

RF TEST REPORT



Report No.: FCC IC_RF_SL17022401-SLX-005A1_UNII
Supersede Report No.: None

Applicant	:	Silex Technology, Inc.
Product Name	:	SDIO Wireless Module
Model No.	:	SX-SDMAC
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01r02
FCC ID	:	N6C-SDMAC
IC ID	:	4908A-SDMAC (FMA)
Dates of test	:	09/03/2017 to 09/18/2017
Issue Date	:	09/18/2017
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X]		
Equipment did not comply with the specification []		

This Test Report is Issued Under the Authority of:

Gary Chou	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
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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/RA, 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_SL17022401-SLX-005A1_UNII	None	Original	09/18/2017

2 Executive Summary

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

Company: Silex Technology, Inc
Product: SDIO Wireless Module
Model: SX-SDMAC

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	:	Silex Technology, Inc
Applicant Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto, 619-0237 Japan
Manufacturer Name	:	Silex Technology, Inc
Manufacturer Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto, 619-0237 Japan

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	SDIO Wireless Module
Model No.	SX-SDMAC
Trade Name	Silex Technology, Inc
Serial No.	MD012974
Module Input Power	3.3 Vdc
Host Host Model No.	N/A
Date of EUT received	08/25/2016
Equipment Class/ Category	UNII
Clock Frequencies	N/A
Port/Connectors	N/a

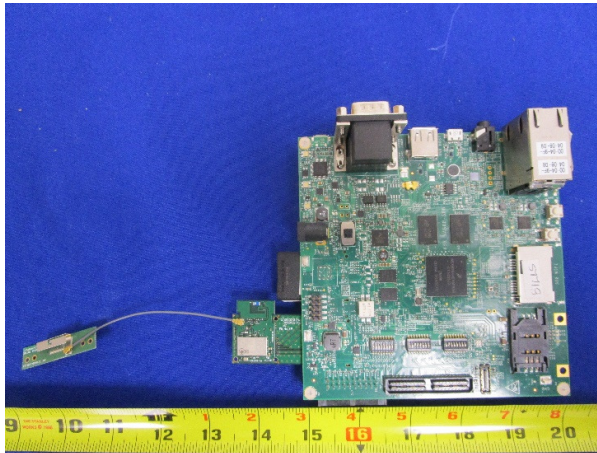
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-HT20	802.11n-HT40	802.11ac-80M
Operating Frequency	2412-2472MHz	2412-2472MHz	5180-5320MHz 5500-5720MHz	2412-2472MHz 5180-5320MHz 5500-5720MHz	2422 MHz - 2452 MHz *1) 5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 5530 MHz-5610 MHz 5775 MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	13	13	15	13(2.4GHz) 15 (5GHz)	9(2.4GHz) 8(5GHz)	4
Antenna Type	Ethertronics Prestta Antenna					
Antenna Gain (Peak)	2.5 dBi (2.4GHz), 3.5 dBi (5 GHz)					
Antenna Connector Type	U.FL					
Note	N/A					

EUT Power level setting

Mode	Frequency	Power Setting
11a/ 11n-20 /11ac-20	5260 MHz	12
	5300 MHz	12
	5320 MHz	8.5
	5500 MHz	8
	5580 MHz	8
	5700 MHz	8.5
	5745 MHz	9
	5785 MHz	9
11n-40/11ac-40	5825 MHz	9
	5270 MHz	11
	5310 MHz	8.5
	5510 MHz	8
	5550 MHz	8.5
11ac-80	5670 MHz	8.5
	5290 MHz	8
	5530 MHz	8
	5610 MHz	9

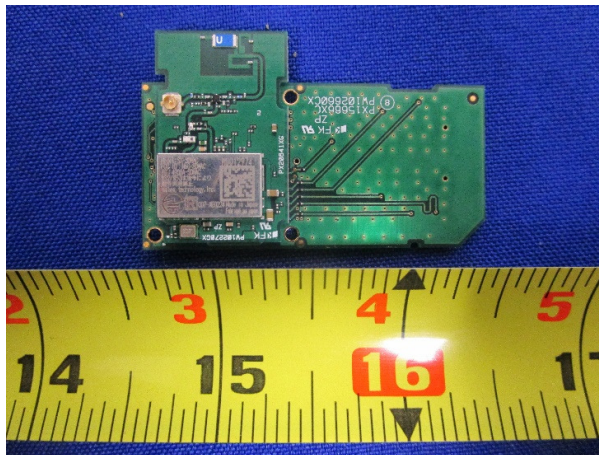
6.3 EUT Photos



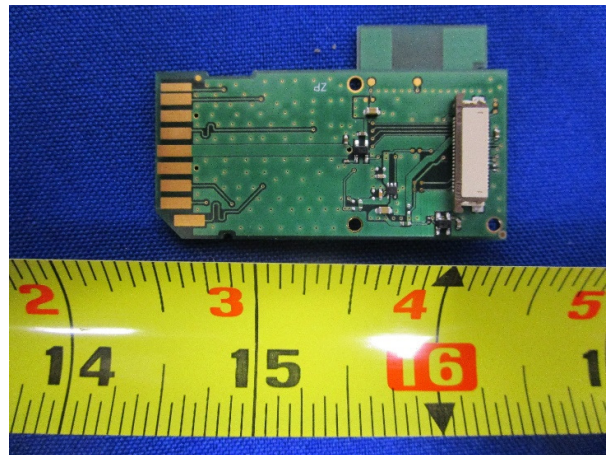
System Board With EUT Top View



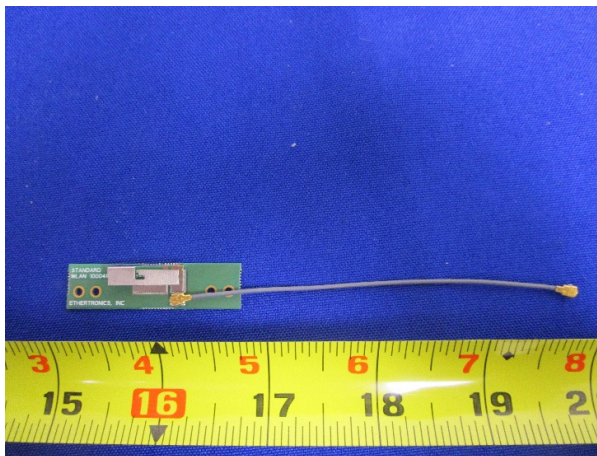
System Board With EUT Bottom View



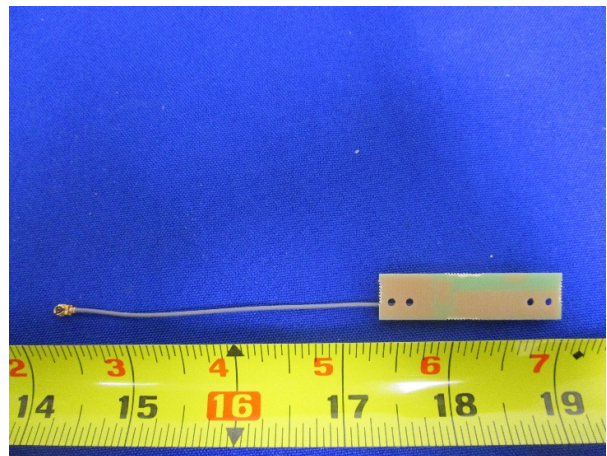
EUT Top View



EUT Bottom View

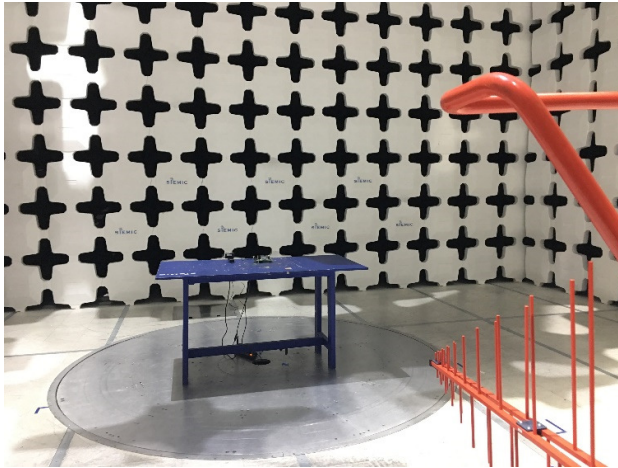


Ethertronics Prestta Antenna Top View

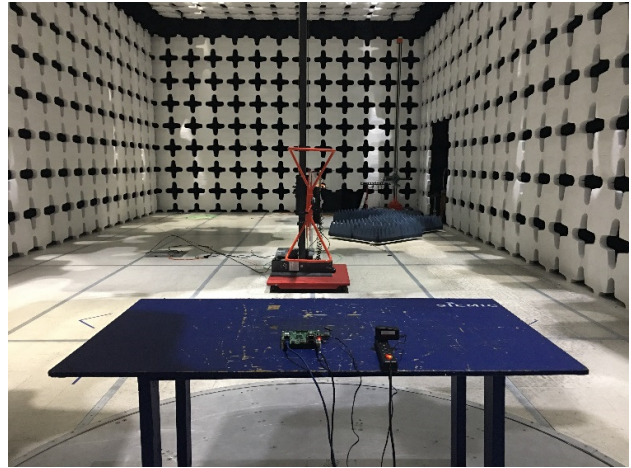


Ethertronics Prestta Antenna Bottom View

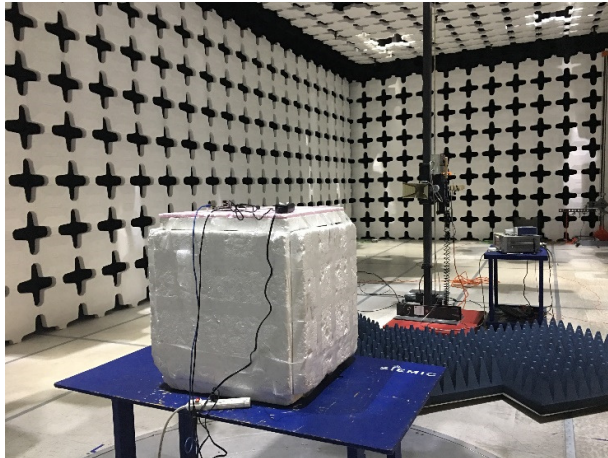
6.4 EUT Test Setup Photos



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 E6510	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	
USB	EUT	Laptop	EUT	Laptop	1	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	TeraTerm & QRCT	Set the WLAN radio to transmit continuously in different 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 v01r02	☐ Pass ☒ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	☐ Pass ☒ 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 v01r02	☐ Pass ☒ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01r02	☐ Pass ☒ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☐ Pass ☒ 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 v01r02	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01r02	☐ Pass ☒ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☐ Pass ☒ N/A
Remark	1. All measurement uncertainties are not taken into consideration for all presented test result. 2. 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. 3. N/A: Refer to Test Report FCC ID: N6C-SDMAC			

9 Measurement Uncertainty

9.1 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.

9.2 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:

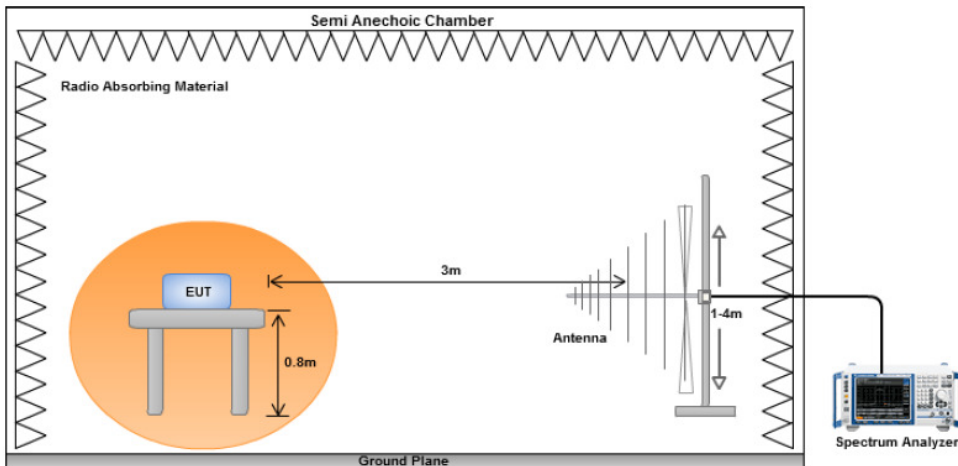
- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

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.

9.3 Radiated Spurious Emissions below 1GHz

Requirement(s):

Spec	Requirement	Applicable										
47CFR§ 15.407(b) 15.209 (a)	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 <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	☒
Frequency range (MHz)	Field Strength (uV/m)											
30 – 88	100											
88 – 216	150											
216 960	200											
Above 960	500											
Test Setup												
Procedure	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: 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	☒ Pass ☐ Fail											

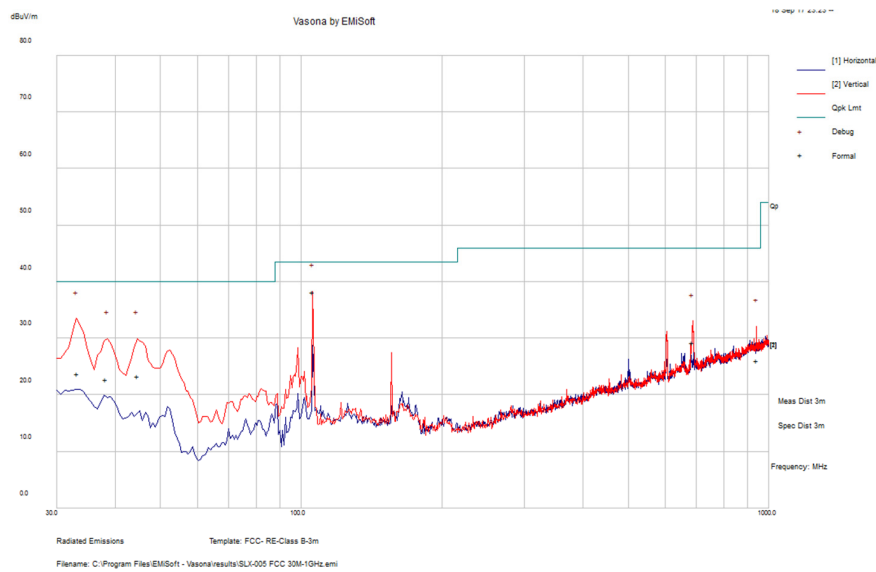
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Gary Chou 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:	Gary Chou			
Test Date:	09/18/2017			
Remarks:	802.11ac VHT80, 5530MHz			



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
105.36	50.18	12.07	-24.96	37.29	Quasi Max	V	400	337	43.5	-6.21	Pass
33.42	28.25	11.34	-16.68	22.91	Quasi Max	V	185	294	40	-17.09	Pass
38.53	30.42	11.42	-20.5	21.34	Quasi Max	V	184	263	40	-18.66	Pass
44.17	35.61	11.52	-24.83	22.3	Quasi Max	V	180	321	40	-17.7	Pass
686.36	31.37	15.52	-16.51	30.38	Quasi Max	V	100	99	46	-15.62	Pass
940.47	21.29	16.75	-13.43	24.61	Quasi Max	V	160	311	46	-21.39	Pass

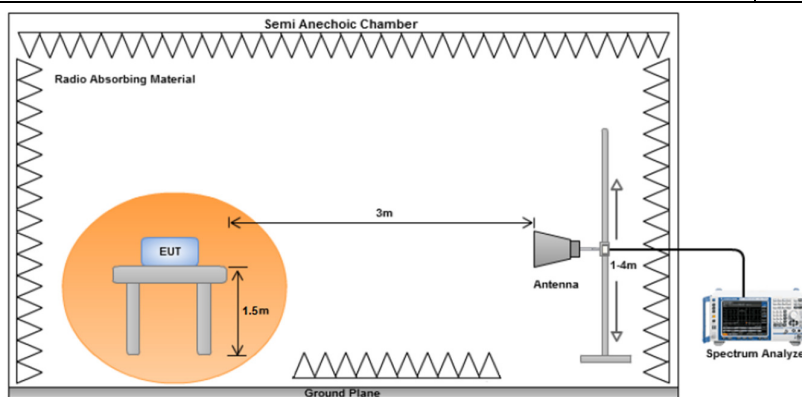
Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

9.4 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.	☐
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☒
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☒
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☐
	(5)	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒

Test Setup



Procedure

- The EUT was switched on and allowed to warm up to its normal operating condition.
- The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - The EUT was then rotated to the direction that gave the maximum emission.
 - Finally, the antenna height was adjusted to the height that gave the maximum emission.
- 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

The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.

Result

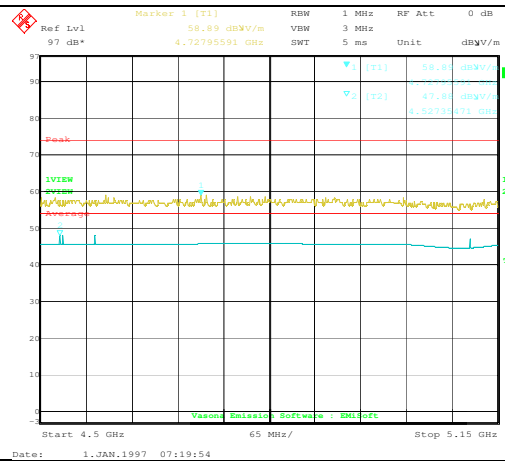
☒ Pass ☐ Fail

Test Data ☒ Yes (See below) ☐ N/A

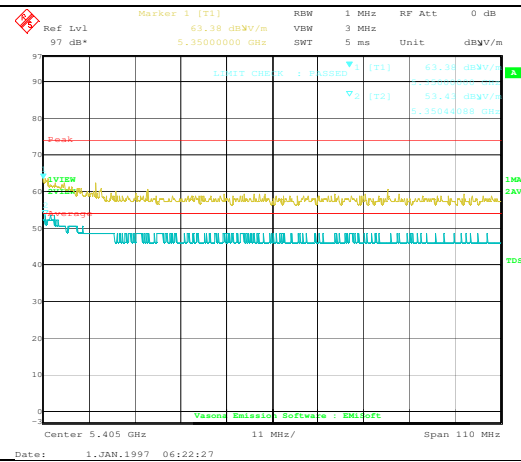
Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Gary Chou at 10m chamber.

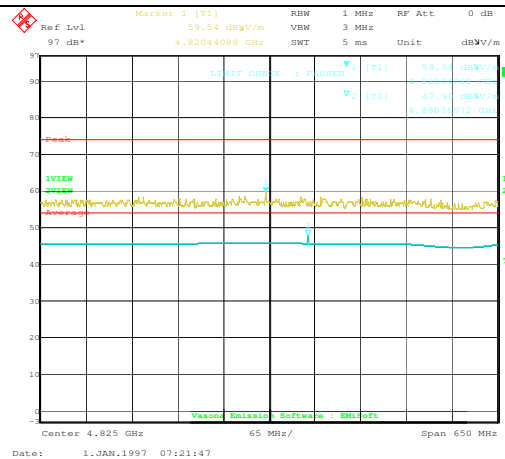
Radiated Restricted band Measurement Plots:



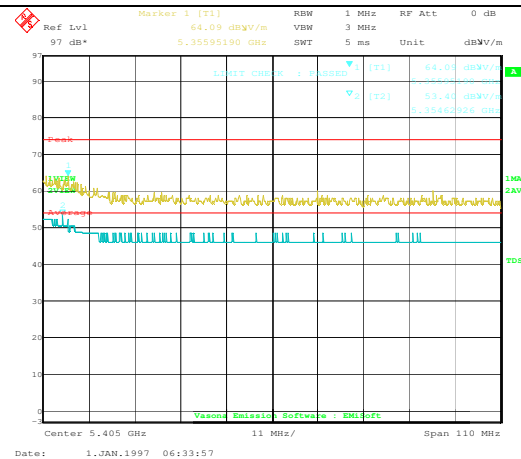
802.11a 5260M(4500-5150MHz)



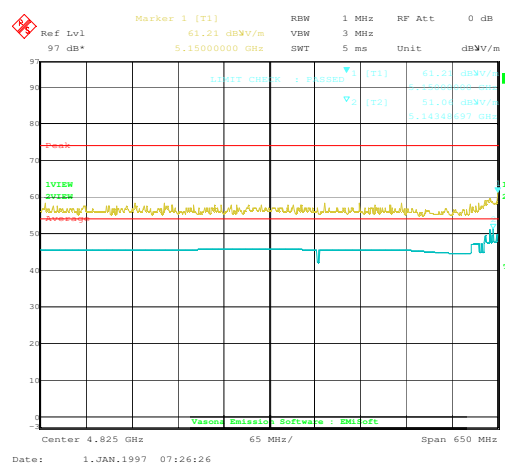
802.11a 5320M(5350-5460MHz)



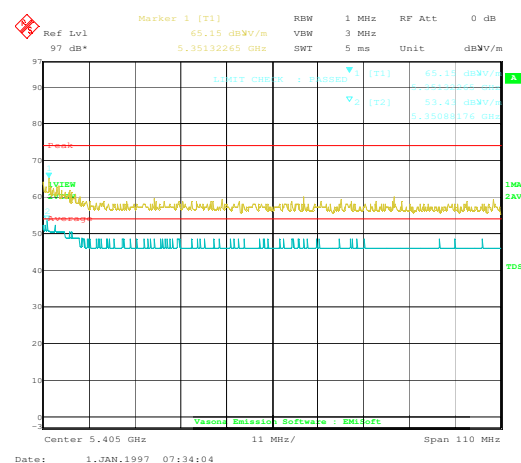
802.11n-HT20 5260M(4500-5150MHz)



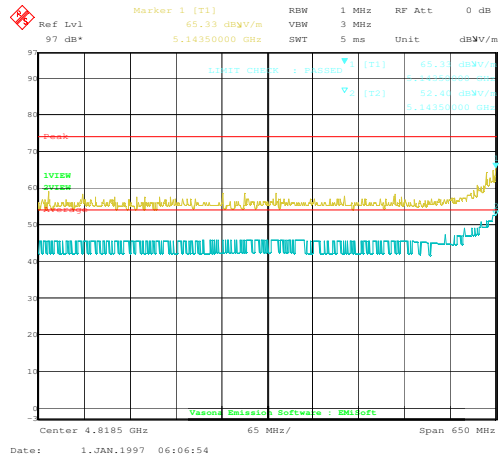
802.11n-HT 5320M(5350-5460MHz)



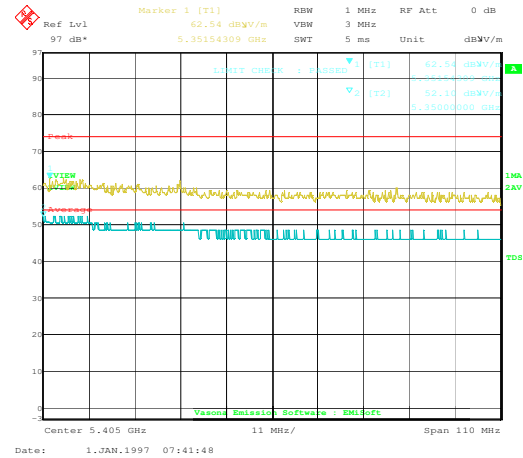
802.11n-HT40 5270M(4500-5150MHz)



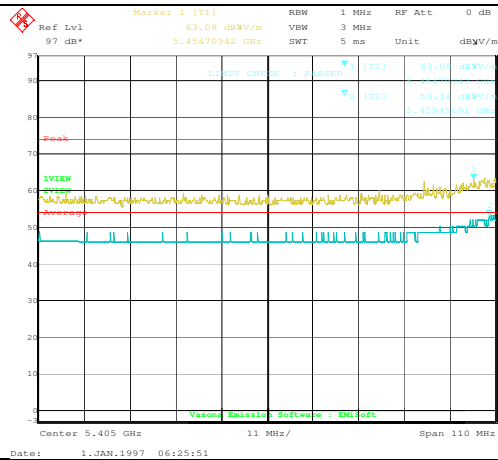
802.11n-HT 5310M(5350-5460MHz)



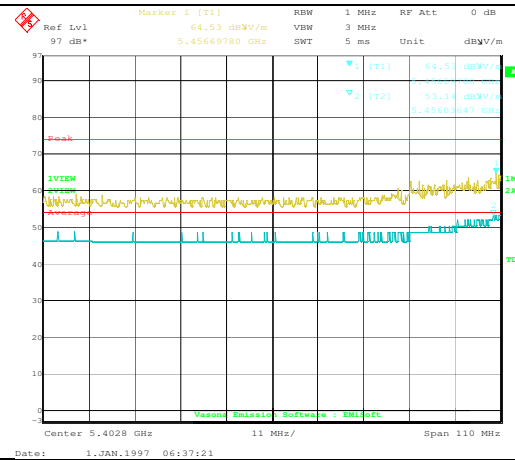
802.11ac-VHT80 5290M(4500-5150MHz)



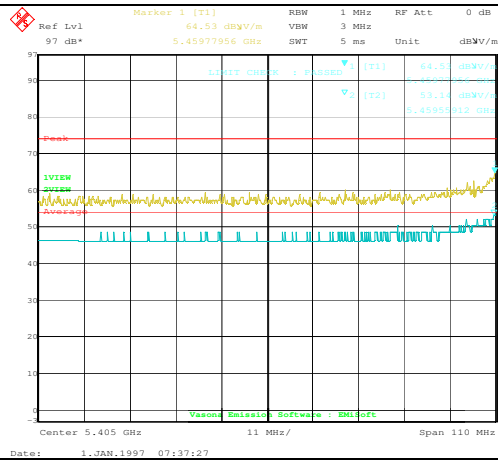
802.11ac-VHT80 5290M(5350-5460MHz)



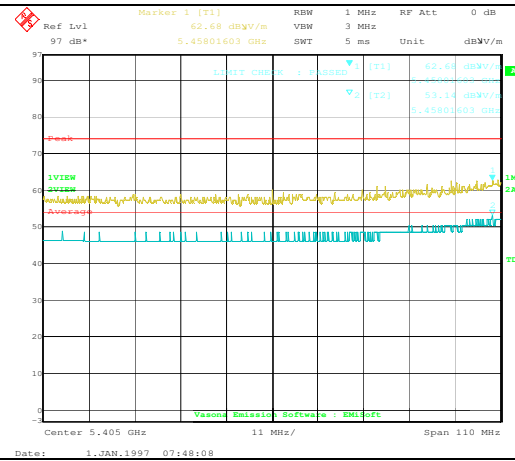
802.11a 5500M(5350-5460MHz)



802.11n-HT20 5500M(5350-5460MHz)



802.11n-HT40 5510M(5350-5460MHz)



802.11ac 5530M(5350-5460MHz)

Radiated Emission Test Results (Above 1GHz)

W53 band:

Above 1GHz-40GHz – 802.11a – 5260MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1894.81	45.32	3.16	-12.32	36.16	Peak Max	V	159	21	74	-37.84	Pass
3542.77	43.57	4.31	-7.22	40.65	Peak Max	V	192	30	74	-33.35	Pass
10519.86	40.04	7.27	0.34	47.65	Peak Max	V	121	33	74	-26.36	Pass
1894.81	33.67	3.16	-12.32	24.51	Average Max	V	159	21	54	-29.49	Pass
3542.77	32.06	4.31	-7.22	29.15	Average Max	V	192	30	54	-24.86	Pass
10519.86	28.41	7.27	0.34	36.02	Average Max	V	121	33	54	-17.98	Pass

Above 1GHz-40GHz – 802.11a – 5280MHz

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
1897.33	45.78	3.16	-12.3	36.64	Peak Max	V	146	272	74	-37.36	Pass
3541.70	44.37	4.3	-7.23	41.45	Peak Max	V	120	202	74	-32.56	Pass
10561.35	40.02	7.33	0.26	47.61	Peak Max	V	190	226	74	-26.39	Pass
1897.33	33.58	3.16	-12.3	24.44	Average Max	V	146	272	54	-29.56	Pass
3541.70	31.57	4.3	-7.23	28.65	Average Max	V	120	202	54	-25.35	Pass
10561.35	28.78	7.33	0.26	36.37	Average Max	V	190	226	54	-17.63	Pass

Above 1GHz-40GHz – 802.11a – 5320MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1894.44	45.66	3.16	-12.32	36.5	Peak Max	V	120	275	74	-37.5	Pass
3572.60	43.31	4.33	-7.13	40.51	Peak Max	V	108	350	74	-33.49	Pass
10639.29	40.63	7.46	0.35	48.44	Peak Max	V	164	19	74	-25.56	Pass
1894.44	33.69	3.16	-12.32	24.53	Average Max	V	120	275	54	-29.47	Pass
3572.60	31.25	4.33	-7.13	28.45	Average Max	V	108	350	54	-25.55	Pass
10639.29	29.03	7.46	0.35	36.84	Average Max	V	164	19	54	-17.16	Pass

Above 1GHz-40GHz – 802.11n-20M – 5260MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1874.03	45.26	3.14	-12.46	35.93	Peak Max	V	188	98	74	-38.07	Pass
3552.69	43.77	4.31	-7.19	40.89	Peak Max	V	176	69	74	-33.11	Pass
10521.06	40.2	7.27	0.34	47.81	Peak Max	V	106	310	74	-26.19	Pass
1874.03	33.36	3.14	-12.46	24.04	Average Max	V	188	98	54	-29.96	Pass
3552.69	31.7	4.31	-7.19	28.82	Average Max	V	176	69	54	-25.18	Pass
10521.06	28.74	7.27	0.34	36.35	Average Max	V	106	310	54	-17.65	Pass

Above 1GHz-40GHz – 802.11n-20M – 5280MHz

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
1885.09	46.06	3.15	-12.39	36.82	Peak Max	V	160	208	74	-37.18	Pass
3551.34	44.3	4.31	-7.2	41.42	Peak Max	V	147	320	74	-32.58	Pass
10559.24	39.81	7.33	0.27	47.4	Peak Max	V	109	271	74	-26.6	Pass
1885.09	33.5	3.15	-12.39	24.26	Average Max	V	160	208	54	-29.74	Pass
3551.34	31.37	4.31	-7.2	28.49	Average Max	V	147	320	54	-25.51	Pass
10559.24	28.46	7.33	0.27	36.06	Average Max	V	109	271	54	-17.94	Pass

Above 1GHz-40GHz – 802.11n-20M – 5320MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1882.58	45.73	3.15	-12.4	36.48	Peak Max	V	113	79	74	-37.52	Pass
3551.60	43.92	4.31	-7.2	41.04	Peak Max	V	175	196	74	-32.96	Pass
10640.91	40.86	7.46	0.36	48.68	Peak Max	V	159	273	74	-25.32	Pass
1882.58	33.41	3.15	-12.4	24.15	Average Max	V	113	79	54	-29.85	Pass
3551.60	31.76	4.31	-7.2	28.87	Average Max	V	175	196	54	-25.13	Pass
10640.91	29.03	7.46	0.36	36.85	Average Max	V	159	273	54	-17.15	Pass

Above 1GHz-40GHz – 802.11n-40M – 5270MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1863.42	44.49	3.13	-12.54	35.08	Peak Max	V	113	280	74	-38.93	Pass
3559.36	43.1	4.32	-7.17	40.24	Peak Max	V	99	335	74	-33.76	Pass
10539.35	40.77	7.3	0.31	48.37	Peak Max	V	155	60	74	-25.63	Pass
1863.42	33.15	3.13	-12.54	23.74	Average Max	V	113	280	54	-30.26	Pass
3559.36	31.02	4.32	-7.17	28.17	Average Max	V	99	335	54	-25.84	Pass
10539.35	28.65	7.3	0.31	36.25	Average Max	V	155	60	54	-17.75	Pass

Above 1GHz-40GHz – 802.11n-40M – 5310MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1857.62	44.7	3.12	-12.58	35.24	Peak Max	V	135	347	74	-38.76	Pass
3558.41	43.27	4.32	-7.17	40.41	Peak Max	V	100	106	74	-33.59	Pass
10618.94	41.1	7.43	0.27	48.8	Peak Max	V	152	147	74	-25.2	Pass
1857.62	33.19	3.12	-12.58	23.73	Average Max	V	135	347	54	-30.27	Pass
3558.41	31.05	4.32	-7.17	28.2	Average Max	V	100	106	54	-25.8	Pass
10618.94	28.99	7.43	0.27	36.68	Average Max	V	152	147	54	-17.32	Pass

Above 1GHz-40GHz – 802.11ac-80M – 5290MHz

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
1923.73	44.65	3.19	-12.16	35.68	Peak Max	V	103	356	74	-38.32	Pass
3581.72	43.65	4.34	-7.1	40.89	Peak Max	V	167	69	74	-33.11	Pass
10579.09	40.52	7.36	0.23	48.11	Peak Max	V	142	134	74	-25.89	Pass
1923.73	33.12	3.19	-12.16	24.15	Average Max	V	103	356	54	-29.85	Pass
3581.72	31.58	4.34	-7.1	28.82	Average Max	V	167	69	54	-25.18	Pass
10579.09	28.72	7.36	0.23	36.31	Average Max	V	142	134	54	-17.69	Pass

W56 band:
Above 1GHz-40GHz – 802.11a – 5500MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1885.28	45.6	3.15	-12.38	36.37	Peak Max	V	164	39	74	-37.63	Pass
3550.29	43.59	4.31	-7.2	40.7	Peak Max	V	177	233	74	-33.3	Pass
11001.10	40.57	8.02	1.5	50.1	Peak Max	V	182	51	74	-23.9	Pass
1885.28	33.47	3.15	-12.38	24.23	Average Max	V	164	39	54	-29.77	Pass
3550.29	31.75	4.31	-7.2	28.86	Average Max	V	177	233	54	-25.14	Pass
11001.10	27.93	8.02	1.5	37.46	Average Max	V	182	51	54	-16.54	Pass

Above 1GHz-40GHz – 802.11a – 5580MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1885.25	44.99	3.15	-12.38	35.75	Peak Max	V	164	338	74	-38.25	Pass
3550.57	43.35	4.31	-7.2	40.47	Peak Max	V	180	72	74	-33.53	Pass
11161.20	39.84	7.88	2.1	49.83	Peak Max	V	120	72	74	-24.17	Pass
1885.25	33.48	3.15	-12.38	24.24	Average Max	V	164	338	54	-29.76	Pass
3550.57	31.54	4.31	-7.2	28.66	Average Max	V	180	72	54	-25.35	Pass
11161.20	28.29	7.88	2.1	38.28	Average Max	V	120	72	54	-15.72	Pass

Above 1GHz-40GHz – 802.11a – 5700MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1884.03	45.45	3.15	-12.39	36.21	Peak Max	V	194	283	74	-37.79	Pass
3552.64	43.26	4.31	-7.19	40.38	Peak Max	V	190	42	74	-33.62	Pass
11400.53	40.57	7.68	2.36	50.61	Peak Max	V	107	19	74	-23.39	Pass
1884.03	33.52	3.15	-12.39	24.27	Average Max	V	194	283	54	-29.73	Pass
3552.64	31.84	4.31	-7.19	28.96	Average Max	V	190	42	54	-25.04	Pass
11400.53	29.03	7.68	2.36	39.07	Average Max	V	107	19	54	-14.93	Pass

Above 1GHz-40GHz – 802.11n-20M – 5500MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1896.39	45.01	3.16	-12.31	35.87	Peak Max	V	135	166	74	-38.13	Pass
3573.64	43.83	4.33	-7.13	41.03	Peak Max	V	100	280	74	-32.97	Pass
11001.79	40.37	8.02	1.51	49.9	Peak Max	V	109	245	74	-24.1	Pass
1896.39	33.62	3.16	-12.31	24.47	Average Max	V	135	166	54	-29.53	Pass
3573.64	31.47	4.33	-7.13	28.68	Average Max	V	100	280	54	-25.33	Pass
11001.79	28.04	8.02	1.51	37.57	Average Max	V	109	245	54	-16.43	Pass

Above 1GHz-40GHz – 802.11n-20M – 5580MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1911.38	45.47	3.18	-12.22	36.42	Peak Max	V	151	114	74	-37.58	Pass
3574.20	43.29	4.33	-7.12	40.5	Peak Max	V	138	71	74	-33.5	Pass
11162.13	39.95	7.88	2.1	49.93	Peak Max	V	134	190	74	-24.07	Pass
1911.38	33.44	3.18	-12.22	24.39	Average Max	V	151	114	54	-29.61	Pass
3574.20	31.75	4.33	-7.12	28.96	Average Max	V	138	71	54	-25.04	Pass
11162.13	28.51	7.88	2.1	38.5	Average Max	V	134	190	54	-15.5	Pass

Above 1GHz-40GHz – 802.11n-20M – 5700MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1908.88	44.88	3.17	-12.24	35.82	Peak Max	V	103	93	74	-38.18	Pass
3574.12	43.3	4.33	-7.12	40.51	Peak Max	V	151	273	74	-33.5	Pass
11399.59	40.14	7.68	2.36	50.18	Peak Max	V	120	20	74	-23.82	Pass
1908.88	33.43	3.17	-12.24	24.37	Average Max	V	103	93	54	-29.63	Pass
3574.12	31.68	4.33	-7.12	28.89	Average Max	V	151	273	54	-25.11	Pass
11399.59	28.88	7.68	2.36	38.92	Average Max	V	120	20	54	-15.08	Pass

Above 1GHz-40GHz – 802.11n-40M – 5510MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1890.01	46.18	3.15	-12.35	36.98	Peak Max	V	181	93	74	-37.02	Pass
3560.45	43.47	4.32	-7.17	40.62	Peak Max	V	145	76	74	-33.38	Pass
11001.09	40.21	8.02	1.5	49.74	Peak Max	V	108	351	74	-24.26	Pass
1890.01	33.84	3.15	-12.35	24.64	Average Max	V	181	93	54	-29.36	Pass
3560.45	31.62	4.32	-7.17	28.77	Average Max	V	145	76	54	-25.23	Pass
11001.09	28.02	8.02	1.5	37.55	Average Max	V	108	351	54	-16.45	Pass

Above 1GHz-40GHz – 802.11n-40M – 5550MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1890.75	45.01	3.15	-12.35	35.82	Peak Max	V	102	336	74	-38.19	Pass
3558.10	43.96	4.32	-7.18	41.1	Peak Max	V	190	237	74	-32.9	Pass
11140.97	39.98	7.9	2.04	49.92	Peak Max	V	162	106	74	-24.08	Pass
1890.75	33.58	3.15	-12.35	24.39	Average Max	V	102	336	54	-29.61	Pass
3558.10	31.95	4.32	-7.18	29.09	Average Max	V	190	237	54	-24.91	Pass
11140.97	28.14	7.9	2.04	38.08	Average Max	V	162	106	54	-15.92	Pass

Above 1GHz-40GHz – 802.11n-40M – 5670MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1889.96	45.37	3.15	-12.35	36.17	Peak Max	V	155	245	74	-37.83	Pass
3560.91	43.68	4.32	-7.17	40.83	Peak Max	V	166	262	74	-33.17	Pass
11339.87	40.63	7.73	2.03	50.39	Peak Max	V	171	191	74	-23.62	Pass
1889.96	33.68	3.15	-12.35	24.48	Average Max	V	155	245	54	-29.52	Pass
3560.91	31.86	4.32	-7.17	29.02	Average Max	V	166	262	54	-24.98	Pass
11339.87	28.9	7.73	2.03	38.66	Average Max	V	171	191	54	-15.34	Pass

Above 1GHz-40GHz – 802.11ac-80M – 5530MHz

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
1904.26	45.31	3.17	-12.26	36.22	Peak Max	V	152	244	74	-37.78	Pass
3583.92	43.4	4.34	-7.09	40.65	Peak Max	V	166	4	74	-33.35	Pass
11059.21	40.61	7.97	1.75	50.33	Peak Max	V	100	264	74	-23.67	Pass
1904.26	33.49	3.17	-12.26	24.4	Average Max	V	152	244	54	-29.61	Pass
3583.92	31.72	4.34	-7.09	28.97	Average Max	V	166	4	54	-25.04	Pass
11059.21	28.33	7.97	1.75	38.06	Average Max	V	100	264	54	-15.95	Pass

Above 1GHz-40GHz – 802.11ac-80M – 5610MHz

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
1903.76	45.25	3.17	-12.26	36.16	Peak Max	V	135	326	74	-37.84	Pass
3583.52	44.16	4.34	-7.1	41.41	Peak Max	V	185	147	74	-32.59	Pass
11219.55	39.4	7.83	2.13	49.37	Peak Max	V	140	101	74	-24.63	Pass
1903.76	33.46	3.17	-12.26	24.37	Average Max	V	135	326	54	-29.64	Pass
3583.52	31.83	4.34	-7.1	29.07	Average Max	V	185	147	54	-24.93	Pass
11219.55	28.21	7.83	2.13	38.18	Average Max	V	140	101	54	-15.82	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
Spectrum Analyzer	N9010A	10SL0219	08/20/2017	1 Year	08/20/2018	☒
RF Preamplifier	LPA-6-30	11140711	02/19/2017	1 Year	02/19/2018	☒
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	03/30/2017	1 Year	03/30/2018	☒
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2017	1 Year	08/12/2018	☒
Horn Antenna (1GHz~26GHz)	3115	100059	08/25/2017	1 Year	08/25/2018	☒
10 Meters SAC	10M	N/A	07/06/2017	1 Year	07/06/2018	☒

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		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 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 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06, AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2