



REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15, Sub-Part 15.407

Report No.: HPEN141-U6 Rev A (Wi-Fi)

Company: Hewlett Packard Enterprise

Model Name: ASIN0301

REGULATORY COMPLIANCE TEST REPORT

Company: Hewlett Packard Enterprise

Model Name: ASIN0301

To: FCC CFR47 Part 15 Subpart C 15.407 (NII)

Test Report Serial No.: HPEN141-U6 Rev A (Wi-Fi)

This report supersedes: NONE

Applicant: Hewlett Packard Enterprise Company
3333 Scott Blvd.
Santa Clara, California 95054
USA

Issue Date: 13th September 2019

This Test Report is Issued Under the Authority of:

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TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. 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 capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

Country	Recognition Body	Status	Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	US0159 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2 4143A-3
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	RCB 210
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA	NB 2280
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.

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>



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	7 th August 2019	Draft for comment
Rev A	13 th September 2019	Initial Release
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In the above table the latest report revision will replace all earlier versions.

3. TEST RESULT CERTIFICATE

Manufacturer: Hewlett Packard Enterprise 3333 Scott Blvd. Santa Clara, California 95054 USA	Tested By: MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model: ASIN0301	Telephone: +1 925 462 0304
Equipment Type: Mobile & Portable Client Device	Fax: +1 925 462 0306
S/N's: Conducted Testing: TWHXKRY005 Radiated Testing: TWHXKRY00P DFS Testing: TWHXKRY00Q	
Test Date(s): 31 st July – 10 th September 2019	Website: www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart E 15.407	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.

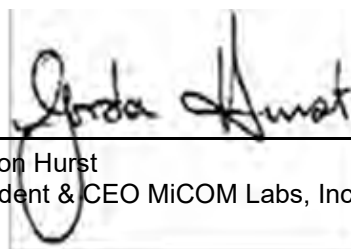
Approved & Released for MiCOM Labs, Inc. by:



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	KDB 662911 D01 V02r01	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	KDB 926956 D01 v02	22nd August 2016	U-NII Device Transition Plan
III	KDB 905462 D03 v01r02	22nd August 2016	UNII clients without radar detection new rules
IV	KDB 905462 D02 v02	April 8 2016	UNII DFS compliance procedures new rules
V	KDB 789033 D02 V02r01	14th December, 2017	Guidelines for Compliance Testing Of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
VI	FCC 06-96	Jun 30 2006	Memorandum Opinion and Order
VII	FCC 47 CFR Part 15.407	2016	Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
VIII	FCC 47 CFR Part 2.1033	2016	FCC requirements and rules regarding photographs and test setup diagrams.
XI	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices
XII	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
XIII	CISPR 32	2015	Electromagnetic compatibility of multimedia equipment - Emission requirements
XIV	A2LA	August 2018	R105 - Requirement's When Making Reference to A2LA Accreditation Status
XV	M 3003	Edition 3 Nov.2012	Expression of Uncertainty and Confidence in Measurements
XVI	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

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.

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Aruba Networks, Hewlett Packard Enterprise Company Aruba User Experience Insight to FCC CFR 47 Part 15 Subpart E 15.407
Applicant:	Hewlett Packard Enterprise 3333 Scott Blvd. Santa Clara, California 95054 USA
Manufacturer:	As applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	HPEN141-U6
Date EUT received:	30 th July 2019
Dates of test (from - to):	31 st July – 10 th September 2019
No of Units Tested:	3
Product Family Name:	Aruba User Experience Insight Sensor
Model(s):	ASIN0301
Location for use:	Indoors
Declared Frequency Range(s):	5150 - 5250; 5250 - 5350; 5470 - 5725; 5725 - 5850 MHz;
Technology:	2x2 MIMO Client Device without radar detection
Type of Modulation:	OFDM
EUT Modes of Operation:	802.11a; 802.11ac-20/40/80; 802.11n HT-20/40;
Declared Nominal Output Power (dBm):	+21 dBm
Rated Input Voltage and Current:	+55Vdc, 0.6A
Operating Temperature Range:	-10°C to +45°C
Equipment Dimensions:	26cm x 7.2cm x 4.2cm
Weight:	<1kg
Hardware Rev:	P2A
Software Rev:	Software Rev: 4.14.76-armada-18.12.3
Product Application:	Mobile & Portable Client Devices

5.2. Scope Of Test Program

Aruba Networks, Hewlett Packard Enterprise Company ASIN0301

The scope of the test program was to test the Aruba Networks, Hewlett Packard Enterprise Company ASIN0301, Aruba User Experience Insight configurations in the frequency ranges 5150 - 5250 MHz; 5250 - 5350 MHz; 5470 - 5725 MHz; 5725 - 5850 MHz; for compliance against the following specification:

FCC CFR 47 Part 15 Subpart E 15.407 (NII)

Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 5250 to 5350 MHz and 5470 to 5725 MHz bands incorporating Dynamic Frequency Selection.

Hewlett Packard Enterprise Company ASIN0301



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

Type (EUT/ Support)	Equipment Description	Manufacturer	Model No.	Serial No.
EUT Conducted	Mobile & Portable Client Device	Hewlett Packard Enterprise	ASIN0301	TWHXKRY005
EUT Radiated	Mobile & Portable Client Device	Hewlett Packard Enterprise	ASIN0301	TWHXKRY00P
EUT Radiated & DFS	Mobile & Portable Client Device	Hewlett Packard Enterprise	ASIN0301	TWHXKRY00Q
Support	POE Power Supply	D-Link	EBU-101-T2	--
Support	Test Equipment	MiCOM Labs	MiTest	ML512

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
integral	Aruba	AB1	STAMP	4.9	3.0	360	-	5150 - 5850

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	5m	1	Yes	USB	Digital	Unknown
Ethernet PoE IN	>30m	1	No	RJ45	Packet	10,100,1000

5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s) (802.11a/b/g/n/ac)	Data Rate with Highest Power MBit/s	Channel Frequency (MHz)		
		Low	Mid	High
5150 - 5250 MHz				
a	6	5,180.00	5,200.00	5,240.00
ac-80	29.3	5,210.00	--	--
HT-20	6.5	5,180.00	5,200.00	5,240.00
HT-40	13.5	5,190.00	--	5,230.00
5250 - 5350 MHz				
a	6	5,260.00	5,300.00	5,320.00
ac-80	29.3	--	--	5,290.00
HT-20	6.5	5,260.00	5,300.00	5,320.00
HT-40	13.5	5,270.00	--	5,310.00
5470 - 5725 MHz				
a	6	5,500.00	5,580.00	5,720.00
ac-80	29.3	5,530.00	5,610.00	5,690.00
HT-20	6.5	5,500.00	5,580.00	5,720.00
HT-40	13.5	5,510.00	5,550.00	5,710.00
5725 - 5850 MHz				
a	6	5,745.00	5,785.00	5,825.00
ac-80	29.3	5,775.00	--	5,775.00
HT-20	6.5	5,745.00	5,785.00	5,825.00
HT-40	13.5	5,755.00	--	5,795.00

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	Comments
Peak Transmit Power	Complies	-
26 dB & 99% Bandwidth	Complies	-
6 dB & 99% Bandwidth	Complies	-
Power Spectral Density	Complies	-
Frequency Stability	Complies	-
Dynamic Frequency Selection (DFS)	Complies	-
Channel Availability Check	*Not Required	-
Initial CAC	*Not Required	-
Beginning CAC	*Not Required	-
End CAC	*Not Required	-
Channel Close / Transmission Time	Complies	-
Non-Occupancy Period	Complies	-
Probability of Detection	*Not Required	-
Detection Bandwidth	*Not Required	-
Radiated	Complies	-
TX Spurious & Restricted Band Emissions	Complies	-
Restricted Edge & Band-Edge Emissions	Complies	-
Digital Emissions (0.03 – 1 GHz)	Complies	See MiCOM Labs Test Report HPEN141-G3 FCC Part 15B
AC Wireline	Complies	See MiCOM Labs Test Report HPEN141-G3 FCC Part 15B
Maximum Permissible Exposure	Complies	See MiCOM Labs Test Report HPEN141-FCC MPE
RF Unique Connector	Complies	-

*EUT is a client device without radar detection

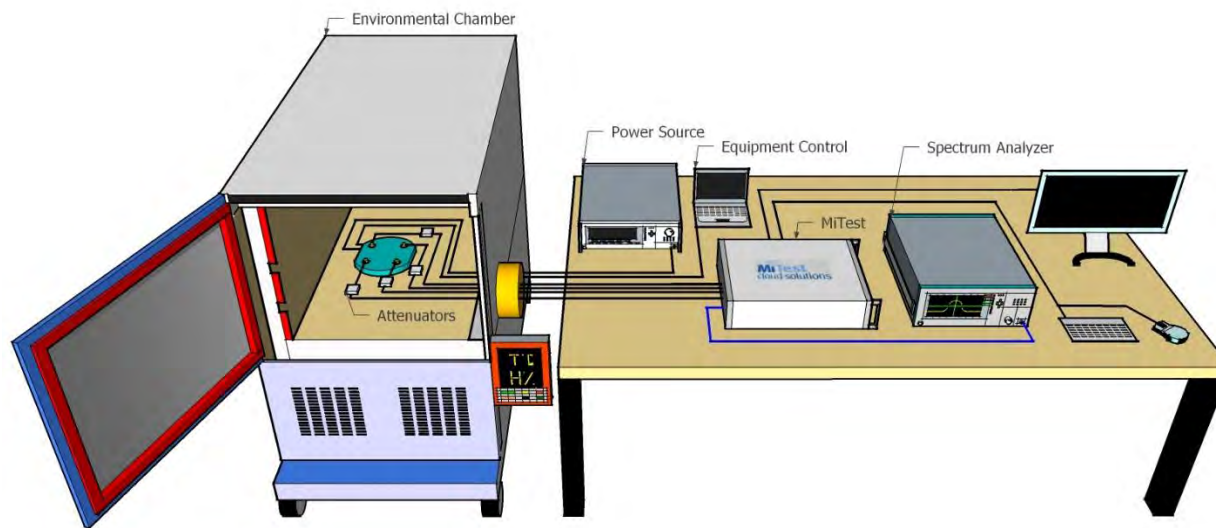
Simultaneous Transmission

The ASIN0301 operates using two technologies BLE and Wi-Fi, these modes of operation can transmit simultaneously. Simultaneous transmission testing was performed to ensure continuous compliance when operating in this mode. No issues were found on the ASIN0301 during the radiated spurious examination where both technologies operated simultaneously

7. TEST EQUIPMENT CONFIGURATION(S)

7.1. 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.

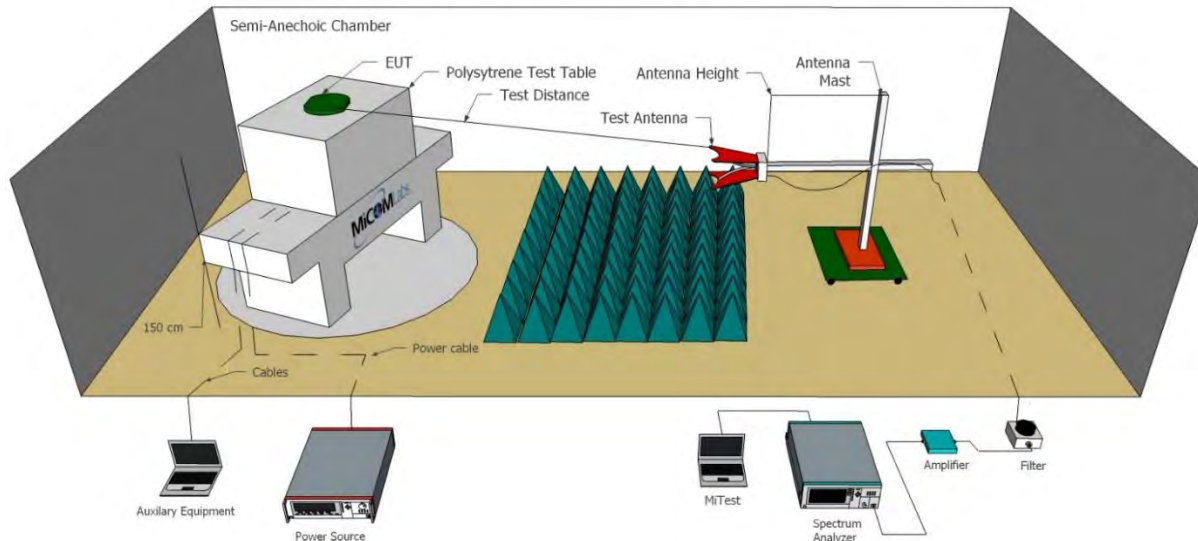
Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	20 Sep 2019
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	20 Sep 2019
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	20 Sep 2019
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	20 Sep 2019
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	20 Sep 2019
249	Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	30 Oct 2019
361	Desktop for RF#1, Labview Software installed	Dell	Vostro 220	WS RF#1	Not Required
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Oct 2019
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

436	USB Wideband Power Sensor	Boonton	55006	8731	14 Sep 2019
440	USB Wideband Power Sensor	Boonton	55006	9178	22 Sep 2019
441	USB Wideband Power Sensor	Boonton	55006	9179	20 Sep 2019
442	USB Wideband Power Sensor	Boonton	55006	9181	6 Oct 2019
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
510	Barometer/Thermometer	Control Company	68000-49	170871375	11 Dec 2019
515	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen with DFS	515	20 Sep 2019
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	24 Feb 2020

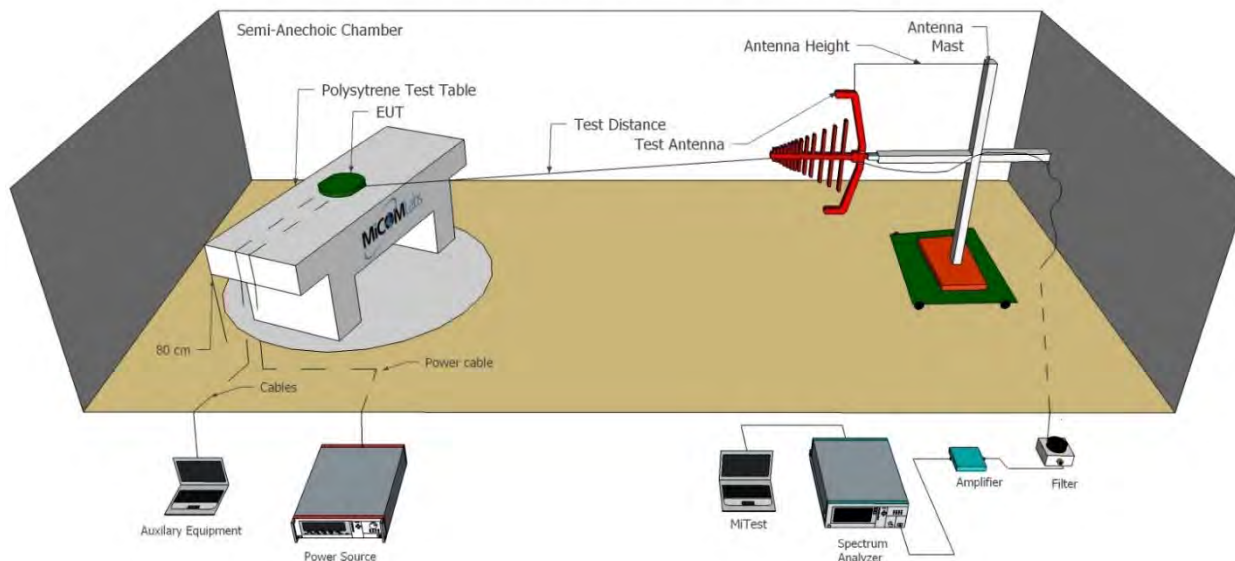
7.2. Radiated Emissions - 3m Chamber

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

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup

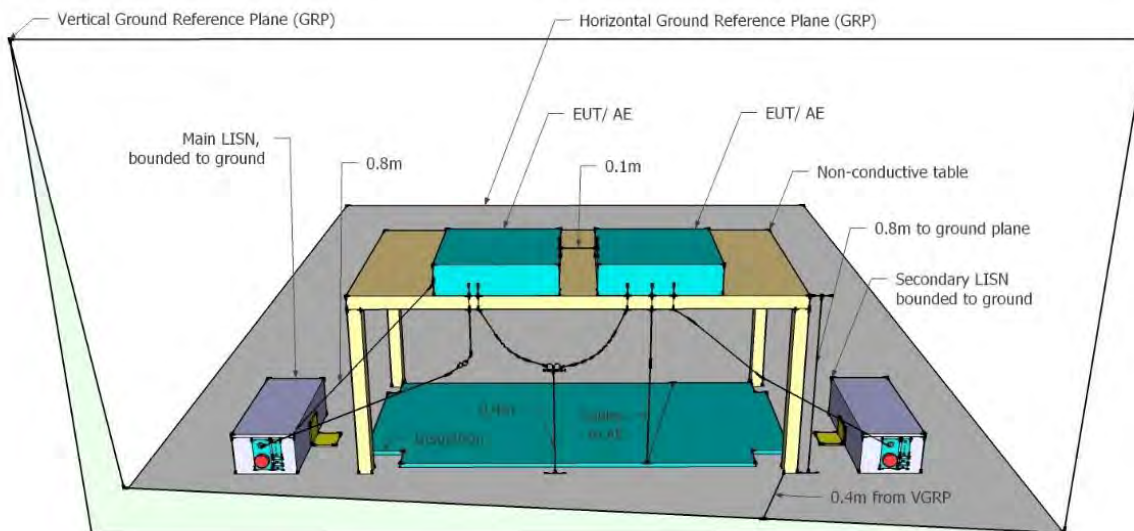


A full system calibration was performed on the test station and any resulting system losses (or gains) were considered in the production of all final measurement data.

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	21 Apr 2020
336	Active Loop Antenna	Emco	6502	00060498	29 Nov 2019
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	4 Apr 2020
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Oct 2019
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	12 Apr 2020
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	12 Oct 2019
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	12 Apr 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
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	9 Oct 2019
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	9 Oct 2019
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	9 Oct 2019
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	9 Oct 2019
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	24 Sep 2019
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	24 Sep 2019
510	Barometer/Thermometer	Control Company	68000-49	170871375	11 Dec 2019
518	Cable - Amp to Antenna	SRC Haverhill	157-3051574	518	24 Sep 2019

7.3. ac Wireline Emissions

Test Setup – Power Input / Output Port



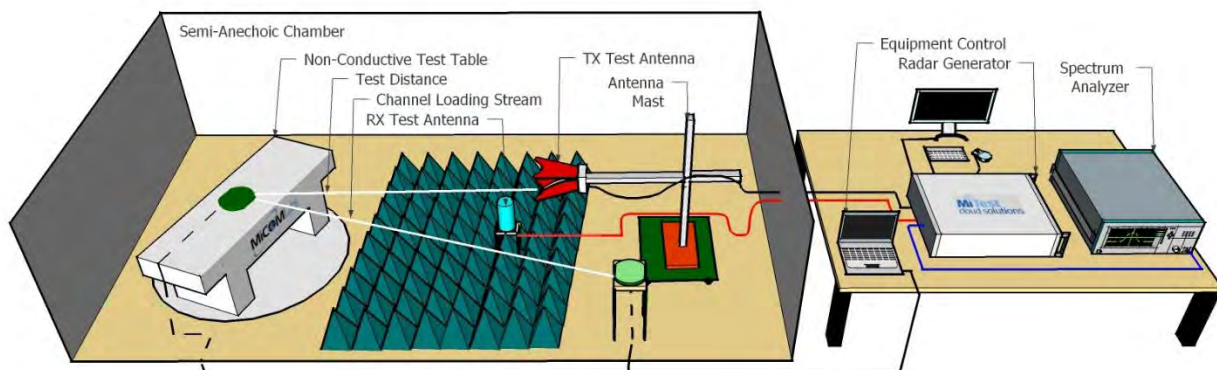
A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
184	Pulse Limiter	Rhode & Schwarz	ESH3Z2	357.8810.52	6 Oct 2019
190	LISN (two-line V-network)	Rhode & Schwarz	ESH3Z5	836679/006	18 Oct 2019
378	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100107/040	12 Oct 2019
295	Conducted Emissions Chamber Maintenance Check	MiCOM	Conducted Emissions Chamber	295	18 Sep 2019
307	BNC-CABLE	Megaphase	1689 1GVT4	15F50B002	11 Sep 2019
316	Dell desktop computer workstation	Dell	Desktop	WS04	Not Required
372	AC Variable PS	California Instruments	1251P	L06951	Cal when used
388	LISN (3 Phase) 9kHz - 30MHz	Rohde & Schwarz	ESH2-Z5	892107/022	20 Oct 2019
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	11 Dec 2019

7.4. Dynamic Frequency Selection (DFS)

Setup for Radiated DFS testing in 3 m chamber where the EUT is the Client device communicating with Master device over the air. Radar Test Waveforms are injected from the MiTest equipment and detected by the Master.

Dynamic Frequency Selection (DFS) - Radiated



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
0507	Power Meter EPM Series	Agilent	E4418B	MY40511221	20 Oct 2019
104	Antenna Horn 1-18GHz	Electro-Mechanics	3115	9205-3882	28 Sep 2019
117	Low Power Sensor - 70dBm to -20dBm 50 MHz - 50GHz	HP	8487D	3318A00371	21 Sep 2019
207	Radiated Immunity Chamber Maintenance Check	MiCOM	Rad Imm Chamber	207	18 Sep 2019
444	SMA Cable Assembly	ETS-Lindgren	RFC-NMS-100-SMS-256 IN	001	Cal when used
510	Barometer/Thermometer	Control Company	68000-49	170871375	11 Dec 2019
71	Spectrum Analyser 9KHz-50GHz	HP	8565E	3425A00181	18 Sep 2019
DFS PCIe#1	PCIe cable for Aeroflex	National Instruments	PCIe cable	None	Not Required
512	MiTest DFS Test System	MiCOM Labs Inc.	MiTest	3C:FD:FE:9F:B4:58	15 Sep 2019

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)

9. TEST RESULTS - see Conducted & Radiated Addendum Files



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