TEST REPORT

Report Number: 14523740-E5V5

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A2848
Brand	:	APPLE
FCC ID	:	BCG-E8435A
IC	:	579C-E8435A
EUT Description	:	SMARTPHONE
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:
August 18, 2023

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

ACCREDITED
CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	07/17/2023	Initial Issue	Chin Pang
V2	07/22/2023	Address TCB's questions section 6, 9, 10	Chin Pang
V3	07/31/2023	Address page 19, 37, page 54-59, 44/66-67, page 74-79	Chin Pang
V4	08/15/2023	Removed protocol references	Francisco Guarnero
V5	08/18/2023	Removed additional protocol references	Francisco Guarnero

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A2848

BRAND: APPLE

SERIAL NUMBER: C07GQU0010S00003PJ (Conducted)
C07GTH0012C00003PJ (Conducted)
LVMPXQW46R (Radiated)

SAMPLE RECEIPT DATE: FEBRUARY 14, 2023

DATE TESTED: MARCH 22 – JULY 31, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 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.

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Approved & Released For
UL Verification Services Inc. By:

Senior Lab Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Tony Li
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Consumer Technology Division
UL Verification Services Inc.

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2. TEST SUMMARY

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	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	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	Complies	None.
15.247 (d)	RSS-247 5.5	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	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 CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 DTS Meas Guidance v05r02, RSS-247 Issue 2, KDB 414788 D01 Radiated Test Site v01r01, KDB 662911, RSS-GEN Issue 5 + A1 + A2.

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
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
☐	Building 5: 47670 Kato Rd, Fremont, CA 94538 USA			

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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_{LAB}
Conducted Antenna Port Emission Measurement	1.94
Power Spectral Density	2.466
Time Domain Measurements Using SA	3.39
RF Power Measurement Direct Method Using Power Meter	0.450 (Peak), 1.3 (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

Uncertainty figures are valid to a confidence level of 95%.

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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 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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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, NB UNII, 802.15.4, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

6.2. MAXIMUM OUTPUT POWER

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

Antenna	Configuration	Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
ANT 4	High Power	2405 - 2475	802.15.4	21.91	155.24
	Low Power			11.18	13.12
ANT 3	High Power	2405 - 2475	802.15.4	21.78	150.66
	Low Power			13.33	21.53

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:
Cable loss is 2.1dB.

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	-4.0	-1.5

6.4. SOFTWARE AND FIRMWARE

The EUT firmware version installed during testing was 21.1.304.2213

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6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X, Y and Z on ANT 4, and ANT 3. It was determined that X (Flatbed) was the worst-case orientation for ANT 4 and ANT 3.

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT was set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario. There were no emissions found below 30MHz within 20dB of the limit

For 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.

For simultaneous transmission of multiple channels in the 2.4GHz and 5GHz bands. No noticeable emission was found.

Note: In the Radiated Plots and emissions data, ANT0=ANT4 and ANT1=ANT 3.

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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

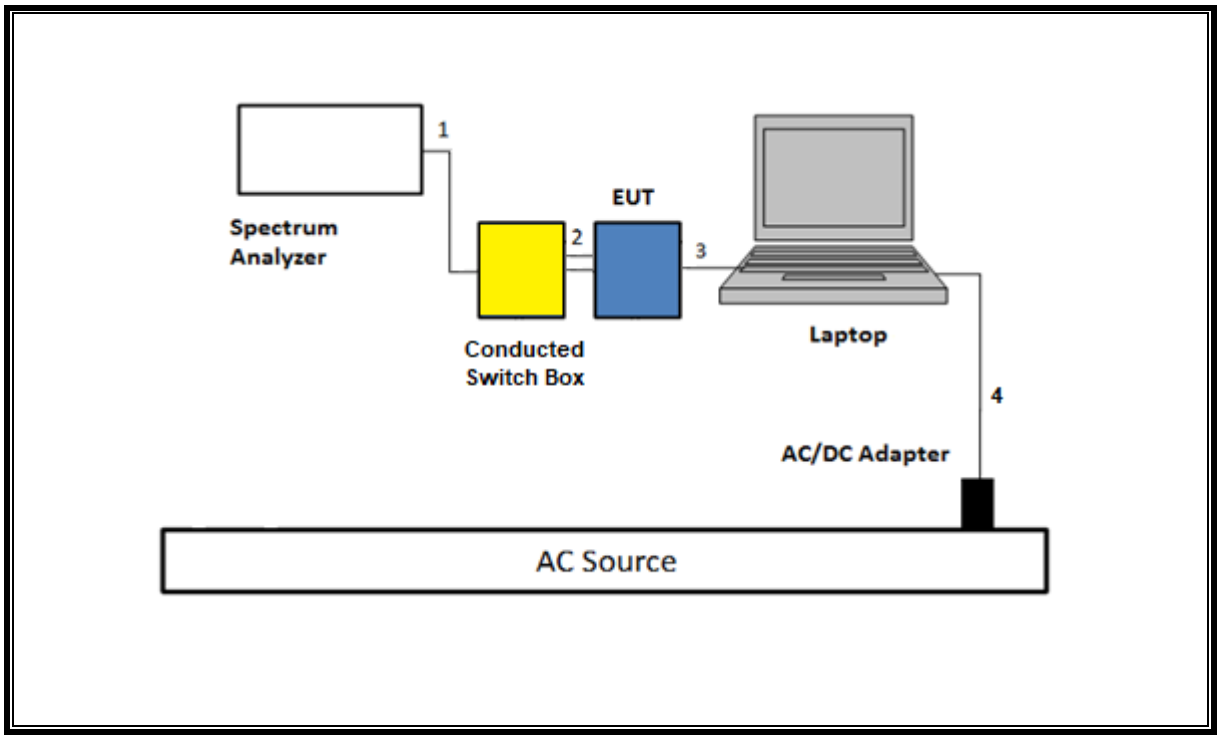
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	SMA	1	SMA	Shielded	0.75	To spectrum Analyzer
2	Antenna	2	SMA	Un-shielded	0.2	To Conducted Switch Box
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	AC	1	AC	Un-shielded	2	N/A

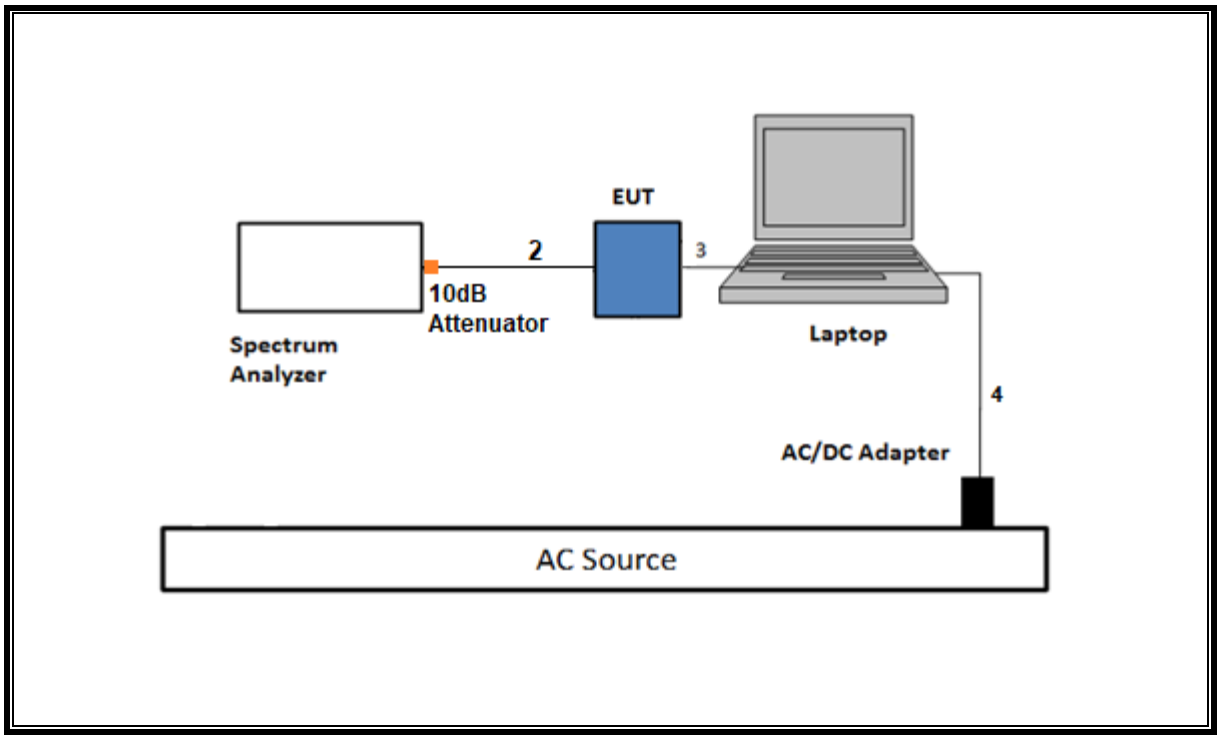
I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Shielded	1	N/A

TEST SETUP

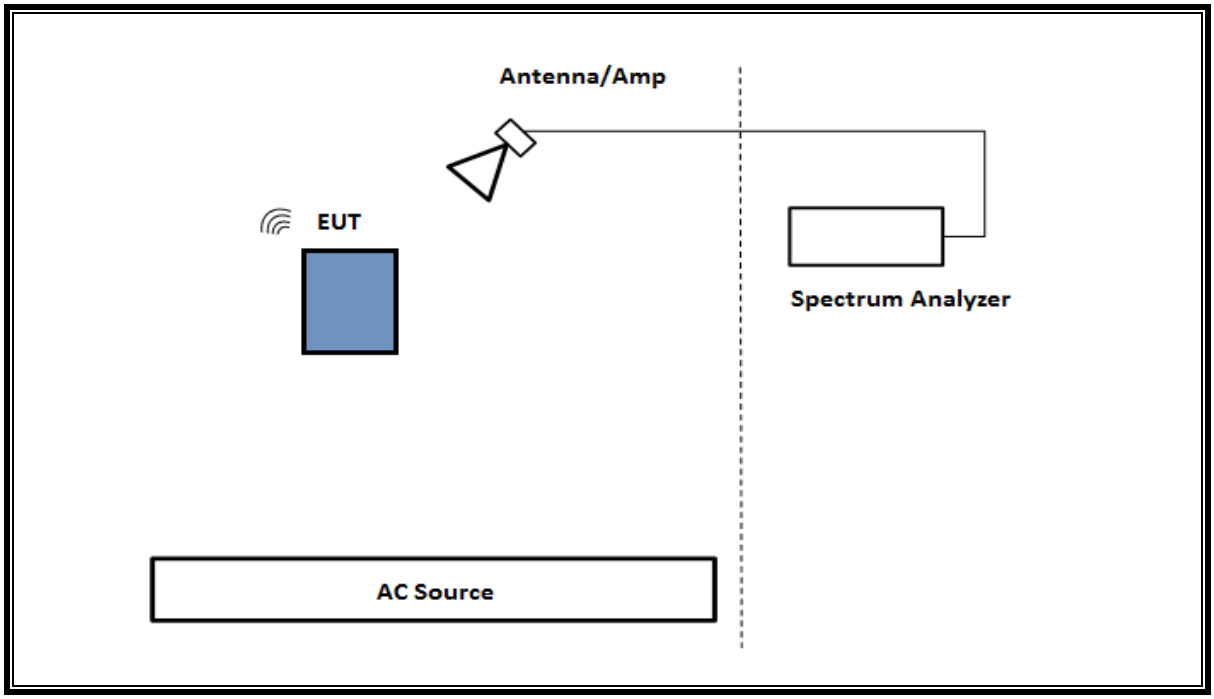
The EUT setup is shown as below. Test software exercised the radio card.

SETUP DIAGRAM FOR CONDUCTED TESTS

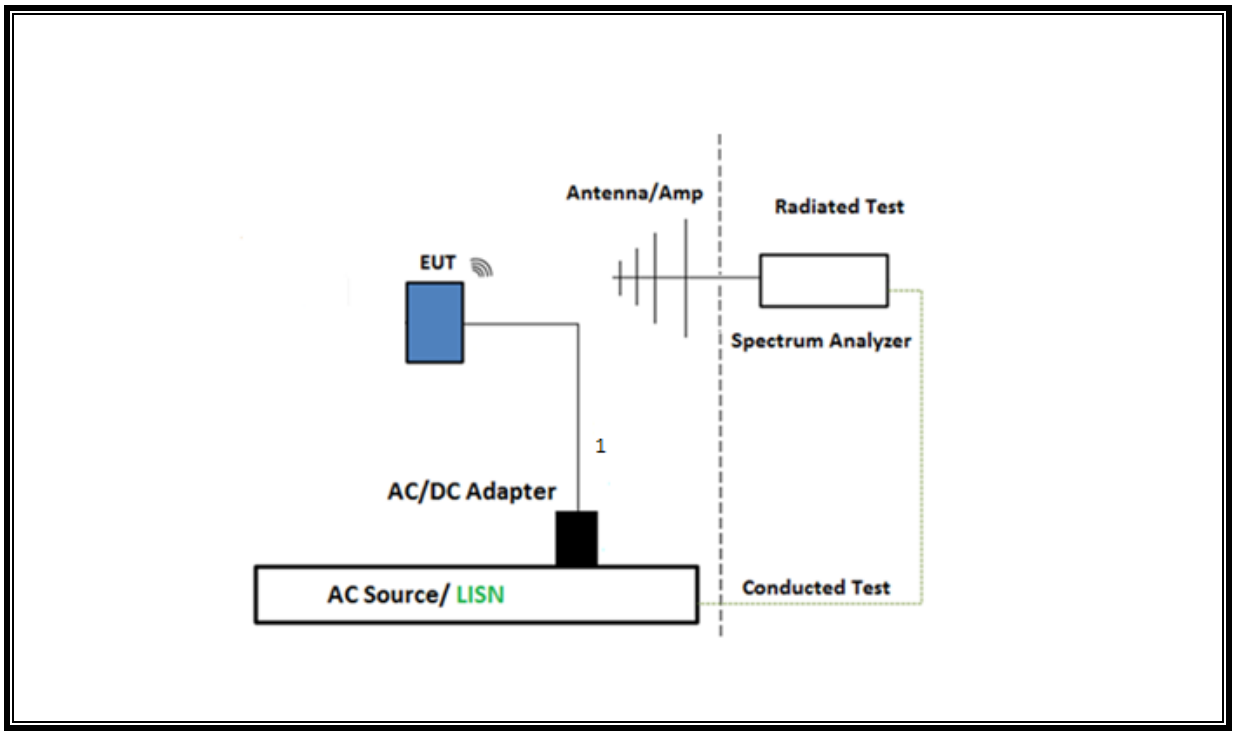




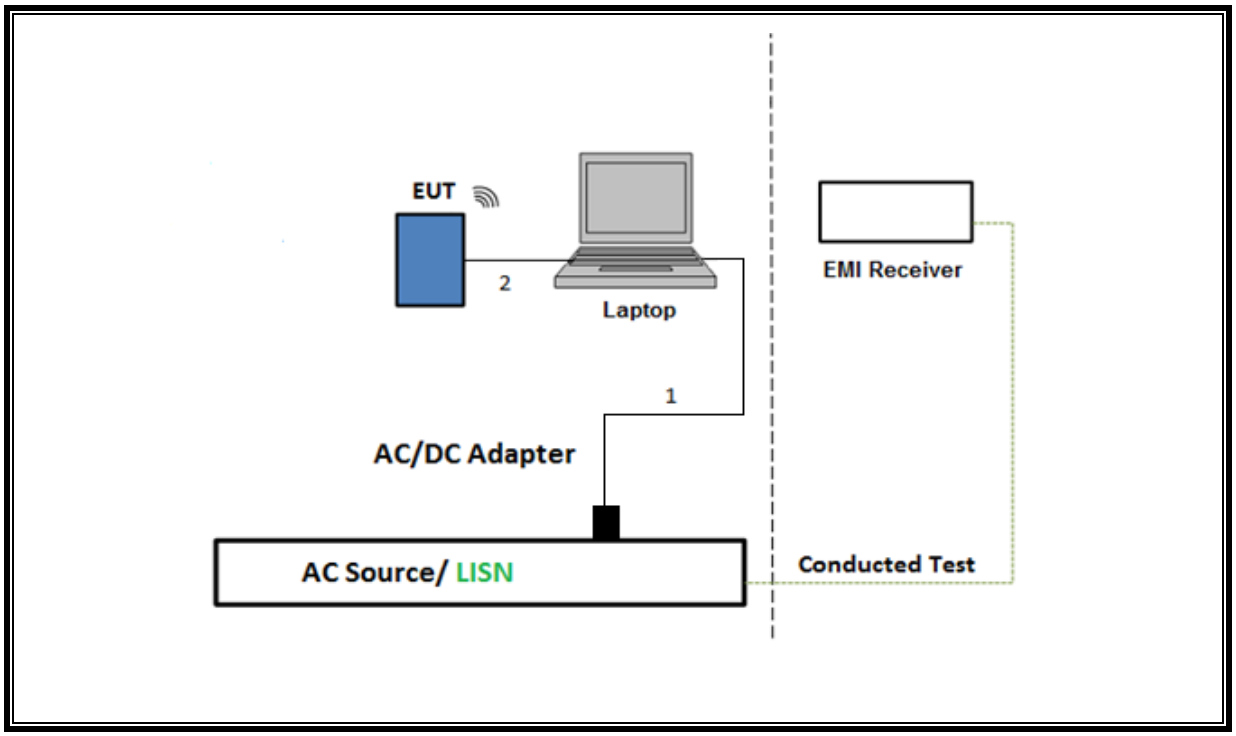
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 558074 D01 v05r02, Section 6.

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW ≥ 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 Measurement using gated average power meter.

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

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1 & Clause 13

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

Band-edge: ANSI C63.10 Subclause -11.13.3.2 & Clause 13: Integration method -Peak detection

Band-edge: ANSI C63.10 Subclause -11.13.3.3 & Clause 13: Integration method -Trace averaging with continuous transmission at full power

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

Radiated emissions non-restricted frequency bands ANSI C63.10 Subclause -11.11 & Clause 13

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4 & 13

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8. TEST AND MEASUREMENT EQUIPMENT

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

Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201499	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226673	01/09/2024	01/09/2023
RF Filter Box, 1-18GHz, 12 Port.	UL-FR1	Frankenstein	231249	02/29/2024	02/29/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	170063	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	230300	01/12/2024	01/12/2023
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, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	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	201497	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	84797	09/20/2023	09/20/2022
RF Filter Box, 1-18GHz	UL-FR1	NA	171389	05/31/2024	05/31/2023
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	80714	10/06/2023	10/06/2022
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
Antenna. Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	172363	01/31/2024	01/31/2023
Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Keysight Technologies Inc	E4440A	81311	02/29/2024	02/29/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	02/28/2024	02/28/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85214	02/28/2024	02/28/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A-544	87738	02/28/2024	02/28/2023
*Conducted Switch Box	N/A	CSB	221008	06/21/2023	06/21/2022
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	Verified/Characterized before use	
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236355	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, 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

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
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
UL AUTOMATION SOFTWARE					
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 was completed before equipment calibration date

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

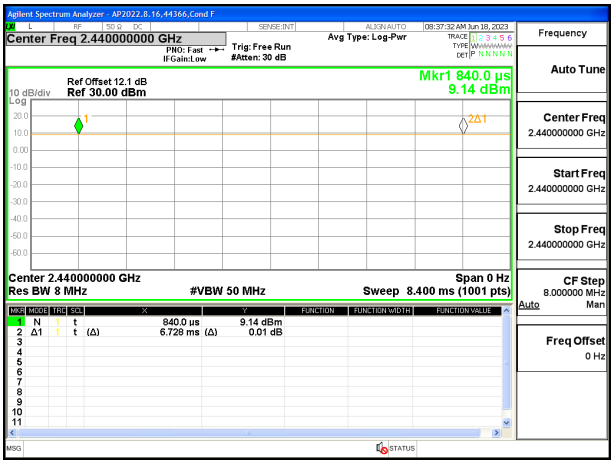
PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
2.4GHz Band						
802.15.4, 2440MHz	6.73	6.73	1.000	100.00%	0.00	0.010

DUTY CYCLE PLOTS



802.15.4

9.2. 99% 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.

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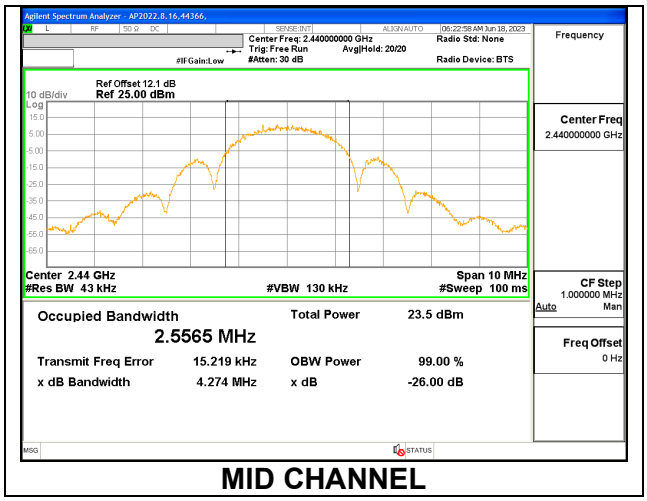
9.2.1. HIGH POWER

ANT 4

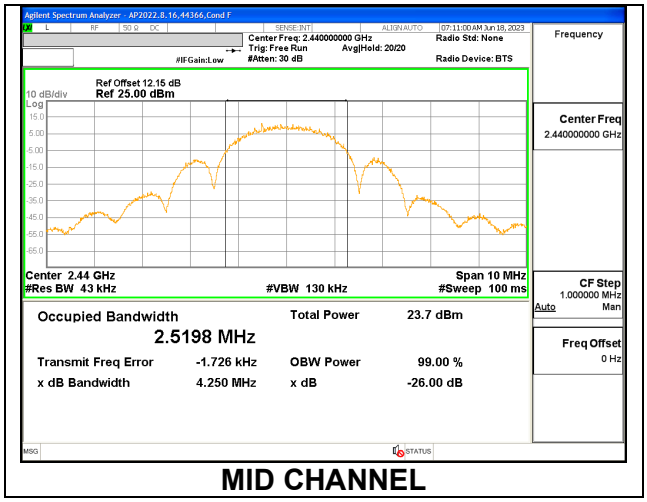
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.3434
Middle	2440	2.5565
High	2475	2.4926



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2405	2.5144
Middle	2440	2.5198
High	2475	2.5123



MID CHANNEL

9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 5.2 (a)

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

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

9.3.1. HIGH POWER

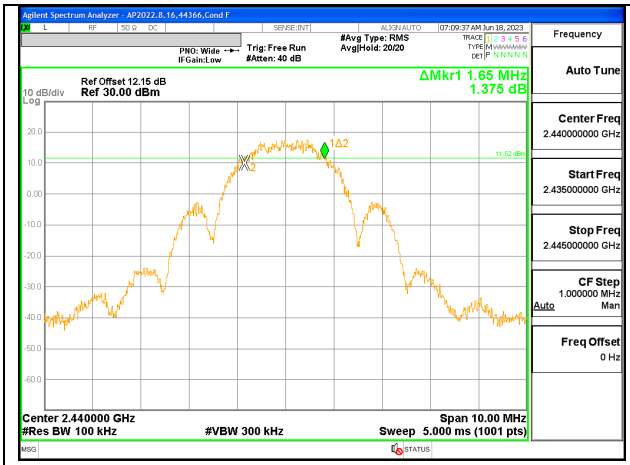
ANT 4

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.630	0.5
Middle	2440	1.690	0.5
High	2475	1.630	0.5

MID CHANNEL

ANT 3

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2405	1.630	0.5
Middle	2440	1.650	0.5
High	2475	1.660	0.5



MID 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

Measurements perform using a wideband RF 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 peak power sensor. Peak output power was read directly from the power meter.

DIRECTIONAL ANTENNA GAIN

For 1 TX:
There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

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9.4.1. HIGH POWER

ANT 4

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	21.65	30	-8.35
Middle	2440	21.91	30	-8.09
High	2475	21.78	30	-8.22

ANT 3

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	21.72	30	-8.28
Middle	2440	21.70	30	-8.30
High	2475	21.78	30	-8.22

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9.4.2. LOW POWER

ANT 4

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	11.07	30	-18.93
Middle	2440	11.09	30	-18.91
High	2475	11.18	30	-18.82

ANT 3

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2405	13.33	30	-16.67
Middle	2440	13.29	30	-16.71
High	2475	13.15	30	-16.85

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9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband RF 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

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9.5.1. HIGH POWER

ANT 4

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	20.91
Middle	2440	20.98
High	2475	20.95

ANT 3

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	20.96
Middle	2440	20.94
High	2475	20.98

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9.5.2. LOW POWER

ANT 4

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	10.45
Middle	2440	10.46
High	2475	10.37

ANT 3

Tested By:	44366
Date:	6/9/2023

Channel	Frequency (MHz)	AV power (dBm)
Low	2405	12.41
Middle	2440	12.46
High	2475	12.42

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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

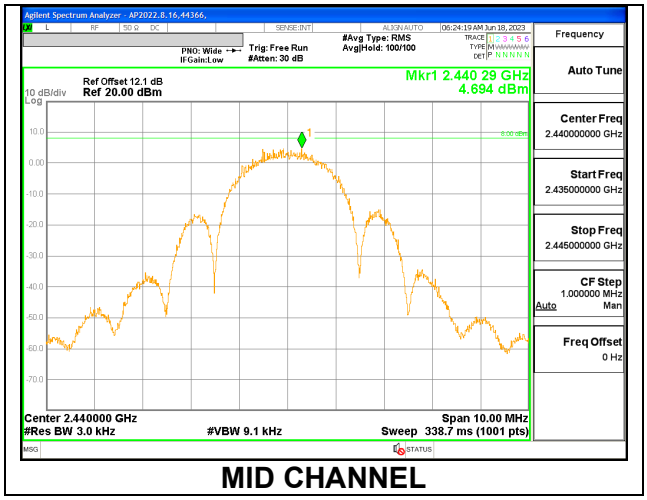
Only Mid channel plot is reported to show setting parameter complies with testing method/procedure.

Only High-Power modes result is reported, it covers all Low Power modes

9.6.1. HIGH POWER

ANT 4

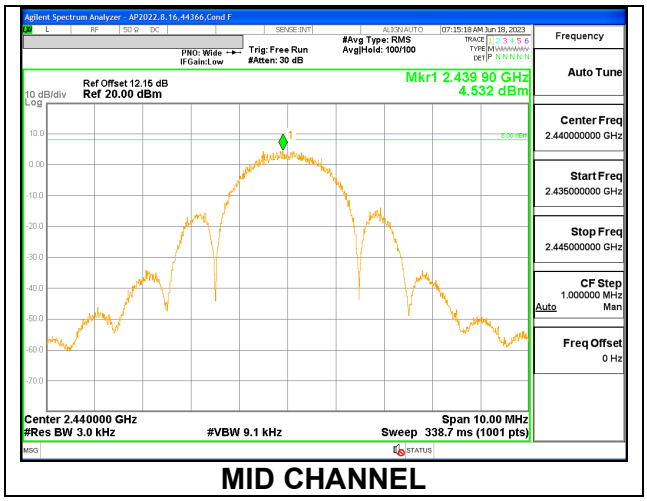
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2405	4.532	8	-3.47
Middle	2440	4.694	8	-3.31
High	2475	4.771	8	-3.23



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2405	4.631	8	-3.37
Middle	2440	4.532	8	-3.47
High	2475	4.745	8	-3.26



MID CHANNEL

9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

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

RESULTS

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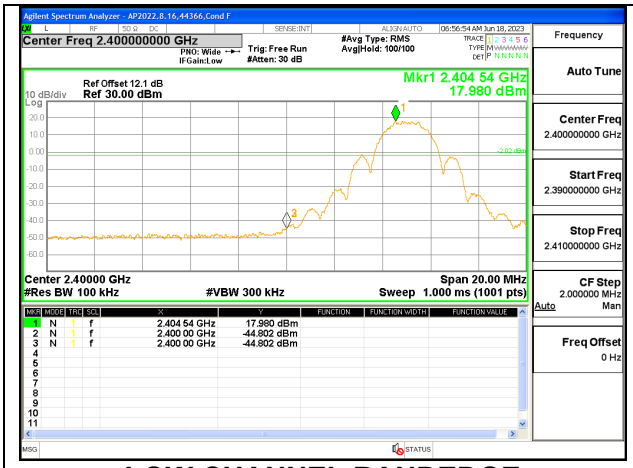
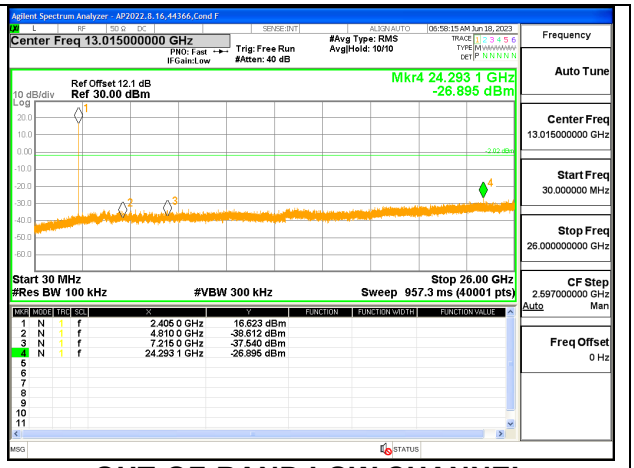
9.7.1. HIGH POWER

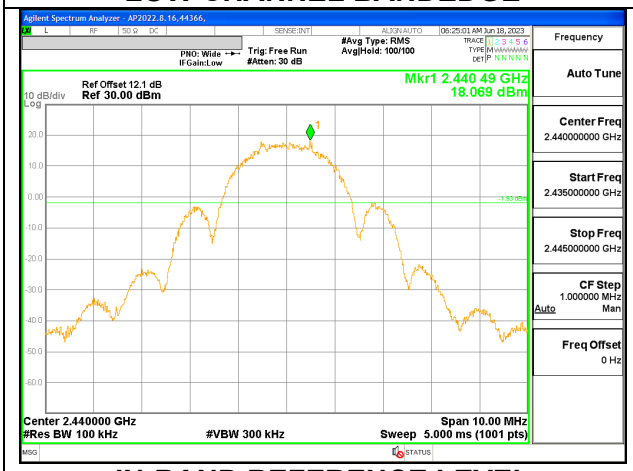
ANT 4



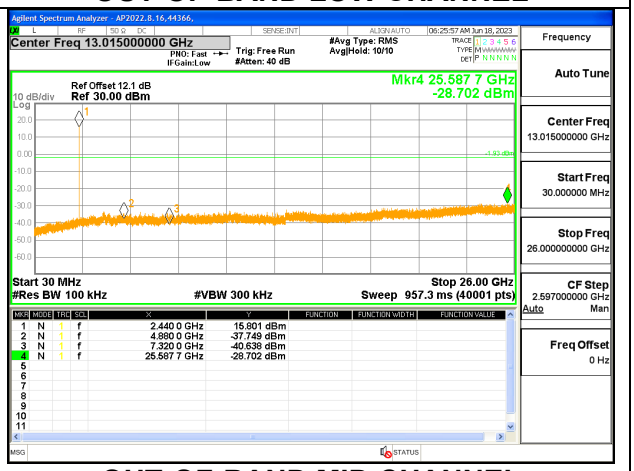
LOW CHANNEL BANDEDGE



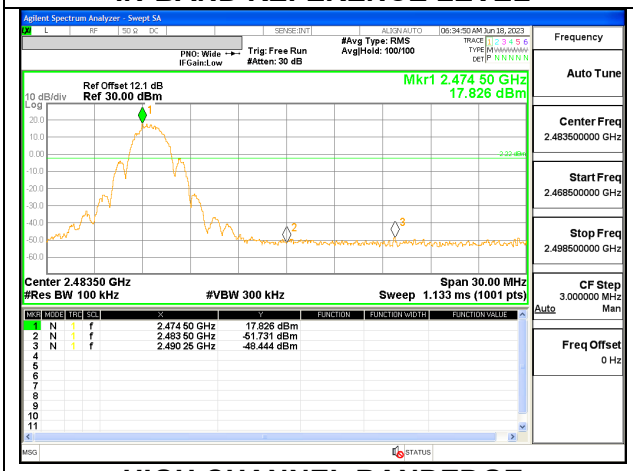
OUT-OF-BAND LOW CHANNEL



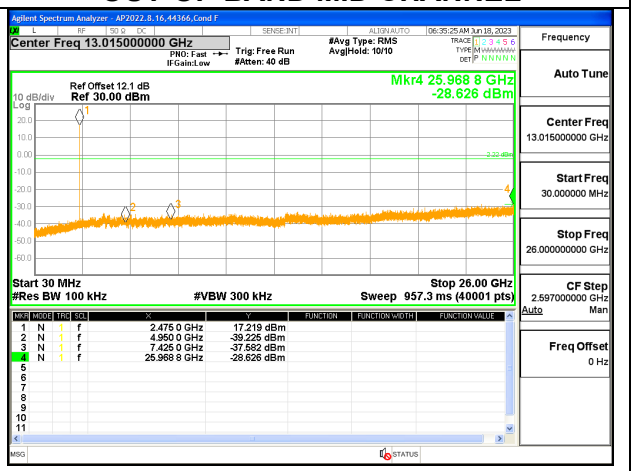
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

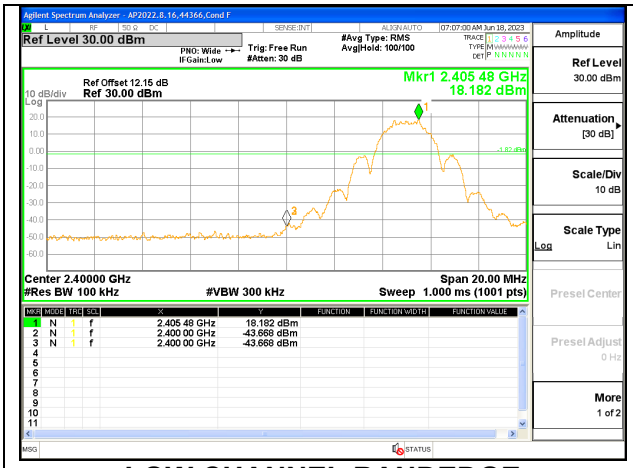


HIGH CHANNEL BANDEDGE

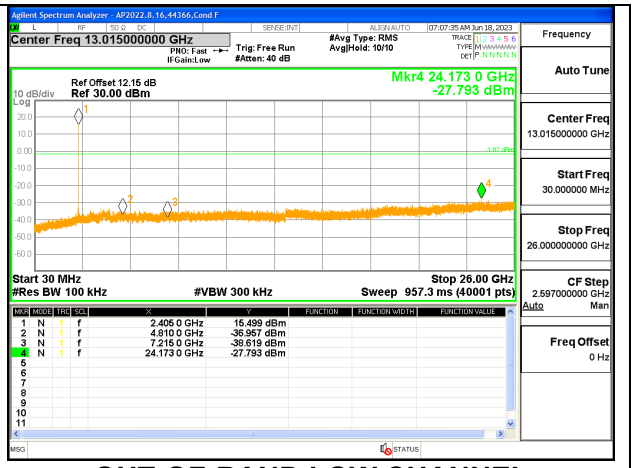


OUT-OF-BAND HIGH CHANNEL

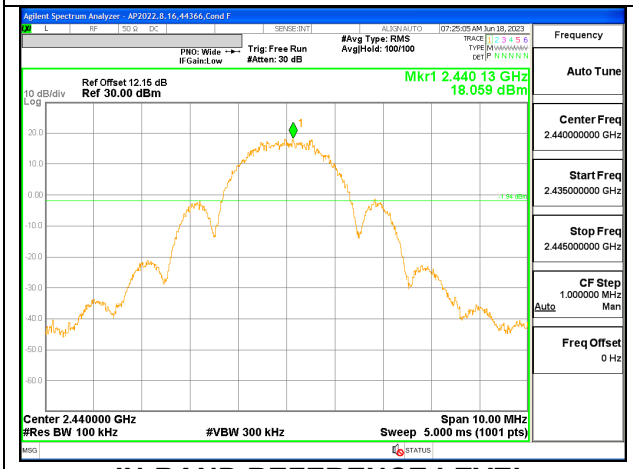
ANT 3



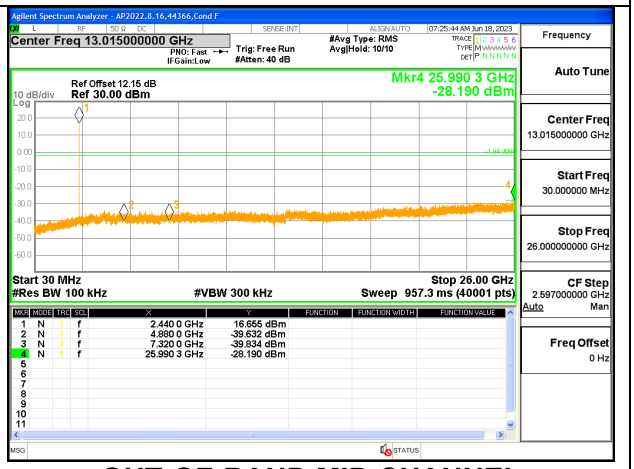
LOW CHANNEL BANDEDGE



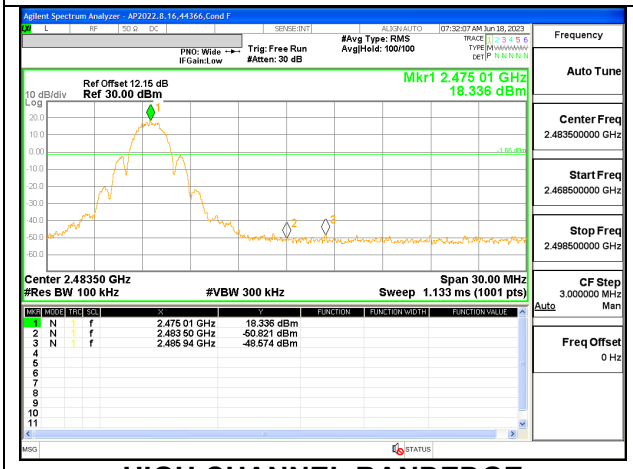
OUT-OF-BAND LOW CHANNEL



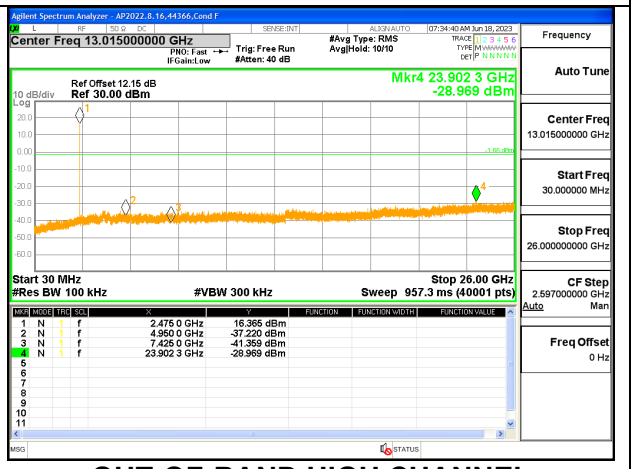
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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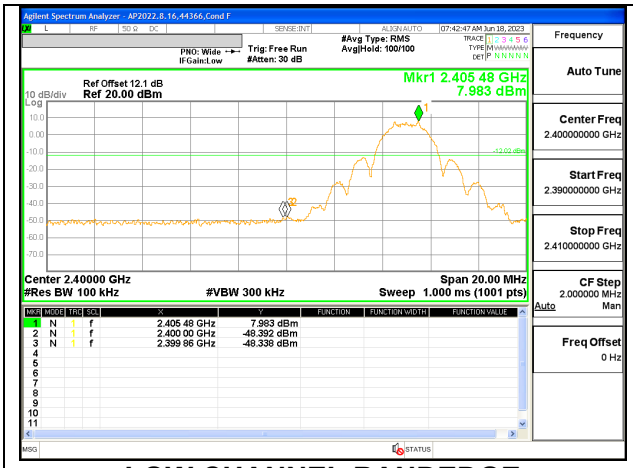
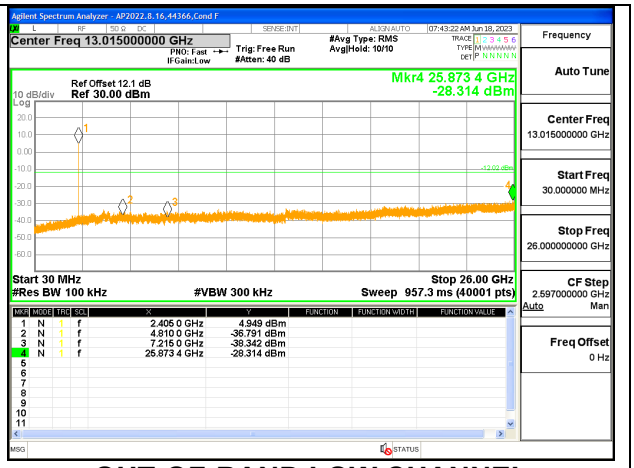
9.7.2. LOW POWER

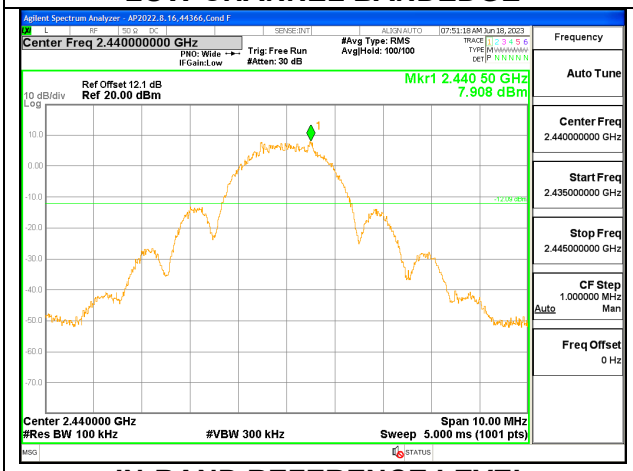
ANT 4



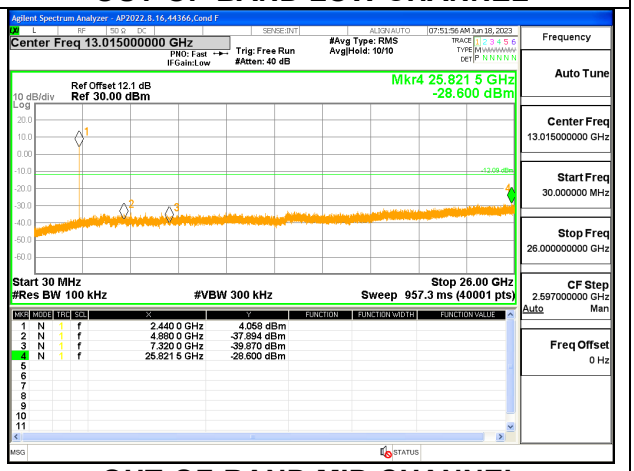
LOW CHANNEL BANDEDGE



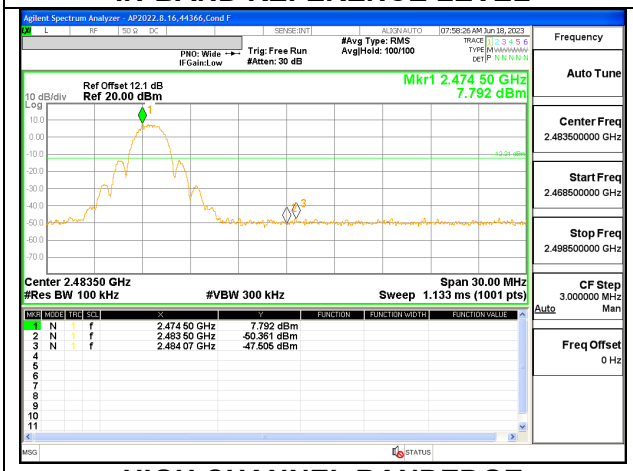
OUT-OF-BAND LOW CHANNEL



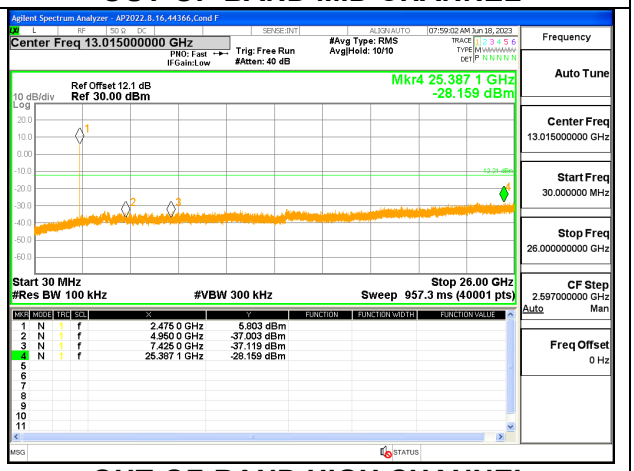
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

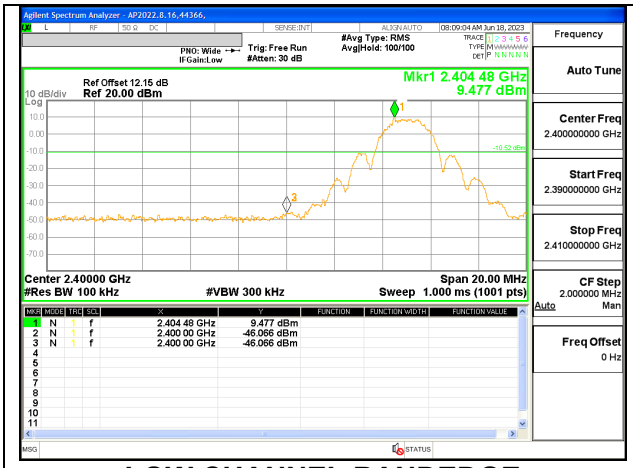


HIGH CHANNEL BANDEDGE

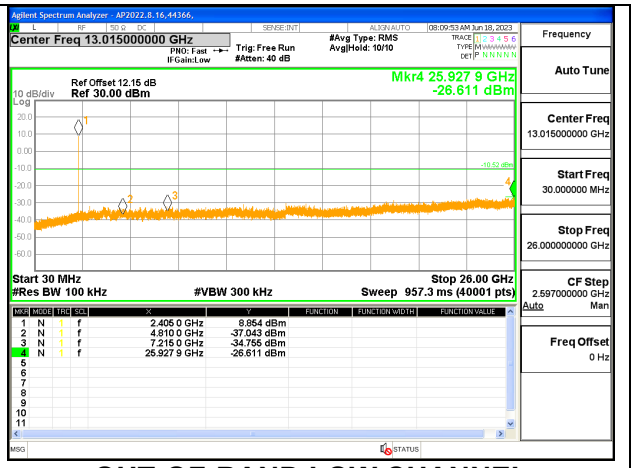


OUT-OF-BAND HIGH CHANNEL

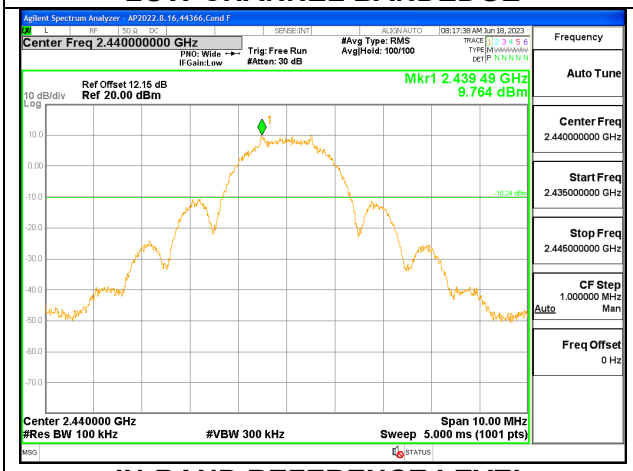
ANT 3



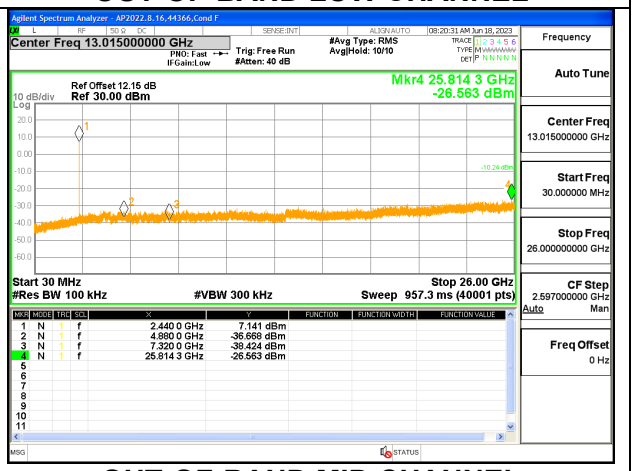
LOW CHANNEL BANDEDGE



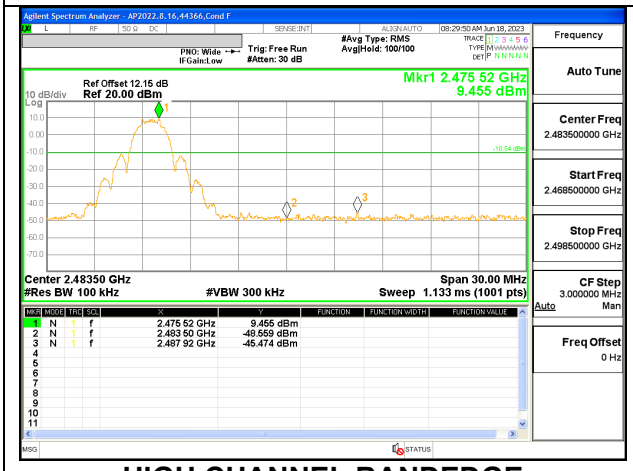
OUT-OF-BAND LOW CHANNEL



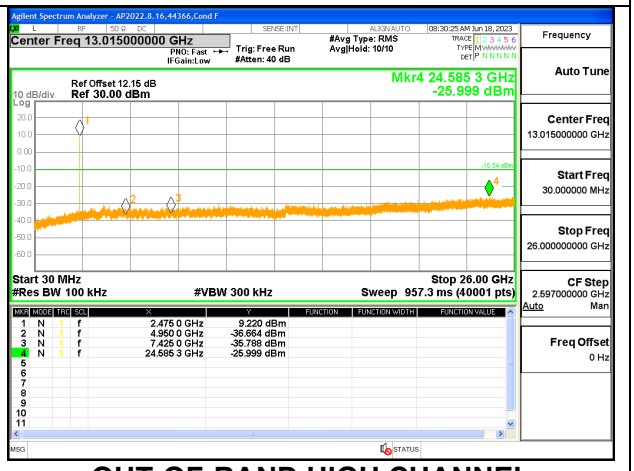
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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10. RADIATED TEST RESULTS

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. 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 on above 1 GHz restricted bandedge, 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. And for Harmonic Spurious final scans above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T (10 Hz) video bandwidth with peak detector 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.

Note: The limits in CFR 47, 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 report in the table) using 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 to 15.209(a) limit.

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.

KDB 558074 D01 15.247 Meas Guidance v05r02

Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

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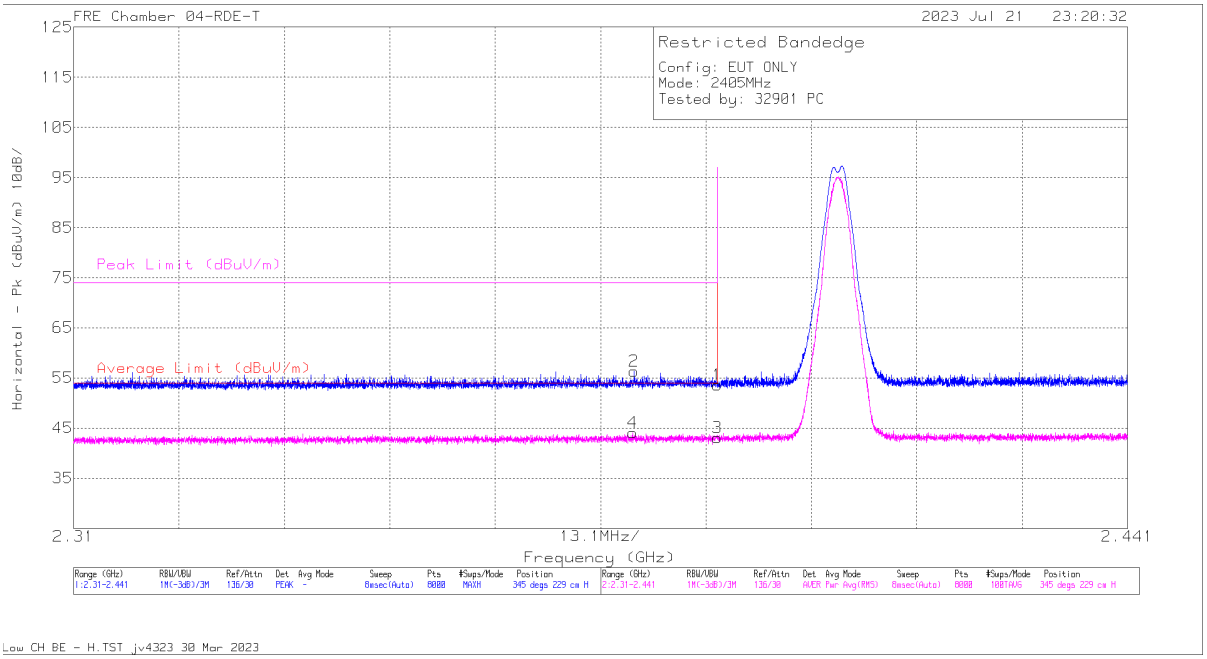
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. ANT4, 802.15.4 HIGH POWER BANDEDGE

Low Channel

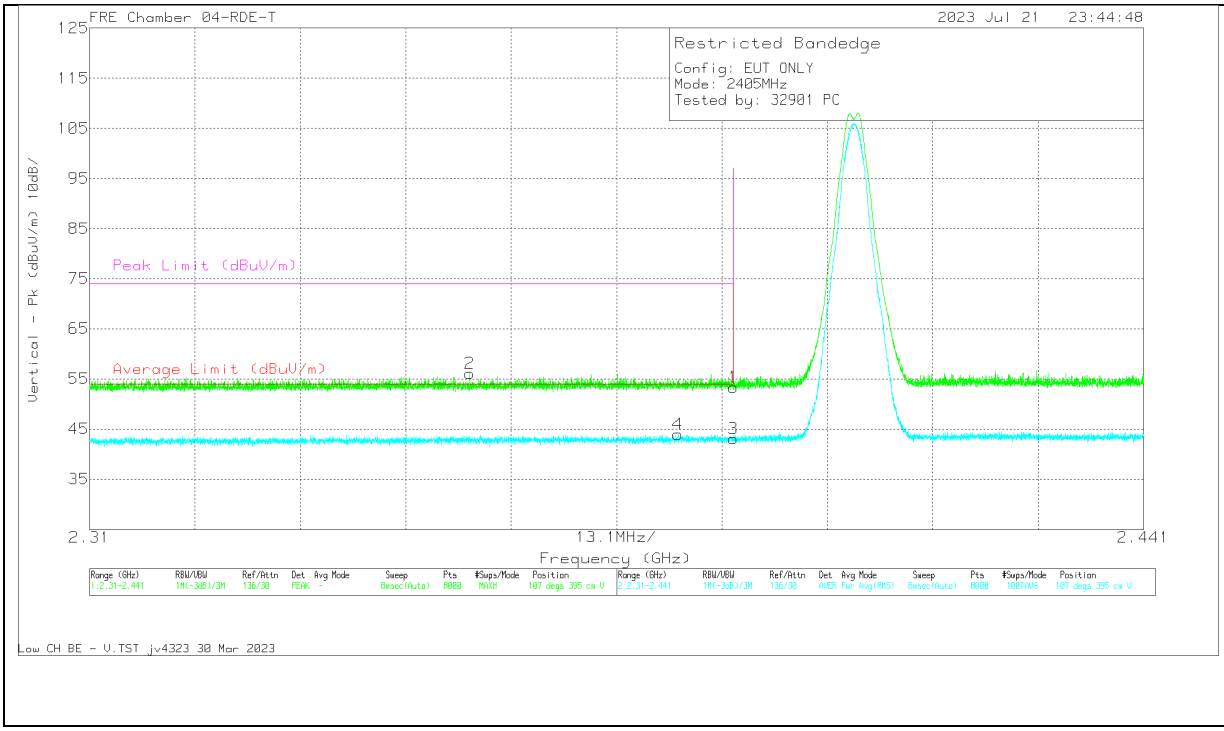
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.37	Pk	32.1	0	-37.89	53.58	-	-	74	-20.42	345	229	H
2	* 2.379684	62.1	Pk	32.1	0	-37.87	56.33	-	-	74	-17.67	345	229	H
3	* 2.39	48.87	RMS	32.1	0	-37.89	43.08	54	-10.92	-	-	345	229	H
4	* 2.37952	49.84	RMS	32.1	0	-37.87	44.07	54	-9.93	-	-	345	229	H

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

VERTICAL RESULT

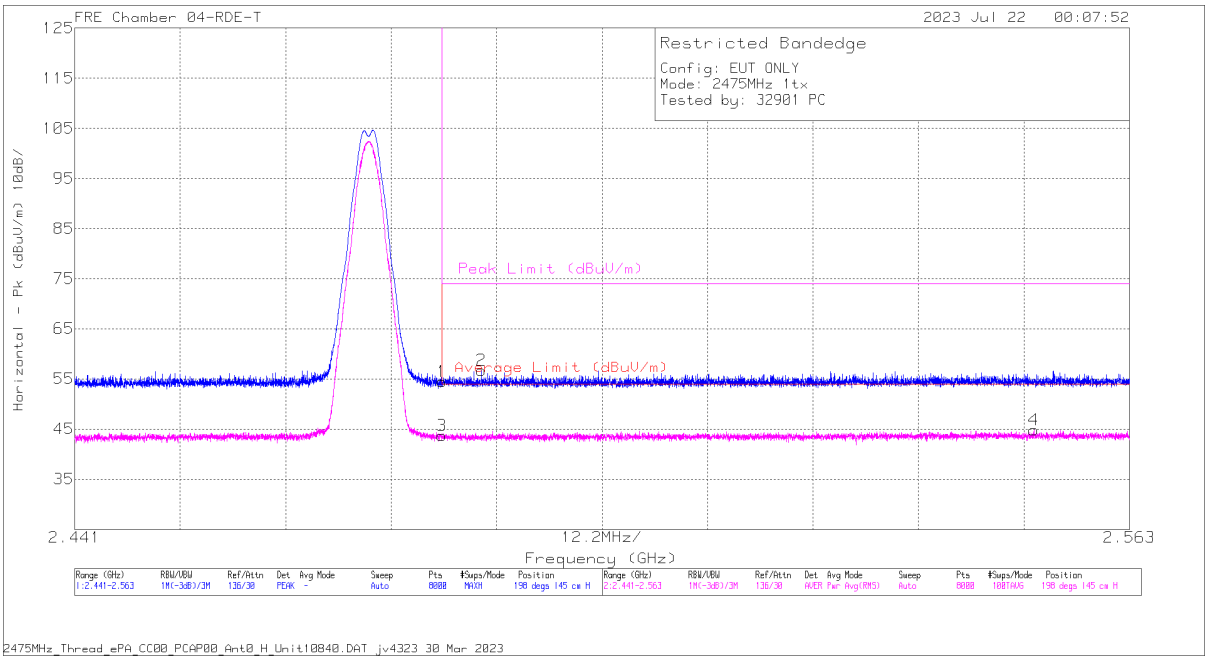


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.16	Pk	32.1	0	-37.89	53.37	-	-	74	-20.63	107	395	V
2	* 2.357231	61.95	Pk	32	0	-37.9	56.05	-	-	74	-17.95	107	395	V
3	* 2.39	48.85	RMS	32.1	0	-37.89	43.06	54	-10.94	-	-	107	395	V
4	* 2.383123	49.75	RMS	32.1	0	-37.89	43.96	54	-10.04	-	-	107	395	V

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

High CHANNEL

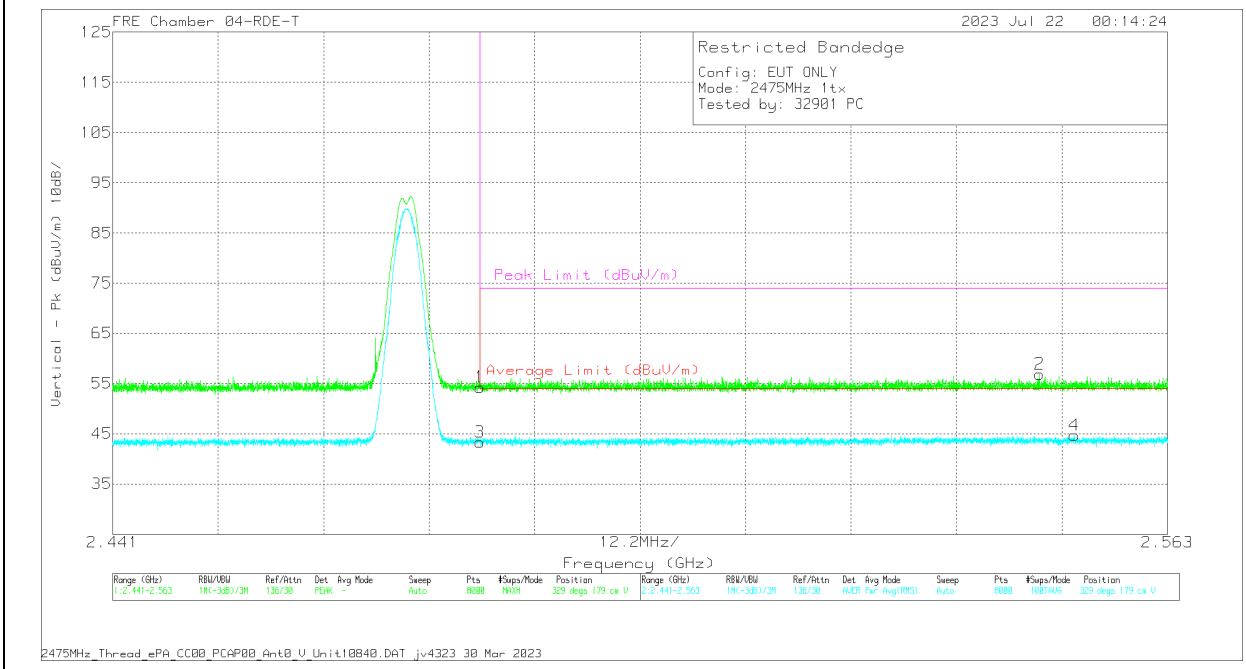
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.08	Pk	32.2	0	-37.81	54.47	-	-	74	-19.53	198	145	H
2	* 2.488022	62.29	Pk	32.3	0	-37.82	56.77	-	-	74	-17.23	198	145	H
3	* 2.4835	49.38	RMS	32.2	0	-37.81	43.77	54	-10.23	-	-	198	145	H
4	2.551943	50.35	RMS	32.3	0	-37.79	44.86	54	-9.14	-	-	198	145	H

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

VERTICAL RESULT



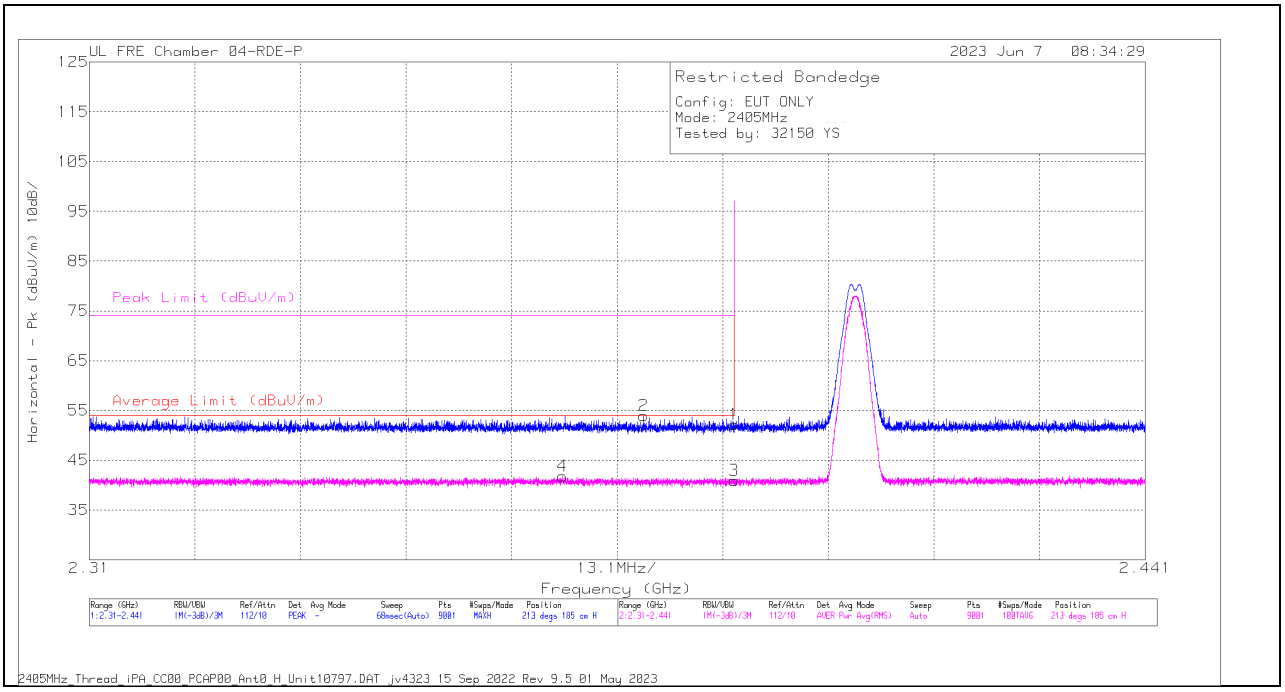
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.89	Pk	32.2	0	-37.81	54.28	-	-	74	-19.72	329	179	V
3	* 2.4835	48.96	RMS	32.2	0	-37.81	43.35	54	-10.65	-	-	329	179	V
2	2.548222	62.36	Pk	32.3	0	-37.75	56.91	-	-	74	-17.09	329	179	V
4	2.552233	50.24	RMS	32.3	0	-37.79	44.75	54	-9.25	-	-	329	179	V

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

10.1.2. ANT4, 802.15.4 LOW POWER BANDEDGE

LOW CHANNEL

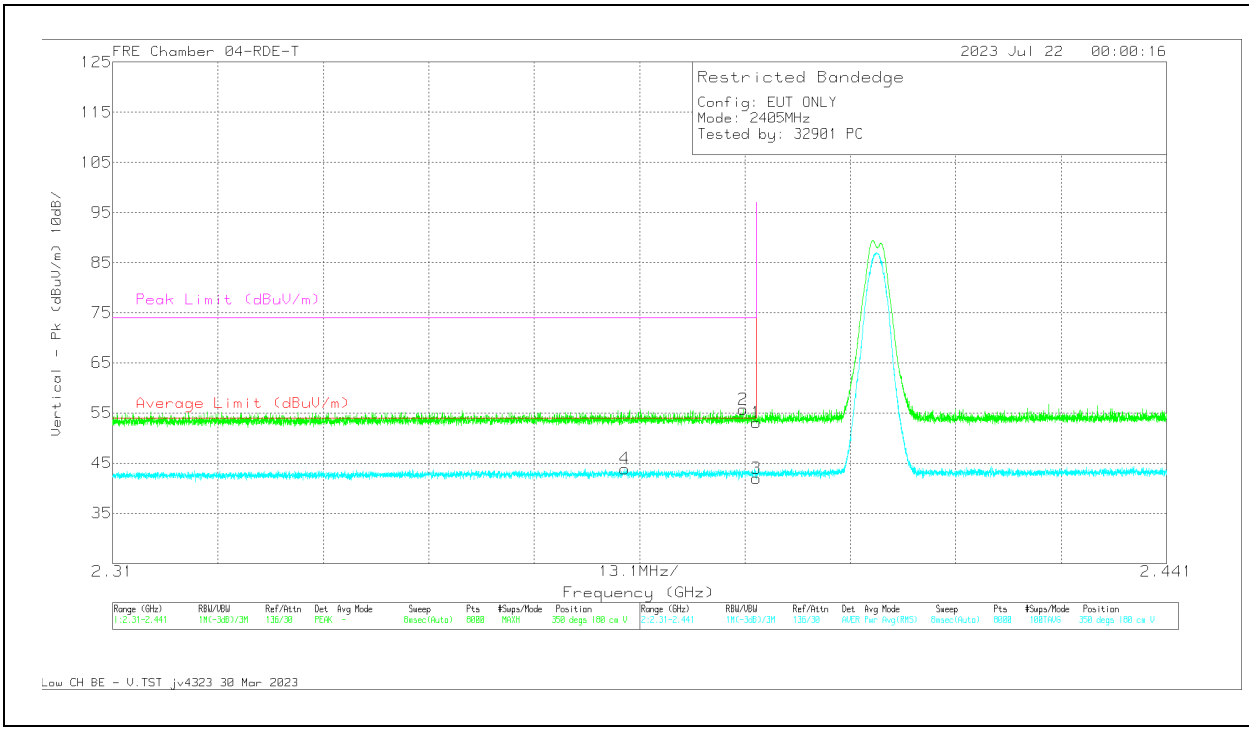
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.19	Pk	31.7	-19.7	52.19	-	-	74	-21.81	213	185	H
2	* 2.378748	41.82	Pk	31.7	-19.6	53.92	-	-	74	-20.08	213	185	H
3	* 2.39	28.95	RMS	31.7	-19.7	40.95	54	-13.05	-	-	213	185	H
4	* 2.368733	29.62	RMS	31.7	-19.5	41.82	54	-12.18	-	-	213	185	H

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

VERTICAL RESULT

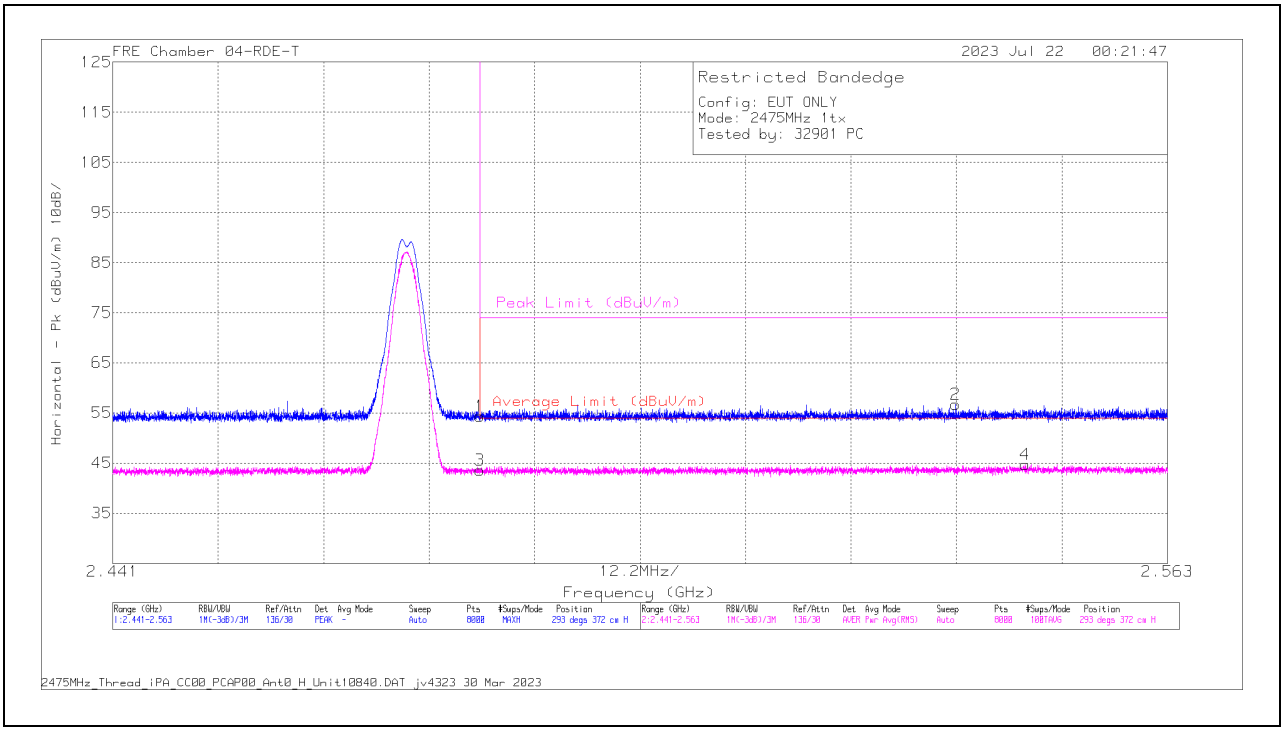


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	58.89	Pk	32.1	0	-37.89	53.1	-	-	74	-20.9	350	180	V
2	* 2.388364	61.54	Pk	32.1	0	-37.87	55.77	-	-	74	-18.23	350	180	V
3	* 2.39	47.75	RMS	32.1	0	-37.89	41.96	54	-12.04	-	-	350	180	V
4	* 2.373674	49.68	RMS	32.1	0	-37.88	43.9	54	-10.1	-	-	350	180	V

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

HIGH CHANNEL

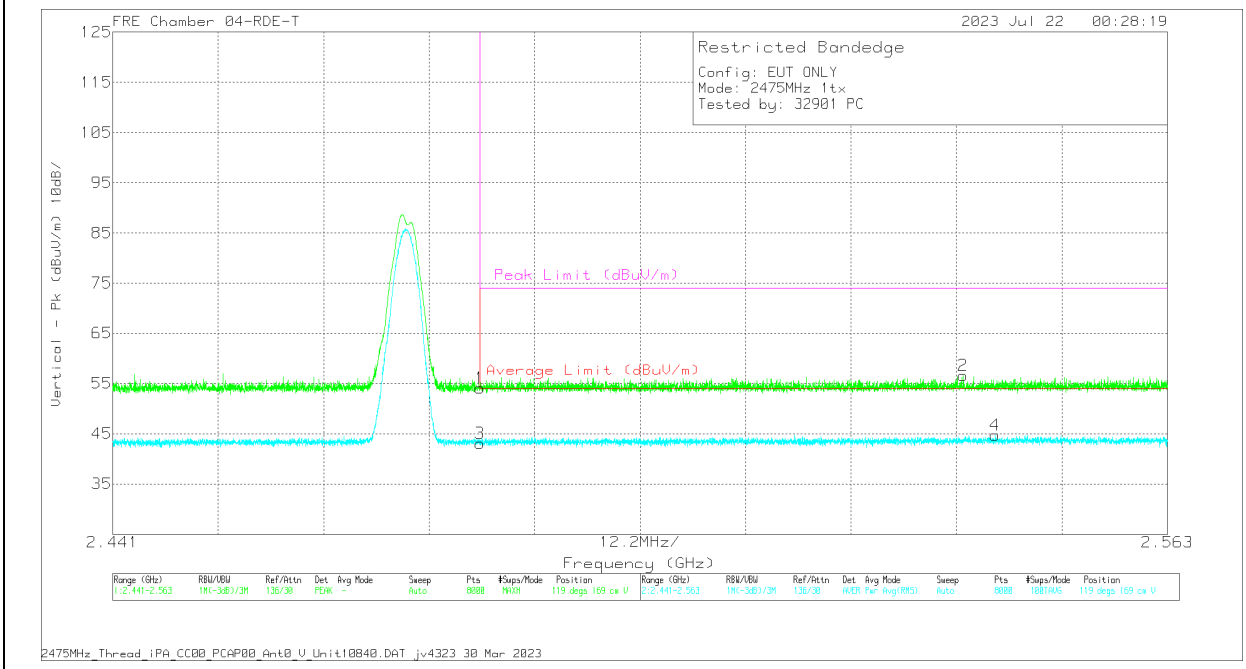
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.94	Pk	32.2	0	-37.81	54.33	-	-	74	-19.67	293	372	H
3	* 2.4835	49.15	RMS	32.2	0	-37.81	43.54	54	-10.46	-	-	293	372	H
2	2.538521	62.14	Pk	32.3	0	-37.75	56.69	-	-	74	-17.31	293	372	H
4	2.546574	50.2	RMS	32.3	0	-37.73	44.77	54	-9.23	-	-	293	372	H

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

VERTICAL RESULT

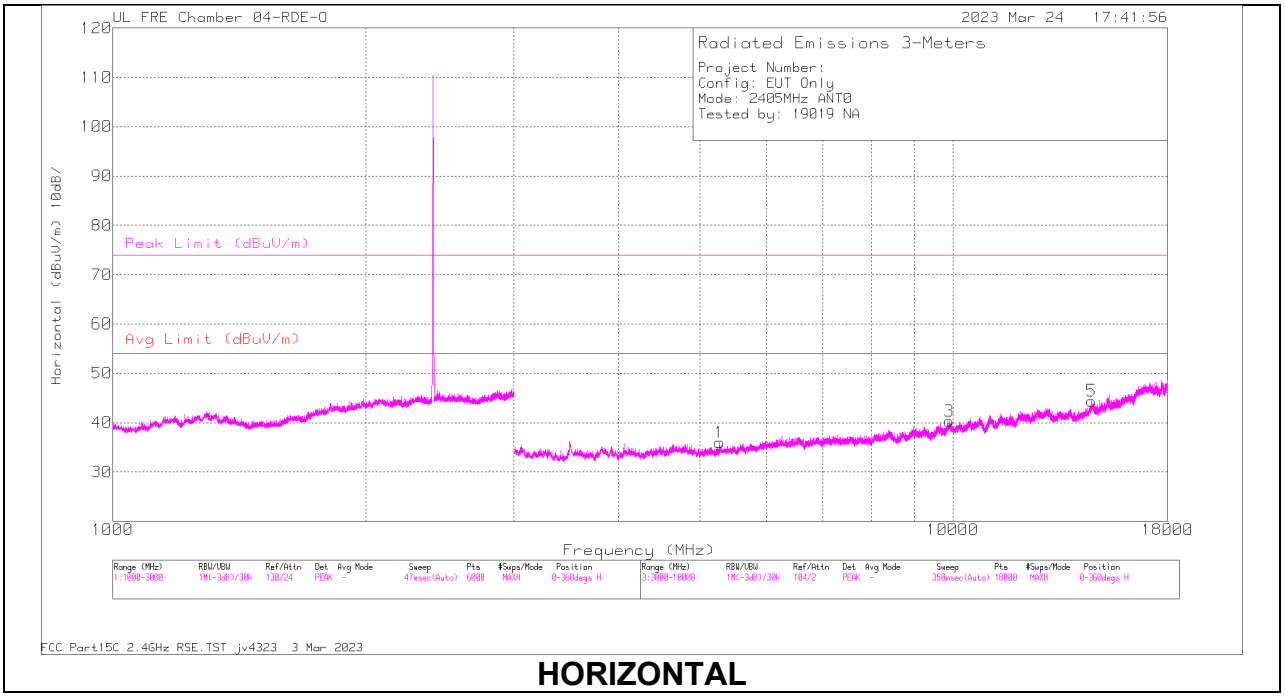


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.66	Pk	32.2	0	-37.81	54.05	-	-	74	-19.95	119	169	V
3	* 2.4835	48.74	RMS	32.2	0	-37.81	43.13	54	-10.87	-	-	119	169	V
2	2.539345	62.07	Pk	32.3	0	-37.75	56.62	-	-	74	-17.38	119	169	V
4	2.543082	50.22	RMS	32.3	0	-37.78	44.74	54	-9.26	-	-	119	169	V

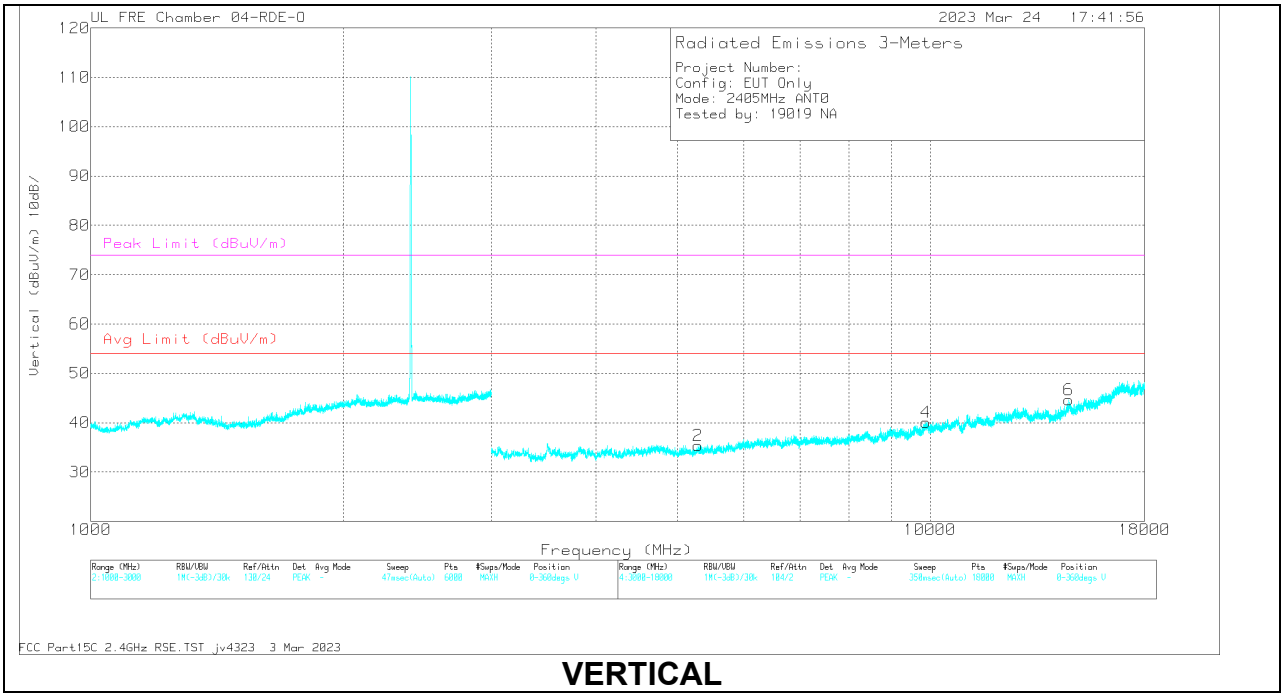
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

10.1.3. ANT4, 802.15.4 HIGH POWER, HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_A CF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5273.994	53.21	PKFH	34.6	-44.93	42.88	74	-31.12	132	175	H
2	5289.673	54.36	PKFH	34.6	-44.95	44.01	74	-29.99	213	188	V
4	9877.876	51.93	PKFH	37.1	-41.5	47.53	74	-26.47	117	193	V
3	9902.168	52.5	PKFH	37.2	-41.04	48.66	74	-25.34	77	184	H
6	14620.347	51.78	PKFH	39.7	-39.63	51.85	74	-22.15	193	139	V
5	14628.131	51.21	PKFH	39.7	-39.22	51.69	74	-22.31	144	130	H

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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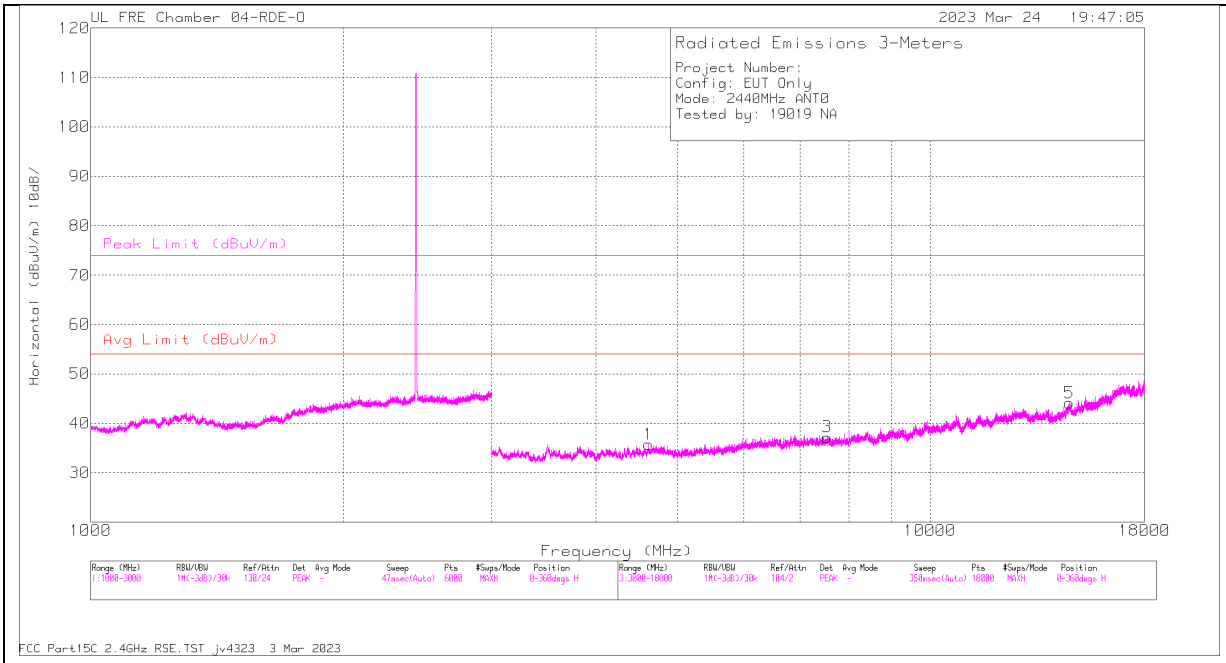
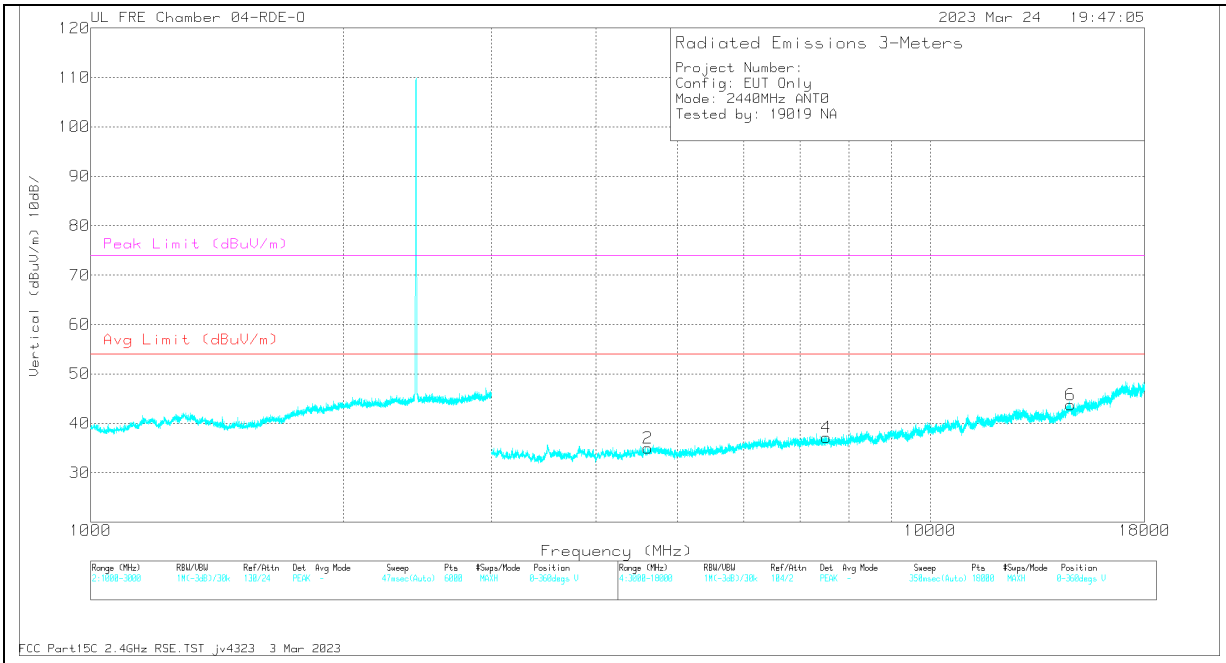
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4619.861	55.73	PKFH	34.5	-46.25	43.98	-	-	74	-30.02	0	218	H
	* 4620.542	41.76	VA1T	34.5	-46.23	30.03	54	-23.97	74	-43.97	0	218	H
3	* 7534.709	51.54	PKFH	35.9	-42.2	45.24	-	-	74	-28.76	75	275	H
	* 7537.008	38.05	VA1T	35.9	-42.18	31.77	54	-22.23	74	-42.23	75	275	H
2	* 4609.583	54.41	PKFH	34.6	-46.26	42.75	-	-	74	-31.25	82	160	V
	* 4610.379	41.44	VA1T	34.6	-46.26	29.78	54	-24.22	74	-44.22	82	160	V
4	* 7522.606	51.07	PKFH	36	-42.19	44.88	-	-	74	-29.12	144	133	V
	* 7521.816	37.98	VA1T	36	-42.19	31.79	54	-22.21	74	-42.21	144	133	V
5	14639.888	51.16	PKFH	39.7	-39.23	51.63	-	-	74	-22.37	190	197	H
6	14692.651	51.17	PKFH	39.7	-39.3	51.57	-	-	74	-22.43	59	254	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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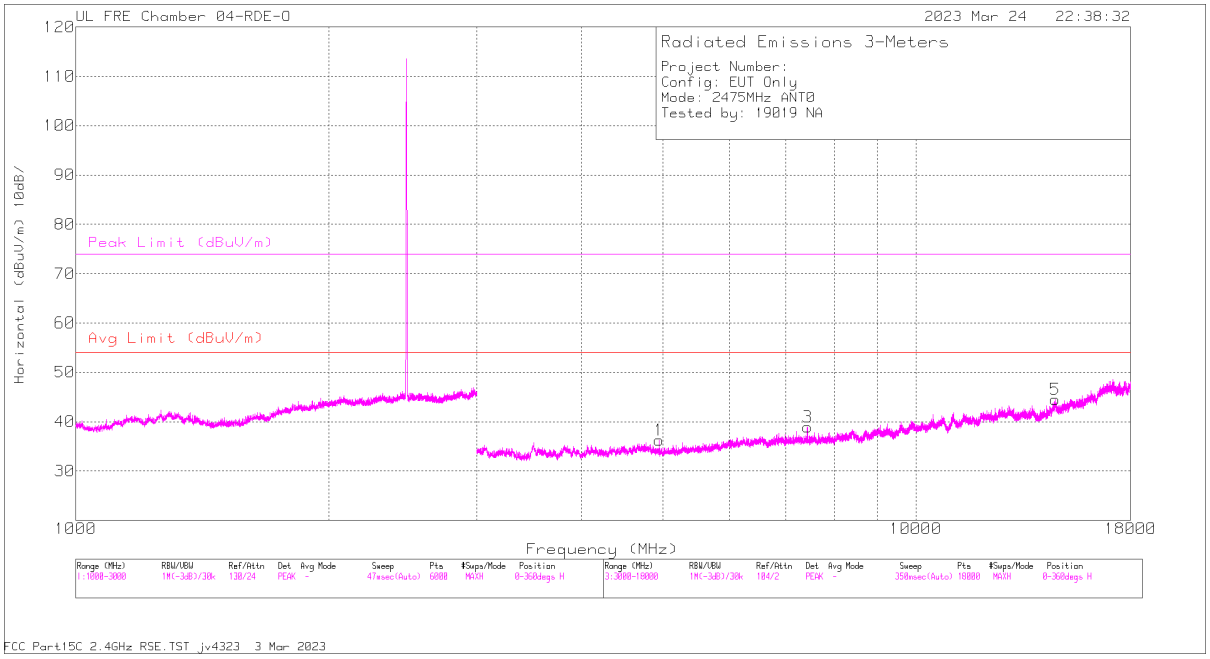
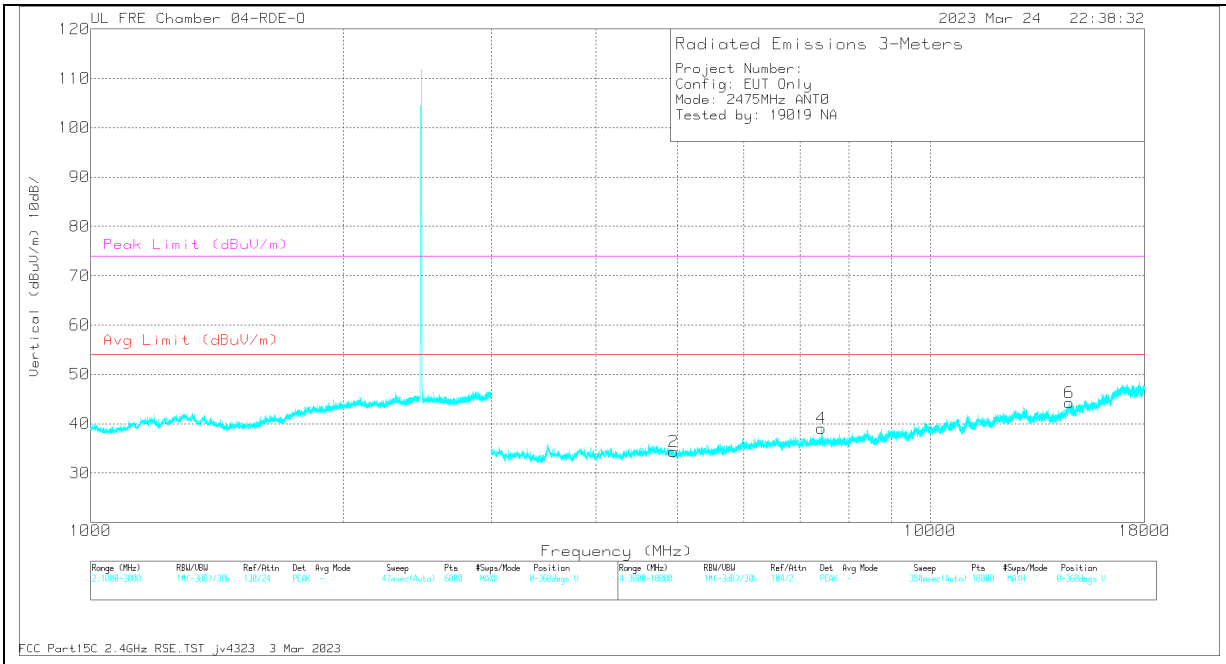
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

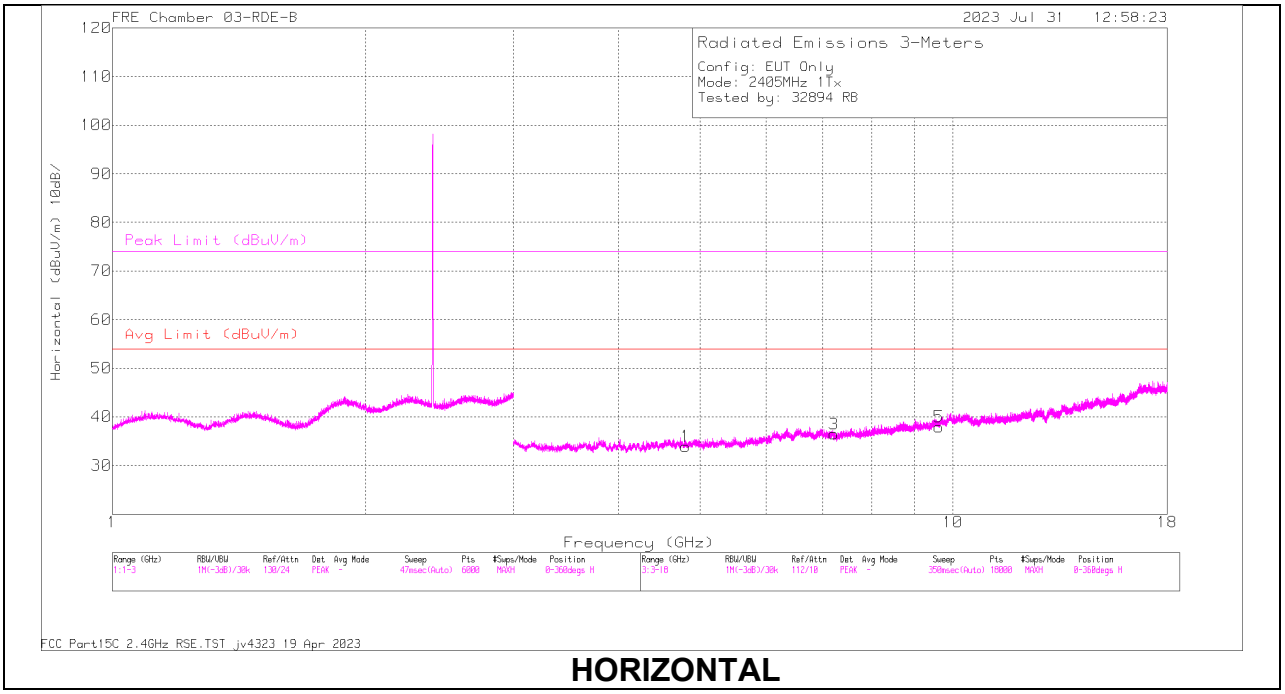
RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4950.181	54.87	PKFH	34.1	-45.68	43.29	-	-	74	-30.71	316	130	H
	* 4949.504	40.64	VA1T	34.1	-45.65	29.09	54	-24.91	74	-44.91	316	130	H
3	* 7427.555	51.73	PKFH	36	-42.36	45.37	-	-	74	-28.63	104	304	H
	* 7426.253	38.06	VA1T	36	-42.36	31.7	54	-22.3	74	-42.3	104	304	H
2	* 4950.016	54.67	PKFH	34.1	-45.67	43.1	-	-	74	-30.9	133	152	V
	* 4948.932	41.05	VA1T	34.1	-45.62	29.53	54	-24.47	74	-44.47	133	152	V
4	* 7424.778	50.99	PKFH	36	-42.35	44.64	-	-	74	-29.36	143	334	V
	* 7422.749	37.92	VA1T	36	-42.35	31.57	54	-22.43	74	-42.43	143	334	V
5	14639.416	50.82	PKFH	39.7	-39.22	51.3	-	-	74	-22.7	161	247	H
6	14642.573	50.97	PKFH	39.7	-39.27	51.4	-	-	74	-22.6	52	152	V

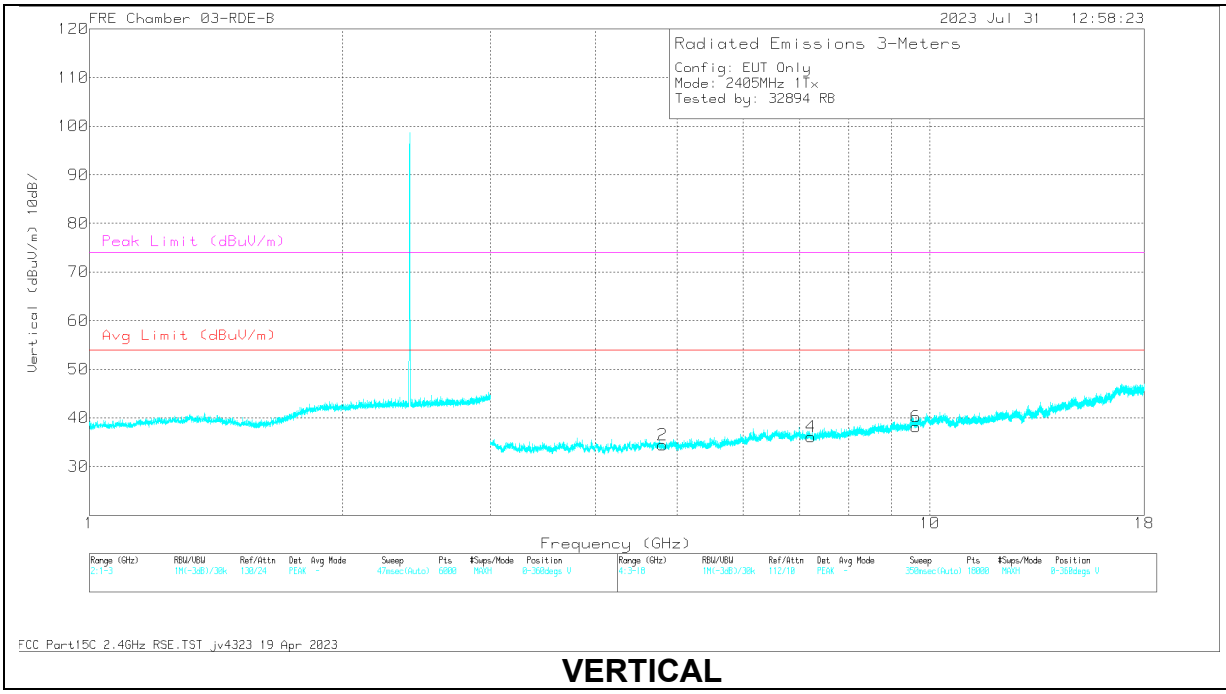
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.4. ANT4, 802.15.4 LOW POWER, HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.810178	58	PKFH	34.2	-49.02	43.18	-	-	74	-30.82	345	216	H
	* 4.80871	44.66	VA1T	34.2	-49	29.86	54	-24.14	-	-	345	216	H
2	* 4.812293	58.06	PKFH	34.2	-49.06	43.2	-	-	74	-30.8	65	275	V
	* 4.812133	44.65	VA1T	34.2	-49.03	29.82	54	-24.18	-	-	65	275	V
3	7.213368	42.98	VA1T	35.8	-47.17	31.61	-	-	-	-	8	239	H
	7.214163	56.55	PKFH	35.8	-47.28	45.07	-	-	74	-28.93	8	239	H
4	7.216621	43	VA1T	35.8	-47.3	31.5	-	-	-	-	9	395	V
	7.218077	56.29	PKFH	35.8	-47.31	44.78	-	-	74	-29.22	9	395	V
5	9.618381	56.45	PKFH	37.1	-46.76	46.79	-	-	74	-27.21	101	275	H
	9.618424	43.24	VA1T	37.1	-46.76	33.58	-	-	-	-	101	275	H
6	9.618788	57.43	PKFH	37.1	-46.72	47.81	-	-	74	-26.19	78	186	V
	9.619153	43.26	VA1T	37.1	-46.72	33.64	-	-	-	-	78	186	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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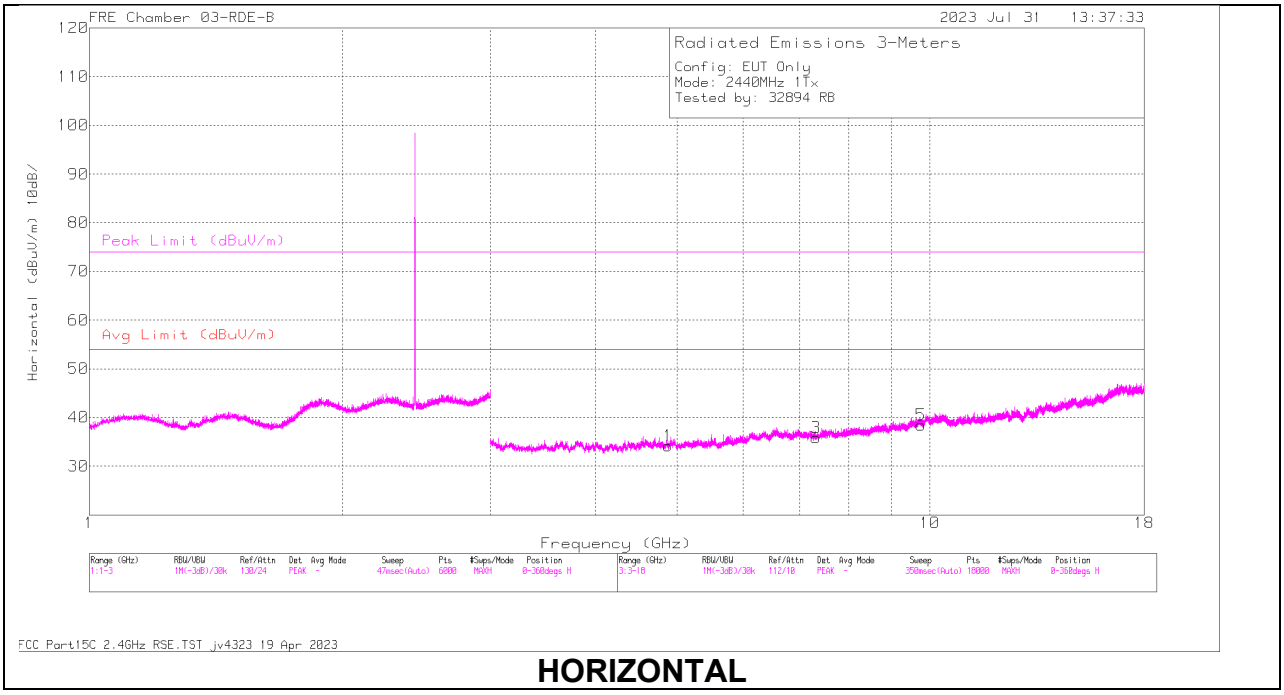
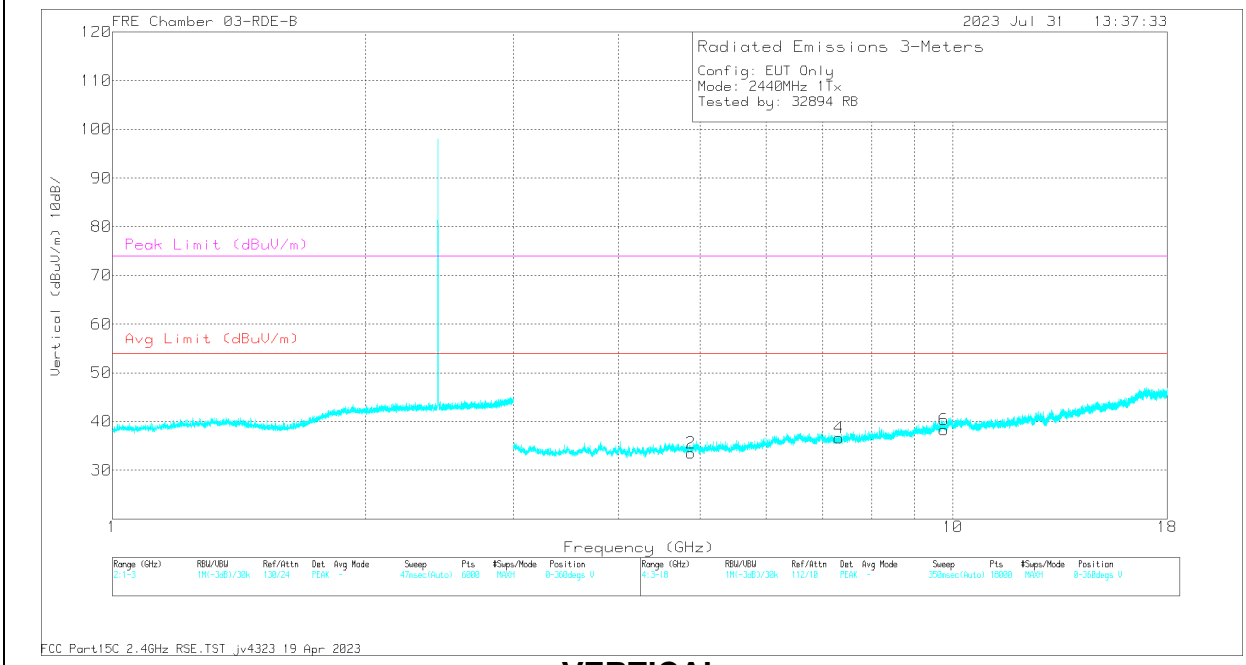
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881425	57.78	PKFH	34.2	-48.9	43.08	-	-	74	-30.92	348	279	H
	* 4.87876	44.35	VA1T	34.2	-48.98	29.57	54	-24.43	-	-	348	279	H
3	* 7.323783	57.56	PKFH	35.8	-47.7	45.66	-	-	74	-28.34	308	313	H
	* 7.321468	43.41	VA1T	35.8	-47.71	31.5	54	-22.5	-	-	308	313	H
2	* 4.879037	58.6	PKFH	34.2	-49	43.8	-	-	74	-30.2	76	275	V
	* 4.878922	44.34	VA1T	34.2	-48.99	29.55	54	-24.45	-	-	76	275	V
4	* 7.320712	57.08	PKFH	35.8	-47.74	45.14	-	-	74	-28.86	324	213	V
	* 7.320411	43.37	VA1T	35.8	-47.68	31.49	54	-22.51	-	-	324	213	V
5	9.758825	58.77	PKFH	37.3	-47.68	48.39	-	-	74	-25.61	11	202	H
	9.758201	44.35	VA1T	37.3	-47.62	34.03	-	-	-	-	11	202	H
6	9.758677	44.5	VA1T	37.3	-47.67	34.13	-	-	-	-	320	225	V
	9.75961	57.38	PKFH	37.3	-47.7	46.98	-	-	74	-27.02	320	225	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
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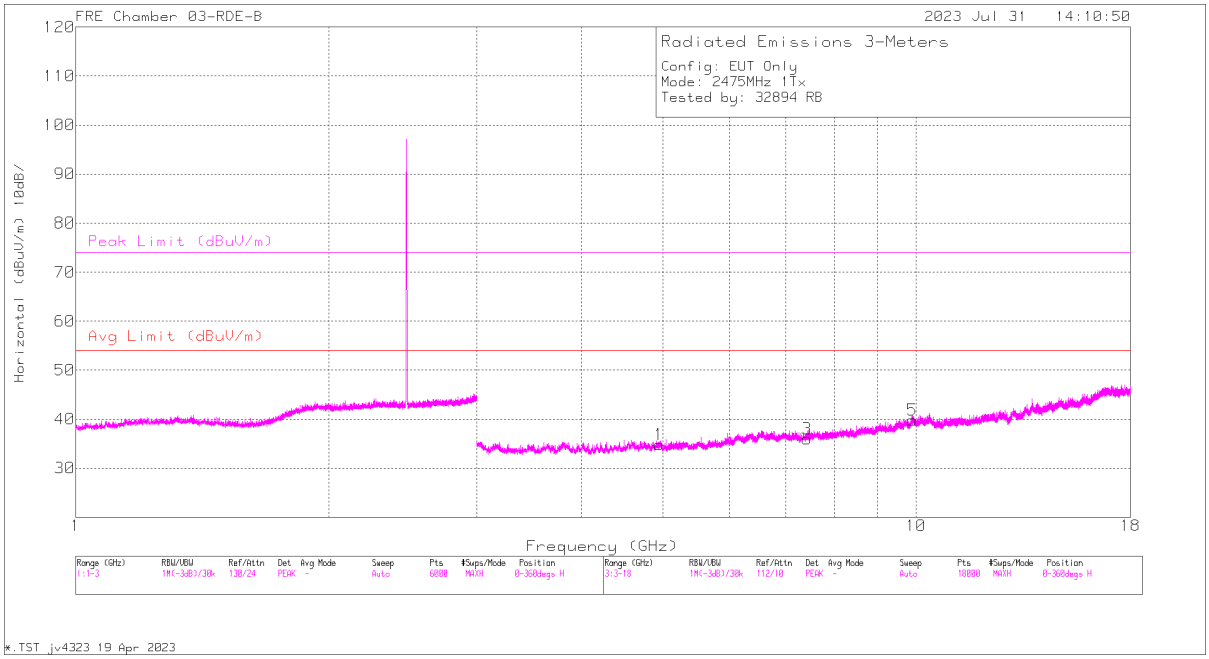
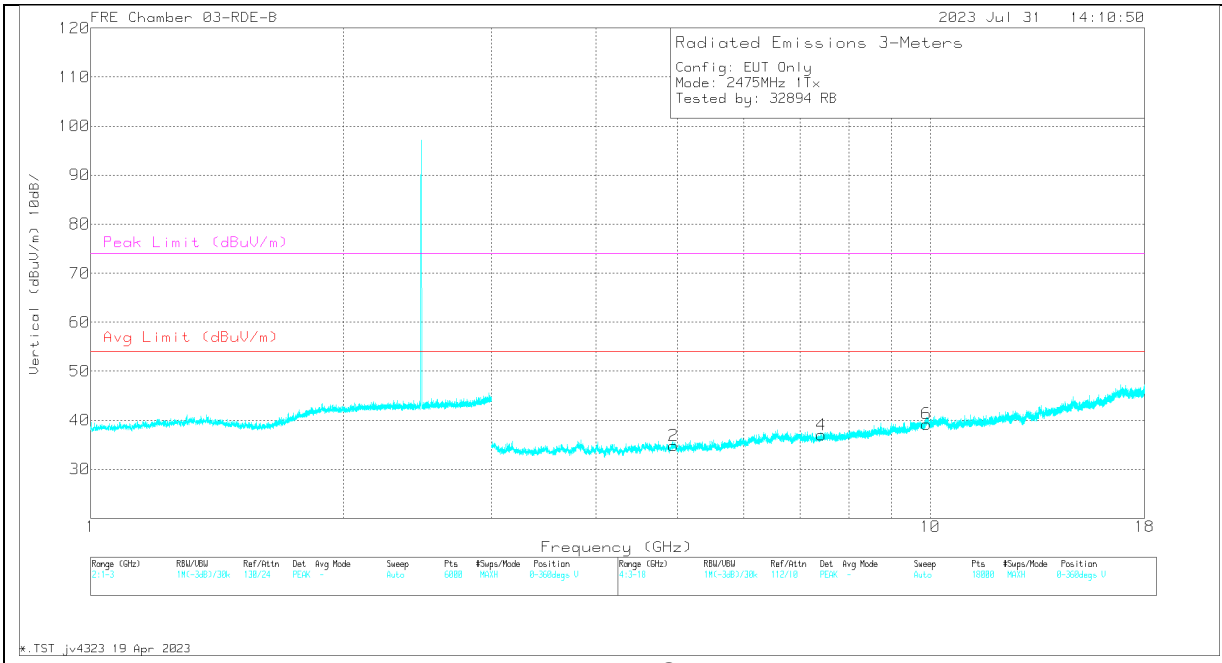
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.952105	58.81	PKFH	34.2	-49.1	43.91	-	-	74	-30.09	199	323	H
	* 4.949965	45.01	VA1T	34.2	-49.1	30.11	54	-23.89	-	-	199	323	H
3	* 7.428156	56.74	PKFH	35.9	-47.42	45.22	-	-	74	-28.78	36	147	H
	* 7.425437	43.31	VA1T	35.9	-47.36	31.85	54	-22.15	-	-	36	147	H
2	* 4.950272	58.95	PKFH	34.2	-49.1	44.05	-	-	74	-29.95	184	176	V
	* 4.949385	45	VA1T	34.2	-49.16	30.04	54	-23.96	-	-	184	176	V
4	* 7.427567	56.8	PKFH	35.9	-47.4	45.3	-	-	74	-28.7	273	319	V
	* 7.424693	43.35	VA1T	35.9	-47.37	31.88	54	-22.12	-	-	273	319	V
5	9.898317	58.31	PKFH	37.4	-47.77	47.94	-	-	74	-26.06	287	240	H
	9.899337	45.07	VA1T	37.4	-47.7	34.77	-	-	-	-	287	240	H
6	9.899952	45.02	VA1T	37.4	-47.7	34.72	-	-	-	-	252	117	V
	9.902596	57.94	PKFH	37.5	-47.64	47.8	-	-	74	-26.2	252	117	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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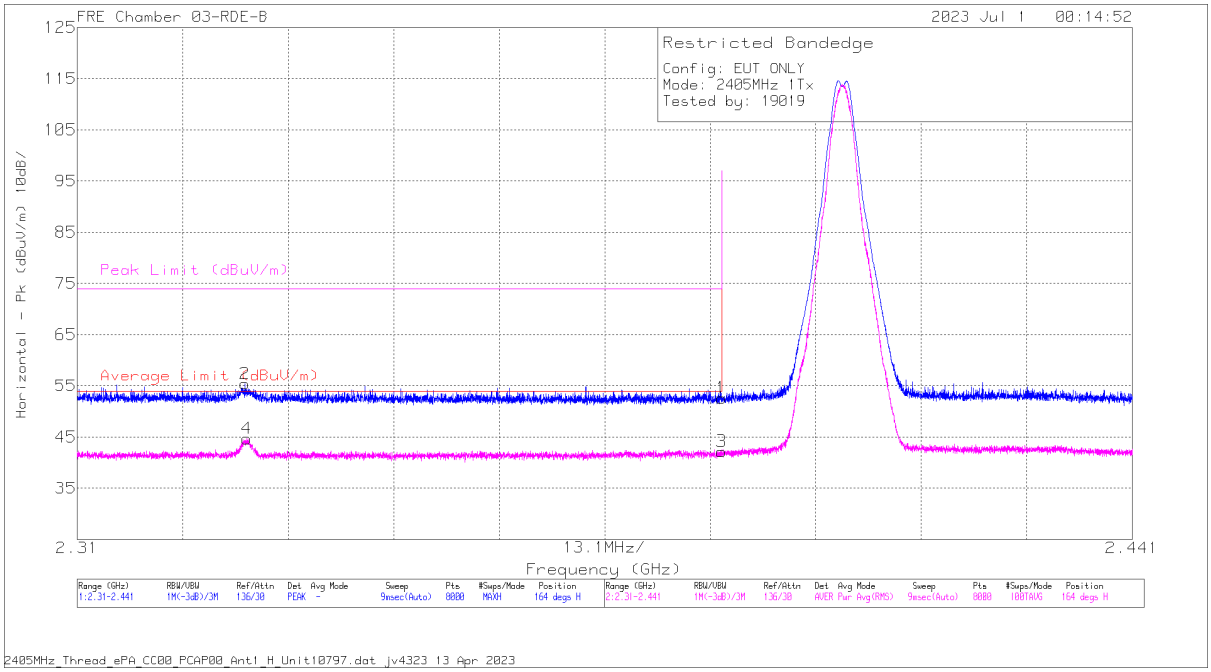
10.1.5. ANT3, 802.15.4 HIGH POWER BANDEDGE

Low Channel

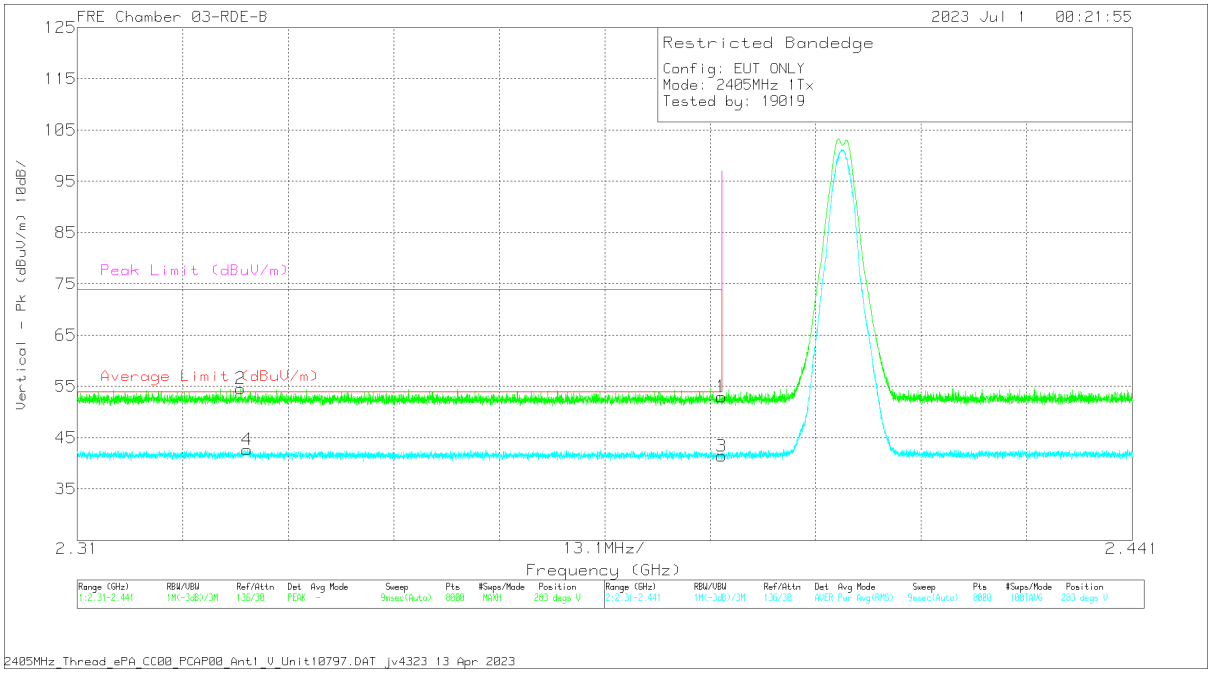
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.6	Pk	32.2	-41.2	52.6	-	-	74	-21.4	164	101	H
2	* 2.330799	64.48	Pk	32.1	-41.2	55.38	-	-	74	-18.62	164	101	H
3	* 2.39	51.16	RMS	32.2	-41.2	42.16	54	-11.84	-	-	164	101	H
4	* 2.331044	53.78	RMS	32.1	-41.2	44.68	54	-9.32	-	-	164	101	H

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

VERTICAL RESULT

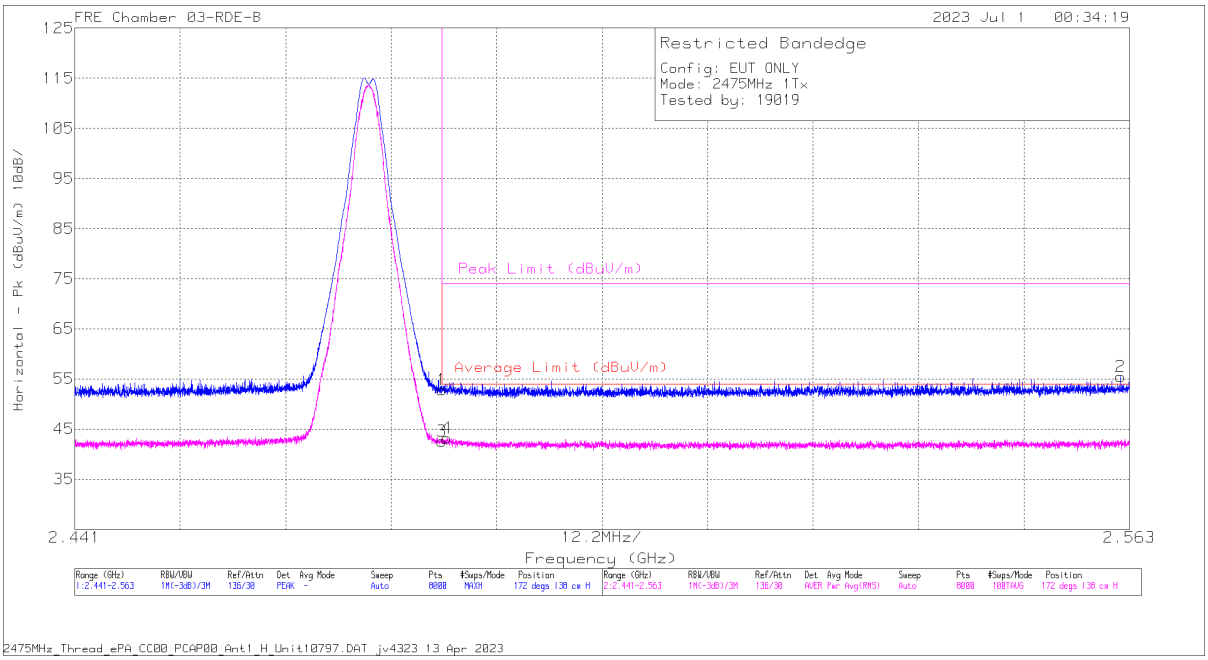


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.97	Pk	32.2	-41.2	52.97	-	-	74	-21.03	283	283	V
2	* 2.330275	63.65	Pk	32.1	-41.2	54.55	-	-	74	-19.45	283	283	V
3	* 2.39	50.39	RMS	32.2	-41.2	41.39	54	-12.61	-	-	283	283	V
4	* 2.331094	51.77	RMS	32.1	-41.21	42.66	54	-11.34	-	-	283	283	V

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

High CHANNEL

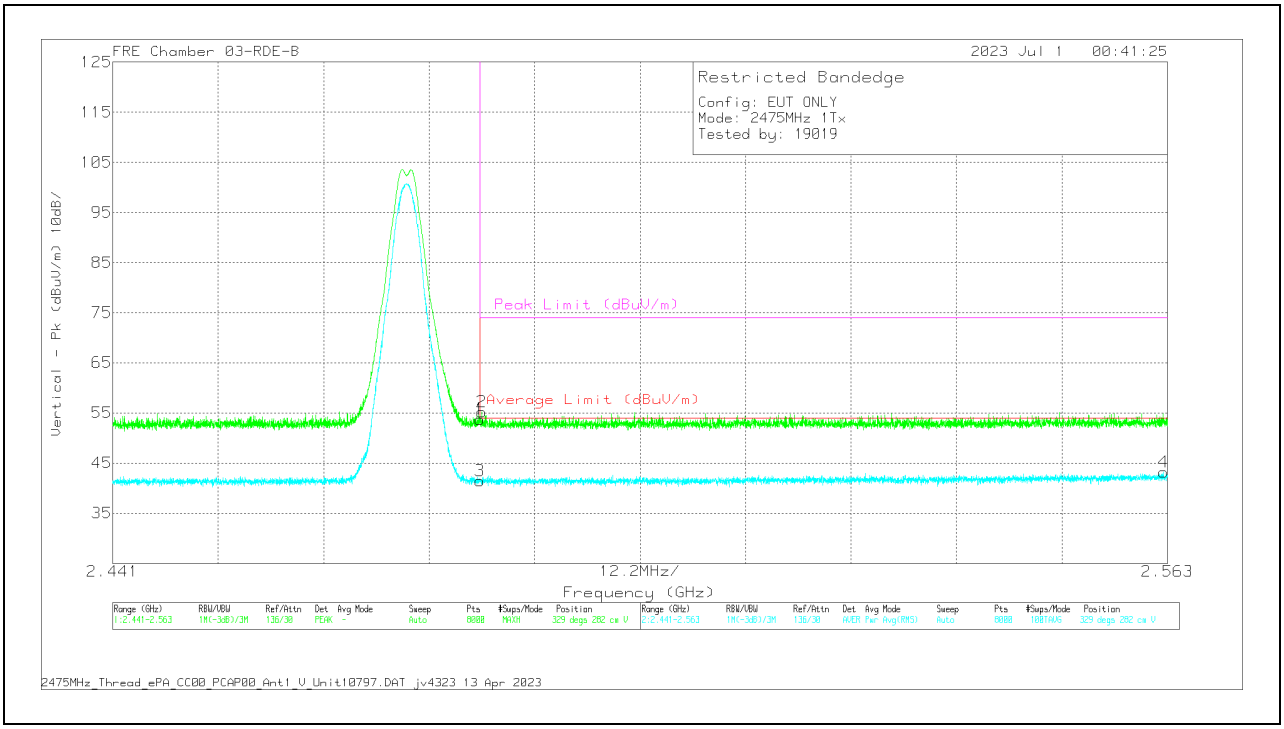
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.79	Pk	32.2	-41.15	52.84	-	-	74	-21.16	172	138	H
3	* 2.4835	51.51	RMS	32.2	-41.15	42.56	54	-11.44	-	-	172	138	H
4	* 2.484056	52.11	RMS	32.2	-41.11	43.2	54	-10.8	-	-	172	138	H
2	2.562009	63.98	Pk	32.3	-40.8	55.48	-	-	74	-18.52	172	138	H

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

VERTICAL RESULT



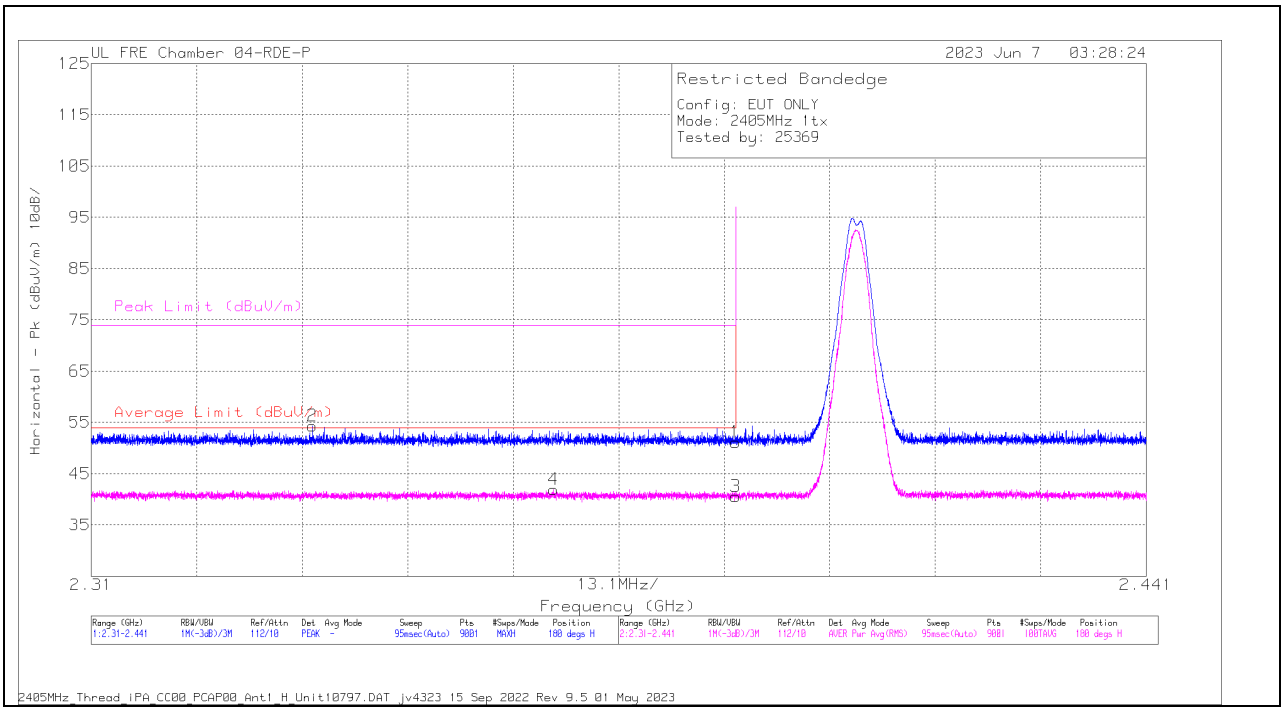
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230300 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	62.71	Pk	32.2	-41.15	53.76	-	-	74	-20.24	329	282	V
2	* 2.48369	64.16	Pk	32.2	-41.13	55.23	-	-	74	-18.77	329	282	V
3	* 2.4835	50.43	RMS	32.2	-41.15	41.48	54	-12.52	-	-	329	282	V
4	2.562574	51.69	RMS	32.3	-40.8	43.19	54	-10.81	-	-	329	282	V

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

10.1.6. ANT3, 802.15.4 LOW POWER BANDEDGE

LOW CHANNEL

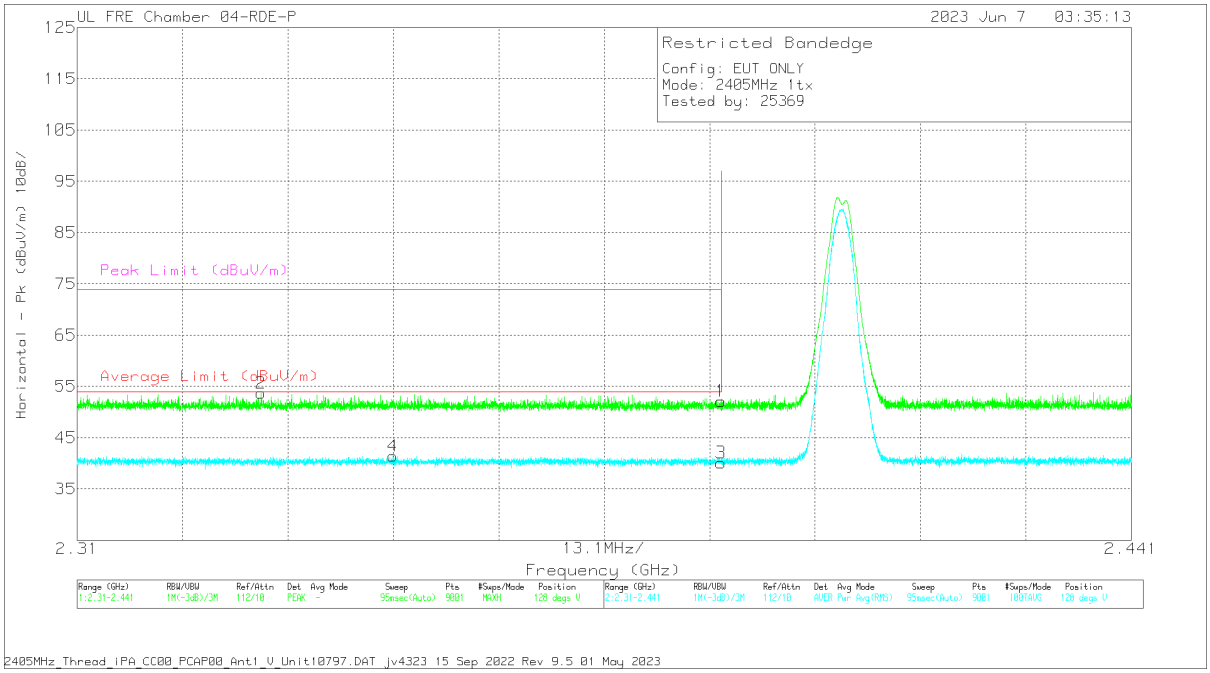
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.12	Pk	31.7	-19.7	51.12	-	-	74	-22.88	180	202	H
2	* 2.337453	42.14	Pk	31.8	-19.6	54.34	-	-	74	-19.66	180	202	H
3	* 2.39	28.56	RMS	31.7	-19.7	40.56	54	-13.44	-	-	180	202	H
4	* 2.367409	29.83	RMS	31.7	-19.6	41.93	54	-12.07	-	-	180	202	H

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

VERTICAL RESULT

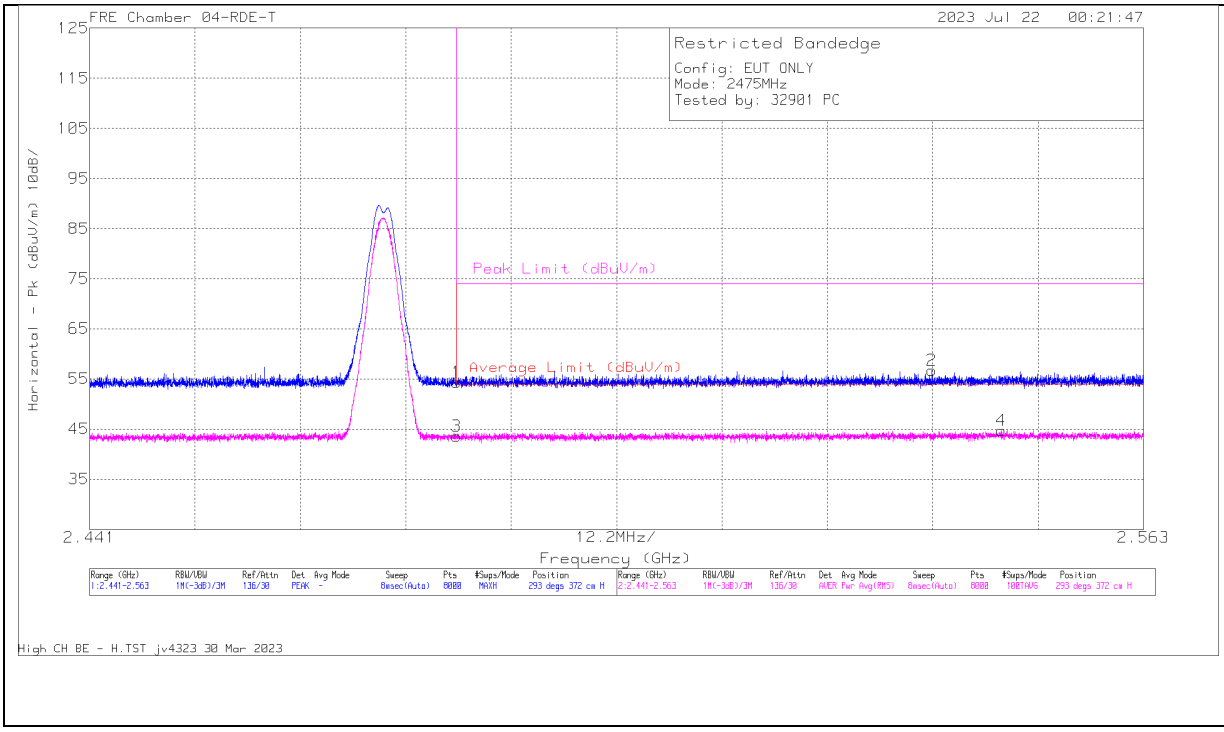


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84797 ACF (dB) - 3mH	Cbl/Amp (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.1	Pk	31.7	-19.7	52.1	-	-	74	-21.9	128	345	V
2	* 2.332824	41.48	Pk	31.7	-19.5	53.68	-	-	74	-20.32	128	345	V
3	* 2.39	28.07	RMS	31.7	-19.7	40.07	54	-13.93	-	-	128	345	V
4	* 2.349258	29.21	RMS	31.8	-19.6	41.41	54	-12.59	-	-	128	345	V

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

HIGH CHANNEL

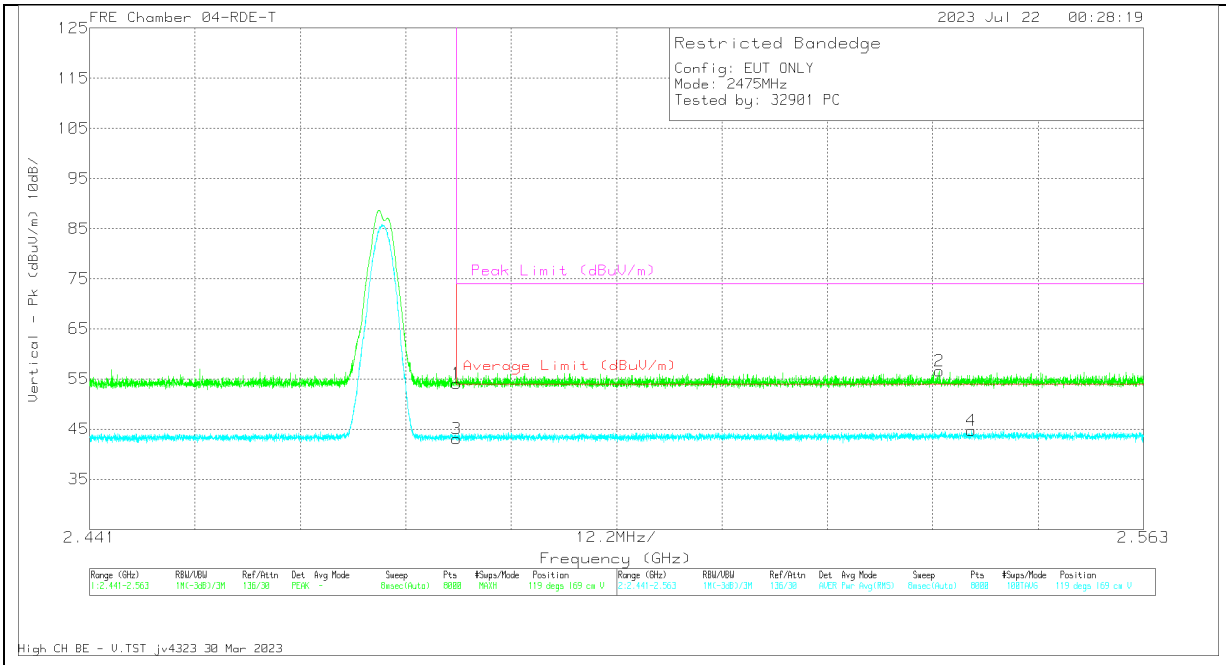
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.94	Pk	32.2	0	-37.81	54.33	-	-	74	-19.67	293	372	H
3	* 2.4835	49.15	RMS	32.2	0	-37.81	43.54	54	-10.46	-	-	293	372	H
2	2.538521	62.14	Pk	32.3	0	-37.75	56.69	-	-	74	-17.31	293	372	H
4	2.546574	50.2	RMS	32.3	0	-37.73	44.77	54	-9.23	-	-	293	372	H

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

VERTICAL RESULT

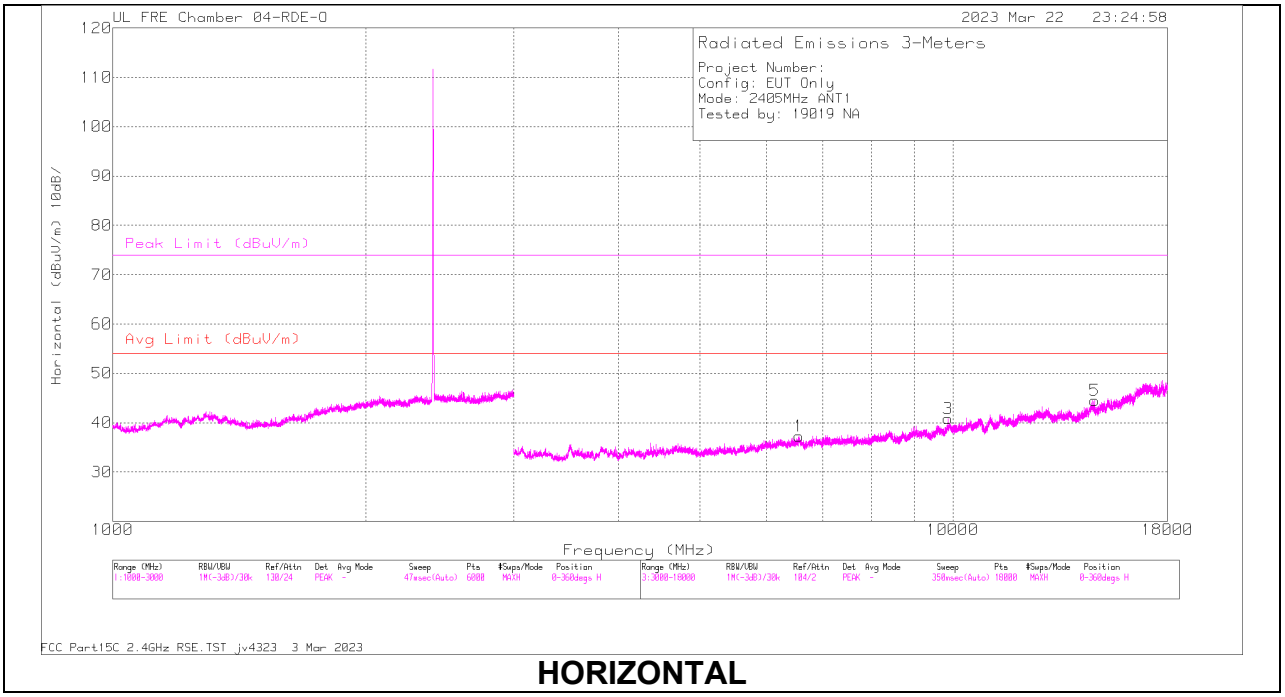


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.66	Pk	32.2	0	-37.81	54.05	-	-	74	-19.95	119	169	V
3	* 2.4835	48.74	RMS	32.2	0	-37.81	43.13	54	-10.87	-	-	119	169	V
2	2.539345	62.07	Pk	32.3	0	-37.75	56.62	-	-	74	-17.38	119	169	V
4	2.543082	50.22	RMS	32.3	0	-37.78	44.74	54	-9.26	-	-	119	169	V

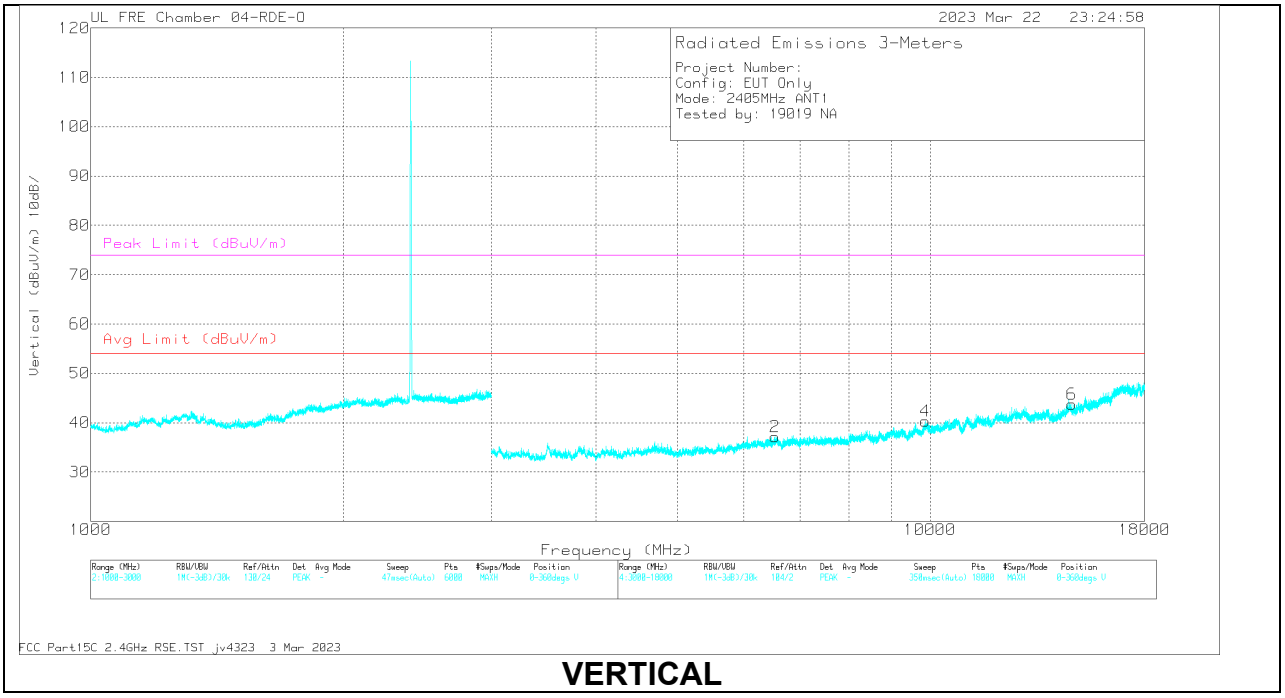
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

10.1.7. ANT3, 802.15.4 HIGH POWER, HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_A CF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	6535.952	51.47	PKFH	35.8	-42.63	44.64	74	-29.36	160	106	V
1	6559.792	51.26	PKFH	36	-42.39	44.87	74	-29.13	65	265	H
4	9865.988	52.28	PKFH	37.1	-41.19	48.19	74	-25.81	126	140	V
3	9867.075	52.13	PKFH	37.1	-41.16	48.07	74	-25.93	40	400	H
6	14737.691	49.65	PKFH	39.8	-40.18	49.27	74	-24.73	99	359	V
5	14738.943	49.86	PKFH	39.8	-40.15	49.51	74	-24.49	130	326	H

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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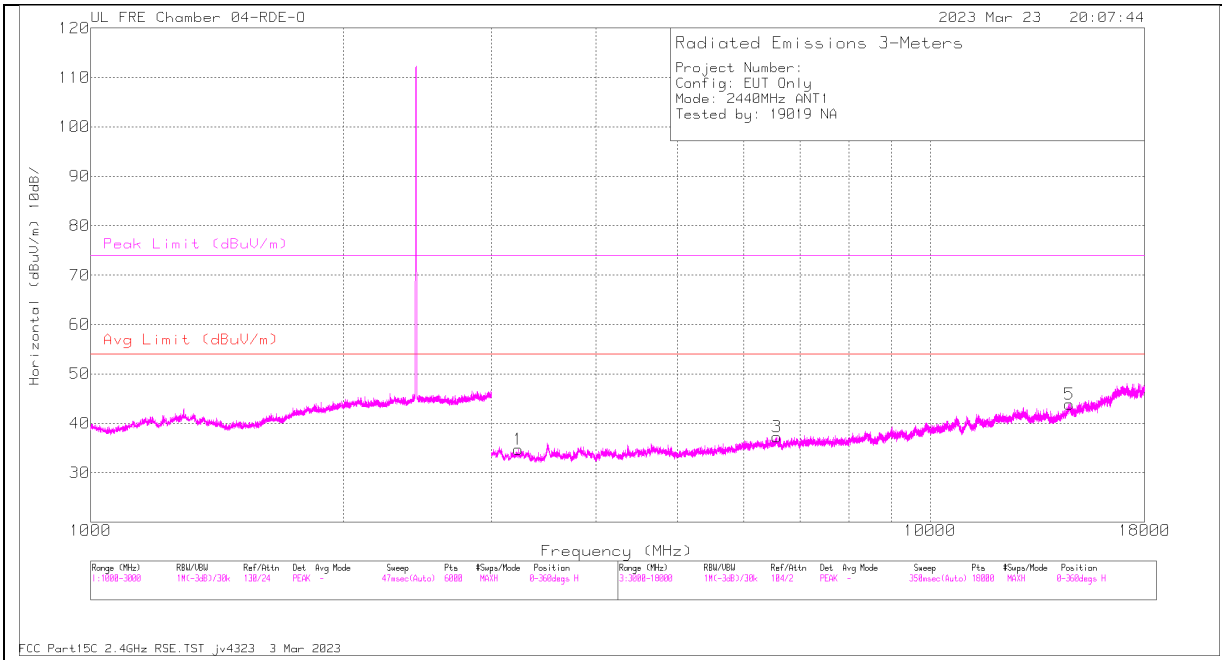
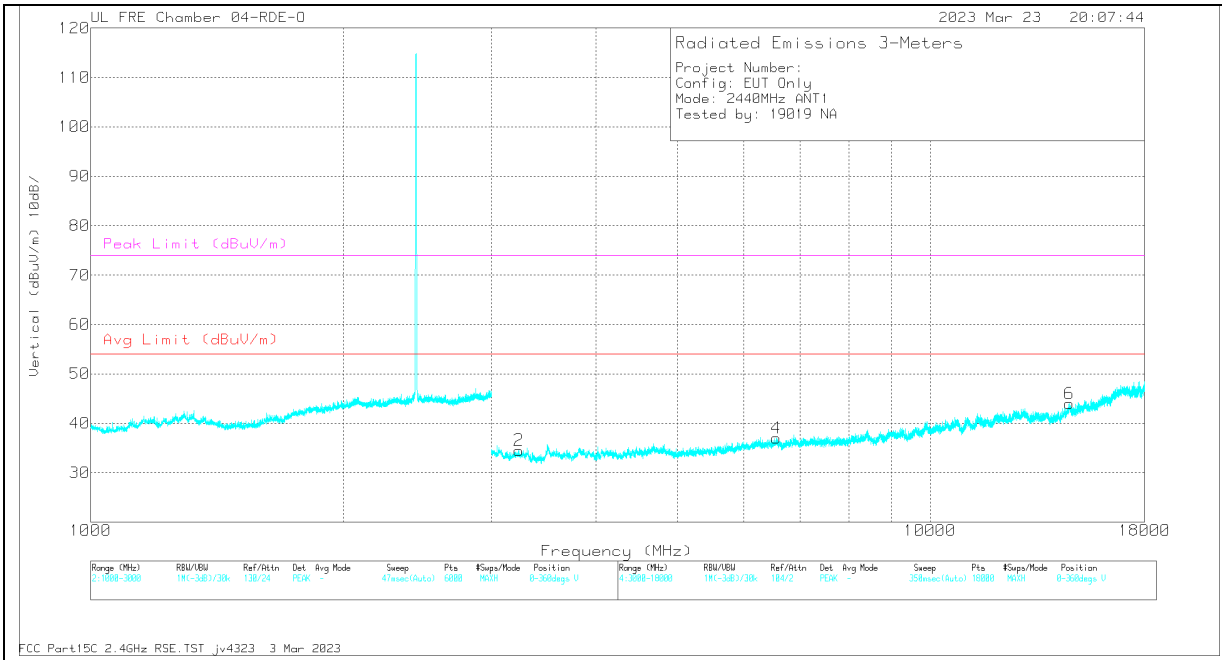
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3232.112	54.21	PKFH	33	-44.77	42.44	74	-31.56	132	274	H
2	3237.03	54.37	PKFH	33	-44.84	42.53	74	-31.47	324	155	V
4	6554.317	51.47	PKFH	35.8	-42.39	44.88	74	-29.12	135	176	V
3	6568.69	51.52	PKFH	36	-42.61	44.91	74	-29.09	3	226	H
6	14640.545	51.77	PKFH	39.7	-39.24	52.23	74	-21.77	73	250	V
5	14646.722	51.01	PKFH	39.7	-39.31	51.4	74	-22.6	114	259	H

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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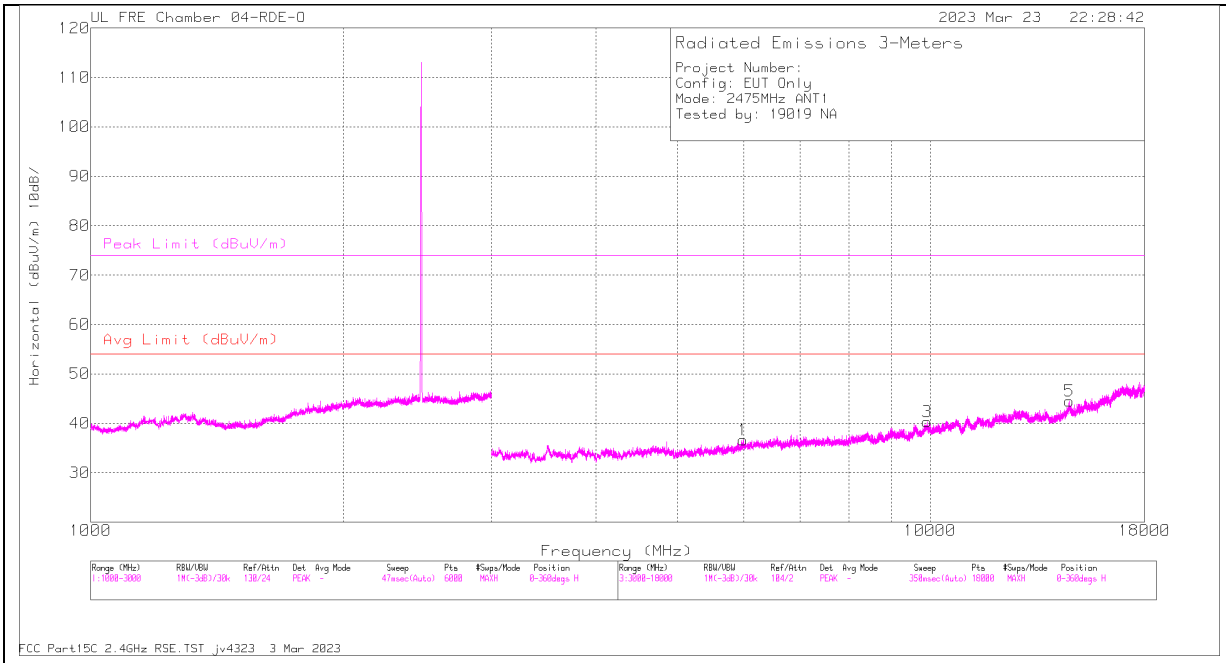
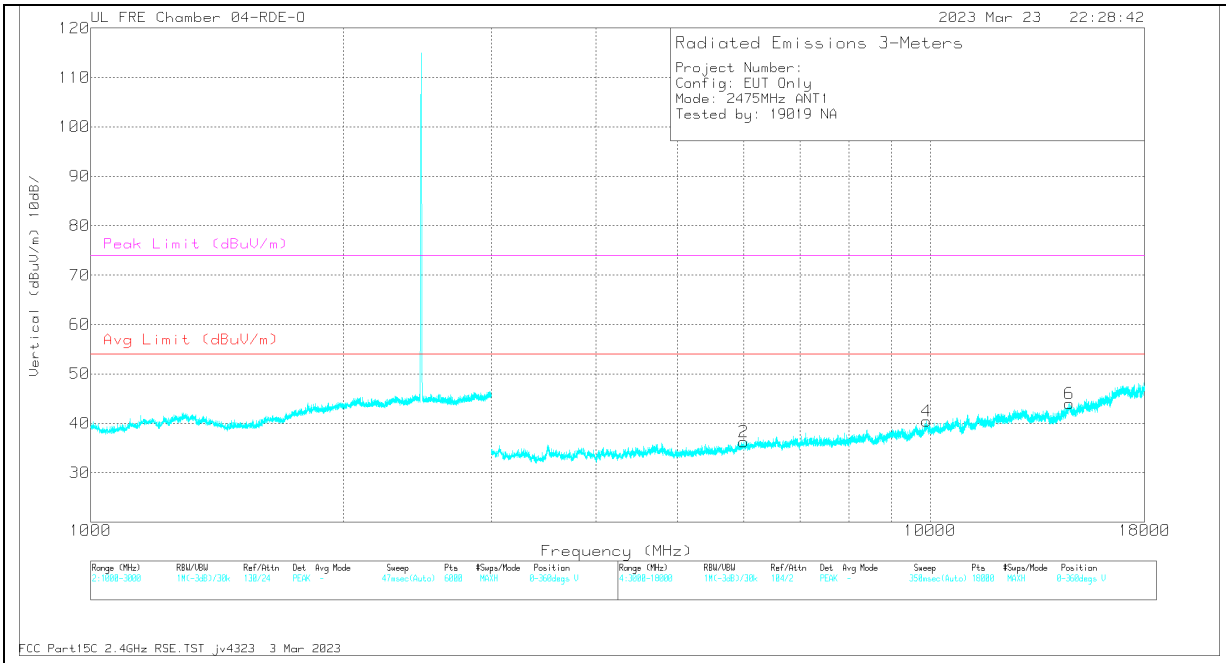
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80404_ACF(dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5980.465	52.45	PKFH	35.4	-43.2	44.65	74	-29.35	242	162	H
2	5992.333	52.57	PKFH	35.3	-43.19	44.68	74	-29.32	195	171	V
4	9894.307	51.73	PKFH	37.3	-41.36	47.67	74	-26.33	0	166	V
3	9925.987	52.83	PKFH	37.1	-41	48.93	74	-25.07	186	156	H
5	14644.747	51.39	PKFH	39.7	-39.29	51.8	74	-22.2	166	125	H
6	14644.895	51.64	PKFH	39.7	-39.29	52.05	74	-21.95	27	195	V

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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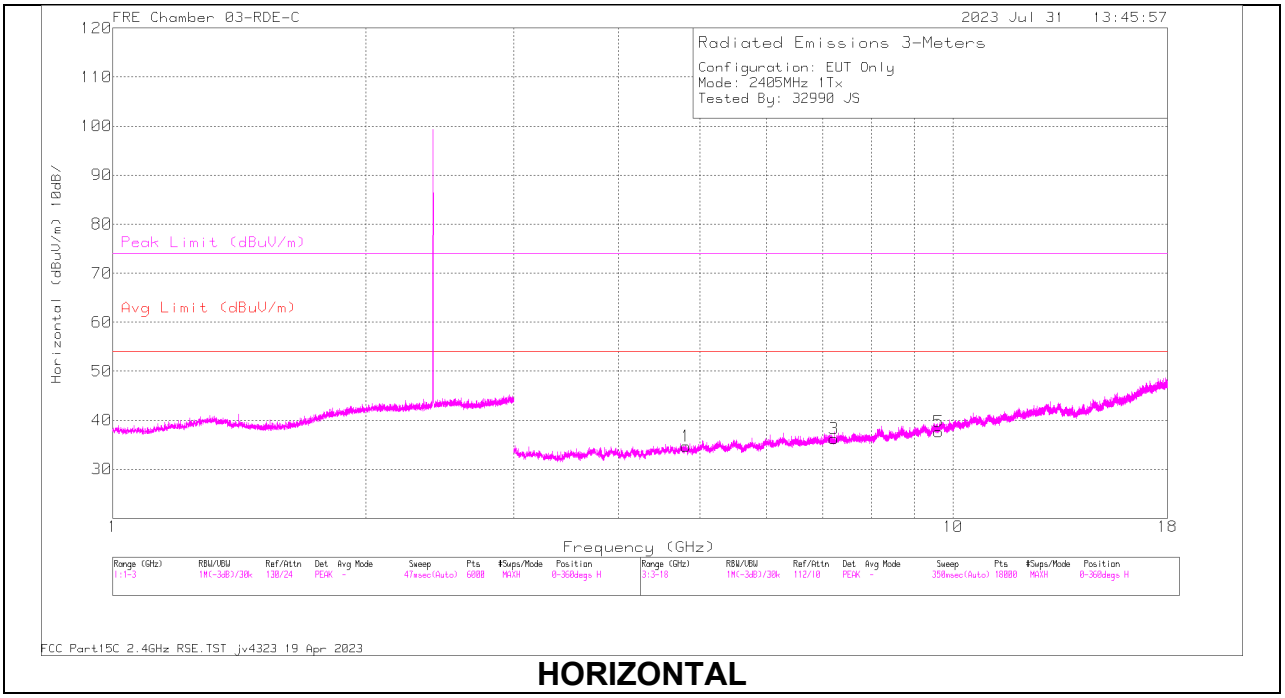
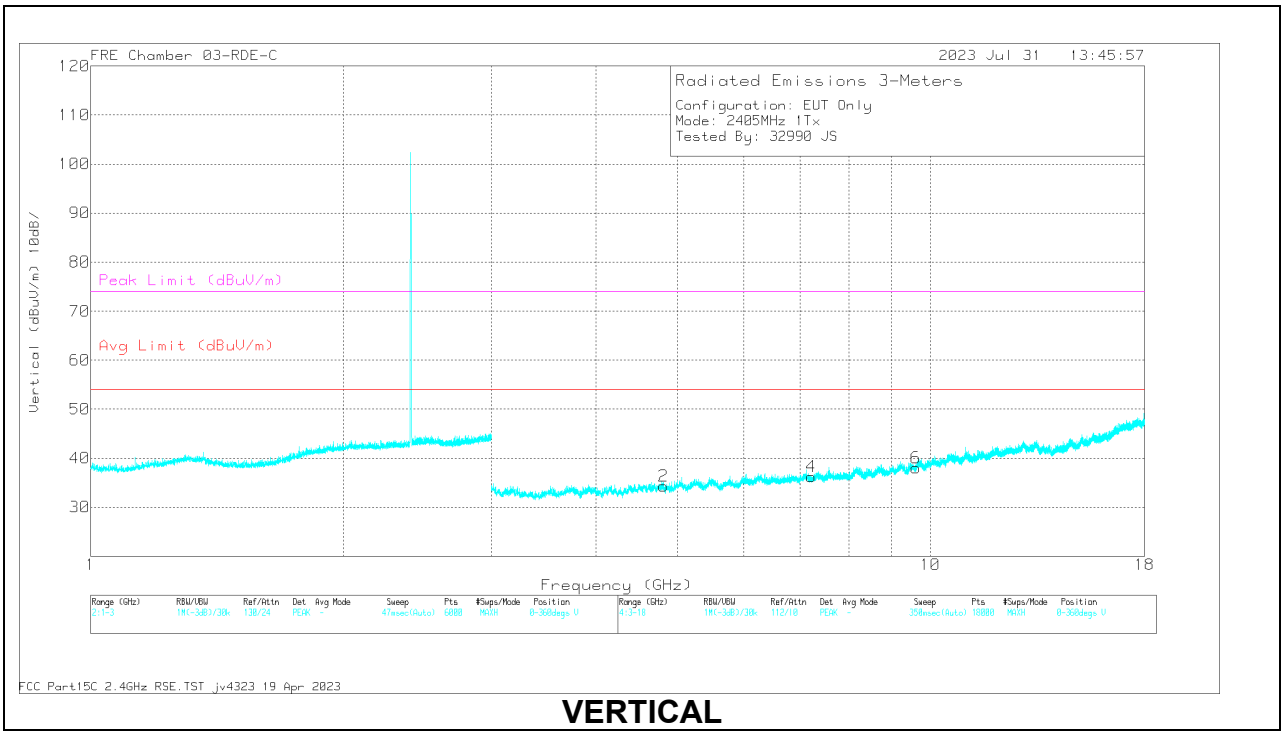
10.1.8. ANT3, 802.15.4 LOW POWER, HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226672 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.809174	57.06	PKFH	34	-47.5	43.56	-	-	74	-30.44	283	358	H
	* 4.809738	43.2	VA1T	34	-47.5	29.7	54	-24.3	-	-	283	358	H
2	* 4.811408	56.92	PKFH	34	-47.5	43.42	-	-	74	-30.58	302	338	V
	* 4.810211	43.25	VA1T	34	-47.5	29.75	54	-24.25	-	-	302	338	V
3	7.21271	41.84	VA1T	35.7	-46.4	31.14	-	-	-	-	197	269	H
	7.21542	54.59	PKFH	35.7	-46.36	43.93	-	-	74	-30.07	197	269	H
4	7.222536	41.85	VA1T	35.7	-46.29	31.26	-	-	-	-	129	299	V
	7.222899	55.65	PKFH	35.7	-46.22	45.13	-	-	74	-28.87	129	299	V
5	9.620248	55.68	PKFH	36.7	-45.8	46.58	-	-	74	-27.42	85	289	H
	9.621569	42.68	VA1T	36.7	-45.8	33.58	-	-	-	-	85	289	H
6	9.620572	56.56	PKFH	36.7	-45.8	47.46	-	-	74	-26.54	155	261	V
	9.620787	42.6	VA1T	36.7	-45.8	33.5	-	-	-	-	155	261	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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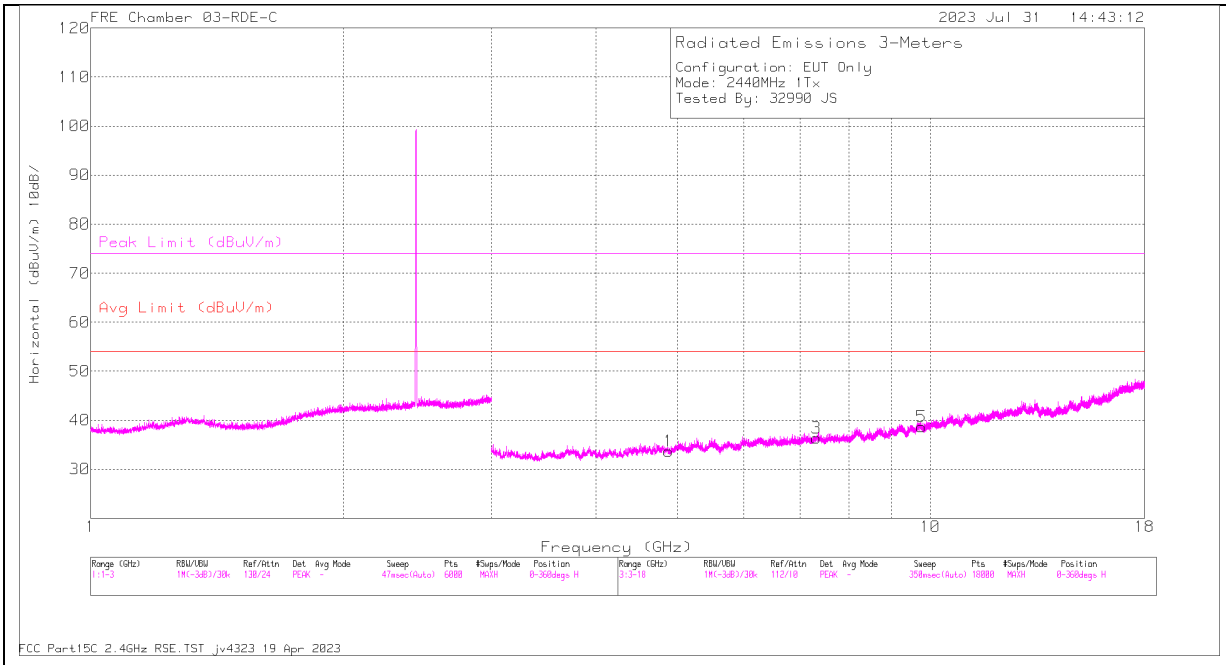
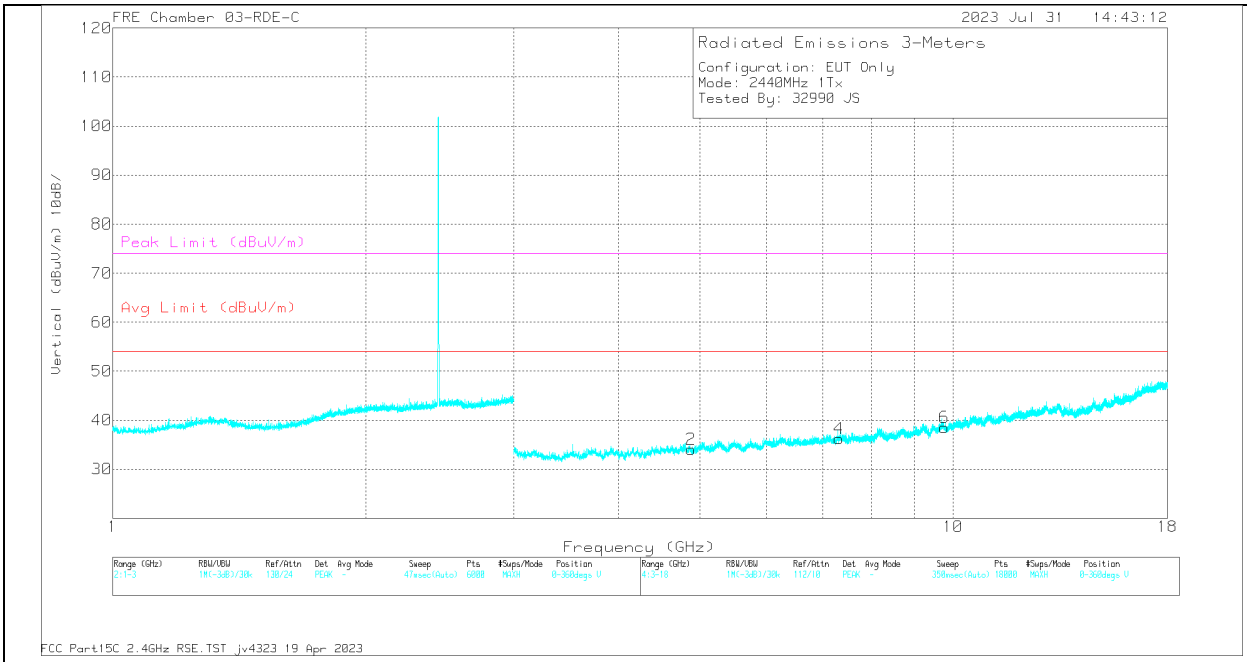
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226672 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.881331	55.8	PKFH	34	0	-47.57	42.23	-	-	74	-31.77	110	239	H
	* 4.880806	42.67	VA1T	34	0	-47.6	29.07	54	-24.93	-	-	110	239	H
3	* 7.323061	56.29	PKFH	35.7	0	-45.7	46.29	-	-	74	-27.71	90	390	H
	* 7.320488	41.83	VA1T	35.7	0	-45.7	31.83	54	-22.17	-	-	90	390	H
2	* 4.879228	56.44	PKFH	34	0	-47.52	42.92	-	-	74	-31.08	139	258	V
	* 4.878305	42.76	VA1T	34	0	-47.57	29.19	54	-24.81	-	-	139	258	V
4	* 7.32236	55.05	PKFH	35.7	0	-45.7	45.05	-	-	74	-28.95	318	103	V
	* 7.320374	41.82	VA1T	35.7	0	-45.7	31.82	54	-22.18	-	-	318	103	V
5	9.758591	42.46	VA1T	36.9	0	-45	34.36	-	-	-	-	352	353	H
	9.759187	55.53	PKFH	36.9	0	-44.98	47.45	-	-	74	-26.55	352	353	H
6	9.760445	42.45	VA1T	36.9	0	-44.86	34.49	-	-	-	-	283	191	V
	9.762463	55.68	PKFH	36.9	0	-44.8	47.78	-	-	74	-26.22	283	191	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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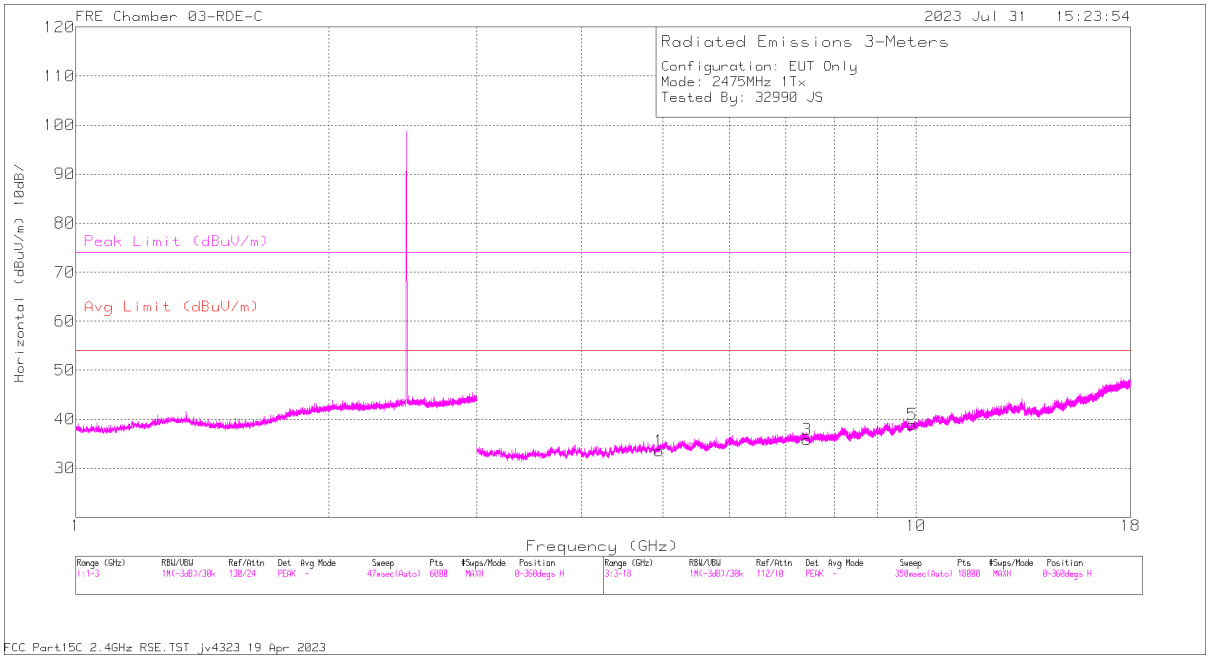
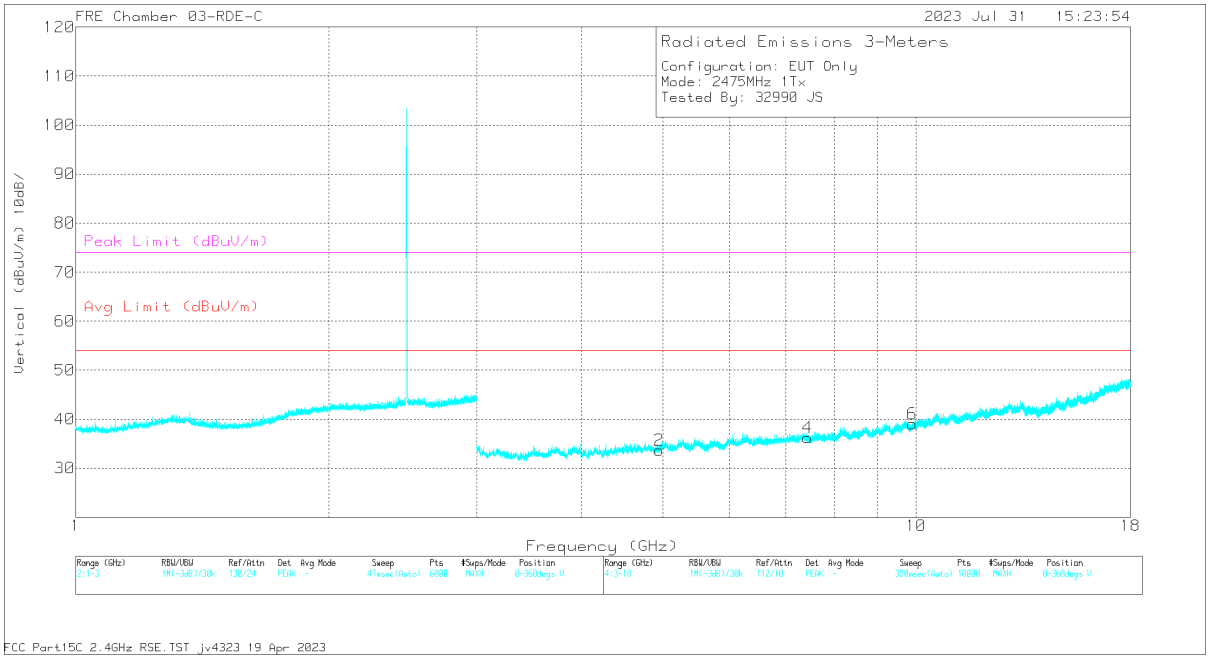
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226672 ACF (dB) 3mH	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.951688	56.58	PKFH	34	0	-47.5	43.08	-	-	74	-30.92	63	145	H
	* 4.949089	42.79	VA1T	34	0	-47.5	29.29	54	-24.71	-	-	63	145	H
3	* 7.425923	54.9	PKFH	35.7	0	-46.11	44.49	-	-	74	-29.51	178	179	H
	* 7.424199	41.94	VA1T	35.7	0	-46.12	31.52	54	-22.48	-	-	178	179	H
2	* 4.953413	56.09	PKFH	34.1	0	-47.46	42.73	-	-	74	-31.27	121	392	V
	* 4.95137	42.81	VA1T	34	0	-47.5	29.31	54	-24.69	-	-	121	392	V
4	* 7.425069	56.02	PKFH	35.7	0	-46.19	45.53	-	-	74	-28.47	47	133	V
	* 7.423705	41.94	VA1T	35.7	0	-46.1	31.54	54	-22.46	-	-	47	133	V
5	9.898931	42.33	VA1T	37	0	-45.4	33.93	-	-	-	-	349	312	H
	9.899688	55.73	PKFH	37	0	-45.4	47.33	-	-	74	-26.67	349	312	H
6	9.900707	55.89	PKFH	37	0	-45.47	47.42	-	-	74	-26.58	226	392	V
	9.901347	42.38	VA1T	37	0	-45.47	33.91	-	-	-	-	226	392	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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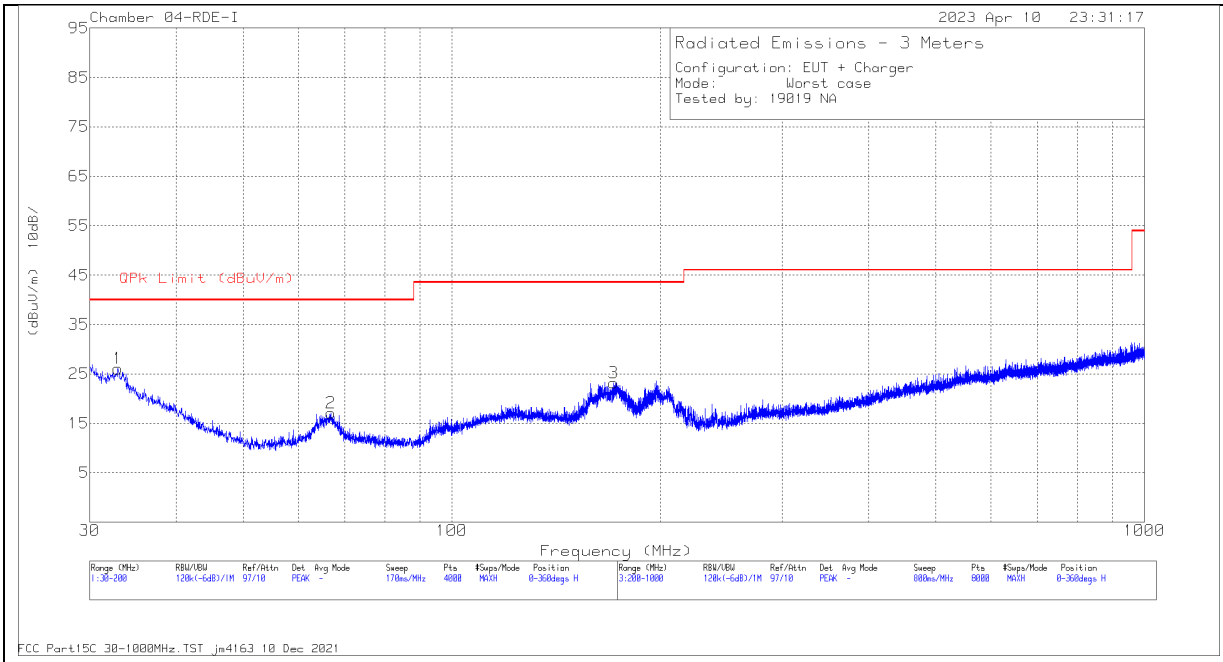
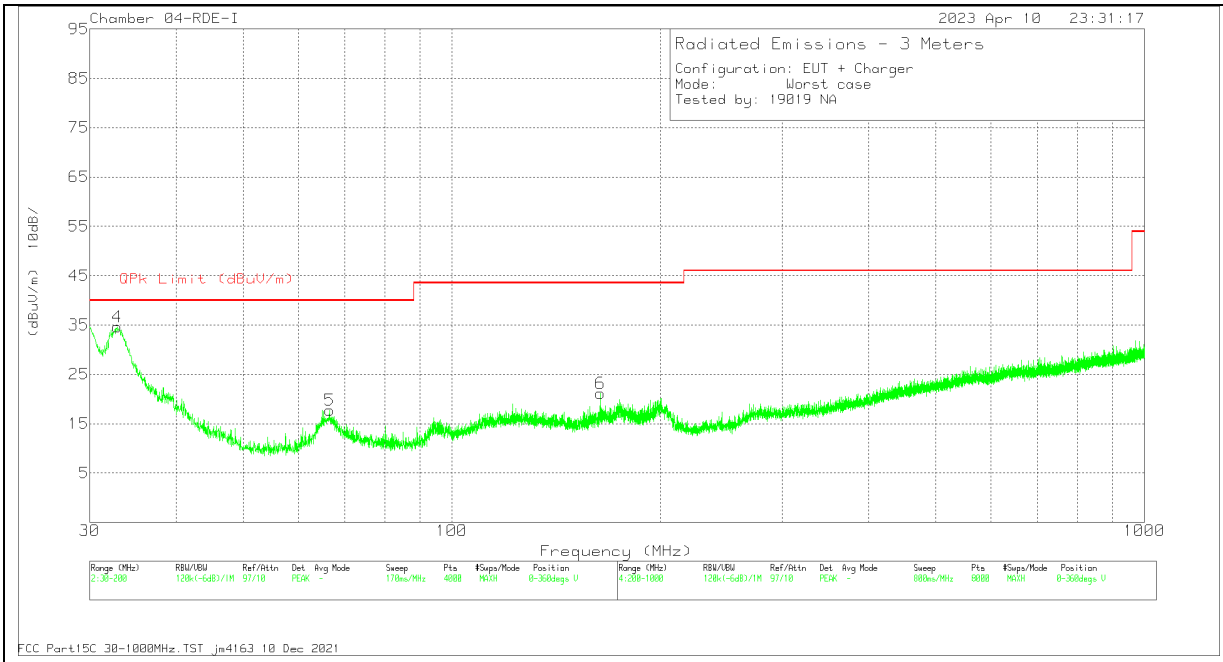
10.2. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80714 ACF (dB) - 10mH	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.9333	31.55	Pk	25.7	-31.2	26.05	40	-13.95	0-360	199	H
2	66.857	33.29	Pk	14.6	-30.8	17.09	40	-22.91	0-360	199	H
3	* 171.094	35.81	Pk	17.6	-30.2	23.21	43.52	-20.31	0-360	199	H
4	32.8482	40.1	Pk	25.7	-31.2	34.6	40	-5.4	0-360	100	V
4	33.0624	36.07	Qp	25.6	-31.2	30.47	40	-9.53	294	119	V
5	66.5595	34.03	Pk	14.6	-30.9	17.73	40	-22.27	0-360	100	V
6	* 163.782	33.46	Pk	17.9	-30.2	21.16	43.52	-22.36	0-360	100	V

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

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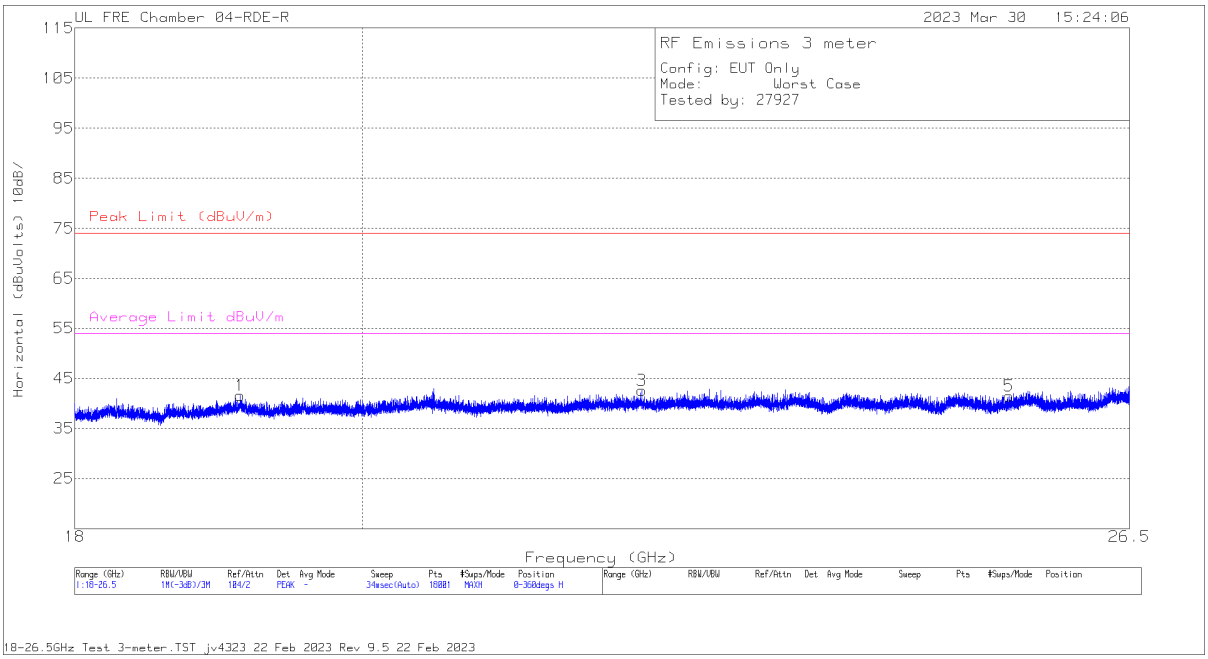
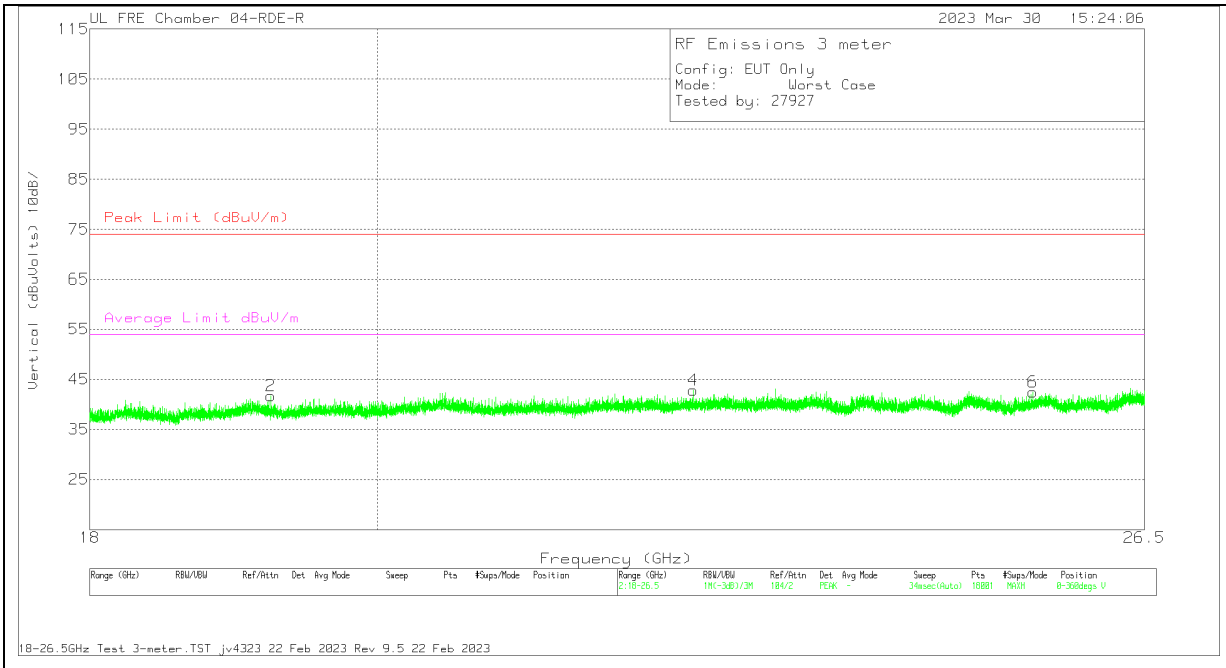
10.3. WORST CASE 18-26 GHZ

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



HORIZONTAL



VERTICAL

DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	172353 ACF (dB) - 3mH	171583 Amp Assembly (dB)	Cables (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	19.12611	57.51	PKFH	33.1	-65.6	15.5	40.51	74	-33.49	-	-	6	362	H
	19.128238	44.37	VA1T	33.1	-65.6	15.5	27.37	-	-	54	-26.63	6	362	H
2	19.234324	57.86	PKFH	33.1	-65.6	15.5	40.86	74	-33.14	-	-	99	161	V
	19.237508	44.05	VA1T	33.1	-65.6	15.5	27.05	-	-	54	-26.95	99	161	V
3	22.160835	56.95	PKFH	33.8	-65.5	16.7	41.95	74	-32.05	-	-	95	363	H
	22.162448	42.87	VA1T	33.8	-65.5	16.7	27.87	-	-	54	-26.13	95	363	H
4	22.456565	57.03	PKFH	33.8	-65.6	16.8	42.03	74	-31.97	-	-	172	186	V
	22.459783	43.24	VA1T	33.8	-65.6	16.8	28.24	-	-	54	-25.76	172	186	V
5	25.3553	51.94	PKFH	34.6	-63.9	17.9	40.54	74	-33.46	-	-	68	302	H
	25.356443	38.57	VA1T	34.6	-63.9	17.9	27.17	-	-	54	-26.83	68	302	H
6	25.438966	38.61	VA1T	34.6	-63.6	17.9	27.51	-	-	54	-26.49	3	197	V
	25.439174	53.15	PKFH	34.6	-63.6	17.9	42.05	74	-31.95	-	-	3	197	V

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

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11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	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

UL VERIFICATION SERVICES INC.
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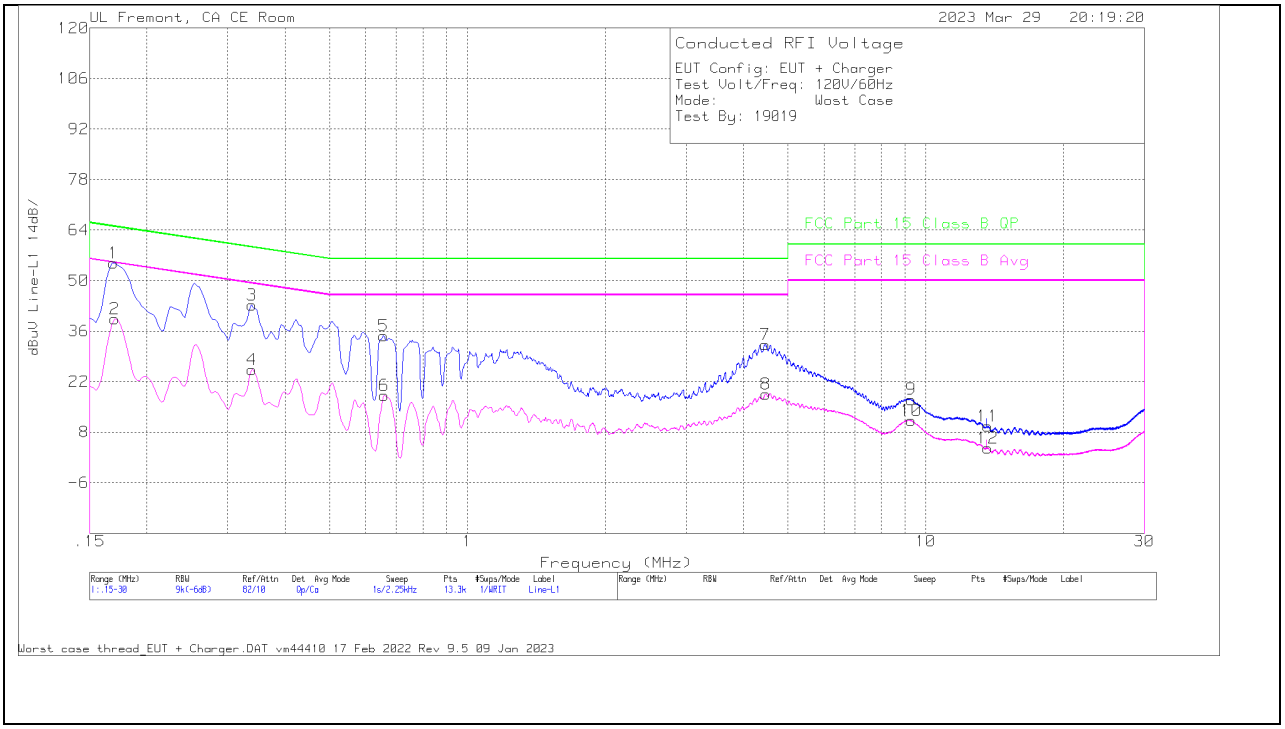
11.1. AC Power Line With AC/DC Adapter

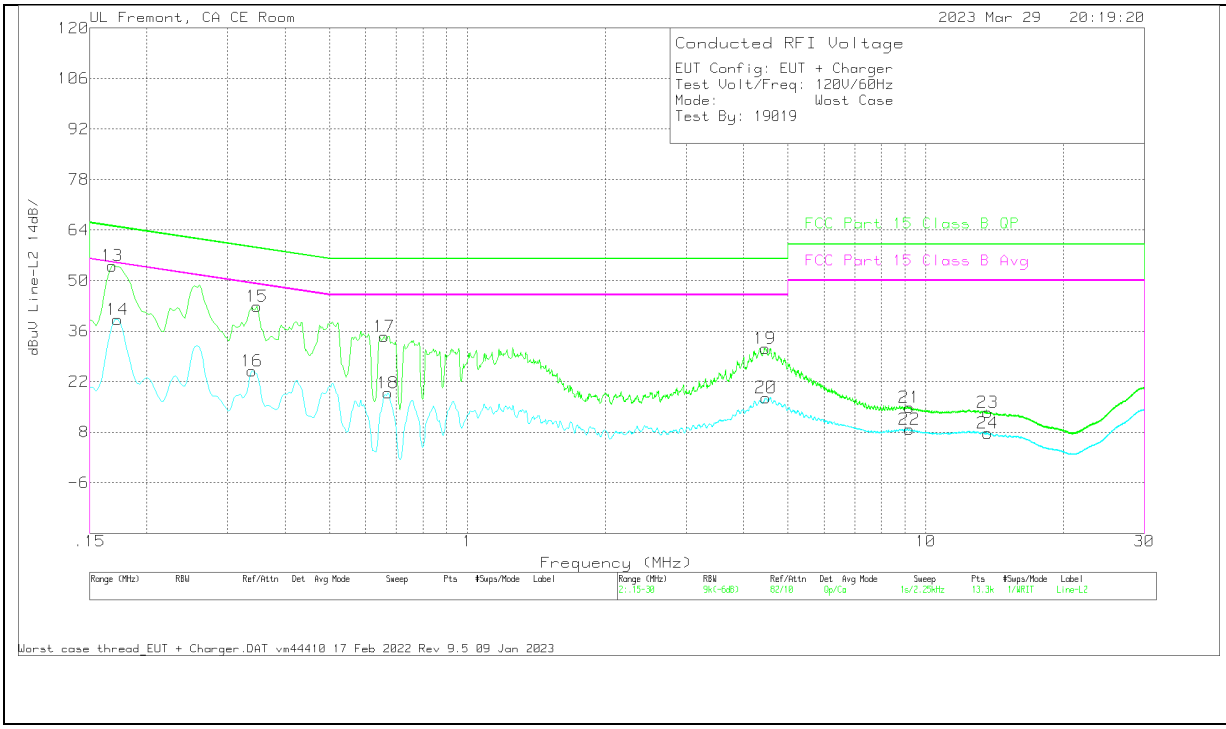
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz

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	30.03	Ca	0	0	9.4	39.43	-	-	54.95	-15.52
4	.339	16.08	Ca	0	0	9.3	25.38	-	-	49.23	-23.85
6	.6585	8.78	Ca	0	.1	9.3	18.18	-	-	46	-27.82
8	4.479	9.18	Ca	0	.1	9.3	18.58	-	-	46	-27.42
10	9.2873	1.67	Ca	0	.2	9.3	11.17	-	-	50	-38.83
12	13.6388	-6.02	Ca	.1	.2	9.3	3.58	-	-	50	-46.42
1	.1691	45.4	Qp	0	0	9.4	54.8	65	-10.2	-	-
3	.339	33.95	Qp	0	0	9.3	43.25	59.23	-15.98	-	-
5	.6563	25.36	Qp	0	.1	9.3	34.76	56	-21.24	-	-
7	4.4588	22.89	Qp	0	.1	9.3	32.29	56	-23.71	-	-
9	9.285	7.56	Qp	0	.2	9.3	17.06	60	-42.94	-	-
11	13.641	.02	Qp	.1	.2	9.3	9.62	60	-50.38	-	-

LINE 2 RESULTS



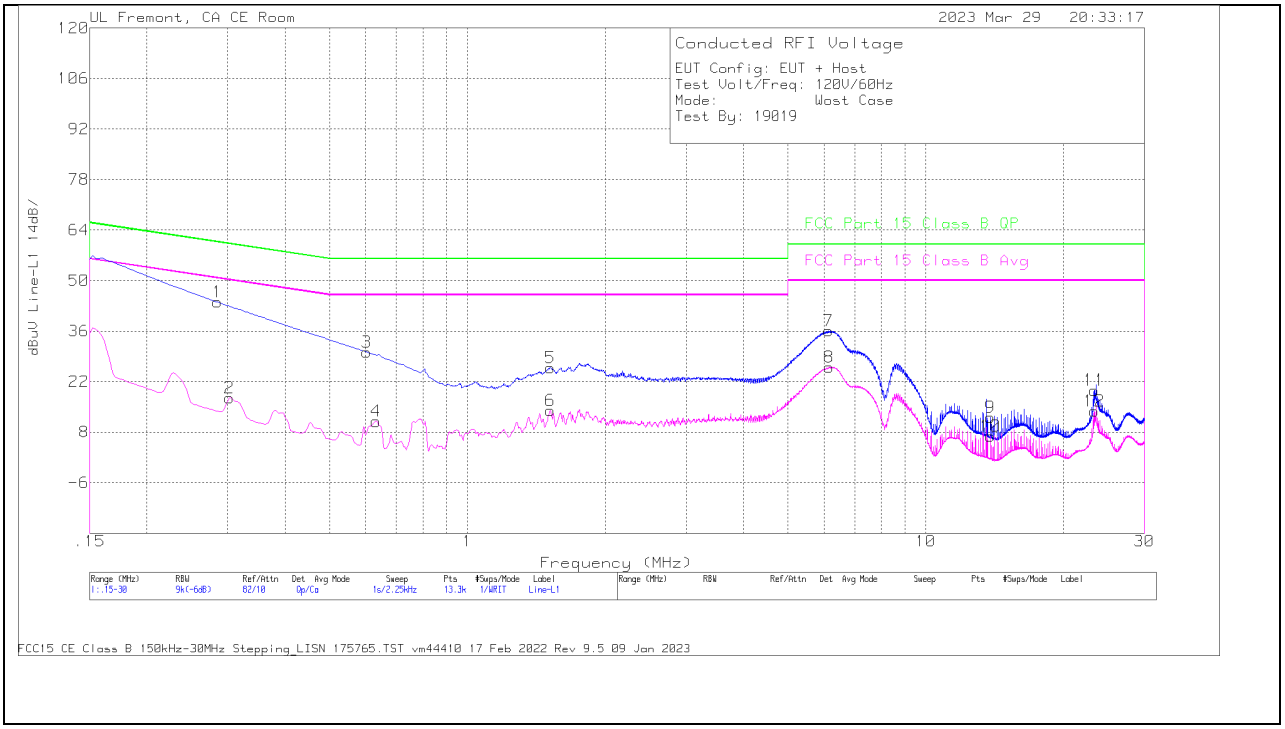
Range 2: Line-L2 .15 - 30MHz

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)
14	.1725	29.78	Ca	0	0	9.4	39.18	-	-	54.84	-15.66
16	.339	15.73	Ca	0	0	9.3	25.03	-	-	49.23	-24.2
18	.672	9.48	Ca	0	.1	9.3	18.88	-	-	46	-27.12
20	4.4835	8.18	Ca	0	.1	9.3	17.58	-	-	46	-28.42
22	9.213	-.69	Ca	0	.2	9.3	8.81	-	-	50	-41.19
24	13.6365	-1.92	Ca	.1	.2	9.3	7.68	-	-	50	-42.32
13	.168	44.69	Qp	0	0	9.4	54.09	65.06	-10.97	-	-
15	.348	33.52	Qp	0	0	9.3	42.82	59.01	-16.19	-	-
17	.6585	25.16	Qp	0	.1	9.3	34.56	56	-21.44	-	-
19	4.4588	21.85	Qp	0	.1	9.3	31.25	56	-24.75	-	-
21	9.213	5.46	Qp	0	.2	9.3	14.96	60	-45.04	-	-
23	13.6523	3.85	Qp	.1	.2	9.3	13.45	60	-46.55	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

11.2. AC Power Line With Laptop

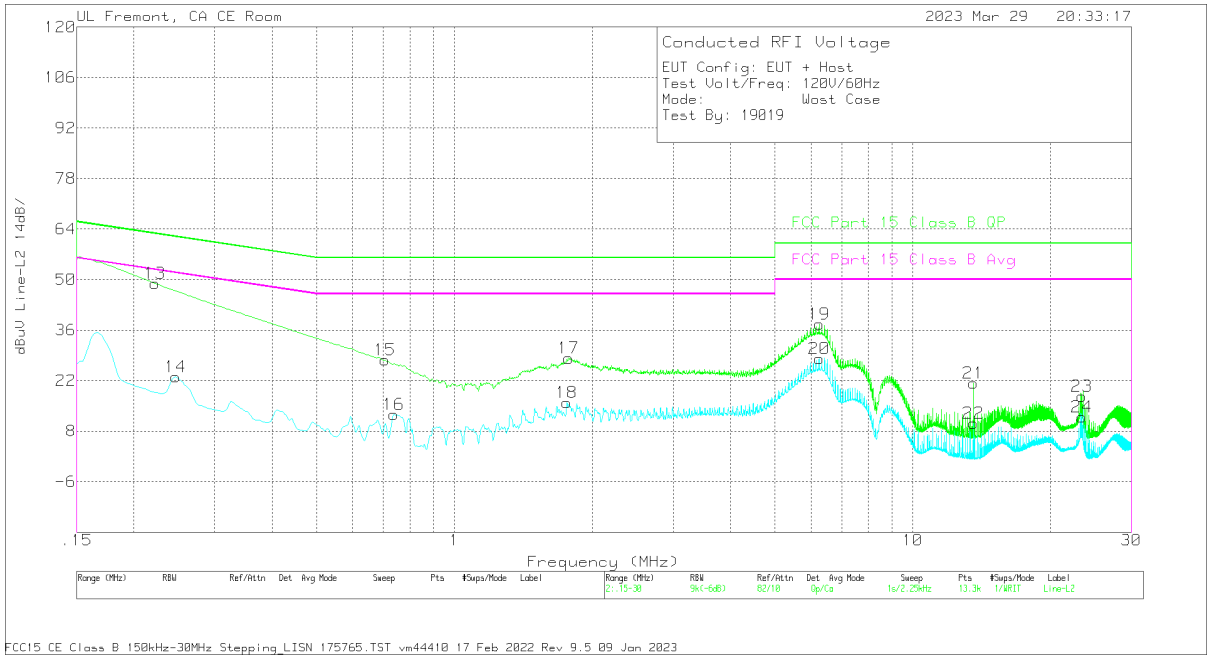
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz

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	.303	8.22	Ca	0	0	9.3	17.52	-	-	50.16	-32.64
4	.6326	1.58	Ca	0	.1	9.3	10.98	-	-	46	-35.02
6	1.518	4.57	Ca	0	.1	9.3	13.97	-	-	46	-32.03
8	6.1508	16.66	Ca	0	.1	9.3	26.06	-	-	50	-23.94
10	13.8278	-2.78	Ca	.1	.2	9.3	6.82	-	-	50	-43.18
12	23.3093	3.88	Ca	.2	.3	9.4	13.78	-	-	50	-36.22
1	.285	34.73	Qp	0	0	9.3	44.03	60.67	-16.64	-	-
3	.6023	20.81	Qp	0	.1	9.3	30.21	56	-25.79	-	-
5	1.518	16.48	Qp	0	.1	9.3	25.88	56	-30.12	-	-
7	6.1305	26.62	Qp	0	.1	9.3	36.02	60	-23.98	-	-
9	13.8278	2.52	Qp	.1	.2	9.3	12.12	60	-47.88	-	-
11	23.3093	9.76	Qp	.2	.3	9.4	19.66	60	-40.34	-	-

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)
14	.2468	13.7	Ca	0	0	9.3	23	-	-	51.87	-28.87
16	.7373	3.19	Ca	0	.1	9.3	12.59	-	-	46	-33.41
18	1.761	6.52	Ca	0	.1	9.3	15.92	-	-	46	-30.08
20	6.2475	18.76	Ca	0	.1	9.3	28.16	-	-	50	-21.84
22	13.56	.61	Ca	.1	.2	9.3	10.21	-	-	50	-39.79
24	23.4083	1.99	Ca	.2	.3	9.4	11.89	-	-	50	-38.11
13	.222	39.7	Qp	0	0	9.3	49	62.74	-13.74	-	-
15	.7058	18.27	Qp	0	.1	9.3	27.67	56	-28.33	-	-
17	1.7756	18.79	Qp	0	.1	9.3	28.19	56	-27.81	-	-
19	6.2475	28.18	Qp	0	.1	9.3	37.58	60	-22.42	-	-
21	13.56	11.65	Qp	.1	.2	9.3	21.25	60	-38.75	-	-
23	23.4083	7.74	Qp	.2	.3	9.4	17.64	60	-42.36	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

12. SETUP PHOTOS

Please refer to setup photos 14523740-EP1V1

END OF TEST REPORT

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