REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15 Subpart C 15.255
ISED RSS-210

Report No.: AIRI02-U5 Rev A

Company: Airvine Scientific

Model Name: WaveTunnel (WT-2041SM-US00)

REGULATORY COMPLIANCE TEST REPORT

Company Name: Airvine Scientific

Model Name: WaveTunnel (WT-2041SM-US00)

To: FCC CFR 47 Part 15 Subpart C 15.255 & ISED RSS-210

Test Report Serial No.: AIRI02-U5 Rev A

This report supersedes: NONE

Applicant: Airvine Scientific
1500 Wyatt Dr.
Santa Clara, California 95054
USA

Issue Date: 3rd February 2023

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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Pleasanton California 94566
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ACCREDITED
TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2017. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-01.pdf

Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 14th day of January 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

1.2. RECOGNITION

MiCOM Labs, Inc is widely recognized for its wireless testing and certification capabilities. In addition to being recognized for Testing and Certification under Phase 2 Mutual Recognition Agreements (MRA) with Canada, Europe, United Kingdom and Japan, our international recognition includes Conformity Assessment Body (CAB) designation status under agreements with Asia Pacific (APEC) MRA Phase 1 countries giving acceptance of MiCOM Labs test reports. MiCOM Labs test reports are accepted globally.

Country	Recognition Body	Status	MRA Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	US0159 Test Firm Designation#: US1084
Canada	Industry Canada (ISED)	FCB	APEC MRA 2	US0159 ISED#: 4143A
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	Japan MRA 2	RCB 210
	Japan Approvals Institute for Telecommunication Equipment (JATE)			
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA 2	NB 2280
United Kingdom	Department for Business, Energy & Industrial Strategy (BEIS)	AB	UK MRA 2	AB 2280
Mexico	Instituto Federal de Telecomunicaciones (IFT)	CAB	Mexico MRA 1	US0159
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)			
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)			
Singapore	Infocomm Development Authority (IDA)			
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)			
Vietnam	Ministry of Communication (MIC)			

TCB – Telecommunications Certification Bodies (TCB)
FCB – Foreign Certification Body
CAB – Conformity Assessment Body
NB – Notified Body
AB – Approved Body
MRA – Mutual Recognition Agreement
MRA PhasePhase I - recognition for product testing
Phase II – recognition for both product testing and certification

1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-02.pdf

Accredited Product Certification Body

A2LA has accredited

MiCOM LABS

Pleasanton, CA

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 *Requirements for bodies certifying products, processes and services*. This product certification body also meets the *A2LA R322 – Specific Requirements – Notified Body Accreditation Requirements* and *A2LA R308 - Specific Requirements - ISO-IEC 17065 - Telecommunication Certification Body Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a management system.

Presented this 14th day of January 2022

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2023

For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation.

United States of America – Telecommunication Certification Body (TCB)
Industry Canada – Certification Body, CAB Identifier – US0159
Europe – Notified Body (NB), NB Identifier - 2280
UK – Approved Body (AB), AB Identifier - 2280
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	24th January 2023	For client review
Rev A	3rd February 2023	Initial Release

In the above table the latest report revision will replace all earlier versions.

3. TEST RESULT CERTIFICATE

Manufacturer:	Airvine Scientific 1500 Wyatt Dr. Santa Clara California 95054 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	WaveTunnel (WT-2041SM-US00)	**Telephone:**	+1 925 462 0304
Equipment Type:	802.11ad 60GHz Wireless Backhaul	**Fax:**	+1 925 462 0306
S/N's:	Dev01		
Test Date(s):	4th – 13th January 2023	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C 15.255 & ISED RSS-210	**EQUIPMENT COMPLIES**

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.

2. Details of test methods used have been recorded and kept on file by the laboratory.

3. Test results apply only to the item(s) tested.

ACCREDITED
TESTING CERT #2381.01

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs, Inc.

Gordon Hurst
President & CEO MiCOM Labs, Inc.

4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
I	KDB 662911 D01, D02, D03	D01 Oct 2013, D02 Oct 2011, D03 Oct 2020	Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band. 662911 D01 Multiple Transmitter Output v02r01, 662911 D02 MIMO with Cross Polarized Antenna v01, 662911 D03 MIMO Antenna Gain Measurement v01, OET 13TR1003 Directional Gain of 802 11 MIMO with CDD 04 05 2013
II	A2LA	22nd June 2022	R105 - Requirement's When Making Reference to A2LA Accreditation Status
III	ANSI C63.10	2020	American National Standard for Testing Unlicensed Wireless Devices
IV	ANSI C63.4	2014	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
V	M 3003	EDITION 4 Oct 2019	Expression of Uncertainty and Confidence in Measurements
VI	RSS-Gen Issue 5	Amendment 1,2 (Feb 2021)	General Requirements for Compliance of Radio Apparatus. With Amendments 1: March 2019 and 2: Feb 2021.
VII	FCC 47 CFR Part 2.1033	May 2021	FCC requirements and rules regarding photographs and test setup diagrams.
VIII	FCC 47 CFR Part 15.255	Apr 2020	FCC requirements and rules regarding operation within the band 57-71 GHz.
IX	FCC 47 CFR Part 15.209	Oct 1997	FCC Requirements and rules regarding general radiated emission limits.
X	KDB 842590	April 2021	Millimeter wave device measurement procedures
XI	RSS-210 Issue 10	Dec 2019	Licence-Exempt Radio Apparatus: Category 1 Equipment. Annex J

4.2. Test and Uncertainty Procedure

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

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5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Airvine Scientific WaveTunnel to FCC CFR 47 Part 15 Subpart C 15.255; Operation within the band 57-71 GHz. And ISED RSS-210; Licence-Excempt Radio Apparatus: Category 1 Equipment.
Applicant:	Airvine Scientific 1500 Wyatt Dr. Santa Clara CA 95054 United States of America
Manufacturer:	AQS
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	AIRI02-U5
Date EUT received:	4th January 2023
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C 15.255 & ISED RSS-210
Dates of test (from - to):	4th – 13th January 2023
No of Units Tested:	1
Product Family Name:	WaveTunnel
Model(s):	WT-2041SM-US00
Location for use:	Indoors
Declared Frequency Range(s):	57000 - 71000 MHz;
Type of Modulation:	16QAM
EUT Modes of Operation:	802.11ad
Declared Nominal Output Power (dBm):	+40 dBm
Transmit/Receive Operation:	Transceiver
Rated Input Voltage and Current:	Input: 100-240V AC 50/60 Hz 2A Output: 48V DC 3.34A
Operating Temperature Range:	0°C to +40°C
ITU Emission Designator:	2G16D2D (2.16GHz BW, Single Channel, QPSK/QAM)
Equipment Dimensions:	10.5 / 9.0 / 4.0 in
Weight:	5.0 lbs
Hardware Rev:	Ver 9.1
Software Rev:	0.4.1.1671736999

5.2. Scope Of Test Program

Airvine Scientific WaveTunnel

The scope of the test program was to test the Airvine Scientific WaveTunnel, WaveTunnel configurations in the frequency ranges 57 – 71 GHz; for compliance against the following specification:

FCC CFR 47 Part 15 Subpart C 15.255
Operation within the band 57-71 GHz.

ISED RSS-210 Issue 10
License-Exempt Radio Apparatus: Category 1 Equipment; Annex J: Devices operating in the band 57-71 GHz.

5.3. Equipment Model(s) and Serial Number(s)

Type (EUT/ Support)	Equipment Description	Manufacturer	Model No.	Serial No.
EUT	802.11ad 60 GHz Wireless Backhaul	AQS	WaveTunnel WT-2041SM-US00	Dev01
Support	Laptop	Dell	--	--

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
integral	Sivers Semiconductors	BFM06010	PCB	22.0	-	TBS	-	57 – 71 GHz

BF Gain - Beamforming Gain
Dir BW - Directional BeamWidth
X-Pol - Cross Polarization

5.5. Cabling and I/O Ports

Port Type	Port Description	Qty	Screened (Yes/ No)	Length
Ethernet	RJ-45	4	N	>3m
USB	microUSB	1	N	<5m
DC Input	DC (4-Pin)	1	N	1.2m

5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s) (802.11a/b/g/n/ac)	Data Rate with Highest Power MBit/s	Channel Frequency (GHz)		
		Low	Mid	High
57.00 – 71.00 GHz				
802.11ad	1000.00	58.32	60.48	64.80

The EUT consists of two 60 GHz antennas broadcasting in opposite directions, the worst case of the two was measured and reported.

5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:
1. NONE

5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:
1. NONE

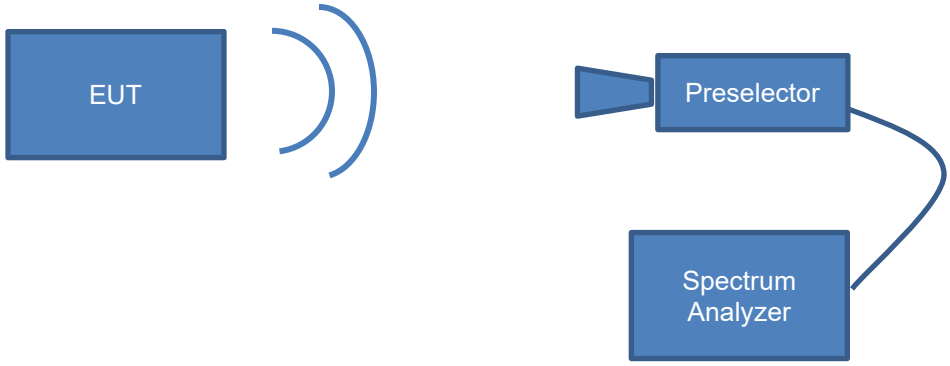
6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
6 dB & 99% Bandwidth	Complies	View Data
Output Power		
Peak EIRP	Complies	View Data
Average EIRP	Complies	View Data
Conducted Output Power	Complies	View Data
Spurious Emissions	Complies	View Data
Frequency Stability	Complies	View Data

7. TEST EQUIPMENT CONFIGURATION(S)

7.1. 60 GHz Radiated



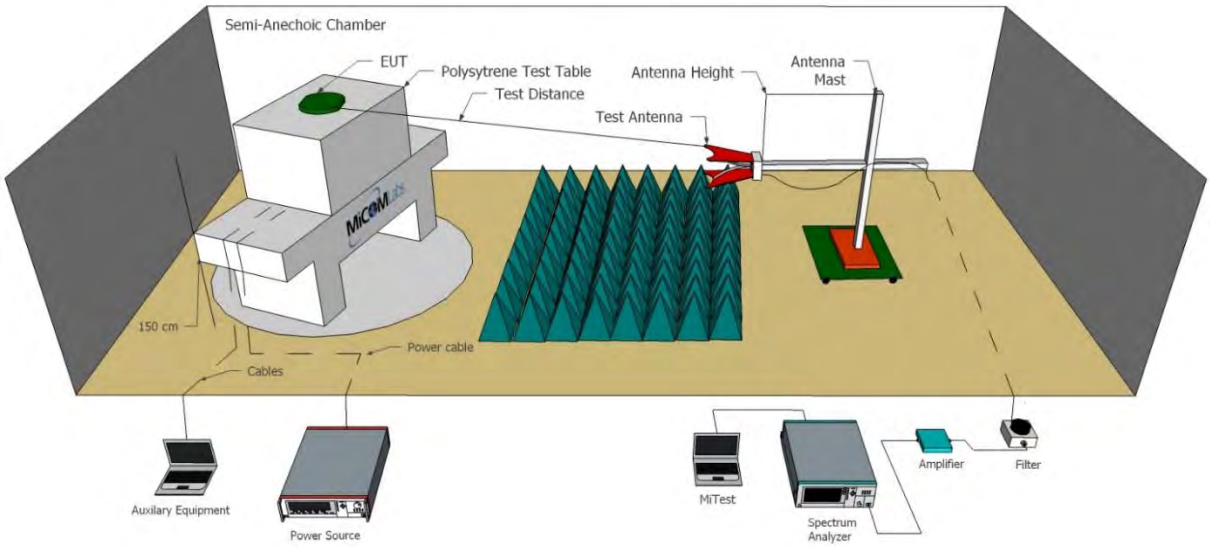
A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	29 Jun 2023
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2023
408	USB to GPIB interface	National Instruments	GPIB-USB HS	14C0DE9	Not Required
089	Spectrum Analyzer	HP	8563A	--	27 Sep 2023
227	V-Band Preselector	HP	11974V	3001A00134	13 Feb 2023
128	U-Band Preselector	HP	11974U	3001A00107	13 Feb 2023
229	W-Band Harmonic Mixer	HP	11970W	2521A01085	13 Feb 2023
	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2024
111	V-Band Standard Gain Horn	Millitech	SHG-15	0537974	25 March 2023
110	U-Band Standard Gain Horn	Millitech	SHG-15	--	25 March 2023
550	W-Band Standard Gain Horn	MPI	261F/387	--	25 March 2023
451	Precision SMA Male RG-402 coax	Fairview Microwave	SCA1814-0101-72	--	Cal When Used
452	Precision SMA Male RG-402 coax	Fairview Microwave	SCA1814-0101-72	--	Cal When Used

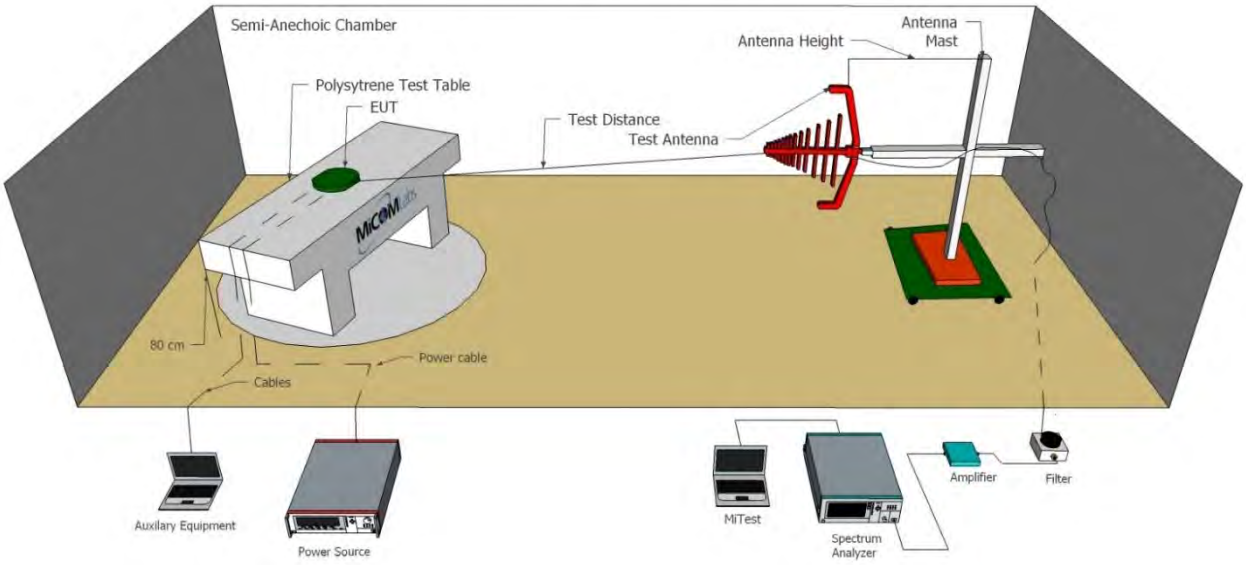
7.2. Radiated Emissions

The following tests were performed using the radiated test set-up shown in the diagram below. Radiated emissions above and below 1GHz.

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup



Test Equipment Utilized

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2023
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	24 Jan 2023
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	29 Sep 2023
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	29 Sep 2023
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	27 Oct 2023
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	30 Sep 2023
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	2 Nov 2023
410	Desktop Computer	Dell	Inspiron 620	WS38	Not Required
411	Mast/Turntable Controller	Sunol Sciences	SC98V	060199-1D	Not Required
412	USB to GPIB Interface	National Instruments	GPIB-USB HS	11B8DC2	Not Required
413	Mast Controller	Sunol Science	TWR95-4	030801-3	Not Required
415	Turntable Controller	Sunol Sciences	Turntable Controller	None	Not Required
416	Gigabit ethernet filter	ETS-Lingren	Gigafoil 260366	None	Not Required
447	MiTest Rad Emissions Test Software	MiCOM	Version 1.0	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	27 Oct 2023
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	27 Oct 2023
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	27 Oct 2023
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	6 Oct 2023
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	6 Oct 2023
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2024
554	Precision SMA Cable	Fairview Microwave	SCE18060101-400CM	554	6 Oct 2023
555	Rhode & Schwarz Receiver (Firmware Version : 2.00 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2023

8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy-to-read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by MiTest. MiTest is an automated test system developed by MiCOM Labs. MiTest is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.

The MiCOM Labs "MiTest" Automated Test System" (Patent Pending)

9. TEST RESULTS

9.1. 6 dB & 99% Bandwidth

Conducted Test Conditions for 6 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.255 ISED RSS-210	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	6 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	FCC 15.255 (e)(1)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for 6 dB and 99% Bandwidth Measurement
The bandwidth at 6 dB and 99 % was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Limits for 6 dB and 99% Bandwidth

(e)(1) Transmitters with an emission bandwidth of less than 100 MHz must limit their peak transmitter conducted output power to the product of 500 mW times their emission bandwidth divided by 100 MHz. For the purposes of this paragraph, emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kHz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (e.g., for frequency hopping devices).

Since the device's operational bandwidth will always be greater than 100 MHz this test is purely informative.

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11ad	**Duty Cycle (%):**	100
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)	
MHz	a	b	c	d	Highest	Lowest
58320.0	1666.667	1633.333	--	--	1666.667	1633.333
60480.0	1593.333	1553.333	--	--	1593.333	1553.333
64800.0	1613.333	1560.000	--	--	1613.333	1560.000

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)
MHz	a	b	c	d	
58320.0	2120.000	2073.000	--	--	2120.000
60480.0	2120.000	2033.000	--	--	2120.000
64800.0	2026.667	2006.667	--	--	2026.667

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.2. Output Power

Test Conditions for Fundamental Emission Measurement			
Standard:	FCC CFR 47:15.255 RSS-210	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.255 (c) Annex J.2.2	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test procedure for Fundamental Emission Measurement
For peak power measurements the spectrum analyzer peak detector trace was integrated over the 99% bandwidth.

For average power measurements the spectrum analyzer sample detector trace was video averaged over 100 sweeps and the trace integrated over the 99% bandwidth.

The integrated power is used to calculate the field strength using this equation from section 9 of ANSI 63.10:

$$E = 126.8 - 20\ \log\lambda + P - G$$

Where:
E is the field strength of the emission at the measurement distance, in dBµV/m
P is the power measured at the output of the test antenna, in dBm
λ is the wavelength of the emission under investigation $[300/f_{MHz}]$, in m
G is the gain of the test antenna, in dBi

The EIRP is then calculated using this equation:

$$EIRP = E_{Meas} + 20\ \log(d_{Meas}) - 104.7$$

Where:
EIRP is the equivalent isotropically radiated power, in dBm
E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m
d_{Meas} is the measurement distance, in m

And the conducted power calculated using:

$$P_{Cond} = EIRP - G_{EUT}$$

Testing was performed under ambient conditions at nominal voltage only.

Test configuration and setup used for the measurement was per the 60 GHz Radiated Test Set-up specified in this document.
Supporting Information:

(C) Within the 57-71 GHz band, emission levels shall not exceed the following equivalent isotropically radiated power (EIRP):
  (1) Products other than fixed field disturbance sensors and short-range devices for interactive motion sensing shall comply with one of the following emission limits, as measured during the transmit interval:
    (i) The average power of any emission shall not exceed 40 dBm and the peak power of any emission shall not exceed 43 dBm; or
    (ii) For fixed point-to-point transmitters located outdoors, the average power of any emission shall not exceed 82 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi. The peak power of any emission shall not exceed 85 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi.
      (A) The provisions in the paragraph (c) for reducing transmit power based on antenna gain shall not require that the power levels be reduced below the limits specified in paragraph (c)(1)(i) of this section.
      (B) The provisions of section 15.204(c)(2) and (4) that permit the use of different antennas of the same type and of equal or less directional gain do not apply to intentional radiator systems operating under this provision. In lieu thereof, intentional radiator systems shall be certified using the specific antenna(s) with which the system will be marketed and operated. Compliance testing shall be performed using the highest gain and the lowest gain antennas for which certification is sought and with the intentional radiated operated at its maximum available output power level. The responsible party, as defined in section 2.909 of this chapter, shall supply a list of acceptable antennas with the application for certification.

(E) Except as specified in paragraph (e)(1) of this section, the peak transmitter conducted output power shall not exceed 500 mW. Depending on the gain of the antenna, it may be necessary to operate the intentional radiator using a lower peak transmitter output power in order to comply with the EIRP limits specified in paragraph (c) of this section.

Equipment Configuration for Peak Output Power			
Variant:	802.11ad	**Duty Cycle (%):**	100.0
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	22.00
Modulation:	16QAM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Peak EIRP	Limit	Margin	EUT Power Setting
MHz	Left	Right			dBm	dBm	dB	
58320.0	42.13	38.56	--	--	42.13	43.00	-0.87	Max
60480.0	42.11	42.47	--	--	42.47	43.00	-0.53	Max
64800.0	41.90	38.44	--	--	41.90	43.00	-1.10	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Equipment Configuration for Average Output Power			
Variant:	802.11ad	**Duty Cycle (%):**	100.0
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	22.00
Modulation:	16QAM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Peak EIRP	Limit	Margin	EUT Power Setting
MHz	Left	Right	--	--	dBm	dBm	dB	
58320.0	29.39	24.97	--	--	29.39	40.00	-10.61	Max
60480.0	28.80	30.02	--	--	30.02	40.00	-9.98	Max
64800.0	29.02	31.60	--	--	31.60	40.00	-8.40	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Equipment Configuration for Conducted Output Power			
Variant:	802.11ad	**Duty Cycle (%):**	100.0
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	22.00
Modulation:	16QAM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Peak Conducted Power	Limit	Margin	EUT Power Setting
MHz	**Left**	**Right**	**--**	**--**	**mW**	**mW**		
58320.0	103.14	45.31	--	--	103.14	500.00	-396.86	Max
60480.0	102.60	111.39	--	--	111.93	500.00	-388.07	Max
64800.0	97.63	44.03	--	--	97.63	500.00	-402.37	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASUREING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

9.3. Spurious Emissions

Test Conditions for Spurious Emissions			
Standard:	FCC CFR 47:15.255 ISED RSS-210	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Spurious Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	FCC 15.255 (d) Annex J.3	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test procedure for Spurious Emission Measurement.
Radiated Emissions below 40 GHz are subject to the general emission requirements of 15.209 and were measured accordingly.

Emissions above 40 GHz were measured using a 1 MHz RBW peak detector.

Measured peak values are converted to Field Strength and then to Power Density using these equations from ANSI 63.10 section 9:

$$E = 126.8 - 20\ \log\lambda + P - G$$

Where:
E is the field strength of the emission at the measurement distance, in dBµV/m
P is the power measured at the output of the test antenna, in dBm
λ is the wavelength of the emission under investigation $[300/f_{MHz}]$, in m
G is the gain of the test antenna, in dBi

Measurements are performed at a distance less than the prescribed 3 meters in the limit, following the procedure of section 9.1 of ANSI 63.10. The field strength is extrapolated from the measured distance to the specified distance using the following equation:

$$E_{SpecLimit} = E_{Meas} + 20\ \log\left(\frac{d_{Meas}}{d_{SpecLimit}}\right)$$

Where:
$E_{SpecLimit}$ is the field strength of the emission at the distance specified by the limit, in dBµV/m
E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m
d_{Meas} is the measurement distance, in m
$d_{SpecLimit}$ is the distance specified by the limit, in m

The extrapolated field strength is converted to linear units using:

$$E_{linear} = 10^{[E_{log}-120/120]}$$

Where:
E_{linear} is the field strength of the emission, in V/m
E_{log} is the field strength of the emission, in dBµV/m

Finally, the field strength is used to calculate the power density

$$PD = \frac{E_{SpecLimit}^2}{377}$$

Where:
PD is the power density at the distance specified by the limit, in W/m^2.
$E_{SpecLimit}$ is the field strength of the emission at the distance specified by the limit, in V/m

Testing was performed under ambient conditions at nominal voltage only.

Test configuration and setup used for the measurement above 40 GHz was per the 60 GHz Radiated Test Set-up specified in this document.

Supporting Information:

(D) Limits on spurious emissions:
- (1) The power density of any emissions outside the 57-71 GHz band shall consist solely of spurious emissions.
- (2) Radiated emissions below 40 GHz shall not exceed the general limits in section 15.209.
- (3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm^2 at a distance of 3 meters.
- (4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

Equipment Configuration for Spurious Emissions			
Variant:	802.11ad	**Duty Cycle (%):**	100
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	22.00
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Temperature	20.0 °C	Maximum Observed Spurious Emission (<40 GHz)		Limit	Margin
Voltage	48.00 Vdc	Emission Frequency	Amplitude		
Test Frequency	Frequency Range	MHz	dBµV	dBµV	dB
58320.0 MHz	30 - 1000 MHz	244.37	54.38	40.00	14.4[1]
	1000 - 18000 MHz	17371.00	43.67	53.98	-10.3
	18000 - 26500 MHz	21662.32	48.24	53.98	-5.7
	26500 - 40000 MHz	40000.00	52.63	53.98	-1.3
60480.0 MHz	30 - 1000 MHz	244.37	54.38	40.00	14.4[1]
	1000 - 18000 MHz	17371.00	43.67	53.98	-10.3
	18000 - 26500 MHz	21662.32	48.24	53.98	-5.7
	26500 - 40000 MHz	40000.00	52.63	53.98	-1.3
64800.0 MHz	30 - 1000 MHz	244.37	54.38	40.00	14.4[1]
	1000 - 18000 MHz	17371.00	43.67	53.98	-10.3
	18000 - 26500 MHz	21662.32	48.24	53.98	-5.7
	26500 - 40000 MHz	40000.00	52.63	53.98	-1.3

NOTE 1: The emissions observed below 1 GHz are attributed to Digital Emissions, and therefore subject to FCC Part 15b Class A limits.

Temperature	20.0 °C	Maximum Observed Spurious Emission (>40 GHz)			Limit	Margin
Voltage	48.00 Vdc	Emission Frequency	Amplitude	Power Density		
Test Frequency	Frequency Range	MHz	dBm	pw/cm^2	pw/cm^2	dB
58320.0 MHz	40000 - 57000 MHz	56688.33	-55.16	7.75	90.00	-82.25
	71000 - 75000 MHz	74460.00	-47.70	79.46	90.00	-10.54
	75000 - 110000 MHz	108483.00	-52.36	53.33	90.00	-36.67
60480.0 MHz	40000 - 57000 MHz	40141.67	-56.00	3.21	90.00	-86.79
	71000 - 75000 MHz	71040.00	-47.53	70.68	90.00	-19.32
	75000 - 110000 MHz	106150.00	-51.68	60.69	90.00	-29.31
64800.0 MHz	40000 - 57000 MHz	40198.33	-55.00	4.05	90.00	-85.95
	71000 - 75000 MHz	74460.00	-47.70	74.67	90.00	-15.33
	75000 - 110000 MHz	109125.00	-52.34	55.40	90.00	-34.60

Note 2: No emissions found from 110 – 200 GHz.

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

9.4. Frequency Stability

Test Conditions for Spurious Emissions			
Standard:	FCC CFR 47:15.255 RSS-210	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Frequency Stability	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.255 (f) Annex J.6	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Frequency Stability Measurement
Frequency Stability was measured with a spectrum analyzer, preselector and high frequency antenna, while the EUT is operating in transmission mode at the appropriate frequency.

(f) Frequency stability.
Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over a temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

During the test all necessary settings, adjustments and control of the EUT have to be performed without disturbing the test environment, i.e., without opening the environmental chamber. The frequency stabilities can be maintained to a lesser temperature range provided that the transmitter is automatically inhibited from operating outside the lesser temperature range. For handheld equipment that is only capable of operating from internal batteries and the supply voltage cannot be varied, the frequency stability tests shall be performed at the nominal battery voltage and the battery end point voltage specified by the manufacturer. An external supply voltage can be used and set at the internal battery nominal voltage, and again at the battery operating end point voltage which shall be specified by the equipment manufacturer. If an unmodulated carrier is not available, the mean frequency of a modulated carrier can be obtained by using a frequency counter with gating time set to an appropriately large multiple of bit periods (gating time depending on the required accuracy). Full details on the choice of values shall be included in the test report.

Limits for Frequency Stability
Within specified Band.

Equipment Configuration for Frequency Stability

Variant:	802.11ad	**Duty Cycle (%):**	100
Data Rate:	1000.00 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	16QAM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	JK
Engineering Test Notes:			

Test Measurement Results

Test Frequency	58320.0	Measured 10 dB Bandwidth Points (GHz)		Result
Temperature	Voltage	Low Frequency	High Frequency	
+50.0	48.0	57.440	59.170	Pass
+40.0	48.0	57.440	59.065	Pass
+30.0	48.0	57.430	59.220	Pass
+20.0	55.0	57.465	59.025	Pass
+20.0	48.0	57.355	59.295	Pass
+}20.0	44.0	57.465	59.025	Pass
+10.0	48.0	57.430	59.030	Pass
0.0	48.0	57.380	58.980	Pass
-10.0	48.0	57.430	58.975	Pass
-20.0	48.0	57.430	59.025	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

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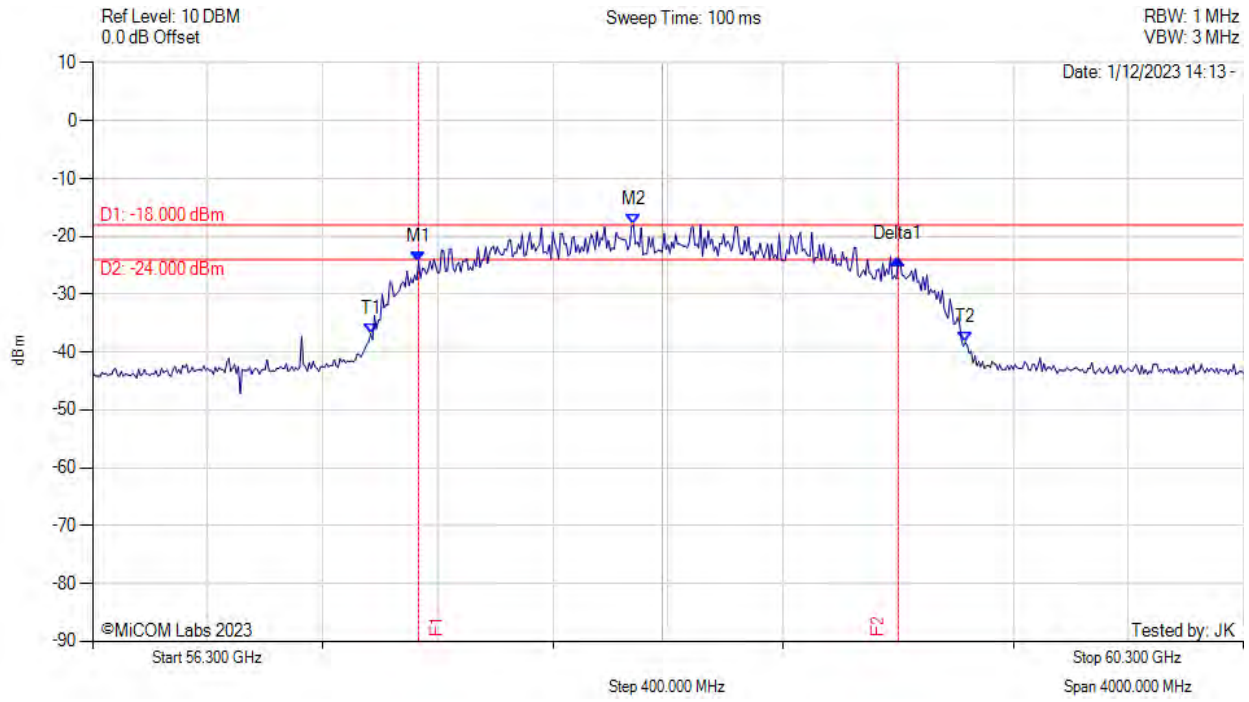
A. APPENDIX - GRAPHICAL IMAGES

A.1. 6 dB & 99% Bandwidth

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

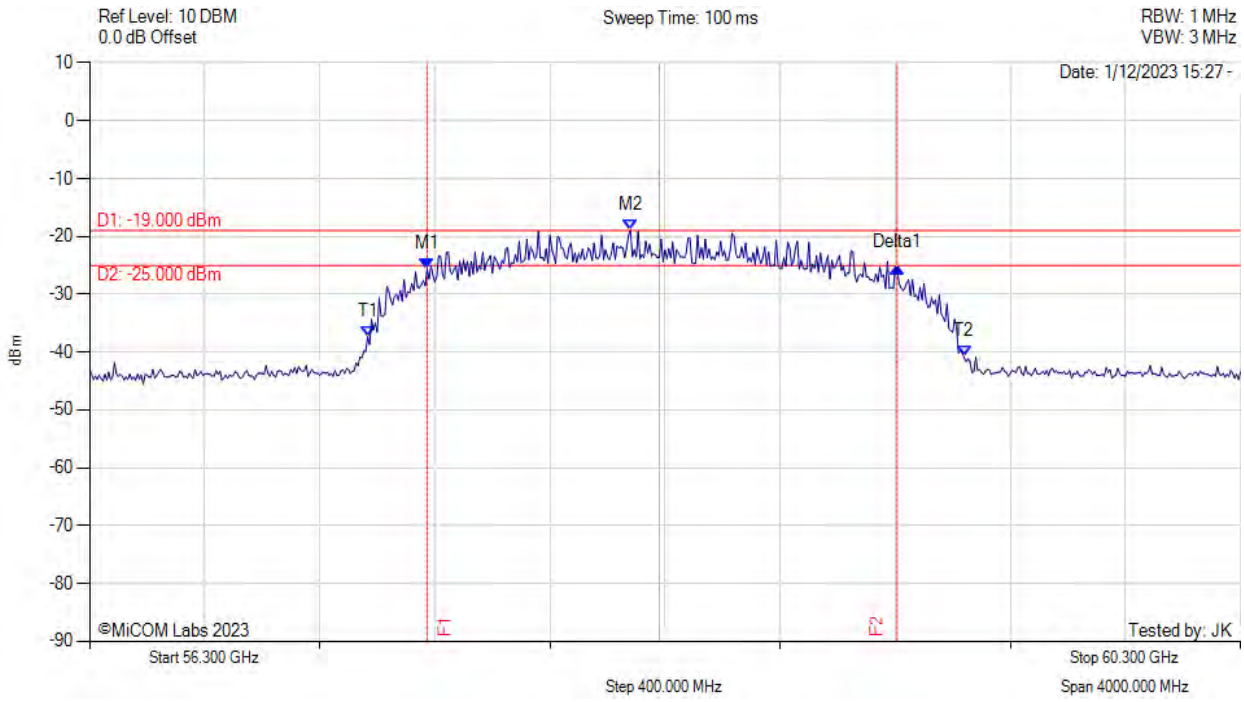


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 57.453 GHz : -24.330 dBm M2 : 58.200 GHz : -18.000 dBm Delta1 : 1666.667 MHz : 0.330 dB T1 : 57.287 GHz : -36.830 dBm T2 : 59.353 GHz : -38.330 dBm OBW : 2120.000 MHz	Measured 6 dB Bandwidth: 1666.667 MHz

back to matrix

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 58.32 GHz, Chain b, Temp: 20, Voltage: 48 Vdc

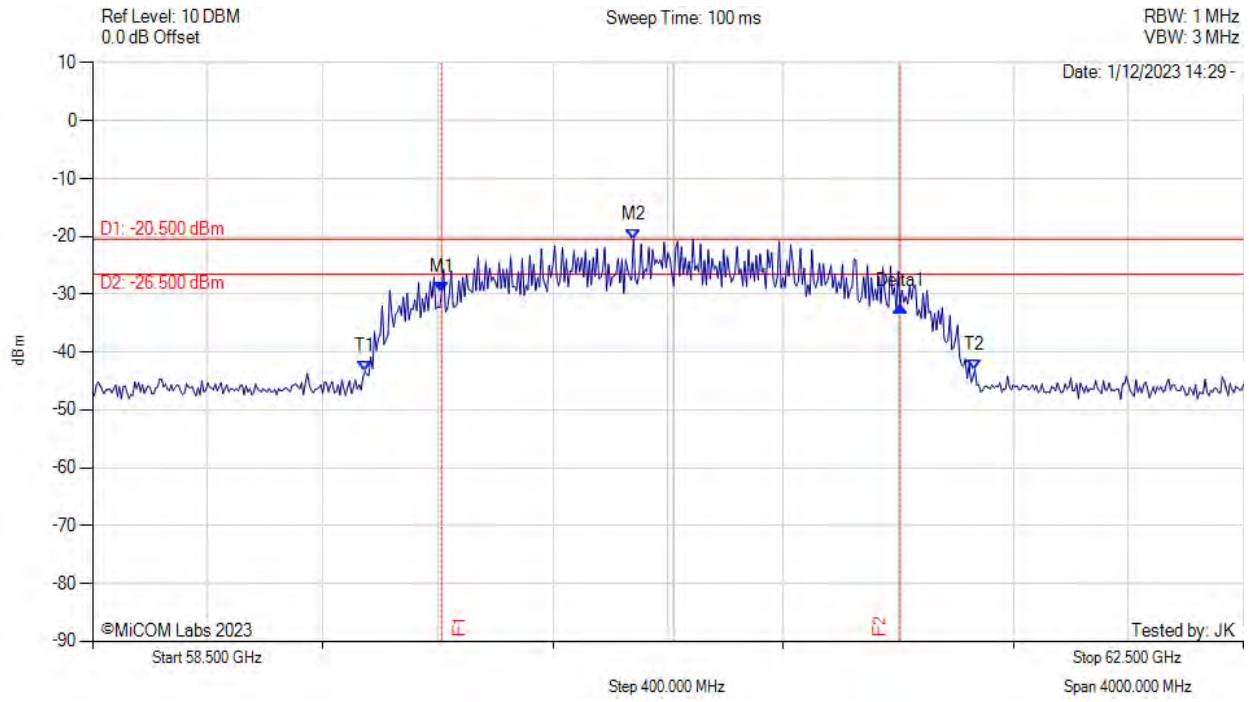


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 57.493 GHz : -25.660 dBm M2 : 58.200 GHz : -19.000 dBm Delta1 : 1633.333 MHz : 0.330 dB T1 : 57.287 GHz : -37.330 dBm T2 : 59.360 GHz : -40.660 dBm OBW : 2073.000 MHz	Measured 6 dB Bandwidth: 1633.333 MHz

back to matrix

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

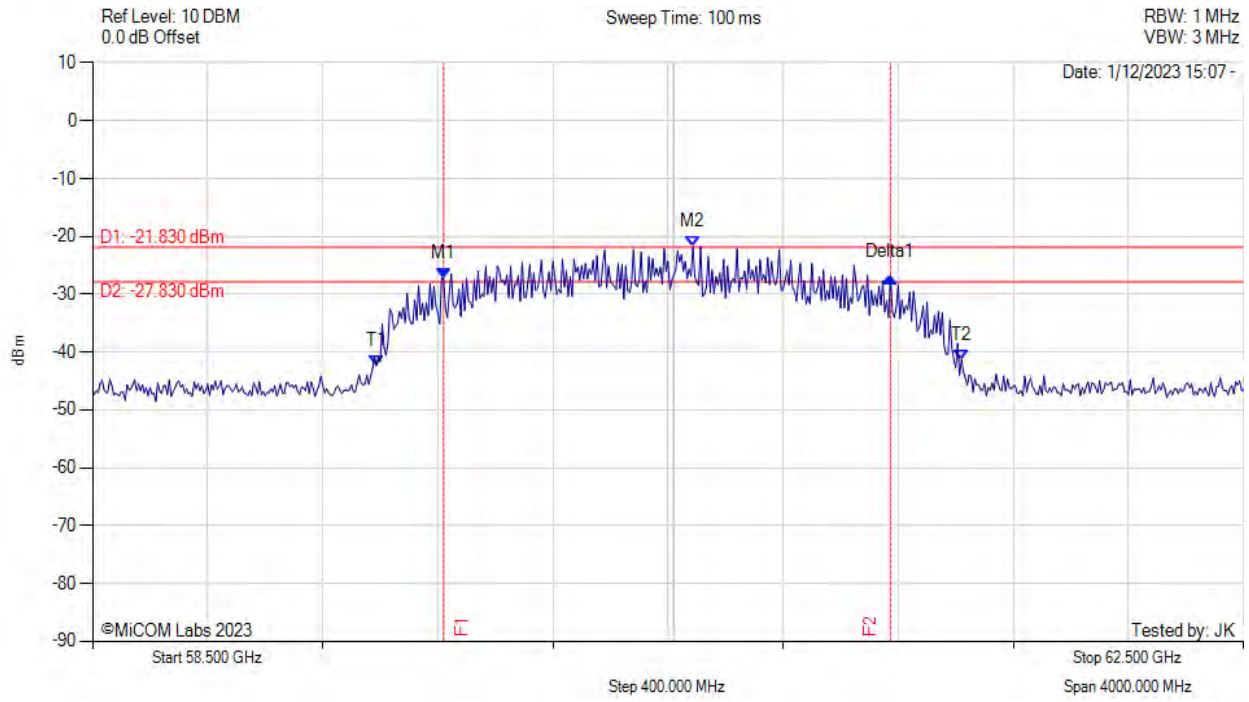


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 59.693 GHz : -29.660 dBm M2 : 60.360 GHz : -20.500 dBm Delta1 : 1593.333 MHz : -2.500 dB T1 : 59.427 GHz : -43.330 dBm T2 : 61.547 GHz : -43.000 dBm OBW : 2120.000 MHz	Measured 6 dB Bandwidth: 1593.333 MHz

back to matrix

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 60.48 GHz, Chain b, Temp: 20, Voltage: 48 Vdc

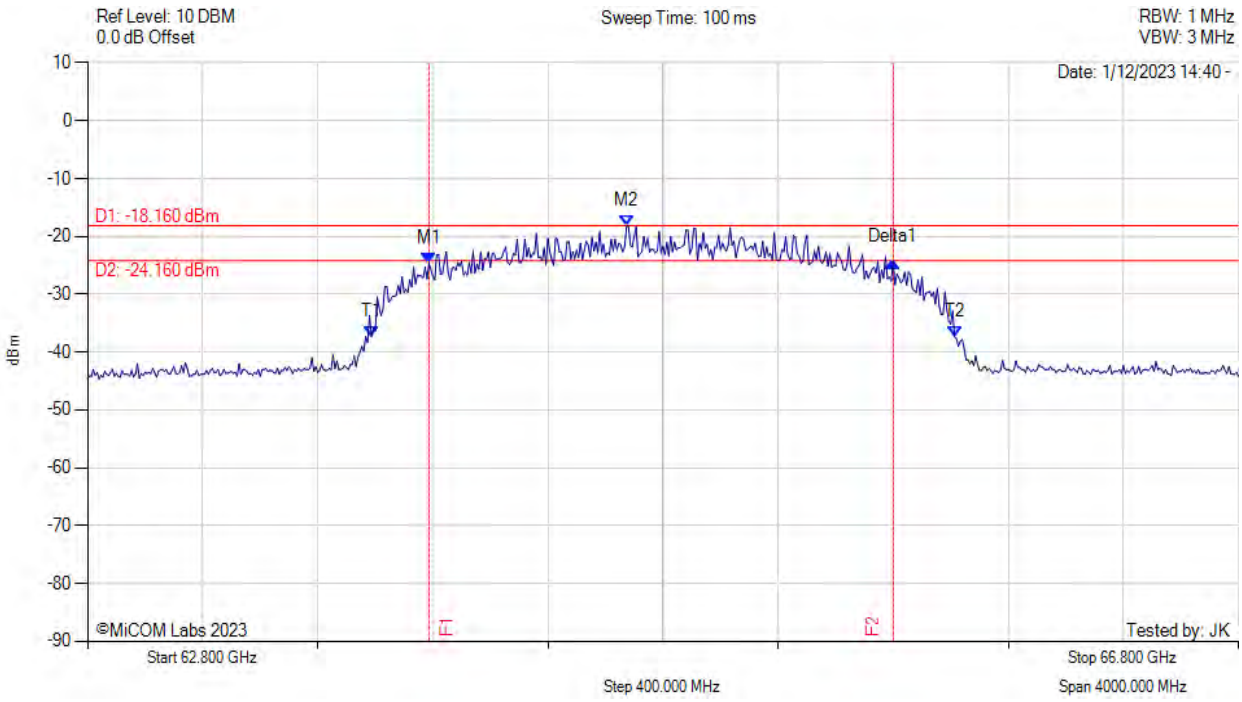


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 59.700 GHz : -27.330 dBm M2 : 60.567 GHz : -21.830 dBm Delta1 : 1553.333 MHz : 0.330 dB T1 : 59.467 GHz : -42.330 dBm T2 : 61.500 GHz : -41.330 dBm OBW : 2033.000 MHz	Measured 6 dB Bandwidth: 1553.333 MHz

back to matrix

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

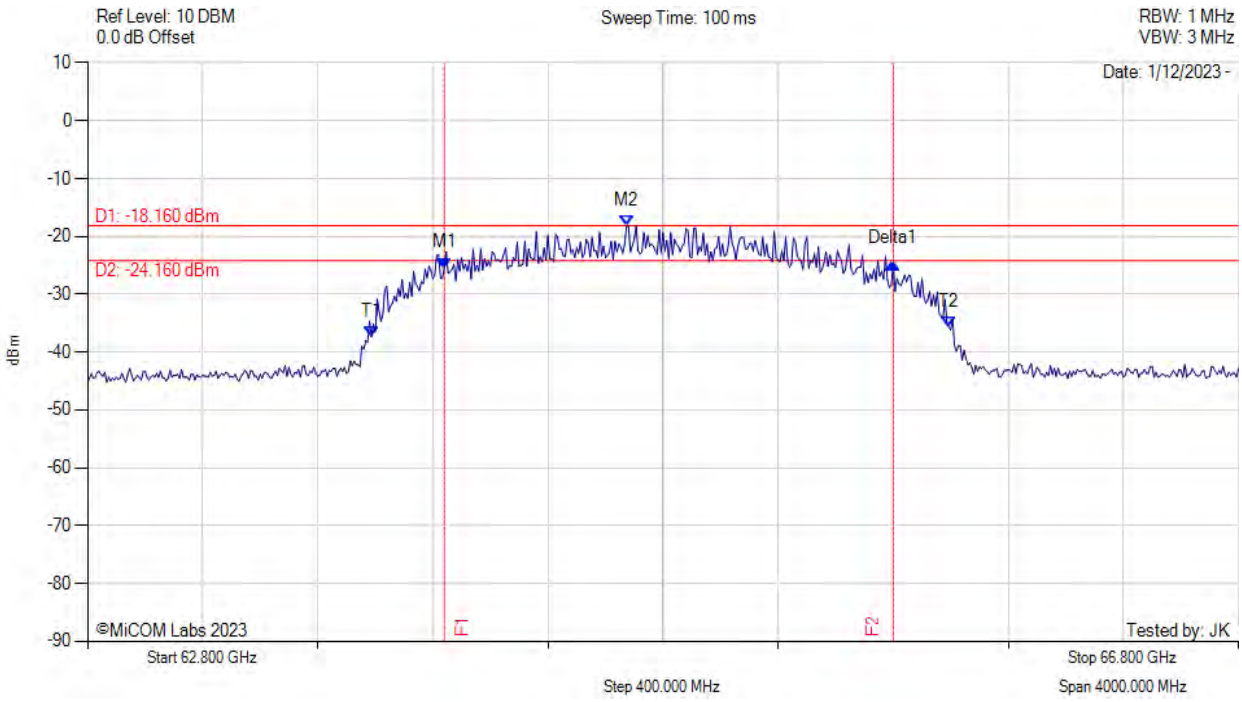


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 63.987 GHz : -24.660 dBm M2 : 64.673 GHz : -18.160 dBm Delta1 : 1613.333 MHz : 0.330 dB T1 : 63.787 GHz : -37.330 dBm T2 : 65.813 GHz : -37.330 dBm OBW : 2026.667 MHz	Measured 6 dB Bandwidth: 1613.333 MHz

back to matrix

6 dB & 99% BANDWIDTH

Variant: 802.11ad, Channel: 64.80 GHz, Chain b, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1 : 64.040 GHz : -25.500 dBm M2 : 64.673 GHz : -18.160 dBm Delta1 : 1560.000 MHz : 0.840 dB T1 : 63.787 GHz : -37.330 dBm T2 : 65.793 GHz : -35.660 dBm OBW : 2006.667 MHz	Measured 6 dB Bandwidth: 1560.000 MHz

back to matrix

A.2. Spurious Emissions

SPURIOUS EMISSIONS

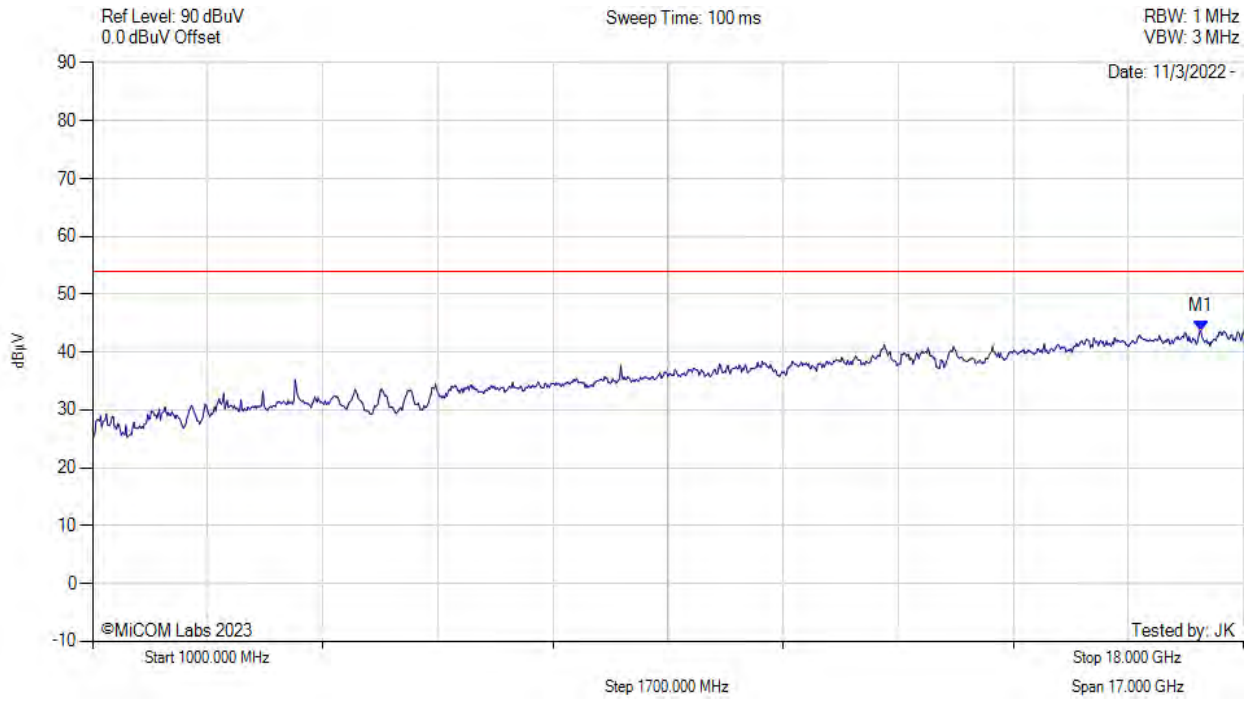
Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Peak Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 244.37 MHz : 54.38 dBuV	Channel Frequency : 58320.0 MHz Emission Frequency: 244.37 MHz Emission Amplitude : 54.38 dBuV Limit : 40.00 dBuV Margin: 14.4 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

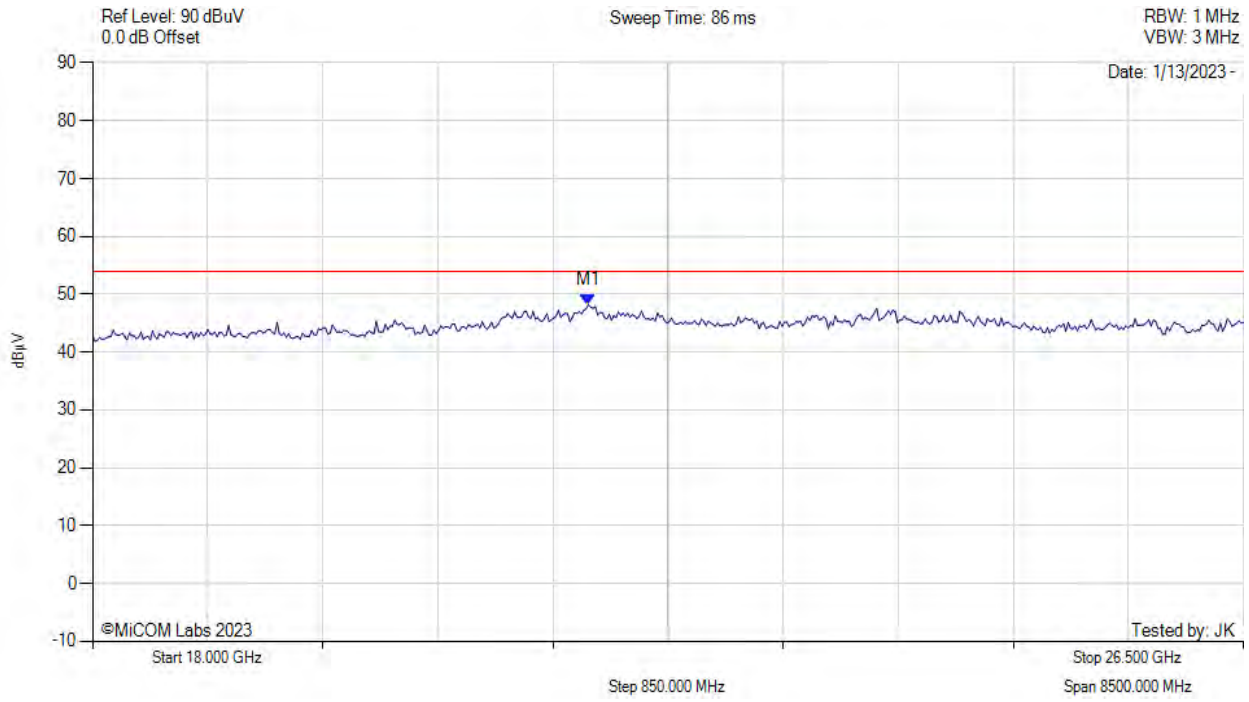


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Avg Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 17371.00 MHz : 43.67 dBuV	Channel Frequency : 58320.0 MHz Emission Frequency: 17371.00 MHz Emission Amplitude : 43.67 dBuV Limit : 53.98 dBuV Margin: -10.3 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

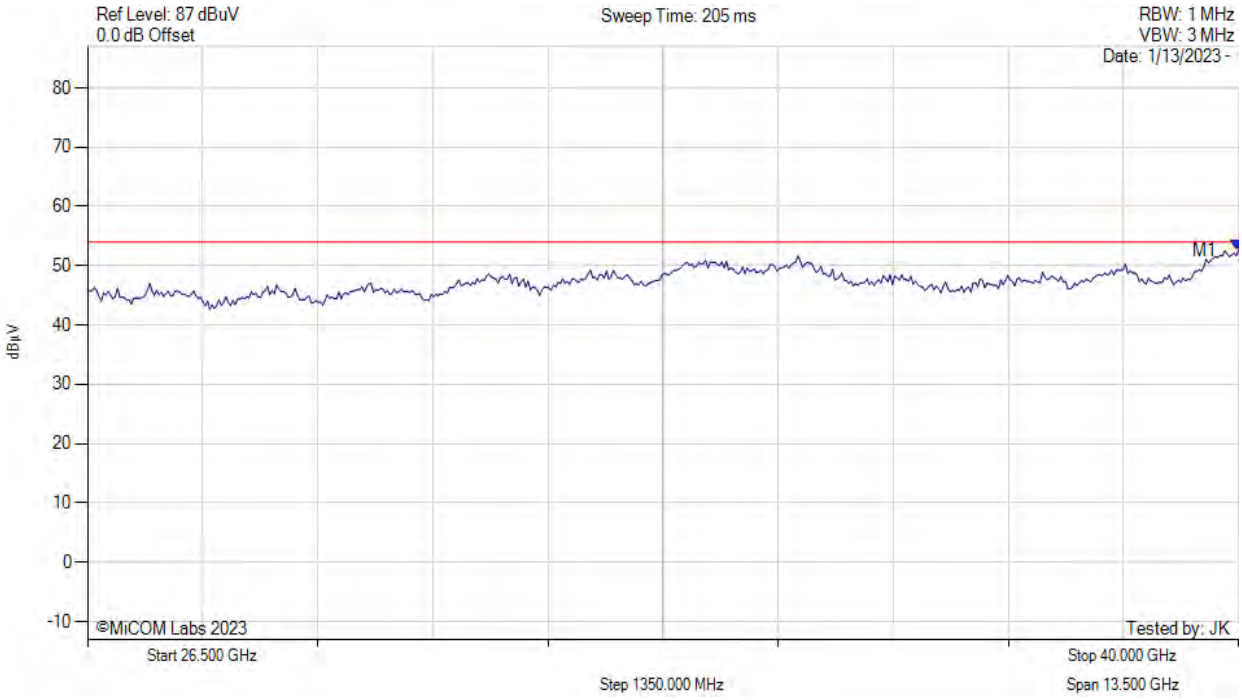


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = MAX HOLD	M1: 21662.32 MHz : 48.24 dBuV	Channel Frequency : 58320.0 MHz Emission Frequency: 21662.32 MHz Emission Amplitude : 48.24 dBuV Limit : 53.98 dBuV Margin: -5.7 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

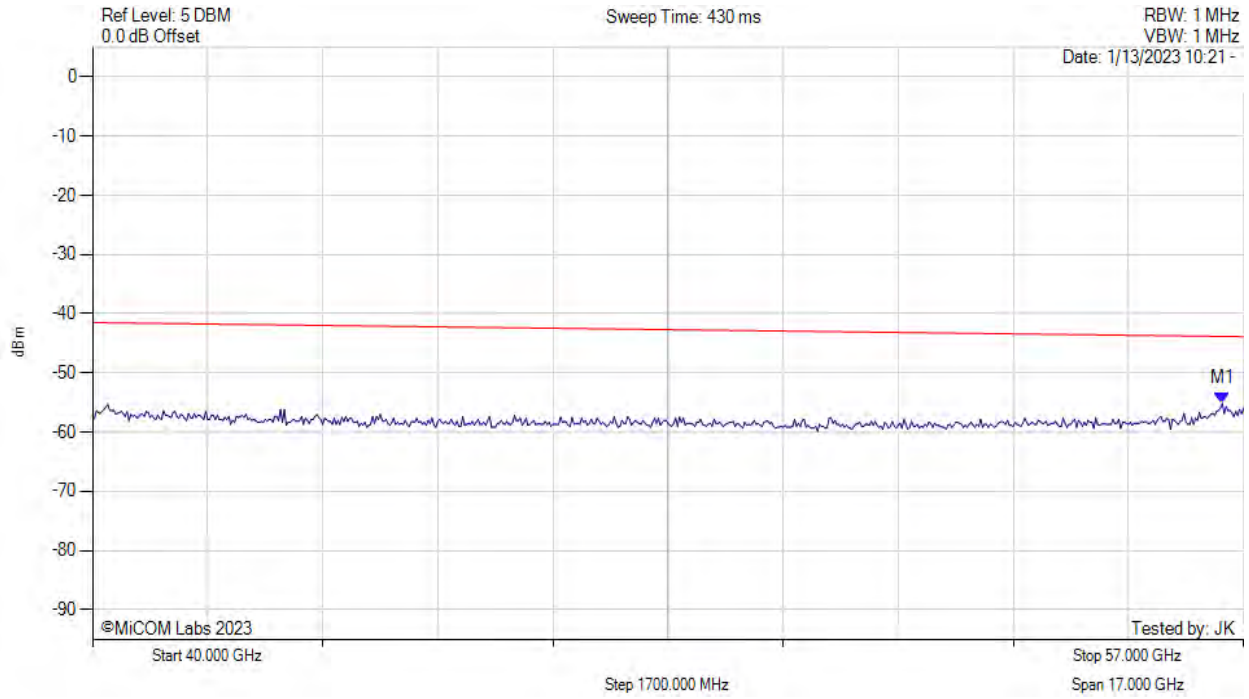


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1: 40000.00 MHz : 52.63 dBuV	Channel Frequency : 58320.0 MHz Emission Frequency: 40000.00 MHz Emission Amplitude : 52.63 dBuV Limit : 53.98 dBuV Margin: -1.3 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

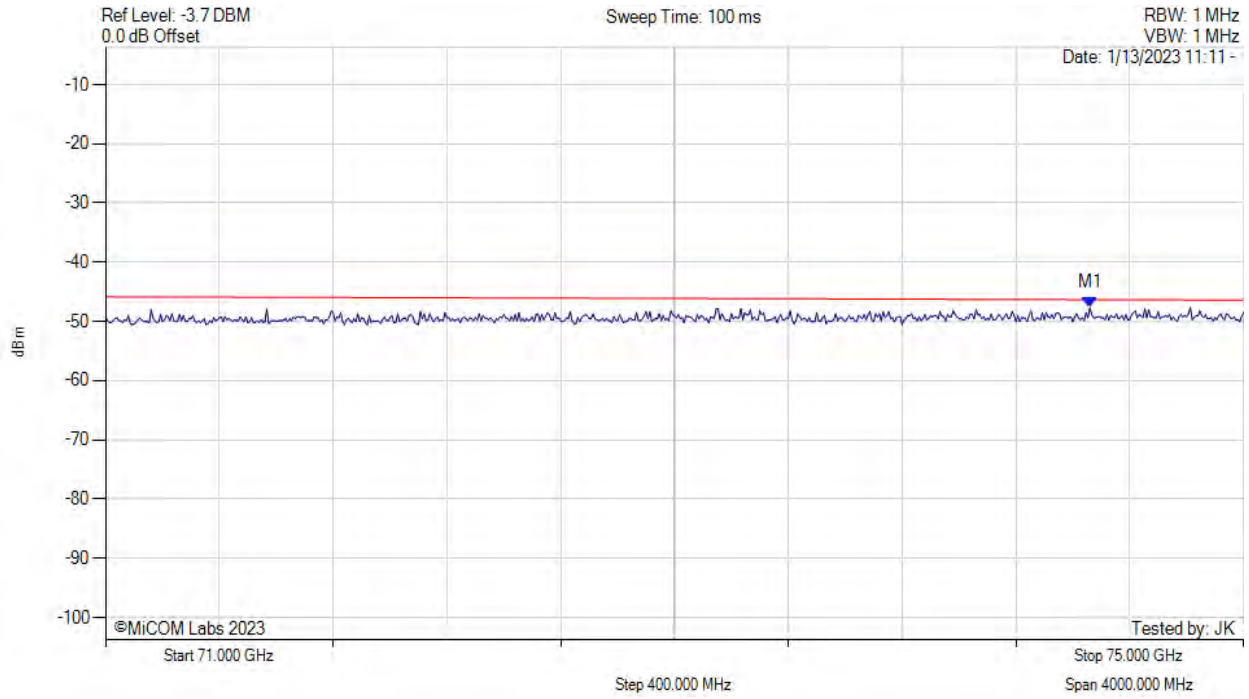


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 56688.33 MHz : -55.16 dBm	Channel Frequency: 58320.0 MHz Emission Frequency: 56688.33 MHz Emission Amplitude : -55.16 dBm Limit : -41.49 dBm Margin: -13.7 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

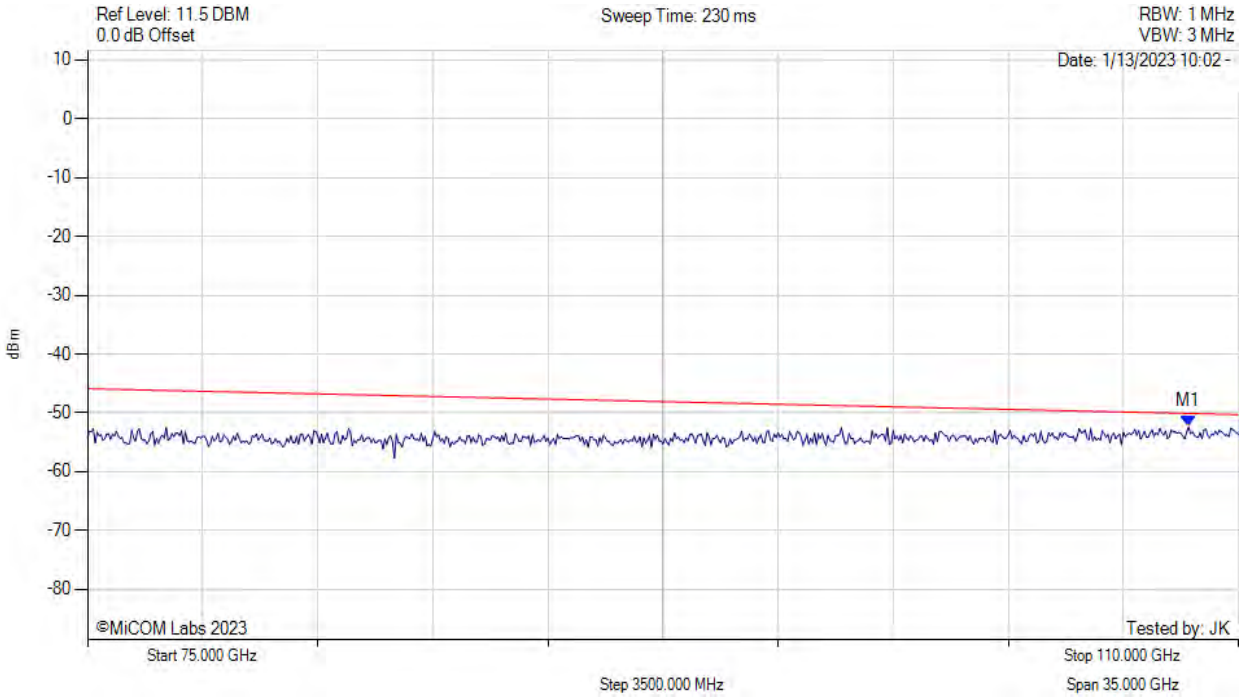


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 74460.00 MHz : -47.70 dBm	Channel Frequency : 58320.0 MHz Emission Frequency: 74460.00 MHz Emission Amplitude : -47.70 dBm Limit : -41.49 dBm Margin: -6.2 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 58.32 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 108483.00 MHz : -52.36 dBm	Channel Frequency : 58320.0 MHz Emission Frequency: 108483.00 MHz Emission Amplitude : -52.36 dBm Limit : -41.49 dBm Margin: -10.9 dB

back to matrix

SPURIOUS EMISSIONS

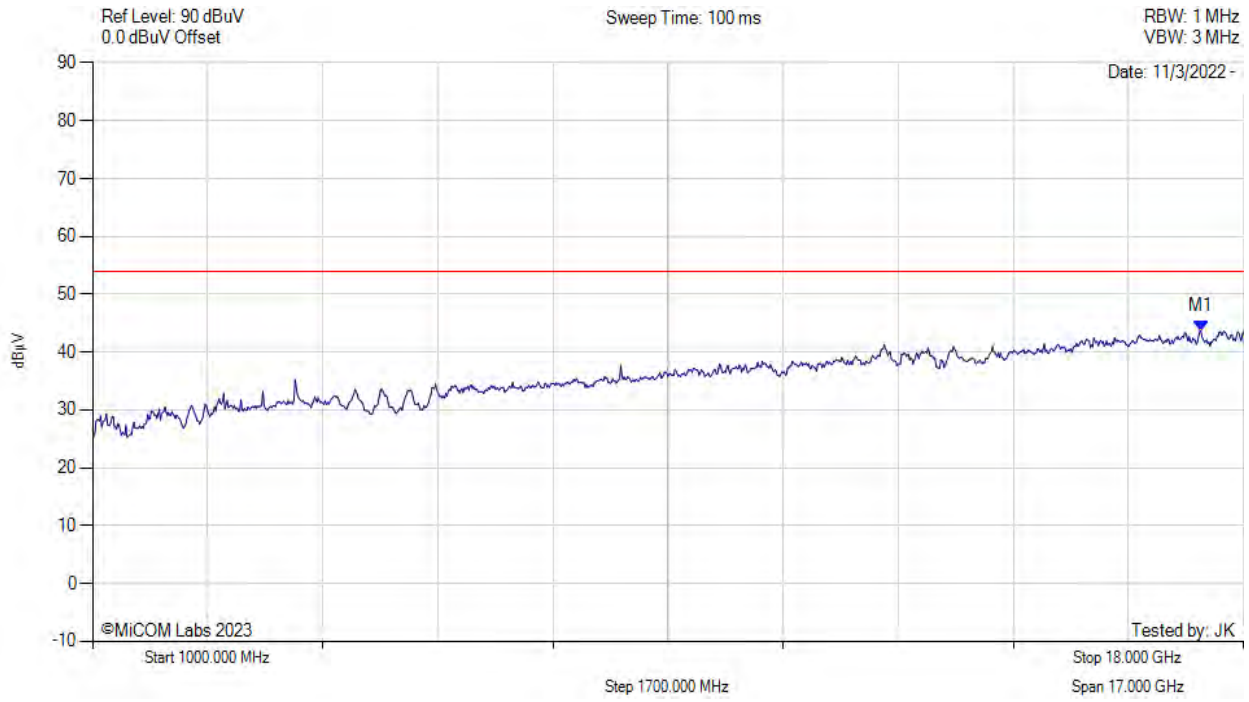
Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Peak Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 244.37 MHz : 54.38 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 244.37 MHz Emission Amplitude : 54.38 dBm Limit : 40.00 dBm Margin: 14.4 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

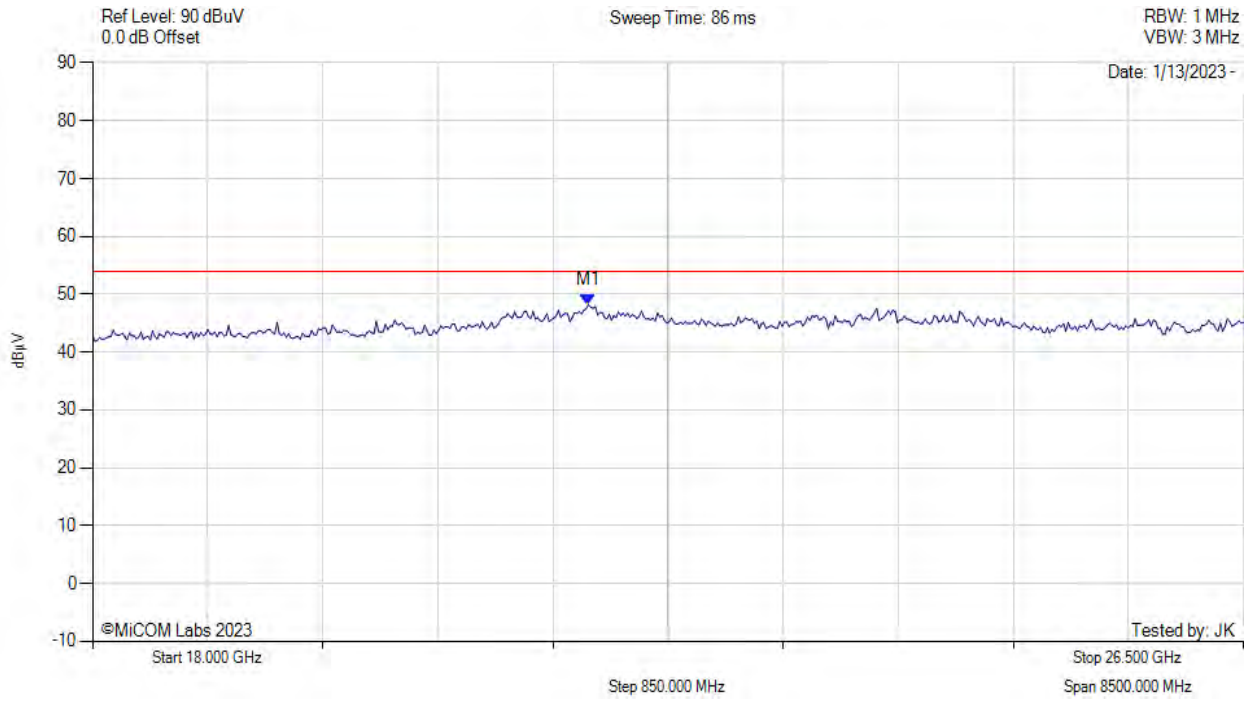


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Avg Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 17371.00 MHz : 43.67 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 17371.00 MHz Emission Amplitude : 43.67 dBm Limit : 53.98 dBm Margin: -10.3 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

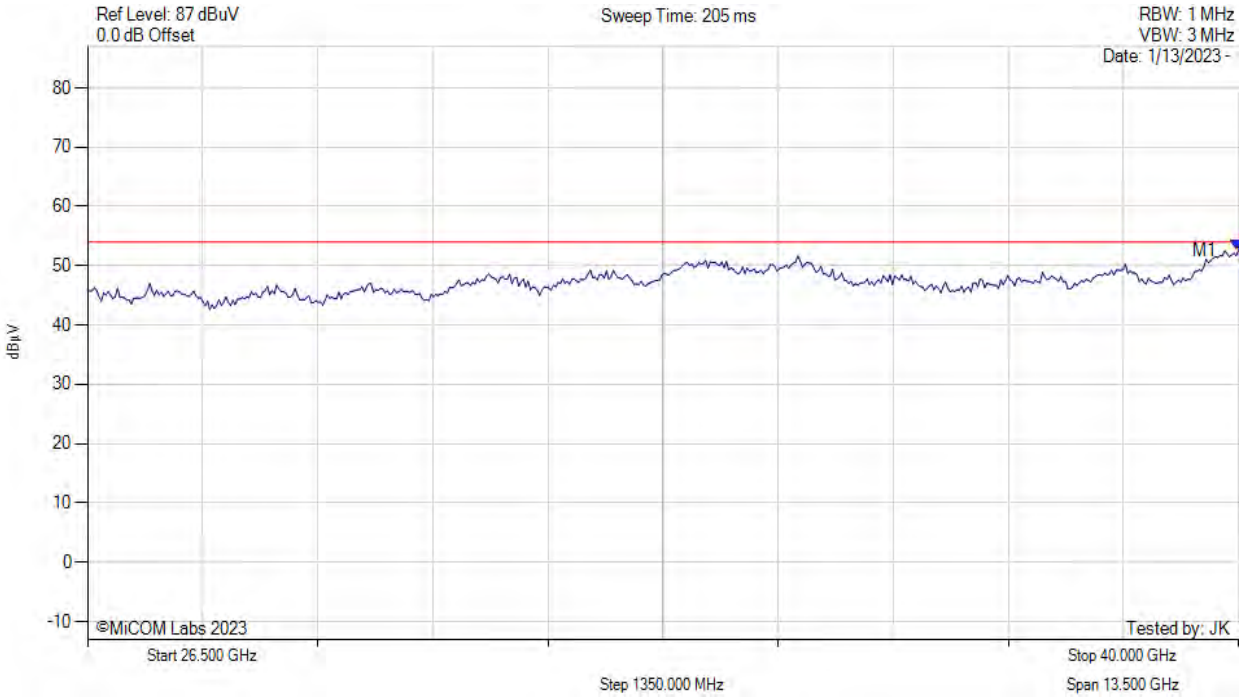


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = MAX HOLD	M1: 21662.32 MHz : 48.24 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 21662.32 MHz Emission Amplitude : 48.24 dBm Limit : 53.98 dBm Margin: -5.7 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

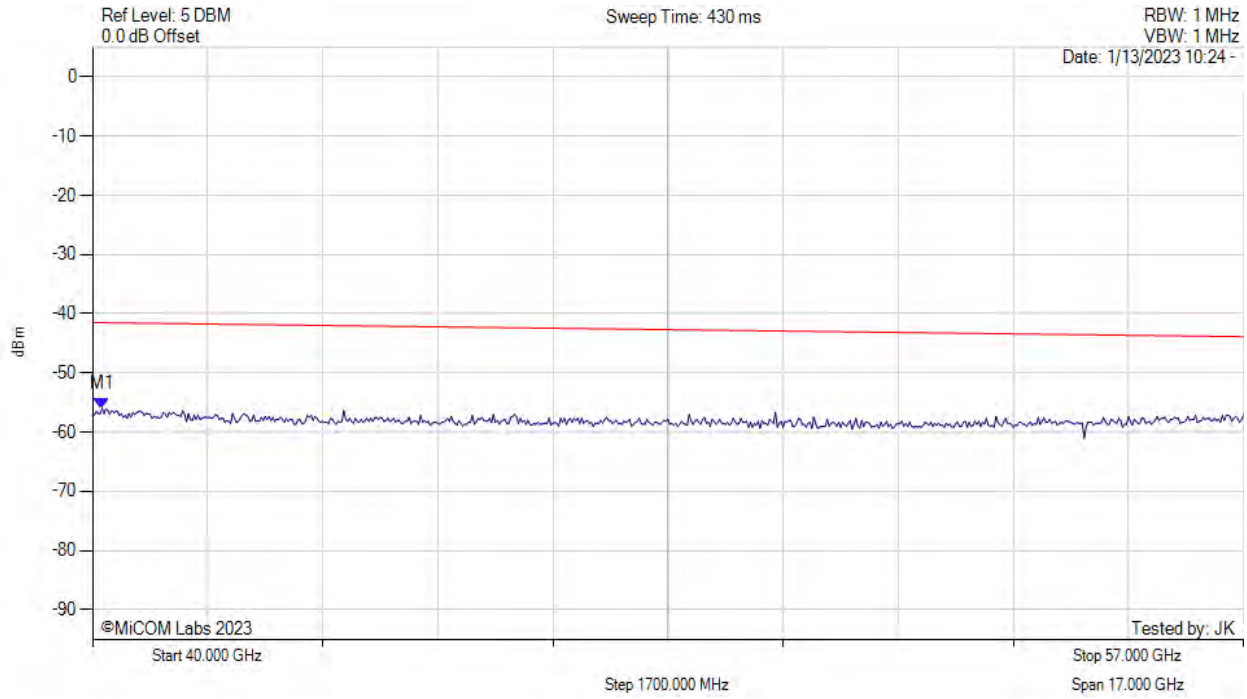


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1: 40000.00 MHz : 52.63 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 40000.00 MHz Emission Amplitude : 52.63 dBm Limit : 53.98 dBm Margin: -1.3 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

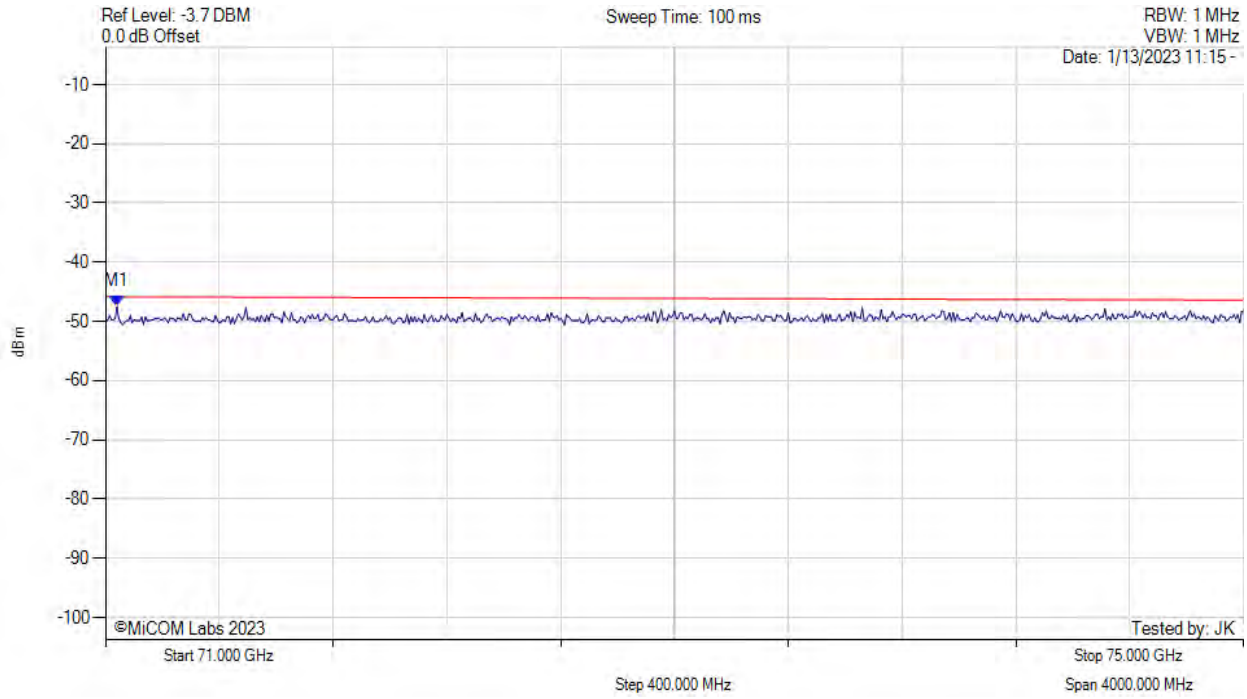


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 40141.67 MHz : -56.00 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 40141.67 MHz Emission Amplitude : -56.00 dBm Limit : -41.49 dBm Margin: -1.3 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

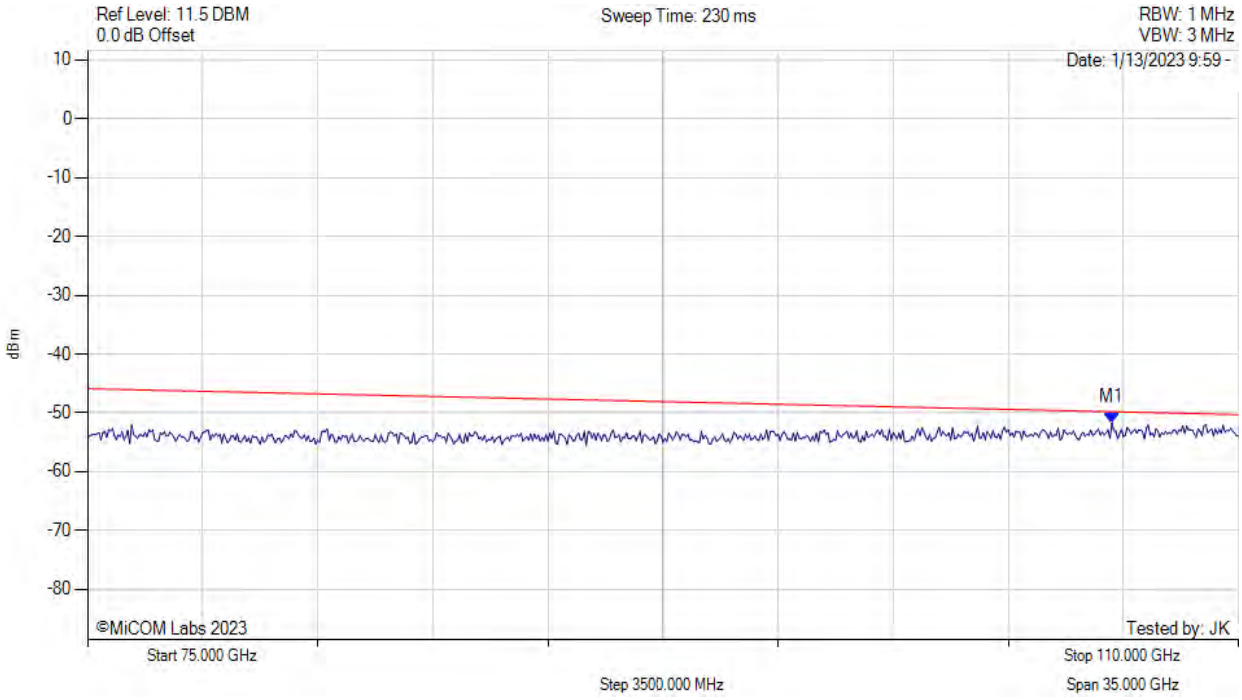


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 71040.00 MHz : -47.53 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 71040.00 MHz Emission Amplitude : -47.53 dBm Limit : -41.49 dBm Margin: -6.0 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 60.48 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 106150.00 MHz : -51.68 dBm	Channel Frequency : 60480.0 MHz Emission Frequency: 106150.00 MHz Emission Amplitude : -51.68 dBm Limit : -41.49 dBm Margin: -10.2 dB

back to matrix

SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc

Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Peak Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 244.37 MHz : 54.38 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 244.37 MHz Emission Amplitude : 54.38 dBm Limit : 40.00 dBm Margin: 14.4 dB

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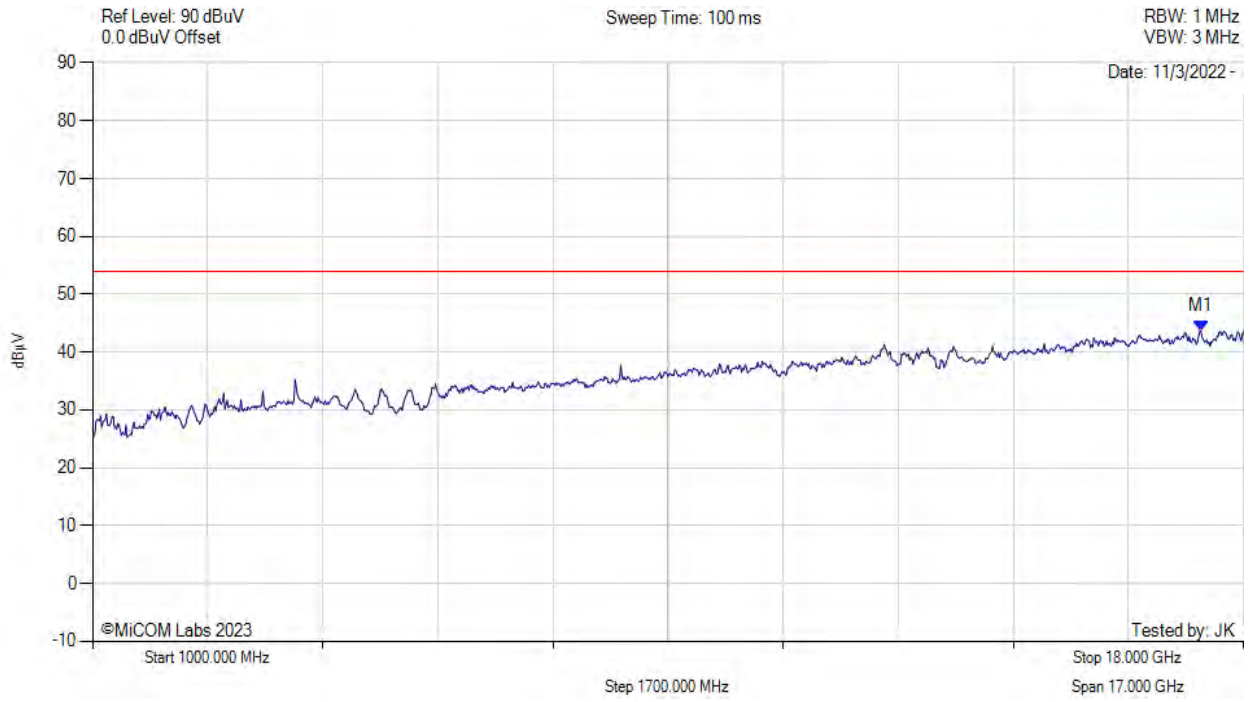
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = Avg Sweep Count = 1 RF Atten (dB) = 0 Trace Mode = CLR/WRITE	M1: 17371.00 MHz : 43.67 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 17371.00 MHz Emission Amplitude : 43.67 dBm Limit : 53.98 dBm Margin: -10.3 dB

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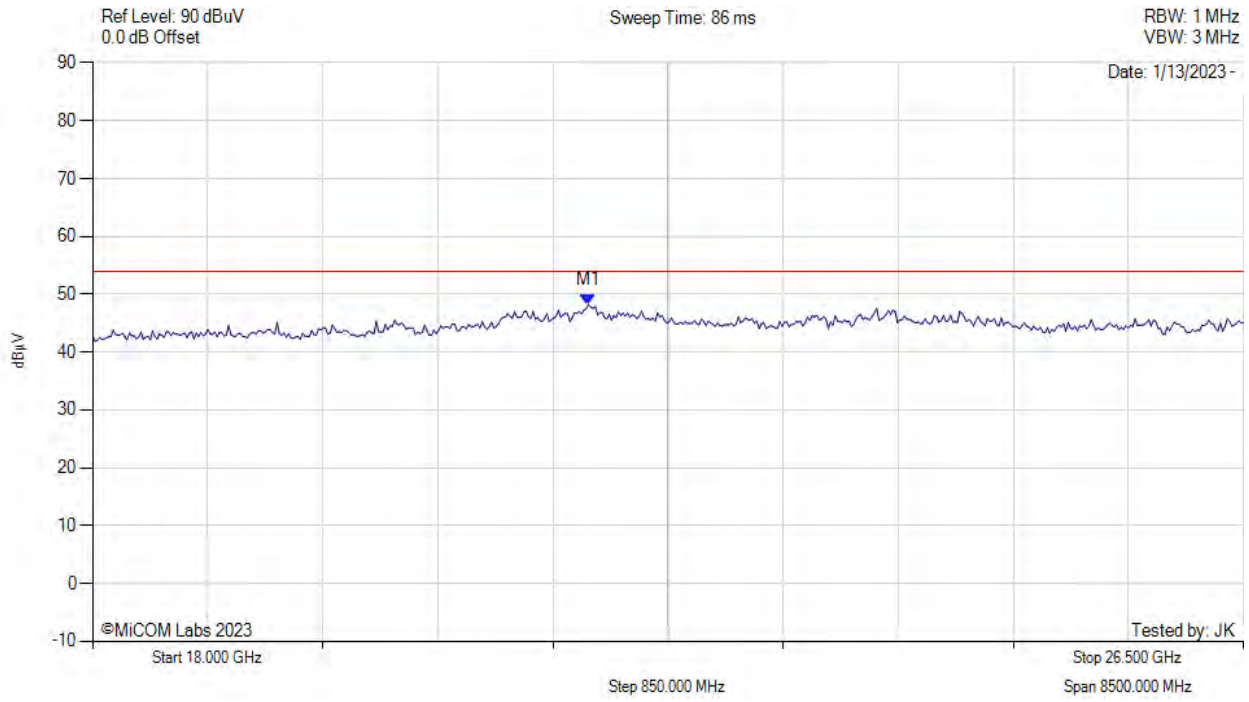
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = MAX HOLD	M1: 21662.32 MHz : 48.24 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 21662.32 MHz Emission Amplitude : 48.24 dBm Limit : 53.98 dBm Margin: -5.7 dB

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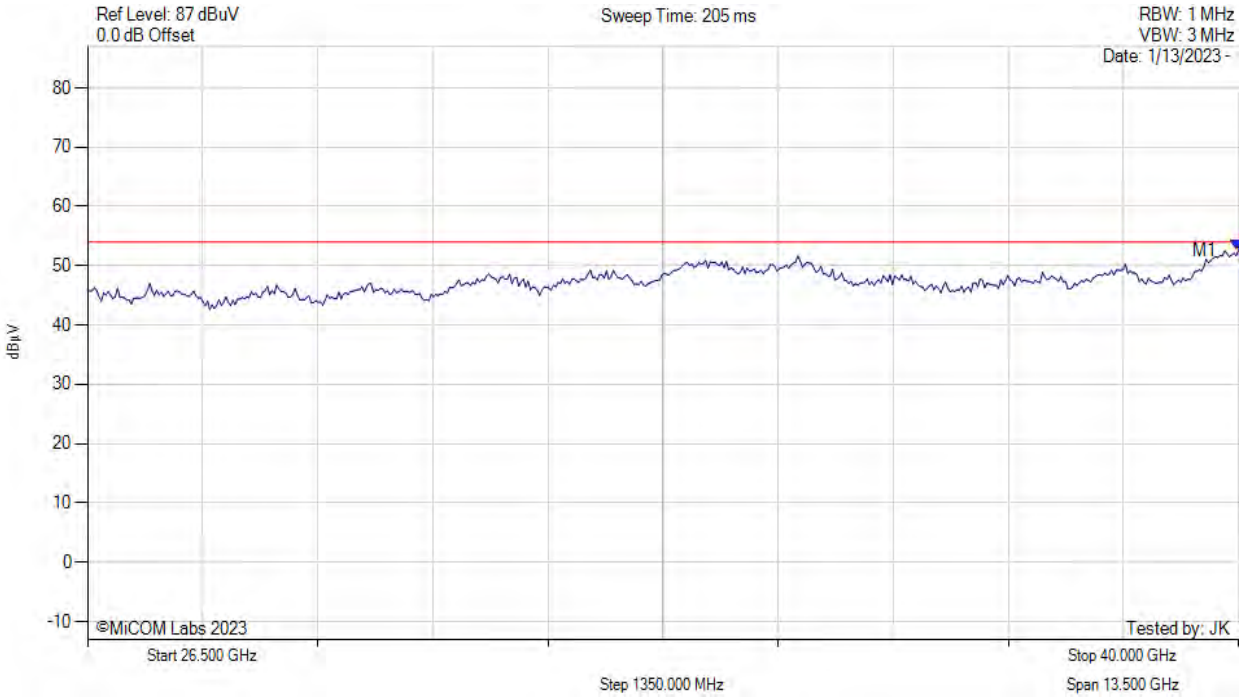
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1: 40000.00 MHz : 52.63 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 40000.00 MHz Emission Amplitude : 52.63 dBm Limit : 53.98 dBm Margin: -1.3 dB

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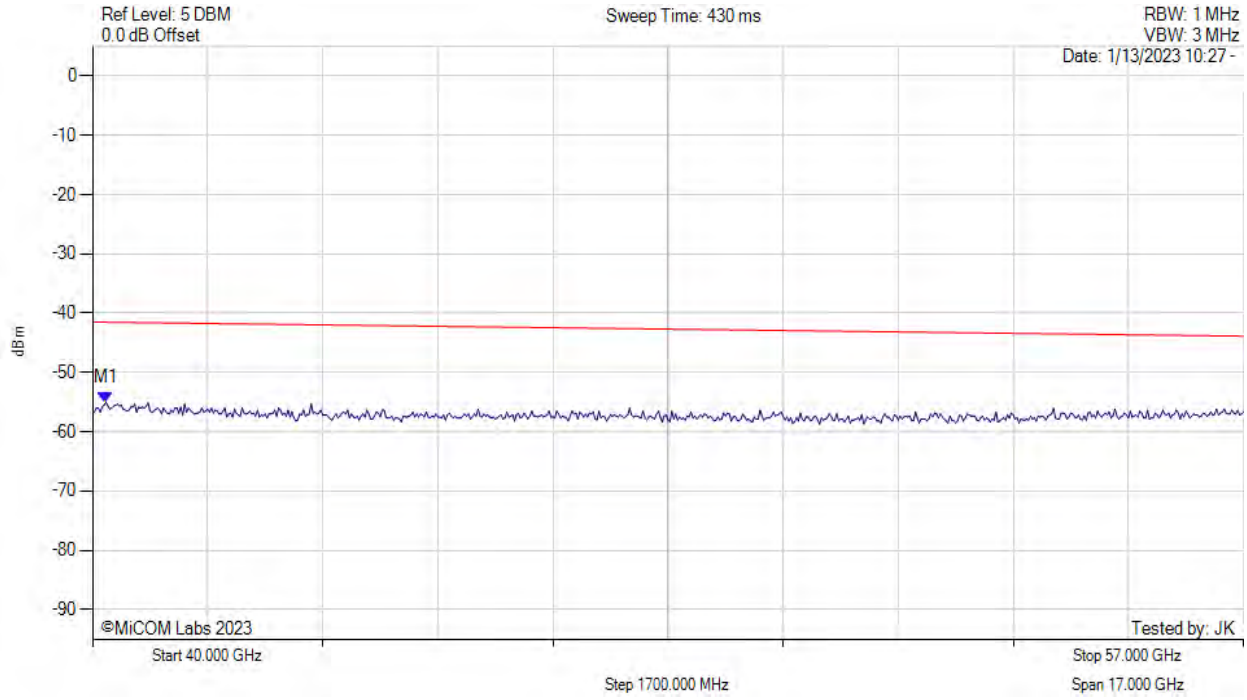
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 40198.33 MHz : -55.00 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 40198.33 MHz Emission Amplitude : -55.00 dBm Limit : -41.49 dBm Margin: -13.5 dB

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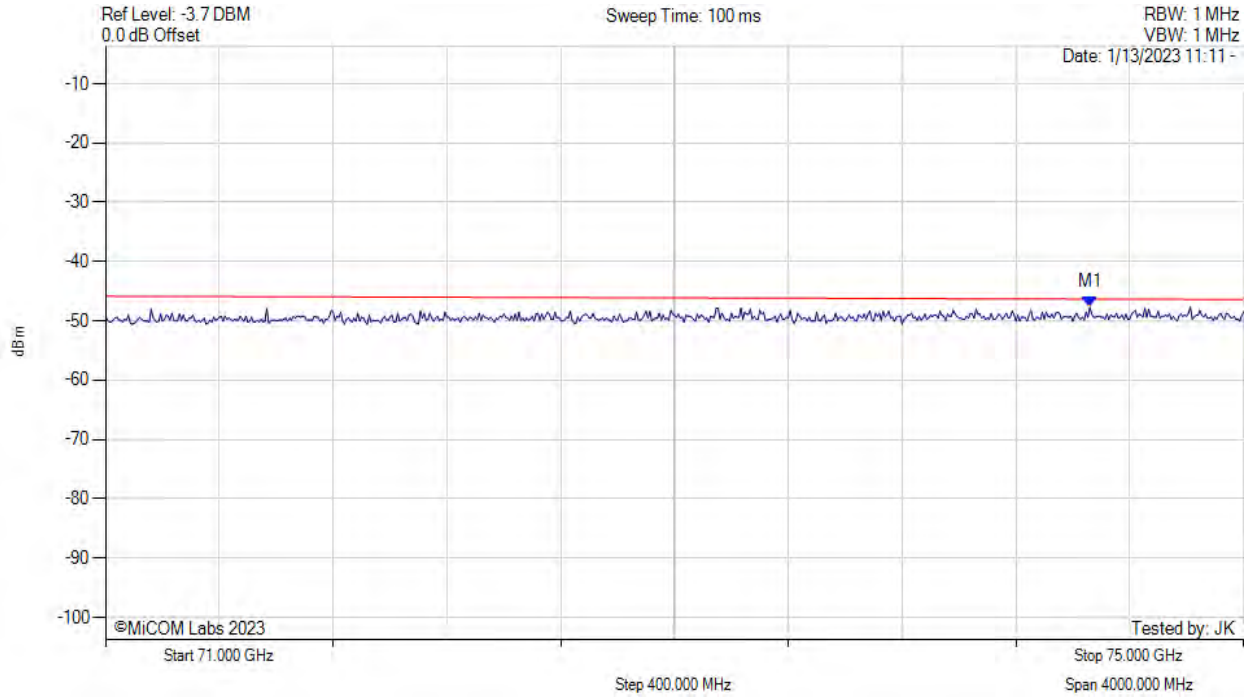
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 74460.00 MHz : -47.70 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 74460.00 MHz Emission Amplitude : -47.70 dBm Limit : -41.49 dBm Margin: -6.2 dB

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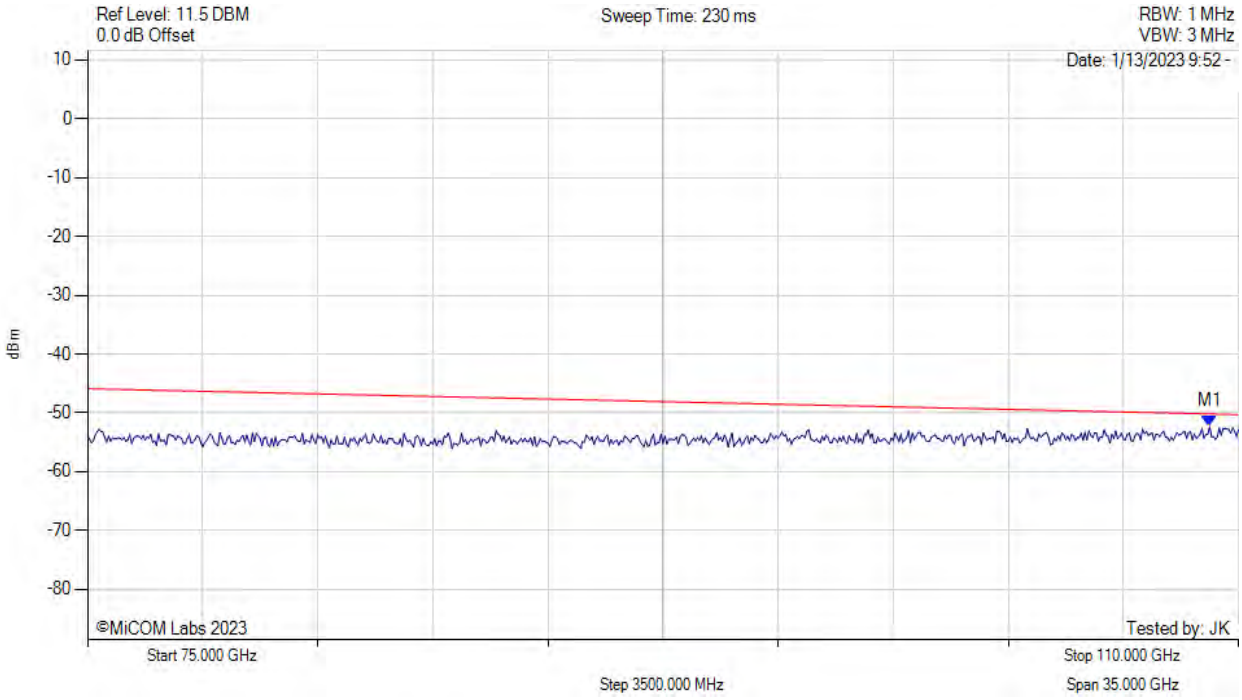
SPURIOUS EMISSIONS

Variant: 802.11ad, Channel: 64.80 GHz, Chain a, Temp: 20, Voltage: 48 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = View RF Atten (dB) = 10 Trace Mode = 0	M1: 109125.00 MHz : -52.34 dBm	Channel Frequency : 64800.0 MHz Emission Frequency: 109125.00 MHz Emission Amplitude : -52.34 dBm Limit : -41.49 dBm Margin: -10.9 dB

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