REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15 Subpart C 15.247 & ISED RSS-247

Report No.: DIGI135–U4-DTS Rev A

Company: Digi International Inc

Model Name: XBSG

Part Numbers: XB-WSB-9S-001
XB-WSB-UT-001
XB-WSB-UM-001
XB-WSB-US-001

REGULATORY COMPLIANCE TEST REPORT

Company Name: Digi International Inc

Model Name: XBSG

To: FCC CFR 47 Part 15 Subpart C 15.247 & ISED RSS-247

Test Report Serial No.: DIGI135-U4-DTS Rev A

This report supersedes: NONE

Applicant: Digi International Inc
9350 Excelsior Blvd.
Hopkins, MN 55343
USA

Issue Date: 15th May 2025

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

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

ilac-MRA a2LA

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 28th day of February 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2025

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

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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

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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 28th day of February 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2025

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

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2. DOCUMENT HISTORY

Document History		
Revision	**Date**	**Comments**
Draft	1st April 2025	Draft for comment
Rev A	15th May 2025	Initial Release

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

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3. TEST RESULT CERTIFICATE

Manufacturer:	Digi International Inc 9350 Excelsior Blvd. Hopkins MN 55343 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	XBSG	**Telephone:**	+1 925 462 0304
Type Of Equipment:	Wireless Communication Modules	**Fax:**	+1 925 462 0306
S/N's:	N/A		
Test Date(s):	25th – 26th, 28th February 2025 3rd – 7th March 2025	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C 15.247 & ISED RSS-247	**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.

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4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
I	KDB 558074 D01 v05r02	Apr 2019	Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC Rules.
II	A2LA	16th April 2024	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 + 2017 Amendment	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	ETSI TR 100 028	2001-12	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
VI	FCC 47 CFR Part 15, Subpart B	Nov 2017	Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES, SubPart B; Unintentional Radiators
VII	FCC 47 CFR Part 15.247	Apr 2020	Radio Frequency Devices; Subpart C – Intentional Radiators
VIII	FCC Public Notice DA 00-705	Mar 2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
IX	ICES-003	Issue 7; Oct 2020	Information Technology Equipment (Including Digital Apparatus)
X	UKAS M3003	Edition 6 March 2024	The Expression of Uncertainty and Confidence in Measurements
XI	RSS-247 Issue 3	Aug 2023	Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices
XII	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.
XIII	FCC 47 CFR Part 2.1033	Feb 2023	FCC requirements and rules regarding photographs and test setup diagrams.
XIV	UKAS LAB 12	Edition 4 April 2022	The Expression of Uncertainty in Testing

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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 Digi International Inc XBSG to FCC CFR 47 Part 15 Subpart C 15.247 & ISED RSS-247
Applicant:	Digi International Inc 9350 Excelsior Blvd. Hopkins MN 55343 United States of America
Manufacturer:	Digi International Inc
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court, Pleasanton California 94566 USA
Test report reference number:	DIGI135-U4-DTS
Date EUT received:	13th February 2025
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C 15.247 & ISED RSS-247
Dates of test (from - to):	25th – 26th, 28th February 2025 3rd – 7th March 2025
No of Units Tested:	1
Product Family Name:	XBee W-SUN RF Module
Model(s):	XBSG (See Appendix B 'Declaration of Similarities/Part Numbers)
Location for use:	Both
Declared Frequency Range(s):	902 - 928 MHz;
Type of Modulation:	OFDM
EUT Modes of Operation:	MCS4-OFDM-otp1: 902 – 928MHz MCS6-OFDM-opt1: 902 – 928MHz MCS7-OFDM-opt1: 902 – 928MHz
Declared Nominal Output Power:	+17 dBm
Transmit/Receive Operation:	Transceiver
Rated Input Voltage and Current:	3.3VDC 0.195A
Operating Temperature Range:	-40°C to +85°C
ITU Emission Designator:	MCS4 OFDM OPT1 1M6F1D MCS6 OFDM OPT1 1M5F1D MCS7 OFDM OPT1 1M5F1D
Equipment Dimensions:	Micro-mount: 1.36 cm x 1.93 cm x 0.241 cm (0.534 in x 0.760 in x 0.095 in) Surface mount (SMT): 2.2 cm x 3.38 cm x 0.325 cm (0.866 in x 1.33 in x 0.128 in) Through hole (TH): 2.44 cm x 2.76 cm x 0.688 cm (0.96 in x 1.088 in x 0.271 in)
Weight:	Micro-mount: 1.2g Surface mount (SMT): 3.0g Through hole (TH): 3.0g
Hardware Rev:	6000
Firmware Rev:	B000

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5.2. Scope Of Test Program

Digi International Inc XBSG

The scope of the test program was to test Digi International Inc XBSG, XBSG configurations in the frequency ranges 902 - 928 MHz; for compliance against the following specification:

FCC CFR 47 Part 15 Subpart C 15.247 (FHSS)
Radio Frequency Devices; Subpart C – Intentional Radiators

ISED RSS-247 Issue 3
Digital Transmission Systems (DTSs), Frequency Hopping System (FHSS) and License-Exempt Local Area Network (LE-LEN) Devices

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

Type (EUT/ Support)	Equipment Description	Manufacturer	Model No.	Serial No.
EUT	Wireless Communication Modules	Digi International	XBSG	086

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
External	Laird	Phantom TRA9023P	OMNI	3	-	-	-	902 – 928
External	Lair/TE Connectivity	FG9026	OMNI	8	-	-	-	902 – 928
Integral	Meritek	AT503008915	Chip	0.8	-	-	-	902 – 928
External	Molex	2111400100	OMNI	1.0	-	-	-	902 – 928
External	Mpdevice	ACE-915NF	Dipole	2.957	-	-	-	902 – 928
External	Taoglas	FXUB65.07.0180C	Patch	2.0	-	-	-	902 – 928

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

5.5. Cabling and I/O Ports

1. NONE

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5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s)	Data Rate with Highest Power kbp/s	Channel Frequency (MHz)		
		Low	Mid	High
902 - 928 MHz				
MCS4-OFDM-opt1	1200	903.2	915.0	927.2
MCS6-OFDM-opt1	2400	903.2	915.2	927.2
MCS7-OFDM-opt1	3600	903.2	915.2	927.2

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

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6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
DTS		
Peak Output Power	Complies	View Data
Power Spectral Density – Peak	Complies	View Data
6 dB & 99% Bandwidth	Complies	View Data
Emissions	Complies	-
(1) Conducted Emissions	Complies	-
(i) Conducted Band-Edge Emissions	Complies	View Data
(ii) Conducted Spurious Emissions	Complies	View Data
(2) Radiated Emissions	Complies	-
(i) TX Spurious & Restricted Band Emissions	Complies	View Data

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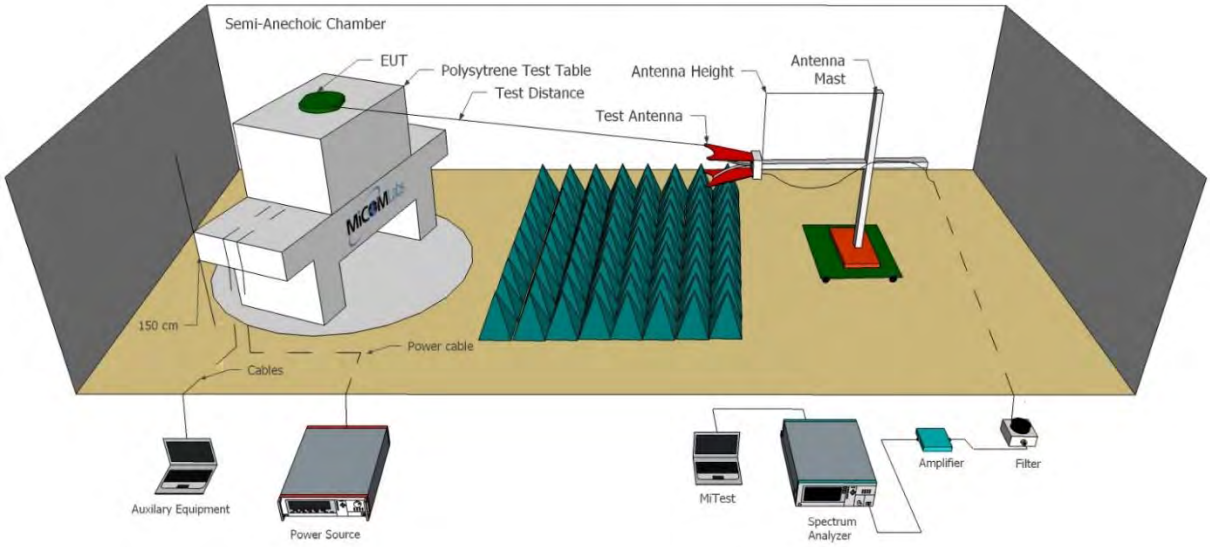
7. TEST EQUIPMENT CONFIGURATION(S)

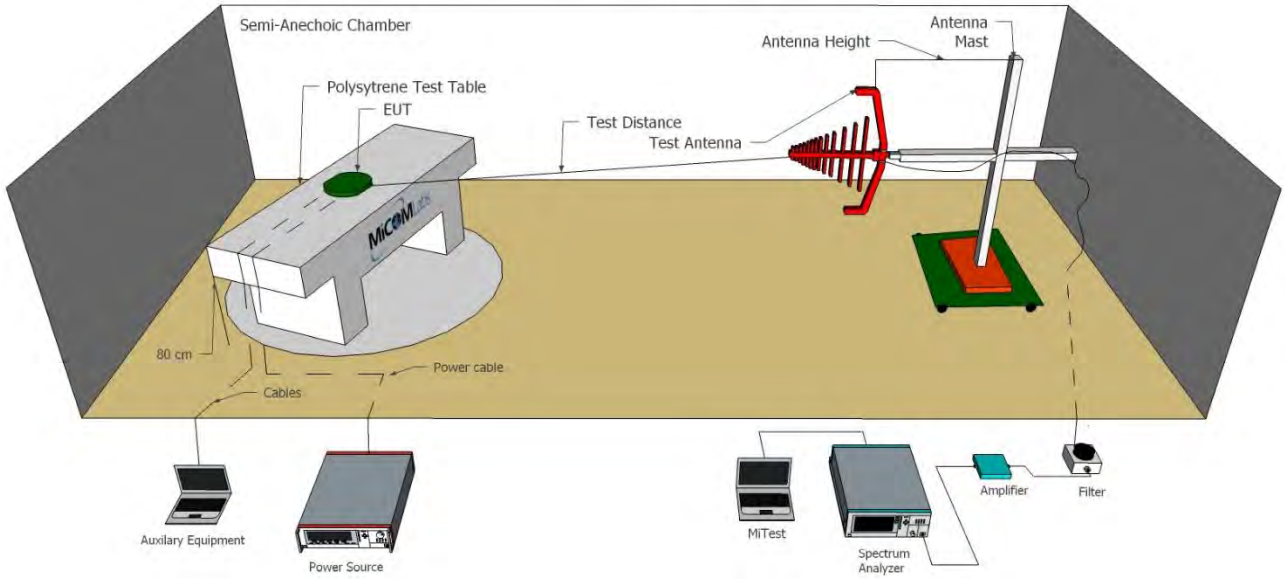
7.1. Radiated

Radiated emissions above and below 1GHz.

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup



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Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
145	18 GHz to 26.6 GHz antenna	Millimeter Products Inc	261K/595	145	23 Jun 2025
148	26.5 GHz to 40 GHz Antenna	Millimeter Products Inc	261A/599	148	28 Jun 2025
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
266	10 Hz to 50GHz MXA Signal Analyzer	Keysight	N9020B	MY60110791	25 Jul 2025
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	20 Jul 2025
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	7 Dec 2025
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	5 Dec 2025
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	13 Jul 2025
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	13 Jul 2025
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	29 Sep 2025
382	Tunable Notch Filter	Wainwright Instruments GmbH	WRCT800/960-0.2/40-8EEK	64	Cal when used
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	13 Jul 2025
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	27 May 2025
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	7 Dec 2025
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	2 Jul 2025
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	Rad Emissions Test Software Version 1.0	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	18 Jul 2025

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463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	18 Jul 2025
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	16 Jul 2025
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	14 Jul 2025
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	18 Jul 2025
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	18 Jul 2025
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2026
554	Precision SMA Cable	Fairview Microwave	SCE18060101-400CM	554	18 Jul 2025
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2025
578	DC Power Supply 0 - 60 V, 0 - 15 A	HP	6274B	2537A-08192	Not Required
596	DC Power Supply	Keysight	E36155A	MY63001023	17 Jan 2026
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used
CC-05	Radiated Emissions Confidence Check	MiCOM	CC-05	None	20 Jul 2025

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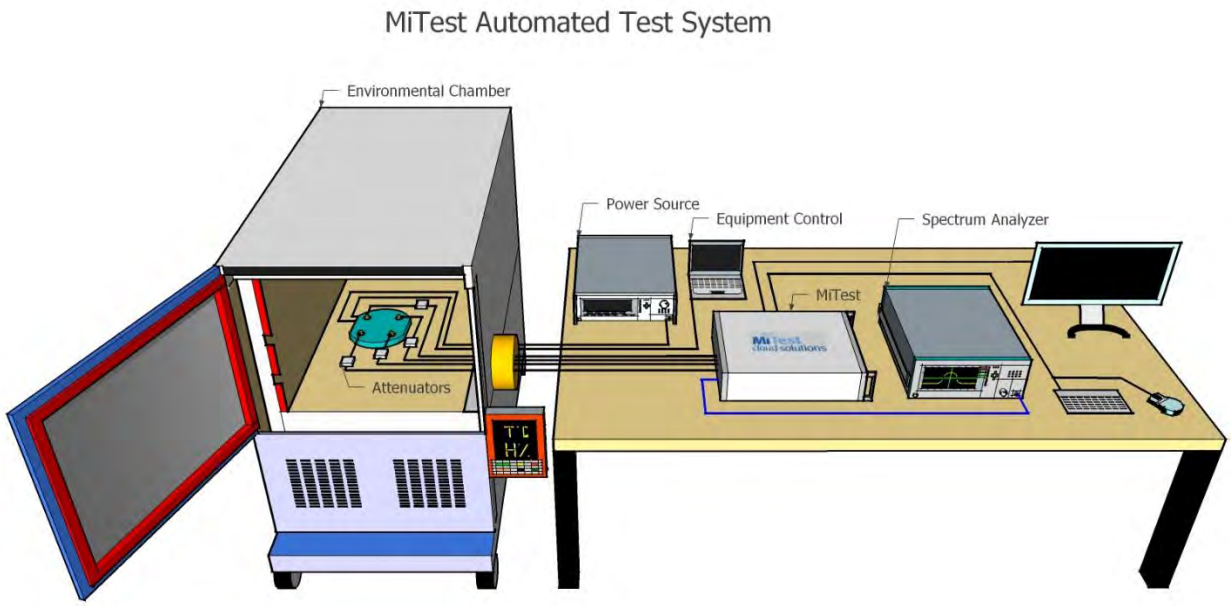
7.2. Conducted Test Setup



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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	11 Jul 2025
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	11 Jul 2025
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	11 Jul 2025
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	11 Jul 2025
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	11 Jul 2025
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	22 Mar 2026
266	10 Hz to 50GHz MXA Signal Analyzer	Keysight	N9020B	MY60110791	25 Jul 2025
382	Tunable Notch Filter	Wainwright Instruments GmbH	WRCT800/960-0.2/40-8EEK	64	Cal when used
398	MiTest RF Conducted Test Software	MiCOM	MiTest ATS	Version 4.2.3.0	Not Required
405	DC Power Supply 0-60V	Agilent	6654A	MY4001826	Cal when used
408	USB to GPIB interface	National Instruments	GPIB-USB HS	14C0DE9	Not Required

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441	USB Wideband Power Sensor	Boonton	55006	9179	4 Dec 2025
442	USB Wideband Power Sensor	Boonton	55006	9181	12 Dec 2025
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	27 Sep 2025
493	USB Wideband Power Sensor	Boonton	55006	9634	8 Oct 2025
494	USB Wideband Power Sensor	Boonton	55006	9726	12 Dec 2025
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2026
512	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen	512	11 Jul 2025
516	USB Wideband Power Sensor	Boonton	RTP5006	10511	4 Dec 2025
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2025
592	Harmonic Mixer, 140 GHz to 220 GHz	Radiometer Physics	RPG FS-Z220	101105	7 Jun 2026
593	Harmonic Mixer, 90 GHz to 140 GHz	Radiometer Physics	RPG FS-Z140	101197	2 Aug 2026
596	DC Power Supply	Keysight	E36155A	MY63001023	17 Jan 2026
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	20 Nov 2025

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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)

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9. TEST RESULTS

9.1. DTS

9.1.1. Peak Output Power

Conducted Test Conditions for Fundamental Emission Output Power			
Standard:	FCC CFR 47:15.247 ISED RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (b) & (c); 5.4	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Fundamental Emission Output Power Measurement
In the case of average power measurements an average power sensor was utilized.

For peak power measurements the spectrum analyzer built-in power function was used to integrate peak power over the 20 dB bandwidth.

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

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.
Supporting Information
Calculated Power = A + G + Y+ 10 log (1/x) dBm

A = Total Power [10*Log10 ($10^{a/10}$ + $10^{b/10}$ + $10^{c/10}$ + $10^{d/10}$)]
G = Antenna Gain
Y = Beamforming Gain
x = Duty Cycle (average power measurements only)

Limits for Fundamental Emission Output Power
(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(3) For systems using digital modulation in the 902-928 MHz and 2400-2483.5 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.
(1) Fixed point-to-point operation:
(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(iii) Fixed, point-to-point operation, as used in paragraphs (c)(1)(i) and (c)(1)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same

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information. The operator of the spread spectrum or digitally modulated intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

(2) In addition to the provisions in paragraphs (b)(3), (b)(4) and (c)(1)(i) of this section, transmitters operating in the 2400-2483.5 MHz band that emit multiple directional beams, simultaneously or sequentially, for the purpose of directing signals to individual receivers or to groups of receivers provided the emissions comply with the following:

(i) Different information must be transmitted to each receiver.

(ii) If the transmitter employs an antenna system that emits multiple directional beams but does not do emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device, i.e., the sum of the power supplied to all antennas, antenna elements, staves, etc. and summed across all carriers or frequency channels, shall not exceed the limit specified in paragraph (b)(1) or (b)(3) of this section, as applicable. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as follows:

(A) The directional gain shall be calculated as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

(B) A lower value for the directional gain than that calculated in paragraph (c)(2)(ii)(A) of this section will be accepted if sufficient evidence is presented, e.g., due to shading of the array or coherence loss in the beamforming.

(iii) If a transmitter employs an antenna that operates simultaneously on multiple directional beams using the same or different frequency channels, the power supplied to each emission beam is subject to the power limit specified in paragraph (c)(2)(ii) of this section. If transmitted beams overlap, the power shall be reduced to ensure that their aggregate power does not exceed the limit specified in paragraph (c)(2)(ii) of this section. In addition, the aggregate power transmitted simultaneously on all beams shall not exceed the limit specified in paragraph (c)(2)(ii) of this section by more than 8 dB.

(iv) Transmitters that emit a single directional beam shall operate under the provisions of paragraph (c)(1) of this section.

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Equipment Configuration for Peak Output Power			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	FCC Limit	ISED EIRP Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	dBm	dBm	dBm	dB	
903.2	17.10	--	--	--	17.10	30.00	36.00	-12.9	PL4
915.2	16.90	--	--	--	16.90	30.00	36.00	-13.1	PL4
927.2	16.50	--	--	--	16.50	30.00	36.00	-13.5	PL4

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Output Power

Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	FCC Limit	ISED EIRP Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	dBm	dBm	dBm	dB	
903.2	16.90	--	--	--	16.9	30.00	36.00	-13.1	PL4
915.2	16.70	--	--	--	16.7	30.00	36.00	-13.3	PL4
927.2	16.20	--	--	--	16.2	30.00	36.00	-13.8	PL4

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Output Power

Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	FCC Limit	ISED EIRP Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	dBm	dBm	dBm	dB	
903.2	16.70	--	--	--	16.7	30.00	36.00	-13.3	PL4
915.2	16.40	--	--	--	16.4	30.00	36.00	-13.6	PL4
927.2	16.10	--	--	--	16.1	30.00	36.00	-13.9	PL4

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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9.1.2. Power Spectral Density – Peak

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.247 ISED RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Power Spectral Density	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (e); 5.2	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Power Spectral Density
The transmitter output was connected to a spectrum analyzer and the measured made in a 3 kHz resolution bandwidth using the analyzer auto-coupled sweep-time. A peak value was found over the full emission bandwidth and the spectrum downloaded for post processing purposes.

Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured separately. The Peak Power Spectral Density is the highest level found across the emission bandwidth. With multiple antenna port measurements the numerical analyzer data from each port is summed (å) and a link to this additional graphic is provided.

Testing was performed under ambient conditions at nominal voltage only.

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

Measure and sum the spectra across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The individual spectra are then summed mathematically in linear power units. Unlike in-band power measurements, in which the sum involves a single measured value (output power) from each output, measurements for compliance with PSD limits involve summing entire spectra across corresponding frequency bins on the various outputs. Consistency is maintained for any device with multiple transmitter outputs to be certain the individual outputs are all aligned with the same span and same number of points. In this instance, the linear power spectrum value within the first spectral bin of output 0 is summed with that in the first spectral bin of output 1, and the first spectral bin of output 2, and so on up to the Nth output to obtain the true value for the first frequency bin of the summed spectrum. The summed spectrum value for each frequency bin is computed in this fashion. These summed spectral values were post processed and the resulting numerical and graphical data presented.

NOTE:
It may be observed that the spectrum in some antenna port plots break the limit line however this in itself does NOT constitute a failure. In all cases a spectrum summation plot is provided in order to prove compliance. A failure occurs only after the summation of all spectrum plots have been summed and are found to be greater than the limit line.

Supporting Information
Calculated Power = A + 10 log (1/x) dBm
A = Total Power Spectral Density [10 Log10 ($10^{a/10}$ + $10^{b/10}$ + $10^{c/10}$ + $10^{d/10}$)]
x = Duty Cycle

Limits Power Spectral Density
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

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Equipment Configuration for Power Spectral Density - Peak			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
903.2	1.479	--	--	--	1.479	8.0	-6.5
915.2	-1.064	--	--	--	-1.064	8.0	-9.1
927.2	-1.602	--	--	--	-1.602	8.0	-9.6

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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Equipment Configuration for Power Spectral Density - Peak			
Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
903.2	7.062	--	--	--	7.062	8.0	-0.9
915.2	6.726	--	--	--	6.726	8.0	-1.3
927.2	5.487	--	--	--	5.487	8.0	-2.5

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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Equipment Configuration for Power Spectral Density - Peak			
Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	0.0
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
903.2	-0.219	--	--	--	-0.219	8.0	-8.2
915.2	2.318	--	--	--	2.318	8.0	-5.7
927.2	-1.380	--	--	--	-1.380	8.0	-9.4

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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9.1.3. 6dB & 99% Bandwidth

Conducted Test Conditions for 6 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247 ISED RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	6 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(2); 5.2	**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

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(2) Systems using digital modulation techniques may operate in the 902-928 MHz and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
903.2	1.083	--	--	--	1.083	1.083	≥500.0	-0.58
915.2	1.092	--	--	--	1.092	1.092	≥500.0	-0.59
927.2	1.100	--	--	--	1.100	1.100	≥500.0	-0.60

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)
	Port(s)				
MHz	a	b	c	d	
903.2	1.241	--	--	--	1.241
915.2	1.610	--	--	--	1.610
927.2	1.583	--	--	--	1.583

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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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
903.2	1.117	--	--	--	1.117	1.117	≥500.0	-0.62
915.2	1.117	--	--	--	1.117	1.117	≥500.0	-0.62
927.2	1.117	--	--	--	1.117	1.117	≥500.0	-0.62

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)
	Port(s)				
MHz	a	b	c	d	
903.2	1.485	--	--	--	1.485
915.2	1.478	--	--	--	1.478
927.2	1.429	--	--	--	1.429

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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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
903.2	1.092	--	--	--	1.092	1.092	≥500.0	-0.59
915.2	1.083	--	--	--	1.083	1.083	≥500.0	-0.58
927.2	1.083	--	--	--	1.083	1.083	≥500.0	-0.58

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)
	Port(s)				
MHz	a	b	c	d	
903.2	1.552	--	--	--	1.552
915.2	1.545	--	--	--	1.545
927.2	1.511	--	--	--	1.511

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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9.1.4. Emissions

9.1.4.1. Conducted Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247 ISED RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Transmitter Conducted Spurious and Band-Edge Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (d) Section 5.5	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement

Transmitter Conducted Spurious and Band-Edge emissions were measured at a limit of 30 dBc (average detector) or 20 dBc (peak detector) below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Measurements were made while EUT was operating in transmit mode of operation at the appropriate centre frequency closest to the band-edge. Emissions were maximized during the measurement and limits derived from the peak spectral power and drawn on each plot.

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

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

Limits Transmitter Conducted Spurious and Band-Edge Emissions

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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9.1.4.1.1. Conducted Low Band-Edge Emissions – Peak

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	903.2 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	850.0 - 915.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Revised Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-10.31	-3.48	902.40	--	--	-0.400

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).

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Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	903.2 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	850.0 - 915.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Revised Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-7.57	-3.48	902.30	--	--	-0.300

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).

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Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	903.2 MHz
Band-Edge Frequency:	902.0 MHz
Test Frequency Range:	850.0 - 915.0 MHz

Port(s)	Band-Edge Markers and Limit			Revised Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-8.51	-3.50	902.30	--	--	-0.300

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).

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9.1.4.1.2. Conducted High Band-Edge Emissions - Peak

Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.2 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	915.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Revised Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-4.51	-4.42	928.00	--	--	-0.000

-

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).

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Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.2 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	915.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Revised Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-4.72	-4.01	927.80	--	--	-0.200

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

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Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99.0
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.2 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	915.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Revised Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-4.02	-3.96	928.0	--	--	-0.000

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

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9.1.4.1.3. Conducted Spurious Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Max Unwanted Emission Levels	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (d)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement
Transmitter Conducted Spurious and Band-Edge emissions were measured at a limit of 30 dBc (average detector) or 20 dBc (peak detector) below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Measurements were made while EUT was operating in transmit mode of operation at the appropriate centre frequency closest to the band-edge. Emissions were maximized during the measurement and limits derived from the peak spectral power and drawn on each plot.

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

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

Limits Transmitter Conducted Spurious and Band-Edge Emissions
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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Equipment Configuration for Conducted Spurious Emissions - Peak			
Variant:	MCS4-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	1200 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Conducted Spurious Emissions - Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
903.2	30.0 - 10000.0	-50.037	-3.62	--	--	--	--	--	--
915.2	30.0 - 10000.0	-50.168	-6.00	--	--	--	--	--	--
927.2	30.0 - 10000.0	-49.969	-6.39	--	--	--	--	--	--

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).

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Equipment Configuration for Conducted Spurious Emissions - Peak			
Variant:	MCS6-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	2400 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Conducted Spurious Emissions - Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
903.2	30.0 - 10000.0	-50.537	-4.87	--	--	--	--	--	--
915.2	30.0 - 10000.0	-50.626	-5.48	--	--	--	--	--	--
927.2	30.0 - 10000.0	-49.289	-5.37	--	--	--	--	--	--

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).

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Equipment Configuration for Conducted Spurious Emissions - Peak			
Variant:	MCS7-OFDM-opt1	**Duty Cycle (%):**	99
Data Rate:	3600 kBit/s	**Antenna Gain (dBi):**	See 5.4 Antenna Details
Modulation:	DTS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	HA
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Conducted Spurious Emissions - Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
903.2	30.0 - 10000.0	-50.113	-4.69	--	--	--	--	--	--
915.2	30.0 - 10000.0	-50.112	-5.29	--	--	--	--	--	--
927.2	30.0 - 10000.0	-49.986	-6.53	--	--	--	--	--	--

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).

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9.1.4.2. Radiated Emissions

Frequency Band			
MHz	**MHz**	**MHz**	**GHz**
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

(1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.

(2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.

(3) Cable locating equipment operated pursuant to §15.213.

(4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.

(5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.

(6) Transmitters operating under the provisions of subparts D or F of this part.

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(7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.

(8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).

(9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).

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9.1.4.2.1. TX Spurious & Restricted Band Emissions

9.1.4.2.1.1. Maritek AT503008915 (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz			
Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	32.91	31.20	3.55	-5.69	29.06	MaxP	Vertical	149	179	40.0	-10.9	Pass
#2	148.34	33.74	4.34	-12.79	25.29	MaxP	Horizontal	100	179	43.5	-18.2	Pass
#3	276.38	37.34	4.90	-11.27	30.97	MaxP	Horizontal	100	300	46.0	-15.0	Pass
#4	749.74	31.30	6.47	-3.57	34.20	MaxP	Horizontal	149	210	46.0	-11.8	Pass
#5	778.84	30.73	6.56	-3.36	33.93	MaxP	Vertical	199	179	46.0	-12.1	Pass
#6	903.00	51.80	6.93	28.70	56.88	Fundamental	Vertical	149	89	--	--	Pass
#7	976.72	30.49	7.19	-1.08	36.61	MaxP	Vertical	100	59	54.0	-17.4	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Ceramic Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	33.88	31.13	3.56	-6.39	28.29	MaxP	Horizontal	149	240	40.0	-11.7	Pass
#2	130.88	32.24	4.25	-11.42	25.08	MaxP	Vertical	100	29	43.5	-18.4	Pass
#3	276.38	35.69	4.90	-11.27	29.33	MaxP	Vertical	100	209	46.0	-16.7	Pass
#4	483.96	31.98	5.63	-6.89	30.72	MaxP	Horizontal	149	330	46.0	-15.3	Pass
#5	747.80	30.89	6.46	-3.57	33.78	MaxP	Vertical	100	90	46.0	-12.2	Pass
#6	915.61	37.17	6.98	-1.75	42.40	Fundamental	Horizontal	100	330	--	--	Pass
#7	991.27	30.71	7.19	-0.87	37.03	MaxP	Horizontal	100	210	54.0	-17.0	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Ceramic Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	148.34	33.40	4.34	-12.79	24.95	MaxP	Horizontal	100	210	43.5	-18.6	Pass
#2	276.38	35.72	4.90	-11.27	29.35	MaxP	Vertical	149	179	46.0	-16.6	Pass
#3	614.91	30.58	6.07	-5.41	31.24	MaxP	Horizontal	149	0	46.0	-14.8	Pass
#4	660.50	31.88	6.21	-4.69	33.40	MaxP	Vertical	149	209	46.0	-12.6	Pass
#5	856.44	30.85	6.78	-2.34	35.28	MaxP	Vertical	149	270	46.0	-10.7	Pass
#6	928.22	35.95	7.00	-1.56	41.39	Fundamental	Vertical	199	89	--	--	Pass
#7	950.53	30.75	7.08	-1.39	36.44	MaxP	Horizontal	100	150	46.0	-9.6	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Ceramic Antenna												

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9.1.4.2.1.2. Maritek AT503008915 (1GHz – 18GHz)

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz			
Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	5420.00	53.81	3.08	34.50	45.33	MaxP	Vertical	199	59	74.0	-28.7	Pass
#2	9908.00	49.43	4.19	37.24	48.41	MaxP	Horizontal	199	180	74.0	-25.6	Pass
#3	10163.00	51.38	4.42	37.44	50.49	MaxP	Vertical	150	90	74.0	-23.5	Pass
#4	13189.00	51.73	5.10	38.98	49.92	MaxP	Horizontal	150	210	74.0	-24.1	Pass
#5	17150.00	48.80	6.67	41.37	55.34	MaxP	Horizontal	150	300	74.0	-18.7	Pass
#6	17915.00	48.80	6.67	41.55	56.75	MaxP	Vertical	199	269	74.0	-17.2	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4, Ceramic Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz

Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2496.00	51.64	2.00	32.44	41.86	MaxP	Horizontal	200	180	74.0	-32.1	Pass
#2	5488.00	53.12	3.10	34.53	44.37	MaxP	Vertical	150	0	74.0	-29.6	Pass
#3	9823.00	49.63	4.36	37.06	48.52	MaxP	Horizontal	150	150	74.0	-25.5	Pass
#4	15382.00	50.56	5.57	40.04	52.46	MaxP	Vertical	150	90	74.0	-21.5	Pass
#5	17609.00	49.48	6.37	41.62	55.12	MaxP	Vertical	200	330	74.0	-18.9	Pass
#6	17728.00	48.77	6.37	41.67	55.54	MaxP	Horizontal	150	60	74.0	-18.5	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4, Ceramic Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz

Antenna:	Ceramic Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	3975.00	50.75	2.52	33.43	41.17	MaxP	Vertical	149	150	74.0	-32.8	Pass
#2	5811.00	50.90	3.20	34.87	44.01	MaxP	Horizontal	149	90	74.0	-30.0	Pass
#3	13648.00	53.07	5.1	38.98	51.26	MaxP	Horizontal	150	210	74	-22.7	Pass
#4	14311.00	52.60	5.24	39.43	51.33	MaxP	Horizontal	149	150	74.0	-22.7	Pass
#5	16759.00	48.82	6.65	41.69	54.84	MaxP	Horizontal	149	270	74.0	-19.2	Pass
#6	17456.00	50.14	6.11	41.39	55.74	MaxP	Vertical	199	30	74.0	-18.3	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4, Ceramic Antenna												

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9.1.4.2.1.3. FG9026 Antenna (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	199.75	41.03	4.59	-12.16	33.46	MaxP	Vertical	100	29	43.5	-10.0	Pass
#2	410.24	35.02	5.38	-8.69	31.72	MaxP	Horizontal	149	0	46.0	-14.3	Pass
#3	519.85	37.97	5.76	-6.73	37.00	MaxP	Vertical	100	59	46.0	-9.0	Pass
#4	519.85	37.86	5.76	-6.73	36.89	MaxP	Horizontal	199	330	46.0	-9.1	Pass
#5	839.95	39.20	6.74	-2.41	43.53	MaxP	Vertical	100	179	46.0	-2.5	Pass
#6	903.00	56.38	6.93	28.70	61.46	Fundamental	Vertical	149	119	--	--	Pass
#7	903.97	39.03	6.93	-1.83	44.13	Fundamental	Horizontal	199	208	--	--	Pass
Test Notes: 3.3Vdc, 903.2 OFDM Opt1 MCS4 FG9026 Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	114.39	32.37	4.17	-11.51	25.02	MaxP	Horizontal	100	60	43.5	-18.5	Pass
#2	399.57	35.52	5.35	-9.07	31.79	MaxP	Horizontal	149	0	46.0	-14.2	Pass
#3	399.57	35.52	5.35	-9.07	31.79	MaxP	Horizontal	149	0	46.0	-14.2	Pass
#4	410.24	36.92	5.38	-8.69	33.62	MaxP	Vertical	200	269	46.0	-12.4	Pass
#5	410.24	36.92	5.38	-8.69	33.62	MaxP	Vertical	200	269	46.0	-12.4	Pass
#6	510.15	37.75	5.72	-6.98	36.49	MaxP	Vertical	100	29	46.0	-9.5	Pass
#7	510.15	37.75	5.72	-6.98	36.49	MaxP	Vertical	100	29	46.0	-9.5	Pass
#8	519.85	37.26	5.76	-6.73	36.29	MaxP	Horizontal	200	330	46.0	-9.7	Pass
#9	839.95	37.40	6.74	-2.41	41.73	MaxP	Vertical	100	59	46.0	-4.3	Pass
#10	839.95	37.40	6.74	-2.41	41.73	MaxP	Vertical	100	59	46.0	-4.3	Pass
#11	915.61	40.91	6.98	-1.75	46.14	Fundamental	Vertical	149	239	--	--	Pass
Test Notes: 3.3Vdc, 915.2 OFDM Opt1 MCS4 FG9026 Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	199.75	35.76	4.59	-12.16	28.18	MaxP	Vertical	99	119	43.5	-15.3	Pass
#2	500.45	38.57	5.69	-7.01	37.24	MaxP	Vertical	99	0	46.0	-8.8	Pass
#3	839.95	37.12	6.74	-2.41	41.45	MaxP	Vertical	99	0	46.0	-4.5	Pass
#4	839.99	31.28	6.74	-2.41	35.61	MaxP	Horizontal	200	178	46.0	-10.4	Pass
#5	928.22	41.37	7.00	-1.56	46.81	Fundamental	Vertical	149	239	--	--	Pass
#6	928.22	36.67	7.00	-1.56	42.11	Fundamental	Horizontal	199	300	--	--	Pass
Test Notes: 3.3Vdc, 927.2 OFDM Opt1 MCS4 FG9026 Antenna												

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9.1.4.2.1.4. FG9026 Antenna (1GHz – 18GHz*)*

Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2700.00	59.54	2.06	32.43	49.85	MaxP	Vertical	199	330	74.0	-24.1	Pass
#2	2700.00	59.27	2.06	32.43	49.58	MaxP	Horizontal	199	330	74.0	-24.4	Pass
#3	3601.00	54.50	2.41	33.09	45.10	MaxP	Horizontal	150	90	74.0	-28.9	Pass
#4	12713.00	52.91	5.43	39.10	50.89	MaxP	Vertical	150	119	74.0	-23.1	Pass
#5	16844.00	47.38	6.32	41.70	53.05	MaxP	Horizontal	150	150	74.0	-21.0	Pass
#6	17915.00	47.83	6.67	41.55	55.79	MaxP	Vertical	150	0	74.0	-18.2	Pass
Test Notes: 3.3Vdc, 903.2 OFDM Opt1 MCS4 FG9026 Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2734.00	58.66	2.11	32.44	49.02	MaxP	Vertical	199	330	74.0	-25.0	Pass
#2	2751.00	49.92	2.11	32.45	40.29	MaxP	Horizontal	149	240	74.0	-33.7	Pass
#3	12764.00	52.18	5.26	39.12	49.37	MaxP	Horizontal	199	60	74.0	-24.6	Pass
#4	13835.00	51.32	5.14	39.10	49.49	MaxP	Vertical	199	209	74.0	-24.5	Pass
#5	17507.00	50.79	6.35	41.49	55.90	MaxP	Vertical	199	330	74.0	-18.1	Pass
#6	17813.00	49.26	6.27	41.66	56.40	MaxP	Horizontal	199	30	74.0	-17.6	Pass
Test Notes: 3.3Vdc, 915.2 OFDM Opt1 MCS4 FG9026 Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	FG9026 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2768.00	57.94	2.16	32.47	48.36	MaxP	Horizontal	199	30	74.0	-25.6	Pass
#2	2768.00	56.25	2.16	32.47	46.67	MaxP	Vertical	150	209	74.0	-27.3	Pass
#3	8837.00	51.58	4.10	36.01	47.79	MaxP	Vertical	150	59	74.0	-26.2	Pass
#4	11081.00	49.81	4.74	37.85	49.04	MaxP	Horizontal	199	120	74.0	-25.0	Pass
#5	17388.00	48.10	6.52	41.34	53.58	MaxP	Horizontal	150	120	74.0	-20.4	Pass
#6	17915.00	46.72	6.67	41.55	54.67	MaxP	Vertical	199	29	74.0	-19.3	Pass
Test Notes: 3.3Vdc, 927.2 OFDM Opt1 MCS4 FG9026 Antenna												

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9.1.4.2.1.5. Phantom TRA9023P (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	276.38	33.8	4.90	-11.27	27.43	MaxP	Vertical	100	330	46.0	-18.6	Pass
#2	276.38	36.37	4.90	-11.27	30.00	MaxP	Horizontal	149	300	46.0	-16.0	Pass
#3	693.48	31.44	6.29	-4.32	33.42	MaxP	Vertical	199	0	46.0	-12.6	Pass
#4	838.98	31.30	6.73	-2.42	35.62	MaxP	Vertical	199	179	46.0	-10.4	Pass
#5	868.08	30.28	6.83	-2.18	34.94	MaxP	Horizontal	199	300	46.0	-11.1	Pass
#6	903.00	57.76	6.93	28.70	62.84	Fundamental	Vertical	100	149	--	--	Pass
#7	964.11	31.33	7.11	-1.09	37.35	MaxP	Horizontal	149	330	54.0	-16.7	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	276.38	36.54	4.90	-11.27	30.18	MaxP	Horizontal	100	300	46.0	-15.8	Pass
#2	359.80	33.45	5.23	-9.77	28.91	MaxP	Horizontal	100	330	46.0	-17.1	Pass
#3	644.01	28.86	6.15	-4.62	30.39	MaxP	Vertical	100	0	46.0	-15.6	Pass
#4	914.64	35.84	6.98	-1.74	41.07	MaxP	Horizontal	149	270	46.0	-4.9	Pass
#5	915.61	41.98	6.98	-1.75	47.21	Fundamental	Vertical	100	209	--	--	Pass
#6	916.58	37.82	6.97	-1.74	43.05	MaxP	Vertical	100	239	46.0	-3.0	Pass
#7	995.15	32.11	7.18	-0.89	38.40	MaxP	Vertical	100	209	54.0	-15.6	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	275.41	31.24	4.90	-11.27	24.86	MaxP	Vertical	199	330	46.0	-21.1	Pass
#2	276.38	35.29	4.90	-11.27	28.92	MaxP	Horizontal	100	120	46.0	-17.1	Pass
#3	740.04	31.36	6.44	-3.70	34.10	MaxP	Horizontal	199	300	46.0	-11.9	Pass
#4	871.96	32.21	6.87	-2.17	36.91	MaxP	Vertical	149	89	46.0	-9.1	Pass
#5	927.25	41.82	7.00	-1.55	47.27	Fundamental	Horizontal	149	300	--	--	Pass
#6	970.90	31.07	7.15	-1.08	37.14	MaxP	Horizontal	149	210	54.0	-16.9	Pass
#7	975.75	32.00	7.18	-1.08	38.09	MaxP	Vertical	100	179	54.0	-15.9	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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9.1.4.2.1.6. Phantom TRA9023P (1GHz – 18GHz)

Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1799.00	57.53	1.73	30.39	44.69	MaxP	Horizontal	149	330	74.0	-29.3	Pass
#2	2700.00	57.31	2.06	32.43	47.61	MaxP	Vertical	199	330	74.0	-26.4	Pass
#3	11880.00	51.88	4.95	38.77	50.55	MaxP	Vertical	199	330	74.0	-23.5	Pass
#4	17541.00	49.31	6.50	41.55	55.10	MaxP	Horizontal	199	90	74.0	-18.9	Pass
#5	17915.00	47.79	6.67	41.55	55.74	MaxP	Vertical	199	239	74.0	-18.3	Pass
#6	17915.00	47.28	6.67	41.55	55.23	MaxP	Horizontal	199	210	74.0	-18.8	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1816.00	54.88	1.73	30.49	42.16	MaxP	Vertical	199	29	74.0	-31.8	Pass
#2	2734.00	59.25	2.11	32.44	49.62	MaxP	Horizontal	150	120	74.0	-24.4	Pass
#3	2734.00	56.53	2.11	32.44	46.90	MaxP	Vertical	150	30	74.0	-27.1	Pass
#4	12730.00	54.54	5.22	39.11	51.72	MaxP	Horizontal	150	210	74.0	-22.3	Pass
#5	17150.00	48.09	6.67	41.37	54.63	MaxP	Vertical	199	29	74.0	-19.4	Pass
#6	17983.00	48.18	6.34	41.48	54.79	MaxP	Horizontal	199	180	74.0	-19.2	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Laird Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1850.00	55.67	1.73	30.49	42.95	MaxP	Vertical	199	29	74	-31.1	Pass
#2	2768.00	57.66	2.16	32.47	48.07	MaxP	Horizontal	150	270	74.0	-25.9	Pass
#3	2768.00	54.57	2.16	32.47	44.99	MaxP	Vertical	199	90	74.0	-29.0	Pass
#4	13546.00	53.20	5.47	39.12	51.14	MaxP	Horizontal	199	30	74.0	-22.9	Pass
#5	15790.00	47.76	5.90	40.51	52.12	MaxP	Vertical	150	239	74.0	-21.9	Pass
#6	17286.00	48.58	6.48	41.30	54.50	MaxP	Horizontal	199	210	74.0	-19.5	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Laird Antenna												

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9.1.4.2.1.7. Molex 2111400100 (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	276.38	38.10	4.90	-11.27	31.73	MaxP	Vertical	99	240	46.0	-14.3	Pass
#2	277.35	30.12	4.90	-11.27	23.76	MaxP	Horizontal	99	240	46.0	-22.2	Pass
#3	838.98	28.73	6.73	-2.42	33.04	MaxP	Horizontal	99	300	46.0	-13.0	Pass
#4	850.62	32.84	6.82	-2.38	37.28	MaxP	Vertical	199	330	46.0	-8.7	Pass
#5	902.03	34.94	6.93	-1.86	40.01	Fundamental	Horizontal	99	330	--	--	Pass
#6	903.00	53.28	6.93	-1.86	58.35	Fundamental	Vertical	99	330	--	--	Pass
#7	971.87	30.40	7.14	-1.08	36.46	MaxP	Vertical	149	330	54.0	-17.5	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	30.97	32.58	3.52	-4.10	32.00	MaxP	Vertical	199	179	40.0	-8.0	Pass
#2	276.38	37.99	4.90	-11.27	31.62	MaxP	Vertical	149	239	46.0	-14.4	Pass
#3	276.38	39.58	4.90	-11.27	33.21	MaxP	Horizontal	99	240	46.0	-12.8	Pass
#4	682.81	29.85	6.27	-4.53	31.59	MaxP	Vertical	99	59	46.0	-14.4	Pass
#5	850.62	32.58	6.82	-2.38	37.03	MaxP	Horizontal	199	330	46.0	-9.0	Pass
#6	915.61	39.74	6.82	-1.75	44.81	Fundamental	Vertical	99	328	--	--	Pass
#7	915.61	39.16	6.98	-1.75	44.39	Fundamental	Horizontal	99	300	--	--	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	138.64	29.68	4.29	-12.13	21.84	MaxP	Vertical	100	209	43.5	-21.7	Pass
#2	275.41	29.73	4.90	-11.27	23.36	MaxP	Vertical	100	239	46.0	-22.6	Pass
#3	276.38	39.08	4.90	-11.27	32.71	MaxP	Horizontal	100	240	46.0	-13.3	Pass
#4	695.42	28.85	6.30	-4.28	30.87	MaxP	Horizontal	100	240	46.0	-15.1	Pass
#5	827.34	31.94	6.73	-2.42	36.25	MaxP	Vertical	100	330	46.0	-9.7	Pass
#6	928.22	41.13	7.00	-1.56	46.57	Fundamental	Vertical	100	330	--	--	Pass
#7	970.90	34.08	7.15	-1.08	40.15	MaxP	Horizontal	100	30	54.0	-13.9	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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9.1.4.2.1.8. Molex 2111400100 (1GHz – 18GHz)

Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1799.00	58.50	1.73	30.39	45.67	MaxP	Vertical	150	269	74.0	-28.3	Pass
#2	1799.00	58.67	1.73	30.39	45.84	MaxP	Horizontal	150	30	74.0	-28.2	Pass
#3	2700.00	55.79	2.06	32.43	46.10	MaxP	Vertical	199	89	74.0	-27.9	Pass
#4	13223.00	51.52	5.07	39.00	49.76	MaxP	Vertical	150	89	74.0	-24.2	Pass
#5	13852.00	53.84	5.29	39.11	52.00	MaxP	Horizontal	150	60	74.0	-22.0	Pass
#6	17915.00	47.68	6.67	41.55	55.63	MaxP	Horizontal	150	60	74.0	-18.4	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1816.00	55.93	1.73	30.49	43.21	MaxP	Horizontal	150	30	74.0	-30.8	Pass
#2	2734.00	55.21	2.11	32.44	45.58	MaxP	Vertical	150	209	74.0	-28.4	Pass
#3	2734.00	55.21	2.11	32.44	45.58	MaxP	Vertical	150	209	74.0	-28.4	Pass
#4	13563.00	52.52	5.35	39.12	50.15	MaxP	Horizontal	199	60	74.0	-23.9	Pass
#5	15365.00	50.31	5.59	40.01	52.41	MaxP	Vertical	150	239	74.0	-21.6	Pass
#6	17813.00	48.55	6.27	41.66	55.69	MaxP	Vertical	150	29	74.0	-18.3	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	Molex Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1850.00	53.89	1.70	30.70	41.41	MaxP	Vertical	150	299	74.0	-32.6	Pass
#2	2768.00	53.69	2.16	32.47	44.11	MaxP	Vertical	199	150	74.0	-29.9	Pass
#3	2768.00	53.22	2.16	32.47	43.63	MaxP	Horizontal	150	150	74.0	-30.4	Pass
#4	10435.00	49.83	4.56	37.58	49.60	MaxP	Horizontal	199	30	74.0	-24.4	Pass
#5	15790.00	49.19	5.90	40.51	53.55	MaxP	Vertical	150	89	74.0	-20.4	Pass
#6	15994.00	48.54	5.82	40.72	52.97	MaxP	Horizontal	150	90	74.0	-21.0	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Molex Antenna												

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9.1.4.2.1.9. ACE-915NF (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	138.64	30.13	4.29	-12.13	22.29	MaxP	Vertical	199	270	43.5	-21.2	Pass
#2	240.49	30.05	4.76	-13.02	21.79	MaxP	Horizontal	199	330	46.0	-24.2	Pass
#3	321.00	31.13	5.11	20.44	25.31	MaxP	Vertical	199	240	46.0	-20.7	Pass
#4	721.61	29.42	6.40	-3.93	31.88	MaxP	Horizontal	100	180	46.0	-14.1	Pass
#5	882.63	30.19	6.88	-2.23	34.84	MaxP	Vertical	149	299	46.0	-11.2	Pass
#6	903.00	55.64	6.93	28.70	60.72	Fundamental	Vertical	100	89	--	--	Pass
#7	945.68	31.75	7.09	-1.53	37.30	MaxP	Horizontal	199	120	46.0	-8.7	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	199.75	36.11	4.59	-12.16	28.54	MaxP	Horizontal	199	330	43.5	-15.0	Pass
#2	359.80	35.66	5.23	-9.77	31.12	MaxP	Vertical	100	328	46.0	-14.9	Pass
#3	665.35	35.33	6.21	-4.73	36.81	MaxP	Vertical	100	269	46.0	-9.2	Pass
#4	880.69	32.96	6.88	-2.21	37.63	MaxP	Vertical	100	149	46.0	-8.4	Pass
#5	915.61	40.83	6.98	-1.75	46.06	Fundamental	Vertical	149	180	--	--	Pass
#6	915.61	35.03	6.98	-1.75	40.26	Fundamental	Horizontal	149	120	--	--	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	30.97	32.99	3.52	-4.10	32.41	MaxP	Horizontal	99	60	40.0	-7.6	Pass
#2	320.03	33.90	5.11	-10.93	28.08	MaxP	Vertical	99	330	46.0	-17.9	Pass
#3	459.71	33.99	5.56	-7.43	32.12	MaxP	Horizontal	199	330	46.0	-13.9	Pass
#4	610.06	34.90	6.04	-5.52	35.42	MaxP	Horizontal	149	330	46.0	-10.6	Pass
#5	670.20	37.34	6.23	-4.78	38.79	MaxP	Vertical	99	299	46.0	-7.2	Pass
#6	927.25	39.39	7.00	-1.55	44.85	MaxP	Fundamental	99	239	--	--	Pass
#7	975.75	32.69	7.18	-1.08	38.78	MaxP	Vertical	149	209	54.0	-15.2	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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9.1.4.2.1.10. ACE-915NF (1GHz – 18GHz)

Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz			
Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1799.00	57.10	1.73	30.39	44.26	MaxP	Vertical	150	90	74.0	-29.7	Pass
#2	2700.00	58.11	2.06	32.43	48.42	MaxP	Vertical	199	330	74.0	-25.6	Pass
#3	2700.00	58.35	2.06	32.43	48.66	MaxP	Horizontal	150	30	74.0	-25.3	Pass
#4	12781.00	54.66	5.29	39.13	52.16	MaxP	Horizontal	199	90	74.0	-21.8	Pass
#5	16470.00	49.11	6.35	41.02	54.83	MaxP	Vertical	151	0	74.0	-20.8	Pass
#6	16878.00	48.71	6.59	41.70	54.75	MaxP	Horizontal	150	270	74.0	-19.3	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2734.00	58.23	2.11	32.44	48.60	MaxP	Horizontal	150	30	74.0	-25.4	Pass
#2	2734.00	56.16	2.11	32.44	46.53	MaxP	Vertical	150	330	74.0	-27.5	Pass
#3	12696.00	53.04	5.26	39.09	51.35	MaxP	Vertical	199	90	74.0	-22.6	Pass
#4	15450.00	50.74	5.58	40.13	53.13	MaxP	Horizontal	150	270	74.0	-20.9	Pass
#5	17507.00	48.13	6.35	41.49	53.23	MaxP	Vertical	150	149	74.0	-20.8	Pass
#6	17898.00	47.54	6.28	41.57	54.72	MaxP	Horizontal	150	210	74.0	-19.3	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz - 18 GHz

Antenna:	MPD Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	2768.00	54.94	2.16	32.47	45.36	MaxP	Horizontal	149	270	74.0	-28.6	Pass
#2	2768.00	56.15	2.16	32.47	46.57	MaxP	Vertical	149	330	74.0	-27.4	Pass
#3	13257.00	52.78	4.93	39.05	51.22	MaxP	Vertical	199	330	74.0	-22.8	Pass
#4	14260.00	51.09	5.36	39.38	49.34	MaxP	Horizontal	199	270	74.0	-24.7	Pass
#5	17898.00	48.01	6.28	41.57	55.19	MaxP	Horizontal	199	30	74.0	-18.8	Pass
#6	17915.00	47.83	6.67	41.55	55.79	MaxP	Vertical	149	269	74.0	-18.2	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 MPD Antenna												

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9.1.4.2.1.11. Taoglas FXUB65 Antenna (30MHz – 1GHz)

Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	199.75	41.43	4.59	-12.16	33.86	MaxP	Vertical	199	330	43.5	-9.6	Pass
#2	276.38	36.45	4.90	-11.27	30.08	MaxP	Vertical	199	270	46.0	-15.9	Pass
#3	671.17	30.29	6.23	-4.76	31.76	MaxP	Horizontal	149	210	46.0	-14.2	Pass
#4	671.17	30.29	6.23	-4.76	31.76	MaxP	Horizontal	149	210	46.0	-14.2	Pass
#5	838.98	31.61	6.73	-2.42	35.92	MaxP	Horizontal	99	300	46.0	-10.1	Pass
#6	903.00	54.25	6.93	28.70	59.33	Fundamental	Horizontal	99	300	--	--	Pass
#7	951.50	32.24	7.08	-1.35	37.97	MaxP	Vertical	99	180	46.0	-8.0	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM Opt1 MCS4 Taoglas FXUB65 Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	31.94	32.64	3.53	-4.85	31.32	MaxP	Vertical	199	209	40.0	-8.7	Pass
#2	219.15	34.05	4.67	-13.59	25.13	MaxP	Horizontal	100	210	46.0	-20.9	Pass
#3	276.38	34.59	4.90	-11.27	28.23	MaxP	Vertical	149	269	46.0	-17.8	Pass
#4	320.03	33.20	5.11	-10.93	27.38	MaxP	Horizontal	100	300	46.0	-18.6	Pass
#5	420.91	28.85	5.41	-8.28	25.98	MaxP	Vertical	149	299	46.0	-20.0	Pass
#6	670.20	38.39	6.23	-4.78	39.84	MaxP	Horizontal	149	300	46.0	-6.2	Pass
#7	915.61	38.96	6.98	-1.75	44.19	Fundamental	Vertical	149	59	--	--	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM Opt1 MCS4 Taoglas FXUB65 Antenna												

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Equipment Configuration for 30 MHz TO 1 GHz

Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	30.97	31.09	3.52	-4.10	30.52	MaxP	Vertical	100	149	40.0	-9.5	Pass
#2	199.75	40.96	4.59	-12.16	33.38	MaxP	Horizontal	100	210	43.5	-10.1	Pass
#3	418.97	29.50	5.41	-8.32	26.59	MaxP	Vertical	100	299	46.0	-19.4	Pass
#4	679.90	36.44	6.27	-4.57	38.13	MaxP	Horizontal	149	300	46.0	-7.9	Pass
#5	709.97	33.25	6.32	-3.84	35.83	MaxP	Vertical	100	330	46.0	-10.2	Pass
#6	839.95	36.56	6.74	-2.41	40.89	MaxP	Horizontal	149	178	46.0	-5.1	Pass
#7	928.22	37.33	7.00	-1.56	42.77	Fundamental	Vertical	199	119	--	--	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM Opt1 MCS4 Taoglas FXUB65 Antenna												

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9.1.4.2.1.12. Taoglas FXUB65 Antenna (1GHz – 18GHz)

Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz			
Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	903.2	**Data Rate:**	Not Applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1799.00	60.65	1.73	30.39	47.81	MaxP	Horizontal	150	210	74.0	-26.2	Pass
#2	1799.00	58.38	1.73	30.39	45.54	MaxP	Vertical	199	150	74.0	-28.5	Pass
#3	2700.00	57.97	2.06	32.43	48.28	MaxP	Horizontal	199	0	74.0	-25.7	Pass
#4	2700.00	55.27	2.06	32.43	45.58	MaxP	Vertical	150	179	74.0	-28.4	Pass
#5	17354.00	49.33	6.36	41.31	55.48	MaxP	Vertical	150	269	74.0	-18.5	Pass
#6	17915.00	49.23	6.67	41.55	57.19	MaxP	Horizontal	150	30	74.0	-16.8	Pass
Test Notes: 3.3Vdc, 903.2 MHz, OFDM, Opt1, MCS4 Taoglas FXUB65 Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz

Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.2	**Data Rate:**	Not applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1816.00	56.68	1.73	30.49	43.96	MaxP	Horizontal	199	330	74.0	-30.0	Pass
#2	2734.00	54.68	2.11	32.44	45.04	MaxP	Vertical	199	239	74.0	-29.0	Pass
#3	13036.00	53.14	5.48	39.02	51.10	MaxP	Horizontal	150	300	74.0	-22.9	Pass
#4	13223.00	52.91	5.07	39.00	51.14	MaxP	Vertical	199	299	74.0	-22.9	Pass
#5	17150.00	48.60	6.67	41.37	55.14	MaxP	Horizontal	150	150	74.0	-18.9	Pass
#6	17150.00	49.19	6.67	41.37	55.73	MaxP	Vertical	150	150	74.0	-18.3	Pass
Test Notes: 3.3Vdc, 915.2 MHz, OFDM, Opt1, MCS4 Taoglas FXUB65 Antenna												

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Equipment Configuration for FCC SPURIOUS 1 GHz -18 GHz

Antenna:	Taoglas FXUB65 Antenna	**Variant:**	DTS
Antenna Gain (dBi):	See 5.4 Antenna Details	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.2	**Data Rate:**	Not applicable
Power Setting:	PL4	**Tested By:**	HA

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
#1	1850.00	54.75	1.70	30.70	42.27	MaxP	Horizontal	150	150	74.0	-31.7	Pass
#2	2768.00	56.71	2.16	32.47	47.13	MaxP	Horizontal	199	0	74.0	-26.9	Pass
#3	2768.00	53.47	2.16	32.47	43.88	MaxP	Vertical	150	239	74.0	-30.1	Pass
#4	15654.00	49.47	5.68	40.36	52.55	MaxP	Vertical	150	90	74.0	-21.4	Pass
#5	17847.00	49.49	6.30	41.63	56.15	MaxP	Vertical	199	209	74.0	-17.9	Pass
#6	17915.00	47.58	6.67	41.55	55.54	MaxP	Horizontal	199	120	74.0	-18.5	Pass
Test Notes: 3.3Vdc, 927.2 MHz, OFDM, Opt1, MCS4 Taoglas FXUB65 Antenna												

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APPENDIX A - GRAPHICAL IMAGES

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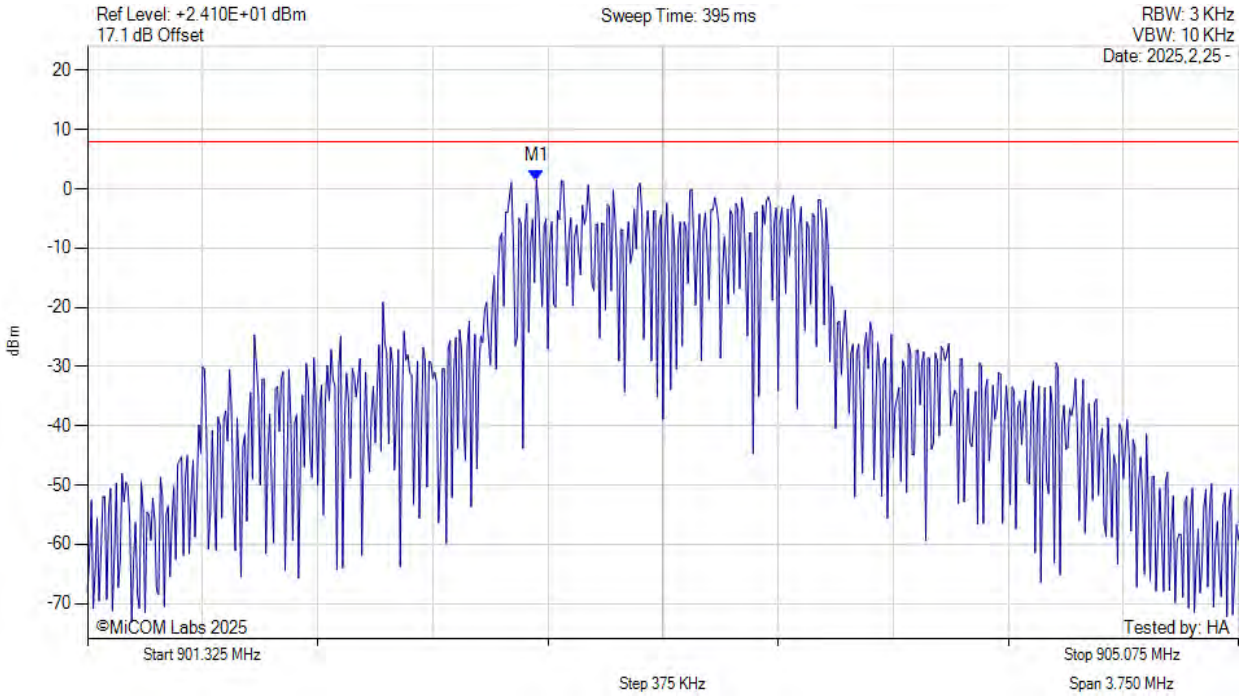
A.1. DTS

A.1.1. Power Spectral Density – Peak

POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.788 MHz : 1.479 dBm	Limit: ≤ 8.000 dBm Margin: -6.52 dB

back to matrix

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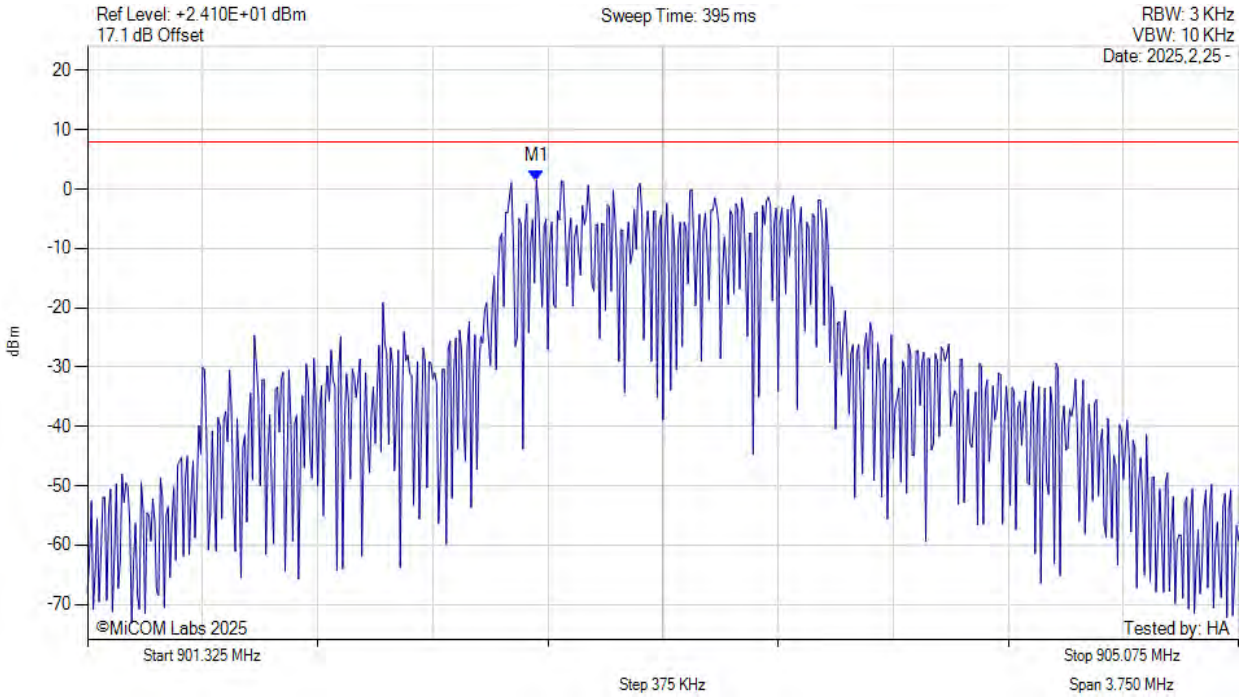
POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 903.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.788 MHz : 1.479 dBm	Limit: ≤ 8.0 dBm Margin: -6.5 dB

back to matrix

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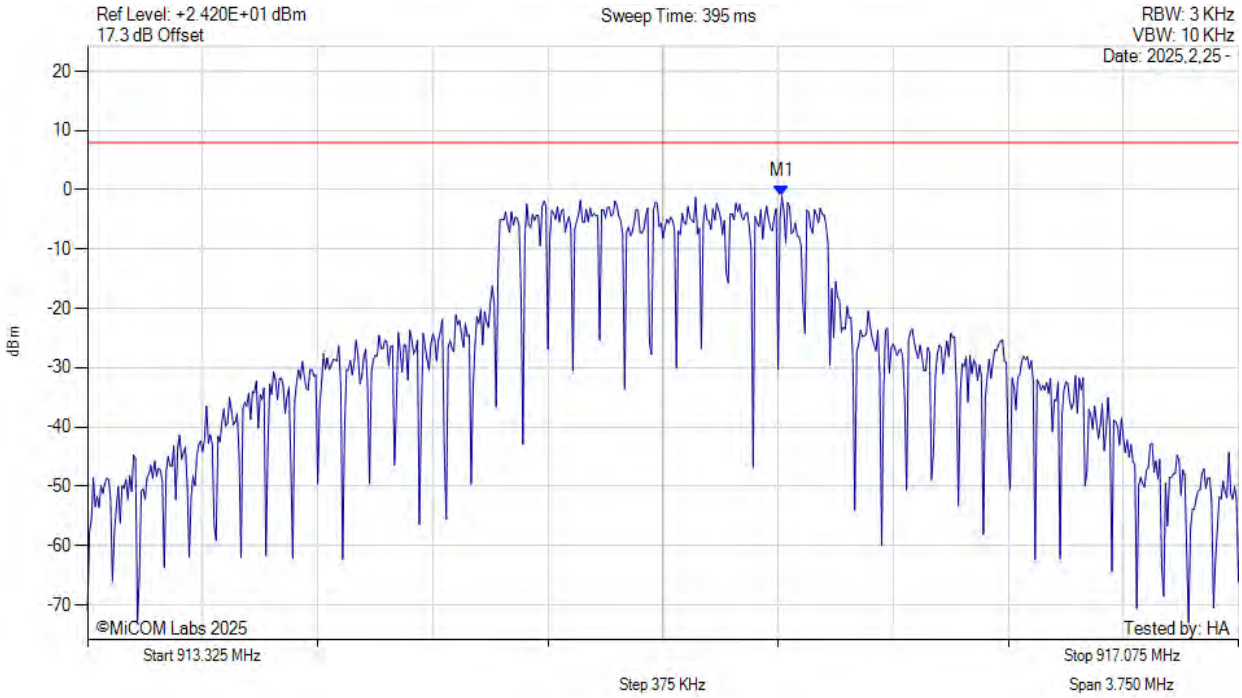
POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 915.588 MHz : -1.064 dBm	Limit: ≤ 8.000 dBm Margin: 9.06 dB

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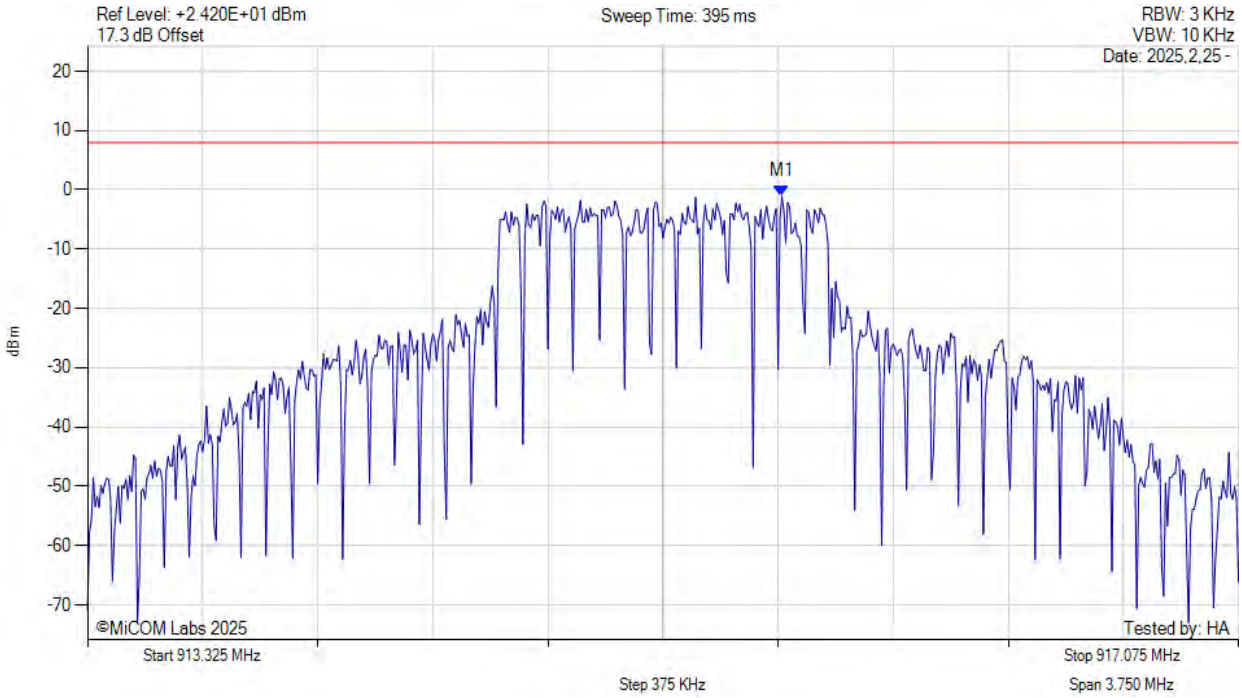
POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 915.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 915.588 MHz : -1.064 dBm	Limit: ≤ 8.0 dBm Margin: -9.1 dB

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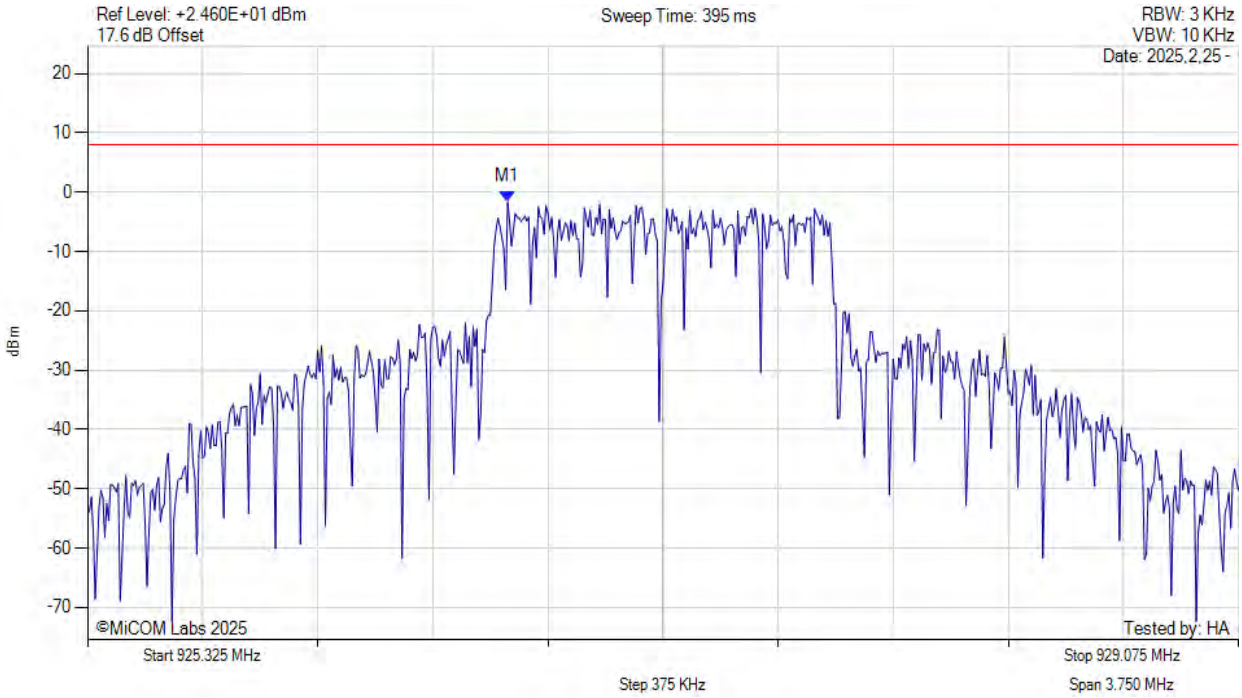
POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.694 MHz : -1.602 dBm	Limit: ≤ 8.000 dBm Margin: 9.60 dB

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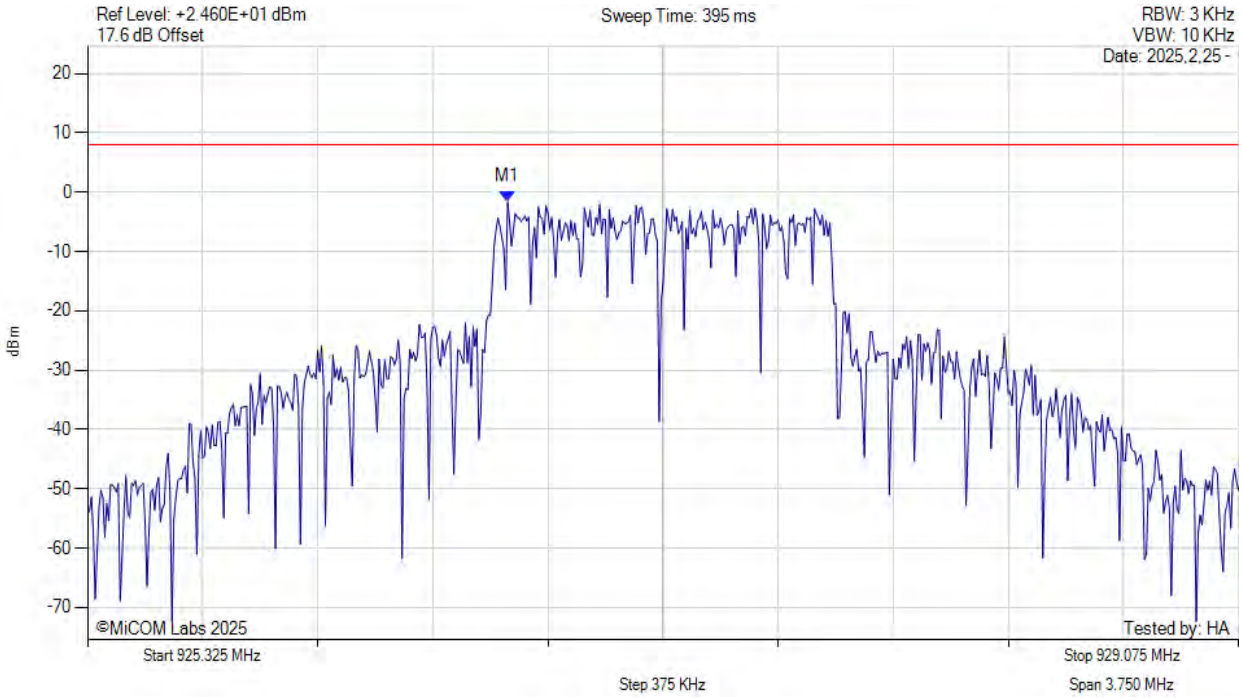
POWER SPECTRAL DENSITY - PEAK

Variant: MCS4-OFDM-opt1, Channel: 927.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.694 MHz : -1.602 dBm	Limit: ≤ 8.0 dBm Margin: -9.6 dB

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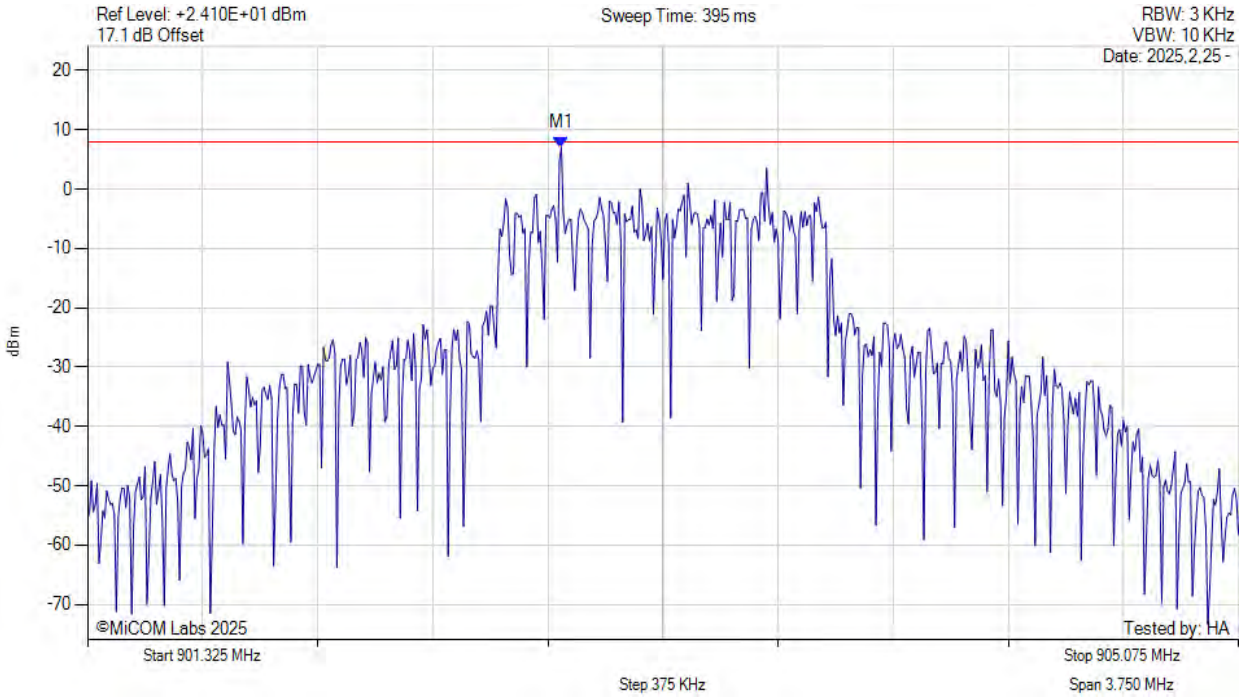
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.869 MHz : 7.062 dBm	Limit: ≤ 8.000 dBm Margin: -0.94 dB

back to matrix

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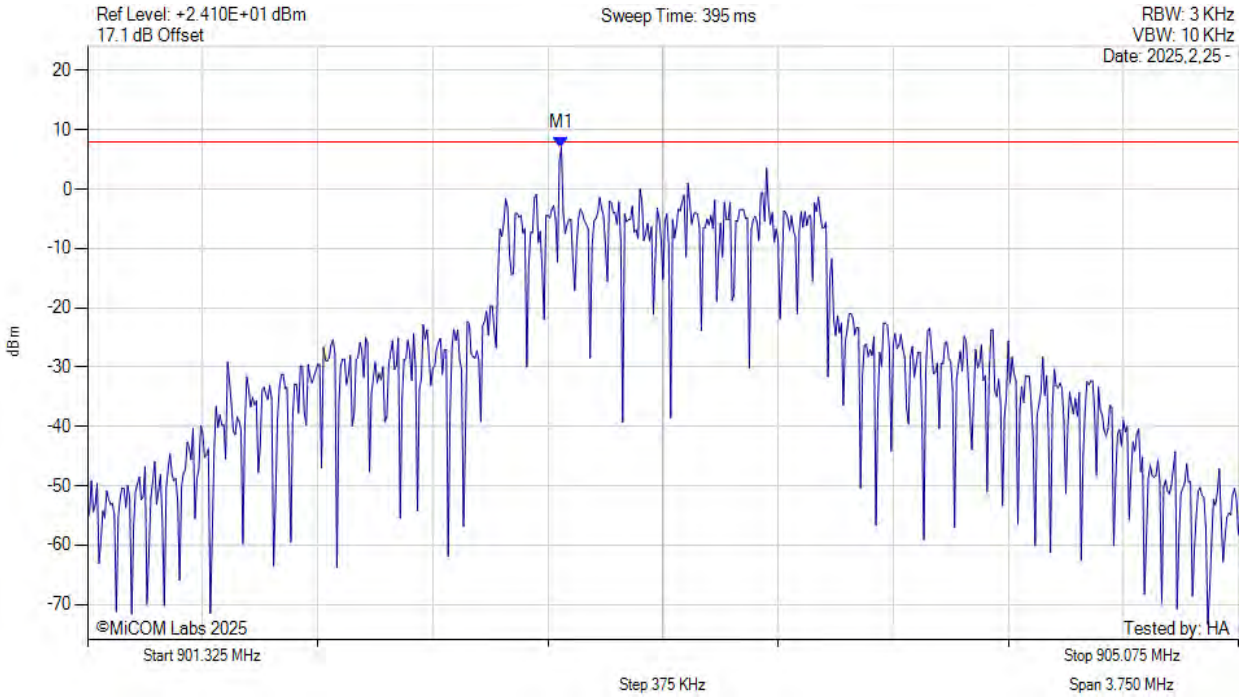
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 903.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.869 MHz : 7.062 dBm	Limit: ≤ 8.0 dBm Margin: -0.9 dB

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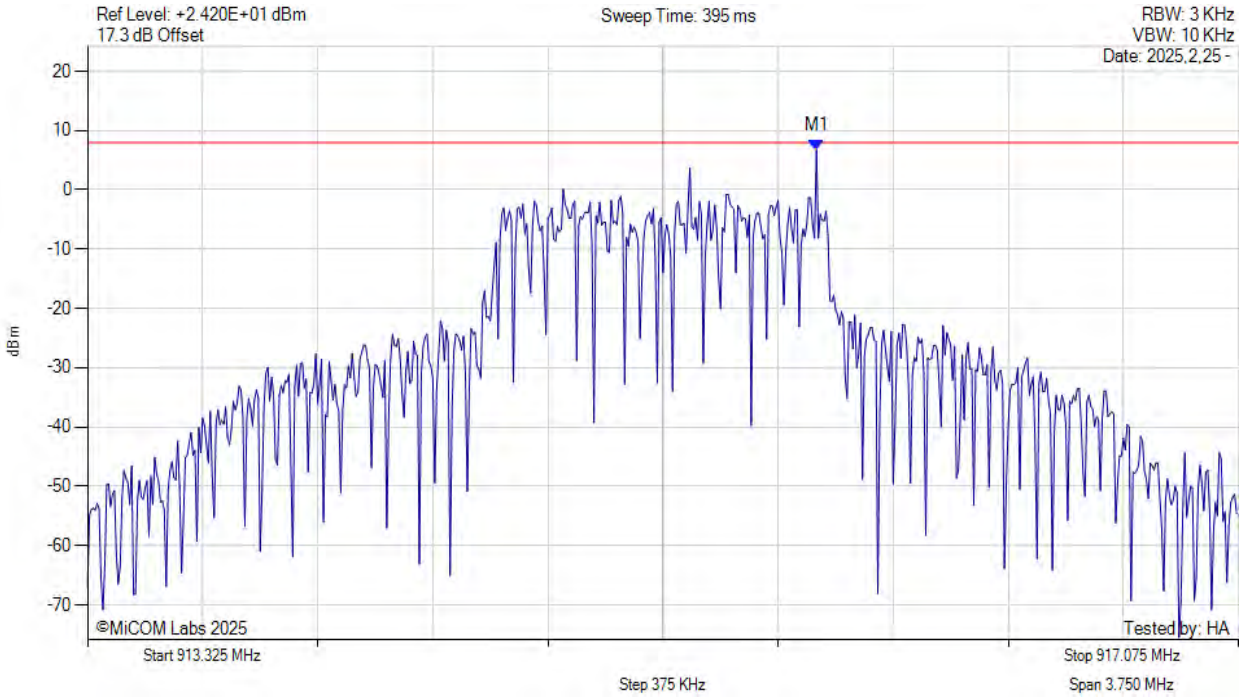
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 915.700 MHz : 6.726 dBm	Limit: ≤ 8.000 dBm Margin: -1.27 dB

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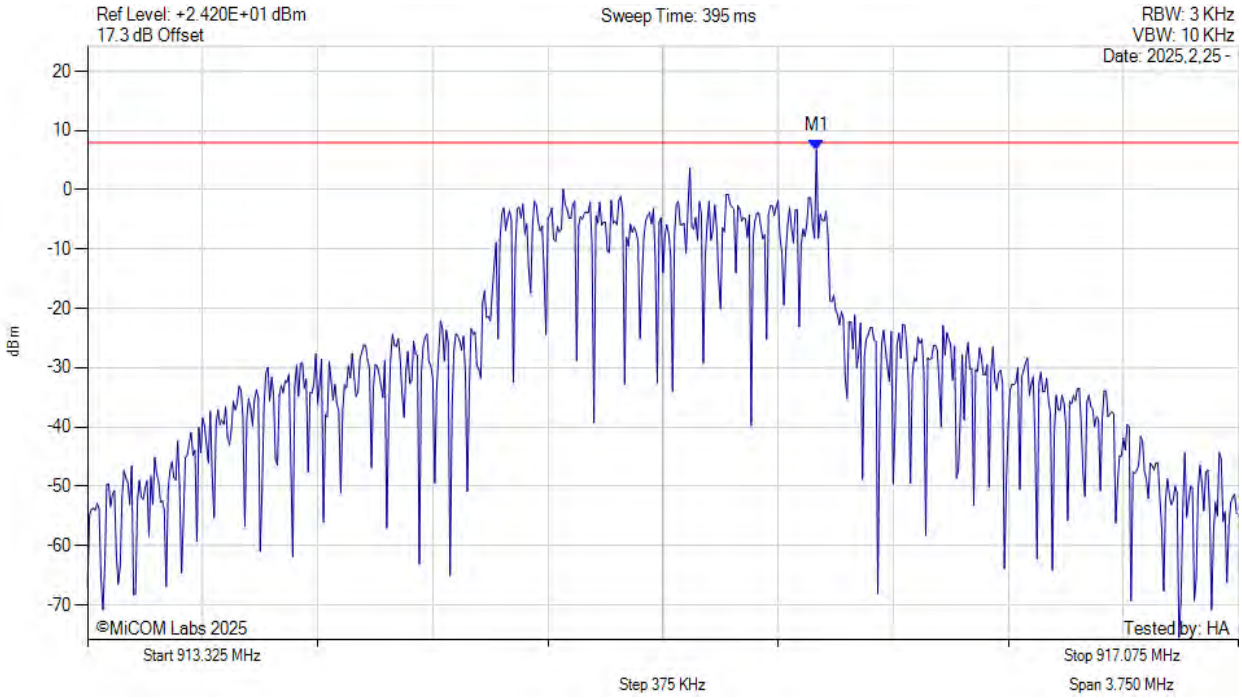
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 915.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 915.700 MHz : 6.726 dBm	Limit: ≤ 8.0 dBm Margin: -1.3 dB

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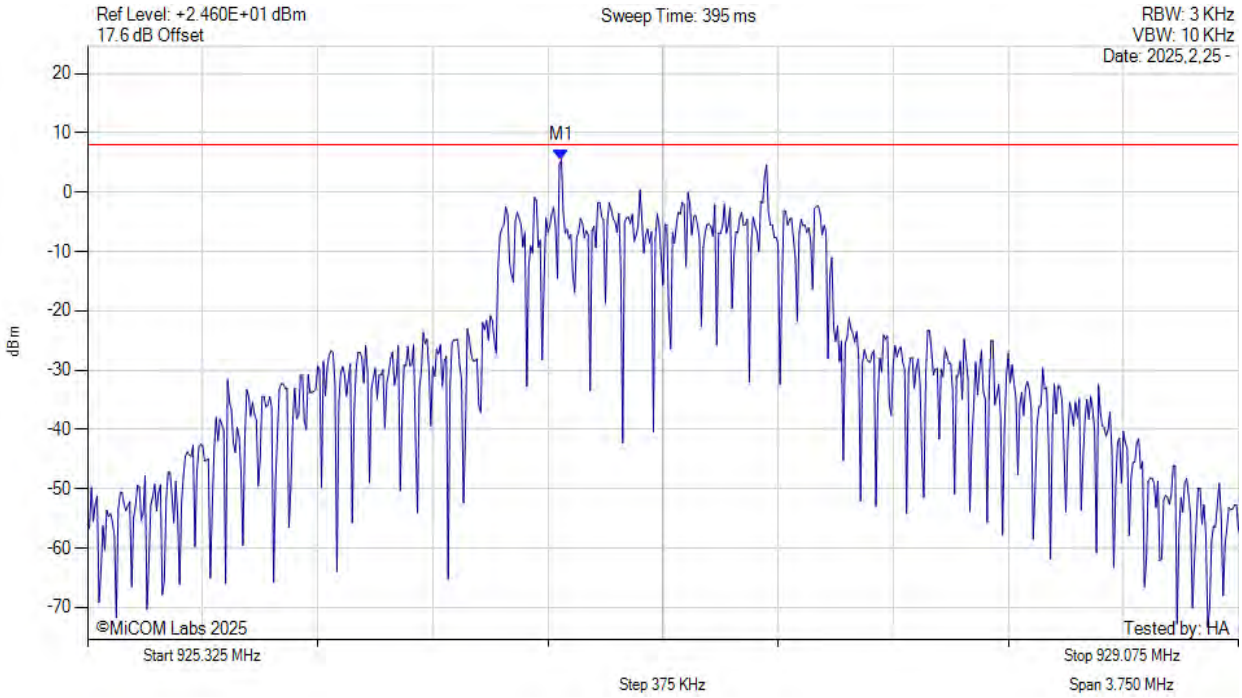
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.869 MHz : 5.487 dBm	Limit: ≤ 8.000 dBm Margin: -2.51 dB

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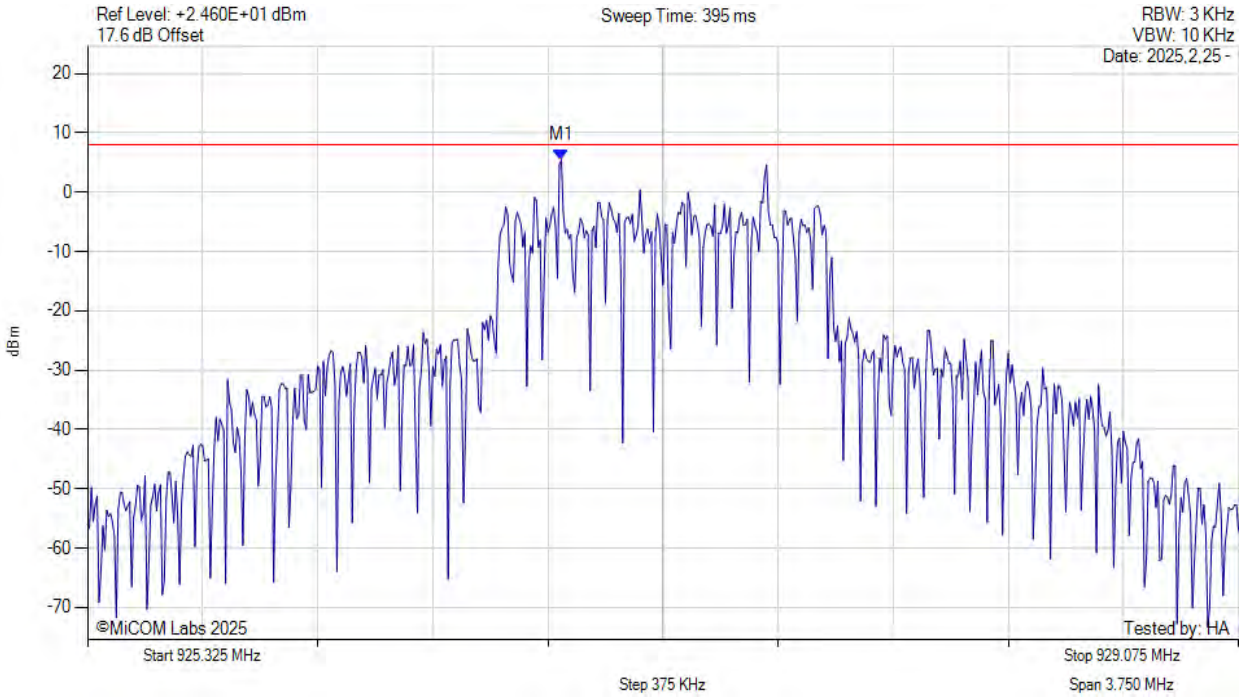
POWER SPECTRAL DENSITY - PEAK

Variant: MCS6-OFDM-opt1, Channel: 927.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.869 MHz : 5.487 dBm	Limit: ≤ 8.0 dBm Margin: -2.5 dB

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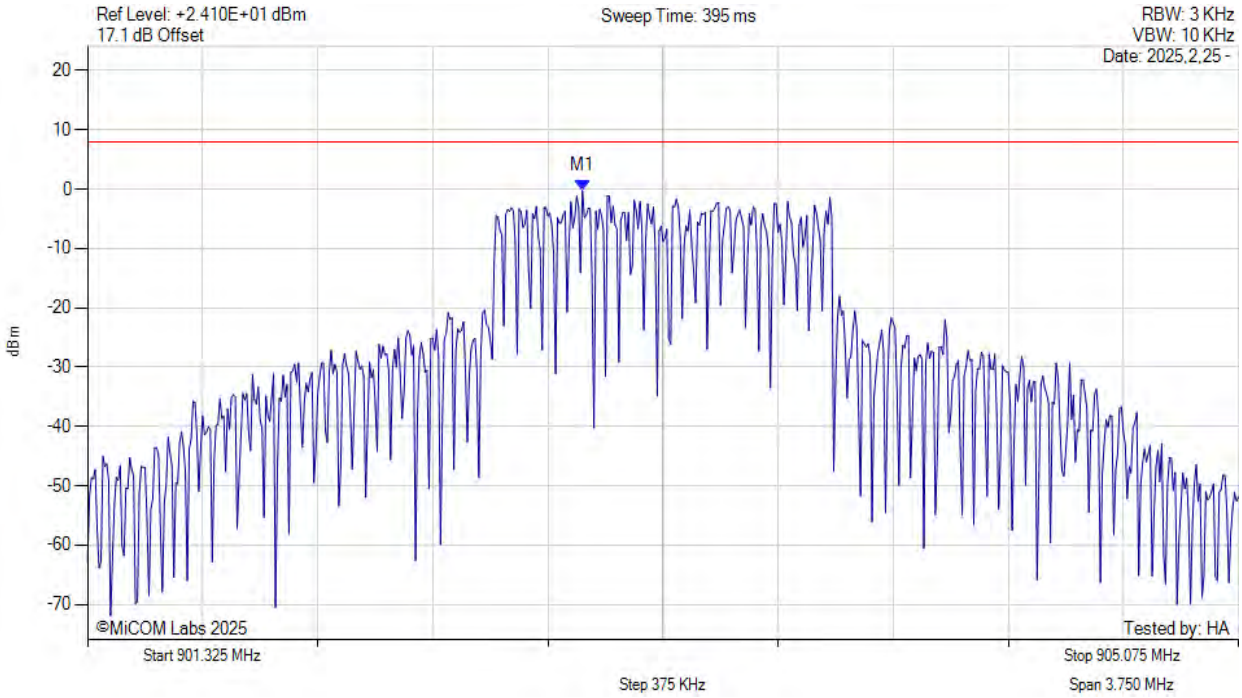
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.938 MHz : -0.219 dBm	Limit: ≤ 8.000 dBm Margin: 8.22 dB

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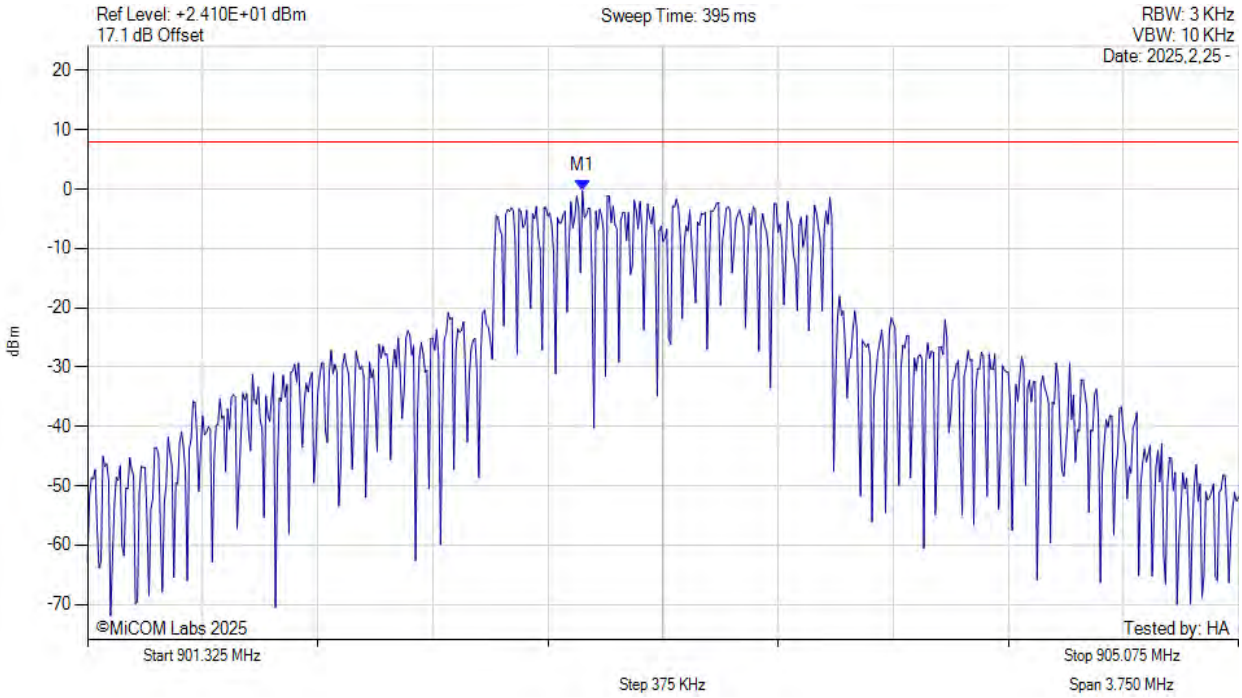
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 903.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.938 MHz : -0.219 dBm	Limit: ≤ 8.0 dBm Margin: -8.2 dB

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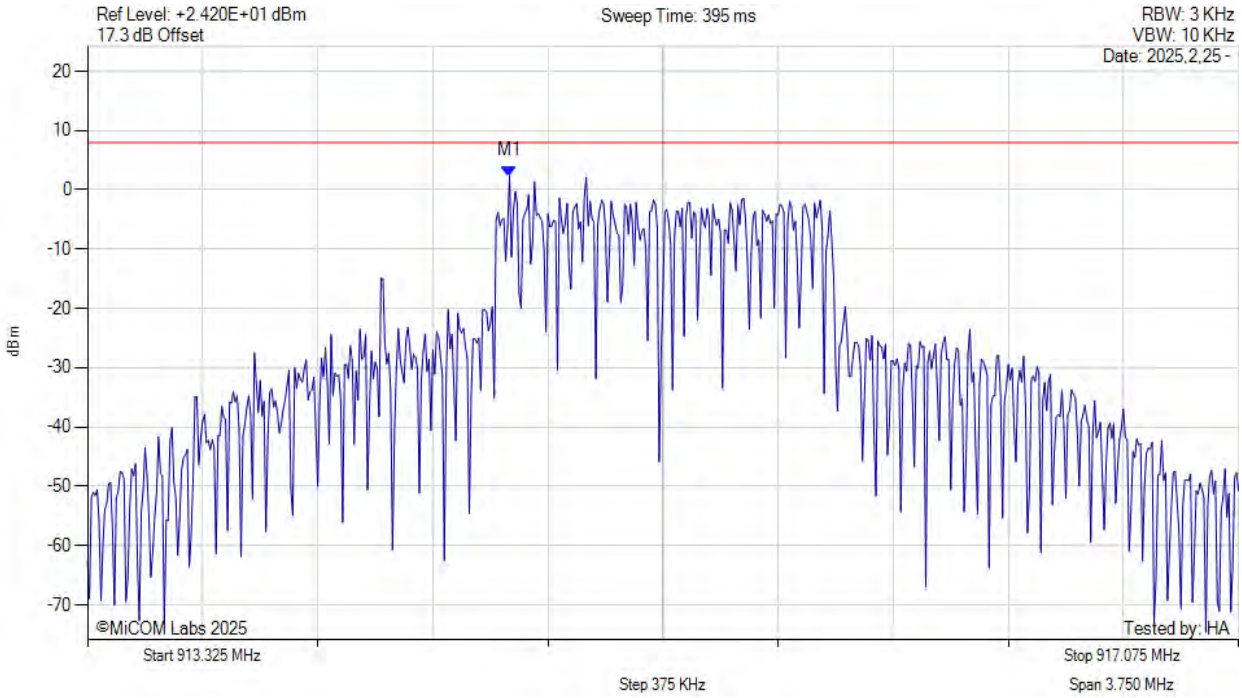
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 914.700 MHz : 2.318 dBm	Limit: ≤ 8.000 dBm Margin: -5.68 dB

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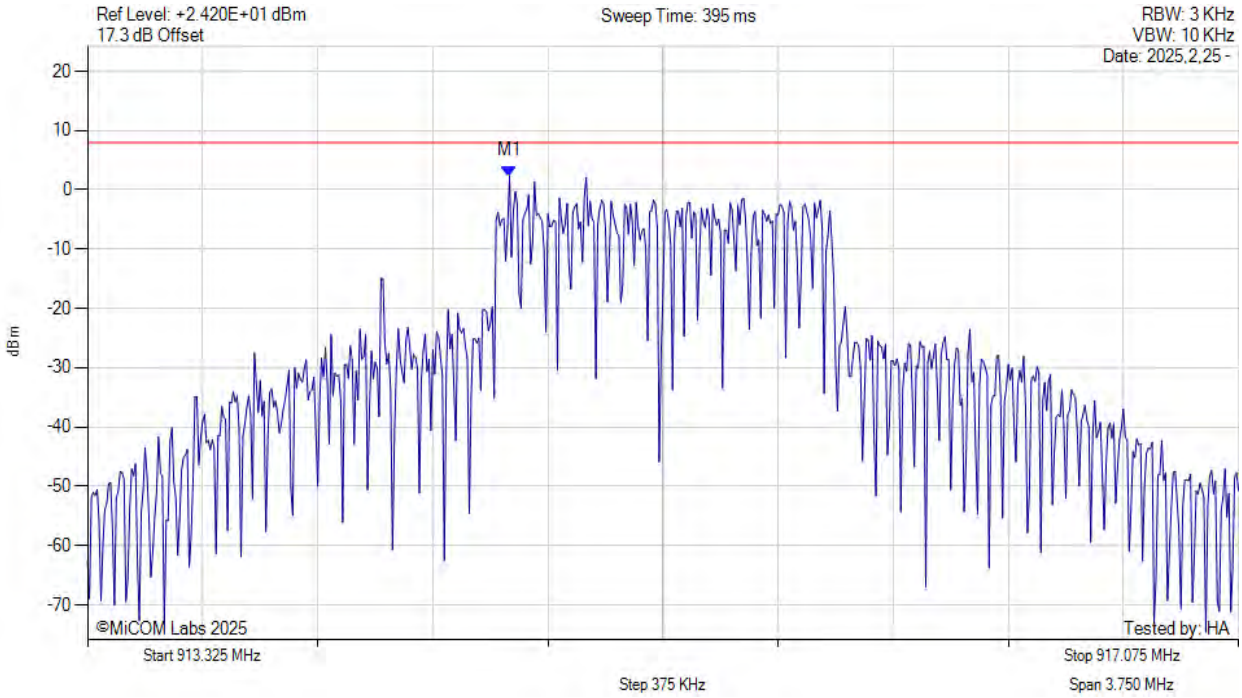
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 915.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 914.700 MHz : 2.318 dBm	Limit: ≤ 8.0 dBm Margin: -5.7 dB

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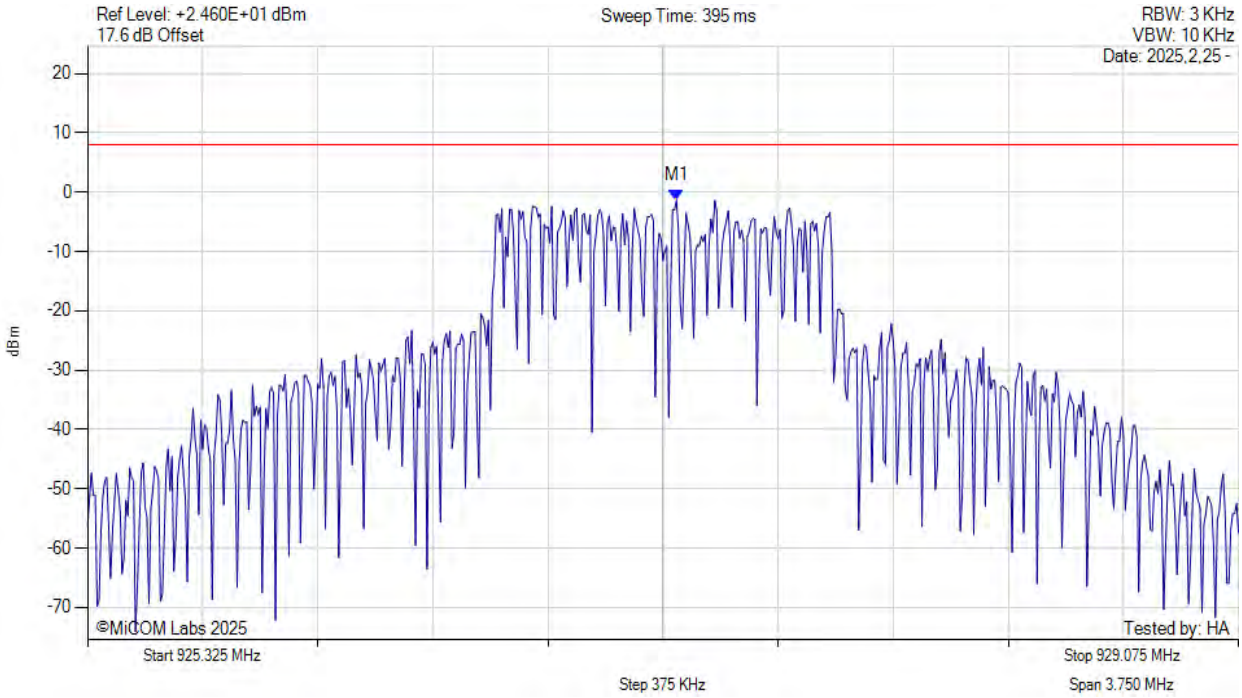
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 927.244 MHz : -1.380 dBm	Limit: ≤ 8.000 dBm Margin: 9.38 dB

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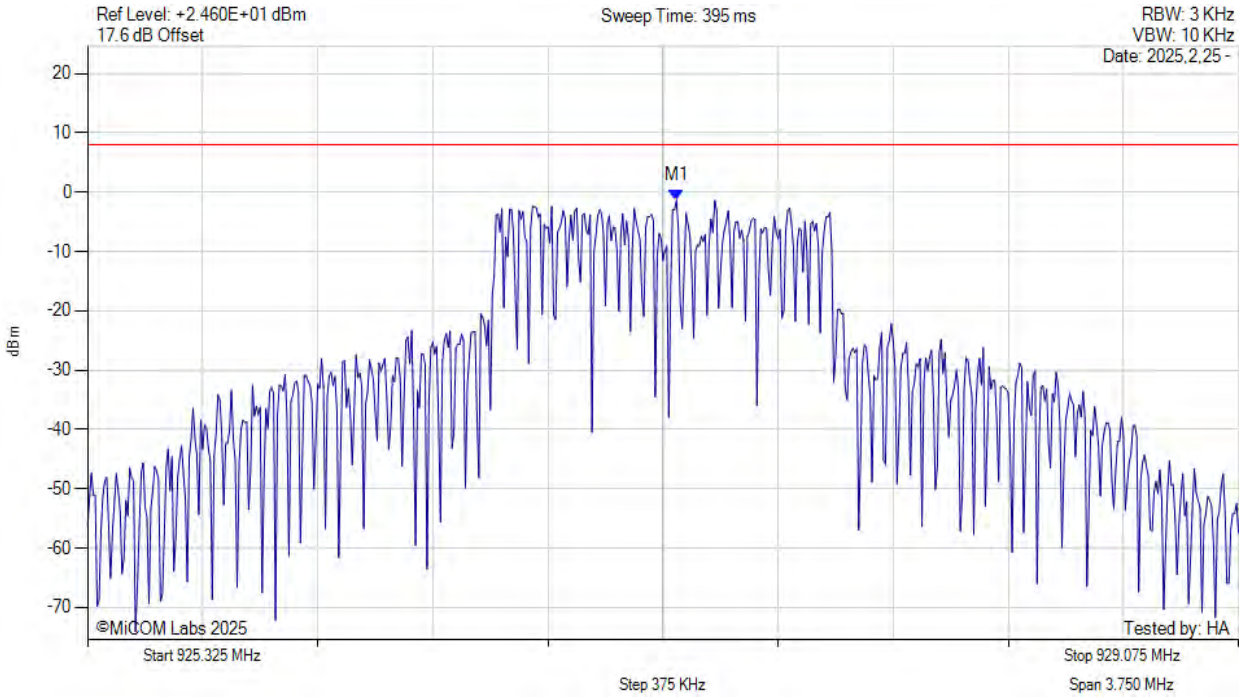
POWER SPECTRAL DENSITY - PEAK

Variant: MCS7-OFDM-opt1, Channel: 927.20 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 927.244 MHz : -1.380 dBm	Limit: ≤ 8.0 dBm Margin: -9.4 dB

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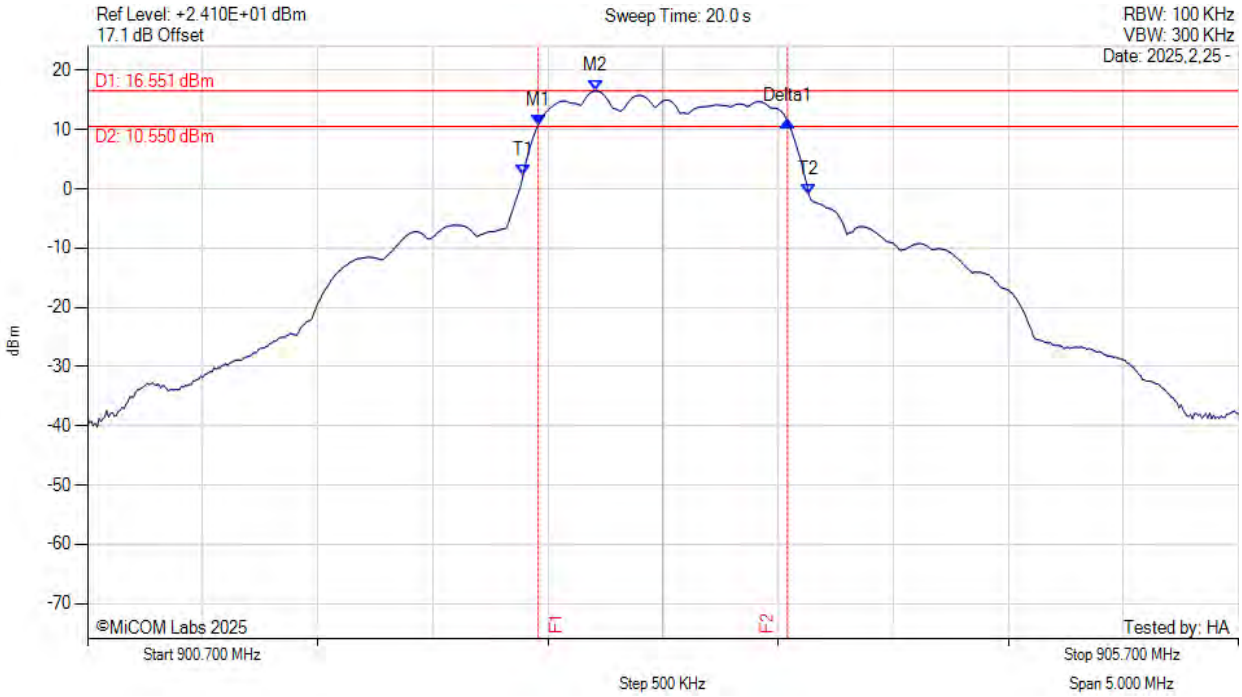
A.1.2. 6dB & 99% Bandwidth

6 dB & 99% BANDWIDTH

Variant: MCS4-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 902.658 MHz : 10.845 dBm M2 : 902.908 MHz : 16.551 dBm Delta1 : 1.083 MHz : 0.607 dB T1 : 902.592 MHz : 2.241 dBm T2 : 903.833 MHz : -0.969 dBm OBW : 1.241 MHz	Measured 6 dB Bandwidth: 1.083 MHz Limit: ≥500.0 kHz Margin: -0.58 MHz

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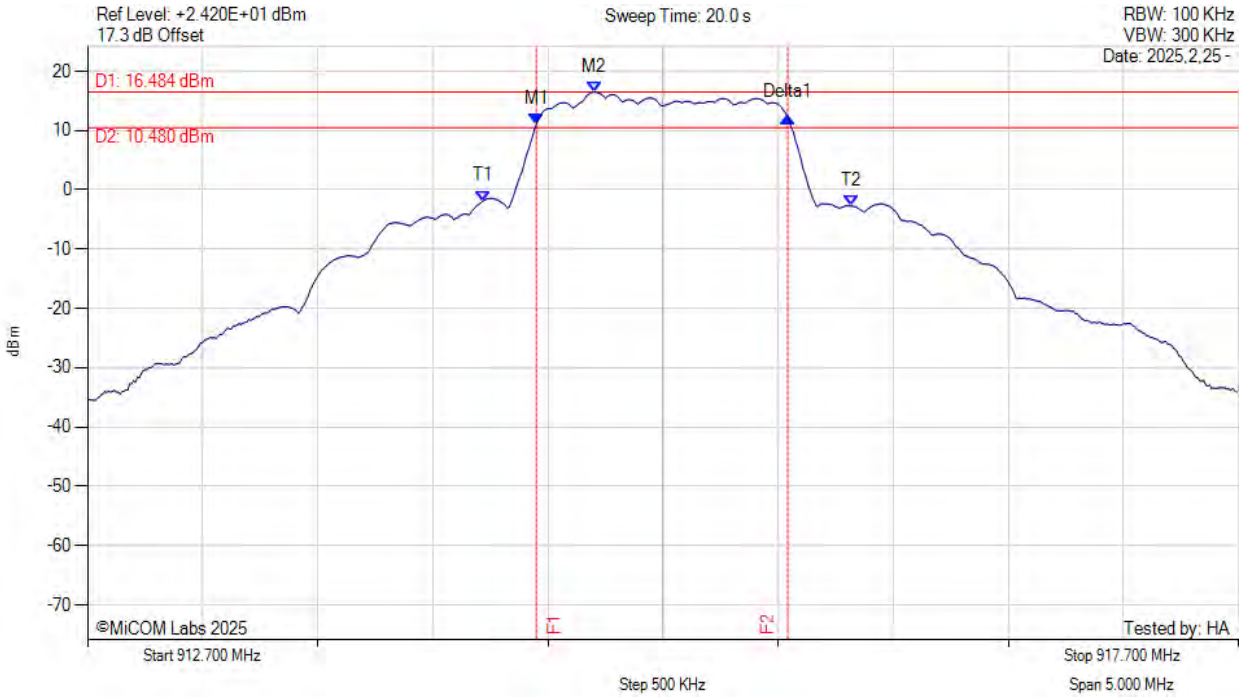
6 dB & 99% BANDWIDTH

Variant: MCS4-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 914.650 MHz : 11.122 dBm M2 : 914.900 MHz : 16.484 dBm Delta1 : 1.092 MHz : 1.154 dB T1 : 914.417 MHz : -1.886 dBm T2 : 916.017 MHz : -2.691 dBm OBW : 1.610 MHz	Measured 6 dB Bandwidth: 1.092 MHz Limit: ≥500.0 kHz Margin: -0.59 MHz

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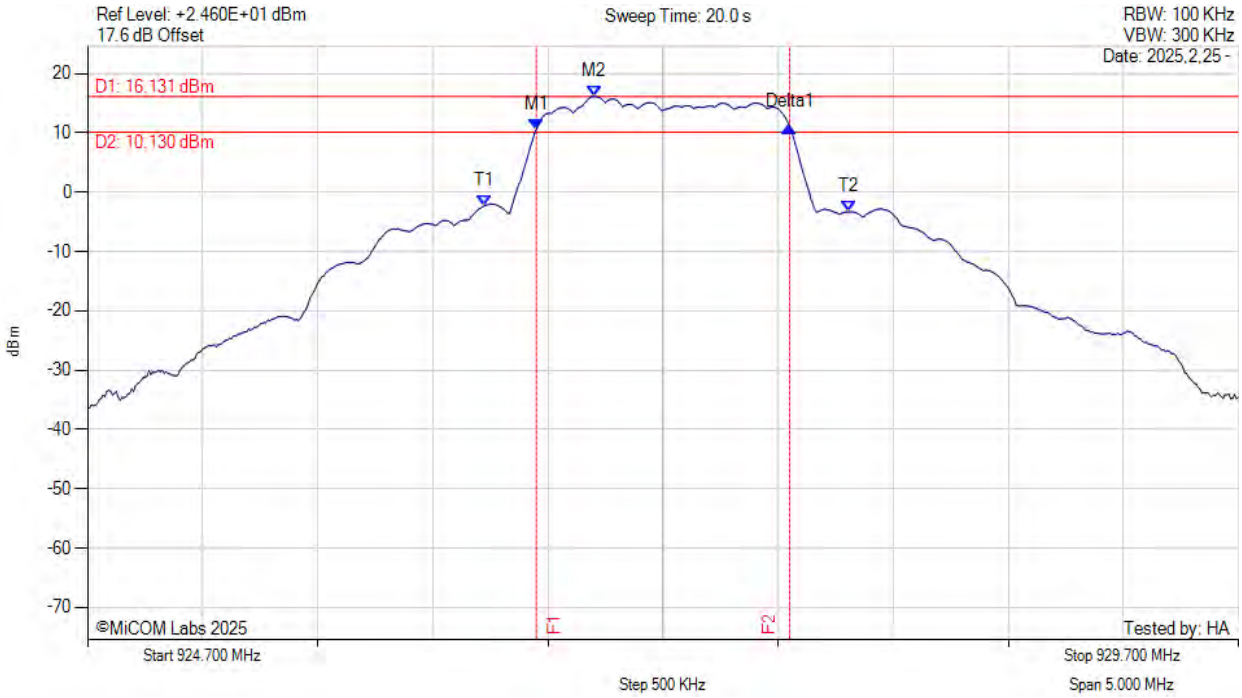
6 dB & 99% BANDWIDTH

Variant: MCS4-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 926.650 MHz : 10.596 dBm M2 : 926.900 MHz : 16.131 dBm Delta1 : 1.100 MHz : 0.439 dB T1 : 926.425 MHz : -2.252 dBm T2 : 928.008 MHz : -3.315 dBm OBW : 1.583 MHz	Measured 6 dB Bandwidth: 1.100 MHz Limit: ≥500.0 kHz Margin: -0.60 MHz

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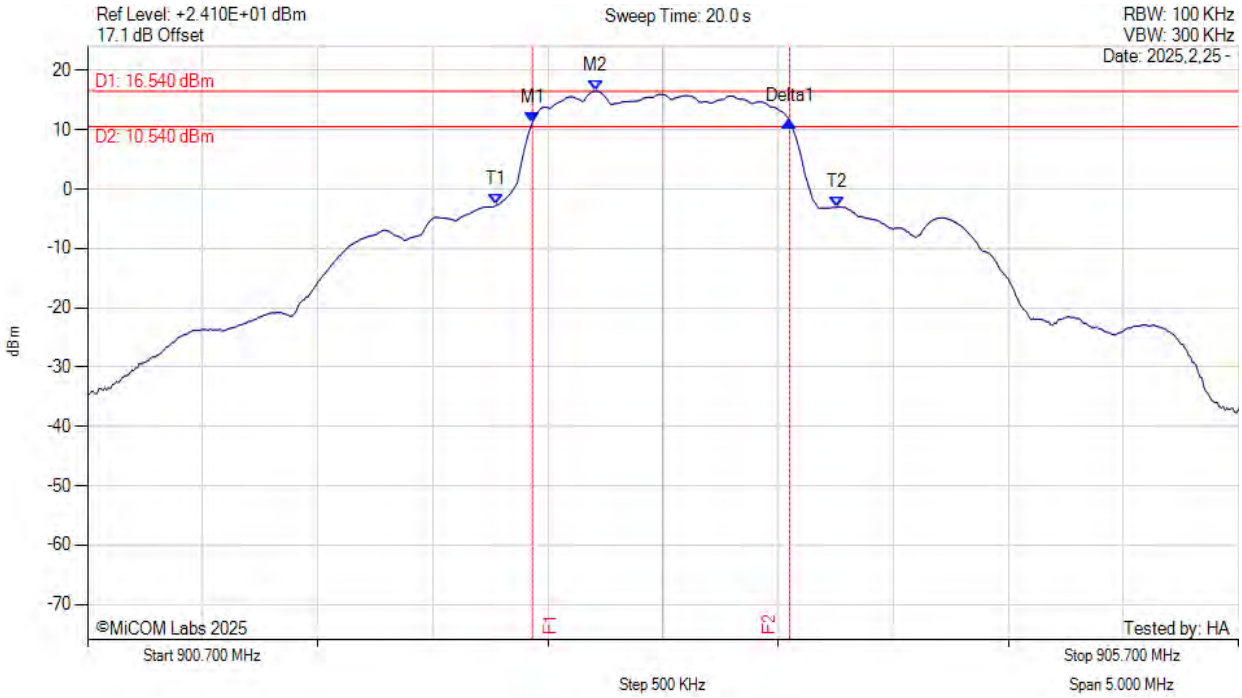
6 dB & 99% BANDWIDTH

Variant: MCS6-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 902.633 MHz : 11.301 dBm M2 : 902.908 MHz : 16.540 dBm Delta1 : 1.117 MHz : 0.123 dB T1 : 902.475 MHz : -2.658 dBm T2 : 903.958 MHz : -3.007 dBm OBW : 1.485 MHz	Measured 6 dB Bandwidth: 1.117 MHz Limit: ≥500.0 kHz Margin: -0.62 MHz

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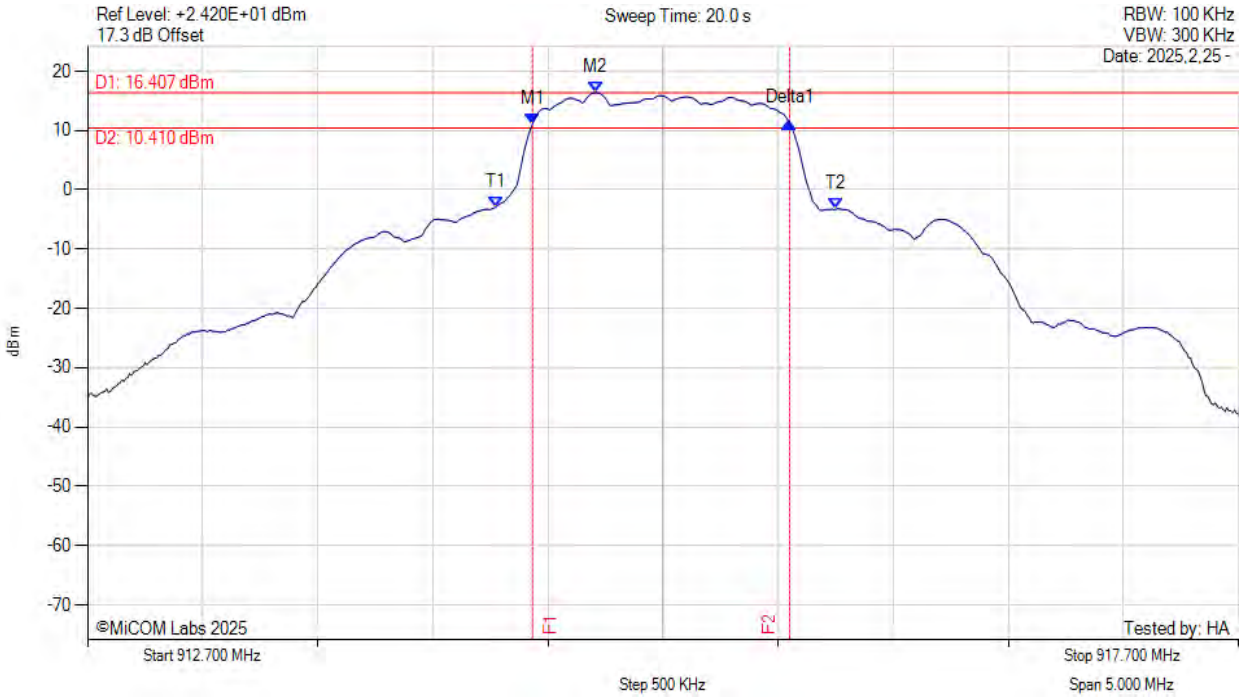
6 dB & 99% BANDWIDTH

Variant: MCS6-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 914.633 MHz : 11.149 dBm M2 : 914.908 MHz : 16.407 dBm Delta1 : 1.117 MHz : 0.085 dB T1 : 914.475 MHz : -2.894 dBm T2 : 915.950 MHz : -3.239 dBm OBW : 1.478 MHz	Measured 6 dB Bandwidth: 1.117 MHz Limit: ≥500.0 kHz Margin: -0.62 MHz

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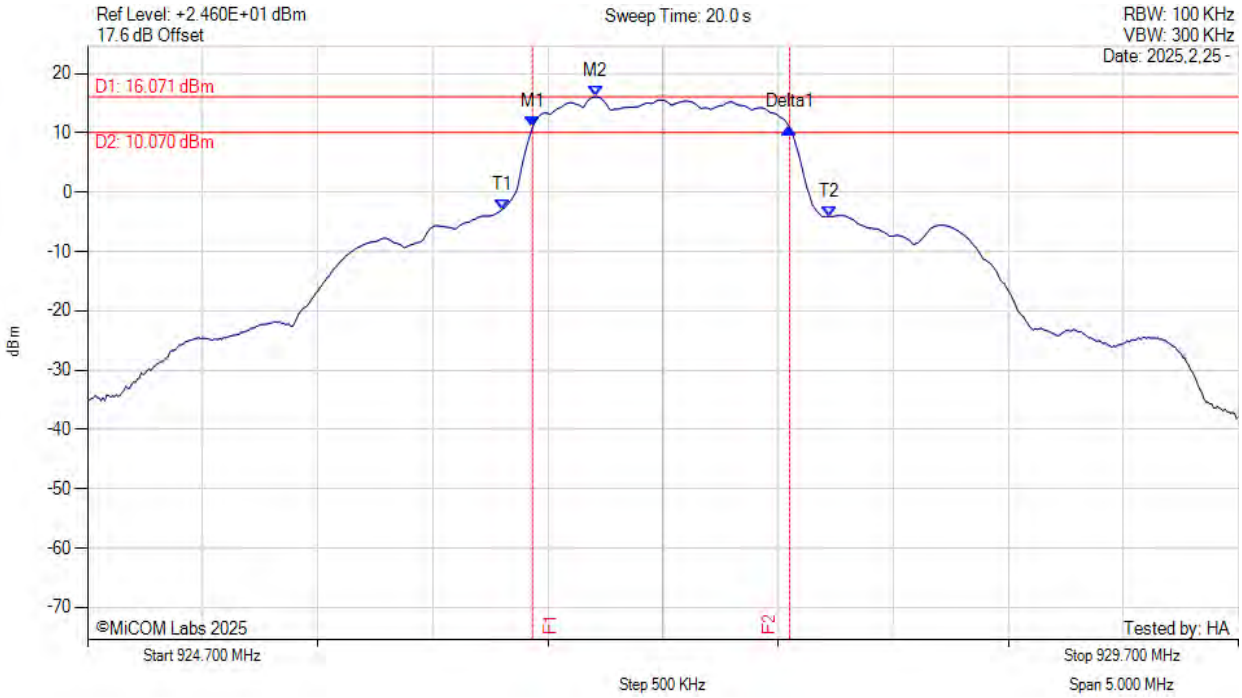
6 dB & 99% BANDWIDTH

Variant: MCS6-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 926.633 MHz : 10.914 dBm M2 : 926.908 MHz : 16.071 dBm Delta1 : 1.117 MHz : -0.022 dB T1 : 926.500 MHz : -2.905 dBm T2 : 927.925 MHz : -4.116 dBm OBW : 1.429 MHz	Measured 6 dB Bandwidth: 1.117 MHz Limit: ≥500.0 kHz Margin: -0.62 MHz

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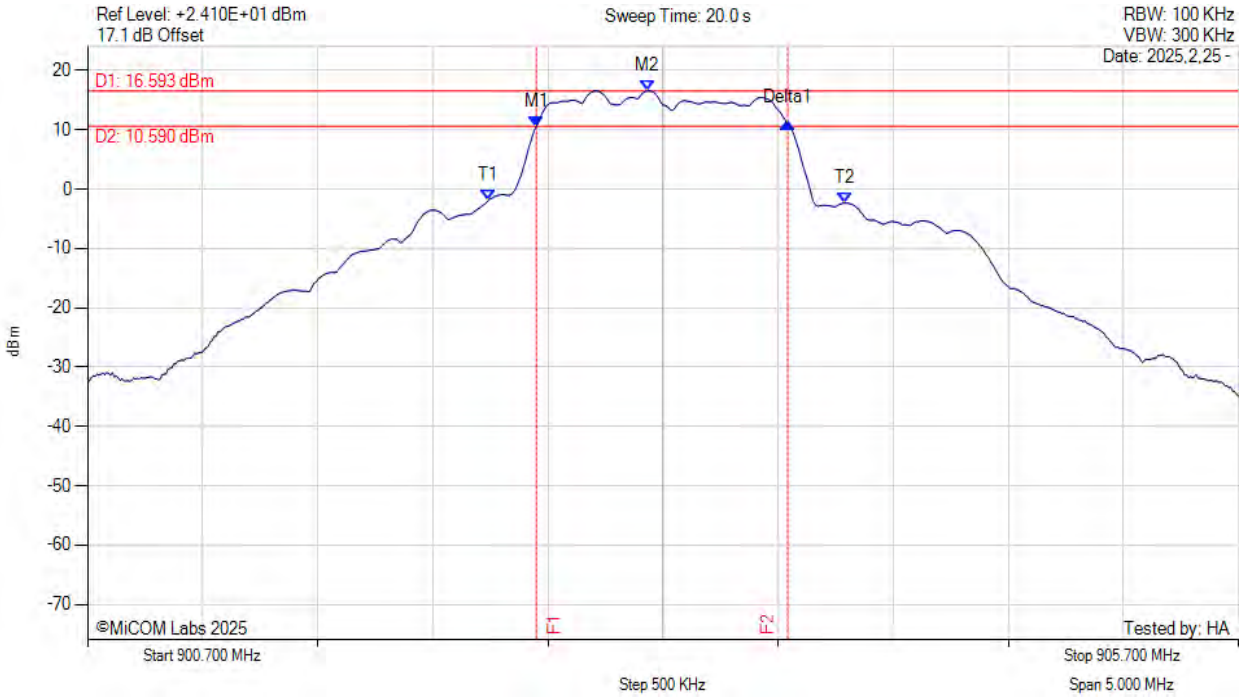
6 dB & 99% BANDWIDTH

Variant: MCS7-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 902.650 MHz : 10.612 dBm M2 : 903.133 MHz : 16.593 dBm Delta1 : 1.092 MHz : 0.534 dB T1 : 902.442 MHz : -1.924 dBm T2 : 903.992 MHz : -2.317 dBm OBW : 1.552 MHz	Measured 6 dB Bandwidth: 1.092 MHz Limit: ≥500.0 kHz Margin: -0.59 MHz

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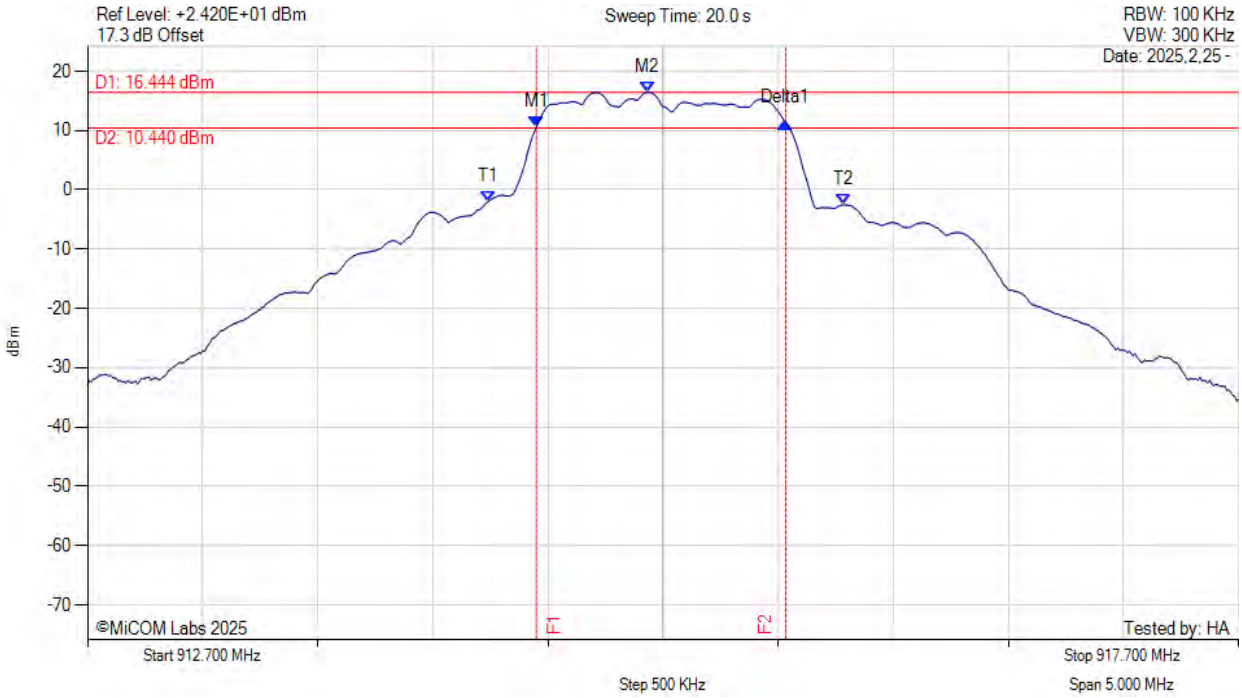
6 dB & 99% BANDWIDTH

Variant: MCS7-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 914.650 MHz : 10.554 dBm M2 : 915.133 MHz : 16.444 dBm Delta1 : 1.083 MHz : 0.846 dB T1 : 914.442 MHz : -1.925 dBm T2 : 915.983 MHz : -2.520 dBm OBW : 1.545 MHz	Measured 6 dB Bandwidth: 1.083 MHz Limit: ≥500.0 kHz Margin: -0.58 MHz

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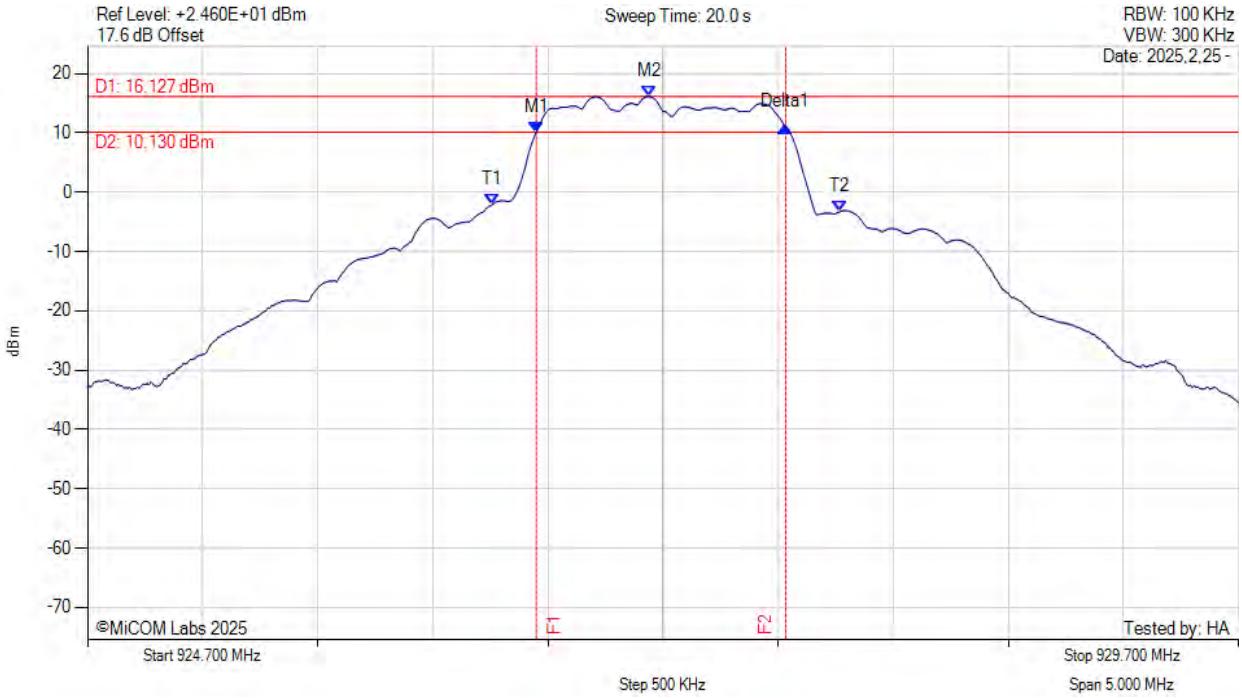
6 dB & 99% BANDWIDTH

Variant: MCS7-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 926.650 MHz : 10.179 dBm M2 : 927.142 MHz : 16.127 dBm Delta1 : 1.083 MHz : 0.903 dB T1 : 926.458 MHz : -2.061 dBm T2 : 927.967 MHz : -3.301 dBm OBW : 1.511 MHz	Measured 6 dB Bandwidth: 1.083 MHz Limit: ≥500.0 kHz Margin: -0.58 MHz

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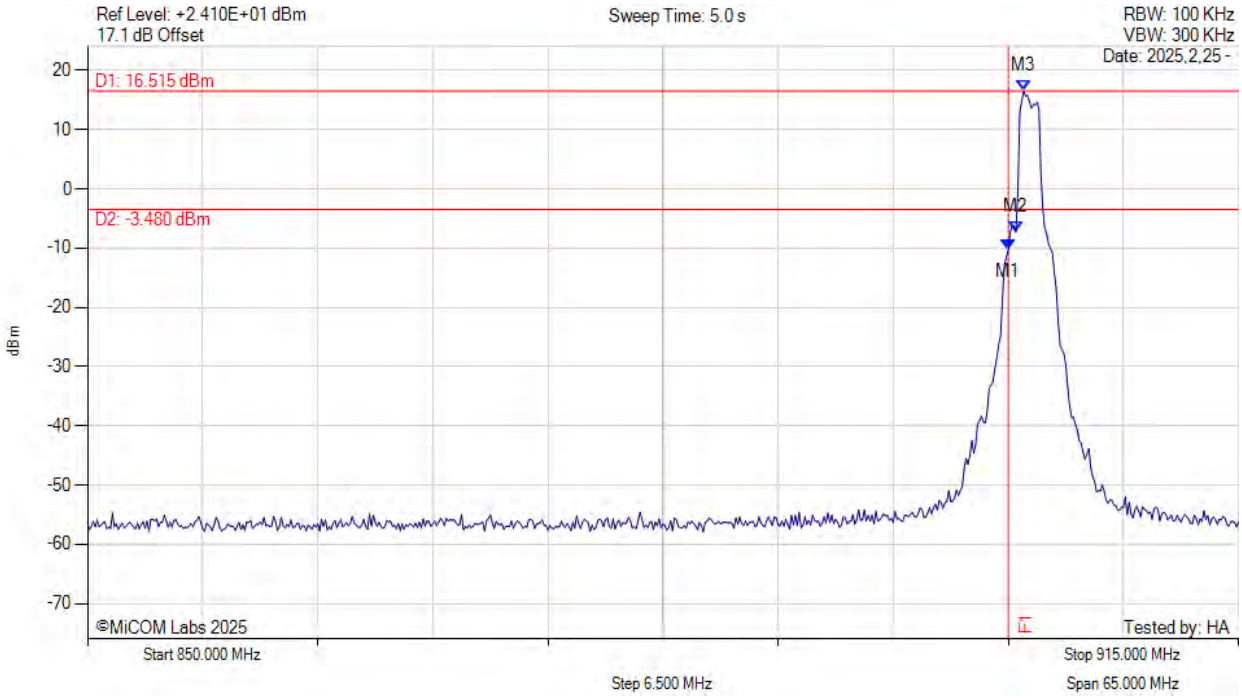
A.1.3. Emissions

A.1.3.1. Conducted Emissions

Conducted Low Band-Edge Emissions – Peak

CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: MCS4-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.000 MHz : -10.314 dBm M2 : 902.430 MHz : -7.251 dBm M3 : 902.870 MHz : 16.515 dBm	Channel Frequency: 903.20 MHz

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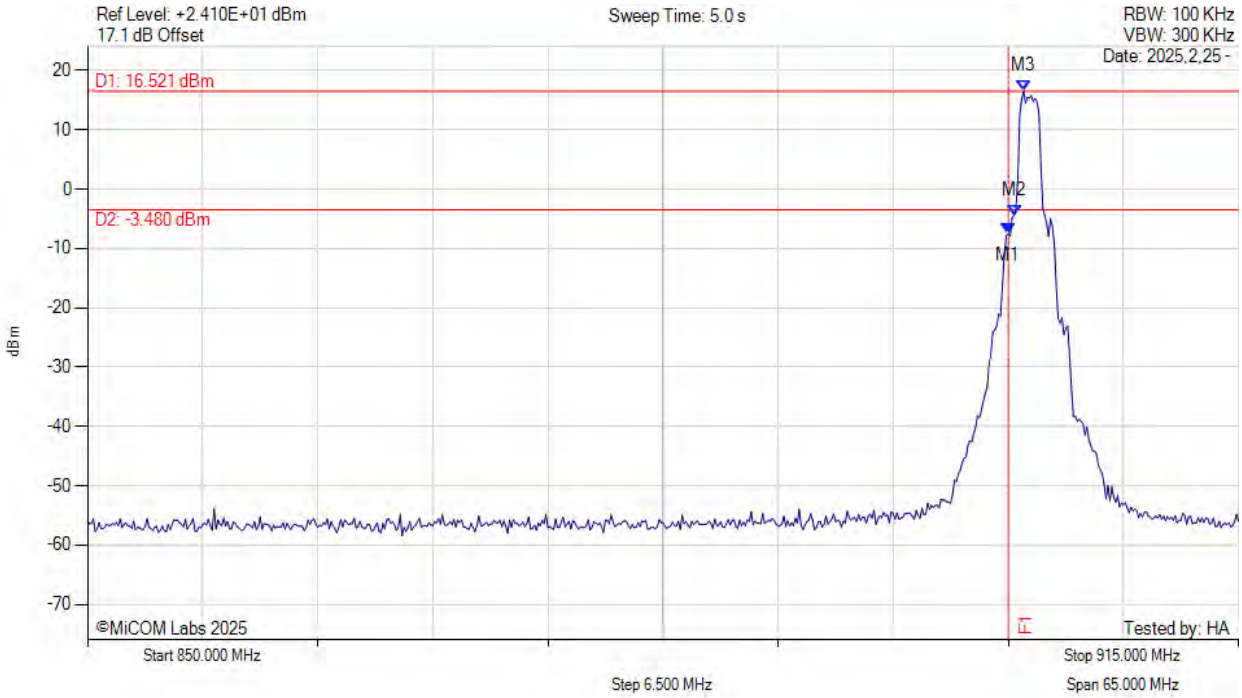
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: MCS6-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.000 MHz : -7.565 dBm M2 : 902.330 MHz : -4.453 dBm M3 : 902.870 MHz : 16.521 dBm	Channel Frequency: 903.20 MHz

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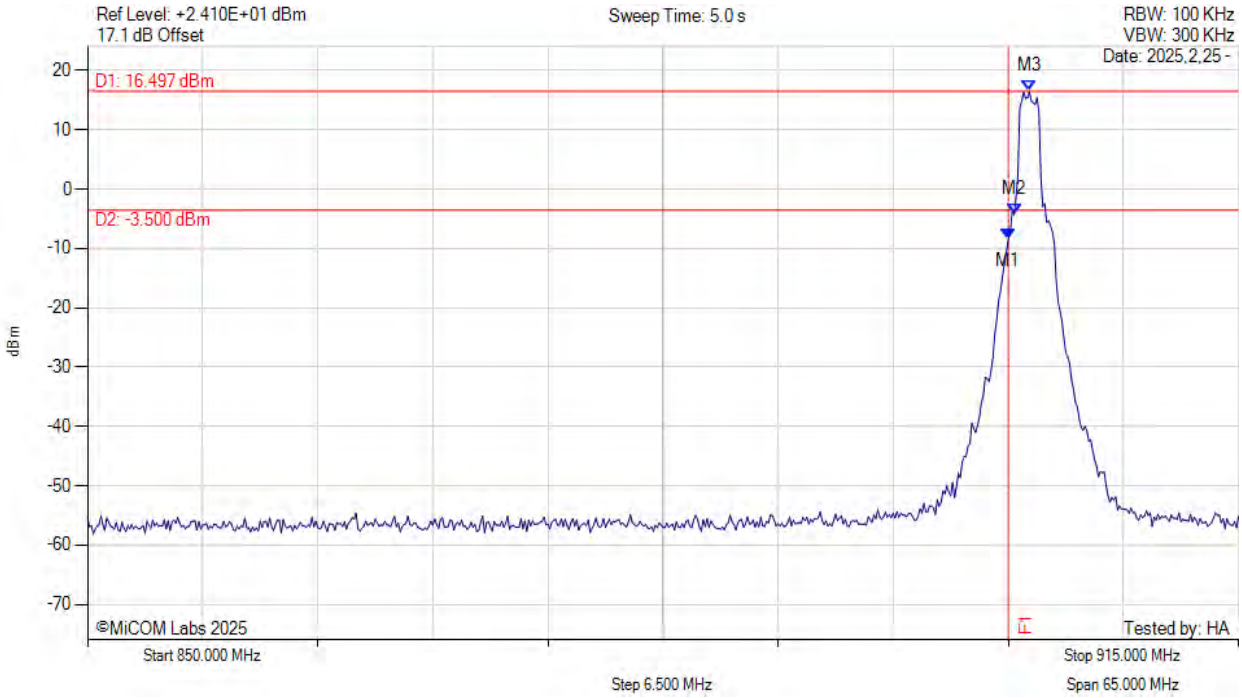
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: MCS7-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 902.000 MHz : -8.512 dBm M2 : 902.330 MHz : -4.284 dBm M3 : 903.190 MHz : 16.497 dBm	Channel Frequency: 903.20 MHz

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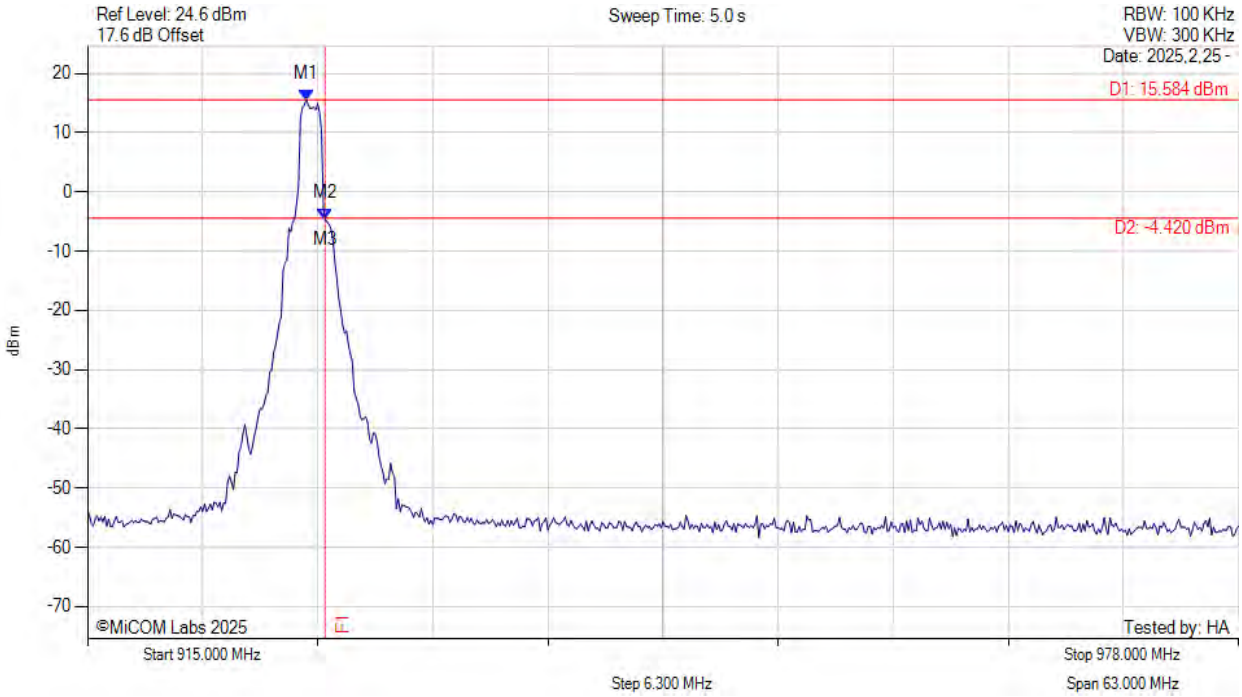
Conducted High Band-Edge Emissions - Peak

CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: MCS4-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.970 MHz : 15.584 dBm M2 : 928.000 MHz : -4.512 dBm M3 : 928.000 MHz : -4.512 dBm	Channel Frequency: 927.20 MHz

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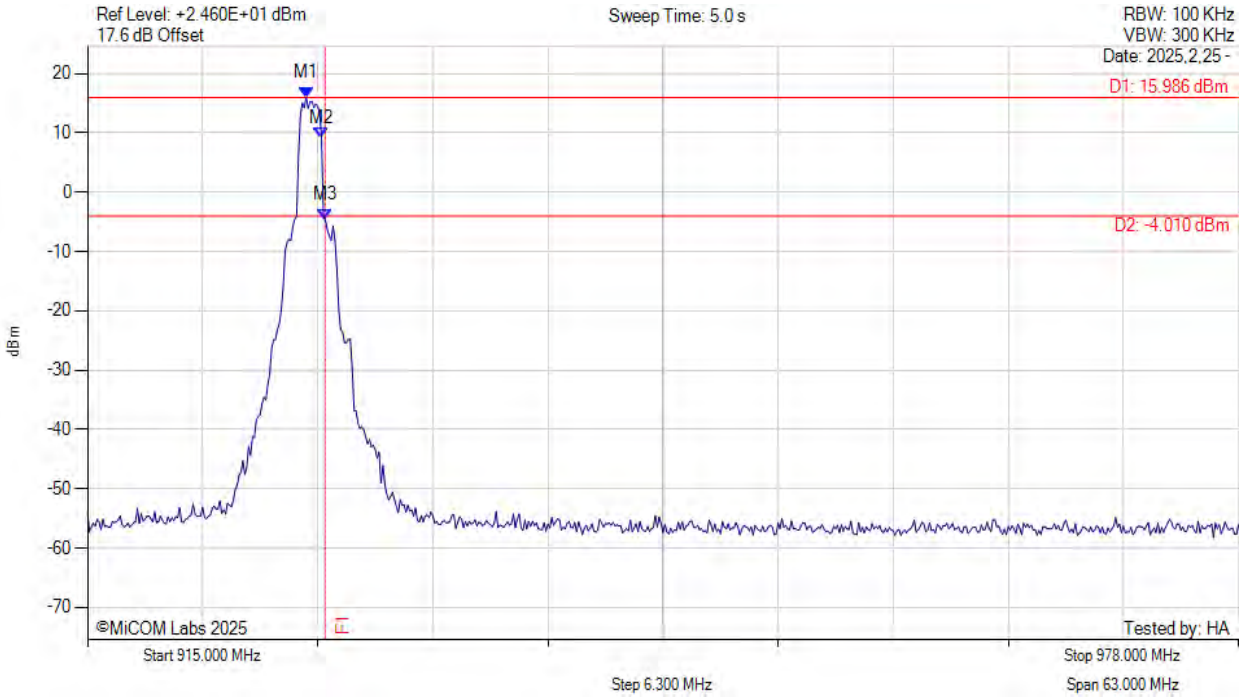
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: MCS6-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.970 MHz : 15.986 dBm M2 : 927.810 MHz : 9.044 dBm M3 : 928.000 MHz : -4.723 dBm	Channel Frequency: 927.20 MHz

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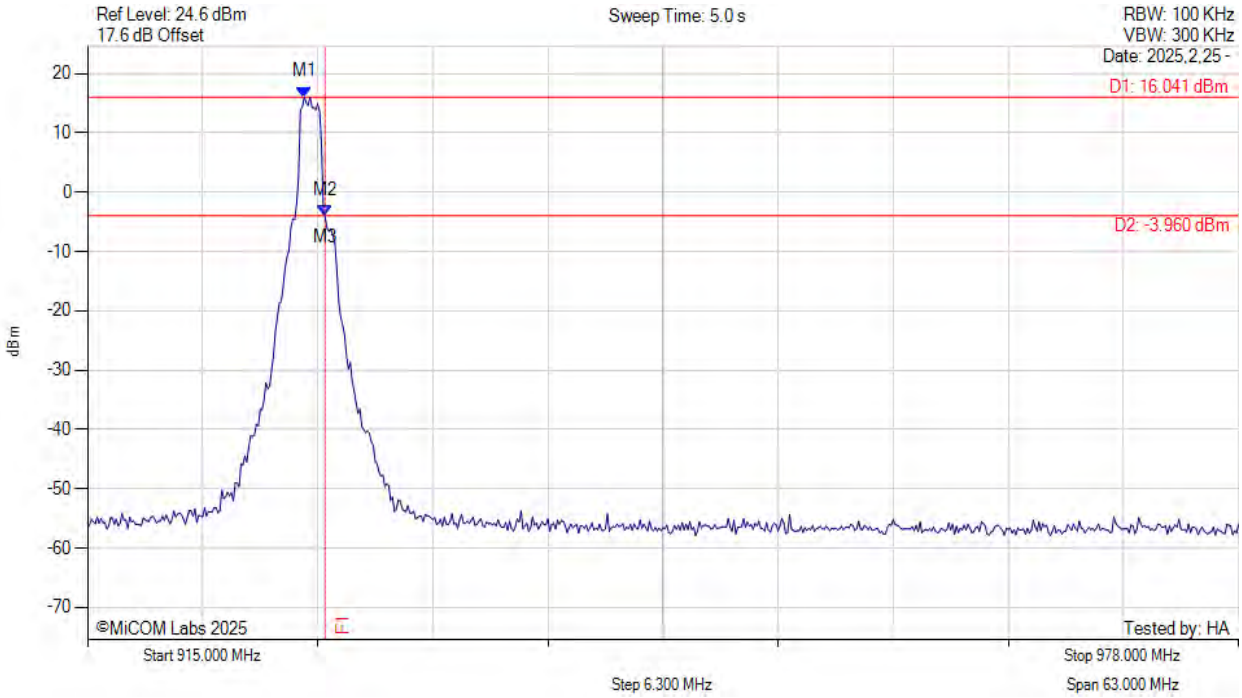
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: MCS7-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 926.860 MHz : 16.041 dBm M2 : 928.000 MHz : -4.019 dBm M3 : 928.000 MHz : -4.019 dBm	Channel Frequency: 927.20 MHz

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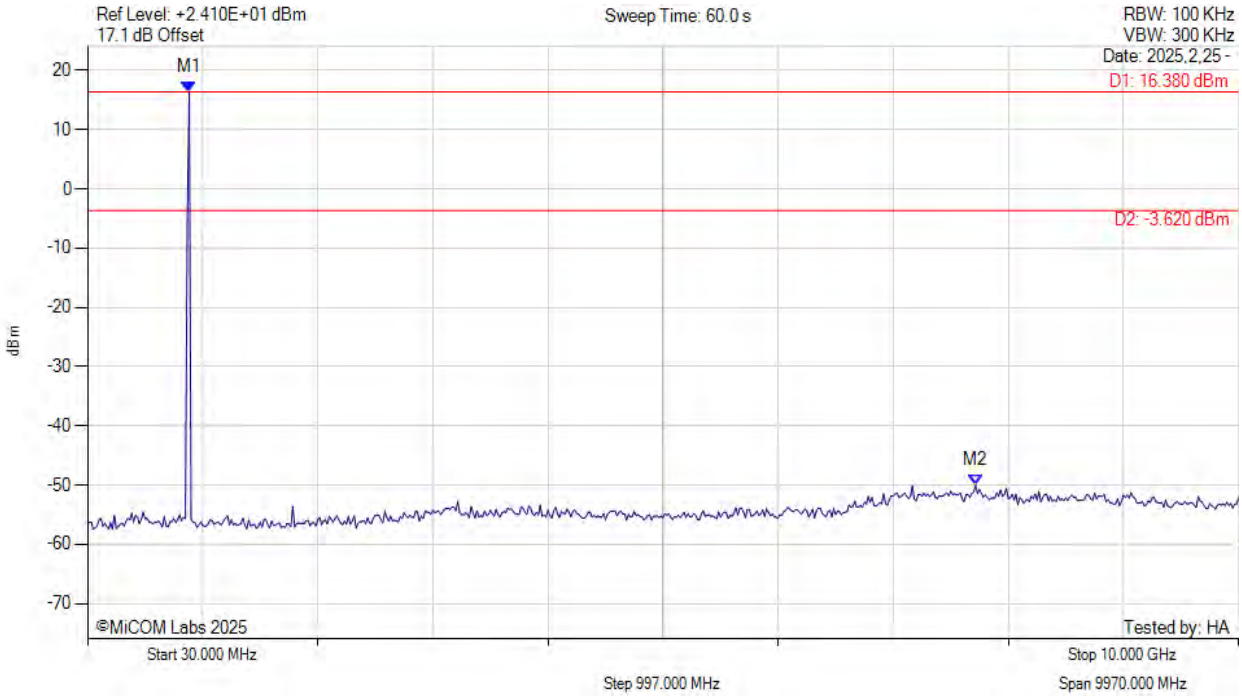
Conducted Spurious Emissions – Peak

CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS4-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 16.380 dBm M2 : 7724.000 MHz : -50.037 dBm	Limit: -3.62 dBm Margin: -46.42 dB

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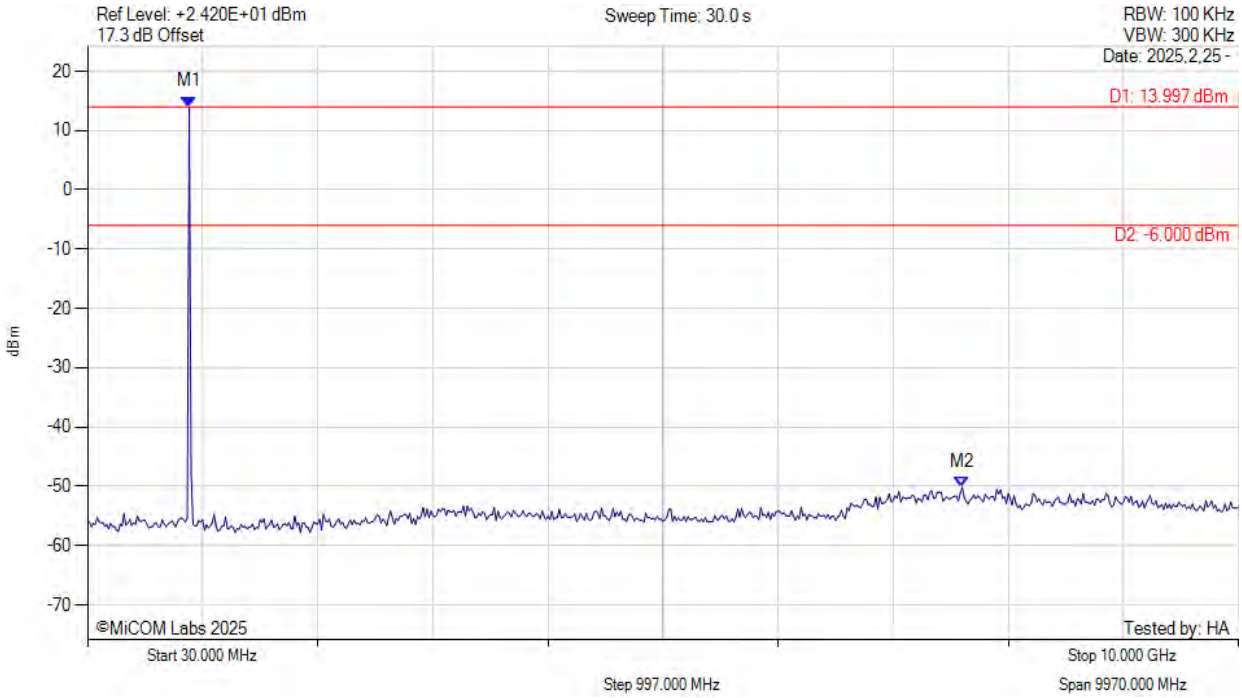
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS4-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 13.997 dBm M2 : 7607.000 MHz : -50.168 dBm	Limit: -6.00 dBm Margin: -44.17 dB

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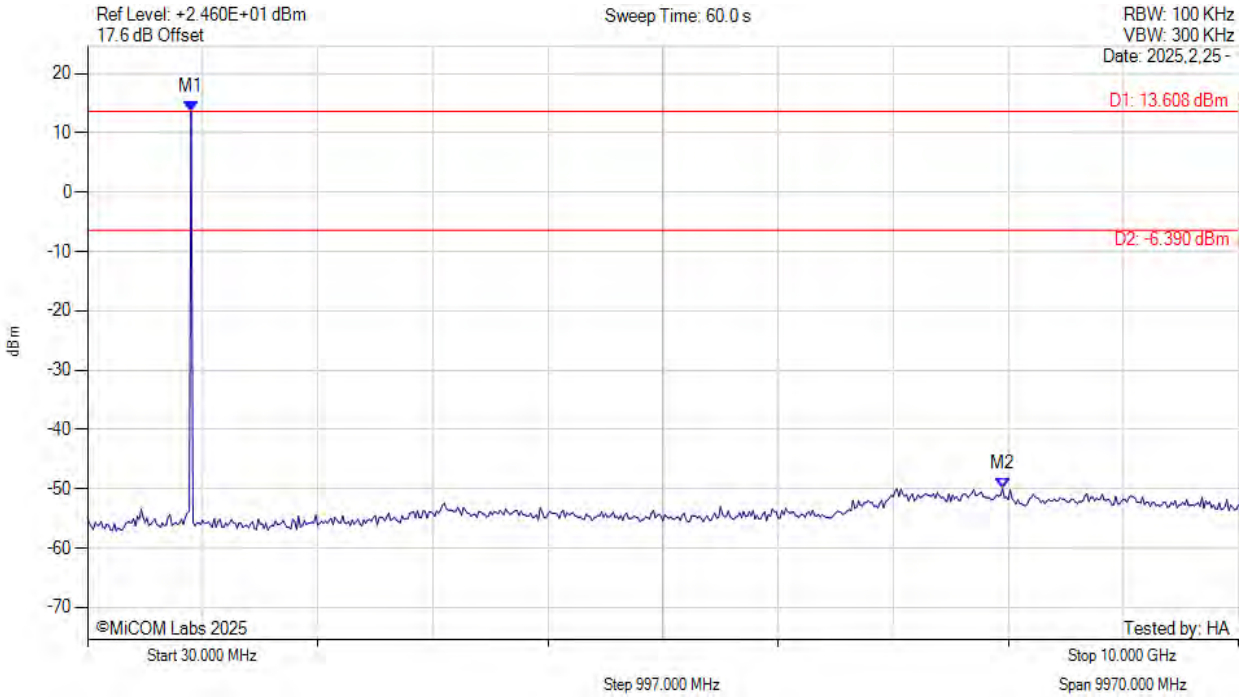
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS4-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 927.000 MHz : 13.608 dBm M2 : 7956.000 MHz : -49.969 dBm	Limit: -6.39 dBm Margin: -43.58 dB

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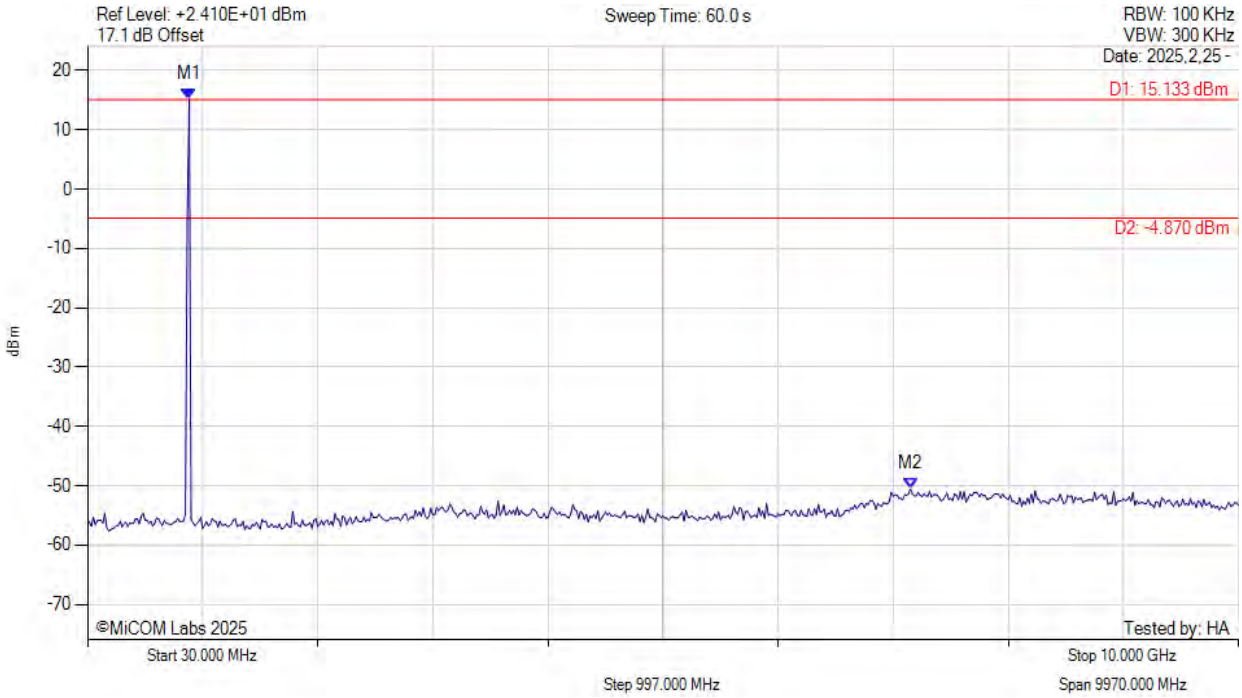
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS6-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 15.133 dBm M2 : 7159.000 MHz : -50.537 dBm	Limit: -4.87 dBm Margin: -45.67 dB

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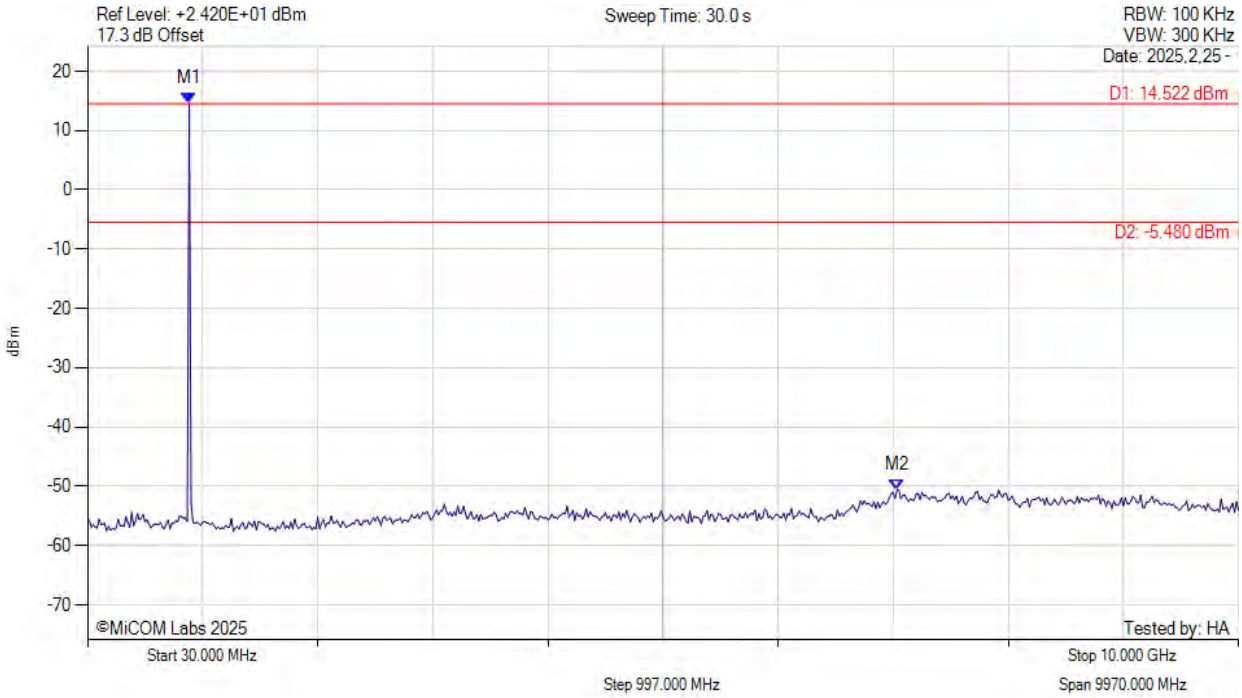
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS6-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 14.522 dBm M2 : 7042.000 MHz : -50.626 dBm	Limit: -5.48 dBm Margin: -45.15 dB

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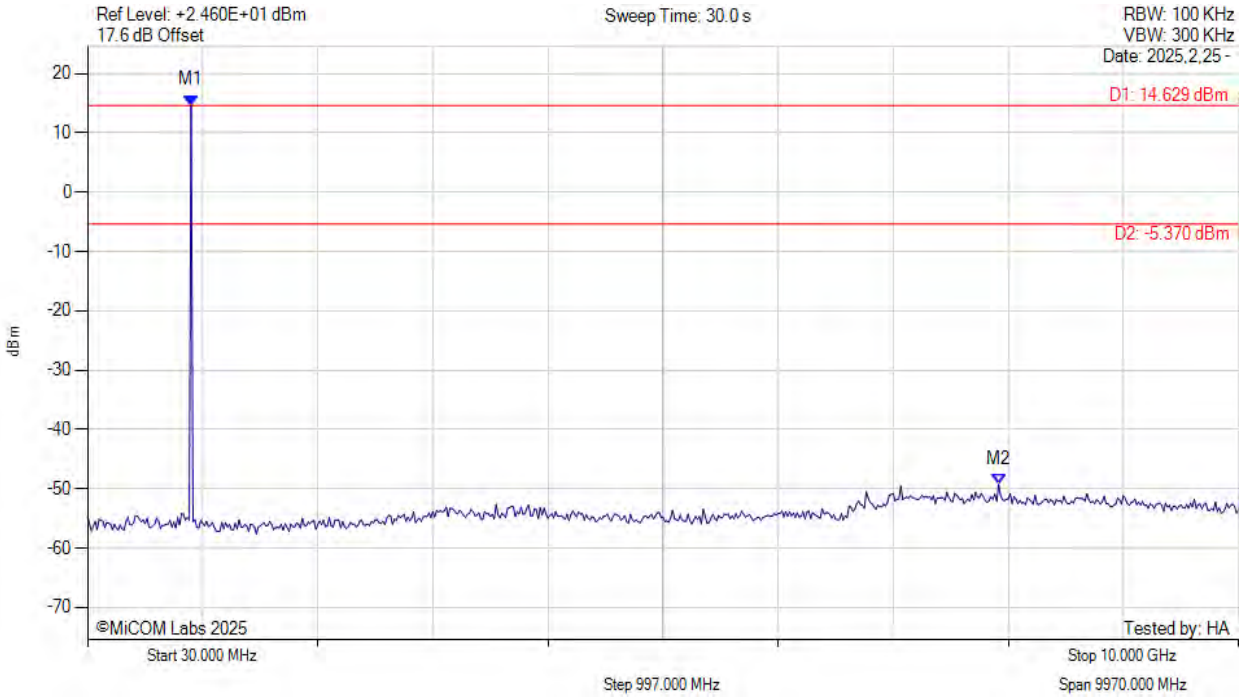
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS6-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 927.000 MHz : 14.629 dBm M2 : 7923.000 MHz : -49.289 dBm	Limit: -5.37 dBm Margin: -43.92 dB

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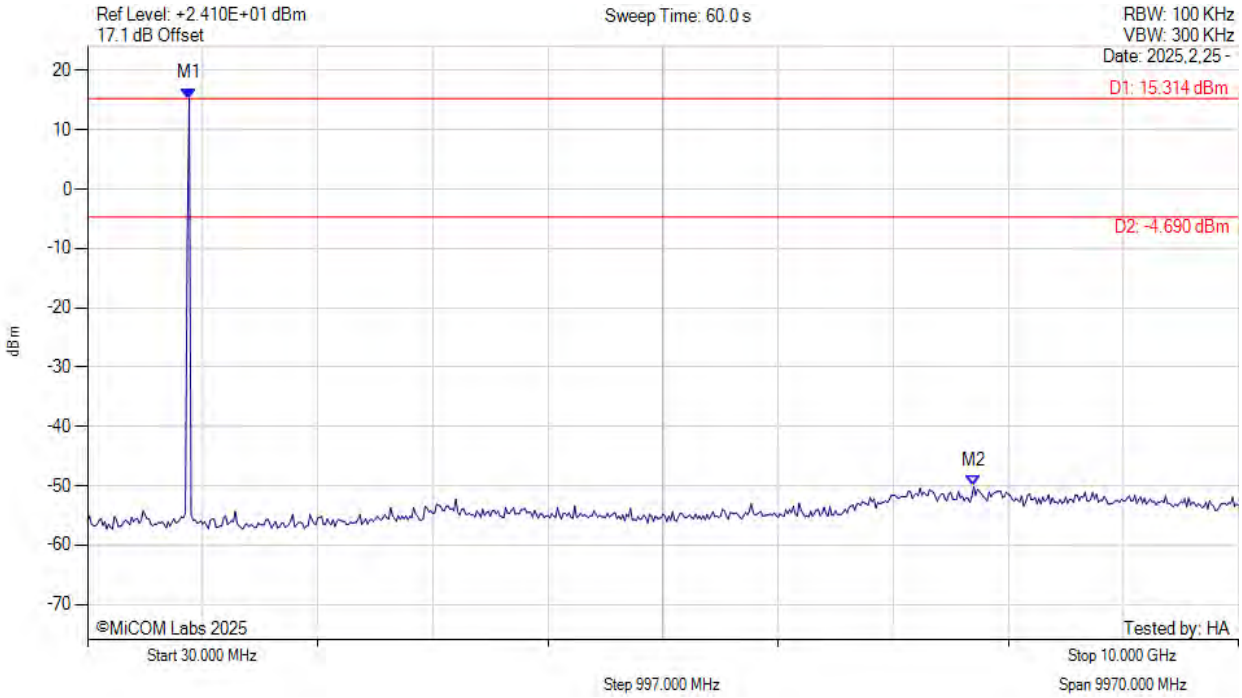
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS7-OFDM-opt1, Channel: 903.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 15.314 dBm M2 : 7707.000 MHz : -50.113 dBm	Limit: -4.69 dBm Margin: -45.42 dB

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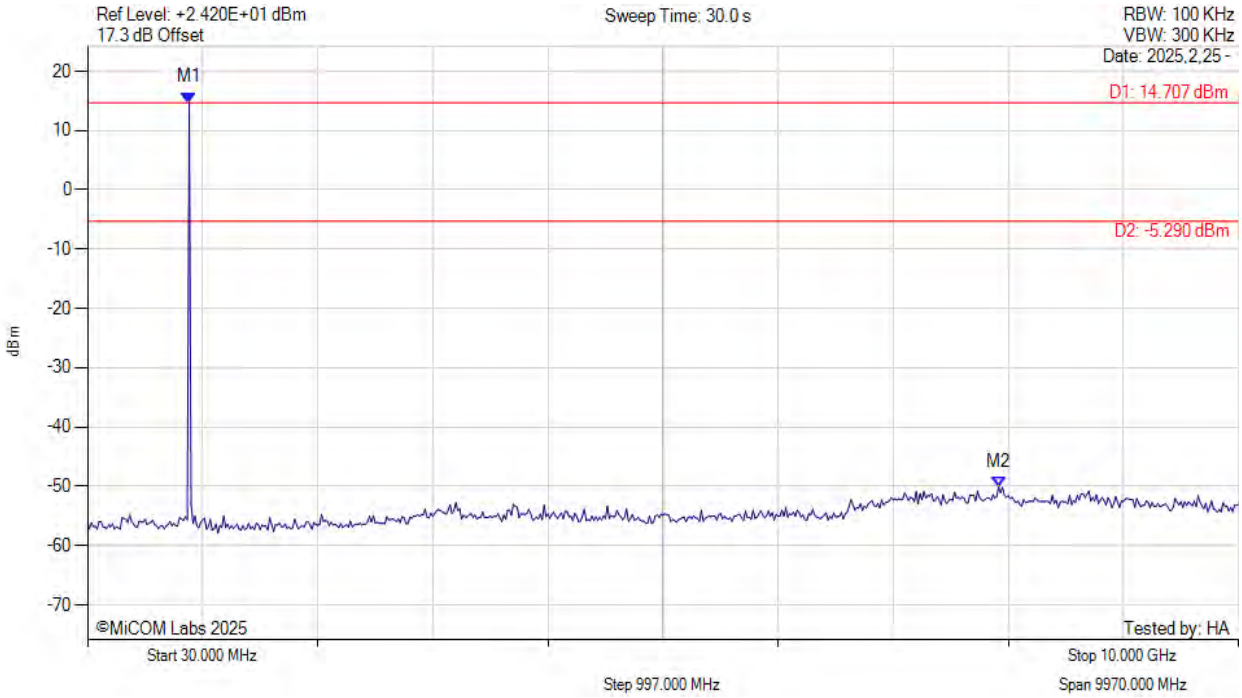
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS7-OFDM-opt1, Channel: 915.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 911.000 MHz : 14.707 dBm M2 : 7923.000 MHz : -50.112 dBm	Limit: -5.29 dBm Margin: -44.82 dB

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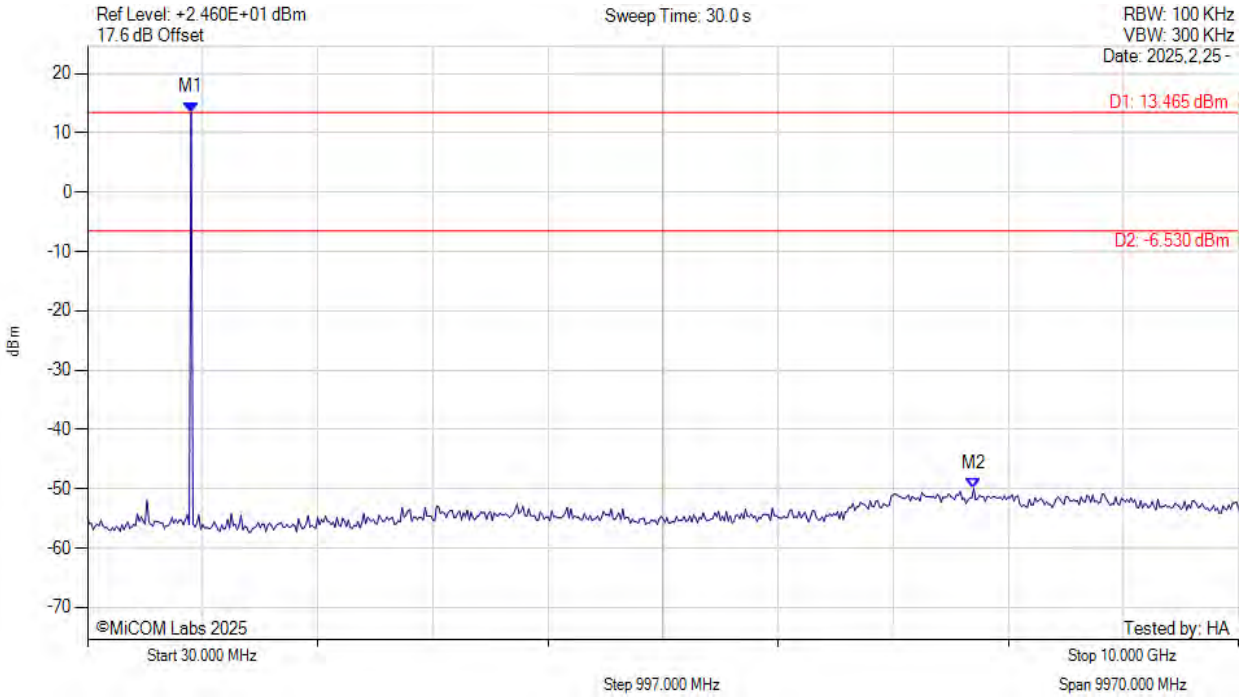
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: MCS7-OFDM-opt1, Channel: 927.20 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 927.000 MHz : 13.465 dBm M2 : 7707.000 MHz : -49.986 dBm	Limit: -6.53 dBm Margin: -43.46 dB

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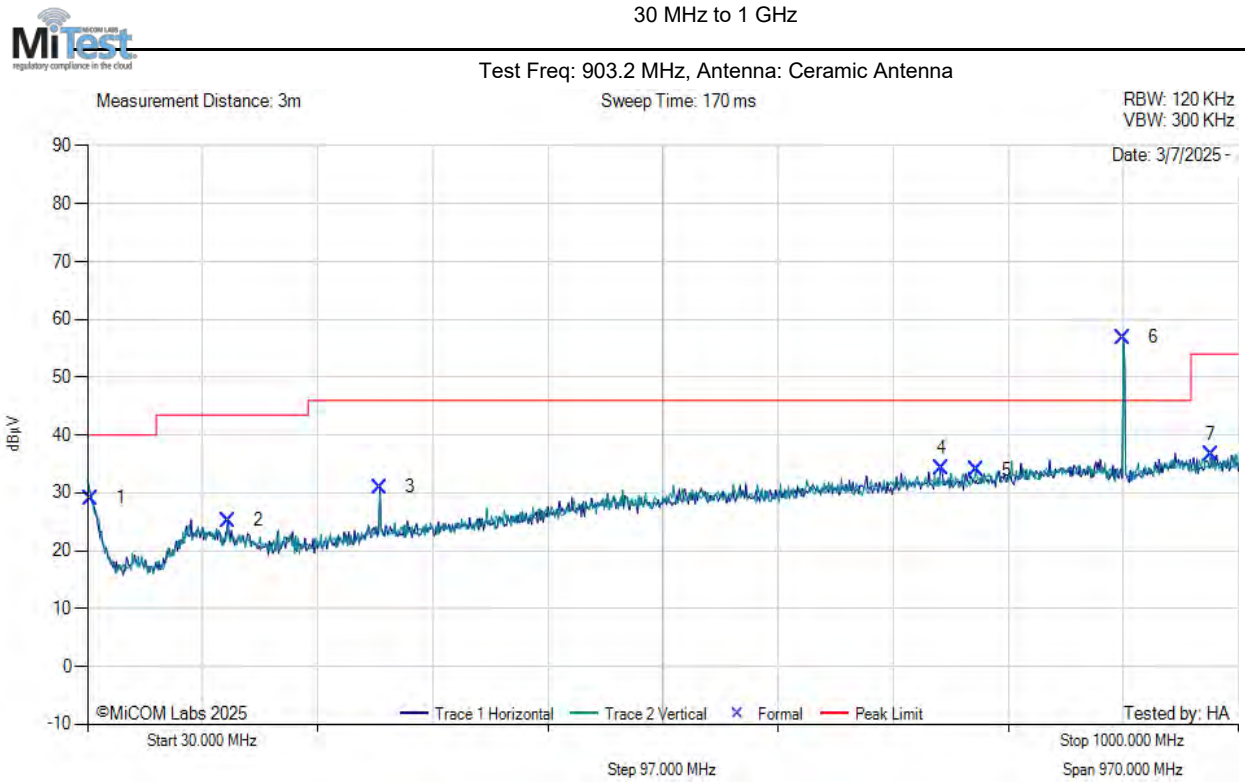
A.1.3.2. Radiated Emissions

TX Spurious & Restricted Band Emissions

Ceramic Antenna (30MHz – 1GHz)



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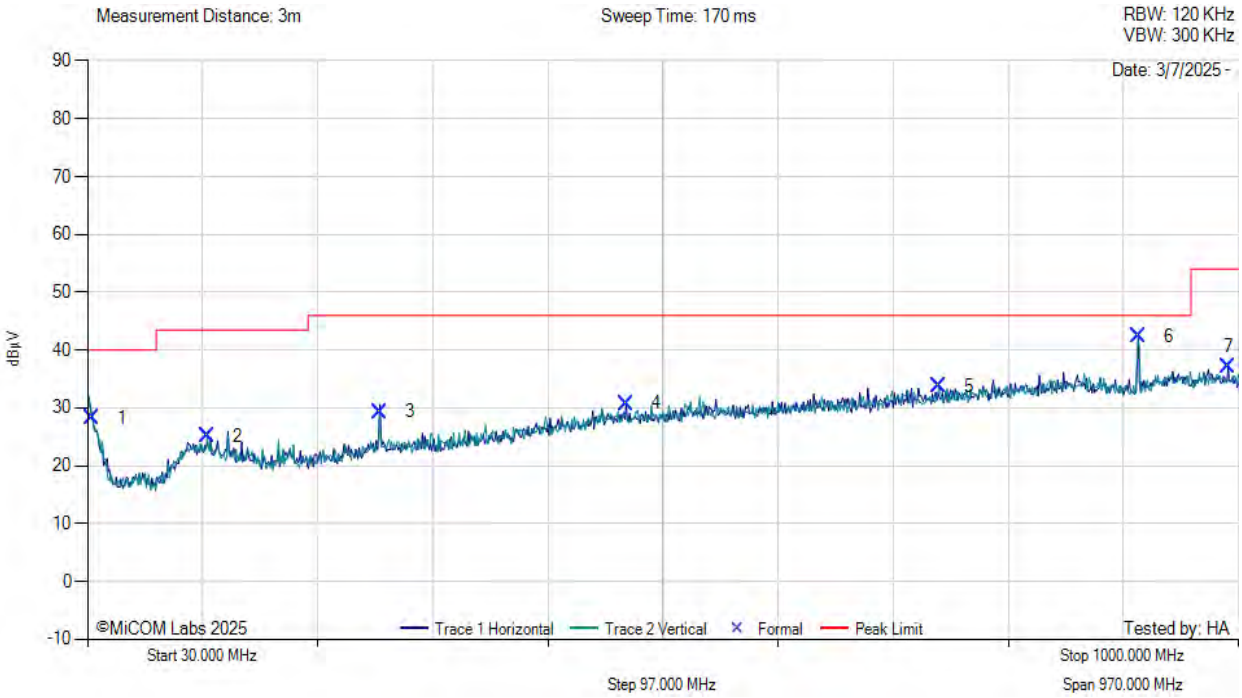
30 MHz to 1 GHz

Test Freq: 915.2 MHz, Antenna: Ceramic Antenna



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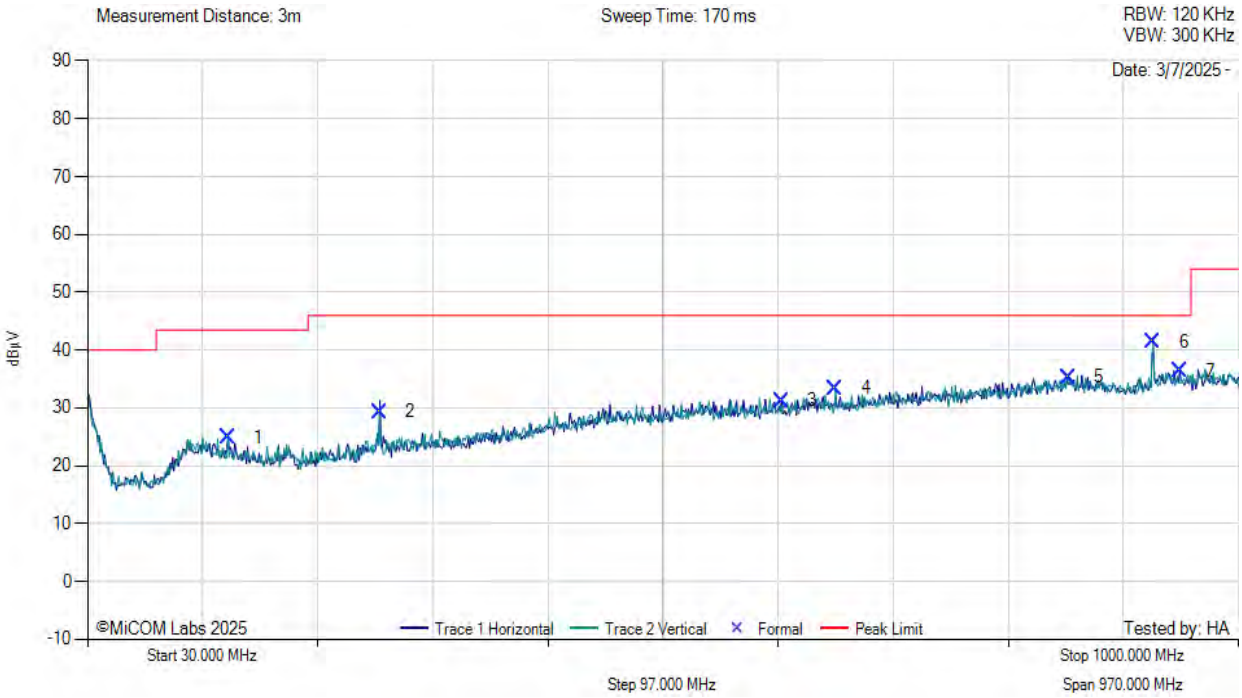
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: Ceramic Antenna



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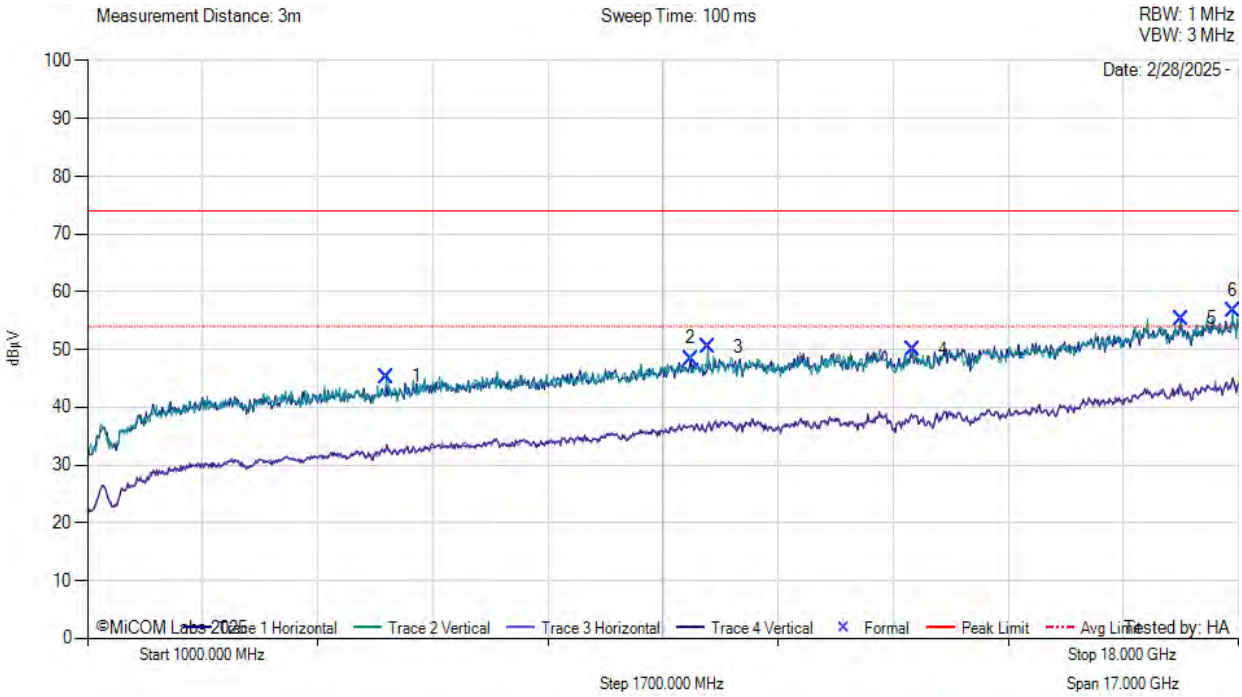
Ceramic Antenna (1GHz – 18GHz)

FCC Spurious 1 GHz -18 GHz

Test Freq: 903.2 MHz, Antenna: Ceramic Antenna



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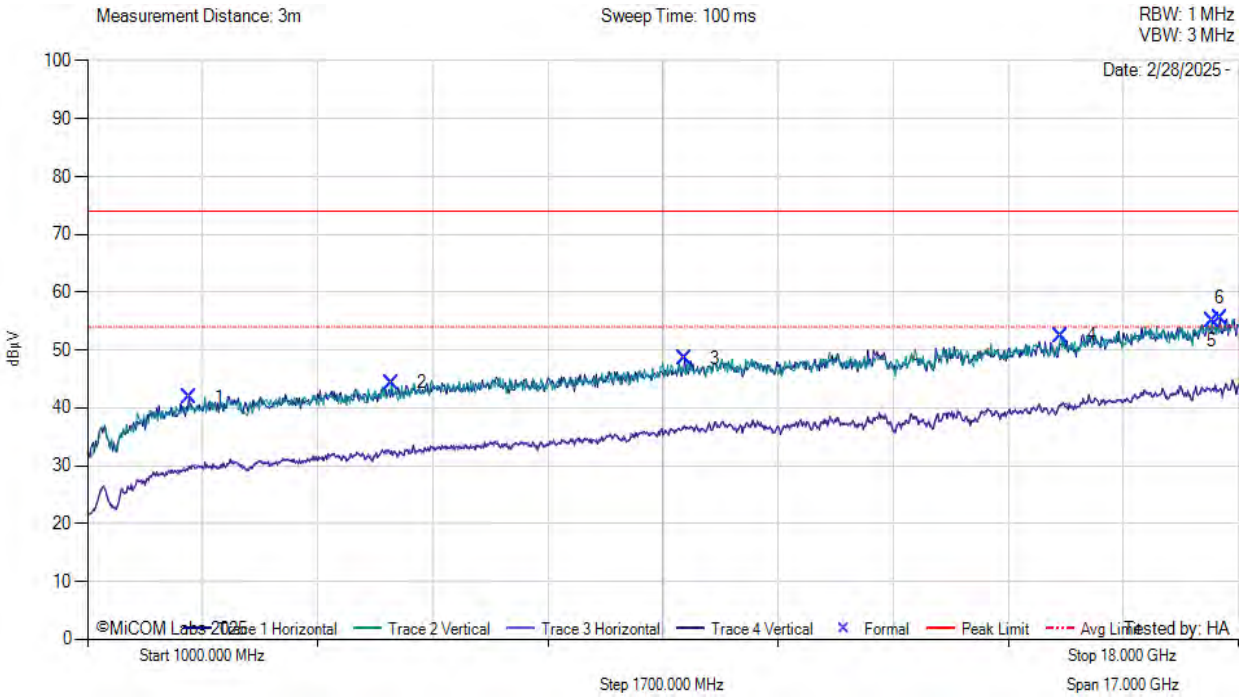
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.2 MHz, Antenna: Ceramic Antenna



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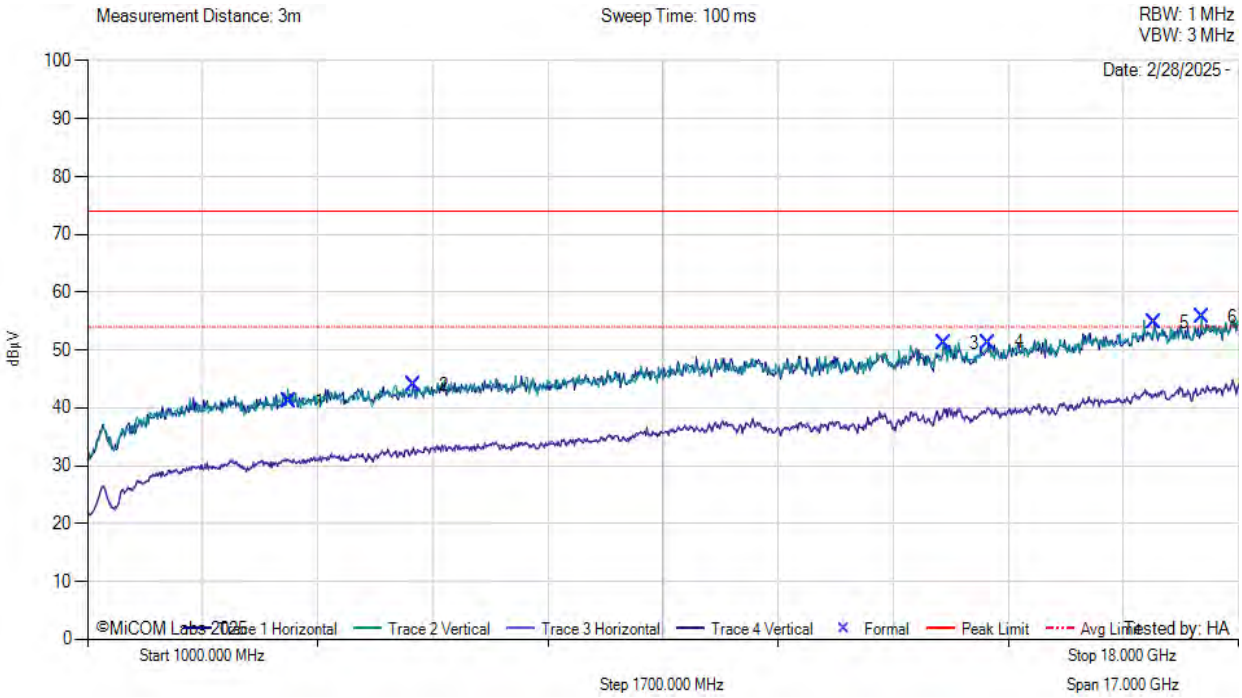
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.2 MHz, Antenna: Ceramic Antenna



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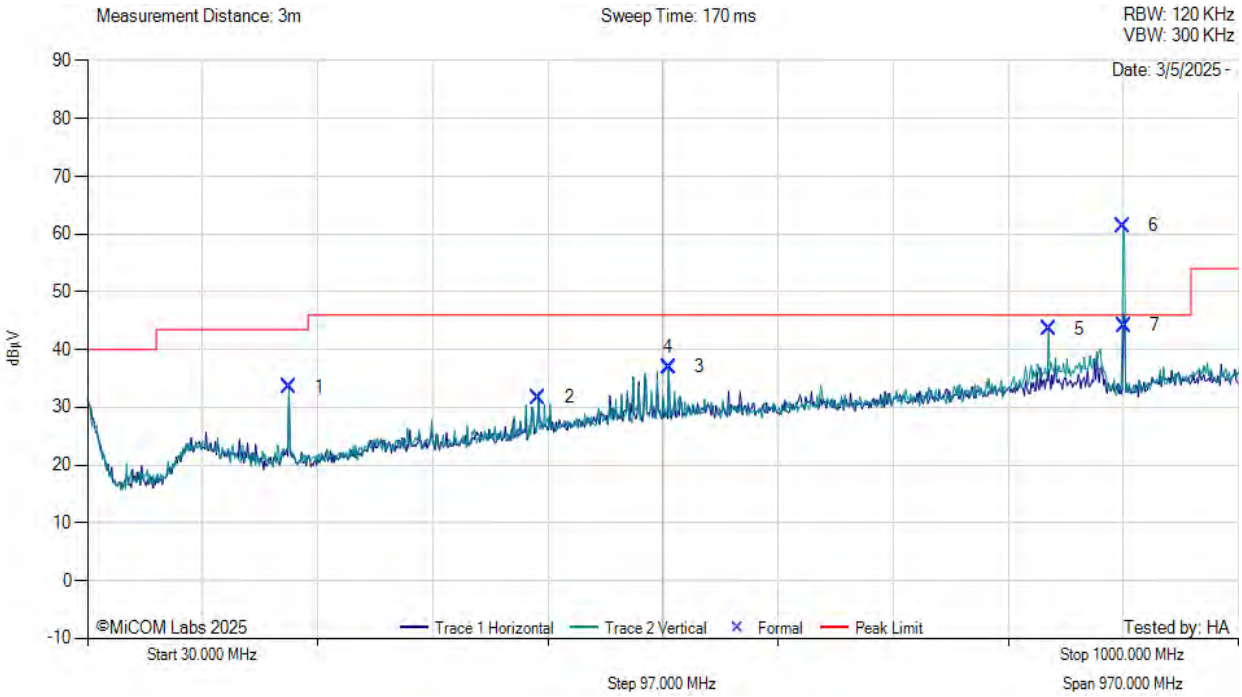
FG9026 Antenna (30MHz – 1GHz)

30 MHz to 1 GHz

Test Freq: 903.2 MHz, Antenna: FG9026 Antenna



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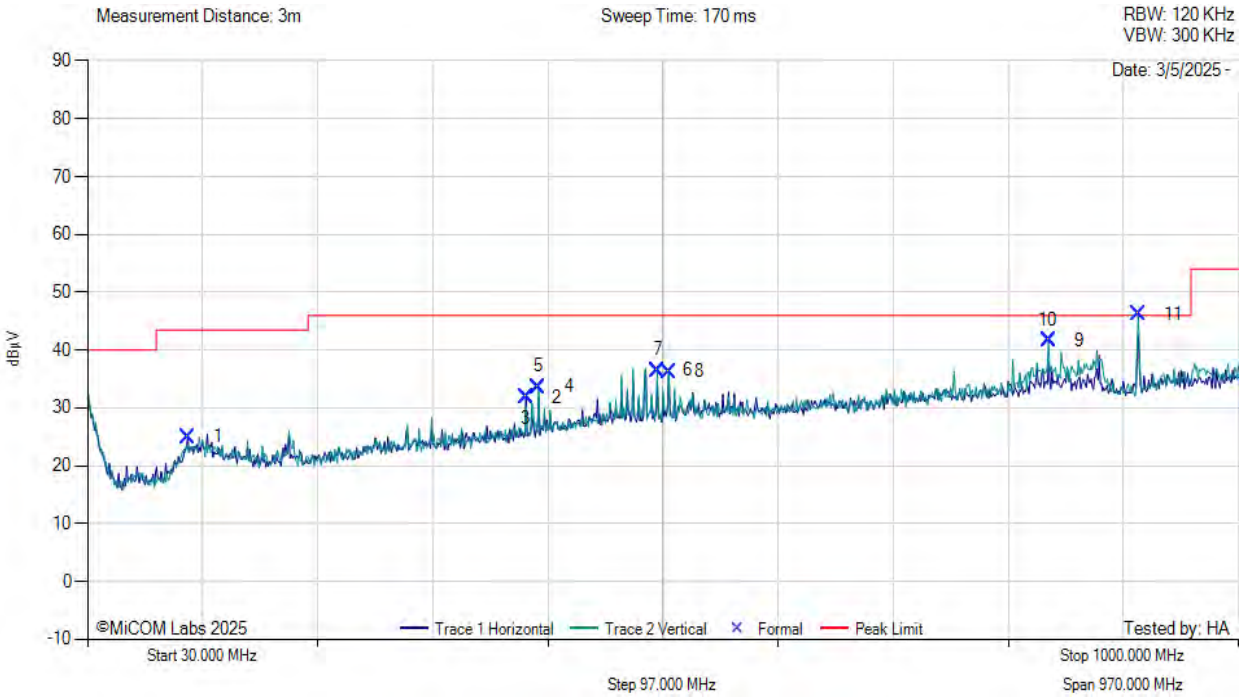
30 MHz to 1 GHz

Test Freq: 915.0 MHz, Antenna: FG9026 Antenna



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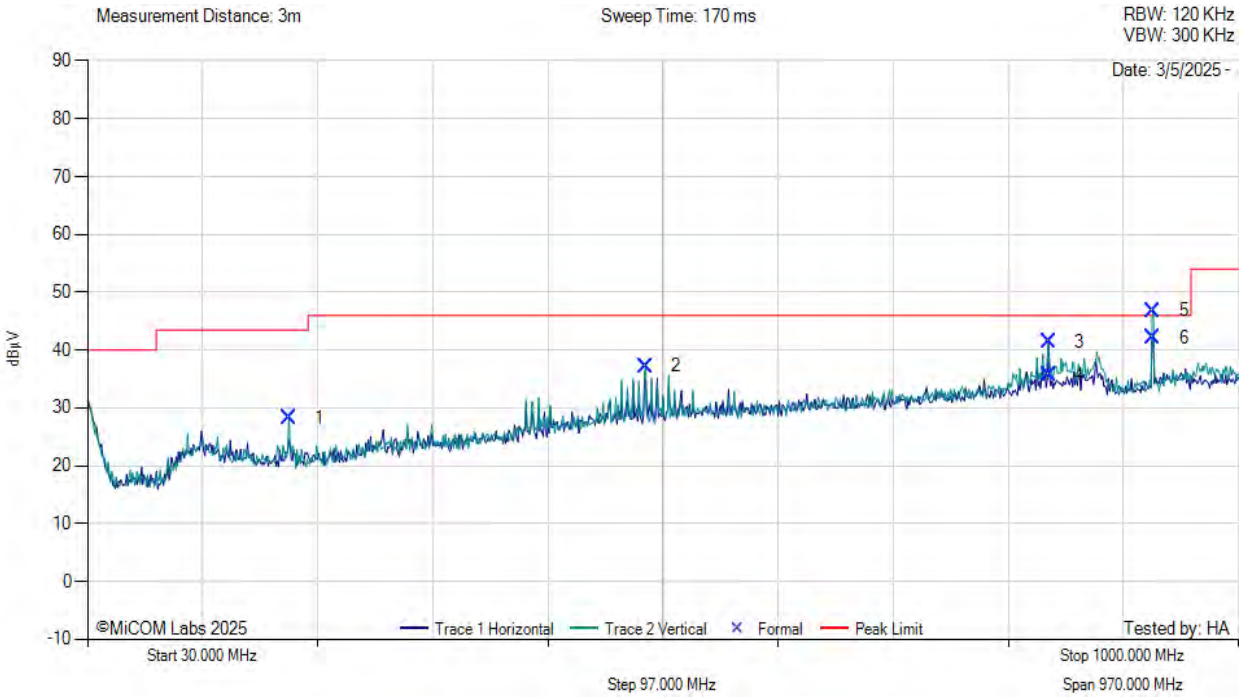
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: FG9026 Antenna



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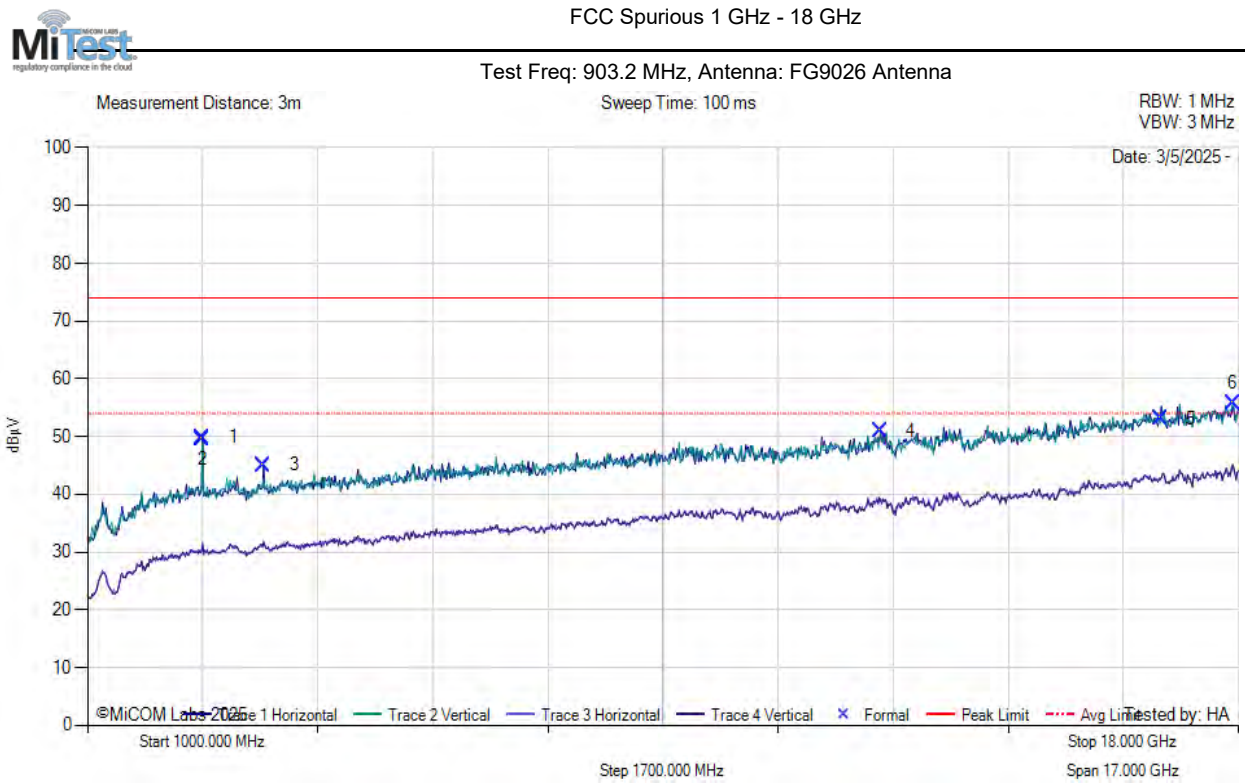
FG9026 Antenna (1GHz – 18GHz)



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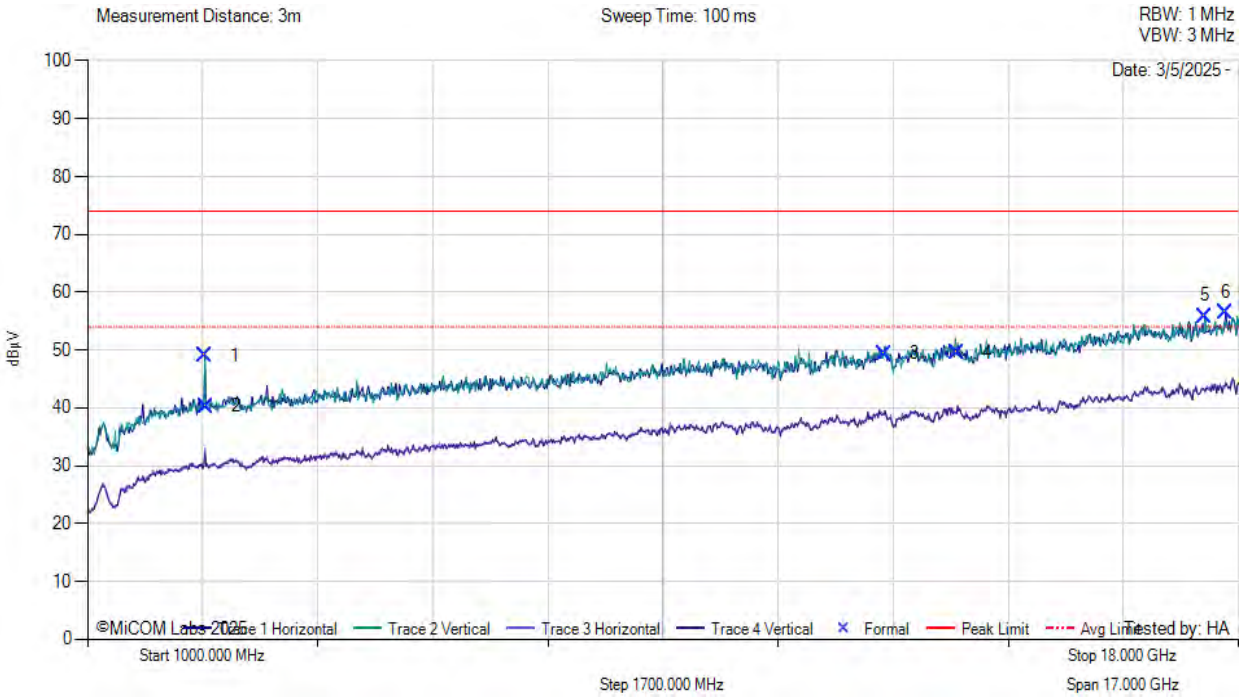
FCC Spurious 1 GHz - 18 GHz

Test Freq: 915.2 MHz, Antenna: FG9026 Antenna



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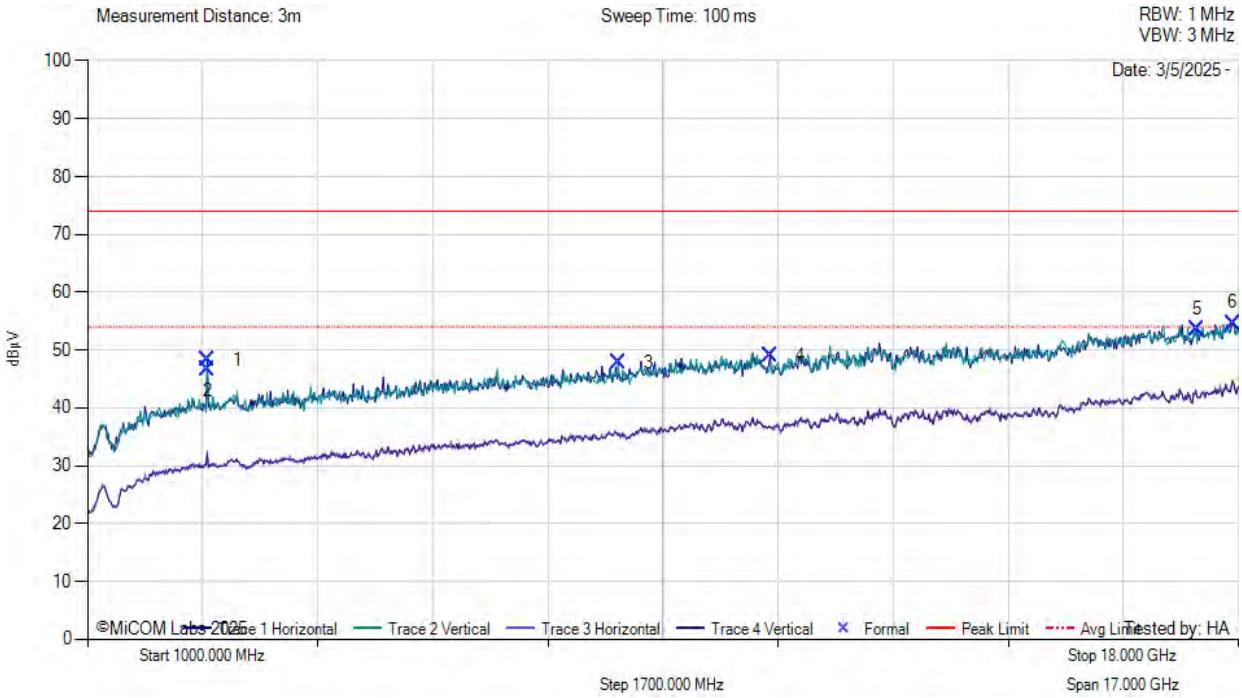
FCC Spurious 1 GHz - 18 GHz

Test Freq: 927.2 MHz, Antenna: FG9026 Antenna



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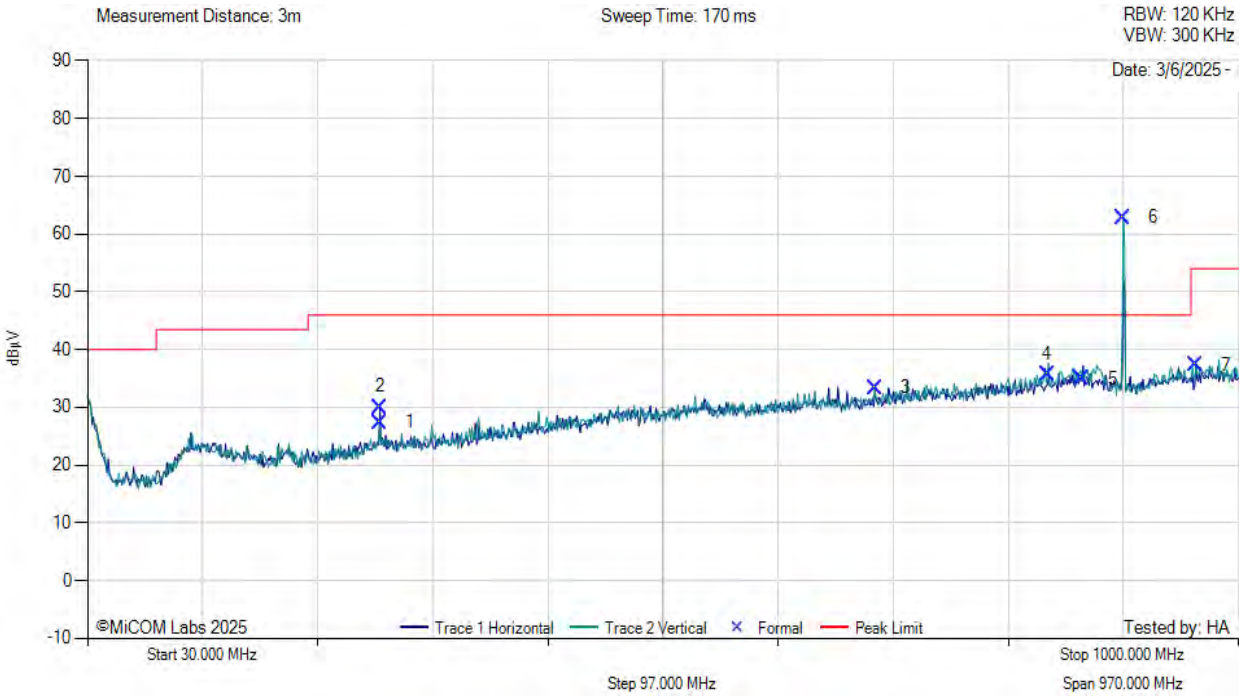
Laird Antenna (30MHz – 1GHz)

30 MHz to 1 GHz

Test Freq: 903.2 MHz, Antenna: Laird Antenna



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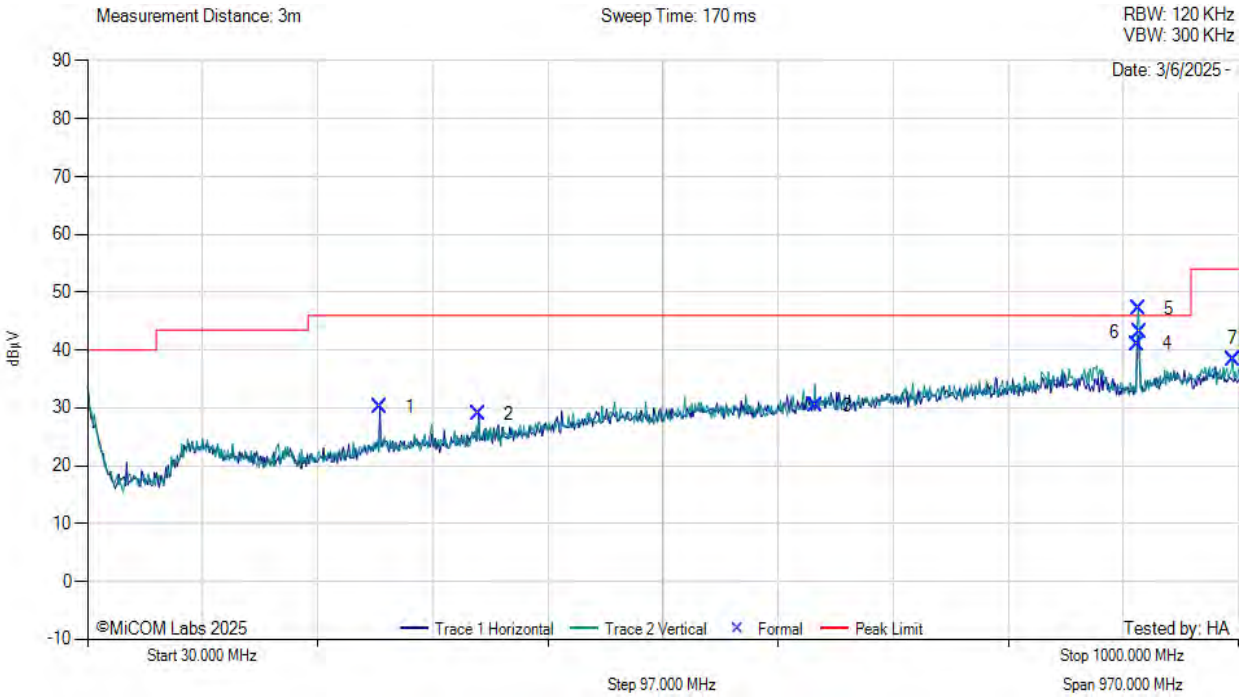
30 MHz to 1 GHz

Test Freq: 915.2 MHz, Antenna: Laird Antenna



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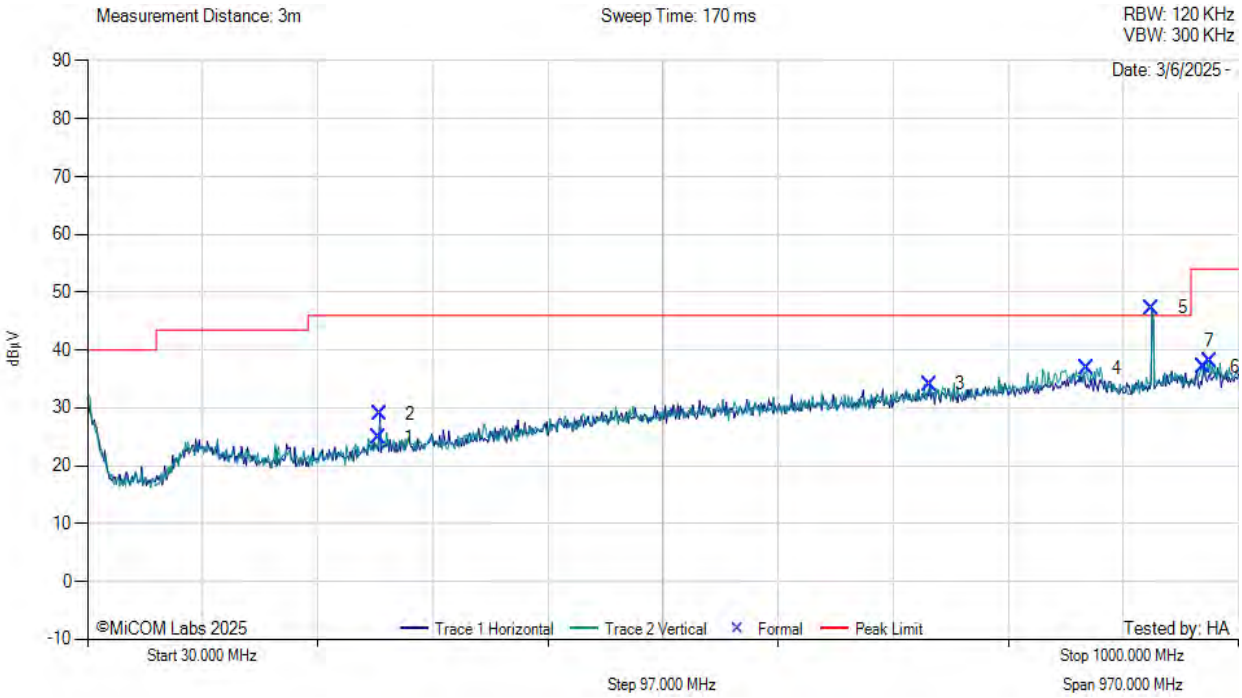
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: Laird Antenna



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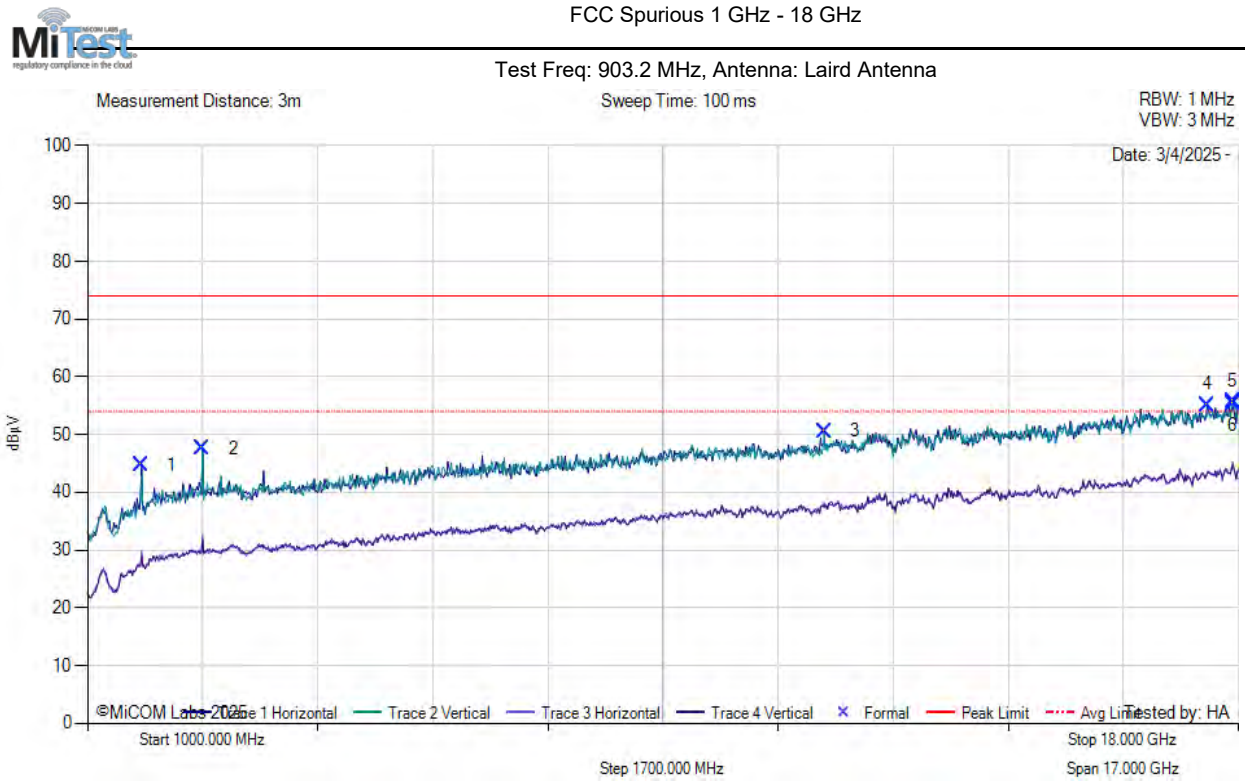
Laird Antenna (1GHz – 18GHz)



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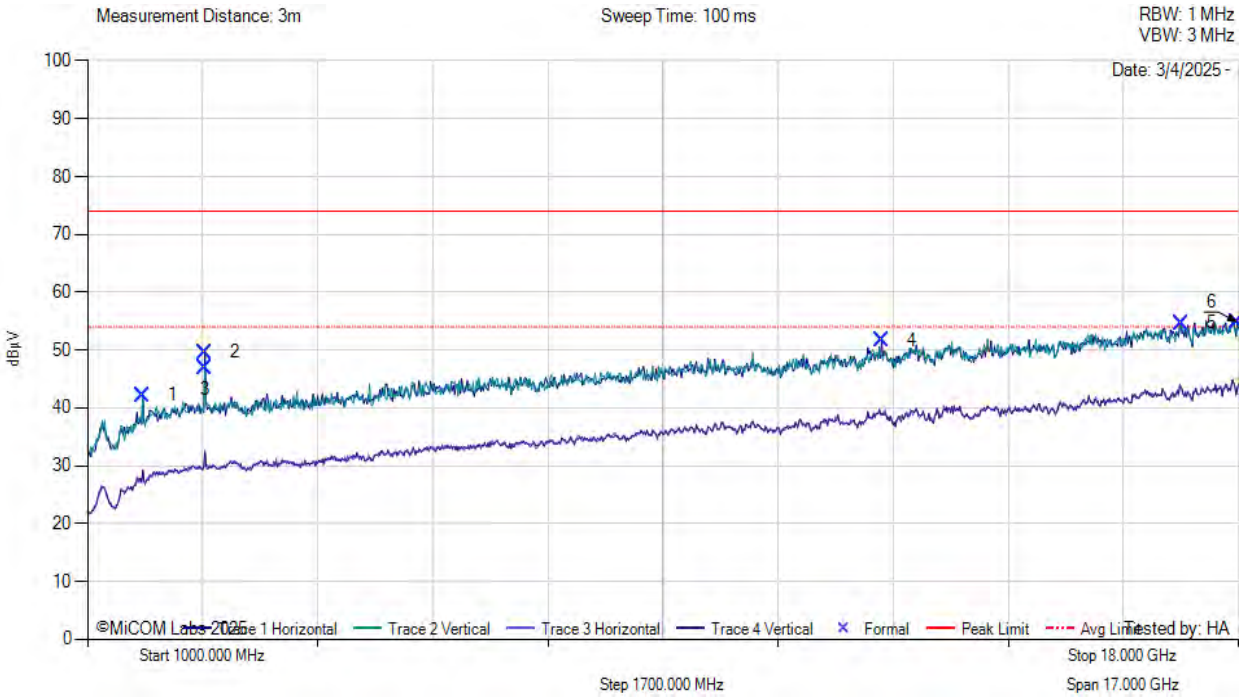
FCC Spurious 1 GHz - 18 GHz

Test Freq: 915.2 MHz, Antenna: Laird Antenna



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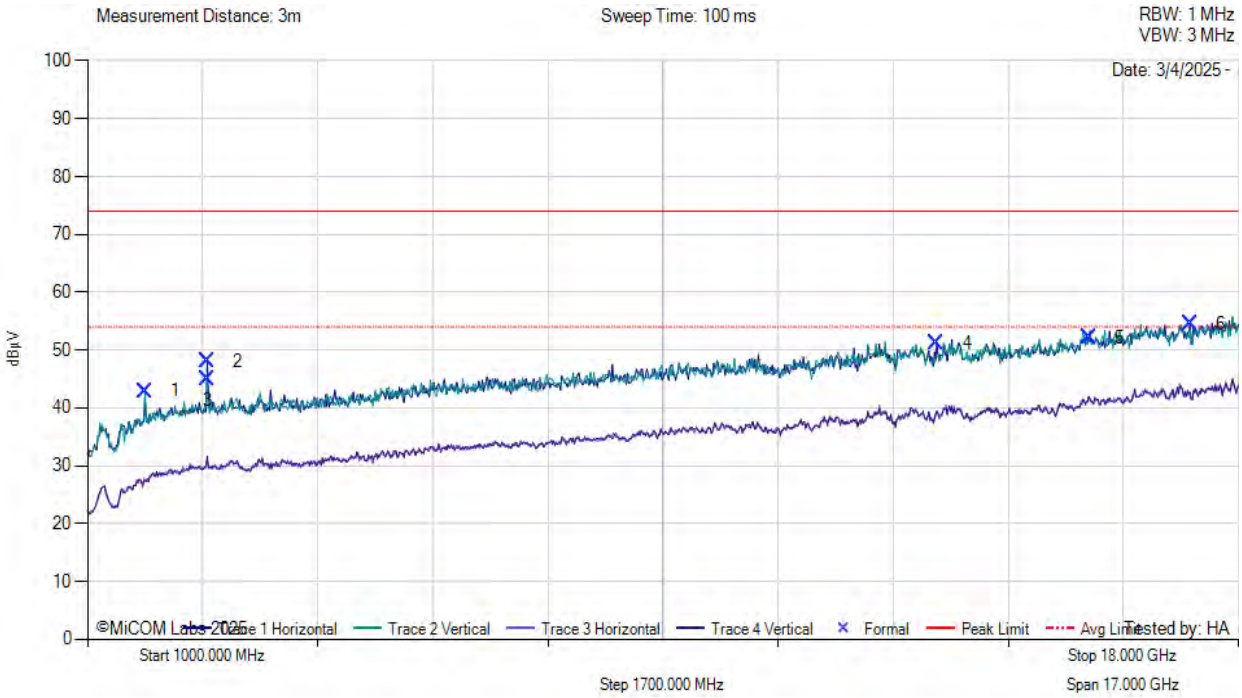
FCC Spurious 1 GHz - 18 GHz

Test Freq: 927.2 MHz, Antenna: Laird Antenna



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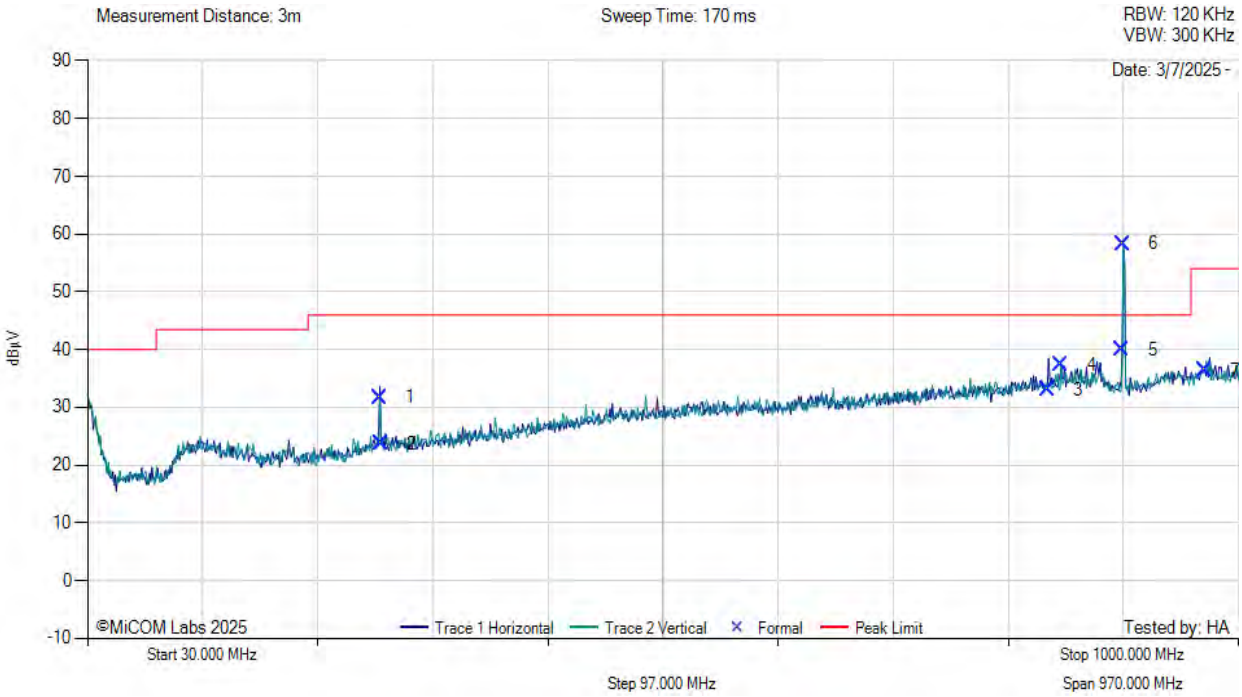
Molex Antenna (30MHz – 1GHz)

30 MHz to 1 GHz

Test Freq: 903.2 MHz, Antenna: Molex Antenna



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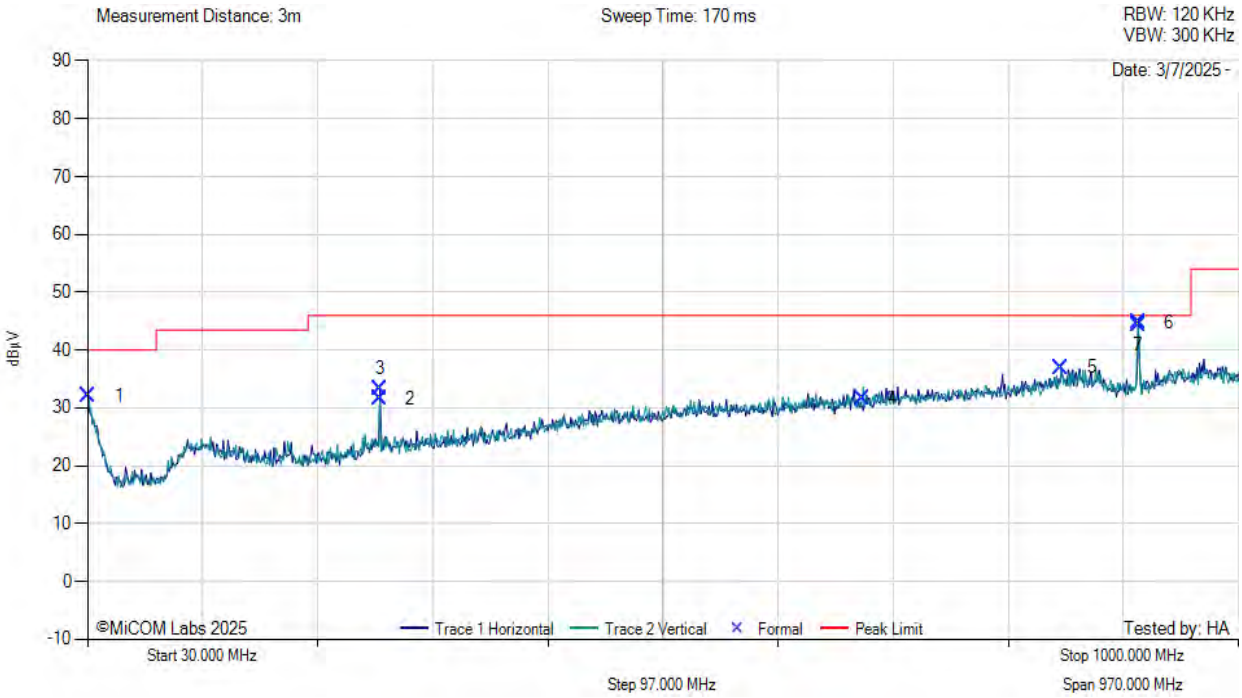
30 MHz to 1 GHz

Test Freq: 915.2 MHz, Antenna: Molex Antenna



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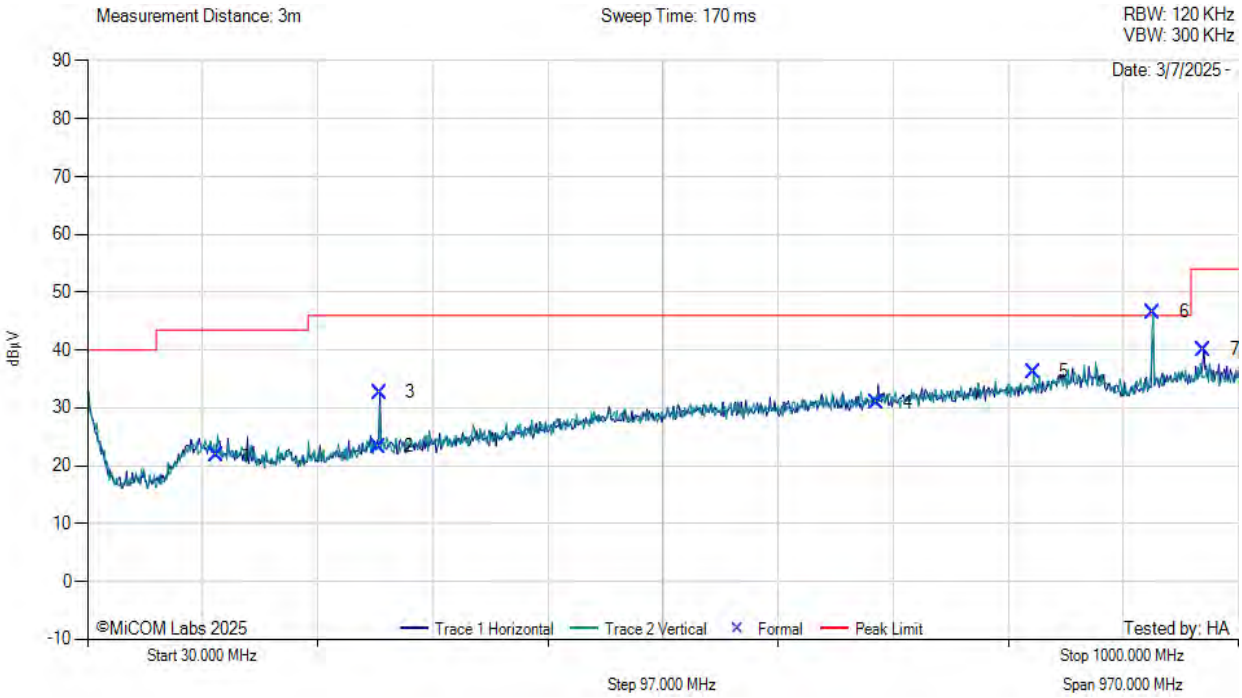
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: Molex Antenna



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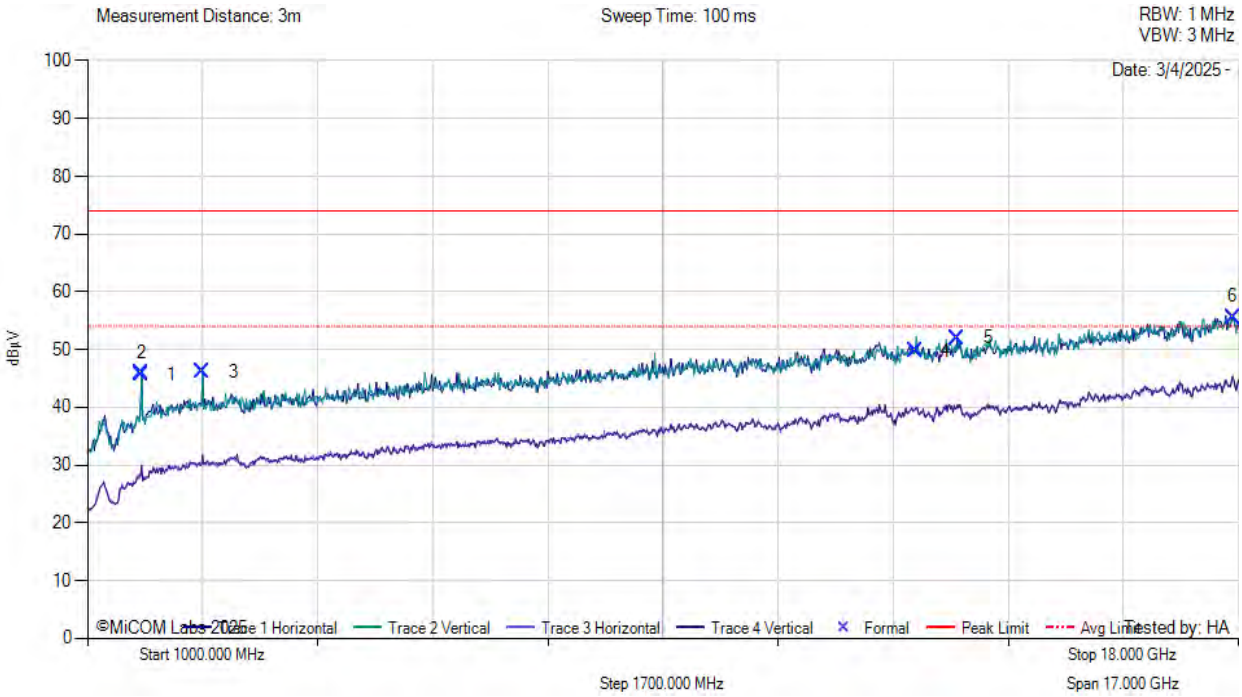
Molex Antenna (1GHz – 18 GHz)

FCC Spurious 1 GHz - 18 GHz

Test Freq: 903.2 MHz, Antenna: Molex Antenna



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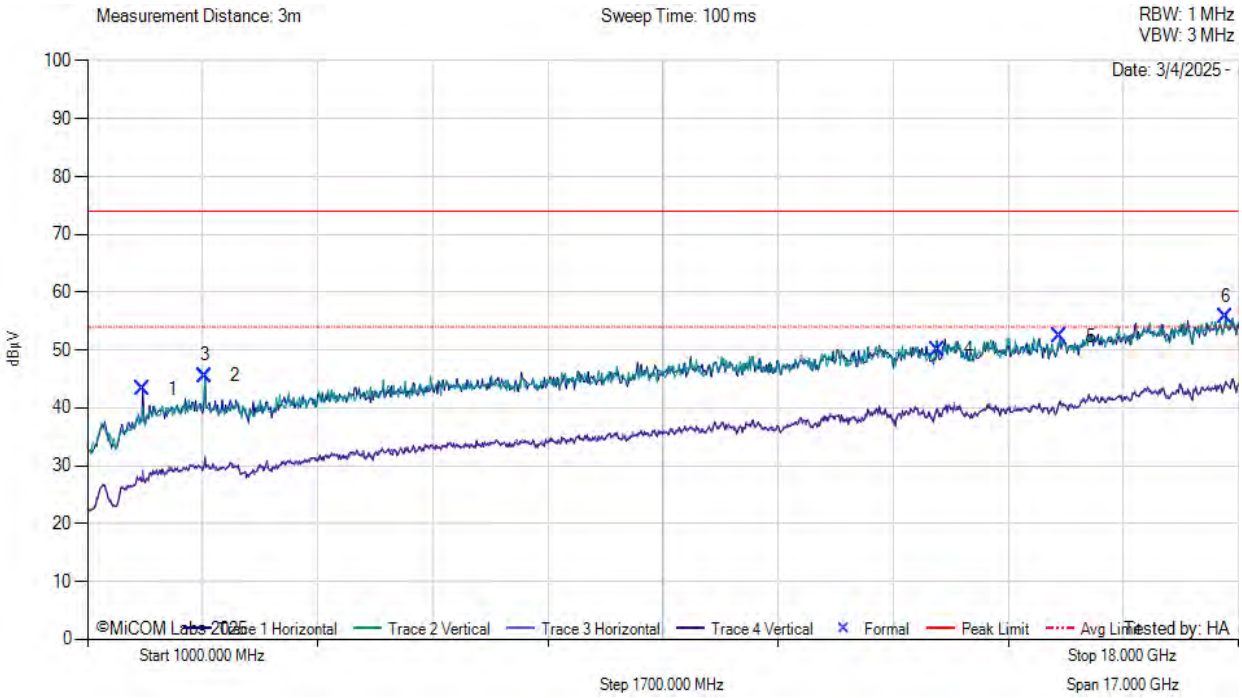
FCC Spurious 1 GHz - 18 GHz

Test Freq: 915.2 MHz, Antenna: Molex Antenna



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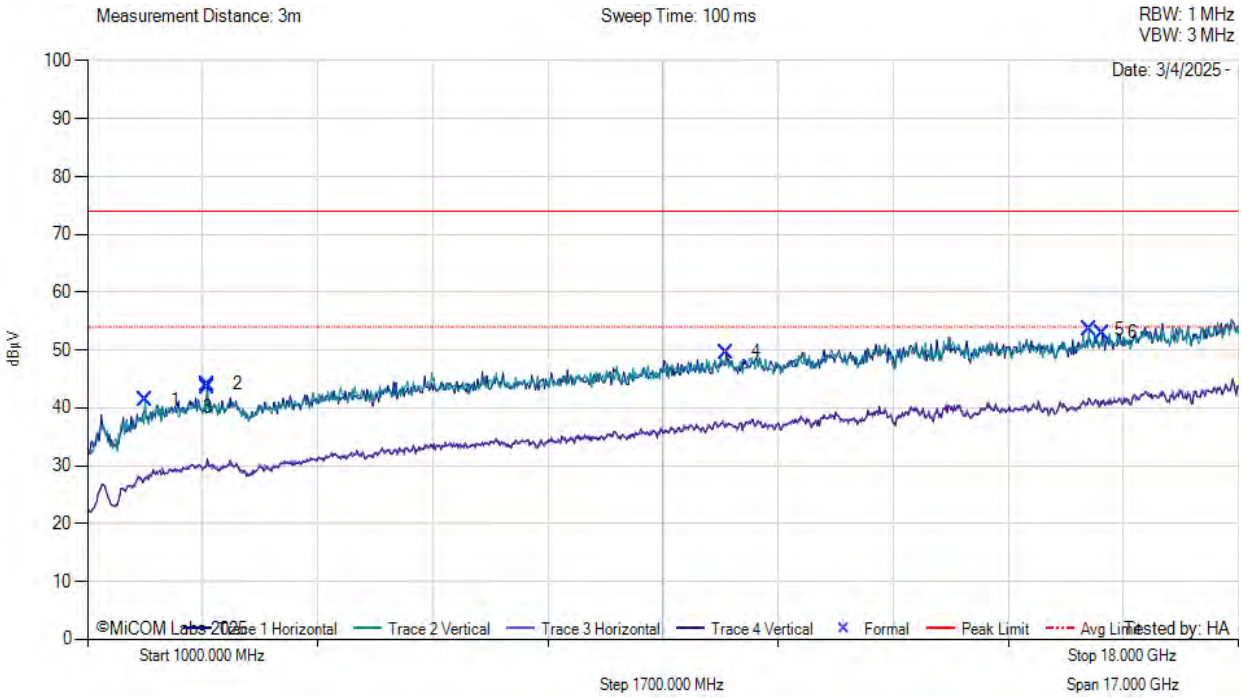
FCC Spurious 1 GHz - 18 GHz

Test Freq: 927.2 MHz, Antenna: Molex Antenna



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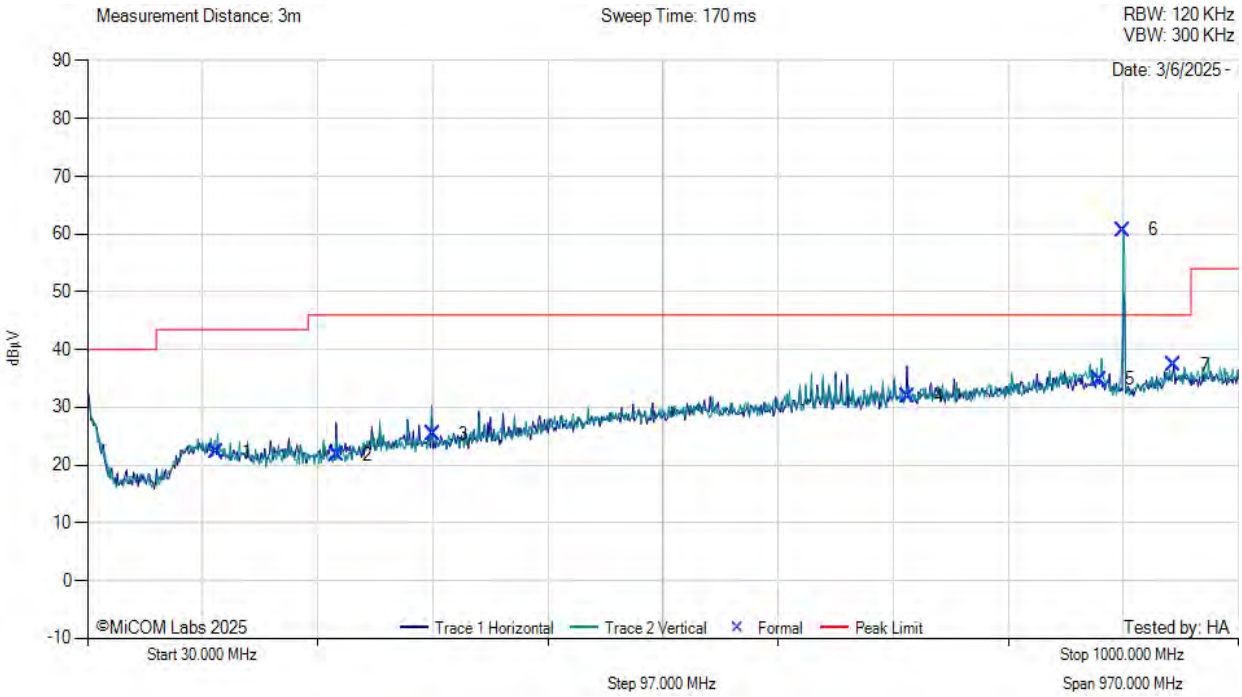
MPD Antenna (30MHz – 1GHz)

30 MHz to 1 GHz

Test Freq: 903.2 MHz, Antenna: MPD Antenna



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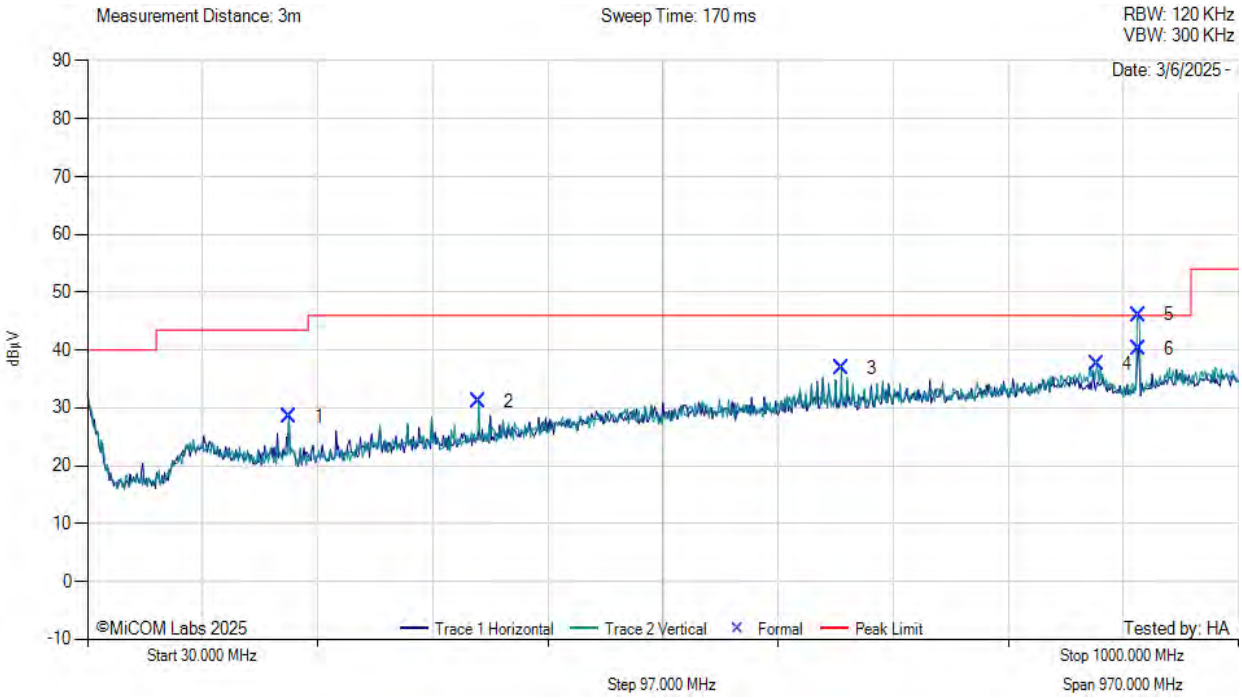
30 MHz to 1 GHz

Test Freq: 915.2 MHz, Antenna: MPD Antenna



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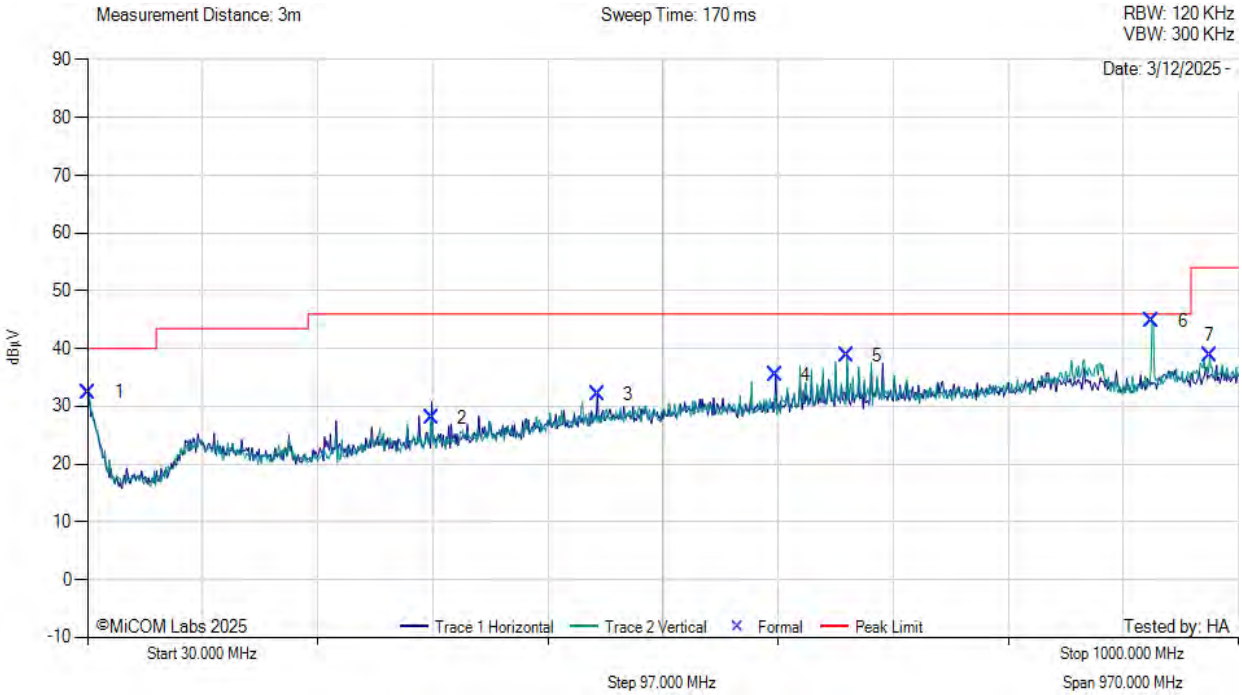
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: MPD Antenna



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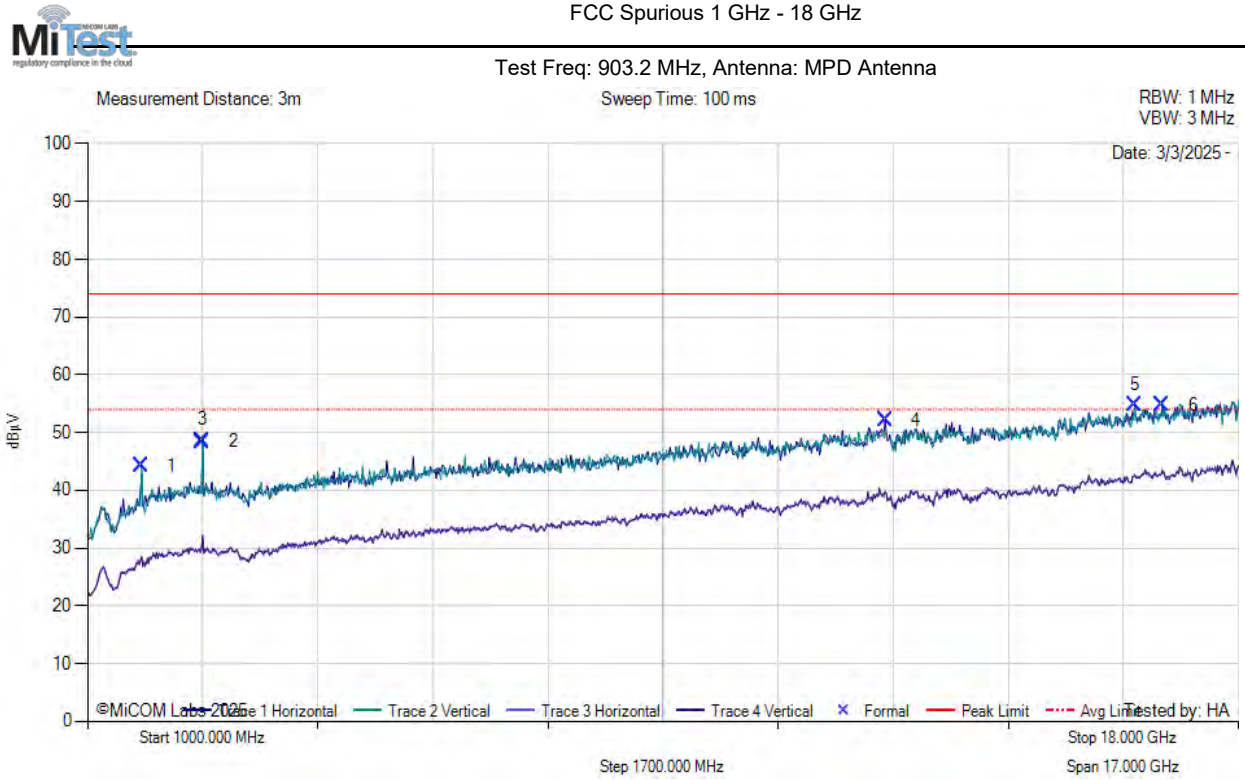
MPD Antenna (1GHz – 18GHz)



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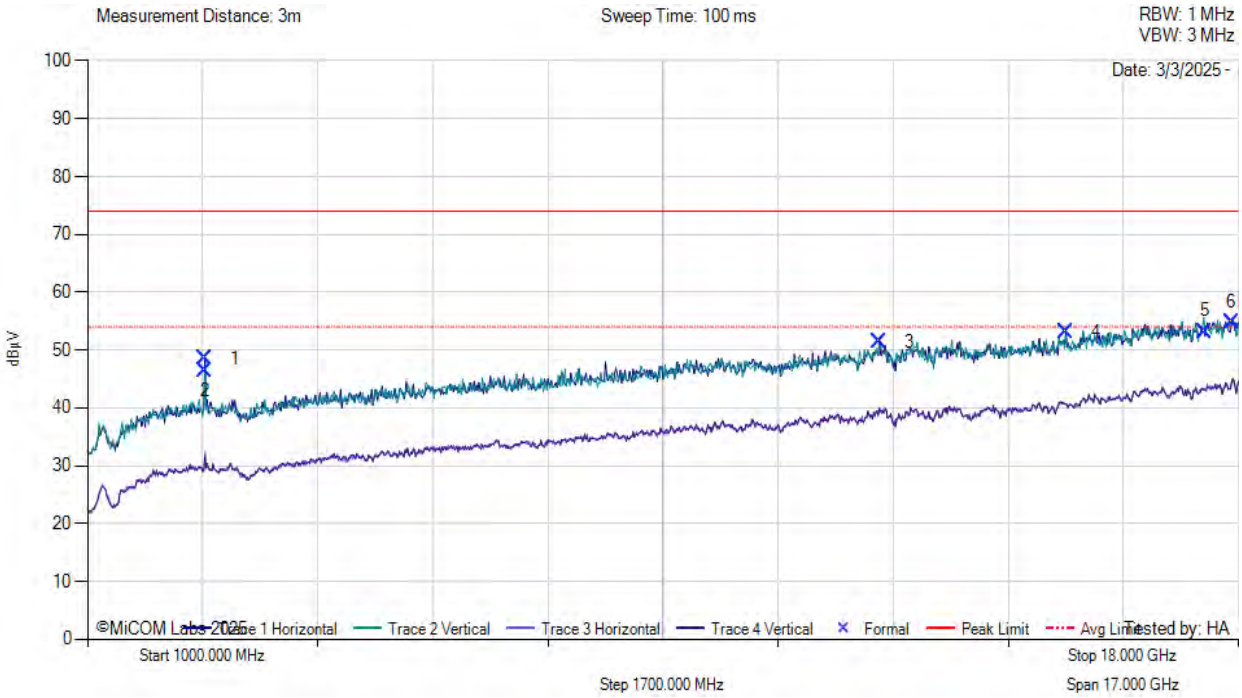
FCC Spurious 1 GHz - 18 GHz

Test Freq: 915.2 MHz, Antenna: MPD Antenna



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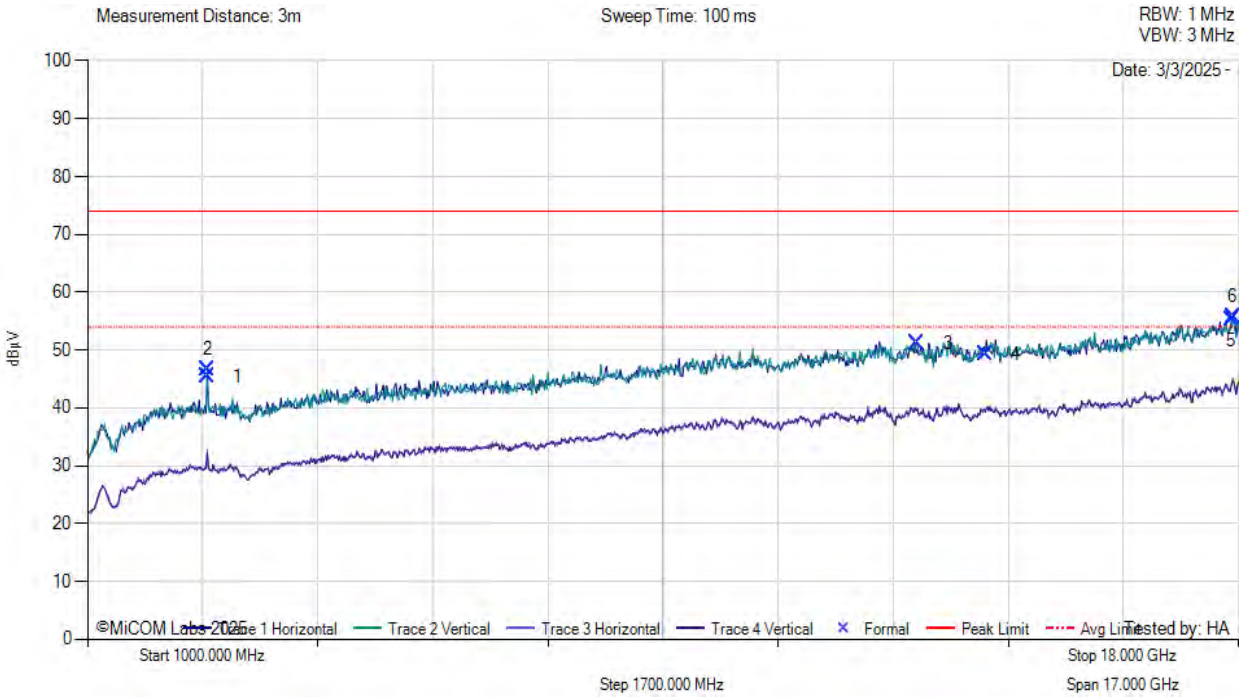
FCC Spurious 1 GHz - 18 GHz

Test Freq: 927.2 MHz, Antenna: MPD Antenna



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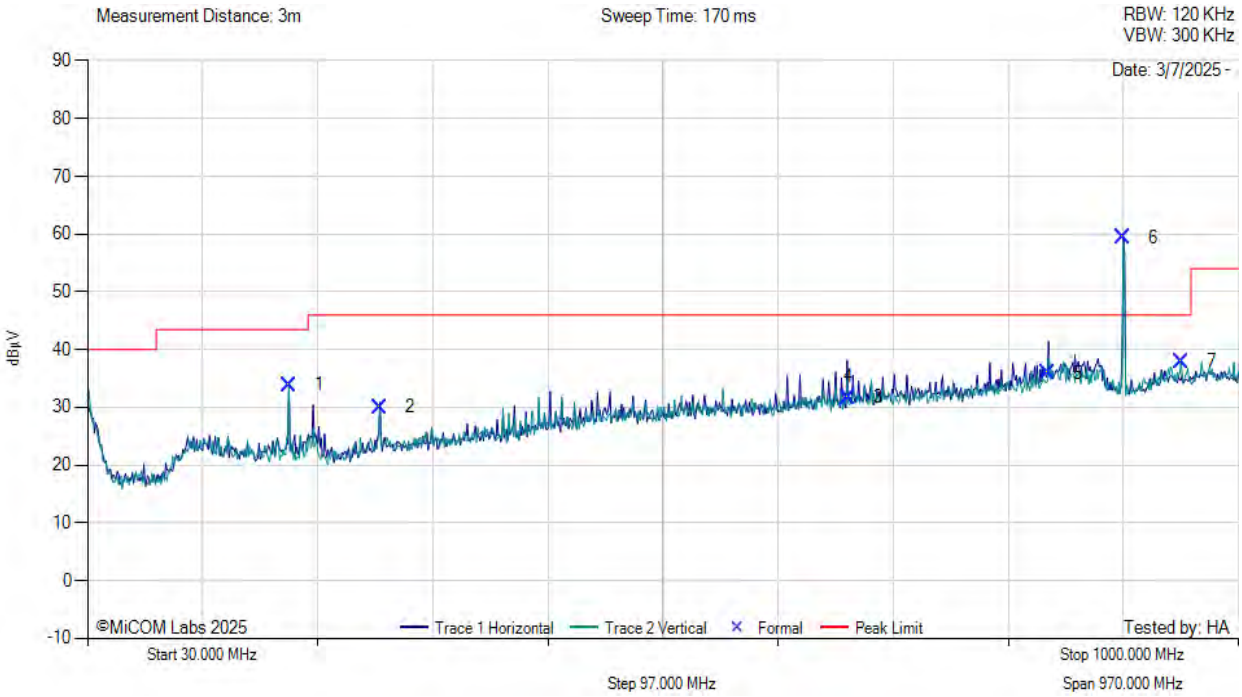
Taoglas FXUB65 Antenna (30MHz – 1GHz)

30 MHz to 1 GHz

Test Freq: 903.2 MHz, Antenna: Taoglas FXUB65 Antenna



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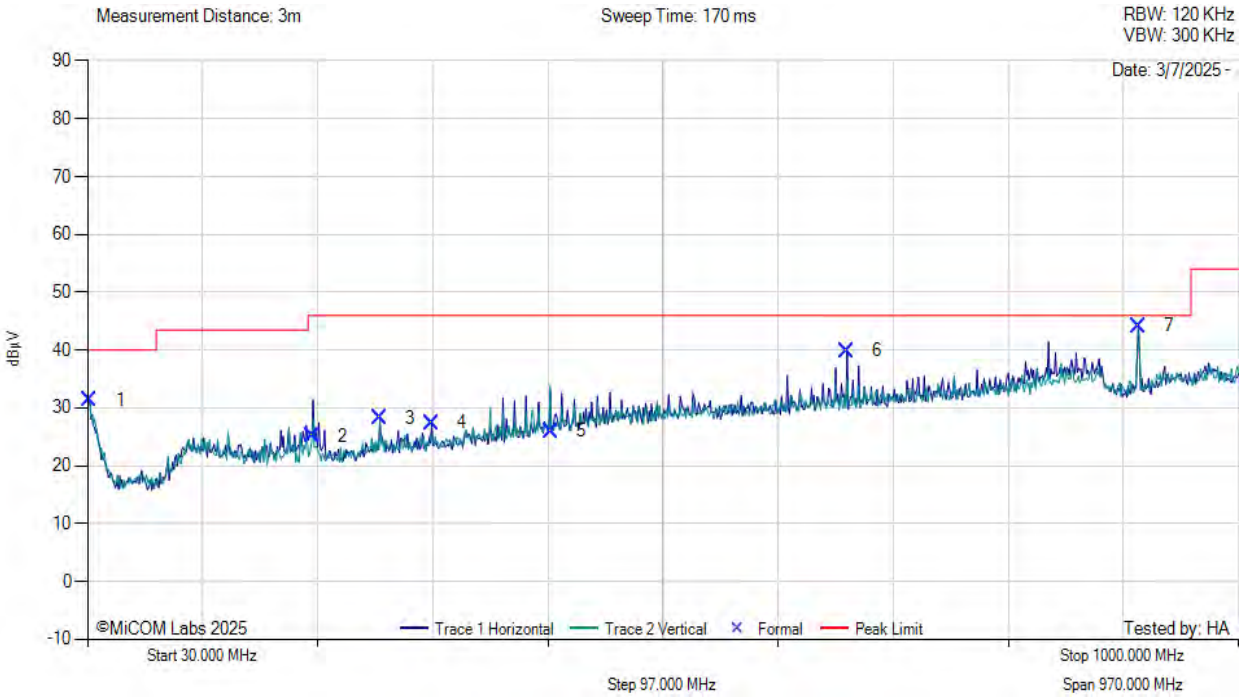
30 MHz to 1 GHz

Test Freq: 915.2 MHz, Antenna: Taoglas FXUB65 Antenna



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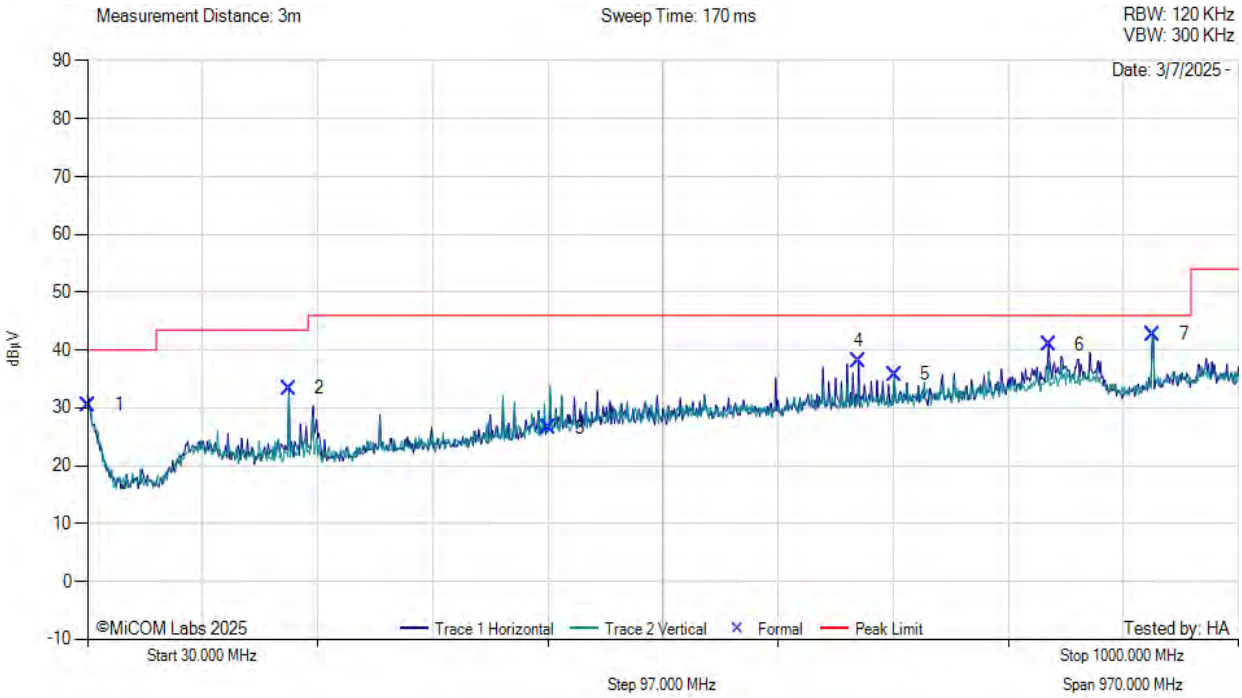
30 MHz to 1 GHz

Test Freq: 927.2 MHz, Antenna: Taoglas FXUB65 Antenna



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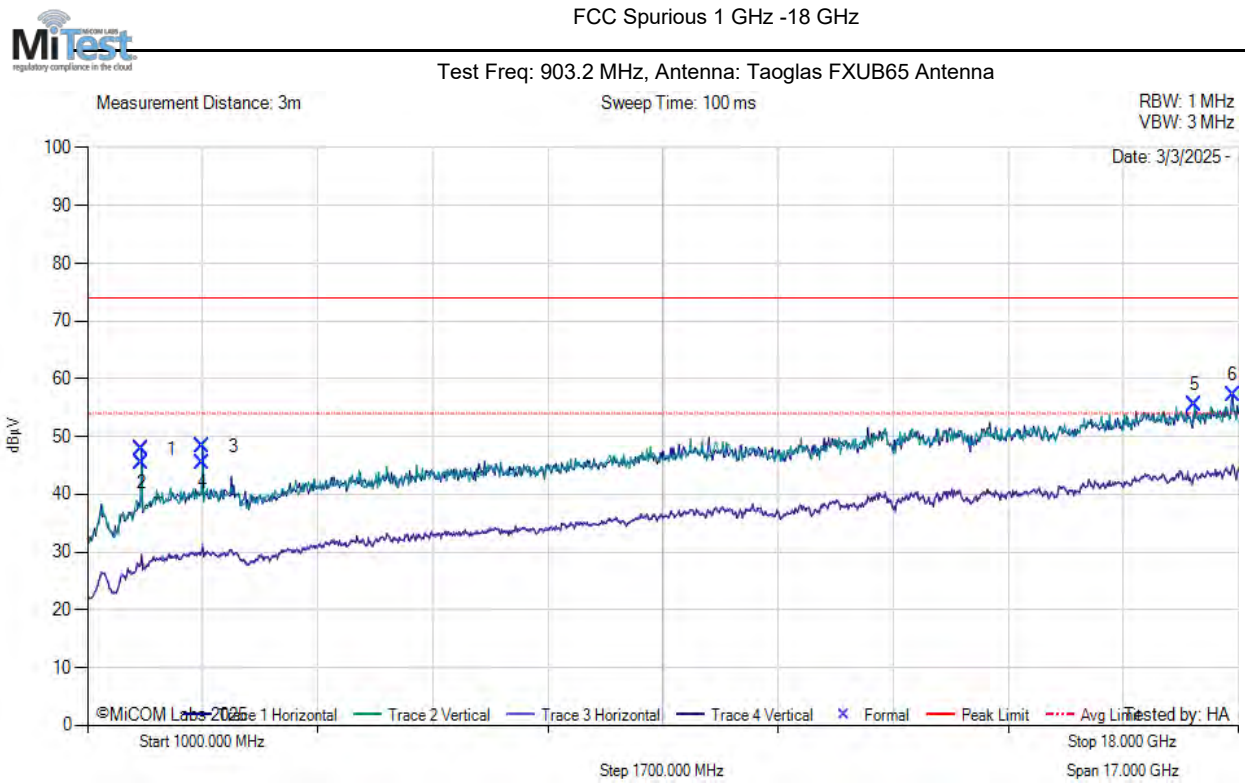
Taoglas FXUB65 Antenna (1GHz – 18GHz)



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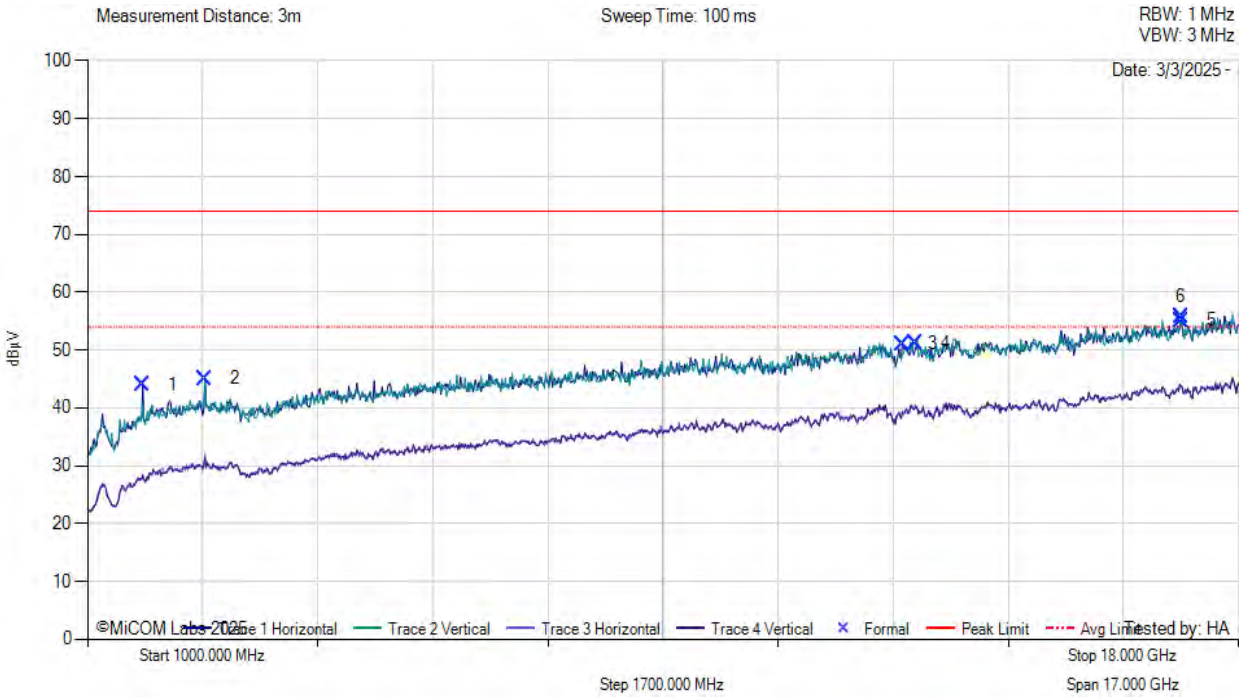
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.2 MHz, Antenna: Taoglas FXUB65 Antenna



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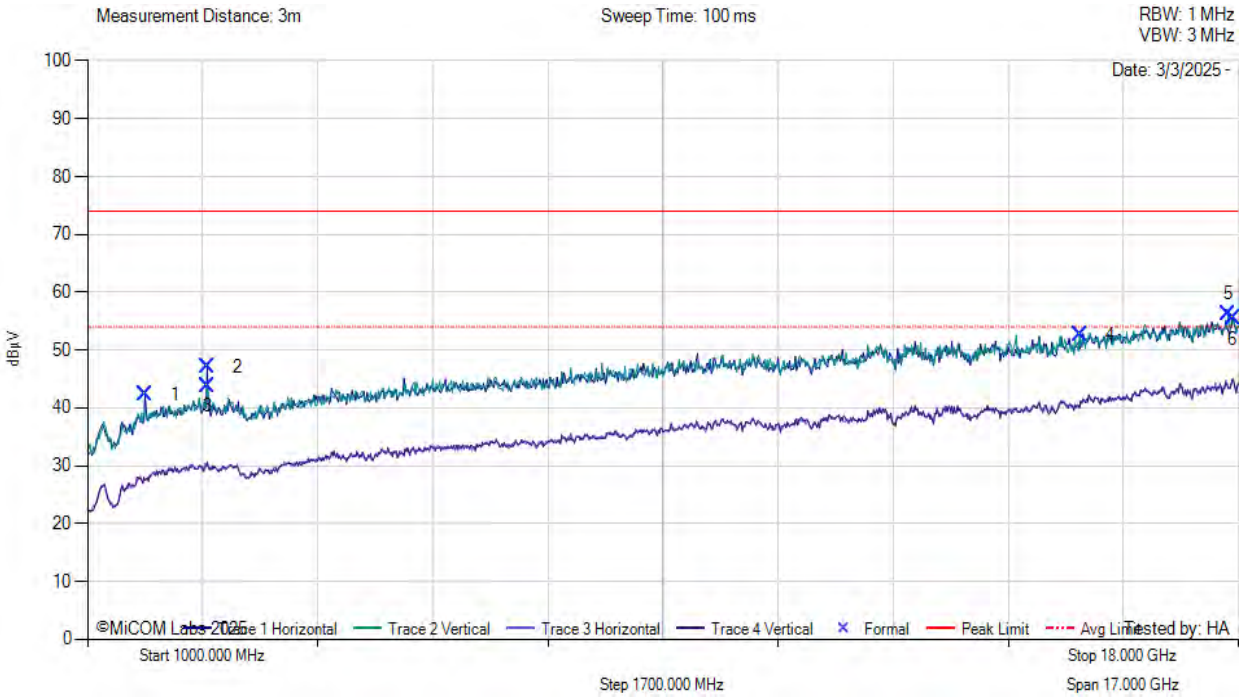
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.2 MHz, Antenna: Taoglas FXUB65 Antenna



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APPENDIX B – DECLARATION OF SIMILARITIES

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Declaration of Similarities

XBee W-SUN RF Module
Model: XBSG

1. Company Name and trademark: Digi International Inc.

2. Date: April 7, 2025

3. Model tested at MiCOM Labs
   XB-WSB-UM-001 XBee Wi-SUN, OFDM, U.FL Antenna, MMT

4. Models within the same family with tested model. Similarities and Differences between the tested model and other models:

The XBee Wi-SUN RF modules have these specifications in common:

Specification				
RF power	FSK: 15.37 dBm EIRP	OFDM: 17.1 EIRP		
Power supply voltage (Vdc)	Min: 2.4	Typ: 3.3	Max: 3.8	
Power supply current (mA)	Max (transmit): 195			
Dimensions	MMT: 1.36 cm x 1.93 cm x 0.241 cm	SMT: 2.2 cm x 3.38 cm x 0.325 cm	TH: 2.44 cm x 2.76 cm x 0.688 cm	
Weight	MMT: 1.2 g	SMT: 3.0 g	TH: 3.0 g	

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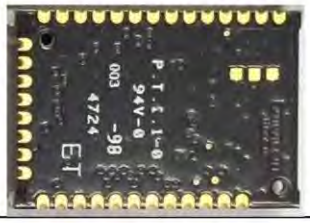
Digi part number	Description	Similarities	Photographs
XB-WSB-UM-001	XBee Wi-SUN, OFDM, U.FL Antenna, MMT	XBee Wi-SUN module. U.FL connector RF output. Uses SiLabs: EFR32FG25A221F1920IM56-B plus passives to match the 902 to 928 MHz. 5 FSK + 4 OFDM modulation. This module is the base component for: XB-WSB-US-001	 

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XB-WSB-9S-001	XBee Wi-SUN, OFDM, 900 MHz Chip Antenna, SMT	XBee Wi-SUN module. Uses SiLabs: EFR32FG25A221F1920IM56-B plus passives to match the 902 to 928 MHz band. 5 FSK + 4 OFDM modulation. This module contains the XB-WSB-RM-001 module. The RF output is routed to the chip antenna on the SMT carrier.	

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XB-WSB-US-001	XBee Wi-SUN, OFDM, U.FL, SMT	XBee Wi-SUN module. U.FL connector RF output. Uses SiLabs: EFR32FG25A221F1920IM56-B plus passives to match the 902 to 928 MHz band. 5 FSK + 4 OFDM modulation. This module contains the XB-WSB-UM-001, and the RF taken from the U.FL on the smaller module.	

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XB-WSB-UT-001	XBee Wi-SUN, OFDM, U.FL Antenna, Through Hole	XBee Wi-SUN module. U.FL connector RF output. Uses SiLabs: EFR32FG25A221F1920IM56-B plus passives to match the 902 to 928 MHz band. 5 FSK + 4 OFDM modulation. This module contains the XB-WSB-RM-001 module. The RF output is routed to the reverse side of the module and is available through the U.FL connector.	

5. Signature

Signature:

Name: Erik Reynolds

Position: Dir. Test Engineering

Date: April 7, 2025

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