



# RF TEST REPORT



**Report No.: FCC IC\_RF\_SL18011901-SFE-006-DSSS**  
**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 FCC Public Notice DA 00-705
FCC ID	:	2ALIS-A1
IC ID	:	22555-A1
Dates of test	:	02/20/2018 – 02/27/2018
Issue Date	:	02/28/2018
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification <input checked="" type="checkbox"/>		
Equipment did not comply with the specification <input type="checkbox"/>		

**This Test Report is Issued Under the Authority of:**

	
<b>Ciper</b>	<b>Chen Ge</b>
Test Engineer	Engineer Reviewer

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



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: [www.siemic.com](http://www.siemic.com); Follow us at:



## 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

**CONTENTS**

**1 REPORT REVISION HISTORY .....4**

**2 EXECUTIVE SUMMARY .....4**

**3 CUSTOMER INFORMATION .....4**

**4 TEST SITE INFORMATION.....4**

**5 MODIFICATION .....4**

**6 EUT INFORMATION .....5**

6.1 EUT Description .....5

6.2 Spec for BT Radio .....5

6.3 EUT test modes/configuration Description.....5

**7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION .....6**

7.1 Supporting Equipment .....6

7.2 Cabling Description .....6

7.3 Test Software Description .....6

**8 TEST SUMMARY.....7**

**9 MEASUREMENT UNCERTAINTY .....8**

9.1 Conducted Emissions .....8

9.2 Radiated Emissions (30MHz to 1GHz).....8

9.3 Radiated Emissions (1GHz to 40GHz).....9

9.4 RF conducted measurement.....9

**10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS.....10**

10.1 Antenna Requirement .....10

10.2 Transmitter Radiated Spurious Emissions Below 1GHz.....11

10.3 Transmitter Radiated Spurious Emissions > 1GHz & Restricted band & non-restricted band emission .....13

**ANNEX A. TEST INSTRUMENT .....17**

**ANNEX B. SIEMIC ACCREDITATION.....18**

## 1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC IC_RF_SL18011901-SFE-006-DSSS	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 1<sup>st</sup> 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 Spec for BT Radio

Radio Type	Bluetooth (Ver4.0+EDR)
Operating Frequency	2402MHz-2480MHz
Modulation	FHSS (BDR, EDR)
Channel Spacing	1MHz (BDR, EDR)
Antenna Type	Dipole
Antenna Gain	3.9 dBi
Antenna Connector Type	U.FL connector

#### Channel List

Type	Channel No.	Frequency (MHz)	Power Setting
Bluetooth(BRD) 2402-2480MHz	0	2402	9
	39	2441	9
	78	2480	9
Bluetooth(EDR) 2402-2480MHz	0	2402	9
	39	2441	9
	78	2480	9

### 6.3 EUT test modes/configuration Description

Mode	Note
Bluetooth	BDR (GFSK)
Bluetooth	EDR (8-DPSK)

## 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	EUT	I/O Port	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 Public Notice DA 00-705	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS Gen 8.10		RSS Gen Issue 4: 2014	
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.10: 2013	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen 8.8		RSS Gen Issue 4: 2014	
Antenna Requirement	FCC	15.203	FCC	-	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A

### DSS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Channel Separation	FCC	15.247 (a)(1)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.1.5)	IC	-	
20dB Occupied Bandwidth	FCC	15.247(a)(1)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.1.2)	IC	-	
99% Occupied Bandwidth	FCC	15.247(a)(2)	FCC		<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	
Number of Hopping Channels	FCC	15.247(a)(1)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.1.5)	IC	-	
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	Public Notice DA 00-705	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS247(5.5)	IC	-	
Time of Occupancy	FCC	15.247(a)(1)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.1.5)	IC	-	
Output Power	FCC	15.247(b)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.4.2)	IC	-	
Receiver Spurious Emissions	FCC	15.247(d)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen (7.1)	IC	RSS Gen (7.1)	
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.4.6)	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.2.2)	IC	-	
Hybrid System Requirement	FCC	15.247(f)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.3)	IC	-	
Hopping Capability	FCC	15.247(g)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS247 (5.1.5)	IC	-	
RF Exposure requirement	FCC	15.247(i)	FCC	Public Notice DA 00-705	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen(3.2)	IC	-	
Remark	<ol style="list-style-type: none"> <li>All measurement uncertainties are not taken into consideration for all presented test result.</li> <li>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.</li> </ol>				

## 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
<b>Expanded Uncertainty (K=2)</b>					<b>3.856266</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>6.0118262</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>8.4726</b>

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
<b>Expanded Uncertainty (K=2)</b>					<b>0.952174</b>

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

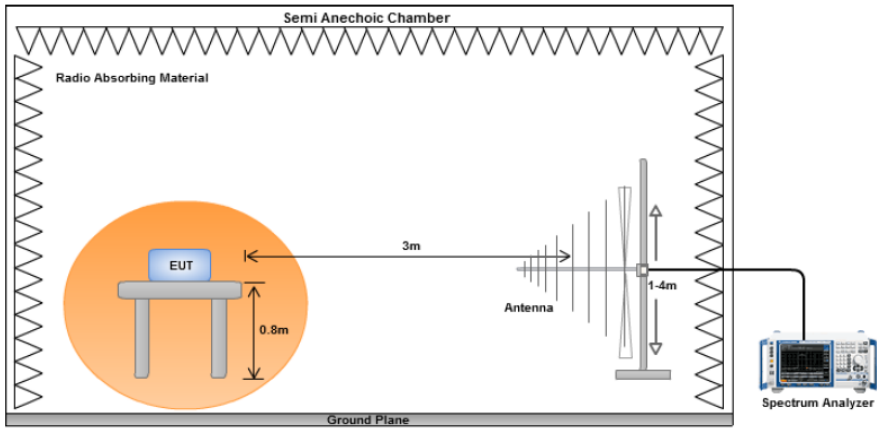
## 10 Measurements, Examination and Derived Results

### 10.1 Antenna Requirement

Spec	Item	Requirement	Applicable
15.203	-	<p>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.</p> <p>Antenna requirement must meet at least one of the following:</p> <p>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.</p>	<input checked="" type="checkbox"/>
Remark	All the Antennas use a unique type of connector to attach to the device.		
Result	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL		

## 10.2 Transmitter Radiated Spurious Emissions Below 1GHz

### Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.247(d), RSS247(5.5)	a)	<p>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</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table>	Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	☒
Frequency range (MHz)	Field Strength (uV/m)												
30 – 88	100												
88 – 216	150												
216 960	200												
Above 960	500												
Test Setup													
Procedure		<ol style="list-style-type: none"> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>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: <ol style="list-style-type: none"> <li>Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</li> <li>The EUT was then rotated to the direction that gave the maximum emission.</li> <li>Finally, the antenna height was adjusted to the height that gave the maximum emission.</li> </ol> </li> <li>A Quasi-peak measurement was then made for that frequency point.</li> <li>Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</li> </ol>											
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											

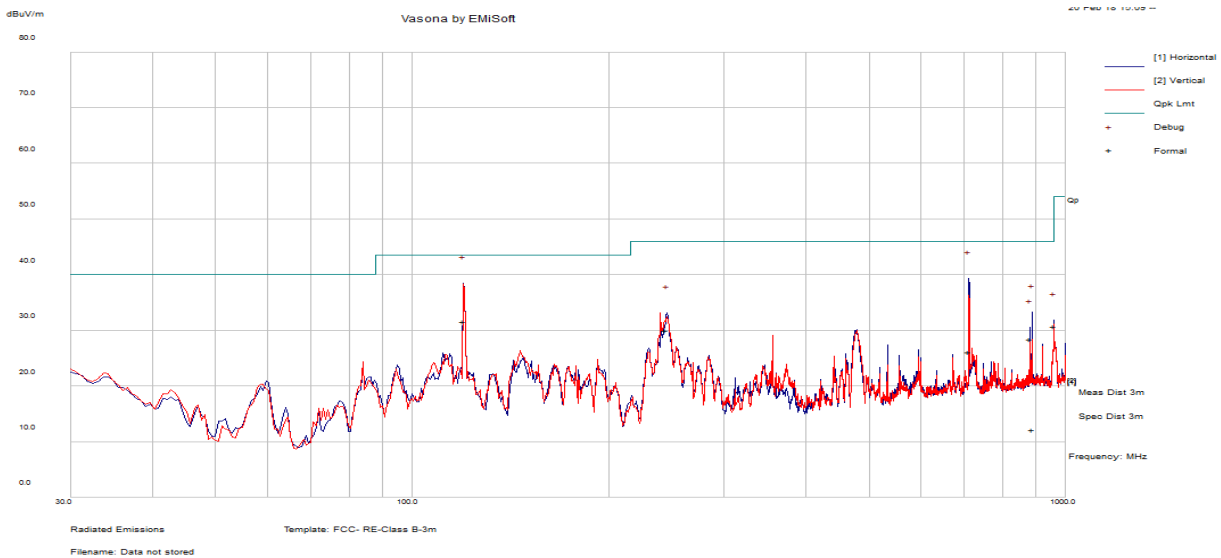
Test Data    ☒ Yes (See below)      ☐ N/A

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

Test was done by CIPHER at 10m Chamber.

### Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Spurious Emissions (30MHz – 1000MHz)			Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Environmental Conditions:	Temp(°C):	22		
	Humidity (%):	37		
	Atmospheric(mbar):	1021		
Mains Power:	120VAC, 60Hz			
Tested by:	Cipher			
Test Date:	02/20/2018 – 02/27/2018			
Remarks:	BDR 2441MHz			



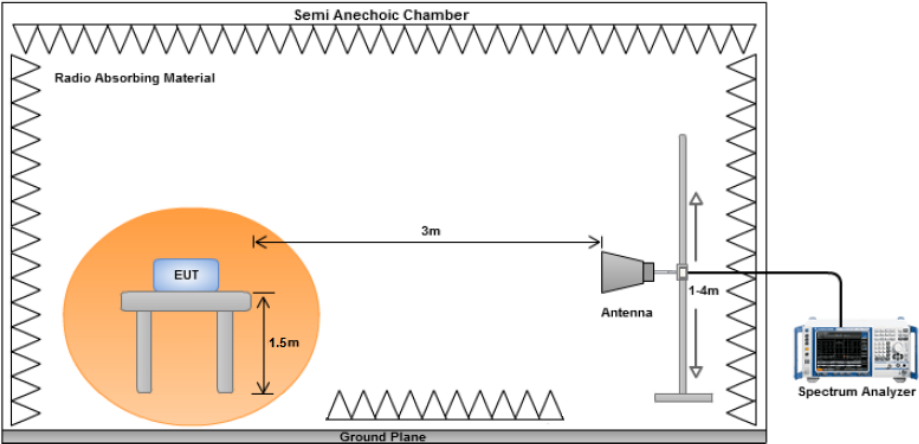
### Quasi Max Measurement

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
119.97	44.54	10	-22.87	31.67	Quasi Max	H	258	277	43.5	-11.83	Pass
711.06	31.4	10	-15.27	26.13	Quasi Max	H	202	140	46	-19.87	Pass
889.13	16.36	10	-14.19	12.17	Quasi Max	H	145	239	46	-33.83	Pass
245.16	45.15	10	-25.15	30	Quasi Max	H	118	282	46	-16	Pass
960.01	34.27	10	-13.55	30.72	Quasi Max	H	127	192	54	-23.28	Pass
883.19	32.77	10	-14.26	28.51	Quasi Max	H	145	144	46	-17.5	Pass

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

### 10.3 Transmitter Radiated Spurious Emissions > 1GHz & Restricted band & non-restricted band emission

**Requirement(s):**

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(5.5)	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  <input checked="" type="checkbox"/> 20 dB down <input type="checkbox"/> 30 dB down	<input checked="" type="checkbox"/>
	b)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	<input checked="" type="checkbox"/>
Test Setup			
Procedure	<ol style="list-style-type: none"> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>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: <ol style="list-style-type: none"> <li>Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</li> <li>The EUT was then rotated to the direction that gave the maximum emission.</li> <li>Finally, the antenna height was adjusted to the height that gave the maximum emission.</li> </ol> </li> <li>An average measurement was then made for that frequency point.</li> <li>Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</li> </ol>		
Remark	The EUT was scanned up to 26GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> 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

### Bluetooth BDR – 2402MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1683.49	70.39	2.92	-14.13	59.18	Peak Max	H	184	40	74	-14.82	Pass
17983.9	40.56	9.15	8.17	57.88	Peak Max	V	291	136	74	-16.12	Pass
4804.37	42.22	4.71	-4.97	41.96	Peak Max	H	225	88	74	-32.04	Pass
1683.49	50.4	2.92	-14.13	39.19	Average Max	H	184	40	54	-14.81	Pass
17983.9	28.48	9.15	8.17	45.8	Average Max	V	291	136	54	-8.2	Pass
4804.37	30.26	4.71	-4.97	30	Average Max	H	225	88	54	-24	Pass

### Bluetooth BDR – 2441MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1683.64	69.35	2.92	-14.13	58.14	Peak Max	H	197	70	74	-15.86	Pass
17899.18	40.15	9.13	8.6	57.88	Peak Max	H	340	305	74	-16.12	Pass
4837.06	42.42	4.67	-5.03	42.06	Peak Max	V	302	119	74	-31.94	Pass
1683.64	49.54	2.92	-14.13	38.33	Average Max	H	197	70	54	-15.67	Pass
17899.18	28.35	9.13	8.6	46.08	Average Max	H	340	305	54	-7.92	Pass
4837.06	30.74	4.67	-5.03	30.38	Average Max	V	302	119	54	-23.62	Pass

### Bluetooth BDR – 2480MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1641.34	68.68	2.87	-14.6	56.95	Peak Max	H	218	34	74	-17.05	Pass
17734.28	41.5	9.09	8.17	58.76	Peak Max	H	180	222	74	-15.24	Pass
4888.87	43.7	4.61	-5.12	43.19	Peak Max	V	400	258	74	-30.81	Pass
1641.34	43.89	2.87	-14.6	32.16	Average Max	H	218	34	54	-21.84	Pass
17734.28	28.48	9.09	8.17	45.74	Average Max	H	180	222	54	-8.26	Pass
4888.87	31.26	4.61	-5.12	30.75	Average Max	V	400	258	54	-23.25	Pass

### Bluetooth EDR – 2402MHz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
17904.74	40.6	9.13	8.59	58.32	Peak Max	V	216	80	74	-15.68	Pass
1683.56	72.89	2.92	-14.13	61.68	Peak Max	H	164	21	74	-12.32	Pass
4937.95	42.06	4.55	-5.13	41.48	Peak Max	V	165	74	74	-32.52	Pass
17904.74	28.57	9.13	8.59	46.29	Average Max	V	216	80	54	-7.71	Pass
1683.56	52.67	2.92	-14.13	41.46	Average Max	H	164	21	54	-12.54	Pass
4937.95	30.41	4.55	-5.13	29.83	Average Max	V	165	74	54	-24.17	Pass

### Bluetooth EDR – 2441MHz

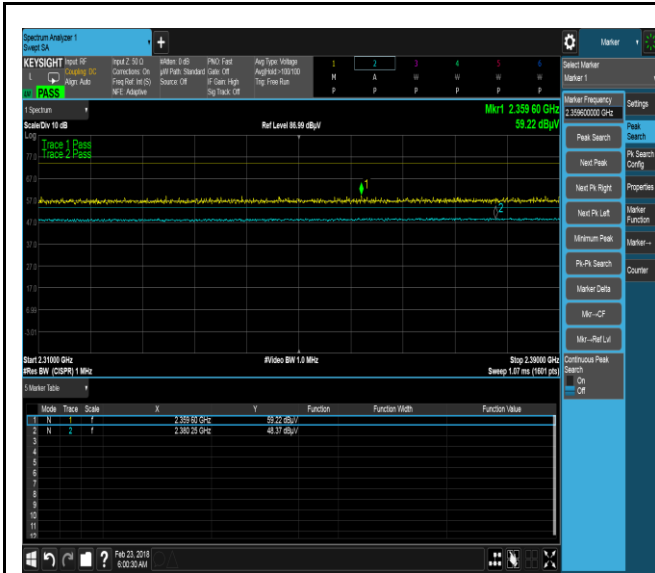
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1683.47	71.42	2.92	-14.13	60.21	Peak Max	H	135	16	74	-13.79	Pass
17978.13	40.26	9.15	8.2	57.61	Peak Max	H	130	356	74	-16.39	Pass
4873.22	43.31	4.63	-5.09	42.85	Peak Max	V	388	44	74	-31.15	Pass
1683.47	51.2	2.92	-14.13	39.99	Average Max	H	135	16	54	-14.01	Pass
17978.13	28.58	9.15	8.2	45.93	Average Max	H	130	356	54	-8.07	Pass
4873.22	31.34	4.63	-5.09	30.88	Average Max	V	388	44	54	-23.12	Pass

### Bluetooth EDR – 2480MHz

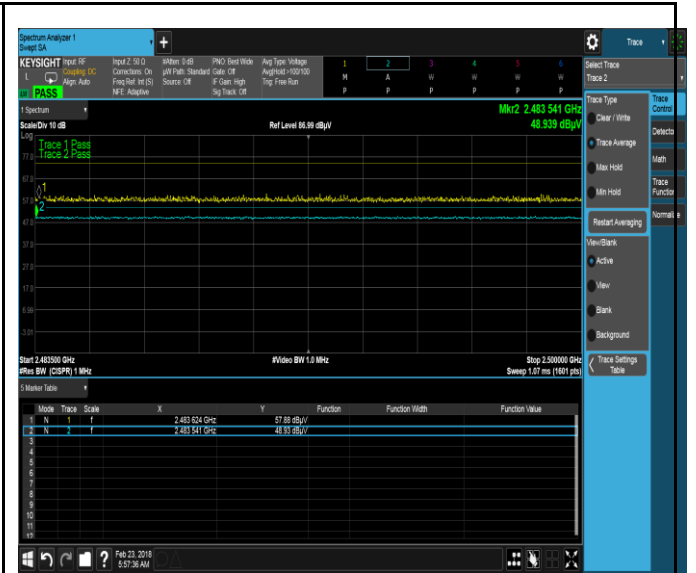
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1683.6	71.77	2.92	-14.13	60.56	Peak Max	H	162	32	74	-13.44	Pass
17889.7	39.87	9.13	8.51	57.51	Peak Max	H	108	311	74	-16.49	Pass
4886.39	43.91	4.61	-5.11	43.41	Peak Max	V	353	226	74	-30.59	Pass
1683.6	51.81	2.92	-14.13	40.6	Average Max	H	162	32	54	-13.4	Pass
17889.7	28.49	9.13	8.51	46.13	Average Max	H	108	311	54	-7.87	Pass
4886.39	31.5	4.61	-5.11	31	Average Max	V	353	226	54	-23	Pass

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

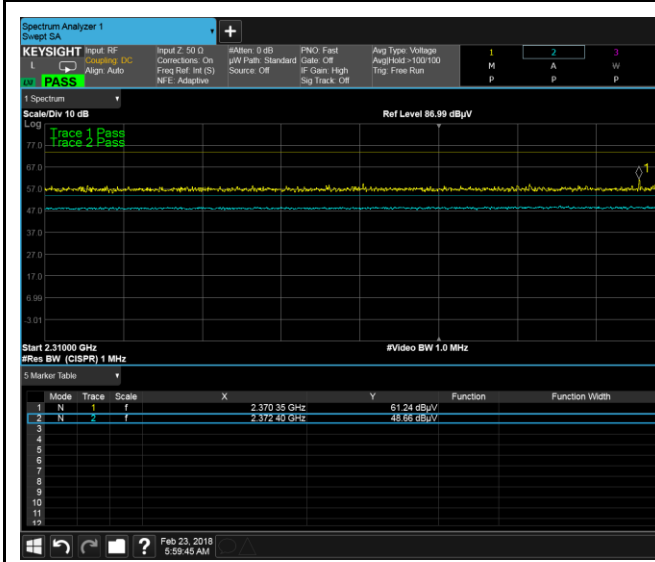
**Restricted Band Test plot (Bluetooth BDR/EDR)**



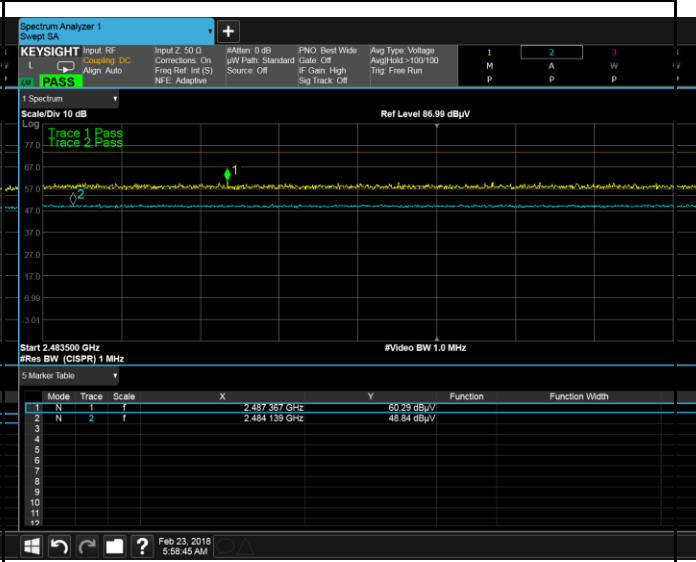
**Restricted Band BDR 2402MHz**



**Restricted Band BDR 2480MHz**



**Restricted Band EDR 2402MHz**



















**Restricted Band EDR 2480MHz**










**Annex A. TEST INSTRUMENT**

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
<b>Radiated Emissions</b>						
Keysight EXA 44GHz Spectrum Analyzer	N9010A	MY5144011 2	11/02/2017	1 Year	11/02/2018	<input checked="" type="checkbox"/>
Pre-Amplifier (1-40GHz)	SAS-474	579	05/04/2017	1 Year	05/04/2018	<input checked="" type="checkbox"/>
Preamplifier (100KHz-7GHz)	LPA-6-30	11170602	02/09/2018	1 Year	02/09/2019	<input checked="" type="checkbox"/>
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	01/13/2018	1 Year	01/13/2019	<input checked="" type="checkbox"/>
Horn Antenna (1-26.5GHz)	3115	10SL0059	08/11/2017	1 Year	08/11/2018	<input checked="" type="checkbox"/>

### 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		<b>Radio &amp; Telecommunications Terminal Equipment:</b> EN45001 – EN ISO/IEC 17025
		<b>Electromagnetic Compatibility:</b> 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		<b>Radio:</b> Scope A – All Radio Standard Specification in Category I
		<b>Telecom:</b> CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		<p><b>Radio:</b> A1. Terminal equipment for purpose of calling</p> <p><b>Telecom:</b> B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law</p>
Korea CAB Accreditation		<p><b>EMI:</b> KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI</p> <p><b>EMS:</b> 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</p> <p><b>Radio:</b> 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</p> <p><b>Telecom:</b> 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</p>
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		<p>R-3083: Radiation 3 meter site</p> <p>C-3421: Main Ports Conducted Interference Measurement</p> <p>T-1597: Telecommunication Ports Conducted Interference Measurement</p>
Australia CAB Recognition		<p><b>EMC:</b> AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4</p> <p><b>Radio communications:</b> 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</p> <p><b>Telecommunications:</b> 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</p>
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