

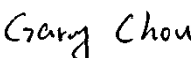
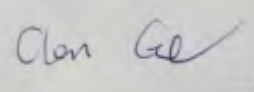
RF TEST REPORT



Report No.: FCC_IC RF_SL15101901-SLX-027_DTS Rev 1.0
Supersede Report No.: FCC_IC RF_SL15101901-SLX-027_DTS

Applicant	:	Silex Technology, Inc.
Product Name	:	802.11a/b/g/n/ac + BT4.1 module
Model No.	:	SX-SDPAC
Test Standard	:	47 CFR 15.247
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r05
FCC ID	:	N6C-SDPAC
IC ID	:	4908A-SDPAC
Dates of test	:	06/01/2016 to 06/30/2016
Issue Date	:	08/09/2016
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



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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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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
6.3	Antenna Description	7
6.4	EUT Photos	8
6.5	EUT Test Setup Photos	9
7	SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION	10
7.1	Supporting Equipment	10
7.2	Cabling Description	10
7.3	Test Software Description	10
8	TEST SUMMARY	11
9	MEASUREMENT UNCERTAINTY	12
10	MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	13
10.1	Conducted Emissions	13
10.2	6dB & 99% Bandwidth	16
10.3	Output Power	21
10.4	Band Edge	23
10.5	Peak Spectral Density	26
10.6	Radiated Spurious Emissions in restricted band	31
10.7	Radiated Spurious Emissions below 1GHz	34
10.8	Radiated Spurious Emissions between 1GHz – 25GHz	37
ANNEX A. TEST INSTRUMENT		43
ANNEX B. SIEMIC ACCREDITATION		44

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC RF_SL15101901-SLX-027_DTS	None	Original	07/05/2016
FCC_IC RF_SL15101901-SLX-027_DTS Rev 1.0	1.0	Updated per TCB reviewer	08/09/2016

2 Executive Summary

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

Company: Silex Technology, Inc.
Product: 802.11a/b/g/n/ac + BT 4.1 module
Model: SX-SDPAC

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	802.11a/b/g/n/ac + BT 4.1 module
Model No.	SX-SDPAC
Trade Name	Silex
Serial No.	N/A
Host Model No.	N/A
Input Power	5VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Date of EUT received	05/26/2016
Equipment Class/ Category	DTS, UNII
Clock Frequencies	N/A
Port/Connectors	PoE, Ethernet

6.2 Radio Description

Wi-Fi:

Radio Type	802.11b	802.11g	802.11n-20M	802.11n-40M
Operating Frequency	2412-2462MHz	2412-2462MHz	2412-2462MHz	2422-2452MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	5MHz	5MHz
Number of Channels	11	11	11	7
Antenna Type	PCB Antenna			
Antenna Gain (Peak)	2.4GHz: 3.25 dBi			
Antenna Connector Type	U.FL			
Note	N/A			

Bluetooth LE:

Radio Type	Bluetooth (Ver4.1)
Operating Frequency	2402MHz-2480MHz
Modulation	GFSK
Channel Spacing	2MHz
Antenna Type	PCB Antenna
Antenna Gain	2.4GHz: 3.25 dBi
Antenna Connector Type	U.FL connector
Note	N/A

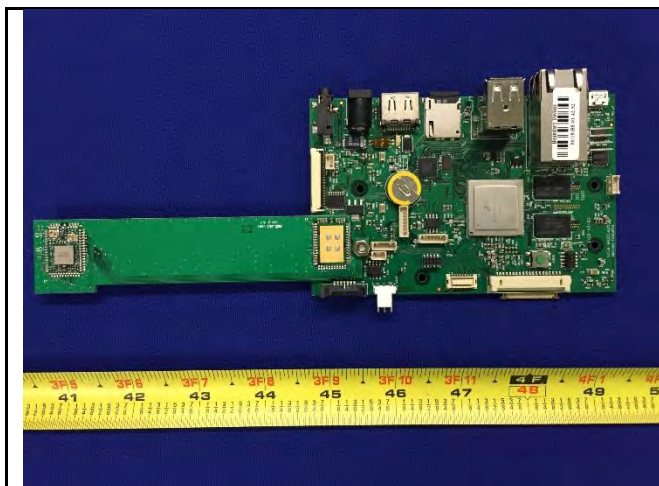
EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	16
802.11-b	2437	16
802.11-b	2462	16
802.11-g	2412	15
802.11-g	2437	15
802.11-g	2462	16
802.11-n-20	2412	15
802.11-n-20	2437	15
802.11-n-20	2462	16
802.11-n-40	2422	15
802.11-n-40	2437	15
802.11-n-40	2452	15

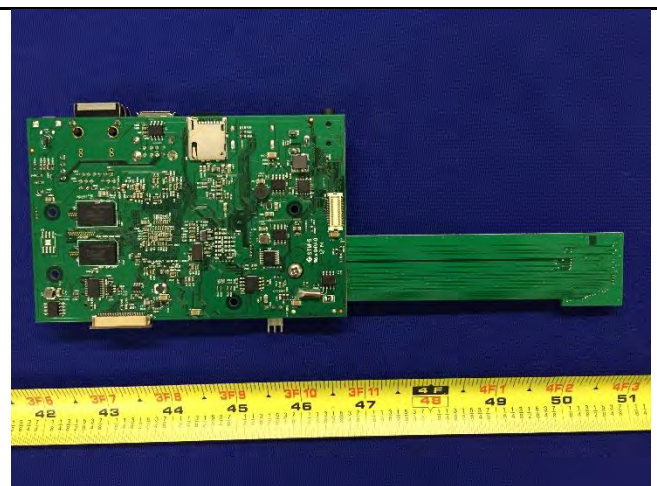
6.3 Antenna Description

Vendor	Part Number	Antenna type	W24	W52	W53	W56
Molex	146153	PCB type di-pole antenna	3.2	4.75	4.75	4.75
Unictron	H2B1PC1A1C (AA258)	PCB type di-pole antenna	2.67	3.35	3.35	3.35
Unictron	H2B1PD1A1C (AA222)	PCB type di-pole antenna	2.57	3.15	3.15	3.15

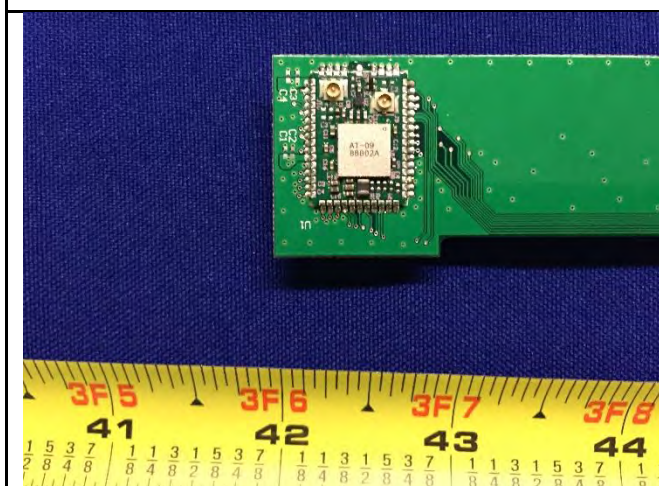
6.4 EUT Photos



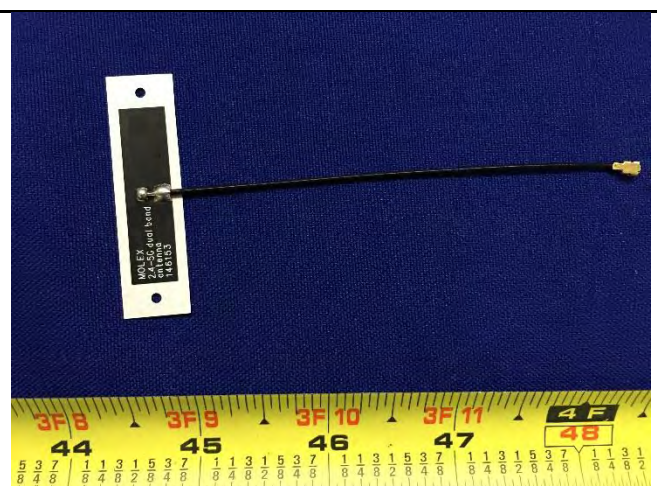
Top View



Bottom View

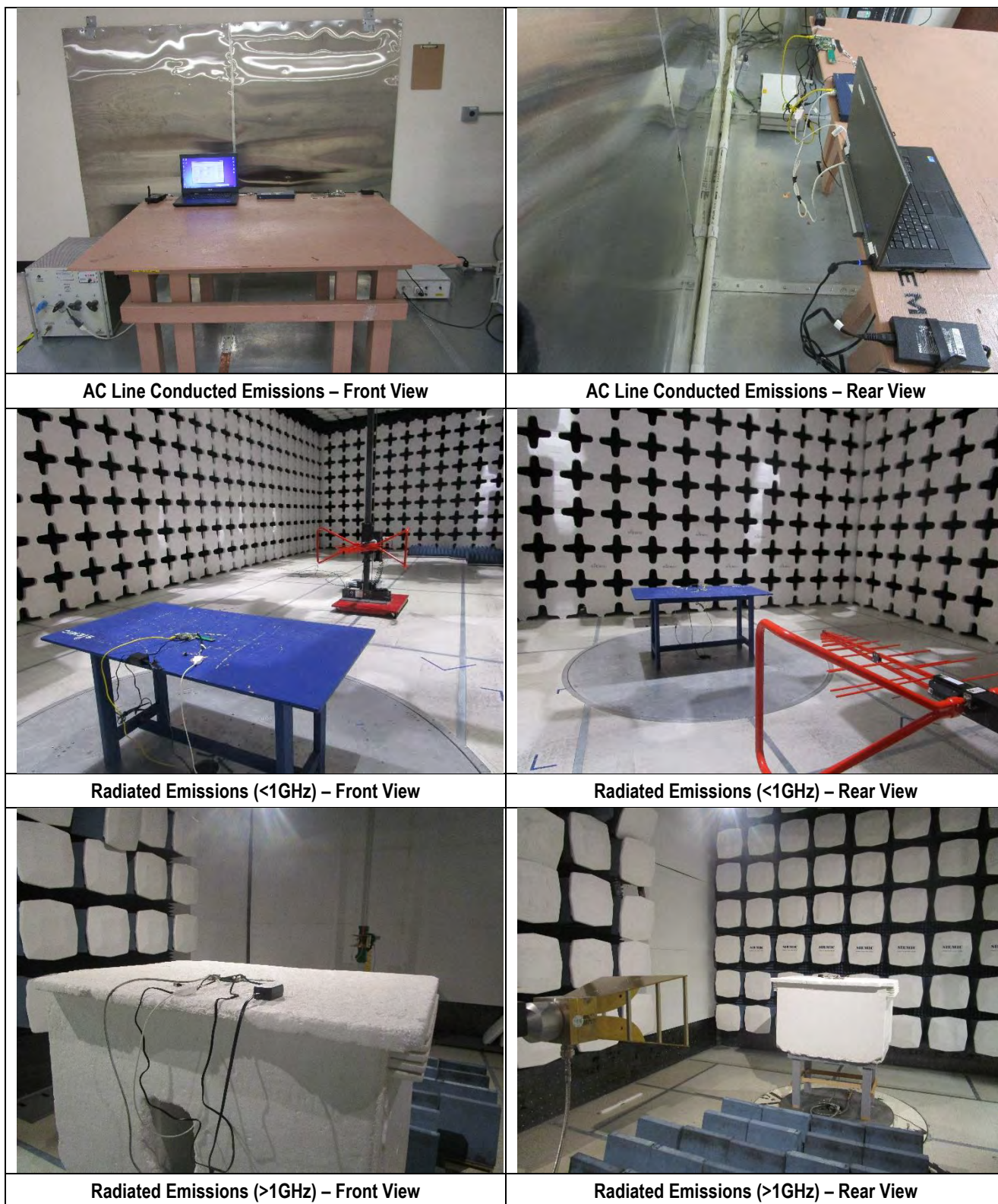


Radio Module View



Antenna View

6.5 EUT Test Setup Photos



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	-
2	Hub	DS108	N/A	NetGear	-

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	-
RJ45	EUT	Hub	Laptop	Hub	1	Unshielded	-

7.3 Test Software Description

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

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Restricted Band of Operation	FCC	15.205	FCC	ANSI C63.10:2013	☒ Pass
	IC	RSS Gen 8.10	IC	558074 D01 DTS Meas Guidance v03r05	☐ 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 v03r05	☒ 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 v03r05	☐ N/A
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r05	☒ 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 v03r05	☒ 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	1. All measurement uncertainties do not take into consideration for all presented test results. 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.				

9 Measurement Uncertainty

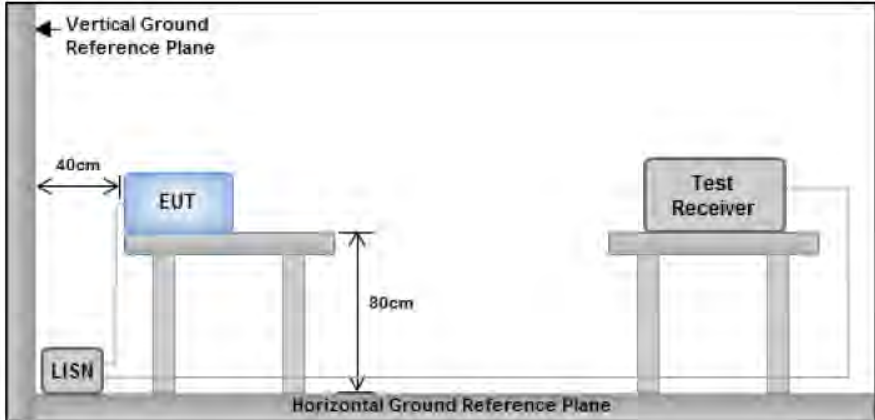
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious 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)	+4.3dB/-4.1dB

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

Frequency ranges (MHz)	Limit (dBuV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

Spec	Item	Requirement	Applicable
47CFR§15.207	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.	☒
Test Setup		 Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes	
Procedure		- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply.	
Remark		EUT tested with AC 110V 60Hz	
Result		☒ Pass ☐ Fail	

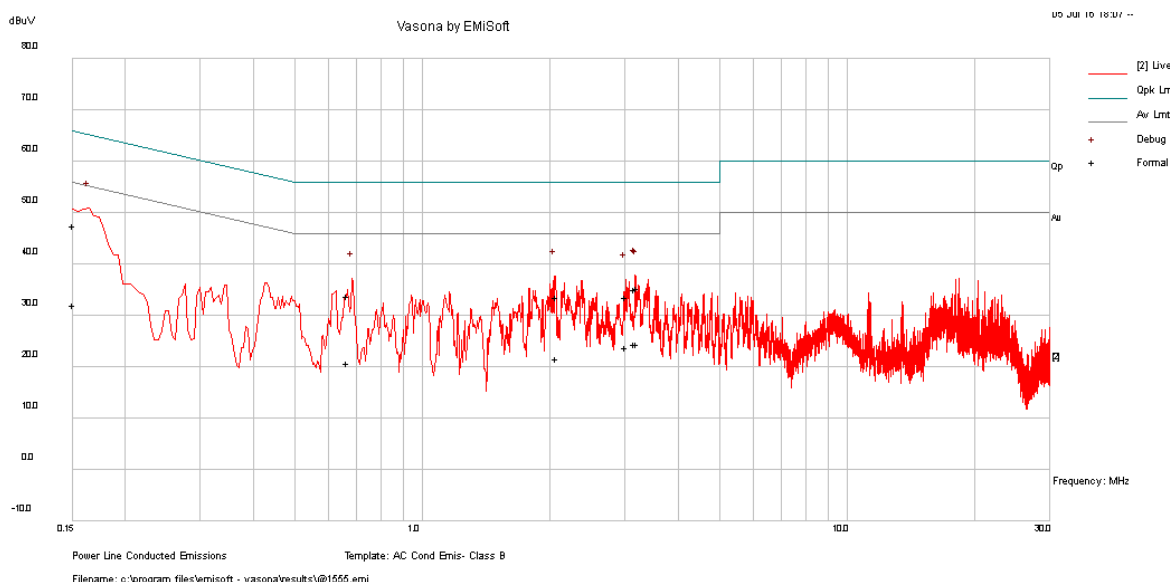
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at Conducted Emission test site.

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120VAC, 60Hz			
Tested by:	Chen Ge			
Test Date:	07/05/2016			
Remarks	AC Line @ Line			



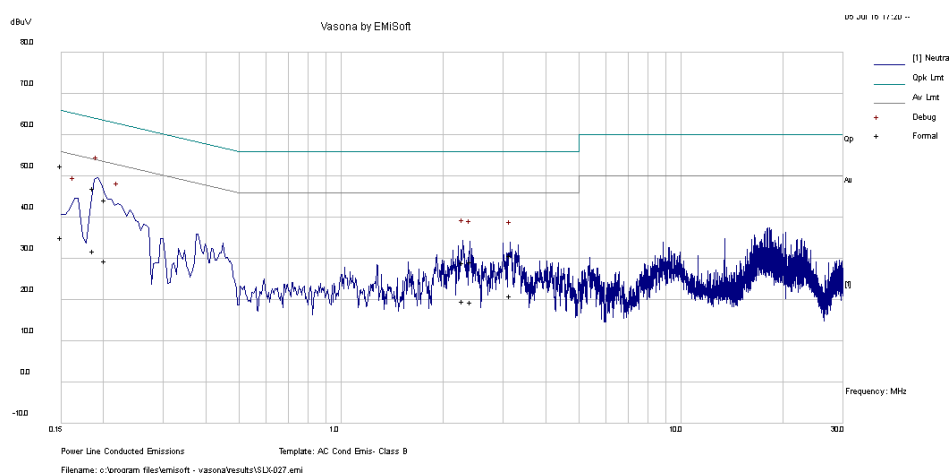
Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.15	35.87	10	1.78	47.65	Quasi Peak	Live	65.93	-18.27	Pass
3.16	24.6	10.03	0.55	35.18	Quasi Peak	Live	56	-20.82	Pass
2.07	23.11	10.02	0.55	33.69	Quasi Peak	Live	56	-22.31	Pass
3.20	24.82	10.03	0.55	35.4	Quasi Peak	Live	56	-20.6	Pass
0.67	23.32	10.01	0.62	33.95	Quasi Peak	Live	56	-22.05	Pass
3.01	23.11	10.03	0.55	33.69	Quasi Peak	Live	56	-22.31	Pass
0.15	20.43	10	1.78	32.22	Average	Live	55.93	-23.71	Pass
3.16	13.88	10.03	0.55	24.46	Average	Live	46	-21.54	Pass
2.07	11.19	10.02	0.55	21.76	Average	Live	46	-24.24	Pass
3.20	13.85	10.03	0.55	24.43	Average	Live	46	-21.57	Pass
0.67	10.1	10.01	0.62	20.73	Average	Live	46	-25.27	Pass
3.01	13.34	10.03	0.55	23.92	Average	Live	46	-22.08	Pass

Note: The results above show only the worst case.

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120VAC, 60Hz			
Tested by:	Chen Ge			
Test Date:	07/05/2016			
Remarks	AC Line @ Neutral			



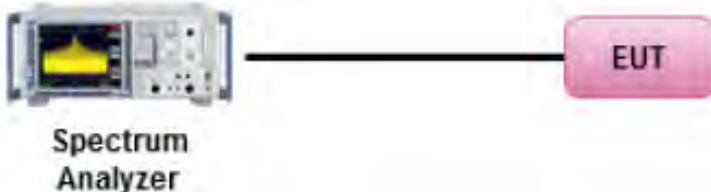
Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.19	35.67	10	1.41	47.09	Quasi Peak	Neutral	64.17	-17.09	Pass
0.20	33.08	10	1.3	44.39	Quasi Peak	Neutral	63.53	-19.14	Pass
0.15	40.7	10	1.8	52.5	Quasi Peak	Neutral	66	-13.5	Pass
2.29	18.5	10.02	0.55	29.08	Quasi Peak	Neutral	56	-26.92	Pass
2.41	18.74	10.03	0.55	29.32	Quasi Peak	Neutral	56	-26.68	Pass
3.15	20.21	10.03	0.55	30.79	Quasi Peak	Neutral	56	-25.21	Pass
0.19	20.57	10	1.41	31.99	Average	Neutral	54.17	-22.19	Pass
0.20	18.21	10	1.3	29.51	Average	Neutral	53.53	-24.02	Pass
0.15	23.43	10	1.8	35.24	Average	Neutral	56	-20.76	Pass
2.29	9.26	10.02	0.55	19.84	Average	Neutral	46	-26.16	Pass
2.41	8.91	10.03	0.55	19.49	Average	Neutral	46	-26.51	Pass
3.15	10.54	10.03	0.55	21.12	Average	Neutral	46	-24.88	Pass

Note: The results above show only the worst case.

10.2 6dB & 99% Bandwidth

Requirement(s):

Spec	Requirement	Applicable
§ 15.247 RSS247 (5.2.1)	6dB BW≥500KHz;	☒
RSS Gen 4.6.1	The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual. The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth	☒
Test Setup		
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 8.1 DTS bandwidth <u>6dB Emission bandwidth measurement procedure</u> - Set RBW = 100 kHz. - Set the video bandwidth (VBW) ≥ 3 x RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. - Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.	
Test Date	06/20/2016	Environmental condition Temperature 23°C Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A	
Result	☒ Pass ☐ Fail	

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes ☐ N/A

Test was done by Chen Ge at RF test site.

Wi-Fi:

6dB Bandwidth measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11b	2412	Low	7.32	≥0.5	Pass
		2437	Mid	7.53	≥0.5	Pass
		2462	High	6.54	≥0.5	Pass
	802.11g	2412	Low	15.96	≥0.5	Pass
		2437	Mid	14.03	≥0.5	Pass
		2462	High	16.32	≥0.5	Pass
	802.11n-20M	2412	Low	16.68	≥0.5	Pass
		2437	Mid	17.58	≥0.5	Pass
		2462	High	17.11	≥0.5	Pass
	802.11n-40M	2422	Low	32.88	≥0.5	Pass
		2437	Mid	34.10	≥0.5	Pass
		2452	High	31.66	≥0.5	Pass

99% OBW measurement result for 2.4GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)
99% OBW	802.11b	2412	Low	13.38
		2437	Mid	13.03
		2462	High	13.09
	802.11g	2412	Low	16.31
		2437	Mid	16.31
		2462	High	16.28
	802.11n-20M	2412	Low	17.52
		2437	Mid	17.48
		2462	High	17.47
	802.11n-40M	2422	Low	35.89
		2437	Mid	35.74
		2452	High	35.75

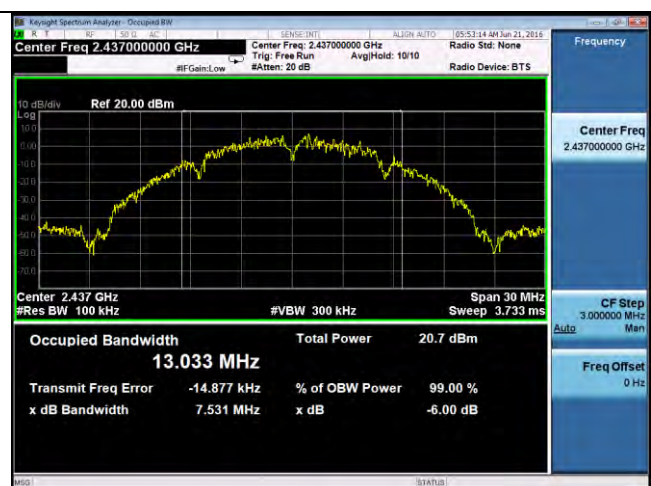
BLE:

Channel	Channel Frequency (MHz)	OBW	
		99% (MHz)	6dB(KHz)
Low	2402	1.08	665.0
Mid	2440	1.08	670.8
High	2480	1.12	672.3

6dB Bandwidth Test Plots



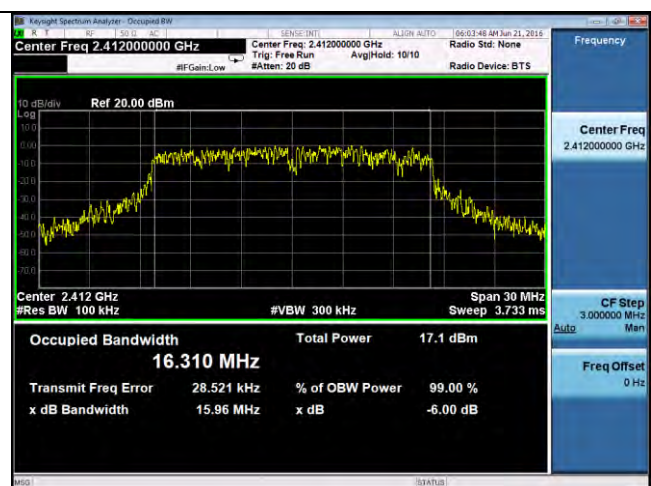
6dB BW -2.4G 802.11b 2412MHz



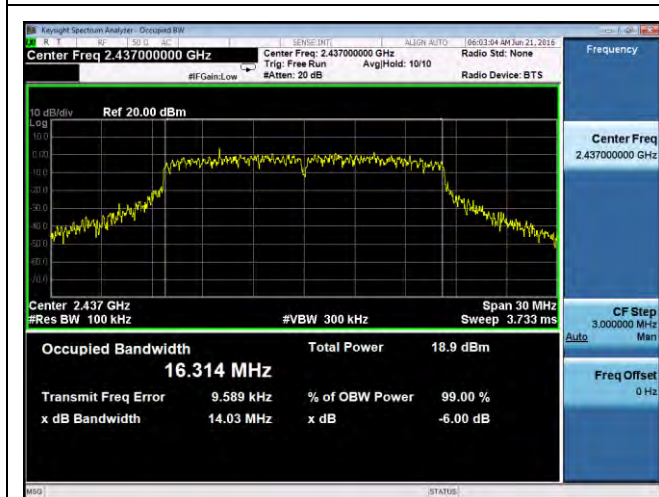
6dB BW -2.4G 802.11b 2437MHz



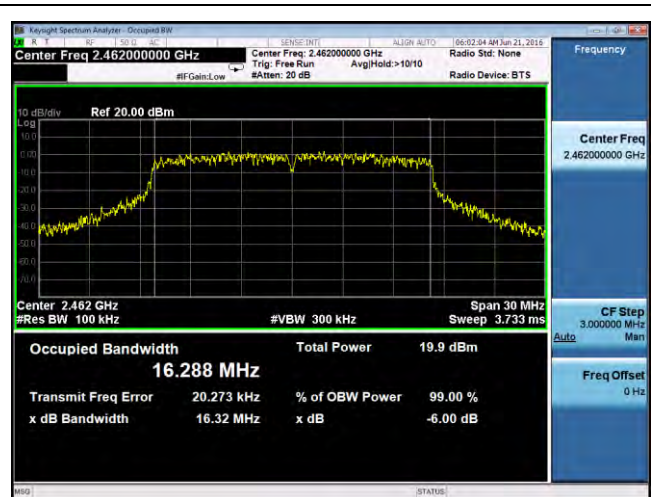
6dB BW -2.4G 802.11b 2462MHz



6dB BW -2.4G 802.11g 2412MHz



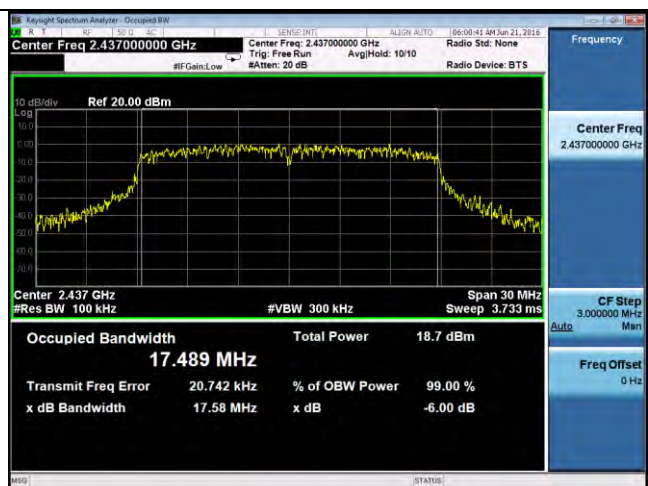
6dB BW -2.4G 802.11g 2437MHz



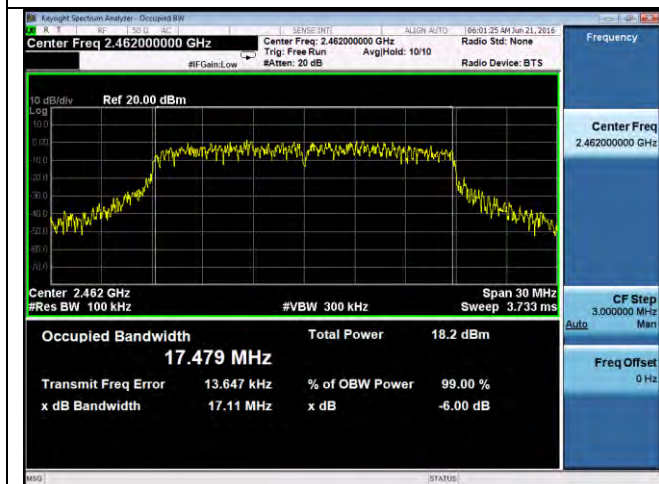
6dB BW -2.4G 802.11g 2462MHz



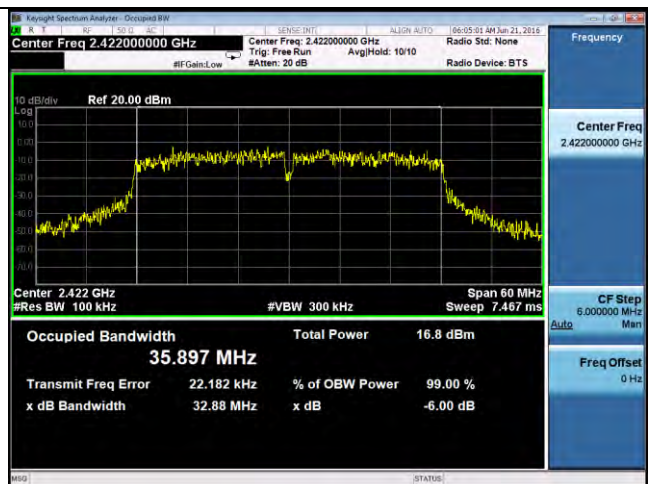
6dB BW -2.4G 802.11n-20M 2412MHz



6dB BW -2.4G 802.11n-20M 2437MHz



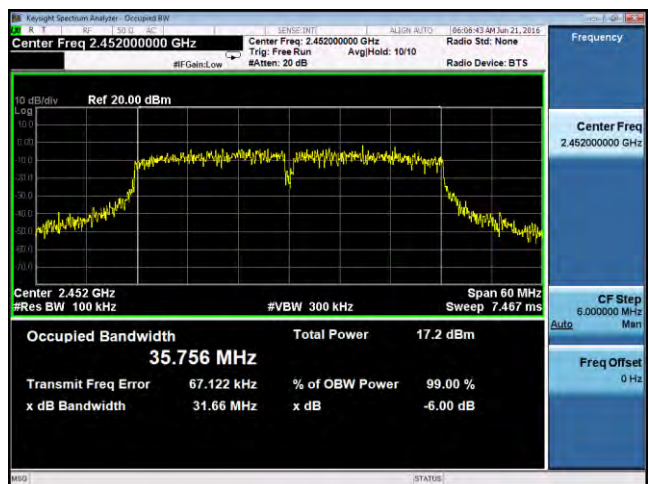
6dB BW -2.4G 802.11n-20M 2462MHz



6dB BW -2.4G 802.11n-40M 2422MHz



6dB BW -2.4G 802.11n-40M 2437MHz



6dB BW -2.4G 802.11n-40M 2452MHz



6dB BW – BLE 2402MHz



6dB BW – BLE 2440MHz



6dB BW – BLE 2480MHz



-

10.3 Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247 RSS247 (5.4.4)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☐
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☐
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & < 50 channels: ≤ 0.25 Watt	☐
	f)	DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤ 1 Watt	☒
Test Setup	 Power Meter		
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 9.2.3.1 <u>Measurement using a Power Meter (PM)</u> Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required. - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result Repeat above steps for different test channel and other modulation type.		
Test Date	06/18/2016 – 06/22/2016	Environmental condition	Temperature 23°C Relative Humidity 44% Atmospheric Pressure 1021mbar
Remark	NONE		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by **Chen Ge** at RF test site.

Output Power measurement result for Wi-Fi:

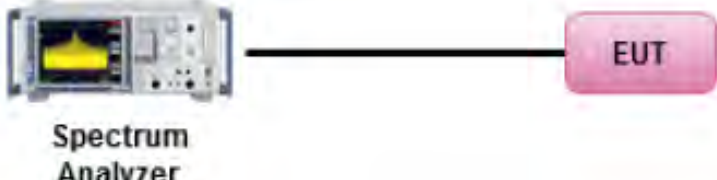
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)	Limit (dBm)	Result
Output power	802.11b	2412	Low	17.13	30	Pass
		2437	Mid	17.26	30	Pass
		2462	High	17.83	30	Pass
	802.11g	2412	Low	15.35	30	Pass
		2437	Mid	15.60	30	Pass
		2462	High	16.38	30	Pass
	802.11n-20M	2412	Low	15.18	30	Pass
		2437	Mid	15.36	30	Pass
		2462	High	16.07	30	Pass
	802.11n-40M	2422	Low	14.71	30	Pass
		2437	Mid	15.02	30	Pass
		2452	High	14.93	30	Pass

Output Power measurement results for BLE:

Type	Freq (MHz)	Test mode	CH	Conducted Power (dBm)	Limit (dBm)	Result
Output power	2402	Bluetooth LE	Low	0.55	≤30	Pass
	2441	Bluetooth LE	Mid	0.83	≤30	Pass
	2480	Bluetooth LE	High	0.65	≤30	Pass

10.4 Band Edge

Requirement(s):

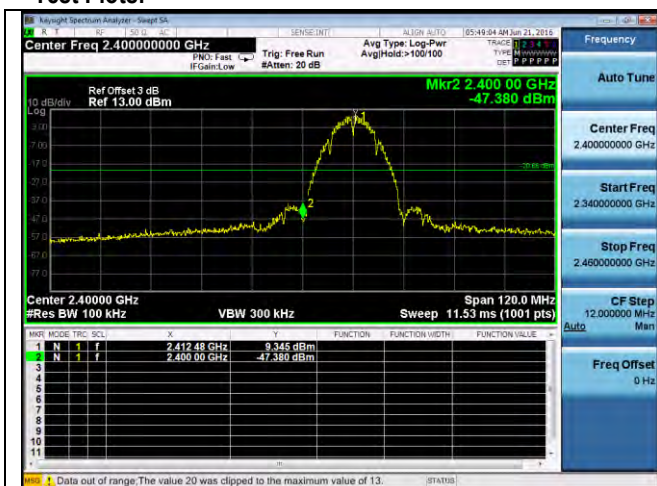
Spec	Item	Requirement	Applicable
§ 15.247 RSS247(5.5)	d)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be 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	☒
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r05 <u>Band Edge measurement procedure</u> 1. Set the EUT to maximum power setting and enable the EUT transmit continuously. 2. Band edge emissions must be at least 30 dB down from the highest emission level within the authorized band as a measured. The attenuation shall be 30 dB instead of 20 dB when Peak conducted output power procedure is used. 3. Change modulation and channel bandwidth then repeat step 1 to 2. 4. Measured and record the results in the test report.		
Test Date	06/18/2016 – 06/22/2016	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes ☒ N/A

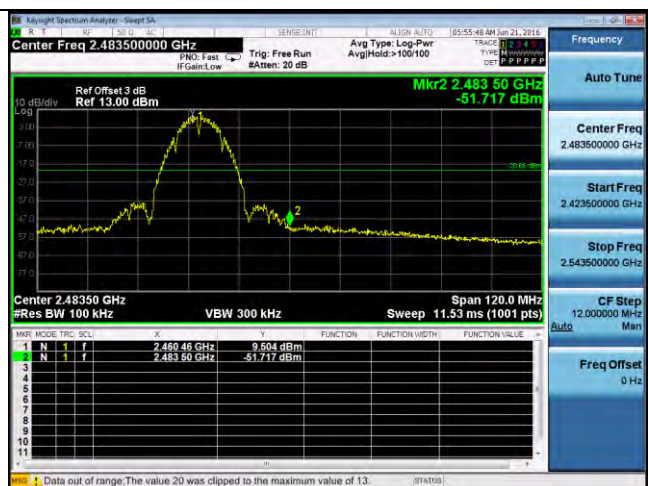
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at RF test site.

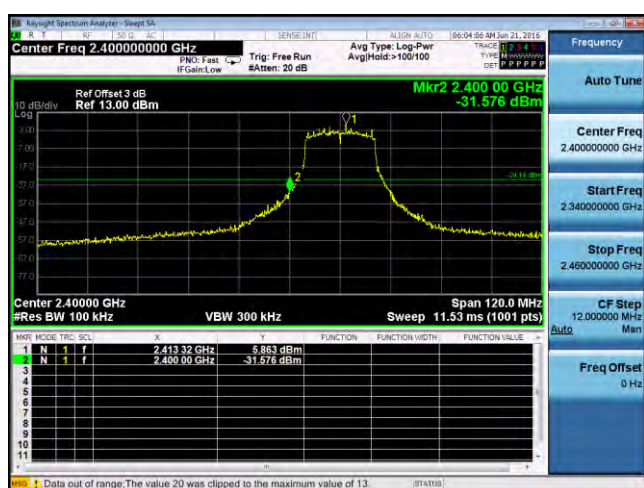
Test Plots:



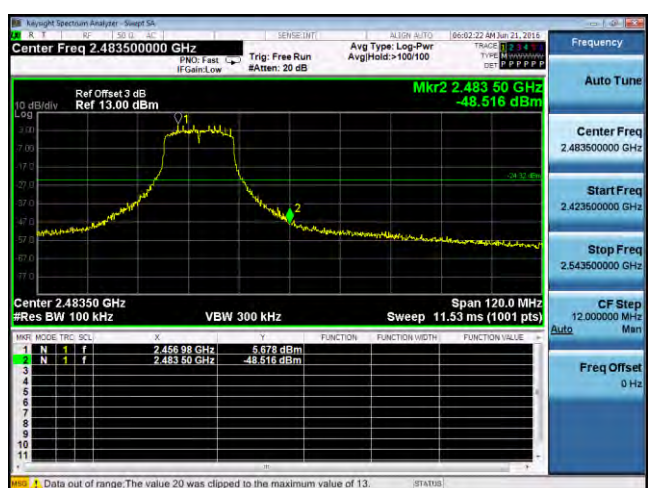
Band Edge-2.4G-802.11b Low



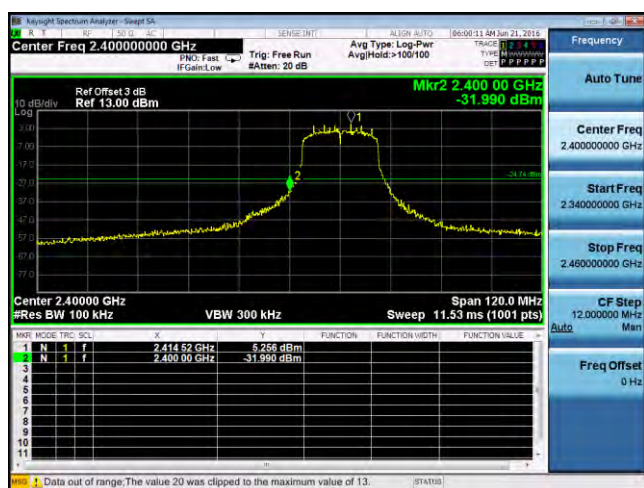
Band Edge-2.4G-802.11b High



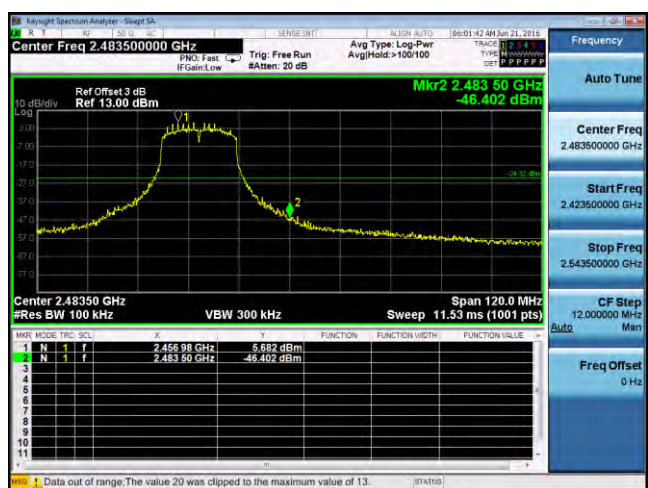
Band Edge-2.4G-802.11g Low



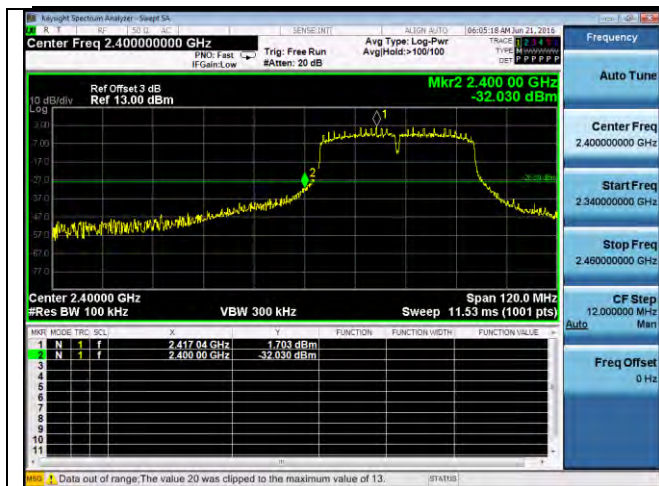
Band Edge-2.4G-802.11g High



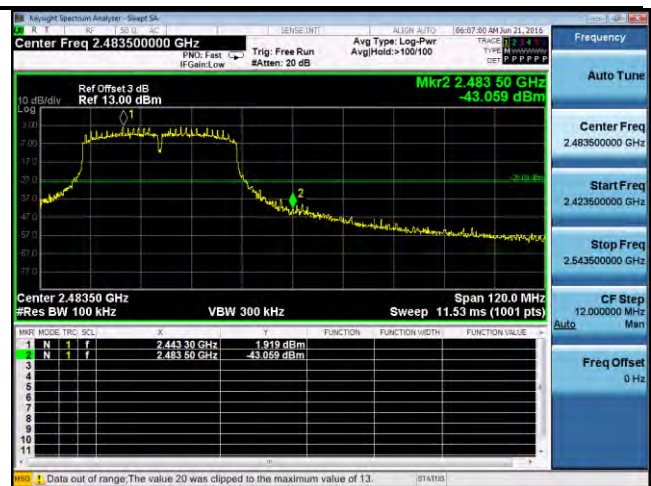
Band Edge-2.4G-802.11n20 Low



Band Edge-2.4G-802.11n20 High



Band Edge-2.4G-802.11n40 Low



Band Edge-2.4G-802.11n40 High



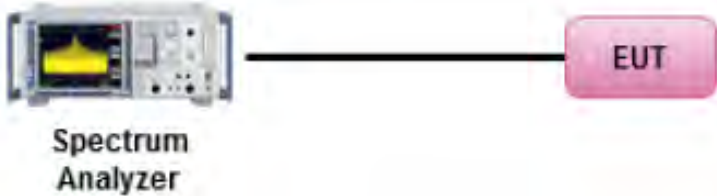
Band Edge-2.4G-BLE Low



Band Edge-2.4G-BLE High

10.5 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(e)	e)	DSSS: $\leq 8\text{dBm}/3\text{KHz}$	☒
RSS247 (5.2.2)	f)	DSSS in hybrid sys with FH turned off: $\leq 8\text{dBm}/3\text{KHz}$	☐
Test Setup			
Test Procedure	558074 D01 DTS Meas Guidance v03r05, 10.2 Method PKPSD (peak PSD) <u>Peak spectral density measurement procedure</u> - Set analyzer center frequency to DTS channel center frequency. - Set the span to 1.5 times the DTS bandwidth. - Set the RBW to: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$. - Set the VBW $\geq 3 \times \text{RBW}$. - Detector = Peak - Sweep time = auto couple. - Trace mode = Max Hold - Allow trace to fully stabilize. - Use the peak marker function to determine the maximum amplitude level within the RBW. - If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.		
Test Date	06/18/2016 – 06/22/2016	Environmental condition	Temperature 22°C Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	N/A		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at RF test site.

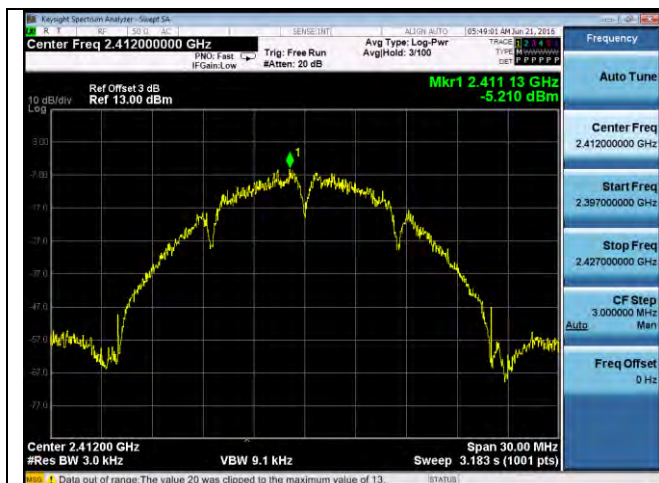
PSD measurement results for Wi-Fi:

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
PSD	802.11b	2412	Low	-5.21	8	Pass
		2437	Mid	-5.70	8	Pass
		2462	High	-5.12	8	Pass
	802.11g	2412	Low	-8.42	8	Pass
		2437	Mid	-7.90	8	Pass
		2462	High	-8.43	8	Pass
	802.11n-20M	2412	Low	-9.69	8	Pass
		2437	Mid	-9.62	8	Pass
		2462	High	-8.49	8	Pass
	802.11n-40M	2422	Low	-12.83	8	Pass
		2437	Mid	-13.27	8	Pass
		2452	High	-13.06	8	Pass

PSD measurement results for BLE:

Type	Freq (MHz)	Test mode	CH	Conducted PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
PSD	2402	Bluetooth LE	Low	-14.26	8	Pass
	2441	Bluetooth LE	Mid	-13.84	8	Pass
	2480	Bluetooth LE	High	-13.93	8	Pass

Test Plots



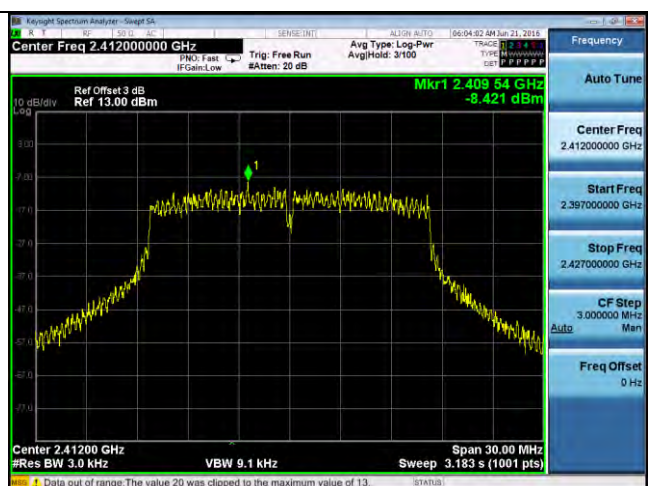
PSD-2.4G-802.11b Low



PSD-2.4G-802.11b Mid



PSD-2.4G-802.11b High



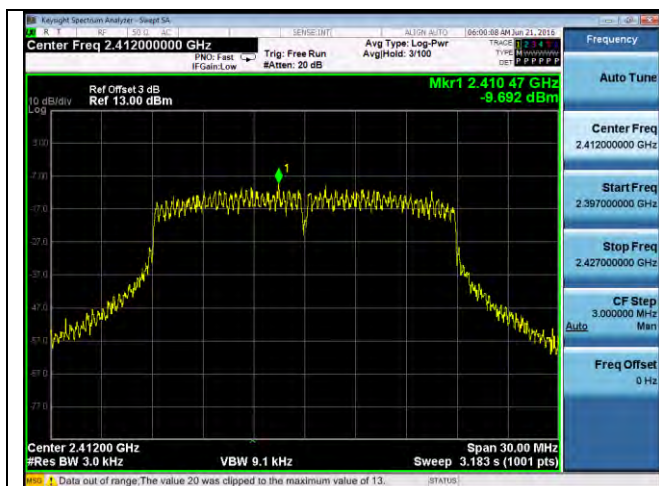
PSD-2.4G-802.11g Low



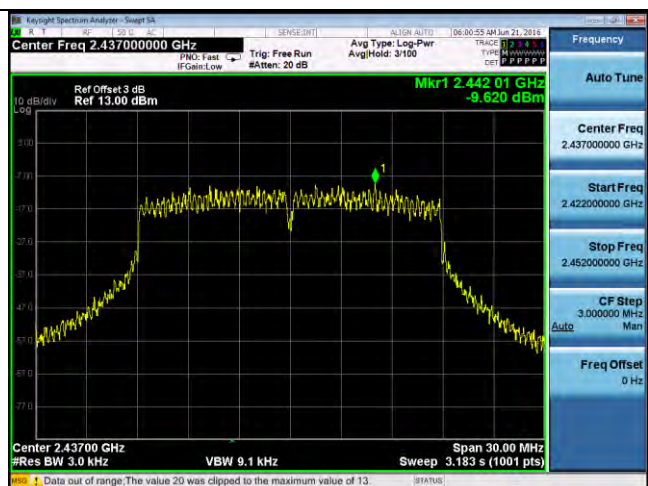
PSD-2.4G-802.11g Mid



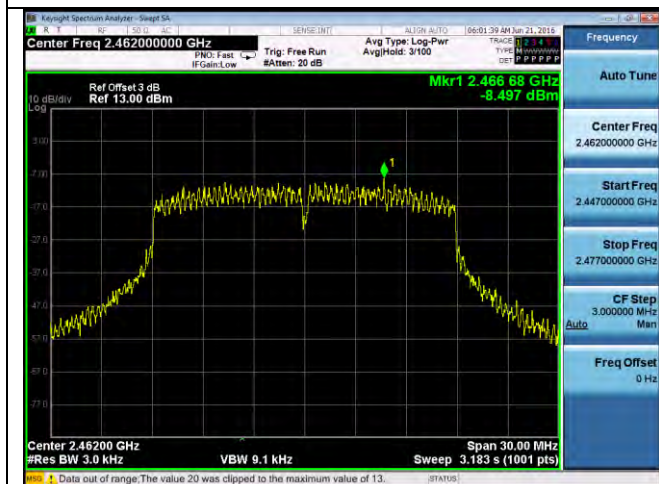
PSD-2.4G-802.11g High



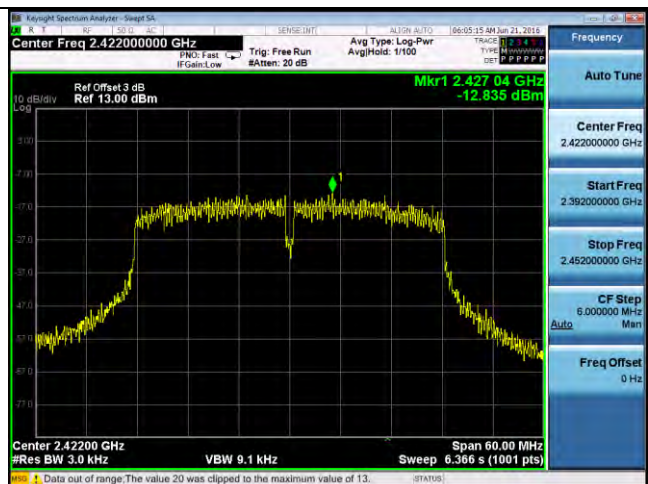
PSD-2.4G-802.11n20 Low



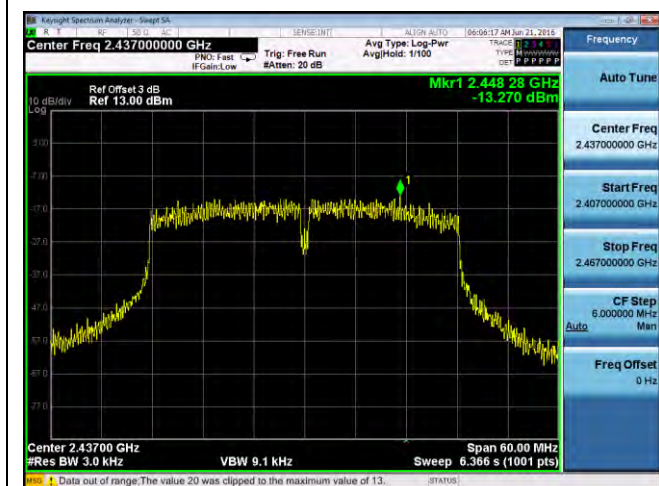
PSD-2.4G-802.11n20 Mid



PSD-2.4G-802.11n20 High



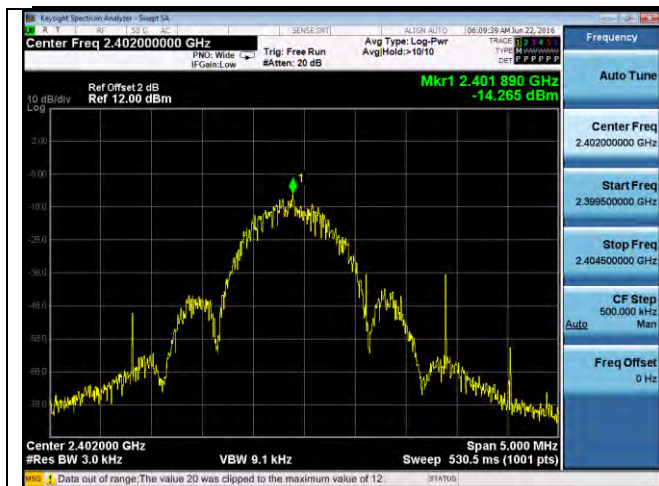
PSD-2.4G-802.11n40 Low



PSD-2.4G-802.11n40 Mid



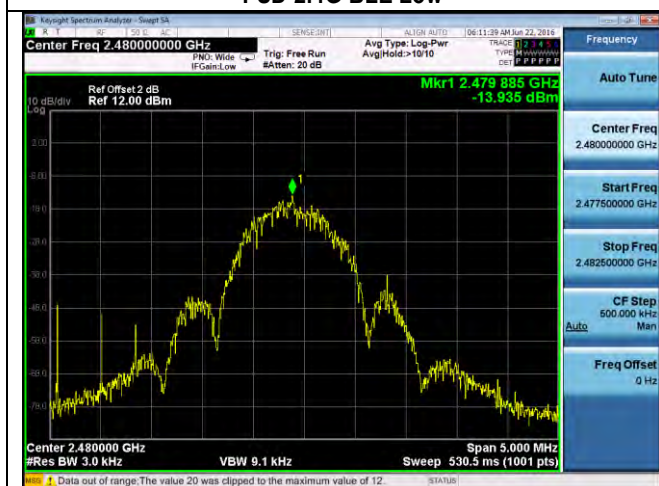
PSD-2.4G-802.11n20 High



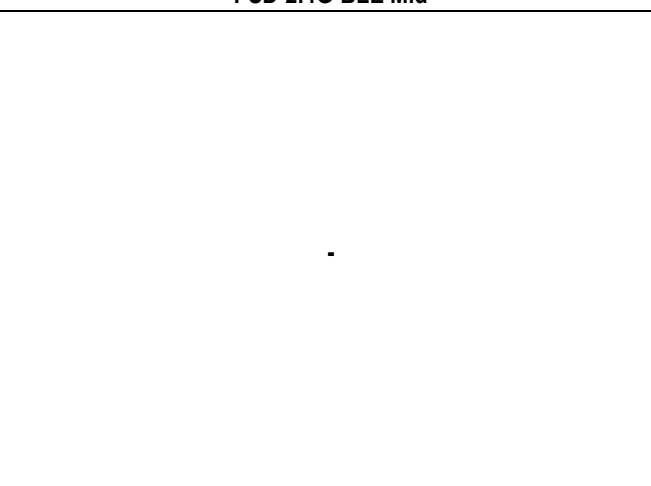
PSD-2.4G-BLE Low



PSD-2.4G-BLE Mid

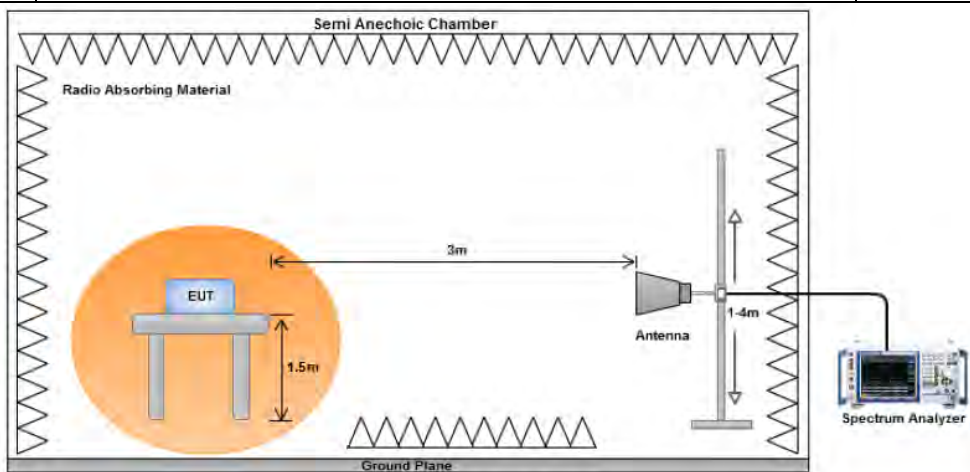


PSD-2.4G-BLE High



10.6 Radiated Spurious Emissions in restricted band

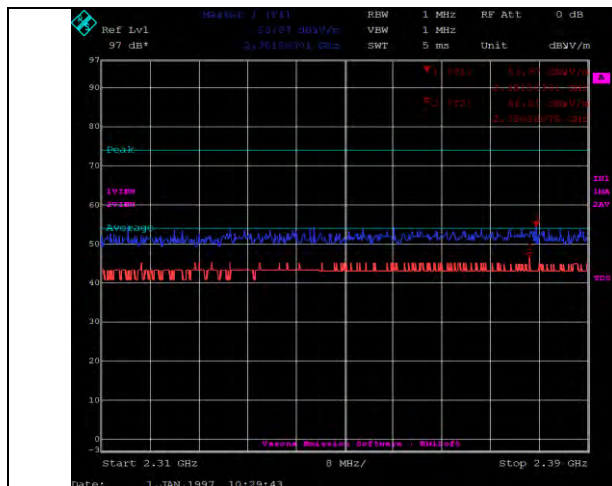
Requirement(s):

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. 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		

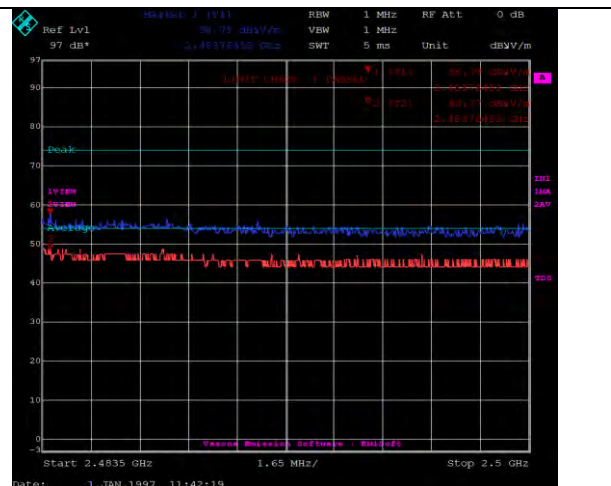
Test Data ☐ Yes (See below) ☒ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at 10m chamber.

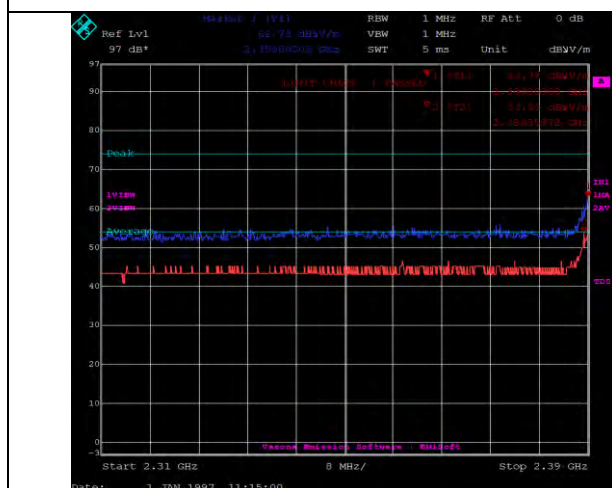
Restricted Band Measurement Plots:



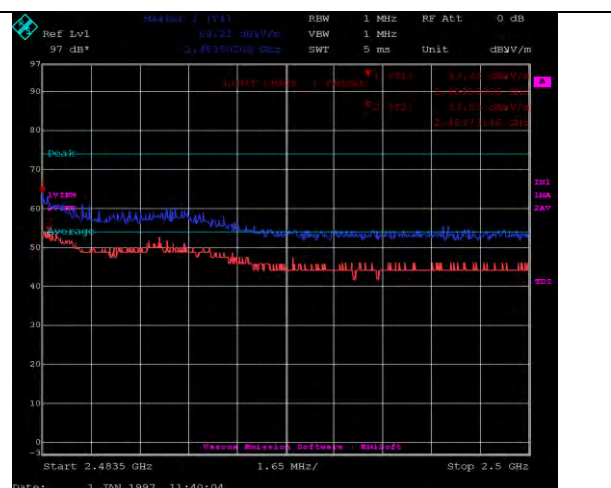
802.11b 2412M-Restricted Band 2310-2390MHz



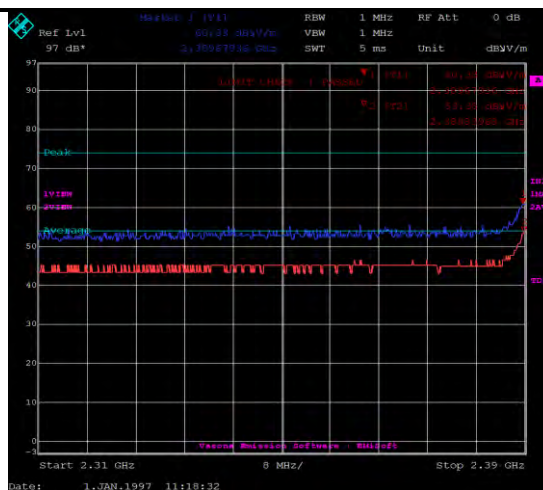
802.11b 2462M-Restricted Band 2483.5-2500MHz



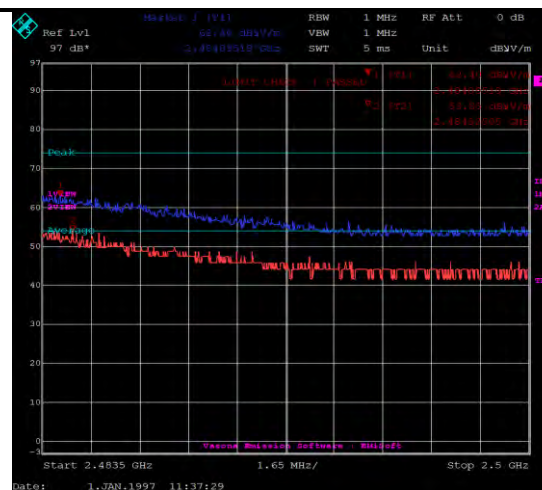
802.11g 2412M-Restricted Band 2310-2390MHz



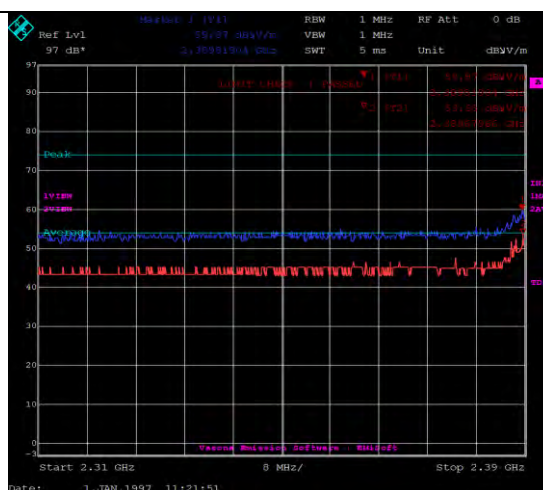
802.11g 2462M-Restricted Band 2483.5-2500MHz



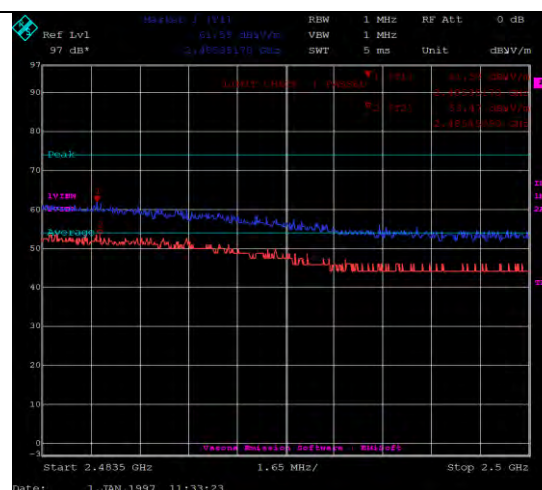
802.11n20 2412M-Restricted Band 2310-2390MHz



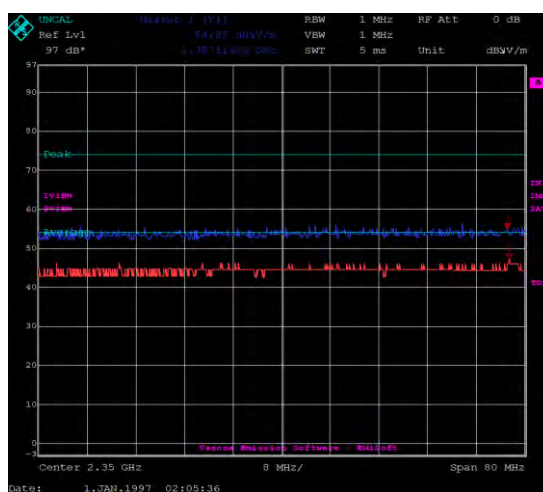
802.11n20 2462M-Restricted Band 2483.5-2500MHz



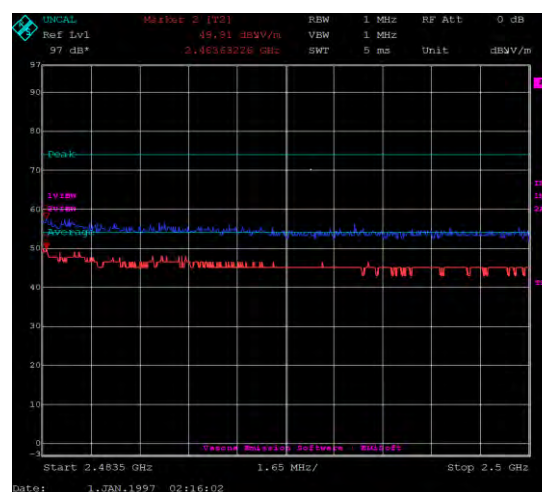
802.11n40 2422M-Restricted Band 2310-2390MHz



802.11n40 2452M-Restricted Band 2483.5-2500MHz



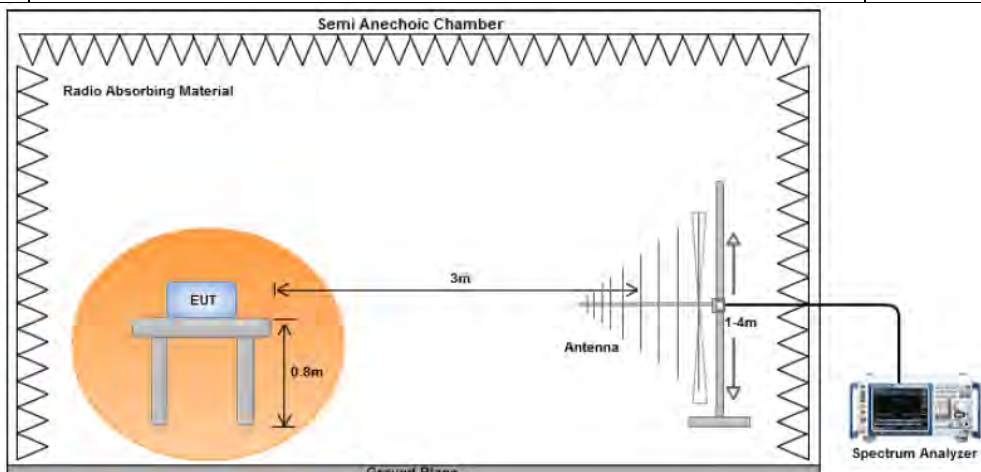
BLE 2402M-Restricted Band 2310-2390MHz



BLE 2480M-Restricted Band 2483.5-2500MHz

10.7 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												

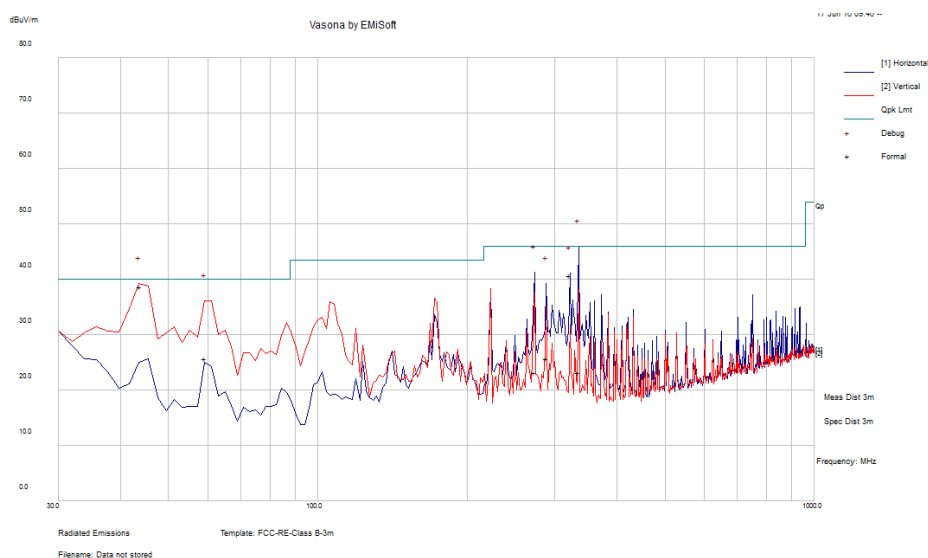
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Chen Ge at 10m chamber.

Radiated Emission Test Results (Below 1GHz)

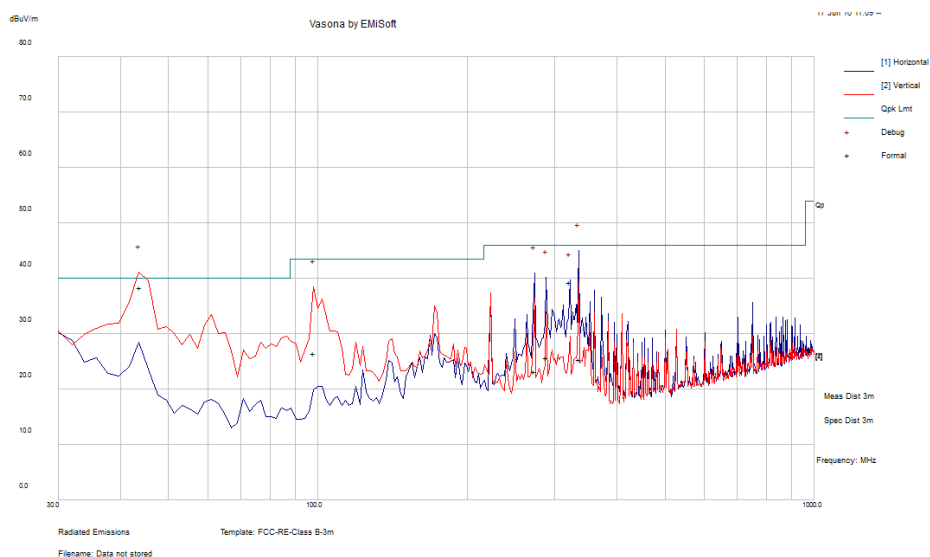
Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Chen Ge			
Test Date:	06/17/2016			
Remarks:	802.11n HT40, middle channel			



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
334.96	45.58	2.79	-25.15	23.22	Quasi Max	H	101	23	46.02	-22.8	Pass
43.81	64.02	0.99	-26.37	38.64	Quasi Max	V	101	249	40	-1.36	Pass
59.28	55.54	1.18	-31.11	25.61	Quasi Max	V	106	97	40	-14.39	Pass
273.17	46.99	2.53	-26.31	23.22	Quasi Max	H	102	159	46.02	-22.8	Pass
321.75	63.14	2.73	-25.25	40.62	Quasi Max	H	101	329	46.02	-5.4	Pass
288.63	49.47	2.58	-26.32	25.73	Quasi Max	H	121	208	46.02	-20.29	Pass

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

Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	120VAC, 60Hz			
Tested by:	Chen Ge			
Test Date:	06/17/2016			
Remarks:	BLE, middle channel			

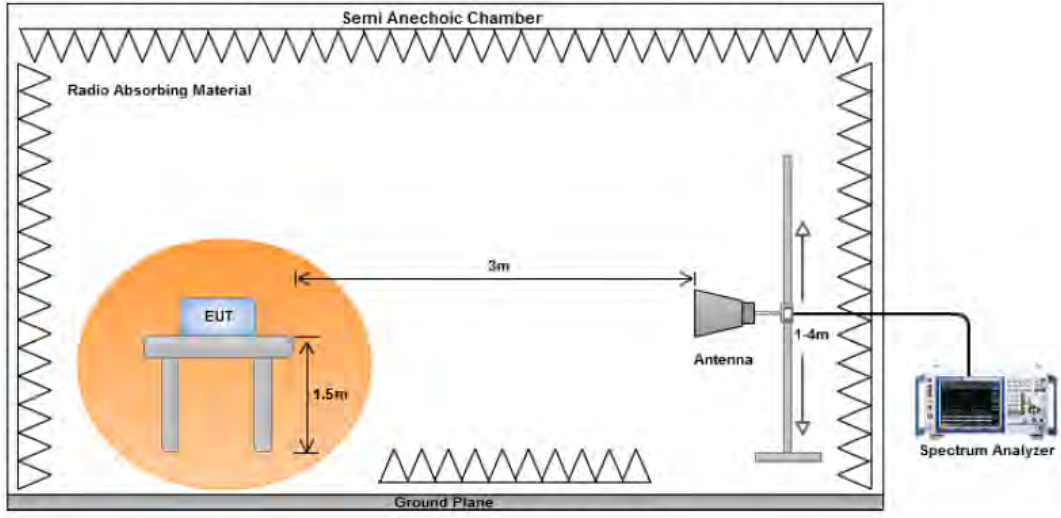


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
43.79	63.69	0.99	-26.35	38.33	Quasi Max	V	100	340	40	-1.67	Pass
335.42	47.79	2.79	-25.15	25.43	Quasi Max	H	106	166	46.02	-20.59	Pass
272.86	47	2.53	-26.31	23.22	Quasi Max	H	120	240	46.02	-22.8	Pass
98.19	54.68	1.54	-29.71	26.51	Quasi Max	V	112	149	43.52	-17.01	Pass
288.56	49.39	2.58	-26.32	25.65	Quasi Max	H	158	254	46.02	-20.37	Pass
321.76	61.76	2.73	-25.25	39.24	Quasi Max	H	100	327	46.02	-6.78	Pass

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

10.8 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 Chen Ge at 3m chamber.

Radiated Emission Test Results (Above 1GHz)

1GHz-25GHz – 802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7237.36	38.52	7.36	48.58	37.23	34.53	Peak Max	H	100	358	74	-39.47	Pass
9651.53	40.35	7.9	48.89	37.95	37.31	Peak Max	V	149	18	74	-36.69	Pass
4825.11	39.67	7.04	50.28	33.29	29.72	Peak Max	H	102	149	74	-44.28	Pass
7237.36	26.87	7.36	48.58	37.23	22.88	Average Max	H	100	358	54	-31.12	Pass
9651.53	27.95	7.9	48.89	37.95	24.91	Average Max	V	149	18	54	-29.09	Pass
4825.11	27.86	7.04	50.28	33.29	17.91	Average Max	H	102	149	54	-36.09	Pass
7237.36	38.52	7.36	48.58	37.23	34.53	Peak Max	H	100	358	74	-39.47	Pass
9651.53	40.35	7.9	48.89	37.95	37.31	Peak Max	V	149	18	74	-36.69	Pass

1GHz-25GHz- 802.11b - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7314.78	38.55	7.34	48.19	37.04	34.74	Peak Max	H	228	192	74	-39.26	Pass
9749.42	39.4	7.95	48.89	37.95	36.41	Peak Max	H	225	150	74	-37.59	Pass
4873.89	37.87	7.06	50.28	33.32	27.97	Peak Max	V	207	0	74	-46.03	Pass
7314.78	26.75	7.34	48.19	37.04	22.94	Average Max	H	228	192	54	-31.06	Pass
9749.42	27.15	7.95	48.89	37.95	24.16	Average Max	H	225	150	54	-29.84	Pass
4873.89	26.5	7.06	50.28	33.32	16.6	Average Max	V	207	0	54	-37.4	Pass
7314.78	38.55	7.34	48.19	37.04	34.74	Peak Max	H	228	192	74	-39.26	Pass
9749.42	39.4	7.95	48.89	37.95	36.41	Peak Max	H	225	150	74	-37.59	Pass

1GHz-25GHz- 802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7383.24	39.2	7.33	48.19	36.92	35.26	Peak Max	H	169	329	74	-38.74	Pass
9844.78	39.9	7.99	48.74	38.25	37.4	Peak Max	V	233	94	74	-36.6	Pass
4921.86	39.56	7.07	50.28	33.32	29.67	Peak Max	V	233	166	74	-44.33	Pass
7383.24	27.11	7.33	48.19	36.92	23.17	Average Max	V	138	123	54	-30.83	Pass
9844.78	27.99	7.99	48.74	38.25	25.49	Average Max	V	233	94	54	-28.51	Pass
4921.86	26.93	7.07	50.28	33.32	17.04	Average Max	V	233	166	54	-36.96	Pass
7383.24	39.2	7.33	48.19	36.92	35.26	Peak Max	H	169	329	74	-38.74	Pass
9844.78	39.9	7.99	48.74	38.25	37.4	Peak Max	V	233	94	74	-36.6	Pass

1GHz-25GHz – 802.11g – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7236.44	40.02	7.36	48.58	37.23	36.03	Peak Max	V	203	0	74	-37.97	Pass
9648.33	39.82	7.9	48.89	37.99	36.82	Peak Max	H	219	201	74	-37.18	Pass
4825.97	39.3	7.04	50.28	33.29	29.35	Peak Max	V	173	51	74	-44.65	Pass
7236.44	27.47	7.36	48.58	37.23	23.48	Average Max	V	203	0	54	-30.52	Pass
9648.33	27.83	7.9	48.89	37.99	24.83	Average Max	V	158	90	54	-29.17	Pass
4825.97	27.47	7.04	50.28	33.29	17.52	Average Max	V	173	51	54	-36.48	Pass
7236.44	40.02	7.36	48.58	37.23	36.03	Peak Max	V	203	0	74	-37.97	Pass
9648.33	39.82	7.9	48.89	37.99	36.82	Peak Max	H	219	201	74	-37.18	Pass

1GHz-25GHz- 802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7307.78	39.32	7.34	48.19	37.04	35.51	Peak Max	V	98	14	74	-38.49	Pass
9750.51	39.59	7.95	48.74	38.25	37.05	Peak Max	V	131	52	74	-36.95	Pass
4874.07	62.16	7.06	50.28	33.32	52.26	Peak Max	V	127	0	74	-21.74	Pass
7307.78	27.03	7.34	48.19	37.04	23.22	Average Max	H	128	163	54	-30.78	Pass
9750.51	27.58	7.95	48.74	38.25	25.04	Average Max	V	131	52	54	-28.96	Pass
4874.07	27.46	7.06	50.28	33.32	17.56	Average Max	V	127	0	54	-36.44	Pass
7307.78	39.32	7.34	48.19	37.04	35.51	Peak Max	V	98	14	74	-38.49	Pass
9750.51	39.59	7.95	48.74	38.25	37.05	Peak Max	V	131	52	74	-36.95	Pass

1GHz-25GHz- 802.11g - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7383.7	39.17	7.33	48.19	36.92	35.23	Peak Max	V	173	98	74	-38.77	Pass
9848.71	40.18	7.99	48.74	38.25	37.68	Peak Max	V	98	228	74	-36.32	Pass
4925.48	39.75	7.07	50.28	33.32	29.86	Peak Max	V	225	194	74	-44.14	Pass
7383.7	27.25	7.33	48.19	36.92	23.31	Average Max	V	173	98	54	-30.69	Pass
9848.71	28.07	7.99	48.74	38.25	25.57	Average Max	H	132	131	54	-28.43	Pass
4925.48	27.41	7.07	50.28	33.32	17.52	Average Max	V	225	194	54	-36.48	Pass
7383.7	39.17	7.33	48.19	36.92	35.23	Peak Max	V	173	98	74	-38.77	Pass
9848.71	40.18	7.99	48.74	38.25	37.68	Peak Max	V	98	228	74	-36.32	Pass

1GHz-25GHz – 802.11n-20M – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7237.2	39.81	7.36	48.58	37.23	35.82	Peak Max	V	205	124	74	-38.18	Pass
9648.51	40.66	7.9	48.89	37.99	37.66	Peak Max	V	119	0	74	-36.34	Pass
4826.32	39.35	7.04	50.28	33.29	29.4	Peak Max	H	100	220	74	-44.6	Pass
7237.2	27.32	7.36	48.58	37.23	23.33	Average Max	V	205	124	54	-30.67	Pass
9648.51	27.83	7.9	48.89	37.99	24.83	Average Max	V	119	0	54	-29.17	Pass
4826.32	27.69	7.04	50.28	33.29	17.74	Average Max	H	100	220	54	-36.26	Pass
7237.2	39.81	7.36	48.58	37.23	35.82	Peak Max	V	205	124	74	-38.18	Pass
9648.51	40.66	7.9	48.89	37.99	37.66	Peak Max	V	119	0	74	-36.34	Pass

1GHz-25GHz- 802.11n-20M - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4872.62	38.84	7.06	50.28	33.32	28.94	Peak Max	H	235	182	74	-45.06	Pass
4872.62	27.96	7.06	50.28	33.32	18.06	Average Max	H	235	182	54	-35.94	Pass
7311.72	39.59	7.34	48.19	37.04	35.78	Peak Max	H	233	0	74	-38.22	Pass
7311.72	27.06	7.34	48.19	37.04	23.25	Average Max	V	98	180	54	-30.75	Pass
9750.54	39.59	7.95	48.74	38.25	37.05	Peak Max	V	147	126	74	-36.95	Pass
9750.54	27.4	7.95	48.74	38.25	24.86	Average Max	V	147	126	54	-29.14	Pass
4872.62	38.84	7.06	50.28	33.32	28.94	Peak Max	H	235	182	74	-45.06	Pass
4872.62	27.96	7.06	50.28	33.32	18.06	Average Max	H	235	182	54	-35.94	Pass

1GHz-25GHz- 802.11n-20M – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4922.92	40.74	7.07	50.28	33.32	30.85	Peak Max	H	120	162	74	-43.15	Pass
9846.72	40.41	7.99	48.74	38.25	37.91	Peak Max	V	184	3	74	-36.09	Pass
7383.37	39.25	7.33	48.19	36.92	35.31	Peak Max	V	110	157	74	-38.69	Pass
4922.92	27.59	7.07	50.28	33.32	17.7	Average Max	H	120	162	54	-36.3	Pass
9846.72	27.97	7.99	48.74	38.25	25.47	Average Max	V	184	3	54	-28.53	Pass
7383.37	27.39	7.33	48.19	36.92	23.45	Average Max	V	110	157	54	-30.55	Pass
4922.92	40.74	7.07	50.28	33.32	30.85	Peak Max	H	120	162	74	-43.15	Pass
9846.72	40.41	7.99	48.74	38.25	37.91	Peak Max	V	184	3	74	-36.09	Pass

1GHz-25GHz – 802.11n-40M – 2422MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4843.82	39.53	7.05	50.28	33.29	29.59	Peak Max	V	115	196	74	-44.41	Pass
7266.48	41.81	7.35	48.19	37.04	38.01	Peak Max	V	131	0	74	-35.99	Pass
9685.96	39.31	7.92	48.89	37.95	36.29	Peak Max	H	101	255	74	-37.71	Pass
4843.82	27.46	7.05	50.28	33.29	17.52	Average Max	V	115	196	54	-36.48	Pass
7266.48	27.16	7.35	48.19	37.04	23.36	Average Max	V	131	0	54	-30.64	Pass
9685.96	27.12	7.92	48.89	37.95	24.1	Average Max	H	101	255	54	-29.9	Pass
4843.82	39.53	7.05	50.28	33.29	29.59	Peak Max	V	115	196	74	-44.41	Pass
7266.48	41.81	7.35	48.19	37.04	38.01	Peak Max	V	131	0	74	-35.99	Pass

1GHz-25GHz- 802.11n-40M – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7310.4	39.3	7.34	48.19	37.04	35.49	Peak Max	V	100	237	74	-38.51	Pass
9744.91	39.76	7.94	48.89	37.95	36.76	Peak Max	V	112	127	74	-37.24	Pass
4871.64	39.9	7.06	50.28	33.32	30	Peak Max	V	100	80	74	-44	Pass
7310.4	27.18	7.34	48.19	37.04	23.37	Average Max	V	100	237	54	-30.63	Pass
9744.91	27.66	7.94	48.89	37.95	24.66	Average Max	V	112	127	54	-29.34	Pass
4871.64	28.26	7.06	50.28	33.32	18.36	Average Max	V	100	80	54	-35.64	Pass
7310.4	39.3	7.34	48.19	37.04	35.49	Peak Max	V	100	237	74	-38.51	Pass
9744.91	39.76	7.94	48.89	37.95	36.76	Peak Max	V	112	127	74	-37.24	Pass

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

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7354.86	39.46	7.34	48.19	36.92	35.53	Peak Max	H	240	99	74	-38.47	Pass
9808.38	40.83	7.97	48.74	38.25	38.31	Peak Max	V	108	326	74	-35.69	Pass
4902.92	39.56	7.06	50.28	33.32	29.66	Peak Max	V	111	332	74	-44.34	Pass
7354.86	27.2	7.34	48.19	36.92	23.27	Average Max	V	122	166	54	-30.73	Pass
9808.38	28.02	7.97	48.74	38.25	25.5	Average Max	V	108	326	54	-28.5	Pass
4902.92	27.89	7.06	50.28	33.32	17.99	Average Max	V	111	332	54	-36.01	Pass
7354.86	39.46	7.34	48.19	36.92	35.53	Peak Max	H	240	99	74	-38.47	Pass
9808.38	40.83	7.97	48.74	38.25	38.31	Peak Max	V	108	326	74	-35.69	Pass

Above 1GHz-25GHz- BLE - 2402MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9604.26	40.3	7.88	48.89	37.99	37.28	Peak Max	H	136	38	74	-36.72	Pass
7202.75	39.28	7.36	48.58	37.23	35.29	Peak Max	V	207	283	74	-38.71	Pass
4804.36	38.4	7.04	50.28	33.29	28.45	Peak Max	H	242	359	74	-45.55	Pass
9604.26	28.16	7.88	48.89	37.99	25.14	Average Max	H	136	38	54	-28.86	Pass
7202.75	27.71	7.36	48.58	37.23	23.72	Average Max	V	207	283	54	-30.28	Pass
4804.36	26.78	7.04	50.28	33.29	16.83	Average Max	H	242	359	54	-37.17	Pass

Above 1GHz-25GHz- BLE - 2440MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
7320.4	40.7	7.34	48.19	37.04	36.89	Peak Max	V	229	327	74	-37.11	Pass
9757.2	39.59	7.95	48.74	38.25	37.05	Peak Max	V	237	318	74	-36.95	Pass
4883.69	40.27	7.06	50.28	33.32	30.37	Peak Max	V	180	264	74	-43.63	Pass
7320.4	27.49	7.34	48.19	37.04	23.68	Average Max	H	175	54	54	-30.32	Pass
9757.2	27.34	7.95	48.74	38.25	24.8	Average Max	H	196	143	54	-29.2	Pass
4883.69	27.93	7.06	50.28	33.32	18.03	Average Max	V	180	264	54	-35.97	Pass

Above 1GHz-25GHz- BLE - 2480MHz

Frequency MHz	Raw dBuV	Cable Loss	Amp dB	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9921.51	39.69	8.02	48.74	38.52	37.49	Peak Max	V	143	33	74	-36.51	Pass
7442.18	39.27	7.32	48.19	36.92	35.32	Peak Max	H	192	204	74	-38.68	Pass
4957	39.01	7.08	50.28	33.67	29.48	Peak Max	H	221	75	74	-44.52	Pass
9921.51	27.49	8.02	48.74	38.52	25.29	Average Max	V	143	33	54	-28.71	Pass
7442.18	27.51	7.32	48.19	36.92	23.56	Average Max	H	192	204	54	-30.44	Pass
4957	27.37	7.08	50.28	33.67	17.84	Average Max	H	221	75	54	-36.16	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	06/08/2016	1 Year	06/08/2017	☒
CHASE LISN	MN2050B	1018	08/07/2015	1 Year	08/07/2016	☒
Radiated Emissions						
R & S Receiver	ESIB 40	1018	08/07/2015	1 Year	08/07/2016	☒
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	08/12/2015	1 Year	08/12/2016	☒
Horn Antenna (1GHz~26GHz)	3115	100059	08/25/2015	1 Year	08/25/2016	☒
Pre-Amplifier	LPA-6-30	11140711	02/10/2016	1 Year	02/10/2017	☒
3 Meters SAC	3M	N/A	08/08/2015	1 Year	08/08/2016	☒
10 Meters SAC	10M	N/A	09/05/2015	1 Year	09/05/2016	☒
RF Conducted Measurement						
Spectrum Analyzer	N9010A	10SL0219	08/20/2015	1 Year	08/20/2016	☒
R & S Receiver	ESIB 40	100179	06/08/2016	1 Year	06/08/2017	☒
ETS-Lingren USB RF Power Sensor	7002-006	10SL0190	09/03/2015	1 Year	09/03/2016	☒

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