

# TEST REPORT

**Report Number. :** 14523778-E5V2

**Applicant :** APPLE INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95014, U.S.A

**Model :** A2847 (Parent Model)  
A3093, A3094, A3096 (Variant Model)

**FCC ID :** BCG-E8431A (Parent Model)  
BCG-E8432A, BCG-E8433A, BCG-E8434A (Variant Model)

**IC :** 579C-E8431A (Parent Model)  
579C-E8432A, 579C-E8433A, 579C-E8434A (Variant Model)

**EUT Description :** SMARTPHONE

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

**Date Of Issue:**  
August 15, 2023

**Prepared by:**  
UL Verification Services Inc.  
47173 Benicia Street  
Fremont, CA 94538 U.S.A.  
TEL: (510) 319-4000  
FAX: (510) 661-0888



---

**REPORT REVISION HISTORY**

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	8/9/2023	Initial Issue	Chin Pang
V2	8/15/2023	Addressed TCB Questions section 3, 6.3, 8	Chris Xiong

---

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS .....</b>	<b>5</b>
<b>2. TEST RESULT SUMMARY .....</b>	<b>7</b>
<b>3. TEST METHODOLOGY .....</b>	<b>7</b>
<b>4. FACILITIES AND ACCREDITATION .....</b>	<b>7</b>
<b>5. DECISION RULES AND MEASUREMENT UNCERTAINTY .....</b>	<b>8</b>
5.1. METROLOGICAL TRACEABILITY .....	8
5.2. DECISION RULES.....	8
5.3. MEASUREMENT UNCERTAINTY.....	8
5.4. SAMPLE CALCULATION .....	9
<b>6. EQUIPMENT UNDER TEST .....</b>	<b>10</b>
6.1. EUT DESCRIPTION .....	10
6.2. MAXIMUM OUTPUT POWER.....	10
6.3. DESCRIPTION OF AVAILABLE ANTENNAS .....	10
6.4. SOFTWARE AND FIRMWARE.....	10
6.5. WORST-CASE CONFIGURATION AND MODE.....	11
6.6. DESCRIPTION OF TEST SETUP.....	12
<b>7. MEASUREMENT METHOD.....</b>	<b>16</b>
<b>8. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>17</b>
<b>9. ANTENNA PORT TEST RESULTS .....</b>	<b>19</b>
9.1. ON TIME AND DUTY CYCLE.....	19
9.2. 26 dB BANDWIDTH.....	20
9.3. 6 dB BANDWIDTH.....	22
9.4. OUTPUT POWER AND PSD.....	24
<b>10. RADIATED TEST RESULTS.....</b>	<b>28</b>
10.1. TRANSMITTER ABOVE 1 GHz.....	30
10.1.1. ANT 6, 500Kbps LOW POWER BAND EDGE .....	30
10.1.2. ANT 6, 500Kbps LOW POWER HARMONICS AND SPURIOUS EMISSIONS .....	34
10.1.3. ANT 5, 500Kbps LOW POWER BAND EDGE .....	40
10.1.4. ANT 5, 500Kbps LOW POWER HARMONICS AND SPURIOUS EMISSIONS .....	44
10.2. WORST CASE BELOW 1 GHz .....	50
10.3. WORST CASE 18-26 GHz.....	52
10.4. WORST CASE 26-40 GHz.....	54

---

<b>11. AC POWER LINE CONDUCTED EMISSIONS .....</b>	<b>56</b>
11.1. AC POWER LINE WITH LAPTOP .....	57
11.2. AC POWER LINE WITH AC/DC ADAPTER .....	59
<b>12. SETUP PHOTOS.....</b>	<b>61</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** APPLE INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95014, U.S.A

**EUT DESCRIPTION:** SMARTPHONE

**MODEL:** A2847 (Parent Model)  
A3093, A3094, A3096 (Variant Model)

**BRAND:** APPLE

**SERIAL NUMBER:** C4CT6TDNQK (Conducted), YRN2MWW1K3 (Radiated)

**SAMPLE RECEIPT DATE:** FEBRUARY 20, 2023

**DATE TESTED:** MARCH 24 – AUGUST 15, 2023

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart E	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:



---

Chin Pang  
Senior Lab Engineer  
Consumer Technology Division  
UL Verification Services Inc.

---

Francisco Guarnero  
Senior Test Engineer  
Consumer Technology Division  
UL Verification Services Inc.

## 2. TEST RESULT SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 12.2.
See Comment	RSS-GEN 6.7	26dB BW/99% OBW	Reporting purposes only	Per ANSI C63.10 Sections 6.9.2 and 6.9.3
15.407 (e)	RSS-247 6.2.4.1	6 dB BW	Complies	None.
15.407 (a) (1-4), (h) (1)	RSS-247 6.2	Output Power	Complies	None.
15.407 (a) (1-3, 5)	RSS-247 6.2	PSD	Complies	None.
15.209, 15.205, 15.407 (b)	RSS-GEN 8.9, 8.10, RSS-247 6.2	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Complies	None.

## 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC 15.407
- FCC CFR 47 Part 15
- FCC KDB 662911 D01 v02r01
- FCC KDB 789033 D02 v02r01
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1 +A2
- RSS-247 Issue 2.
- KDB 414788 D01 Radiated Test Site v01r01

## 4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #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, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
<input checked="" type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
<input type="checkbox"/>	Building 5: 47670 Kato Rd, Fremont, CA 94538 USA			

## 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>
Conducted Antenna Port Emission Measurement	1.94 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 dB
RF Power Measurement Direct Method Using Power Meter	0.450 dB(Peak), 1.3 dB (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.2%
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

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 Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

The Model and FCC/IC ID covered by this report includes:

Parent Model: A2847, FCC ID: BCG-E8431A, IC ID: 579C-E8431A

Variant Models:       A3093, FCC ID: BCG-E8432A, IC ID: 579C-E8432A  
                           A3094, FCC ID: BCG-E8433A, IC ID: 579C-E8433A  
                           A3096, FCC ID: BCG-E8434A, IC ID: 579C-E8434A

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

#### 5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
<b>5.8 GHz band, 1TX</b>			
5728.75 - 5846.25	802.15.4ab	16.72	46.99

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:  
 The radio utilizes. Cable loss is 3.15 dB.

Frequency Range (GHz)	Antenna 6 (dBi)	Antenna 5 (dBi)
5728.75 - 5846.25	-3.50	-1.90

### 6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 1868.0.30.0.1~1536.4601.33

---

## 6.5. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z on Ant 6 and Ant 5. It was determined that Y (Landscape) orientation was the worst-case orientation for both Ant 6 and Ant 5.

There are index 1, index 2 and index 3 corresponding to 250Kbps, 500Kbps and 1000Kbps data rate. Baseline investigation on the different data rate, based on highest PSD 500Kbps is determined to be the worst case, therefore 500Kbps was used to perform all final test.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-40GHz, and power line conducted emissions were performed with the EUT with power setting as worst-case scenario.

For Radiated band edge test all test modes have been investigated with power set at higher setting as worst-case scenario.

Below 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz, the worst-case configuration reported was tested with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop. There were no emissions found below 30MHz within 20dB of the limit.

Simultaneous transmission with the Bluetooth was investigated, and no noticeable emission was found.

For radiated band edge and emissions spurious, 500Kbps is set as the worst-case data rates for final test

Note: Note: In the Radiated Plots and emissions data, ANT0=ANT6 and ANT1=ANT5.

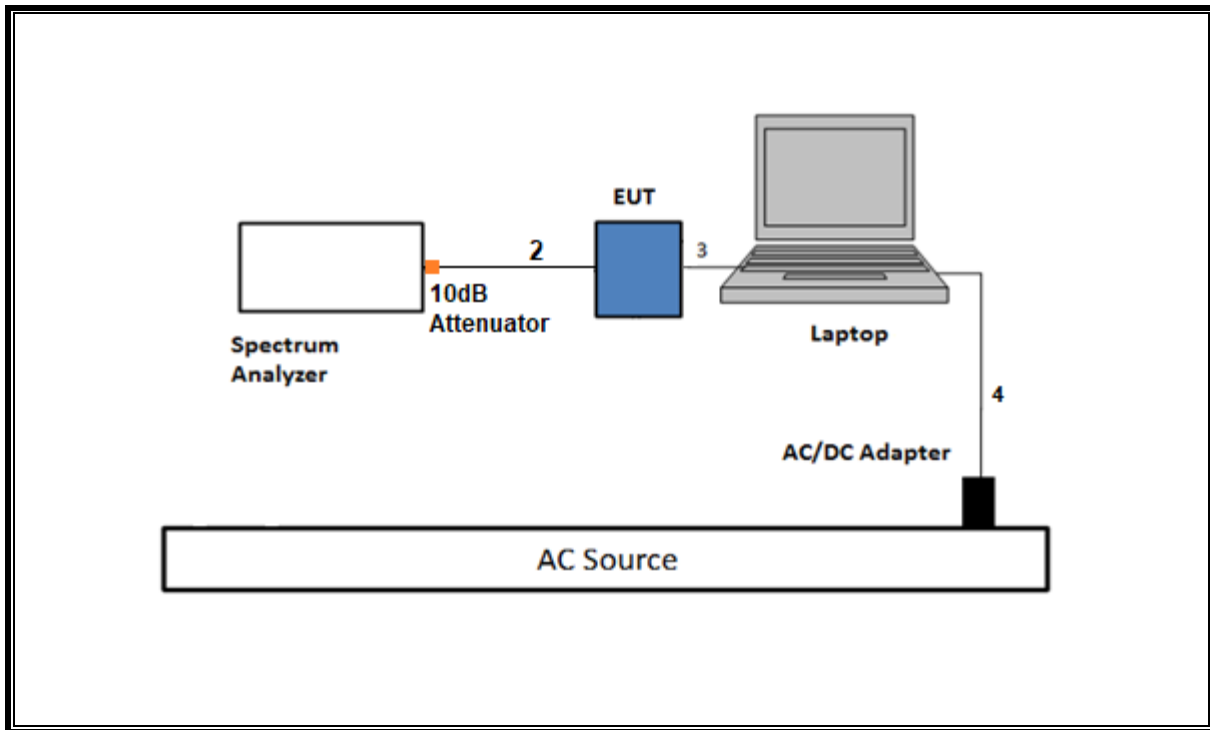
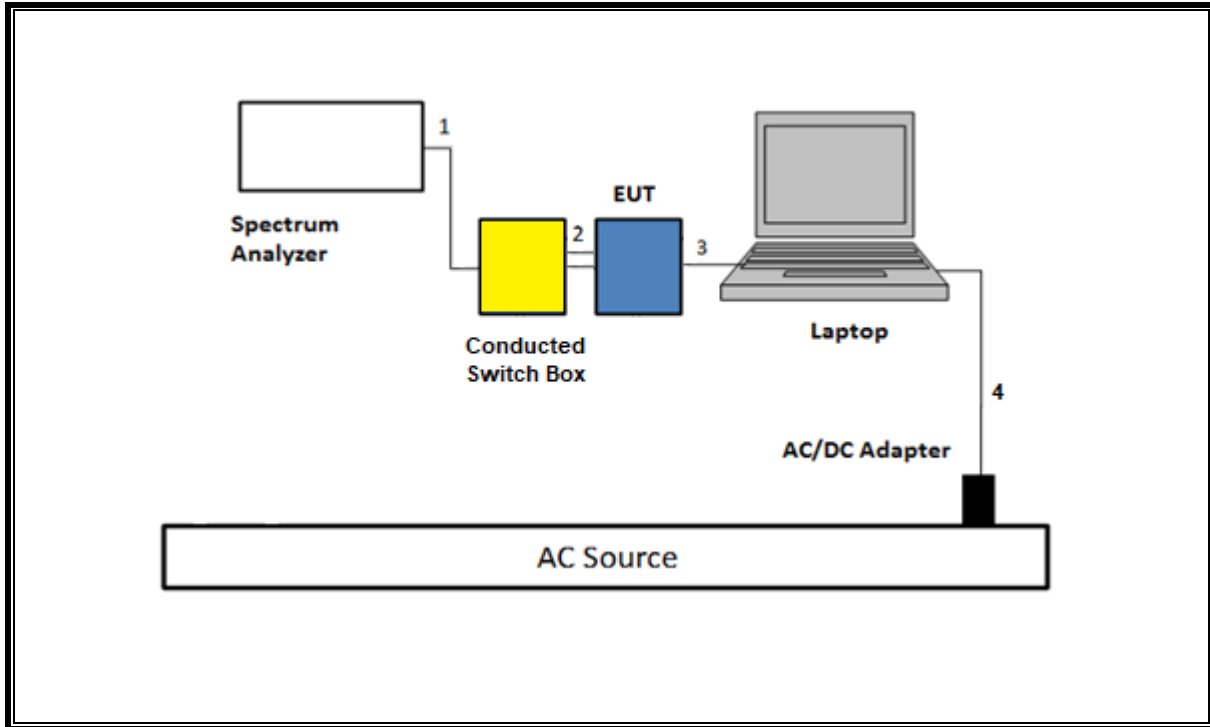
## 6.6 DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Apple	Macbook Pro	C02VD7SAHV22	BCGA1708		
Laptop AC/DC adapter	Liteon Technology	A1424	NSW25679	DoC		
EUT AC/DC adapter	Apple	A1720	C3D8417A7R93KVPA8	DoC		
Conducted Switch Box	UL	n/a	208281	N/A		
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	N/A		
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	SMA	1	SMA	Shielded	0.75	To spectrum Analyzer
2	Antenna	2	SMA	Un-shielded	0.2	To Conducted Switch Box
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	AC	1	AC	Un-shielded	2	N/A
I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Shielded	1	N/A

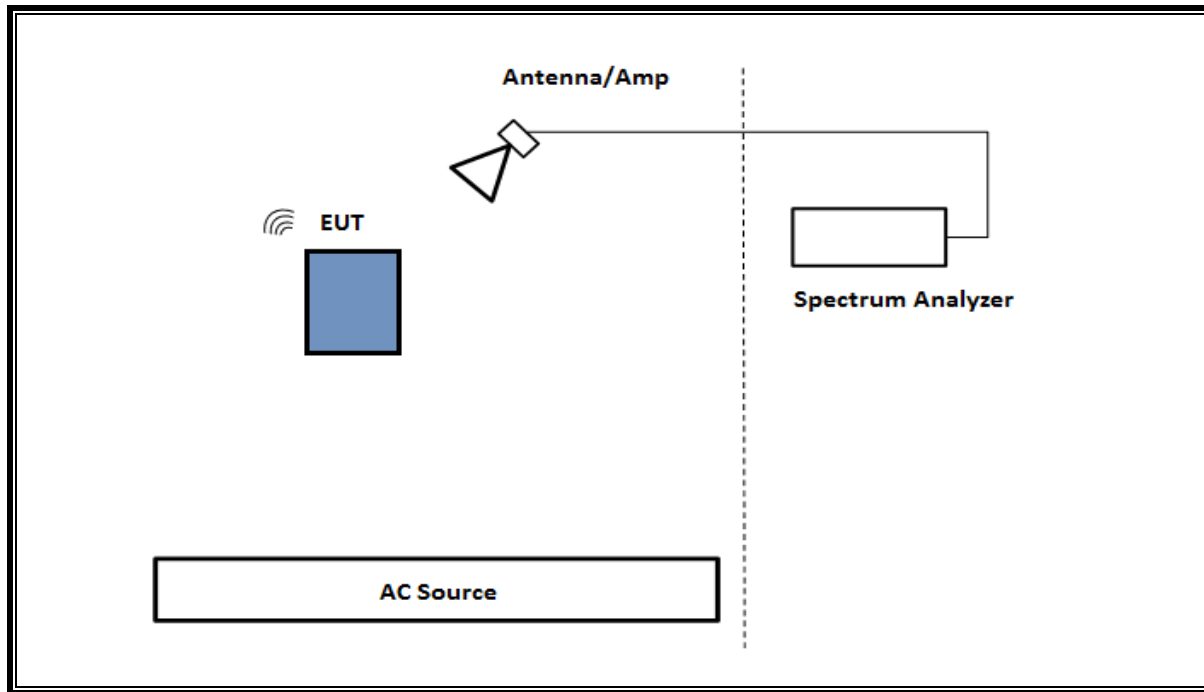
### TEST SETUP

The EUT setup is shown as below. Test software exercised the radio card.

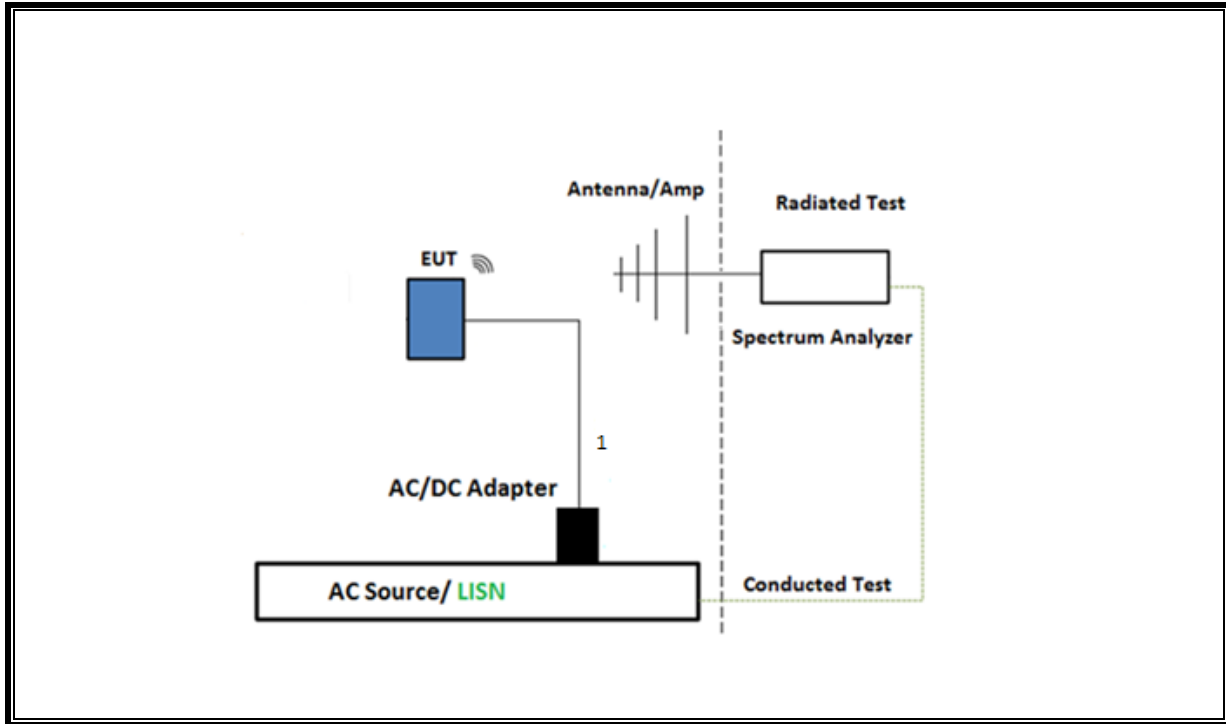
**SETUP DIAGRAM FOR RF CONDUCTED TESTS**



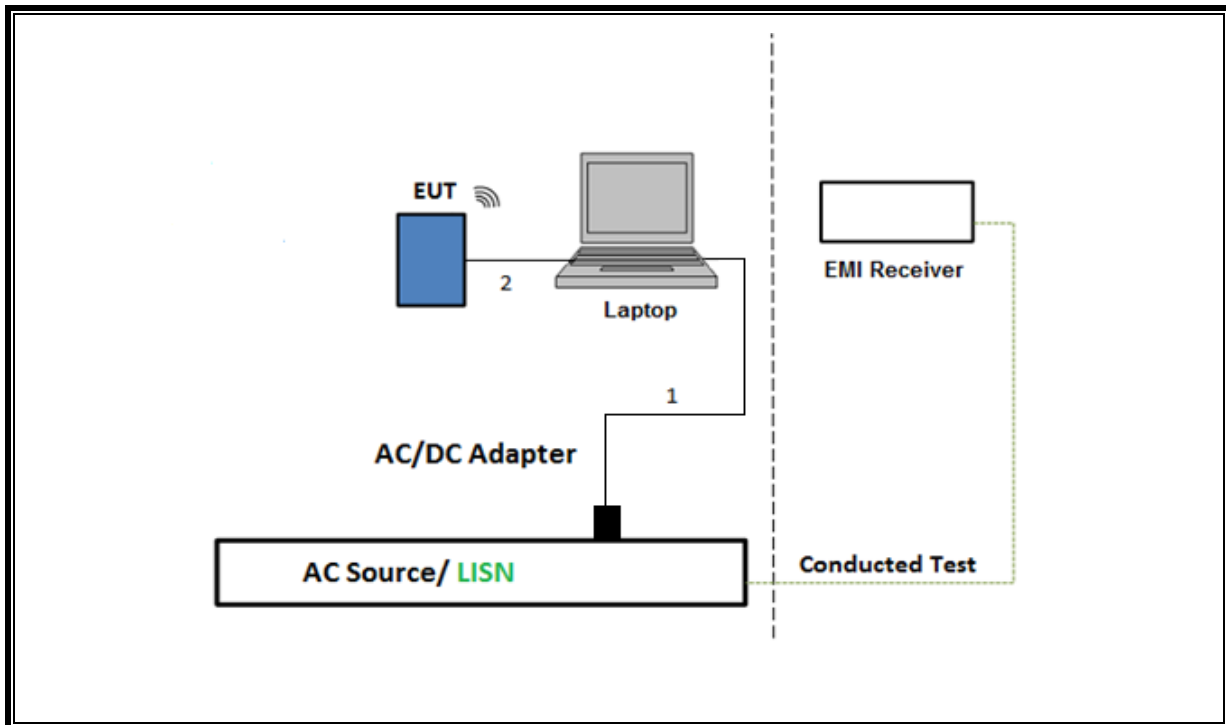
**SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz**



**SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST**



**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**



## 7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

6 dB Emission BW: KDB 789033 D02 v02r01, Section C.2

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

99% Occupied BW: KDB 789033 D02 v02r01, Section D.

Conducted Output Power: KDB 789033 D02 v02r01

Power Spectral Density: KDB 789033 D02 v02r01, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

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, Horn 1-18GHz	ETS Lindgren	3117	200784	01/31/2024	01/31/2023
RF Filter Box, 1-18GHz, 17 Ports	UL-FR1	RATS 2	226781	04/30/2024	04/30/2023
EMI Receiver	Rohde & Schwarz	ESW44	235670	04/30/2024	04/30/2023
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	84797	09/20/2023	09/20/2022
RF Filter Box, 1-18GHz	UL-FR1	N/A	171389	05/31/2024	05/31/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201497	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	222740	08/31/2023	08/31/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	02/29/2024	02/29/2023
*Filter Box, 1-18GHz 12 Port	UL-FR1	Frankenstein	217255	08/23/2023	08/23/2022
*Antenna Horn, 18 to 26.5GHz	ARA	MWH-1826/B	172353	06/01/2023	06/01/2022
Antenna, Horn 26.5 to 40GHz	A.R.A.	MWH-2640/B	199660	12/06/2023	12/06/2022
Link File, RF Amplifier Assembly, 26-40GHz, 65dB Gain	AMPLICAL	AMP26G40-65	172346	02/29/2024	02/29/2023
RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023
*Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80404	08/08/2023	08/08/2022
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	216812	09/17/2023	09/17/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	02/29/2024	02/29/2023
*Antenna, Passive Loop 100KHz to 30MHz	ETS-Lindgren	EM-6872	170015	07/28/2023	07/28/2022
*Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170013	07/28/2023	07/28/2022
Link File, RF Amplifier Assembly, 26-40GHz, 65dB Gain	AMPLICAL	AMP26G40-65	221834	02/29/2024	02/29/2023
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	NA	230878	02/29/2024	02/29/2023
*Antenna Horn, 26.5 to 40GHz	ARA	MWH-2640/B	172367	06/01/2023	06/01/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	87738	01/31/2024	01/31/2023
Conducted Switch Box	N/A	CSB	208281	04/30/2024	04/30/2023
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	Verified/Characterized before use	
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90756	01/31/2024	01/31/2023
Power Sensor, P- series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90389	01/31/2024	01/31/2023
*Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	80508	06/08/2023	06/08/2022
*Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	89831	08/10/2023	08/10/2022

<b>AC Line Conducted</b>					
<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>ID Num</b>	<b>Cal Due</b>	<b>Last Cal</b>
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	93091	02/29/2024	02/29/2023
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175764	01/31/2024	01/31/2023
*Transient Limiter	TE	TBFL1	207996	07/15/2023	07/15/2022
<b>UL AUTOMATION SOFTWARE</b>					
Radiated Software	UL	UL EMC	Ver 9.5, May 1 , 2023		
Conducted Software	UL	UL EMC	2020.8.16		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, Mar 3, 2023		

\*Testing is completed before equipment expiration date.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

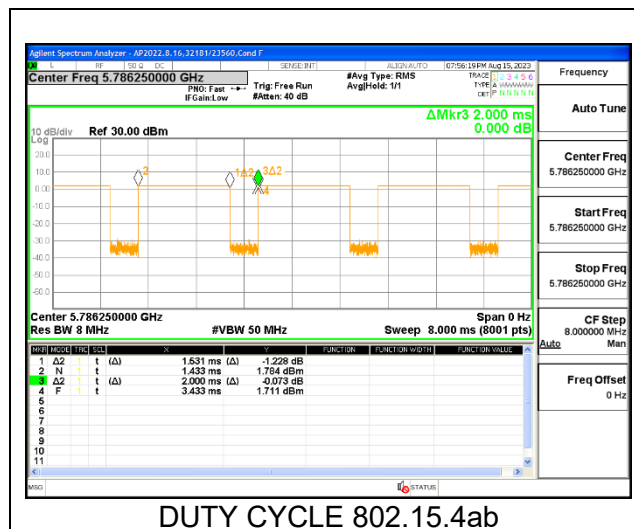
#### PROCEDURE

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>802.15.4ab</b>						
5786.25MHz	1.531	2.000	0.766	76.55%	1.16	0.653

#### DUTY CYCLE PLOTS



## 9.2. 26 dB BANDWIDTH

### LIMITS

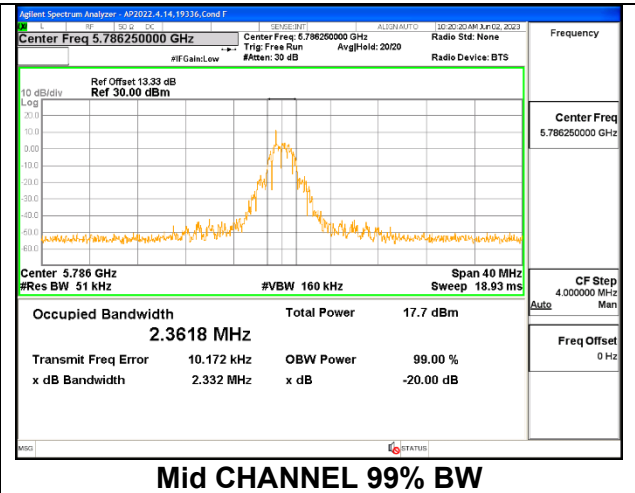
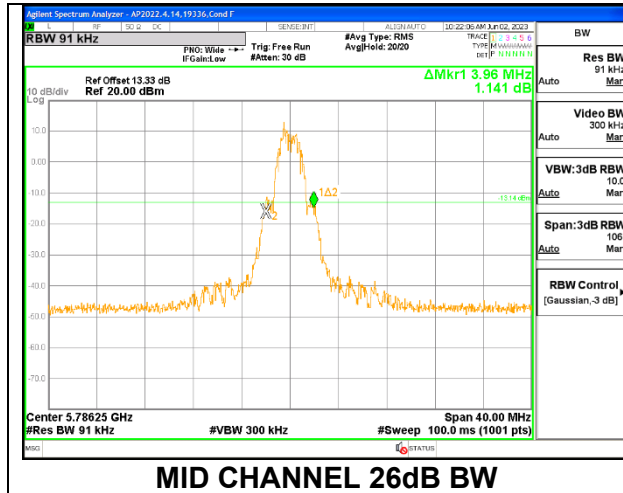
None; for reporting purposes only.

### RESULTS

Only High Power modes result is reported, it covers all Low Power modes. Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

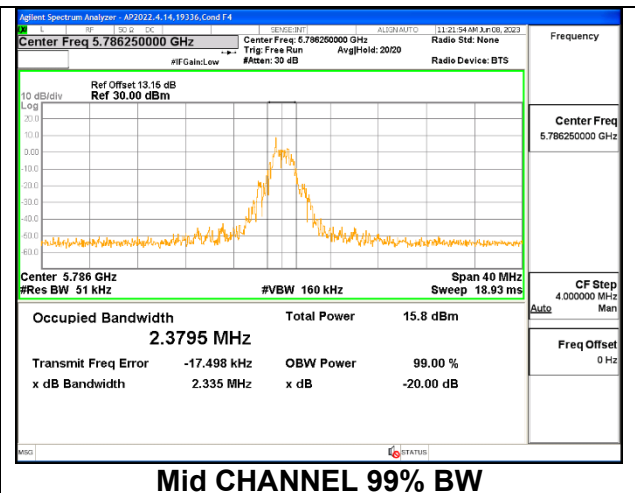
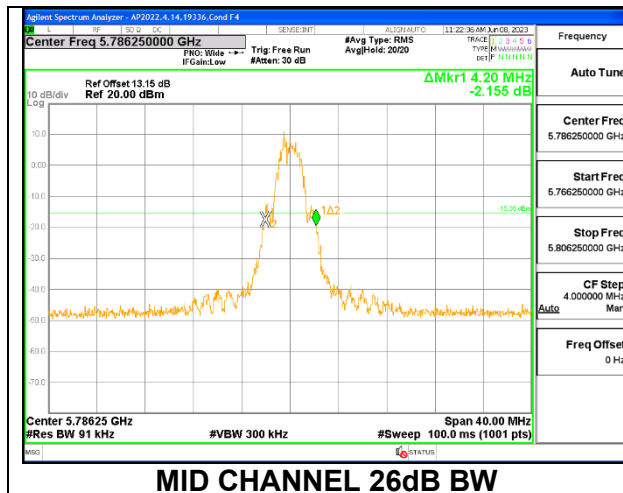
**1TX Antenna 6 MODE**

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5728.75	4.24	2.3490
Mid	5786.25	3.96	2.3618
High	5846.25	4.12	2.3877



**1TX Antenna 5 MODE**

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5728.75	3.92	2.3854
Mid	5786.25	4.20	2.3795
High	5846.25	4.16	2.3126



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

#### **LIMITS**

FCC §15.407 (e)

RSS-247 6.2.4.1

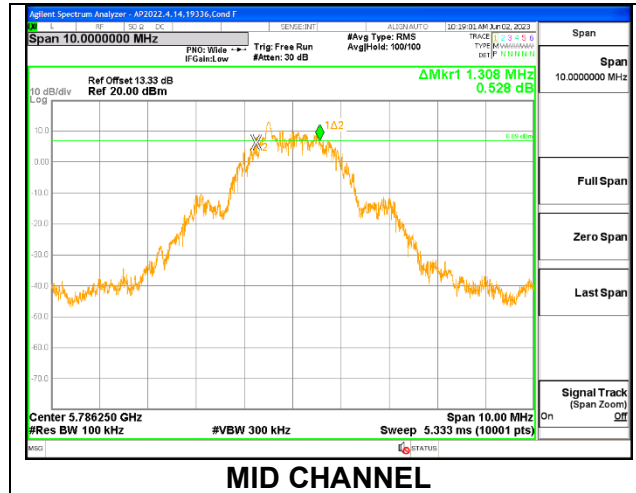
The minimum 6 dB bandwidth shall be at least 500 kHz.

#### **RESULTS**

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

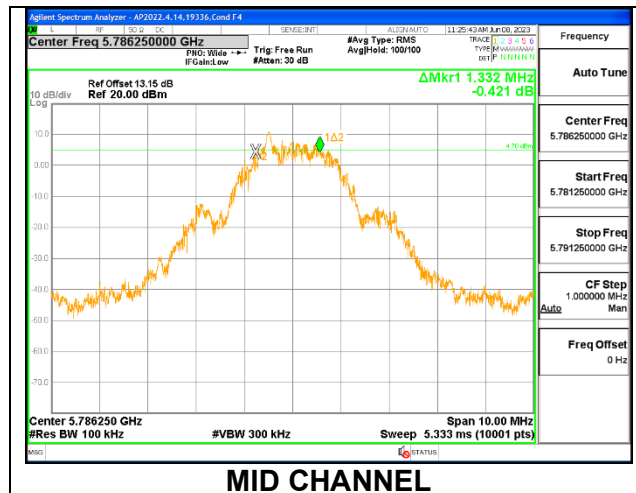
**1TX Antenna 6 MODE**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5728.75	1.211	0.5
Mid	5786.25	1.308	0.5
High	5846.25	1.144	0.5



**1TX Antenna 5 MODE**

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5728.75	1.253	0.5
Mid	5786.25	1.332	0.5
High	5846.25	1.289	0.5



## 9.4. OUTPUT POWER AND PSD

### LIMITS

#### **FCC §15.407**

##### **Band 5.725-5.85 GHz**

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.



**RSS-247****Band 5.725-5.85 GHz**

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

**TEST PROCEDURE**

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3 a. Method PM.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F.

Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

**DIRECTIONAL ANTENNA GAIN**

For 1 TX:

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

<b>ANT 6</b>	<b>ANT 5</b>
(dBi)	(dBi)
-3.50	-1.90

**Low Power 1TX Antenna 6 MODE (FCC + IC)**

<b>Test Engineer:</b>	19336
<b>Test Date:</b>	8/11-14, 2023

**Antenna Gain and Limit**

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/500KHz)
Low	5728.75	-3.5	30.00	30.00
Mid	5786.25	-3.5	30.00	30.00
High	5846.25	-3.5	30.00	30.00

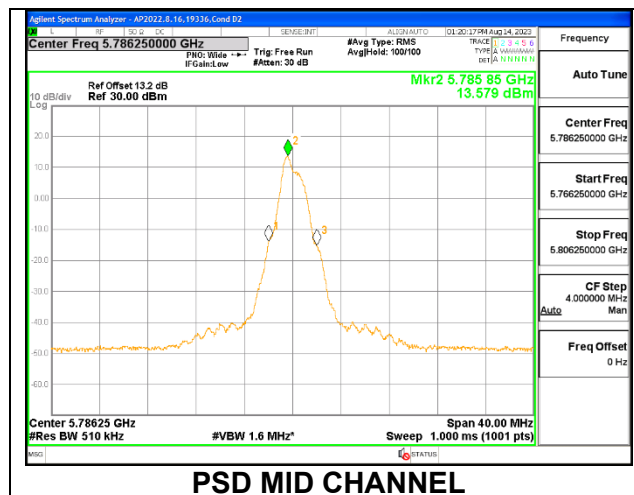
<b>Duty Cycle CF (dB)</b>	1.16	<b>Included in Calculations of Corr'd PSD and Power</b>
---------------------------	------	---

**Output Power Results**

Channel	Frequency (MHz)	Antenna 6 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5728.75	15.51	16.67	30.00	-13.33
Mid	5786.25	15.56	16.72	30.00	-13.28
High	5846.25	15.49	16.65	30.00	-13.35

**PSD Results**

Channel	Frequency (MHz)	Antenna 6 Meas PSD (dBm/500KHz)	Total Corr'd PSD (dBm/500KHz)	PSD Limit (dBm/500KHz)	PSD Margin (dB)
Low	5728.75	13.380	14.540	30.00	-15.46
Mid	5786.25	13.579	14.739	30.00	-15.26
High	5846.25	13.263	14.423	30.00	-15.58



**Low Power 1TX Antenna 5 MODE (FCC + IC)**

<b>Test Engineer:</b>	19336
<b>Test Date:</b>	08/11-14, 20023

**Antenna Gain and Limit**

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/500KHz)
Low	5728.75	-1.90	30.00	30.00
Mid	5786.25	-1.90	30.00	30.00
High	5846.25	-1.90	30.00	30.00

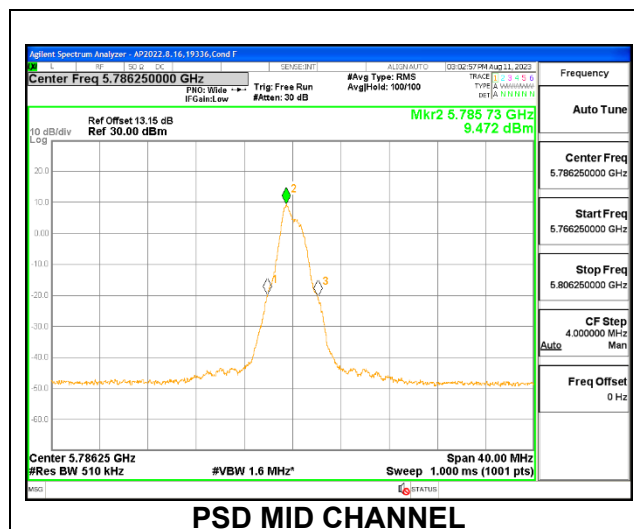
<b>Duty Cycle CF (dB)</b>	1.16	<b>Included in Calculations of Corr'd PSD and Power</b>
---------------------------	------	---

**Output Power Results**

Channel	Frequency (MHz)	Antenna 5 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5728.75	11.33	12.49	30.00	-17.51
Mid	5786.25	11.00	12.16	30.00	-17.84
High	5846.25	11.00	12.16	30.00	-17.84

**PSD Results**

Channel	Frequency (MHz)	Antenna 5 Meas PSD (dBm/500KHz)	Total Corr'd PSD (dBm/500KHz)	PSD Limit (dBm/500KHz)	PSD Margin (dB)
Low	5728.75	9.588	10.748	30.00	-19.25
Mid	5786.25	9.472	10.632	30.00	-19.37
High	5846.25	8.921	10.081	30.00	-19.92



## 10. RADIATED TEST RESULTS

### LIMITS

FCC §15.205 and §15.209 -Restricted bands  
 FCC §15.407(b)(1-3) -Un-Restricted bands  
 RSS 247 Issue 2 Sections  
 6.2.1.2 (for 5150-5250 MHz band)  
 6.2.2.2 (for 5250-5350 MHz band)  
 6.2.3.2 (for 5470-5600 MHz and 5650-5725 MHz bands)  
 6.2.4.2 (for 5725-5850 MHz band)

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. Peak detection is used unless otherwise noted as quasi-peak.

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 30 MHz to 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

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.

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. Blue color trace on plots: Parallel orientation. Green color trace on plots: Perpendicular orientation.

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.

#### **RESULTS**

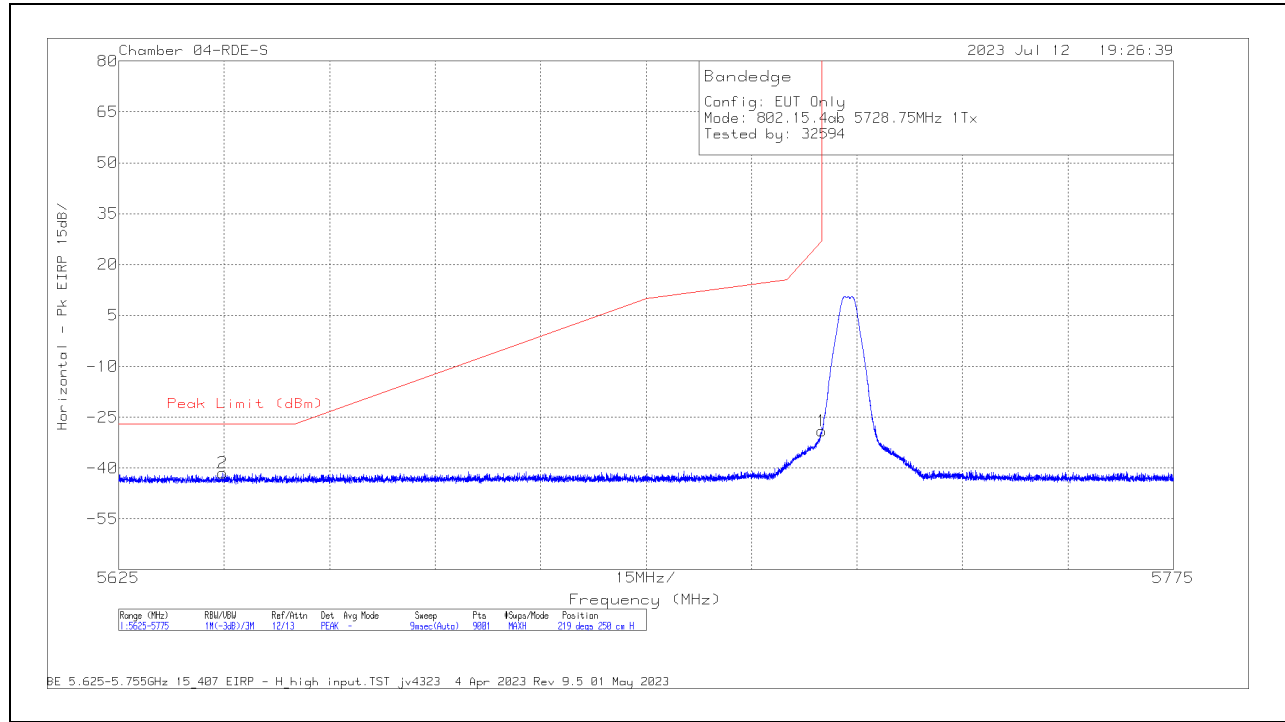
## 10.1. TRANSMITTER ABOVE 1 GHz

### 10.1.1. ANT 6, 500Kbps LOW POWER BAND EDGE

#### 1TX Antenna 6

#### BANDEDGE (LOW CHANNEL)

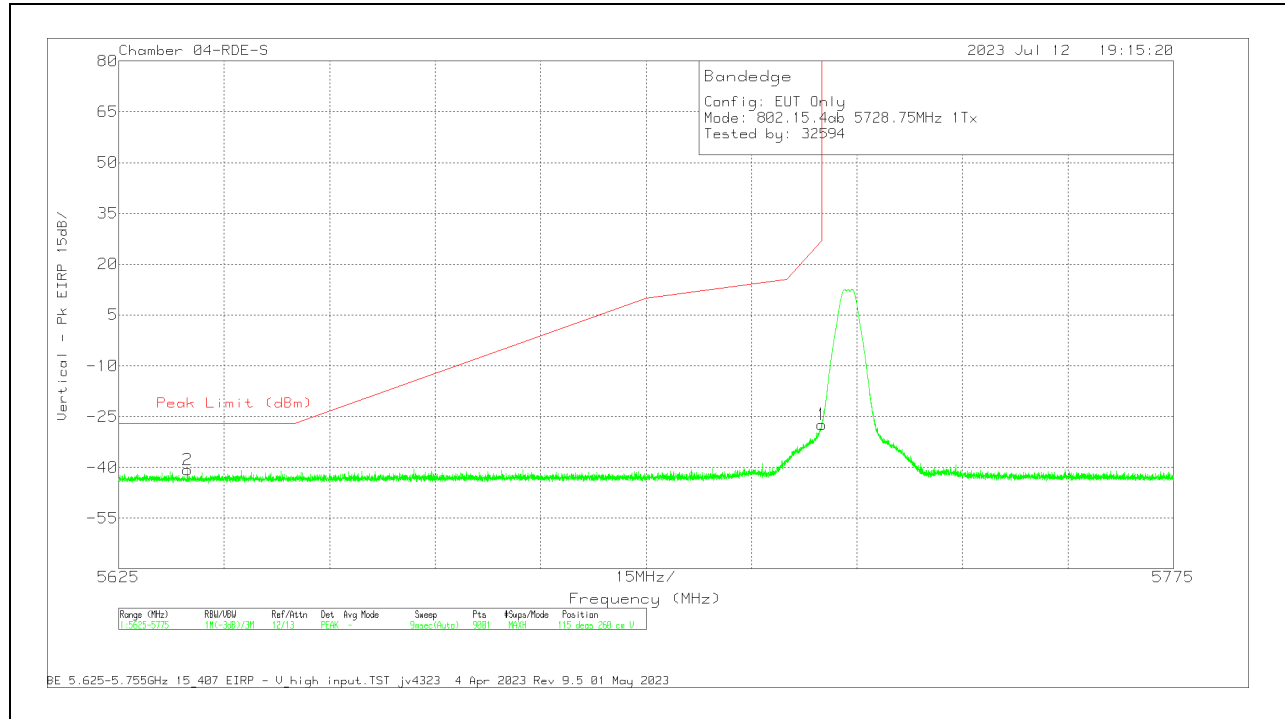
#### HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	200784 ACF (dB) 3mH	Conversion Factor (dB)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5639.784	-65.28	Pk	34.6	11.8	0	-22.62	-41.5	-27	-14.5	219	250	H
1	5725	-53.01	Pk	34.7	11.8	0	-22.54	-29.05	27	-56.05	219	250	H

Pk - Peak detector

**VERTICAL RESULT**

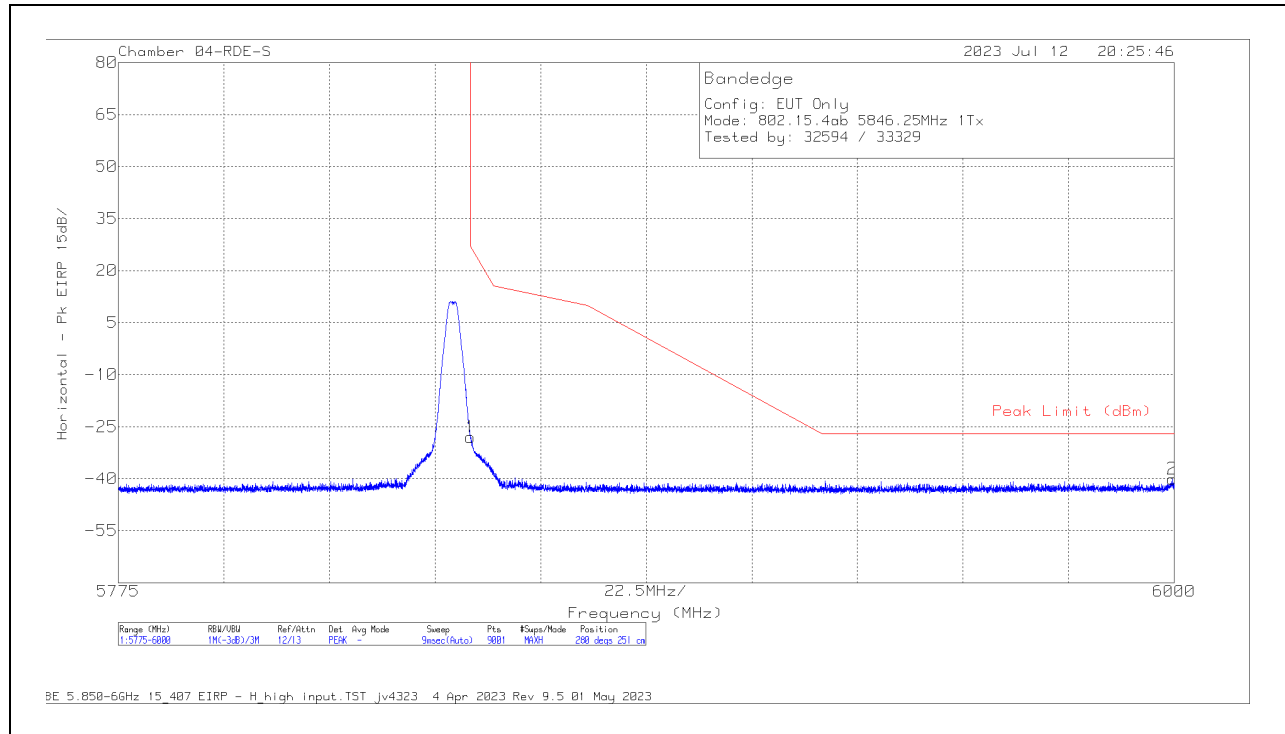


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	200784 ACF (dB) 3mH	Conversion Factor (dB)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5634.784	-64.51	Pk	34.6	11.8	0	-22.67	-40.78	-27	-13.78	115	260	V
1	5725	-51.26	Pk	34.7	11.8	0	-22.54	-27.3	27	-54.3	115	260	V

Pk - Peak detector

# BANDEDGE (HIGH CHANNEL)

## HORIZONTAL RESULT

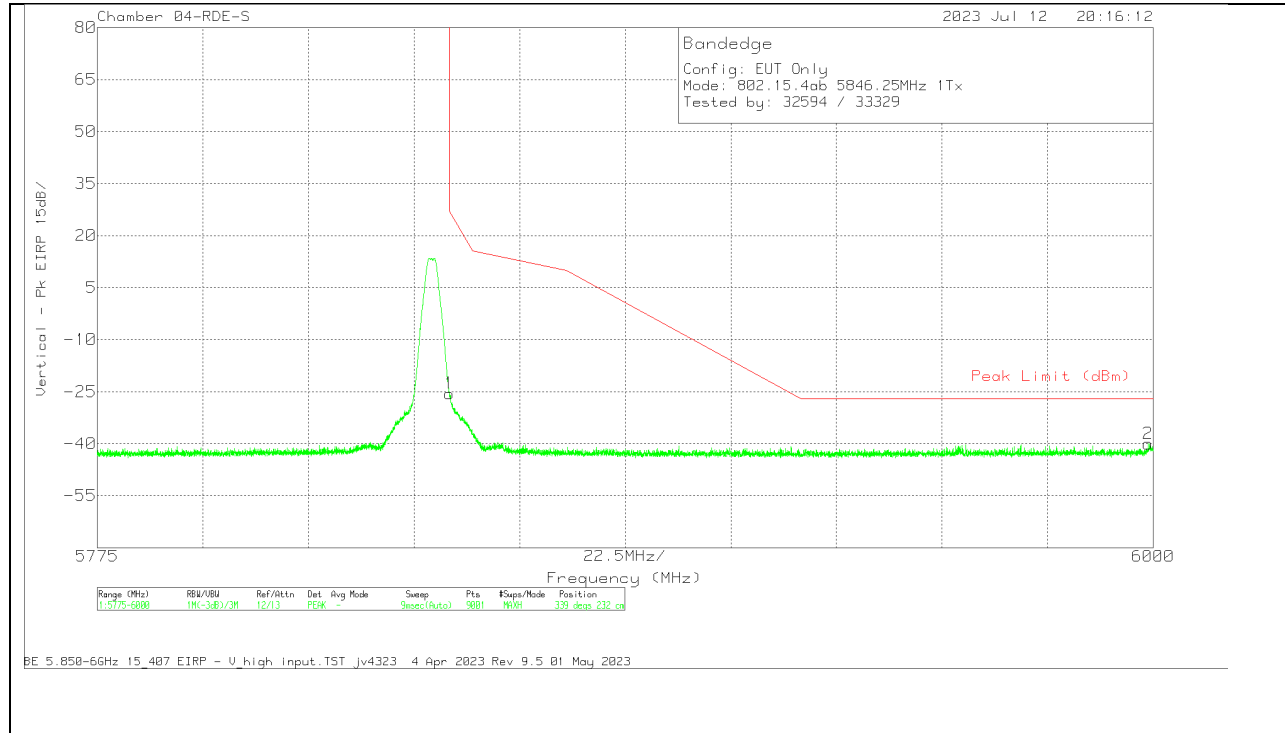


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	200784 ACF (dB) 3mH	Conversion Factor (dB)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5850	-52.47	Pk	35	11.8	0	-22.34	-28.01	27	-55.01	280	251	H
2	5999.55	-64.62	Pk	35.3	11.8	0	-22.52	-40.04	-27	-13.04	280	251	H

Pk - Peak detector



**VERTICAL RESULT**

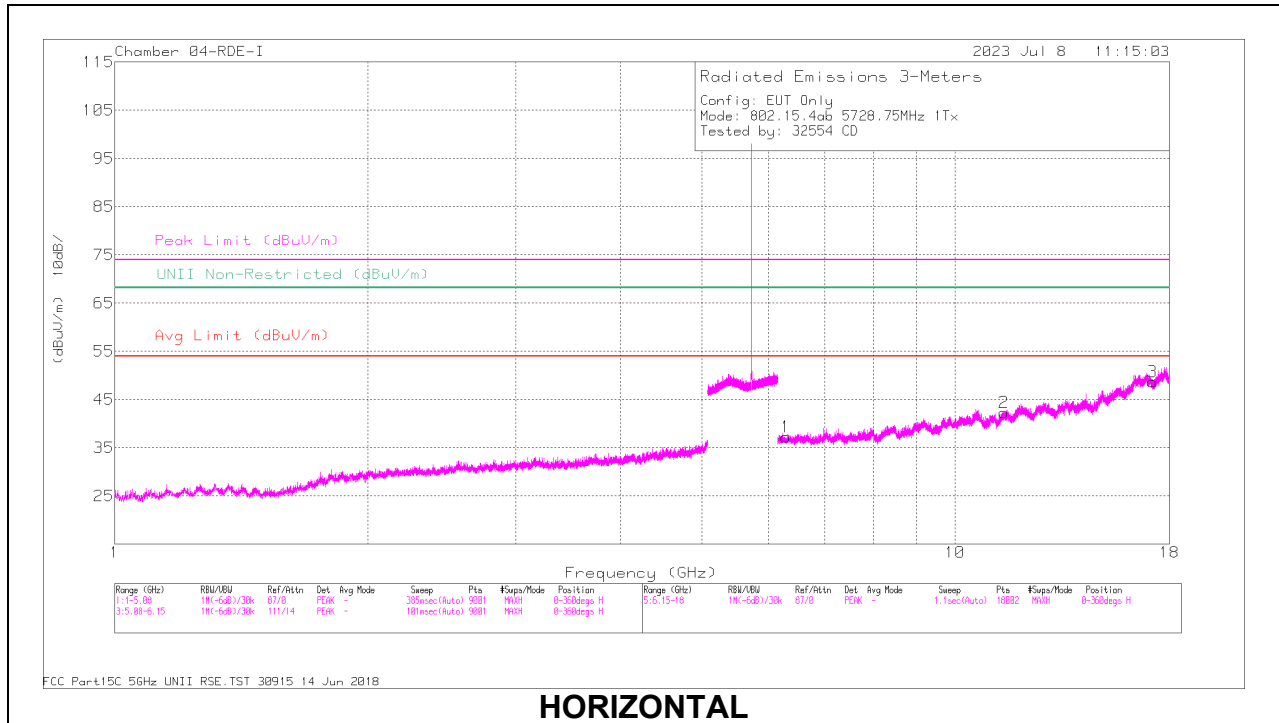


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	200784 ACF (dB) 3mH	Conversion Factor (dB)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5850	-49.97	Pk	35	11.8	0	-22.34	-25.51	27	-52.51	339	232	V
2	5998.95	-64.59	Pk	35.3	11.8	0	-22.51	-40	-27	-13	339	232	V

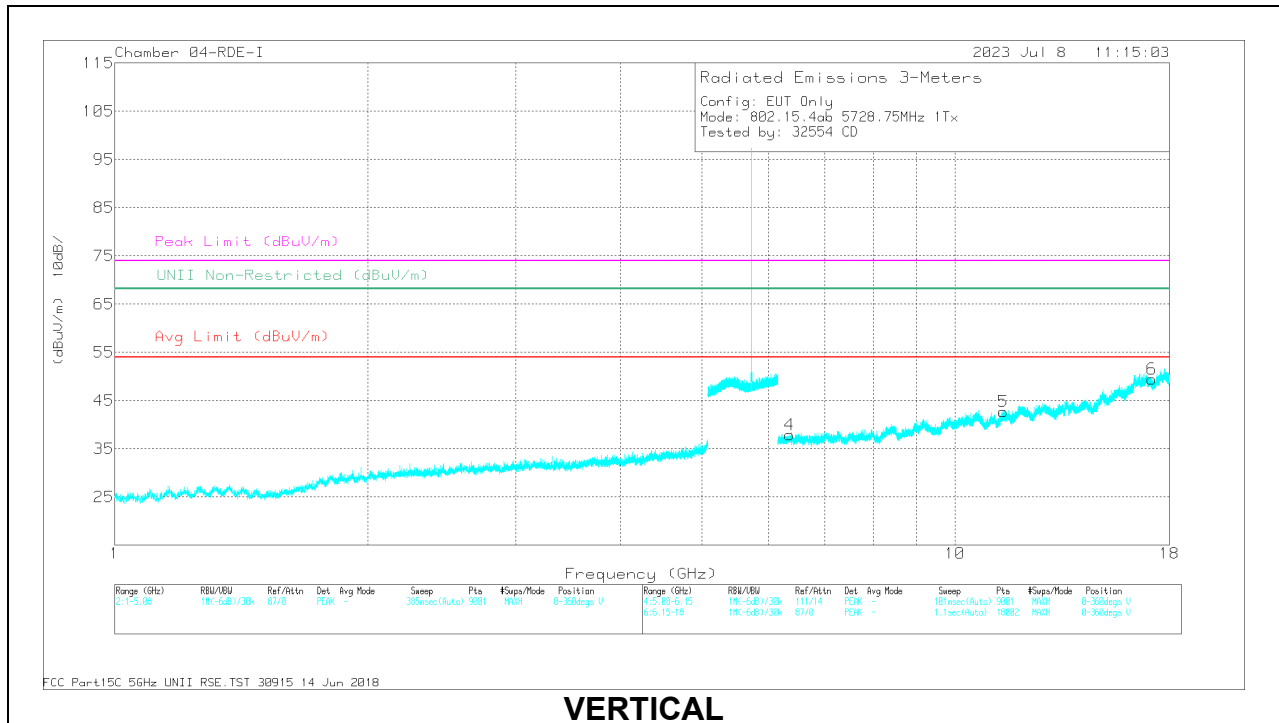
Pk - Peak detector

### 10.1.2. ANT 6, 500Kbps LOW POWER HARMONICS AND SPURIOUS EMISSIONS

#### LOW CHANNEL RESULTS



HORIZONTAL



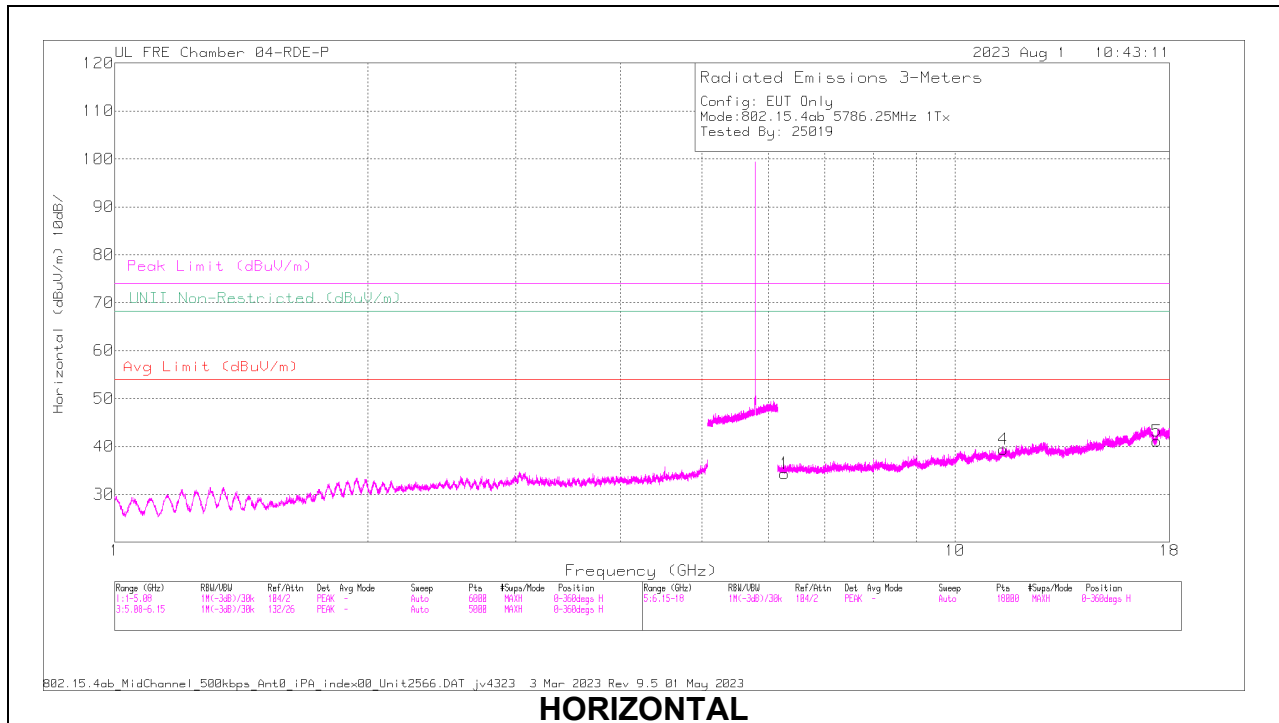
VERTICAL

**RADIATED EMISSIONS**

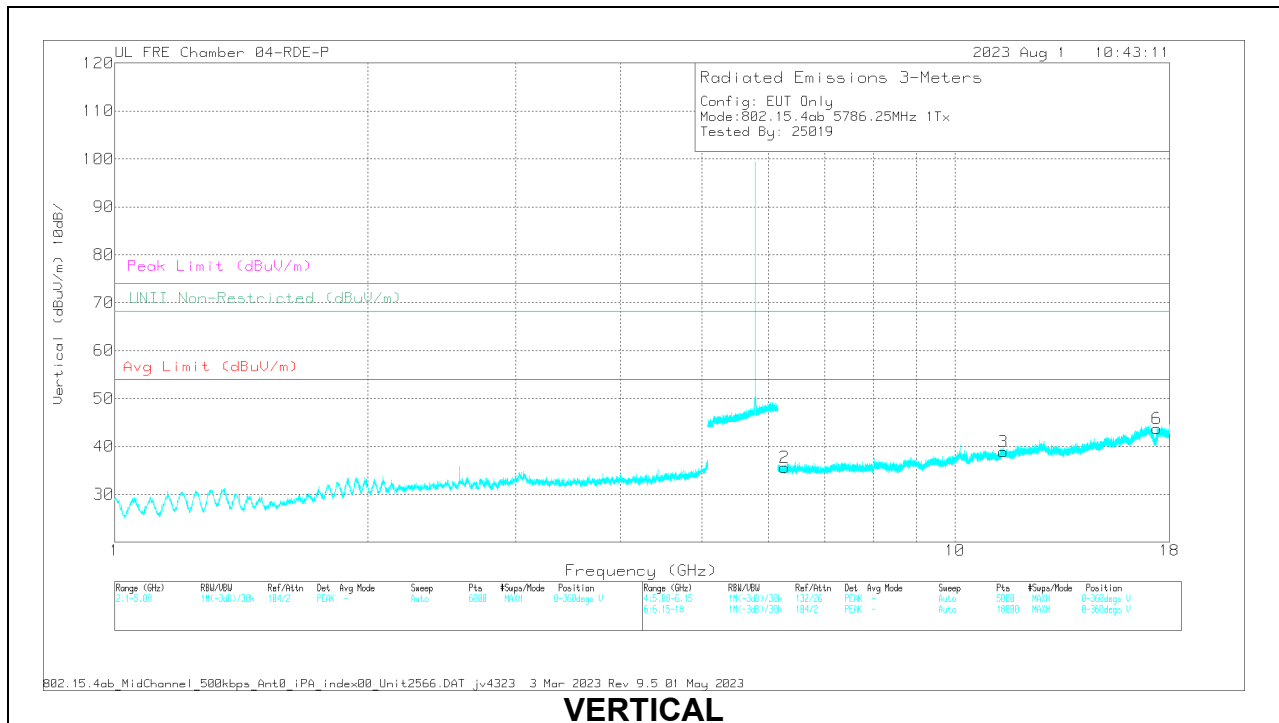
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.286975	32.7	PK-U	35.7	-21.4	47	-	-	-	-	68.2	-21.2	0	101	H
2	* 11.4427	30.62	PK-U	37.9	-16.6	51.92	-	-	74	-22.08	-	-	0	101	H
	* 11.440	19.52	ADR	37.9	-16.6	40.82	54	-13.18	-	-	-	-	0	101	H
3	17.190027	28.56	PK-U	41.4	-12.1	57.86	-	-	-	-	68.2	-10.34	0	200	H
4	6.362855	33.41	PK-U	35.7	-20.8	48.31	-	-	-	-	68.2	-19.89	0	101	V
5	* 11.4166	30.62	PK-U	37.9	-16.7	51.82	-	-	74	-22.18	-	-	0	200	V
	* 11.4153	19.73	ADR	37.9	-16.7	40.93	54	-13.07	-	-	-	-	0	200	V
6	17.148953	28.99	PK-U	41.5	-12.1	58.39	-	-	-	-	68.2	-9.81	0	200	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### MID CHANNEL RESULTS



### HORIZONTAL



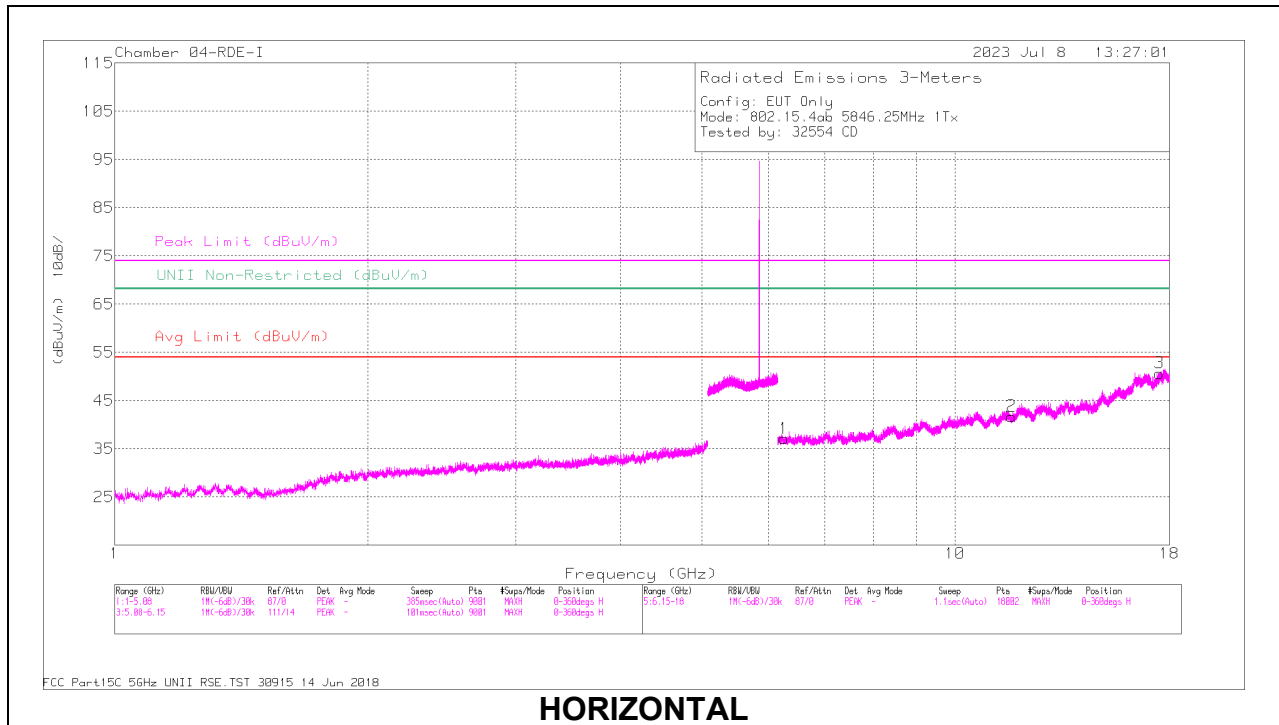
### VERTICAL

**RADIATED EMISSIONS**

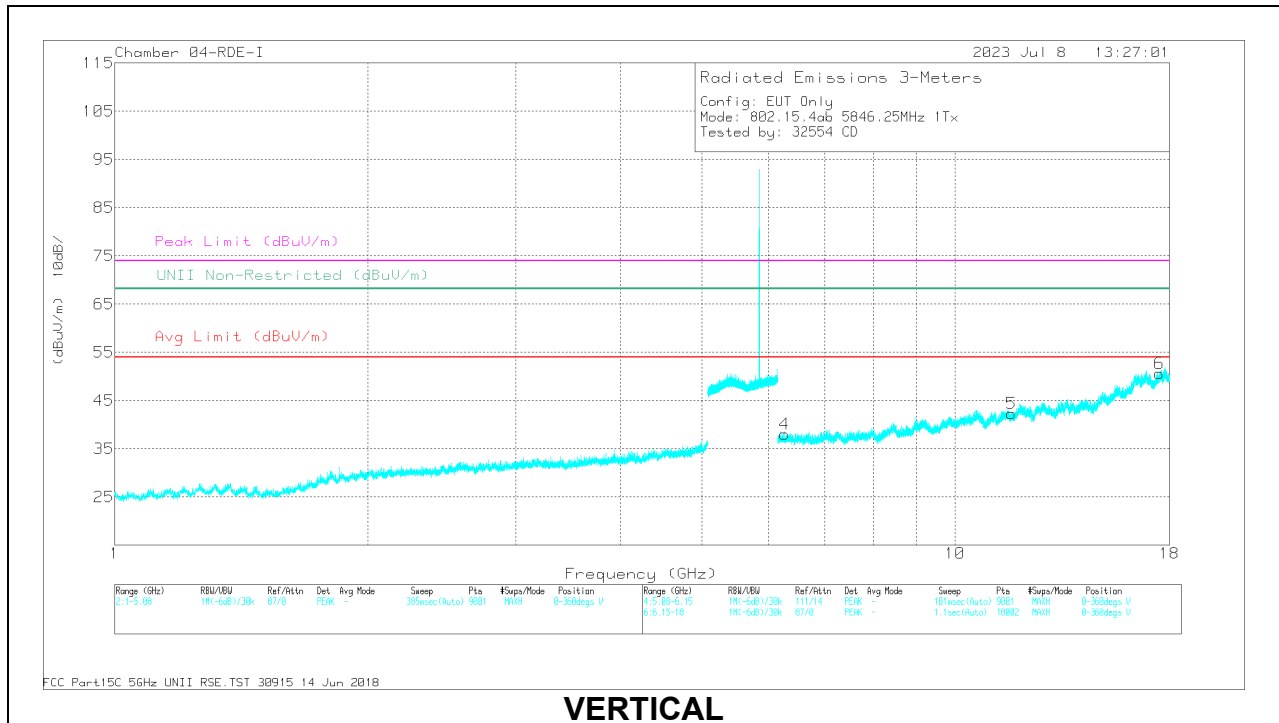
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222740 ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	6.267511	54.85	PK-U	35.3	-44.62	45.53	-	-	-	-	68.2	-22.67	144	201	V
1	6.267744	55.26	PK-U	35.3	-44.62	45.94	-	-	-	-	68.2	-22.26	144	100	H
4	*11.416853	42.36	ADR	38	-42.88	37.48	54	-16.52	-	-	-	-	144	100	H
	*11.41696	54.29	PK-U	38	-42.88	49.41	-	-	74	-24.59	-	-	144	100	H
3	*11.418009	54.27	PK-U	38	-42.92	49.35	-	-	74	-24.65	-	-	144	200	V
	*11.418787	42.68	ADR	38	-42.89	37.79	54	-16.21	-	-	-	-	144	200	V
6	17.405062	52.5	PK-U	41.4	-41.89	52.01	-	-	-	-	68.2	-16.19	144	200	V
5	17.405908	50.95	PK-U	41.4	-41.92	50.43	-	-	-	-	68.2	-17.77	144	100	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

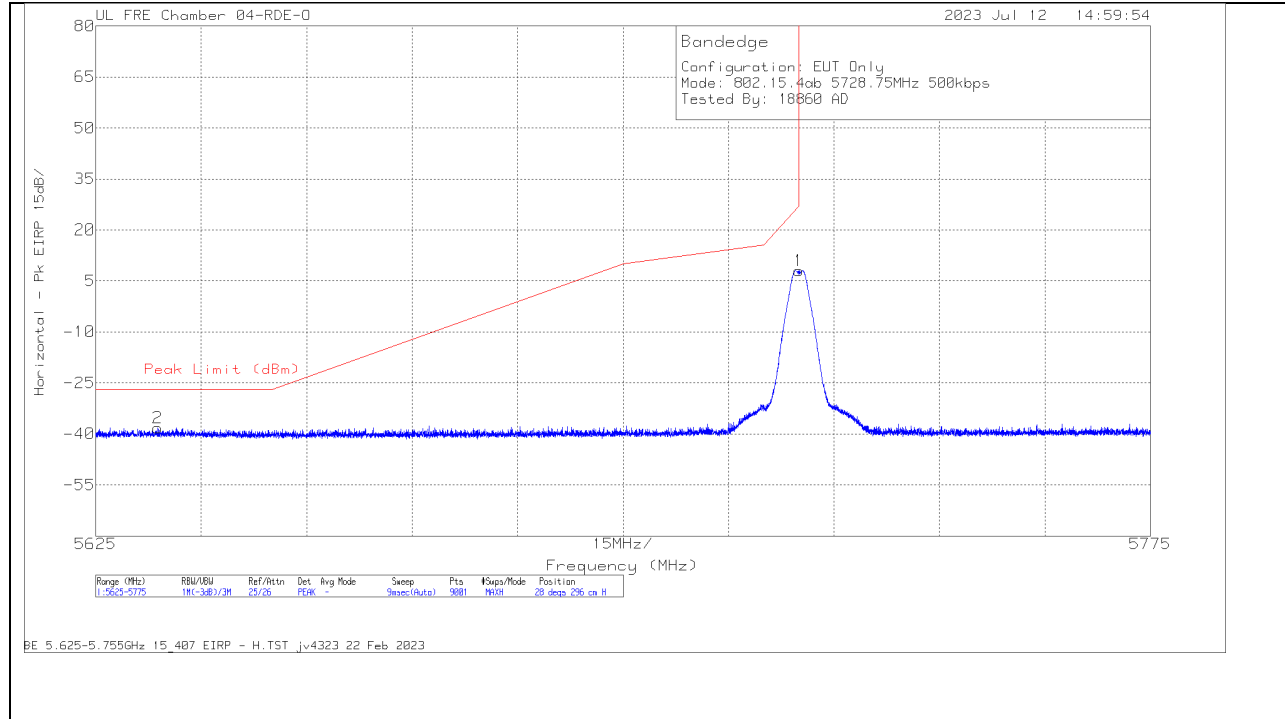
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.255813	32.29	PK-U	35.7	-21.2	46.79	-	-	-	-	68.2	-21.41	0	200	H
2	*11.68450	30.54	PK-U	38.3	-17.1	51.74	-	-	74	-22.26	-	-	0	101	H
	*11.681436	19.1	ADR	38.3	-17	40.4	54	-13.6	-	-	-	-	0	101	H
3	17.50522	29.92	PK-U	41.7	-11.8	59.82	-	-	-	-	68.2	-8.38	0	200	H
4	6.272596	32.93	PK-U	35.7	-21.5	47.13	-	-	-	-	68.2	-21.07	0	101	V
5	*11.676344	30.73	PK-U	38.3	-17.1	51.93	-	-	74	-22.07	-	-	0	200	V
	*11.677253	19.09	ADR	38.3	-17	40.39	54	-13.61	-	-	-	-	0	200	V
6	17.50797	29.54	PK-U	41.7	-11.7	59.54	-	-	-	-	68.2	-8.66	0	101	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### 10.1.3. ANT 5, 500Kbps LOW POWER BAND EDGE

#### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT

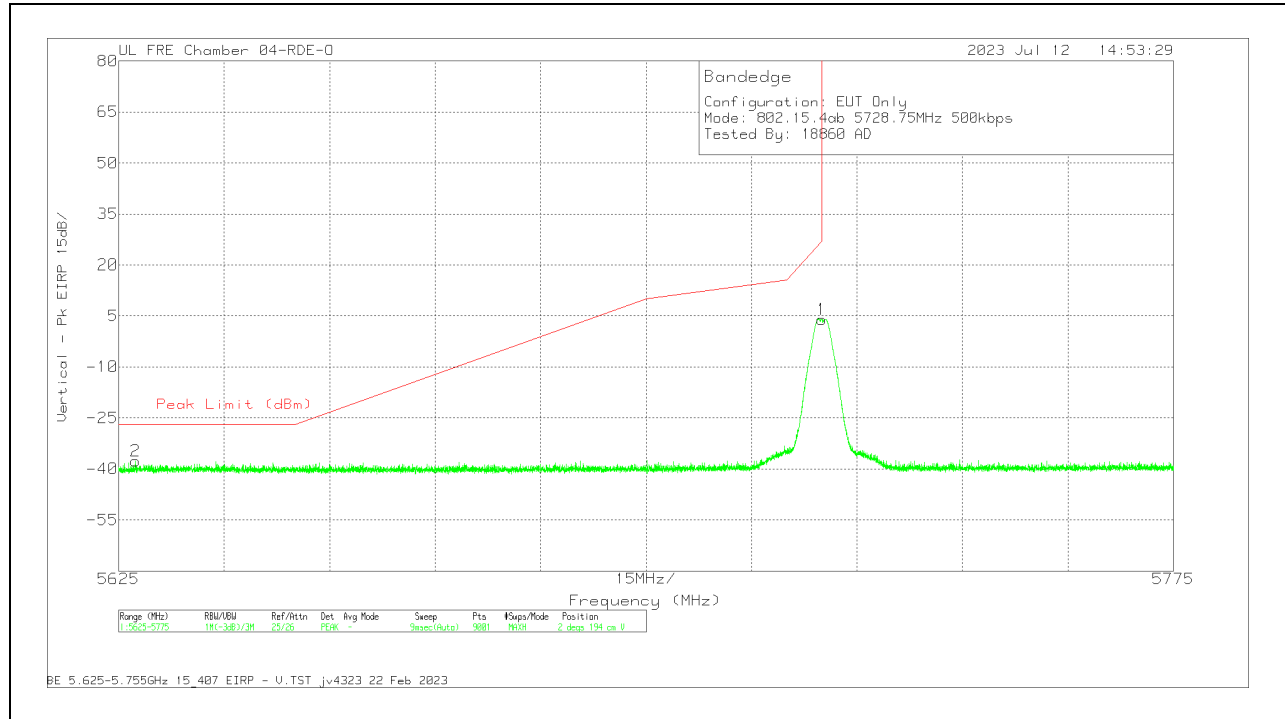


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	80404_ACF(dB) - 3mH	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5633.817	-50.37	Pk	34.8	11.8	-34.47	-38.24	-27	-11.24	28	296	H
1	5725	-4.23	Pk	34.8	11.8	-34.39	7.98	27	-19.02	28	296	H

Pk - Peak detector



**VERTICAL RESULT**

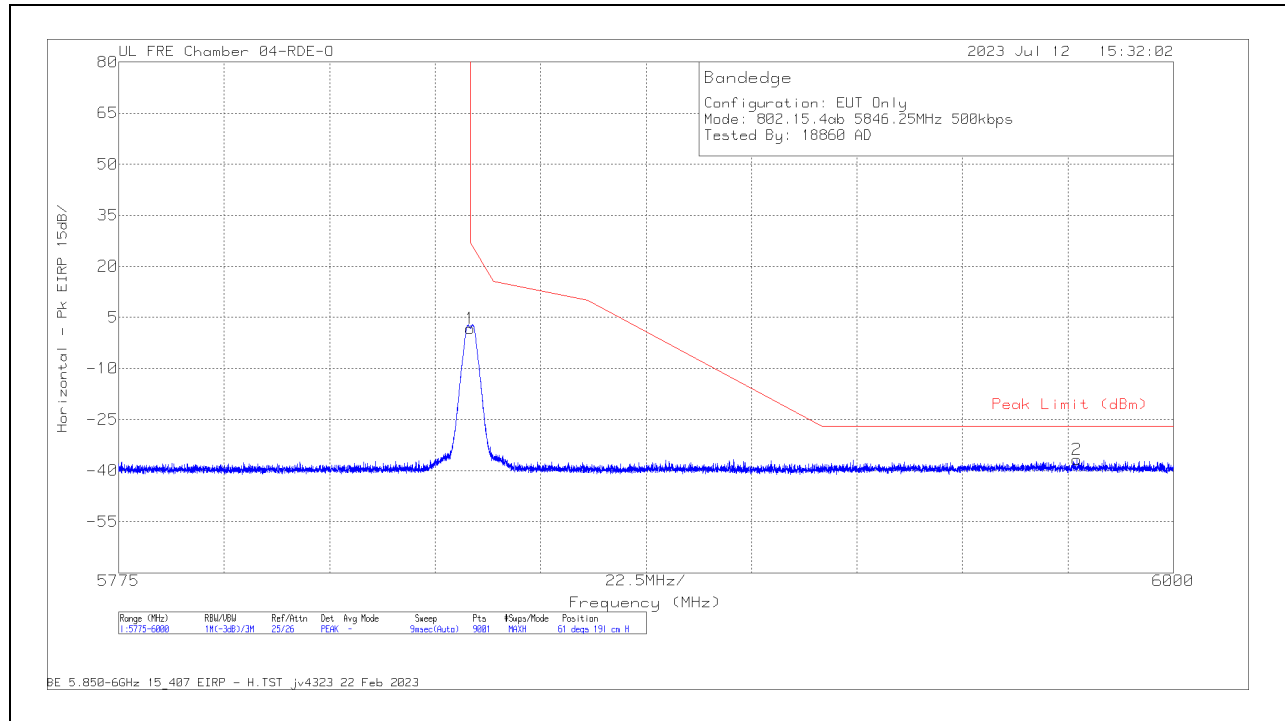


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	80404_ACF(dB) - 3mH	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5627.367	-49.67	PK	34.8	11.8	-34.54	-37.61	-27	-10.61	2	194	V
1	5725	-8.22	PK	34.8	11.8	-34.39	3.99	27	-23.01	2	194	V

Pk - Peak detector

# BANDEGE (HIGH CHANNEL)

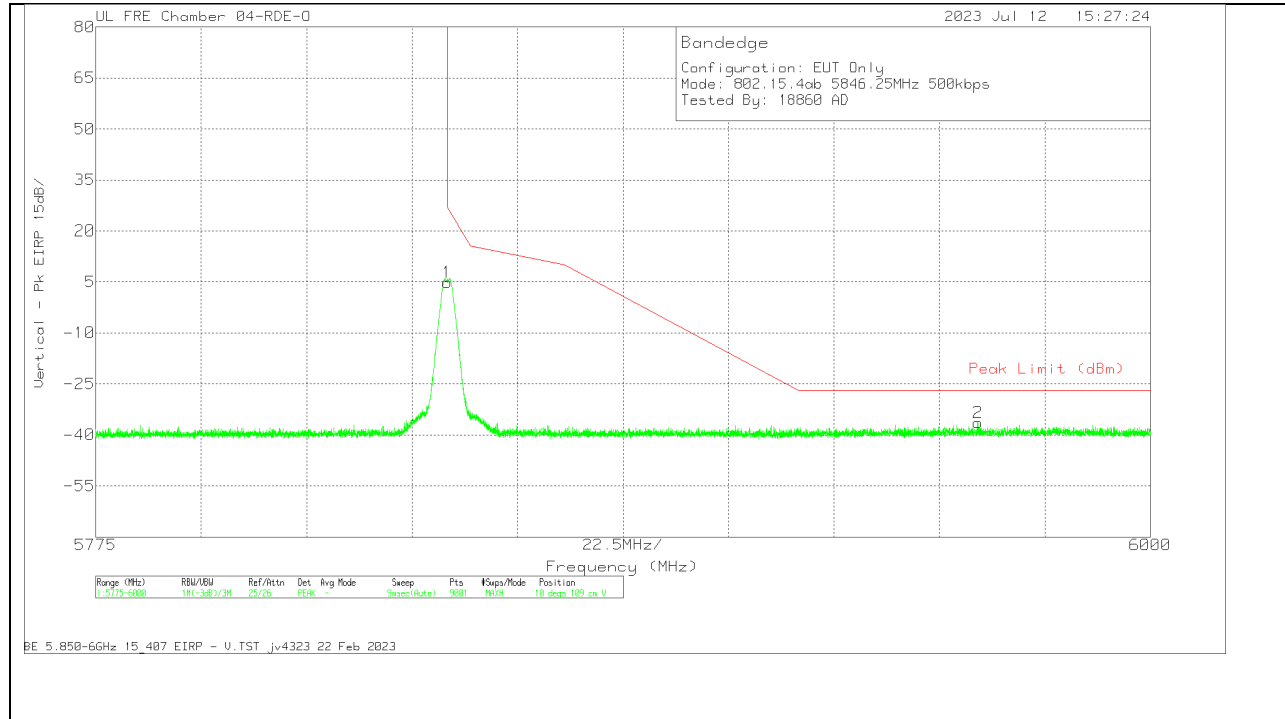
## HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	80404_ACF(dB) - 3mH	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5850	-10.99	PK	35.1	11.8	-34.17	1.74	27	-25.26	61	191	H
2	5979.425	-49.95	PK	35.4	11.8	-34.02	-36.77	-27	-9.77	61	191	H

Pk - Peak detector

**VERTICAL RESULT**

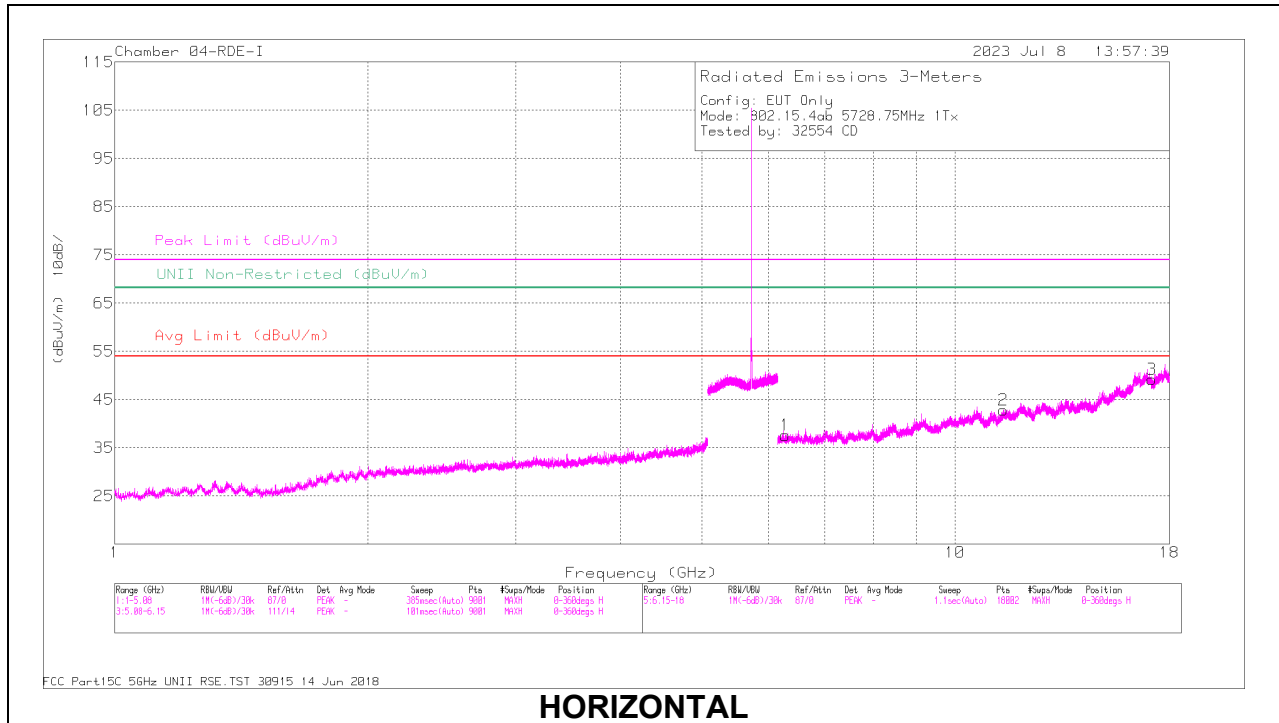


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	80404_ACF(dB) - 3mH	Conversion Factor (dB)	Gain/Loss (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5850	-7.9	PK	35.1	11.8	-34.17	4.83	27	-22.17	10	109	V
2	5963.175	-49.6	PK	35.3	11.8	-33.8	-36.3	-27	-9.3	10	109	V

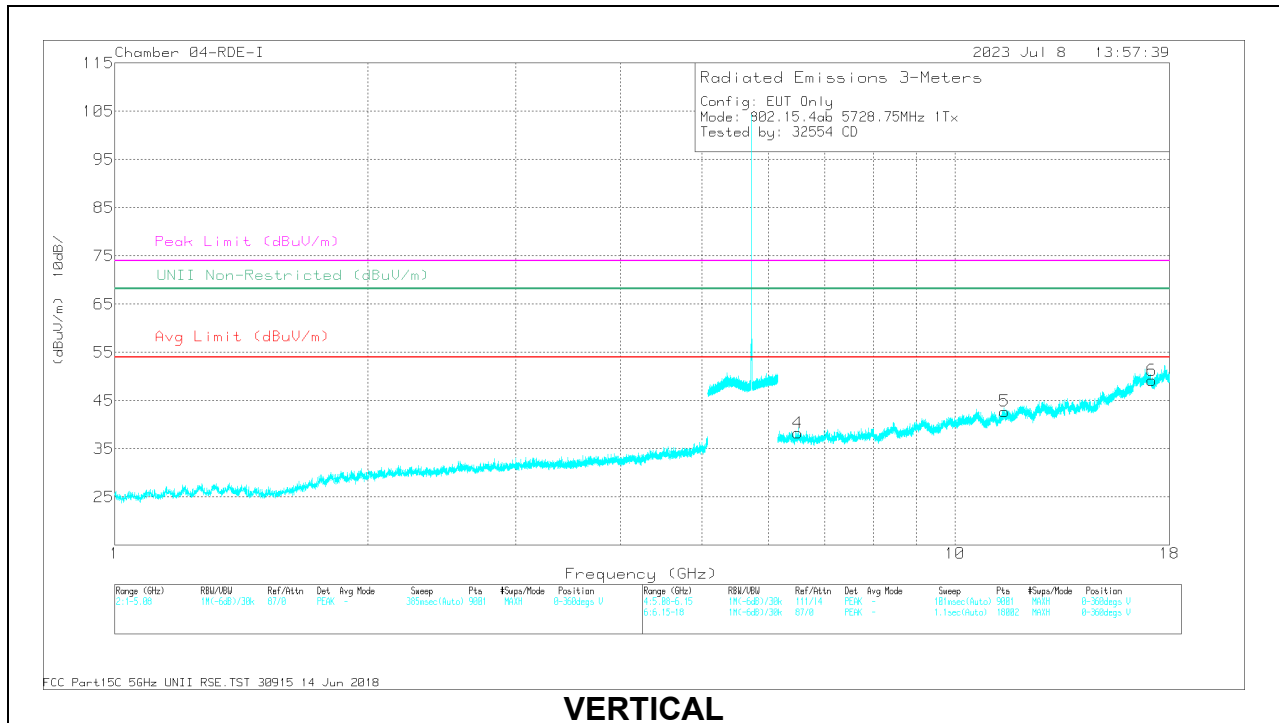
Pk - Peak detector

### 10.1.4. ANT 5, 500Kbps LOW POWER HARMONICS AND SPURIOUS EMISSIONS

#### LOW CHANNEL RESULTS



HORIZONTAL



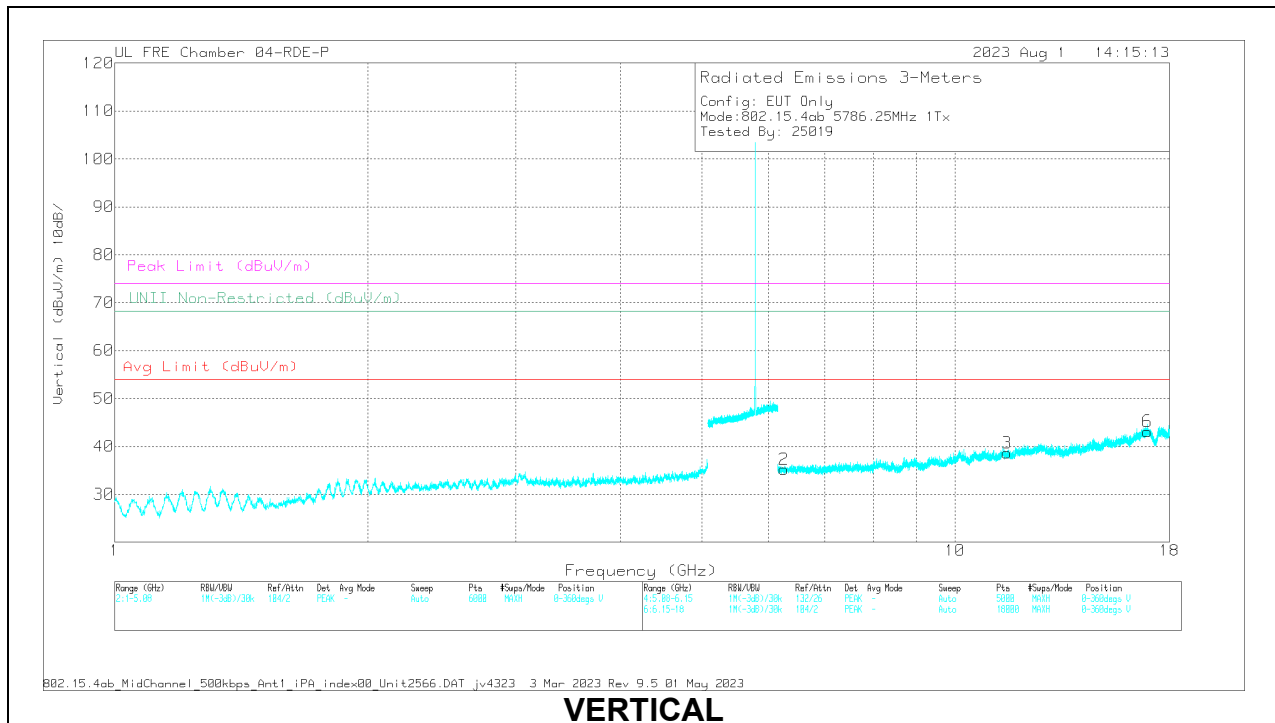
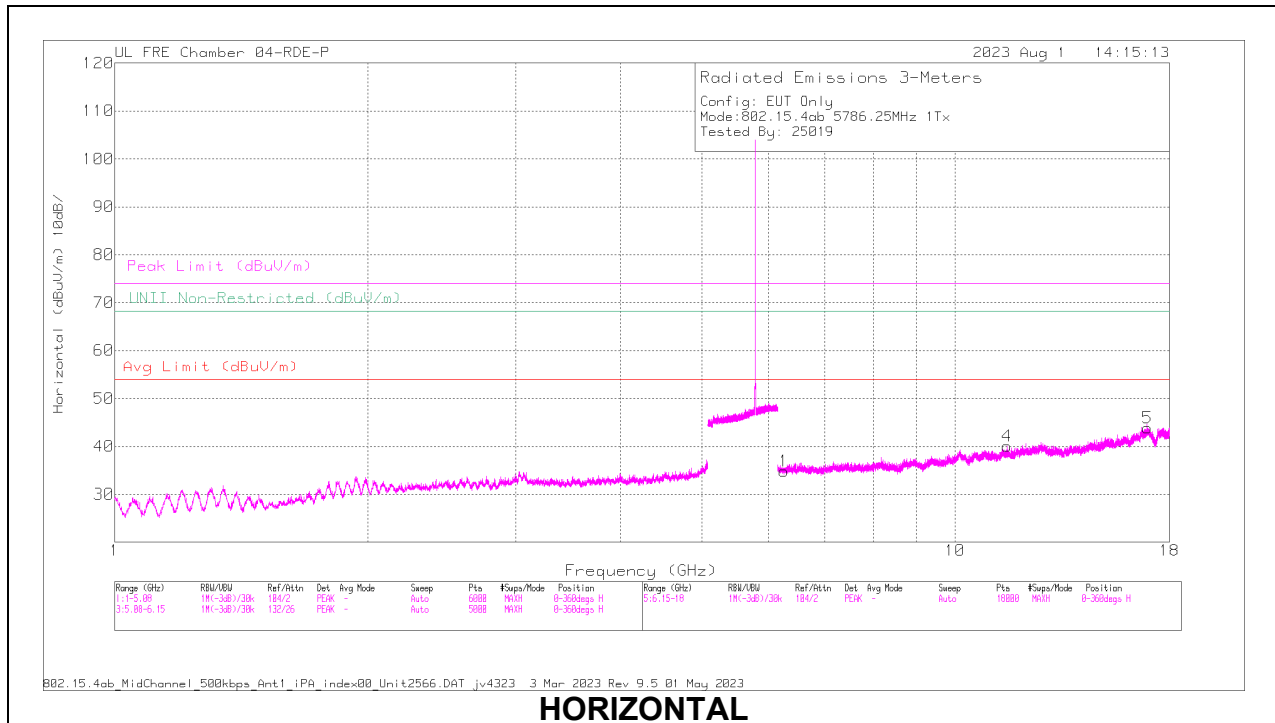
VERTICAL

**RADIATED EMISSIONS**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.27923	33.3	PK-U	35.7	-21.5	47.5	-	-	-	-	68.2	-20.7	0	200	H
2	*11.422374	30.48	PK-U	37.9	-16.6	51.78	-	-	74	-22.22	-	-	0	101	H
	* 11.42399	19.47	ADR	37.9	-16.6	40.77	54	-13.23	-	-	-	-	0	101	H
3	17.163017	29.53	PK-U	41.5	-12.1	58.93	-	-	-	-	68.2	-9.27	0	200	H
4	6.502934	31.83	PK-U	35.7	-20	47.53	-	-	-	-	68.2	-20.67	0	200	V
5	*11.459189	30.97	PK-U	38	-17	51.97	-	-	74	-22.03	-	-	0	101	V
	*11.457853	19.34	ADR	38	-17	40.34	54	-13.66	-	-	-	-	0	101	V
6	17.161599	29.12	PK-U	41.5	-12.1	58.52	-	-	-	-	68.2	-9.68	0	200	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### MID CHANNEL RESULTS

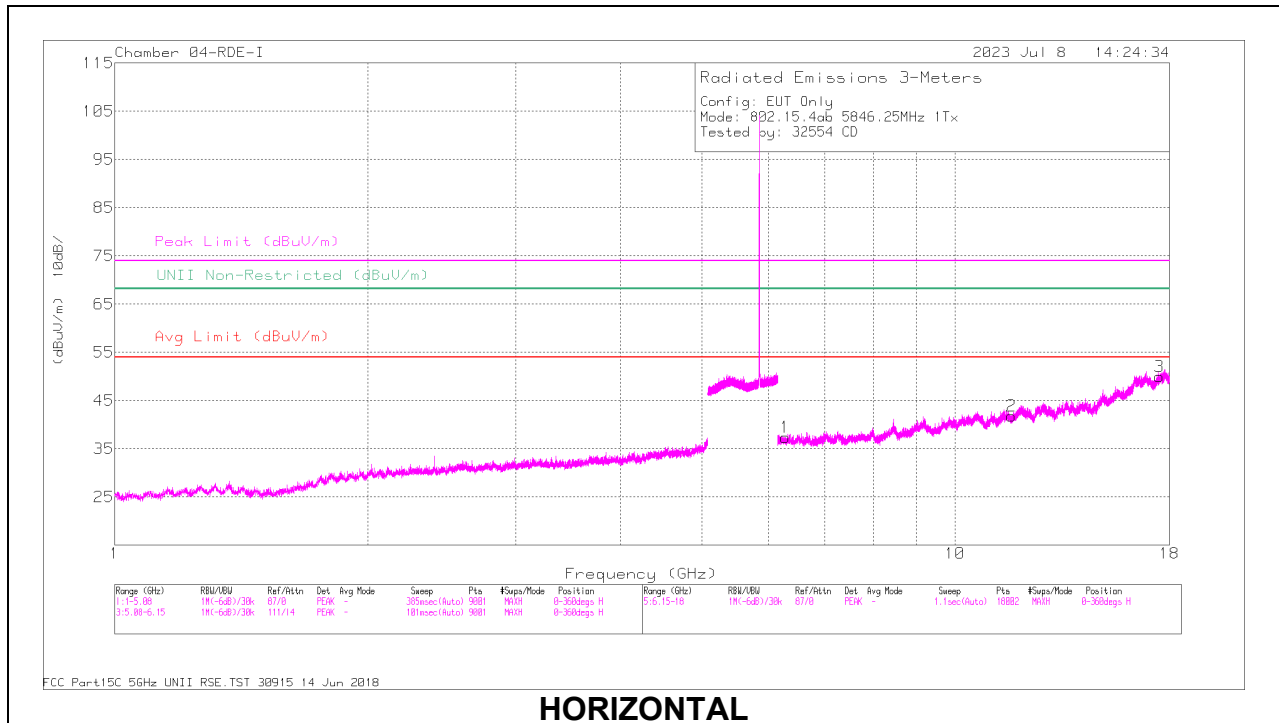


**RADIATED EMISSIONS**

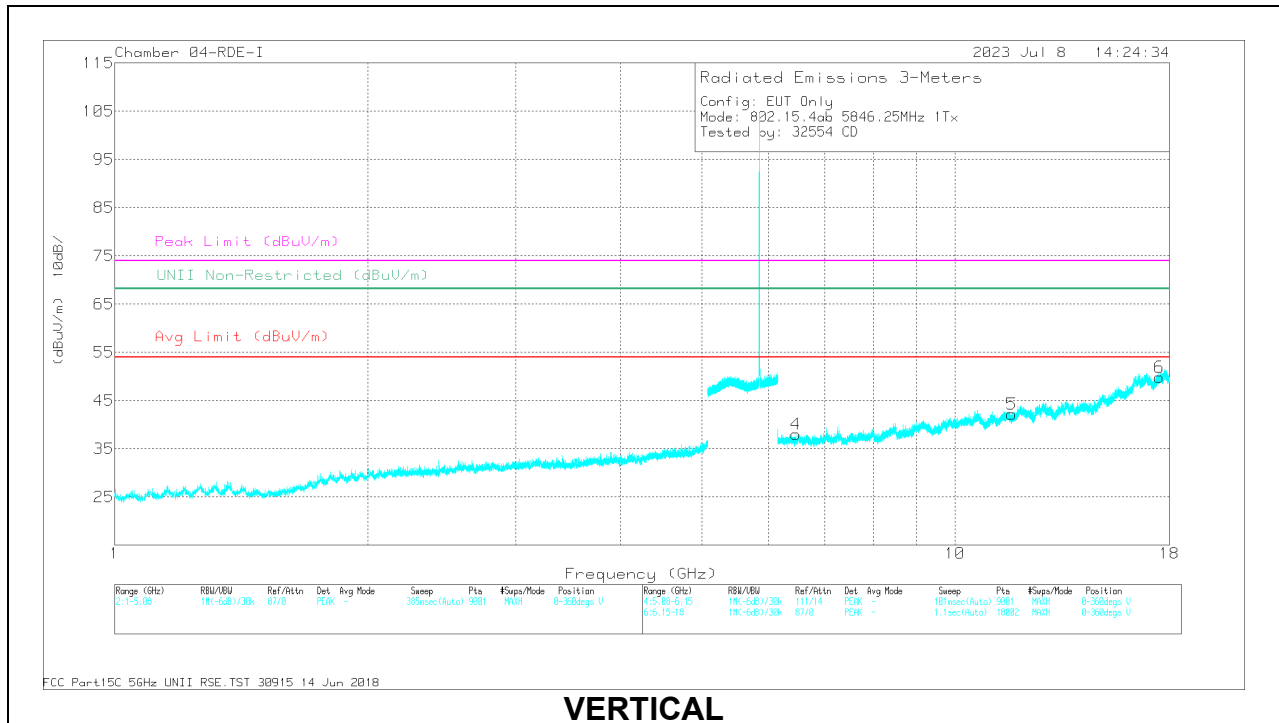
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	222740 ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	6.261415	55.29	PK-U	35.3	-44.75	45.84	-	-	-	-	68.2	-22.36	0	201	V
1	6.262174	55.35	PK-U	35.3	-44.83	45.82	-	-	-	-	68.2	-22.38	0	100	H
4	*11.52693	42.8	ADR	38.1	-43.24	37.66	54	-16.34	-	-	-	-	0	100	H
	*11.52884	54.63	PK-U	38.1	-43.21	49.52	-	-	74	-24.48	-	-	0	100	H
3	*11.529969	54.31	PK-U	38.1	-43.21	49.2	-	-	74	-24.8	-	-	0	200	V
	*11.530097	42.75	ADR	38.1	-43.21	37.64	54	-16.36	-	-	-	-	0	200	V
5	16.936082	53.59	PK-U	42.3	-42.31	53.58	-	-	-	-	68.2	-14.62	0	100	H
6	16.938278	53.34	PK-U	42.3	-42.33	53.31	-	-	-	-	68.2	-14.89	0	200	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

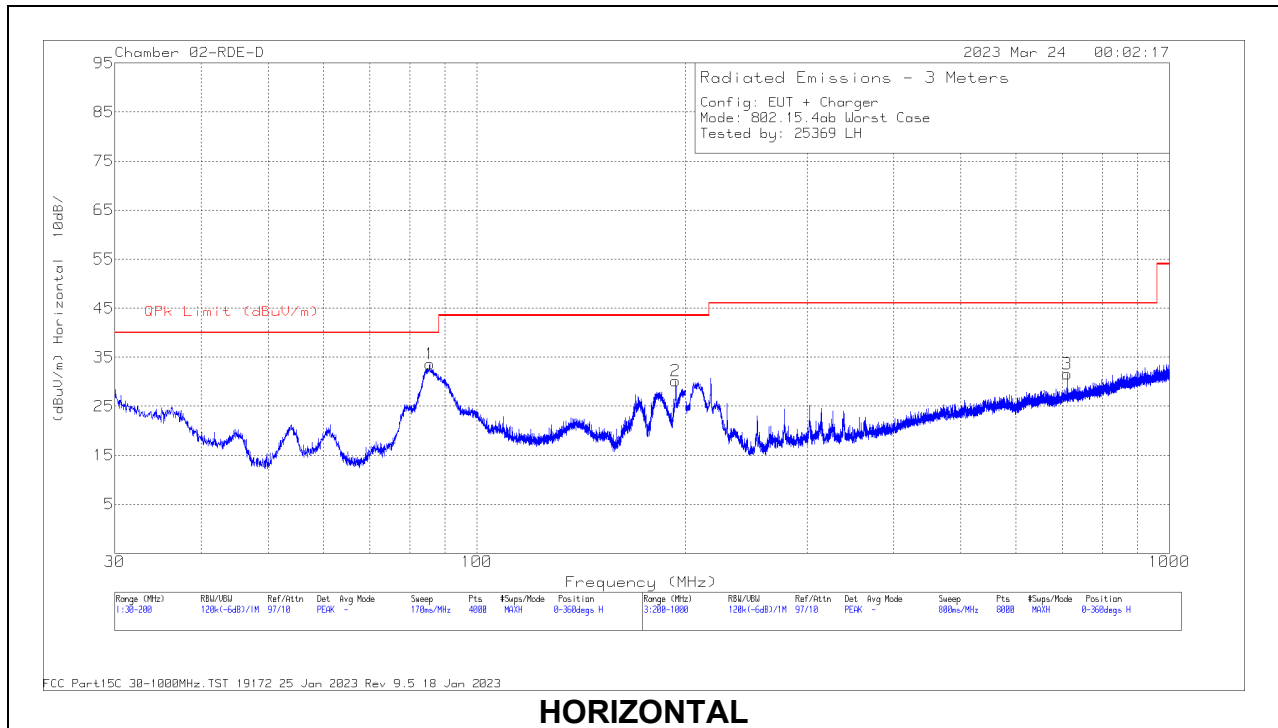


**RADIATED EMISSIONS**

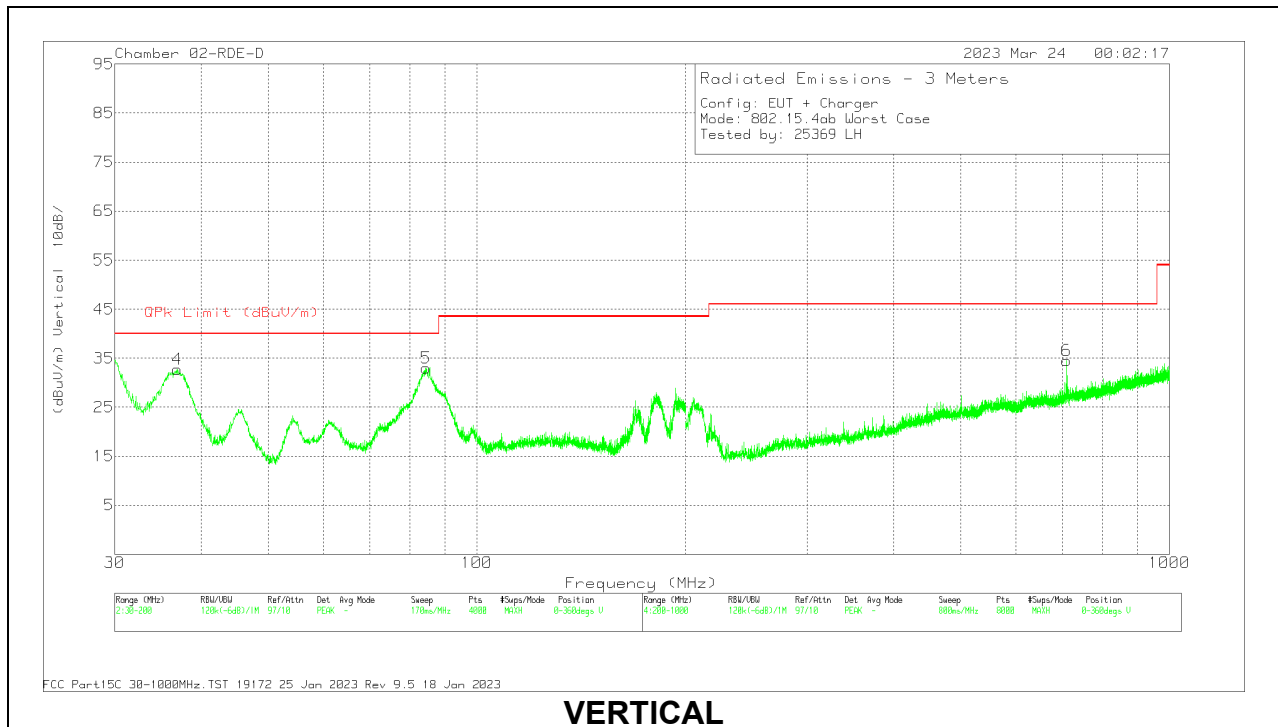
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	6.281504	33.21	PK-U	35.7	-21.5	47.41	-	-	-	-	68.2	-20.79	0	101	H
2	*11.673856	31.42	PK-U	38.2	-17	52.62	-	-	74	-21.38	-	-	0	101	H
	*11.676052	19.11	ADR	38.3	-17.1	40.31	54	-13.69	-	-	-	-	0	101	H
3	17.510701	29.42	PK-U	41.7	-11.7	59.42	-	-	-	-	68.2	-8.78	0	101	H
4	6.466699	32.8	PK-U	35.6	-20.7	47.7	-	-	-	-	68.2	-20.5	0	101	V
5	*11.684121	30.81	PK-U	38.3	-17.2	51.91	-	-	74	-22.09	-	-	0	101	V
	*11.685616	19.18	ADR	38.3	-17	40.48	54	-13.52	-	-	-	-	0	101	V
6	17.501719	29.52	PK-U	41.7	-11.9	59.32	-	-	-	-	68.2	-8.88	0	200	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK-U - U-NII: Maximum Peak  
 ADR - U-NII AD primary method, RMS average

### 10.2. WORST CASE BELOW 1 GHz



**HORIZONTAL**



**VERTICAL**

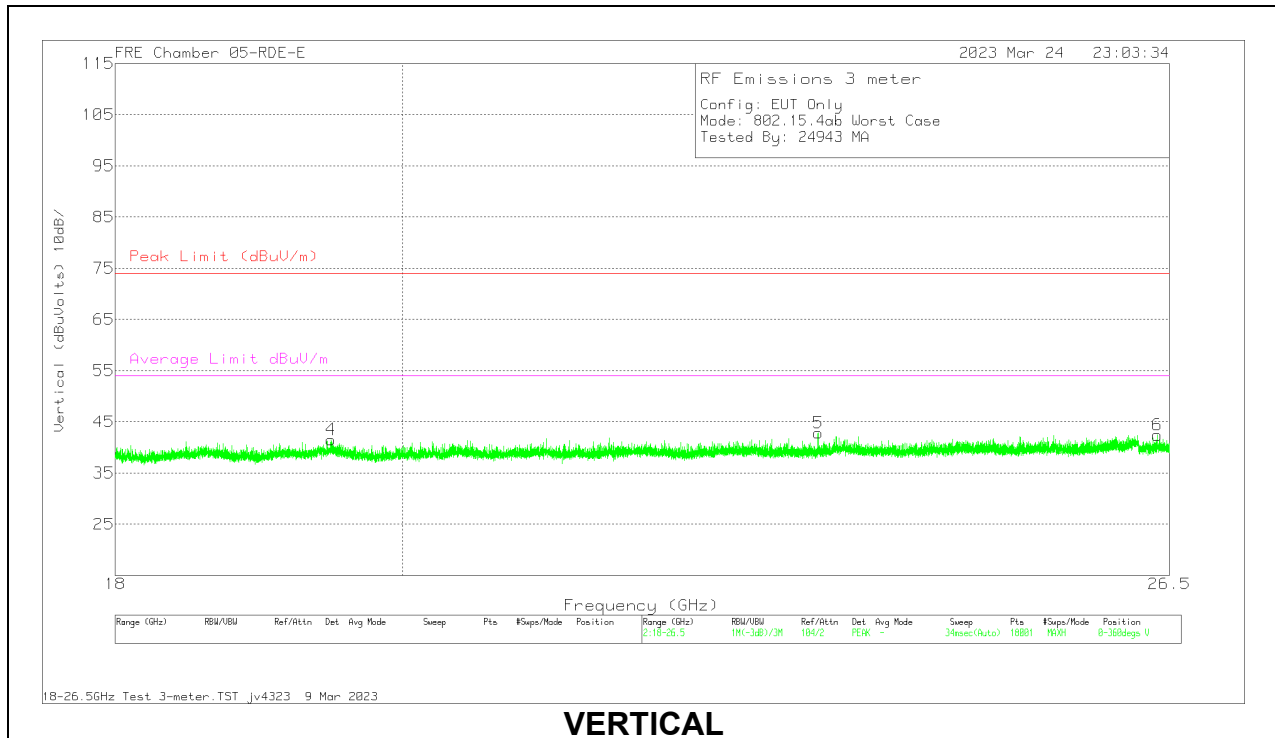
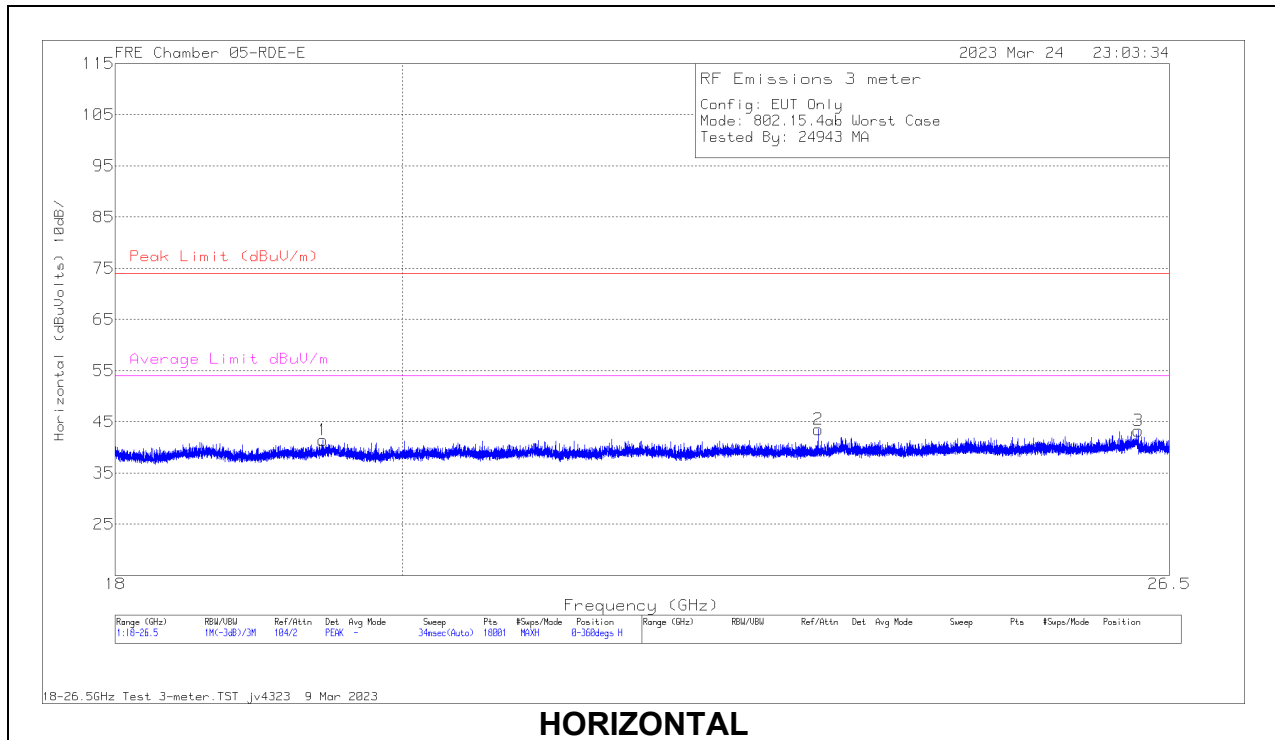
**Below 1GHz DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80508 ACF (dB)	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	36.9718	41.16	Pk	22	-30.4	32.76	40	-7.24	0-360	98	V
5	84.4141	50.04	Pk	13.2	-30.2	33.04	40	-6.96	0-360	98	V
1	85.5194	50.63	Pk	13.2	-30.2	33.63	40	-6.37	0-360	299	H
	85.4904	49.06	Qp	13.2	-30.2	32.06	40	-7.94	47	226	H
2	193.667	41.93	Pk	18	-29.8	30.13	43.52	-13.39	0-360	99	H
6	709.966	35.44	Pk	26.5	-27.4	34.54	46.02	-11.48	0-360	99	V
3	712.167	32.46	Pk	26.5	-27.4	31.56	46.02	-14.46	0-360	401	H

Pk - Peak detector

Qp - Quasi-Peak detector

### 10.3. WORST CASE 18-26 GHz

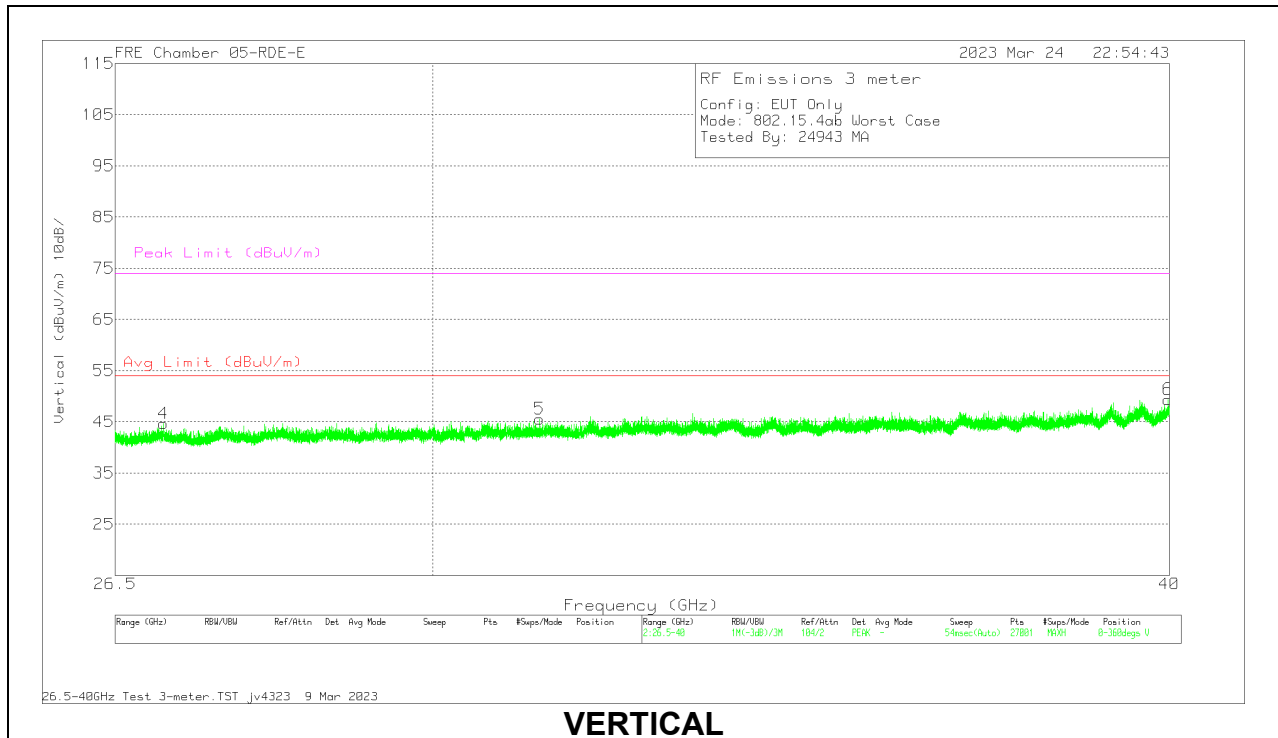
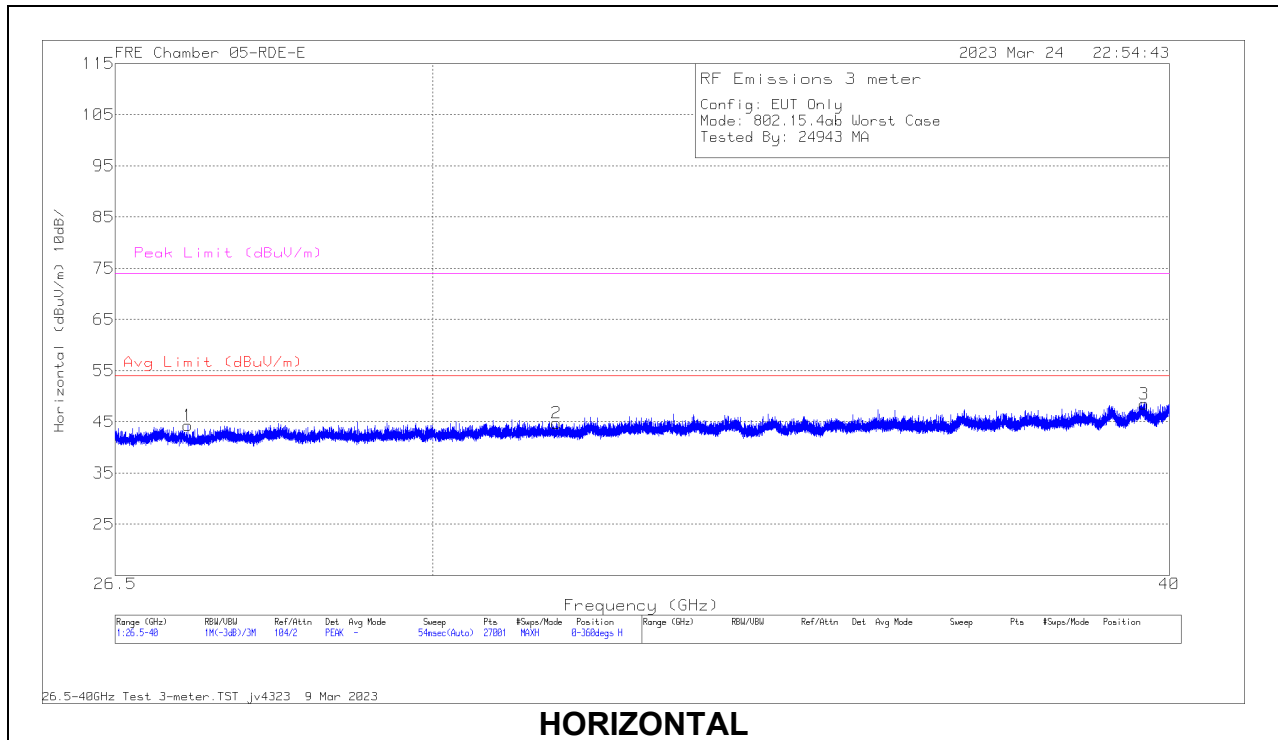


**18 – 26GHz DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn ACF (dB/m)	amp/cbl (dB)	CBL/S WITCH	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19.426583	57.53	Pk	32.4	-61.8	13.3	41.43	74	-32.57	54	-12.57	0-360	101	H
4	* 19.483249	57.62	Pk	32.4	-61.9	13.4	41.52	74	-32.48	54	-12.48	0-360	101	V
2	23.297859	57.81	Pk	33.2	-62.1	14.6	43.51	74	-30.49	54	-10.49	0-360	200	H
5	23.297859	57.11	Pk	33.2	-62.1	14.6	42.81	74	-31.19	54	-11.19	0-360	101	V
3	26.198718	55.08	Pk	33.8	-61.3	15.7	43.28	74	-30.72	54	-10.72	0-360	200	H
6	26.382413	53.82	Pk	34	-61.1	15.7	42.42	74	-31.58	54	-11.58	0-360	101	V

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

### 10.4. WORST CASE 26-40 GHz



**26 – 40GHz DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn ACF (dB/m)	amp/cb l (dB)	CBL/S WITCH	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Avg Margin (dB)	Azimuth (Degs)	Height (cm)	Polarit y
2	* 31.487	54.25	Pk	36.6	-63.4	17.3	44.75	74	-29.25	54	-9.25	0-360	101	H
3	* 39.6085	55.04	Pk	38.4	-64.9	19.9	48.44	74	-25.56	54	-5.56	0-360	101	H
5	* 31.2785	56.17	Pk	36.7	-64.4	17.1	45.57	74	-28.43	54	-8.43	0-360	200	V
6	* 39.9775	55.08	Pk	38.4	-64.1	20	49.38	74	-24.62	54	-4.62	0-360	101	V
4	27.0055	59.37	Pk	35.8	-66.6	16.1	44.67	74	-29.33	54	-9.33	0-360	200	V
1	27.262	59.1	Pk	35.9	-66.6	15.9	44.3	74	-29.7	54	-9.7	0-360	200	H

\* - 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 (dB $\mu$ V)	
	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.

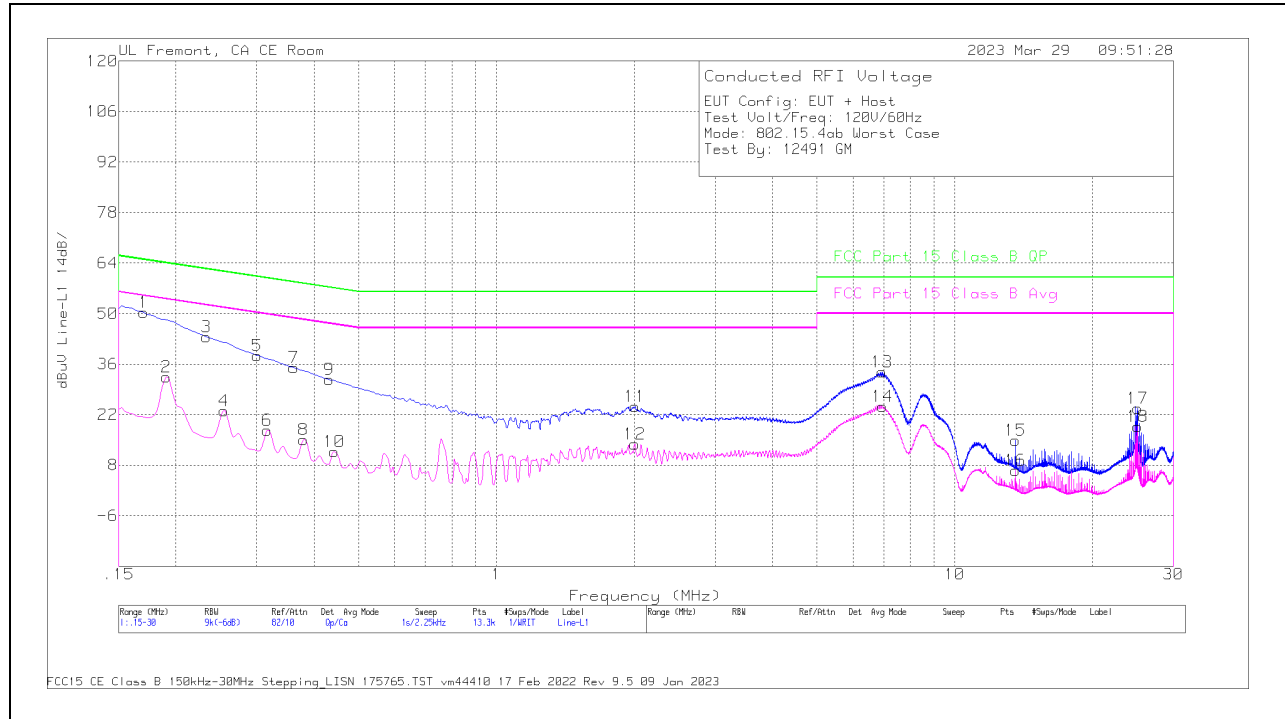
Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS



# 11.1. AC POWER LINE WITH LAPTOP

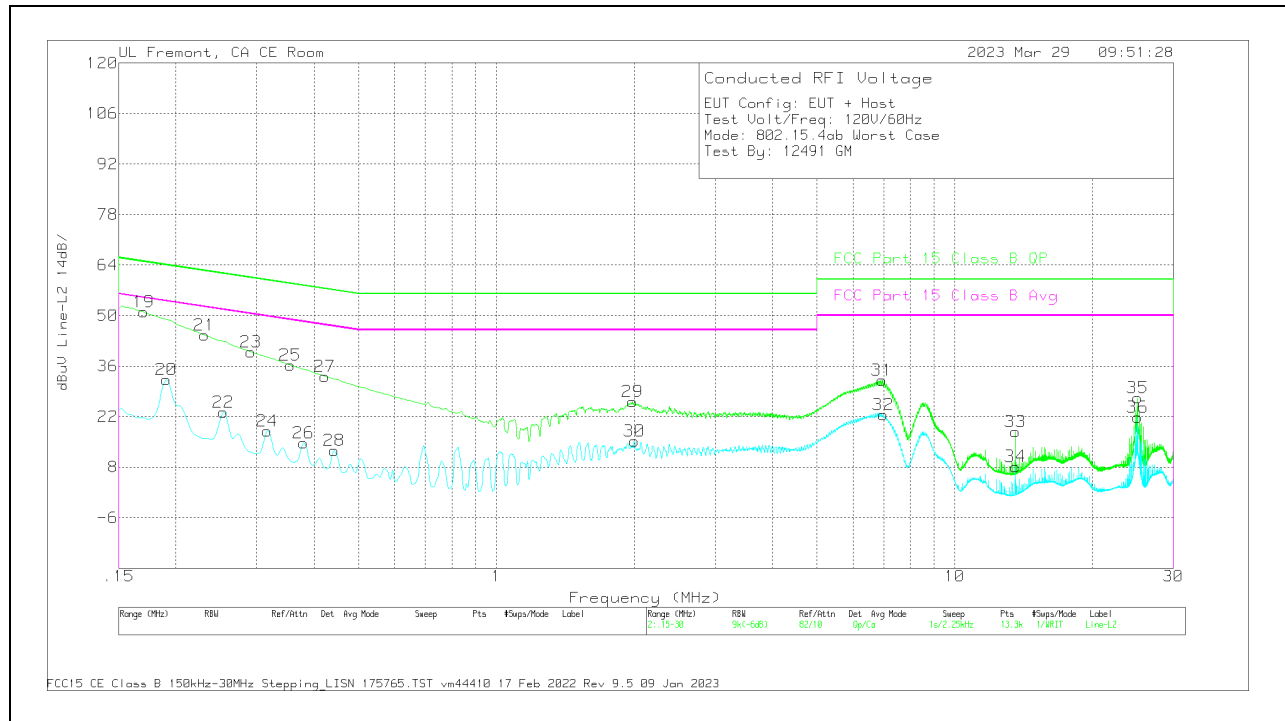
## LINE 1 RESULTS



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.cs v dB	C1&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR) Margin (dB)
2	.1905	23	Ca	0	0	9.4	32.4	-	-	54.01	-21.61
4	.2546	13.71	Ca	0	0	9.3	23.01	-	-	51.6	-28.59
6	.3165	8.32	Ca	0	0	9.3	17.62	-	-	49.8	-32.18
8	.3795	5.68	Ca	0	.1	9.3	15.08	-	-	48.29	-33.21
10	.4425	2.41	Ca	0	.1	9.3	11.81	-	-	47.01	-35.2
12	2.004	4.5	Ca	0	.1	9.3	13.9	-	-	46	-32.1
14	6.9563	14.77	Ca	0	.2	9.3	24.27	-	-	50	-25.73
16	13.56	-3.11	Ca	.1	.2	9.3	6.49	-	-	50	-43.51
18	25.0845	8.81	Ca	.2	.3	9.4	18.71	-	-	50	-31.29
1	.1703	40.93	Qp	0	0	9.4	50.33	64.95	-14.62	-	-
3	.2333	34.31	Qp	0	0	9.3	43.61	62.33	-18.72	-	-
5	.3008	29.13	Qp	0	0	9.3	38.43	60.22	-21.79	-	-
7	.3615	25.68	Qp	0	0	9.3	34.98	58.69	-23.71	-	-
9	.4313	22.32	Qp	0	.1	9.3	31.72	57.23	-25.51	-	-
11	2.0074	14.92	Qp	0	.1	9.3	24.32	56	-31.68	-	-
13	6.9405	24.29	Qp	0	.2	9.3	33.79	60	-26.21	-	-
15	13.56	5.34	Qp	.1	.2	9.3	14.94	60	-45.06	-	-
17	25.0845	13.93	Qp	.2	.3	9.4	23.83	60	-36.17	-	-

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

### LINE 2 RESULTS

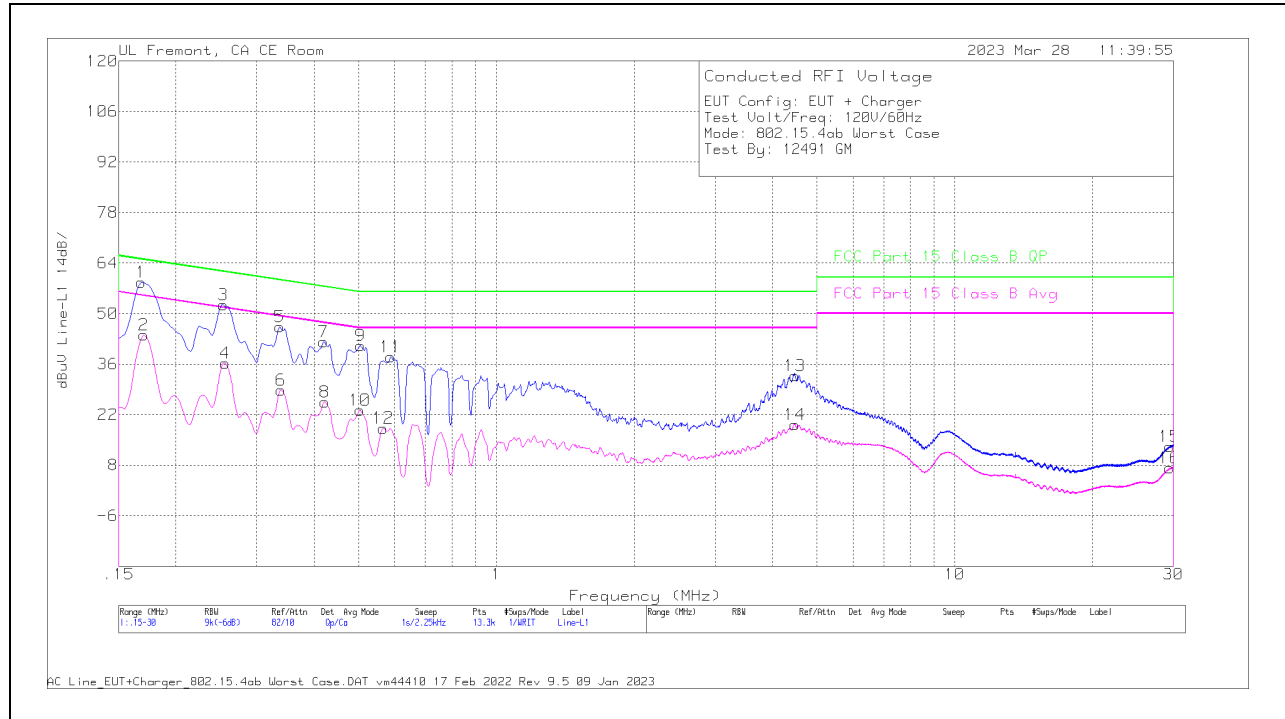


Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN dB	C2&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
20	.1905	22.79	Ca	0	0	9.4	32.19	-	-	54.01	-21.82
22	.2535	13.89	Ca	0	0	9.3	23.19	-	-	51.64	-28.45
24	.3165	8.77	Ca	0	0	9.3	18.07	-	-	49.8	-31.73
26	.3795	5.27	Ca	0	.1	9.3	14.67	-	-	48.29	-33.62
28	.4425	3.15	Ca	0	.1	9.3	12.55	-	-	47.01	-34.46
30	1.9995	5.85	Ca	0	.1	9.3	15.25	-	-	46	-30.75
32	6.9776	13.08	Ca	0	.1	9.3	22.48	-	-	50	-27.52
34	13.56	-1.41	Ca	.1	.2	9.3	8.19	-	-	50	-41.81
36	25.0845	11.92	Ca	.2	.3	9.4	21.82	-	-	50	-28.18
19	.1703	41.6	Qp	0	0	9.4	51	64.95	-13.95	-	-
21	.231	35.3	Qp	0	0	9.3	44.6	62.41	-17.81	-	-
23	.2918	30.66	Qp	0	0	9.3	39.96	60.47	-20.51	-	-
25	.3548	27.04	Qp	0	0	9.3	36.34	58.85	-22.51	-	-
27	.4223	23.78	Qp	0	.1	9.3	33.18	57.4	-24.22	-	-
29	1.9793	16.71	Qp	0	.1	9.3	26.11	56	-29.89	-	-
31	6.9473	22.68	Qp	0	.1	9.3	32.08	60	-27.92	-	-
33	13.56	8.21	Qp	.1	.2	9.3	17.81	60	-42.19	-	-
35	25.0845	17.28	Qp	.2	.3	9.4	27.18	60	-32.82	-	-

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

# 11.2. AC POWER LINE WITH AC/DC ADAPTER

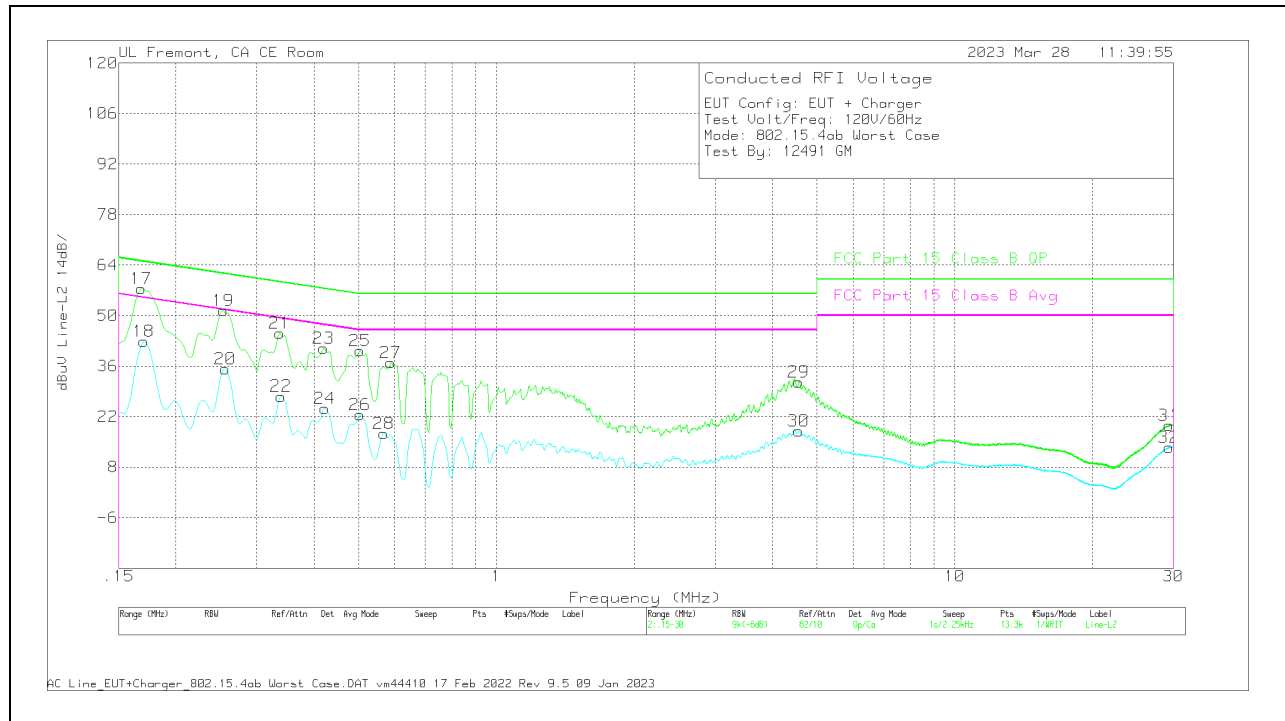
## LINE 1 RESULTS



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv dB	C1&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
2	.1703	34.63	Ca	0	0	9.4	44.03	-	-	54.95	-10.92
4	.2558	27.04	Ca	0	0	9.3	36.34	-	-	51.57	-15.23
6	.339	19.47	Ca	0	0	9.3	28.77	-	-	49.23	-20.46
8	.4223	16.08	Ca	0	.1	9.3	25.48	-	-	47.4	-21.92
10	.5033	13.79	Ca	0	.1	9.3	23.19	-	-	46	-22.81
12	.5663	8.87	Ca	0	.1	9.3	18.27	-	-	46	-27.73
14	4.4858	9.83	Ca	0	.1	9.3	19.23	-	-	46	-26.77
16	29.445	-2.81	Ca	.3	.3	9.4	7.19	-	-	50	-42.81
1	.168	49.32	Qp	0	0	9.4	58.72	65.06	-6.34	-	-
3	.2535	43.21	Qp	0	0	9.3	52.51	61.64	-9.13	-	-
5	.3368	36.98	Qp	0	0	9.3	46.28	59.28	-13	-	-
7	.42	32.72	Qp	0	.1	9.3	42.12	57.45	-15.33	-	-
9	.5055	31.78	Qp	0	.1	9.3	41.18	56	-14.82	-	-
11	.5888	28.63	Qp	0	.1	9.3	38.03	56	-17.97	-	-
13	4.4858	23.43	Qp	0	.1	9.3	32.83	56	-23.17	-	-
15	29.4551	3.21	Qp	.3	.3	9.4	13.21	60	-46.79	-	-

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

### LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN dB	C2&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
18	.1703	33.41	Ca	0	0	9.4	42.81	-	-	54.95	-12.14
20	.2558	25.89	Ca	0	0	9.3	35.19	-	-	51.57	-16.38
22	.339	18.36	Ca	0	0	9.3	27.66	-	-	49.23	-21.57
24	.4223	14.87	Ca	0	.1	9.3	24.27	-	-	47.4	-23.13
26	.5033	13.1	Ca	0	.1	9.3	22.5	-	-	46	-23.5
28	.5685	7.98	Ca	0	.1	9.3	17.38	-	-	46	-28.62
30	4.56	8.62	Ca	0	.1	9.3	18.02	-	-	46	-27.98
32	29.355	3.42	Ca	.3	.3	9.4	13.42	-	-	50	-36.58
17	.168	48.03	Qp	0	0	9.4	57.43	65.06	-7.63	-	-
19	.2535	42.02	Qp	0	0	9.3	51.32	61.64	-10.32	-	-
21	.3368	35.76	Qp	0	0	9.3	45.06	59.28	-14.22	-	-
23	.42	31.55	Qp	0	.1	9.3	40.95	57.45	-16.5	-	-
25	.5044	30.79	Qp	0	.1	9.3	40.19	56	-15.81	-	-
27	.5888	27.51	Qp	0	.1	9.3	36.91	56	-19.09	-	-
29	4.56	22.23	Qp	0	.1	9.3	31.63	56	-24.37	-	-
31	29.3595	9.63	Qp	.3	.3	9.4	19.63	60	-40.37	-	-

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

## **12. SETUP PHOTOS**

Please refer to 14523778-EP1V1 FCC IC for setup photos

**END OF TEST REPORT**