

# RF TEST REPORT



Report No.: FCC\_RF\_SL14062601-ZBR-020-UWD-1000\_Rev1.0  
Supersede Report No.: FCC\_RF\_SL14062601-ZBR-020-UWD-1000

Applicant	:	Zebra Technologies Corp.
Product Name	:	Wireless –AG network mini PCI adapter
Model No.	:	WLM54AG23
Test Standard	:	47 CRF 15.247: 2013 RSS-210 Issue 8: 2010
Test Method	:	ANSI C63.4: 2009 558074 D01 DTS Meas Guidance v03r02
FCC ID	:	XWX-WLM54AG23
IC ID	:	8701A-WLM54AG23
Dates of test	:	Jul 09, 2014 to September 04, 2014
Issue Date	:	9/4/2014
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Equipment complied with the specification [X] Equipment did not comply with the specification [ ]		

This Test Report is Issued Under the Authority of:	
<b>Nima Molaei</b>	<b>David Zhang</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

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## 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
FCC_RF_SL14062601-ZBR-020-UWD-1000	None	Original	08/11/2014
FCC_RF_SL14062601-ZBR-020-UWD-1000_Rev1.0	1.0	Add Antenna Photo Change Output Power Method	09/04/2014

## 2 Executive Summary

The purpose of this test program was to demonstrate compliance with the FCC, IC certified radio module, Wireless-AG network mini PCI adapter (FCC ID: XWX-WLM54AG23, IC ID: 8701A-WLM54AG23), from Zebra Technologies Corp, and Model: WLM54AG23, to be installed inside the host unit of Zebra Technologies Corp. (Model: UWD-1000), against the current Stipulated Standards. The WLM54AG23 to be installed inside the host unit of Zebra Technologies Corp. (Model: UWD-1000) has demonstrated compliance with the Stipulated Standard listed on 1st page.

## 3 Customer information

Applicant Name	:	Zebra Technologies Corp.
Applicant Address	:	333 Corporate Woods Pkwy. Vernon Hills,IL 60061, USA
Manufacturer Name	:	Zebra Technologies Corp.
Manufacturer Address	:	333 Corporate Woods Pkwy. Vernon Hills,IL 60061, USA

## 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	:	Wireless-AG network mini PCI adapter
Model No.	:	WLM54AG23
Trade Name	:	Zebra
Serial No.	:	23255790
Host Model No.	:	UWD-1000
Input Power	:	100VAC - 240VAC
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Hardware version	:	N/A
Software version	:	N/A
Date of EUT received	:	06/10/2014
Equipment Class/ Category	:	Wideband transmission system
Clock Frequencies	:	2412 MHz- 2462 MHz
Port/Connectors	:	RG45

### 6.2 Radio Description

#### Spec for Radio -

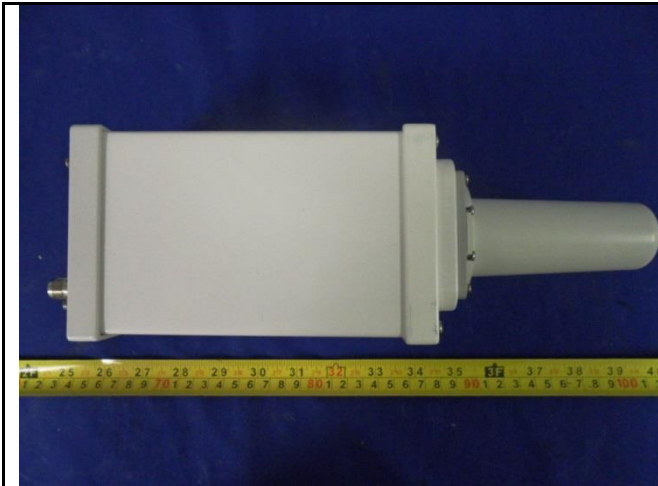
Radio Type	802.11b	802.11g
Operating Frequency	2412-2462MHz	2412-2462MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz
Number of Channels	11	11
Antenna Type	External dipole antenna	
Antenna Gain	2 dBi & 5.2 dBi	
Antenna Connector Type	Reversed TNC	

### 6.3 EUT test modes/configuration Description

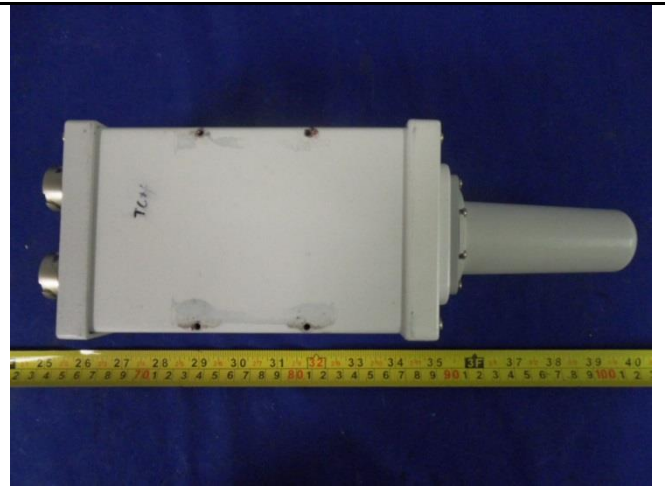
Test Item	Operating mode	Tested antenna port	Test frequencies
TX Spurious emission Intensity	Continuous Transmitting	TX port	Low, Mid, High
Note: The measurement has been done with 5.2 dBi antenna as a worst case.			



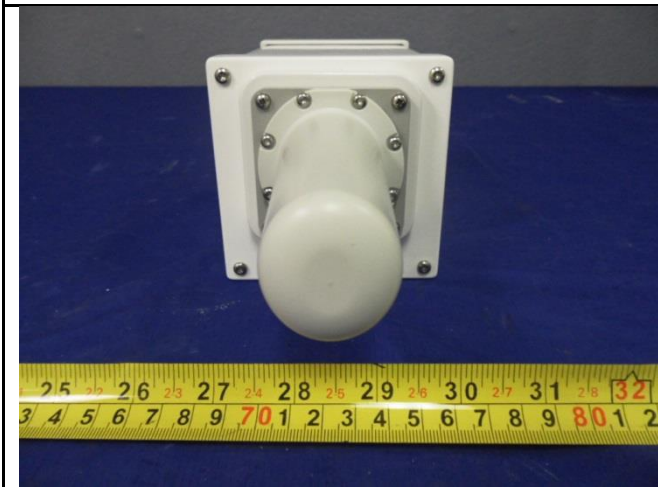
**6.4 EUT Photos - External**



**Top View**



**Bottom View**



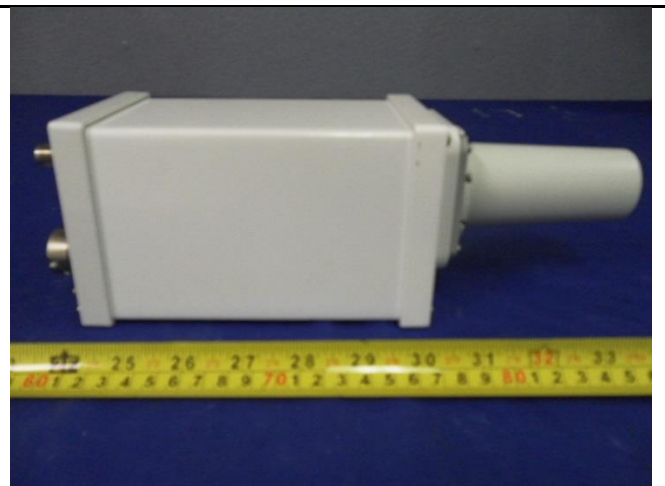
**Front View**



**Rear View**



**Left View**



**Right View**



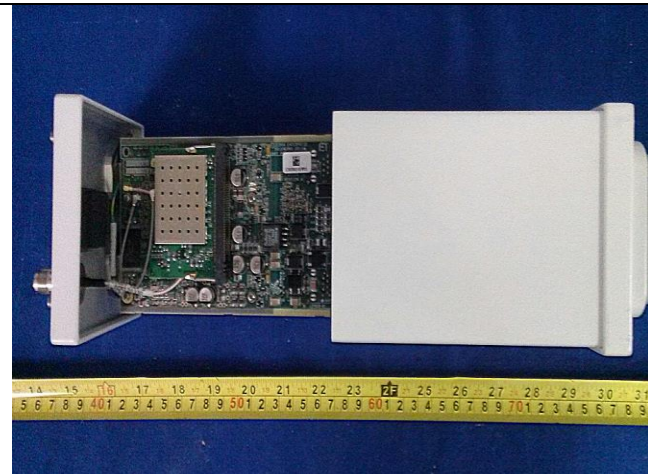
2 dBi Antenna Photo



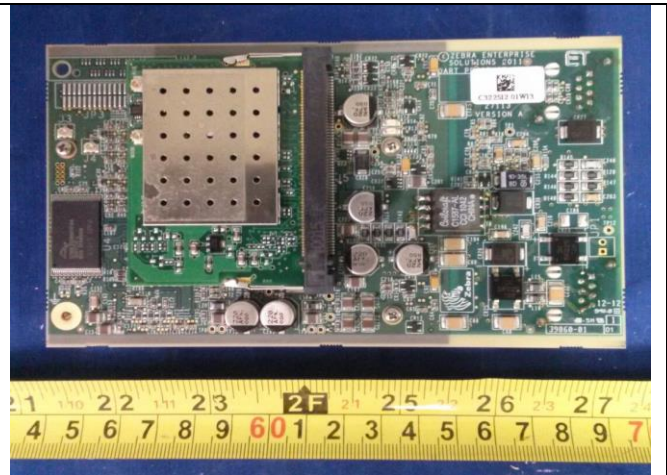
5.2 dBi Antenna Photo



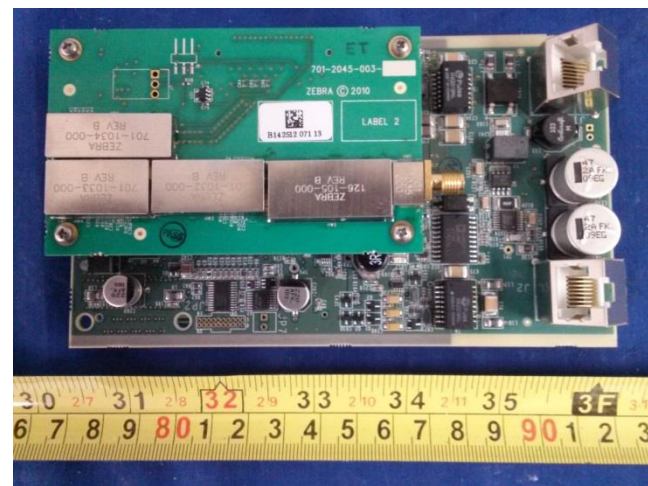
**6.5 EUT Photos - Internal**



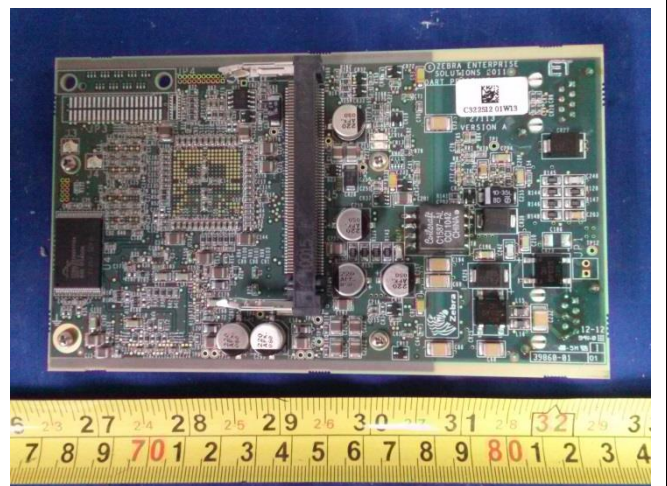
**EUT -Cover off**



**EUT - PCBA1 Top Side**



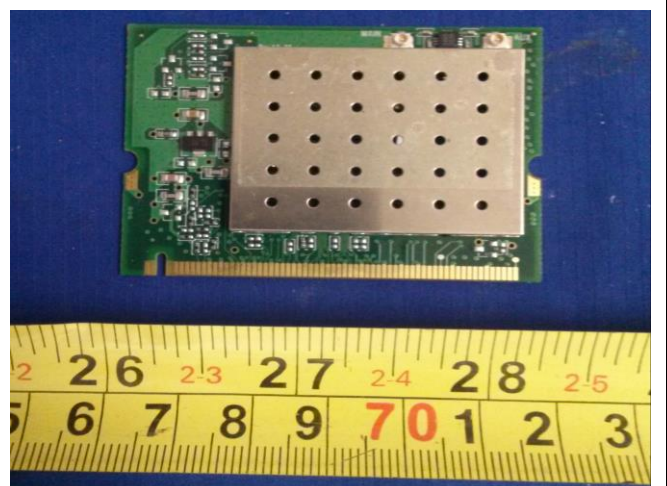
**EUT -PCBA1 Bottom Side**



**EUT - PCBA2 Top Side**



**EUT -PCBA2 Bottom Side**

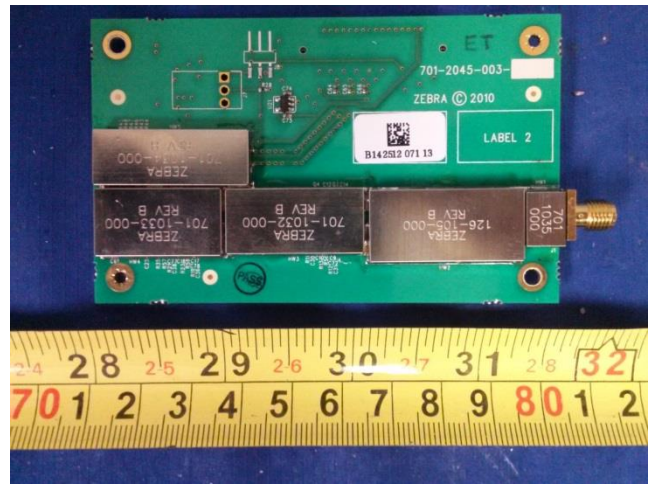


**EUT - WLAN Module Top Side**

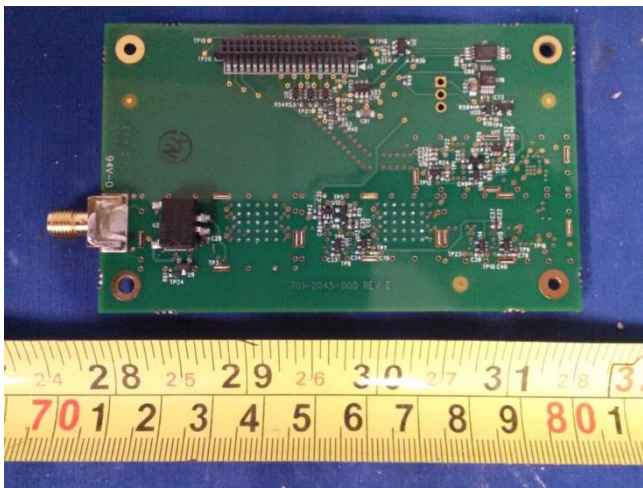




**EUT — WLAN Module Bottom Side**



**EUT – PCBA3 Top Side**

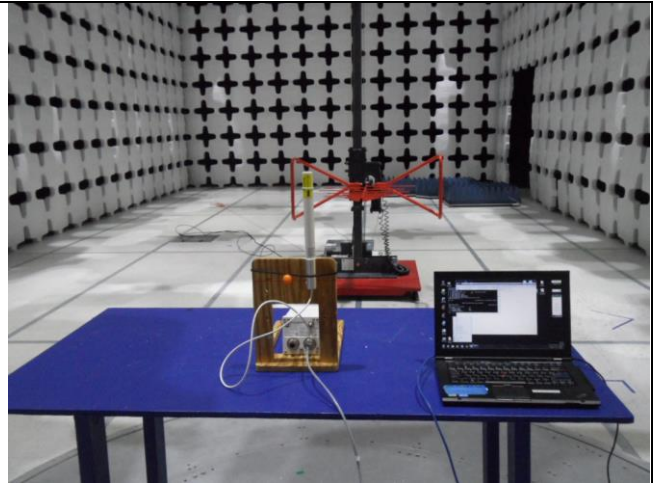


**EUT –PCBA3 Bottom Side**

**6.6 EUT Test Setup Photos**



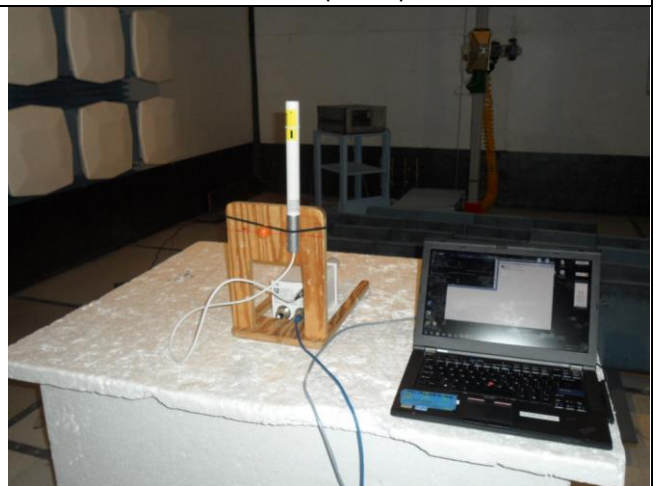
**Radiated Emissions (<1GHz) – Front View**



**Radiated Emissions (<1GHz) – Rear View**



**Radiated Emissions (>1GHz) – Front View**



**Radiated Emissions (>1GHz) – Rear View**

## 7 Supporting Equipment/Software and cabling Description

### 7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Pavilion g4	5CD2135VQM	HP	-
2	DC Power Supply	PA-1650-05D2	CN-0F7970-71615-845-0E91	HP	-

### 7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
-	-	-	-	-	-	-	-

### 7.3 Test Software Description

Test Item	Software	Description
RF Testing	Splat	Set the EUT to transmit continuously

## 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	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS 210 (2.2)	IC	-	
AC Conducted Emissions Voltage	FCC	15.207(a)	FCC	ANSI C63.4 – 2009	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> 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	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210 (A8.1)	IC	-	
Occupied Bandwidth	FCC	15.247(a)(1)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.1)	IC	-	
Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r02	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210 (A8.2)	IC	-	
Number of Hopping Channels	FCC	15.247(a)(1)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.1)	IC	-	
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.4 – 2009, 558074 D01 DTS Meas Guidance v03r02	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS210(A8.5)	IC	-	
Time of Occupancy	FCC	15.247(a)(1)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.1)	IC	-	
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r02	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210 (A8.4)	IC	-	
Receiver Spurious Emissions	FCC	15.247(d)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen (4.8)	IC	-	
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.4)	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r02	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.3)	IC	-	
Hybrid System Requirement	FCC	15.247(f)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.3)	IC	-	
Hopping Capability	FCC	15.247(g)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.1)	IC	-	
Hopping Coordination Requirement	FCC	15.247(h)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS210(A8.1)	IC	-	
RF Exposure requirement	FCC	15.247(i)	FCC	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
	IC	RSS Gen(5.5)	IC	-	
Remark	<ol style="list-style-type: none"> <li>All measurement uncertainties do not take into consideration for all presented test results.</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

Emissions			
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



## 10 Measurements, Examination and Derived Results

### 10.1 Radiated Emissions below 1GHz

Requirement(s):

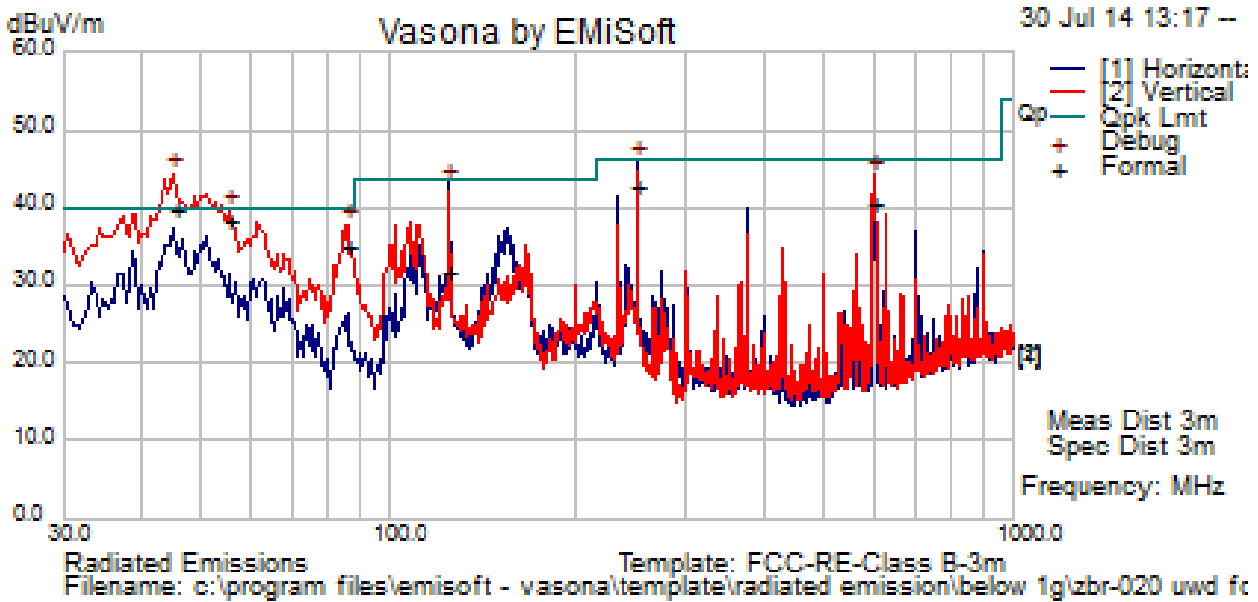
Spec	Item	Requirement	Applicable										
47CFR§15.247(d), RSS210(A8.5)	a)	<p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted 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

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

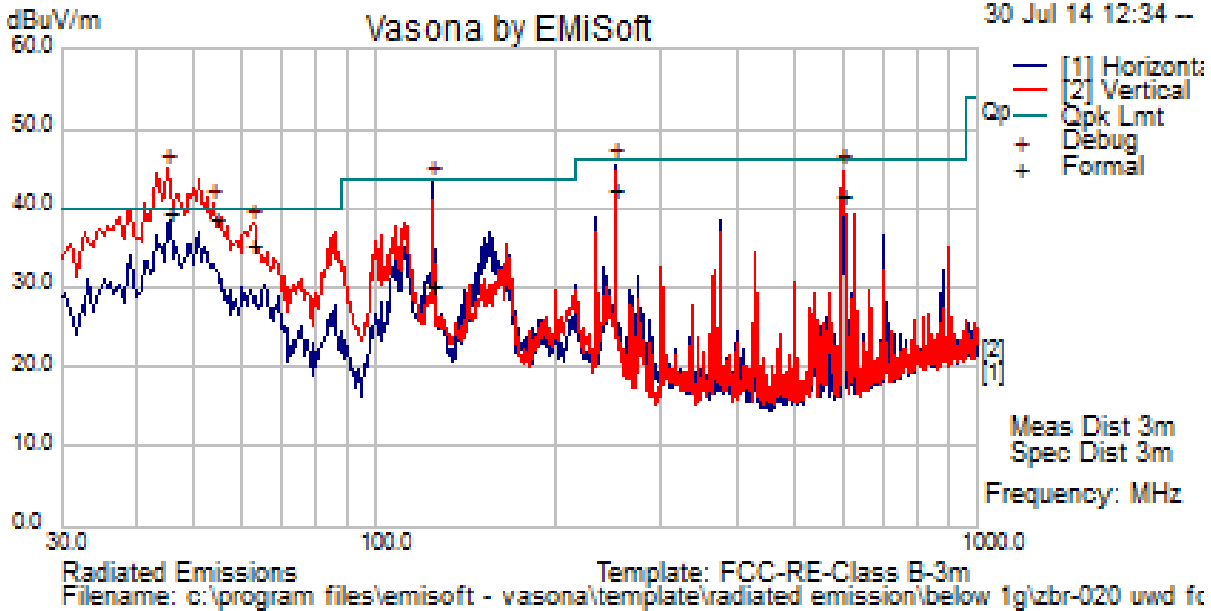
Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	25.1			
	Humidity (%)	48.2			
	Atmospheric (mbar):	1020			
Mains Power:	110VAC, 60Hz				
Tested by:	Teody Manansala				
Test Date:	30-Jul-14				
Remarks:	UWD-1000-11b- 2437MHz				



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
45.2679	66.77	1.16	-28.17	39.76	Quasi Max	V	170	203	40	-0.24	Pass
249.955	68.63	2.77	-28.74	42.66	Quasi Max	H	119	241	46	-3.34	Pass
55.3185	69.07	1.23	-31.95	38.35	Quasi Max	V	117	168	40	-1.65	Pass
124.553	55.51	2.04	-26.1	31.45	Quasi Max	H	295	270	43.5	-12.05	Pass
598.327	58.39	4.17	-22.13	40.43	Quasi Max	V	111	46	46	-5.57	Pass
85.4982	65.82	1.6	-32.37	35.05	Quasi Max	V	122	283	40	-4.95	Pass

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

Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	25.1			
	Humidity (%)	48.2			
	Atmospheric (mbar):	1020			
Mains Power:	110VAC, 60Hz				
Tested by:	Teody Manansala				
Test Date:	30-Jul-14				
Remarks:	UWD-1000-11g- 2437MHz				



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Po l	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
45.21741	66.27	1.16	-28.13	39.3	Quasi Max	V	155	154	40	-0.7	Pass
53.88694	69.25	1.21	-31.74	38.72	Quasi Max	V	107	200	40	-1.28	Pass
124.5875	54.29	2.04	-26.1	30.23	Quasi Max	H	195	245	43.5	-13.27	Pass
249.9549	68.26	2.77	-28.74	42.29	Quasi Max	H	109	247	46	-3.71	Pass
598.448	59.35	4.17	-22.13	41.39	Quasi Max	V	100	357	46	-4.61	Pass
62.24512	65.49	1.32	-31.61	35.19	Quasi Max	V	121	240	40	-4.81	Pass

## 10.2 Radiated Spurious Emissions above 1GHz

### Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§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  <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 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

### Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Radiated Spurious Emission	1MHz	3MHz	1GHz - 25 GHz	Peak	Auto	Max hold	PK Measurement
Radiated Spurious Emission	1MHz	10Hz	1GHz - 25 GHz	Peak	Auto	Max hold	Ave Measurement

Test Data     Yes (See below)     N/A

Test Plot     Yes (See below)     N/A

## Radiated Emission Test Results (Above 1GHz)

### Above 1GHz-25GHz – 802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17847.41	39.86	7.00	13.95	60.81	Peak Max	H	260	290	74	-13.19	Pass
4273.70	36.72	2.99	-0.24	39.47	Peak Max	V	236	322	74	-34.53	Pass
17847.41	26.63	7.00	13.95	47.58	Average Max	H	260	290	54	-6.42	Pass
4273.70	23.59	2.99	-0.24	26.34	Average Max	V	236	322	54	-27.66	Pass

### Restricted Band – Lower band (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
2390.00	45.54	2.11	-3.54	44.11	Peak Max	H	122	261	74	-29.89	Pass
2390.00	52.20	2.11	-3.53	50.78	Peak Max	V	160	136	74	-23.22	Pass
2390.00	32.22	2.11	-3.54	30.80	Average Max	H	122	261	54	-23.20	Pass
2390.00	40.64	2.11	-3.53	39.22	Average Max	V	160	136	54	-14.78	Pass

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

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
12095.79	40.66	5.37	6.48	52.52	Peak Max	V	308	262	74	-21.48	Pass
3920.28	37.15	2.84	-0.33	39.66	Peak Max	V	302	304	74	-34.34	Pass
12095.79	27.93	5.37	6.48	39.79	Average Max	V	308	262	54	-14.21	Pass
3920.28	23.58	2.84	-0.33	26.09	Average Max	V	302	304	54	-27.91	Pass

### Above 1GHz-25GHz- 802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
11098.62	41.38	5.01	5.57	51.97	Peak Max	V	308	283	74	-22.03	Pass
4597.43	36.20	3.11	-0.16	39.14	Peak Max	H	275	114	74	-34.86	Pass
11098.62	28.18	5.01	5.57	38.76	Average Max	V	308	283	54	-15.24	Pass
4597.43	23.37	3.11	-0.16	26.32	Average Max	H	275	114	54	-27.68	Pass

### Restricted Band – Higher band (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
2483.50	54.90	2.15	-3.32	53.73	Peak Max	H	164	243	74	-20.27	Pass
2483.50	62.93	2.15	-3.32	51.76	Peak Max	V	119	240	74	-12.24	Pass
2483.50	46.42	2.15	-3.32	45.25	Average Max	H	164	243	54	-9.75	Pass
2483.50	49.82	2.15	-3.32	48.65	Average Max	V	119	240	54	-5.35	Pass

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

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7374.65	40.99	4.37	3.41	48.76	Peak Max	H	111	35	74	-25.24	Pass
3893.71	37.14	2.83	-0.38	39.59	Peak Max	V	317	276	74	-34.41	Pass
7374.65	28.61	4.37	3.41	36.38	Average Max	H	111	35	54	-17.62	Pass
3893.71	23.78	2.83	-0.38	26.23	Average Max	V	317	276	54	-27.77	Pass

### Restricted Band – Lower band (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
2390.00	64.98	2.11	-3.53	63.56	Peak Max	H	134	242	74	-10.44	Pass
2390.00	68.31	2.11	-3.53	66.89	Peak Max	V	99	315	74	-7.11	Pass
2390.00	42.37	2.11	-3.53	40.95	Average Max	H	134	242	54	-13.05	Pass
2390.00	48.28	2.11	-3.53	46.86	Average Max	V	99	315	54	-7.14	Pass

### Above 1GHz-25GHz- 802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
11960.49	40.91	5.33	6.49	52.73	Peak Max	H	166	298	74	-21.27	Pass
3657.56	36.43	2.69	-0.84	38.27	Peak Max	V	321	267	74	-35.73	Pass
11960.49	28.16	5.33	6.49	39.97	Average Max	H	166	298	54	-14.03	Pass
3657.56	23.18	2.69	-0.84	25.02	Average Max	V	321	267	54	-28.98	Pass



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

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
12128.99	40.39	5.39	6.46	52.24	Peak Max	V	100	0	74	-21.76	Pass
3768.20	37.24	2.76	-0.62	39.37	Peak Max	H	194	87	74	-34.63	Pass
12128.99	27.60	5.39	6.46	39.45	Average Max	V	100	0	54	-14.55	Pass
3768.20	24.05	2.76	-0.62	26.18	Average Max	H	194	87	54	-27.82	Pass

**Restricted Band – Higher band (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
2483.50	62.07	2.15	-3.32	60.9	Peak Max	H	149	108	74	-13.1	Pass
2483.50	69.27	2.15	-3.32	68.1	Peak Max	V	120	243	74	-5.9	Pass
2483.50	43.65	2.15	-3.32	42.48	Average Max	H	149	108	54	-11.52	Pass
2483.50	5.13	2.15	-3.32	48.96	Average Max	V	120	243	54	-5.04	Pass

















## Annex A. TEST INSTRUMENT








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

## **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		<a href="#">A1</a> , <a href="#">A2</a> , <a href="#">A3</a> , <a href="#">A4</a> , <a href="#">B1</a> , <a href="#">B2</a> , <a href="#">B3</a> , <a href="#">B4</a> , 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)	 	<a href="#">Phase I</a> , <a href="#">Phase II</a>
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		<b>(Phase II)</b> OFCA Foreign Certification Body for Radio and Telecom
		<b>(Phase I)</b> 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		R-3083: Radiation 3 meter site
		C-3421: Main Ports Conducted Interference Measurement
		T-1597: Telecommunication Ports Conducted Interference Measurement
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