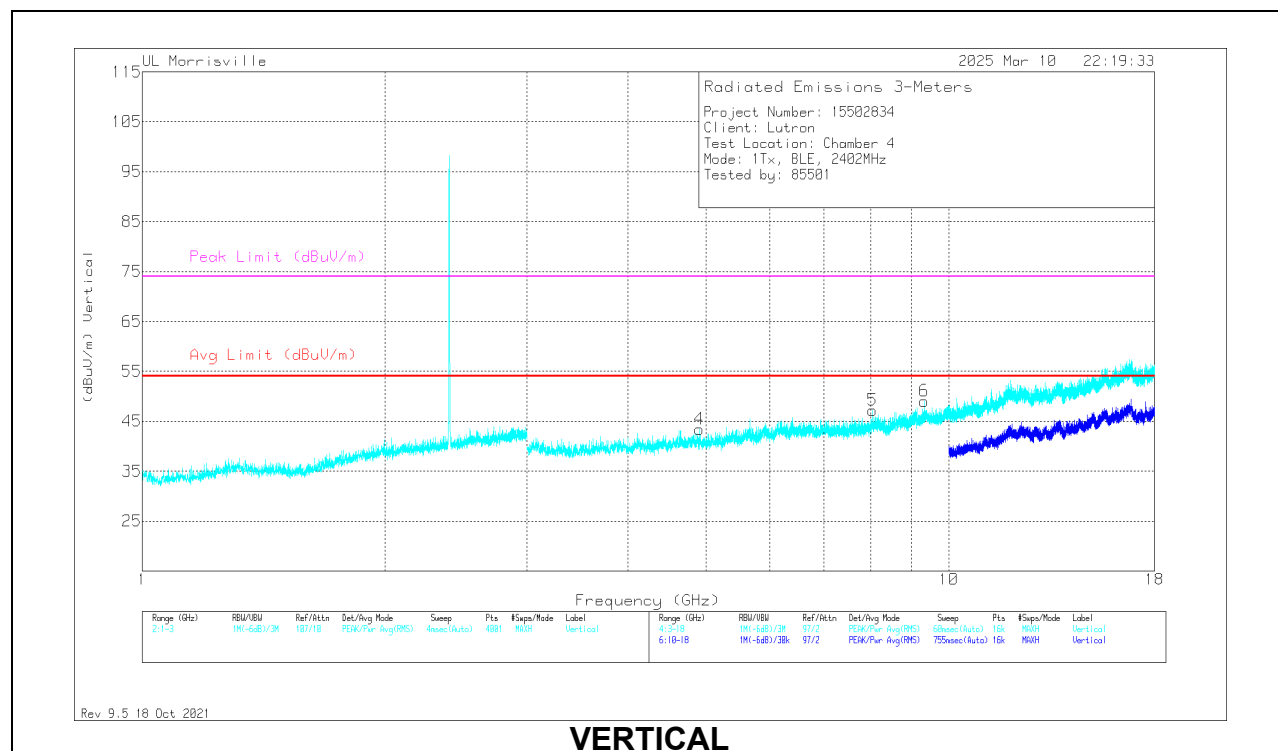
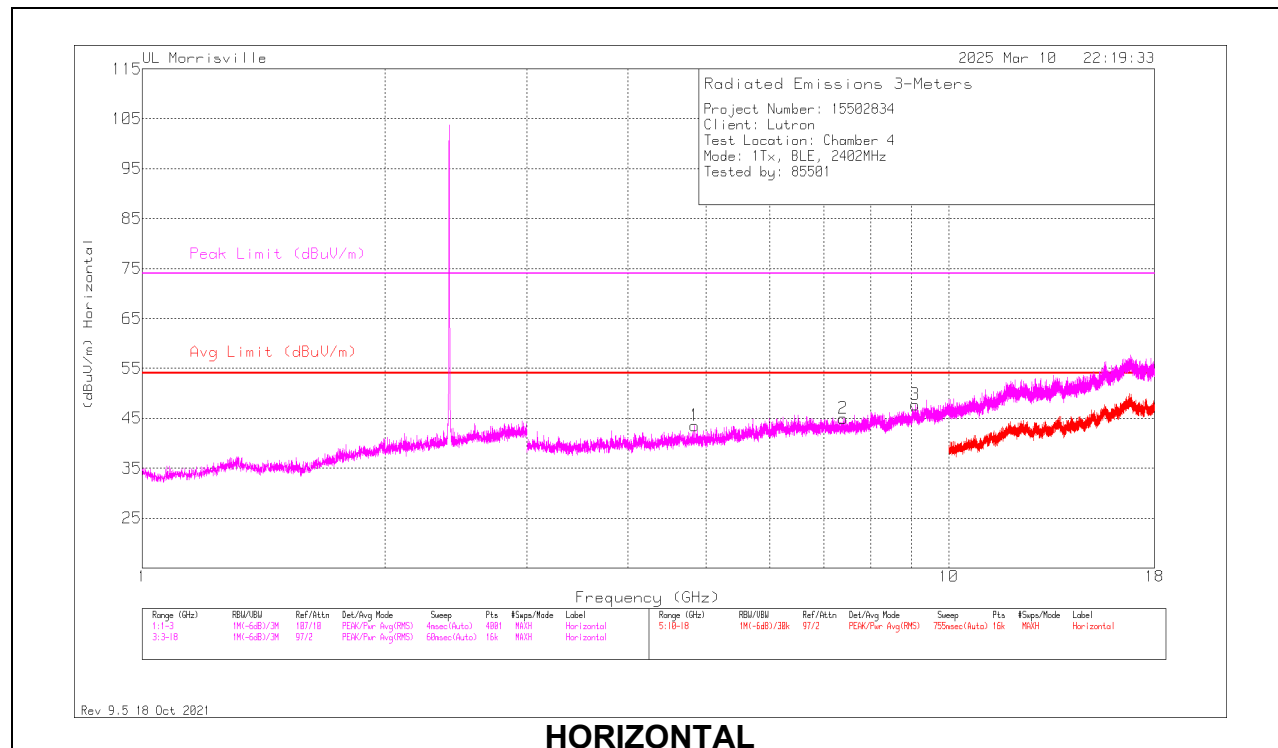
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

ADV - Linear Voltage Average

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	* ** 4.83938	40.59	Pk	34.1	-31.2	43.49	54	-10.51	74	-30.51	0-360	100	H
2	* ** 7.39594	37.12	Pk	35.6	-27.7	45.02	54	-8.98	74	-28.98	0-360	100	H
3	* ** 9.09375	36.1	Pk	36.3	-24.7	47.7	54	-6.3	74	-26.3	0-360	100	H
4	* ** 4.90781	40.41	Pk	34	-31	43.41	54	-10.59	74	-30.59	0-360	200	V
5	* ** 8.04844	38.51	Pk	35.8	-27.1	47.21	54	-6.79	74	-26.79	0-360	200	V
6	* ** 9.3257	36.82	PK2	36.5	-24.3	49.02	-	-	74	-24.98	89	221	V
	* ** 9.32577	24.25	ADV	36.5	-24.3	36.45	54	-17.55	-	-	89	221	V

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

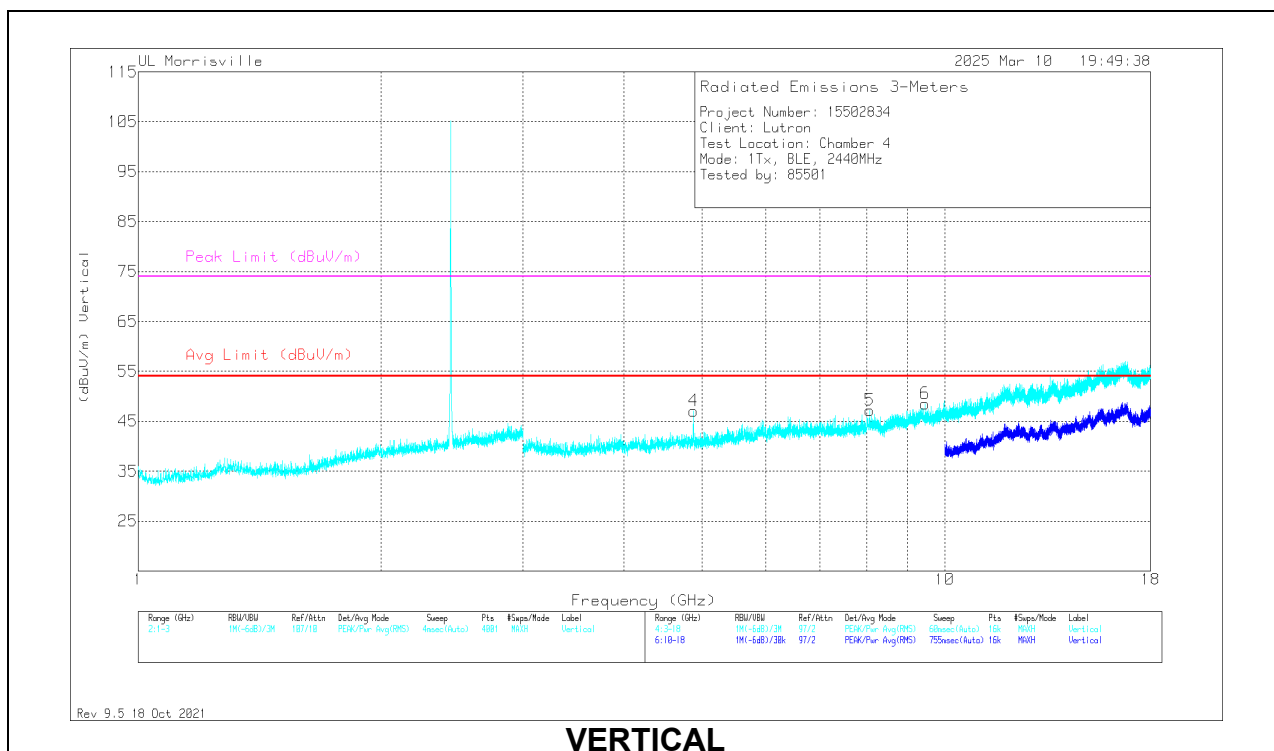
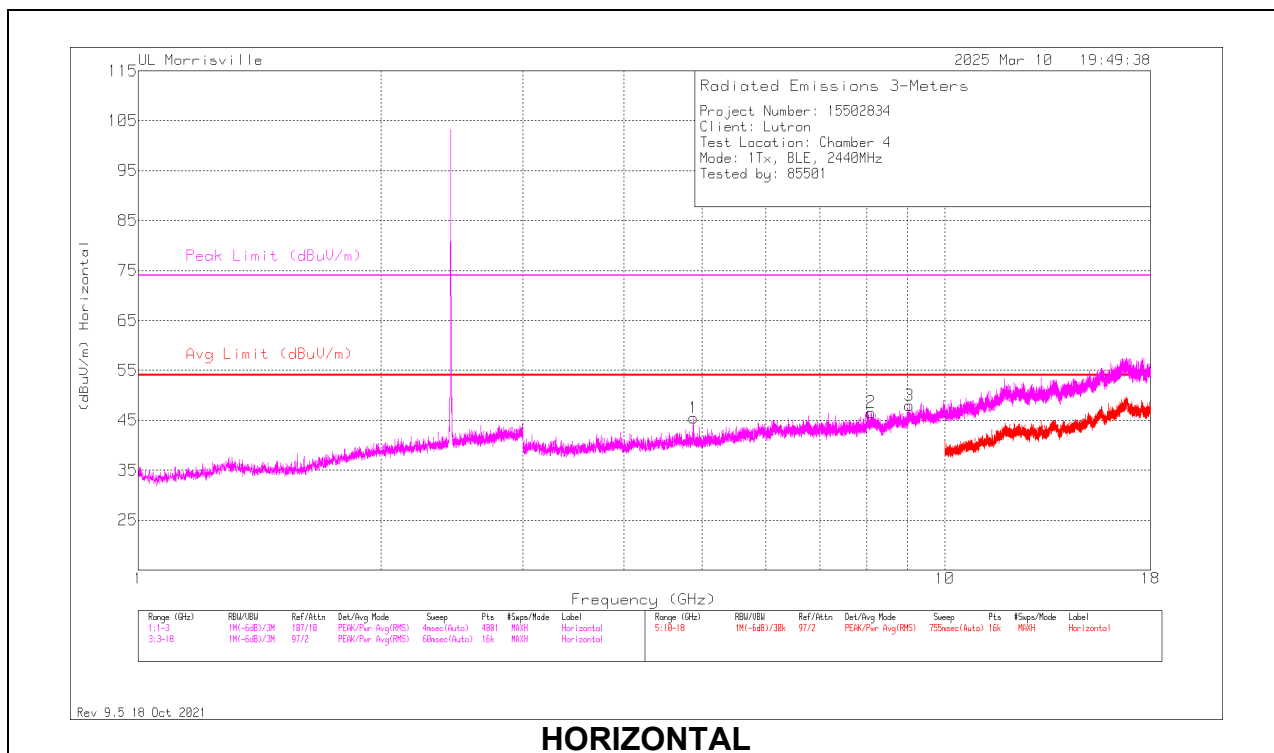
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	* ** 4.87875	42.44	Pk	34	-31	45.44	54	-8.56	74	-28.56	0-360	100	H
2	* ** 8.10656	37.77	Pk	35.8	-27	46.57	54	-7.43	74	-27.43	0-360	100	H
3	* ** 9.04688	35.72	Pk	36.2	-24	47.92	54	-6.08	74	-26.08	0-360	100	H
4	* ** 4.88063	44.08	Pk	34	-31	47.08	54	-6.92	74	-26.92	0-360	200	V
5	* ** 8.07188	38.55	Pk	35.8	-27.1	47.25	54	-6.75	74	-26.75	0-360	200	V
6	* ** 9.44829	37.27	PK2	36.7	-25.1	48.87	-	-	74	-25.13	168	185	V
	* ** 9.44891	24.83	ADV	36.7	-25.1	36.43	54	-17.57	-	-	168	185	V

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

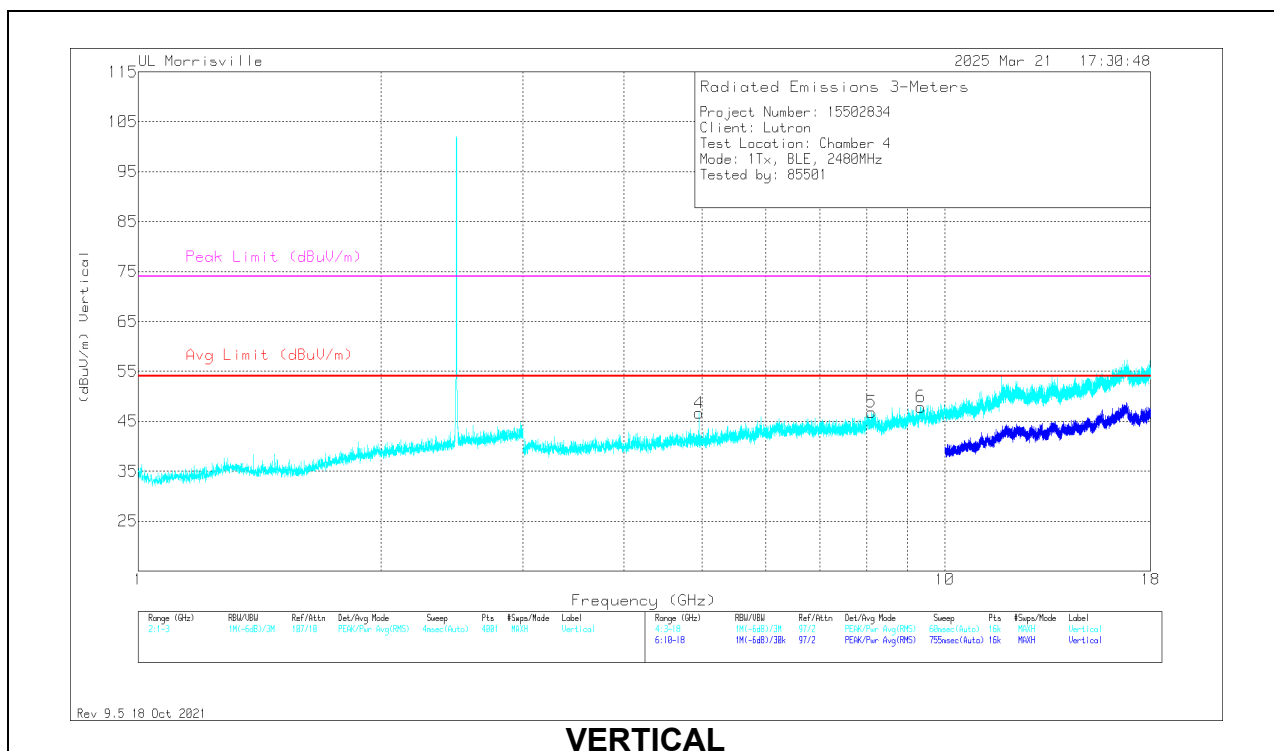
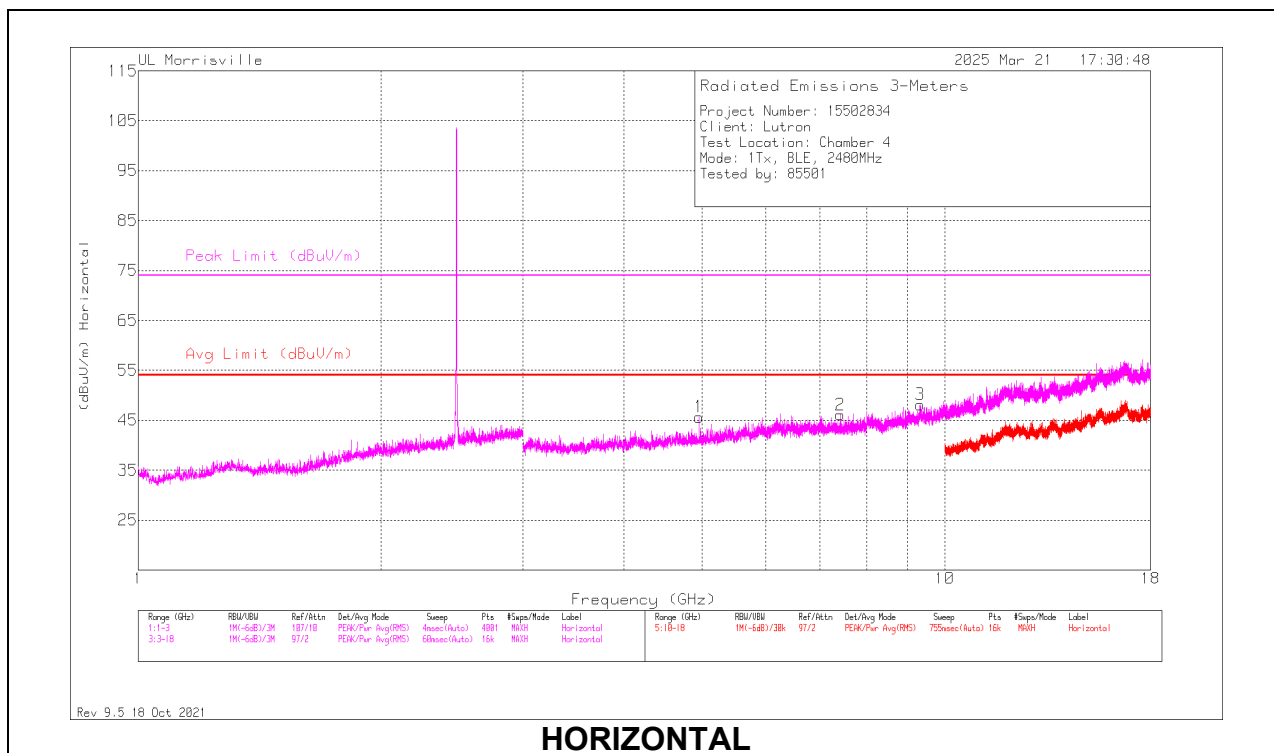
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (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	* ** 4.96031	42.53	Pk	33.9	-30.8	45.63	54	-8.37	74	-28.37	0-360	100	H
2	* ** 7.42031	38.18	Pk	35.6	-27.7	46.08	54	-7.92	74	-27.92	0-360	100	H
3	* ** 9.32281	37.04	PK2	36.4	-24.4	49.04	-	-	74	-24.96	202	220	H
	* ** 9.32275	24.76	ADV	36.4	-24.4	36.76	54	-17.24	-	-	202	220	H
4	* ** 4.95844	43.61	Pk	33.9	-30.9	46.61	54	-7.39	74	-27.39	0-360	200	V
5	* ** 8.11688	37.67	Pk	35.8	-26.7	46.77	54	-7.23	74	-27.23	0-360	200	V
6	* ** 9.34781	35.68	Pk	36.5	-24.3	47.88	54	-6.12	74	-26.12	0-360	200	V

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

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

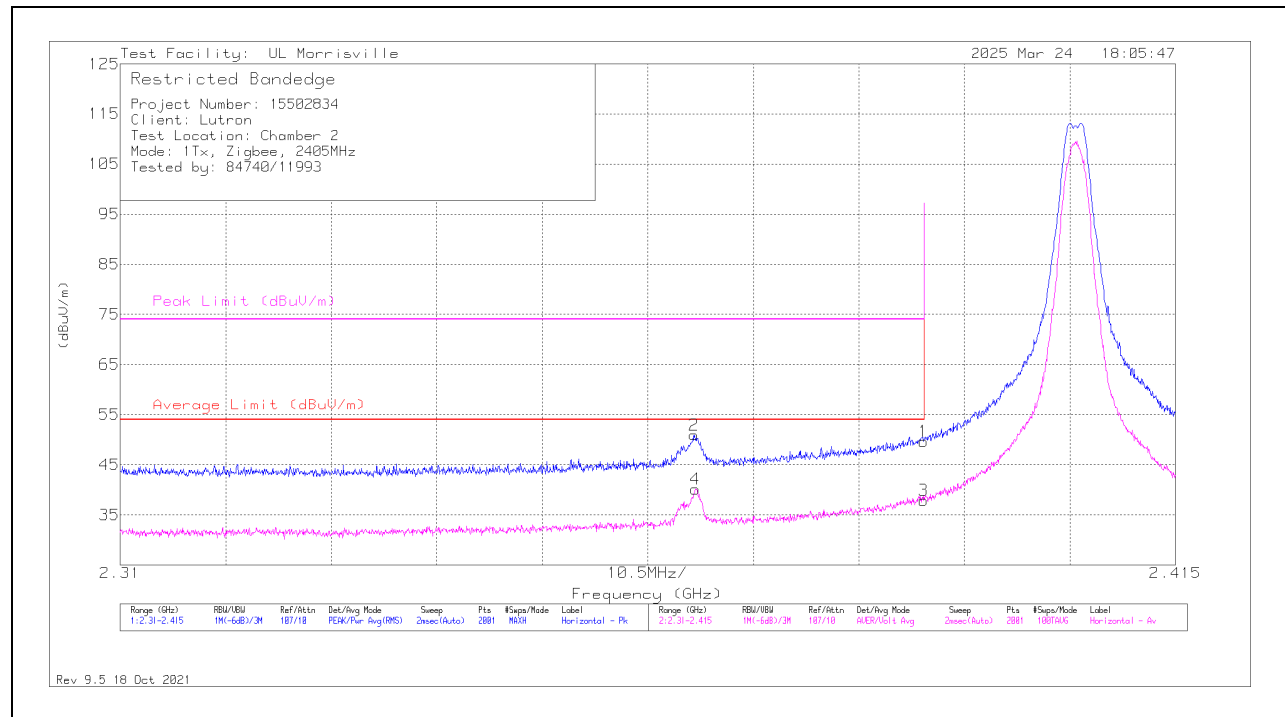
Pk - Peak detector

PK2 - Maximum Peak

ADV - Linear Voltage Average

10.2.3. 802.15.4
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	40.97	Pk	32.3	-23.6	0	49.67	-	-	74	-24.33	83	220	H
2	*** 2.36712	42.36	Pk	32.2	-23.6	0	50.96	-	-	74	-23.04	83	220	H
3	*** 2.38996	29.23	ADV	32.3	-23.6	-9.89	28.04	54	-25.96	-	-	83	219	H
4	*** 2.36723	31.53	ADV	32.2	-23.6	-9.89	30.24	54	-23.76	-	-	83	219	H

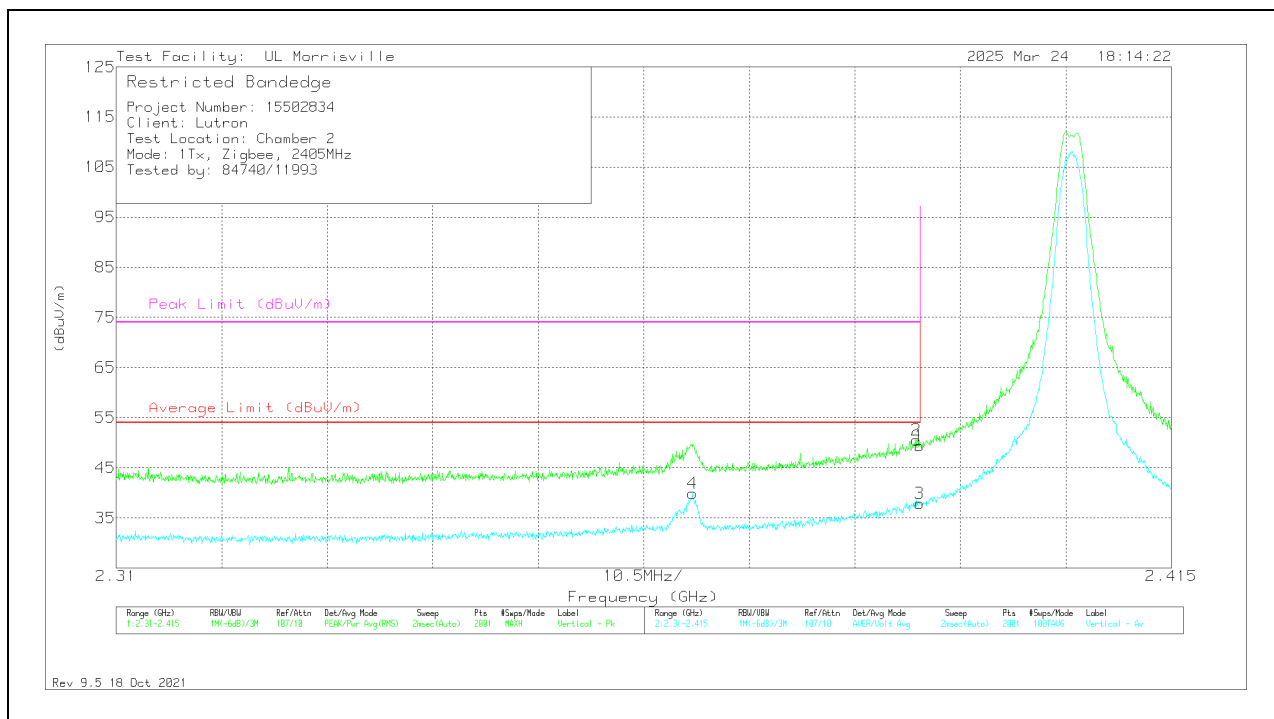
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - 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	40.68	Pk	32.3	-23.6	0	49.38	-	-	74	-24.62	41	306	V
2	*** 2.38964	41.74	Pk	32.3	-23.5	0	50.54	-	-	74	-23.46	41	306	V
3	*** 2.38996	29.19	ADV	32.3	-23.6	-9.89	28	54	-26	-	-	41	306	V
4	*** 2.36733	31.29	ADV	32.2	-23.6	-9.89	30	54	-24	-	-	41	306	V

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

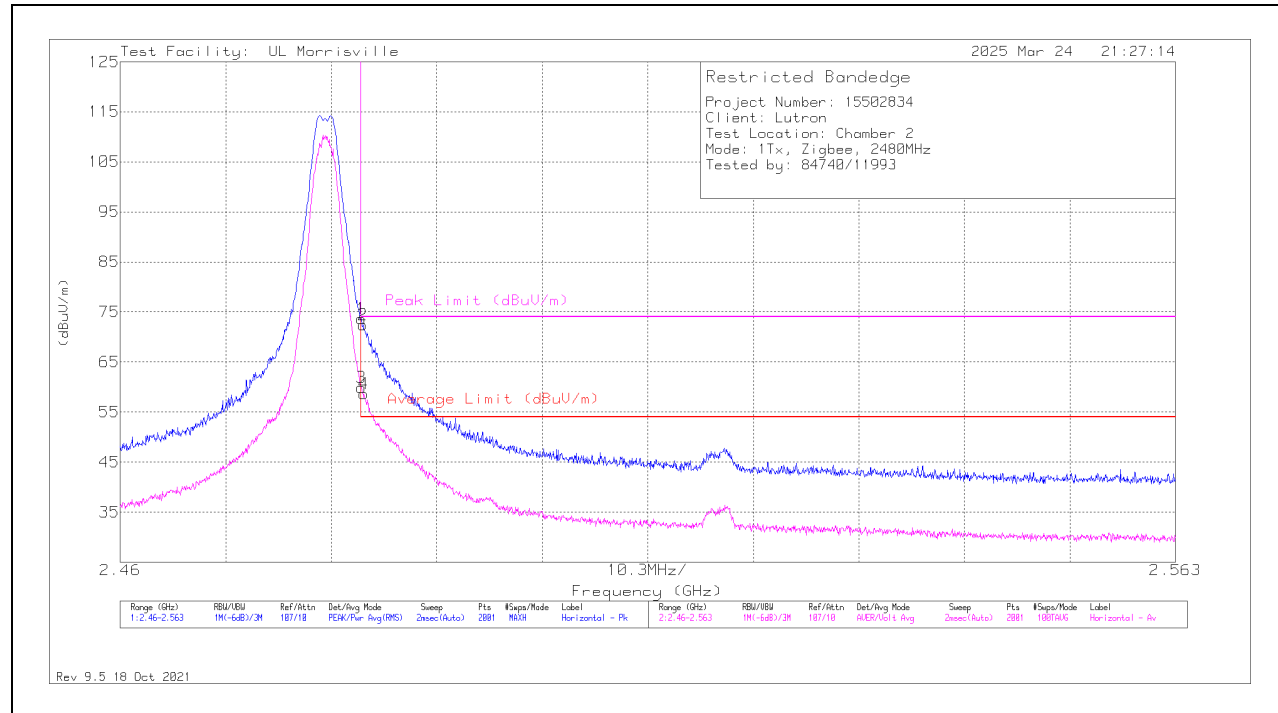
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

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	65.31	Pk	32.5	-24.1	0	73.71	-	-	74	-.29	82	235	H
2	*** 2.48369	64.05	Pk	32.5	-24.1	0	72.45	-	-	74	-1.55	82	235	H
3	*** 2.48354	51.55	ADV	32.5	-24.1	-9.89	50.06	54	-3.94	-	-	82	235	H
4	*** 2.48379	50.29	ADV	32.5	-24.1	-9.89	48.8	54	-5.2	-	-	82	235	H

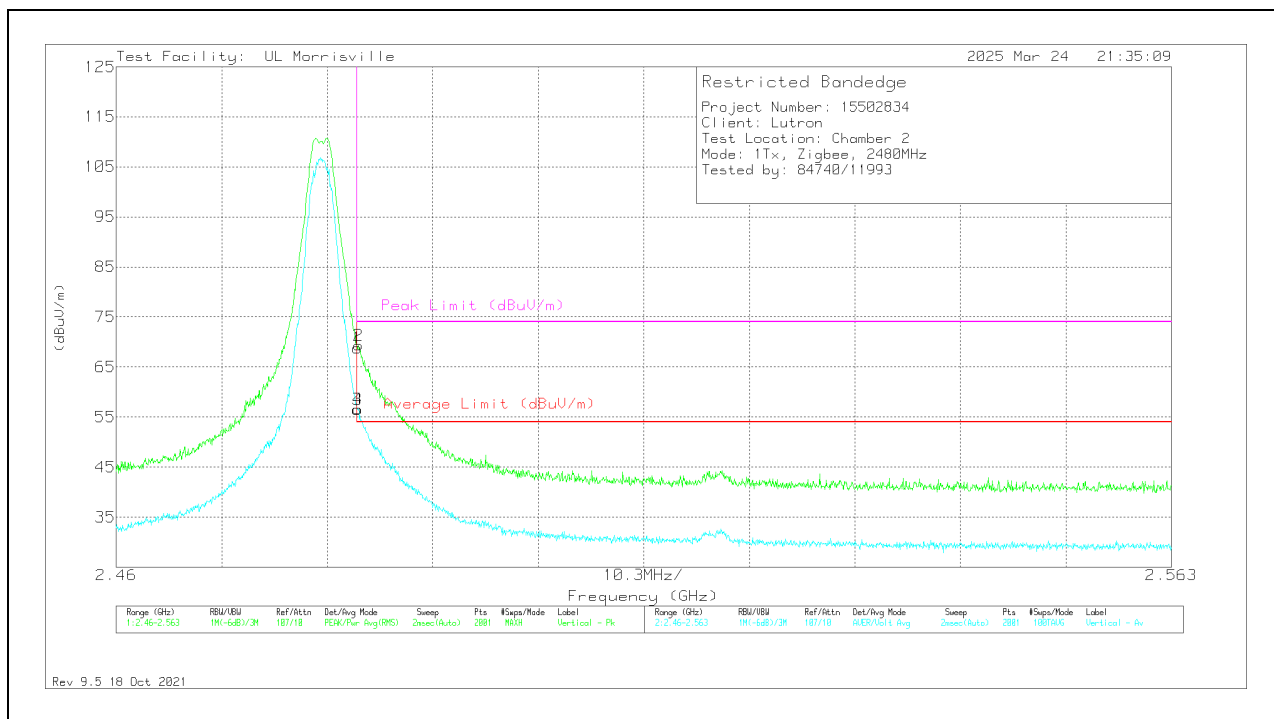
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - 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	60.41	Pk	32.5	-24.1	0	68.81	-	-	74	-5.19	72	341	V
2	*** 2.48364	60.96	Pk	32.5	-24.1	0	69.36	-	-	74	-4.64	72	341	V
3	*** 2.48354	48.14	ADV	32.5	-24.1	-9.89	46.65	54	-7.35	-	-	72	341	V
4	*** 2.48359	48.19	ADV	32.5	-24.1	-9.89	46.7	54	-7.3	-	-	72	341	V

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

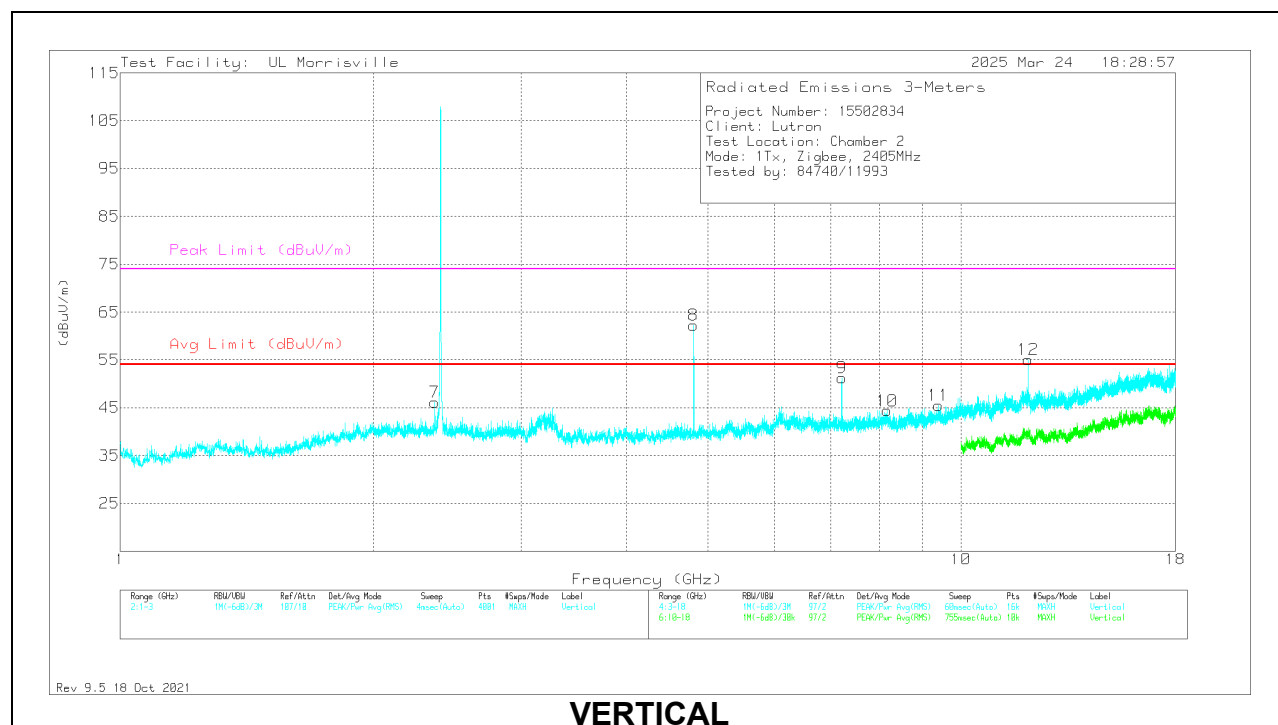
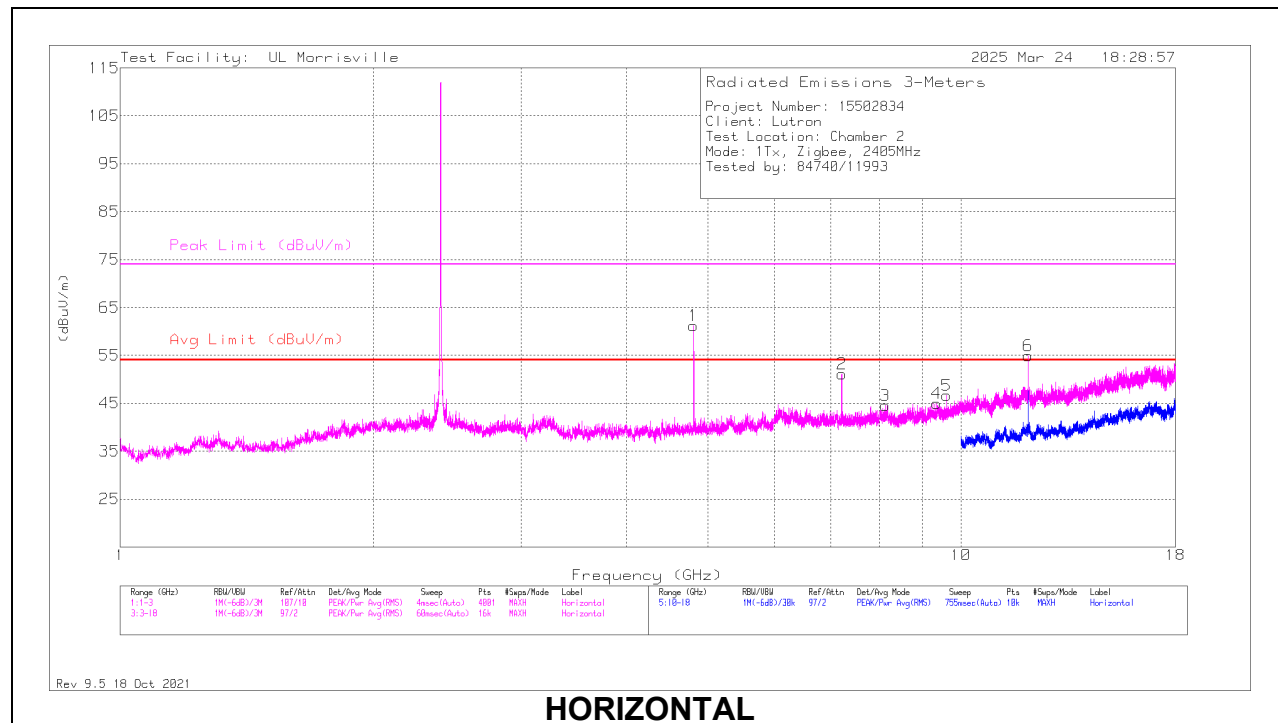
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

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)	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
7	*** 2.3675	37.54	Pk	32.2	-23.6	0	46.14	54	-7.86	74	-27.86	0-360	199	V
1	*** 4.81107	72.48	PK2	34.2	-43.7	0	62.98	-	-	74	-11.02	28	212	H
	*** 4.81103	65.53	ADV	34.2	-43.7	-9.89	46.14	54	-7.86	-	-	28	212	H
3	*** 8.13469	49.52	Pk	35.8	-40.8	0	44.52	54	-9.48	74	-29.48	0-360	101	H
4	*** 9.36375	48.45	Pk	36.1	-39.6	0	44.95	54	-9.05	74	-29.05	0-360	200	H
6	*** 12.02247	56.74	PK2	38.9	-38.3	0	57.34	-	-	74	-16.66	67	227	H
	*** 12.02216	47.62	ADV	38.9	-38.3	-9.89	38.33	54	-16.67	-	-	67	227	H
8	*** 4.80888	73.1	PK2	34.2	-43.8	0	63.5	-	-	74	-10.5	56	196	V
	*** 4.80908	66.02	ADV	34.2	-43.8	-9.89	46.53	54	-9.47	-	-	56	196	V
10	*** 8.17313	48.98	Pk	35.8	-40.4	0	44.38	54	-9.62	74	-29.62	0-360	101	V
11	*** 9.405	49.35	Pk	36.2	-40	0	45.55	54	-8.45	74	-28.45	0-360	199	V
12	*** 12.02248	59.46	PK2	38.9	-38.3	0	60.06	-	-	74	-13.94	49	175	V
	*** 12.02239	50.86	ADV	38.9	-38.3	-9.89	41.57	54	-15.43	-	-	49	175	V
9	7.21594	57.43	Pk	35.6	-41.8	0	51.23	-	-	-	-	0-360	199	V
2	7.21688	57.3	Pk	35.6	-41.8	0	51.1	-	-	-	-	0-360	101	H
5	9.61875	50.71	Pk	36.5	-40.6	0	46.61	-	-	-	-	0-360	101	H

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

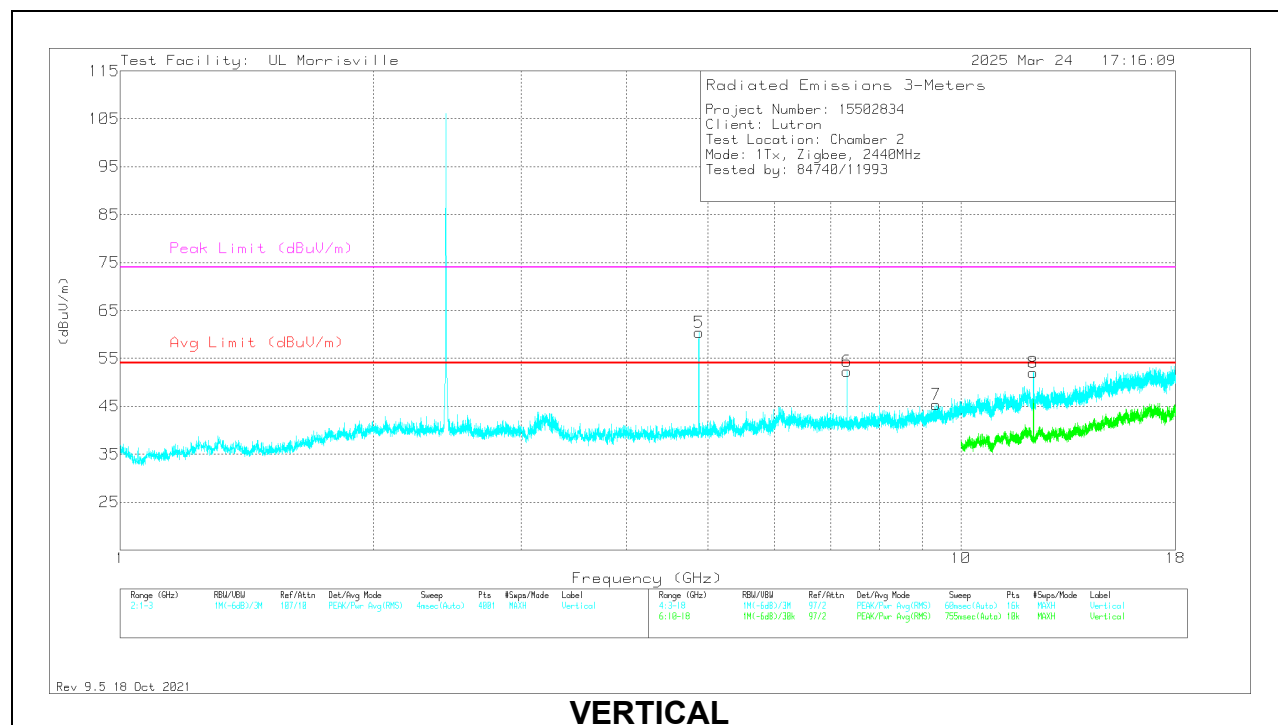
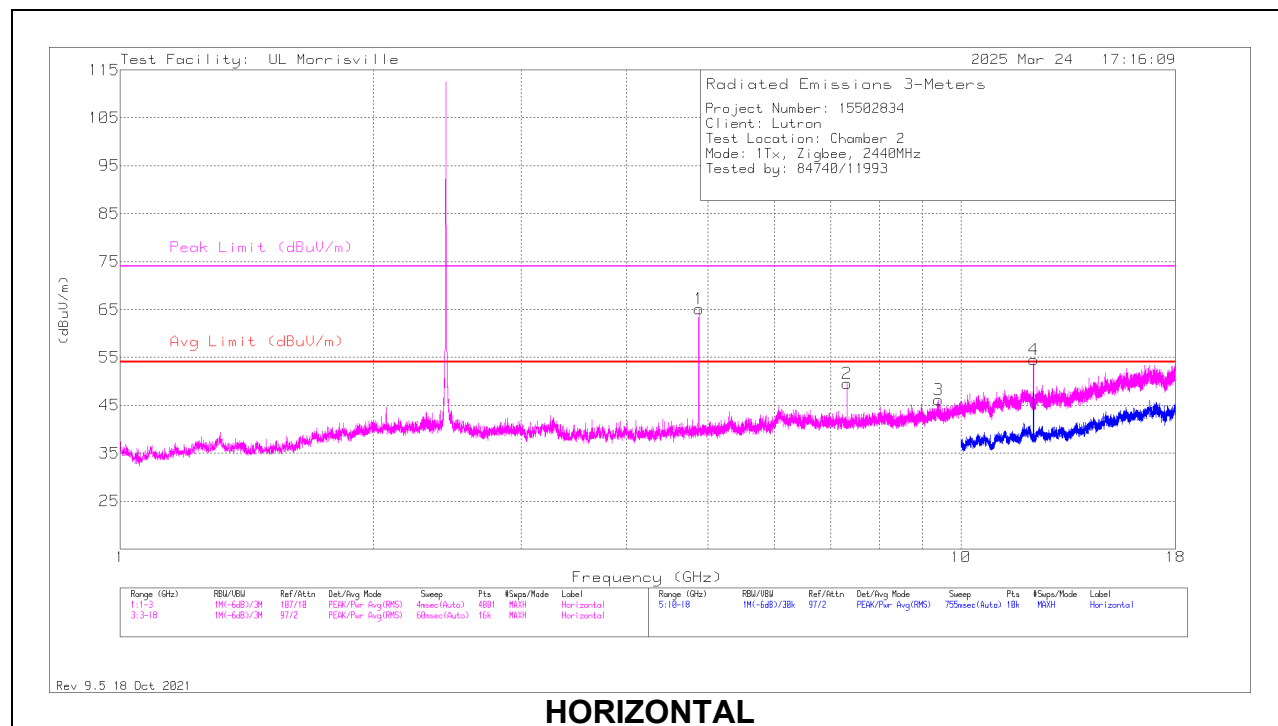
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - Maximum Peak

ADV - U-NII AD primary method, Linear Voltage Average

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	* ** 4.88116	75.49	PK2	34.1	-43.7	0	65.89	-	-	74	-8.11	33	209	H
	* ** 4.87907	68.18	ADV	34.1	-43.7	-9.89	48.69	54	-5.31	-	-	33	209	H
2	* ** 7.3216	58.73	PK2	35.6	-41.8	0	52.53	-	-	74	-21.47	26	101	H
	* ** 7.32121	37.76	ADV	35.6	-41.8	-9.89	21.67	54	-33.33	-	-	26	101	H
3	* ** 9.39938	49.66	Pk	36.2	-39.7	0	46.16	54	-7.84	74	-27.84	0-360	101	H
4	* ** 12.20133	48.59	PK2	38.9	-38.4	0	49.09	-	-	74	-24.91	206	228	H
	* ** 12.20284	35.6	ADV	38.9	-38.5	-9.89	26.11	54	-29.89	-	-	206	228	H
5	* ** 4.87897	53.61	PK2	34.1	-43.7	0	44.01	-	-	74	-29.99	193	320	V
	* ** 4.88045	40.26	ADV	34.1	-43.7	-9.89	20.77	54	-36.23	-	-	193	320	V
6	* ** 7.31693	50.81	PK2	35.6	-41.8	0	44.61	-	-	74	-29.39	11	254	V
	* ** 7.31701	38.06	ADV	35.6	-41.8	-9.89	21.97	54	-36.03	-	-	11	254	V
7	* ** 9.34969	49.15	Pk	36.1	-39.9	0	45.35	54	-8.65	74	-28.65	0-360	101	V
8	* ** 12.19566	48.15	PK2	38.9	-38.3	0	48.75	-	-	74	-25.25	40	255	V
	* ** 12.19615	35.65	ADV	38.9	-38.3	-9.89	26.36	54	-32.64	-	-	40	255	V

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

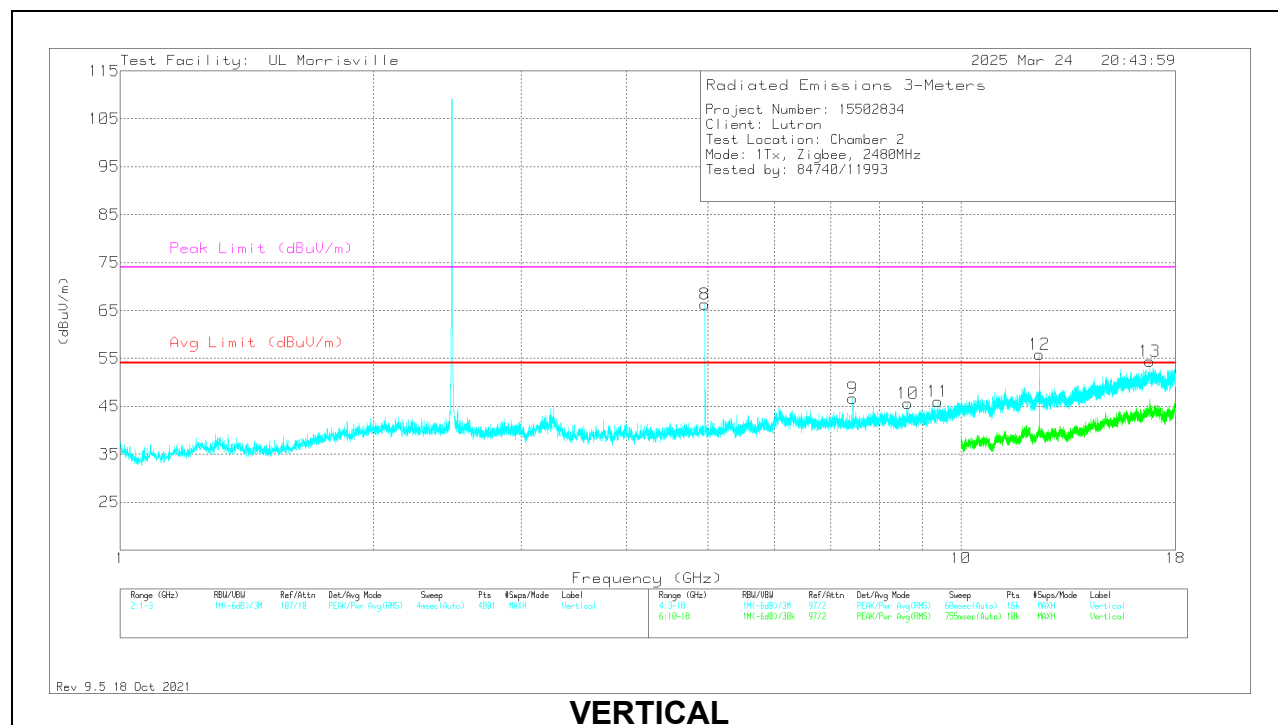
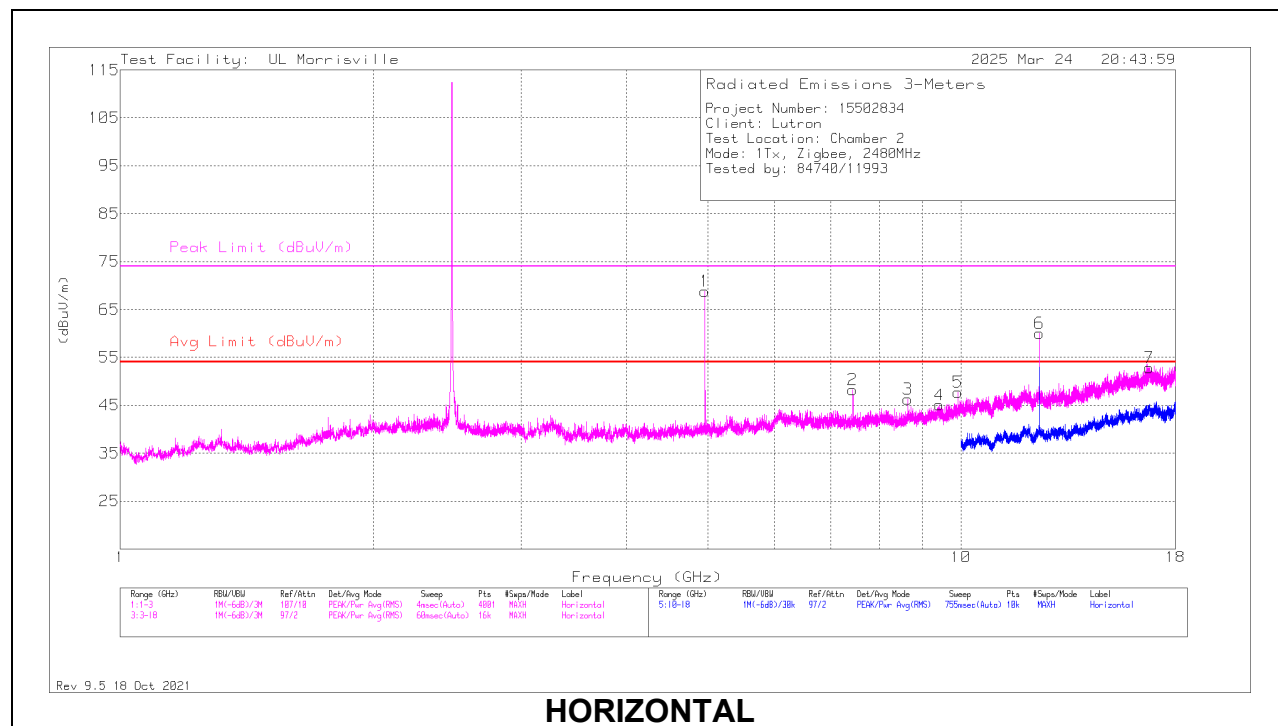
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

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	*** 4.96109	79.64	PK2	34	-43.8	0	69.84	-	-	74	-4.16	32	205	H
	*** 4.96112	72.98	ADV	34	-43.8	-9.89	53.29	54	-7.1	-	-	32	205	H
2	*** 7.43856	57.33	PK2	35.6	-41	0	51.93	-	-	74	-22.07	33	103	H
	*** 7.43842	47.45	ADV	35.6	-41	-9.89	32.16	54	-22.84	-	-	33	103	H
4	*** 9.43031	48.84	Pk	36.3	-40.1	0	45.04	54	-8.96	74	-28.96	0-360	200	H
6	*** 12.40261	60.97	PK2	38.8	-38.4	0	61.37	-	-	74	-12.63	54	199	H
	*** 12.40284	53.12	ADV	38.8	-38.4	-9.89	43.63	54	-12.37	-	-	54	199	H
8	*** 4.95899	77.18	PK2	34	-43.8	0	67.38	-	-	74	-6.62	54	110	V
	*** 4.95903	70.28	ADV	34	-43.8	-9.89	50.59	54	-6.41	-	-	54	110	V
9	*** 7.43813	52.1	Pk	35.6	-41	0	46.7	54	-7.3	74	-27.3	0-360	101	V
11	*** 9.38813	49.58	Pk	36.2	-39.8	0	45.98	54	-8.02	74	-28.02	0-360	200	V
12	*** 12.3977	58.91	PK2	38.8	-38.2	0	59.51	-	-	74	-14.49	64	170	V
	*** 12.3973	50.88	ADV	38.8	-38.2	-9.89	41.59	54	-16.41	-	-	64	170	V
10	8.64563	49.92	Pk	35.8	-40.1	0	45.62	-	-	-	-	0-360	101	V
3	8.65031	50.34	Pk	35.8	-39.9	0	46.24	-	-	-	-	0-360	200	H
5	9.9225	51.12	Pk	37.1	-40.5	0	47.72	-	-	-	-	0-360	200	H
7	16.75969	46.67	Pk	41.1	-34.9	0	52.87	-	-	-	-	0-360	101	H
13	16.76531	47.52	Pk	41.1	-34.2	0	54.42	-	-	-	-	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

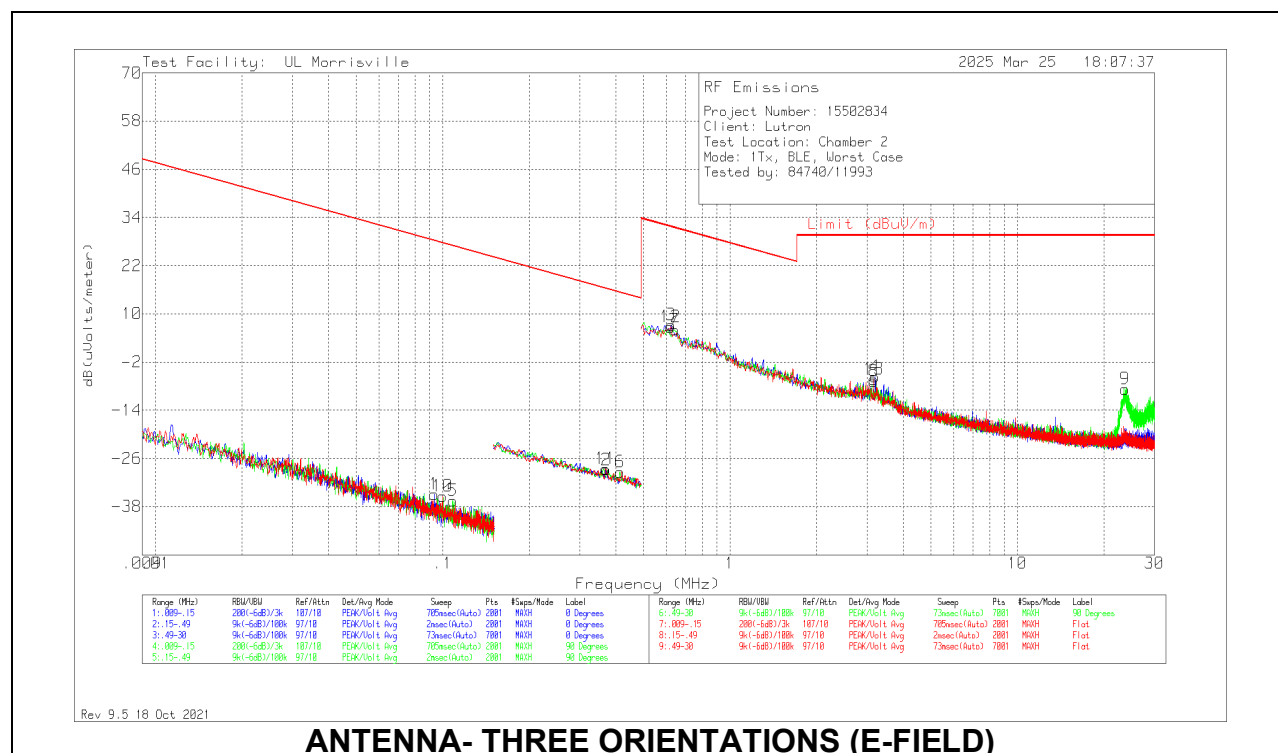
ADV - Linear Voltage Average

10.3. WORST CASE BELOW 30MHZ

10.3.1. BLE TYPE

SPURIOUS EMISSIONS BELOW 30 MHz (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 $40 \cdot \log(\text{test distance} / \text{specification distance})$.

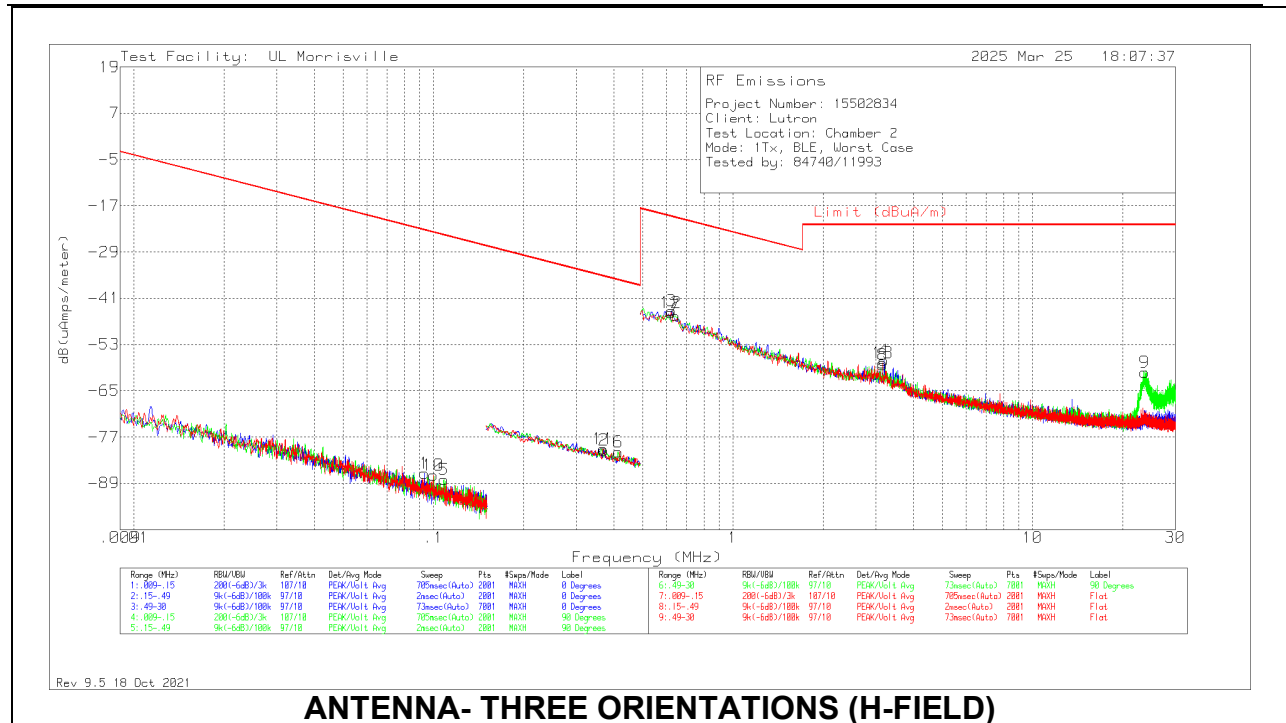


ANTENNA- THREE ORIENTATIONS (E-FIELD)

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	.09338	33.9	Pk	11.1	.1	-80	-34.9	28.2	-	-63.1	0-360	0 degs
10	.09981	33.45	Pk	11.1	.1	-80	-35.35	27.62	-	-62.97	0-360	Flat
5	.10826	32.23	Pk	11.1	.1	-80	-36.57	26.92	-	-63.49	0-360	90 degs
11	.36896	40.41	Pk	10.9	.1	-80	-28.59	16.26	36.26	-44.85	0-360	Flat
2	.37007	40.18	Pk	10.9	.1	-80	-28.82	16.24	36.24	-45.06	0-360	0 degs
6	.41342	39.56	Pk	11	.1	-80	-29.34	15.28	35.28	-44.62	0-360	90 degs
12	.6207	35.68	Pk	11	.1	-40	6.78	31.75	-	-24.97	0-360	Flat
3	.62491	36.11	Pk	11	.1	-40	7.21	31.69	-	-24.48	0-360	0 degs
7	.64178	34.9	Pk	11	.1	-40	6	31.46	-	-25.46	0-360	90 degs
8	3.16294	21.78	Pk	11.1	.3	-40	-6.82	29.54	-	-36.36	0-360	90 degs
13	3.16294	22.36	Pk	11.1	.3	-40	-6.24	29.54	-	-35.78	0-360	Flat
4	3.19667	22.97	Pk	11.1	.3	-40	-5.63	29.54	-	-35.17	0-360	0 degs
9	23.72859	22.08	Pk	8.4	.8	-40	-8.72	29.54	-	-38.26	0-360	90 degs

Pk - Peak detector



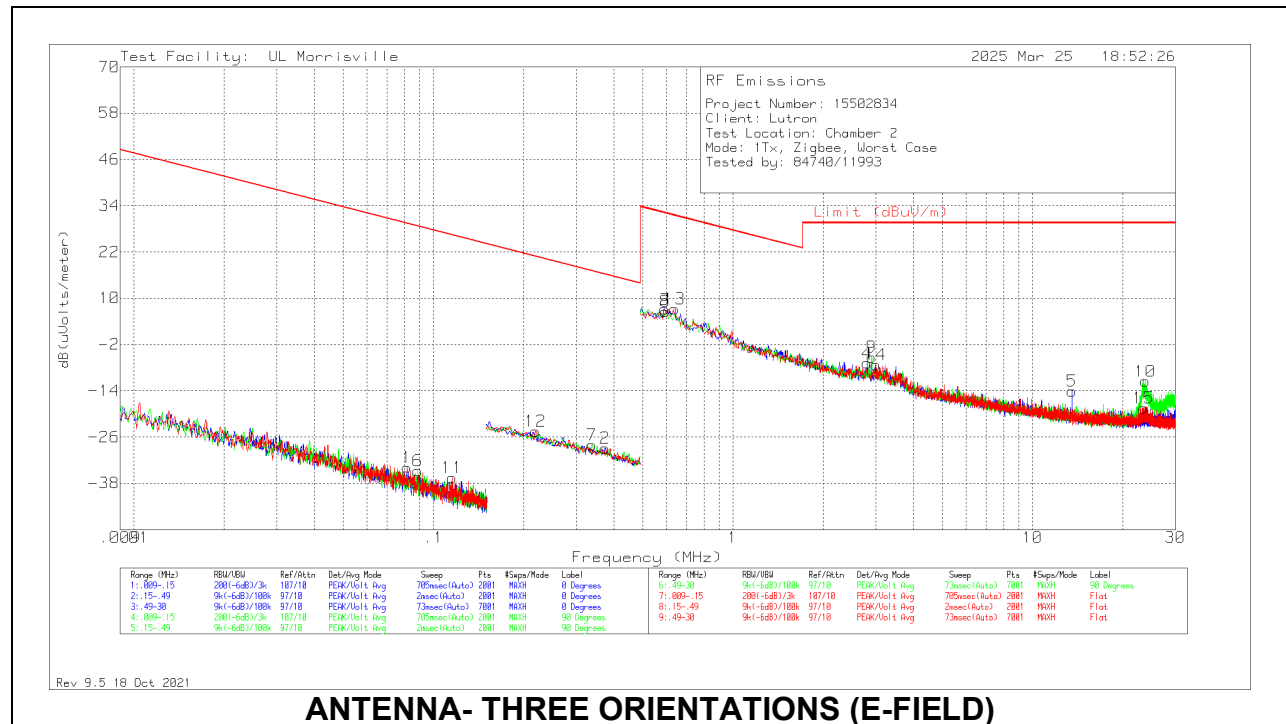
ANTENNA- THREE ORIENTATIONS (H-FIELD)

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	.09338	33.9	Pk	-40.4	.1	-80	-86.4	-23.3	-	-63.1	0-360	0 degs
10	.09981	33.45	Pk	-40.4	.1	-80	-86.85	-23.88	-	-62.97	0-360	Flat
5	.10826	32.23	Pk	-40.4	.1	-80	-88.07	-24.58	-	-63.49	0-360	90 degs
11	.36896	40.41	Pk	-40.6	.1	-80	-80.09	-35.24	-15.24	-44.85	0-360	Flat
2	.37007	40.18	Pk	-40.6	.1	-80	-80.32	-35.26	-15.26	-45.06	0-360	0 degs
6	.41342	39.56	Pk	-40.5	.1	-80	-80.84	-36.22	-16.22	-44.62	0-360	90 degs
12	.6207	35.68	Pk	-40.5	.1	-40	-44.72	-19.75	-	-24.97	0-360	Flat
3	.62491	36.11	Pk	-40.5	.1	-40	-44.29	-19.81	-	-24.48	0-360	0 degs
7	.64178	34.9	Pk	-40.5	.1	-40	-45.5	-20.04	-	-25.46	0-360	90 degs
8	3.16294	21.78	Pk	-40.4	.3	-40	-58.32	-21.96	-	-36.36	0-360	90 degs
13	3.16294	22.36	Pk	-40.4	.3	-40	-57.74	-21.96	-	-35.78	0-360	Flat
4	3.19667	22.97	Pk	-40.4	.3	-40	-57.13	-21.96	-	-35.17	0-360	0 degs
9	23.72859	22.08	Pk	-43.1	.8	-40	-60.22	-21.96	-	-38.26	0-360	90 degs

Pk - Peak detector

10.3.2. 802.15.4

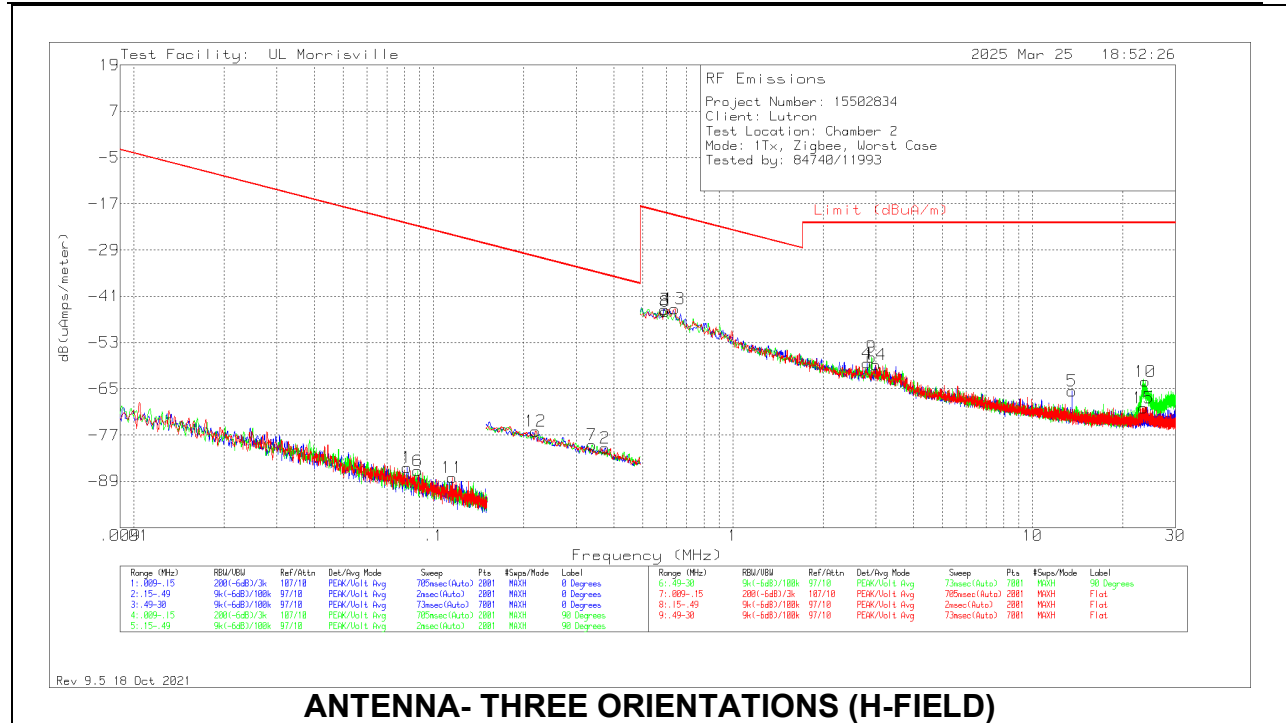


ANTENNA- THREE ORIENTATIONS (E-FIELD)

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	.08163	34.83	Pk	11.2	.1	-80	-33.87	29.37	49.37	-63.24	0-360	0 degs
6	.08852	33.99	Pk	11.1	.1	-80	-34.81	28.66	48.66	-63.47	0-360	90 degs
11	.11571	32.3	Pk	11.1	.1	-80	-36.5	26.34	46.34	-62.84	0-360	Flat
12	.21945	44.49	Pk	10.9	.1	-80	-24.51	20.78	40.78	-45.29	0-360	Flat
7	.33879	40.93	Pk	10.9	.1	-80	-28.07	17.01	37.01	-45.08	0-360	90 degs
2	.37449	40.15	Pk	10.9	.1	-80	-28.85	16.14	36.14	-44.99	0-360	0 degs
3	.59118	36.03	Pk	11	.1	-40	7.13	32.17	-	-25.04	0-360	0 degs
8	.5954	35.41	Pk	11	.1	-40	6.51	32.11	-	-25.6	0-360	90 degs
13	.63756	36.18	Pk	11	.1	-40	7.28	31.51	-	-24.23	0-360	Flat
4	2.80458	21.85	Pk	11.1	.2	-40	-6.85	29.54	-	-36.39	0-360	0 degs
9	2.90577	23.4	Pk	11.1	.2	-40	-5.3	29.54	-	-34.84	0-360	90 degs
14	3.00274	21.37	Pk	11.1	.3	-40	-7.23	29.54	-	-36.77	0-360	Flat
5	13.5596	15.52	Pk	9.8	.6	-40	-14.08	29.54	-	-43.62	0-360	0 degs
15	23.4419	12.36	Pk	8.4	.8	-40	-18.44	29.54	-	-47.98	0-360	Flat
10	23.82134	19.23	Pk	8.4	.8	-40	-11.57	29.54	-	-41.11	0-360	90 degs

Pk - Peak detector



ANTENNA- THREE ORIENTATIONS (H-FIELD)

Below 30MHz Data

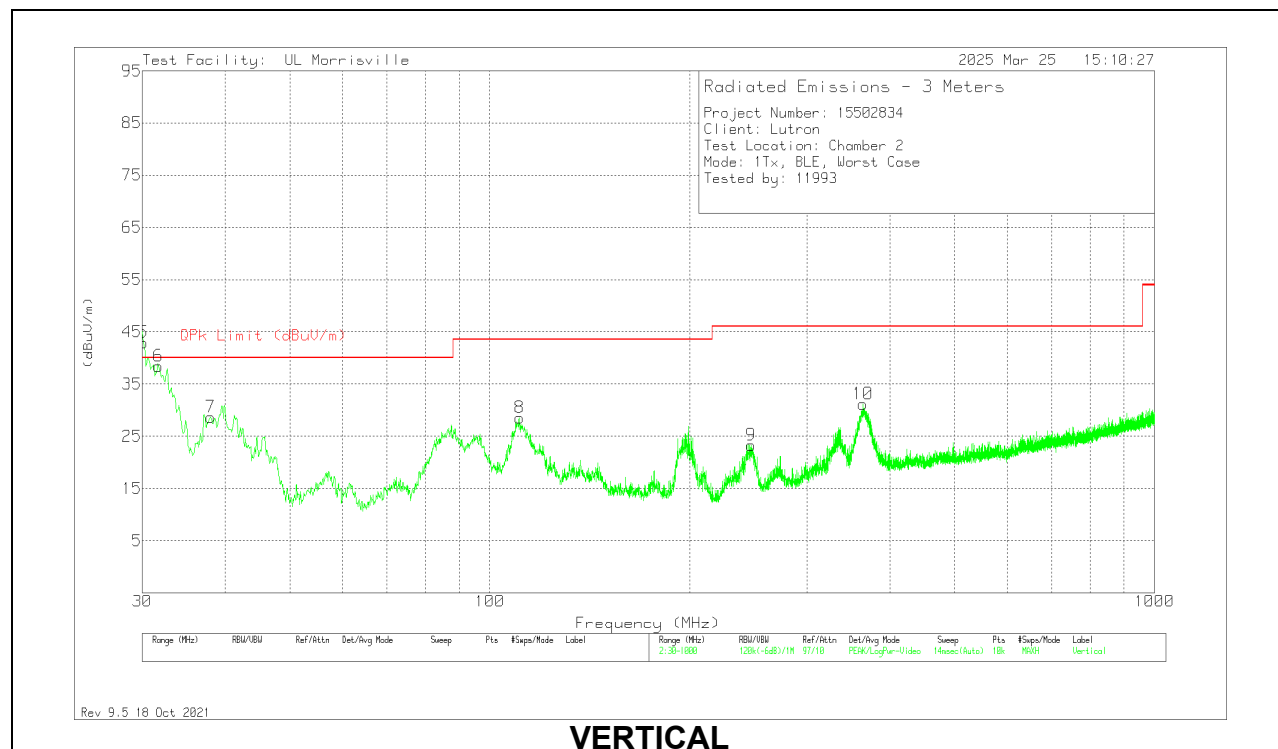
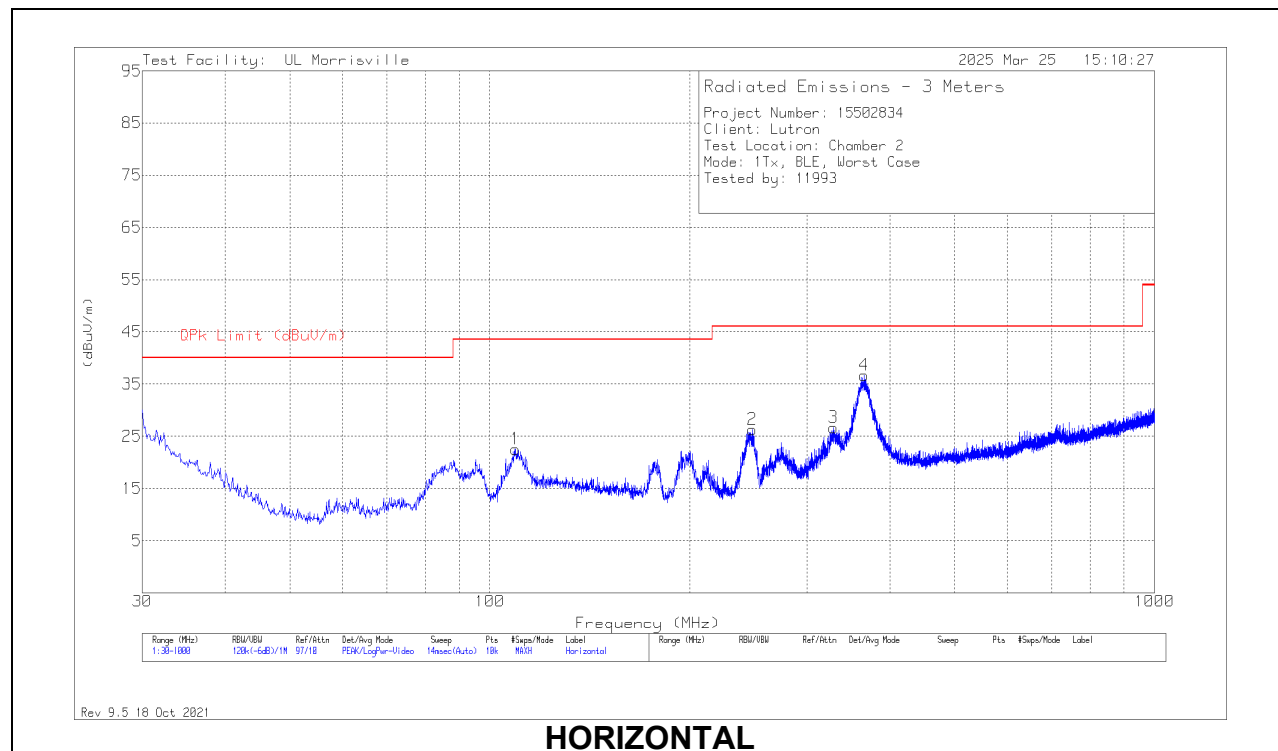
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QP/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
1	.08163	34.83	Pk	-40.3	.1	-80	-85.37	-22.13	-2.13	-63.24	0-360	0 degs
6	.08852	33.99	Pk	-40.4	.1	-80	-86.31	-22.84	-2.84	-63.47	0-360	90 degs
11	.11571	32.3	Pk	-40.4	.1	-80	-88	-25.16	-5.16	-62.84	0-360	Flat
12	.21945	44.49	Pk	-40.6	.1	-80	-76.01	-30.72	-10.72	-45.29	0-360	Flat
7	.33879	40.93	Pk	-40.6	.1	-80	-79.57	-34.49	-14.49	-45.08	0-360	90 degs
2	.37449	40.15	Pk	-40.6	.1	-80	-80.35	-35.36	-15.36	-44.99	0-360	0 degs
3	.59118	36.03	Pk	-40.5	.1	-40	-44.37	-19.33	-	-25.04	0-360	0 degs
8	.5954	35.41	Pk	-40.5	.1	-40	-44.99	-19.39	-	-25.6	0-360	90 degs
13	.63756	36.18	Pk	-40.5	.1	-40	-44.22	-19.99	-	-24.23	0-360	Flat
4	2.80458	21.85	Pk	-40.4	.2	-40	-58.35	-21.96	-	-36.39	0-360	0 degs
9	2.90577	23.4	Pk	-40.4	.2	-40	-56.8	-21.96	-	-34.84	0-360	90 degs
14	3.00274	21.37	Pk	-40.4	.3	-40	-58.73	-21.96	-	-36.77	0-360	Flat
5	13.5596	15.52	Pk	-41.7	.6	-40	-65.58	-21.96	-	-43.62	0-360	0 degs
15	23.4419	12.36	Pk	-43.1	.8	-40	-69.94	-21.96	-	-47.98	0-360	Flat
10	23.82134	19.23	Pk	-43.1	.8	-40	-63.07	-21.96	-	-41.11	0-360	90 degs

Pk - Peak detector

10.4. WORST CASE BELOW 1 GHZ

10.4.1. BLE TYPE

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	* ** 109.249	34.37	Pk	18.9	-30.7	22.57	43.52	-20.95	0-360	299	H
2	* ** 248.444	37.87	Pk	18	-29.6	26.27	46.02	-19.75	0-360	101	H
3	* ** 328.954	35.32	Pk	20.5	-29.2	26.62	46.02	-19.4	0-360	101	H
7	* ** 38.051	38.47	Pk	21.8	-31.6	28.67	40	-11.33	0-360	101	V
8	* ** 110.898	40.14	Pk	19.2	-30.8	28.54	43.52	-14.98	0-360	101	V
9	* ** 247.183	34.82	Pk	18.1	-29.6	23.32	46.02	-22.7	0-360	101	V
5	30.097	47.35	Pk	27.3	-31.7	42.95	-	-	0-360	101	V
6	31.746	43.84	Pk	26.2	-31.6	38.44	-	-	0-360	101	V
10	364.165	38.75	Pk	21.4	-29	31.15	-	-	0-360	199	V
4	365.329	44.24	Pk	21.5	-29.1	36.64	-	-	0-360	101	H

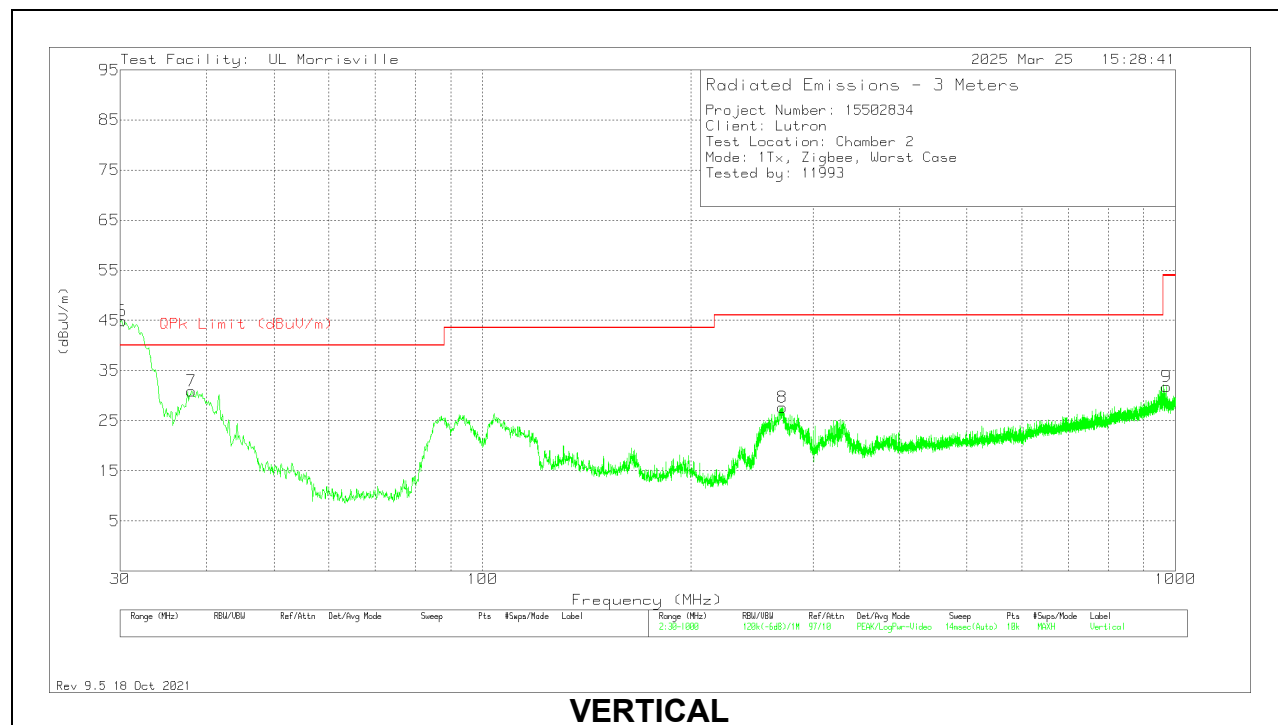
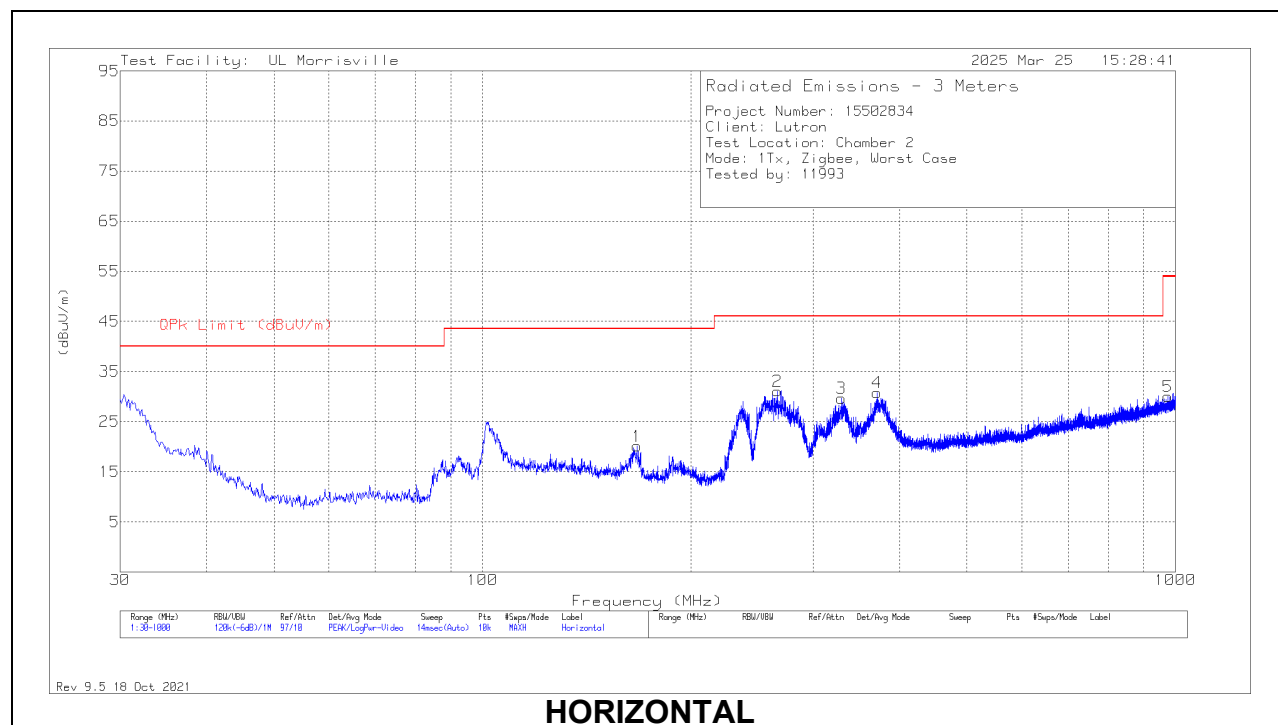
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.4.2. 802.15.4

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	* ** 166.964	31.99	Pk	18.4	-30.3	20.09	43.52	-23.43	0-360	199	H
2	* ** 266.389	41.1	Pk	19.5	-29.5	31.1	46.02	-14.92	0-360	99	H
3	* ** 329.73	38.47	Pk	20.5	-29.3	29.67	46.02	-16.35	0-360	99	H
5	* ** 975.265	25.58	Pk	29.7	-25.3	29.98	53.97	-23.99	0-360	399	H
7	* ** 38.051	40.69	Pk	21.8	-31.6	30.89	40	-9.11	0-360	101	V
8	* ** 271.045	37.5	Pk	19.8	-29.6	27.7	46.02	-18.32	0-360	101	V
9	* ** 971.191	27.39	Pk	29.7	-25.3	31.79	53.97	-22.18	0-360	101	V
6	30.194	49.38	Pk	27.3	-31.7	44.98	-	-	0-360	101	V
4	370.761	38.21	Pk	21.5	-28.9	30.81	-	-	0-360	99	H

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

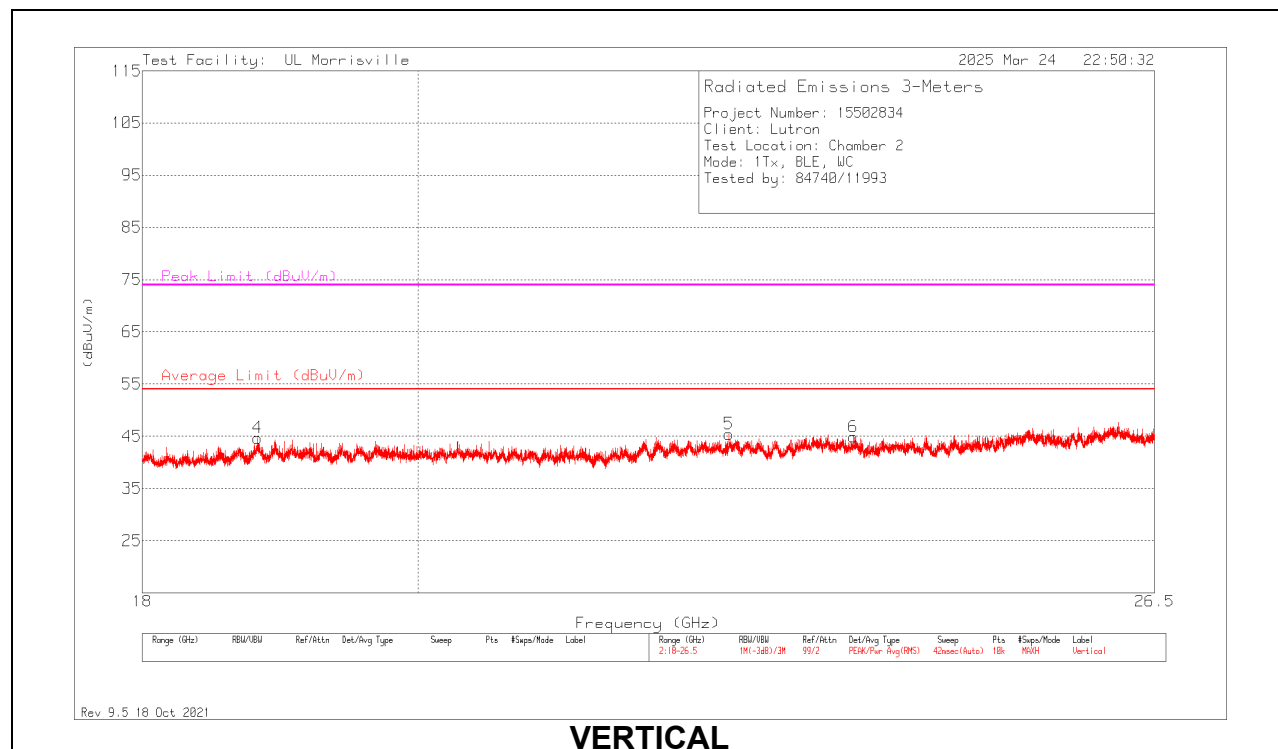
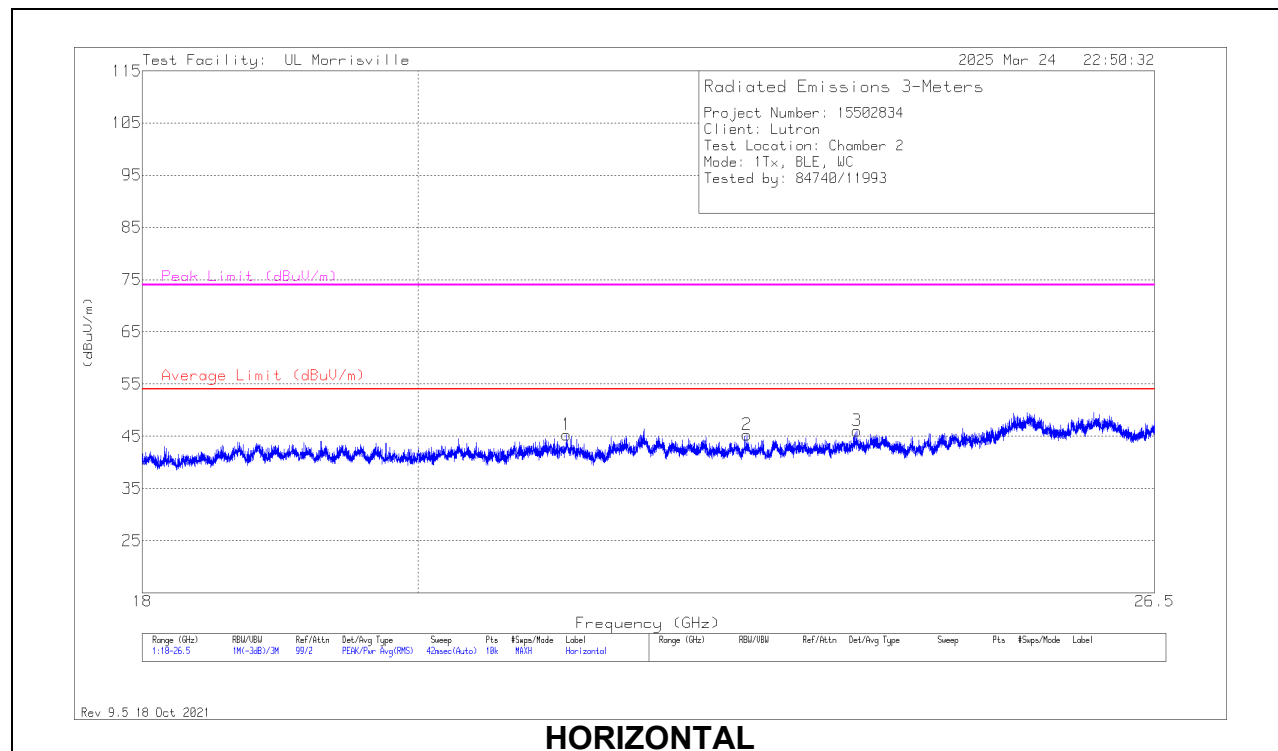
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.5. WORST CASE 18-26 GHZ

10.5.1. BLE TYPE

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	* ** 21.16678	49.4	Pk	33.6	-37.7	45.3	54	-8.7	74	-28.7	0-360	101	H
2	* ** 22.67708	48.45	Pk	34.1	-37.3	45.25	54	-8.75	74	-28.75	0-360	101	H
3	* ** 23.65193	48.9	Pk	34.5	-37.4	46	54	-8	74	-28	0-360	101	H
4	* ** 18.81167	48.87	Pk	33.4	-37.6	44.67	54	-9.33	74	-29.33	0-360	101	V
5	* ** 22.5224	48.92	Pk	34.2	-37.7	45.42	54	-8.58	74	-28.58	0-360	101	V
6	* ** 23.61964	47.75	Pk	34.6	-37.5	44.85	54	-9.15	74	-29.15	0-360	200	V

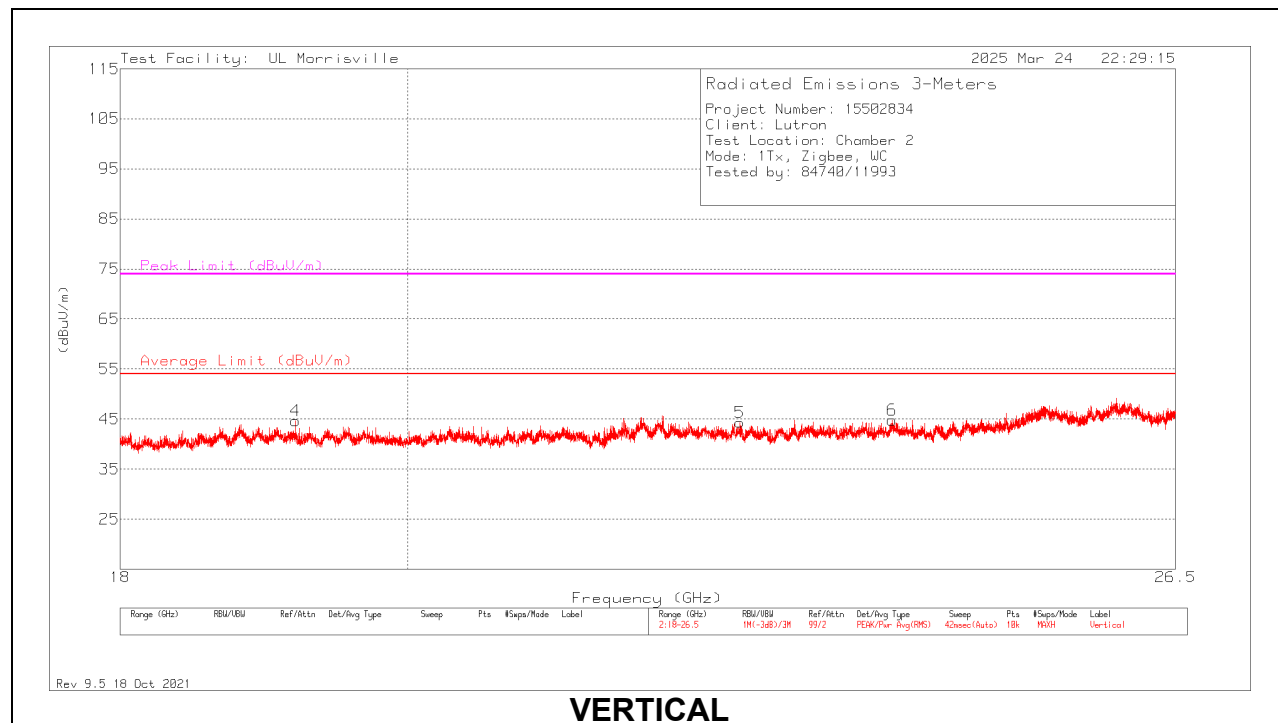
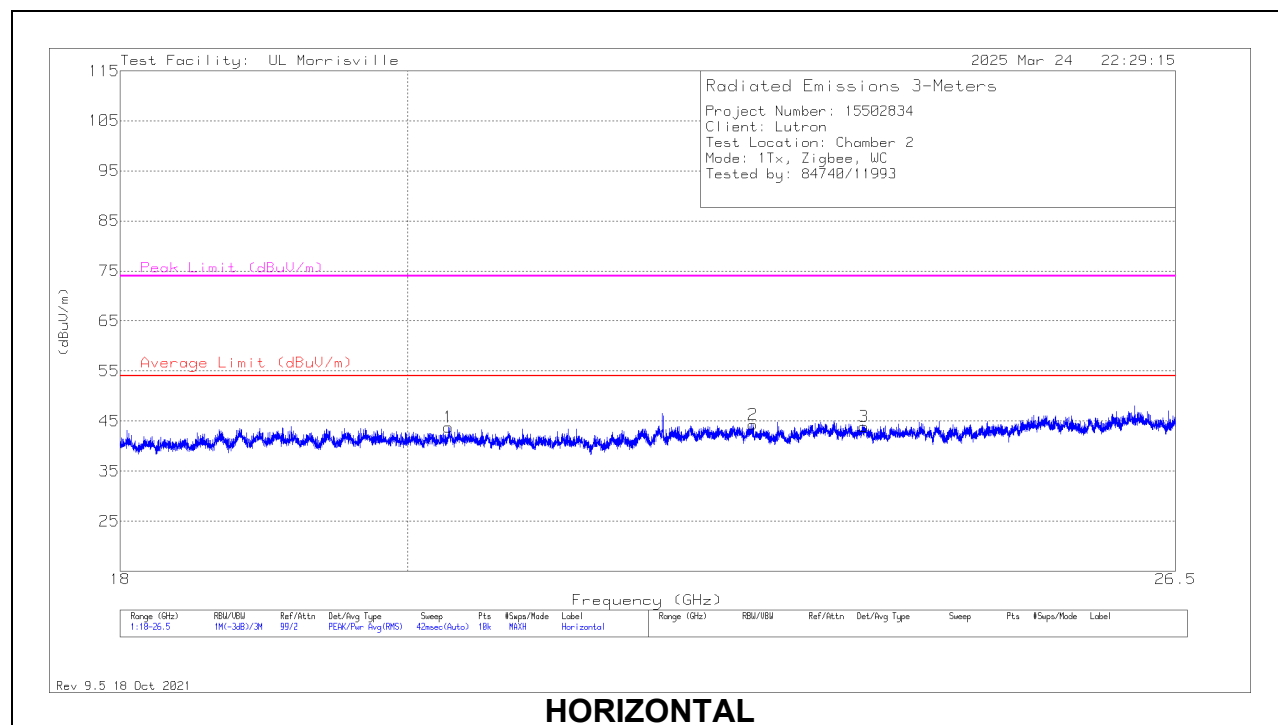
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.5.2. 802.15.4

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	* ** 20.30327	47.86	Pk	33.6	-37.7	43.76	54	-10.24	74	-30.24	0-360	149	H
2	* ** 22.69663	47.74	Pk	34.1	-37.5	44.34	54	-9.66	74	-29.66	0-360	249	H
3	* ** 23.64174	46.74	Pk	34.6	-37.4	43.94	54	-10.06	74	-30.06	0-360	299	H
4	* ** 19.19498	49.68	Pk	33.5	-38.5	44.68	54	-9.32	74	-29.32	0-360	299	V
5	* ** 22.59124	47.14	Pk	34.3	-37.1	44.34	54	-9.66	74	-29.66	0-360	101	V
6	* ** 23.88396	47.21	Pk	34.4	-36.8	44.81	54	-9.19	74	-29.19	0-360	299	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

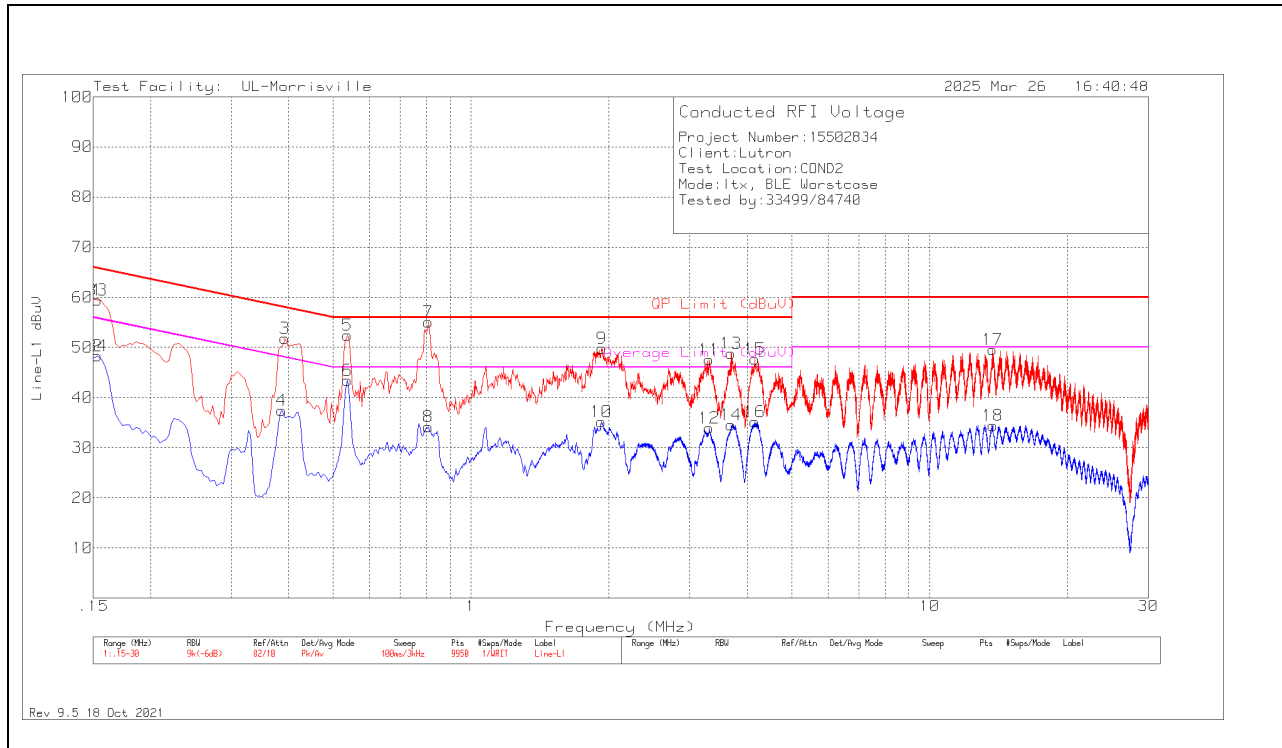
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

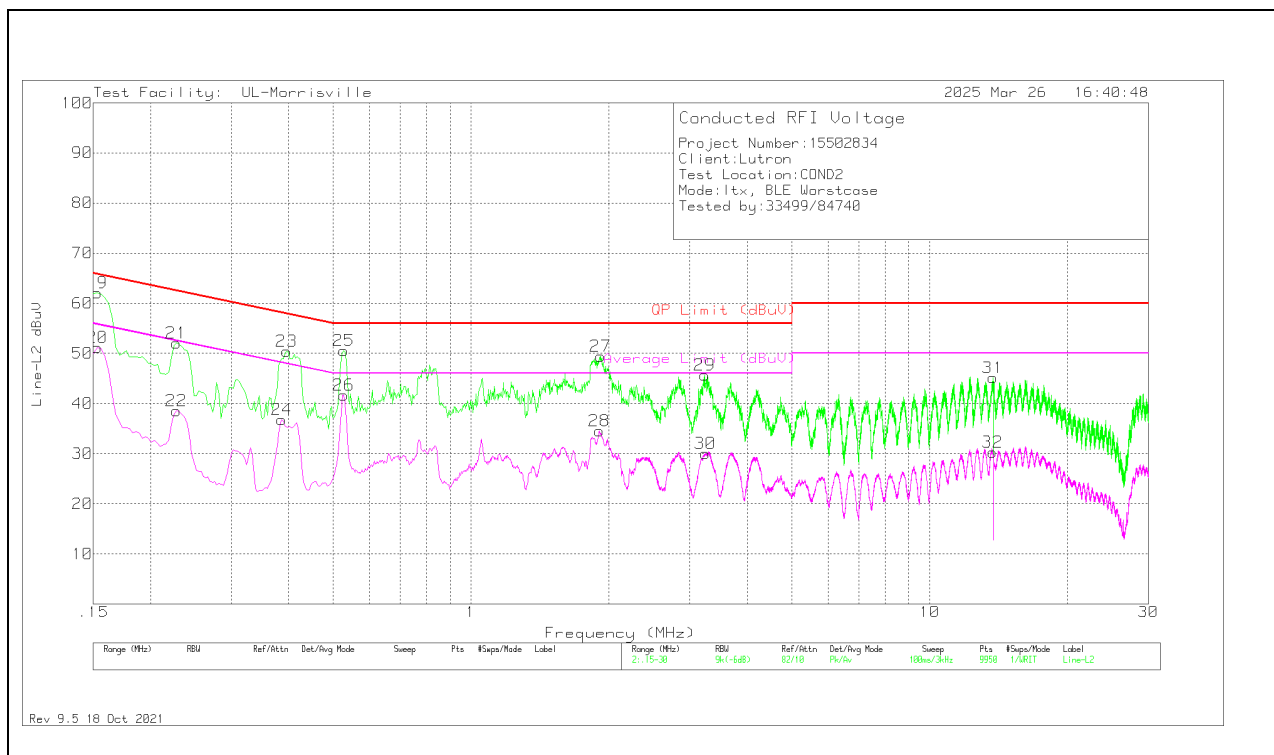
11.1.1. AC Power Line Norm (BLE TYPE) LINE 1 RESULTS



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	49.47	Pk	.2	9.8	59.47	65.84	-6.37	-	-
2	.153	38.33	Av	.2	9.8	48.33	-	-	55.84	-7.51
33	.153	49.47	Pk	.2	9.8	59.47	65.84	-6.37	-	-
34	.153	38.33	Av	.2	9.8	48.33	-	-	55.84	-7.51
4	.387	27.49	Av	.1	9.8	37.39	-	-	48.13	-10.74
3	.393	41.88	Pk	.1	9.8	51.78	58	-6.22	-	-
5	.5258	40.01	Qp	0	9.8	49.81	56	-6.19	-	-
6	.5258	33.83	Ca	0	9.8	43.63	-	-	46	-2.37
7	.80592	39.13	Qp	0	9.8	48.93	56	-7.07	-	-
8	.807	24.36	Av	0	9.8	34.16	-	-	46	-11.84
10	1.923	25.34	Av	0	9.8	35.14	-	-	46	-10.86
9	1.929	40.06	Pk	0	9.8	49.86	56	-6.14	-	-
11	3.309	37.81	Pk	0	9.8	47.61	56	-8.39	-	-
12	3.309	24.12	Av	0	9.8	33.92	-	-	46	-12.08
13	3.693	38.9	Pk	0	9.9	48.8	56	-7.2	-	-
14	3.693	24.65	Av	0	9.9	34.55	-	-	46	-11.45
15	4.152	37.76	Pk	0	9.9	47.66	56	-8.34	-	-
16	4.155	25.22	Av	0	9.9	35.12	-	-	46	-10.88
17	13.722	39.43	Pk	.1	10	49.53	60	-10.47	-	-
18	13.725	24.3	Av	.1	10	34.4	-	-	50	-15.6

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

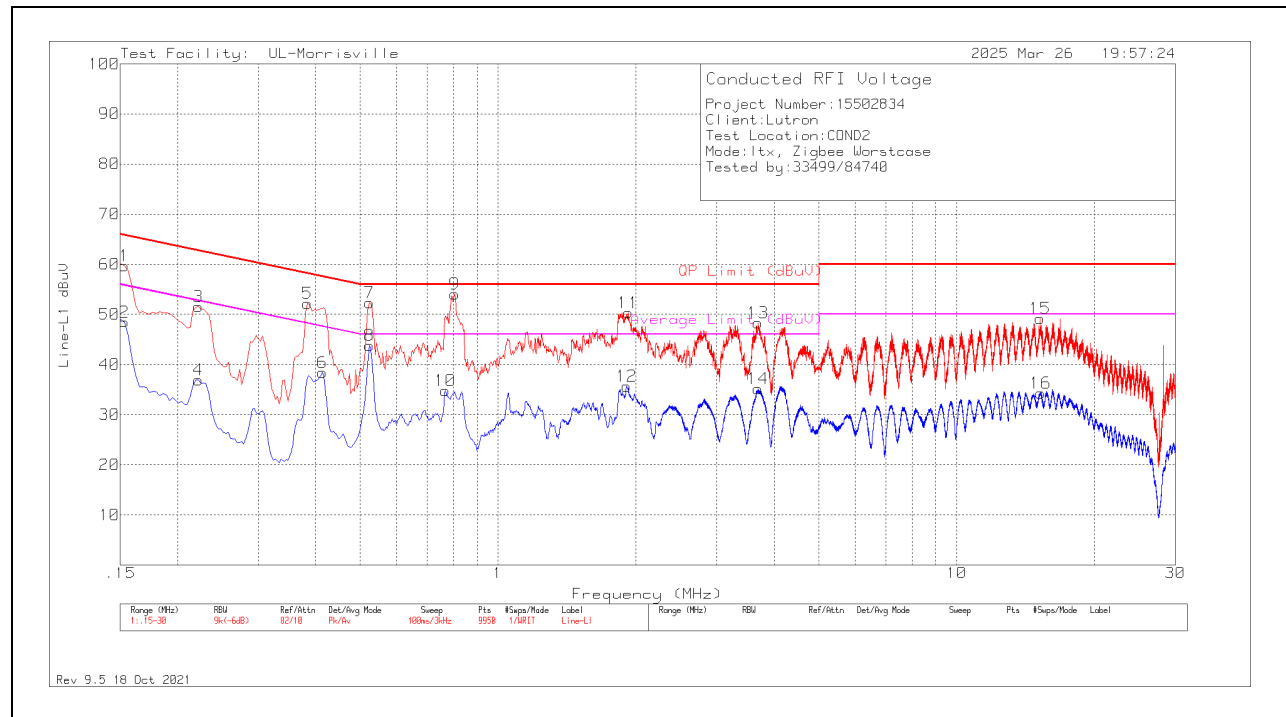
LINE 2 RESULTS



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)
19	.15164	50.14	Qp	.2	9.8	60.14	65.91	-5.77	-	-
20	.1508	42.05	Ca	.2	9.8	52.05	-	-	55.96	-3.91
21	.228	42.17	Pk	.1	9.8	52.07	62.52	-10.45	-	-
22	.228	28.64	Av	.1	9.8	38.54	-	-	52.52	-13.98
24	.387	26.92	Av	.1	9.8	36.82	-	-	48.13	-11.31
23	.396	40.51	Pk	.1	9.8	50.41	57.94	-7.53	-	-
25	.52418	38.31	Qp	0	9.8	48.11	56	-7.89	-	-
26	.52418	32.49	Ca	0	9.8	42.29	-	-	46	-3.71
28	1.905	24.75	Av	0	9.8	34.55	-	-	46	-11.45
27	1.917	39.64	Pk	0	9.8	49.44	56	-6.56	-	-
29	3.234	35.92	Pk	0	9.8	45.72	56	-10.28	-	-
30	3.246	20.21	Av	0	9.8	30.01	-	-	46	-15.99
32	13.722	20.17	Av	.1	10	30.27	-	-	50	-19.73
31	13.734	35.03	Pk	.1	10	45.13	60	-14.87	-	-

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

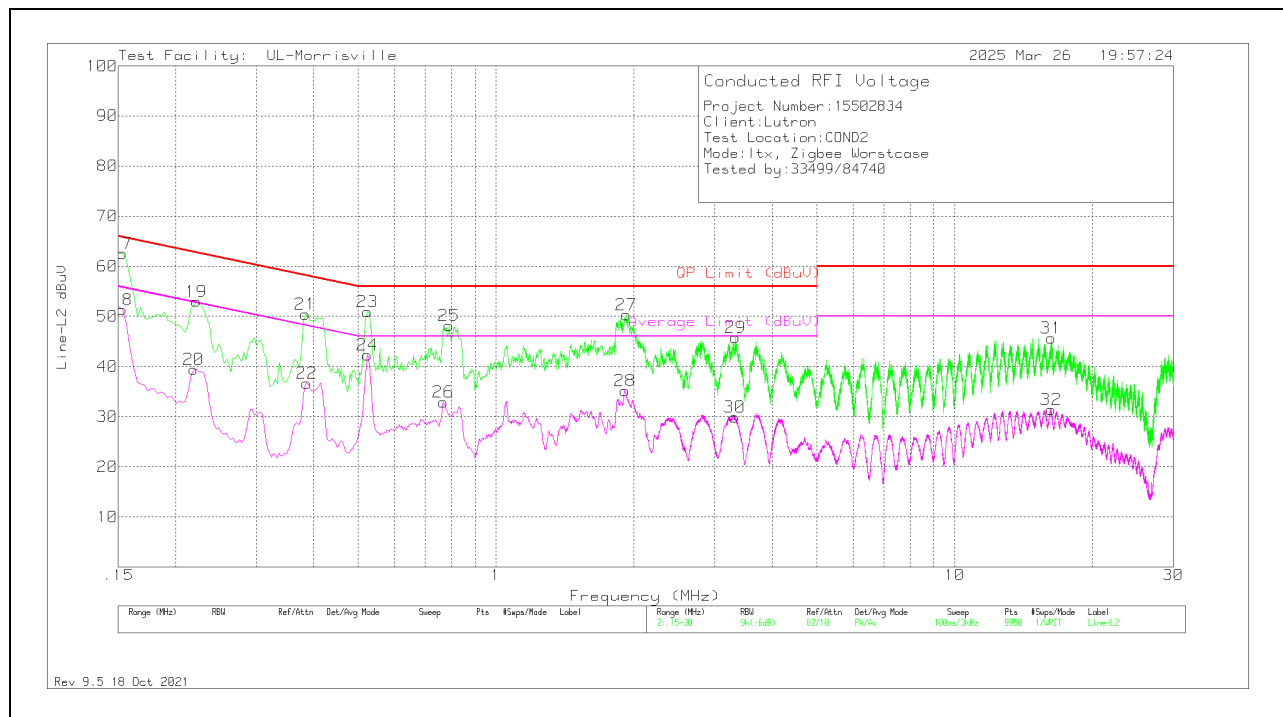
11.1.1. AC Power Line Norm (802.15.4) LINE 1 RESULTS



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	49.71	Pk	.2	9.8	59.71	65.84	-6.13	-	-
2	.153	38.49	Av	.2	9.8	48.49	-	-	55.84	-7.35
3	.222	41.63	Pk	.1	9.8	51.53	62.74	-11.21	-	-
4	.222	27.07	Av	.1	9.8	36.97	-	-	52.74	-15.77
5	.384	42.29	Pk	.1	9.8	52.19	58.19	-6	-	-
6	.414	28.47	Av	.1	9.8	38.37	-	-	47.57	-9.2
7	.52572	40.1	Qp	0	9.8	49.9	56	-6.1	-	-
8	.52572	33.99	Ca	0	9.8	43.79	-	-	46	-2.21
9	.8031	44.24	QP	0	9.8	48.93	56	-7.07	-	-
10	.768	24.96	Av	0	9.8	34.76	-	-	46	-11.24
11	1.92296	35.45	Qp	0	9.8	45.25	56	-10.75	-	-
12	1.908	25.82	Av	0	9.8	35.62	-	-	46	-10.38
13	3.693	38.4	Pk	0	9.9	48.3	56	-7.7	-	-
14	3.693	25.3	Av	0	9.9	35.2	-	-	46	-10.8
15	15.21	38.87	Pk	.2	10.1	49.17	60	-10.83	-	-
16	15.237	23.99	Av	.2	10.1	34.29	-	-	50	-15.71

Pk - Peak detector
Qp - Quasi-Peak detector
Av - Average detection
Ca - CISPR 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)
17	.15086	50.23	Qp	.2	9.8	60.23	65.95	-5.72	-	-
18	.15086	41.94	Ca	.2	9.8	51.94	-	-	55.95	-4.01
19	.222	43.1	Pk	.1	9.8	53	62.74	-9.74	-	-
20	.219	29.56	Av	.1	9.8	39.46	-	-	52.86	-13.4
21	.384	40.59	Pk	.1	9.8	50.49	58.19	-7.7	-	-
22	.387	26.8	Av	.1	9.8	36.7	-	-	48.13	-11.43
23	.52424	38.44	Qp	0	9.8	48.24	56	-7.76	-	-
24	.52424	32.6	Ca	0	9.8	42.4	-	-	46	-3.6
25	.789	38.37	Pk	0	9.8	48.17	56	-7.83	-	-
26	.768	23.13	Av	0	9.8	32.93	-	-	46	-13.07
27	1.90874	35.96	Qp	0	9.8	45.76	56	-10.24	-	-
28	1.911	25.35	Av	0	9.8	35.15	-	-	46	-10.85
29	3.33	35.99	Pk	0	9.8	45.79	56	-10.21	-	-
30	3.318	20.14	Av	0	9.8	29.94	-	-	46	-16.06
31	16.23	35.43	Pk	.2	10.1	45.73	60	-14.27	-	-
32	16.224	21.08	Av	.2	10.1	31.38	-	-	50	-18.62

Pk - Peak detector
Qp - Quasi-Peak detector
Av - Average detection
Ca - CISPR average detection

12. SETUP PHOTOS

Please refer to R15502834-EP1 for setup photos

END OF TEST REPORT