

REGULATORY COMPLIANCE TEST REPORT

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

Report No.: ITRO67-U44 Rev A

Company: Itron Inc.

Model Name: ERW-1350-001



REGULATORY COMPLIANCE TEST REPORT

Company Name: Itron Inc.

Model Name: ERW-1350-001

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

Test Report Serial No.: ITRO67-U44 Rev A

This report supersedes: NONE

Applicant: Itron Inc.

2401 North State St.

Waseca, Minnesota 56093 United States of America

Issue Date: 4th September 2024

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.

575 Boulder Court Pleasanton California 94566 USA

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MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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

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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; https://www.a2la.org/scopepdf/2381-01.pdf



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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)	ТСВ	-	US0159 Test Firm Designation#: US1084	
Canada	Industry Canada (ISED)	FCB	APEC MRA 2	US0159 ISED#: 4143A	
Japan	MIC (Ministry of Internal Affairs and Communication) Japan Approvals Institute for Telecommunication Equipment (JATE)		Japan MRA 2	RCB 210	
	VCCI		-	A-0012	
Europe	European Commission	NB	EU MRA 2	NB 2280	
United Kingdom	Department for Business, Energy & Industrial Strategy (BEIS)	AB	UK MRA 2	AB 2280	
Mexico	Instituto Federal de Telecomunicaciones (IFT)	CAB	Mexico MRA 1	US0159	
Australia	Australian Communications and Media Authority (ACMA)				
Hong Kong	Office of the Telecommunication Authority (OFTA)				
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)			ADEC MDA 4	1100450
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	US0159	
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

MRA 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; https://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 - 150-16C 17005 - Telecommunication Certification Body Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a management system.



Presented this 28th day of February 2024.

Mr. trace Mointurff, Vice President, Accreditation Services For the Accreditation Council Certificate Number 2381 02

Valid to November 30, 2026

For the product certification schemes to which this occreditation applies, always refer to the organization's Fraduct 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	9th August 2024	Draft report for client review.			
Draft #2	25 th August 2024	Additional draft for review			
Rev A	4 th September 2024	Initial release			

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



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3. TEST RESULT CERTIFICATE

Manufacturer: Itron Inc.

2401 North State St.

Waseca

MN 56093 United States of

America

Model: ERW-1350-001 **Telephone:** +1 925 462 0304

Type Of Equipment: RF-based meter data collection

solution.

S/N's: Conducted RF: 2935662-20

Radiated RF: 2935662-23

Test Date(s): 20th – 21th, 24th, 26th June and 13th

August 2024

 $2^{nd} - 3^{rd}$, 8^{th} , $10^{th} - 12^{th}$ July 2024

Tested By: MiCOM Labs, Inc.

Pleasanton

Fax: +1 925 462 0306

Website: www.micomlabs.com

575 Boulder Court

California 94566 USA

TEST RESULTS

EQUIPMENT COMPLIES

STANDARD(S)

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

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.

Approved & Released for MiCOM Labs, Inc. by:

Gordon Hurs

President & CEO MiCOM Labs, Inc.

Graeme Grieve

Quality Manager MiCOM Labs, Inc.

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4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
ı	KDB 558074 D01 v05r02	Apr 2019	Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC Rules.
II	A2LA	16th April 2024	R105 - Requirement's When Making Reference to A2LA Accreditation Status
III	ANSI C63.10	2020	American National Standard for Testing Unlicensed Wireless Devices
IV	ANSI C63.4	2014	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)
Х	UKAS M3003	Edition 6 March 2024	The Expression of Uncertainty and Confidence in Measurements
XI	RSS-247 Issue 3	Aug 2023	Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices
XII	RSS-Gen Issue 5	Amendment 1,2 (Feb 2021)	General Requirements for Compliance of Radio Apparatus. With Amendments 1: March 2019 and 2: Feb 2021.
XIII	FCC 47 CFR Part 2.1033	Feb 2023	FCC requirements and rules regarding photographs and test setup diagrams.
XIV	UKAS LAB 12	Edition 4 April 2022	The Expression of Uncertainty in Testing

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4.2. Test and Uncertainty Procedure

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

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

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



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5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description		
Purpose:	Test of the Itron Inc. ERW-1350-001 to FCC CFR 47 Part 15		
	Subpart C 15.247 & ISED RSS-247		
Applicant:			
	2401 North State St.		
	Waseca, Minnesota 56093, USA		
Manufacturer:			
Laboratory performing the tests:			
	575 Boulder Court		
Toot report reference number:	Pleasanton California 94566 USA		
Test report reference number:			
Date EUT received:			
Standard(s) applied:	·		
Dates of test (from - to):			
No of Holes Tooks de	2 nd – 3 rd , 8 th , 10 th – 12 th July 2024		
No of Units Tested:			
Product Family Name:			
Model(s):			
	ERW-1650-001,		
	ERW-1650-004, ERW-1650-008,		
	ERW-1650-009		
Location for use:			
Declared Frequency Range(s):			
Type of Modulation:	•		
EUT Modes of Operation:			
Lot wodes of operation.	GFSK, 100kbps, PL 3 (FHSS); GFSK, 10kbps, PL 3 (FHSS);		
	GFSK, 150kbps, PL 2 (Hybrid); GFSK, 150kbps, PL 3 (FHSS);		
	GFSK, 25kbps, PL 3 (FHSS); GFSK, 300kbps PL 2 (Hybrid);		
	GFSK, 300kbps PL 3 (FHSS); GFSK, 37.5 kbps, PL 3 (FHSS);		
	OOK PL 1; OOK PL 3 ;		
Declared Nominal Output Power (dBm):	+27 dBm		
Transmit/Receive Operation:	Transceiver		
Rated Input Voltage and Current:	3.6VDC, 0.25A		
Operating Temperature Range:	-40°C to +70°C		
ITU Emission Designator:	GFSK 100 KBits/s PL 3; 125KF1D		
	GFSK 10 KBits/s PL 3; 20K0F1D		
	GFSK 150 KBits/s PL 2; 184KF1D		
	GFSK 150 KBits/s PL 3; 283KF1D		
	GFSK 25 KBits/s PL 3; 29K0F1D		
	GFSK 300 KBits/s PL 2; 330KF1D		
	GFSK 300 KBits/s PL 3; 326KF1D		
	GFSK 37.5 KBits/s PL 3; 75K0F1D OOK 16.38 KBits/s PL 1; 127KL1D		
	OOK 16.38 KBits/s PL 1; 127KL1D		
	OON 10.30 NDIIS/S FL 3, 1/2NL1D		

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Equipment Dimensions:	3.2 x 4.8 x 2.3 inches
Weight:	9.6 oz
Hardware Rev:	3
Software Rev:	CSL 10.0.15.0

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5.2. Scope Of Test Program

Itron Inc. ERW-1350-001

The scope of the test program was to test the Itron Inc. ERW-1350-001 in the frequency range 902 – 928 MHz; for compliance against the following specifications:

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

Radio Frequency Devices; Subpart C - Intentional Radiators

ISED RSS-247

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

The Itron ERW-1350-001 is also marketed as the following Model Numbers per Manufacturer Declaration (refer to Section 11 of this report)

ERW-1650-001,

ERW-1650-004,

ERW-1650-008,

ERW-1650-009



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

Type (EUT/ Support)	Equipment Description	Mfr	Model No.	Serial No.
EUT	RF-based meter data collection solution	Itron, Inc.	ERW-1350-001	Conducted RF: 2935662-20 Radiated RF: 2935662-23
Laptop Computer	Support	Lenovo	ThinkPad	N/A

5.4. Antenna Details

Туре	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
integral	Itron Inc.	None	PCB	2.23		360	-	902 - 928
External	Itron	CFG-0900- 003	1/4 Wave Inverted F Antenna	4	-	360	-	910 - 940

BF Gain - Beamforming Gain

Dir BW - Directional BeamWidth

X-Pol - Cross Polarization

5.5. Cabling and I/O Ports

1. NONE.

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)			
operational ineae(e)	kbp/s	Low	Mid	High	
	902 - 928 MI	-lz			
GFSK PL 3 (FHSS)	100	902.30	914.60	926.90	
GFSK PL 3 (FHSS)	10	902.20	915.00	927.75	
GFSK PL 2 (Hybrid)	150	902.40	915.20	927.60	
GFSK PL 3 (FHSS)	150	902.40	915.20	927.60	
GFSK PL 3 (FHSS)	25	902.20	915.00	927.75	
GFSK PL 2 (Hybrid)	300	902.40	915.20	927.60	
GFSK PL 3 (FHSS)	300	902.40	915.20	927.60	
GFSK PL 3 (FHSS)	37.5	903.00	915.00	926.80	
OOK PL 1	16.38	903.00	915.00	926.80	
OOK PL 3	16.38	903.00	915.00	926.80	

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5.7. Equipment Modifications

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

5.8. Deviations from the Test Standard

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

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6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
20 dB & 99% Bandwidth	Complies	View Data
Frequency Hopping Tests	Complies	-
Number of Hopping Channels	Complies	View Data
Channel Separation	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	-
(i) TX Spurious & Restricted Band Emissions	Complies	View Data

Note: Dwell Time and Channel Occupancy were not tested as part of this test program, these were declared for normal network operation by Itron. See Section 10 of this report for additional information.



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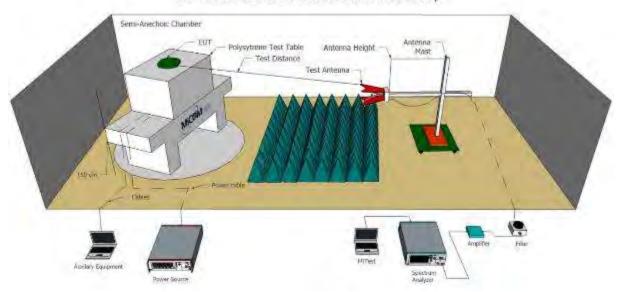
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7. TEST EQUIPMENT CONFIGURATION(S)

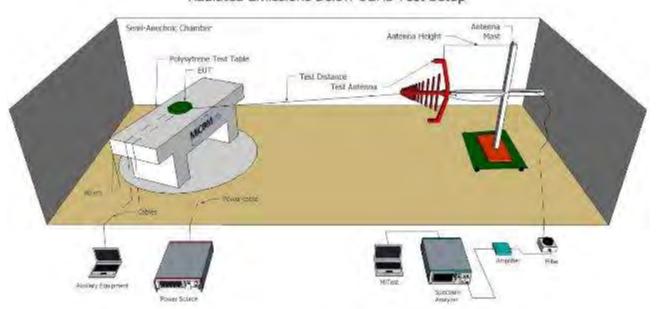
7.1. Radiated

Radiated emissions above and below 1GHz.

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup



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A 444	Decembetion	Na	N/1 a al a l#	0	Calibration Due Data
Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
266	10 Hz to 50GHz MXA Signal Analyzer	Keysight	N9020B	MY60110791	25 Jul 2025
285	DC Power Supply	Keysight	E36155A	MY63000156	4 Dec 2024
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	11 Oct 2024
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	7 Dec 2024
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	5 Dec 2024
341	900MHz Notch Filter	EWT	EWT-14-0199	H1	13 Sep 2024
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	13 Sep 2024
373	26III RMS Multimeter	Fluke	Fluke 26 series	76080720	29 Sep 2024
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	13 Sep 2024
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	13 Sep 2024
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	27 Oct 2024
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	7 Dec 2024
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	2 Nov 2024
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	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	18 Sep 2024
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	18 Sep 2024
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	16 Sep 2024
465	Low Pass Filter DC- 1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	14 Sep 2024



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-					
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	18 Sep 2024
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	18 Sep 2024
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2026
554	Precision SMA Cable	Fairview Microwave	SCE18060101- 400CM	554	18 Sep 2024
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2025
578	DC Power Supply 0 - 60 V, 0 - 15 A	HP	6274B	2537A-08192	Not Required
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used
CC05	Confidence Check	MiCOM	CC05	None	11 Nov 2024



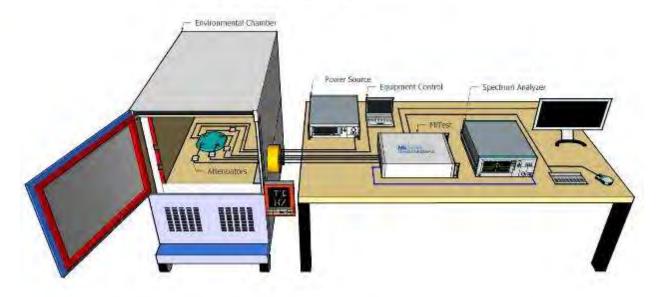
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7.2. Conducted Test Setup

MiTest Automated Test System



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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814- 0101-72	#3 SA	26 Oct 2024
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814- 0101-72	#3P1	26 Oct 2024
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814- 0101-72	#3P2	26 Oct 2024
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814- 0101-72	#3P3	26 Oct 2024
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812- 0101-72	#3P4	26 Oct 2024
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105- 02	9340 #2	22 Mar 2025
266	10 Hz to 50GHz MXA Signal Analyzer	Keysight	N9020B	MY60110791	25 Jul 2025
285	DC Power Supply	Keysight	E36155A	MY63000156	4 Dec 2024
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 2024
442	USB Wideband Power Sensor	Boonton	55006	9181	12 Dec 2024

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445	PoE Injector	D-Link	DPE- 101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	27 Sep 2024
493	USB Wideband Power Sensor	Boonton	55006	9634	8 Oct 2024
494	USB Wideband Power Sensor	Boonton	55006	9726	12 Dec 2024
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2026
512	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen	512	24 Oct 2024
516	USB Wideband Power Sensor	Boonton	RTP5006	10511	4 Dec 2024
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2025
75	Environmental Chamber	Thermatron	SE-300-2- 2	27946	20 Nov 2024



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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 <u>MiTest</u>. <u>MiTest</u> is an automated test system developed by MiCOM Labs. <u>MiTest</u> 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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