

# TEST REPORT

**Report Number. :** 14629526-E2V3

**Applicant :** CRADLEPOINT, INC.  
1100 W Idaho St  
Boise, ID, 83702  
U.S.A

**Model :** S5A312A

**FCC ID :** UXX-S5A312A

**IC :** 6921A-S5A312A

**EUT Description :** W1855 Series 5G Wideband Adapter

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5 + A1 + A2

**Date Of Issue:**  
2023-06-20

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## REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-05-30	Initial Issue	
V2	2023-06-13	Updated Section 6.3	Kiya Kedida
V3	2023-06-20	Updated Section 6.5 and Set-up Photos	Kiya Kedida

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** CRADLEPOINT, INC.  
1100 W Idaho St  
Boise, ID, 83702  
U.S.A

**EUT DESCRIPTION:** W1855 Series 5G Wideband Adapter

**MODEL:** S5A312A

**SERIAL NUMBER:** MM225200006604

**SAMPLE RECEIPT DATE:** 2023-02-20

**DATE TESTED:** 2023-02-22 TO 2023-04-28

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

UL Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
UL Verification Services Inc. By:

Prepared By:



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Dan Coronia  
Operations Leader  
Consumer Technology Division  
UL Verification Services Inc.

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Kiya Kedida  
Senior Test Engineer  
Consumer Technology Division  
UL Verification Services Inc.

## 2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. 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 (see section 6.3)

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	Compliant	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	Compliant	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Compliant	None.

## 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, ANSI C63.10-2013, 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 2.

## 4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, 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 1: 47173 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
<input type="checkbox"/>	Building 2: 47266 Benicia Street Fremont, CA 94538, U.S.A	US0104	22541	550739
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd Fremont, CA 94538, U.S.A	US0104	2324B	550739

## 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	U <sub>Lab</sub>
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Power Spectral Density	2.47 dB
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
Unwanted Emissions, Conducted	1.94 dB
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	3.39%
Temperature	0.57°C
Humidity	3.39%
DC Supply Voltages	0.57%

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 W1855 Series 5G Wideband Adapter.

### 6.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Conducted Power (dBm)	Output Conducted Power (mW)
2402 - 2480	BLE (1 Mbps)	14.65	29.17
2402 - 2480	BLE (2 Mbps)	11.35	13.65

### 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 2.9dBi.

### 6.4. SOFTWARE AND FIRMWARE

The EUT firmware/software installed during testing was 7.23.20.

### 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 output power as worst-case scenario.

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

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

Worst-case data rates as provided by the client were:

BLE :1 Mbps  
BLE : 2 Mbps

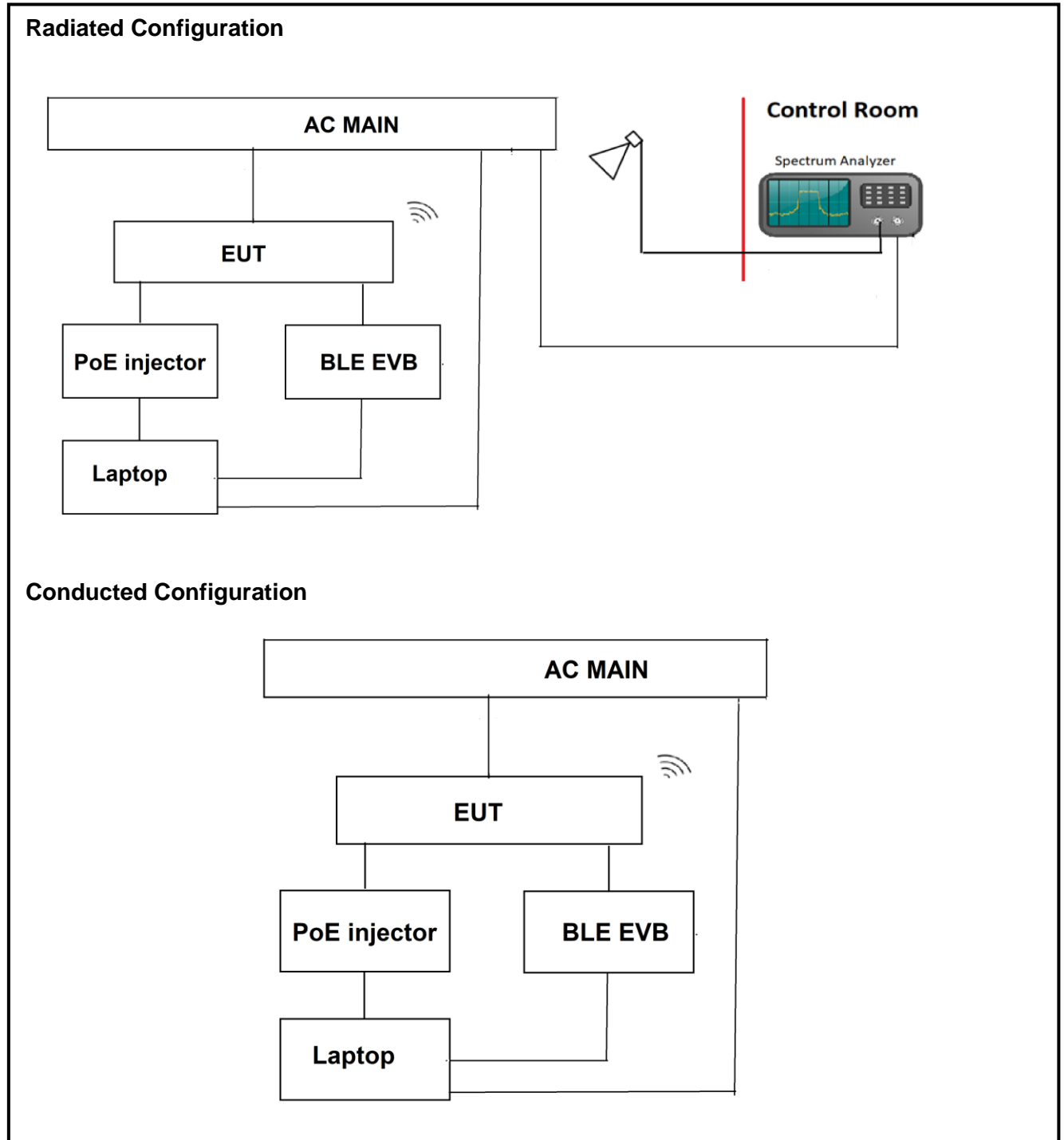
## 6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Lenovo	T460s	PC0JMBF8	Doc		
Laptop AC/DC Adapter	Lenovo	ADLX65YLC2A	8SSA10M13548L1CZ85M00Y6	Doc		
PoE injector	PHIHONG	POE29U-1AT(PL)	V220201025A2	Doc		
BLE EVB	Silicon Labs	PCB4001 Rev A03	181941947	Doc		
I/O CABLES (CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	AC	Un-shielded	1.25	AC Mains to Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1.0	AC/DC Adapter to Laptop
3	AC	1	AC	Un-shielded	1.25	AC Mains to EUT AC/DC Adapter
4	Ethernet	2	RJ45	Un-shielded	1.5	EUT to PoE Injector and PC Ethernet Adapter
5	USB	1	USB	Shielded	0.05	BLE EVB to PC Female Adapter
6	10 Pin	1	Pin	Shielded	0.05	BLE EVB to EUT Ribbon Cable
7	SMA Cable	1	SMA	Un-Shielded	1.0	EUT to Spectrum Analyzer
I/O CABLES (RADIATED TEST)						
Cable No.	Port	# Of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	AC	Un-shielded	1.25	AC Mains to Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1.0	AC/DC Adapter to Laptop
3	AC	1	AC	Un-shielded	1.25	AC Mains to EUT AC/DC Adapter
4	Ethernet	2	RJ45	Un-shielded	1.5	EUT to PoE Injector and PC Ethernet Adapter
5	USB	1	USB	Shielded	0.05	BLE EVB to PC Female Adapter
6	10 Pin	1	Pin	Shielded	0.05	BLE EVB to EUT Ribbon Cable
7	SMA Cable	1	SMA	Un-Shielded	1.0	EUT to Horn Antenna

**TEST SETUP**

The EUT is a stand-alone unit, and the radio is exercised by BG tool Compliance GUI test utility software.

**SETUP DIAGRAM**



## 7. MEASUREMENT METHOD

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

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW  $\geq$  DTS BW

Occupied BW (99%): ANSI C63.10-2013 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)

Radiated emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11

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

Conducted emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.2

Band-edge: ANSI C63.10 Subclause -11.13.3.2 Integration method -Peak detection

Band-edge: ANSI C63.10 Subclause -11.13.3.4 Integration method -Trace averaging across ON and OFF times DC correction

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

## 8. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
Antenna, Broadband Hybrid, 30MHz to 2GHz	Sunol Sciences Corp.	JB1	80706	2023-07-28	2022-07-28
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	Port 0	213877	2023-11-23	2022-11-23
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	222741	2023-08-31	2022-08-31
RF Filter Box, 1-18GHz	FREMONT	SAC-L1	171875	2023-11-10	2022-11-10
EMI TEST RECEIVER, with B8 option	Rohde & Schwarz	ESW44	191429	2024-02-29	2023-02-15
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	225688	2024-02-29	2023-02-14
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	199659	2023-06-12	2022-06-12
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	234683	2024-03-29	2023-03-18
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	170014	2023-07-19	2022-07-19
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	170016	2023-07-19	2022-07-19
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent Technologies	N9030A	80396	2024-01-31	2023-01-27
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2024-01-31	2023-01-26
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	81319	2024-01-31	2023-01-25
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	N/A	Verified	Verified
AC Line Conducted					
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2024-01-31	2023-01-31
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2024-02-29	2023-02-29
Transient Limiter	TE	TBFL1	207996	2023-07-15	2022-07-15
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Rev 2015-12-29, 2020-04-15 & 2023-01-18		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		
AC Line Conducted Software	UL	UL EMC	Rev 2022-02-17		

## 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)
<b>2.4GHz Band</b>						
BLE (1Mbps)	2.148	2.502	0.859	85.87%	0.66	0.465
BLE (2Mbps)	1.082	1.875	0.577	57.70%	2.39	0.925

#### DUTY CYCLE PLOTS



## 9.2. 99% BANDWIDTH

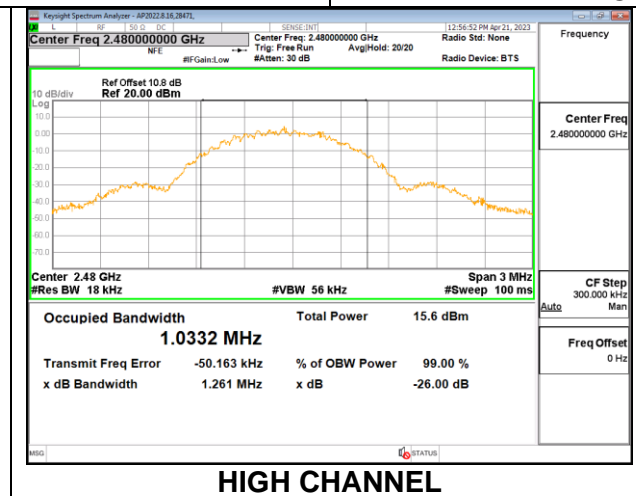
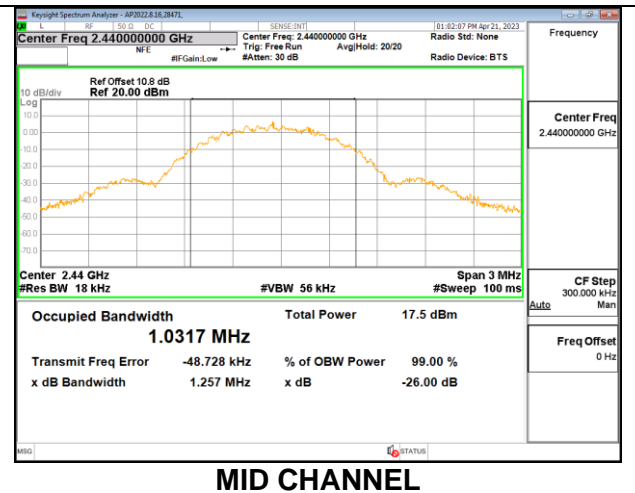
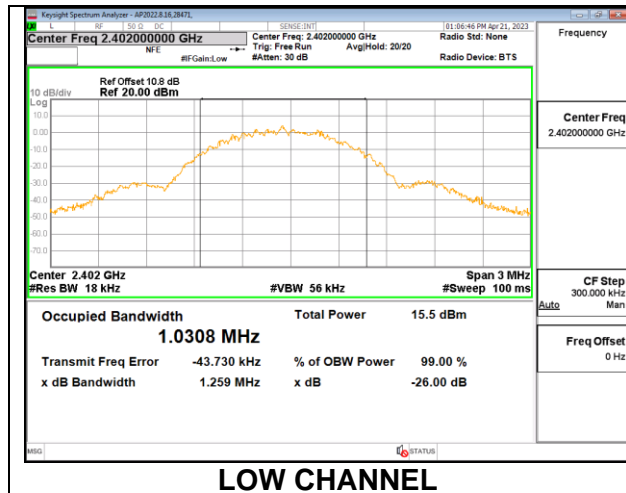
### LIMITS

None; for reporting purposes only.

### RESULTS

#### 9.2.1. BLE (1Mbps)

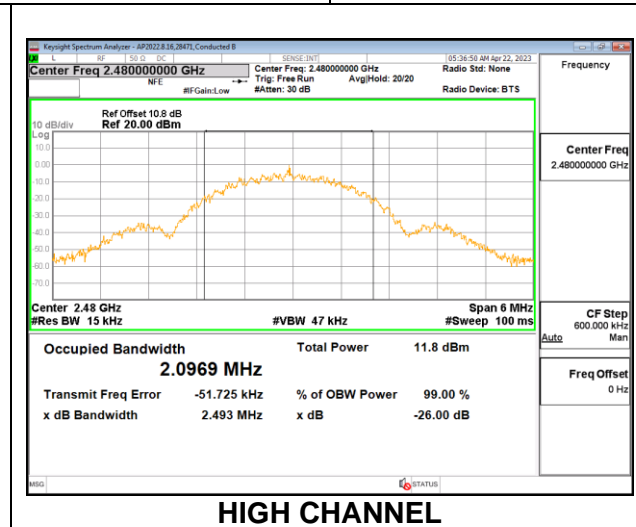
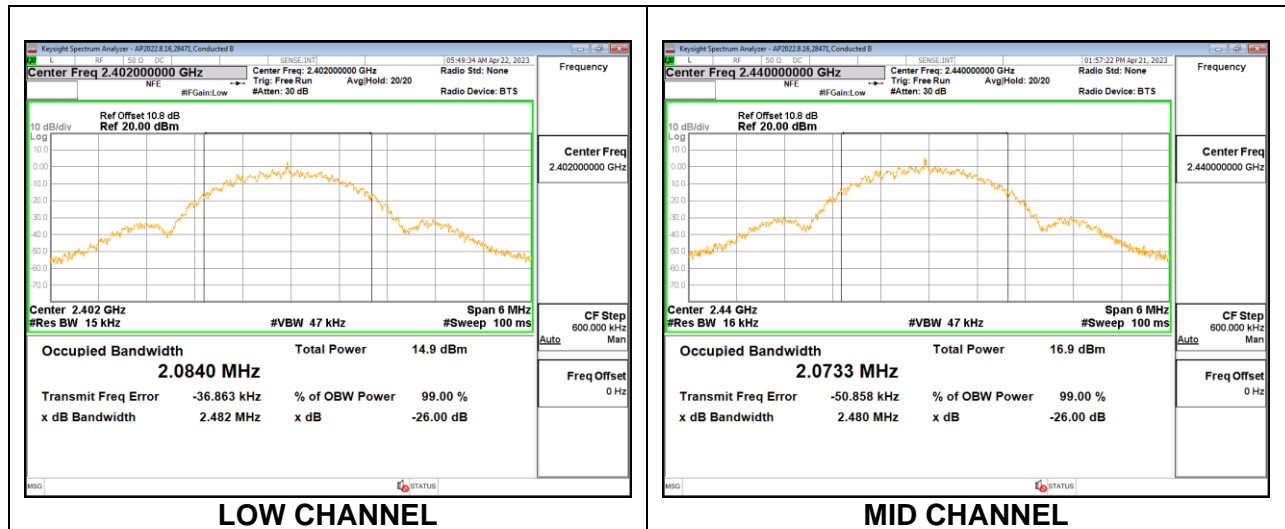
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0308
Middle	2440	1.0317
High	2480	1.0332





### 9.2.2. BLE (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0840
Middle	2440	2.0733
High	2480	2.0969



### **9.3. 6 dB BANDWIDTH**

#### **LIMITS**

FCC §15.247 (a) (2)

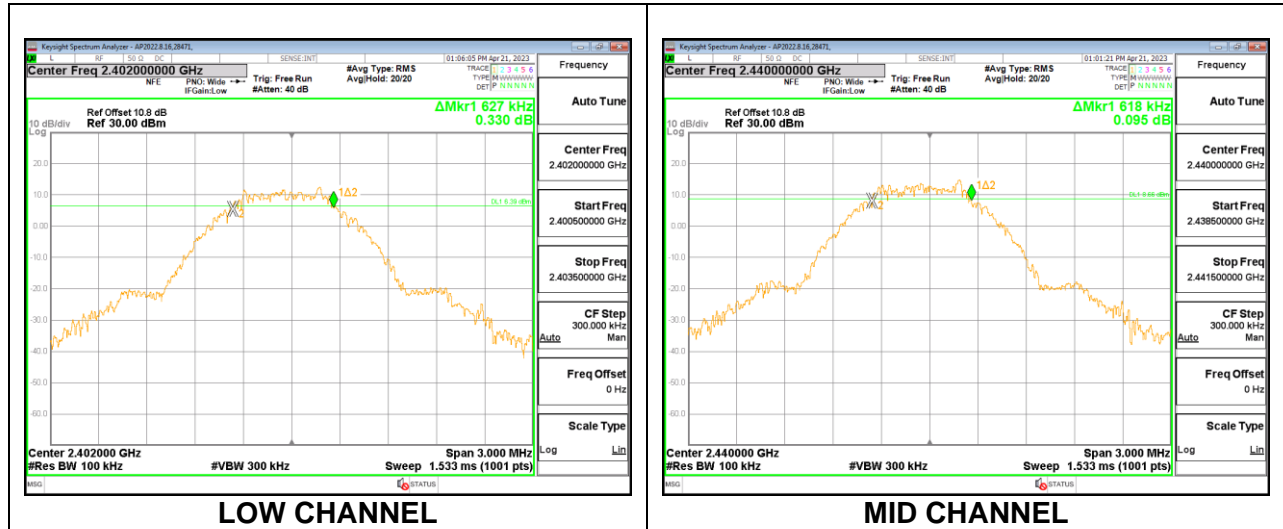
RSS-247 5.2 (a)

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

#### **RESULTS**

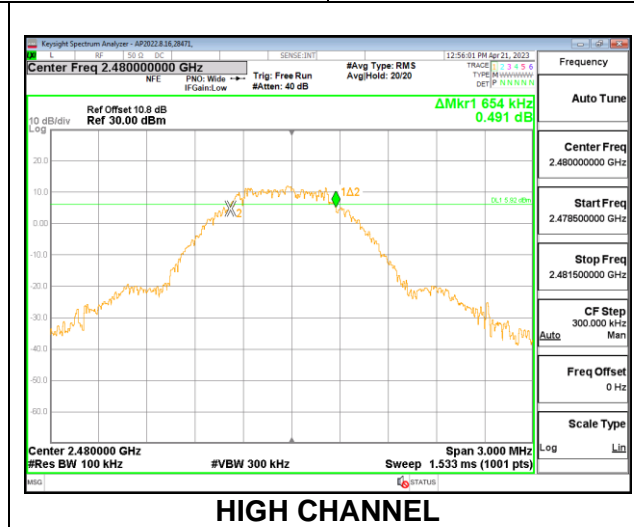
### 9.3.1. BLE (1Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.627	0.5
Middle	2440	0.618	0.5
High	2480	0.654	0.5



**LOW CHANNEL**

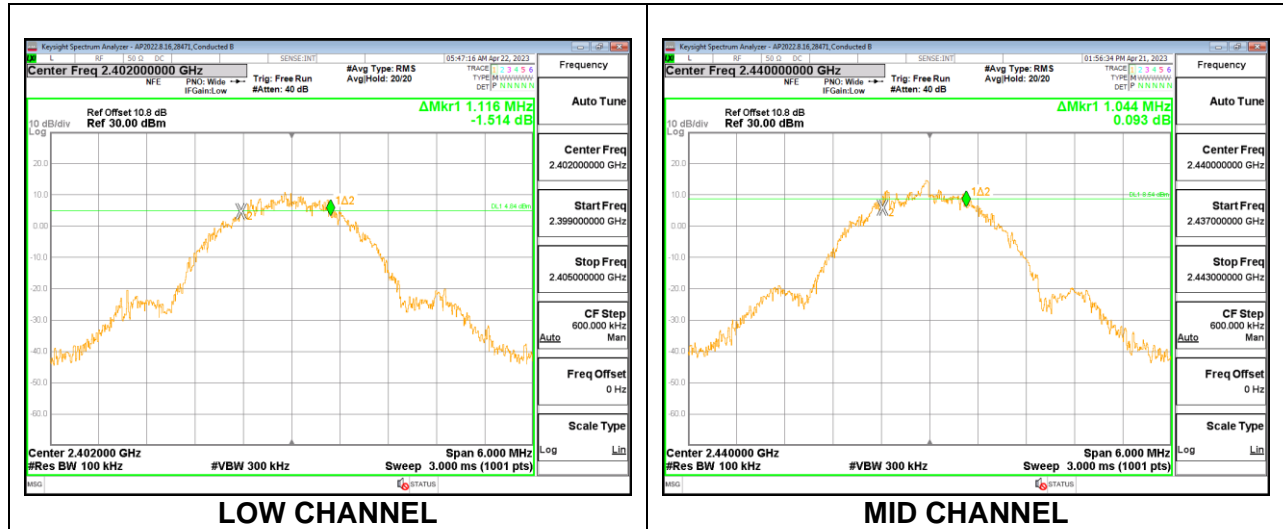
**MID CHANNEL**



**HIGH CHANNEL**

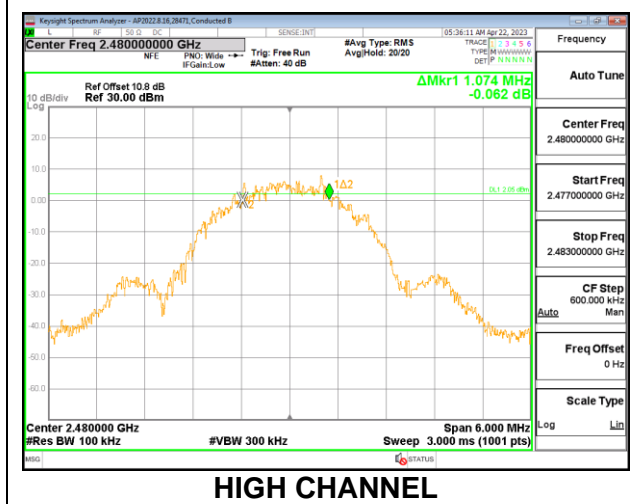
### 9.3.2. BLE (2Mbps)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.116	0.5
Middle	2440	1.044	0.5
High	2480	1.074	0.5



**LOW CHANNEL**

**MID CHANNEL**



**HIGH CHANNEL**

## 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 power output was measured on the EUT antenna port using 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)

<b>Tested By:</b>	28471 TL
<b>Date:</b>	2023-04-21

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.69	30	-17.310
Middle	2440	14.65	30	-15.350
High	2480	12.89	30	-17.110

#### 9.4.2. BLE (2Mbps)

<b>Tested By:</b>	28471 TL
<b>Date:</b>	2023-04-21

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.37	30	-20.630
Middle	2440	11.63	30	-18.370
High	2480	9.46	30	-20.540

## 9.5. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using 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)

<b>Tested By:</b>	28471 TL
<b>Date:</b>	2023-04-21

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	12.26
Middle	2440	14.33
High	2480	12.5

#### 9.5.2. BLE (2Mbps)

<b>Tested By:</b>	28471 TL
<b>Date:</b>	2023-04-28

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	8.61
Middle	2440	11.36
High	2480	8.49

## **9.6. POWER SPECTRAL DENSITY**

### **LIMITS**

FCC §15.247 (e)

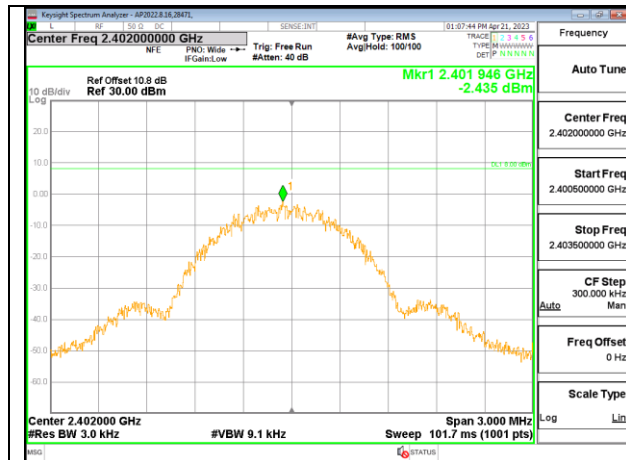
RSS-247 (5.2) (b)

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.

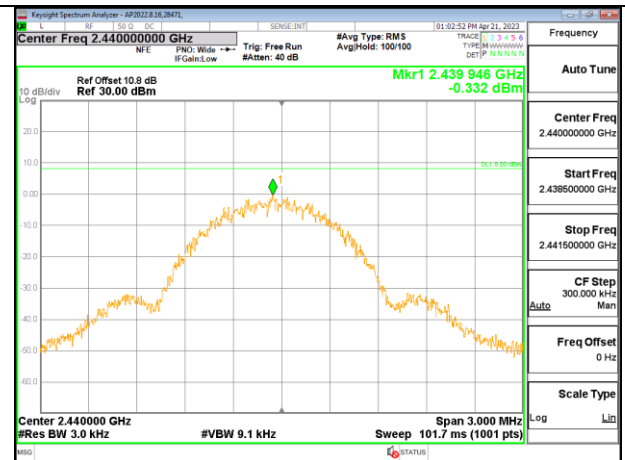
### **RESULTS**

### 9.6.1. BLE (1Mbps)

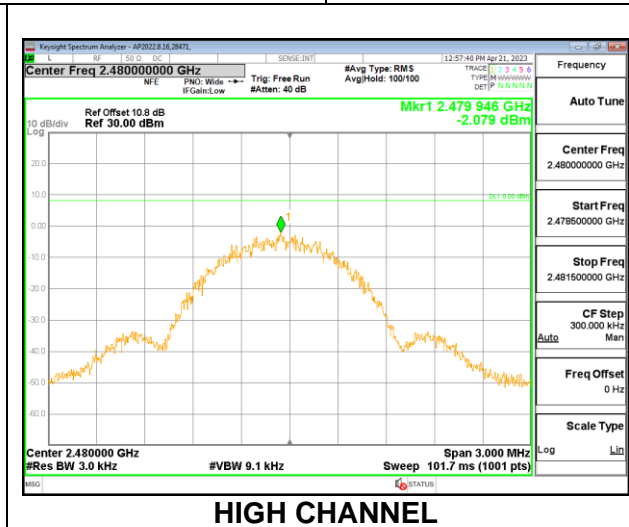
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-2.435	8	-10.44
Middle	2440	-0.332	8	-8.33
High	2480	-2.079	8	-10.08



**LOW CHANNEL**



**MID CHANNEL**

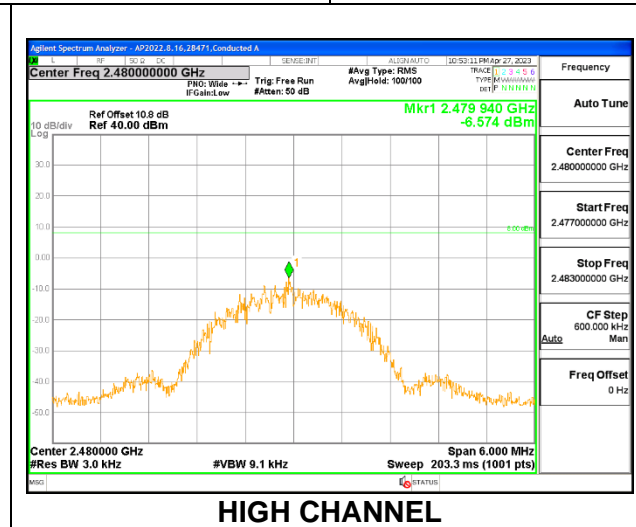
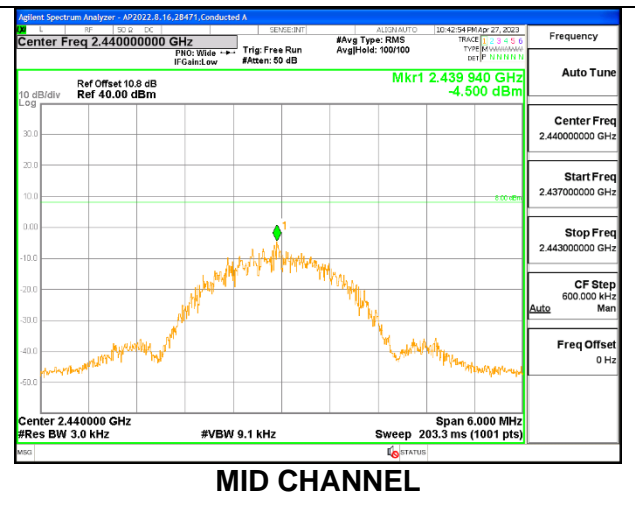
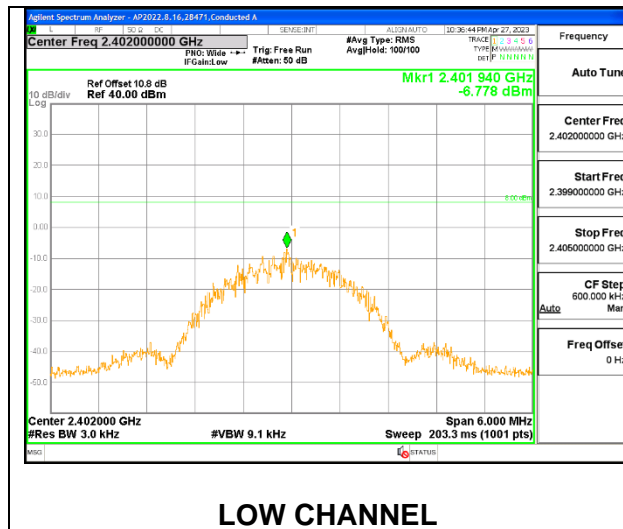


**HIGH CHANNEL**



### 9.6.2. BLE (2Mbps)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-6.778	8	-14.78
Middle	2440	-4.550	8	-12.55
High	2480	-6.547	8	-14.55



## **9.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

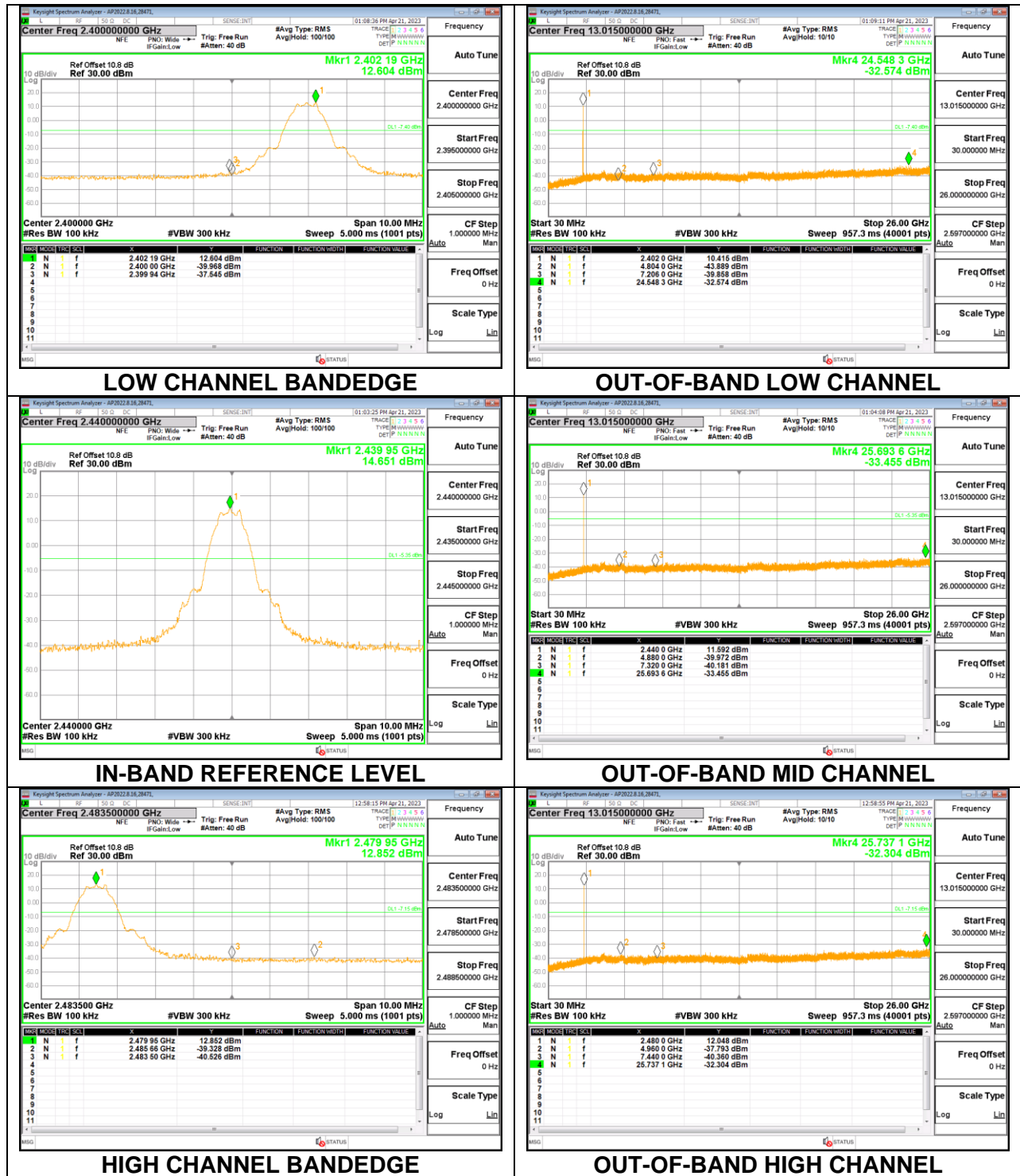
FCC §15.247 (d)

RSS-247 5.5

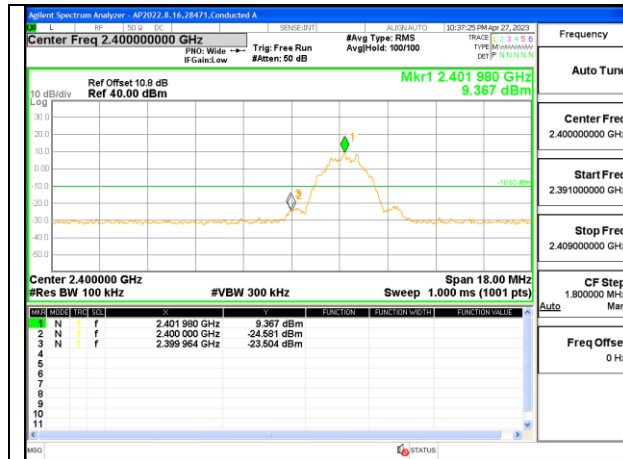
Output power was measured based on the use of a peak measurement; therefore the required attenuation is 20 dB.

### **RESULTS**

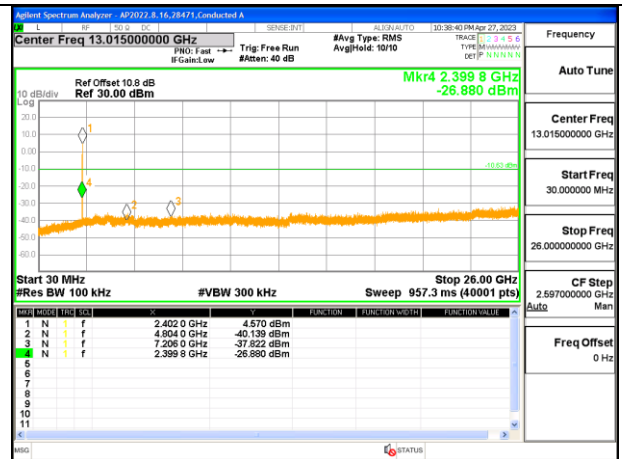
### 9.7.1. BLE (1Mbps)



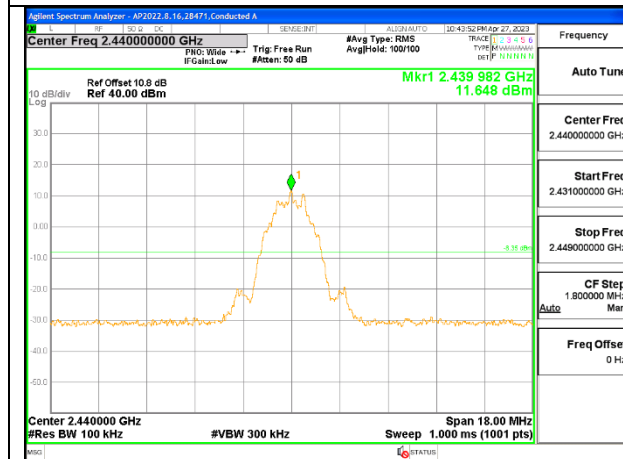
### 9.7.2. BLE (2Mbps)



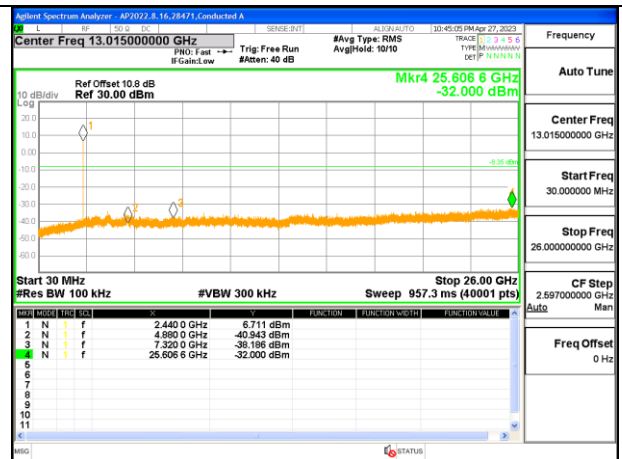
**LOW CHANNEL BANDEDGE**



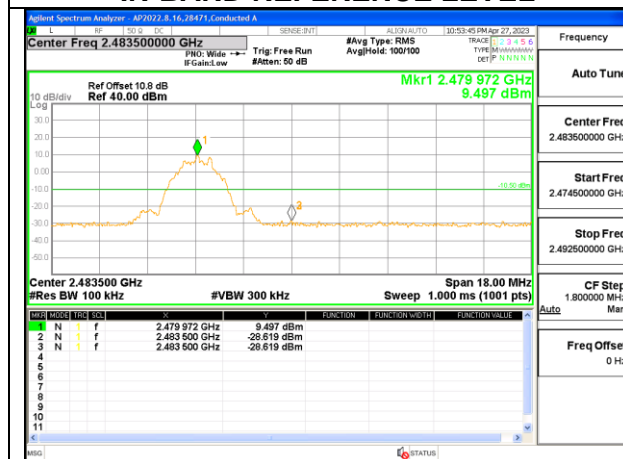
**OUT-OF-BAND LOW CHANNEL**



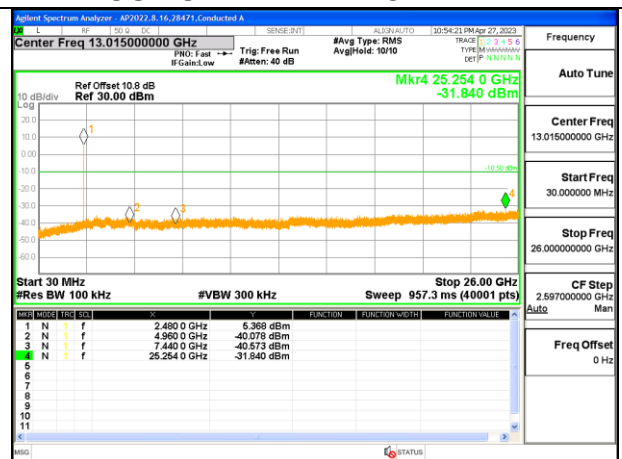
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL**

## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

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

#### 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.

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.

2D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

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.

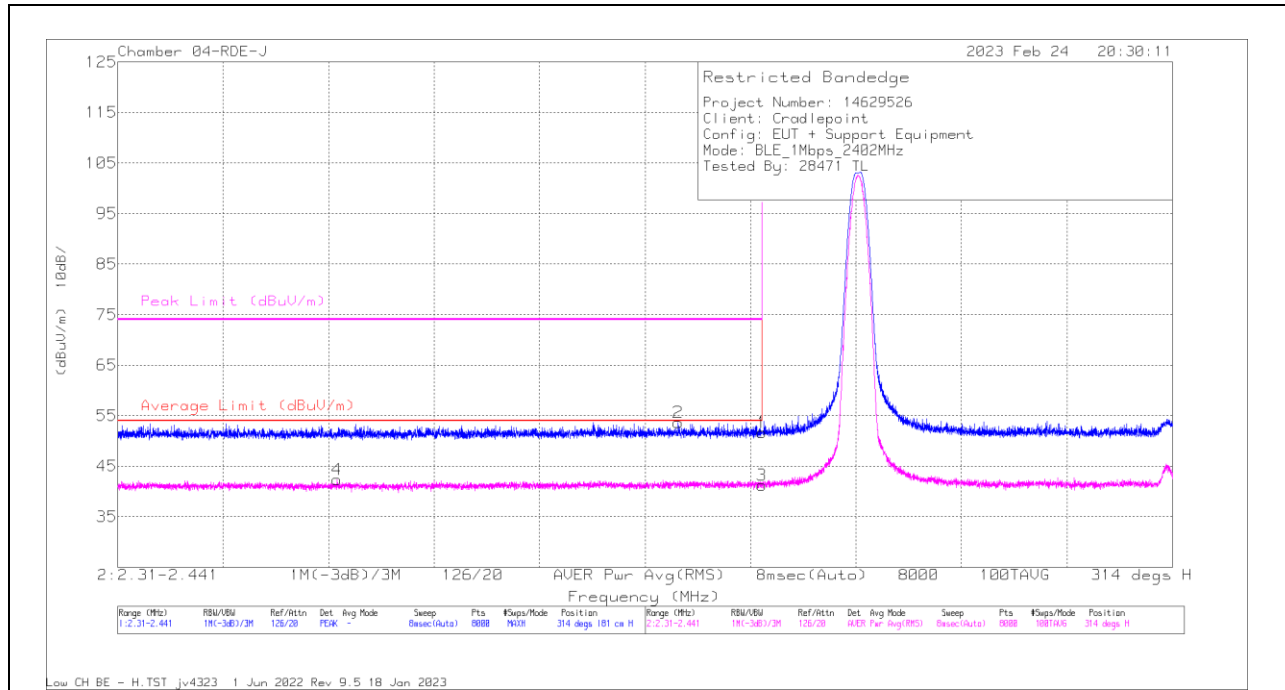
NOTE: The limits in FCC 47 CFR, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table), using the free space impedance of 377 Ohms. For example, the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to  $Y - 51.5 = Z$  dBuA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has 15.209(a) limit.

## 10.2. TRANSMITTER ABOVE 1 GHz

### 10.2.1. BLE (1Mbps)

#### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT



#### Trace Markers

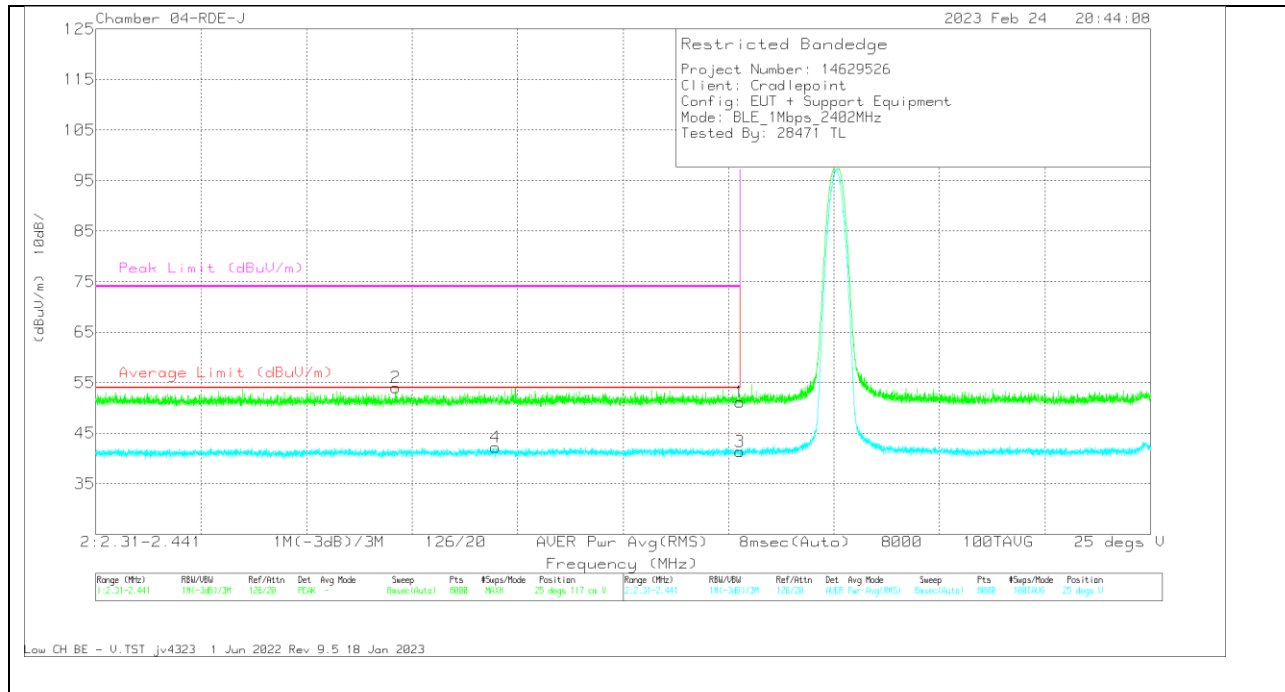
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Ampl/Chl/Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	55.38	Pk	32	-35.7	0	51.68	-	-	74	-22.32	314	181	H
2	* 2379.619	57.38	Pk	32	-35.7	0	53.68	-	-	74	-20.32	314	181	H
3	* 2390	44.32	RMS	32	-35.7	.66	41.28	54	-12.72	-	-	314	181	H
4	* 2337.251	45.36	RMS	31.9	-35.6	.66	42.32	54	-11.68	-	-	314	181	H

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

Pk - Peak detector

RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

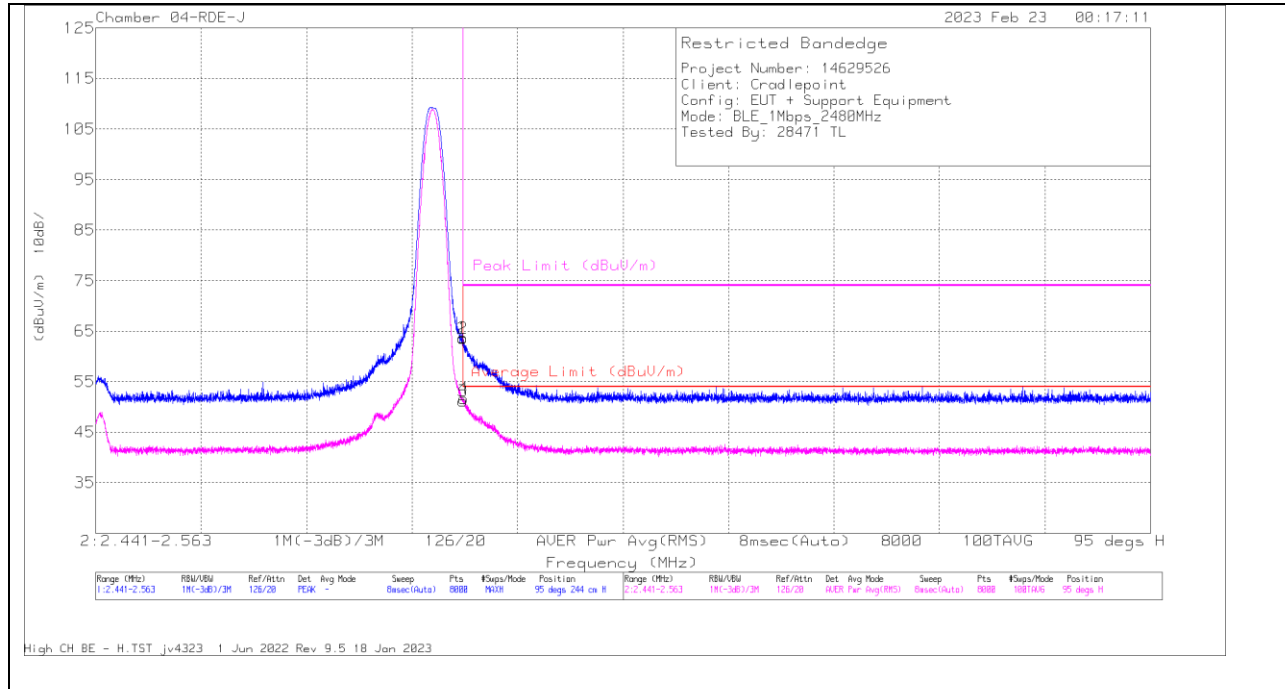
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cbl(Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	54.88	Pk	32	-35.7	0	51.18	-	-	74	-22.82	25	117	V
2	* 2347.241	57.81	Pk	31.9	-35.7	0	54.01	-	-	74	-19.99	25	117	V
3	* 2390	44.41	RMS	32	-35.7	.66	41.37	54	-12.63	-	-	25	117	V
4	* 2359.688	45.24	RMS	31.9	-35.6	.66	42.2	54	-11.8	-	-	25	117	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection



**BANEDGE (HIGH CHANNEL)**

**HORIZONTAL RESULT**



**Trace Markers**

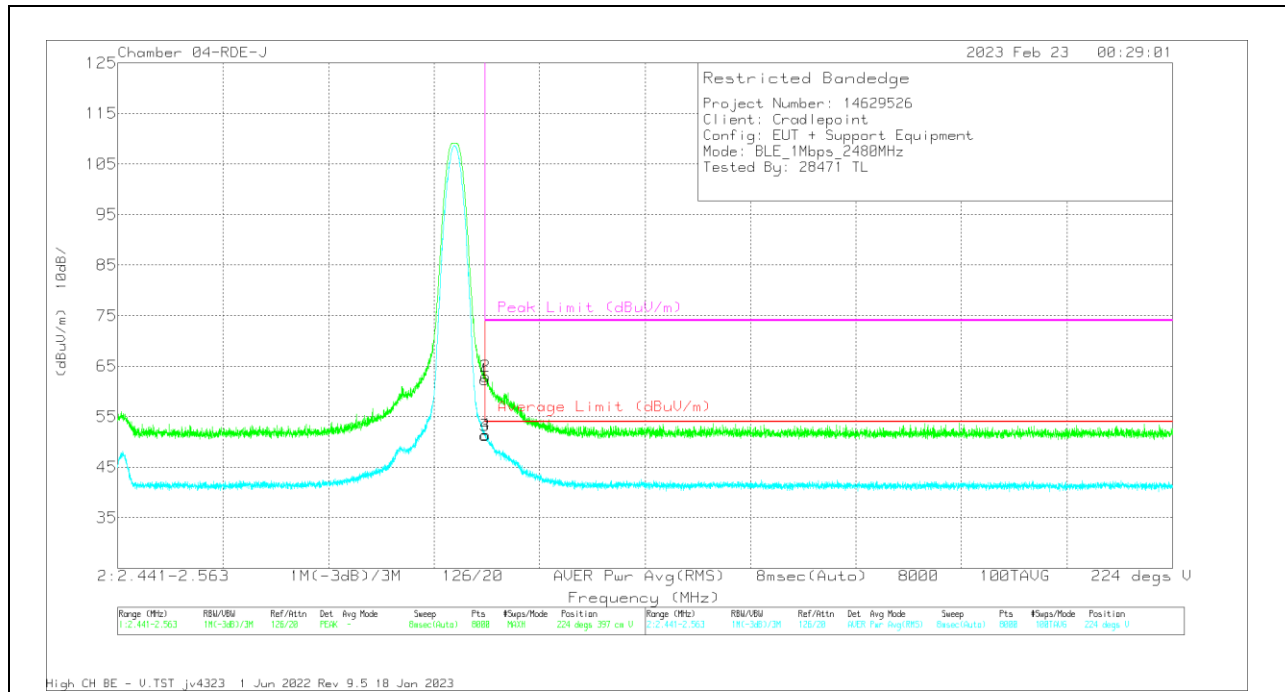
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/ChnPd (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	66.88	Pk	32.2	-35.4	0	63.68	-	-	74	-10.32	95	244	H
2	* 2483.507	66.72	Pk	32.2	-35.4	0	63.52	-	-	74	-10.48	95	244	H
3	* 2483.5	53.69	RMS	32.2	-35.4	.66	51.15	54	-2.85	-	-	95	244	H
4	* 2483.523	54.15	RMS	32.2	-35.4	.66	51.61	54	-2.39	-	-	95	244	H

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

Pk - Peak detector

RMS - RMS detection

### VERTICAL RESULT



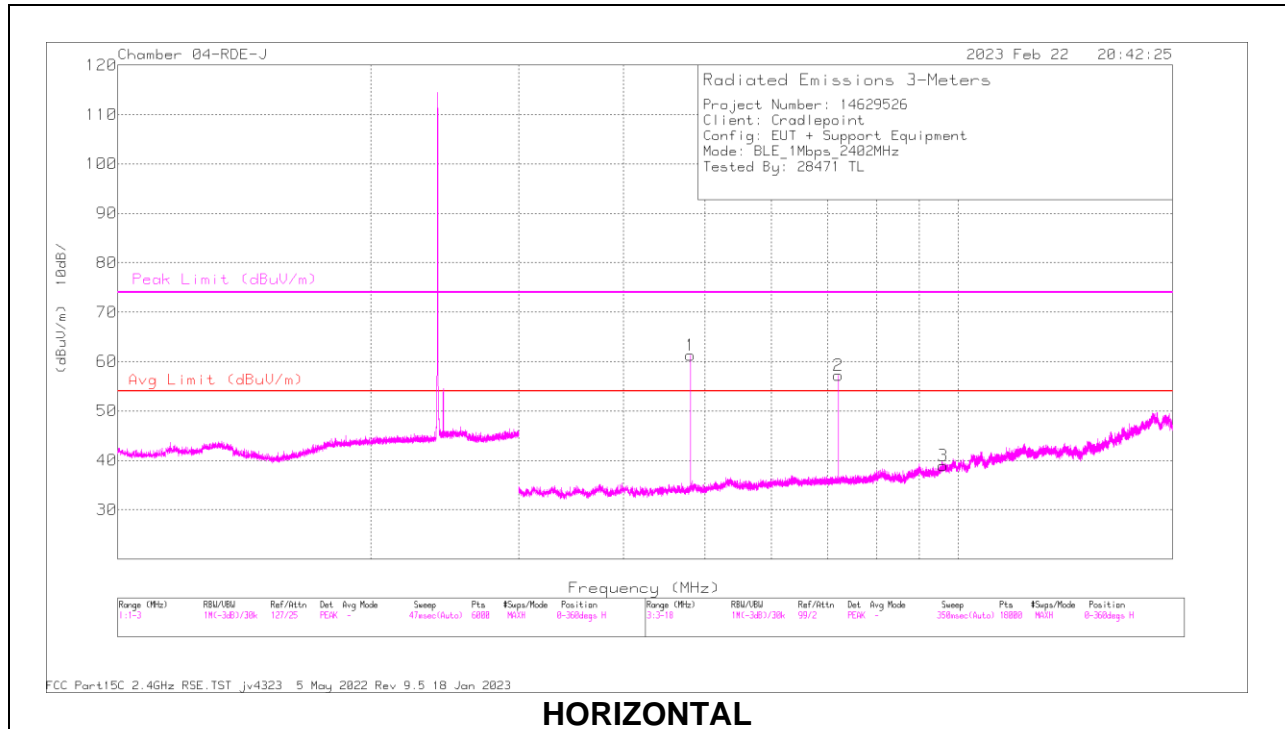
### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3MHz	Amp/CbI/Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	65.59	Pk	32.2	-35.4	0	62.39	-	-	74	-11.61	224	397	V
2	* 2483.523	66.11	Pk	32.2	-35.4	0	62.91	-	-	74	-11.09	224	397	V
3	* 2483.5	53.8	RMS	32.2	-35.4	.66	51.26	54	-2.74	-	-	224	397	V
4	* 2483.553	53.99	RMS	32.2	-35.4	.66	51.45	54	-2.55	-	-	224	397	V

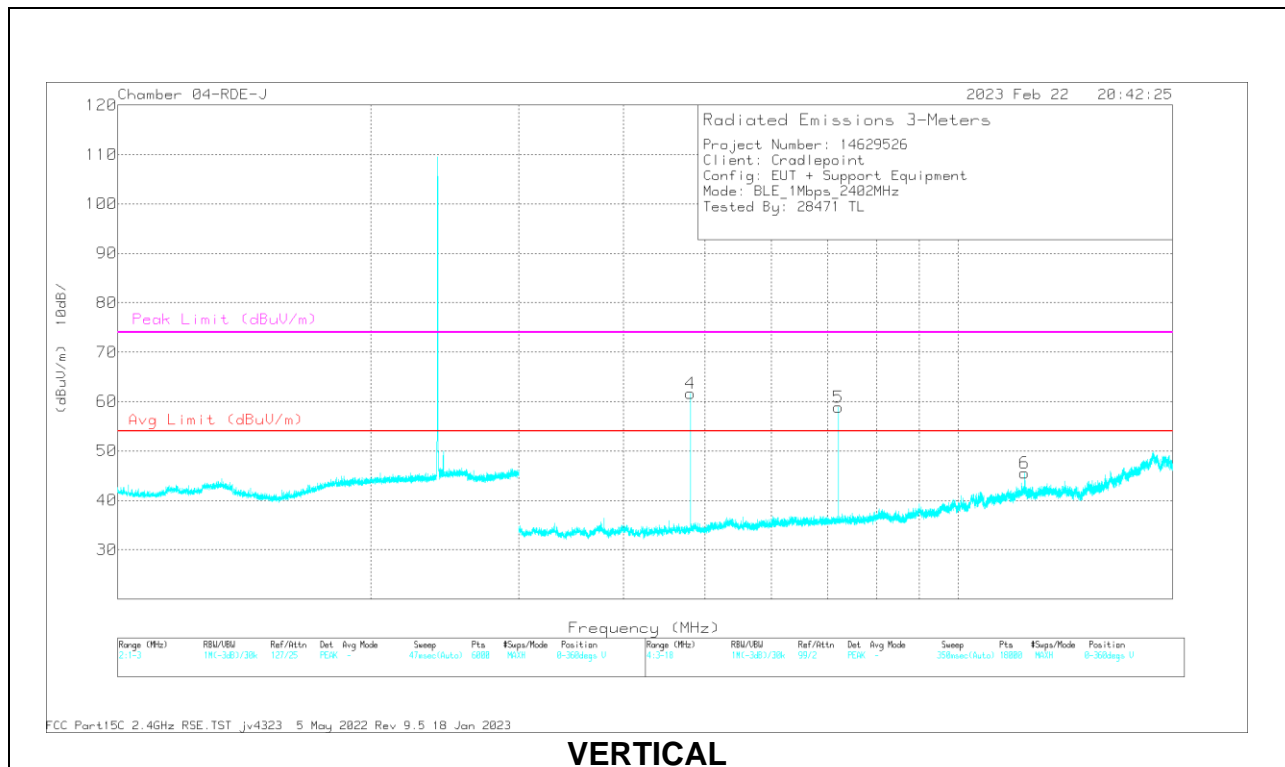
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

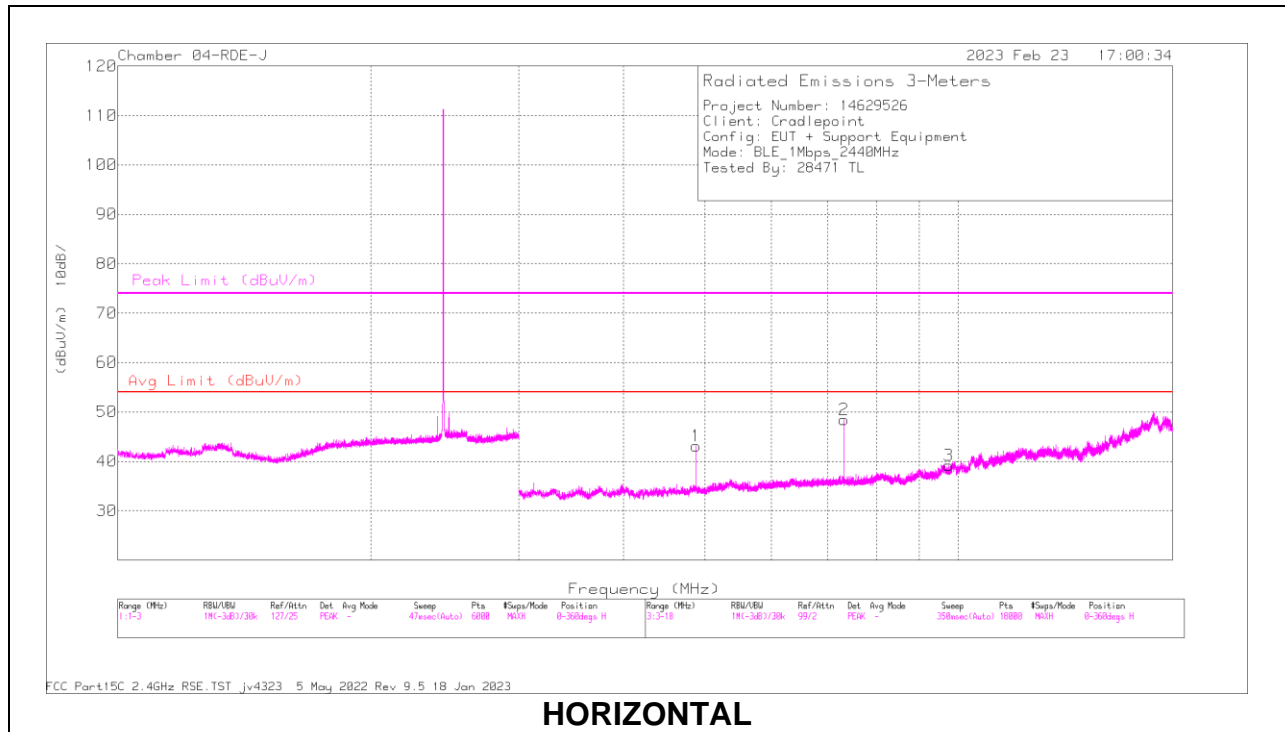
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cb/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4804.404	66.67	PK2	34	-44.5	0	56.17	-	-	74	-17.83	21	143	H
	* 4803.798	62.53	MAv1	34	-44.5	.66	52.69	54	-1.31	-	-	21	143	H
2	7206.634	60.23	PK2	35.8	-40.4	0	55.63	-	-	-	-	139	161	H
	7206.523	54.62	MAv1	35.8	-40.4	.66	50.68	-	-	-	-	139	161	H
3	9596.131	48.46	PK2	36.7	-36	0	49.16	-	-	-	-	341	371	H
	9595.031	36.51	MAv1	36.7	-36	.66	37.87	-	-	-	-	341	371	H
4	* 4804.409	67.4	PK2	34	-44.5	0	56.9	-	-	74	-17.1	156	117	V
	* 4803.582	63.37	MAv1	34	-44.5	.66	53.53	54	-1.47	-	-	156	117	V
5	7205.955	60.94	PK2	35.8	-40.4	0	56.34	-	-	-	-	123	217	V
	7205.252	55.59	MAv1	35.8	-40.3	.66	51.75	-	-	-	-	123	217	V
6	* 12003.114	51.47	PK2	38.7	-38	0	52.17	-	-	74	-21.83	303	174	V
	* 12010.548	40	MAv1	38.7	-38	.66	41.36	54	-12.64	-	-	303	174	V

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

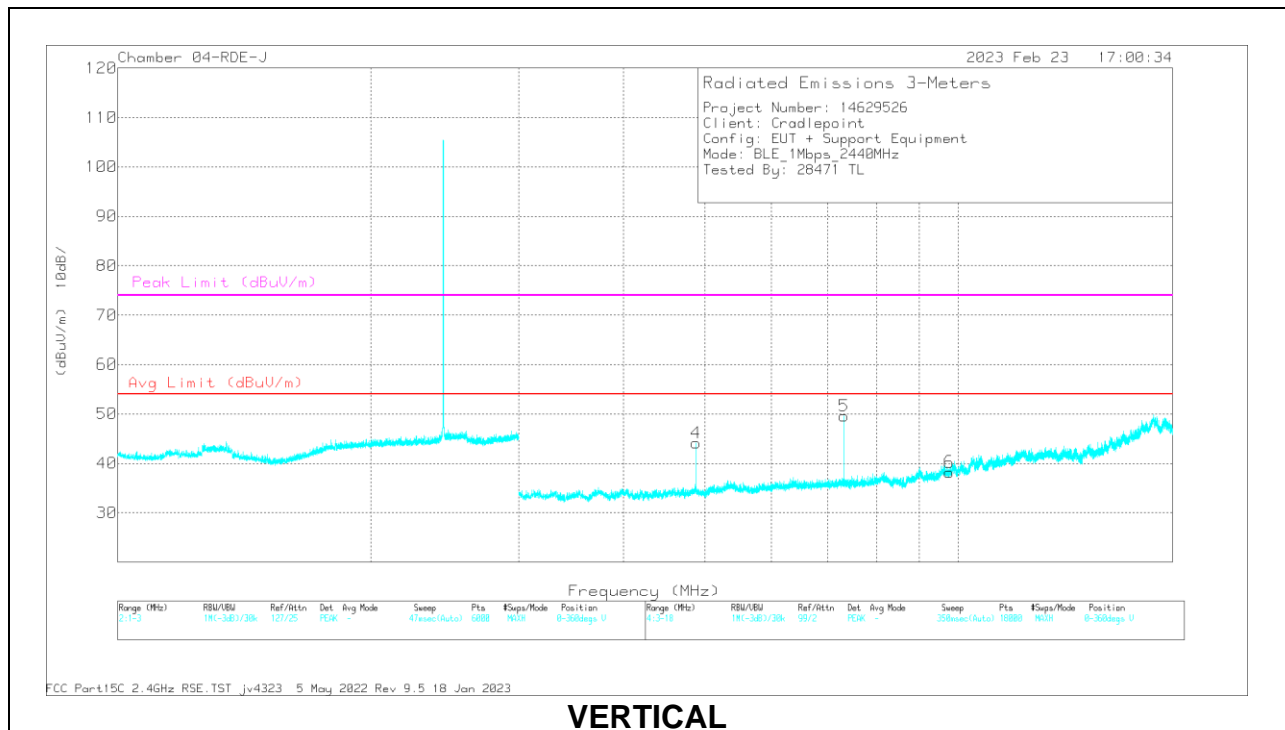
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

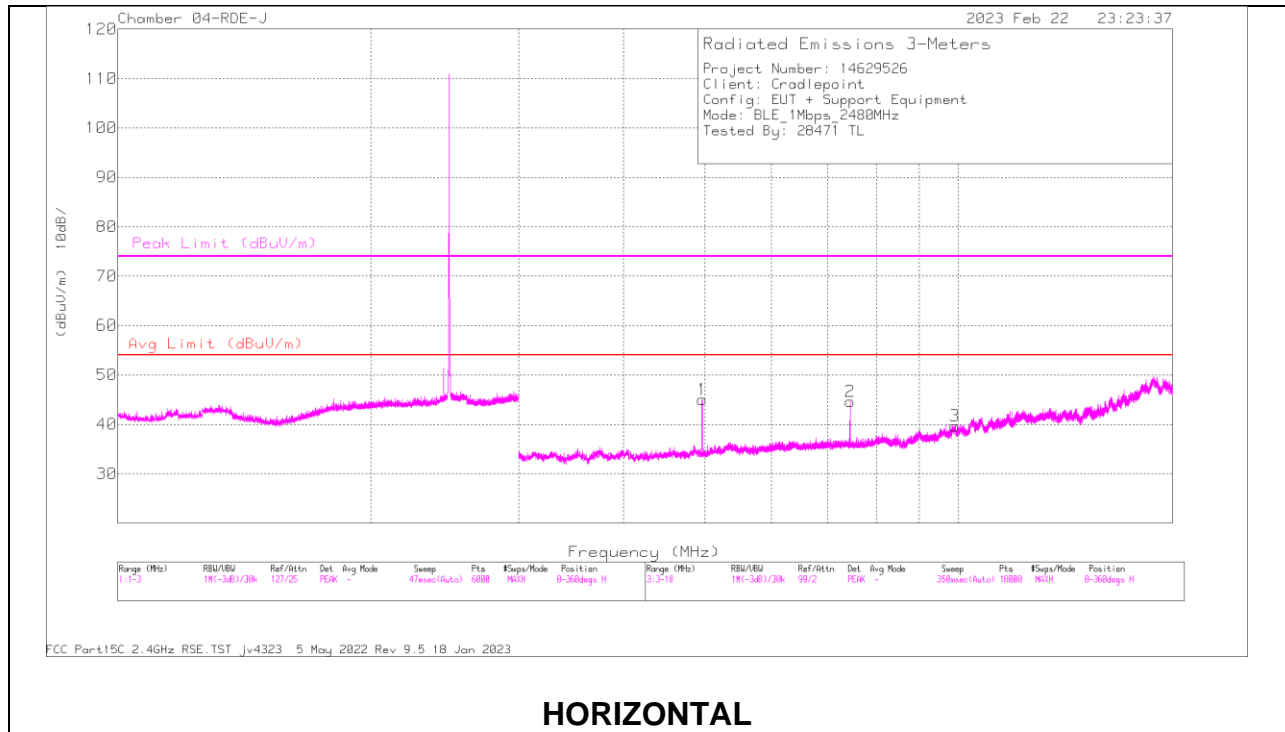
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cb/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4879.3	59.95	PK2	34	-43.7	0	50.25	-	-	74	-23.75	133	139	H
	* 4879.78	52.89	MAv1	34	-43.7	.66	43.85	54	-10.15	-	-	133	139	H
2	* 7318.961	56.92	PK2	35.8	-40.4	0	52.32	-	-	74	-21.68	146	346	H
	* 7320.392	50.15	MAv1	35.8	-40.4	.66	46.21	54	-7.79	-	-	146	346	H
3	9763.646	47.76	PK2	36.8	-36	0	48.56	-	-	-	-	189	361	H
	9762.219	36.72	MAv1	36.8	-36	.66	38.18	-	-	-	-	189	361	H
4	* 4879.449	62.63	PK2	34	-43.7	0	52.93	-	-	74	-21.07	79	392	V
	* 4879.84	57.4	MAv1	34	-43.7	.66	48.36	54	-5.64	-	-	79	392	V
5	* 7319.187	60.78	PK2	35.8	-40.4	0	56.18	-	-	74	-17.82	149	227	V
	* 7320.503	55.58	MAv1	35.8	-40.4	.66	51.64	54	-2.36	-	-	149	227	V
6	9758.06	48.09	PK2	36.8	-36.1	0	48.79	-	-	-	-	239	216	V
	9744.726	36.67	MAv1	36.8	-35.9	.66	38.23	-	-	-	-	239	216	V

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

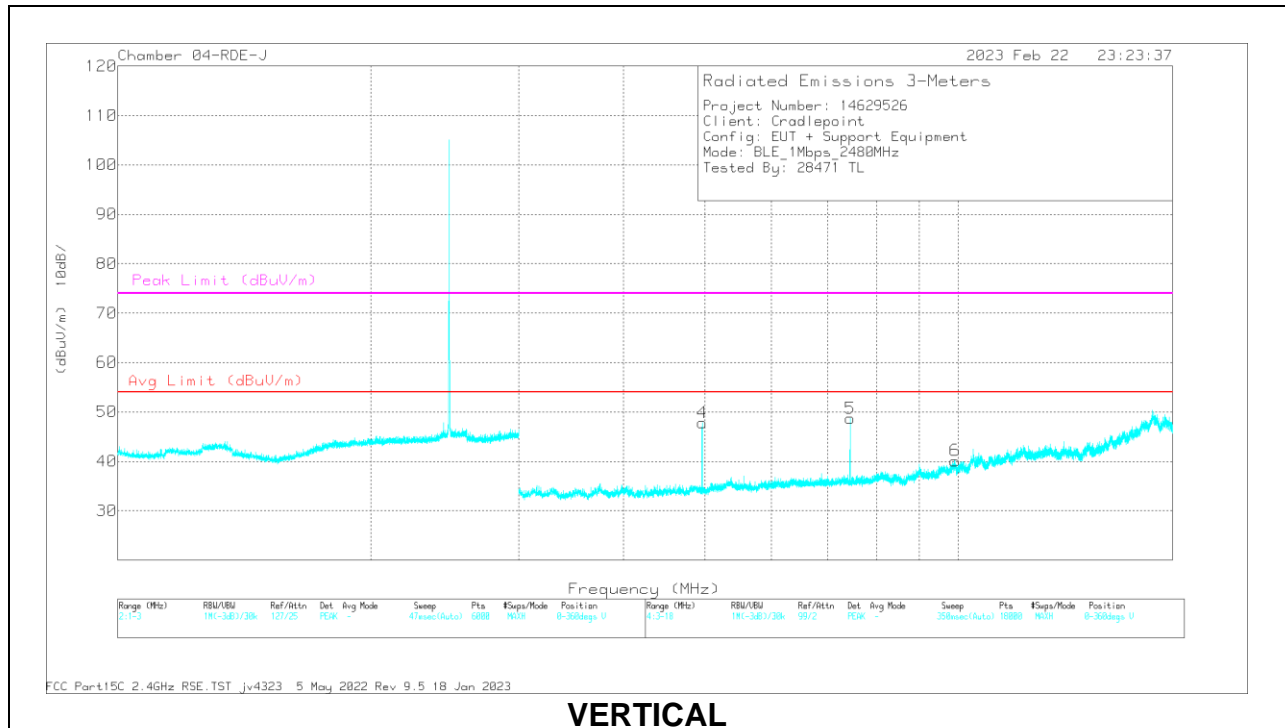
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cbl/Filtr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4960.309	61.02	PK2	34.1	-44.3	0	50.82	-	-	74	-23.18	145	283	H
	* 4959.9	54.89	MAv1	34.1	-44.3	.66	45.35	54	-8.65	-	-	145	283	H
2	* 7440.474	55.36	PK2	35.8	-40.1	0	51.06	-	-	74	-22.94	131	395	H
	* 7439.105	48.23	MAv1	35.8	-40	.66	44.69	54	-9.31	-	-	131	395	H
3	9920.218	47.22	PK2	37	-33.9	0	50.32	-	-	-	-	42	195	H
	9919.053	35.43	MAv1	37	-34	.66	39.09	-	-	-	-	42	195	H
4	* 4960.52	61.65	PK2	34.1	-44.3	0	51.45	-	-	74	-22.55	130	387	V
	* 4959.953	56.16	MAv1	34.1	-44.3	.66	46.62	54	-7.38	-	-	130	387	V
5	* 7439.212	59.23	PK2	35.8	-40	0	55.03	-	-	74	-18.97	140	294	V
	* 7439.345	53.71	MAv1	35.8	-40	.66	50.17	54	-3.83	-	-	140	294	V
6	9914.669	47.11	PK2	37	-34	0	50.11	-	-	-	-	166	307	V
	9902.396	35.56	MAv1	37	-34.5	.66	38.72	-	-	-	-	166	307	V

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

PK2 - KDB558074 Method: Maximum Peak

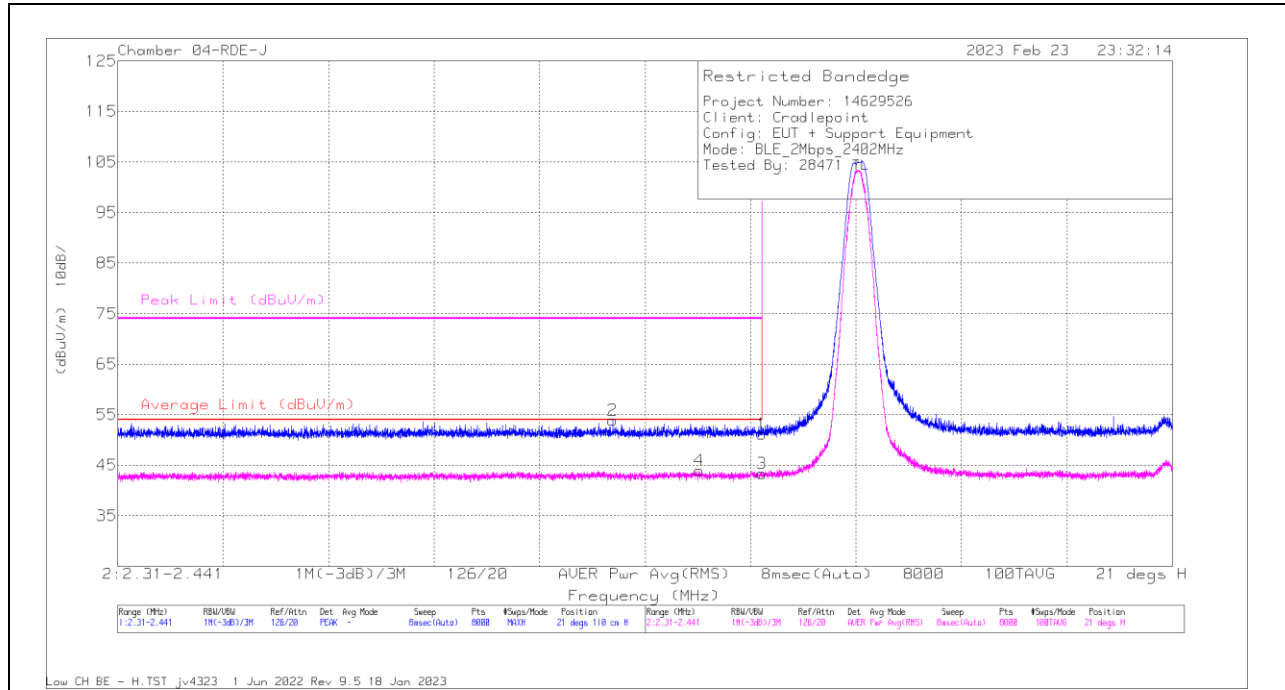
MAv1 - KDB558074 Option 1 Maximum RMS Average



## 10.2.2. BLE (2Mbps)

### BANDEDGE (LOW CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

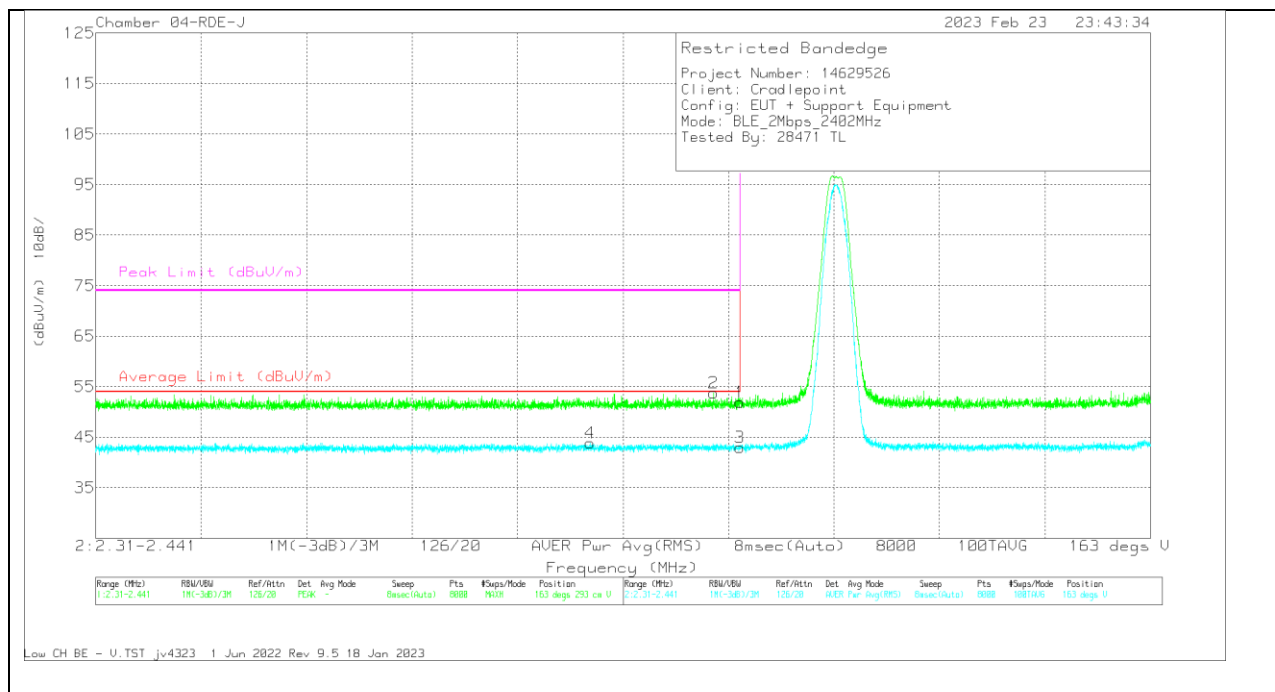
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF (dB) - 3mH	Amp/Cbl/Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	54.88	Pk	32	-35.7	0	51.18	-	-	74	-22.82	21	110	H
2	* 2371.463	57.59	Pk	31.9	-35.6	0	53.89	-	-	74	-20.11	21	110	H
3	* 2390	44.65	RMS	32	-35.7	2.39	43.34	54	-10.66	-	-	21	110	H
4	* 2382.223	45.28	RMS	32	-35.7	2.39	43.97	54	-10.03	-	-	21	110	H

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

Pk - Peak detector

RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cbl/Pad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2390	55.61	Pk	32	-35.7	0	51.91	-	-	74	-22.09	163	293	V
2	* 2386.743	57.32	Pk	32	-35.6	0	53.72	-	-	74	-20.28	163	293	V
3	* 2390	44.29	RMS	32	-35.7	2.39	42.98	54	-11.02	-	-	163	293	V
4	* 2371.43	45.17	RMS	31.9	-35.6	2.39	43.86	54	-10.14	-	-	163	293	V

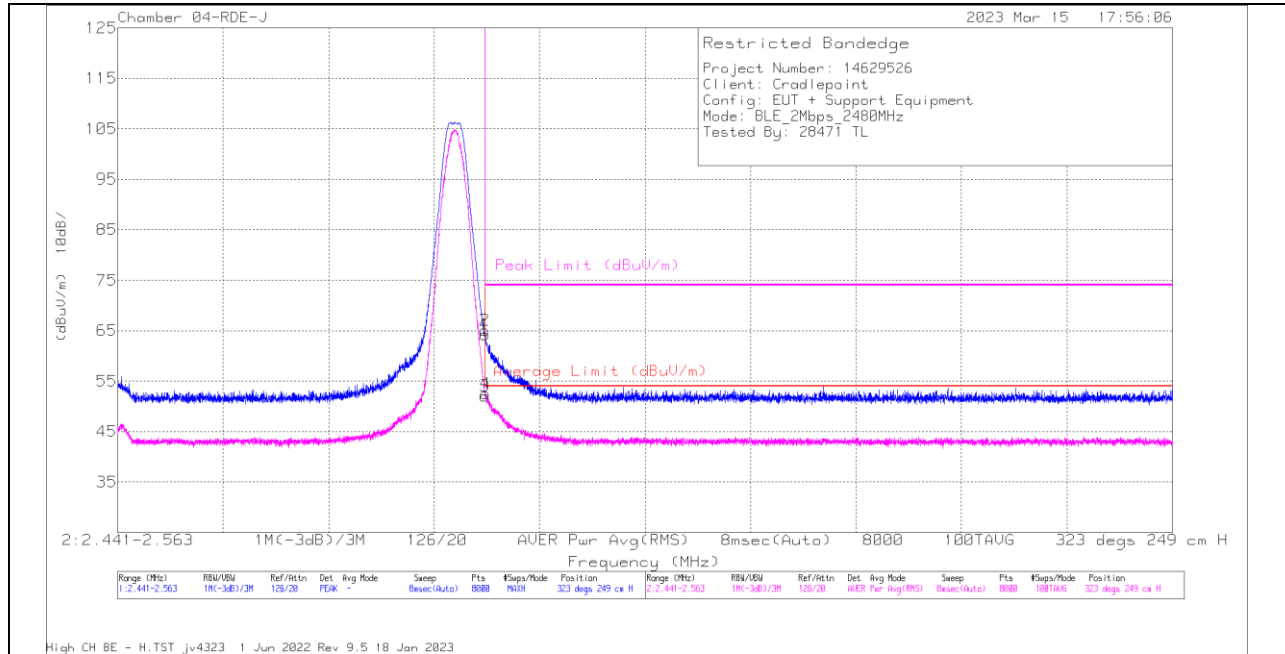
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

**BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL RESULT**

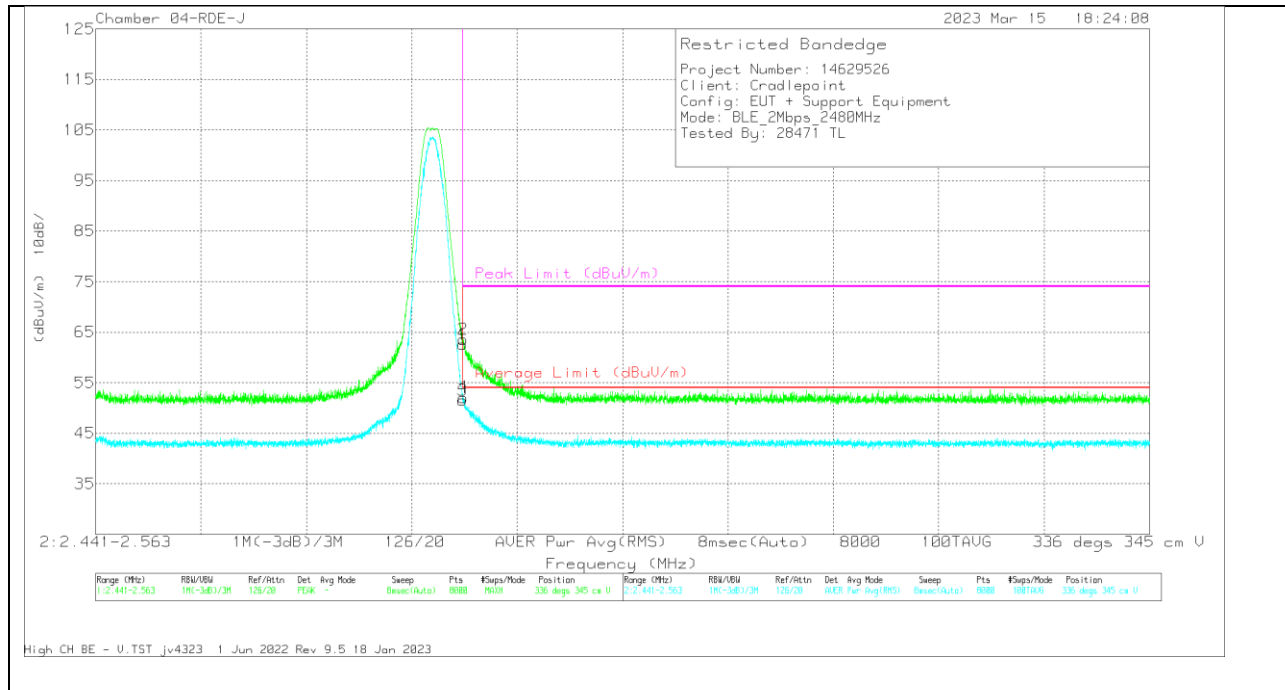


**Trace Markers**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/CbIPad (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	67.42	Pk	32.2	-35.4	0	64.22	-	-	74	-9.78	323	249	H
2	* 2483.507	68.26	Pk	32.2	-35.4	0	65.06	-	-	74	-8.94	323	249	H
3	* 2483.5	52.8	RMS	32.2	-35.4	2.39	51.99	54	-2.01	-	-	323	249	H
4	* 2483.523	53.28	RMS	32.2	-35.4	2.39	52.47	54	-1.53	-	-	323	249	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3MHz	Amp/CbI(Pad) (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2483.5	65.74	Pk	32.2	-35.4	0	62.54	-	-	74	-11.46	336	345	V
2	* 2483.553	66.77	Pk	32.2	-35.4	0	63.57	-	-	74	-10.43	336	345	V
3	* 2483.5	52.36	RMS	32.2	-35.4	2.39	51.55	54	-2.45	-	-	336	345	V
4	* 2483.523	52.9	RMS	32.2	-35.4	2.39	52.09	54	-1.91	-	-	336	345	V

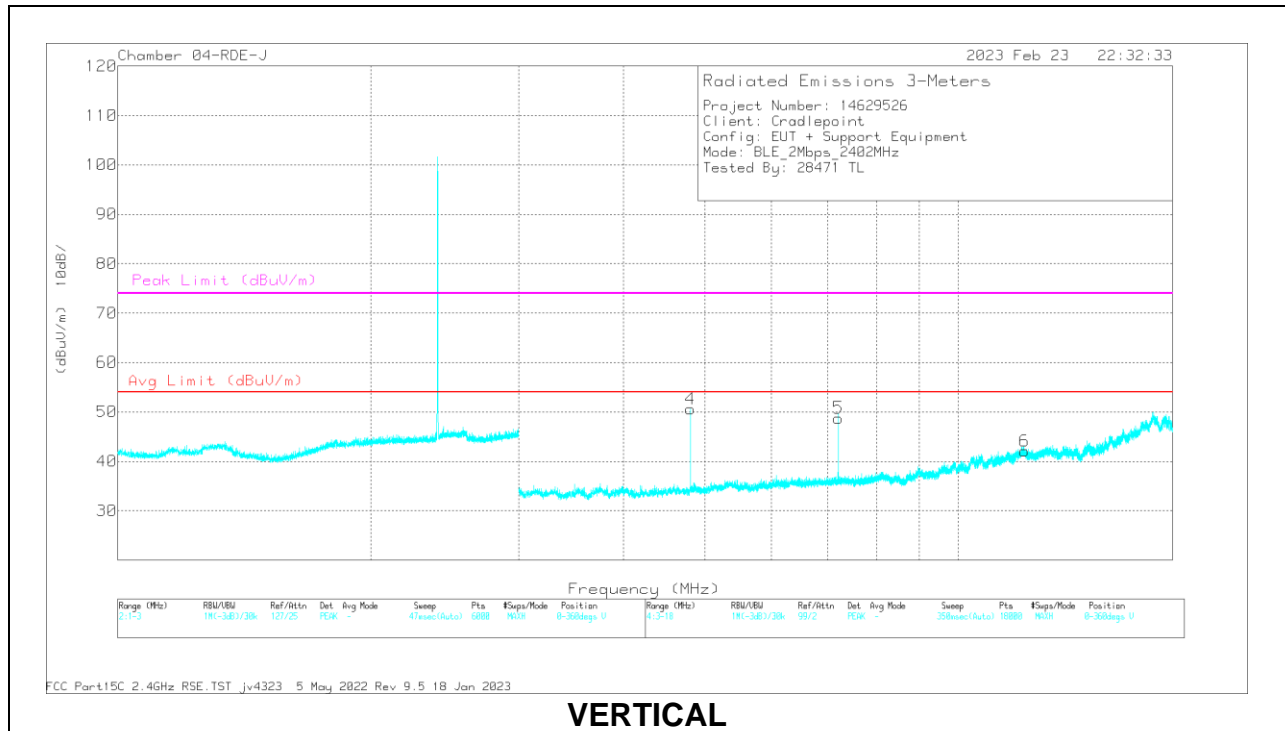
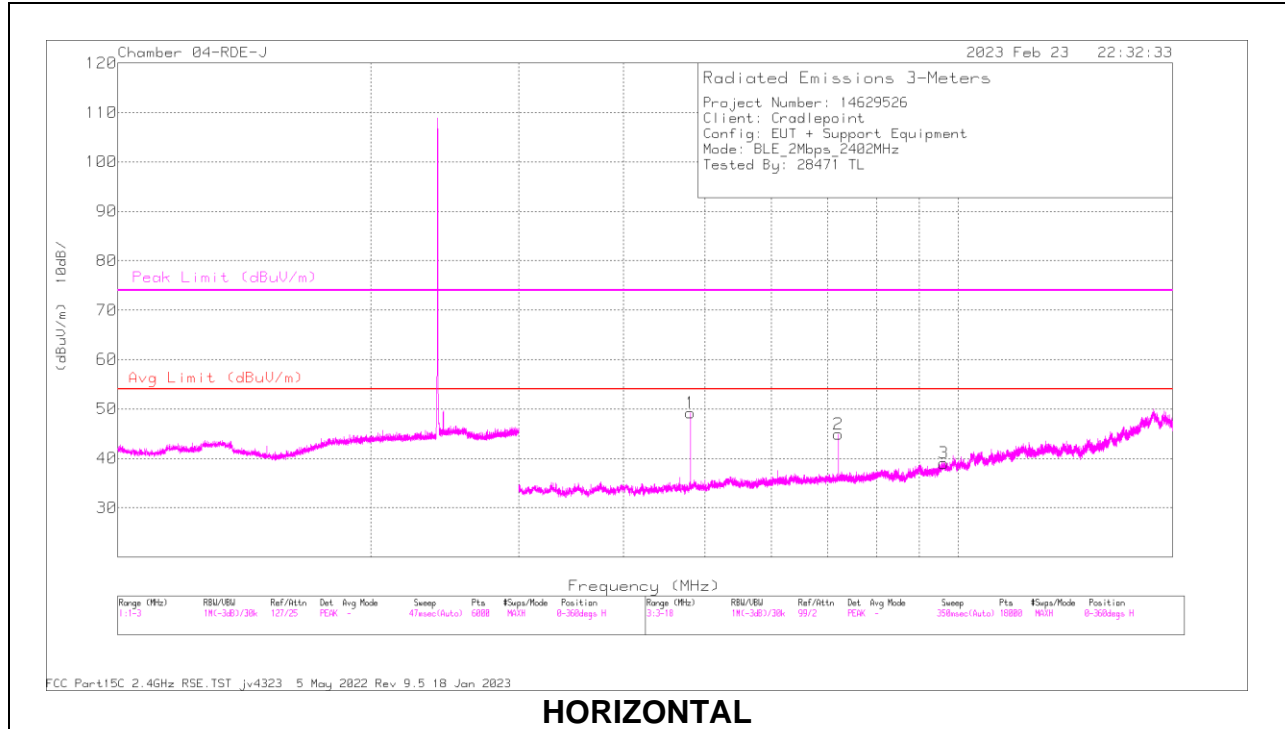
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL RESULTS



**RADIATED EMISSIONS**

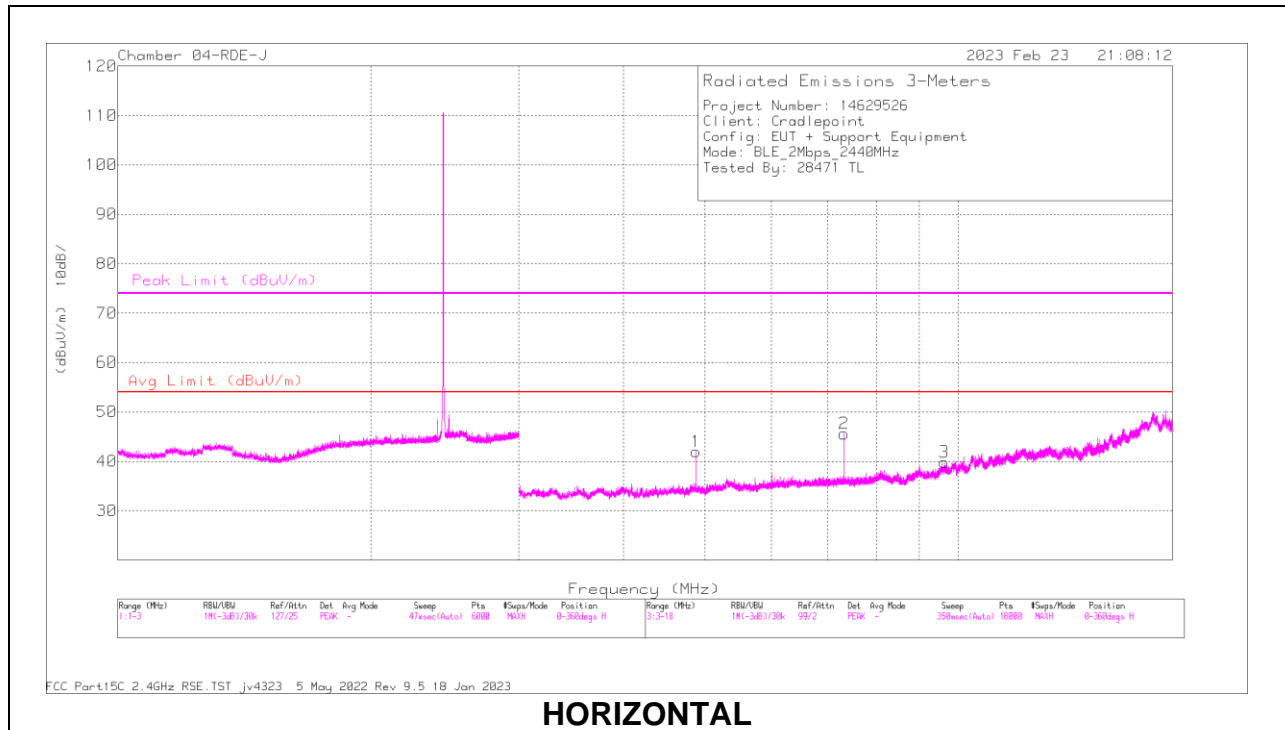
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cb/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4802.907	65.66	PK2	34	-44.5	0	55.16	-	-	74	-18.84	139	141	H
	* 4803.095	57.97	MAv1	34	-44.5	2.39	49.86	54	-4.14	-	-	139	141	H
2	7207.377	58.04	PK2	35.8	-40.4	0	53.44	-	-	-	-	152	128	H
	7207.175	49.37	MAv1	35.8	-40.4	2.39	47.16	-	-	-	-	152	128	H
3	9625.271	48.48	PK2	36.7	-35.6	0	49.58	-	-	-	-	360	386	H
	9626.989	36.41	MAv1	36.7	-35.5	2.39	40	-	-	-	-	360	386	H
4	* 4803	67.09	PK2	34	-44.5	0	56.59	-	-	74	-17.41	159	105	V
	* 4803.153	60.12	MAv1	34	-44.5	2.39	52.01	54	-1.99	-	-	159	105	V
5	7207.252	60.19	PK2	35.8	-40.4	0	55.59	-	-	-	-	250	195	V
	7204.605	52.29	MAv1	35.8	-40.3	2.39	50.18	-	-	-	-	250	195	V
6	* 11991.89	51.9	PK2	38.7	-38	0	52.6	-	-	74	-21.4	232	206	V
	* 11986.47	40.25	MAv1	38.7	-38.1	2.39	43.24	54	-10.76	-	-	232	206	V

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

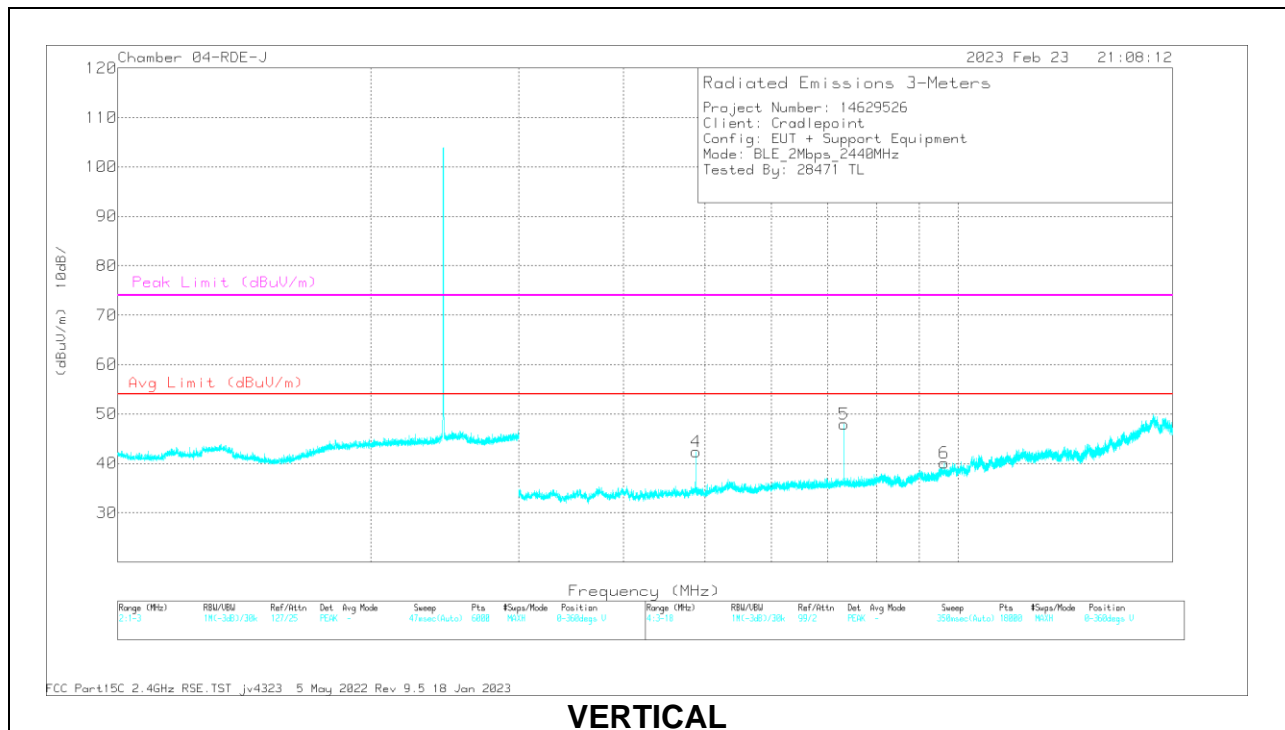
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cbl/Filtr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4878.791	59.14	PK2	34	-43.7	0	49.44	-	-	74	-24.56	135	159	H
	* 4879.135	49.61	MAv1	34	-43.7	2.39	42.3	54	-11.7	-	-	135	159	H
2	* 7318.556	58.46	PK2	35.8	-40.4	0	53.86	-	-	74	-20.14	158	373	H
	* 7318.499	50.24	MAv1	35.8	-40.4	2.39	48.03	54	-5.97	-	-	158	373	H
3	9615.613	47.87	PK2	36.7	-35.6	0	48.97	-	-	-	-	136	179	H
	9630.31	36.45	MAv1	36.7	-35.2	2.39	40.34	-	-	-	-	136	179	H
4	* 4879.177	61.4	PK2	34	-43.7	0	51.7	-	-	74	-22.3	76	390	V
	* 4880.711	52.83	MAv1	34	-43.7	2.39	45.52	54	-8.48	-	-	76	390	V
5	* 7318.436	60.87	PK2	35.8	-40.4	0	56.27	-	-	74	-17.73	153	245	V
	* 7321.196	53.29	MAv1	35.8	-40.4	2.39	51.08	54	-2.92	-	-	153	245	V
6	9624.69	48.3	PK2	36.7	-35.6	0	49.4	-	-	-	-	289	199	V
	9637.404	36.33	MAv1	36.7	-35.5	2.39	39.92	-	-	-	-	289	199	V

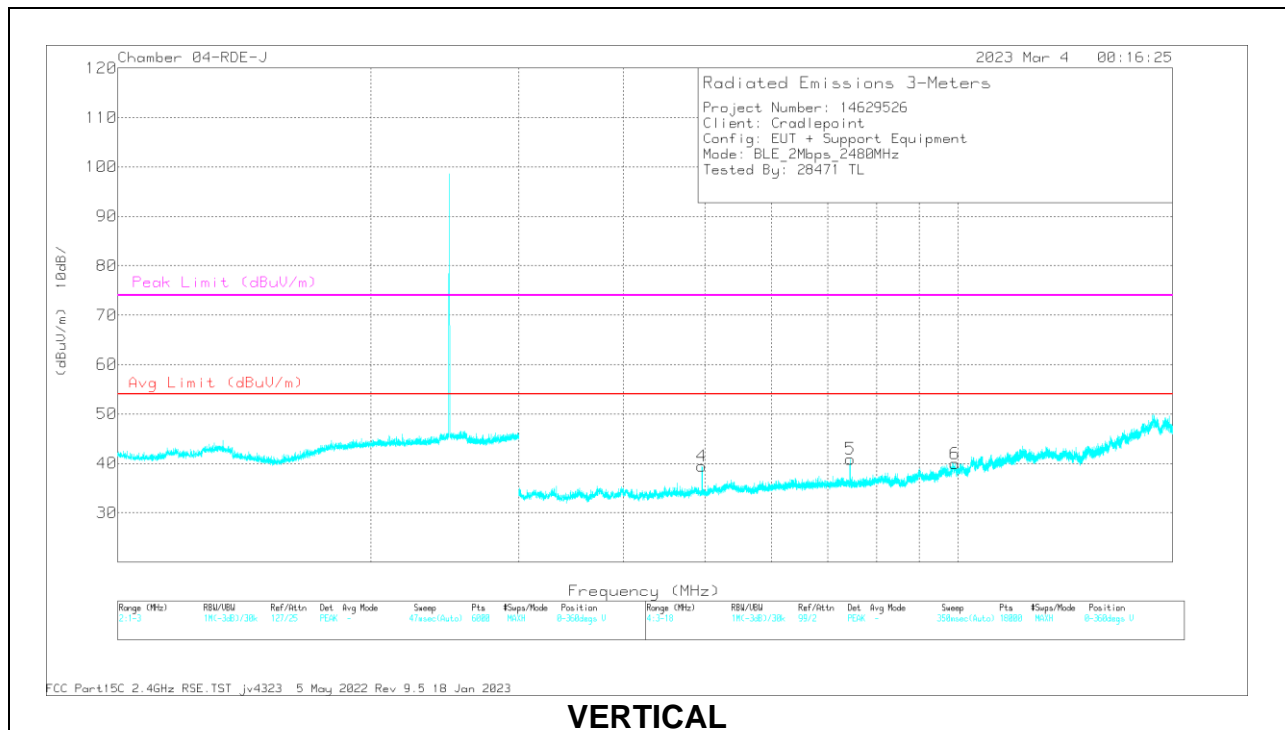
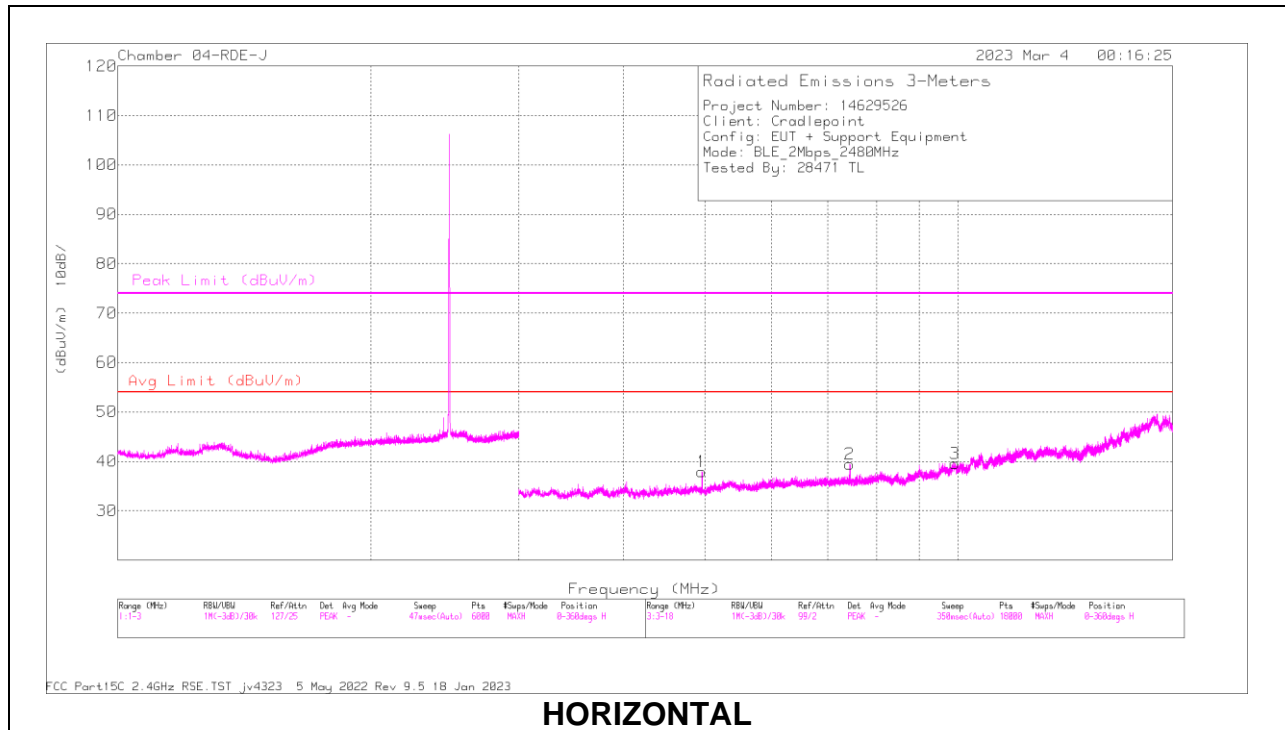
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average



### HIGH CHANNEL RESULTS



**RADIATED EMISSIONS**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	222741 ACF(dB) - 3mH	Amp/Cb/Fitr (dB)	DCCF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4958.98	55.68	PK2	34.1	-44.2	0	45.58	-	-	74	-28.42	252	146	H
	* 4959.46	45.03	MAv1	34.1	-44.2	2.39	37.32	54	-16.68	-	-	252	146	H
2	* 7438.55	53.9	PK2	35.8	-40	0	49.7	-	-	74	-24.3	251	191	H
	* 7441.134	43.78	MAv1	35.8	-40.2	2.39	41.77	54	-12.23	-	-	251	191	H
3	9927.687	46.3	PK2	37	-34.1	0	49.2	-	-	-	-	163	395	H
	9925.293	35.23	MAv1	37	-33.8	2.39	40.82	-	-	-	-	163	395	H
4	* 4958.717	60.27	PK2	34.1	-44.2	0	50.17	-	-	74	-23.83	64	279	V
	* 4960.437	51.15	MAv1	34.1	-44.3	2.39	43.34	54	-10.66	-	-	64	279	V
5	* 7438.512	54.59	PK2	35.8	-40	0	50.39	-	-	74	-23.61	251	230	V
	* 7438.628	44.86	MAv1	35.8	-40	2.39	43.05	54	-10.95	-	-	251	230	V
6	9911.104	46.74	PK2	37	-33.8	0	49.94	-	-	-	-	160	137	V
	9904.511	35.53	MAv1	37	-34.3	2.39	40.62	-	-	-	-	160	137	V

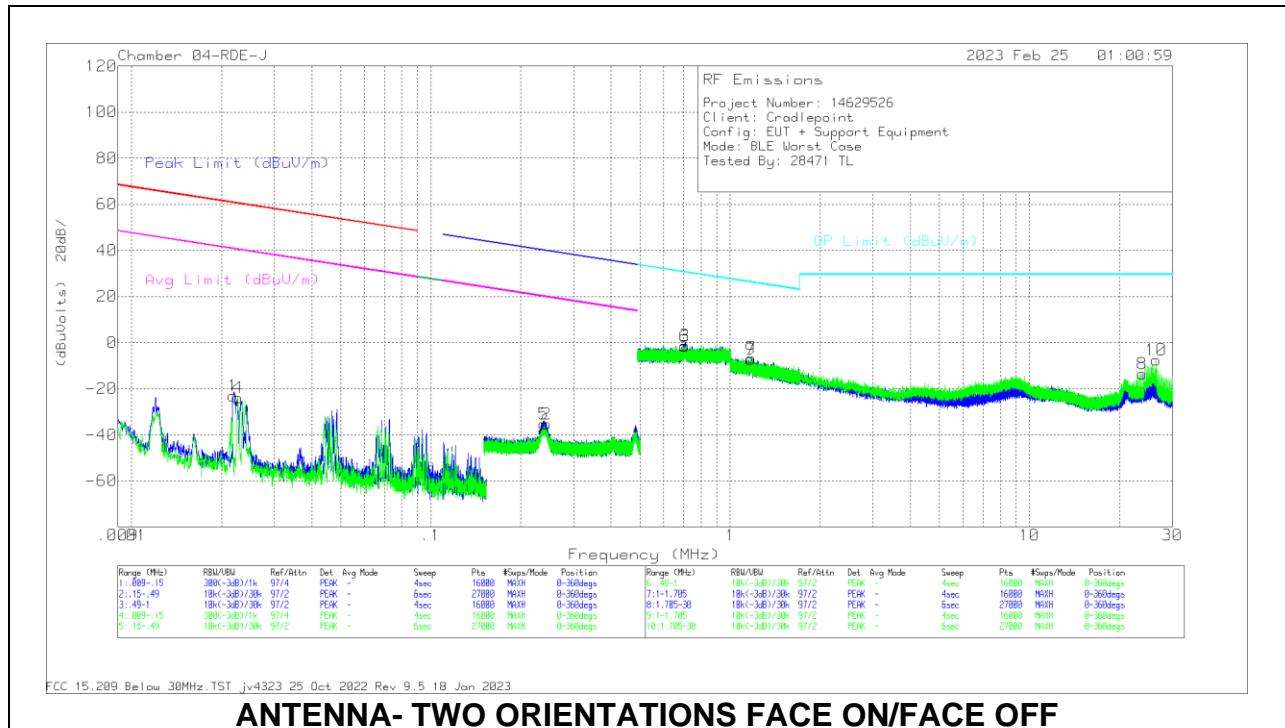
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### 10.3. WORST CASE BELOW 30MHz

#### SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



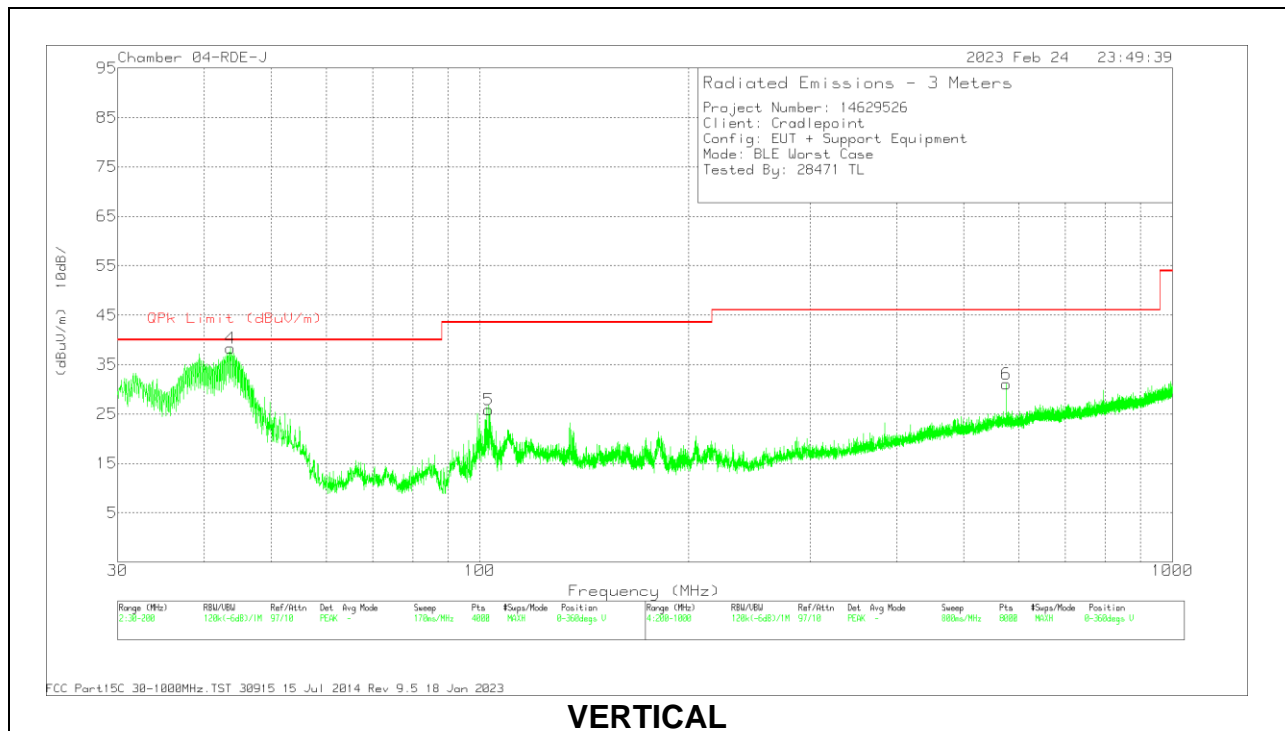
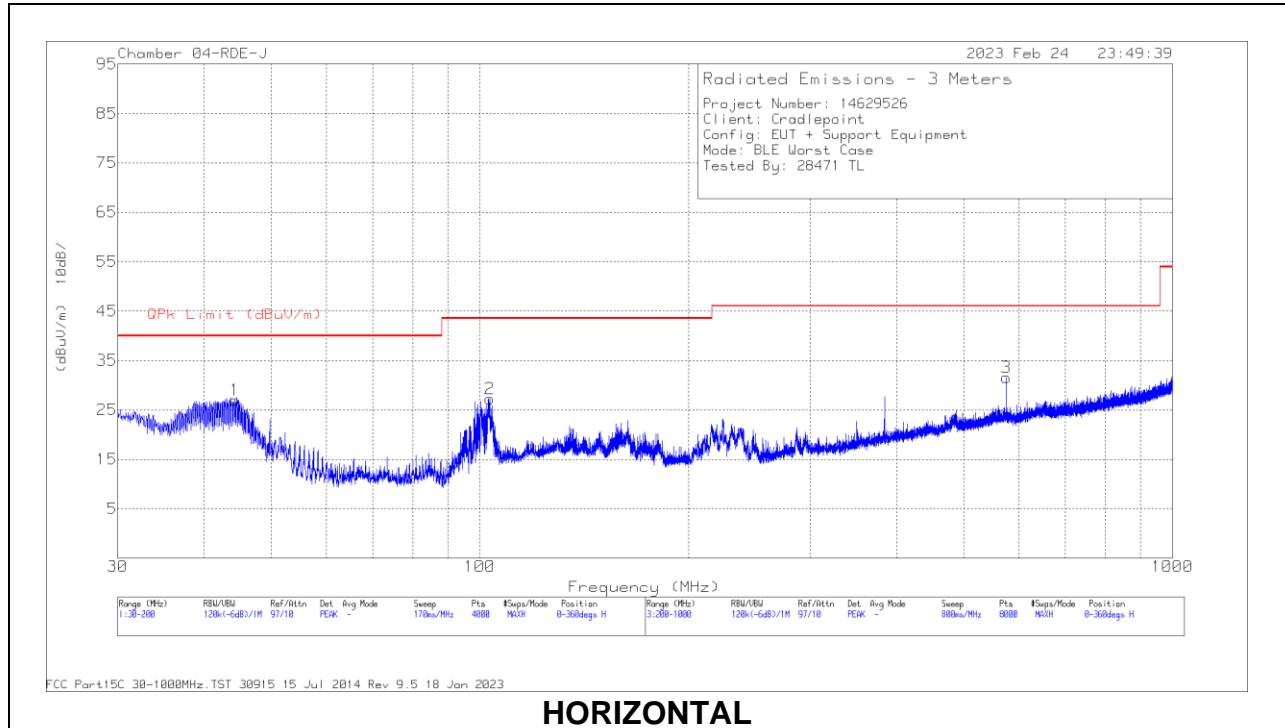
**Below 30MHz Data**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0219	30.45	Pk	58.6	-32	-80	-22.95	-	-83.74	40.79	-63.74	-	-	-	-	-	-	0-360
2	.2432	20.93	Pk	56	-32.3	-80	-35.37	-	-	-	-	-	-	39.9	-75.27	19.9	-55.27	0-360
4	.0226	29.51	Pk	58.6	-32	-80	-23.89	60.49	-84.38	40.49	-64.38	-	-	-	-	-	-	0-360
5	.2389	20.86	Pk	56	-32.3	-80	-35.44	-	-	-	-	-	-	40.05	-75.49	20.05	-55.49	0-360
3	.7058	14.86	Pk	56.1	-32.2	-40	-1.24	-	-	-	-	30.64	-31.88	-	-	-	-	0-360
6	.7071	14.5	Pk	56.1	-32.2	-40	-1.6	-	-	-	-	30.62	-32.22	-	-	-	-	0-360
7	1.1779	19.64	Pk	45.8	-32.2	-40	-6.76	-	-	-	-	26.2	-32.96	-	-	-	-	0-360
8	23.8115	24.87	Pk	33.5	-31.8	-40	-13.43	-	-	-	-	29.5	-42.93	-	-	-	-	0-360
9	1.1716	19	Pk	45.9	-32.2	-40	-7.3	-	-	-	-	26.25	-33.55	-	-	-	-	0-360
10	26.4022	30.93	Pk	33.3	-31.8	-40	-7.57	-	-	-	-	29.5	-37.07	-	-	-	-	0-360

Pk - Peak detector

### 10.4. WORST CASE BELOW 1 GHz

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



## Below 1GHz Data

### Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80706 ACF (dB)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	44.3262	42.04	Pk	16.6	-31.7	26.94	40	-13.06	0-360	298	H
2	103.374	41.28	Pk	17.3	-31.3	27.28	43.52	-16.24	0-360	198	H
4	43.6035	52.91	Pk	17.1	-31.7	38.31	40	-1.69	0-360	100	V
5	102.949	39.83	Pk	17.2	-31.2	25.83	43.52	-17.69	0-360	100	V
3	576.049	36.89	Pk	24.3	-29.6	31.59	46.02	-14.43	0-360	199	H
6	576.049	36.36	Pk	24.3	-29.6	31.06	46.02	-14.96	0-360	100	V

Pk - Peak detector

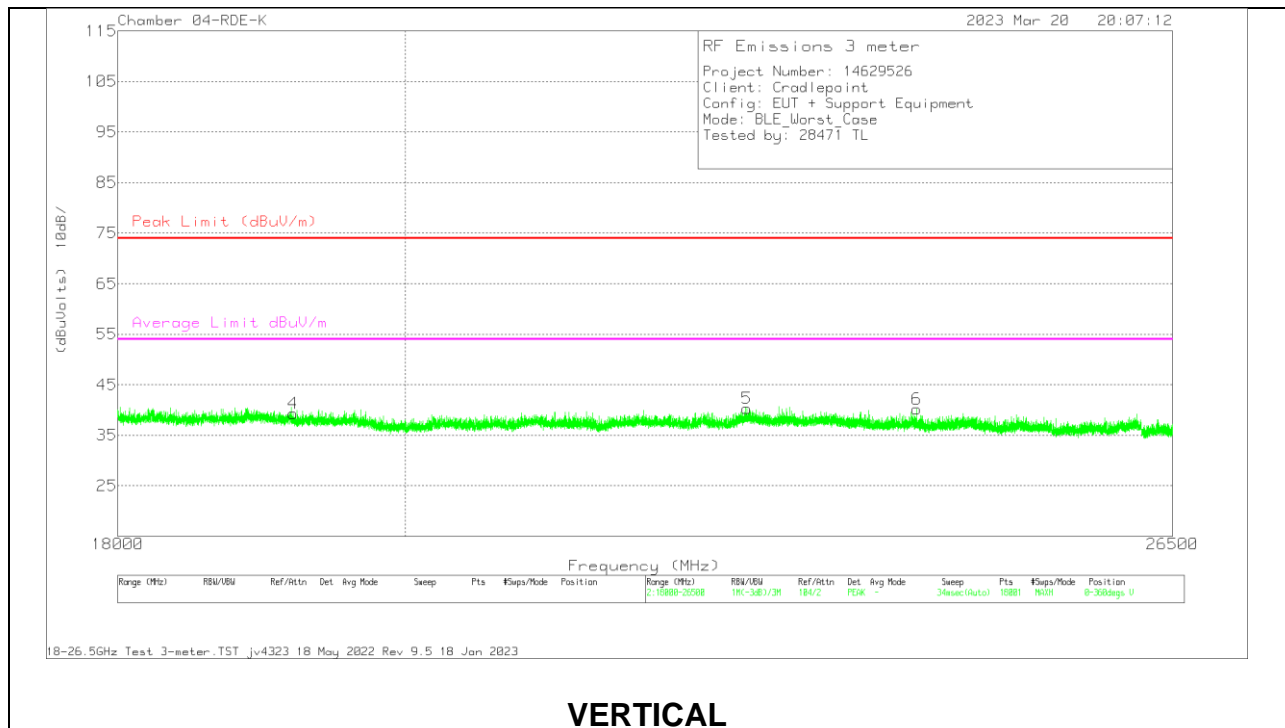
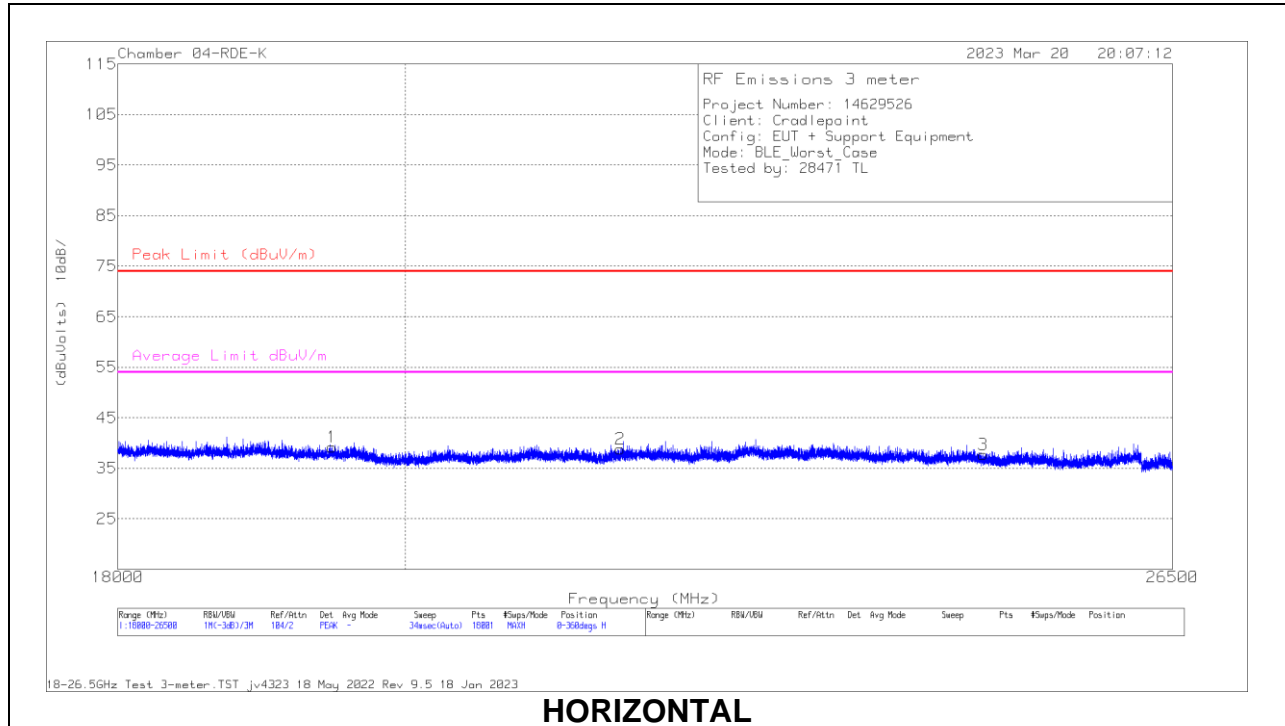
### Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	80706 ACF (dB)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
43.6035	10.31	Qp	17.1	-31.7	-4.29	40	-44.29	116	100	H
44.562	10.42	Qp	16.5	-31.7	-4.78	40	-44.78	116	102	V
44.0898	10.25	Qp	16.8	-31.7	-4.65	40	-44.65	116	100	V

Qp - Quasi-Peak detector

### 10.5. WORST CASE 18-26 GHz

#### SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



## 18 – 26GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	199659 ACF (dB)	234683 Amp/Cb1 (dB)	Cables (dB)	Corrected Reading (dBuVols)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19473.333	50.06	Pk	33.4	-62.8	18.5	39.16	74	-34.84	54	-14.64	0-360	199	H
2	21640.832	48.52	Pk	32.9	-62	19.4	38.82	74	-35.18	54	-15.18	0-360	101	H
3	24723.497	45.93	Pk	33.3	-62.2	20.7	37.73	74	-36.27	54	-16.27	0-360	199	H
4	* 19197.565	50.05	Pk	33.4	-62.5	18.4	39.35	74	-34.65	54	-14.65	0-360	101	V
5	* 22669.331	49.75	Pk	33.1	-62.5	19.9	40.25	74	-33.75	54	-13.75	0-360	200	V
6	24129.914	48.81	Pk	33.3	-62.4	20.5	40.21	74	-33.79	54	-13.79	0-360	200	V

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



## 11. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

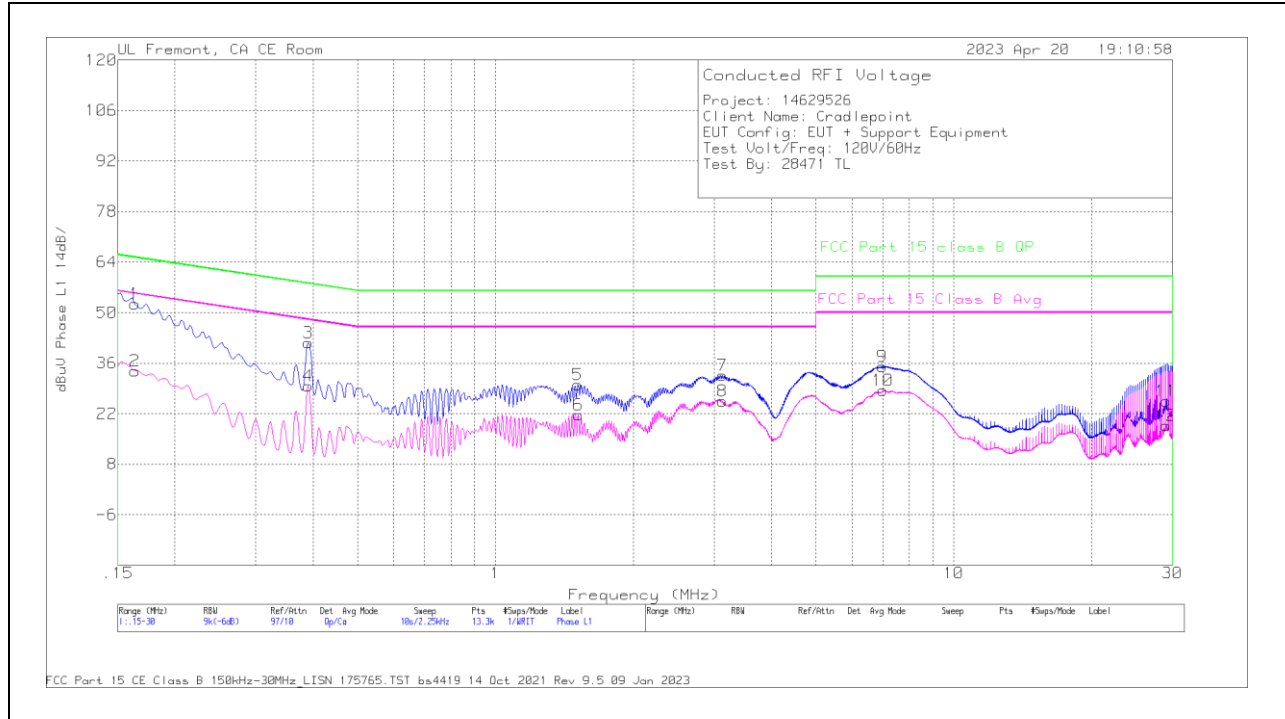
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 <sup>*</sup>	56 to 46 <sup>*</sup>
0.5-5	56	46
5-30	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

### RESULTS

AC Power Line Norm

LINE 1 RESULTS

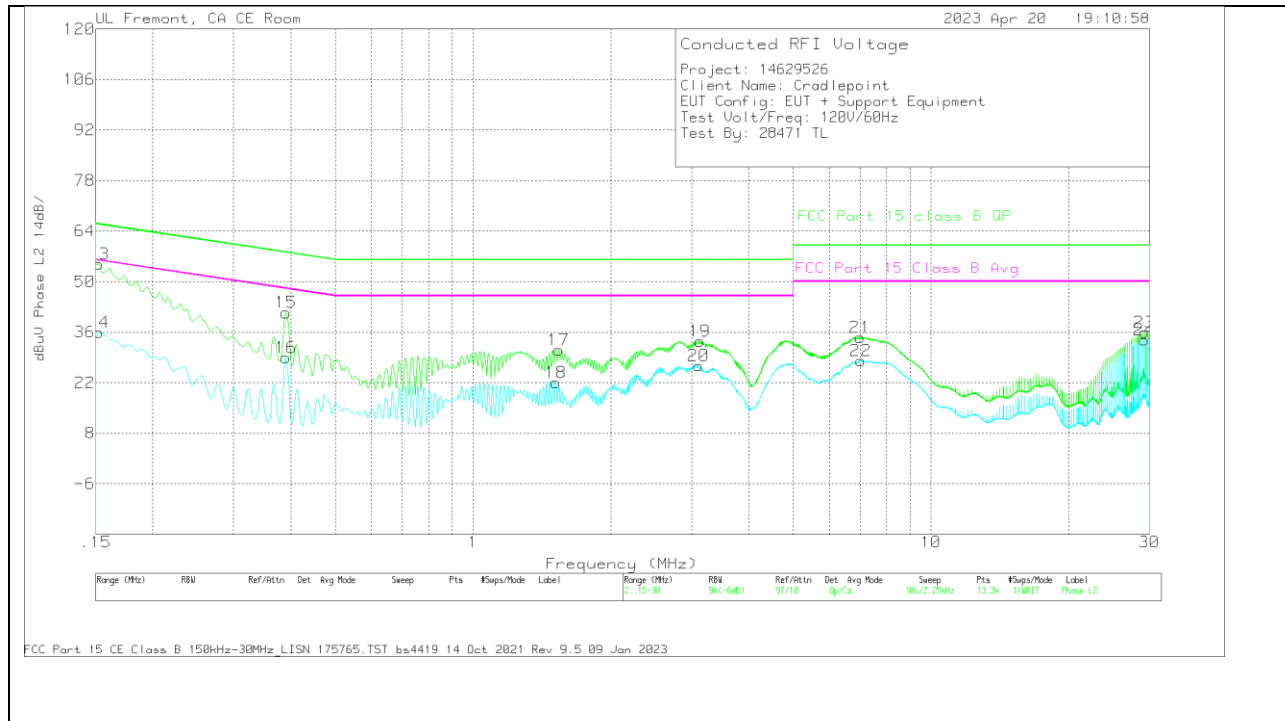


Trace Markers

Range 1: Phase L1 .15 - 30MHz												
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	C1&C3 cable path loss	PRE0186447 LISN L1	207996 Limiter with short cabl	10 dB Pad	Corrected Reading dBuV	FCC Part 15 Class B Avg	Margin (dB)	FCC Part 15 class B QP	Margin (dB)
2	.1635	14.47	Ca	0	0	9.4	10	33.87	55.28	-21.41	-	-
4	.3908	10.27	Ca	.1	0	9.3	10	29.67	48.05	-18.38	-	-
6	1.5158	2.26	Ca	.1	0	9.3	10	21.66	46	-24.34	-	-
8	3.129	6.16	Ca	.1	0	9.3	10	25.56	46	-20.44	-	-
10	7.0035	8.89	Ca	.2	0	9.3	10	28.39	50	-21.61	-	-
12	29.0648	-1.14	Ca	.3	.1	9.4	10	18.66	50	-31.34	-	-
1	.1635	33.11	Qp	0	0	9.4	10	52.51	-	-	65.28	-12.77
3	.3908	22.24	Qp	.1	0	9.3	10	41.64	-	-	58.05	-16.41
5	1.5135	10.54	Qp	.1	0	9.3	10	29.94	-	-	56	-26.06
7	3.129	13.22	Qp	.1	0	9.3	10	32.62	-	-	56	-23.38
9	6.9878	15.54	Qp	.2	0	9.3	10	35.04	-	-	60	-24.96
11	29.0648	5.69	Qp	.3	.1	9.4	10	25.49	-	-	60	-34.51

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

### LINE 2 RESULTS



#### Trace Markers

Range 2: Phase L2 .15 - 30MHz												
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	C2&C3 cable path loss	PRE0186447 LISN L2	207996 Limiter with short cabl	10 dB Pad	Corrected Reading dBuV	FCC Part 15 Class B Avg	Margin (dB)	FCC Part 15 class B QP	Margin (dB)
14	.1523	16.57	Ca	0	0	9.4	10	35.97	55.88	-19.91	-	-
16	.3908	9.62	Ca	.1	0	9.3	10	29.02	48.05	-19.03	-	-
18	1.5158	2.68	Ca	.1	0	9.3	10	22.08	46	-23.92	-	-
20	3.1065	7.25	Ca	.1	0	9.3	10	26.65	46	-19.35	-	-
22	7.026	8.74	Ca	.1	0	9.3	10	28.14	50	-21.86	-	-
24	29.2391	14.02	Ca	.3	.1	9.4	10	33.82	50	-16.18	-	-
13	.1523	35.51	Qp	0	0	9.4	10	54.91	-	-	65.88	-10.97
15	.3908	22	Qp	.1	0	9.3	10	41.4	-	-	58.05	-16.65
17	1.5383	11.64	Qp	.1	0	9.3	10	31.04	-	-	56	-24.96
19	3.1268	14.1	Qp	.1	0	9.3	10	33.5	-	-	56	-22.5
21	7.0125	15.19	Qp	.1	0	9.3	10	34.59	-	-	60	-25.41
23	29.2403	16.11	Qp	.3	.1	9.4	10	35.91	-	-	60	-24.09

Qp - Quasi-Peak detector  
 Ca - CISPR average detection