

RF TEST REPORT



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

Applicant	:	Silex Technology, Inc.
Product Name	:	SDIO Wireless Module
Model No.	:	SX-SDMAC
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	:	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

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/RRR, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC IC_RF_SL17022401-SLX-005_DTS	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	Silex SX-SDMAC Module with Ethertronics Prestta Antenna
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	DTS
Clock Frequencies	N/A
Port/Connectors	N/a

6.2 Radio Description

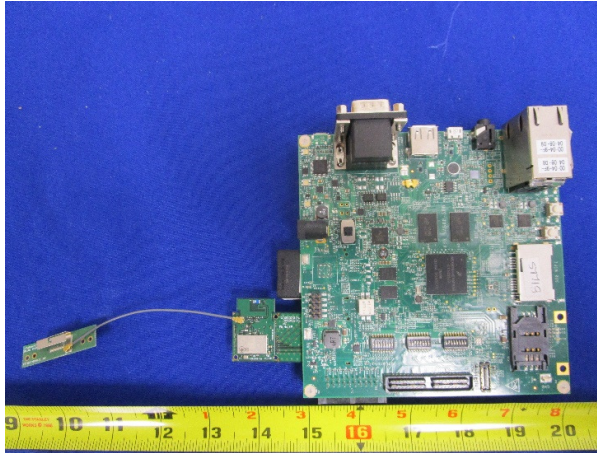
Radio Type	802.11b	802.11g	802.11a	802.11n-HT20	802.11n-HT40	802.11ac-80M
Operating Frequency	2412-2472MHz	2412-2472MHz	5180-5320MHz 5500-5720MHz	2412-2472MHz 5180-5320MHz 5500-5720MHz	2422 MHz - 2452 MHz 5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 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					

Note: 99% duty cycle modulated signal was used for testing.

[Power setting: WLAN]

Mode	Rate	Frequency	Power Setting
11b	2 Mbps (Short GI)	2412 MHz	17.5
		2417 MHz	18
		2437 MHz	18
		2457 MHz	18
		2462 MHz	17.5
11g	24Mbps	2412 MHz	13
		2417 MHz	15
		2437 MHz	15
		2457 MHz	15
		2462 MHz	12
11n20	MCS4	2412 MHz	12
		2417 MHz	15
		2437 MHz	15
		2457 MHz	15
		2462 MHz	11.5
11n40	MCS3	2422 MHz	9
		2427 MHz	9.5
		2437 MHz	10.5
		2447 MHz	10.5
		2452 MHz	9.5

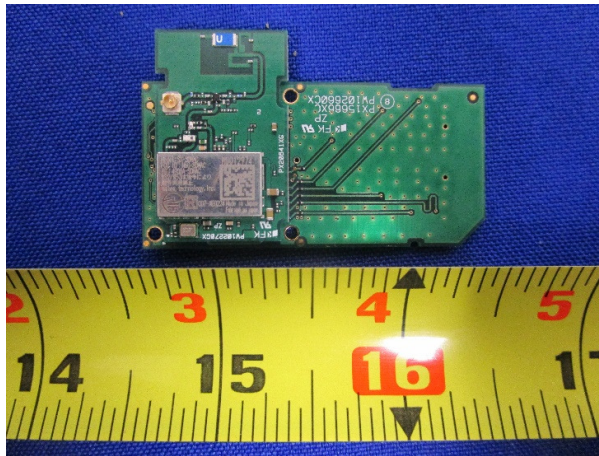
6.3 EUT Photos



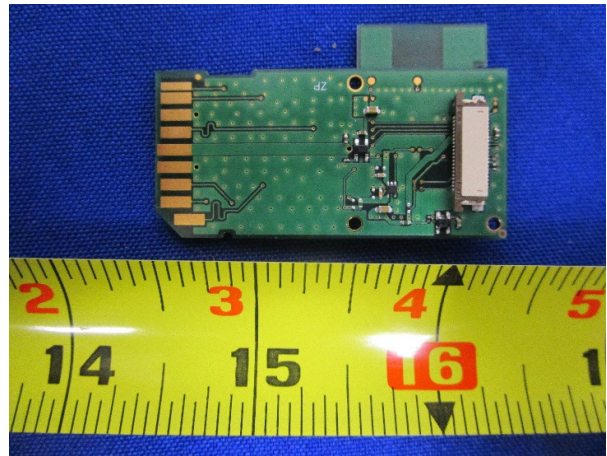
System Board With EUT Top View



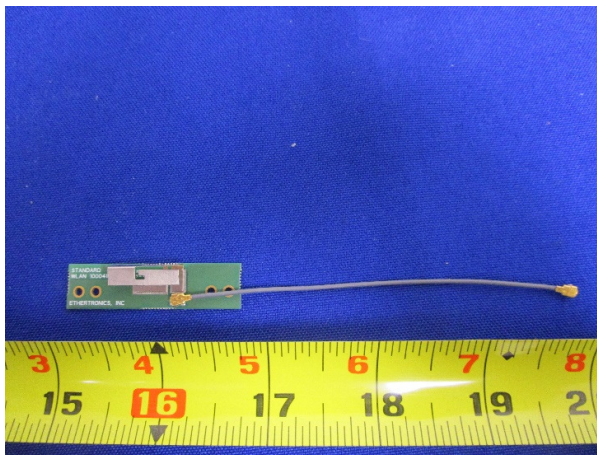
System Board With EUT Bottom View



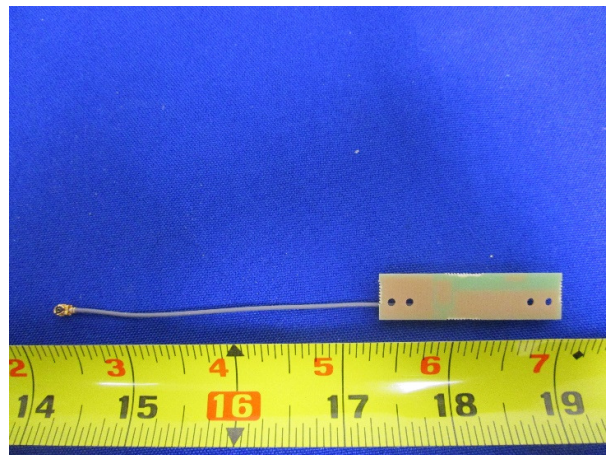
EUT Top View



EUT Bottom View

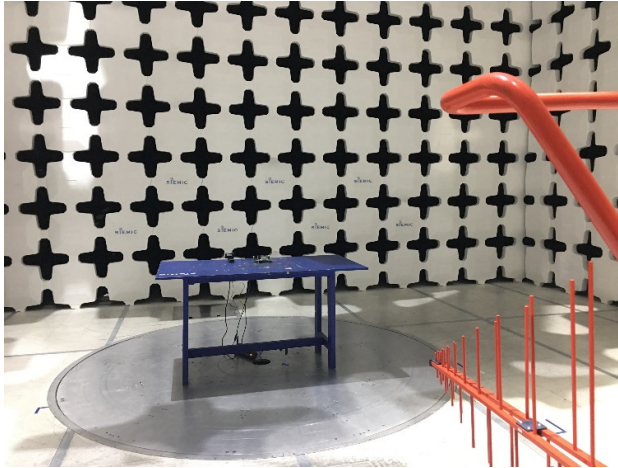


Ethertronics Prestta Antenna Top View

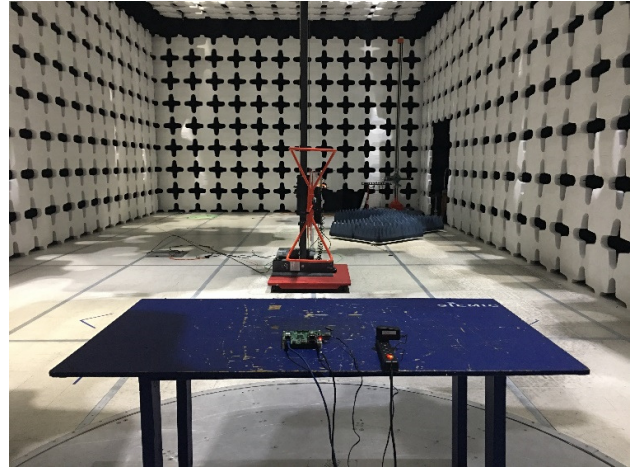


Ethertronics Prestta Antenna Bottom View

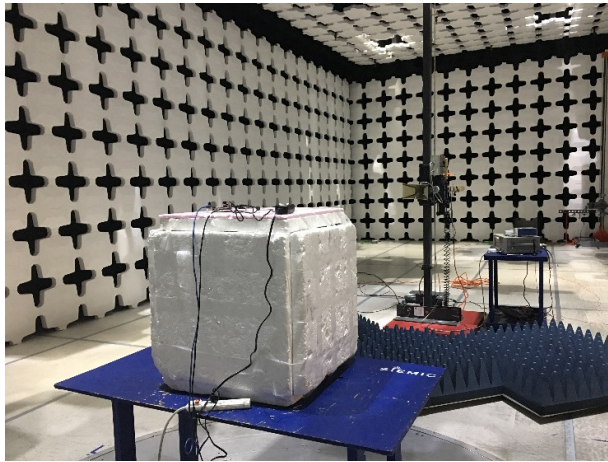
6.4 EUT Test Setup Photos



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	FCC	ANSI C63.10:2013	☐ Pass
	IC	RSS Gen 8.10	IC	558074 D01 DTS Meas Guidance v04	☒ N/A
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☐ Pass
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	☒ N/A

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☐ Pass
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	☒ N/A
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.2.1)	IC		☒ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013	☒ Pass
	IC	RSS247 (5.5)	IC	558074 D01 DTS Meas Guidance v04	☐ N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.4.4)	IC		☒ N/A
Receiver Spurious Emissions	IC	RSS Gen (4.8)	IC	RSS Gen Issue 4: 2014	☐ Pass ☒ N/A
Antenna Gain > 6 dBi	FCC	15.247(e)	FCC	-	☐ Pass
	IC	-	IC	-	☒ N/A
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v04	☐ Pass
	IC	RSS247 (5.2.2)	IC		☒ N/A
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	☒ N/A
Remark	- 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. - 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 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

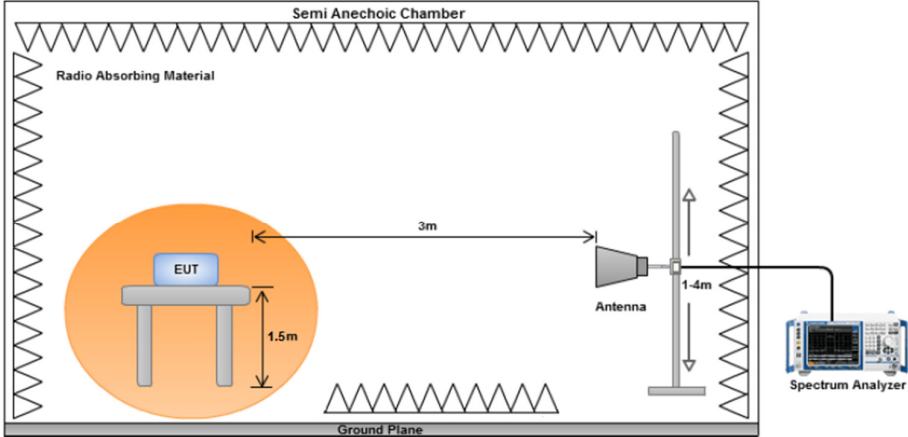
Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty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

Requirement(s):

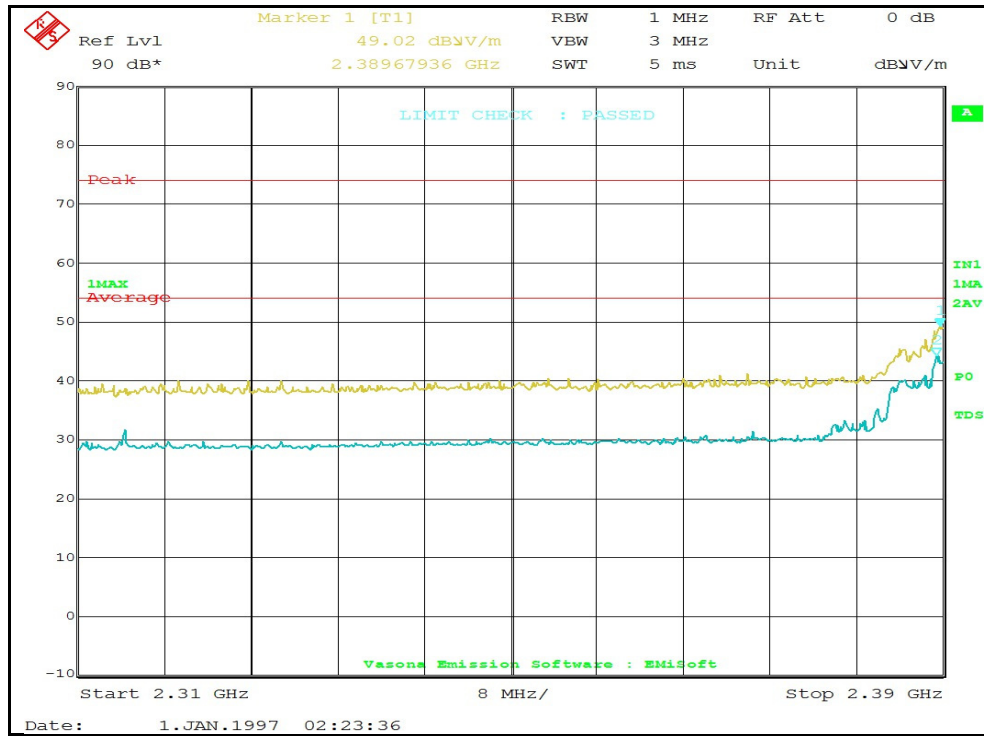
Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247(A8.5)	1	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out 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. Radiated measurement was measured with antenna port terminated, there isn't outstanding emission found at the edge of restricted frequency, within x dB margin		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes (See below) ☒ N/A

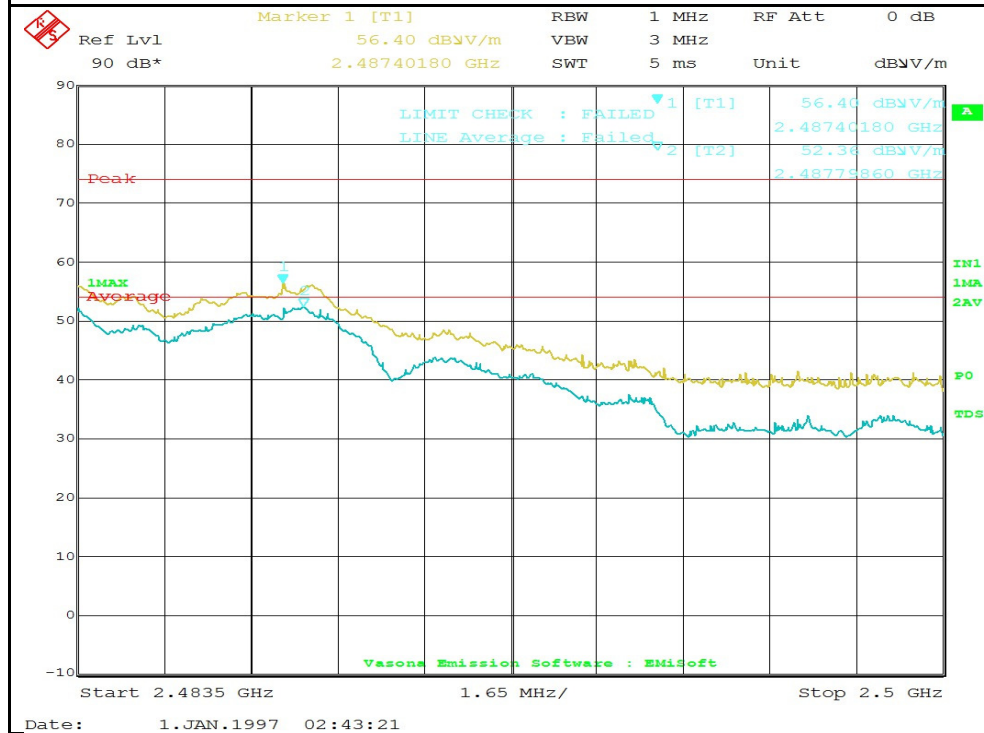
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Gary Chou at 10m chamber.

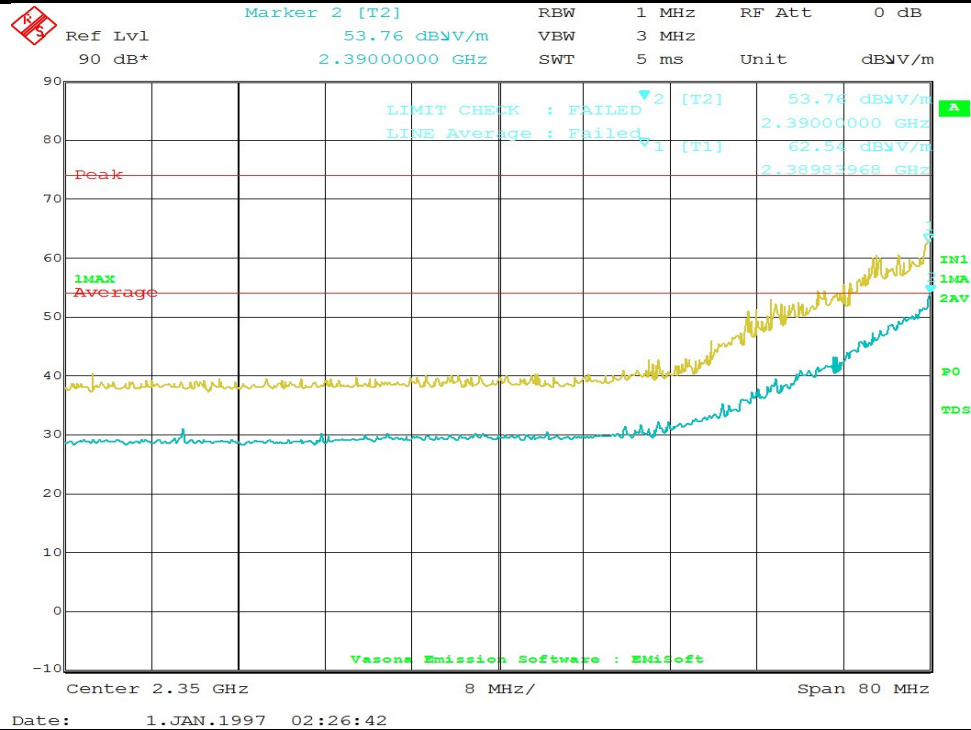
Restricted Band Measurement Plots:



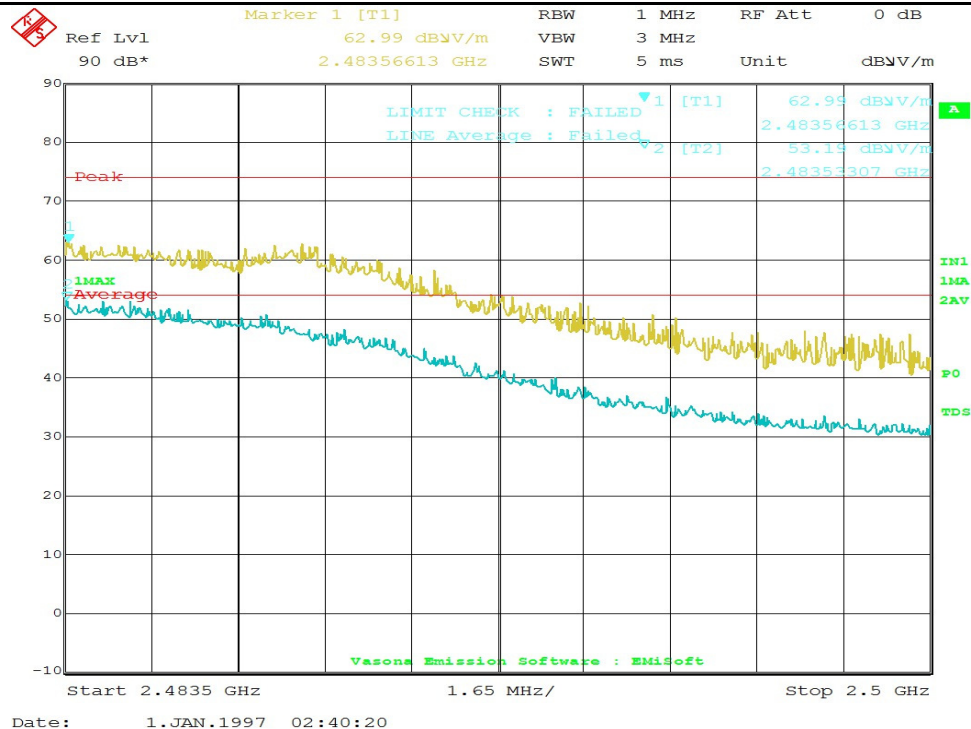
802.11b-2412MHz



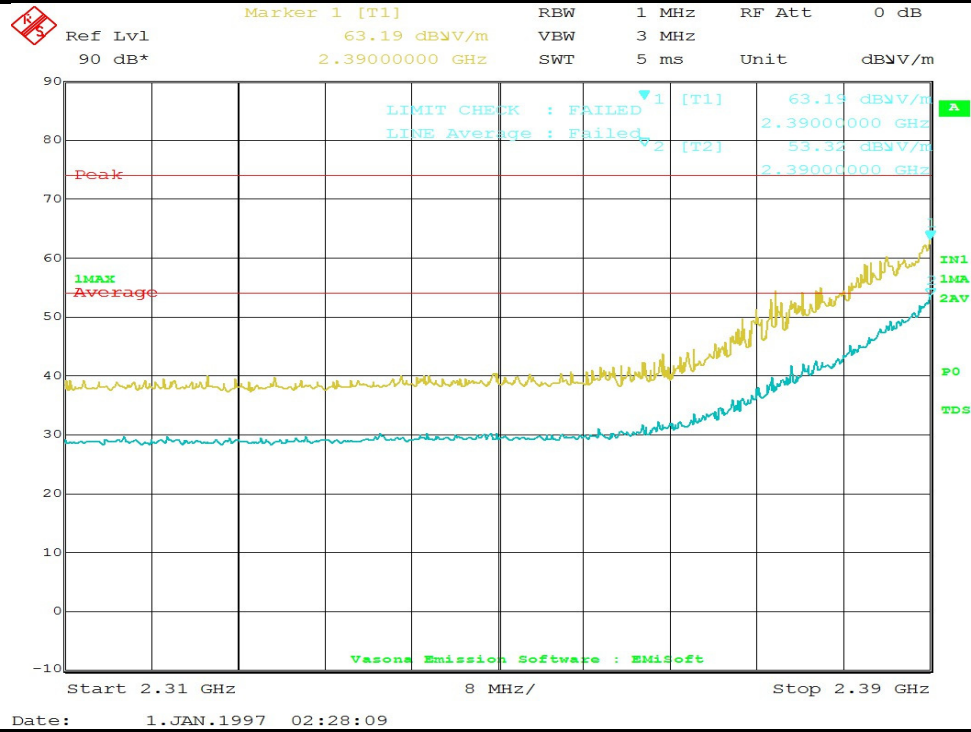
802.11b-2462MHz



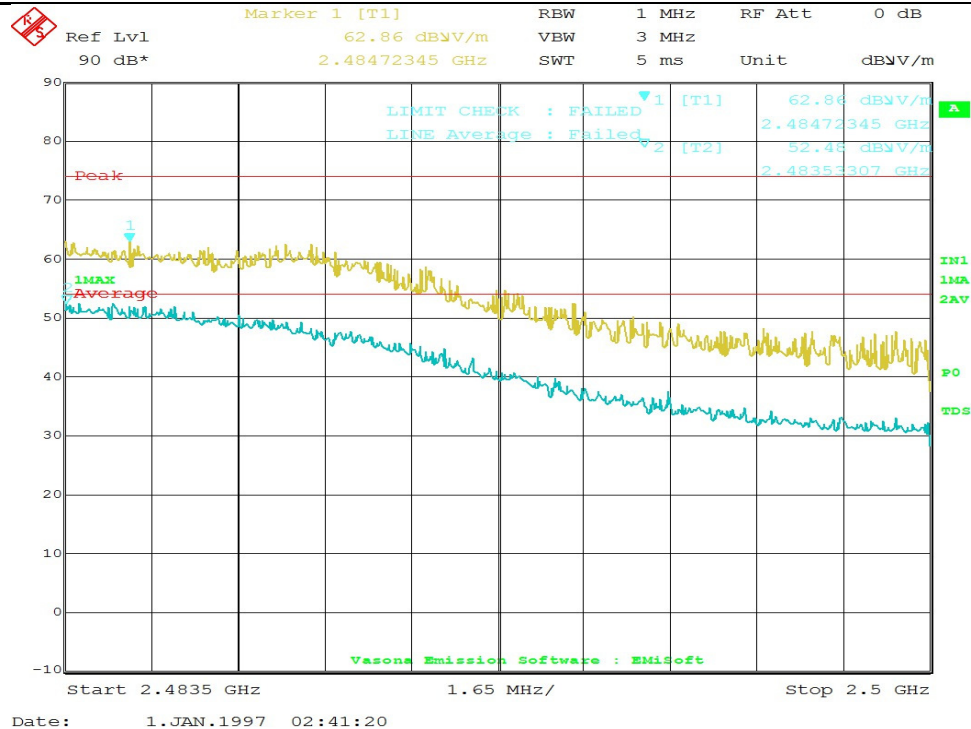
802.11g-2412MHz



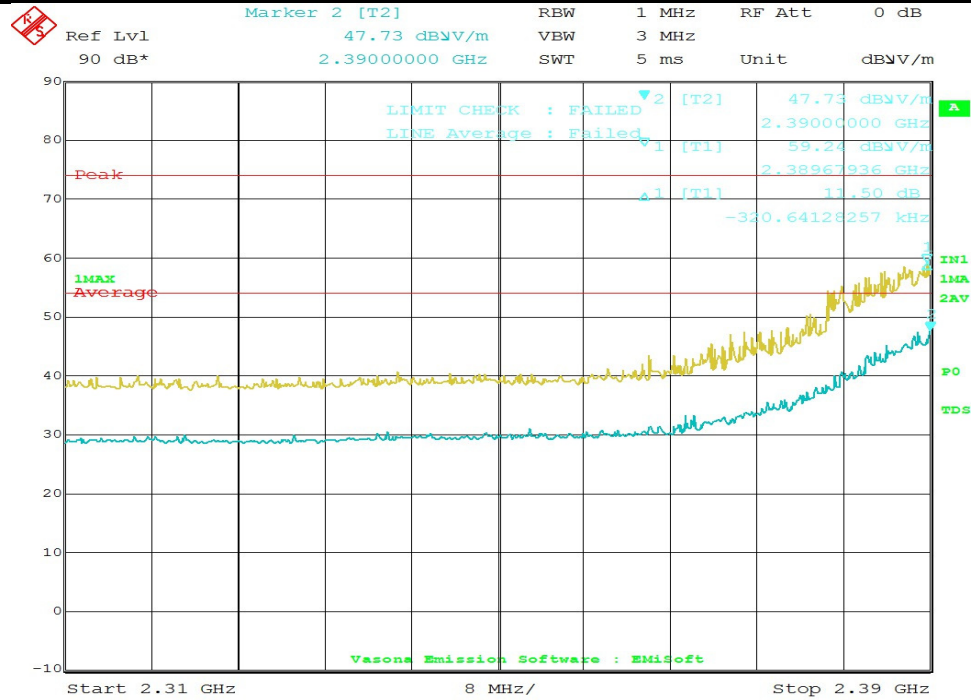
802.11g-2462MHz



802.11n-HT20-2412MHz

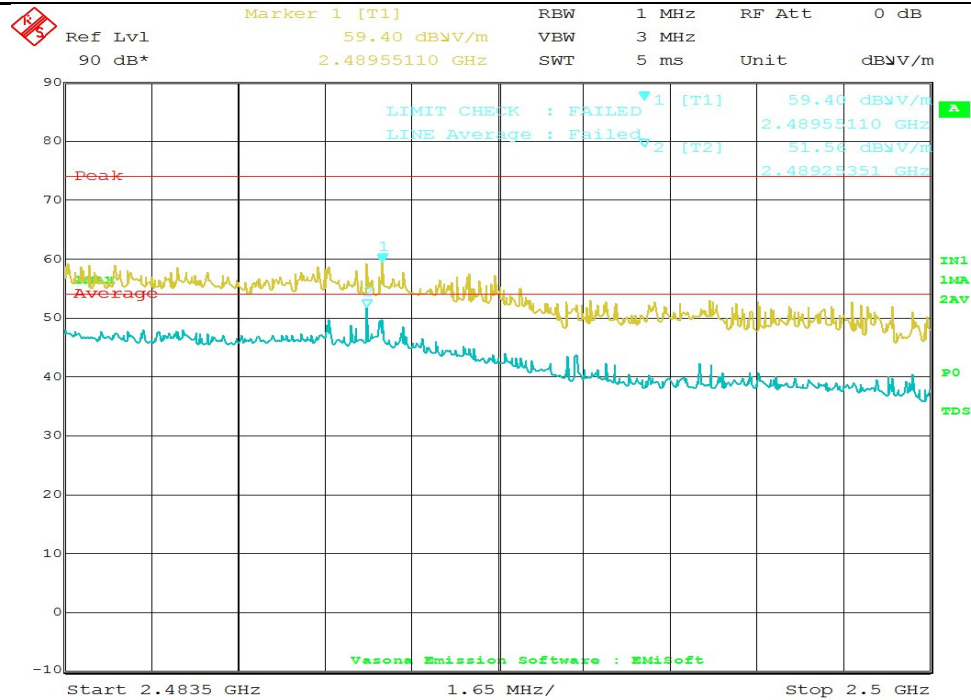


802.11n-HT20-2462MHz



Date: 1.JAN.1997 02:34:43

802.11n-HT40-2422MHz

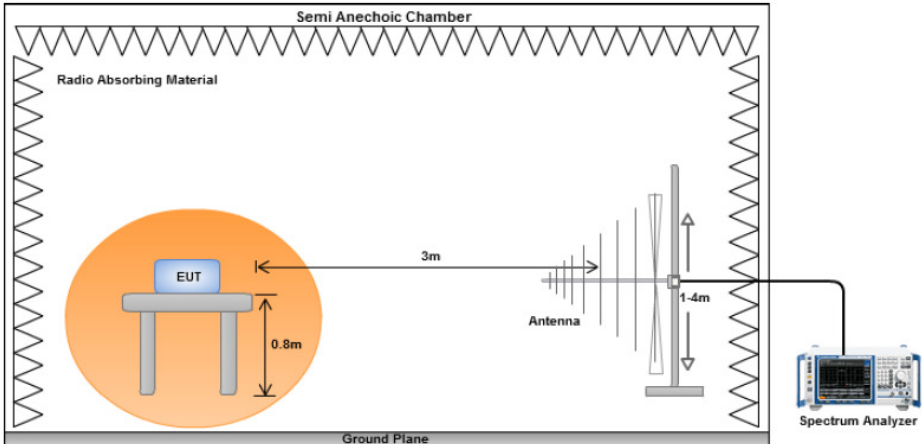


Date: 1.JAN.1997 02:48:36

802.11n-HT40-2452MHz

10.2 Radiated Spurious Emissions below 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.247(d) RSS247 (5.5)	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><tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr><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></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												

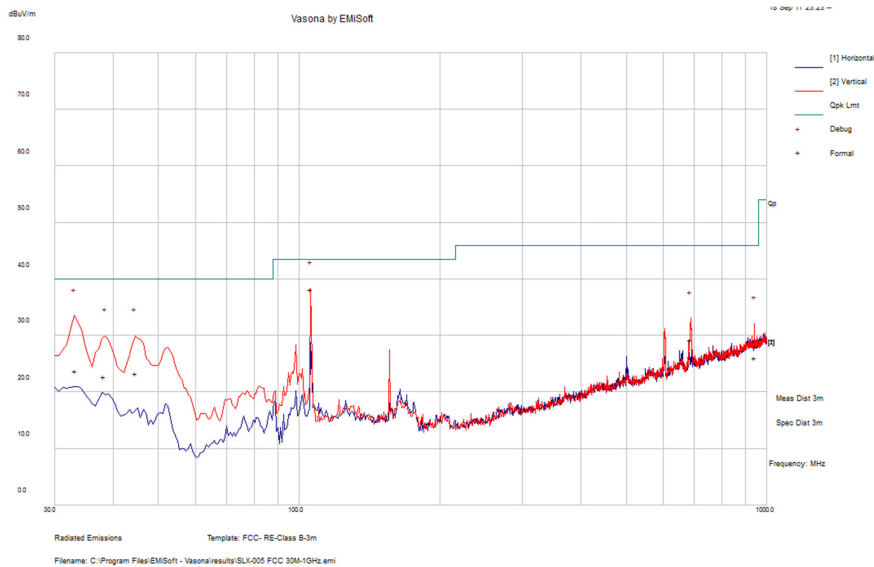
Test Data ☒ Yes (See below) ☐ N/A

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):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Gary Chou			
Test Date:	09/18/2017			
Remarks:	802.11n HT20, middle channel			

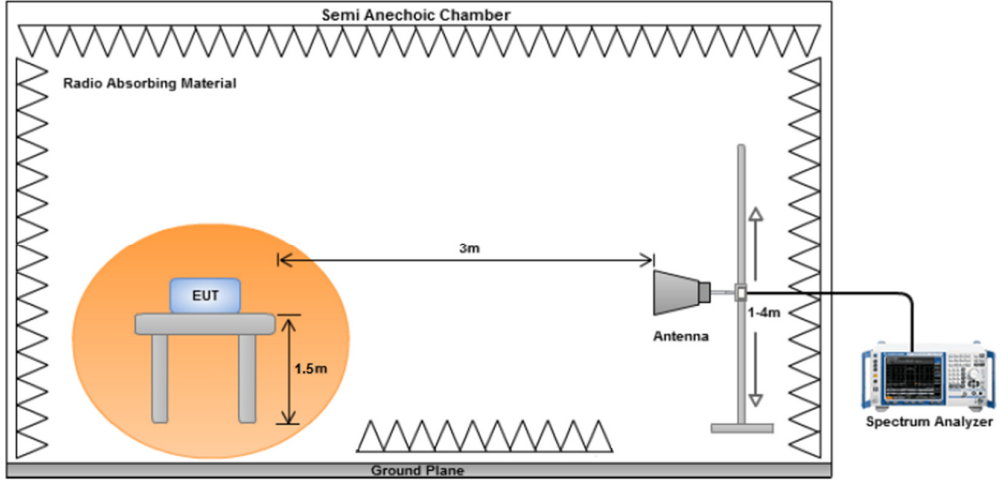


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
105.68	51.06	12.07	-24.96	38.17	Quasi Max	V	400	337	43.5	-5.33	Pass
33.20	29.08	11.34	-16.68	23.73	Quasi Max	V	185	294	40	-16.27	Pass
38.26	31.75	11.42	-20.5	22.67	Quasi Max	V	184	263	40	-17.33	Pass
44.66	36.62	11.52	-24.83	23.31	Quasi Max	V	180	321	40	-16.69	Pass
686.32	30.15	15.52	-16.51	29.17	Quasi Max	V	100	99	46	-16.83	Pass
940.23	22.7	16.75	-13.43	26.02	Quasi Max	V	160	311	46	-19.98	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), RSS210(A8.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 20 dB down ☒ 30 dB down	☒
	b)	or 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. There isn't outstanding emission found at the edge of restricted frequency.		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Gary Chou at 3m chamber.

Radiated Emission Test Results (Above 1GHz)

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
17869.02	37.61	11.21	8.29	57.12	Peak Max	H	336	174	74	-16.88	Pass
7234.85	40.2	6.63	0.02	46.85	Peak Max	H	254	67	74	-27.15	Pass
4824.04	42.26	5.48	-5	42.74	Peak Max	V	215	228	74	-31.26	Pass
3840.29	45.85	4.86	-6.1	44.61	Peak Max	H	99	83	74	-29.39	Pass
17869.02	25.21	11.21	8.29	44.71	Average Max	H	336	174	54	-9.29	Pass
7234.85	28.94	6.63	0.02	35.59	Average Max	H	254	67	54	-18.41	Pass
4824.04	32.61	5.48	-5	33.08	Average Max	V	215	228	54	-20.92	Pass
3840.29	40.38	4.86	-6.1	39.14	Average Max	H	99	83	54	-14.86	Pass

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
17841.57	38.28	11.21	8.01	57.5	Peak Max	H	151	247	74	-16.5	Pass
9747.95	40.32	7.92	-0.46	47.78	Peak Max	V	127	125	74	-26.22	Pass
7311.72	40.12	6.68	0.06	46.86	Peak Max	V	235	356	74	-27.14	Pass
4876.48	40.18	5.51	-5.1	40.6	Peak Max	H	373	64	74	-33.4	Pass
17841.57	25.76	11.21	8.01	44.98	Average Max	H	151	247	54	-9.02	Pass
9747.95	27.98	7.92	-0.46	35.44	Average Max	V	127	125	54	-18.56	Pass
7311.72	28.85	6.68	0.06	35.6	Average Max	V	235	356	54	-18.4	Pass
4876.48	28.74	5.51	-5.1	29.15	Average Max	H	373	64	54	-24.85	Pass

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
4919.29	39.94	15.54	-5.14	50.34	Peak Max	H	396	104	74	-23.66	Pass
7385.78	40.01	16.73	-0.25	56.5	Peak Max	V	251	101	74	-17.5	Pass
9846.37	39.02	17.85	-0.45	56.42	Peak Max	H	326	239	74	-17.58	Pass
4919.29	28.23	15.54	-5.14	38.63	Average Max	H	396	104	54	-15.37	Pass
7385.78	27.89	16.73	-0.25	44.37	Average Max	H	387	282	54	-9.63	Pass
9846.37	27.29	17.85	-0.45	44.69	Average Max	V	310	339	54	-9.31	Pass

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
7233.14	39.83	16.63	0.01	56.48	Peak Max	V	169	271	74	-17.52	Pass
9647.97	39.73	17.99	-0.34	57.38	Peak Max	V	117	4	74	-16.62	Pass
4822.69	43.6	15.48	-5	54.08	Peak Max	V	190	85	74	-19.92	Pass
7233.14	28.21	16.63	0.01	44.85	Average Max	V	169	271	54	-9.15	Pass
9647.97	28.15	17.99	-0.34	45.8	Average Max	V	117	4	54	-8.2	Pass
4822.69	30.57	15.48	-5	41.05	Average Max	V	190	85	54	-12.96	Pass

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
4876.21	45.14	15.51	-5.1	55.56	Peak Max	H	99	160	74	-18.44	Pass
7310.00	40.25	16.68	0.07	57	Peak Max	H	208	255	74	-17	Pass
9748.20	40.04	17.92	-0.46	57.5	Peak Max	V	257	271	74	-16.5	Pass
4876.21	32.05	15.51	-5.1	42.46	Average Max	H	99	160	54	-11.54	Pass
7310.00	28.26	16.68	0.07	45.01	Average Max	H	208	255	54	-8.99	Pass
9748.20	27.66	17.92	-0.46	45.12	Average Max	V	257	271	54	-8.88	Pass

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
4922.64	41.5	15.54	-5.14	51.9	Peak Max	H	270	347	74	-22.1	Pass
7385.51	39.95	16.73	-0.24	56.44	Peak Max	H	147	251	74	-17.56	Pass
9848.12	40.87	17.85	-0.45	58.27	Peak Max	V	98	330	74	-15.73	Pass
4922.64	29.18	15.54	-5.14	39.59	Average Max	H	270	347	54	-14.42	Pass
7385.51	28.14	16.73	-0.24	44.62	Average Max	H	147	251	54	-9.38	Pass
9848.12	27.52	17.85	-0.45	44.92	Average Max	V	98	330	54	-9.08	Pass

1GHz-25GHz – 802.11n-20M – 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
9646.33	39.66	17.99	-0.33	57.32	Peak Max	H	177	183	74	-16.68	Pass
4822.49	41.21	15.48	-5	51.69	Peak Max	V	314	21	74	-22.31	Pass
7234.45	39.74	16.63	0.02	56.39	Peak Max	V	263	294	74	-17.61	Pass
9646.33	27.01	17.99	-0.33	44.67	Average Max	V	141	289	54	-9.33	Pass
4822.49	29.06	15.48	-5	39.54	Average Max	H	100	301	54	-14.46	Pass
7234.45	27.61	16.63	0.02	44.26	Average Max	H	341	329	54	-9.74	Pass

1GHz-25GHz- 802.11n-20M - 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
4872.00	41.07	15.51	-5.09	51.49	Peak Max	V	275	333	74	-22.51	Pass
7310.89	40.96	16.68	0.07	57.71	Peak Max	H	131	291	74	-16.29	Pass
9747.84	39.06	17.92	-0.46	56.52	Peak Max	V	184	166	74	-17.48	Pass
4872.00	29	15.51	-5.09	39.42	Average Max	V	275	333	54	-14.58	Pass
7310.89	29.46	16.68	0.07	46.21	Average Max	H	131	291	54	-7.8	Pass
9747.84	27.08	17.92	-0.46	44.54	Average Max	V	184	166	54	-9.46	Pass

1GHz-25GHz- 802.11n-20M – 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
4925.30	40.79	15.54	-5.14	51.19	Peak Max	H	259	272	74	-22.81	Pass
7386.19	39.62	16.73	-0.25	56.11	Peak Max	H	243	317	74	-17.89	Pass
9846.38	39.41	17.85	-0.45	56.81	Peak Max	V	214	288	74	-17.19	Pass
4925.30	28.26	15.54	-5.14	38.67	Average Max	H	259	272	54	-15.33	Pass
7386.19	27.56	16.73	-0.25	44.04	Average Max	H	243	317	54	-9.96	Pass
9846.38	27.27	17.85	-0.45	44.67	Average Max	V	214	288	54	-9.33	Pass

Above 1GHz-25GHz- 802.11n-40M - 2422MHz

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
4844.93	41.35	15.47	-4.97	51.86	Peak Max	V	104	230	74	-22.14	Pass
9688.77	39.19	18.02	-0.2	57	Peak Max	H	103	4	74	-17	Pass
7266.88	39.49	16.62	-0.02	56.08	Peak Max	H	189	162	74	-17.92	Pass
4844.93	28.47	15.47	-4.97	38.97	Average Max	V	104	230	54	-15.03	Pass
9688.77	27.56	18.02	-0.2	45.38	Average Max	H	103	4	54	-8.62	Pass
7266.88	27.31	16.62	-0.02	43.9	Average Max	V	224	124	54	-10.1	Pass

Above 1GHz-25GHz- 802.11n-40M - 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
7311.26	39.61	16.69	0.02	56.32	Peak Max	H	248	240	74	-17.68	Pass
9748.79	39.41	17.91	-0.44	56.88	Peak Max	H	242	107	74	-17.12	Pass
4874.73	44.53	15.51	-5.1	54.94	Peak Max	H	140	183	74	-19.06	Pass
7311.26	27.78	16.69	0.02	44.49	Average Max	H	248	240	54	-9.51	Pass
9748.79	27.23	17.91	-0.44	44.7	Average Max	V	172	347	54	-9.31	Pass
4874.73	32.37	15.51	-5.1	42.78	Average Max	H	140	183	54	-11.22	Pass

Above 1GHz-25GHz- 802.11n-40M - 2452MHz

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
7356.23	39.82	16.76	-0.13	56.45	Peak Max	V	145	356	74	-17.55	Pass
9921.68	39.74	17.8	-0.42	57.12	Peak Max	H	154	207	74	-16.88	Pass
4904.34	41.53	15.56	-5.13	51.96	Peak Max	H	166	164	74	-22.04	Pass
7356.23	27.64	16.76	-0.13	44.27	Average Max	V	145	356	54	-9.73	Pass
9921.68	27.57	17.8	-0.42	44.95	Average Max	H	154	207	54	-9.05	Pass
4904.34	29.11	15.56	-5.13	39.53	Average Max	H	166	164	54	-14.47	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