REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 15.247, RSS-247 Issue 2

Report No.: THNK16-U2 Rev A

Company: Thinkify LLC

Model Name: TR100

REGULATORY COMPLIANCE TEST REPORT

Company: Thinkify LLC

Model Name: TR100

To: FCC CFR 47 15.247, RSS-247 Issue 2

Test Report Serial No.: THNK16-U2 Rev A

This report supersedes: NONE

Applicant: Thinkify LLC
18450 Technology Drive, Suite E1
Morgan Hill, California 95037
USA

Issue Date: 1st October 2020

This Test Report is Issued Under the Authority of:

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

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

Table of Contents

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

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Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

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

Presented this 24th day of February 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2021

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

1.2. RECOGNITION

MiCOM Labs, Inc has widely recognized wireless testing and certification capabilities. In addition to being recognized for Testing and Certification under Phase 2 agreements with Canada, Europe and Japan, our international recognition includes Conformity Assessment Body designation under Phase 1 agreements with APEC MRA countries. 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
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)			

EU MRA – European Union Mutual Recognition Agreement
NB – Notified Body
APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.
MRA PhasePhase I - recognition for product testing
Phase II – recognition for both product testing and certification

1.3. PRODUCT CERTIFICATION

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

Accredited Product Certification Body

A2LA has accredited

MiCOM LABS

Pleasanton, CA

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

Presented this 24th day of February 2020

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2021

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
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	30th September 2020	Draft report for client review.
Rev A	1st October 2020	Initial Release

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

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

3. TEST RESULT CERTIFICATE

Manufacturer:	Thinkify LLC 18450 Technology Drive, Suite E1 Morgan Hill California 95037	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	TR100	**Telephone:**	+1 925 462 0304
Type Of Equipment:	Reader	**Fax:**	+1 925 462 0306
S/N's:	None Provided		
Test Date(s):	28th – 29th September 2020	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart E 15.247 **ISED RSS-247 Issue 2**	**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.

A2LA ACCREDITED
TESTING CERT #2381.01

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs, Inc.

Gordon Hurst
President & CEO MiCOM Labs, Inc.

4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
I	KDB 662911 D01 & D02	Oct 31 2013	Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band
II	A2LA	October 2019	R105 - Requirement's When Making Reference to A2LA Accreditation Status
III	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices
IV	ANSI C63.4	2014	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
V	CISPR 32	2015	Electromagnetic compatibility of multimedia equipment - Emission requirements
VI	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
VII	FCC 06-96	Jun 30 2006	Memorandum Opinion and Order
VIII	FCC 47 CFR Part 15.247	2020	Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
IX	ICES-003	Issue 6 Jan 2016; Updated April 2019	Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement.
X	M 3003	Edition 3 Nov.2012	Expression of Uncertainty and Confidence in Measurements
XI	RSS-247 Issue 2	Feb 2017	Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices
XII	RSS-Gen Issue 5	March 2019 Amendment 1	General Requirements for Compliance of Radio Apparatus
XIII	FCC 47 CFR Part 2.1033	2020	FCC requirements and rules regarding photographs and test setup diagrams.

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 Thinkify LLC TR100 to FCC CFR 47 Part 15 Subpart E 15.247 and ISED RSS-247 Issue 2.
Applicant:	Thinkify LLC 18450 Technology Drive, Suite E1 Morgan Hill California 95037
Manufacturer:	Thinkify LLC
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	THNK16-U2 Draft
Date EUT received:	5th August 2020
Standard(s) applied:	FCC CFR 47 Part 15 Subpart E 15.247 ISED RSS-247
Dates of test (from - to):	28th – 29th September 2020
No of Units Tested:	1
Product Family Name:	TR100
Model(s):	TR100
Location for use:	Outdoors
Declared Frequency Range(s):	902-928MHz
Type of Modulation:	FHSS
EUT Modes of Operation:	GFSK
Declared Nominal Output Power (dBm):	30 dBm
Transmit/Receive Operation:	Transceiver
Rated Input Voltage and Current:	5VDC, 1A
Operating Temperature Range:	-20 to +40 C
ITU Emission Designator:	220KL70
Equipment Dimensions:	45 X 70 X 6 mm
Weight:	18 grams
Hardware Rev:	Rev. B
Software Rev:	Version 1.0.8

5.2. Scope Of Test Program

Thinkify LLC TR100

The scope of the test program was to test the Thinkify LLC TR100 configurations in the frequency 902-928 MHz for compliance against the following specifications:

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

RSS-247 Issue 2
Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and License-Exempt Local Area Network (LE-LEN) Devices.

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

Type (EUT/ Support)	Equipment Description	Mfr.	Model No.	Serial No.
EUT	Access Point	Not Provided by Client	TR100	--

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
external	Not Provided by Client	Not Provided by Client	Directional	6.0	-	360	-	902 - 928

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

5.5. Cabling and I/O Ports

Port Type	Max Cable Length	# of Ports	Screened	Connector Type	Data Type	Data Rate(s)
USB	>3m	1	No	Data	Debug	-

5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s)	Data Rate with Highest Power KBit/s	Channel Frequency (MHz)		
		Low	Mid	High
902 - 928 MHz				
GFSK	100	902.75	915.25	927.25

5.7. Equipment Modifications

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

5.8. Deviations from the Test Standard

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

6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
Peak Output Power	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
20 dB & 99% Bandwidth	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	-
(i) TX Spurious & Restricted Band Emissions	Complies	View Data
(3) Radiated Emissions (0.03 - 1 GHz)	Complies	View Data

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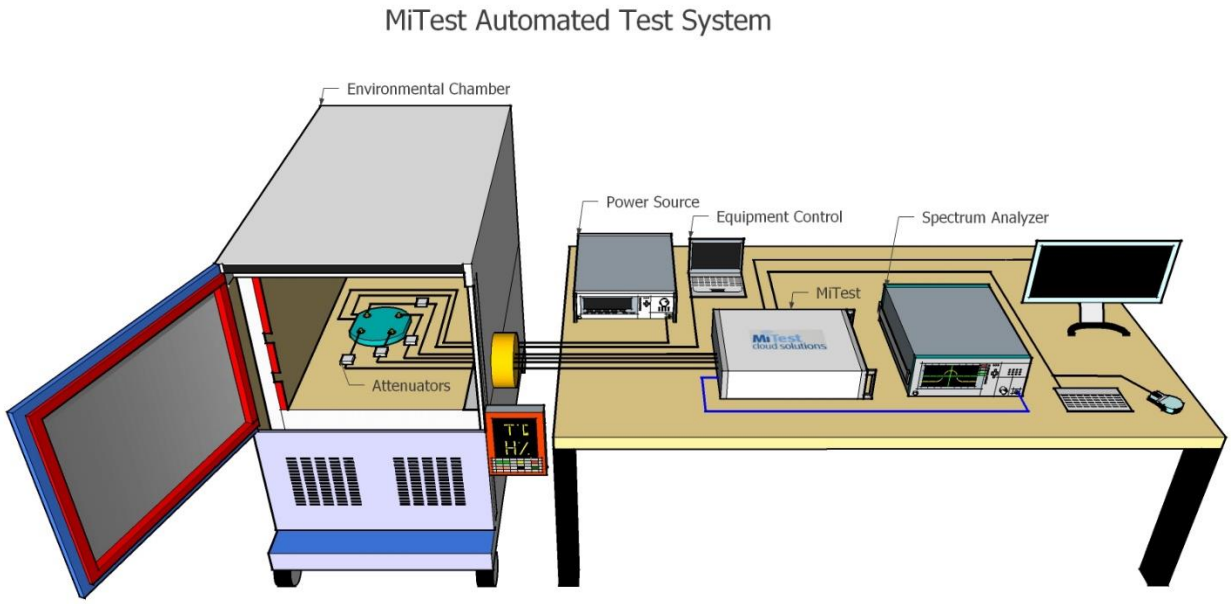
7. TEST EQUIPMENT CONFIGURATION(S)

7.1. Conducted



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.

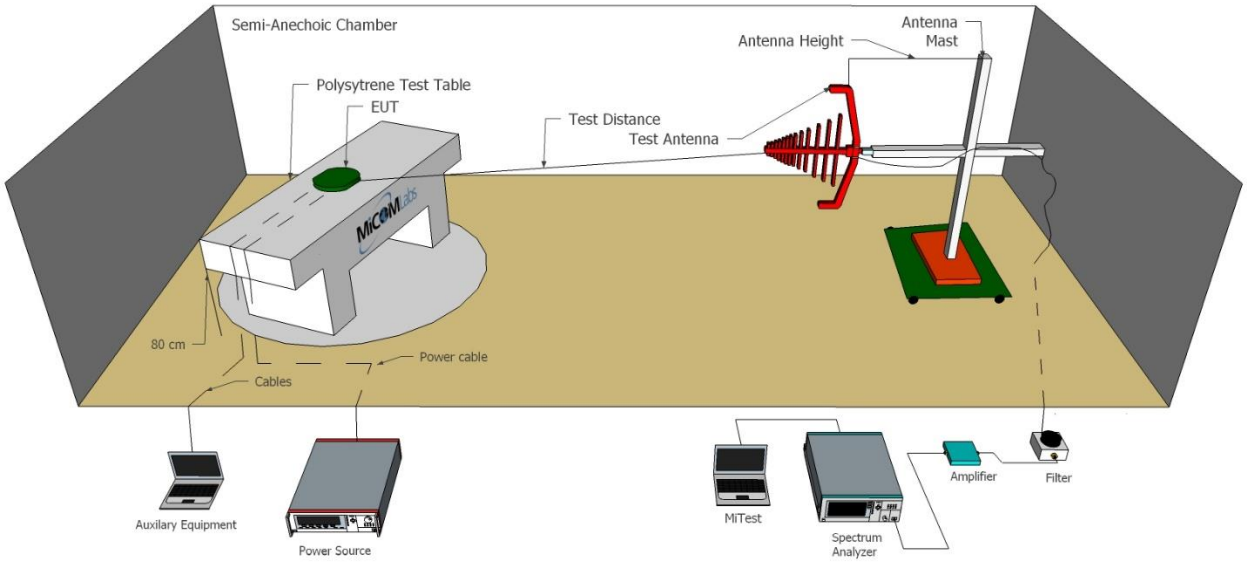
Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	28 Nov 2020
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	28 Nov 2020
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	28 Nov 2020
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	28 Nov 2020
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	28 Nov 2020
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	30 Oct 2020
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2021
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Mar 2021
398	MiTest RF Conducted Test Software	MiCOM	MiTest ATS	Version 4.1	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
440	USB Wideband Power Sensor	Boonton	55006	9178	22 Mar 2021
441	USB Wideband Power Sensor	Boonton	55006	9179	20 Mar 2021
442	USB Wideband Power Sensor	Boonton	55006	9181	19 Mar 2021
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	20 Mar 2021
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2020
515	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen with DFS	515	28 Oct 2020
534	Power Sensor 50 GHz - 70dBm to +20dBm	R&S	NRP50SN	1419.0093K02-100888-SB	26 Feb 2021
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	20 Feb 2021

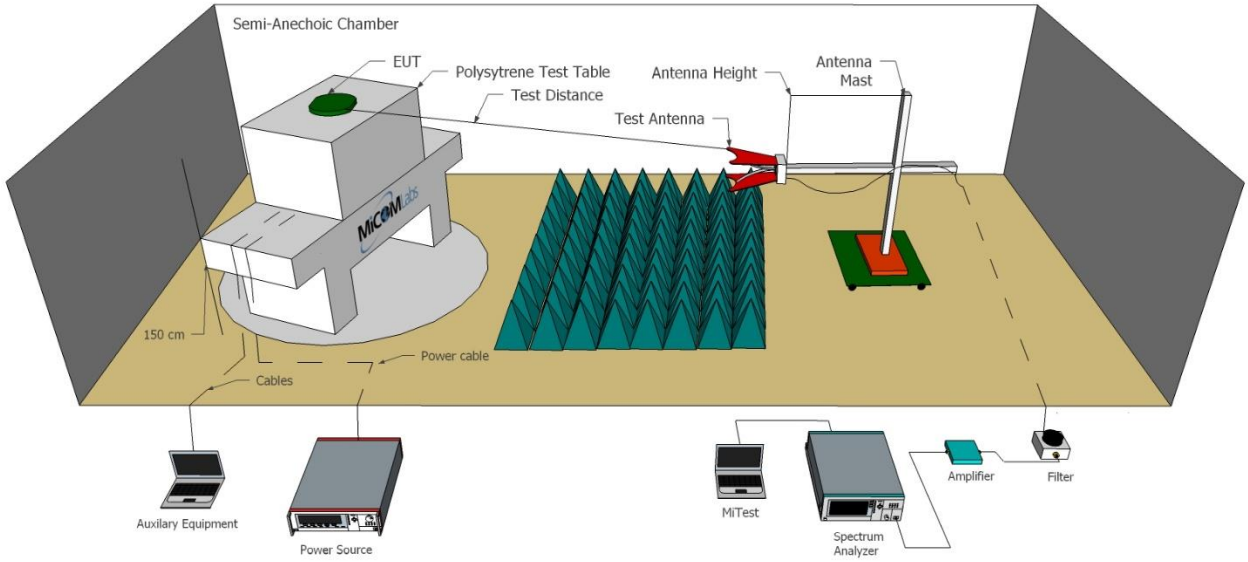
7.2. Radiated Emissions

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

Radiated Emissions Below 1GHz Test Setup



Radiated Emissions Above 1GHz Test Setup



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
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2021
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	26 Nov 2020
301	5470 to 5725 MHz Notch Filter	Microtronics	RBC50704	001	4 Dec 2020
302	5150 to 5350 MHz Notch Filter	Microtronics	BRC50703	002	4 Dec 2020
303	5725 to 5875 MHz Notch filter	Microtronics	BRC50705	003	4 Dec 2020
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	29 Nov 2020
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	4 Apr 2021
341	900MHz Notch Filter	EWT	EWT-14-0199	H1	4 Dec 2020
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	4 Dec 2020
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	21 Mar 2021
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Mar 2021
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	4 Dec 2020
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	9 Dec 2020
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	12 Dec 2020
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	9 Dec 2020
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
414	DC Power Supply 0-60V	HP	6274	1029A01285	Cal when used
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	447	Not Required

			Test Software Version 1.0		
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	4 Dec 2020
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	4 Dec 2020
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	4 Dec 2020
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	4 Dec 2020
466	Low Pass Filter DC-1500 MHz	Mini-Circuits	NLP-1750+	VUU10401438	4 Dec 2020
467	2495 to 2650 MHz notch filter	MicroTronics	BRM50709	011	4 Dec 2020
470	High Pass filter	Mini Circuits	SHP-700	None	4 Dec 2020
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	4 Dec 2020
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	4 Dec 2020
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2020
518	Cable - Amp to Antenna	SRC Haverhill	157-3051574	518	4 Dec 2020
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

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)

8.1. Peak Transmit Power

Conducted Test Conditions for Maximum Conducted Output Power			
Standard:	FCC CFR 47:15.247 RSS-247 Issue 2	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Maximum Conducted Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(2) RSS-247: 5.4(a)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

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

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

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

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

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

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

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

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

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

(iii) Fixed, point-to-point operation, as used in paragraphs (c)(1)(i) and (c)(1)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum or digitally modulated intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

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

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

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

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

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

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

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

Equipment Configuration for Output Power Peak			
Variant:	FHSS	**Duty Cycle (%):**	99.0
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.0
Modulation:	GFSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dB	
902.75	29.70	--	--	--	29.70	30.00	-0.30	Max
915.25	29.60	--	--	--	29.60	30.00	-0.40	Max
927.25	29.30	--	--	--	29.30	30.00	-0.70	Max

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.

8.2. 20 dB & 99% Bandwidth

Conducted Test Conditions for 20 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247 RSS-247 Issue 2	**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) RSS-247 5.1(c)	**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.

Equipment Configuration for 20 dB 99% Bandwidth			
Variant:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 20 dB Bandwidth (MHz) Port(s)				20 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	MHz	MHz
902.8	0.239	--	--	--	0.239	0.239	0.5	-0.26
915.3	0.225	--	--	--	0.225	0.225	0.5	-0.28
927.3	0.232	--	--	--	0.232	0.232	0.5	-0.27

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
902.8	0.225	--	--	--	0.225		
915.3	0.221	--	--	--	0.221		
927.3	0.224	--	--	--	0.224		

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).

8.3. Frequency Hopping Tests

Conducted Test Conditions for Frequency Hopping Measurements			
Standard:	FCC CFR 47:15.247 RSS-247 Issue 2	**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) RSS-247 5.1 (c)	**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.

8.3.1. Number of Hopping Channels

Equipment Configuration for Number of Hopping Channels			
Variant:	FHSS	**Antenna:**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	99.0	**Tested By:**	SB
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

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

8.3.2. Channel Separation

Equipment Configuration for Channel Separation			
Variant:	FHSS	**Antenna:**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	99.0	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Center Frequency (MHz)	Chan Separation (MHz)	Limit (MHz)	Pass / Fail
915.3	0.500	0.239	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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8.3.3. Chanel Dwell Time & Occupancy

Variant:	FHSS	**Antenna:**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
Duty Cycle (%):	99.0	**Tested By:**	SB
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
915.3	0.395	0.395	20s	400.000	Pass

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

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

8.4. Emissions

8.4.1. Conducted Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247 RSS-247 Issue 2	**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) RSS-247 5.5	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

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

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

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

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

Limits Transmitter Conducted Spurious and Band-Edge Emissions

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

8.4.1.1. Conducted Unwanted Spurious Emissions

Equipment Configuration for Unwanted Emissions Peak			
Variant:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
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 - 10000.0	-25.479	8.69	--	--	--	--	--	--
915.3	30.0 - 10000.0	-31.662	7.79	--	--	--	--	--	--
927.3	30.0 - 10000.0	-32.700	7.24	--	--	--	--	--	--

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).

8.4.1.2. Conducted Band-Edge Emissions

Equipment Configuration for Conducted Low Band-Edge Emissions (Static) Peak

Variant:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
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	-37.23	8.72	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

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

Equipment Configuration for Conducted Upper Band-Edge Emissions (Static) Peak			
Variant:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
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	-30.00	7.93	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

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:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
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	-30.03	8.74	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

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:	FHSS	**Duty Cycle (%):**	99
Data Rate:	100 KBp/s	**Antenna Gain (dBi):**	6.00
Modulation:	GFSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
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	-30.14	8.35	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

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

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8.4.2. Radiated Emissions

Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions (Restricted Bands)			
Standard:	FCC CFR 47:15.247 RSS-247 Issue 2	**Ambient Temp. (ºC):**	20.0 - 24.5
Test Heading:	Radiated Spurious and Band-Edge Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.205, 15.209	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Spurious and Band-Edge Emissions (Restricted Bands)
Radiated emissions for restricted bands above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned. Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Test configuration and setup for Radiated Spurious and Band-Edge Measurement were per the Radiated Test Set-up specified in this document.

Limits for Restricted Bands
Peak emission: 74 dBuV/m
Average emission: 54 dBuV/m

Field Strength Calculation
The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.
FS = R + AF + CORR - FO

where:
FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss or Waveguide Loss

Example:
Given receiver input reading of 51.5 dBmV; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength (FS) of the measured emission is:

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBmV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:
Level (dBmV/m) = 20 * Log (level (mV/m))

40 dBmV/m = 100 mV/m
48 dBmV/m = 250 mV/m

Restricted Bands of Operation (15.205)
(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

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.

(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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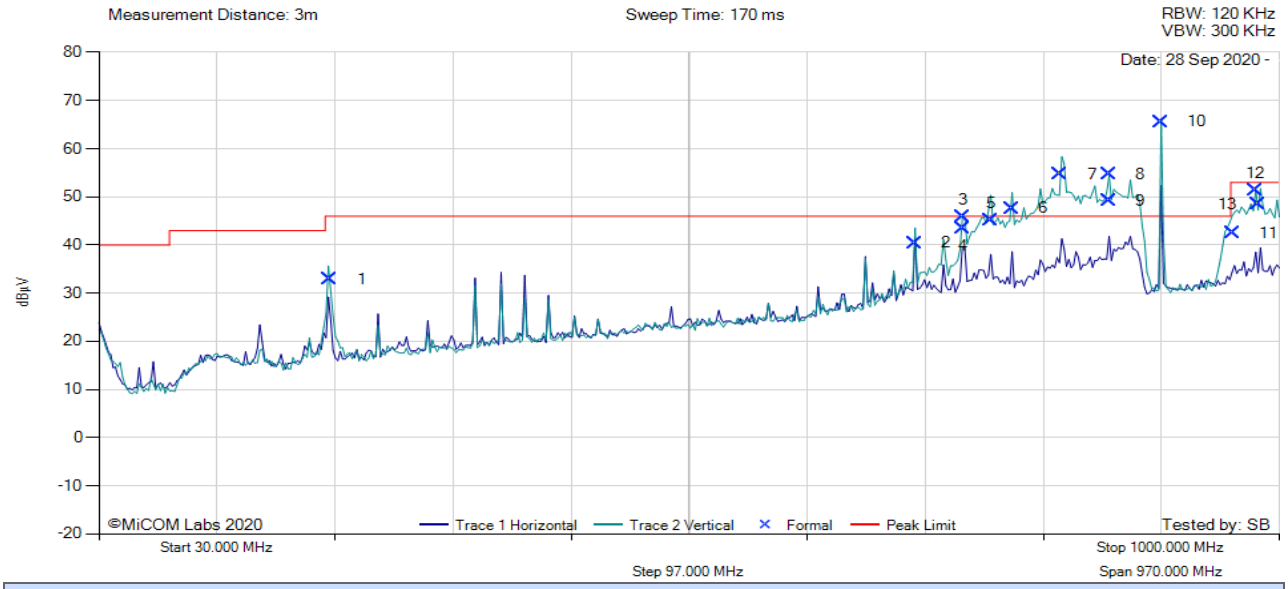
8.4.2.1. TX Spurious & Restricted Band Emissions

Equipment Configuration for Radiated Digital Emissions			
Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 902.75 MHz, Power Setting: Max



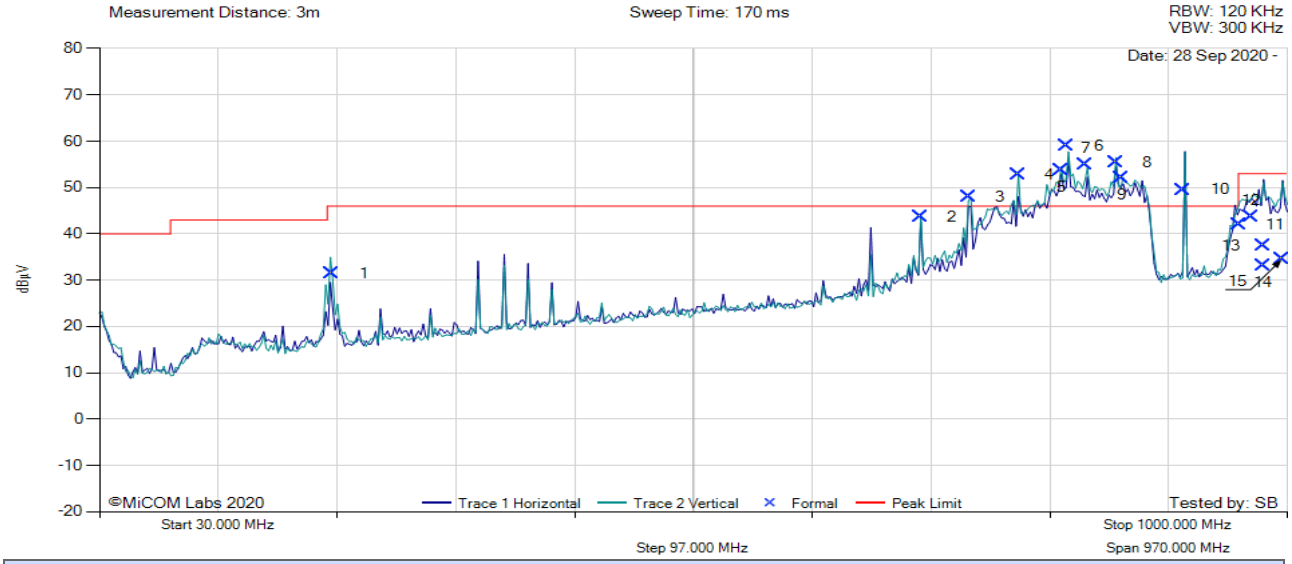
30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	220.07	45.18	4.62	-16.98	32.82	Peak (NRB)	Vertical	150	0	--	--	Pass
2	700.06	41.39	6.20	-7.22	40.37	Peak (NRB)	Vertical	150	0	--	--	Pass
3	739.99	46.13	6.31	-6.63	45.81	Peak (NRB)	Vertical	150	0	--	--	Pass
4	740.07	43.70	6.32	-6.61	43.41	Peak (NRB)	Vertical	150	0	--	--	Pass
5	762.86	45.02	6.39	-6.31	45.10	Peak (NRB)	Vertical	150	0	--	--	Pass
6	779.98	47.22	6.43	-6.09	47.56	Peak (NRB)	Vertical	150	0	--	--	Pass
7	820.09	53.67	6.54	-5.58	54.63	Peak (NRB)	Vertical	150	0	--	--	Pass
8	859.99	53.37	6.65	-5.34	54.68	Peak (NRB)	Vertical	150	0	--	--	Pass
9	860.01	47.90	6.65	-5.34	49.21	Peak (NRB)	Vertical	150	0	--	--	Pass
10	902.80	63.76	6.76	-4.93	65.59	Fundamental	Vertical	150	0	--	--	
11	961.51	39.57	6.94	-4.08	42.43	MaxQP	Vertical	150	2	53.0	-10.6	Pass
12	979.99	48.09	6.99	-3.85	51.23	MaxQP	Vertical	150	5	53.0	-1.8	Pass
13	982.84	45.08	6.99	-3.71	48.36	MaxQP	Vertical	150	9	53.0	-4.6	Pass

Equipment Configuration for Radiated Digital Emissions

Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 915.25 MHz, Power Setting: Max



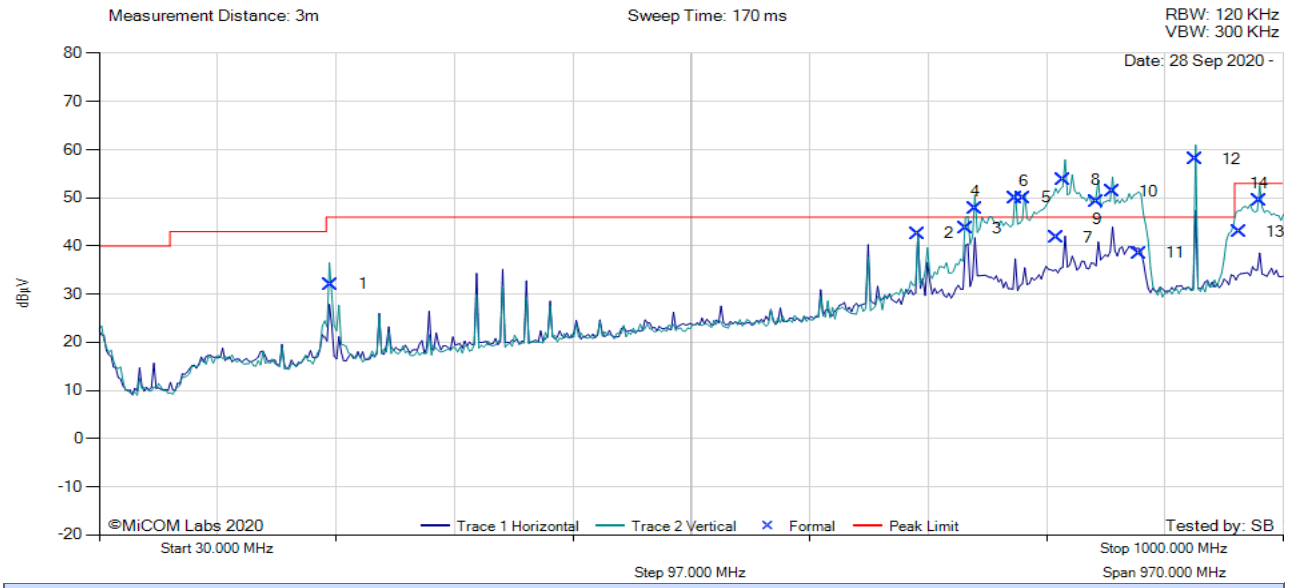
30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	220.08	43.79	4.62	-16.98	31.43	Peak (NRB)	Vertical	150	0	--	--	Pass
2	700.05	44.63	6.20	-7.22	43.61	Peak (NRB)	Vertical	150	0	--	--	Pass
3	740.05	48.25	6.32	-6.61	47.96	Peak (NRB)	Vertical	150	0	--	--	Pass
4	780.07	52.38	6.43	-6.10	52.71	Peak (NRB)	Vertical	150	0	--	--	Pass
5	815.34	52.74	6.53	-5.55	53.72	Peak (NRB)	Vertical	150	0	--	--	Pass
6	820.05	58.02	6.54	-5.58	58.98	Peak (NRB)	Vertical	150	0	--	--	Pass
7	835.32	53.63	6.58	-5.36	54.85	Peak (NRB)	Vertical	150	0	--	--	Pass
8	859.99	54.03	6.65	-5.34	55.34	Peak (NRB)	Vertical	150	0	--	--	Pass
9	864.76	50.58	6.66	-5.26	51.99	Peak (NRB)	Vertical	150	0	--	--	Pass
10	915.28	47.41	6.80	-4.66	49.55	Peak (NRB)	Horizontal	150	0	--	--	Pass
11	960.41	39.16	6.94	-4.09	42.01	MaxQP	Vertical	150	351	46.0	-4.0	Pass
12	970.33	40.77	6.97	-4.10	43.64	MaxQP	Vertical	148	358	53.0	-9.4	Pass
13	980.00	34.23	6.99	-3.85	37.37	MaxQP	Horizontal	148	141	53.0	-15.6	Pass
14	980.05	30.00	6.99	-3.84	33.15	MaxQP	Horizontal	148	229	53.0	-19.9	Pass
15	995.31	31.07	7.03	-3.62	34.48	MaxQP	Horizontal	148	239	53.0	-18.5	Pass

Equipment Configuration for Radiated Digital Emissions

Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 927.25 MHz, Power Setting: Max



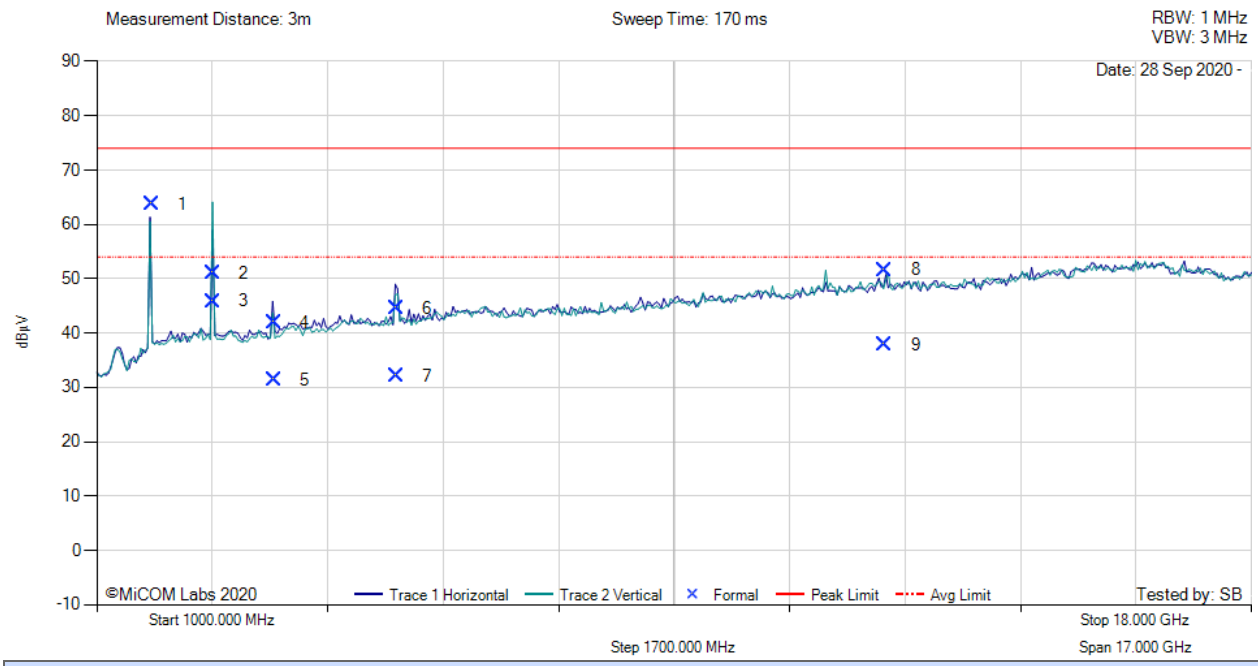
30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	220.09	44.34	4.62	-16.98	31.98	Peak (NRB)	Vertical	150	0	--	--	Pass
2	700.07	43.62	6.20	-7.22	42.60	Peak (NRB)	Vertical	150	0	--	--	Pass
3	740.00	43.99	6.32	-6.61	43.70	Peak (NRB)	Vertical	150	0	--	--	Pass
4	747.33	47.94	6.34	-6.49	47.79	Peak (NRB)	Vertical	150	0	--	--	Pass
5	780.03	49.66	6.43	-6.10	49.98	Peak (NRB)	Vertical	150	0	--	--	Pass
6	787.26	49.41	6.45	-5.99	49.87	Peak (NRB)	Vertical	150	0	--	--	Pass
7	814.26	40.71	6.52	-5.54	41.69	Peak (NRB)	Vertical	150	0	--	--	Pass
8	820.03	52.68	6.54	-5.58	53.64	Peak (NRB)	Vertical	150	0	--	--	Pass
9	847.22	48.03	6.62	-5.44	49.21	Peak (NRB)	Vertical	150	0	--	--	Pass
10	859.98	49.97	6.65	-5.34	51.28	Peak (NRB)	Vertical	150	0	--	--	Pass
11	881.62	36.91	6.73	-5.19	38.45	Peak (NRB)	Vertical	150	0	--	--	Pass
12	927.36	55.80	6.83	-4.58	58.05	Peak (NRB)	Vertical	150	0	--	--	Pass
13	963.68	39.97	6.95	-4.07	42.85	MaxQP	Vertical	148	7	53.0	-10.2	Pass
14	980.04	46.19	6.99	-3.84	49.34	MaxQP	Vertical	148	0	53.0	-3.7	Pass

Equipment Configuration for Restricted Band Spurious Emissions

Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 902.75 MHz, Power Setting: Max



1000.00 - 18000.00 MHz

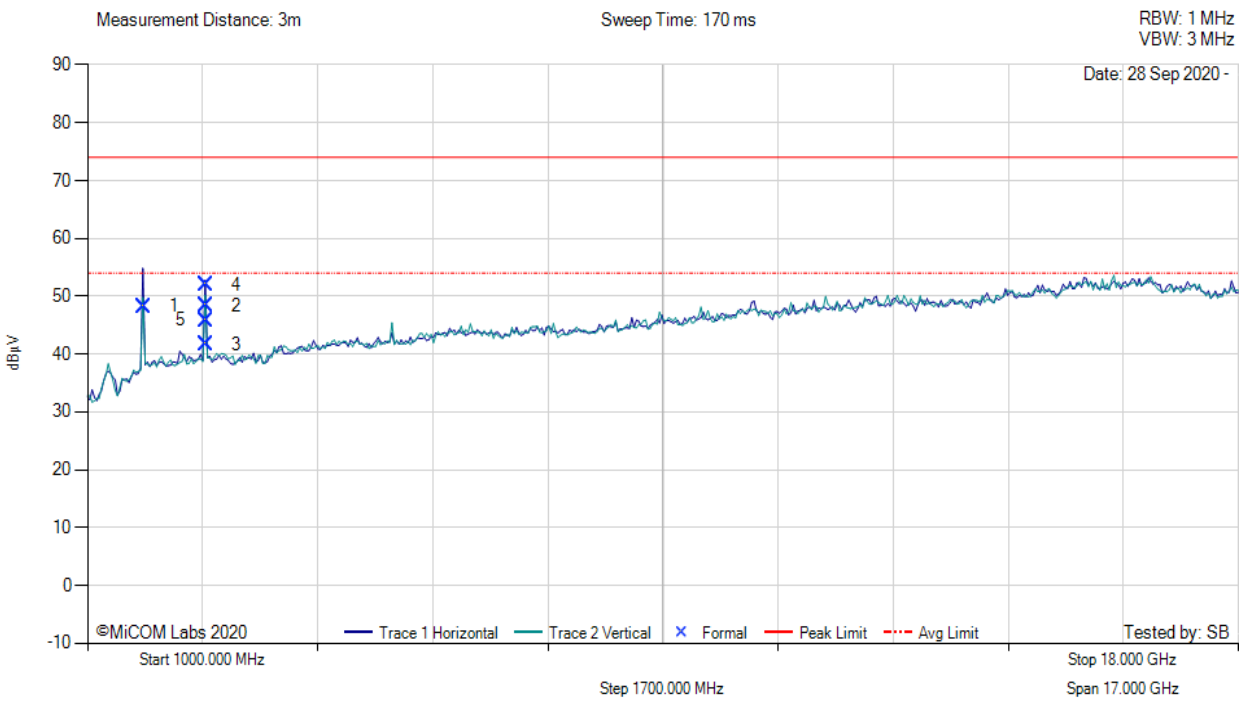
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1805.56	76.40	1.75	-14.50	63.65	Peak (NRB)	Horizontal	100	0	--	--	Pass
2	2708.42	61.09	2.13	-12.15	51.07	Max Peak	Vertical	179	4	74.0	-22.9	Pass
3	2708.42	55.87	2.13	-12.15	45.85	Max Avg	Vertical	179	4	54.0	-8.2	Pass
4	3611.30	51.50	2.46	-12.07	41.89	Max Peak	Horizontal	168	122	74.0	-32.1	Pass
5	3611.30	40.93	2.46	-12.07	31.32	Max Avg	Horizontal	168	122	54.0	-22.7	Pass
6	5415.81	53.45	3.02	-11.94	44.53	Max Peak	Horizontal	140	109	74.0	-29.5	Pass
7	5415.81	41.06	3.02	-11.94	32.14	Max Avg	Horizontal	140	109	54.0	-21.9	Pass
8	12606.44	54.55	4.90	-7.89	51.56	Max Peak	Horizontal	161	209	74.0	-22.4	Pass
9	12606.44	40.88	4.90	-7.89	37.89	Max Avg	Horizontal	161	209	54.0	-16.1	Pass

Equipment Configuration for Restricted Band Spurious Emissions

Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 915.25 MHz, Power Setting: Max

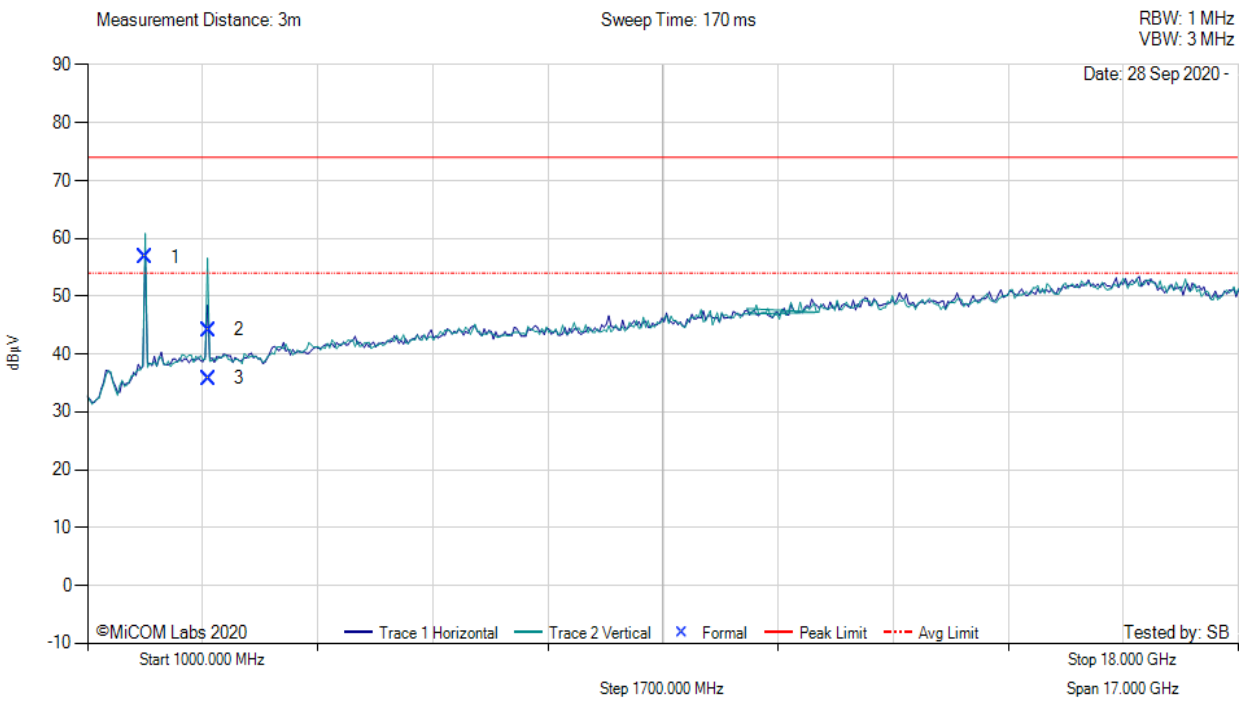


1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1830.15	60.61	1.76	-14.14	48.23	Peak (NRB)	Vertical	100	0	--	--	Pass
2	2745.73	58.10	2.16	-11.90	48.36	Max Peak	Vertical	181	5	74.0	-25.6	Pass
3	2745.73	51.42	2.16	-11.90	41.68	Max Avg	Vertical	181	5	54.0	-12.3	Pass
4	2746.04	61.73	2.16	-11.91	51.98	Max Peak	Horizontal	101	308	74.0	-22.0	Pass
5	2746.04	55.61	2.16	-11.91	45.86	Max Avg	Horizontal	101	308	54.0	-8.1	Pass

Equipment Configuration for Restricted Band Spurious Emissions			
Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 927.25 MHz, Power Setting: Max



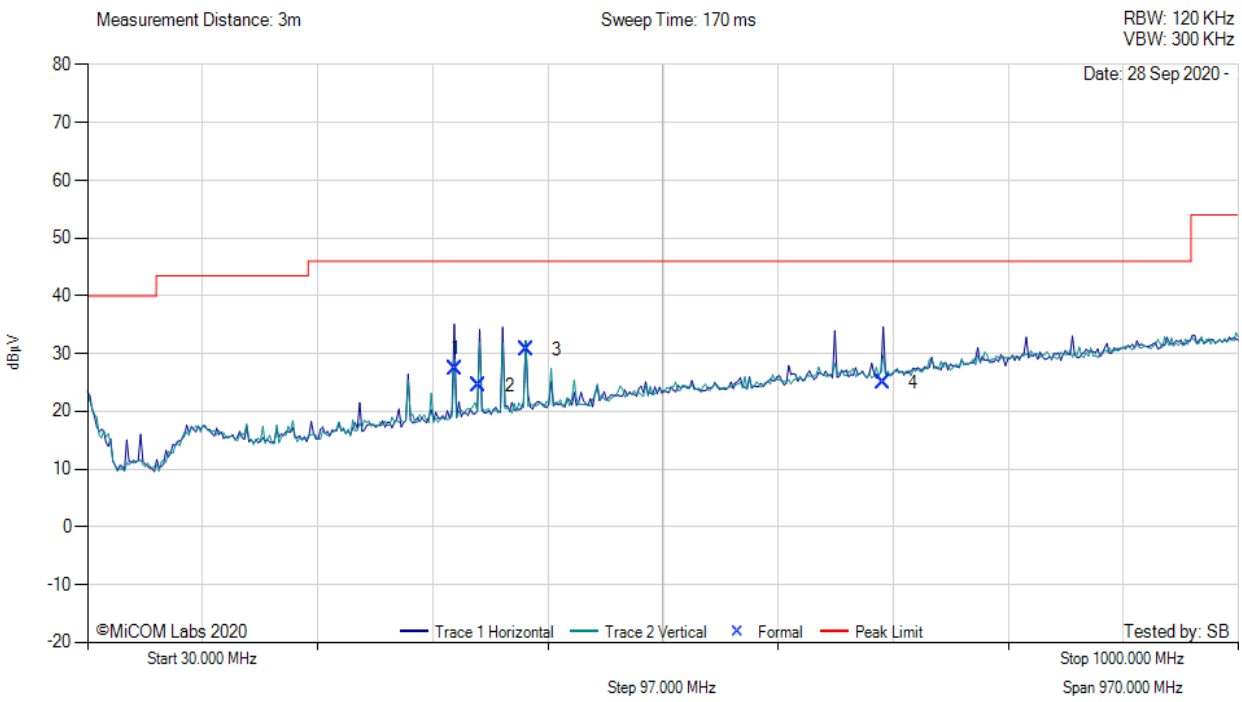
1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1854.33	69.00	1.77	-14.08	56.69	Peak (NRB)	Vertical	100	0	--	--	Pass
2	2781.85	54.01	2.16	-12.01	44.16	Max Peak	Vertical	167	10	74.0	-29.8	Pass
3	2781.85	45.61	2.16	-12.01	35.76	Max Avg	Vertical	167	10	54.0	-18.2	Pass

8.4.2.2. Digital Emissions (0.03 - 1 GHz)

Equipment Configuration for Radiated Digital Emissions (Class B)			
Antenna:	Integral	**Variant:**	FHSS
Antenna Gain (dBi):	6.00	**Modulation:**	GFSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	Not Applicable
Channel Frequency (MHz):	902.75	**Data Rate:**	100 Kbit/s
Power Setting:	Not Applicable	**Tested By:**	SB

Test Measurement Results

Variant: FHSS, Test Freq: 927.25 MHz, Power Setting: Max



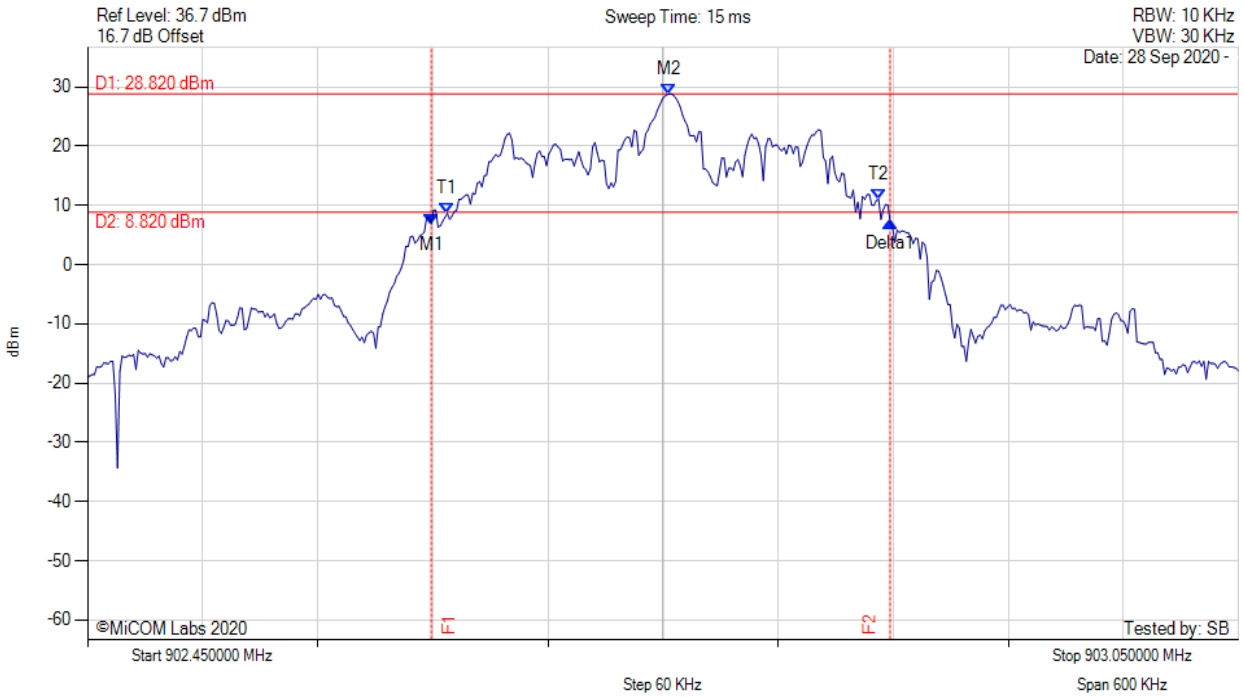
30.00 - 1000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	340.07	35.79	5.05	-13.56	27.28	Peak (Scan)	Vertical	100	0	46.0	-18.7	Pass
2	360.03	32.05	5.12	-12.69	24.48	Peak (Scan)	Horizontal	100	0	46.0	-21.5	Pass
3	400.01	37.61	5.26	-12.12	30.75	Peak (Scan)	Horizontal	100	0	46.0	-15.3	Pass
4	700.04	25.99	6.20	-7.22	24.97	Peak (Scan)	Horizontal	100	0	46.0	-21.0	Pass

A. APPENDIX - GRAPHICAL IMAGES

A.1. 20 dB & 99% Bandwidth

20 dB 99% BANDWIDTH

Variant: FHSS, Channel: 902.75 MHz, Chain a, Temp: 20

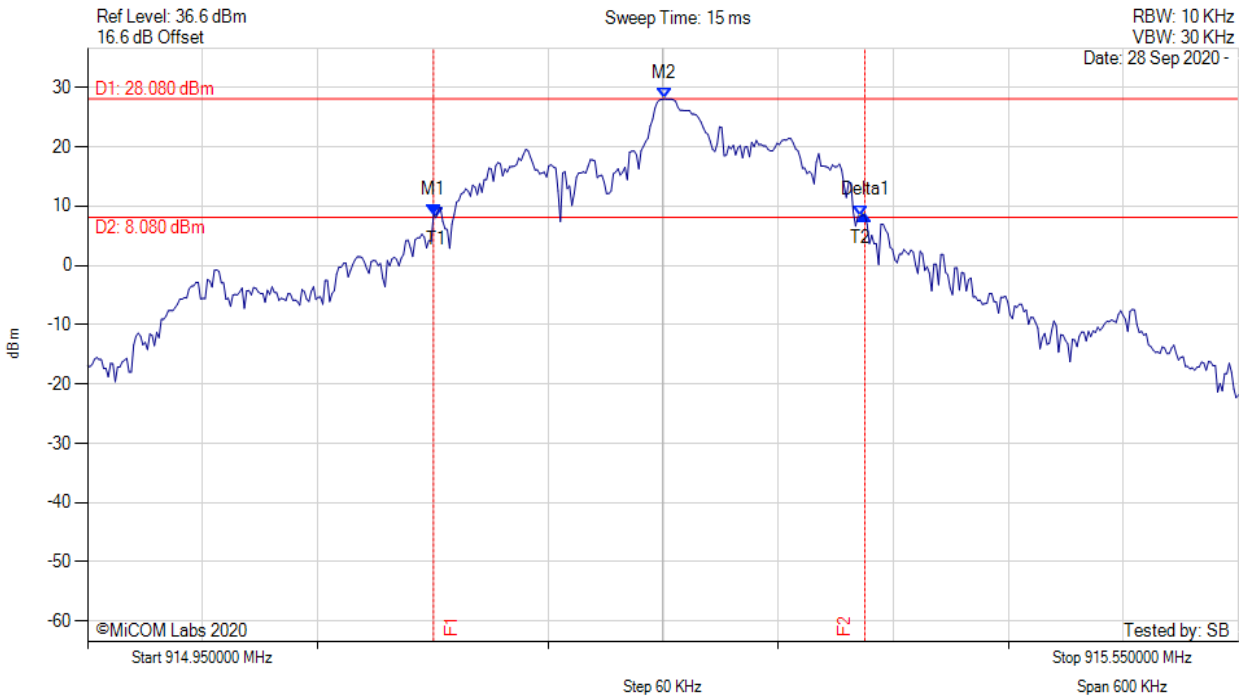


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.629 MHz : 6.875 dBm M2 : 902.753 MHz : 28.821 dBm Delta1 : 239 KHz : 0.287 dB T1 : 902.638 MHz : 8.632 dBm T2 : 902.862 MHz : 10.991 dBm OBW : 225 KHz	Measured 20 dB Bandwidth: 0.239 MHz Limit: 0.5 kHz Margin: 0.26 MHz

back to matrix

20 dB 99% BANDWIDTH

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20

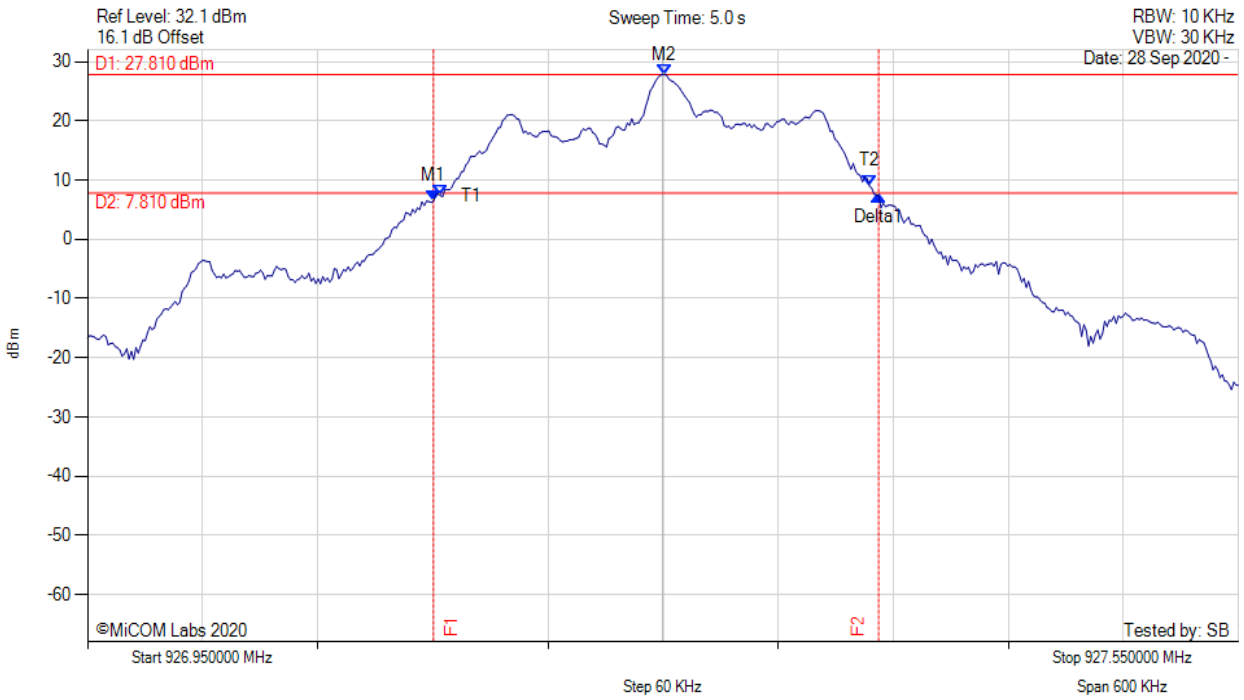


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.130 MHz : 8.553 dBm M2 : 915.251 MHz : 28.077 dBm Delta1 : 225 KHz : -0.085 dB T1 : 915.132 MHz : 8.034 dBm T2 : 915.353 MHz : 8.248 dBm OBW : 221 KHz	Measured 20 dB Bandwidth: 0.225 MHz Limit: 0.5 kHz Margin: 0.28 MHz

back to matrix

20 dB 99% BANDWIDTH

Variant: FHSS, Channel: 927.25 MHz, Chain a, Temp: 20



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.130 MHz : 6.459 dBm M2 : 927.251 MHz : 27.813 dBm Delta1 : 232 KHz : 0.980 dB T1 : 927.134 MHz : 7.392 dBm T2 : 927.358 MHz : 8.999 dBm OBW : 224 KHz	Measured 20 dB Bandwidth: 0.232 MHz Limit: 0.5 kHz Margin: 0.27 MHz

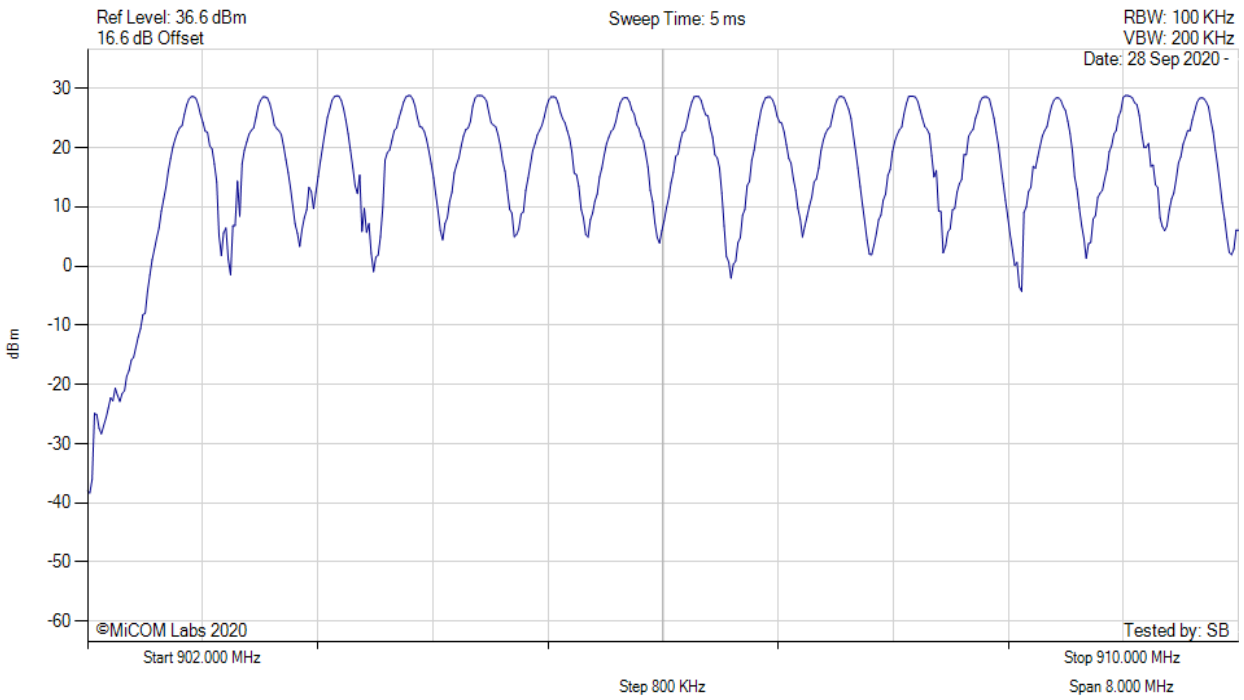
back to matrix

A.2. Frequency Hopping Tests

A.2.1. Number of Hopping Channels

NUMBER OF HOPPING CHANNELS

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20

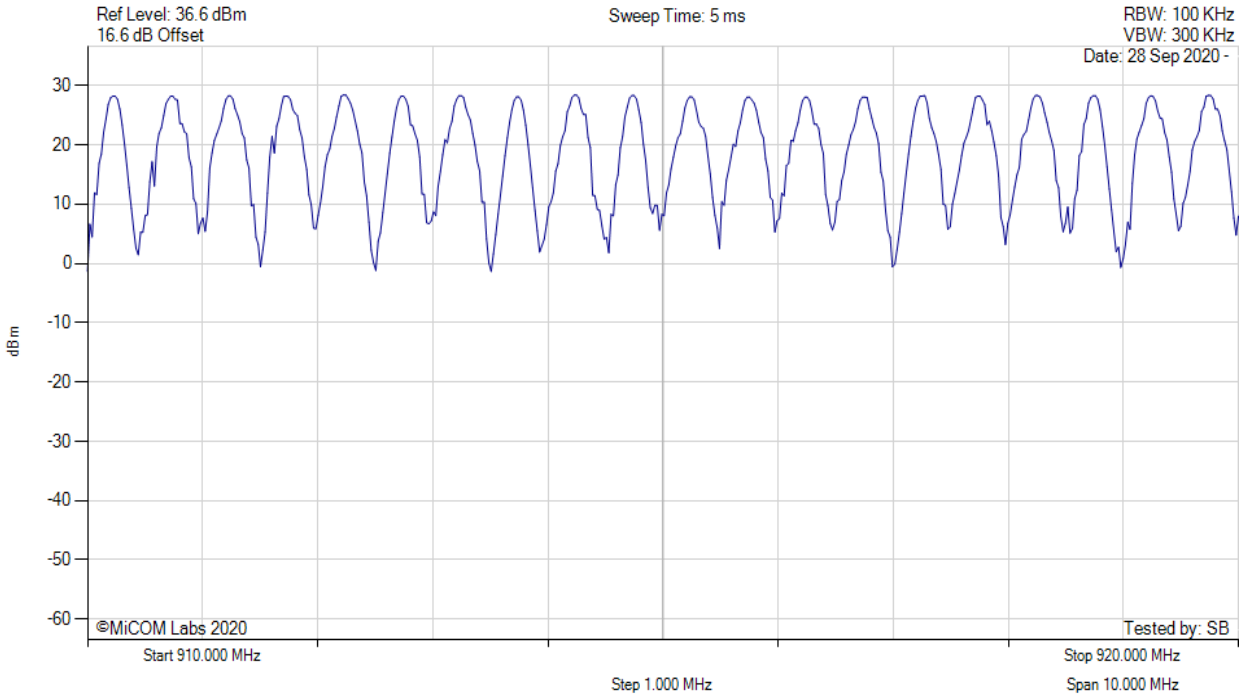


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

back to matrix

NUMBER OF HOPPING CHANNELS

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20

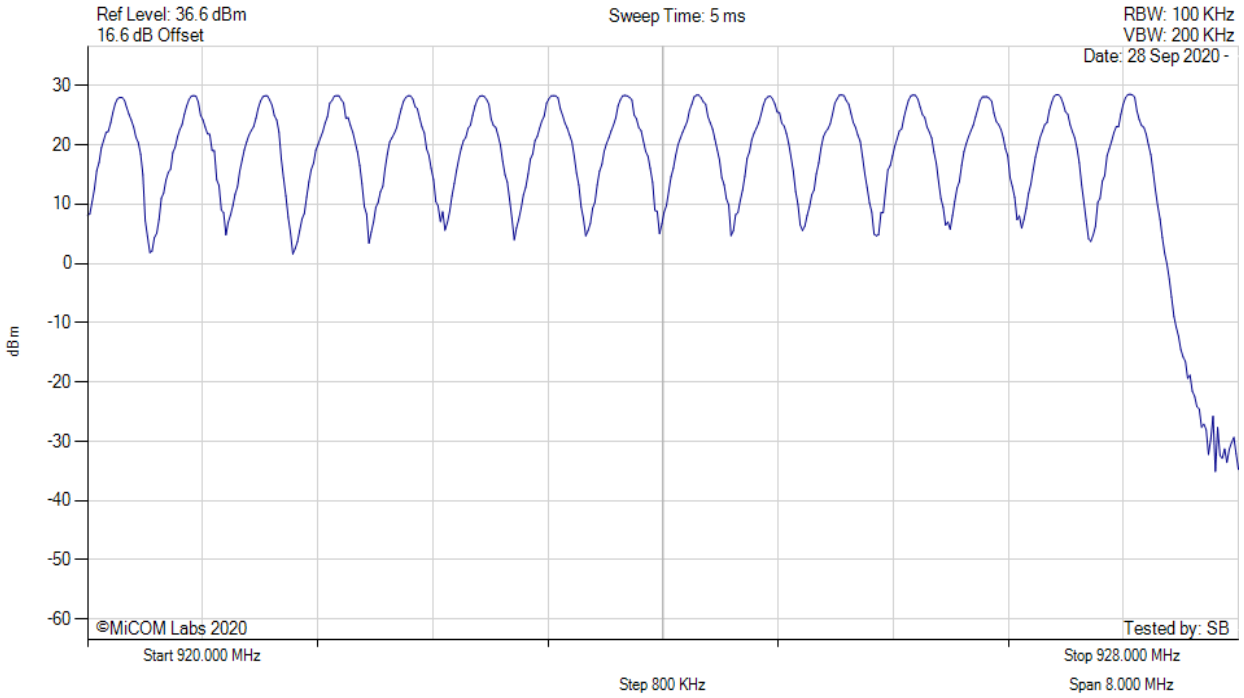


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

back to matrix

NUMBER OF HOPPING CHANNELS

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20



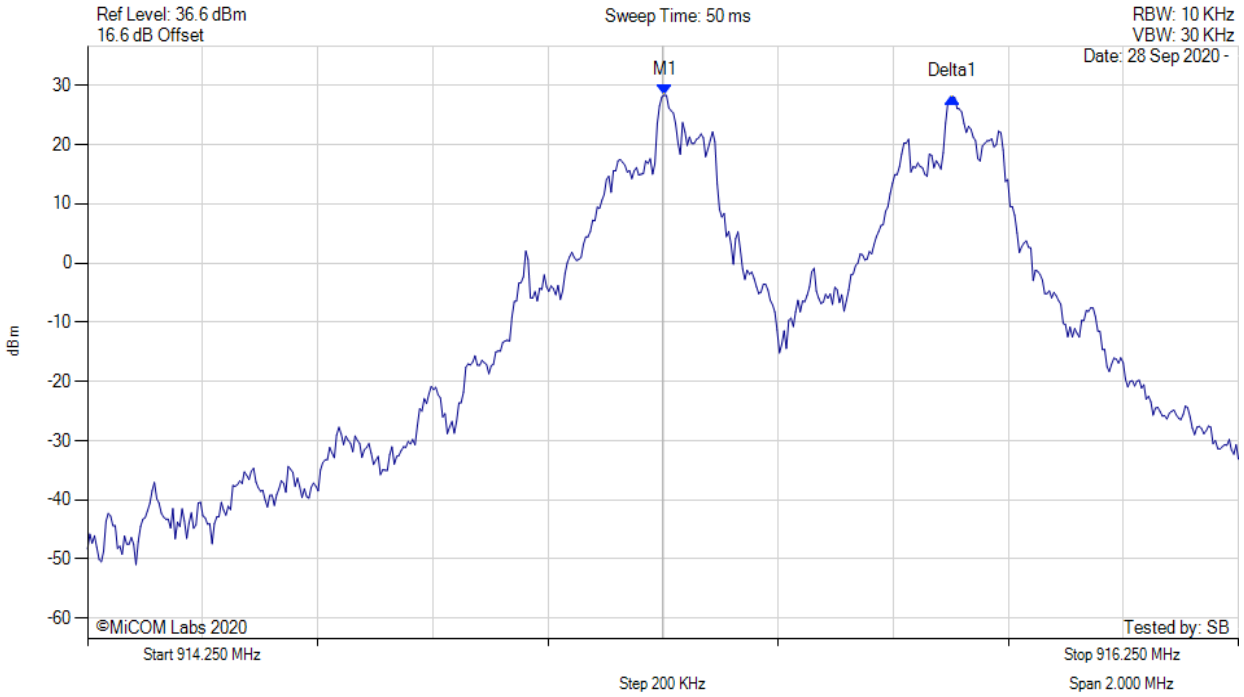
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW		Channel Frequency: 915.25 MHz

back to matrix

A.2.2. Channel Separation

CHANNEL SEPARATION

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20



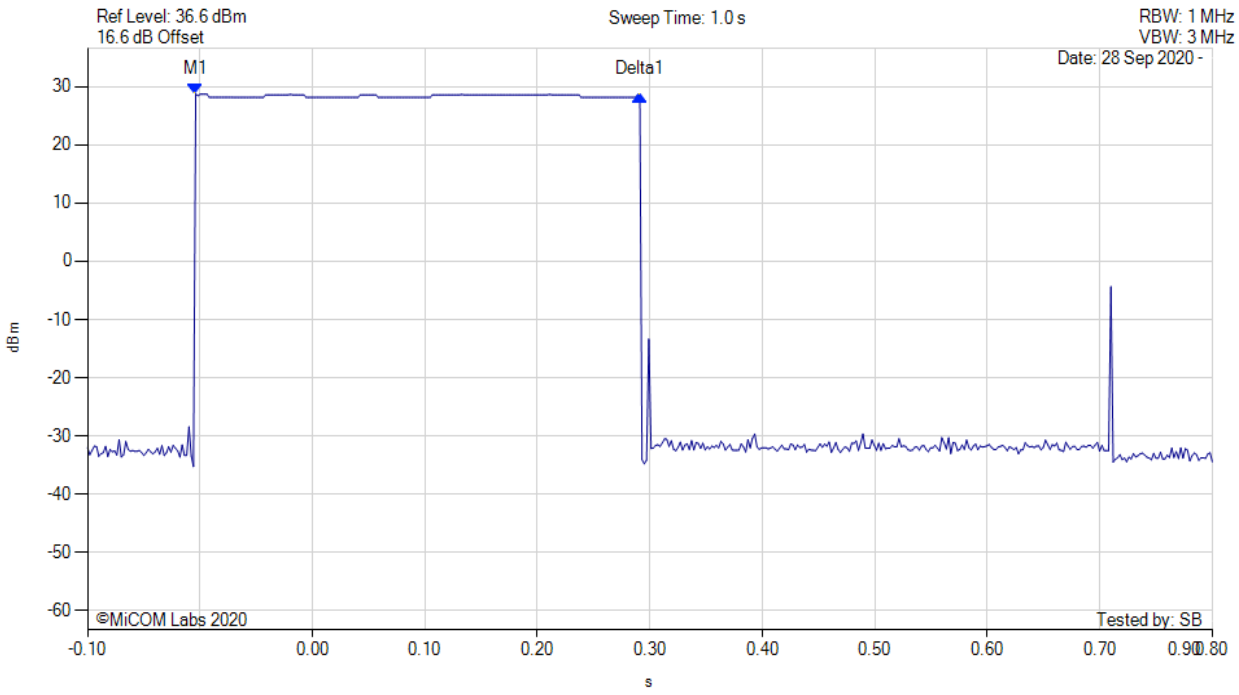
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.253 MHz : 28.341 dBm Delta1 : 500 KHz : -0.309 dB	Channel Frequency: 915.25 MHz

back to matrix

A.2.3. Dwell Time

DWELL TIME

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20



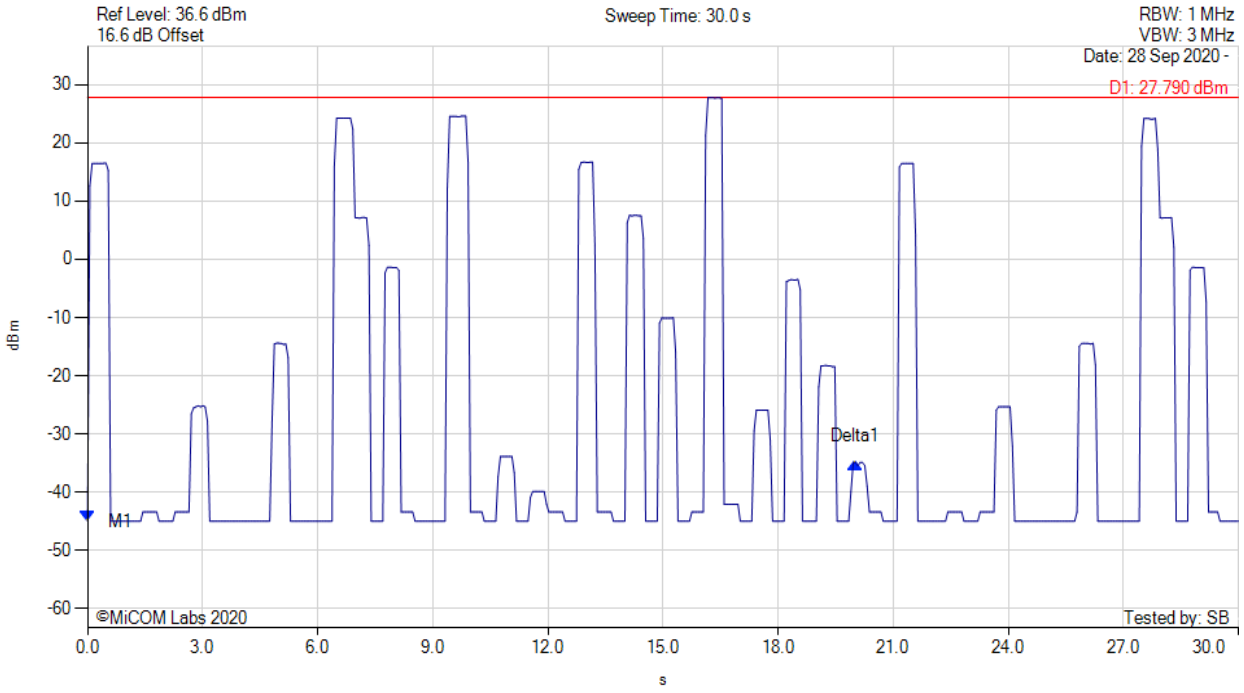
Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1(915.25 MHz) : -0.004 s : 28.762 dBm Delta1(915.25 MHz) : 0.395 s : -0.153 dB	Channel Frequency: 915.25 MHz

back to matrix

A.2.4. Channel Occupancy

CHANNEL OCCUPANCY

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20



Analyzer Setup	Marker:Time:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1(915.25 MHz) : 0.000 s : -44.986 dBm Delta1(915.25 MHz) : 20.000 s : 10.103 dB	Channel Frequency: 915.25 MHz

back to matrix

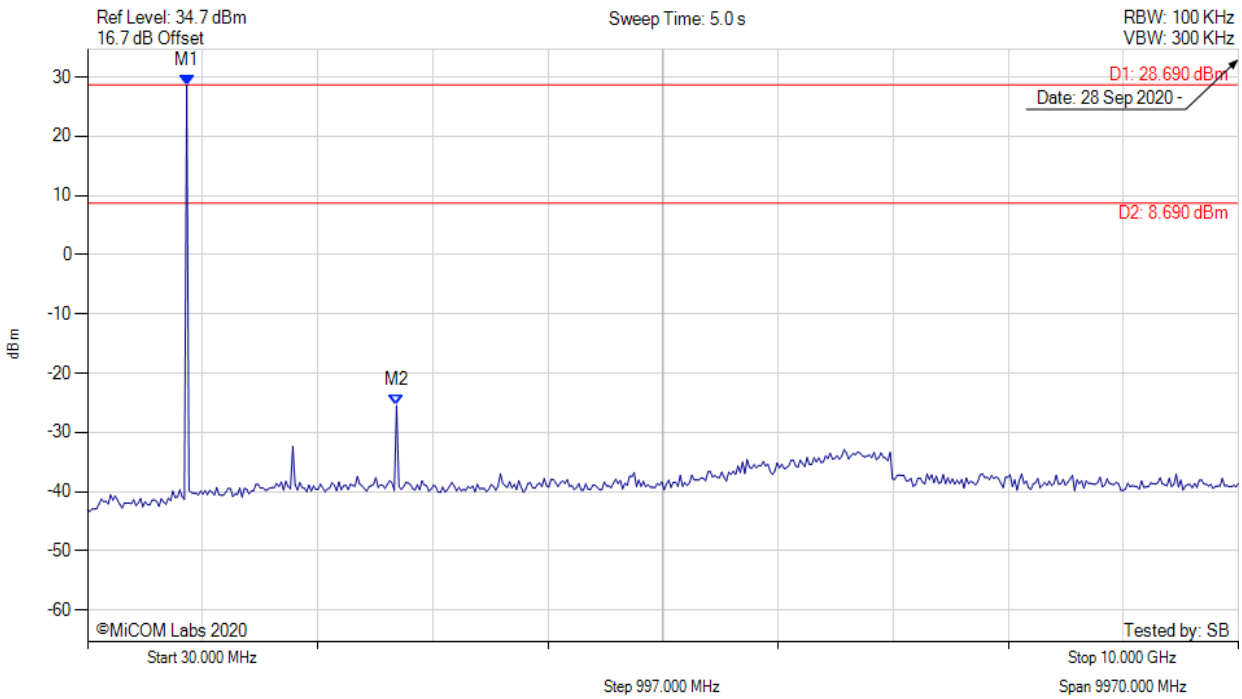
A.3. Emissions

A.3.1. Conducted Emissions

A.3.1.1. Conducted Unwanted Spurious Emissions

UNWANTED EMISSIONS PEAK

Variant: FHSS, Channel: 902.75 MHz, Chain a, Temp: 20

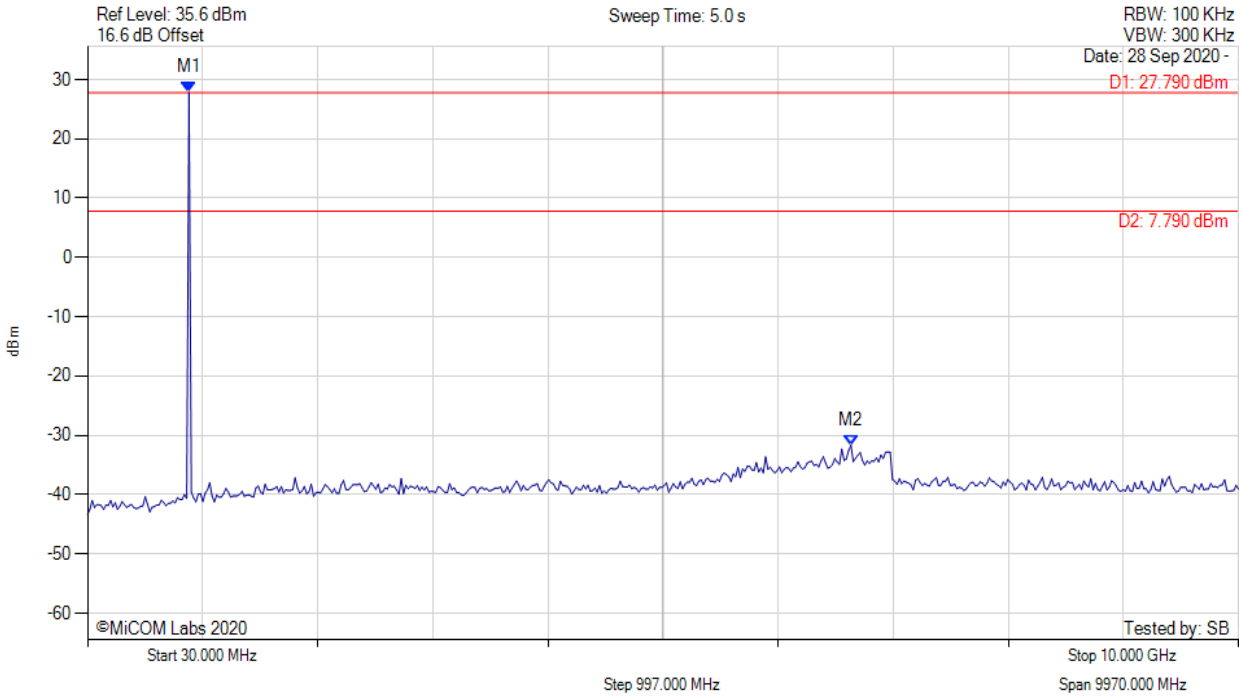


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 889.138 MHz : 28.694 dBm M2 : 2707.315 MHz : -25.479 dBm	Limit: 8.69 dBm Margin: -34.17 dB

back to matrix

UNWANTED EMISSIONS PEAK

Variant: FHSS, Channel: 915.25 MHz, Chain a, Temp: 20

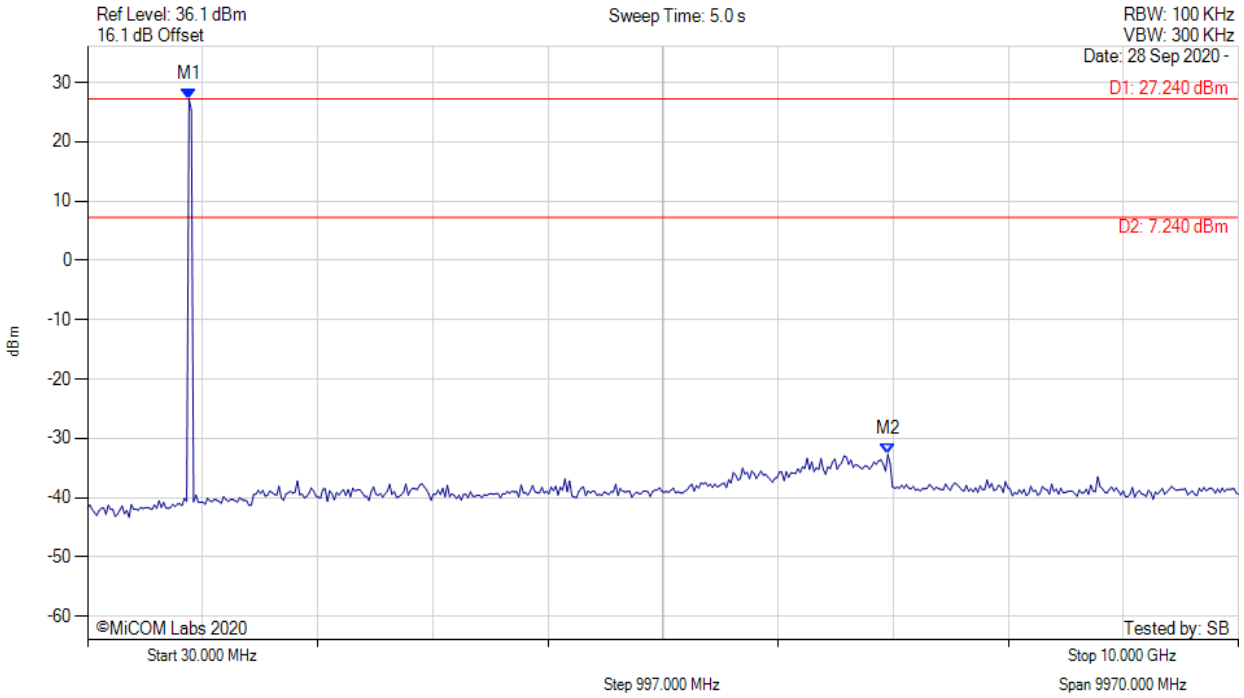


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.118 MHz : 27.790 dBm M2 : 6643.367 MHz : -31.662 dBm	Limit: 7.79 dBm Margin: -39.45 dB

back to matrix

UNWANTED EMISSIONS PEAK

Variant: FHSS, Channel: 927.25 MHz, Chain a, Temp: 20



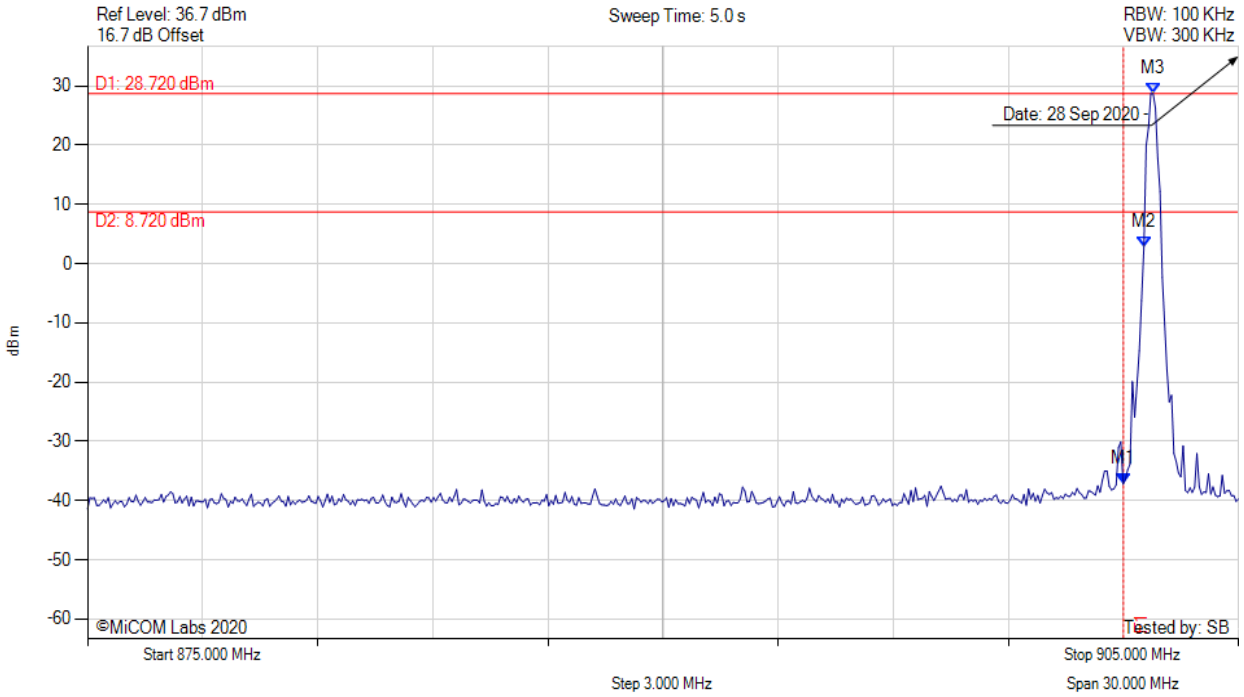
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.118 MHz : 27.239 dBm M2 : 6963.046 MHz : -32.700 dBm	Limit: 7.24 dBm Margin: -39.94 dB

back to matrix

A.3.1.2. Conducted Band-Edge Emissions

CONDUCTED LOW BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FHSS, Channel: 902.75 MHz, Chain a, Temp: 20

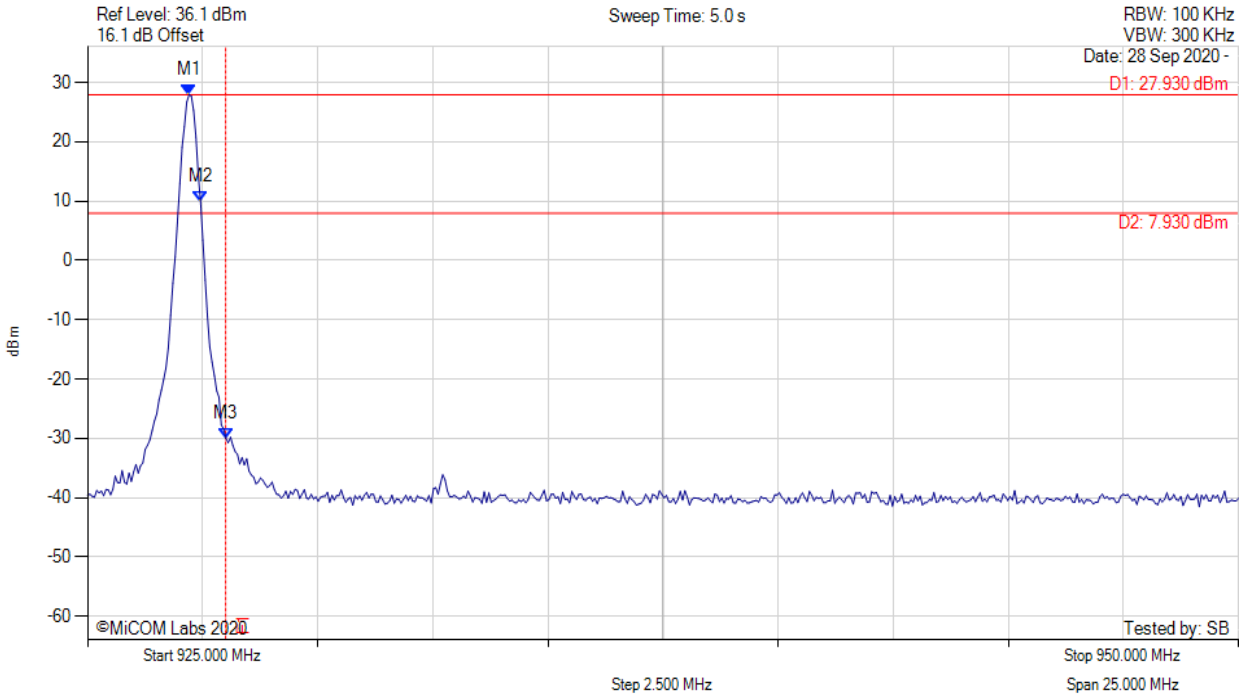


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -37.231 dBm M2 : 902.535 MHz : 2.763 dBm M3 : 902.776 MHz : 28.716 dBm	Channel Frequency: 902.75 MHz

back to matrix

CONDUCTED UPPER BAND-EDGE EMISSIONS (STATIC) PEAK

Variant: FHSS, Channel: 927.25 MHz, Chain a, Temp: 20

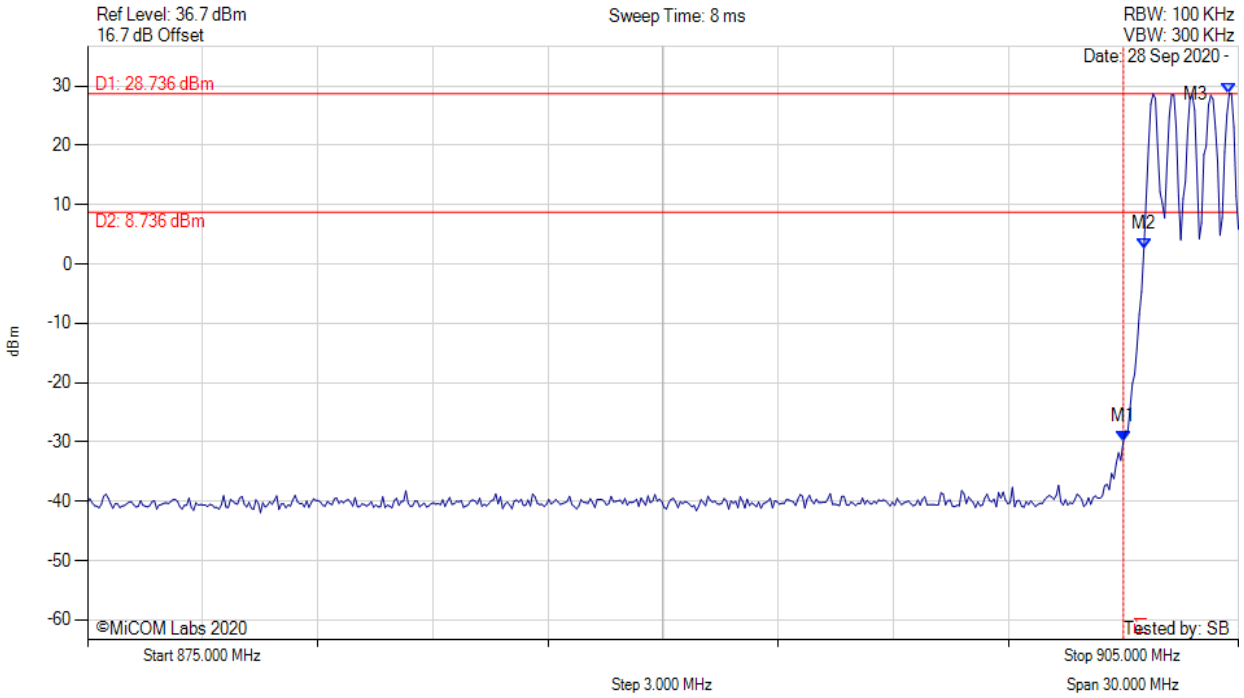


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 927.204 MHz : 27.928 dBm M2 : 927.455 MHz : 9.828 dBm M3 : 928.000 MHz : -29.995 dBm	Channel Frequency: 927.25 MHz

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FHSS, Channel: 902.75 MHz, Chain a, Temp: 20

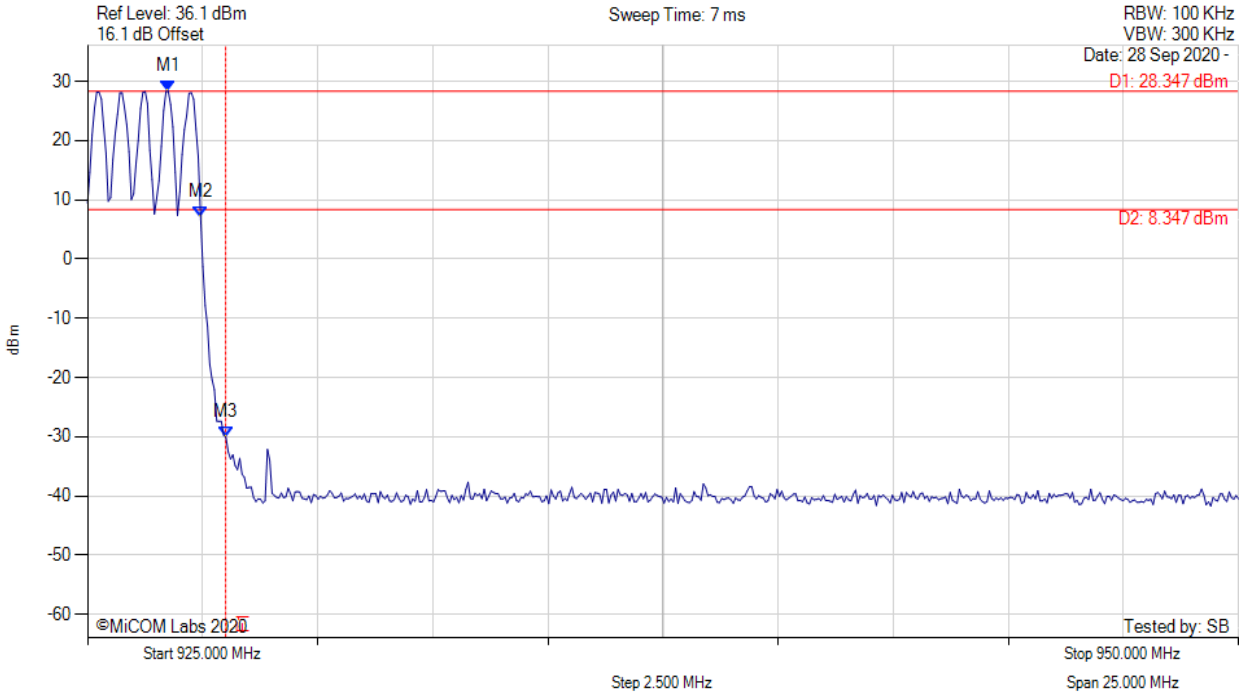


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -30.027 dBm M2 : 902.535 MHz : 2.501 dBm M3 : 904.760 MHz : 28.736 dBm	Channel Frequency: 902.75 MHz

back to matrix

CONDUCTED UPPER BAND-EDGE EMISSIONS (HOPPING) PEAK

Variant: FHSS, Channel: 927.25 MHz, Chain a, Temp: 20



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 926.754 MHz : 28.347 dBm M2 : 927.455 MHz : 7.072 dBm M3 : 928.000 MHz : -30.135 dBm	Channel Frequency: 927.25 MHz

back to matrix

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