RF TEST REPORT

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Report No.: **SL14052701-SLX-012_FCC-IC(15.247)_Rev2.0**
Supersede Report No.: **SL14052701-SLX-012_FCC-IC(15.247)_Rev1.0**

Applicant	:	Silex Technology, Inc.
Product Name	:	SDIO Wireless Module
Model No.	:	SX-SDMAN
Test Standard	:	FCC 15.247: 2013 RSS 210 Issue8: 2010
Test Method	:	ANSI C63.4:2009 FCC KDB 558074 D01 DTS Meas Guidance v03r02
FCC ID	:	N6C-SDMAN
IC ID	:	4908B-SDMAN
Dates of test	:	June 23 - June 26, 20144
Issue Date	:	July 15, 2014
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:	
Angel Escamilla	N. Molaei G.
Angel Escamilla	Nima Molaei
Test Engineer	Engineer Reviewer
This test report may be reproduced in full only. **Test result presented in this test report is applicable to the representative sample only.**	

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

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
SL14052701-SLX-012_FCC-IC(15.247)	Original	-	6/27/2014
SL14052701-SLX-012_FCC-IC(15.247)_Rev1.0	1.0	-The FCC ID and IC ID were corrected. - The photos of the support PCBs were removed from the test report. -The test results for the 5GHz DTS band were added.	7/8/2014
SL14052701-SLX-012_FCC-IC(15.247)_Rev2.0	2.0	- The test procedure on page 14 was corrected.	7/15/2014

2 Executive Summary

The purpose of this test program was to demonstrate compliance of the FCC, IC certified radio module, SDIO Wireless Module (FCC ID: N6C-SDMAN, IC ID: 4908B-SDMAN), from Silex Technology, Inc., and Model: SX-SDMAN against the current Stipulated Standards after the reduction of the RF output power. The SDIO Wireless Module with reduced RF output power has demonstrated compliance with the standards 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	:	SDIO Wireless Module
Model No.	:	SX-SDMAN
Trade Name	:	Silex
Serial No.	:	PW100120BA
Input Power	:	3.3VDC
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Hardware version	:	-
Software version	:	-
Date of EUT received	:	June 19, 2014
Equipment Class/ Category	:	DTS
Clock Frequencies	:	26 MHz
Port/Connectors	:	SDIO

6.2 Radio Description

Radio list	:	802.11a/b/g/n (2.4GHz and 5GHz)
Radio Manufacturer	:	Silex Technology, Inc.
Radio Model	:	SX-SDMAN

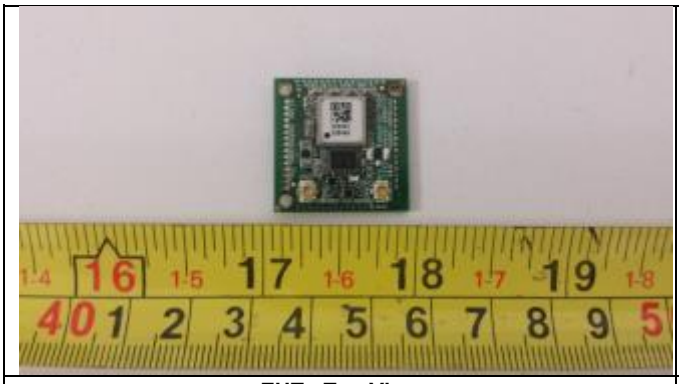
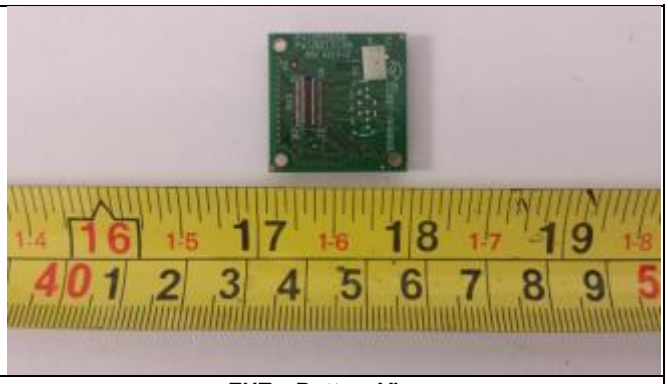
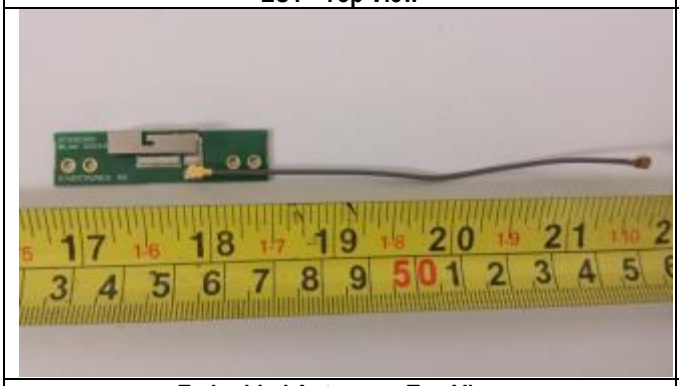
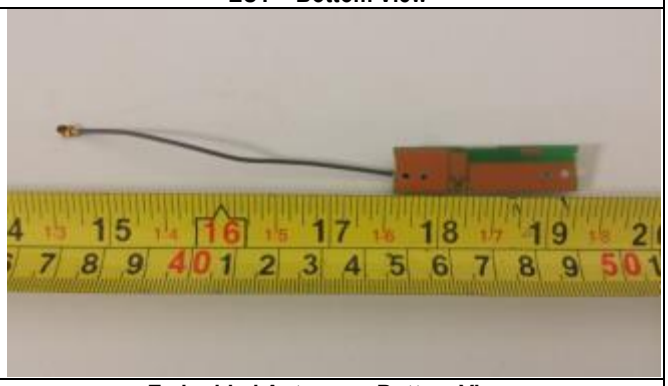
Spec for Radio -

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5320MHz 5470-5725MHz 5725-5825MHz	2412-2462MHz 5180-5320MHz 5470-5725MHz 5725-5825MHz	5190-5310MHz 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 Ch.	11 Ch.	21 Ch.	32 Ch.	16 Ch.
Antenna Type	Embedded antenna: Ethertronics				
Antenna Gain	Embedded antenna: 2.0 dBi (2.4GHz), 2.5 dBi (5GHz)				
Antenna Connector Type	U.FL connector				

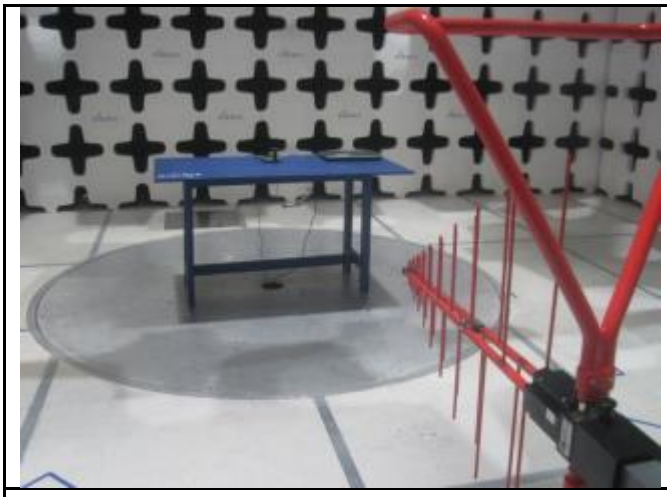
6.3 EUT test modes/configuration Description

Mode	Note
802.11n-HT20: (Mid-CH: 2437MHz)	Below 1GHz, Power setting: 5.5dBm
802.11n-HT20: (Low-CH: 2412MHz, Mid-CH: 2437MHz, High-CH: 2462MHz)	Above 1GHz, Power setting: 5.5dBm
802.11n-HT40: (Low-CH: 5745MHz, Mid-CH: 5785MHz, High-CH: 5825MHz)	Above 1GHz, Power setting: 4.5dBm
Note:	

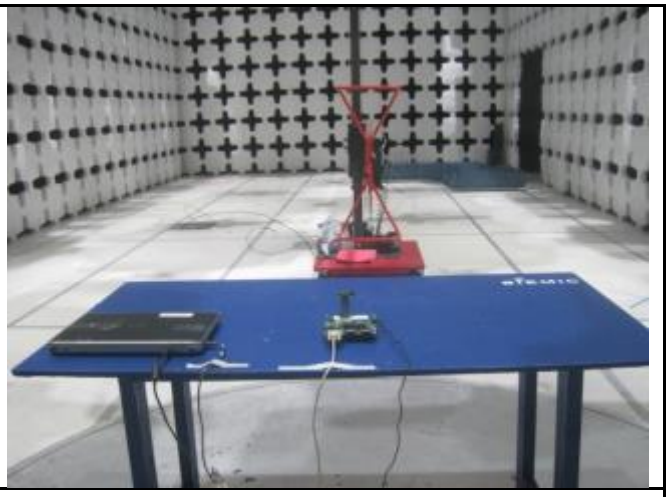
6.4 EUT – Photos

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>EUT - Top View</td><td>EUT – Bottom View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Embedded Antenna – Top View</td><td>Embedded Antenna – Bottom View</td></tr>
</table>

6.5 EUT Test Setup Photos

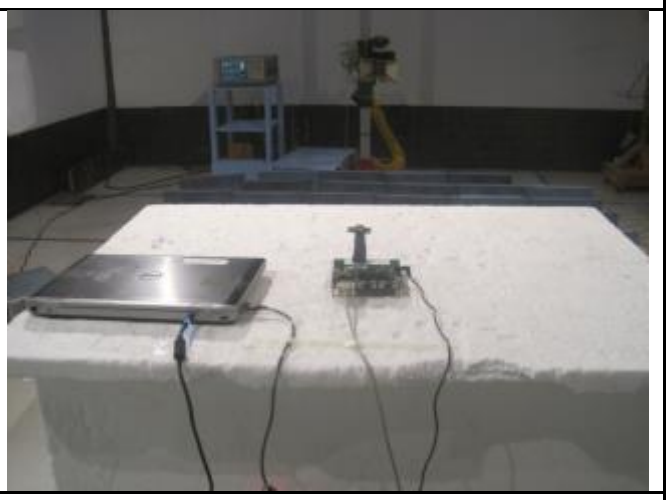


Test setup (<1GHz) - Front

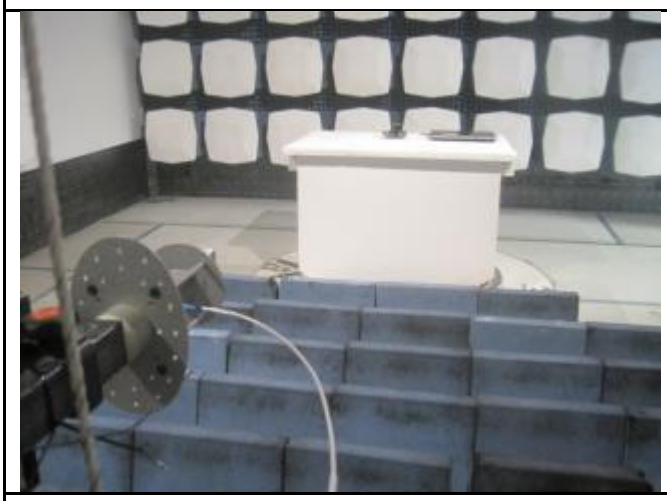


Test setup (<1GHz) - Rear

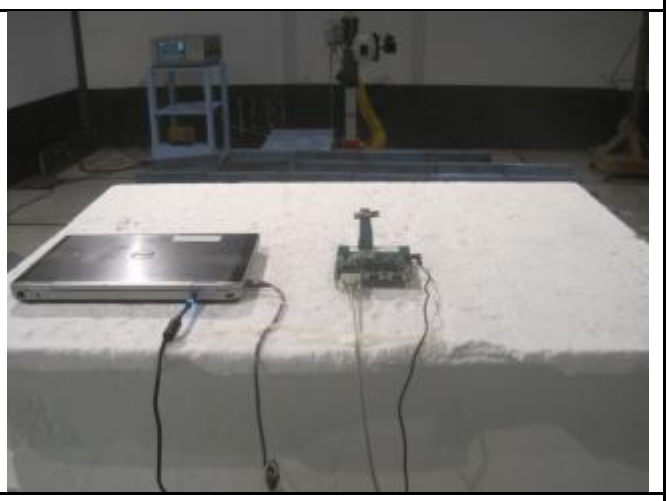
Test setup (>1GHz) - Front



Test setup (>1GHz) - Rear



Test setup (>18GHz) - Front



Test setup (>18GHz) - Rear

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Index	Supporting Equipment Description	Model	Serial No.	Manu	Note
1	Laptop	Latitude E6530	1Z4TJV1	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/Serial	Laptop	USB	Support PCB	Serial	2	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
Radiated Testing	TTE test software	Set the EUT to different modulation and channels

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.4 – 2009 558074 D01 DTS Meas Guidance v03r02	☒ Pass ☐ N/A
	IC	RSS 210 (2.2)	IC	-	
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS Gen (7.2.2)	IC	-	

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Channel Separation	FCC	15.247(a)(1)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Occupied Bandwidth	FCC	15.247(a)(1)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Bandwidth	FCC	15.247(a)(2)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210 (A8.2)	IC	-	
Number of Hopping Channels	FCC	15.247(a)(1)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.4 – 2009 558074 D01 DTS Meas Guidance v03r02	☒ Pass ☐ N/A
	IC	RSS210(A8.5)	IC	-	
Band Edge Measurement	FCC	15.247(d)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.5)	IC	-	
Time of Occupancy	FCC	15.247(a)(1)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Output Power	FCC	15.247(b)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.4)	IC	-	
Antenna Gain > 6 dBi	FCC	RSS210(A8.4)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.4)	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.3)	IC	-	
Hopping Capability	FCC	15.247(g)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC	-	
Hopping Coordination Requirement	FCC	15.247(h)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSS210(A8.1)	IC		
RF Exposure requirement	FCC	15.247(i)	FCC	Refer to original test report (32IE0154-HO-01-C-R1)	☐ Pass ☒ N/A
	IC	RSSGen(5.5)	IC		
Remark	1. All measurement uncertainties are not taken into consideration for all presented test result. 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

Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

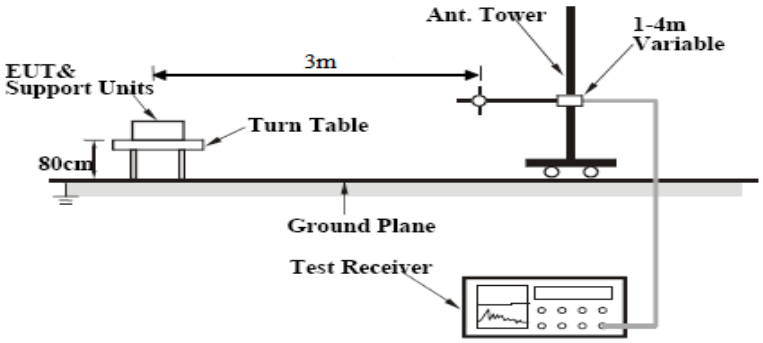
9.1 Radiated Measurement

Receiver/Spectrum analyser setting

Test	Detector	RBW	VBW	Test Distance	Notes
Radiated Emission < 1GHz (30MHz – 1GHz)	PK/QP	100 KHz	300 KHz	3m	-
Radiated Emission > 1GHz (1GHz – 40GHz)	PK/AV	1 MHz	3 MHz / 10 Hz	3m	-

9.1.1 Radiated Measurement below 1GHz

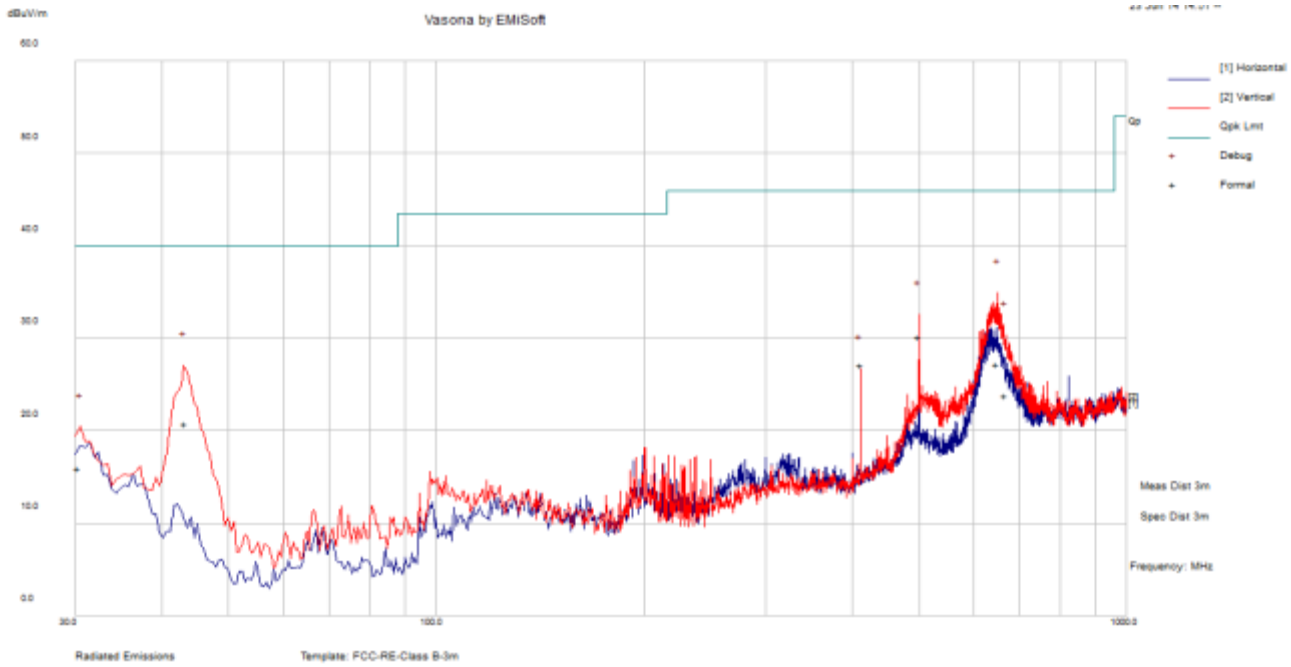
Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="2">§ 15.247(d), RSS210(A8.5)</td><td>a)</td><td>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</td><td>☐</td></tr>
<tr><td>b)</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">Different RF configurations were evaluated but not much difference was found. The data here is the worst case data with the EUT under 802.11n-HT20 mode.</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

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	21		
	Humidity (%)	46		
	Atmospheric (mbar):	1021		
Tested by:	Angel Escamilla			
Test Date:	06/23/2014			
Remarks:	802.11n-HT20 – Mid channel (2437MHz)			



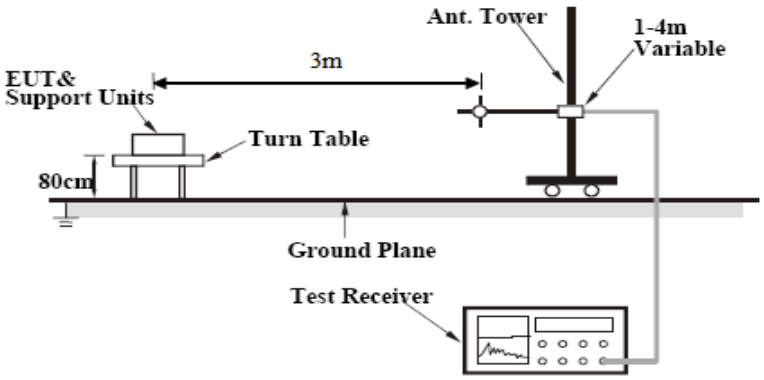
30MHz – 1000MHz at 3m distance

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
30.34	31.24	1.16	-16.41	15.99	Quasi Max	V	100.00	179.00	40.00	-24.01	Pass
43.26	46.46	1.16	-26.78	20.83	Quasi Max	V	101.00	273.00	40.00	-19.17	Pass
411.41	48.06	3.43	-24.42	27.07	Quasi Max	V	124.00	197.00	46.00	-18.93	Pass
499.99	48.70	4.16	-22.70	30.16	Quasi Max	V	107.00	289.00	46.00	-15.84	Pass
649.58	43.82	4.34	-20.93	27.23	Quasi Max	V	100.00	252.00	46.00	-18.77	Pass
667.10	40.47	4.40	-21.08	23.79	Quasi Max	V	233.00	213.00	46.00	-22.21	Pass

Note: Both horizontal and vertical polarizations were investigated. All radio types and modulations were investigated. Only the worst case is shown above.

9.1.2 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(d), RSS210(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(a)	☒
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. Peak maximization and average measurements were then made for that frequency point with the following Receiver/Spectrum analyser setting: - Peak: RBW = 1MHz, VBW = 3MHz, Detector = Peak - Average: RBW = 1MHz, VBW = 10Hz, Detector = Peak 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	Different RF configurations were evaluated but not much difference was found. The data here is the worst case data with the EUT under 802.11n-HT20 mode for the 2.4GHz band and 802.11n-HT40 mode for the 5GHz band . Both horizontal and vertical polarizations have been verified for all the different mode measurements.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Radiated Spurious Emission Test Results (Above 1GHz)

Test specification	Above 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	22		
	Humidity (%)	44		
	Atmospheric (mbar):	1020		
Tested by:	Angel Escamilla			
Test Date:	06/24-27/2014			
Remarks:	802.11n-HT20			

1GHz- 25GHz: 802.11n-HT20 – Low channel (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
2344.69	37.62	2.09	-3.64	36.07	Peak Max	V	100.00	358.00	74.00	-37.93	Pass
3947.39	37.11	2.86	-0.28	39.69	Peak Max	H	217.00	168.00	74.00	-34.31	Pass
4055.93	35.00	2.91	-0.19	37.72	Peak Max	H	131.00	7.00	74.00	-36.28	Pass
4800.24	36.14	3.17	0.10	39.42	Peak Max	H	101.00	83.00	74.00	-34.58	Pass
15477.28	43.25	6.88	10.16	60.29	Peak Max	V	102.00	200.00	74.00	-13.71	Pass
17948.70	40.49	7.01	14.29	61.80	Peak Max	H	217.00	155.00	74.00	-12.20	Pass
2344.69	24.02	2.09	-3.64	22.47	Average Max	V	100.00	358.00	54.00	-31.53	Pass
3947.39	23.57	2.86	-0.28	26.15	Average Max	H	217.00	168.00	54.00	-27.85	Pass
4055.93	21.50	2.91	-0.19	24.22	Average Max	H	131.00	7.00	54.00	-29.78	Pass
4800.24	23.02	3.17	0.10	26.29	Average Max	H	101.00	83.00	54.00	-27.71	Pass
15477.28	30.00	6.88	10.16	47.04	Average Max	V	102.00	200.00	54.00	-6.96	Pass

Note: Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified.

Restricted band at 2390MHz

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
2390.00	62.27	2.11	-3.53	60.86	Peak Max	H	191.00	196.00	74.00	-13.14	Pass
2390.00	56.17	2.11	-3.53	54.75	Peak Max	V	163.00	283.00	74.00	-19.25	Pass
2390.00	45.41	2.11	-3.53	43.99	Average Max	H	191.00	196.00	54.00	-10.01	Pass
2390.00	40.68	2.11	-3.53	39.26	Average Max	V	163.00	283.00	54.00	-14.74	Pass

1GHz- 25GHz: 802.11n-HT20 – Mid channel (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
2344.64	38.01	2.09	-3.64	36.46	Peak Max	H	252.00	10.00	74.00	-37.54	Pass
2498.30	37.24	2.16	-3.28	36.11	Peak Max	V	109.00	139.00	74.00	-37.89	Pass
3682.34	34.65	2.70	-0.79	36.56	Peak Max	V	221.00	108.00	74.00	-37.44	Pass
3946.45	36.84	2.86	-0.28	39.42	Peak Max	V	252.00	84.00	74.00	-34.58	Pass
4049.90	35.34	2.91	-0.19	38.06	Peak Max	H	217.00	276.00	74.00	-35.94	Pass
4798.89	36.42	3.17	0.10	39.69	Peak Max	H	113.00	86.00	74.00	-34.31	Pass
2344.64	24.39	2.09	-3.64	22.84	Average Max	H	252.00	10.00	54.00	-31.16	Pass
2498.30	23.72	2.16	-3.28	22.59	Average Max	V	109.00	139.00	54.00	-31.41	Pass
3682.34	21.04	2.70	-0.79	22.95	Average Max	V	221.00	108.00	54.00	-31.05	Pass
3946.45	23.53	2.86	-0.28	26.10	Average Max	V	252.00	84.00	54.00	-27.90	Pass
4049.90	21.96	2.91	-0.19	24.67	Average Max	H	217.00	276.00	54.00	-29.33	Pass

Note: Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified.

1GHz- 25GHz: 802.11n-HT20 – High channel (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
2338.70	37.88	2.09	-3.66	36.31	Peak Max	V	216.00	279.00	74.00	-37.69	Pass
3351.29	34.93	2.50	-1.42	36.01	Peak Max	H	122.00	12.00	74.00	-37.99	Pass
3945.54	37.50	2.86	-0.28	40.08	Peak Max	V	284.00	82.00	74.00	-33.92	Pass
4005.79	39.49	2.89	-0.18	42.20	Peak Max	H	297.00	276.00	74.00	-31.80	Pass
4856.86	35.44	3.19	0.17	38.81	Peak Max	V	257.00	21.00	74.00	-35.19	Pass
15530.26	42.82	6.88	9.95	59.65	Peak Max	H	227.00	354.00	74.00	-14.35	Pass
2338.70	24.57	2.09	-3.66	23.00	Average Max	V	216.00	279.00	54.00	-31.00	Pass
3351.29	21.76	2.50	-1.42	22.84	Average Max	H	122.00	12.00	54.00	-31.16	Pass
3945.54	24.19	2.86	-0.28	26.77	Average Max	V	284.00	82.00	54.00	-27.23	Pass
4005.79	26.42	2.89	-0.18	29.13	Average Max	H	297.00	276.00	54.00	-24.87	Pass
4856.86	21.88	3.19	0.17	25.25	Average Max	V	257.00	21.00	54.00	-28.75	Pass

Note: Emission was scanned up to 25GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified.

Restricted band at 2483.5MHz

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
2483.50	60.47	2.15	-3.32	59.30	Peak Max	H	111.00	21.00	74.00	-14.70	Pass
2483.50	53.23	2.15	-3.32	52.07	Peak Max	V	119.00	162.00	74.00	-21.93	Pass
2483.50	42.56	2.15	-3.32	41.40	Average Max	H	111.00	21.00	54.00	-12.60	Pass
2483.50	38.92	2.15	-3.32	37.76	Average Max	V	119.00	162.00	54.00	-16.24	Pass

1GHz- 40GHz: 802.11n-HT40 – Low channel (5745MHz)

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
2334.45	40.92	1.67	-3.67	38.92	Peak Max	V	147.00	353.00	68.30	-29.38	Pass
3921.11	40.97	2.27	-0.33	42.91	Peak Max	H	133.00	70.00	68.30	-25.39	Pass
7594.16	43.92	3.39	3.79	51.09	Peak Max	V	173.00	76.00	68.30	-17.21	Pass
9469.31	42.40	3.46	6.53	52.38	Peak Max	H	152.00	122.00	68.30	-15.92	Pass
12353.53	43.87	4.37	6.33	54.57	Peak Max	V	100.00	300.00	68.30	-13.73	Pass
17789.86	41.73	5.59	13.76	61.08	Peak Max	H	162.00	251.00	68.30	-7.22	Pass
2334.45	26.92	1.67	-3.67	24.93	Average Max	V	147.00	353.00	54.00	-29.07	Pass
3921.11	27.77	2.27	-0.33	29.71	Average Max	H	133.00	70.00	54.00	-24.29	Pass
7594.16	30.35	3.39	3.79	37.52	Average Max	V	173.00	76.00	54.00	-16.48	Pass
9469.31	29.62	3.46	6.53	39.60	Average Max	H	152.00	122.00	54.00	-14.40	Pass
12353.53	30.46	4.37	6.33	41.15	Average Max	V	100.00	300.00	54.00	-12.85	Pass
17789.86	28.02	5.59	13.76	47.37	Average Max	H	162.00	251.00	54.00	-6.63	Pass

Note: Emission was scanned up to 40GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified. 802.11n-HT40 mode was found as worst case at the 5GHz band.

1GHz- 40GHz: 802.11n-HT40 – Mid channel (5785MHz)

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
8326.81	44.00	3.22	5.08	52.30	Peak Max	H	136.00	319.00	68.30	-16.00	Pass
9134.69	43.50	3.32	5.93	52.75	Peak Max	H	129.00	319.00	68.30	-15.55	Pass
12049.82	43.50	4.29	6.51	54.30	Peak Max	V	0.00	38.00	68.30	-14.00	Pass
13303.66	43.75	4.78	8.12	56.65	Peak Max	V	159.00	301.00	68.30	-11.65	Pass
17897.00	41.45	5.60	14.12	61.17	Peak Max	V	191.00	39.00	68.30	-7.13	Pass
8326.81	30.39	3.22	5.08	38.69	Average Max	H	136.00	319.00	54.00	-15.31	Pass
9134.69	29.76	3.32	5.93	39.02	Average Max	H	129.00	319.00	54.00	-14.98	Pass
12049.82	30.05	4.29	6.51	40.85	Average Max	V	0.00	38.00	54.00	-13.15	Pass
13303.66	30.38	4.78	8.12	43.27	Average Max	V	159.00	301.00	54.00	-10.73	Pass
17897.00	28.15	5.60	14.12	47.87	Average Max	V	191.00	39.00	54.00	-6.13	Pass

Note: Emission was scanned up to 40GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified. 802.11n-HT40 mode was found as worst case at the 5GHz band.

1GHz- 40GHz: 802.11n-HT40 – High channel (5825MHz)

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
3929.96	40.44	2.28	-0.31	42.41	Peak Max	H	133.00	335.00	68.30	-25.89	Pass
4716.04	41.34	2.52	-0.01	43.85	Peak Max	V	162.00	216.00	68.30	-24.45	Pass
8332.63	43.60	3.22	5.09	51.91	Peak Max	V	109.00	171.00	68.30	-16.39	Pass
12321.07	43.61	4.36	6.35	54.32	Peak Max	V	101.00	221.00	68.30	-13.98	Pass
15535.65	43.74	5.51	9.90	59.15	Peak Max	H	118.00	328.00	68.30	-9.15	Pass
17950.23	41.57	5.61	14.30	61.48	Peak Max	H	168.00	154.00	68.30	-6.82	Pass
3929.96	27.19	2.28	-0.31	29.15	Average Max	H	133.00	335.00	54.00	-24.85	Pass
4716.04	27.76	2.52	-0.01	30.27	Average Max	V	162.00	216.00	54.00	-23.73	Pass
8332.63	30.39	3.22	5.09	38.70	Average Max	V	109.00	171.00	54.00	-15.30	Pass
12321.07	29.96	4.36	6.35	40.67	Average Max	V	101.00	221.00	54.00	-13.33	Pass
15535.65	29.93	5.51	9.90	45.34	Average Max	H	118.00	328.00	54.00	-8.66	Pass
17950.23	28.04	5.61	14.30	47.95	Average Max	H	168.00	154.00	54.00	-6.05	Pass

Note: Emission was scanned up to 40GHz; no emissions were detected above the noise floor which was at least 20dB below the specification limit; both horizontal and vertical polarization were verified. 802.11n-HT40 mode was found as worst case at the 5GHz band.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☐
R&S LISN	ESH2-Z5	861741/013	05/18/2014	1 Year	05/18/2015	☐
CHASE LISN	MN2050B	1018	07/24/2013	1 Year	07/24/2014	☐
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☐
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2014	1 Year	03/01/2015	☑
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☑
ETS-Lingren Loop Antenna	6512	00049120	05/13/2014	1 Year	05/13/2015	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	07/13/2013	1 Year	07/13/2014	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2014	1 Year	04/26/2015	☑
Horn Antenna (18-40 GHz)	AH-840	101013	04/23/2014	1 Year	04/23/2015	☑
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	05/30/2014	1 Year	05/30/2015	☑
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2014	1 Year	05/30/2015	☑
3 Meters SAC	3M	N/A	10/13/2013	1 Year	10/13/2014	☑
10 Meters SAC	10M	N/A	06/05/2014	1 Year	06/05/2015	☑
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2014	1 Year	05/30/2015	☐
Spectrum Analyzer	E4407B	US88441016	05/31/2014	1 Year	05/31/2015	☐
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☐

Annex B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex C. 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

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