TEST REPORT

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Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2307-0099(1)

2. Customer

- Name (FCC) : Point Mobile Co., LTD. / Name (IC) : POINTMOBILE CO.,LTD
- Address (FCC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu, Seoul, South Korea, 08512
  Address (IC) : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu Seoul Korea (Republic Of)

3. Use of Report : FCC & IC Certification

4. Product Name / Model Name : MOBILE COMPUTER / PM86W
   FCC ID : V2X-PM86W
   IC : 10664A-PM86W

5. FCC Regulation(s): Part 15.247
   IC Standard(s): RSS-247 Issue 2, RSS-Gen Issue 5
   Test Method used: KDB558074 D01v05r02, ANSI C63.10-2013

6. Date of Test : 2023.05.26 ~ 2023.07.13

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test report is not related to KOLAS accreditation.

Affirmation	Tested by Name : SeungMin Gil (Signature)	Technical Manager Name : JaeJin Lee (Signature)

2023 . 07 . 27 .

Dt&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2307-0099	Jul, 20. 2023	Initial issue	SeungMin Gil	JaeJin Lee
DRTFCC2307-0099(1)	Jul, 27. 2023	Revised the section 1.1	SeungMin Gil	JaeJin Lee

Table of Contents

1. General Information 5
1.1. Explanations for Reference Test Data 5
1.1.1. Introduction 5
1.1.2. Explain the Differences 5
1.1.3. Spot Check Verification Data 5
1.1.4. Reference Section 6
1.1. Description of EUT 7
1.2. Declaration by the applicant / manufacturer 7
1.3. Testing Laboratory 8
1.4. Testing Environment 8
1.5. Measurement Uncertainty 8
1.6. Test Equipment List 9
2. Test Methodology 10
2.1. EUT Configuration 10
2.2. EUT Exercise 10
2.3. General Test Procedures 10
2.4. Instrument Calibration 10
2.5. Description of Test Modes 11
3. Antenna Requirements 11
4. Summary of Test Results 12
5. Test Result 13
5.1. Maximum Peak Conducted Output Power 13
5.1.1. Test Setup 13
5.1.2. Test Procedures 13
5.1.3. Test Results 14
5.2. 6 dB Bandwidth 31
5.2.1. Test Setup 31
5.2.2. Test Procedures 31
5.2.3. Test Results 32
5.3. Power Spectral Density 49
5.3.1. Test Setup 49
5.3.2. Test Procedures 49
5.3.3. Test Results 49
5.4. Unwanted Emissions (Conducted) 58
5.4.1. Test Setup 58
5.4.2. Test Procedures 58
5.4.3. Test Results 59
5.5. Unwanted Emissions (Radiated) 91
5.5.1. Test Setup 93
5.5.2. Test Procedures 93
5.5.3. Test Results 94
5.6. AC Power-Line Conducted Emissions 97
5.6.1. Test Setup 97
5.6.2. Test Procedures 97
5.6.3. Test Results 97
5.7. Occupied Bandwidth 100
5.7.1. Test Setup 100
5.7.2. Test Procedures 100
5.7.3. Test Results 101
APPENDIX I 118

APPENDIX II 119
APPENDIX III 122

1. General Information

1.1. Explanations for Reference Test Data

1.1.1. Introduction

This report includes the Bluetooth LE test data of FCC ID: V2X-PM86 / IC: 10664A-PM86 with reference to KDB 484596 D01v01. The applicant takes full responsibility that the test data as reference section below represents compliance for FCC ID: V2X-PM86W / IC: 10664A-PM86W.

Reference FCC ID / IC	Exhibit type	Separated FCC ID / IC
FCC ID: V2X-PM86 / IC: 10664A-PM86	Original Grant / New Single Certification	FCC ID: V2X-PM86W / IC: 10664A-PM86W

1.1.2. Explain the Differences

FCC ID: V2X-PM86W / IC: 10664A-PM86W is same the internal printed circuit board with FCC ID: V2X-PM86 / IC: 10664A-PM86. For FCC ID: V2X-PM86W / IC: 10664-PM86W, WWAN transmitter has been removed.
(It does not changed the SW/HW component of Bluetooth LE.)

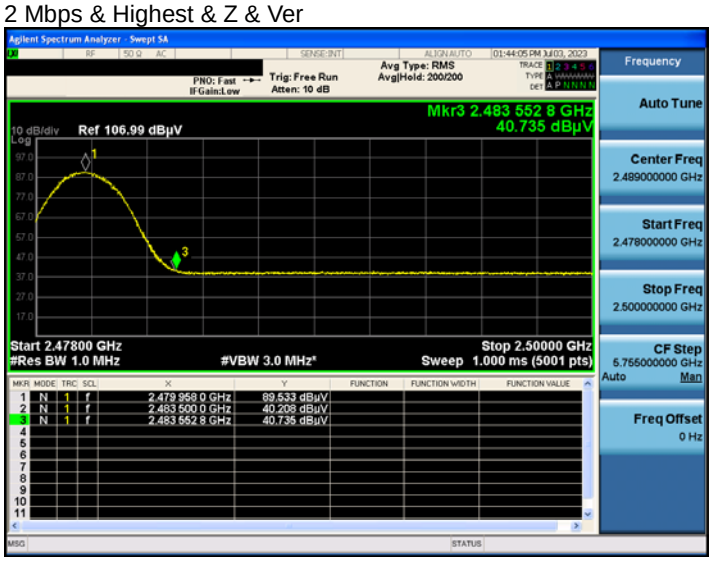
1.1.3. Spot Check Verification Data

Test data from the variant device(FCC ID: V2X-PM86W / IC: 10664A-PM86W)

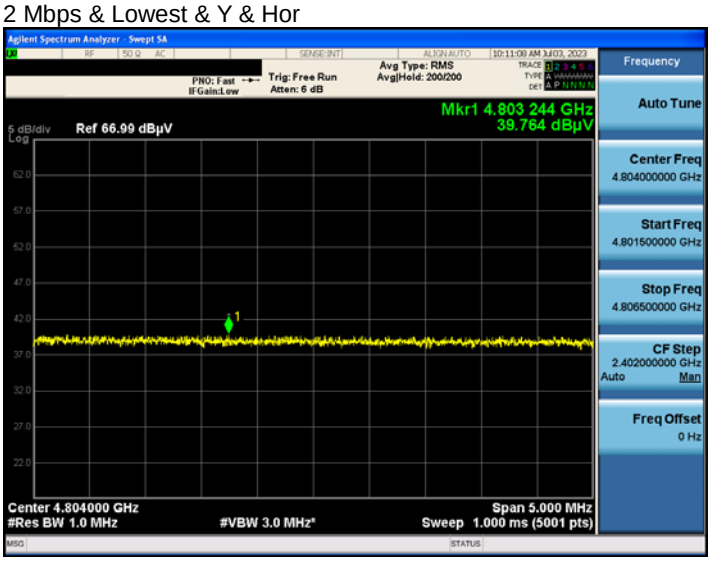
Test item	Mode	TX Freq. (MHz)	Detector Mode	Frequency (MHz)	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Radiated Band edge	2Mbps	2 480	Average	2 483.55	40.74	5.62	5.09	N/A	51.45	54.00	2.55
Radiated Spurious emission	2Mbps	2 402	Average	4 803.24	39.76	2.42	5.09	N/A	47.27	54.00	6.73

Note: Sample Calculation.
Margin = Limit – Result / Result = Reading + TF+ DCCF + DCF / TF = AF + CL + HL + AL – AG
Where, TF = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, HL = High pass filter Loss,
AL = Attenuator Loss, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

Radiated Band edge (Plot: Reading Value)
2 Mbps & Highest & Z & Ver



Radiated Spurious emission (Plot: Reading Value)
2 Mbps & Lowest & Y & Hor



Comparison results between reference device and variant device

Equipment Class (capability)	FCC Part/ RSS Std.	Mode	TX Freq. (MHz)	Test item	Detector Mode	Reference FCC ID: V2X-PM86 / IC: 10664A-PM86		Separated FCC ID: V2X-PM86W / IC: 10664A-PM86W		Limit (dBuV/m)	Deviation (dB)
						Frequency (MHz)	Result (dBuV/m)	Frequency (MHz)	Result (dBuV/m)		
DTS (Bluetooth LE)	15.247 / RSS-247	2Mbps	2 480	Radiated Band edge	Average	2 483.51	51.46	2 483.55	51.45	54.00	-0.01
		2Mbps	2 402	Radiated Spurious emission	Average	4 805.17	46.72	4 803.24	47.27	54.00	0.55

Note1: The spot check were performed based on worst-case results reported in the original test report.
The spot check test results show good correlation between two products.

1.1.4. Reference Section

Reference FCC ID: V2X-PM86 / IC: 10664A-PM86

Equipment Class	FCC Part/ RSS Std.	Capability	Band(MHz)	Exhibit type	Report title	Reference Sections
DTS	15.247 / RSS-247	Bluetooth LE	2 402 ~ 2 480	Original Grant/ New Single Certification	DTS	All

1.1. Description of EUT

Equipment Class	Digital Transmission System (DTS)
Product Name	MOBILE COMPUTER
Model Name	PM86W
Add Model Name	-
Firmware Version Identification Number	86.00
EUT Serial Number (Reference product) Note2	Conducted: 23070A0067, Radiated: 23070A0126
EUT Serial Number (Separated product) Note3	Radiated: 23070A0070
Power Supply	DC 3.8 V
Frequency Range	2 402 MHz ~ 2 480 MHz
Max. RF Output Power	4.69 dBm (0.003 W)
Modulation Technique	GFSK
Symbol Rate	1 Ms/s(1 Mbps, Coded S=2, Coded S=8), 2 Ms/s(2 Mbps)
Antenna Specification	Antenna Type: LDS Antenna Gain: 3.9 dBi (PK)

Note1: EUT has two BLE transmitters, and this test report includes the test data for a transmitter using BCM43752.
Note2: Reference FCC ID: V2X-PM86 / IC: 10664A-PM86
Note3: Separated FCC ID: V2X-PM86W / IC: 10664A-PM86W

1.2. Declaration by the applicant / manufacturer

N/A

1.3. Testing Laboratory

Dt&C Co., Ltd.		
The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of Part 2.948 according to ANSI C63.4-2014. **- FCC & IC MRA Designation No. : KR0034** **- ISED#: 5740A**		
www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

1.4. Testing Environment

Ambient Condition	
▪ Temperature	+21 ℃ ~ +24 ℃
▪ Relative Humidity	+40 % ~ +43 %

1.5. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Antenna-port conducted emission	1.0 dB (The confidence level is about 95 %, k = 2)
AC power-line conducted emission	3.4 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz Below)	4.8 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz ~ 18 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated emission (18 GHz Above)	5.2 dB (The confidence level is about 95 %, k = 2)

1.6. Test Equipment List

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	22/06/24	23/06/24	MY46471622
			23/06/23	24/06/23	
Spectrum Analyzer	Agilent Technologies	N9020A	22/12/16	23/12/16	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	22/06/24	23/06/24	US47360812
			23/06/23	24/06/23	
DC Power Supply	Agilent Technologies	66332A	22/06/24	23/06/24	US37474125
			23/06/23	24/06/23	
Multimeter	FLUKE	17B+	22/12/16	23/12/16	36390701WS
Signal Generator	Rohde Schwarz	SMBV100A	22/12/16	23/12/16	255571
Signal Generator	ANRITSU	MG3695C	22/12/16	23/12/16	173501
Thermohygrometer	BODYCOM	BJ5478	22/12/16	23/12/16	120612-1
Thermohygrometer	BODYCOM	BJ5478	22/12/16	23/12/16	120612-2
Thermohygrometer	BODYCOM	BJ5478	22/06/24	23/06/24	N/A
			23/06/23	24/06/23	
Loop Antenna	ETS-Lindgren	6502	22/04/22	24/04/22	00203480
Hybrid Antenna	Schwarzbeck	VULB 9160	22/12/16	23/12/16	3362
Horn Antenna	ETS-Lindgren	3117	22/06/24	23/06/24	00143278
			23/06/23	24/06/23	
Horn Antenna	A.H.Systems Inc.	SAS-574	22/06/24	23/06/24	155
			23/06/23	24/06/23	
PreAmplifier	tsj	MLA-0118-B01-40	22/12/16	23/12/16	1852267
PreAmplifier	tsj	MLA-1840-J02-45	22/06/24	23/06/24	16966-10728
			23/06/23	24/06/23	
PreAmplifier	H.P	8447D	22/12/16	23/12/16	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000-15000-40SS	22/06/24	23/06/24	8
			23/06/23	24/06/23	
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300-18000-60SS	22/06/24	23/06/24	1
			23/06/23	24/06/23	
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	22/06/24	23/06/24	3
			23/06/23	24/06/23	
Attenuator	Hefei Shunze	SS5T2.92-10-40	22/06/24	23/06/24	16012202
			23/06/23	24/06/23	
Attenuator	Aeroflex/Weinschel	56-3	22/06/24	23/06/24	Y2370
			23/06/23	24/06/23	
Attenuator	SMAJK	SMAJK-2-3	22/06/24	23/06/24	3
			23/06/23	24/06/23	
Attenuator	SMAJK	SMAJK-2-3	22/06/24	23/06/24	2
			23/06/23	24/06/23	
Attenuator	Aeroflex/Weinschel	86-10-11	22/06/24	23/06/24	408
			23/06/23	24/06/23	
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	22/12/16	23/12/16	1338004 1911481
EMI Test Receiver	ROHDE&SCHWARZ	ESCI7	23/01/31	24/01/31	100910
PULSE LIMITER	Rohde Schwarz	ESH3-Z2	22/08/22	23/08/22	101333
LISN	SCHWARZBECK	NSLK 8128 RC	22/10/26	23/10/26	8128 RC-387
Thermo Hygro Meter	TESTO	608-H1	23/01/13	24/01/13	45084791
Cable	Dt&C	Cable	23/01/04	24/01/04	G-2
Cable	HUBER+SUHNER	SUCOFLEX 100	23/01/04	24/01/04	G-3
Cable	Dt&C	Cable	23/01/04	24/01/04	G-4
Cable	OMT	YSS21S	23/01/04	24/01/04	G-5
Cable	Junkosha	MWX241	23/01/03	24/01/03	mmW-1
Cable	Junkosha	MWX241	23/01/03	24/01/03	mmW-4
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-01
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-02
Cable	JUNKOSHA	MWX241/B	23/01/04	24/01/04	M-03
Cable	JUNKOSHA	J12J101757-00	23/01/04	24/01/04	M-07
Cable	HUBER+SUHNER	SUCOFLEX106	23/01/04	24/01/04	M-09
Cable	Radiall	TESTPRO3	23/01/04	24/01/04	RFC-70
Test Software	tsj	Radiated Emission Measurement	NA	NA	Version 2.00.0147
Test Software	tsj	Noise Terminal Measurement	NA	NA	Version 2.00.0185

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note2: The cable is not a regular calibration item, so it has been calibrated by Dt&C itself.

2. Test Methodology

The measurement procedures described in the ANSI C63.10-2013 and the guidance provided in KDB558074 D01v05r02 were used in measurement of the EUT.
The EUT was tested per the guidance of KDB558074 D01v05r02. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the test mode to fix the TX frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3. General Test Procedures

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB558074 D01v05r02.
So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10-2013.
The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector.

Radiated Emissions

Basically the radiated tests were performed with KDB558074 D01v05r02. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10-2013 as stated on section 12.1 of the KDB558074 D01v05r02.
The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

2.4. Instrument Calibration

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.5. Description of Test Modes

The EUT has been tested with the operating condition for maximizing the emission characteristics. A test program is used to control the EUT for staying in continuous transmitting. The Bluetooth low energy mode with below low, middle and high channels were tested and reported.

Note: This EUT have a variable power settings. High power setting and Low power setting were investigated.

Test Mode	Power setting configuration	Date rate	Tested Frequency (MHz)		
			Lowest Frequency	Middle Frequency	Highest Frequency
TM 1	High	1 Mbps	2 402	2 440	2 480
TM 2	High	2 Mbps	2 402	2 440	2 480
TM 3	High	500 kbps: Coded S=2	2 402	2 440	2 480
TM 4	High	125 kbps: Coded S=8	2 402	2 440	2 480
TM 5	Low	1 Mbps	2 402	2 440	2 480
TM 6	Low	2 Mbps	2 402	2 440	2 480
TM 7	Low	500 kbps: Coded S=2	2 402	2 440	2 480
TM 8	Low	125 kbps: Coded S=8	2 402	2 440	2 480

EUT Operation test setup

The following firmware was installed on the EUT and Test software(Qualcomm Radio Control Tool 4.0.194.0) was used to control the transmit parameters during test.

High power setting: BCM4362A2_001.003.006.1093.1177_test_class 1

Low power setting: BCM4362A2_001.003.006.1093.1177_test_class 2

3. Antenna Requirements

▣ **According to Part 15.203**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

The antenna is attached on the device by means of unique coupling method.
Therefore this E.U.T complies with the requirement of Part 15.203

4. Summary of Test Results

FCC part section(s)	RSS section(s)	Test Description	Limit	Test Condition	Status Note 1
15.247(a)	RSS-247[5.2]	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	RSS-247[5.4]	Maximum Peak Output Power	< 1 Watt (conducted), FCC & IC < 4 Watt (e.i.r.p), IC		C
15.247(d)	RSS-247[5.5]	Unwanted Emissions(Conducted)	20 dBc in any 100 kHz BW		C
15.247(e)	RSS-247[5.2]	Power Spectral Density	< 8 dBm / 3 kHz		C
-	RSS-Gen[6.7]	Occupied Bandwidth (99 %)	NA		C
15.247(d) 15.205 15.209	RSS-247[5.5] RSS-Gen[8.9] RSS-Gen[8.10]	Unwanted Emissions(Radiated)	Part 15.209 limits (Refer to section 5.5)	Radiated	C Note 3
15.207	RSS-Gen [8.8]	AC Power-Line Conducted Emissions	Part 15.207 limits (Refer to section 5.6)	AC Line Conducted	C
15.203	-	Antenna Requirements	Part 15.203 (Refer to section 3)	-	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS.
Note 3: This test item was performed in three orthogonal EUT positions and the worst case data was reported.

5. Test Result

5.1. Maximum Peak Conducted Output Power

▣ Test Requirements and limit, Part 15.247(b) & RSS-247 [5.4]

A transmitter antenna terminal of EUT is connected to the input of a spectrum analyzer.

Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of RSS-247.

5.1.1. Test Setup

Refer to the APPENDIX I.

5.1.2. Test Procedures

- **KDB558074 D01v05r02 - Section 8.3.1.1**
- **ANSI C63.10-2013 – Section 11.9.1.1**

RBW ≥ DTS bandwidth

1. Set the RBW ≥ DTS bandwidth. **Actual RBW = 2 MHz or 2.4 MHz**
2. Set VBW ≥ 3 x RBW. **Actual VBW = 6 MHz or 8 MHz**
3. Set span **≥ 3 x RBW.**
4. Sweep time = **auto couple**
5. Detector = **peak**
6. Trace mode = **max hold**
7. Allow trace to fully stabilize
8. Use peak marker function to determine the peak amplitude level.

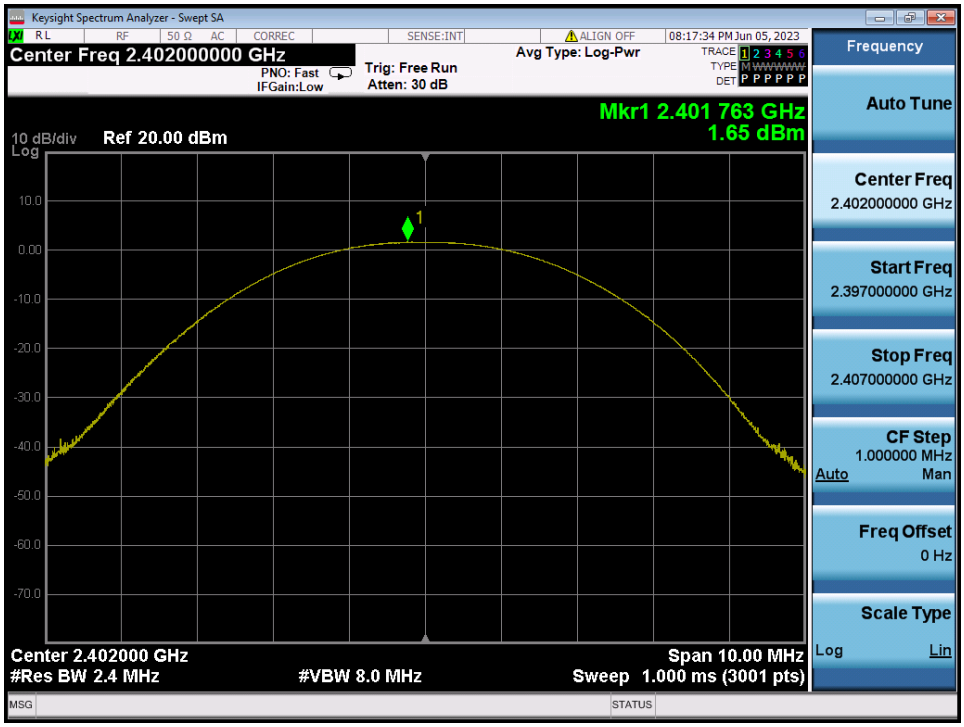
5.1.3. Test Results

Test Mode	Tested Channel	Burst Average Output Power (dBm)	Peak Conducted Output Power (dBm)	Antenna Gain(dBi)	e.i.r.p[Note3] (dBm)
TM 1	Lowest	1.61	1.65	3.90	5.55
	Middle	3.80	3.98	3.90	7.88
	Highest	4.49	4.65	3.90	8.55
TM 2	Lowest	1.60	1.72	3.90	5.62
	Middle	3.76	4.07	3.90	7.97
	Highest	4.48	**4.69**	3.90	8.59
TM 3	Lowest	1.61	1.66	3.90	5.56
	Middle	3.79	4.02	3.90	7.92
	Highest	4.50	4.64	3.90	8.54
TM 4	Lowest	1.61	1.64	3.90	5.54
	Middle	3.79	4.02	3.90	7.92
	Highest	4.50	4.62	3.90	8.52

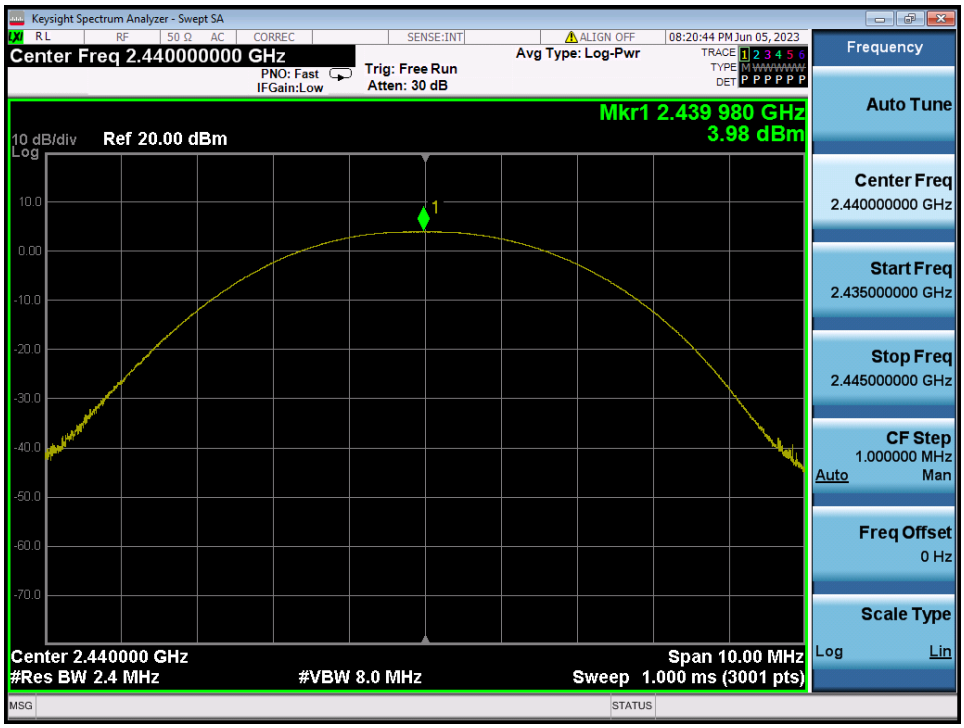
Test Mode	Tested Channel	Burst Average Output Power (dBm)	Peak Conducted Output Power (dBm)	Antenna Gain(dBi)	e.i.r.p[Note3] (dBm)
TM 5	Lowest	-0.65	0.86	-0.52	0.89
	Middle	-0.43	0.91	-0.13	0.97
	Highest	0.26	1.06	0.63	1.16
TM 6	Lowest	-0.81	0.83	-0.49	0.89
	Middle	-0.62	0.87	0.03	1.01
	Highest	0.10	1.02	0.75	1.19
TM 7	Lowest	-0.68	0.86	-0.56	0.88
	Middle	-0.44	0.90	-0.12	0.97
	Highest	0.25	1.06	0.61	1.15
TM 8	Lowest	-0.68	0.86	-0.58	0.87
	Middle	-0.44	0.90	-0.09	0.98
	Highest	0.25	1.06	0.60	1.15

Note 1: The average output power was tested using an average power meter for reference only.
Note 2: See next pages for actual measured spectrum plots.
Note 3: e.i.r.p = P_{cond} + G_{EUT}
P_{cond} = measured power at feedpoint of the EUT antenna, in dBm (Peak Conducted Output Power)
G_{EUT} = gain of the EUT radiating element (antenna), in dBi

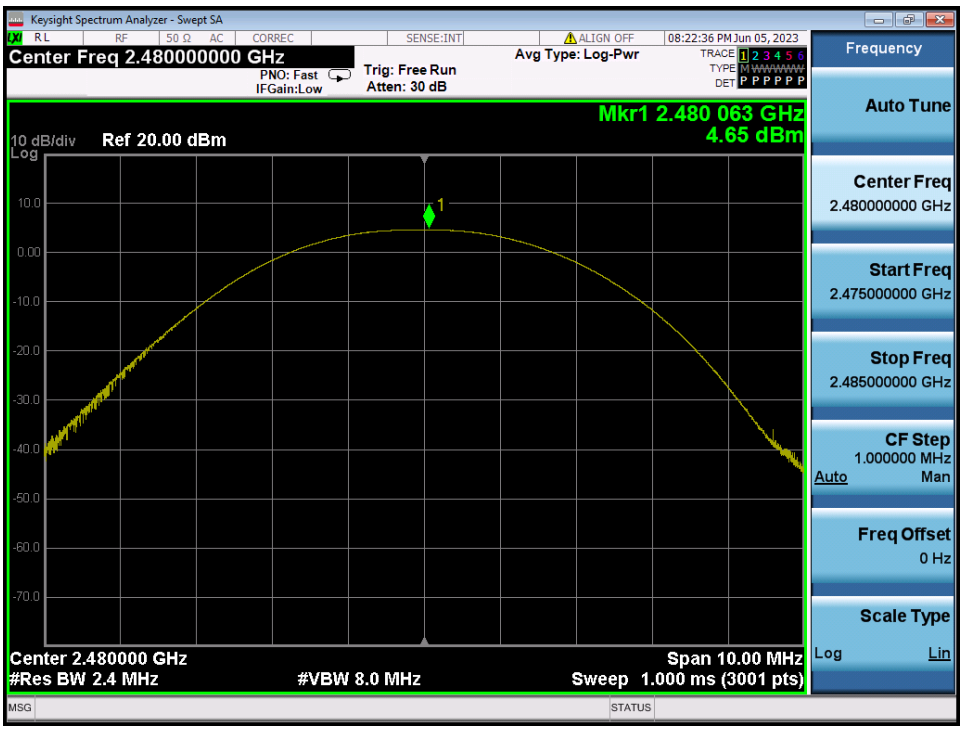
Peak Output Power TM 1 Test Channel : Lowest



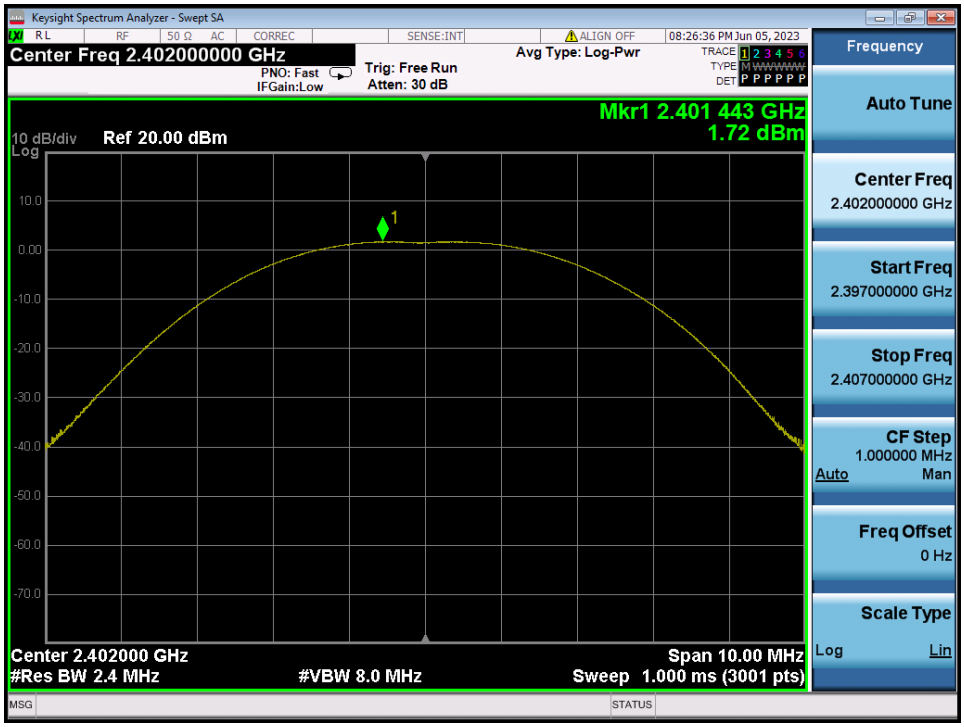
Peak Output Power TM 1 Test Channel : Middle



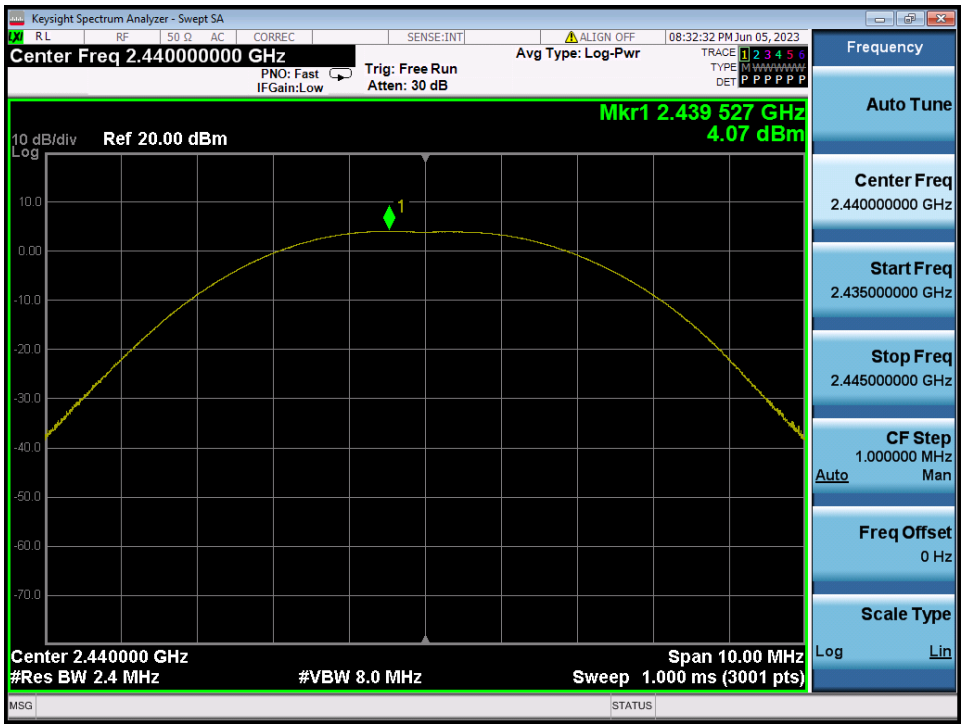
Peak Output Power TM 1 Test Channel : Highest



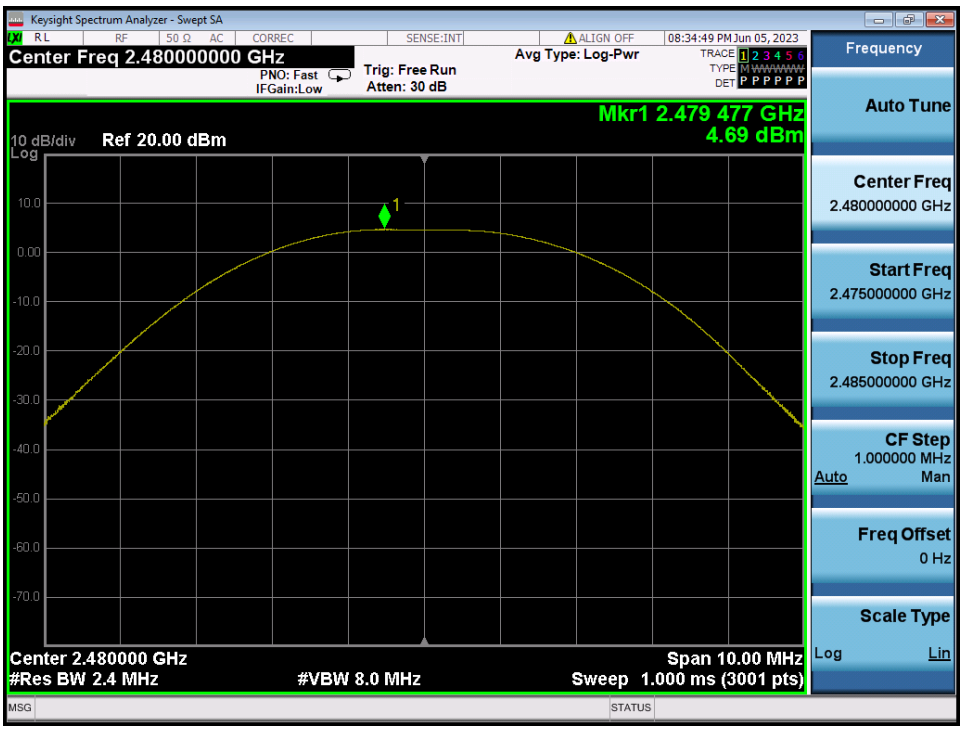
Peak Output Power TM 2 Test Channel : Lowest



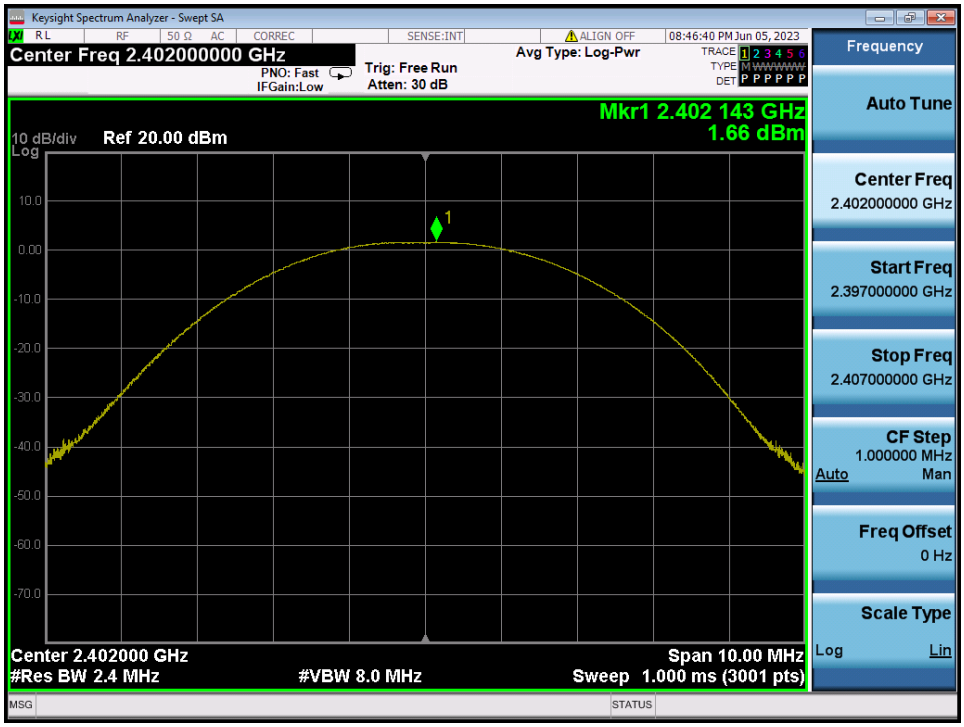
Peak Output Power TM 2 Test Channel : Middle



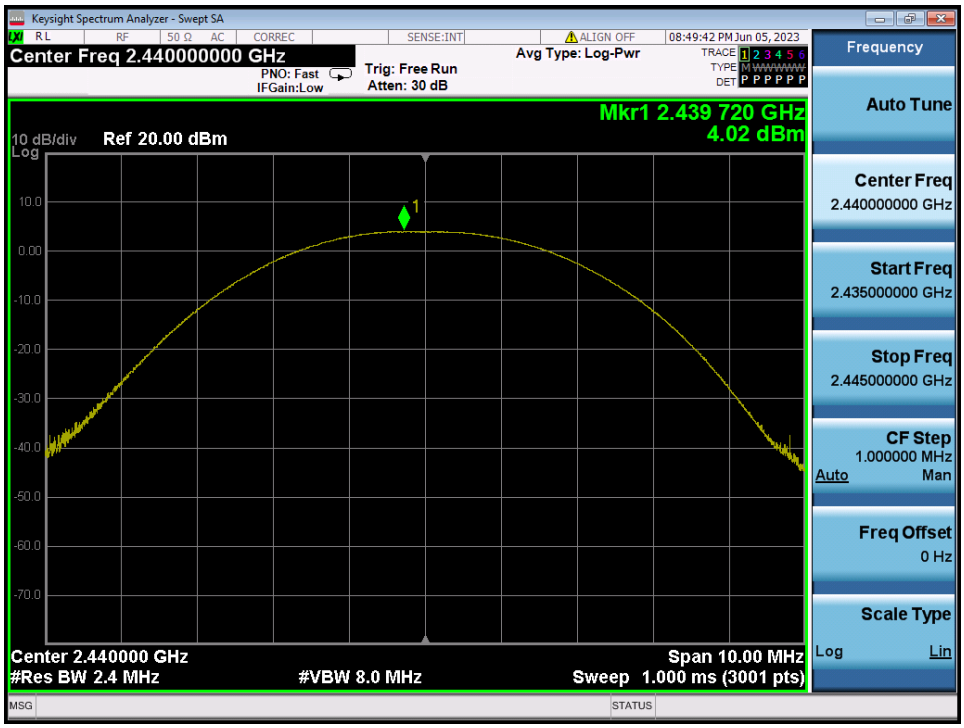
Peak Output Power TM 2 Test Channel : Highest



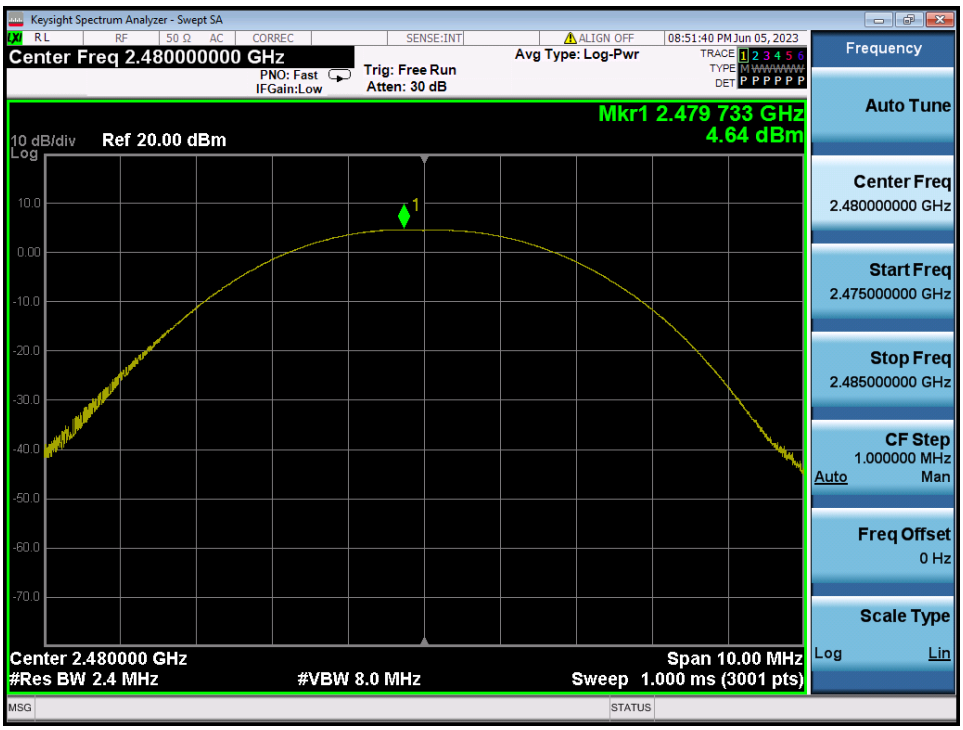
Peak Output Power TM 3 Test Channel : Lowest



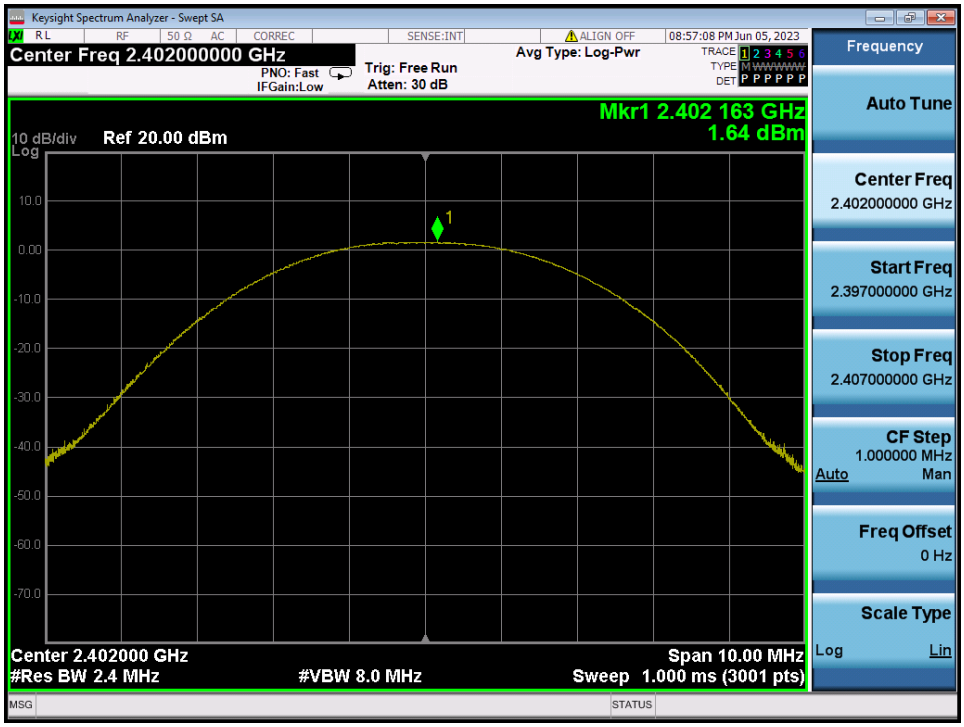
Peak Output Power TM 3 Test Channel : Middle



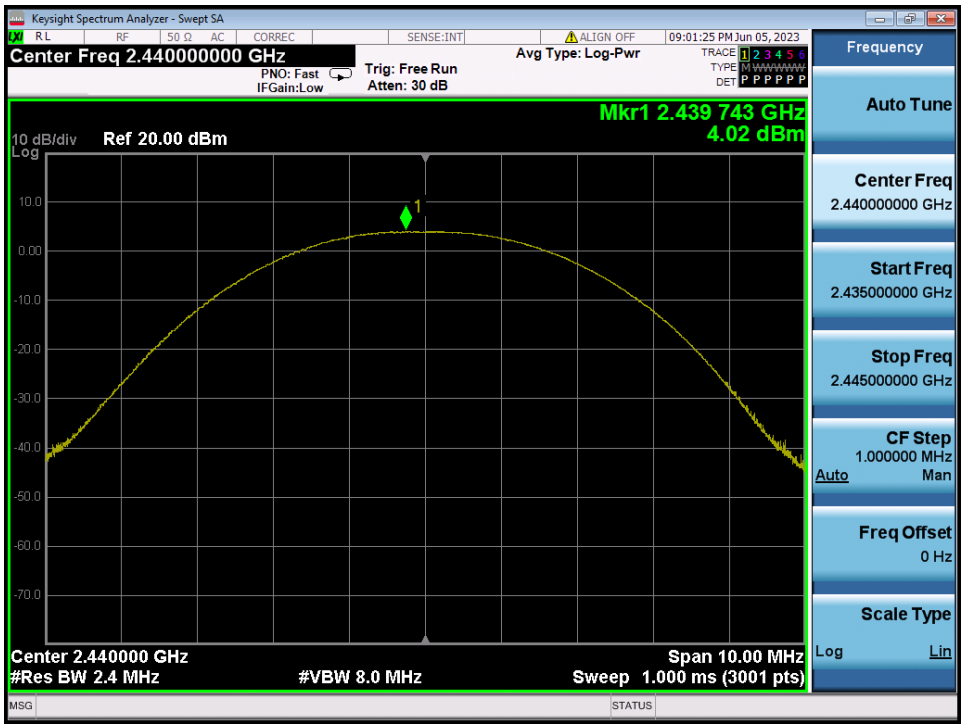
Peak Output Power TM 3 Test Channel : Highest



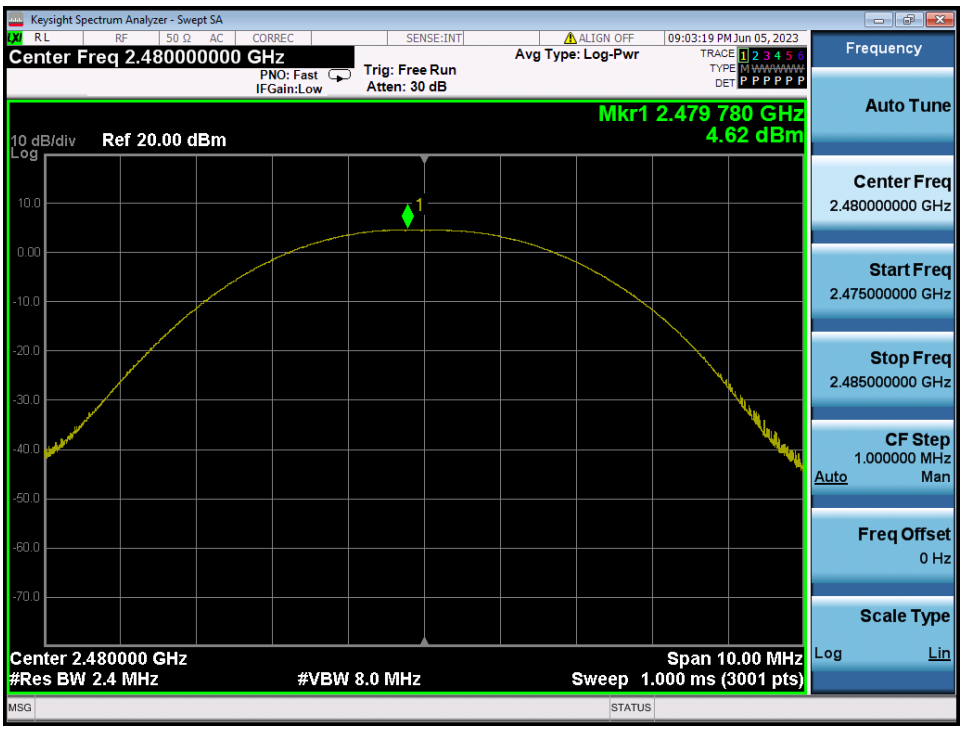
Peak Output Power TM 4 Test Channel : Lowest



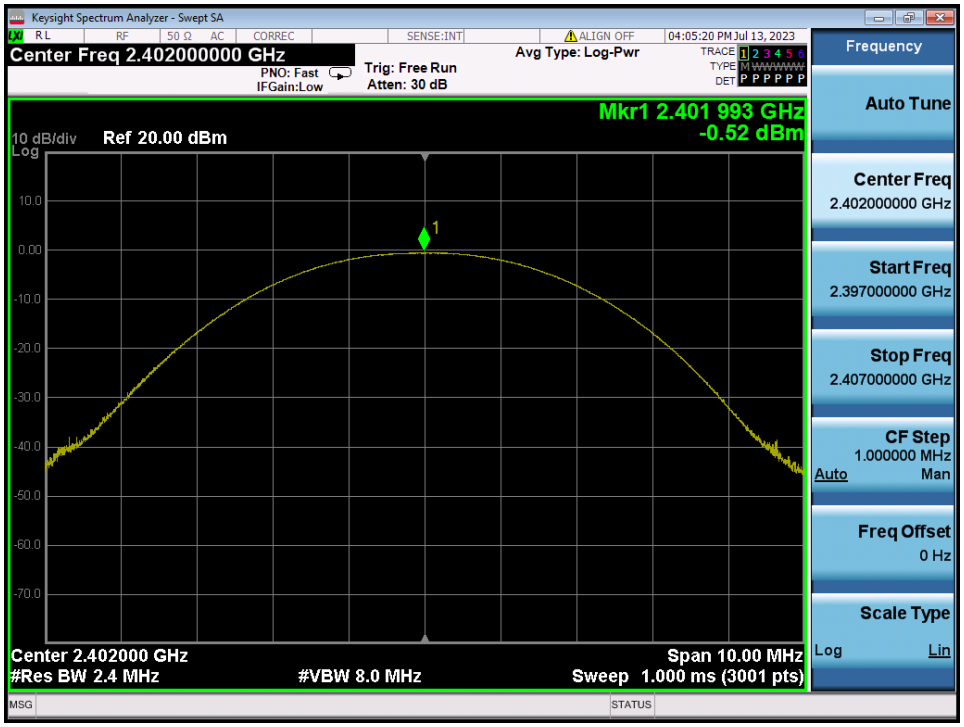
Peak Output Power TM 4 Test Channel : Middle



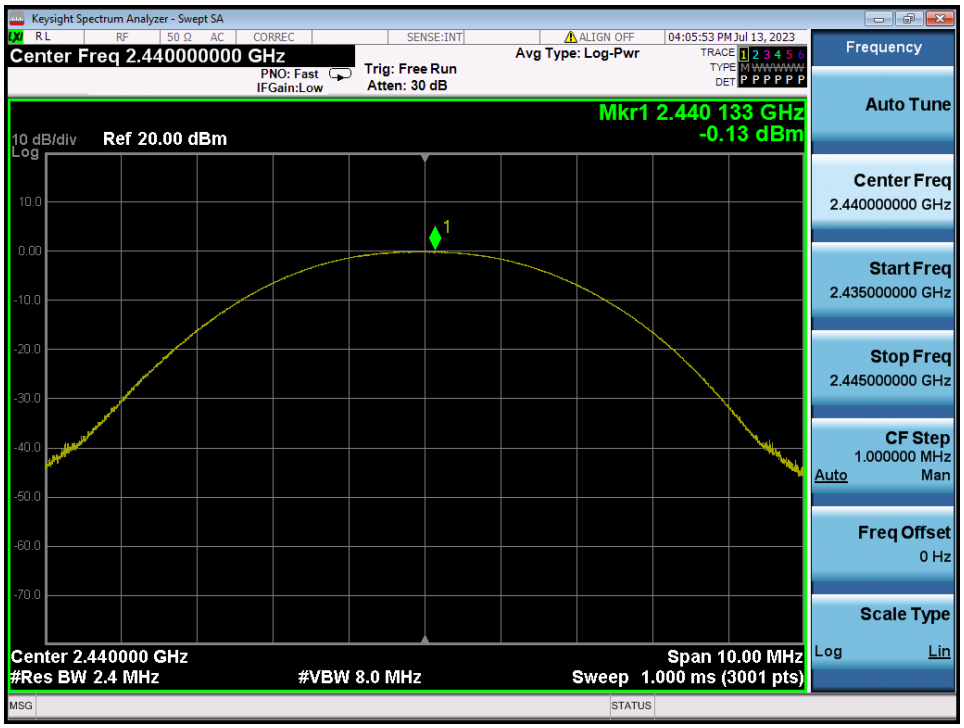
Peak Output Power TM 4 Test Channel : Highest



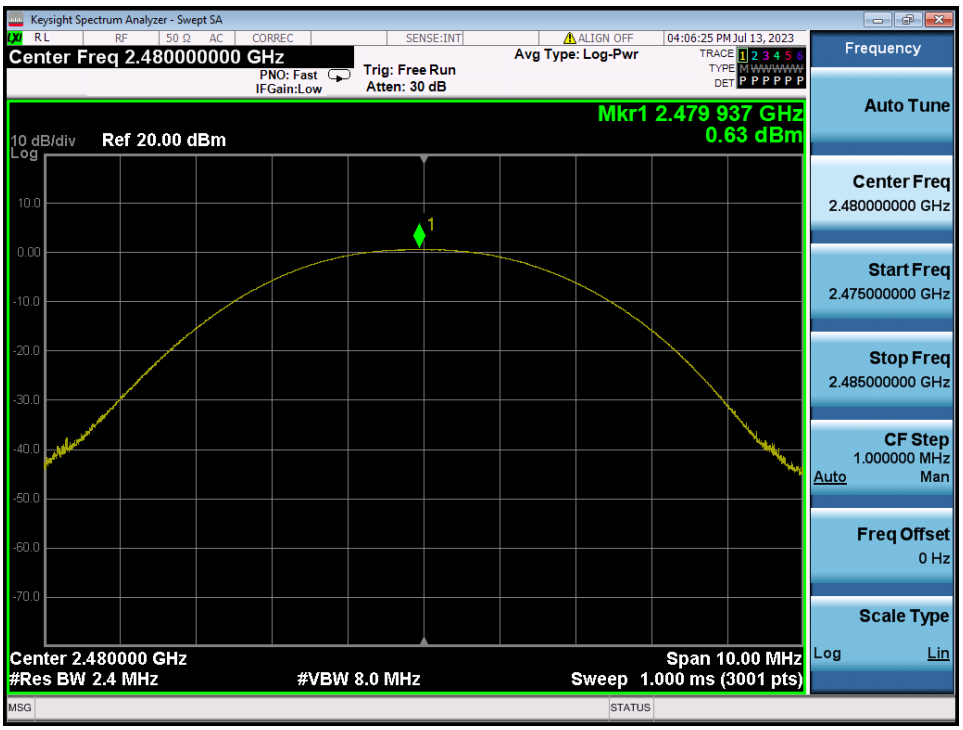
Peak Output Power TM 5 Test Channel : Lowest



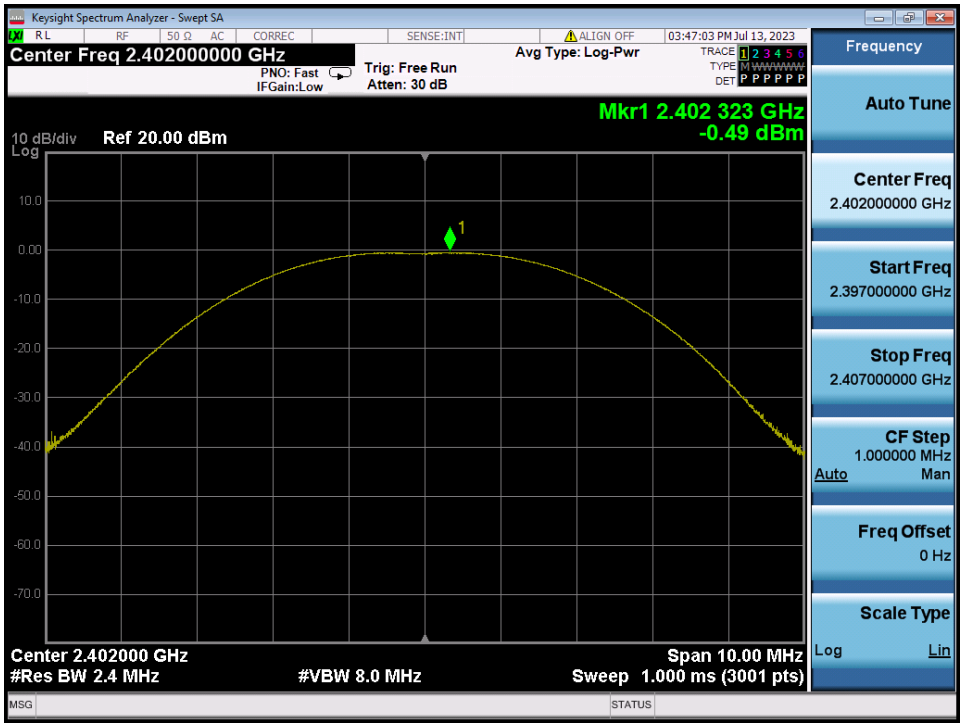
Peak Output Power TM 5 Test Channel : Middle



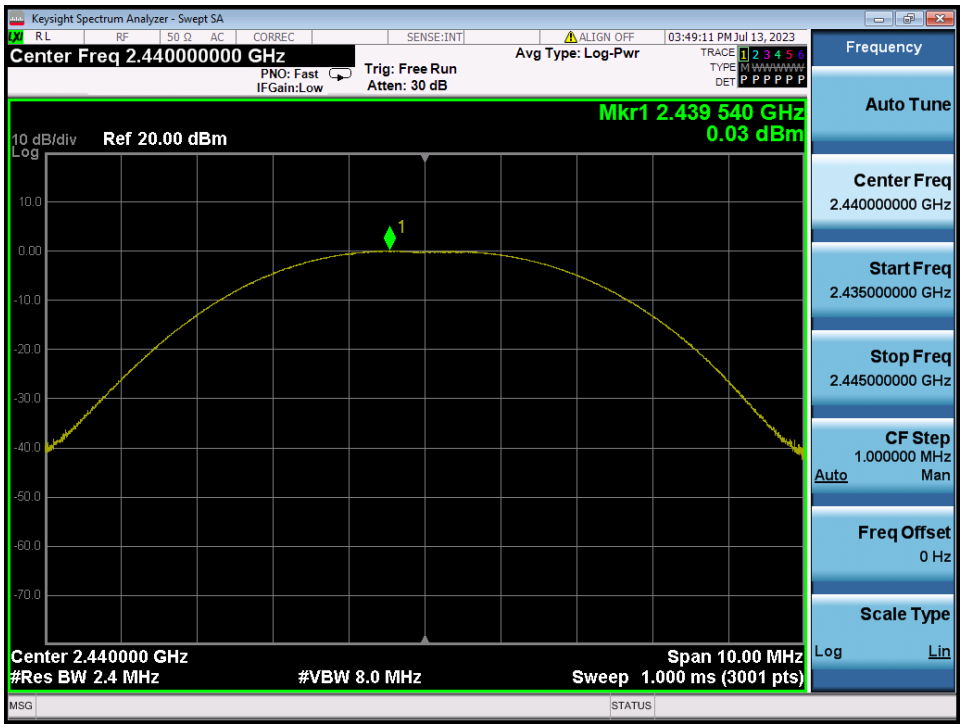
Peak Output Power TM 5 Test Channel : Highest



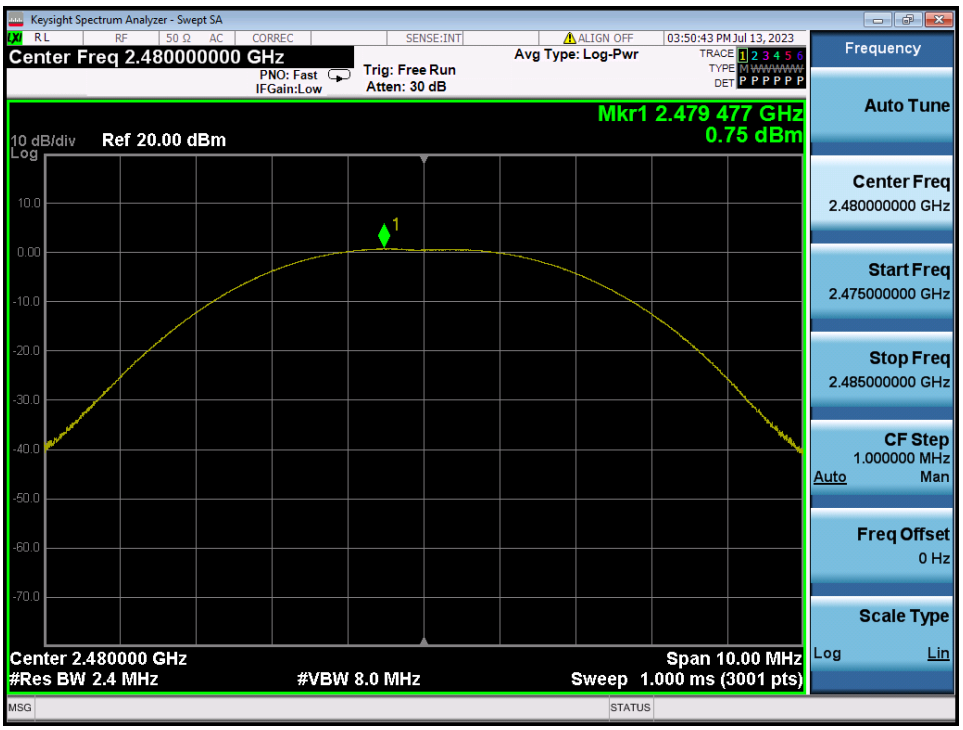
Peak Output Power TM 6 Test Channel : Lowest



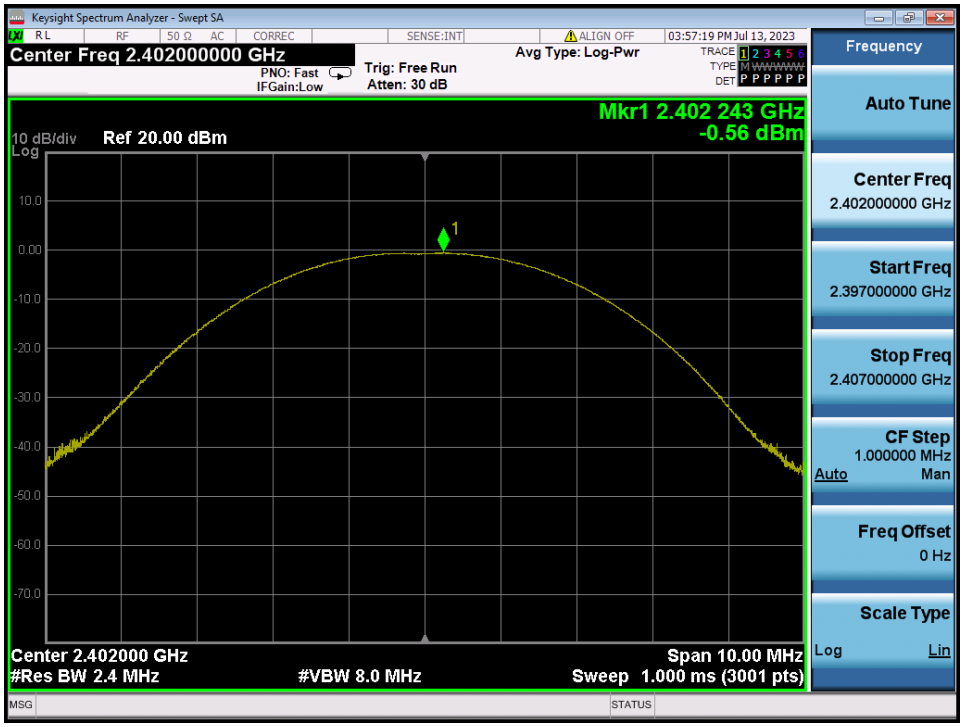
Peak Output Power TM 6 Test Channel : Middle



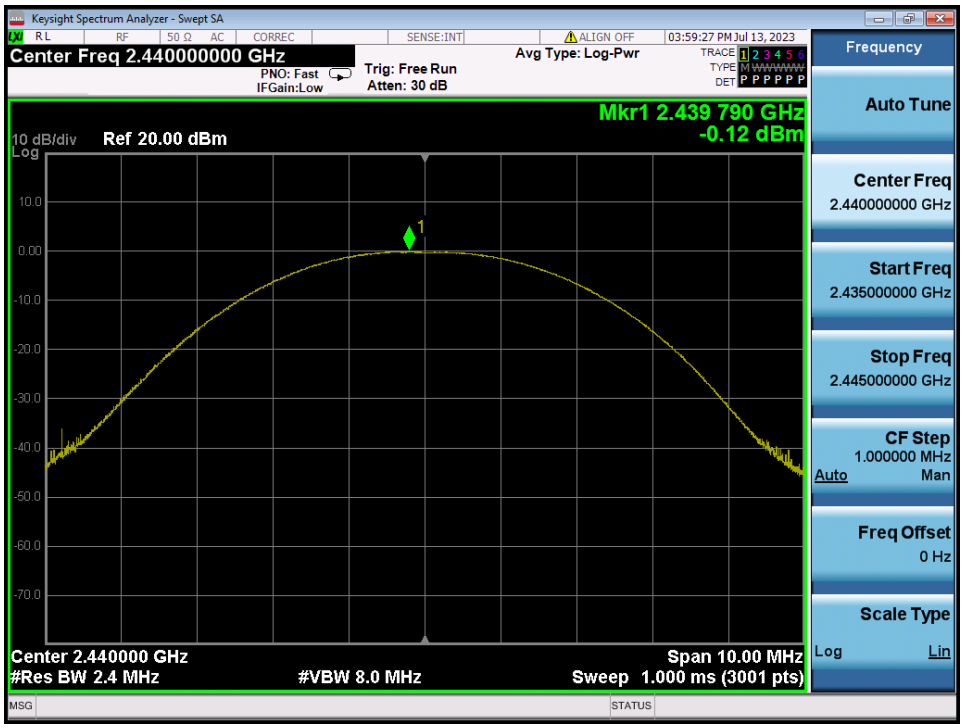
Peak Output Power TM 6 Test Channel : Highest



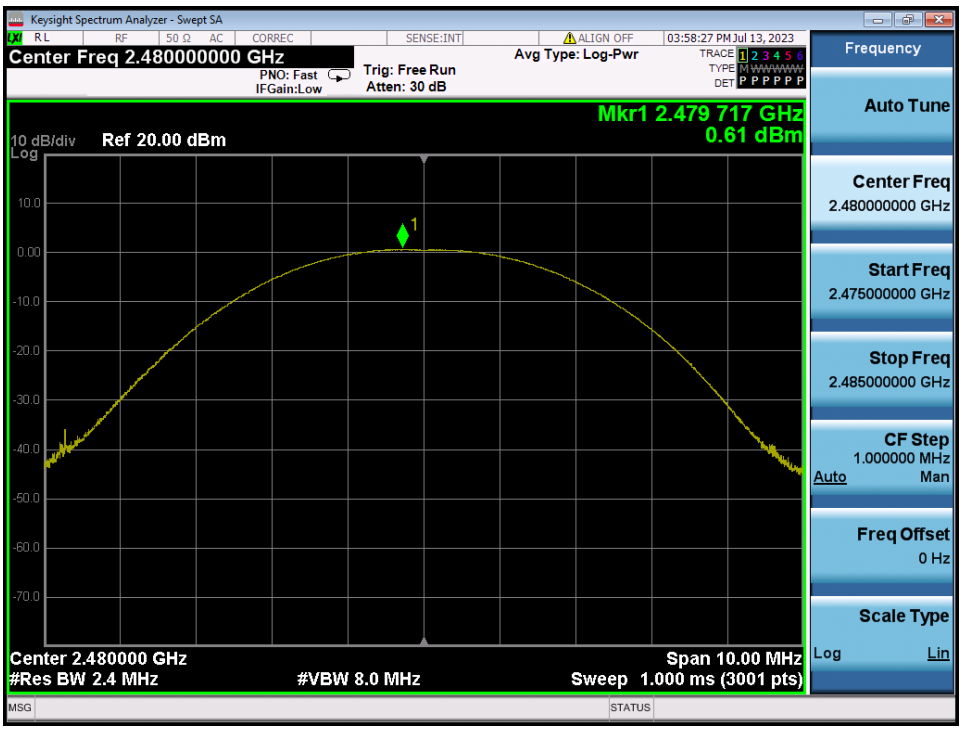
Peak Output Power TM 7 Test Channel : Lowest



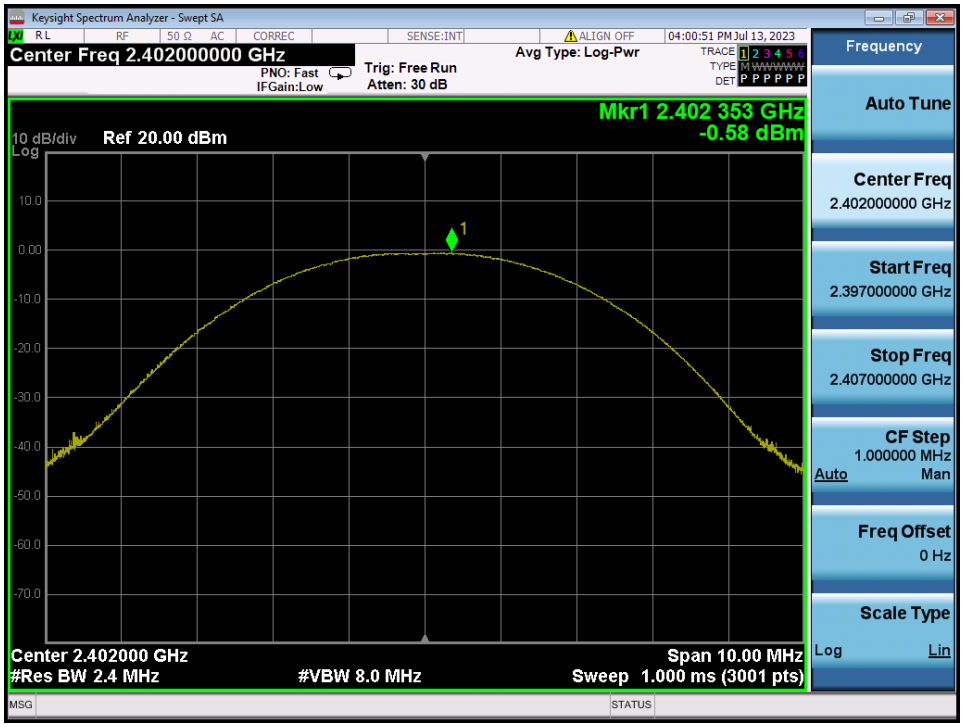
Peak Output Power TM 7 Test Channel : Middle



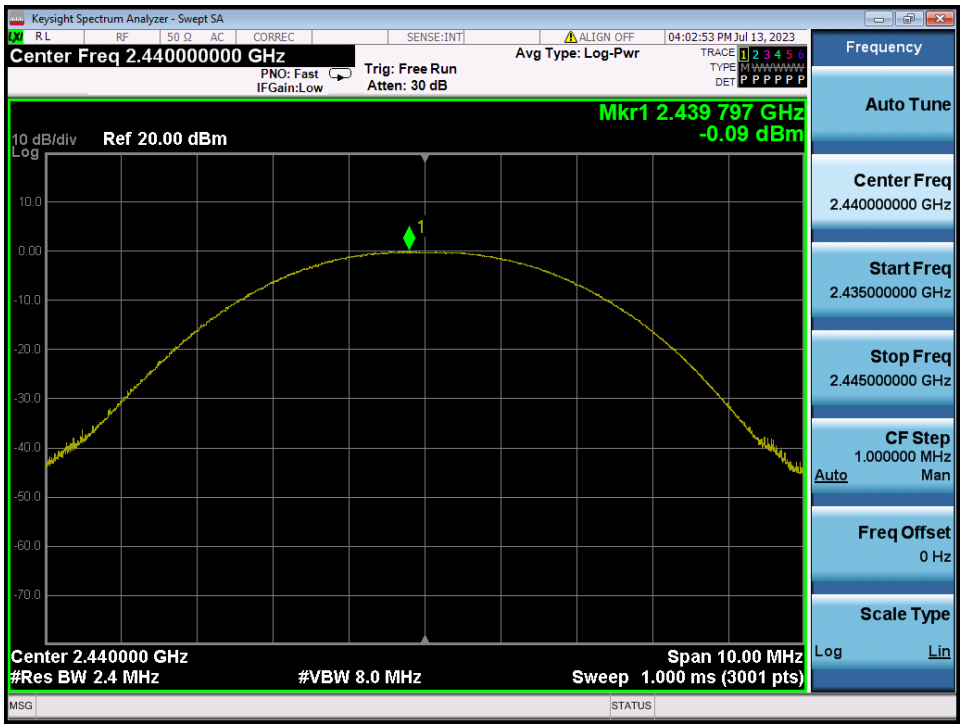
Peak Output Power TM 7 Test Channel : Highest



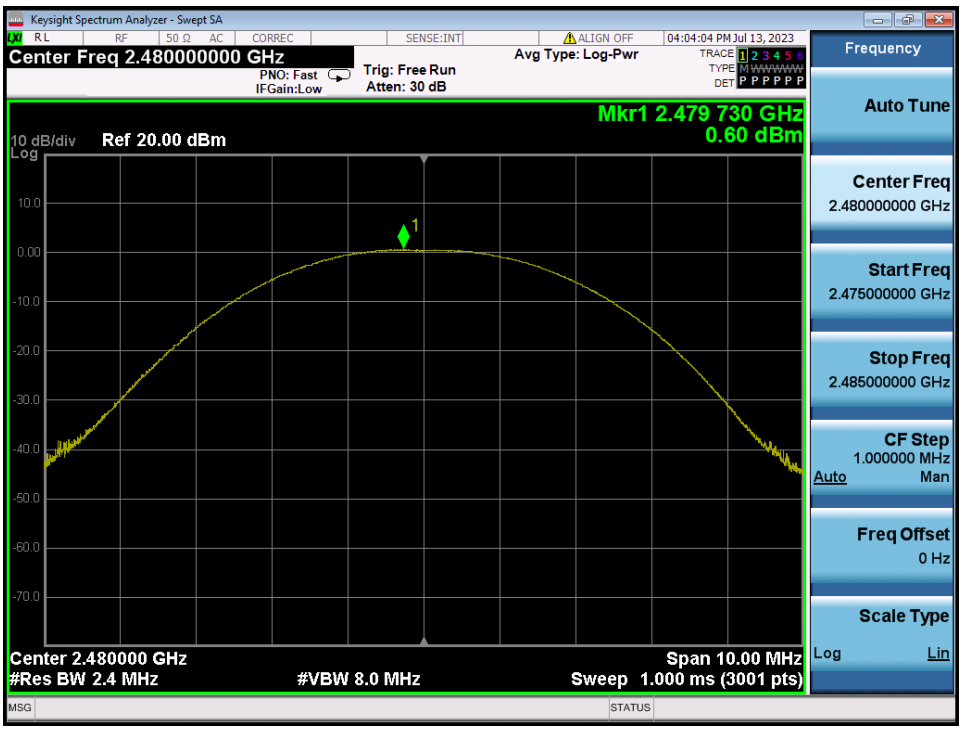
Peak Output Power TM 8 Test Channel : Lowest



Peak Output Power TM 8 Test Channel : Middle



Peak Output Power TM 8 Test Channel : Highest



5.2. 6 dB Bandwidth

▣ Test Requirements and limit, Part 15.247(a) & RSS-247 [5.2]

The bandwidth at 6 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the EUT's antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6 dB bandwidth is 500 kHz.

5.2.1. Test Setup

Refer to the APPENDIX I.

5.2.2. Test Procedures

- **KDB558074 D01v05r02 - Section 8.2**
- **ANSI C63.10-2013 – Section 11.8.2**

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = **Peak**.
4. Trace mode = **max hold**.
5. Sweep = **auto couple**.
6. Allow the trace to stabilize.
7. Option 1 - Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

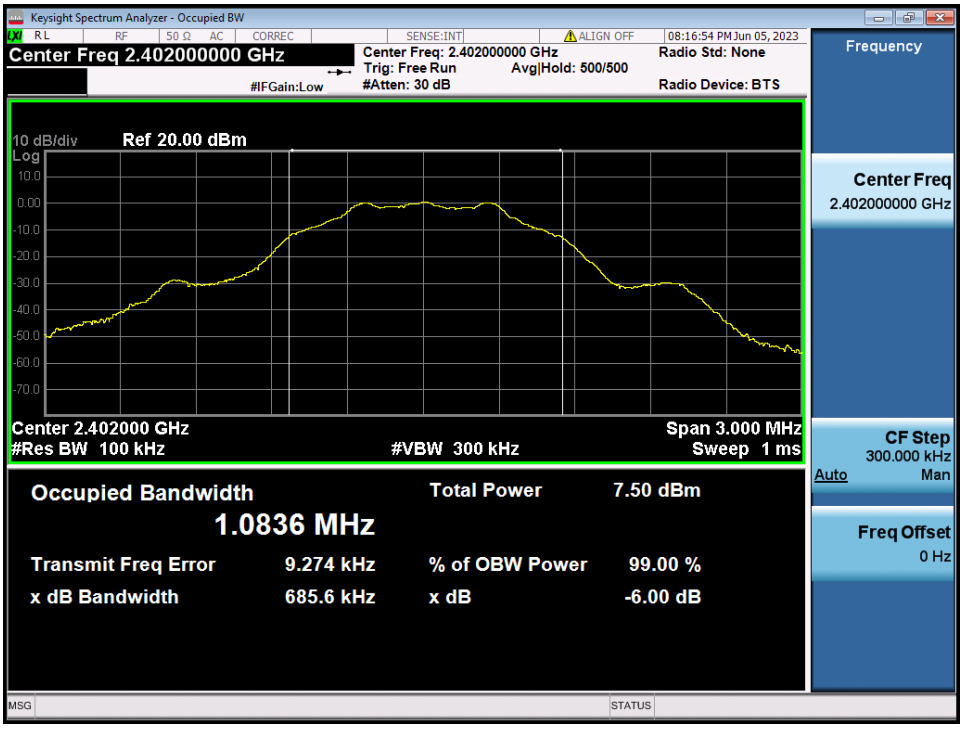
   Option 2 - The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

5.2.3. Test Results

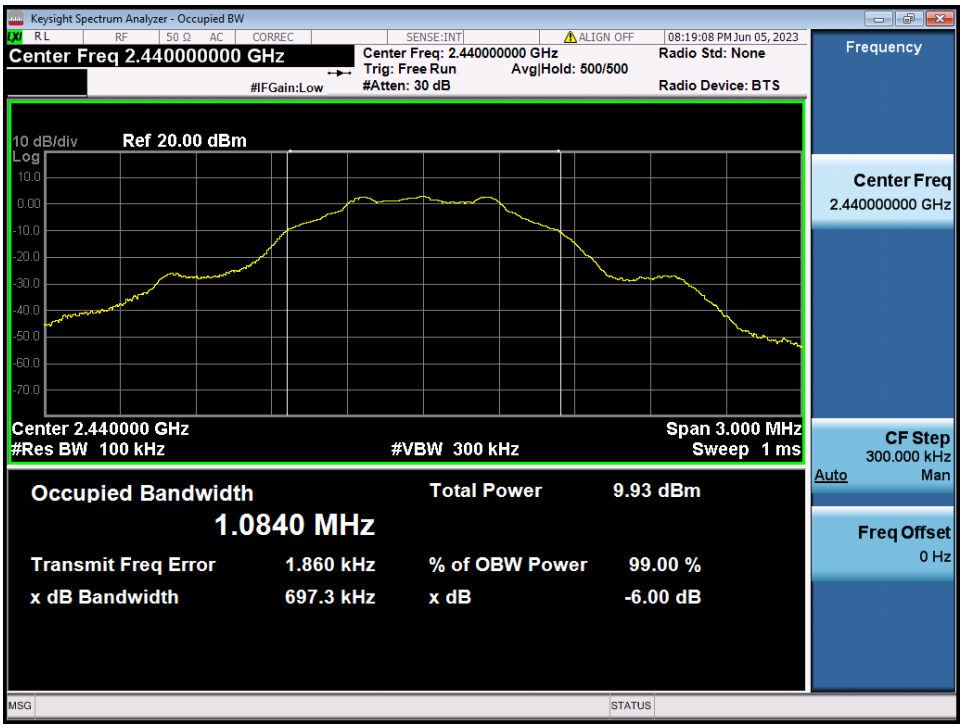
Test Mode	Tested Channel	Test Results (MHz)
TM 1	Lowest	0.686
	Middle	0.697
	Highest	0.708
TM 2	Lowest	1.334
	Middle	1.349
	Highest	1.326
TM 3	Lowest	0.667
	Middle	0.665
	Highest	0.668
TM 4	Lowest	0.699
	Middle	0.694
	Highest	0.697

Test Mode	Tested Channel	Test Results (MHz)
TM 5	Lowest	0.685
	Middle	0.686
	Highest	0.694
TM 6	Lowest	1.358
	Middle	1.356
	Highest	1.369
TM 7	Lowest	0.668
	Middle	0.667
	Highest	0.668
TM 8	Lowest	0.691
	Middle	0.697
	Highest	0.689

6 dB Bandwidth TM 1 Test Channel : Lowest

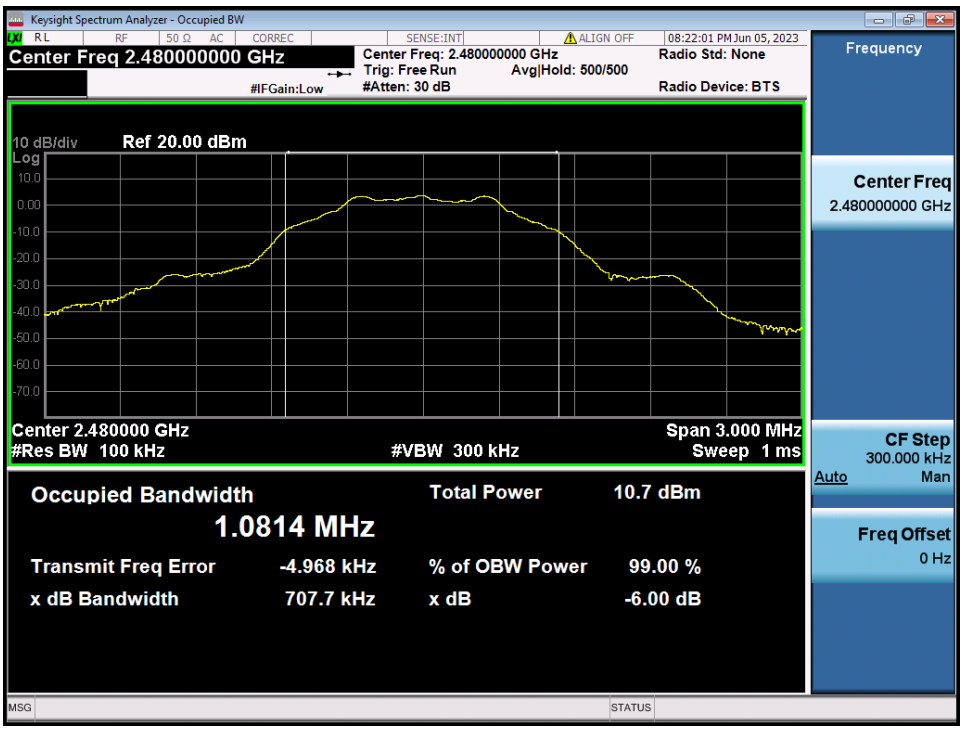


6 dB Bandwidth TM 1 Test Channel : Middle

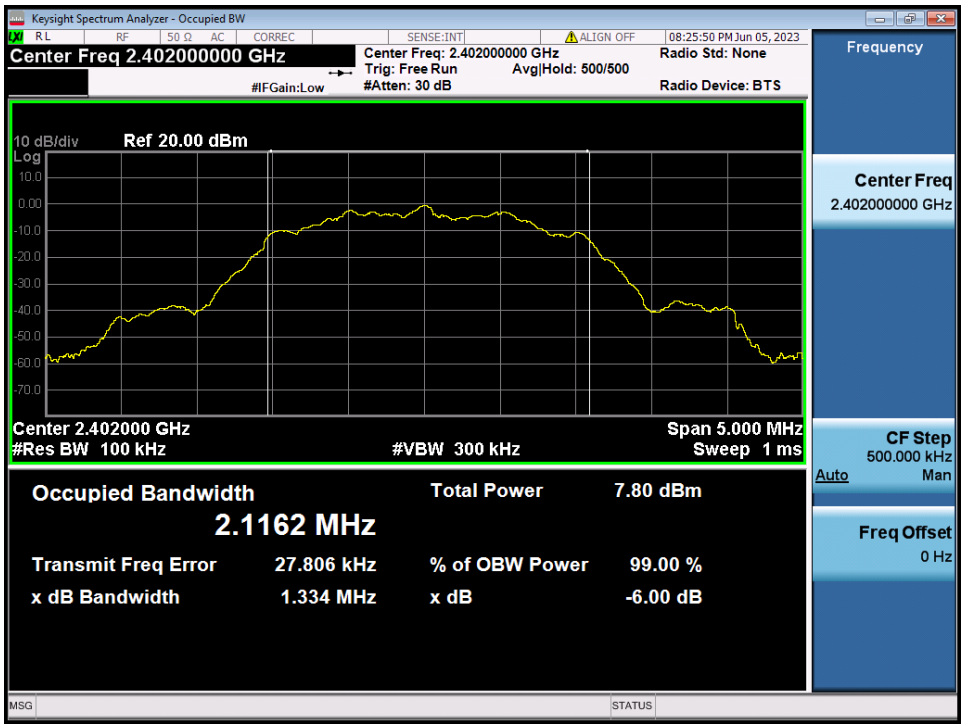


6 dB Bandwidth

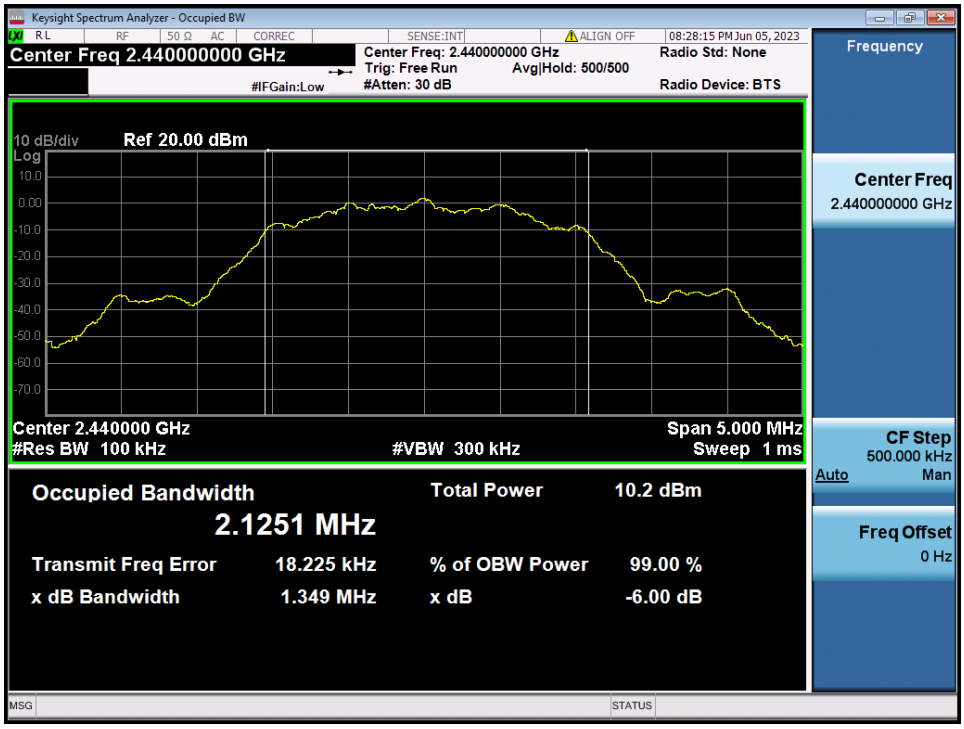
TM 1 Test Channel : Highest



6 dB Bandwidth TM 2 Test Channel : Lowest

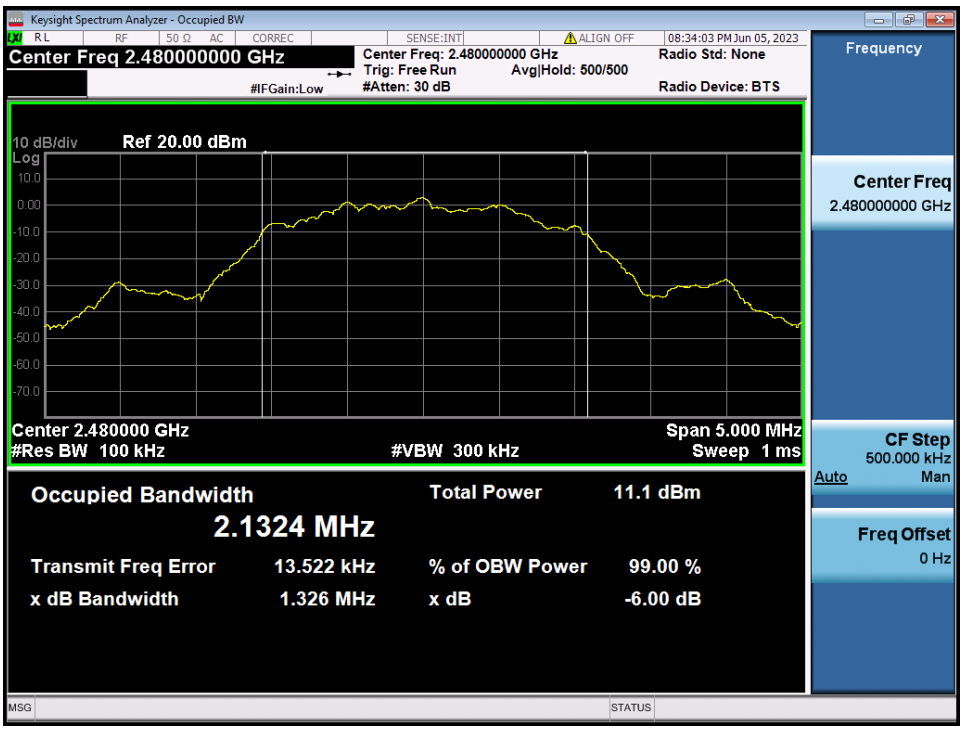


6 dB Bandwidth TM 2 Test Channel : Middle



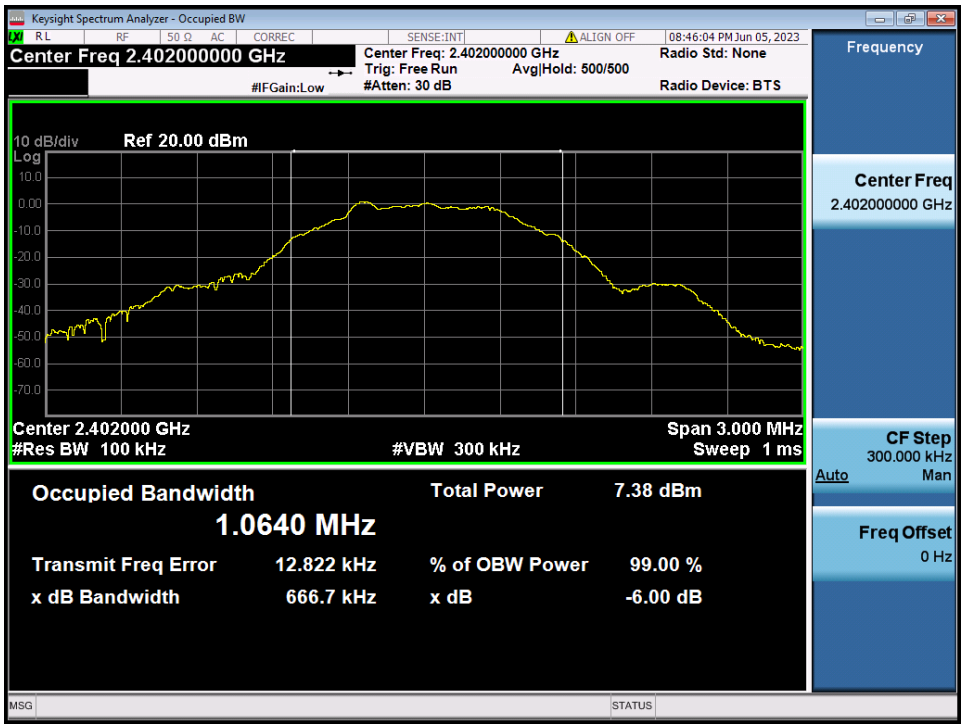
6 dB Bandwidth

TM 2 Test Channel : Highest



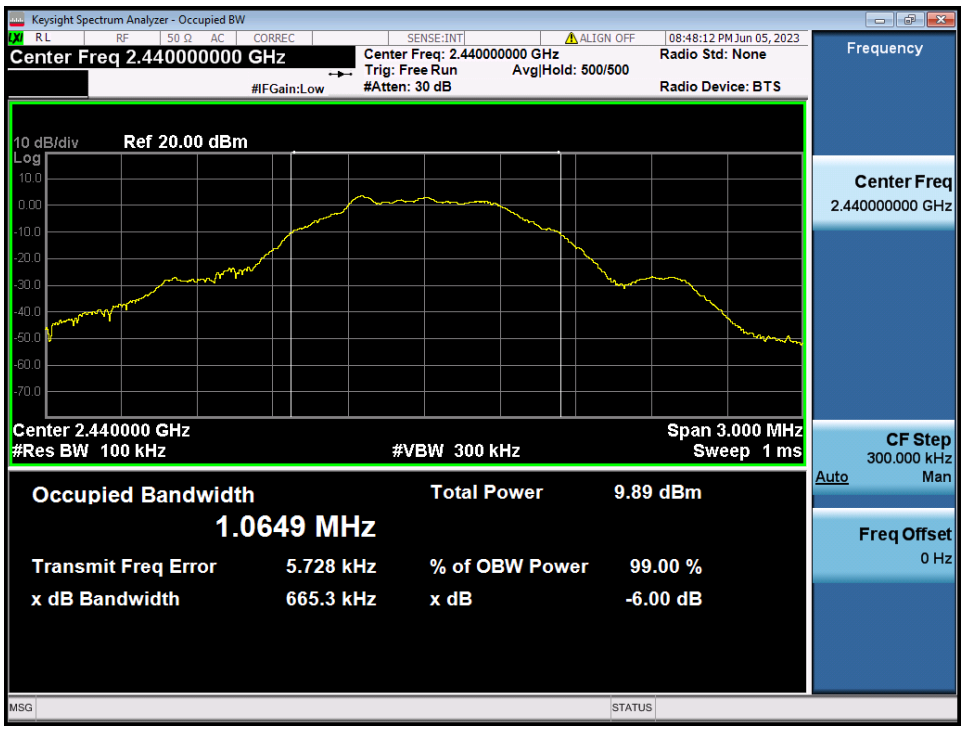
6 dB Bandwidth

TM 3 Test Channel : Lowest

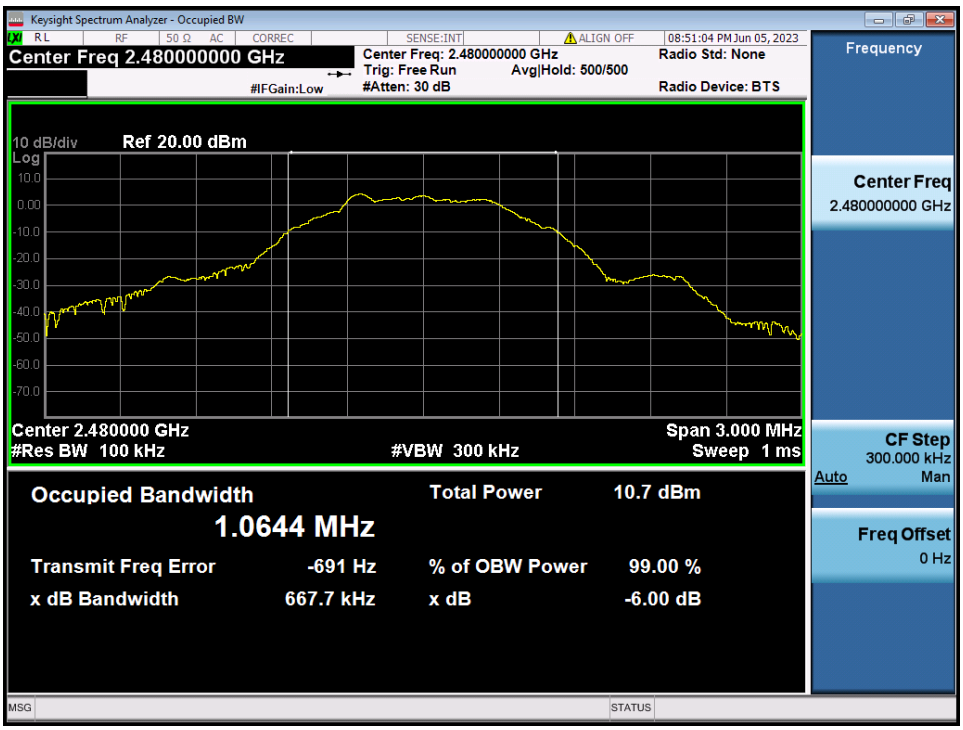


6 dB Bandwidth

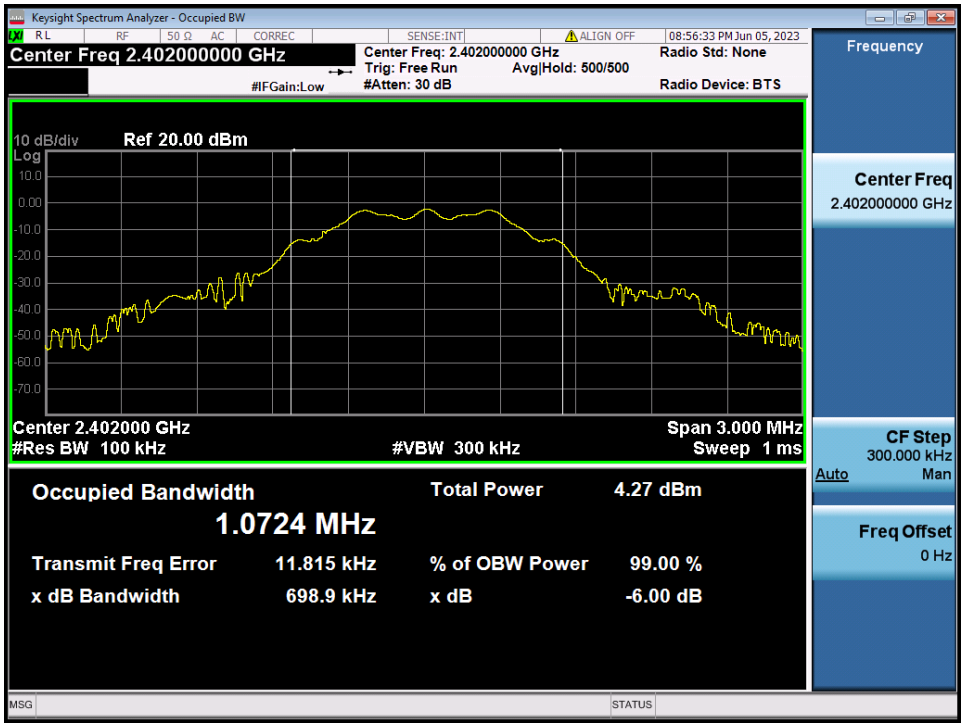
TM 3 Test Channel : Middle



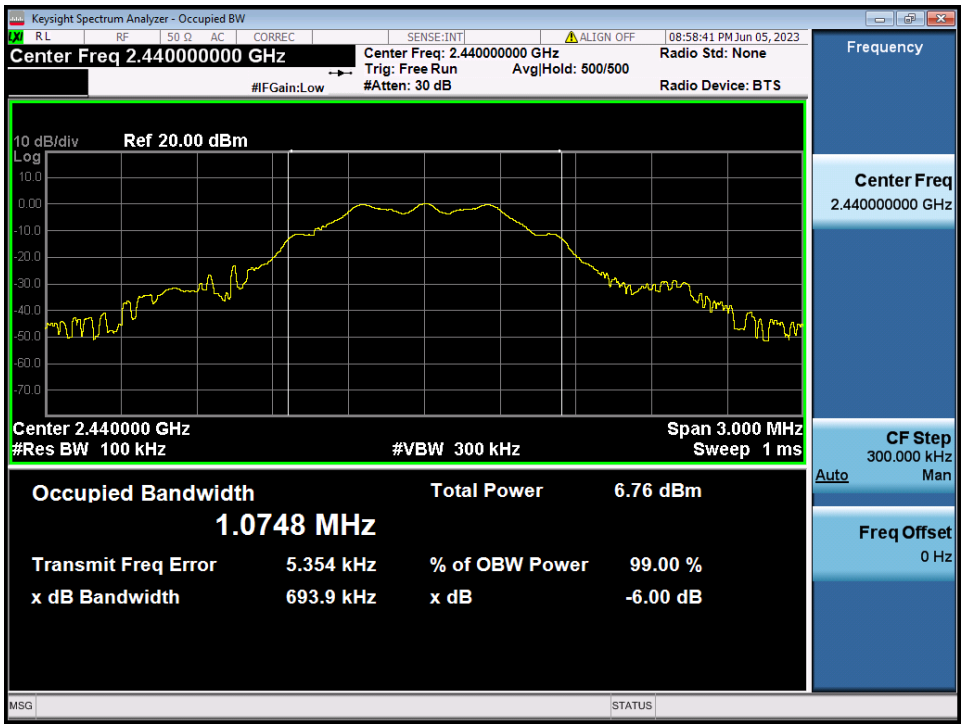
6 dB Bandwidth TM 3 Test Channel : Highest



6 dB Bandwidth TM 4 Test Channel : Lowest

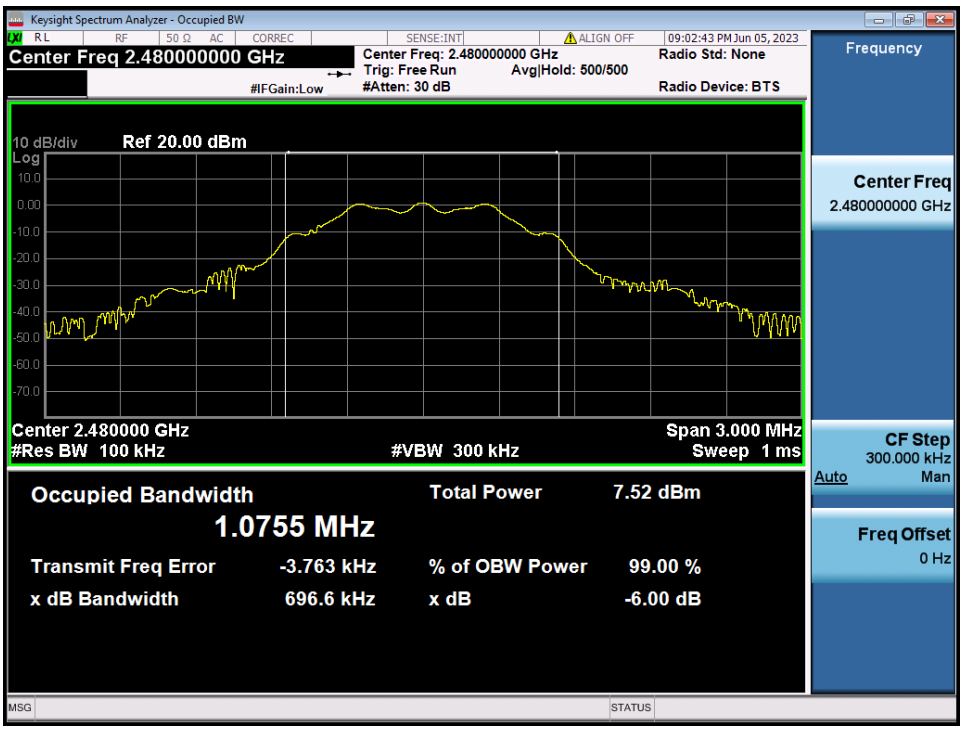


6 dB Bandwidth TM 4 Test Channel : Middle



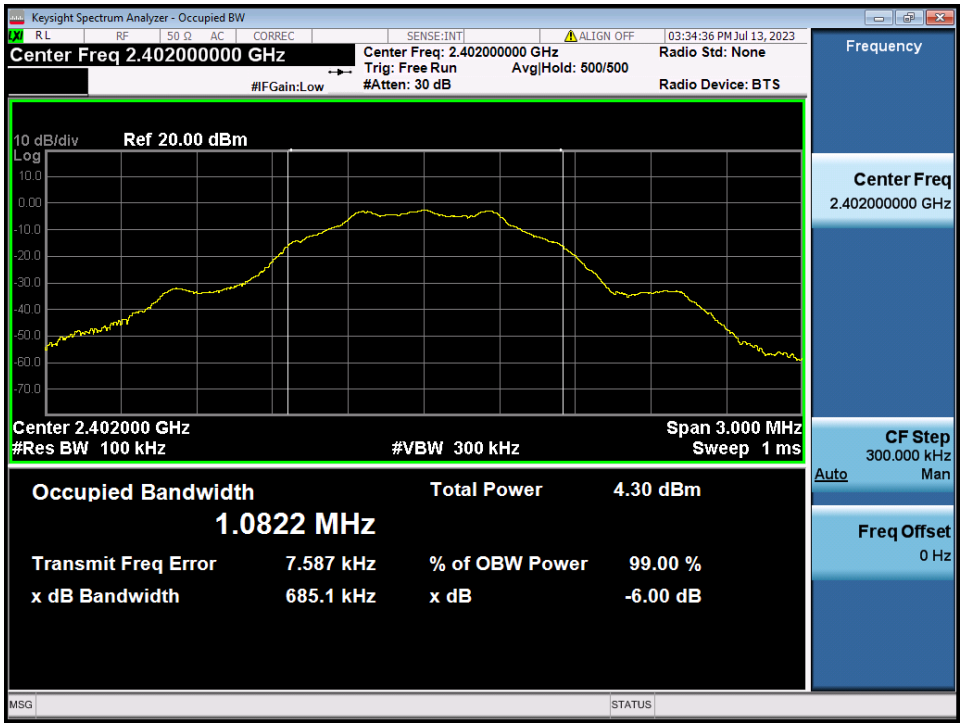
6 dB Bandwidth

TM 4 Test Channel : Highest



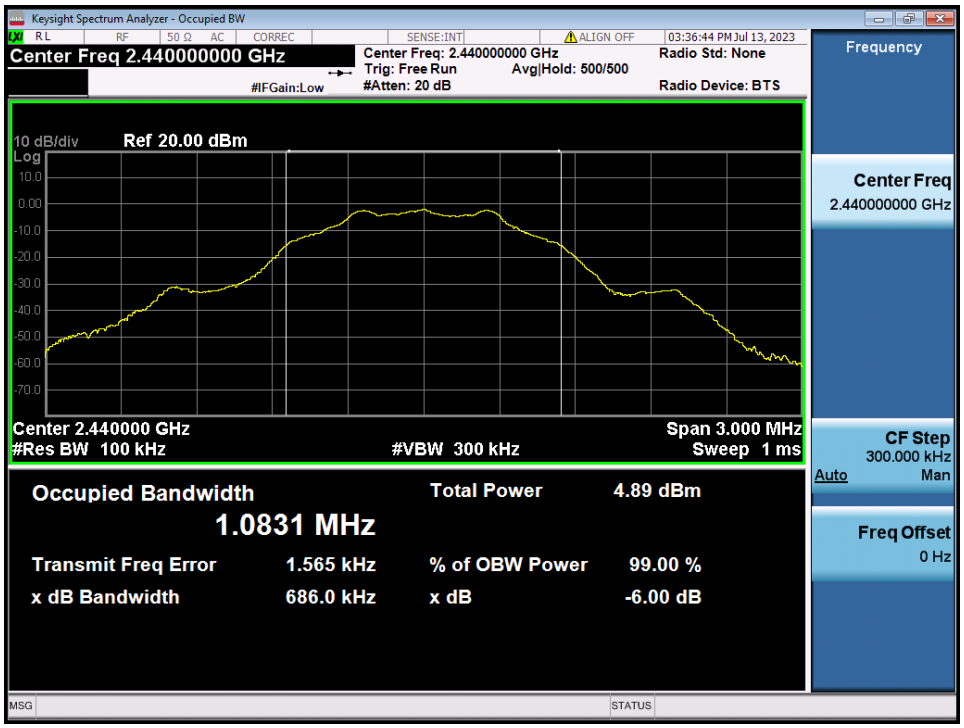
6 dB Bandwidth

TM 5 Test Channel : Lowest



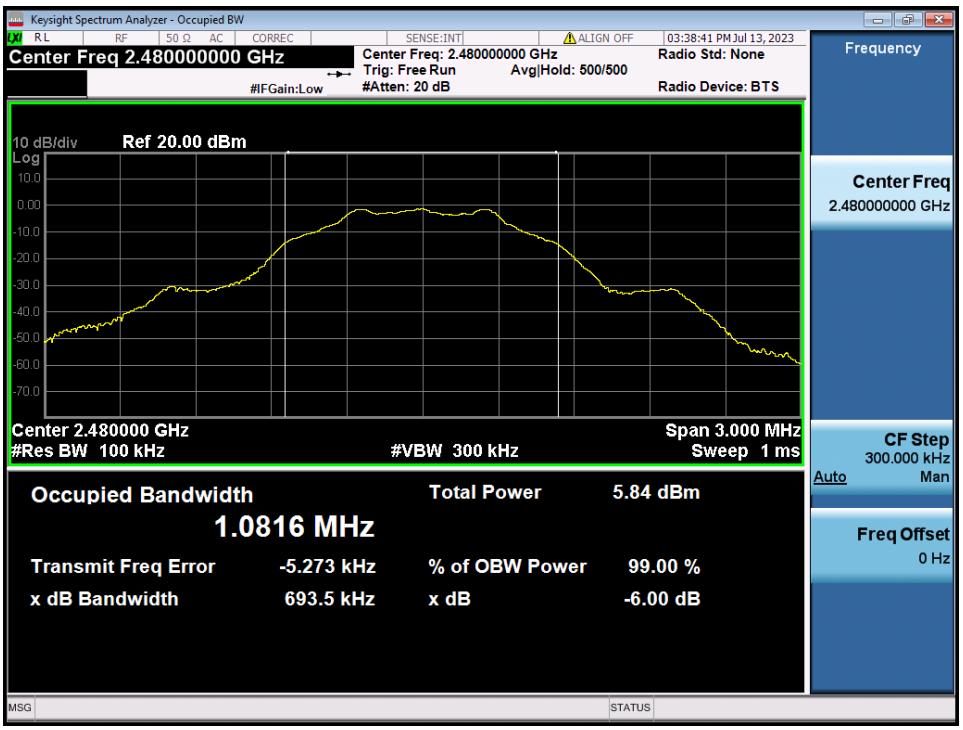
6 dB Bandwidth

TM 5 Test Channel : Middle

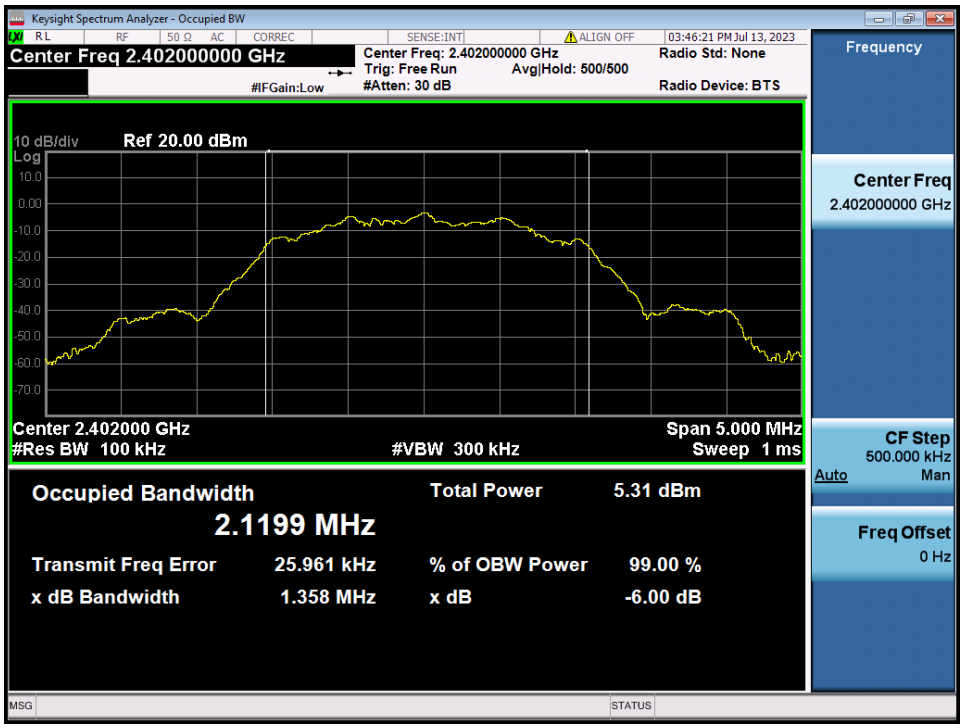


6 dB Bandwidth

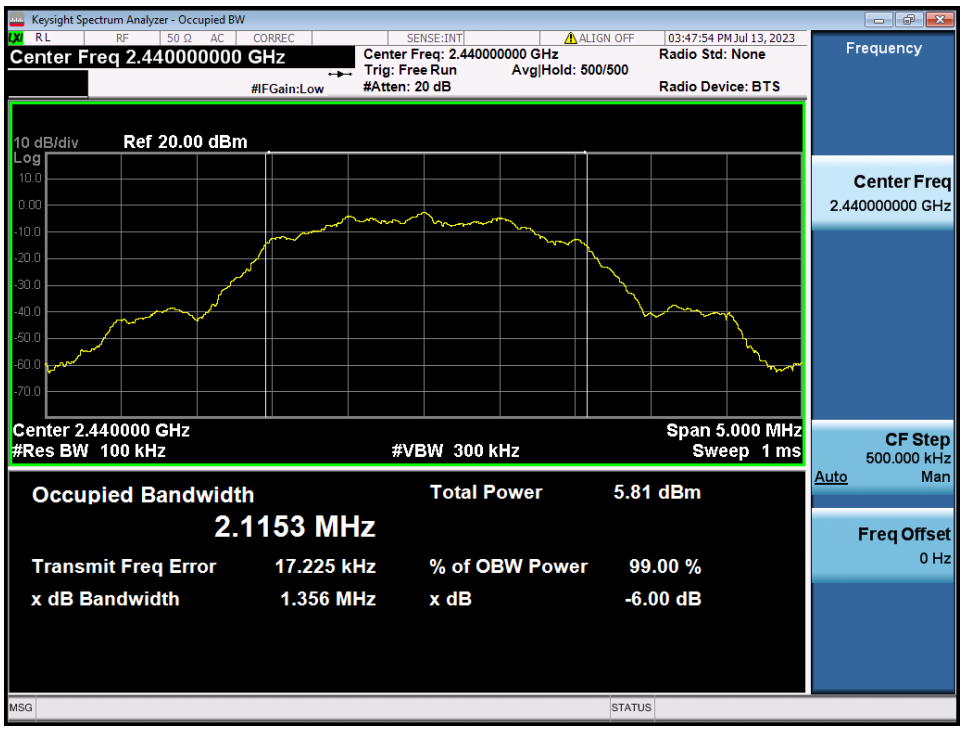
TM 5 Test Channel : Highest



6 dB Bandwidth TM 6 Test Channel : Lowest

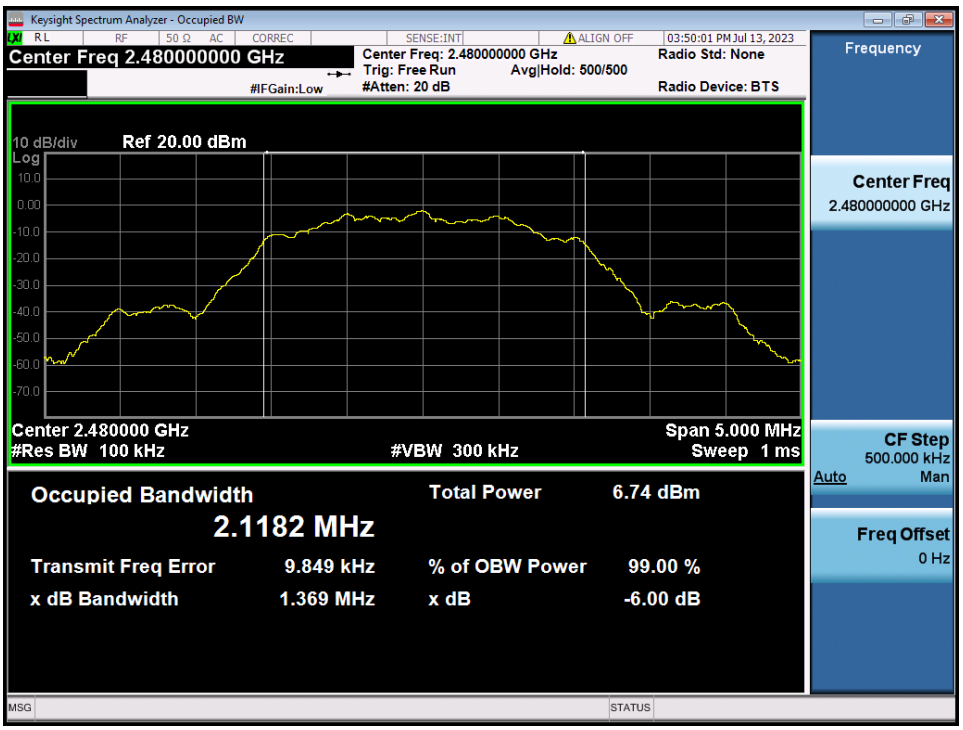


6 dB Bandwidth TM 6 Test Channel : Middle

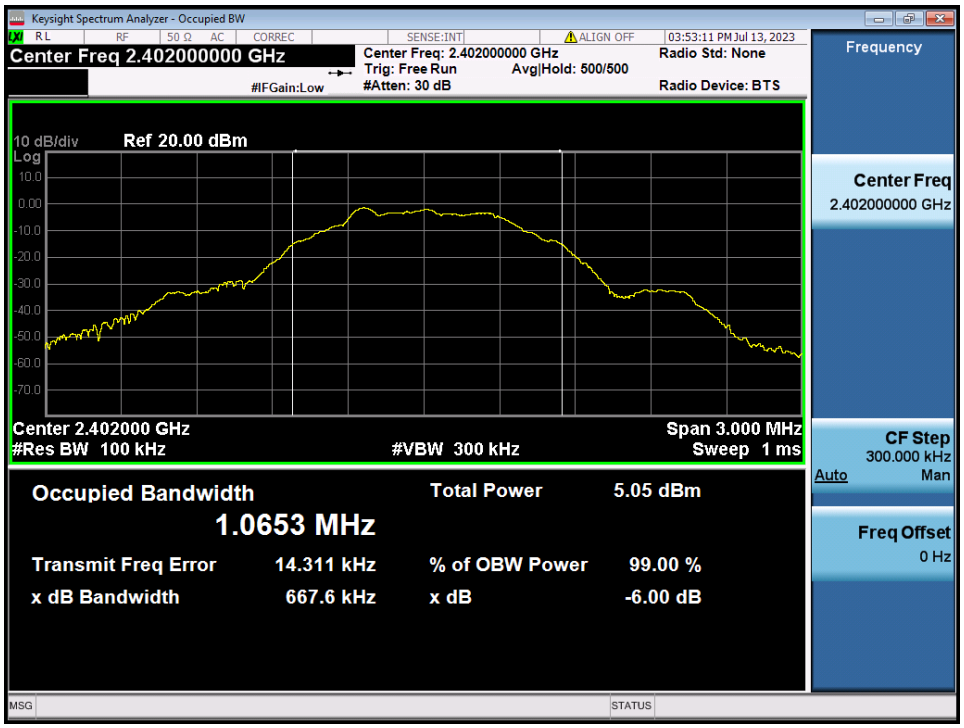


6 dB Bandwidth

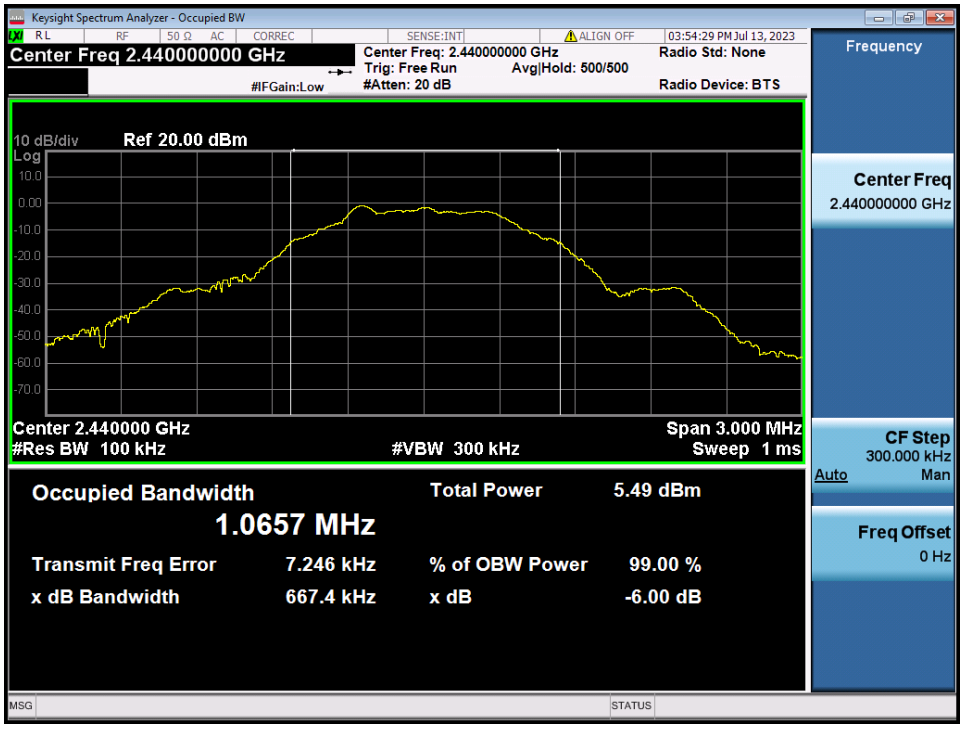
TM 6 Test Channel : Highest



6 dB Bandwidth TM 7 Test Channel : Lowest

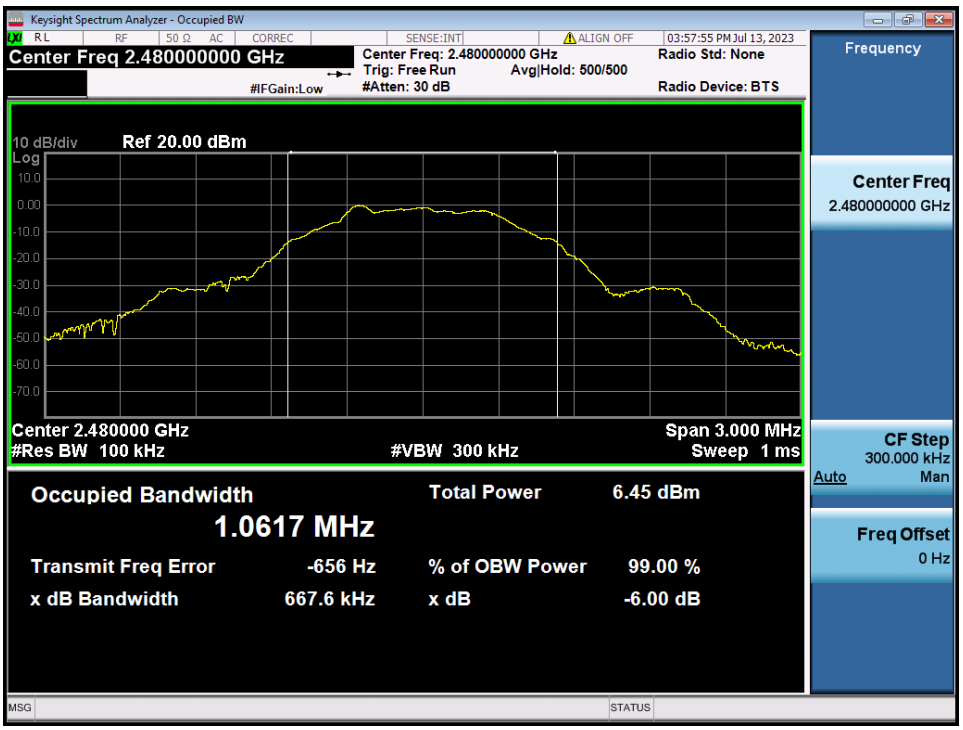


6 dB Bandwidth TM 7 Test Channel : Middle

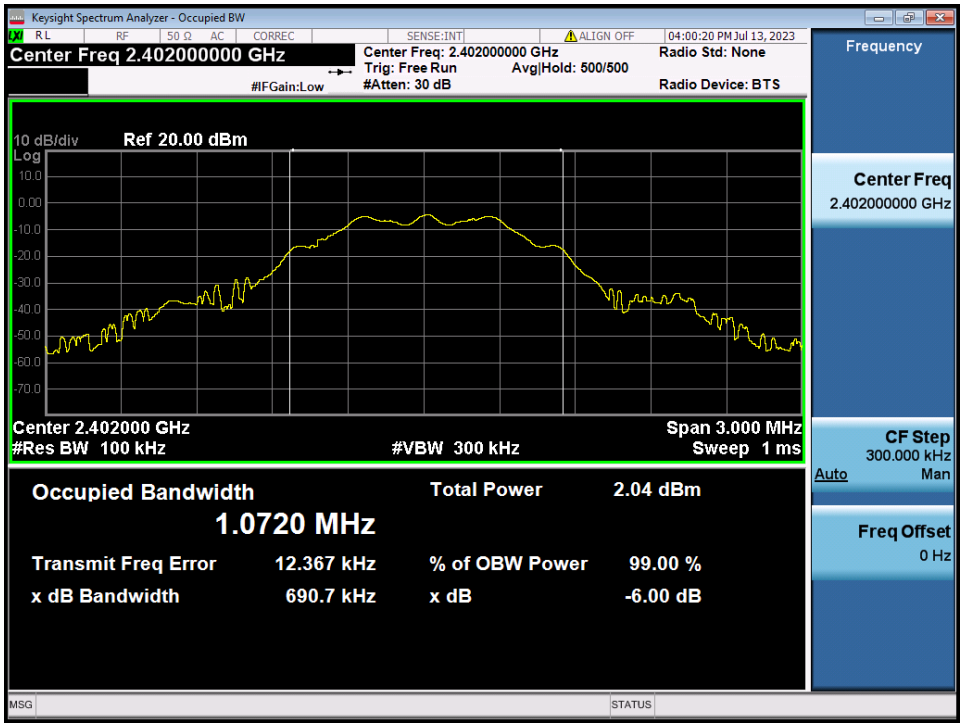


6 dB Bandwidth

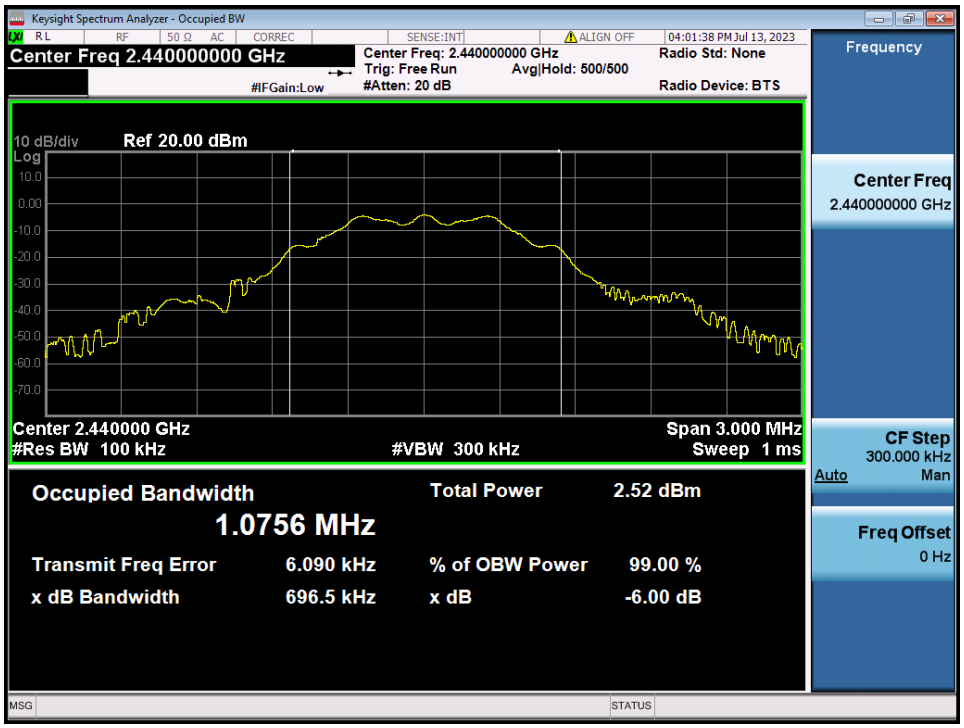
TM 7 Test Channel : Highest



6 dB Bandwidth TM 8 Test Channel : Lowest

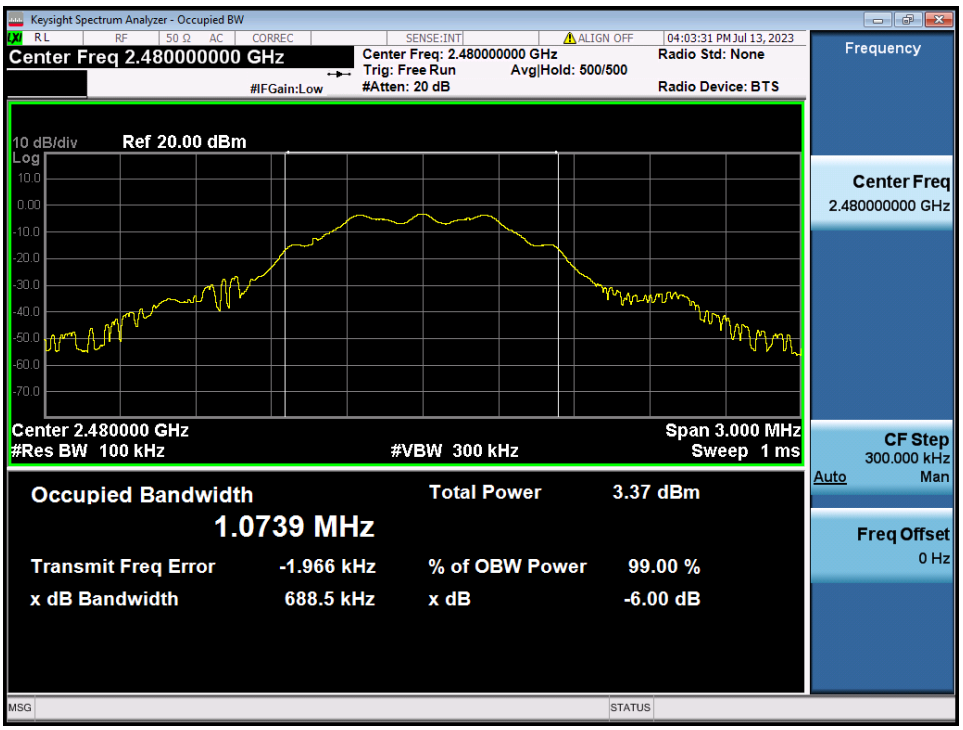


6 dB Bandwidth TM 8 Test Channel : Middle



6 dB Bandwidth

TM 8 Test Channel : Highest



5.3. Power Spectral Density

▣ Test requirements and limit, Part 15.247(e) & RSS-247 [5.2]

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.3.1. Test Setup

Refer to the APPENDIX I.

5.3.2. Test Procedures

- **KDB558074 D01v05r02 - Section 8.4**
- **ANSI C63.10-2013 – Section 11.10.2**

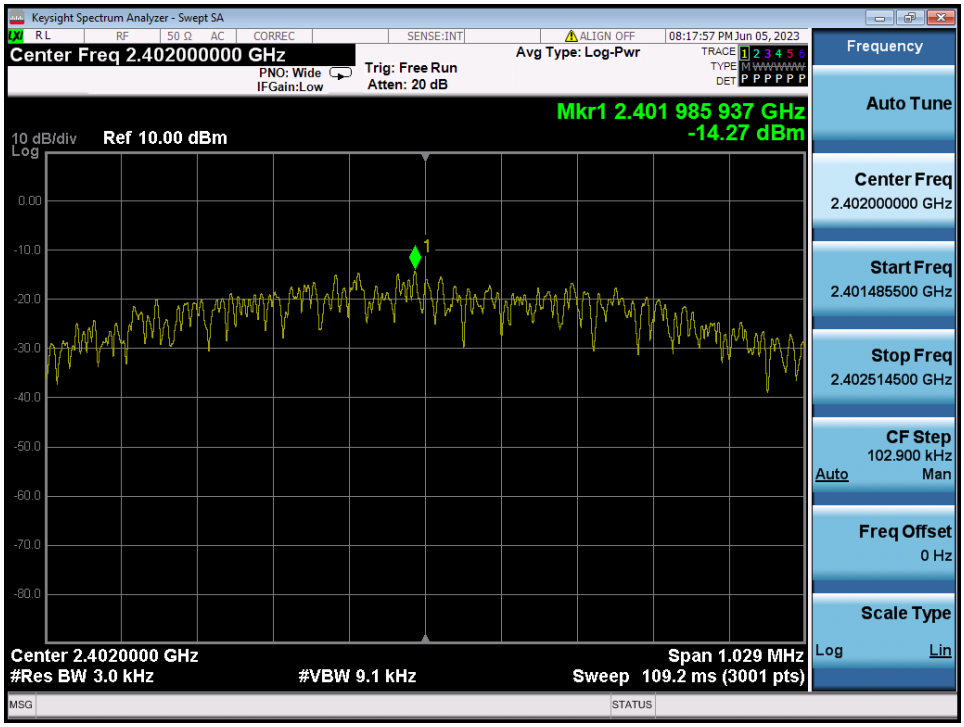
Method PKPSD (peak PSD)

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to **1.5 times** the DTS bandwidth.
3. Set the RBW : **3 kHz ≤ RBW ≤ 100 kHz**.
4. Set the VBW ≥ **3 x RBW.**
5. Detector = **peak.**
6. Sweep time = **auto couple.**
7. Trace mode = **max hold.**
8. Allow trace to fully stabilize.
9. Use the **peak marker function** to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

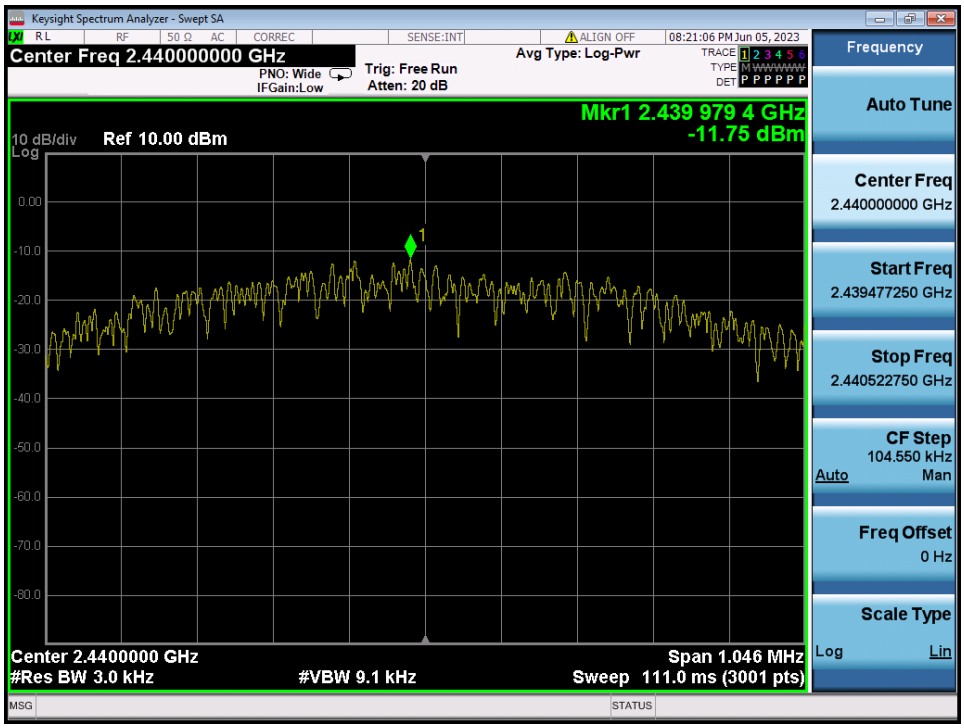
5.3.3. Test Results

Test Mode	Tested Channel	RBW	PKPSD (dBm)	Limit (dBm / 3 kHz)
TM 1	Lowest	3 kHz	-14.27	8.00
	Middle	3 kHz	-11.75	8.00
	Highest	3 kHz	-11.02	8.00
TM 2	Lowest	3 kHz	-17.10	8.00
	Middle	3 kHz	-14.54	8.00
	Highest	3 kHz	-13.59	8.00
TM 3	Lowest	3 kHz	-5.21	8.00
	Middle	3 kHz	-2.73	8.00
	Highest	3 kHz	-1.92	8.00
TM 4	Lowest	3 kHz	-5.09	8.00
	Middle	3 kHz	-2.71	8.00
	Highest	3 kHz	-1.88	8.00

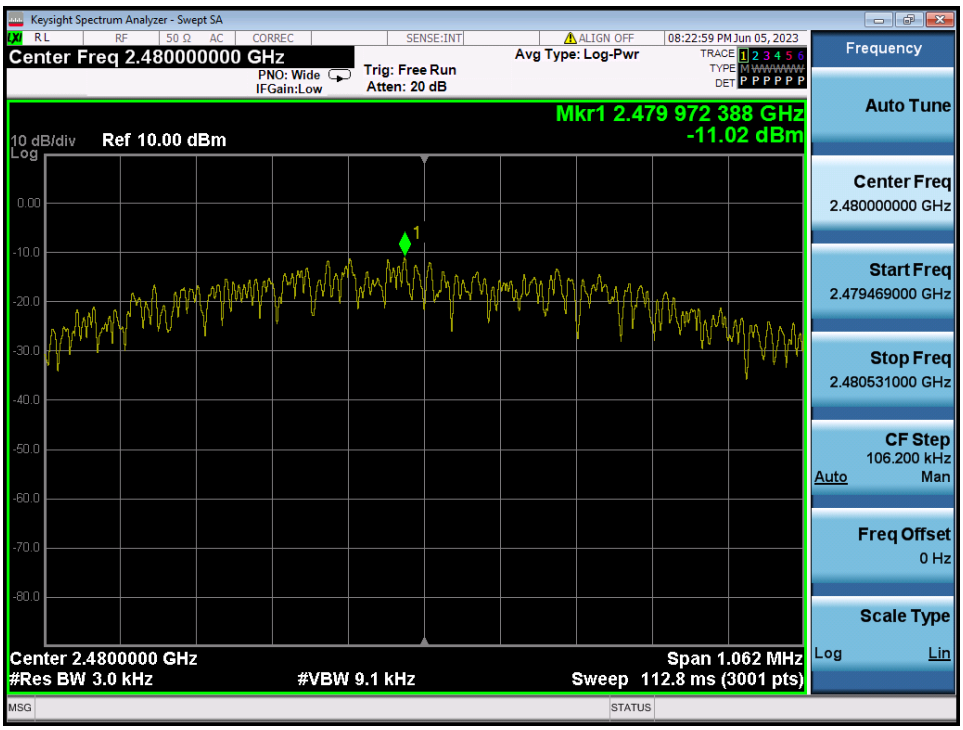
Maximum PKPSD TM 1 Test Channel : Lowest



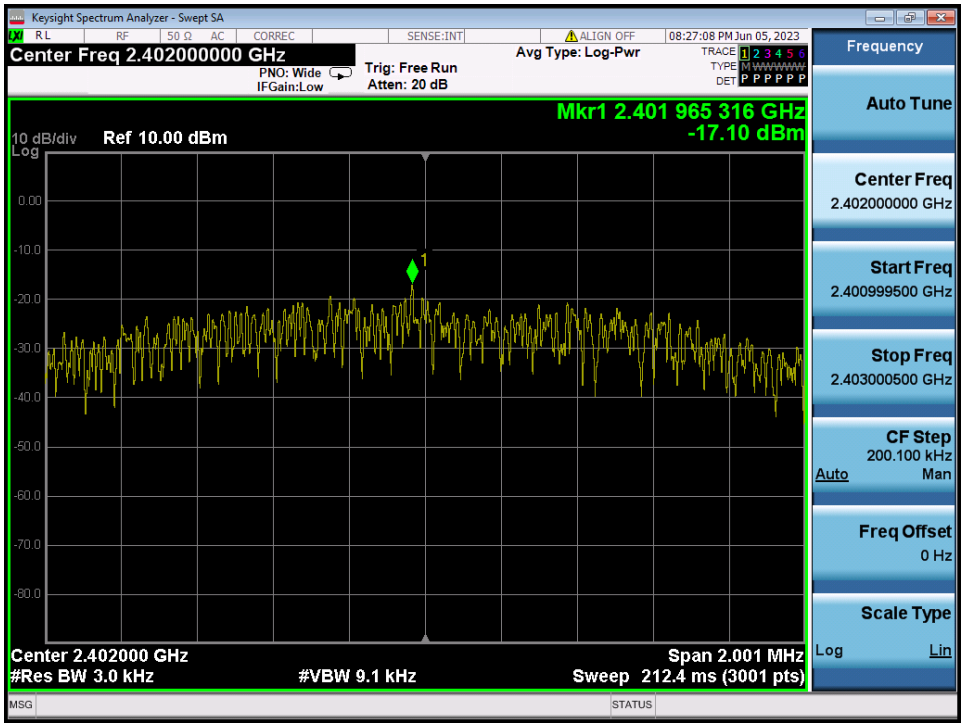
Maximum PKPSD TM 1 Test Channel : Middle



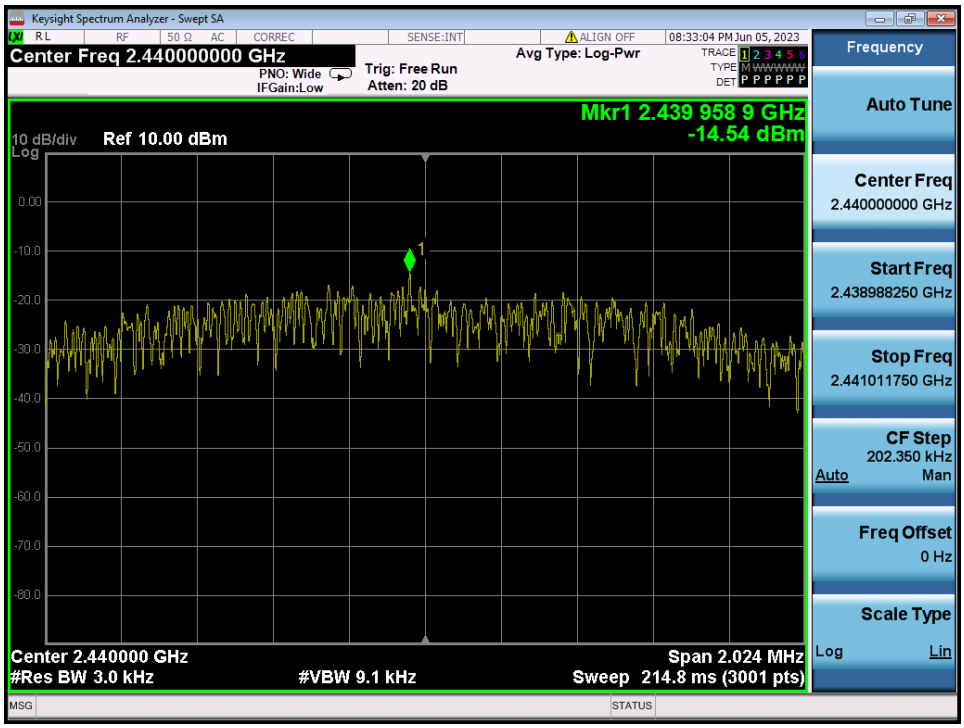
Maximum PKPSD TM 1 Test Channel : Highest



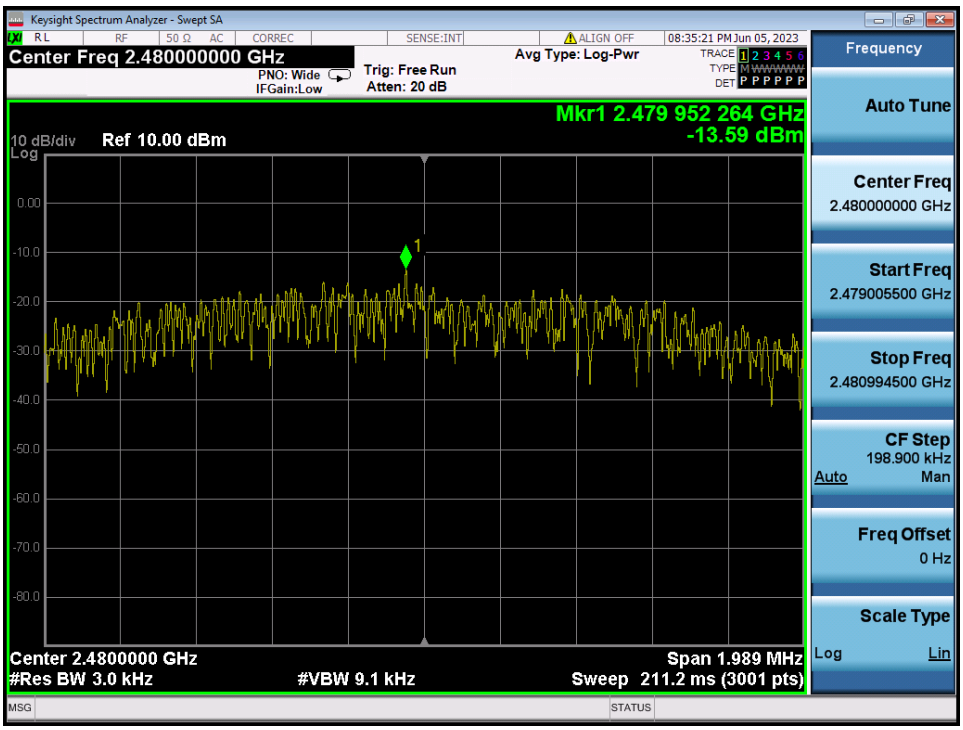
Maximum PKPSD TM 2 Test Channel : Lowest



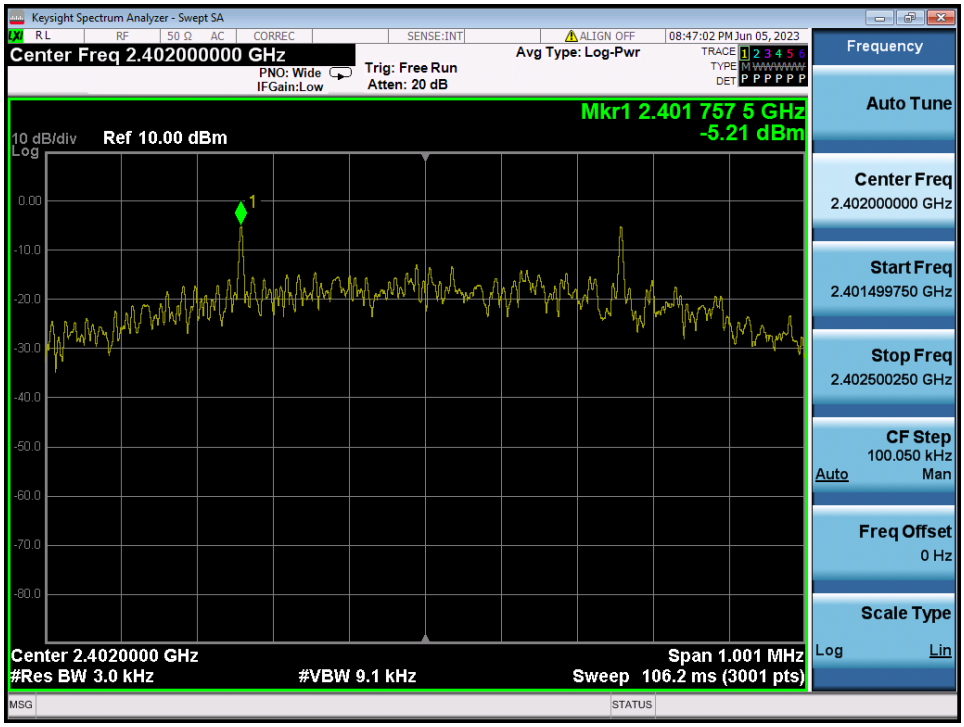
Maximum PKPSD TM 2 Test Channel : Middle



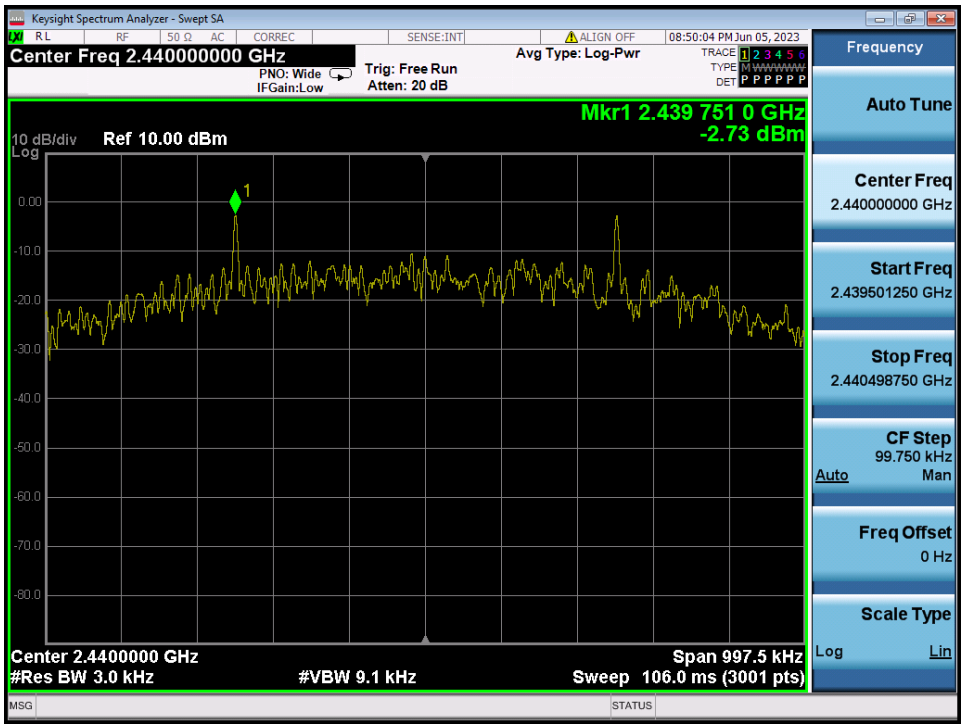
Maximum PKPSD TM 2 Test Channel : Highest



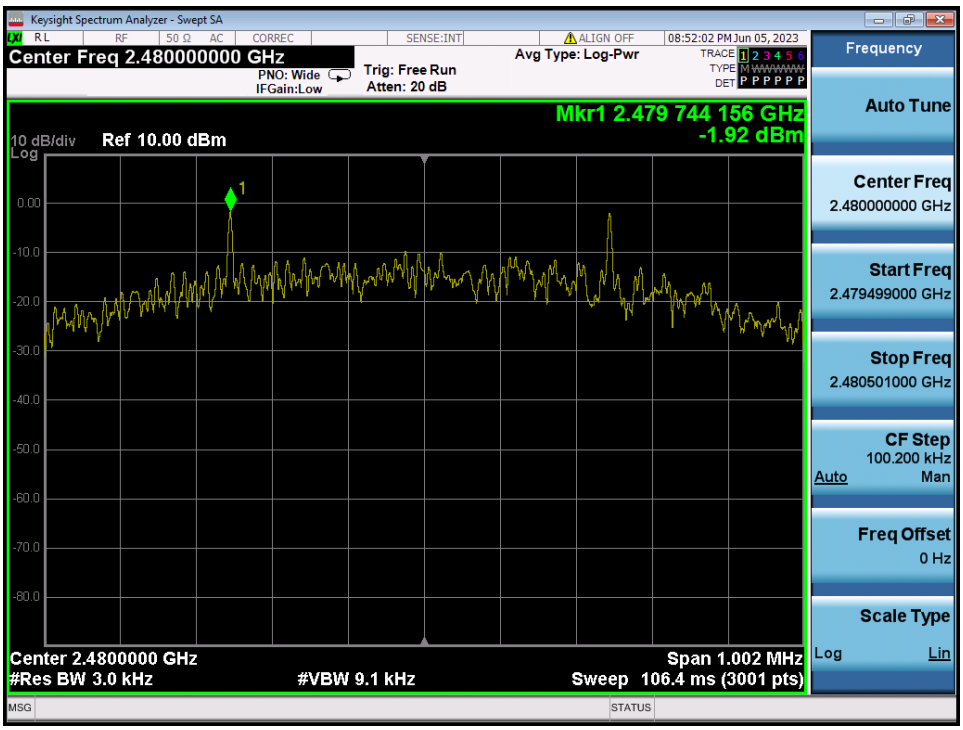
Maximum PKPSD TM 3 Test Channel : Lowest



Maximum PKPSD TM 3 Test Channel : Middle



Maximum PKPSD TM 3 Test Channel : Highest



Maximum PKPSD TM 4 Test Channel : Lowest

Maximum PKPSD TM 4 Test Channel : Middle

Maximum PKPSD TM 4 Test Channel : Highest

5.4. Unwanted Emissions (Conducted)

▣ **Test requirements and limit, Part 15.247(d) & RSS-247 [5.5]**

In any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions :

If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to 15.247(b)(3) requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured inband average PSD level.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

5.4.1. Test Setup

Refer to the APPENDIX I including path loss

5.4.2. Test Procedures

- **KDB558074 D01v05r02 - Section 8.5**
- **ANSI C63.10-2013 – Section 11.11**

Reference level measurement

1. Set instrument center frequency to DTS channel center frequency.
2. Set the span to ≥ 1.5 times the DTS bandwidth.
3. Set the RBW = 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum PSD level
   LIMIT LINE = 20 dB below of the reference level.

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = **100 kHz.(Actual 1 MHz , See below note)**
3. Set the VBW ≥ **3 x RBW.(Actual 3 MHz, See below note)**
4. Detector = **peak**.
5. Ensure that the number of measurement points ≥ span / RBW
6. Sweep time = **auto couple.**
7. Trace mode = **max hold.**
8. **Allow the trace to stabilize** (this may take some time, depending on the extent of the span).
9. Use the peak marker function to determine the maximum amplitude level.

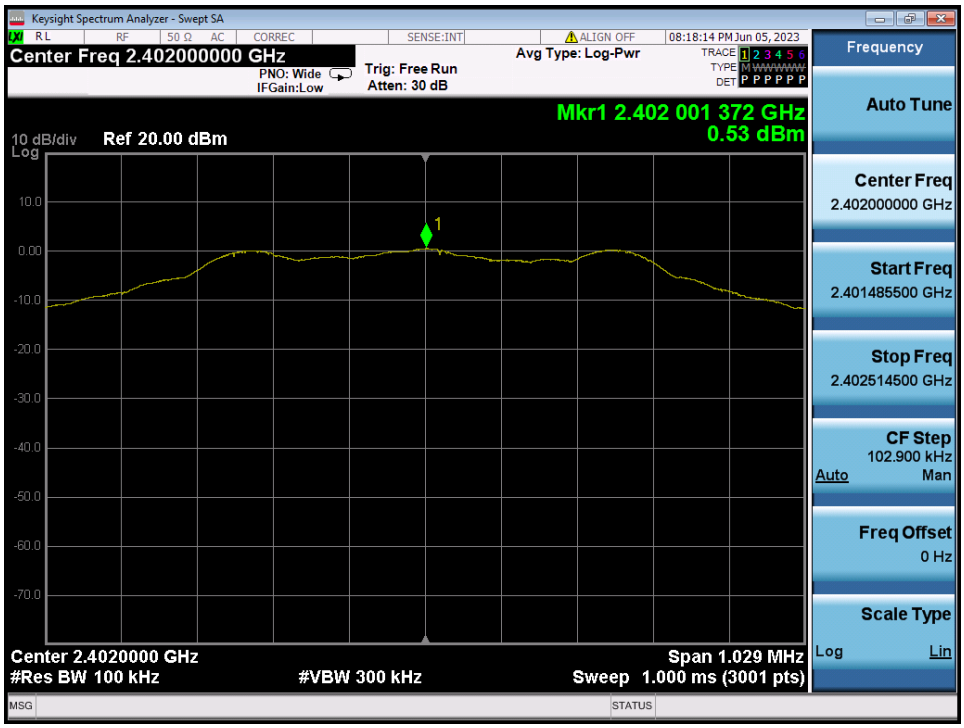
Note: The unwanted(conducted) emission was tested with below settings.

Frequency range	RBW	VBW	Detector	Trace	Sweep Point
9 kHz ~ 30 MHz	100 kHz	300 kHz	Peak	Max Hold	40 001
30 MHz ~ 10 GHz	1 MHz	3 MHz			
10 GHz ~ 25 GHz	1 MHz	3 MHz			

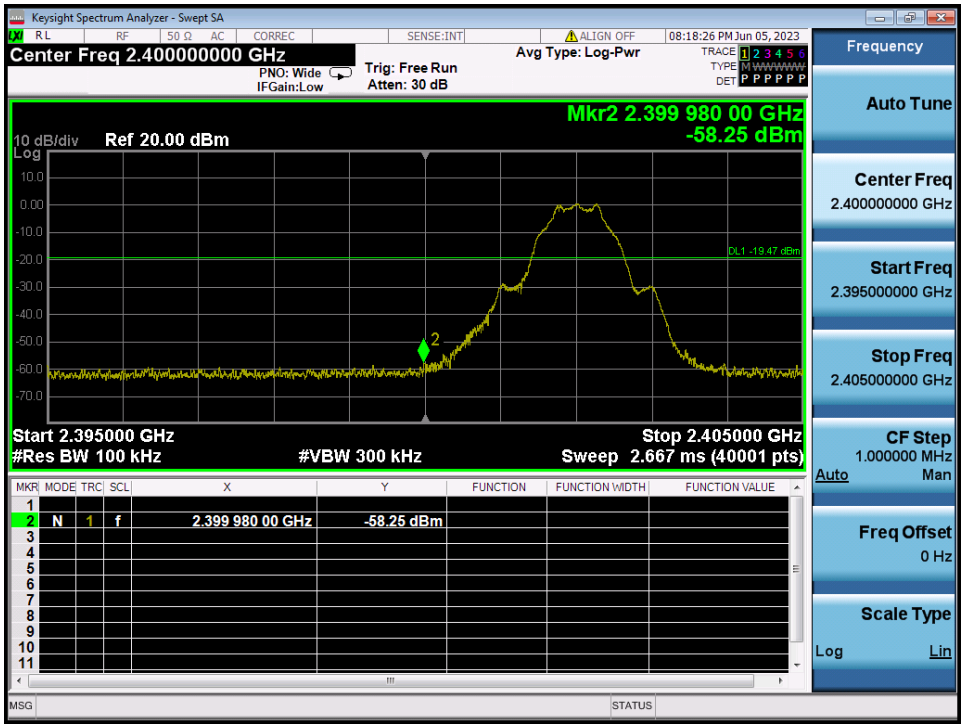
If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 kHz, VBW = 300 kHz, SPAN = 100 MHz and BINS = 2 001 to get accurate emission level within 100 kHz BW.

5.4.3. Test Results

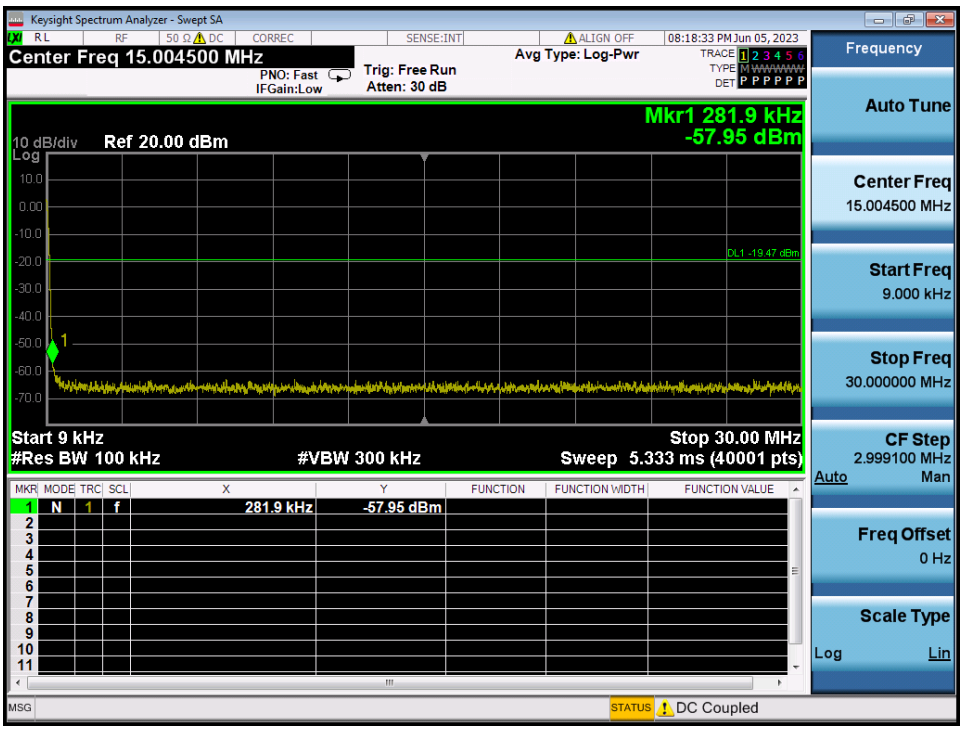
TM 1 Reference (Test Channel : Lowest)



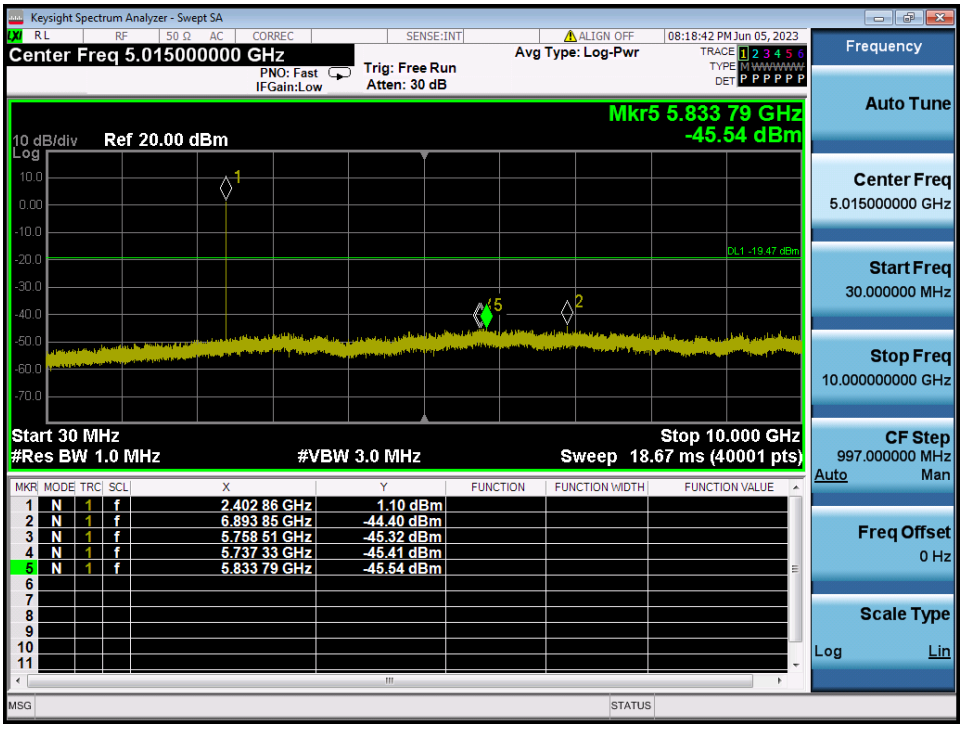
TM 1 Low Band-edge (Test Channel : Lowest)



TM 1 Conducted Spurious Emissions 1 (Test Channel : Lowest)

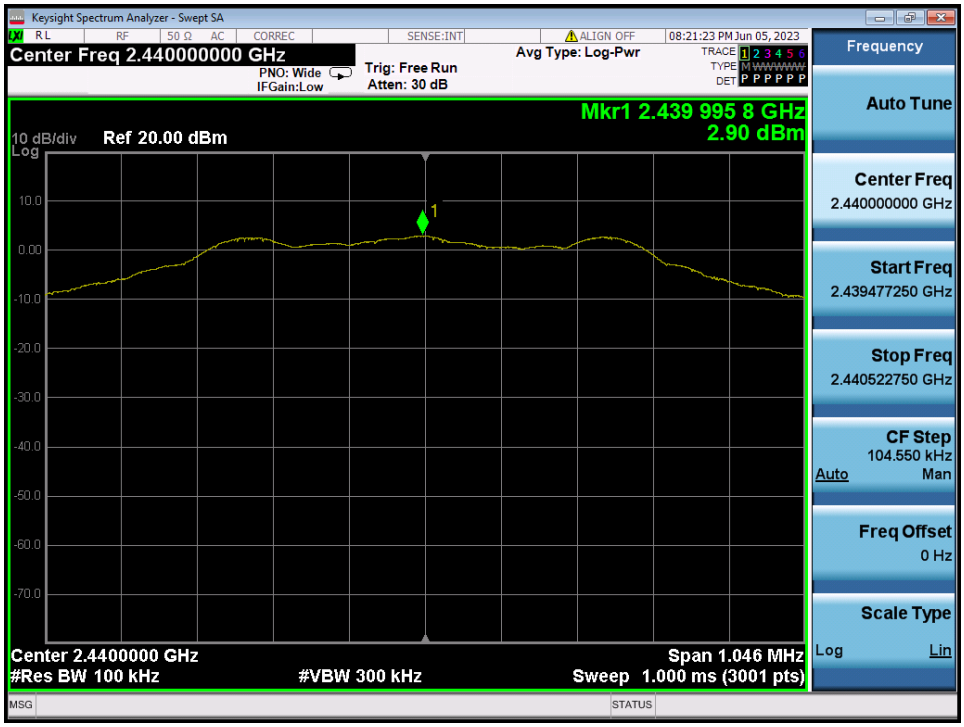


TM 1 Conducted Spurious Emissions 2 (Test Channel : Lowest)

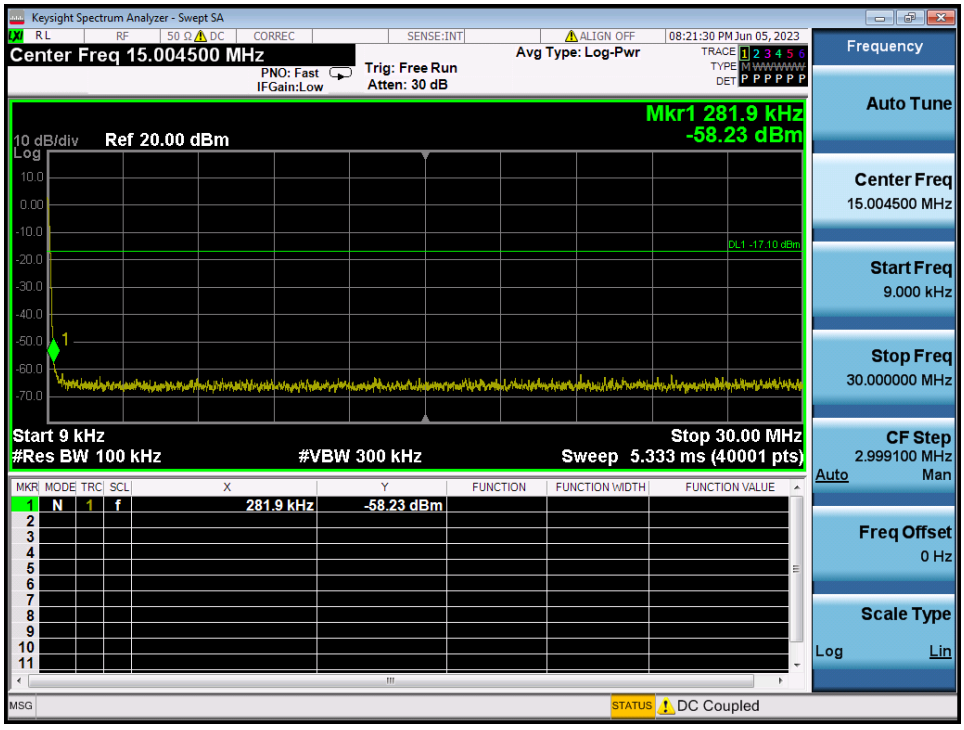


TM 1 Conducted Spurious Emissions 3 (Test Channel : Lowest)

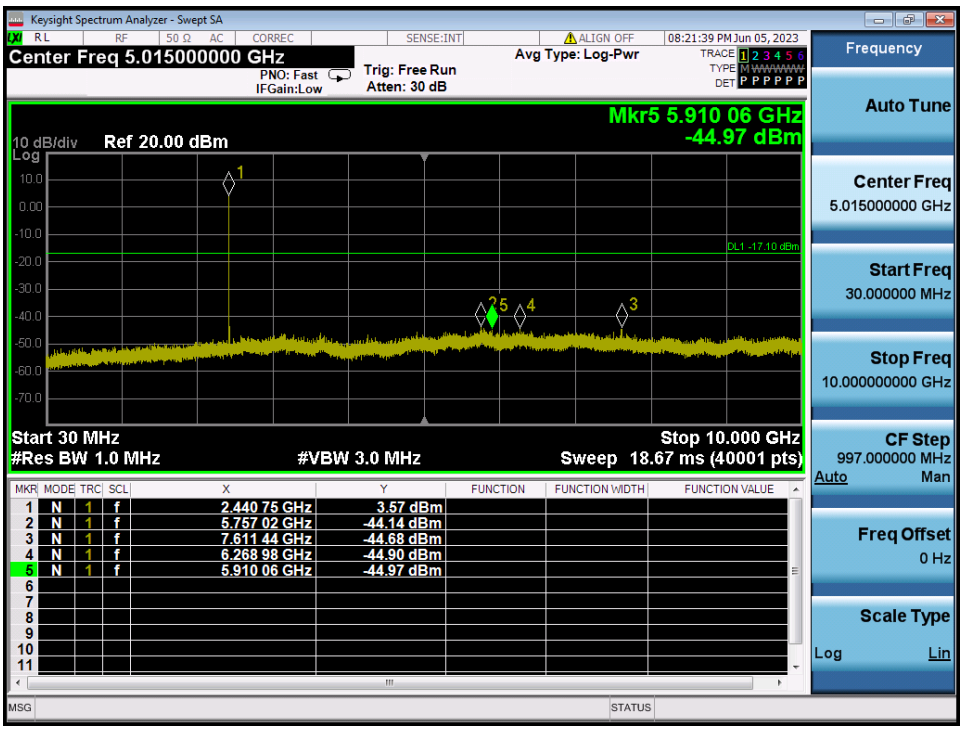
TM 1 Reference (Test Channel : Middle)



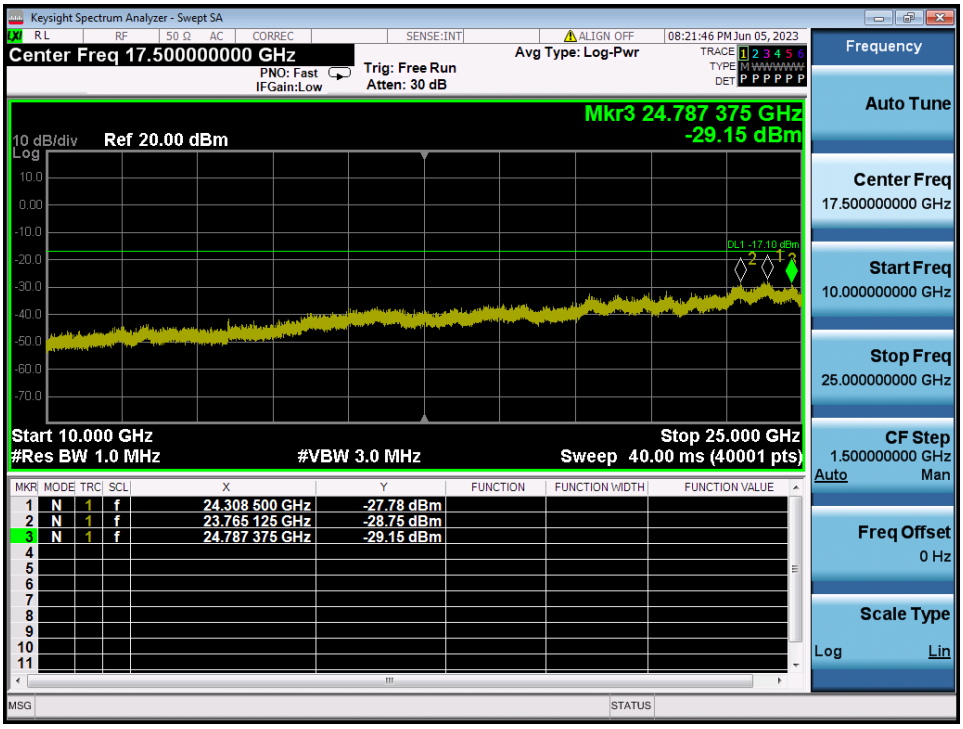
TM 1 Conducted Spurious Emissions 1 (Test Channel : Middle)



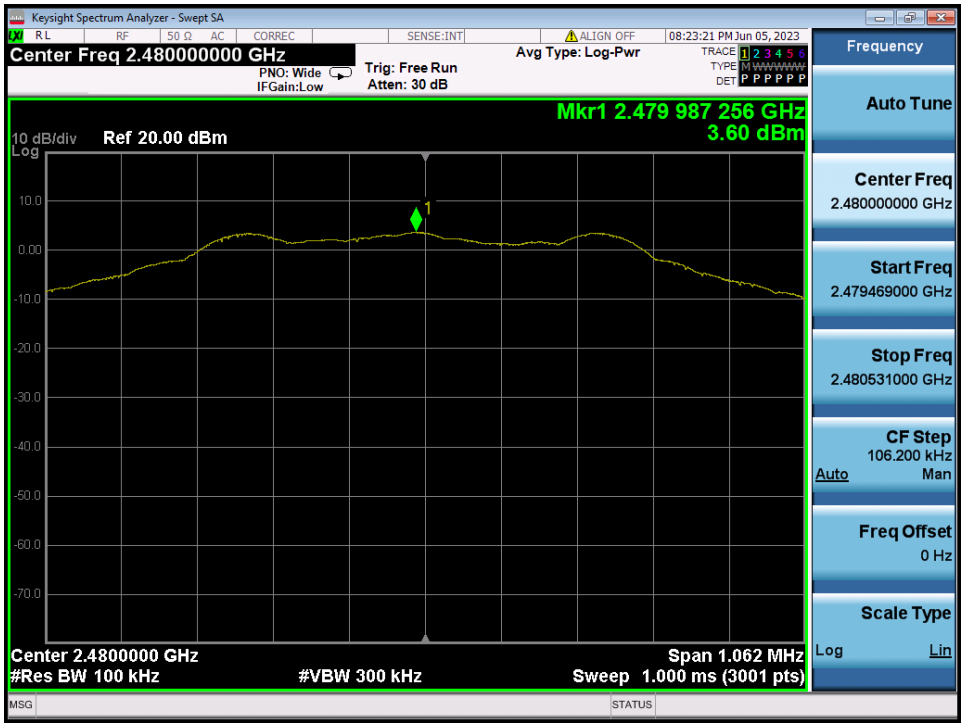
TM 1 Conducted Spurious Emissions 2 (Test Channel : Middle)



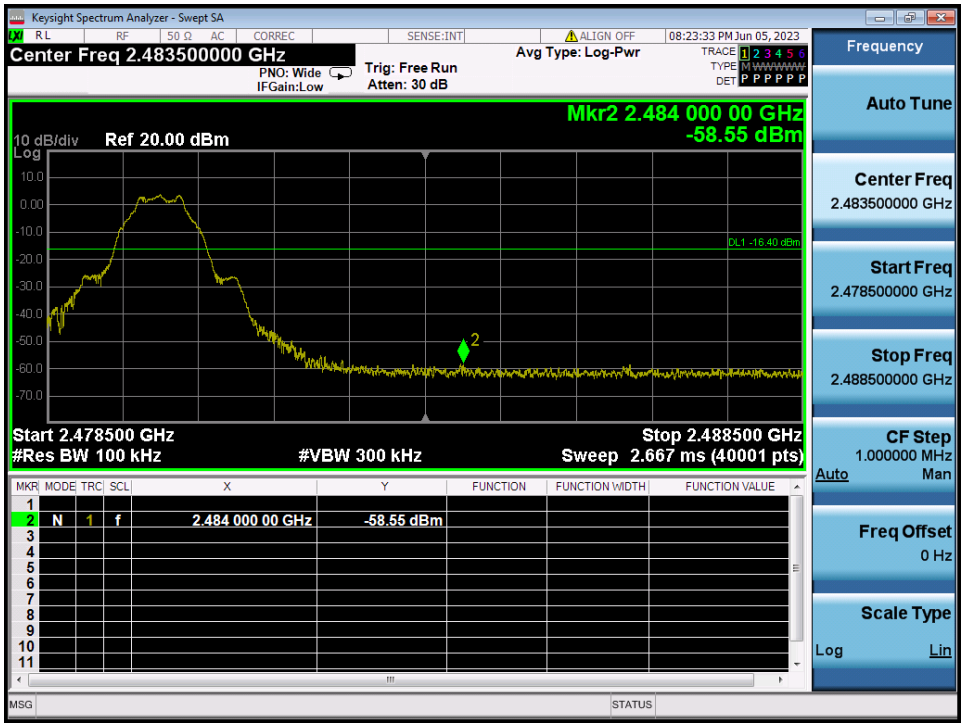
TM 1 Conducted Spurious Emissions 3 (Test Channel : Middle)



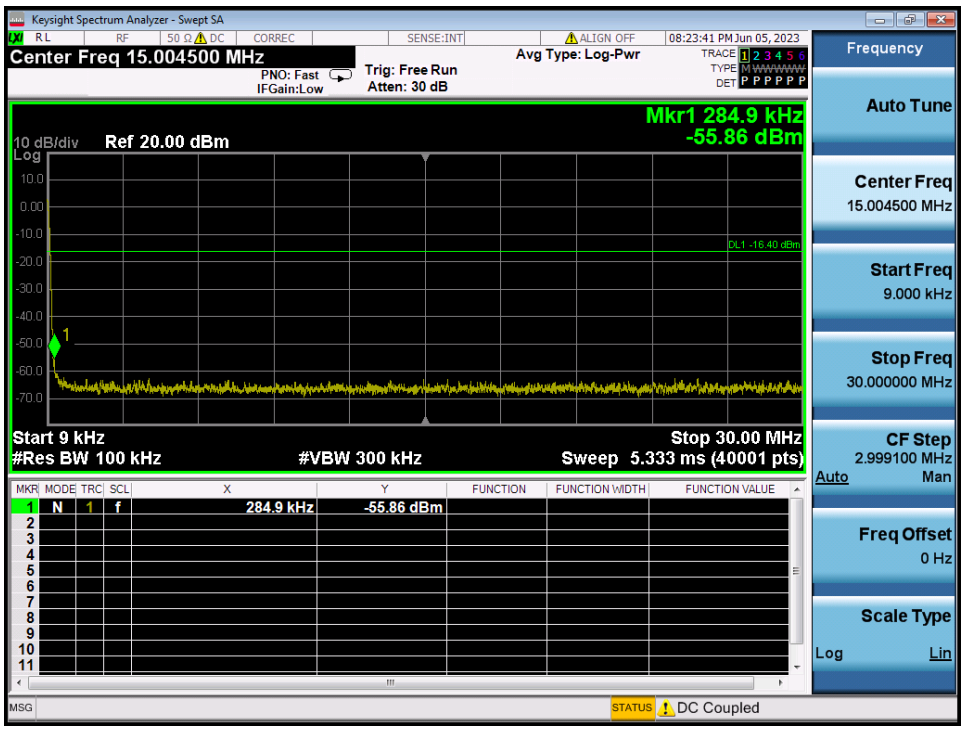
TM 1 Reference (Test Channel : Highest)



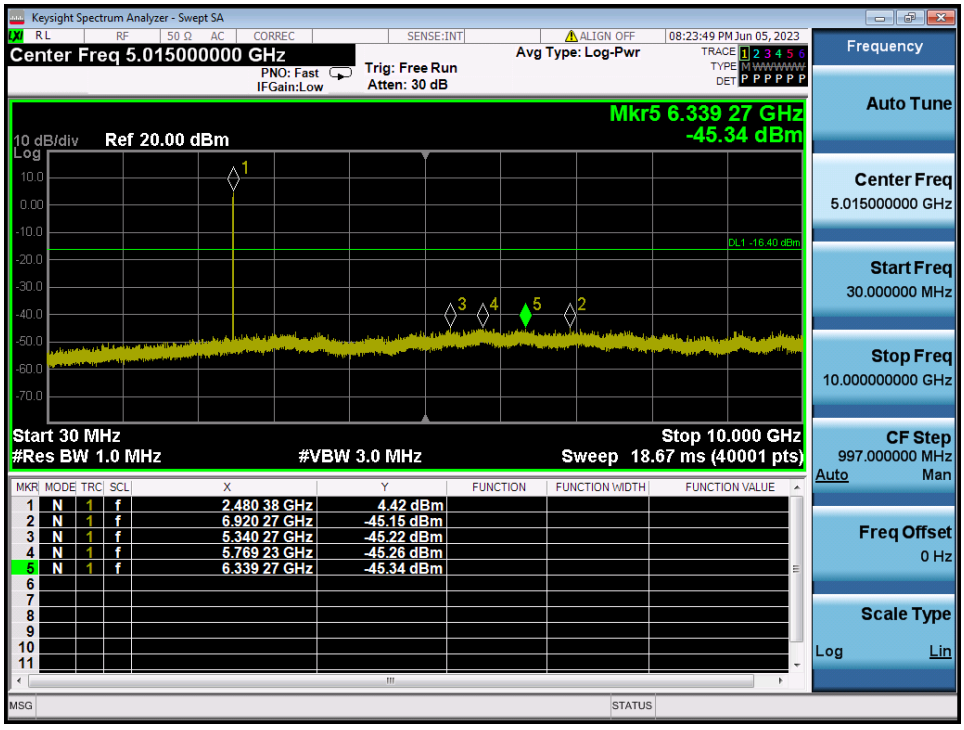
TM 1 High Band-edge (Test Channel : Highest)



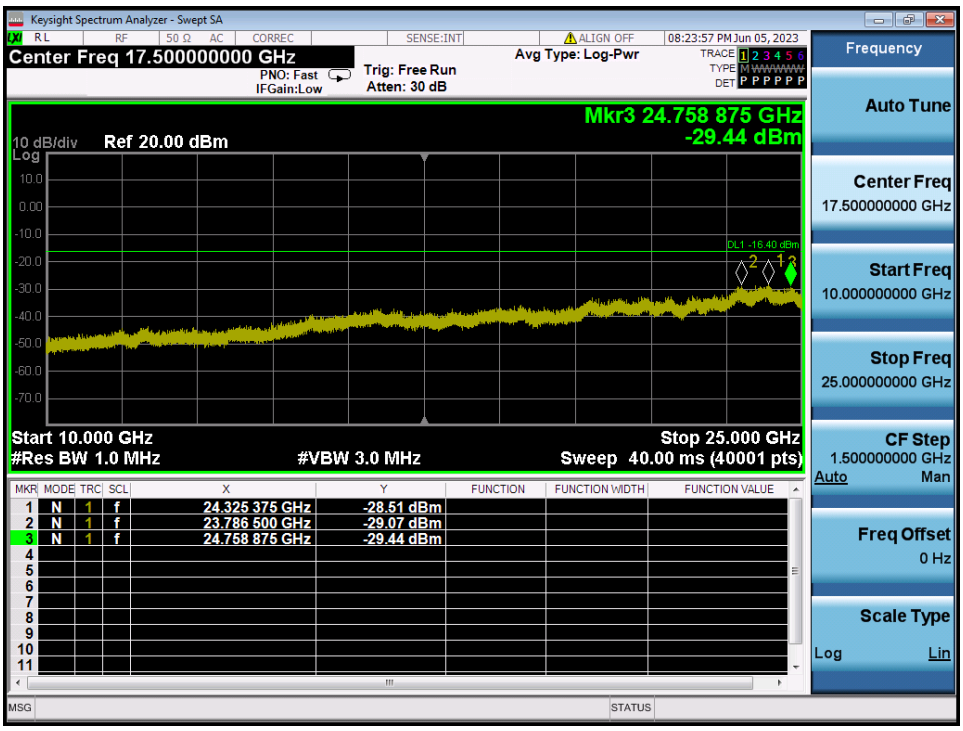
TM 1 Conducted Spurious Emissions 1 (Test Channel : Highest)



TM 1 Conducted Spurious Emissions 2 (Test Channel : Highest)

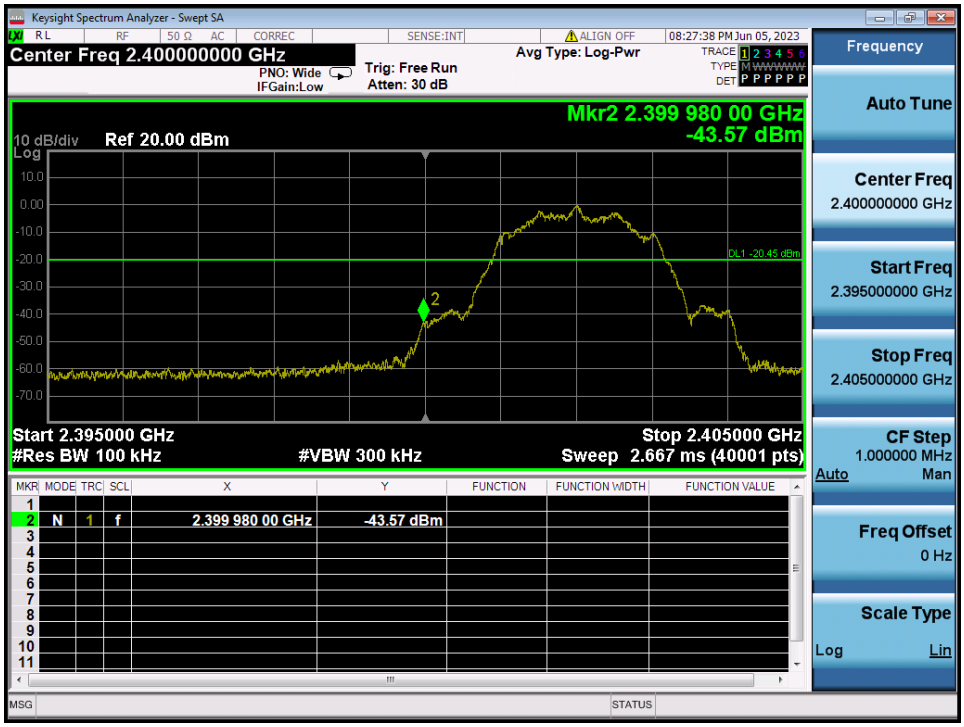


TM 1 Conducted Spurious Emissions 3 (Test Channel : Highest)

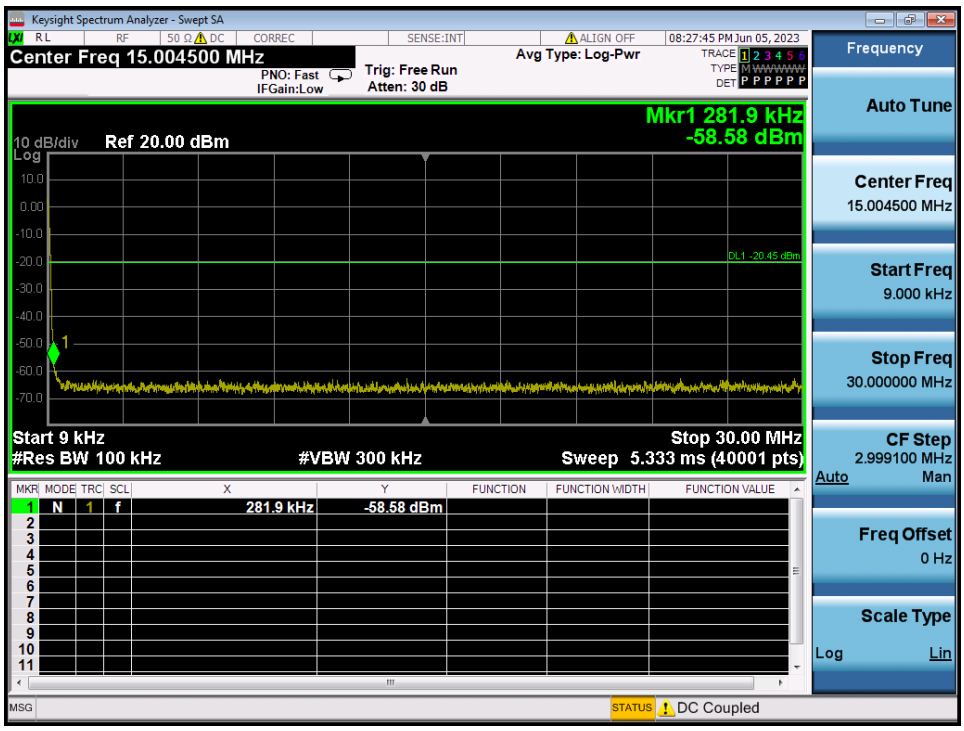


TM 2 Reference (Test Channel : Lowest)

TM 2 Low Band-edge (Test Channel : Lowest)



TM 2 Conducted Spurious Emissions 1 (Test Channel : Lowest)



TM 2 Conducted Spurious Emissions 2 (Test Channel : Lowest)