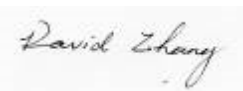


RF TEST REPORT



Report No.: FCC_RF_SL14031101-SLX-004_15.407 Rev1.0
Supersede Report No.: FCC_RF_SL14031101-SLX-004_15.407

Applicant	Hospira, Inc.		
Product Name	SDIO Wireless Module		
Model No.	SX-SDMAN		
Test Standard	FCC 15.407E: 2013 RSS 210 Issue8: 2010		
Test Method	ANSI C63.4:2009 FCC KDB 789033 D01 v01 r03		
Date of test	04/17/2014 - 04/28/2014		
Issue Date	06/10/2014		
Test Result	<u>Pass</u> Fail		
Equipment complied with the specification	[x]		
Equipment did not comply with the specification	[]		
			
David Zhang		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 tested sample only			

Issued By:
SIEMIC Laboratories
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FCC ID	STJ-SDMAN
IC ID	5627A-SDMAN

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/RRR, 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
HongKong	OFTA (US002)	RF , Telecom

Test report No.	FCC_RF_SL14031101-SLX-004_15.407 Rev1.0
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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL14031101-SLX-004_15.407 Rev1.0	Original	-	4/28/2014
FCC_RF_SL14031101-SLX-004_15.407 Rev1.0	Rev1.0	Update EUT photo	6/10/2014

Test report No.	FCC_RF_SL14031101-SLX-004_15.407 Rev1.0
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2 Executive Summary

The purpose of this test programme was to demonstrate compliance of the FCC, IC certified radio module, SDIO Wireless Module (FCC ID: STJ-SDMAN, IC ID: 5627A-SDMAN), from Hospira, Inc., and Model: SX-SDMAN, to be installed inside portable host unit of Hospira, Inc., Wireless Infusion Pump, against the current Stipulated Standards. The SDIO Wireless Module to be installed inside portable host unit of Hospira Wireless Infusion Pump has demonstrated compliance with listed on 1st page.

3 Customer information

Applicant Name	:	Hospira, Inc.
Applicant Address	:	375 North Field Drive building H3, Lake Forest, IL. 60045
Manufacturer Name	:	Hospira, Inc.
Manufacturer Address	:	375 North Field Drive building H3, Lake Forest, IL. 60045

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
-	-	-	-

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6 EUT Information

6.1 EUT Description

Product Name	:	SDIO Wireless Module
Model No.	:	SX-SDMAN
Trade Name	:	Hospira
Serial No.	:	PW100125BA
Input Power	:	3.3VDC
Power Adapter Manu/Model	:	-
Power Adapter SN	:	-
Hardware version	:	-
Software version	:	-
Date of EUT received	:	04/17/2014
Equipment Class/ Category	:	UNII
Clock Frequencies	:	26 MHz
Port/Connectors	:	SDIO

6.2 Radio Description

Radio list	:	802.11a/b/g/n (2.4GHz and 5GHz)
Radio Manu	:	Silex
Radio Model	:	SX-SDMAN

Note: The Bluetooth radio function on this radio module is disabled via software by manufacturer.

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.	14 Ch.
Antenna Type	Embedded PCB antenna				
Antenna Gain	4.2 dBi (2.4 GHz), 4.9 dBi (5 GHz)				
Antenna Connector Type	U.FL connector				
Note	The Radio module was tested with following antenna in the original FCC grant, - Embedded antenna: 2.0 dBi (2.4GHz), 2.5 dBi (5GHz) - Sleeve antenna: 1.0 dBi (2.4GHz), 1.1 dBi (5GHz) Now the antenna to be used with the radio module in the host unit has following antenna gain, - 4.2 dBi (2.4 GHz), 4.9 dBi (5 GHz) - EUT is only SISO with TX diversity. It's verify that with this higher gain antenna, there isn't power limit reduction for the radio module and the radio module still can meet FCC rule part requirement on the output power and power spectral density.				

6.3 EUT test modes/configuration Description

Mode	Note
802.11a (11a)	24Mbps, PN9
802.11n-20MHz (11n-20)	MCS1 (Long GI), PN9
802.11n-40MHz (11n-40)	MCS3 (Long GI), PN9

Note:

- Testing purpose for current report is PCII to add the 5.4GHz band only. The worst case test modes were reference to original FCC test report (report number: 32IE0154-HO-01-C-R1) & (SL13032601-SLX-003_ (FCC_15.407)_RF Rev1.0).
- Power setting for 5.4GHz band are:

802.11a: 5500MHz: 13.0dBm, 5580MHz: 14.0dBm, 5700: 14.0dBm (Antenna Port 1)
802.11n-20(5GHz): 5500MHz: 13.0dBm, 5580MHz: 14.0dBm, 5700MHz: 14.0dBm (Antenna Port 1)
802.11n-40(5GHz): 5510MHz: 9.5dBm, 5550MHz: 14.0dBm, 5670MHz: 14.0dBm (Antenna Port 1)

Test Item	Operating mode	Tested antenna port	Test frequencies
Band Edge and Radiated Spurious Emissions	802.11a, 802.11n-20, 802.11n-40	TX1	5180, 5260, 5320MHz (802.11a, 802.11n-20) 5190, 5230, 5310MHz (802.11n-40) 5500, 5580, 5700MHz (802.11a, 802.11n-20) 5510, 5550, 5670MHz (802.11n-40)

Note:

- Testing purpose for current report is PCII to add the 5.4GHz band only. The test port selection was reference to original FCC test report (report number: 32IE0154-HO-01-C-R1). The port CN1 was used for measurement due to higher output power (CN1 is TX1 port)
- EUT has 2 TX ports but they're TX diversity, only one port will be chosen at single moment. They don't transmit simultaneously.

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6.4 EUT Photos - External



Top Side View



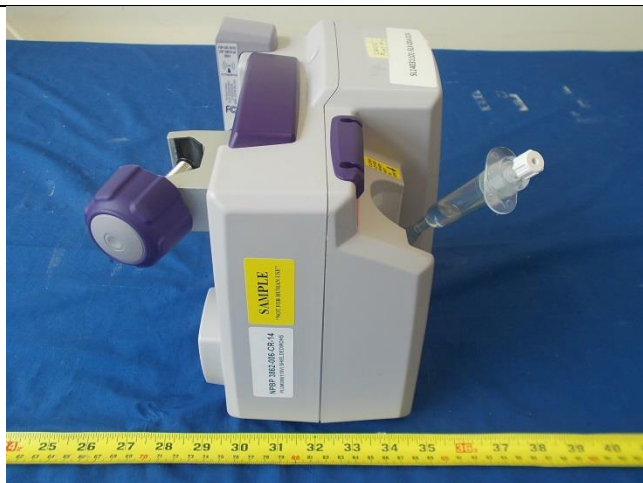
Bottom Side View



Front Side View Side



Rear View Side



Left Side View



Right Side View

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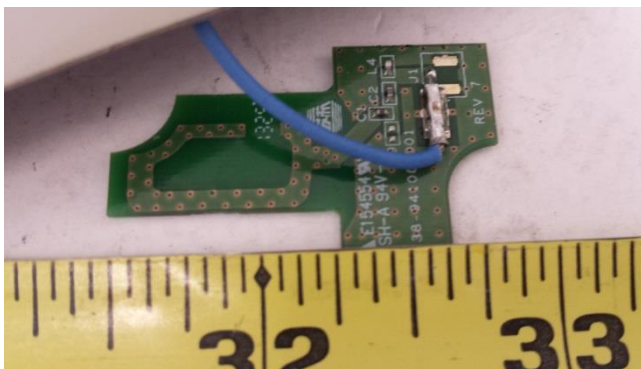
6.5 EUT Photos - Internal



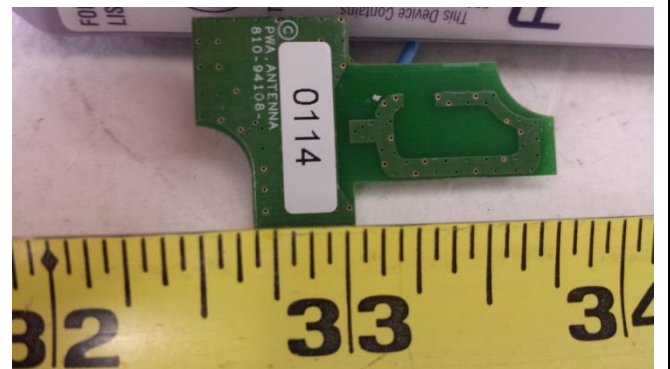
Host Cover off view



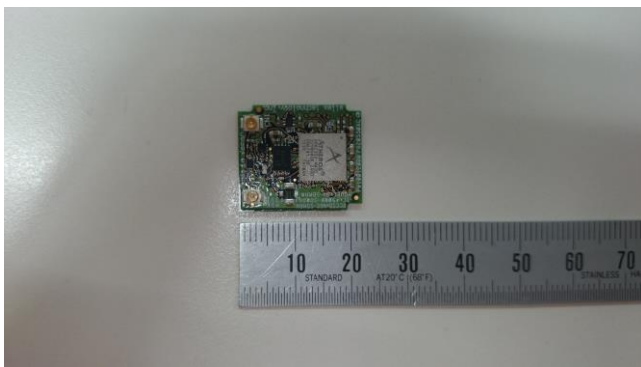
Host Radio Board



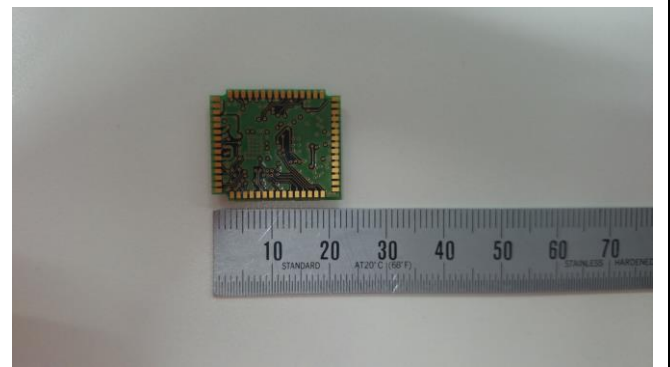
Antenna Top View



Antenna Bottom View



Radio Module - Top zoom in view



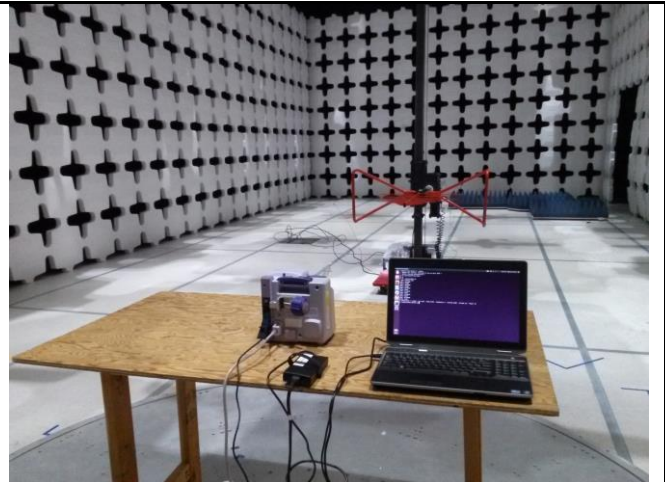
Radio Module - Bottom zoom in view

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6.6 EUT Test Setup Photos



Test setup (<1GHz) - Front



Test setup (<1GHz) - Rear



Test setup at 3 meter distance (>1GHz) - Front



Test setup at 3 meter distance (>1GHz) - Rear

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7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Index	Supporting Equipment Description	Model	Serial No.	Manu	Note
1	Laptop	E6530	P28X4 A00	Dell	-
2	AC/DC Power Adpater	DA130PE1-00	CN-0JU012-48661-04C-HJIX-A03	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 cable	Laptop	USB	EUT	Micro-USB	1.0	No	-

7.3 Test Software Description

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

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8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	Refer to original test report (32IE0154-HO-01-C-R1) & (SL13032601-SLX-003_ (FCC_15.407)_RF Rev1.0)	☐ Pass ☒ N/A
	IC	RSS 210 (2.2)	IC	-	
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS Gen (7.2.2)	IC	-	

Test Item	Test standard		Test Method/Procedure		Pass / Fail
26 dB Emission Bandwidth	FCC	15.407 (a) (2)	FCC	Refer to original test report (32IE0154-HO-01-C-R1) & (SL13032601-SLX-003_ (FCC_15.407)_RF Rev1.0)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.2) (2)	IC	-	
99% Bandwidth	FCC	-	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.2) (2)	IC	-	
Maximum conducted Output Power	FCC	15.407 (a) (2)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.2) (1)	IC	-	
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	-	IC	-	
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	FCC	ANSI C63.4 – 2009 789033 D01 General UNII Test Procedures v01r03	☒ Pass ☐ N/A
	IC	RSS210(A9.3)(1)	IC	-	
Power Spectral Density	FCC	15.407 (a) (2)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.2) (1)	IC	-	
Peak Excursion Ratio	FCC	15.407(a)(6)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	-	IC	-	
RF Exposure	FCC	15.407 (f)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS Gen (5.5)	IC	-	
Frequency Stability	FCC	15.407 (g)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.5) (e)	IC	-	
Dynamic Frequency Selection (DFS)	FCC	15.407 (h)(2)(b)(iii)	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.3)	IC	-	
User Manual	FCC	-	FCC	Refer to original test report (Same as above)	☐ Pass ☒ N/A
	IC	RSS 210 (A9.5) (g)	IC	-	
Remark	- All measurement uncertainties are not taken into consideration for all presented test result. - 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.				

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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

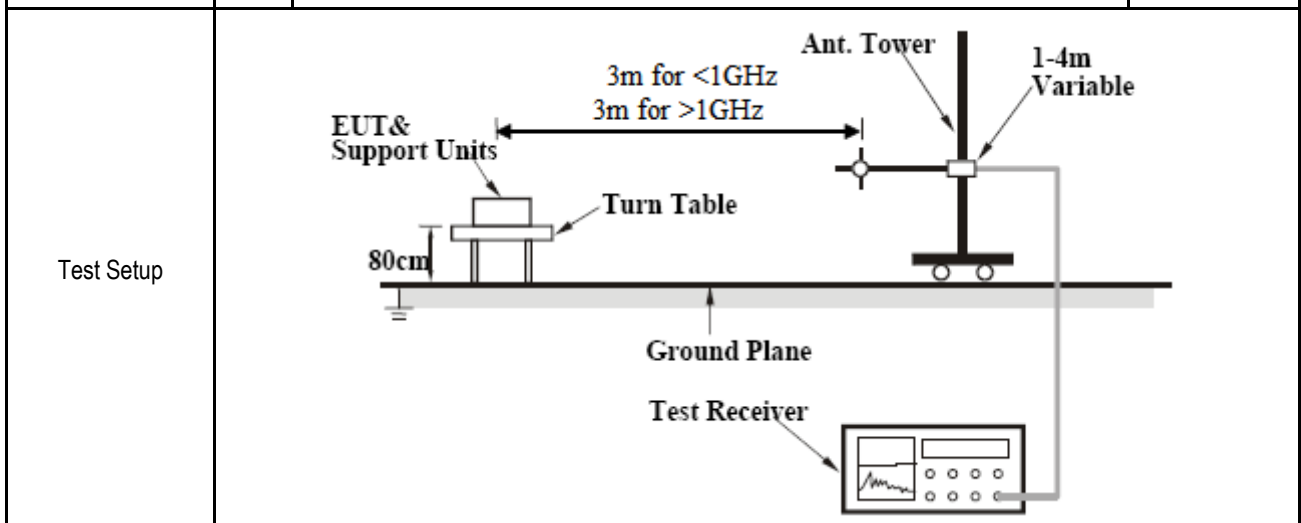
Receiver/Spectrum analyser setting

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	1m	-
Band Edge	PK/AV	1 MHz	3 MHz	3m	-

9.1.1 Radiated Measurement below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407(b)(2), 15.407(b)(6) , RSS210(A9.3)(1)	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)	Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.	☒



Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - 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: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - A Quasi-peak measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
-----------	--

Remark	None
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Result	☒ Pass ☐ Fail
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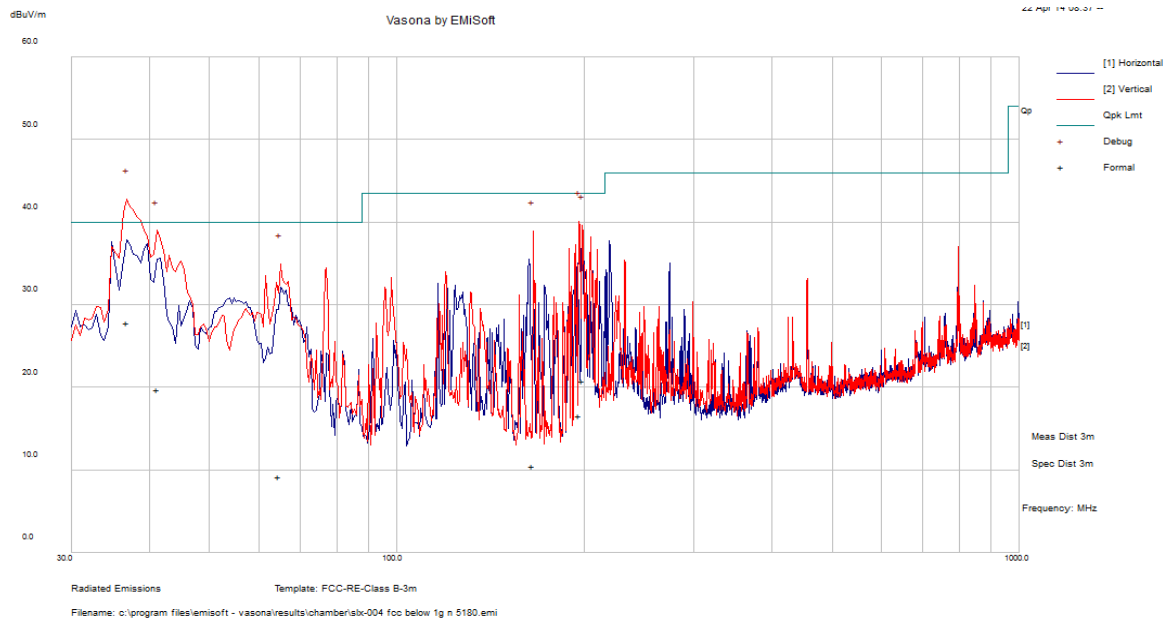
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

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Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz		Result	Pass
Environmental Conditions:	Temp (°C):	21		
	Humidity (%)	45		
	Atmospheric (mbar):	1008		
Mains Power:	120VAC, 60Hz			
Tested by:	Teody Manansala			
Test Date:	22-Apr-14			
Remarks:	802.11n-20M-5180			

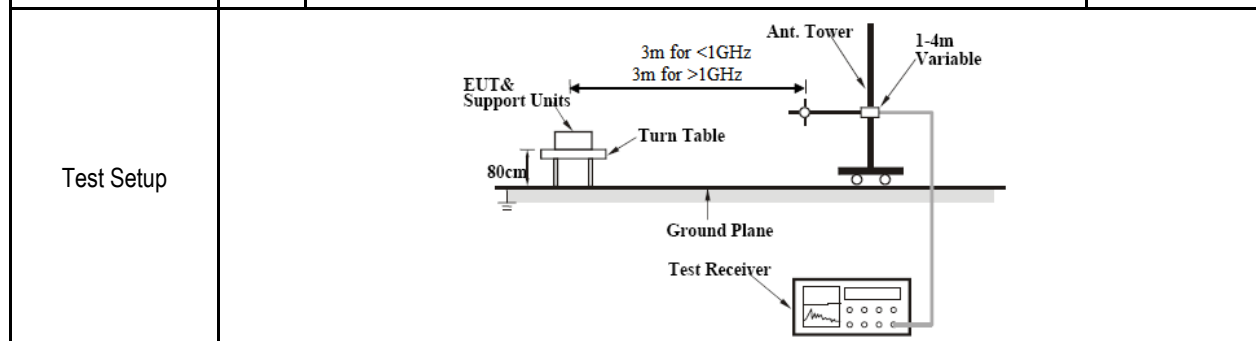


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
36.79	48.23	1.16	-21.62	27.77	Quasi Max	V	316.00	194.00	40.00	-12.23	Pass
41.27	43.77	1.16	-25.18	19.75	Quasi Max	V	400.00	160.00	40.00	-20.25	Pass
196.12	42.68	2.48	-28.60	16.57	Quasi Max	V	178.00	108.00	43.50	-26.93	Pass
198.52	46.42	2.49	-28.12	20.79	Quasi Max	H	201.00	137.00	43.50	-22.71	Pass
165.19	36.64	2.32	-28.46	10.49	Quasi Max	V	101.00	273.00	43.50	-33.01	Pass
64.68	39.20	1.35	-31.38	9.16	Quasi Max	V	262.00	166.00	40.00	-30.84	Pass

9.1.2 Radiated Spurious Emissions > 1GHz & Band Edge

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407(b)(2), 15.407(b)(6), RSS210(A9.3)(1)	1)	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☒
	3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☐



Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - 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: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - A Quasi-peak measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
-----------	--

Test Date	04/27/2014-04/28/2014	Environmental condition	Temperature 24oC Relative Humidity 49% Atmospheric Pressure 1019mbar
Remark	Both horizontal and vertical polarization had 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

Test Result for above 1GHz

Above 1GHz- 40GHz: 802.11a-Low channel (5180MHz)

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
4763.70	42.36	2.54	0.36	45.26	Peak Max	V	186.00	268.00	68.30	-23.04	Pass
1514.67	44.06	1.20	-5.80	39.46	Peak Max	V	327.00	267.00	68.30	-28.84	Pass

Above 1GHz- 40GHz: 802.11a-Mid channel (5220MHz)

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
2653.47	59.72	1.73	-2.48	58.98	Peak Max	V	108.00	48.00	68.30	-9.32	Pass
1264.27	53.55	1.00	-6.42	48.13	Peak Max	V	102.00	225.00	68.30	-20.17	Pass

Above 1GHz- 40GHz: 802.11a-High channel (5240MHz)

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
2709.04	43.39	1.74	-2.34	42.79	Peak Max	V	365.00	109.00	68.30	-25.51	Pass
1102.53	44.14	0.87	-6.72	38.29	Peak Max	V	298.00	196.00	68.30	-30.01	Pass

Above 1GHz- 40GHz: 802.11a-Low channel (5260MHz)

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
1264.25	63.37	1.25	-6.42	58.20	Peak Max	H	128.00	212.00	68.30	-10.10	Pass
10128.76	37.35	4.74	5.52	47.61	Peak Max	H	115.00	280.00	68.30	-20.69	Pass

Above 1GHz- 40GHz: 802.11a-Mid channel (5300MHz)

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
1263.90	57.25	1.25	-6.42	52.09	Peak Max	H	144.00	54.00	68.30	-16.21	Pass
3793.40	38.17	2.82	-0.20	40.80	Peak Max	V	119.00	208.00	68.30	-27.50	Pass

Above 1GHz- 40GHz: 802.11a-High channel (5320MHz)

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
1263.59	60.77	1.25	-6.42	55.60	Peak Max	V	95.00	150.00	68.30	-12.70	Pass
3800.84	38.19	2.83	-0.18	40.85	Peak Max	H	99.00	79.00	68.30	-27.45	Pass

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Above 1GHz- 40GHz: 802.11a-Low channel (5500MHz)

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
994.57	45.00	0.96	-6.95	39.02	Peak Max	H	138.00	206.00	68.30	-29.28	Pass
1623.81	39.08	1.62	-5.38	35.31	Peak Max	V	105.00	43.00	68.30	-32.99	Pass

Above 1GHz- 40GHz: 802.11a-Mid channel (5580MHz)

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
1079.55	40.77	1.06	-6.77	35.05	Peak Max	H	124.00	77.00	68.30	-33.25	Pass
1242.85	42.36	0.95	-6.97	36.35	Peak Max	H	117.00	334.00	68.30	-31.95	Pass

Above 1GHz- 40GHz: 802.11a-High channel (5700MHz)

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
8913.02	37.70	4.19	6.24	48.14	Peak Max	H	166.00	296.00	68.30	-20.16	Pass
1106.60	45.12	1.09	-6.71	39.49	Peak Max	V	178.00	125.00	68.30	-28.81	Pass

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Above 1GHz- 40GHz: 802.11a-Low channel (5180MHz)

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
8836.82	44.26	3.32	6.11	53.69	Peak Max	H	174.00	193.00	68.30	-14.61	Pass
1460.02	60.75	1.15	-6.02	55.88	Peak Max	V	123.00	309.00	68.30	-12.42	Pass

Above 1GHz- 40GHz: 802.11a-Mid channel (5220MHz)

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
3599.66	39.44	2.76	-0.21	42.00	Peak Max	V	107.00	16.00	68.30	-26.30	Pass
11136.40	35.20	5.24	6.09	46.53	Peak Max	H	148.00	266.00	68.30	-21.77	Pass

Above 1GHz- 40GHz: 802.11a-High channel (5240MHz)

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
1202.17	61.86	1.23	-6.29	56.79	Peak Max	V	114.00	217.00	68.30	-11.51	Pass
10629.33	36.41	5.05	5.98	47.43	Peak Max	V	148.00	4.00	68.30	-20.87	Pass

Above 1GHz- 40GHz: 802.11n-20M-Low channel (5260MHz)

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
1108.29	49.87	1.09	-6.71	44.24	Peak Max	V	155.00	263.00	68.30	-24.06	Pass
1424.63	39.98	1.39	-6.15	35.22	Peak Max	V	122.00	157.00	68.30	-33.08	Pass

Above 1GHz- 40GHz: 802.11n-20M-Mid channel (5300MHz)

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
1106.49	44.80	1.09	-6.71	39.17	Peak Max	H	120.00	52.00	68.30	-29.13	Pass
1079.55	40.77	1.06	-6.77	35.05	Peak Max	H	124.00	77.00	68.30	-33.25	Pass

Above 1GHz- 40GHz: 802.11n-20M-High channel (5320MHz)

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
1617.27	41.16	1.61	-5.41	37.35	Peak Max	V	100.00	66.00	68.30	-30.95	Pass
1174.45	42.86	0.95	-6.97	36.84	Peak Max	V	166.00	250.00	68.30	-31.46	Pass

Above 1GHz- 40GHz: 802.11n-20M-Low channel (5500MHz)

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
11055.75	36.54	5.11	5.90	47.55	Peak Max	V	133.00	293.00	68.30	-20.75	Pass
1007.55	42.34	0.98	-6.92	36.40	Peak Max	H	173.00	47.00	68.30	-31.90	Pass

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Above 1GHz- 40GHz: 802.11n-20M-Mid channel (5580MHz)

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
3787.85	40.25	2.82	-0.21	42.87	Peak Max	V	112.00	16.00	68.30	-25.43	Pass
11721.26	35.79	5.35	6.21	47.35	Peak Max	H	155.00	279.00	68.30	-20.95	Pass

Above 1GHz- 40GHz: 802.11n-20M-High channel (5700MHz)

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
3793.51	38.75	2.82	-0.20	41.38	Peak Max	V	103.00	30.00	68.30	-26.92	Pass
11315.04	36.26	5.20	6.29	47.76	Peak Max	H	116.00	239.00	68.30	-20.54	Pass

Above 1GHz- 40GHz: 802.11n-40M-Low channel (5190MHz)

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
3605.42	37.26	2.76	-0.19	39.84	Peak Max	H	130.00	42.00	68.30	-28.46	Pass
2785.65	39.78	1.07	-6.58	34.27	Peak Max	H	151.00	210.00	68.30	-34.03	Pass

Above 1GHz- 40GHz: 802.11n-40M-High channel (5230MHz)

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
3602.84	38.62	2.76	-0.20	41.19	Peak Max	H	166.00	293.00	68.30	-27.11	Pass
10629.33	36.41	5.05	5.98	47.43	Peak Max	V	148.00	4.00	68.30	-20.87	Pass

Above 1GHz- 40GHz: 802.11n-40M-Low channel (5270MHz)

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
1262.42	58.40	1.24	-6.42	53.23	Peak Max	H	173.00	184.00	68.30	-15.07	Pass
3791.20	39.39	2.82	-0.20	42.02	Peak Max	H	174.00	308.00	68.30	-26.28	Pass

Above 1GHz- 40GHz: 802.11n-40M-High channel (5310MHz)

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
1264.18	63.85	1.25	-6.42	58.69	Peak Max	V	119.00	228.00	68.30	-9.61	Pass
11187.51	37.06	5.15	6.10	48.31	Peak Max	V	155.00	3.00	68.30	-19.99	Pass

Above 1GHz- 40GHz: 802.11n-40M-Low channel (5510MHz)

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
2200.45	42.34	0.96	-6.95	36.35	Peak Max	H	170.00	178.00	68.30	-31.95	Pass
1061.64	41.82	1.04	-6.80	36.06	Peak Max	H	105.00	33.00	68.30	-32.24	Pass

Above 1GHz- 40GHz: 802.11n-40M-Mid channel (5550MHz)

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
3793.92	37.96	2.82	-0.19	40.59	Peak Max	H	136.00	43.00	68.30	-27.71	Pass
1107.10	40.61	1.09	-6.71	34.98	Peak Max	H	158.00	220.00	68.30	-33.32	Pass

Above 1GHz- 40GHz: 802.11n-40M-High channel (5670MHz)

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
2665.95	40.59	2.18	-2.45	40.31	Peak Max	V	120.00	296.00	68.30	-27.99	Pass
1264.18	36.32	1.25	-6.42	31.16	Average Max	V	119.00	228.00	68.30	-37.14	Pass

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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	05/18/2014	☐
CHASE LISN	MN2050B	1018	07/24/2013	1 Year	07/24/2014	☐
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☐
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	05/13/2013	1 Year	05/13/2014	☒
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	02/09/2013	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	05/30/2013	1 Year	05/30/2014	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2013	1 Year	05/30/2014	☒
3 Meters SAC	3M	N/A	10/13/2013	1 Year	10/13/2014	☒
10 Meters SAC	10M	N/A	06/05/2013	1 Year	06/05/2014	☒
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☒
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2013	1 Year	05/30/2014	☐
Spectrum Analyzer	E4407B	US88441016	05/31/2013	1 Year	05/31/2014	☐
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☐

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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
HongKong 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

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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 Radiocommunications : 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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