
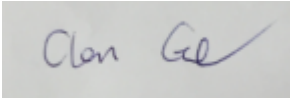


RF TEST REPORT



Report No.: FCC_IC_RF_SL16112301-ZBR-017R3_DTS_2.4G
Supersede Report No.: None





Applicant	:	Zebra Technologies Corporation
Product Name	:	ZT610, ZT620 front panel
Model No.	:	UZ7211486030B
Test Standard	:	47 CFR 15.247 RSS 247 Iss 2: Feb 2017
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v04
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

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
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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Test report No.	FCC_IC_RF_SL16112301-ZBR-017R3_DTS_2.4G

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_SL16112301-ZBR-017R3_DTS_2.4G	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	PiFA Antenna			
Antenna Gain (Peak)	2.25 dBi (for 2.4GHz) 3.7 dBi (5GHz)			
Antenna Connector Type	U.FL connector			

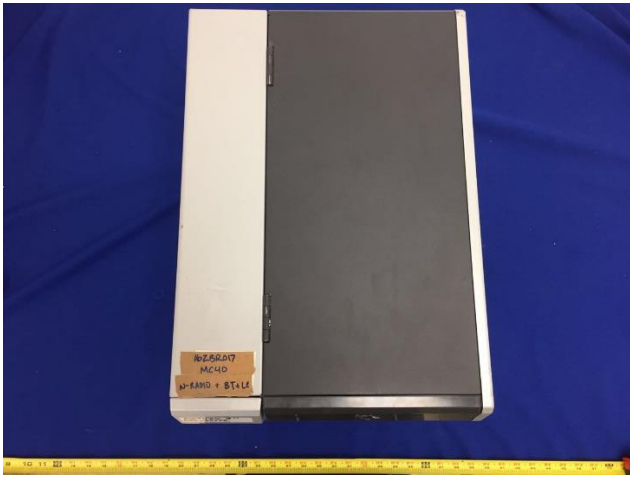
6.3 EUT Photos-External



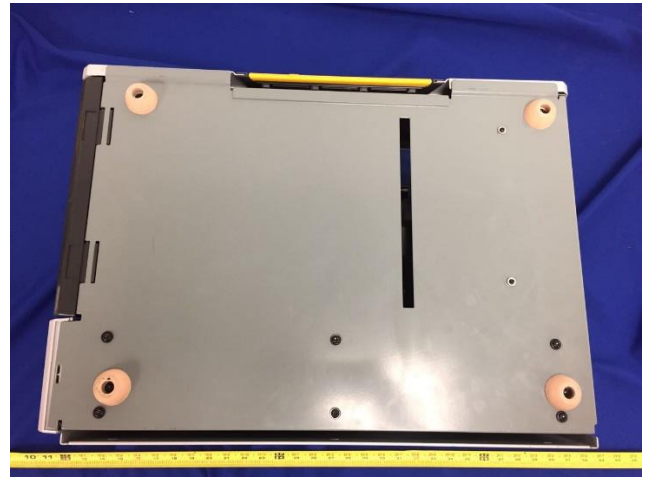
EUT – Front View



EUT – Rear View



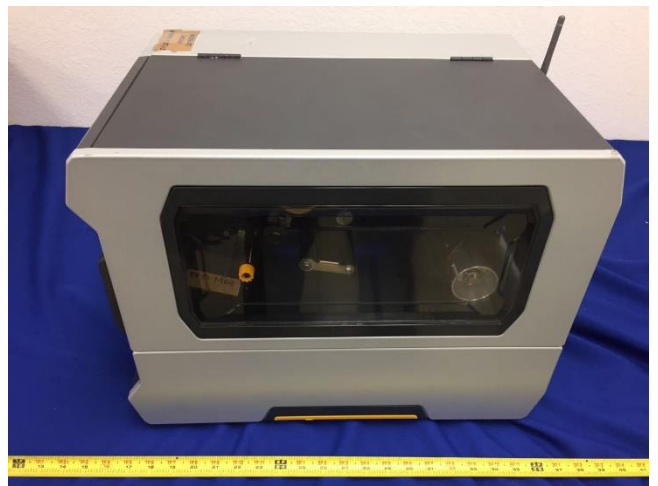
EUT – Top View



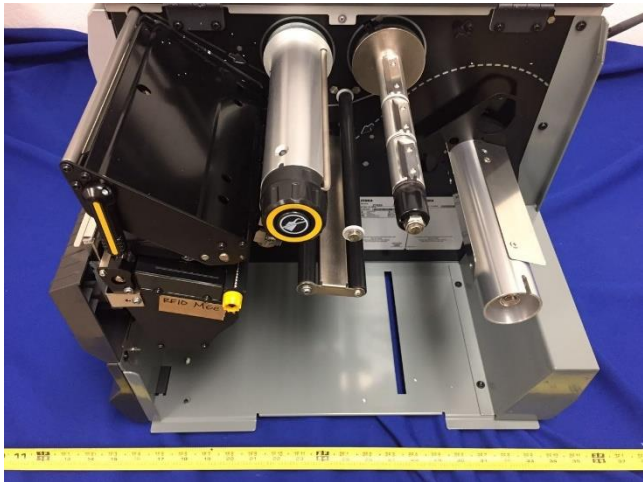
EUT – Bottom View



EUT – Left Side View



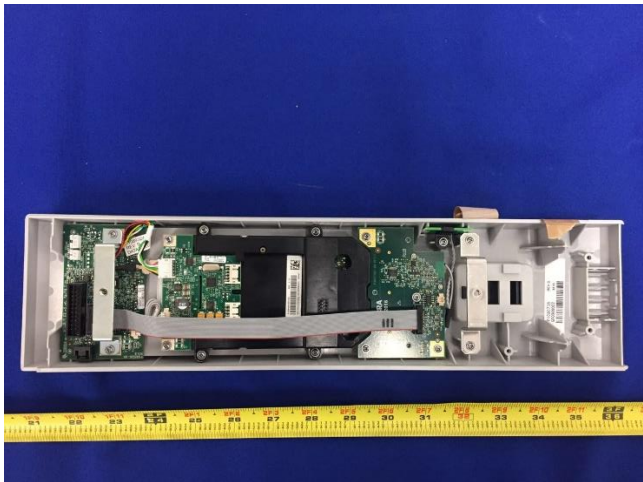
EUT – Right Side View



Open Case View

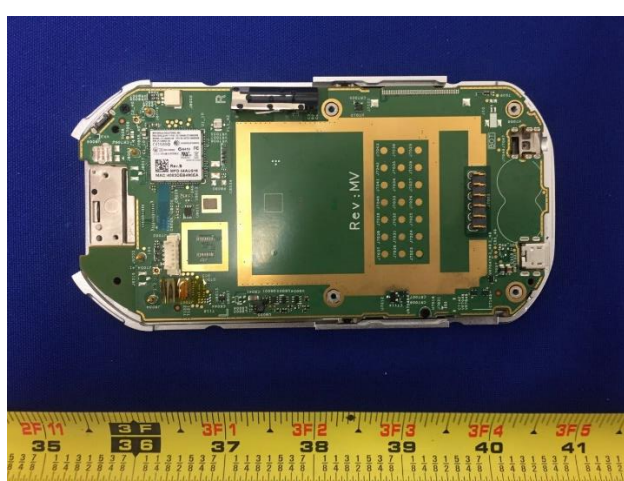


MC40 Panel Front

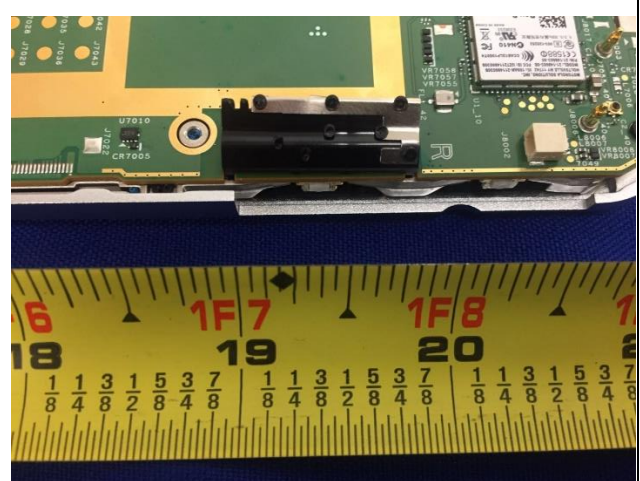


MC40 Panel Front

6.4 EUT Photos – Internal



Radio Board View

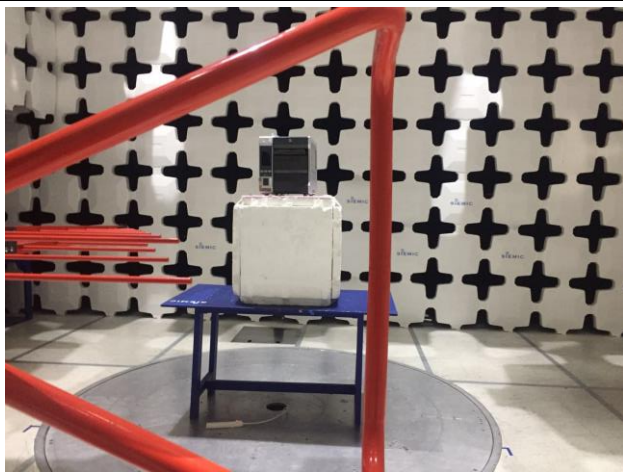


Antenna View



Antenna View

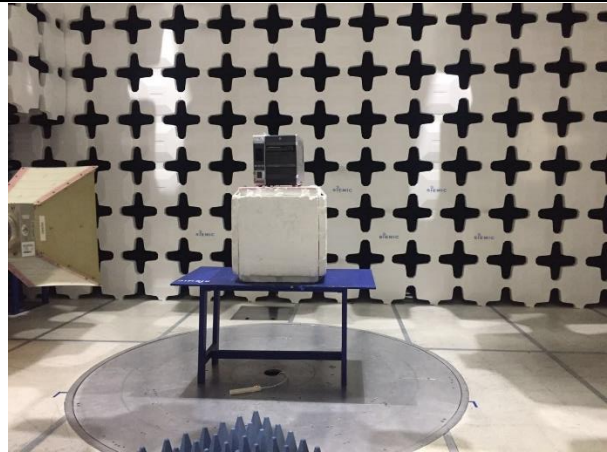
6.5 EUT Test Setup Photos



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	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Andriod 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	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen 8.10	IC		<input type="checkbox"/> N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	<input type="checkbox"/> Pass
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	<input checked="" type="checkbox"/> N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	<input type="checkbox"/> Pass
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	<input checked="" type="checkbox"/> N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v04	<input type="checkbox"/> Pass
	IC	RSS247 (5.2.1)	IC		<input checked="" type="checkbox"/> N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v04	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.5)	IC		<input type="checkbox"/> N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	<input type="checkbox"/> Pass
	IC	RSS247 (5.4.4)	IC		<input checked="" type="checkbox"/> N/A
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	<input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	<input type="checkbox"/> Pass
	IC	-	IC	-	<input checked="" type="checkbox"/> N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v04	<input type="checkbox"/> Pass
	IC	RSS247 (5.2.2)	IC		<input checked="" type="checkbox"/> N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	<input type="checkbox"/> Pass
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	<input checked="" type="checkbox"/> N/A
Remark	<ol style="list-style-type: none"> All measurement uncertainties do not take into consideration for all presented test results. 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

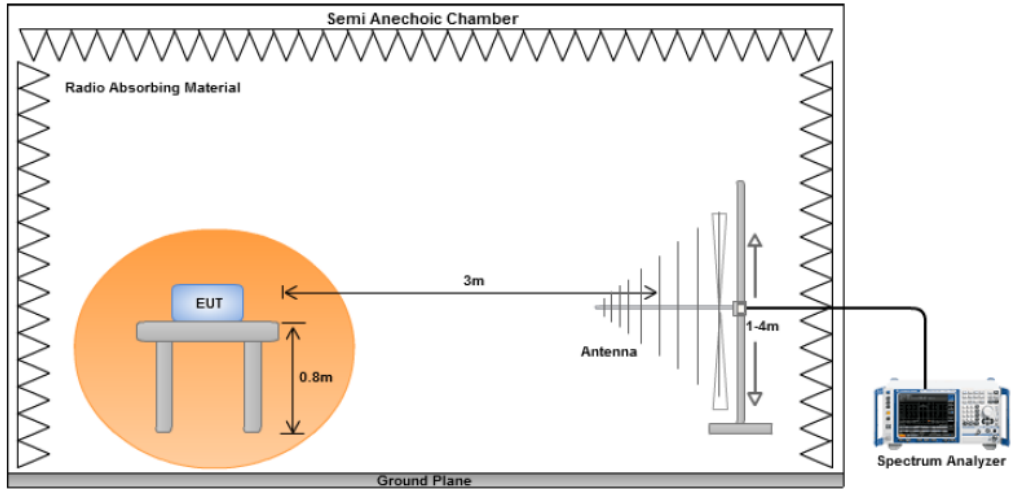
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty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

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.247(d) RSS247 (5.5)	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"> 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	☒ Pass ☐ Fail												

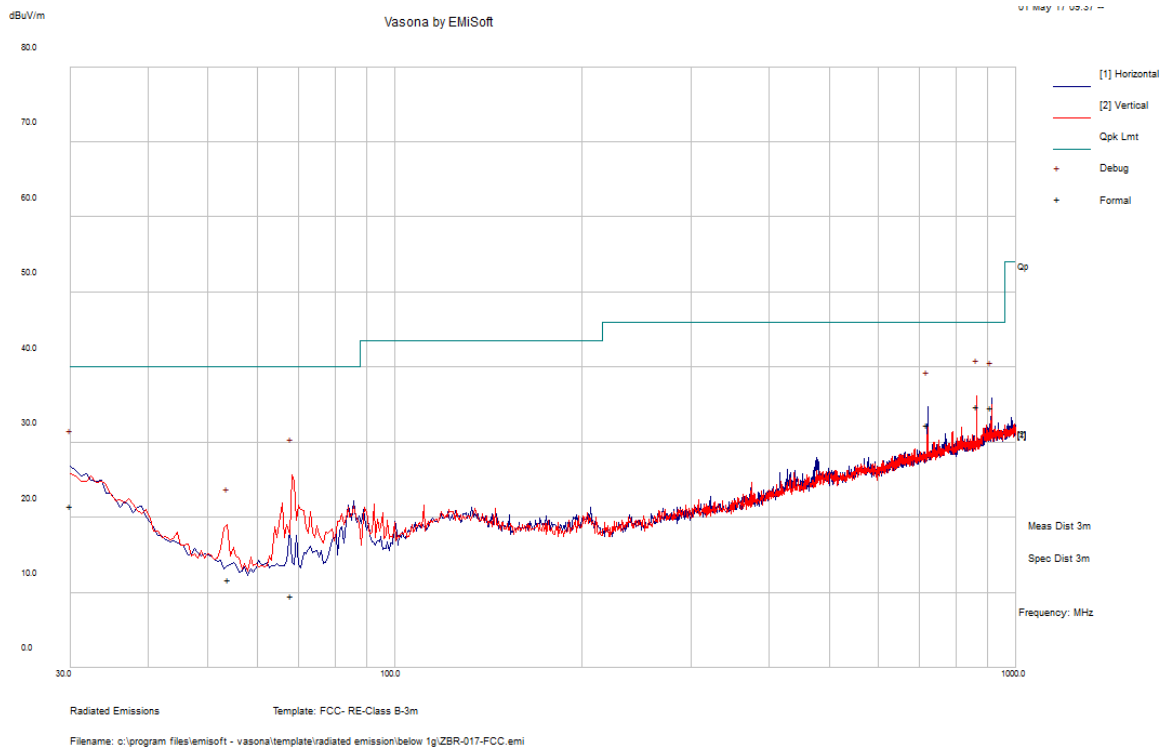
Test Data ☒ Yes (See below) ☐ N/A

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
Environmental Conditions:	Temp (°C):	25.7		
	Humidity (%)	29		
	Atmospheric (mPa):			
Mains Power:	120VAC, 60Hz			
Tested by:	Anish Kumar			
Test Date:	05/25/2017			
Remarks:	2.4GHz 11n20 2437MHz			



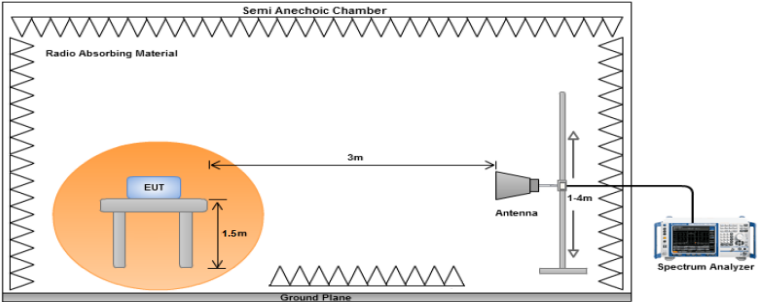
Quasi Max Measurement

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
864.9391	33.71	14.66	-13.64	34.73	Quasi Max	V	248	109	46	-11.27	Pass
913.0778	32.32	14.94	-12.66	34.6	Quasi Max	H	319	178	46	-11.4	Pass
720.7681	33.3	14.37	-15.36	32.3	Quasi Max	H	106	42	46	-13.7	Pass
30.01793	24.35	10.99	-13.84	21.51	Quasi Max	H	243	131	40	-18.49	Pass
68.11656	26.43	11.46	-28.27	9.62	Quasi Max	V	224	47	40	-30.38	Pass
53.84719	28.68	11.37	-28.29	11.76	Quasi Max	V	284	182	40	-28.24	Pass

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

10.2 Radiated Spurious Emissions Above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247 (5.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required <input type="checkbox"/> 20 dB down <input checked="" 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"> 1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. 		
Remark	None		
Result	<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 Emission Test Results (Above 1GHz)

802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17408.4	34.52	0.99	7.86	43.37	Peak Max	V	164	54	74	-30.63	Pass
9900.089	34.95	2.76	-0.51	37.2	Peak Max	V	268	279	74	-36.8	Pass
1679.866	40.58	7.08	-14.17	33.49	Peak Max	H	134	315	74	-40.51	Pass
17408.4	23.25	0.99	7.86	32.09	Average Max	V	164	54	54	-21.91	Pass
9900.089	22.87	2.76	-0.51	25.13	Average Max	V	268	279	54	-28.87	Pass
1679.866	31.84	7.08	-14.17	24.75	Average Max	H	134	315	54	-29.25	Pass

802.11b - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17975.713	34.89	0.85	8.21	43.95	Peak Max	V	400	4	74	-30.05	Pass
13240.78	34.75	2.33	3.61	40.68	Peak Max	V	306	310	74	-33.32	Pass
4791.058	36.26	5.28	-5	36.54	Peak Max	H	304	52	74	-37.47	Pass
17975.713	23.21	0.85	8.21	32.27	Average Max	V	400	4	54	-21.73	Pass
13240.78	22.89	2.33	3.61	28.83	Average Max	V	306	310	54	-25.17	Pass
4791.058	23.31	5.28	-5	23.59	Average Max	H	304	52	54	-30.41	Pass

802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17850.83	36.05	0.88	8.1	45.04	Peak Max	H	169	45	74	-28.96	Pass
11380.37	35.73	2.3	2.26	40.28	Peak Max	V	360	272	74	-33.72	Pass
1680.021	41.48	7.08	-14.17	34.39	Peak Max	H	101	321	74	-39.61	Pass
17850.83	23.25	0.88	8.1	32.24	Average Max	H	169	45	54	-21.76	Pass
11380.37	23.36	2.3	2.26	27.91	Average Max	V	360	272	54	-26.09	Pass
1680.021	32.59	7.08	-14.17	25.5	Average Max	H	101	321	54	-28.5	Pass

802.11g - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17902.68	35.16	0.87	8.6	44.63	Peak Max	H	280	65	74	-29.37	Pass
12805.6	34.47	2.53	3.55	40.55	Peak Max	V	155	357	74	-33.45	Pass
6085.187	34.67	4.39	-2.6	36.46	Peak Max	H	295	116	74	-37.54	Pass
17902.68	23.25	0.87	8.6	32.72	Average Max	H	280	65	54	-21.28	Pass
12805.6	22.67	2.53	3.55	28.75	Average Max	V	155	357	54	-25.25	Pass
6085.187	22.6	4.39	-2.6	24.39	Average Max	H	295	116	54	-29.61	Pass

802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17644.37	35.4	0.94	8.26	44.6	Peak Max	V	316	167	74	-29.4	Pass
3703.495	35.9	5.57	-6.87	34.59	Peak Max	H	327	53	74	-39.41	Pass
5653.877	35.11	4.5	-4.14	35.47	Peak Max	V	165	110	74	-38.53	Pass
17644.37	23.17	0.94	8.26	32.37	Average Max	V	316	167	54	-21.63	Pass
3703.495	24.16	5.57	-6.87	22.86	Average Max	H	327	53	54	-31.14	Pass
5653.877	22.63	4.5	-4.14	22.99	Average Max	V	165	110	54	-31.01	Pass

802.11g - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17597.24	35.54	0.95	8.05	44.55	Peak Max	H	208	356	74	-29.45	Pass
11827.3	34.42	2.58	2.19	39.19	Peak Max	H	152	142	74	-34.81	Pass
5241.987	34.45	5.04	-4.38	35.11	Peak Max	V	100	69	74	-38.89	Pass
17597.24	23.25	0.95	8.05	32.25	Average Max	H	208	356	54	-21.75	Pass
11827.3	22.77	2.58	2.19	27.54	Average Max	H	152	142	54	-26.46	Pass
5241.987	22.5	5.04	-4.38	23.16	Average Max	V	100	69	54	-30.84	Pass

802.11n20 - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17754.01	34.85	0.91	7.99	43.76	Peak Max	H	182	286	74	-30.24	Pass
13079.58	33.78	2.41	3.7	39.89	Peak Max	V	287	17	74	-34.11	Pass
6308.469	34.46	4.5	-2.68	36.27	Peak Max	H	112	147	74	-37.73	Pass
17754.01	23.23	0.91	7.99	32.13	Average Max	H	182	286	54	-21.87	Pass
13079.58	22.21	2.41	3.7	28.32	Average Max	V	287	17	54	-25.68	Pass
6308.469	22.77	4.5	-2.68	24.59	Average Max	H	112	147	54	-29.41	Pass

802.11n20 – 2437MHz

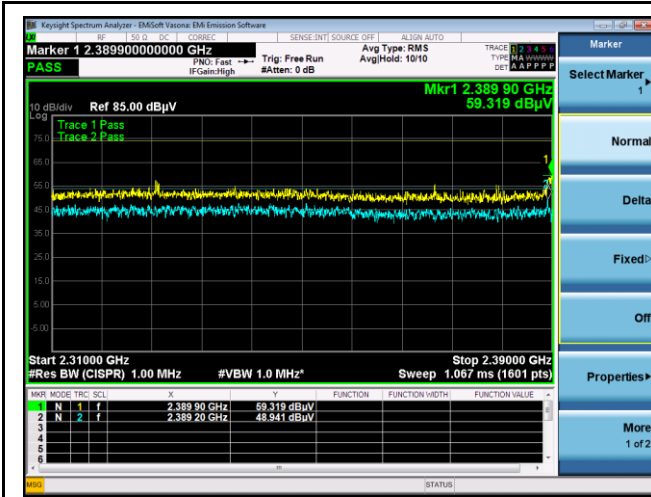
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17928.54	34.92	0.86	8.46	44.24	Peak Max	V	286	226	74	-29.76	Pass
4965.447	35.46	5.48	-5.13	35.81	Peak Max	V	202	27	74	-38.2	Pass
1680.046	41.8	7.08	-14.17	34.71	Peak Max	V	268	326	74	-39.29	Pass
17928.54	23.25	0.86	8.46	32.57	Average Max	V	286	226	54	-21.43	Pass
4965.447	23.28	5.48	-5.13	23.63	Average Max	V	202	27	54	-30.37	Pass
1680.046	33.22	7.08	-14.17	26.14	Average Max	V	268	326	54	-27.87	Pass

802.11n20 - 2462MHz

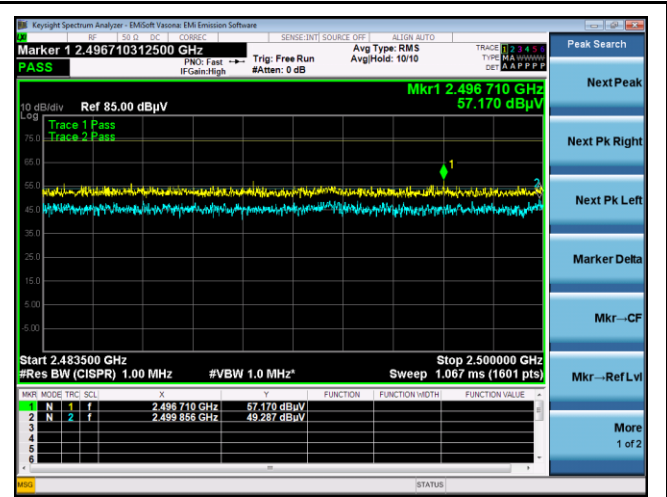
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17899.06	35.17	0.87	8.6	44.64	Peak Max	H	330	191	74	-29.36	Pass
8346.3	36.17	3.56	-0.13	39.6	Peak Max	H	294	139	74	-34.4	Pass
5443.742	35.17	4.67	-4.04	35.8	Peak Max	V	323	15	74	-38.21	Pass
17899.06	23.21	0.87	8.6	32.68	Average Max	H	330	191	54	-21.32	Pass
8346.3	23.42	3.56	-0.13	26.85	Average Max	H	294	139	54	-27.15	Pass
5443.742	22.97	4.67	-4.04	23.6	Average Max	V	323	15	54	-30.4	Pass

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

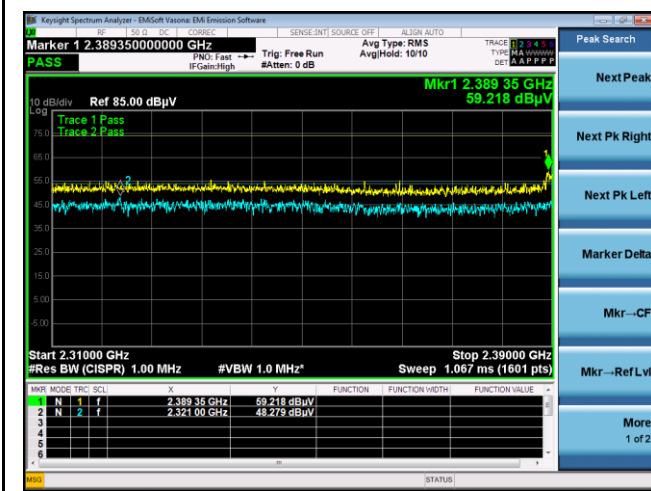
Restricted Band Measurement Plot



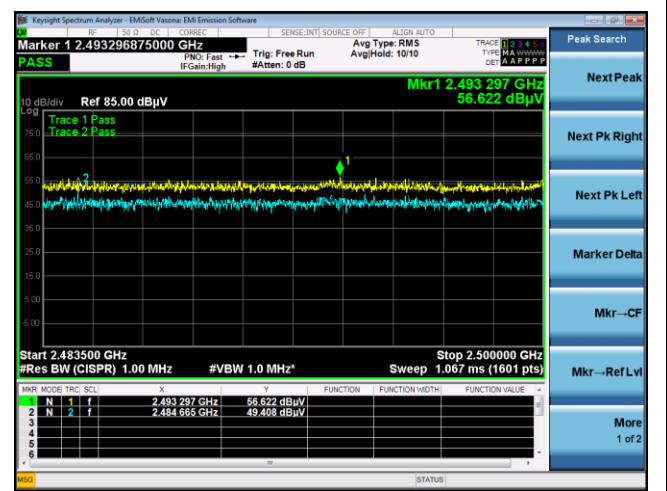
Restricted Band 802.11b 2412MHz



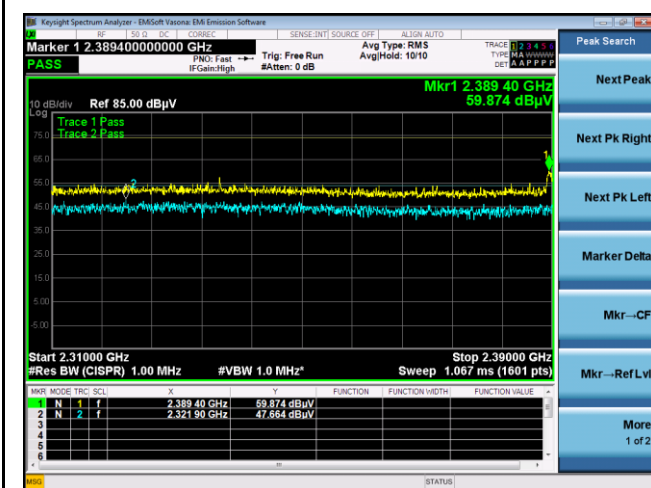
Restricted Band 802.11b 2462MHz



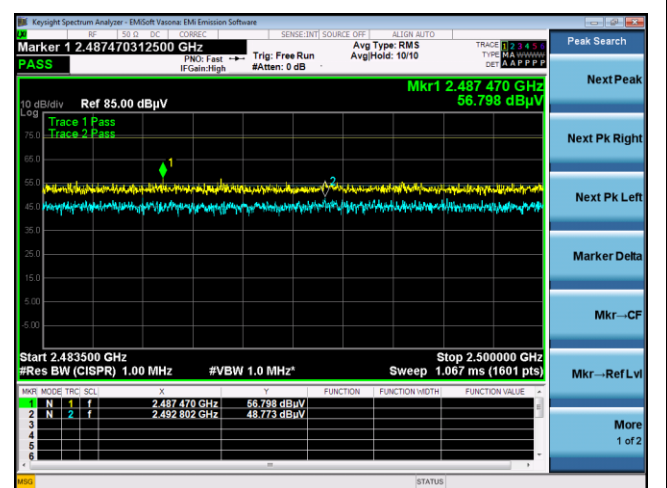
Restricted Band 802.11g 2412MHz



Restricted Band 802.11g 2462MHz



Restricted Band 802.11n-20M 2412MHz



Restricted Band 802.11n-20M 2462MHz

















Annex A. TEST INSTRUMENT








Instrument	Model	Manufacturer	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2017	1 Year	06/08/2018	<input checked="" type="checkbox"/>
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2017	1 Year	08/20/2018	<input checked="" type="checkbox"/>
Pre-Amplifier (1-26.5GHz)	8449B	Hewlett Packard	3008A00715	03/30/2017	1 Year	03/30/2017	<input checked="" type="checkbox"/>
Preamplifier (100KHz-7GHz)	LPA-6-30	RF Bay, Inc.	11140711	02/10/2017	1 Year	02/10/2017	<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	09/05/2017	1 Year	09/05/2018	<input checked="" type="checkbox"/>
RF Conducted Measurement							
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2017	1 Year	08/20/2018	<input checked="" type="checkbox"/>
USB RF Power Sensor	7002-006	ETS-Lingren	10SL0190	09/03/2017	1 Year	09/03/2018	<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