



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

RADIATED SPURIOUS EMISSIONS

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

Applicant: **Same as Above**

Radio Module Model: **CC3135MODRNMMOBR**

FCC ID: **2AOVI-KNOXRT35**

Testing Commenced: **2026-01-19**

Testing Ended: **2026-01-19**

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.

Wireless transmitter is pre-certified; testing was performed due to additional antennas.

Standards:

- **FCC Part 15 Subpart C, Section 15.247**
- **FCC Part 15.31(e)**
- **ANSI C63.10:2020**



Order Number: F2X34964A

Applicant: Knox Company
FCC ID: 2AOVI-KNOXRT35

Evaluation Conducted by:

Erik Tobin, EMC 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

This test report may be reproduced in full; partial reproduction only may be made with the written consent of F2 Labs. The results in this report apply only to the equipment tested.



TABLE OF CONTENTS

1	<u>ADMINISTRATIVE INFORMATION</u>
2	<u>SUMMARY OF TEST RESULTS/MODIFICATIONS</u>
3	<u>ENGINEERING STATEMENT</u>
4	<u>EUT INFORMATION AND DATA</u>
5	<u>LIST OF MEASUREMENT INSTRUMENTATION</u>
6	<u>RADIATED SPURIOUS EMISSIONS</u>
	➤ <u>ANRD245X05-RSP</u>
	➤ <u>NMO5E2400B</u>
7	<u>TEST SETUP PHOTOGRAPHS</u>



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 5.

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	±2.54
Radiated Emissions <1 GHz @10m	±5.09dB	±2.55
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38

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
F2X34964A-01E	First Issue	2026-01-30	K. Littell



2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Antenna	Results
Radiated Spurious Emissions	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Dipole Antenna ANRD245X05-RSP	Complies
		Dipole Antenna GW.71.51553	Complies
		Collinear Antenna NM05E2400B	Complies

Note: F2 Labs report F2P33423-03E shows compliance @ 2.4 GHz for similar antenna, with higher gain than the Taoglas Limited antenna FXP840.07.0055 (3.3dBi gain) being added with PCII but not tested.

Modifications Made to the Equipment
None



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:

Radio Module Model: **CC3135MODRNMMOBR**

FCC ID: **2AOVI-KNOXRT35**

Serial No.: 001

4.2 Trade Name:

Knox Company

4.3 Power Supply:

CUI SDI90-12-U, used to power the Host device which was used to power the module that was placed outside of the Host.

4.4 Applicable Rules:

CFR 47, Part 15.247, subpart C



4.5 Antennas:

Antenna Type	Manufacturer	Model Number	Gain @ 2.4 GHz
Dipole	AIR802	ANRD245X05-RSP	5dBi
Dipole	Taoglas Limited	GW.71.5153	3.8dBi
Balance Flex	Molex	1461530100	3.0dBi
Collinear	Pulse/Larson Electronics	NMO5E2400B	2.95dBi

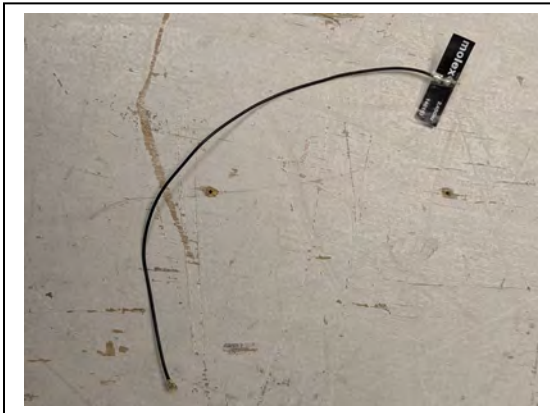
ANRD245X05-RSP



GW.71.5153



1461530100



NMO5E2400B



**4.6 Accessories:**

Device	Manufacturer	Model Number	Serial Number
Power Supply	CUI	SDI90-12-U	None Specified
KeySecure (host)	Knox Company	KS-6K2	None Specified

4.7 Test Item Condition:

The equipment to be tested was received in good condition.

4.8 Testing Algorithm:

Set to continuously transmit the modulated carrier at 2.4 GHz (2412 & 2462 MHz). The module was tested while connected to a Host due to the Host supplying power and communication for the module. 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	2026-05-07
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2026-04-08
Low Loss Cable Set	CL315 / CL138	Fairview Microwave	FMC0202914-72/FMC0202914-240	None Spec.	2026-04-09
Horn Antenna 18-26.5 GHz	CL114	A.H. Systems, Inc.	SAS-572	237	2026-02-06
Pre-Amplifier	CL153	Keysight Tech.	83006A	MY39500791	2026-04-10
Horn Antenna	CL333	EMC Shop	DRHA18G	J203061349	2026-07-09
Pre-Amplifier	CL189	Com-Power	PAM-840A	461303	2026-04-10
Pre-Amplifier	CL285	Com-Power	PAM-0207	322	2026-04-08
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	2026-09-02
Software:	Tile Version 3.4.B.3		Software Verified: 2026-01-19		
Software:	EMC 32, Version 8.53.0		Software Verified: 2026-01-19		
Temp/Hum. Recorder	CL327	Thermpro	TP50	8	2028-03-20
Temp/Hum. Recorder	CL294	Thermpro	TP50	2	2023-04-15



6 RADIATED SPURIOUS EMISSIONS

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).



6.2 Radiated Spurious Emission Test Data

Test Date(s):	2026-01-09	Test Engineer:	E. Tobiin
Standard(s):	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	Air Temperature:	19.9°C
		Relative Humidity:	40%

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 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 line indicates ambient noise, and the red line indicates the measurement with the EUT on. 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.

Test data presented reflects worst-case test conditions, as follows:

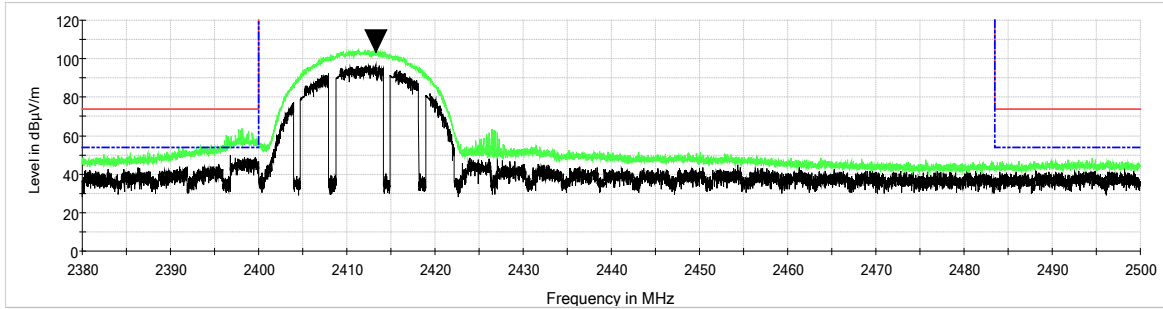
- ANRD245X05-RSP: 11M Data Rate, 2412 MHz
- NMO5E2400B: 11M Data Rate, 2412 MHz

**ANRD245X05-RSP: Band Edge Measurements (11M - worst-case)**

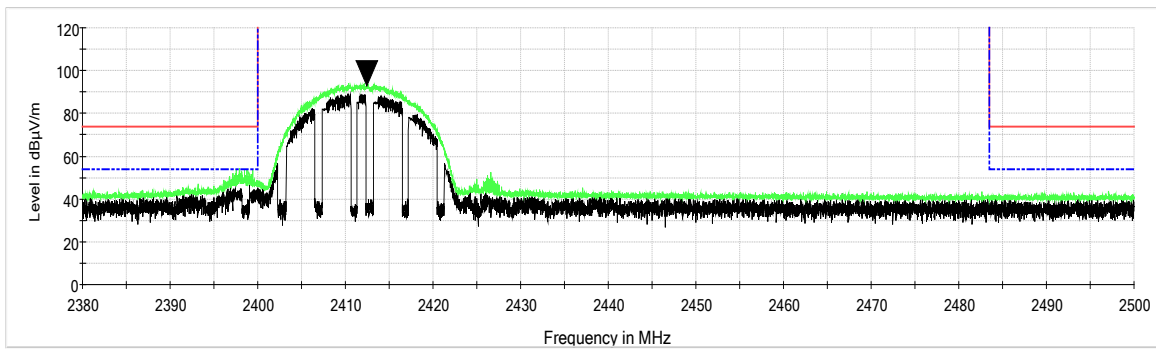
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
2390.000000	53.5	39.6	1000.000	140.0	V	240.0	4.0	14.4	54.0	
2390.000000	44.3	30.3	1000.000	140.0	H	263.0	4.0	23.7	54.0	
2398.520000	64.5	48.9	1000.000	150.0	V	240.0	4.0	5.1	54.0	
2398.520000	54.8	39.6	1000.000	140.0	H	345.0	4.0	14.4	54.0	
2399.000000	52.9	37.9	1000.000	140.0	H	345.0	4.0	16.1	54.0	
2399.000000	64.0	48.8	1000.000	150.0	V	240.0	4.0	5.2	54.0	
2400.000000	49.9	36.8	1000.000	140.0	H	263.0	4.0	17.2	54.0	
2400.000000	60.8	47.7	1000.000	140.0	V	240.0	4.0	6.3	54.0	
2483.500000	43.6	29.9	1000.000	150.0	H	38.0	4.3	24.1	54.0	
2483.500000	53.7	40.2	1000.000	140.0	V	235.0	4.3	13.8	54.0	
2490.000000	42.6	29.1	1000.000	150.0	H	38.0	4.4	24.9	54.0	
2490.000000	51.3	37.9	1000.000	140.0	V	235.0	4.4	16.1	54.0	



**ANRD245X05-RSP: 2412 MHz, 11M
Band Edge - Vertical**

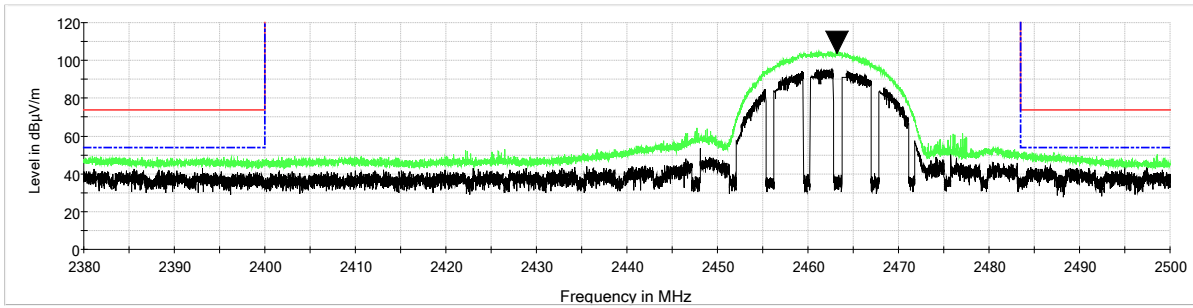


**ANRD245X05-RSP: 2412 MHz, 11M
Band Edge - Horizontal**

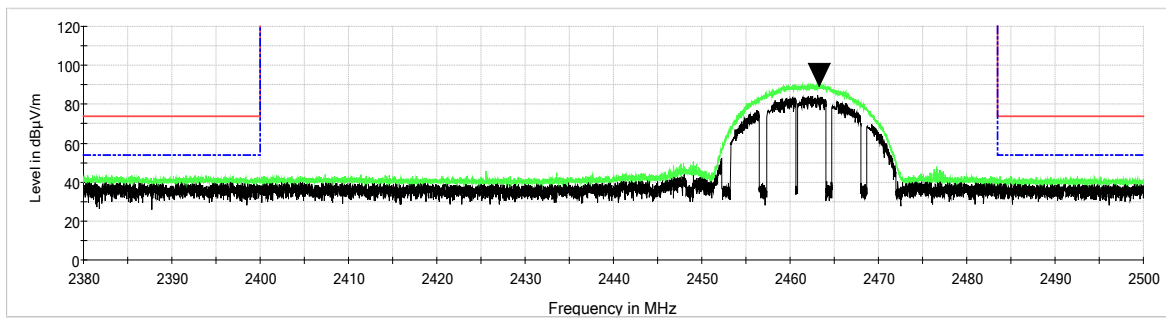




**ANRD245X05-RSP: 2462 MHz, 11M
Band Edge - Vertical**



**ANRD245X05-RSP: 2462 MHz, 11M
Band Edge - Horizontal**

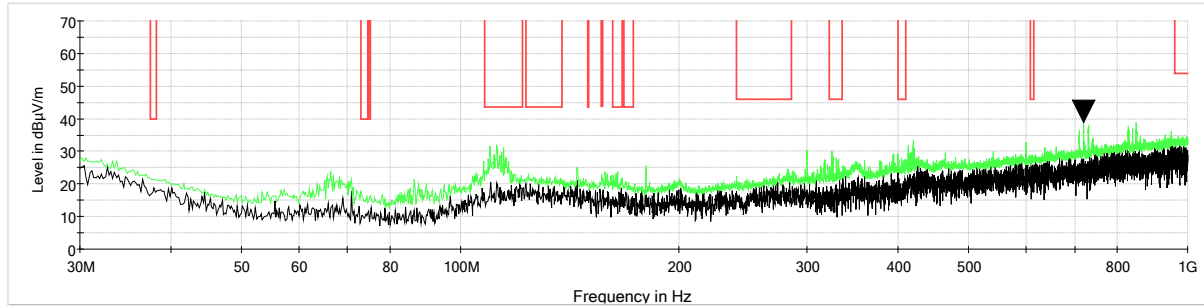


**ANRD245X05-RSP: Radiated Spurious Emissions Measurements
30 MHz to 1000 MHz (all channels)**

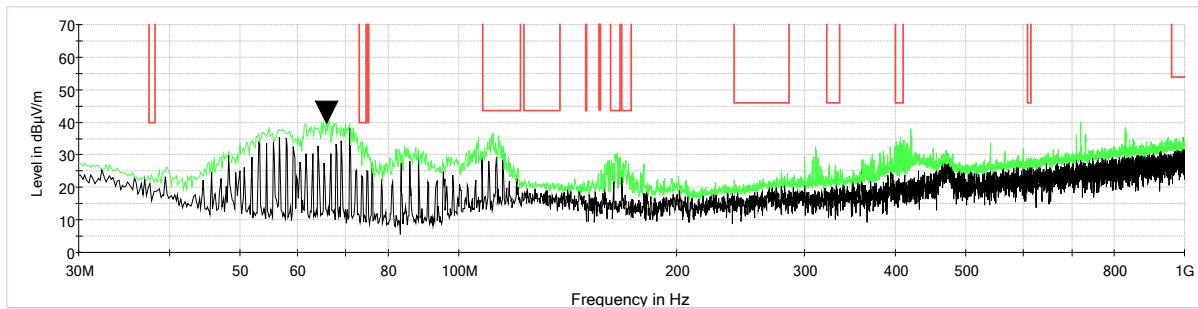
Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
65.890000	27.8	120.000	150.0	H	0.0	-31.8	12.2	40.0
73.844000	21.6	120.000	150.0	H	5.0	-31.6	18.4	40.0
109.928000	15.0	120.000	150.0	V	0.0	-27.0	28.5	43.5
111.674000	25.2	120.000	150.0	H	359.0	-26.7	18.3	43.5
112.256000	20.4	120.000	150.0	V	0.0	-26.6	23.1	43.5
113.614000	23.2	120.000	150.0	H	0.0	-26.4	20.3	43.5
114.778000	16.1	120.000	150.0	V	0.0	-26.2	27.4	43.5
164.636000	14.7	120.000	150.0	V	3.0	-27.1	28.8	43.5
300.048000	22.5	120.000	150.0	V	0.0	-25.1	23.5	46.0
404.226000	19.7	120.000	150.0	V	2.0	-22.4	26.3	46.0
406.166000	23.7	120.000	150.0	H	355.0	-22.4	22.3	46.0
419.940000	25.7	120.000	150.0	H	0.0	-22.0	20.3	46.0
419.940000	24.8	120.000	150.0	H	7.0	-22.0	21.2	46.0



ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 30 MHz to 1000 MHz, Vertical



ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 30 MHz to 1000 MHz, Horizontal

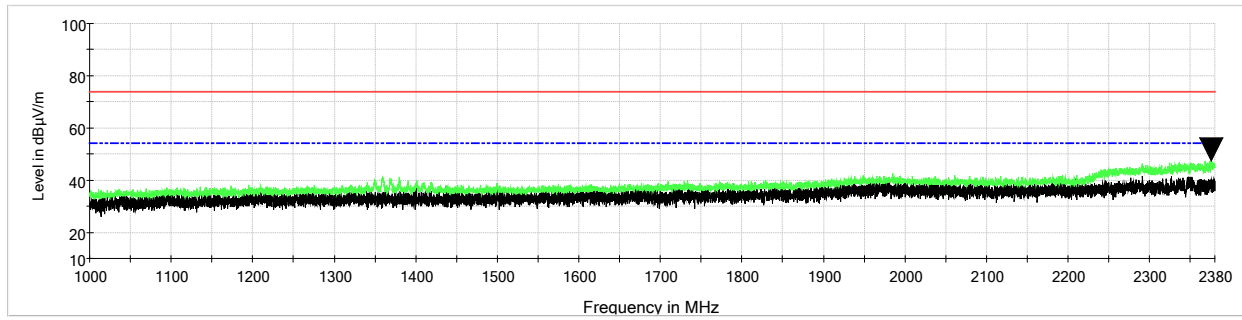


**ANRD245X05-RSP: Radiated Spurious Emissions Measurements
Above 1 GHz (all channels)**

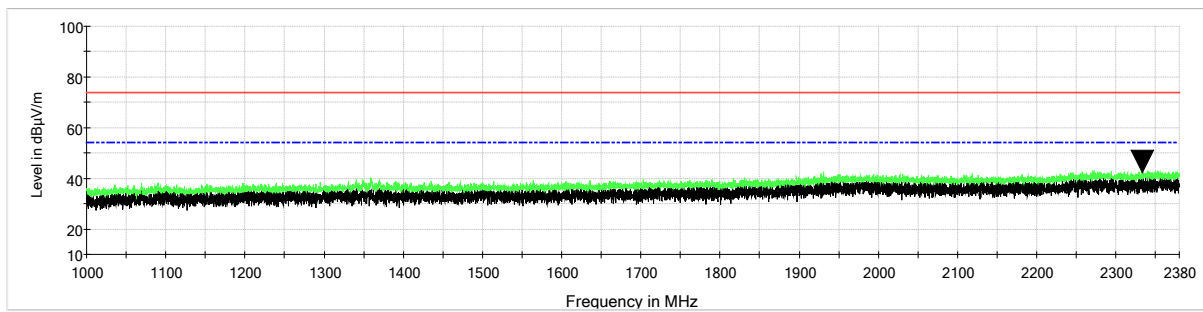
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
12060.000000	57.9	44.0	1000.000	150.0	V	0.0	16.8	10.0	54.0	
12060.000000	58.0	44.0	1000.000	150.0	H	0.0	16.8	10.0	54.0	
14472.000000	58.8	45.0	1000.000	150.0	V	0.0	17.7	9.0	54.0	
14472.000000	59.0	45.0	1000.000	150.0	H	0.0	17.7	9.0	54.0	
16884.000000	62.8	49.4	1000.000	150.0	V	356.0	22.0	4.6	54.0	
16884.000000	63.2	49.4	1000.000	150.0	H	0.0	22.0	4.6	54.0	



ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 1 GHz to 2.38 GHz, Vertical

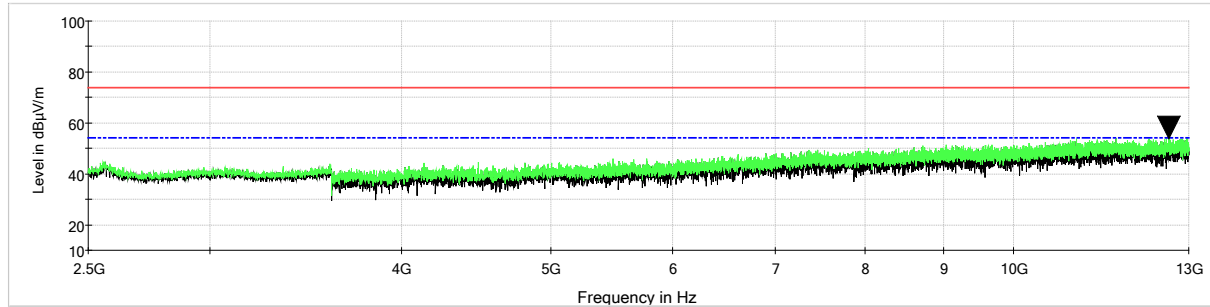


ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 1 GHz to 2.38 GHz, Horizontal

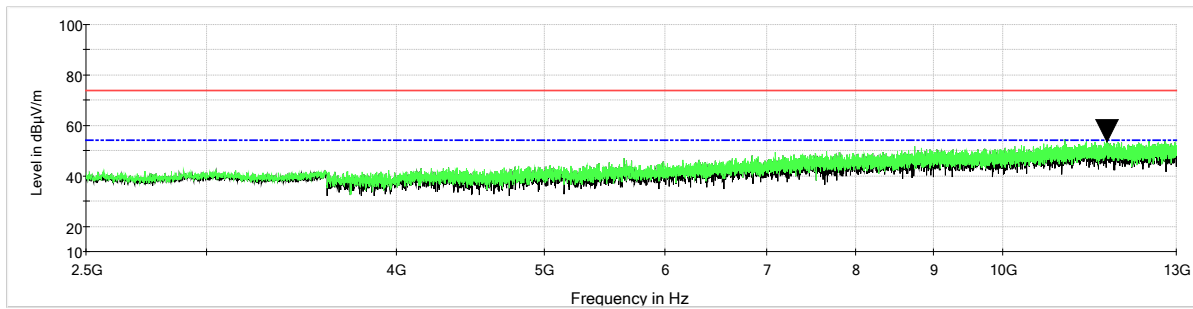




ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 2.5 GHz to 13 GHz, Vertical

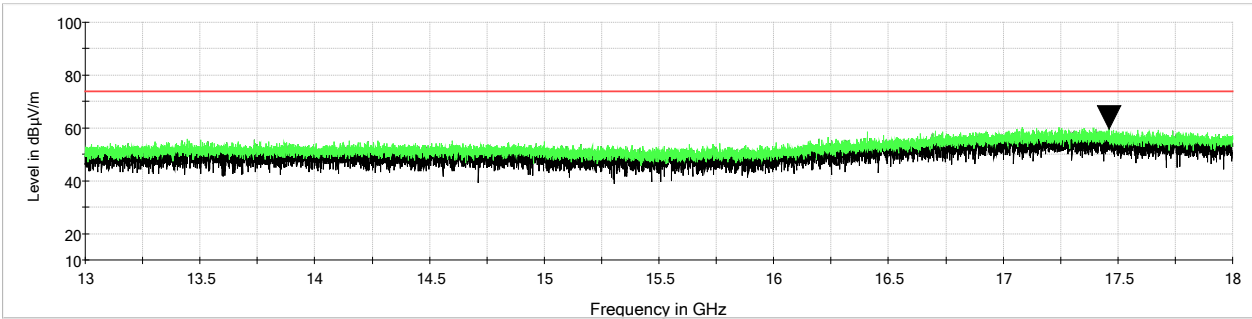


ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 2.5 GHz to 13 GHz, Horizontal

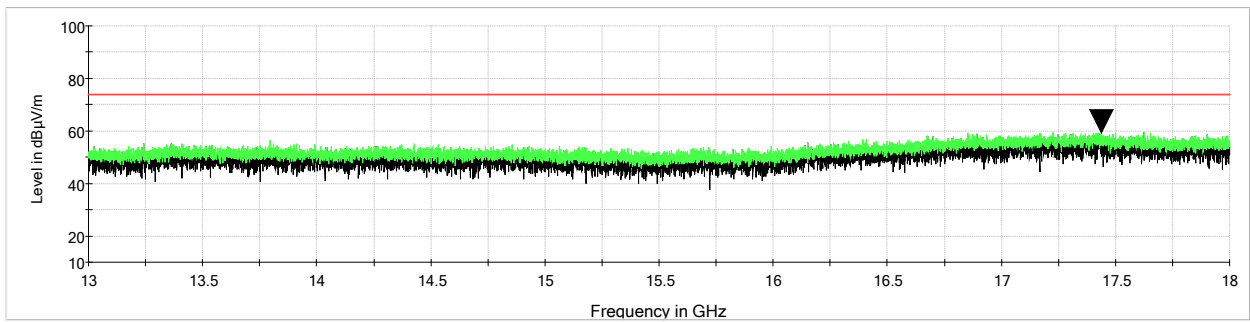




ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 13 GHz to 18 GHz, Vertical

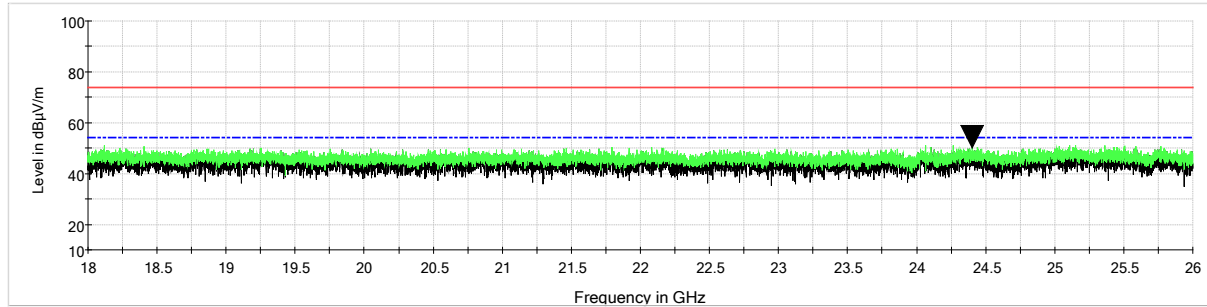


ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 13 GHz to 18 GHz, Horizontal

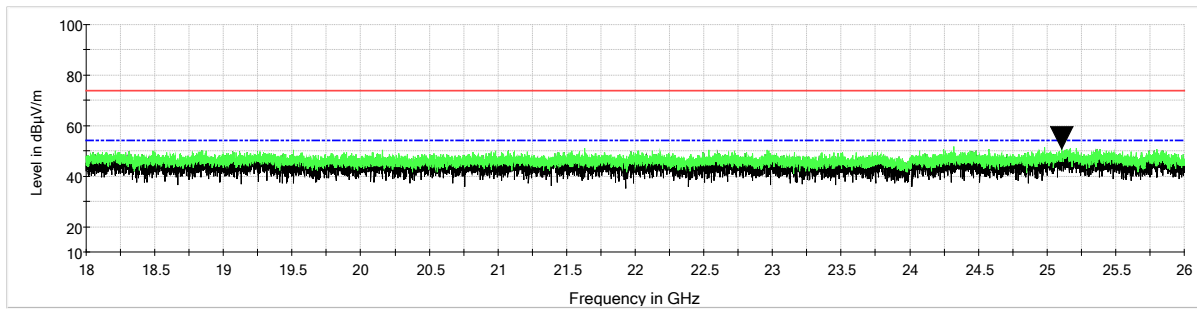




ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 18 GHz to 26 GHz, Vertical

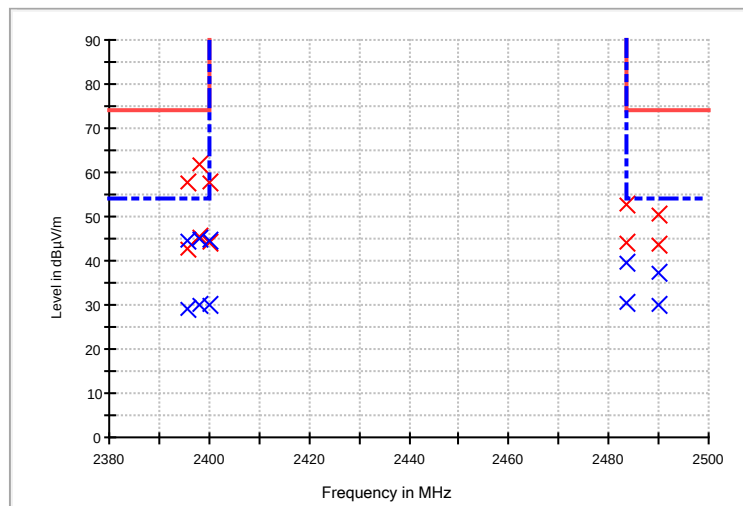


ANRD245X05-RSP: 2412 MHz, 11M
Characterization Scan, 18 GHz to 26 GHz, Horizontal



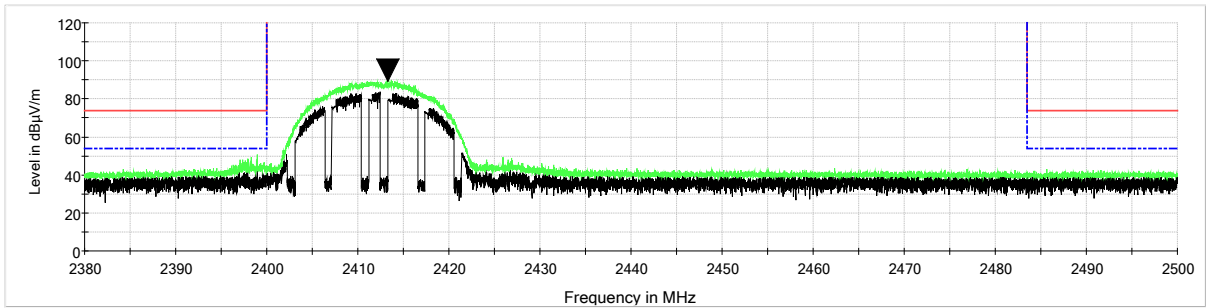
**NMO5E2400B: Band Edge Measurements (11M)**

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
2395.670000	42.9	29.1	1000.000	140.0	V	267.0	4.0	24.9	54.0	
2395.670000	57.6	44.4	1000.000	140.0	H	188.0	4.0	9.6	54.0	
2398.000000	45.5	30.2	1000.000	140.0	V	267.0	4.0	23.8	54.0	
2398.000000	62.0	44.9	1000.000	140.0	H	188.0	4.0	9.1	54.0	
2400.000000	44.2	30.2	1000.000	140.0	V	267.0	4.0	23.8	54.0	
2400.000000	57.8	44.5	1000.000	140.0	H	188.0	4.0	9.5	54.0	
2483.500000	52.9	39.6	1000.000	140.0	H	188.0	4.3	14.4	54.0	
2483.500000	44.1	30.7	1000.000	140.0	V	267.0	4.3	23.3	54.0	
2490.000000	50.6	37.3	1000.000	140.0	H	188.0	4.4	16.7	54.0	
2490.000000	43.5	30.0	1000.000	140.0	V	267.0	4.4	24.0	54.0	

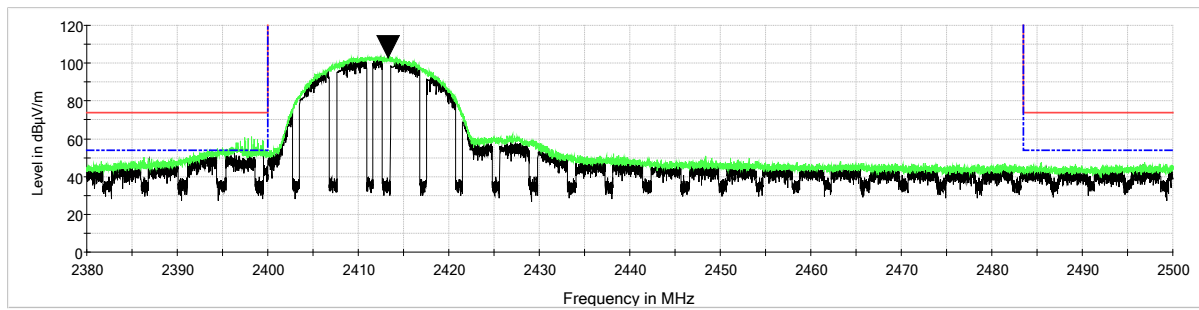




**NMO5E2400B: 2412 MHz, 11M
Band Edge - Vertical**

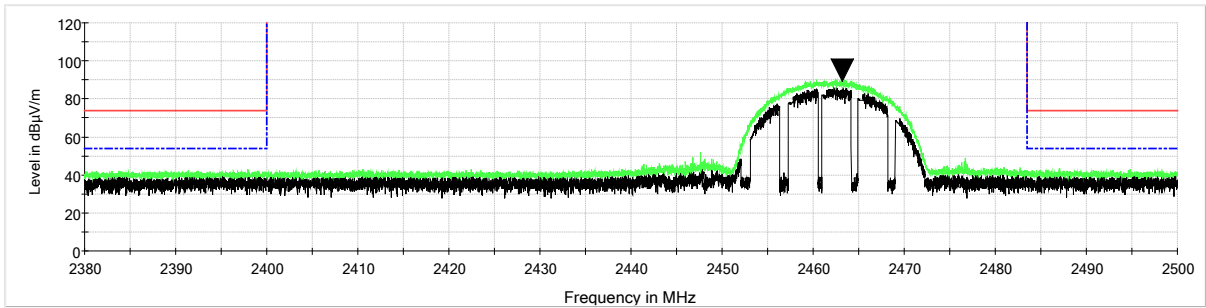


**NMO5E2400B: 2412 MHz, 11M
Band Edge - Horizontal**

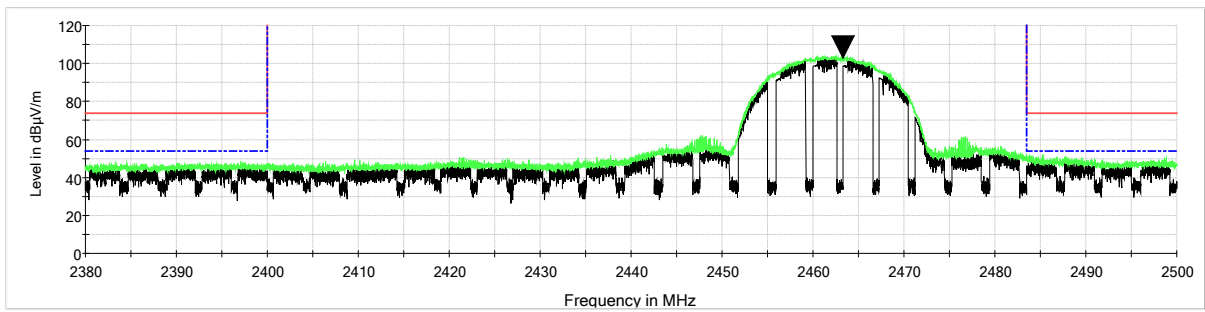




**NMO5E2400B: 2462 MHz, 11M
Band Edge - Vertical**



**NMO5E2400B: 2462 MHz, 11M
Band Edge - Horizontal**

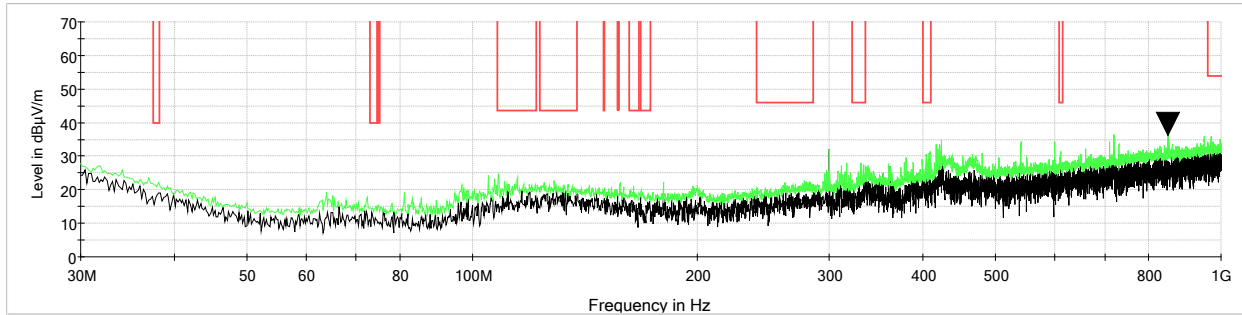


**NMO5E2400B: Radiated Spurious Emissions Measurements,
30 MHz to 1000 MHz, 11M (all channels)**

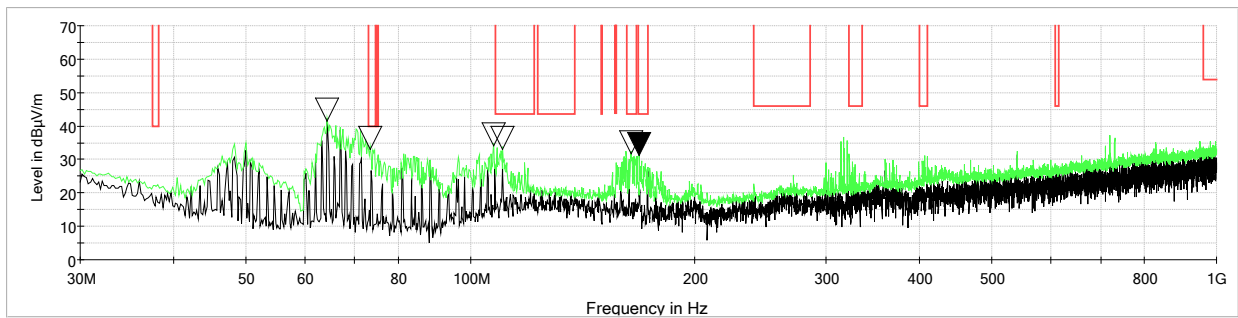
Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
64.338000	36.2	120.000	150.0	H	1.0	-32.0	3.8	40.0
73.456000	28.9	120.000	150.0	H	0.0	-31.6	11.1	40.0
107.406000	29.4	120.000	150.0	H	0.0	-27.5	14.1	43.5
108.376000	16.6	120.000	150.0	V	356.0	-27.3	26.9	43.5
110.510000	31.7	120.000	150.0	H	0.0	-26.9	11.8	43.5
164.054000	21.5	120.000	150.0	H	0.0	-27.0	22.0	43.5
168.516000	24.3	120.000	150.0	H	0.0	-27.4	19.2	43.5
299.854000	19.0	120.000	150.0	V	0.0	-25.1	27.0	46.0
330.506000	20.2	120.000	150.0	V	0.0	-24.3	25.8	46.0
408.688000	22.2	120.000	150.0	V	0.0	-22.3	23.8	46.0
423.238000	26.6	120.000	150.0	V	0.0	-22.0	19.4	46.0
720.058000	29.3	120.000	150.0	V	1.0	-17.2	16.7	46.0



NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 30 MHz to 1000 MHz, Vertical



NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 30 MHz to 1000 MHz, Horizontal

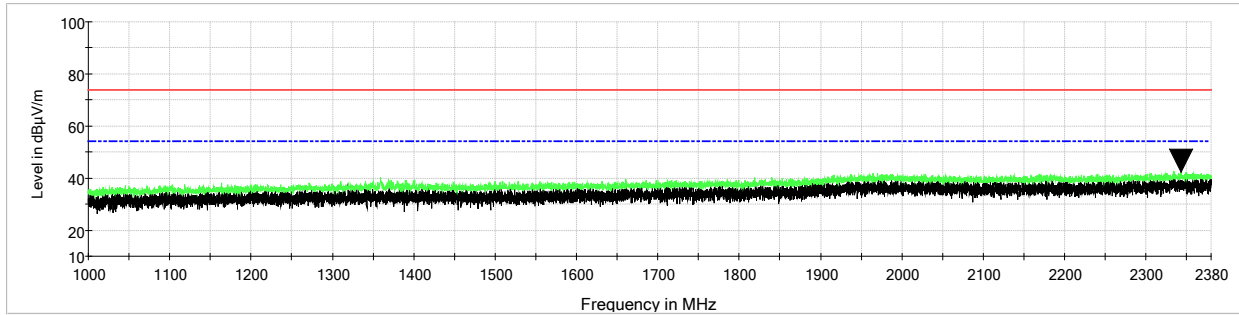


**NMO5E2400B: Radiated Spurious Emissions Measurements
Above 1 GHz, 11M (all channels)**

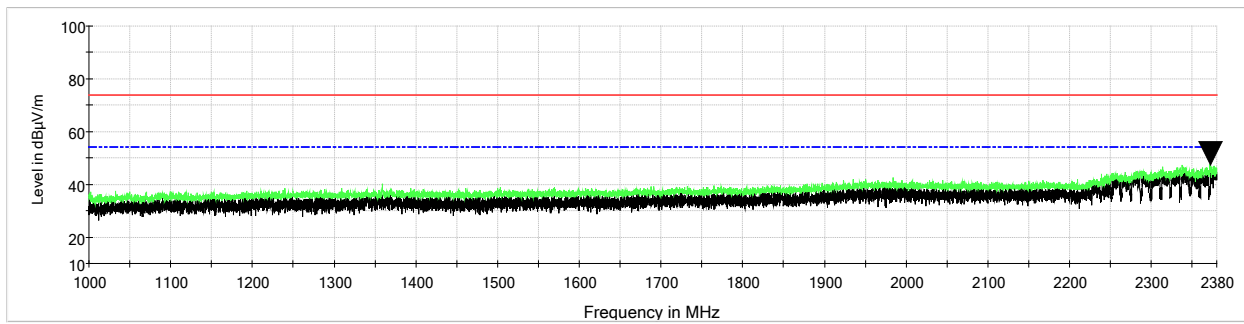
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Comment
12060.000000	57.5	44.0	1000.000	140.0	V	0.0	16.8	10.0	54.0	
12060.000000	57.9	44.0	1000.000	140.0	H	10.0	16.8	10.0	54.0	
14472.000000	59.2	44.9	1000.000	140.0	V	6.0	17.7	9.1	54.0	
14472.000000	58.6	44.9	1000.000	140.0	H	358.0	17.7	9.1	54.0	
16884.000000	63.3	49.3	1000.000	140.0	H	5.0	22.0	4.7	54.0	
16884.000000	63.8	49.3	1000.000	140.0	V	346.0	22.0	4.7	54.0	



NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 1 GHz to 2.38 GHz, Vertical

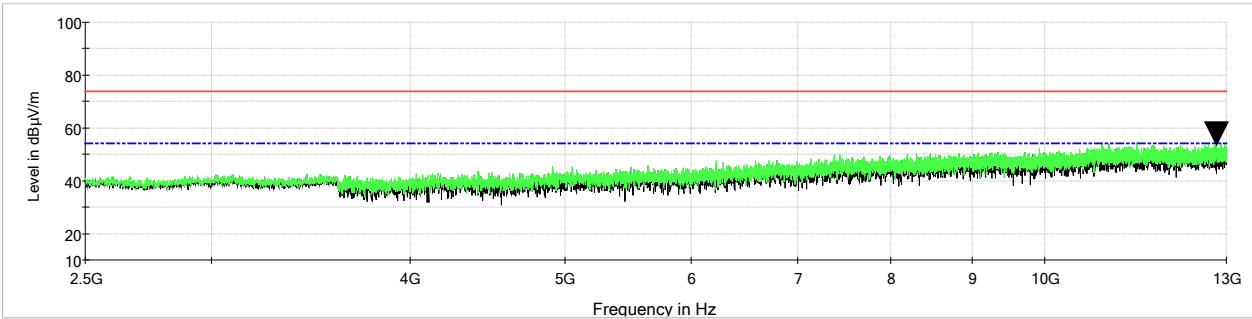


NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 1 GHz to 2.38 GHz, Horizontal

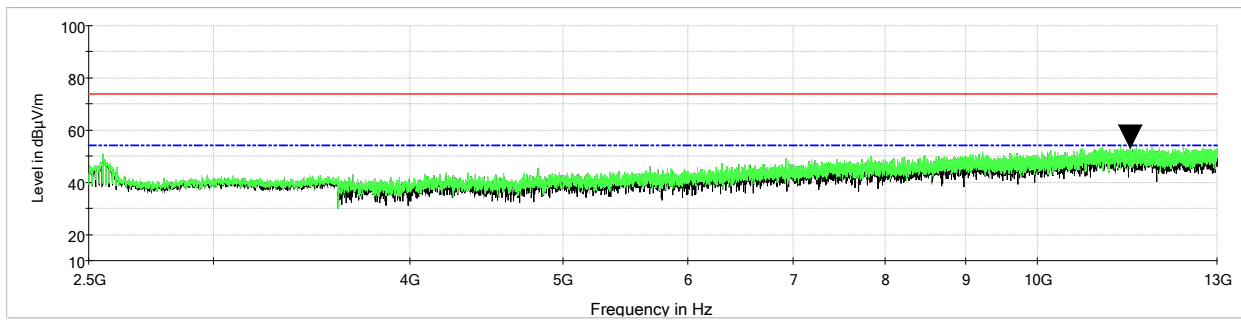




NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 2.5 GHz to 13 GHz, Vertical

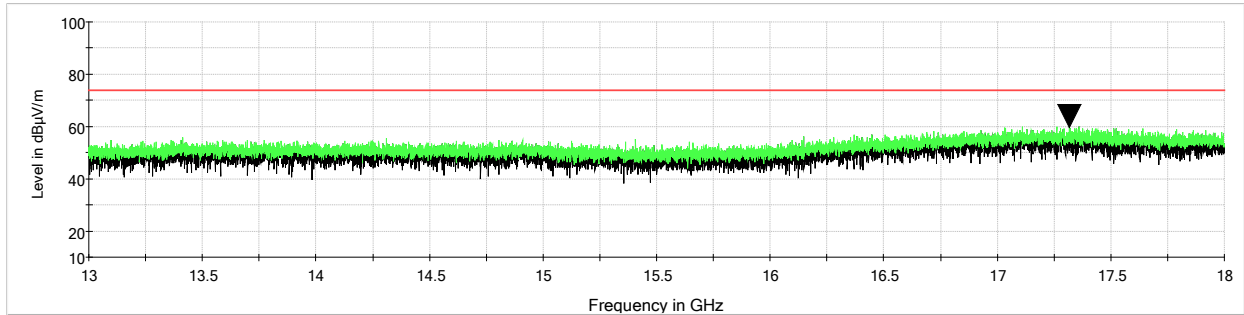


NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 2.5 GHz to 13 GHz, Horizontal





NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 13 GHz to 18 GHz, Vertical

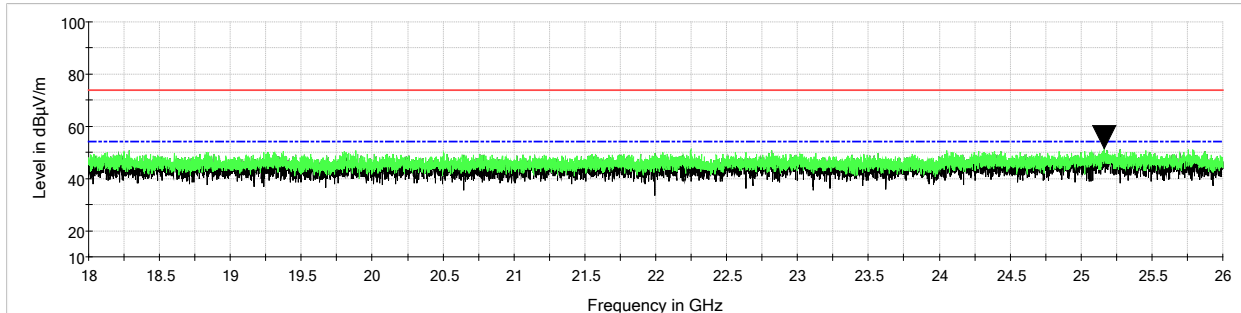


NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 13 GHz to 18 GHz, Horizontal

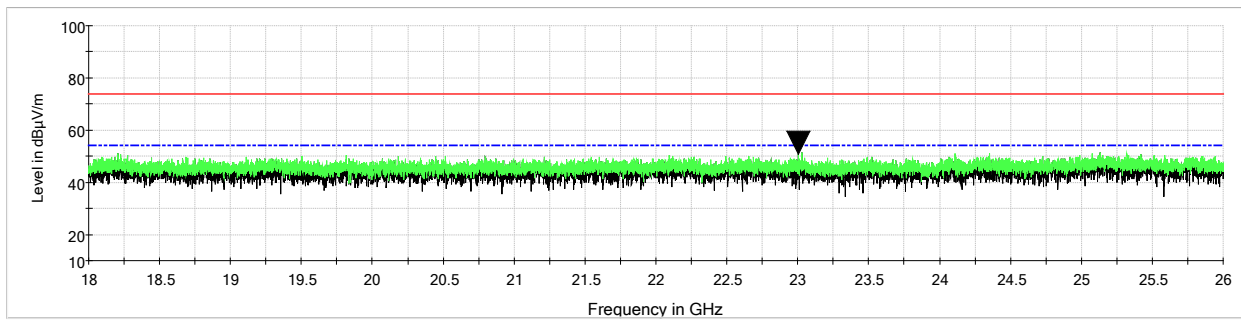




NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 18 GHz to 26 GHz, Vertical



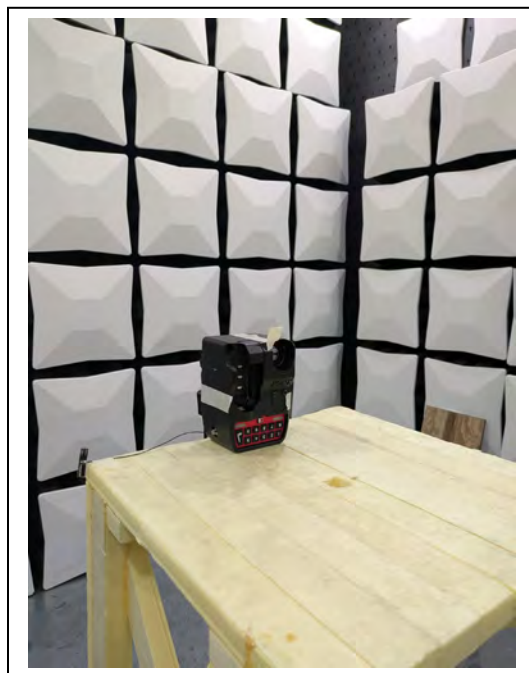
NMO5E2400B: 2412 MHz, 11M
Characterization Scan, 18 GHz to 26 GHz, Horizontal





7 TEST SETUP PHOTOGRAPHS

General Test Setup

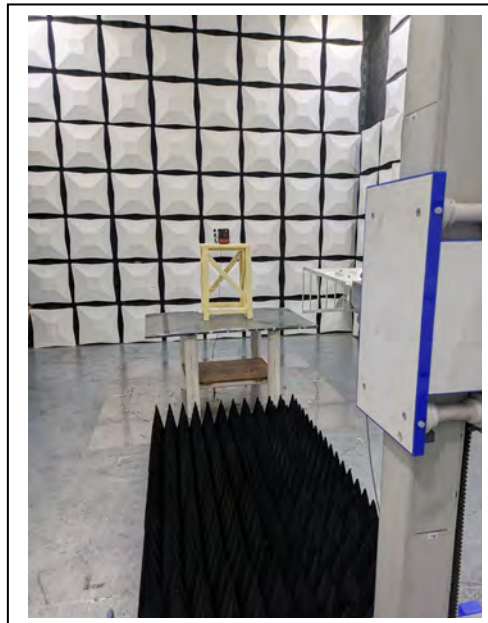




ANRD245X05-RSP: Radiated Spurious Emissions, 30 MHz to 1000 MHz



ANRD245X05-RSP: Radiated Spurious Emissions, 1 GHz to 18 GHz





ANRD245X05-RSP: Radiated Spurious Emissions, 18 GHz to 26 GHz





NMO5E2400B: Radiated Spurious Emissions, 30 MHz to 1000 MHz



NMO5E2400B: Radiated Spurious Emissions, 1 GHz to 18 GHz





NMO5E2400B: Radiated Spurious Emissions, 18 GHz to 26 GHz

