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PCII TEST REPORT

Manufacturer: Knox Company
1601 West Deer Valley Road
Phoenix, Arizona 85027 USA

Applicant: Same as Above

Product Name: Radio Module

Product Description: Radio Module

**Operating Voltage/Freq.
of EUT During Testing:** 120V/60 Hz

Model(s): CC3135MODRNMMOBR

FCC ID: 2AOVI-KNOXRT35

Testing Commenced: 2024-10-31

Testing Ended: 2024-11-07

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.

**Test report reflects limited testing for PCII.*

Rules:

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



Order No(s): F2P33423, F2P33423-C1

Applicant: Knox Company
Model(s): CC3135MODRNMMOBR

Evaluation Conducted by:

Erik Tobin, EMC Engineer

Julius Chiller, Senior Wireless Project Engineer

Report Reviewed by:

Ken Littell, Vice President of Operations

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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 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 Uncertainty
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
F2P33423-01E	First Issue	2024-12-12	K. Littell



2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
Radiated Spurious Emission	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies

**Test report reflects limited testing for PCII.*

Modifications Made to the Equipment
None



Order No(s): F2P33423, F2P33423-C1

Applicant: Knox Company
Model(s): CC3135MODRNMMOBR

3 ENGINEERING STATEMENT

This report has been prepared on behalf of Knox Company 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.



4 EUT INFORMATION AND DATA

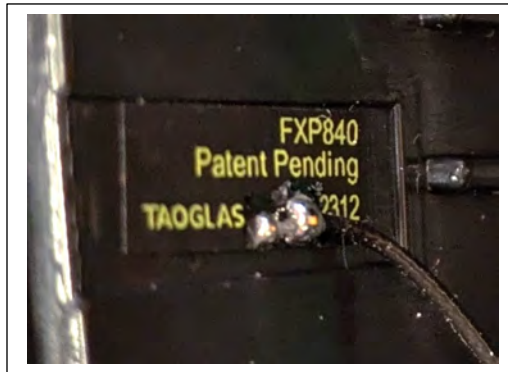
4.1 Equipment Under Test:

Product: Radio Module

Model(s): CC3135MODRNMMOBR

Serial No.: 32565

FCC ID: 2AOVI-KNOXRT35



4.2 Trade Name:

Knox Company

4.3 Power Supply:

120V/60 Hz

4.4 Applicable Rules:

CFR 47, Part 15.247, subpart C

4.5 Antenna:

Integral Flat Patch Antenna: 3.35dBi Gain

4.6 Accessories:

Device	Manufacturer	Model Number	Serial Number
Power Supply	Tensility	TSA1201A-1201000US	None Specified

4.7 Test Item Condition:

The equipment to be tested was received in good condition.

4.8 Testing Algorithm:

EUT was set up to transmit continuously. The module was tested while connected to a Host due to the Host supplying power and communication for the module. The Host was opened up so that the module was exposed, and the Host was not functioning.

**5 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	2025-03-31
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2025-04-09
Low Loss Cable Set	CL315 / CL318	Fairview Microwave	FMC0202914-72/FMC0202914-	None Spec.	2025-04-09
Pre-Amplifier	CL250	Com-Power	PAM-118A	18040011	2025-04-11
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	2025-09-18
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	2025-12-04
Horn Antenna 26.5-40 GHz	CL188	Com-Power	AH-640	091065	Verified
Pre-Amplifier	CL189	Com-Power	PAM-840A	461303	2026-04-10
Software:	Tile Version 3.4.B.3		Software Verified: 2024-10-31 to 2024-11-07		
Software:	EMC 32, Version 8.53.0		Software Verified: 2024-10-31 to 2024-11-07		
Temp/Hum Rec	CL232	Extech	445814	01	2025-05-19



6 RADIATED SPURIOUS EMISSIONS

The EUT antenna port was fitted with its Integral Antenna, 3.35dBi Gain. 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.

6.1 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 30 MHz to 26 GHz at the low, mid, and high channels and the MCS_0 bandwidth, high channel was determined to be worse case. The tables of measured results follow in data presented and include measurements from all channels.



6.2 Radiated Spurious Emissions Test Data

Test Date(s):	2024-10-31 to 2024-11-07	Test Engineer(s):	E. Tobin, J. Chiller
Standards:	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	Air Temperature:	21.1°C
		Relative Humidity:	52%

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.

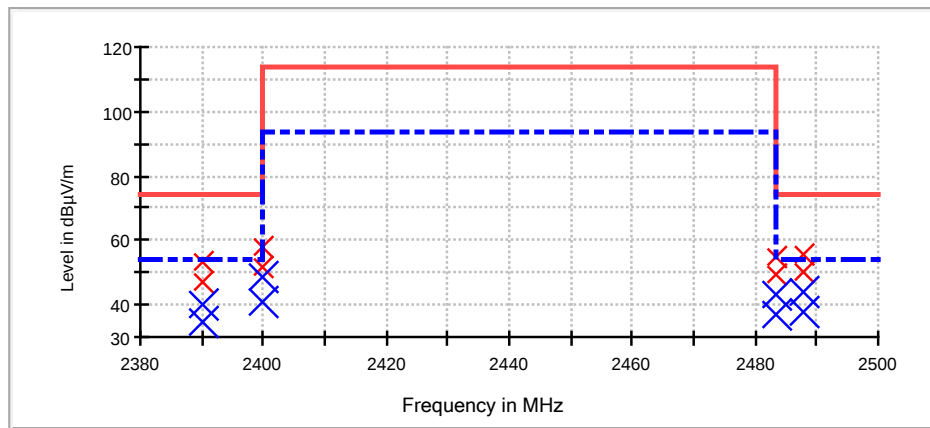
In the following plots, the BLACK trace indicates the active PEAK scan and the GREEN trace is the Max-Hold level reached during the rotation of the unit. Emissions to be found by the EUT were measured and listed in tables. The plots are for reference only and the limit lines are not actual limit lines but merely a guide.

The MCS_0 bandwidth, high channel, was found to be the worst case emissions.



1MB

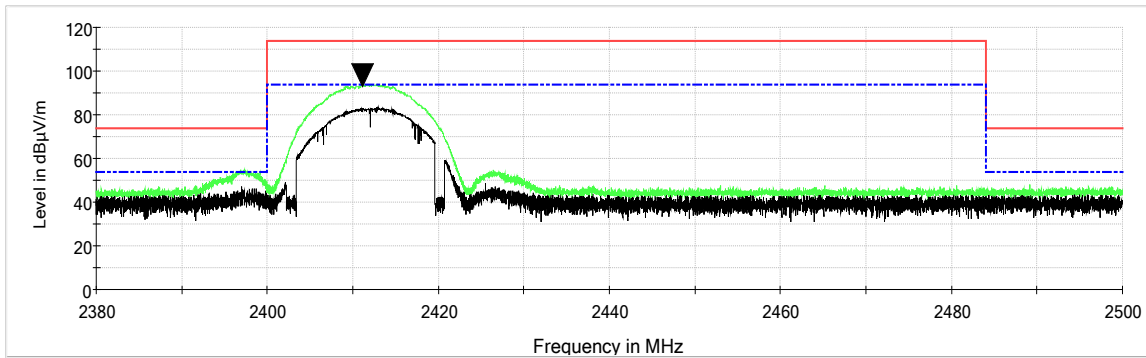
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
2390.000000	53.1	40.0	1000.0	1000.000	150.0	H	339.0	8.2	14.0	54.0	
2390.000000	47.3	34.7	1000.0	1000.000	150.0	V	0.0	8.2	19.3	54.0	
2400.000000	51.8	40.6	1000.0	1000.000	150.0	V	346.0	8.2	13.4	54.0	
2400.000000	58.1	48.5	1000.0	1000.000	150.0	H	5.0	8.2	5.5	54.0	
2483.500000	55.0	43.0	1000.0	1000.000	150.0	H	15.0	8.3	11.0	54.0	
2483.500000	49.3	37.0	1000.0	1000.000	150.0	V	356.0	8.3	17.0	54.0	
2488.000000	55.8	43.9	1000.0	1000.000	150.0	H	338.0	8.4	10.1	54.0	
2488.000000	50.4	37.8	1000.0	1000.000	150.0	V	1.0	8.4	16.2	54.0	



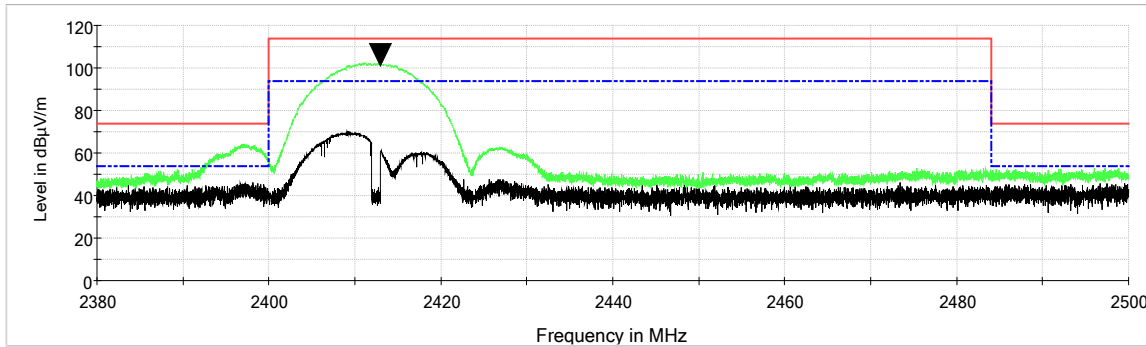


1MB, 2412

Band Edge – Vertical



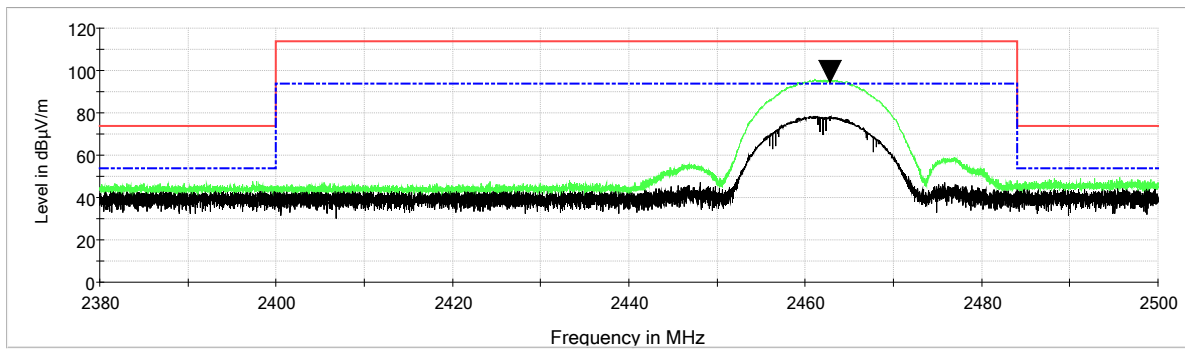
Band Edge – Horizontal



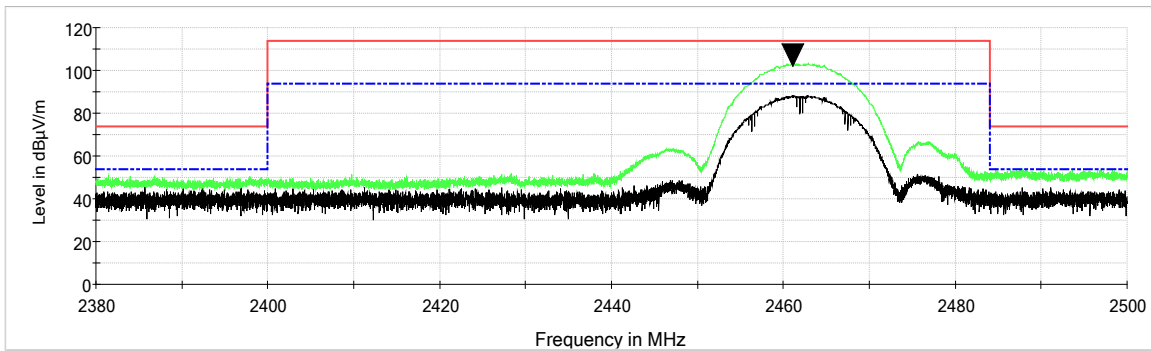


1MB, 2462

Band Edge – Vertical



Band Edge – Horizontal

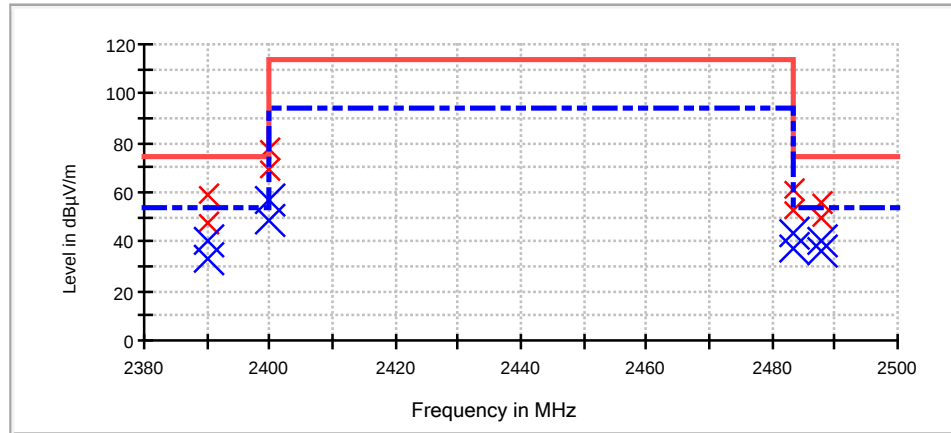




6MB

Measurements: Band Edges

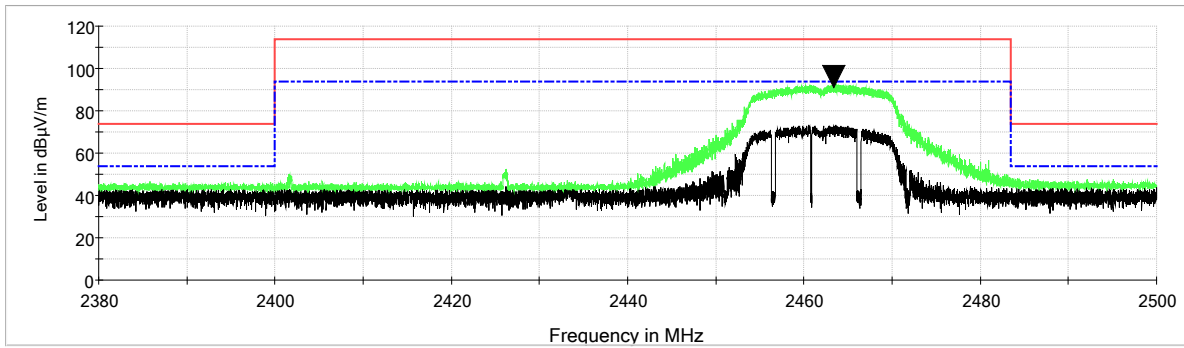
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB μ V/m)	Comment
2390.000000	58.7	40.7	1000.0	1000.000	150.0	H	11.0	8.2	13.3	54.0	
2390.000000	47.3	33.5	1000.0	1000.000	150.0	V	349.0	8.2	20.5	54.0	
2400.000000	77.8	56.8	1000.0	1000.000	150.0	H	0.0	8.2	-2.8	54.0	
2400.000000	69.4	48.2	1000.0	1000.000	150.0	V	0.0	8.2	5.8	54.0	
2483.500000	53.3	37.1	1000.0	1000.000	150.0	V	0.0	8.3	16.9	54.0	
2483.500000	60.6	43.0	1000.0	1000.000	150.0	H	353.0	8.3	11.0	54.0	
2488.000000	50.1	35.9	1000.0	1000.000	150.0	V	0.0	8.4	18.1	54.0	
2488.000000	55.9	40.8	1000.0	1000.000	150.0	H	0.0	8.4	13.2	54.0	



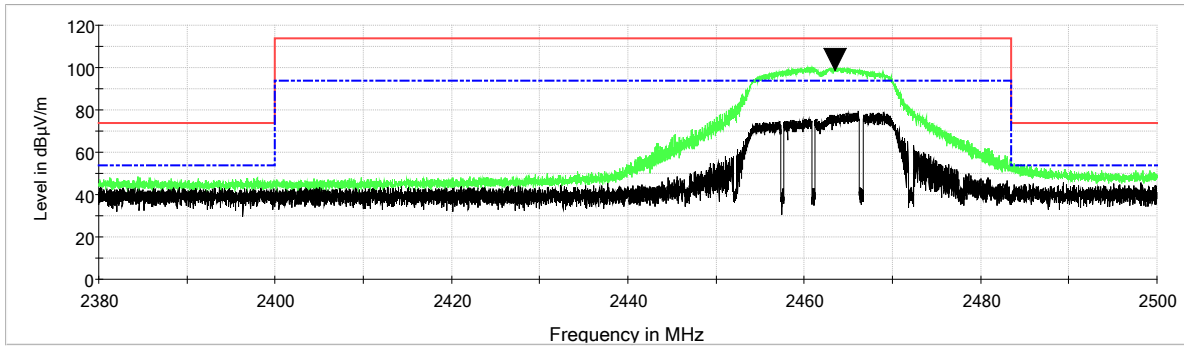


6MB, 2462

Band Edge – Vertical



Band Edge – Horizontal

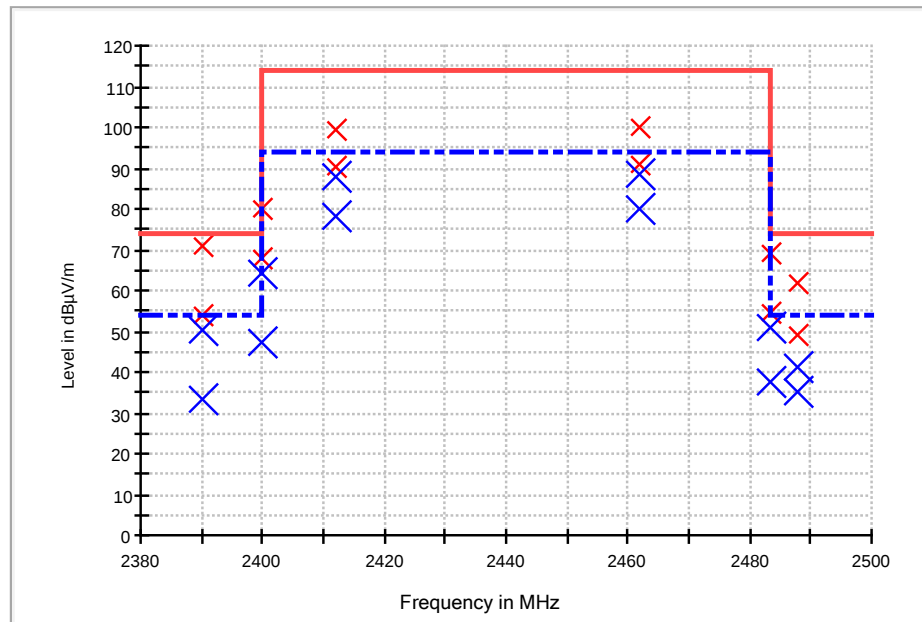




MCS_0

Measurements: Band Edges

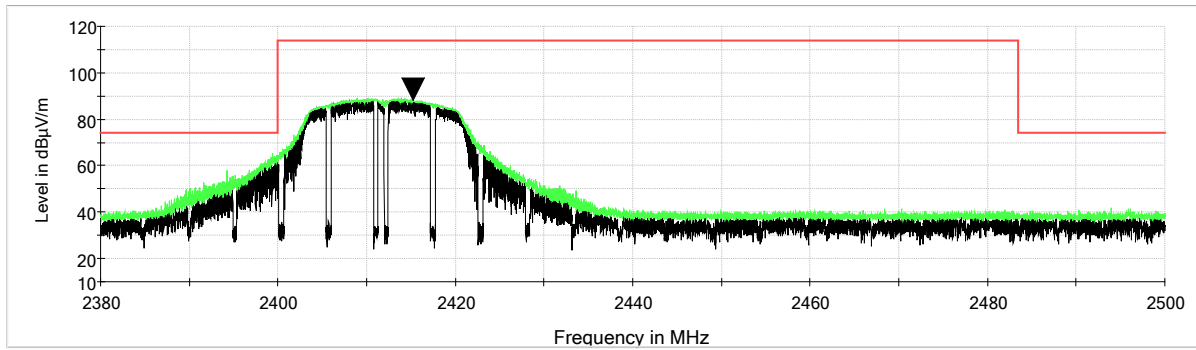
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
2390.000000	70.7	50.3	1000.000	180.0	H	171.0	-10.8	3.7	54.0	
2390.000000	53.9	33.5	1000.000	150.0	V	1.0	-10.8	20.5	54.0	
2400.000000	79.8	64.2	1000.000	180.0	H	171.0	-10.8	-10.2	54.0	
2400.000000	67.9	47.3	1000.000	150.0	V	357.0	-10.8	6.7	54.0	
2412.000000	90.1	78.4	1000.000	150.0	V	18.0	-10.9	15.6	94.0	
2412.000000	99.3	87.7	1000.000	180.0	H	171.0	-10.9	6.3	94.0	
2462.000000	91.1	79.8	1000.000	150.0	V	293.0	-11.0	14.2	94.0	
2462.000000	99.8	88.2	1000.000	150.0	H	86.0	-11.0	5.8	94.0	
2483.500000	69.2	50.7	1000.000	150.0	H	324.0	-11.0	3.3	54.0	
2483.500000	54.7	37.5	1000.000	150.0	V	0.0	-11.0	16.5	54.0	
2488.000000	49.0	35.0	1000.000	150.0	V	0.0	-10.9	19.0	54.0	
2488.000000	61.8	41.2	1000.000	150.0	H	8.0	-10.9	12.8	54.0	



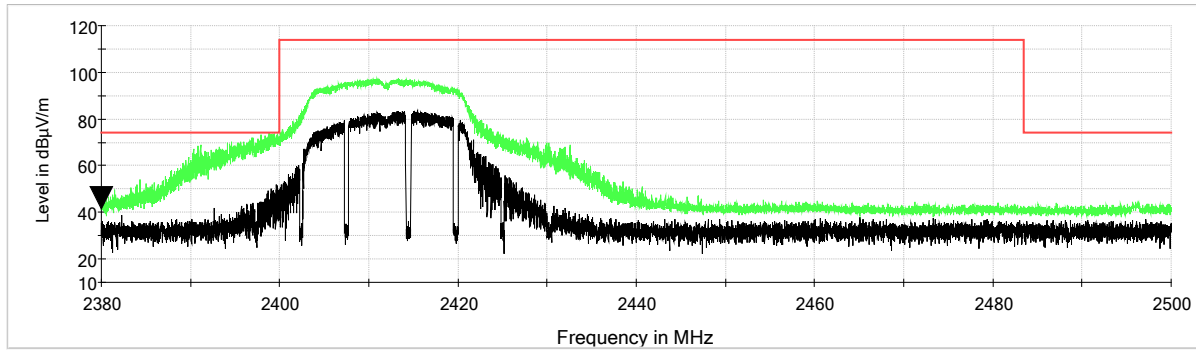


MCS_0, 2412

Band Edge – Vertical



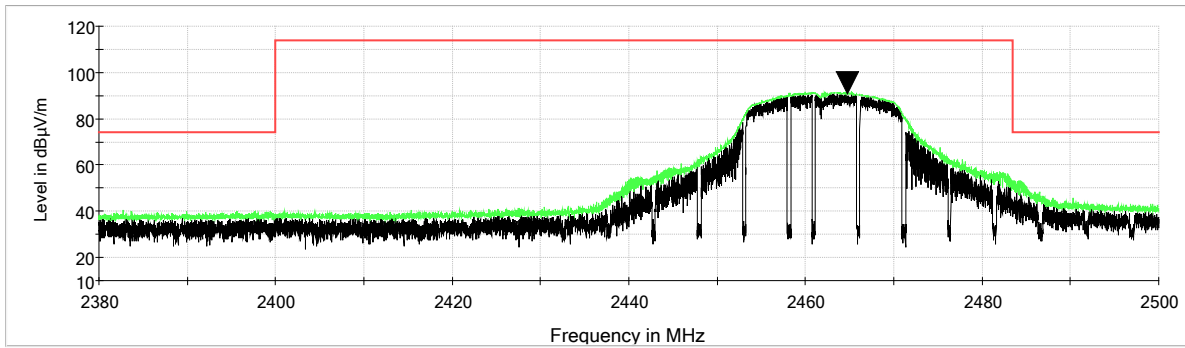
Band Edge – Horizontal



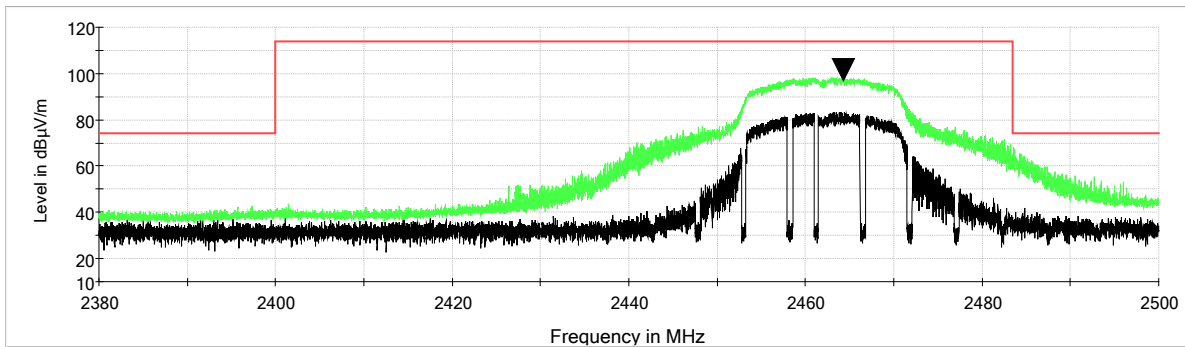


MCS_0, 2462

Band Edge – Vertical



Band Edge – Horizontal

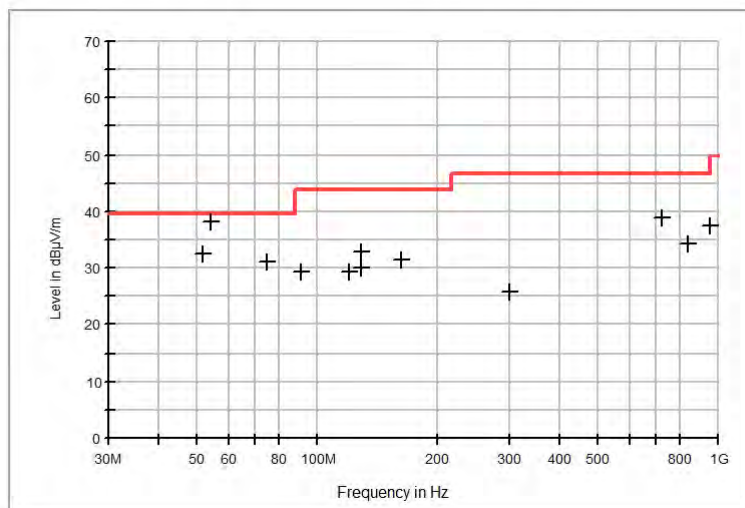




All Channels

Measurements: 30 MHz to 1000 MHz

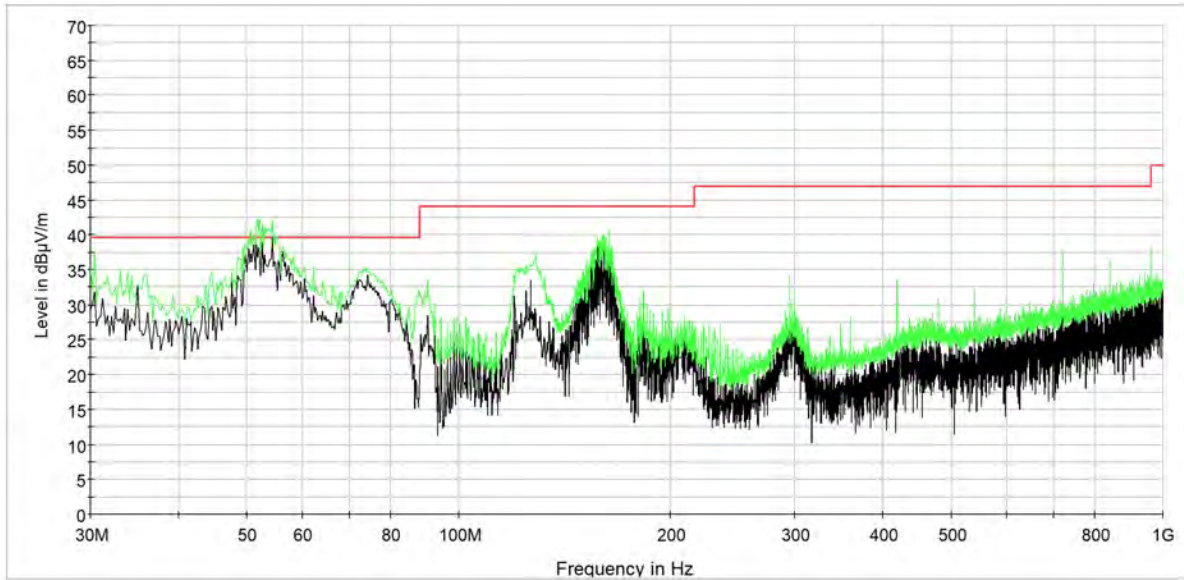
Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
51.730000	32.5	120.000	100.0	V	36.0	-32.4	27.1	39.6
54.250000	38.2	120.000	100.0	V	0.0	-32.6	21.5	39.6
74.230000	31.1	120.000	100.0	V	220.0	-31.6	28.5	39.6
90.330000	29.2	120.000	100.0	V	196.0	-32.2	34.8	44.0
120.020000	29.2	120.000	252.0	H	186.0	-25.7	34.8	44.0
128.550000	30.1	120.000	132.0	H	169.0	-25.5	33.9	44.0
128.550000	33.0	120.000	100.0	V	348.0	-25.5	31.0	44.0
160.760000	31.4	120.000	110.0	V	21.0	-26.9	32.6	44.0
300.050000	25.7	120.000	100.0	H	0.0	-25.1	41.2	46.9
720.060000	39.0	120.000	105.0	H	336.0	-17.2	27.9	46.9
840.140000	34.4	120.000	100.0	H	265.0	-14.9	32.5	46.9
960.040000	37.4	120.000	110.0	H	0.0	-12.2	32.6	50.0



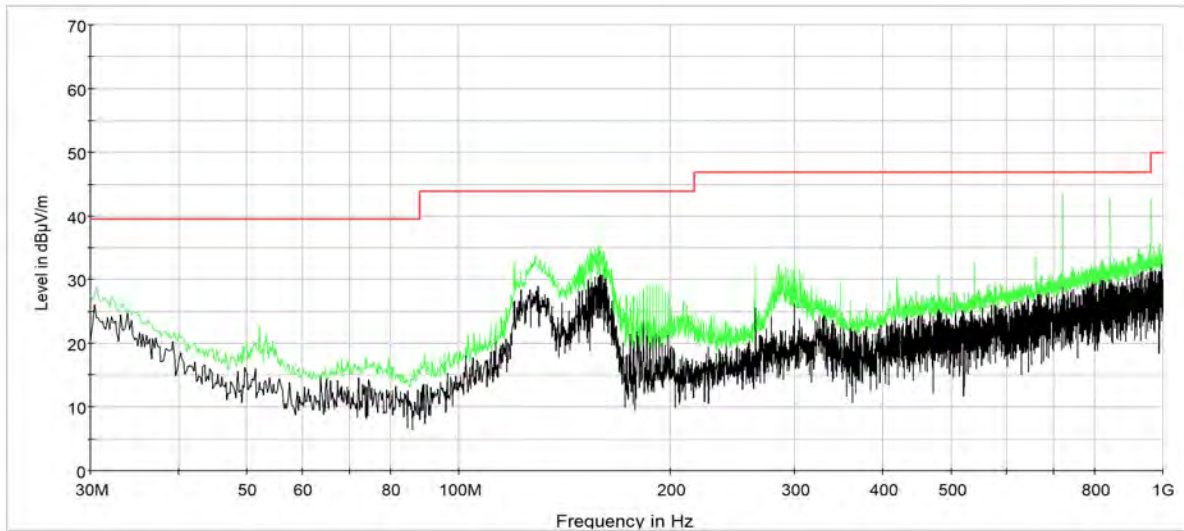


All Channels

Radiated Spurious Emissions: 30 MHz to 1000 MHz - Vertical



Radiated Spurious Emissions: 30 MHz to 1000 MHz - Horizontal

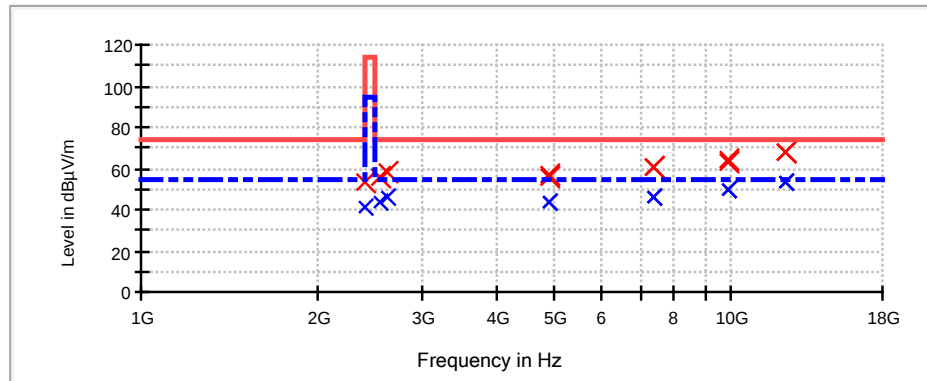




1MB, 2462 MHz

Measurements: Greater Than 1 GHz

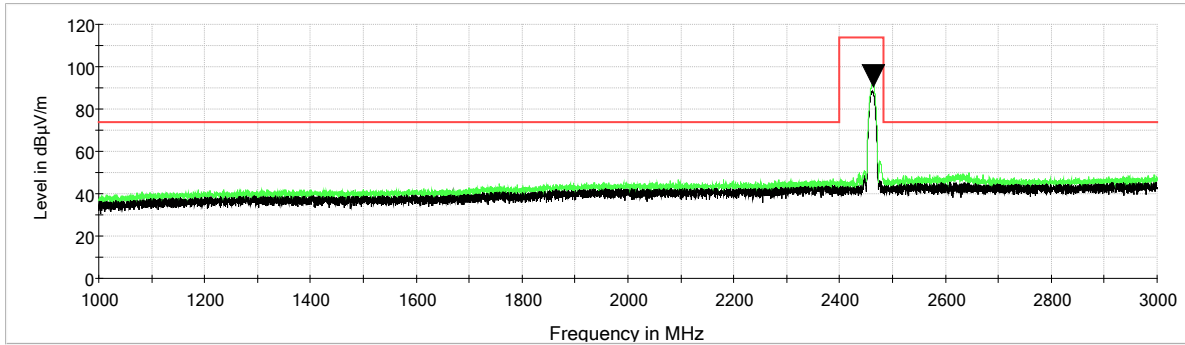
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
2382.400000	53.4	41.8	1000.0	1000.000	150.0	H	351.0	8.3	12.2	54.0	
2539.800000	56.2	44.1	1000.0	1000.000	150.0	H	4.0	8.6	9.9	54.0	
2619.800000	58.6	46.5	1000.0	1000.000	150.0	H	0.0	8.9	7.5	54.0	
4924.000000	56.4	43.7	1000.0	1000.000	150.0	V	0.0	13.9	10.3	54.0	
4924.000000	56.3	43.3	1000.0	1000.000	150.0	H	356.0	13.9	10.7	54.0	
7386.000000	60.8	46.4	1000.0	1000.000	150.0	V	2.0	18.9	7.6	54.0	
7386.000000	60.5	46.5	1000.0	1000.000	150.0	H	6.0	18.9	7.5	54.0	
9848.000000	63.7	49.7	1000.0	1000.000	150.0	V	0.0	22.3	4.3	54.0	
9848.000000	63.5	49.7	1000.0	1000.000	150.0	H	353.0	22.3	4.3	54.0	
12310.000000	67.5	53.3	1000.0	1000.000	150.0	V	0.0	25.7	0.7	54.0	
12310.000000	67.5	53.3	1000.0	1000.000	150.0	H	0.0	25.7	0.7	54.0	



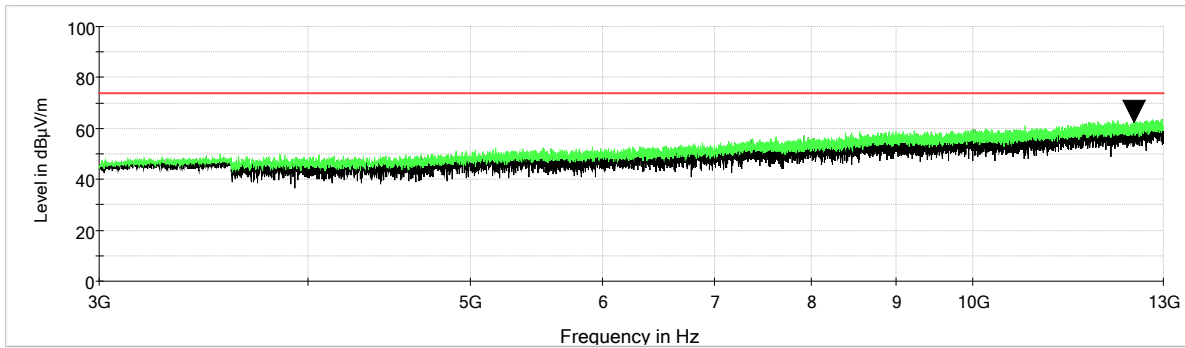


1MB, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Vertical



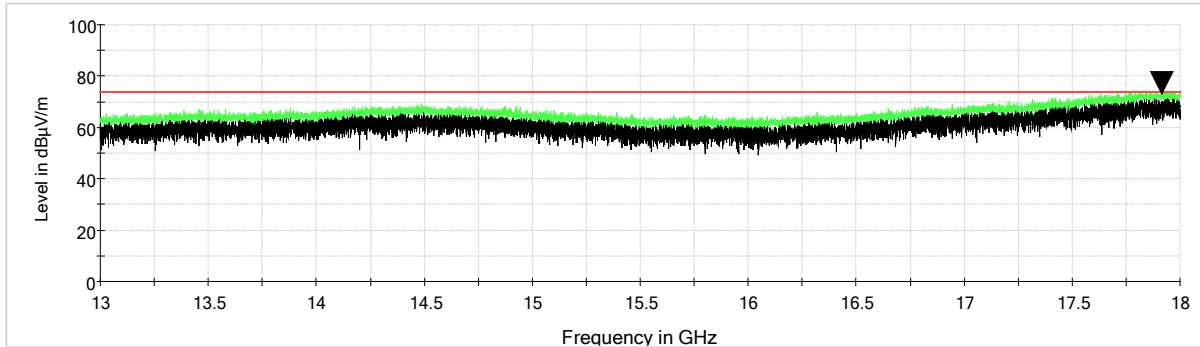
Radiated Spurious Emissions: 3 GHz to 13 GHz - Vertical



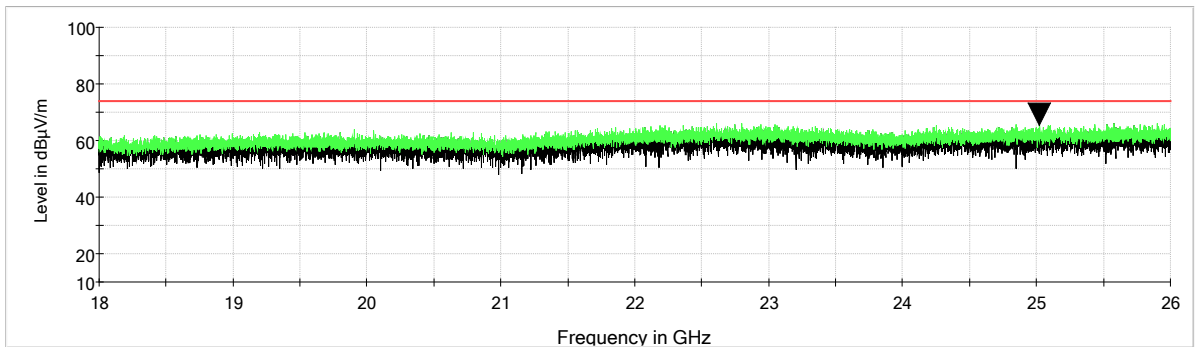


1MB, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Vertical



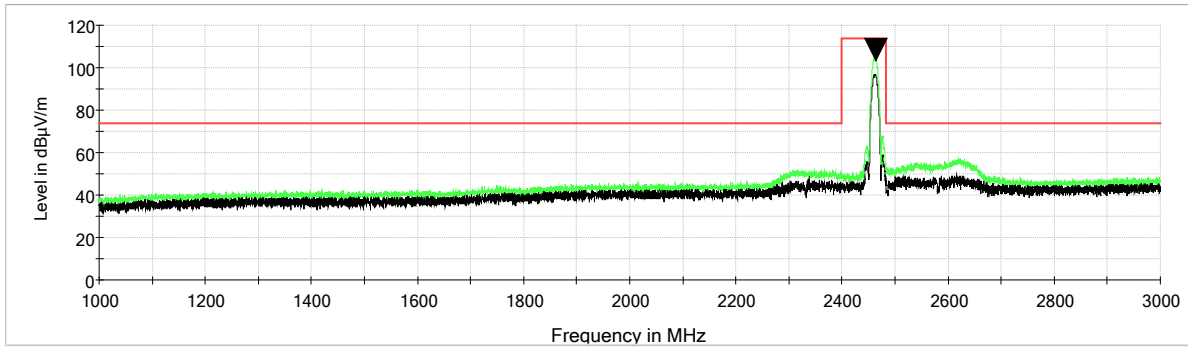
Radiated Spurious Emissions: 18 GHz to 26 GHz - Vertical



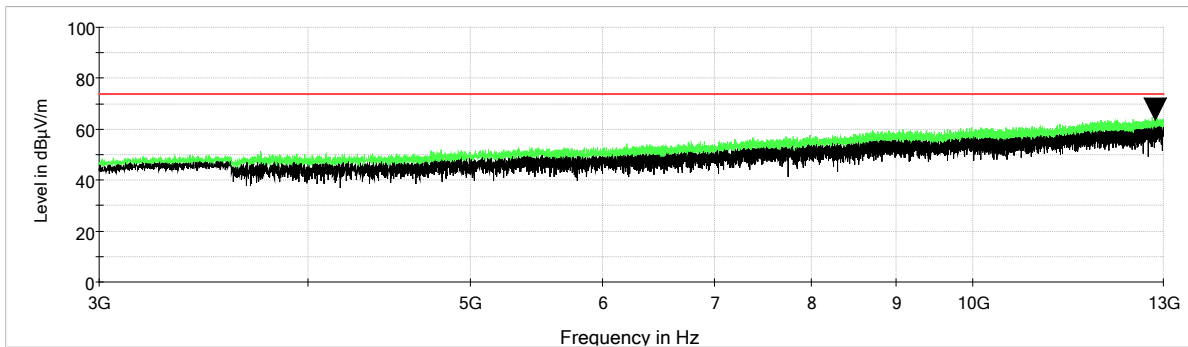


1MB, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Horizontal



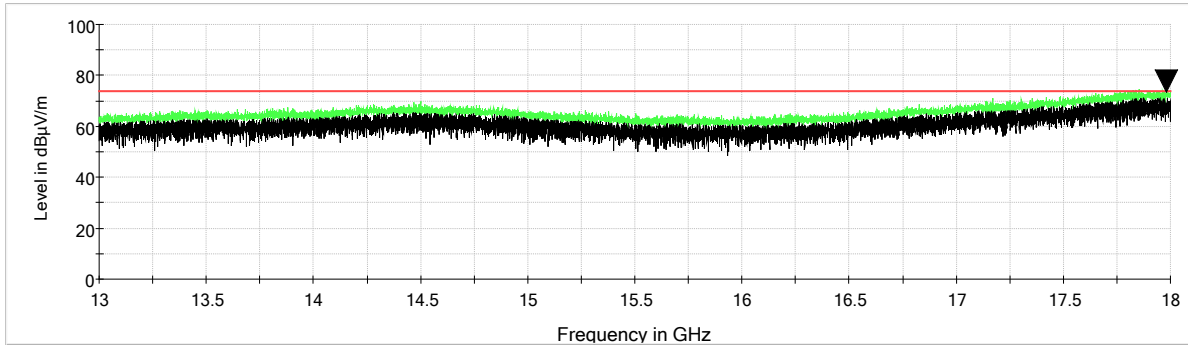
Radiated Spurious Emissions: 3 GHz to 13 GHz - Horizontal



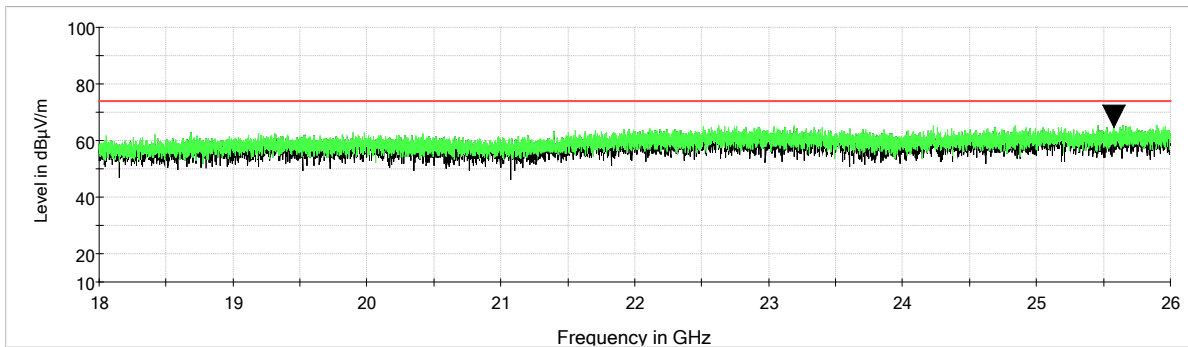


1MB, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Horizontal



Radiated Spurious Emissions: 18 GHz to 26 GHz - Horizontal

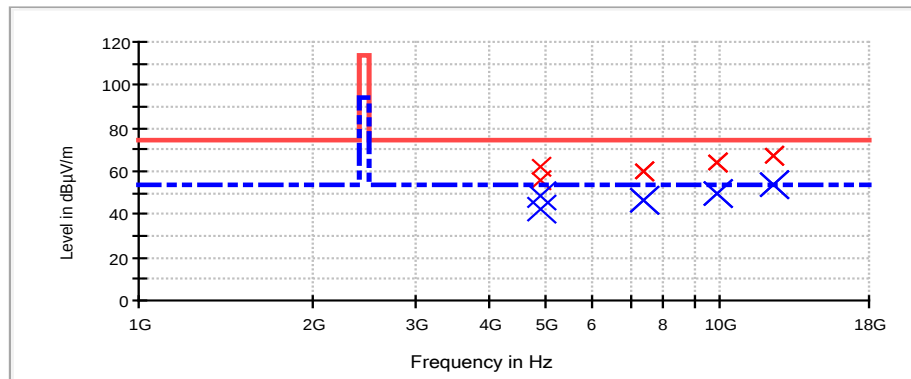




6MB, 2462 MHz

Measurements: Greater Than 1 GHz

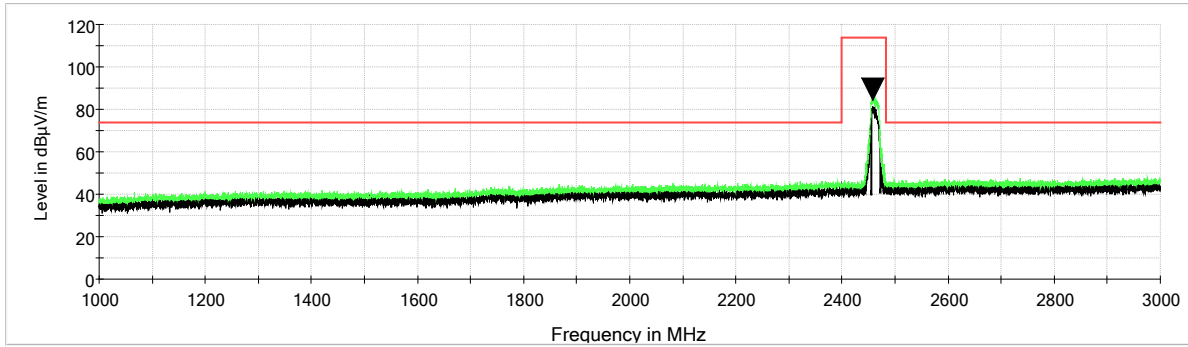
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
4924.000000	61.7	48.4	1000.0	1000.000	150.0	H	336.0	13.9	5.6	54.0	
4924.000000	55.7	42.0	1000.0	1000.000	150.0	V	14.0	13.9	12.0	54.0	
7386.000000	60.1	46.3	1000.0	1000.000	150.0	V	0.0	18.9	7.7	54.0	
7386.000000	60.1	46.3	1000.0	1000.000	150.0	H	14.0	18.9	7.7	54.0	
9848.000000	64.0	49.6	1000.0	1000.000	150.0	H	356.0	22.3	4.4	54.0	
9848.000000	63.8	49.6	1000.0	1000.000	150.0	V	0.0	22.3	4.4	54.0	
12310.000000	67.1	53.5	1000.0	1000.000	150.0	V	0.0	25.7	0.5	54.0	
12310.000000	67.1	53.5	1000.0	1000.000	150.0	H	0.0	25.7	0.5	54.0	



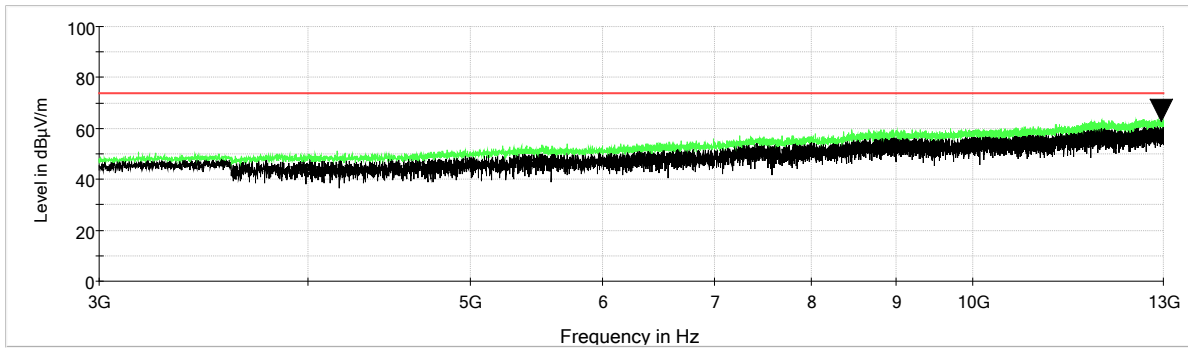


6MB, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Vertical



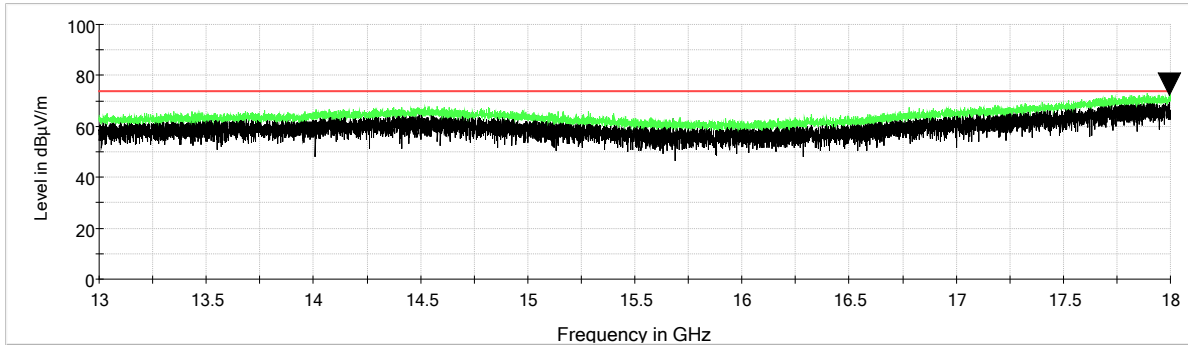
Radiated Spurious Emissions: 3 GHz to 13 GHz - Vertical



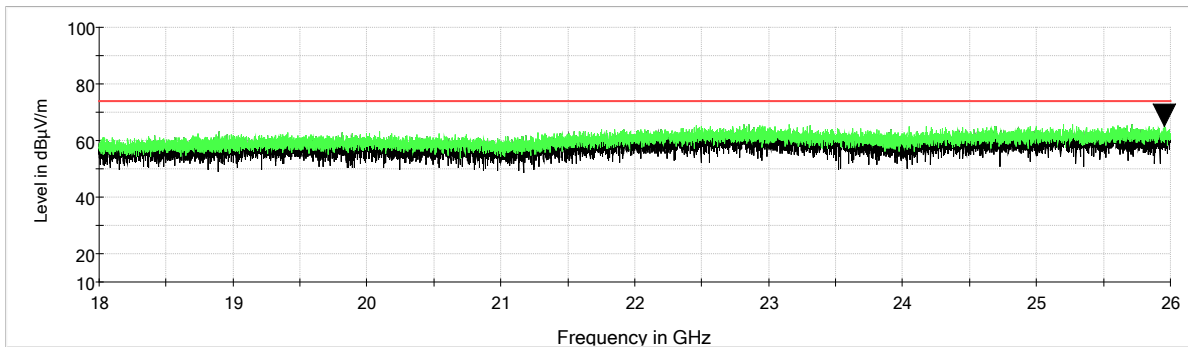


6MB, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Vertical



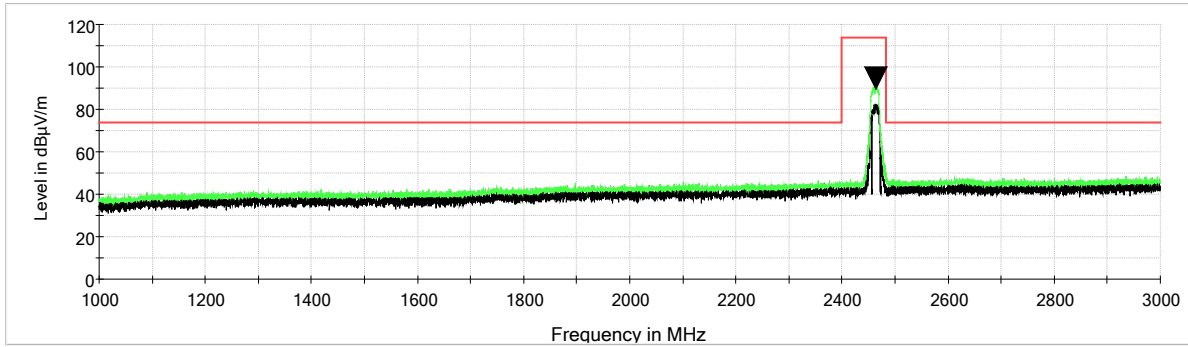
Radiated Spurious Emissions: 18 GHz to 26 GHz - Vertical



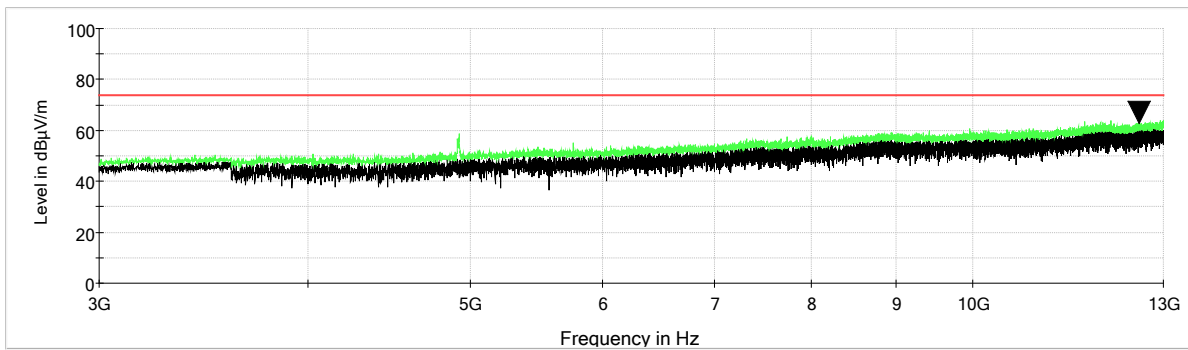


6MB, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Horizontal



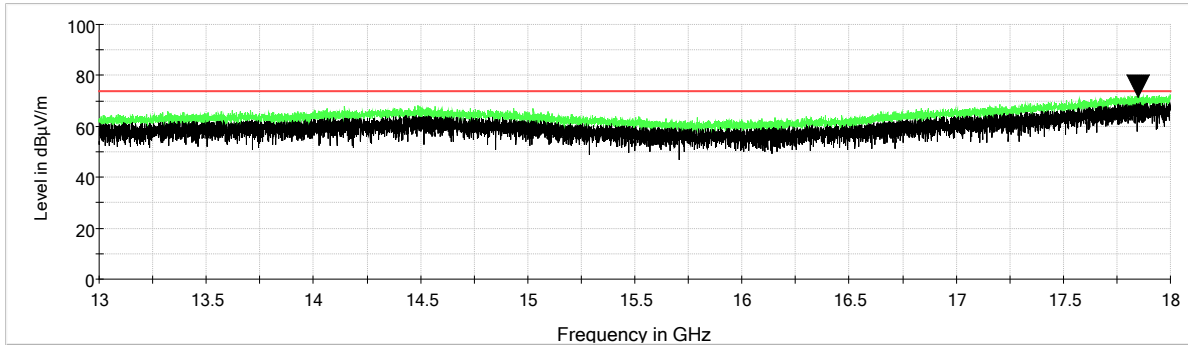
Radiated Spurious Emissions: 3 GHz to 13 GHz - Horizontal



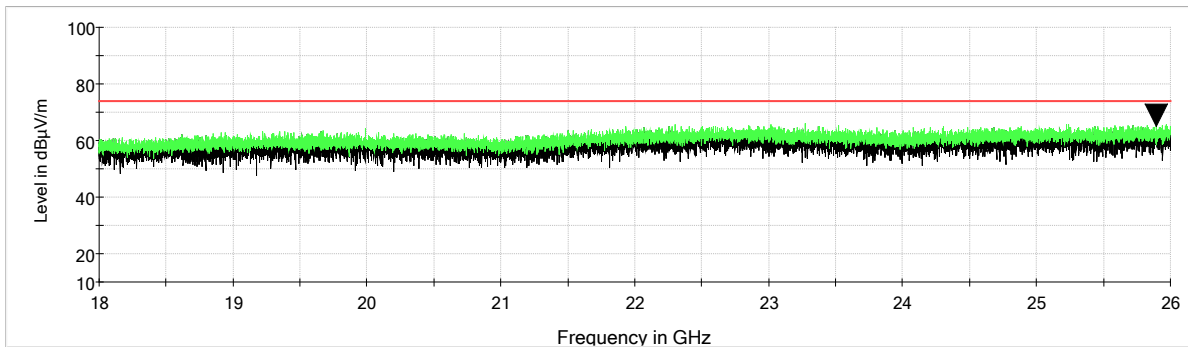


6MB, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Horizontal



Radiated Spurious Emissions: 18 GHz to 26 GHz - Horizontal

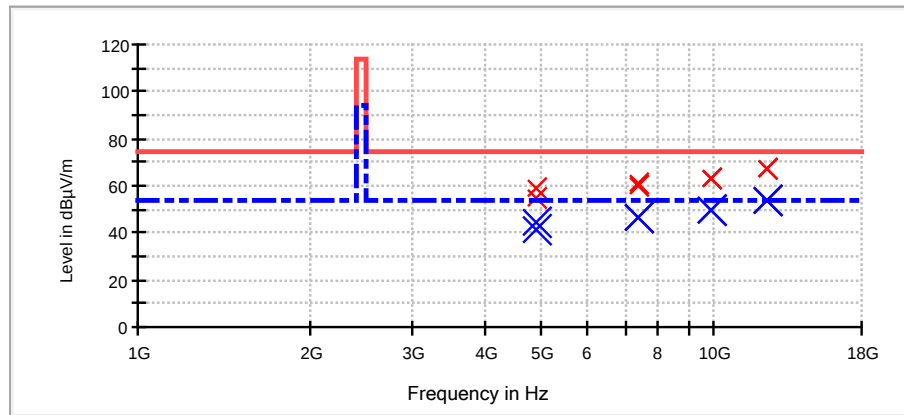




MCS_0, 2462 MHz

Measurements: Greater Than 1 GHz

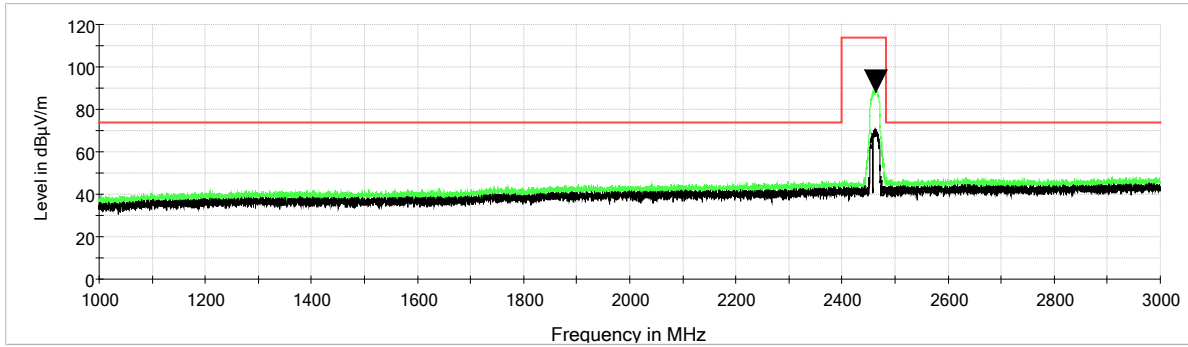
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
4924.000000	59.3	44.8	1000.0	1000.000	150.0	H	355.0	13.9	9.2	54.0	
4924.000000	55.3	41.6	1000.0	1000.000	150.0	V	356.0	13.9	12.4	54.0	
7386.000000	60.8	46.2	1000.0	1000.000	150.0	H	0.0	18.9	7.8	54.0	
7386.000000	60.2	46.3	1000.0	1000.000	150.0	V	9.0	18.9	7.7	54.0	
9848.000000	63.6	49.6	1000.0	1000.000	150.0	V	329.0	22.3	4.4	54.0	
9848.000000	63.3	49.6	1000.0	1000.000	150.0	H	351.0	22.3	4.4	54.0	
12310.000000	67.3	53.4	1000.0	1000.000	150.0	H	0.0	25.7	0.6	54.0	
12310.000000	67.1	53.4	1000.0	1000.000	150.0	V	30.0	25.7	0.6	54.0	



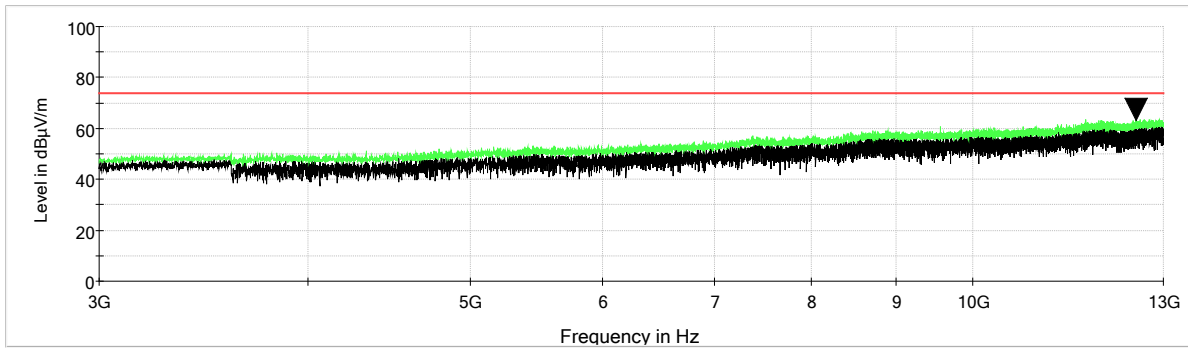


MCS_0, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Vertical



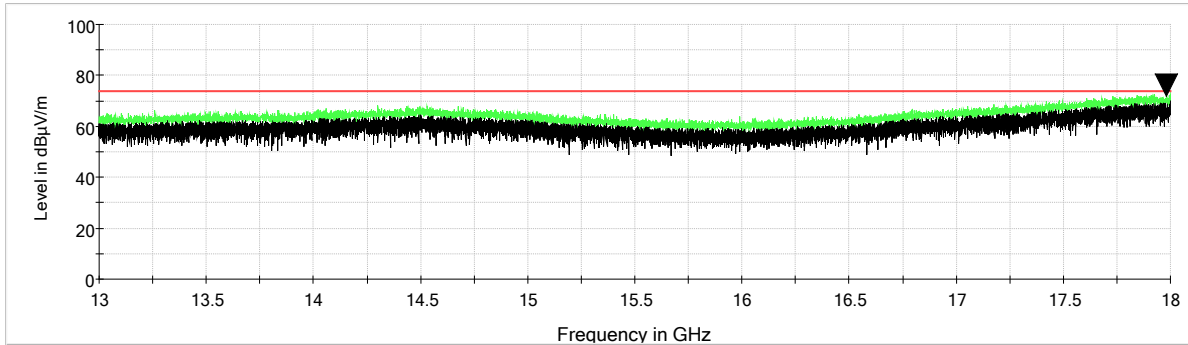
Radiated Spurious Emissions: 3 GHz to 13 GHz - Vertical



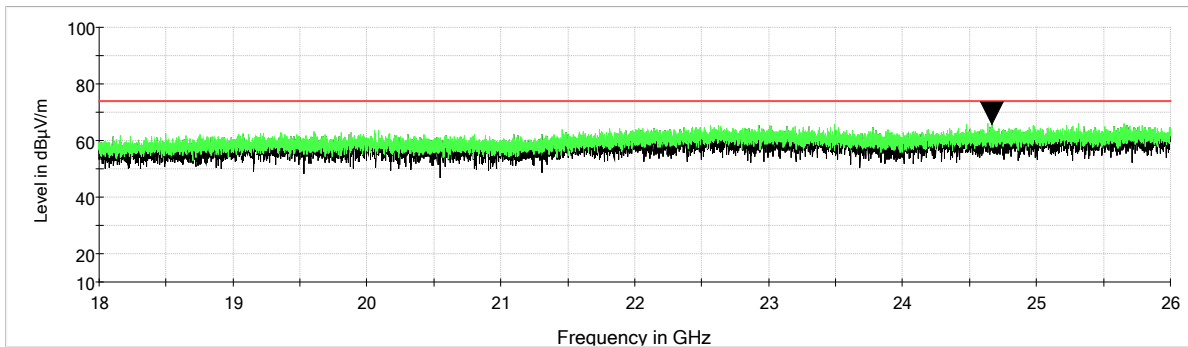


MCS_0, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Vertical



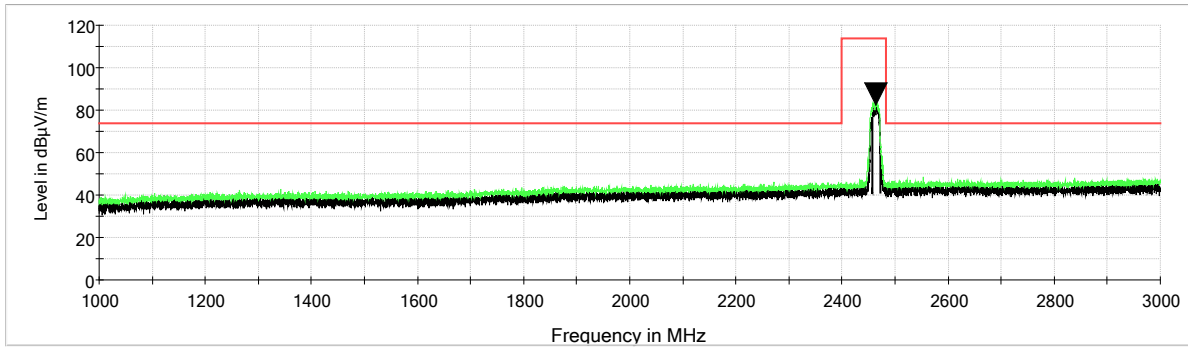
Radiated Spurious Emissions: 18 GHz to 26 GHz - Vertical



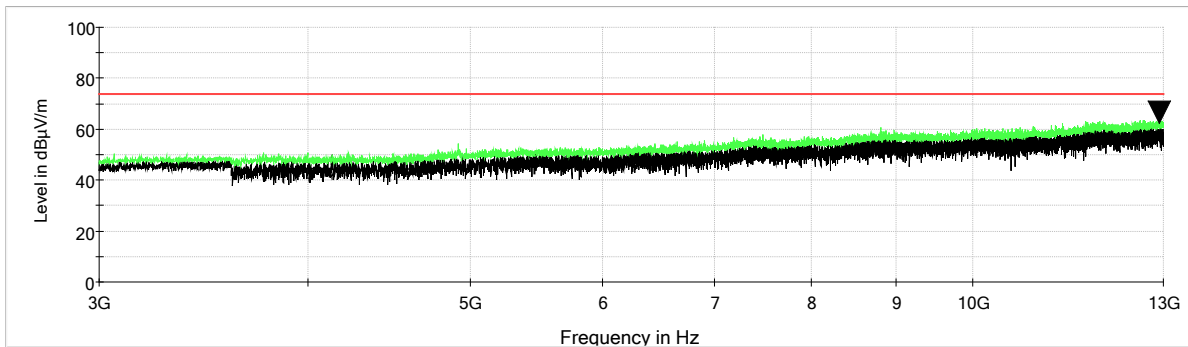


MCS_0, 2462 MHz

Radiated Spurious Emissions: 1 GHz to 3 GHz - Horizontal



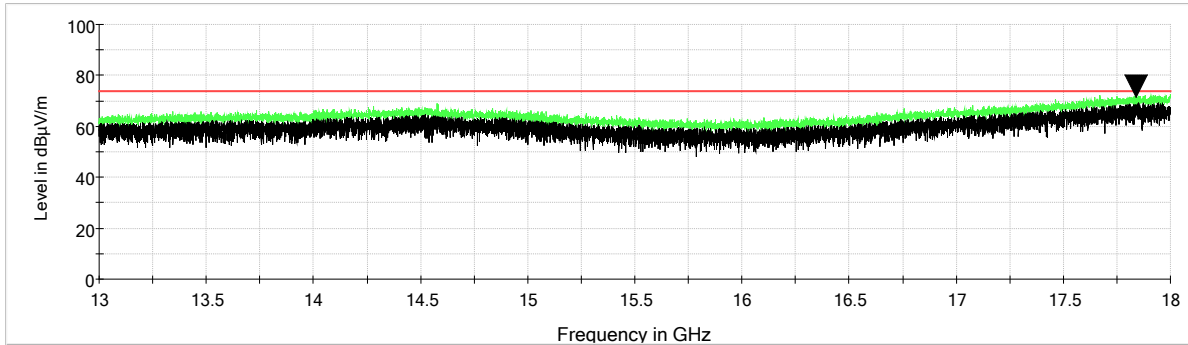
Radiated Spurious Emissions: 3 GHz to 13 GHz - Horizontal



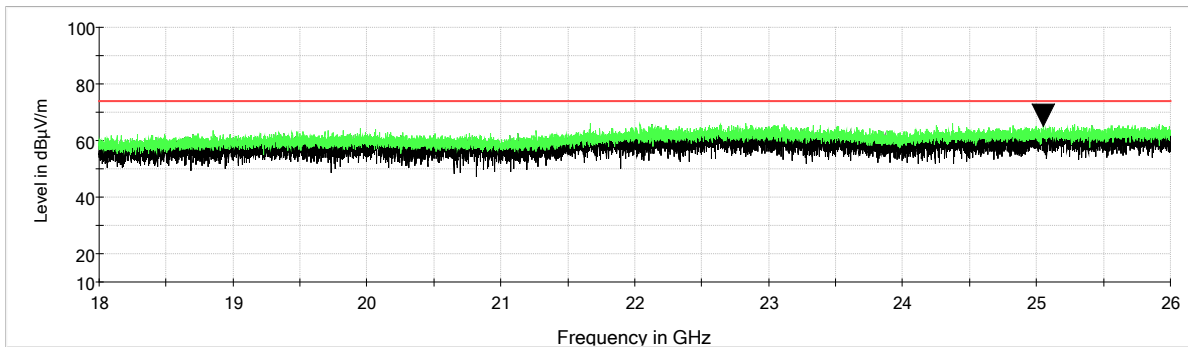


MCS_0, 2462 MHz

Radiated Spurious Emissions: 13 GHz to 18 GHz - Horizontal



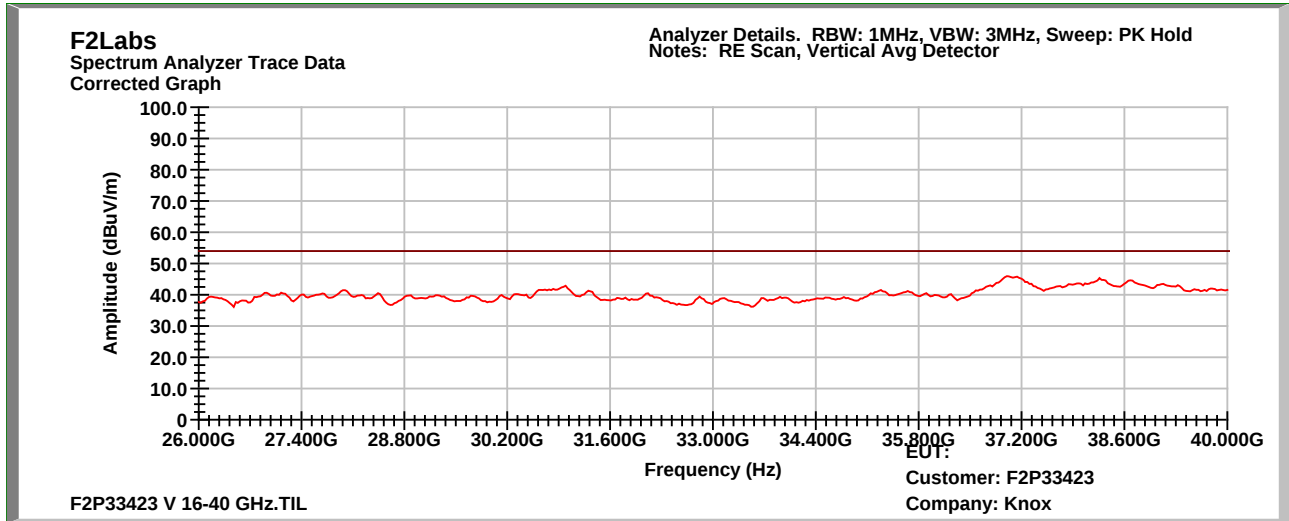
Radiated Spurious Emissions: 18 GHz to 26 GHz - Horizontal



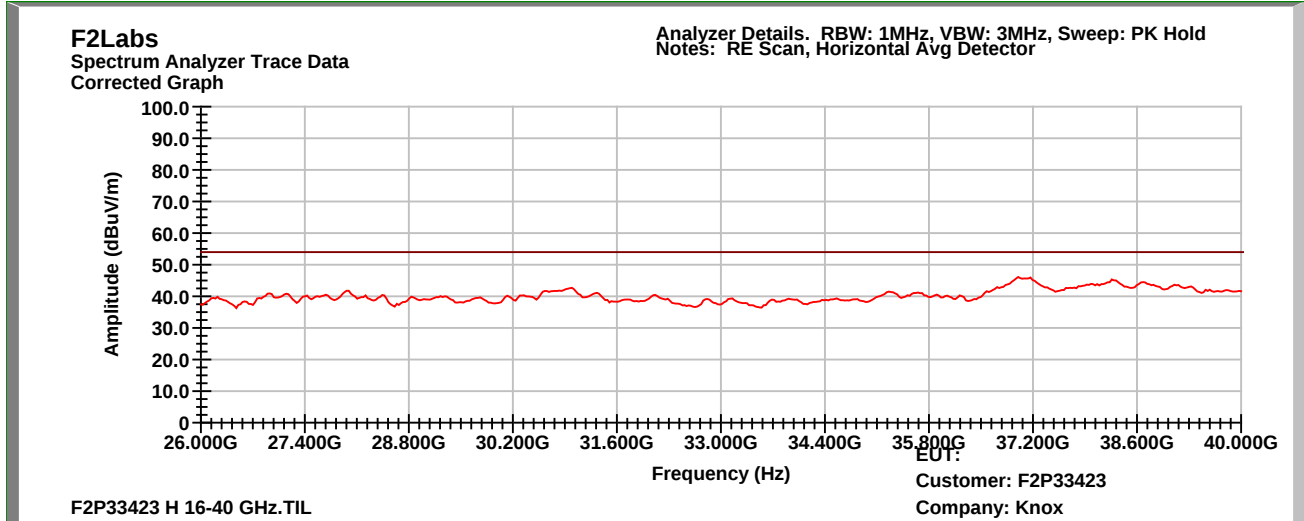


All Channels

Radiated Spurious Emissions: 18 GHz to 40 GHz - Vertical



Radiated Spurious Emissions: 18 GHz to 40 GHz - Horizontal



7 TEST SETUP PHOTOGRAPH(S)

Note: The module was tested while connected to a Host due to the Host supplying power and communication for the module. The Host was opened up so that the module was exposed, and the Host was not functioning.

Radiated Spurious Emissions: 30 MHz to 1000 MHz

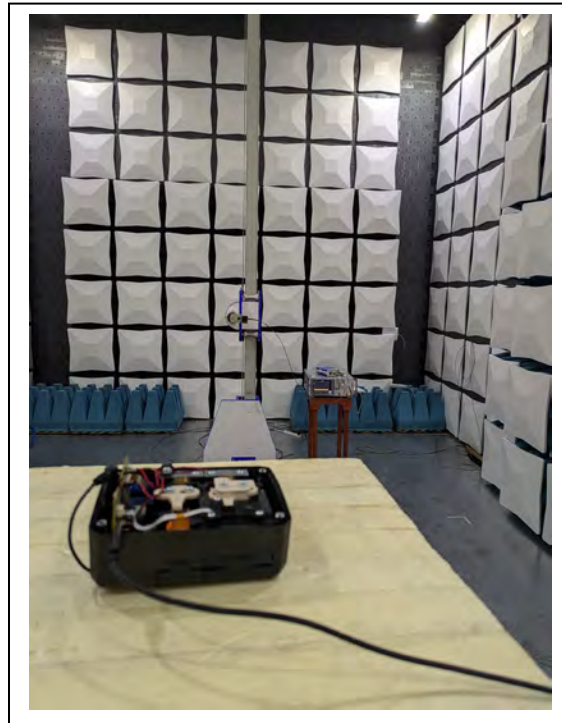


Radiated Spurious Emissions: 1 GHz to 18 GHz





Radiated Spurious Emissions: 18 GHz to 26 GHz



Radiated Spurious Emissions: 26 GHz to 40 GHz

