F2 Labs
16740 Peters Road
Middlefield, Ohio 44062
United States of America
www.f2labs.com

CERTIFICATION TEST REPORT

Manufacturer:	**PetroPower, LLC** **3003 East 37th Street North, Suite 100** **Wichita, Kansas 67219 USA**
Applicant:	**Same as Above**
Product Name:	**T-Rex Solar IMU Sensor**
Product Description:	The product is a battery/solar powered sensor intended to be attached to the surface equipment at an oil well to collect motion data.
Operating Voltage/Freq. of EUT During Testing:	3.7VDC
Model(s):	**T-Rex Polished Rod Sensor*** **Denotes actual model tested as representative of product family that includes models T-Rex Drive Shaft Sensor and T-Rex Polished Rod Sensor.*
FCC ID:	**2BGG6PP12**
Testing Commenced:	2024-07-26
Testing Ended:	2024-08-09
Summary of Test Results:	**In Compliance** The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications and/or manufacturer's statement. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

Rules:

- **FCC Part 15 Subpart C, Section 15.247**
- **FCC Part 15.31(e)**
- **ANSI C63.10:2013**

Evaluation Conducted by:

Erik Tobin, EMC Engineer

Julius Chiller, Senior Wireless Project Engineer

Report Reviewed by:

Ken Littell, Vice President of Operations

F2 Labs
26501 Ridge Road
Damascus, MD 20872
Ph 301.253.4500

F2 Labs
16740 Peters Road
Middlefield, OH 44062
Ph 440.632.5541

F2 Labs
8583 Zionsville Road
Indianapolis, IN 46268
Ph 317.610.0611

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD**.**

1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10 and recommended FCC procedure of measurement under Section 15.247 and in KDB558074. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data, and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainly
Radiated Emissions <1 GHz @ 3m	±5.07dB	±2.54dB
Radiated Emissions <1 GHz @10m	±5.09dB	±2.55dB
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81dB
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55dB
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38dB

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2P32069A-02E	First Issue	2024-08-15	K. Littell

2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
Occupied Bandwidth	CFR 47 Part 15.247(a)(2) / KDB558074	Complies
Conducted Output Power	CFR 47 Part 15.247(b)(2) / KDB558074	Complies
Voltage Variations	CFR 47 Part 15.31(e)	Complies
Conducted Spurious Emissions	CFR 47 Part 15.247(d) / Part 15.207 / KDB558074	Complies
Radiated Spurious Emissions	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies*
Peak Power Spectral Density	CFR 47 Part 15.247(e) / KDB558074	Complies
Frequency Separation	ANSI 63.10 2013 (7.8.2)	Not Applicable
Number of Hopping Frequencies	ANSI 63.10 2013 (7.8.3)	Not Applicable
Dwell Time	ANSI 63.10 2013 (7.8.4)	Not Applicable
Conducted Emissions	CFR 47 Part 15.207(a)	Not Applicable

Modifications Made to the Equipment
*RF output power setting was reduced to 3dBm to meet Spurious Emissions requirements.

3 TABLE OF MEASURED RESULTS

1 Mbps

Test	Low Channel 2.402 GHz	Mid Channel 2.440 GHz	High Channel 2.480 GHz
Conducted Output Power	1.55mW / 1.91dBm	1.52mW / 1.81dBm	1.49mW / 1.74dBm
Conducted Output Power Limit	1 Watt / 30dBm	1 Watt / 30dBm	1 Watt / 30dBm
E.I.R.P.	3.24mW / 5.11dBm	3.17mW / 5.01dBm	3.11mW / 4.94dBm
E.I.R.P. Limit	4 Watts / 36.02dBm	4 Watts / 36.02dBm	4 Watts / 36.02dBm
Peak Power Spectral Density	-11.1dBm	-11.03dBm	-12.10dBm
Peak Power Spectral Density Limit	8dBm	8dBm	8dBm
-6dB Occupied Bandwidth	0.704 MHz	0.714 MHz	0.728 MHz
99% Occupied Bandwidth	1.07 MHz	1.07 MHz	1.07 MHz
Occupied Bandwidth Limit	≥ 500KHz	≥ 500KHz	≥ 500KHz

2 Mbps

Test		Low Channel 2.402 GHz	Mid Channel 2.440 GHz	High Channel 2.480 GHz
Conducted Output Power		1.56mW / 1.92dBm	1.52mW / 1.81dBm	1.48mW / 1.71dBm
Conducted Output Power Limit		1 Watt / 30dBm	1 Watt / 30dBm	1 Watt / 30dBm
E.I.R.P.		3.25mW / 5.12dBm	3.17mW / 5.01dBm	3.10mW / 4.91dBm
E.I.R.P. Limit		4 Watts / 36.02dBm	4 Watts / 36.02dBm	4 Watts / 36.02dBm
Peak Power Spectral Density		-13.3dBm	-14.69dBm	-14.79dBm
Peak Power Spectral Density Limit		8dBm	8dBm	8dBm
-6dB Occupied Bandwidth		1.154 MHz	1.138 MHz	1.194 MHz
99% Occupied Bandwidth		2.09 MHz	2.09 MHz	2.09 MHz
Occupied Bandwidth Limit		≥ 500KHz	≥ 500KHz	≥ 500KHz
Voltage Variations*	Nominal 3.3VDC	1.55mW / 1.91dBm	--	--
	-15% 2.6VDC	1.54mW / 1.90dBm	--	--
	+15% 3.7VDC	1.53mW / 1.88dBm	--	--
Limit		1W / 30dBm	1W / 30dBm	1W / 30dBm

To meet the requirements of 15.31, voltage was varied to the manufacturer's maximum limit. Lower level was 2.6VDC, below which the unit no longer operated.

4 ENGINEERING STATEMENT

This report has been prepared on behalf of PetroPower, LLC to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.247 of the FCC Rules using ANSI C63.10 and KDB558074 standards. The test results found in this test report relate only to the items tested.

5 EUT INFORMATION AND DATA

5.1 Equipment Under Test:

Product: T-Rex Solar IMU Sensor
Model(s): T-Rex Polished Rod Sensor*
**Denotes actual model tested as representative of product family that includes models T-Rex Drive Shaft Sensor and T-Rex Polished Rod Sensor.*
Serial No.: None Specified
FCC ID: 2BGG6PP12

5.2 Trade Name:

PetroPower, LLC

5.3 Power Supply:

3.7 VDC

5.4 Applicable Rules:

CFR 47, Part 15.247, subpart C

5.5 Antenna:

Molex 146153 series balanced antenna, 3.2dBi peak gain.

5.6 Accessories:

Device	Manufacturer	Model Number	Serial Number
USB to Serial	FTDI	FTD1232	None Specified
DC Supply*	BK Precision	1685B	346F17303
Computer*	Dell-Latitude	T17G	17XZ4Q2

**Indicates F2 Labs-supplied equipment.*

5.7 Test Item Condition:

The equipment to be tested was received in good condition.

5.8 Testing Algorithm:

EUT was set to transmit a continuous modulated signal on the low, mid and high channels in the 2.4 GHz Bluetooth band. Both 1 Mbps and 2 Mbps data rates were tested. The highest emissions were recorded in the data tables.

6 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	Albatross Projects	B83117-DF435-T261	US140023	2024-11-15
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2025-04-09
Low Loss Cable Set	CL315 / CL318	Fairview Microwave	FMC0202914-72/FMC0202914-240	None Spec.	2025-04-09 / 2025-04-10
Horn Antenna	CL098	Emco	3115	9809-5580	2025-01-02
Horn Antenna 18-26.5 GHz	CL114	A.H. Systems, Inc.	SAS-572	237	2026-01-09
Pre-Amplifier	CL153	Keysight Tech.	83006A	MY39500791	2024-11-14
Active 18” Loop Antenna	CL163-Loop	A.H. Systems, Inc.	EHA-52B	100	2024-12-14
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	2024-09-25
Software:	Tile Version 3.4.B.3		Software Verified: 2024-08-09		
Software:	EMC 32, Version 8.53.0		Software Verified: 2024-08-09		
Temp/Hum Rec	CL293	Thermpro	TP50	1	2025-05-31

7 OCCUPIED BANDWIDTH

7.1 Requirements:

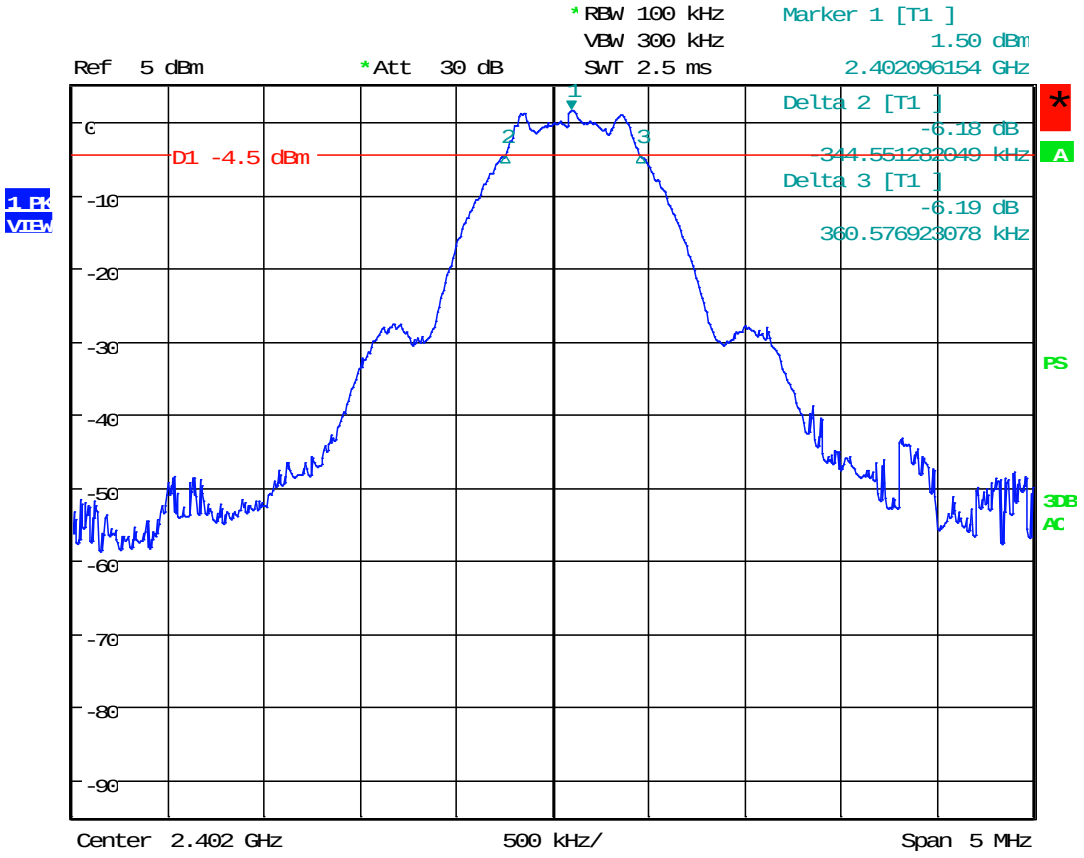
The 6dB bandwidth shall be greater than 500 kHz.

Bandwidth measurements were made at the low, mid and high frequencies with the Resolution Bandwidth set at 30 kHz (video bandwidth set at 100 kHz) for the 99% OBW, and 100kHz Resolution Bandwidth and 300kHz Video Bandwidth for the 6dB OBW. The span was set at 5 MHz. The bandwidth was measured using the analyzer's marker function.

7.2 Occupied Bandwidth Test Data

Test Date:	2024-07-29	**Test Engineer(s):**	J. Chiller E. Tobin
Standard(s):	CFR 47 Part 15.247(a)(2); KDB558074	**Air Temperature:**	22.4ºC
		Relative Humidity:	46%

-6dB: 1 Mbps, Low Channel



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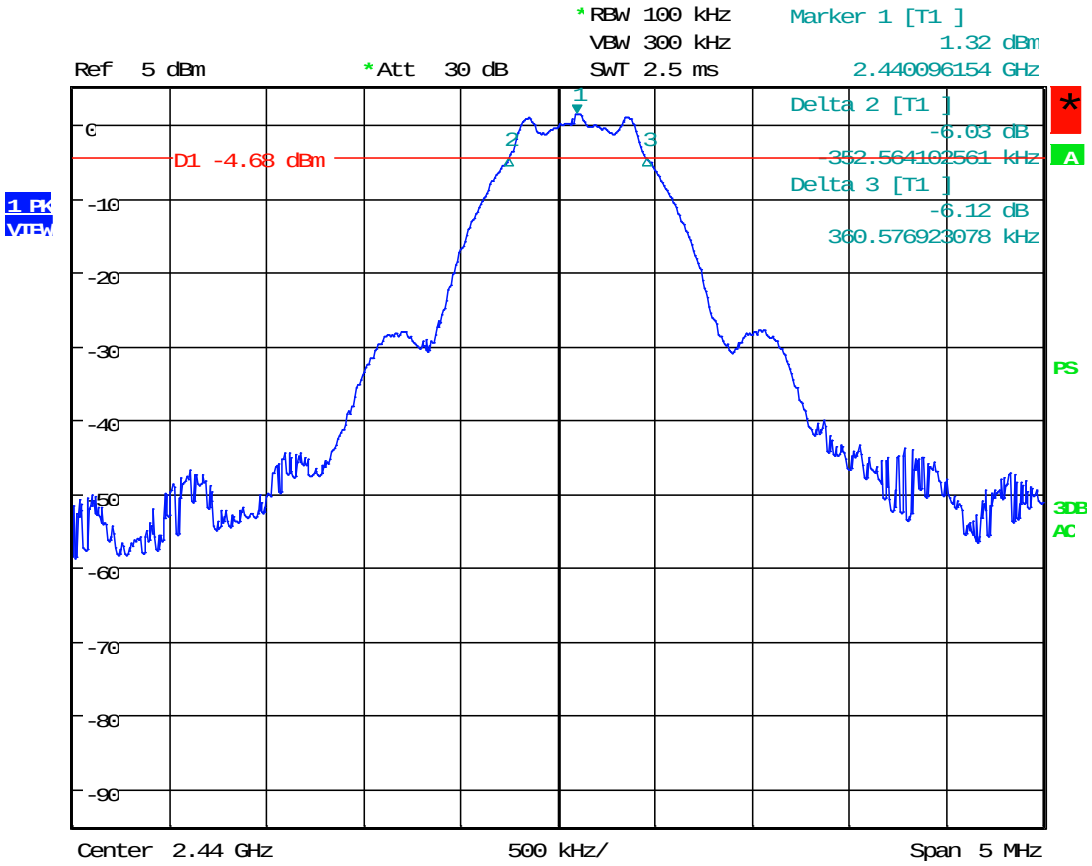
-6dB: 1 Mbps, Mid Channel



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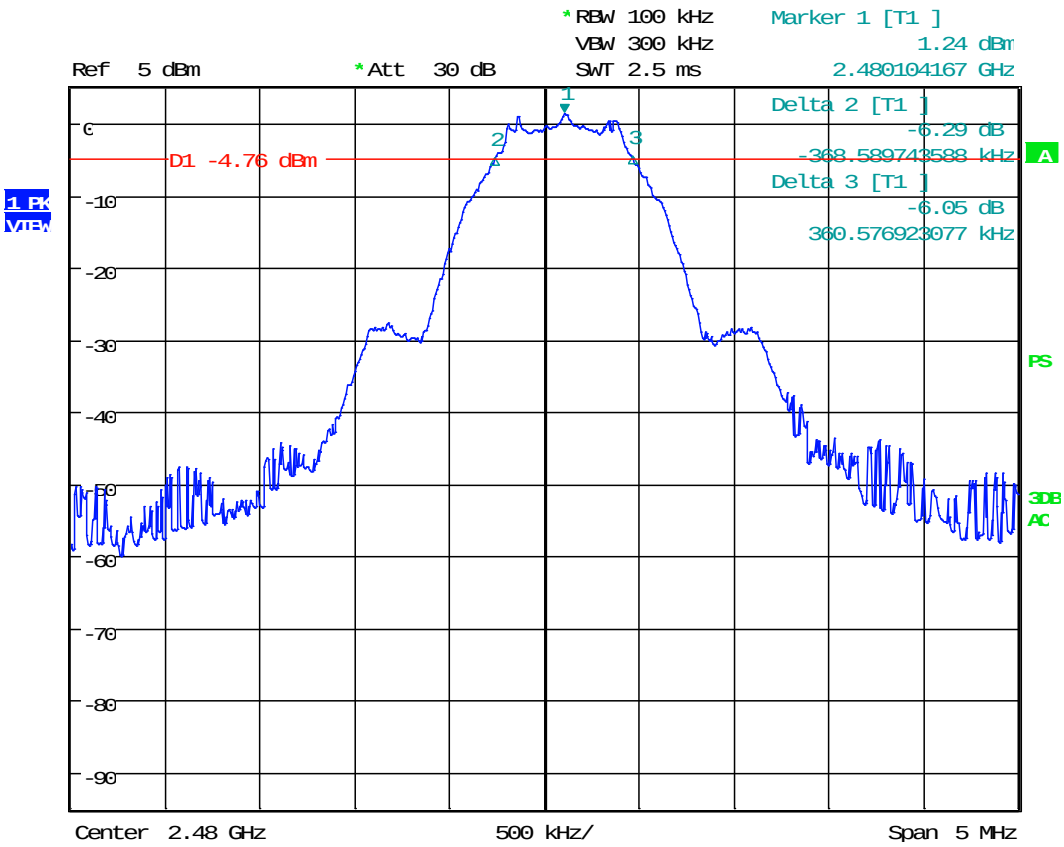
-6dB: 1 Mbps, High Channel



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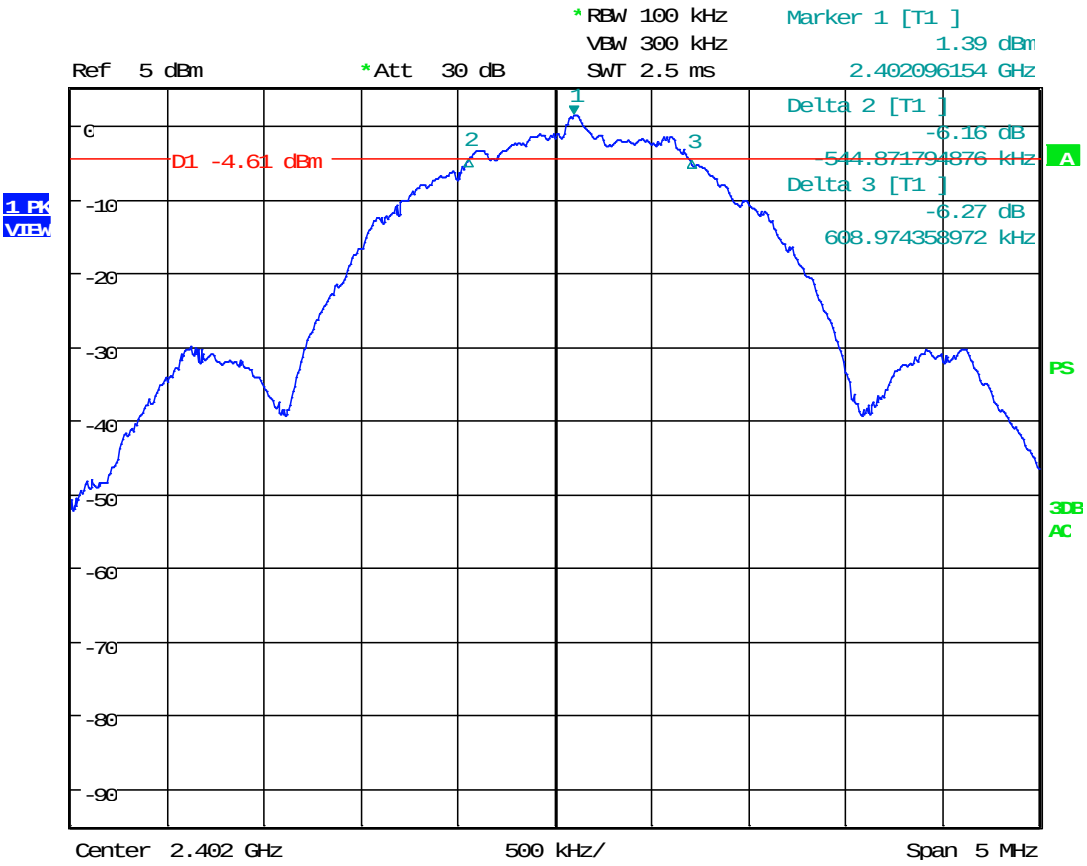
-6dB: 2 Mbps, Low Channel



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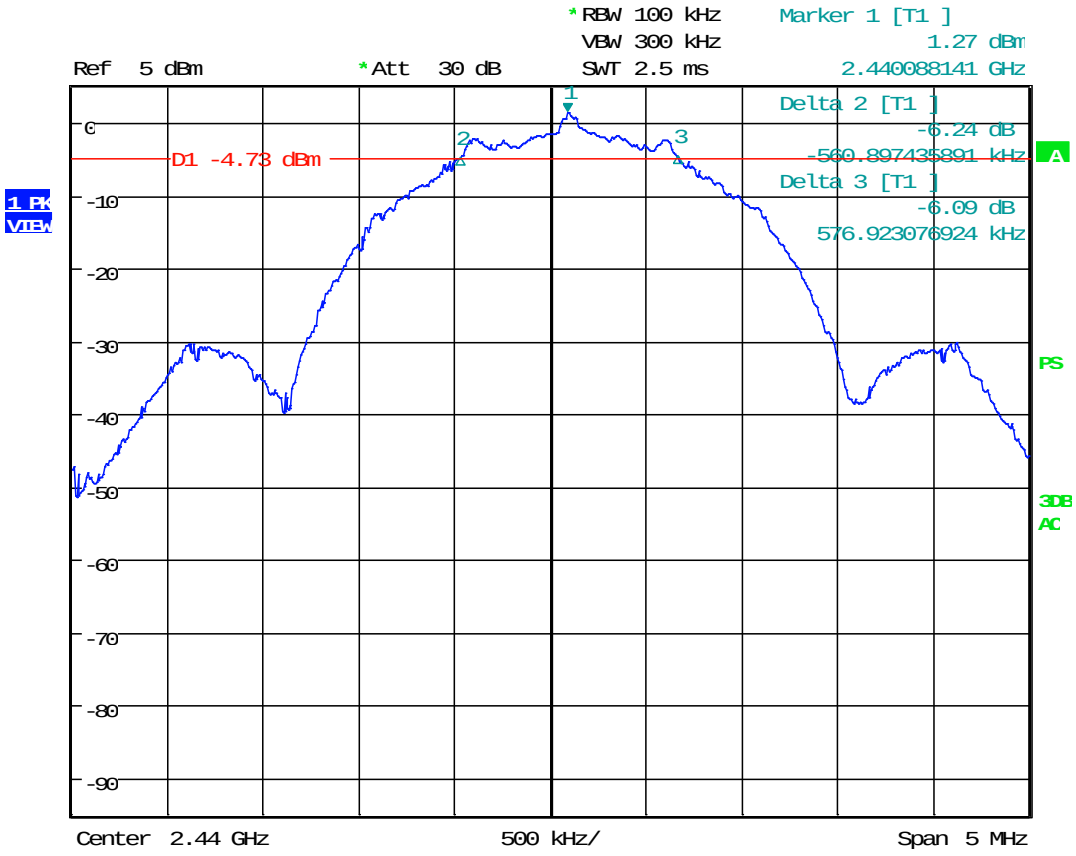
-6dB: 2 Mbps, Mid Channel



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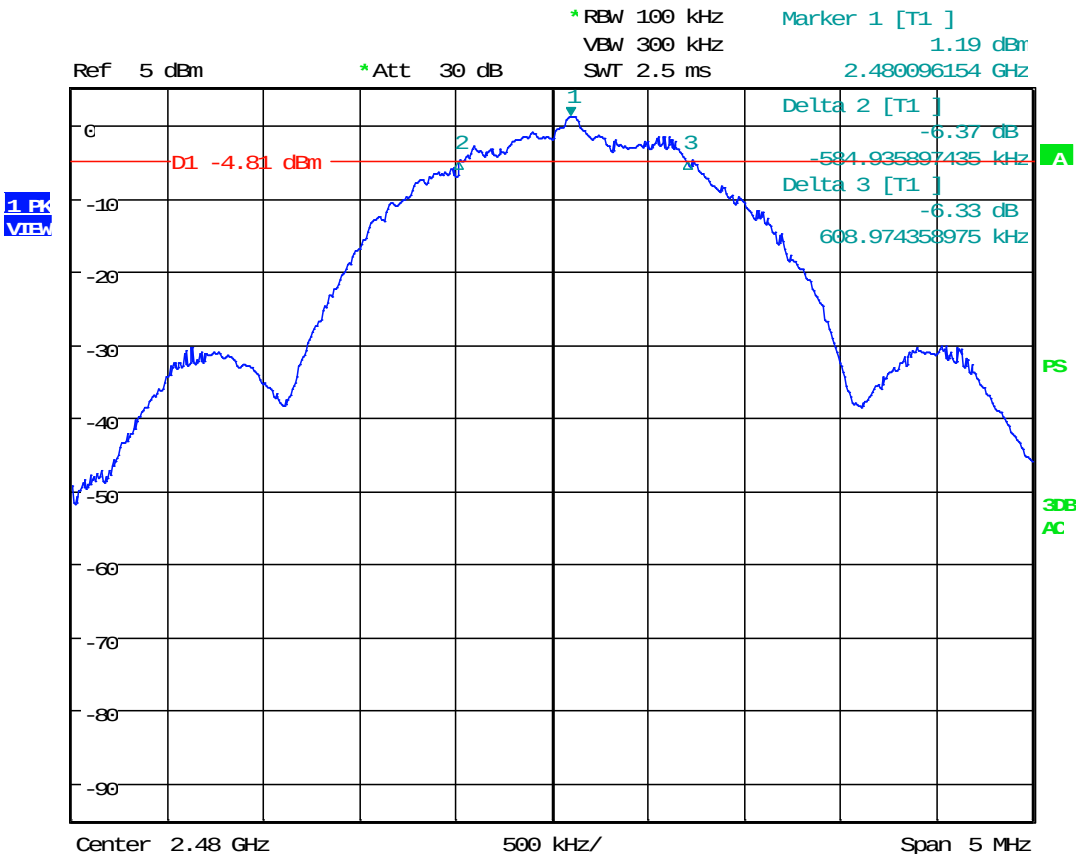
-6dB: 2 Mbps, High Channel



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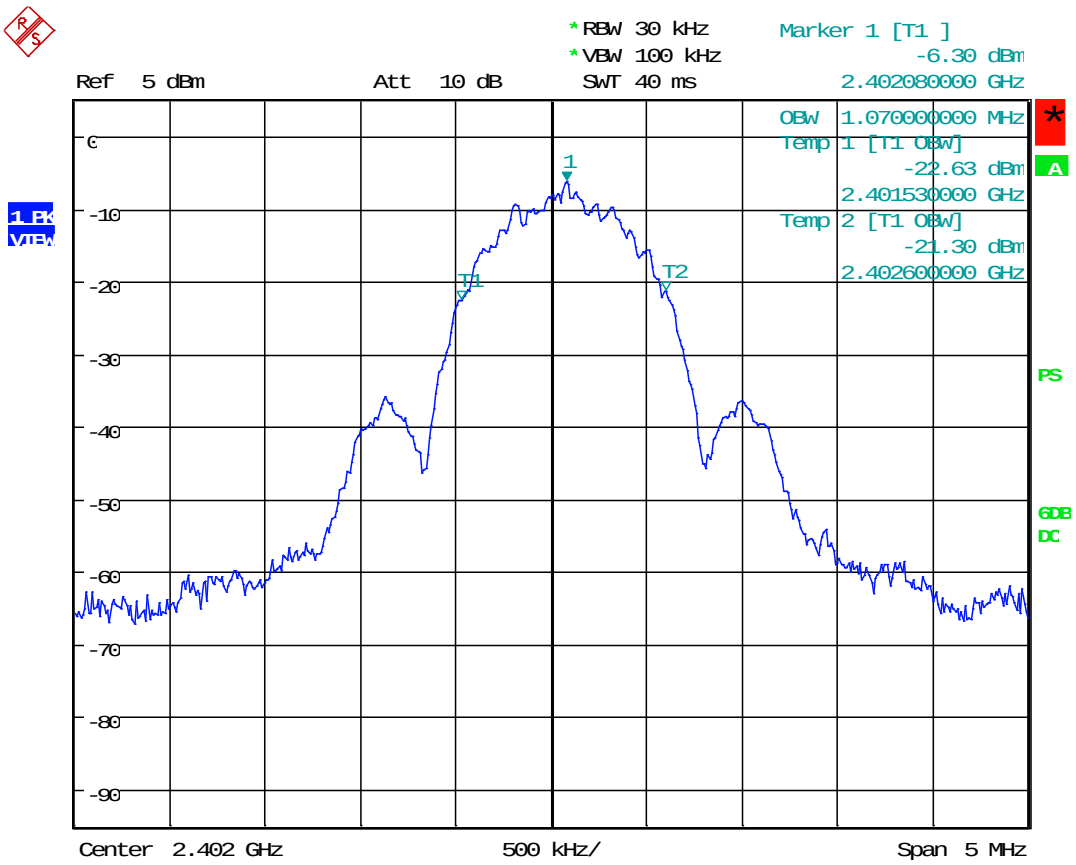
99%: 1 MB, Low Channel



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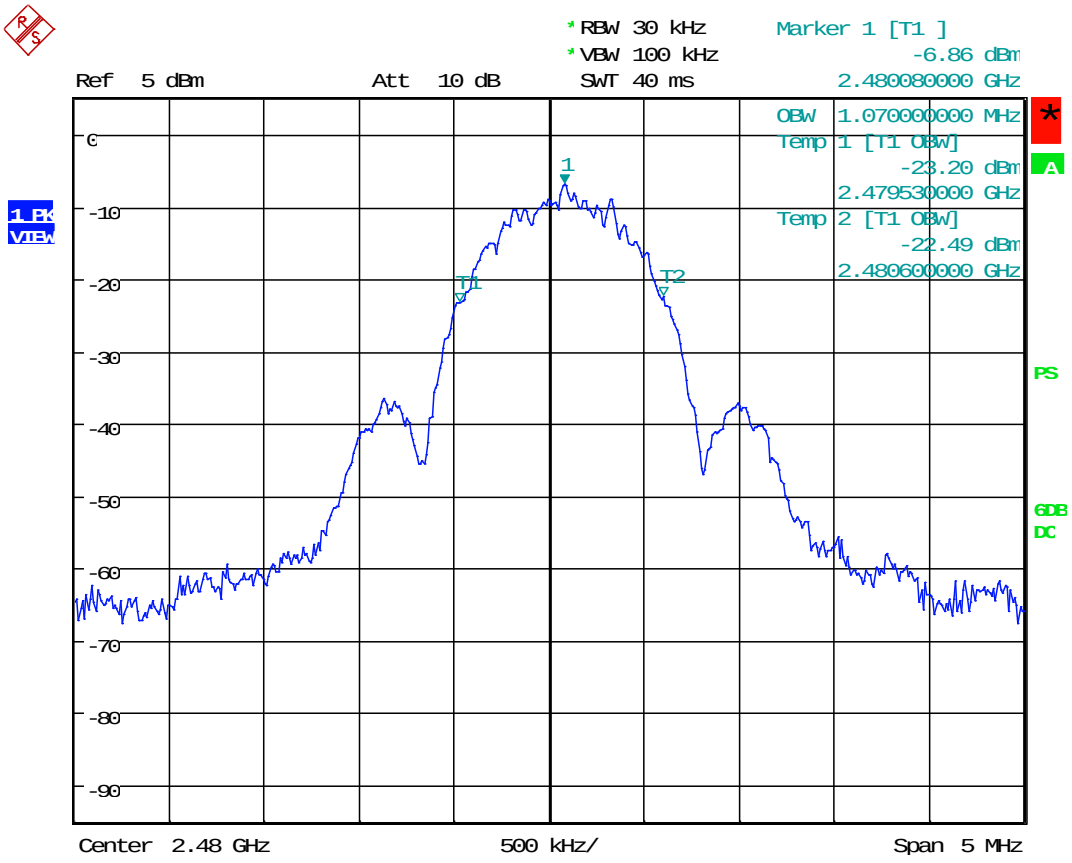

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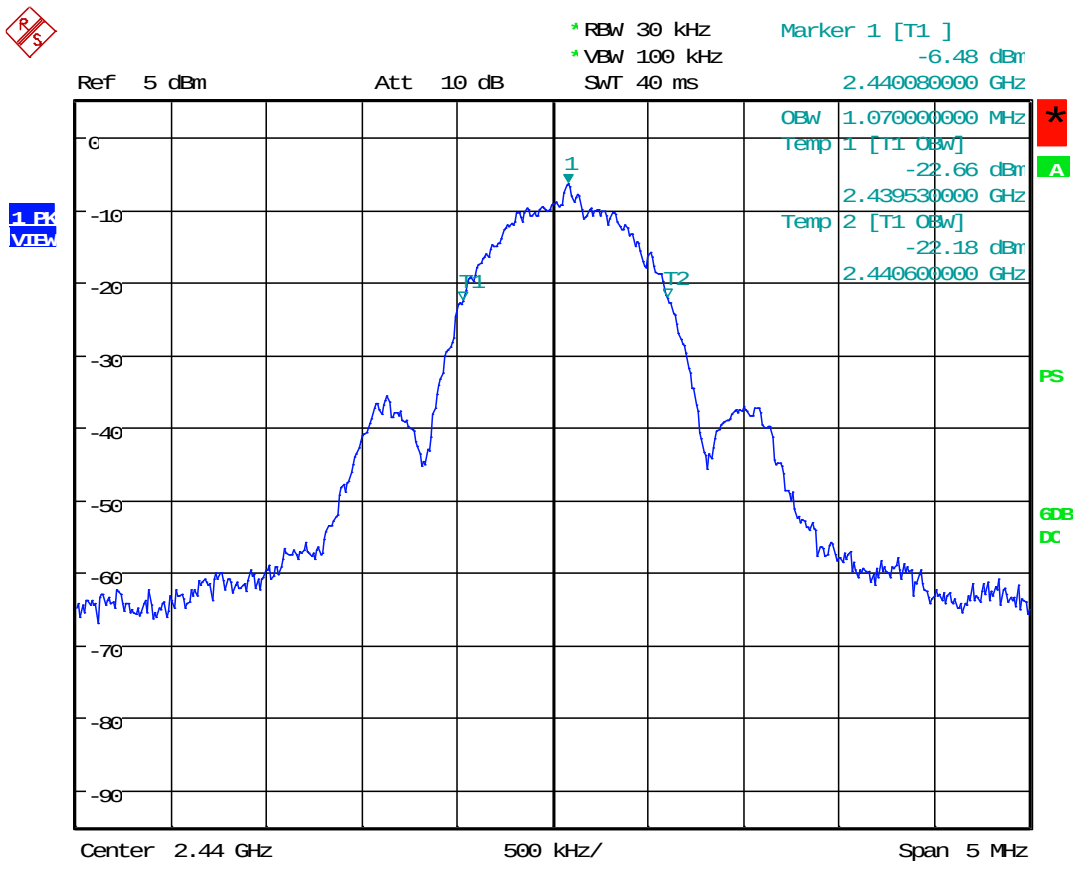

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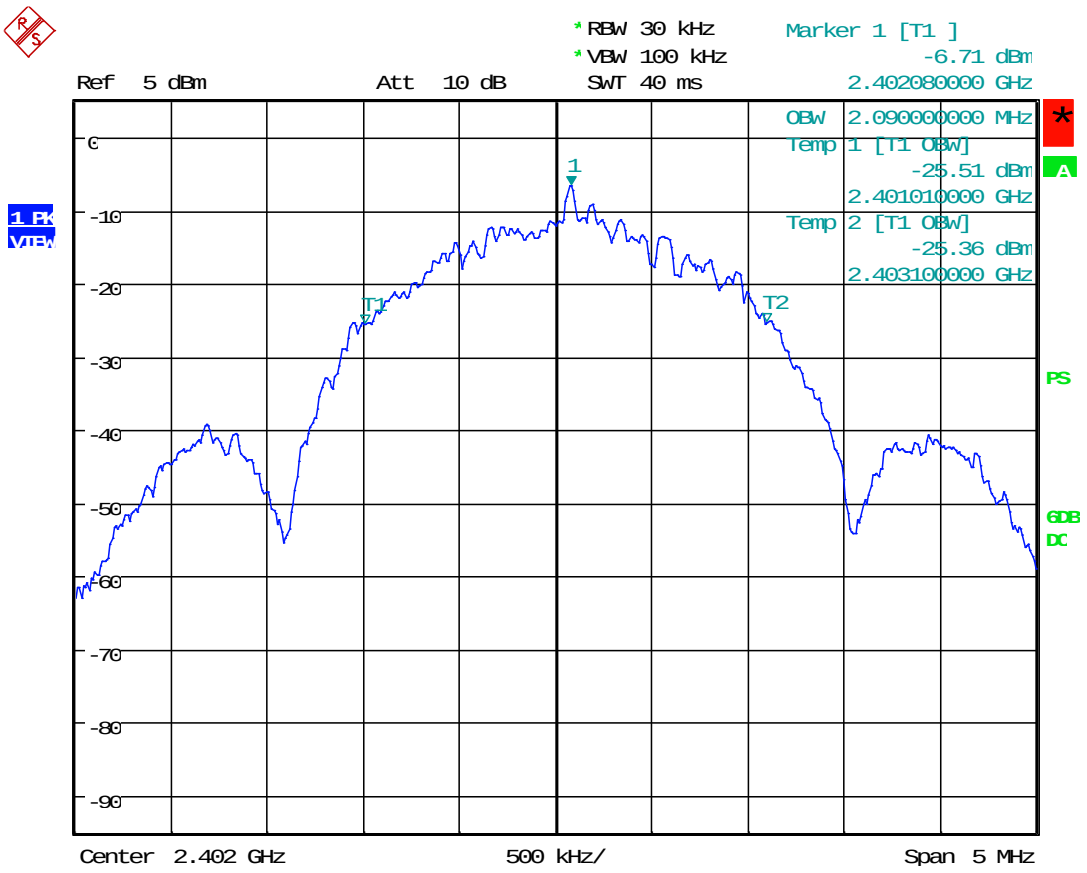
99%: 2 MB, Low Channel



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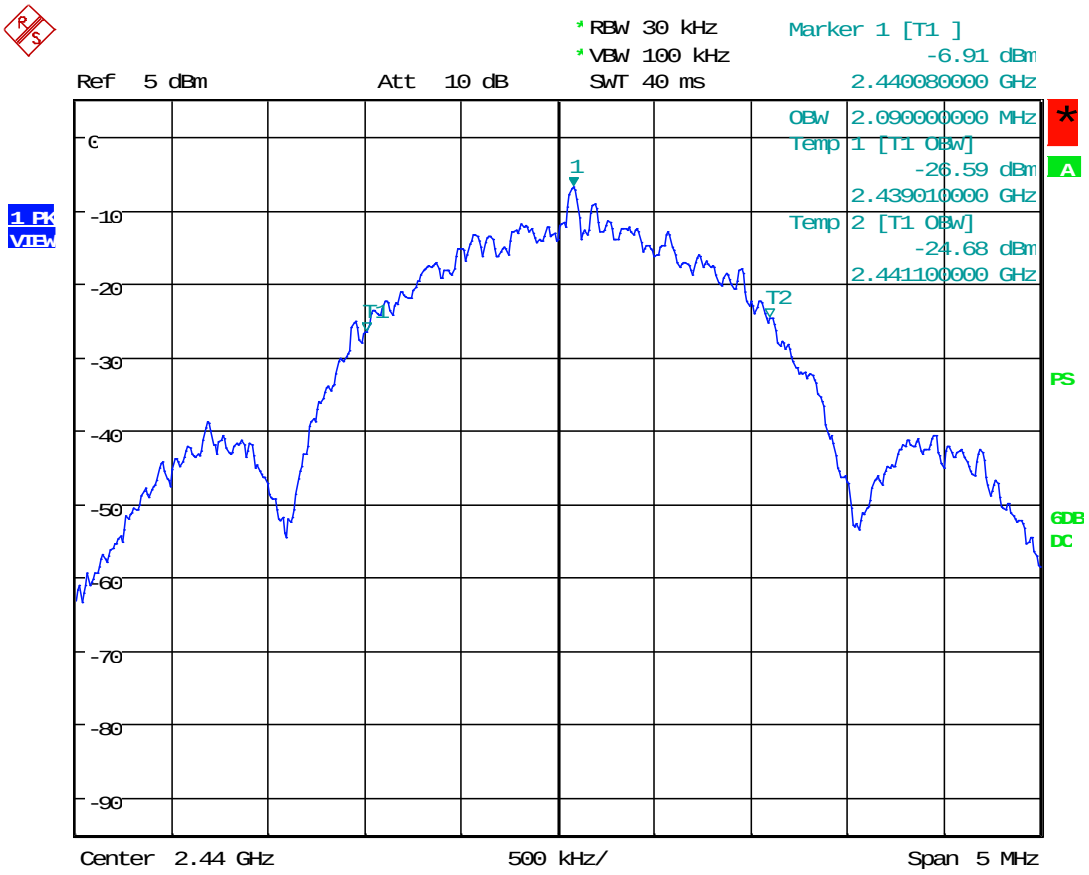

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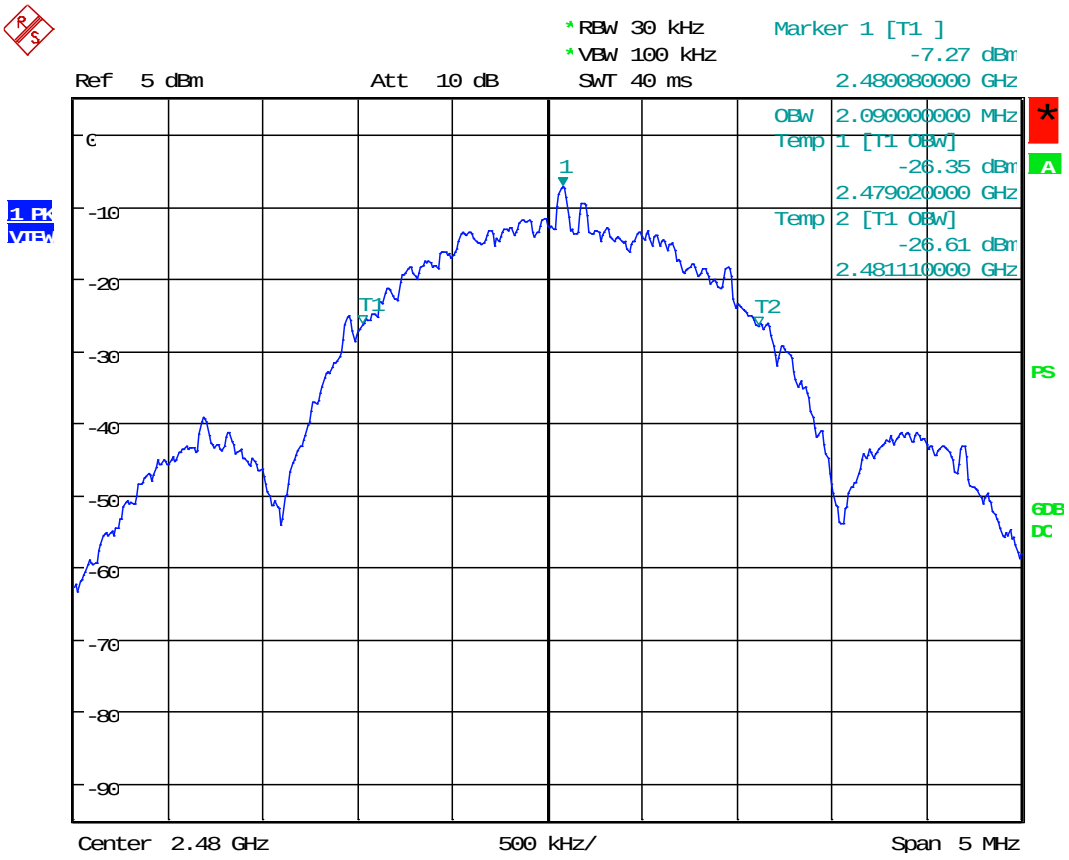
99%: 2 MB, High Channel



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8 CONDUCTED OUTPUT POWER

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the receiver. The peak power output was measured.

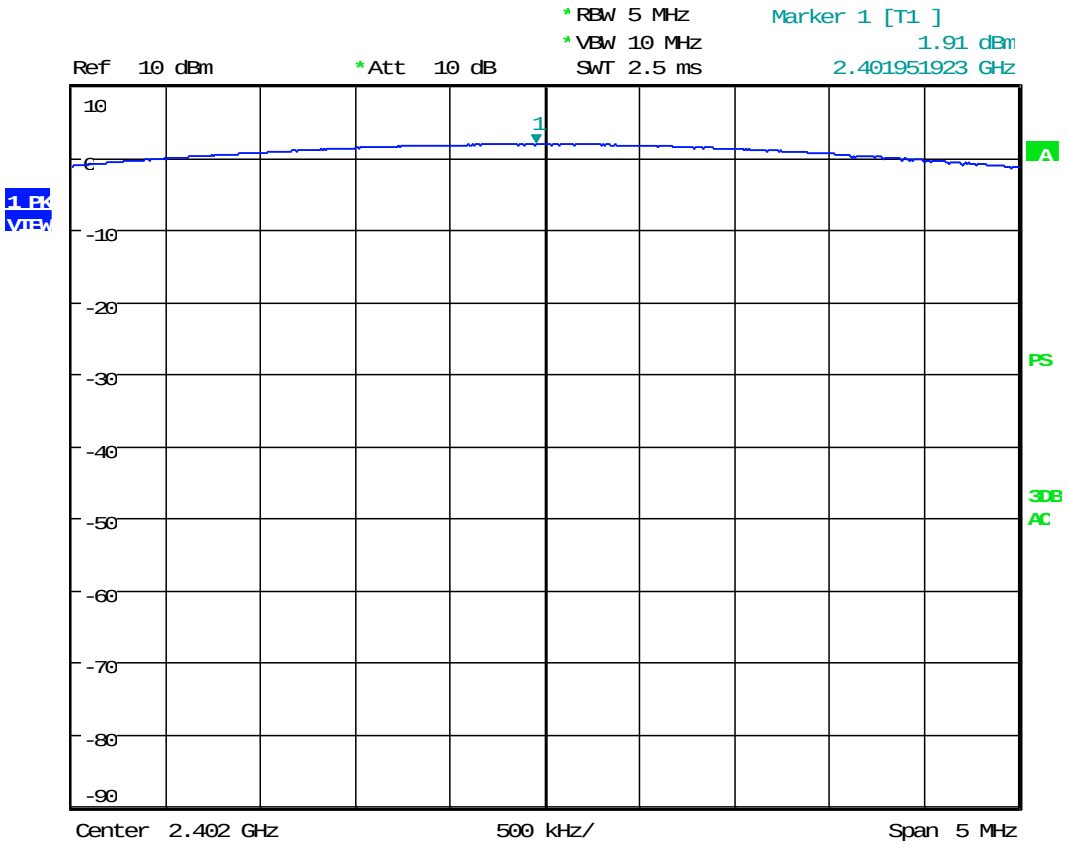
8.1 Requirements:

The peak power output shall be 1 watt (30 dBm) or less when using an antenna with a gain of less than 6dBi. For antennas having a gain of more than 6dBi, the limit is reduced by 1dB for every dB the antenna gain is over 6dBi.

8.2 Conducted Output Power Test Data

Test Date:	2024-08-08	**Test Engineer(s):**	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	**Air Temperature:**	22ºC
		Relative Humidity:	49%

1 Mbps: Low Channel



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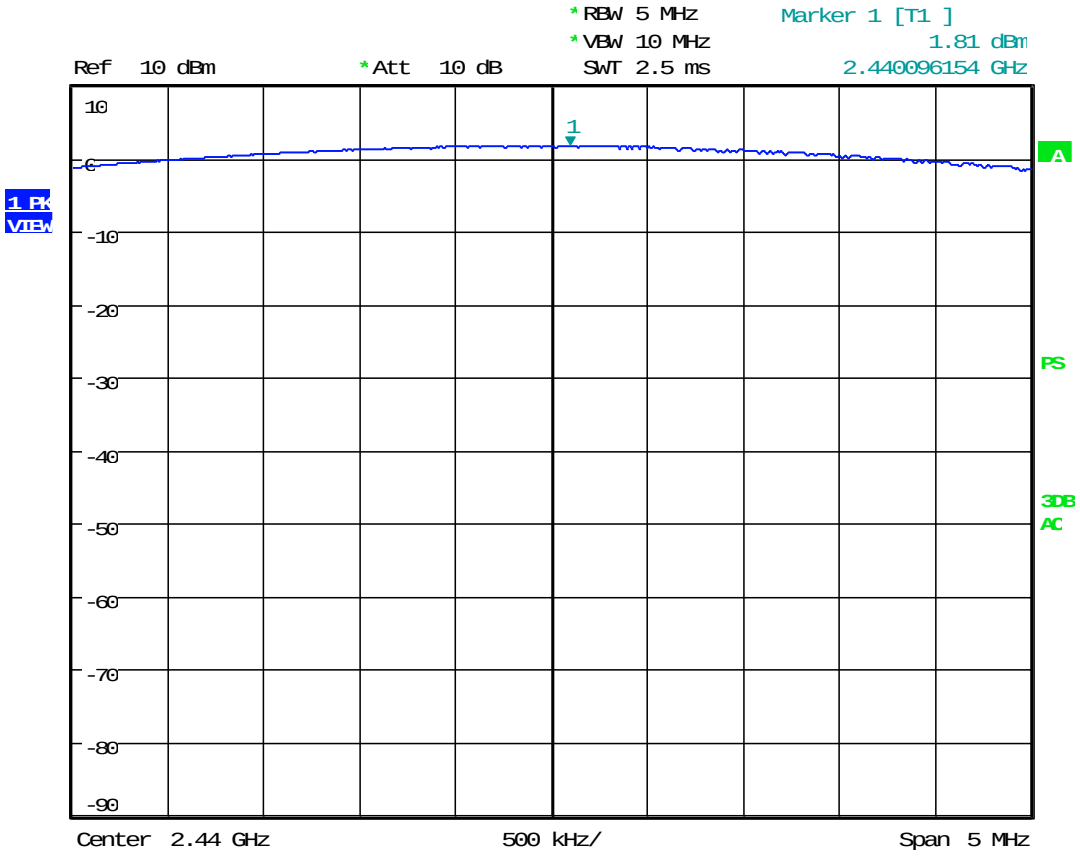
1 Mbps: Mid Channel



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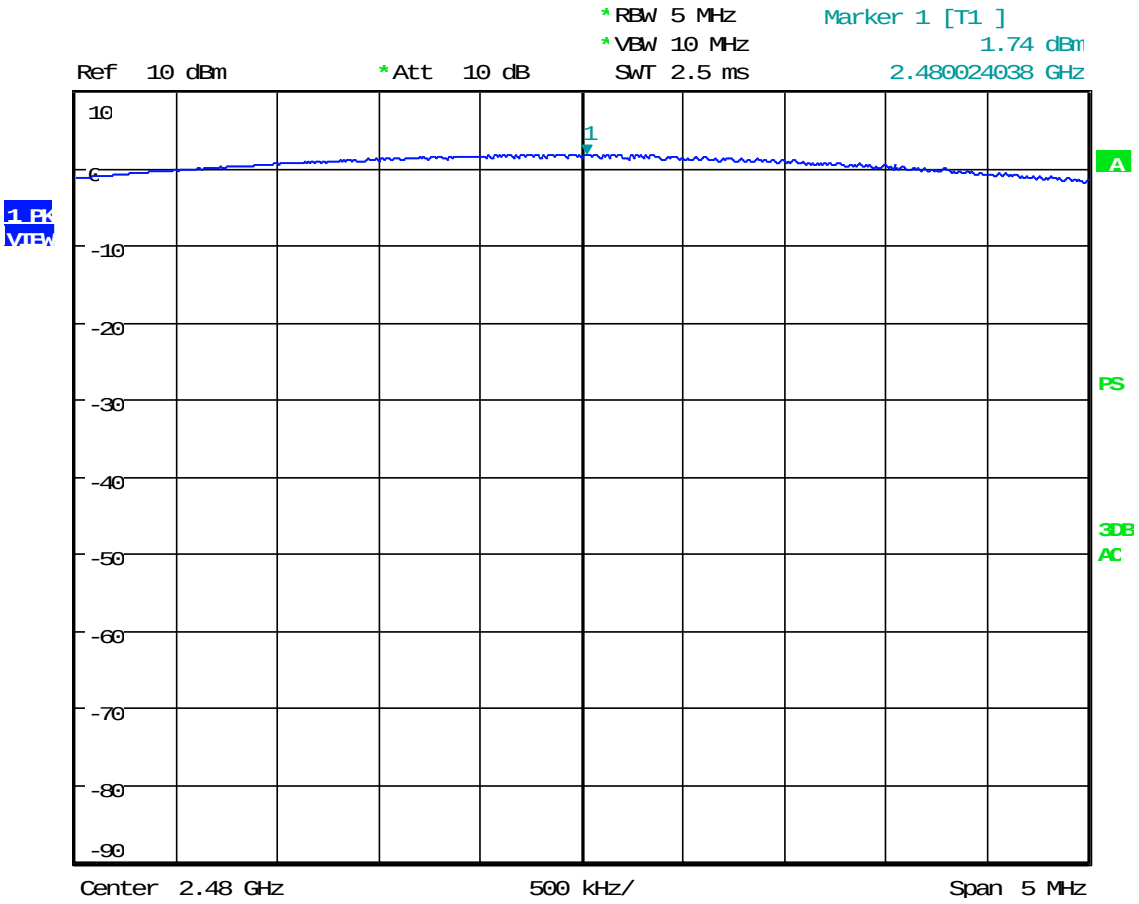
1 Mbps: High Channel



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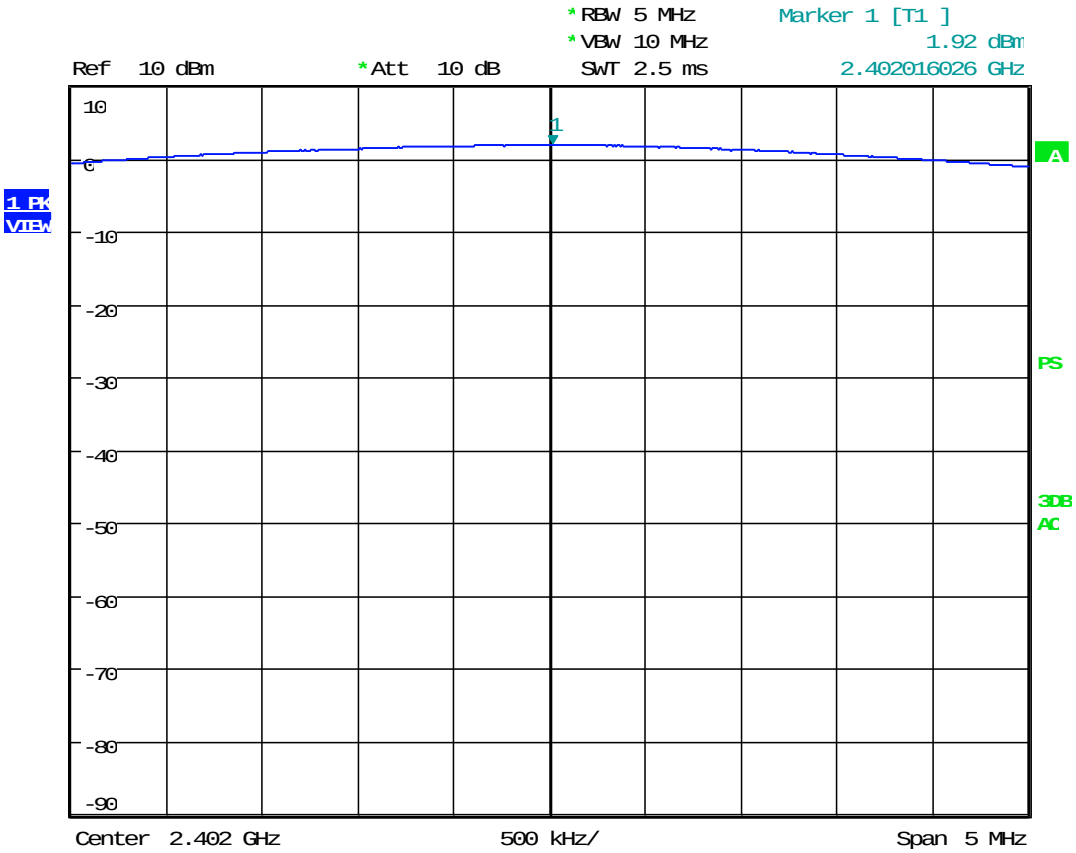
2 Mbps: Low Channel



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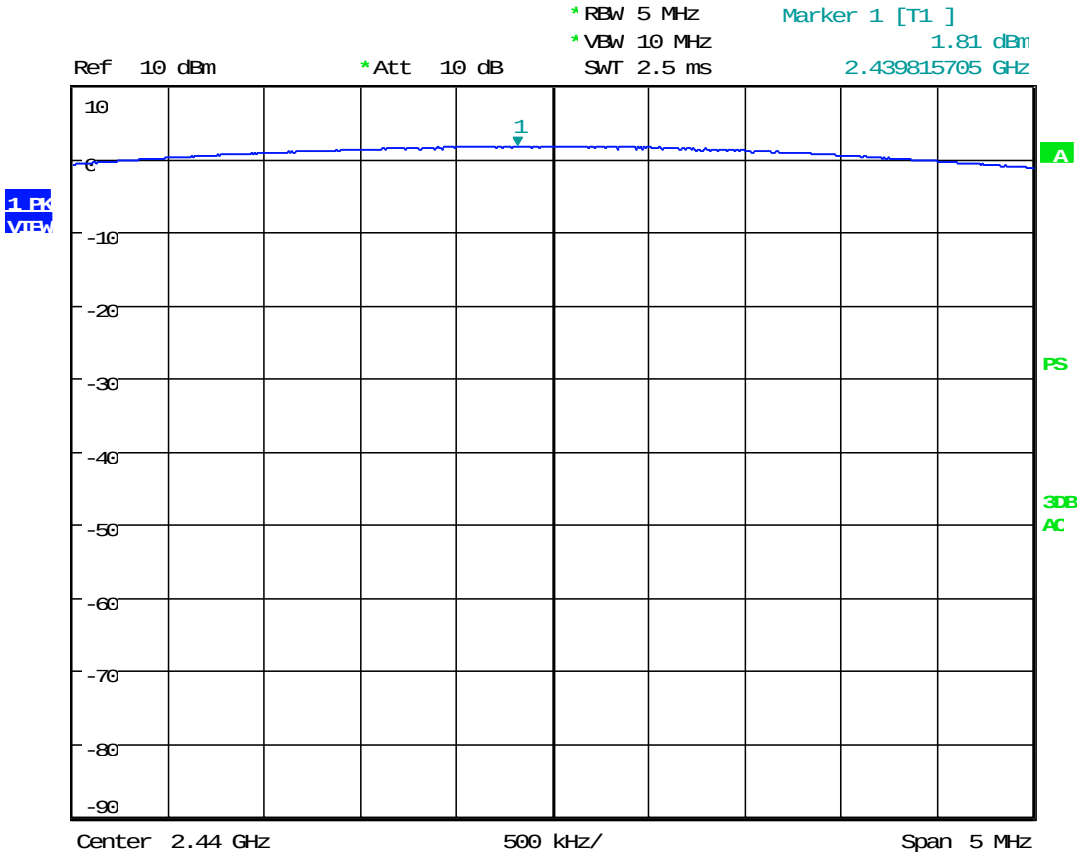
2 Mbps: Mid Channel



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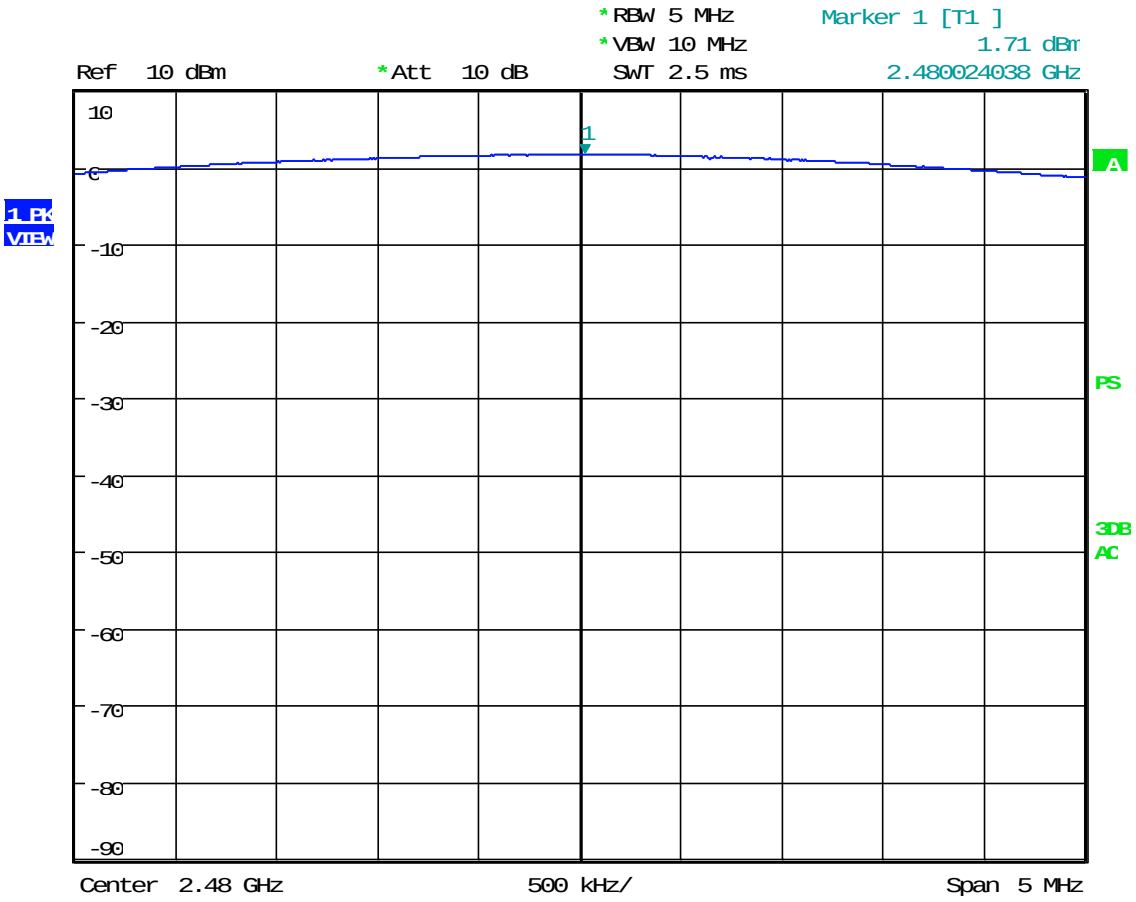
2 Mbps: High Channel



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9 VOLTAGE VARIATIONS

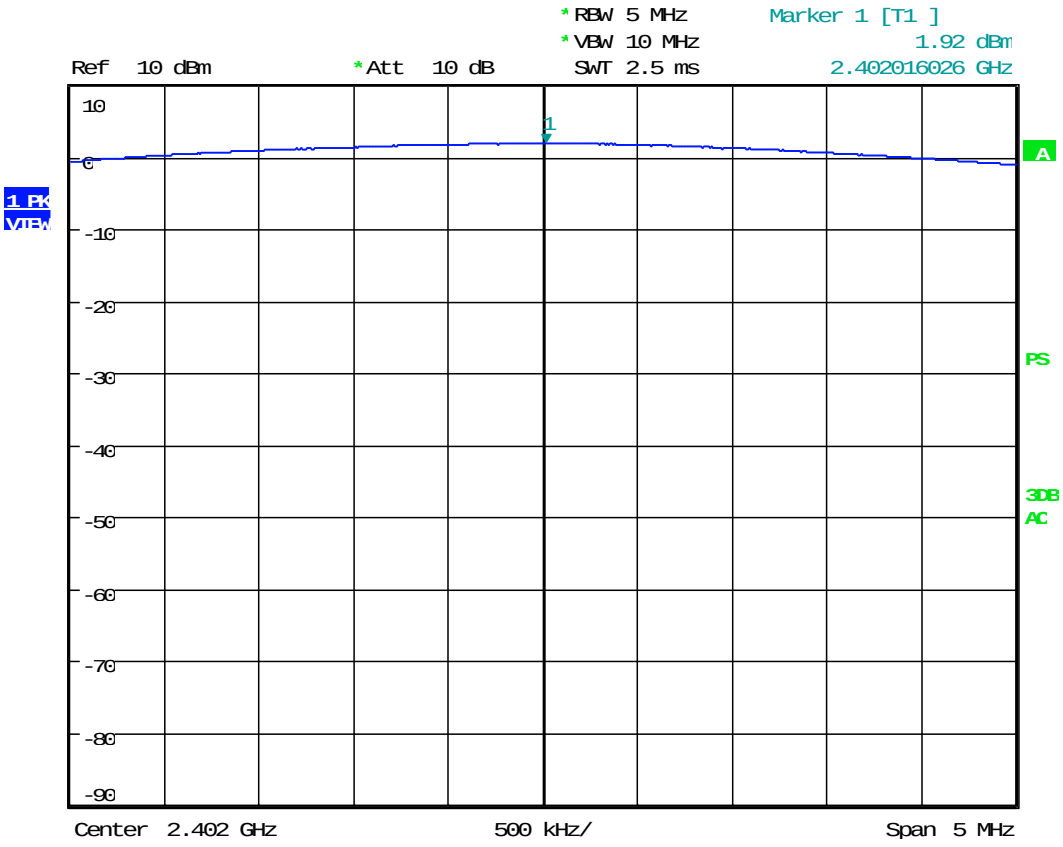
9.1 Requirements

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

9.2 Voltage Variations Test Data

Test Date(s):	2024-08-08	**Test Engineer(s):**	J. Chiller
Rule:	15.31(e)	**Air Temperature:**	22.5º C
Test Results:	Complies	**Relative Humidity:**	47%

Nominal Voltage: 3.3VDC



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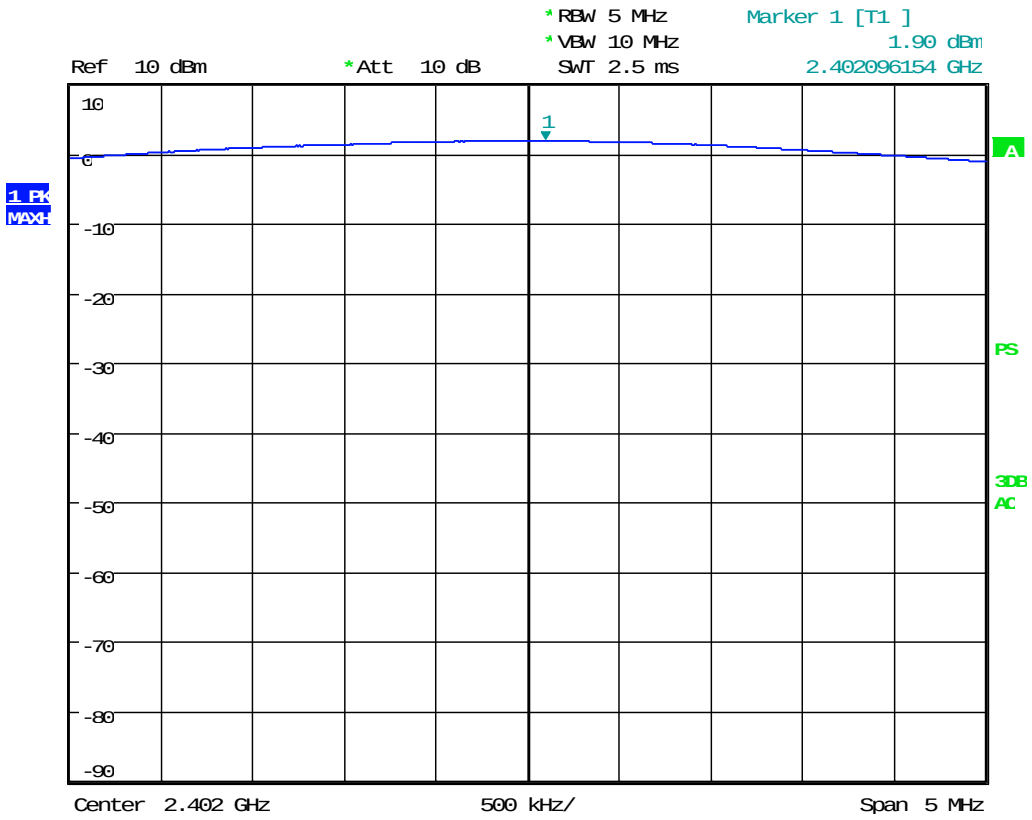
2.6VDC



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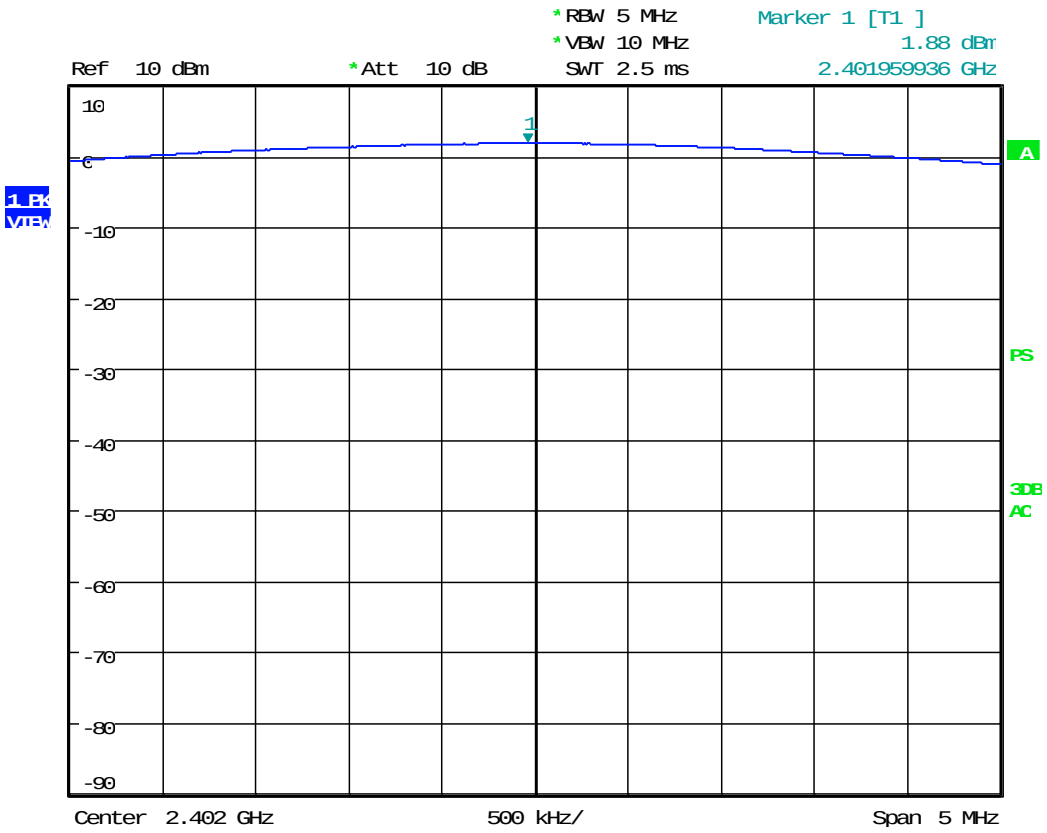
3.7VDC



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10 CONDUCTED SPURIOUS EMISSIONS

The following tests were performed to demonstrate compliance.

RF Antenna Conducted Test

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the spectrum analyzer.

10.1 Requirements:

All Spurious Emissions must be at least 20dB down from the highest emission level measured within the authorized band up through the tenth harmonic. Emissions in the restricted bands must comply with the levels specified in § 15.209(a)

Spurious emissions measurements were made at the low, mid, and upper channels with the appropriate spectrum analyzer resolution bandwidth. Additionally, band edges were measured for the low and high channels to verify compliance.

10.2 Conducted Spurious Emissions Test Data

Test Date:	2024-08-02	**Test Engineer(s):**	J. Chiller E. Tobin
Standards:	CFR 47 Part 15.247(d) / Part 15.207 KDB558074	**Air Temperature:**	21.0ºC
		Relative Humidity:	40%
Results:	Complies		

1 Mbps, Low Band Edge

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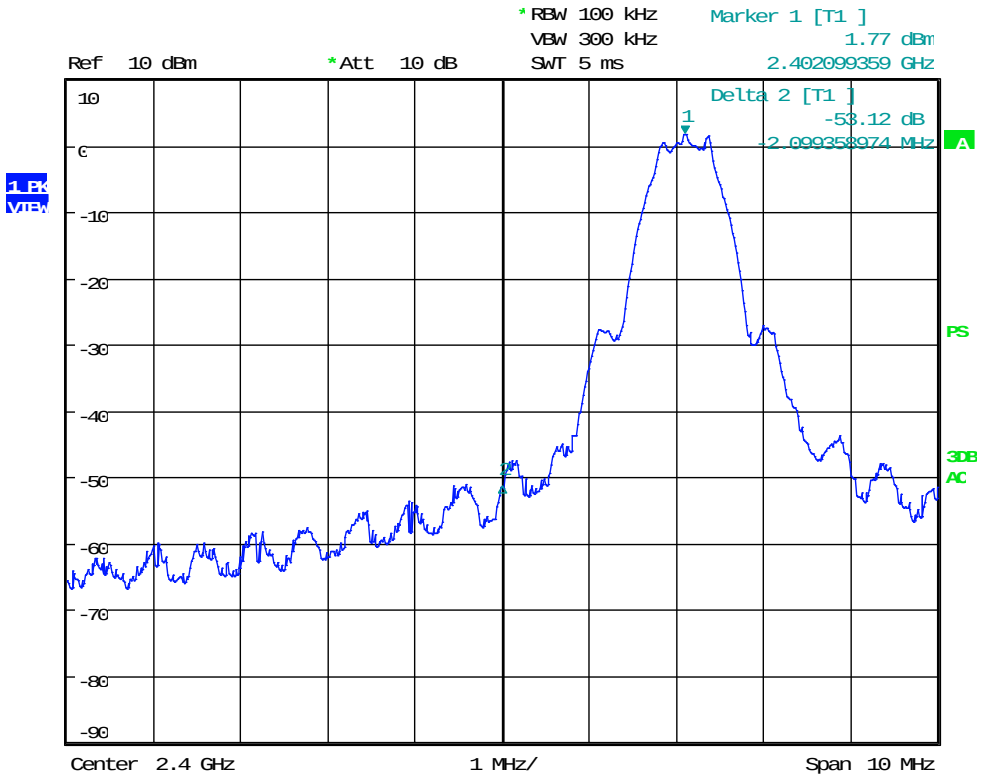

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1 Mbps, Upper Band Edge

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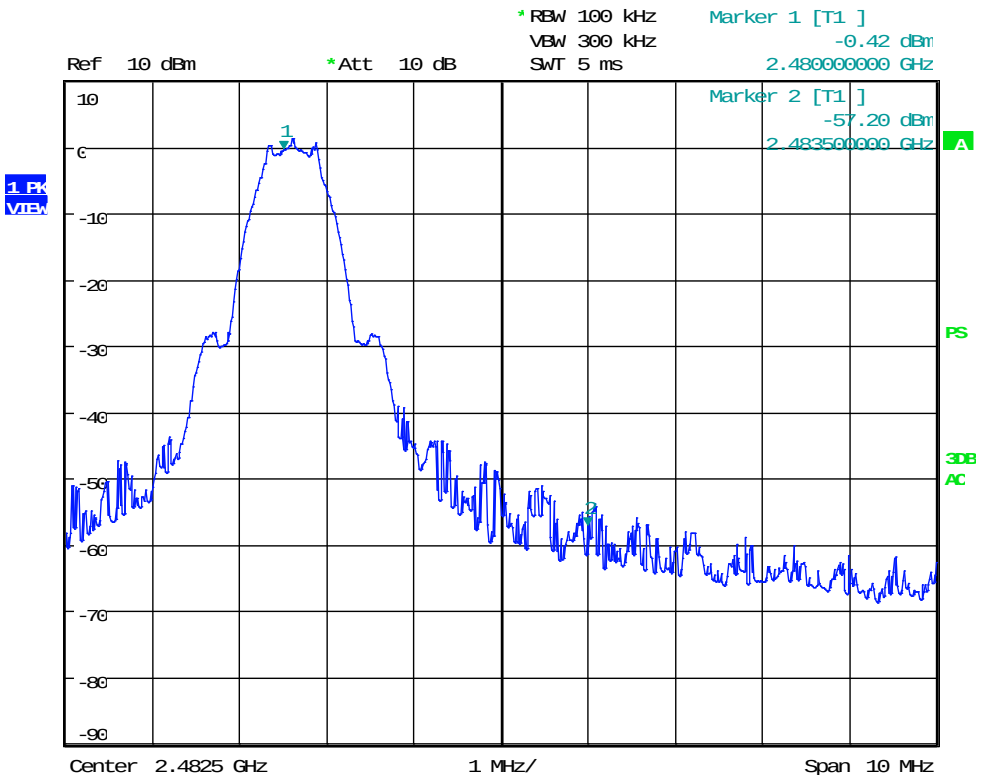

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2 Mbps, Low Band Edge

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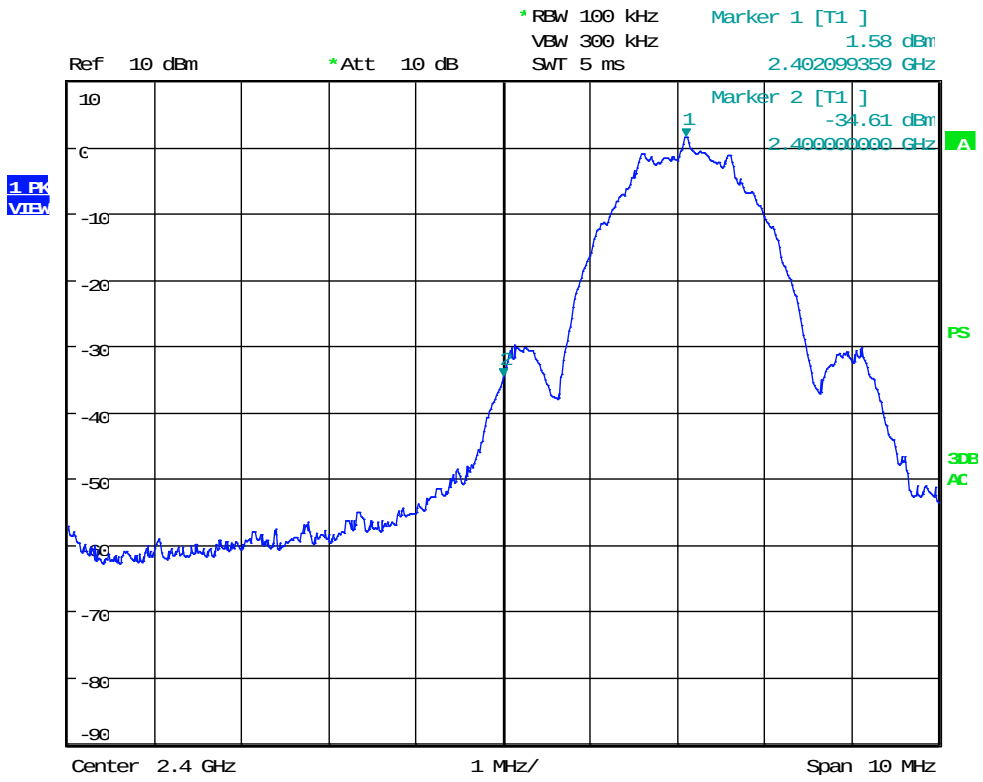

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2 Mbps, Upper Band Edge

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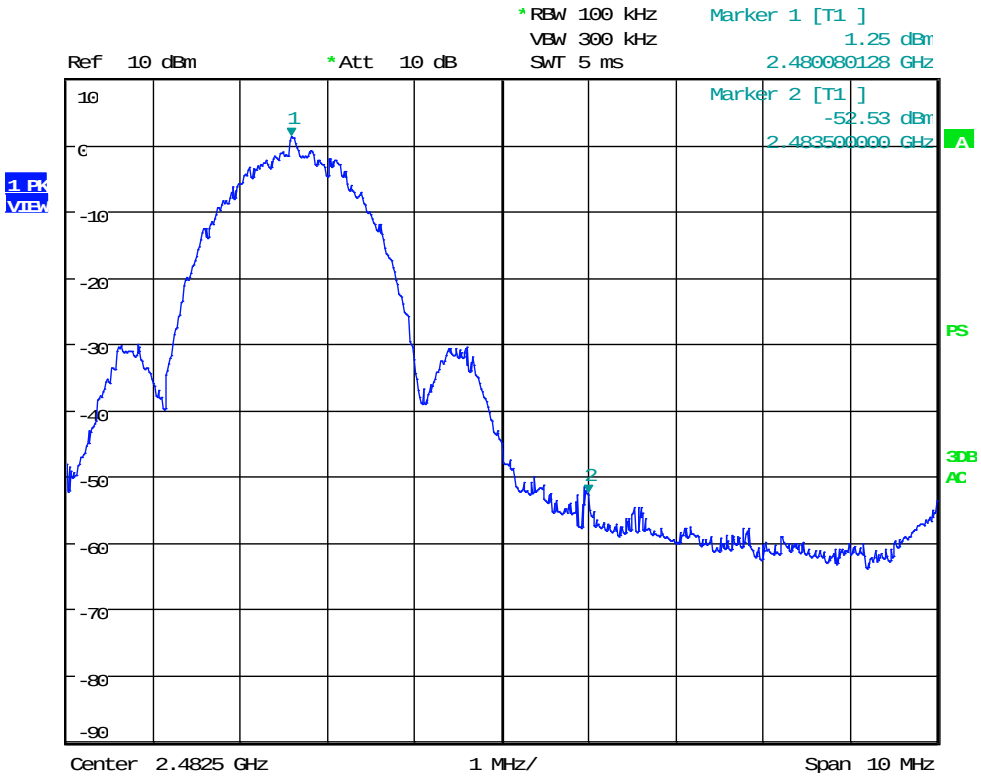

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Low Channel: 1 Mbps, 0.009 MHz to 0.15 MHz

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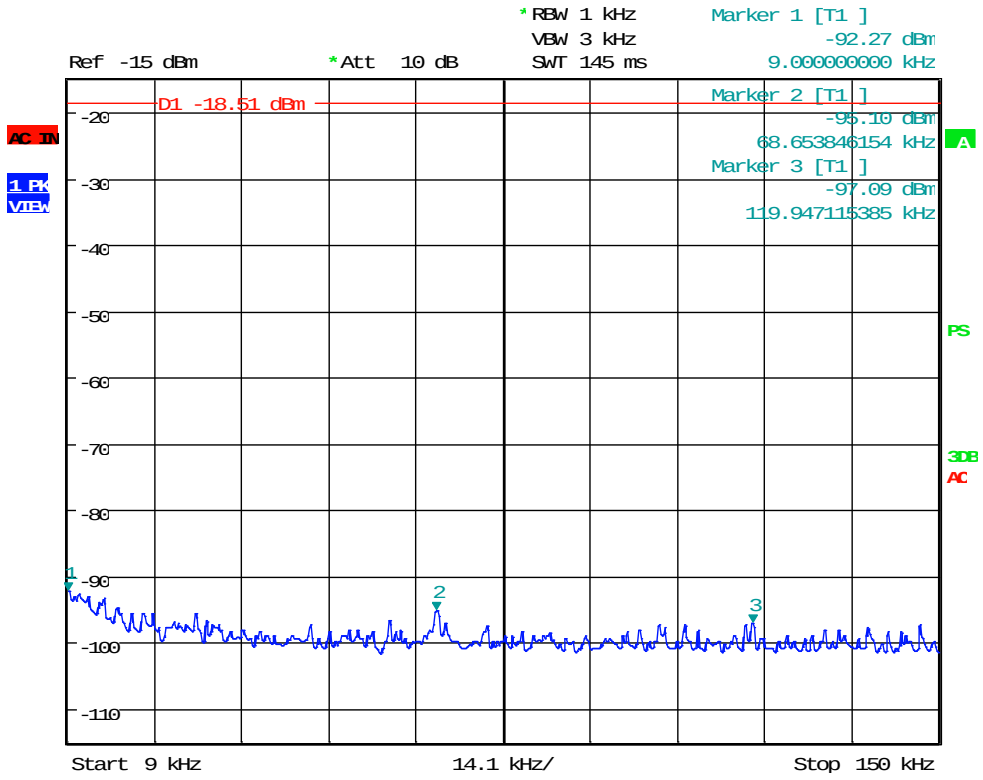

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Low Channel: 1 Mbps, 0.15 MHz to 30 MHz

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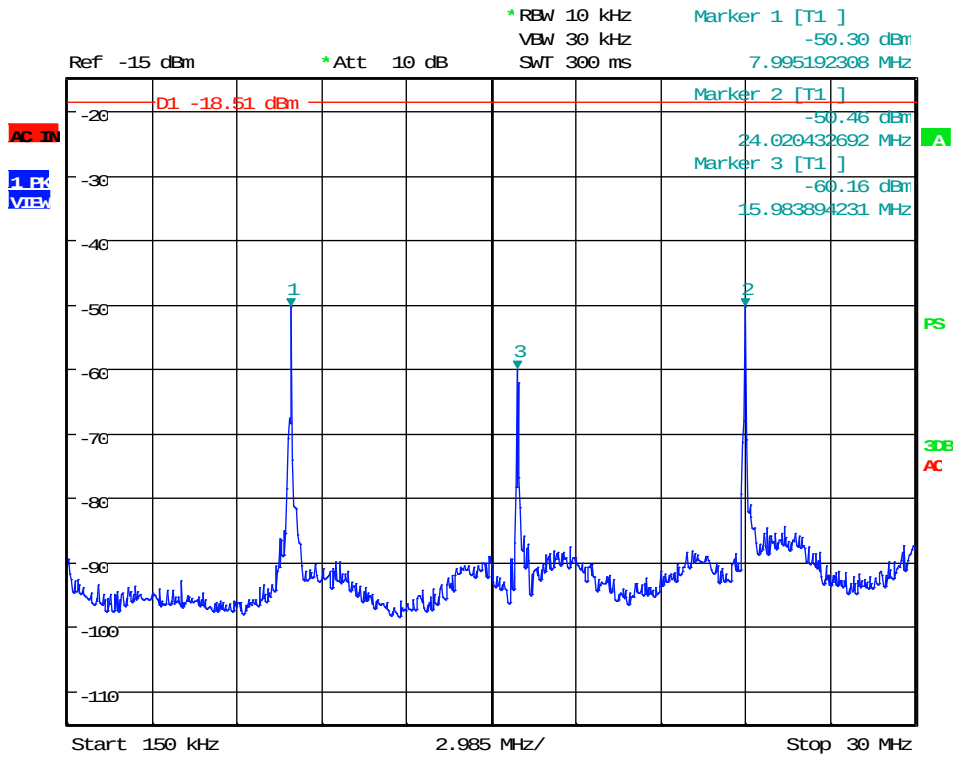

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Low Channel: 1 Mbps, 30 MHz to 1000 MHz

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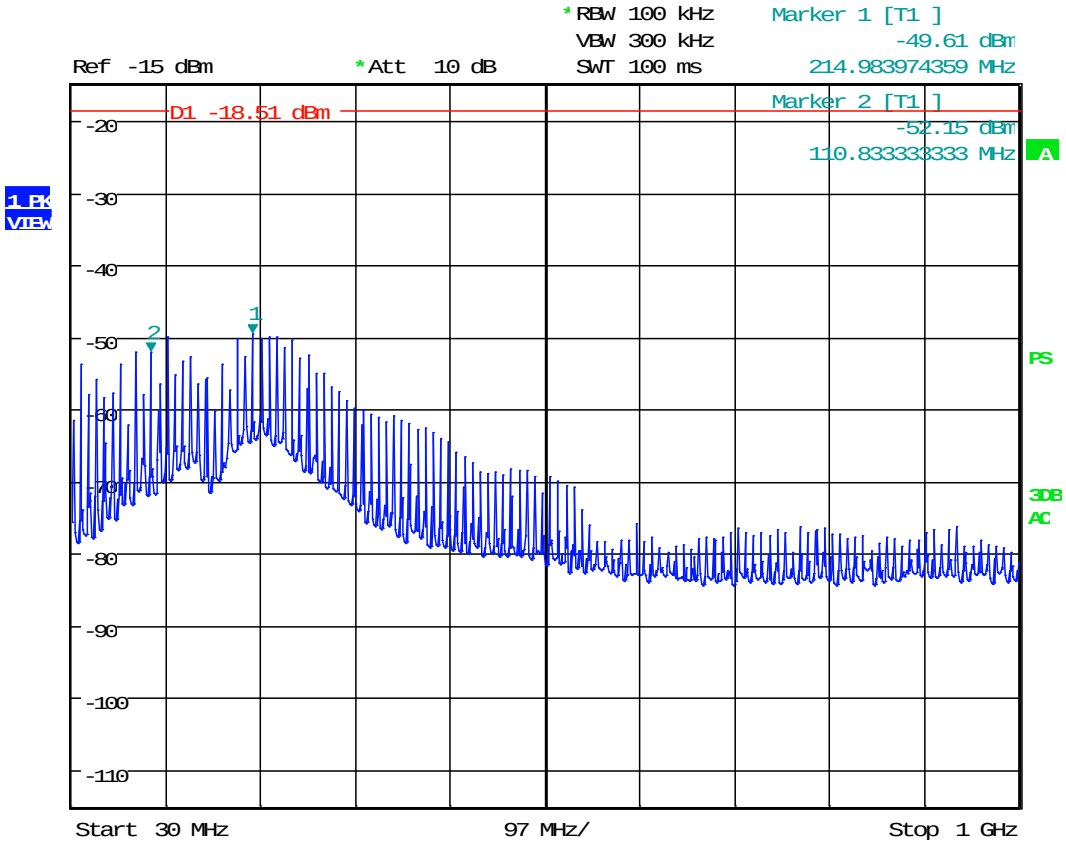

Date: 2.AUG.2024 12:08:02

Low Channel: 1 Mbps, 1 GHz to 18 GHz

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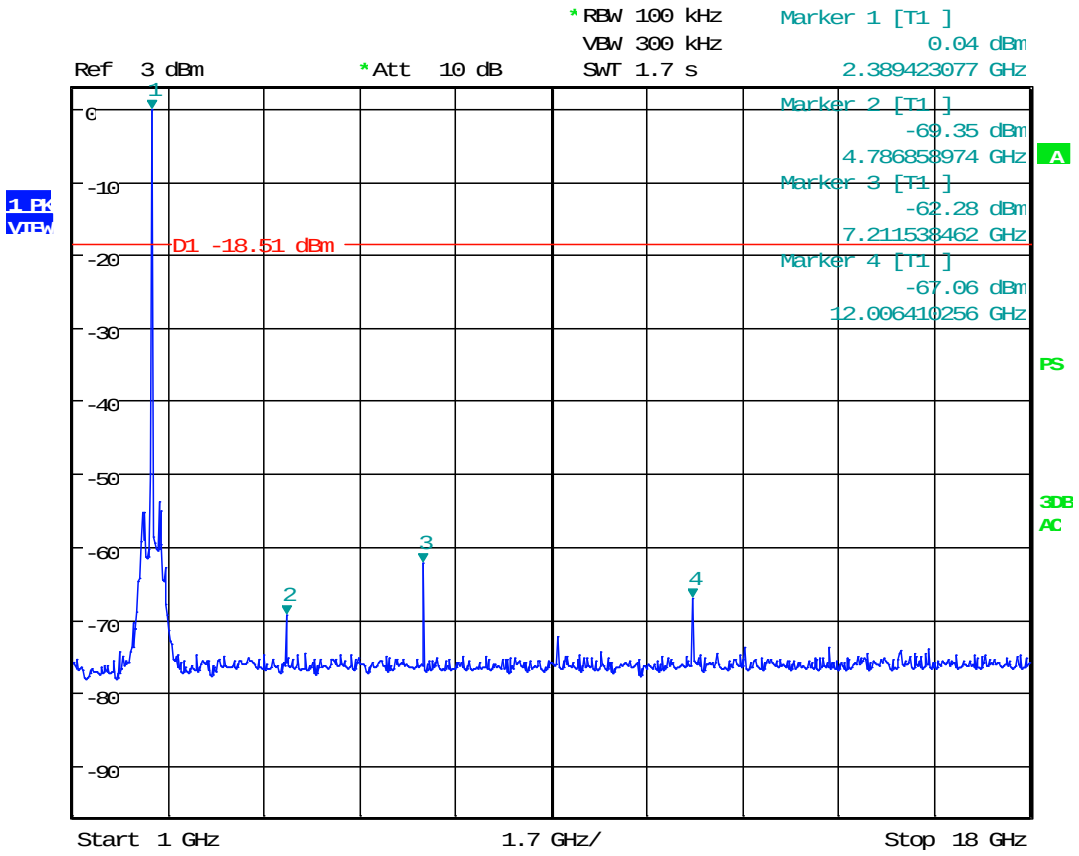
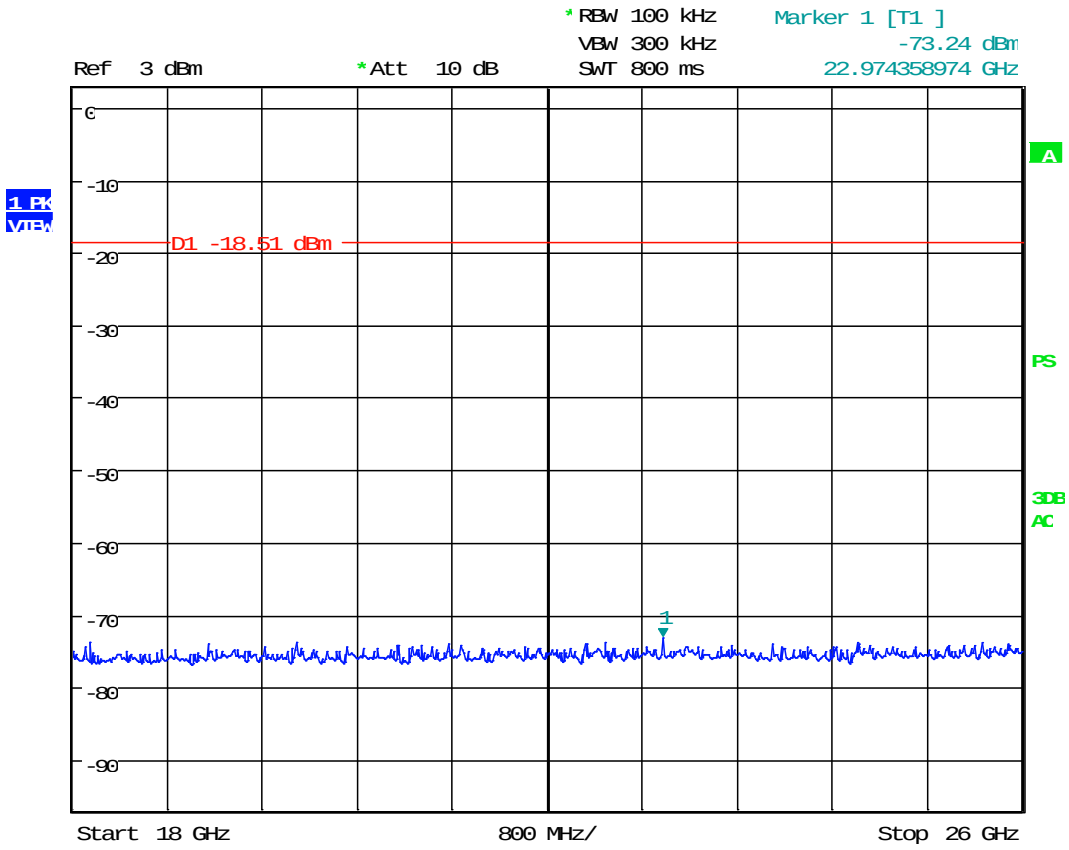


Date: 2.AUG.2024 12:10:43

Low Channel: 1 Mbps, 18 GHz to 26 GHz

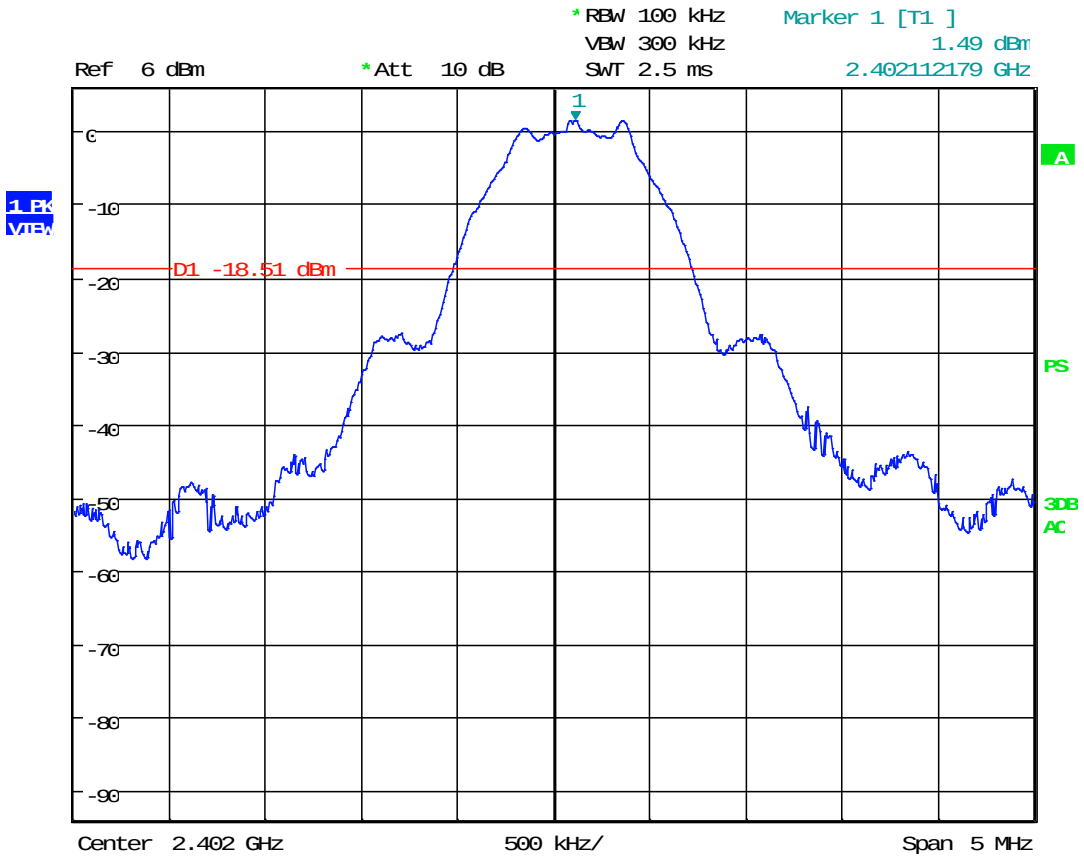
.



Date: 2.AUG.2024 12:11:29

Low Channel: 1 Mbps, Spur Reference

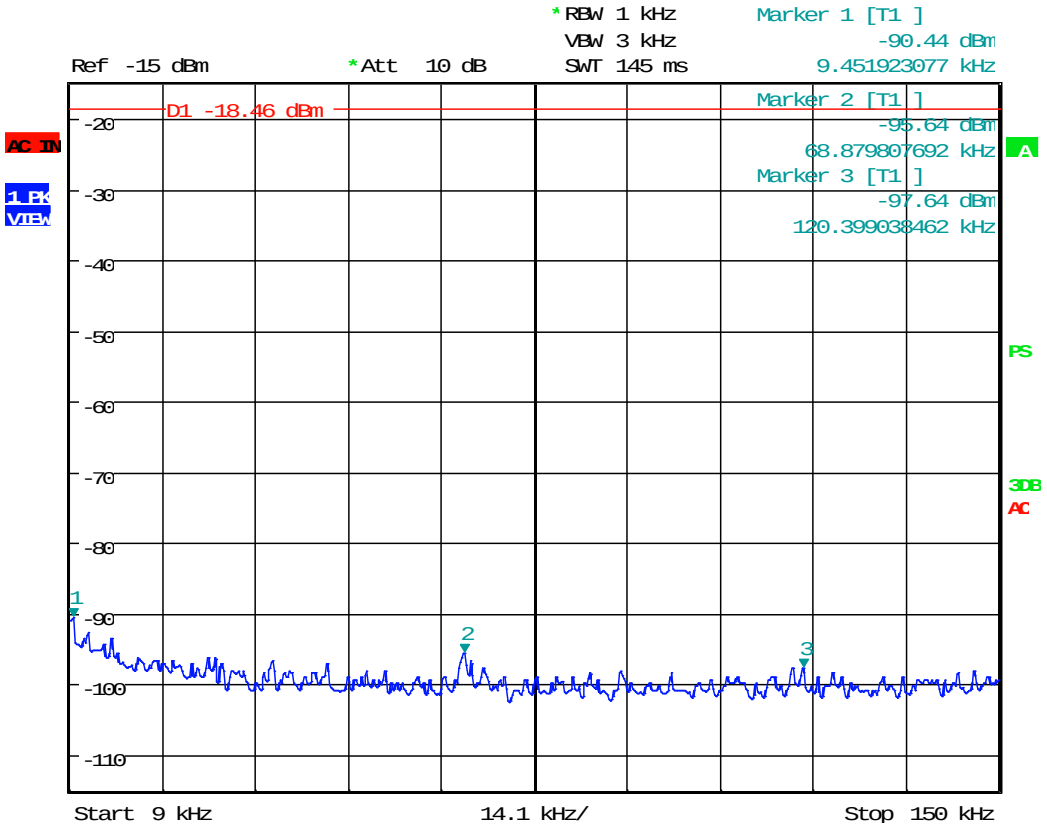
.



Date: 2.AUG.2024 12:04:27

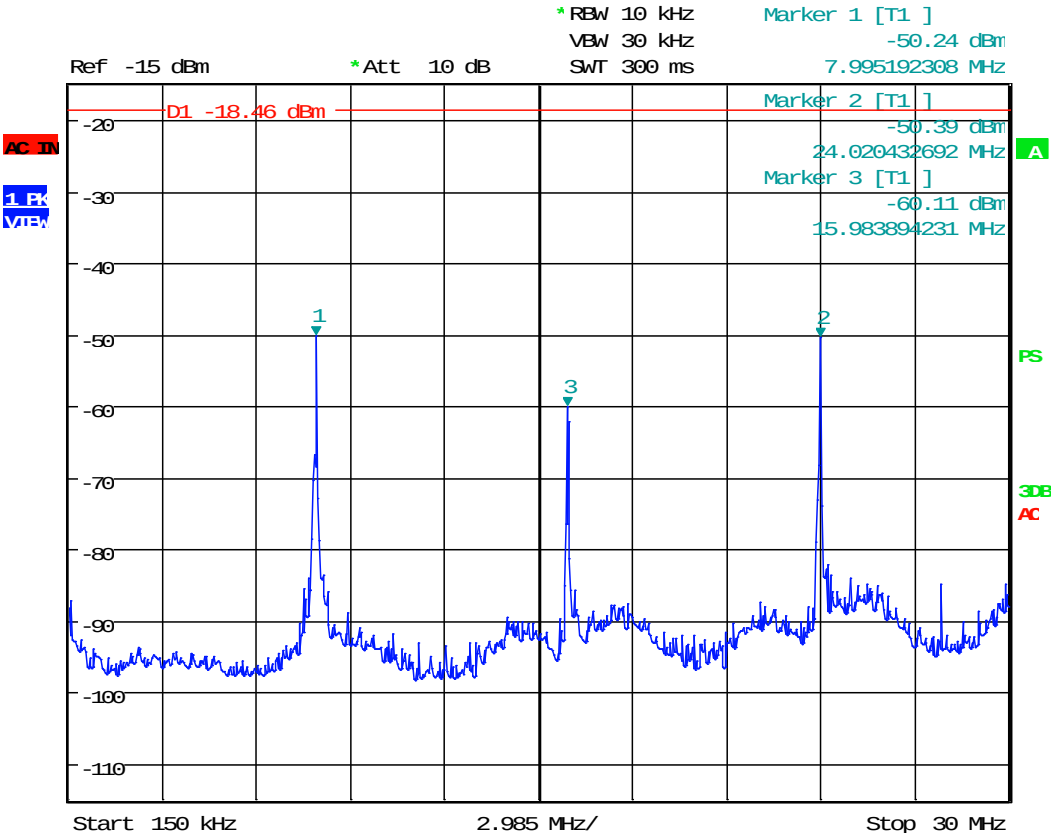
Mid Channel: 1 Mbps, 0.009 MHz to 0.15 MHz

.



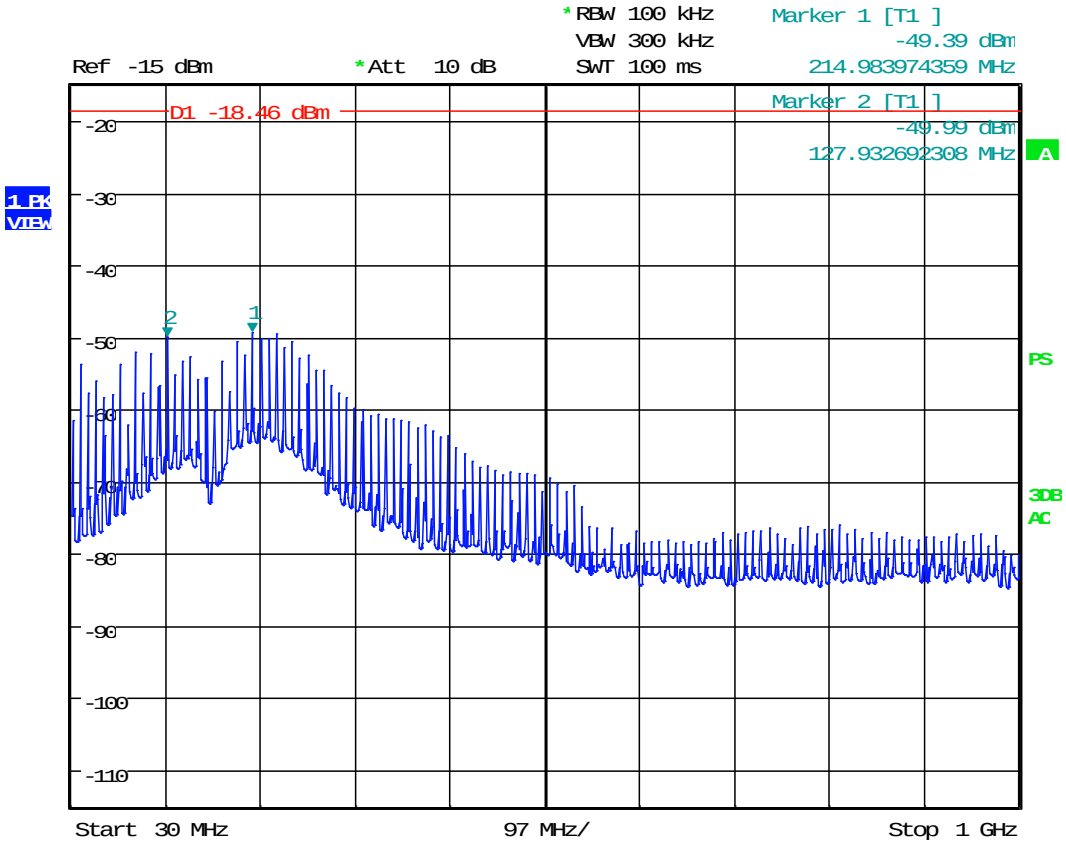
Mid Channel: 1 Mbps, 0.15 MHz to 30 MHz

.



Mid Channel: 1 Mbps, 30 MHz to 1000 MHz

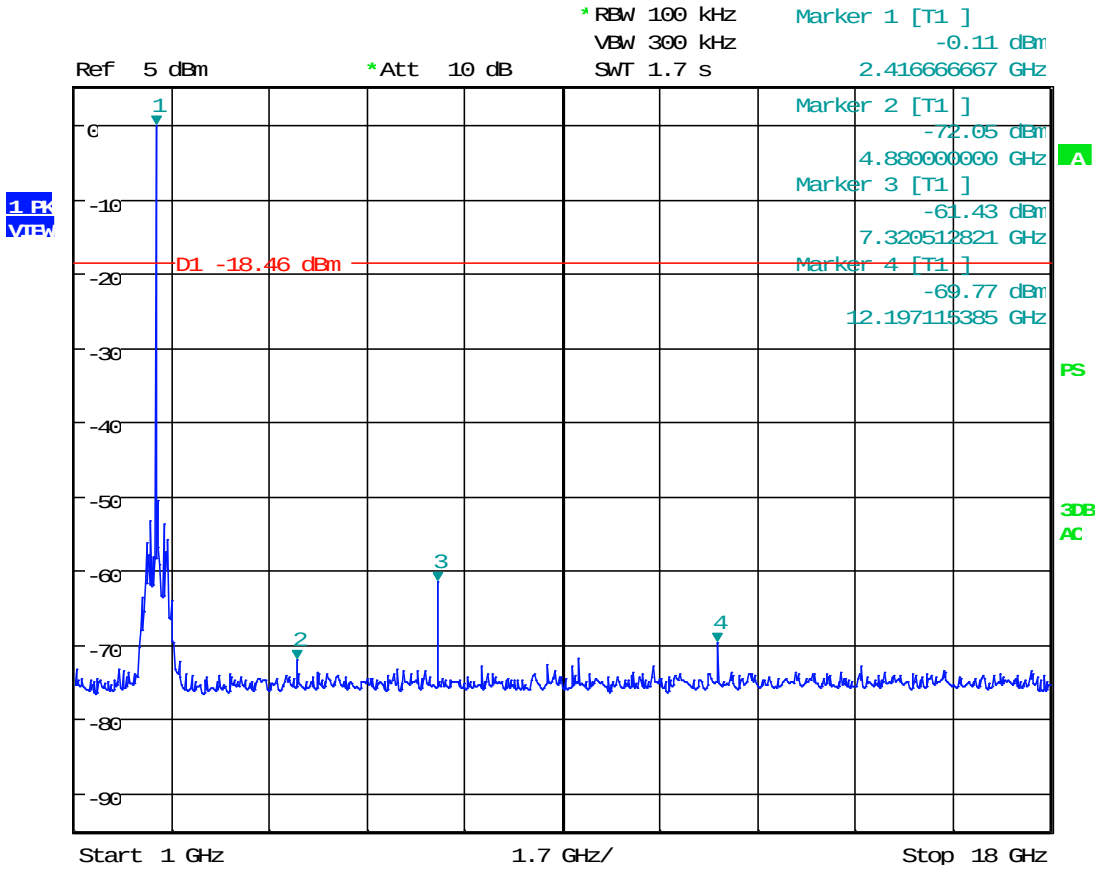
.



Date: 2.AUG.2024 12:18:14

Mid Channel: 1 Mbps, 1 GHz to 18 GHz

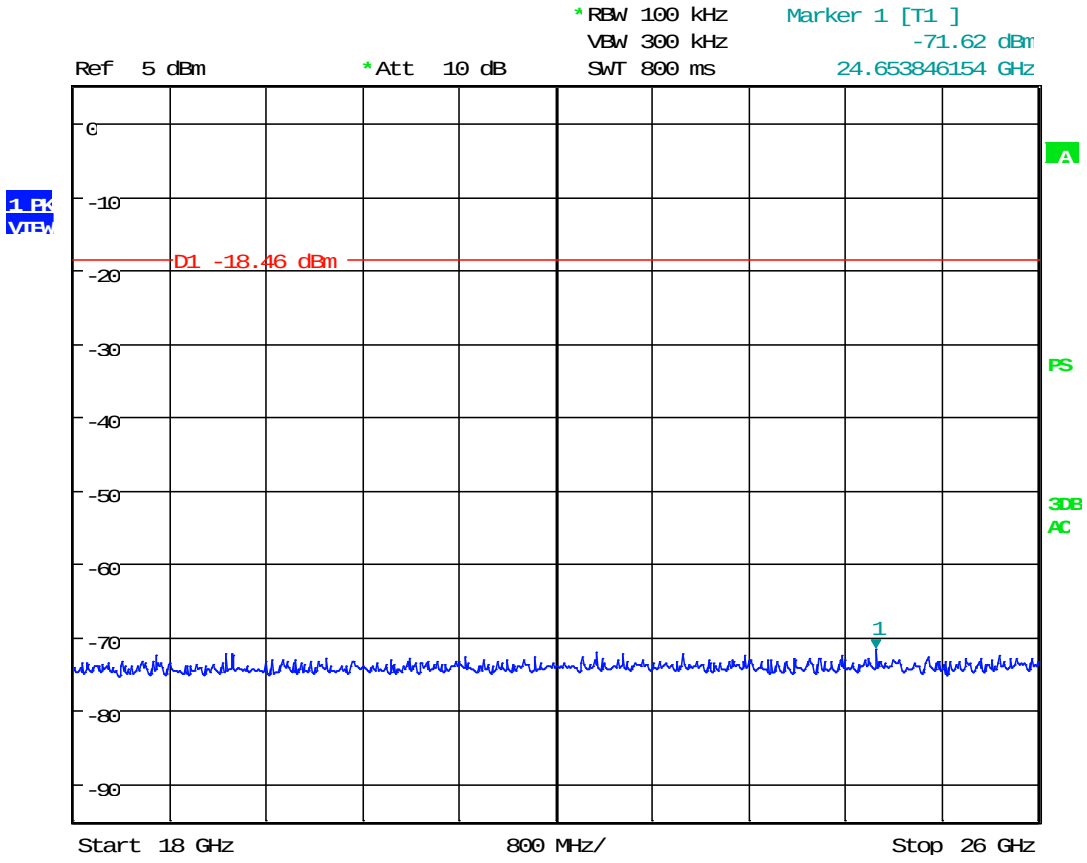
.



Date: 2.AUG.2024 12:23:21

Mid Channel: 1 Mbps, 18 GHz to 26 GHz

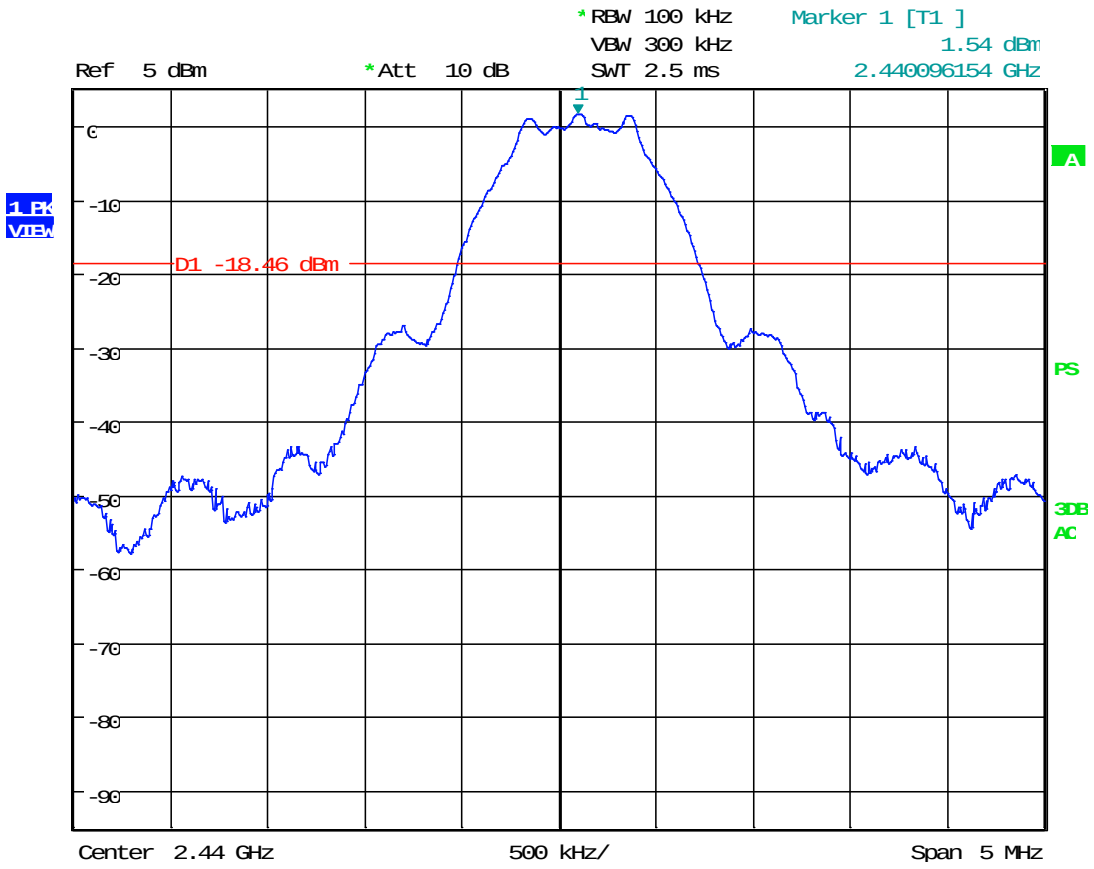
.



Date: 2.AUG.2024 12:27:32

Mid Channel: 1 Mbps, Spur Reference

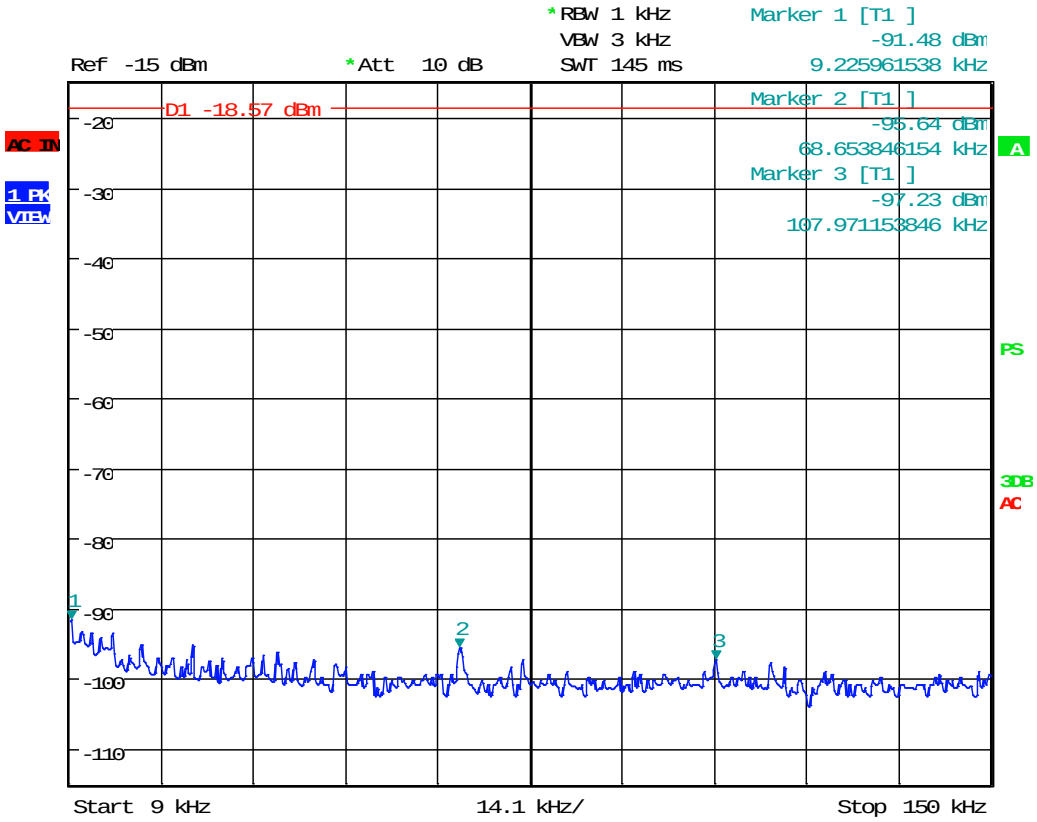
.



Date: 2.AUG.2024 12:14:11

High Channel: 1 Mbps, 0.009 MHz to 0.15 MHz

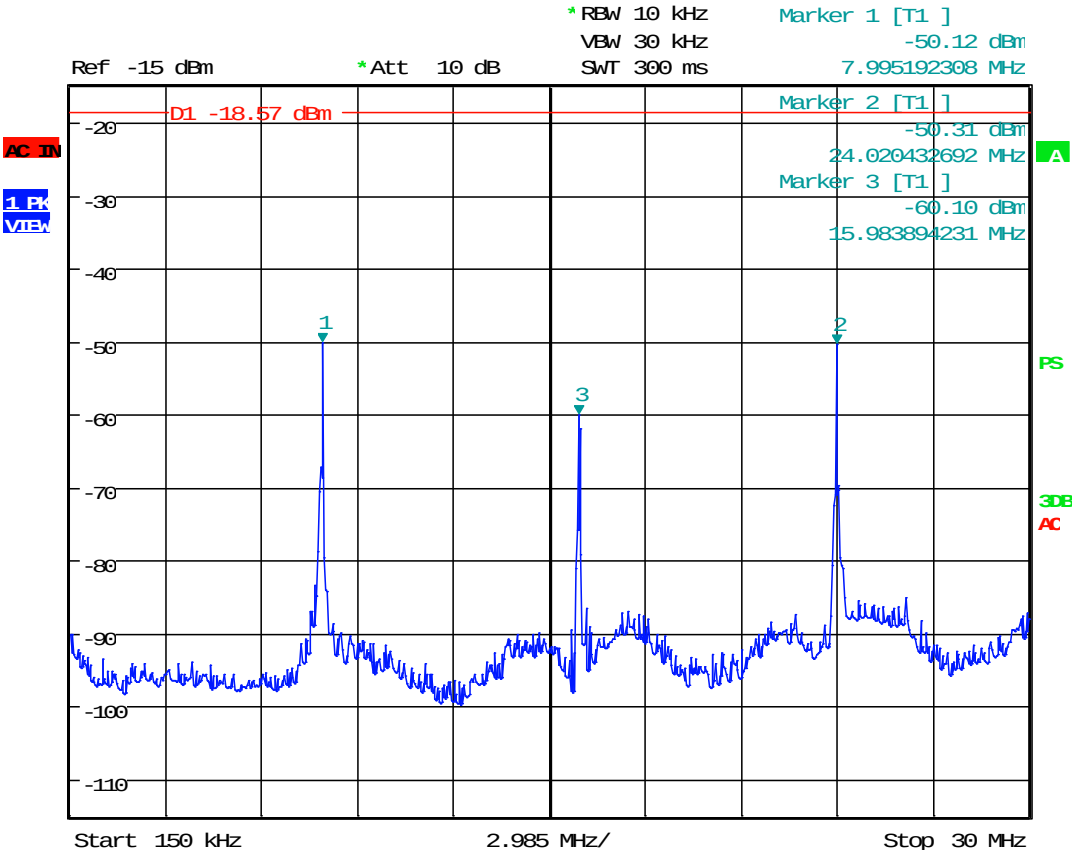
.



Date: 2.AUG.2024 12:31:08

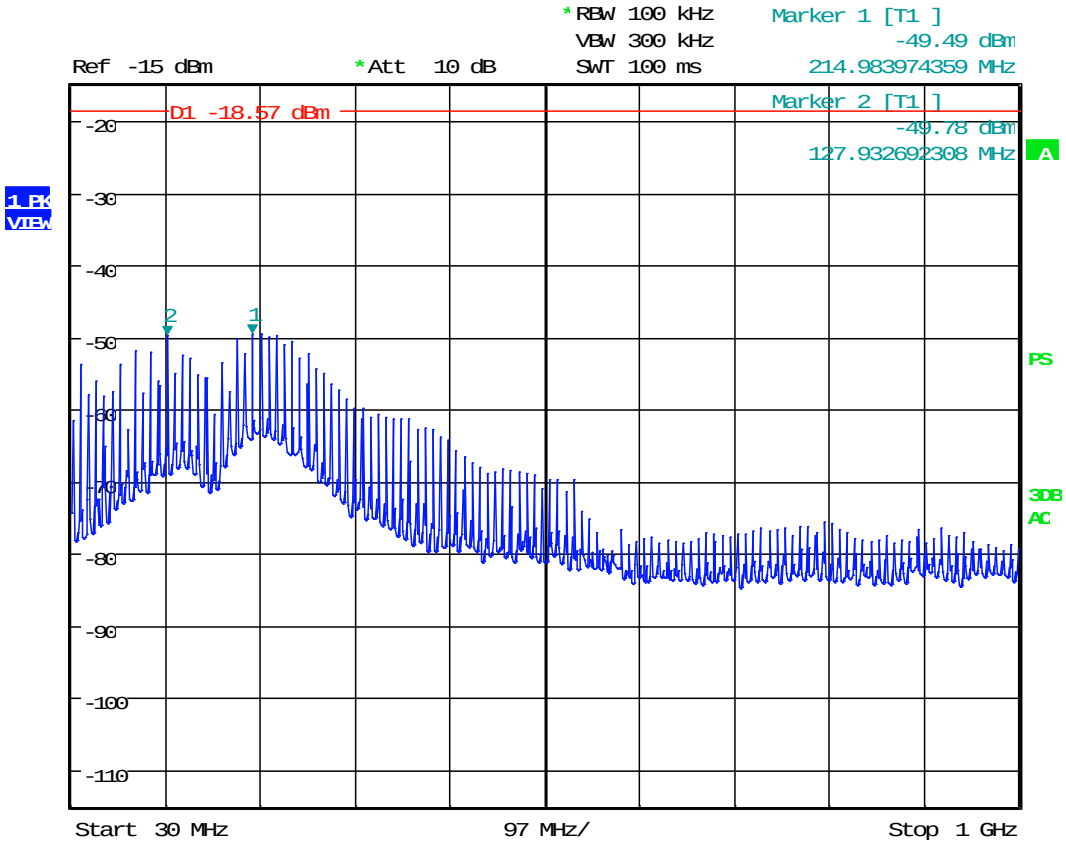
High Channel: 1 Mbps, 0.15 MHz to 30 MHz

.



High Channel: 1 Mbps, 30 MHz to 1000 MHz

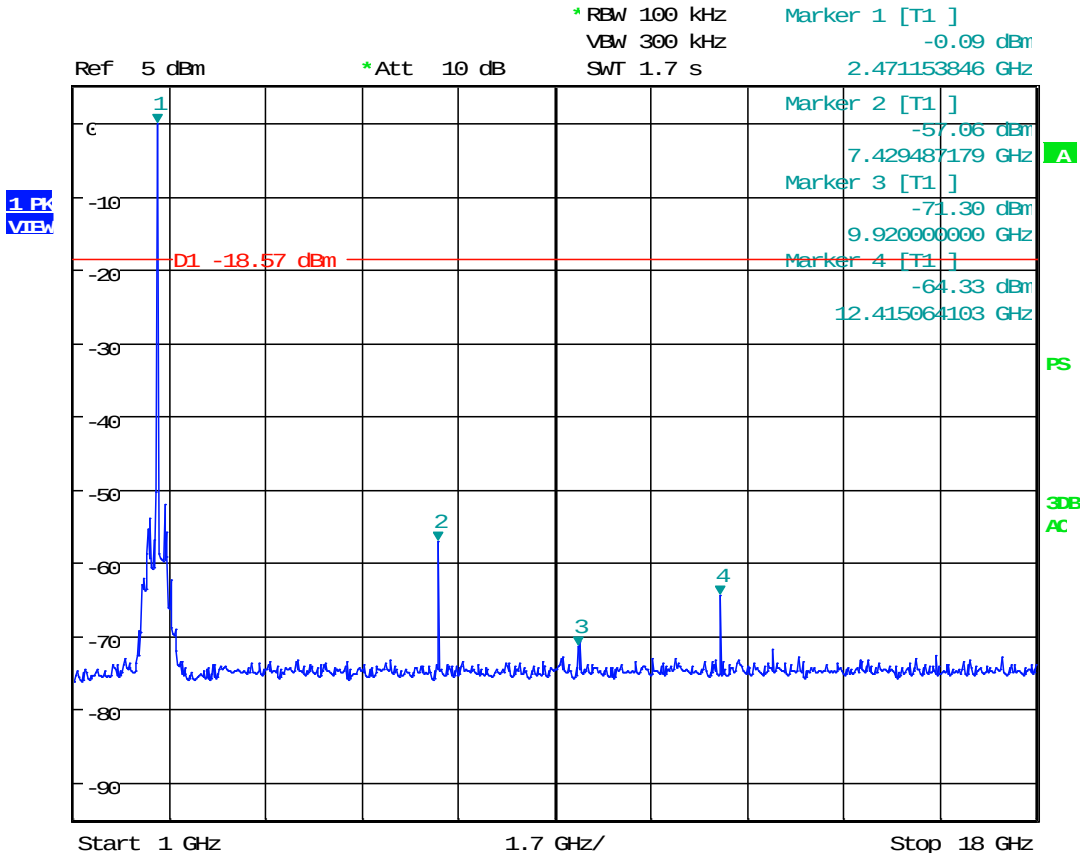
.



Date: 2.AUG.2024 12:32:44

High Channel: 1 Mbps, 1 GHz to 18 GHz

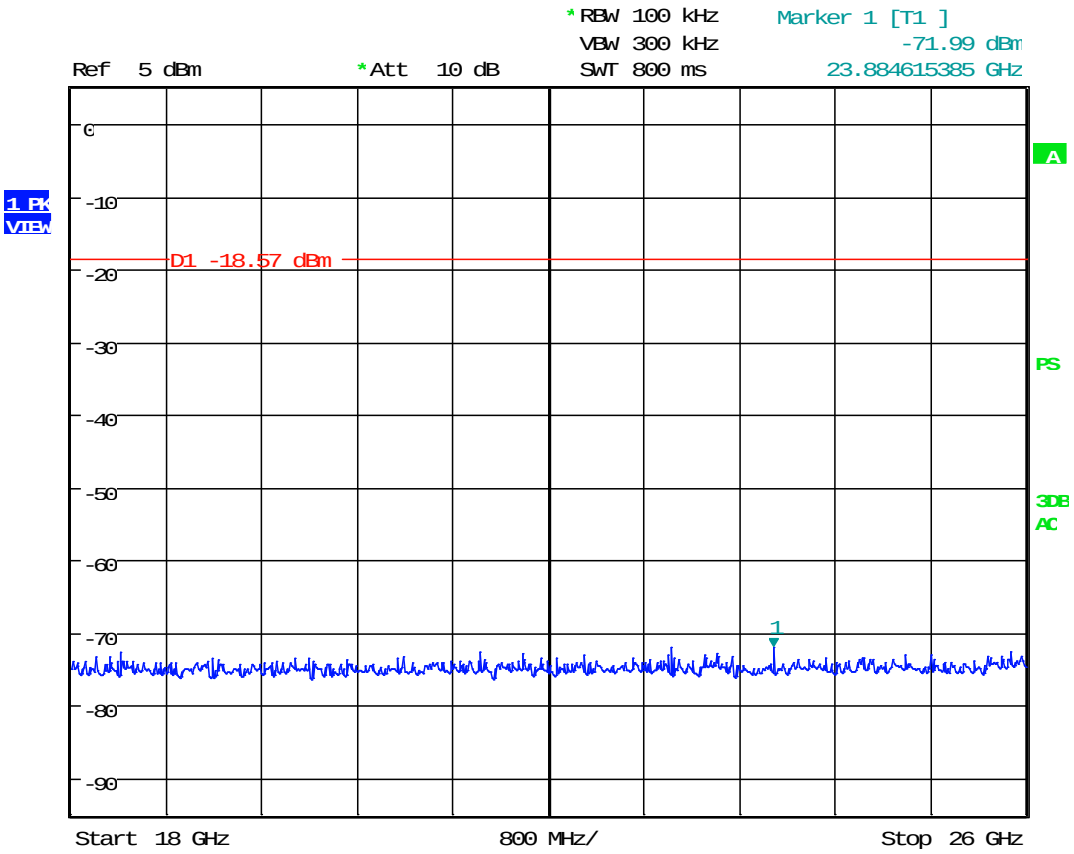
.



Date: 2.AUG.2024 12:37:43

High Channel: 1 Mbps, 18 GHz to 26 GHz

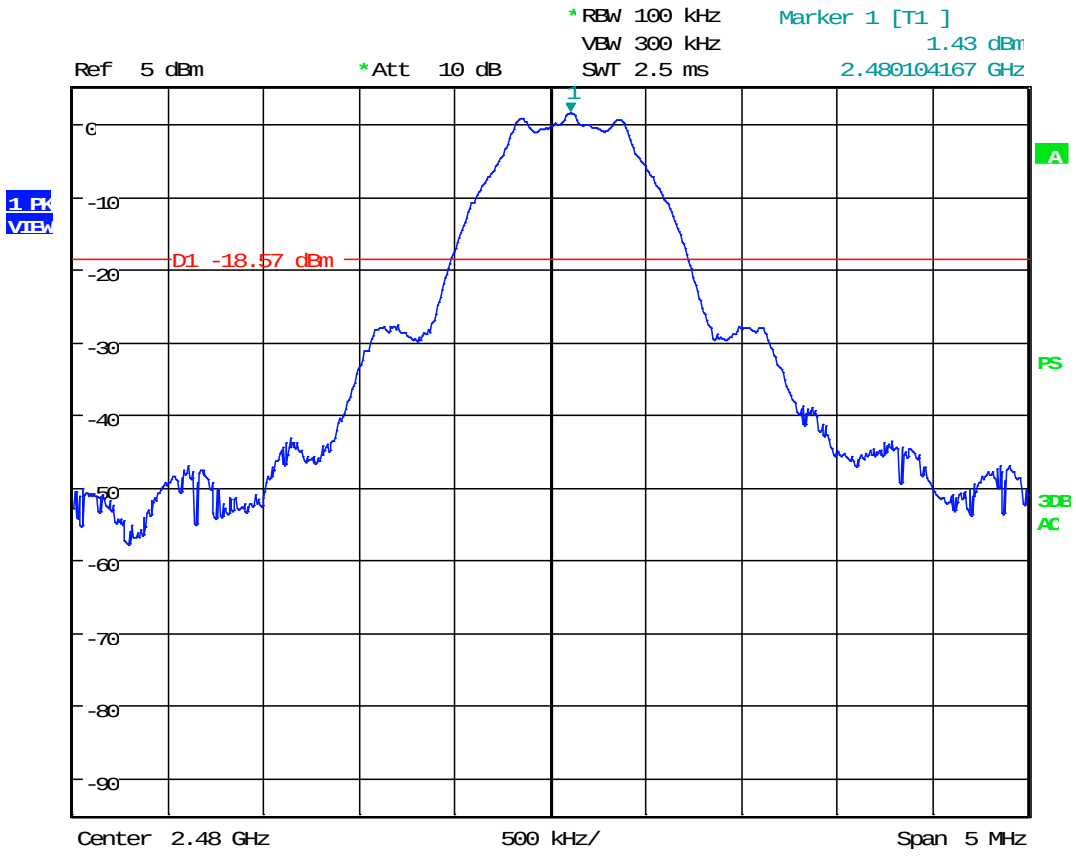
.



Date: 2.AUG.2024 12:38:15

High Channel: 1 Mbps, Spur Reference

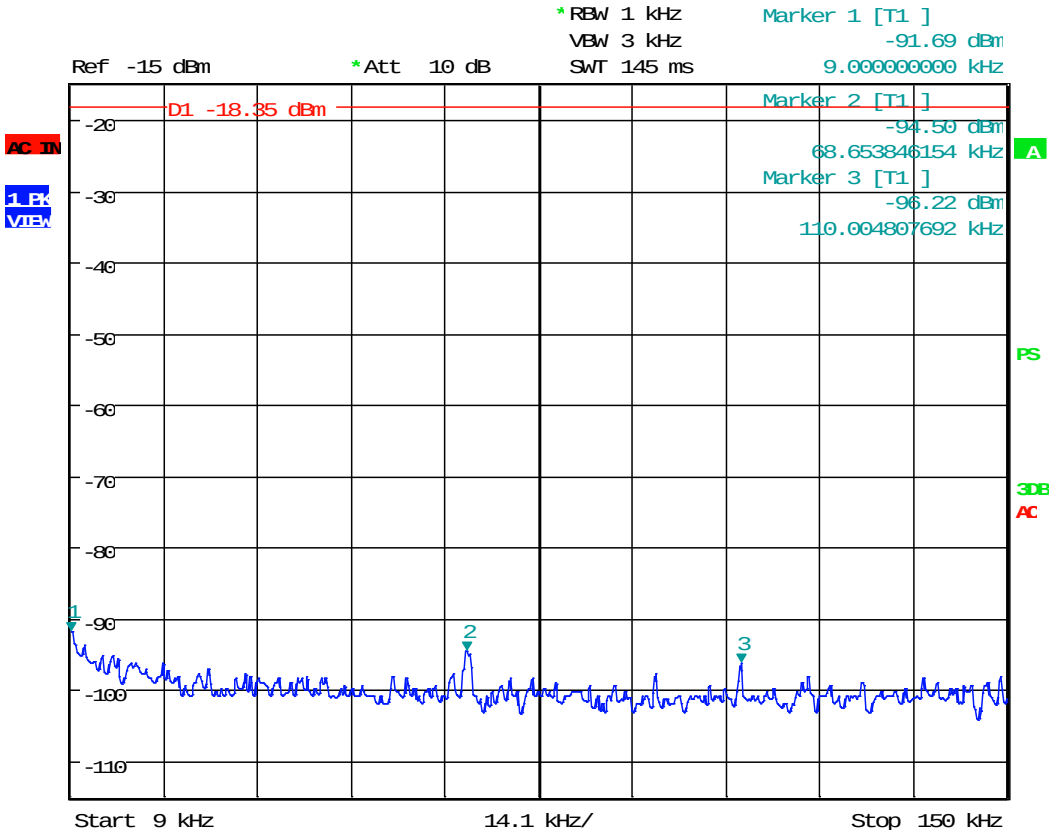
.



Date: 2.AUG.2024 12:29:51

Low Channel: 2 Mbps, 0.009 MHz to 0.15 MHz

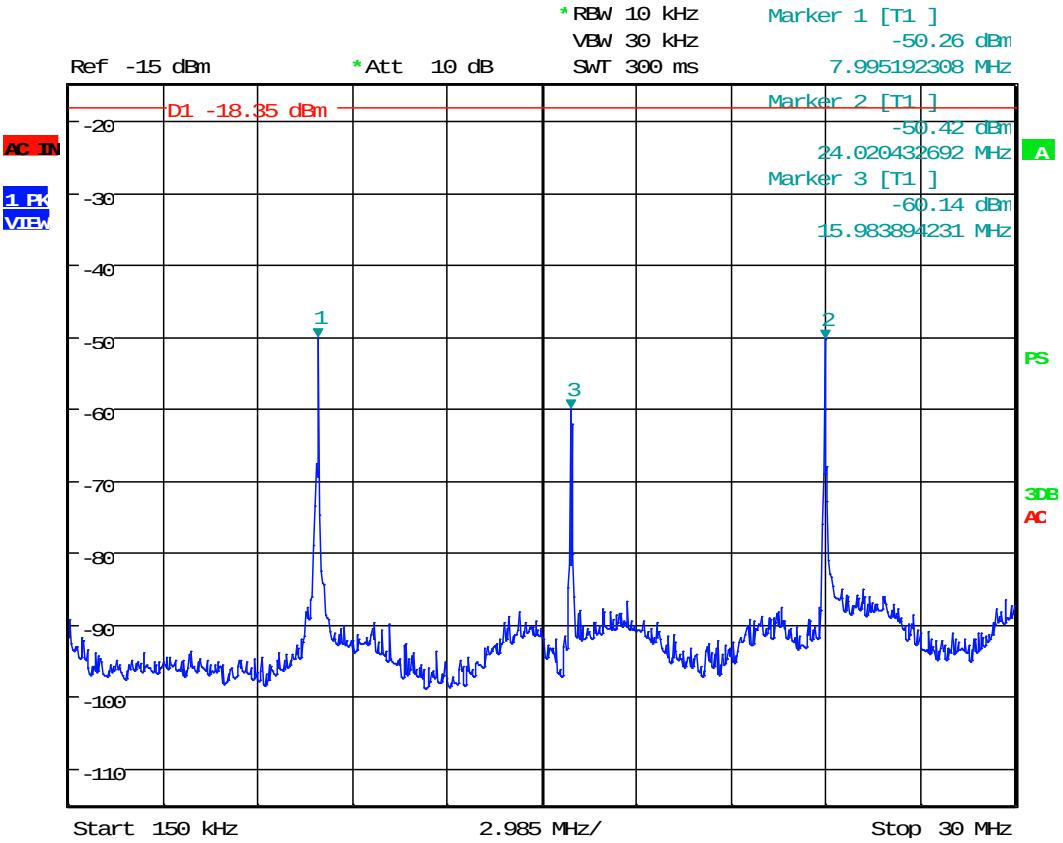
.



Date: 2.AUG.2024 12:42:49

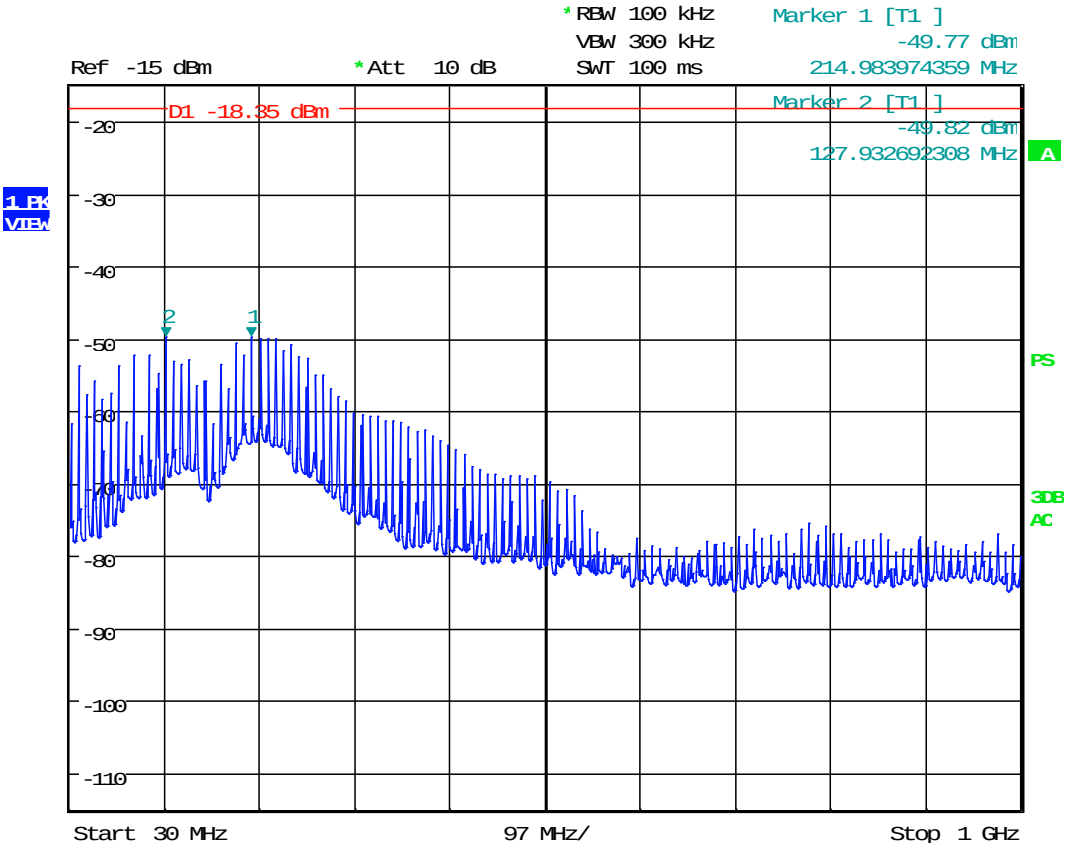
Low Channel: 2 Mbps, 0.15 MHz to 30 MHz

.



Low Channel: 2 Mbps, 30 MHz to 1000 MHz

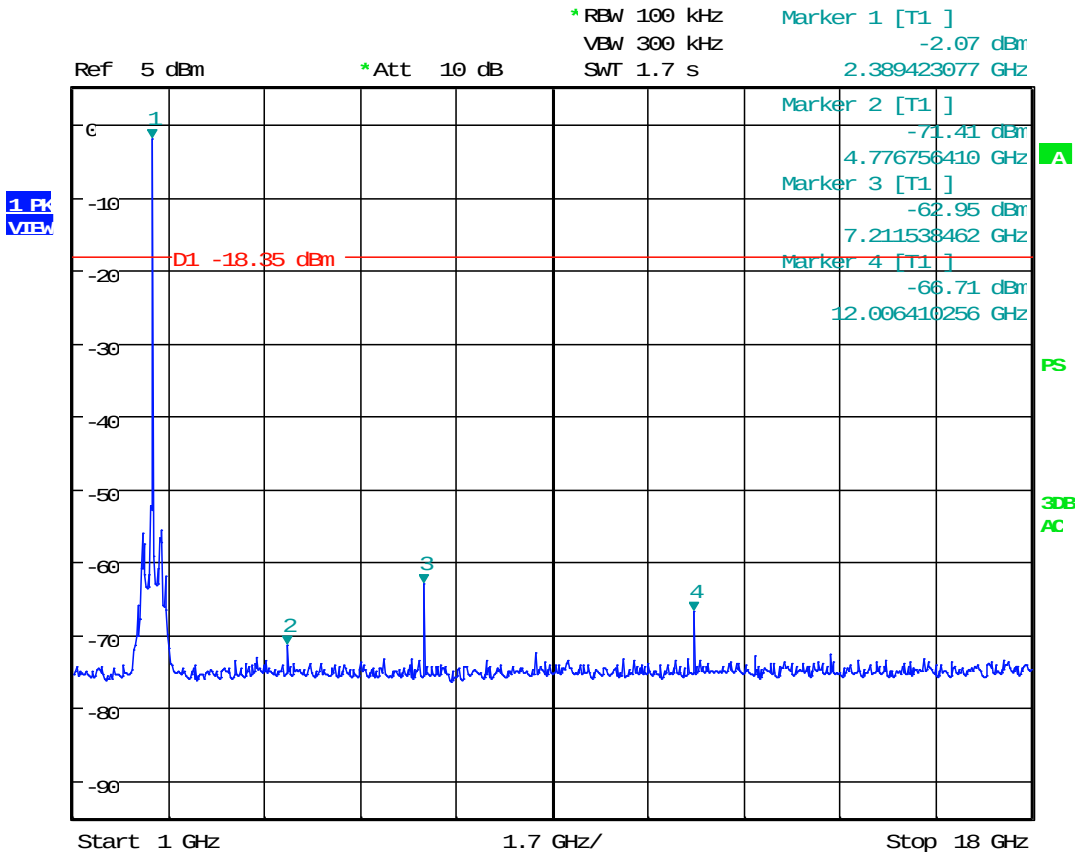
.



Date: 2.AUG.2024 12:45:30

Low Channel: 2 Mbps, 1 GHz to 18 GHz

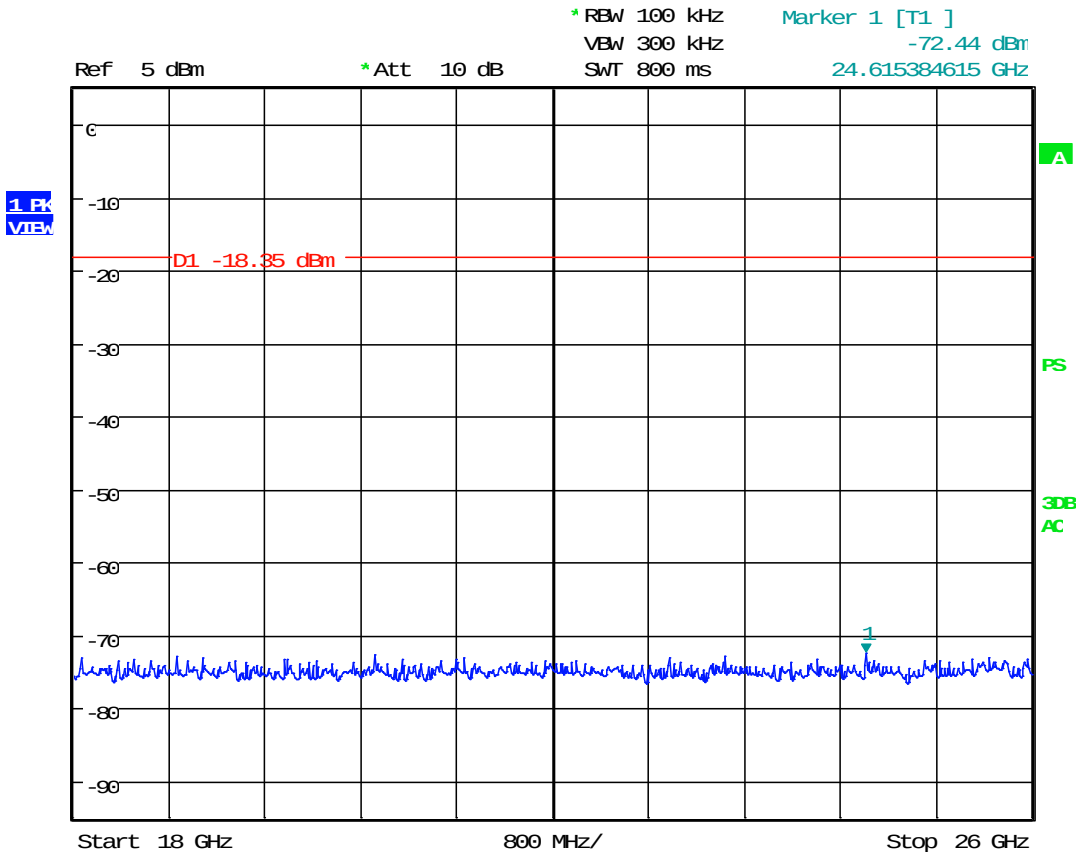
.



Date: 2.AUG.2024 12:47:39

Low Channel: 2 Mbps, 18 GHz to 26 GHz

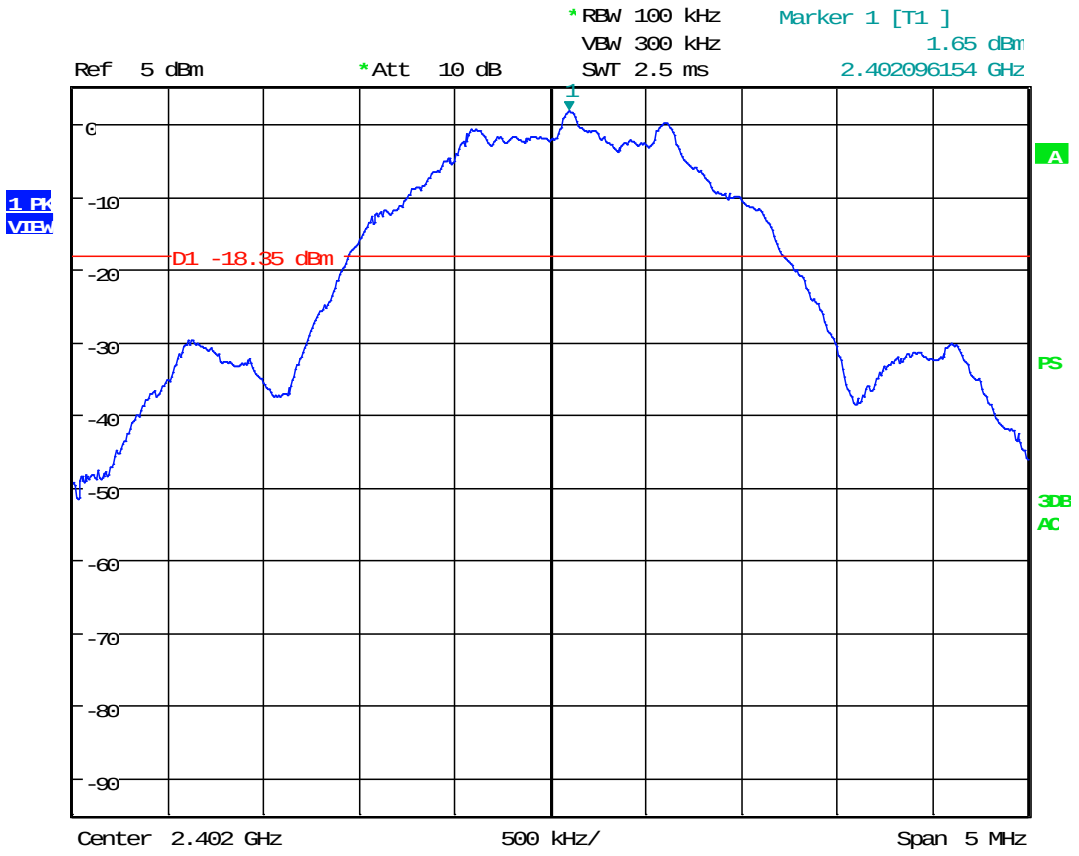
.



Date: 2.AUG.2024 12:48:03

Low Channel: 2 Mbps, Spur Reference

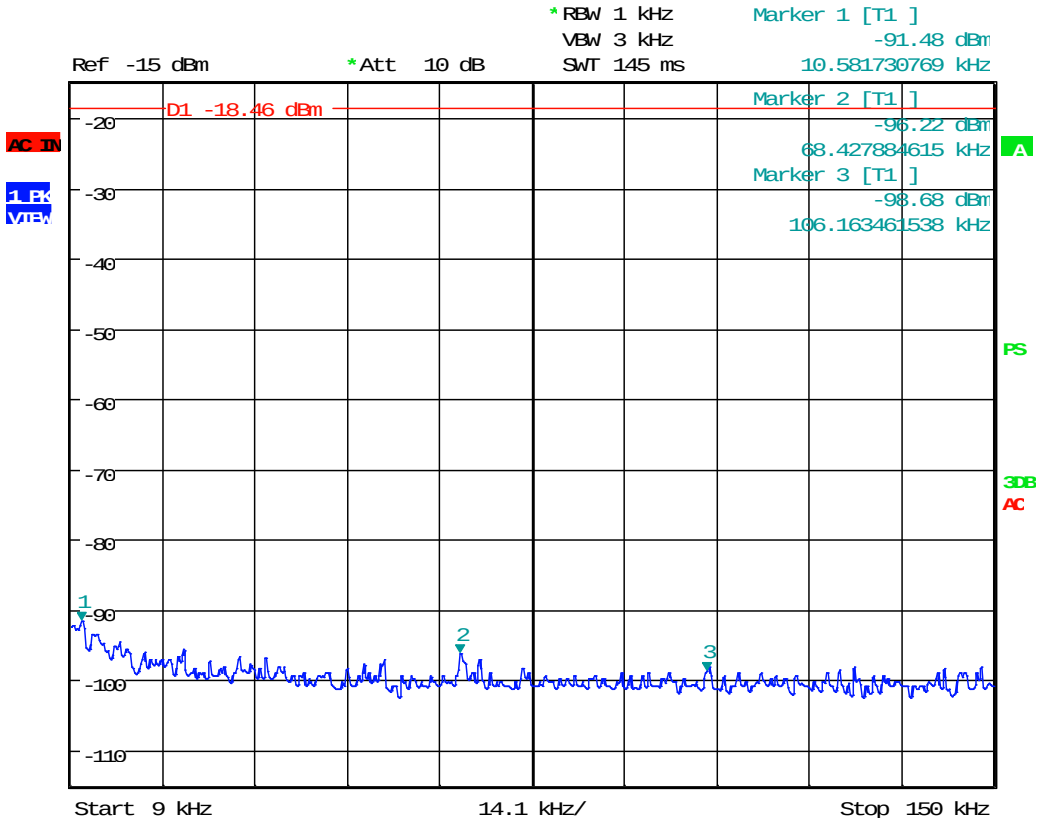
.



Date: 2.AUG.2024 12:41:37

Mid Channel: 2 Mbps, 0.009 MHz to 0.15 MHz

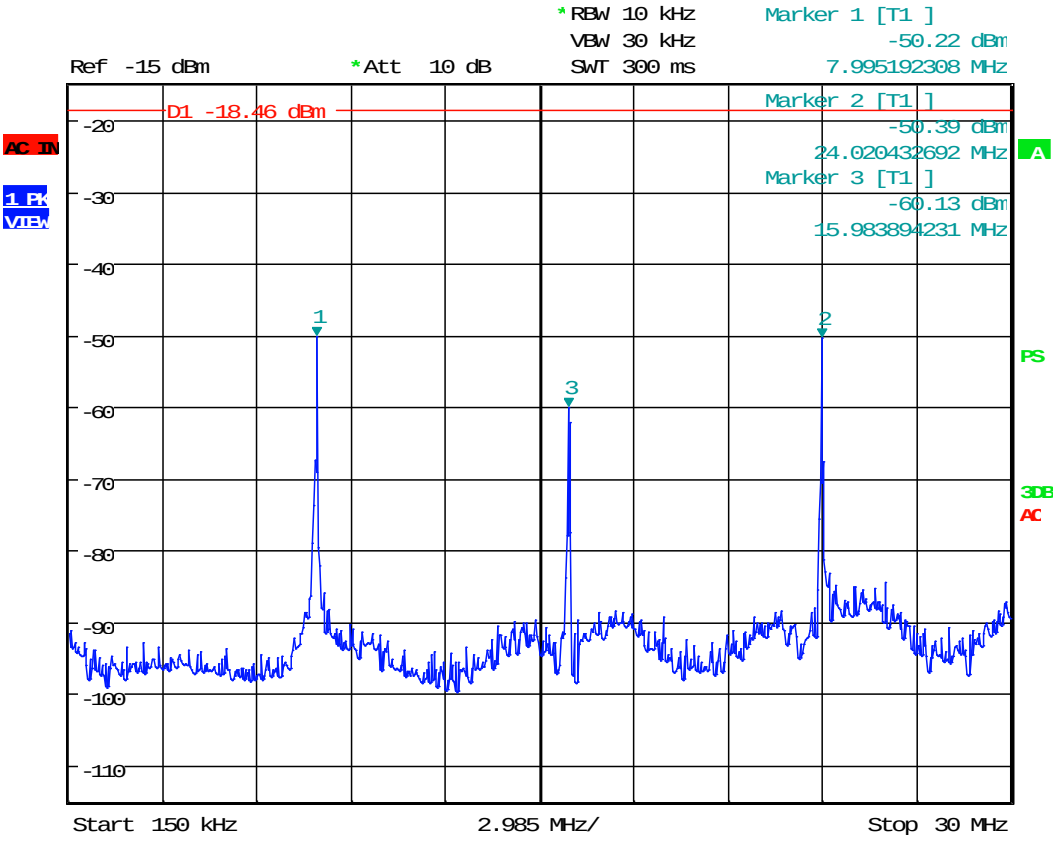
.



Date: 2.AUG.2024 12:50:32

Mid Channel: 2 Mbps, 0.15 MHz to 30 MHz

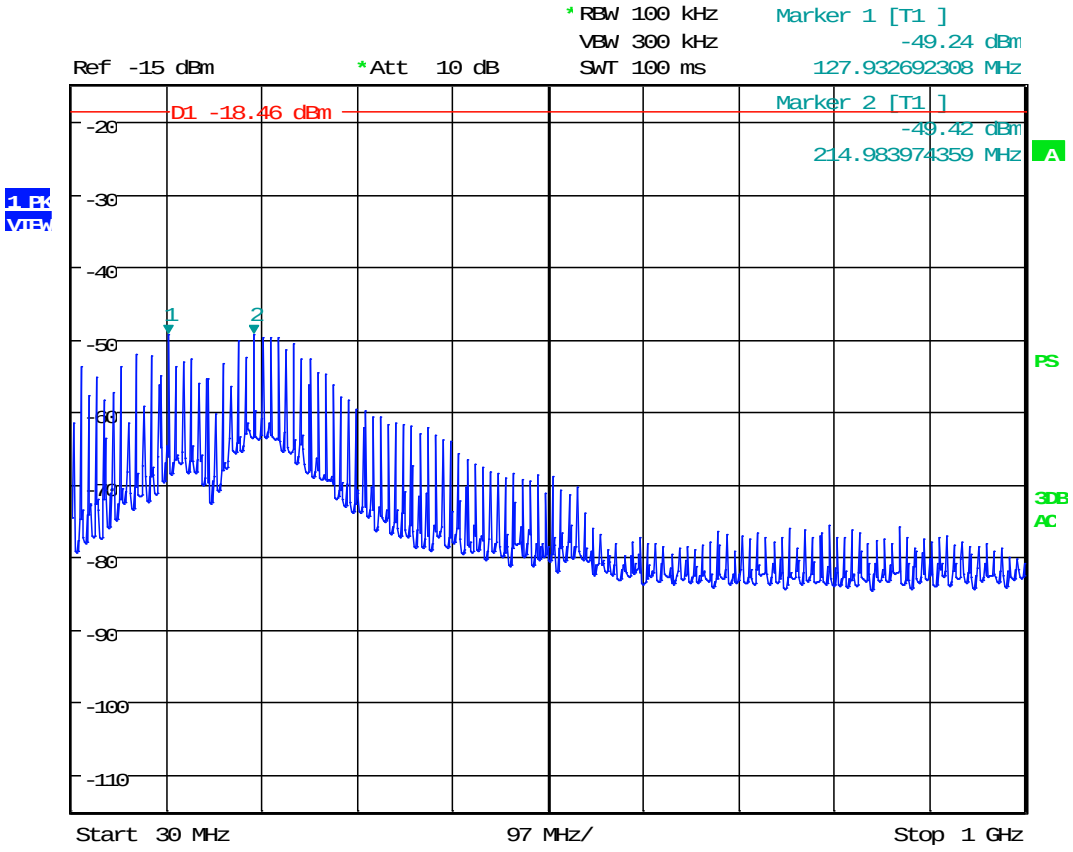
.



Date: 2.AUG.2024 12:52:15

Mid Channel: 2 Mbps, 30 MHz to 1000 MHz

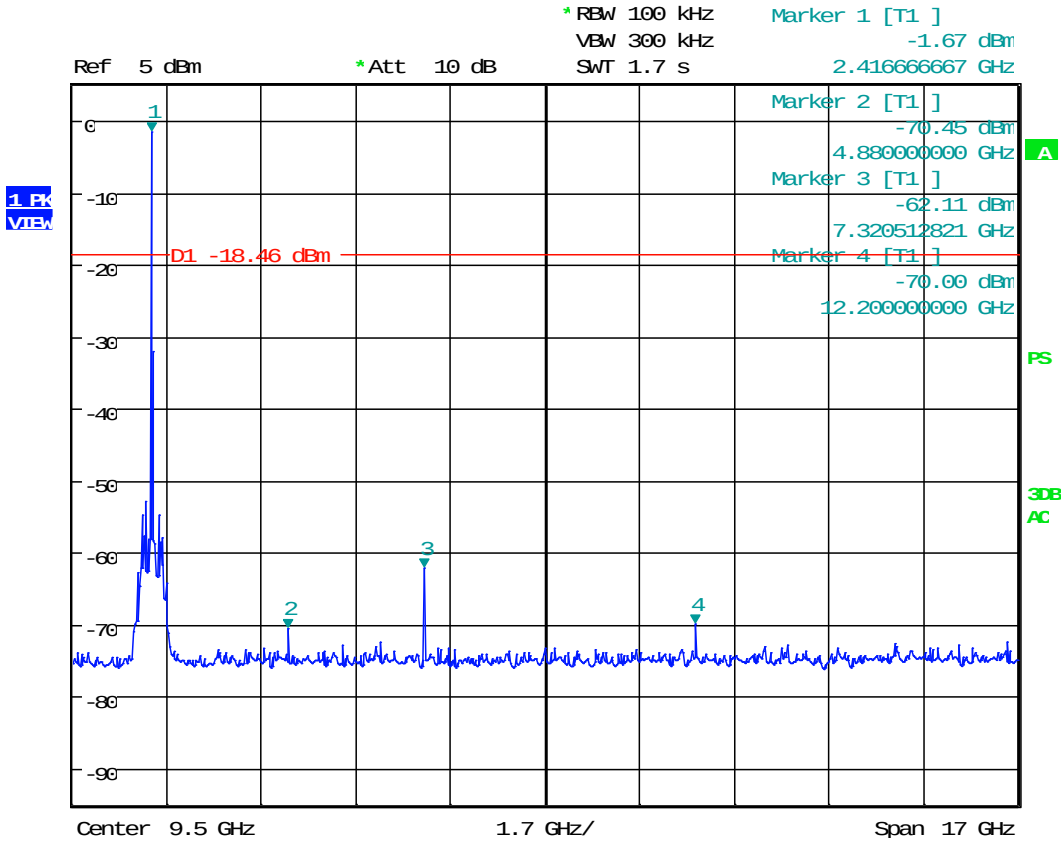
.



Date: 2.AUG.2024 12:53:04

Mid Channel: 2 Mbps, 1 GHz to 18 GHz

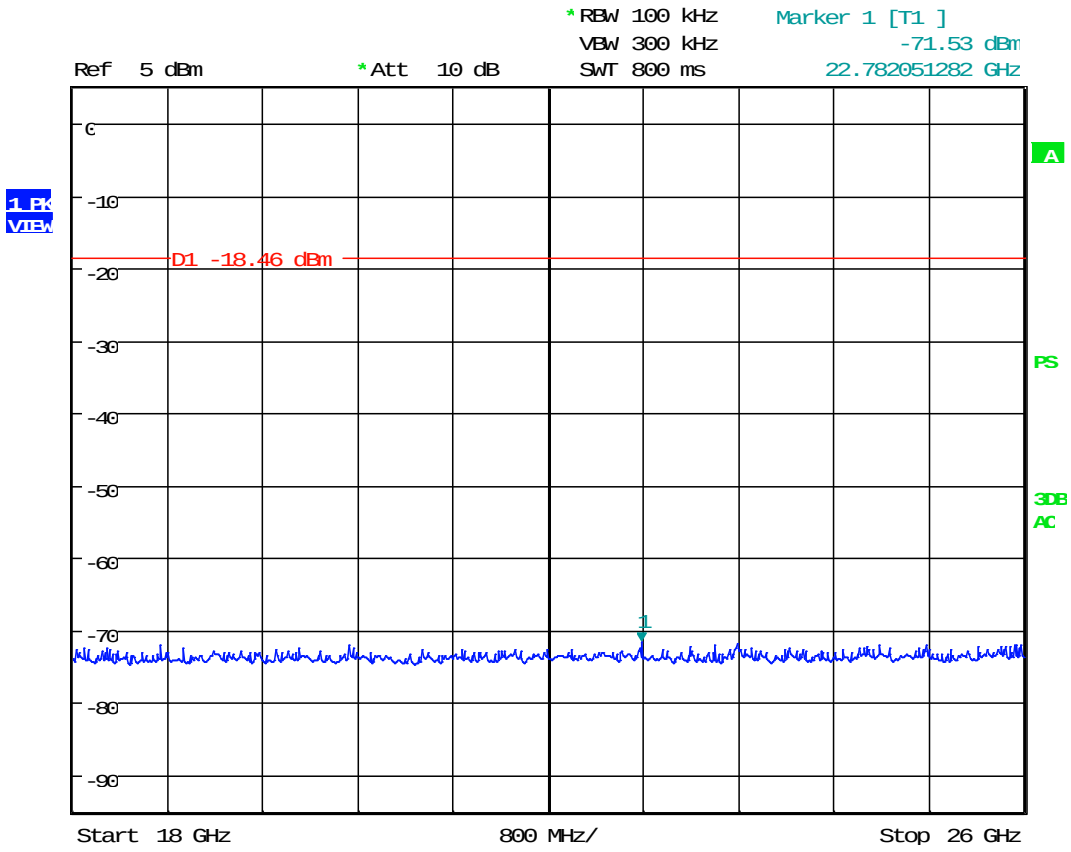
.



Date: 2.AUG.2024 12:57:17

Mid Channel: 2 Mbps, 18 GHz to 26 GHz

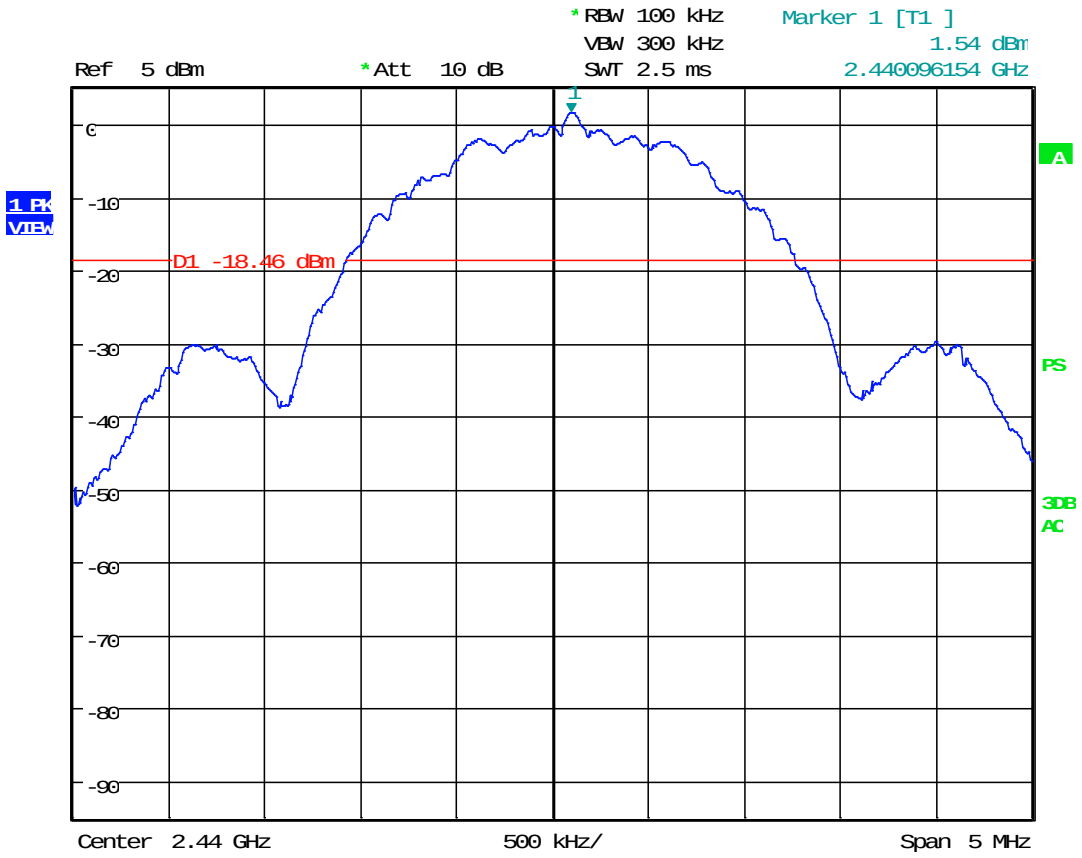
.



Date: 2.AUG.2024 12:59:03

Mid Channel: 2 Mbps, Spur Reference

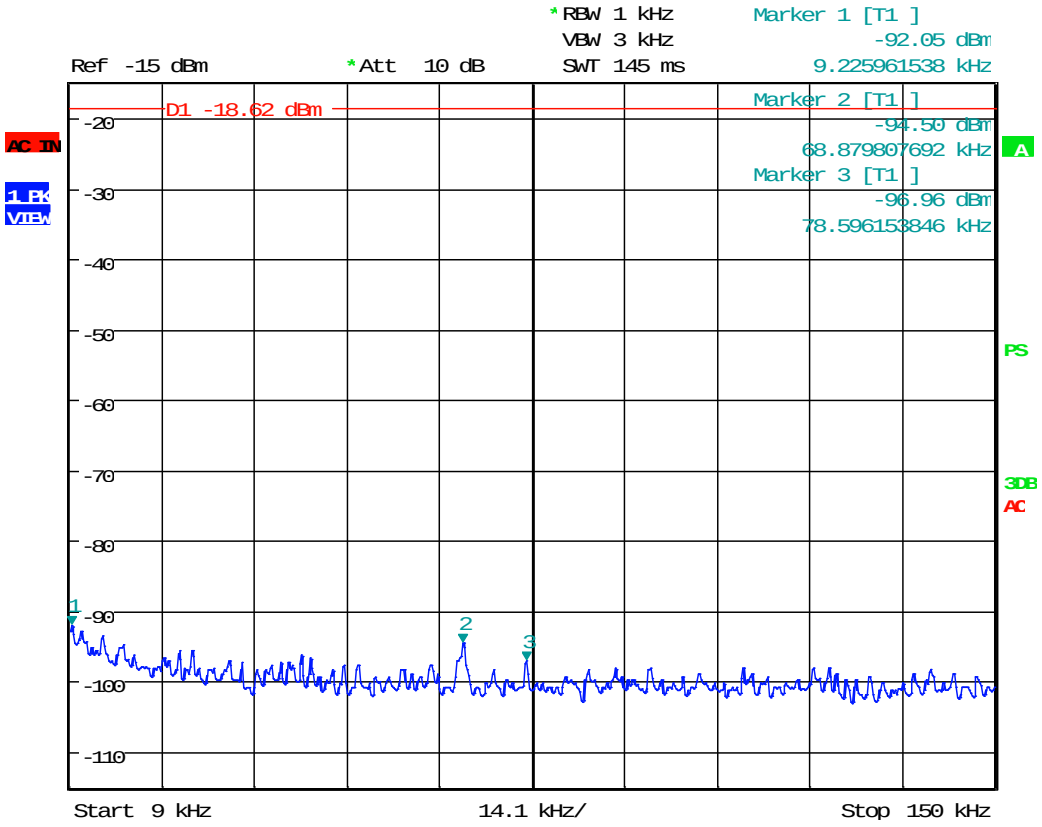
.



Date: 2.AUG.2024 12:49:23

High Channel: 2 Mbps, 0.009 MHz to 0.15 MHz

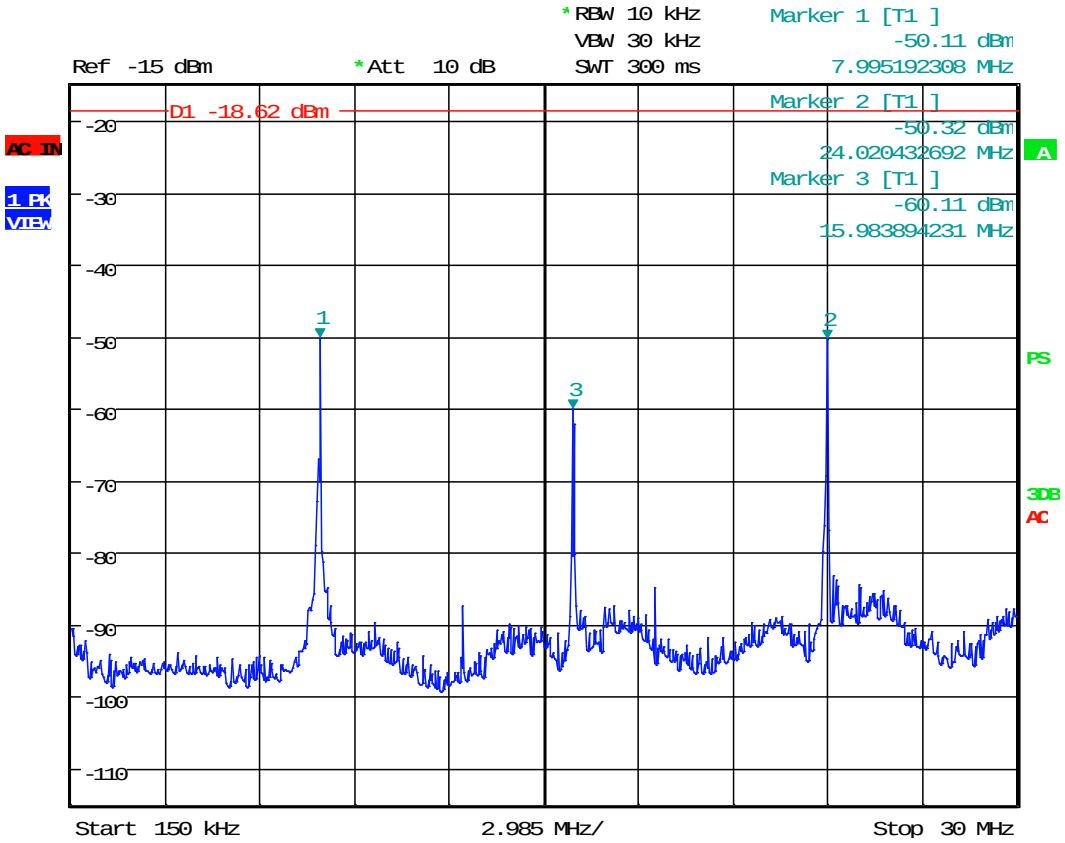
.



Date: 2.AUG.2024 13:01:28

High Channel: 2 Mbps, 0.15 MHz to 30 MHz

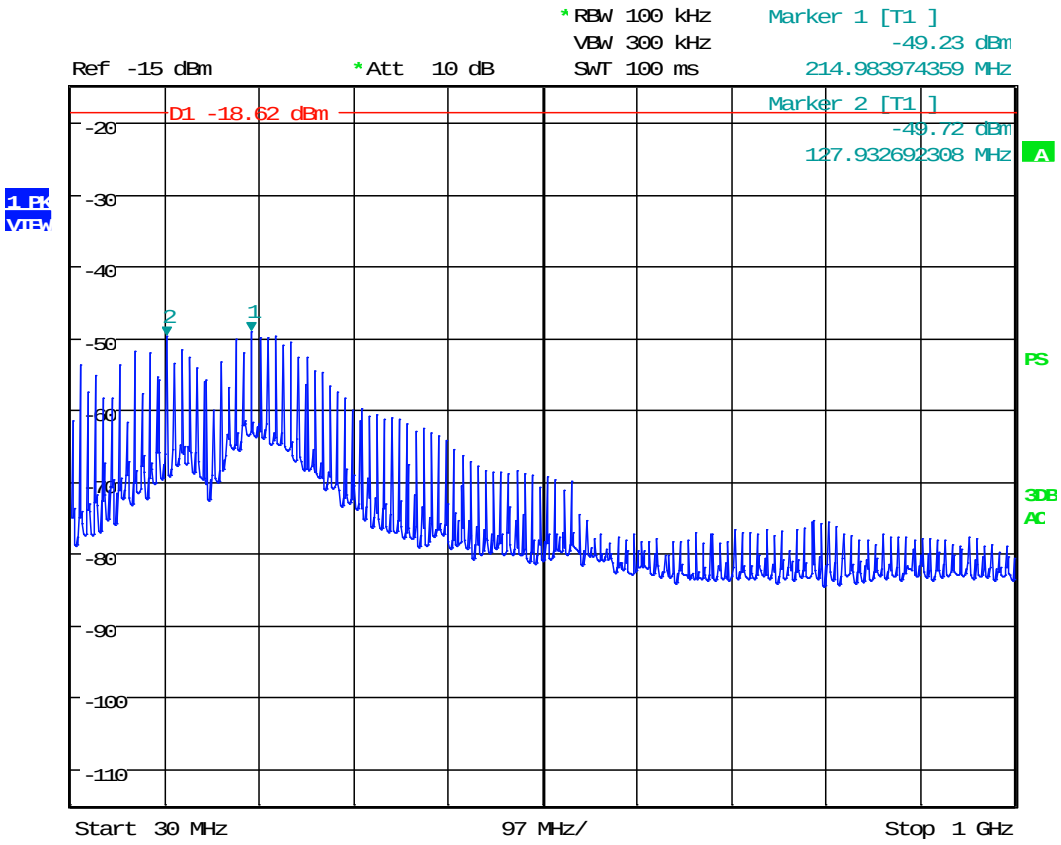
.



Date: 2.AUG.2024 13:02:04

High Channel: 2 Mbps, 30 MHz to 1000 MHz

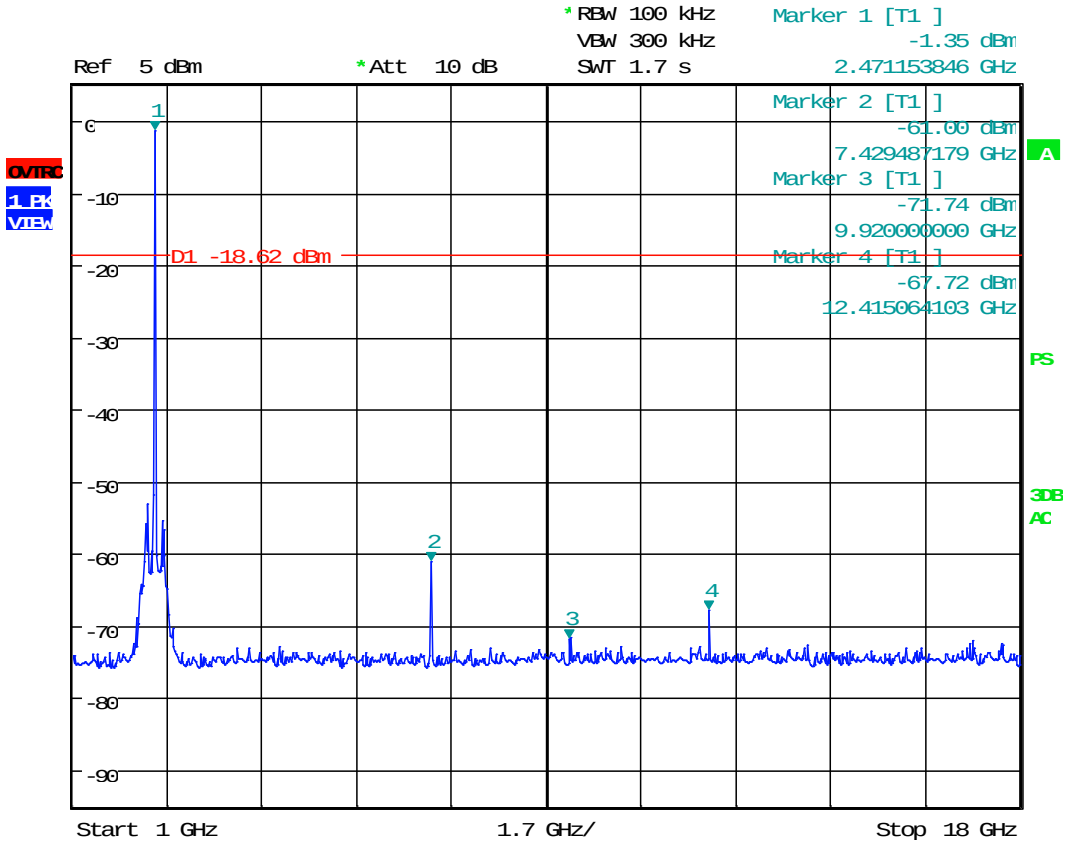
.



Date: 2.AUG.2024 13:02:40

High Channel: 2 Mbps, 1 GHz to 18 GHz

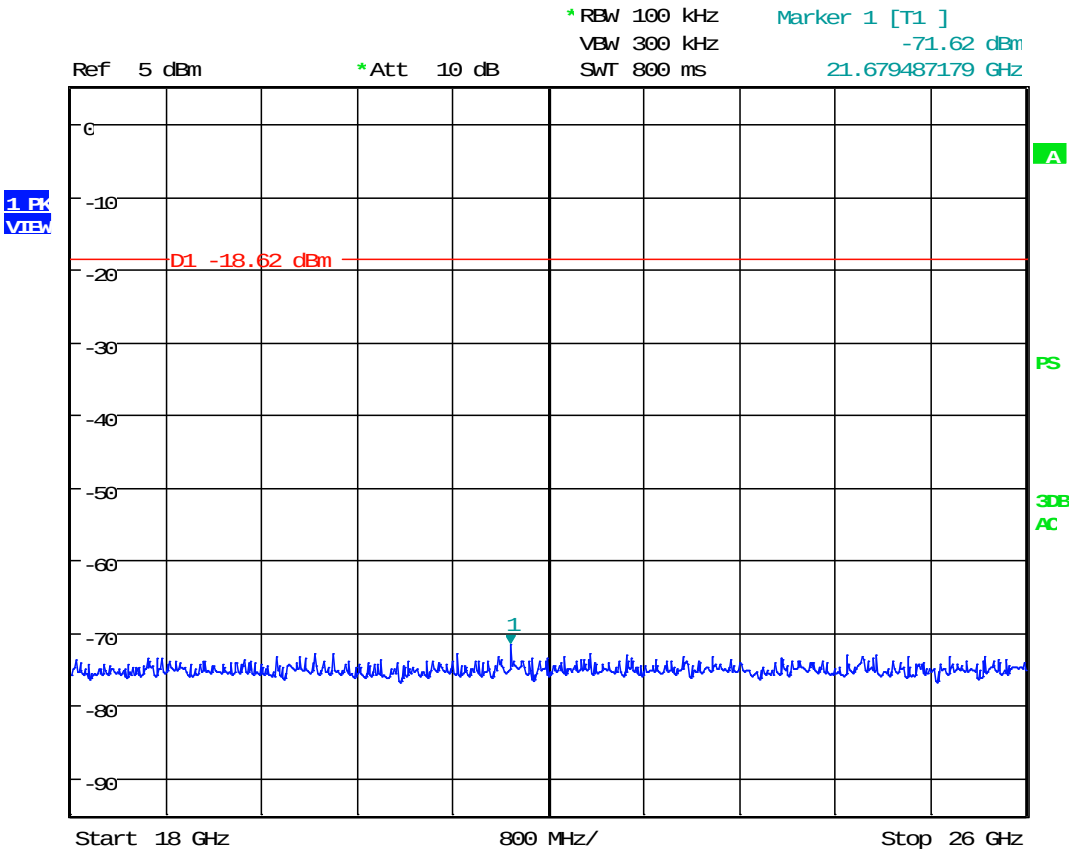
.



Date: 2.AUG.2024 13:04:03

High Channel: 2 Mbps, 18 GHz to 26 GHz

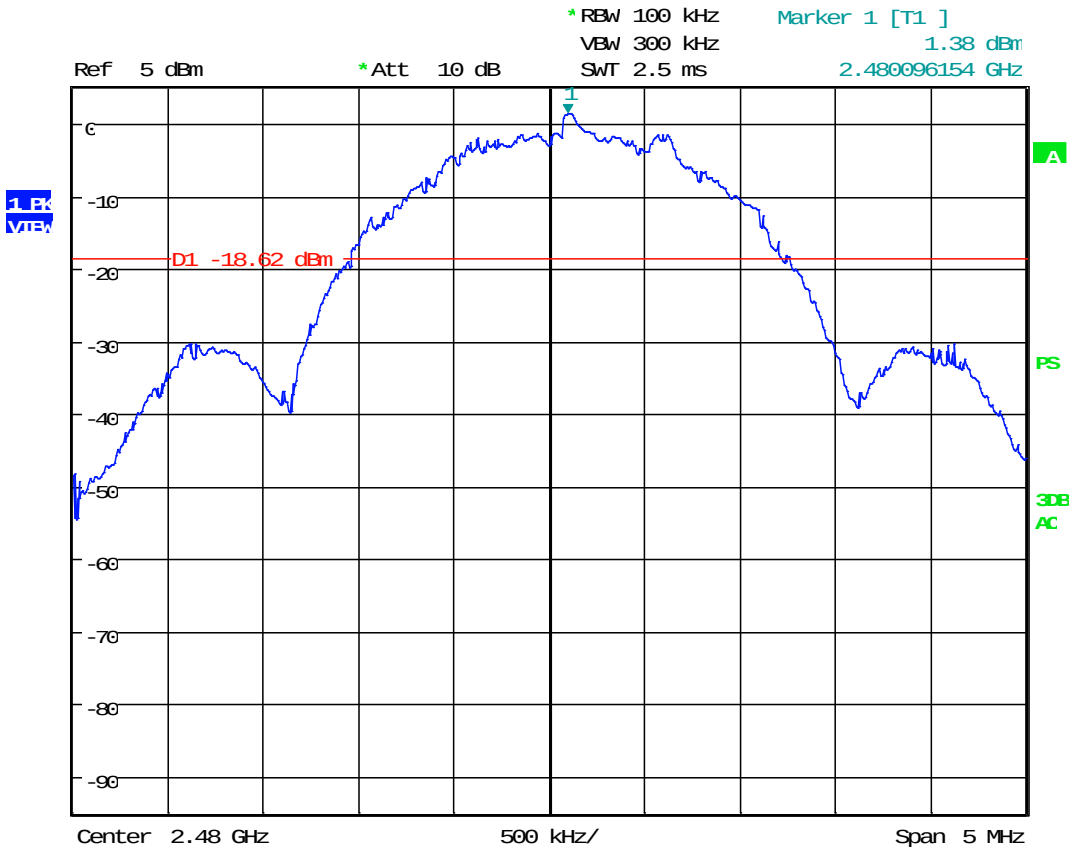
.



Date: 2.AUG.2024 13:04:23

High Channel: 2 Mbps, Spur Reference

.



Date: 2.AUG.2024 13:00:15

11 RADIATED SPURIOUS EMISSIONS

The EUT antenna port was fitted with its 3.2dBi gain balanced antenna. Radiated emissions were measured in a Semi-Anechoic Chamber. All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

11.1 Requirements:

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).

Scans were performed from 9kHz to 10 GHz at the low, mid, and high channels and the low channel was determined to be the worst case. The tables of measured results follow in data presented and include measurements from all channels.

11.2 Radiated Spurious Emissions Test Data

Test Date(s):	2024-08-09	**Test Engineer(s):**	J. Chiller E. Tobin
Standards:	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	**Air Temperature:**	23.2ºC
		Relative Humidity:	42%

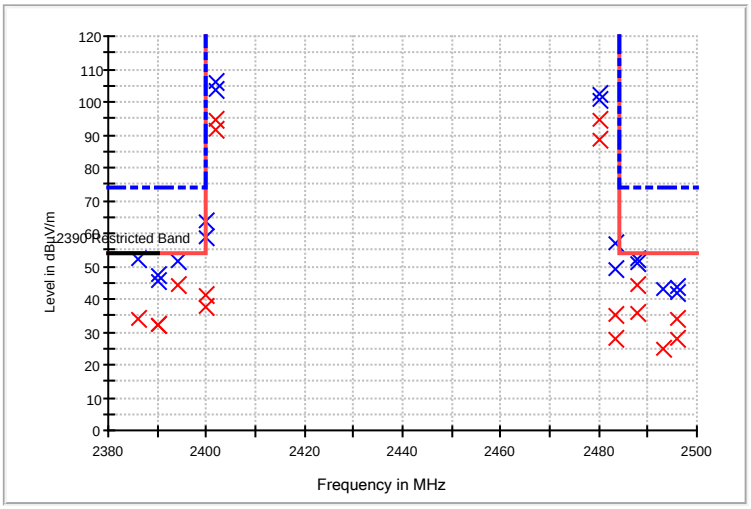
Notes: Plots are peak, max hold prescan data included only to determine what frequencies to investigate and measure. The EUT was initially placed in a semi-anechoic chamber, and rotated in all three orthogonal positions to maximize the emissions. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned on the Semi-Anechoic Chamber for maximum emissions. While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

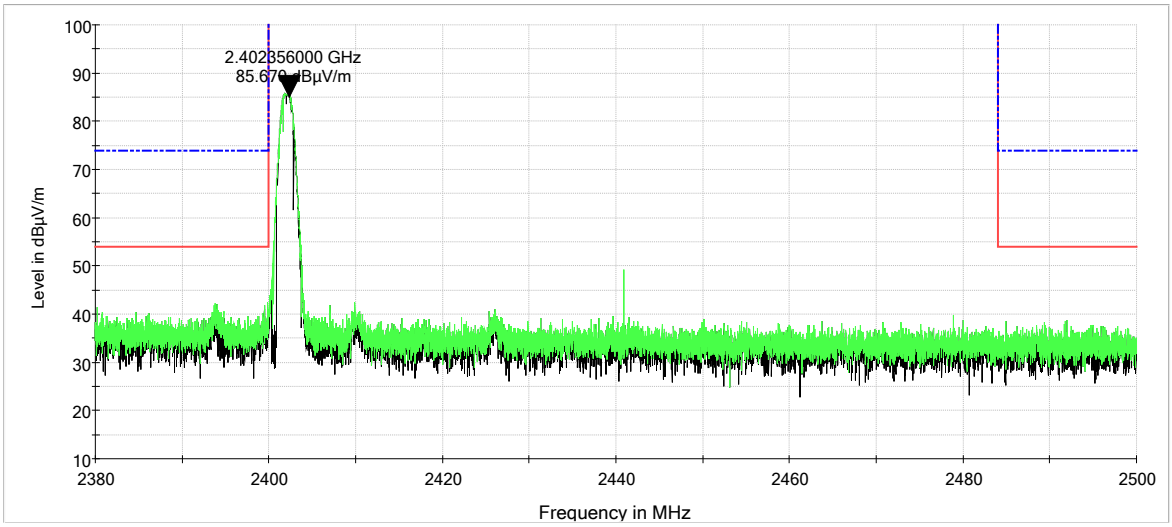
The following plots are for reference only and the limit lines are not actual limit lines but merely a guide.

Measurements: 1 Mbps, Band Edges

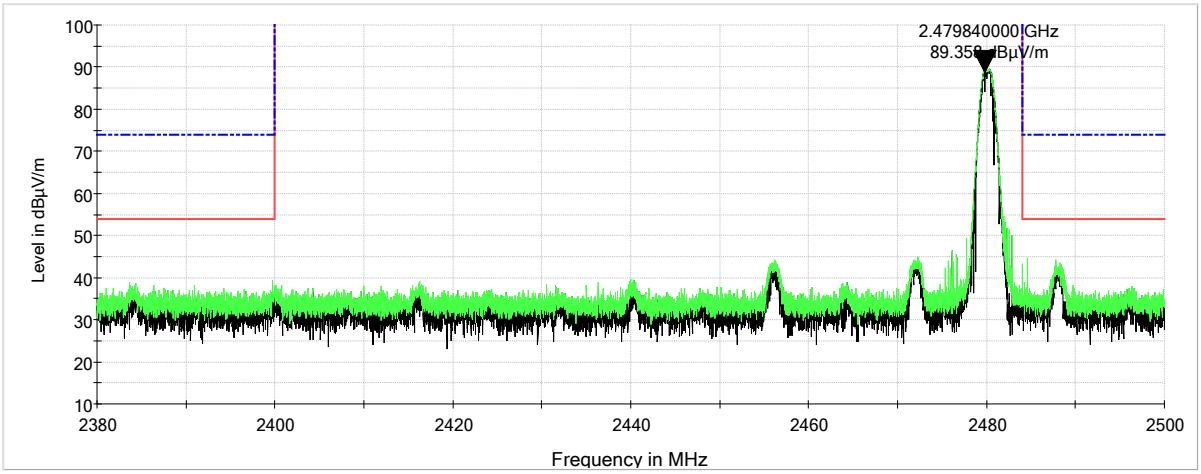
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/	Comment
2386.000000	51.9	33.9	1000.000	150.0	H	186.0	-10.7	20.1	54.0	
2390.000000	45.7	32.3	1000.000	150.0	V	277.0	-10.8	21.8	54.0	
2390.000000	47.3	32.4	1000.000	150.0	H	186.0	-10.8	21.6	54.0	
2394.000000	51.6	44.1	1000.000	150.0	H	186.0	-10.8	30.7	74.8	-20 dBc
2400.000000	63.7	41.1	1000.000	150.0	H	186.0	-10.8	33.7	74.8	-20 dBc
2400.000000	58.7	37.7	1000.000	150.0	V	277.0	-10.8	37.1	74.8	-20 dBc
2402.000000	103.4	91.8	1000.000	150.0	V	277.0	-10.8	-----	-----	
2402.000000	106.1	94.8	1000.000	150.0	H	186.0	-10.8	-----	-----	
2480.000000	100.7	88.6	1000.000	150.0	V	266.0	-11.0	-----	-----	
2480.000000	102.7	94.7	1000.000	150.0	H	196.0	-11.0	-----	-----	
2483.500000	49.0	28.0	1000.000	150.0	V	266.0	-11.0	26.0	54.0	
2483.500000	57.0	34.9	1000.000	150.0	H	196.0	-11.0	19.1	54.0	
2487.772000	51.1	36.1	1000.000	150.0	V	266.0	-10.9	17.9	54.0	
2487.844000	51.9	44.2	1000.000	150.0	H	196.0	-10.9	9.8	54.0	
2493.052000	43.0	24.6	1000.000	150.0	H	196.0	-10.9	29.4	54.0	
2496.040000	43.8	28.0	1000.000	150.0	V	266.0	-10.9	26.0	54.0	
2496.136000	41.8	33.7	1000.000	150.0	H	196.0	-10.9	20.3	54.0	



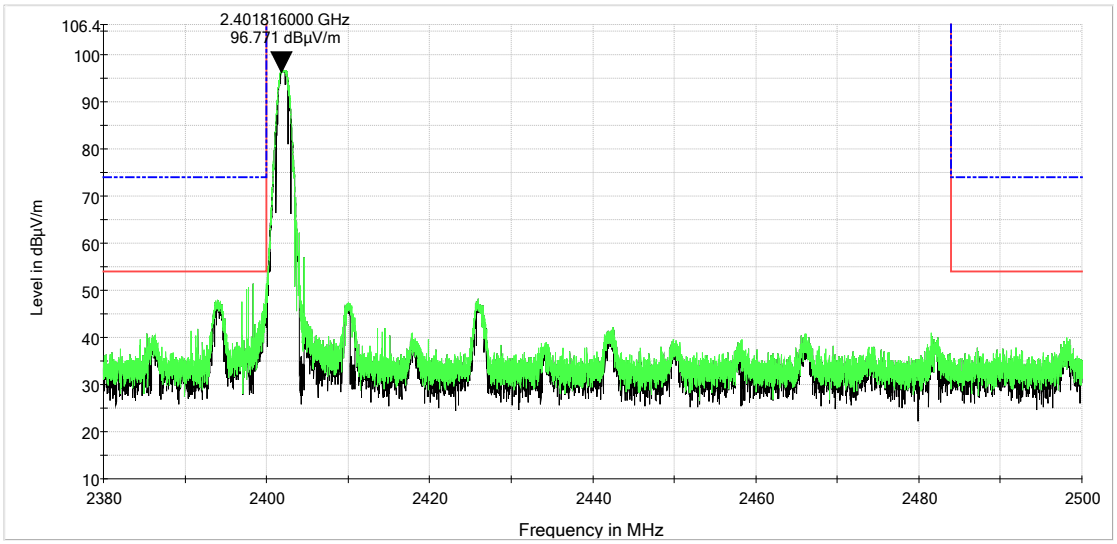
Lower Band Edge – 1 Mbps, Vertical



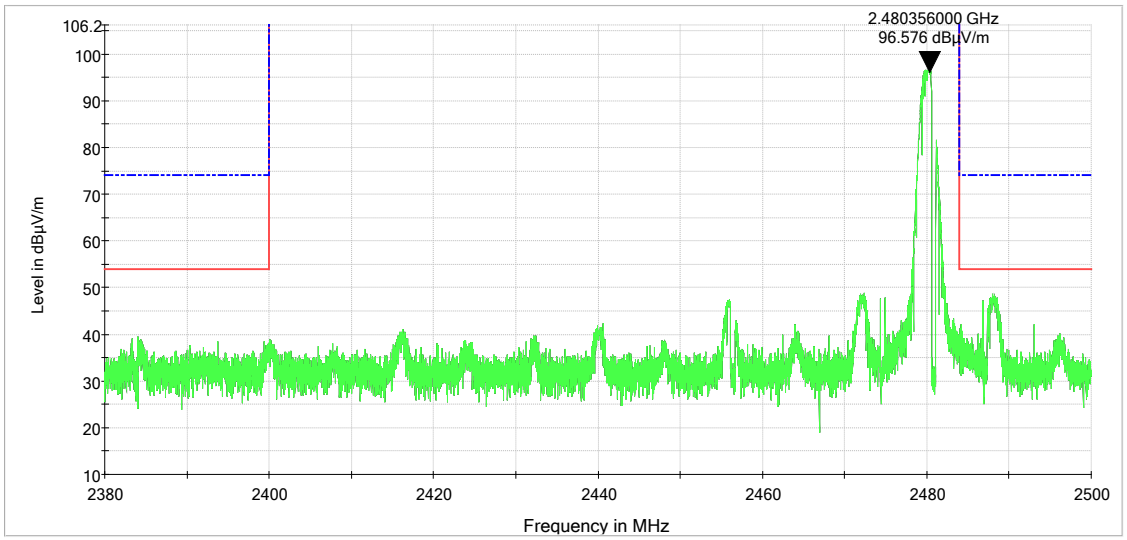
Upper Band Edge – 1 Mbps, Vertical



Lower Band Edge – 1 Mbps, Horizontal

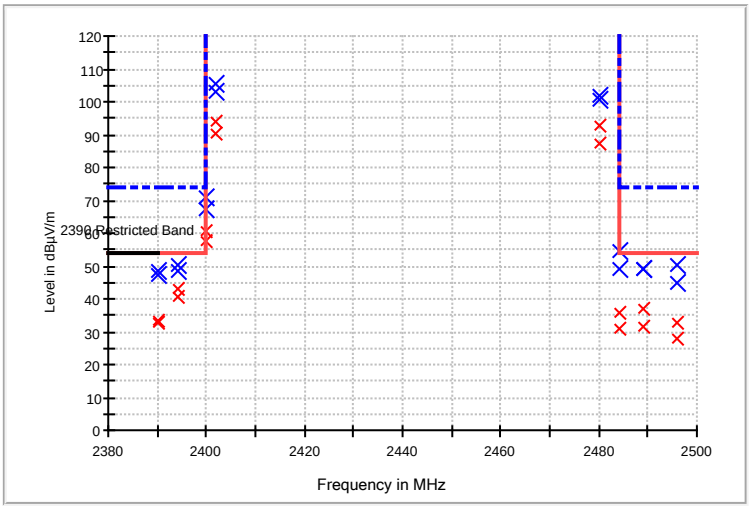


Upper Band Edge – 1 Mbps, Horizontal

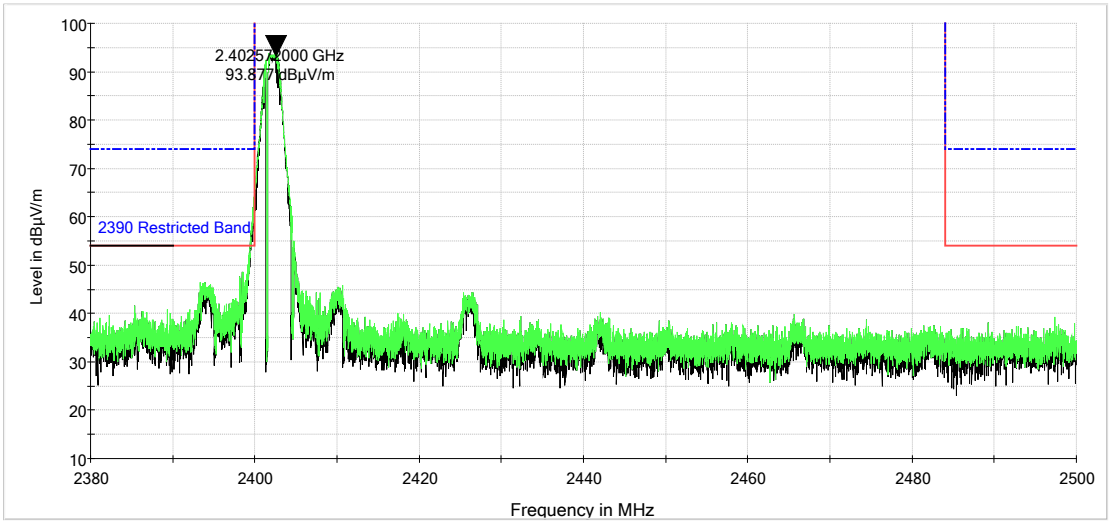


Measurements: 2 Mbps, Band Edges

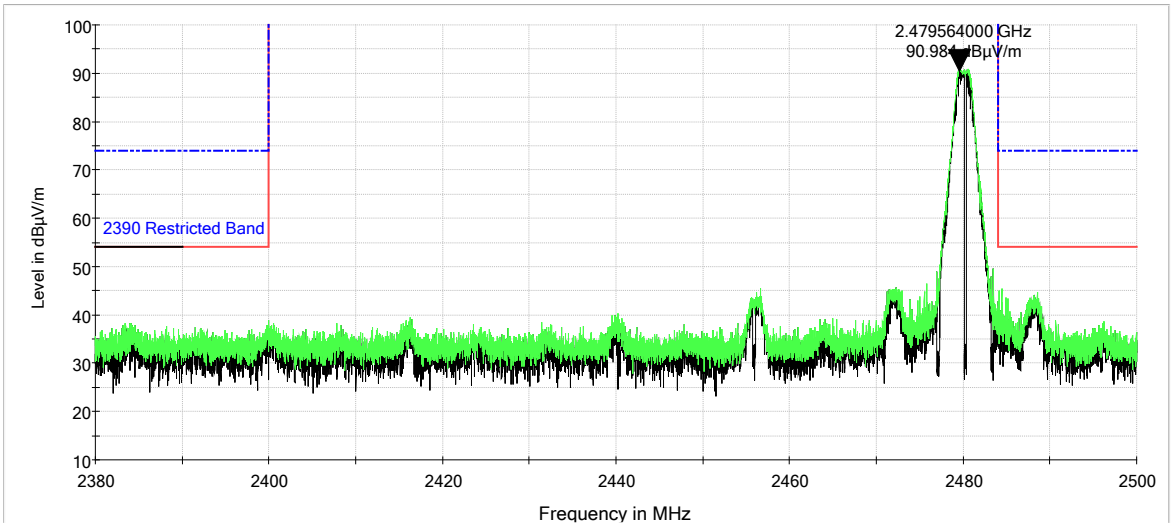
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2390.000000	47.0	33.2	1000.000	150.0	V	288.0	-10.8	20.8	54.0	
2390.000000	48.4	32.9	1000.000	160.0	H	188.0	-10.8	21.1	54.0	
2394.000000	50.5	43.2	1000.000	160.0	H	188.0	-10.8	30.9	74.1	-20 dBc
2394.000000	48.5	40.4	1000.000	150.0	V	288.0	-10.8	33.7	74.1	-20 dBc
2400.000000	67.3	57.5	1000.000	150.0	V	288.0	-10.8	16.6	74.1	-20 dBc
2400.000000	70.6	60.8	1000.000	160.0	H	188.0	-10.8	13.3	74.1	-20 dBc
2402.000000	103.0	90.2	1000.000	150.0	V	290.0	-10.8	-----	-----	
2402.000000	105.7	94.1	1000.000	160.0	H	188.0	-10.8	-----	-----	
2480.000000	102.0	93.0	1000.000	150.0	H	198.0	-11.0	-----	-----	
2480.000000	100.4	87.4	1000.000	150.0	V	284.0	-11.0	-----	-----	
2483.500000	54.3	35.8	1000.000	150.0	H	198.0	-11.0	18.2	54.0	
2483.500000	48.8	30.6	1000.000	150.0	V	283.0	-11.0	23.4	54.0	
2489.000000	49.2	36.7	1000.000	150.0	H	198.0	-10.9	17.3	54.0	
2489.000000	48.8	31.3	1000.000	150.0	V	283.0	-10.9	22.7	54.0	
2496.000000	50.4	32.5	1000.000	150.0	H	198.0	-10.9	21.5	54.0	
2496.000000	45.0	27.8	1000.000	150.0	V	283.0	-10.9	26.2	54.0	



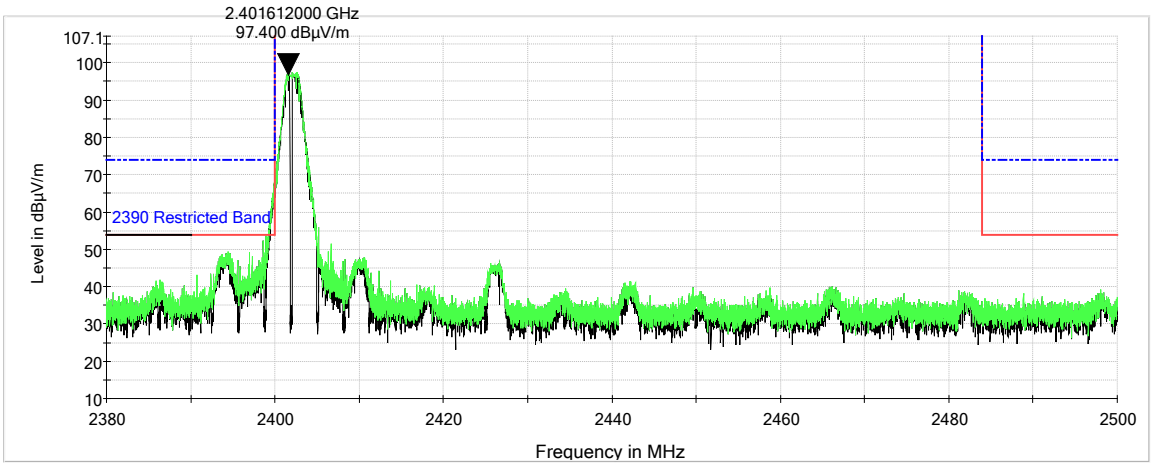
Lower Band Edge – 2 Mbps, Vertical



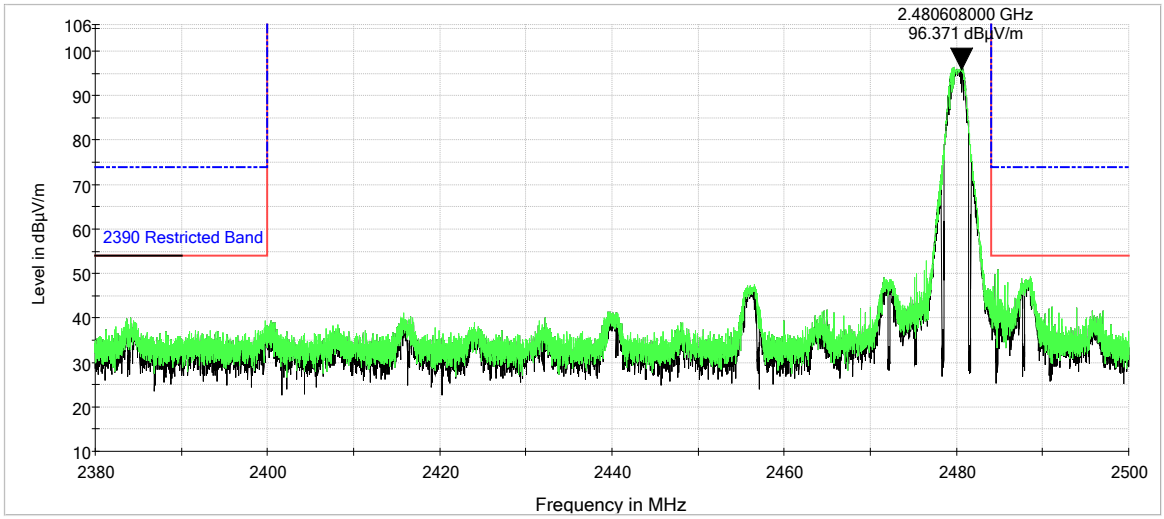
Upper Band Edge – 2 Mbps, Vertical



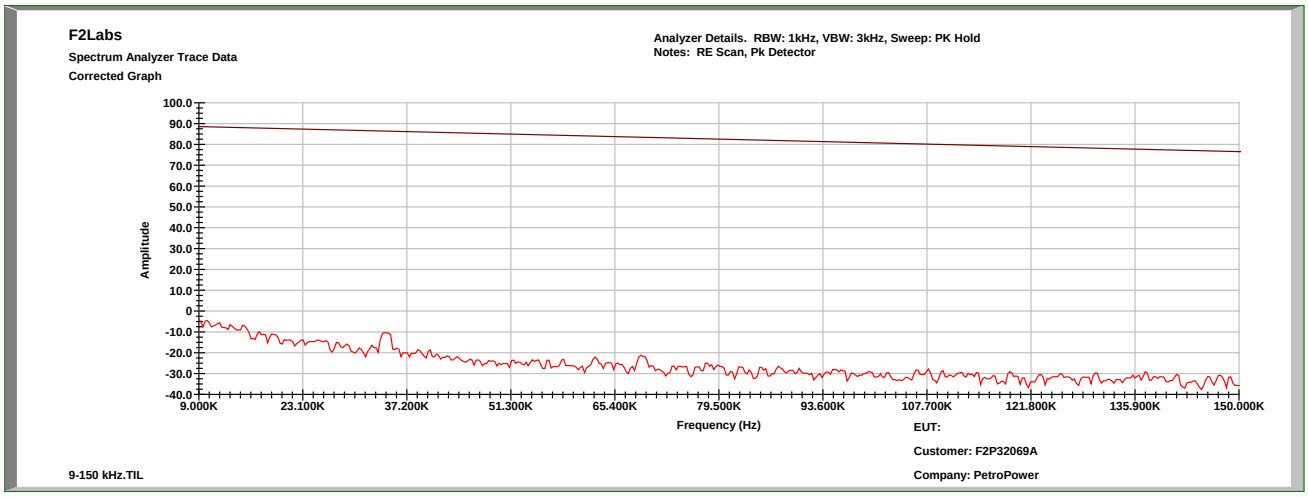
Lower Band Edge – 2 Mbps, Horizontal



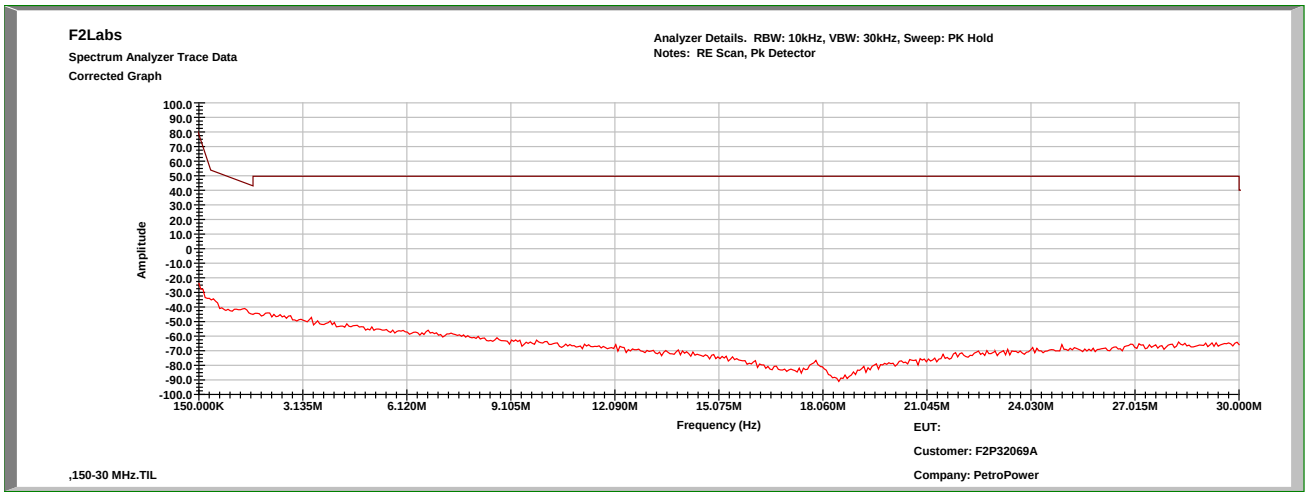
Upper Band Edge – 2 Mbps, Horizontal



Radiated Spurious Emissions: 0.009 MHz to 0.15 MHz

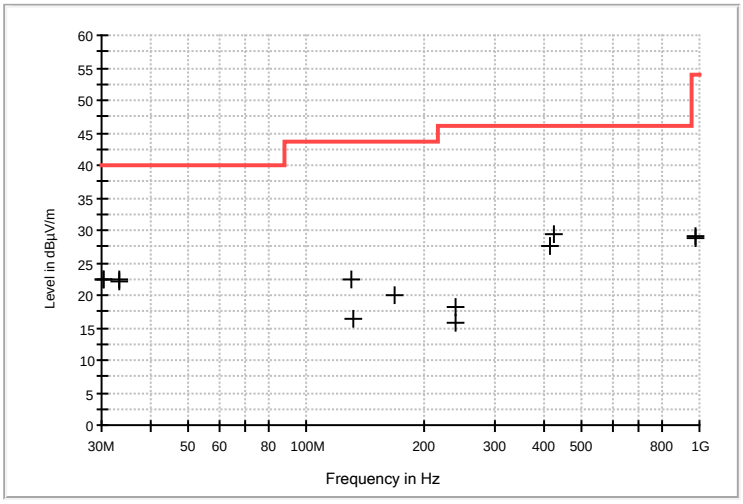


Radiated Spurious Emissions: 0.15 MHz to 30 MHz

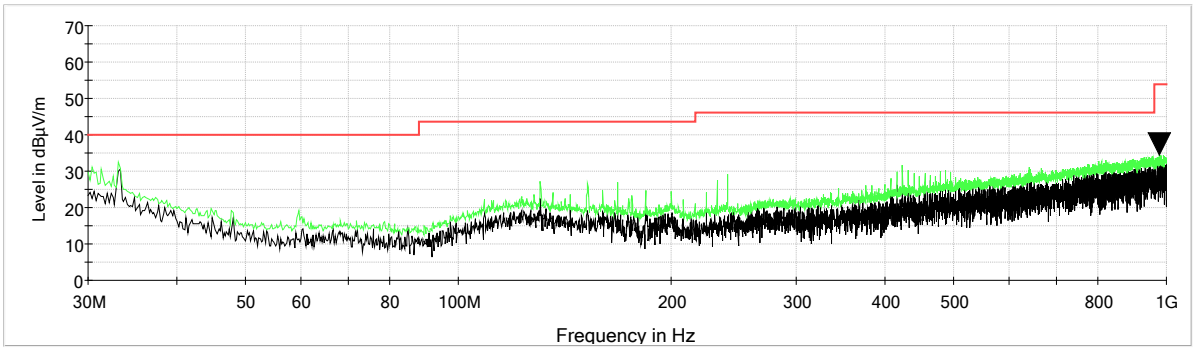


Measurements: 30 MHz to 1000 MHz

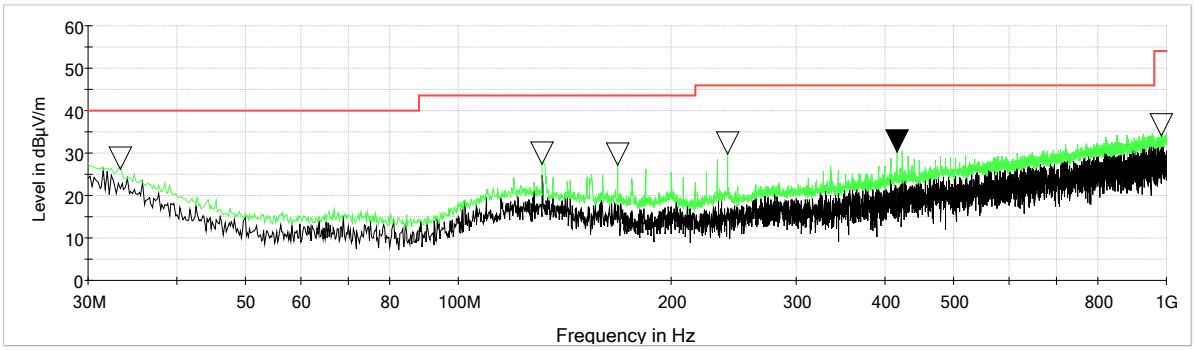
Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.388000	22.3	120.000	100.0	V	209.0	-19.4	17.7	40.0
30.388000	22.5	120.000	100.0	V	6.0	-19.4	17.5	40.0
33.104000	22.2	120.000	100.0	V	358.0	-21.3	17.8	40.0
33.298000	22.3	120.000	200.0	H	2.0	-21.5	17.7	40.0
130.492000	22.4	120.000	100.0	V	18.0	-25.6	21.1	43.5
131.462000	16.3	120.000	200.0	H	0.0	-25.6	27.2	43.5
167.934000	20.1	120.000	200.0	H	0.0	-27.3	23.4	43.5
239.908000	15.9	120.000	100.0	V	341.0	-26.8	30.1	46.0
239.908000	18.2	120.000	200.0	H	0.0	-26.8	27.8	46.0
416.060000	27.6	120.000	200.0	H	3.0	-22.1	18.4	46.0
424.014000	29.4	120.000	100.0	V	8.0	-21.9	16.6	46.0
977.108000	28.8	120.000	100.0	V	352.0	-11.8	25.2	54.0
982.540000	29.0	120.000	200.0	H	359.0	-11.8	25.0	54.0



Radiated Spurious Emissions: 30 MHz to 1000 MHz - Vertical

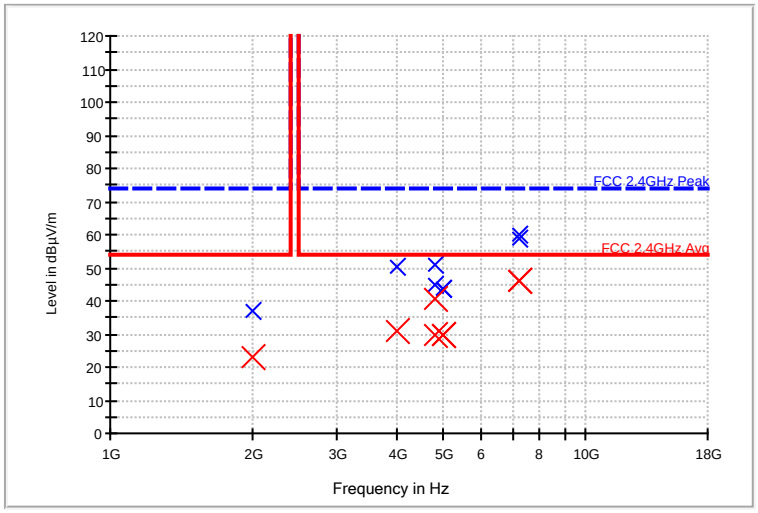


Radiated Spurious Emissions: 30 MHz to 1000 MHz - Horizontal

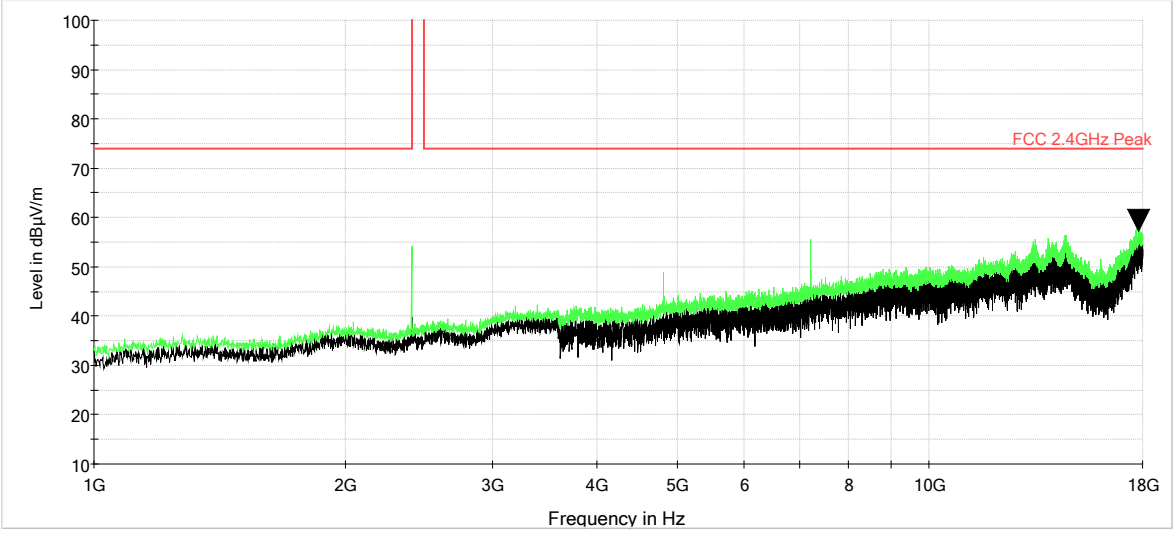


Measurements: 1 GHz to 18 GHz

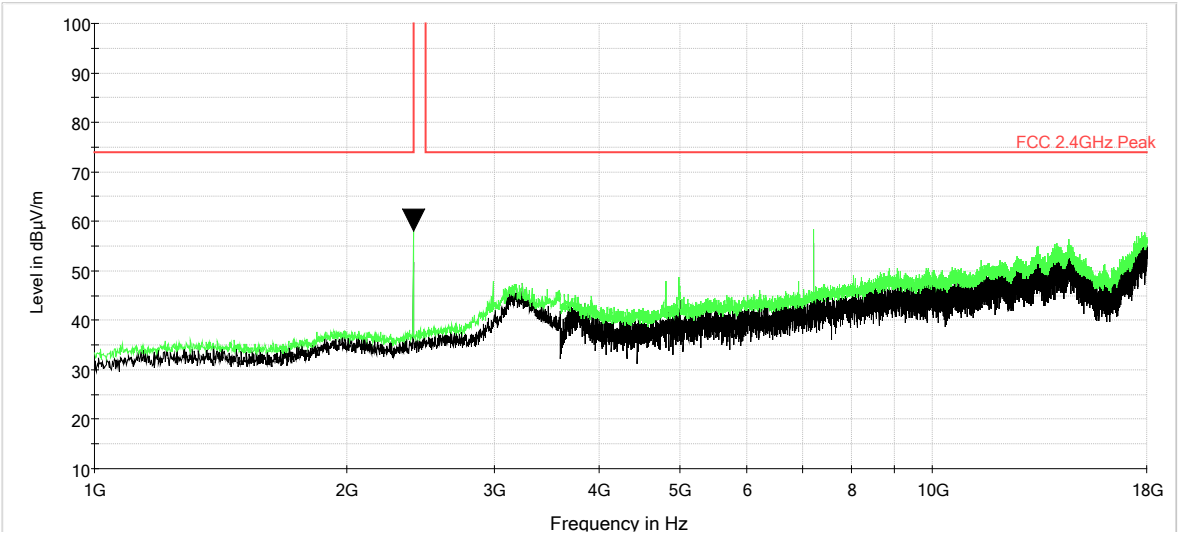
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2000.000000	36.8	22.9	1000.000	150.0	V	229.0	-11.0	31.1	54.0
3984.000000	50.1	31.0	1000.000	153.0	H	236.0	-7.2	23.0	54.0
4802.000000	44.7	29.9	1000.000	153.0	H	267.0	-5.4	24.1	54.0
4804.000000	50.9	40.9	1000.000	162.0	V	191.0	-5.4	13.1	54.0
4987.000000	43.7	29.8	1000.000	153.0	V	352.0	-4.8	24.2	54.0
4997.000000	43.8	29.7	1000.000	153.0	H	120.0	-4.7	24.3	54.0
7206.000000	58.6	46.2	1000.000	153.0	V	195.0	-1.2	7.8	54.0
7206.000000	60.3	46.1	1000.000	153.0	H	324.0	-1.2	7.9	54.0



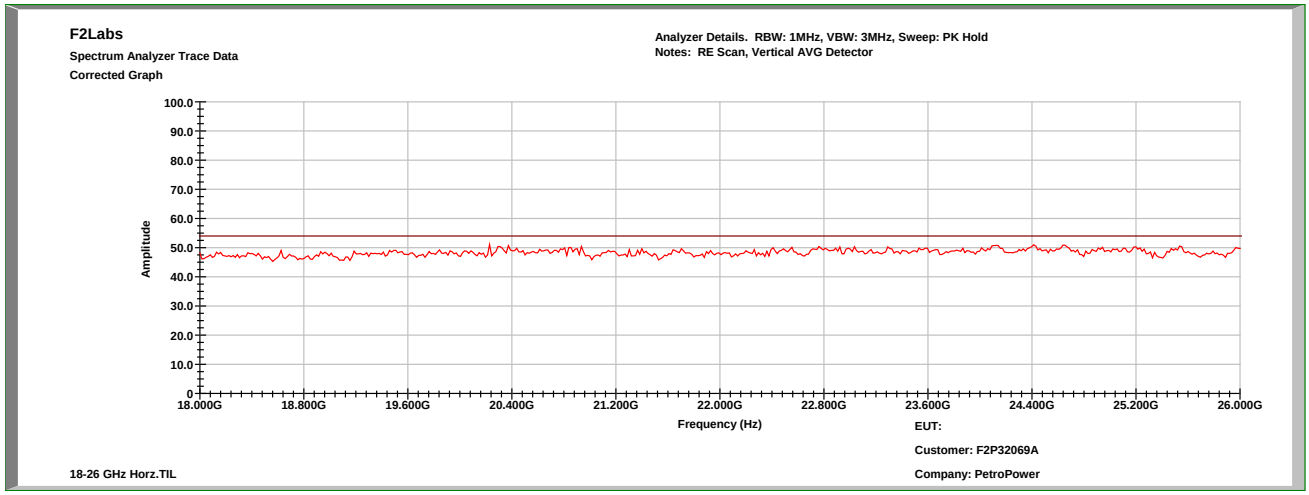
Radiated Spurious Emissions: 1 GHz to 18 GHz - Vertical



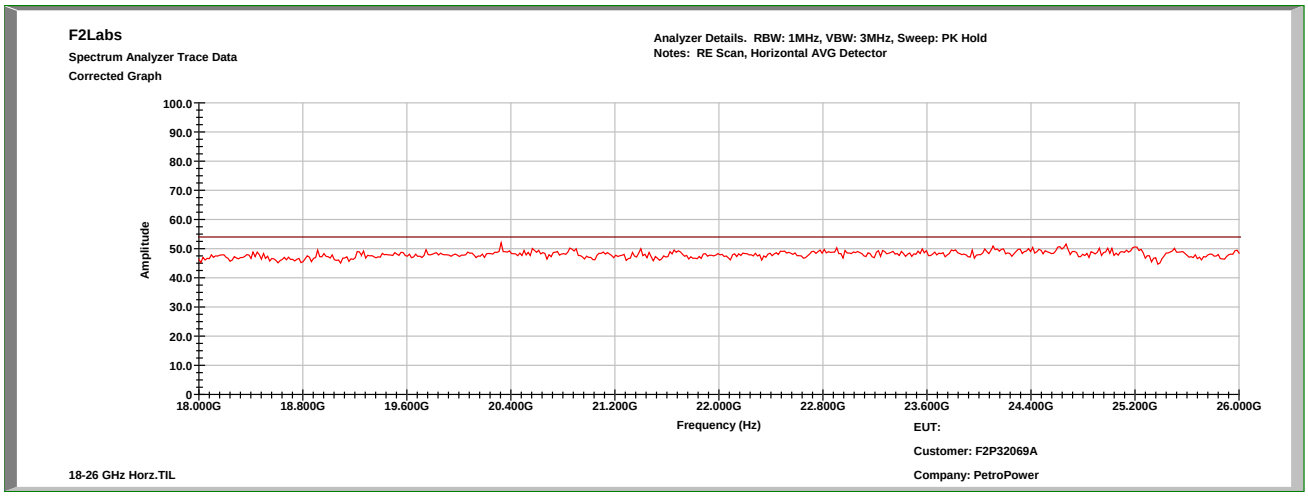
Radiated Spurious Emissions: 1 GHz to 18 GHz - Horizontal



Radiated Spurious Emissions: 18 GHz to 26 GHz - Vertical



Radiated Spurious Emissions: 18 GHz to 26 GHz - Horizontal



12 PEAK POWER SPECTRAL DENSITY (PSD)

Peak power spectral density measurements were performed.

12.1 Requirements:

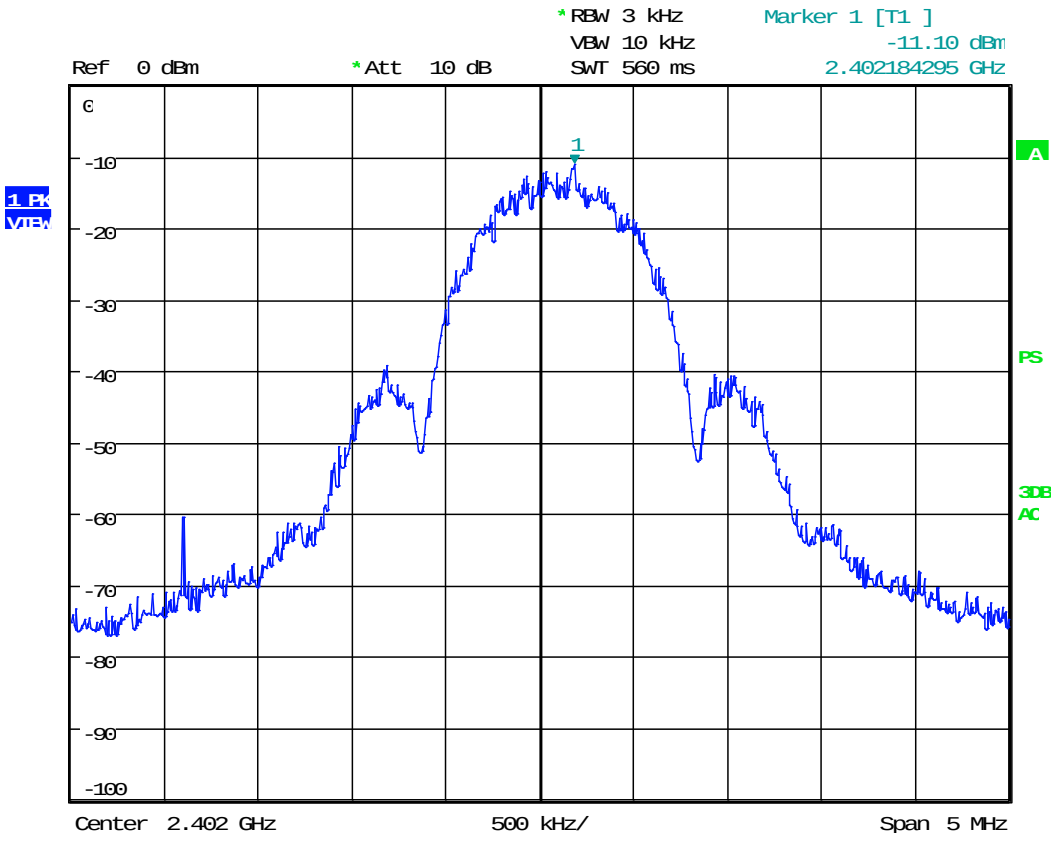
The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

Power spectral density measurements were performed at a resolution bandwidth of 3kHz (video bandwidth set at 10kHz). The peak spectral densities were measured at the low, mid, and upper channels.

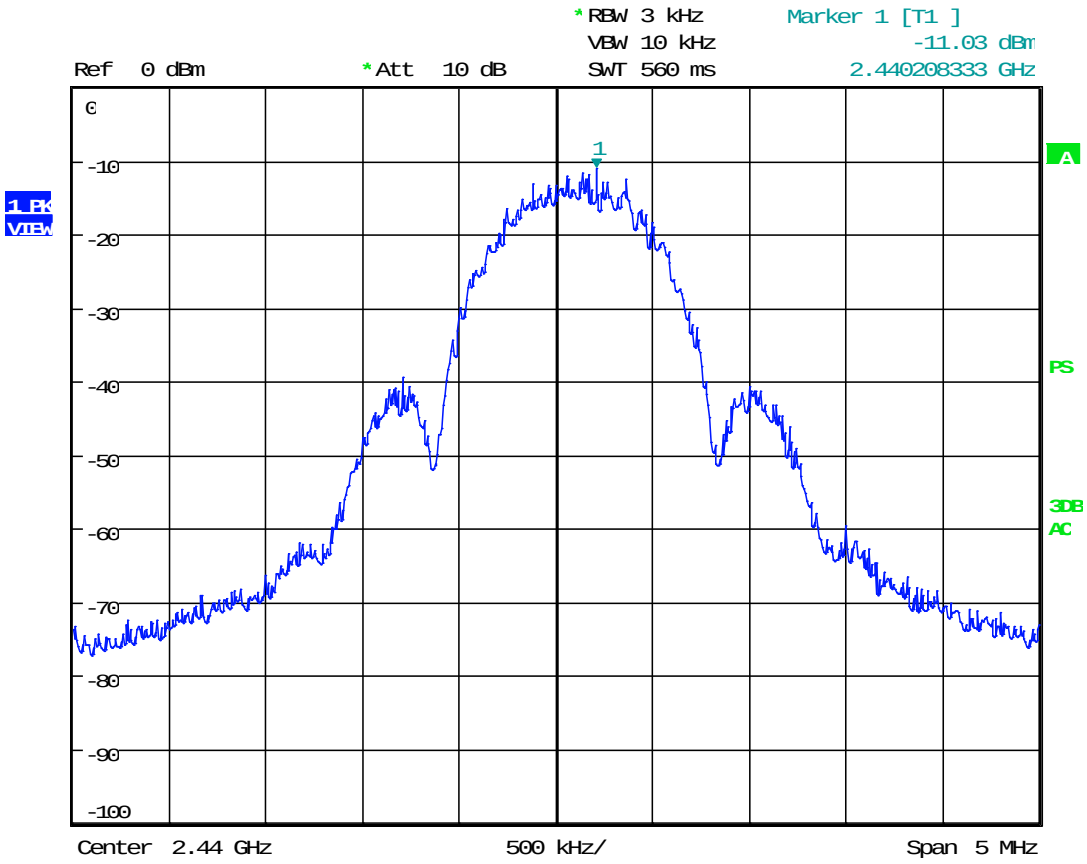
12.2 Peak Power Spectral Density Test Data

Test Date(s):	2024-08-08	Test Engineer(s):	K. Littell
Standards:	CFR 47 Part 15.247(e); KDB558074	Air Temperature:	22.5ºC
		Relative Humidity:	47%

1 Mbps: Low Channel

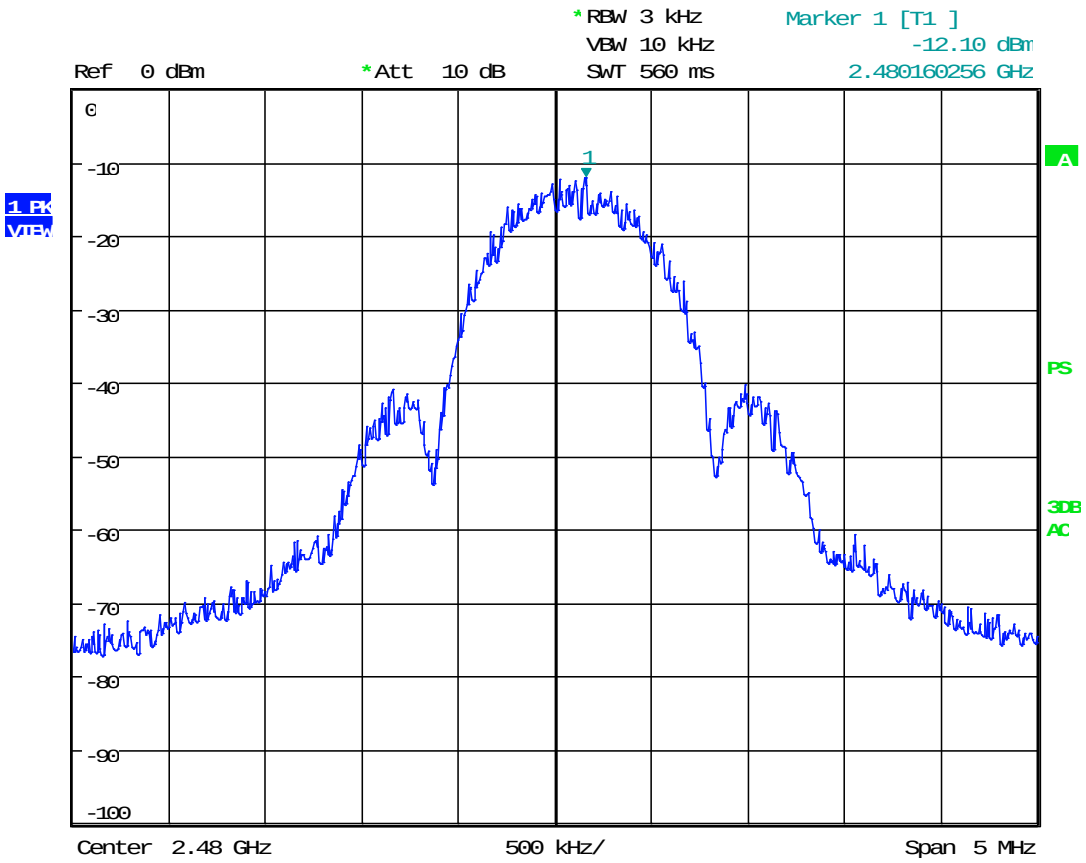


1 Mbps: Mid Channel



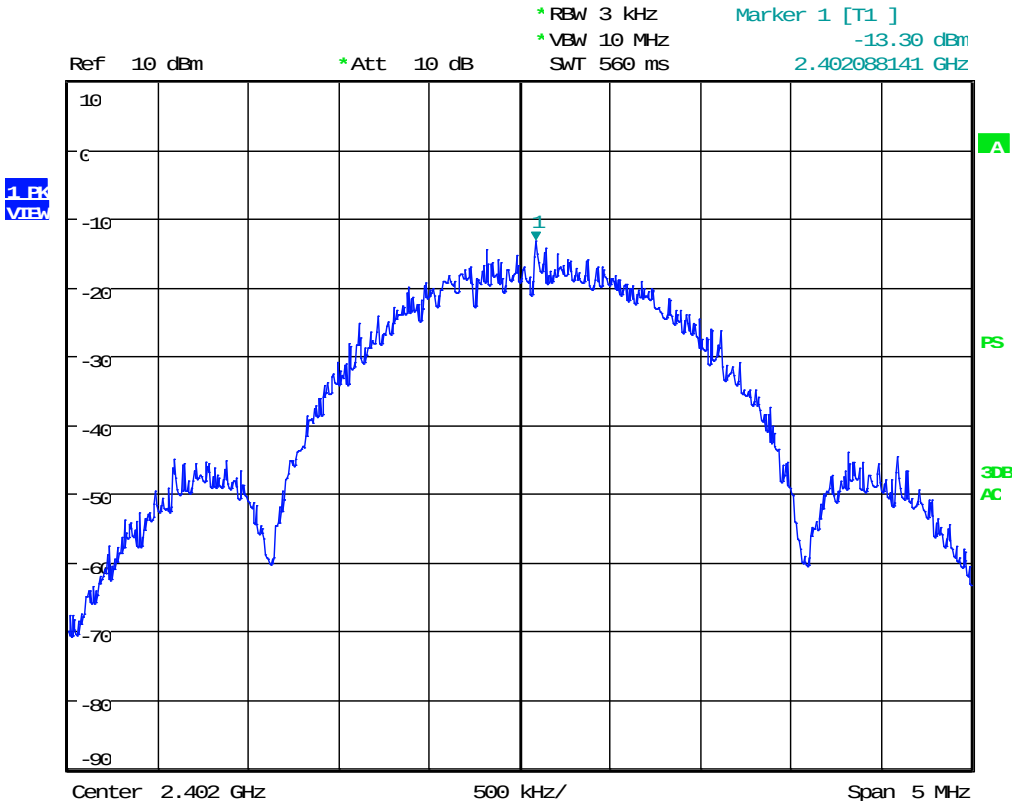
Date: 9.AUG.2024 08:59:51

1 Mbps: High Channel



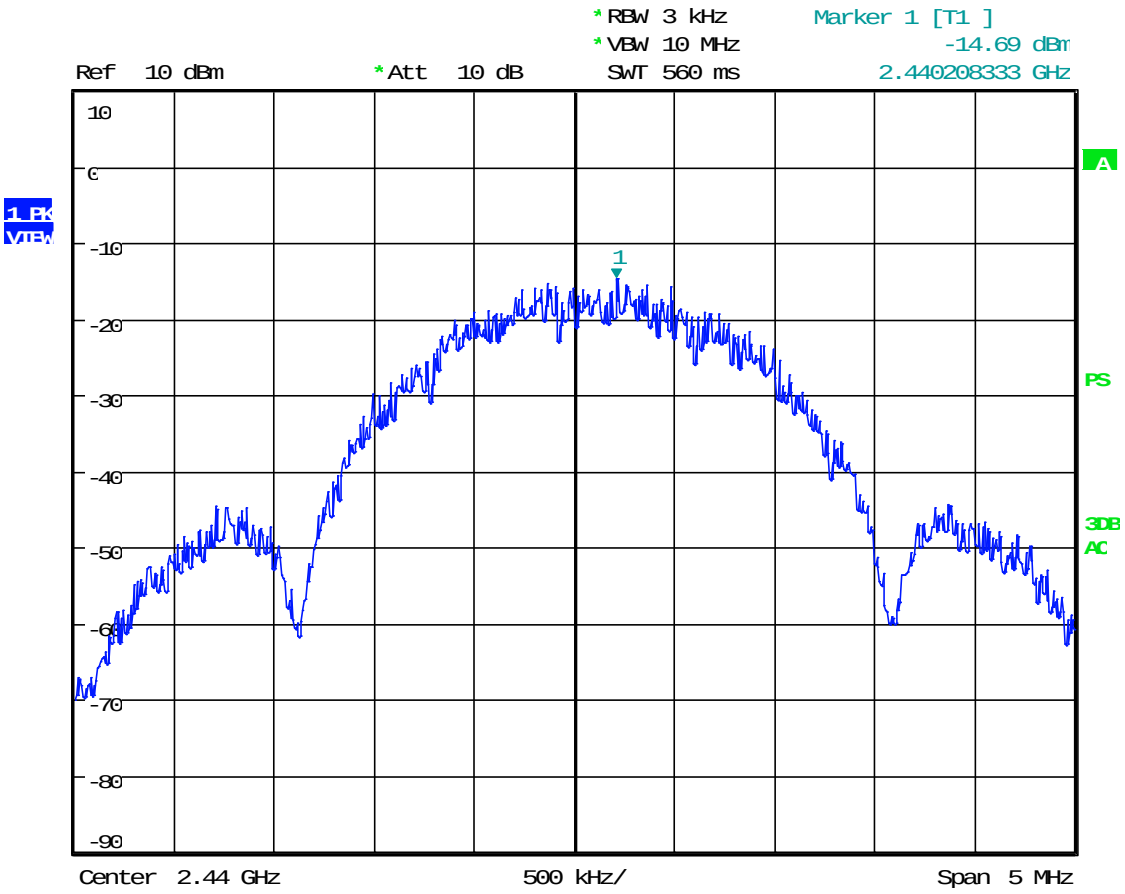
Date: 9.AUG.2024 09:00:56

2 Mbps: Low Channel



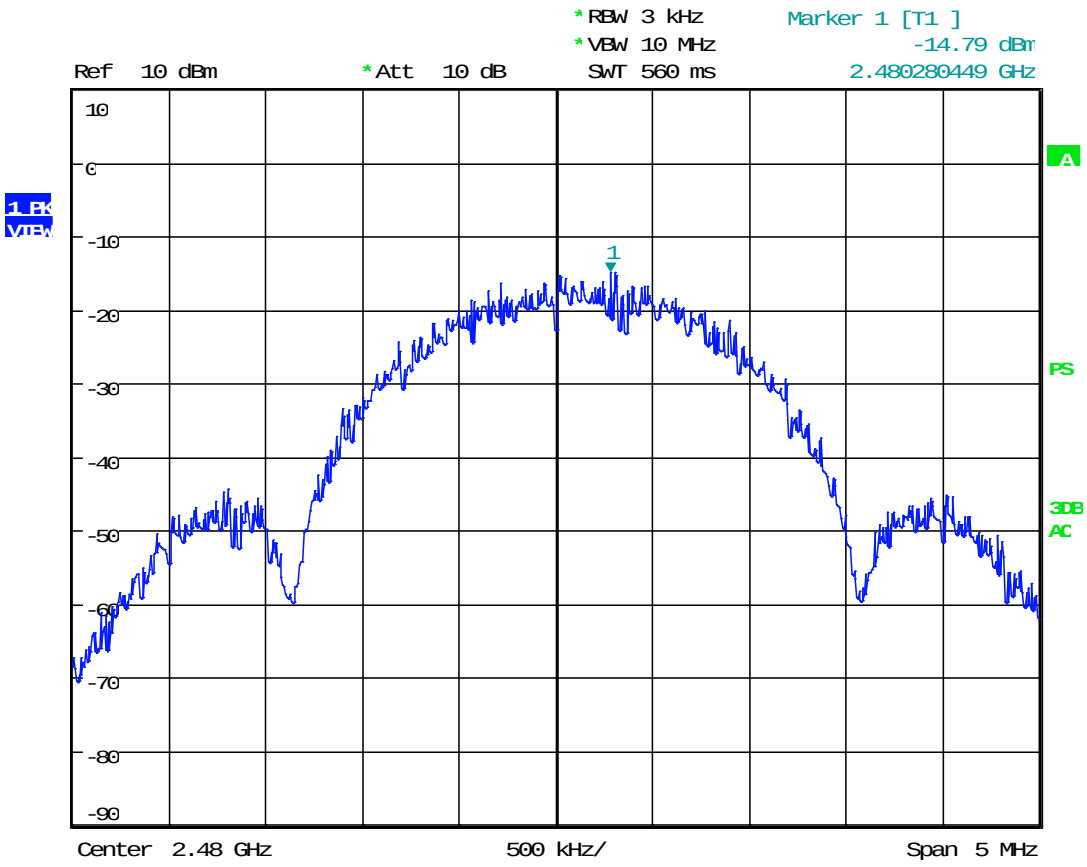
Date: 8.AUG.2024 11:13:46

2 Mbps: Mid Channel



Date: 8.AUG.2024 11:15:07

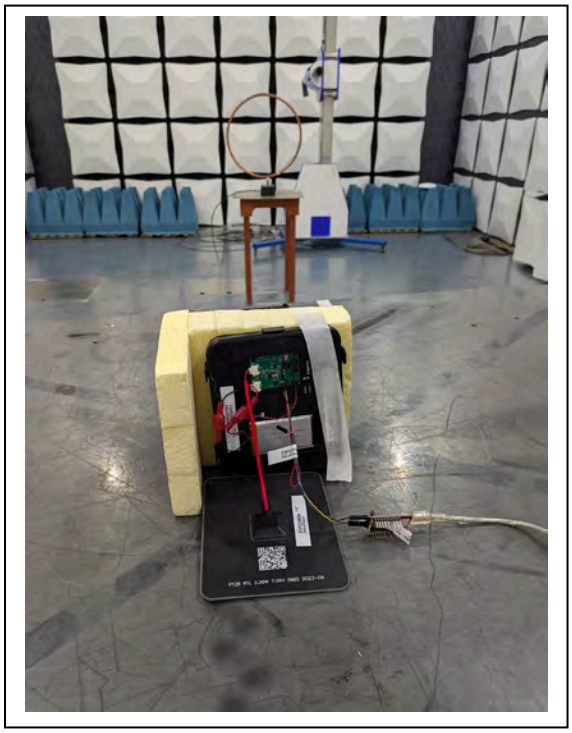
2 Mbps: High Channel



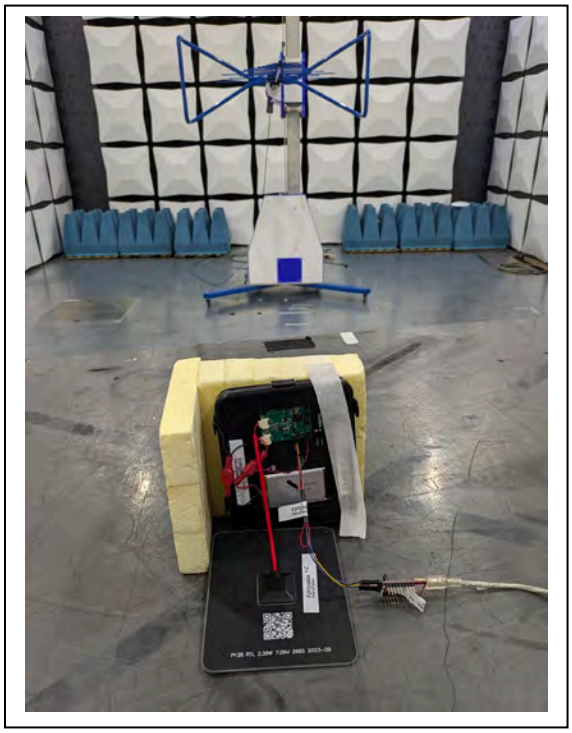
Date: 8.AUG.2024 11:16:24

13 TEST SETUP PHOTOGRAPH(S)

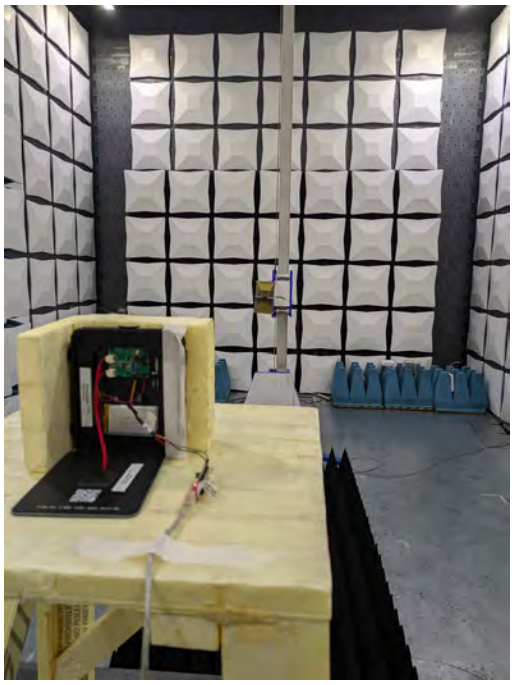
Radiated Spurious Emissions: 0.009 MHz to 30 MHz



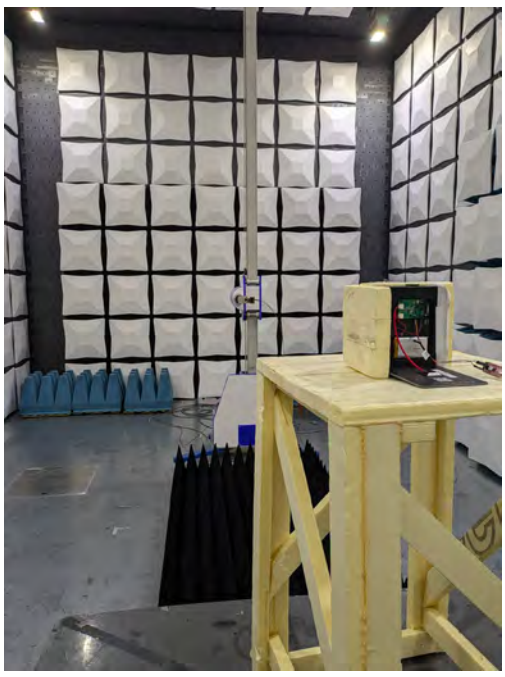
Radiated Spurious Emissions: 30 MHz to 1000 MHz



Radiated Spurious Emissions: 1 GHz to 18 GHz



Radiated Spurious Emissions: 18 GHz to 26 GHz



Conducted Output Power, Peak Power Spectral Density, Occupied Bandwidth, Conducted Spurious Emissions and Voltage Variations