REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15 Subpart C 15.247 (FHSS)
ISED RSS-247 Issue 4

Report No.: DIGI140-U4A Rev B

Company: Digi International Inc.

Model Name: XBP9XR

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REGULATORY COMPLIANCE TEST REPORT

Company Name: Digi International

Model Name: XBP9XR

To: FCC CFR 47 Part 15 Subpart C 15.247 (FHSS)
ISED RSS-247 Issue 4

Test Report Serial No.: DIGI140-U4A Rev B

This report supersedes: DIGI140-U4A Rev A

Applicant: Digi International Inc.
9350 Excelsior Blvd. Suite 700
Hopkins, Minnesota 55343
USA

Issue Date: 4th September 2026

This Test Report is Issued Under the Authority of:

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

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. Testing Accreditation

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

Accredited Laboratory

A2LA has accredited

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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 30th day of December 2025.

Mr. Trace McIntuff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2027

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
Indonesia	Minister of Communication and Digital Education Keputusan Menteri Komunikasi Dan Digital	Number 13 List of Overseas Test Labs	--	Lab nº50/2025 of Decree nº13
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 Phase 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 30th day of December 2025.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2027

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	19th December 2025	Draft for comment
Draft #2	15th January 2025	Additional draft for comment.
Rev A	21st January 2026	Initial Release
Rev B Draft	31st August 2026	Draft for comment – addition of Meritek 900MHz AT503008915M antenna.
Rev B	4th September 2026	2nd Document 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. Suite 700 Hopkins Minnesota 55343 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	XBP9XR	**Telephone:**	+1 925 462 0304
Type Of Equipment:	RF Radio Module	**Fax:**	+1 925 462 0306
S/N's:	0013A2004267B068		
Test Date(s):	14th - 17th November 2025, 4th - 5th December 2025, 27th August 2026	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C 15.247 (FHSS) 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 R105	24th February 2025	Requirements 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 4	July 2025	RSS-247 — Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands.
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. XBP9XR to FCC CFR 47 Part 15 Subpart C 15.247 (FHSS) Radio Frequency Devices; Subpart C – Intentional Radiators and ISED RSS-247
Applicant:	Digi International Inc. 9350 Excelsior Blvd. Suite 700 Hopkins Minnesota 55343 USA
Manufacturer:	Same as above
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	DIGI140-U4A
Date EUT received:	3rd November 2025 & 6th August 2026
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C 15.247 (FHSS) 15.247 (FHSS)
Dates of test (from - to):	14th - 17th November 2025 & 4th - 5th December 2025 27th August 2026
No of Units Tested:	1
Product Family Name:	Digi XBee XR PRO / XBP9XR
Model/Part Numbers:	XBP-9XR-CS-001 XBP-9XR-RS-001 XBP-9XR-US-001
Location for use:	Both indoor and outdoor
Declared Frequency Range(s):	902 – 928 MHz;
Type of Modulation:	FSK
EUT Modes of Operation:	FSK-10k; FSK-110k; FSK-250k;
Declared Nominal Output Power (dBm):	+30 dBm
Transmit/Receive Operation:	Single chain
Rated Input Voltage and Current:	2.6V to 3.6V (3.3V nominal) / 1.5A
Operating Temperature Range:	-40°C to +85°C (Client Declared)
ITU Emission Designator:	500KF1D
Equipment Dimensions:	22.03 / 3.05 / 33.82 mm
Weight:	0.0033 Kg
Hardware Rev:	Not Provided
Software Rev:	Not Provided

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5.2. Scope Of Test Program

Digi International Inc. XBP9XR
The scope of the test program was to test the Digi International Inc. part number XBP-9XR-US-001 in the frequency ranges 902 – 928 MHz; for compliance against the following specification.

Part number XBP-9XR-US-001 is a single technology transmitting FHSS in the frequency band 902 – 928 MHz. Test data from XBP-9XR-UUS-001 was reused to generate this report. The device is a PCB utilizing dual technologies hosting 902 – 925 MHz FHSS and BLE. The XBP-9XR-US-001 removes the BLE technology through pcb depopulation.

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

RSS-247 Issue 4 July 2025
RSS-247 — Digital Transmission Systems, Frequency Hopping Systems and License-Exempt Local Area Network Devices in 902-928 MHz.

This testing covers the following variants, see Appendix C - Declaration of Similarity:

XBP-9XR-US-001 EUT tested in full	XBP-9XR-CS-001
	XBP-9XR-RS-001

Digi International XBP-9XR-US-001 w/ Development Board

EUT Photos	
Part Description	XBP-9XR-US-001
SN	0013A2004267B068

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

Type (EUT/ Support)	Equipment Description	Mfr	Model/Part No.	Serial No.
EUT	Wireless module	DIGI	XBP-9XR-US-001	0013A2004267B068
EUT Support	XBee SMT Development Board E207844	DIGI	30015552-03_A	648 947LF
MiCOM Labs Power Supply Support	System DC Power Supply	Agilent	6654A	MY40001826
Support	Laptop Computer	HP	Zbook 15 G3 Info	CND6235VDT

5.4. Cabling and I/O Ports

Port Type	Max Cable Length	# of Ports	Shielded	Conn Type	Data Type	Environment
U.FL	<3m	1 or 2 (Based on Model)	Yes	RF	Digital	Indoor/Outdoor
USB-C	<3m	1	Yes	USB-C female	Digital	Indoor/Outdoor

5.5. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
external	Laird	TRA8903	Dome	3.0	-	360	-	902 - 928
external	Laird/TE Connectivity	FG9026	Omni	8.0	-	360	-	902 - 928
external	Mpdevice	ACE-915NF (Digi A09-HASM-675)	Dipole	2.1	-	360	-	902 - 928
integral	Meritek	AT503008915	Chip	0.8	-	360	-	902 - 928
external	Molex	2111400100	FPC	1.0	-	360	-	902 - 928
external	Taoglas	FXUB65.07.0180C	FPC	2.0	-	360	-	902 - 928
external	TE Connectivity	PC9013N	Yagi	15.0	-	360	-	902 - 928
Integral	Meritek	AT50308915M	Chip	0.8	-	360	-	902-928

BF Gain - Beamforming Gain
Dir BW - Directional Beam Width
X-Pol - Cross Polarization

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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	Channel Frequency (MHz)		
		Low	Mid	High
		902 - 928 MHz		
FSK-10k	10k	902.50	915.00	927.50
FSK-110k	110k	902.50	915.00	927.50
FSK-250k	250k	902.75	915.25	927.25

5.7. Operational Modes

Operating Mode(s)	Operating Mode Description
902 – 928 MHz FHSS	Frequency Hopping Spread Spectrum

5.8. Equipment Modifications

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

5.9. 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
20 dB & 99% Bandwidth	Complies	View Data
Frequency Hopping Tests	Complies	-
Number of Hopping Channels	Complies	View Data
Channel Separation	Complies	View Data
Dwell Time	Complies	View Data
Channel Occupancy	Complies	View Data
Output Power	Complies	View Data
Emissions	Complies	-
(1) Conducted Emissions	Complies	-
(i) Conducted Unwanted Spurious Emissions	Complies	View Data
(ii) Conducted Band-Edge Emissions	Complies	View Data
(2) Radiated Emissions	Complies	-
TX Spurious & Restricted Band Emissions	Complies	View Data
(3) Digital Emissions (0.03 - 1 GHz)	See MiCOM Labs FCC Part 15B Test Report DIGI140-U2A	-
(4) AC Wireline Emissions	[1]Not Applicable	-

[1]XBP9XR is Vdc powered

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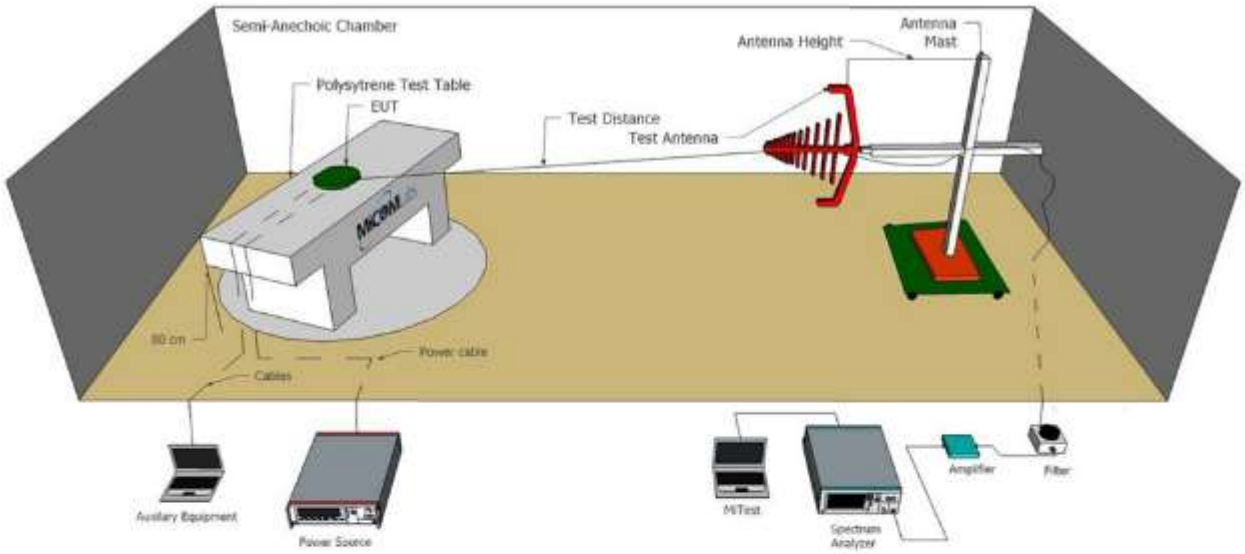
7. TEST EQUIPMENT CONFIGURATION(S)

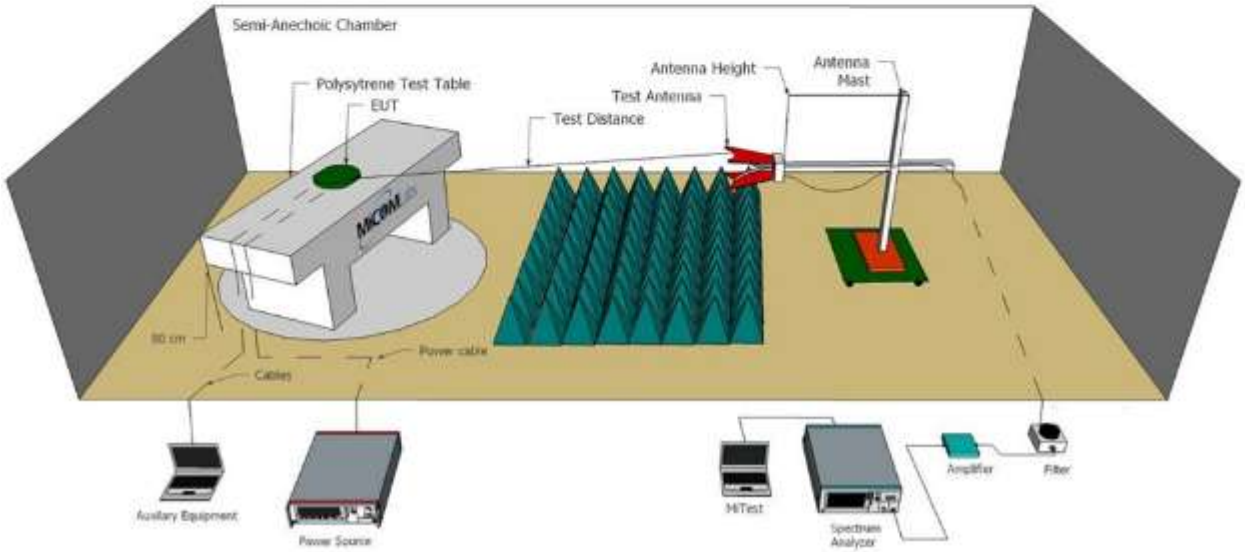
7.1.1. Radiated Test Setup

Test setup diagrams for Radiated Emissions below and above 1 GHz.

Radiated Emissions Below 1GHz Test Setup



Radiated Emissions Above 1GHz Test Setup



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Test Equipment Utilized

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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	30 Jan 2027
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	5 Dec 2026
341	900MHz Notch Filter	EWT	EWT-14-0199	H1	13 Sep 2026
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	25 Aug 2027
382	Tunable Notch Filter	Wainwright Instruments GmbH	WRCT800/960-0.2/40-8EEK	64	Cal when used
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	18 Aug 2027
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	7 Dec 2026
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	18 Aug 2027
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 Aug 2027
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	18 Aug 2027
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	18 Aug 2027
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	18 Aug 2027

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469	Low pass filter	Mini Circuit	SLP-1000	None	18 Aug 2027
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	18 Aug 2027
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	18 Aug 2027
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2027
554	Precision SMA Cable	Fairview Microwave	SCE18060101-400CM	554	22 Jun 2027
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	14 Aug 2027
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 2027
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	30 Jan 2027

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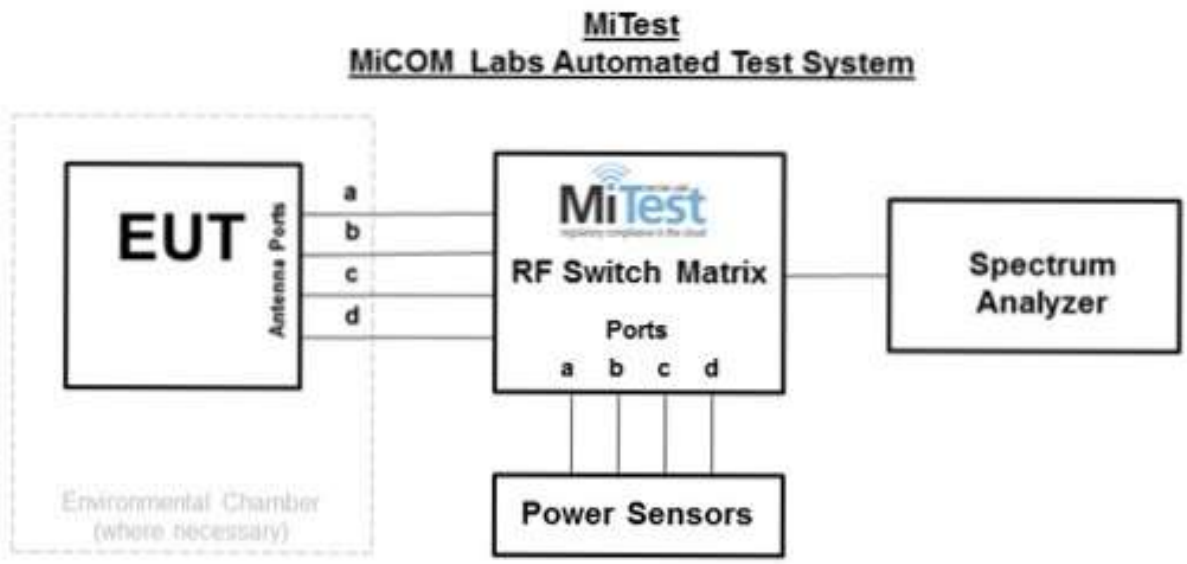
7.1.2. Conducted Test Setup



Conducted Test Measurement Setup

Test Equipment Utilized

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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	8 Mar 2026
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	8 Mar 2026
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	8 Mar 2026
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	8 Mar 2026
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	8 Mar 2026
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 2026

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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
441	USB Wideband Power Sensor	Boonton	55006	9179	4 Dec 2026
442	USB Wideband Power Sensor	Boonton	55006	9181	12 Dec 2026
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	21 Aug 2027
494	USB Wideband Power Sensor	Boonton	55006	9726	12 Dec 2026
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2027
512	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen	512	8 Mar 2026
516	USB Wideband Power Sensor	Boonton	RTP5006	10511	4 Dec 2026
555	Rhode & Schwarz Receiver	Rhode & Schwarz	ESW 44	101893	14 Aug 2026
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 2027
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	20 Jun 2026

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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. 20 dB & 99% Bandwidth

Conducted Test Conditions for 20 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247, RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	20 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(1)(i)/(ii)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for 20 dB and 99% Bandwidth Measurement

The bandwidth at 20 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 20 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:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(ii) Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

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Equipment Configuration for 20 dB 99% Bandwidth			
Variant:	FSK-10k	**Duty Cycle (%):**	100
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
902.5	0.132	--	--	--	0.132	0.132	≤ 500	-0.368
915.0	0.132	--	--	--	0.132	0.132	≤ 500	-0.368
927.5	0.132	--	--	--	0.132	0.132	≤ 500	-0.368

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
902.5	0.116	--	--	--	0.116		
915.0	0.116	--	--	--	0.116		
927.5	0.116	--	--	--	0.116		

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 20 dB 99% Bandwidth			
Variant:	FSK-110k	**Duty Cycle (%):**	100
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	MHz	MHz
902.5	0.240	--	--	--	0.240	0.240	≤ 500	-0.260
915.0	0.240	--	--	--	0.240	0.240	≤ 500	-0.260
927.5	0.240	--	--	--	0.240	0.240	≤ 500	-0.260

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
902.5	0.212	--	--	--	0.212		
915.0	0.212	--	--	--	0.212		
927.5	0.212	--	--	--	0.212		

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 20 dB 99% Bandwidth			
Variant:	FSK-250k	**Duty Cycle (%):**	100
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	MHz	MHz
902.8	0.313	--	--	--	0.313	0.313	≤ 500	-0.187
915.3	0.313	--	--	--	0.313	0.313	≤ 500	-0.187
927.3	0.313	--	--	--	0.313	0.313	≤ 500	-0.187

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
902.8	0.297	--	--	--	0.297		
915.3	0.297	--	--	--	0.297		
927.3	0.297	--	--	--	0.297		

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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9.2. Frequency Hopping Tests

Conducted Test Conditions for Frequency Hopping Measurements			
Standard:	FCC CFR 47:15.247, RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Frequency Hopping Tests	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(1)(i)/(ii)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References, FCC Public Notice DA 00-705		

Test Procedure for Frequency Hopping Measurements

These tests cover the following measurements:

i) channel separation
ii) channel occupancy
iii) dwell time
iv) number of hopping frequencies

Frequency hopping testing was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency or hopping mode.

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 Frequency Hopping Measurements

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

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(ii) Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

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9.2.1. Number of Hopping Channels

Equipment Configuration for Number of Hopping Channels			
Variant:	FSK-10k	**Antenna:**	Not Applicable
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	16	--	--
910.0-920.0	20	--	--
920.0-928.0	14	--	--
Total number of Hops	**50**	**50**	**Pass**

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

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

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Equipment Configuration for Number of Hopping Channels

Variant:	FSK-110k	**Antenna:**	Not Applicable
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	16	--	--
910.0-920.0	20	--	--
920.0-9280.0	14	--	--
Total number of Hops	**50**	**50**	**Pass**

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

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Equipment Configuration for Number of Hopping Channels

Variant:	FSK-250k	**Antenna:**	Not Applicable
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Frequency Range (MHz)	Number of Hopping Channels	Limit	Pass / Fail
902.0-910.0	15	--	--
910.0-920.0	20	--	--
920.0-928.0	15	--	--
Total number of Hops	**50**	**50**	**Pass**

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

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9.2.2. Channel Separation

Equipment Configuration for Channel Separation			
Variant:	FSK-10k	**Antenna:**	Not Applicable
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.0	0.500	0.132	Pass

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

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Equipment Configuration for Channel Separation			
Variant:	FSK-110k	**Antenna:**	Not Applicable
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.0	0.496	0.240	Pass

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

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Equipment Configuration for Channel Separation			
Variant:	FSK-250k	**Antenna:**	Not Applicable
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.3	0.496	0.313	Pass

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

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9.2.3. Channel Occupancy & Dwell Time

Equipment Configuration for Channel Occupancy			
Variant:	FSK-10k	**Antenna:**	Not Applicable
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency(MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.00	0.198	396.790	20.00	400.000	Pass

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

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Equipment Configuration for Channel Occupancy

Variant:	FSK-110k	**Antenna:**	Not Applicable
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency(MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.00	0.032	256.510	20.00	400.000	Pass

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

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

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Equipment Configuration for Channel Occupancy

Variant:	FSK-250k	**Antenna:**	Not Applicable
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	100.0	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency(MHz)	Dwell Time (Single Burst) (S)	Channel Occupancy (mS)	Observation Period (S)	Channel Occupancy Limit (mS)	Pass / Fail
915.30	0.016	160.320	10.00	400.000	Pass

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

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9.3. Output Power

Conducted Test Conditions for Fundamental Emission Output Power			
Standard:	FCC CFR 47:15.247, RSS-247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(1), (b)(1)/(2)/(3)	**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, nominal voltage. 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

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

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following for frequency hopping systems:

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 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.

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Equipment Configuration for Output Power Peak

Variant:	FSK-10k	**Duty Cycle (%):**	100.0
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	0.80
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.5	29.86	--	--	--	29.86	30.00	-0.14	PL3
915.0	29.88	--	--	--	29.88	30.00	-0.12	PL3
927.5	29.98	--	--	--	29.98	30.00	-0.02	PL3

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 Output Power Peak

Variant:	FSK-110k	**Duty Cycle (%):**	100.0
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	0.80
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.5	28.49	--	--	--	28.49	30.00	-1.51	PL3
915.0	28.21	--	--	--	28.21	30.00	-1.79	PL3
927.5	28.74	--	--	--	28.74	30.00	-1.26	PL3

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 Output Power Peak			
Variant:	FSK-250k	**Duty Cycle (%):**	100.0
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	0.80
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dB	
902.8	28.29	--	--	--	28.29	30.00	-1.71	PL3
915.3	28.09	--	--	--	28.09	30.00	-1.91	PL3
927.3	28.55	--	--	--	28.55	30.00	-1.45	PL3

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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9.4. Emissions

9.4.1. Conducted Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247, 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)	**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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9.4.1.1. Conducted Unwanted Spurious Emissions

Equipment Configuration for Unwanted Emissions Peak			
Variant:	FSK-10k	**Duty Cycle (%):**	100
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.5	30.0 - 26000.0	-32.876	7.23	--	--	--	--	--	--
915.0	30.0 - 26000.0	-32.868	6.84	--	--	--	--	--	--
927.5	30.0 - 26000.0	-33.930	6.89	--	--	--	--	--	--

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 Unwanted Emissions Peak

Variant:	FSK-110k	**Duty Cycle (%):**	100
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.5	30.0 - 26000.0	-33.061	7.13	--	--	--	--	--	--
915.0	30.0 - 26000.0	-33.082	7.26	--	--	--	--	--	--
927.5	30.0 - 26000.0	-33.177	7.02	--	--	--	--	--	--

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 Unwanted Emissions Peak

Variant:	FSK-250k	**Duty Cycle (%):**	100
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Unwanted Emissions Peak (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
902.8	30.0 - 26000.0	-32.773	6.81	--	--	--	--	--	--
915.3	30.0 - 26000.0	-33.179	6.58	--	--	--	--	--	--
927.3	30.0 - 26000.0	-33.570	7.14	--	--	--	--	--	--

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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9.4.1.2. Conducted Band-Edge Emissions

Equipment Configuration for Conducted Low Band-Edge Emissions (Hopping) Peak			
Variant:	FSK-10k	**Duty Cycle (%):**	100.0
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 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	-23.87	7.45	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 (Hopping) Peak			
Variant:	FSK-110k	**Duty Cycle (%):**	100.0
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 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	-22.92	7.33	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 (Hopping) Peak			
Variant:	FSK-250k	**Duty Cycle (%):**	100.0
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.8 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 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	-26.23	7.35	902.50	--	--	-0.500

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 Low Band-Edge Emissions (Static) Peak			
Variant:	FSK-10k	**Duty Cycle (%):**	100.0
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 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	-27.32	7.52	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

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Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak			
Variant:	FSK-110k	**Duty Cycle (%):**	100.0
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.5 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	875.0 - 905.0 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	-25.49	7.55	902.20	--	--	-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

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 (Static) Peak			
Variant:	FSK-250k	**Duty Cycle (%):**	100.0
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	902.8 MHz
Band-Edge Frequency:	902.0 MHz
Test Frequency Range:	875.0 - 905.0 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	-26.87	7.40	902.50	--	--	-0.500

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 Upper Band-Edge Emissions (Hopping) Peak			
Variant:	FSK-10k	**Duty Cycle (%):**	100.0
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 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	-35.11	7.28	927.20	--	--	-0.800

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 Upper Band-Edge Emissions (Hopping) Peak			
Variant:	FSK-110k	**Duty Cycle (%):**	100.0
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 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	-33.18	7.20	927.30	--	--	-0.700

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 Upper Band-Edge Emissions (Hopping) Peak			
Variant:	FSK-250k	**Duty Cycle (%):**	100.0
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.3 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 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	-25.83	7.21	927.60	--	--	-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 Upper Band-Edge Emissions (Static) Peak			
Variant:	FSK-10k	**Duty Cycle (%):**	100.0
Data Rate:	10.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 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	-24.61	7.36	927.70	--	--	-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 Upper Band-Edge Emissions (Static) Peak

Variant:	FSK-110k	**Duty Cycle (%):**	100.0
Data Rate:	110.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.5 MHz
Band-Edge Frequency:	928.0 MHz
Test Frequency Range:	925.0 - 950.0 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	-22.74	7.38	927.70	--	--	-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 Upper Band-Edge Emissions (Static) Peak			
Variant:	FSK-250k	**Duty Cycle (%):**	100.0
Data Rate:	250.00 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	FSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	927.3 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	925.0 - 950.0 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	-25.78	7.32	927.50	--	--	-0.500

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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9.4.2. 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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9.4.2.3. TX Spurious & Restricted Band Emissions

10.4.2.3.1 Ceramic / Chip / Meritek Antenna (AT503008915)

Equipment Configuration for FCC Tx Spurious 1-18 GHz			
Antenna:	Ceramic Antenna	**Variant:**	900
Antenna Gain (dBi):	0.8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.5	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1646.00	61.85	2.52	-16.24	48.13	MaxP	Vertical	199	270	74.0	-25.9	Pass
#2	1799.00	63.00	2.65	-14.67	50.98	MaxP	Vertical	150	330	74.0	-23.0	Pass
#3	1901.00	62.13	2.68	-13.86	50.95	MaxP	Vertical	199	209	74.0	-23.1	Pass
#4	3839.00	54.18	3.40	-11.65	45.93	MaxP	Vertical	199	179	74.0	-28.1	Pass
#5	4774.00	53.46	3.78	-12.21	45.03	MaxP	Horizontal	150	30	74.0	-29.0	Pass
#6	9483.00	48.78	5.32	-6.24	47.86	MaxP	Vertical	199	239	74.0	-26.1	Pass
#7	11846.00	51.74	6.13	-5.68	52.19	MaxP	Horizontal	150	120	74.0	-21.8	Pass
#8	17796.00	47.87	7.72	0.95	56.55	MaxP	Horizontal	199	30	74.0	-17.5	Pass
#9	17864.00	48.09	7.77	1.31	57.18	MaxP	Vertical	150	59	74.0	-16.8	Pass
Test Notes: Ceramic antenna. 902.5 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Ceramic Antenna	**Variant:**	900
Antenna Gain (dBi):	0.8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1017.00	62.70	2.12	-17.15	47.67	MaxP	Vertical	150	330	74.0	-26.3	Pass
#2	1816.00	65.18	2.66	-14.49	53.34	MaxP	Horizontal	150	150	74.0	-20.7	Pass
#3	1816.00	60.07	2.66	-14.49	48.24	MaxP	Vertical	150	330	74.0	-25.8	Pass
#4	1918.00	59.35	2.67	-13.81	48.21	MaxP	Vertical	150	209	74.0	-25.8	Pass
#5	7426.00	49.66	4.63	-7.66	46.63	MaxP	Horizontal	150	60	74.0	-27.4	Pass
#6	7681.00	49.84	4.65	-7.48	47.01	MaxP	Vertical	199	89	74.0	-27.0	Pass
#7	10061.00	50.34	5.50	-5.26	50.58	MaxP	Horizontal	199	30	74.0	-23.4	Pass
#8	12713.00	53.06	6.14	-7.84	51.37	MaxP	Vertical	199	0	74.0	-22.6	Pass
#9	17864.00	48.37	7.77	1.31	57.46	MaxP	Horizontal	150	30	74.0	-16.5	Pass
#10	17983.00	49.79	7.74	0.62	58.16	MaxP	Vertical	199	330	74.0	-15.8	Pass
Test Notes: Ceramic antenna. 915 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSIONS
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Ceramic Antenna	**Variant:**	900
Antenna Gain (dBi):	0.8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1102.00	62.64	2.21	-17.53	47.32	MaxP	Horizontal	150	30	74.0	-26.7	Pass
#2	1663.00	62.82	2.54	-16.04	49.33	MaxP	Vertical	199	119	74.0	-24.7	Pass
#3	1799.00	63.65	2.65	-14.67	51.63	MaxP	Vertical	199	270	74.0	-22.4	Pass
#4	1850.00	64.91	2.66	-14.40	53.18	MaxP	Horizontal	150	150	74.0	-20.8	Pass
#5	6406.00	47.92	4.24	-8.48	43.69	MaxP	Vertical	199	270	74.0	-30.3	Pass
#6	6814.00	50.67	4.40	-7.67	47.40	MaxP	Horizontal	199	150	74.0	-26.6	Pass
#7	12713.00	53.13	6.14	-7.84	51.43	MaxP	Vertical	199	239	74.0	-22.6	Pass
#8	12985.00	53.12	6.56	-7.63	52.05	MaxP	Horizontal	199	270	74.0	-21.9	Pass
#9	17660.00	50.11	7.20	0.03	57.34	MaxP	Horizontal	199	150	74.0	-16.7	Pass
#10	17864.00	47.71	7.77	1.31	56.80	MaxP	Vertical	199	29	74.0	-17.2	Pass
Test Notes: Ceramic antenna. 927.5 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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10.4.2.3.2 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF)

Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Dipole A09-HASM-675	**Variant:**	900
Antenna Gain (dBi):	2.1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.5	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1119.00	70.16	2.21	-17.45	54.92	MaxP	Vertical	150	179	74.0	-19.1	Pass
#2	1595.00	63.47	2.49	-16.48	49.49	MaxP	Vertical	150	300	74.0	-24.5	Pass
#3	1799.00	66.63	2.65	-14.67	54.61	MaxP	Horizontal	150	150	74.0	-19.4	Pass
#4	3601.00	60.04	3.33	-11.85	51.52	MaxP	Horizontal	150	210	74.0	-22.5	Pass
#5	3601.00	58.84	3.33	-11.85	50.32	MaxP	Vertical	199	299	74.0	-23.7	Pass
#6	9024.00	53.10	5.25	-7.33	51.02	MaxP	Vertical	150	29	74.0	-23.0	Pass
#7	11727.00	52.46	5.92	-6.08	52.30	MaxP	Vertical	199	89	74.0	-21.7	Pass
#8	15110.00	50.45	6.61	-3.40	53.66	MaxP	Horizontal	150	330	74.0	-20.3	Pass

Test Notes: Dipole A09-HASM-675 antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6 / -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Dipole A09-HASM-675	**Variant:**	900
Antenna Gain (dBi):	2.1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1085.00	69.29	2.19	-17.56	53.93	MaxP	Vertical	149	300	74.0	-20.1	Pass
#2	1663.00	63.31	2.54	-16.04	49.82	MaxP	Vertical	149	119	74.0	-24.2	Pass
#3	1816.00	67.46	2.66	-14.49	55.62	MaxP	Horizontal	149	150	74.0	-18.4	Pass
#4	1816.00	64.60	2.66	-14.49	52.76	MaxP	Vertical	149	239	74.0	-21.2	Pass
#5	3652.00	60.35	3.34	-11.91	51.79	MaxP	Horizontal	149	210	74.0	-22.2	Pass
#6	10061.00	49.71	5.50	-5.26	49.95	MaxP	Vertical	149	239	74.0	-24.0	Pass
#7	10554.00	48.08	5.81	-4.37	49.52	MaxP	Horizontal	149	210	74.0	-24.5	Pass
#8	12866.00	51.18	6.37	-8.46	49.09	MaxP	Horizontal	199	180	74.0	-24.9	Pass
#9	17864.00	47.99	7.77	1.31	57.08	MaxP	Vertical	149	209	74.0	-16.9	Pass
Test Notes: Dipole A09-HASM-675 antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Dipole A09-HASM-675	**Variant:**	900
Antenna Gain (dBi):	2.1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1119.00	68.71	2.21	-17.45	53.46	MaxP	Vertical	150	119	74.0	-20.5	Pass
#2	1323.00	63.95	2.33	-16.21	50.06	MaxP	Vertical	199	270	74.0	-23.9	Pass
#3	1850.00	66.48	2.66	-14.40	54.75	MaxP	Horizontal	199	150	74.0	-19.3	Pass
#4	1850.00	69.31	2.66	-14.40	52.25	MaxP	Vertical	150	330	74.0	-21.8	Pass
#5	3703.00	58.48	3.36	-11.78	50.06	MaxP	Vertical	150	119	74.0	-23.9	Pass
#6	8225.00	50.74	5.13	-8.19	47.67	MaxP	Horizontal	199	240	74.0	-26.3	Pass
#7	9279.00	53.53	5.36	-7.13	51.76	MaxP	Vertical	150	29	74.0	-22.2	Pass
#8	17796.00	48.80	7.72	0.95	57.47	MaxP	Horizontal	150	90	74.0	-16.5	Pass
Test Notes: Dipole A09-HASM-675 antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.3 Dome / Laird Antenna (A09-D3NF /TRA8903)

Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Dome A09-D3NF	**Variant:**	900
Antenna Gain (dBi):	3	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1051.00	74.19	2.18	-17.55	58.82	MaxP	Vertical	199	29	74.0	-15.2	Pass
#2	1799.00	69.21	2.65	-14.67	57.20	MaxP	Vertical	199	0	74.0	-16.8	Pass
#3	3601.00	61.04	3.33	-11.85	52.52	MaxP	Vertical	199	269	74.0	-21.5	Pass
#4	3601.00	55.74	3.33	-11.85	47.22	MaxP	Horizontal	150	120	74.0	-26.8	Pass
#5	4502.00	56.23	3.69	-12.01	47.92	MaxP	Vertical	150	270	74.0	-26.1	Pass
#6	10843.00	50.84	6.12	-5.88	51.07	MaxP	Horizontal	199	0	74.0	-22.9	Pass
#7	17133.00	49.43	7.02	0.11	56.55	MaxP	Horizontal	150	30	74.0	-17.4	Pass
#8	17881.00	45.88	8.07	1.46	55.41	MaxP	Vertical	199	149	74.0	-18.6	Pass
Test Notes: Dome A09-D3NF antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Dome A09-D3NF	**Variant:**	900
Antenna Gain (dBi):	3	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	70.47	2.66	-14.49	58.63	MaxP	Vertical	199	0	74.0	-15.4	Pass
#2	3652.00	63.27	3.34	-11.91	54.71	MaxP	Vertical	199	269	74.0	-19.3	Pass
#3	4570.00	56.94	3.74	-12.12	48.55	MaxP	Vertical	150	270	74.0	-25.4	Pass
#4	10452.00	49.81	5.73	-4.43	51.11	MaxP	Vertical	199	269	74.0	-22.9	Pass
#5	12832.00	53.70	6.49	-8.33	51.86	MaxP	Horizontal	199	240	74.0	-22.1	Pass
#6	16623.00	49.96	6.73	0.24	56.93	MaxP	Vertical	150	149	74.0	-17.1	Pass
#7	17881.00	45.36	8.07	1.46	54.90	MaxP	Horizontal	199	120	74.0	-19.1	Pass
Test Notes: Dome A09-D3NF antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Dome A09-D3NF	**Variant:**	900
Antenna Gain (dBi):	3	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	69.33	2.66	-14.40	57.60	MaxP	Vertical	199	29	74.0	-16.4	Pass
#2	3703.00	60.06	3.36	-11.78	51.63	MaxP	Vertical	199	299	74.0	-22.4	Pass
#3	8123.00	50.89	4.74	-7.76	47.87	MaxP	Horizontal	150	240	74.0	-26.1	Pass
#4	9279.00	53.43	5.36	-7.13	51.66	MaxP	Vertical	150	0	74.0	-22.3	Pass
#5	17643.00	50.72	7.31	-0.25	57.78	MaxP	Vertical	199	299	74.0	-16.2	Pass
#6	17932.00	47.50	8.07	1.02	56.59	MaxP	Horizontal	199	270	74.0	-17.4	Pass
Test Notes: Dome A09-D3NF antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.4 Omni / Laird Antenna (A09-F8NF/ FG9026)

Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Laird FG9026	**Variant:**	900
Antenna Gain (dBi):	8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.5	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1034.00	79.91	2.15	-17.39	64.67	MaxP	Horizontal	199	60	74.0	-9.3	Pass
#2	1040.18	71.34	2.16	-17.46	56.04	MaxP	Horizontal	152	62	74.0	-18.0	Pass
#3	1040.18	58.59	2.16	-17.46	43.29	AVG	Horizontal	152	62	54.0	-10.7	Pass
#4	1052.17	71.21	2.18	-17.55	55.85	MaxP	Horizontal	150	63	74.0	-18.2	Pass
#5	1052.17	58.48	2.18	-17.55	43.11	AVG	Horizontal	150	63	54.0	-10.9	Pass
#6	1323.00	62.08	2.33	-16.21	48.19	MaxP	Vertical	199	119	74.0	-25.8	Pass
#7	1799.00	72.30	2.65	-14.67	60.28	MaxP	Horizontal	199	120	74.0	-13.7	Pass
#8	1799.00	64.75	2.65	-14.67	52.73	MaxP	Vertical	199	179	74.0	-21.3	Pass
#9	3601.00	63.98	3.33	-11.85	55.46	MaxP	Vertical	199	0	74.0	-18.5	Pass
#10	4502.00	65.76	3.69	-12.01	57.45	MaxP	Vertical	150	0	74.0	-16.6	Pass
#11	10146.00	47.23	5.74	-5.18	47.79	MaxP	Horizontal	150	30	74.0	-26.2	Pass
#12	17932.00	48.10	8.07	1.02	57.19	MaxP	Horizontal	150	180	74.0	-16.8	Pass
Test Notes: Laird FG 9026 antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Laird FG9026	**Variant:**	900
Antenna Gain (dBi):	8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1034.79	69.19	2.15	-17.40	53.94	MaxP	Horizontal	149	62	74.0	-20.1	Pass
#2	1034.79	56.27	2.15	-17.40	41.02	AVG	Horizontal	149	62	54.0	-13.0	Pass
#3	1068.02	70.24	2.14	-17.55	54.83	MaxP	Horizontal	184	60	74.0	-19.2	Pass
#4	1068.02	57.72	2.14	-17.55	42.32	AVG	Horizontal	184	60	54.0	-11.7	Pass
#5	1816.00	70.53	2.66	-14.49	58.70	MaxP	Horizontal	199	60	74.0	-15.3	Pass
#6	1816.00	64.91	2.66	-14.49	53.08	MaxP	Vertical	150	330	74.0	-20.9	Pass
#7	1986.00	59.80	2.73	-13.33	49.20	MaxP	Vertical	150	29	74.0	-24.8	Pass
#8	3652.00	67.52	3.34	-11.91	58.95	MaxP	Vertical	199	0	74.0	-15.0	Pass
#9	4570.00	55.53	3.74	-12.12	47.14	MaxP	Vertical	150	0	74.0	-26.9	Pass
#10	9755.00	51.04	5.63	-6.11	50.56	MaxP	Vertical	150	119	74.0	-23.4	Pass
#11	11030.00	46.15	6.21	-4.98	47.38	MaxP	Horizontal	150	240	74.0	-26.6	Pass
#12	17541.00	50.61	7.50	-0.56	57.55	MaxP	Vertical	150	119	74.0	-16.4	Pass
#13	17779.00	47.98	7.65	1.01	56.63	MaxP	Horizontal	199	0	74.0	-17.4	Pass
Test Notes: Laird FG 9026 antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Laird FG9026	**Variant:**	900
Antenna Gain (dBi):	8	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.5	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1034.00	79.09	2.15	-17.39	63.84	MaxP	Horizontal	150	60	74.0	-10.2	Pass
#2	1037.00	68.59	2.15	-17.42	53.32	MaxP	Horizontal	153	63	74.0	-20.7	Pass
#3	1037.00	56.26	2.15	-17.42	40.98	AVG	Horizontal	153	63	54.0	-13.0	Pass
#4	1072.30	69.39	2.16	-17.56	53.99	MaxP	Horizontal	152	63	74.0	-20.0	Pass
#5	1072.30	56.66	2.16	-17.56	41.26	AVG	Horizontal	152	63	54.0	-12.7	Pass
#6	1850.00	68.47	2.66	-14.40	56.73	MaxP	Horizontal	150	60	74.0	-17.3	Pass
#7	3703.00	64.19	3.36	-11.78	55.76	MaxP	Vertical	199	0	74.0	-18.2	Pass
#8	8497.00	52.26	5.02	-8.05	49.24	MaxP	Horizontal	150	180	74.0	-24.8	Pass
#9	8684.00	52.17	5.28	-8.02	49.42	MaxP	Vertical	150	89	74.0	-24.6	Pass
#10	9279.00	54.44	5.36	-7.13	52.67	MaxP	Vertical	150	179	74.0	-21.3	Pass
#11	17218.00	49.10	7.38	0.37	56.85	MaxP	Horizontal	199	270	74.0	-17.1	Pass
#12	17864.00	48.09	7.77	1.31	57.17	MaxP	Vertical	150	330	74.0	-16.8	Pass
Test Notes: Laird FG 9026 antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.5 Flex / Molex (211140-0100)

Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Molex	**Variant:**	900
Antenna Gain (dBi):	1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1119.00	65.19	2.21	-17.45	49.95	MaxP	Horizontal	149	330	74.0	-24.1	Pass
#2	1136.00	64.88	2.22	-17.44	49.66	MaxP	Vertical	149	330	74.0	-24.3	Pass
#3	1799.00	62.06	2.65	-14.67	50.04	MaxP	Horizontal	149	150	74.0	-24.0	Pass
#4	2411.00	56.32	3.02	-12.01	47.32	MaxP	Horizontal	199	180	74.0	-26.7	Pass
#5	3601.00	61.18	3.33	-11.85	52.66	MaxP	Vertical	149	149	74.0	-21.3	Pass
#6	4502.00	58.59	3.69	-12.01	50.27	MaxP	Vertical	149	29	74.0	-23.7	Pass
#7	9687.00	47.08	5.54	-6.31	46.31	MaxP	Vertical	149	179	74.0	-27.7	Pass
#8	12254.00	51.24	5.13	-6.30	50.07	MaxP	Horizontal	199	90	74.0	-23.9	Pass
#9	17779.00	47.93	7.65	1.01	56.59	MaxP	Vertical	149	0	74.0	-17.4	Pass
#10	17864.00	47.57	7.77	1.31	56.66	MaxP	Horizontal	199	240	74.0	-17.3	Pass
Test Notes: Molex antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSIONS
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Molex	**Variant:**	900
Antenna Gain (dBi):	1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1051.00	65.24	2.18	-17.55	49.87	MaxP	Vertical	199	330	74.0	-24.1	Pass
#2	1323.00	56.92	2.33	-16.21	43.03	MaxP	Vertical	149	119	74.0	-31.0	Pass
#3	1816.00	65.46	2.66	-14.49	53.62	MaxP	Vertical	199	239	74.0	-20.4	Pass
#4	1816.00	63.65	2.66	-14.49	51.81	MaxP	Horizontal	199	0	74.0	-22.2	Pass
#5	2479.00	64.52	3.06	-11.72	55.86	MaxP	Vertical	149	59	74.0	-18.1	Pass
#6	3652.00	60.99	3.34	-11.91	52.43	MaxP	Vertical	199	149	74.0	-21.6	Pass
#7	4570.00	57.20	3.74	-12.12	48.81	MaxP	Vertical	149	29	74.0	-25.2	Pass
#8	12492.00	47.51	6.01	-6.42	47.10	MaxP	Horizontal	149	300	74.0	-26.9	Pass
#9	17541.00	51.10	7.50	-0.56	58.04	MaxP	Horizontal	199	240	74.0	-16.0	Pass
Test Notes: Molex antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Molex	**Variant:**	900
Antenna Gain (dBi):	1	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	69.99	2.66	-14.40	58.25	MaxP	Vertical	199	179	74.0	-15.7	Pass
#2	1850.00	68.53	2.66	-14.40	56.79	MaxP	Horizontal	199	150	74.0	-17.2	Pass
#3	2411.00	70.47	3.02	-12.01	61.47	MaxP	Horizontal	150	330	74.0	-12.5	Pass
#4	3703.00	60.39	3.36	-11.78	51.96	MaxP	Vertical	150	0	74.0	-22.0	Pass
#5	10010.00	47.66	5.65	-5.12	48.19	MaxP	Vertical	199	0	74.0	-25.8	Pass
#6	11200.00	48.91	6.27	-5.37	49.81	MaxP	Horizontal	199	240	74.0	-24.2	Pass
#7	16725.00	48.78	7.07	-0.06	55.79	MaxP	Horizontal	199	30	74.0	-18.2	Pass
#8	17864.00	48.18	7.77	1.31	57.27	MaxP	Vertical	199	270	74.0	-16.7	Pass
Test Notes: Molex antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.6 Flex Square / Taoglas (FXUB65.07.0180C)

10.4.2.3.6.1 TAOGLAS 10kbps

Equipment Configuration for FCC Tx Spurious 1-18 GHz			
Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1102.00	71.23	2.21	-17.53	55.91	MaxP	Horizontal	149	120	74.0	-18.1	Pass
#2	1799.00	71.55	2.65	-14.67	59.53	MaxP	Horizontal	149	150	74.0	-14.5	Pass
#3	3601.00	57.68	3.33	-11.85	49.16	MaxP	Horizontal	149	210	74.0	-24.8	Pass
#4	3601.00	56.75	3.33	-11.85	48.23	MaxP	Vertical	199	330	74.0	-25.8	Pass
#5	10486.00	49.52	5.74	-4.64	50.62	MaxP	Vertical	199	89	74.0	-23.4	Pass
#6	12407.00	51.61	5.85	-6.05	51.40	MaxP	Horizontal	149	210	74.0	-22.6	Pass
#7	17575.00	48.57	7.50	-0.45	55.61	MaxP	Horizontal	149	270	74.0	-18.4	Pass
#8	17779.00	47.86	7.65	1.01	56.51	MaxP	Vertical	199	239	74.0	-17.5	Pass
Test Notes: 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1085.00	72.53	2.19	-17.56	57.16	MaxP	Horizontal	149	120	74.0	-16.8	Pass
#2	1816.00	74.53	2.66	-14.49	62.69	MaxP	Horizontal	149	60	74.0	-11.3	Pass
#3	1816.00	70.64	2.66	-14.49	58.81	MaxP	Vertical	149	330	74.0	-15.2	Pass
#4	2037.00	57.44	2.76	-12.98	47.22	MaxP	Vertical	199	29	74.0	-26.8	Pass
#5	3652.00	58.48	3.34	-11.91	49.91	MaxP	Horizontal	199	210	74.0	-24.1	Pass
#6	7205.00	51.12	4.52	-7.46	48.17	MaxP	Vertical	149	0	74.0	-25.8	Pass
#7	9517.00	49.84	5.39	-6.19	49.04	MaxP	Horizontal	149	300	74.0	-25.0	Pass
#8	17847.00	48.93	7.67	1.27	57.88	MaxP	Vertical	199	330	74.0	-16.1	Pass
#9	17949.00	48.30	8.05	0.80	57.16	MaxP	Horizontal	199	240	74.0	-16.8	Pass
Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1102.00	72.39	2.21	-17.53	57.07	MaxP	Horizontal	150	330	74.0	-16.9	Pass
#2	1323.00	59.87	2.33	-16.21	45.99	MaxP	Vertical	150	119	74.0	-28.0	Pass
#3	1850.00	73.77	2.66	-14.40	62.03	MaxP	Horizontal	199	60	74.0	-12.0	Pass
#4	1850.00	70.01	2.66	-14.40	58.27	MaxP	Vertical	150	330	74.0	-15.7	Pass
#5	3703.00	62.18	3.36	-11.78	53.75	MaxP	Horizontal	150	60	74.0	-20.2	Pass
#6	3703.00	60.46	3.36	-11.78	52.03	MaxP	Vertical	199	330	74.0	-22.0	Pass
#7	9279.00	55.65	5.36	-7.13	53.88	MaxP	Horizontal	150	300	74.0	-20.1	Pass
#8	17558.00	49.59	7.61	-0.45	56.75	MaxP	Vertical	150	0	74.0	-17.3	Pass
Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.6.2 TAOGLAS 110kbps

Equipment Configuration for FCC Tx Spurious 1-18 GHz			
Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	110kbps
Power Setting:	Max	**Tested By:**	MN

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	1102.00	72.44	2.21	-17.53	57.12	MaxP	Vertical	149	330	74.0	-16.9	Pass
#2	1323.00	59.51	2.33	-16.21	45.63	MaxP	Vertical	150	0	74.0	-28.4	Pass
#3	1799.00	74.06	2.65	-14.67	62.04	MaxP	Horizontal	199	30	74.0	-12.0	Pass
#4	1799.00	71.28	2.65	-14.67	59.26	MaxP	Vertical	149	330	74.0	-14.7	Pass
#5	2479.00	60.76	3.06	-11.72	52.10	MaxP	Vertical	199	330	74.0	-21.9	Pass
#6	3601.00	56.37	3.33	-11.85	47.85	MaxP	Horizontal	149	210	74.0	-26.2	Pass
#7	10010.00	46.91	5.65	-5.12	47.44	MaxP	Vertical	199	330	74.0	-26.6	Pass
#8	10418.00	48.52	5.93	-4.63	49.82	MaxP	Horizontal	149	180	74.0	-24.2	Pass
#9	17864.00	48.50	7.77	1.31	57.59	MaxP	Horizontal	149	180	74.0	-16.4	Pass
Test Notes: 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	110kbps
Power Setting:	Max	**Tested By:**	MN

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	1068.00	73.87	2.14	-17.55	58.47	MaxP	Horizontal	149	120	74.0	-15.5	Pass
#2	1323.00	58.02	2.33	-16.21	44.14	MaxP	Vertical	199	269	74.0	-29.9	Pass
#3	1816.00	73.99	2.66	-14.49	62.15	MaxP	Horizontal	149	60	74.0	-11.8	Pass
#4	1816.00	68.73	2.66	-14.49	56.90	MaxP	Vertical	149	330	74.0	-17.1	Pass
#5	3652.00	58.16	3.34	-11.91	49.60	MaxP	Horizontal	149	330	74.0	-24.4	Pass
#6	6389.00	49.86	4.25	-8.48	45.62	MaxP	Horizontal	149	90	74.0	-28.4	Pass
#7	9721.00	50.79	5.53	-5.98	50.34	MaxP	Vertical	149	179	74.0	-23.7	Pass
#8	17864.00	48.43	7.77	1.31	57.52	MaxP	Vertical	149	209	74.0	-16.5	Pass
#9	17932.00	48.27	8.07	1.02	57.36	MaxP	Horizontal	149	210	74.0	-16.6	Pass
Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	110kbps
Power Setting:	Max	**Tested By:**	MN

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	1068.00	74.18	2.14	-17.55	58.78	MaxP	Horizontal	150	120	74.0	-15.2	Pass
#2	1323.00	59.00	2.33	-16.21	45.11	MaxP	Vertical	199	119	74.0	-28.9	Pass
#3	1850.00	73.83	2.66	-14.40	62.10	MaxP	Horizontal	150	60	74.0	-11.9	Pass
#4	1850.00	69.66	2.66	-14.40	57.92	MaxP	Vertical	150	330	74.0	-16.1	Pass
#5	3703.00	61.11	3.36	-11.78	52.68	MaxP	Horizontal	150	60	74.0	-21.3	Pass
#6	7426.00	50.30	4.63	-7.66	47.27	MaxP	Horizontal	150	300	74.0	-26.7	Pass
#7	9279.00	56.04	5.36	-7.13	54.27	MaxP	Horizontal	150	120	74.0	-19.7	Pass
#8	17575.00	49.15	7.50	-0.45	56.19	MaxP	Vertical	150	149	74.0	-17.8	Pass
Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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10.4.2.3.6.3 TAOGLAS 250kbps

Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	250kbps
Power Setting:	Max	**Tested By:**	MN

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	1051.00	72.29	2.18	-17.55	56.93	MaxP	Horizontal	150	270	74.0	-17.1	Pass
#2	1799.00	73.91	2.65	-14.67	61.89	MaxP	Horizontal	199	30	74.0	-12.1	Pass
#3	1799.00	71.24	2.65	-14.67	59.22	MaxP	Vertical	150	330	74.0	-14.8	Pass
#4	3601.00	56.46	3.33	-11.85	47.94	MaxP	Horizontal	150	210	74.0	-26.1	Pass
#5	9024.00	51.63	5.25	-7.33	49.56	MaxP	Vertical	199	90	74.0	-24.4	Pass
#6	9908.00	49.72	5.71	-5.67	49.77	MaxP	Horizontal	199	0	74.0	-24.2	Pass
#7	17558.00	48.50	7.61	-0.45	55.66	MaxP	Vertical	199	0	74.0	-18.3	Pass
#8	17864.00	48.53	7.77	1.31	57.62	MaxP	Horizontal	199	0	74.0	-16.4	Pass
Test Notes: 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	250kbps
Power Setting:	Max	**Tested By:**	MN

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	1102.00	70.4	2.21	-17.53	55.08	MaxP	Vertical	150	330	74.0	-18.9	Pass
#2	1323.00	61.07	2.33	-16.21	47.19	MaxP	Vertical	199	270	74.0	-26.8	Pass
#3	1816.00	73.46	2.66	-14.49	61.63	MaxP	Horizontal	150	60	74.0	-12.4	Pass
#4	1816.00	70.07	2.66	-14.49	58.24	MaxP	Vertical	150	330	74.0	-15.8	Pass
#5	3652.00	58.3	3.34	-11.91	49.73	MaxP	Vertical	150	330	74.0	-24.3	Pass
#6	10180.00	49.86	5.54	-5.34	50.06	MaxP	Horizontal	150	300	74.0	-23.9	Pass
#7	10962.00	47.46	5.91	-5.11	48.27	MaxP	Vertical	150	119	74.0	-25.7	Pass
#8	17201.00	44.76	7.13	0.35	52.24	MaxP	Horizontal	150	270	74.0	-21.8	Pass
#9	17881.00	46.97	8.07	1.46	56.51	MaxP	Vertical	150	89	74.0	-17.5	Pass
Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	TAOGLAS	**Variant:**	900
Antenna Gain (dBi):	2	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	250kbps
Power Setting:	Max	**Tested By:**	MN

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	1068.00	74.75	2.14	-17.55	59.35	MaxP	Horizontal	150	120	74.0	-14.7	Pass
#2	1850.00	73.89	2.66	-14.40	62.15	MaxP	Horizontal	150	60	74.0	-11.9	Pass
#3	1850.00	70.41	2.66	-14.40	58.67	MaxP	Horizontal	1900	0	74.0	-15.3	Pass
#4	2394.00	69.02	3.02	-12.11	59.93	MaxP	Horizontal	199	0	74.0	-14.1	Pass
#5	3703.00	61.52	3.36	-11.78	53.10	MaxP	Horizontal	150	60	74.0	-20.9	Pass
#6	8735.00	50.84	5.39	-8.38	47.85	MaxP	Vertical	150	300	74.0	-26.2	Pass
#7	9279.00	57.23	5.36	-7.13	55.46	MaxP	Horizontal	150	300	74.0	-18.5	Pass
#8	17422.00	48.13	7.48	-0.36	55.25	MaxP	Vertical	150	239	74.0	-18.8	Pass
#9	17881.00	47.02	8.07	1.46	56.55	MaxP	Horizontal	150	270	74.0	-17.5	Pass
Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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10.4.2.3.7 Yagi / TE connectivity (PC9013N)

Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Yagi PC9013N	**Variant:**	900
Antenna Gain (dBi):	15	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1085.00	67.90	2.19	-17.56	52.54	MaxP	Horizontal	150	150	74.0	-21.5	Pass
#2	1646.00	64.28	2.52	-16.24	50.56	MaxP	Vertical	199	119	74.0	-23.4	Pass
#3	1799.00	67.20	2.65	-14.67	55.18	MaxP	Horizontal	150	180	74.0	-18.8	Pass
#4	1799.00	64.27	2.65	-14.67	52.25	MaxP	Vertical	199	29	74.0	-21.7	Pass
#5	2088.00	58.24	2.78	-13.07	47.94	MaxP	Vertical	199	179	74.0	-26.1	Pass
#6	3601.00	58.96	3.33	-11.85	50.44	MaxP	Vertical	199	0	74.0	-23.6	Pass
#7	3601.00	59.00	3.33	-11.85	50.48	MaxP	Horizontal	150	210	74.0	-23.5	Pass
#8	3839.00	55.09	3.40	-11.65	46.84	MaxP	Vertical	150	209	74.0	-27.2	Pass
#9	4502.00	58.58	3.69	-12.01	50.27	MaxP	Horizontal	150	210	74.0	-23.7	Pass
#10	9517.00	51.00	5.39	-6.19	50.20	MaxP	Vertical	199	270	74.0	-23.8	Pass
#11	12815.00	54.19	6.27	-8.44	52.02	MaxP	Horizontal	199	150	74.0	-22.0	Pass
#12	17864.00	48.19	7.77	1.31	57.28	MaxP	Vertical	199	330	74.0	-16.7	Pass
#13	17915.00	48.62	7.75	1.20	57.58	MaxP	Horizontal	199	30	74.0	-16.4	Pass
Test Notes: Yagi PC9013N antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. Yagi PC9013N antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx SPURIOUS 1-18 GHz

Antenna:	Yagi PC9013N	**Variant:**	900
Antenna Gain (dBi):	15	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915.00	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1085.00	68.32	2.19	-17.56	52.95	MaxP	Horizontal	150	150	74.0	-21.0	Pass
#2	1680.00	63.68	2.55	-15.85	50.39	MaxP	Vertical	199	119	74.0	-23.6	Pass
#3	1816.00	64.25	2.66	-14.49	52.41	MaxP	Horizontal	150	180	74.0	-21.6	Pass
#4	1901.00	61.27	2.68	-13.86	50.09	MaxP	Vertical	199	209	74.0	-23.9	Pass
#5	3652.00	59.67	3.34	-11.91	51.11	MaxP	Horizontal	199	210	74.0	-22.9	Pass
#6	3652.00	58.23	3.34	-11.91	49.67	MaxP	Vertical	199	0	74.0	-24.3	Pass
#7	10299.00	50.27	5.70	-5.33	50.64	MaxP	Horizontal	199	240	74.0	-23.4	Pass
#8	10435.00	50.07	5.72	-4.50	51.29	MaxP	Vertical	150	269	74.0	-22.7	Pass
#9	17796.00	47.90	7.72	0.95	56.58	MaxP	Vertical	199	89	74.0	-17.4	Pass
#10	17949.00	47.85	8.05	0.80	56.71	MaxP	Horizontal	199	240	74.0	-17.3	Pass
Test Notes: Yagi PC9013N antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. Yagi PC9013N antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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Equipment Configuration for FCC Tx Spurious 1-18 GHz

Antenna:	Yagi PC90`3N	**Variant:**	900
Antenna Gain (dBi):	15	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.50	**Data Rate:**	10kbps
Power Setting:	Max	**Tested By:**	MN

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	1085.00	69.61	2.19	-17.56	54.25	MaxP	Horizontal	150	150	74.0	-19.8	Pass
#2	1680.00	62.63	2.55	-15.85	49.34	MaxP	Vertical	150	269	74.0	-24.7	Pass
#3	1850.00	67.23	2.66	-14.40	55.49	MaxP	Horizontal	199	150	74.0	-18.5	Pass
#4	1918.00	61.61	2.67	-13.81	50.47	MaxP	Vertical	150	209	74.0	-23.5	Pass
#5	3703.00	59.70	3.36	-11.78	51.27	MaxP	Horizontal	199	180	74.0	-22.7	Pass
#6	8480.00	52.35	5.33	-7.90	49.78	MaxP	Vertical	150	299	74.0	-24.2	Pass
#7	9279.00	54.39	5.36	-7.13	52.62	MaxP	Vertical	150	29	74.0	-21.4	Pass
#8	12713.00	55.28	6.14	-7.84	53.59	MaxP	Vertical	199	209	74.0	-20.4	Pass
#9	16691.00	49.99	7.00	-0.10	56.89	MaxP	Horizontal	199	330	74.0	-17.1	Pass
Test Notes: Yagi PC9013N antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used												

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-07 MEASUREMENT OF RADIATED EMISSION
Measurement Uncertainty:	+5.6/ -4.5 dB

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

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10.4.2.3.8 Ceramic / Chip / Meritek (AT503008915M)

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.5	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

Test Measurement Results

1000.00 - 17983.00 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	59.70	2.97	-14.67	48.00	MaxP	Horizontal	149	60	74.0	-26.0	Pass
#2	1799.00	57.73	2.97	-14.67	46.03	MaxP	Vertical	149	330	74.0	-28.0	Pass
#3	2700.00	59.88	3.70	-11.49	52.09	MaxP	Vertical	149	330	74.0	-21.9	Pass
#4	3601.00	57.95	4.31	-11.85	50.41	MaxP	Vertical	199	330	74.0	-23.6	Pass
#5	13597.00	50.10	9.56	-6.84	52.82	MaxP	Vertical	199	0	74.0	-21.2	Pass
#6	15008.00	48.66	9.43	-3.71	54.38	MaxP	Horizontal	199	240	74.0	-19.6	Pass
#7	17915.00	45.87	10.85	1.20	57.92	MaxP	Horizontal	149	60	74.0	-16.1	Pass
Test Notes: Ceramic Antenna, 902.5MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.												

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 FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

Test Measurement Results

1000.00 - 17983.00 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	59.23	2.98	-14.49	47.72	MaxP	Horizontal	199	330	74.0	-26.3	Pass
#2	2734.00	61.28	3.72	-11.54	53.45	MaxP	Horizontal	151	270	74.0	-20.5	Pass
#3	2734.00	60.91	3.72	-11.54	53.08	MaxP	Vertical	199	270	74.0	-20.9	Pass
#4	3652.00	53.43	4.37	-11.78	46.02	MaxP	Vertical	151	330	74.0	-28.0	Pass
#5	4570.00	54.92	4.95	-12.12	47.75	MaxP	Horizontal	151	270	74.0	-26.2	Pass
#6	9143.00	51.42	8.16	-9.08	50.50	MaxP	Vertical	151	330	74.0	-23.5	Pass
#7	11897.00	52.04	9.35	-5.46	55.93	MaxP	Horizontal	151	60	74.0	-18.1	Pass
#8	11897.00	51.33	9.35	-5.46	55.22	MaxP	Vertical	151	89	74.0	-18.8	Pass
#9	17150.00	46.15	10.54	0.18	56.87	MaxP	Horizontal	199	210	74.0	-17.1	Pass
Test Notes: Ceramic Antenna, 915MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.												

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 FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.5	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

Test Measurement Results

1000.00 - 17983.00 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	59.77	3.02	-14.40	48.38	MaxP	Horizontal	150	210	74.0	-25.6	Pass
#2	1850.00	58.33	3.02	-14.40	46.95	MaxP	Vertical	150	330	74.0	-27.1	Pass
#3	2768.00	61.36	3.74	-11.48	53.62	MaxP	Vertical	150	330	74.0	-20.4	Pass
#4	2768.00	61.32	3.74	-11.48	53.57	MaxP	Horizontal	150	330	74.0	-20.4	Pass
#5	3703.00	53.53	4.37	-11.78	46.12	MaxP	Horizontal	150	330	74.0	-27.9	Pass
#6	4638.00	53.21	4.95	-12.12	46.04	MaxP	Vertical	150	330	74.0	-28.0	Pass
#7	13546.00	51.08	9.49	-7.00	53.57	MaxP	Horizontal	199	120	74.0	-20.4	Pass
#8	15076.00	47.84	9.47	-3.48	53.83	MaxP	Vertical	150	89	74.0	-20.2	Pass
#9	17626.00	46.55	10.89	-0.37	57.06	MaxP	Horizontal	150	330	74.0	-16.9	Pass
Test Notes: Ceramic Antenna, 927.5MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.												

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 30 MHZ TO 1 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.5	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

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	62.98	52.03	4.15	-17.61	38.57	MaxP	Horizontal	100	0	40.0	-1.4	Pass
#2	65.89	56.50	4.17	-17.63	43.04	NRB	Vertical	100	209	--	--	Pass
#3	173.56	51.23	4.66	-14.27	41.61	MaxP	Vertical	100	59	43.5	-1.9	Pass
#4	191.02	53.10	4.75	-14.19	43.66	NRB	Vertical	100	149	--	--	Pass
#5	233.70	50.64	4.90	-13.80	41.75	MaxP	Vertical	100	239	46.0	-4.3	Pass
#6	276.38	51.68	5.07	-11.90	44.85	MaxP	Vertical	100	149	46.0	-1.1	Pass
#7	299.66	52.69	5.19	-11.94	45.94	MaxP	Vertical	100	179	46.0	-0.1	Pass
#8	319.06	54.81	5.25	-11.48	48.58	NRB	Vertical	100	299	--	--	Pass
#9	319.06	52.26	5.25	-11.48	46.03	NRB	Horizontal	100	0	--	--	Pass
#10	361.74	48.76	5.42	-10.30	43.88	MaxP	Vertical	100	209	46.0	-2.1	Pass
#11	600.36	44.11	6.25	-6.45	43.91	MaxP	Vertical	100	179	46.0	-2.1	Pass
#12	666.32	42.29	6.54	-5.34	43.49	MaxP	Vertical	100	0	46.0	-2.5	Pass
#13	733.25	40.47	6.77	-4.43	42.82	MaxP	Horizontal	199	120	46.0	-3.2	Pass
#14	903.00	68.26	7.42	-2.45	73.23	Fundamental	Horizontal	100	330	--	--	Pass
#15	903.00	68.04	7.42	-2.45	73.01	Fundamental	Vertical	100	330	--	--	Pass
Test Notes: Ceramic Antenna, 902.5MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.												

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 30 MHZ TO 1 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	915	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

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	65.89	56.04	4.17	-17.63	42.58	NRB	Horizontal	98	0	--	--	Pass
#2	65.89	54.90	4.17	-17.63	41.44	NRB	Vertical	98	270	--	--	Pass
#3	173.56	51.54	4.66	-14.27	41.93	MaxP	Vertical	98	89	43.5	-1.6	Pass
#4	191.02	53.59	4.75	-14.19	44.15	NRB	Vertical	98	180	--	--	Pass
#5	276.38	48.96	5.07	-11.90	42.13	MaxP	Vertical	98	149	46.0	-3.9	Pass
#6	299.66	52.14	5.19	-11.94	45.40	MaxP	Vertical	98	180	46.0	-0.6	Pass
#7	299.66	48.25	5.19	-11.94	41.50	MaxP	Horizontal	98	0	46.0	-4.5	Pass
#8	319.06	54.89	5.25	-11.48	48.66	NRB	Vertical	98	299	--	--	Pass
#9	319.06	53.21	5.25	-11.48	46.98	NRB	Horizontal	98	0	--	--	Pass
#10	361.74	50.97	5.42	-10.30	46.09	NRB	Vertical	149	209	--	--	Pass
#11	500.45	44.40	5.85	-7.64	42.61	MaxP	Vertical	98	0	46.0	-3.4	Pass
#12	667.29	46.46	6.53	-5.35	47.64	NRB	Horizontal	149	300	--	--	Pass
#13	667.29	44.55	6.53	-5.35	45.73	MaxP	Vertical	100	0	46.0	-0.3	Pass
#14	733.25	38.39	6.77	-4.43	40.74	MaxP	Vertical	98	149	46.0	-5.3	Pass
#15	875.84	36.56	7.35	-2.79	41.11	MaxP	Horizontal	149	150	46.0	-4.9	Pass
#16	915.61	56.72	7.46	-2.30	61.88	Fundamental	Vertical	98	330	--	--	Pass
#17	915.61	56.67	7.46	-2.30	61.83	Fundamental	Horizontal	98	330	--	--	Pass
#18	995.15	37.18	7.57	-1.44	43.30	MaxP	Horizontal	149	90	54.0	-10.7	Pass
Test Notes: Ceramic Antenna, 915MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.												

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 30 MHZ TO 1 GHZ

Antenna:	Ceramic	**Variant:**	Ceramic antenna
Antenna Gain (dBi):	Not Applicable	**Modulation:**	FSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	927.5	**Data Rate:**	10 kbps
Power Setting:	PL3	**Tested By:**	MN

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	63.95	51.90	4.17	-17.63	38.44	MaxP	Horizontal	98	0	40.0	-1.6	Pass
#2	65.89	53.06	4.17	-17.63	39.59	MaxP	Vertical	98	29	40.0	-0.4	Pass
#3	172.59	51.29	4.66	-14.22	41.73	MaxP	Vertical	98	89	43.5	-1.8	Pass
#4	191.02	53.66	4.75	-14.19	44.22	NRB	Vertical	98	149	--	--	Pass
#5	276.38	50.10	5.07	-11.90	43.27	MaxP	Vertical	98	149	46.0	-2.7	Pass
#6	276.38	49.10	5.07	-11.90	42.27	MaxP	Horizontal	98	0	46.0	-3.7	Pass
#7	299.66	54.19	5.19	-11.94	47.44	NRB	Vertical	98	179	--	--	Pass
#8	319.06	54.68	5.25	-11.48	48.45	NRB	Vertical	98	299	--	--	Pass
#9	319.06	52.67	5.25	-11.48	46.44	NRB	Horizontal	98	0	--	--	Pass
#10	361.74	50.39	5.42	-10.30	45.51	MaxP	Vertical	149	209	46.0	-0.5	Pass
#11	447.10	44.54	5.70	-8.52	41.72	MaxP	Horizontal	199	330	46.0	-4.3	Pass
#12	666.32	45.85	6.11	-6.52	45.44	MaxP	Horizontal	98	0	46.0	-0.6	Pass
#13	928.22	53.91	7.51	-2.06	59.36	Fundamental	Horizontal	149	90	--	--	Pass
#14	928.22	52.96	7.51	-2.06	58.41	Fundamental	Vertical	199	0	--	--	Pass
#15	967.99	41.42	7.54	-1.67	47.29	MaxP	Horizontal	98	60	54.0	-6.7	Pass
Test Notes: Ceramic Antenna, 927.5MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.												

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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APPENDIX A - GRAPHICAL IMAGES

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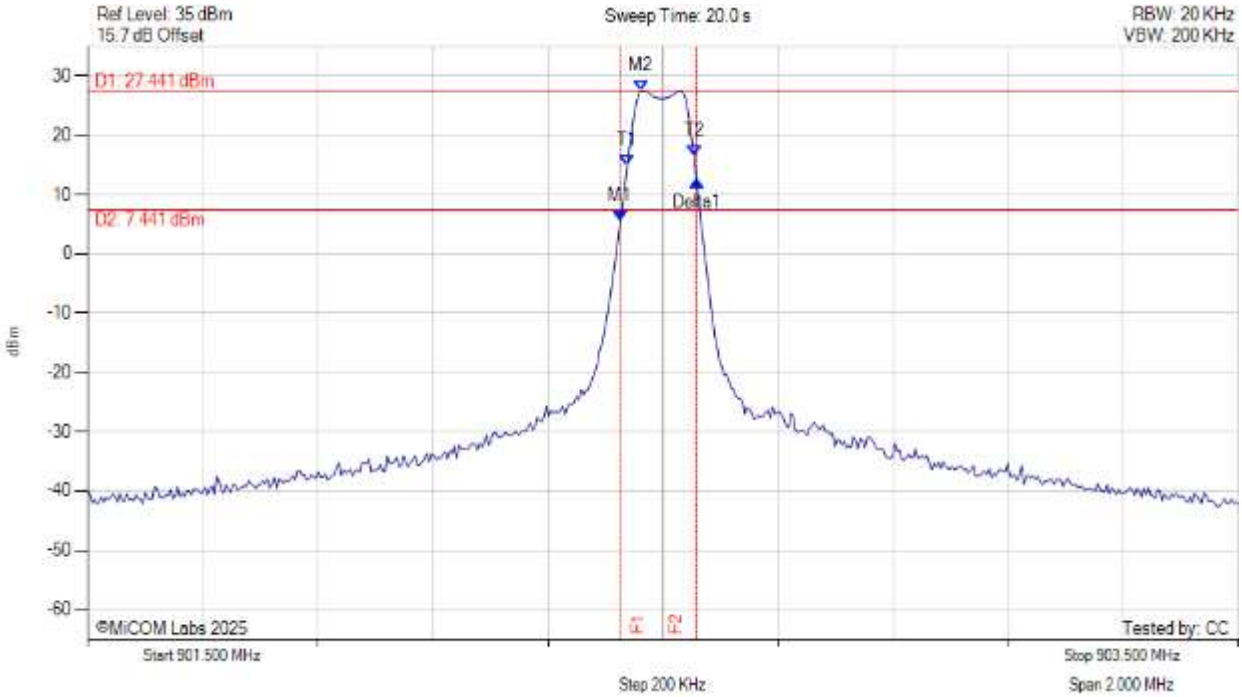
A.1. 20 dB & 99% Bandwidth

20 dB 99% BANDWIDTH

Variant: FSK-10k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.426 MHz : 5.421 dBm M2 : 902.462 MHz : 27.441 dBm Delta1 : 132 KHz : 6.900 dB T1 : 902.438 MHz : 14.874 dBm T2 : 902.554 MHz : 16.599 dBm OBW : 116 KHz	Channel Frequency: 902.50 MHz Measured 20 dB Bandwidth: 0.132 MHz Limit: 500 kHz Margin: -0.368 MHz

back to matrix

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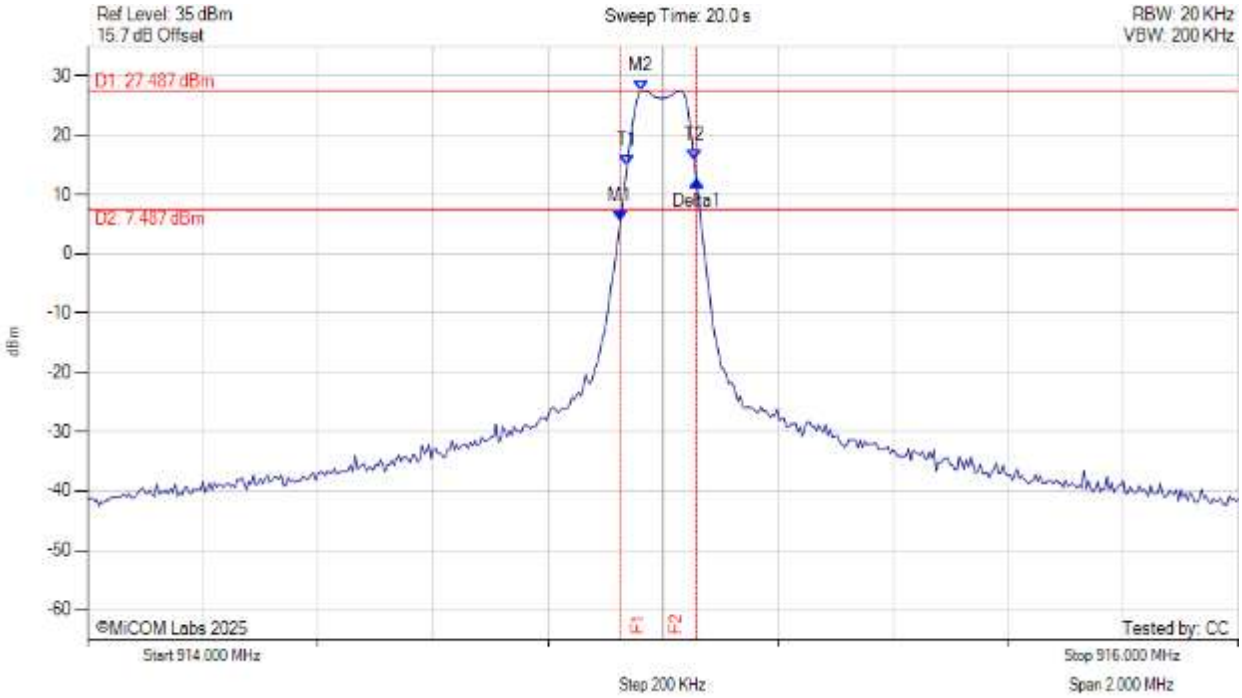
20 dB 99% BANDWIDTH

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.926 MHz : 5.517 dBm M2 : 914.962 MHz : 27.487 dBm Delta1 : 132 KHz : 6.837 dB T1 : 914.938 MHz : 14.968 dBm T2 : 915.054 MHz : 15.889 dBm OBW : 116 KHz	Channel Frequency: 915.00 MHz Measured 20 dB Bandwidth: 0.132 MHz Limit: 500 kHz Margin: -0.368 MHz

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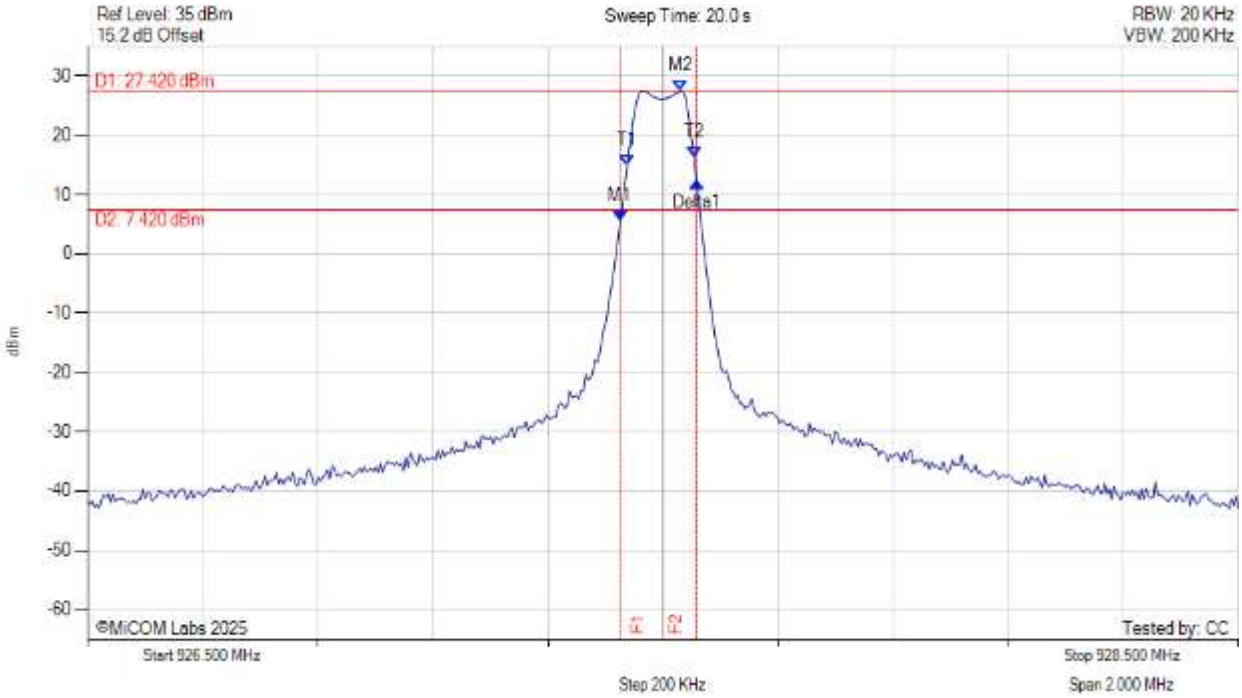
20 dB 99% BANDWIDTH

Variant: FSK-10k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.426 MHz : 5.482 dBm M2 : 927.530 MHz : 27.420 dBm Delta1 : 132 KHz : 6.687 dB T1 : 927.438 MHz : 14.896 dBm T2 : 927.554 MHz : 16.312 dBm OBW : 116 KHz	Channel Frequency: 927.50 MHz Measured 20 dB Bandwidth: 0.132 MHz Limit: 500 kHz Margin: -0.368 MHz

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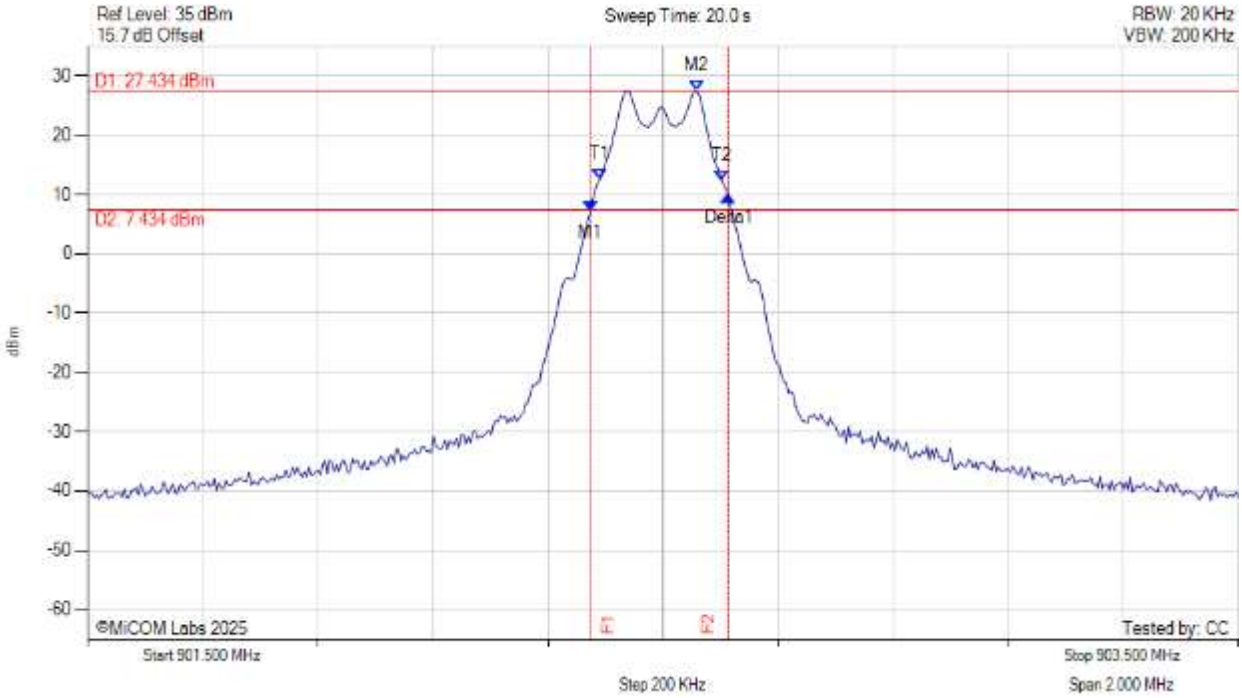
20 dB 99% BANDWIDTH

Variant: FSK-110k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.374 MHz : 7.107 dBm M2 : 902.558 MHz : 27.434 dBm Delta1 : 240 KHz : 2.540 dB T1 : 902.390 MHz : 12.480 dBm T2 : 902.602 MHz : 12.358 dBm OBW : 212 KHz	Channel Frequency: 902.50 MHz Measured 20 dB Bandwidth: 0.240 MHz Limit: 500 kHz Margin: -0.260 MHz

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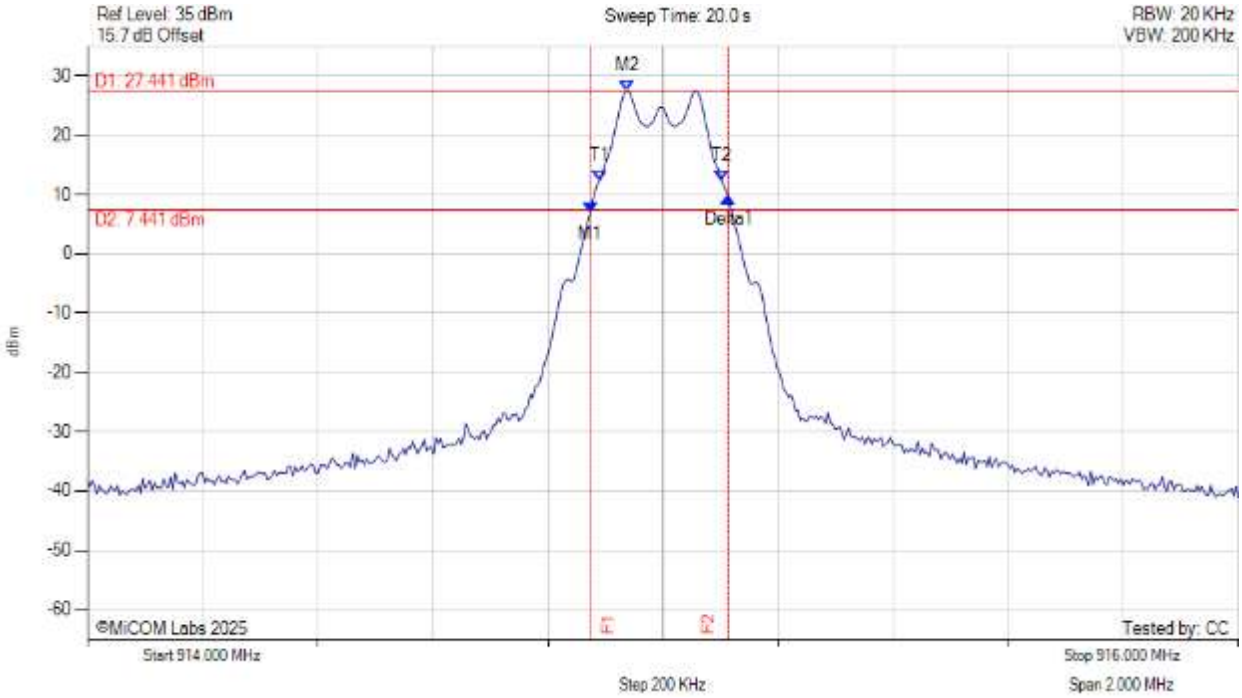
20 dB 99% BANDWIDTH

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 914.874 MHz : 6.961 dBm M2 : 914.938 MHz : 27.441 dBm Delta1 : 240 KHz : 2.569 dB T1 : 914.890 MHz : 12.348 dBm T2 : 915.102 MHz : 12.236 dBm OBW : 212 KHz	Channel Frequency: 915.00 MHz Measured 20 dB Bandwidth: 0.240 MHz Limit: 500 kHz Margin: -0.260 MHz

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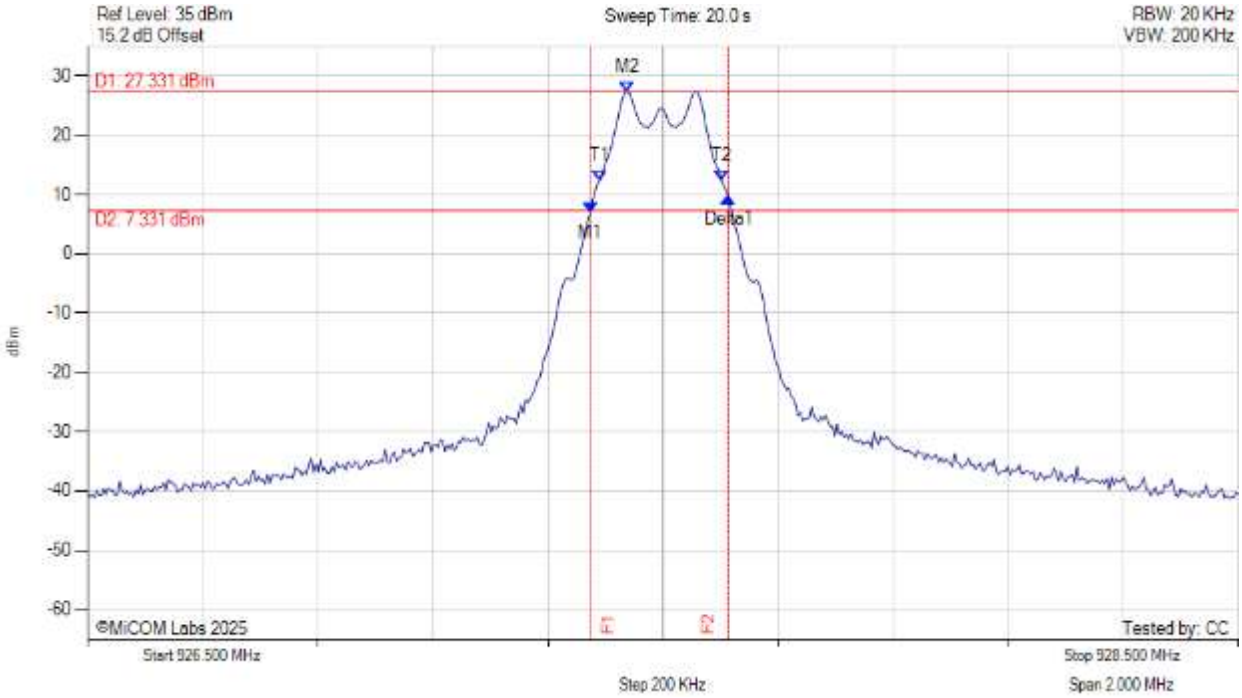
20 dB 99% BANDWIDTH

Variant: FSK-110k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.374 MHz : 6.981 dBm M2 : 927.438 MHz : 27.331 dBm Delta1 : 240 KHz : 2.469 dB T1 : 927.390 MHz : 12.338 dBm T2 : 927.602 MHz : 12.204 dBm OBW : 212 KHz	Channel Frequency: 927.50 MHz Measured 20 dB Bandwidth: 0.240 MHz Limit: 500 kHz Margin: -0.260 MHz

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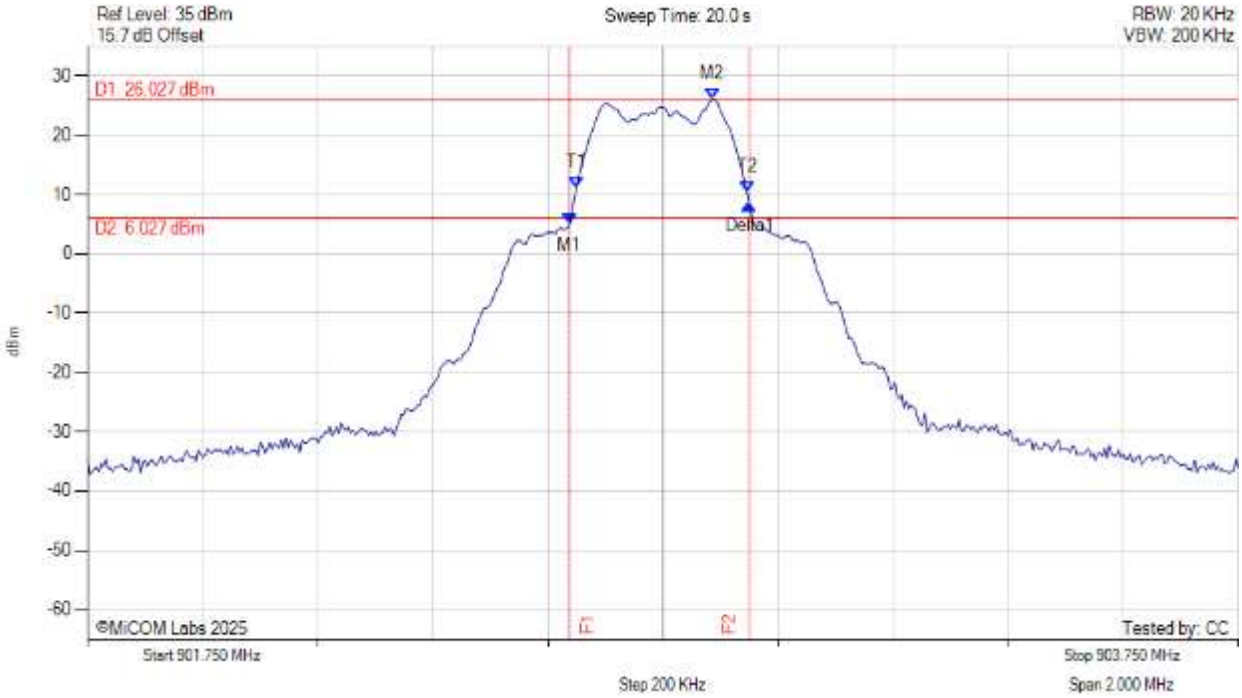
20 dB 99% BANDWIDTH

Variant: FSK-250k, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 902.588 MHz : 4.980 dBm M2 : 902.836 MHz : 26.027 dBm Delta1 : 313 KHz : 3.317 dB T1 : 902.600 MHz : 11.085 dBm T2 : 902.896 MHz : 10.337 dBm OBW : 297 KHz	Channel Frequency: 902.75 MHz Measured 20 dB Bandwidth: 0.313 MHz Limit: 500 kHz Margin: -0.187 MHz

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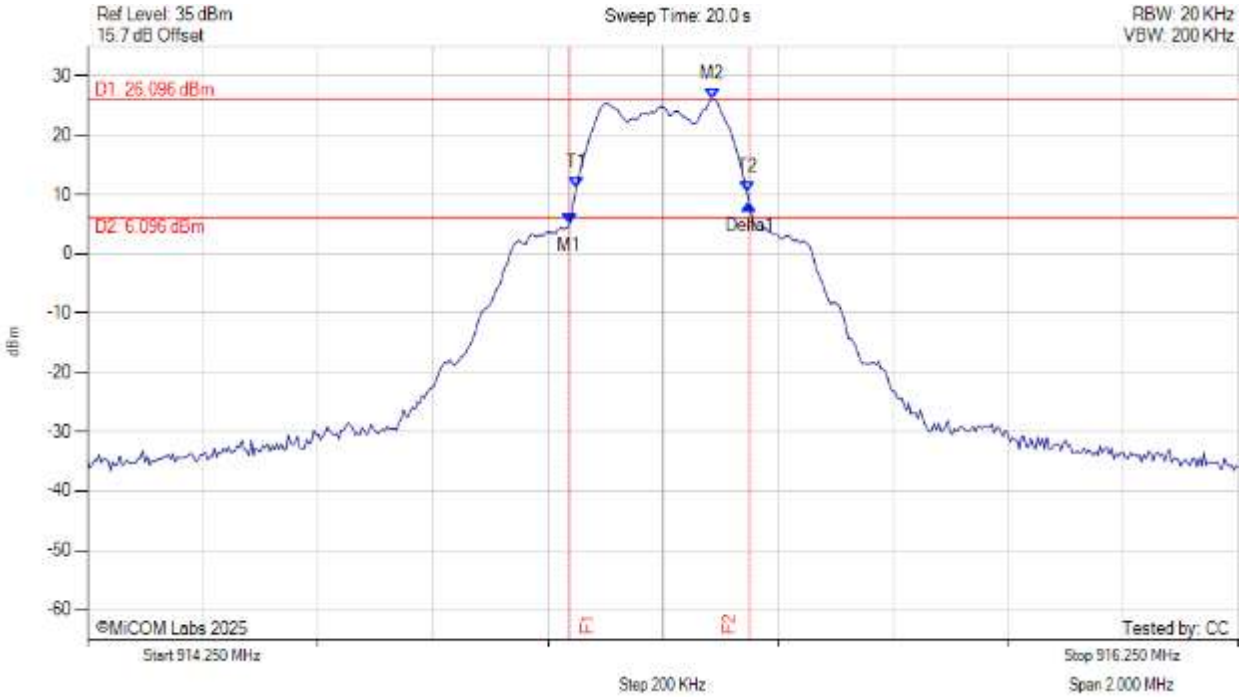
20 dB 99% BANDWIDTH

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 915.088 MHz : 4.990 dBm M2 : 915.336 MHz : 26.096 dBm Delta1 : 313 KHz : 3.303 dB T1 : 915.100 MHz : 11.193 dBm T2 : 915.396 MHz : 10.345 dBm OBW : 297 KHz	Channel Frequency: 915.25 MHz Measured 20 dB Bandwidth: 0.313 MHz Limit: 500 kHz Margin: -0.187 MHz

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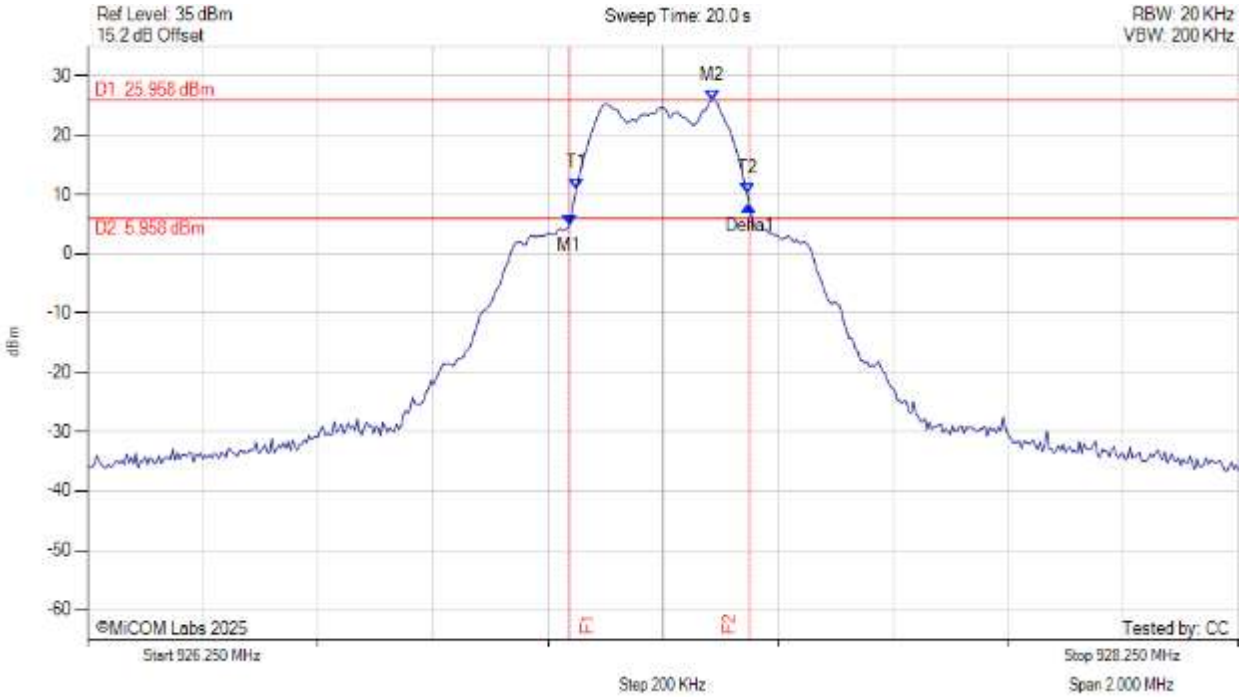
20 dB 99% BANDWIDTH

Variant: FSK-250k, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = MAX HOLD	M1 : 927.088 MHz : 4.935 dBm M2 : 927.336 MHz : 25.958 dBm Delta1 : 313 KHz : 3.238 dB T1 : 927.100 MHz : 11.028 dBm T2 : 927.396 MHz : 10.219 dBm OBW : 297 KHz	Channel Frequency: 927.25 MHz Measured 20 dB Bandwidth: 0.313 MHz Limit: 500 kHz Margin: -0.187 MHz

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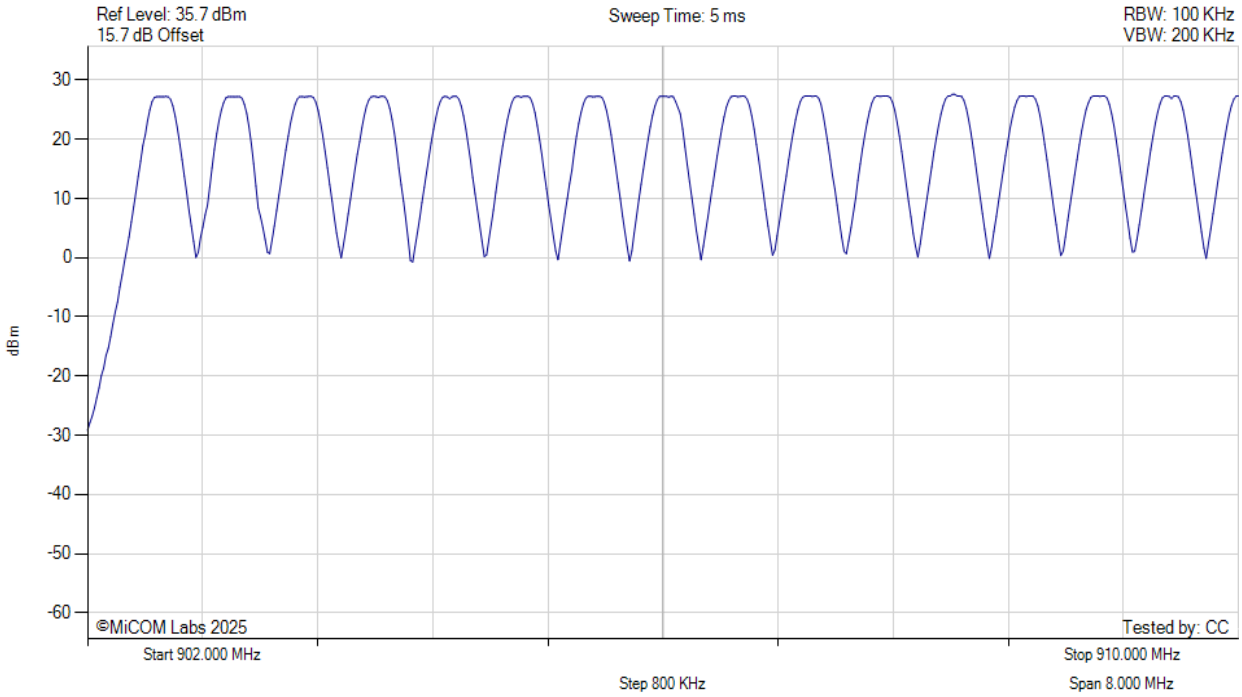
A.2. Frequency Hopping Tests

A.2.1. Number of Hopping Channels

NUMBER OF HOPPING CHANNELS

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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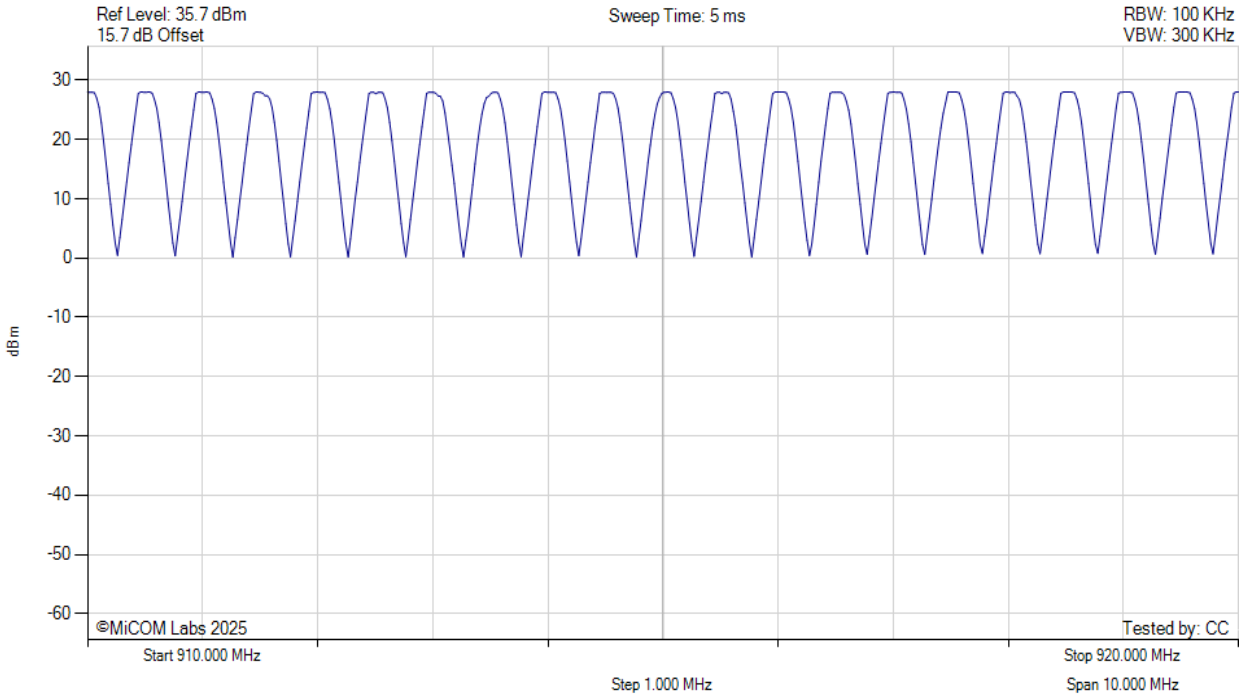
NUMBER OF HOPPING CHANNELS

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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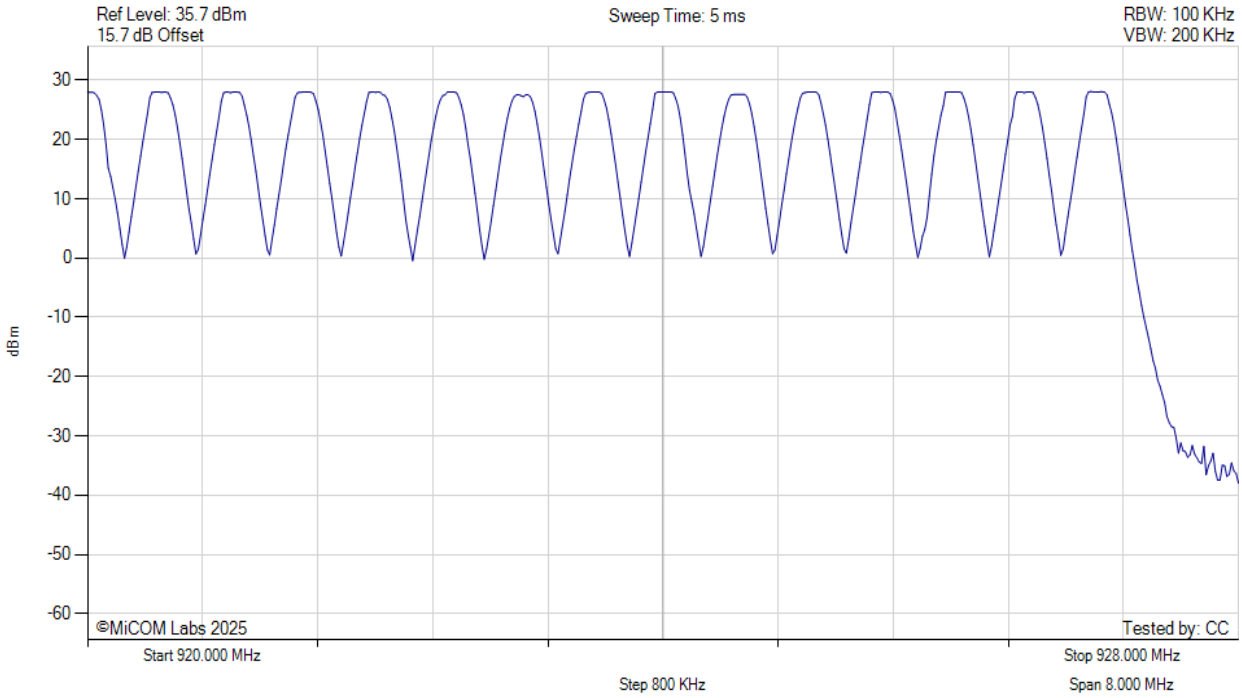
NUMBER OF HOPPING CHANNELS

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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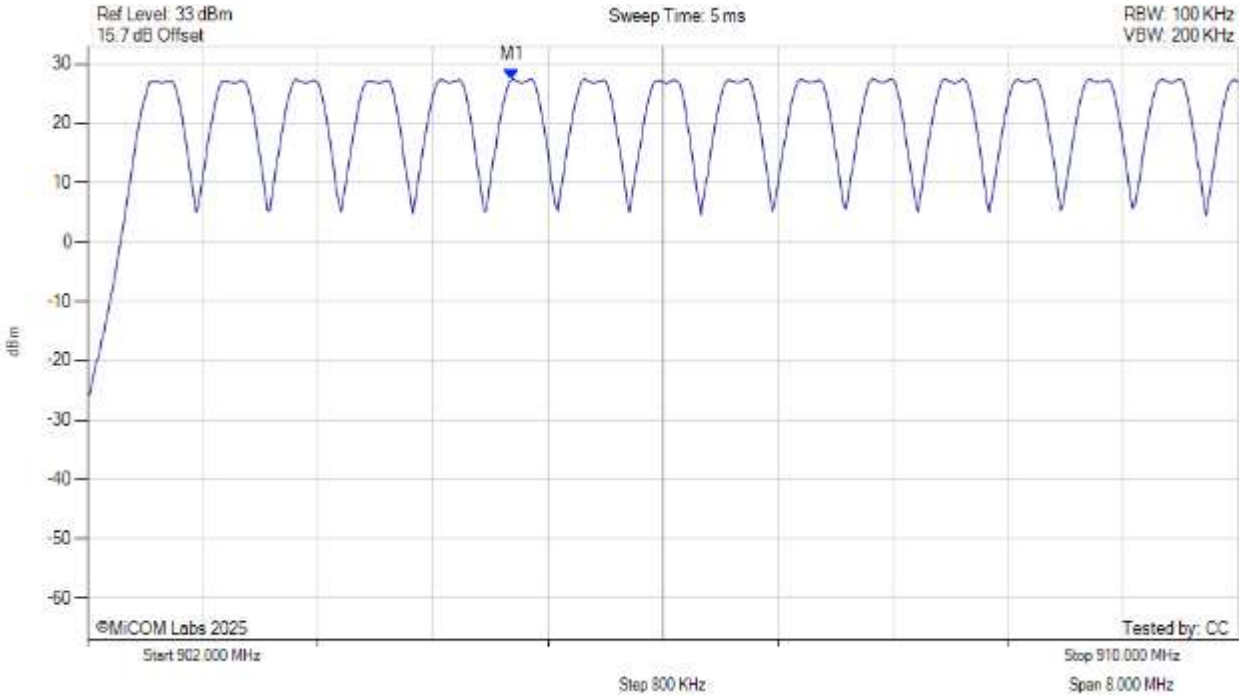
NUMBER OF HOPPING CHANNELS

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 904.950 MHz : 27.371 dBm	Channel Frequency: 915.00 MHz

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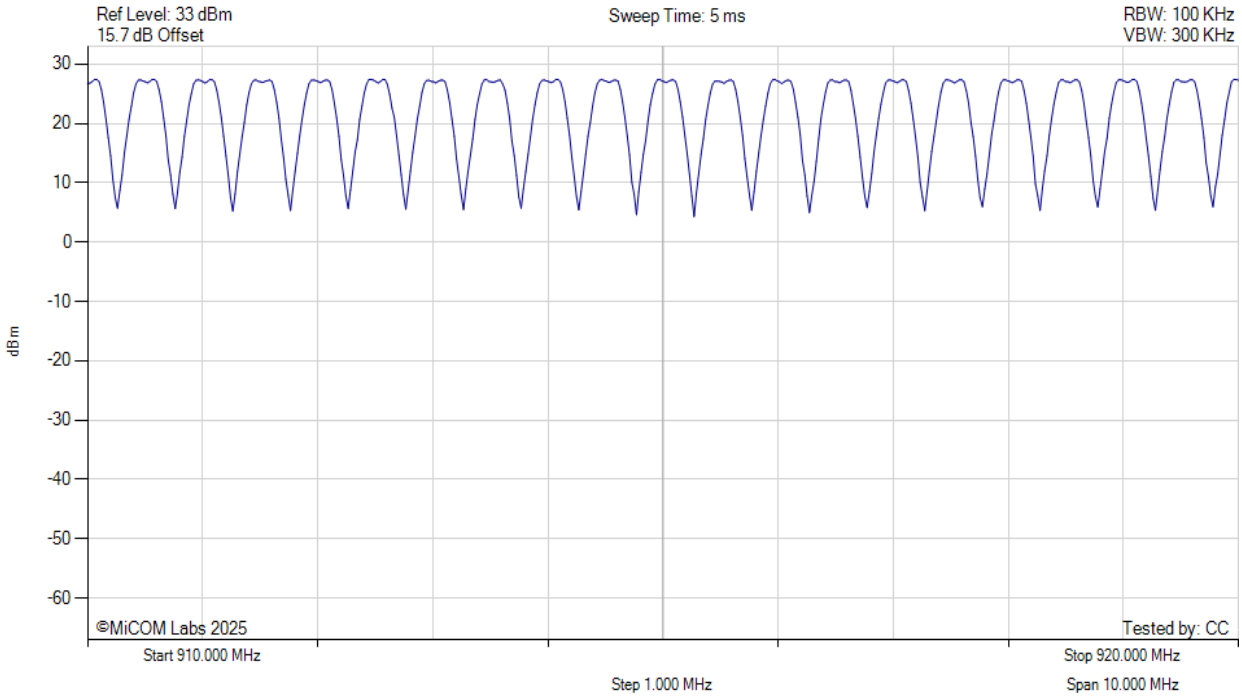
NUMBER OF HOPPING CHANNELS

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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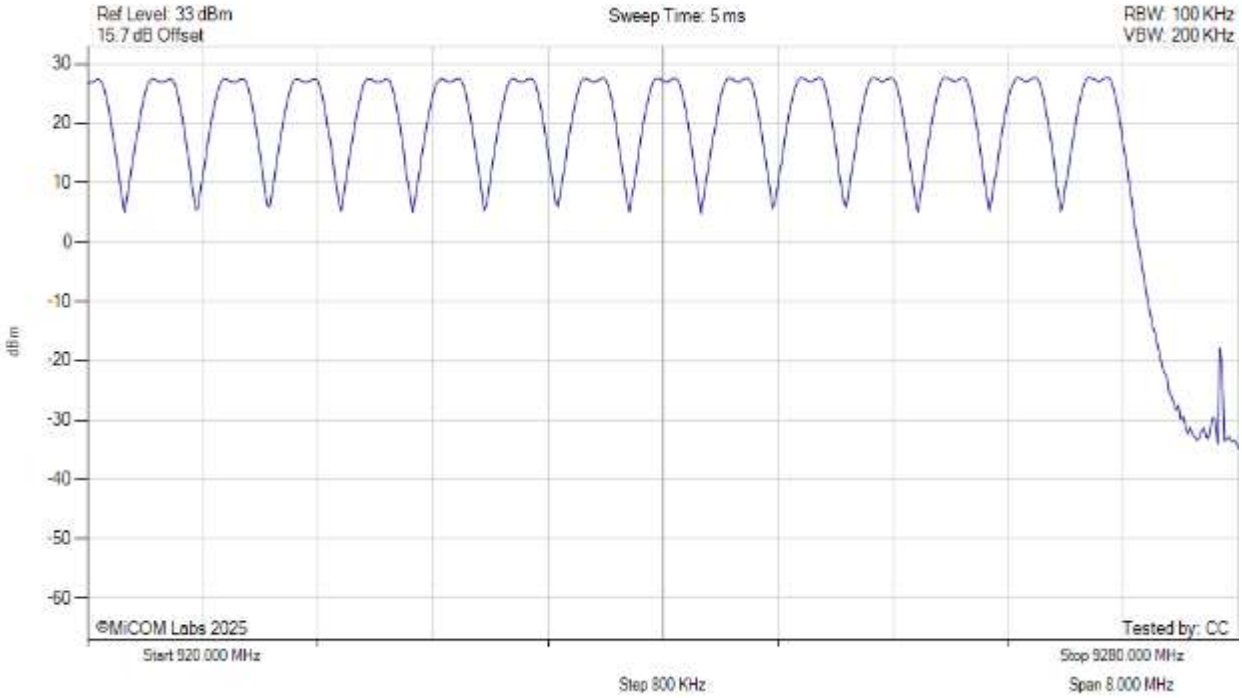
NUMBER OF HOPPING CHANNELS

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.00 MHz

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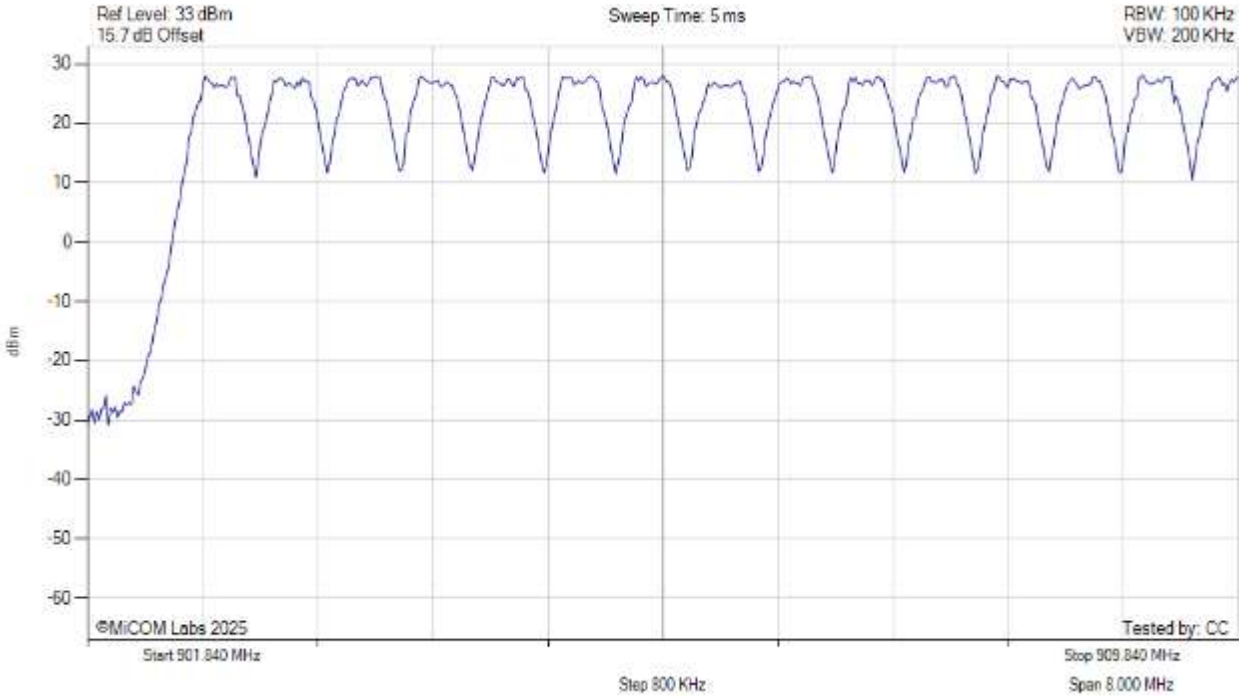
NUMBER OF HOPPING CHANNELS

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

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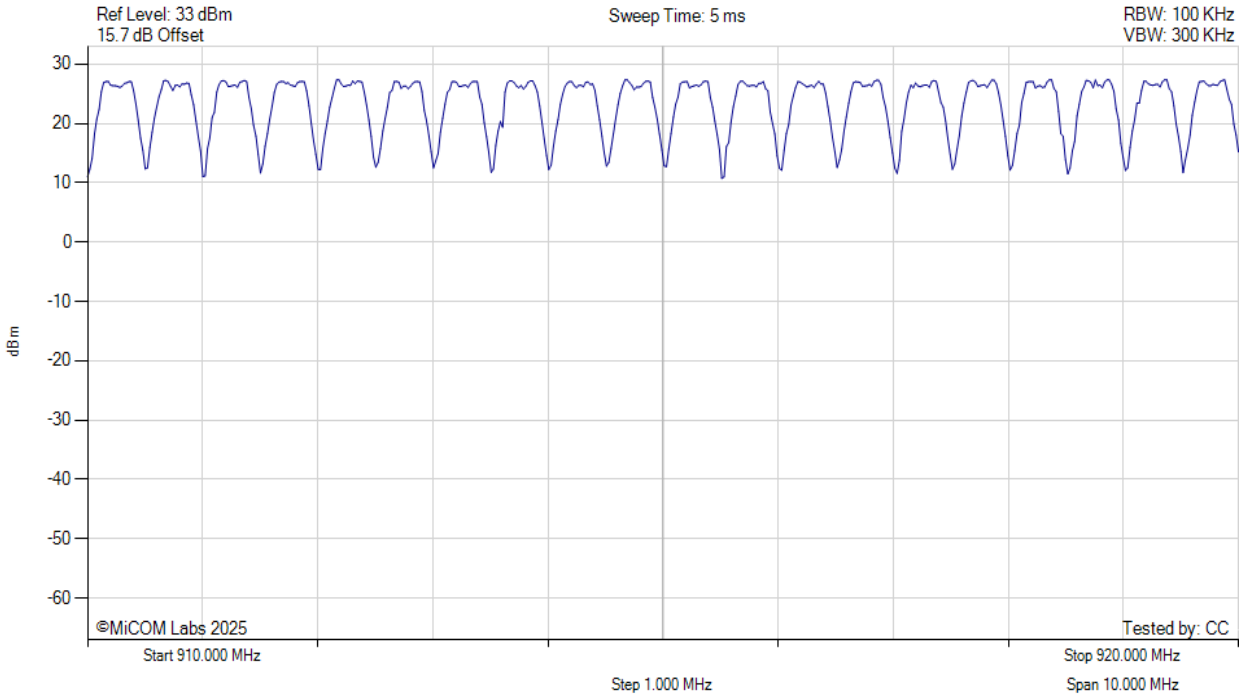
NUMBER OF HOPPING CHANNELS

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

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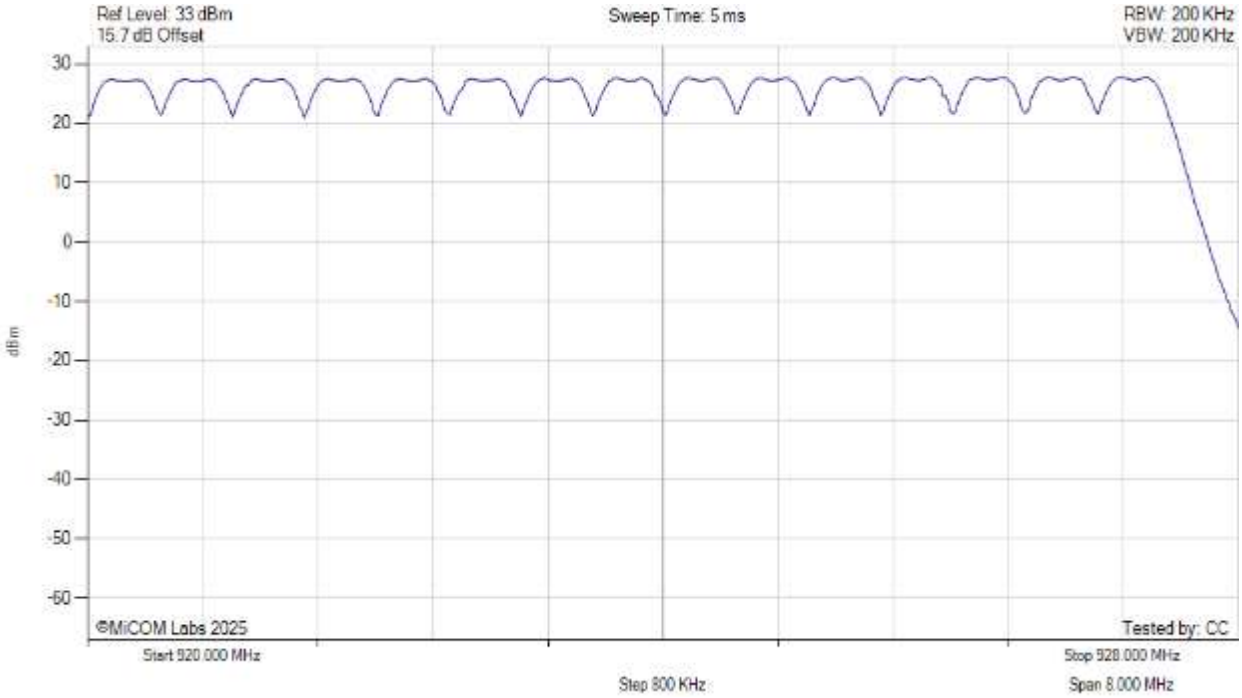
NUMBER OF HOPPING CHANNELS

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

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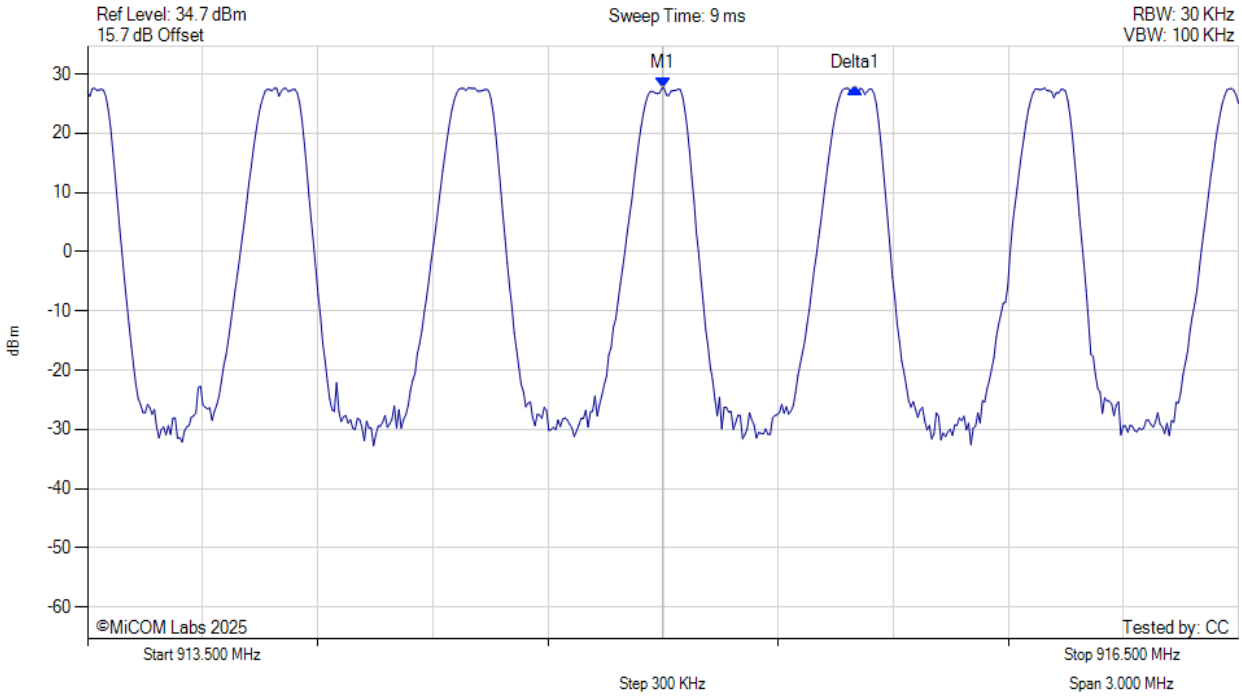
A.2.2. Channel Separation

CHANNEL SEPARATION

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.000 MHz : 27.642 dBm Delta1 : 500 KHz : -0.028 dB	Channel Frequency: 915.00 MHz

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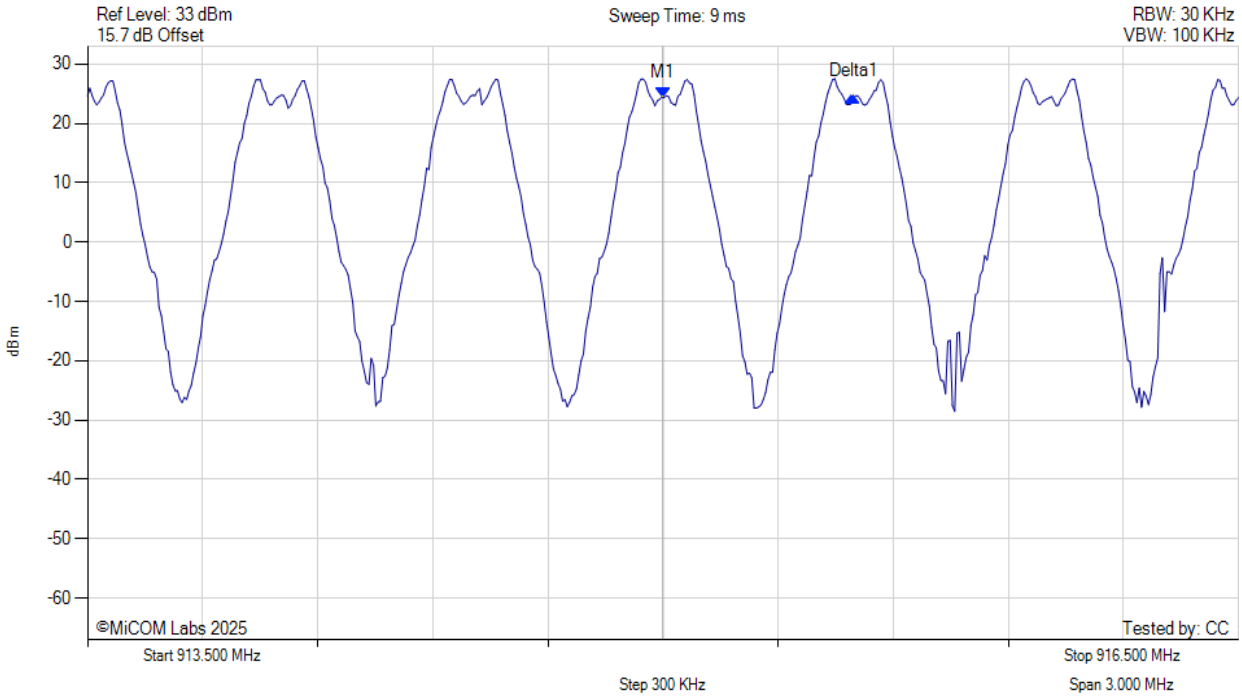
CHANNEL SEPARATION

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.000 MHz : 24.394 dBm Delta1 : 496 KHz : -0.083 dB	Channel Frequency: 915.00 MHz

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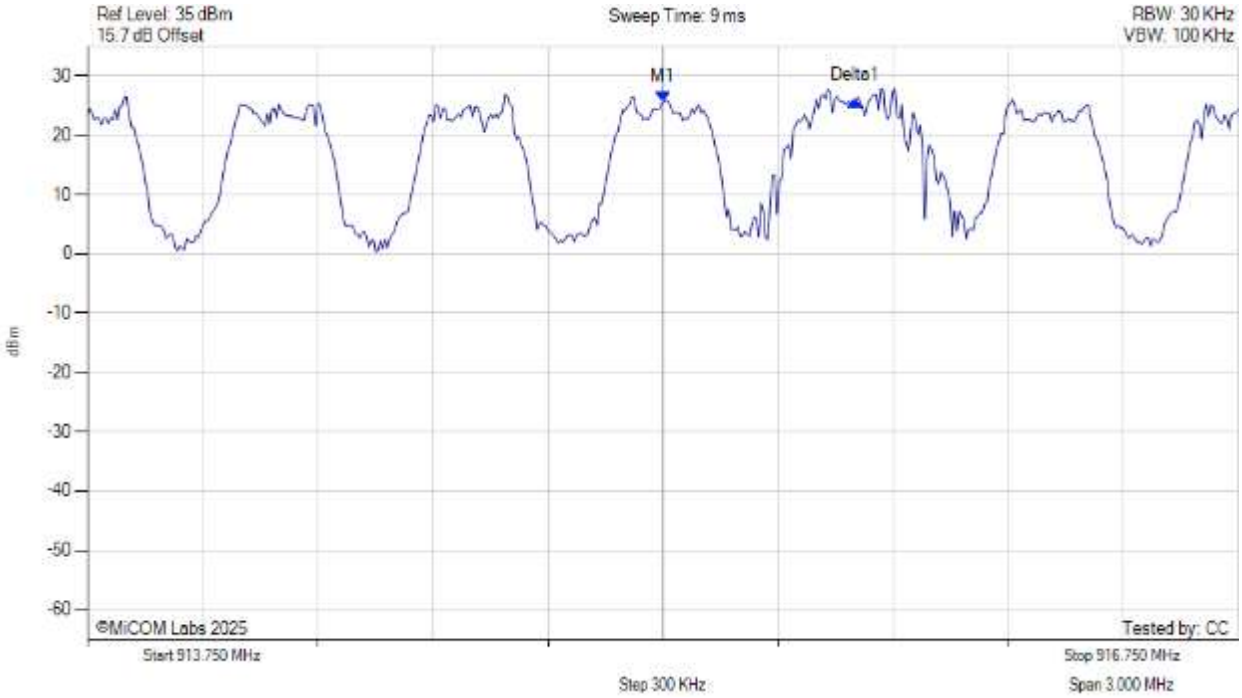
CHANNEL SEPARATION

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.250 MHz : 25.686 dBm Delta1 : 496 KHz : -0.397 dB	Channel Frequency: 915.25 MHz

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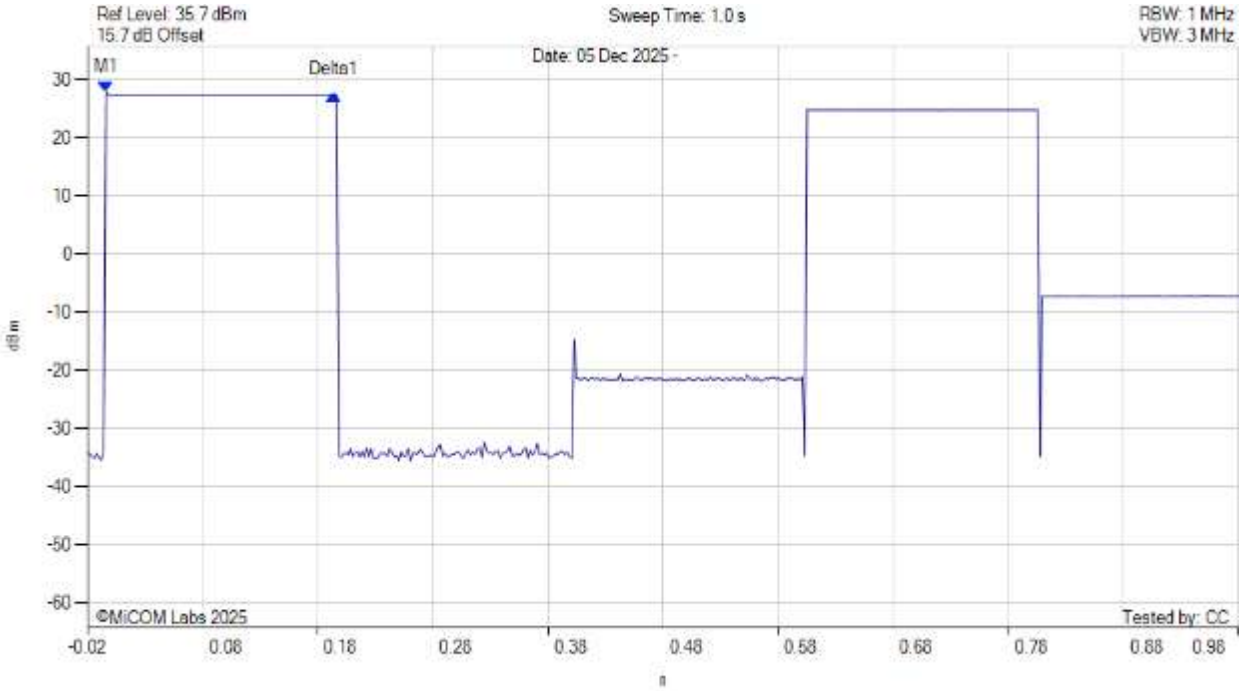
A.2.3. Dwell Time

DWELL TIME

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1(915.00 MHz) : -0.004 s : 27.919 dBm Delta1(915.00 MHz) : 0.198 s : -0.510 dB	Channel Frequency: 915.00 MHz

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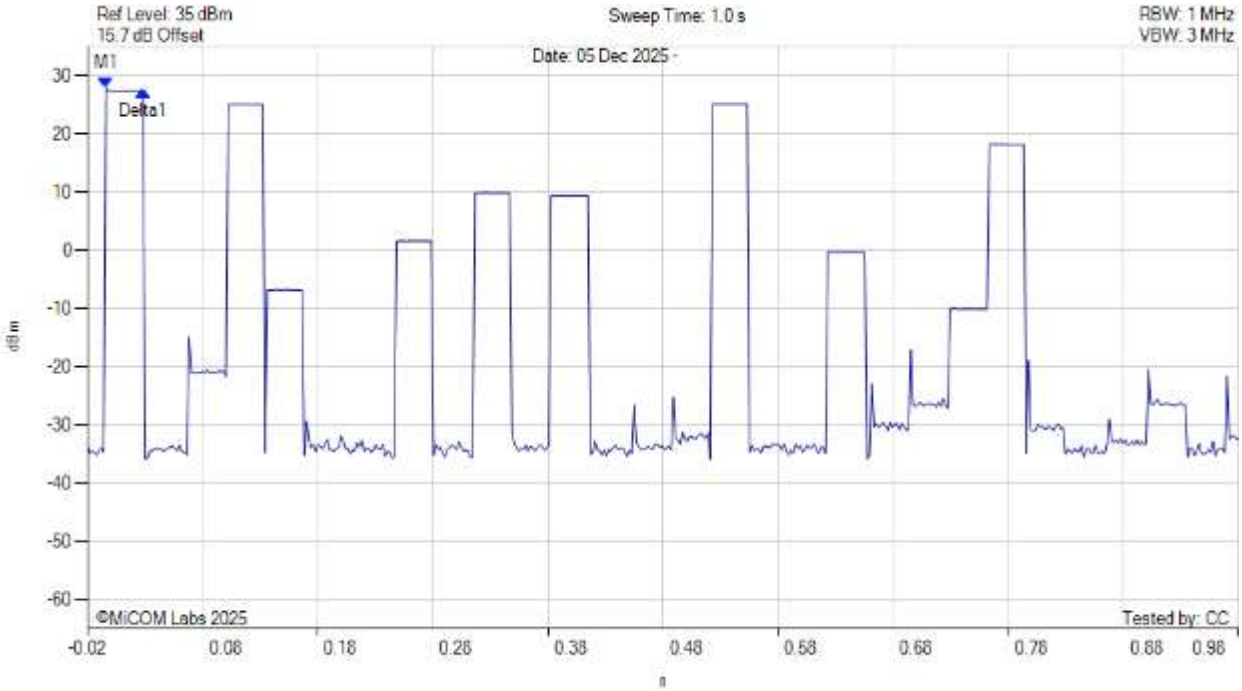
DWELL TIME

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1(915.00 MHz) : -0.004 s : 27.904 dBm Delta1(915.00 MHz) : 0.032 s : -0.478 dB	Channel Frequency: 915.00 MHz

back to matrix

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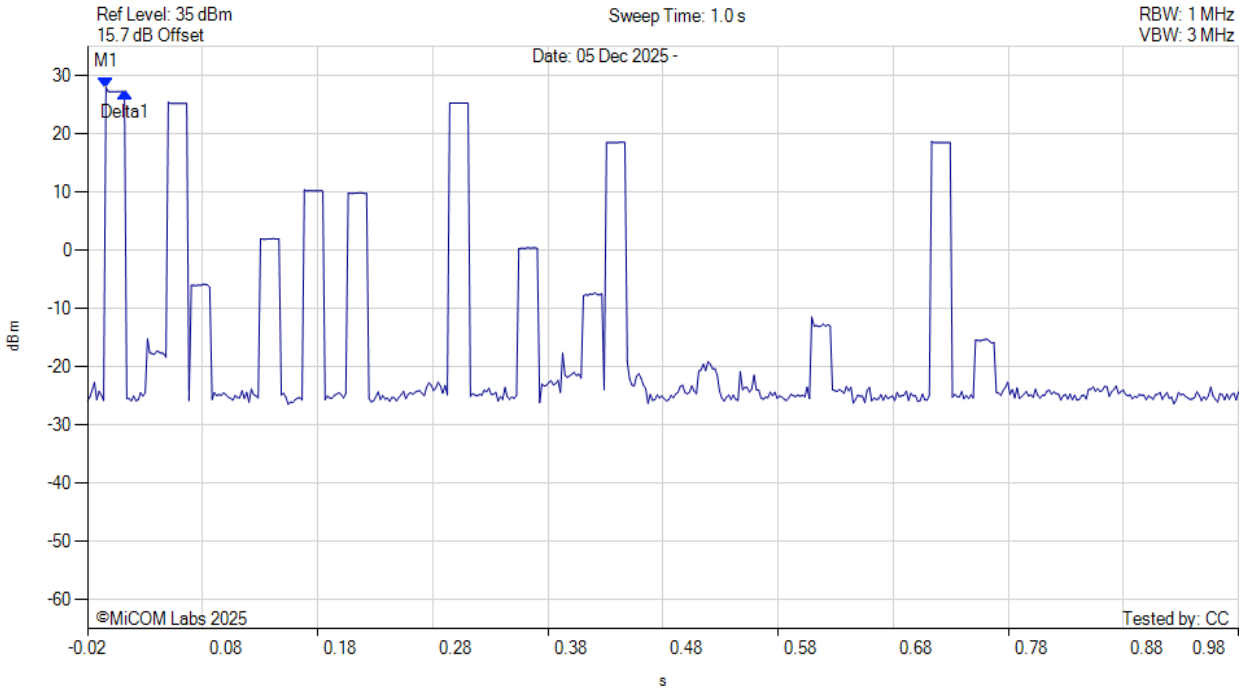
DWELL TIME

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 40 Trace Mode = VIEW	M1(915.25 MHz) : -0.004 s : 27.962 dBm Delta1(915.25 MHz) : 0.016 s : -0.744 dB	Channel Frequency: 915.25 MHz

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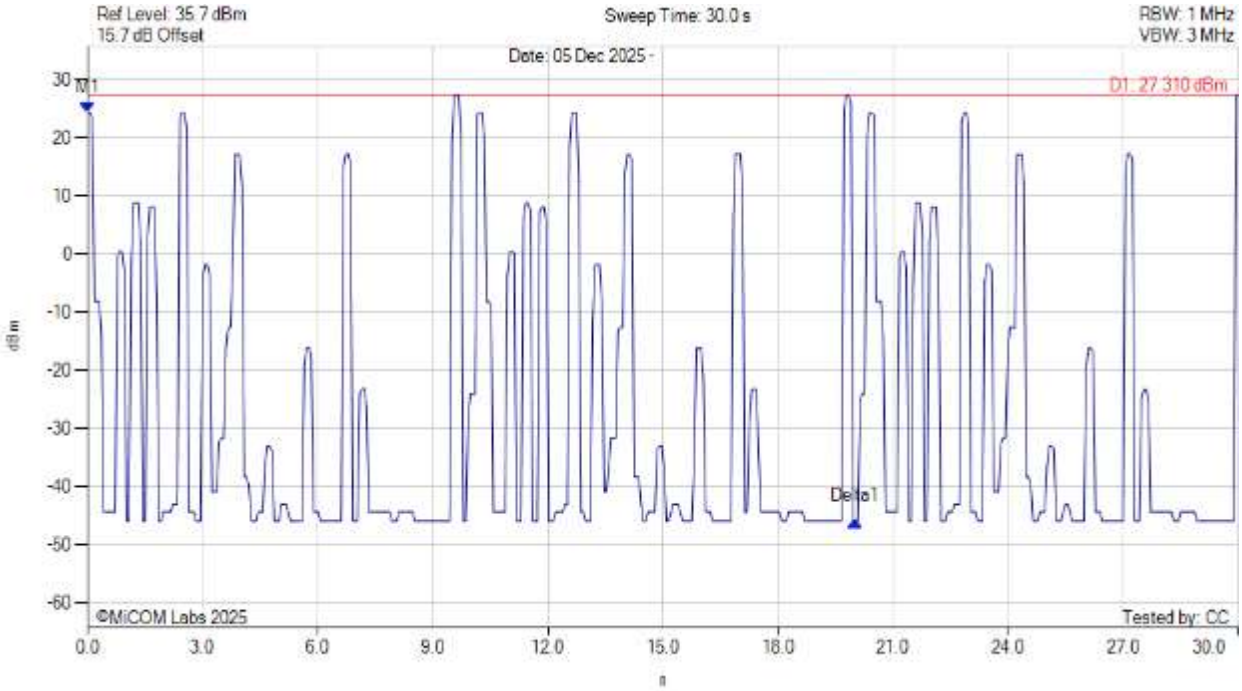
A.2.4. Channel Occupancy

CHANNEL OCCUPANCY

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1(915.00 MHz) : 0.000 s : 24.254 dBm Delta1(915.00 MHz) : 20.000 s : -70.140 dB	Channel Frequency: 915.00 MHz

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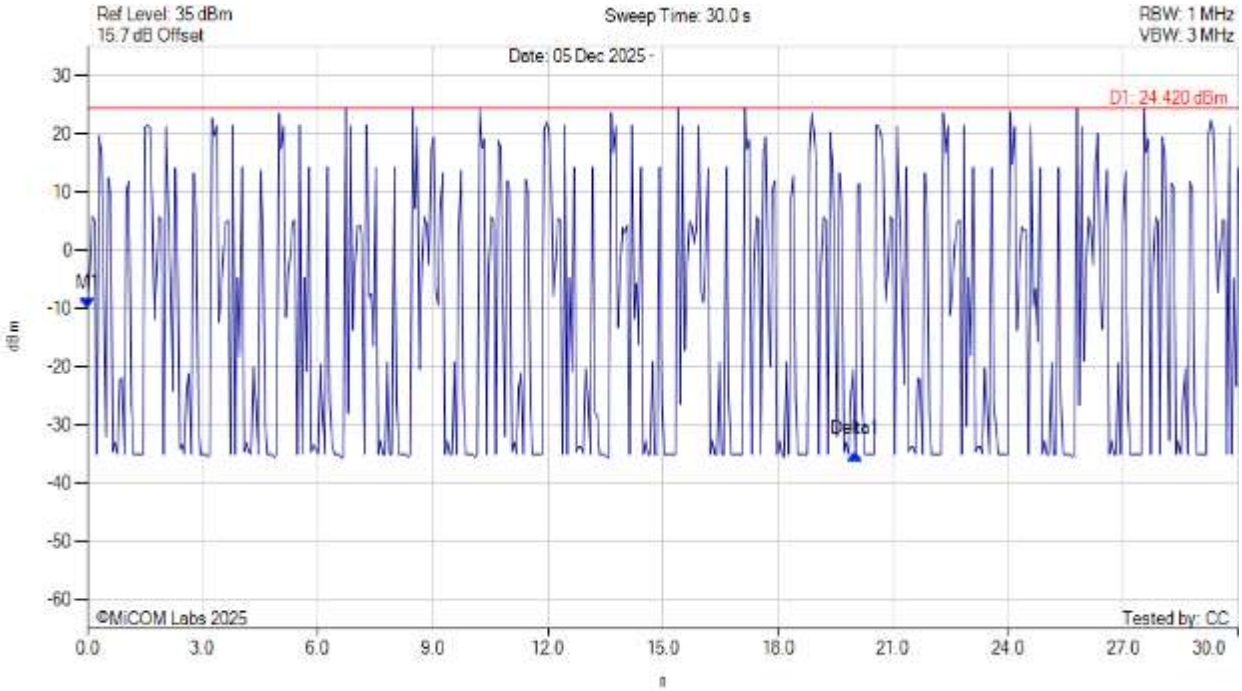
CHANNEL OCCUPANCY

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 40 Trace Mode = VIEW	M1(915.00 MHz) : 0.000 s : -10.013 dBm Delta1(915.00 MHz) : 20.000 s : -24.978 dB	Channel Frequency: 915.00 MHz

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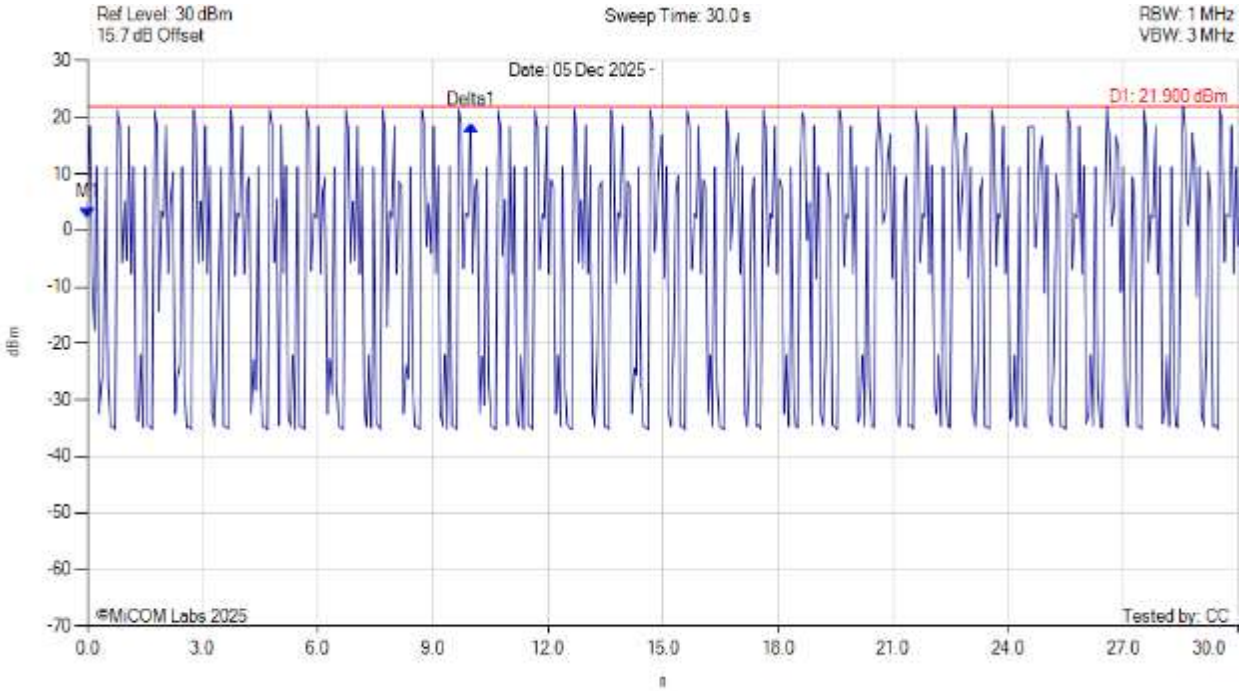
CHANNEL OCCUPANCY

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 40 Trace Mode = VIEW	M1(915.25 MHz) : 0.000 s : 2.236 dBm Delta1(915.25 MHz) : 10.000 s : 16.344 dB	Channel Frequency: 915.25 MHz

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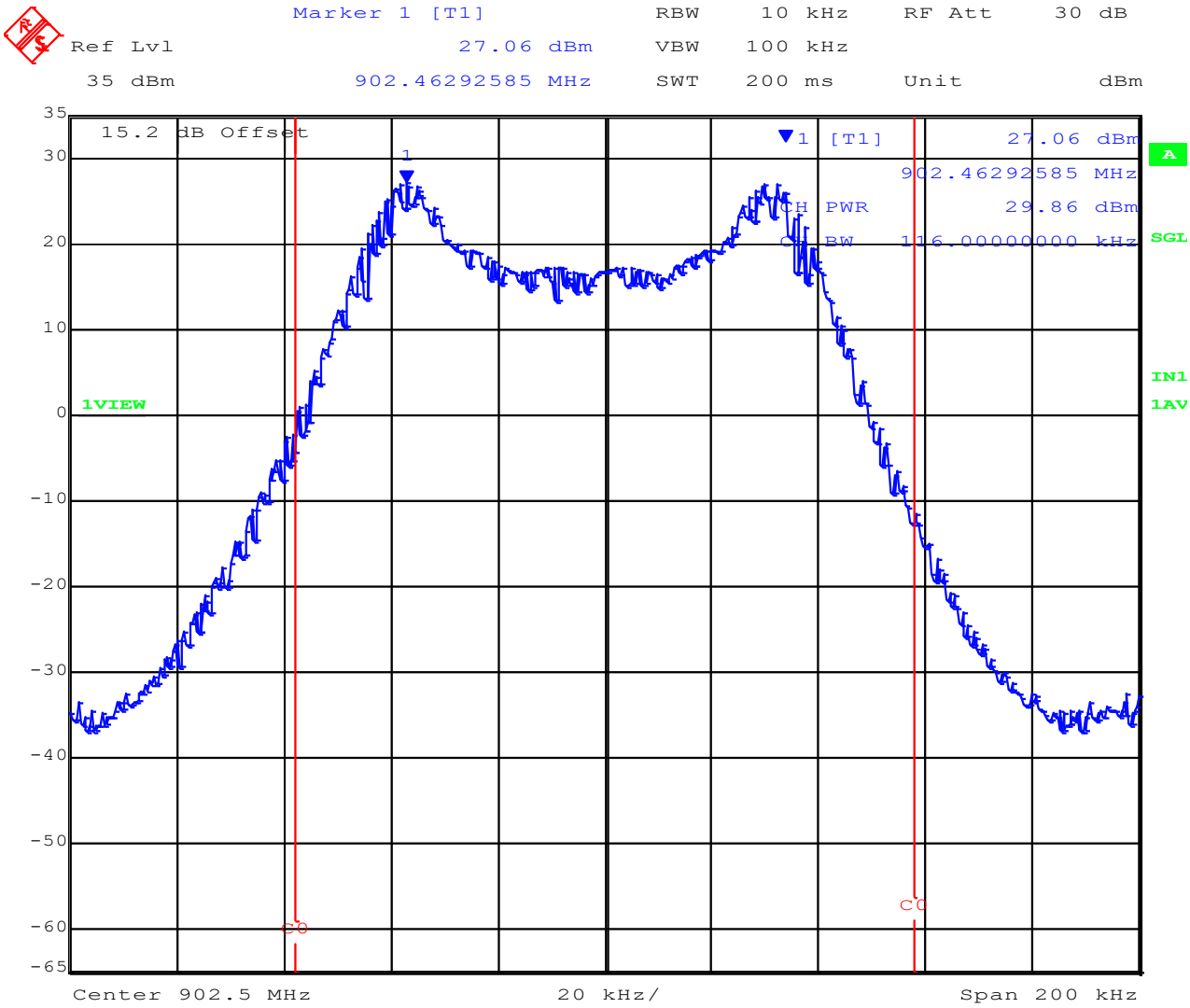
A.3. Output Power

900 MHz Data Rate Variant 10k @ 902.5 MHz



Date: 4.DEC.2025 11:36:11

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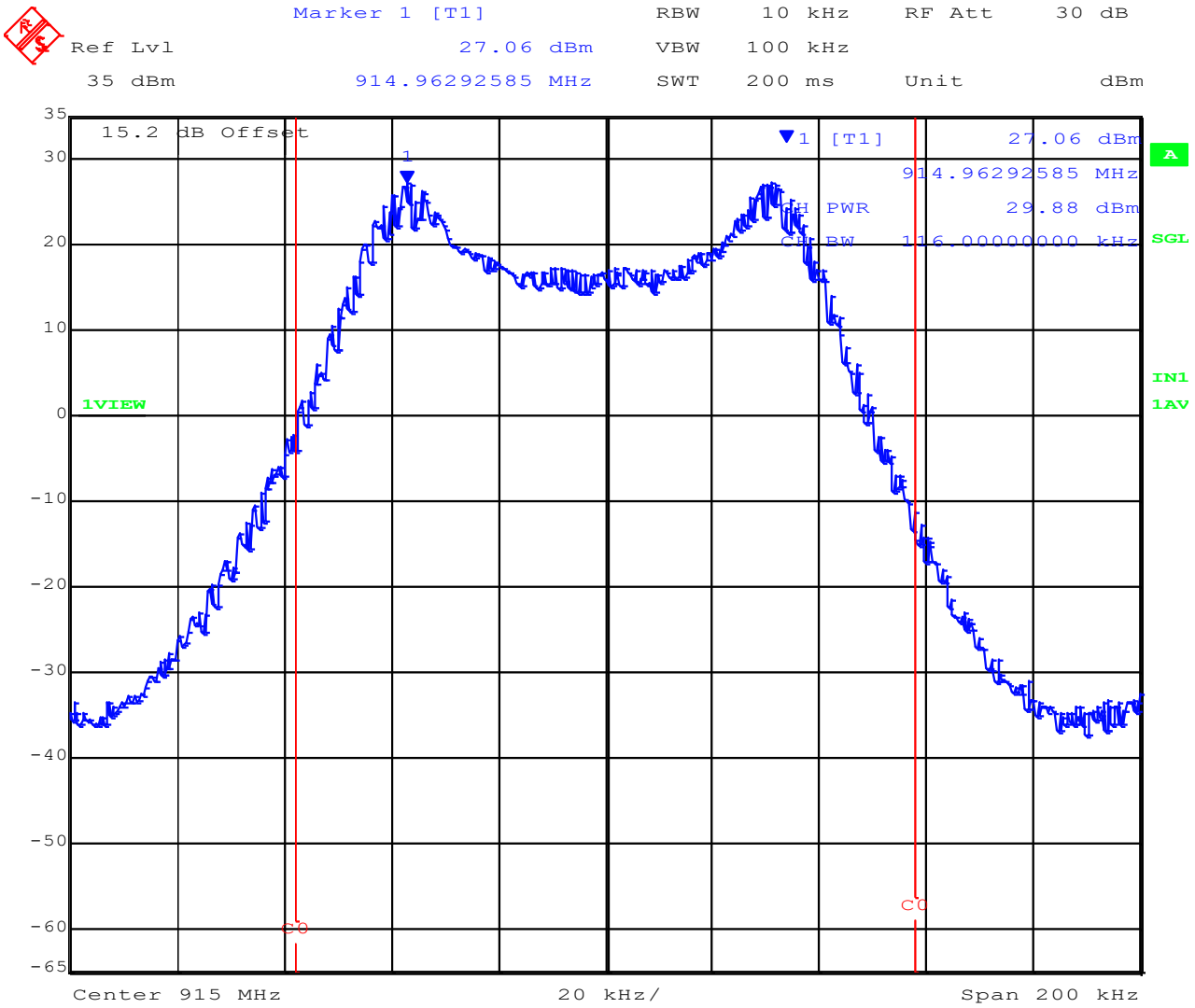
900 MHz Data Rate Variant 10k @ 915MHz



Date: 4.DEC.2025 11:32:14

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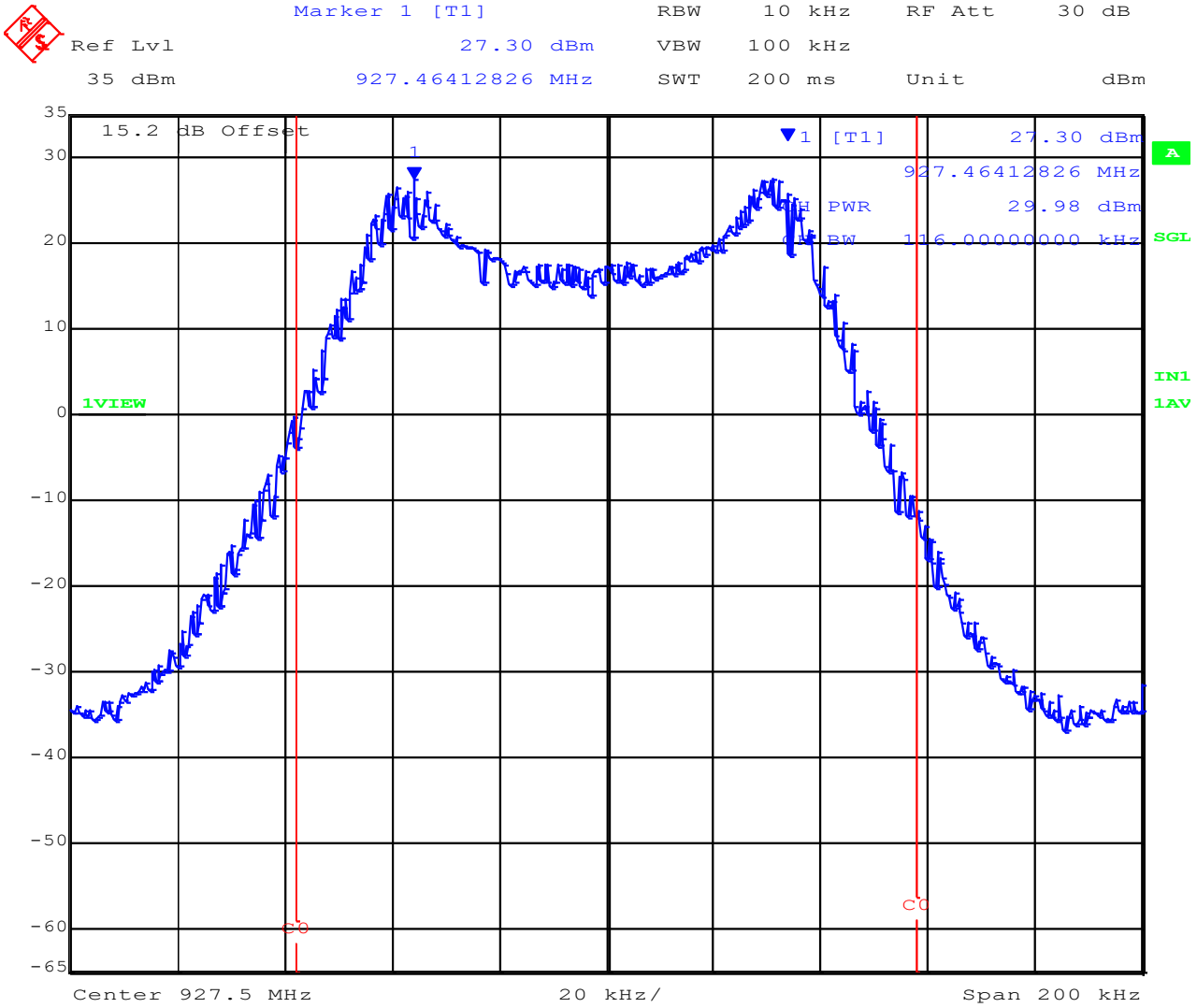
900 MHz Data Rate Variant 10k @ 927.5MHz



Date: 4.DEC.2025 11:34:30

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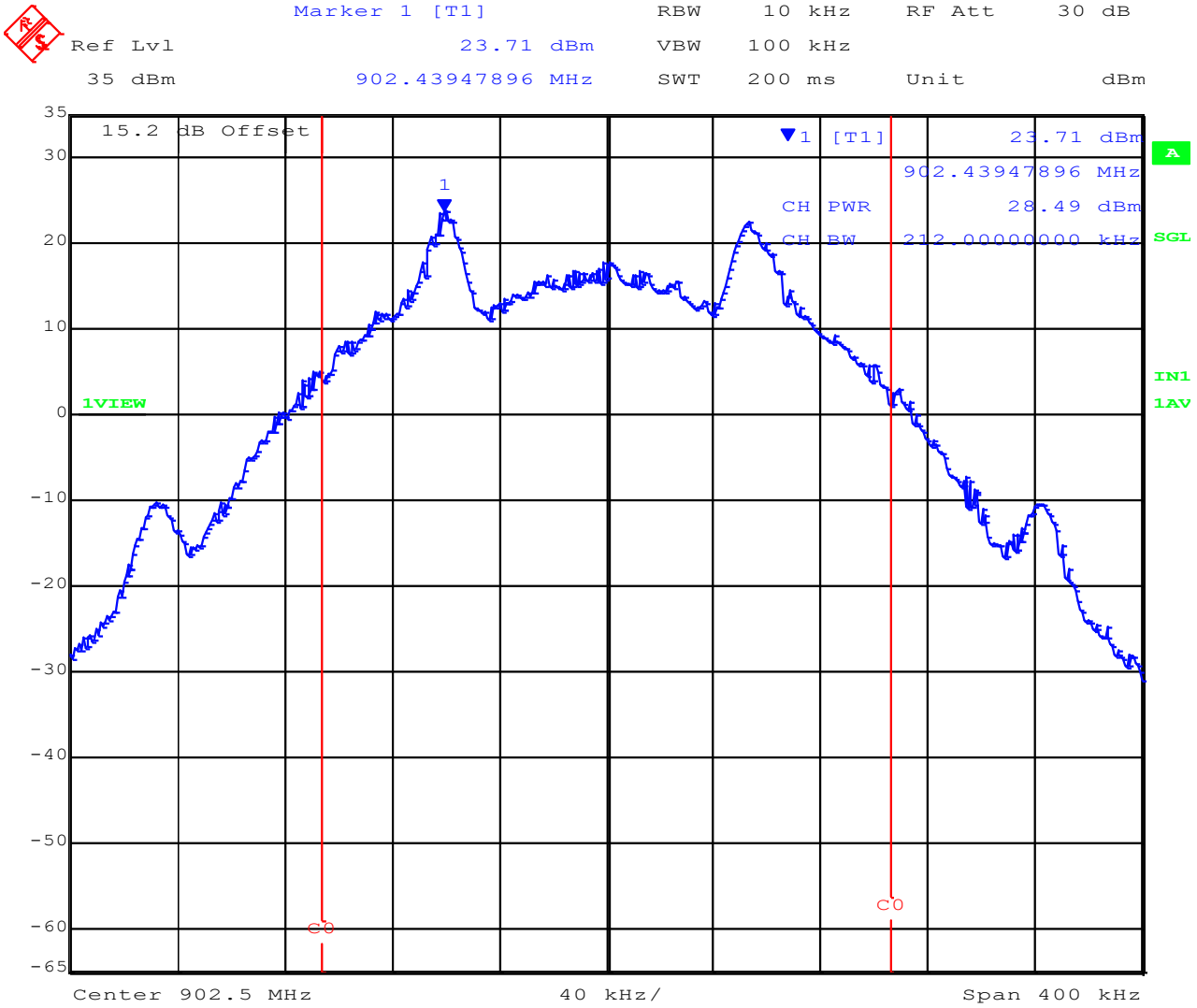
900 MHz Data Rate Variant 110k @ 902.5 MHz



Date: 4.DEC.2025 11:45:41

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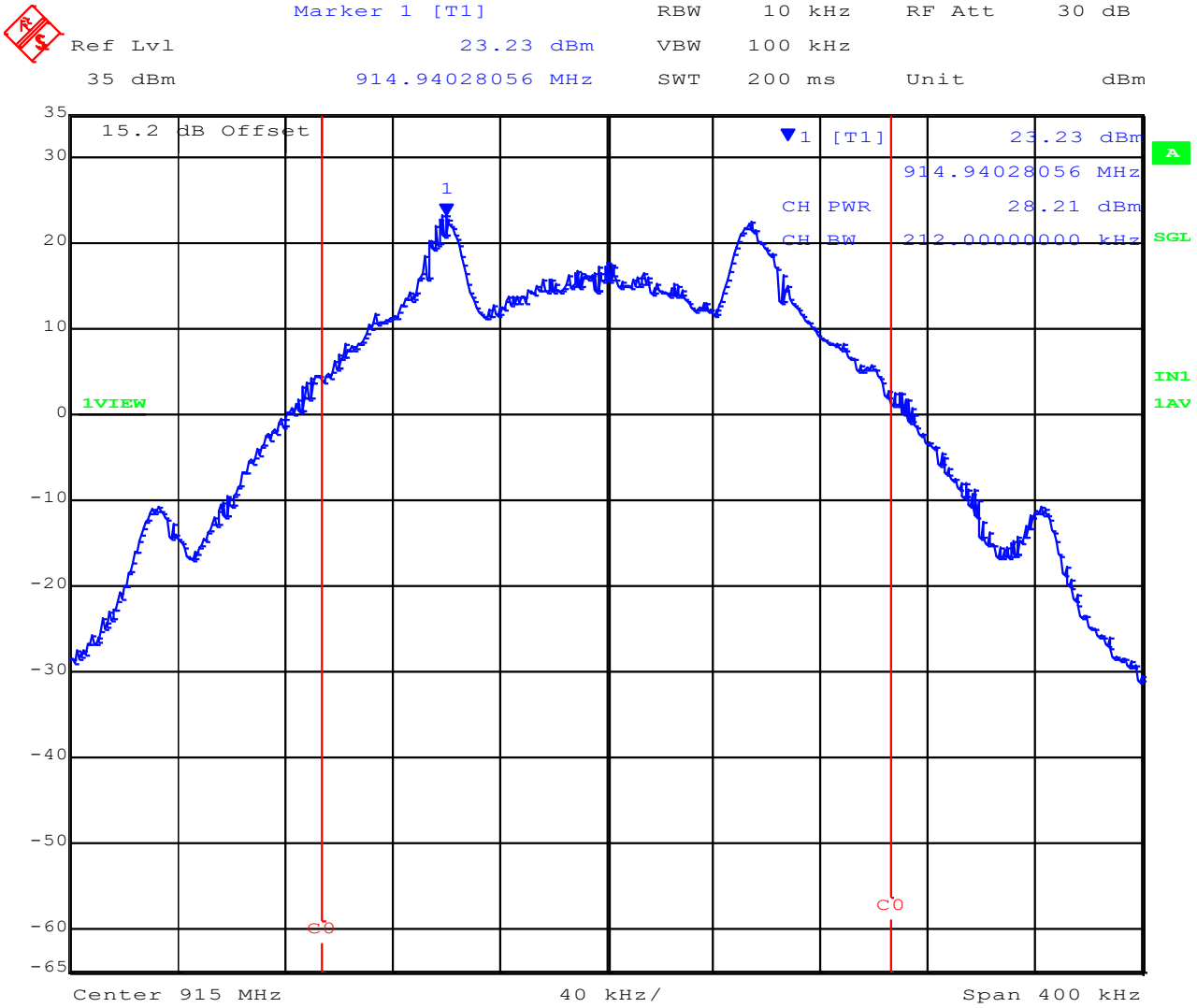
900 MHz Data Rate Variant 110k @ 915 MHz



Date: 4.DEC.2025 12:41:53

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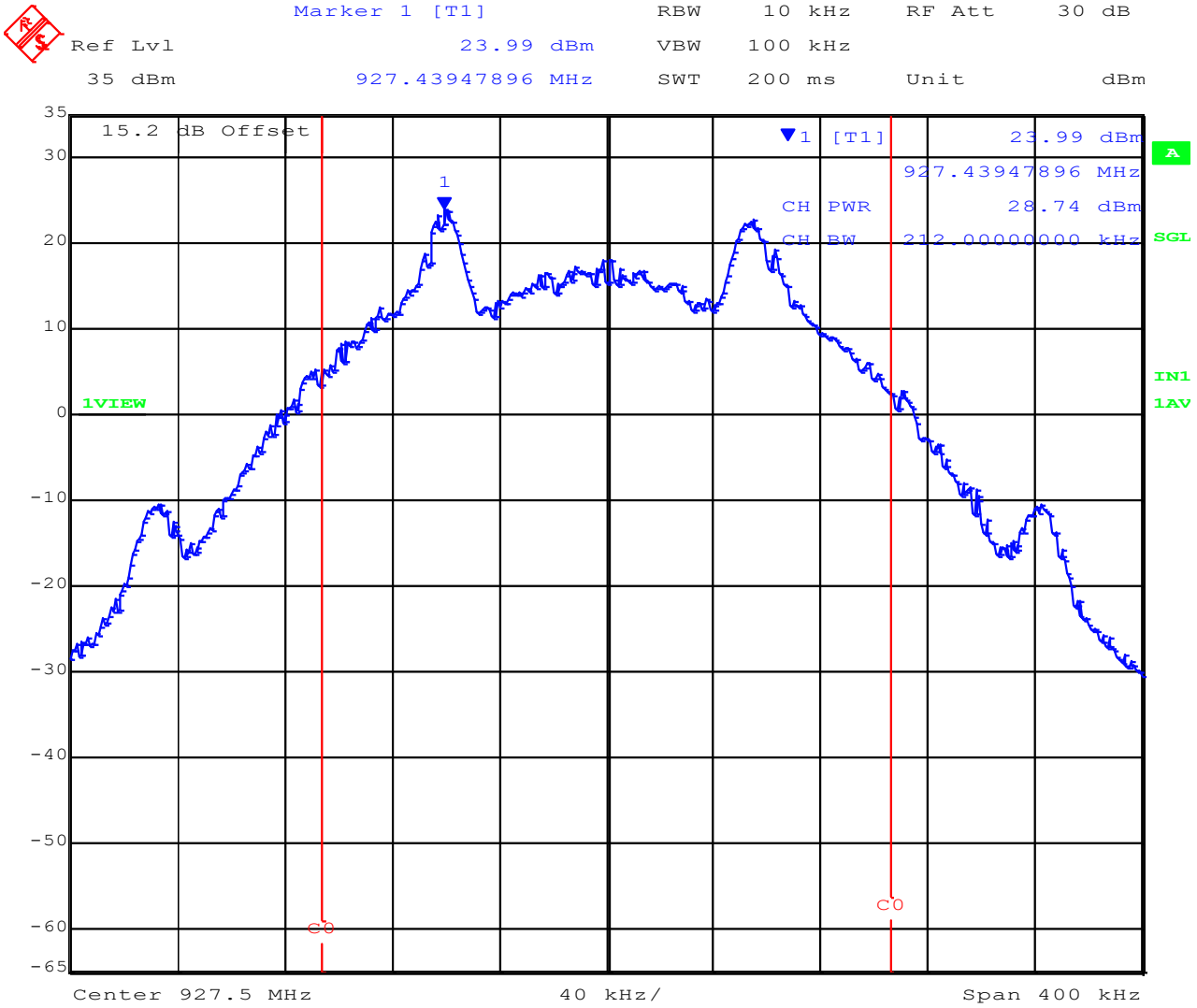
900 MHz Data Rate Variant 110k @ 927.5 MHz



Date: 4.DEC.2025 12:47:38

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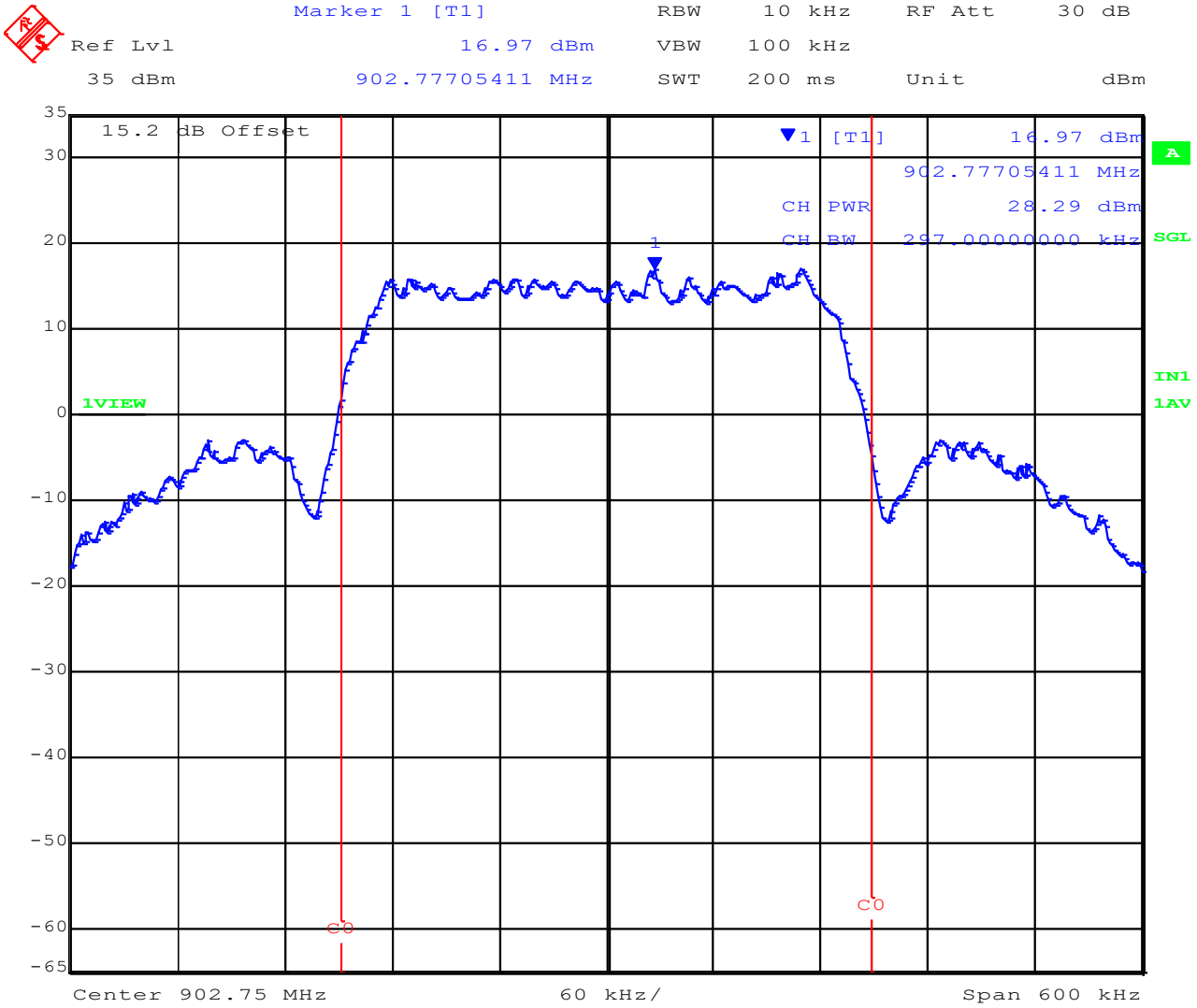
900 MHz Data Rate Variant 250k @ 902.75 MHz



Date: 4.DEC.2025 11:51:12

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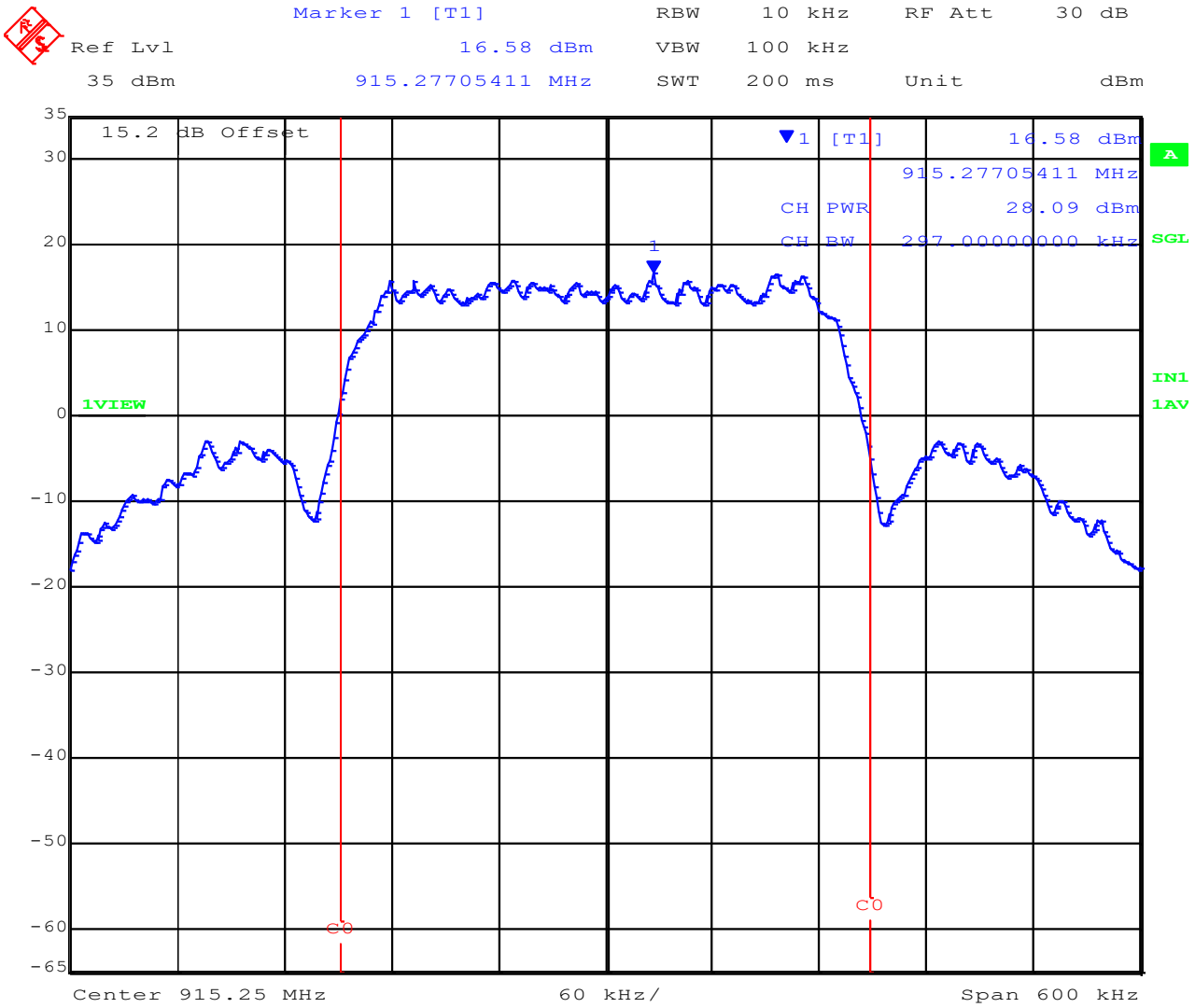
900 MHz Data Rate Variant 250k @ 915.25 MHz



Date: 4.DEC.2025 12:19:43

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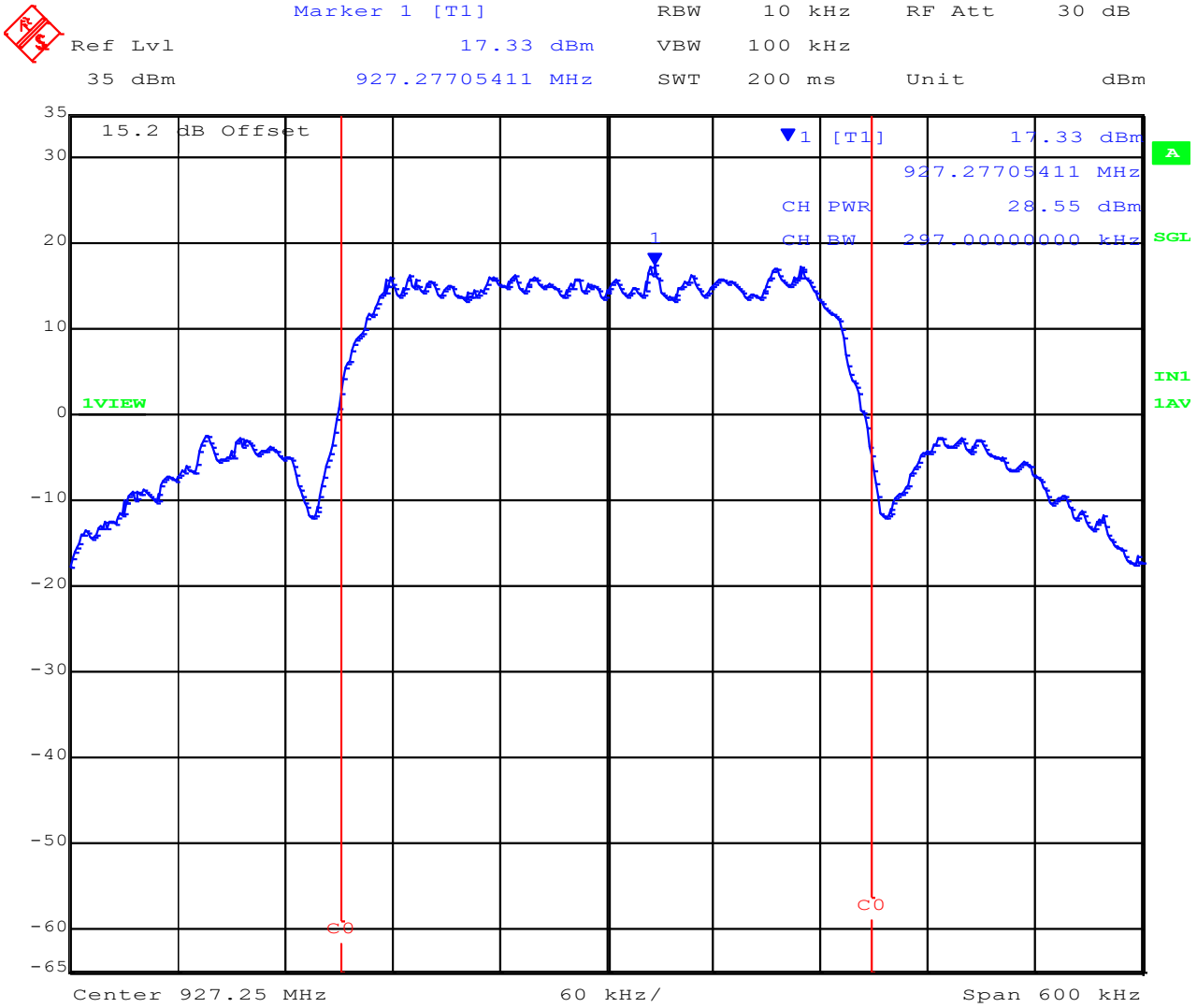
900 MHz Data Rate Variant 250k @ 927.25 MHz



Date: 4.DEC.2025 12:28:45

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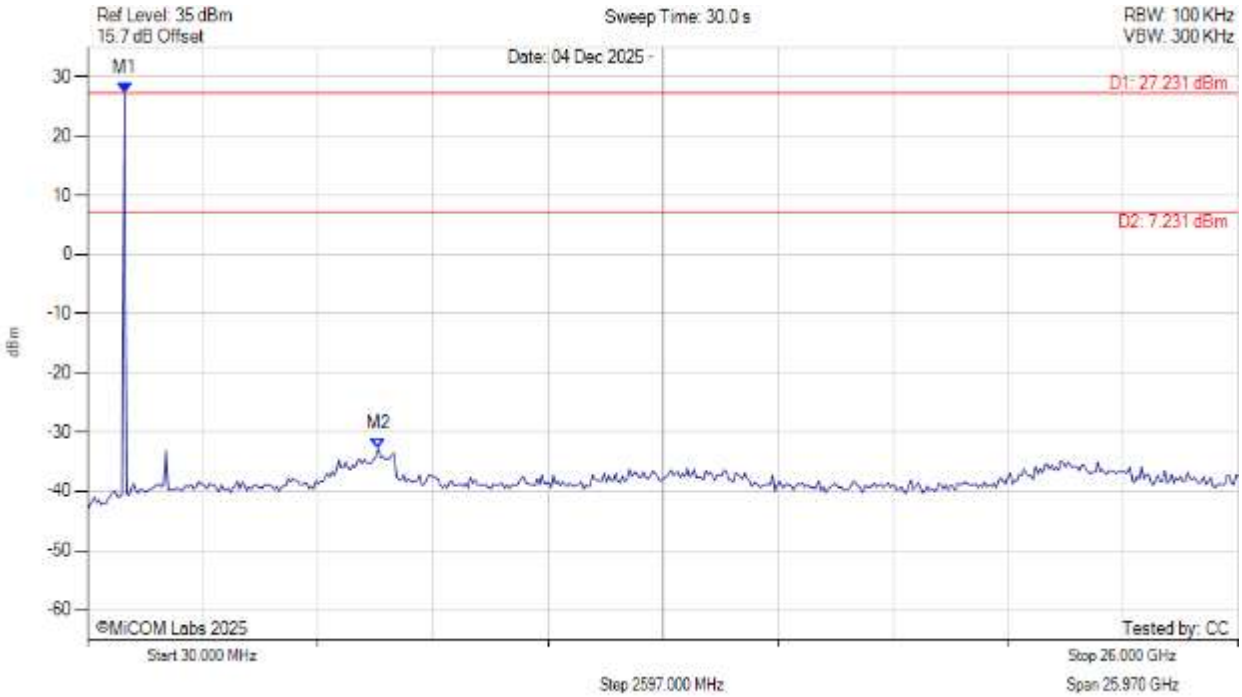
A.4. Emissions

A.4.1. Conducted Emissions

A.4.1.1. Conducted Unwanted Spurious Emissions

UNWANTED EMISSIONS PEAK

Variant: FSK-10k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 862.705 MHz : 27.231 dBm M2 : 6587.555 MHz : -32.876 dBm	Channel Frequency: 902.50 MHz Limit: 7.23 dBm Margin: -40.11 dB

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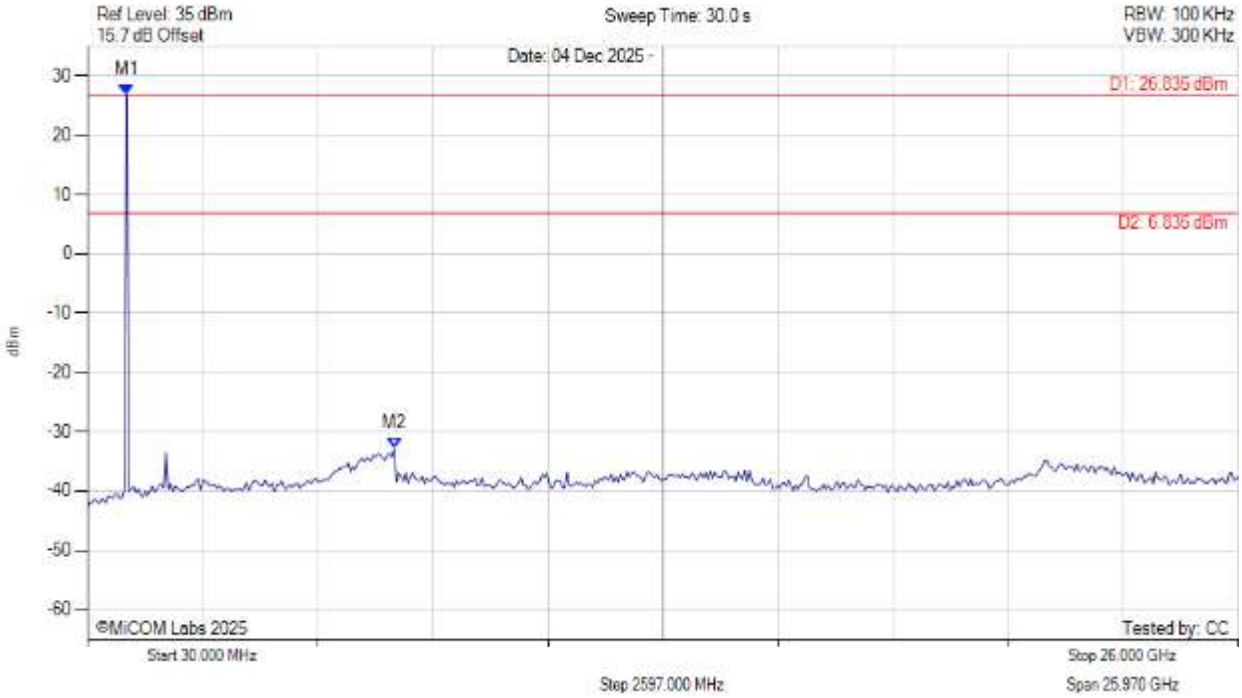
UNWANTED EMISSIONS PEAK

Variant: FSK-10k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.749 MHz : 26.835 dBm M2 : 6951.864 MHz : -32.868 dBm	Channel Frequency: 915.00 MHz Limit: 6.84 dBm Margin: -39.71 dB

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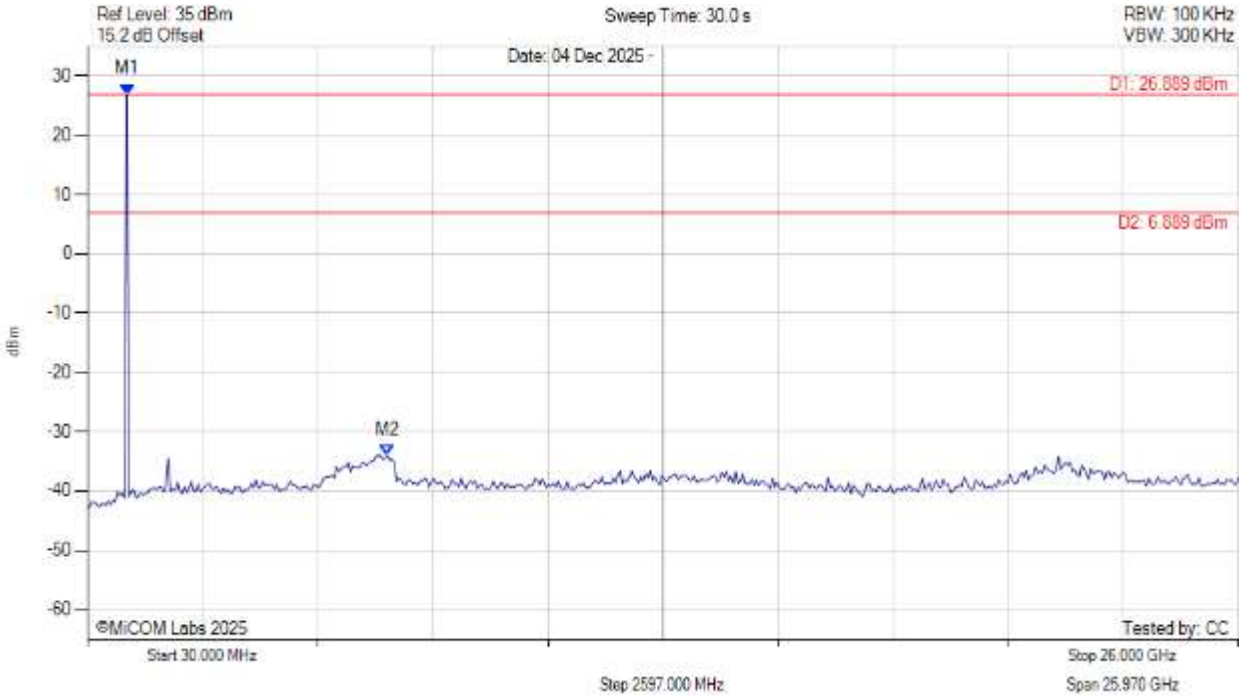
UNWANTED EMISSIONS PEAK

Variant: FSK-10k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 927.500 MHz : 26.900 dBm M2 : 6795.731 MHz : -33.930 dBm	Channel Frequency: 927.50 MHz Limit: 6.89 dBm Margin: -40.82 dB

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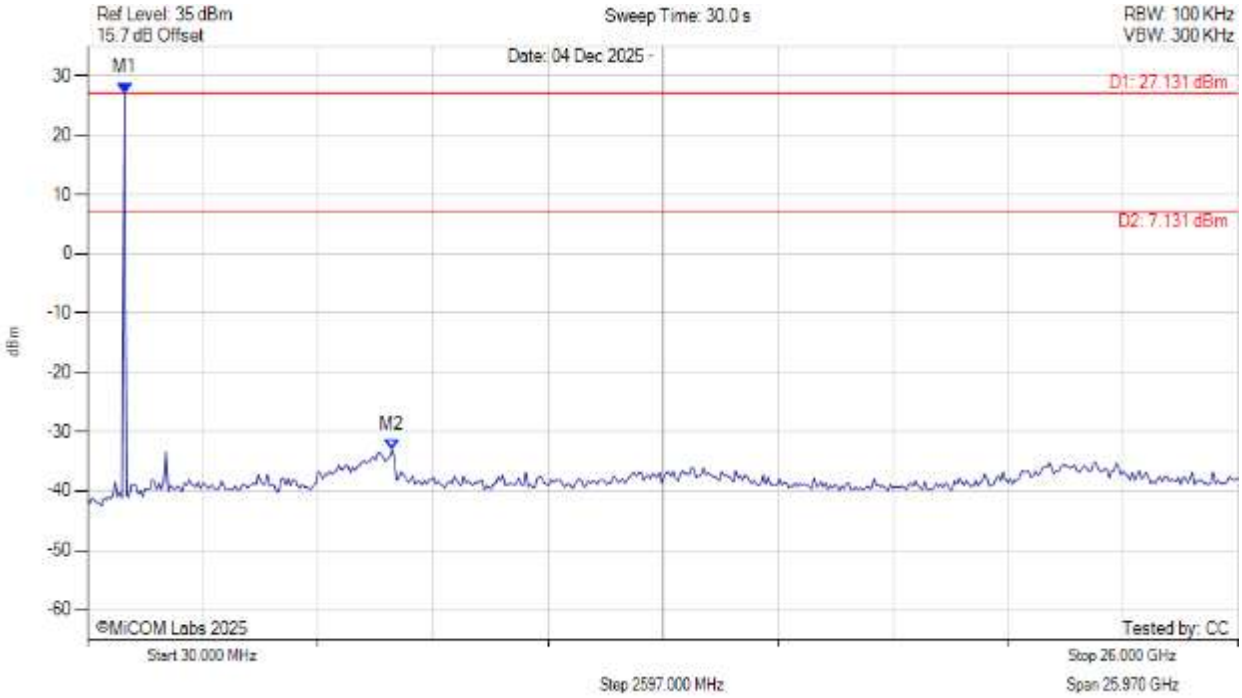
UNWANTED EMISSIONS PEAK

Variant: FSK-110k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 862.705 MHz : 27.131 dBm M2 : 6899.820 MHz : -33.061 dBm	Channel Frequency: 902.50 MHz Limit: 7.13 dBm Margin: -40.19 dB

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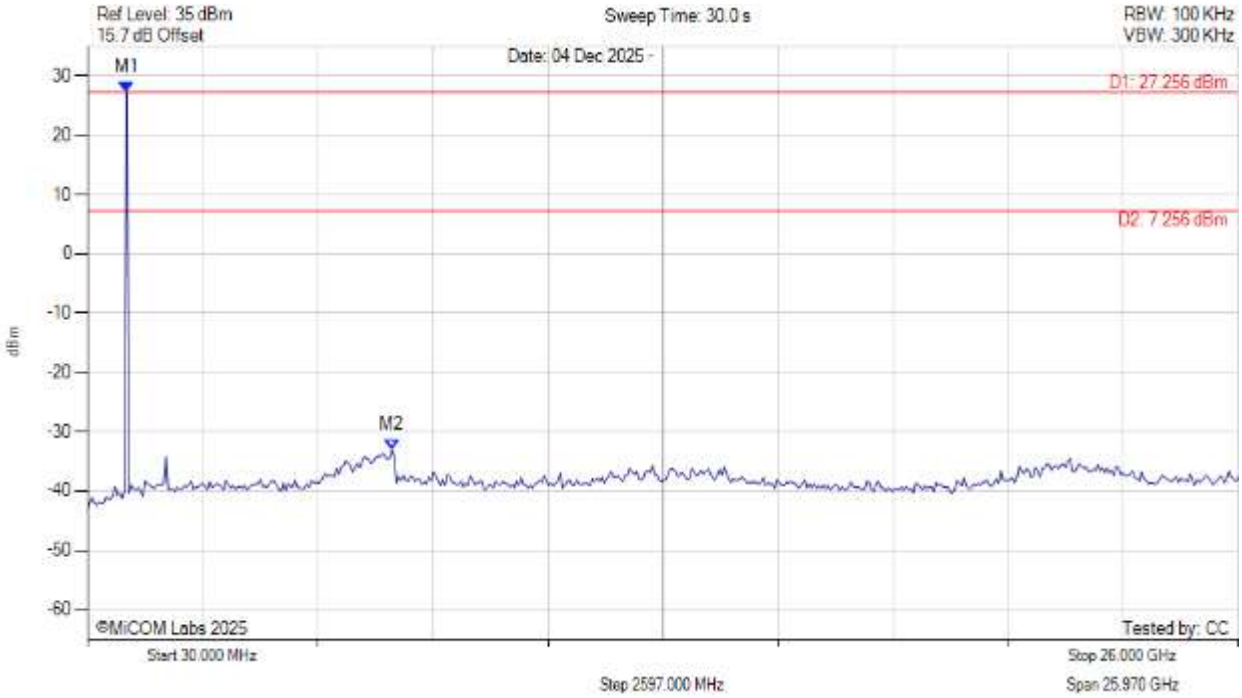
UNWANTED EMISSIONS PEAK

Variant: FSK-110k, Channel: 915.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.000 MHz : 27.256 dBm M2 : 6899.820 MHz : -33.082 dBm	Channel Frequency: 915.00 MHz Limit: 7.26 dBm Margin: -40.34 dB

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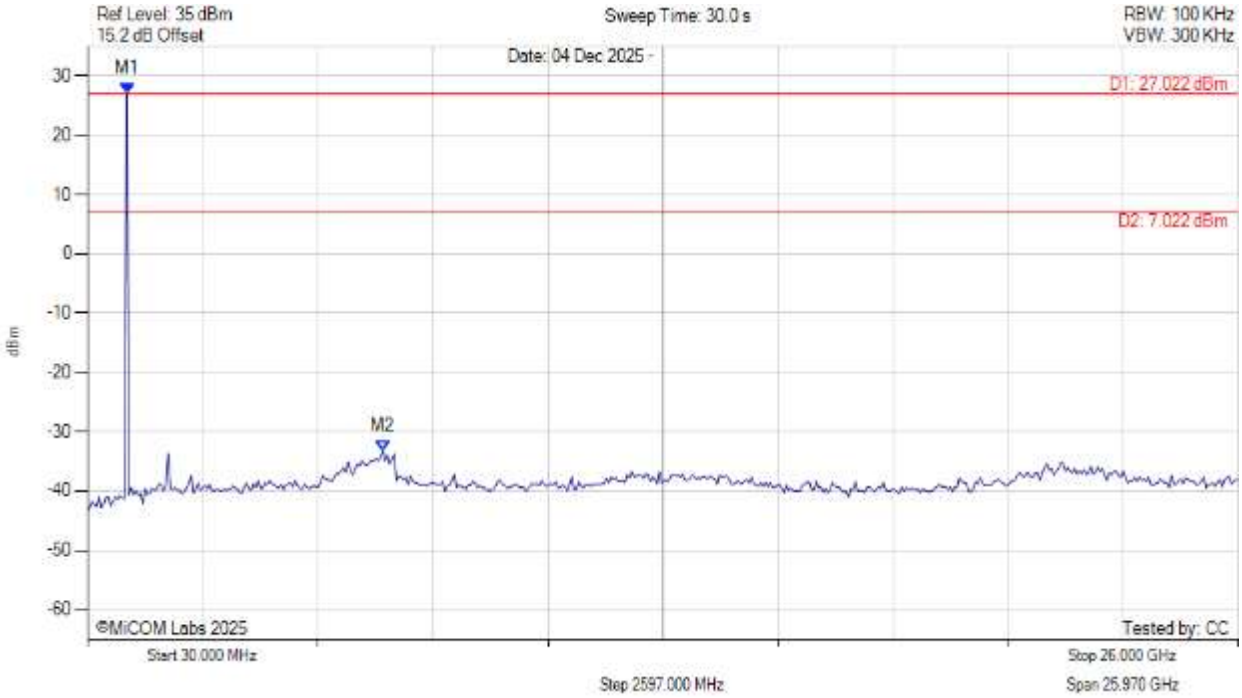
UNWANTED EMISSIONS PEAK

Variant: FSK-110k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.500 MHz : 27.022 dBm M2 : 6691.643 MHz : -33.177 dBm	Channel Frequency: 927.50 MHz Limit: 7.02 dBm Margin: -40.20 dB

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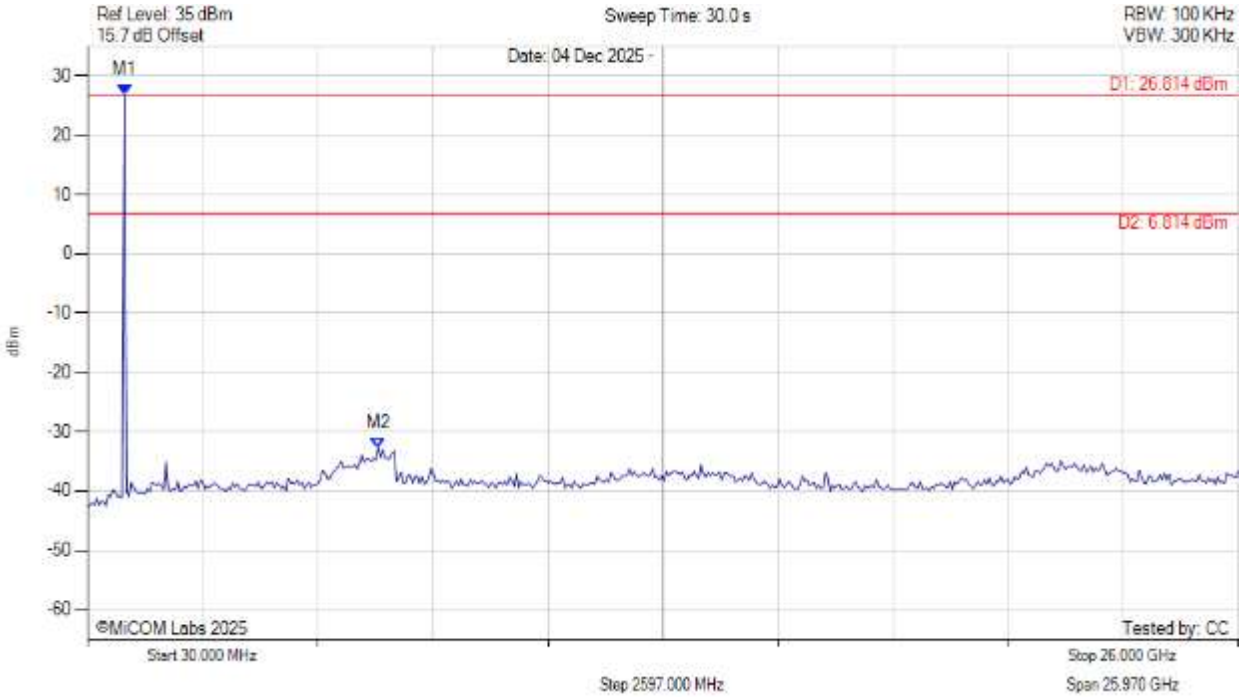
UNWANTED EMISSIONS PEAK

Variant: FSK-250k, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 862.705 MHz : 26.814 dBm M2 : 6587.555 MHz : -32.773 dBm	Channel Frequency: 902.75 MHz Limit: 6.81 dBm Margin: -39.58 dB

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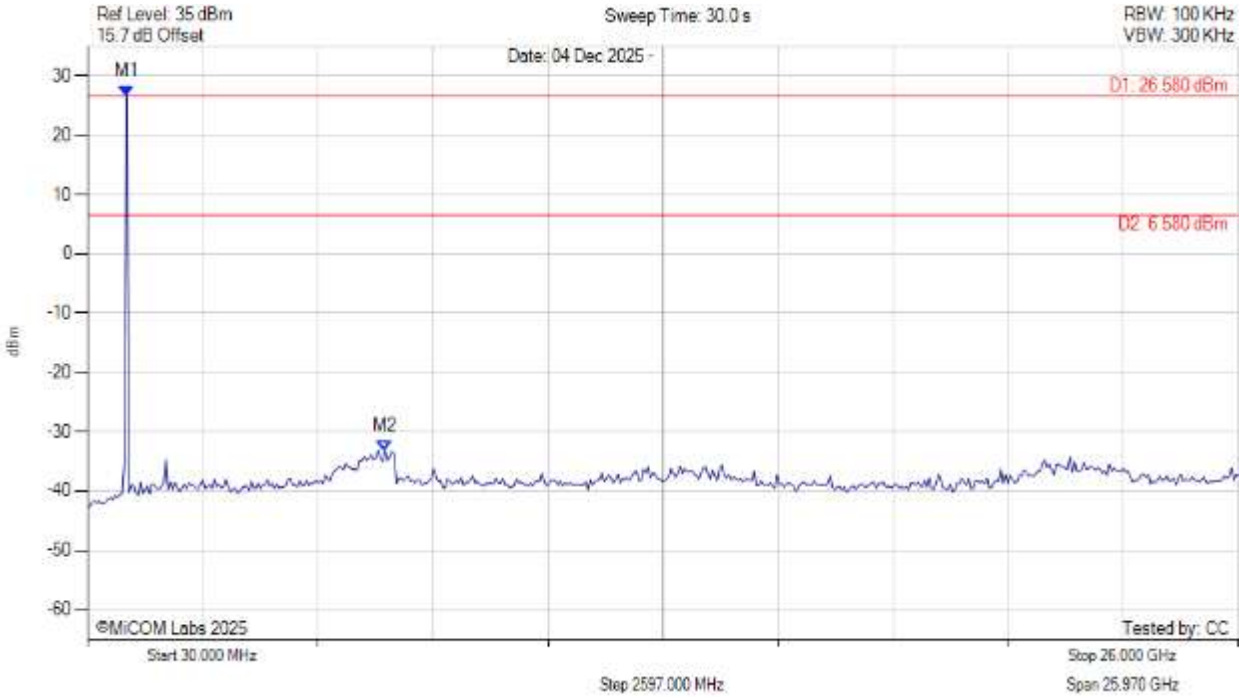
UNWANTED EMISSIONS PEAK

Variant: FSK-250k, Channel: 915.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.749 MHz : 26.580 dBm M2 : 6743.687 MHz : -33.179 dBm	Channel Frequency: 915.25 MHz Limit: 6.58 dBm Margin: -39.76 dB

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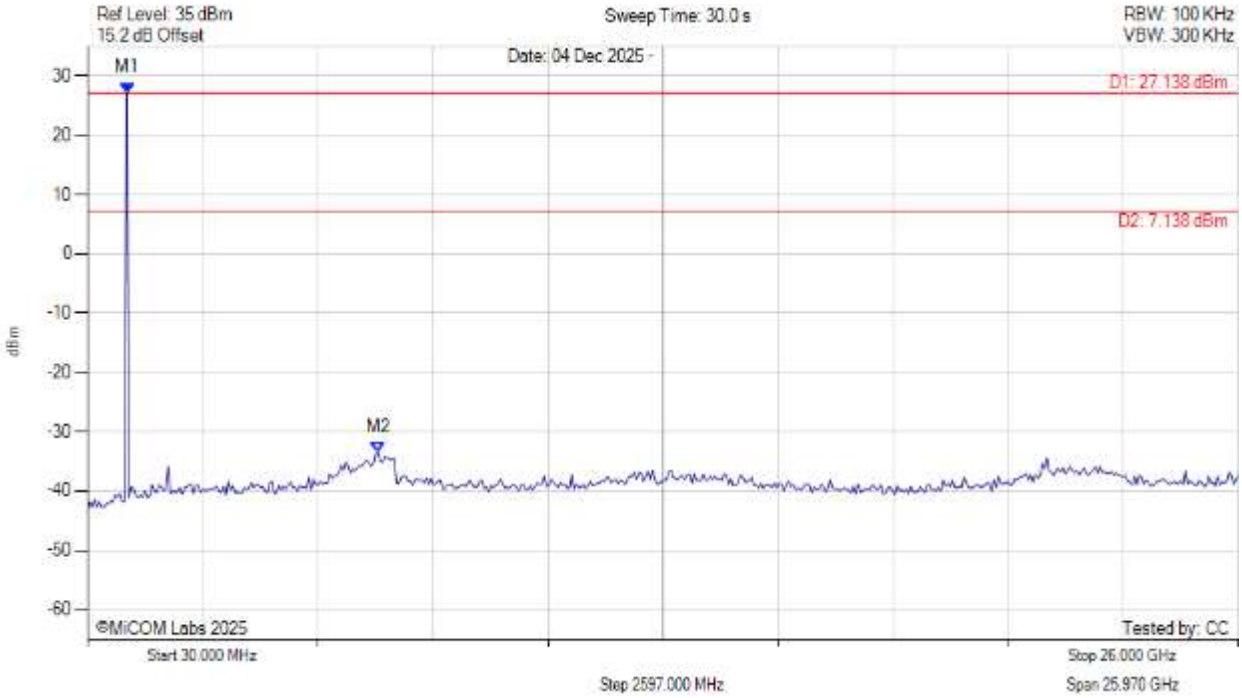
UNWANTED EMISSIONS PEAK

Variant: FSK-250k, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.250 MHz : 27.138 dBm M2 : 6587.555 MHz : -33.570 dBm	Channel Frequency: 927.25 MHz Limit: 7.14 dBm Margin: -40.71 dB

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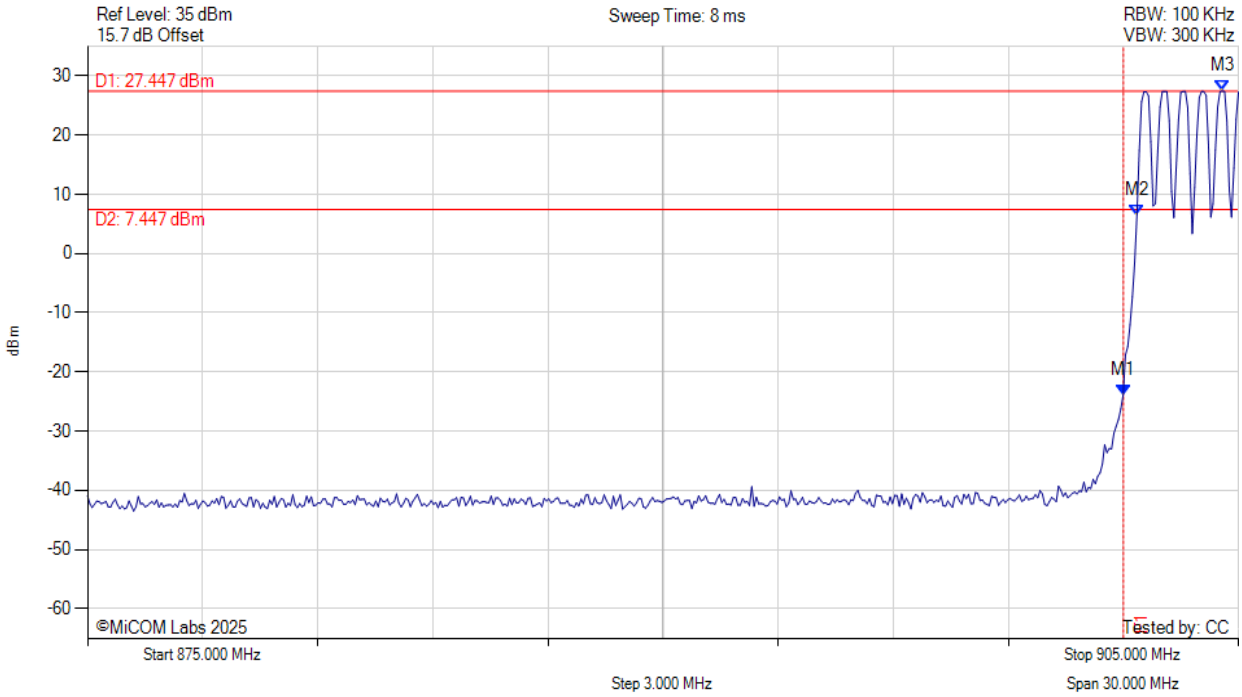
A.4.1.2. Conducted Band-Edge Emissions

CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-10k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -23.871 dBm M2 : 902.355 MHz : 6.554 dBm M3 : 904.579 MHz : 27.447 dBm	Channel Frequency: 902.50 MHz

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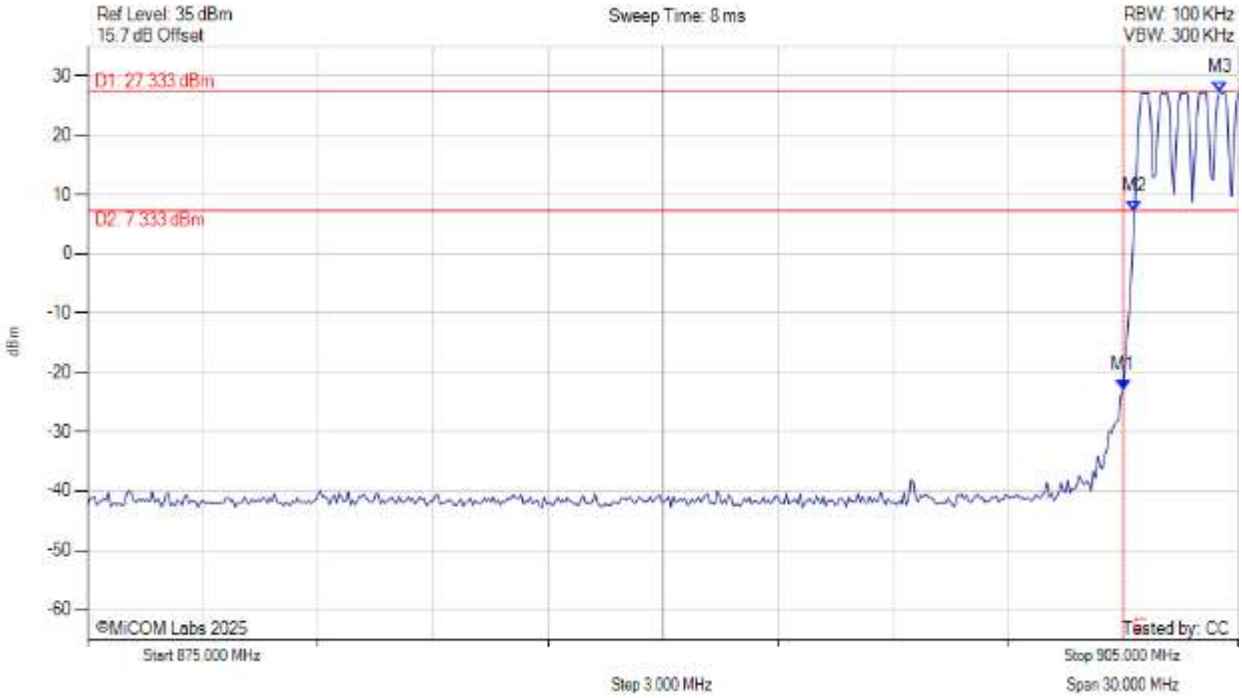
CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-110k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -22.923 dBm M2 : 902.295 MHz : 7.064 dBm M3 : 904.519 MHz : 27.333 dBm	Channel Frequency: 902.50 MHz

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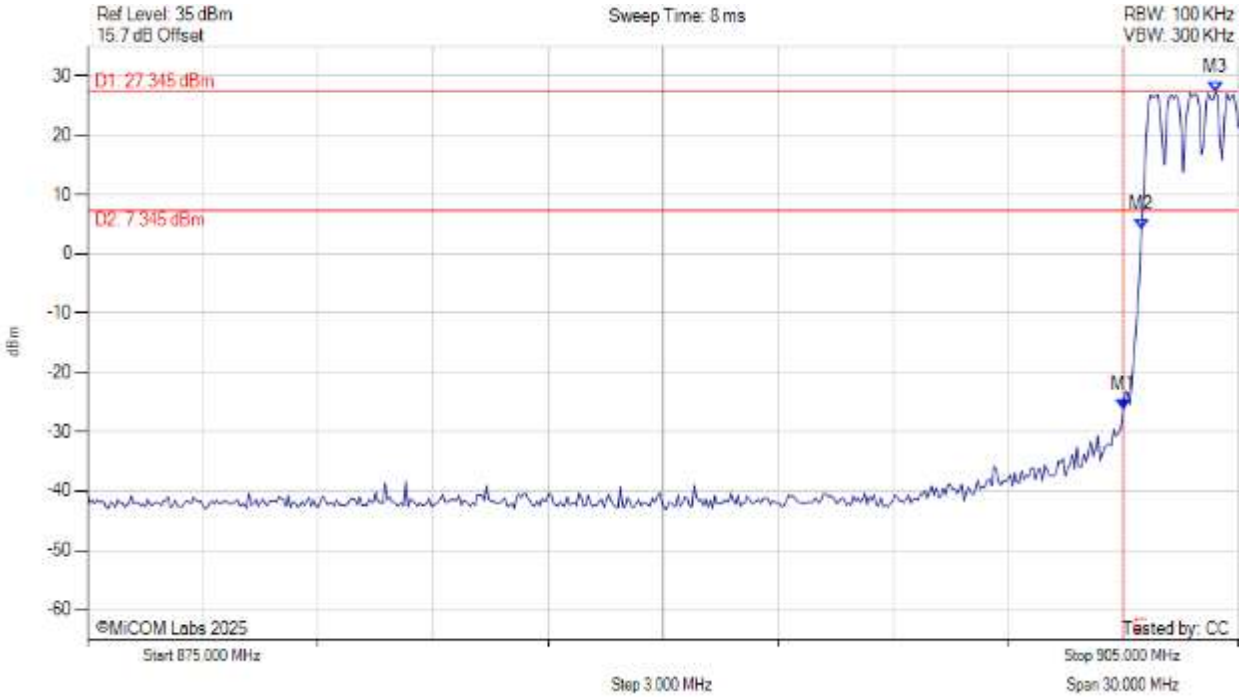
CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-250k, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -26.228 dBm M2 : 902.475 MHz : 4.036 dBm M3 : 904.399 MHz : 27.345 dBm	Channel Frequency: 902.75 MHz

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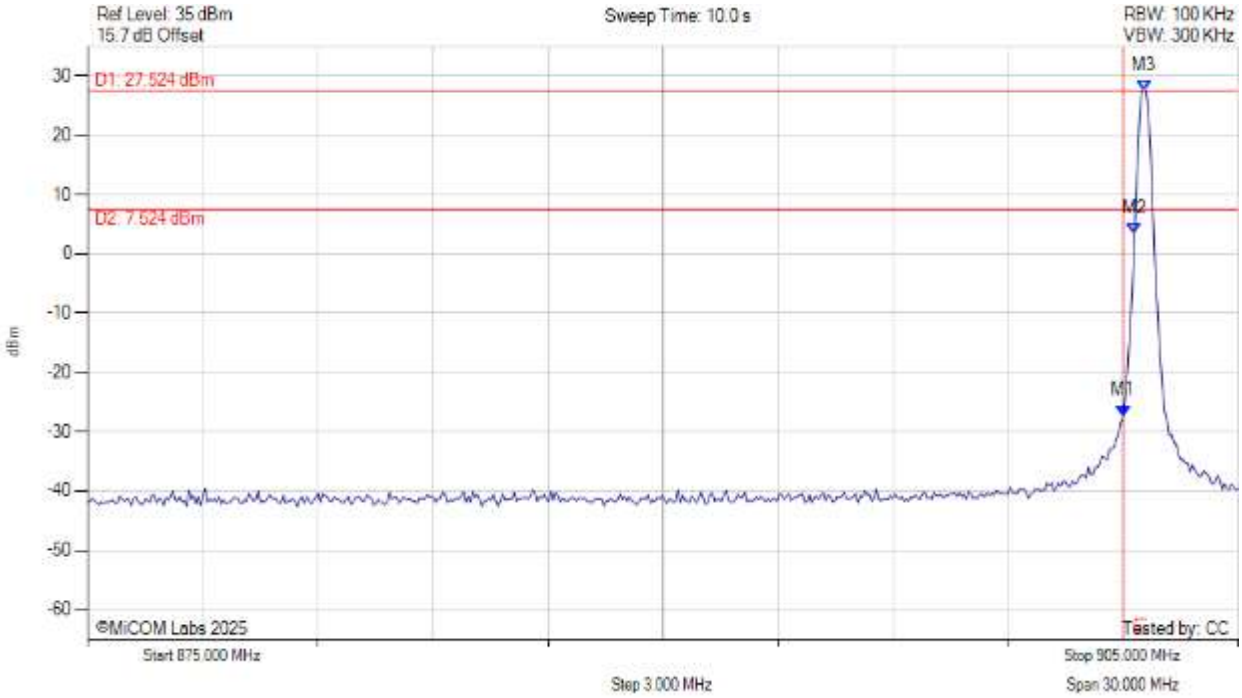
CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-10k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -27.320 dBm M2 : 902.295 MHz : 3.326 dBm M3 : 902.535 MHz : 27.524 dBm	Channel Frequency: 902.50 MHz

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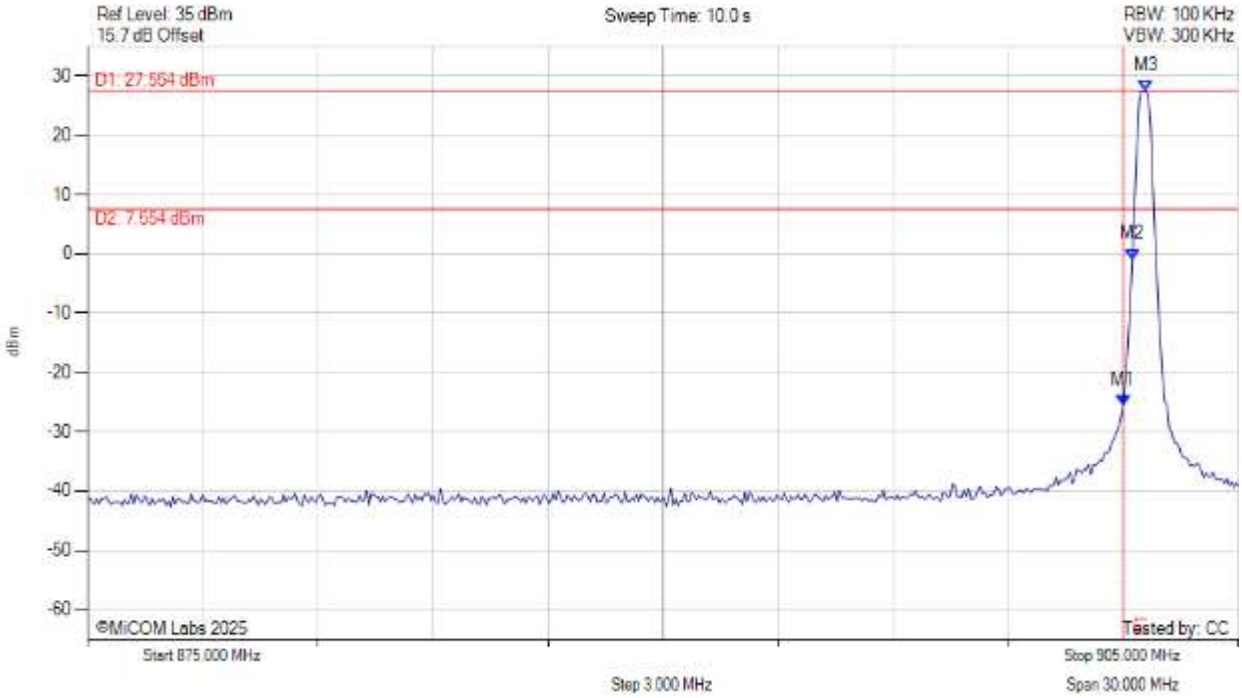
CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-110k, Channel: 902.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -25.490 dBm M2 : 902.234 MHz : -0.906 dBm M3 : 902.595 MHz : 27.554 dBm	Channel Frequency: 902.50 MHz

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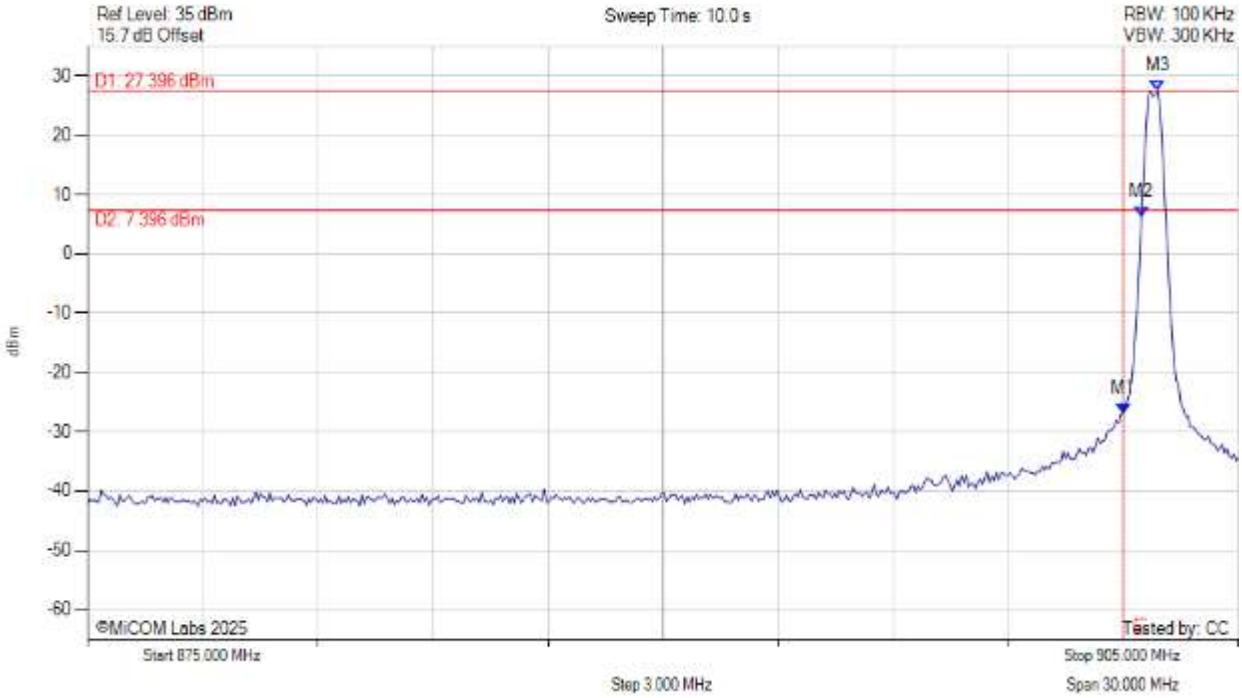
CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-250k, Channel: 902.75 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -26.869 dBm M2 : 902.475 MHz : 6.263 dBm M3 : 902.896 MHz : 27.396 dBm	Channel Frequency: 902.75 MHz

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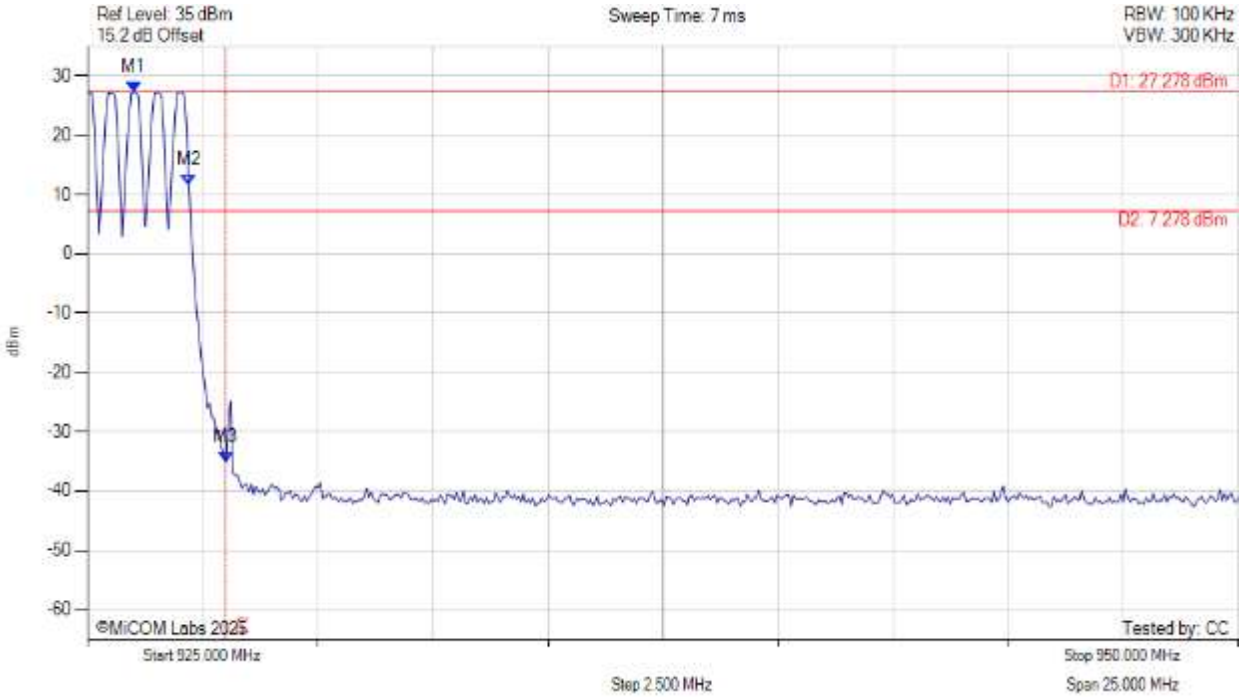
CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-10k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 926.002 MHz : 27.278 dBm M2 : 927.204 MHz : 11.524 dBm M3 : 928.000 MHz : -35.111 dBm	Channel Frequency: 927.50 MHz

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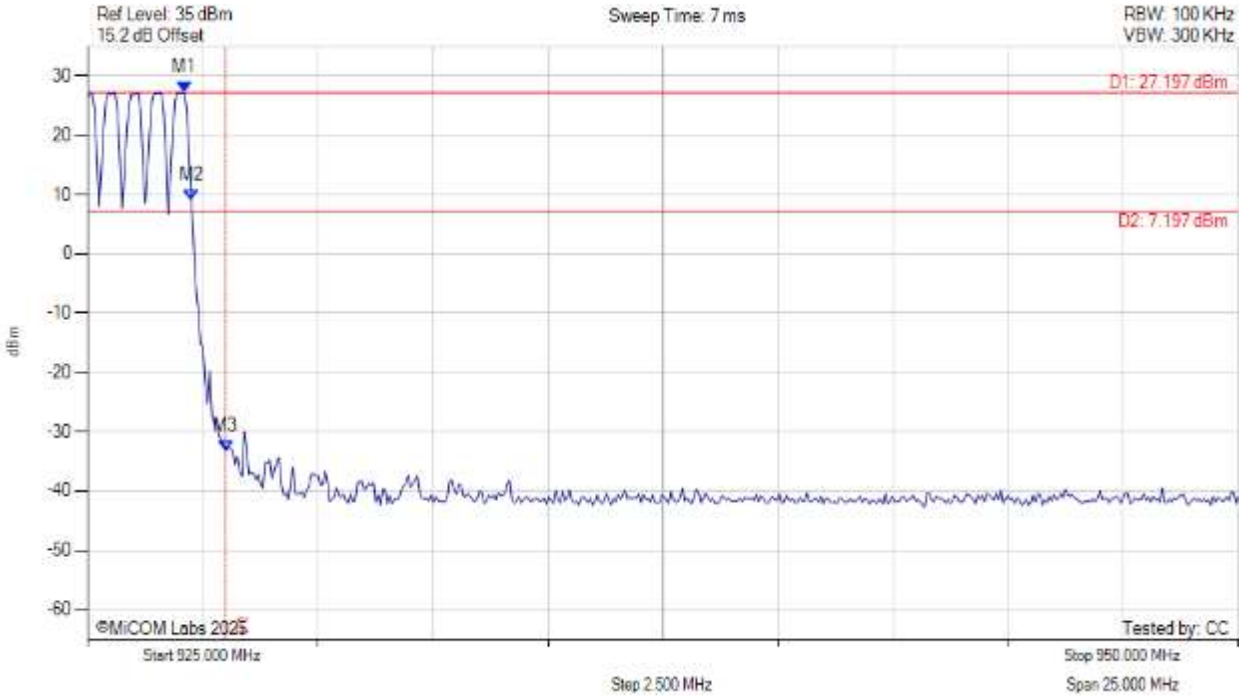
CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-110k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.104 MHz : 27.197 dBm M2 : 927.255 MHz : 8.942 dBm M3 : 928.000 MHz : -33.177 dBm	Channel Frequency: 927.50 MHz

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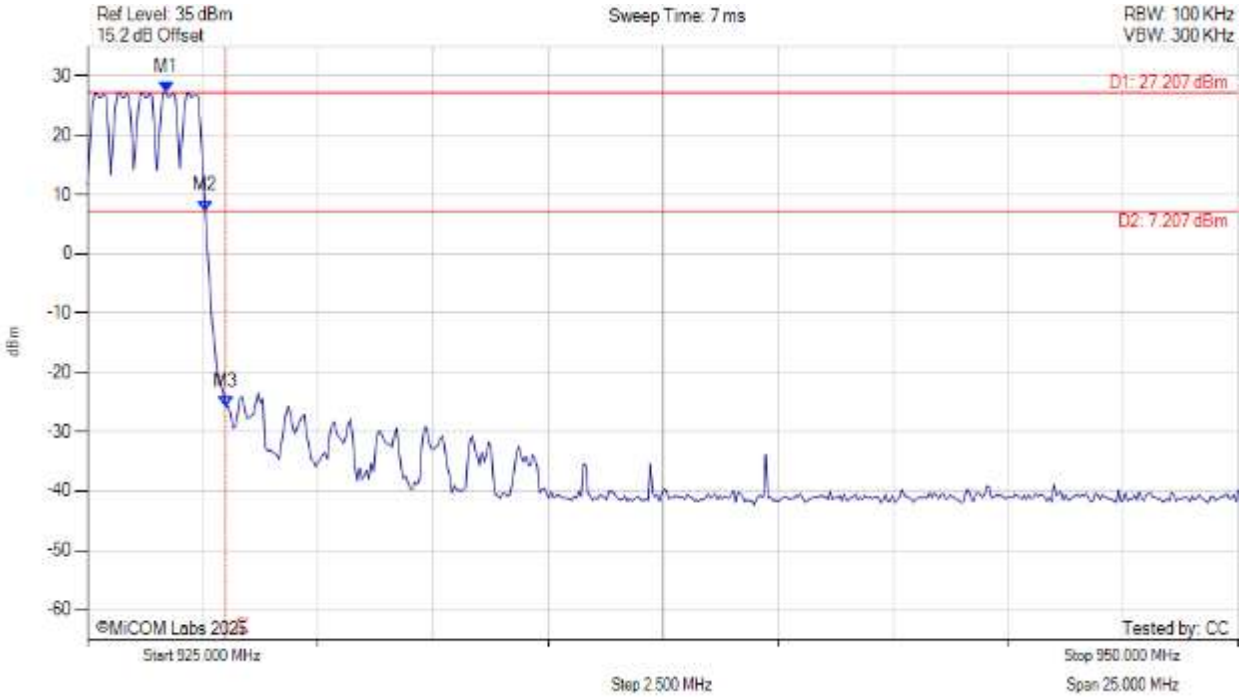
CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FSK-250k, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 926.703 MHz : 27.207 dBm M2 : 927.555 MHz : 7.288 dBm M3 : 928.000 MHz : -25.829 dBm	Channel Frequency: 927.25 MHz

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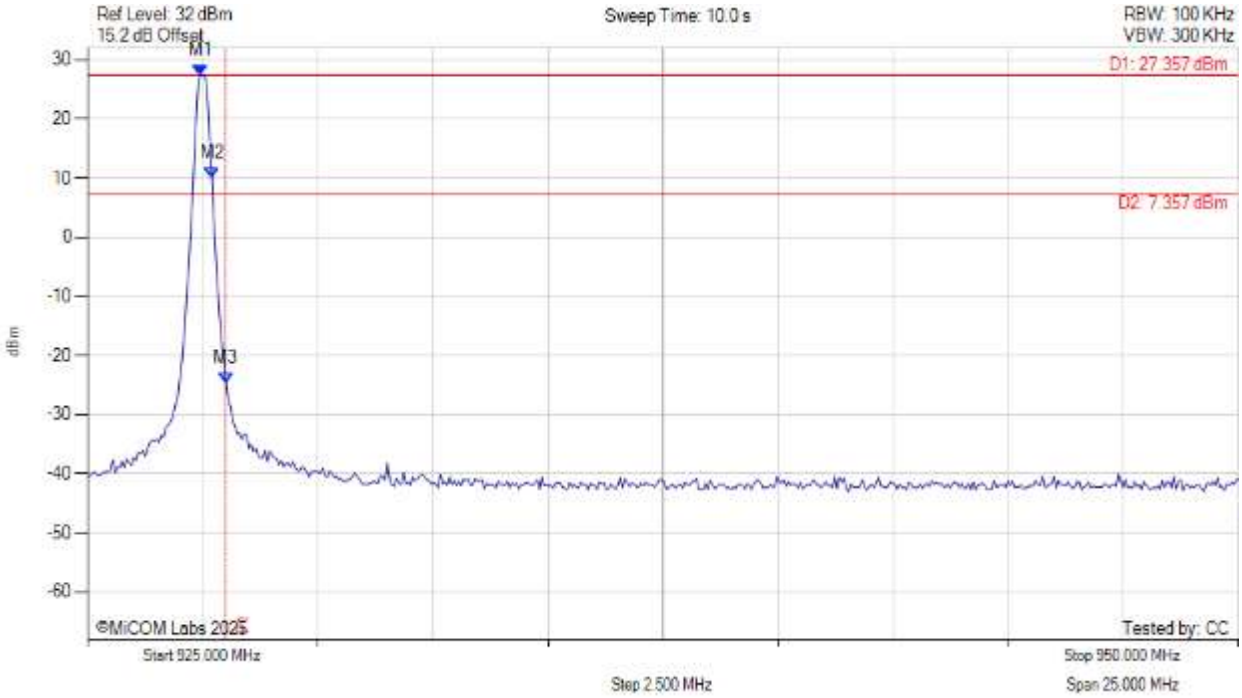
CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-10k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.455 MHz : 27.357 dBm M2 : 927.705 MHz : 9.897 dBm M3 : 928.000 MHz : -24.611 dBm	Channel Frequency: 927.50 MHz

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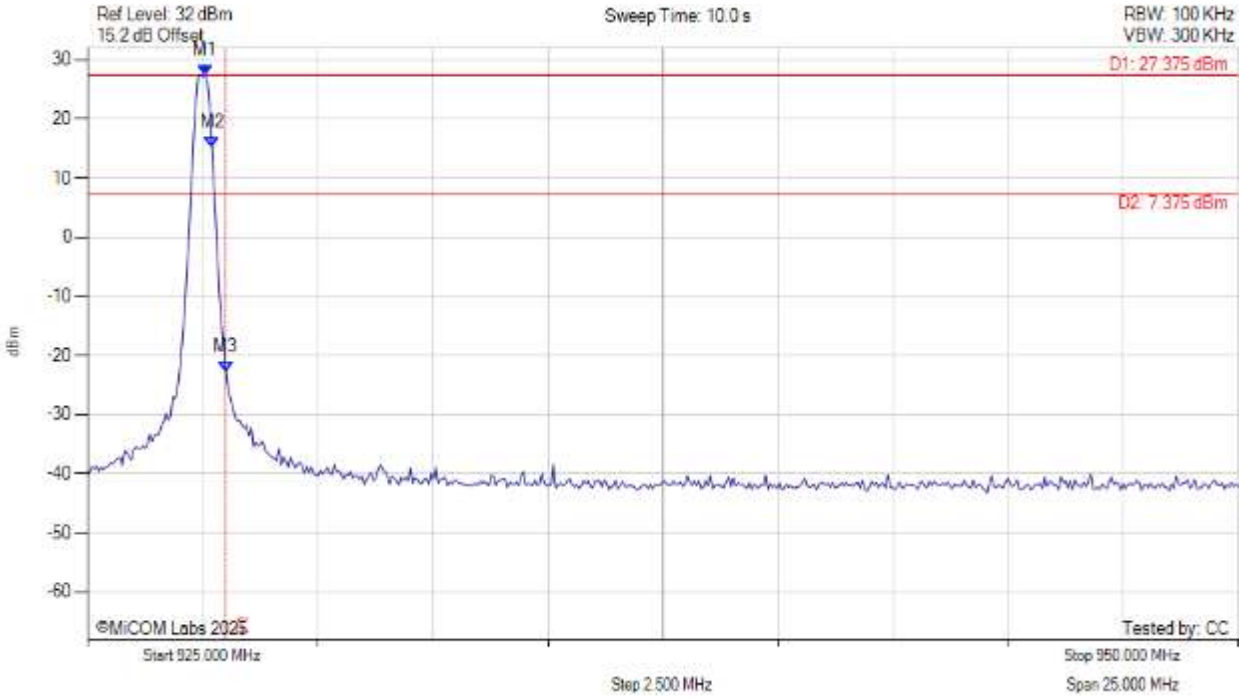
CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-110k, Channel: 927.50 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.555 MHz : 27.375 dBm M2 : 927.705 MHz : 15.108 dBm M3 : 928.000 MHz : -22.738 dBm	Channel Frequency: 927.50 MHz

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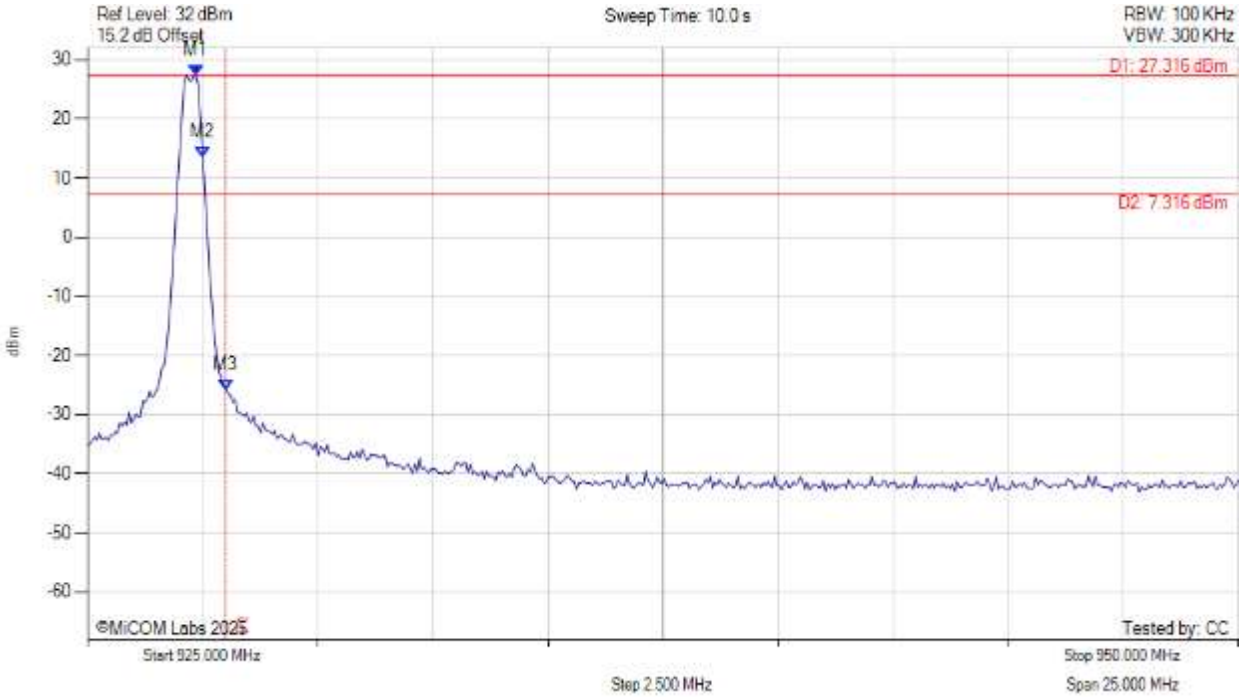
CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FSK-250k, Channel: 927.25 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.355 MHz : 27.316 dBm M2 : 927.505 MHz : 13.428 dBm M3 : 928.000 MHz : -25.783 dBm	Channel Frequency: 927.25 MHz

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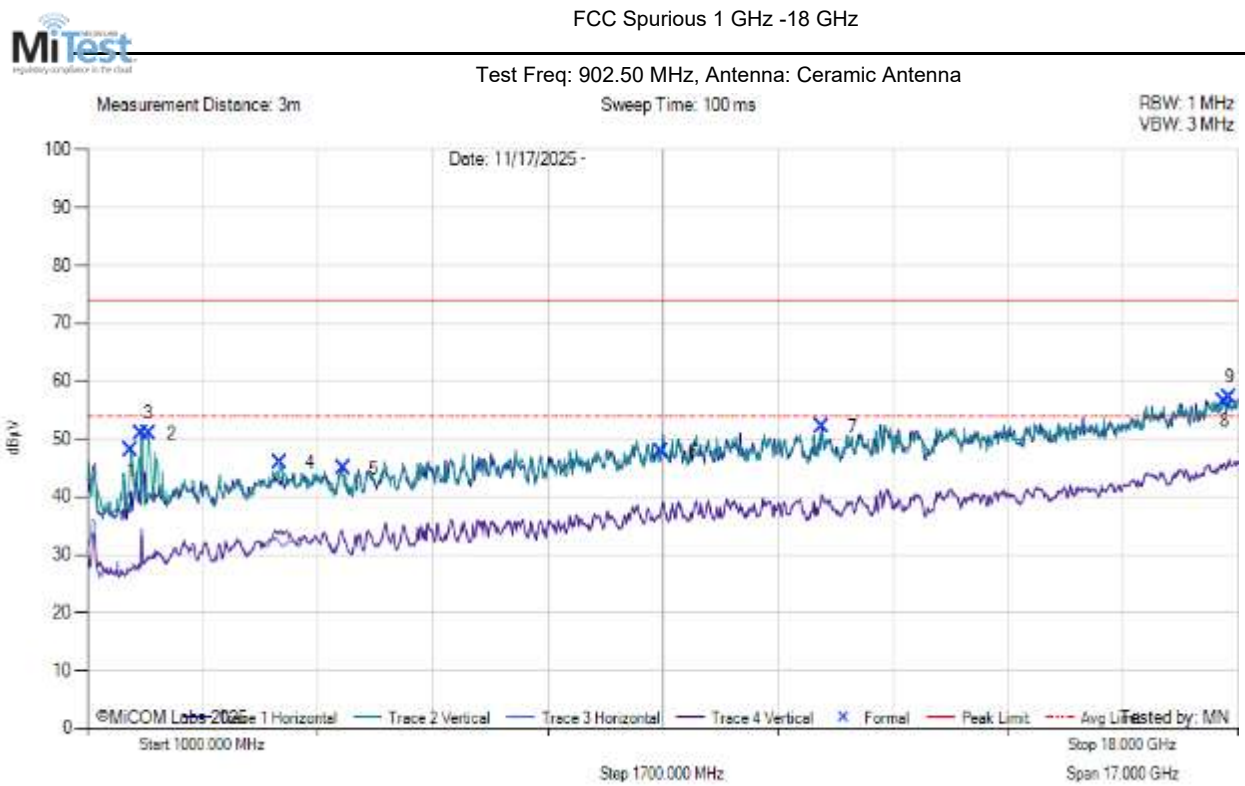
A.4.2. Radiated Emissions

A.4.2.3. TX Spurious & Restricted Band Emissions

A.4.2.3.1 Ceramic / Chip/ Meritek Antenna (AT503008915)



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	1646.00	61.85	2.52	-16.24	48.13	MaxP	Vertical	199	270	74.0	-25.9	Pass
2	1799.00	63.00	2.65	-14.67	50.98	MaxP	Vertical	150	330	74.0	-23.0	Pass
3	1901.00	62.13	2.68	-13.86	50.95	MaxP	Vertical	199	209	74.0	-23.1	Pass
4	3839.00	54.18	3.40	-11.65	45.93	MaxP	Vertical	199	179	74.0	-28.1	Pass
5	4774.00	53.46	3.78	-12.21	45.03	MaxP	Horizontal	150	30	74.0	-29.0	Pass
6	9483.00	48.78	5.32	-6.24	47.86	MaxP	Vertical	199	239	74.0	-26.1	Pass
7	11846.00	51.74	6.13	-5.68	52.19	MaxP	Horizontal	150	120	74.0	-21.8	Pass
8	17796.00	47.87	7.72	0.95	56.55	MaxP	Horizontal	199	30	74.0	-17.5	Pass
9	17864.00	48.09	7.77	1.31	57.18	MaxP	Vertical	150	59	74.0	-16.8	Pass

Test Notes: Ceramic antenna. 902.5 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used

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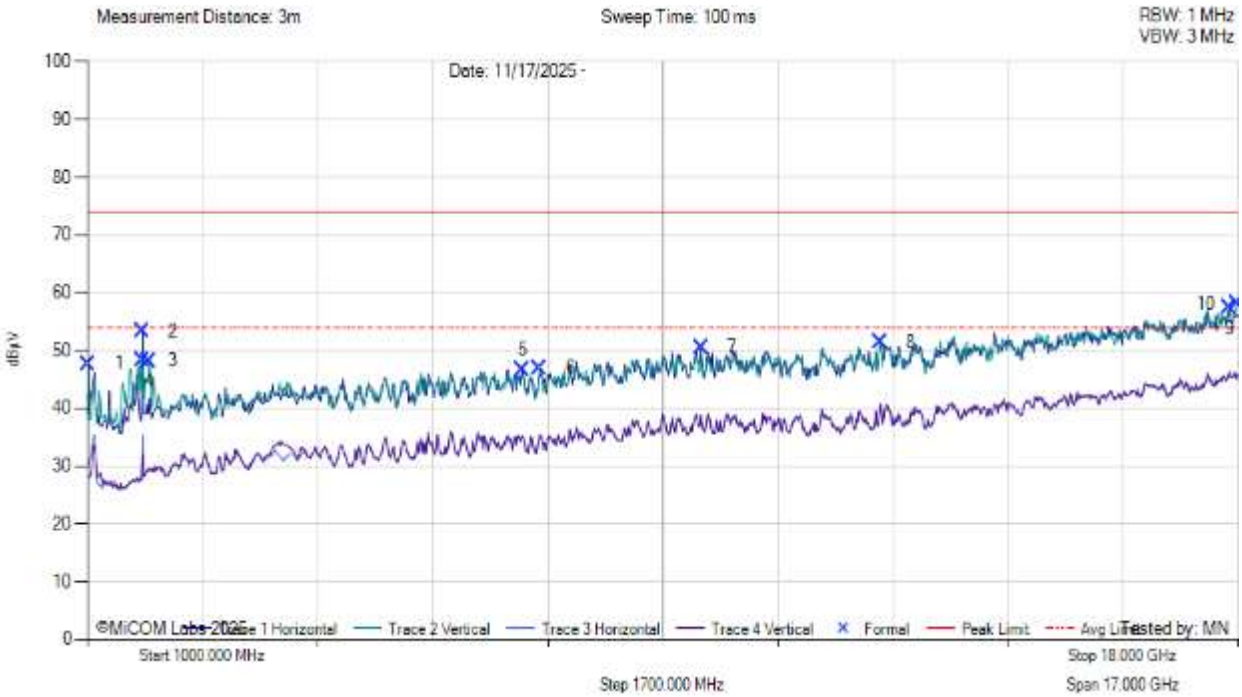
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: Ceramic Antenna



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	1017.00	62.70	2.12	-17.15	47.67	MaxP	Vertical	150	330	74.0	-26.3	Pass
2	1816.00	65.18	2.66	-14.49	53.34	MaxP	Horizontal	150	150	74.0	-20.7	Pass
3	1816.00	60.07	2.66	-14.49	48.24	MaxP	Vertical	150	330	74.0	-25.8	Pass
4	1918.00	59.35	2.67	-13.81	48.21	MaxP	Vertical	150	209	74.0	-25.8	Pass
5	7426.00	49.66	4.63	-7.66	46.63	MaxP	Horizontal	150	60	74.0	-27.4	Pass
6	7681.00	49.84	4.65	-7.48	47.01	MaxP	Vertical	199	89	74.0	-27.0	Pass
7	10061.00	50.34	5.50	-5.26	50.58	MaxP	Horizontal	199	30	74.0	-23.4	Pass
8	12713.00	53.06	6.14	-7.84	51.37	MaxP	Vertical	199	0	74.0	-22.6	Pass
9	17864.00	48.37	7.77	1.31	57.46	MaxP	Horizontal	150	30	74.0	-16.5	Pass
10	17983.00	49.79	7.74	0.62	58.16	MaxP	Vertical	199	330	74.0	-15.8	Pass

Test Notes: Ceramic antenna. 915 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used

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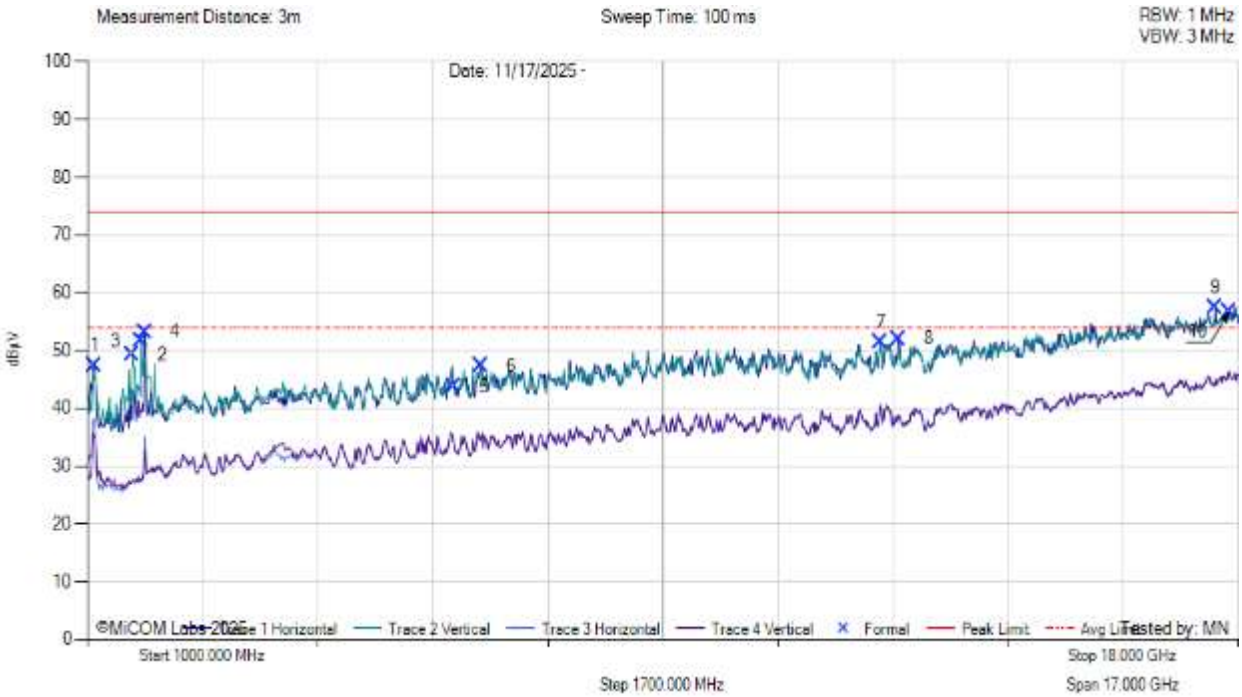
FCC Spurious 1 GHz -18 GHz

Test Freq 927.50 MHz, Antenna: Ceramic Antenna



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	1102.00	62.64	2.21	-17.53	47.32	MaxP	Horizontal	150	30	74.0	-26.7	Pass
2	1663.00	62.82	2.54	-16.04	49.33	MaxP	Vertical	199	119	74.0	-24.7	Pass
3	1799.00	63.65	2.65	-14.67	51.63	MaxP	Vertical	199	270	74.0	-22.4	Pass
4	1850.00	64.91	2.66	-14.40	53.18	MaxP	Horizontal	150	150	74.0	-20.8	Pass
5	6406.00	47.92	4.24	-8.48	43.69	MaxP	Vertical	199	270	74.0	-30.3	Pass
6	6814.00	50.67	4.40	-7.67	47.40	MaxP	Horizontal	199	150	74.0	-26.6	Pass
7	12713.00	53.13	6.14	-7.84	51.43	MaxP	Vertical	199	239	74.0	-22.6	Pass
8	12985.00	53.12	6.56	-7.63	52.05	MaxP	Horizontal	199	270	74.0	-21.9	Pass
9	17660.00	50.11	7.20	0.03	57.34	MaxP	Horizontal	199	150	74.0	-16.7	Pass
10	17864.00	47.71	7.77	1.31	56.80	MaxP	Vertical	199	29	74.0	-17.2	Pass

Test Notes: Ceramic antenna. 927.5 MHz 3.3V PS, PS and laptop are on the table. Ceramic antenna used

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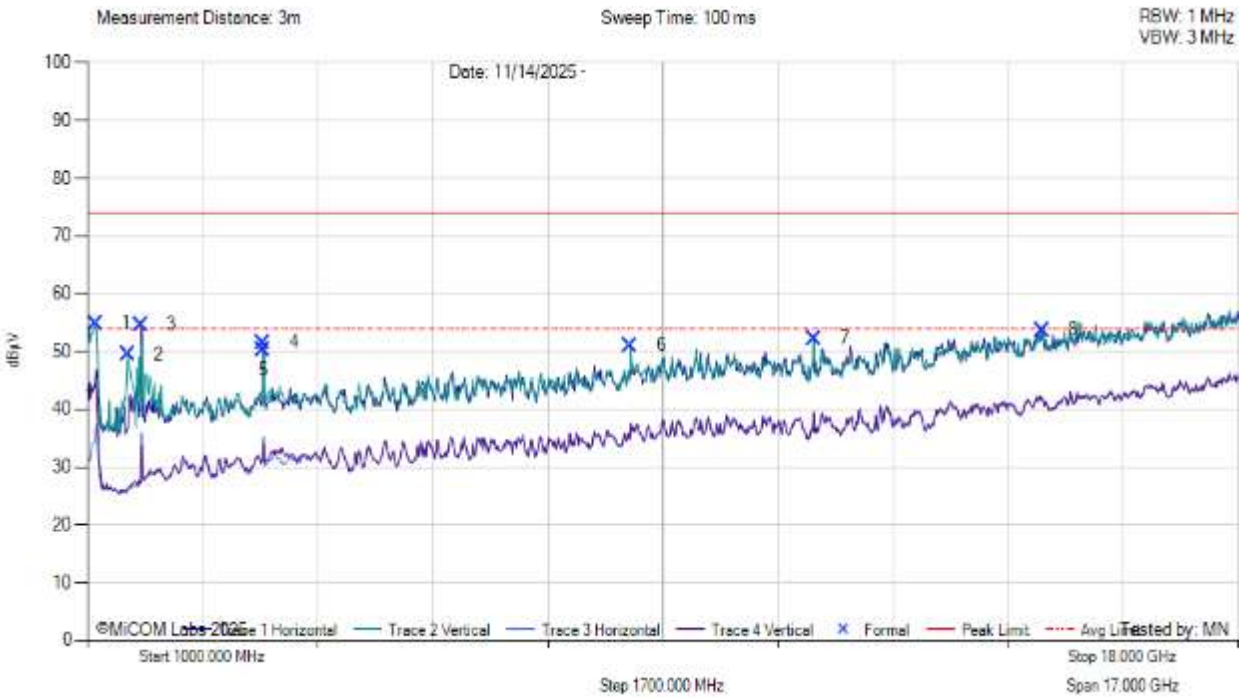
A.4.2.3.2 Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF)

FCC Spurious 1 GHz -18 GHz

Test Freq: 902.50 MHz, Antenna: Dipole A09-HASM-675



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	1119.00	70.16	2.21	-17.45	54.92	MaxP	Vertical	150	179	74.0	-19.1	Pass
2	1595.00	63.47	2.49	-16.48	49.49	MaxP	Vertical	150	300	74.0	-24.5	Pass
3	1799.00	66.63	2.65	-14.67	54.61	MaxP	Horizontal	150	150	74.0	-19.4	Pass
4	3601.00	60.04	3.33	-11.85	51.52	MaxP	Horizontal	150	210	74.0	-22.5	Pass
5	3601.00	58.84	3.33	-11.85	50.32	MaxP	Vertical	199	299	74.0	-23.7	Pass
6	9024.00	53.10	5.25	-7.33	51.02	MaxP	Vertical	150	29	74.0	-23.0	Pass
7	11727.00	52.46	5.92	-6.08	52.30	MaxP	Vertical	199	89	74.0	-21.7	Pass
8	15110.00	50.45	6.61	-3.40	53.66	MaxP	Horizontal	150	330	74.0	-20.3	Pass

Test Notes: Dipole A09-HASM-675 antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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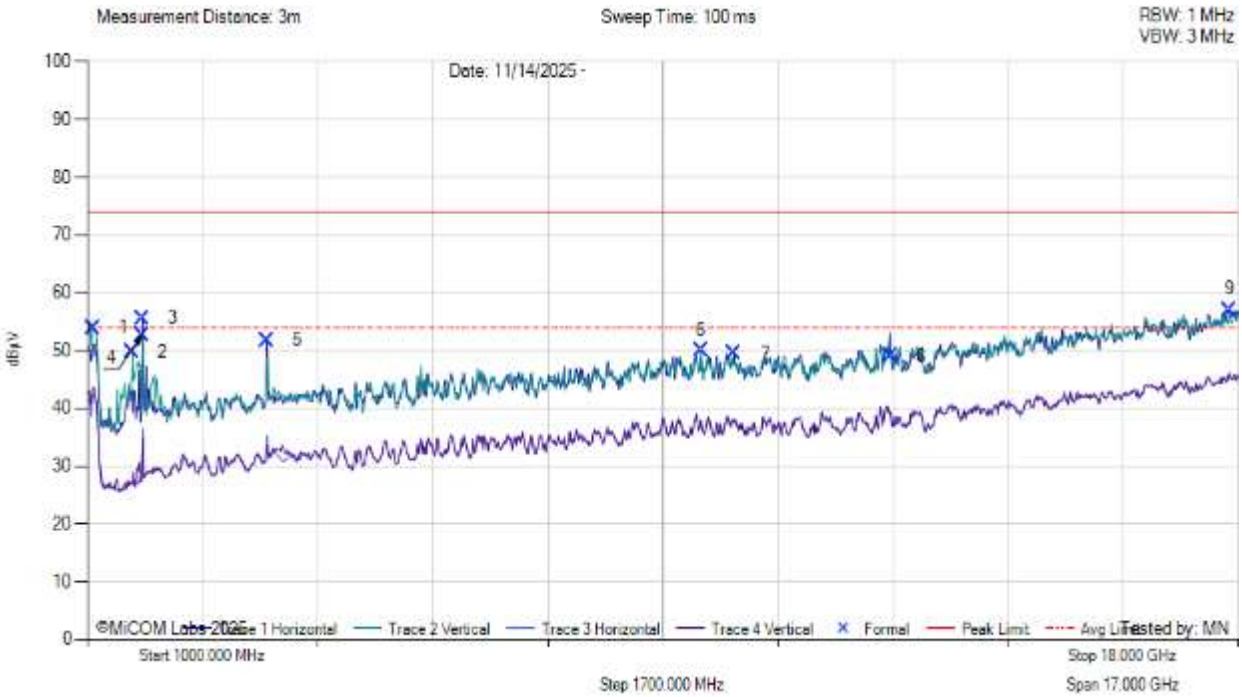
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: Dipole A09-HASM-675



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	1085.00	69.29	2.19	-17.56	53.93	MaxP	Vertical	149	300	74.0	-20.1	Pass
2	1663.00	63.31	2.54	-16.04	49.82	MaxP	Vertical	149	119	74.0	-24.2	Pass
3	1816.00	67.46	2.66	-14.49	55.62	MaxP	Horizontal	149	150	74.0	-18.4	Pass
4	1816.00	64.60	2.66	-14.49	52.76	MaxP	Vertical	149	239	74.0	-21.2	Pass
5	3652.00	60.35	3.34	-11.91	51.79	MaxP	Horizontal	149	210	74.0	-22.2	Pass
6	10061.00	49.71	5.50	-5.26	49.95	MaxP	Vertical	149	239	74.0	-24.0	Pass
7	10554.00	48.08	5.81	-4.37	49.52	MaxP	Horizontal	149	210	74.0	-24.5	Pass
8	12866.00	51.18	6.37	-8.46	49.09	MaxP	Horizontal	199	180	74.0	-24.9	Pass
9	17864.00	47.99	7.77	1.31	57.08	MaxP	Vertical	149	209	74.0	-16.9	Pass

Test Notes: Dipole A09-HASM-675 antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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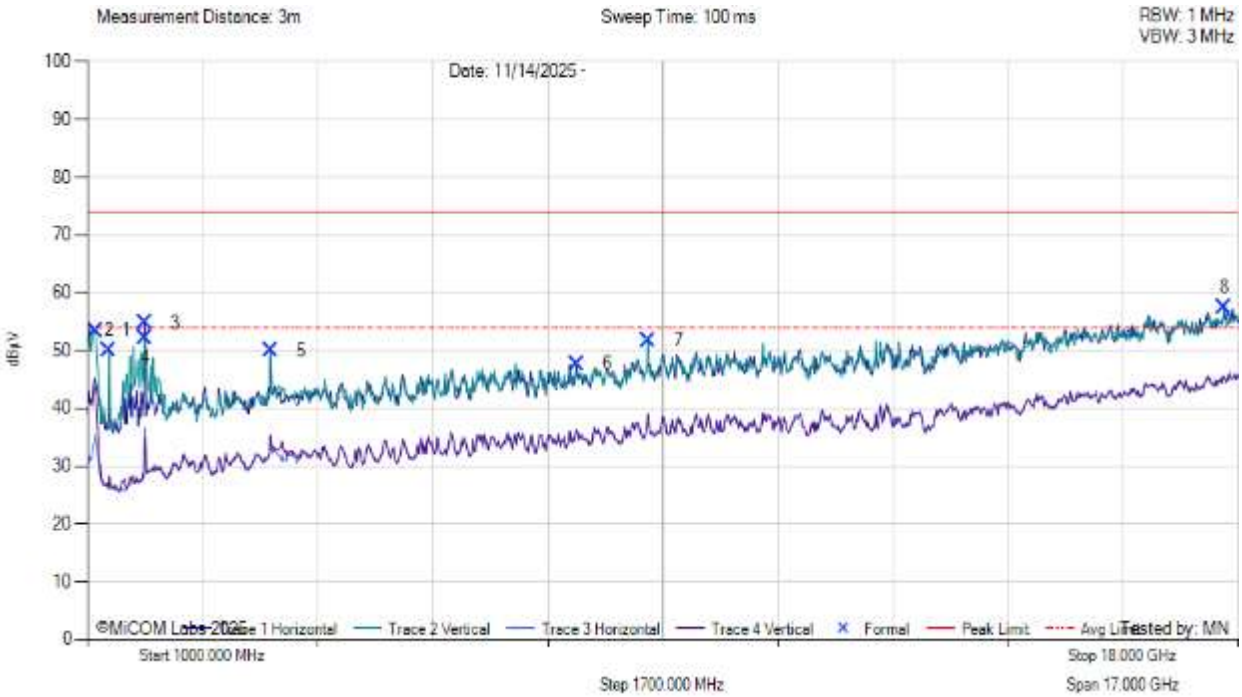
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.5 MHz, Antenna: Dipole A09-HASM-675



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	1119.00	68.71	2.21	-17.45	53.46	MaxP	Vertical	150	119	74.0	-20.5	Pass
2	1323.00	63.95	2.33	-16.21	50.06	MaxP	Vertical	199	270	74.0	-23.9	Pass
3	1850.00	66.48	2.66	-14.40	54.75	MaxP	Horizontal	199	150	74.0	-19.3	Pass
4	1850.00	69.31	2.66	-14.40	52.25	MaxP	Vertical	150	330	74.0	-21.8	Pass
5	3703.00	58.48	3.36	-11.78	50.06	MaxP	Vertical	150	119	74.0	-23.9	Pass
6	8225.00	50.74	5.13	-8.19	47.67	MaxP	Horizontal	199	240	74.0	-26.3	Pass
7	9279.00	53.53	5.36	-7.13	51.76	MaxP	Vertical	150	29	74.0	-22.2	Pass
8	17796.00	48.80	7.72	0.95	57.47	MaxP	Horizontal	150	90	74.0	-16.5	Pass

Test Notes: Dipole A09-HASM-675 antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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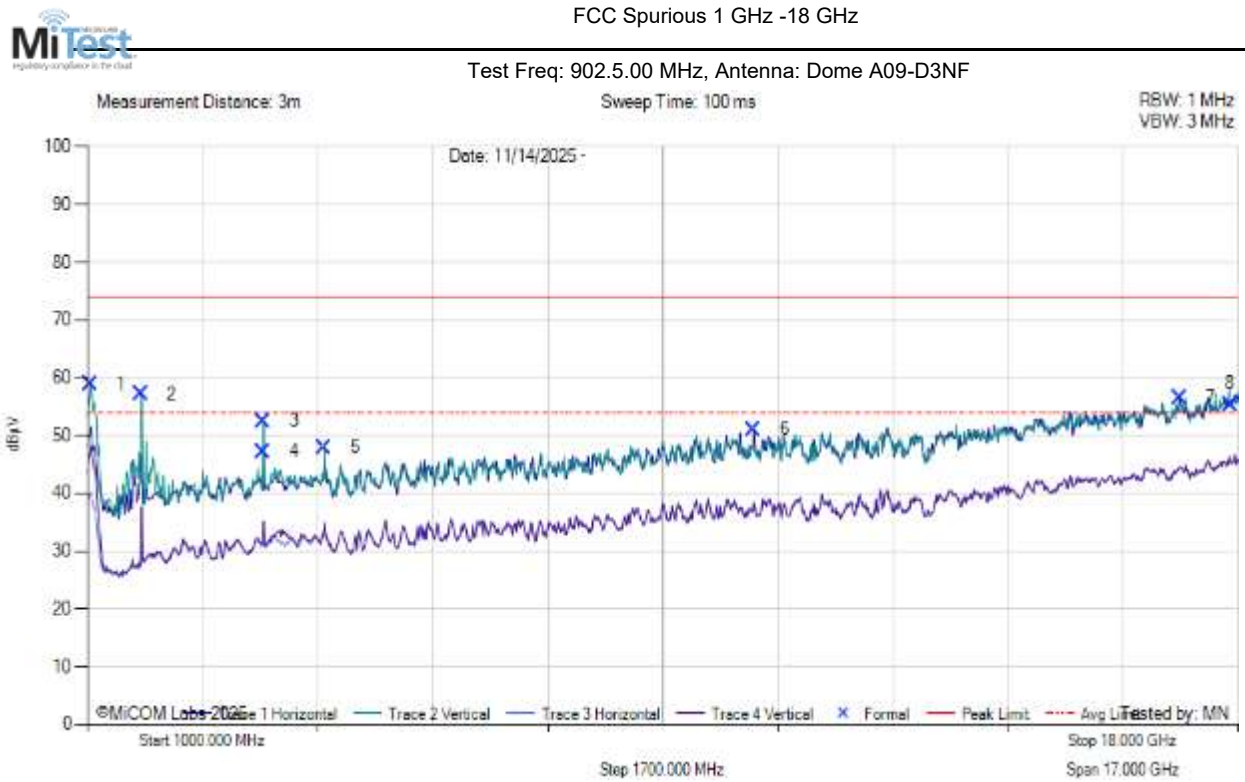
A.4.2.3.3 Dome / Laird Antenna (A09-D3NF /TRA8903)



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	1051.00	74.19	2.18	-17.55	58.82	MaxP	Vertical	199	29	74.0	-15.2	Pass
2	1799.00	69.21	2.65	-14.67	57.20	MaxP	Vertical	199	0	74.0	-16.8	Pass
3	3601.00	61.04	3.33	-11.85	52.52	MaxP	Vertical	199	269	74.0	-21.5	Pass
4	3601.00	55.74	3.33	-11.85	47.22	MaxP	Horizontal	150	120	74.0	-26.8	Pass
5	4502.00	56.23	3.69	-12.01	47.92	MaxP	Vertical	150	270	74.0	-26.1	Pass
6	10843.00	50.84	6.12	-5.88	51.07	MaxP	Horizontal	199	0	74.0	-22.9	Pass
7	17133.00	49.43	7.02	0.11	56.55	MaxP	Horizontal	150	30	74.0	-17.4	Pass
8	17881.00	45.88	8.07	1.46	55.41	MaxP	Vertical	199	149	74.0	-18.6	Pass

Test Notes: Dome A09-D3NF antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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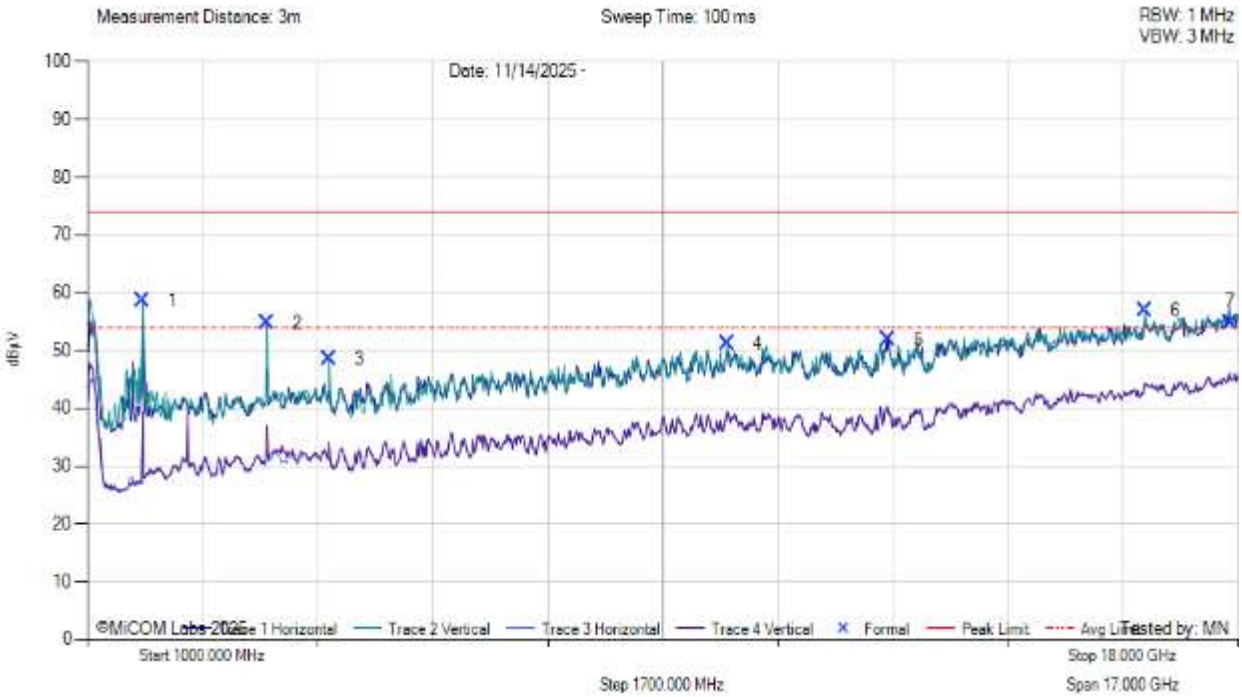
FCC Spurious 1 GHz - 18 GHz

Test Freq: 915.00 MHz, Antenna: Dome A09-D3NF



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	70.47	2.66	-14.49	58.63	MaxP	Vertical	199	0	74.0	-15.4	Pass
2	3652.00	63.27	3.34	-11.91	54.71	MaxP	Vertical	199	269	74.0	-19.3	Pass
3	4570.00	56.94	3.74	-12.12	48.55	MaxP	Vertical	150	270	74.0	-25.4	Pass
4	10452.00	49.81	5.73	-4.43	51.11	MaxP	Vertical	199	269	74.0	-22.9	Pass
5	12832.00	53.70	6.49	-8.33	51.86	MaxP	Horizontal	199	240	74.0	-22.1	Pass
6	16623.00	49.96	6.73	0.24	56.93	MaxP	Vertical	150	149	74.0	-17.1	Pass
7	17881.00	45.36	8.07	1.46	54.90	MaxP	Horizontal	199	120	74.0	-19.1	Pass

Test Notes: Dome A09-D3NF antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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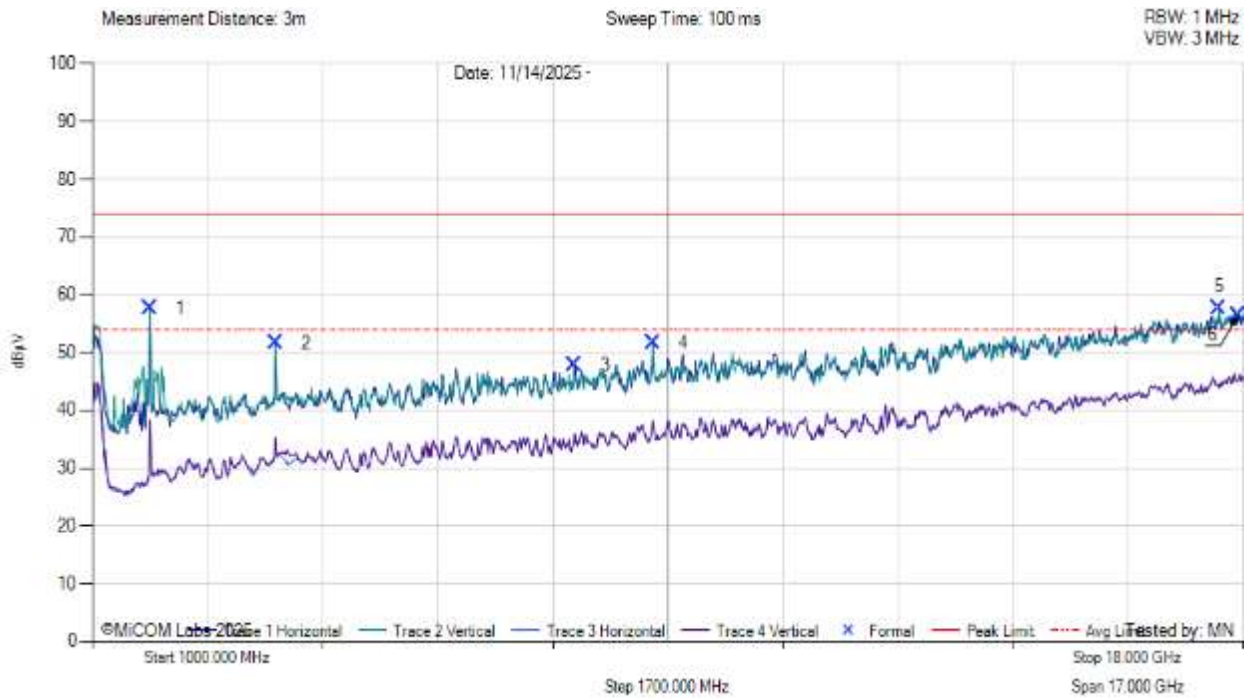
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.5 MHz, Antenna: Dome A09-D3NF



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	69.33	2.66	-14.40	57.60	MaxP	Vertical	199	29	74.0	-16.4	Pass
2	3703.00	60.06	3.36	-11.78	51.63	MaxP	Vertical	199	299	74.0	-22.4	Pass
3	8123.00	50.89	4.74	-7.76	47.87	MaxP	Horizontal	150	240	74.0	-26.1	Pass
4	9279.00	53.43	5.36	-7.13	51.66	MaxP	Vertical	150	0	74.0	-22.3	Pass
5	17643.00	50.72	7.31	-0.25	57.78	MaxP	Vertical	199	299	74.0	-16.2	Pass
6	17932.00	47.50	8.07	1.02	56.59	MaxP	Horizontal	199	270	74.0	-17.4	Pass

Test Notes: Dome A09-D3NF antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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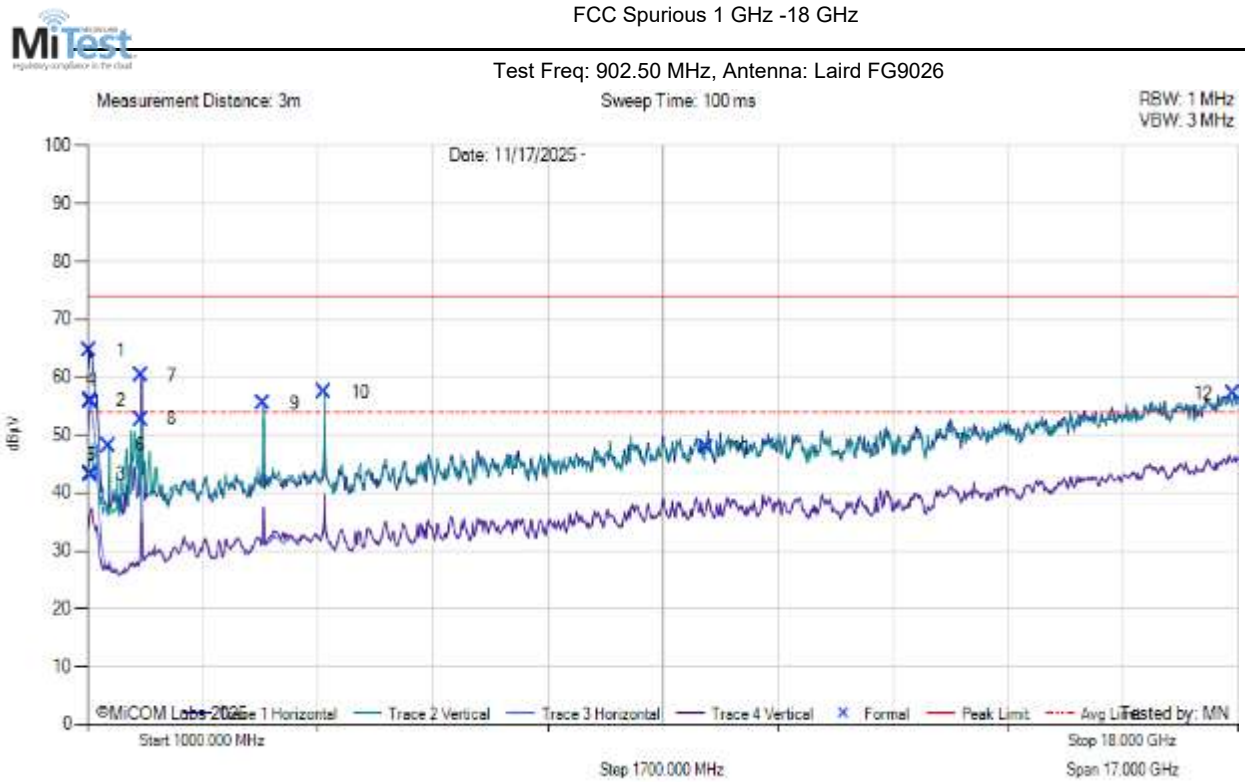
A.4.2.3.4 Omni / Laird Antenna (A09-F8NF/ FG9026)



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	1034.00	79.91	2.15	-17.39	64.67	MaxP	Horizontal	199	60	74.0	-9.3	Pass
2	1040.18	71.34	2.16	-17.46	56.04	MaxP	Horizontal	152	62	74.0	-18.0	Pass
3	1040.18	58.59	2.16	-17.46	43.29	AVG	Horizontal	152	62	54.0	-10.7	Pass
4	1052.17	71.21	2.18	-17.55	55.85	MaxP	Horizontal	150	63	74.0	-18.2	Pass
5	1052.17	58.48	2.18	-17.55	43.11	AVG	Horizontal	150	63	54.0	-10.9	Pass
6	1323.00	62.08	2.33	-16.21	48.19	MaxP	Vertical	199	119	74.0	-25.8	Pass
7	1799.00	72.30	2.65	-14.67	60.28	MaxP	Horizontal	199	120	74.0	-13.7	Pass
8	1799.00	64.75	2.65	-14.67	52.73	MaxP	Vertical	199	179	74.0	-21.3	Pass
9	3601.00	63.98	3.33	-11.85	55.46	MaxP	Vertical	199	0	74.0	-18.5	Pass
10	4502.00	65.76	3.69	-12.01	57.45	MaxP	Vertical	150	0	74.0	-16.6	Pass
11	10146.00	47.23	5.74	-5.18	47.79	MaxP	Horizontal	150	30	74.0	-26.2	Pass
12	17932.00	48.10	8.07	1.02	57.19	MaxP	Horizontal	150	180	74.0	-16.8	Pass

Test Notes: Laird FG 9026 antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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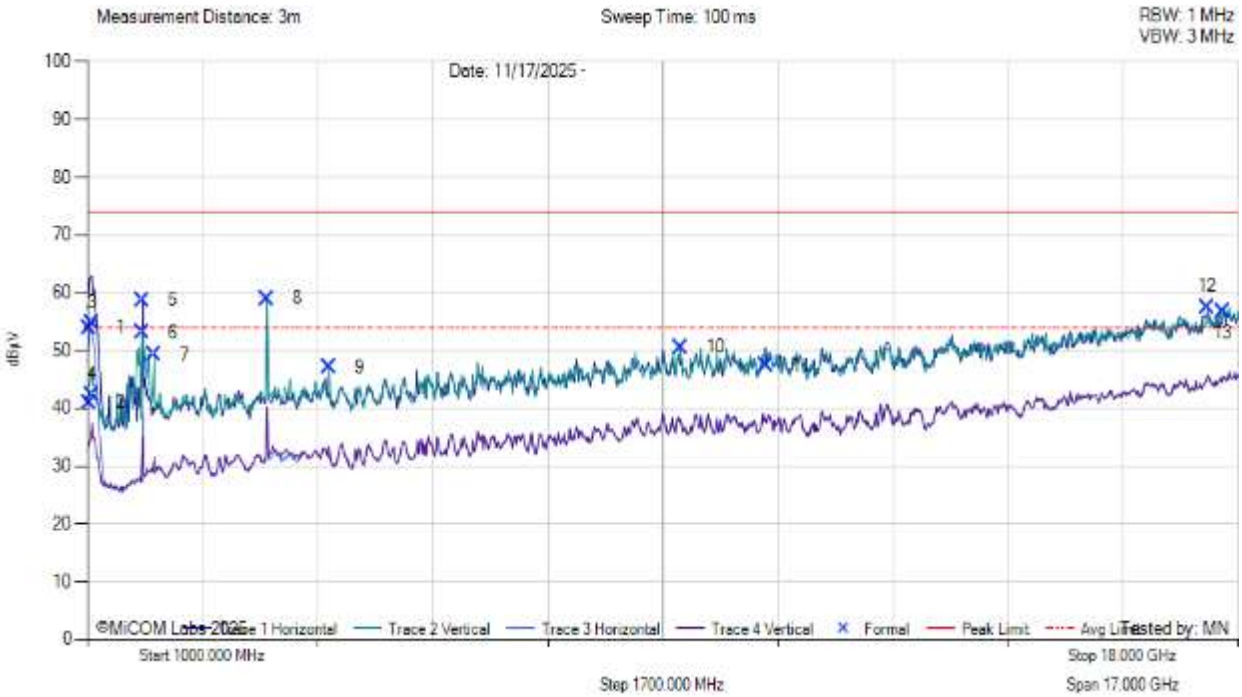
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: Laird FG9026



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	1034.79	69.19	2.15	-17.40	53.94	MaxP	Horizontal	149	62	74.0	-20.1	Pass
2	1034.79	56.27	2.15	-17.40	41.02	AVG	Horizontal	149	62	54.0	-13.0	Pass
3	1068.02	70.24	2.14	-17.55	54.83	MaxP	Horizontal	184	60	74.0	-19.2	Pass
4	1068.02	57.72	2.14	-17.55	42.32	AVG	Horizontal	184	60	54.0	-11.7	Pass
5	1816.00	70.53	2.66	-14.49	58.70	MaxP	Horizontal	199	60	74.0	-15.3	Pass
6	1816.00	64.91	2.66	-14.49	53.08	MaxP	Vertical	150	330	74.0	-20.9	Pass
7	1986.00	59.80	2.73	-13.33	49.20	MaxP	Vertical	150	29	74.0	-24.8	Pass
8	3652.00	67.52	3.34	-11.91	58.95	MaxP	Vertical	199	0	74.0	-15.0	Pass
9	4570.00	55.53	3.74	-12.12	47.14	MaxP	Vertical	150	0	74.0	-26.9	Pass
10	9755.00	51.04	5.63	-6.11	50.56	MaxP	Vertical	150	119	74.0	-23.4	Pass
11	11030.00	46.15	6.21	-4.98	47.38	MaxP	Horizontal	150	240	74.0	-26.6	Pass
12	17541.00	50.61	7.50	-0.56	57.55	MaxP	Vertical	150	119	74.0	-16.4	Pass
13	17779.00	47.98	7.65	1.01	56.63	MaxP	Horizontal	199	0	74.0	-17.4	Pass

Test Notes: Laird FG 9026 antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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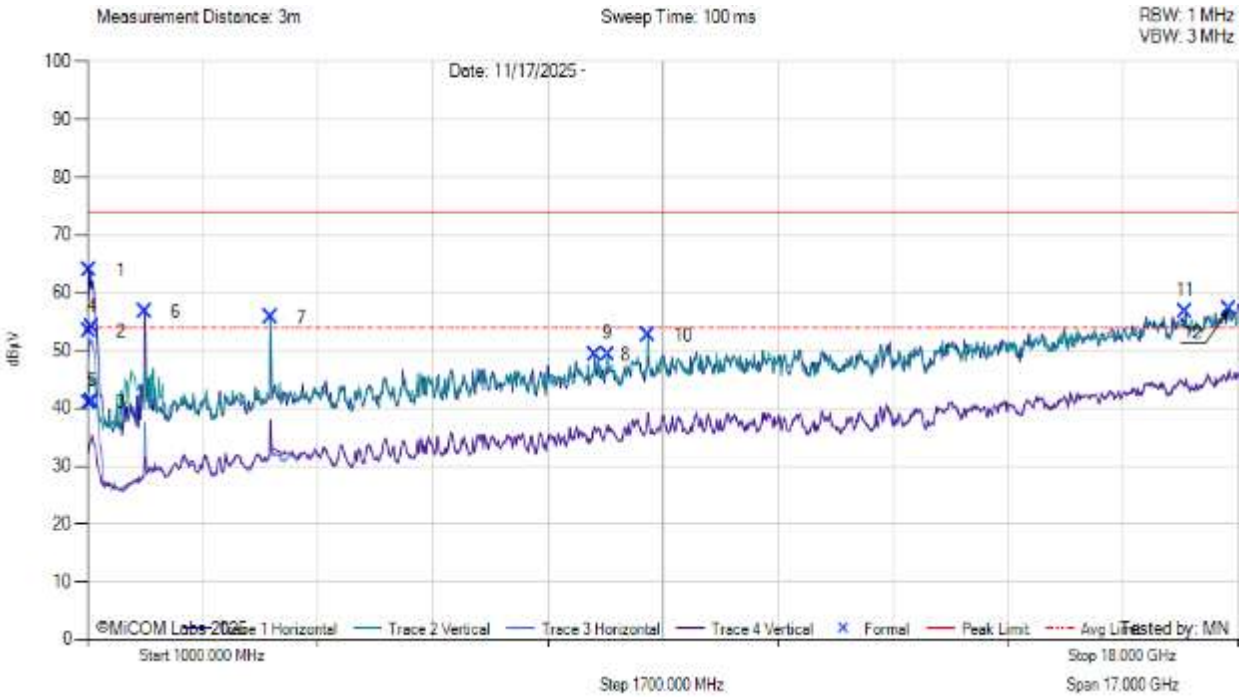
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: Laird FG9026



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	1034.00	79.09	2.15	-17.39	63.84	MaxP	Horizontal	150	60	74.0	-10.2	Pass
2	1037.00	68.59	2.15	-17.42	53.32	MaxP	Horizontal	153	63	74.0	-20.7	Pass
3	1037.00	56.26	2.15	-17.42	40.98	AVG	Horizontal	153	63	54.0	-13.0	Pass
4	1072.30	69.39	2.16	-17.56	53.99	MaxP	Horizontal	152	63	74.0	-20.0	Pass
5	1072.30	56.66	2.16	-17.56	41.26	AVG	Horizontal	152	63	54.0	-12.7	Pass
6	1850.00	68.47	2.66	-14.40	56.73	MaxP	Horizontal	150	60	74.0	-17.3	Pass
7	3703.00	64.19	3.36	-11.78	55.76	MaxP	Vertical	199	0	74.0	-18.2	Pass
8	8497.00	52.26	5.02	-8.05	49.24	MaxP	Horizontal	150	180	74.0	-24.8	Pass
9	8684.00	52.17	5.28	-8.02	49.42	MaxP	Vertical	150	89	74.0	-24.6	Pass
10	9279.00	54.44	5.36	-7.13	52.67	MaxP	Vertical	150	179	74.0	-21.3	Pass
11	17218.00	49.10	7.38	0.37	56.85	MaxP	Horizontal	199	270	74.0	-17.1	Pass
12	17864.00	48.09	7.77	1.31	57.17	MaxP	Vertical	150	330	74.0	-16.8	Pass

Test Notes: Laird FG 9026 antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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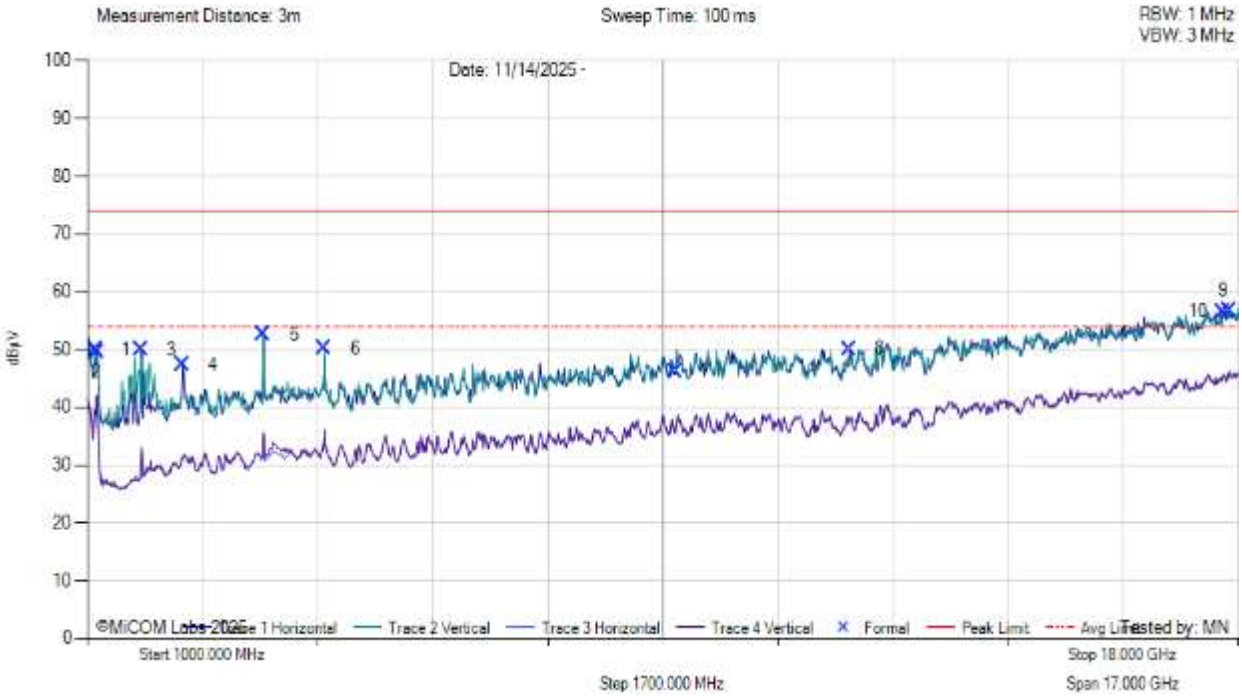
A.4.2.3.5 Flex / Molex (211140-0100)

FCC Spurious 1 GHz -18 GHz

Test Freq: 902.50 MHz, Antenna: Molex



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	1119.00	65.19	2.21	-17.45	49.95	MaxP	Horizontal	149	330	74.0	-24.1	Pass
2	1136.00	64.88	2.22	-17.44	49.66	MaxP	Vertical	149	330	74.0	-24.3	Pass
3	1799.00	62.06	2.65	-14.67	50.04	MaxP	Horizontal	149	150	74.0	-24.0	Pass
4	2411.00	56.32	3.02	-12.01	47.32	MaxP	Horizontal	199	180	74.0	-26.7	Pass
5	3601.00	61.18	3.33	-11.85	52.66	MaxP	Vertical	149	149	74.0	-21.3	Pass
6	4502.00	58.59	3.69	-12.01	50.27	MaxP	Vertical	149	29	74.0	-23.7	Pass
7	9687.00	47.08	5.54	-6.31	46.31	MaxP	Vertical	149	179	74.0	-27.7	Pass
8	12254.00	51.24	5.13	-6.30	50.07	MaxP	Horizontal	199	90	74.0	-23.9	Pass
9	17779.00	47.93	7.65	1.01	56.59	MaxP	Vertical	149	0	74.0	-17.4	Pass
10	17864.00	47.57	7.77	1.31	56.66	MaxP	Horizontal	199	240	74.0	-17.3	Pass

Test Notes: Molex antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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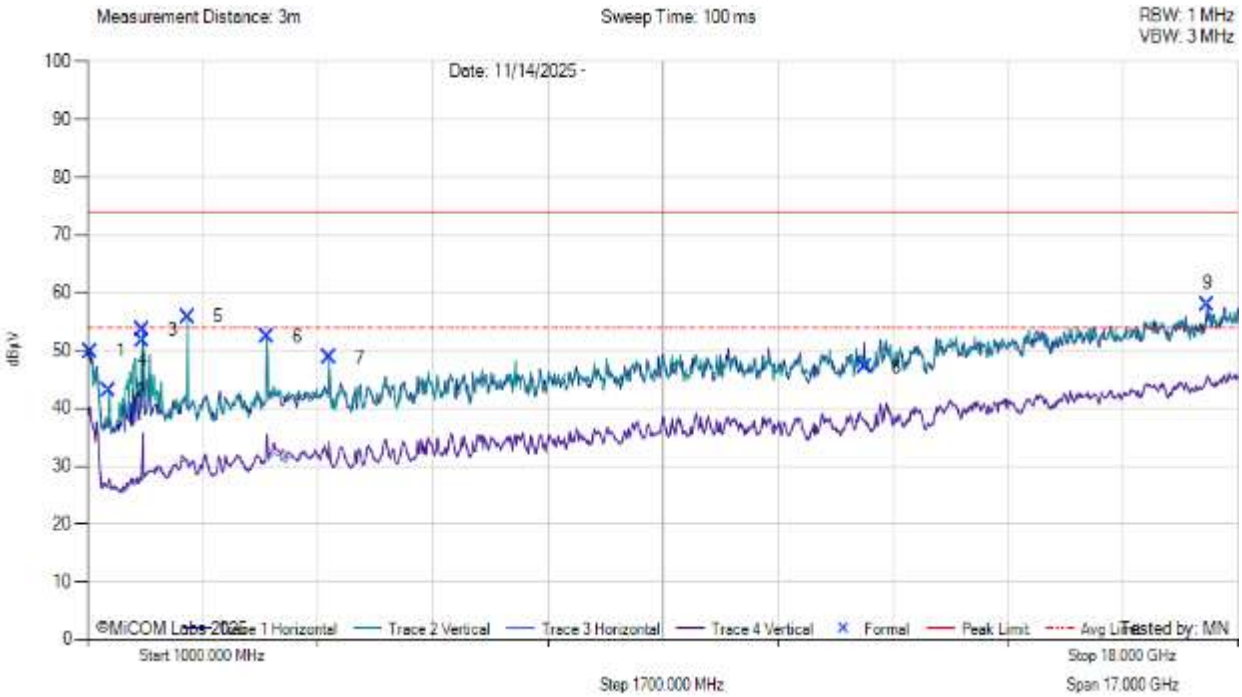
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: Molex



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	1051.00	65.24	2.18	-17.55	49.87	MaxP	Vertical	199	330	74.0	-24.1	Pass
2	1323.00	56.92	2.33	-16.21	43.03	MaxP	Vertical	149	119	74.0	-31.0	Pass
3	1816.00	65.46	2.66	-14.49	53.62	MaxP	Vertical	199	239	74.0	-20.4	Pass
4	1816.00	63.65	2.66	-14.49	51.81	MaxP	Horizontal	199	0	74.0	-22.2	Pass
5	2479.00	64.52	3.06	-11.72	55.86	MaxP	Vertical	149	59	74.0	-18.1	Pass
6	3652.00	60.99	3.34	-11.91	52.43	MaxP	Vertical	199	149	74.0	-21.6	Pass
7	4570.00	57.20	3.74	-12.12	48.81	MaxP	Vertical	149	29	74.0	-25.2	Pass
8	12492.00	47.51	6.01	-6.42	47.10	MaxP	Horizontal	149	300	74.0	-26.9	Pass
9	17541.00	51.10	7.50	-0.56	58.04	MaxP	Horizontal	199	240	74.0	-16.0	Pass

Test Notes: Molex antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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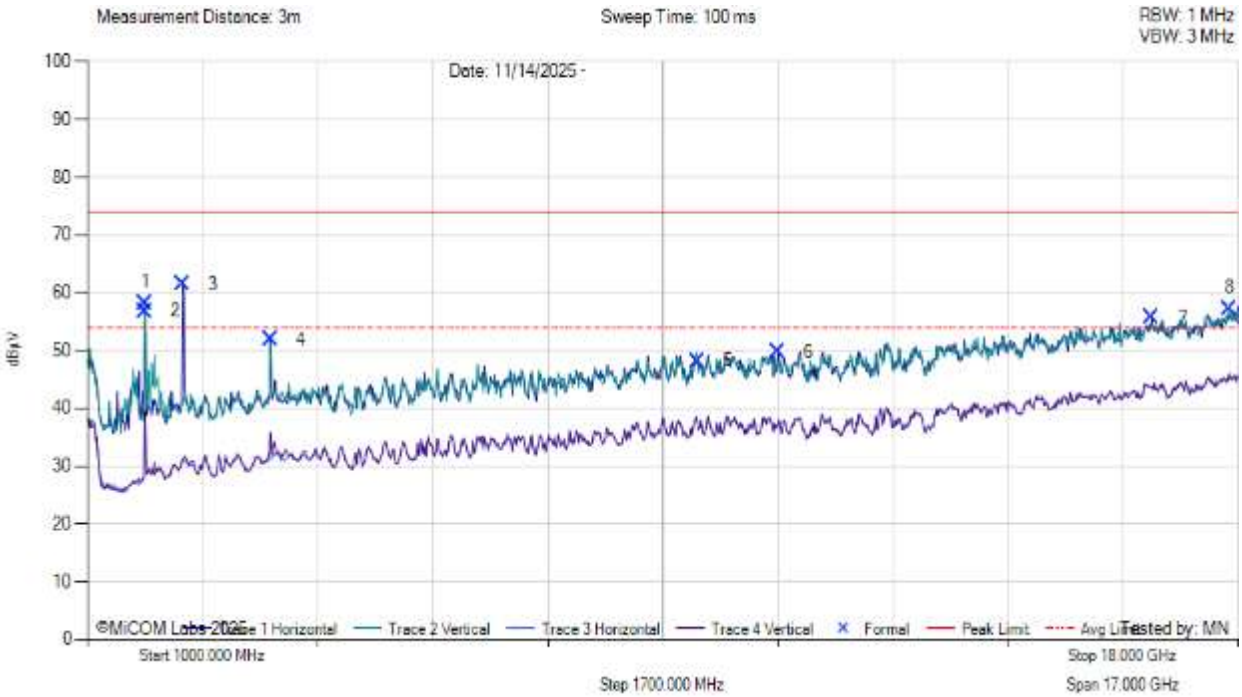
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: Molex



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	69.99	2.66	-14.40	58.25	MaxP	Vertical	199	179	74.0	-15.7	Pass
2	1850.00	68.53	2.66	-14.40	56.79	MaxP	Horizontal	199	150	74.0	-17.2	Pass
3	2411.00	70.47	3.02	-12.01	61.47	MaxP	Horizontal	150	330	74.0	-12.5	Pass
4	3703.00	60.39	3.36	-11.78	51.96	MaxP	Vertical	150	0	74.0	-22.0	Pass
5	10010.00	47.66	5.65	-5.12	48.19	MaxP	Vertical	199	0	74.0	-25.8	Pass
6	11200.00	48.91	6.27	-5.37	49.81	MaxP	Horizontal	199	240	74.0	-24.2	Pass
7	16725.00	48.78	7.07	-0.06	55.79	MaxP	Horizontal	199	30	74.0	-18.2	Pass
8	17864.00	48.18	7.77	1.31	57.27	MaxP	Vertical	199	270	74.0	-16.7	Pass

Test Notes: Molex antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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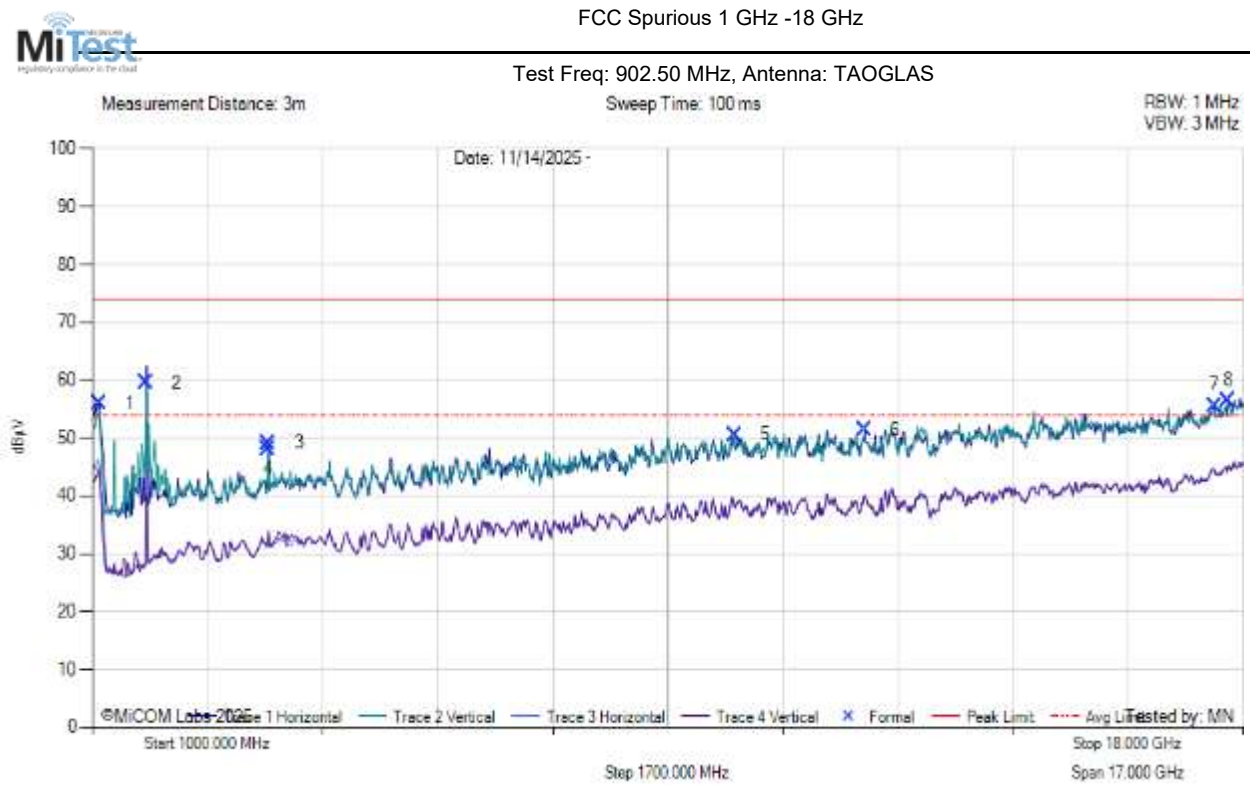
A.4.2.3.5 Flex Square / Taoglas (FXUB65.07.0180C)

A.4.2.3.5.1 TAOGLAS 10kbps



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	1102.00	71.23	2.21	-17.53	55.91	MaxP	Horizontal	149	120	74.0	-18.1	Pass
2	1799.00	71.55	2.65	-14.67	59.53	MaxP	Horizontal	149	150	74.0	-14.5	Pass
3	3601.00	57.68	3.33	-11.85	49.16	MaxP	Horizontal	149	210	74.0	-24.8	Pass
4	3601.00	56.75	3.33	-11.85	48.23	MaxP	Vertical	199	330	74.0	-25.8	Pass
5	10486.00	49.52	5.74	-4.64	50.62	MaxP	Vertical	199	89	74.0	-23.4	Pass
6	12407.00	51.61	5.85	-6.05	51.40	MaxP	Horizontal	149	210	74.0	-22.6	Pass
7	17575.00	48.57	7.50	-0.45	55.61	MaxP	Horizontal	149	270	74.0	-18.4	Pass
8	17779.00	47.86	7.65	1.01	56.51	MaxP	Vertical	199	239	74.0	-17.5	Pass

Test Notes: 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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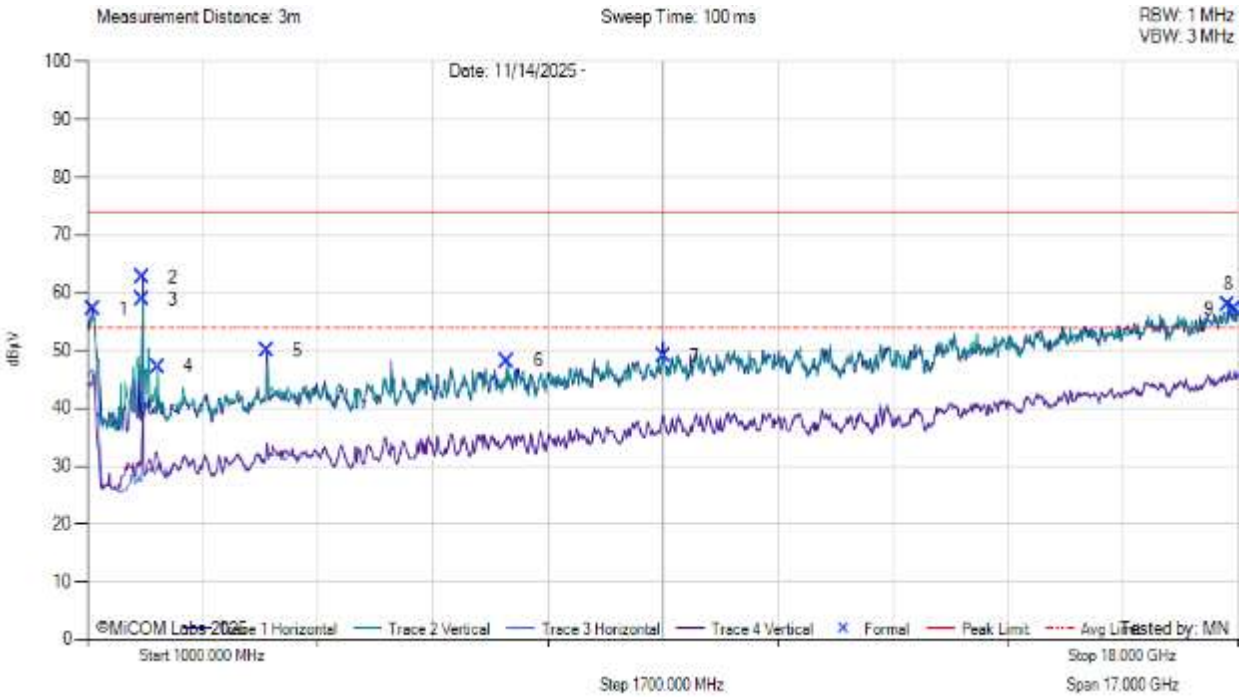
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: TAOGLAS



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	1085.00	72.53	2.19	-17.56	57.16	MaxP	Horizontal	149	120	74.0	-16.8	Pass
2	1816.00	74.53	2.66	-14.49	62.69	MaxP	Horizontal	149	60	74.0	-11.3	Pass
3	1816.00	70.64	2.66	-14.49	58.81	MaxP	Vertical	149	330	74.0	-15.2	Pass
4	2037.00	57.44	2.76	-12.98	47.22	MaxP	Vertical	199	29	74.0	-26.8	Pass
5	3652.00	58.48	3.34	-11.91	49.91	MaxP	Horizontal	199	210	74.0	-24.1	Pass
6	7205.00	51.12	4.52	-7.46	48.17	MaxP	Vertical	149	0	74.0	-25.8	Pass
7	9517.00	49.84	5.39	-6.19	49.04	MaxP	Horizontal	149	300	74.0	-25.0	Pass
8	17847.00	48.93	7.67	1.27	57.88	MaxP	Vertical	199	330	74.0	-16.1	Pass
9	17949.00	48.30	8.05	0.80	57.16	MaxP	Horizontal	199	240	74.0	-16.8	Pass

Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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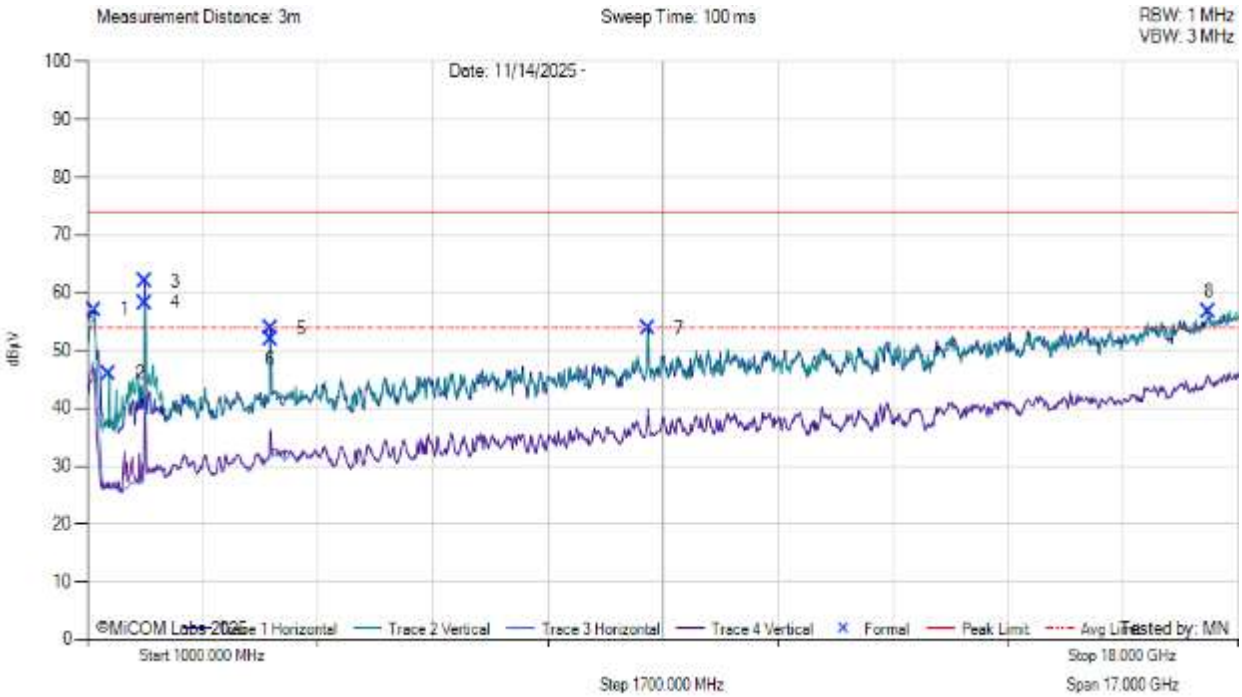
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: TAOGLAS



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	1102.00	72.39	2.21	-17.53	57.07	MaxP	Horizontal	150	330	74.0	-16.9	Pass
2	1323.00	59.87	2.33	-16.21	45.99	MaxP	Vertical	150	119	74.0	-28.0	Pass
3	1850.00	73.77	2.66	-14.40	62.03	MaxP	Horizontal	199	60	74.0	-12.0	Pass
4	1850.00	70.01	2.66	-14.40	58.27	MaxP	Vertical	150	330	74.0	-15.7	Pass
5	3703.00	62.18	3.36	-11.78	53.75	MaxP	Horizontal	150	60	74.0	-20.2	Pass
6	3703.00	60.46	3.36	-11.78	52.03	MaxP	Vertical	199	330	74.0	-22.0	Pass
7	9279.00	55.65	5.36	-7.13	53.88	MaxP	Horizontal	150	300	74.0	-20.1	Pass
8	17558.00	49.59	7.61	-0.45	56.75	MaxP	Vertical	150	0	74.0	-17.3	Pass

Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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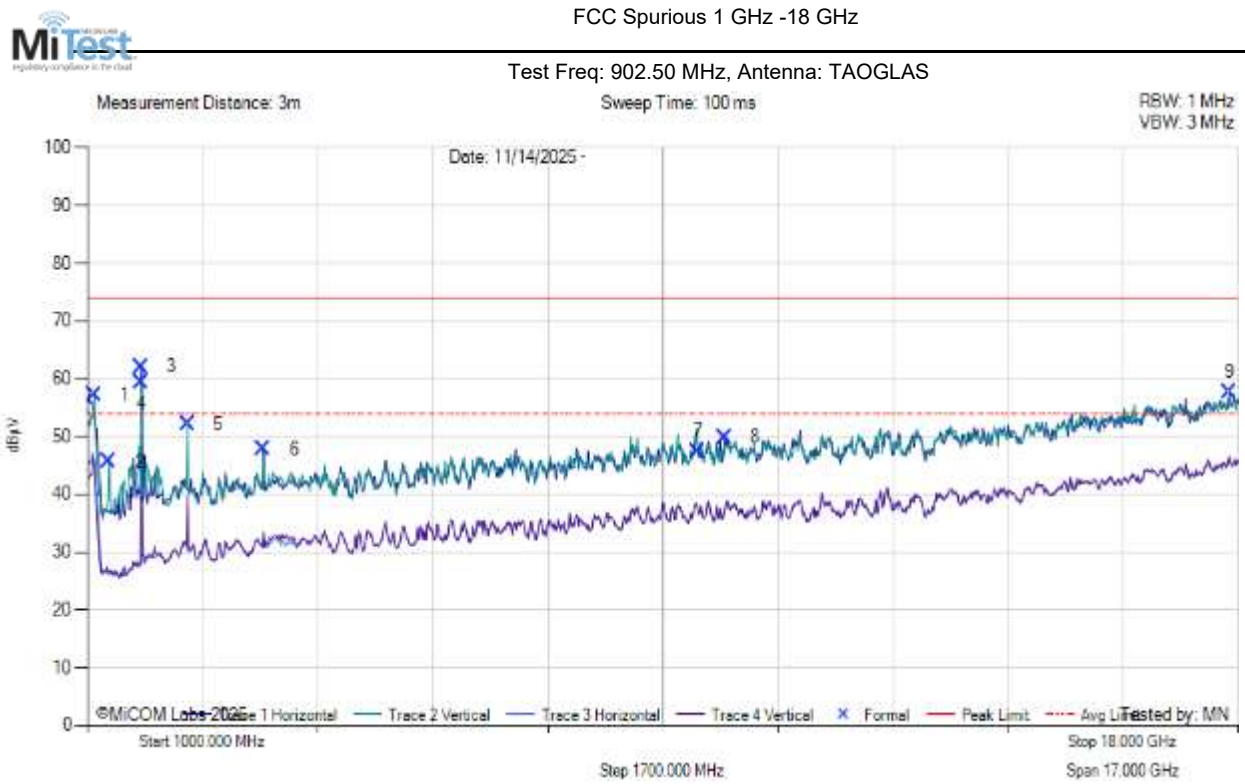
A.4.2.3.5.2 TAOGLAS 110kbps



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	1102.00	72.44	2.21	-17.53	57.12	MaxP	Vertical	149	330	74.0	-16.9	Pass
2	1323.00	59.51	2.33	-16.21	45.63	MaxP	Vertical	150	0	74.0	-28.4	Pass
3	1799.00	74.06	2.65	-14.67	62.04	MaxP	Horizontal	199	30	74.0	-12.0	Pass
4	1799.00	71.28	2.65	-14.67	59.26	MaxP	Vertical	149	330	74.0	-14.7	Pass
5	2479.00	60.76	3.06	-11.72	52.10	MaxP	Vertical	199	330	74.0	-21.9	Pass
6	3601.00	56.37	3.33	-11.85	47.85	MaxP	Horizontal	149	210	74.0	-26.2	Pass
7	10010.00	46.91	5.65	-5.12	47.44	MaxP	Vertical	199	330	74.0	-26.6	Pass
8	10418.00	48.52	5.93	-4.63	49.82	MaxP	Horizontal	149	180	74.0	-24.2	Pass
9	17864.00	48.50	7.77	1.31	57.59	MaxP	Horizontal	149	180	74.0	-16.4	Pass

Test Notes: 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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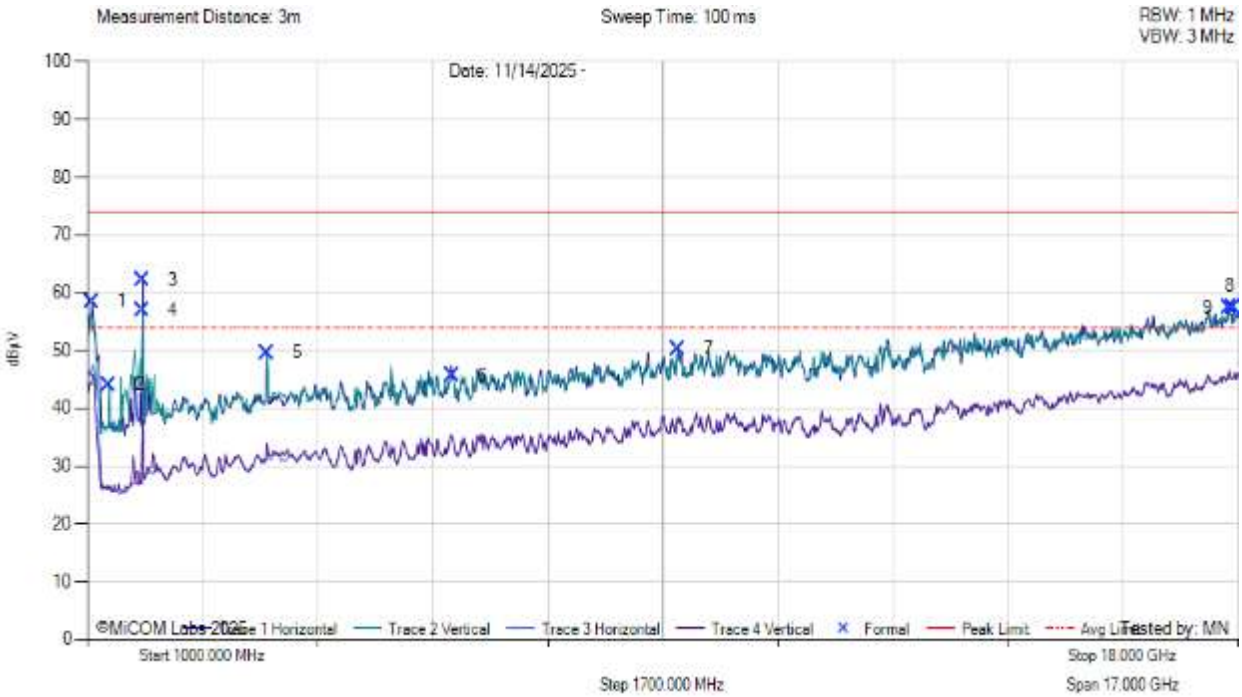
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: TAOGLAS



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	1068.00	73.87	2.14	-17.55	58.47	MaxP	Horizontal	149	120	74.0	-15.5	Pass
2	1323.00	58.02	2.33	-16.21	44.14	MaxP	Vertical	199	269	74.0	-29.9	Pass
3	1816.00	73.99	2.66	-14.49	62.15	MaxP	Horizontal	149	60	74.0	-11.8	Pass
4	1816.00	68.73	2.66	-14.49	56.90	MaxP	Vertical	149	330	74.0	-17.1	Pass
5	3652.00	58.16	3.34	-11.91	49.60	MaxP	Horizontal	149	330	74.0	-24.4	Pass
6	6389.00	49.86	4.25	-8.48	45.62	MaxP	Horizontal	149	90	74.0	-28.4	Pass
7	9721.00	50.79	5.53	-5.98	50.34	MaxP	Vertical	149	179	74.0	-23.7	Pass
8	17864.00	48.43	7.77	1.31	57.52	MaxP	Vertical	149	209	74.0	-16.5	Pass
9	17932.00	48.27	8.07	1.02	57.36	MaxP	Horizontal	149	210	74.0	-16.6	Pass

Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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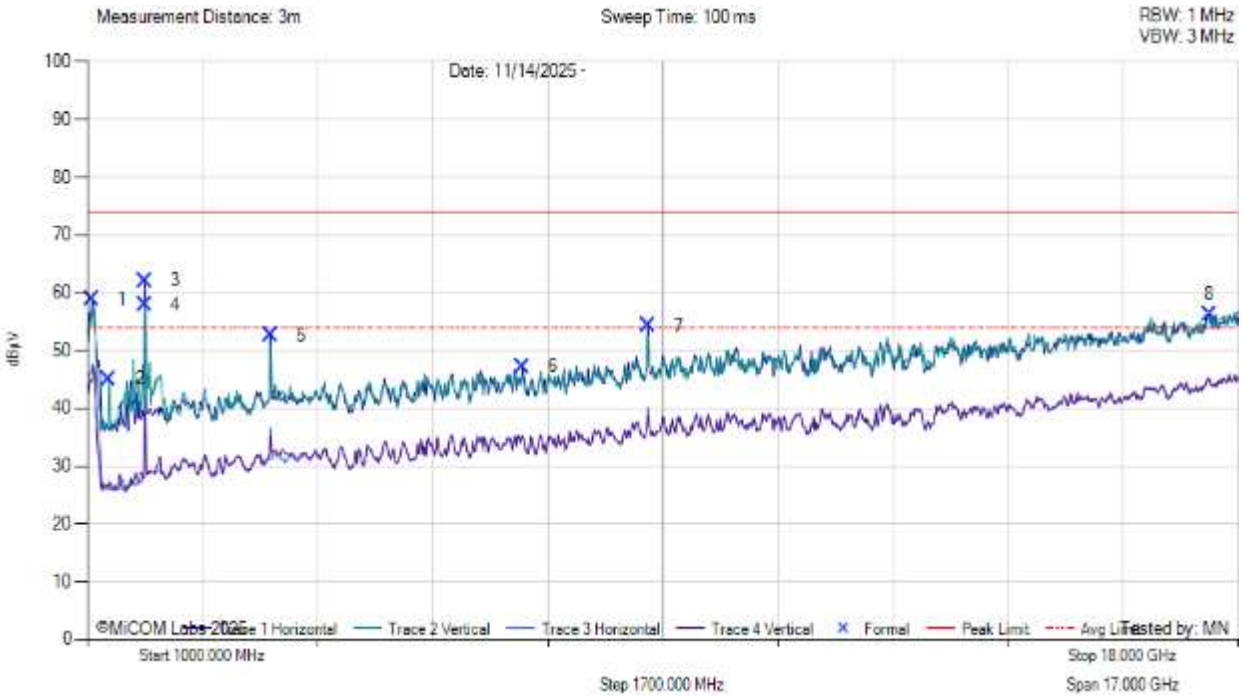
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: TAOGLAS



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	1068.00	74.18	2.14	-17.55	58.78	MaxP	Horizontal	150	120	74.0	-15.2	Pass
2	1323.00	59.00	2.33	-16.21	45.11	MaxP	Vertical	199	119	74.0	-28.9	Pass
3	1850.00	73.83	2.66	-14.40	62.10	MaxP	Horizontal	150	60	74.0	-11.9	Pass
4	1850.00	69.66	2.66	-14.40	57.92	MaxP	Vertical	150	330	74.0	-16.1	Pass
5	3703.00	61.11	3.36	-11.78	52.68	MaxP	Horizontal	150	60	74.0	-21.3	Pass
6	7426.00	50.30	4.63	-7.66	47.27	MaxP	Horizontal	150	300	74.0	-26.7	Pass
7	9279.00	56.04	5.36	-7.13	54.27	MaxP	Horizontal	150	120	74.0	-19.7	Pass
8	17575.00	49.15	7.50	-0.45	56.19	MaxP	Vertical	150	149	74.0	-17.8	Pass

Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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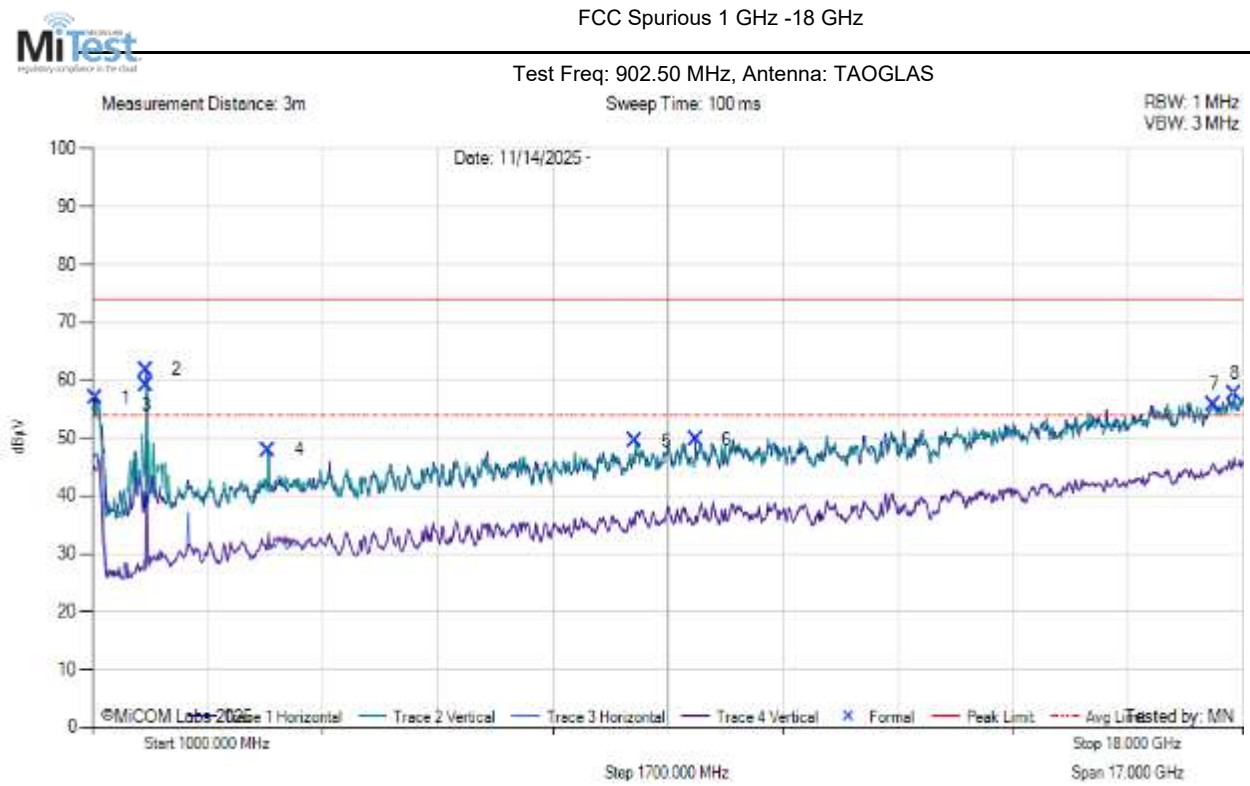
A.4.2.3.5.3 TAOGLAS 250kbps



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	1051.00	72.29	2.18	-17.55	56.93	MaxP	Horizontal	150	270	74.0	-17.1	Pass
2	1799.00	73.91	2.65	-14.67	61.89	MaxP	Horizontal	199	30	74.0	-12.1	Pass
3	1799.00	71.24	2.65	-14.67	59.22	MaxP	Vertical	150	330	74.0	-14.8	Pass
4	3601.00	56.46	3.33	-11.85	47.94	MaxP	Horizontal	150	210	74.0	-26.1	Pass
5	9024.00	51.63	5.25	-7.33	49.56	MaxP	Vertical	199	90	74.0	-24.4	Pass
6	9908.00	49.72	5.71	-5.67	49.77	MaxP	Horizontal	199	0	74.0	-24.2	Pass
7	17558.00	48.50	7.61	-0.45	55.66	MaxP	Vertical	199	0	74.0	-18.3	Pass
8	17864.00	48.53	7.77	1.31	57.62	MaxP	Horizontal	199	0	74.0	-16.4	Pass

Test Notes: 902.50 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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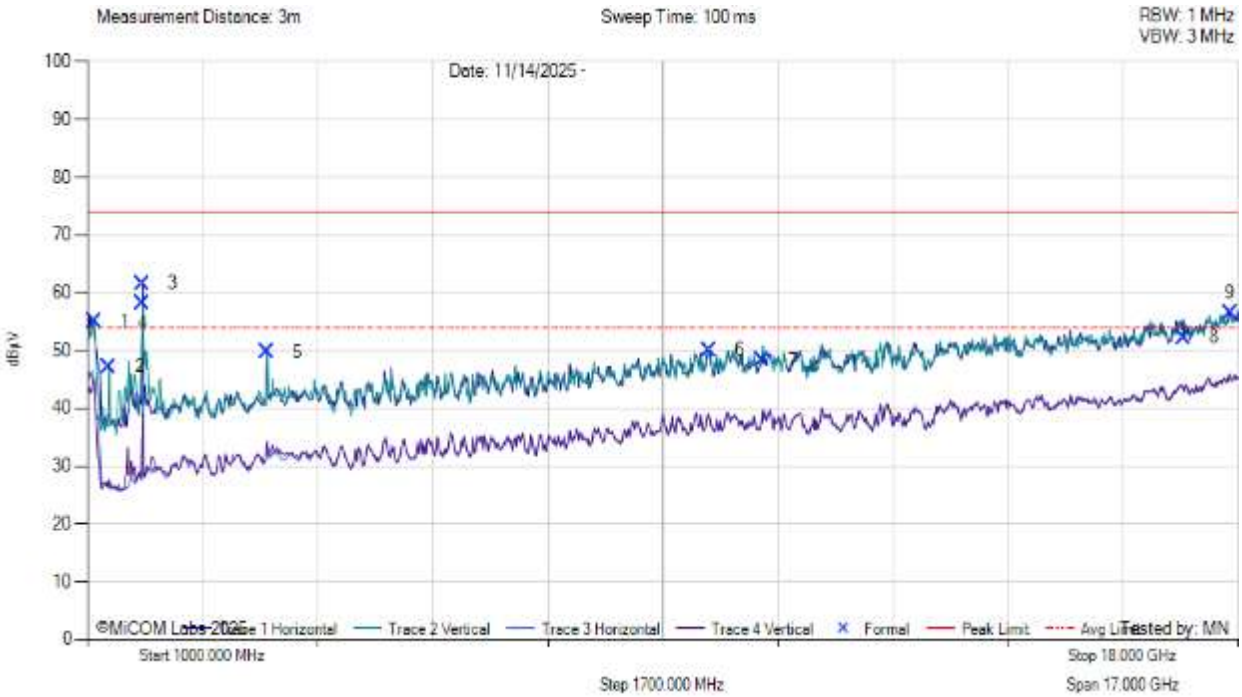
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: TAOGLAS



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	1102.00	70.4	2.21	-17.53	55.08	MaxP	Vertical	150	330	74.0	-18.9	Pass
2	1323.00	61.07	2.33	-16.21	47.19	MaxP	Vertical	199	270	74.0	-26.8	Pass
3	1816.00	73.46	2.66	-14.49	61.63	MaxP	Horizontal	150	60	74.0	-12.4	Pass
4	1816.00	70.07	2.66	-14.49	58.24	MaxP	Vertical	150	330	74.0	-15.8	Pass
5	3652.00	58.3	3.34	-11.91	49.73	MaxP	Vertical	150	330	74.0	-24.3	Pass
6	10180.00	49.86	5.54	-5.34	50.06	MaxP	Horizontal	150	300	74.0	-23.9	Pass
7	10962.00	47.46	5.91	-5.11	48.27	MaxP	Vertical	150	119	74.0	-25.7	Pass
8	17201.00	44.76	7.13	0.35	52.24	MaxP	Horizontal	150	270	74.0	-21.8	Pass
9	17881.00	46.97	8.07	1.46	56.51	MaxP	Vertical	150	89	74.0	-17.5	Pass

Test Notes: 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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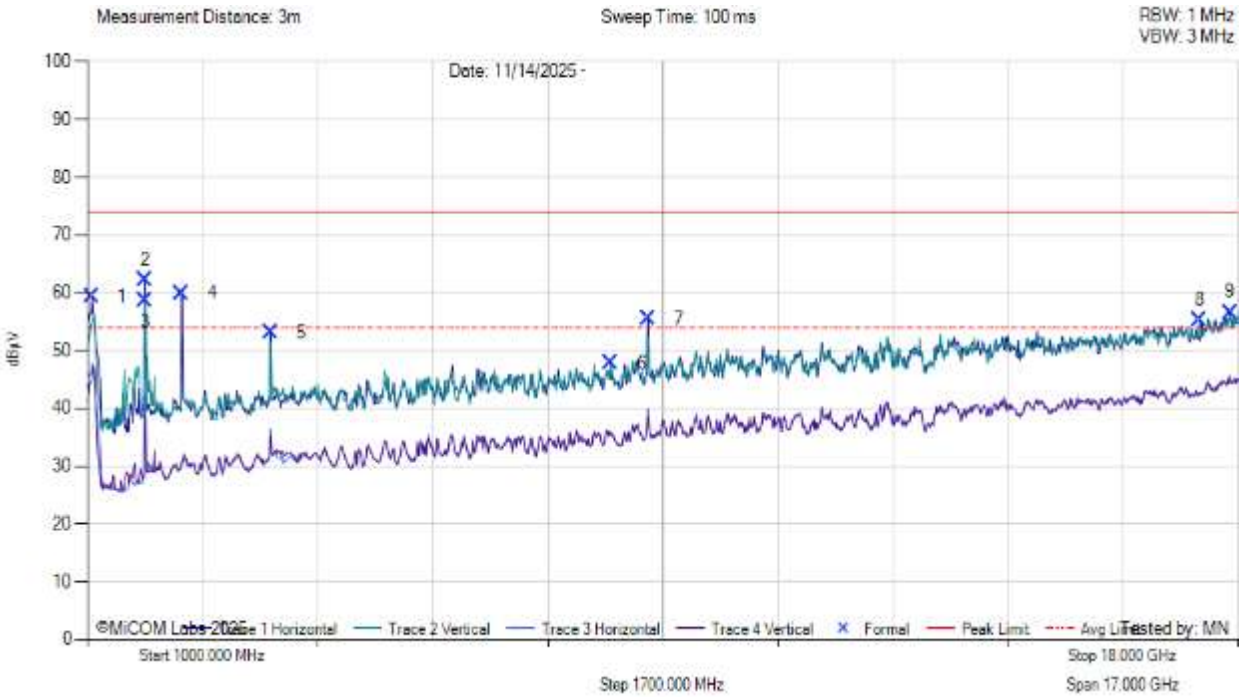
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: TAOGLAS



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	1068.00	74.75	2.14	-17.55	59.35	MaxP	Horizontal	150	120	74.0	-14.7	Pass
2	1850.00	73.89	2.66	-14.40	62.15	MaxP	Horizontal	150	60	74.0	-11.9	Pass
3	1850.00	70.41	2.66	-14.40	58.67	MaxP	Horizontal	1900	0	74.0	-15.3	Pass
4	2394.00	69.02	3.02	-12.11	59.93	MaxP	Horizontal	199	0	74.0	-14.1	Pass
5	3703.00	61.52	3.36	-11.78	53.10	MaxP	Horizontal	150	60	74.0	-20.9	Pass
6	8735.00	50.84	5.39	-8.38	47.85	MaxP	Vertical	150	300	74.0	-26.2	Pass
7	9279.00	57.23	5.36	-7.13	55.46	MaxP	Horizontal	150	300	74.0	-18.5	Pass
8	17422.00	48.13	7.48	-0.36	55.25	MaxP	Vertical	150	239	74.0	-18.8	Pass
9	17881.00	47.02	8.07	1.46	56.55	MaxP	Horizontal	150	270	74.0	-17.5	Pass

Test Notes: 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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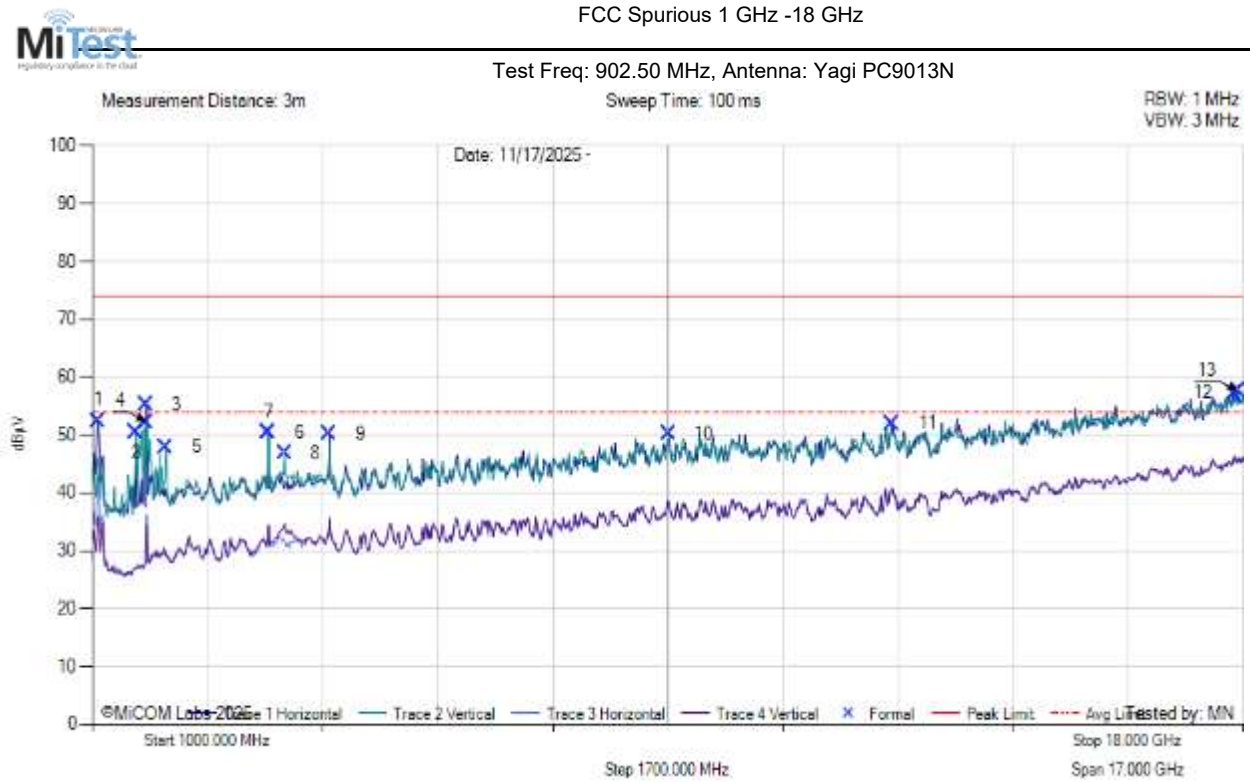
A.4.2.3.6 Yagi / TE connectivity (PC9013N)



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	1085.00	67.90	2.19	-17.56	52.54	MaxP	Horizontal	150	150	74.0	-21.5	Pass
2	1646.00	64.28	2.52	-16.24	50.56	MaxP	Vertical	199	119	74.0	-23.4	Pass
3	1799.00	67.20	2.65	-14.67	55.18	MaxP	Horizontal	150	180	74.0	-18.8	Pass
4	1799.00	64.27	2.65	-14.67	52.25	MaxP	Vertical	199	29	74.0	-21.7	Pass
5	2088.00	58.24	2.78	-13.07	47.94	MaxP	Vertical	199	179	74.0	-26.1	Pass
6	3601.00	58.96	3.33	-11.85	50.44	MaxP	Vertical	199	0	74.0	-23.6	Pass
7	3601.00	59.00	3.33	-11.85	50.48	MaxP	Horizontal	150	210	74.0	-23.5	Pass
8	3839.00	55.09	3.40	-11.65	46.84	MaxP	Vertical	150	209	74.0	-27.2	Pass
9	4502.00	58.58	3.69	-12.01	50.27	MaxP	Horizontal	150	210	74.0	-23.7	Pass
10	9517.00	51.00	5.39	-6.19	50.20	MaxP	Vertical	199	270	74.0	-23.8	Pass
11	12815.00	54.19	6.27	-8.44	52.02	MaxP	Horizontal	199	150	74.0	-22.0	Pass
12	17864.00	48.19	7.77	1.31	57.28	MaxP	Vertical	199	330	74.0	-16.7	Pass
13	17915.00	48.62	7.75	1.20	57.58	MaxP	Horizontal	199	30	74.0	-16.4	Pass

Test Notes: Yagi PC9013N antenna. 902.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. Yagi PC9013N antenna used

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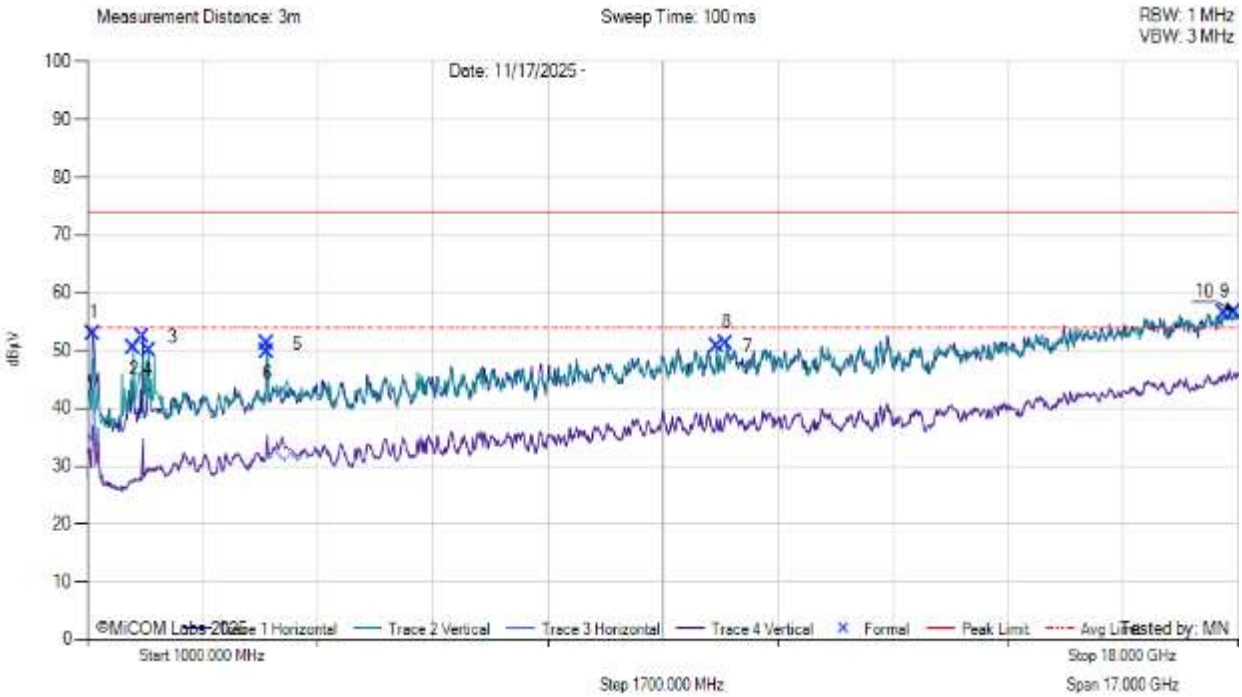
FCC Spurious 1 GHz -18 GHz

Test Freq: 915.00 MHz, Antenna: Yagi PC9013N



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	1085.00	68.32	2.19	-17.56	52.95	MaxP	Horizontal	150	150	74.0	-21.0	Pass
2	1680.00	63.68	2.55	-15.85	50.39	MaxP	Vertical	199	119	74.0	-23.6	Pass
3	1816.00	64.25	2.66	-14.49	52.41	MaxP	Horizontal	150	180	74.0	-21.6	Pass
4	1901.00	61.27	2.68	-13.86	50.09	MaxP	Vertical	199	209	74.0	-23.9	Pass
5	3652.00	59.67	3.34	-11.91	51.11	MaxP	Horizontal	199	210	74.0	-22.9	Pass
6	3652.00	58.23	3.34	-11.91	49.67	MaxP	Vertical	199	0	74.0	-24.3	Pass
7	10299.00	50.27	5.70	-5.33	50.64	MaxP	Horizontal	199	240	74.0	-23.4	Pass
8	10435.00	50.07	5.72	-4.50	51.29	MaxP	Vertical	150	269	74.0	-22.7	Pass
9	17796.00	47.90	7.72	0.95	56.58	MaxP	Vertical	199	89	74.0	-17.4	Pass
10	17949.00	47.85	8.05	0.80	56.71	MaxP	Horizontal	199	240	74.0	-17.3	Pass

Test Notes: Yagi PC9013N antenna. 915 MHz 3.3V PS, PS under the table, laptop is next to the unit. Yagi PC9013N antenna used

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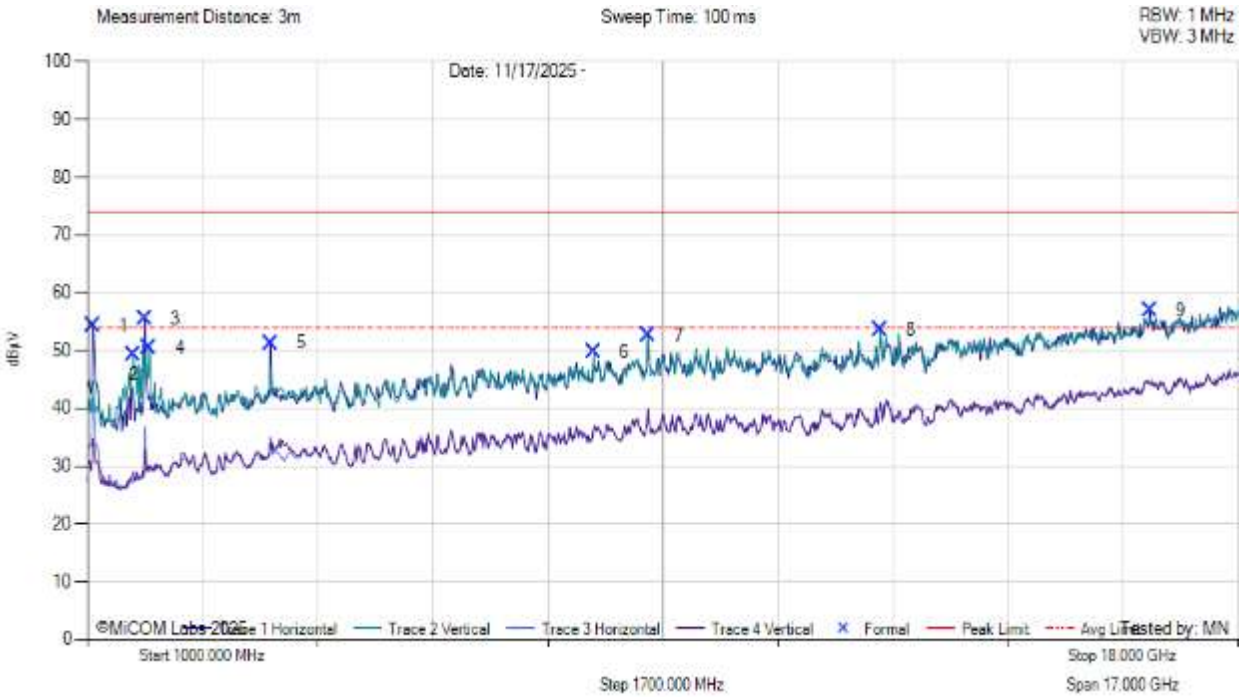
FCC Spurious 1 GHz -18 GHz

Test Freq: 927.50 MHz, Antenna: Yagi PC90`3N



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	1085.00	69.61	2.19	-17.56	54.25	MaxP	Horizontal	150	150	74.0	-19.8	Pass
2	1680.00	62.63	2.55	-15.85	49.34	MaxP	Vertical	150	269	74.0	-24.7	Pass
3	1850.00	67.23	2.66	-14.40	55.49	MaxP	Horizontal	199	150	74.0	-18.5	Pass
4	1918.00	61.61	2.67	-13.81	50.47	MaxP	Vertical	150	209	74.0	-23.5	Pass
5	3703.00	59.70	3.36	-11.78	51.27	MaxP	Horizontal	199	180	74.0	-22.7	Pass
6	8480.00	52.35	5.33	-7.90	49.78	MaxP	Vertical	150	299	74.0	-24.2	Pass
7	9279.00	54.39	5.36	-7.13	52.62	MaxP	Vertical	150	29	74.0	-21.4	Pass
8	12713.00	55.28	6.14	-7.84	53.59	MaxP	Vertical	199	209	74.0	-20.4	Pass
9	16691.00	49.99	7.00	-0.10	56.89	MaxP	Horizontal	199	330	74.0	-17.1	Pass

Test Notes: Yagi PC9013N antenna. 927.5 MHz 3.3V PS, PS under the table, laptop is next to the unit. TAOGLAS antenna used

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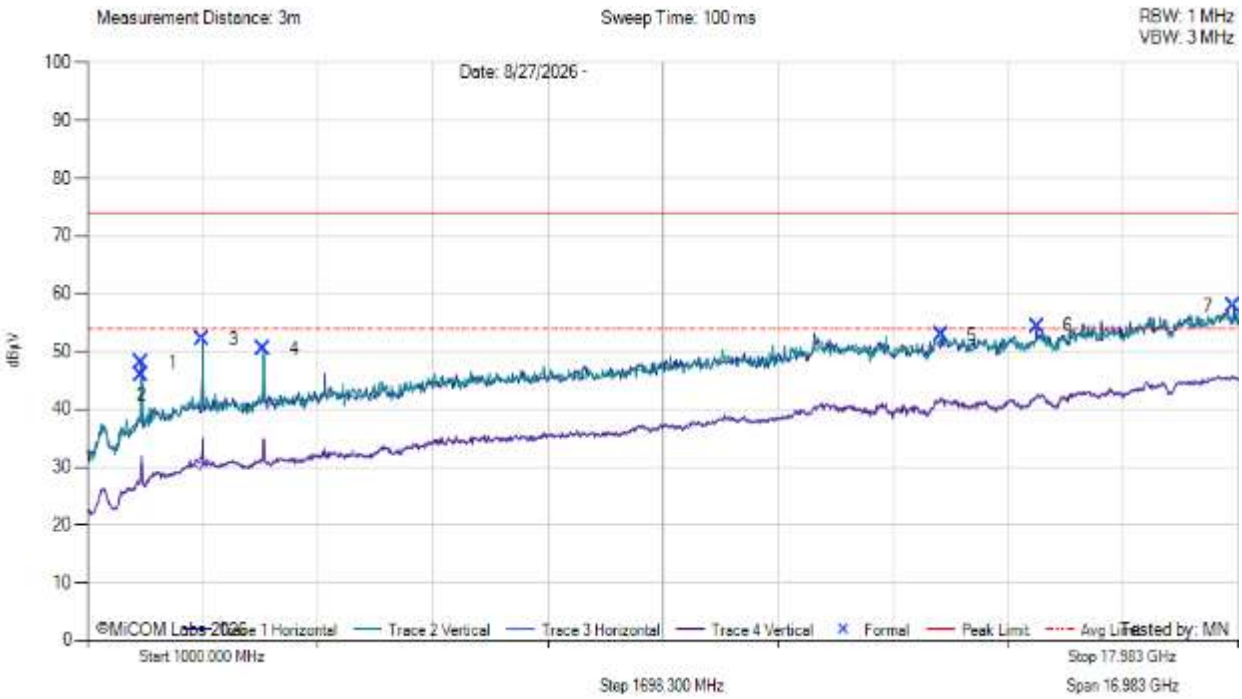
A.4.2.3.7 Ceramic / Chip / Meritek Antenna (AT503008915M)

FCC Spurious 1 GHz -18 GHz



1000.00 - 17983.00 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	59.70	2.97	-14.67	48.00	MaxP	Horizontal	149	60	74.0	-26.0	Pass
2	1799.00	57.73	2.97	-14.67	46.03	MaxP	Vertical	149	330	74.0	-28.0	Pass
3	2700.00	59.88	3.70	-11.49	52.09	MaxP	Vertical	149	330	74.0	-21.9	Pass
4	3601.00	57.95	4.31	-11.85	50.41	MaxP	Vertical	199	330	74.0	-23.6	Pass
5	13597.00	50.10	9.56	-6.84	52.82	MaxP	Vertical	199	0	74.0	-21.2	Pass
6	15008.00	48.66	9.43	-3.71	54.38	MaxP	Horizontal	199	240	74.0	-19.6	Pass
7	17915.00	45.87	10.85	1.20	57.92	MaxP	Horizontal	149	60	74.0	-16.1	Pass

Test Notes: Ceramic Antenna, 902.5MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.

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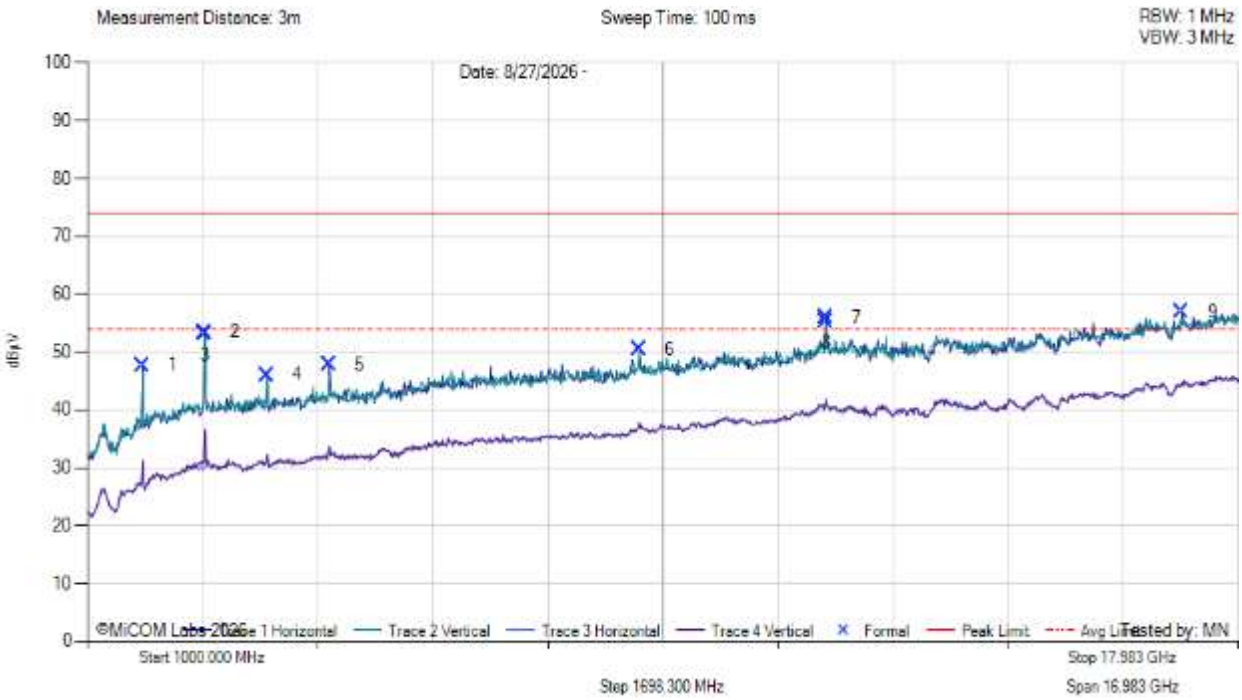
FCC Spurious 1 GHz -18 GHz



1000.00 - 17983.00 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	59.23	2.98	-14.49	47.72	MaxP	Horizontal	199	330	74.0	-26.3	Pass
2	2734.00	61.28	3.72	-11.54	53.45	MaxP	Horizontal	151	270	74.0	-20.5	Pass
3	2734.00	60.91	3.72	-11.54	53.08	MaxP	Vertical	199	270	74.0	-20.9	Pass
4	3652.00	53.43	4.37	-11.78	46.02	MaxP	Vertical	151	330	74.0	-28.0	Pass
5	4570.00	54.92	4.95	-12.12	47.75	MaxP	Horizontal	151	270	74.0	-26.2	Pass
6	9143.00	51.42	8.16	-9.08	50.50	MaxP	Vertical	151	330	74.0	-23.5	Pass
7	11897.00	52.04	9.35	-5.46	55.93	MaxP	Horizontal	151	60	74.0	-18.1	Pass
8	11897.00	51.33	9.35	-5.46	55.22	MaxP	Vertical	151	89	74.0	-18.8	Pass
9	17150.00	46.15	10.54	0.18	56.87	MaxP	Horizontal	199	210	74.0	-17.1	Pass

Test Notes: Ceramic Antenna, 915MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.

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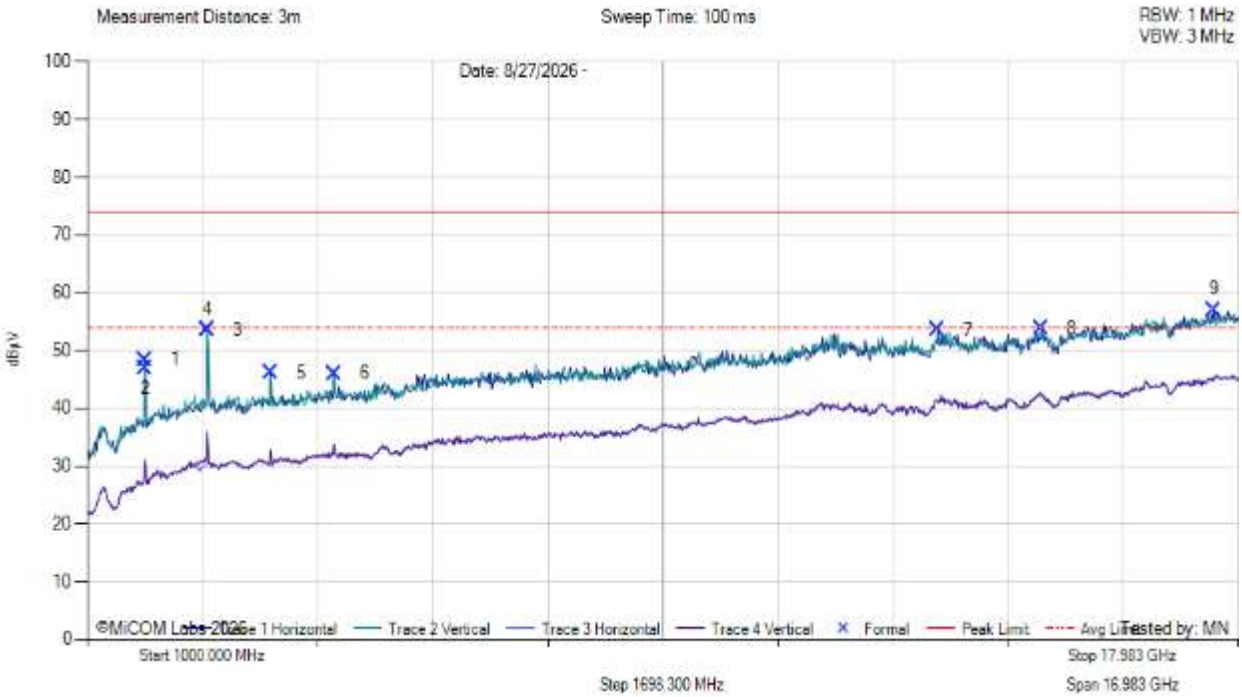
FCC Spurious 1 GHz -18 GHz



1000.00 - 17983.00 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	59.77	3.02	-14.40	48.38	MaxP	Horizontal	150	210	74.0	-25.6	Pass
2	1850.00	58.33	3.02	-14.40	46.95	MaxP	Vertical	150	330	74.0	-27.1	Pass
3	2768.00	61.36	3.74	-11.48	53.62	MaxP	Vertical	150	330	74.0	-20.4	Pass
4	2768.00	61.32	3.74	-11.48	53.57	MaxP	Horizontal	150	330	74.0	-20.4	Pass
5	3703.00	53.53	4.37	-11.78	46.12	MaxP	Horizontal	150	330	74.0	-27.9	Pass
6	4638.00	53.21	4.95	-12.12	46.04	MaxP	Vertical	150	330	74.0	-28.0	Pass
7	13546.00	51.08	9.49	-7.00	53.57	MaxP	Horizontal	199	120	74.0	-20.4	Pass
8	15076.00	47.84	9.47	-3.48	53.83	MaxP	Vertical	150	89	74.0	-20.2	Pass
9	17626.00	46.55	10.89	-0.37	57.06	MaxP	Horizontal	150	330	74.0	-16.9	Pass

Test Notes: Ceramic Antenna, 927.5MHz. 3.3V, 10 kbps, PS is on the table and laptop is on the table.

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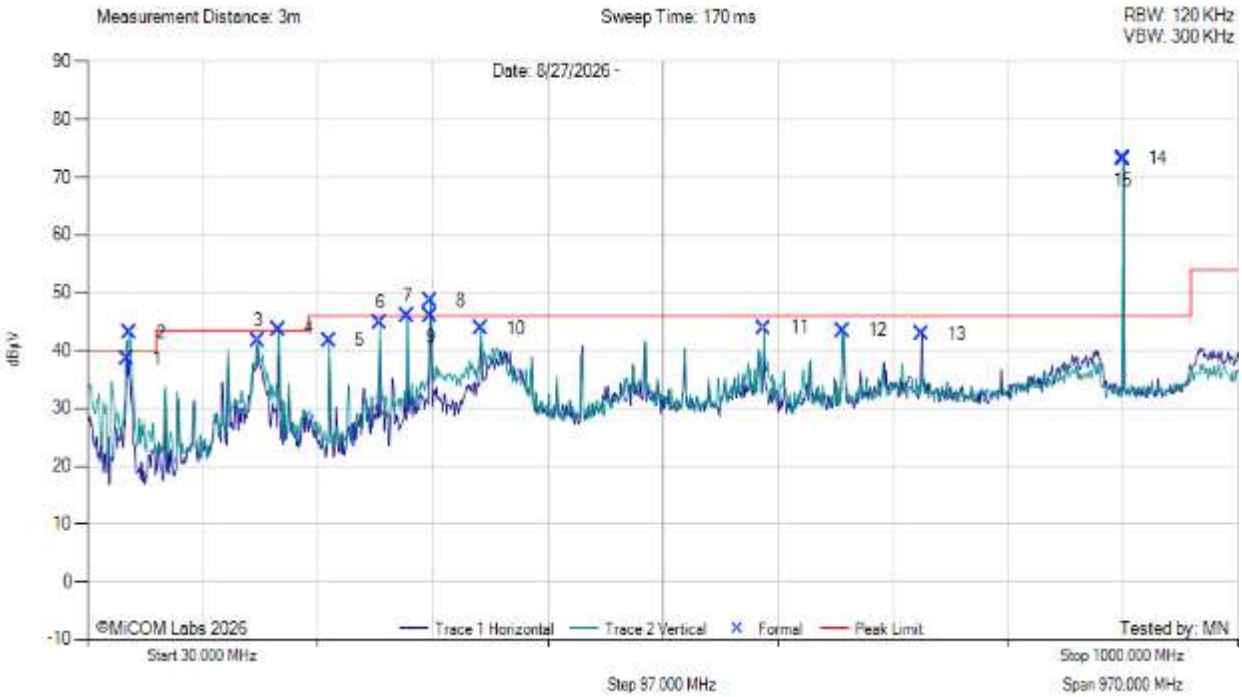
30 MHz to 1 GHz



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	62.98	52.03	4.15	-17.61	38.57	MaxP	Horizontal	100	0	40.0	-1.4	Pass
2	65.89	56.50	4.17	-17.63	43.04	NRB	Vertical	100	209	--	--	Pass
3	173.56	51.23	4.66	-14.27	41.61	MaxP	Vertical	100	59	43.5	-1.9	Pass
4	191.02	53.10	4.75	-14.19	43.66	NRB	Vertical	100	149	--	--	Pass
5	233.70	50.64	4.90	-13.80	41.75	MaxP	Vertical	100	239	46.0	-4.3	Pass
6	276.38	51.68	5.07	-11.90	44.85	MaxP	Vertical	100	149	46.0	-1.1	Pass
7	299.66	52.69	5.19	-11.94	45.94	MaxP	Vertical	100	179	46.0	-0.1	Pass
8	319.06	54.81	5.25	-11.48	48.58	NRB	Vertical	100	299	--	--	Pass
9	319.06	52.26	5.25	-11.48	46.03	NRB	Horizontal	100	0	--	--	Pass
10	361.74	48.76	5.42	-10.30	43.88	MaxP	Vertical	100	209	46.0	-2.1	Pass
11	600.36	44.11	6.25	-6.45	43.91	MaxP	Vertical	100	179	46.0	-2.1	Pass
12	666.32	42.29	6.54	-5.34	43.49	MaxP	Vertical	100	0	46.0	-2.5	Pass
13	733.25	40.47	6.77	-4.43	42.82	MaxP	Horizontal	199	120	46.0	-3.2	Pass
14	903.00	68.26	7.42	-2.45	73.23	Fundamental	Horizontal	100	330	--	--	Pass
15	903.00	68.04	7.42	-2.45	73.01	Fundamental	Vertical	100	330	--	--	Pass

Test Notes: Ceramic Antenna, 902.5MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.

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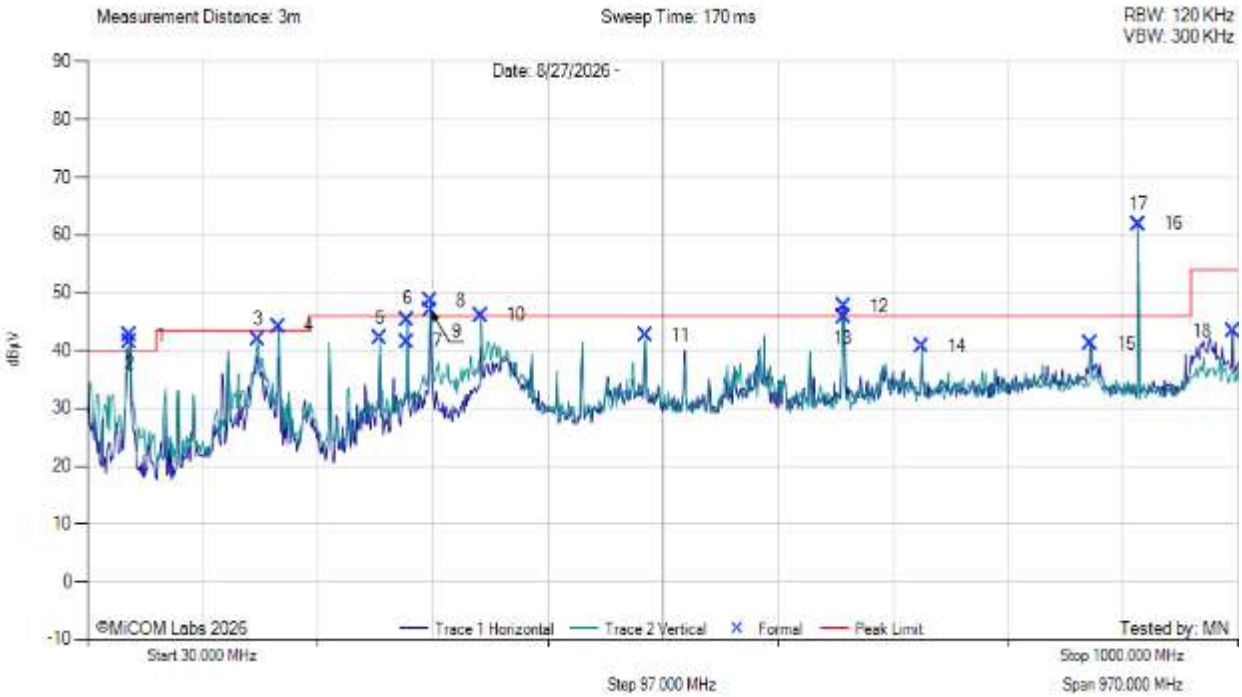
30 MHz to 1 GHz



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	65.89	56.04	4.17	-17.63	42.58	NRB	Horizontal	98	0	--	--	Pass
2	65.89	54.90	4.17	-17.63	41.44	NRB	Vertical	98	270	--	--	Pass
3	173.56	51.54	4.66	-14.27	41.93	MaxP	Vertical	98	89	43.5	-1.6	Pass
4	191.02	53.59	4.75	-14.19	44.15	NRB	Vertical	98	180	--	--	Pass
5	276.38	48.96	5.07	-11.90	42.13	MaxP	Vertical	98	149	46.0	-3.9	Pass
6	299.66	52.14	5.19	-11.94	45.40	MaxP	Vertical	98	180	46.0	-0.6	Pass
7	299.66	48.25	5.19	-11.94	41.50	MaxP	Horizontal	98	0	46.0	-4.5	Pass
8	319.06	54.89	5.25	-11.48	48.66	NRB	Vertical	98	299	--	--	Pass
9	319.06	53.21	5.25	-11.48	46.98	NRB	Horizontal	98	0	--	--	Pass
10	361.74	50.97	5.42	-10.30	46.09	NRB	Vertical	149	209	--	--	Pass
11	500.45	44.40	5.85	-7.64	42.61	MaxP	Vertical	98	0	46.0	-3.4	Pass
12	667.29	46.46	6.53	-5.35	47.64	NRB	Horizontal	149	300	--	--	Pass
13	667.29	44.55	6.53	-5.35	45.73	MaxP	Vertical	100	0	46.0	-0.3	Pass
14	733.25	38.39	6.77	-4.43	40.74	MaxP	Vertical	98	149	46.0	-5.3	Pass
15	875.84	36.56	7.35	-2.79	41.11	MaxP	Horizontal	149	150	46.0	-4.9	Pass
16	915.61	56.72	7.46	-2.30	61.88	Fundamental	Vertical	98	330	--	--	Pass
17	915.61	56.67	7.46	-2.30	61.83	Fundamental	Horizontal	98	330	--	--	Pass
18	995.15	37.18	7.57	-1.44	43.30	MaxP	Horizontal	149	90	54.0	-10.7	Pass

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Test Notes: Ceramic Antenna, 915MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.

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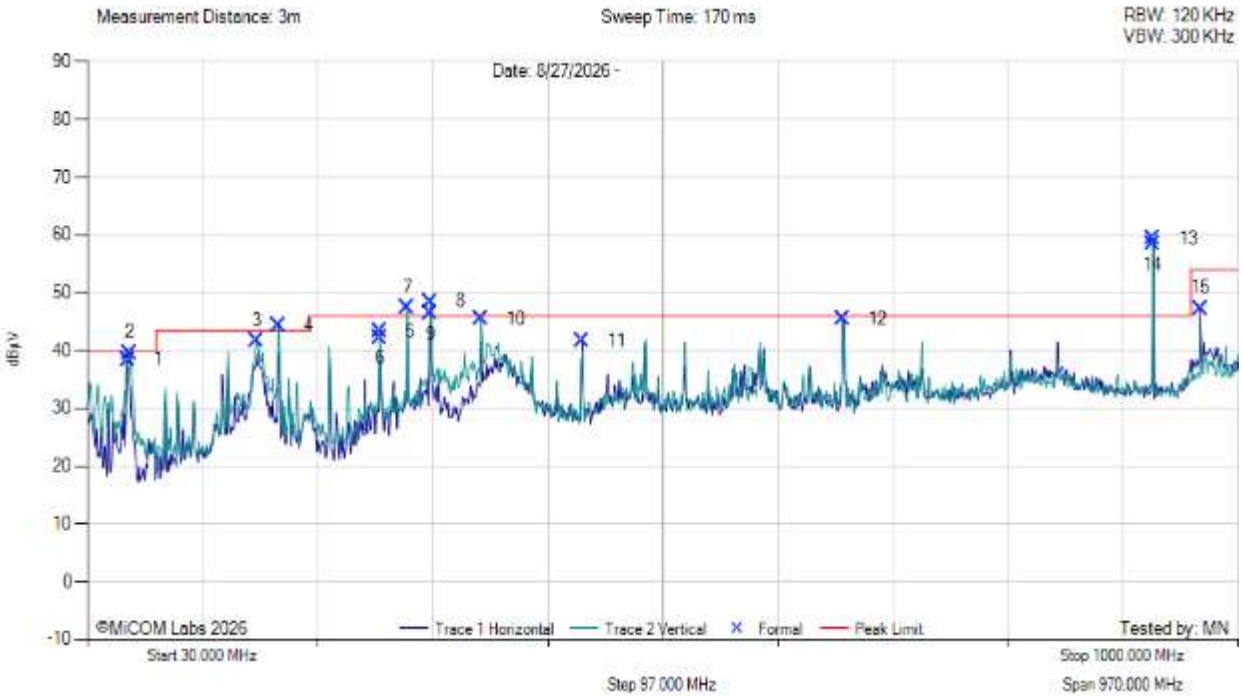
30 MHz to 1 GHz



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	63.95	51.90	4.17	-17.63	38.44	MaxP	Horizontal	98	0	40.0	-1.6	Pass
2	65.89	53.06	4.17	-17.63	39.59	MaxP	Vertical	98	29	40.0	-0.4	Pass
3	172.59	51.29	4.66	-14.22	41.73	MaxP	Vertical	98	89	43.5	-1.8	Pass
4	191.02	53.66	4.75	-14.19	44.22	NRB	Vertical	98	149	--	--	Pass
5	276.38	50.10	5.07	-11.90	43.27	MaxP	Vertical	98	149	46.0	-2.7	Pass
6	276.38	49.10	5.07	-11.90	42.27	MaxP	Horizontal	98	0	46.0	-3.7	Pass
7	299.66	54.19	5.19	-11.94	47.44	NRB	Vertical	98	179	--	--	Pass
8	319.06	54.68	5.25	-11.48	48.45	NRB	Vertical	98	299	--	--	Pass
9	319.06	52.67	5.25	-11.48	46.44	NRB	Horizontal	98	0	--	--	Pass
10	361.74	50.39	5.42	-10.30	45.51	MaxP	Vertical	149	209	46.0	-0.5	Pass
11	447.10	44.54	5.70	-8.52	41.72	MaxP	Horizontal	199	330	46.0	-4.3	Pass
12	666.32	45.85	6.11	-6.52	45.44	MaxP	Horizontal	98	0	46.0	-0.6	Pass
13	928.22	53.91	7.51	-2.06	59.36	Fundamental	Horizontal	149	90	--	--	Pass
14	928.22	52.96	7.51	-2.06	58.41	Fundamental	Vertical	199	0	--	--	Pass
15	967.99	41.42	7.54	-1.67	47.29	MaxP	Horizontal	98	60	54.0	-6.7	Pass

Test Notes: Ceramic Antenna, 927.5MHz. 3.3V, 10 kbps, PS is under the table and laptop is on the table.

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APPENDIX B - TEST SETUP PHOTOGRAPHS

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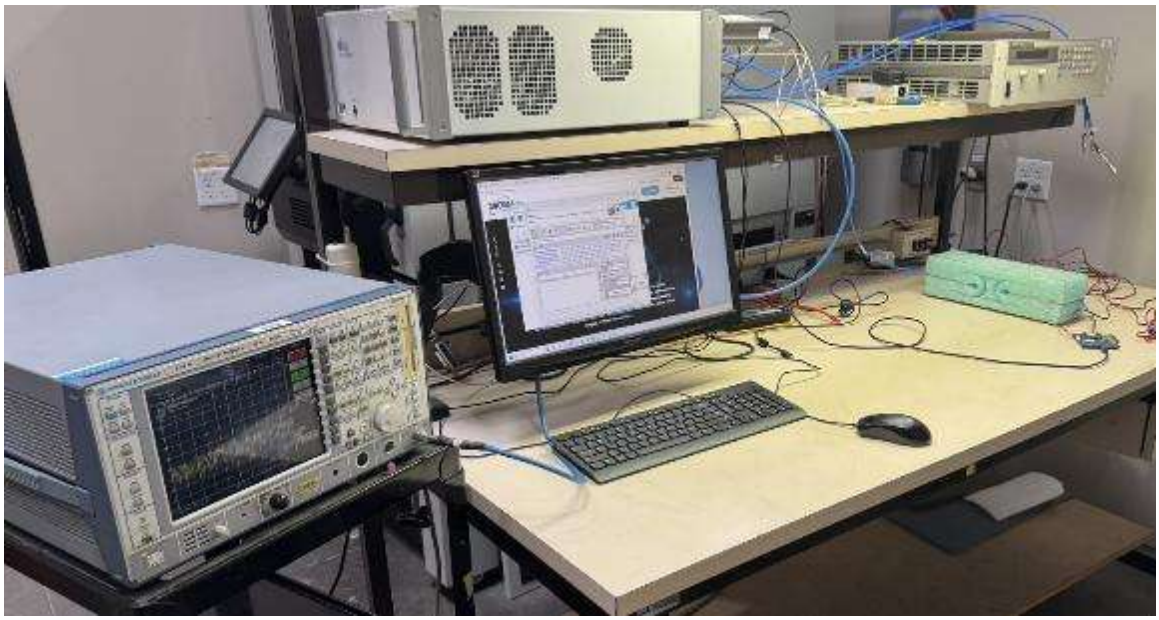
B.1 Conducted Test Setup



Conducted 900 MHz Test Setup

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B.2 Test Setup - Radiated Emissions - 3m Chamber TX Spurious,

RE#1 - Ceramic / Chip/ Meritek Antenna (AT503008915) with integral antennas

Model: XB3P-9XR-CMS-001
SN: 0013A2FFD89B89F4

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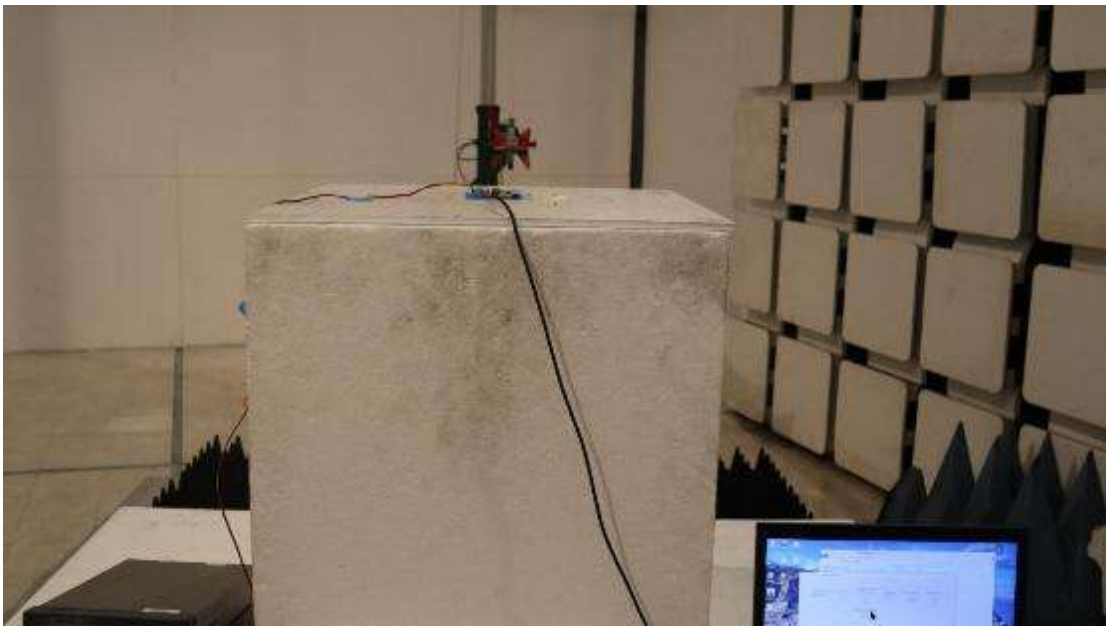
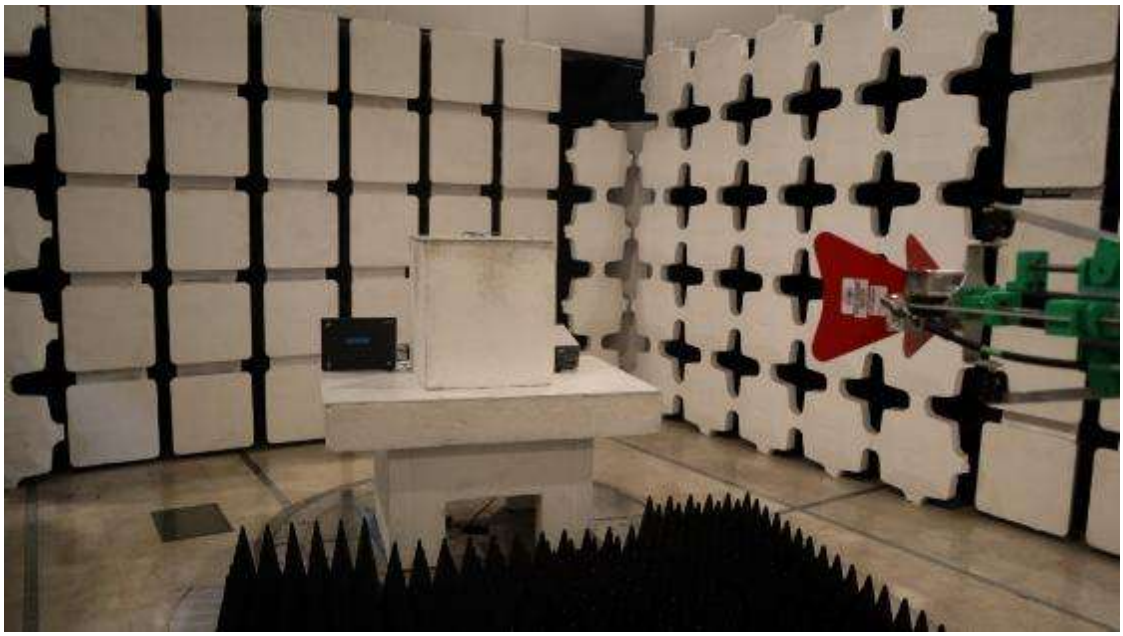


TX Spurious, Ceramic antenna (915MHz) used, Horizontal Front View



TX Spurious, Ceramic antenna (915MHz) used, Horizontal Front View

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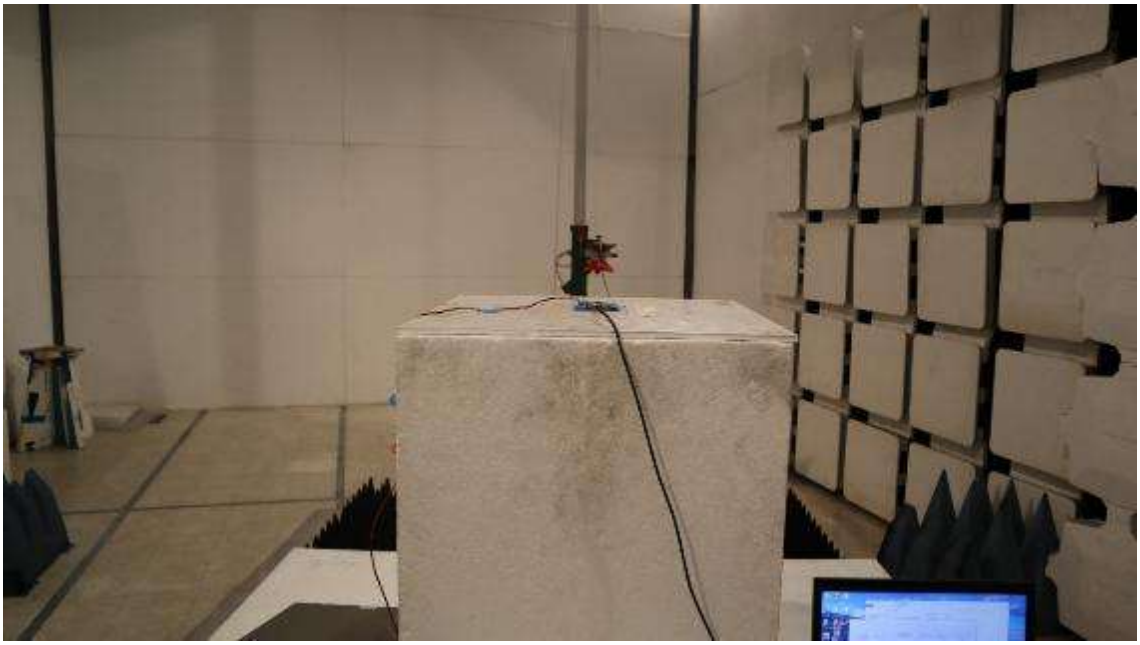
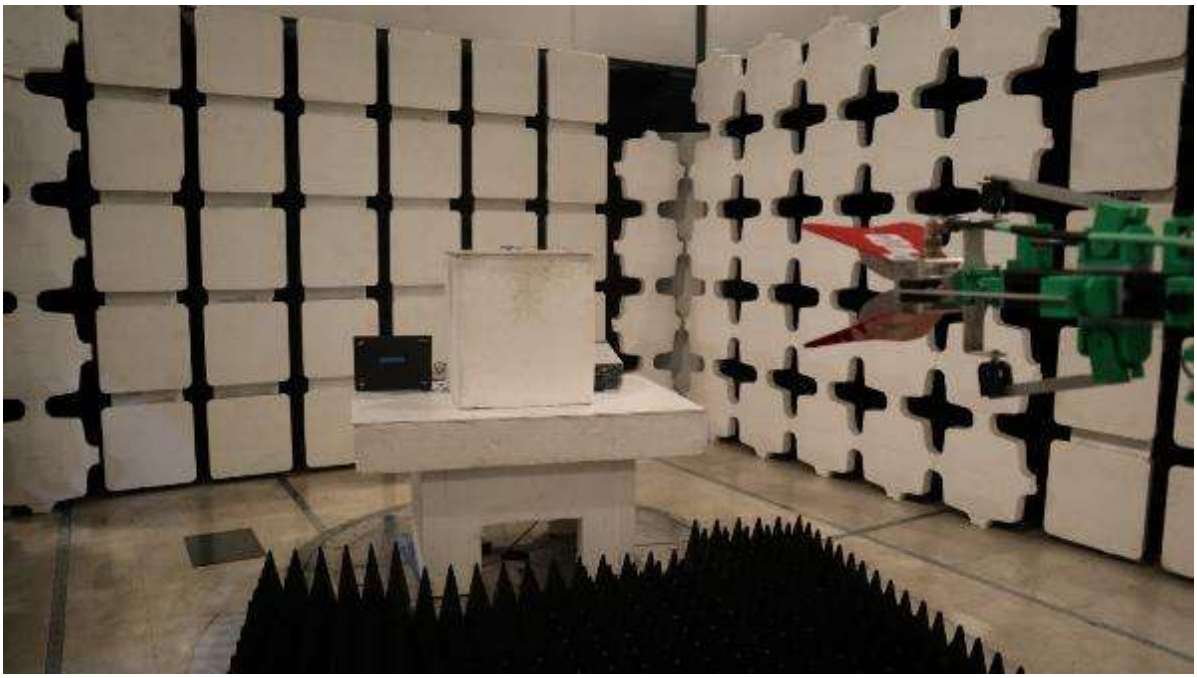


TX Spurious, Ceramic antenna (915MHz) used, Vertical Back View



TX Spurious, Ceramic antenna (915MHz) used, Vertical Front View

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RE#2 – Ceramic / Chip / Meritek Antenna (AT503008915M)

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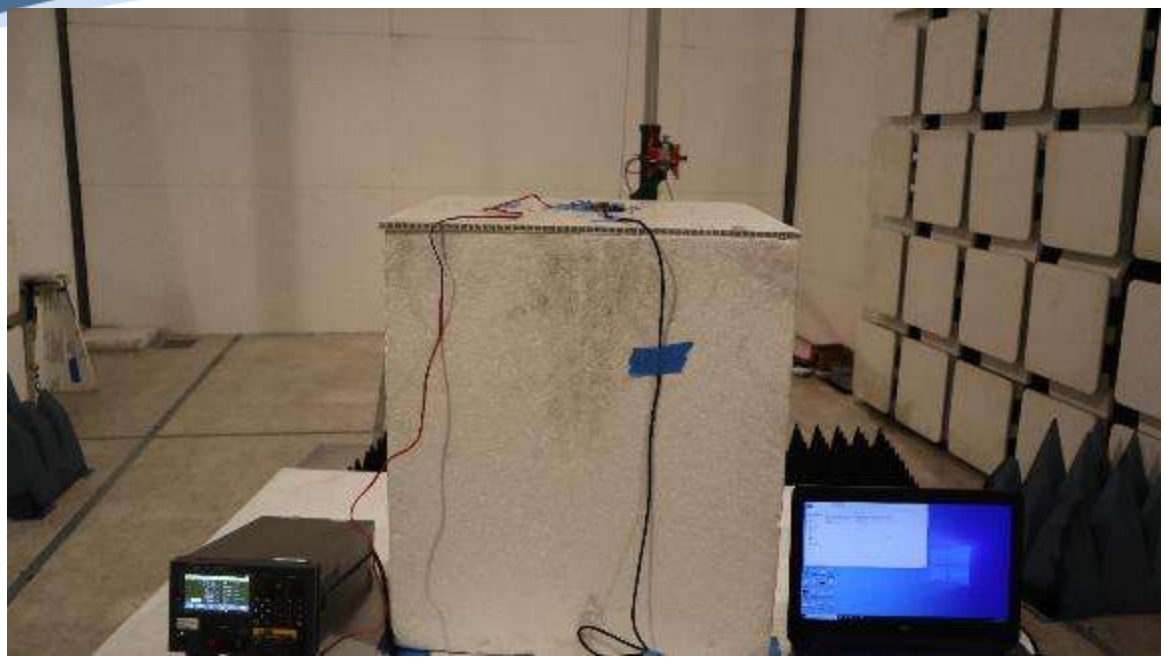
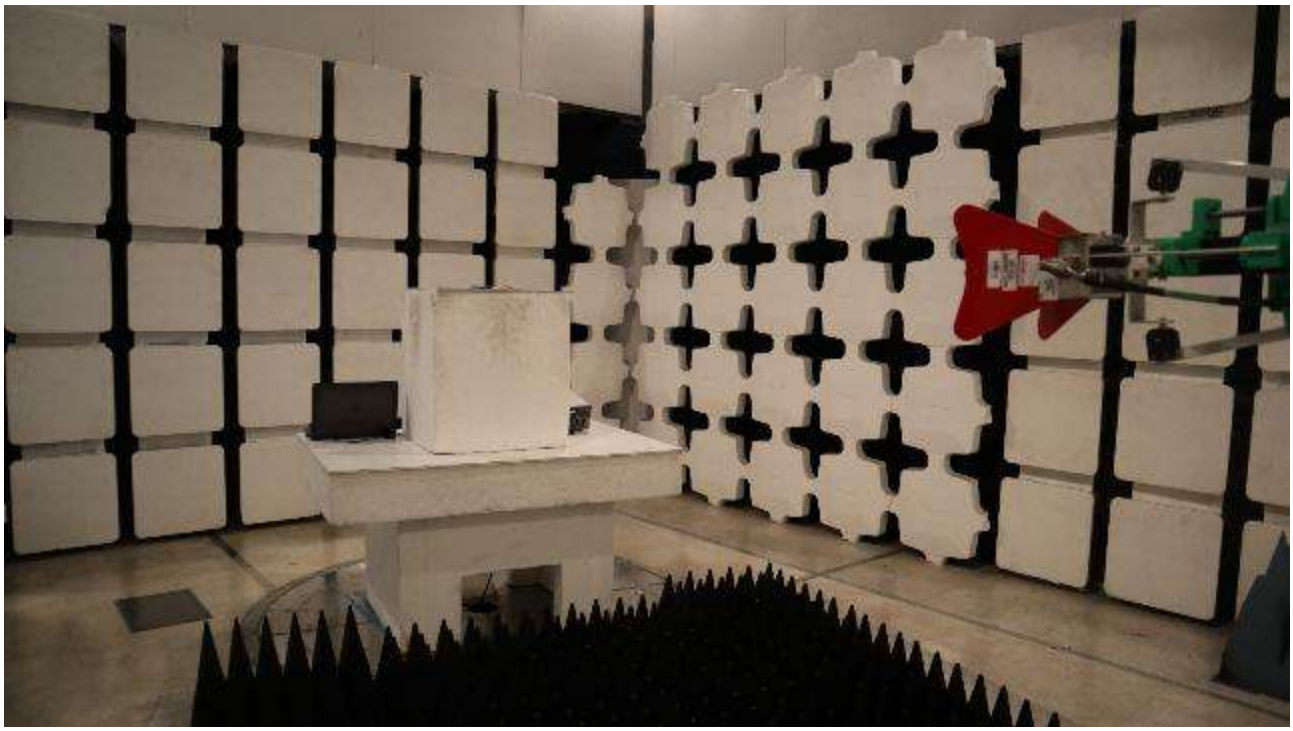


TX Spurious, Ceramic antenna (915MHz) used, Horizontal Front View



TX Spurious, Ceramic antenna (915MHz) used, Horizontal Back View

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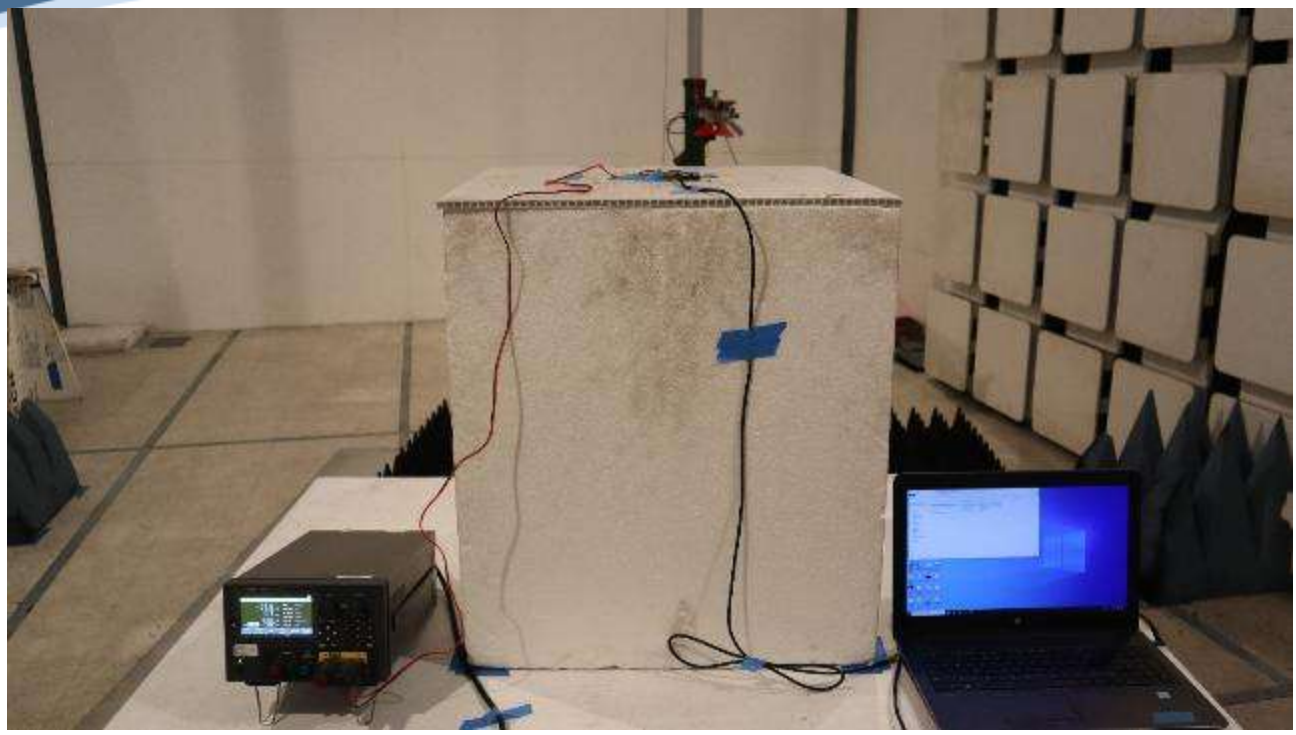
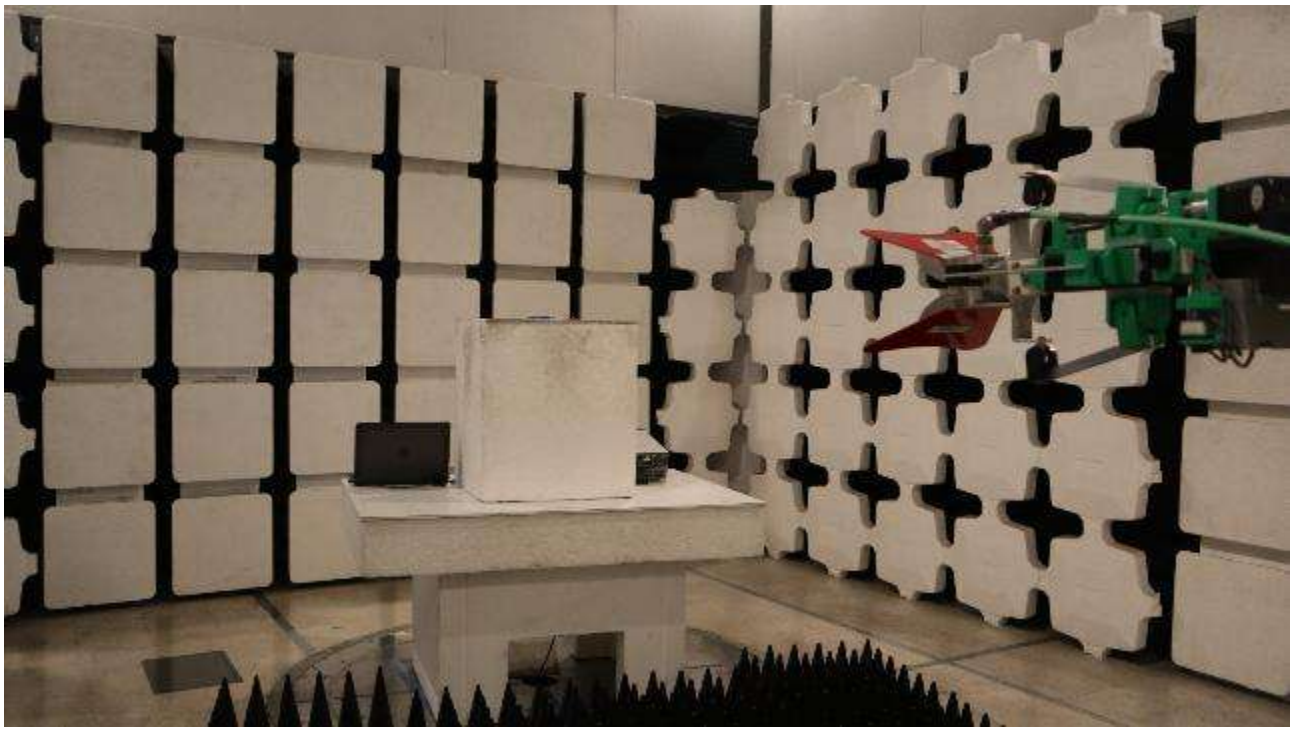


TX Spurious, Ceramic antenna (915MHz) used, Vertical Front View



TX Spurious, Ceramic antenna (915MHz) used, Vertical Back View

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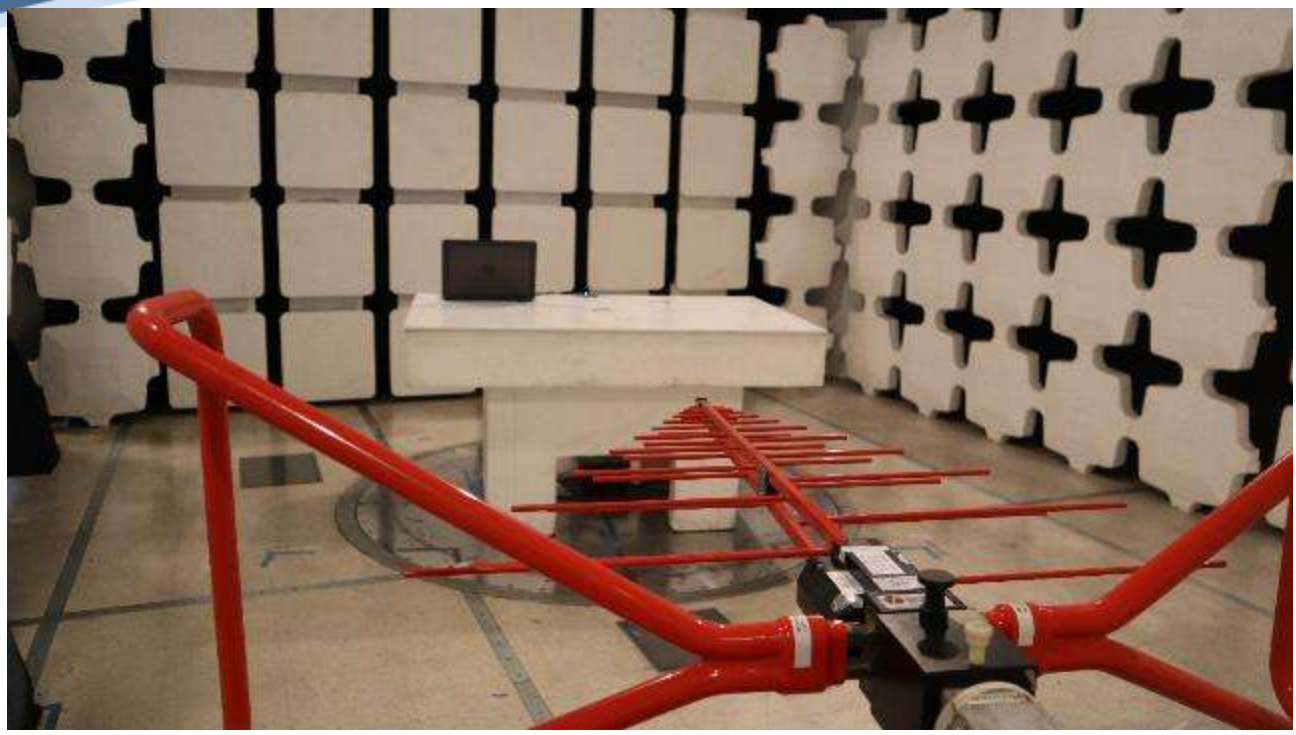
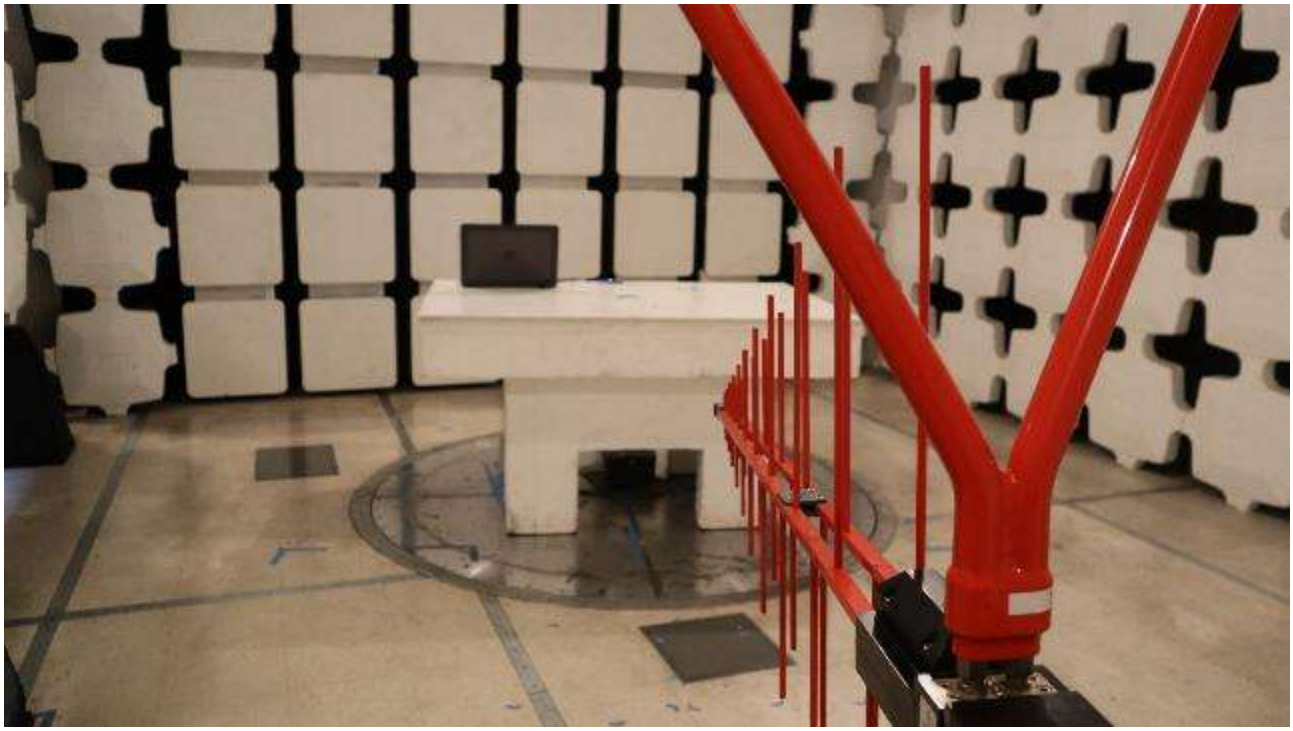


TX Spurious (30M-1G), Ceramic antenna (915MHz) used, Horizontal Back View



TX Spurious (30M-1G), Ceramic antenna (915MHz) used, Vertical Back View

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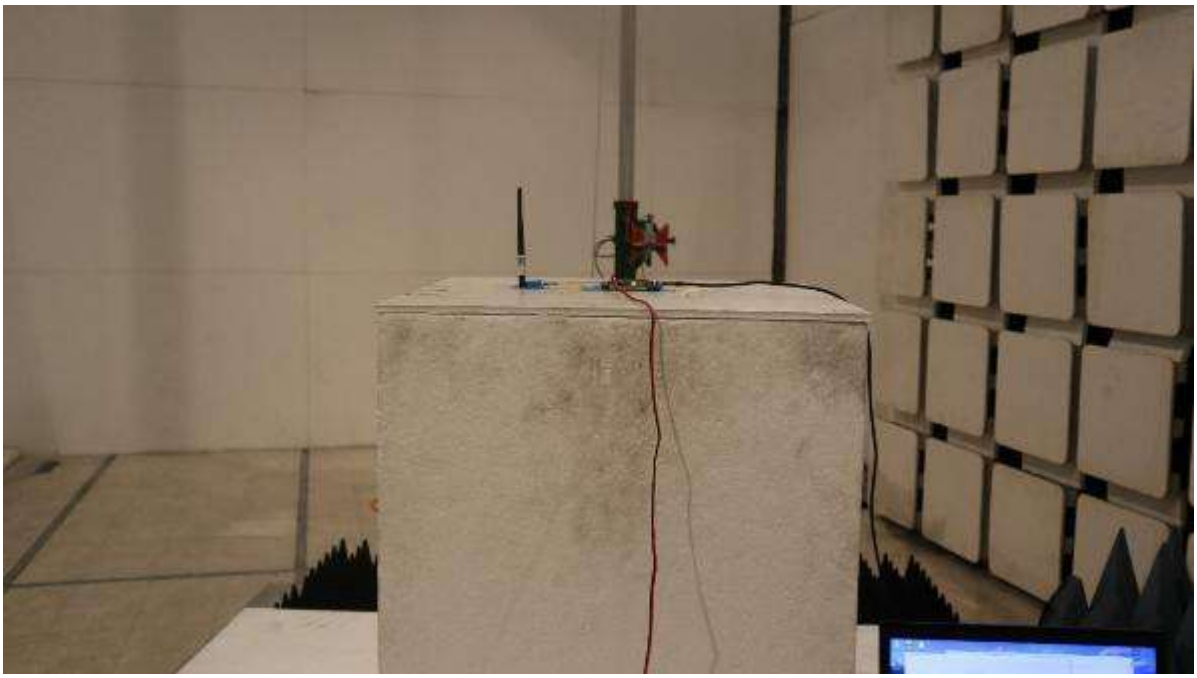
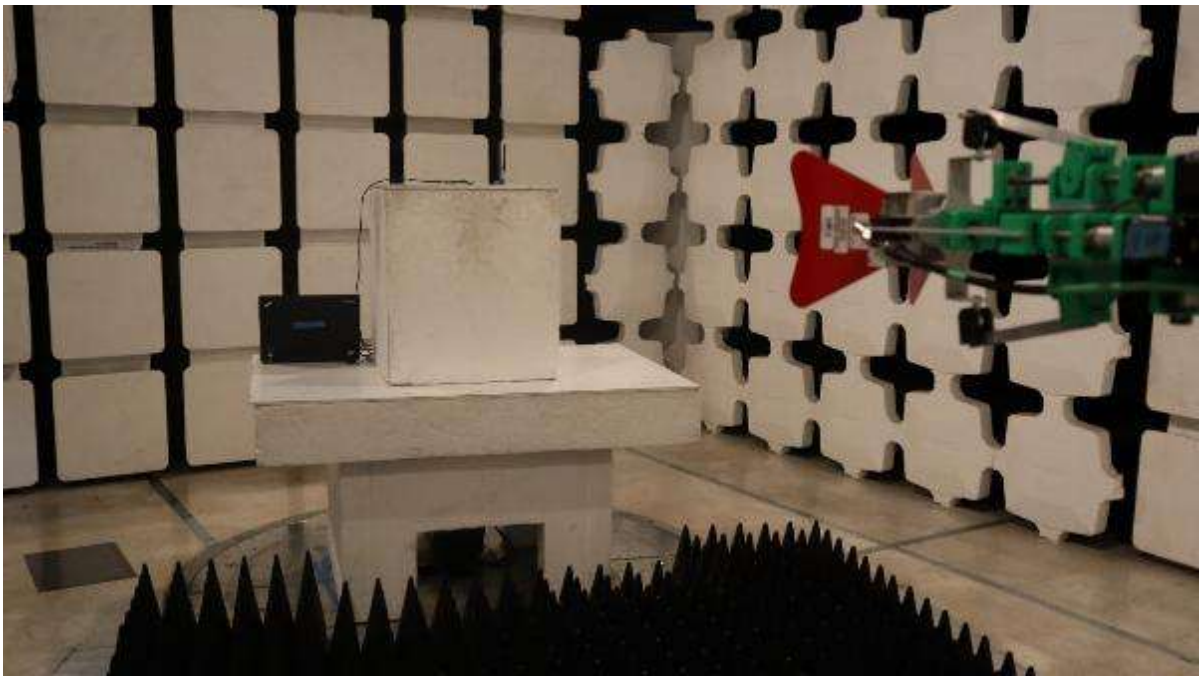
RE#3 – Dipole / Mpdevice Antenna (A09-HASM-675 / ACE-915NF)



TX Spurious, Dipole antenna (915MHz) used, Horizontal Back View



TX Spurious, Dipole antenna (915MHz) used, Horizontal Front View

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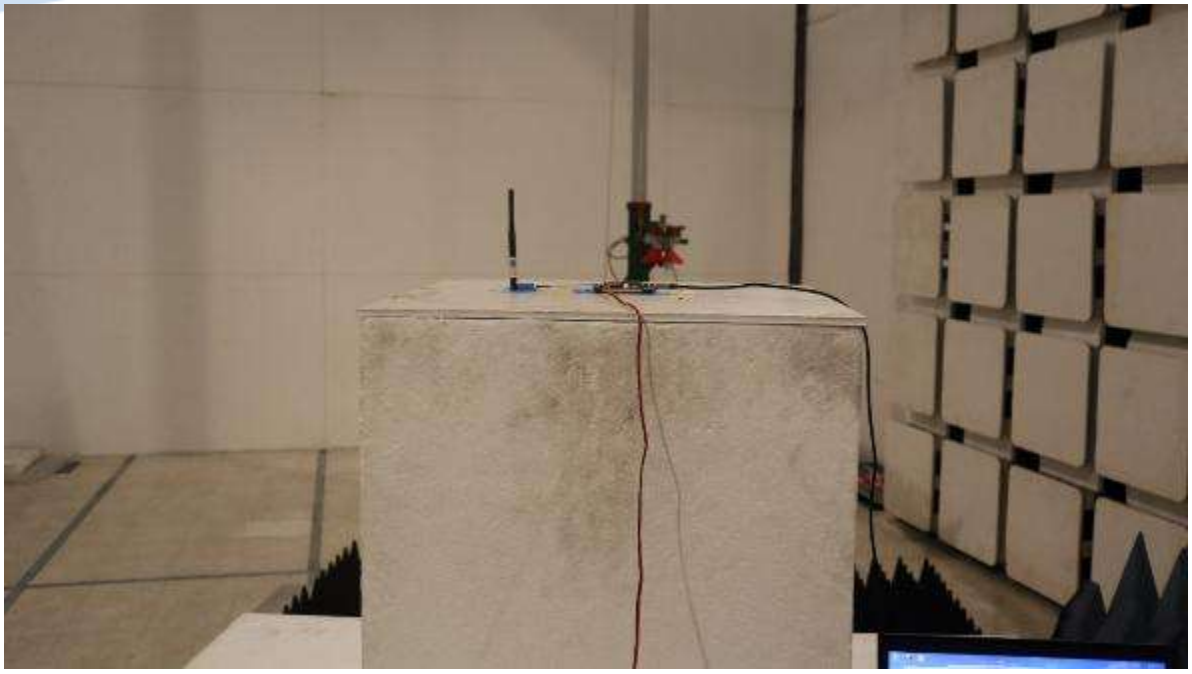
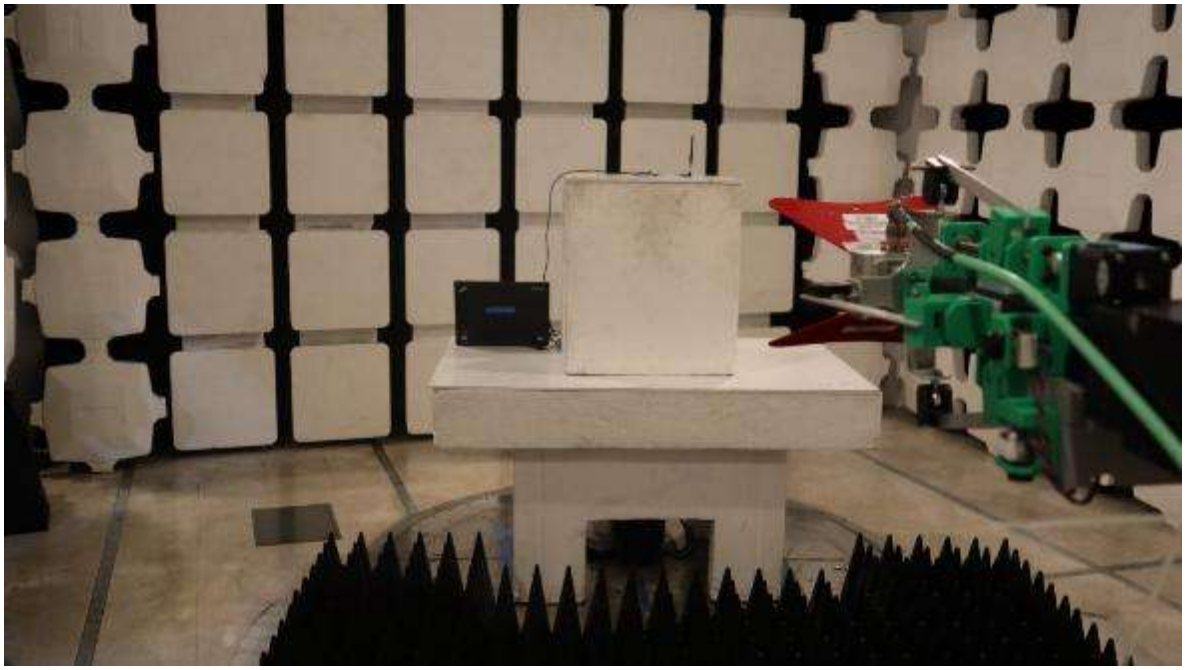


TX Spurious, Dipole antenna (915MHz) used, Vertical Back View



TX Spurious, Dipole antenna (915MHz) used, Vertical Front View

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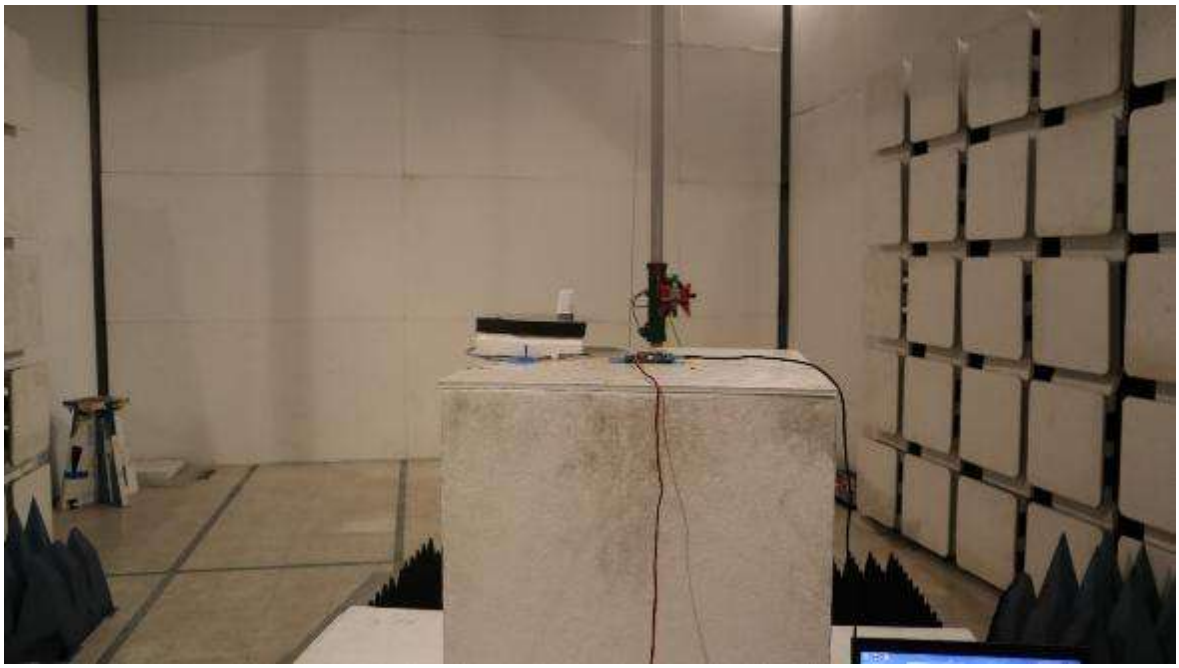
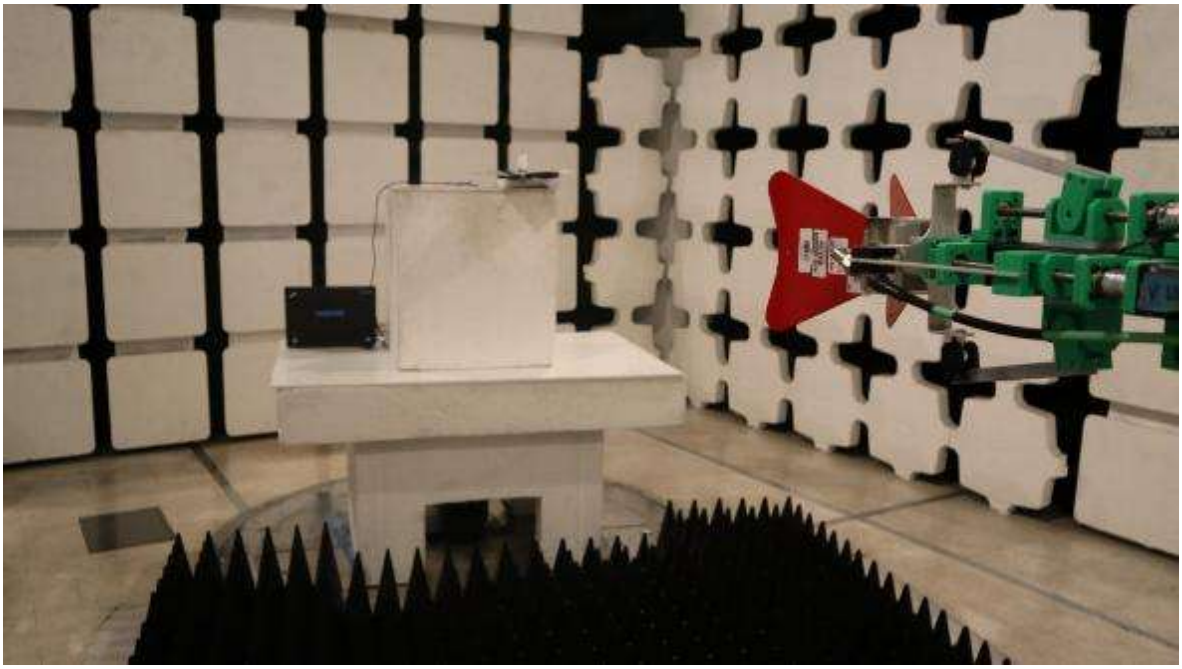
RE#3 - Dome / Laird Antenna (A09-D3NF /TRA8903) Antenna Setup



TX Spurious, Dome A09-D3NF antenna (915MHz) used, Horizontal Back View



TX Spurious, Dome A09-D3NF antenna (915MHz) used, Horizontal Front View

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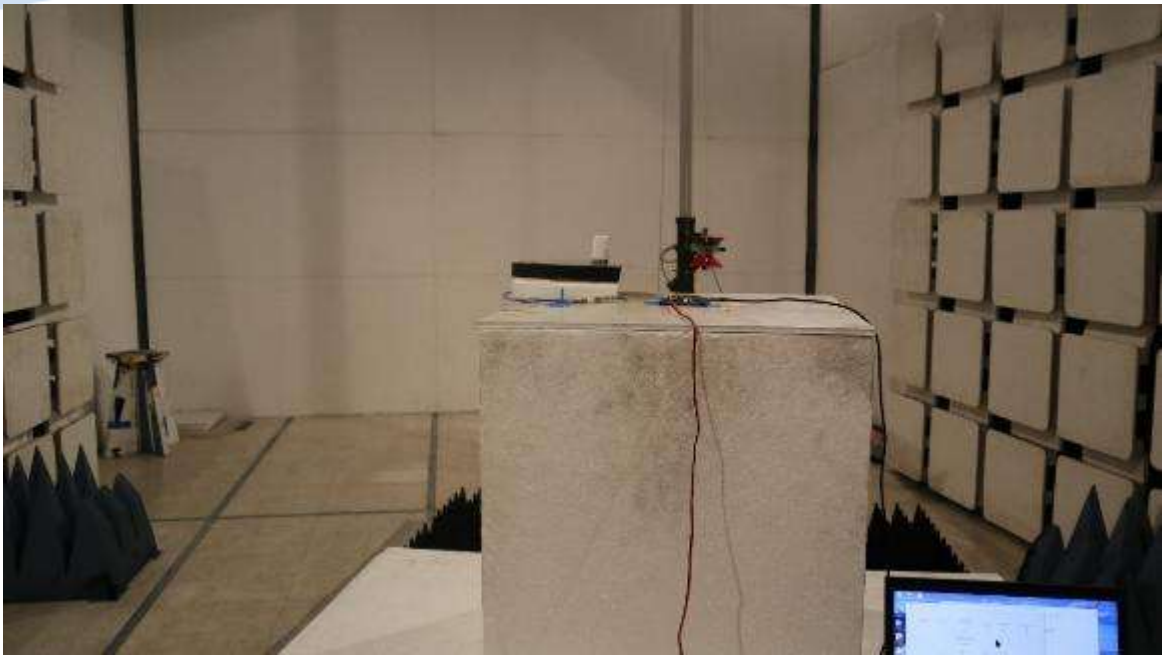
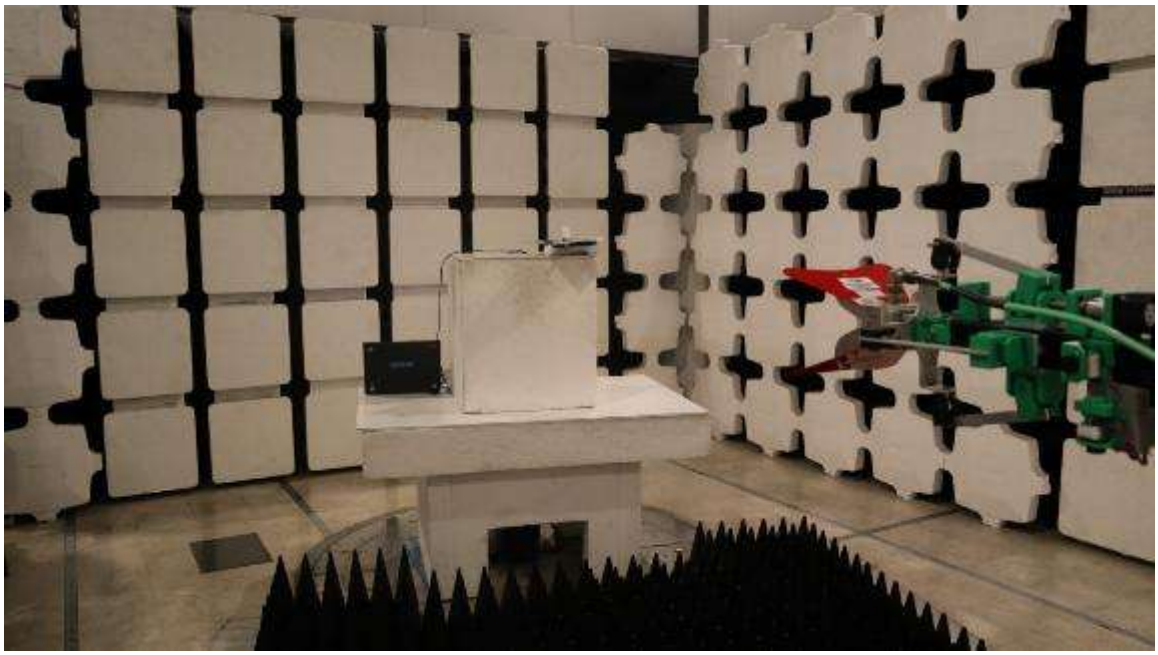


TX Spurious, Dome A09-D3NF antenna (915MHz) used, Vertical Back View



TX Spurious, Dome A09-D3NF antenna (915MHz) used, Vertical Front View

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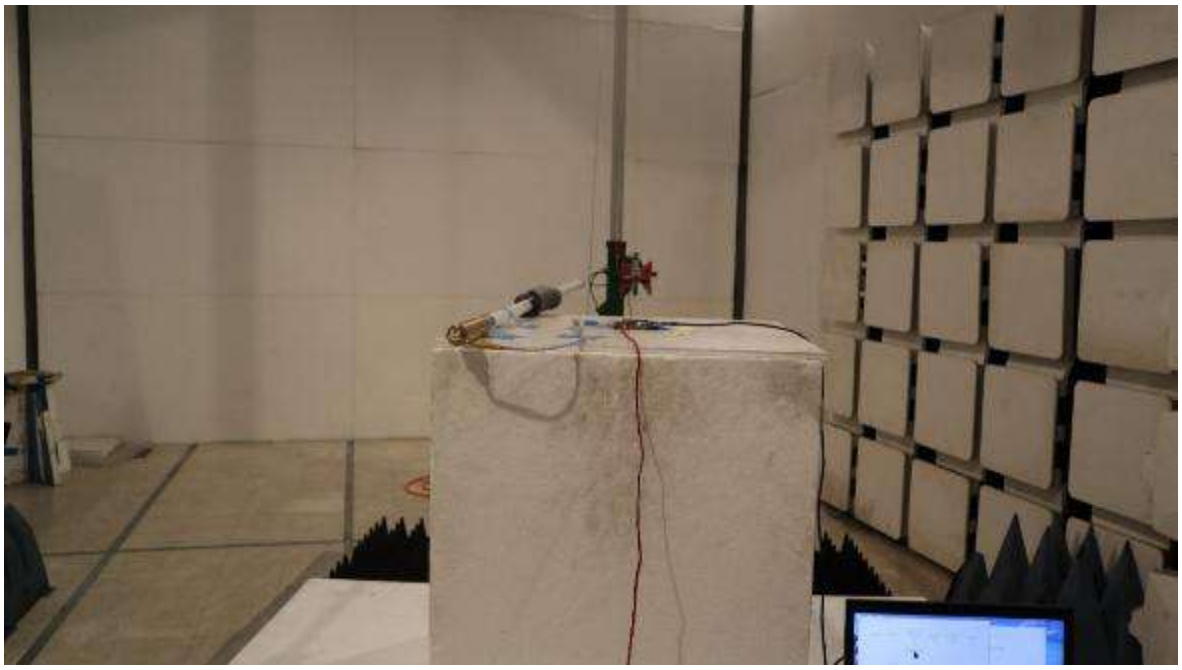
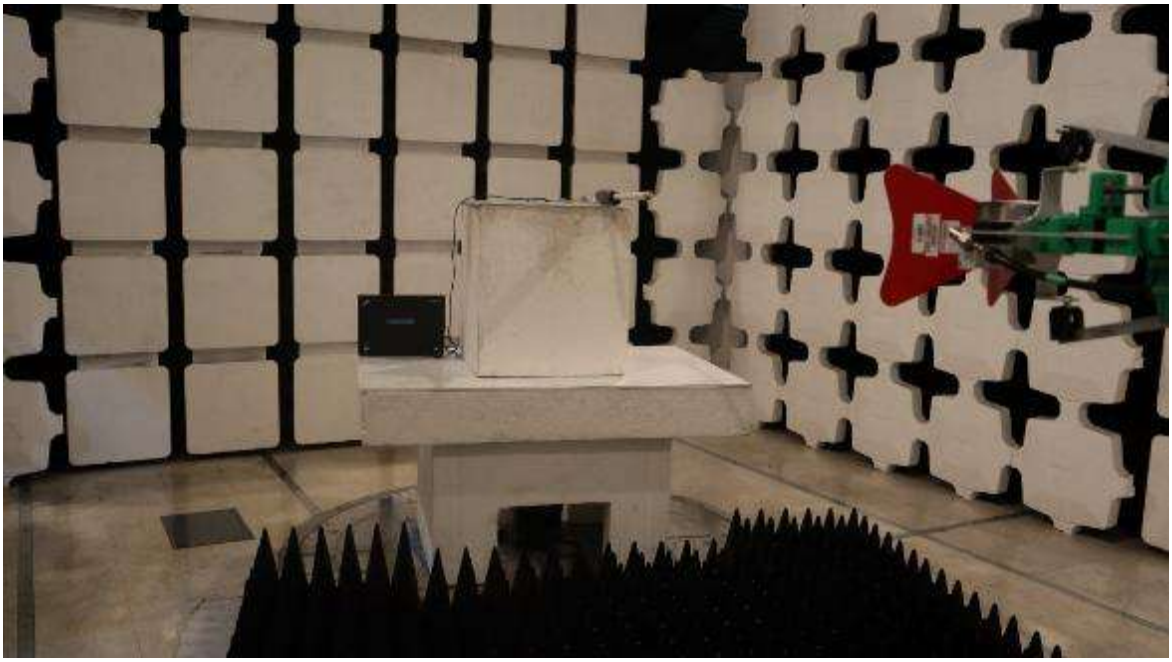
RE#4 - Omni / Laird Antenna (A09-F8NF/ FG9026) Antenna Setup



TX Spurious, Laird FG9026 antenna (915MHz) used, Horizontal Back View



TX Spurious, Laird FG9026 antenna (915MHz) used, Horizontal Front View

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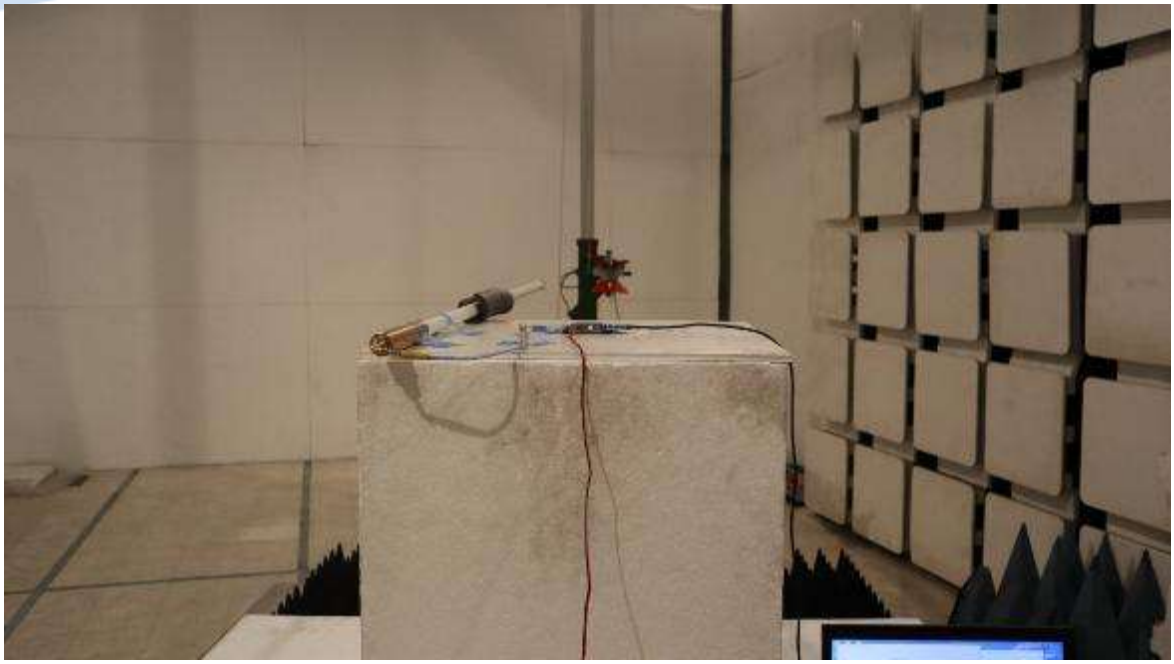
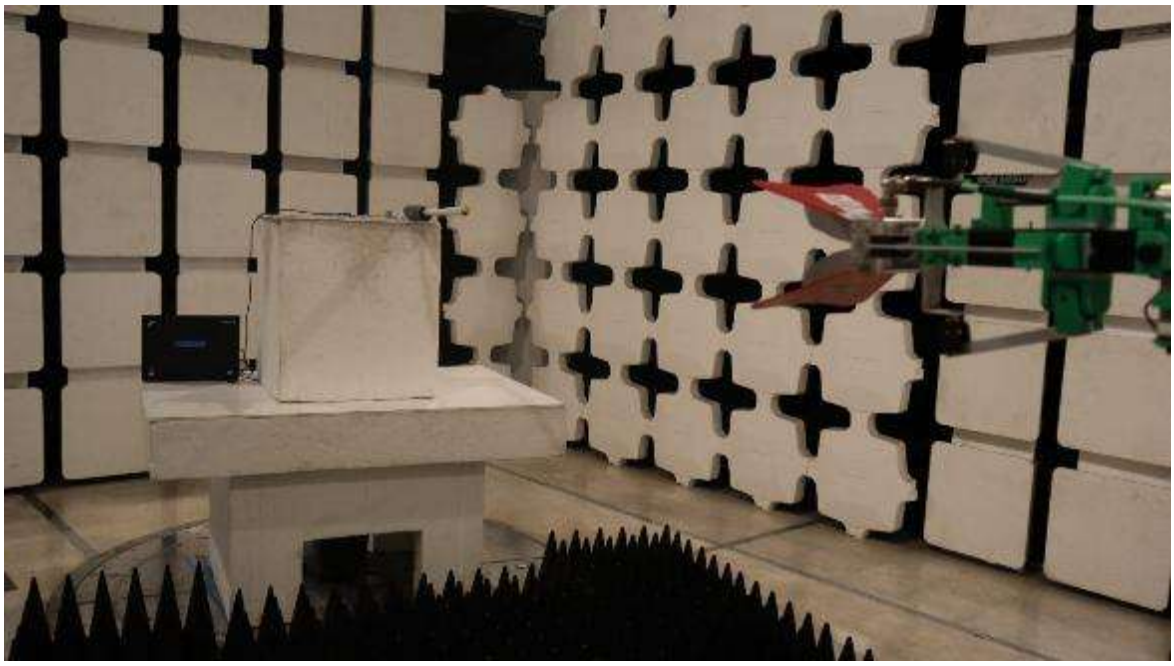


TX Spurious, Laird FG9026 antenna (915MHz) used, Vertical Back View



TX Spurious, Laird FG9026 antenna (915MHz) used, Vertical Front View

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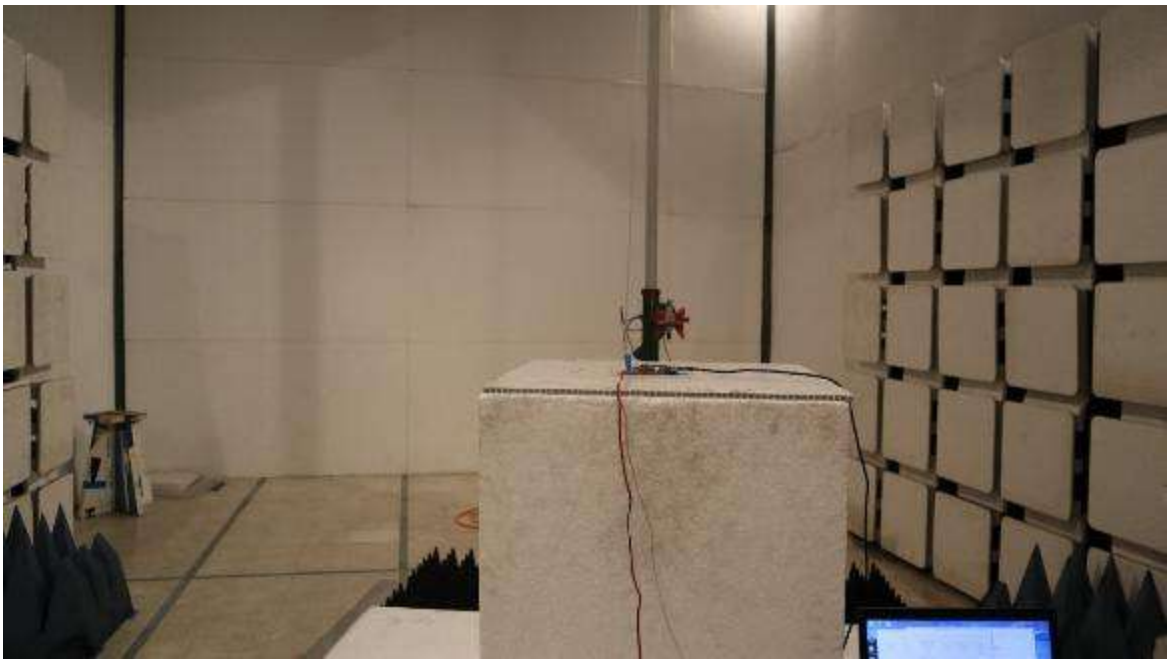
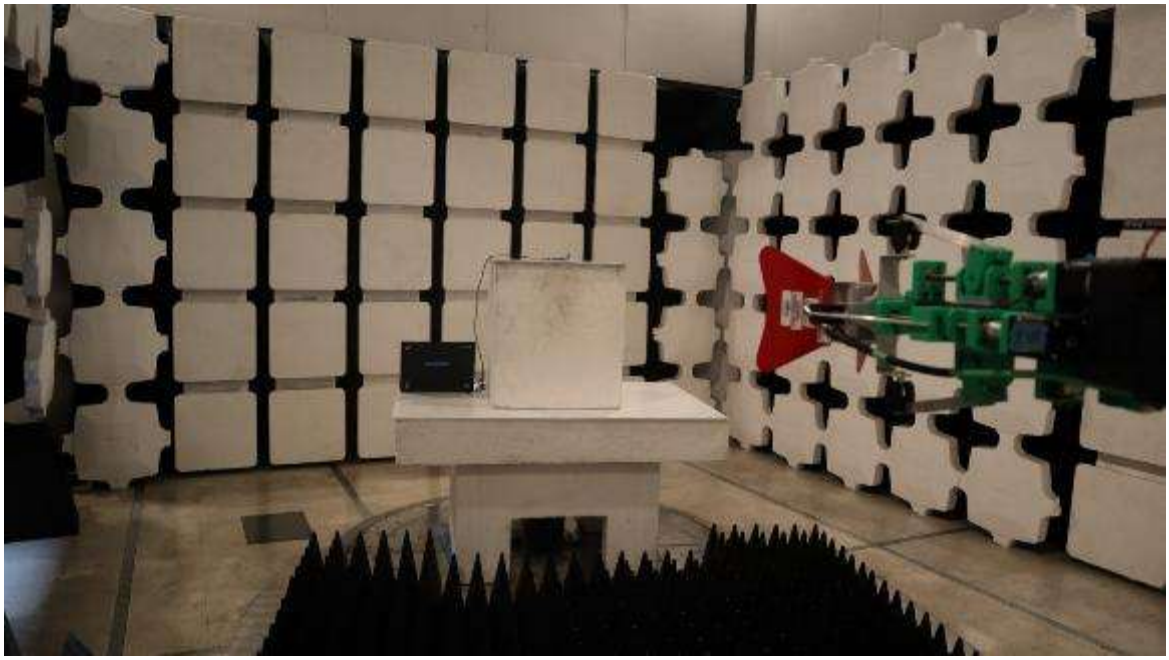
RE#5 - Flex / Molex (211140-0100) Antenna Setup



TX Spurious, Molex antenna (915MHz) used, Horizontal Back View



TX Spurious, Molex antenna (915MHz) used, Horizontal Front View

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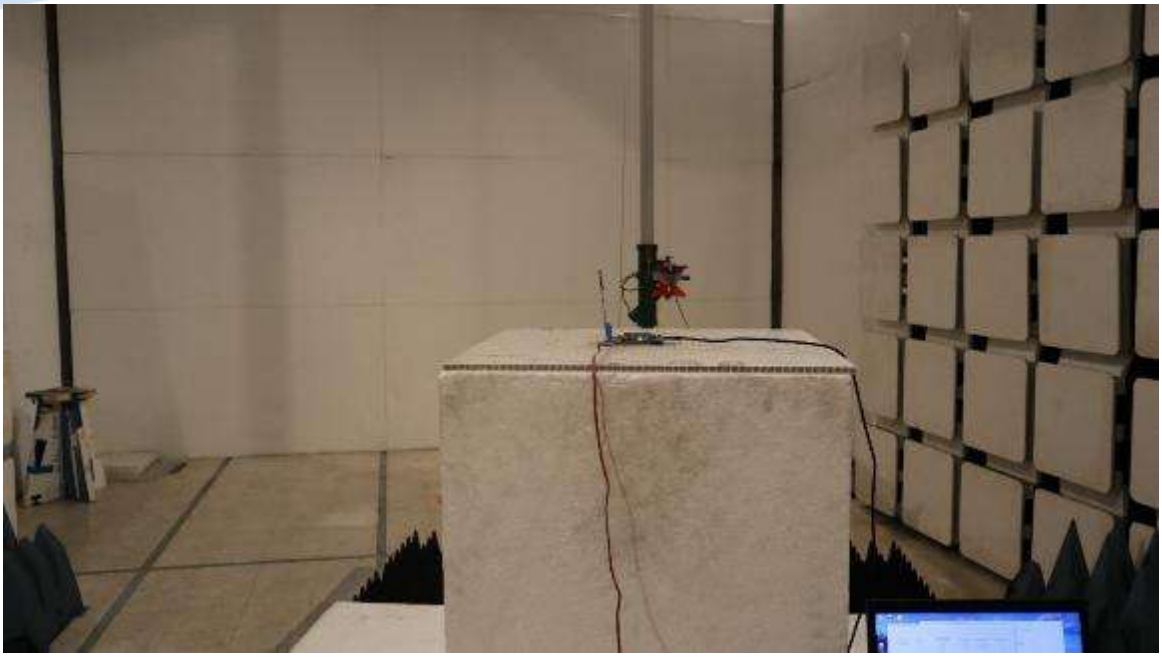
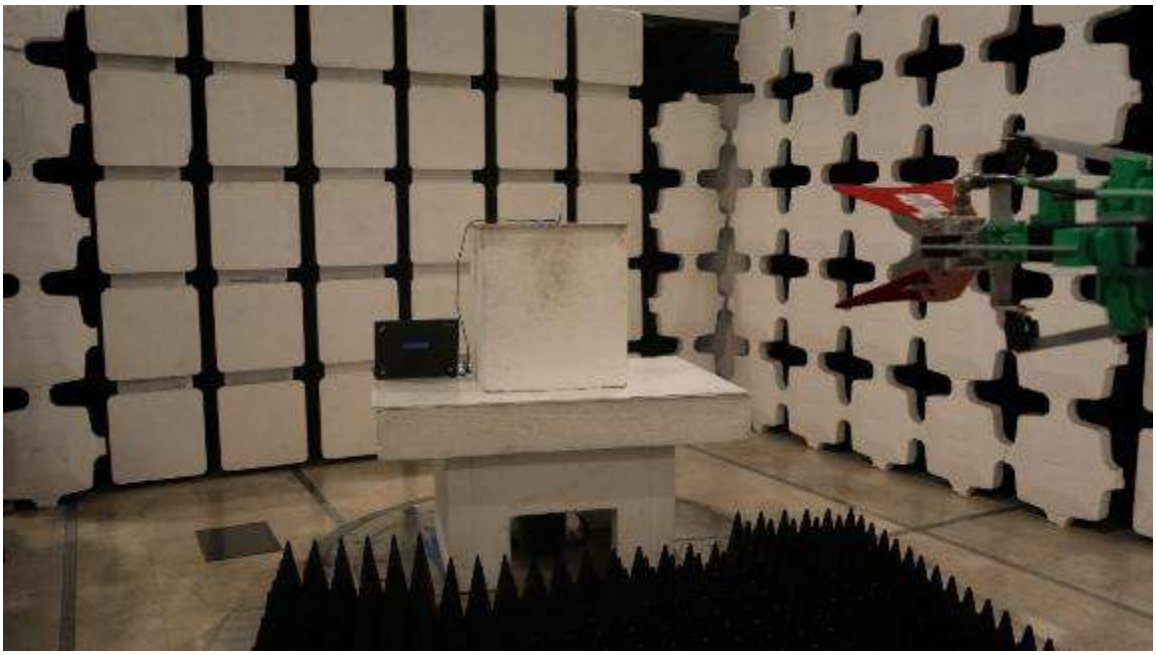


TX Spurious, Molex antenna (915MHz) used, Vertical Back View



TX Spurious, Molex antenna (915MHz) used, Vertical Front View

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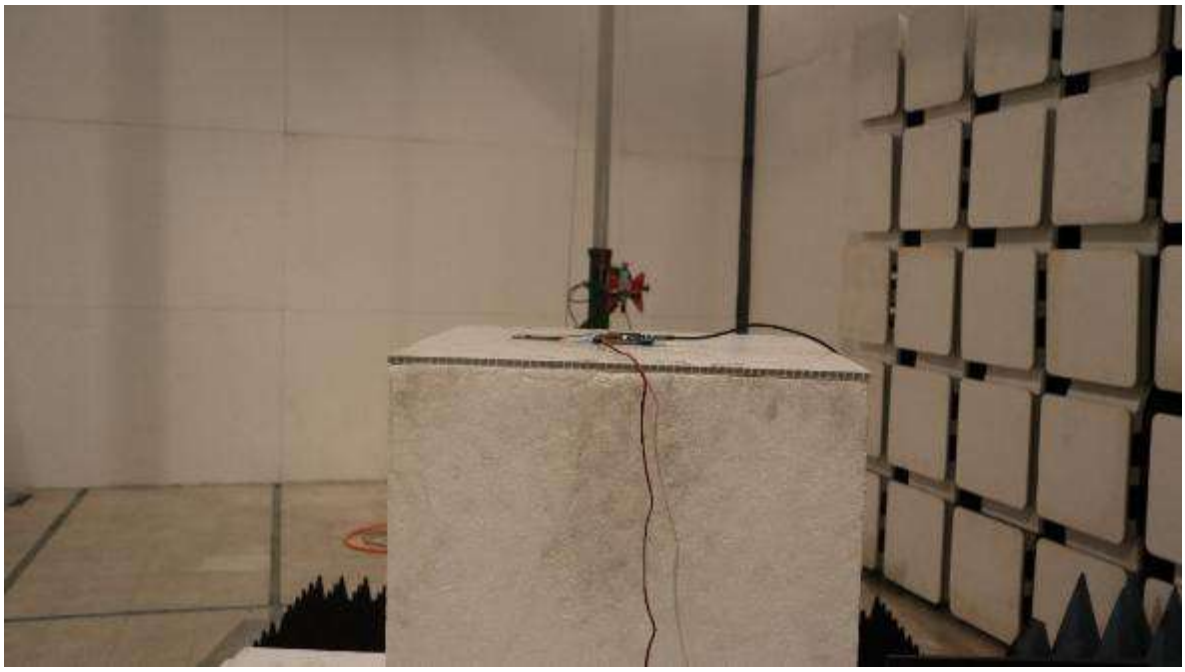
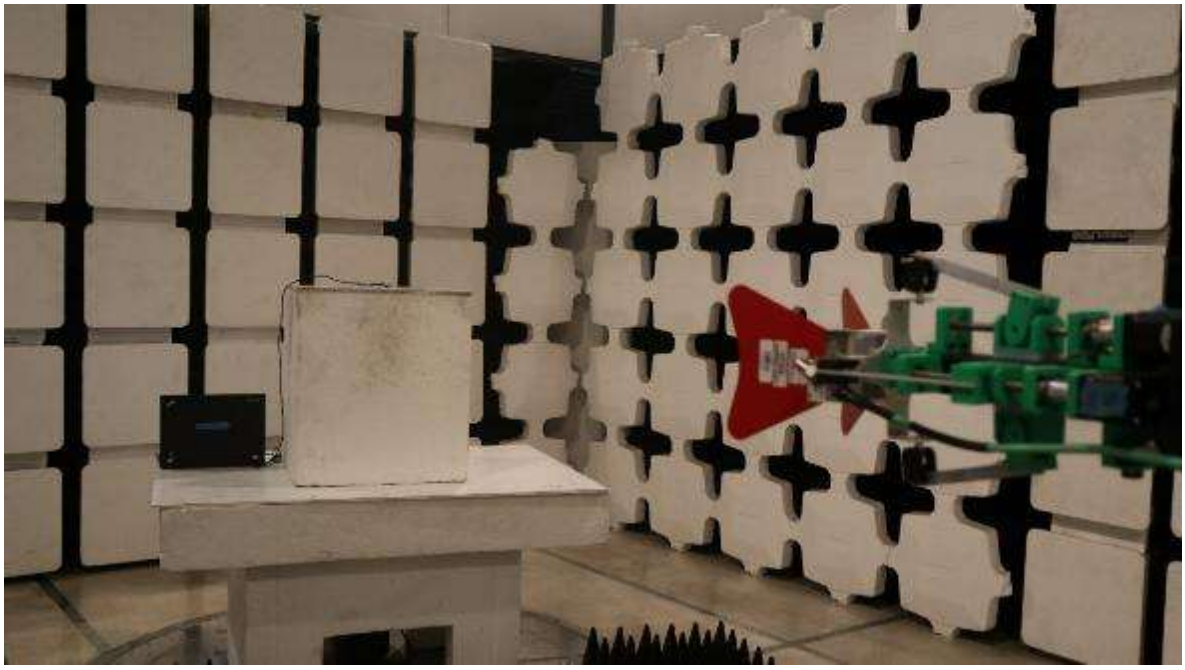
RE#6 - Flex Square / Taoglas (FXUB65.07.0180C) Antenna Setup



TX Spurious, TAOGLAS antenna (915MHz) used, Horizontal Back View



TX Spurious, TAOGLAS antenna (915MHz) used, Horizontal Front View

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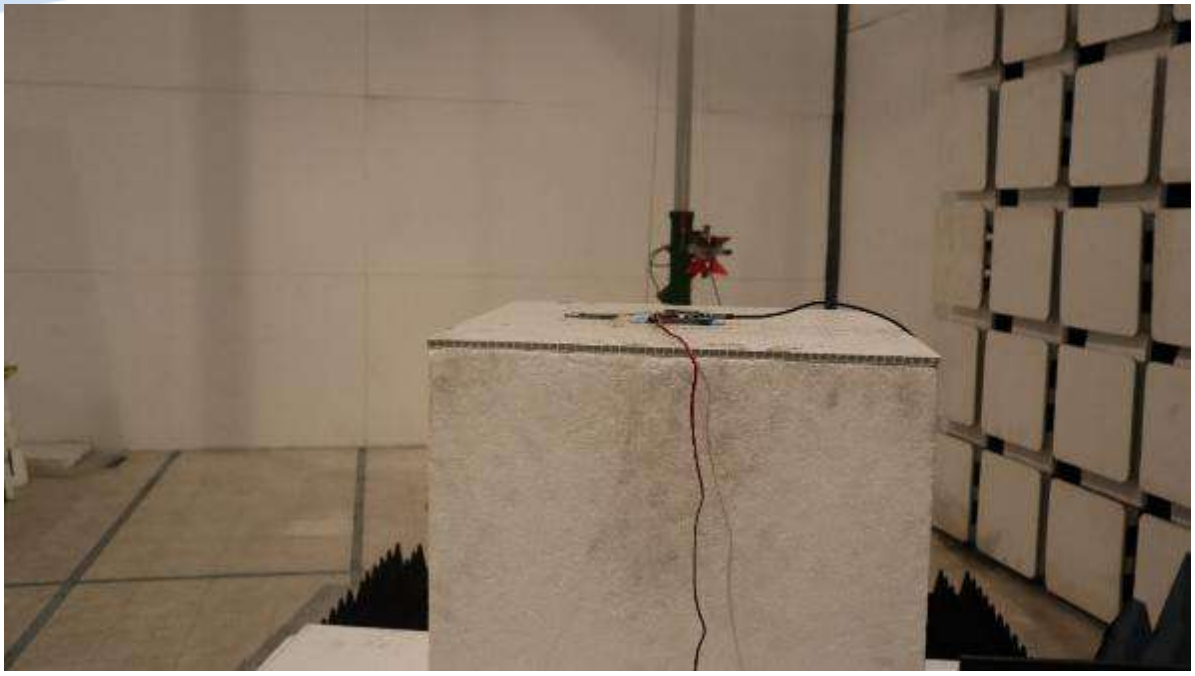
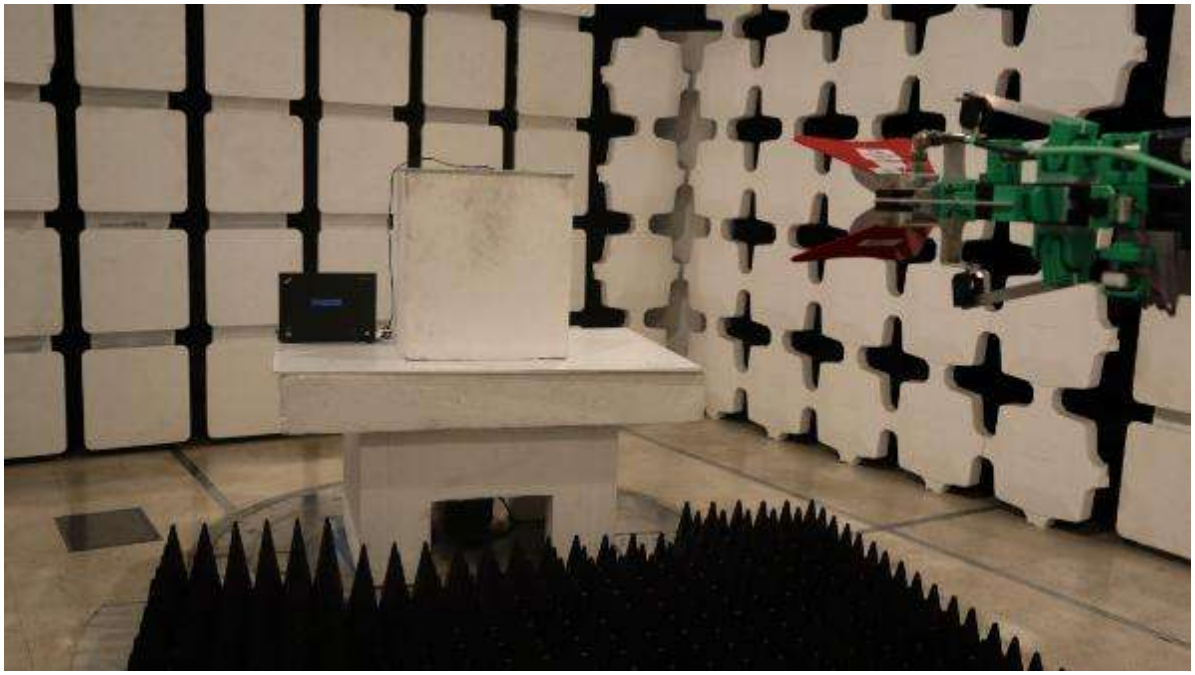


TX Spurious, TAOGLAS antenna (915MHz) used, Vertical Back View



TX Spurious, TAOGLAS antenna (915MHz) used, Vertical Front View

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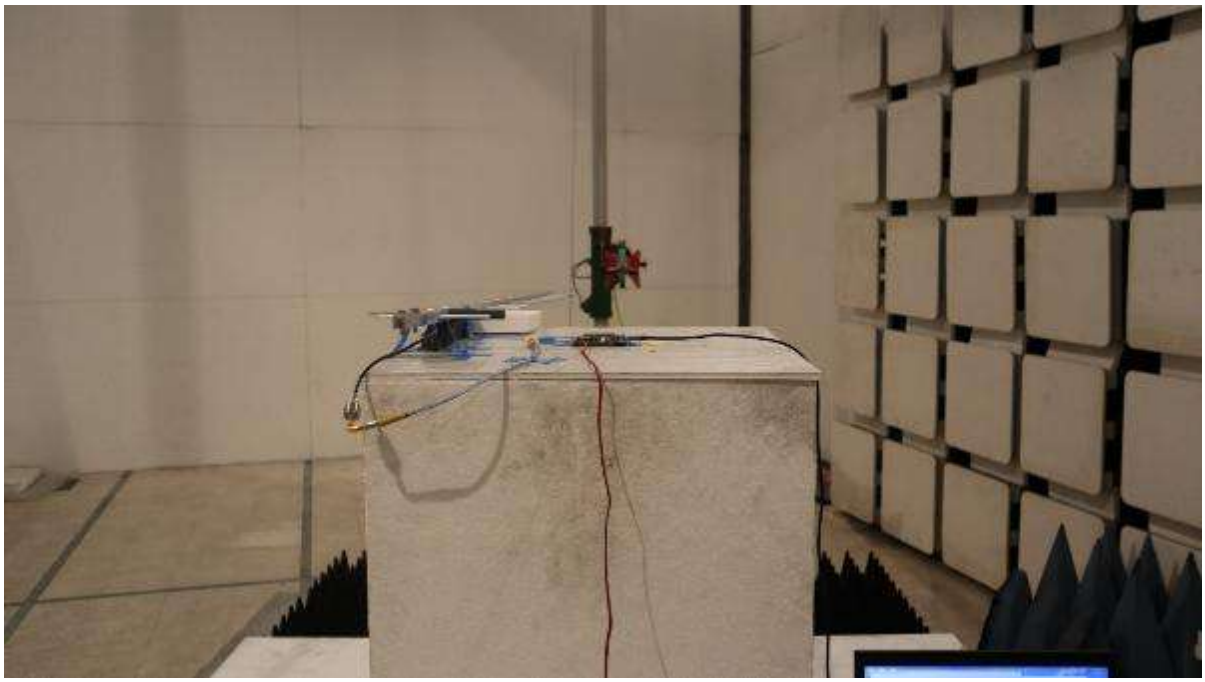
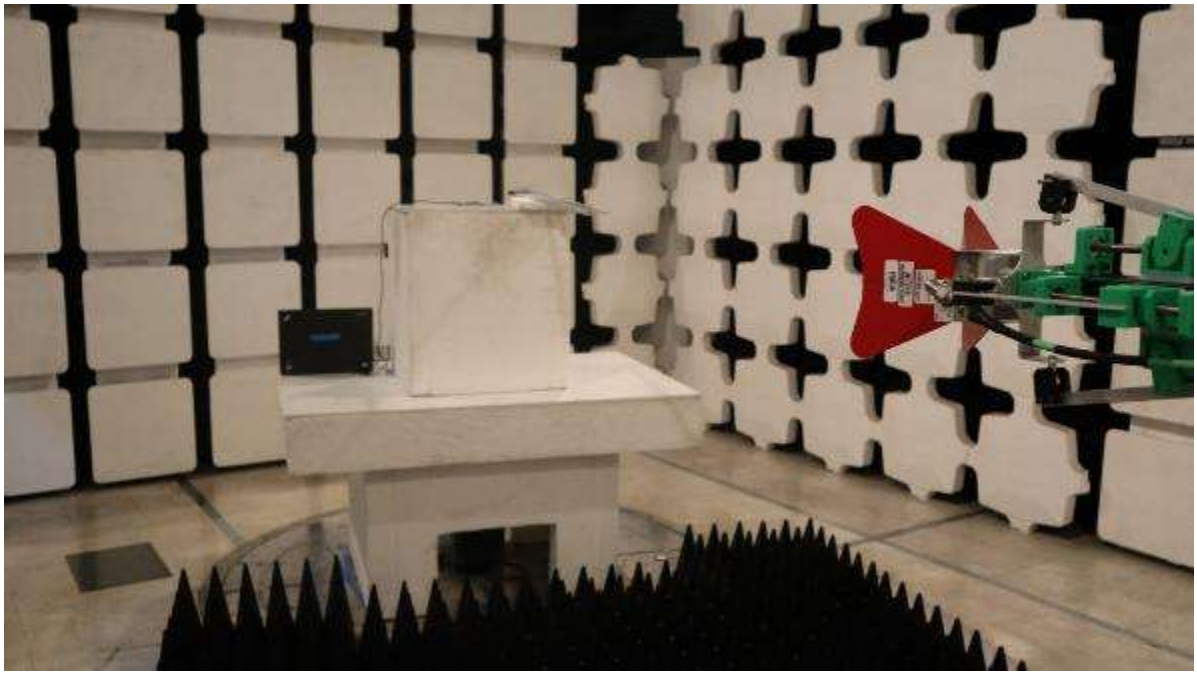
RE#7 - Yagi / TE connectivity (PC9013N) Antenna Setup



TX Spurious, Yagi PC9013N antenna (915MHz) used, Horizontal Back View



TX Spurious, Yagi PC9013N antenna (915MHz) used, Horizontal Front View

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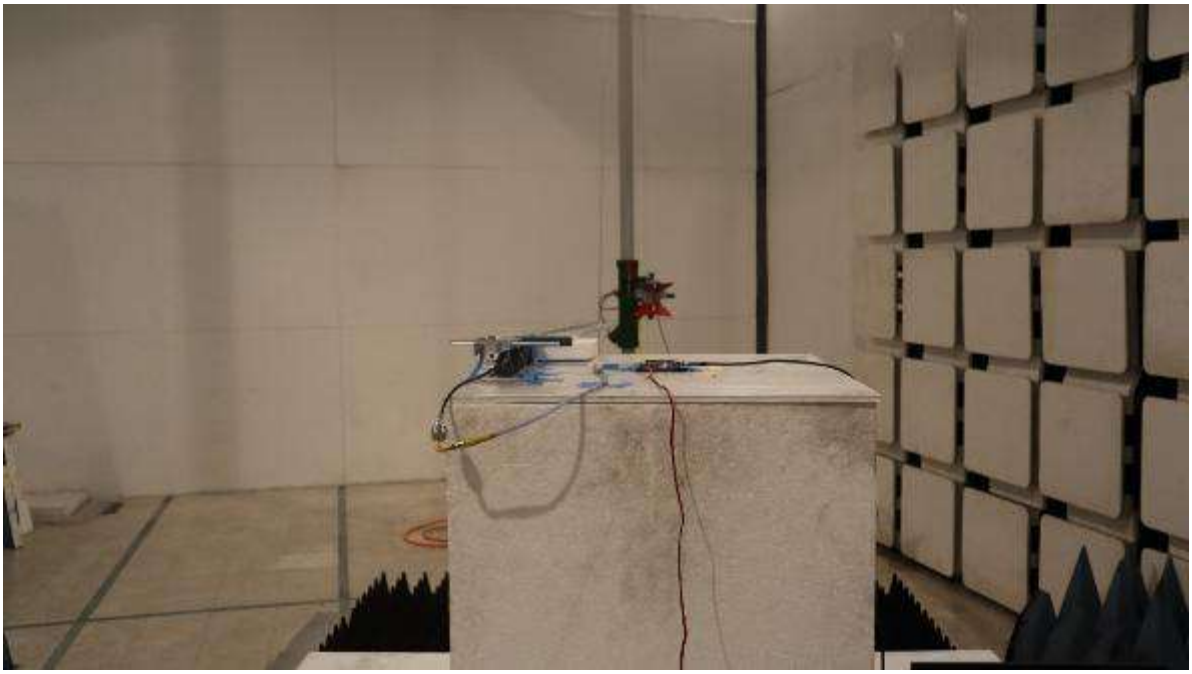
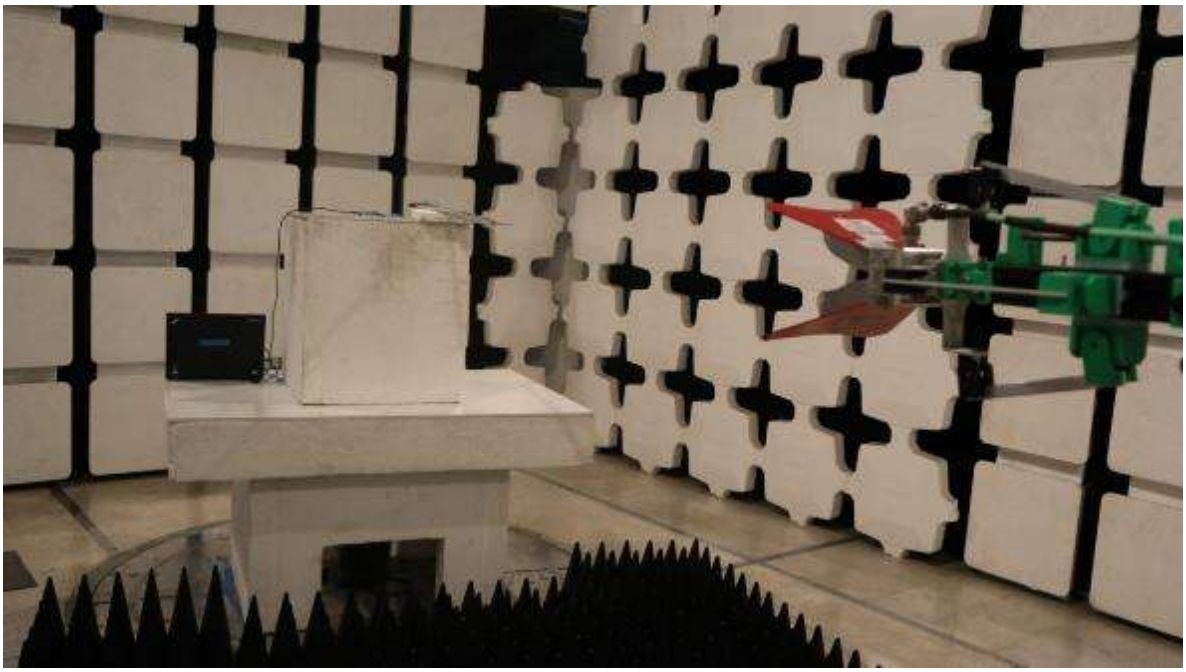


TX Spurious, Yagi PC9013N antenna (915MHz) used, Vertical Back View



TX Spurious, Yagi PC9013N antenna (915MHz) used, Vertical Front View

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APPENDIX C – DECLARATION OF SIMILARITY

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Letter of Similarity

Date: 22 January 2026

FCC ID: MCQ-XBP9XR
IC: 1846A-XBP9XR
Model Name: XBP9XR
Model Number (HVIN): XBP-9XR-CS-001, XBP-9XR-RS-001, XBP-9XR-US-001, XB3P-9XR-UUS-001

Part number XB3P-9XR-UUS-001 was tested. The same PCB is used for all parts in this document. The remaining parts do not have a 2.4 GHz connection. The circuitry that generates the 2.4 GHz signal is depopulated in these parts. The circuitry that generates the sub-gig signal is identical to the tested part.

Part Number	Sub-gig connection	2.4 GHz connection
XB3P-9XR-UUS-001	u.fl	u.fl
XBP-9XR-CS-001	Chip antenna	none
XBP-9XR-RS-001	RF pad	none
XBP-9XR-US-001	u.fl	none

For the sub-gig connection, a jumper is placed to route the RF signal to the u.fl connector, the chip antenna circuit or a pad that is soldered to the carrier PCB.

Regards,

Paul Dahl

Paul Dahl
Sr. Manger of Engineering
Digi International Inc.

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