



RF TEST REPORT



Report No.: FCC IC_RF_SL19010903-CSC-001_DTS
Supersede Report No.:

Applicant	:	Cisco Systems Inc
Product Name	:	Cisco Wireless Router
FCC Host Model No.	:	C1121X-8PLTEPWB
IC Host Model No.	:	C1121X-8PLTEPWA
Test Standard	:	47 CFR 15.247 RSS 247 Iss 2: Feb 2017
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 5: Apr 2018 558074 D01 DTS Meas Guidance v05r01
Module FCC ID	:	LDKC11011757
Module IC	:	2461N-11011757
Dates of test	:	03/01/2019 – 03/10/2019
Issue Date	:	03/15/2019
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:

	
Deon Dai	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

Visit us at: www.siemic.com; Follow us at:



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

CONTENTS

1	REPORT REVISION HISTORY	4
2	EXECUTIVE SUMMARY	5
3	CUSTOMER INFORMATION	5
4	TEST SITE INFORMATION	5
5	MODIFICATION	5
6	EUT INFORMATION	6
6.1	EUT Description	6
6.2	Radio Description	6
7	SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION.....	7
7.1	Supporting Equipment	7
7.2	Cabling Description	7
7.3	Test Software Description	7
8	TEST SUMMARY	8
9	MEASUREMENT UNCERTAINTY	9
10	MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	10
10.1	Radiated Spurious Emissions in restricted band	10
10.2	Radiated Spurious Emissions below 1GHz	14
10.3	Radiated Spurious Emissions between 1GHz – 25GHz	16
10.4	Receiver Spurious Emissions	20
ANNEX A. TEST INSTRUMENT		24
ANNEX B. SIEMIC ACCREDITATION		25

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC IC_RF_SL19010903-CSC-001_DTS	None	Original	03/15/2019

2 Executive Summary

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

Company:	Cisco Systems, Inc.
Product:	Cisco Wireless Router
FCC Host Model:	C1121X-8PLTEPWB
IC Host Model:	C1121X-8PLTEPWA

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page. This test report covers the radiated emissions requirements of the standards referenced in the report to allow system level approval of the module in specified Hosts.

3 Customer information

Applicant Name	:	Cisco Systems, Inc.
Applicant Address	:	125 West Tasman Dr. San Jose, CA 95134
Manufacturer Name	:	Cisco Systems, Inc.
Manufacturer Address	:	125 West Tasman Dr. San Jose, CA 95134

4 Test site information

Lab performing tests	SIEMIC Inc.
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	540430
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	Cisco Wireless Router
FCC Host Model No.	C1121X-8PLTEPWB
IC Host Model No.	C1121X-8PLTEPWA
Trade Name	Cisco
Serial No.	FGL224410BU
Host Model No.	N/A
Input Power	12V AC/DC 6A
Power Adapter Manu/Model	DELTA ELECTRONICS, INC / ADP-150BR B
Power Adapter SN	N/A
Date of EUT received	01/14/2019
Equipment Class/ Category	DTS
Clock Frequencies	N/A
Port/Connectors	Power Port, Lan Port, USB Port, Micro-USB Port

6.2 Radio Description

Radio Type	802.11b/g/n/ac-20M
Operating Frequency	2412-2462MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)
Channel Spacing	5MHz
Number of Channels	11
Antenna Type	Internal PIFA Antenna
Antenna Gain (Peak)	2.14 dBi
Antenna Connector Type	U.FL Connector
Note	-

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	ThinkPad T420s	N/A	Lenovo	-
2	Console Cable	USB to RJ45 Cable	-	Moyina	-
3	Power Adapter	ADP-150BR B	-	DELTA ELECTRONICS, INC	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
Console Cable	EUT	Micro-USB Port	Laptop	USB	1.8	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Tera Term	Set the EUT to transmit continuously in different test modes

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013	<input checked="" type="checkbox"/> Pass*
	IC	RSS Gen 8.10	IC	558074 D01 DTS Meas Guidance v05r01	<input type="checkbox"/> N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	<input checked="" type="checkbox"/> Pass*
	IC	RSS Gen 8.8	IC	RSS Gen Issue 5: 2018	<input type="checkbox"/> N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	<input checked="" type="checkbox"/> Pass*
	IC	RSS Gen 6.7	IC	RSS Gen Issue 5: 2018	<input type="checkbox"/> N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v05r01	<input checked="" type="checkbox"/> Pass*
	IC	RSS247 (5.2.a)	IC		<input type="checkbox"/> N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v05r01	<input checked="" type="checkbox"/> Pass
	IC	RSS247 (5.5)	IC		<input type="checkbox"/> N/A
Maximum conducted Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v05r01	<input checked="" type="checkbox"/> Pass*
	IC	RSS247 (5.4.d)	IC		<input type="checkbox"/> N/A
Receiver Spurious Emissions	IC	RSS Gen (7.3)	IC	RSS Gen Issue 5: 2018	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	<input checked="" type="checkbox"/> Pass*
	IC	-	IC	-	<input type="checkbox"/> N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v05r01	<input checked="" type="checkbox"/> Pass*
	IC	RSS247 (5.2.b)	IC		<input type="checkbox"/> N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	<input checked="" type="checkbox"/> Pass
	IC	RSS Gen(3.4)	IC	RSS Gen Issue 5: 2018	<input 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. Only Band Edge and Radiated Spurious Emissions was testing for specific host in this test report. Pass* : Please refer to original filing test reports: EDCS – 12057781 				

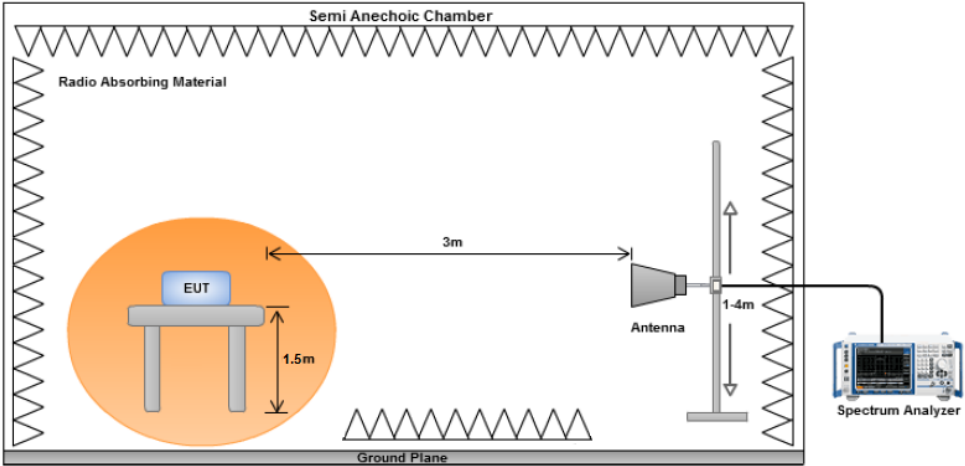
9 Measurement Uncertainty

Emissions			
Test Item	Frequency Range	Description	Uncertainty
AC Conducted Emissions	150KHz – 30MHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±3.5dB
RF conducted measurement	150KHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±0.95dB
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)	±6dB
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)	±6dB

10 Measurements, Examination and Derived Results

10.1 Radiated Spurious Emissions in restricted band

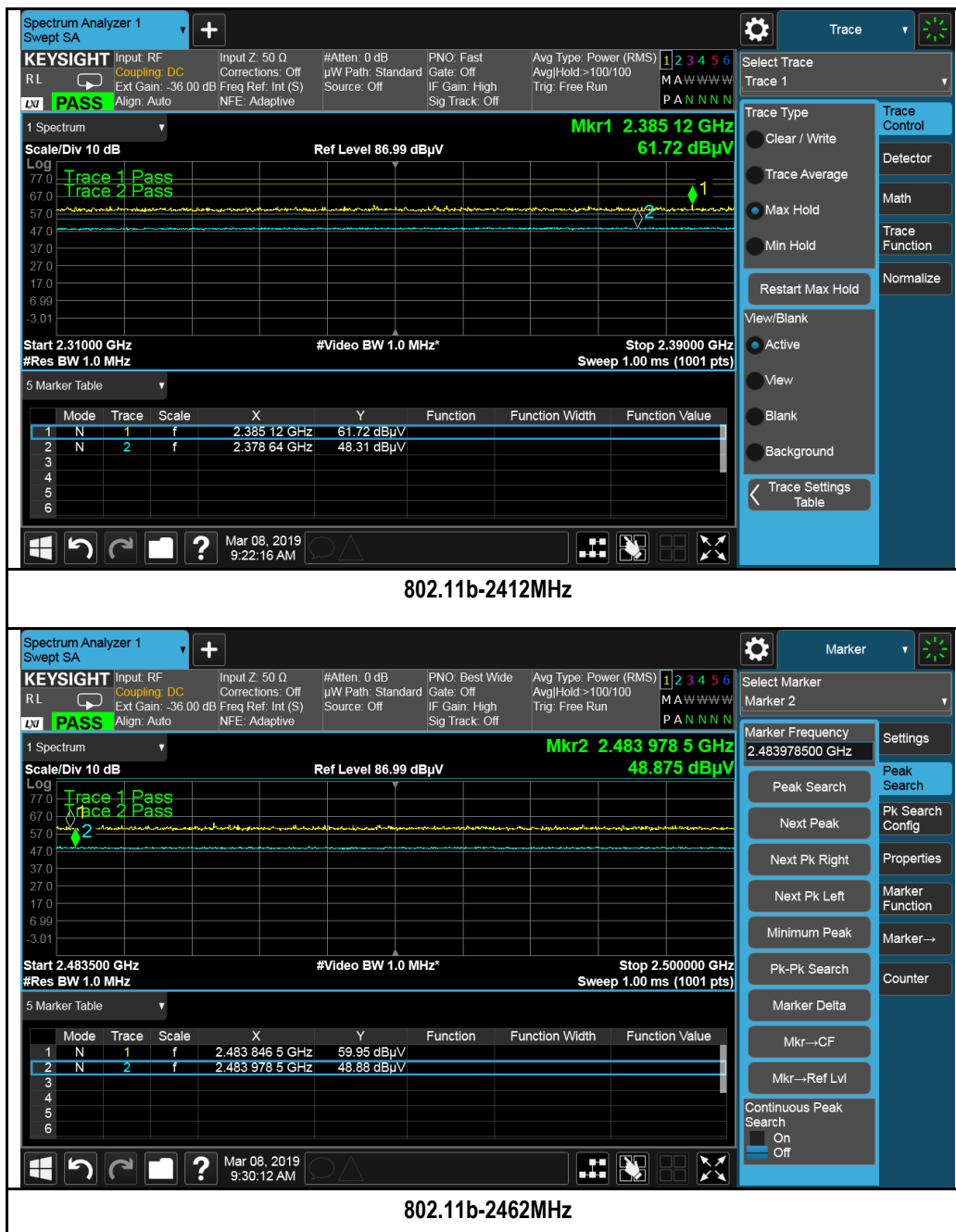
Requirement(s):

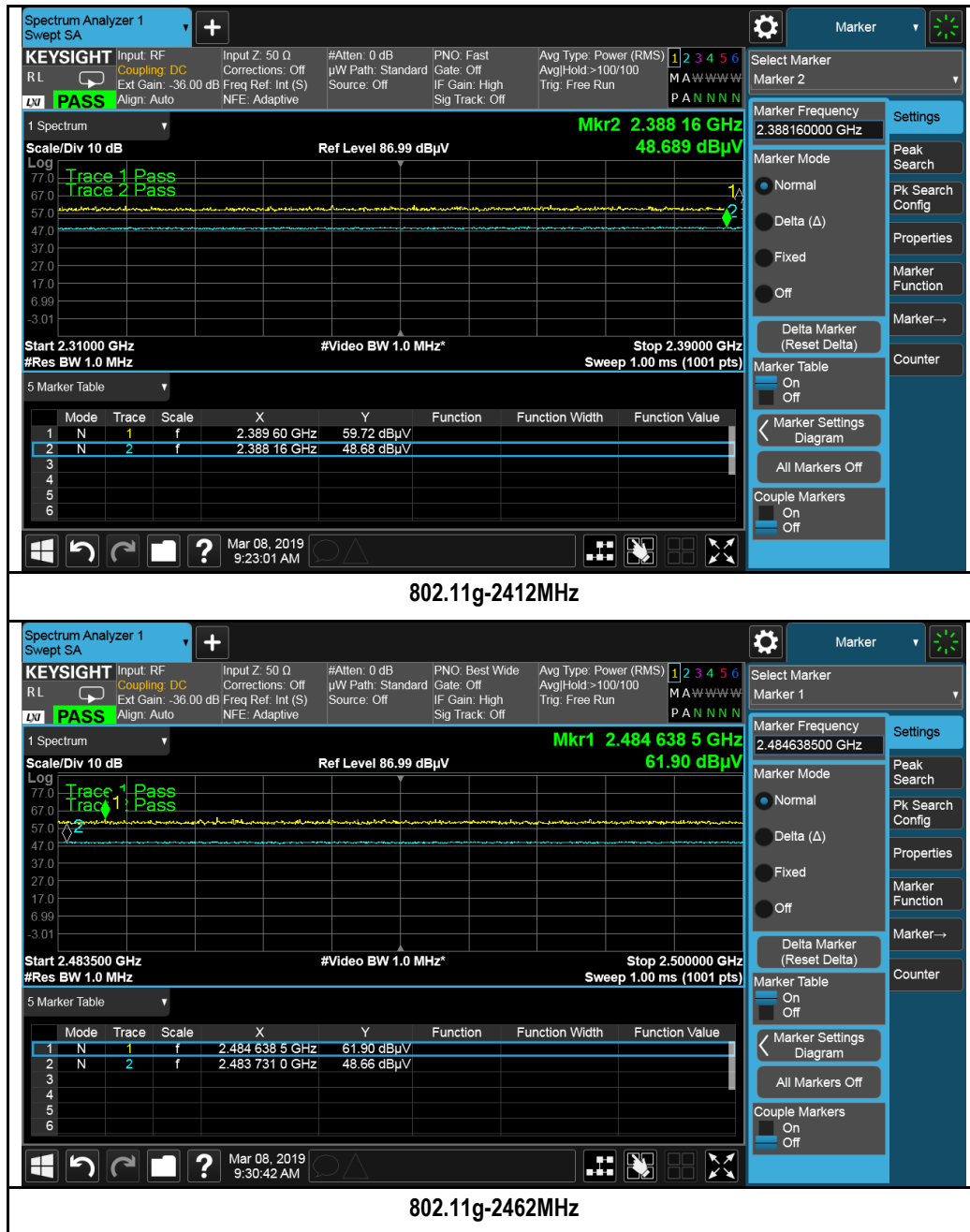
Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(5.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall 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"> 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			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

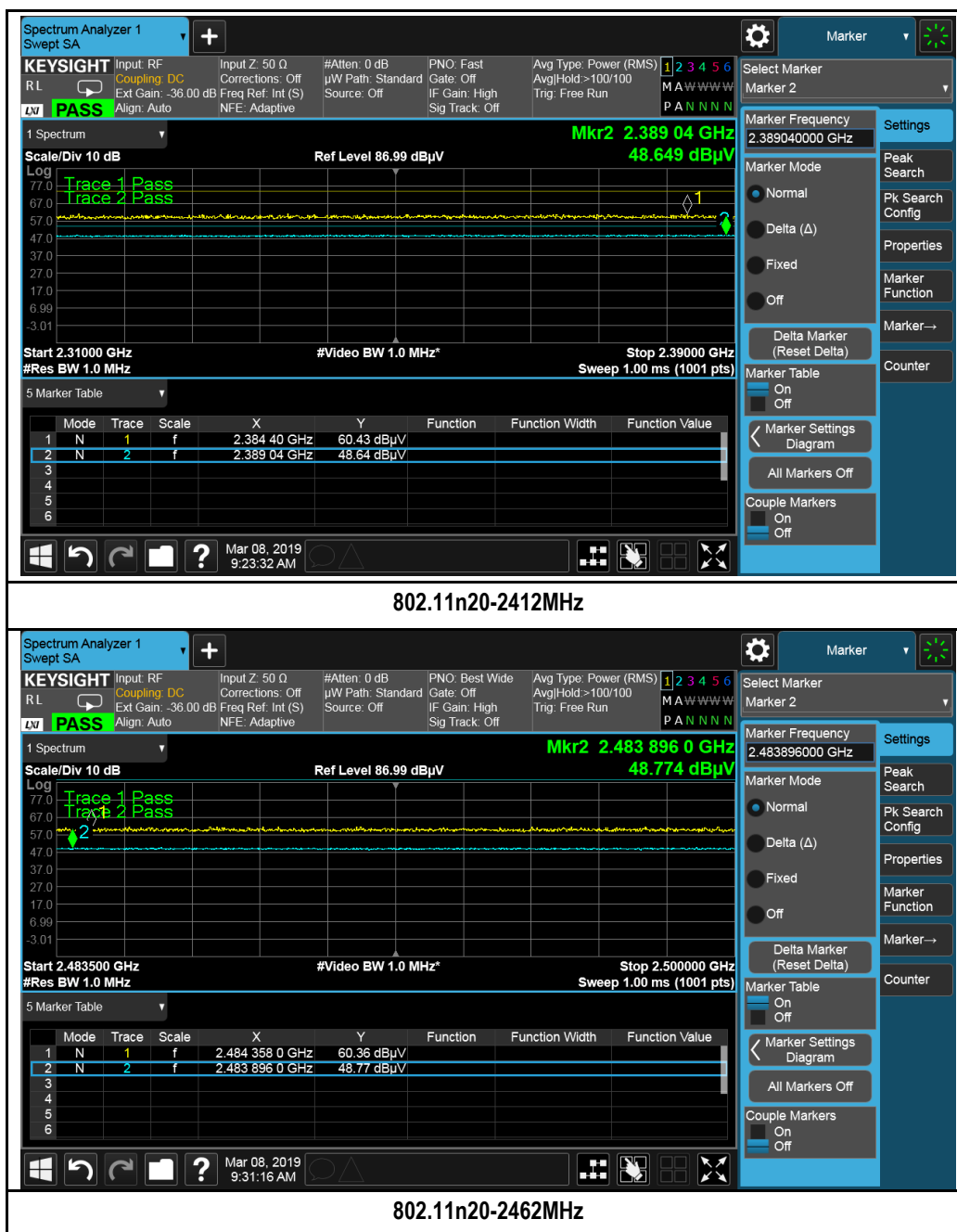
Test Data ☐ Yes (See below) ☒ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at 10m chamber.

Restricted Band Measurement Plots:

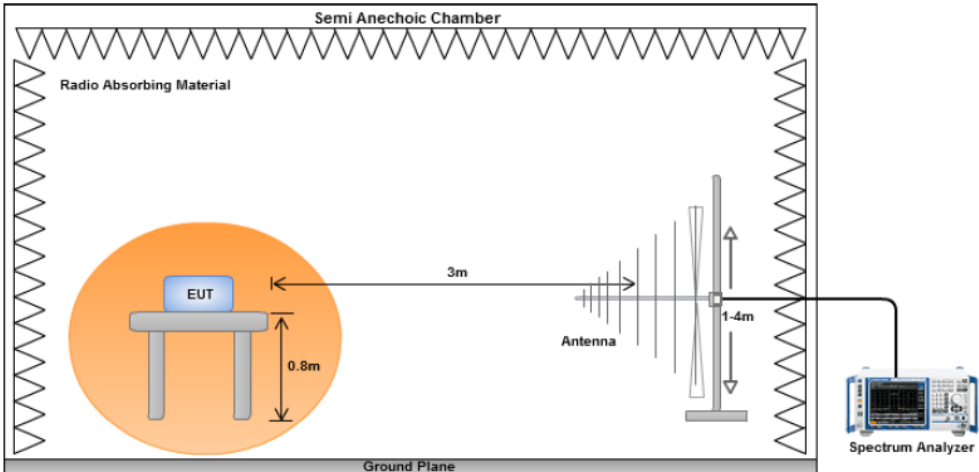






10.2 Radiated Spurious Emissions below 1GHz

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><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">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. A Quasi-peak measurement was then made for that frequency point.4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.												
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												

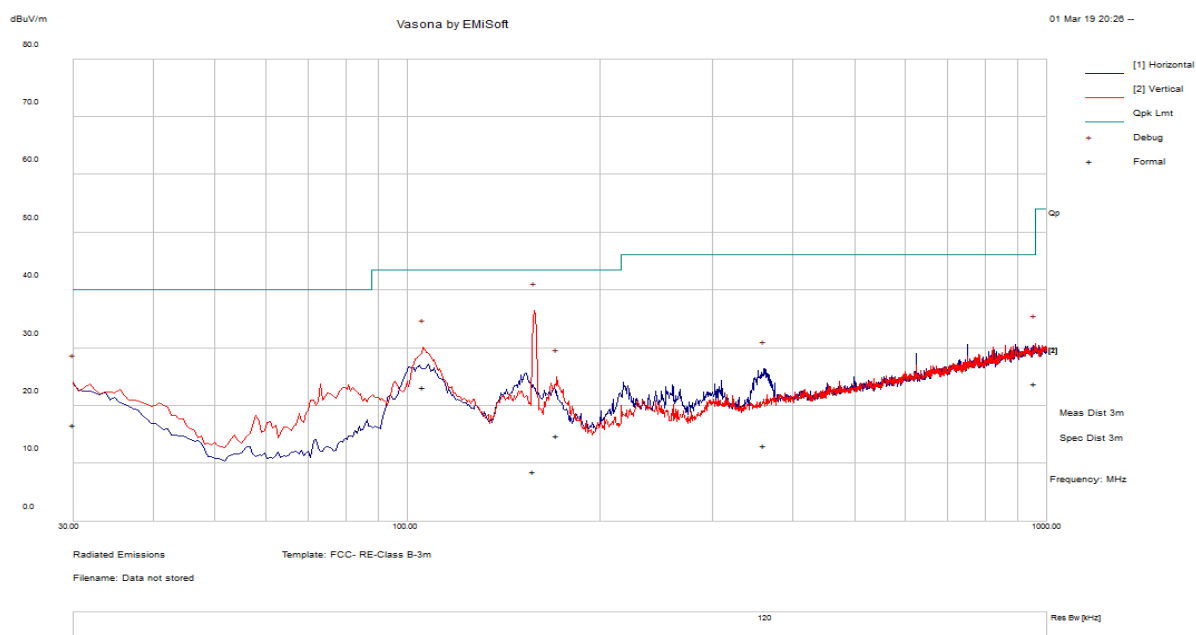
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz			Result	Pass
Environmental Conditions:	Temp (°C):	26			
	Humidity (%)	47			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Deon Dai				
Test Date:	03/01/2019				
Remarks:	802.11n20, 2437MHz				

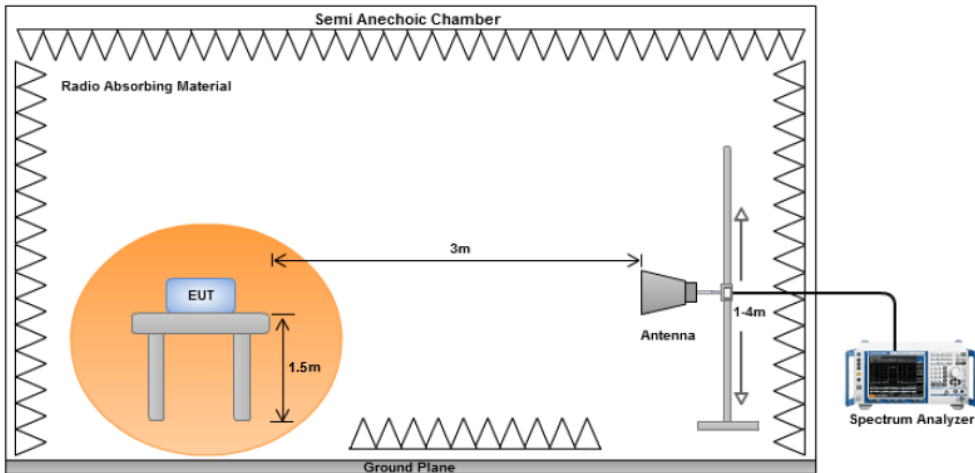


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
157.70	19.65	12.25	-23.3	8.6	Quasi Max	V	218	258	43.5	-34.9	Pass
105.62	35.56	11.92	-24.31	23.17	Quasi Max	V	176	263	43.5	-20.34	Pass
957.61	20.29	16.08	-12.52	23.85	Quasi Max	H	344	68	46	-22.15	Pass
30.02	17.72	11.12	-12.1	16.73	Quasi Max	V	212	142	40	-23.27	Pass
171.02	26.48	12.36	-24.01	14.84	Quasi Max	V	176	7	43.5	-28.66	Pass
361.56	20.19	13.57	-20.66	13.1	Quasi Max	H	143	292	46	-32.9	Pass

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

10.3 Radiated Spurious Emissions between 1GHz – 25GHz

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"> 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			
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 Deon Dai at 3m chamber.

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
3178.19	48.09	3.41	-13.79	37.71	Peak Max	V	207	293	74	-36.29	Pass
4824.63	48.63	4.12	-10.92	41.83	Peak Max	H	220	34	74	-32.17	Pass
8748.59	49.94	5.63	-6.49	49.08	Peak Max	V	163	149	74	-24.92	Pass
3178.19	41.73	3.41	-13.79	31.35	Average Max	V	207	293	54	-22.65	Pass
4824.63	37.03	4.12	-10.92	30.23	Average Max	H	220	34	54	-23.77	Pass
8748.59	38.5	5.63	-6.49	37.64	Average Max	V	163	149	54	-16.36	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
3728.45	48.34	3.57	-13.15	38.76	Peak Max	V	208	296	74	-35.24	Pass
4873.77	48.35	4.17	-11.01	41.51	Peak Max	H	223	32	74	-32.49	Pass
8331.66	49.74	5.41	-7.04	48.11	Peak Max	H	165	145	74	-25.89	Pass
3728.45	42.56	3.57	-13.15	32.98	Average Max	V	208	296	54	-21.02	Pass
4873.77	37.32	4.17	-11.01	30.48	Average Max	H	223	32	54	-23.52	Pass
8331.66	38.34	5.41	-7.04	36.71	Average Max	H	165	145	54	-17.29	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
3634.99	47.71	3.57	-13.43	37.85	Peak Max	H	204	294	74	-36.15	Pass
4924.29	48.25	4.22	-11.11	41.36	Peak Max	H	224	32	74	-32.64	Pass
8495.09	49.22	5.53	-6.86	47.89	Peak Max	V	169	149	74	-26.11	Pass
3634.99	41.99	3.57	-13.43	32.13	Average Max	H	204	294	54	-21.87	Pass
4924.29	36.43	4.22	-11.11	29.54	Average Max	H	224	32	54	-24.46	Pass
8495.09	38.04	5.53	-6.86	36.71	Average Max	V	169	149	54	-17.29	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
3332.66	47.56	3.51	-13.74	37.33	Peak Max	H	210	300	74	-36.67	Pass
4824.63	48.63	4.12	-10.92	41.83	Peak Max	V	215	32	74	-32.17	Pass
8292.38	50.53	5.38	-7.08	48.83	Peak Max	H	167	154	74	-25.17	Pass
3332.66	41.05	3.51	-13.74	30.82	Average Max	H	210	300	54	-23.18	Pass
4824.63	37.16	4.12	-10.92	30.36	Average Max	V	215	32	54	-23.64	Pass
8292.38	38.58	5.38	-7.08	36.88	Average Max	H	167	154	54	-17.12	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
3246.09	48.4	3.47	-13.75	38.12	Peak Max	V	205	295	74	-35.88	Pass
4873.36	48.36	4.17	-11.01	41.52	Peak Max	H	216	25	74	-32.48	Pass
8024.73	50.71	5.42	-7.04	49.09	Peak Max	H	163	148	74	-24.91	Pass
3246.09	42.81	3.47	-13.75	32.53	Average Max	V	205	295	54	-21.47	Pass
4873.36	36.5	4.17	-11.01	29.66	Average Max	H	216	25	54	-24.34	Pass
8024.73	38.98	5.42	-7.04	37.36	Average Max	H	163	148	54	-16.64	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
3314.99	47.31	3.5	-13.74	37.07	Peak Max	H	212	298	74	-36.93	Pass
4924.80	48.28	4.22	-11.11	41.39	Peak Max	V	217	33	74	-32.61	Pass
8882.27	49.92	5.62	-6.17	49.37	Peak Max	V	170	153	74	-24.63	Pass
3314.99	41.75	3.5	-13.74	31.51	Average Max	H	212	298	54	-22.49	Pass
4924.80	37.14	4.22	-11.11	30.25	Average Max	V	217	33	54	-23.75	Pass
8882.27	38.55	5.62	-6.17	38	Average Max	V	170	153	54	-16	Pass

Above 1GHz-25GHz- 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
3275.86	48.32	3.48	-13.75	38.05	Peak Max	H	204	299	74	-35.95	Pass
4824.98	48.6	4.12	-10.92	41.8	Peak Max	H	220	31	74	-32.2	Pass
8655.98	49.72	5.59	-6.64	48.67	Peak Max	H	163	151	74	-25.33	Pass
3275.86	42.09	3.48	-13.75	31.82	Average Max	H	204	299	54	-22.18	Pass
4824.98	37.38	4.12	-10.92	30.58	Average Max	H	220	31	54	-23.42	Pass
8655.98	37.94	5.59	-6.64	36.89	Average Max	H	163	151	54	-17.11	Pass

Above 1GHz-25GHz – 802.11n20 – 2437MHz

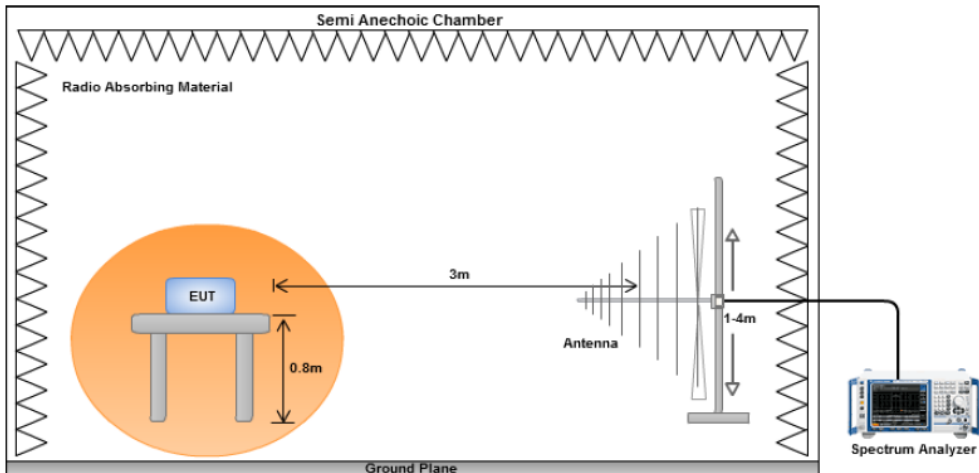
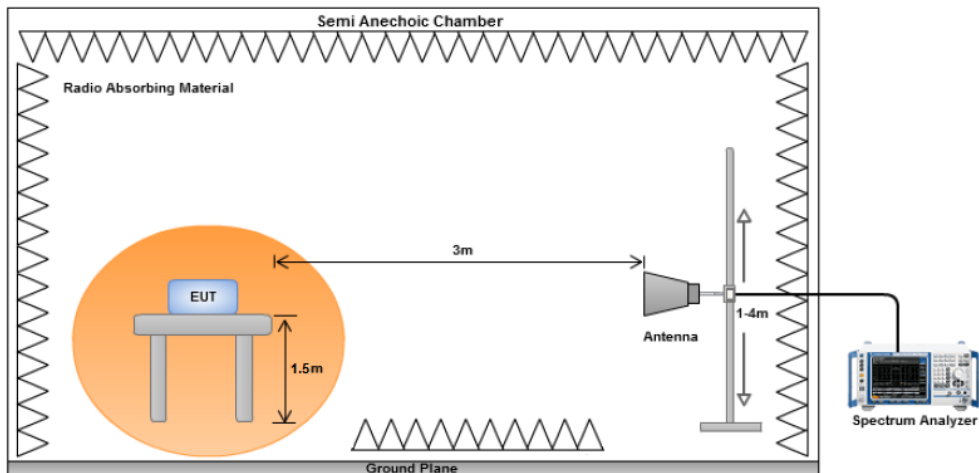
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
3278.64	47.88	3.48	-13.75	37.61	Peak Max	V	210	300	74	-36.39	Pass
4873.34	48.36	4.17	-11.01	41.52	Peak Max	V	221	30	74	-32.48	Pass
8378.13	50.79	5.44	-6.99	49.24	Peak Max	H	169	150	74	-24.76	Pass
3278.64	42.64	3.48	-13.75	32.37	Average Max	V	210	300	54	-21.63	Pass
4873.34	37.07	4.17	-11.01	30.23	Average Max	V	221	30	54	-23.77	Pass
8378.13	39.08	5.44	-6.99	37.53	Average Max	H	169	150	54	-16.47	Pass

Above 1GHz-25GHz- 802.11n20 - 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
3126.08	47.45	3.37	-13.82	37	Peak Max	H	204	294	74	-37	Pass
4924.84	48.29	4.22	-11.11	41.4	Peak Max	H	224	32	74	-32.6	Pass
8969.07	49.78	5.62	-5.98	49.42	Peak Max	V	166	153	74	-24.58	Pass
3126.08	41.43	3.37	-13.82	30.98	Average Max	H	204	294	54	-23.02	Pass
4924.84	36.44	4.22	-11.11	29.55	Average Max	H	224	32	54	-24.45	Pass
8969.07	38.18	5.62	-5.98	37.82	Average Max	V	166	153	54	-16.18	Pass

10.4 Receiver Spurious Emissions

Requirement(s):

Spec	Item	Requirement	Applicable										
RSS GEN 7.3	a)	<p>Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna ports. The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least five times the highest tunable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.</p> <p>Spurious emissions from receivers shall not exceed the radiated emissions limits shown in table 3</p> <table><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	<div>☒</div>
		Frequency range (MHz)	Field Strength (uV/m)										
30 – 88	100												
88 – 216	150												
216 – 960	200												
Above 960	500												
Test Setup													
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. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

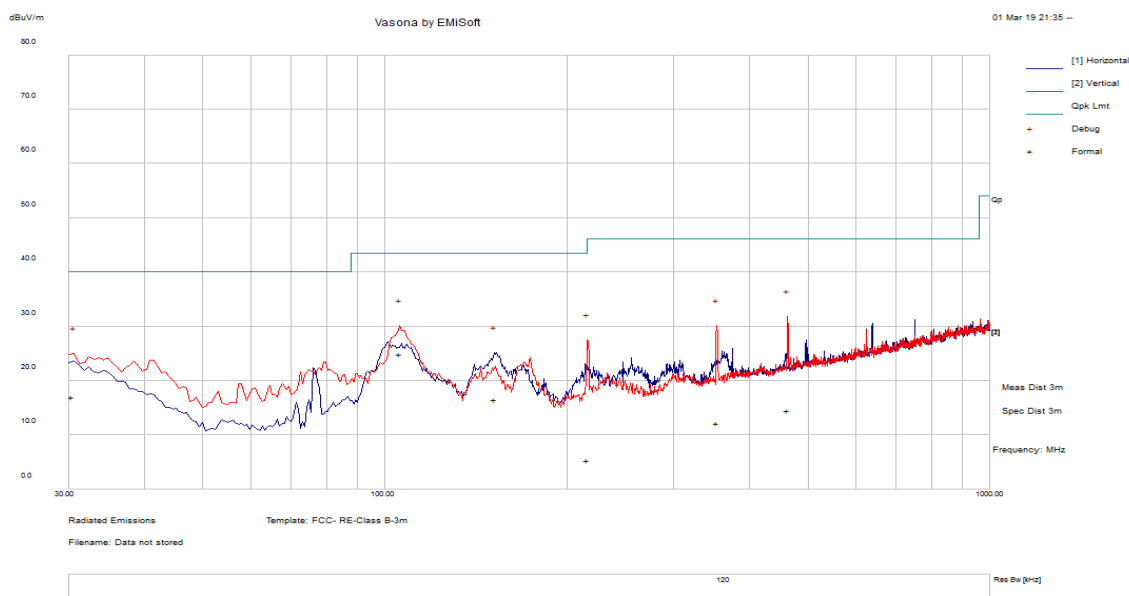
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification	below 1GHz				
Environmental Conditions:	Temp (°C):	26	Result	Pass	
	Humidity (%)	47			
	Atmospheric (mbar):	1020			
Mains Power:	120VAC, 60Hz				
Tested by:	Deon Dai				
Test Date:	03/01/2019				
Remarks:	Receiver mode				



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
105.92	37.23	11.92	-24.25	24.91	Quasi Max	V	110	219	43.5	-18.59	Pass
462.82	19.21	14.13	-18.84	14.49	Quasi Max	V	249	137	46	-31.51	Pass
30.39	18.42	11.12	-12.46	17.07	Quasi Max	V	101	112	40	-22.93	Pass
353.65	19.49	13.54	-20.8	12.23	Quasi Max	V	121	173	46	-33.78	Pass
151.88	27.62	12.21	-23.33	16.5	Quasi Max	H	133	253	43.5	-27	Pass
215.97	17.49	12.77	-24.96	5.3	Quasi Max	V	130	91	43.5	-38.2	Pass

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

Radiated Emission Test Results (Above 1GHz)
















Receiver mode








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
1595.52	46.58	2.43	-6.03	42.98	Peak Max	H	190	305	74	-31.02	Pass
3189.59	44.46	3.42	-1.49	46.39	Peak Max	V	180	178	74	-27.62	Pass
1064.40	57.56	1.94	-7.85	51.65	Peak Max	V	120	201	74	-22.35	Pass
1944.44	48.18	2.7	-2.76	48.12	Peak Max	V	102	208	74	-25.88	Pass
1595.52	29.75	2.43	-6.03	26.16	Average Max	H	190	305	54	-27.84	Pass
3189.59	29.16	3.42	-1.49	31.08	Average Max	V	180	178	54	-22.92	Pass
1064.40	32.88	1.94	-7.85	26.97	Average Max	V	120	201	54	-27.03	Pass
1944.44	29.96	2.7	-2.76	29.9	Average Max	V	102	208	54	-24.1	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Keysight EXA 44GHz Spectrum Analyzer	N9030B(PXA)	MY57140374	08/20/2018	1 Year	08/20/2019	<input checked="" type="checkbox"/>
Bi-Log antenna (30MHz~6GHz)	JB6	A111717	08/12/2018	1 Year	08/12/2019	<input checked="" type="checkbox"/>
Horn Antenna (1GHz~26GHz)	3115	100059	01/26/2019	1 Year	01/26/2020	<input checked="" type="checkbox"/>
Horn Antenna (26GHz~40GHz)	AH-840	101013	08/28/2018	1 Year	08/28/2019	<input checked="" type="checkbox"/>
Pre-Amplifier(0.3MHz-6.5GHz)	LPA-6-30	11170602	02/06/2019	1 Year	02/06/2020	<input checked="" type="checkbox"/>
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	08/16/2018	1 Year	08/16/2019	<input checked="" type="checkbox"/>
Pre-Amp (10MHz~50GHz)	RAMP00M50GA	17032300047	02/10/2019	1 Year	02/10/2020	<input checked="" type="checkbox"/>

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