RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: FCC_IC_RF_SL15081301-SLX-017_DTS
Supersede Report No.: None

Applicant	:	Silex Technology, Inc.
Product Name	:	2x2 802.11abgn SDIO Module
Model No.	:	SX-SDMAN2
Test Standard	:	47 CFR 15.247 RSS 247 Iss.1 : May 2015
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r05
FCC ID	:	N6C-SDMAN2
IC ID	:	4908A-SDMAN2
Dates of test	:	01/20/2017 – 01/23/2017
Issue Date	:	01/31/2017
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:	
Gary Chou	Chen Ge
Gary Chou	**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

CONTENTS

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_SL15081301-SLX-017_DTS_2.4G	None	Original	01/31/2017

2 Executive Summary

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

Company: Silex Technology, Inc.
Product: 2x2 802.11abgn SDIO Module
Model: SX-SDMAN2

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	:	Silex Technology, Inc
Applicant Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto, 619-0237 Japan
Manufacturer Name	:	Silex Technology, Inc
Manufacturer Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto, 619-0237 Japan

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	:	2x2 802.11abgn SDIO Module
Model No.	:	SX-SDMAN2
Trade Name	:	Silex
Serial No.	:	PW101980BA
Host Model No.	:	SD-320AN
Input Power	:	+3.3VDC
Power Adapter Manu/Model	:	Asian Power / WB-10E05R
Power Adapter SN	:	Y16200197310
Radio Hardware version	:	A
Radio Software version	:	3.5.99.21
Date of EUT received	:	01/23/2017
Equipment Class/ Category	:	DTS,UNII
Port/Connectors	:	U.FL

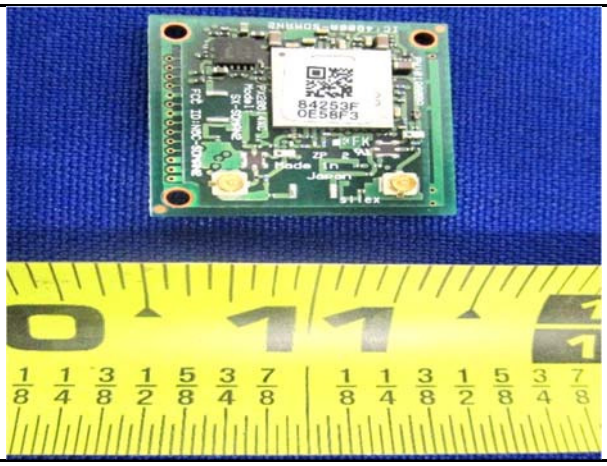
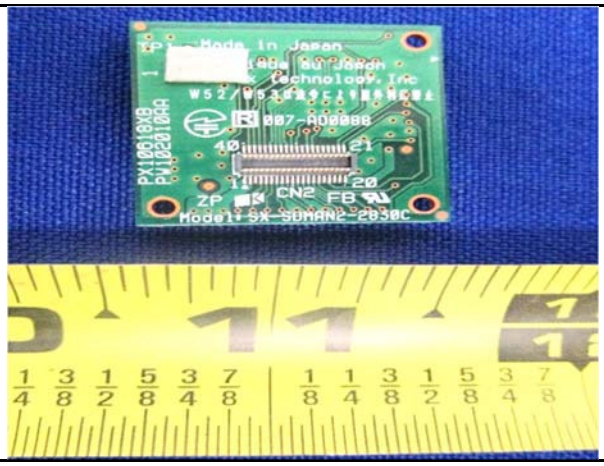
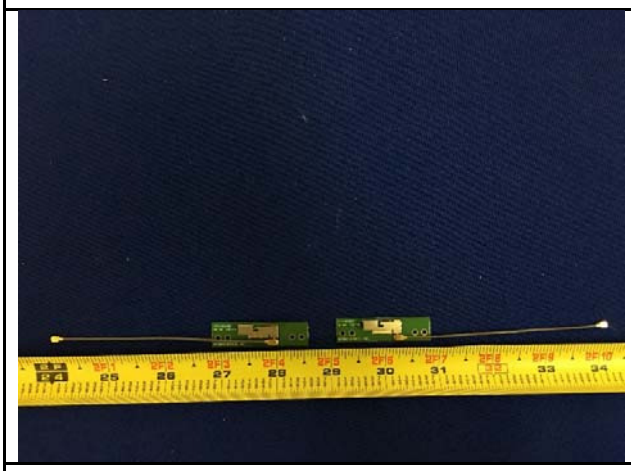
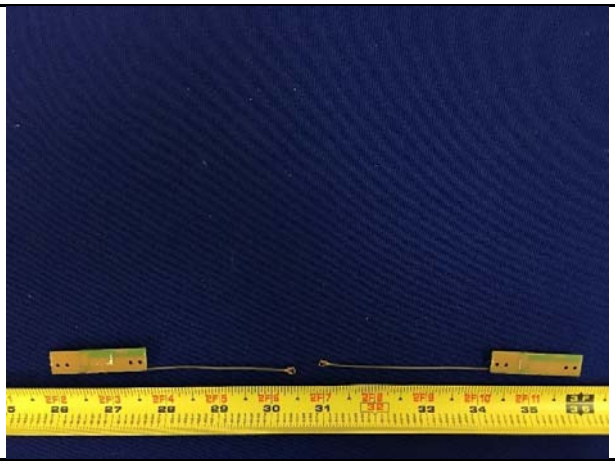
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5725-5825MHz	2412-2462MHz 5180-5240MHz 5240-5320MHz 5500-5700MHz 5725-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz
Number of Channels	11	11	22	11(2.4GHz) 22 (5GHz)	10(5GHz)
Antenna Type	PIFA				
Antenna Gain (Peak)	2.4GHz : 2.5dBi, 5GHz : 3.5dBi				
Antenna Connector Type	U.FL				

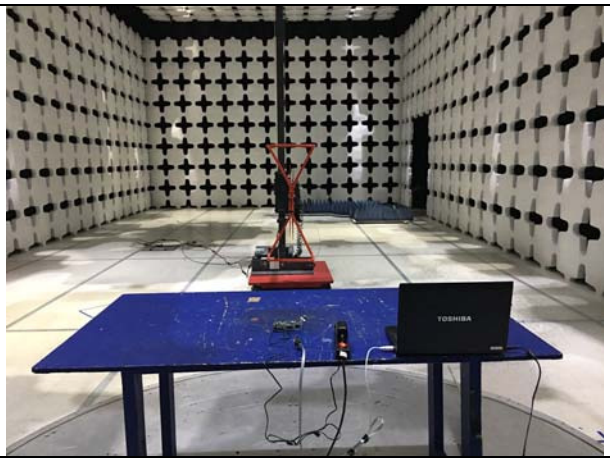
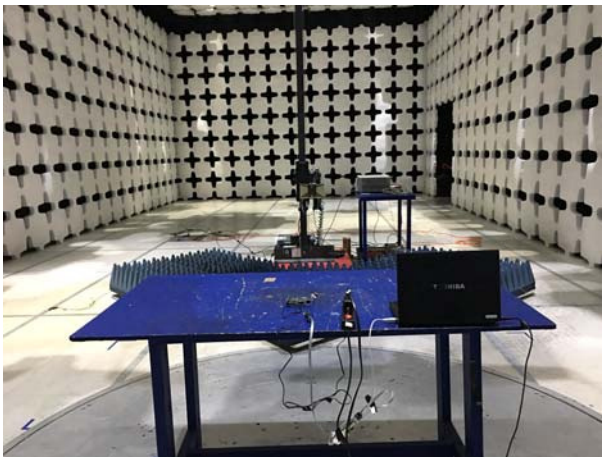
EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	Default
802.11-b	2437	Default
802.11-b	2462	Default
802.11-g	2412	Default
802.11-g	2437	Default
802.11-g	2462	Default
802.11-n-20	2412	Default
802.11-n-20	2437	Default
802.11-n-20	2462	Default

6.3 EUT Photos

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Radio Module – Top view</td><td>Radio Module – Bottom view</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Antenna Top View</td><td>Antenna Bottom View</td></tr>
</table>

6.4 EUT Test Setup Photos

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Radiated Emissions (<1GHz) – Front View</td><td>Radiated Emissions (<1GHz) – Rear View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Radiated Emissions (>1GHz) – Front View</td><td>Radiated Emissions (>1GHz) – Rear View</td></tr>
</table>

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Portege	1C094689H	Toshiba	-
2	Fixture	SD-320AN	002664192	SILEX	-

7.2 Cabling Description

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

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Athtestcmd	Set the EUT to transmit continuously in different test modes and channels

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	

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. 3. The device is operating at near 98% duty cycle.				
Note	Only Radiated Spurious Emission was tested for SX-SDMAN2 with PIFA antenna. Please refer to report with FCC ID: N6C-SDMAN2, IC ID: 4908A-SDMAN2.				

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

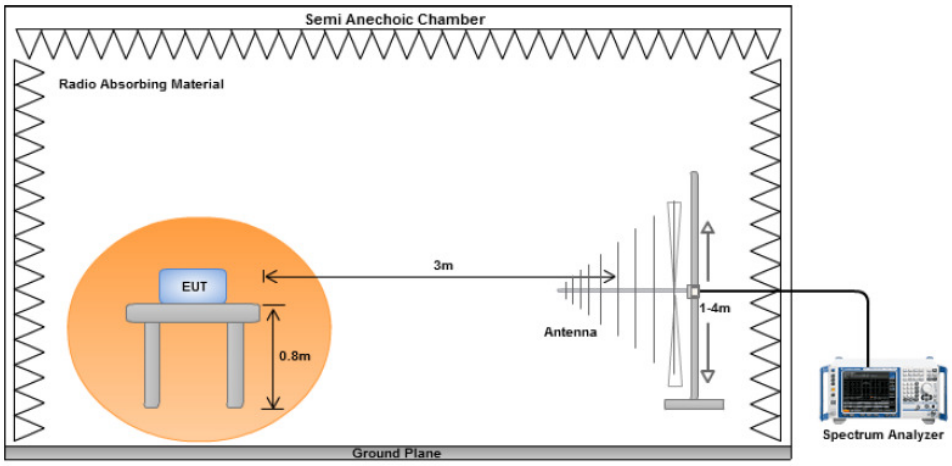
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					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 Radiated Spurious Emissions below 1GHz

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.247(d)
RSS247 (5.5)</td><td>a)</td><td>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
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr>
<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>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">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.</td></tr>
<tr><td>Remark</td><td colspan="3">The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.</td></tr>
<tr><td>Result</td><td colspan="3">☒ Pass ☐ Fail</td></tr>
</table>

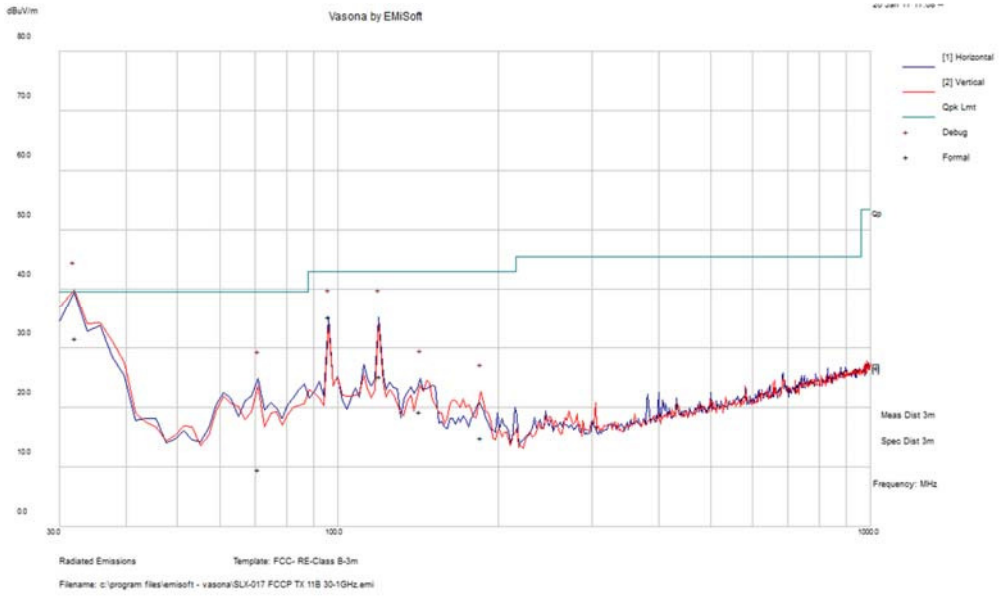
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Gary Chou* at *10m Chamber*.

Radiated Emission Test Results (Below 1GHz)

Test specification	Below 1GHz			
Environmental Conditions:	Temp (°C):	25.7	Result	
	Humidity (%)	29		
	Atmospheric (mPa):			
Mains Power:	110VAC, 60Hz			
Tested by:	Gary Chou			
Test Date:	01/20/2017			
Remarks:	2.4GHz TX Mode 11B 2437MHz			



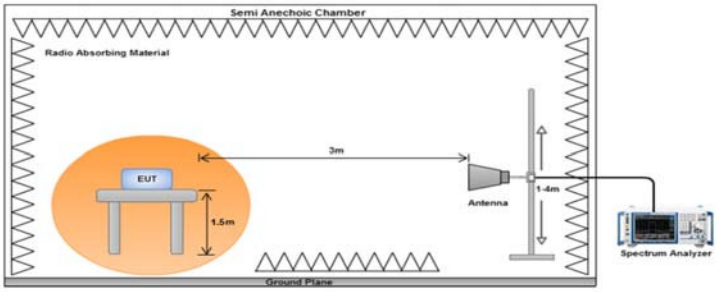
Quasi Max Measurement

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
32.12	46.21	1.03	-15.59	31.65	Quasi Max	V	116	188	39.50	-7.85	Pass
95.97	60.59	1.62	-26.94	35.27	Quasi Max	H	172	225	43.00	-7.73	Pass
119.65	45.89	1.80	-22.44	25.24	Quasi Max	H	265	172	43.00	-17.76	Pass
70.90	36.11	1.48	-27.98	9.61	Quasi Max	H	365	46	39.50	-29.89	Pass
142.62	40.63	1.92	-23.29	19.25	Quasi Max	H	288	166	43.00	-23.75	Pass
185.60	37.68	2.22	-24.95	14.96	Quasi Max	V	99	180	43.00	-28.04	Pass

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

10.2 Radiated Spurious Emissions Above 1GHz

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 ☐ 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		None	
Result		☒ Pass ☐ Fail	

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Gary Chou* at *10m Chamber*.

Radiated Emission Test Results (Above 1GHz)

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
1886.15	45.73	3.15	-12.40	36.48	Peak Max	V	113	79	74	-37.52	Pass
4823.92	43.34	4.68	-5.00	43.02	Peak Max	V	187	352	74	-30.98	Pass
7238.68	41.13	5.89	0.02	47.04	Peak Max	V	256	353	74	-26.96	Pass
1886.15	33.41	3.15	-12.40	24.16	Average Max	V	113	79	54	-29.84	Pass
4823.92	31.63	4.68	-5.00	31.31	Average Max	V	187	352	54	-22.69	Pass
7238.68	28.60	5.89	0.02	34.51	Average Max	V	256	353	54	-19.49	Pass

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
1885.25	45.60	3.15	-12.38	36.37	Peak Max	V	164	39	74	-37.63	Pass
4873.86	42.43	4.63	-5.09	41.97	Peak Max	V	114	156	74	-32.04	Pass
7308.43	40.64	5.92	0.08	46.63	Peak Max	H	370	287	74	-27.37	Pass
1885.25	33.47	3.15	-12.38	24.24	Average Max	V	164	39	54	-29.76	Pass
4873.86	30.52	4.63	-5.09	30.05	Average Max	V	114	156	54	-23.95	Pass
7308.43	28.11	5.92	0.08	34.10	Average Max	H	370	287	54	-19.90	Pass

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
1885.25	44.99	3.15	-12.38	35.76	Peak Max	V	164	338	74	-38.24	Pass
4923.95	41.57	4.57	-5.14	41.00	Peak Max	V	182	3	74	-33.00	Pass
7392.43	40.90	5.95	-0.27	46.58	Peak Max	V	312	41	74	-27.42	Pass
1885.25	33.48	3.15	-12.38	24.25	Average Max	V	164	338	54	-29.75	Pass
4923.95	29.43	4.57	-5.14	28.86	Average Max	V	182	3	54	-25.14	Pass
7392.43	28.00	5.95	-0.27	33.68	Average Max	V	176	349	54	-20.32	Pass

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
1884.03	45.45	3.15	-12.39	36.21	Peak Max	V	194	283	74	-37.79	Pass
4822.51	39.56	4.69	-5.00	39.25	Peak Max	V	182	264	74	-34.75	Pass
7237.63	40.10	5.89	0.02	46.01	Peak Max	V	155	128	74	-27.99	Pass
1884.03	33.52	3.15	-12.39	24.28	Average Max	V	194	283	54	-29.72	Pass
4822.51	27.18	4.69	-5.00	26.87	Average Max	V	182	264	54	-27.13	Pass
7237.63	28.15	5.89	0.02	34.06	Average Max	V	155	128	54	-19.94	Pass

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
1869.92	45.17	3.13	-12.49	35.81	Peak Max	V	137	132	74	-38.19	Pass
4880.51	39.54	4.62	-5.10	39.06	Peak Max	V	132	250	74	-34.94	Pass
7312.18	39.90	5.92	0.06	45.88	Peak Max	V	100	159	74	-28.12	Pass
1869.92	33.18	3.13	-12.49	23.82	Average Max	V	137	132	54	-30.18	Pass
4880.51	28.02	4.62	-5.10	27.54	Average Max	V	132	250	54	-26.46	Pass
7312.18	28.13	5.92	0.06	34.11	Average Max	V	100	159	54	-19.89	Pass

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
1917.55	43.27	3.18	-12.19	34.26	Peak Max	V	192	50	74	-39.74	Pass
4926.16	40.53	4.57	-5.13	39.97	Peak Max	V	106	123	74	-34.03	Pass
7389.54	39.59	5.95	-0.26	45.28	Peak Max	V	112	299	74	-28.72	Pass
1917.55	33.12	3.18	-12.19	24.11	Average Max	V	192	50	54	-29.89	Pass
4926.16	28.72	4.57	-5.13	28.16	Average Max	V	106	123	54	-25.84	Pass
7389.54	27.78	5.95	-0.26	33.47	Average Max	V	112	299	54	-20.53	Pass

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
1915.66	45.09	3.18	-12.20	36.07	Peak Max	V	175	356	74	-37.93	Pass
4826.50	40.25	4.68	-5.01	39.92	Peak Max	V	110	101	74	-34.08	Pass
7238.66	39.82	5.89	0.02	45.73	Peak Max	V	151	221	74	-28.27	Pass
1915.66	33.17	3.18	-12.20	24.15	Average Max	V	175	356	54	-29.85	Pass
4826.50	28.83	4.68	-5.01	28.50	Average Max	V	110	101	54	-25.50	Pass
7238.66	28.15	5.89	0.02	34.06	Average Max	V	151	221	54	-19.94	Pass

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
1918.23	44.16	3.18	-12.19	35.15	Peak Max	V	115	213	74	-38.85	Pass
4881.27	41.67	4.62	-5.10	41.19	Peak Max	V	105	234	74	-32.81	Pass
7239.94	40.08	5.89	0.02	45.99	Peak Max	V	99	215	74	-28.01	Pass
1918.23	33.00	3.18	-12.19	23.99	Average Max	V	115	213	54	-30.01	Pass
4881.27	29.68	4.62	-5.10	29.20	Average Max	V	105	234	54	-24.80	Pass
7239.94	28.33	5.89	0.02	34.24	Average Max	V	99	215	54	-19.76	Pass

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
1896.99	45.44	3.16	-12.30	36.30	Peak Max	V	181	163	74	-37.70	Pass
4928.91	40.03	4.56	-5.13	39.46	Peak Max	V	102	251	74	-34.54	Pass
7392.57	39.48	5.95	-0.27	45.16	Peak Max	V	161	141	74	-28.84	Pass
1896.99	33.64	3.16	-12.30	24.50	Average Max	V	181	163	54	-29.50	Pass
4928.91	28.54	4.56	-5.13	27.97	Average Max	V	102	251	54	-26.03	Pass
7392.57	27.87	5.95	-0.27	33.55	Average Max	V	161	141	54	-20.45	Pass

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

Annex A. TEST INSTRUMENT

Instrument	Model	Manufacturer	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2016	1 Year	06/08/2017	☑
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/06/2016	1 Year	08/06/2017	☑
Pre-Amplifier (1-26.5GHz)	8449B	Hewlett Packard	3008A00715	03/30/2016	1 Year	03/30/2017	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	RF Bay, Inc.	11140711	02/10/2016	1 Year	02/10/2017	☑
ETS-Lingren Loop Antenna	6512	ETS-Lingren	00049120	05/12/2015	1 Year	05/12/2016	☐
Bi-Log antenna (30MHz~2GHz)	JB1	Sunol Sciences	A030702	01/13/2017	1 Year	01/13/2018	☑
Horn Antenna (1-26.5GHz)	3115	EMCO	10SL0059	08/11/2016	1 Year	08/11/2017	☑
3 Meters SAC	3M	ETS-Lingren	N/A	06/09/2016	1 Year	06/09/2017	☐
10 Meters SAC	10M	ETS-Lingren	N/A	07/06/2016	1 Year	07/06/2017	☑

Test Software Version

Test Item	Vendor	Software	Version
Radiated Emission	EMISoft	EMISoft Vasona	V5.0

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