



REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15 SubPart B & ISSED ICES-003

Report No.: SCRA02-U2 Rev A

Company: Alcohol Monitoring Systems

Model Name: Wireless Base Station LTE

REGULATORY COMPLIANCE TEST REPORT

Company: Alcohol Monitoring Systems Company

Model Name: Wireless Base Station LTE

To: FCC CFR 47 Part 15B & ISSED ICES-003

Test Report Serial No.: SCRA02-U2 Rev A

This report supersedes: NONE

Applicant: Alcohol Monitoring Systems
1241 W Mineral Ave
Littleton, Colorado 80120
USA

Issue Date: 29th June 2020

This Test Report is Issued Under the Authority of:

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



MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

Table of Contents

1. ACCREDITATION, LISTINGS & RECOGNITION	4
1.1. TESTING ACCREDITATION	4
1.2. RECOGNITION	5
1.3. PRODUCT CERTIFICATION	6
2. DOCUMENT HISTORY	7
3. TEST RESULT CERTIFICATE	8
4. REFERENCES AND MEASUREMENT UNCERTAINTY	9
4.1. Normative References	9
4.2. Test and Uncertainty Procedures	10
5. TEST SUMMARY	11
6. PRODUCT DETAILS AND TEST CONFIGURATIONS	12
6.1. Test Program Scope	12
6.2. EUT Details	13
6.3. External A.C/D.C. Power Adaptor	14
6.4. Antenna Details	14
6.5. Cabling and I/O Ports	14
6.6. Equipment Details	15
6.7. Equipment Modifications	15
6.8. Deviations from the Test Standard	15
6.9. EUT Configurations	16
7. TEST RESULTS	18
7.1. EMC EMISSIONS TEST RESULTS	18
7.1.1 Radiated Digital Emissions	18
7.1.3 AC Mains Power Input/Output Ports	26

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>



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)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

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 Phase

Phase 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.

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	26th March 2020	Draft report for client review.
Rev A	29th June 2020	Initial Release
.		
.		
.		
.		
.		

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

3. TEST RESULT CERTIFICATE

Manufacturer: Alcohol Monitoring Systems
1241 W Mineral Ave
Littleton, Colorado 80120
USA

Tested By: MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA

Model: BS500; BS510

Telephone: +1 925 462 0304

Equipment Type: Wireless Base Station LTE

Fax: +1 925 462 0306

S/N's: Conducted: WB104CX
Radiated: WB104CQ

Test Date(s): 18th – 19th March 2020

Website: www.micomlabs.com

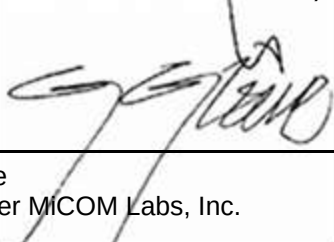
STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15B & ISSED ICES-003	EQUIPMENT COMPLIES

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.

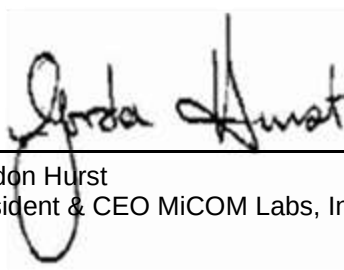
Notes:

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.

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)	FCC CFR 47 Part 15, Subpart B	2020	Title 47 CFR Part 15, Sub Part B; Unintentional Radiators
(ii)	ICES-003, Issue 6	Jan 2016; Updated April 2019	Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement
(iii)	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
(iv)	M 3003	Edition 2 Dec. 2007	Expression of Uncertainty and Confidence in Measurements
(v)	LAB34	Edition 1 August 2002	The expression of uncertainty in EMC Testing
(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)	A2LA	October 2019	R105 - Requirement's When Making Reference to A2LA Accreditation Status

4.2 Test and Uncertainty Procedures

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.

5. TEST SUMMARY

The following table represents the list of measurements required for the following standards.

TABLE OF REQUIRED TESTS – Emissions

Test Standard	Description	Limits	Compliance
FCC Part 15B & ICES-003	Radiated Emissions	Class B	Complies
FCC Part 15B & ICES-003	Conducted Emissions - ac power I/O port	Class B	Complies

Note 1: EUT WBS GEN 2 setup consist of two configurations: Charging powered via AC/DC Power Supply and Battery Powered

Note 2: Test results reported in this document relate only to the items tested.

6. PRODUCT DETAILS AND TEST CONFIGURATIONS

6.1. Test Program Scope

The scope of the test program was to test the Alcohol Monitoring Systems, Wireless Base Station LTE (BS500; BS510) for compliance against the following standards:

- FCC CFR 47 Part 15, Subpart B - Title 47 CFR Part 15, SubPart B; Unintentional Radiators.
- ICES-003, Issue 6 Jan 2016; Updated April 2019 - Information Technology Equipment (ITE) – Limits and methods of measurement.

The manufacturer declared that the only difference between the 2 models BS500 and BS510 is in the SIM card used in normal operation.

6.2. EUT Details

Detail	Description
Purpose:	Test of the Alcohol Monitoring Systems Wireless Base Station (WBS GEN 2) for compliance to FCC Part 15 B and Canada ISSED ICES-003.
Applicant:	Alcohol Monitoring Systems 1241 W Mineral Ave Littleton, Colorado 80120 USA
Manufacturer:	Same as Applicant
Test Laboratory:	MiCOM Labs, Inc. 575 Boulder Court, Pleasanton, California 94566, USA
Test report reference number:	SCRA02-U2 Rev A
Date EUT received:	30 th October 2019
Dates of test (from - to):	18 th – 19 th March 2020
No of Units Tested:	One
Equipment Type:	Wireless Base Station
Product Name:	Wireless Base Station LTE
Model Nos.:	BS500; BS510.
Serial No.:	Conducted: WB104CX, Radiated: WB104CQ
Equipment Secondary Function(s):	None
Type of Technology:	Transceiver
Installation type:	Fixed installation
Construction/Location for Use:	Indoor and Outdoors
Software/Firmware Release:	NA
Hardware Release:	1
Rated Input Voltage and Current:	AC/DC PS: Input: 100-240VAC, 50-60 Hz 0.5A Output: 5 Vdc, 3 A
Equipment Dimensions:	6 in x 6 in x 3 in (L x W x H)
Temperature:	Nominal: 20 °C Max: 100 °C Min: -20 °C
Weight:	1.0 lbs
Primary Function:	Wireless Base Station

6.3. External A.C/D.C. Power Adaptor

The Alcohol Monitoring Systems WBS GEN 2 is powered via AC/DC Power Supply

AC/DC Adapter
Scram Systems Model: DYS618-050300-16720 IP: 100-240 V _{AC} 50/60 Hz, 0.5A OP: 5V 3A

6.4. Antenna Details

No antennas were tested as part of this test program.

6.5. Cabling and I/O Ports

The following is a description of the cable and input, output ports available on the EUT.

Port Type	Port Description	Qty	Screened (Yes/ No)	Length
DC Input	DC	1	N	3m

6.6. Equipment Details

The following is a description of supporting equipment used during the test program.

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr.	Model No.	Serial No.
EUT	Wireless Base Station	AMS	BS500	Conducted: WB104CX
EUT	Wireless Base Station	AMS	BS500	Radiated: WB104CQ
Support	AC/DC adaptor	Scram Systems	DYS618-050300-16720	--

6.7. Equipment Modifications

None

6.8. Deviations from the Test Standard

No deviations from the test standard were required in order to complete the test program:

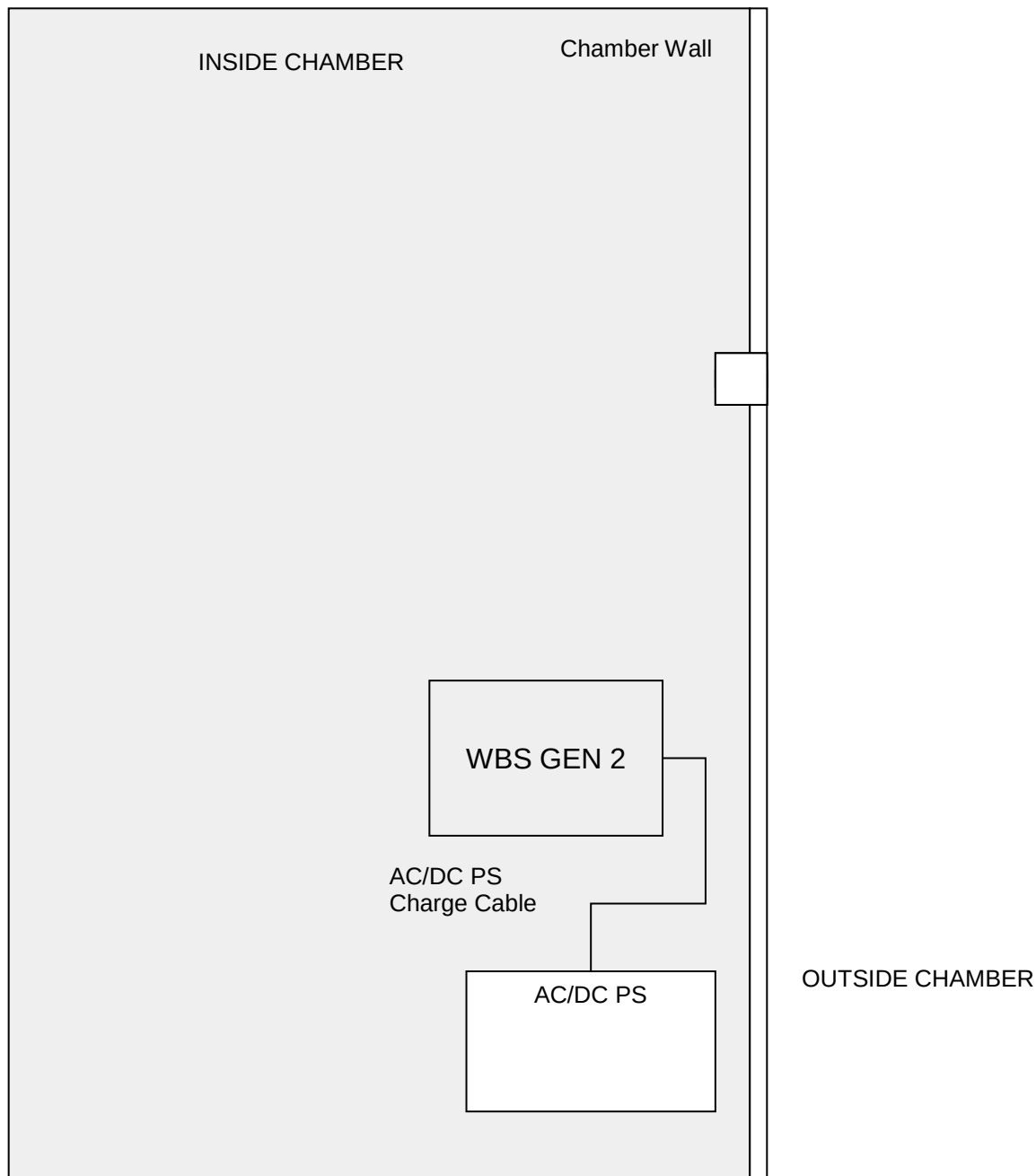
6.9. EUT Configurations

The WBS GEN 2 setup consists of two configurations: Charging the EUT battery while operating; and battery powered operation.

The worst case configuration was used to ensure compliance: in this case charging the EUT battery while Operating Continuously on a designated channel.

1. The EUT was tested for radiated digital emissions in a 3-meter chamber in battery charging mode with AC/DC adapter connected to the WBS GEN 2 to charge internal batteries.

Diagram of EUT Configuration for Emissions, WBS GEN 2 charged by External PS



7. TEST RESULTS

7.1. EMC EMISSIONS TEST RESULTS

7.1.1 Radiated Digital Emissions

FCC, Part 15 Subpart B §15.109
Industry Canada ICES-003 Section 6.2

Test Procedure

Testing 30 – 1,000 MHz was performed in a anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR Compliant receiver. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Only the highest emissions relative to the limit are listed.

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.

$$FS = R + AF + CORR - FO$$

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

FO = Distance Falloff Factor

$$CORR = \text{Correction Factor} = CL - AG + NFL$$

CL = Cable Loss

AG = Amplifier Gain

NFL = Notch Filter Loss or Waveguide Loss

Field Strength Calculation Example:

Given receiver input reading of 51.5 dB μ V; 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 of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

FCC and IC Spurious Emissions Limits

FCC, Part 15 Subpart B §15.109
 Industry Canada ICES-003 Section 6.2

Except for Class A digital device, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values.

Limits below 1 GHz:

Class A limits

Frequency(MHz)	Quasi-peak Limit (dB μ V/m)	Measurement Distance (meters)	Quasi-peak Limit (dB μ V/m)	Measurement Distance (meters)
30 to 88	39.0	10	49.5	3
88-216	43.5	10	54	3
216-960	46.4	10	56.9	3
960-1000	49.5	10	60	3

Class B limits

Frequency(MHz)	Quasi-peak Limit (dB μ V/m)	Measurement Distance (meters)	Quasi-peak Limit (dB μ V/m)	Measurement Distance (meters)
30 to 88	29.5	10	40	3
88-216	33	10	43.5	3
216-960	35.6	10	46	3
960-1000	43.5	10	54	3

Limits above 1GHz:

Frequency(MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Measurement Distance (meters)	Class (A/B)
1 000 to 6000	54	74	3	Class B

Frequency(MHz)	Average Limit (dB μ V/m)	Peak Limit (dB μ V/m)	Measurement Distance (meters)	Class (A/B)
1 000 to 6000	60	80	3	Class A

Traceability

Laboratory Measurement Uncertainty	
Measurement uncertainty	+5.6/ -4.5 dB

Method
Work instruction WI-EMC-07: Radiated Emissions Test

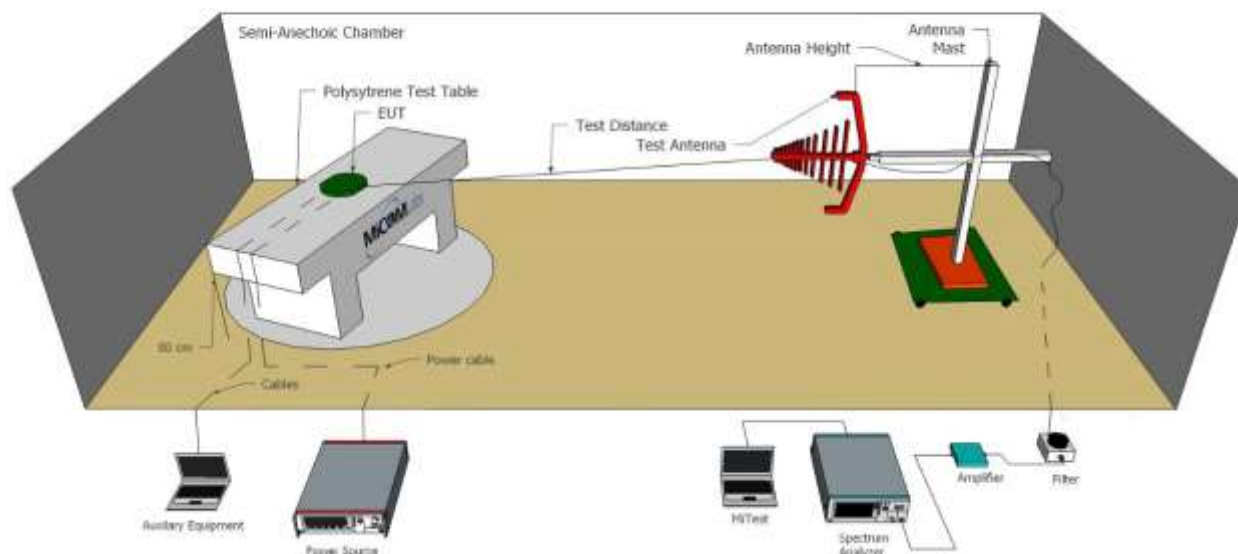
Test Equipment Utilized

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2020
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	26 Nov 2020
301	5470 to 5725 MHz Notch Filter	Microtronics	RBC50704	001	3 Sep 2020
302	5150 to 5350 MHz Notch Filter	Microtronics	BRC50703	002	3 Sep 2020
303	5725 to 5875 MHz Notch filter	Microtronics	BRC50705	003	3 Sep 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	3 Sep 2020
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	3 Sep 2020
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	3 Sep 2020
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	21 Sep 2020
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	3 Sep 2020
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Oct 2020
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	6 Sep 2020
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	12 Oct 2020
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	9 Sep 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

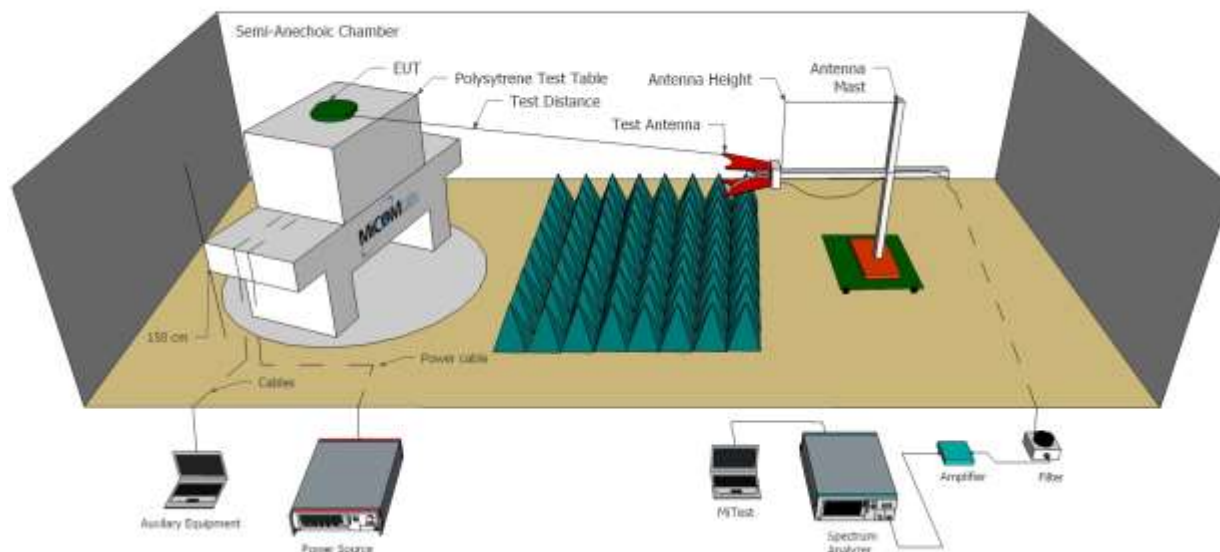
447	MiTest Rad Emissions Test Software	MiCOM	Rad Emissions Test Software Version 1.0	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	5 Sep 2020
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	5 Sep 2020
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	9 Sep 2020
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	3 Sep 2020
466	Low Pass Filter DC-1500 MHz	Mini-Circuits	NLP-1750+	VUU10401438	3 Sep 2020
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	9 Sep 2020
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	9 Sep 2020
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2020
518	Cable - Amp to Antenna	SRC Haverhill	157-3051574	518	9 Sep 2020
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

Test Setup for Radiated Emissions for above and below 1 GHz

Radiated Emissions Below 1GHz Test Setup



Radiated Emissions Above 1GHz Test Setup



Radiated 30-1000 MHz

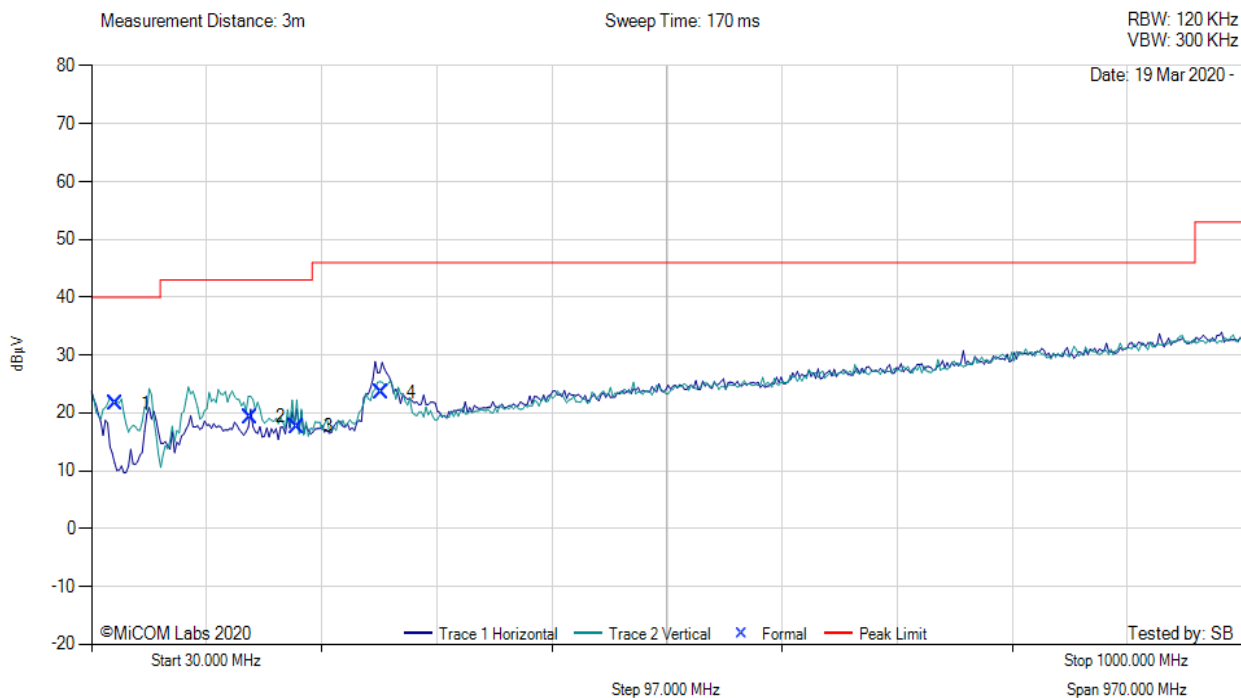
Equipment Configuration for Radiated Digital Emissions (Class B)

Antenna:	Integral	Variant:	802.11b
Antenna Gain (dBi):	Not Applicable	Modulation:	CCK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	99
Channel Frequency (MHz):	2442.00	Data Rate:	1
Power Setting:	0	Tested By:	SB

Test Measurement Results



Variant: CCK, Test Freq: 2442.00 MHz, Power Setting: 0, Duty Cycle (%): 99



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	50.22	38.63	3.73	-20.71	21.65	Peak (NRB)	Vertical	100	62	--	--	Pass
2	163.71	31.06	4.37	-16.15	19.28	MaxQP	Vertical	103	189	43.0	-23.7	Pass
3	203.71	29.32	4.54	-16.24	17.62	Peak (NRB)	Vertical	100	62	--	--	Pass
4	273.87	33.27	4.82	-14.62	23.47	MaxQP	Horizontal	116	119	46.0	-22.5	Pass

Test Notes: WBS GEN 2 with Battery Charging and powered by ACDC 5VDC 3A.

Radiated 1000-6000 MHz

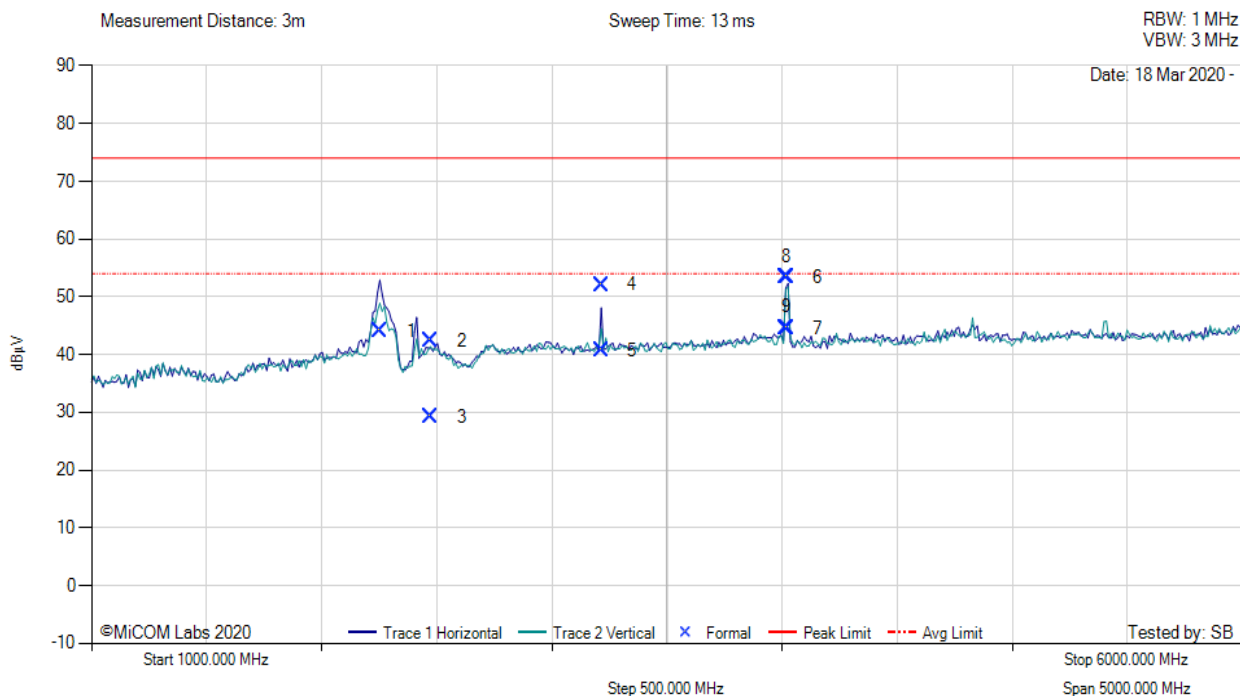
Equipment Configuration for Radiated Digital Emissions (Class B)

Antenna:	Integral	Variant:	802.11b
Antenna Gain (dBi):	Not Applicable	Modulation:	CCK
Beam Forming Gain (Y):	Not Applicable	Duty Cycle (%):	99
Channel Frequency (MHz):	2442.00	Data Rate:	1
Power Setting:	0	Tested By:	SB

Test Measurement Results



Variant: CCK, Test Freq: 2442.00 MHz, Power Setting: 0, Duty Cycle (%): 99



1000.00 - 6000.00 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	2256.17	54.81	1.94	-12.67	44.08	Fundamental	Horizontal	100	0	--	--	
2	2475.42	52.71	2.07	-12.35	42.43	Max Peak	Horizontal	167	185	74.0	-31.6	Pass
3	2475.42	39.47	2.07	-12.35	29.19	Max Avg	Horizontal	167	185	54.0	-24.8	Pass
4	3216.37	61.54	2.36	-11.81	52.09	Max Peak	Horizontal	101	280	74.0	-21.9	Pass
5	3216.37	50.19	2.36	-11.81	40.74	Max Avg	Horizontal	101	280	54.0	-13.3	Pass
6	4018.56	62.79	2.66	-12.12	53.33	Max Peak	Horizontal	102	142	74.0	-20.7	Pass
7	4018.56	53.98	2.66	-12.12	44.52	Max Avg	Horizontal	102	142	54.0	-9.5	Pass
8	4020.57	62.94	2.65	-12.12	53.47	Max Peak	Vertical	101	22	74.0	-20.5	Pass
9	4020.57	54.15	2.65	-12.12	44.68	Max Avg	Vertical	101	22	54.0	-9.3	Pass

7.1.3 AC Mains Power Input/Output Ports

Scope

This test assesses the ability of the EUT to limit its internal noise from being present on the AC mains power input/output ports.

Test Procedure

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

Limits

The equipment shall meet the class B limits given in FCC 15.207 & ICES-003. Alternatively, for equipment intended to be used in telecommunication centres only, the class A limits given in FCC 15B, ICES-003 may be used.

Limits for conducted disturbance at the mains ports of class B ITE

Frequency of emission (MHz)	Quasi-peak dBuV	Average dBuV
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50
Note 1	* Decreases with the logarithm of the frequency	
Note 2	* The lower limit applies at the boundary between frequency ranges	

Limits for conducted disturbance at the mains ports of class A ITE

Frequency of emission (MHz)	Quasi-peak dBuV	Average dBuV
0.15–0.5	79	66
0.5–30	73	60
Note 1	* The lower limit shall apply at the transition frequency.	

Traceability

All conducted emission measurements are traceable to national standards. The uncertainty of measurement at a confidence level of not less than 95 %, with a coverage factor of k=2, in the range 9 kHz – 30 MHz (Average & Quasi-peak) is ± 2.64 dB.

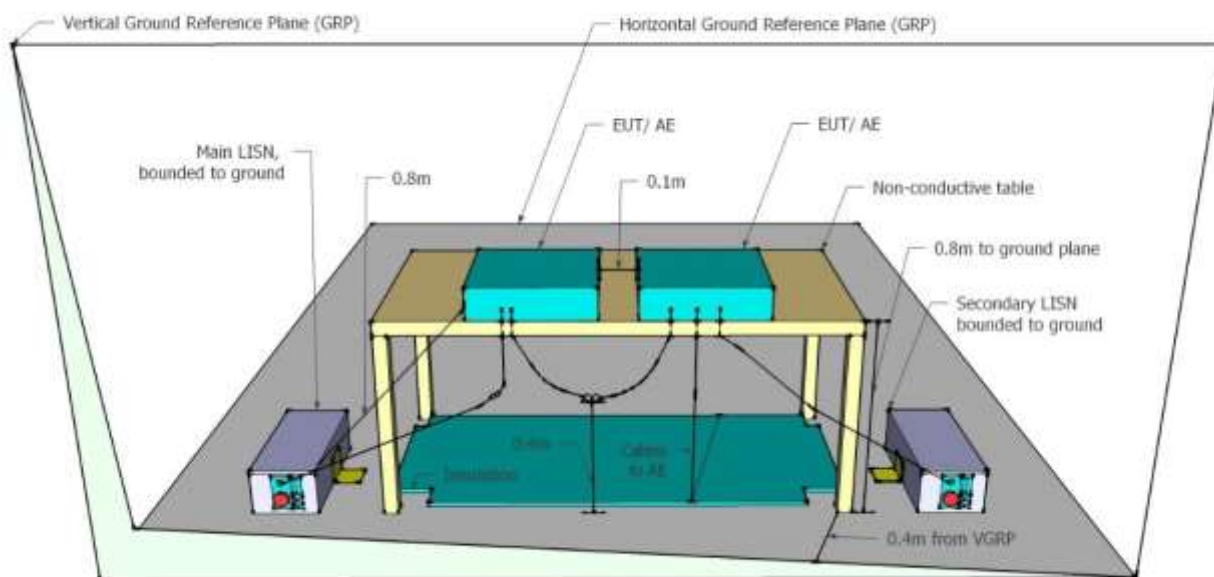
Laboratory Measurement Uncertainty	
Measurement uncertainty	± 2.64 dB

Method
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'

Test Equipment Utilized

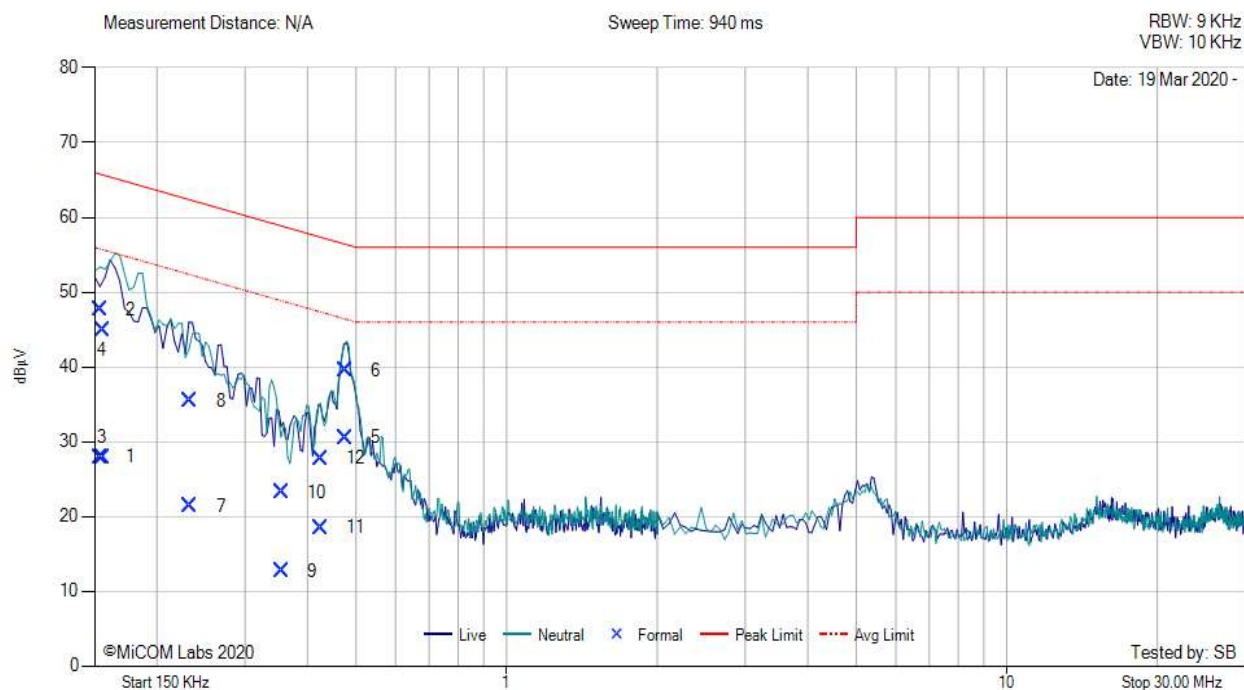
Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
184	Pulse Limiter	Rhode & Schwarz	ESH3Z2	357.8810.52	30 Aug 2021
190	LISN (two-line V-network)	Rhode & Schwarz	ESH3Z5	836679/006	18 Oct 2020
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2020
295	Conducted Emissions Chamber Maintenance Check	MiCOM	Conducted Emissions Chamber	295	26 Jun 2020
307	BNC-CABLE	Megaphase	1689 1GVT4	15F50B002	11 Sep 2020
316	Dell desktop computer workstation	Dell	Desktop	WS04	Not Required
372	AC Variable PS	California Instruments	1251P	L06951	Cal when used
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Oct 2020
389	LISN (3 Phase) 9kHz - 30 MHz for support equipment	Rohde & Schwarz	ESH2-Z5	881493/013	Not Required
496	MiTest Conducted Emissions test software.	MiCOM	Conducted Emissions Test Software Version 1.0	496	Not Required
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2020

Test Setup – Power Input / Output Port



Measurement Results

Model:	WBS GEN 2	Configuration tested:	AC/DC PS DYS618-050300-16720
Input power:	120 Vac/60 Hz	Standard:	FCC Part 15.207; ISED ICES-003



Num	Frequency MHz	Raw dBμV	Cable Loss dB	Factor dB	Total Correction dBμV	Corrected Value dBμV	Measurement Type	Line	Limit dBμV/m	Margin dB	Pass /Fail
1	0.154	17.99	0.05	9.92	9.97	27.96	Max Avg	Neutral	55.9	-27.9	Pass
2	0.154	37.69	0.05	9.92	9.97	47.66	Max Qp	Neutral	65.9	-18.2	Pass
3	0.156	17.88	0.05	9.92	9.97	27.85	Max Avg	Live	55.8	-28.0	Pass
4	0.156	35.04	0.05	9.92	9.97	45.01	Max Qp	Live	65.8	-20.8	Pass
5	0.476	20.53	0.08	9.93	10.01	30.54	Max Avg	Neutral	46.7	-16.2	Pass
6	0.476	29.54	0.08	9.93	10.01	39.55	Max Qp	Neutral	56.7	-17.1	Pass
7	0.233	11.39	0.07	9.92	9.99	21.38	Max Avg	Neutral	53.6	-32.3	Pass
8	0.233	25.51	0.07	9.92	9.99	35.50	Max Qp	Neutral	63.6	-28.1	Pass
9	0.355	2.77	0.04	9.92	9.96	12.73	Max Avg	Neutral	50.1	-37.4	Pass
10	0.355	13.32	0.04	9.92	9.96	23.28	Max Qp	Neutral	60.1	-36.9	Pass
11	0.425	8.56	0.04	9.93	9.97	18.53	Max Avg	Live	48.1	-29.6	Pass
12	0.425	17.79	0.04	9.93	9.97	27.76	Max Qp	Live	58.1	-30.4	Pass



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