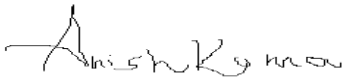
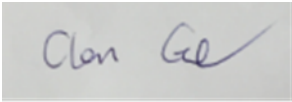


RF TEST REPORT



Report No.: FCC_IC_RF_SL16112301-ZBR-017R3_UNII_5G
Supersede Report No.: NONE


Applicant	:	Zebra Technologies Corporation
Product Name	:	ZT610, ZT620 front panel
Model No.	:	UZ7211486030B
Test Standard	:	47 CFR 15.407 RSS-247 Issue 1, May 2015
Test Method	:	ANSI C63.4: 2014 RSS-Gen Issue 4, Nov 2014 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	UZ7211486030B
IC ID	:	109AN-211486030B
Dates of test	:	05/22/2017 – 05/26/2017
Issue Date	:	06/17/2017
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:	
	
Anish Kumar	Chen Ge
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
775 Montague Expressway, Milpitas, 95035 CA



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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/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
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

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_SL16112301-ZBR-017R3_UNII_5G	None	Original	06/17/2017

2 Executive Summary

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

Company: Zebra Technologies Corp.
Product: ZT610, ZT620 front panel
Model: UZ7211486030B

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	Zebra Technologies Corp.
Applicant Address	3 Overlook Point Lincolnshire, IL 60069, USA
Manufacturer Name	Zebra Technologies Corp.
Manufacturer Address	3 Overlook Point Lincolnshire, IL 60069, 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	:	ZT610, ZT620 with new front panel
Model No.	:	UZ7211486030B
Trade Name	:	Zebra Technologies Corp.
Serial No.	:	N/A
Input Power	:	100-240VAC,50/60Hz
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Product Hardware version	:	N/A
Product Software version	:	N/A
Radio Hardware version	:	N/A
Radio Software version	:	N/A
Date of EUT received	:	05/20/2017
Equipment Class/ Category	:	DTS
Port/Connectors	:	None

6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5725-5825MHz	2412-2462MHz 5180-5240MHz 5240-5320MHz 5500-5700MHz 5725-5825MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)
Number of Channels	11	11	22	11(2.4GHz) 22 (5GHz)
Antenna Type	Sector Antenna			
Antenna Gain (Peak)	2.25 dBi (for 2.4GHz) 3.7 dBi (5GHz)			
Antenna Connector Type	U.FL connector			

6.3 EUT Photos-External



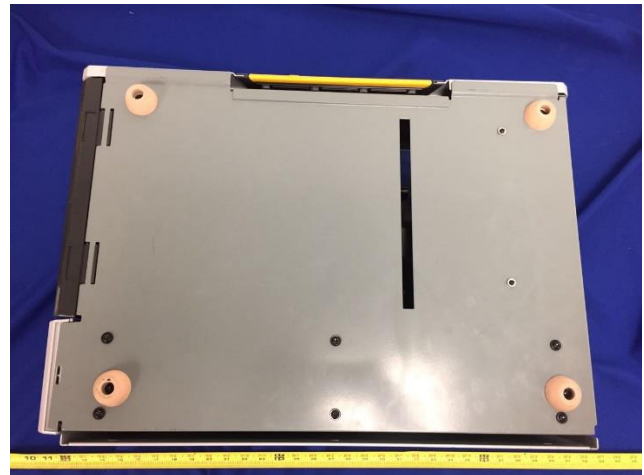
EUT – Front View



EUT – Rear View



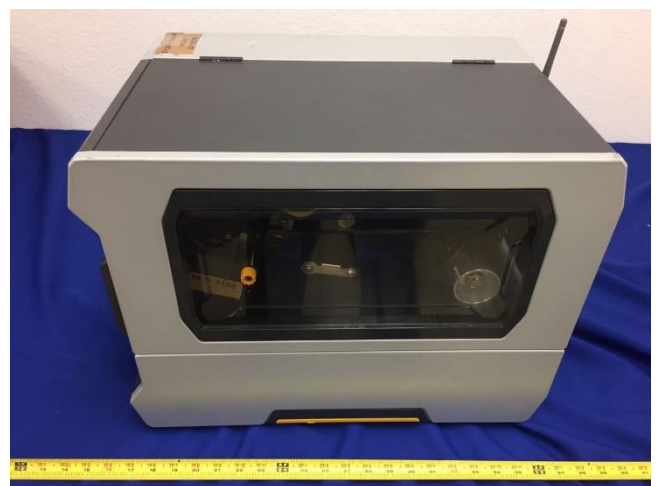
EUT – Top View



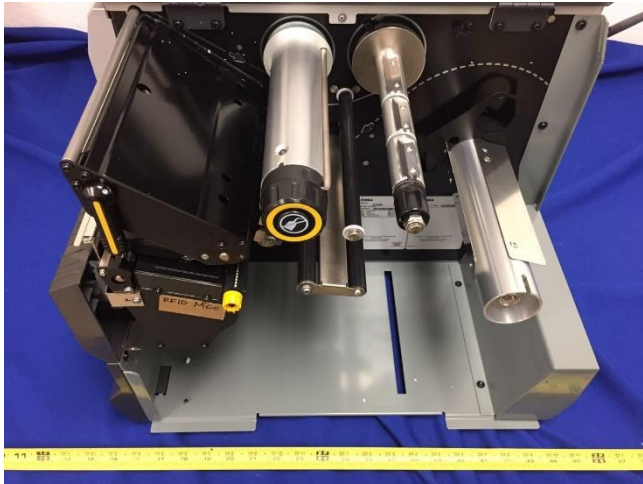
EUT – Bottom View



EUT – Left Side View



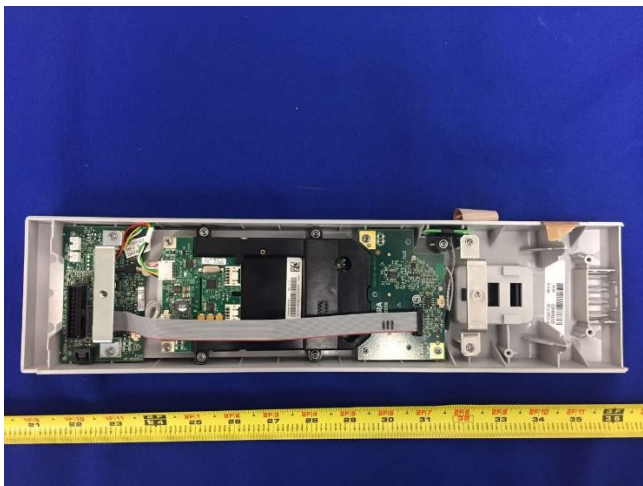
EUT – Right Side View



Open Case View

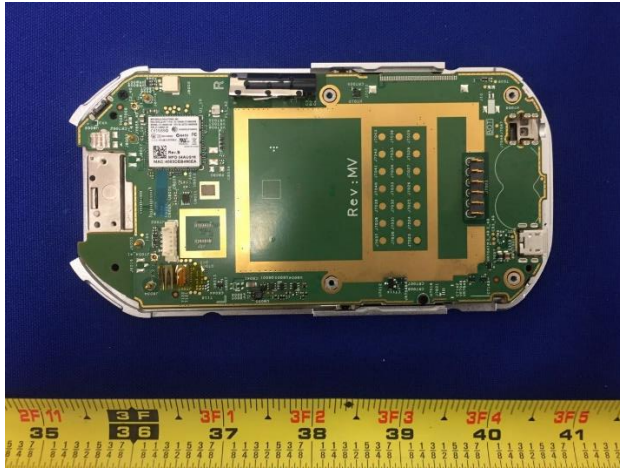
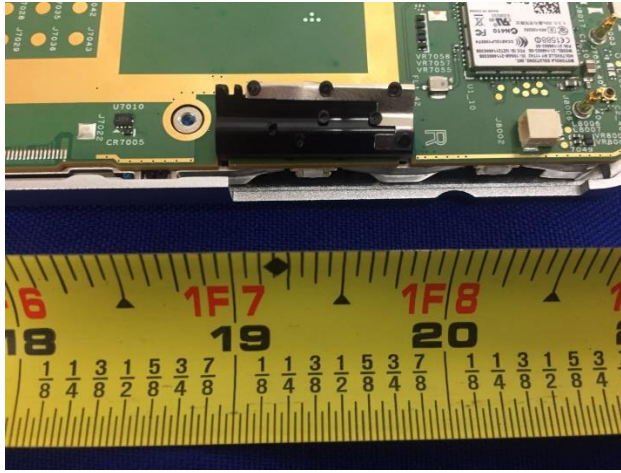



MC40 Panel Front

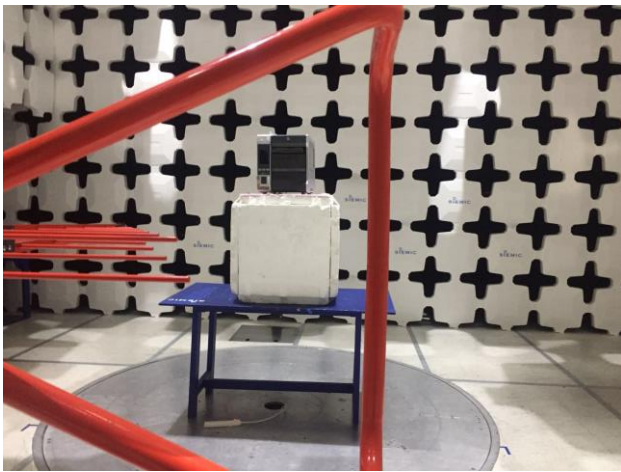


MC40 Panel Front

6.4 EUT Photos -Internal

	
<p>Radio Board View</p>	<p>Antenna View</p>
	
<p>Antenna View</p>	

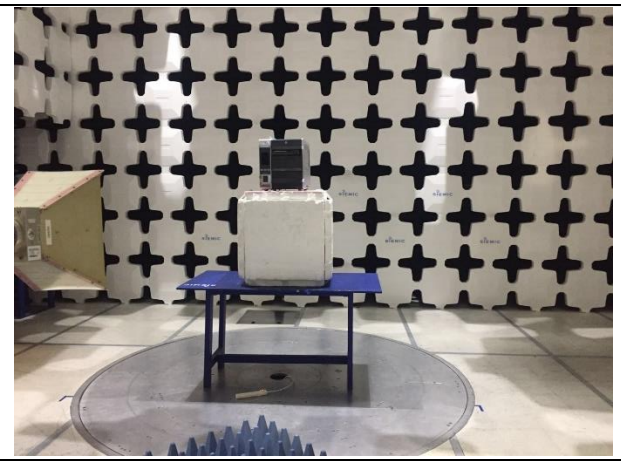
6.5 EUT Test Setup Photos



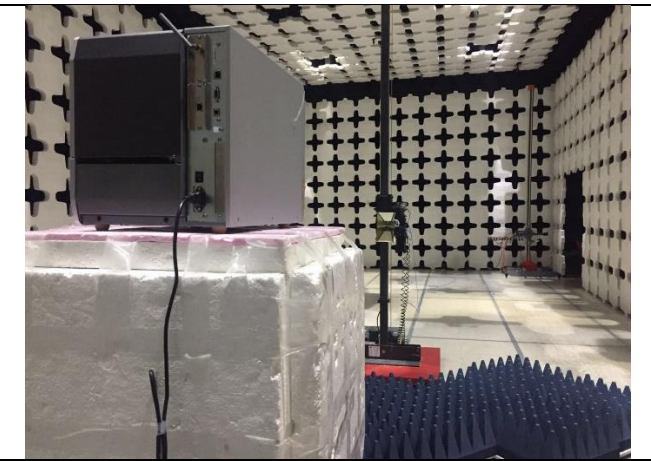
Radiated Emissions (<1GHz) – Front View



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	Latitude 3550	N/A	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	
N/A	-	-	-	-	-	-	-
							-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Andorid Panel	Set the EUT to transmit continuously in diferent test mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS 247(A9.3)(1)		
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Frequency Stability	FCC	15.407 (g)	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
User Manual	FCC	-	-	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A

Remark	<ol style="list-style-type: none"> 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. The device is operating at near 98% duty cycle.
Note	Only Radiated Spurious Emission was tested. Please refer to report no. : 211486030B for rest of the items.

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

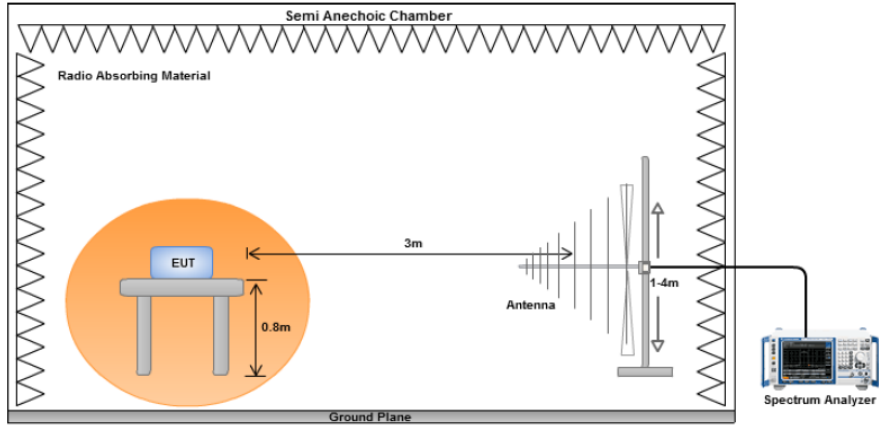
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty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

Requirement(s):

Spec	Requirement	Applicable										
47CFR§15.407(b) 15.209 (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	<input checked="" type="checkbox"/>
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"> 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: <ol style="list-style-type: none"> 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	The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.											
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail											

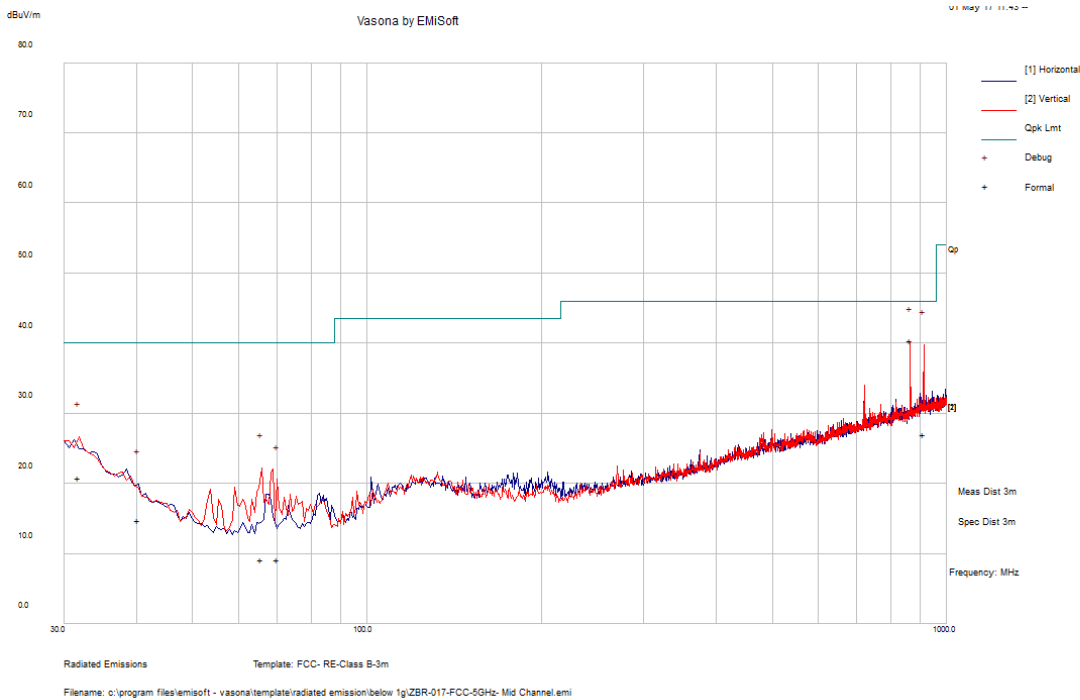
Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Anish Kumar at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	26.1			
	Humidity (%)	47.5			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Anish Kumar				
Test Date:	05/25/2017				
Remarks:	5GHz 11n-40 5230MHz				



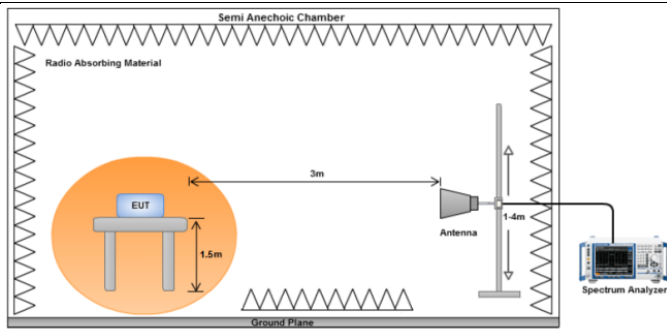
Quasi Max Measurement

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
865.0141	39.41	14.66	-13.63	40.44	Quasi Max	V	136	257	46	-5.56	Pass
912.7525	24.79	14.94	-12.66	27.07	Quasi Max	V	121	325	46	-18.93	Pass
31.83031	25.37	11.03	-15.54	20.85	Quasi Max	V	151	200	40	-19.15	Pass
65.57625	26.07	11.45	-28.44	9.09	Quasi Max	V	299	57	40	-30.91	Pass
69.9325	25.91	11.47	-28.22	9.16	Quasi Max	V	269	277	40	-30.84	Pass
40.22219	25.51	11.17	-21.99	14.69	Quasi Max	H	376	159	40	-25.31	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§15.407(b)(2), 15.407(b)(6)	(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.	<input checked="" type="checkbox"/>
	(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.	<input type="checkbox"/>
	(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.	<input type="checkbox"/>
	(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.	<input checked="" type="checkbox"/>
	(5)	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"> 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: <ol style="list-style-type: none"> 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. An average 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	Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Anish Kumar at 3m chamber.

Radiated Spurious Emission Test Results (Above 1GHz)

Above 1GHz – 802.11a – 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
12126.7	35.66	2.67	2.52	40.84	Peak Max	H	179	25	74	-33.16	Pass
5201.054	34.8	5.12	-4.5	35.43	Peak Max	H	201	305	74	-38.57	Pass
17931.32	35.37	0.86	8.45	44.68	Peak Max	V	231	82	74	-29.32	Pass
12126.7	24.04	2.67	2.52	29.23	Average Max	H	179	25	54	-24.77	Pass
5201.054	23.33	5.12	-4.5	23.95	Average Max	H	201	305	54	-30.05	Pass
17931.32	22.69	0.86	8.45	32	Average Max	V	231	82	54	-22	Pass

Above 1GHz – 802.11a – 5200MHz

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
17919.9	34.51	0.87	8.51	43.89	Peak Max	H	185	22	74	-30.11	Pass
12410.9	33.84	2.66	2.61	39.11	Peak Max	H	251	161	74	-34.89	Pass
6987.094	33.56	4.23	-0.25	37.53	Peak Max	H	254	247	74	-36.47	Pass
17919.9	22.76	0.87	8.51	32.14	Average Max	H	185	22	54	-21.86	Pass
12410.9	22.05	2.66	2.61	27.31	Average Max	H	251	161	54	-26.69	Pass
6987.094	21.25	4.23	-0.25	25.23	Average Max	H	254	247	54	-28.78	Pass

Above 1GHz – 802.11a – 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
17904.4	35.59	0.87	8.59	45.05	Peak Max	V	166	241	74	-28.95	Pass
2159.77	41.07	6.65	-11.96	35.75	Peak Max	V	209	350	74	-38.25	Pass
1200.042	41.82	7.6	-16.09	33.33	Peak Max	H	182	4	74	-40.67	Pass
17904.4	23.21	0.87	8.59	32.67	Average Max	V	166	241	54	-21.33	Pass
2159.77	34.39	6.65	-11.96	29.07	Average Max	V	209	350	54	-24.93	Pass
1200.042	34.92	7.6	-16.09	26.43	Average Max	H	182	4	54	-27.57	Pass

Above 1GHz – 802.11a – 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
12450.66	49.24	8.96	-7.29	50.91	Peak Max	V	162	355	74	-23.09	Pass
1537.31	65.16	4.77	-29.18	40.75	Peak Max	V	230	259	74	-33.25	Pass
2132.68	59.44	5.10	-25.49	39.05	Peak Max	V	238	0	74	-34.95	Pass
12450.66	37.98	8.96	-7.29	39.65	Average Max	V	162	355	54	-14.35	Pass
1537.31	62.44	4.77	-29.18	38.03	Average Max	V	230	259	54	-15.97	Pass
2132.68	45.50	5.10	-25.49	25.11	Average Max	V	238	0	54	-28.89	Pass

Above 1GHz – 802.11a – 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
17852.95	49.39	9.45	-3.27	55.56	Peak Max	H	194	273	74	-18.44	Pass
1537.20	65.16	4.77	-29.18	40.76	Peak Max	H	100	240	74	-33.25	Pass
2133.42	61.25	5.10	-25.49	40.87	Peak Max	H	216	280	74	-33.13	Pass
17852.95	37.16	9.45	-3.27	43.34	Average Max	H	194	273	54	-10.66	Pass
1537.20	62.87	4.77	-29.18	38.46	Average Max	H	100	240	54	-15.54	Pass
2133.42	45.07	5.10	-25.49	24.68	Average Max	H	216	280	54	-29.32	Pass

Above 1GHz – 802.11a – 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
2503.03	53.46	5.94	-23.84	35.57	Peak Max	V	243	54	74	-38.43	Pass
6075.22	59.18	7.17	-15.17	51.19	Peak Max	V	247	361	74	-22.81	Pass
1537.45	64.80	4.77	-29.17	40.39	Peak Max	V	225	260	74	-33.61	Pass
2503.03	42.07	5.94	-23.84	24.18	Average Max	V	243	54	54	-29.82	Pass
6075.22	49.20	7.17	-15.17	41.21	Average Max	V	247	361	54	-12.79	Pass
1537.45	62.04	4.77	-29.17	37.63	Average Max	V	225	260	54	-16.37	Pass

Above 1GHz – 802.11n 20– 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
17394.095	35.34	0.99	7.86	44.19	Peak Max	V	391	357	74	-29.81	Pass
13664.129	35.36	2.26	2.86	40.48	Peak Max	H	368	130	74	-33.52	Pass
2303.8335	36.05	6.58	-11.54	31.09	Peak Max	V	289	15	74	-42.91	Pass
17394.095	23.25	0.99	7.86	32.1	Average Max	V	391	357	54	-21.9	Pass
13664.129	23.34	2.26	2.86	28.46	Average Max	H	368	130	54	-25.54	Pass
2303.8335	24.22	6.58	-11.54	19.25	Average Max	V	289	15	54	-34.75	Pass

Above 1GHz – 802.11n – 5200MHz

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
17763.03	35.25	0.91	7.91	44.07	Peak Max	H	163	62	74	-29.93	Pass
11422.16	35.58	2.34	2.24	40.16	Peak Max	V	183	29	74	-33.85	Pass
2160.06	37.48	6.65	-11.97	32.16	Peak Max	H	369	310	74	-41.84	Pass
17763.03	23.26	0.91	7.91	32.08	Average Max	H	163	62	54	-21.93	Pass
11422.16	23.55	2.34	2.24	28.12	Average Max	V	183	29	54	-25.88	Pass
2160.06	27.38	6.65	-11.97	22.06	Average Max	H	369	310	54	-31.94	Pass

Above 1GHz – 802.11n 20– 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
17634.45	35.99	0.94	8.22	45.15	Peak Max	H	383	269	74	-28.85	Pass
11830.3	34.28	2.58	2.18	39.04	Peak Max	H	152	19	74	-34.96	Pass
3141.215	36.44	5.99	-8.47	33.96	Peak Max	V	230	299	74	-40.04	Pass
17634.45	23.14	0.94	8.22	32.3	Average Max	H	383	269	54	-21.7	Pass
11830.3	22.8	2.58	2.18	27.56	Average Max	H	152	19	54	-26.44	Pass
3141.215	24.07	5.99	-8.47	21.59	Average Max	V	230	299	54	-32.41	Pass

Above 1GHz – 802.11n20 – 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
17918.44	49.65	9.46	-3.11	56.01	Peak Max	V	166	46	74	-18.00	Pass
7243.95	49.18	7.36	-11.55	44.99	Peak Max	V	231	338	74	-29.01	Pass
1537.33	66.20	4.77	-29.18	41.80	Peak Max	V	229	260	74	-32.20	Pass
17918.44	37.32	9.46	-3.11	43.67	Average Max	V	166	46	54	-10.33	Pass
7243.95	38.19	7.36	-11.55	34.00	Average Max	V	231	338	54	-20.00	Pass
1537.33	64.37	4.77	-29.18	39.97	Average Max	V	229	260	54	-14.03	Pass

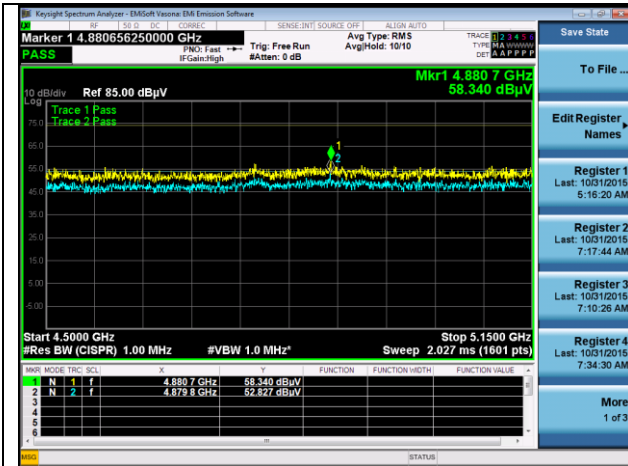
Above 1GHz – 802.11n20 – 5785MHz

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
6032.11	58.04	7.17	-15.21	49.99	Peak Max	V	202	0	74	-24.01	Pass
1537.34	66.32	4.77	-29.18	41.91	Peak Max	V	231	260	74	-32.09	Pass
2133.38	62.35	5.10	-25.49	41.96	Peak Max	H	246	187	74	-32.04	Pass
6032.11	46.97	7.17	-15.21	38.92	Average Max	V	202	0	54	-15.08	Pass
1537.34	64.43	4.77	-29.18	40.03	Average Max	V	231	260	54	-13.97	Pass
2133.38	50.13	5.10	-25.49	29.74	Average Max	H	246	187	54	-24.26	Pass

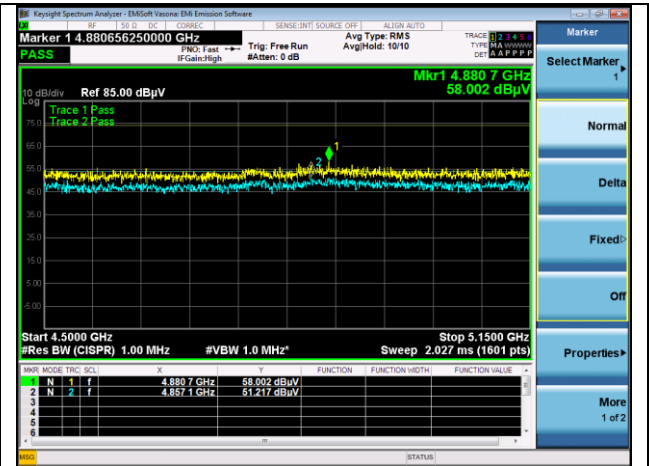
Above 1GHz – 802.11n20– 5825MHz

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
17049.28	48.72	9.32	-5.07	52.98	Peak Max	V	144	0	74	-21.02	Pass
6076.80	52.90	7.17	-15.16	44.91	Peak Max	H	163	325	74	-29.09	Pass
1537.24	66.40	4.77	-29.18	41.99	Peak Max	V	231	260	74	-32.01	Pass
17049.28	37.20	9.32	-5.07	41.46	Average Max	V	144	0	54	-12.54	Pass
6076.80	41.79	7.17	-15.16	33.80	Average Max	H	163	325	54	-20.20	Pass
1537.24	64.63	4.77	-29.18	40.22	Average Max	V	231	260	54	-13.78	Pass

Radiated Restricted Band Test Results (Above 1GHz)



Lower Band 802.11a 5180MHz



Lower Band 802.11n-20M 5180MHz

















Annex A. TEST INSTRUMENT








Instrument	Model	Manufacturer	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2017	1 Year	06/08/2018	<input type="checkbox"/>
CHASE LISN (9k-30MHz)	MN2050B	Chase	1018	08/07/2016	1 Year	08/07/2017	<input type="checkbox"/>
Radiated Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2017	1 Year	06/08/2018	<input checked="" type="checkbox"/>
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2016	1 Year	08/20/2017	<input checked="" type="checkbox"/>
Pre-Amplifier (1-26.5GHz)	8449B	Hewlett Packard	3008A00715	03/30/2017	1 Year	03/30/2018	<input checked="" type="checkbox"/>
Preamplifier (100KHz-7GHz)	LPA-6-30	RF Bay, Inc.	11140711	02/10/2017	1 Year	02/10/2018	<input checked="" type="checkbox"/>
ETS-Lingren Loop Antenna	6512	ETS-Lingren	00049120	05/12/2017	1 Year	05/12/2018	<input type="checkbox"/>
Bi-Log antenna (30MHz~2GHz)	JB1	Sunol Sciences	A030702	08/15/2017	1 Year	08/15/2018	<input checked="" type="checkbox"/>
Horn Antenna (1-26.5GHz)	3115	EMCO	10SL0059	08/25/2017	1 Year	08/25/2018	<input checked="" type="checkbox"/>
3 Meters SAC	3M	ETS-Lingren	N/A	06/09/2017	1 Year	06/09/2018	<input checked="" type="checkbox"/>
10 Meters SAC	10M	ETS-Lingren	N/A	09/05/2016	1 Year	09/05/2017	<input checked="" type="checkbox"/>
RF Conducted Measurement							
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2016	1 Year	08/20/2017	<input checked="" type="checkbox"/>
USB RF Power Sensor	7002-006	ETS-Lingren	10SL0190	09/03/2016	1 Year	09/03/2017	<input checked="" type="checkbox"/>

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