TEST REPORT

Report Number : 13573771-E2V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A2484 (Parent Model, Full Test) A2641, A2643, A2644, A2645 (Variant Models)
FCC ID	:	BCG-E4003A (Parent Model) BCG-E4005A, BCG-E4035A, BCG-E4036A (Variant Models)
IC	:	579C-E4003A (Parent Model) 579C-E4005A, 579C-E4035A, 579C-E4036A (Variant Models)
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 05, 2021

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	7/30/2021	Initial Issue	Chin Pang
V2	8/5/2021	Address TCB Questions	Chin Pang

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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:	A2484 (PARENT MODEL) A2641, A2643, A2644, A2645 (VARIANT MODELS)
BRAND:	APPLE
FCC IC:	BCG-E4003A (PARENT MODEL) BCG-E4005A, BCG-E4035A, BCG-E4036A (VARIANT MODELS)
IC ID:	579C-E4003A (PARENT MODEL) 579C-E4005A, 579C-E4035A, 579C-E4036A (VARIANT MODELS)
SERIAL NUMBER:	C070407005S0G3H1, Q7X92R9C06
SAMPLE RECEIPT DATE:	11/05/2020, 6/28/2021
DATE TESTED:	DECEMBER 04, 2020 – AUGUST 05, 2021

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:

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

Prepared By:

Jingang Li
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

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2. TEST SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

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 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, KDB 662911, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 2.

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	208313
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	208313
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	208313

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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}
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 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, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC and WPT. All models support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. 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: A2484; FCC ID: BCG-E4003A, IC ID: 579C-E4003A

Variant Models: A2641; FCC ID: BCG-E4005A, IC ID: 579C-E4005A
A2643; FCC ID: BCG-E4035A, IC ID: 579C-E4035A
A2644; FCC ID: BCG-E4036A, IC ID: 579C-E4036A
A2645; FCC ID: BCG-E4036A, IC ID: 579C-E4036A

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	2402 - 2480	BLE 1M	19.71	93.54
	Low Power			11.14	13.00
	High Power	2404 - 2478	BLE 2M	19.73	93.97
	Low Power			11.1	12.88
ANT 3	High Power	2402 - 2480	BLE 1M	20.10	102.33
	Low Power			11.13	12.97
	High Power	2404 - 2478	BLE 2M	20.25	105.93
	Low Power			11.13	12.97
BF, ANT 4 + ANT 3	High Power	2402 - 2480	BLE 1M	20.16	103.75
	Low Power			14.25	26.61
	High Power	2404 - 2478	BLE 2M	20.21	104.95
	Low Power			14.22	26.42

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency Range (GHz)	ANT 4 (dBi)	ANT 3 (dBi)
2.4	0.1	-0.6

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 19.1.309.2612

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X, Y and Z on ANT 4, ANT 3 and 2TX beamforming, it was determined that X (Flatbed) was the worst-case orientation for ANT 4. And Y (Landscape) orientation was the worst case for both ANT 3 and 2TX Beamforming.

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.

High Power Beamforming BLE 1Mbps mode is set to maximum power per chain to cover both SISO and MIMO modes to complies with radiated spurious emissions limits in the restricted bands between 1GHz and 18GHz low/mid/high channel (except the band edge).

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 BLE and 5GHz bands. No noticeable emission was found.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

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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

I/O CABLES (RF 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	1.0	N/A
3	Antenna	1	SMA	Un-shielded	0.2	To spectrum Analyzer

I/O CABLES (RF RADIATED 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	Un-shielded	1	N/A

TEST SETUP

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

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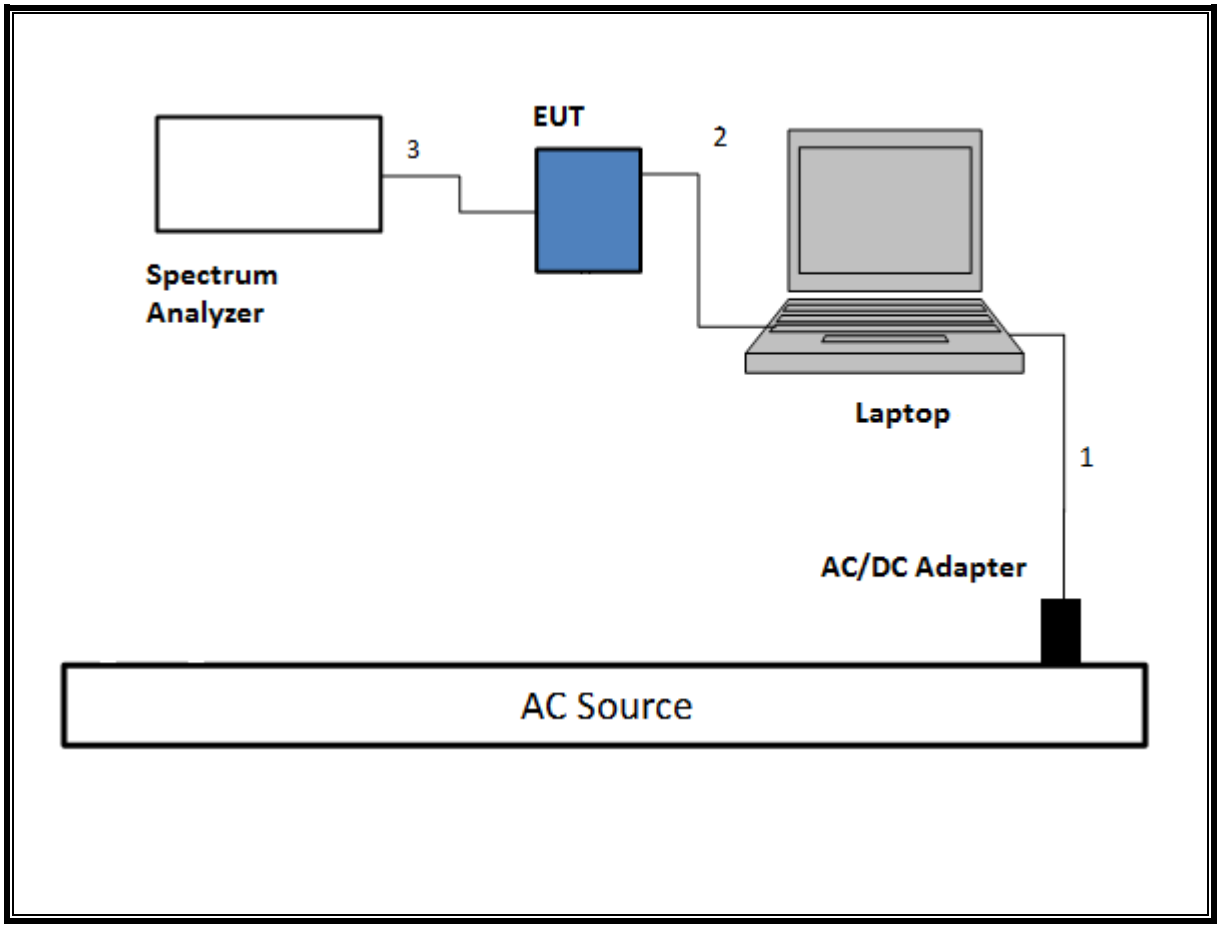
SETUP DIAGRAM FOR CONDUCTED TESTS



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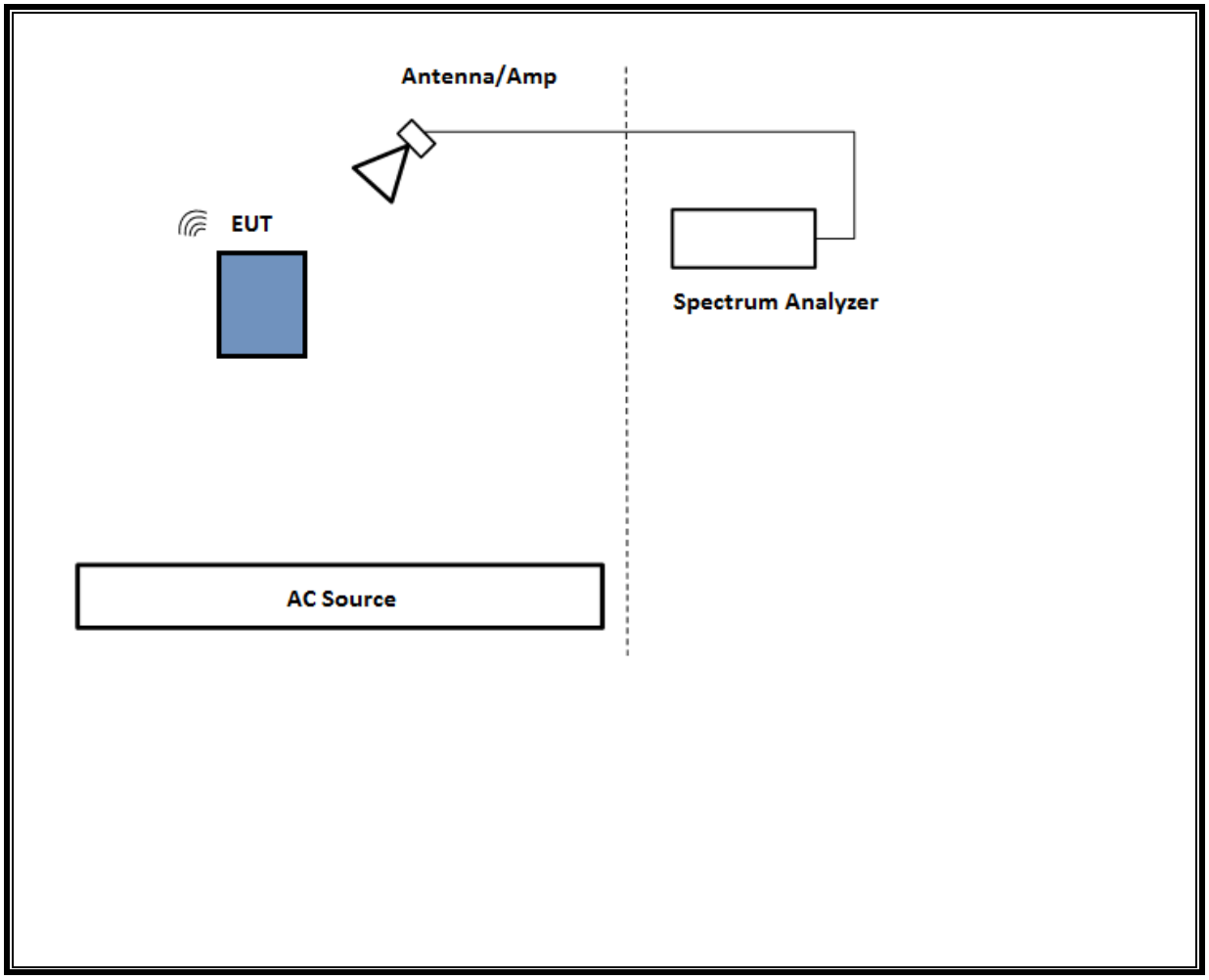
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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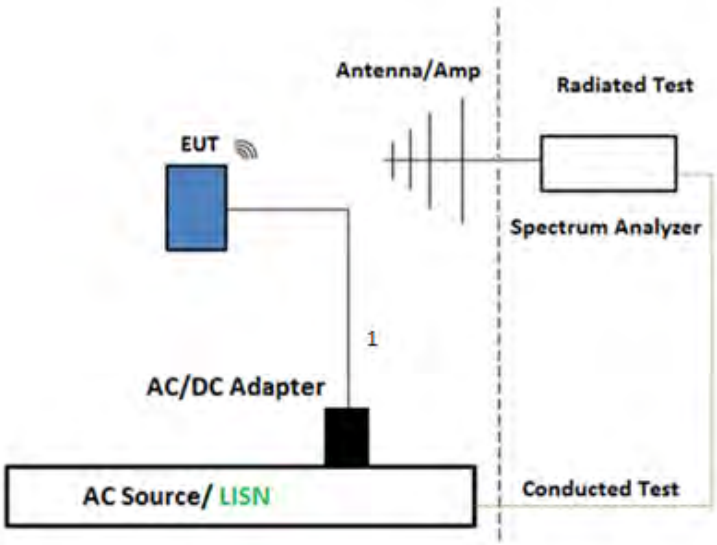
SETUP DIAGRAM FOR BELOW 1GHZ AND AC LINE CONDUCTED TEST



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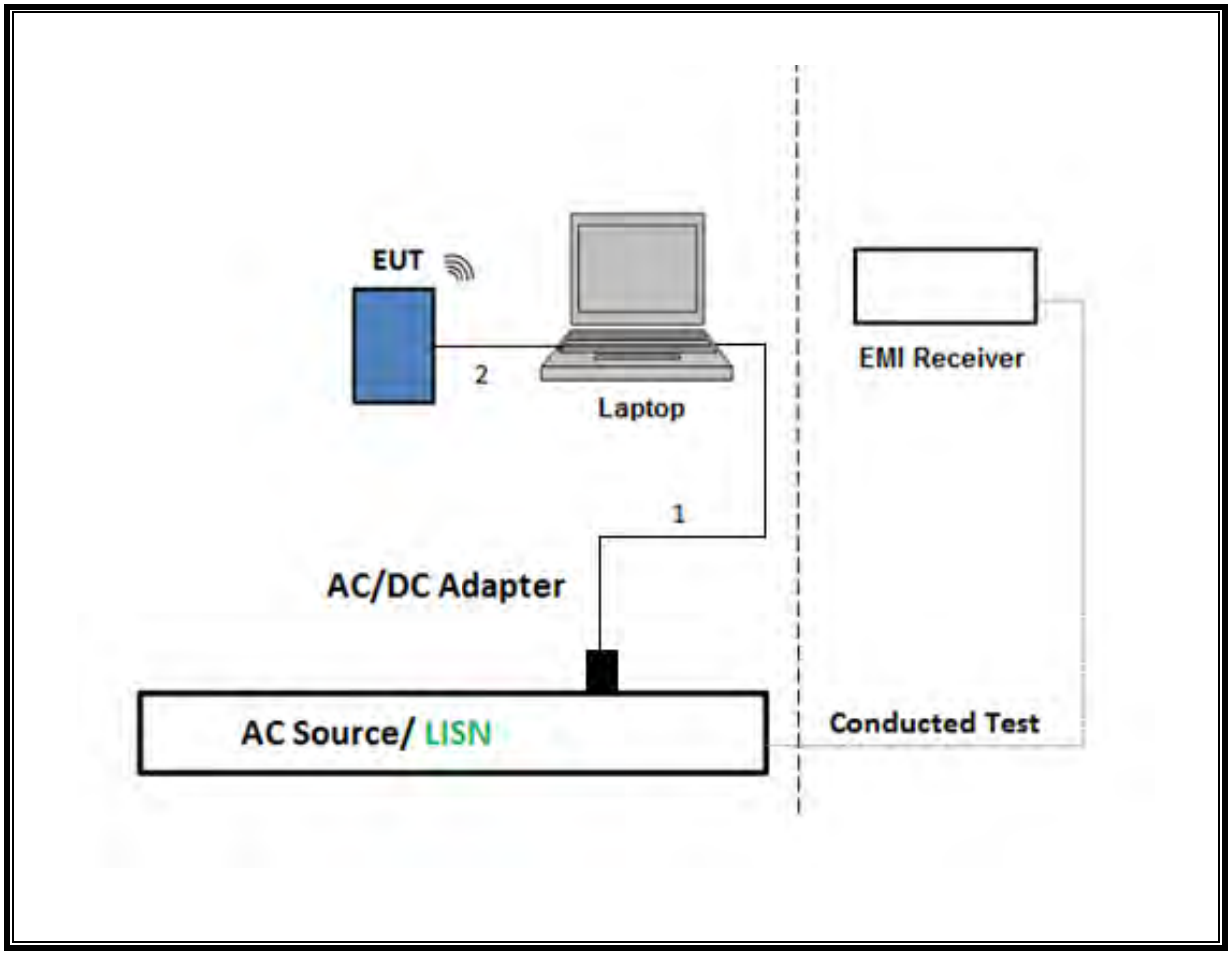
TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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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

NOTE: All conducted antenna port tests for Beamforming applied the same test procedures as BLE 1Mbps and BLE 2Mbps normal modes.

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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
Antenna, Horn 1-18GHz	ETS Lindgren	3117	PRE0078107	03/01/2022	03/01/2021
Amplifier, 1 to 18GHz	Amplical	AMP1G18-35	138301	03/30/2022	03/30/2021
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179522	02/19/2022	02/19/2021
*Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T907	01/22/2021	01/22/2020
Antenna, Horn 1-18GHz	ETS Lindgren	3117	PRE0100034	09/15/2021	09/15/2020
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	T1569	03/31/2022	03/31/2021
Antenna, BroadBand Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	202329	10/27/2021	10/27/2020
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	202989	12/03/2021	12/03/2020
Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T447	09/24/2021	09/24/2020
*Pre-Amp 18-26GHz	Agilent Technology	8449B	T404	04/08/2021	04/08/2020
Power Meter, P-series single channel	Keysight	N1912A	T1244	01/25/2022	01/25/2021
Power Sensor	Keysight	N19**2**1A	T1224	01/25/2022	01/25/2021
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	11/23/2021	11/23/2020
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1210	01/22/2022	01/22/2021
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/27/2022	01/27/2021

AC Line Conducted					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	T1436	02/19/2022	02/19/2021
Power Cable, Line Conducted Emissions	UL	PR1	T861	10/27/2021	10/27/2020
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01	PRE0186446	01/20/2022	01/20/2021
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, Mar 6, 2020		
Conducted Software	UL	UL EMC	2020.2.26		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, February 21, 2020		

*Testing was completed before calibration expiration 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						
BLE, 1Mbps	1.57	1.57	1.000	100.00%	0.00	0.010
BLE, 2Mbps	1.31	1.31	1.000	100.00%	0.00	0.010
BLE, TXBF, 1Mbps	1.45	1.45	1.000	100.00%	0.00	0.010
BLE, TXBF, 2Mbps	1.43	1.43	1.000	100.00%	0.00	0.010

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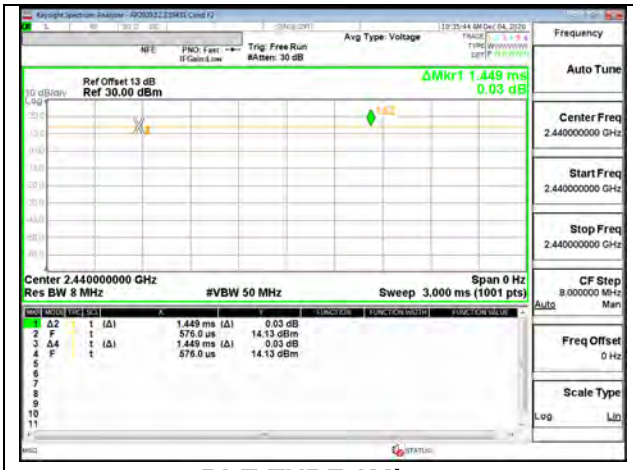
DUTY CYCLE PLOTS

BLE 1Mbps

BLE 2Mbps



BLE TXBF 1Mbps

BLE TXBF 2Mbps

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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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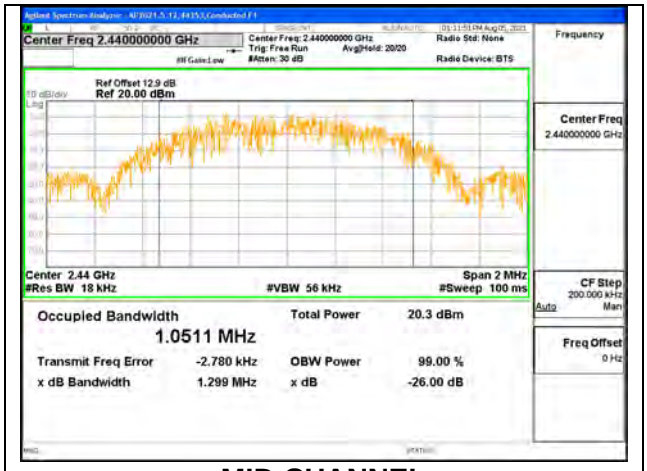
9.2.1. **HIGH POWER BLE (1Mbps)**

ANT 4

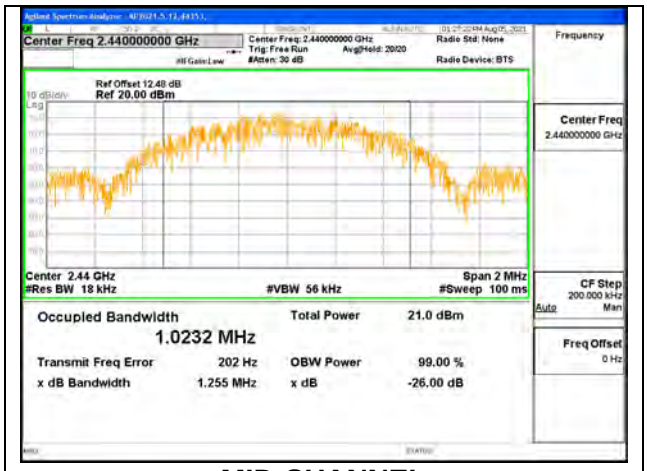
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.032
Middle	2440	1.051
High	2480	1.028



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.039
Middle	2440	1.023
High	2480	1.053



MID CHANNEL

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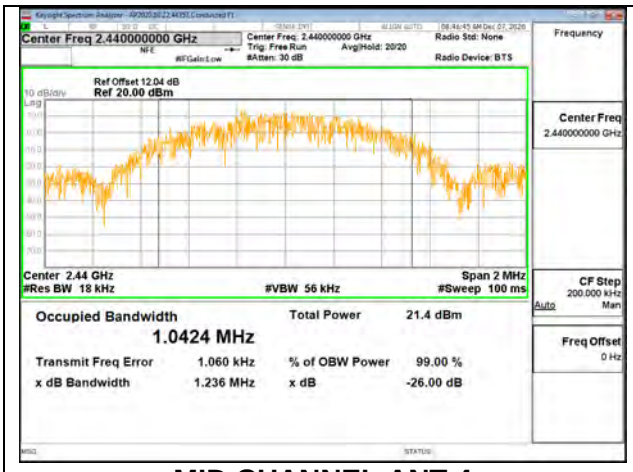
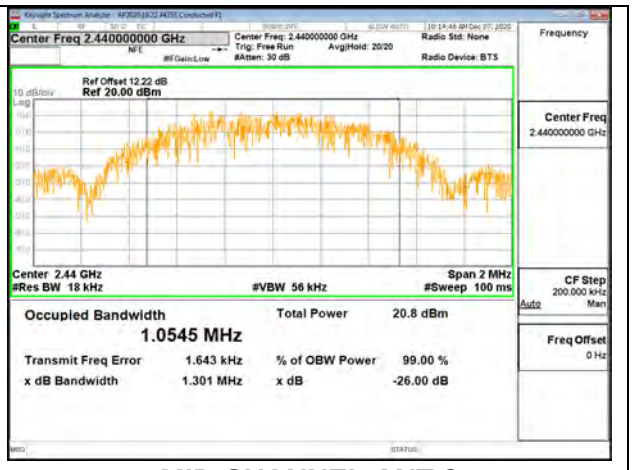
9.2.2. **HIGH POWER BLE TXBF (1Mbps)**

Channel	Frequency (MHz)	99% Bandwidth ANT 4 (MHz)	99% Bandwidth ANT 3 (MHz)
Low	2402	1.056	1.047
Mid	2440	1.042	1.055
High	2480	1.060	1.035

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4



MID CHANNEL ANT 3

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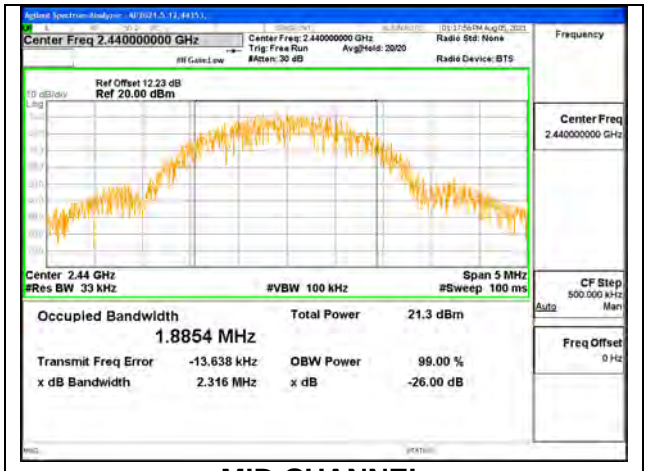
9.2.3. **HIGH POWER BLE (2Mbps)**

ANT 4

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	1.859
Middle	2440	1.885
High	2478	1.911



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	1.871
Middle	2440	1.896
High	2478	1.918

MID CHANNEL

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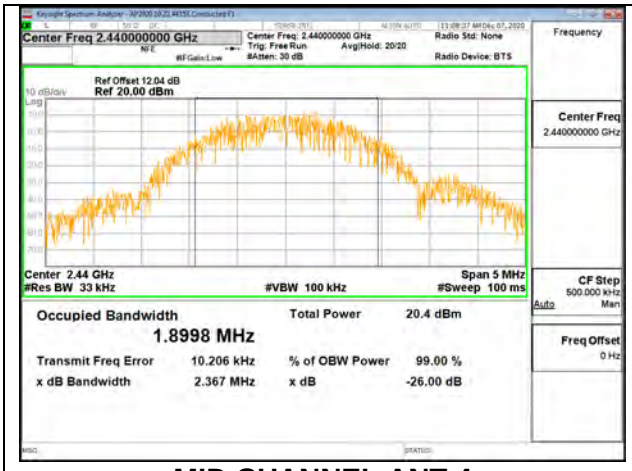
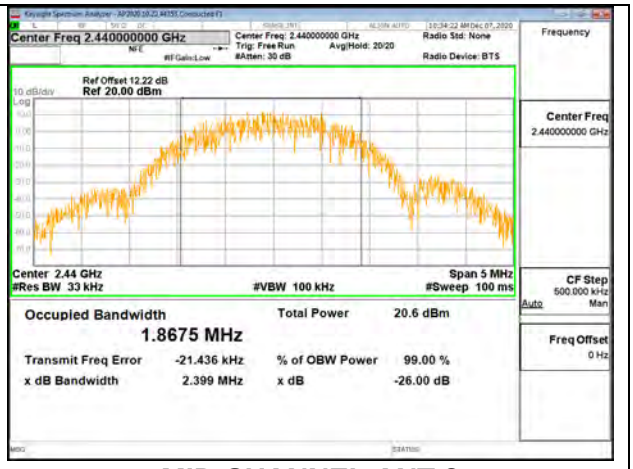
9.2.4. **HIGH POWER BLE TXBF (2Mbps)**

Channel	Frequency (MHz)	99% Bandwidth ANT 4 (MHz)	99% Bandwidth ANT 3 (MHz)
Low	2404	1.885	1.904
Mid	2440	1.900	1.868
High	2478	1.865	1.896

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4



MID CHANNEL ANT 3

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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

The 6dB bandwidth was measured for the narrowest bandwidth mode, High Power 1Mbps, to demonstrate compliance with the minimum required bandwidth of 500 kHz. Other modes were not tested as their bandwidth is greater than the High Power 1Mbps mode, as demonstrated by the 99% bandwidth measurements performed on all modes.

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

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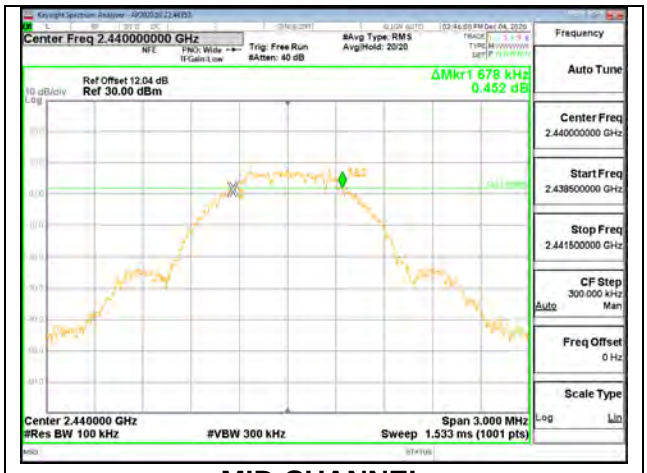
9.3.1. **HIGH POWER BLE (1Mbps)**

ANT 4

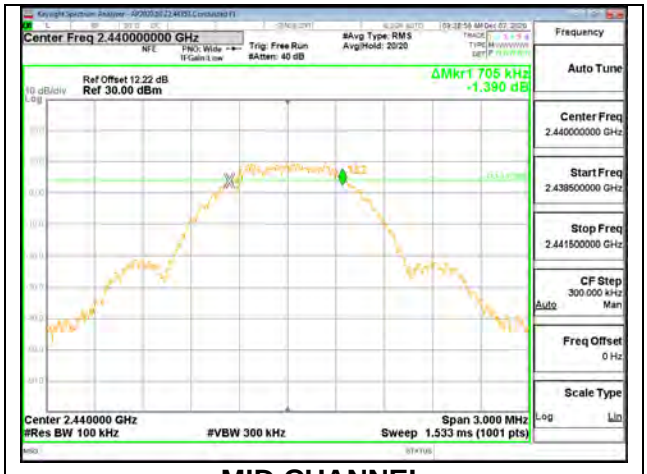
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.690	0.5
Middle	2440	0.678	0.5
High	2480	0.708	0.5



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.711	0.5
Middle	2440	0.705	0.5
High	2480	0.708	0.5



MID CHANNEL

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9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

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

TEST PROCEDURE

The 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 power meter

DIRECTIONAL ANTENNA GAIN

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

For 2TX:

Tx chains are correlated for power and PSD due to the device supporting Beamforming mode. The directional gains are as follows:

Band (GHz)	ANT 4 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	0.10	-0.60	-0.24	2.77

RESULTS

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9.4.1. HIGH POWER BLE (1Mbps)

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.71	30	-10.29
Middle	2440	19.63	30	-10.37
High	2480	19.33	30	-10.67

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.10	30	-9.90
Middle	2440	20.04	30	-9.96
High	2480	20.01	30	-9.99

9.4.2. HIGH POWER BLE TXBF (1Mbps)

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	17.14	17.11	20.14	30	-9.86
Middle	2440	17.22	17.07	20.16	30	-9.84
High	2480	17.10	17.16	20.14	30	-9.86

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9.4.3. HIGH POWER BLE (2Mbps)

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	19.70	30	-10.30
Middle	2440	19.73	30	-10.27
High	2478	19.69	30	-10.31

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	20.11	30	-9.89
Middle	2440	20.25	30	-9.75
High	2478	20.06	30	-9.94

9.4.4. HIGH POWER BLE TXBF (2Mbps)

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	16.92	17.19	20.07	30	-9.93
Middle	2440	17.20	17.20	20.21	30	-9.79
High	2478	16.90	17.17	20.05	30	-9.95

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9.4.5. **LOW POWER BLE (1Mbps)**

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.06	30	-18.94
Middle	2440	11.14	30	-18.86
High	2480	11.10	30	-18.90

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.08	30	-18.92
Middle	2440	11.05	30	-18.95
High	2480	11.13	30	-18.87

9.4.6. **LOW POWER BLE TXBF (1Mbps)**

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.28	11.09	14.20	30	-15.80
Middle	2440	11.30	11.02	14.17	30	-15.83
High	2480	11.21	11.27	14.25	30	-15.75

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9.4.7. LOW POWER BLE (2Mbps)

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	11.02	30	-18.98
Middle	2440	11.10	30	-18.90
High	2478	10.99	30	-19.01

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	11.00	30	-19.00
Middle	2440	11.13	30	-18.87
High	2478	11.04	30	-18.96

9.4.8. LOW POWER BLE TXBF (2Mbps)

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	11.14	10.96	14.06	30	-15.94
Middle	2440	11.22	11.19	14.22	30	-15.78
High	2478	11.07	11.05	14.07	30	-15.93

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9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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 BLE (1Mbps)

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	19.40
Middle	2440	19.31
High	2480	19.01

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	19.79
Middle	2440	19.73
High	2480	19.66

9.5.2. HIGH POWER BLE TXBF (1Mbps)

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	16.77	16.68	19.74
Middle	2440	16.81	16.78	19.81
High	2480	16.74	16.80	19.78

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9.5.3. **HIGH POWER BLE (2Mbps)**

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	19.37
Middle	2440	19.42
High	2478	19.36

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	19.85
Middle	2440	19.93
High	2478	19.80

9.5.4. **HIGH POWER BLE TXBF (2Mbps)**

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2404	16.67	16.85	19.77
Middle	2440	16.88	16.87	19.89
High	2478	16.65	16.83	19.75

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9.5.5. **LOW POWER BLE (1Mbps)**

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	10.73
Middle	2440	10.82
High	2480	10.79

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	10.76
Middle	2440	10.74
High	2480	10.81

9.5.6. **LOW POWER BLE TXBF (1Mbps)**

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	10.85	10.77	13.82
Middle	2440	10.92	10.74	13.84
High	2480	10.83	10.88	13.87

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9.5.7. LOW POWER BLE (2Mbps)

ANT 4

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	10.70
Middle	2440	10.79
High	2478	10.68

ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	10.68
Middle	2440	10.80
High	2478	10.71

9.5.8. LOW POWER BLE TXBF (2Mbps)

ANT 4 + ANT 3

Tested By:	44353
Date:	7/29/2021

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2404	10.80	10.64	13.73
Middle	2440	10.86	10.82	13.85
High	2478	10.77	10.65	13.72

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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

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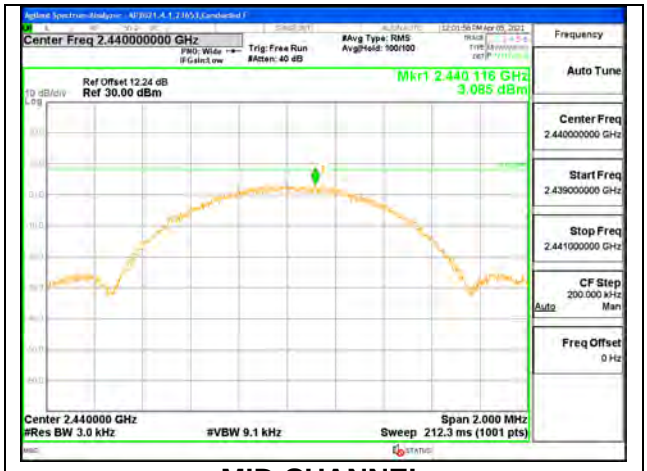
9.6.1. **HIGH POWER BLE (1Mbps)**

ANT 4

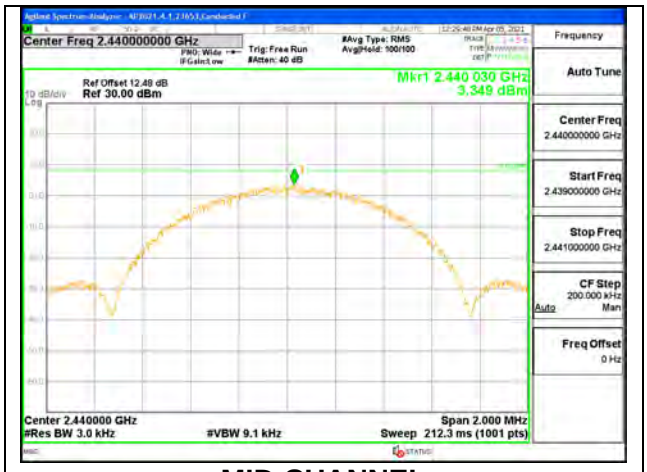
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	3.251	8	-4.75
Middle	2440	3.085	8	-4.92
High	2480	2.733	8	-5.27



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	3.528	8	-4.47
Middle	2440	3.349	8	-4.65
High	2480	3.318	8	-4.68



MID CHANNEL

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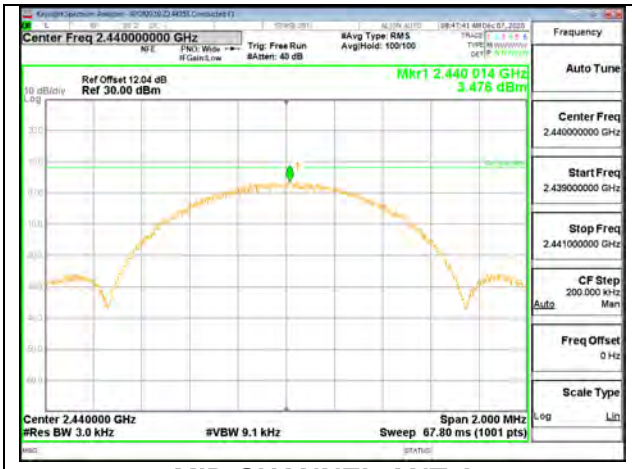
9.6.2. **HIGH POWER BLE TXBF (1Mbps)**

Duty Cycle CF (dB)		Included in Calculations of Corr'd PSD

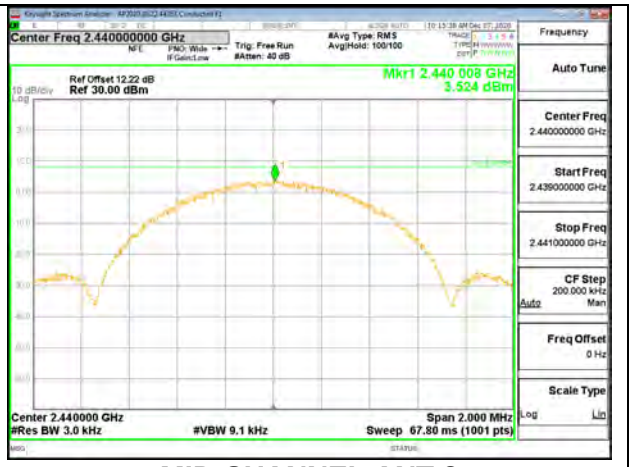
PSD Results

Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2402	3.228	3.267	6.26	8.0	-1.7
Mid	2440	3.476	3.524	6.51	8.0	-1.5
High	2480	3.378	3.500	6.45	8.0	-1.6

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4



MID CHANNEL ANT 3

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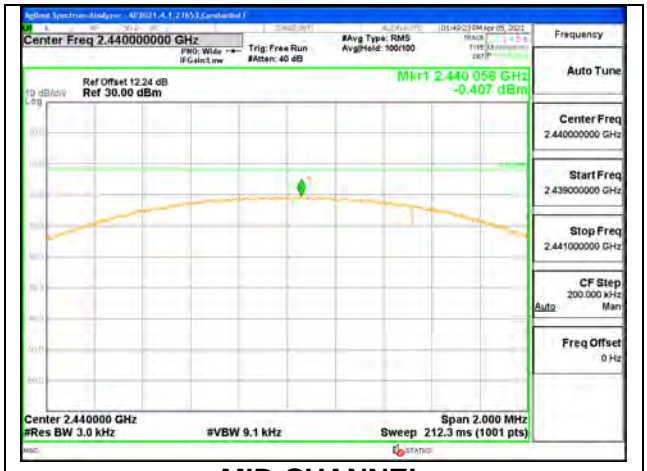
9.6.3. **HIGH POWER BLE (2Mbps)**

ANT 4

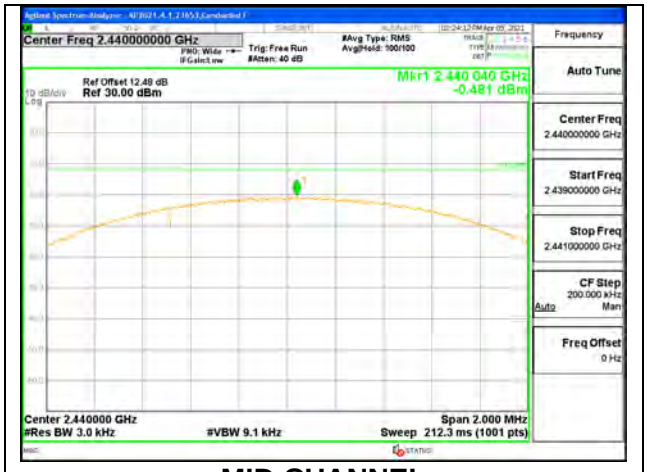
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-0.667	8	-8.67
Middle	2440	-0.407	8	-8.41
High	2478	-0.791	8	-8.79



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-0.763	8	-8.76
Middle	2440	-0.481	8	-8.48
High	2478	-1.308	8	-9.31



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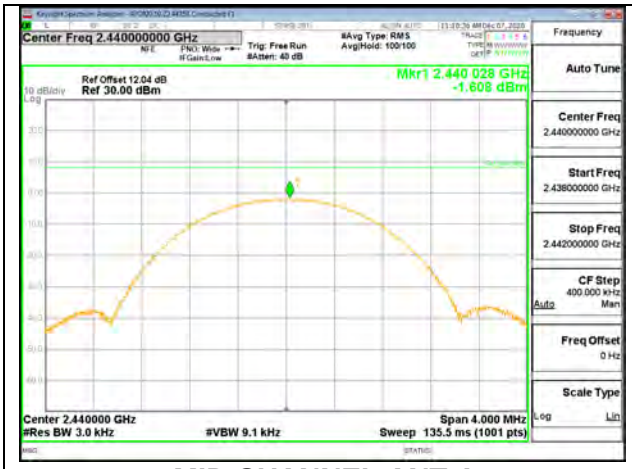
9.6.4. HIGH POWER BLE TXBF (2Mbps)

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

PSD Results

Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2404	-1.771	-1.664	1.29	8.0	-6.7
Mid	2440	-1.608	-1.680	1.37	8.0	-6.6
Hjigh	2478	-1.846	-1.683	1.25	8.0	-6.8

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4

MID CHANNEL ANT 3

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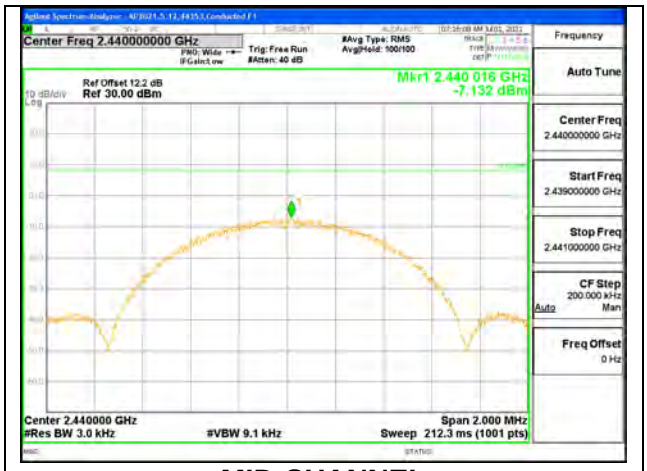
9.6.5. **LOW POWER BLE (1Mbps)**

ANT 4

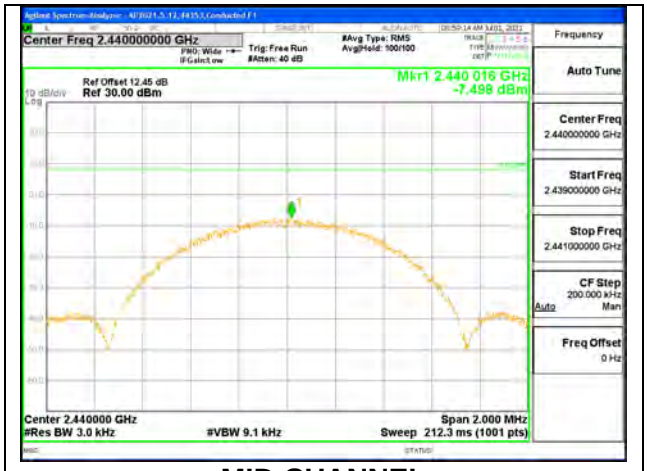
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-7.449	8	-15.45
Middle	2440	-7.132	8	-15.13
High	2480	-7.398	8	-15.40



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-7.395	8	-15.40
Middle	2440	-7.498	8	-15.50
High	2480	-7.247	8	-15.25



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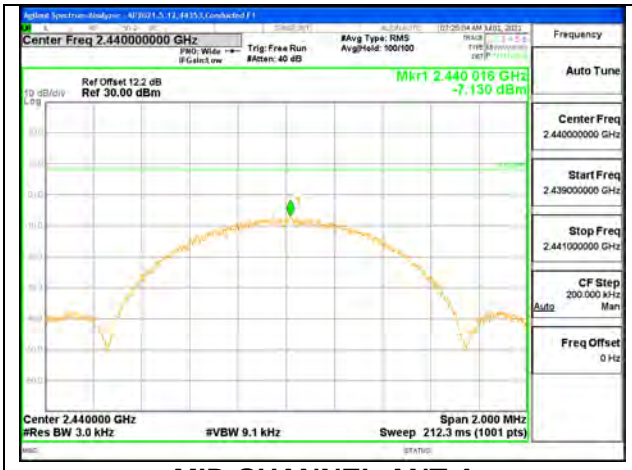
9.6.6. **LOW POWER BLE TXBF (1Mbps)**

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

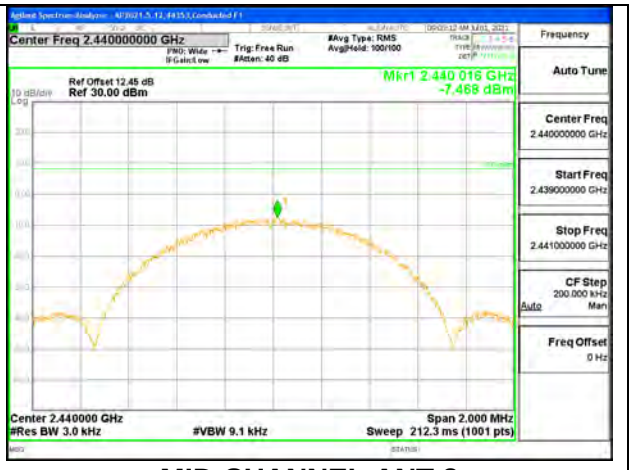
PSD Results

Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2402	-7.398	-7.421	-4.40	8.0	-12.4
Mid	2440	-7.130	-7.468	-4.29	8.0	-12.3
Hjigh	2480	-7.483	-7.174	-4.32	8.0	-12.3

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4



MID CHANNEL ANT 3

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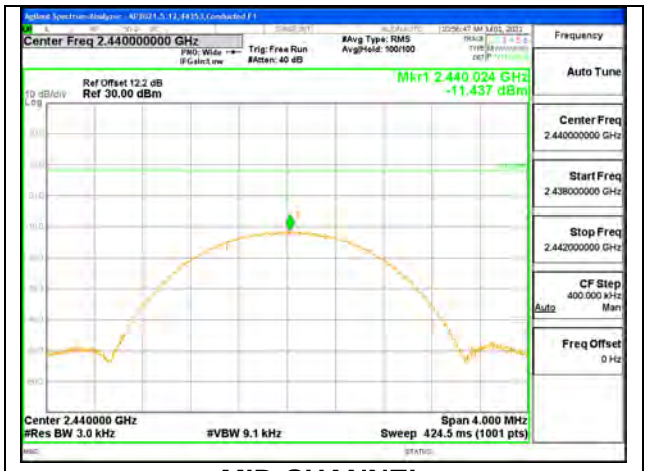
9.6.7. **LOW POWER BLE (2Mbps)**

ANT 4

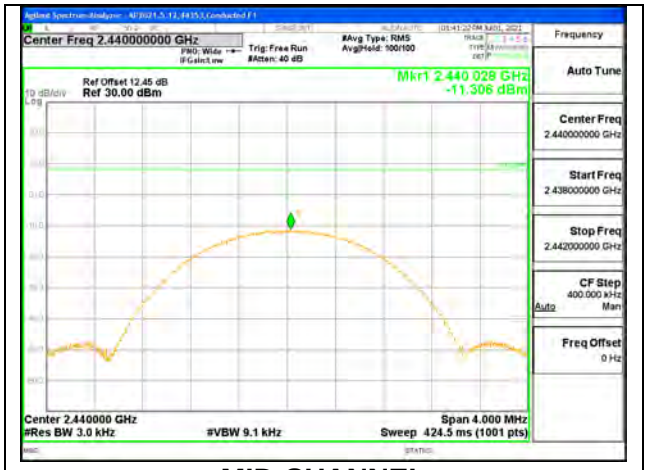
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-11.573	8	-19.57
Middle	2440	-11.437	8	-19.44
High	2478	-11.741	8	-19.74



MID CHANNEL

ANT 3

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-11.622	8	-19.62
Middle	2440	-11.306	8	-19.31
High	2478	-11.591	8	-19.59



MID CHANNEL

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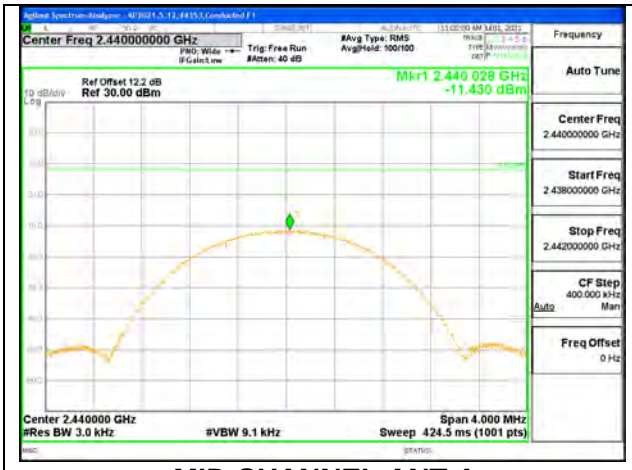
9.6.8. LOW POWER BLE TXBF (2Mbps)

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

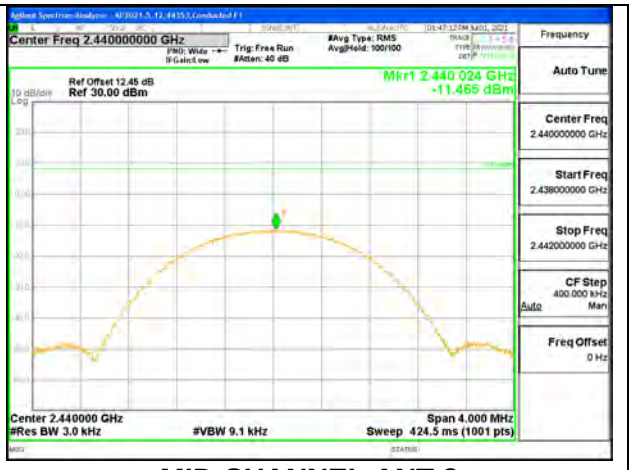
PSD Results

Channel	Frequency (MHz)	ANT 4 Meas (dBm/ 3kHz)	ANT 3 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2404	-11.612	-11.678	-8.63	8.0	-16.6
Mid	2440	-11.430	-11.465	-8.44	8.0	-16.4
Hjigh	2478	-11.721	-11.640	-8.67	8.0	-16.7

Note: Test procedures and setting are same as BLE normal mode.



MID CHANNEL ANT 4



MID CHANNEL ANT 3

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9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

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

Note: Test procedures and setting are same as BLE normal mode.

RESULTS

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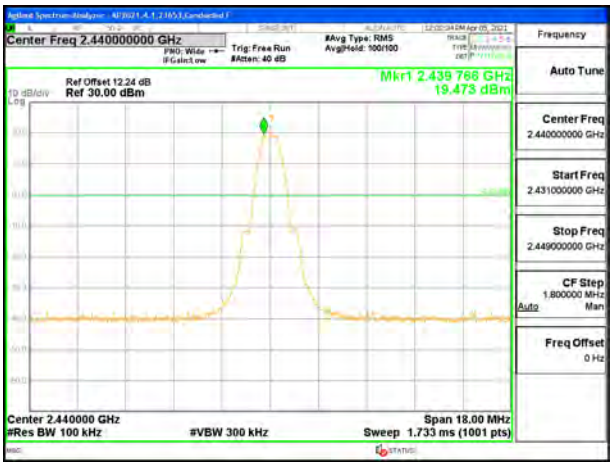
9.7.1. **HIGH POWER BLE (1Mbps)**

ANT 4

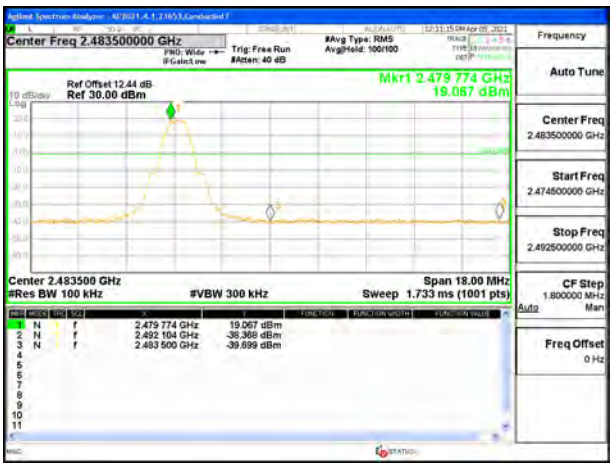
LOW CHANNEL BANDEDGE

OUT-OF-BAND LOW CHANNEL

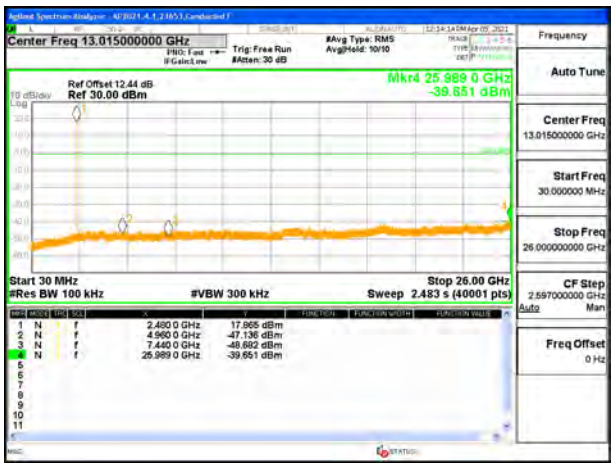


IN-BAND REFERENCE LEVEL

OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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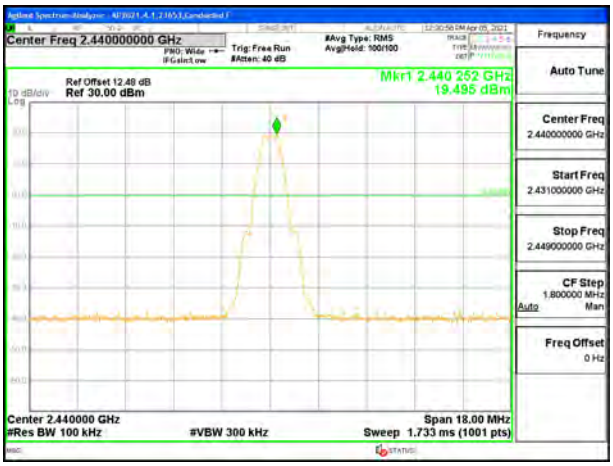
ANT 3

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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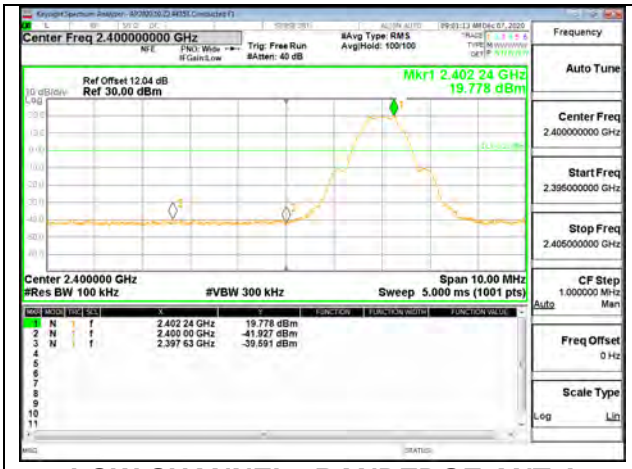
9.7.2. **HIGH POWER BLE TXBF (1Mbps)**

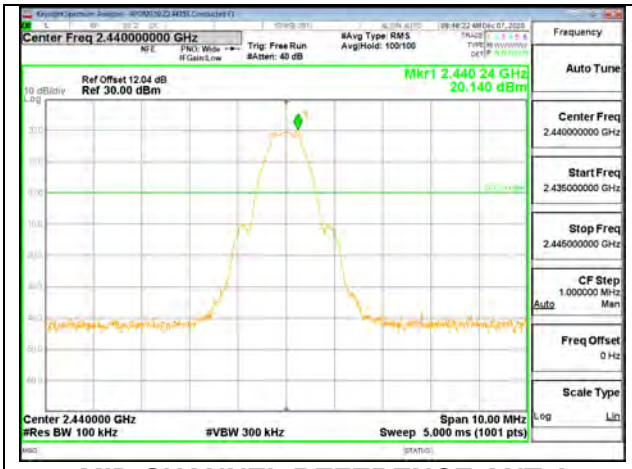
Note: Test procedures and setting are same as BLE normal mode.

ANT 4 (1Mbps)



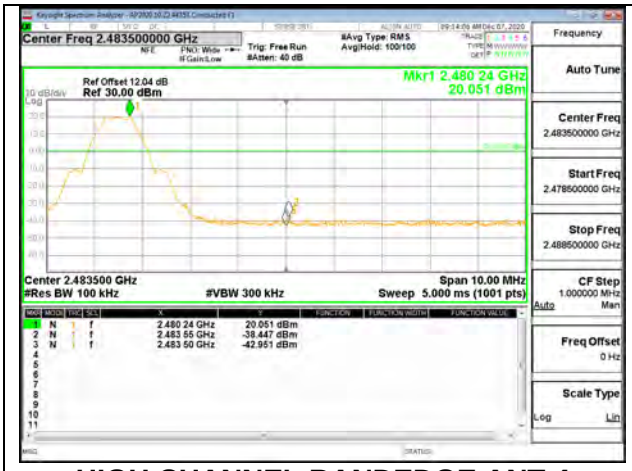
LOW CHANNEL , BANDEDGE ANT 4

LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4

MID CHANNEL OUT-OF-BAND ANT 4



HIGH CHANNEL BANDEDGE ANT 4

HIGH CHANNEL OUT-OF-BAND ANT 4

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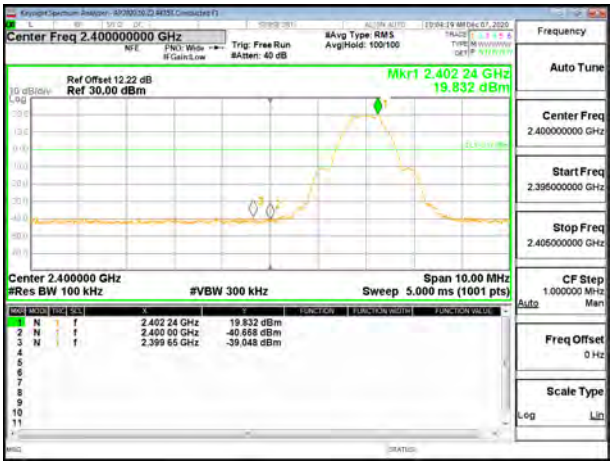
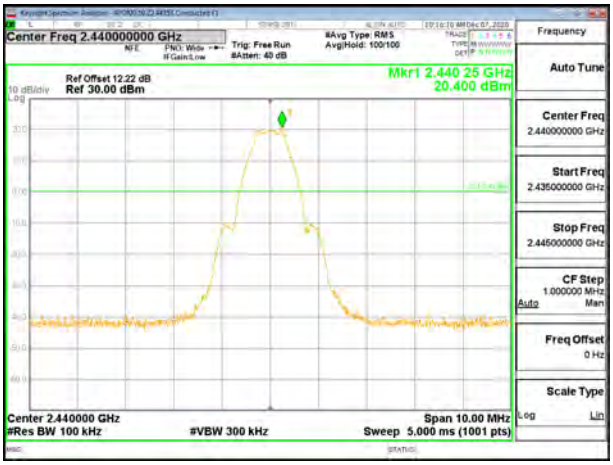
ANT 3 (1Mbps)



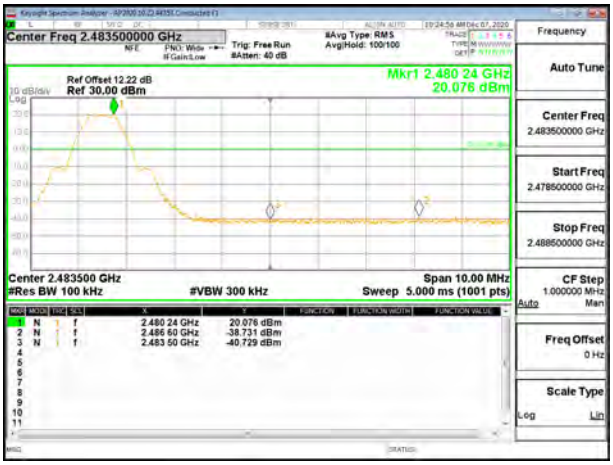
LOW CHANNEL , BANDEDGE ANT 3

LOW CHANNEL OUT-OF-BAND ANT 3



MID CHANNEL REFERENCE ANT 3

MID CHANNEL OUT-OF-BAND ANT 3



HIGH CHANNEL REFERENCE ANT 3

HIGH CHANNEL OUT-OF-BAND ANT 3

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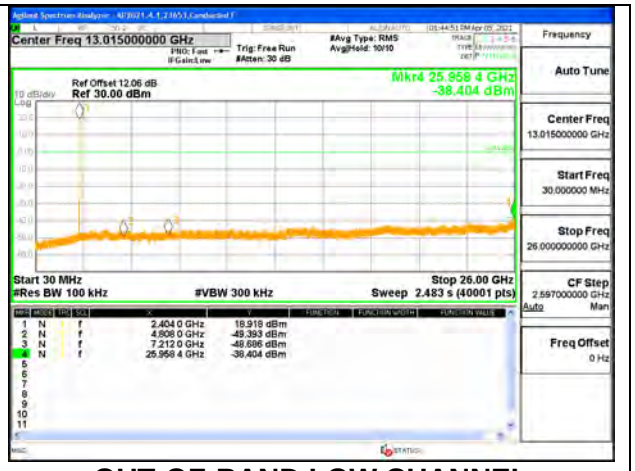
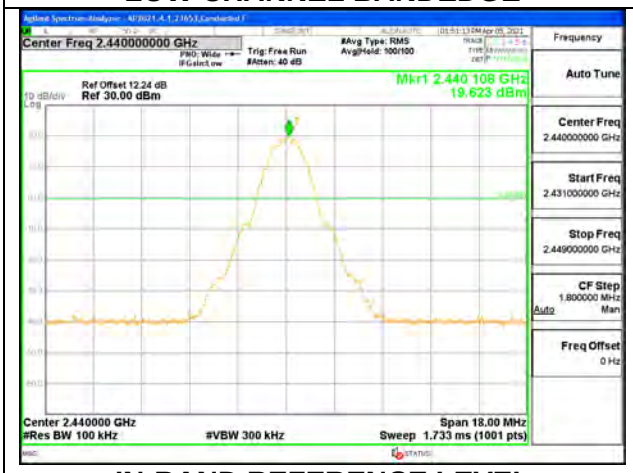
9.7.3. **HIGH POWER BLE (2Mbps)**

ANT 4

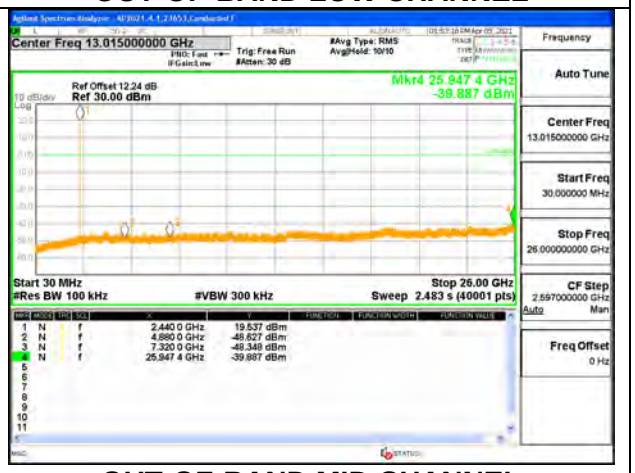
LOW CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL

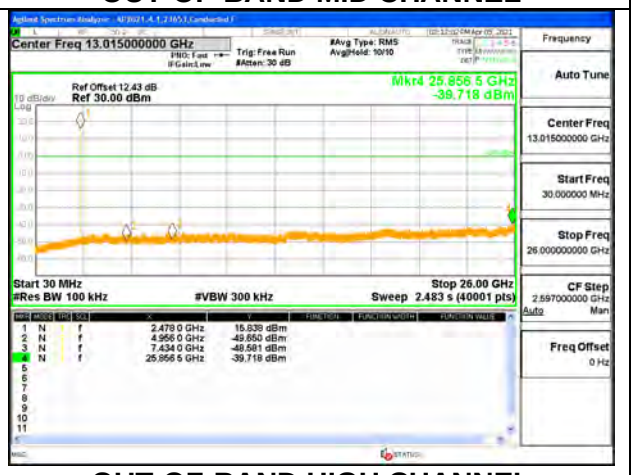


IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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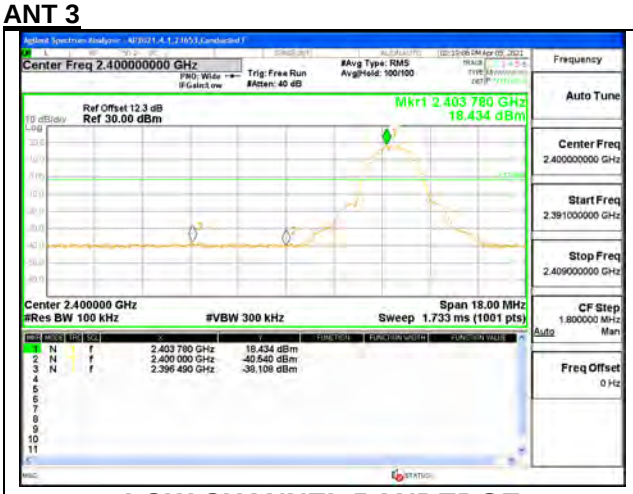
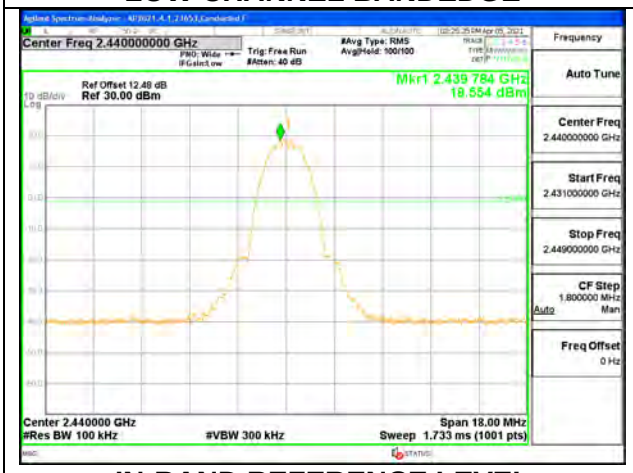
ANT 3

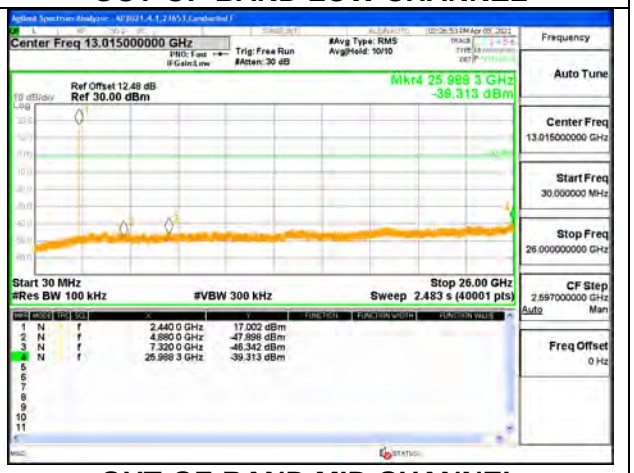


LOW CHANNEL BANDEDGE

OUT-OF-BAND LOW CHANNEL

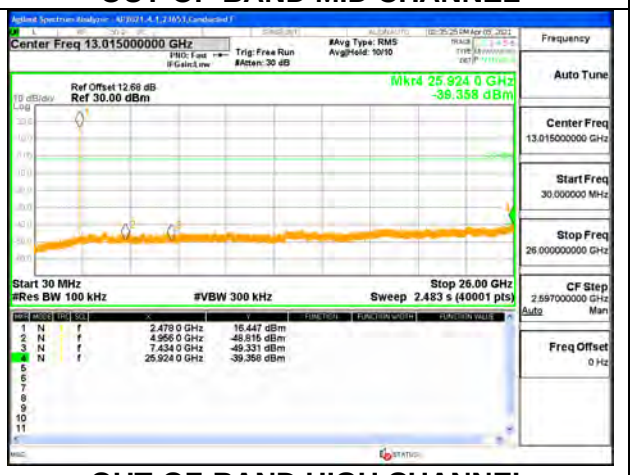


IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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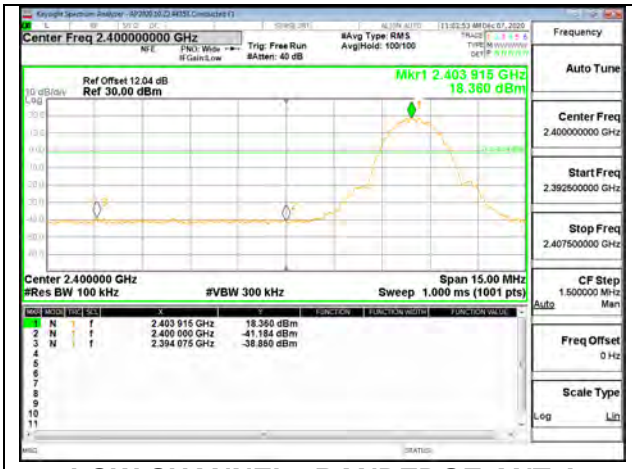
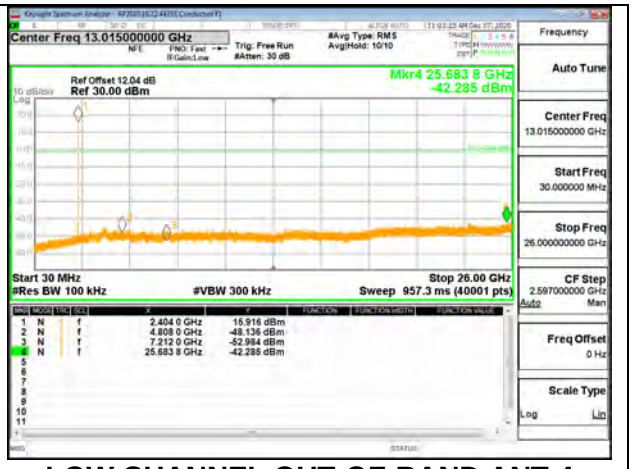
9.7.4. HIGH POWER BLE TXBF (2Mbps)

Note: Test procedures and setting are same as BLE normal mode.

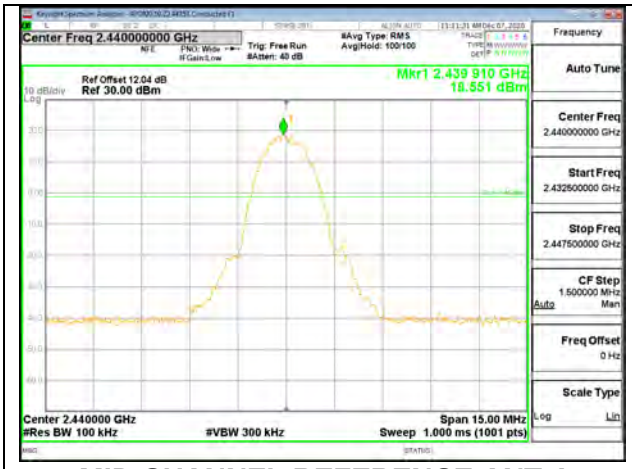
ANT 4 (2Mbps)



LOW CHANNEL , BANDEDGE ANT 4

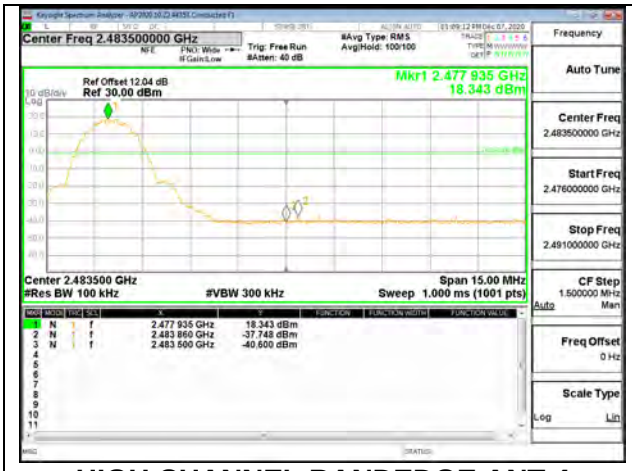


LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4

MID CHANNEL OUT-OF-BAND ANT 4



HIGH CHANNEL BANDEDGE ANT 4

HIGH CHANNEL OUT-OF-BAND ANT 4

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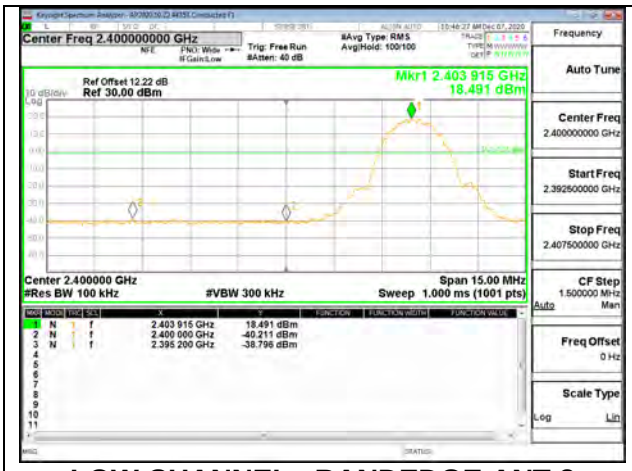
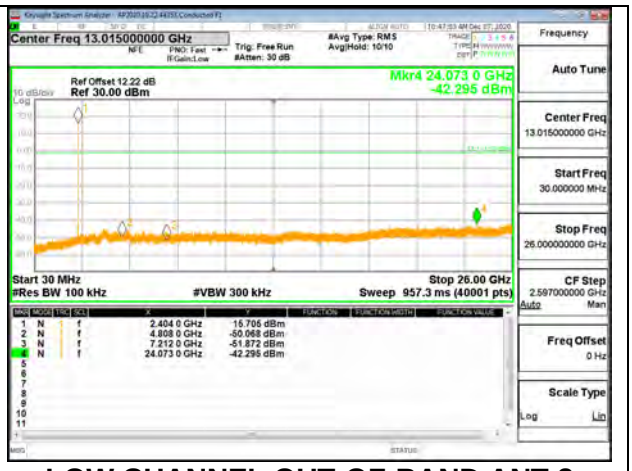
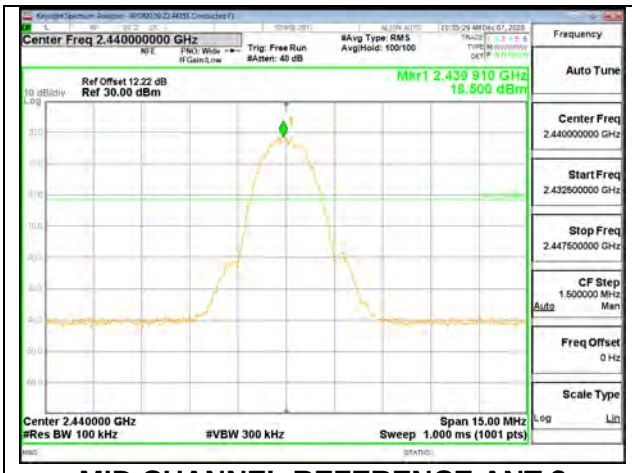
ANT 3 (2Mbps)



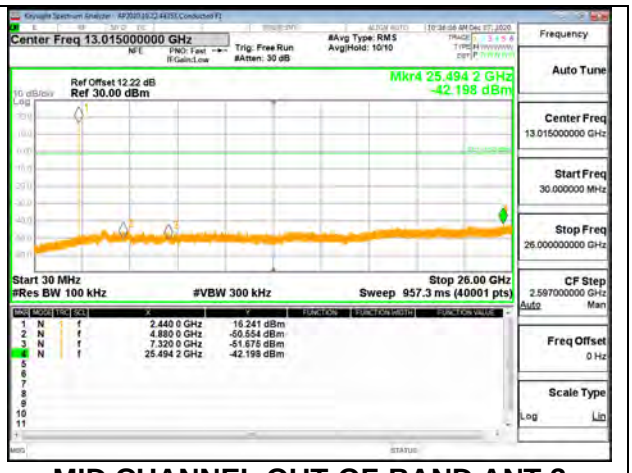
LOW CHANNEL , BANDEDGE ANT 3



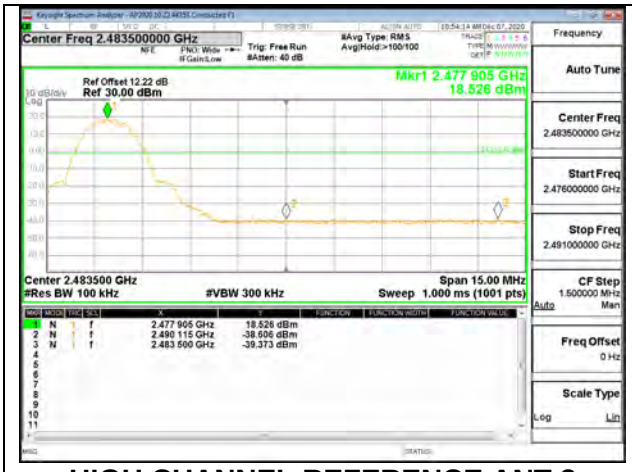
LOW CHANNEL OUT-OF-BAND ANT 3



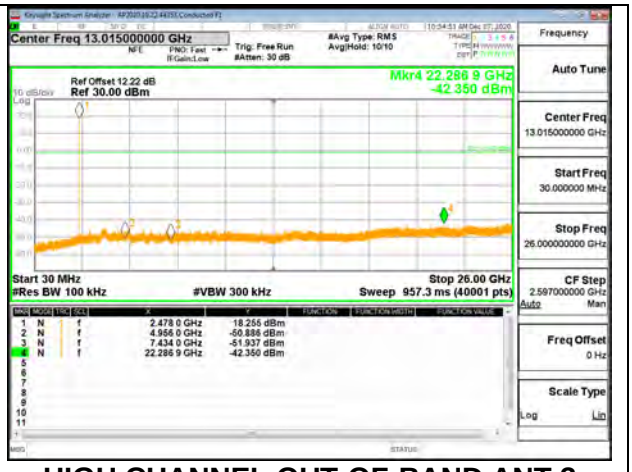
MID CHANNEL REFERENCE ANT 3



MID CHANNEL OUT-OF-BAND ANT 3



HIGH CHANNEL REFERENCE ANT 3



HIGH CHANNEL OUT-OF-BAND ANT 3

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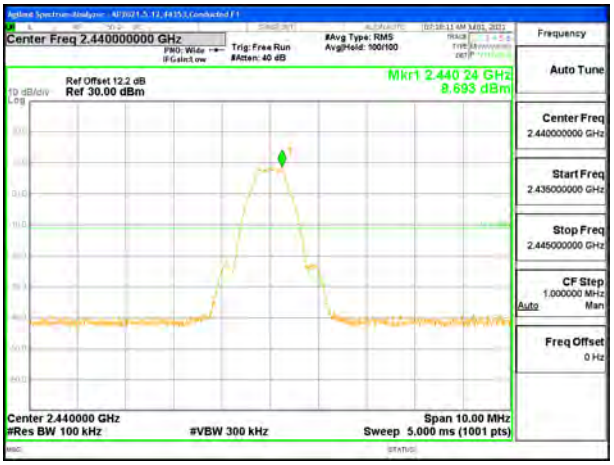
9.7.5. **LOW POWER BLE (1Mbps)**

ANT 4

LOW CHANNEL BANDEDGE

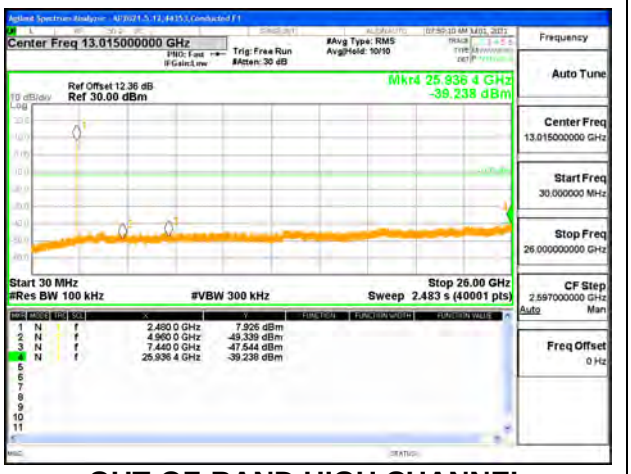
OUT-OF-BAND LOW CHANNEL



IN-BAND REFERENCE LEVEL

OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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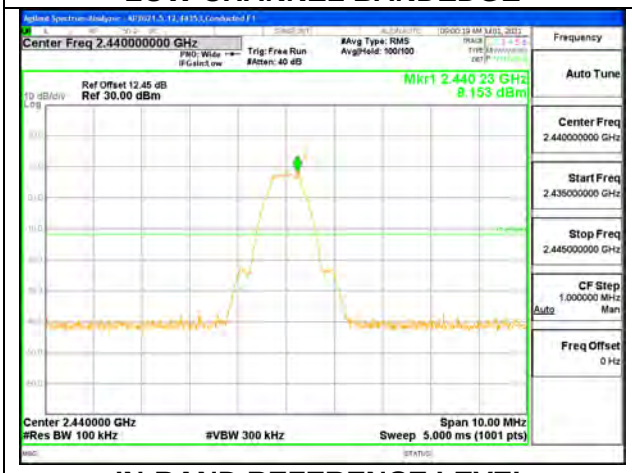
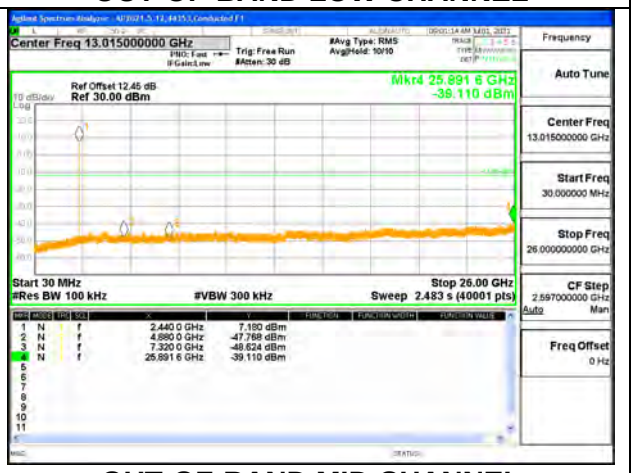
ANT 3

LOW CHANNEL BANDEDGE

OUT-OF-BAND LOW CHANNEL

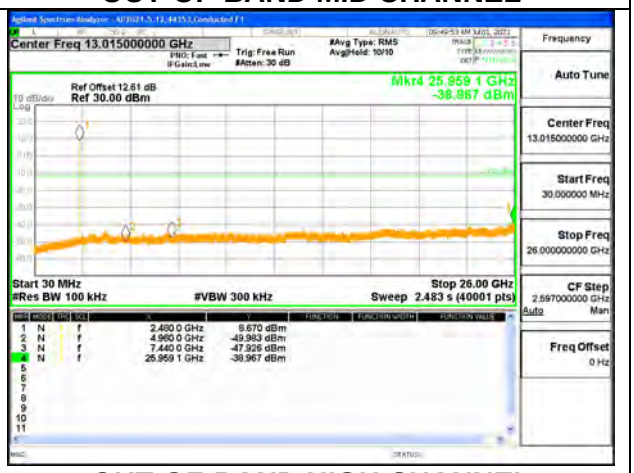


IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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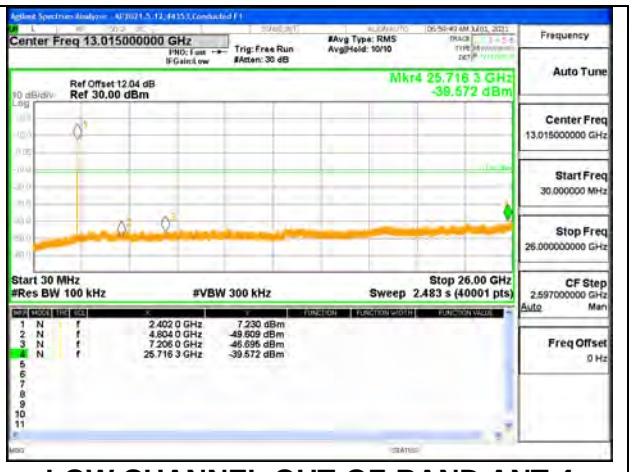
9.7.6. LOW POWER BLE TXBF (1Mbps)

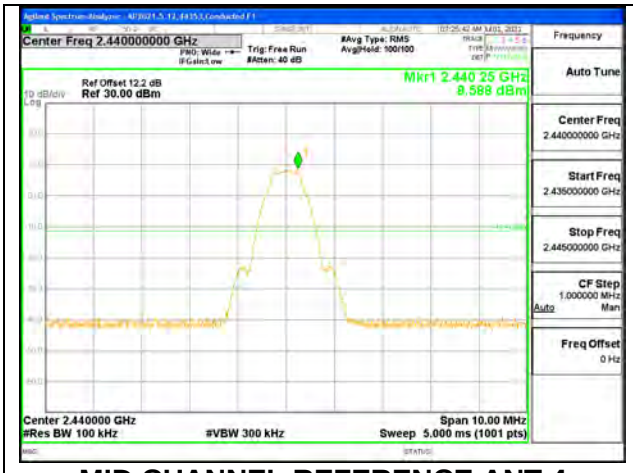
Note: Test procedures and setting are same as BLE normal mode.

ANT 4

LOW CHANNEL , BANDEDGE ANT 4

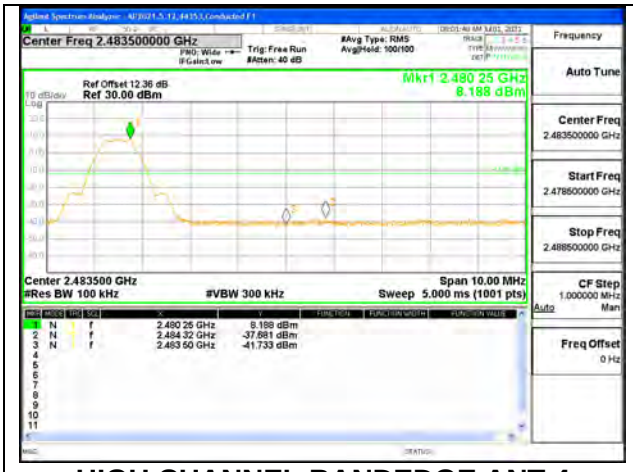


LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4

MID CHANNEL OUT-OF-BAND ANT 4



HIGH CHANNEL BANDEDGE ANT 4

HIGH CHANNEL OUT-OF-BAND ANT 4

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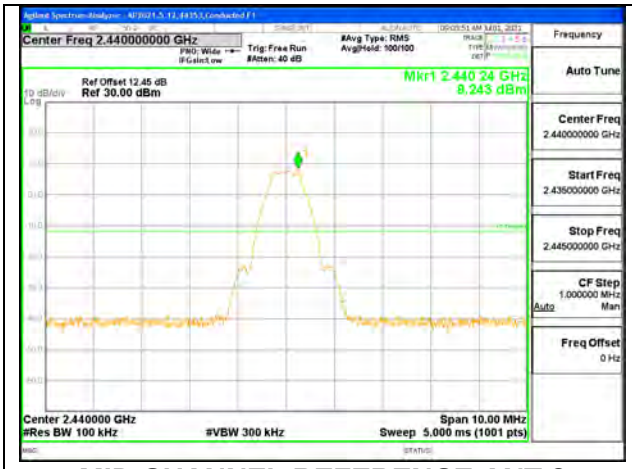
ANT 3 (1Mbps)

LOW CHANNEL , BANDEDGE ANT 3

LOW CHANNEL OUT-OF-BAND ANT 3



MID CHANNEL REFERENCE ANT 3

MID CHANNEL OUT-OF-BAND ANT 3

HIGH CHANNEL REFERENCE ANT 3

HIGH CHANNEL OUT-OF-BAND ANT 3

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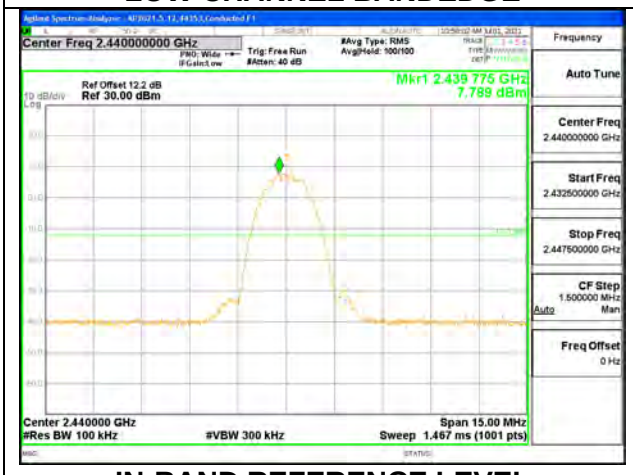
9.7.7. **LOW POWER BLE (2Mbps)**

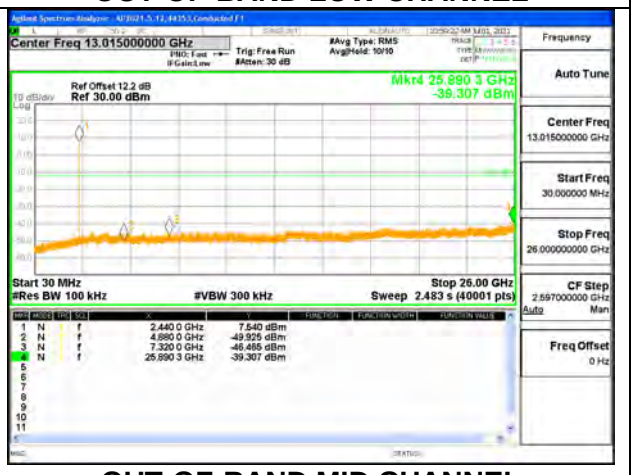
ANT 4

LOW CHANNEL BANDEDGE

OUT-OF-BAND LOW CHANNEL

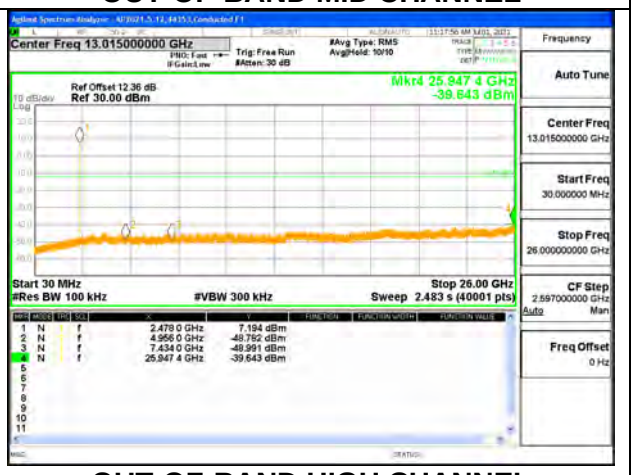


IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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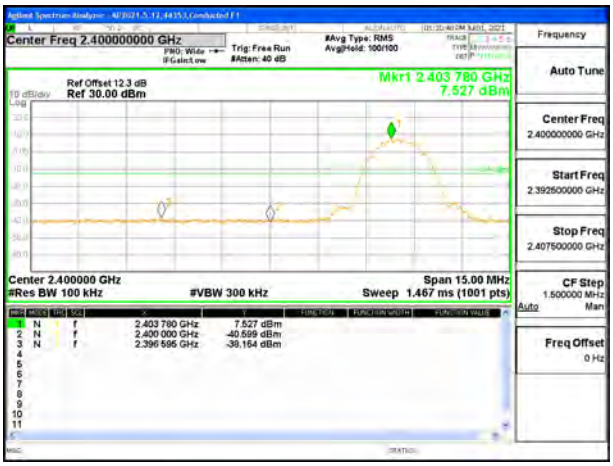
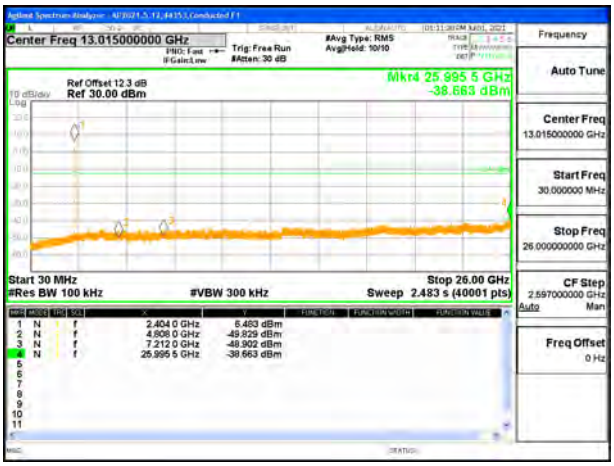
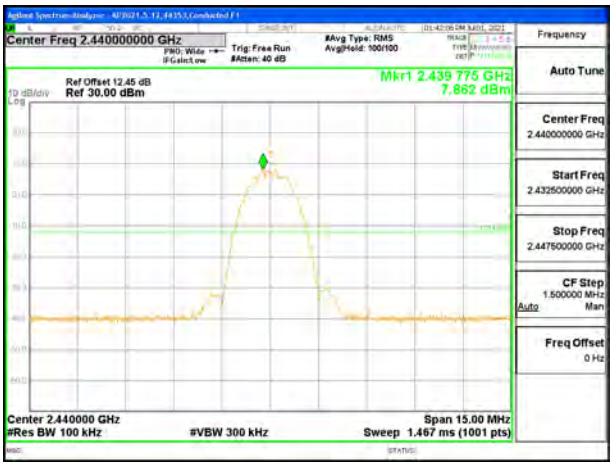
ANT 3



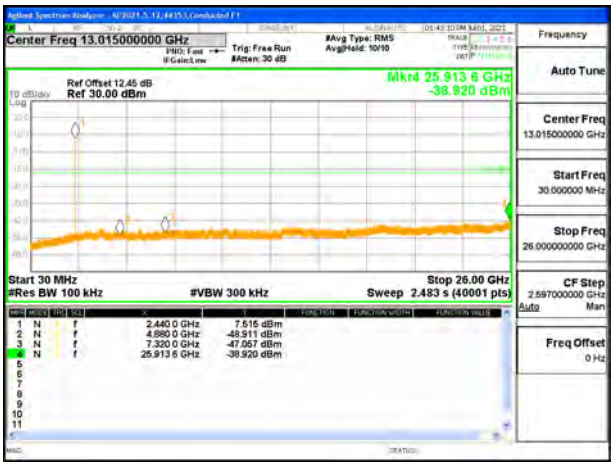
LOW CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL

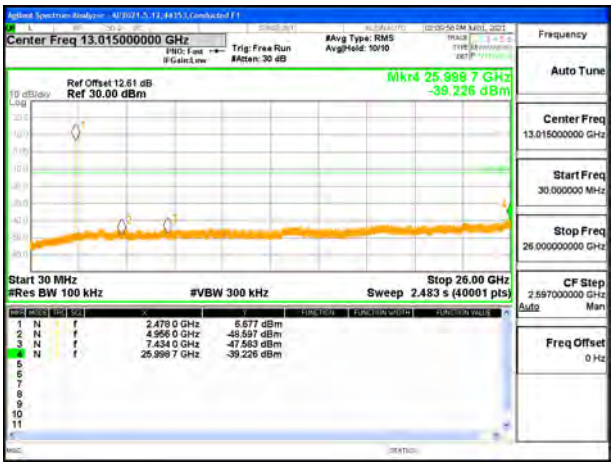


IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

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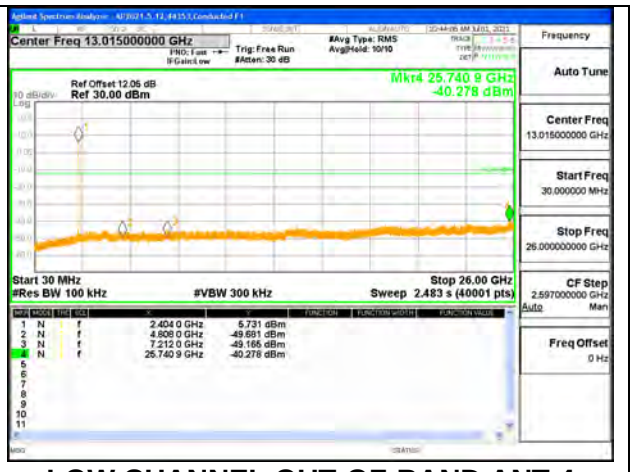
9.7.8. LOW POWER BLE TXBF (2Mbps)

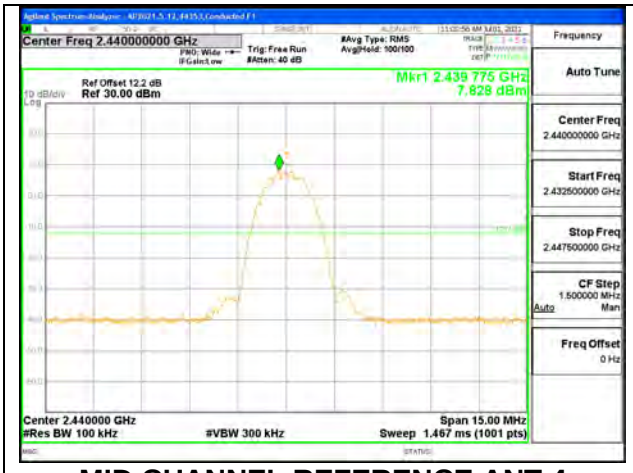
Note: Test procedures and setting are same as BLE normal mode.

ANT 4

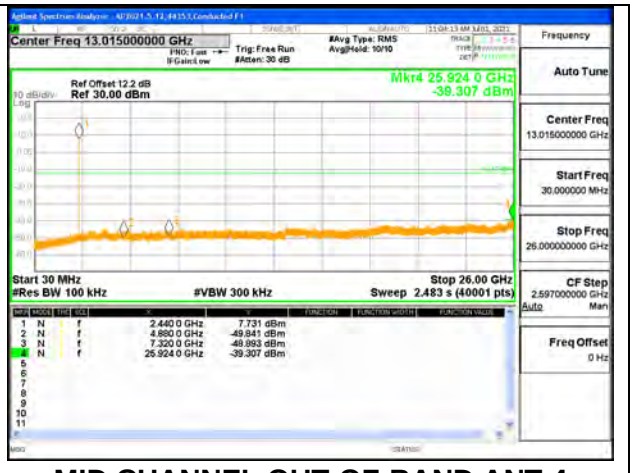
LOW CHANNEL , BANDEDGE ANT 4



LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4



MID CHANNEL OUT-OF-BAND ANT 4

HIGH CHANNEL BANDEDGE ANT 4

HIGH CHANNEL OUT-OF-BAND ANT 4

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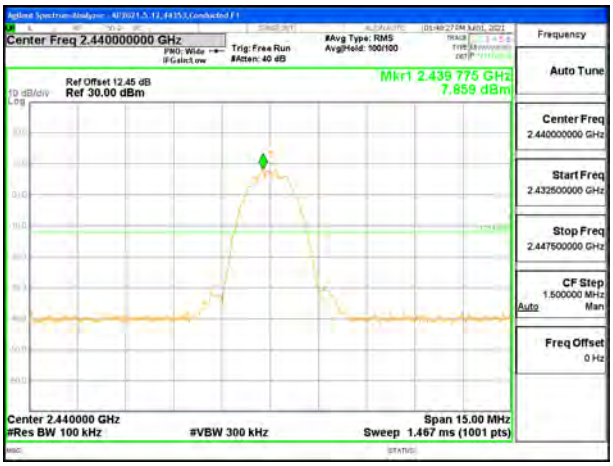
ANT 3 (2Mbps)

LOW CHANNEL , BANDEDGE ANT 3

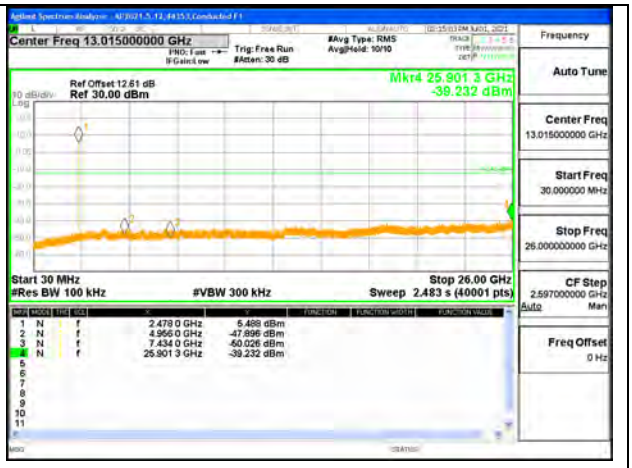
LOW CHANNEL OUT-OF-BAND ANT 3



MID CHANNEL REFERENCE ANT 3

MID CHANNEL OUT-OF-BAND ANT 3

HIGH CHANNEL REFERENCE ANT 3



HIGH CHANNEL OUT-OF-BAND ANT 3

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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

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

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. 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 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.

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KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

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.

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

RESULTS

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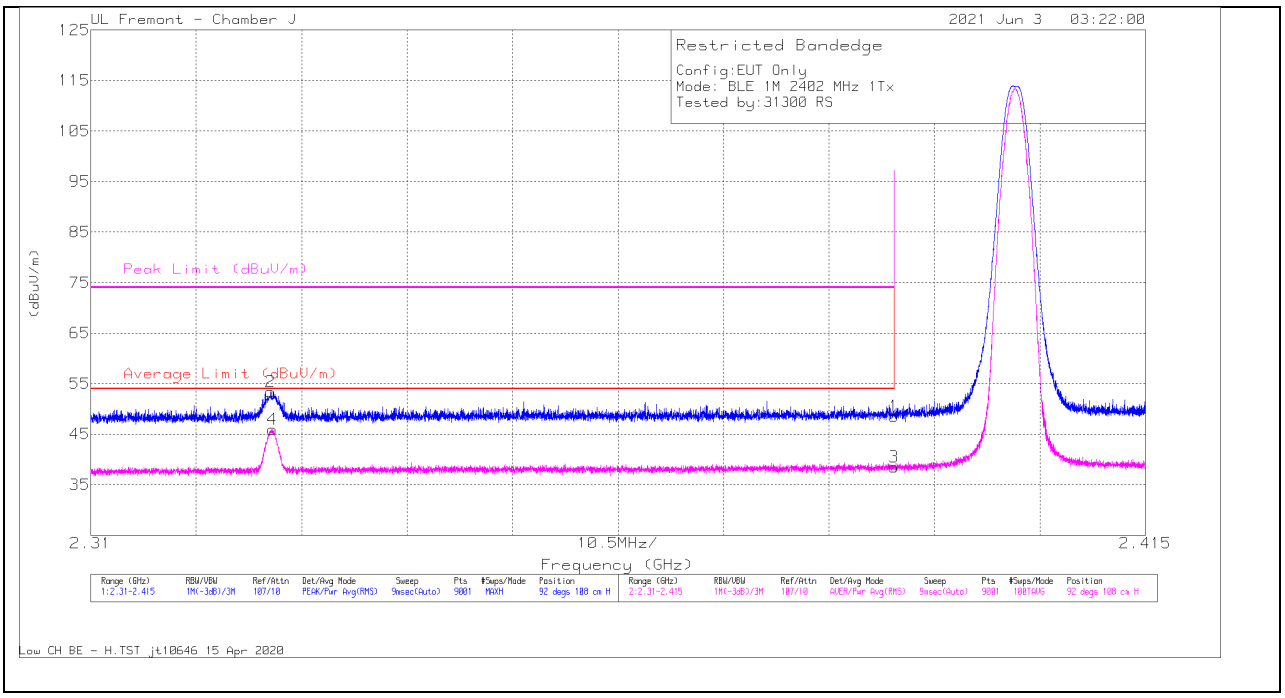
10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. HIGH POWER BLE (1Mbps)

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.63	Pk	32.1	-25.2	48.53	-	-	74	-25.47	92	108	H
2	* 2.32789	46.95	Pk	31.8	-25.3	53.45	-	-	74	-20.55	92	108	H
3	* 2.38999	31.55	RMS	32.1	-25.2	38.45	54	-15.55	-	-	92	108	H
4	* 2.32811	39.47	RMS	31.8	-25.3	45.97	54	-8.03	-	-	92	108	H

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

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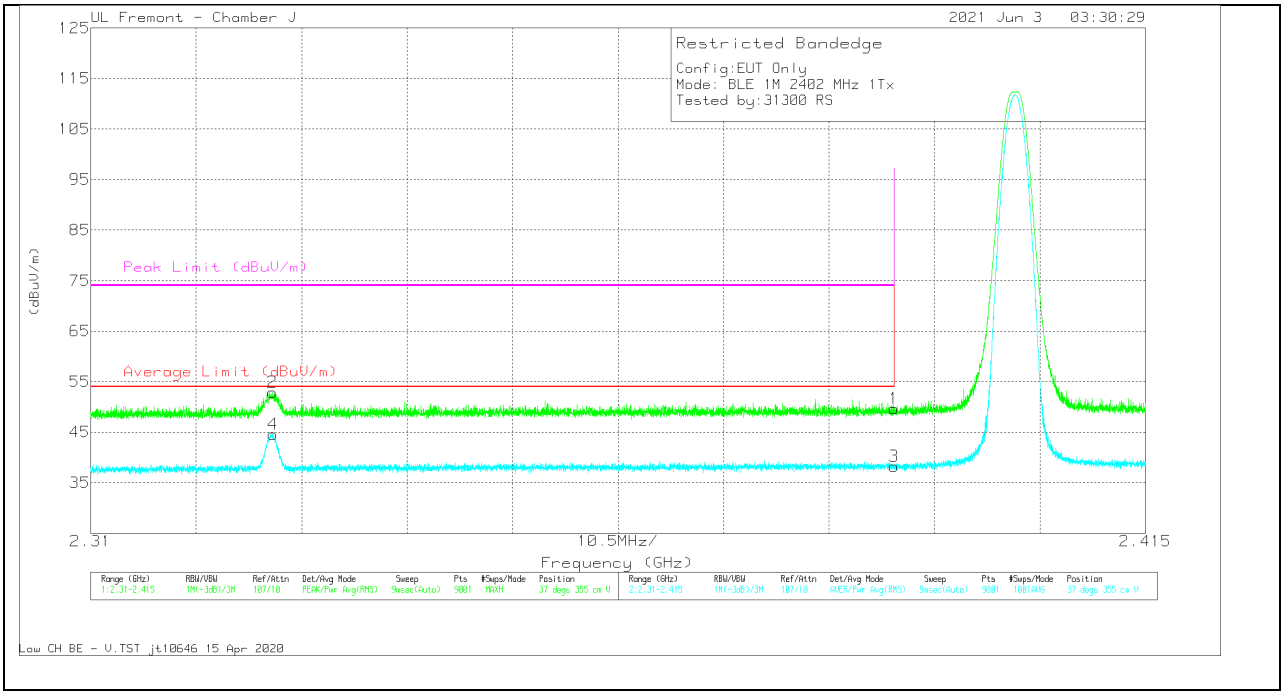
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	42.75	Pk	32.1	-25.2	49.65	-	-	74	-24.35	37	355	V
2	* 2.32807	46.42	Pk	31.8	-25.3	52.92	-	-	74	-21.08	37	355	V
3	* 2.38999	31.35	RMS	32.1	-25.2	38.25	54	-15.75	-	-	37	355	V
4	* 2.32813	38.12	RMS	31.8	-25.3	44.62	54	-9.38	-	-	37	355	V

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

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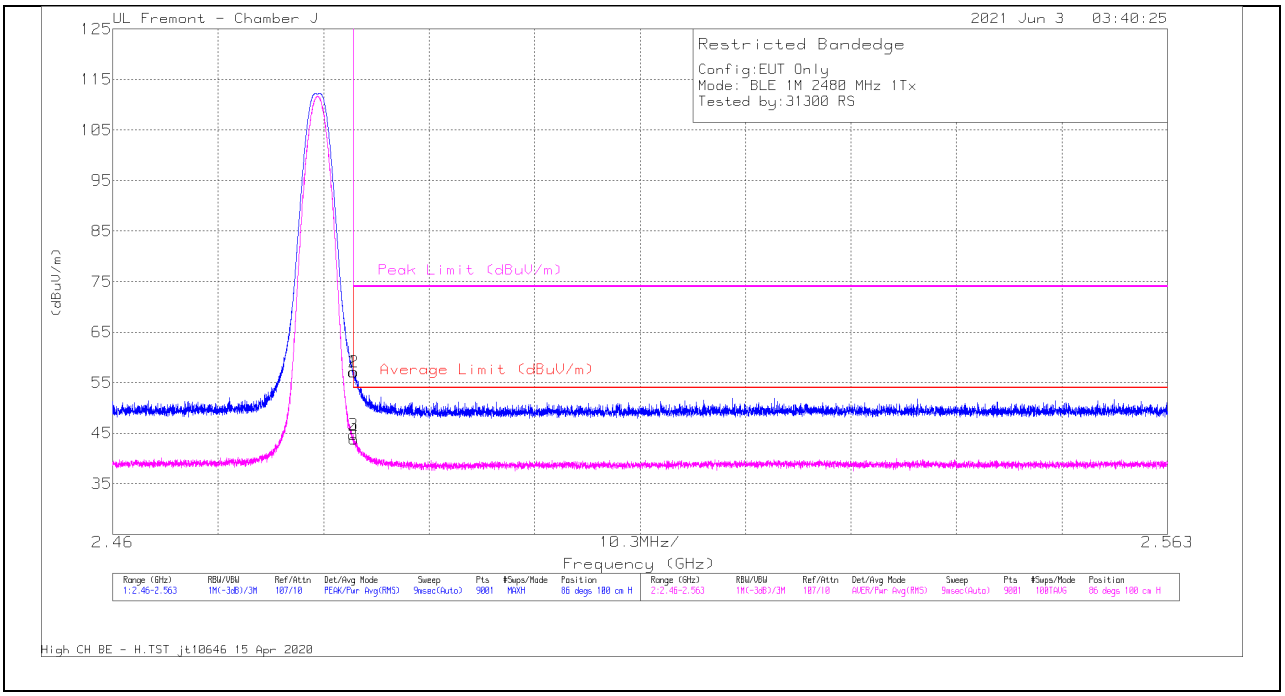
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	49.84	Pk	32.5	-25.2	57.14	-	-	74	-16.86	86	100	H
2	* 2.48355	49.8	Pk	32.5	-25.2	57.1	-	-	74	-16.9	86	100	H
3	* 2.48351	37.45	RMS	32.5	-25.2	44.75	54	-9.25	-	-	86	100	H
4	* 2.48353	36.58	RMS	32.5	-25.2	43.88	54	-10.12	-	-	86	100	H

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

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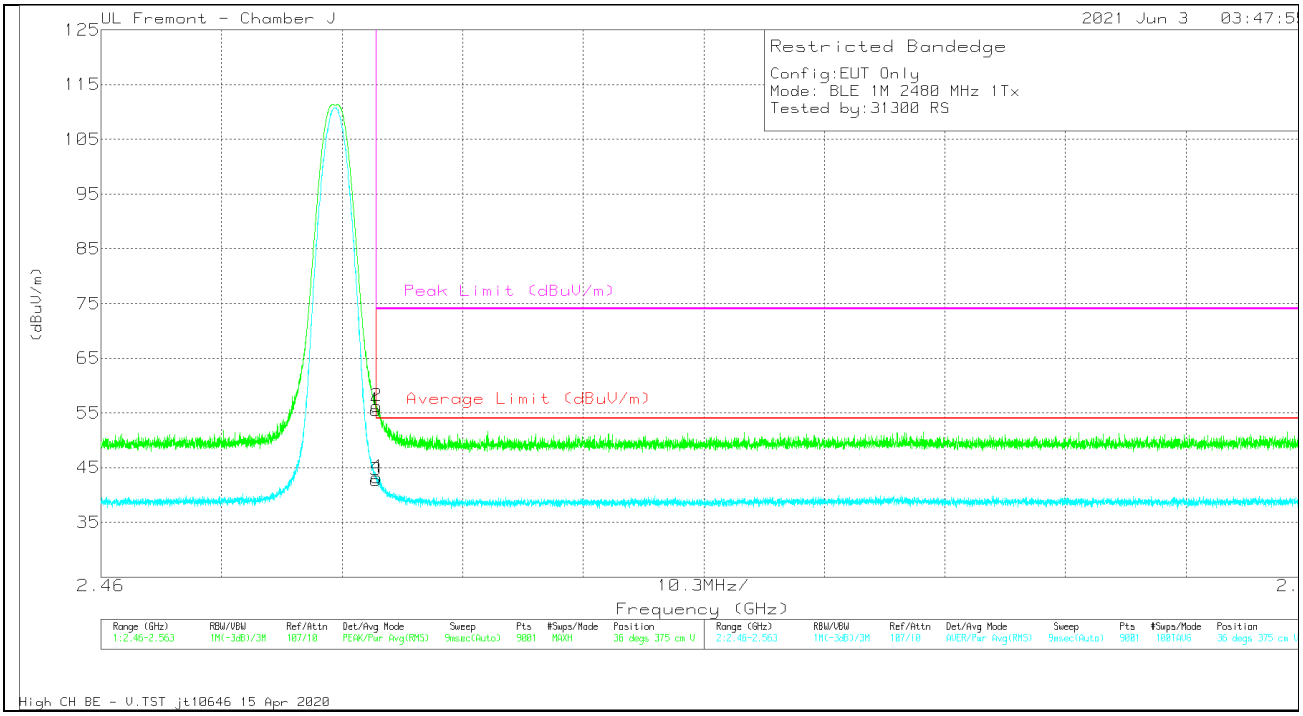
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	48.26	Pk	32.5	-25.2	55.56	-	-	74	-18.44	36	375	V
2	* 2.48356	48.91	Pk	32.5	-25.2	56.21	-	-	74	-17.79	36	375	V
3	* 2.48351	35.38	RMS	32.5	-25.2	42.68	54	-11.32	-	-	36	375	V
4	* 2.48354	35.96	RMS	32.5	-25.2	43.26	54	-10.74	-	-	36	375	V

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

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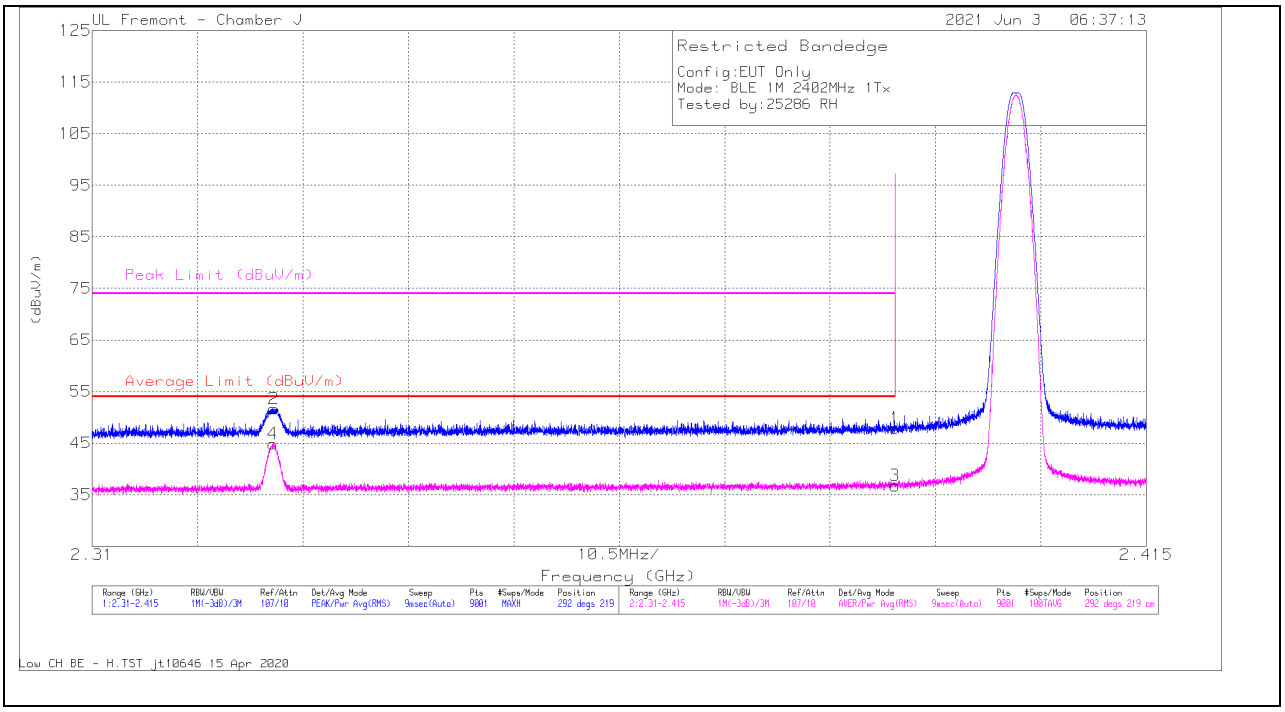
ANT 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	40.99	Pk	32.1	-25.2	47.89	-	-	74	-26.11	292	219	H
2	* 2.3281	45.16	Pk	31.8	-25.3	51.66	-	-	74	-22.34	292	219	H
3	* 2.38999	29.86	RMS	32.1	-25.2	36.76	54	-17.24	-	-	292	219	H
4	* 2.32801	38.36	RMS	31.8	-25.3	44.86	54	-9.14	-	-	292	219	H

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

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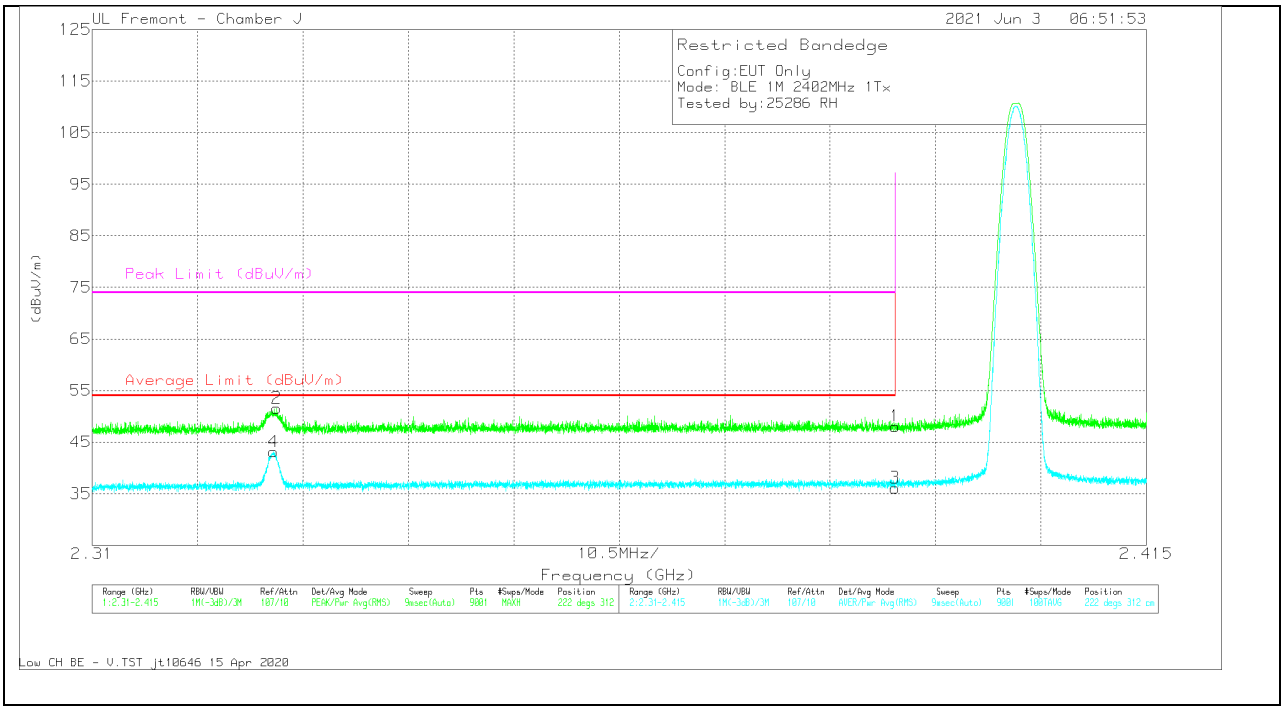
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.16	Pk	32.1	-25.2	48.06	-	-	74	-25.94	222	312	V
2	* 2.32838	45.07	Pk	31.8	-25.3	51.57	-	-	74	-22.43	222	312	V
3	* 2.38999	29.2	RMS	32.1	-25.2	36.1	54	-17.9	-	-	222	312	V
4	* 2.32805	36.61	RMS	31.8	-25.3	43.11	54	-10.89	-	-	222	312	V

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

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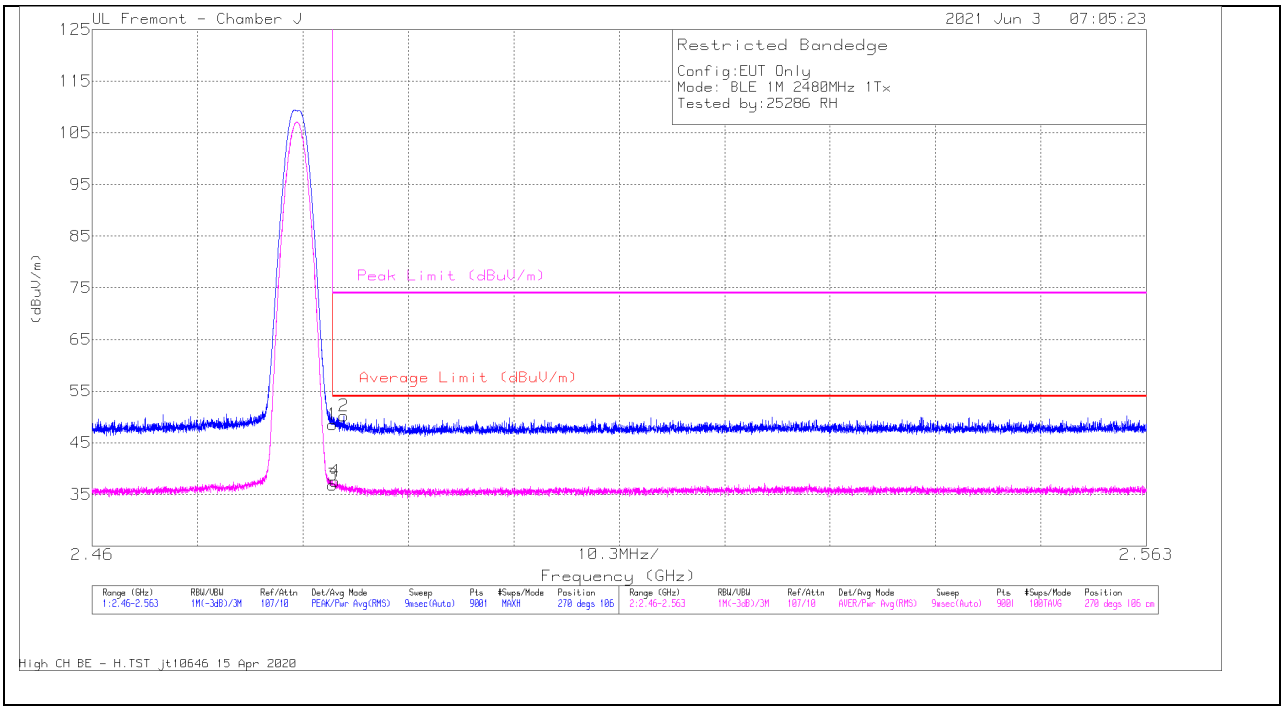
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	41.21	Pk	32.5	-25.2	48.51	-	-	74	-25.49	270	106	H
2	* 2.48459	42.91	Pk	32.5	-25.2	50.21	-	-	74	-23.79	270	106	H
3	* 2.48351	29.54	RMS	32.5	-25.2	36.84	54	-17.16	-	-	270	106	H
4	* 2.48373	30.27	RMS	32.5	-25.2	37.57	54	-16.43	-	-	270	106	H

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

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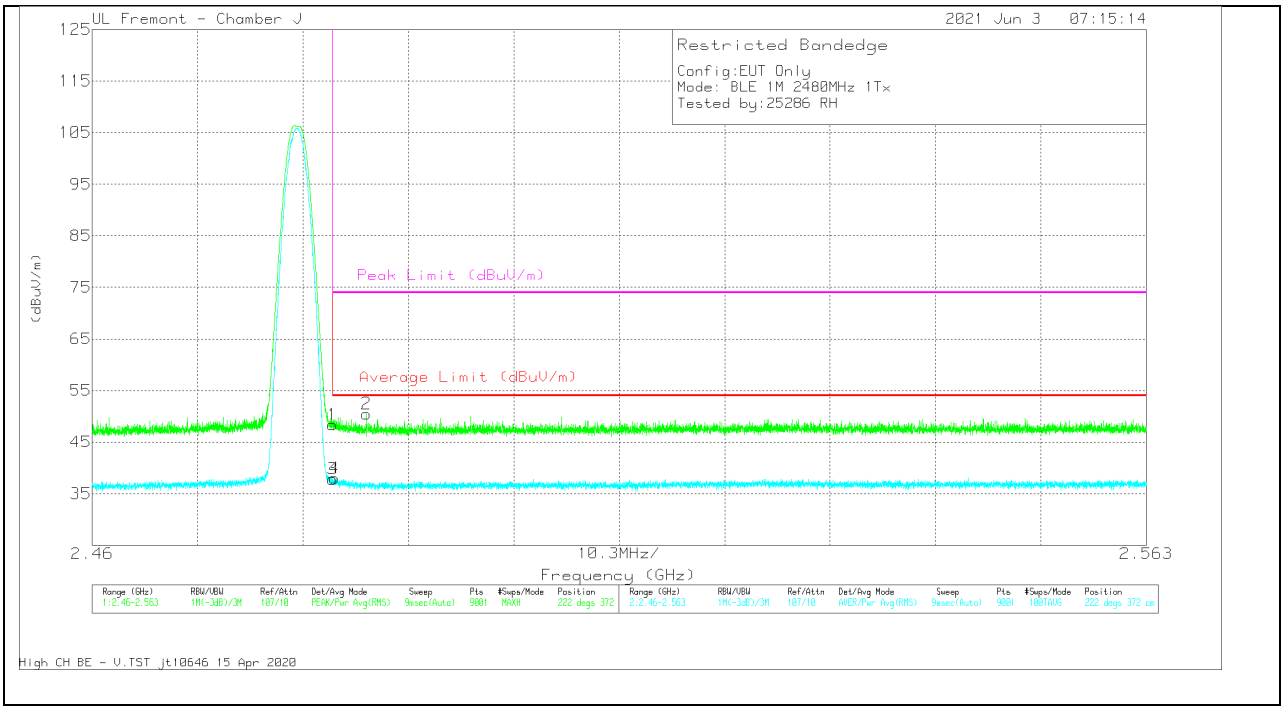
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	41.07	Pk	32.5	-25.2	48.37	-	-	74	-25.63	222	372	V
2	* 2.48681	43.17	Pk	32.5	-25.2	50.47	-	-	74	-23.53	222	372	V
3	* 2.48351	30.54	RMS	32.5	-25.2	37.84	54	-16.16	-	-	222	372	V
4	* 2.48369	30.72	RMS	32.5	-25.2	38.02	54	-15.98	-	-	222	372	V

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

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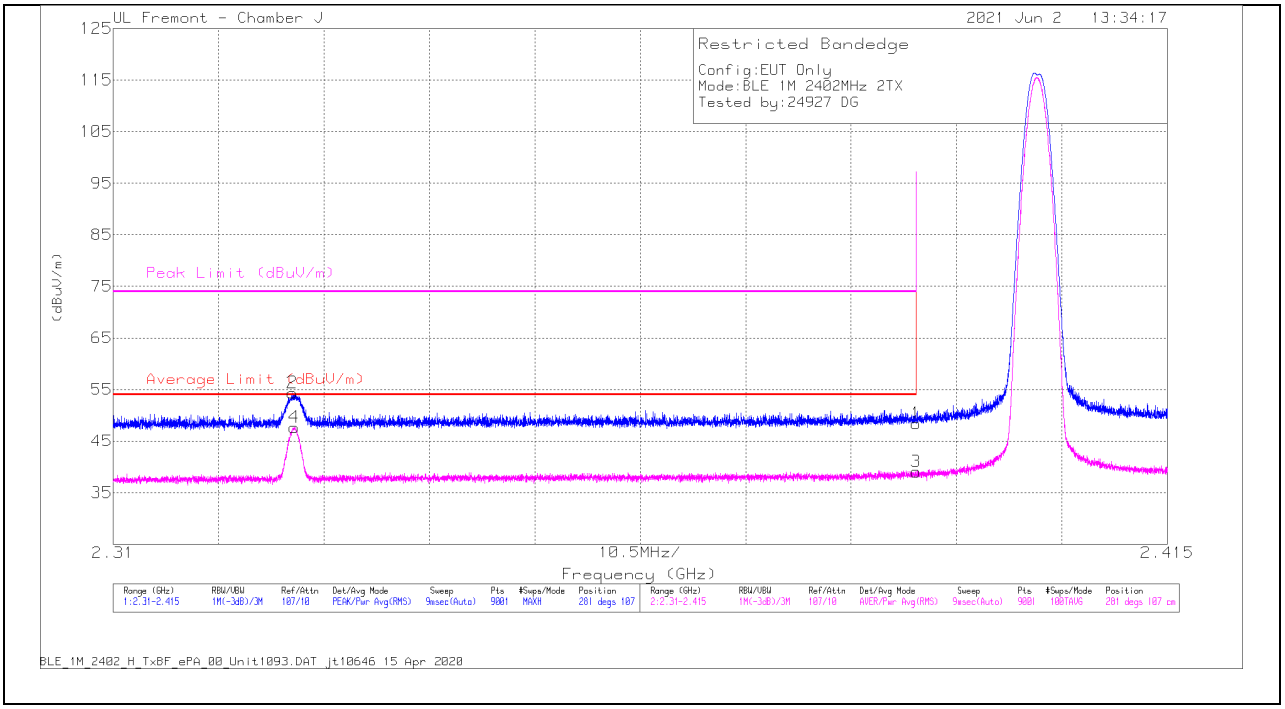
10.2.2. HIGH POWER BLE TXBF (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.53	Pk	32.1	-25.2	48.43	-	-	74	-25.57	281	107	H
2	* 2.32785	47.88	Pk	31.8	-25.3	54.38	-	-	74	-19.62	281	107	H
3	* 2.38999	32.18	RMS	32.1	-25.2	39.08	54	-14.92	-	-	281	107	H
4	* 2.32804	41.18	RMS	31.8	-25.3	47.68	54	-6.32	-	-	281	107	H

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

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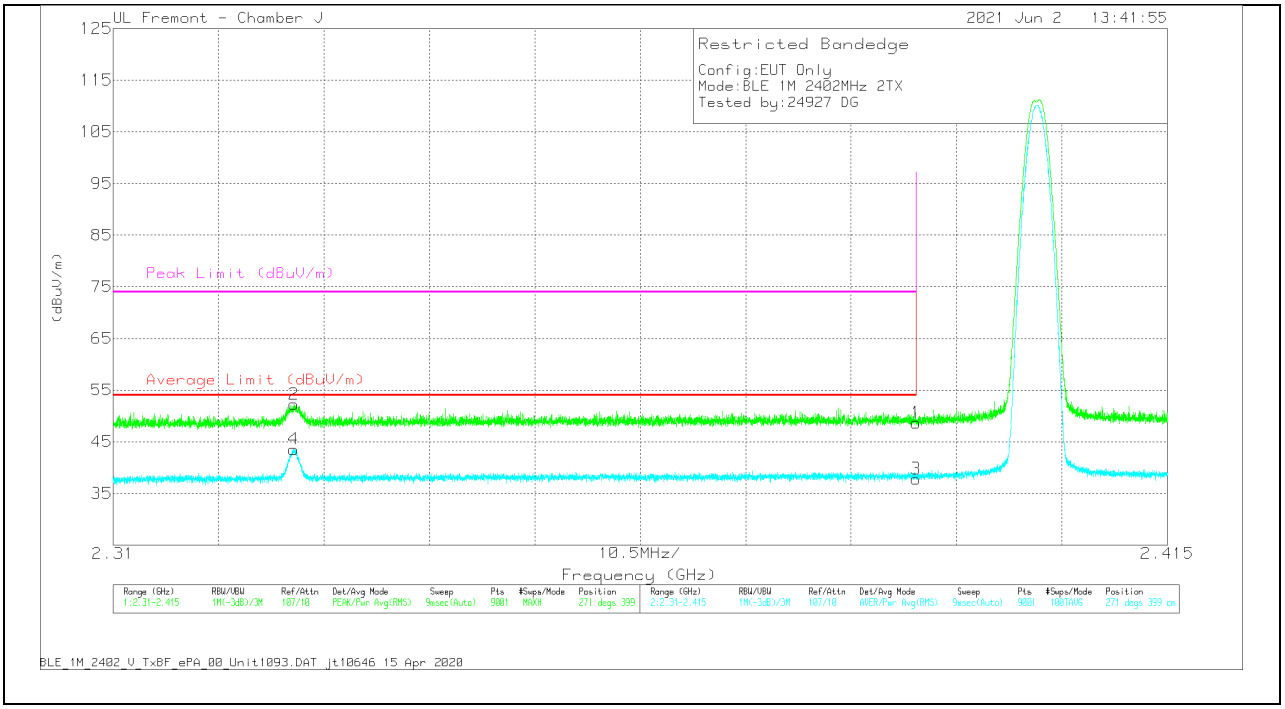
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.79	Pk	32.1	-25.2	48.69	-	-	74	-25.31	271	399	V
2	* 2.328	45.74	Pk	31.8	-25.3	52.24	-	-	74	-21.76	271	399	V
3	* 2.38999	30.89	RMS	32.1	-25.2	37.79	54	-16.21	-	-	271	399	V
4	* 2.32797	37.06	RMS	31.8	-25.3	43.56	54	-10.44	-	-	271	399	V

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

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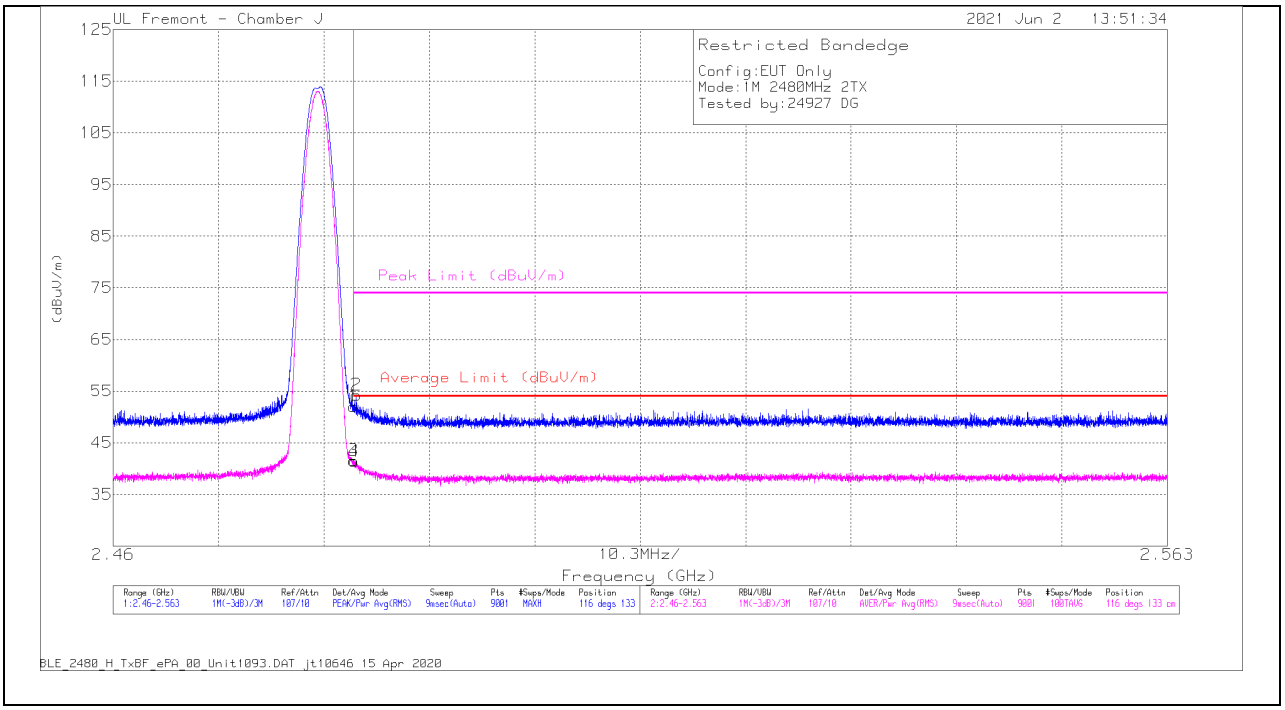
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	44.75	Pk	32.5	-25.2	52.05	-	-	74	-21.95	116	133	H
2	* 2.48376	46.95	Pk	32.5	-25.2	54.25	-	-	74	-19.75	116	133	H
3	* 2.48351	34.26	RMS	32.5	-25.2	41.56	54	-12.44	-	-	116	133	H
4	* 2.48356	34.1	RMS	32.5	-25.2	41.4	54	-12.6	-	-	116	133	H

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

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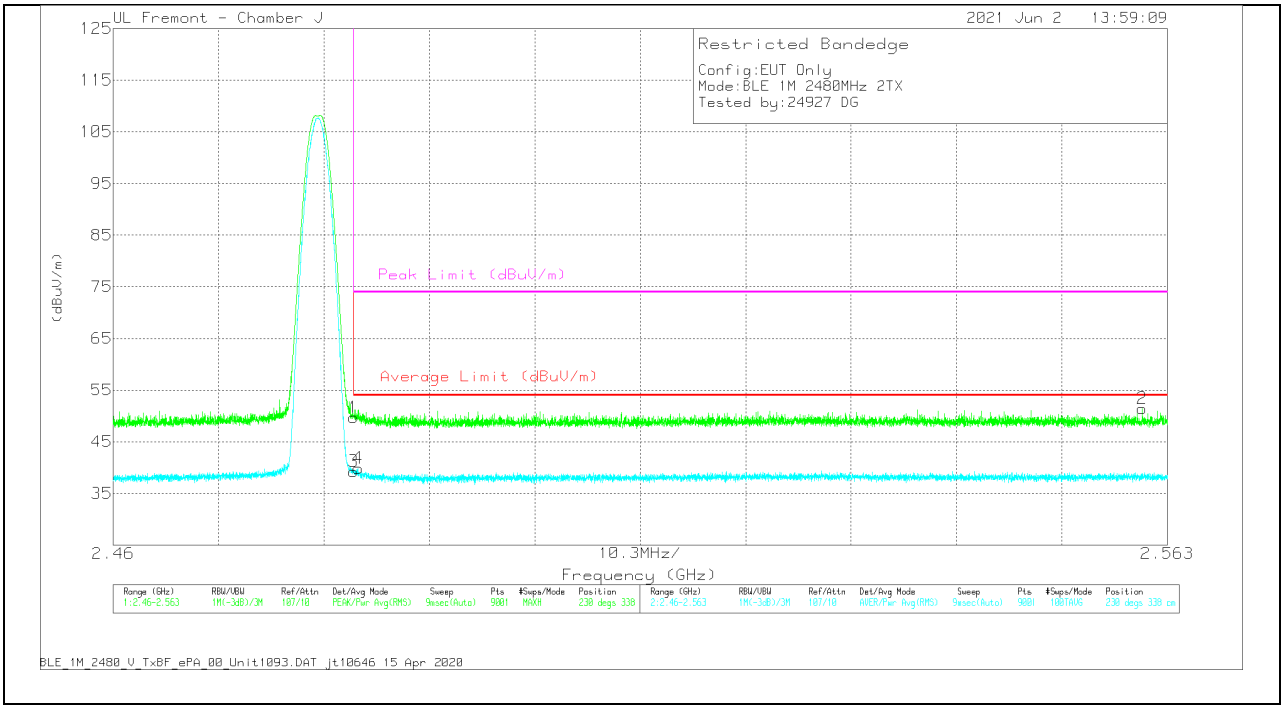
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.38	Pk	32.5	-25.2	49.68	-	-	74	-24.32	230	338	V
2	2.56056	43.92	Pk	32.6	-25.1	51.42	-	-	74	-22.58	230	338	V
3	* 2.48351	31.94	RMS	32.5	-25.2	39.24	54	-14.76	-	-	230	338	V
4	* 2.48394	32.57	RMS	32.5	-25.2	39.87	54	-14.13	-	-	230	338	V

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

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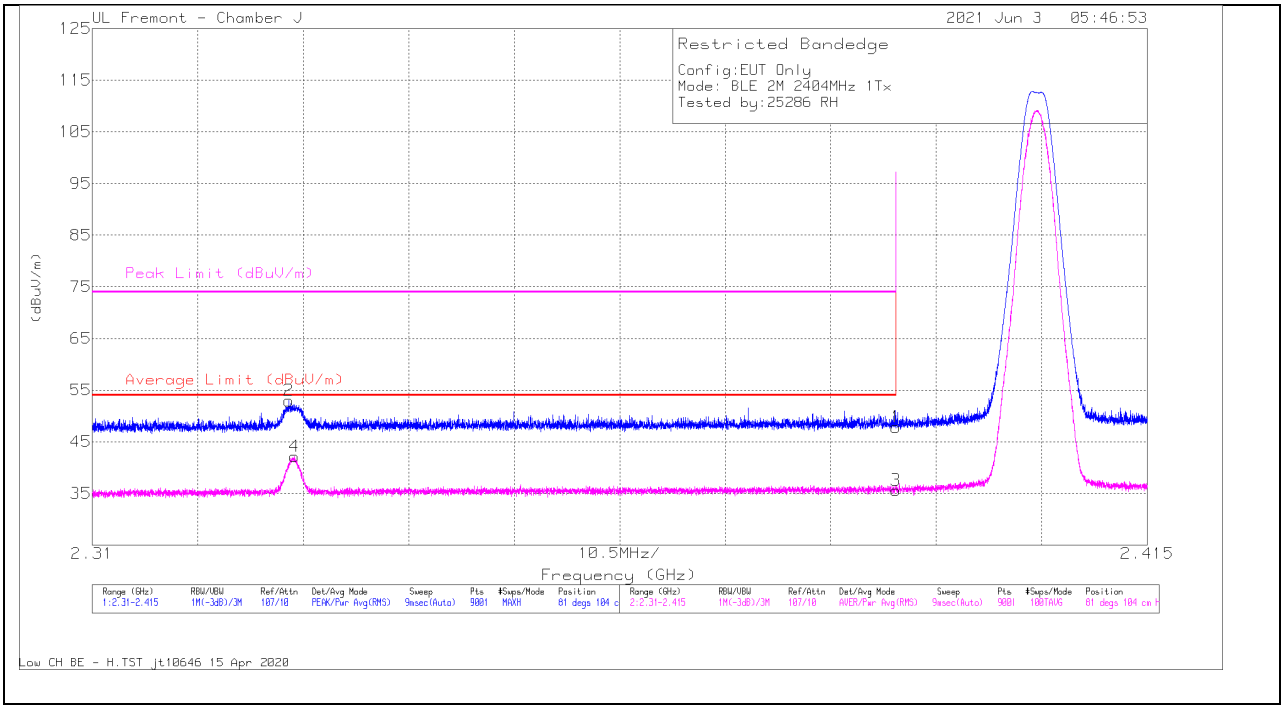
10.2.3. HIGH POWER BLE (2Mbps)

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	40.94	Pk	32.1	-25.2	47.84	-	-	74	-26.16	81	104	H
2	* 2.32954	46.46	Pk	31.8	-25.3	52.96	-	-	74	-21.04	81	104	H
3	* 2.38999	28.69	RMS	32.1	-25.2	35.59	54	-18.41	-	-	81	104	H
4	* 2.33015	35.65	RMS	31.8	-25.3	42.15	54	-11.85	-	-	81	104	H

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

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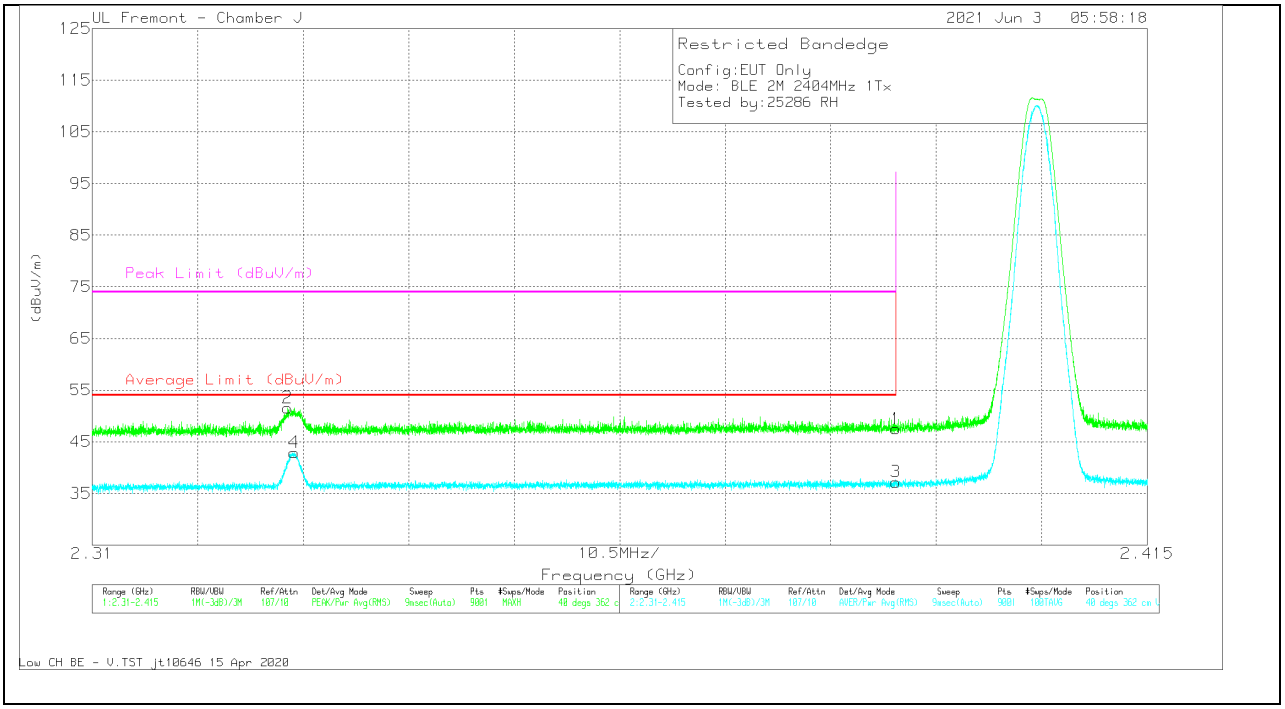
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	40.59	Pk	32.1	-25.2	47.49	-	-	74	-26.51	40	362	V
2	* 2.32946	45.06	Pk	31.8	-25.3	51.56	-	-	74	-22.44	40	362	V
3	* 2.38999	30.32	RMS	32.1	-25.2	37.22	54	-16.78	-	-	40	362	V
4	* 2.3301	36.4	RMS	31.8	-25.3	42.9	54	-11.1	-	-	40	362	V

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

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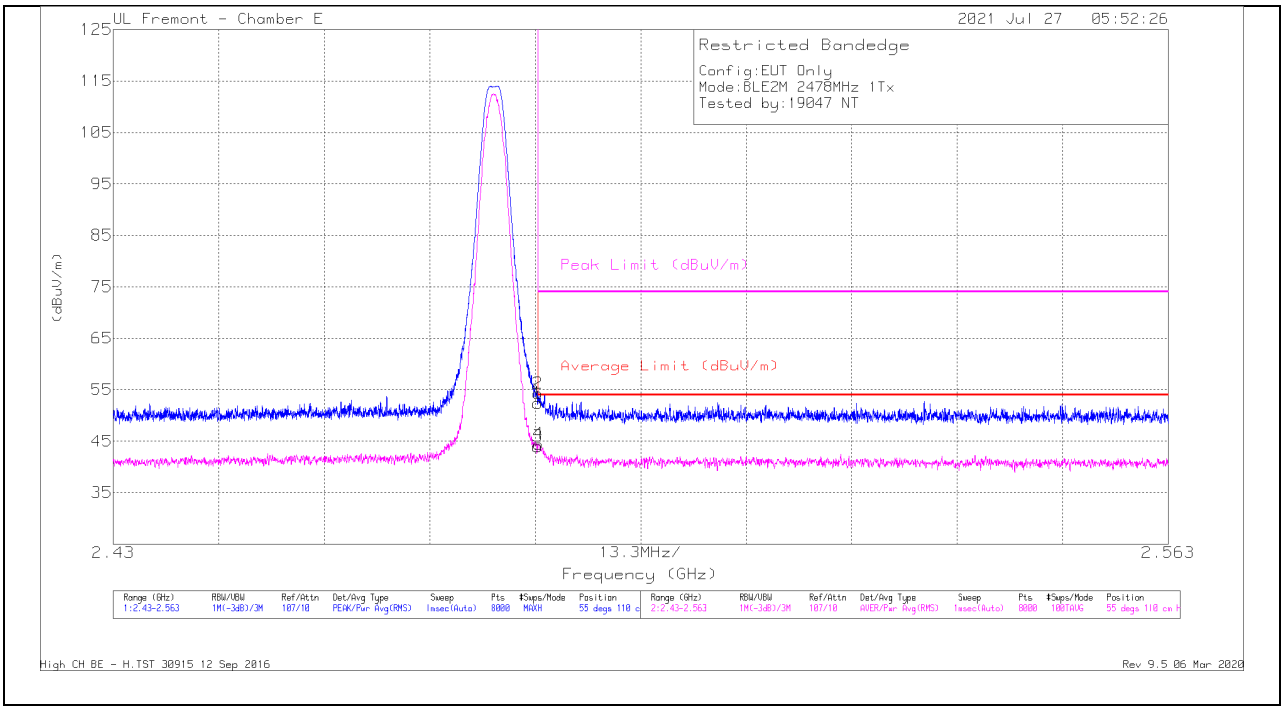
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	45.23	Pk	32.6	-25.4	52.43	-	-	74	-21.57	55	110	H
3	* 2.48351	36.8	RMS	32.6	-25.4	44	54	-10	-	-	55	110	H
2	* 2.48354	47.09	Pk	32.6	-25.4	54.29	-	-	74	-19.71	55	110	H
4	* 2.48364	37.28	RMS	32.6	-25.4	44.48	54	-9.52	-	-	55	110	H

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

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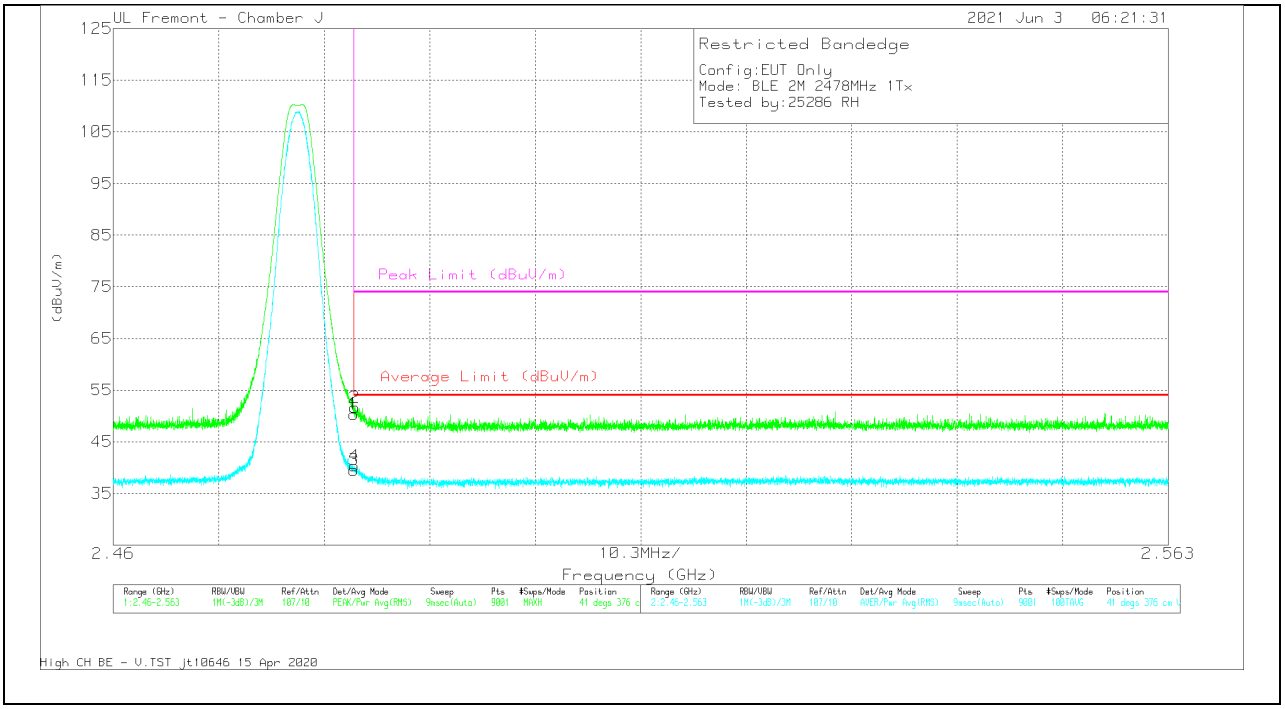
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.03	Pk	32.5	-25.2	50.33	-	-	74	-23.67	41	376	V
2	* 2.48359	44.36	Pk	32.5	-25.2	51.66	-	-	74	-22.34	41	376	V
3	* 2.48351	32.25	RMS	32.5	-25.2	39.55	54	-14.45	-	-	41	376	V
4	* 2.48353	33.01	RMS	32.5	-25.2	40.31	54	-13.69	-	-	41	376	V

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

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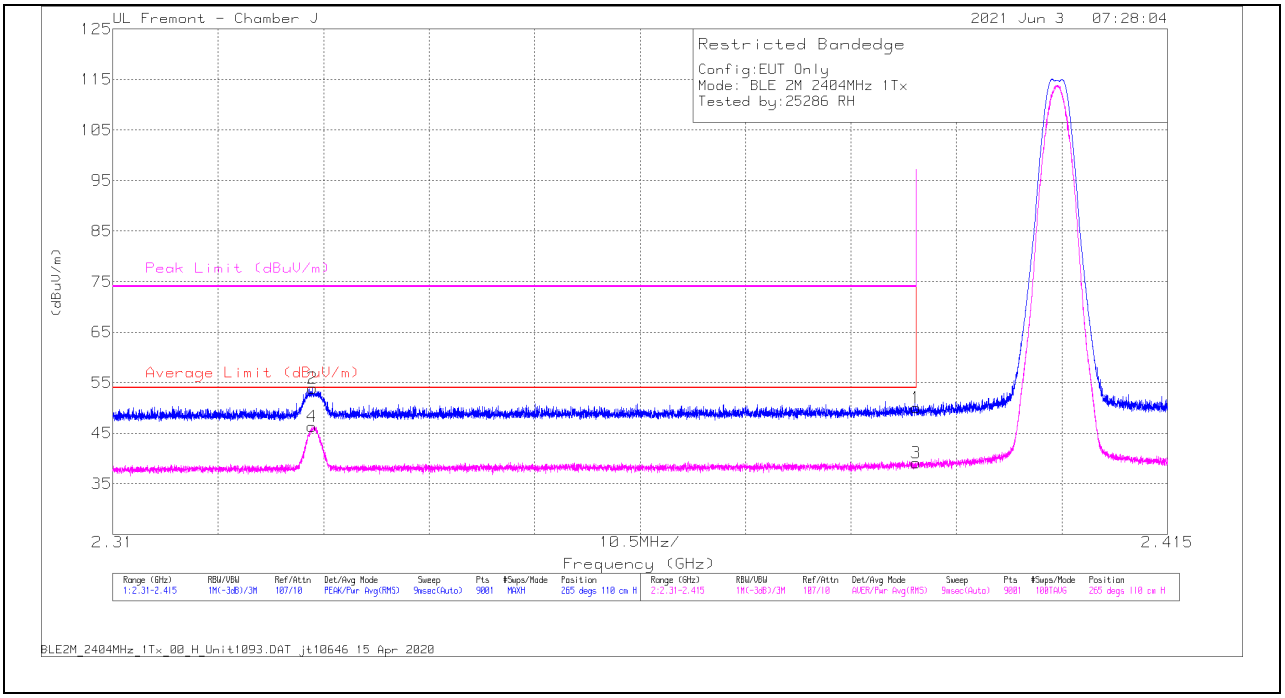
ANT 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	43.16	Pk	32.1	-25.2	50.06	-	-	74	-23.94	265	110	H
2	* 2.3299	47.35	Pk	31.8	-25.3	53.85	-	-	74	-20.15	265	110	H
3	* 2.38999	32.19	RMS	32.1	-25.2	39.09	54	-14.91	-	-	265	110	H
4	* 2.32981	39.84	RMS	31.8	-25.3	46.34	54	-7.66	-	-	265	110	H

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

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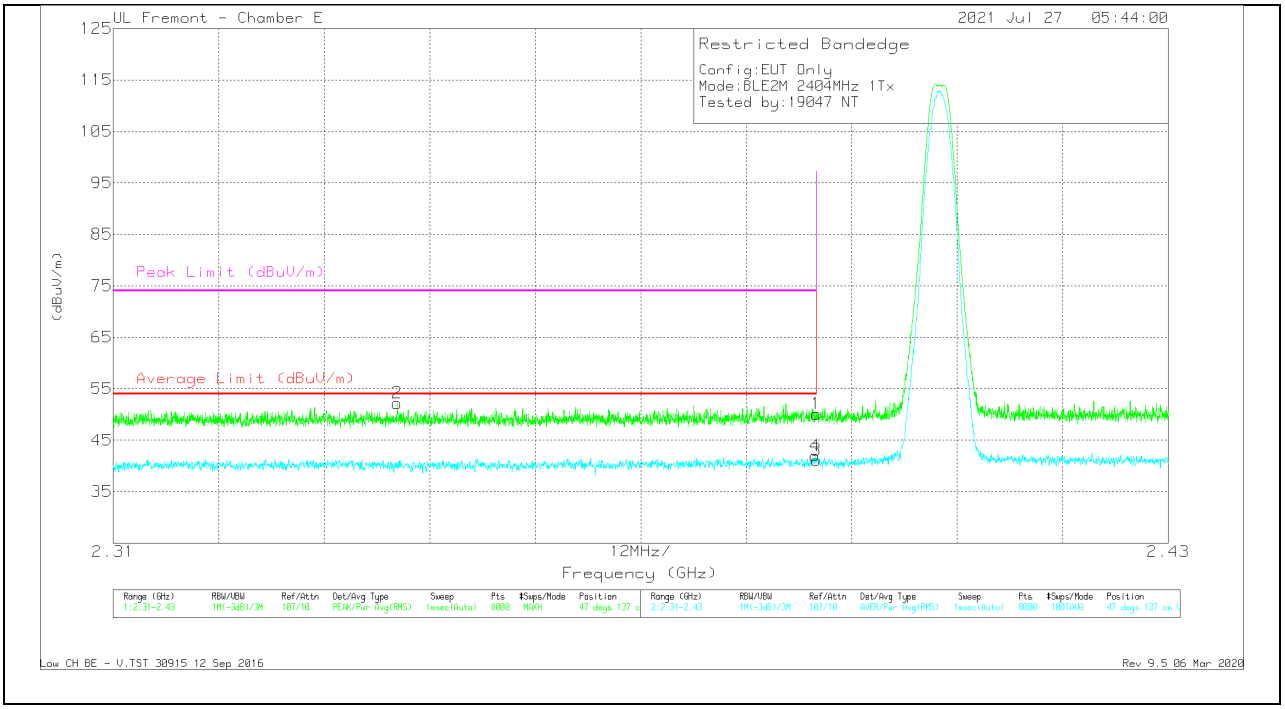
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.3423	45.59	Pk	32	-25.4	52.19	-	-	74	-21.81	47	137	V
4	* 2.38984	35.17	RMS	32.2	-25.4	41.97	54	-12.03	-	-	47	137	V
1	* 2.38999	43.31	Pk	32.2	-25.4	50.11	-	-	74	-23.89	47	137	V
3	* 2.38999	34.33	RMS	32.2	-25.4	41.13	54	-12.87	-	-	47	137	V

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

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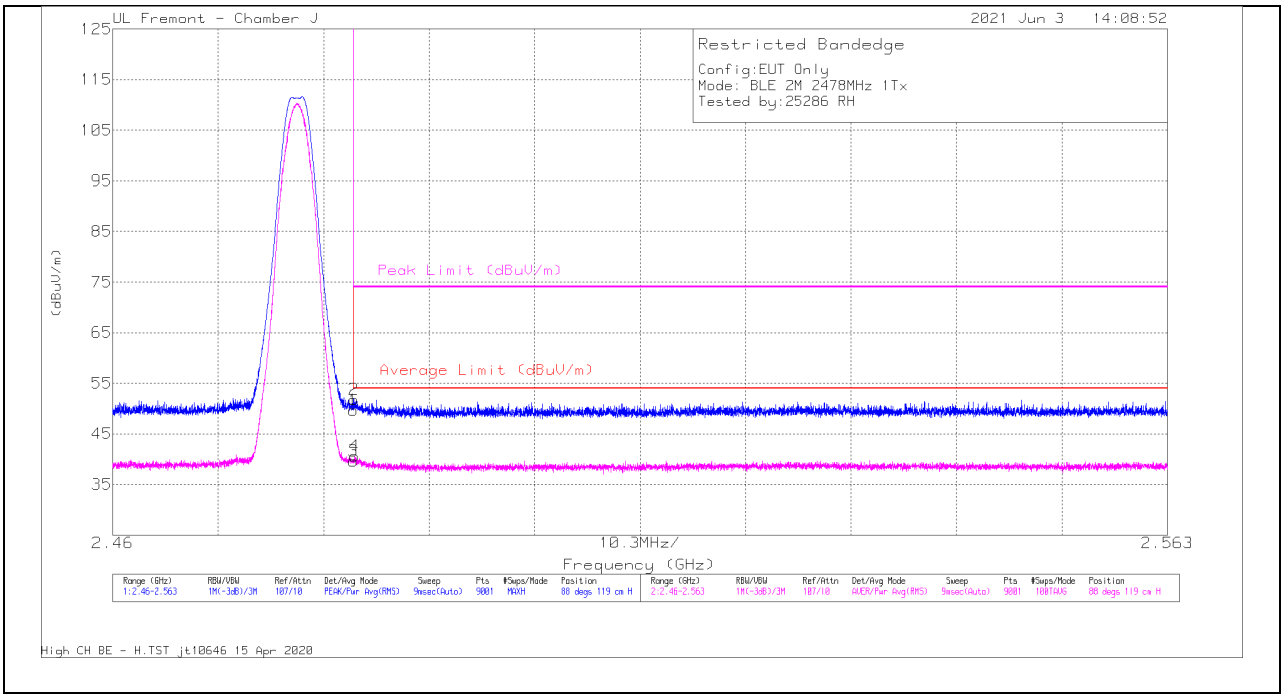
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.37	Pk	32.5	-25.2	49.67	-	-	74	-24.33	88	119	H
2	* 2.48355	44.5	Pk	32.5	-25.2	51.8	-	-	74	-22.2	88	119	H
3	* 2.48351	32.31	RMS	32.5	-25.2	39.61	54	-14.39	-	-	88	119	H
4	* 2.4836	33.27	RMS	32.5	-25.2	40.57	54	-13.43	-	-	88	119	H

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

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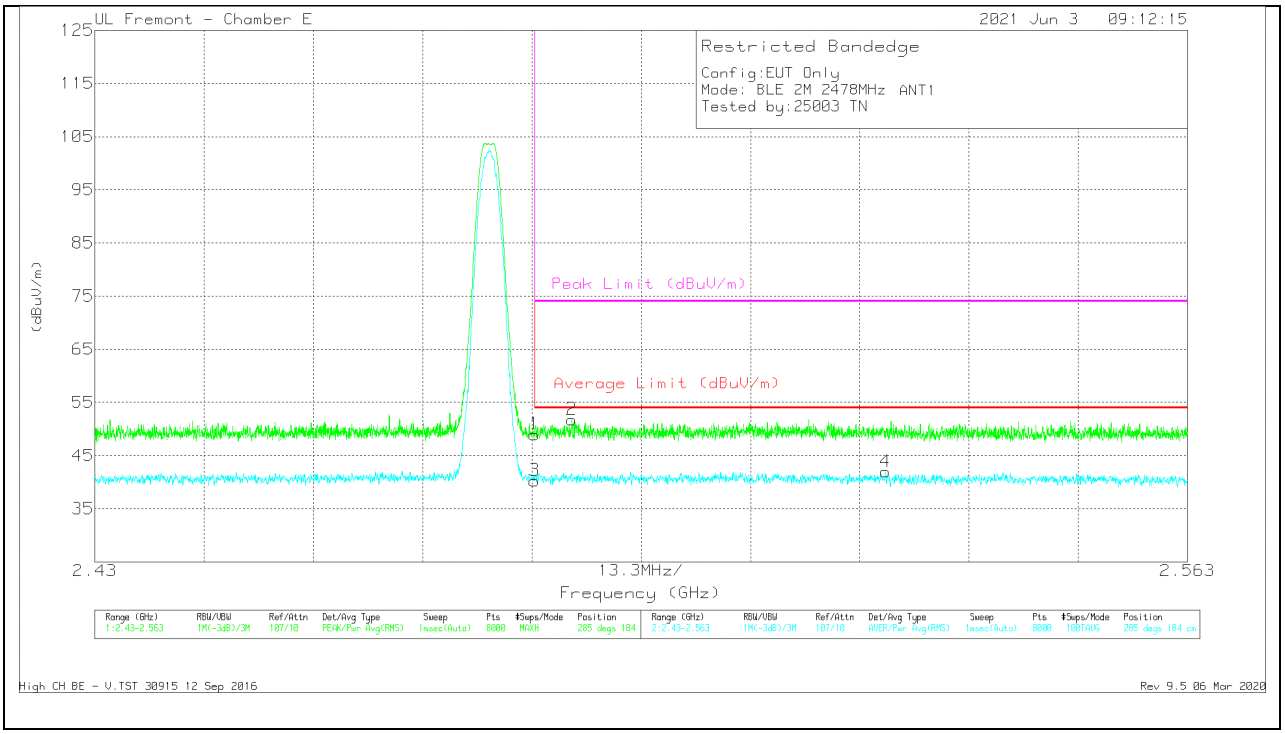
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	41.79	Pk	32.6	-25.4	48.99	-	-	74	-25.01	285	184	V
3	* 2.48351	33.1	RMS	32.6	-25.4	40.3	54	-13.7	-	-	285	184	V
2	* 2.48803	44.5	Pk	32.7	-25.4	51.8	-	-	74	-22.2	285	184	V
4	2.52624	34.86	RMS	32.5	-25.4	41.96	54	-12.04	-	-	285	184	V

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

High CH BE - V.TST 30915 12 Sep 2016

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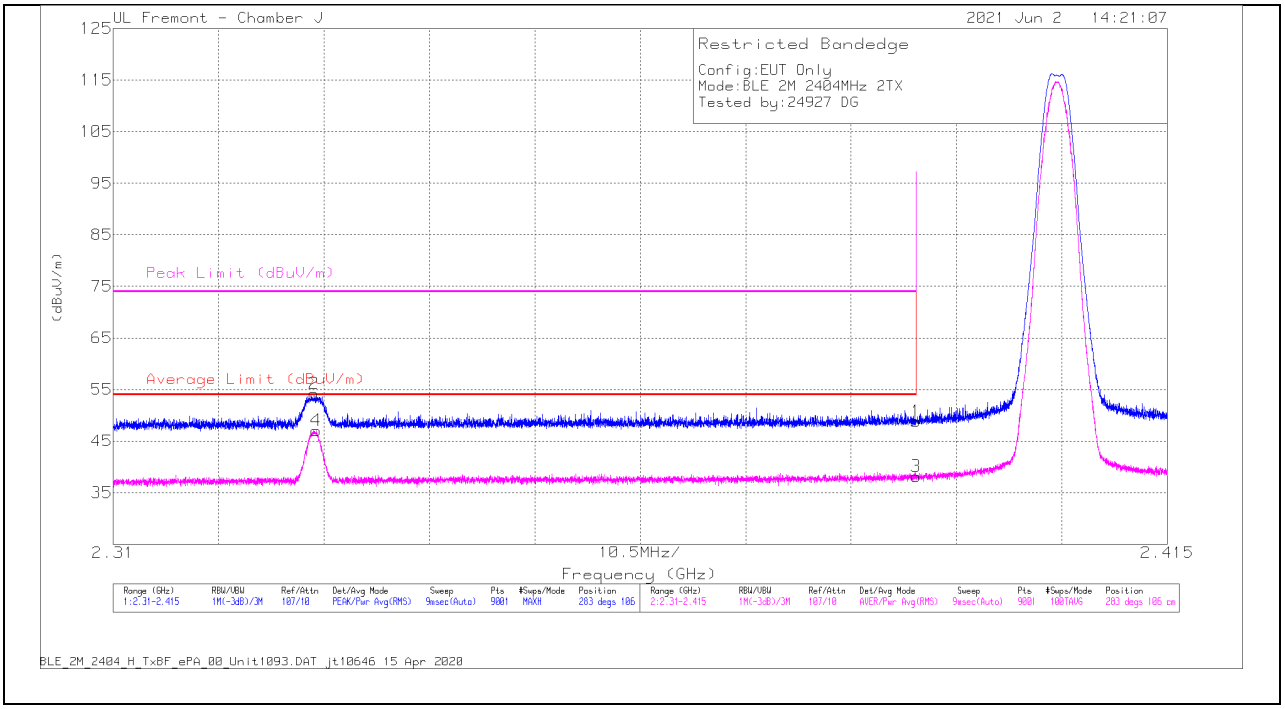
10.2.4. HIGH POWER BLE TXBF (2Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.93	Pk	32.1	-25.2	48.83	-	-	74	-25.17	283	106	H
2	* 2.32999	47.67	Pk	31.8	-25.3	54.17	-	-	74	-19.83	283	106	H
3	* 2.38999	31.25	RMS	32.1	-25.2	38.15	54	-15.85	-	-	283	106	H
4	* 2.33022	40.56	RMS	31.8	-25.3	47.06	54	-6.94	-	-	283	106	H

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

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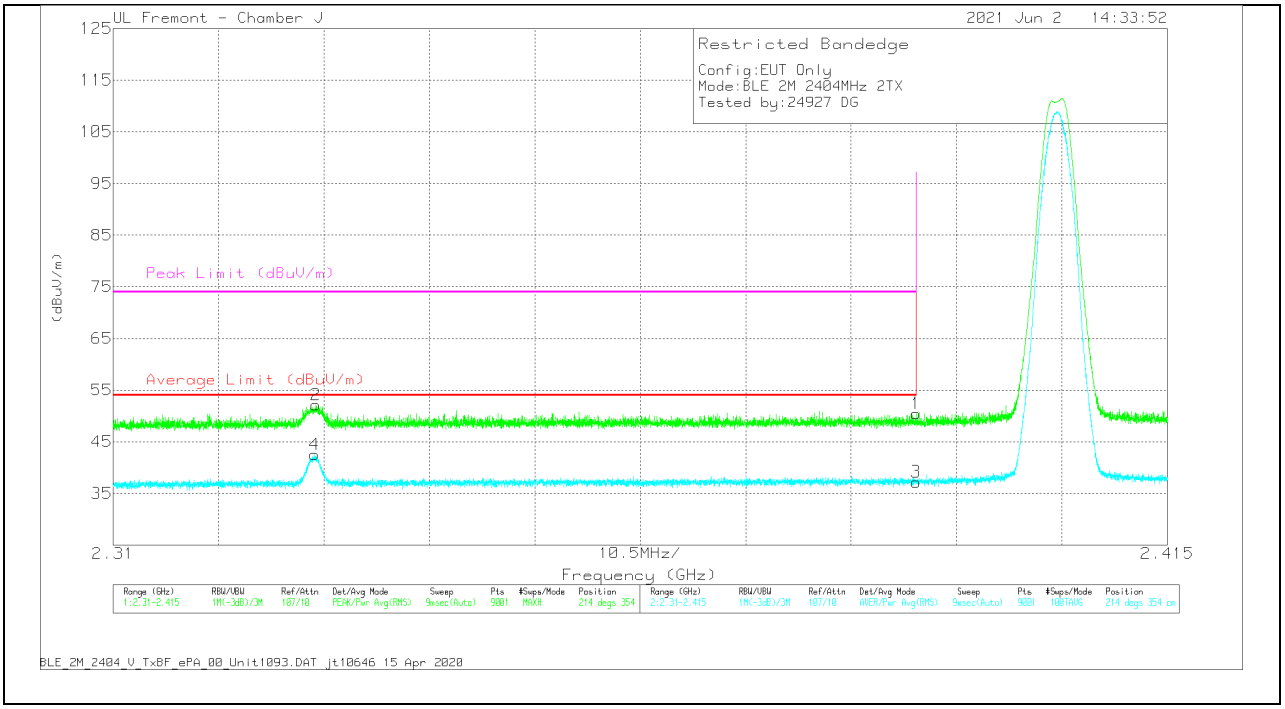
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	43.55	Pk	32.1	-25.2	50.45	-	-	74	-23.55	214	354	V
2	* 2.33021	45.64	Pk	31.8	-25.3	52.14	-	-	74	-21.86	214	354	V
3	* 2.38999	30.31	RMS	32.1	-25.2	37.21	54	-16.79	-	-	214	354	V
4	* 2.33004	36.01	RMS	31.8	-25.3	42.51	54	-11.49	-	-	214	354	V

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

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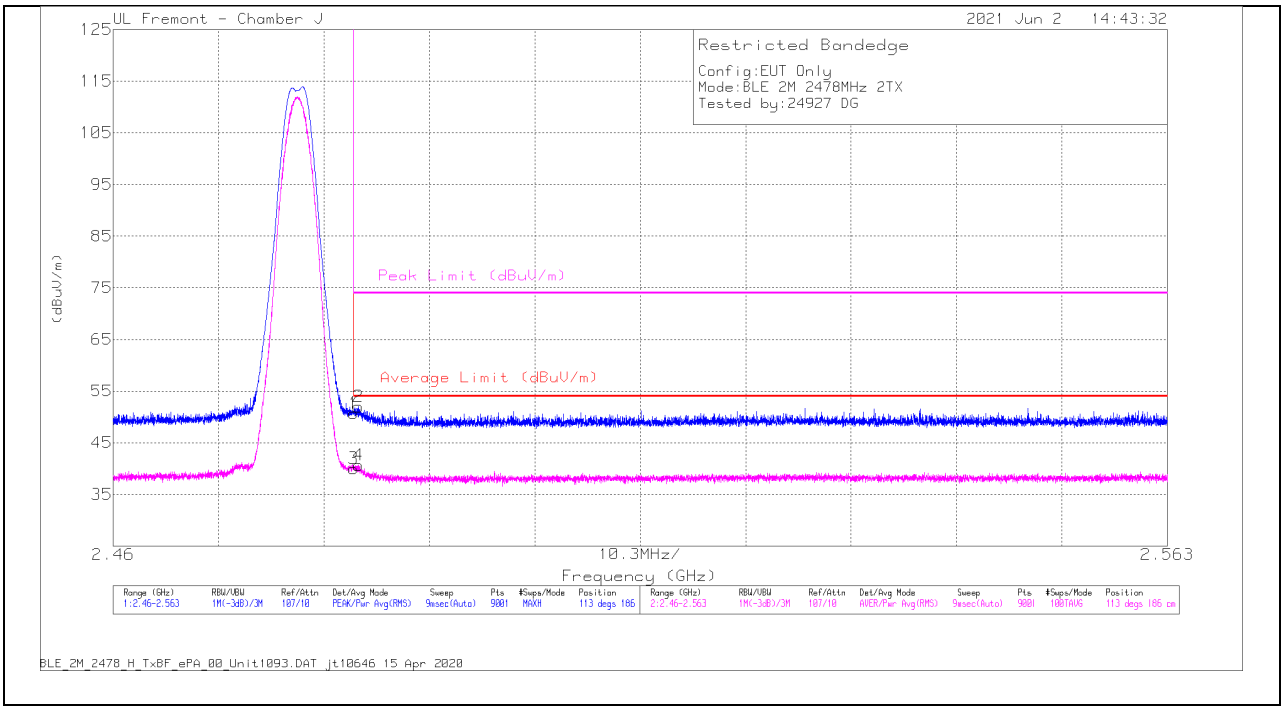
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE010 0034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.39	Pk	32.5	-25.2	50.69	-	-	74	-23.31	113	186	H
2	* 2.48395	44.68	Pk	32.5	-25.2	51.98	-	-	74	-22.02	113	186	H
3	* 2.48351	32.68	RMS	32.5	-25.2	39.98	54	-14.02	-	-	113	186	H
4	* 2.48398	33.35	RMS	32.5	-25.2	40.65	54	-13.35	-	-	113	186	H

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

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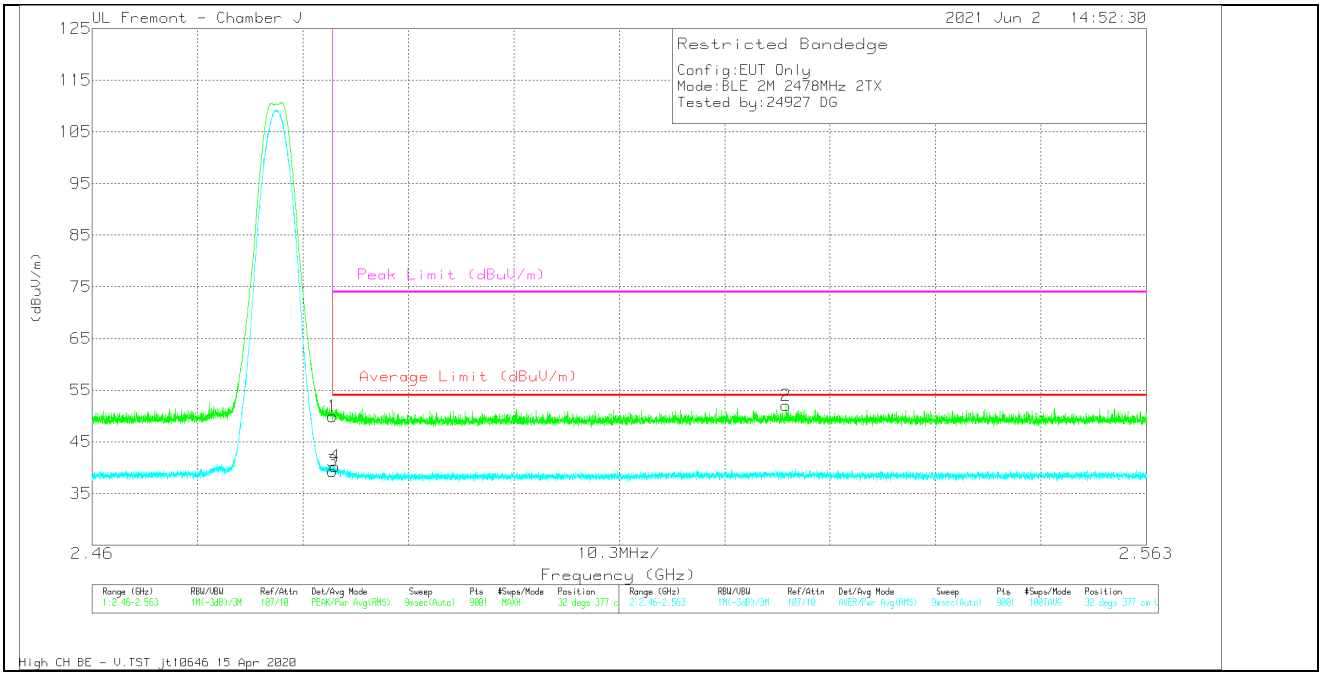
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE010 0034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.62	Pk	32.5	-25.2	49.92	-	-	74	-24.08	32	377	V
2	2.52777	44.31	Pk	32.8	-25.1	52.01	-	-	74	-21.99	32	377	V
3	* 2.48351	32.02	RMS	32.5	-25.2	39.32	54	-14.68	-	-	32	377	V
4	* 2.48373	32.93	RMS	32.5	-25.2	40.23	54	-13.77	-	-	32	377	V

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

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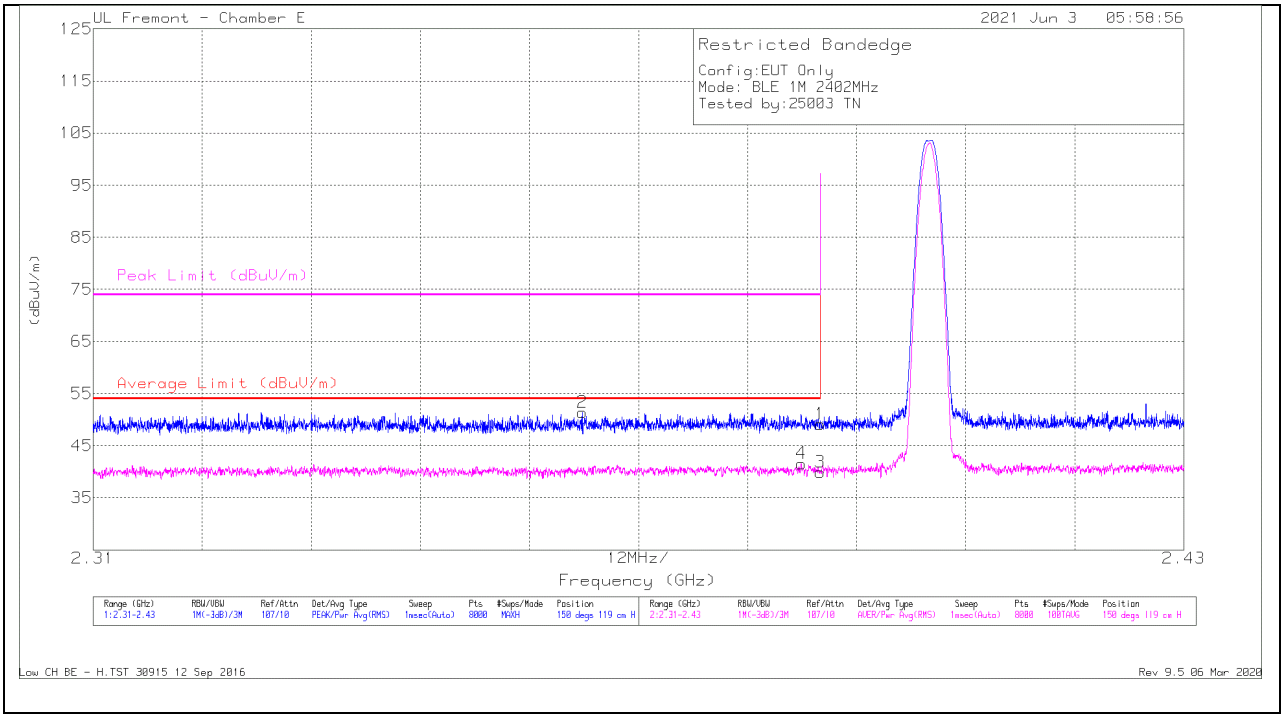
10.2.5. LOW POWER BLE (1Mbps)

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	42.39	Pk	32.2	-25.4	49.19	-	-	74	-24.81	150	119	H
2	* 2.36381	44.81	Pk	32	-25.4	51.41	-	-	74	-22.59	150	119	H
3	* 2.38999	33.13	RMS	32.2	-25.4	39.93	54	-14.07	-	-	150	119	H
4	* 2.38791	34.79	RMS	32.2	-25.4	41.59	54	-12.41	-	-	150	119	H

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

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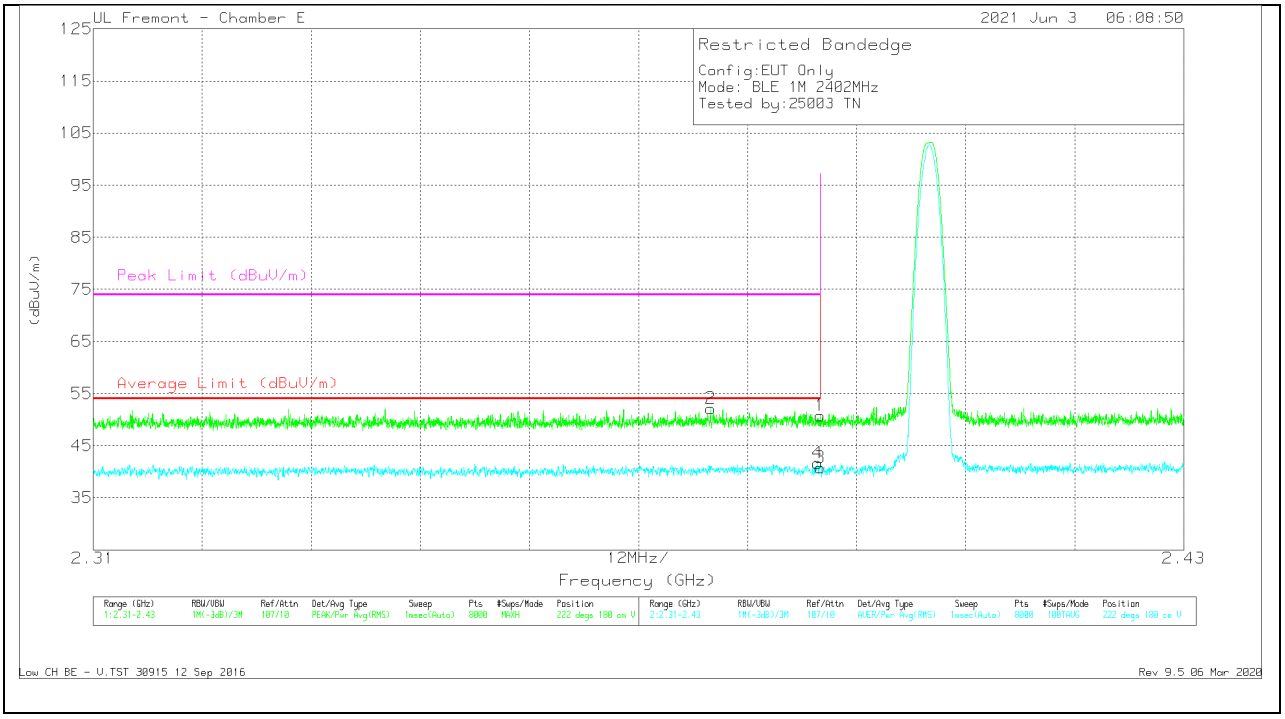
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	43.91	Pk	32.2	-25.4	50.71	-	-	74	-23.29	222	180	V
2	* 2.37793	45.31	Pk	32.2	-25.4	52.11	-	-	74	-21.89	222	180	V
3	* 2.38999	33.94	RMS	32.2	-25.4	40.74	54	-13.26	-	-	222	180	V
4	* 2.38971	34.87	RMS	32.2	-25.4	41.67	54	-12.33	-	-	222	180	V

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

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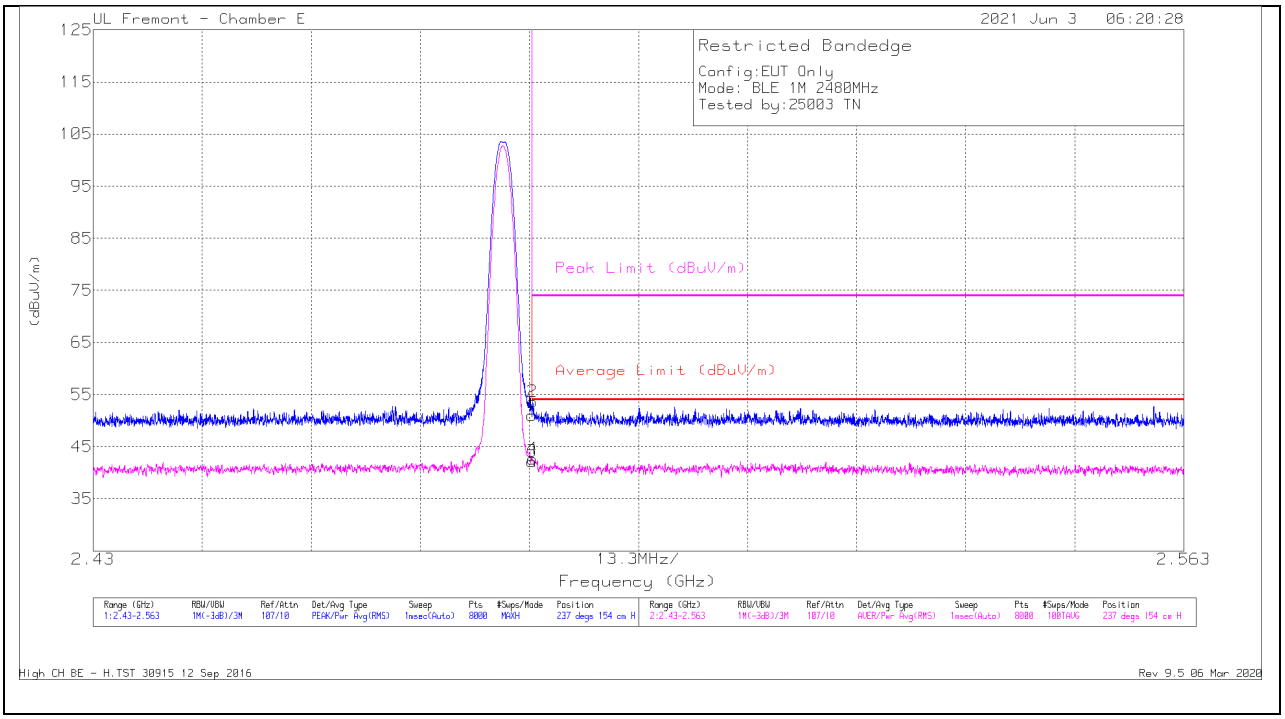
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.75	Pk	32.6	-25.4	50.95	-	-	74	-23.05	237	154	H
2	* 2.48356	46.44	Pk	32.6	-25.4	53.64	-	-	74	-20.36	237	154	H
3	* 2.48351	34.91	RMS	32.6	-25.4	42.11	54	-11.89	-	-	237	154	H
4	* 2.48356	35.46	RMS	32.6	-25.4	42.66	54	-11.34	-	-	237	154	H

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

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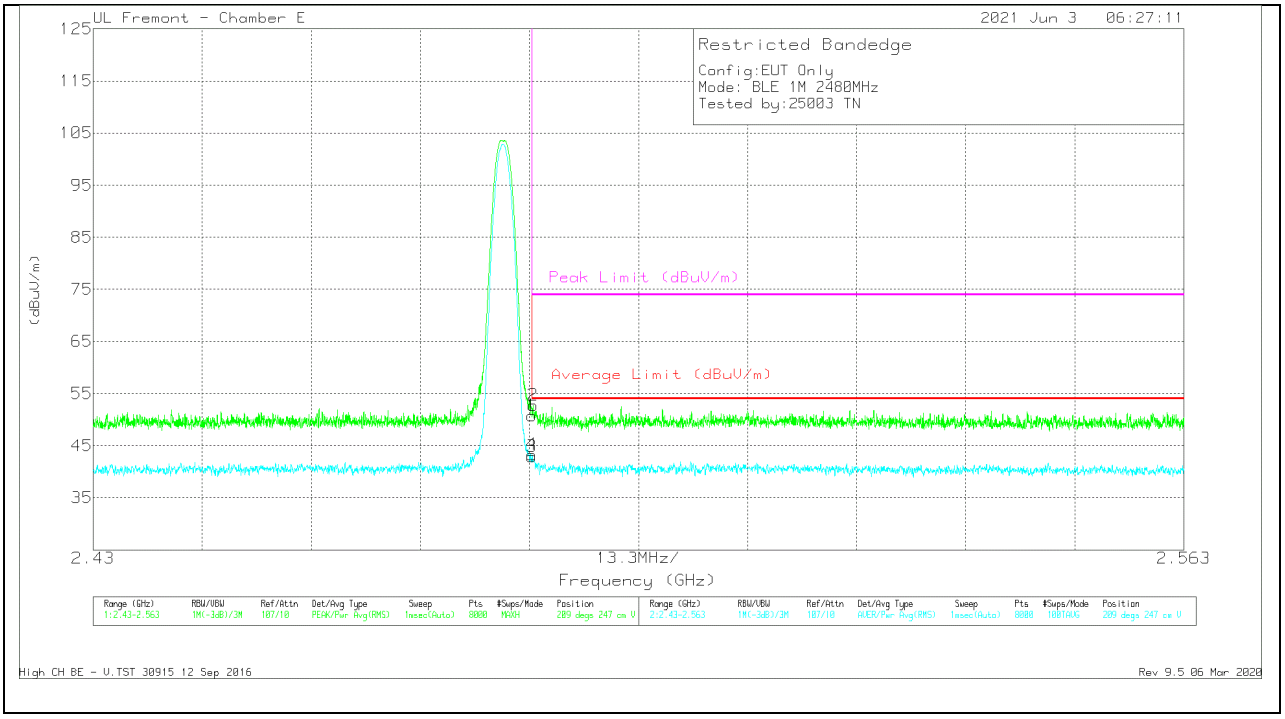
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.61	Pk	32.6	-25.4	50.81	-	-	74	-23.19	209	247	V
2	* 2.48366	45.5	Pk	32.6	-25.4	52.7	-	-	74	-21.3	209	247	V
3	* 2.48351	35.68	RMS	32.6	-25.4	42.88	54	-11.12	-	-	209	247	V
4	* 2.48352	36.04	RMS	32.6	-25.4	43.24	54	-10.76	-	-	209	247	V

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

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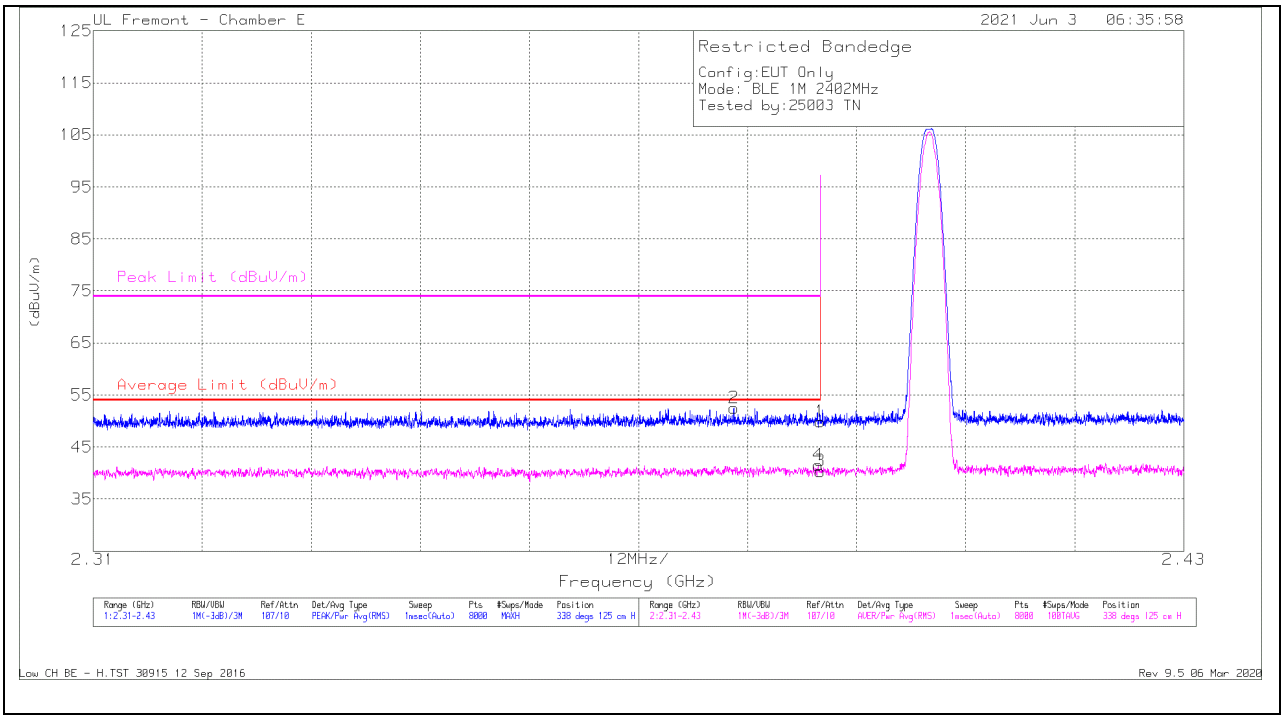
ANT 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	43.09	Pk	32.2	-25.4	49.89	-	-	74	-24.11	338	125	H
2	* 2.38048	45.65	Pk	32.2	-25.4	52.45	-	-	74	-21.55	338	125	H
3	* 2.38999	33.55	RMS	32.2	-25.4	40.35	54	-13.65	-	-	338	125	H
4	* 2.38977	34.71	RMS	32.2	-25.4	41.51	54	-12.49	-	-	338	125	H

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

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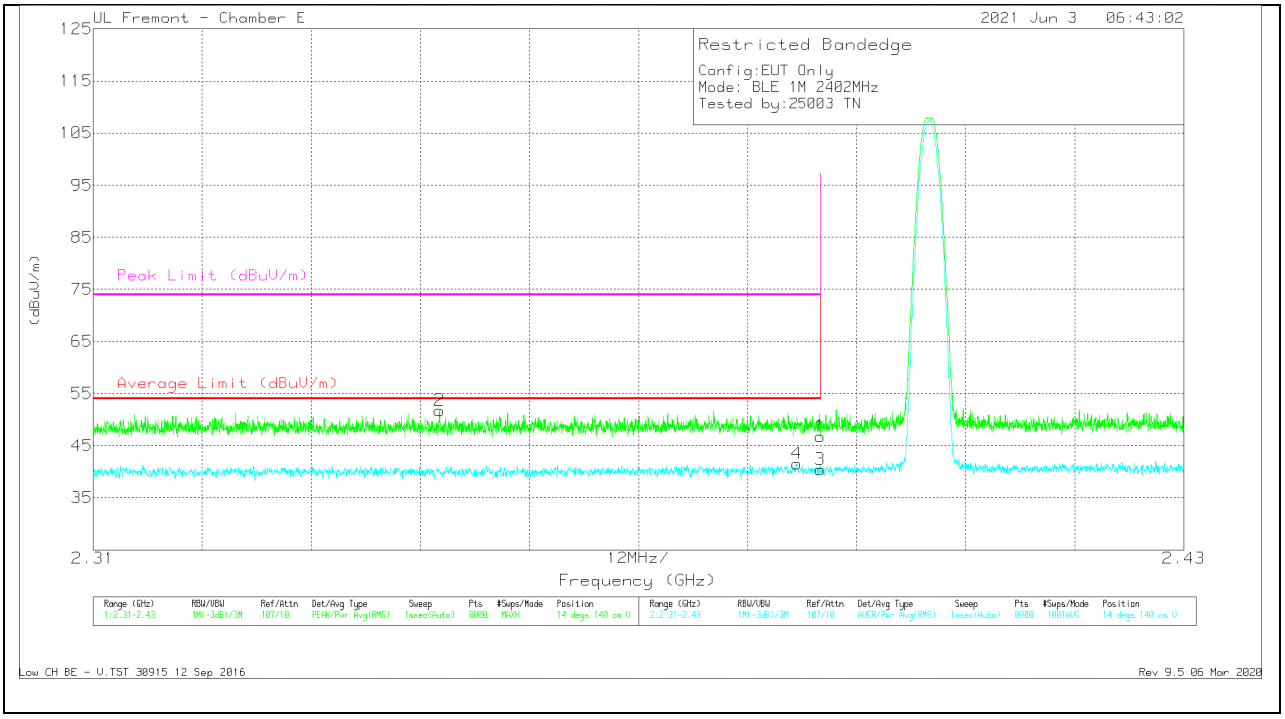
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	39.91	Pk	32.2	-25.4	46.71	-	-	74	-27.29	14	140	V
2	* 2.34811	45.25	Pk	31.9	-25.4	51.75	-	-	74	-22.25	14	140	V
3	* 2.38999	33.64	RMS	32.2	-25.4	40.44	54	-13.56	-	-	14	140	V
4	* 2.38741	34.69	RMS	32.2	-25.4	41.49	54	-12.51	-	-	14	140	V

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

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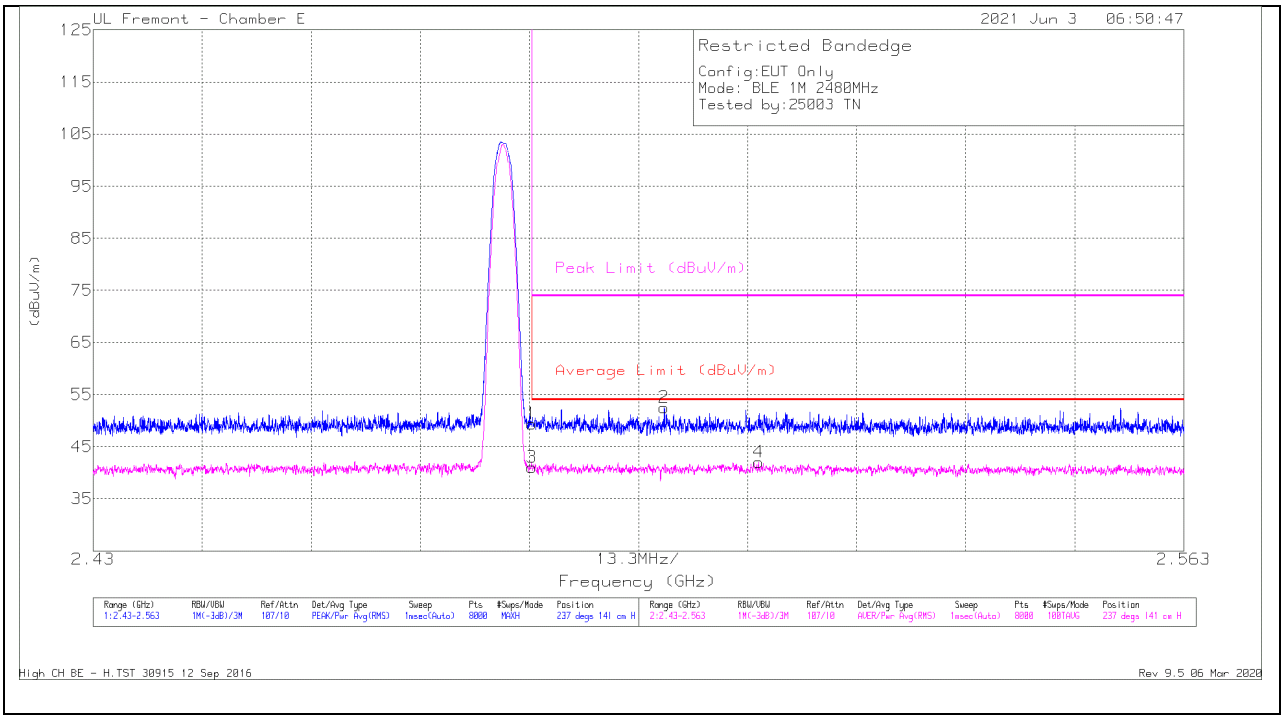
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.18	Pk	32.6	-25.4	49.38	-	-	74	-24.62	237	141	H
3	* 2.48351	33.84	RMS	32.6	-25.4	41.04	54	-12.96	-	-	237	141	H
2	* 2.49965	45.27	Pk	32.7	-25.5	52.47	-	-	74	-21.53	237	141	H
4	2.51114	34.68	RMS	32.7	-25.4	41.98	54	-12.02	-	-	237	141	H

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

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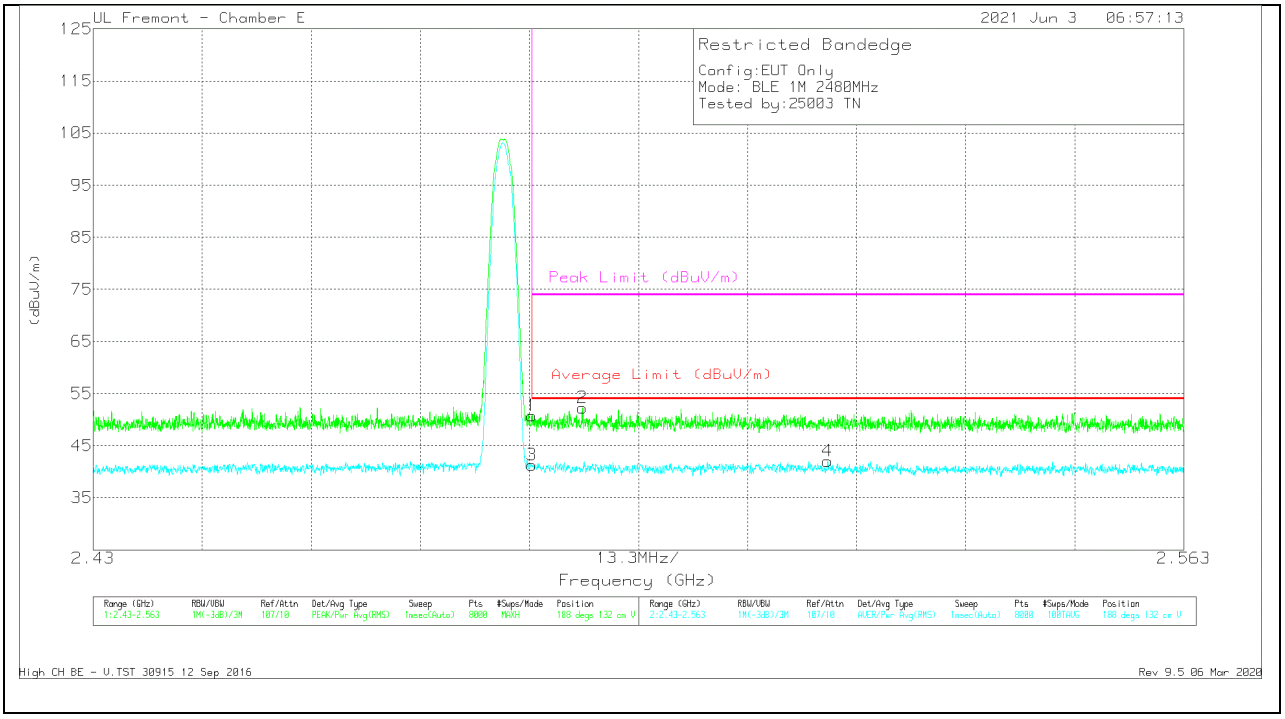
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.53	Pk	32.6	-25.4	50.73	-	-	74	-23.27	188	132	V
3	* 2.48351	34.03	RMS	32.6	-25.4	41.23	54	-12.77	-	-	188	132	V
2	* 2.48969	45.09	Pk	32.7	-25.5	52.29	-	-	74	-21.71	188	132	V
4	2.51957	34.84	RMS	32.6	-25.4	42.04	54	-11.96	-	-	188	132	V

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

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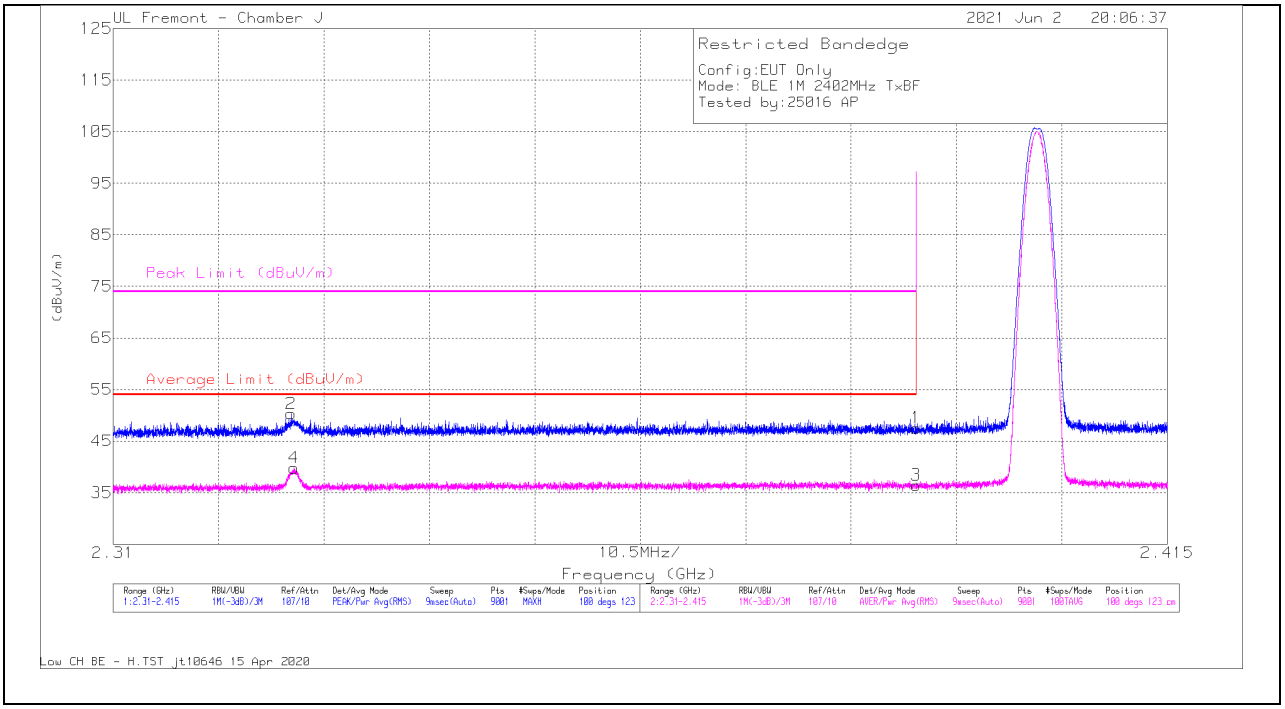
10.2.6. LOW POWER BLE TXBF (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	40.66	Pk	32.1	-25.2	47.56	-	-	74	-26.44	100	123	H
2	* 2.32772	43.8	Pk	31.8	-25.3	50.3	-	-	74	-23.7	100	123	H
3	* 2.38999	29.58	RMS	32.1	-25.2	36.48	54	-17.52	-	-	100	123	H
4	* 2.32798	33.3	RMS	31.8	-25.3	39.8	54	-14.2	-	-	100	123	H

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

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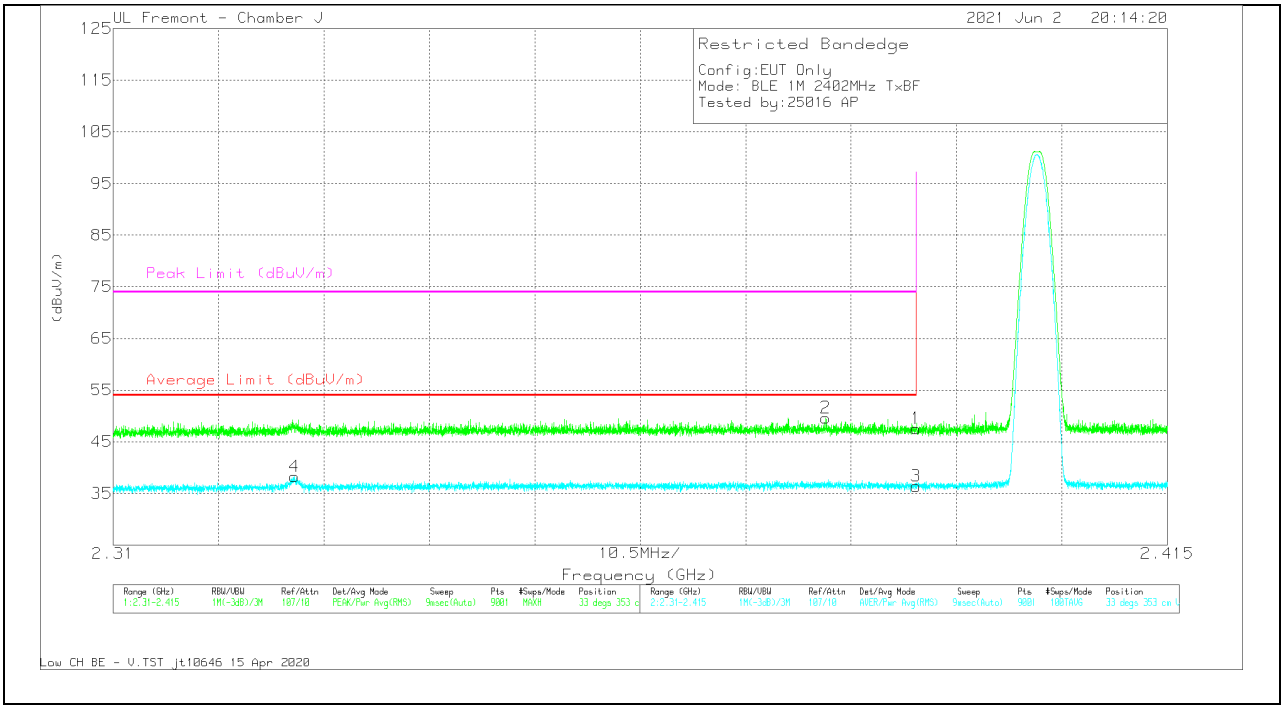
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	40.64	Pk	32.1	-25.2	47.54	-	-	74	-26.46	33	353	V
2	* 2.38096	42.71	Pk	32.1	-25.2	49.61	-	-	74	-24.39	33	353	V
3	* 2.38999	29.49	RMS	32.1	-25.2	36.39	54	-17.61	-	-	33	353	V
4	* 2.32808	31.76	RMS	31.8	-25.3	38.26	54	-15.74	-	-	33	353	V

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

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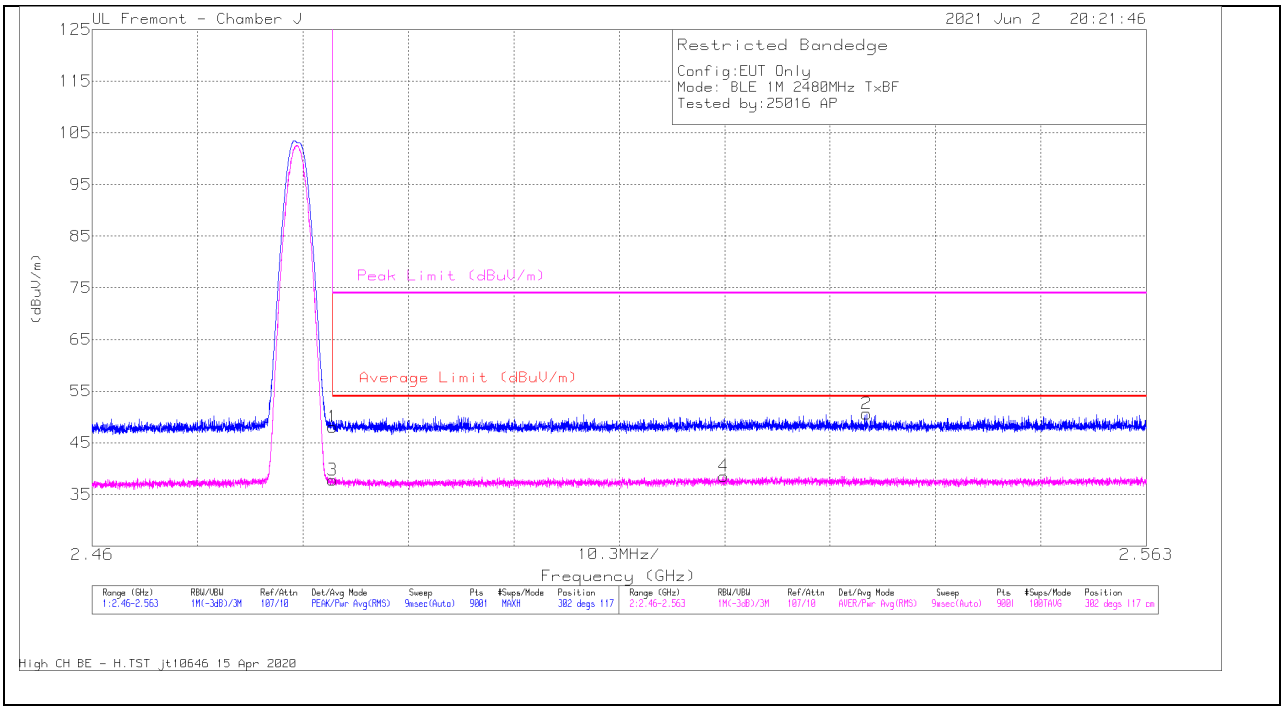
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	40.79	Pk	32.5	-25.2	48.09	-	-	74	-25.91	302	117	H
2	2.53567	43.03	Pk	32.7	-25.1	50.63	-	-	74	-23.37	302	117	H
3	* 2.48351	30.48	RMS	32.5	-25.2	37.78	54	-16.22	-	-	302	117	H
4	2.52172	31.02	RMS	32.7	-25.2	38.52	54	-15.48	-	-	302	117	H

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

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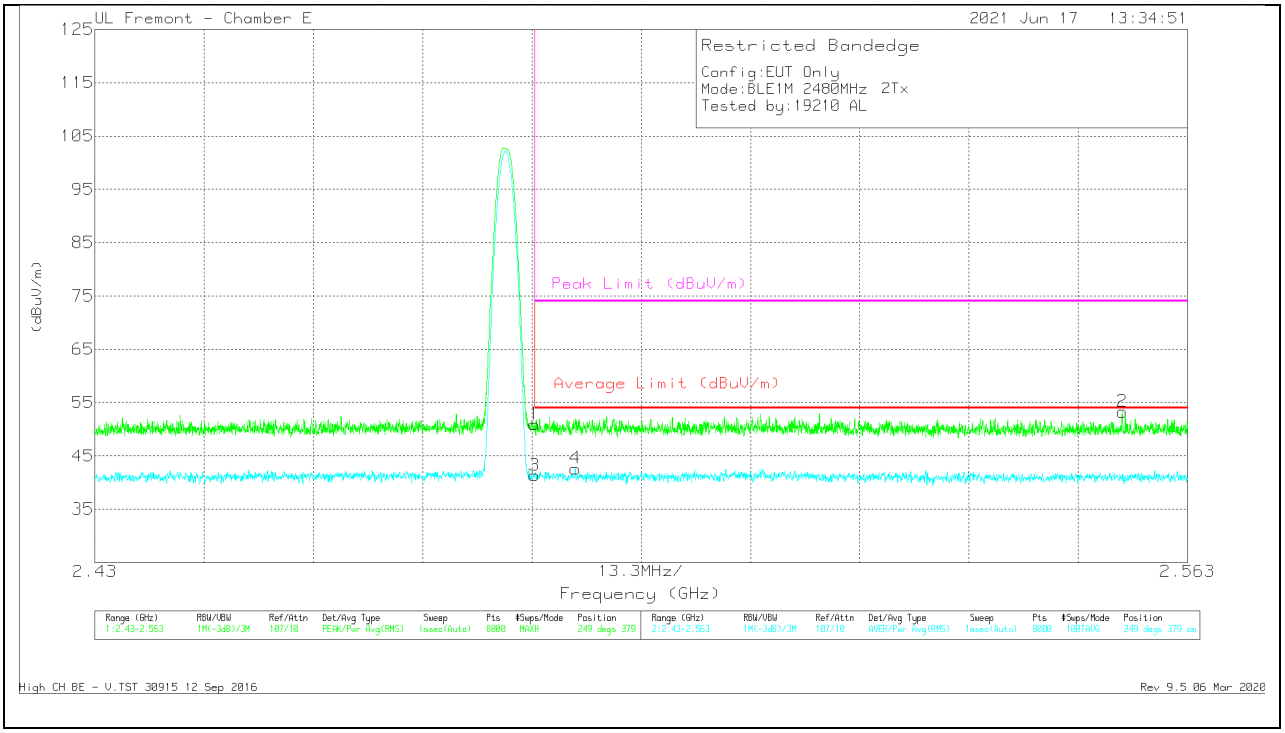
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	43.72	Pk	32.6	-25.4	50.92	-	-	74	-23.08	249	379	V
3	* 2.48351	34.13	RMS	32.6	-25.4	41.33	54	-12.67	-	-	249	379	V
4	* 2.48849	35.34	RMS	32.7	-25.4	42.64	54	-11.36	-	-	249	379	V
2	2.55505	46.29	Pk	32.4	-25.4	53.29	-	-	74	-20.71	249	379	V

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

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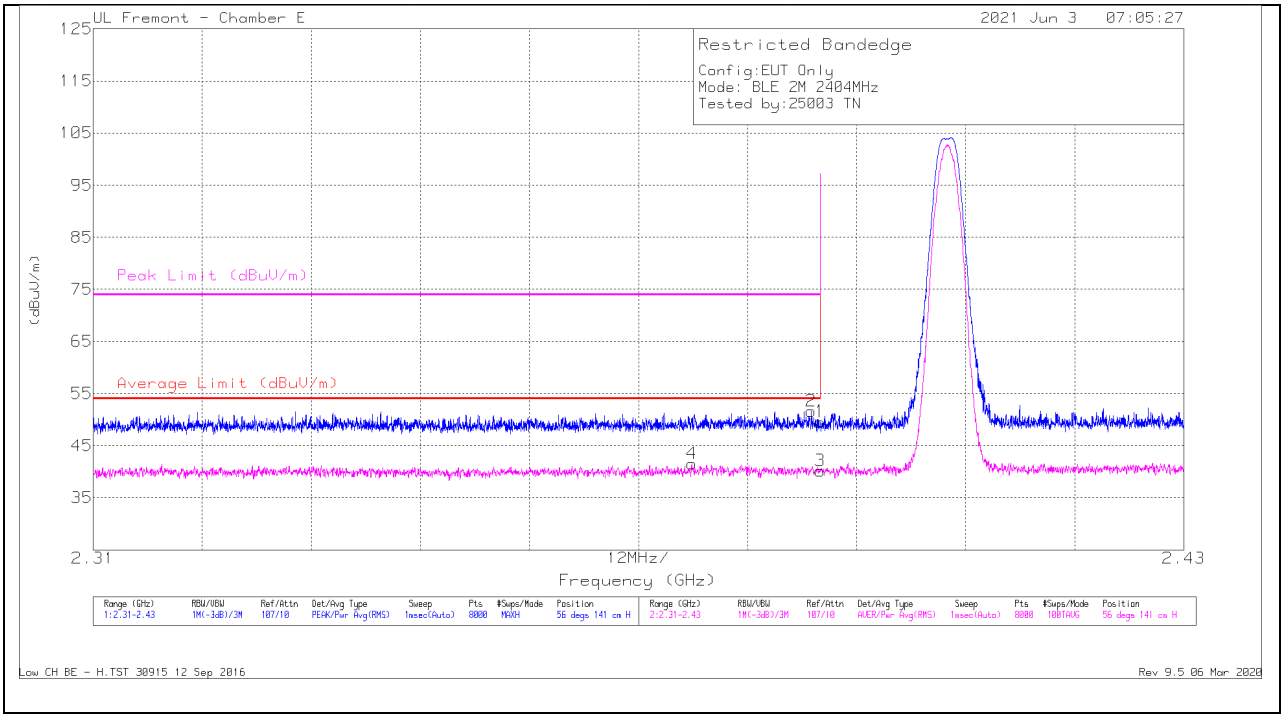
10.2.7. LOW POWER BLE (2Mbps)

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	42.77	Pk	32.2	-25.4	49.57	-	-	74	-24.43	56	141	H
2	* 2.38902	44.8	Pk	32.2	-25.4	51.6	-	-	74	-22.4	56	141	H
3	* 2.38999	33.33	RMS	32.2	-25.4	40.13	54	-13.87	-	-	56	141	H
4	* 2.37586	34.68	RMS	32.2	-25.4	41.48	54	-12.52	-	-	56	141	H

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

Low CH BE - H.TST 30915 12 Sep 2016
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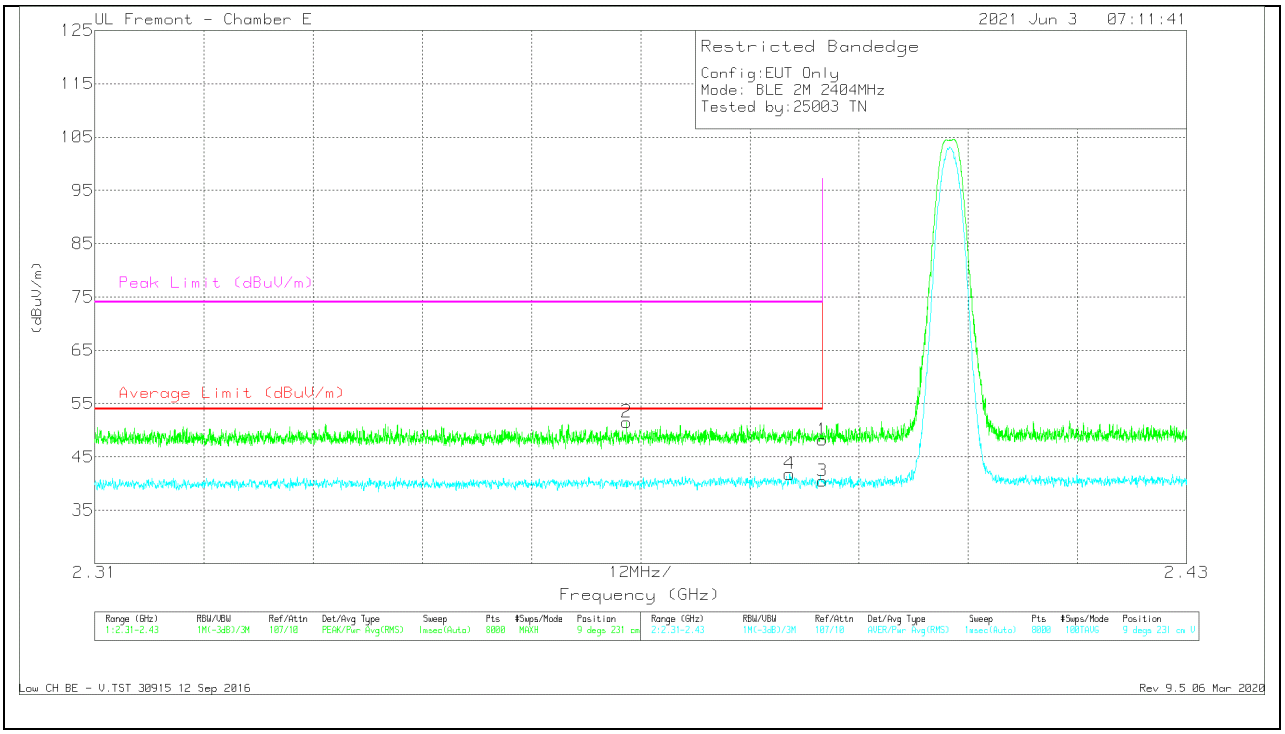
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE007810 7 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.36845	44.93	Pk	32.1	-25.5	51.53	-	-	74	-22.47	9	231	V
4	* 2.38636	35.01	RMS	32.2	-25.4	41.81	54	-12.19	-	-	9	231	V
1	* 2.38999	41.4	Pk	32.2	-25.4	48.2	-	-	74	-25.8	9	231	V
3	* 2.38999	33.68	RMS	32.2	-25.4	40.48	54	-13.52	-	-	9	231	V

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

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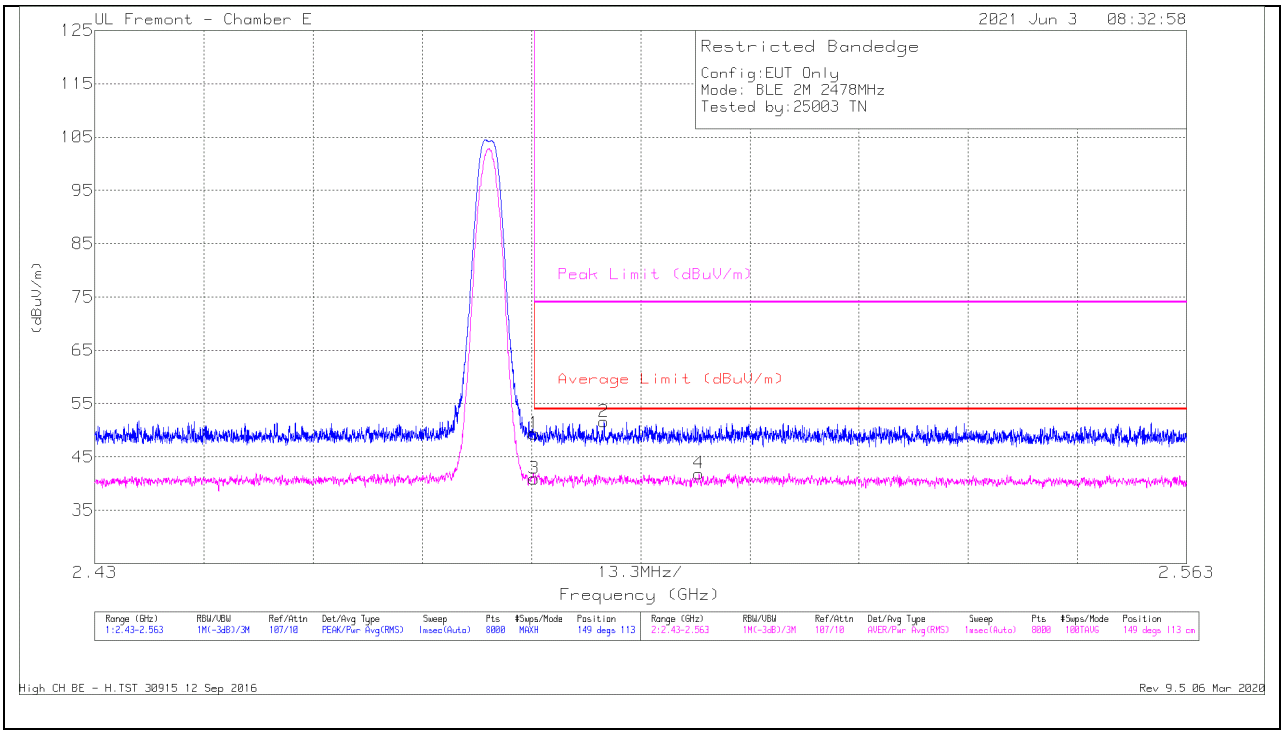
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.18	Pk	32.6	-25.4	49.38	-	-	74	-24.62	149	113	H
2	* 2.49204	44.4	Pk	32.7	-25.5	51.6	-	-	74	-22.4	149	113	H
3	* 2.48351	33.74	RMS	32.6	-25.4	40.94	54	-13.06	-	-	149	113	H
4	2.50359	34.6	RMS	32.7	-25.4	41.9	54	-12.1	-	-	149	113	H

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

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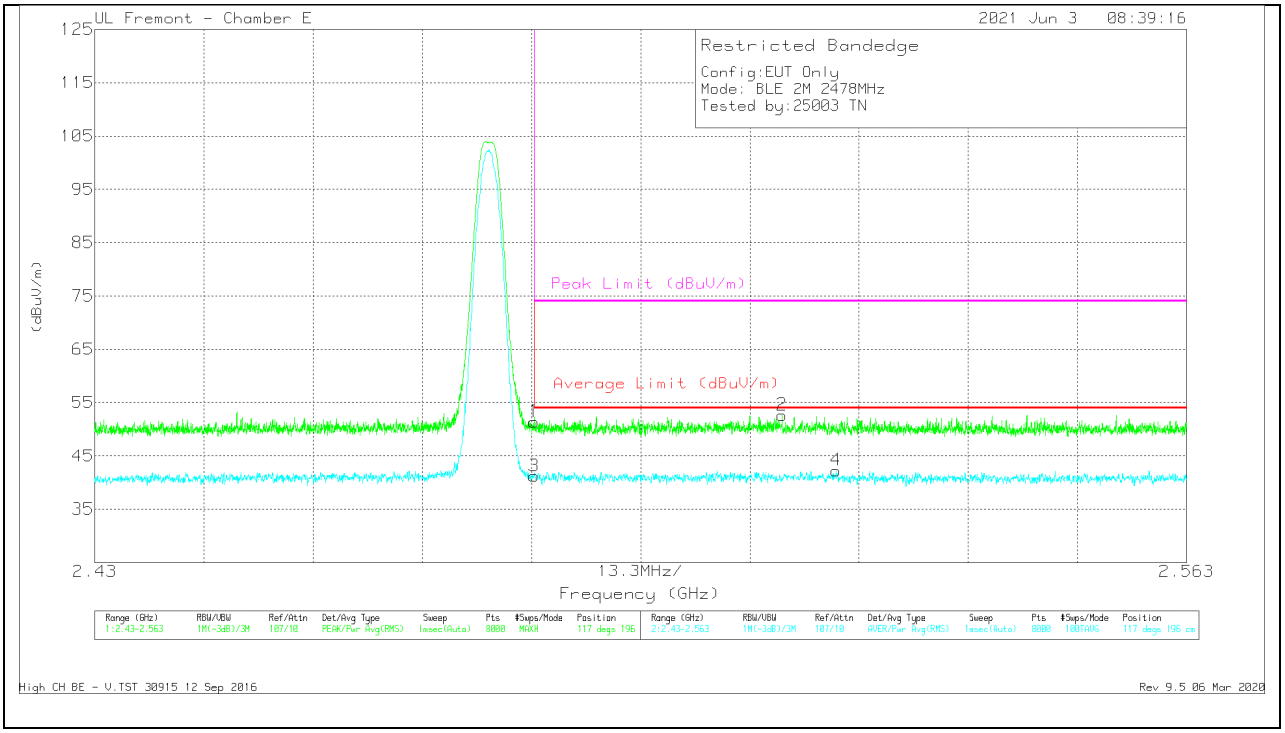
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	44.21	Pk	32.6	-25.4	51.41	-	-	74	-22.59	117	196	V
3	* 2.48351	34.04	RMS	32.6	-25.4	41.24	54	-12.76	-	-	117	196	V
2	2.51372	45.35	Pk	32.7	-25.4	52.65	-	-	74	-21.35	117	196	V
4	2.5203	35.07	RMS	32.6	-25.4	42.27	54	-11.73	-	-	117	196	V

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

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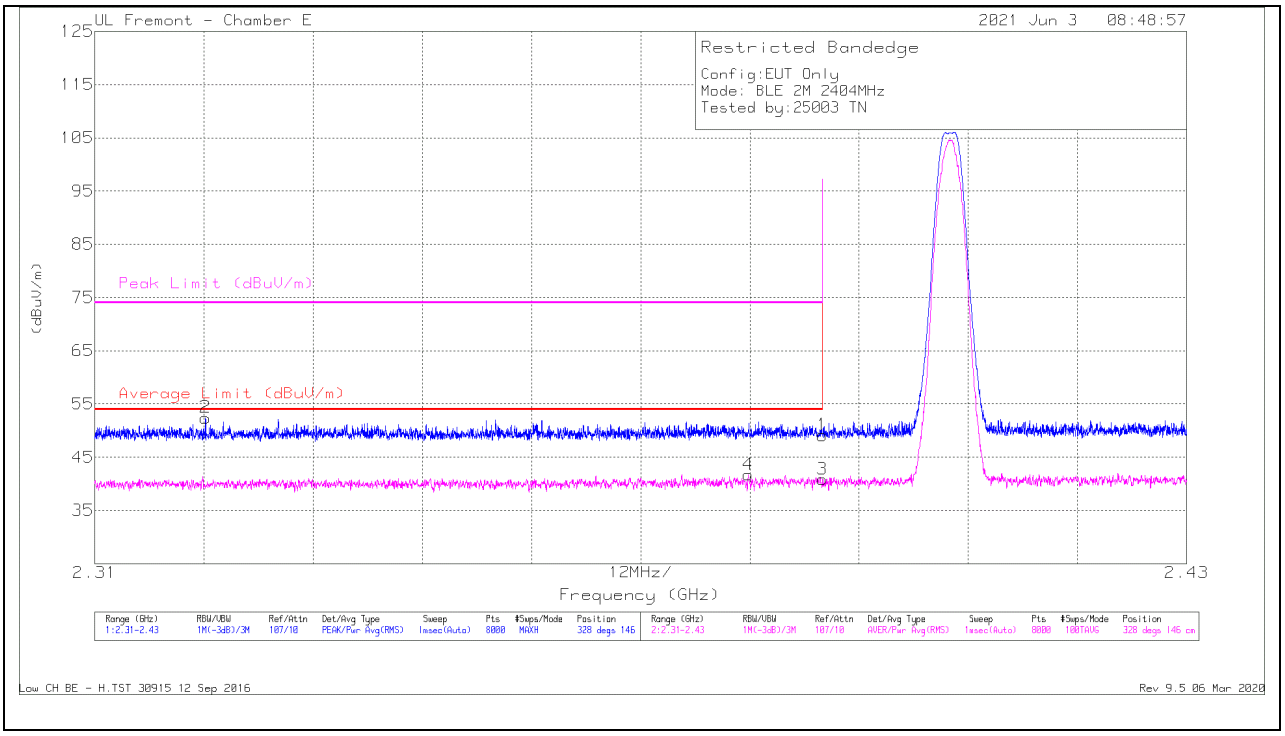
ANT 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.32217	45.92	Pk	32	-25.5	52.42	-	-	74	-21.58	328	146	H
4	* 2.38181	34.9	RMS	32.2	-25.4	41.7	54	-12.3	-	-	328	146	H
1	* 2.38999	42.34	Pk	32.2	-25.4	49.14	-	-	74	-24.86	328	146	H
3	* 2.38999	34.05	RMS	32.2	-25.4	40.85	54	-13.15	-	-	328	146	H

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

Low CH BE - H.TST 30915 12 Sep 2016
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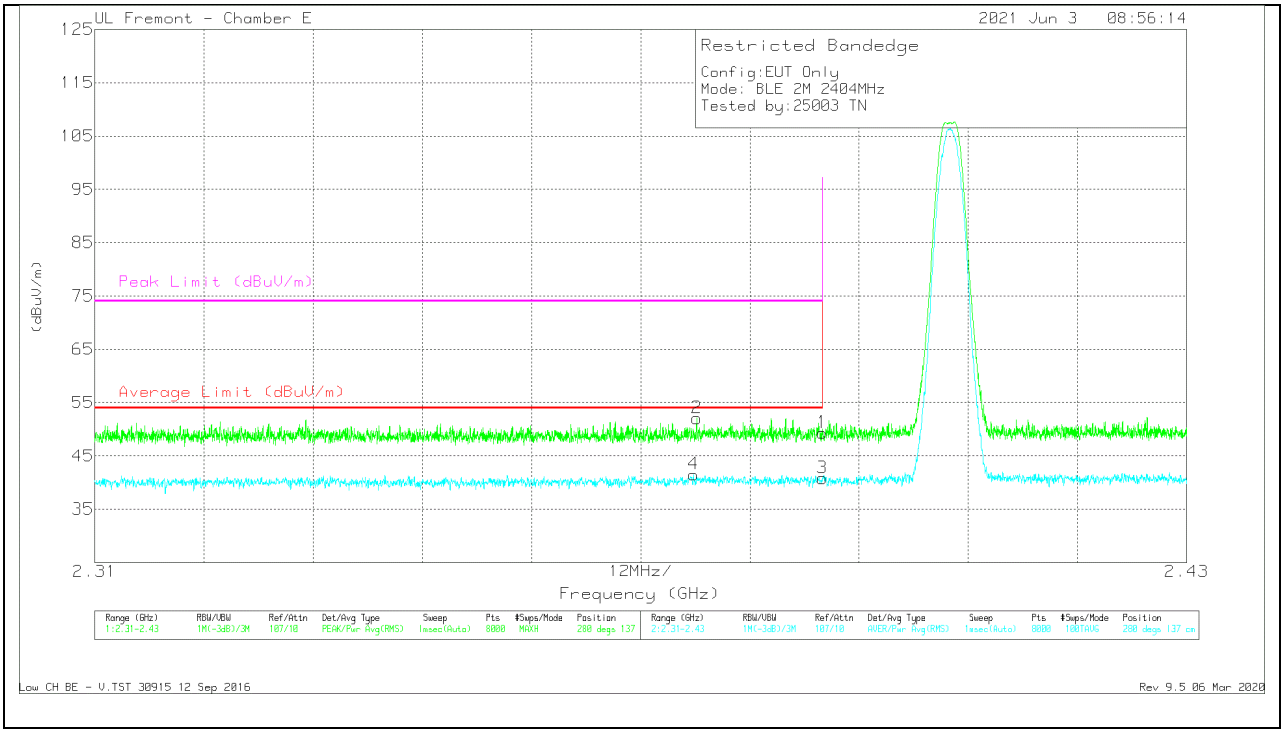
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.37581	34.74	RMS	32.2	-25.4	41.54	54	-12.46	-	-	280	137	V
2	* 2.37616	45.28	Pk	32.2	-25.4	52.08	-	-	74	-21.92	280	137	V
1	* 2.38999	42.52	Pk	32.2	-25.4	49.32	-	-	74	-24.68	280	137	V
3	* 2.38999	34.02	RMS	32.2	-25.4	40.82	54	-13.18	-	-	280	137	V

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

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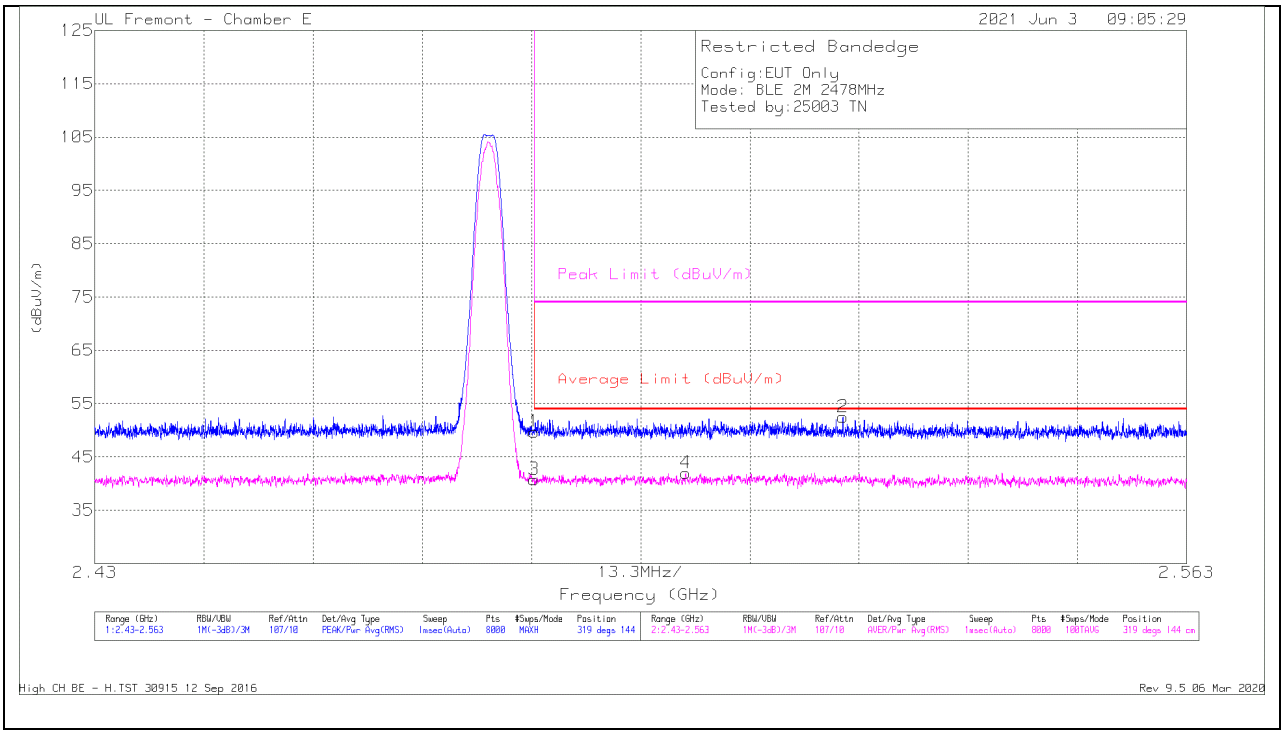
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.53	Pk	32.6	-25.4	49.73	-	-	74	-24.27	319	144	H
3	* 2.48351	33.56	RMS	32.6	-25.4	40.76	54	-13.24	-	-	319	144	H
4	2.50198	34.79	RMS	32.7	-25.5	41.99	54	-12.01	-	-	319	144	H
2	2.52113	45.29	Pk	32.6	-25.4	52.49	-	-	74	-21.51	319	144	H

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

High CH BE - H.TST 30915 12 Sep 2016
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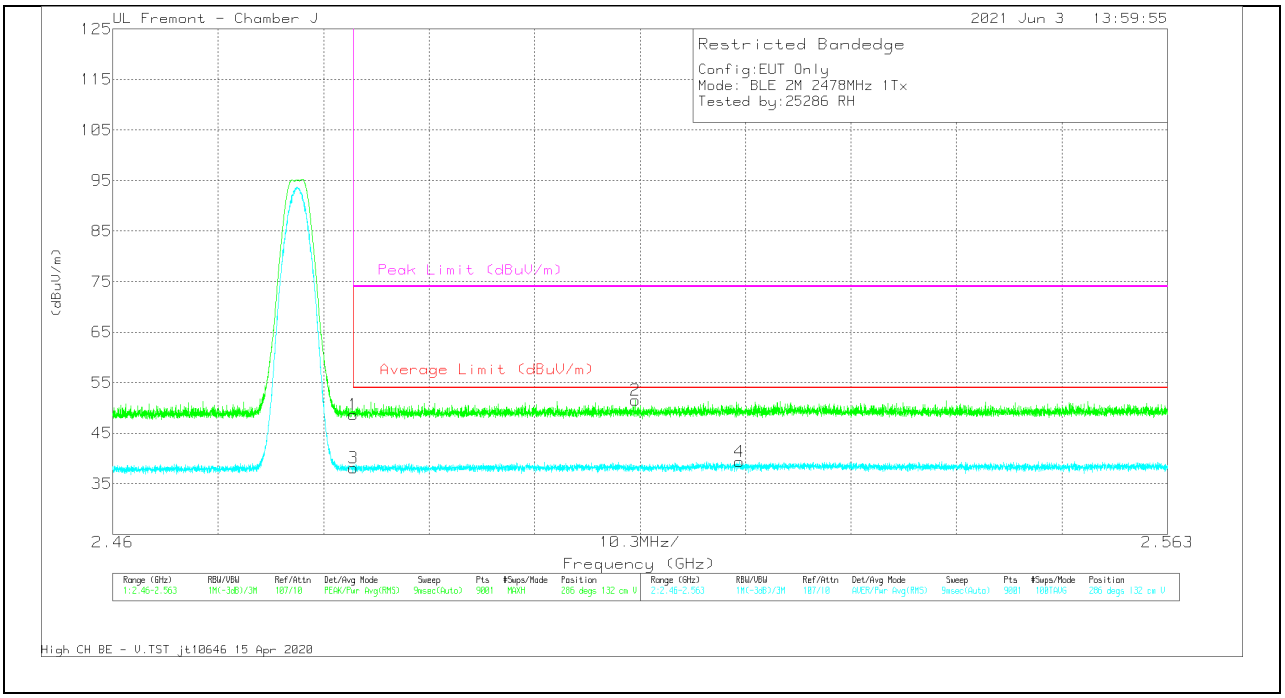
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	41.43	Pk	32.5	-25.2	48.73	-	-	74	-25.27	286	132	V
2	2.51102	44.09	Pk	32.6	-25.2	51.49	-	-	74	-22.51	286	132	V
3	* 2.48351	30.79	RMS	32.5	-25.2	38.09	54	-15.91	-	-	286	132	V
4	2.52119	31.9	RMS	32.7	-25.2	39.4	54	-14.6	-	-	286	132	V

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

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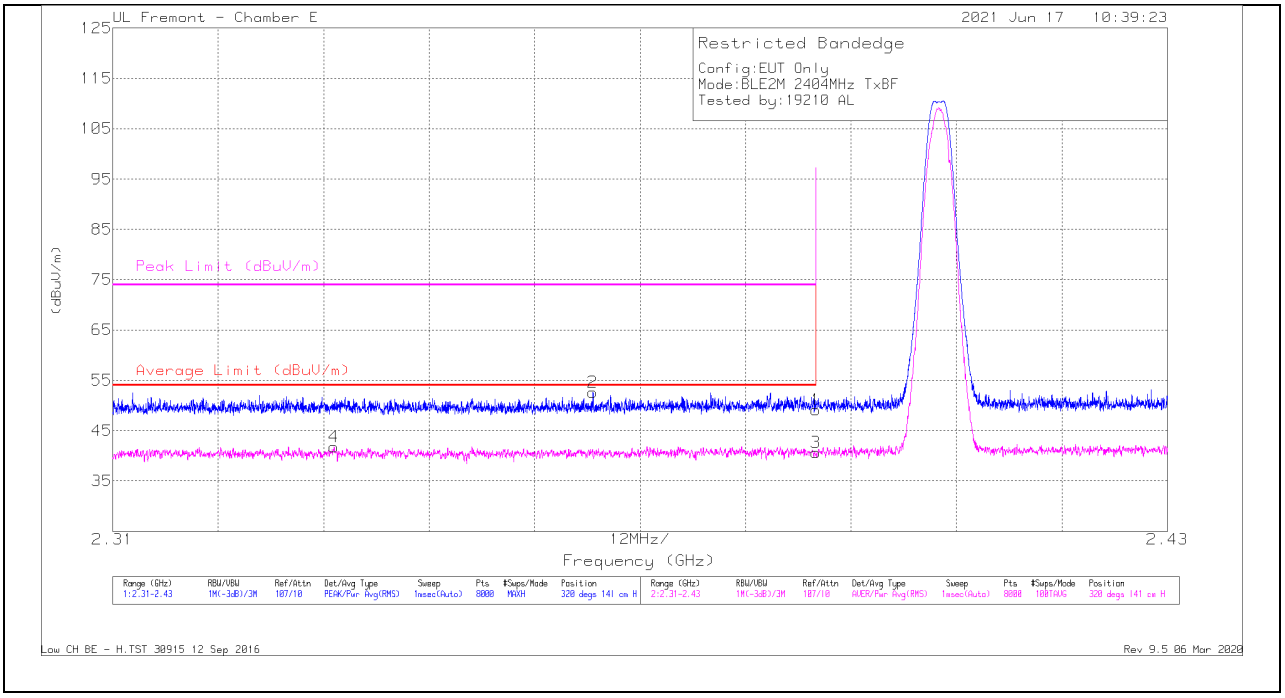
10.2.8. LOW POWER BLE TXBF (2Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	42.39	Pk	32.2	-25.4	49.19	-	-	74	-24.81	320	141	H
2	* 2.36464	45.89	Pk	32.1	-25.4	52.59	-	-	74	-21.41	320	141	H
3	* 2.38999	33.86	RMS	32.2	-25.4	40.66	54	-13.34	-	-	320	141	H
4	* 2.33519	35.21	RMS	32.1	-25.5	41.81	54	-12.19	-	-	320	141	H

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

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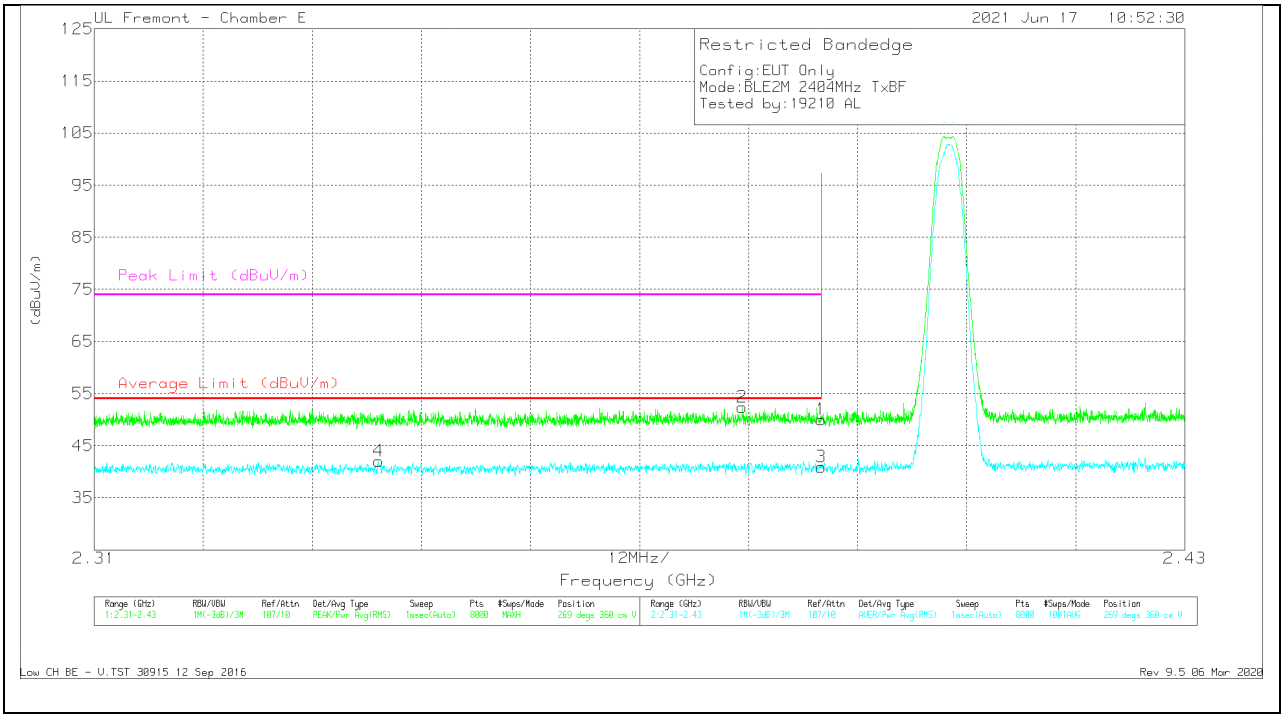
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.34128	35.38	RMS	32	-25.4	41.98	54	-12.02	-	-	269	360	V
2	* 2.3813	45.57	Pk	32.2	-25.4	52.37	-	-	74	-21.63	269	360	V
1	* 2.38999	43.15	Pk	32.2	-25.4	49.95	-	-	74	-24.05	269	360	V
3	* 2.38999	34.08	RMS	32.2	-25.4	40.88	54	-13.12	-	-	269	360	V

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

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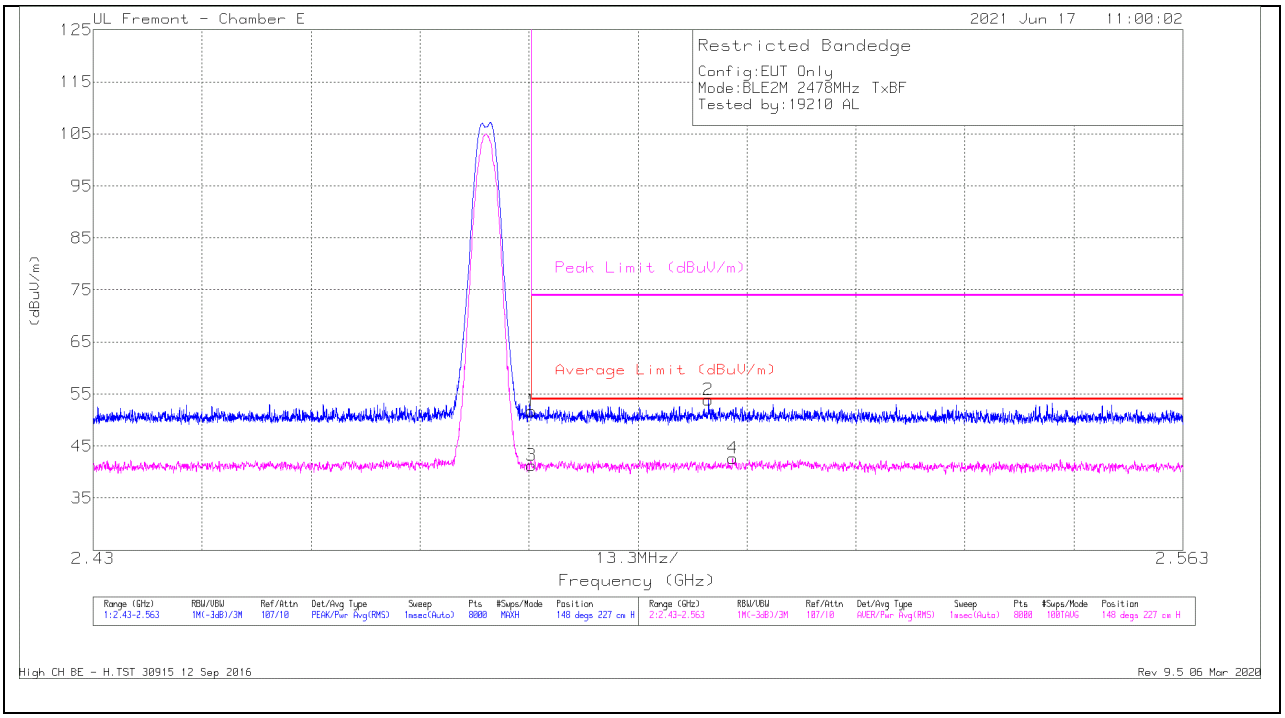
BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	44.51	Pk	32.6	-25.4	51.71	-	-	74	-22.29	148	227	H
3	* 2.48351	34.07	RMS	32.6	-25.4	41.27	54	-12.73	-	-	148	227	H
2	2.50509	46.52	Pk	32.7	-25.4	53.82	-	-	74	-20.18	148	227	H
4	2.50805	35.28	RMS	32.7	-25.3	42.68	54	-11.32	-	-	148	227	H

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

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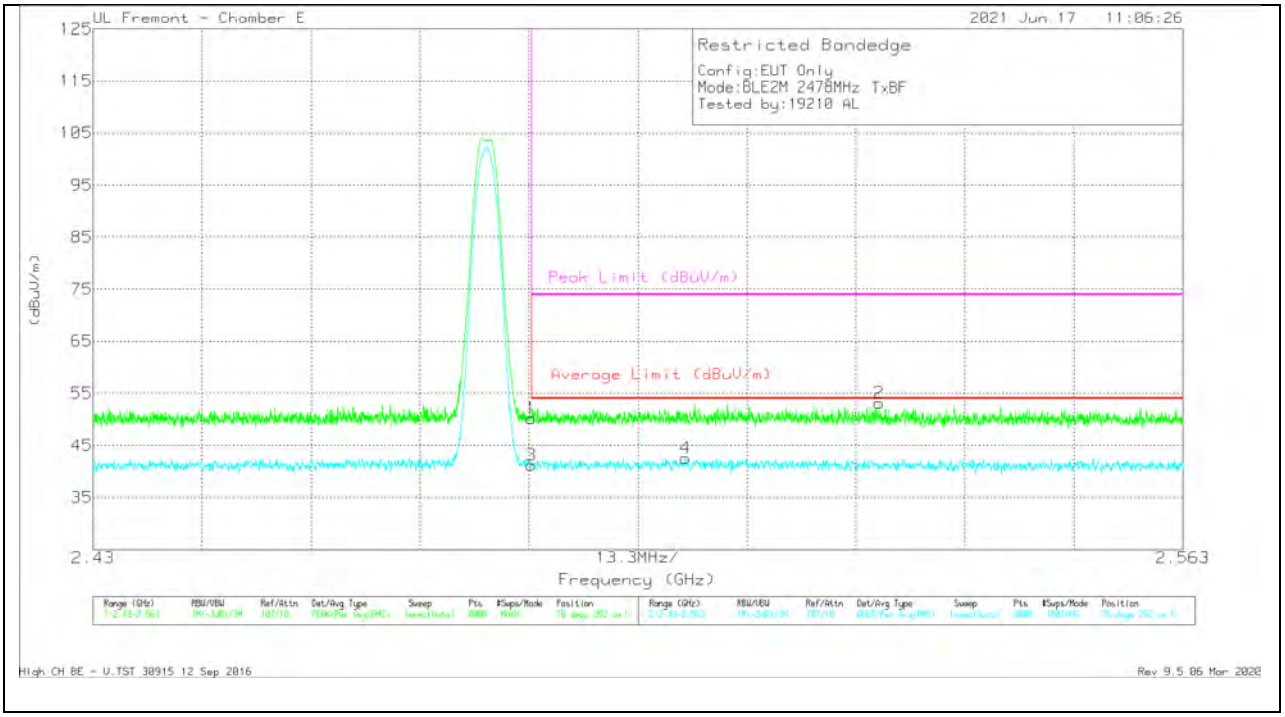
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078 107 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	42.95	Pk	32.6	-25.4	50.15	-	-	74	-23.85	76	292	V
3	* 2.48351	34	RMS	32.6	-25.4	41.2	54	-12.8	-	-	76	292	V
4	2.50228	35.37	RMS	32.7	-25.5	42.57	54	-11.43	-	-	76	292	V
2	2.52594	46.02	Pk	32.5	-25.4	53.12	-	-	74	-20.88	76	292	V

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

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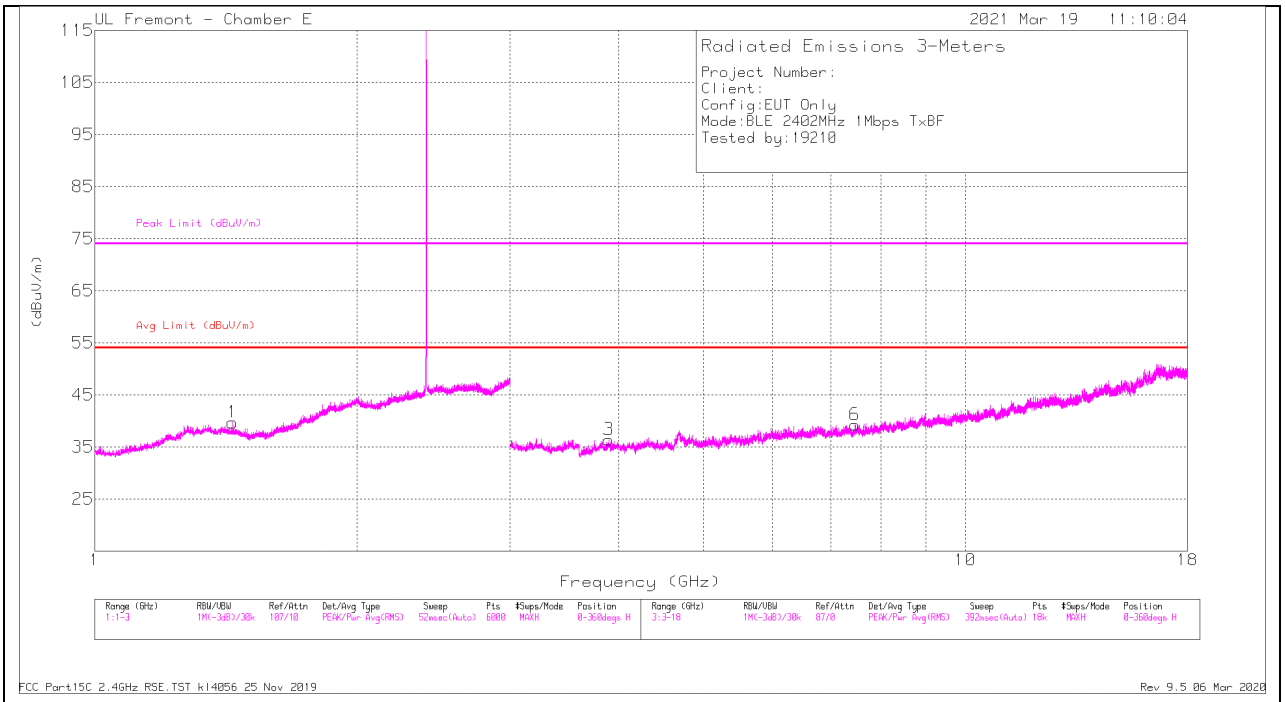
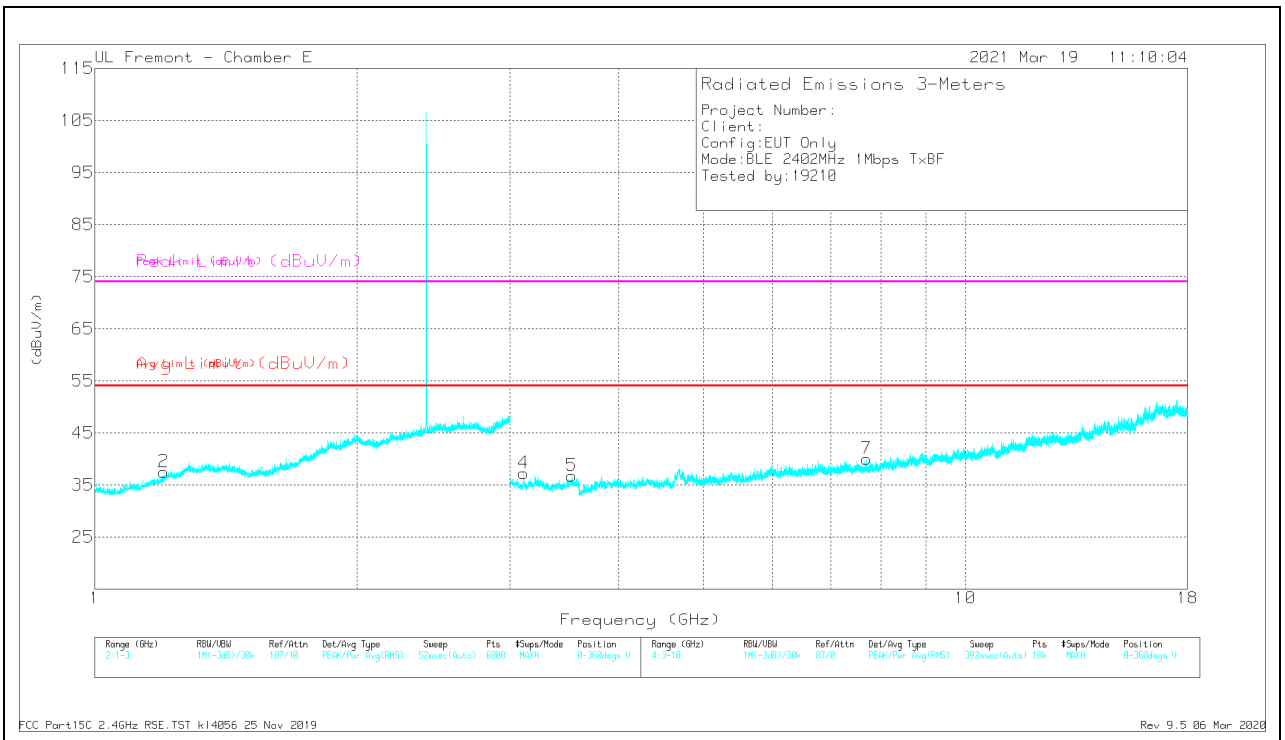
10.2.9. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.4395	36.59	PK2	29	-20.2	45.39	-	-	74	-28.61	193	139	H
	* 1.43816	25	MAv1	29.1	-20.2	33.9	54	-20.1	-	-	193	139	H
2	* 1.20065	37.14	PK2	28.5	-21.4	44.24	-	-	74	-29.76	120	352	V
	* 1.19973	25.1	MAv1	28.4	-21.4	32.1	54	-21.9	-	-	120	352	V
3	* 3.891	41.26	PK2	33.5	-32.3	42.46	-	-	74	-31.54	338	187	H
	* 3.89301	30.13	MAv1	33.5	-32.3	31.33	54	-22.67	-	-	338	187	H
6	* 7.46737	37.41	PK2	35.7	-28.1	45.01	-	-	74	-28.99	235	250	H
	* 7.46884	25.98	MAv1	35.7	-28.1	33.58	54	-20.42	-	-	235	250	H
5	* 3.53082	43.92	PK2	33.4	-34	43.32	-	-	74	-30.68	254	330	V
	* 3.52922	32.19	MAv1	33.4	-34	31.59	54	-22.41	-	-	254	330	V
7	* 7.69908	38.07	PK2	35.9	-28.2	45.77	-	-	74	-28.23	318	206	V
	* 7.70035	26.73	MAv1	35.9	-28.2	34.43	54	-19.57	-	-	318	206	V
4	3.10903	32.94	MAv1	33	-34.8	31.14	-	-	-	-	205	149	V
	3.11047	44.92	PK2	33	-34.8	43.12	-	-	-	-	205	149	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST kl4056 25 Nov 2019
Rev 9.5 06 Mar 2020

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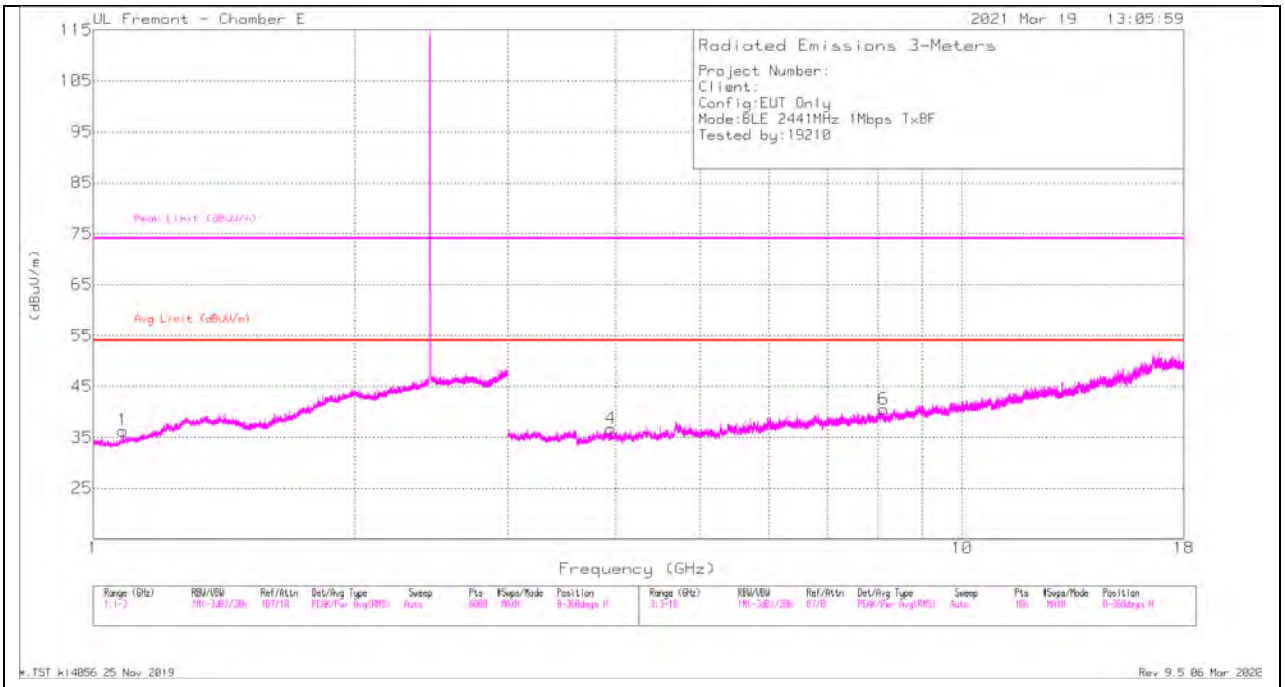
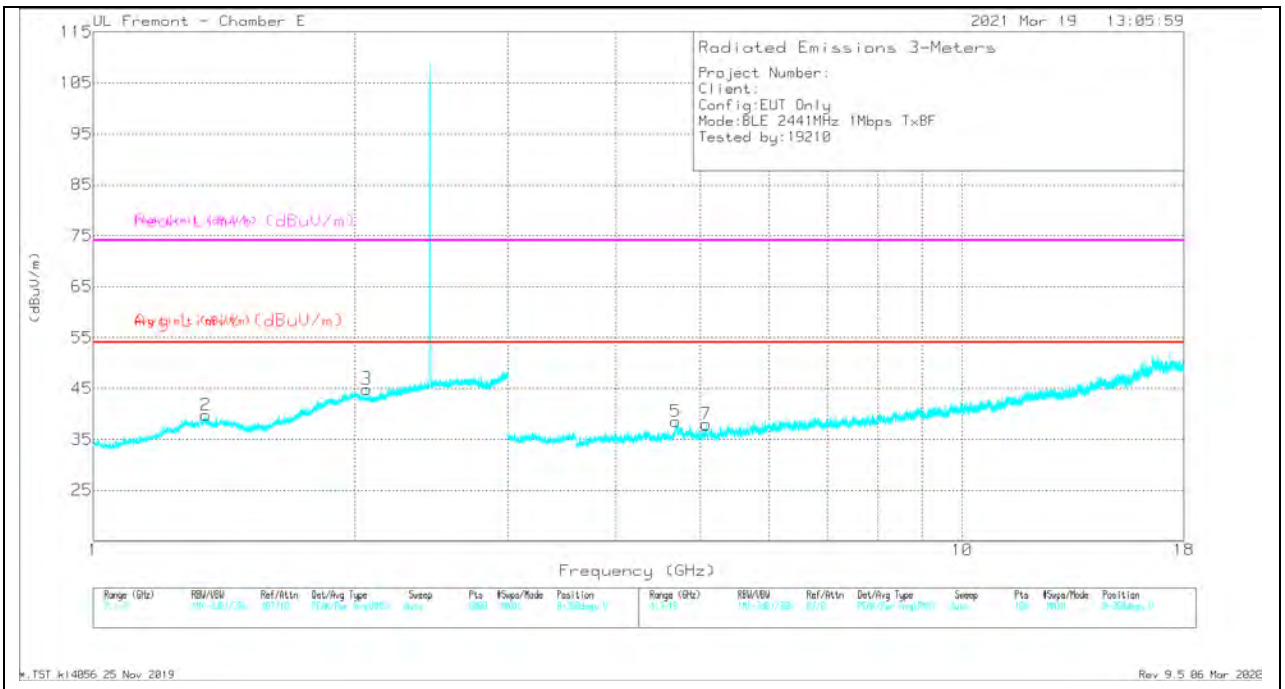
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.08321	36.99	PK2	27.3	-22.2	0	42.09	-	-	74	-31.91	49	397	H
	* 1.08009	25.46	MAv1	27.2	-22.2	0	30.46	54	-23.54	-	-	49	397	H
2	* 1.34722	37.12	PK2	29.5	-20.6	0	46.02	-	-	74	-27.98	193	230	V
	* 1.34651	25.29	MAv1	29.5	-20.6	0	34.19	54	-19.81	-	-	193	230	V
4	* 3.94396	41.14	PK2	33.4	-33	0	41.54	-	-	74	-32.46	36	172	H
	* 3.94318	30.26	MAv1	33.4	-33	0	30.66	54	-23.34	-	-	36	172	H
6	* 8.13141	37.85	PK2	35.8	-27.3	0	46.35	-	-	74	-27.65	86	131	H
	* 8.13003	26.64	MAv1	35.8	-27.3	0	35.14	54	-18.86	-	-	86	131	H
5	* 4.68093	40.64	PK2	34.4	-31.8	0	43.24	-	-	74	-30.76	357	200	V
	* 4.68181	29.71	MAv1	34.4	-31.8	0	32.31	54	-21.69	-	-	357	200	V
7	* 5.07148	40.43	PK2	34.4	-31.9	0	42.93	-	-	74	-31.07	243	302	V
	* 5.07174	29.21	MAv1	34.4	-31.9	0	31.71	54	-22.29	-	-	243	302	V
3	2.06333	37.74	PK2	31.2	-18.7	0	50.24	-	-	-	-	152	250	V
	2.06421	25.54	MAv1	31.2	-18.7	0	38.04	-	-	-	-	152	250	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

*.TST kl4056 25 Nov 2019
Rev 9.5 06 Mar 2020

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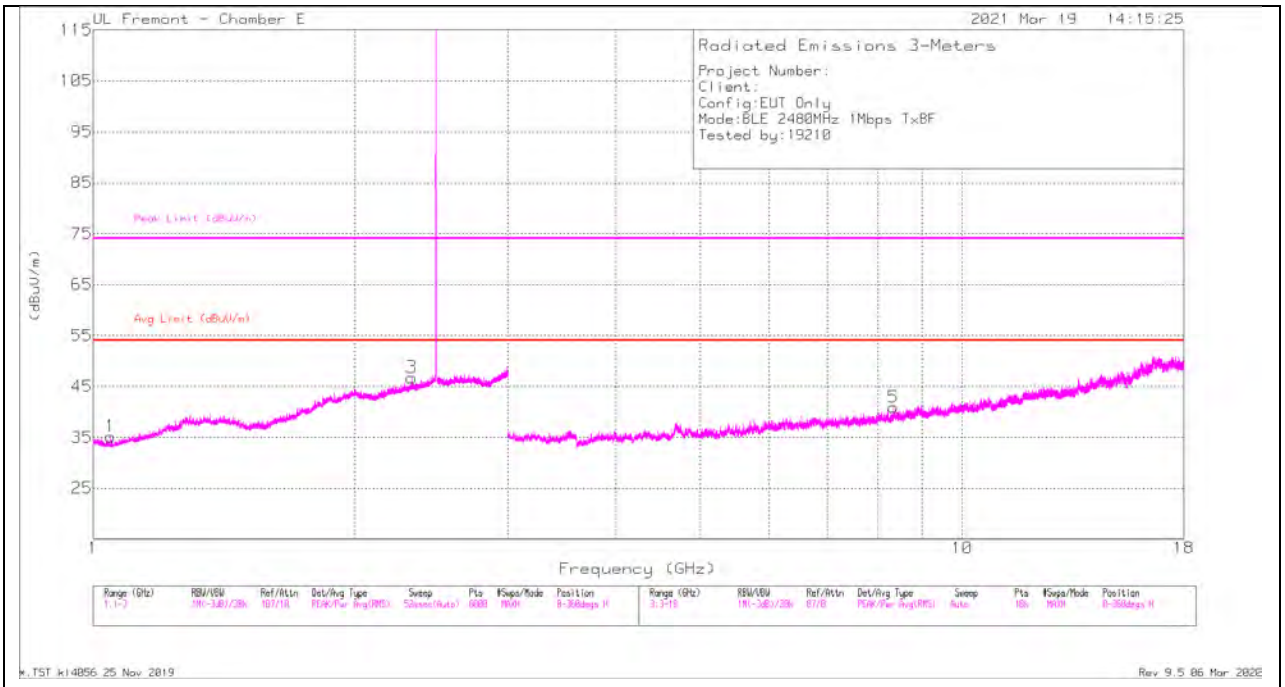
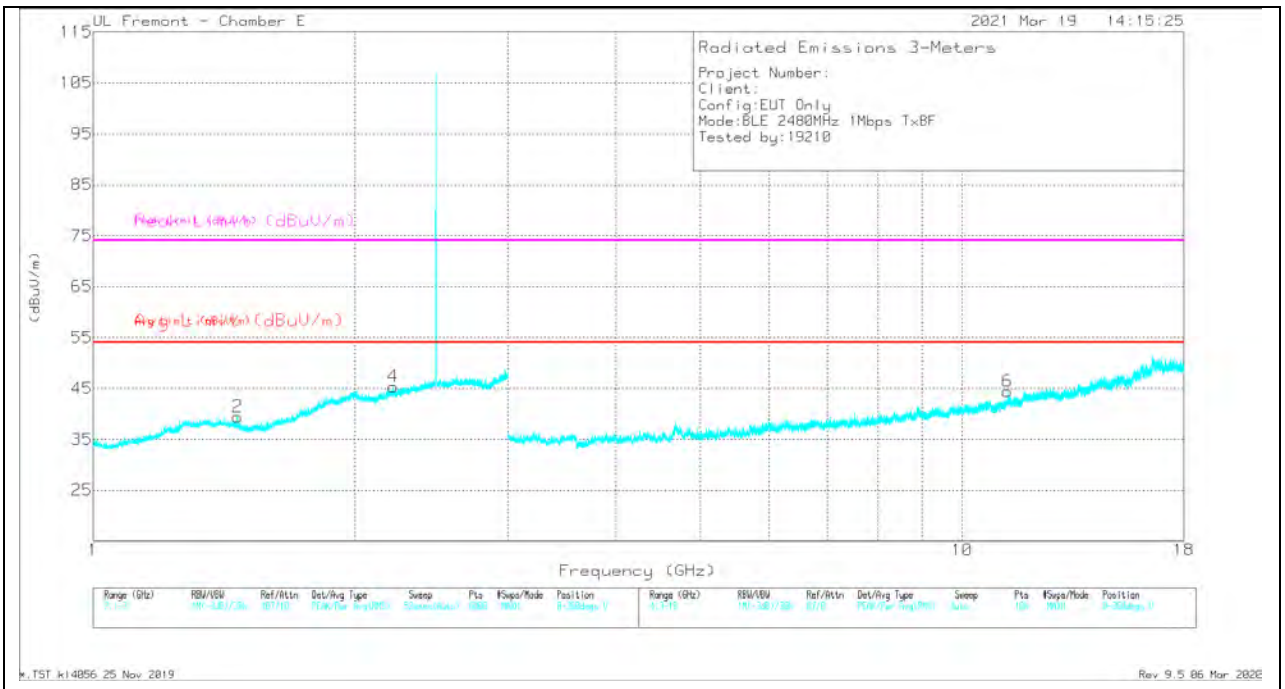
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0078107 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.04792	36.51	PK2	27.2	-22.3	0	41.41	-	-	74	-32.59	26	111	H
	* 1.04737	25.02	MAv1	27.2	-22.3	0	29.92	54	-24.08	-	-	26	111	H
3	* 2.32662	38.09	PK2	32	-18.3	0	51.79	-	-	74	-22.21	268	185	H
	* 2.32423	26.52	MAv1	31.9	-18.3	0	40.12	54	-13.88	-	-	268	185	H
2	* 1.46657	37.04	PK2	28.4	-20.1	0	45.34	-	-	74	-28.66	326	307	V
	* 1.46702	25.35	MAv1	28.3	-20.1	0	33.55	54	-20.45	-	-	326	307	V
4	* 2.21794	37.67	PK2	31.8	-18.5	0	50.97	-	-	74	-23.03	259	203	V
	* 2.21568	26.2	MAv1	31.7	-18.5	0	39.4	54	-14.6	-	-	259	203	V
5	* 8.34235	36.45	PK2	35.9	-26.3	0	46.05	-	-	74	-27.95	177	300	H
	* 8.34525	25.67	MAv1	35.9	-26.3	0	35.27	54	-18.73	-	-	177	300	H
6	* 11.2763	35.12	PK2	38	-23	0	50.12	-	-	74	-23.88	160	174	V
	* 11.27634	23.9	MAv1	38	-23	0	38.9	54	-15.1	-	-	160	174	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

*.TST kl4056 25 Nov 2019
Rev 9.5 06 Mar 2020

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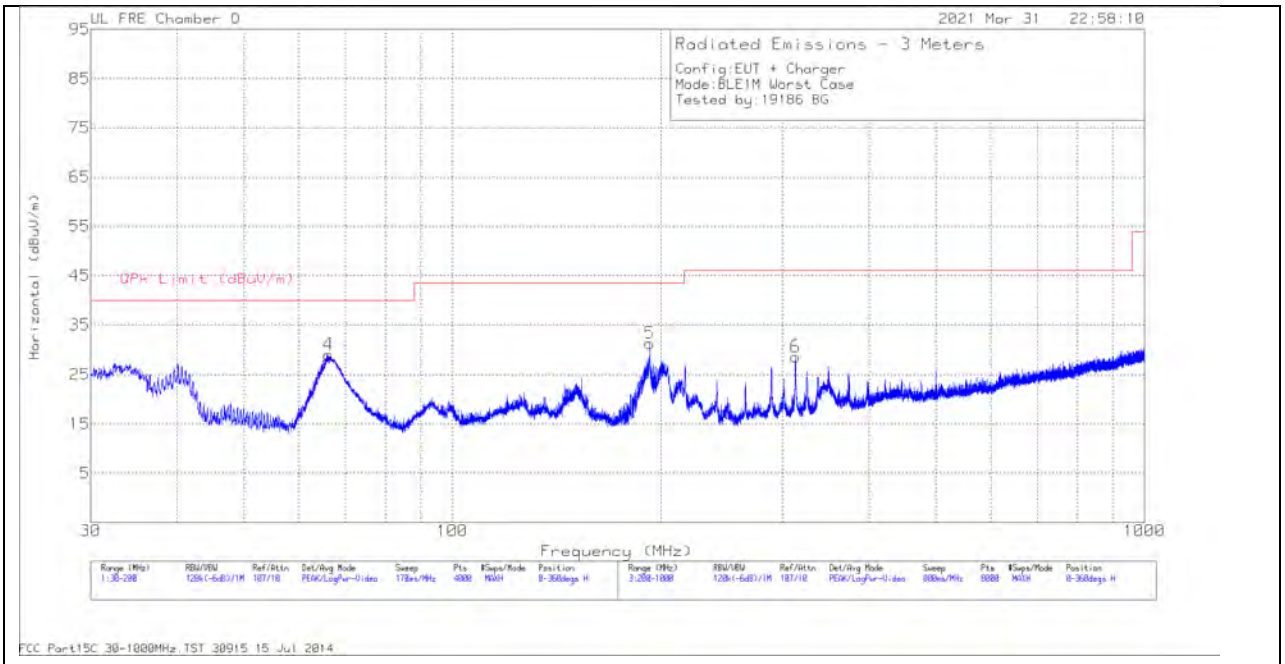
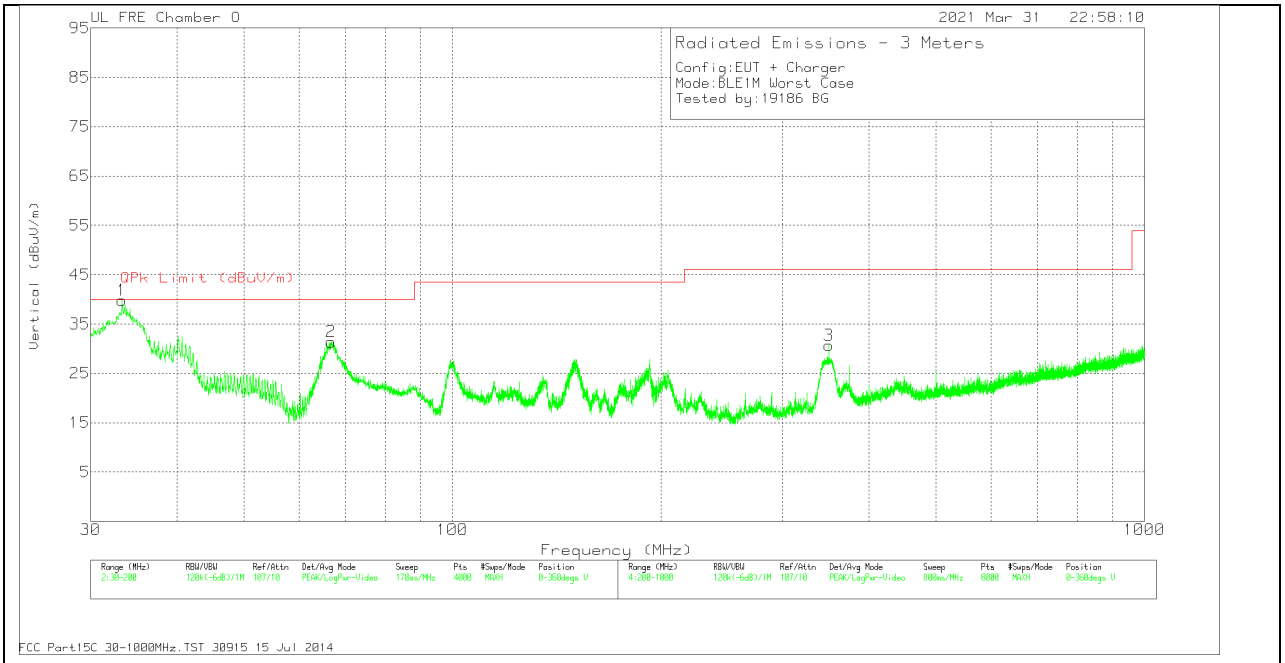
10.3. WORST CASE BELOW 1 GHZ

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



HORIZONTAL



VERTICAL

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DATA

Range 1: Horizontal 30 - 200MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	AF 202329 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
65.9902	43.3	Qp	13.8	-32.2	24.9	40	-15.1	283	307	H
192.7609	43.34	Qp	17.2	-31.5	29.04	43.52	-14.48	41	128	H

Range 2: Vertical 30 - 200MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	AF 202329 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
33.5231	40.72	Qp	24.6	-32.5	32.82	40	-7.18	296	105	V
66.6524	46.39	Qp	13.8	-32.2	27.99	40	-12.01	357	106	V

Range 3: Horizontal 200 - 1000MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	AF 202329 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
313.1902	37.78	Qp	19.6	-31	26.38	46.02	-19.64	12	104	H

Range 4: Vertical 200 - 1000MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	AF 202329 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
350.0348	39.35	Qp	20.1	-30.9	28.55	46.02	-17.47	105	239	V

Qp - Quasi-Peak detector

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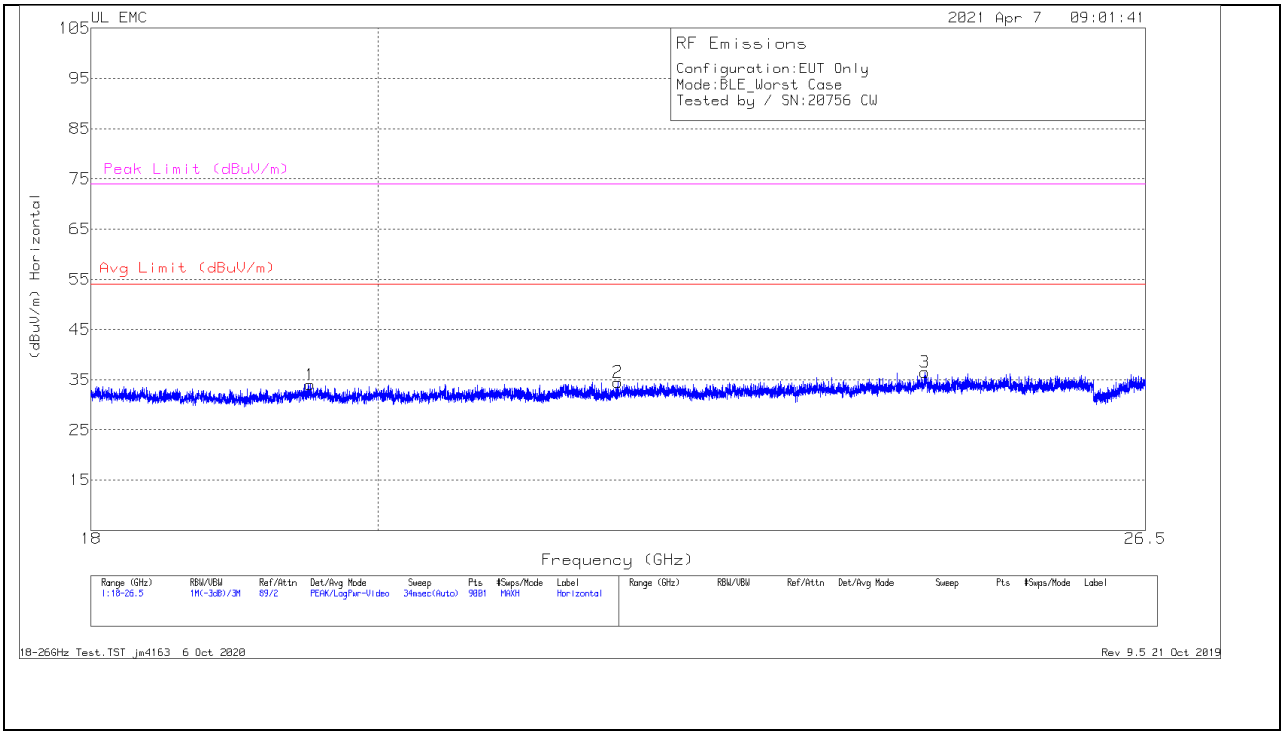
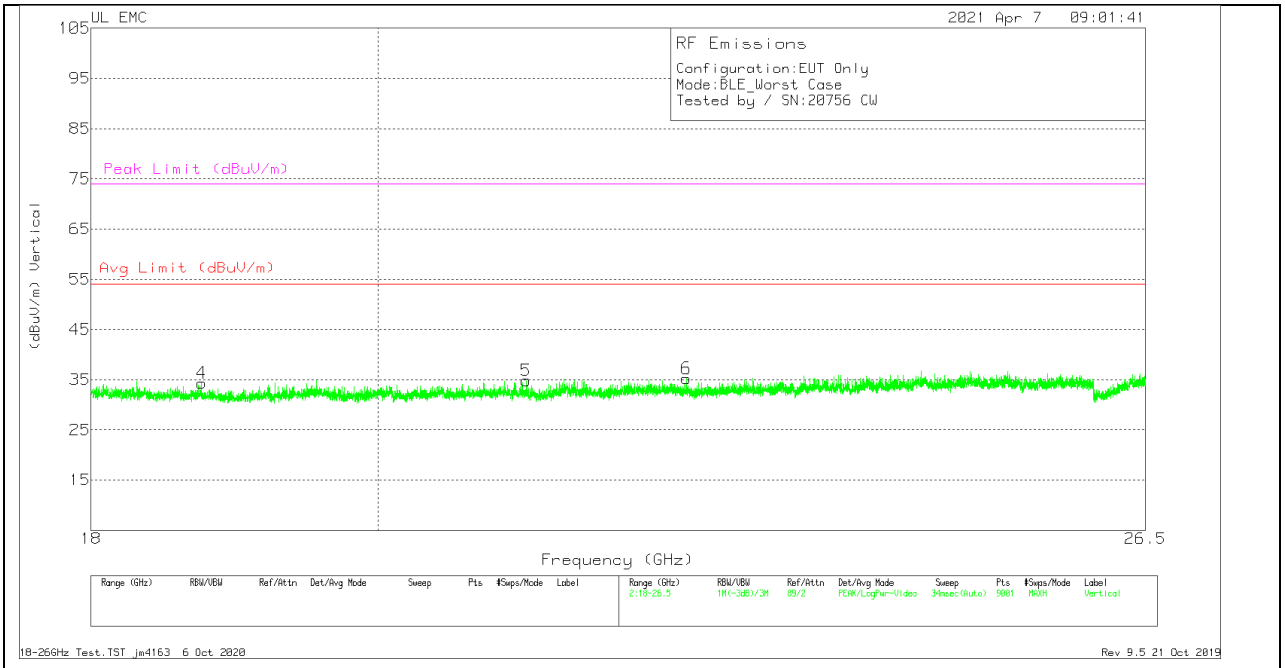
10.4. WORST CASE 18-26 GHz

HORIZONTAL



VERTICAL



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DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T447 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.50544	67.92	Pk	32.8	-57.2	-9.5	34.02	54	-19.98	74	-39.98
2	21.83916	68.09	Pk	33.3	-57.4	-9.5	34.49	54	-19.51	74	-39.51
3	24.44111	67.7	Pk	34.3	-56	-9.5	36.5	54	-17.5	74	-37.5
4	18.74422	69.93	Pk	32.4	-58.5	-9.5	34.33	54	-19.67	74	-39.67
5	21.11572	67.83	Pk	33.2	-56.7	-9.5	34.83	54	-19.17	74	-39.17
6	22.39355	68.74	Pk	33.6	-57.6	-9.5	35.24	54	-18.76	74	-38.76

Pk - Peak detector

18-26GHz Test.TST jm4163 6 Oct 2020
Rev 9.5 21 Oct 2019

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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 (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency

TEST PROCEDURE

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

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

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

RESULTS

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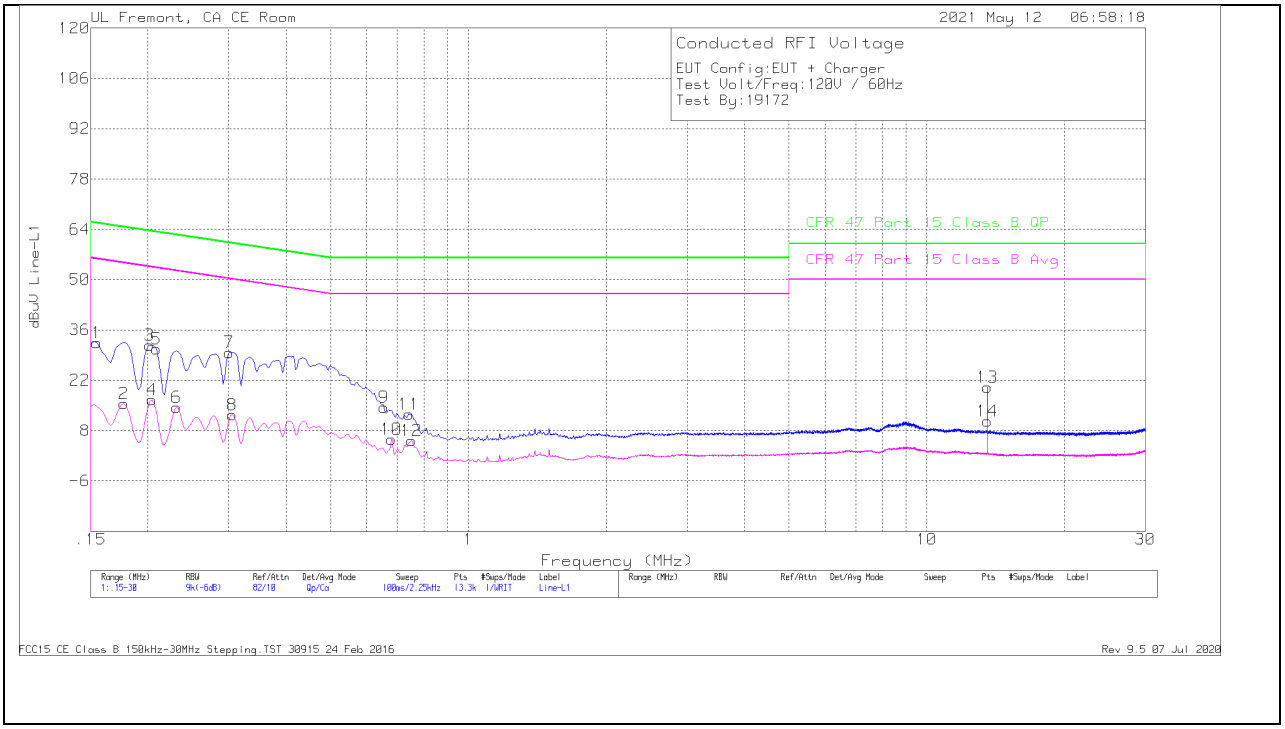
11.1. AC Power Line WITH AC/DC ADAPTER

LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.1545	22.3	Qp	.1	0	10.1	32.5	65.75	-33.25	-	-
2	.177	5.44	Ca	0	0	10.1	15.54	-	-	54.63	-39.09
3	.20175	21.67	Qp	0	0	10.1	31.77	63.54	-31.77	-	-
4	.204	6.45	Ca	0	0	10.1	16.55	-	-	53.45	-36.9
5	.2085	20.66	Qp	0	0	10.1	30.76	63.26	-32.5	-	-
6	.231	4.46	Ca	0	0	10.1	14.56	-	-	52.41	-37.85
7	.30075	19.65	Qp	0	0	10.1	29.75	60.22	-30.47	-	-
8	.30525	2.33	Ca	0	0	10.1	12.43	-	-	50.1	-37.67
9	.654	4.43	Qp	0	0	10.1	14.53	56	-41.47	-	-
10	.67988	-4.44	Ca	0	0	10.1	5.66	-	-	46	-40.34
11	.74175	2.53	Qp	0	0	10.1	12.63	56	-43.37	-	-
12	.75075	-5.02	Ca	0	.1	10.1	5.18	-	-	46	-40.82
*13	13.56	9.59	Qp	.1	.2	10.2	20.09	60	-39.91	-	-
*14	13.56	.17	Ca	.1	.2	10.2	10.67	-	-	50	-39.33

Qp - Quasi-Peak detector
Ca - CISPR average detection
*Indicates UL RFID Signal. Not from device.

FCC15 CE Class B 150kHz-30MHz Stepping.TST 30915 24 Feb 2016
Rev 9.5 07 Jul 2020

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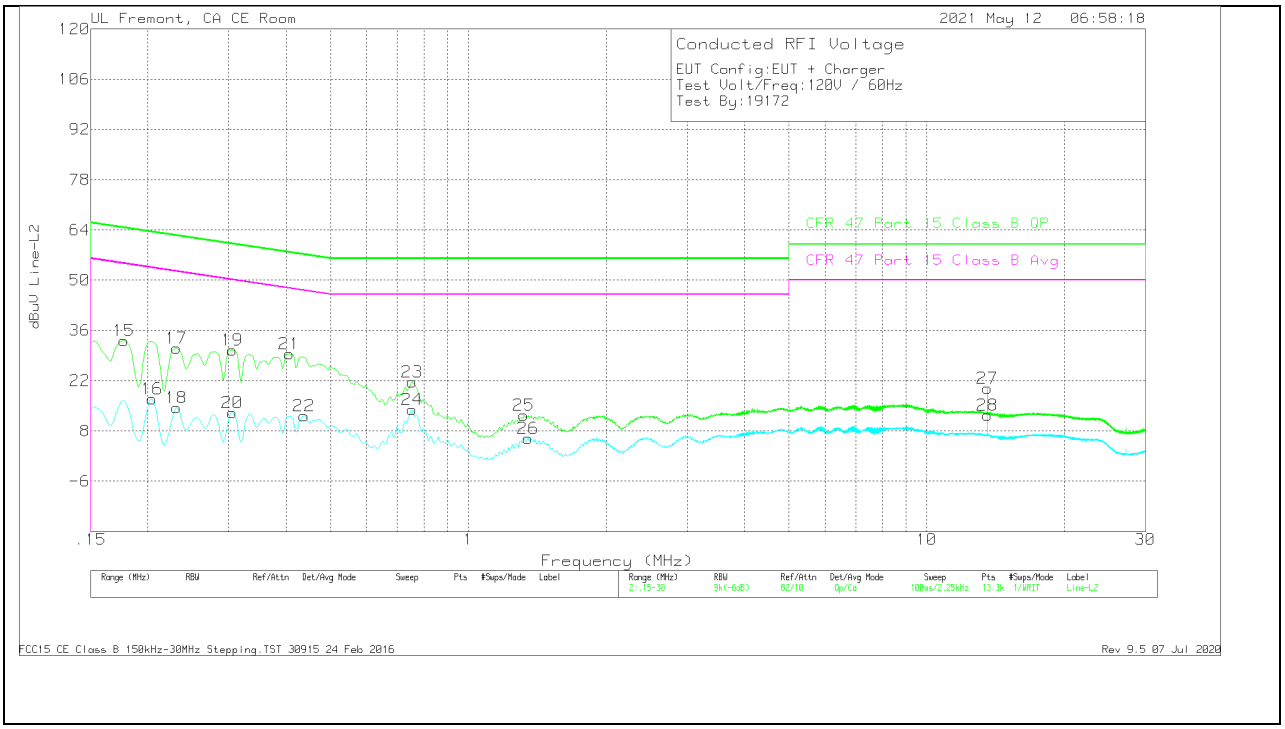
LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
15	.177	23.01	Qp	0	0	10.1	33.11	64.63	-31.52	-	-
16	.204	6.84	Ca	0	0	10.1	16.94	-	-	53.45	-36.51
17	.231	20.97	Qp	0	0	10.1	31.07	62.41	-31.34	-	-
18	.231	4.33	Ca	0	0	10.1	14.43	-	-	52.41	-37.98
19	.30525	20.41	Qp	0	0	10.1	30.51	60.1	-29.59	-	-
20	.30525	3.02	Ca	0	0	10.1	13.12	-	-	50.1	-36.98
21	.4065	19.35	Qp	0	0	10.1	29.45	57.72	-28.27	-	-
22	.438	2.09	Ca	0	0	10.1	12.19	-	-	47.1	-34.91
23	.753	11.59	Qp	0	0	10.1	21.69	56	-34.31	-	-
24	.753	3.8	Ca	0	0	10.1	13.9	-	-	46	-32.1
25	1.32225	2.23	Qp	0	.1	10.1	12.43	56	-43.57	-	-
26	1.3515	-4.22	Ca	0	.1	10.1	5.98	-	-	46	-40.02
*27	13.56	9.41	Qp	.1	.2	10.2	19.91	60	-40.09	-	-
*28	13.56	1.96	Ca	.1	.2	10.2	12.46	-	-	50	-37.54

Qp - Quasi-Peak detector
Ca - CISPR average detection
*Indicates UL RFID Signal. Not from device.

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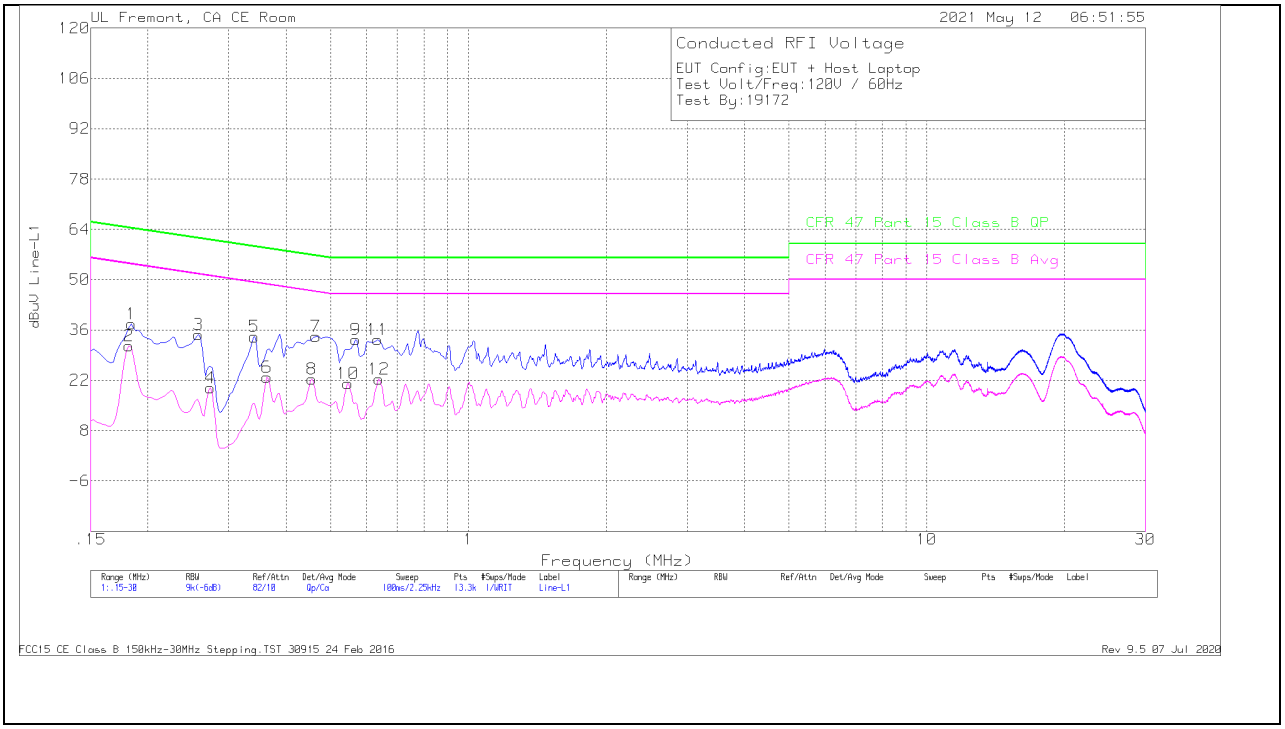
11.2. AC Power Line WITH LAPTOP

LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L1	LC Cables C1&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
1	.18375	27.61	Qp	0	0	10.1	37.71	64.31	-26.6	-	-
2	.1815	21.54	Ca	0	0	10.1	31.64	-	-	54.42	-22.78
3	.258	24.64	Qp	0	0	10.1	34.74	61.5	-26.76	-	-
4	.27375	9.72	Ca	0	0	10.1	19.82	-	-	51	-31.18
5	.34125	24.02	Qp	0	0	10.1	34.12	59.17	-25.05	-	-
6	.36375	12.7	Ca	0	0	10.1	22.8	-	-	48.64	-25.84
7	.465	24.09	Qp	0	0	10.1	34.19	56.6	-22.41	-	-
8	.456	12.27	Ca	0	0	10.1	22.37	-	-	46.77	-24.4
9	.5685	23.18	Qp	0	0	10.1	33.28	56	-22.72	-	-
10	.546	11.06	Ca	0	0	10.1	21.16	-	-	46	-24.84
11	.63375	23.17	Qp	0	0	10.1	33.27	56	-22.73	-	-
12	.63825	12.27	Ca	0	0	10.1	22.37	-	-	46	-23.63

Qp - Quasi-Peak detector
Ca - CISPR average detection

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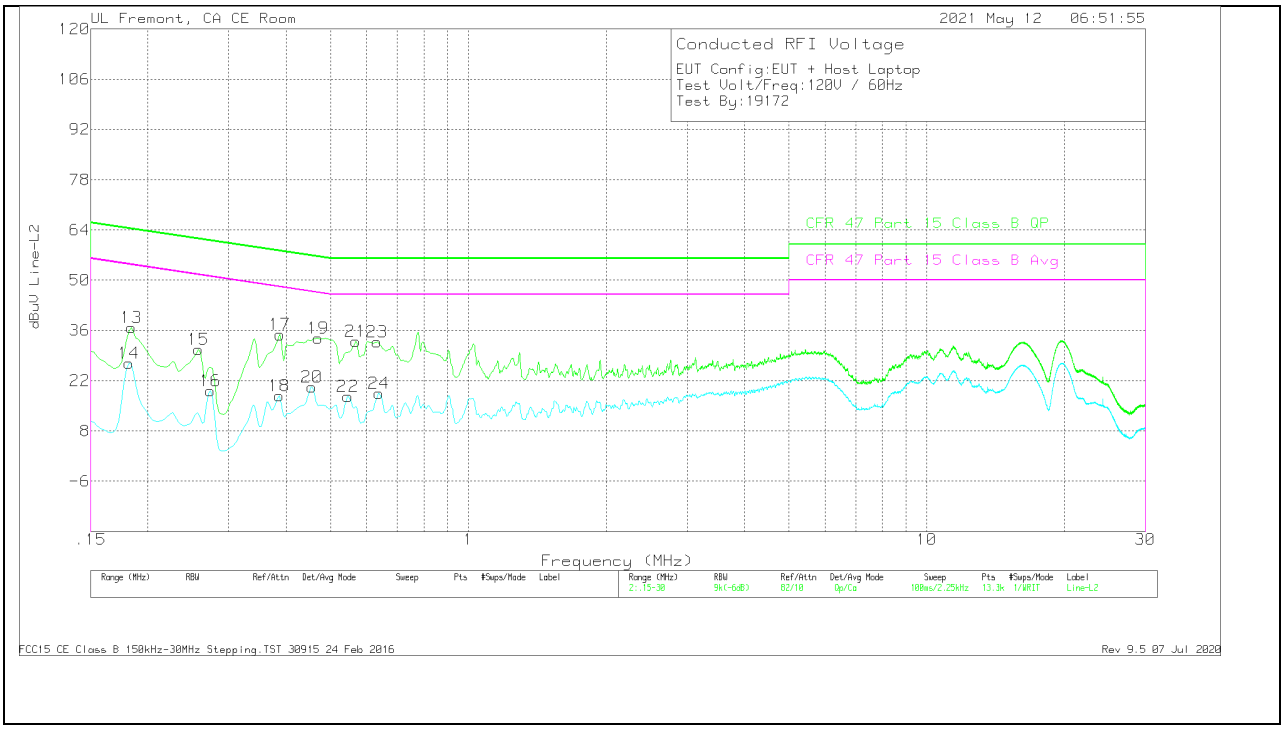
LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	PRE0186446 L2	LC Cables C2&C3 dB	Limiter	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR)Margin (dB)
13	.18375	26.69	Qp	0	0	10.1	36.79	64.31	-27.52	-	-
14	.1815	16.77	Ca	0	0	10.1	26.87	-	-	54.42	-27.55
15	.258	20.58	Qp	0	0	10.1	30.68	61.5	-30.82	-	-
16	.27375	9.15	Ca	0	0	10.1	19.25	-	-	51	-31.75
17	.3885	24.72	Qp	0	0	10.1	34.82	58.1	-23.28	-	-
18	.38625	7.69	Ca	0	0	10.1	17.79	-	-	48.14	-30.35
19	.4695	23.78	Qp	0	0	10.1	33.88	56.52	-22.64	-	-
20	.456	10.2	Ca	0	0	10.1	20.3	-	-	46.77	-26.47
21	.5685	22.82	Qp	0	0	10.1	32.92	56	-23.08	-	-
22	.546	7.6	Ca	0	0	10.1	17.7	-	-	46	-28.3
23	.6315	22.66	Qp	0	0	10.1	32.76	56	-23.24	-	-
24	.63825	8.47	Ca	0	0	10.1	18.57	-	-	46	-27.43

Qp - Quasi-Peak detector
Ca - CISPR average detection

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12. SETUP PHOTOS

Please refer to 13573771-EP1V1 for setup photos

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