RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC IC_RF_SL18011901-SFE-006-DTS
Supersede Report No.: N/A

Applicant	:	Lighthouse AI, Inc
Product Name	:	Lighthouse
Model No.	:	A1
Test Standard	:	47 CFR 15.247 RSS-247 Issue 2, February 2017
Test Method	:	ANSI C63.10: 2013 RSS Gen Issue 4: Nov 2014 558074 D01 DTS Meas Guidance v04
FCC ID	:	2ALIS–A1
IC ID	:	22555-A1
Dates of test	:	02/20/2018 – 02/27/2018
Issue Date	:	02/28/2018
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
Cipher	**Chen Ge**
Test Engineer	Engineer Reviewer

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ilac-MRA
A2LA ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC IC_RF_SL18011901-SFE-006-DTS	None	Original	02/28/2018

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: *Lighthouse AI, Inc*
Product: *Lighthouse*
Model: *A1*

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	*:*	*Lighthouse AI, Inc*
Applicant Address	*:*	*380 Portage Avenue, Palo Alto, CA*
Manufacturer Name	*:*	*Hon Hai Precision Industry CO, LTD (Foxconn)*
Manufacturer Address	*:*	*NANNING FUGUI PRECISION INDUSTRIAL CO.,LTD.* *B FACTORIES AREA,FOXCONN NANNING SCITECH PARK,NO.51,TONGLE, NANNING CITY, GUANGXI PROVINCE, CHINA-530031*

4 Test site information

Lab performing tests	*SIEMIC Laboratories*
Lab Address	*775 Montague Expressway, Milpitas, CA 95035*
FCC Test Site No.	*881796*
IC Test Site No.	*4842D-2*
VCCI Test Site No.	*A0133*

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Lighthouse
Model No.	:	A1
Trade Name	:	Lighthouse AI
Serial No.	:	A1003170012
Input Power	:	100-240VAC,50/60Hz
Power Adapter Manu/Model	:	2ABS048F US
Power Adapter SN	:	11-16120136-00145
Product Hardware version	:	v3.2
Product Software version	:	build-alexandria-1079
Radio Hardware version	:	WCN-3660B-0-79WLNSP-TR-05-1
Radio Software version	:	CNSS.PR.2.0.1.2.c1-00021-M8936BAAAANAZW-1
Date of EUT received	:	02/06/2018
Equipment Class/ Category	:	DTS, UNII
Port/Connectors	:	None

6.2 Radio Description

Radio Type	802.11b	802.11g	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	2412-2462MHz	2422-2452MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	5MHz	5MHz
Number of Channels	11	11	11	7
Antenna Type	Dipole			
Antenna Gain (Peak)	2.4GHz: 3.9 dBi			
Antenna Connector Type	U.FL			
Note	Bluetooth, 2.4GHz and 5GHz radio does not transmit simultaneously.			

EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	14
802.11-b	2437	14
802.11-b	2462	14
802.11-g	2412	14
802.11-g	2437	14
802.11-g	2462	14
802.11-n-20	2412	14
802.11-n-20	2437	14
802.11-n-20	2462	14
802.11-n-40	2422	14
802.11-n-40	2437	14
802.11-n-40	2452	14

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	N/A	3YZQ162	Dell	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
USB	USB	EUT	USB	Laptop	USB	1	Unshielded

7.3 Test Software Description

Test Item	Software	Description
RF Testing	QRCT	Set the EUT to transmit continuously in diferent test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS Gen 8.10	IC		
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☐ Pass ☒ N/A
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	
Antenna Requirement	FCC	15.203	FCC	-	☒ Pass ☐ N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☐ Pass ☒ N/A
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r05	☐ Pass ☒ N/A
	IC	RSS247 (5.2.1)	IC		
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v03r05	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r05	☐ Pass ☒ N/A
	IC	RSS247 (5.4.4)	IC		
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	☐ Pass ☒ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☐ Pass ☒ N/A
	IC	-	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r05	☐ Pass ☒ N/A
	IC	RSS247 (5.2.2)	IC		
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass ☒ N/A
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	
Remark	1. All measurement uncertainties do not take into consideration for all presented test results. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.				

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:

- *Uncertainty of the receiver*
- *Uncertainty of the LISN*
- *Uncertainty of cables*
- *Uncertainty due to the mismatches*
- *Etc, see the below table for details*

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					**3.856266**

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- *Uncertainty of the receiver*
- *Uncertainty of the antenna*
- *Uncertainty of cables*
- *Uncertainty due to the mismatches*
- *NSA Calibration*
- *Etc., details see the below table*

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					**6.0118262**

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- *Uncertainty of the receiver*
- *Uncertainty of the antenna*
- *Uncertainty of cables*
- *Uncertainty due to the mismatches*
- *VSWR Calibration*
- *Etc., details see the below table*

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					**8.4726**

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- *Uncertainty of the Reference Level Uncertainty*
- *Uncertainty of variable attenuators*
- *Uncertainty of cables*
- *Uncertainty due to the mismatches*

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					**0.952174**

The total derived measurement uncertainty is +/- 0.95 dB.

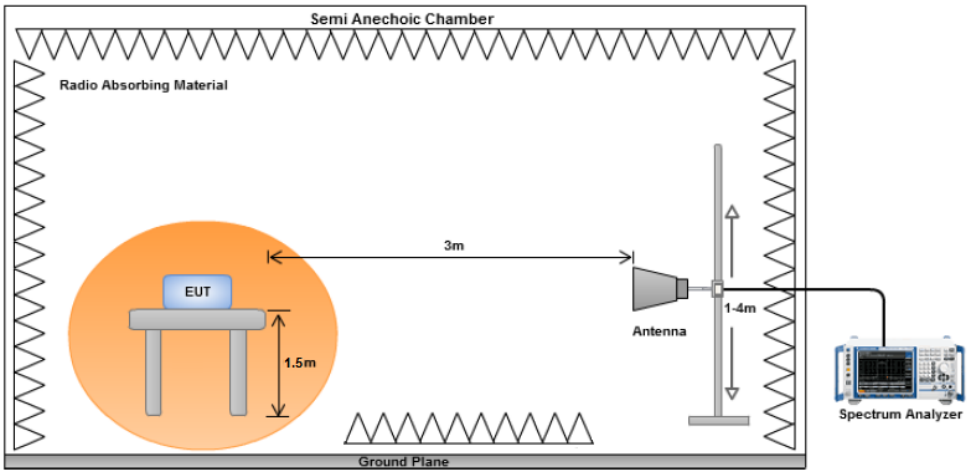
10 Measurements, Examination and Derived Results

10.1 Antenna Requirement

Spec	Item	Requirement	Applicable
15.203	-	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. Antenna requirement must meet at least one of the following: a) Antenna must be permanently attached to the device. b) Antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.	☒
Remark	All the Antennas use a unique type of connector to attach to the device.		
Result	☒ PASS ☐ FAIL		

10.2 Radiated Spurious Emissions in restricted band

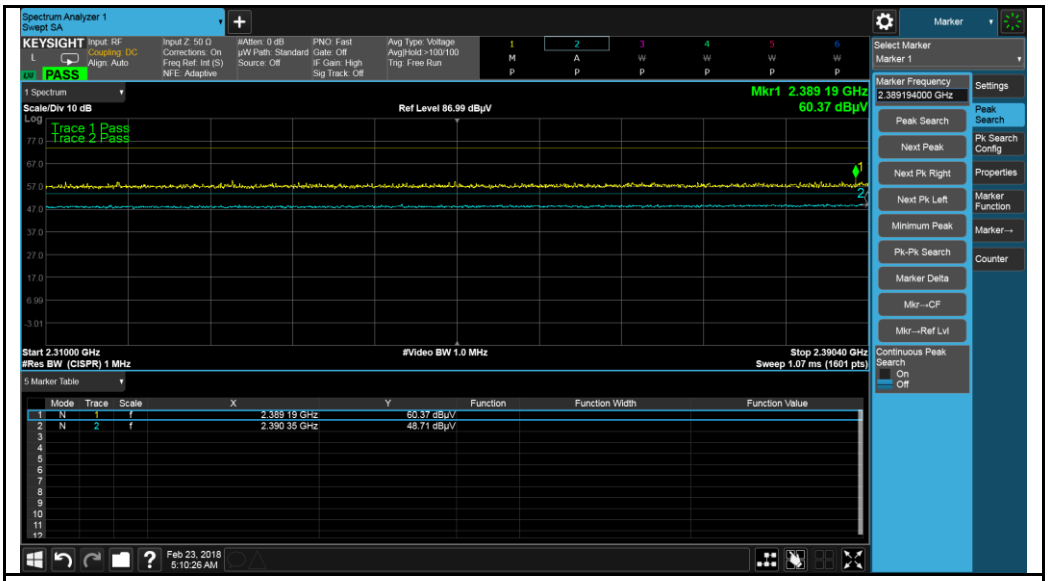
Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(A8.5)	a)	For non-restricted band, 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 or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure		1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.	
Remark		The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. Radiated measurement was measured with antenna port terminated, there isn't outstanding emission found at the edge of restricted frequency, within x dB margin	
Result		☒ Pass ☐ Fail	

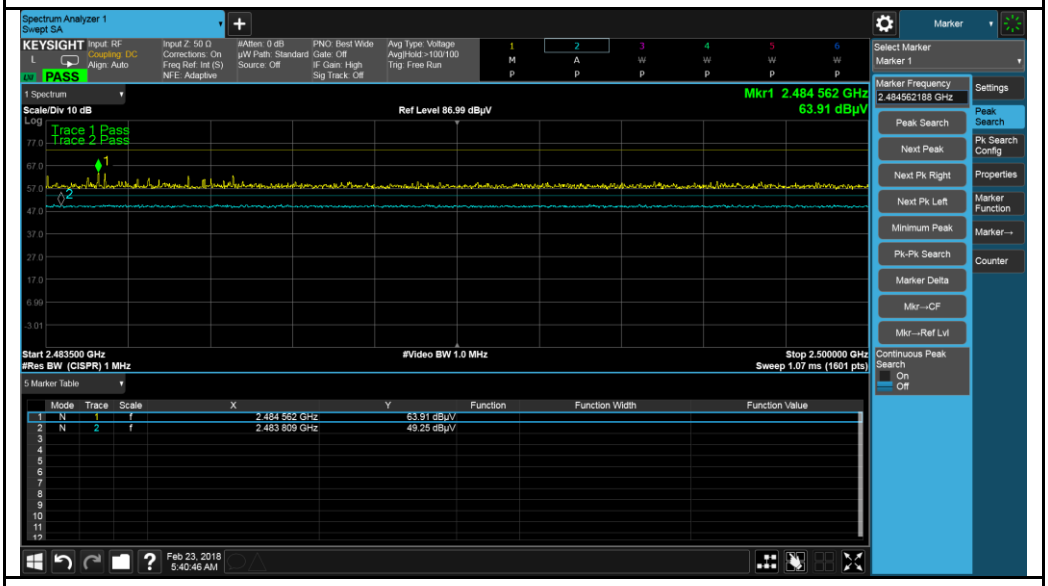
Test Data ☐ Yes (See below) ☒ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at 10m chamber.

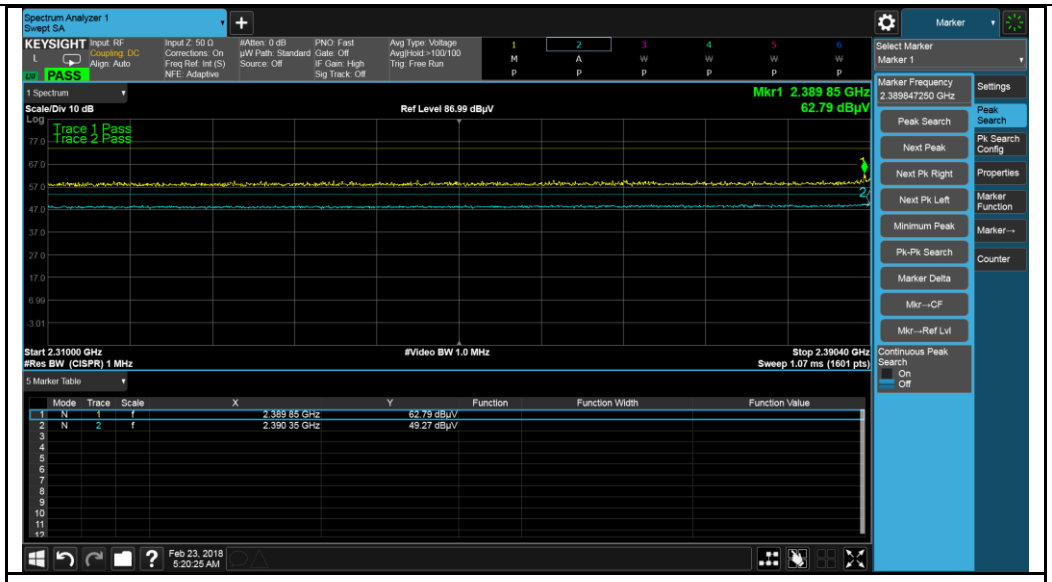
Restricted Band Measurement Plots:



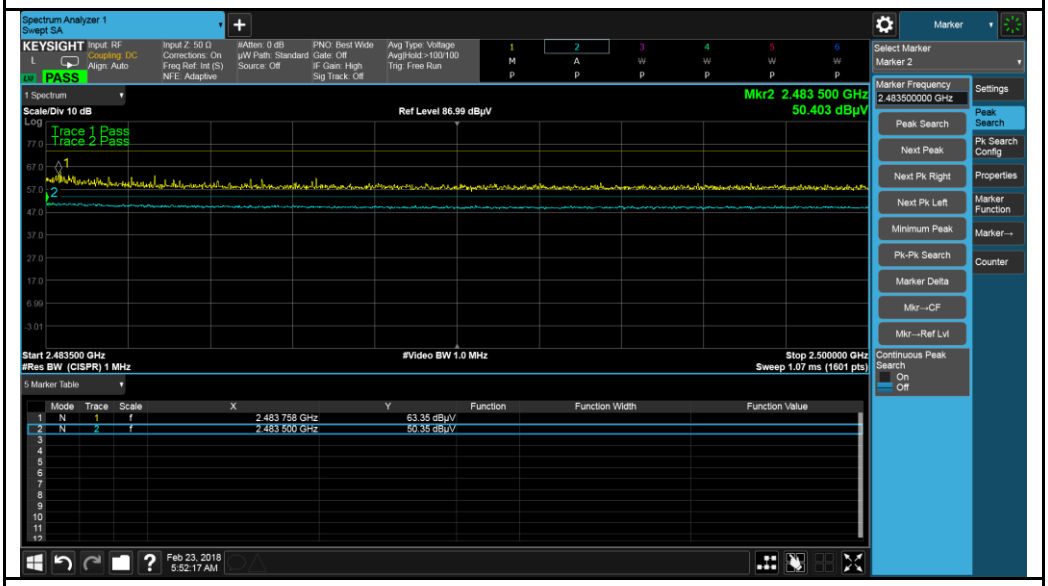
802.11b-2412MHz



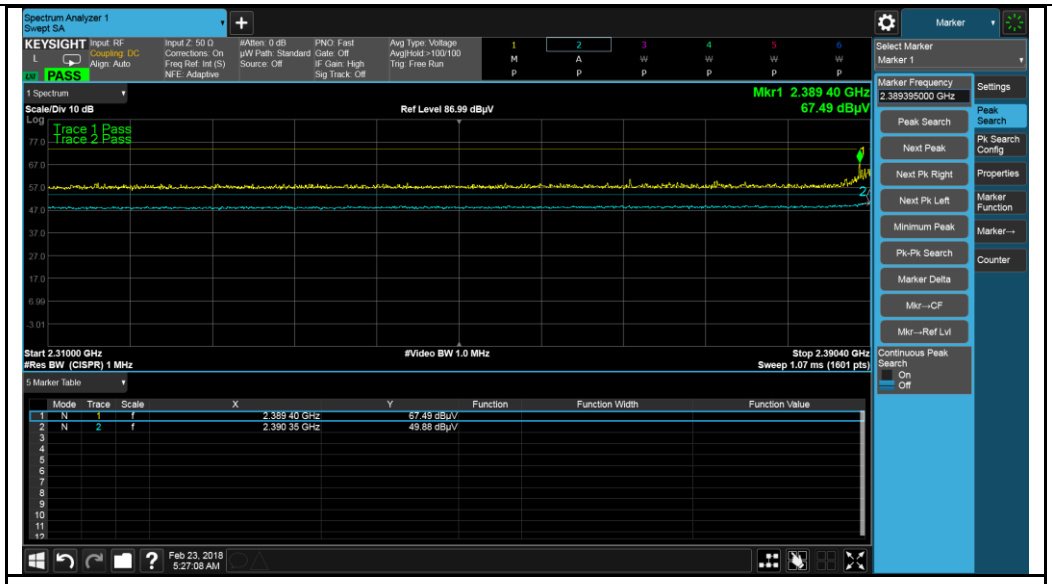
802.11b-2462MHz



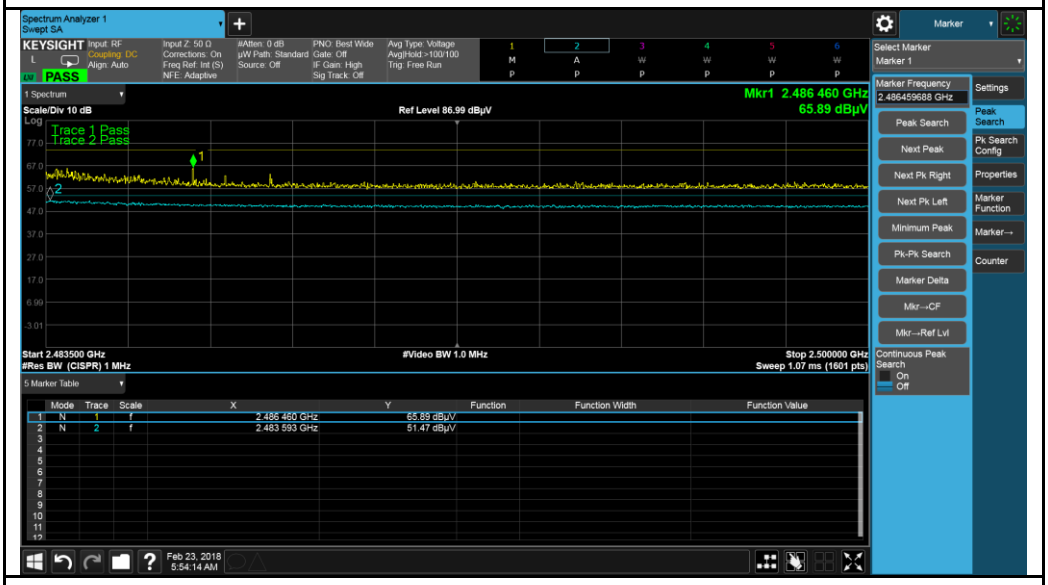
802.11g-2412MHz



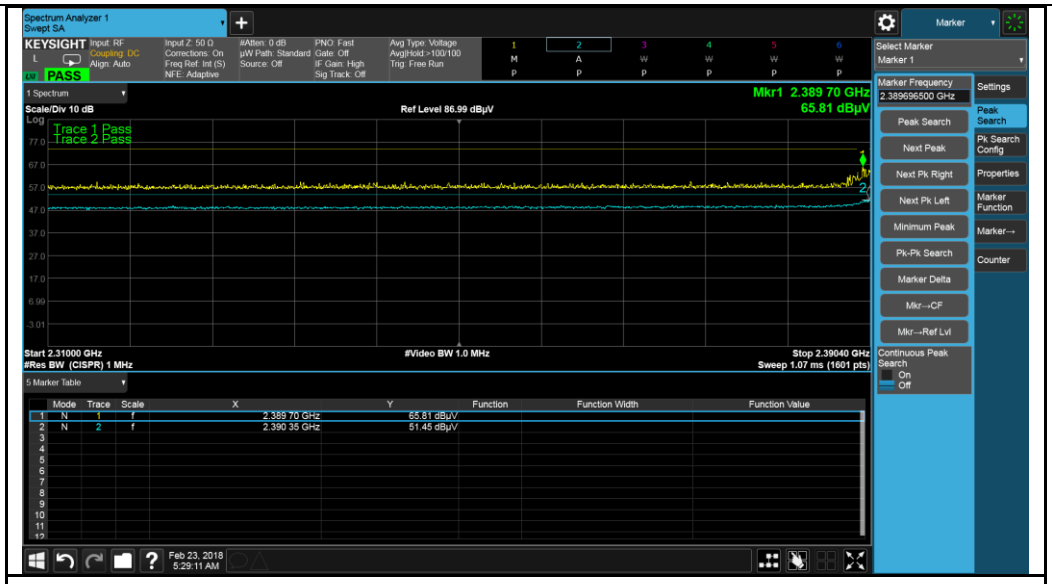
802.11g-2462MHz



802.11n-HT20-2412MHz



802.11n-HT20-2462MHz



802.11n-HT40-2422MHz

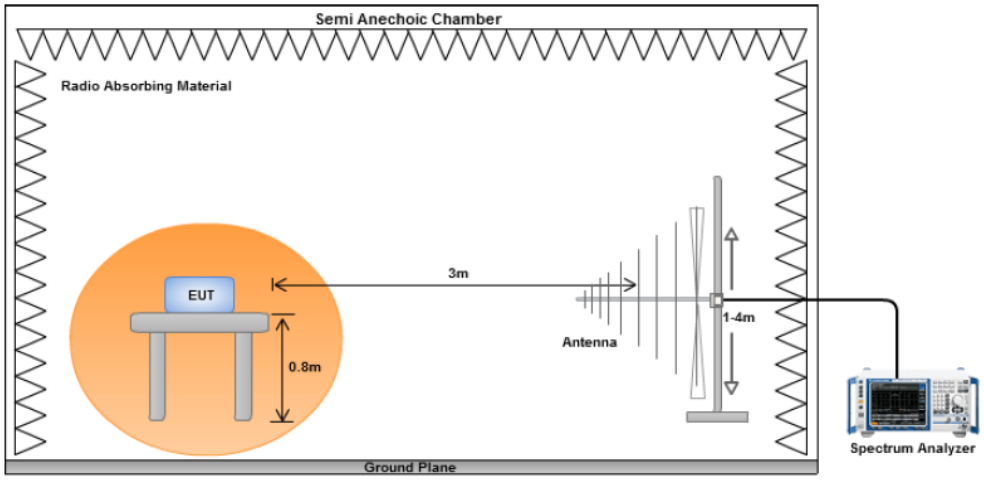
802.11n-HT40-2452MHz

10.3 Radiated Spurious Emissions below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d) RSS247 (5.5)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges	☒

Frequency range (MHz)	Field Strength (uV/m)
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.
Result	☒ Pass ☐ Fail

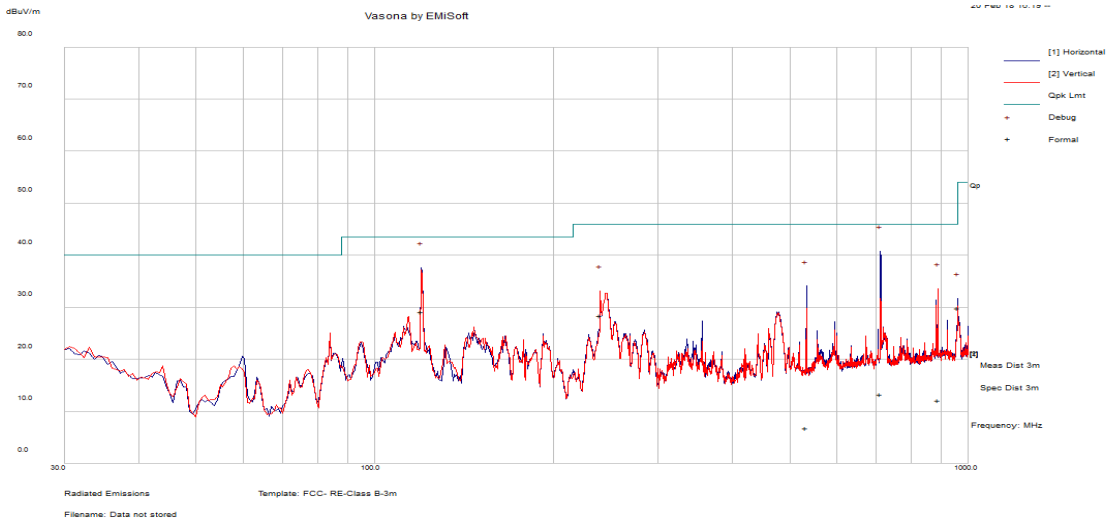
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Cipher			
Test Date:	02/20/2018 – 02/27/2018			
Remarks:	802.11n HT40-2437			

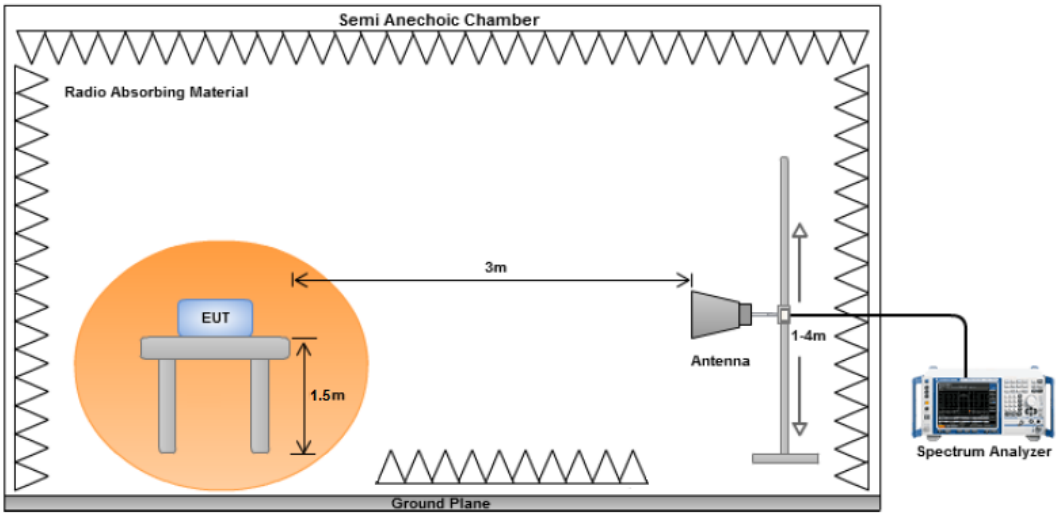


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
710.88	18.54	10	-15.27	13.27	Quasi Max	H	120	130	46	-32.73	Pass
119.97	42.05	10	-22.87	29.18	Quasi Max	H	254	103	43.5	-14.32	Pass
533.25	15.01	10	-18.13	6.88	Quasi Max	H	329	138	46	-39.12	Pass
888.88	16.42	10	-14.2	12.22	Quasi Max	V	195	87	46	-33.78	Pass
240.01	43.48	10	-25.09	28.4	Quasi Max	V	134	291	46	-17.6	Pass
959.99	33.41	10	-13.55	29.86	Quasi Max	H	130	189	46	-16.14	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.4 Radiated Spurious Emissions between 1GHz – 25GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(A8.5)	a)	For non-restricted band, 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 or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure		1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.	
Remark		The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. There isn't outstanding emission found at the edge of restricted frequency.	
Result		☒ Pass ☐ Fail	

Test Data ☒ Yes (See below) ☐ N/A
Test Plot ☐ Yes (See below) ☒ N/A
Test was done by Cipher at 10m chamber.

Radiated Emission Test Results (Above 1GHz)

Above 1GHz-25GHz – 802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1681.58	69.29	2.92	-14.15	58.06	Peak Max	H	111	119	74	-15.94	Pass
17114.58	40.75	8.98	5.85	55.58	Peak Max	H	354	105	74	-18.42	Pass
4825.33	44.36	4.68	-5.01	44.03	Peak Max	V	109	95	74	-29.97	Pass
1681.58	49.56	2.92	-14.15	38.33	Average Max	H	111	119	54	-15.67	Pass
17114.58	28.74	8.98	5.85	43.57	Average Max	H	354	105	54	-10.43	Pass
4825.33	31.27	4.68	-5.01	30.94	Average Max	H	363	131	54	-23.06	Pass

Above 1GHz-25GHz- 802.11b - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1683.32	69.31	2.92	-14.13	58.1	Peak Max	H	177	122	74	-15.9	Pass
17039.3	40.61	8.97	5.41	54.99	Peak Max	H	104	61	74	-19.01	Pass
4881.18	43.13	4.62	-5.1	42.65	Peak Max	V	146	139	74	-31.35	Pass
1683.32	49.73	2.92	-14.13	38.52	Average Max	H	177	122	54	-15.48	Pass
17039.3	28.06	8.97	5.41	42.44	Average Max	H	104	61	54	-11.56	Pass
4881.18	31.49	4.62	-5.1	31.01	Average Max	V	146	139	54	-22.99	Pass

Above 1GHz-25GHz – 802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1683.72	69.57	2.92	-14.13	58.36	Peak Max	H	199	342	74	-15.64	Pass
17160.52	40.58	8.98	5.45	55.01	Peak Max	V	275	14	74	-18.99	Pass
4949.87	42.81	4.54	-5.13	42.22	Peak Max	H	376	27	74	-31.78	Pass
1683.72	49.31	2.92	-14.13	38.1	Average Max	H	199	342	54	-15.9	Pass
17160.52	29.08	8.98	5.45	43.51	Average Max	H	207	259	54	-10.49	Pass
4949.87	30.95	4.54	-5.13	30.36	Average Max	H	376	27	54	-23.64	Pass

Above 1GHz-25GHz- 802.11g - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17910.2	40.49	9.13	8.56	58.18	Peak Max	H	391	90	74	-15.82	Pass
1683.48	70.99	2.92	-14.13	59.78	Peak Max	H	147	35	74	-14.22	Pass
4802.68	42.35	4.71	-4.97	42.09	Peak Max	H	99	281	74	-31.91	Pass
17910.2	28.86	9.13	8.56	46.55	Average Max	H	391	90	54	-7.45	Pass
1683.48	50.97	2.92	-14.13	39.76	Average Max	H	147	35	54	-14.24	Pass
4802.678	30.69	4.71	-4.97	30.43	Average Max	V	125	157	54	-23.57	Pass

Above 1GHz-25GHz – 802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1683.83	71.42	2.92	-14.13	60.21	Peak Max	H	225	19	74	-13.79	Pass
17288.5	40.69	9	6.7	56.39	Peak Max	V	98	231	74	-17.61	Pass
4871.1	43.31	4.63	-5.09	42.85	Peak Max	V	171	63	74	-31.15	Pass
1683.83	51.26	2.92	-14.13	40.05	Average Max	H	225	19	54	-13.95	Pass
17288.5	29.23	9	6.7	44.93	Average Max	V	98	231	54	-9.07	Pass
4871.1	31.87	4.63	-5.09	31.41	Average Max	V	171	63	54	-22.59	Pass

Above 1GHz-25GHz- 802.11g - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17423.3	40.47	9.02	7.74	57.23	Peak Max	H	232	66	74	-16.77	Pass
1683.5	69.62	2.92	-14.13	58.41	Peak Max	H	129	83	74	-15.59	Pass
4916.78	43.99	4.58	-5.14	43.43	Peak Max	V	228	16	74	-30.57	Pass
17423.3	28.39	9.02	7.74	45.15	Average Max	V	262	348	54	-8.85	Pass
1683.5	49.72	2.92	-14.13	38.51	Average Max	H	129	83	54	-15.49	Pass
4916.78	31.67	4.58	-5.14	31.11	Average Max	H	110	159	54	-22.89	Pass

Above 1GHz-25GHz- 802.11n20 - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17886	41.41	9.12	8.47	59	Peak Max	V	361	199	74	-15	Pass
1683.8	70.16	2.92	-14.13	58.95	Peak Max	H	181	61	74	-15.05	Pass
4801.6	42.78	4.71	-4.97	42.52	Peak Max	V	197	115	74	-31.48	Pass
17886	28.8	9.12	8.47	46.39	Average Max	V	361	199	54	-7.61	Pass
1683.8	50.43	2.92	-14.13	39.22	Average Max	H	181	61	54	-14.78	Pass
4801.6	30.71	4.71	-4.97	30.45	Average Max	V	197	115	54	-23.55	Pass

Above 1GHz-25GHz – 802.11n20 – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17415.97	41.15	9.01	7.8	57.96	Peak Max	H	236	52	74	-16.04	Pass
1683.42	69.16	2.92	-14.13	57.95	Peak Max	H	133	112	74	-16.05	Pass
4851.87	44.8	4.65	-5.05	44.4	Peak Max	V	282	226	74	-29.6	Pass
17415.97	28.32	9.01	7.8	45.13	Average Max	V	229	270	54	-8.87	Pass
1683.42	49.42	2.92	-14.13	38.21	Average Max	H	133	112	54	-15.79	Pass
4851.87	31.95	4.65	-5.05	31.55	Average Max	H	330	92	54	-22.45	Pass

Above 1GHz-25GHz- 802.11n20 - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17718.16	40.12	9.08	8.32	57.52	Peak Max	V	218	118	74	-16.48	Pass
1683.9	68.42	2.92	-14.13	57.21	Peak Max	H	104	130	74	-16.79	Pass
4850.85	43.89	4.65	-5.05	43.49	Peak Max	H	322	46	74	-30.51	Pass
17718.16	28.7	9.08	8.32	46.1	Average Max	H	340	28	54	-7.9	Pass
1683.9	48.88	2.92	-14.13	37.67	Average Max	H	104	130	54	-16.33	Pass
4850.85	32.04	4.65	-5.05	31.64	Average Max	H	322	46	54	-22.36	Pass

Above 1GHz-25GHz- 802.11n40 - 2422MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17726.53	41.21	9.08	8.25	58.54	Peak Max	H	392	159	74	-15.46	Pass
1683.75	71.45	2.92	-14.13	60.24	Peak Max	H	198	356	74	-13.76	Pass
4822.98	43.5	4.68	-5	43.18	Peak Max	H	163	169	74	-30.82	Pass
17726.53	28.89	9.08	8.25	46.22	Average Max	H	392	159	54	-7.78	Pass
1683.75	51.56	2.92	-14.13	40.35	Average Max	H	198	356	54	-13.65	Pass
4822.98	31.81	4.68	-5	31.49	Average Max	H	163	169	54	-22.51	Pass

Above 1GHz-25GHz – 802.11n40 – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17629	40.48	9.06	8.2	57.74	Peak Max	V	193	313	74	-16.26	Pass
1683.42	69.54	2.92	-14.13	58.33	Peak Max	H	210	104	74	-15.67	Pass
4839.8	43.57	4.67	-5.03	43.21	Peak Max	V	159	101	74	-30.79	Pass
17629	28.73	9.06	8.2	45.99	Average Max	H	264	238	54	-8.01	Pass
1683.42	49.95	2.92	-14.13	38.74	Average Max	H	210	104	54	-15.26	Pass
4839.8	31.48	4.67	-5.03	31.12	Average Max	H	117	84	54	-22.88	Pass

Above 1GHz-25GHz- 802.11n40 - 2452MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17933.4	41.48	9.14	8.43	59.05	Peak Max	H	283	203	74	-14.95	Pass
1683.67	70.34	2.92	-14.13	59.13	Peak Max	H	197	348	74	-14.87	Pass
4885.72	44.71	4.61	-5.11	44.21	Peak Max	H	225	250	74	-29.79	Pass
17933.4	28.67	9.14	8.43	46.24	Average Max	V	340	198	54	-7.76	Pass
1683.67	50.65	2.92	-14.13	39.44	Average Max	H	197	348	54	-14.56	Pass
4885.72	31.95	4.61	-5.11	31.45	Average Max	H	225	250	54	-22.55	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY51440112	11/02/2017	1 Year	11/02/2018	☑
Pre-Amplifier (1-40GHz)	SAS-474	579	05/04/2017	1 Year	05/04/2018	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11170602	02/09/2018	1 Year	02/09/2019	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	01/13/2018	1 Year	01/13/2019	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	08/11/2017	1 Year	08/11/2018	☑

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		**Radio & Telecommunications Terminal Equipment:** EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		**(Phase II)** OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		**Radio:** Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		***Radio***: A1. Terminal equipment for purpose of calling ***Telecom***: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		***EMI:*** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI ***EMS:*** KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		***EMC:*** AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2