

TEST REPORT

Report Number: 14523744-E1V2

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

Model : A3101 (Full Test Model)
A3102, A3104 (Variant Models)

Brand : APPLE

FCC ID : BCG-E8436A (Full Test Model)
BCG-E8437A, BCG-E8438A (Variant Models)

IC : 579C-E8436A (Full Test Model)
579C-E8437A, 579C-E8438A (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 03, 2023

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



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	8/2/2023	<u>Initial Issue</u>	Chin Pang
V2	8/3/2023	<u>Addressed TCB Questions sections 6, 9, 10</u>	Tony Li

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	6
2. TEST SUMMARY	8
3. TEST METHODOLOGY	8
4. FACILITIES AND ACCREDITATION	9
5. DECISION RULES AND MEASUREMENT UNCERTAINTY	9
5.1. METROLOGICAL TRACEABILITY	9
5.2. DECISION RULES.....	9
5.3. MEASUREMENT UNCERTAINTY.....	10
6. EQUIPMENT UNDER TEST	11
6.1. EUT DESCRIPTION	11
6.2. MAXIMUM OUTPUT POWER.....	11
6.3. DESCRIPTION OF AVAILABLE ANTENNAS	12
6.4. SOFTWARE AND FIRMWARE.....	12
6.5. WORST-CASE CONFIGURATION AND MODE.....	13
6.6. DESCRIPTION OF TEST SETUP.....	14
7. TEST AND MEASUREMENT EQUIPMENT	18
8. MEASUREMENT METHODS	20
9. ANTENNA PORT TEST RESULTS.....	21
9.1. ON TIME AND DUTY CYCLE.....	21
9.2. 20 dB AND 99% BANDWIDTH	22
9.2.1. HIGH POWER BASIC DATA RATE GFSK MODULATION.....	23
9.2.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION.....	24
9.2.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION	25
9.2.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	26
9.3. HOPPING FREQUENCY SEPARATION	27
9.3.1. HIGH POWER BASIC DATA RATE GFSK MODULATION.....	28
9.4. NUMBER OF HOPPING CHANNELS.....	29
9.4.1. HIGH POWER BASIC DATA RATE GFSK MODULATION.....	30
9.5. AVERAGE TIME OF OCCUPANCY.....	32
9.5.1. HIGH POWER BASIC DATA RATE GFSK MODULATION.....	33
9.6. OUTPUT POWER.....	37

9.6.1.	HIGH POWER BASIC DATA RATE GFSK MODULATION.....	39
9.6.2.	HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION.....	39
9.6.3.	HIGH POWER ENHANCED DATA RATE QPSK MODULATION	40
9.6.4.	HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION	40
9.6.5.	HIGH POWER ENHANCED DATA RATE 8PSK MODULATION	41
9.6.6.	HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	41
9.6.7.	LOW POWER BASIC DATA RATE GFSK MODULATION.....	42
9.6.8.	LOW POWER BASIC DATA RATE TXBF GFSK MODULATION.....	42
9.6.9.	LOW POWER ENHANCED DATA RATE QPSK MODULATION	43
9.6.10.	LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION.....	43
9.6.11.	LOW POWER ENHANCED DATA RATE 8PSK MODULATION	44
9.6.12.	LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	44
9.7.	AVERAGE POWER.....	45
9.7.1.	HIGH POWER BASIC DATA RATE GFSK MODULATION.....	46
9.7.2.	HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION.....	46
9.7.3.	HIGH POWER ENHANCED DATA RATE QPSK MODULATION	47
9.7.4.	HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION	47
9.7.5.	HIGH POWER ENHANCED DATA RATE 8PSK MODULATION	48
9.7.6.	HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	48
9.7.7.	LOW POWER BASIC DATA RATE GFSK MODULATION.....	49
9.7.8.	LOW POWER BASIC DATA RATE TXBF GFSK MODULATION.....	49
9.7.9.	LOW POWER ENHANCED DATA RATE QPSK MODULATION	50
9.7.10.	LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION.....	50
9.7.11.	LOW POWER ENHANCED DATA RATE 8PSK MODULATION	51
9.7.12.	LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	51
9.8.	CONDUCTED SPURIOUS EMISSIONS.....	52
9.8.1.	HIGH POWER BASIC DATA RATE GFSK MODULATION.....	53
9.8.2.	HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION.....	57
9.8.3.	HIGH POWER ENHANCED DATA RATE 8PSK MODULATION	61
9.8.4.	HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION.....	65
9.8.5.	LOW POWER BASIC DATA RATE GFSK MODULATION.....	69
9.8.6.	LOW POWER BASIC DATA RATE TXBF GFSK MODULATION.....	73
9.8.7.	LOW POWER ENHANCED DATA RATE 8PSK MODULATION	77
9.8.8.	LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION	81
10.	RADIATED TEST RESULTS	85
10.1.	TRANSMITTER ABOVE 1 GHz.....	87
10.1.1.	HIGH POWER BASIC DATA RATE GFSK MODULATION	87
10.1.2.	HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION	95
10.1.3.	HIGH POWER ENHANCED DATA RATE 8PSK MODULATION.....	99
10.1.4.	HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION.....	107
10.1.5.	LOW POWER BASIC DATA RATE GFSK MODULATION	111
10.1.6.	LOW POWER BASIC DATA RATE TXBF GFSK MODULATION	119
10.1.7.	LOW POWER ENHANCED DATA RATE 8PSK MODULATION	123
10.1.8.	LOW POWER BASIC DATA RATE TXBF 8PSK MODULATION.....	131
10.1.9.	GFSK TXBF HARMONICS AND SPURIOUS EMISSIONS	135
10.2.	WORST CASE BELOW 1 GHZ.....	141
10.3.	WORST CASE 18-26 GHZ.....	143
11.	AC POWER LINE CONDUCTED EMISSIONS	145

11.1.	AC Power Line With AC/DC Adapter	146
11.2.	AC Power Line With Laptop.....	148
12.	SETUP PHOTOS	150

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A3101 (Full Test Model)
A3102, A3104 (Variant Models)

BRAND: APPLE

SERIAL NUMBER: C07GT40004U00006GU (Conducted)
CLX2X4640 (Radiated)
CY2KJ6YF12 (Radiated)

SAMPLE RECEIPT DATE: JANUARY 23, 2023

DATE TESTED: MARCH 06 – AUGUST 3, 2023

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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

Approved & Released For
UL Verification Services Inc. By:



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

Prepared By:



Chris Xiong
Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	RSS-GEN 6.7	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	RSS-247 (5.1) (b)	Hopping Frequency Separation	Complies	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Number of Hopping Channels	Complies	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Average Time of Occupancy	Complies	None.
15.247 (b)(1)	RSS-247 (5.4) (b)	Output Power	Complies	None.
See Comment		Average Power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
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 the following standards/ rules/ KDBs:

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 D01 Multiple Transmitter Output v02r01
 RSS-GEN Issue 5 + A1:2019 + A2:2021
 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	550739
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
☐	Building 5: 47670 Kato Rd, Fremont, CA 94538 USA			

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U _{Lab}
Conducted Antenna Port Emission Measurement	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 dB (Peak) 1.300 dB (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 db
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 db
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 db
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 db
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 db
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 db

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

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

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

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

Full Test Model: A3101, FCC ID: BCG-E8436A, IC ID: 579C-E8436A

Variant Models: A3102, FCC ID: BCG-E8437A, IC ID: 579C-E8437A
A3104, FCC ID: BCG-E8438A, IC ID: 579C-E8438A

6.2. MAXIMUM OUTPUT POWER

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

Antenna	Config	Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
ANT 4	High Power	2402 - 2480	Basic GFSK	20.13	103.04
		2402 - 2480	DQPSK	19.07	80.72
		2402 - 2480	Enhanced 8PSK	19.24	83.95
	Low Power	2402 - 2480	Basic GFSK	11.66	14.66
		2402 - 2480	DQPSK	11.03	12.68
		2402 - 2480	Enhanced 8PSK	11.24	13.30
ANT 3	High Power	2402 - 2480	Basic GFSK	20.11	102.57
		2402 - 2480	DQPSK	19.05	80.35
		2402 - 2480	Enhanced 8PSK	19.24	83.95
	Low Power	2402 - 2480	Basic GFSK	11.65	14.62
		2402 - 2480	DQPSK	11.05	12.74
		2402 - 2480	Enhanced 8PSK	11.25	13.34
Beamforming ANT 4 + ANT 3	High Power	2402 - 2480	Basic GFSK TxBF	20.15	103.51
		2402 - 2480	DQPSK TxBF	19.05	80.35
		2402 - 2480	Enhanced 8PSK TxBF	19.25	84.14
	Low Power	2402 - 2480	Basic GFSK TxBF	14.65	29.17
		2402 - 2480	DQPSK TxBF	14.05	25.41
		2402 - 2480	Enhanced 8PSK TxBF	14.28	26.79

Note: GFSK, DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case.

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna type is IFA.

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

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

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 21.1.304.2213

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 Y (Landscape) was the worst-case orientation for ANT 4 and ANT 3. (Flatbed) orientation was the worst case for 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.

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 EUT was 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 BT and 5GHz bands, No noticeable emission was found.

GFSK, DQPSK, 8PSK average power are all investigated, The GFSK & 8PSK power are the worst case. For average power data please refer to section 9.7.

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

GFSK mode: DH5

8PSK mode: 3-DH5

Beamforming: GFSK, DH5, 8PSK, 3-DH5

For radiated harmonic spurious emissions test, high power beamforming GFSK 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.

For Radiated band edge, GFSK, 8PSK and TXBF modulations were all investigated on low and high power setting.

NOTE:

ANT 0 on radiated plots corresponds to ANT 4

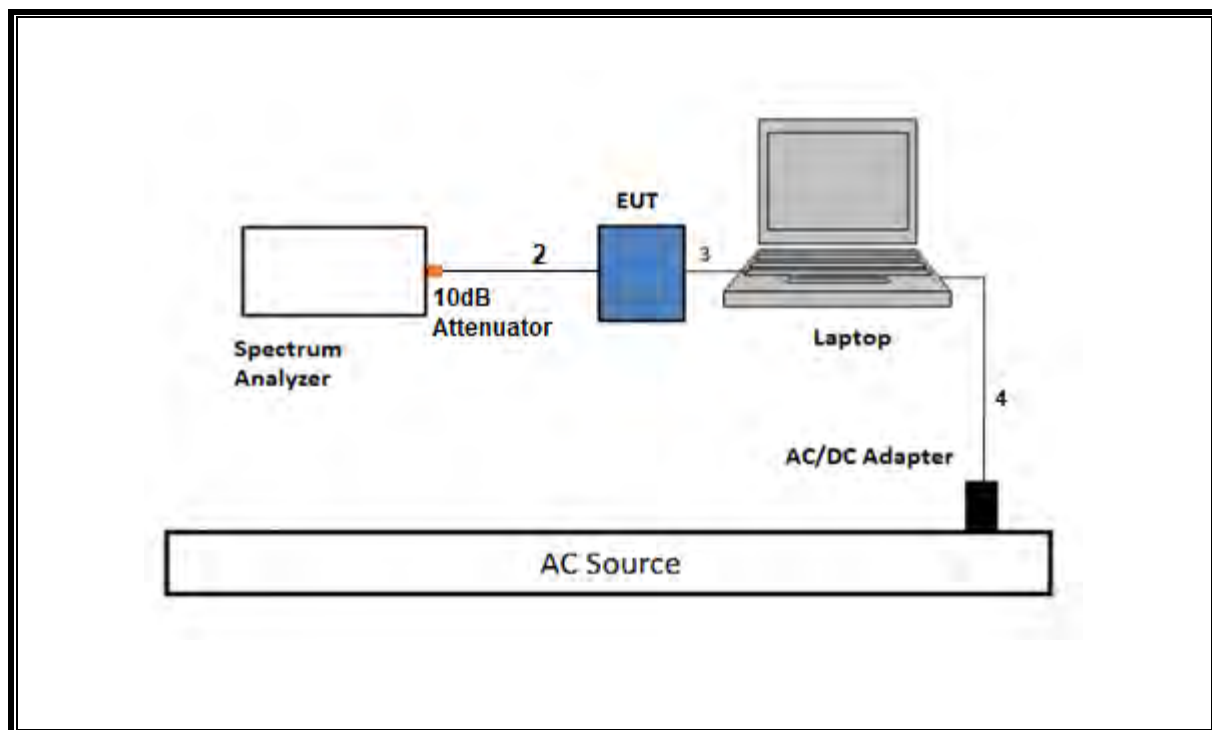
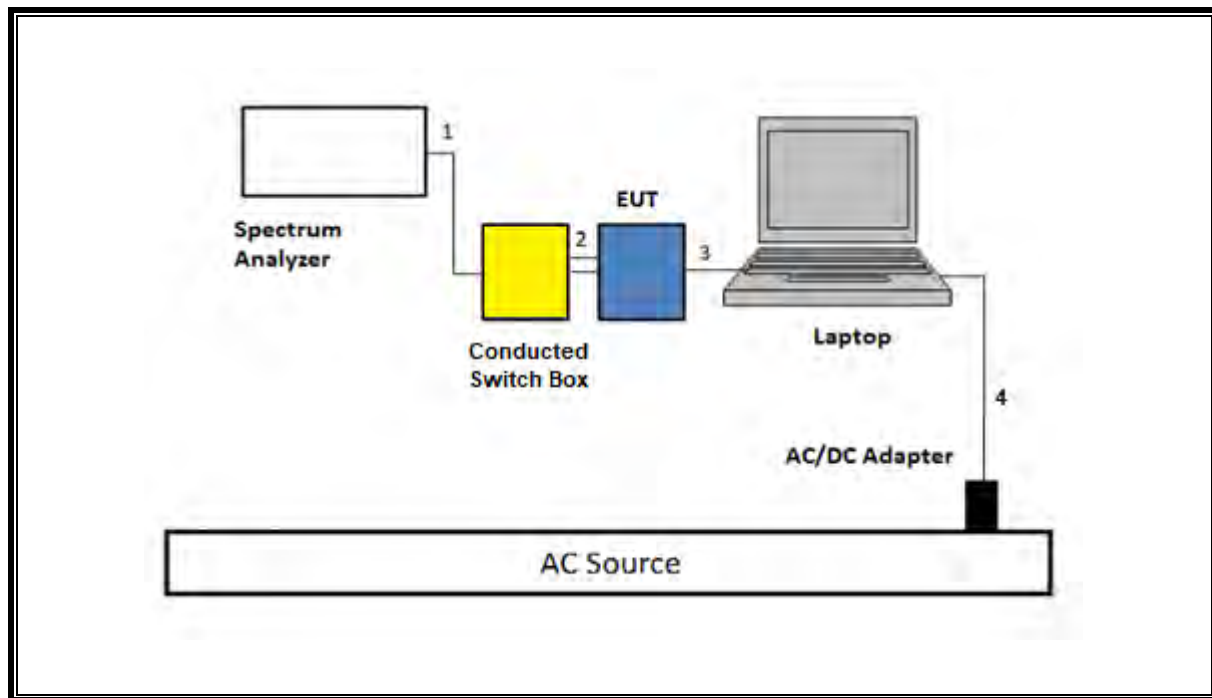
ANT 1 on radiated plots corresponds to ANT 3

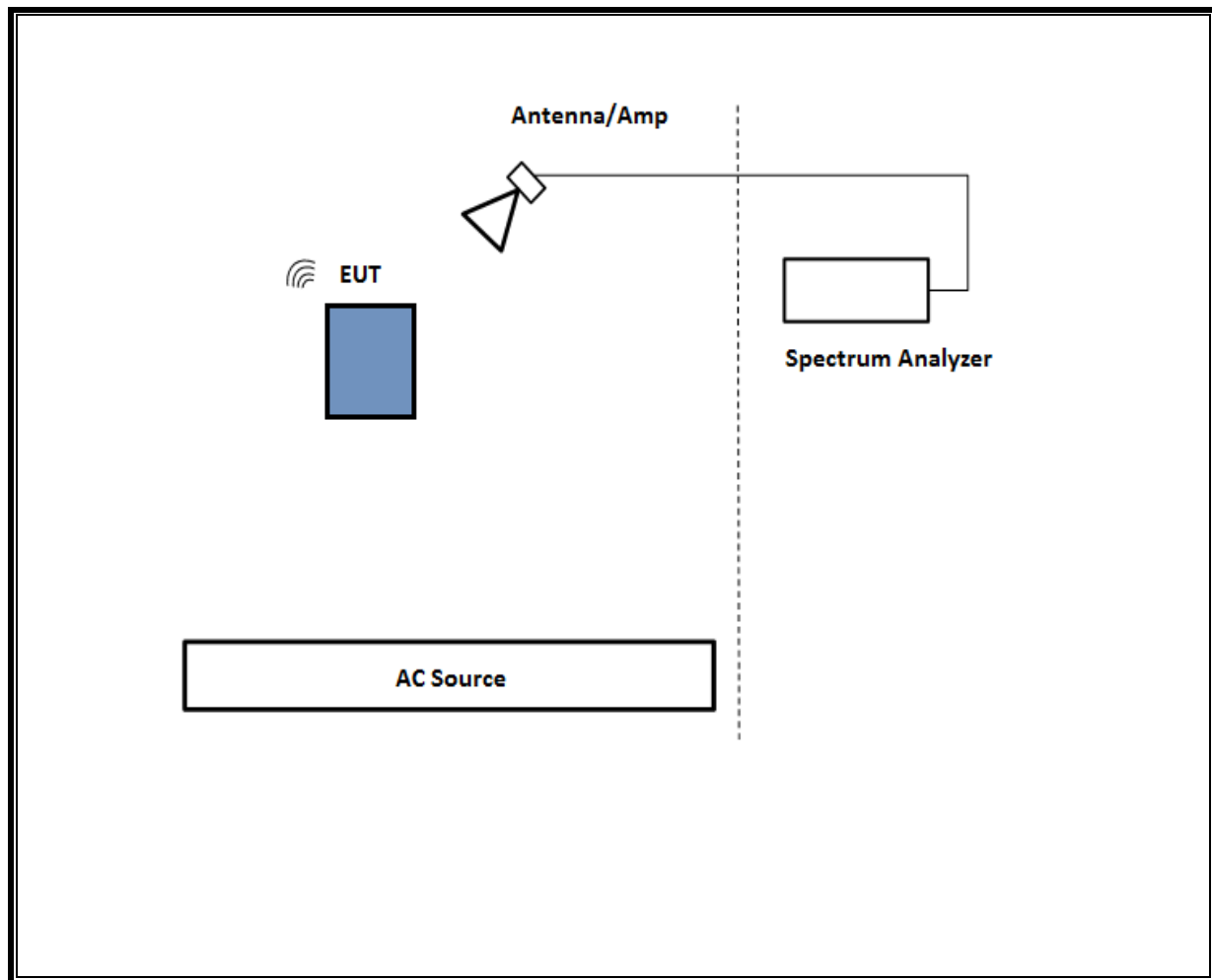
6.6. DESCRIPTION OF TEST SETUP

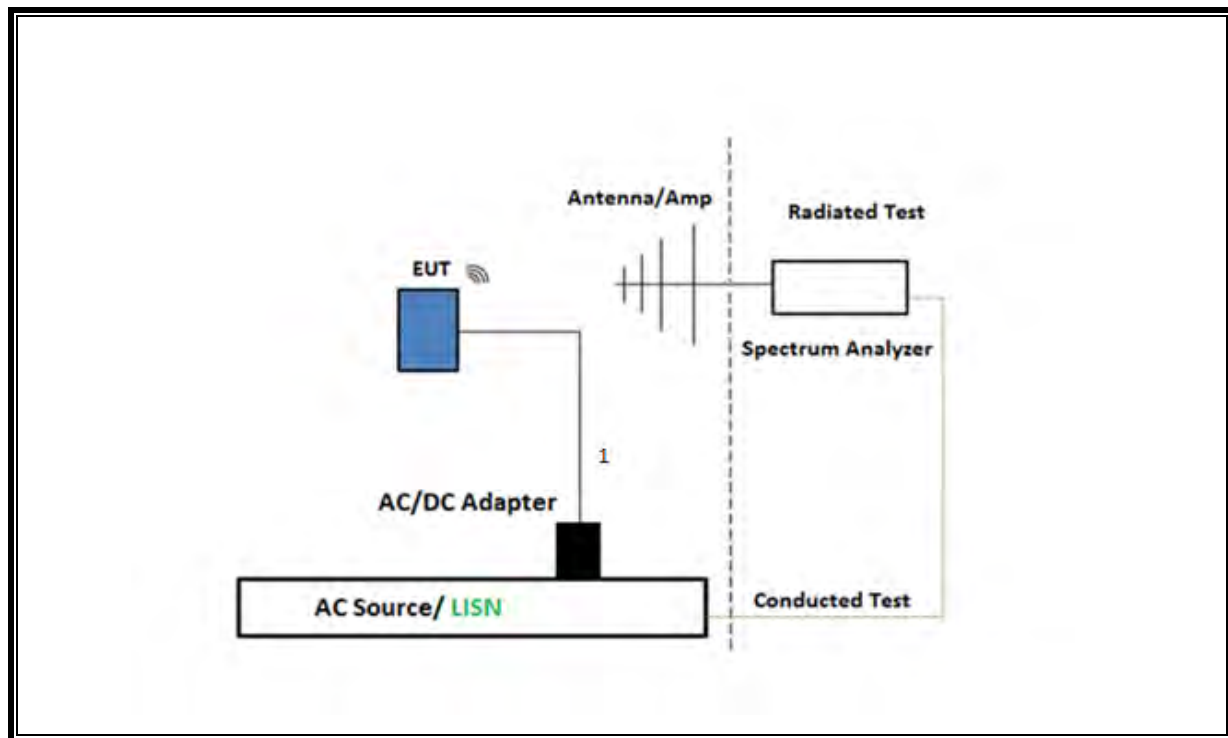
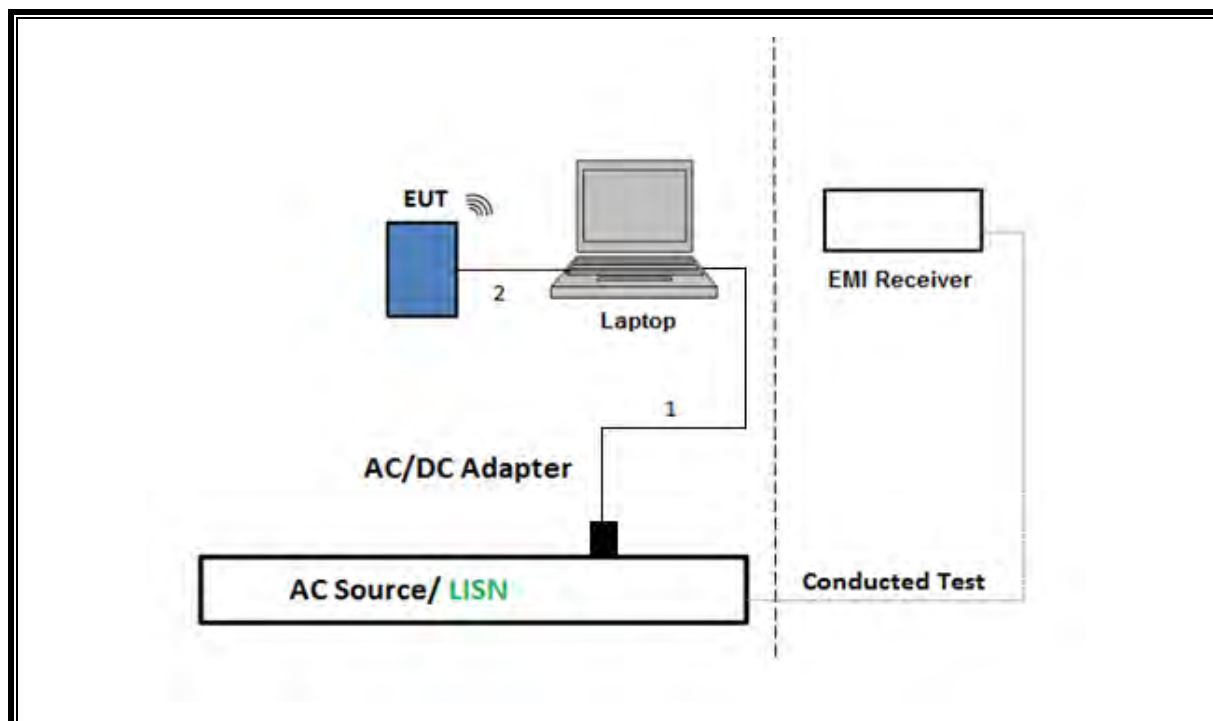
SUPPORT TEST EQUIPMENT						
Description		Manufacturer	Model	Serial Number	FCC ID/ DoC	
Laptop		Apple	Macbook Pro	C02VD7SAHV22	BCGA1708	
Laptop AC/DC adapter		Liteon Technology	A1424	NSW25679	DoC	
EUT AC/DC adapter		Apple	A1720	C3D8417A7R93KVPA8	DoC	
Conducted Switch Box		UL	n/a	208281	N/A	
10dB Fixed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

TEST SETUP

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

SETUP DIAGRAM FOR CONDUCTED TESTS

SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz

SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**

7. 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	84796	09/19/2023	09/19/2022
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp	JB3	80714	10/06/2023	10/06/2022
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	204041	08/24/2023	08/24/2022
EMI Receiver	Rohde & Schwarz	ESW44	201498	02/29/2024	02/29/2023
RF Filter Box 1-18GHz	UL-FR1	SAC 12 port rf box	217521	10/09/2023	10/09/2022
*Antenna Horn, 18 to 26.5GHz	ARA	MWH-1826/B	172353	06/01/2023	06/01/2022
RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	171583	02/29/2024	02/29/2023
*Antenna, Passive Loop 30Hz to 1MHz	Electro-Metrics	EM-6871	170013	07/28/2023	07/28/2022
*Antenna, Passive Loop 100KHz to 30MHz	ETS-Lindgren	EM-6872	170015	07/28/2023	07/28/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	230299	01/12/2024	01/12/2023
RF Filter Box, 1-18GHz	UL-FR1	N/A	171875	11/10/2023	11/10/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223461	02/29/2024	02/19/2023
Antenna, Horn 1-18GHz	ETS Lindgren	3117	226673	01/09/2024	01/09/2023
RF Filter Box 1-18GHz	UL-FR1	SAC 12 port rf box	217521	10/09/2023	10/09/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	02/29/2024	02/29/2023
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	84796	09/19/2023	09/19/2022
RF Filter, 1-18GHz, 12 Port	UL-FR1	Frankenstein 1	216812	09/17/2023	09/17/2022
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201498	02/29/2024	02/29/2023
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	221832	02/29/2024	02/29/2023
Power Sensor	Keysight	N1921A	90391	01/31/2024	01/31/2023
Power Meter, P-series single channel	Keysight	N1912A	90630	01/31/2024	01/31/2023
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236358	Verified/Characterized before use	
10dB Fixed Attenuator, 2 Watts Up to 26.5 GHz	Pasternack Enterprises	PE7024-10	236355	Verified/Characterized before use	
Conducted Switch Box	N/A	CSB	208281	04/30/2024	04/30/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80397	02/28/2024	02/28/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	85214	02/28/2024	02/28/2023

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

8. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

Occupied BW (20dB): ANSI C63.10-2013 Section 6.9.2

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Peak Output Power: ANSI C63.10-2013 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

Conducted Band-Edge: ANSI C63.10-2013 Section 6.10.4

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

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10-2013 Section 6.3, 6.5 & 13

Radiated Spurious Emissions above 1GHz: ANSI C63.10-2013 Section 6.3, 6.6 & 13

Radiated Band-edge: ANSI C63.10-2013 Section 6.10.5 & 13

AC Power-line conducted emissions: ANSI C63.10-2013, Section 6.2.

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

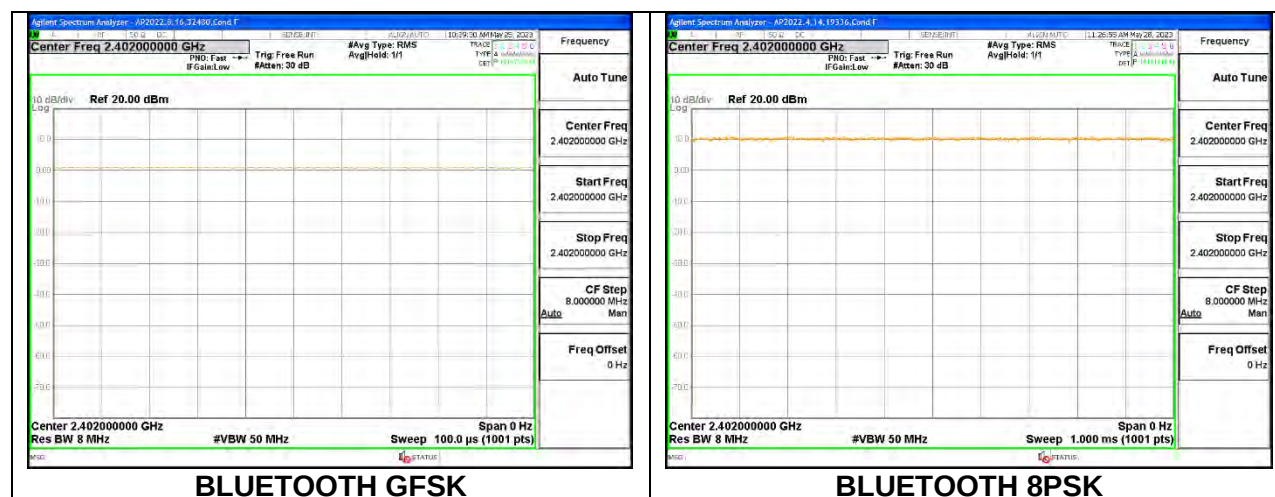
ANSI C63.10, Section 11.6: Zero-Span Spectrum Analyzer Method.

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/T Minimum VBW (kHz)
Bluetooth GFSK	100.00	100.00	1.000	100.0%	0.00	0.010
Bluetooth 8PSK	100.00	100.00	1.000	100.0%	0.00	0.010

Note: Duty Cycle for GFSK TxBF and 8PSK TxBF are the same as those for GFSK and 8PSK 1TX shown in the table above.

DUTY CYCLE PLOTS



9.2. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq 3 \times \text{RBW}$. The sweep time is coupled.

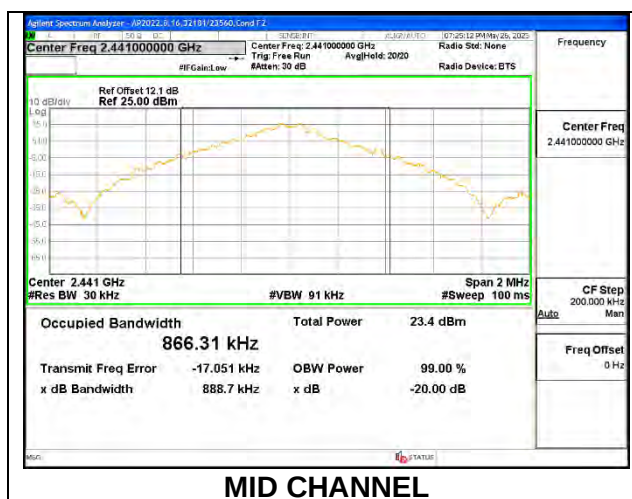
RESULTS

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

9.2.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

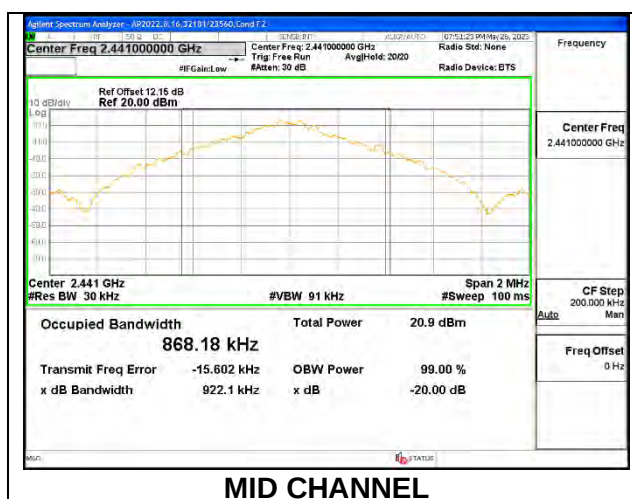
ANT 4

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.88880	0.86679
Mid	2441	0.88870	0.86631
High	2480	0.88710	0.86660



ANT 3

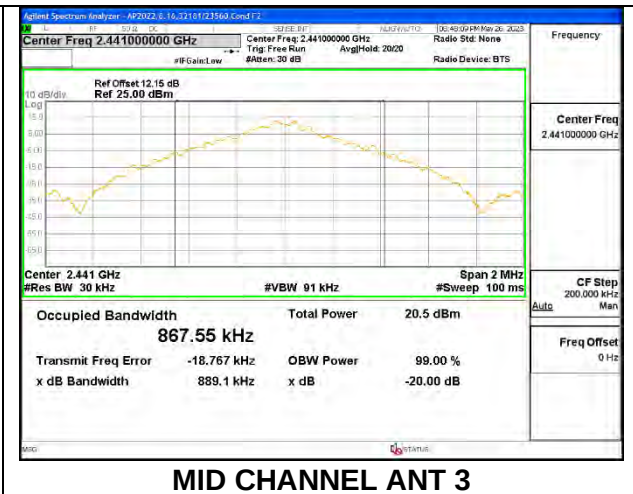
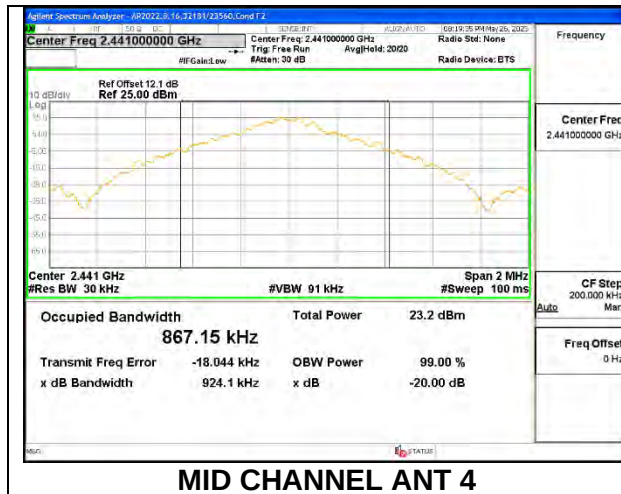
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.88920	0.86747
Mid	2441	0.92210	0.86818
High	2480	0.88880	0.86885



9.2.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

Note: Test procedures and setting on beamforming mode are same as BT basic and EDR mode

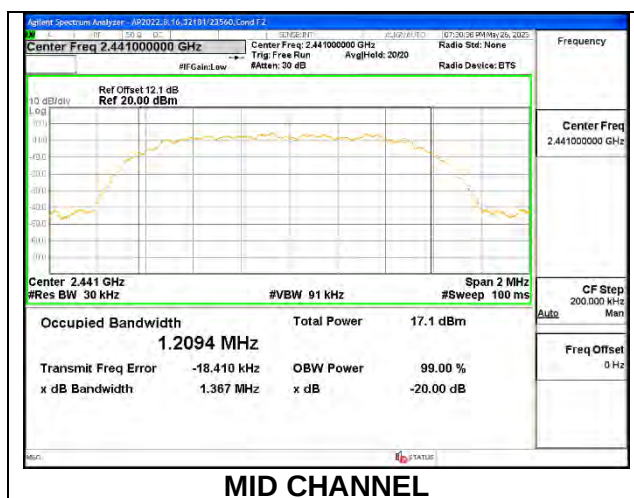
Channel	Frequency (MHz)	20dB Bandwidth ANT 4 (MHz)	20dB Bandwidth ANT 3 (MHz)	99% Bandwidth ANT 4 (MHz)	99% Bandwidth ANT 3 (MHz)
Low	2402	0.88880	0.88760	0.86575	0.86978
Mid	2441	0.92410	0.88910	0.86715	0.86755
High	2480	0.88900	0.92590	0.86606	0.86696



9.2.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

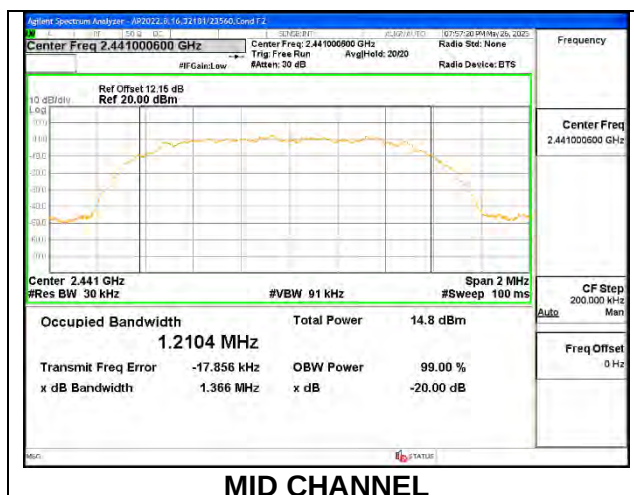
ANT 4

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.3610	1.2085
Mid	2441	1.3670	1.2094
High	2480	1.3660	1.2084



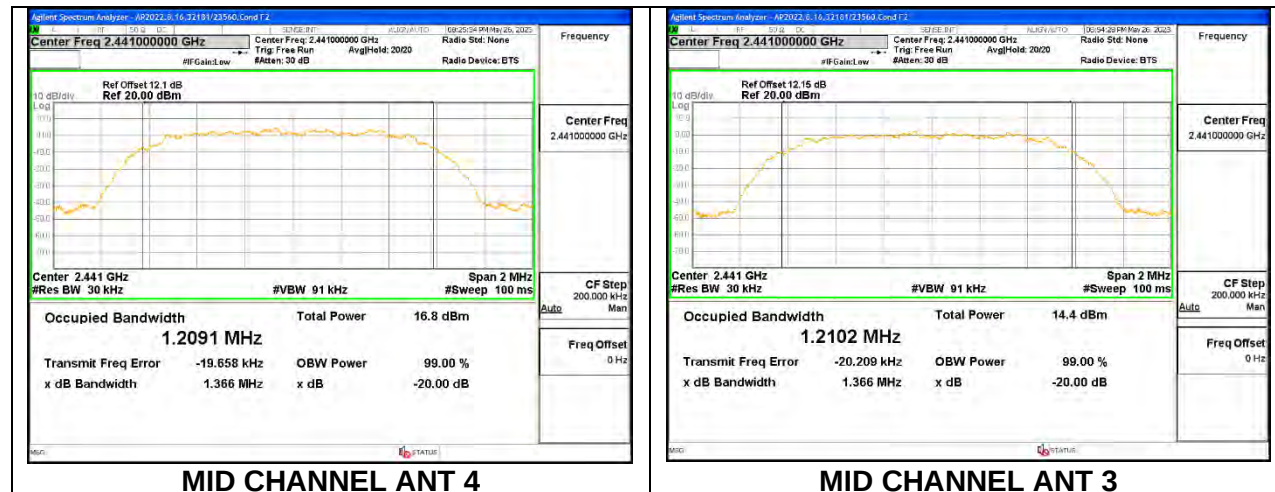
ANT 3

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.3660	1.2102
Mid	2441	1.3660	1.2104
High	2480	1.3650	1.2094



9.2.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth ANT 4 (MHz)	20dB Bandwidth ANT 3 (MHz)	99% Bandwidth ANT 4 (MHz)	99% Bandwidth ANT 3 (MHz)
Low	2402	1.3680	1.3650	1.2099	1.2091
Mid	2441	1.3660	1.3660	1.2091	1.2102
High	2480	1.3670	1.3630	1.2085	1.2091



9.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

RSS-247 (5.1) (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

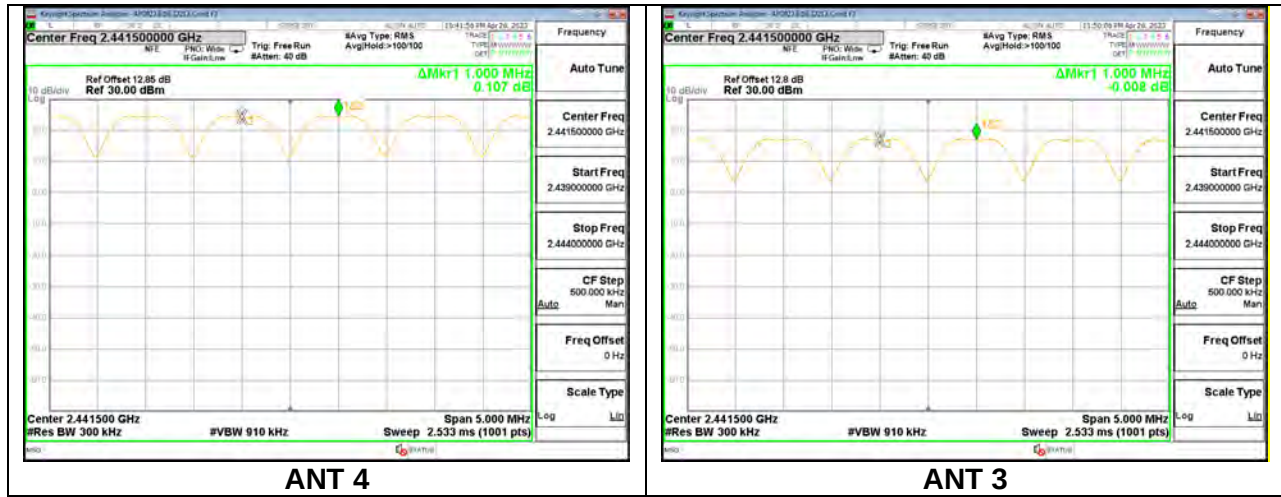
The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to $VBW \geq 3 \times RBW$. The sweep time is coupled.

RESULTS

Only High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has exact same channel plan.

9.3.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

HOPPING FREQUENCY SEPARATION



9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

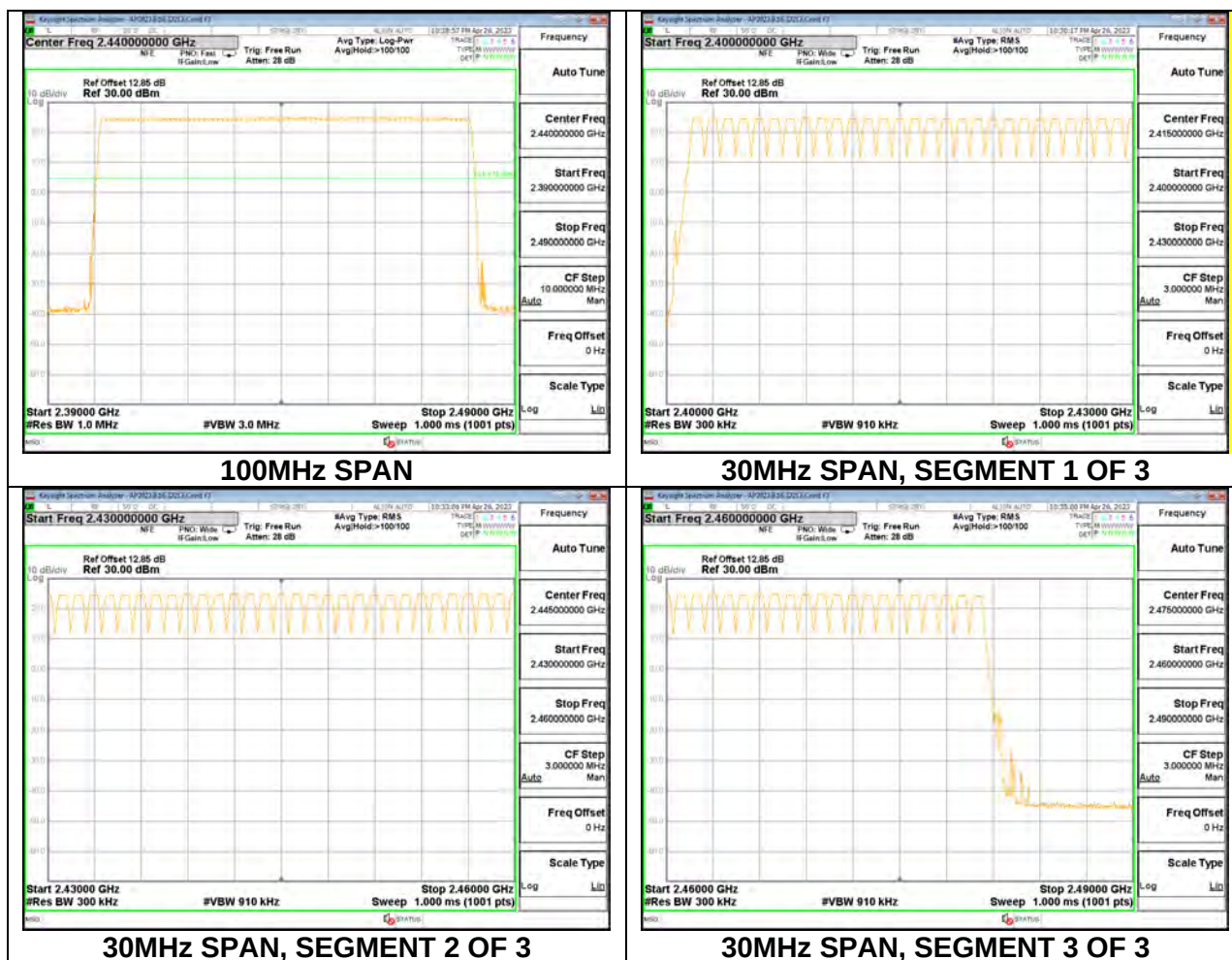
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

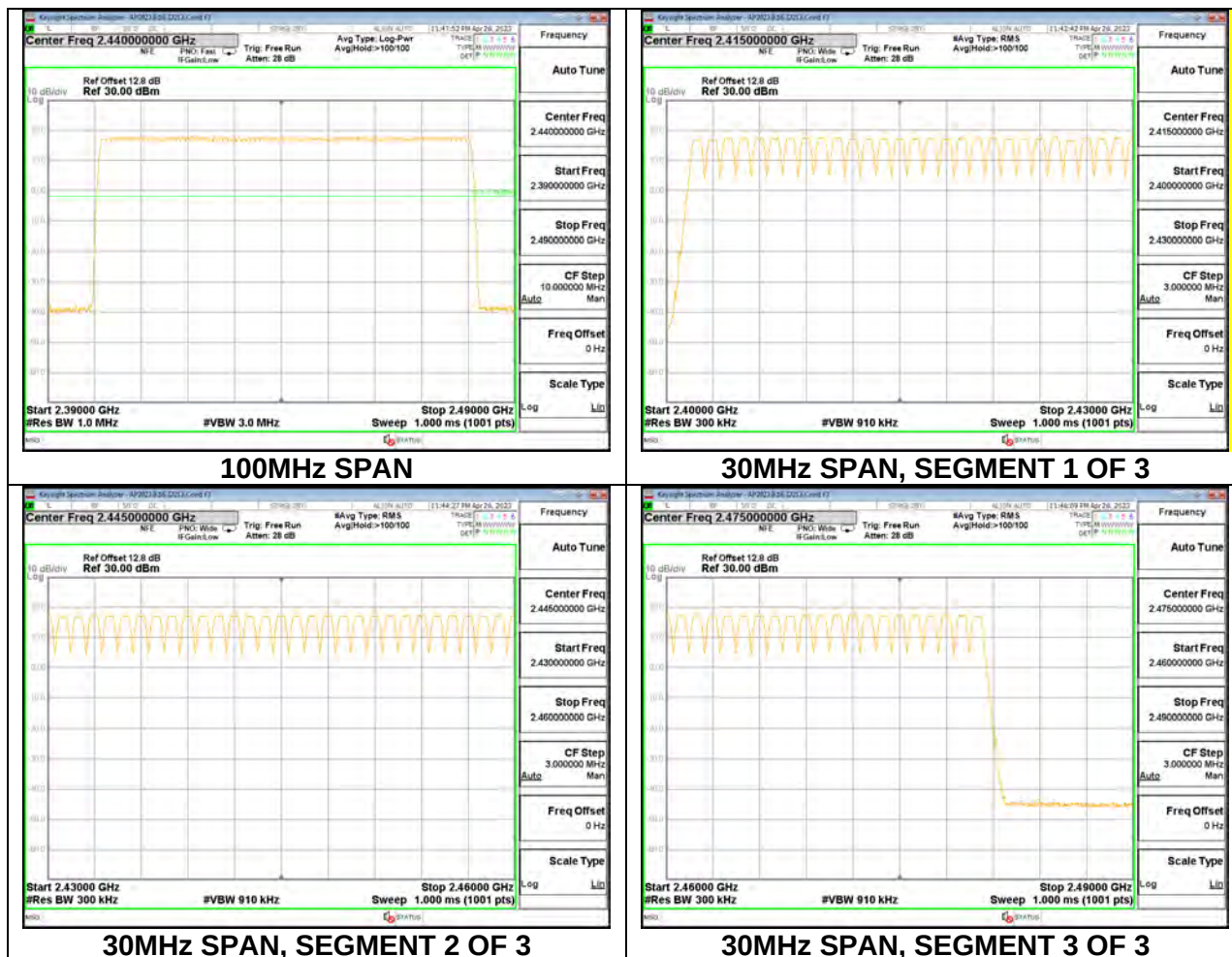
RESULTS

Normal Mode: 79 Channels Observed. Only High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has exact same channel plan.

9.4.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 4



ANT 3

9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 3.16 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

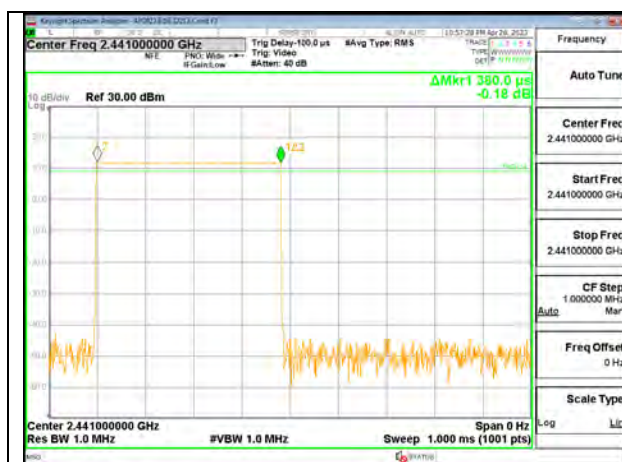
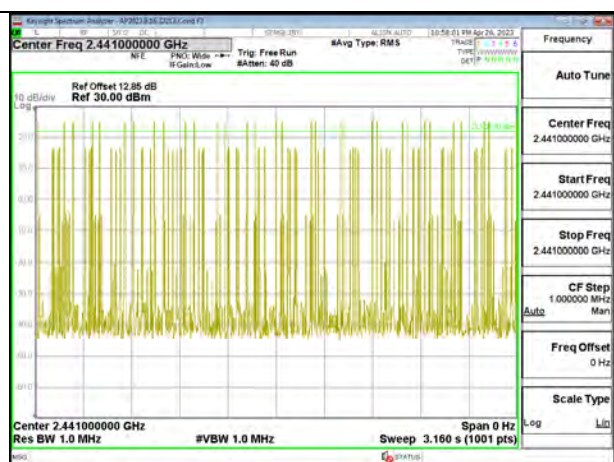
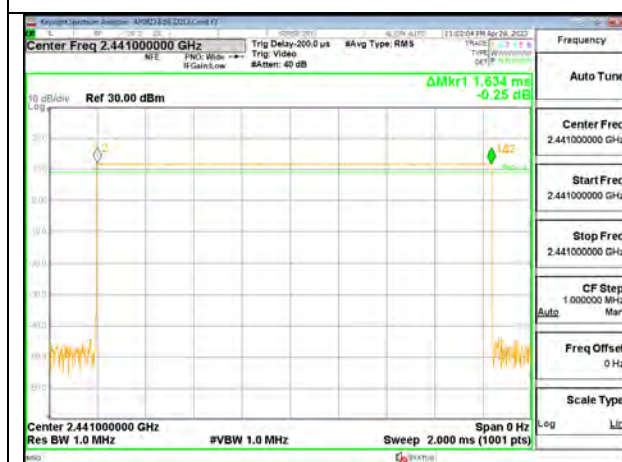
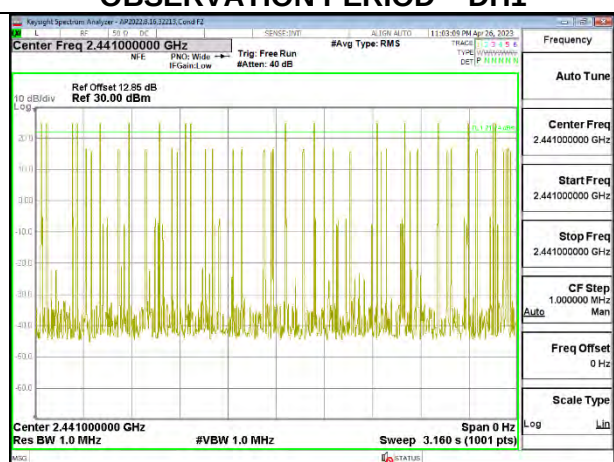
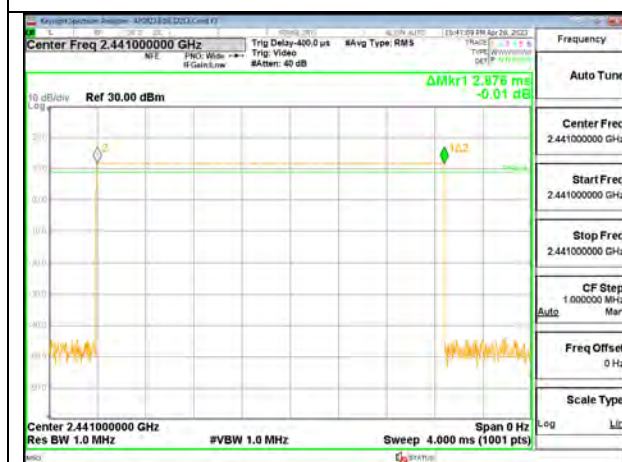
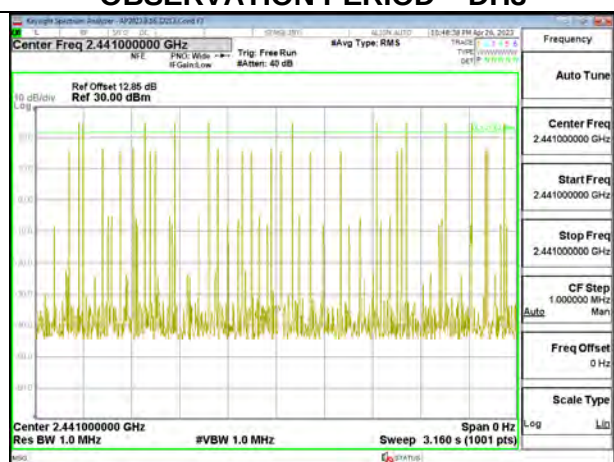
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

RESULTS

Only High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has exact same timing.

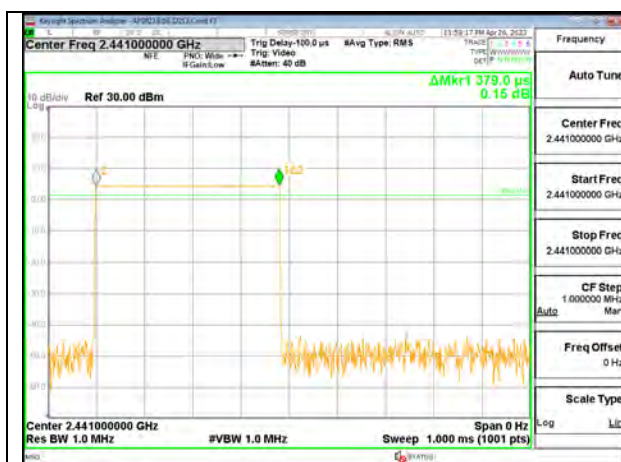
9.5.1. HIGH POWER BASIC DATA RATE GFSK MODULATION**ANT 4**

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.380	31.000	0.118	0.4	-0.282
DH3	1.634	17.000	0.278	0.4	-0.122
DH5	2.876	10.000	0.288	0.4	-0.112
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.38	7.75	0.029	0.4	-0.371
DH3	1.634	4.25	0.069	0.4	-0.331
DH5	2.876	2.5	0.072	0.4	-0.328

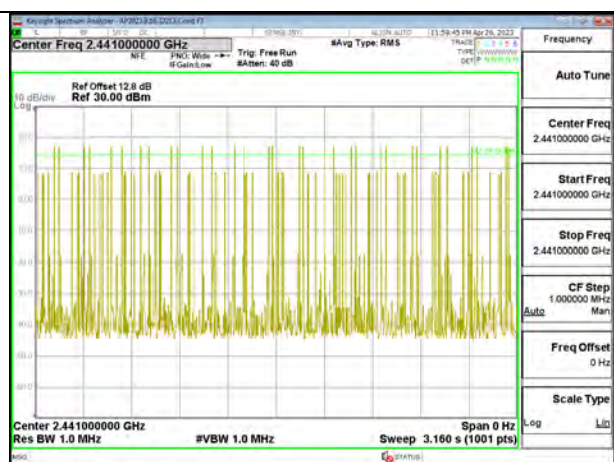
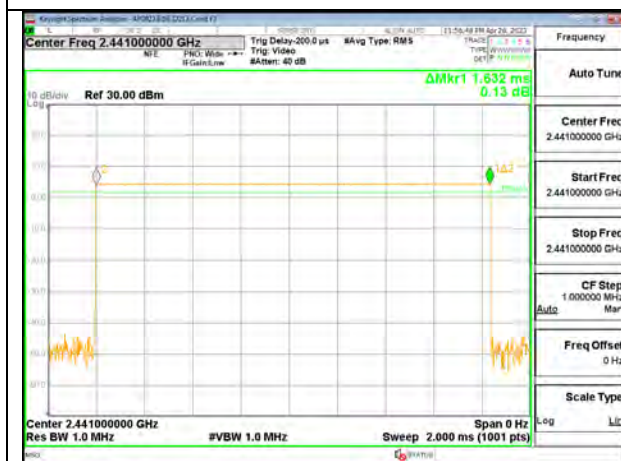
**PULSE WIDTH – DH1****NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1****PULSE WIDTH – DH3****NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3****PULSE WIDTH – DH5****NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5**

ANT 3

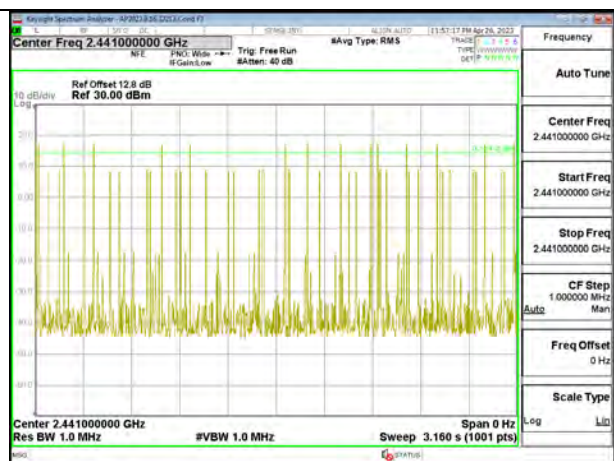
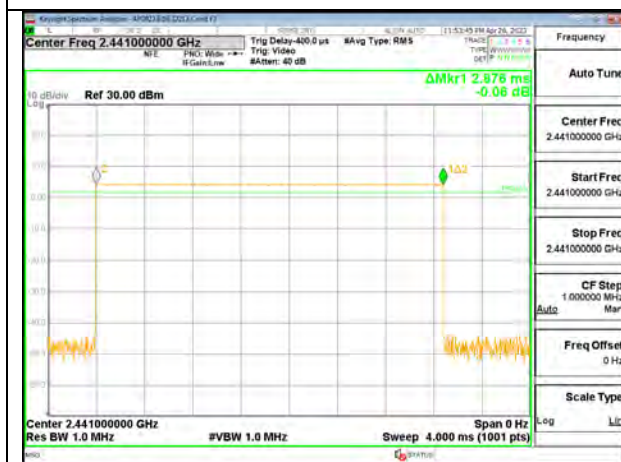
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.379	31	0.117	0.4	-0.283
DH3	1.632	14	0.228	0.4	-0.172
DH5	2.876	8	0.230	0.4	-0.170
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.379	7.75	0.029	0.4	-0.371
DH3	1.632	3.5	0.057	0.4	-0.343
DH5	2.876	2	0.058	0.4	-0.342



PULSE WIDTH – DH1

NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1

PULSE WIDTH – DH5

NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3

PULSE WIDTH – DH5

NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5

9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

TEST PROCEDURE

Measurements perform using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband peak power sensor. Peak output power was read directly from the power meter.

DIRECTIONAL ANTENNA GAIN

For 1 TX:

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

For 2 TX:

Tx chains are correlated for power due to the device supporting beamforming. 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	-4	-1.5	-2.57	0.35

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2013 section 14.4.3

Uncorrelated directional gain= $10 \cdot \log((10^{(\text{Ant1}/10)} + 10^{(\text{Ant2}/10)})/2)$

Correlated directional Gain= $10 \cdot \log(((10^{(\text{Ant1}/20)} + 10^{(\text{Ant2}/20)})^2)/2)$

Sample Calculation:

Ant4 = -4, Ant3 = -1.5

Uncorrelated Antenna gain = $10 \cdot \log[(10^{(-4/10)} + 10^{(-1.5/10)})/2] = -2.57\text{dBi}$

Correlated Antenna gain = $10 \cdot \log[(10^{(-4/20)} + 10^{(-1.5/20)})^2/2] = 0.35\text{dBi}$

RESULTS

9.6.1. HIGH POWER BASIC DATA RATE GFSK MODULATION**ANT 4**

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.09	21	-0.91
Middle	2441	20.13	21	-0.87
High	2480	20.11	21	-0.89

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.11	21	-0.89
Middle	2441	20.10	21	-0.90
High	2480	20.08	21	-0.92

9.6.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION**ANT 4 + ANT 3**

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	17.13	17.14	20.15	21	-0.85
Middle	2441	17.14	17.13	20.15	21	-0.85
High	2480	17.10	17.11	20.12	21	-0.88

9.6.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

ANT 4

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.04	21	-1.96
Middle	2441	19.07	21	-1.93
High	2480	19.03	21	-1.97

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.03	21	-1.97
Middle	2441	19.05	21	-1.95
High	2480	19.05	21	-1.95

9.6.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.04	16.03	19.05	21	-1.95
Middle	2441	16.03	16.02	19.04	21	-1.96
High	2480	16.05	16.03	19.05	21	-1.95

9.6.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.22	21	-1.78
Middle	2441	19.24	21	-1.76
High	2480	19.21	21	-1.79

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.23	21	-1.77
Middle	2441	19.24	21	-1.76
High	2480	19.20	21	-1.80

9.6.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.21	16.20	19.22	21	-1.78
Middle	2441	16.24	16.24	19.25	21	-1.75
High	2480	16.22	16.19	19.22	21	-1.78

9.6.7. LOW POWER BASIC DATA RATE GFSK MODULATION**ANT 4**

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.60	21	-9.40
Middle	2441	11.66	21	-9.34
High	2480	11.63	21	-9.37

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.61	21	-9.39
Middle	2441	11.65	21	-9.35
High	2480	11.63	21	-9.37

9.6.8. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION**ANT 4 + ANT 3**

Tested By:	32181
Date:	7/24.23

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.60	11.63	14.63	21	-6.37
Middle	2441	11.64	11.64	14.65	21	-6.35
High	2480	11.61	11.63	14.63	21	-6.37

9.6.9. LOW POWER ENHANCED DATA RATE QPSK MODULATION

ANT 4

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.00	21	-10.00
Middle	2441	11.03	21	-9.97
High	2480	11.02	21	-9.98

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.03	21	-9.97
Middle	2441	11.05	21	-9.95
High	2480	11.02	21	-9.98

9.6.10. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.04	11.02	14.04	21	-6.96
Middle	2441	11.05	11.02	14.05	21	-6.95
High	2480	11.04	11.00	14.03	21	-6.97

9.6.11. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.21	21	-9.79
Middle	2441	11.24	21	-9.76
High	2480	11.20	21	-9.80

ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.22	21	-9.78
Middle	2441	11.25	21	-9.75
High	2480	11.24	21	-9.76

9.6.12. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Output Power ANT 4 (dBm)	Output Power ANT 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.23	11.25	14.25	21	-6.75
Middle	2441	11.28	11.26	14.28	21	-6.72
High	2480	11.26	11.24	14.26	21	-6.74

9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements perform using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

RESULTS

9.7.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 4

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	19.72
Middle	2441	19.74
High	2480	19.73

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	19.71
Middle	2441	19.73
High	2480	19.70

9.7.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	16.74	16.72	19.74
Middle	2441	16.75	16.72	19.75
High	2480	16.73	16.73	19.74

9.7.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

ANT 4

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.22
Middle	2441	16.24
High	2480	16.23

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.21
Middle	2441	16.22
High	2480	16.20

9.7.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	13.20	13.21	16.22
Middle	2441	13.23	13.22	16.24
High	2480	13.19	13.20	16.21

9.7.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.23
Middle	2441	16.25
High	2480	16.24

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.22
Middle	2441	16.24
High	2480	16.23

9.7.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	13.22	13.23	16.24
Middle	2441	13.25	13.24	16.26
High	2480	13.21	13.22	16.23

9.7.7. LOW POWER BASIC DATA RATE GFSK MODULATION**ANT 4**

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.22
Middle	2441	11.24
High	2480	11.25

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	11.21
Middle	2441	11.24
High	2480	11.23

9.7.8. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION**ANT 4 + ANT 3**

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	11.22	11.24	14.24
Middle	2441	11.24	11.23	14.25
High	2480	11.23	11.23	14.24

9.7.9. LOW POWER ENHANCED DATA RATE QPSK MODULATION

ANT 4

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.19
Middle	2441	8.20
High	2480	8.20

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.20
Middle	2441	8.21
High	2480	8.22

9.7.10. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	8.20	8.19	11.21
Middle	2441	8.21	8.22	11.23
High	2480	8.23	8.18	11.22

9.7.11. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.22
Middle	2441	8.24
High	2480	8.23

ANT 3

Tested By:	32181
Date	7/24/2023

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.21
Middle	2441	8.23
High	2480	8.24

9.7.12. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 4 + ANT 3

Tested By:	32181
Date:	7/24/2023

Channel	Frequency (MHz)	Average Power ANT 4 (dBm)	Average Power ANT 3 (dBm)	Total Power (dBm)
Low	2402	8.22	8.21	11.23
Middle	2441	8.25	8.24	11.26
High	2480	8.24	8.23	11.25

9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

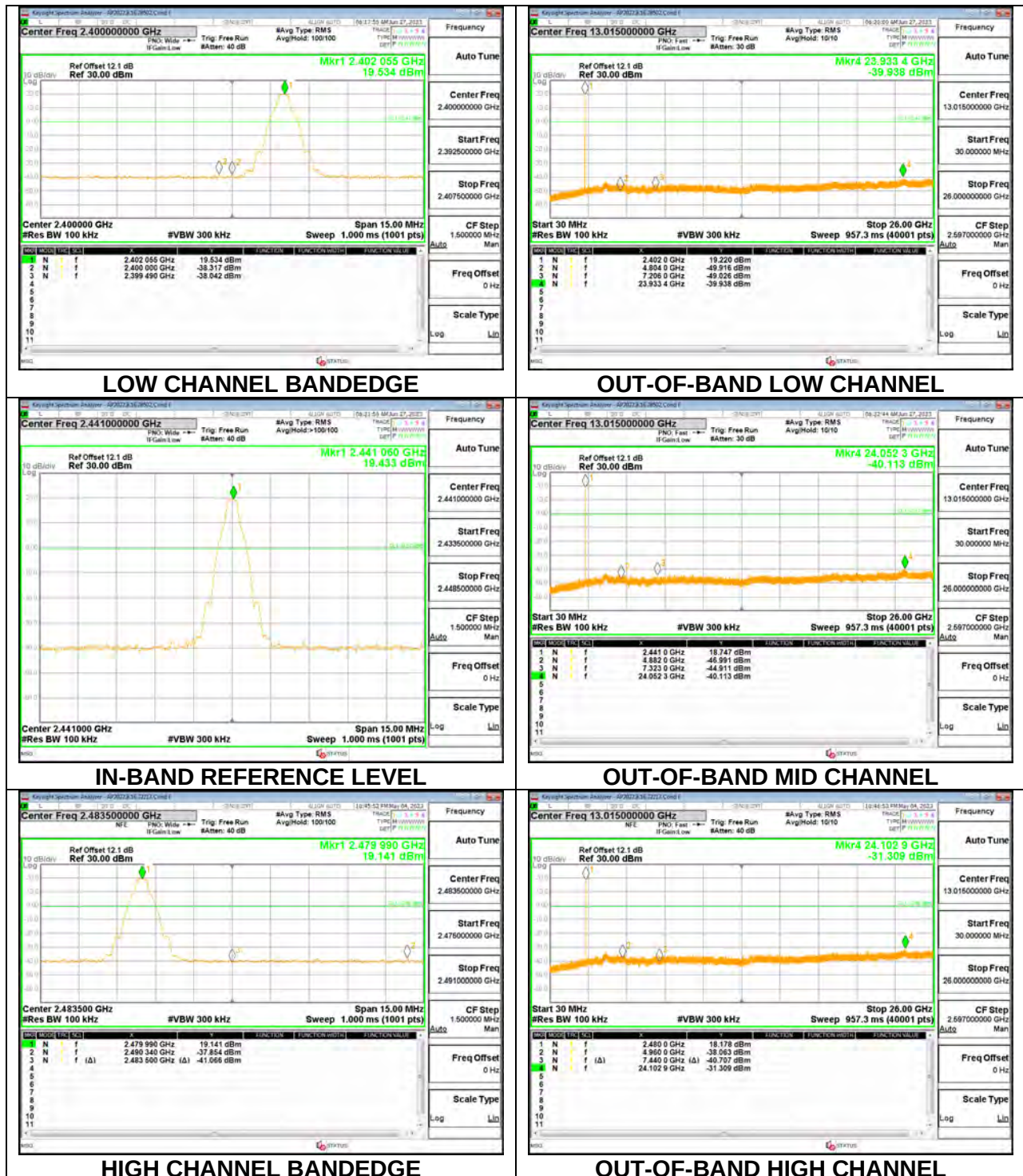
The band edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

Note: Test procedure on Beamforming mode is same as BT BDR and EDR mode.

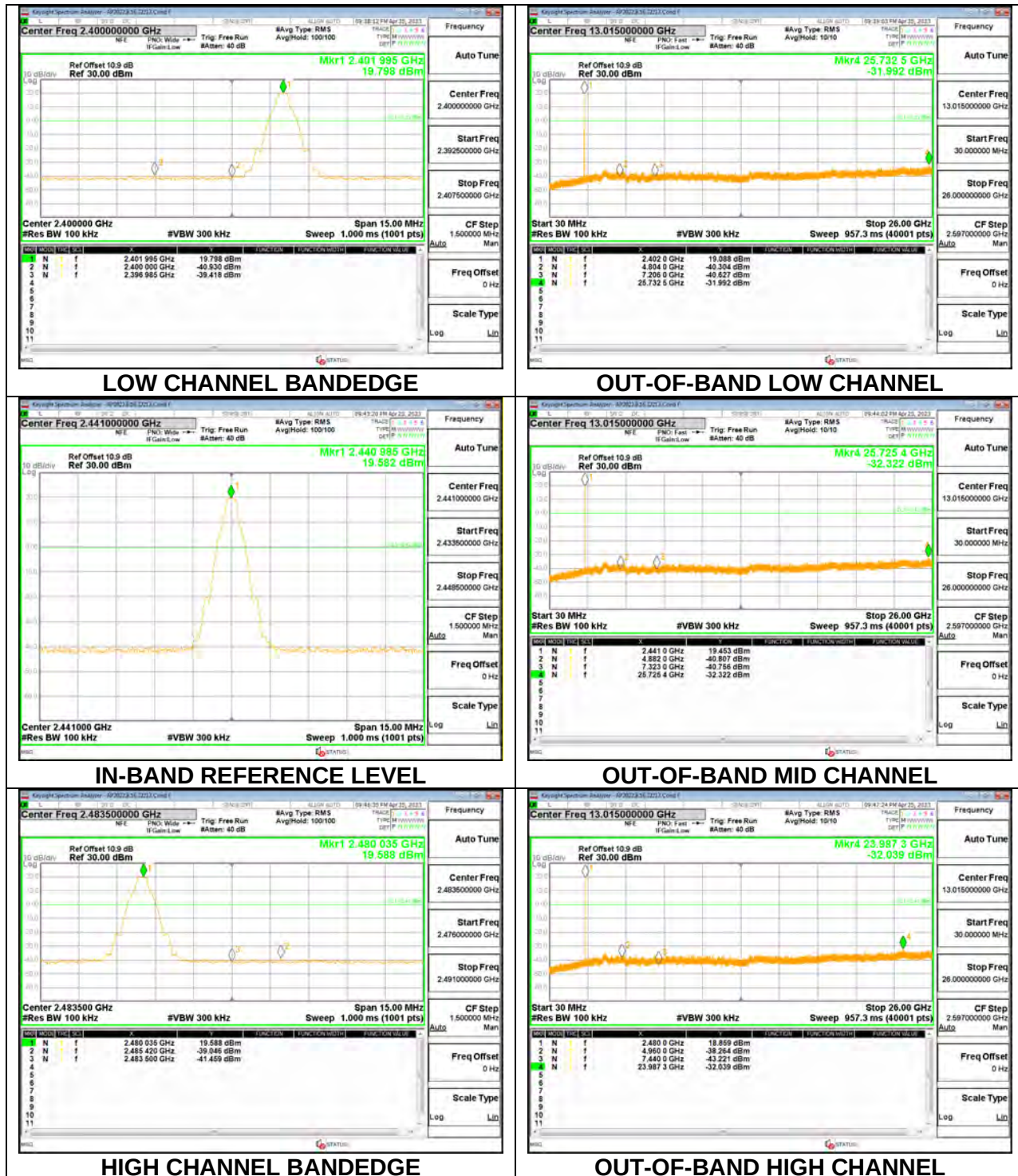
RESULTS

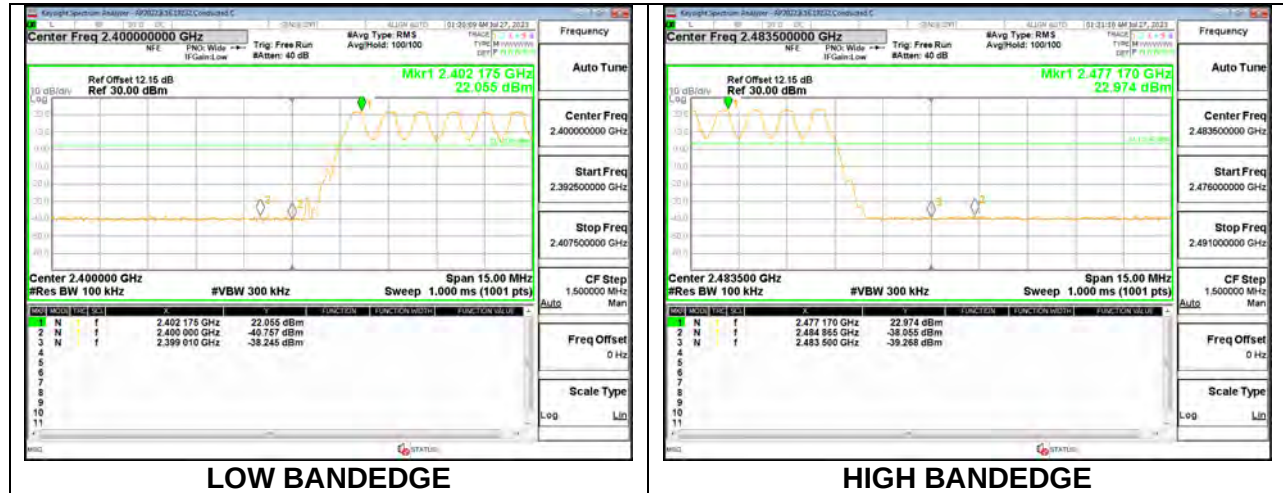
9.8.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 4 SPURIOUS EMISSIONS, NON-HOPPING



ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3 SPURIOUS EMISSIONS, NON-HOPPING

ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

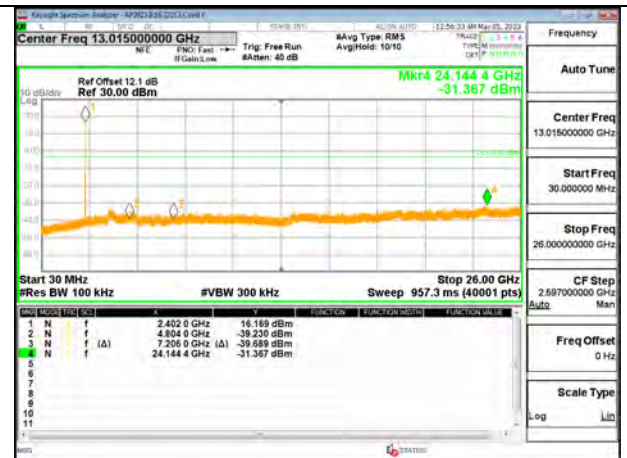
9.8.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

Note: Test procedure on beamforming mode is same as BT basic and EDR mode

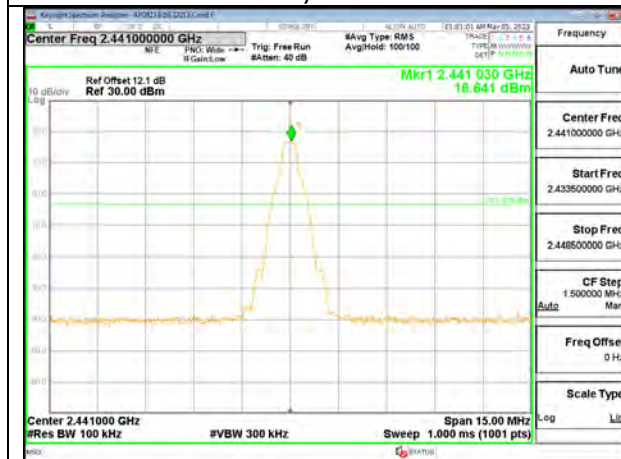
ANT 4



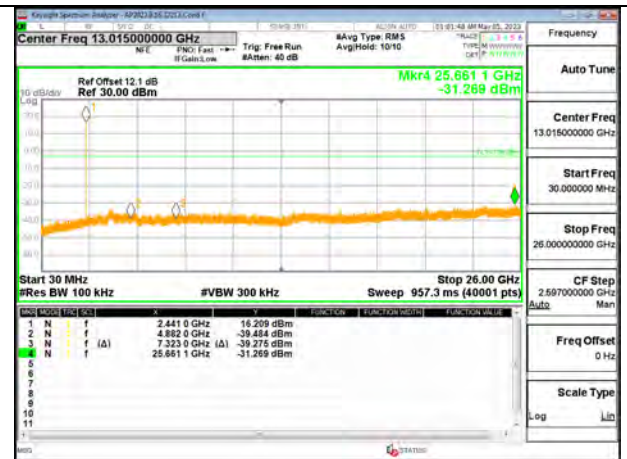
LOW CHANNEL, BANDEDGE ANT 4



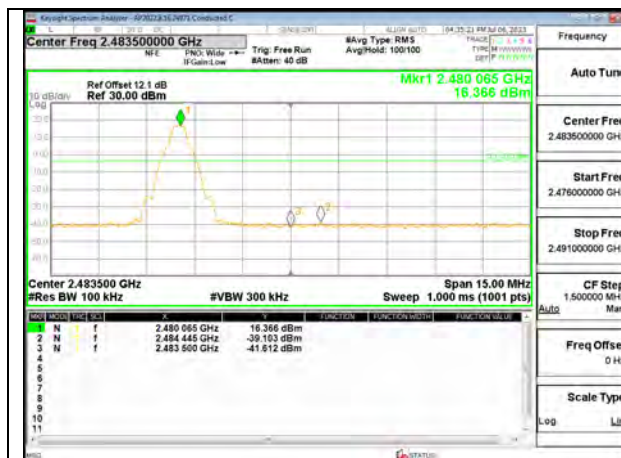
LOW CHANNEL OUT-OF-BAND ANT 4



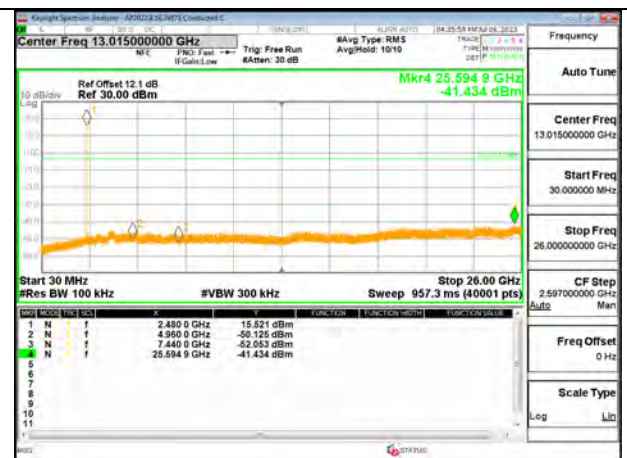
MID CHANNEL REFERENCE ANT 4



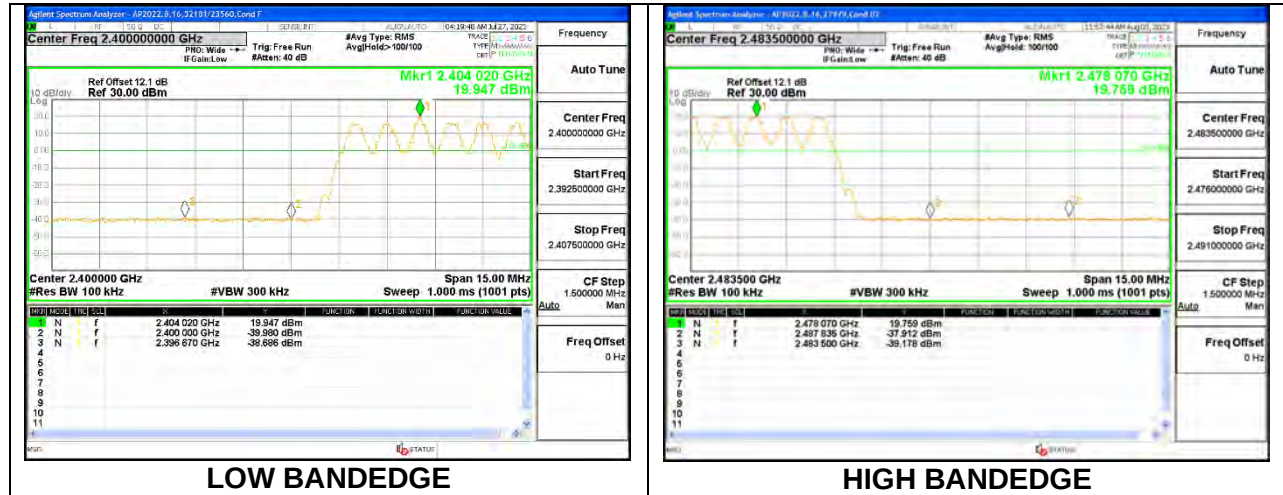
MID CHANNEL OUT-OF-BAND ANT 4

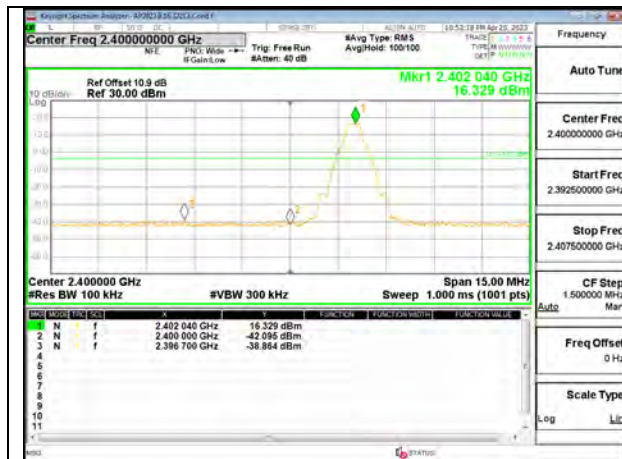
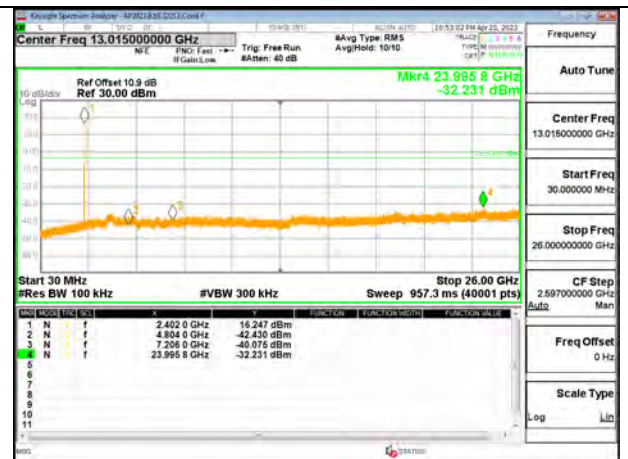
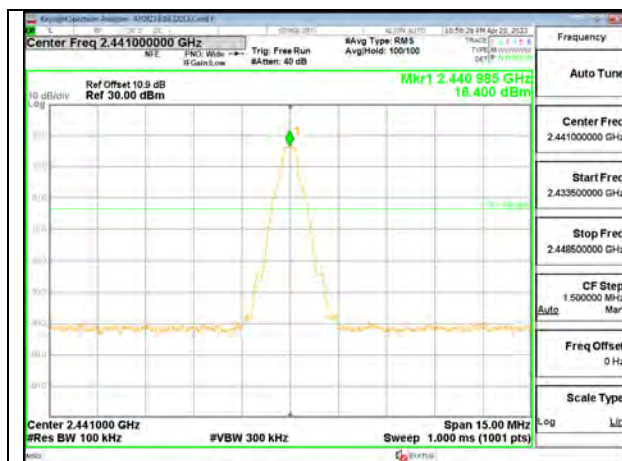
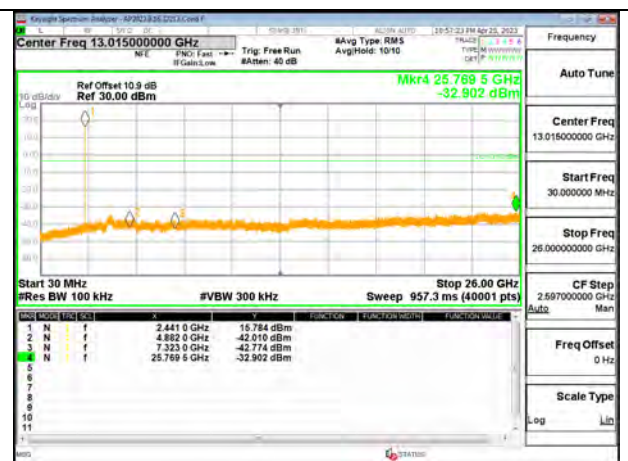
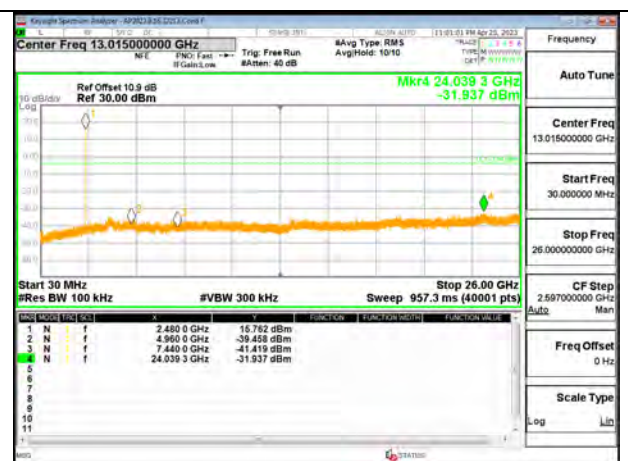


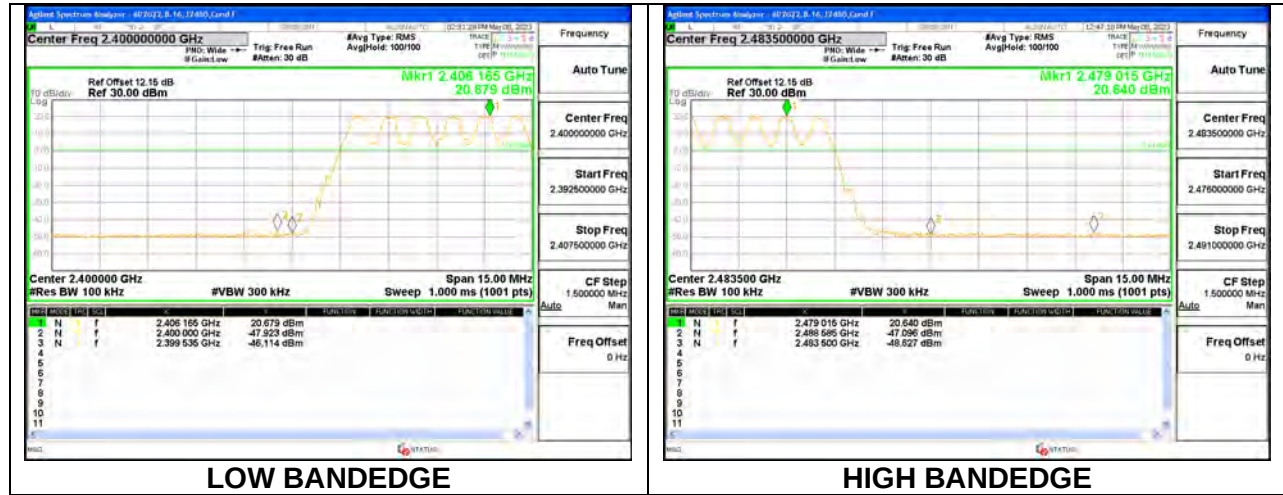
HIGH CHANNEL BANDEDGE ANT 4



HIGH CHANNEL OUT-OF-BAND ANT 4

ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3**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 BANDEDGE ANT 3****HIGH CHANNEL OUT-OF-BAND ANT 3**

ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

9.8.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

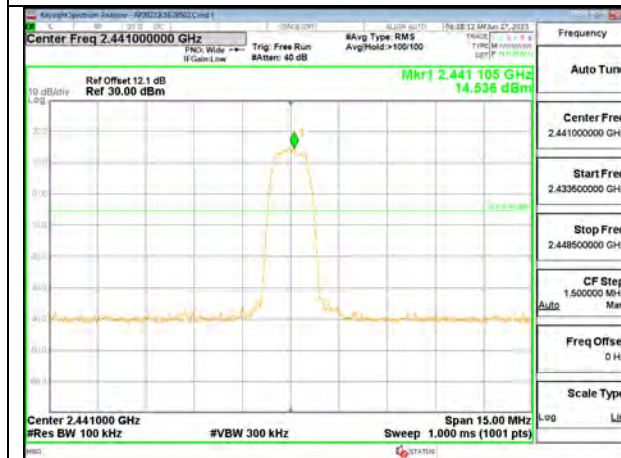
ANT 4 SPURIOUS EMISSIONS, NON-HOPPING



LOW CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL



IN-BAND REFERENCE LEVEL



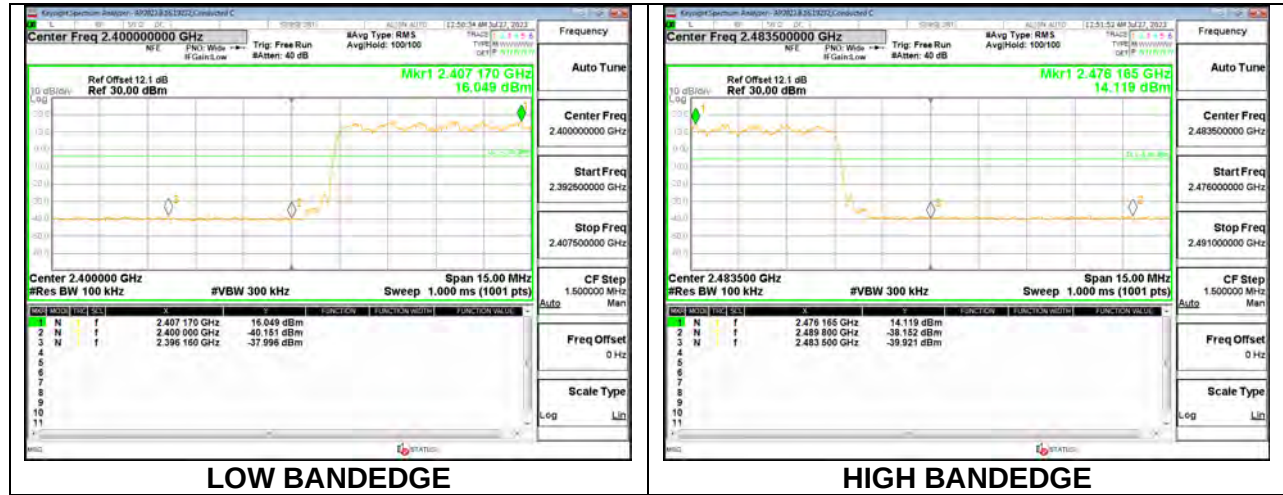
OUT-OF-BAND MID CHANNEL

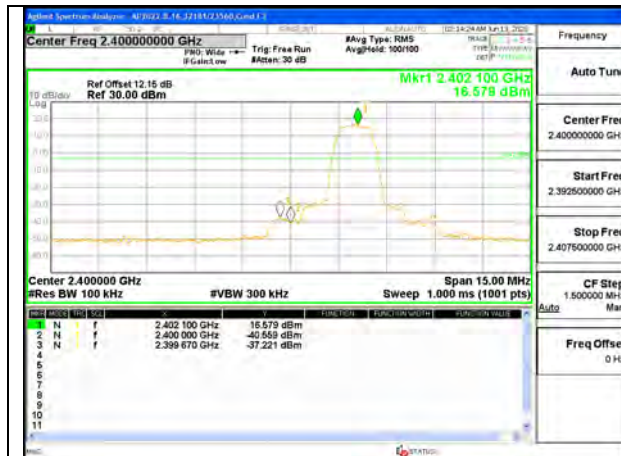
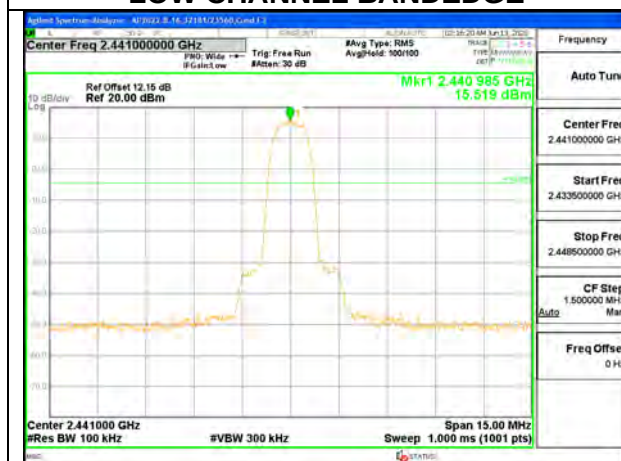
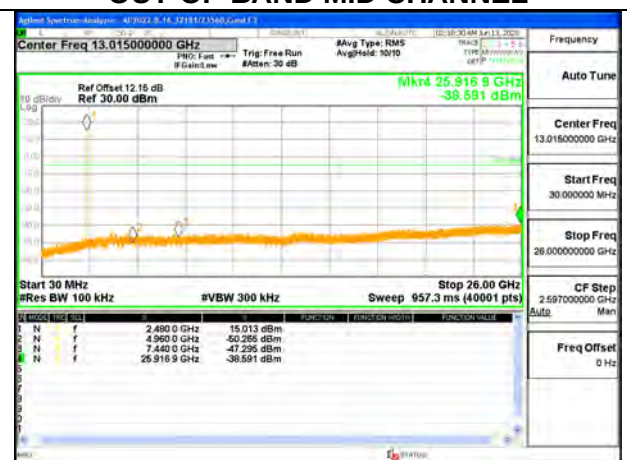


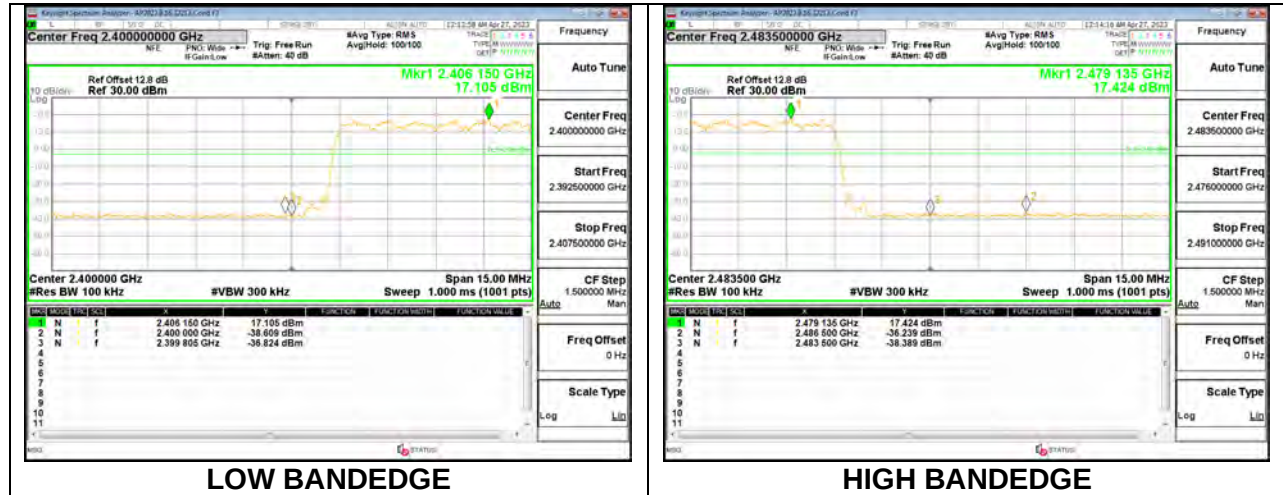
HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

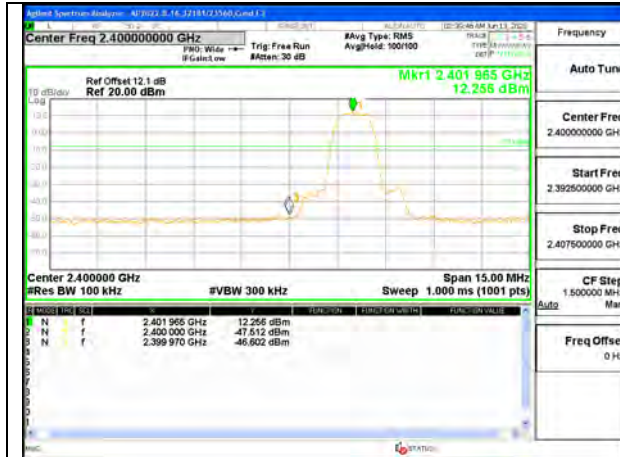
ANT 3 SPURIOUS EMISSIONS, NON-HOPPING**LOW CHANNEL BANDEDGE****OUT-OF-BAND LOW CHANNEL****IN-BAND REFERENCE LEVEL****OUT-OF-BAND MID CHANNEL****HIGH CHANNEL BANDEDGE****OUT-OF-BAND HIGH CHANNEL**

ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

9.8.4. HIGH POWER ENHANCED RATE TXBF 8PSK MODULATION

Note: Test procedure on beamforming mode is same as BT basic and EDR mode

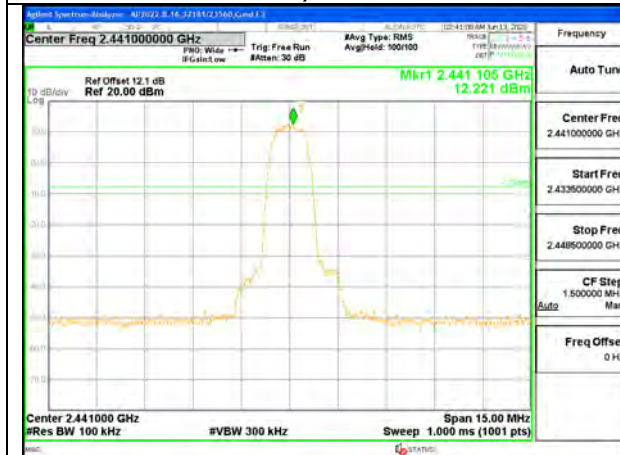
ANT 4



LOW CHANNEL , BANDEDGE ANT 4



LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4



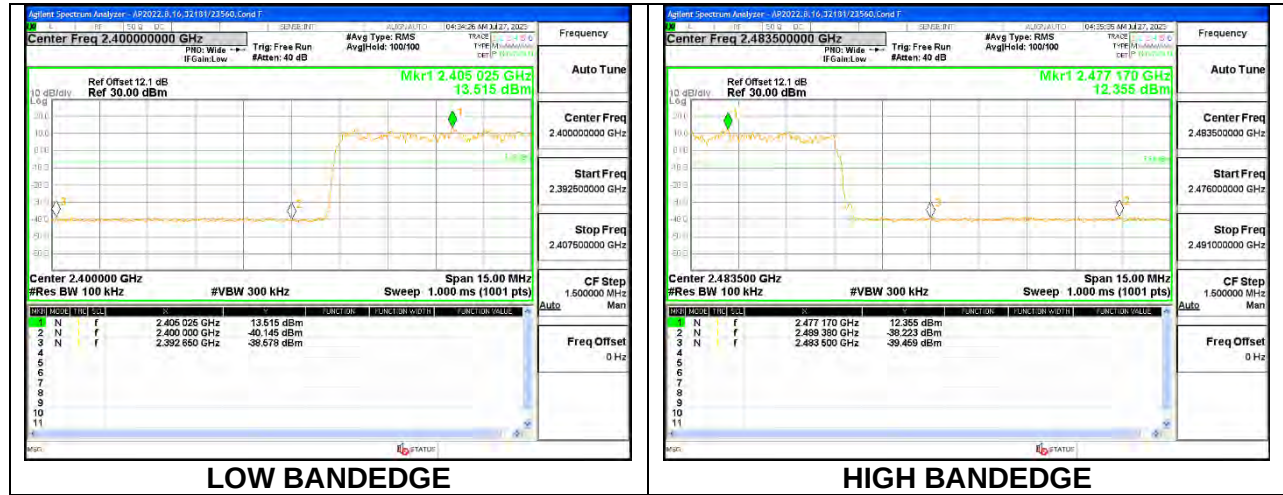
MID CHANNEL OUT-OF-BAND ANT 4

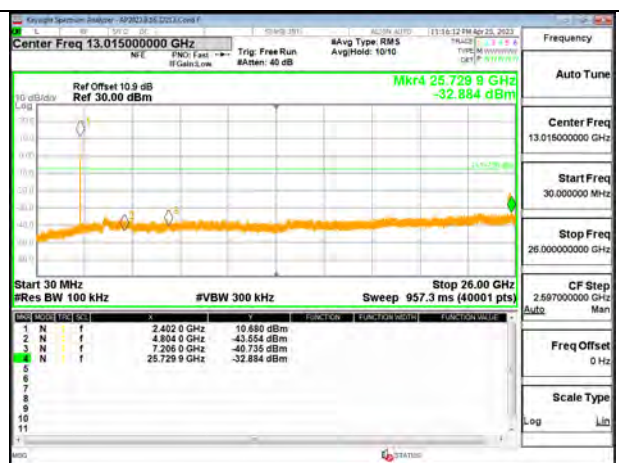
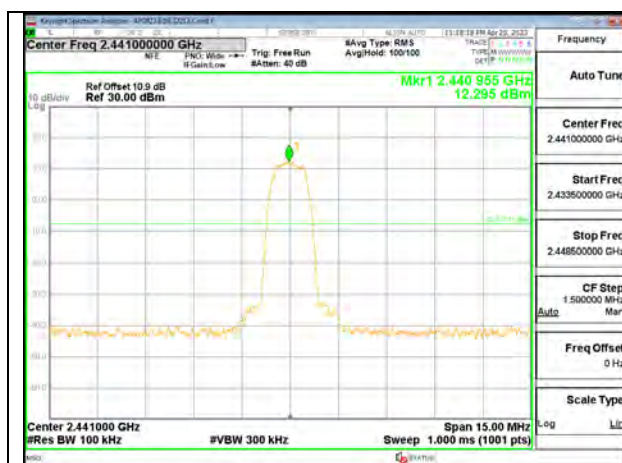
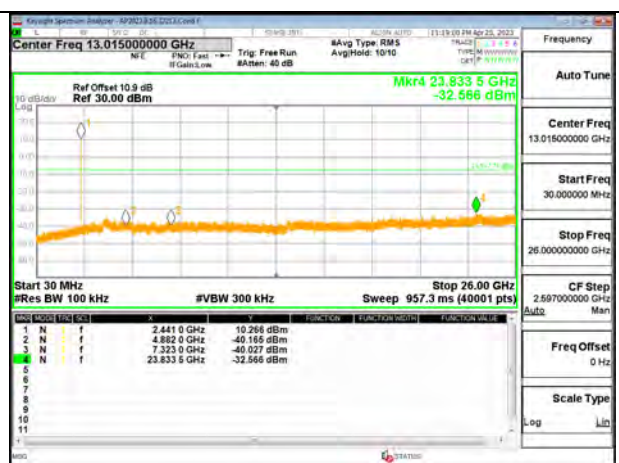


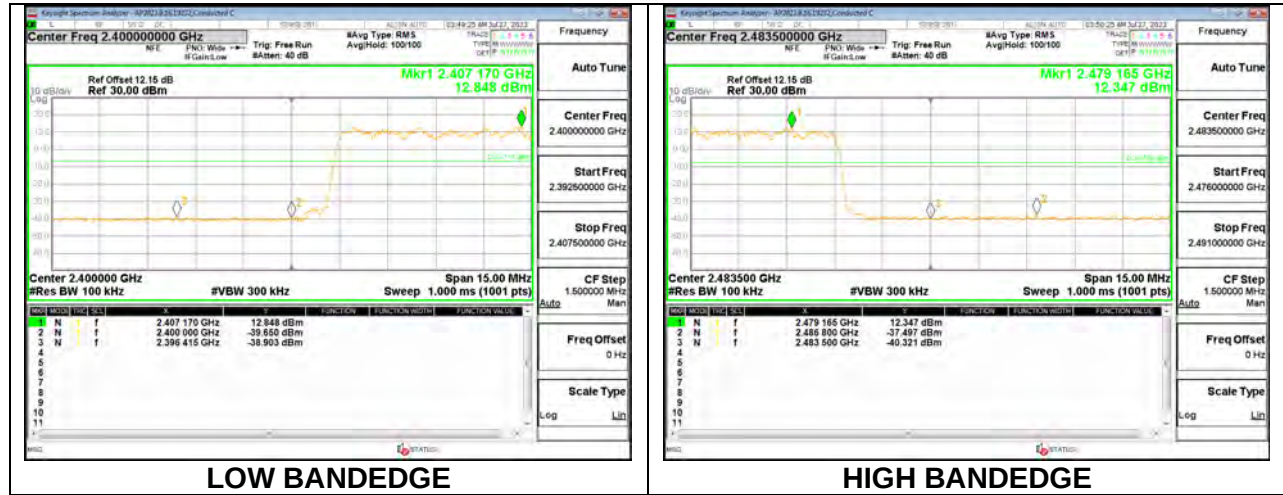
HIGH CHANNEL BANDEDGE ANT 4



HIGH CHANNEL OUT-OF-BAND ANT 4

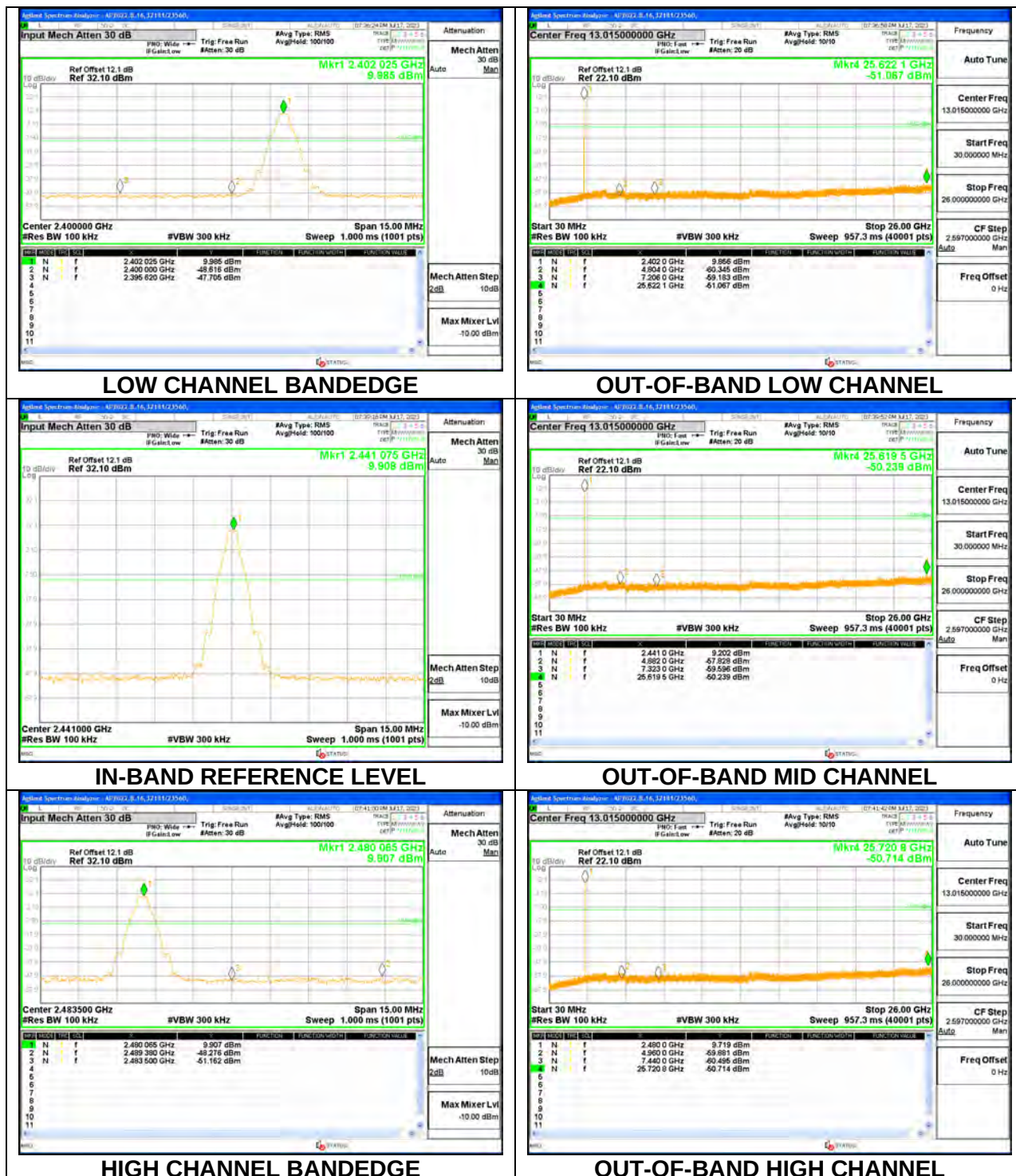
ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3**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 BANDEDGE ANT 3****HIGH CHANNEL OUT-OF-BAND ANT 3**

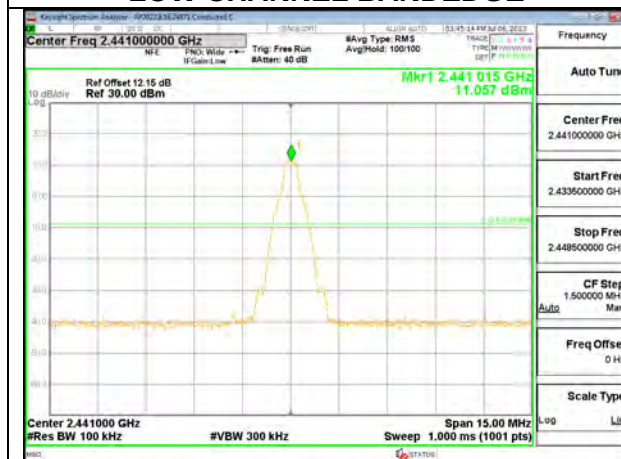
ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

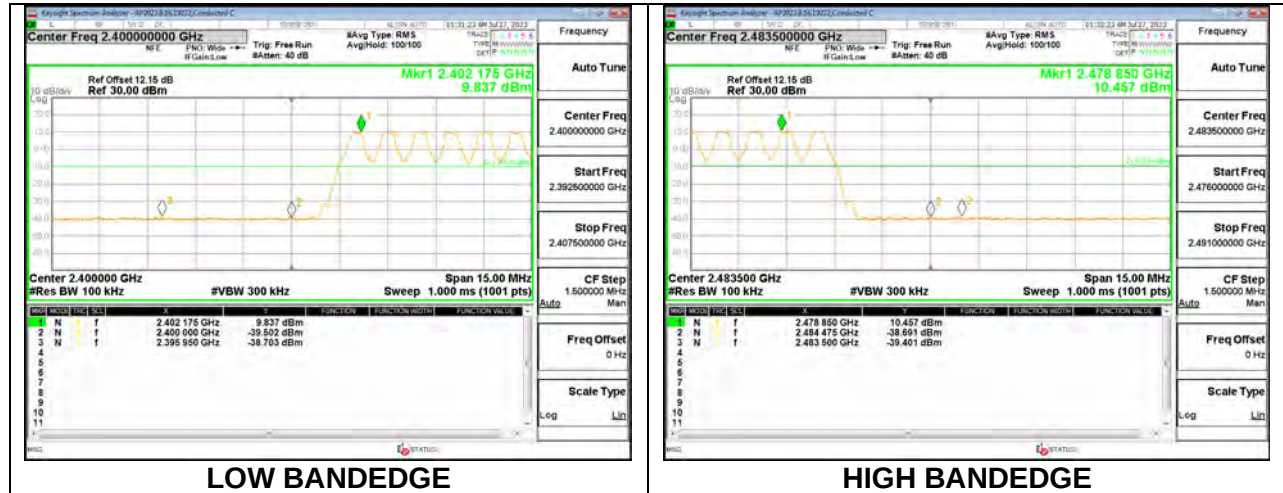
9.8.5. LOW POWER BASIC DATA RATE GFSK MODULATION

ANT 4 SPURIOUS EMISSIONS, NON-HOPPING



ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3 SPURIOUS EMISSIONS, NON-HOPPING**LOW CHANNEL BANDEDGE****OUT-OF-BAND LOW CHANNEL****IN-BAND REFERENCE LEVEL****OUT-OF-BAND MID CHANNEL****HIGH CHANNEL BANDEDGE****OUT-OF-BAND HIGH CHANNEL**

ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

9.8.6. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION

Note: Test procedure on beamforming mode is same as BT basic and EDR mode

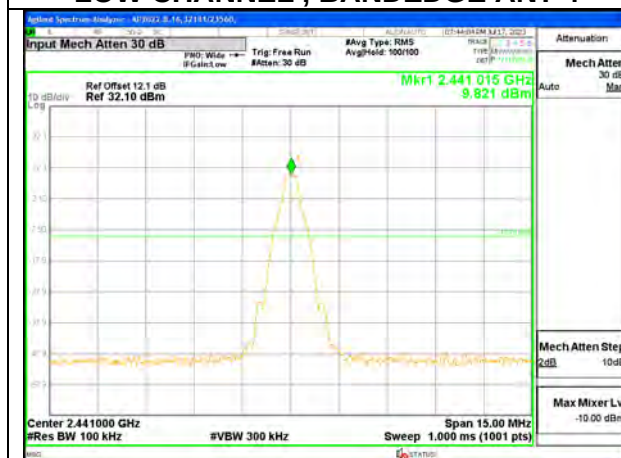
ANT 4



LOW CHANNEL, BANDEDGE ANT 4



LOW CHANNEL OUT-OF-BAND ANT 4



MID CHANNEL REFERENCE ANT 4



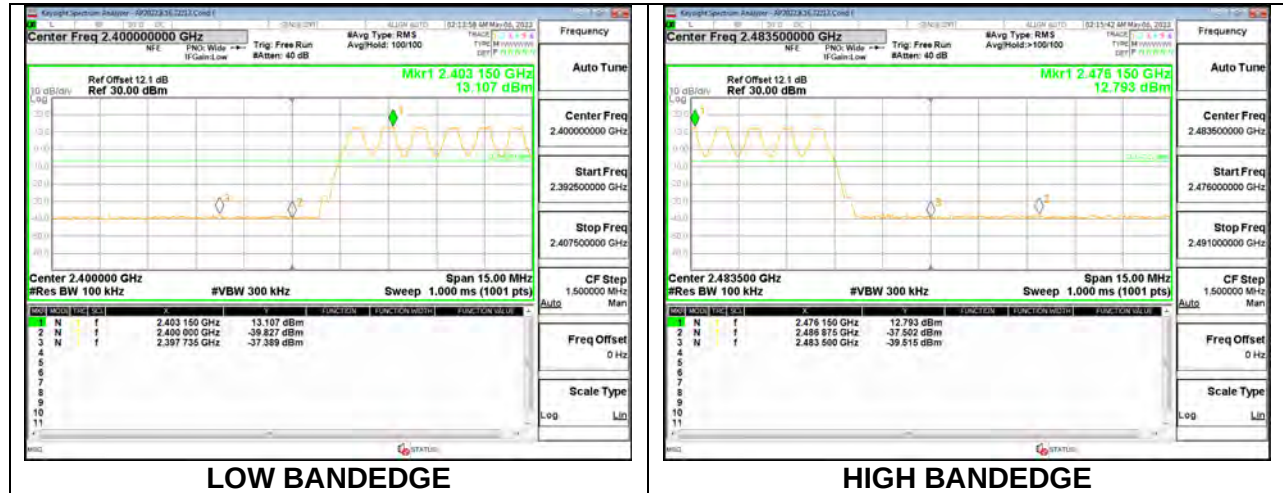
MID CHANNEL OUT-OF-BAND ANT 4

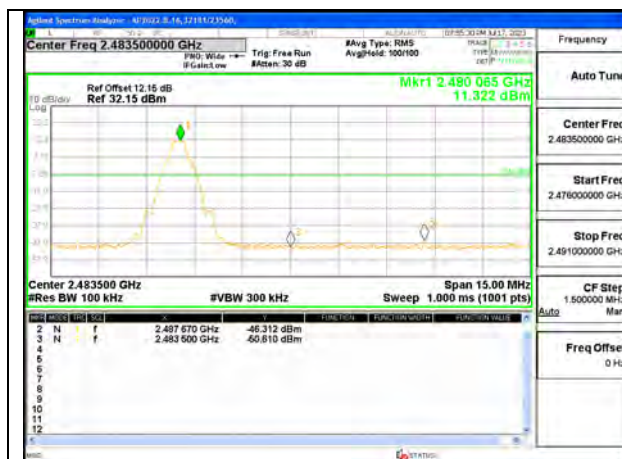


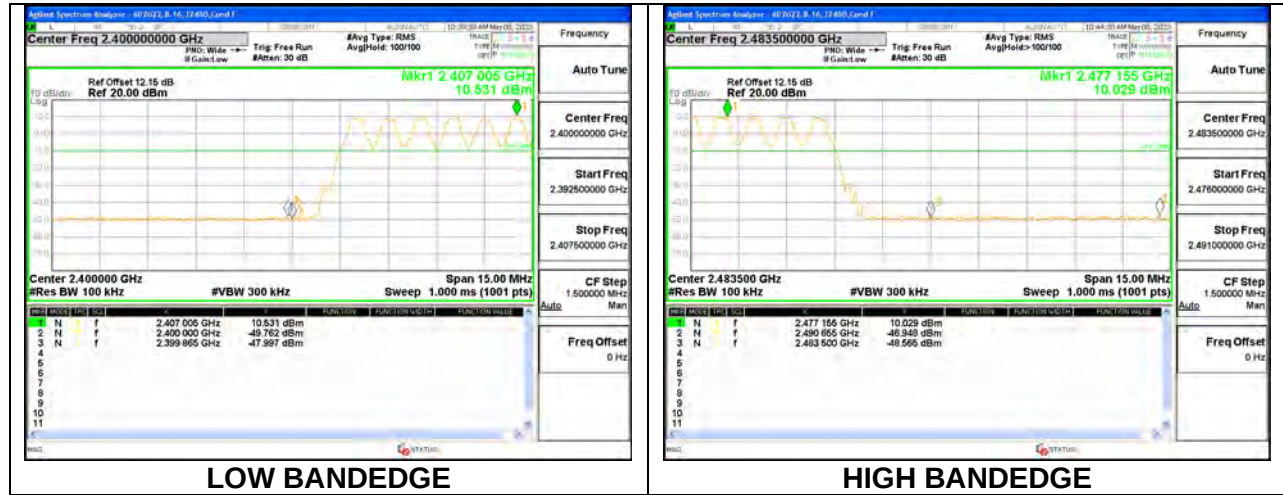
HIGH CHANNEL BANDEDGE ANT 4



HIGH CHANNEL OUT-OF-BAND ANT 4

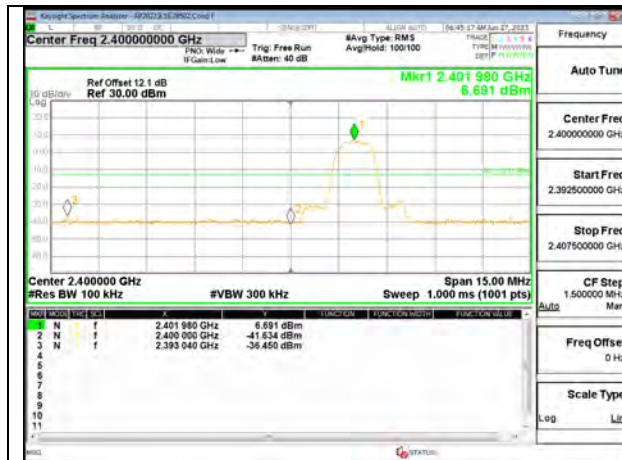
ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3**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 BANDEDGE ANT 3****HIGH CHANNEL OUT-OF-BAND ANT 3**

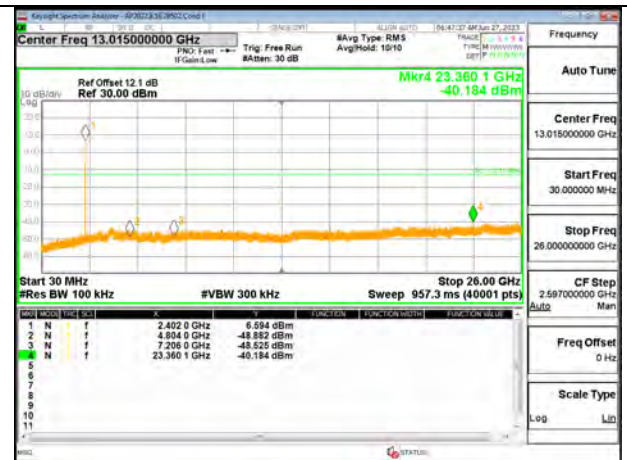
ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

9.8.7. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

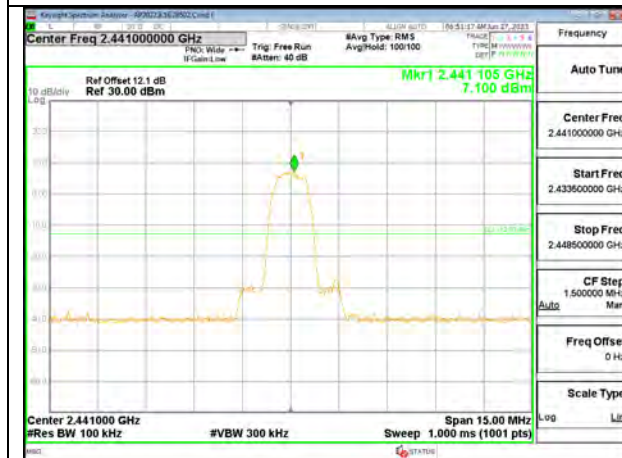
ANT 4 SPURIOUS EMISSIONS, NON-HOPPING



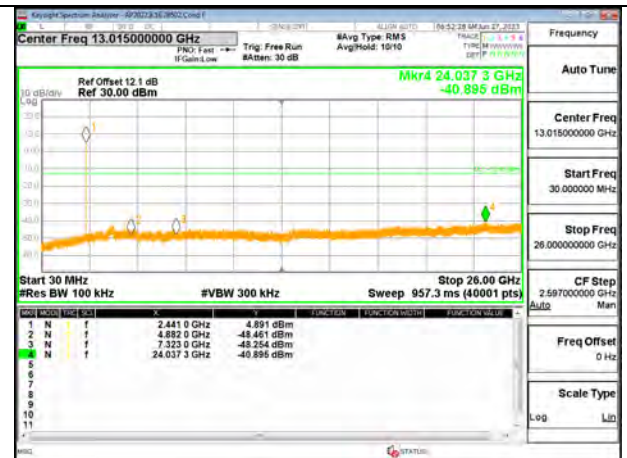
LOW CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL



IN-BAND REFERENCE LEVEL



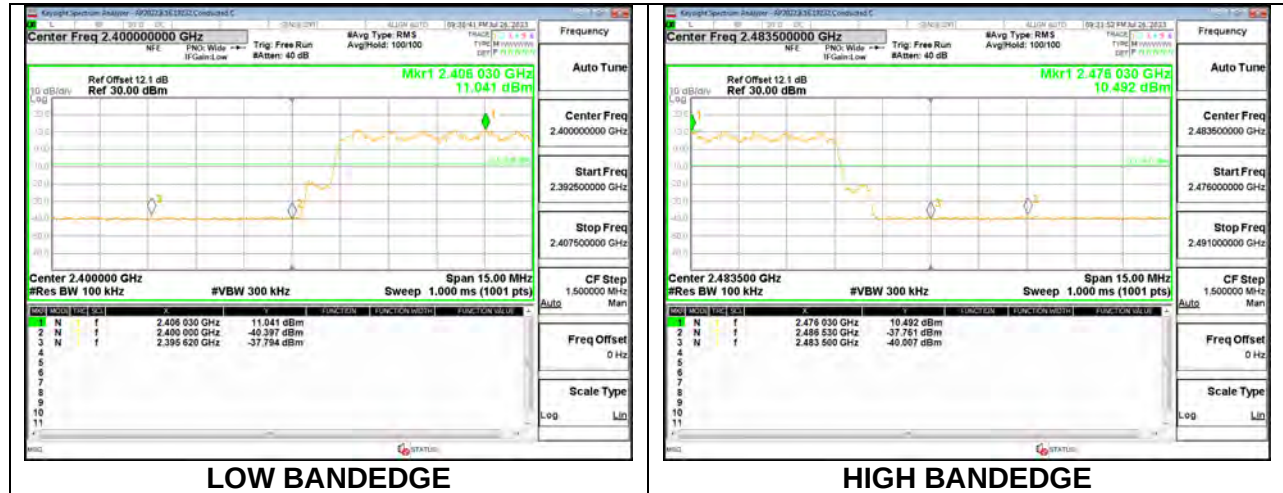
OUT-OF-BAND MID CHANNEL

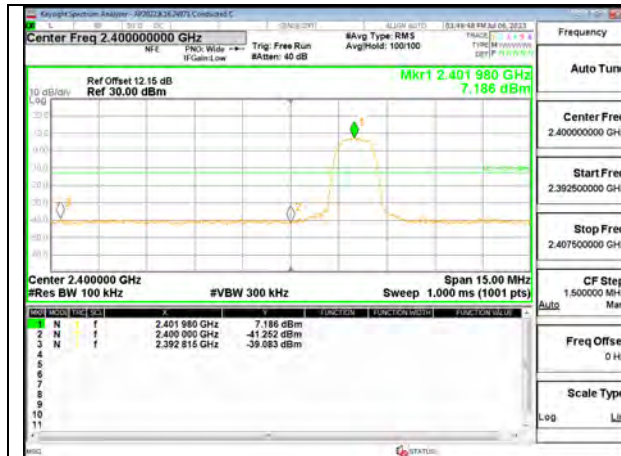
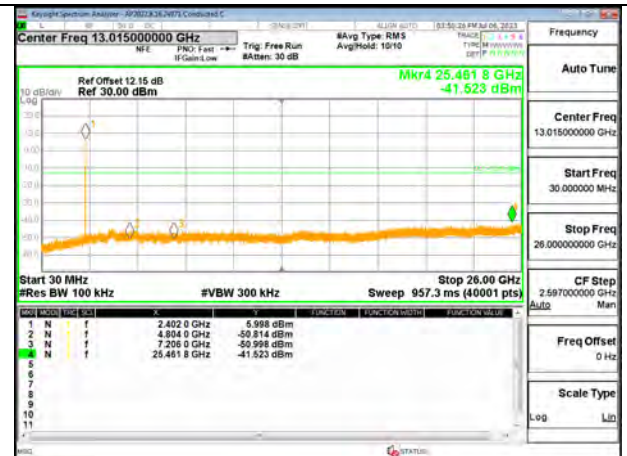
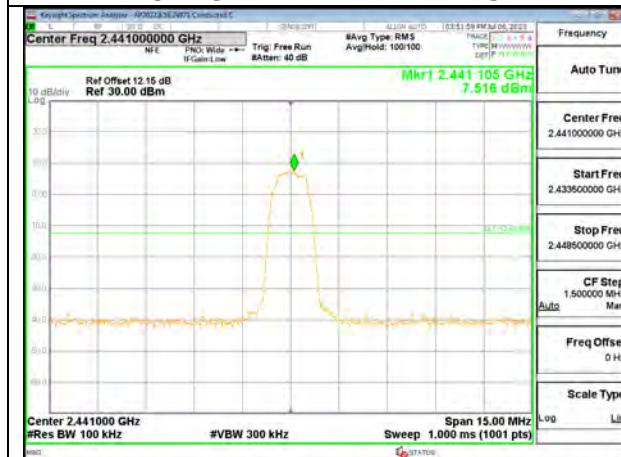
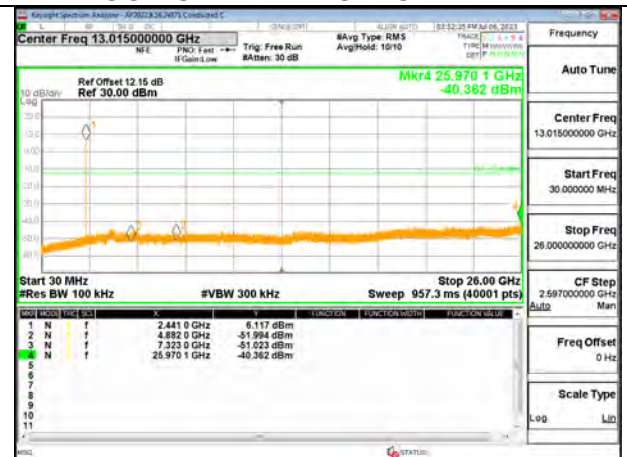


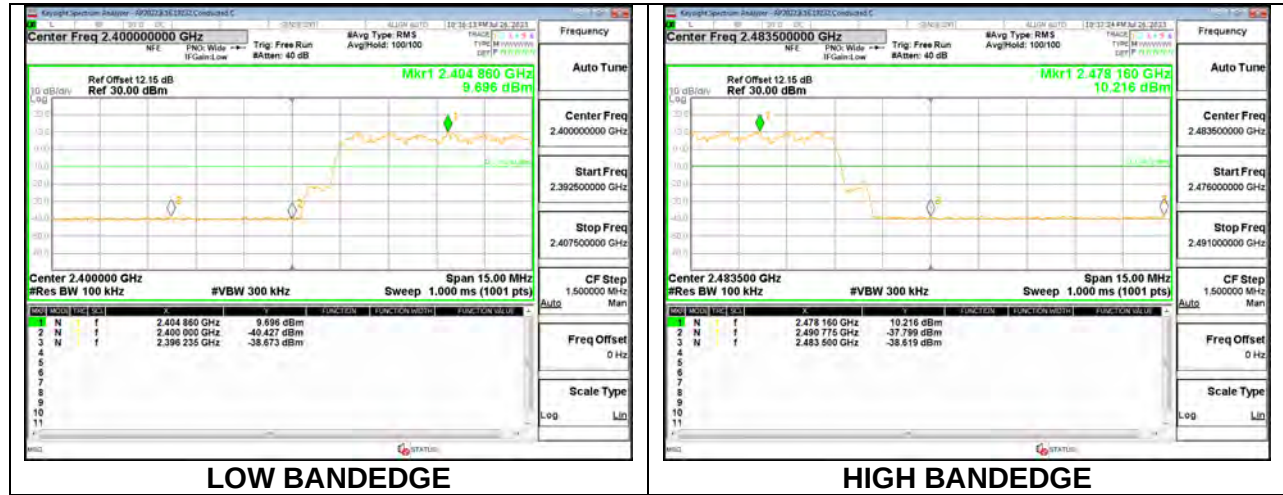
HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

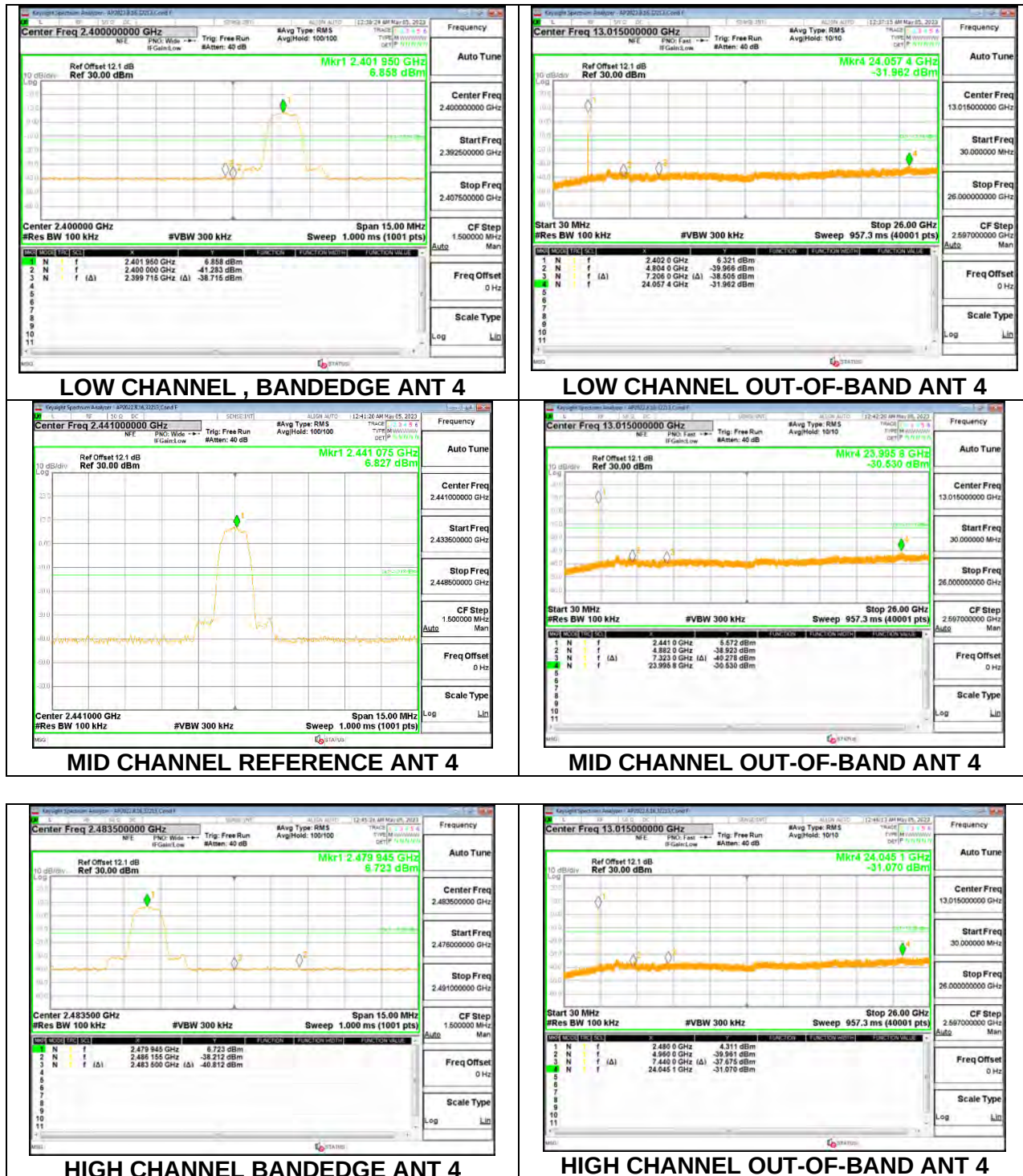
ANT 3 SPURIOUS EMISSIONS, NON-HOPPING**LOW CHANNEL BANDEDGE****OUT-OF-BAND LOW CHANNEL****IN-BAND REFERENCE LEVEL****OUT-OF-BAND MID CHANNEL****HIGH CHANNEL BANDEDGE****OUT-OF-BAND HIGH CHANNEL**

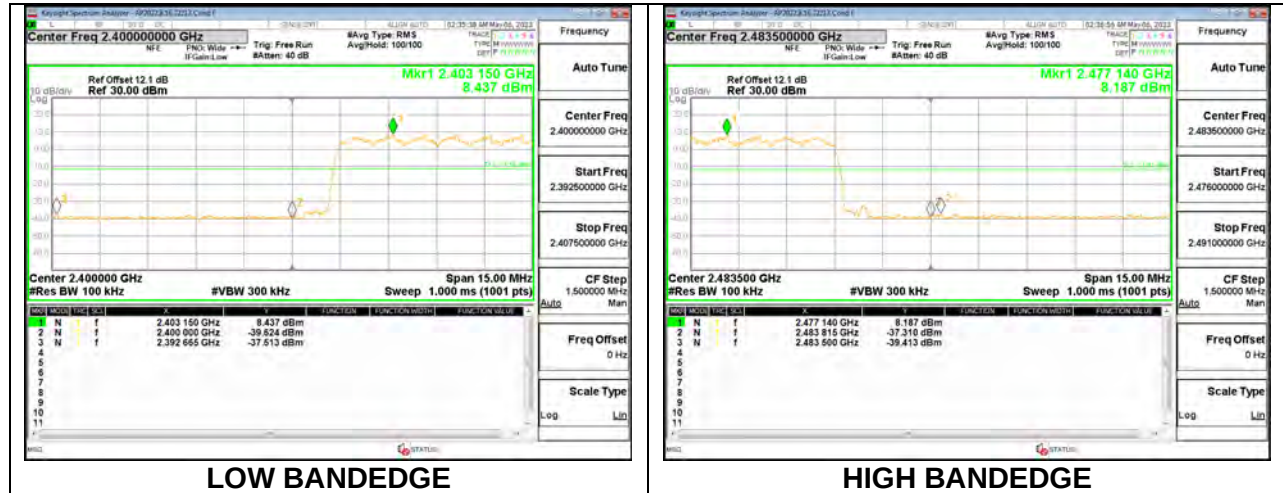
ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

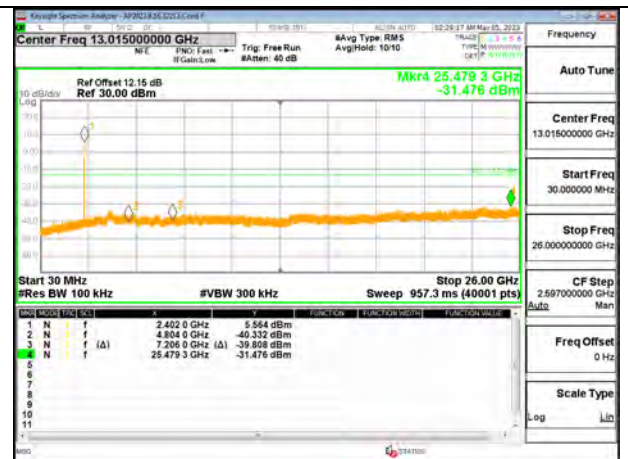
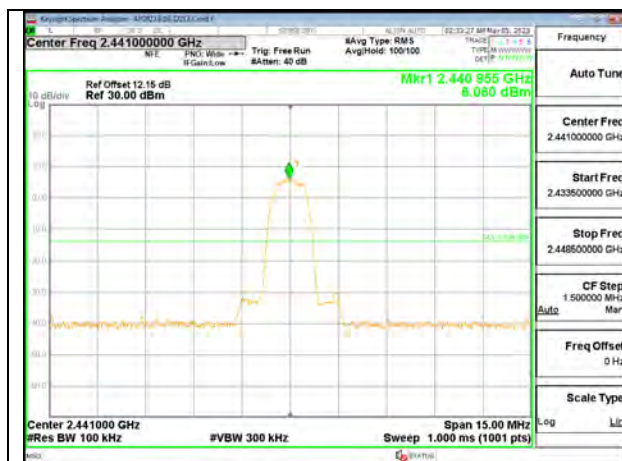
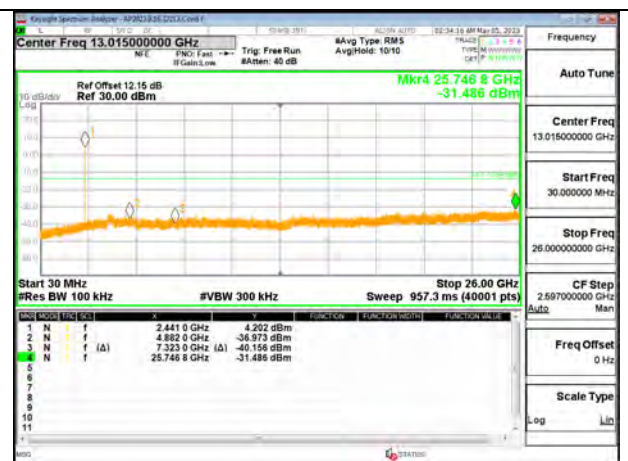
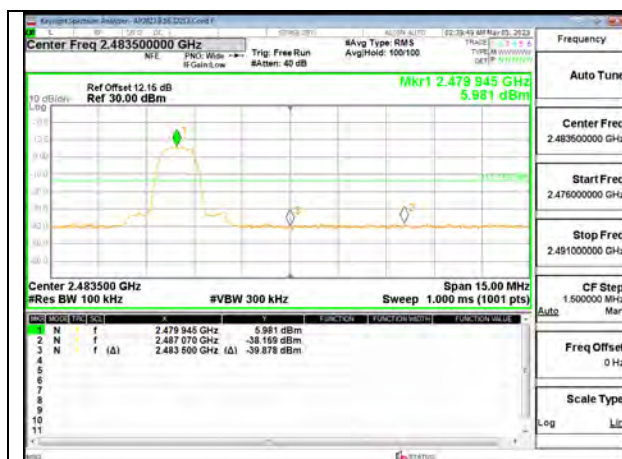
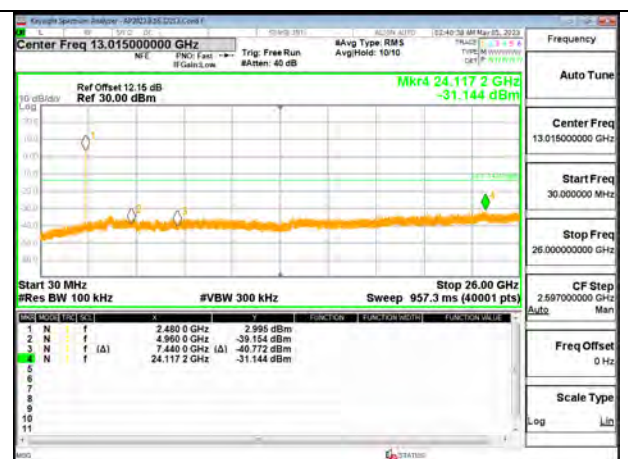
9.8.8. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

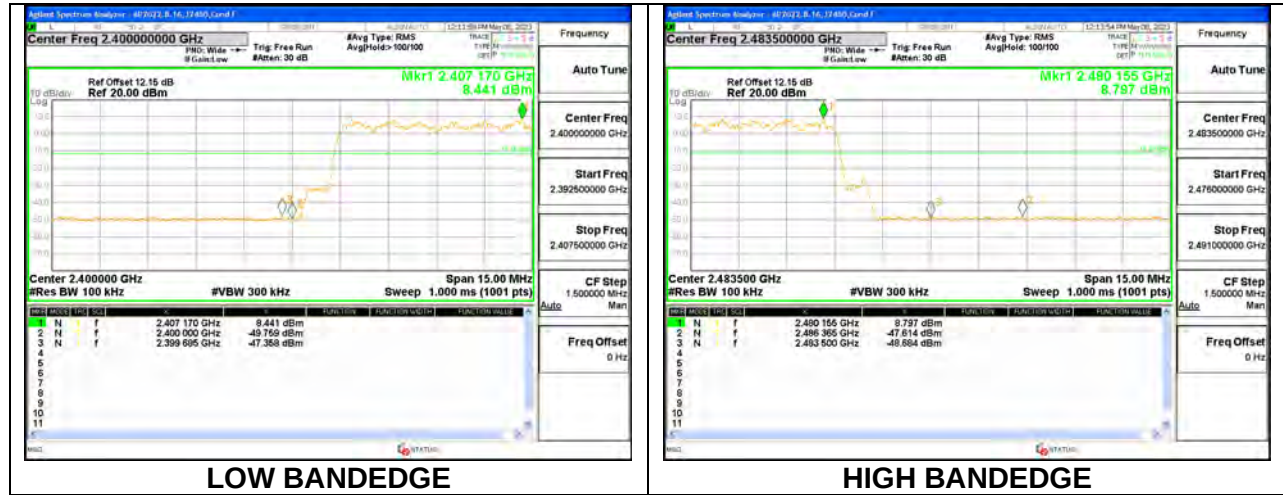
Note: Test procedure on beamforming mode is same as BT basic and EDR mode

ANT 4



ANT 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

ANT 3**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 BANDEDGE ANT 3****HIGH CHANNEL OUT-OF-BAND ANT 3**

ANT 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

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

TEST PROCEDURE

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

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final scans above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T (10 Hz) video bandwidth with peak detector for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

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

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

KDB 558074 D01 15.247 Meas Guidance v05r02

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

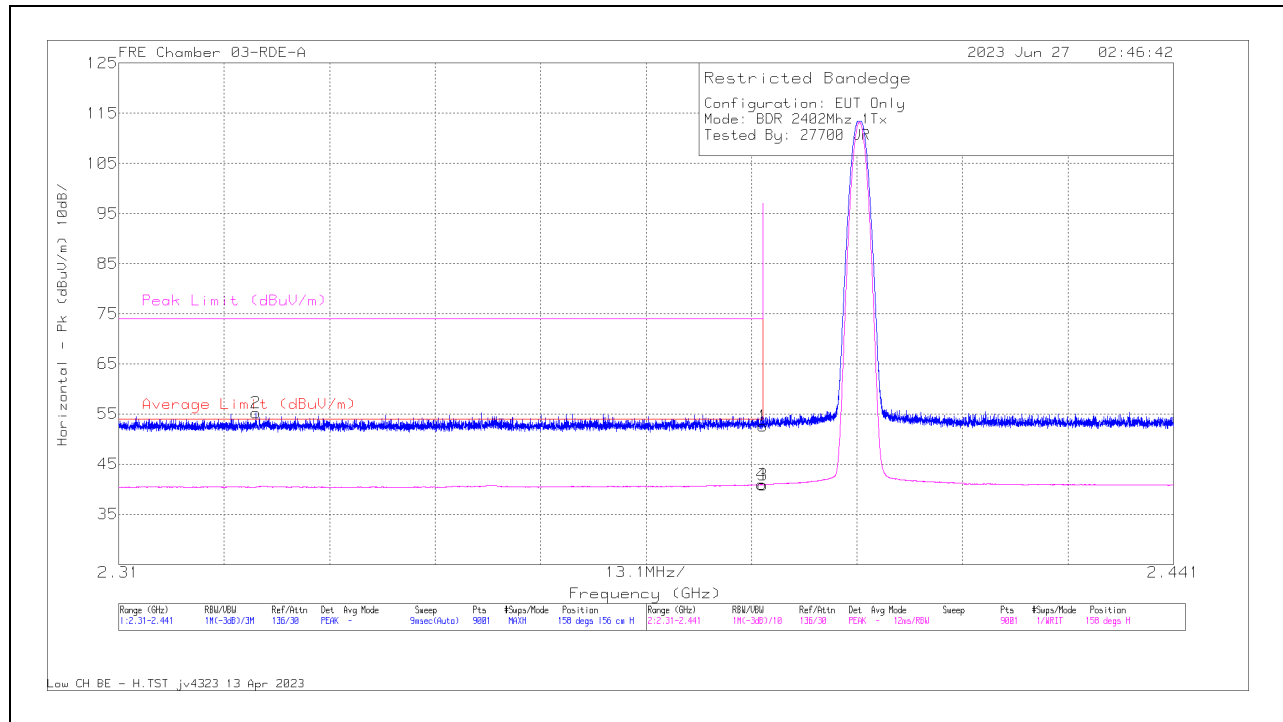
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



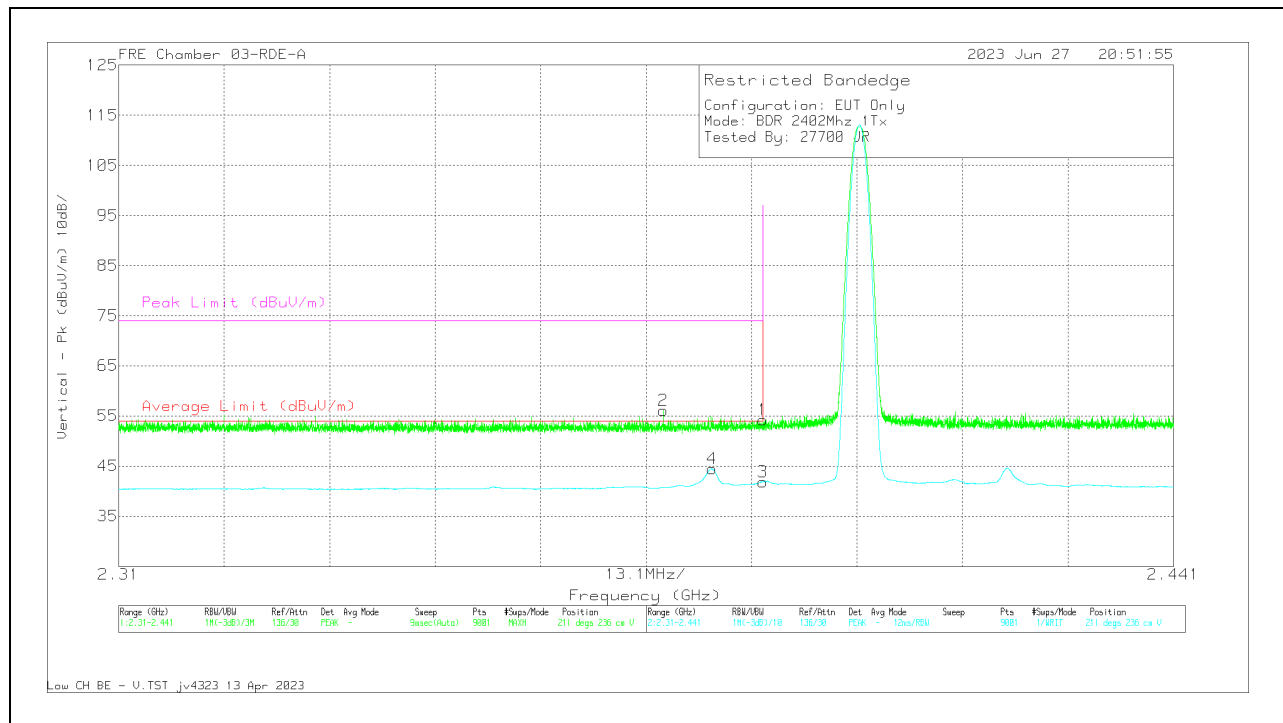
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dBm)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60.76	Pk	32.2	0	-40.42	52.54	-	-	74	-21.46	158	156	H
2	* 2.327001	63.6	Pk	32.1	0	-40.49	55.21	-	-	74	-18.79	158	156	H
3	* 2.39	49.08	VA1T	32.2	0	-40.42	40.86	54	-13.14	-	-	158	156	H
4	* 2.389825	49.14	VA1T	32.2	0	-40.42	40.92	54	-13.08	-	-	158	156	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

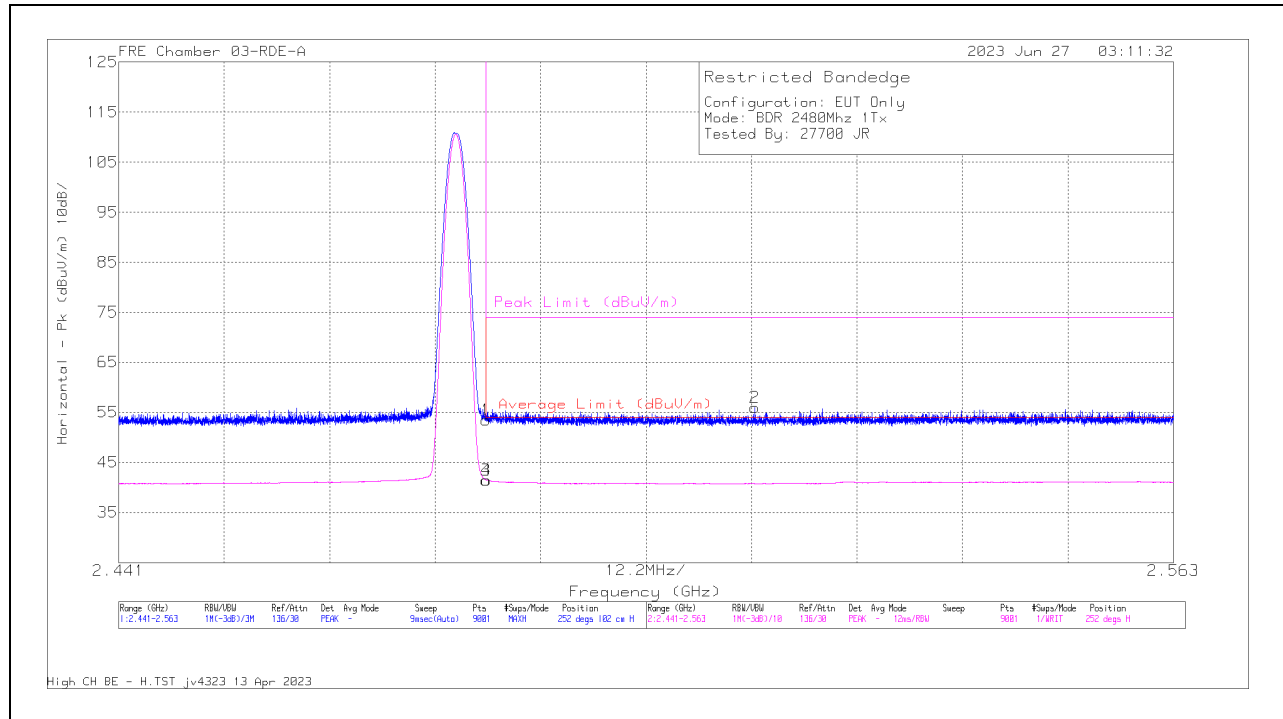


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	62.4	Pk	32.2	0	-40.42	54.18	-	-	74	-19.82	211	236	V
2	* 2.377613	64.4	Pk	32.1	0	-40.42	56.08	-	-	74	-17.92	211	236	V
3	* 2.39	50.08	VA1T	32.2	0	-40.42	41.86	54	-12.14	-	-	211	236	V
4	* 2.383682	52.77	VA1T	32.1	0	-40.39	44.48	54	-9.52	-	-	211	236	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

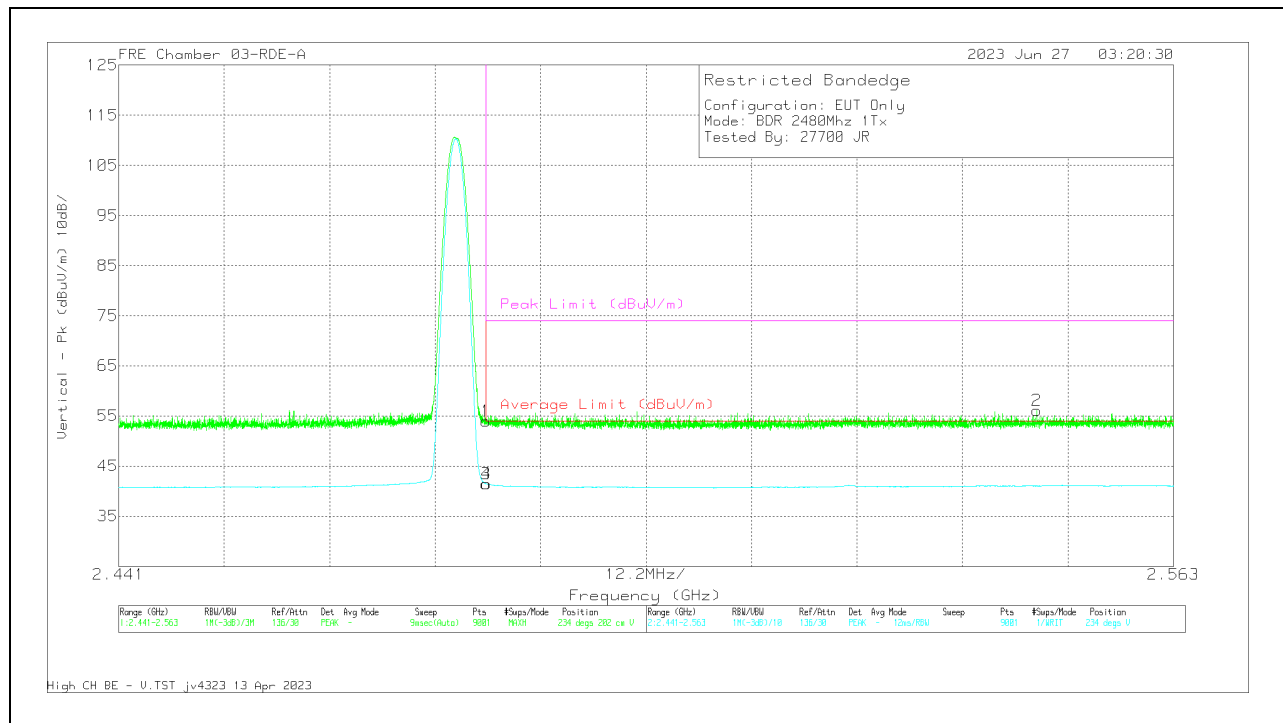
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.32	Pk	32.3	0	-40.11	53.51	-	-	74	-20.49	252	102	H
3	* 2.4835	49.33	VA1T	32.3	0	-40.11	41.52	54	-12.48	-	-	252	102	H
4	* 2.483512	49.31	VA1T	32.3	0	-40.11	41.5	54	-12.5	-	-	252	102	H
2	2.514568	63.63	Pk	32.4	0	-40.02	56.01	-	-	74	-17.99	252	102	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

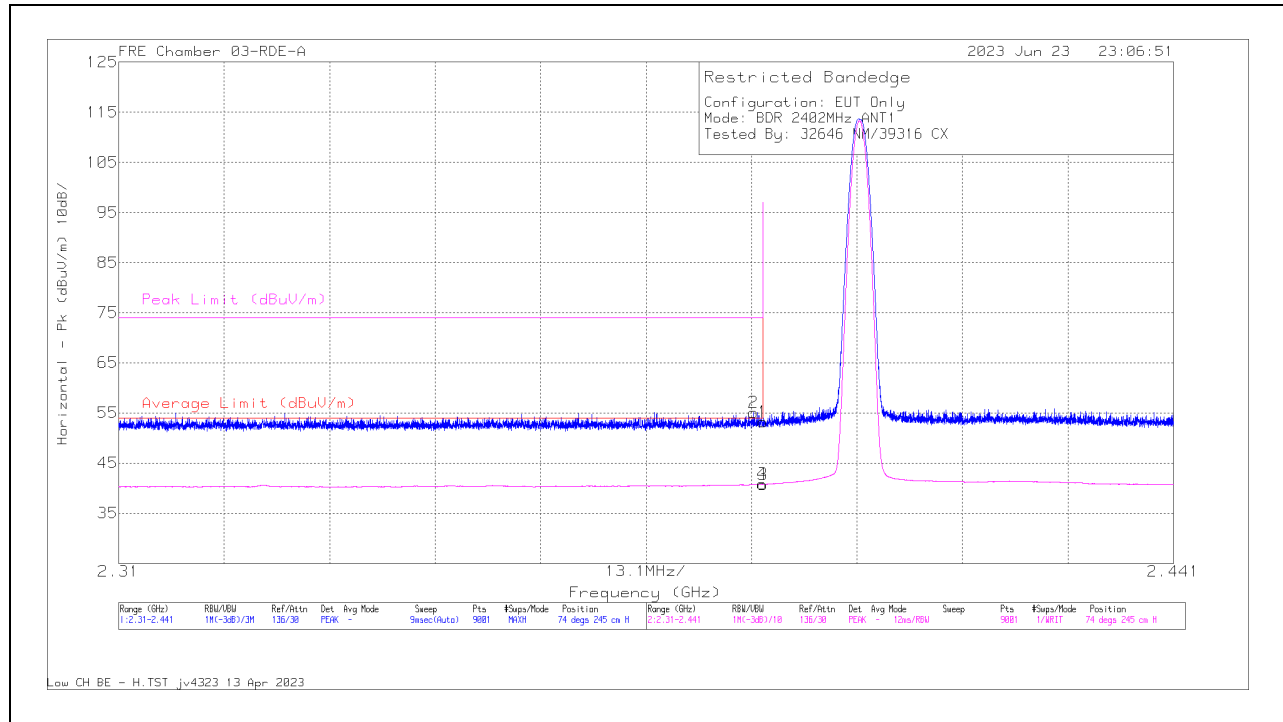


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.82	Pk	32.3	0	-40.11	54.01	-	-	74	-19.99	234	202	V
3	* 2.4835	49.28	VA1T	32.3	0	-40.11	41.47	54	-12.53	-	-	234	202	V
4	* 2.483512	49.27	VA1T	32.3	0	-40.11	41.46	54	-12.54	-	-	234	202	V
2	2.547198	63.59	Pk	32.5	0	-39.99	56.1	-	-	74	-17.9	234	202	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT 3**BANDEDGE (LOW CHANNEL)****HORIZONTAL RESULT**

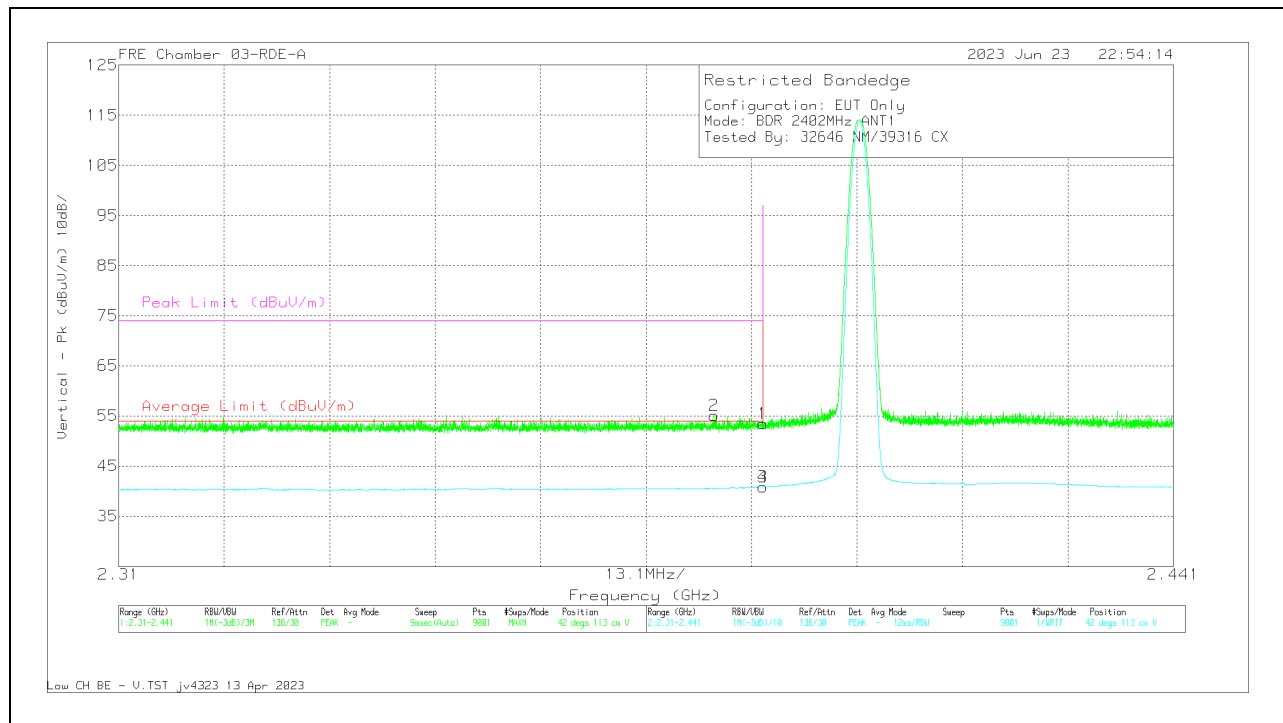
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.41	PK	32.2	0	-40.42	53.19	-	-	74	-20.81	74	245	H
2	* 2.38887	63.42	PK	32.1	0	-40.42	55.1	-	-	74	-18.9	74	245	H
3	* 2.39	48.99	VA1T	32.2	0	-40.42	40.77	54	-13.23	-	-	74	245	H
4	* 2.38997	49	VA1T	32.2	0	-40.42	40.78	54	-13.22	-	-	74	245	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

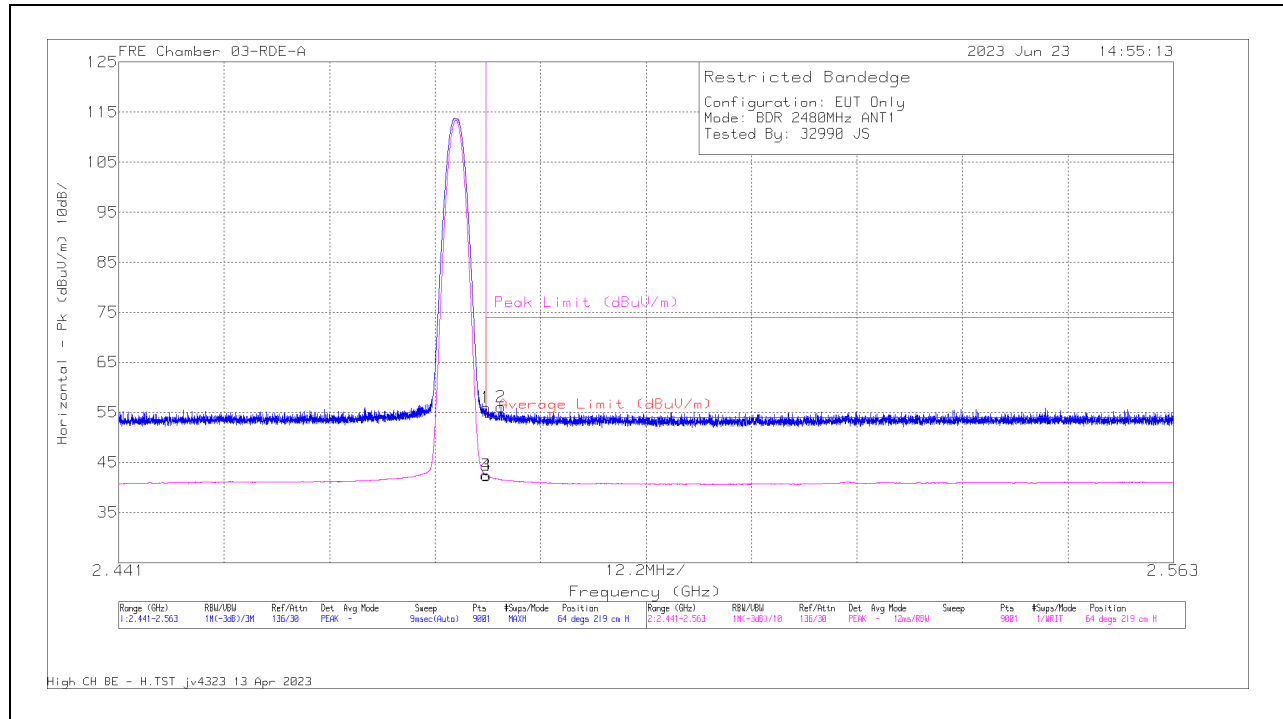


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.65	Pk	32.2	0	-40.42	53.43	-	-	74	-20.57	42	113	V
2	* 2.383974	63.34	Pk	32.1	0	-40.38	55.06	-	-	74	-18.94	42	113	V
3	* 2.39	49.07	VA1T	32.2	0	-40.42	40.85	54	-13.15	-	-	42	113	V
4	* 2.39	49.07	VA1T	32.2	0	-40.42	40.85	54	-13.15	-	-	42	113	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

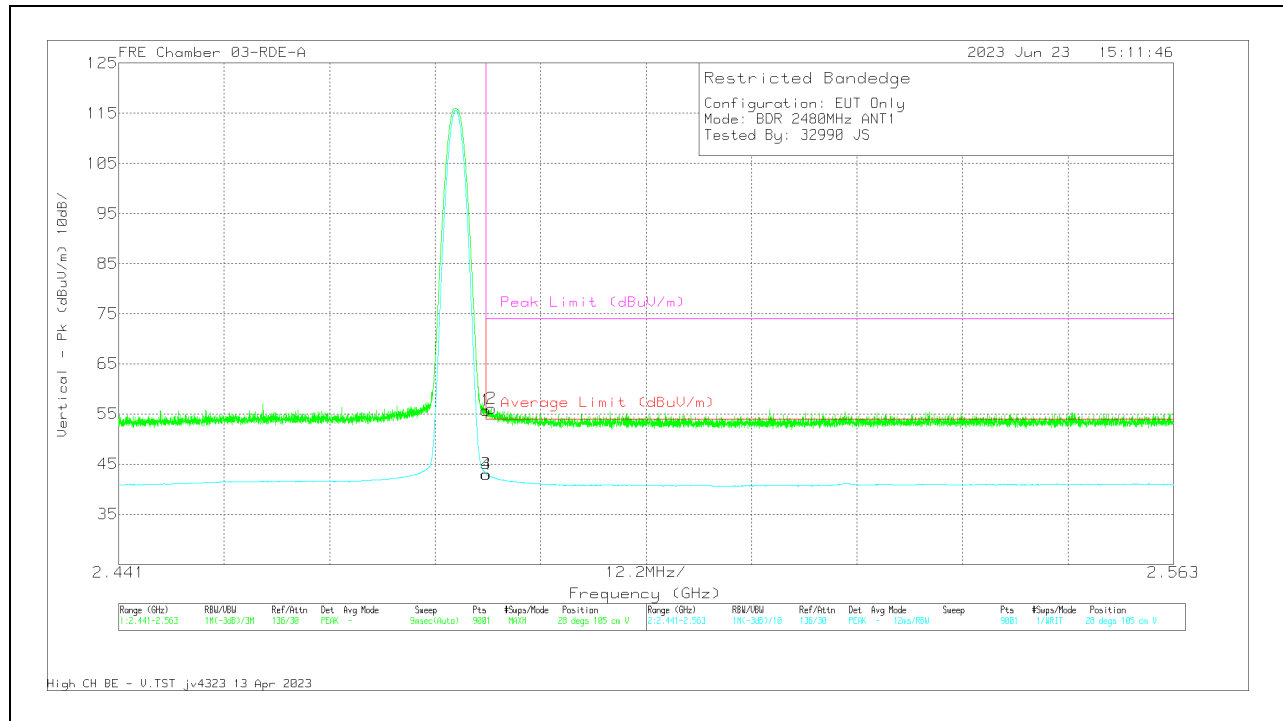
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	63.73	PK	32.3	0	-40.11	55.92	-	-	74	-18.08	64	219	H
2	* 2.485193	63.95	PK	32.3	0	-40.11	56.14	-	-	74	-17.86	64	219	H
3	* 2.4835	50.22	VA1T	32.3	0	-40.11	42.41	54	-11.59	-	-	64	219	H
4	* 2.483512	50.21	VA1T	32.3	0	-40.11	42.4	54	-11.6	-	-	64	219	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	63.55	Pk	32.3	0	-40.11	55.74	-	-	74	-18.26	28	105	V
2	* 2.484122	63.94	Pk	32.3	0	-40.11	56.13	-	-	74	-17.87	28	105	V
3	* 2.4835	50.84	VA1T	32.3	0	-40.11	43.03	54	-10.97	-	-	28	105	V
4	* 2.483512	50.82	VA1T	32.3	0	-40.11	43.01	54	-10.99	-	-	28	105	V

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

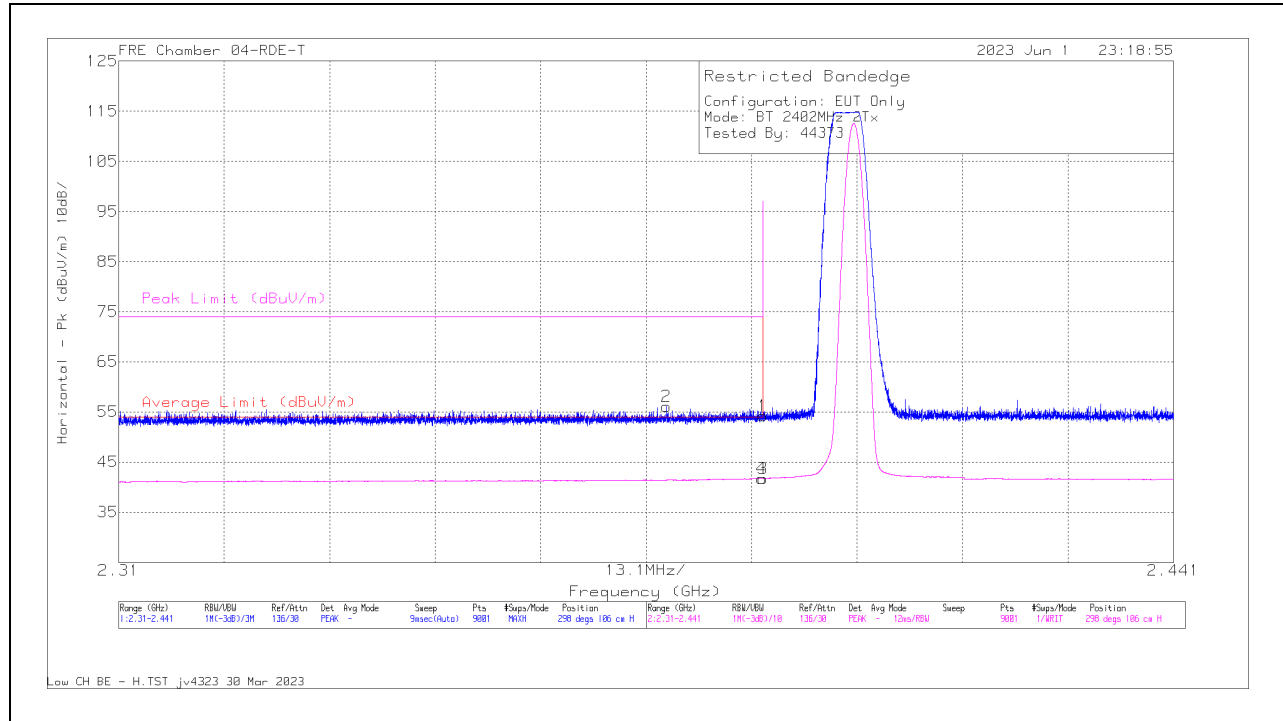
Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



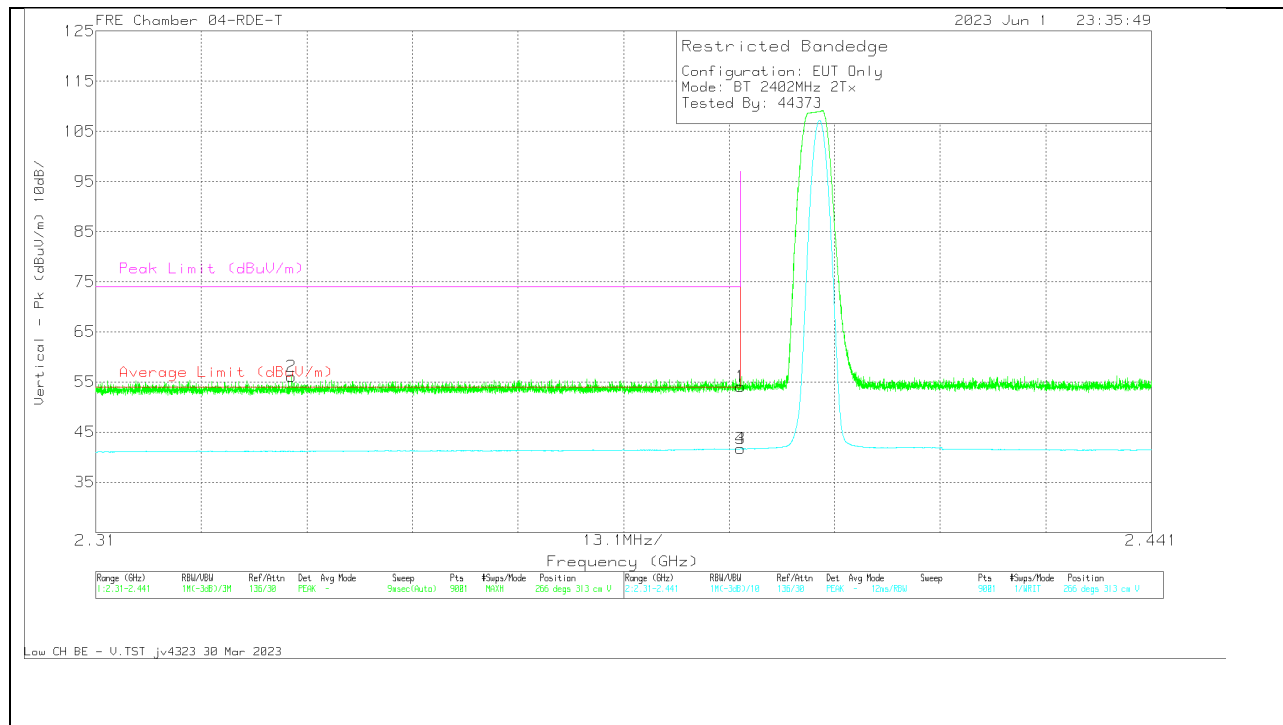
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60	Pk	32.1	-37.89	54.21	-	-	74	-19.79	298	106	H
2	* 2.378035	61.91	Pk	32.1	-37.87	56.14	-	-	74	-17.86	298	106	H
3	* 2.39	47.52	VA1T	32.1	-37.89	41.73	54	-12.27	-	-	298	106	H
4	* 2.389869	47.55	VA1T	32.1	-37.89	41.76	54	-12.24	-	-	298	106	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

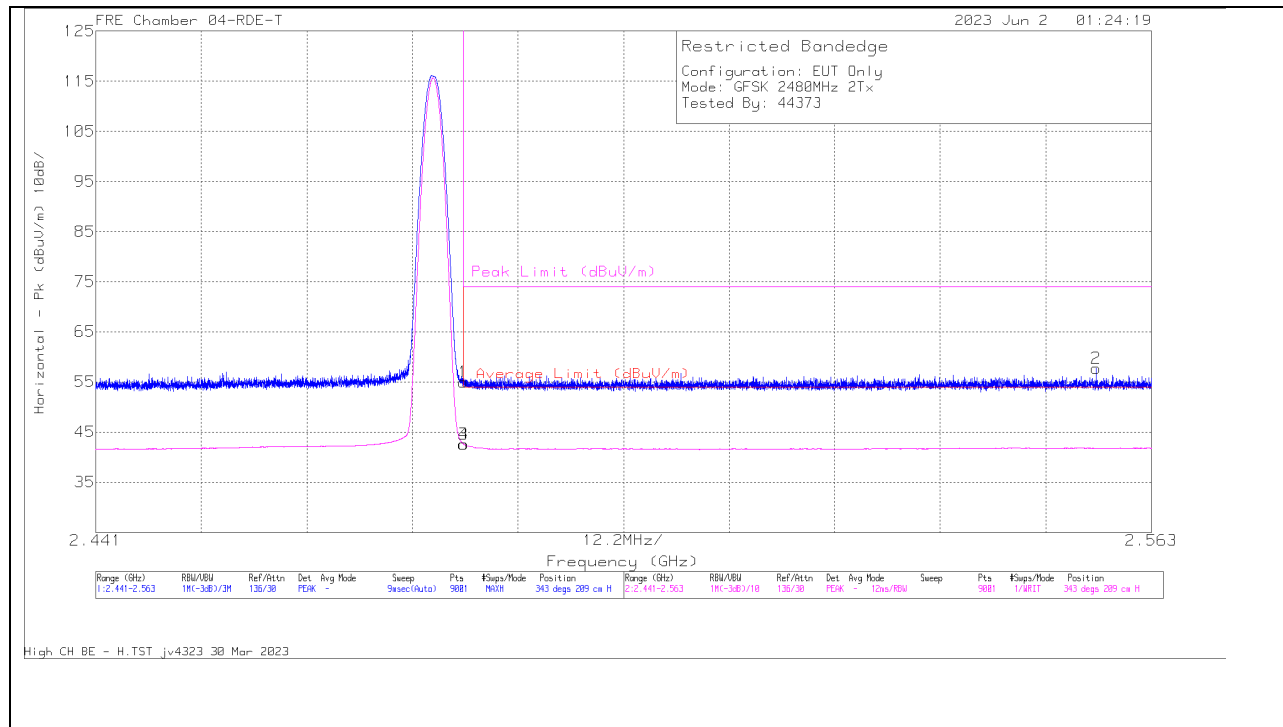


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.89	Pk	32.1	-37.89	54.1	-	-	74	-19.9	266	313	V
2	* 2.334309	62.12	Pk	31.9	-37.92	56.1	-	-	74	-17.9	266	313	V
3	* 2.39	47.45	VA1T	32.1	-37.89	41.66	54	-12.34	-	-	266	313	V
4	* 2.39	47.45	VA1T	32.1	-37.89	41.66	54	-12.34	-	-	266	313	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

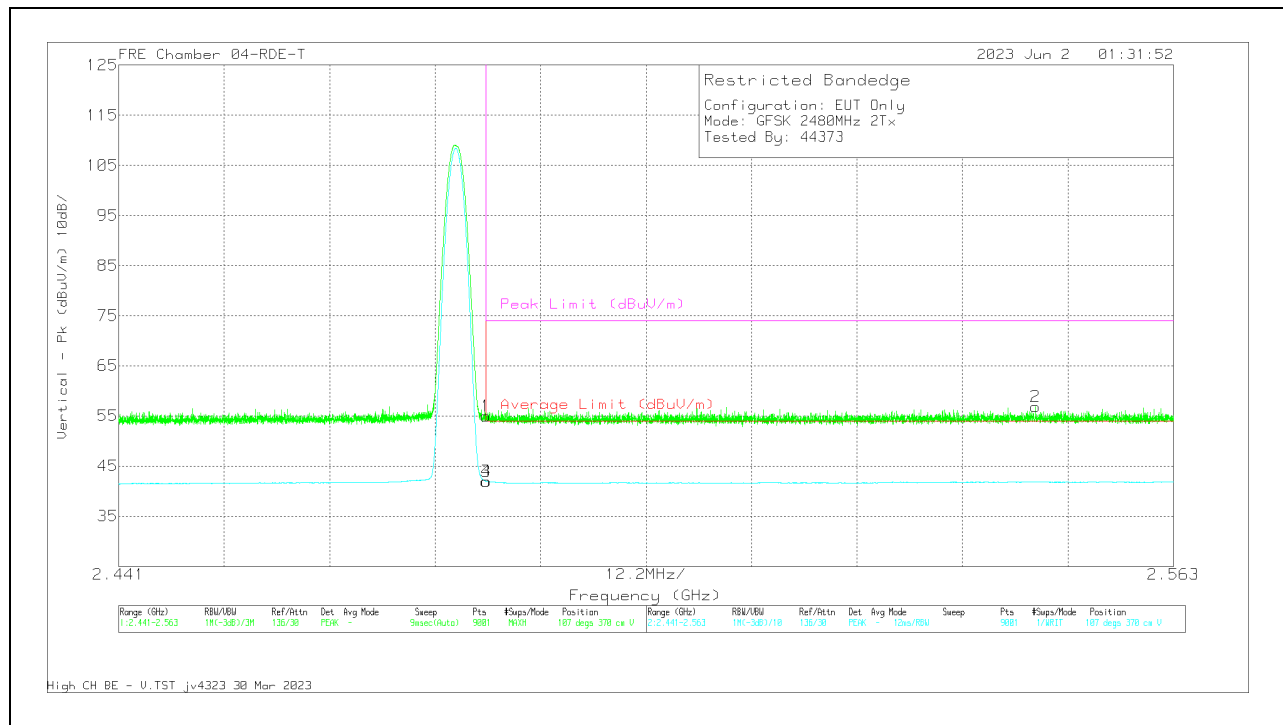
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.58	Pk	32.2	-37.81	54.97	-	-	74	-19.03	343	209	H
3	* 2.4835	48.23	VA1T	32.2	-37.81	42.62	54	-11.38	-	-	343	209	H
4	* 2.483512	48.21	VA1T	32.2	-37.81	42.6	54	-11.4	-	-	343	209	H
2	2.556633	63.19	Pk	32.3	-37.77	57.72	-	-	74	-16.28	343	209	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.61	Pk	32.2	-37.81	55	-	-	74	-19	107	370	V
3	* 2.4835	47.59	VA1T	32.2	-37.81	41.98	54	-12.02	-	-	107	370	V
4	* 2.483512	47.58	VA1T	32.2	-37.81	41.97	54	-12.03	-	-	107	370	V
2	2.547049	62.25	Pk	32.3	-37.73	56.82	-	-	74	-17.18	107	370	V

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

Pk - Peak detector

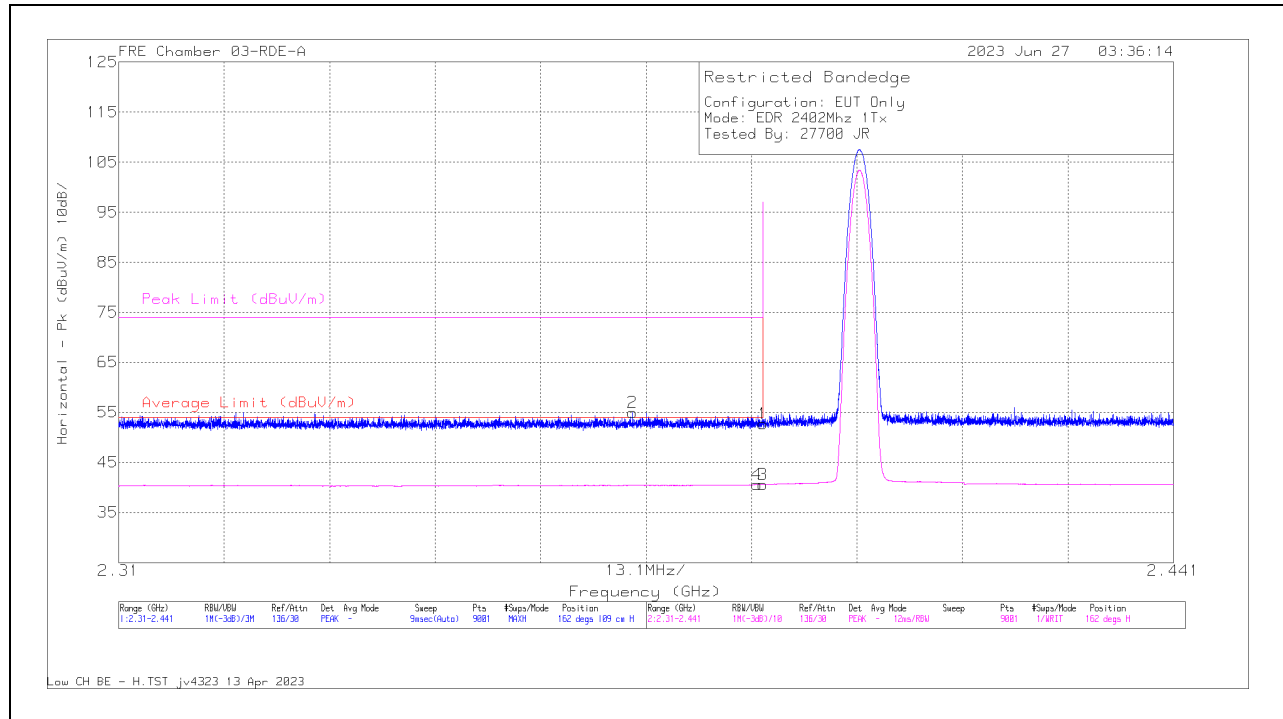
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



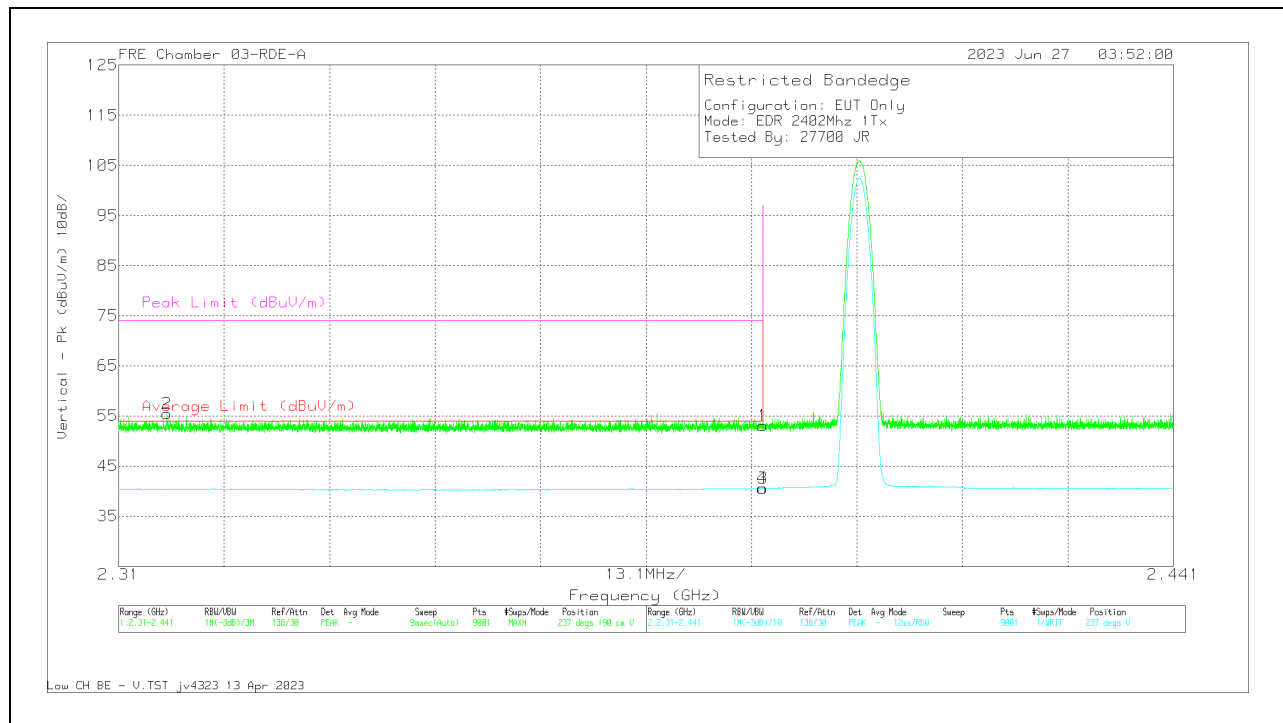
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	230299 ACF (dBm)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBm)	Average Limit (dBm)	Margin (dB)	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60.99	Pk	32.2	0	-40.42	52.77	-	-	74	-21.23	162	109	H
2	* 2.373814	63.25	Pk	32.1	0	-40.41	54.94	-	-	74	-19.06	162	109	H
3	* 2.39	48.79	VA1T	32.2	0	-40.42	40.57	54	-13.43	-	-	162	109	H
4	* 2.389272	48.83	VA1T	32.2	0	-40.42	40.61	54	-13.39	-	-	162	109	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

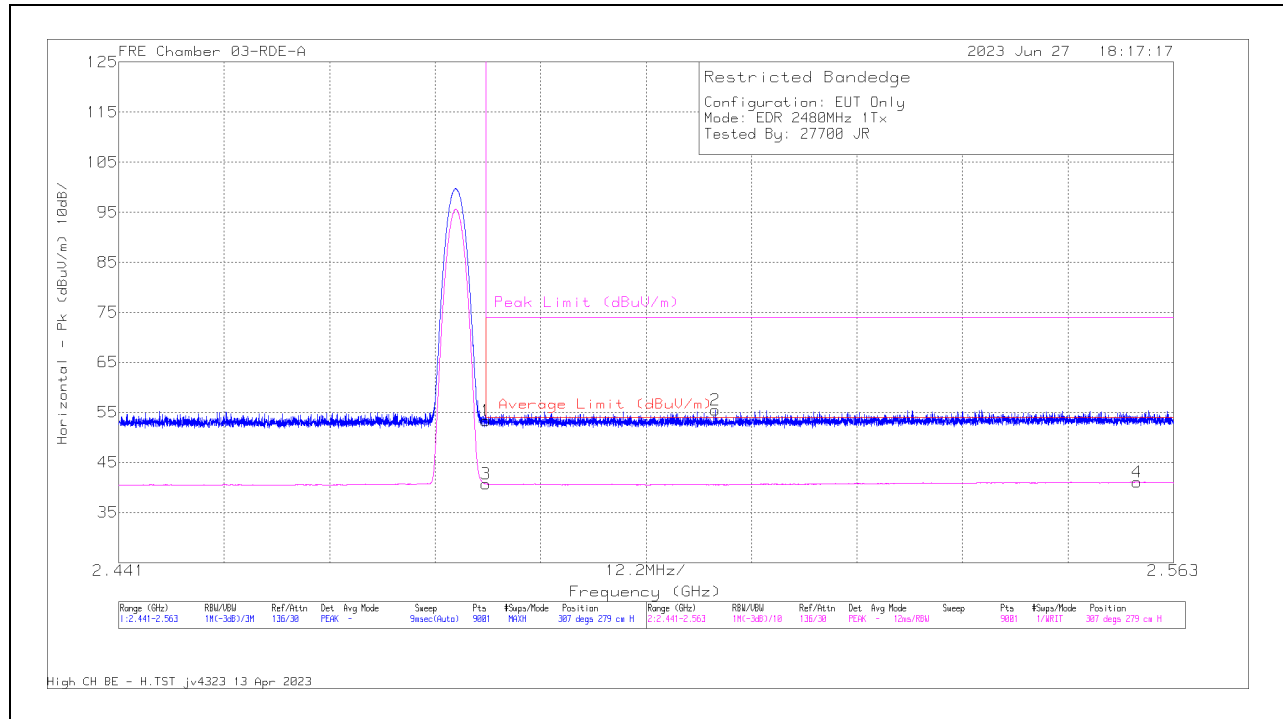


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.27	Pk	32.2	0	-40.42	53.05	-	-	74	-20.95	237	190	V
2	* 2.315968	64.01	Pk	32	0	-40.49	55.52	-	-	74	-18.48	237	190	V
3	* 2.39	48.77	VA1T	32.2	0	-40.42	40.55	54	-13.45	-	-	237	190	V
4	* 2.389971	48.78	VA1T	32.2	0	-40.42	40.56	54	-13.44	-	-	237	190	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

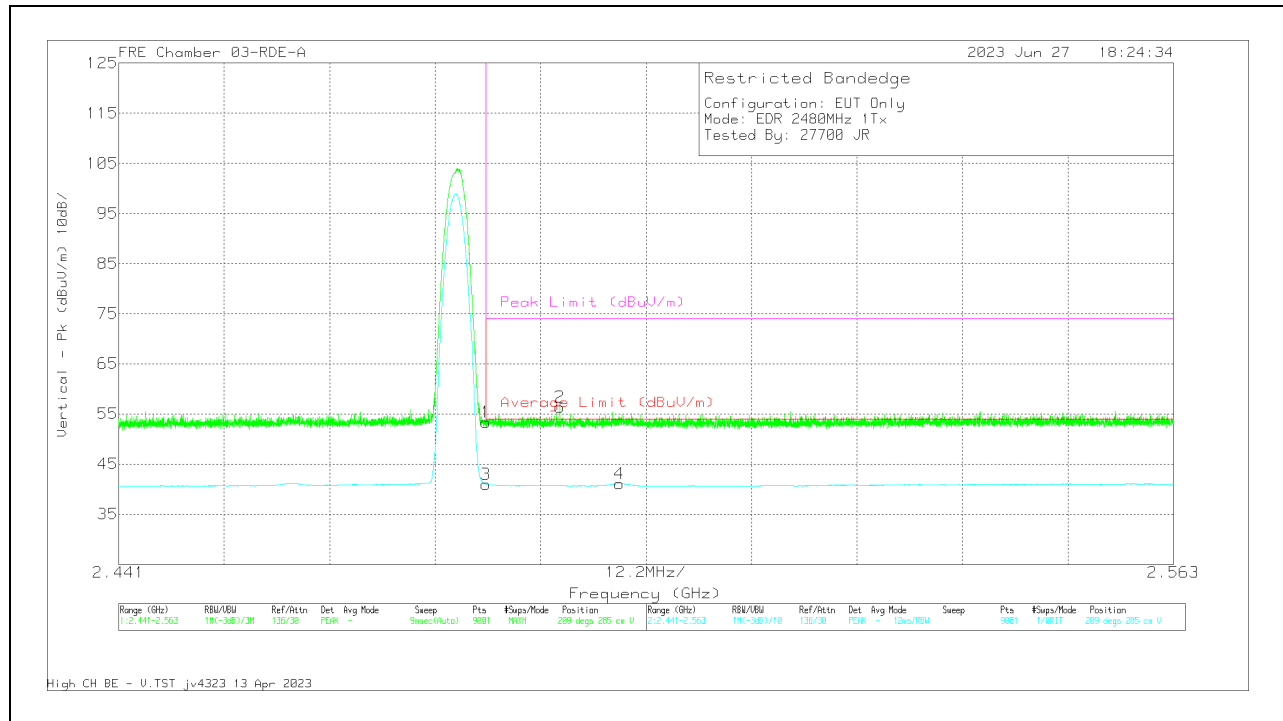
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.15	Pk	32.3	0	-40.11	53.34	-	-	74	-20.66	307	279	H
3	* 2.4835	48.52	VA1T	32.3	0	-40.11	40.71	54	-13.29	-	-	307	279	H
2	2.509973	63.15	Pk	32.4	0	-40.08	55.47	-	-	74	-18.53	307	279	H
4	2.558815	48.46	VA1T	32.5	0	-39.89	41.07	54	-12.93	-	-	307	279	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

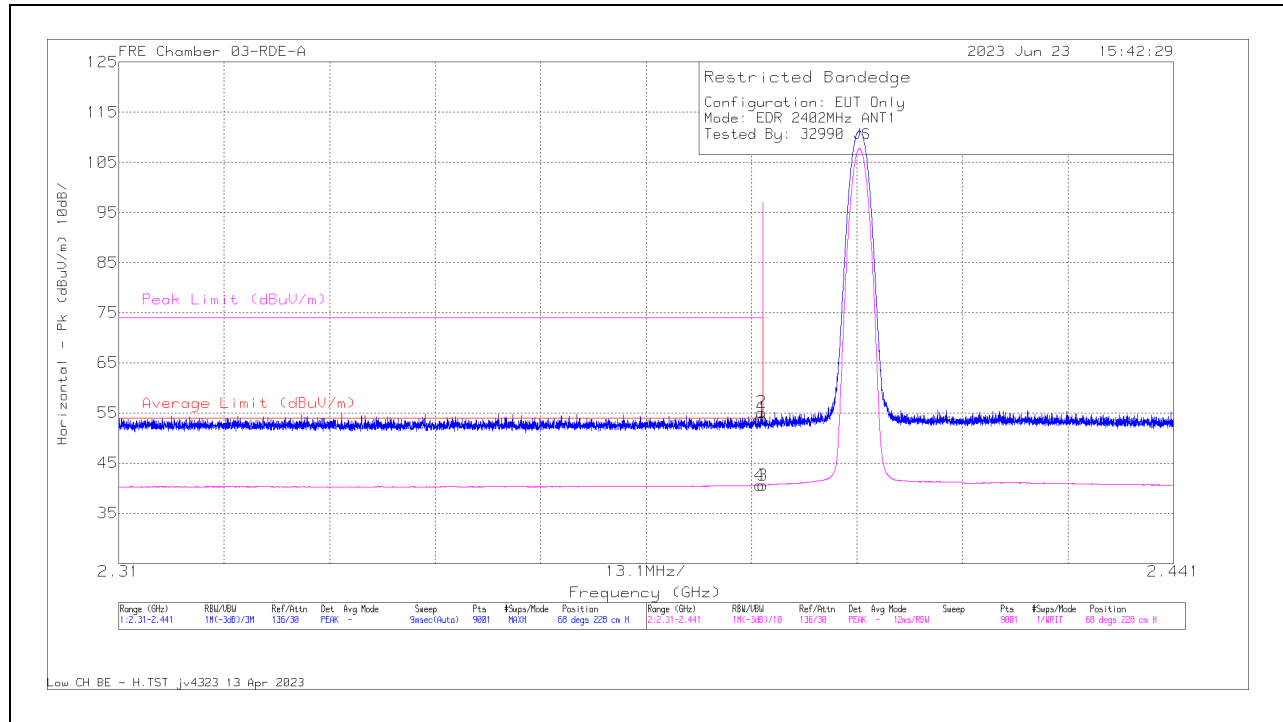


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.12	Pk	32.3	0	-40.11	53.31	-	-	74	-20.69	209	285	V
2	* 2.492038	64.15	Pk	32.3	0	-40.09	56.36	-	-	74	-17.64	209	285	V
3	* 2.4835	48.78	VA1T	32.3	0	-40.11	40.97	54	-13.03	-	-	209	285	V
4	* 2.498925	48.75	VA1T	32.4	0	-40.03	41.12	54	-12.88	-	-	209	285	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT 3**BANDEDGE (LOW CHANNEL)****HORIZONTAL RESULT**

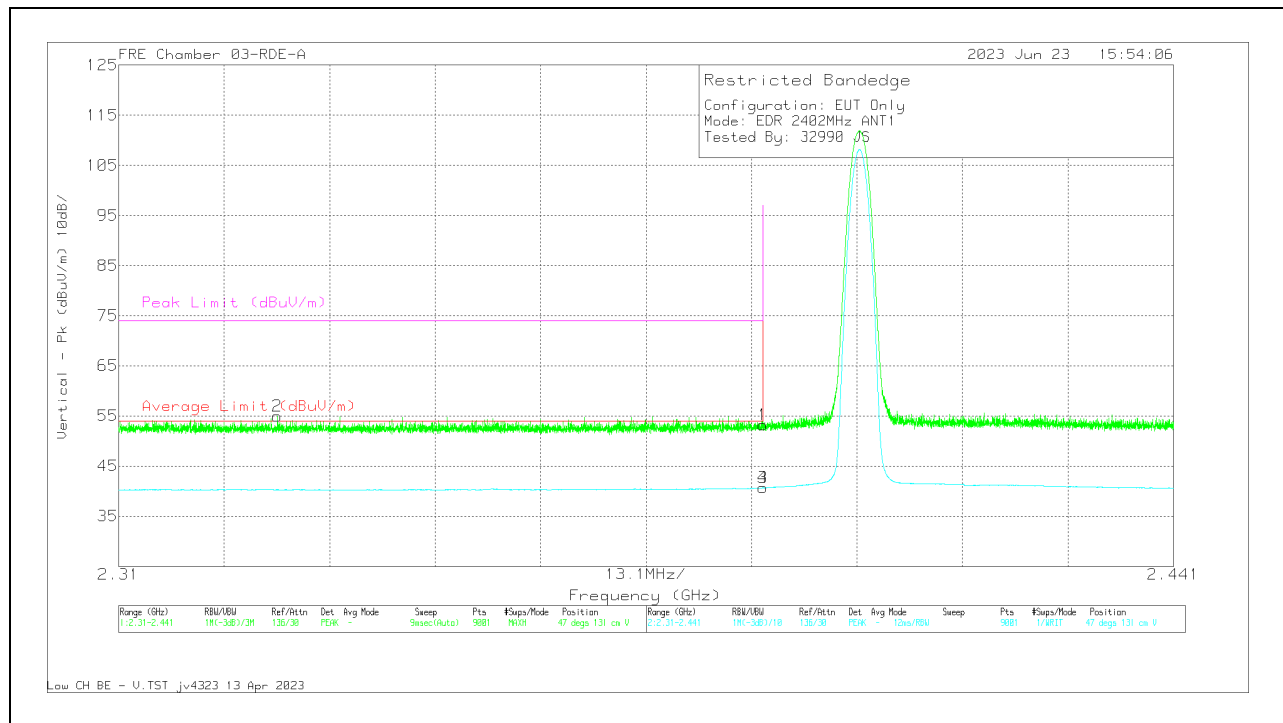
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	62.22	Pk	32.2	0	-40.42	54	-	-	74	-20	68	228	H
2	* 2.389825	63.38	Pk	32.2	0	-40.42	55.16	-	-	74	-18.84	68	228	H
3	* 2.39	48.79	VA1T	32.2	0	-40.42	40.57	54	-13.43	-	-	68	228	H
4	* 2.389607	48.83	VA1T	32.2	0	-40.42	40.61	54	-13.39	-	-	68	228	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

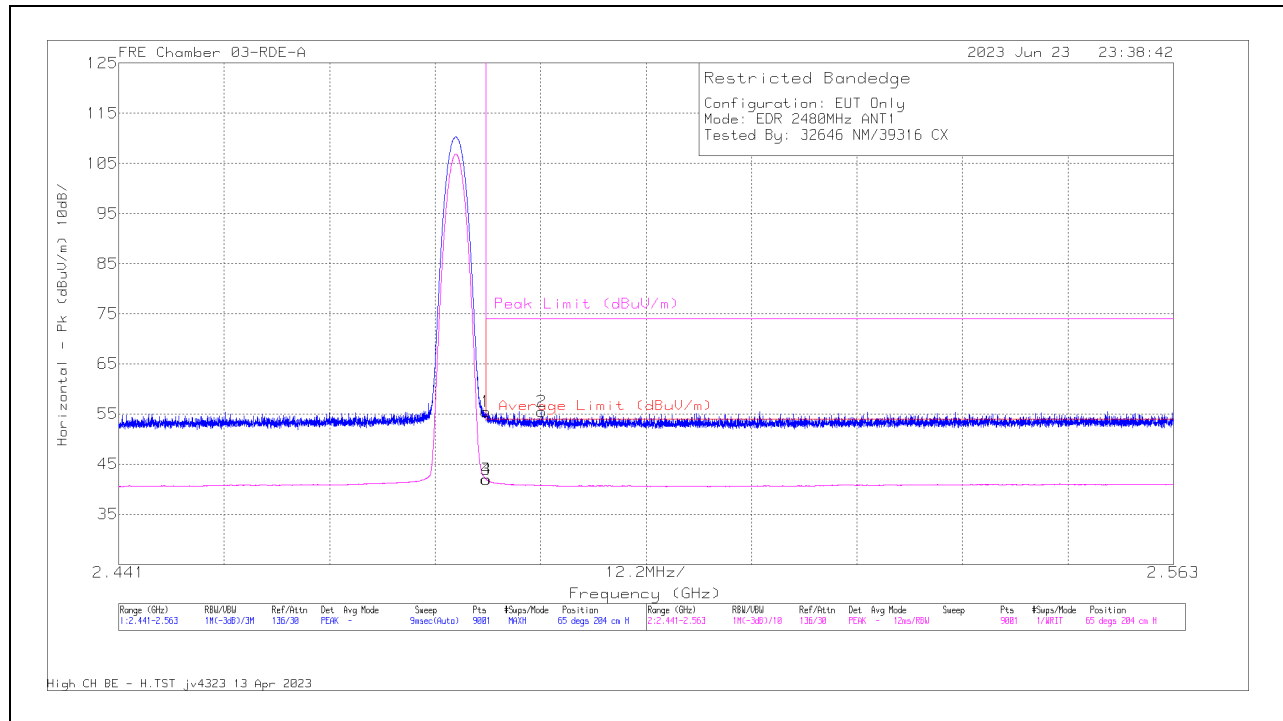


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.46	Pk	32.2	0	-40.42	53.24	-	-	74	-20.76	47	131	V
2	* 2.329665	63.4	Pk	32.1	0	-40.47	55.03	-	-	74	-18.97	47	131	V
3	* 2.39	48.89	VA1T	32.2	0	-40.42	40.67	54	-13.33	-	-	47	131	V
4	* 2.39	48.89	VA1T	32.2	0	-40.42	40.67	54	-13.33	-	-	47	131	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

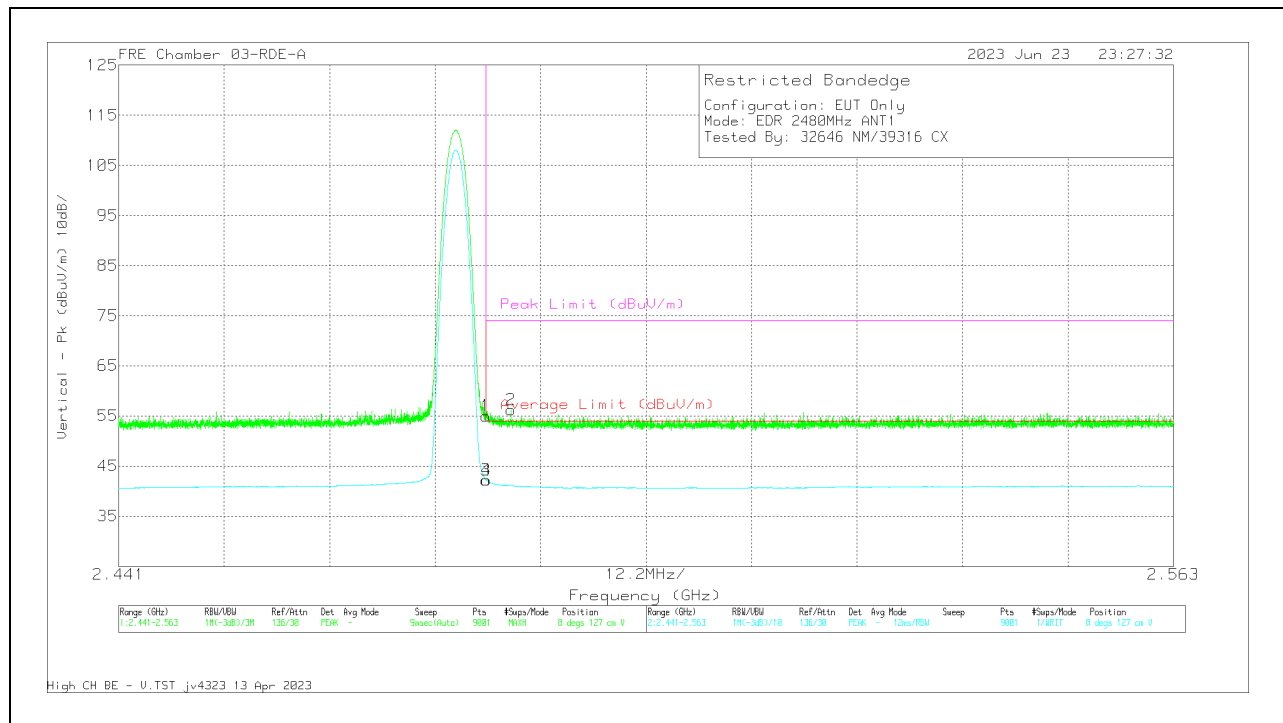
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	63.24	Pk	32.3	0	-40.11	55.43	-	-	74	-18.57	65	204	H
2	* 2.489951	63.28	Pk	32.3	0	-40.05	55.53	-	-	74	-18.47	65	204	H
3	* 2.4835	49.75	VA1T	32.3	0	-40.11	41.94	54	-12.06	-	-	65	204	H
4	* 2.483512	49.72	VA1T	32.3	0	-40.11	41.91	54	-12.09	-	-	65	204	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	62.85	Pk	32.3	0	-40.11	55.04	-	-	74	-18.96	8	127	V
2	* 2.486385	64.02	Pk	32.3	0	-40.09	56.23	-	-	74	-17.77	8	127	V
3	* 2.4835	50.08	VA1T	32.3	0	-40.11	42.27	54	-11.73	-	-	8	127	V
4	* 2.483512	50.07	VA1T	32.3	0	-40.11	42.26	54	-11.74	-	-	8	127	V

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

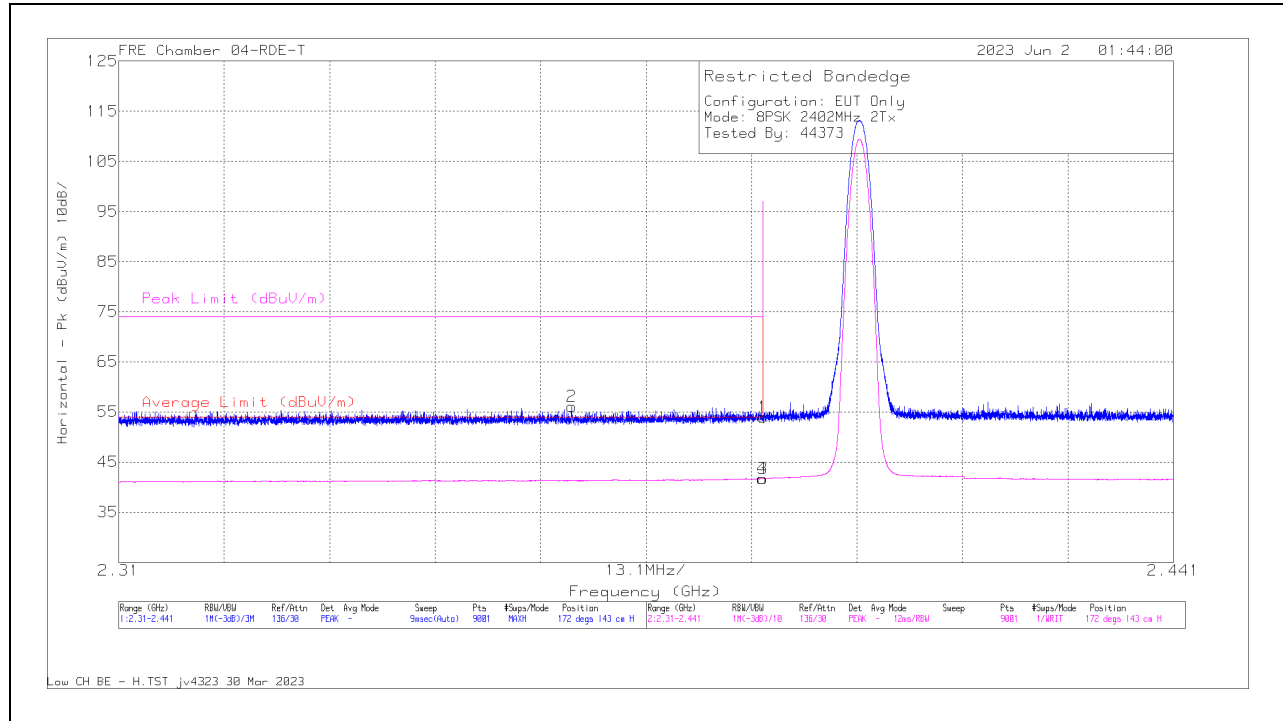
PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



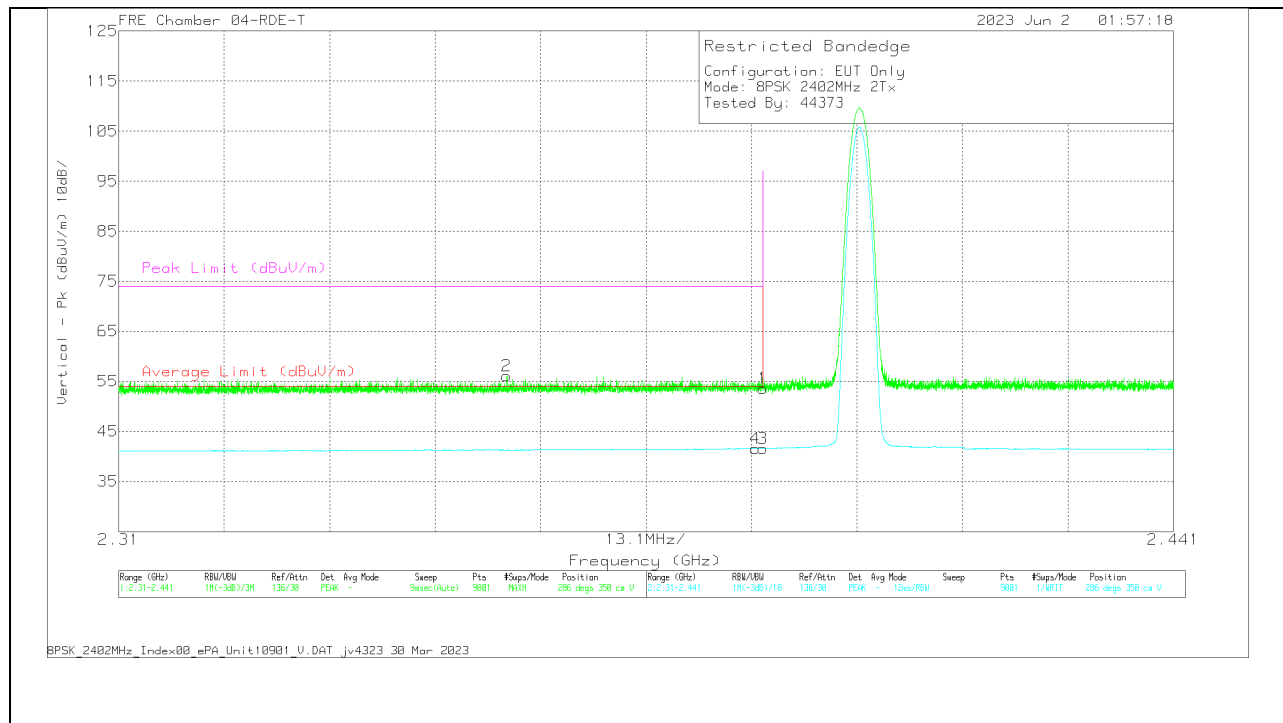
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarization
1	* 2.39	59.75	Pk	32.1	-37.89	53.96	-	-	74	-20.04	172	143	H
2	* 2.366259	62.01	Pk	32	-37.91	56.1	-	-	74	-17.9	172	143	H
3	* 2.39	47.48	VA1T	32.1	-37.89	41.69	54	-12.31	-	-	172	143	H
4	* 2.389927	47.5	VA1T	32.1	-37.89	41.71	54	-12.29	-	-	172	143	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

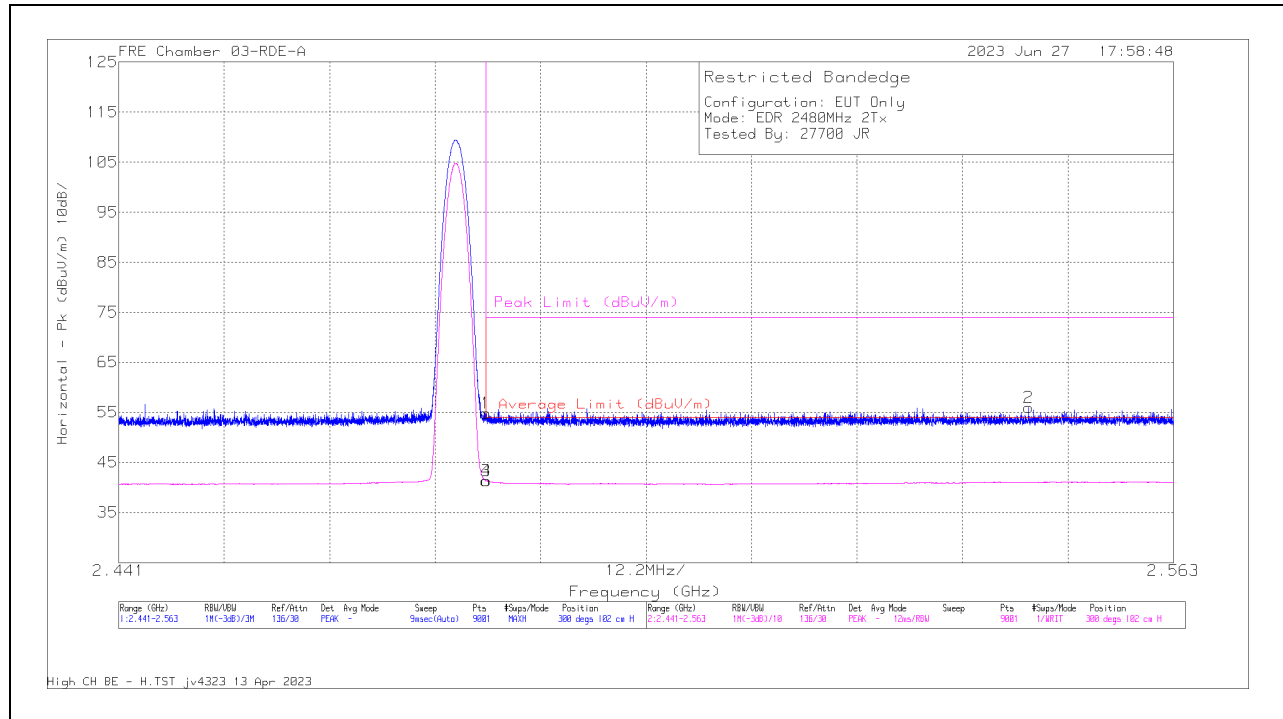


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.43	Pk	32.1	-37.89	53.64	-	-	74	-20.36	286	350	V
2	* 2.358209	61.98	Pk	32	-37.91	56.07	-	-	74	-17.93	286	350	V
3	* 2.39	47.4	VA1T	32.1	-37.89	41.61	54	-12.39	-	-	286	350	V
4	* 2.389054	47.42	VA1T	32.1	-37.88	41.64	54	-12.36	-	-	286	350	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

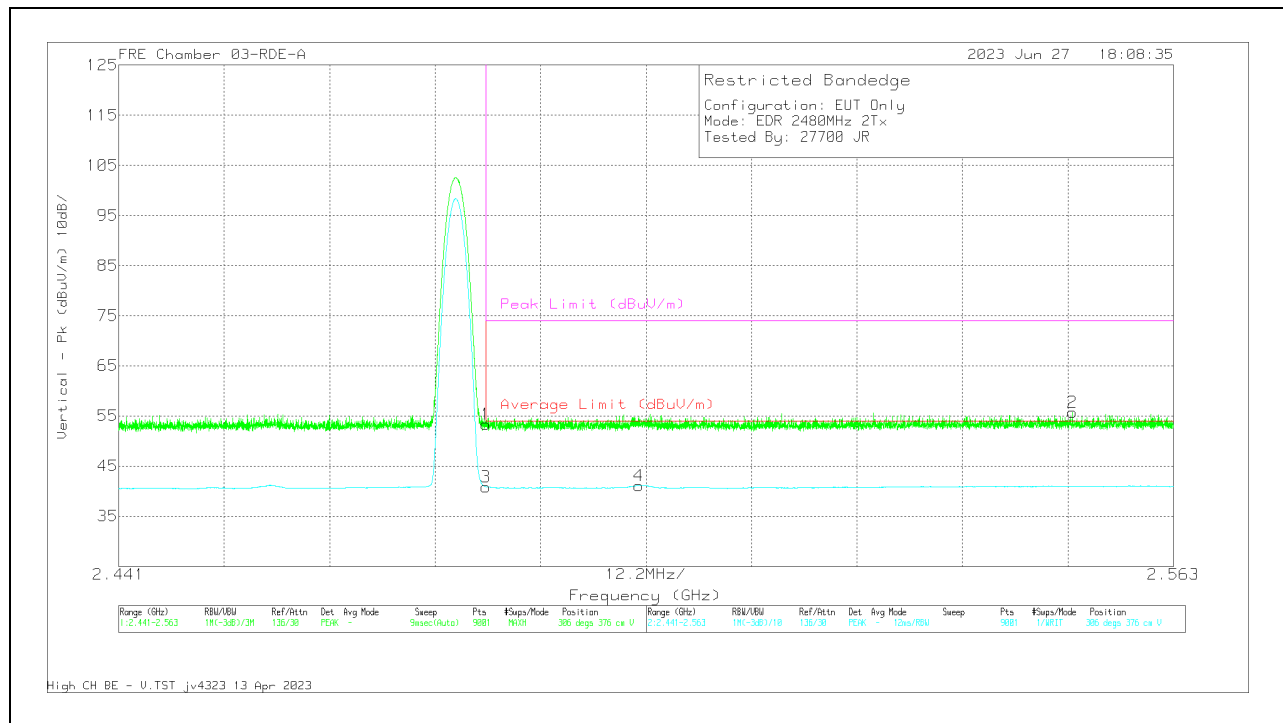
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	62.62	Pk	32.3	0	-40.11	54.81	-	-	74	-19.19	300	102	H
3	* 2.4835	49.15	VA1T	32.3	0	-40.11	41.34	54	-12.66	-	-	300	102	H
4	* 2.483512	49.14	VA1T	32.3	0	-40.11	41.33	54	-12.67	-	-	300	102	H
2	2.546235	63.41	Pk	32.5	0	-39.98	55.93	-	-	74	-18.07	300	102	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.18	Pk	32.3	0	-40.11	53.37	-	-	74	-20.63	306	376	V
3	* 2.4835	48.67	VA1T	32.3	0	-40.11	40.86	54	-13.14	-	-	306	376	V
4	2.501162	48.8	VA1T	32.4	0	-40.06	41.14	54	-12.86	-	-	306	376	V
2	2.551346	63.2	Pk	32.5	0	-39.94	55.76	-	-	74	-18.24	306	376	V

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

PK - Peak detector

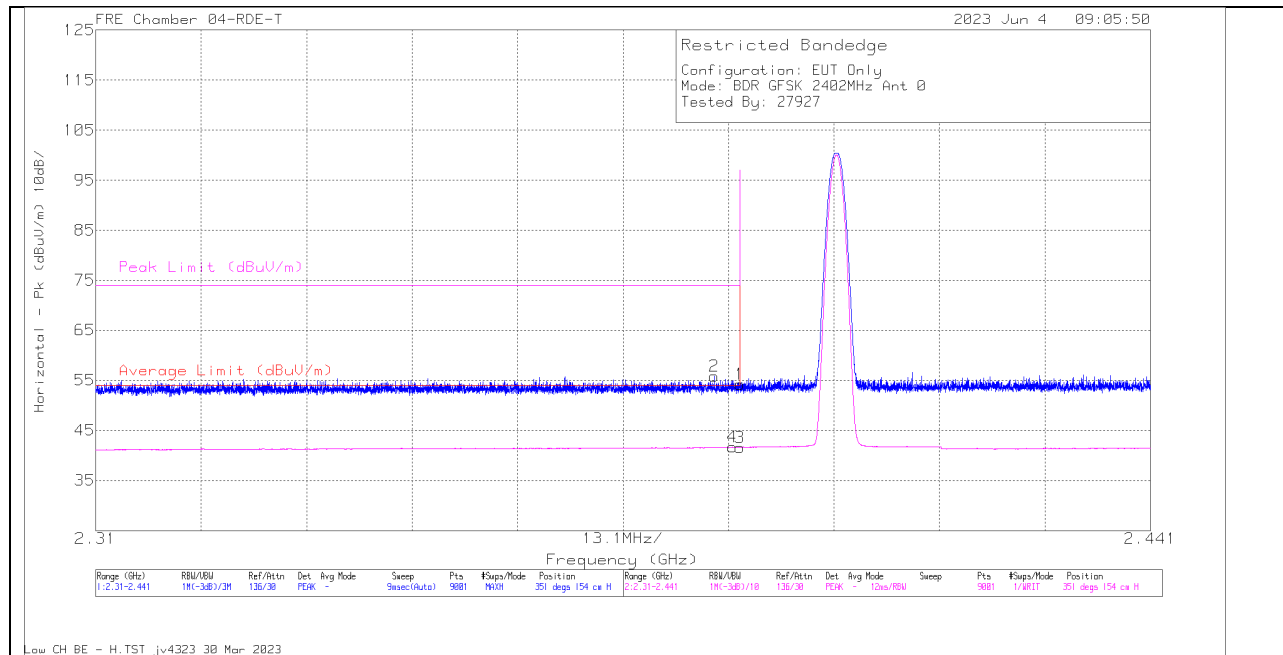
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.5. LOW POWER BASIC DATA RATE GFSK MODULATION

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



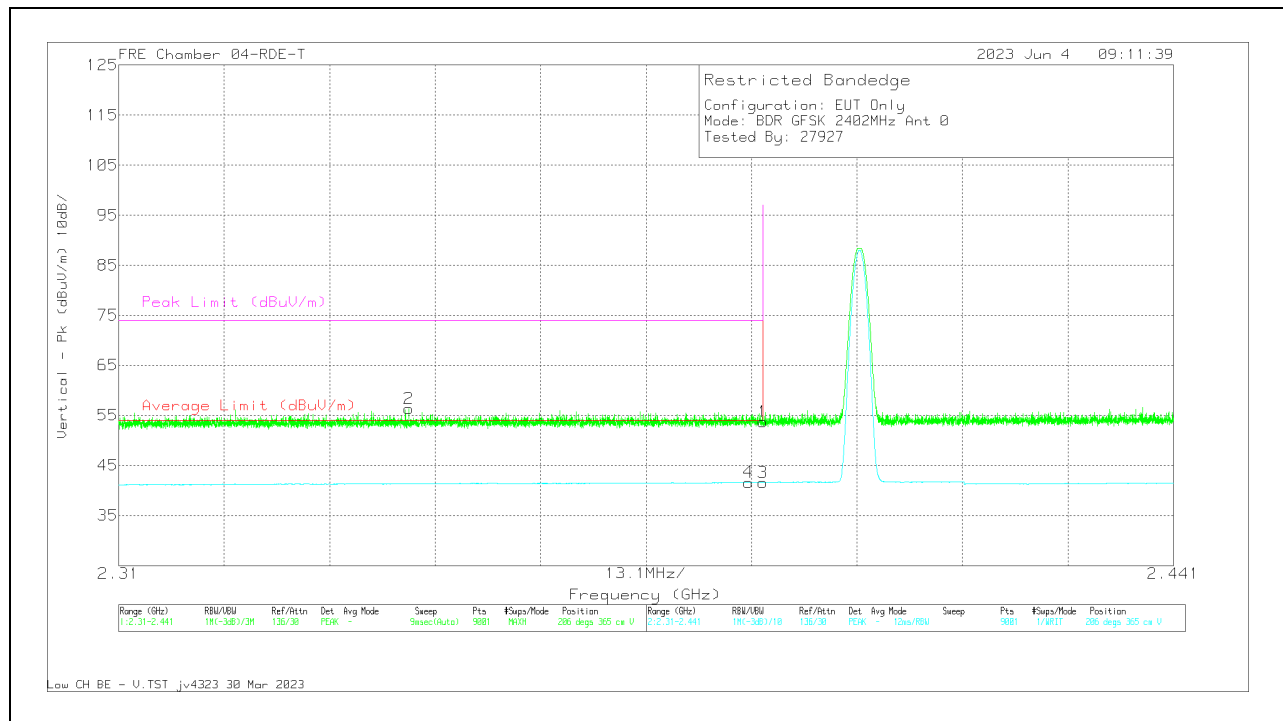
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60.05	Pk	32.1	-37.89	54.26	-	-	74	-19.74	351	154	H
2	* 2.386797	61.61	Pk	32.1	-37.86	55.85	-	-	74	-18.15	351	154	H
3	* 2.39	47.41	VA1T	32.1	-37.89	41.62	54	-12.38	-	-	351	154	H
4	* 2.389054	47.44	VA1T	32.1	-37.88	41.66	54	-12.34	-	-	351	154	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

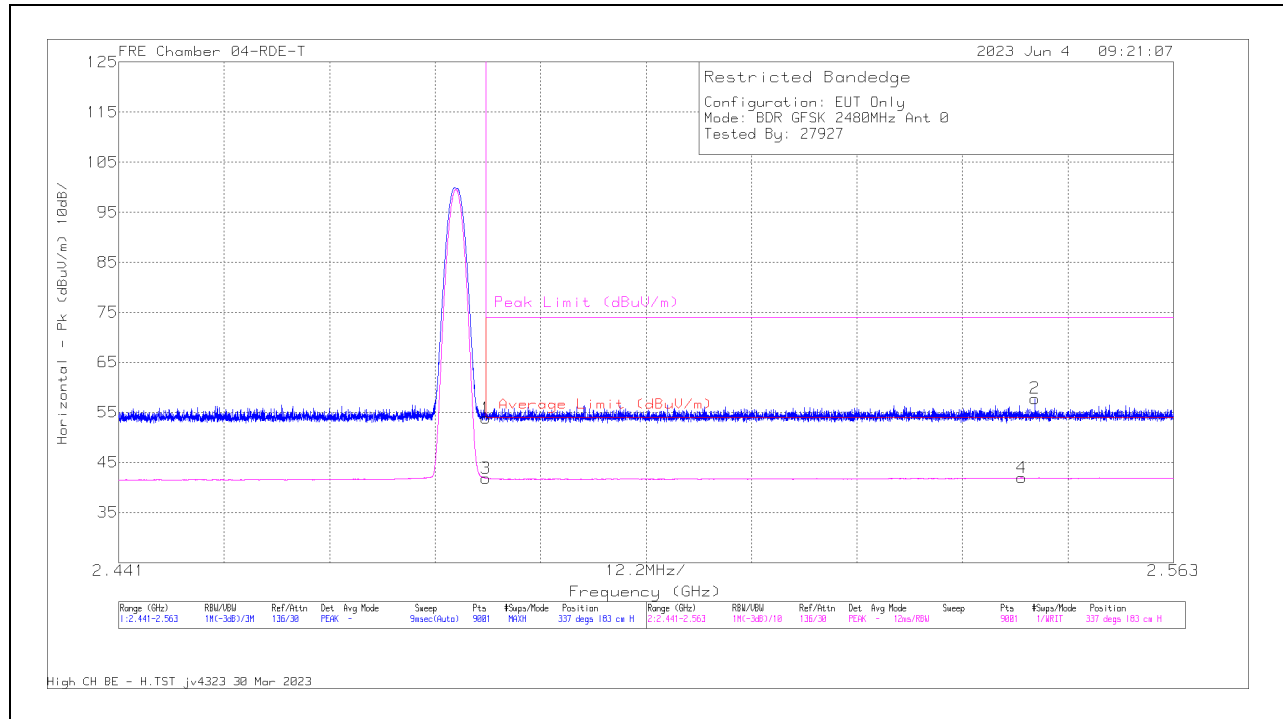


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.51	Pk	32.1	-37.89	53.72	-	-	74	-20.28	206	365	V
2	* 2.346055	62.37	Pk	31.9	-37.88	56.39	-	-	74	-17.61	206	365	V
3	* 2.39	47.35	VA1T	32.1	-37.89	41.56	54	-12.44	-	-	206	365	V
4	* 2.388253	47.42	VA1T	32.1	-37.87	41.65	54	-12.35	-	-	206	365	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

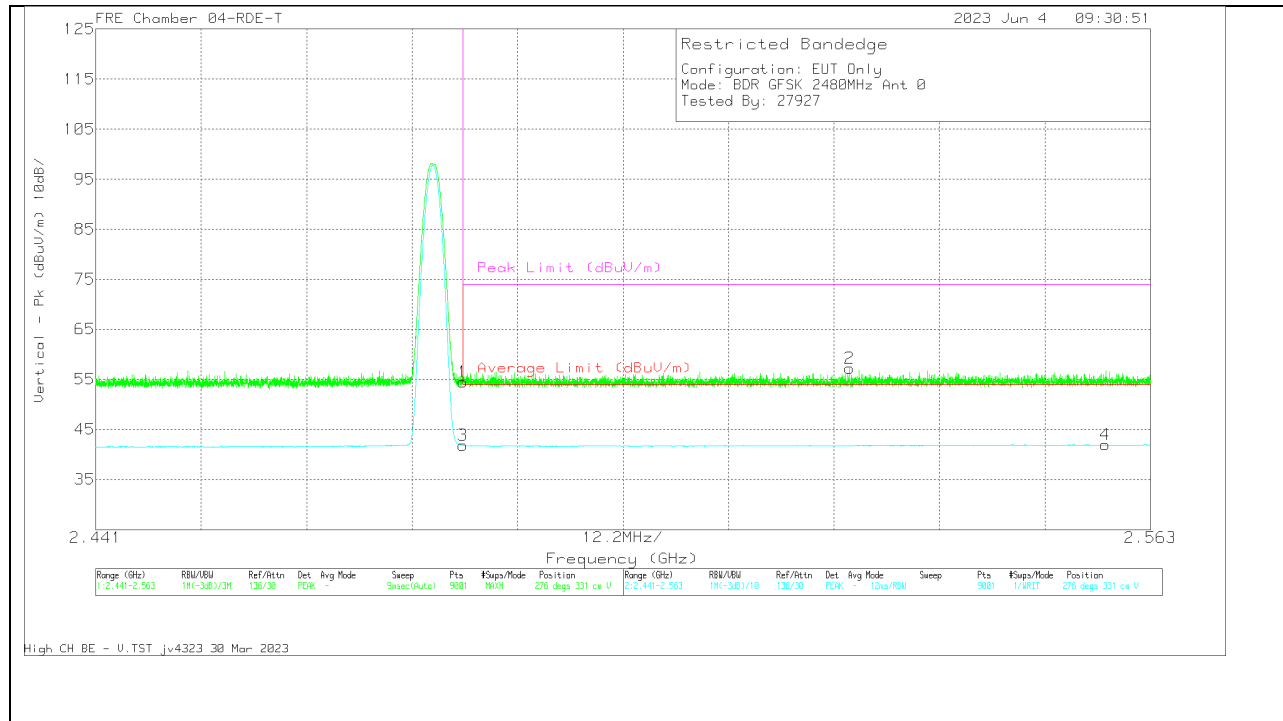
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.51	Pk	32.2	-37.81	53.9	-	-	74	-20.1	337	183	H
3	* 2.4835	47.48	VA1T	32.2	-37.81	41.87	54	-12.13	-	-	337	183	H
4	2.545422	47.36	VA1T	32.3	-37.74	41.92	54	-12.08	-	-	337	183	H
2	2.546981	63.22	Pk	32.3	-37.73	57.79	-	-	74	-16.21	337	183	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

VERTICAL RESULT

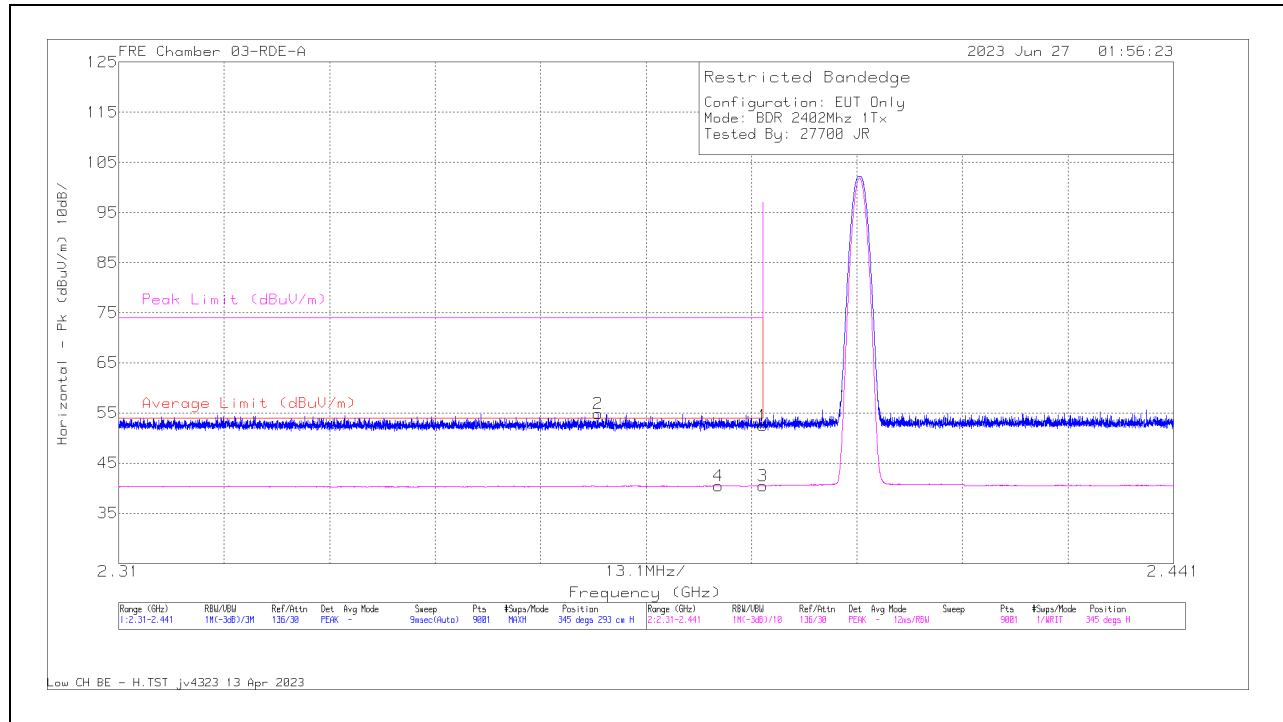


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.09	Pk	32.2	-37.81	54.48	-	-	74	-19.52	276	331	V
3	* 2.4835	47.45	VA1T	32.2	-37.81	41.84	54	-12.16	-	-	276	331	V
2	2.528219	62.69	Pk	32.3	-37.77	57.22	-	-	74	-16.78	276	331	V
4	2.557785	47.52	VA1T	32.2	-37.79	41.93	54	-12.07	-	-	276	331	V

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT 3**BANDEDGE (LOW CHANNEL)****HORIZONTAL RESULT**

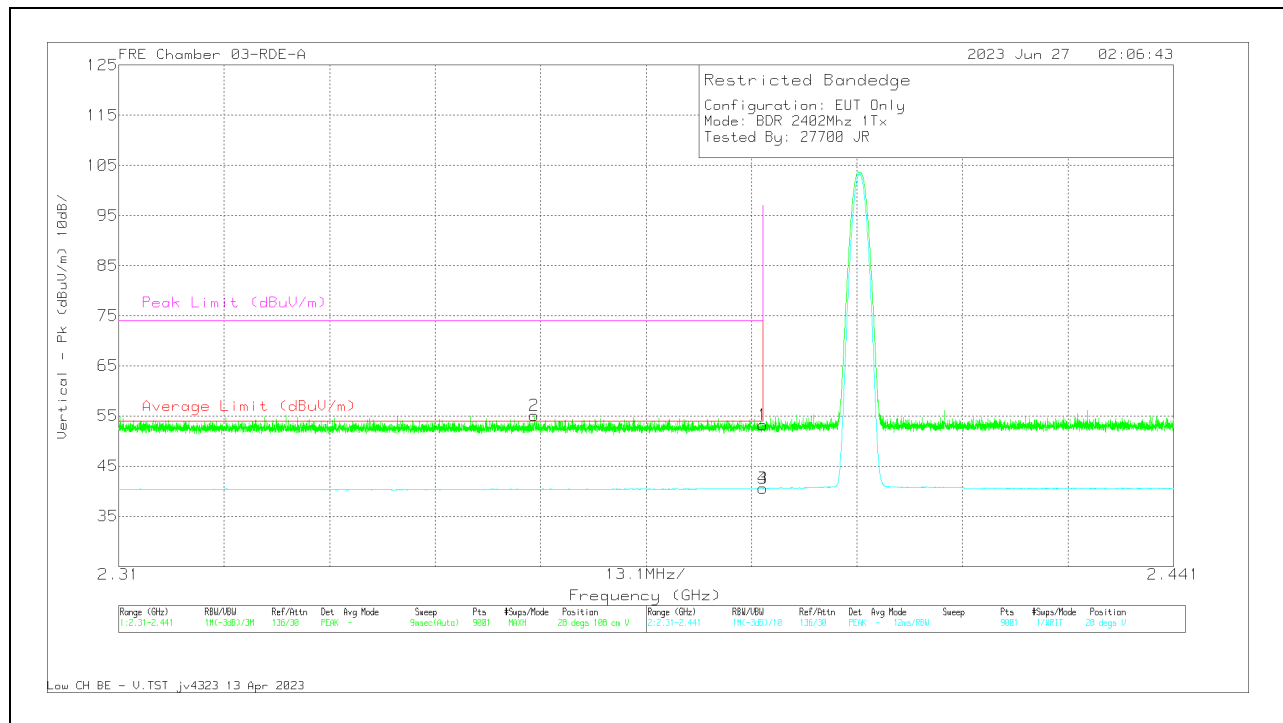
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60.72	PK	32.2	-40.42	52.5	-	-	74	-21.5	345	293	H
2	* 2.369519	63.15	PK	32.1	-40.43	54.82	-	-	74	-19.18	345	293	H
3	* 2.39	48.68	VA1T	32.2	-40.42	40.46	54	-13.54	-	-	345	293	H
4	* 2.384454	48.79	VA1T	32.1	-40.38	40.51	54	-13.49	-	-	345	293	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

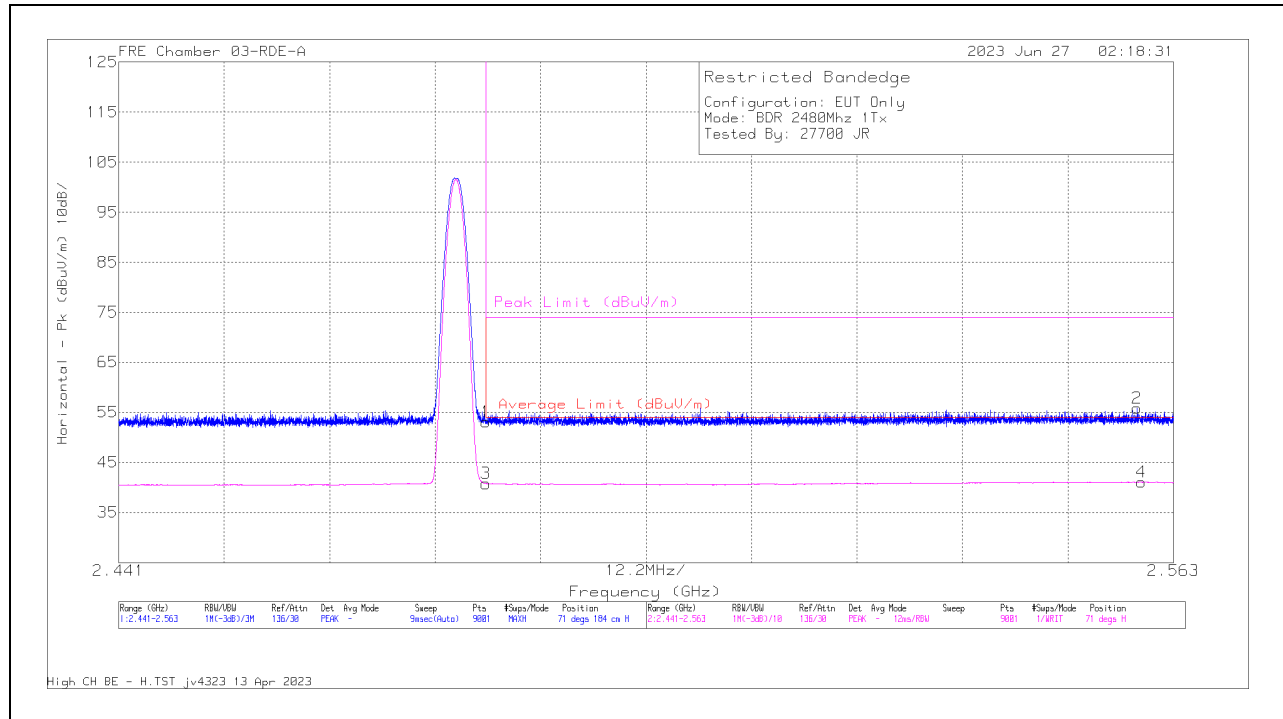


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.41	Pk	32.2	-40.42	53.19	-	-	74	-20.81	28	108	V
2	* 2.36163	63.46	Pk	32.1	-40.46	55.1	-	-	74	-18.9	28	108	V
3	* 2.39	48.75	VA1T	32.2	-40.42	40.53	54	-13.47	-	-	28	108	V
4	* 2.39	48.75	VA1T	32.2	-40.42	40.53	54	-13.47	-	-	28	108	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

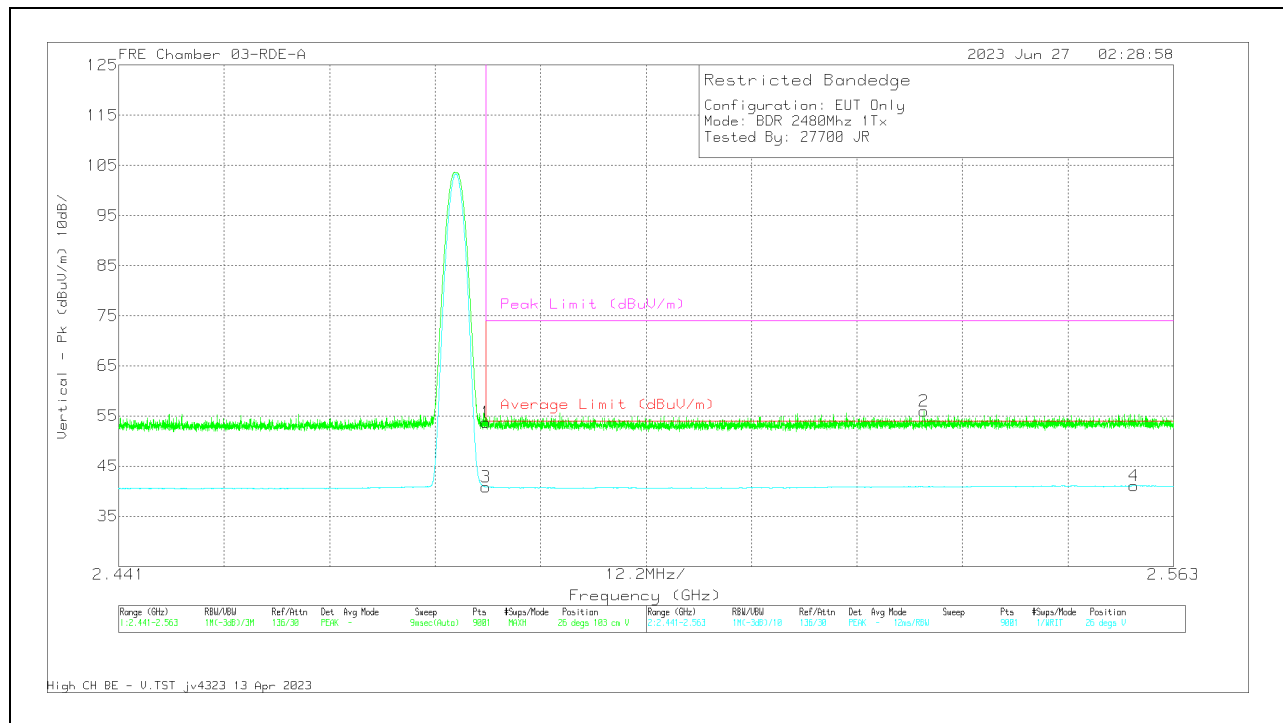
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.94	Pk	32.3	0	-40.11	53.13	-	-	74	-20.87	71	184	H
3	* 2.4835	48.59	VA1T	32.3	0	-40.11	40.78	54	-13.22	-	-	71	184	H
2	2.558802	63.28	Pk	32.5	0	-39.89	55.89	-	-	74	-18.11	71	184	H
4	2.55929	48.47	VA1T	32.5	0	-39.9	41.07	54	-12.93	-	-	71	184	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.48	Pk	32.3	0	-40.11	53.67	-	-	74	-20.33	26	103	V
3	* 2.4835	48.64	VA1T	32.3	0	-40.11	40.83	54	-13.17	-	-	26	103	V
2	2.53417	63.43	Pk	32.5	0	-39.98	55.95	-	-	74	-18.05	26	103	V
4	2.558436	48.51	VA1T	32.5	0	-39.9	41.11	54	-12.89	-	-	26	103	V

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

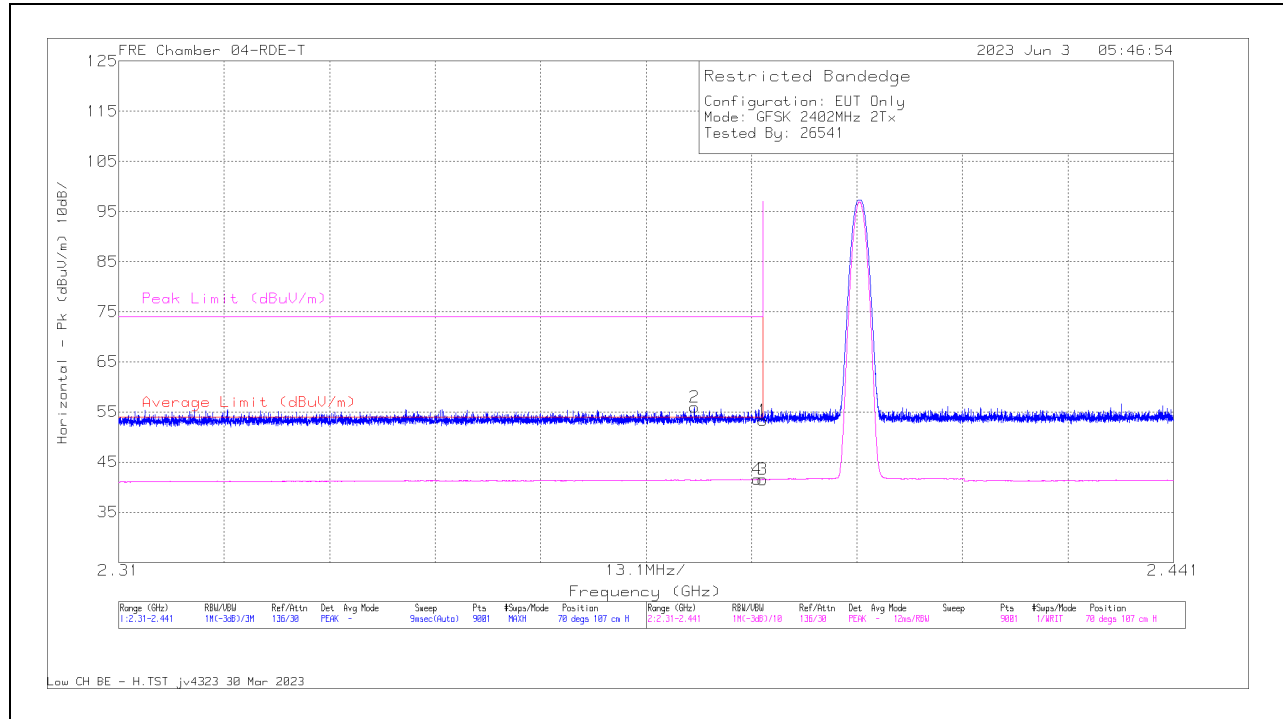
PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.6. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



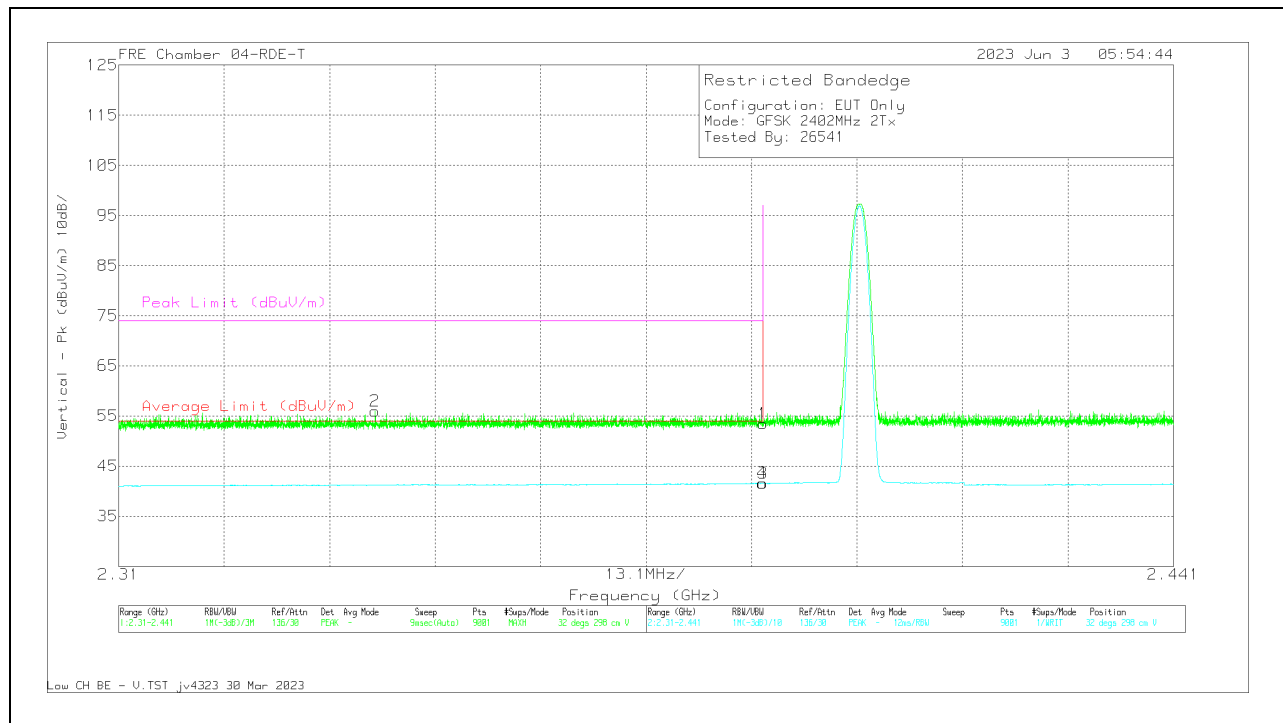
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.15	Pk	32.1	-37.89	53.36	-	-	74	-20.64	70	107	H
2	* 2.381499	61.71	Pk	32.1	-37.88	55.93	-	-	74	-18.07	70	107	H
3	* 2.39	47.32	VA1T	32.1	-37.89	41.53	54	-12.47	-	-	70	107	H
4	* 2.389316	47.33	VA1T	32.1	-37.88	41.55	54	-12.45	-	-	70	107	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

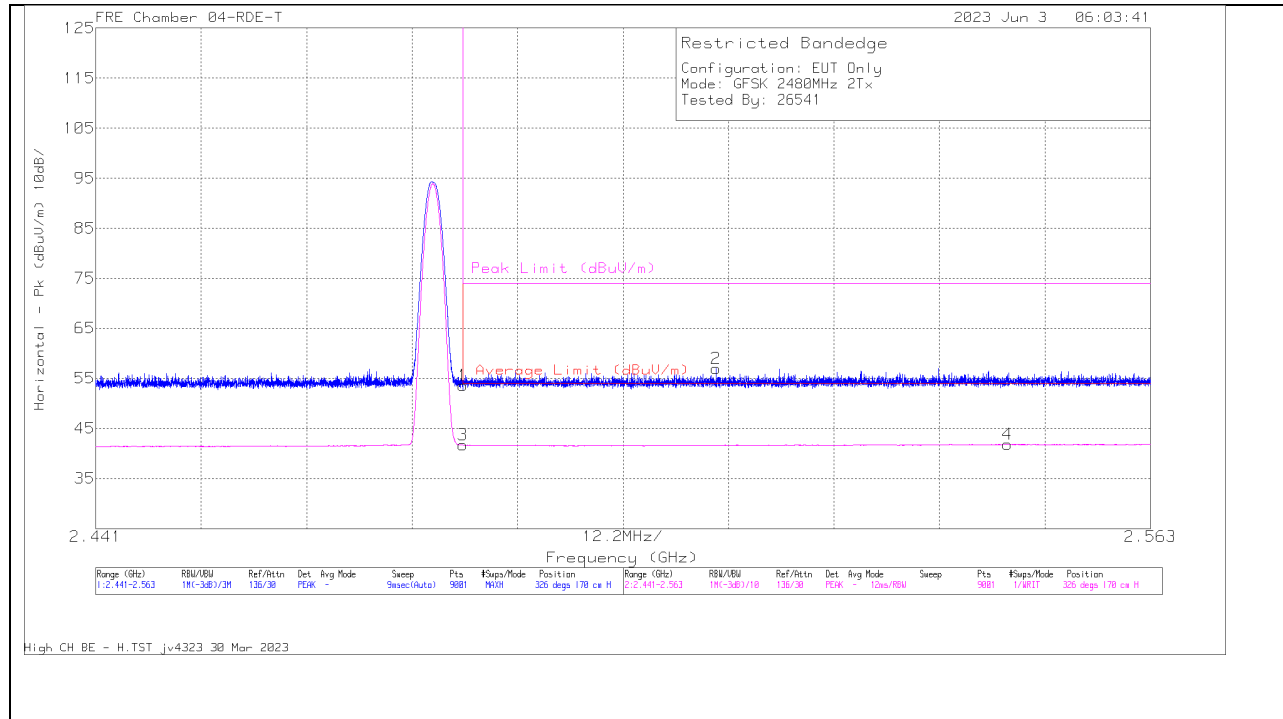


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.21	Pk	32.1	-37.89	53.42	-	-	74	-20.58	32	298	V
2	* 2.341863	61.95	Pk	31.9	-37.9	55.95	-	-	74	-18.05	32	298	V
3	* 2.39	47.34	VA1T	32.1	-37.89	41.55	54	-12.45	-	-	32	298	V
4	* 2.389898	47.35	VA1T	32.1	-37.89	41.56	54	-12.44	-	-	32	298	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

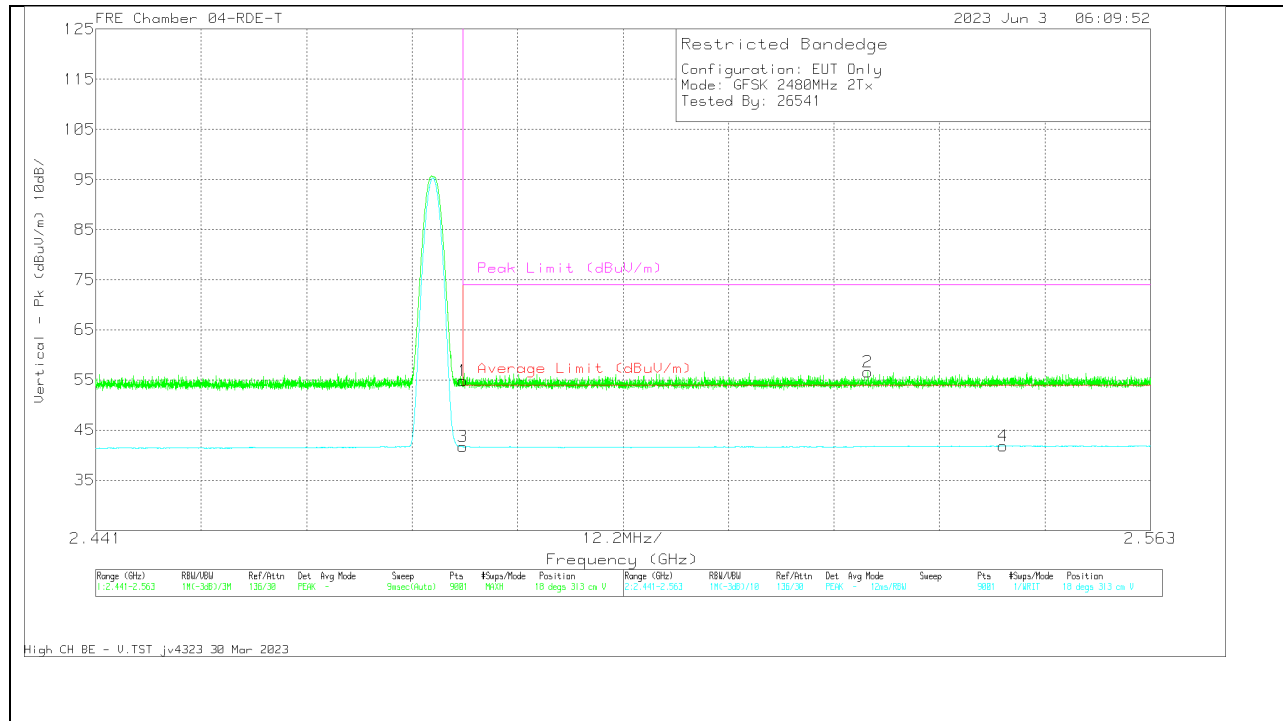
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.23	Pk	32.2	-37.81	53.62	-	-	74	-20.38	326	170	H
3	* 2.4835	47.27	VA1T	32.2	-37.81	41.66	54	-12.34	-	-	326	170	H
2	2.512752	62.54	Pk	32.3	-37.81	57.03	-	-	74	-16.97	326	170	H
4	2.546466	47.31	VA1T	32.3	-37.73	41.88	54	-12.12	-	-	326	170	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.5	Pk	32.2	-37.81	54.89	-	-	74	-19.11	18	313	V
3	* 2.4835	47.28	VA1T	32.2	-37.81	41.67	54	-12.33	-	-	18	313	V
2	2.53032	62.05	Pk	32.3	-37.71	56.64	-	-	74	-17.36	18	313	V
4	2.545991	47.29	VA1T	32.3	-37.73	41.86	54	-12.14	-	-	18	313	V

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

PK - Peak detector

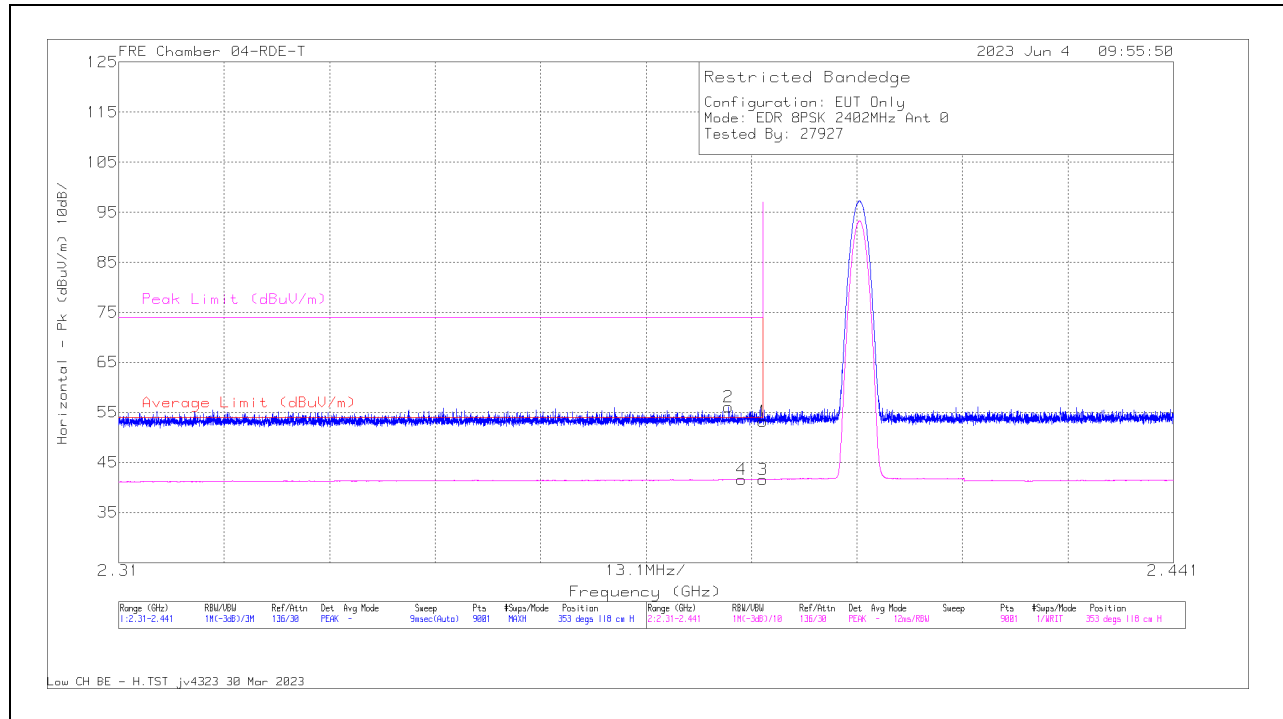
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.7. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



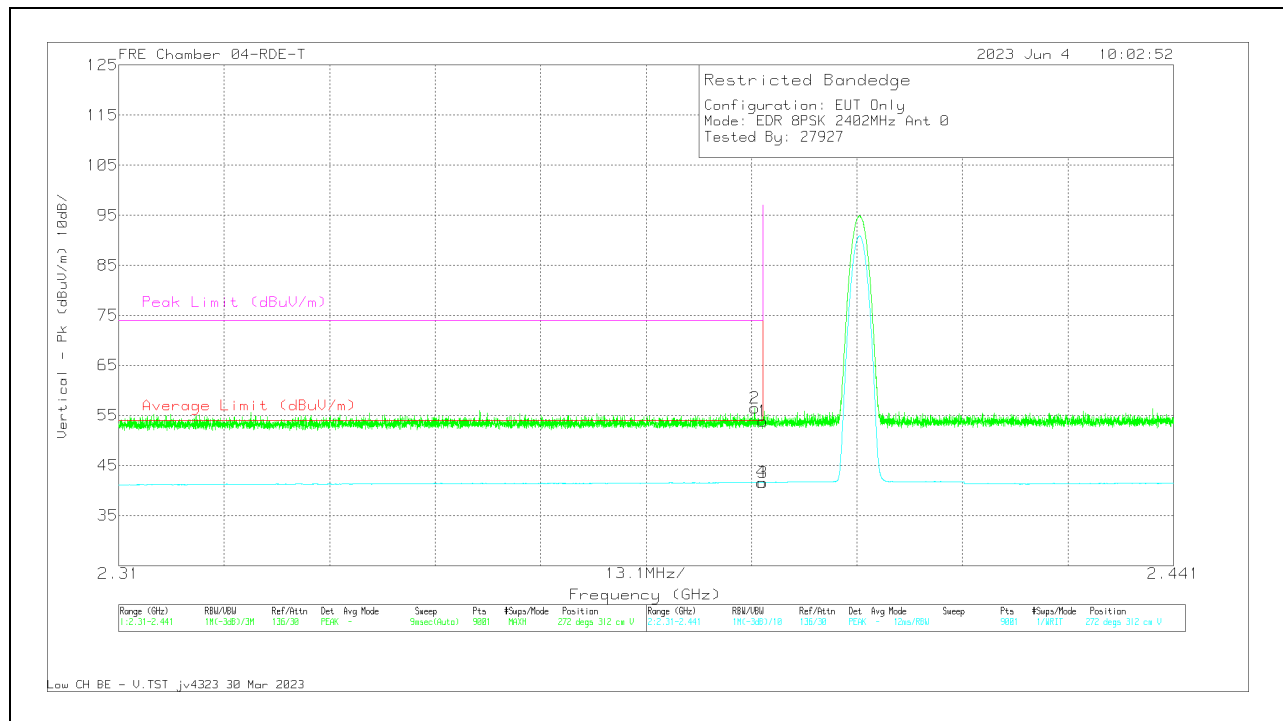
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	58.99	Pk	32.1	-37.89	53.2	-	-	74	-20.8	353	118	H
2	* 2.385706	61.85	Pk	32.1	-37.86	56.09	-	-	74	-17.91	353	118	H
3	* 2.39	47.38	VA1T	32.1	-37.89	41.59	54	-12.41	-	-	353	118	H
4	* 2.387351	47.4	VA1T	32.1	-37.86	41.64	54	-12.36	-	-	353	118	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

VERTICAL RESULT

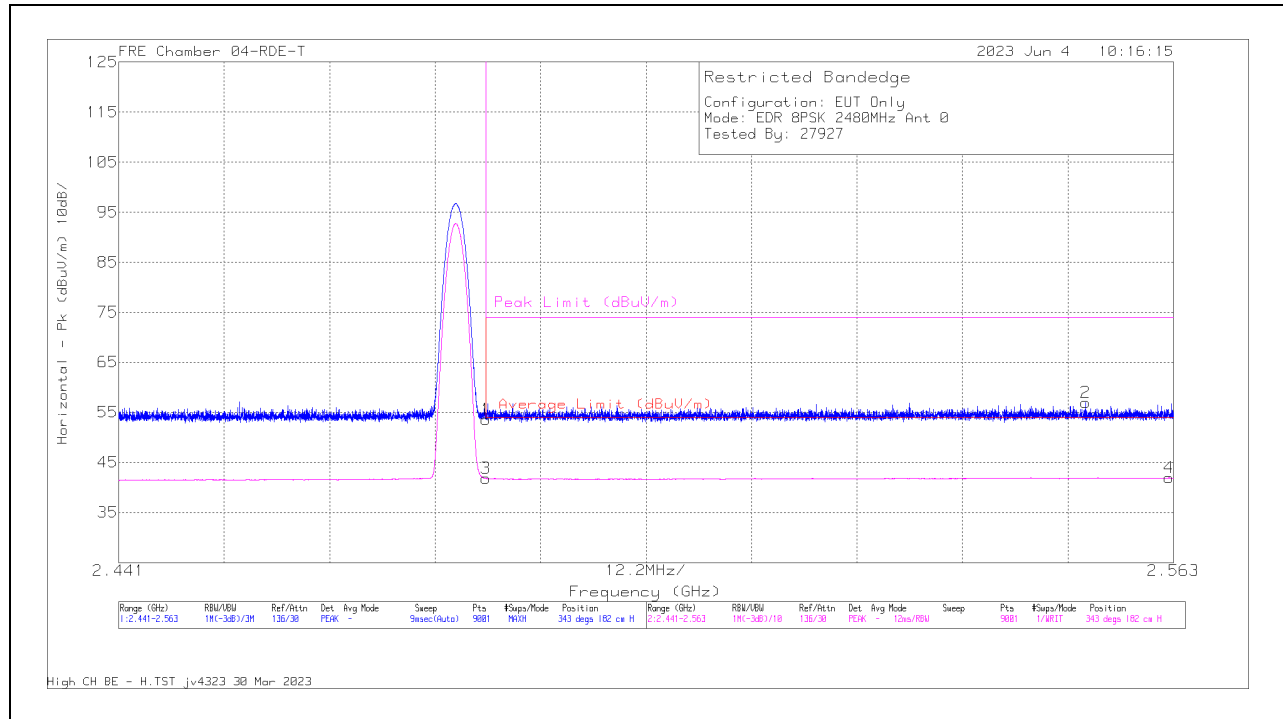


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.6	Pk	32.1	-37.89	53.81	-	-	74	-20.19	272	312	V
2	* 2.388966	62.3	Pk	32.1	-37.88	56.52	-	-	74	-17.48	272	312	V
3	* 2.39	47.42	VA1T	32.1	-37.89	41.63	54	-12.37	-	-	272	312	V
4	* 2.389883	47.44	VA1T	32.1	-37.89	41.65	54	-12.35	-	-	272	312	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

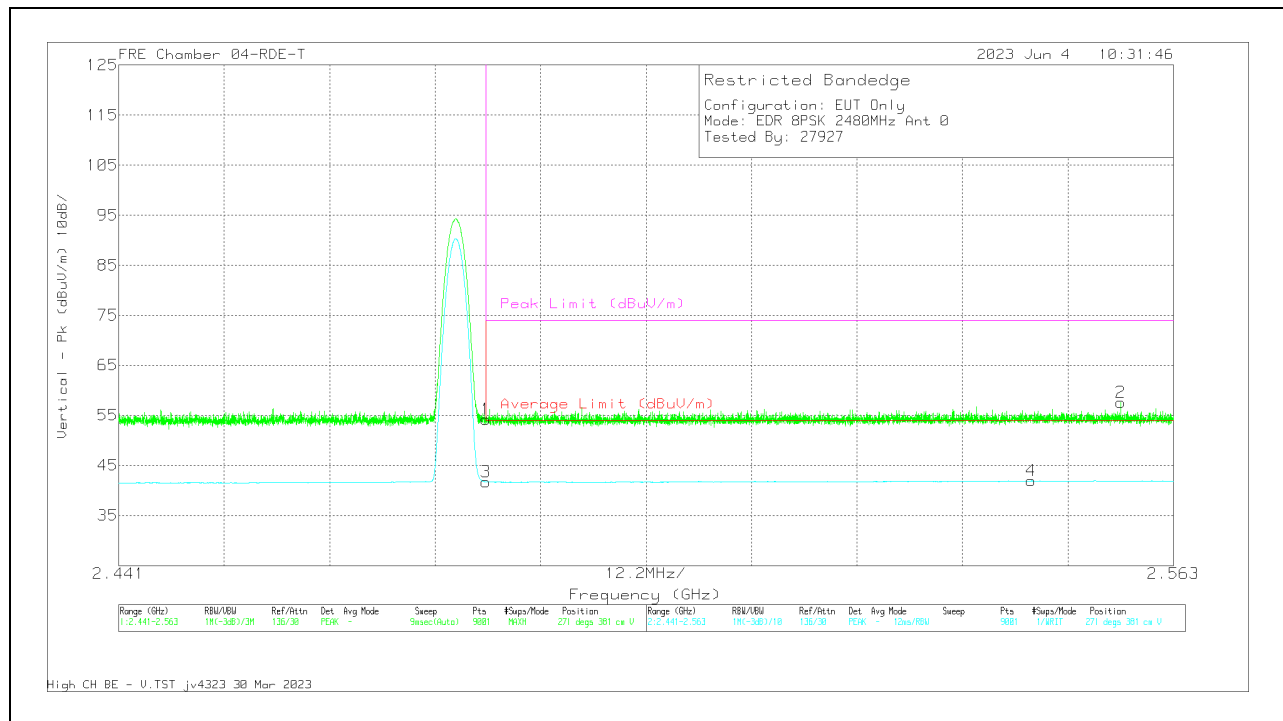
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.21	Pk	32.2	-37.81	53.6	-	-	74	-20.4	343	182	H
3	* 2.4835	47.41	VA1T	32.2	-37.81	41.8	54	-12.2	-	-	343	182	H
2	2.552851	62.4	Pk	32.3	-37.78	56.92	-	-	74	-17.08	343	182	H
4	2.562462	47.48	VA1T	32.2	-37.76	41.92	54	-12.08	-	-	343	182	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

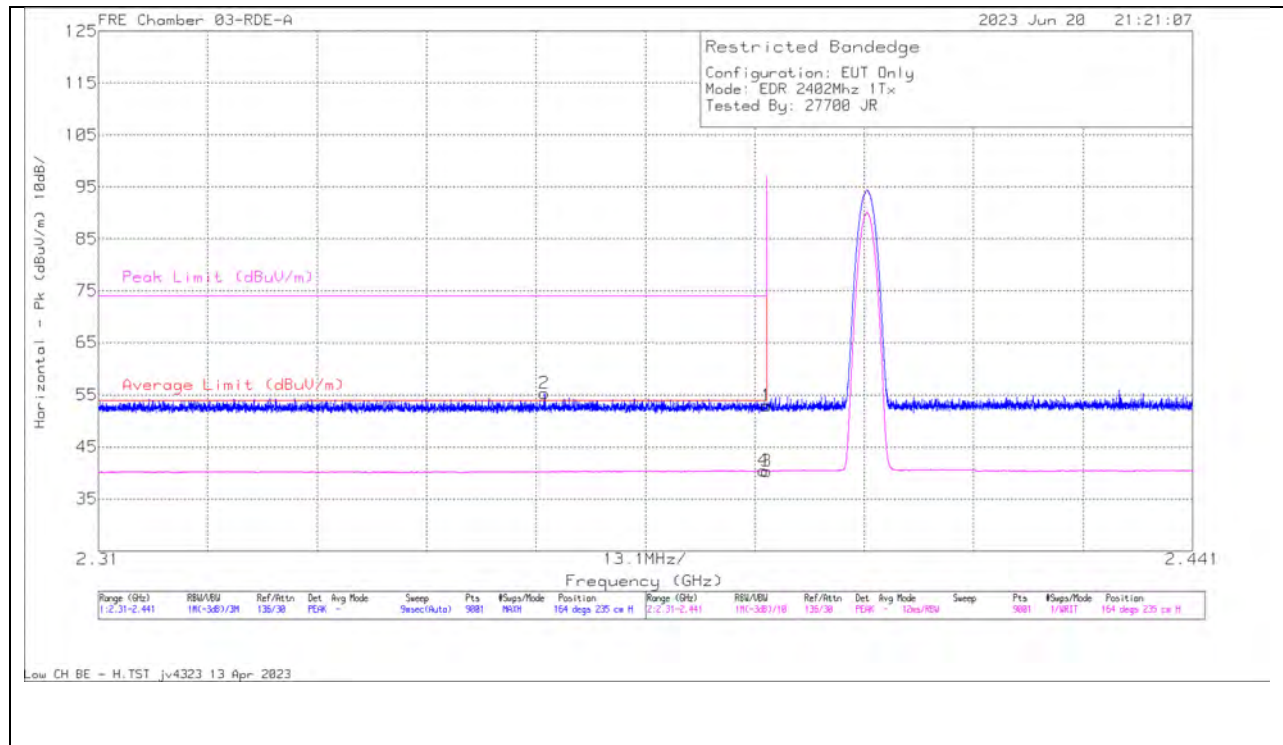


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.87	Pk	32.2	-37.81	54.26	-	-	74	-19.74	271	381	V
3	* 2.4835	47.36	VA1T	32.2	-37.81	41.75	54	-12.25	-	-	271	381	V
4	2.546574	47.35	VA1T	32.3	-37.73	41.92	54	-12.08	-	-	271	381	V
2	2.55689	63.07	Pk	32.3	-37.77	57.6	-	-	74	-16.4	271	381	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT 3**BANDEDGE (LOW CHANNEL)****HORIZONTAL RESULT**

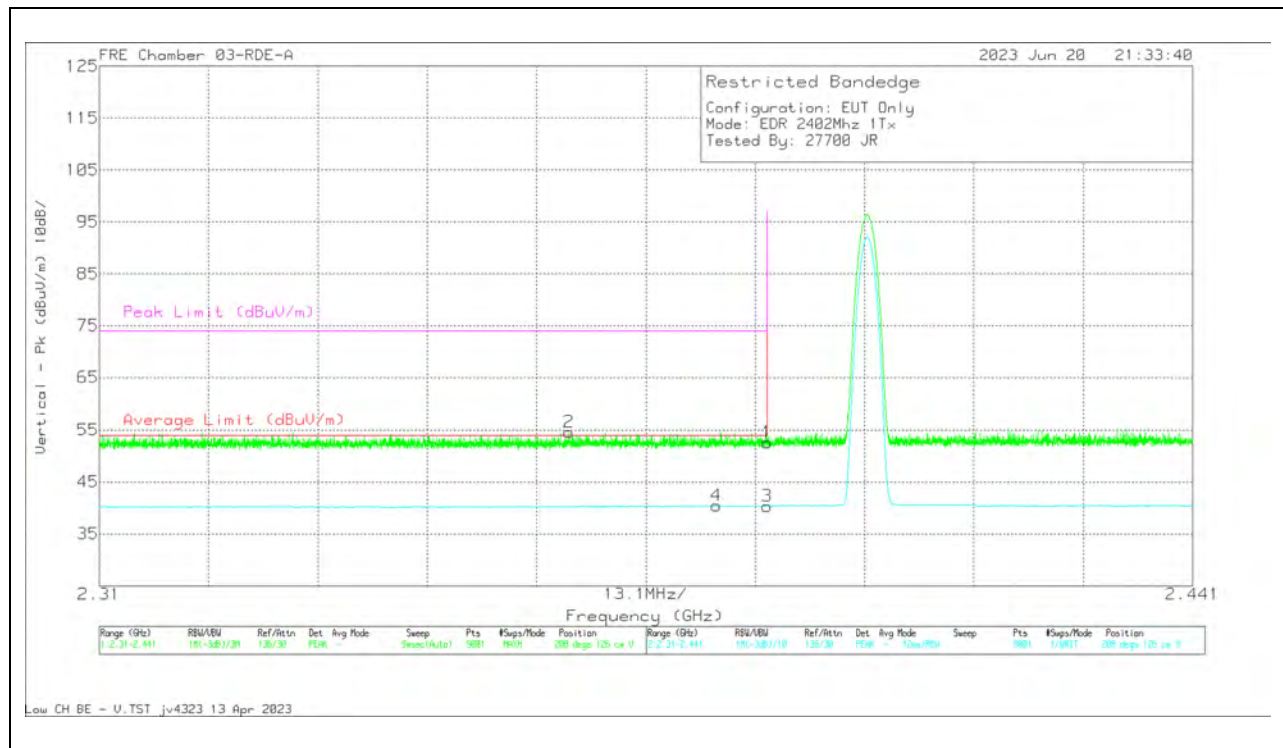
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	61.19	Pk	32.2	0	-40.42	52.97	-	-	74	-21.03	164	235	H
2	* 2.363421	63.68	Pk	32.1	0	-40.46	55.32	-	-	74	-18.68	164	235	H
3	* 2.39	48.61	VA1T	32.2	0	-40.42	40.39	54	-13.61	-	-	164	235	H
4	* 2.389607	48.65	VA1T	32.2	0	-40.42	40.43	54	-13.57	-	-	164	235	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

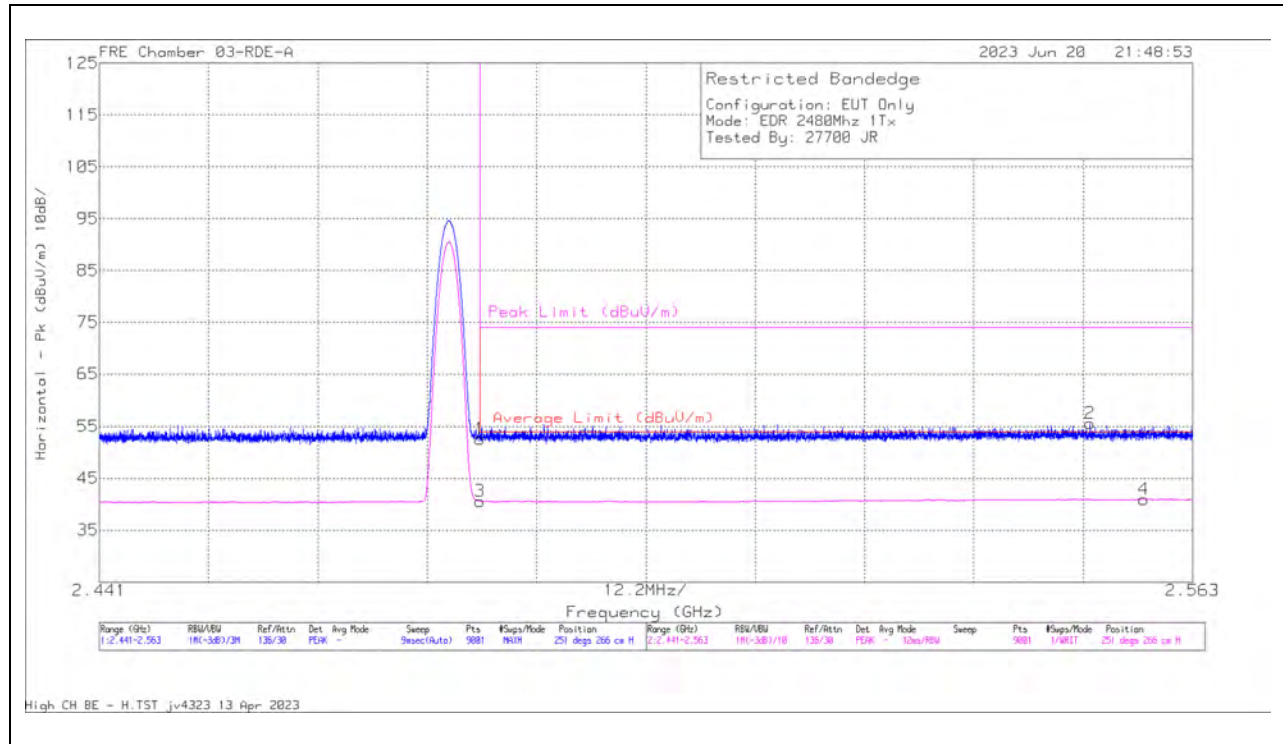


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dBm)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	60.77	Pk	32.2	0	-40.42	52.55	-	-	74	-21.45	208	126	V
2	* 2.366303	62.86	Pk	32.1	0	-40.41	54.55	-	-	74	-19.45	208	126	V
3	* 2.39	48.6	VA1T	32.2	0	-40.42	40.38	54	-13.62	-	-	208	126	V
4	* 2.383915	48.72	VA1T	32.1	0	-40.38	40.44	54	-13.56	-	-	208	126	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

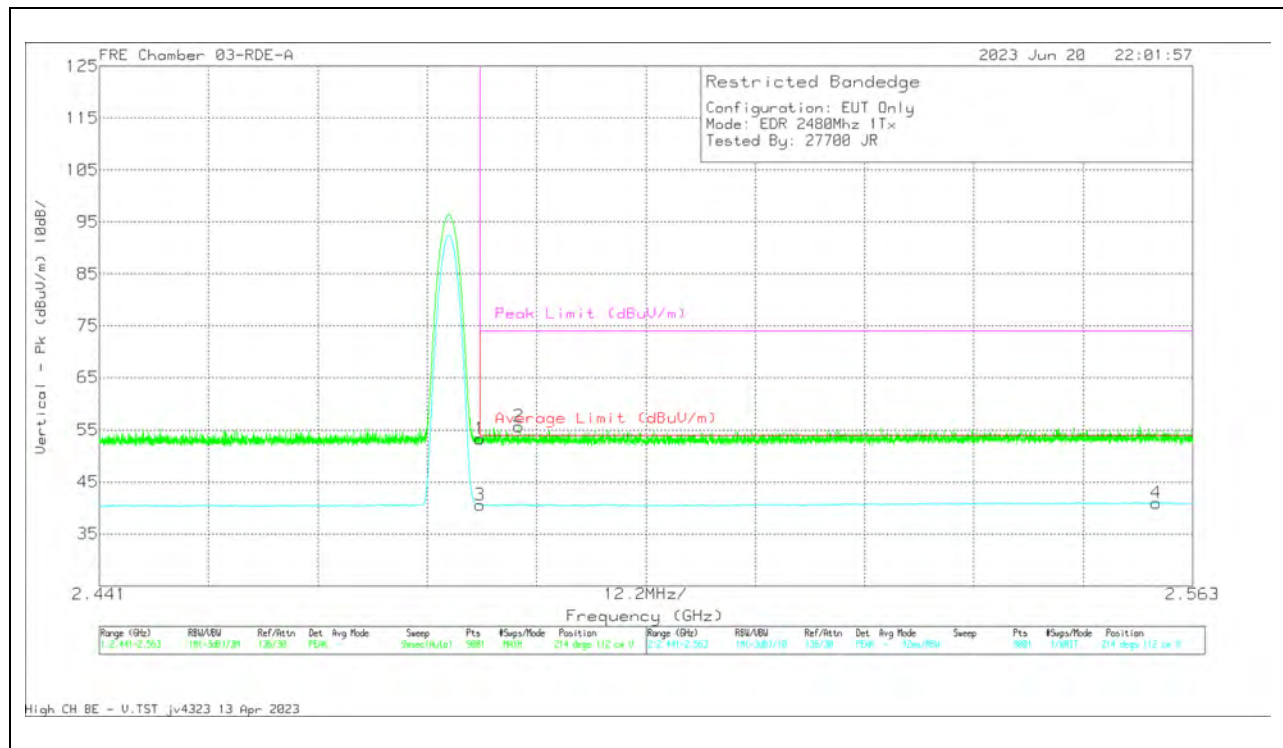
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.45	Pk	32.3	0	-40.11	52.64	-	-	74	-21.36	251	266	H
3	* 2.4835	48.38	VA1T	32.3	0	-40.11	40.57	54	-13.43	-	-	251	266	H
2	2.551563	63	Pk	32.5	0	-39.95	55.55	-	-	74	-18.45	251	266	H
4	2.557527	48.41	VA1T	32.5	0	-39.92	40.99	54	-13.01	-	-	251	266	H

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

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	230299 ACF (dB/m)	DCCF (dB)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	61.12	Pk	32.3	0	-40.11	53.31	-	-	74	-20.69	214	112	V
2	* 2.487822	63.51	Pk	32.3	0	-40.06	55.75	-	-	74	-18.25	214	112	V
3	* 2.4835	48.4	VA1T	32.3	0	-40.11	40.59	54	-13.41	-	-	214	112	V
4	2.558951	48.39	VA1T	32.5	0	-39.89	41	54	-13	-	-	214	112	V

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

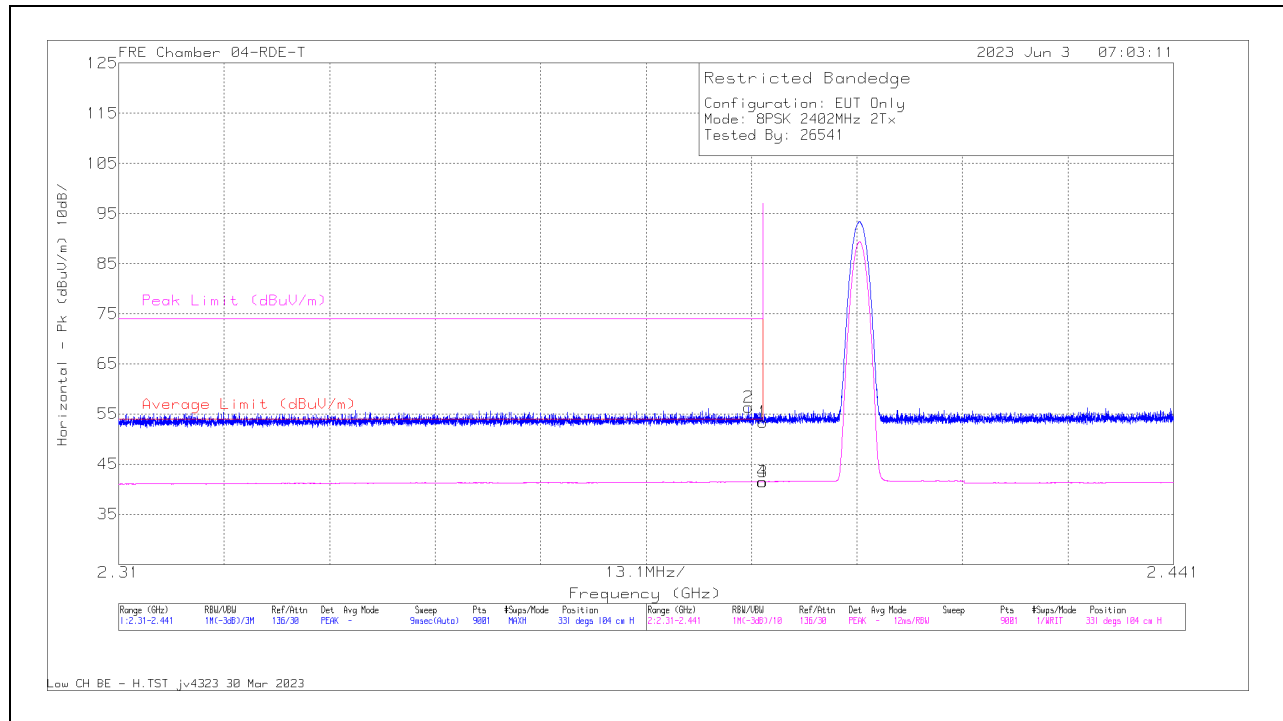
Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.8. LOW POWER BASIC DATA RATE TXBF 8PSK MODULATION

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



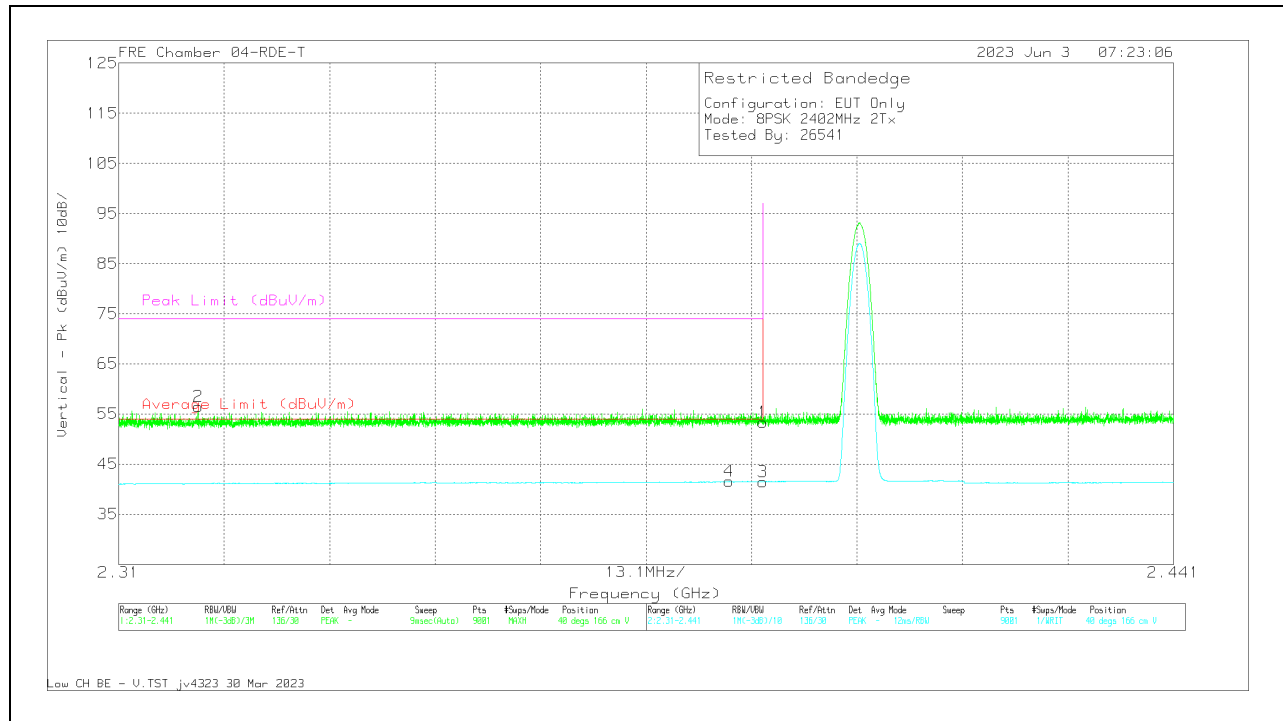
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.2	Pk	32.1	-37.89	53.41	-	-	74	-20.59	331	104	H
2	* 2.388224	62.11	Pk	32.1	-37.87	56.34	-	-	74	-17.66	331	104	H
3	* 2.39	47.29	VA1T	32.1	-37.89	41.5	54	-12.5	-	-	331	104	H
4	* 2.389956	47.31	VA1T	32.1	-37.89	41.52	54	-12.48	-	-	331	104	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

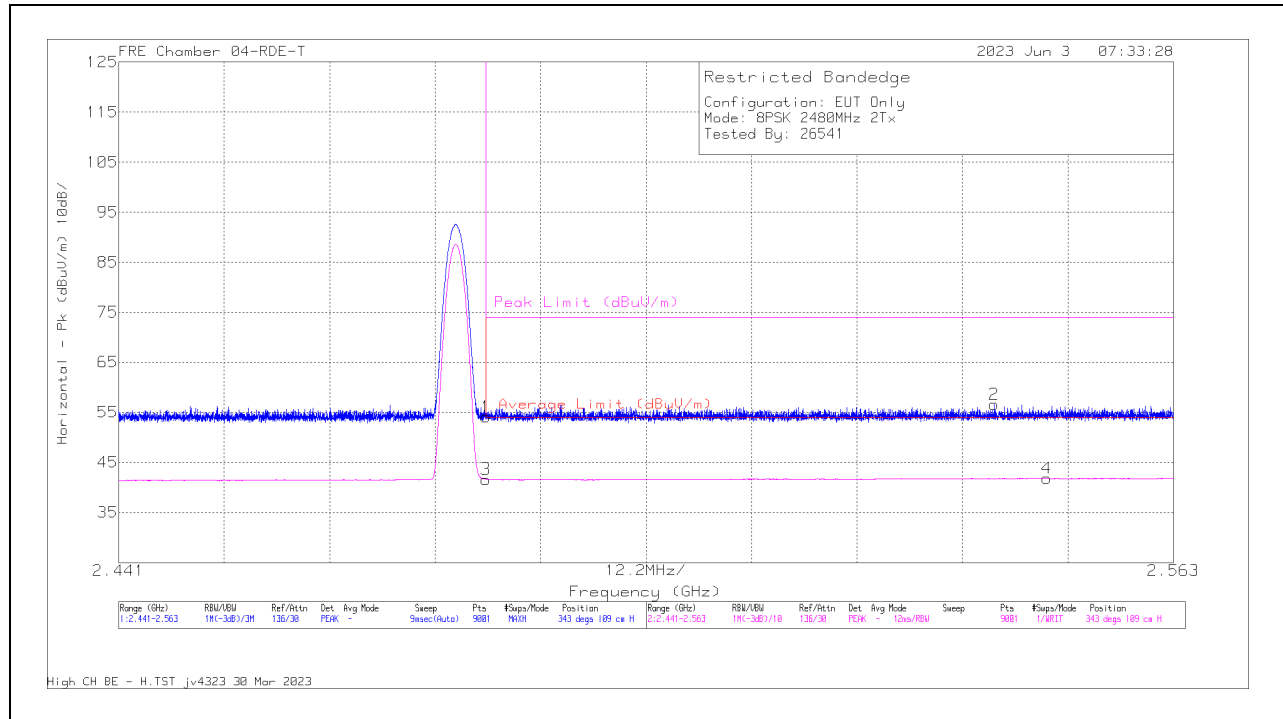


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB 3mH)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	59.16	Pk	32.1	-37.89	53.37	-	-	74	-20.63	40	166	V
2	* 2.31984	62.56	Pk	31.8	-37.92	56.44	-	-	74	-17.56	40	166	V
3	* 2.39	47.26	VA1T	32.1	-37.89	41.47	54	-12.53	-	-	40	166	V
4	* 2.385822	47.3	VA1T	32.1	-37.86	41.54	54	-12.46	-	-	40	166	V

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)**HORIZONTAL RESULT**

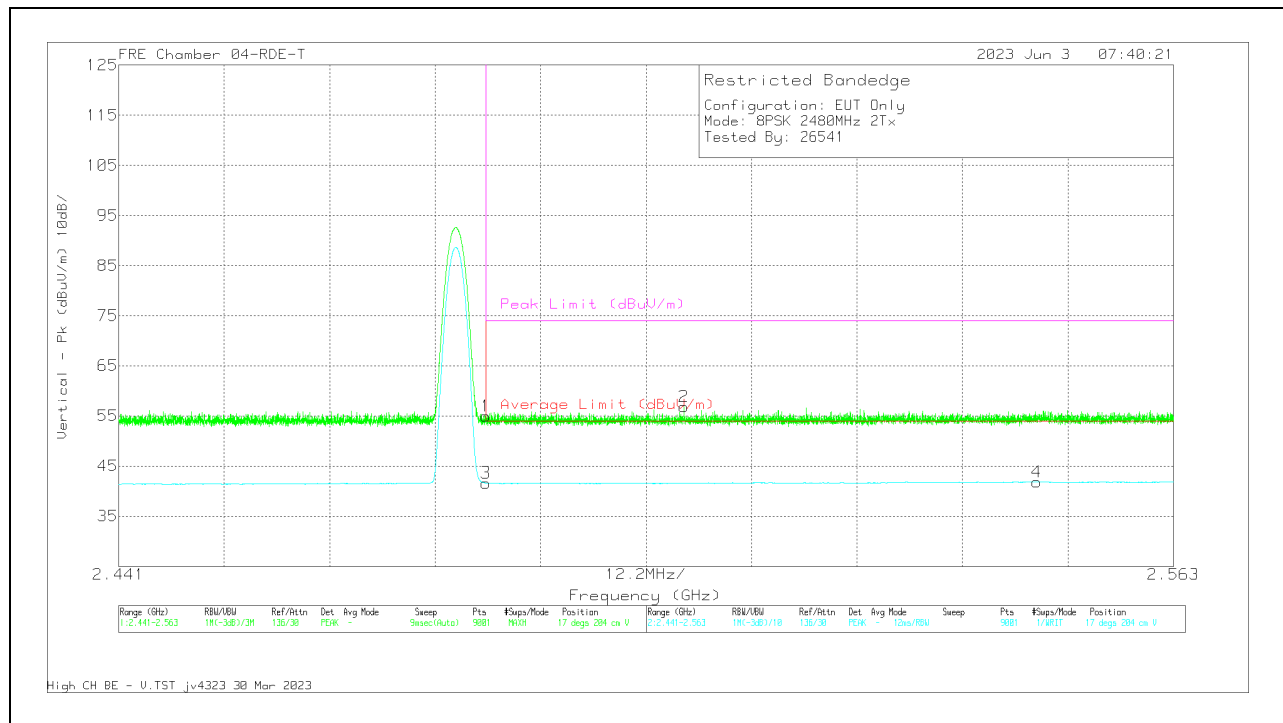
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	59.75	Pk	32.2	-37.81	54.14	-	-	74	-19.86	343	109	H
3	* 2.4835	47.26	VA1T	32.2	-37.81	41.65	54	-12.35	-	-	343	109	H
2	2.542263	62.07	Pk	32.3	-37.77	56.6	-	-	74	-17.4	343	109	H
4	2.548364	47.32	VA1T	32.3	-37.75	41.87	54	-12.13	-	-	343	109	H

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

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB) 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	60.54	Pk	32.2	-37.81	54.93	-	-	74	-19.07	17	204	V
3	* 2.4835	47.26	VA1T	32.2	-37.81	41.65	-	-12.35	-	-	17	204	V
2	2.506367	62.35	Pk	32.3	-37.81	56.84	-	-	74	-17.16	17	204	V
4	2.547184	47.29	VA1T	32.3	-37.73	41.86	-	-12.14	-	-	17	204	V

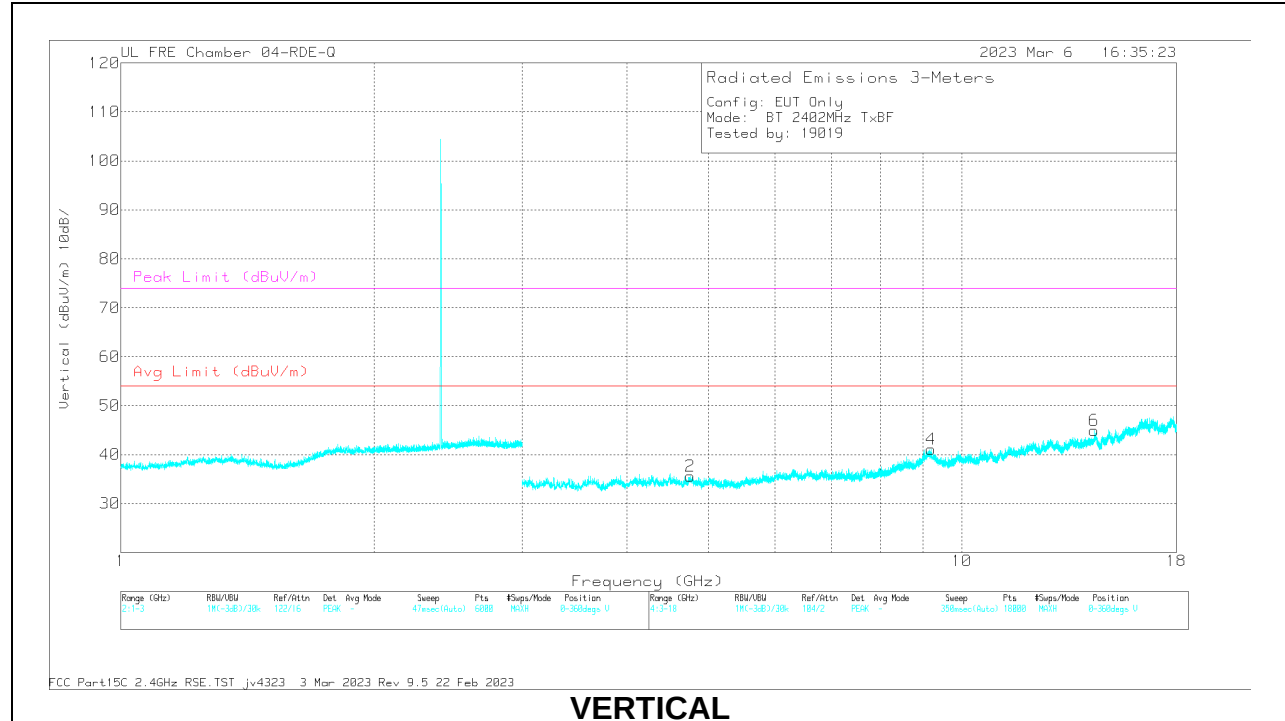
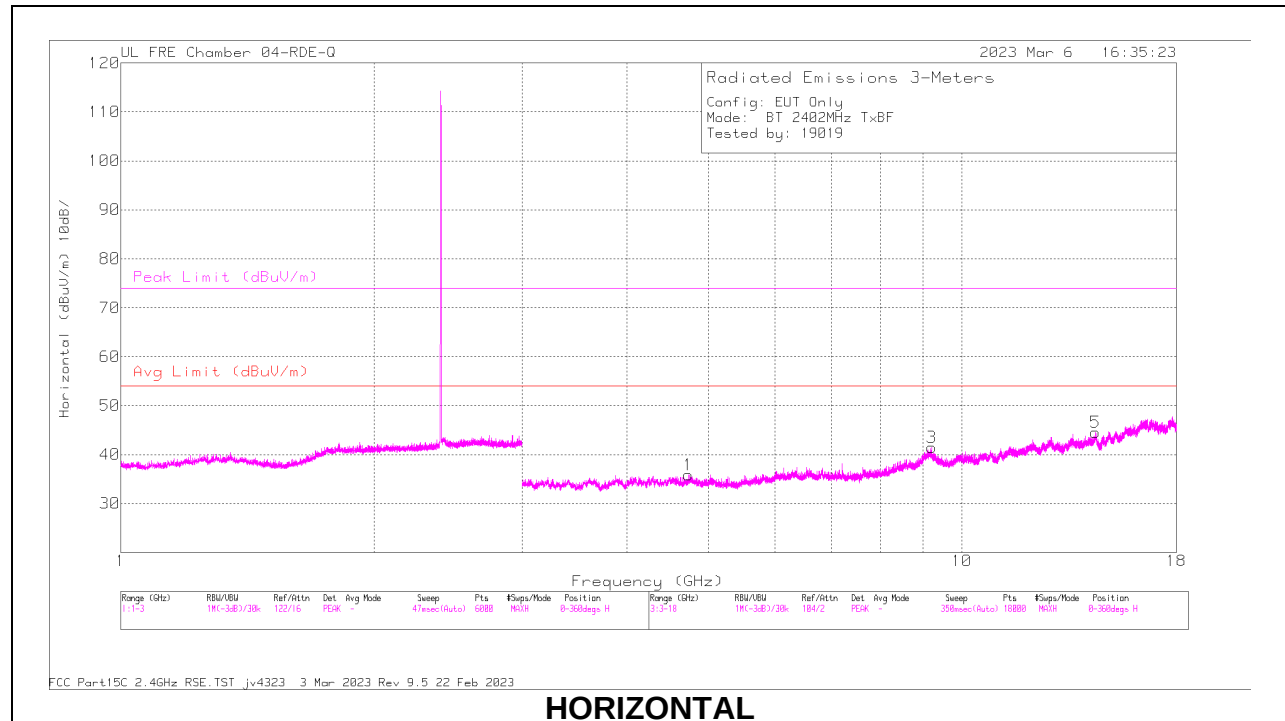
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.9. GFSK TXBF HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

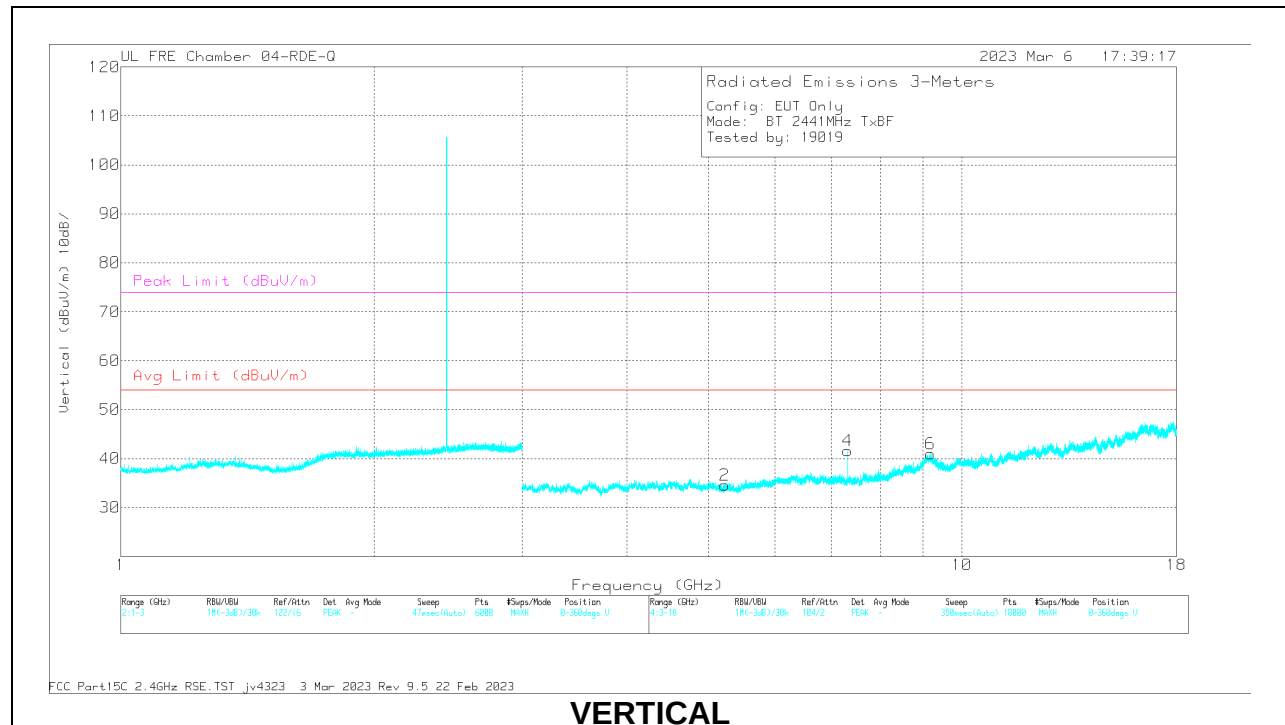
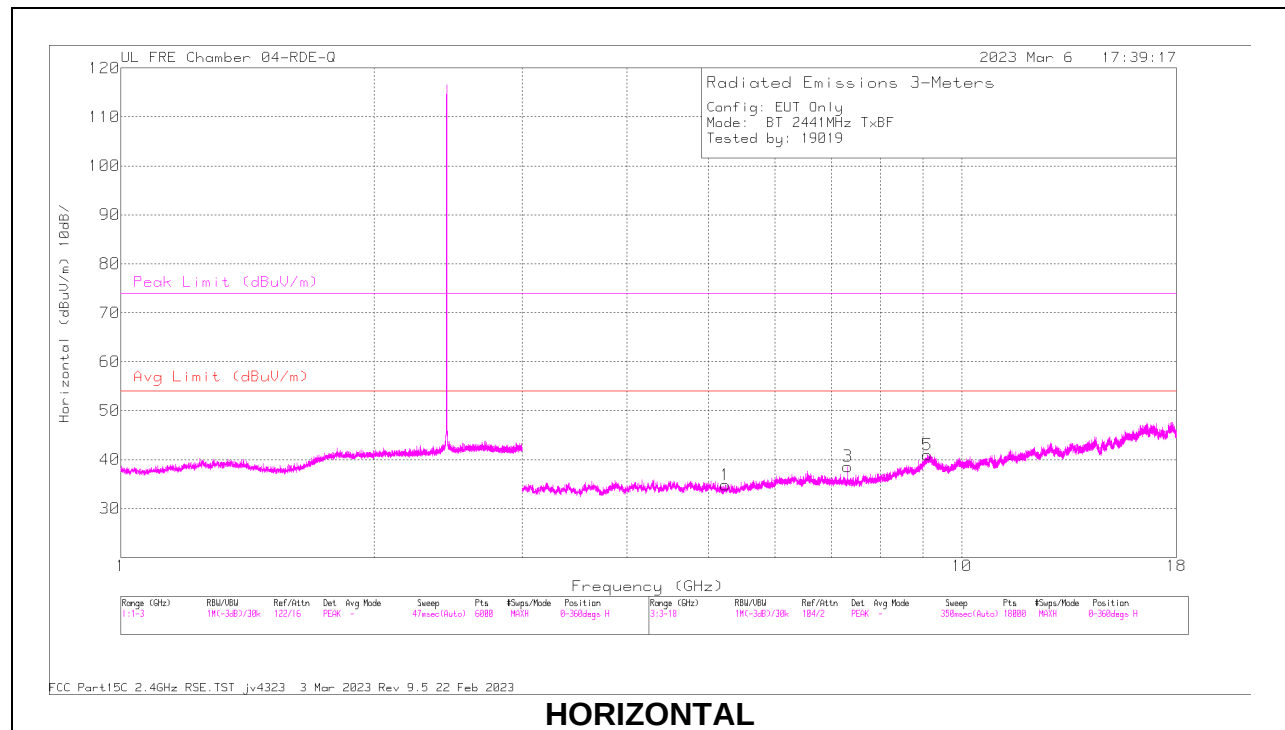
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84796 ACF (dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.730593	55.18	PKFH	34.2	-45.79	43.59	-	-	74	-30.41	357	117	H
1	* 4.734162	41.71	VA1T	34.2	-45.62	30.29	54	-23.71	-	-	357	117	H
2	* 4.753705	55.19	PKFH	34.2	-45.42	43.97	-	-	74	-30.03	311	174	V
2	* 4.750597	41.75	VA1T	34.2	-45.5	30.45	54	-23.55	-	-	311	174	V
4	9.204685	55.63	PKFH	36.4	-41.77	50.26	-	-	-	-	187	198	V
3	9.207088	53.99	PKFH	36.4	-41.84	48.55	-	-	-	-	336	241	H
6	14.380503	55.86	PKFH	39.4	-43.29	51.97	-	-	-	-	139	240	V
5	14.426901	55.16	PKFH	39.4	-42.75	51.81	-	-	-	-	273	151	H

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

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

MID CHANNEL RESULTS



RADIATED EMISSIONS

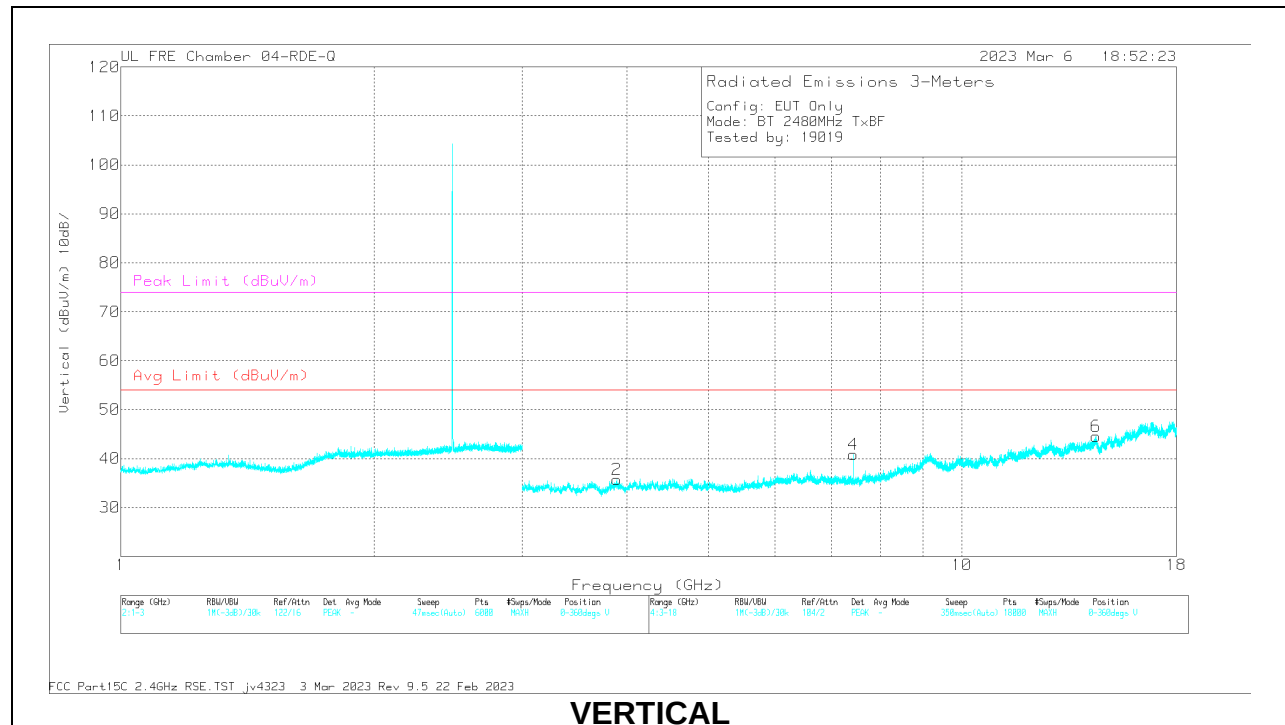
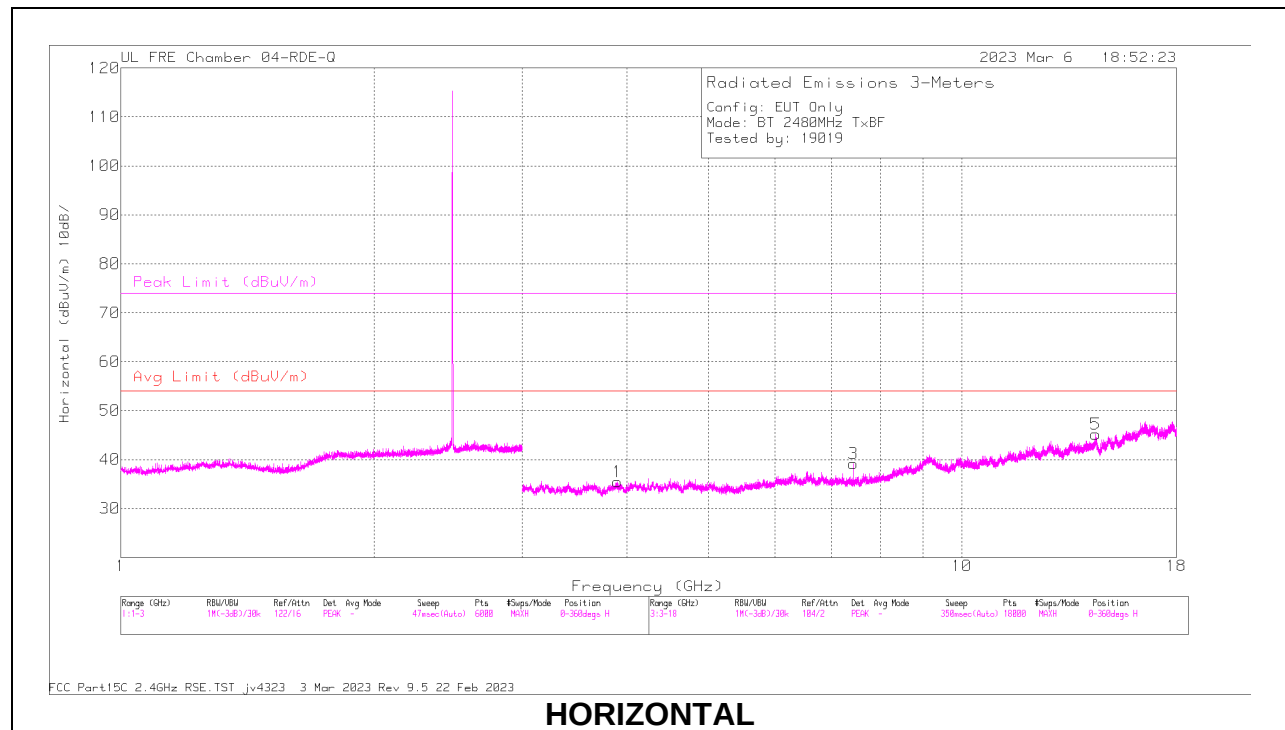
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84796 ACF (dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 7.31884	53.98	PKFH	35.5	-44.74	44.74	-	-	74	-29.26	153	124	H
	* 7.31943	40.13	VA1T	35.5	-44.73	30.9	54	-23.1	-	-	153	124	H
5	* 9.108553	53.94	PKFH	36.4	-41.67	48.67	-	-	74	-25.33	118	137	H
	* 9.106152	40.79	VA1T	36.4	-41.61	35.58	54	-18.42	-	-	118	137	H
4	* 7.315951	53.9	PKFH	35.5	-44.74	44.66	-	-	74	-29.34	125	368	V
	* 7.316512	40.1	VA1T	35.5	-44.75	30.85	54	-23.15	-	-	125	368	V
6	* 9.176011	54.74	PKFH	36.4	-41.86	49.28	-	-	74	-24.72	97	334	V
	* 9.178659	40.73	VA1T	36.4	-41.88	35.25	54	-18.75	-	-	97	334	V
2	5.225925	55	PKFH	34.1	-46.07	43.03	-	-	-	-	173	241	V
1	5.232993	54.62	PKFH	34.1	-45.9	42.82	-	-	-	-	58	130	H

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

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	84796 ACF (dB) - 3mH	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 3.893291	54.37	PKFH	33.1	-44.2	43.27	-	-	74	-30.73	86	185	H
	* 3.893588	41.32	VA1T	33.1	-44.18	30.24	54	-23.76	-	-	86	185	H
3	* 7.434189	54.2	PKFH	35.4	-44.67	44.93	-	-	74	-29.07	335	137	H
	* 7.433225	41.23	VA1T	35.4	-44.66	31.97	54	-22.03	-	-	335	137	H
2	* 3.886378	55.52	PKFH	33	-44.15	44.37	-	-	74	-29.63	264	143	V
	* 3.886238	41.38	VA1T	33	-44.14	30.24	54	-23.76	-	-	264	143	V
4	* 7.432142	54.59	PKFH	35.4	-44.67	45.32	-	-	74	-28.68	53	156	V
	* 7.431751	39.98	VA1T	35.4	-44.68	30.7	54	-23.3	-	-	53	156	V
5	14.432448	54.9	PKFH	39.4	-42.54	51.76	-	-	-	-	351	106	H
6	14.453351	54.63	PKFH	39.3	-42.41	51.52	-	-	-	-	71	189	V

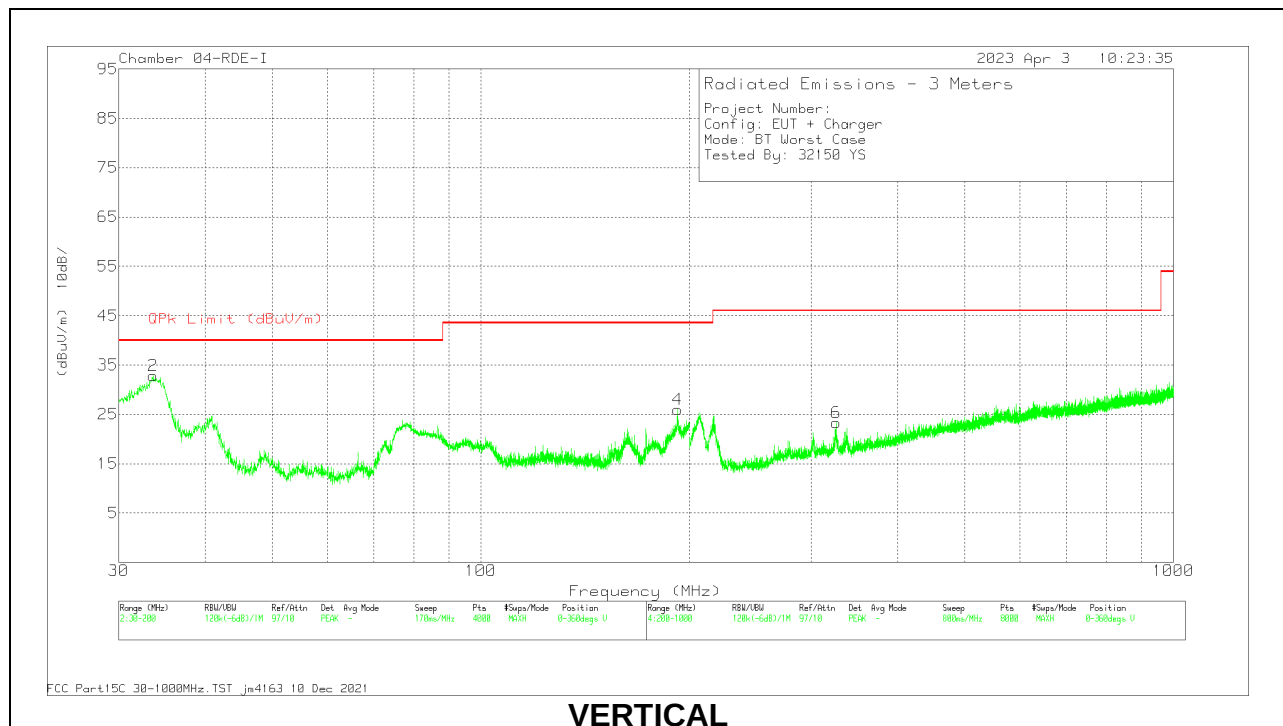
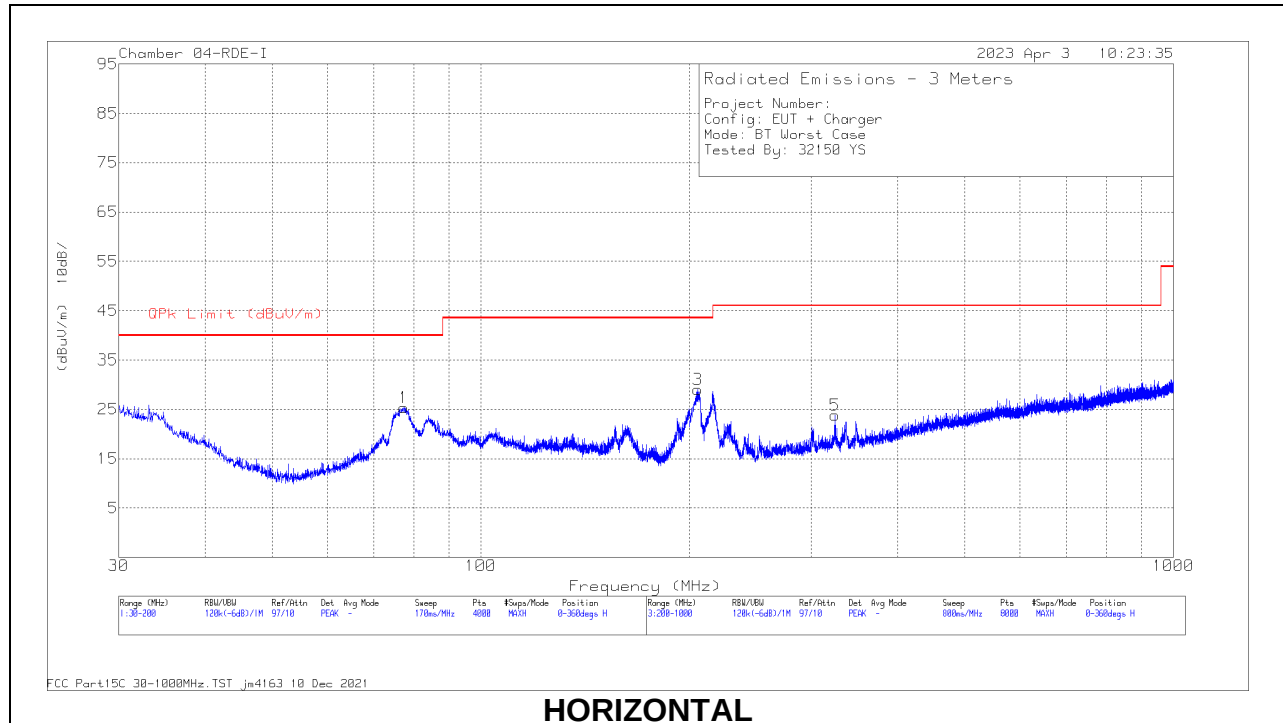
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.2. WORST CASE BELOW 1 GHZ

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



Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80714 ACF (dB) - 10mH	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	77.3573	41.7	Pk	14.4	-30.8	25.3	40	-14.7	0-360	299	H
2	33.656	38.8	Pk	25.1	-31.1	32.8	40	-7.2	0-360	101	V
	34.1245	36.31	Qp	24.8	-31.1	30.01	40	-9.99	339	136	V
4	192.264	38.43	Pk	17.7	-30.1	26.03	43.52	-17.49	0-360	101	V
3	205.601	42.15	Pk	17	-30.1	29.05	43.52	-14.47	0-360	101	H
5	* 324.716	33.68	Pk	19.7	-29.5	23.88	46.02	-22.14	0-360	101	H
6	* 325.916	33.07	Pk	19.7	-29.4	23.37	46.02	-22.65	0-360	100	V

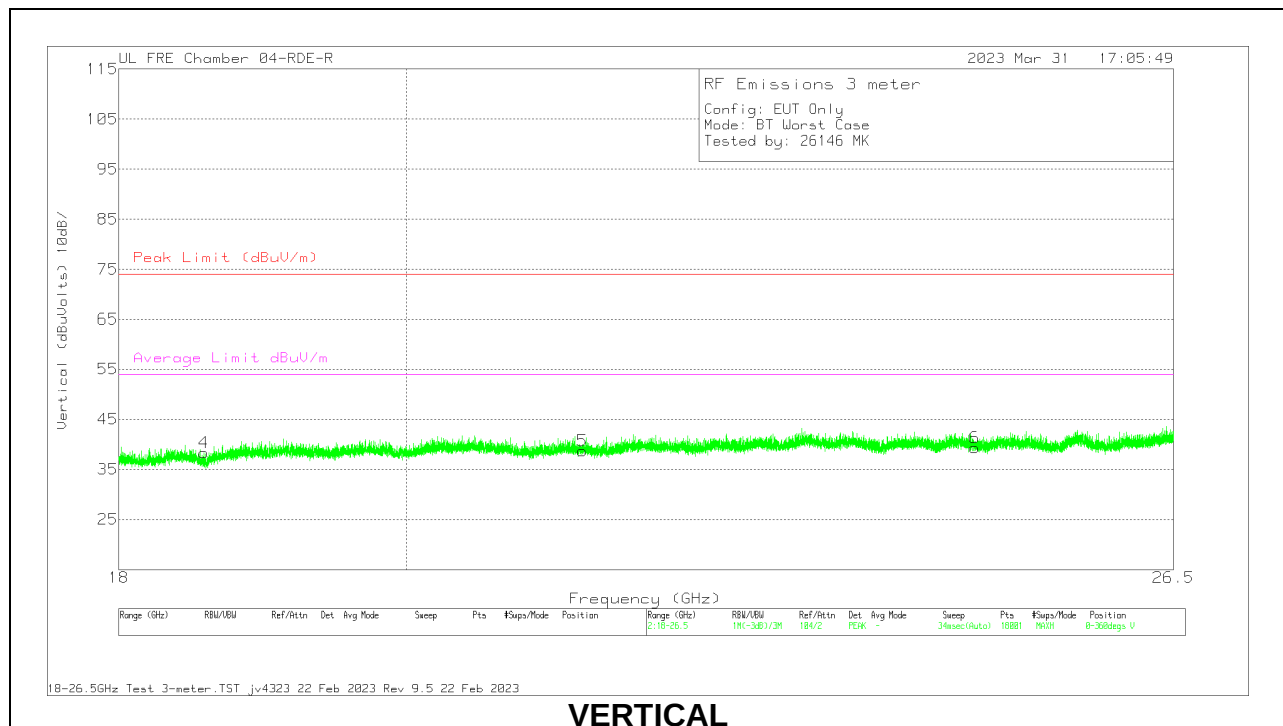
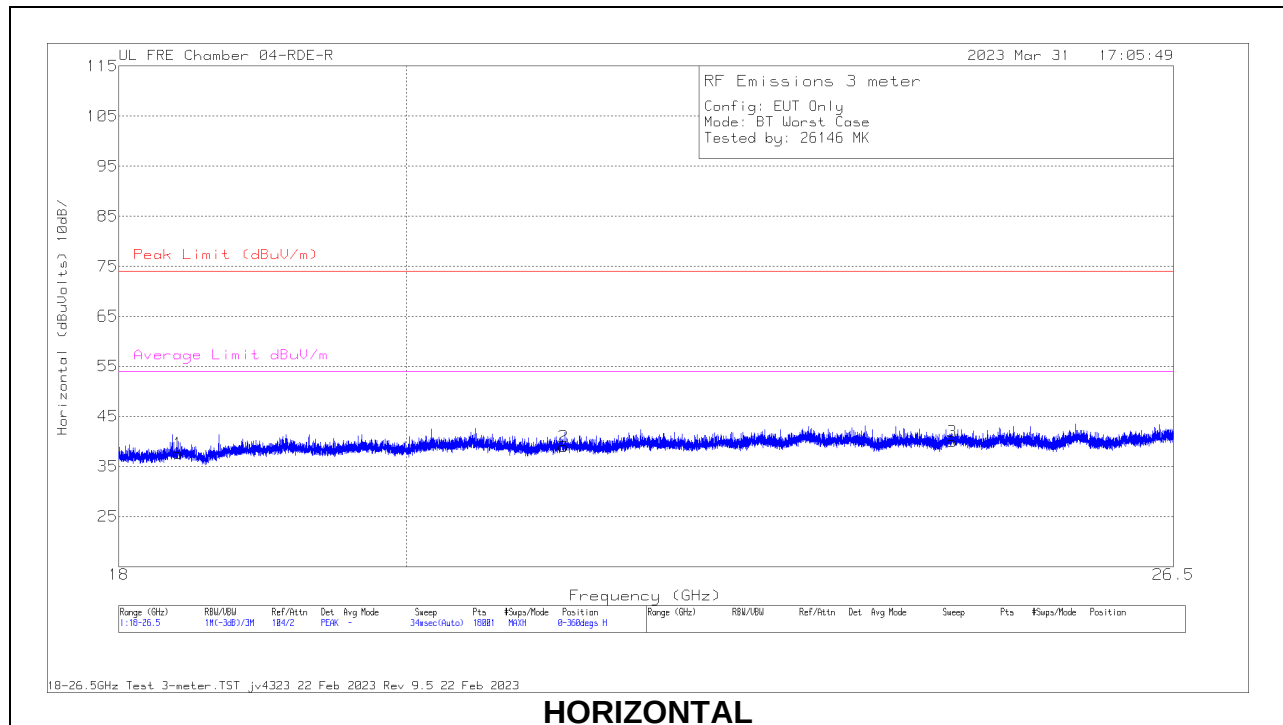
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

10.3. WORST CASE 18-26 GHZ

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



18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	172353 ACF (dB) - 3mH	171583 Amp Assembly (dB)	Cables (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	PK Margin (dB)	Average Limit dBuV/m	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.397139	55.96	Pk	32.6	-66.1	15.1	37.56	74	-36.44	54	-16.44	0-360	99	H
2	* 21.18986	53.55	Pk	33.4	-64.4	16.4	38.95	74	-35.05	54	-15.05	0-360	99	H
4	* 18.571389	56.49	Pk	32.7	-66	15.2	38.39	74	-35.61	54	-15.61	0-360	99	V
5	* 21.336721	53.51	Pk	33.3	-64.5	16.4	38.71	74	-35.29	54	-15.29	0-360	99	V
3	24.434969	52.61	Pk	34.4	-64.5	17.5	40.01	74	-33.99	54	-13.99	0-360	99	H
6	24.638025	51.89	Pk	34.4	-64.5	17.6	39.39	74	-34.61	54	-14.61	0-360	99	V

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

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

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

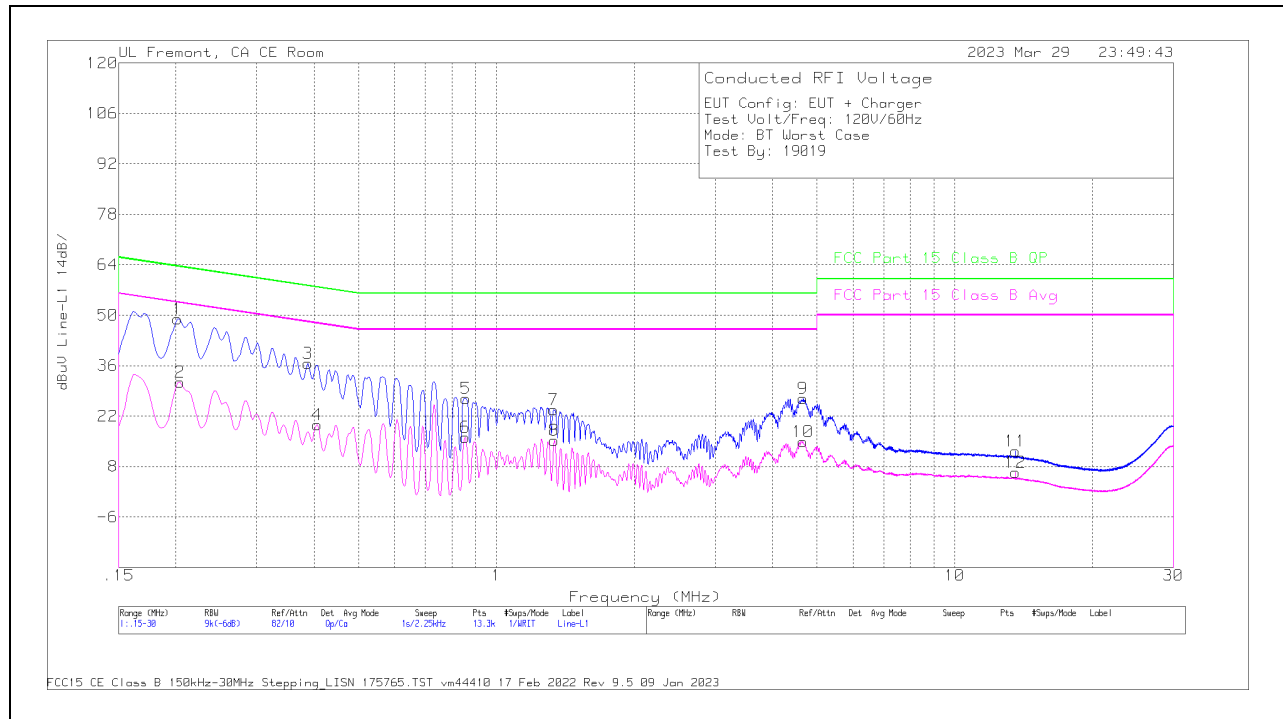
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1. AC Power Line With AC/DC Adapter

LINE 1 RESULTS

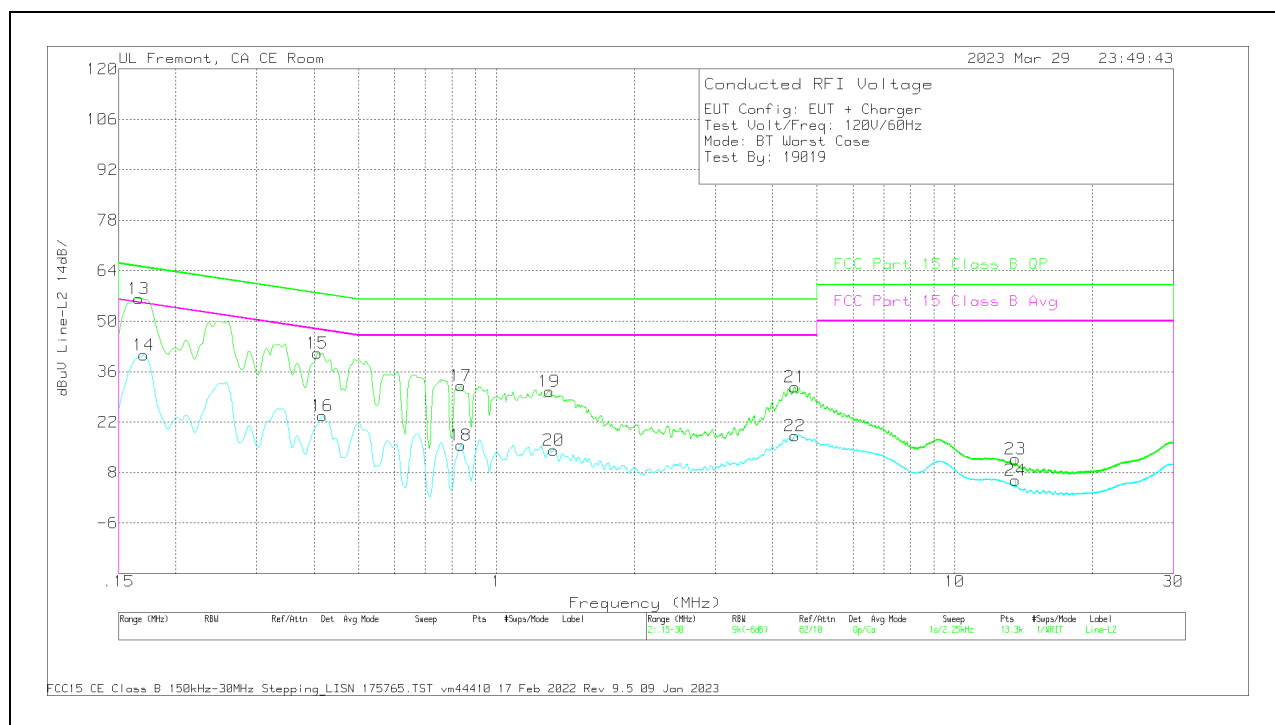


Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv dB	C1&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
2	.204	21.98	Ca	0	0	9.4	31.38	-	-	53.45	-22.07
4	.4065	10.2	Ca	0	.1	9.3	19.6	-	-	47.72	-28.12
6	.8543	6.63	Ca	0	.1	9.3	16.03	-	-	46	-29.97
8	1.338	5.91	Ca	0	.1	9.3	15.31	-	-	46	-30.69
10	4.668	5.42	Ca	0	.1	9.3	14.82	-	-	46	-31.18
12	13.56	-3.3	Ca	.1	.2	9.3	6.3	-	-	50	-43.7
1	.2018	39.54	Qp	0	0	9.4	48.94	63.54	-14.6	-	-
3	.3885	27.27	Qp	0	.1	9.3	36.67	58.1	-21.43	-	-
5	.8588	17.51	Qp	0	.1	9.3	26.91	56	-29.09	-	-
7	1.3335	14.42	Qp	0	.1	9.3	23.82	56	-32.18	-	-
9	4.6703	17.46	Qp	0	.1	9.3	26.86	56	-29.14	-	-
11	13.56	2.7	Qp	.1	.2	9.3	12.3	60	-47.7	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



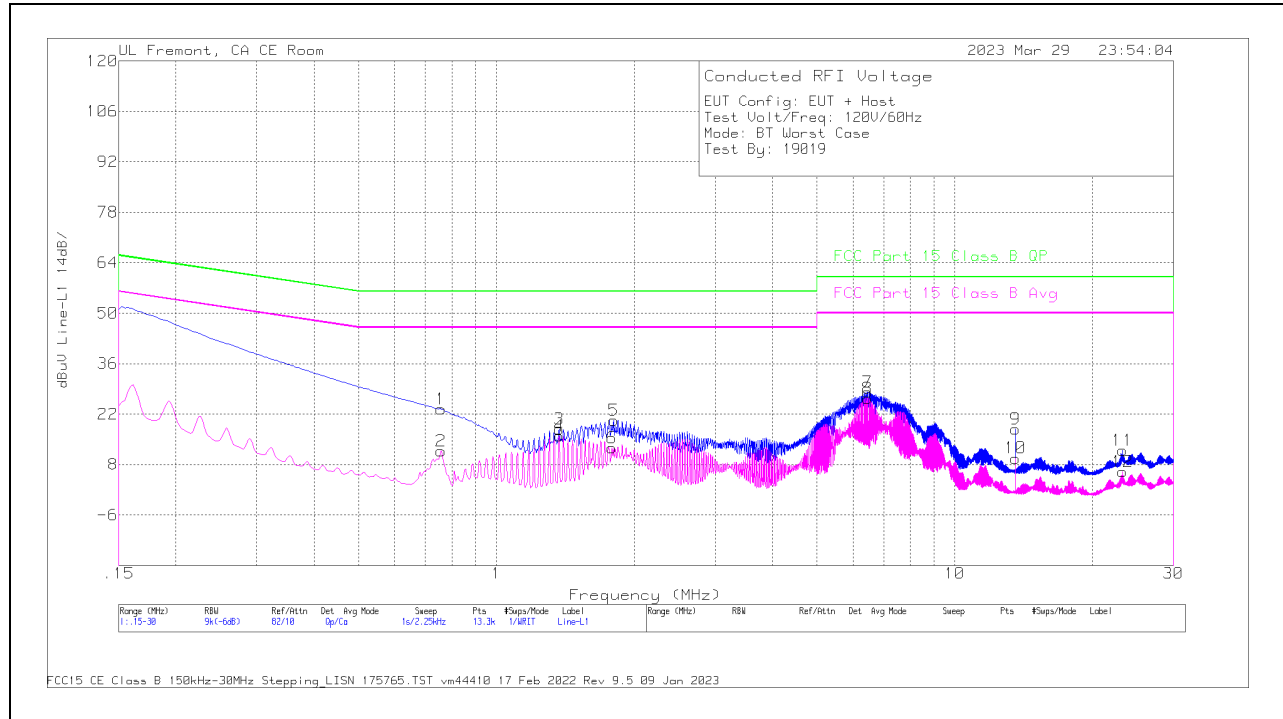
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2 LISN dB	C2&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
14	.1703	31.28	Ca	0	0	9.4	40.68	-	-	54.95	-14.27
16	.4178	14.43	Ca	0	.1	9.3	23.83	-	-	47.49	-23.66
18	.8363	6.21	Ca	0	.1	9.3	15.61	-	-	46	-30.39
20	1.3313	4.79	Ca	0	.1	9.3	14.19	-	-	46	-31.81
22	4.4858	8.76	Ca	0	.1	9.3	18.16	-	-	46	-27.84
24	13.56	-3.78	Ca	.1	.2	9.3	5.82	-	-	50	-44.18
13	.1658	46.93	Qp	0	0	9.4	56.33	65.17	-8.84	-	-
15	.4065	31.75	Qp	0	.1	9.3	41.15	57.72	-16.57	-	-
17	.8363	22.65	Qp	0	.1	9.3	32.05	56	-23.95	-	-
19	1.302	21.14	Qp	0	.1	9.3	30.54	56	-25.46	-	-
21	4.4858	22.34	Qp	0	.1	9.3	31.74	56	-24.26	-	-
23	13.56	2.19	Qp	.1	.2	9.3	11.79	60	-48.21	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

11.2. AC Power Line With Laptop

LINE 1 RESULTS

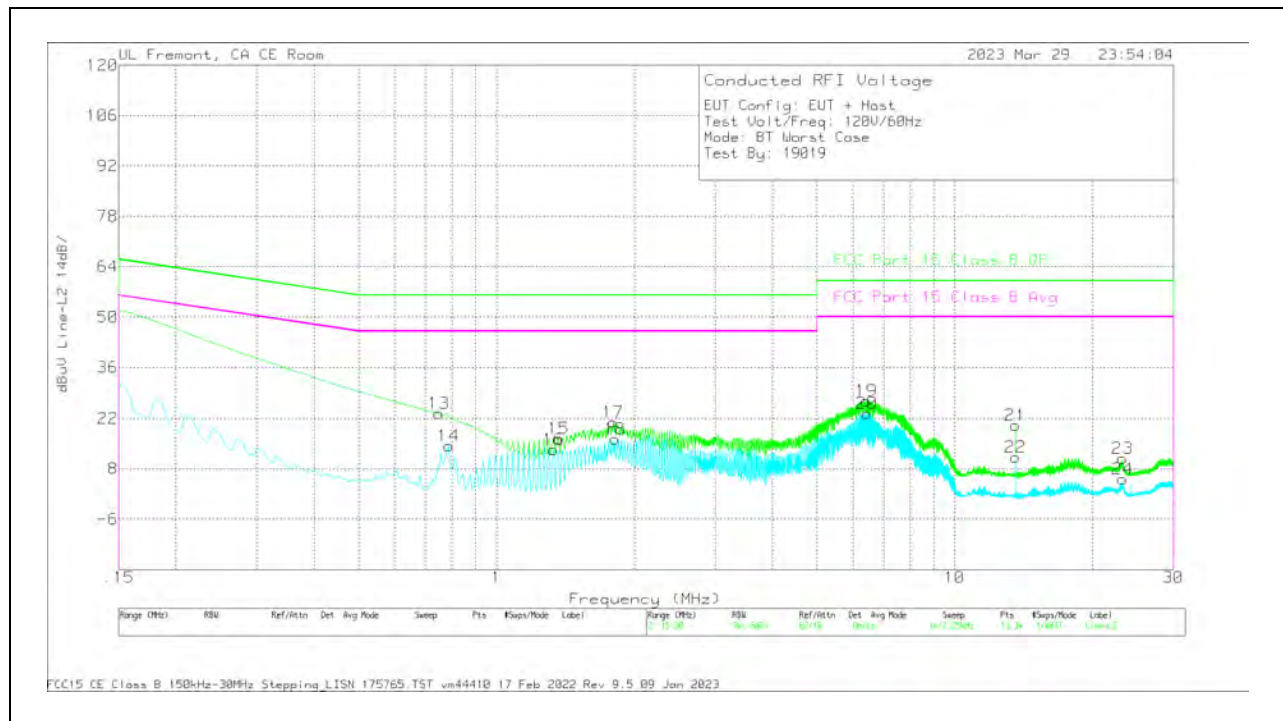


Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv dB	C1&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
2	.7575	2.34	Ca	0	.1	9.3	11.74	-	-	46	-34.26
4	1.3695	6.53	Ca	0	.1	9.3	15.93	-	-	46	-30.07
6	1.7858	3.26	Ca	0	.1	9.3	12.66	-	-	46	-33.34
8	6.459	16.95	Ca	0	.1	9.3	26.35	-	-	50	-23.65
10	13.56	.16	Ca	.1	.2	9.3	9.76	-	-	50	-40.24
12	23.2215	-3.91	Ca	.2	.3	9.4	5.99	-	-	50	-44.01
1	.7575	14.02	Qp	0	.1	9.3	23.42	56	-32.58	-	-
3	1.3695	8.52	Qp	0	.1	9.3	17.92	56	-38.08	-	-
5	1.8015	10.88	Qp	0	.1	9.3	20.28	56	-35.72	-	-
7	6.459	18.65	Qp	0	.1	9.3	28.05	60	-31.95	-	-
9	13.56	8.26	Qp	.1	.2	9.3	17.86	60	-42.14	-	-
11	23.2193	2.11	Qp	.2	.3	9.4	12.01	60	-47.99	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN dB	C2&C3 cable path loss dB	207996 Limiter with short cabl dB	Corrected Reading dBuV	FCC Part 15 Class B QP dBuV	QP Margin (dB)	FCC Part 15 Class B Avg dBuV	Av(CISPR)Margin (dB)
14	.7868	4.89	Ca	0	.1	9.3	14.29	-	-	46	-31.71
16	1.3313	3.85	Ca	0	.1	9.3	13.25	-	-	46	-32.75
18	1.815	6.84	Ca	0	.1	9.3	16.24	-	-	46	-29.76
20	6.4365	14.03	Ca	0	.1	9.3	23.43	-	-	50	-26.57
22	13.56	1.7	Ca	.1	.2	9.3	11.3	-	-	50	-38.7
24	23.2193	-4.73	Ca	.2	.3	9.4	5.17	-	-	50	-44.83
13	.7485	14	Qp	0	.1	9.3	23.4	56	-32.6	-	-
15	1.365	7.13	Qp	0	.1	9.3	16.53	56	-39.47	-	-
17	1.7993	11.51	Qp	0	.1	9.3	20.91	56	-35.09	-	-
19	6.423	17.44	Qp	0	.1	9.3	26.84	60	-33.16	-	-
21	13.56	10.48	Qp	.1	.2	9.3	20.08	60	-39.92	-	-
23	23.2193	1	Qp	.2	.3	9.4	10.9	60	-49.1	-	-

Qp - Quasi-Peak detector

Ca - CISPR average detection

12. SETUP PHOTOS

Please refer to 14523744-EP1V1 for setup photos

END OF TEST REPORT