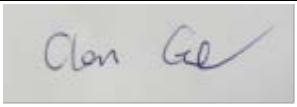
RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: FCC_IC_RF_SL16040101-AER-001_DTS_Rev. 1.0
Supersede Report No.: None

Applicant	:	Aerohive Networks, Inc.
Product Name	:	Access Point
Model No.	:	AP245X
Test Standard	:	47 CFR 15.247 RSS 247 Iss.1 : May 2015
Test Method	:	ANSI C63.10: 2013 RSS Gen Iss 4: Nov 2014 558074 D01 DTS Meas Guidance v03r04
FCC ID	:	WBV-AP245
IC ID	:	7774A-AP245
Dates of test	:	05/06/2016 – 06/03/2016
Issue Date	:	06/16/2016
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:	
	
Rachana Khanduri	Chen Ge
Test Engineer	Engineer Reviewer

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ilac-MRA
A2LA ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

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

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_RF_SL16040101-AER-001_DTS_2.4G	None	Original	06/14/2016
FCC_IC_RF_SL16040101-AER-001_DTS_2.4G_Rev. 1.0	Rev. 1.0	Updated Internal Photos and Test Instruments information	06/16/2016

2 Executive Summary

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

Company: Aerohive Networks, Inc.
Product: Access Point
Model: AP245X

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	:	Aerohive Networks, Inc.
Applicant Address	:	1011 McCarthy Blvd, Milpitas, CA 95035, California, United States
Manufacturer Name	:	Aerohive Networks, Inc.
Manufacturer Address	:	1011 McCarthy Blvd, Milpitas, CA 95035, California, United States

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	:	Access Point
Model No.	:	AP245X
Trade Name	:	Aerohive
Serial No.	:	N/A
Host Model No.	:	N/A
Input Power	:	100-240V, 50/60Hz
Power Adapter Manu/Model	:	Microsemi 9001GR
Power Adapter SN	:	C15336594000002605
Product Hardware version	:	1
Product Software version	:	HIVEOS 7.0r1
Radio Hardware version	:	1
Radio Software version	:	HIVEOS 7.0r1
Date of EUT received	:	05/07/2016
Equipment Class/ Category	:	DTS,UNII
Port/Connectors	:	PoE, Ethernet,USB

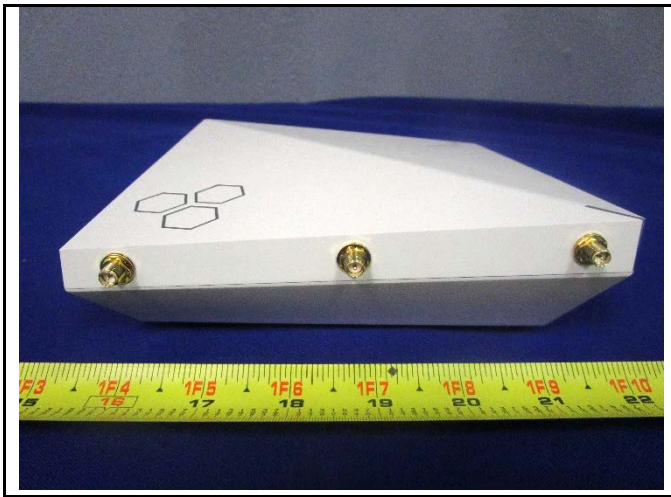
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz 5725-5825MHz	2412-2462MHz 5180-5240MHz 5240-5320MHz 5500-5700MHz 5725-5825MHz	5190-5230MHz 5270-5310MHz 5510-5670MHz 5755-5795MHz	5210MHz, 5290MHz 5530MHZ, 5610MHz, 5690MHz,5775MHz
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 (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	11	11	22	11(2.4GHz) 22 (5GHz)	10(5GHz)	6 (5GHz)
Antenna Type	Sector Antenna					
Antenna Gain (Peak)	5.5 dBi (for 2.4GHz) 6 dBi (5GHz)					
Antenna Connector Type	U.FL connector					

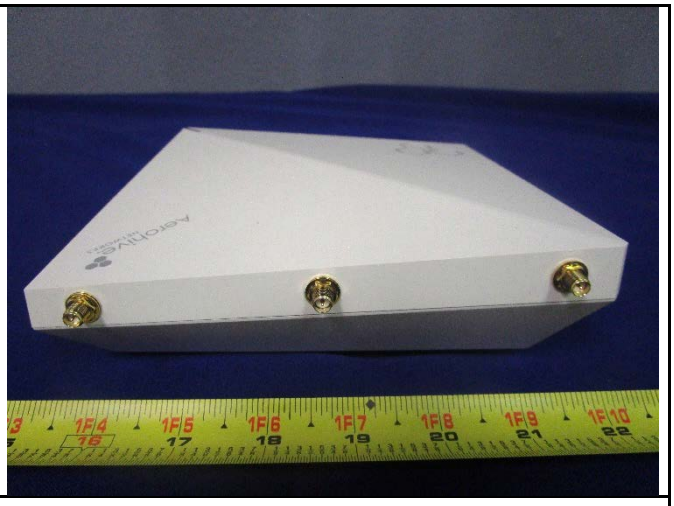
EUT Power level setting

Mode	Frequency (MHz)	Power setting
802.11-b	2412	84
802.11-b	2437	84
802.11-b	2462	84
802.11-g	2412	84
802.11-g	2437	84
802.11-g	2462	84
802.11-n-20	2412	84
802.11-n-20	2437	84
802.11-n-20	2462	84

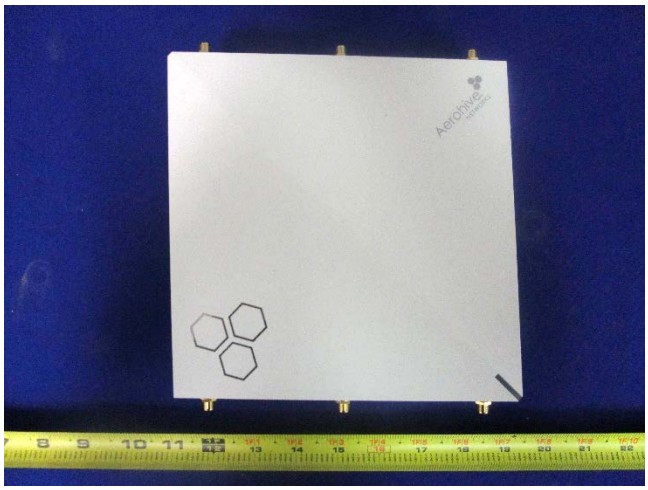
6.3 EUT Photos-External



EUT - Front View

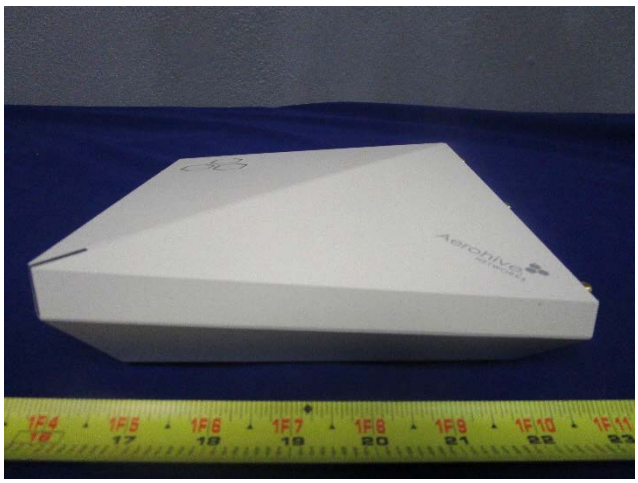


EUT – Rear View

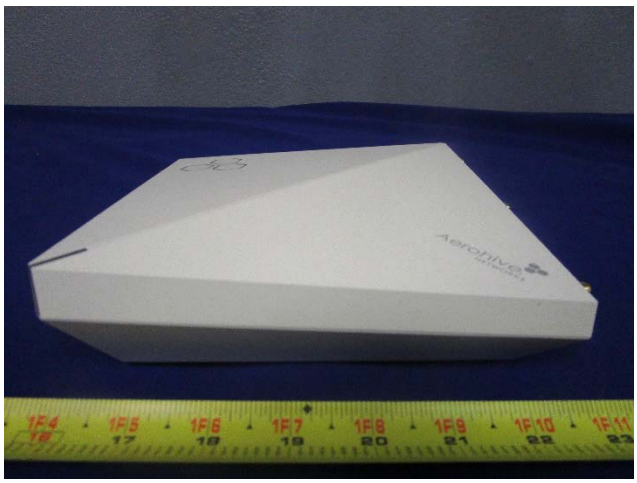


EUT - Top View

EUT – Bottom View



EUT – Left Side View



EUT – Right Side View

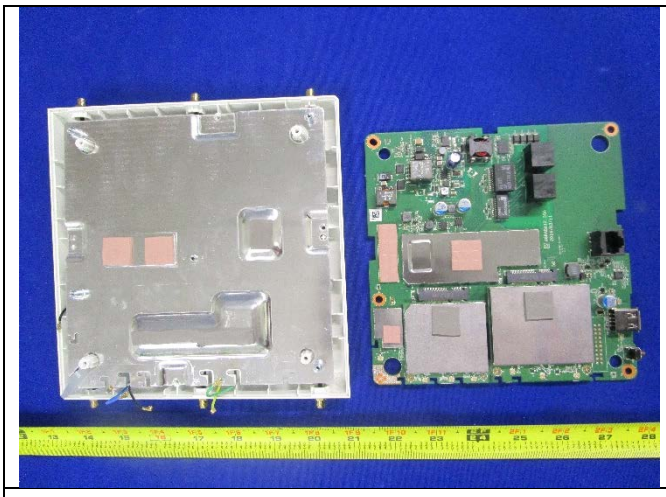
Antenna- Top View

Antenna – Bottom View

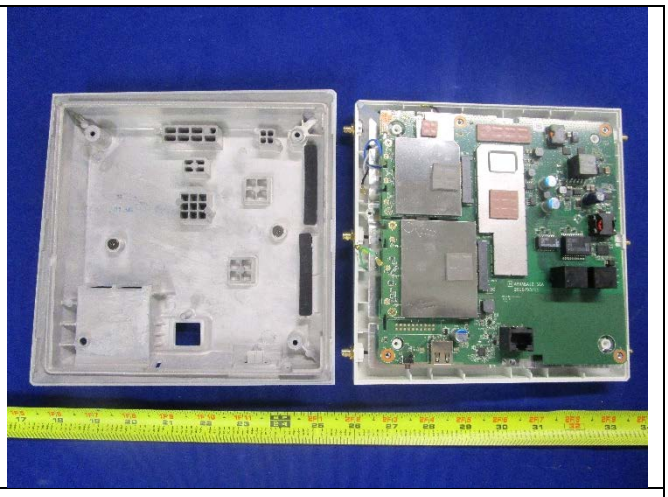
Support Equipment Power Supply Top View

Support Equipment Power Supply Bottom View

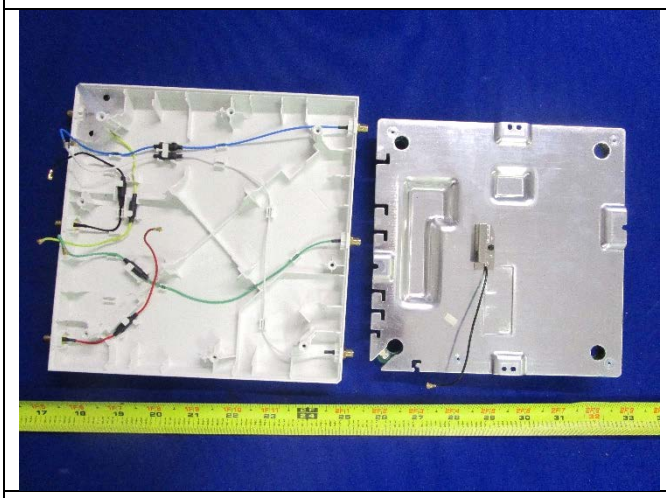
6.4 EUT Photos – Internal



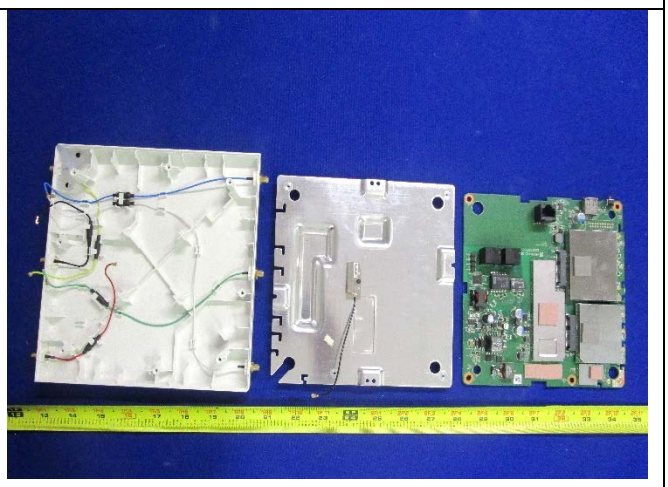
EUT: Cover Off View 1



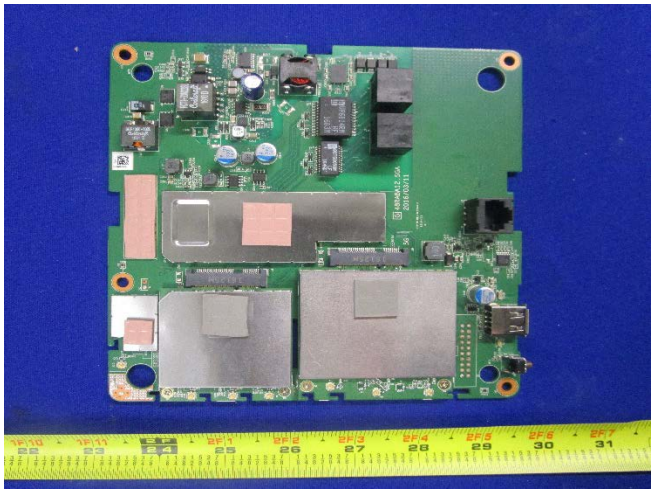
EUT: Cover Off View 2



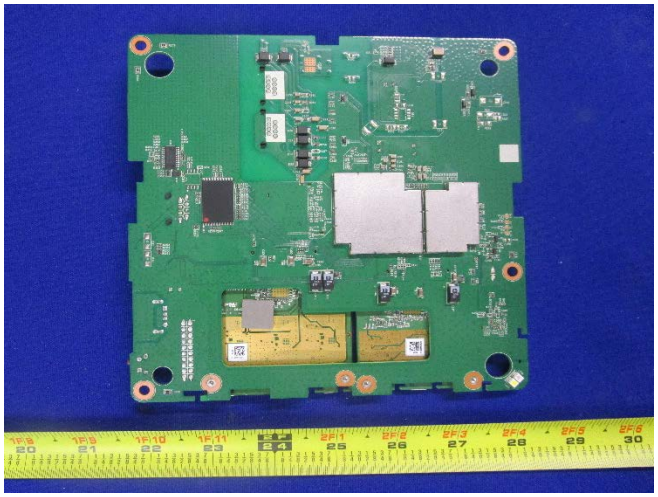
EUT: Cover Off View 3



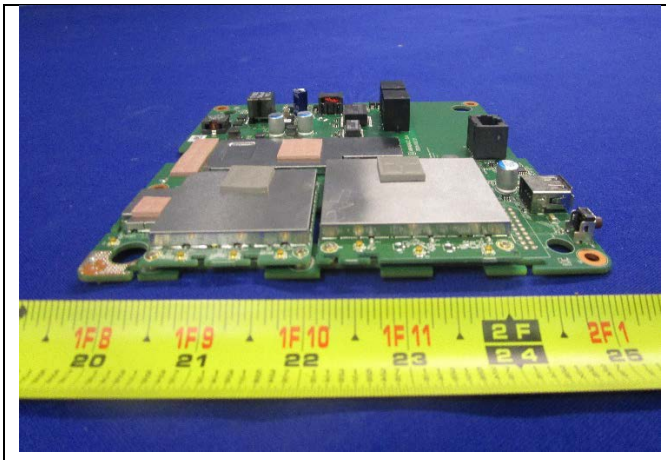
EUT: Cover Off View 4



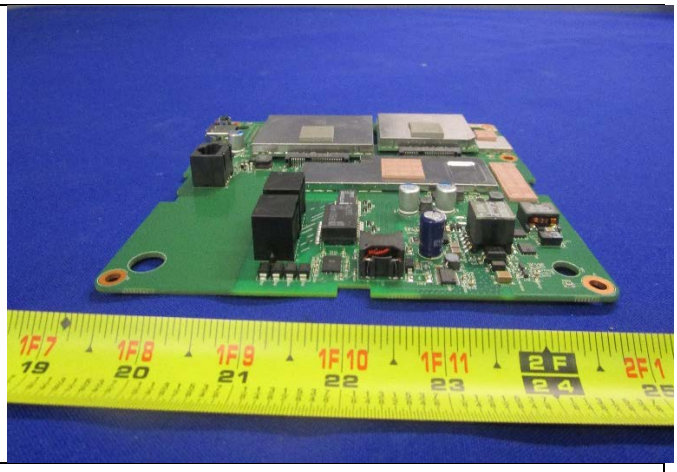
PCBA Top View



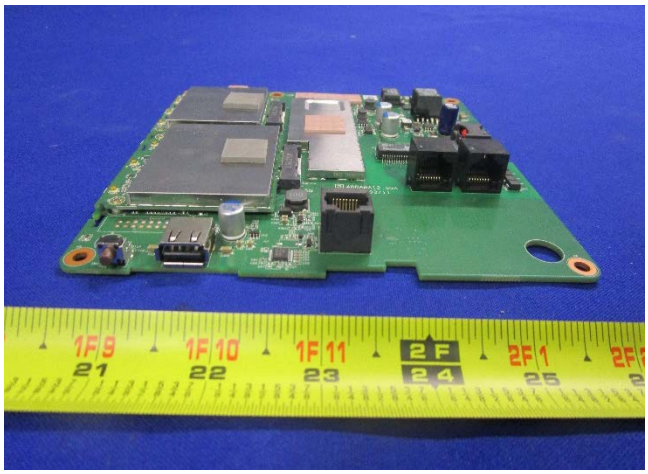
PCBA Bottom View



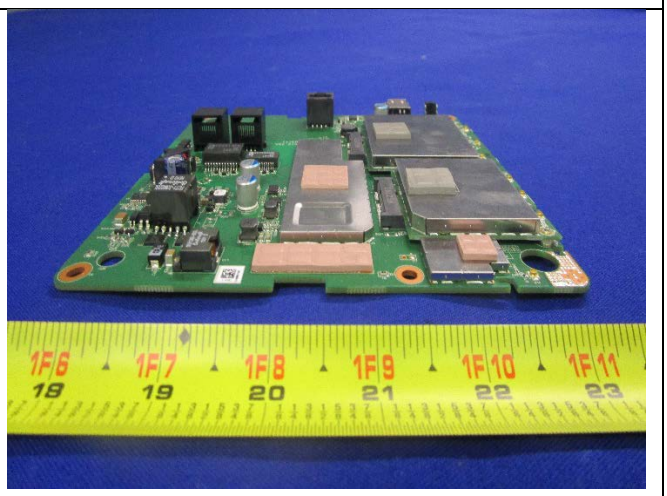
PCBA Front View



PCBA Rear View

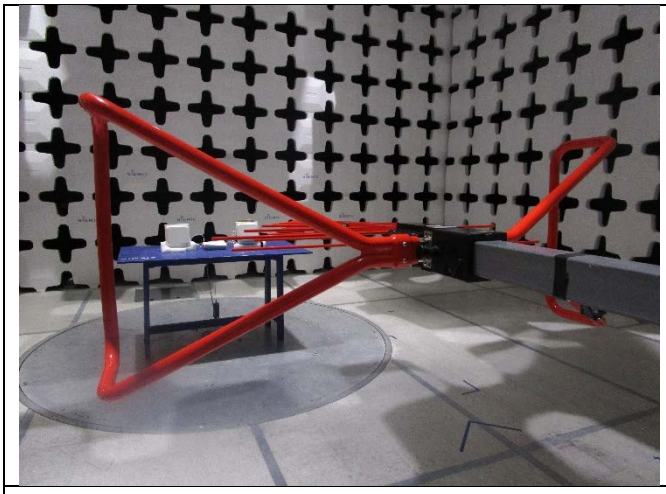


PCBA Left-Side View

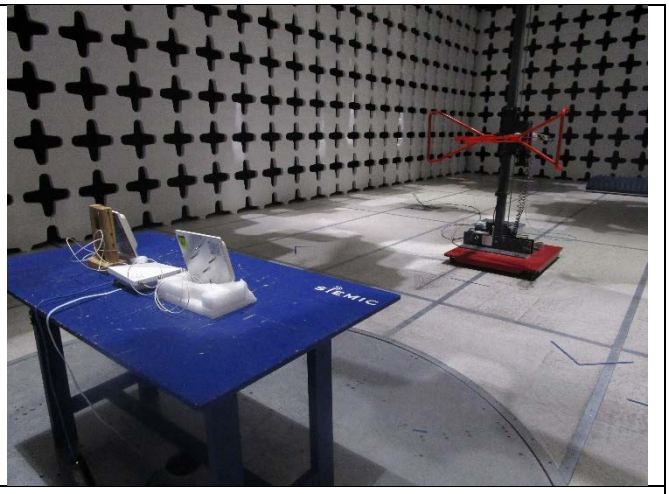


PCBA Right-Side View

6.5 EUT Test Setup Photos



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View

Radiated Emissions (>1GHz) – Front View

Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Latitude 3550	N/A	Dell	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
RJ45	EUT	RJ45	POE	RJ45	2	Unshielded	-
RJ45	POE	RJ45	Laptop	USB	3	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Tera Term	Set the EUT 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 558074 D01 DTS Meas Guidance v03r04	☒ Pass ☐ N/A
	IC	RSS Gen 8.10	IC		
AC Conducted Emissions	FCC	15.207(a)	FCC	ANSI C63.10:2013	☐ Pass ☒ N/A
	IC	RSS Gen 8.8	IC	RSS Gen Issue 4: 2014	

DTS Band Requirement

Test Item	Test standard		Test Method/Procedure		Pass / Fail
99% Occupied Bandwidth	-	-	-	-	☐ Pass ☒ N/A
	IC	RSS Gen 6.6	IC	RSS Gen Issue 4: 2014 -	
6dB Bandwidth	FCC	15.247(a)(2)	FCC	558074 D01 DTS Meas Guidance v03r04	☐ Pass ☒ N/A
	IC	RSS247 (5.2.1)	IC		
Band Edge and Radiated Spurious Emissions	FCC	15.247(d)	FCC	ANSI C63.10:2013 558074 D01 DTS Meas Guidance v03r04	☒ Pass ☐ N/A
	IC	RSS247 (5.5)	IC		
Output Power	FCC	15.247(b)	FCC	558074 D01 DTS Meas Guidance v03r04	☒ Pass ☐ N/A
	IC	RSS247 (5.4.4)	IC		
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 ☒ N/A
	IC	-	IC	-	
Power Spectral Density	FCC	15.247(e)	FCC	558074 D01 DTS Meas Guidance v03r04	☐ Pass ☒ N/A
	IC	RSS247 (5.2.2)	IC		
RF Exposure requirement	FCC	15.247(i)	FCC	-	☐ Pass ☒ N/A
	IC	RSS Gen(5.5)	IC	RSS Gen Issue 4: 2014	
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. 3. The device is operating at near 98% duty cycle.				
Note	Only Output Power and Radiated Spurious Emission was tested for AP245X with sector antenna. Please refer to report no. : FCC_IC_RF_SL16040101-AER-001_DTS_2.4G_Omni for rest of the items.				

9 Measurement Uncertainty

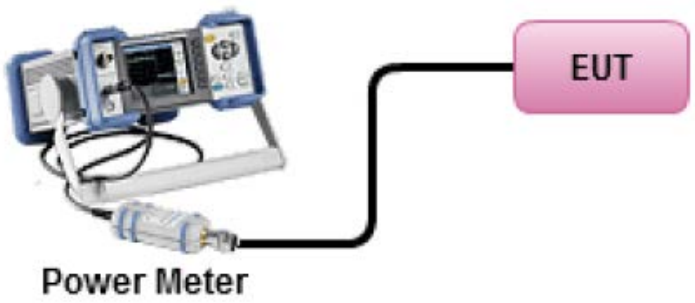
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious 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 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			
Test Procedure	558074 D01 DTS Meas Guidance v03r04, 9.2.3.1 Measurement using a Power Meter (PM) 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	05/17/2016	Environmental condition	Temperature 23ºC Relative Humidity 44% Atmospheric Pressure 1021mbar
Remark	Directional Gain = G_{ANT} + 10*log(N_{ANT}) dBi Antenna Gain (G_{ANT}) = 5.5dBi N_{ANT} = 3		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Rachana Khanduri* at *RF Test Site*.

Output Power measurement result

For Non- Beamforming:

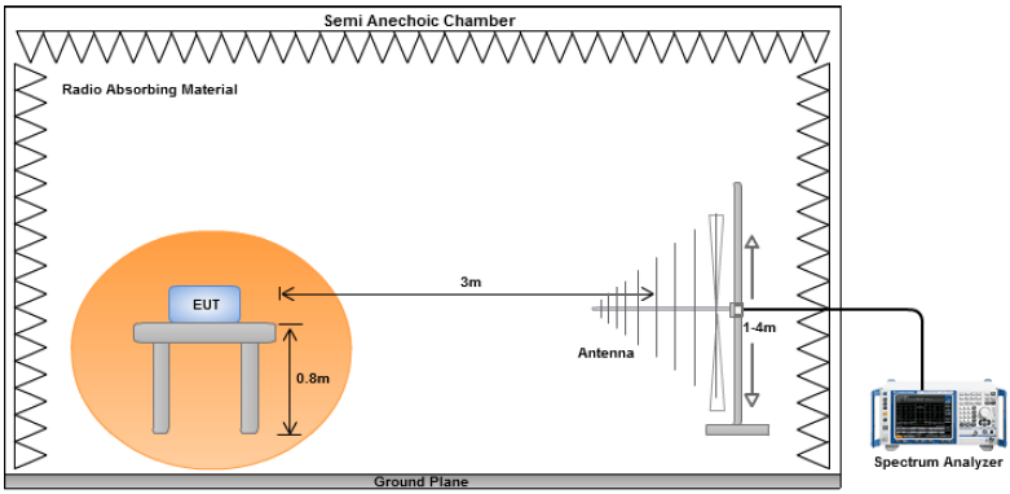
Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain1	Chain2	Chain3	Combined Power		
Output	802.11b	2412	Low	20.02	18.67	18.97	24.03	30	Pass
Output	802.11b	2437	Mid	19.96	18.62	18.80	23.94	30	Pass
Output	802.11b	2462	High	20.06	18.57	18.90	24.00	30	Pass
Output	802.11g	2412	Low	19.46	18.02	18.41	23.44	30	Pass
Output	802.11g	2437	Mid	19.55	18.12	18.31	23.48	30	Pass
Output	802.11g	2462	High	19.64	18.06	18.34	23.51	30	Pass
Output	802.11n-20M	2412	Low	20.23	18.67	19.03	24.13	30	Pass
Output	802.11n-20M	2437	Mid	20.26	18.76	19.01	24.17	30	Pass
Output	802.11n-20M	2462	High	20.03	18.72	18.97	24.05	30	Pass
Note	N/A								

For Beamforming:

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain1	Chain2	Chain3	Combined Power		
Output	802.11b	2412	Low	20.02	18.67	18.97	24.03	25.73	Pass
Output	802.11b	2437	Mid	19.96	18.62	18.80	23.94	25.73	Pass
Output	802.11b	2462	High	20.06	18.57	18.90	24.00	25.73	Pass
Output	802.11g	2412	Low	19.46	18.02	18.41	23.44	25.73	Pass
Output	802.11g	2437	Mid	19.55	18.12	18.31	23.48	25.73	Pass
Output	802.11g	2462	High	19.64	18.06	18.34	23.51	25.73	Pass
Output	802.11n-20M	2412	Low	20.23	18.67	19.03	24.13	25.73	Pass
Output	802.11n-20M	2437	Mid	20.26	18.76	19.01	24.17	25.73	Pass
Output	802.11n-20M	2462	High	20.03	18.72	18.97	24.05	25.73	Pass
Note	Directional Gain = 5.5 + 10* log(3) = 10.27dBi Directional Gain is greater than 6dBi. So, Limit = 30- 4.27 = 25.73dBm								

10.2 Radiated Spurious Emissions below 1GHz

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.247(d)
RSS247 (5.5)</td><td>a)</td><td>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></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">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.</td></tr>
<tr><td>Remark</td><td colspan="3">The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.</td></tr>
<tr><td>Result</td><td colspan="3">☒ Pass ☐ Fail</td></tr>
</table>

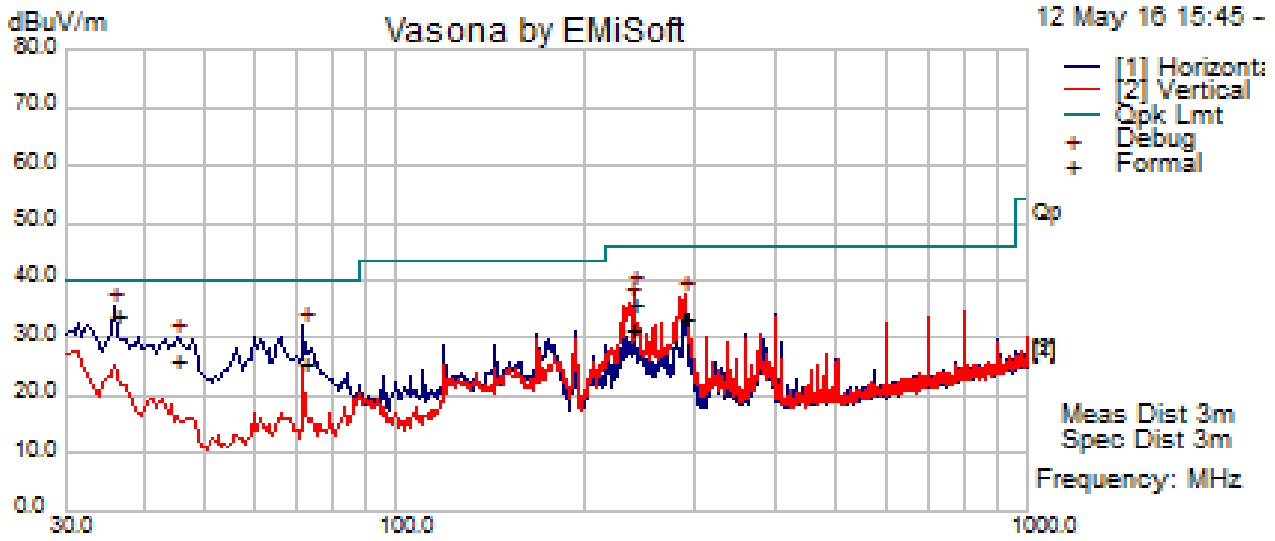
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Rachana Khanduri* at *10m Chamber*.

Radiated Emission Test Results (Below 1GHz)

Test specification	Below 1GHz			
Environmental Conditions:	Temp (°C):	25.7	Result	
	Humidity (%)	29		
	Atmospheric (mPa):			
Mains Power:	110VAC, 60Hz			
Tested by:	Rachana Khanduri			
Test Date:	05/12/2016			
Remarks:	2.4GHz 11n20 2437MHz			



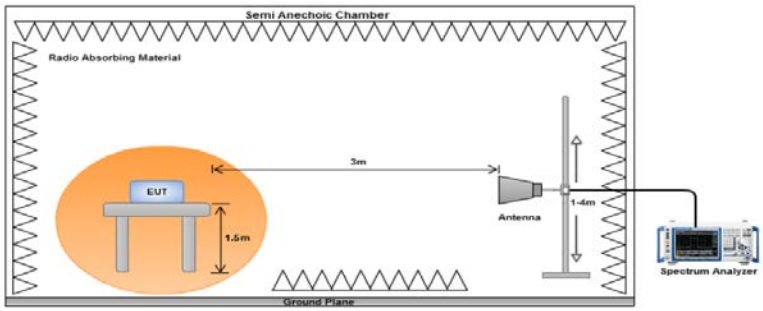
Quasi Max Measurement

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
36.01	53.85	0.87	-20.78	33.93	Quasi Max	H	104	282	40.00	-6.07	Pass
240.01	61.14	2.33	-27.59	35.88	Quasi Max	V	132	292	46.02	-10.14	Pass
71.94	55.03	1.27	-30.97	25.33	Quasi Max	H	132	270	40.00	-14.67	Pass
288.43	57.02	2.58	-26.31	33.29	Quasi Max	V	126	340	46.02	-12.73	Pass
235.06	57.10	2.30	-27.78	31.63	Quasi Max	V	104	123	46.02	-14.39	Pass
45.15	52.05	0.98	-27.21	25.82	Quasi Max	H	132	235	40.00	-14.18	Pass

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

10.3 Radiated Spurious Emissions Above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§15.247(d), RSS247 (5.5)	a)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☐ 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	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. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	None		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Rachana Khanduri* at *3m Chamber*.

Radiated Emission Test Results (Above 1GHz)

802.11b – 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17576.50	48.73	9.42	-3.60	54.55	Peak Max	H	243	55	74	-19.45	Pass
1537.46	67.96	4.77	-29.17	43.55	Peak Max	H	206	85	74	-30.45	Pass
2133.06	60.74	5.10	-25.49	40.35	Peak Max	V	210	350	74	-33.65	Pass
17576.50	37.41	9.42	-3.60	43.23	Average Max	H	243	55	54	-10.77	Pass
1537.46	64.79	4.77	-29.17	40.38	Average Max	H	206	85	54	-13.62	Pass
2133.06	47.08	5.1	-25.49	26.69	Average Max	V	210	350	54	-27.31	Pass

802.11b - 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17983.93	48.55	9.47	-3.23	54.79	Peak Max	V	216	191	74	-19.21	Pass
1537.36	67.37	4.77	-29.18	42.97	Peak Max	H	100	50	74	-31.04	Pass
3076.18	54.81	6.56	-21.02	40.36	Peak Max	H	235	361	74	-33.64	Pass
17983.93	36.72	9.47	-3.23	42.96	Average Max	V	216	191	54	-11.04	Pass
1537.36	64.42	4.77	-29.18	40.01	Average Max	H	100	50	54	-13.99	Pass
3076.18	43.10	6.56	-21.02	28.65	Average Max	H	235	361	54	-25.36	Pass

802.11b – 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
13007.58	50.49	8.83	-7.73	51.59	Peak Max	V	225	62	74	-22.41	Pass
4924.29	53.95	7.07	-16.97	44.06	Peak Max	V	226	343	74	-29.94	Pass
1537.32	70.60	4.77	-29.18	46.20	Peak Max	H	185	90	74	-27.80	Pass
13007.58	38.83	8.83	-7.73	39.94	Average Max	V	225	62	54	-14.06	Pass
4924.29	46.07	7.07	-16.97	36.17	Average Max	V	226	343	54	-17.83	Pass
1537.32	68.92	4.77	-29.18	44.52	Average Max	H	185	90	54	-9.48	Pass

802.11g - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17634.67	49.97	9.43	-3.37	56.02	Peak Max	V	173	237	74	-17.98	Pass
1537.26	67.91	4.77	-29.18	43.50	Peak Max	H	137	52	74	-30.50	Pass
3078.08	53.72	6.56	-21.01	39.27	Peak Max	V	210	167	74	-34.73	Pass
17634.67	37.11	9.43	-3.37	43.16	Average Max	V	173	237	54	-10.84	Pass
1537.26	65.67	4.77	-29.18	41.27	Average Max	H	137	52	54	-12.73	Pass
3078.08	42.31	6.56	-21.01	27.87	Average Max	V	210	167	54	-26.14	Pass

802.11g – 2437MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17681.85	48.34	9.43	-3.15	54.62	Peak Max	H	243	93	74	-19.38	Pass
7539.81	50.43	7.31	-11.00	46.75	Peak Max	V	209	0	74	-27.25	Pass
1537.37	68.91	4.77	-29.18	44.50	Peak Max	V	194	236	74	-29.50	Pass
17681.85	36.71	9.43	-3.15	42.99	Average Max	H	243	93	54	-11.01	Pass
7539.81	38.92	7.31	-11.00	35.23	Average Max	V	209	0	54	-18.77	Pass
1537.37	66.59	4.77	-29.18	42.19	Average Max	V	194	236	54	-11.82	Pass

802.11g - 2462MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17905.30	47.89	9.46	-3.08	54.27	Peak Max	H	119	361	74	-19.73	Pass
4915.48	51.22	7.07	-16.99	41.3	Peak Max	H	243	323	74	-32.7	Pass
1537.28	67.49	4.77	-29.18	43.09	Peak Max	H	138	52	74	-30.91	Pass
17905.30	36.68	9.46	-3.08	43.06	Average Max	H	119	361	54	-10.94	Pass
4915.48	39.58	7.07	-16.99	29.66	Average Max	H	243	323	54	-24.34	Pass
1537.28	65.45	4.77	-29.18	41.04	Average Max	H	138	52	54	-12.96	Pass

802.11n20 - 2412MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17638.36	48.77	9.43	-3.36	54.84	Peak Max	H	246	41	74	-19.16	Pass
12450.54	51.24	8.96	-7.29	52.91	Peak Max	V	104	0	74	-21.09	Pass
1537.13	66.82	4.77	-29.18	42.41	Peak Max	V	194	214	74	-31.59	Pass
17638.36	37.25	9.43	-3.36	43.32	Average Max	H	246	41	54	-10.68	Pass
12450.54	38.69	8.96	-7.29	40.36	Average Max	V	104	0	54	-13.64	Pass
1537.13	64.28	4.77	-29.18	39.88	Average Max	V	194	214	54	-14.12	Pass

802.11n20 – 2437MHz

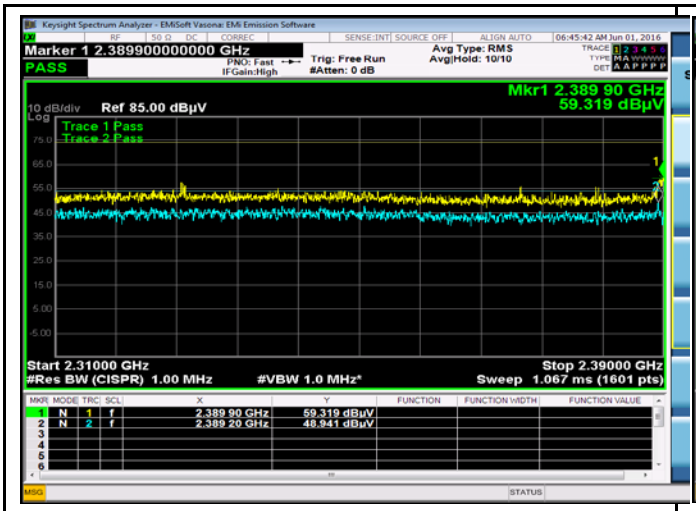
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17233.42	48.68	9.36	-4.44	53.59	Peak Max	H	158	333	74	-20.41	Pass
4874.39	54.26	7.06	-17.09	44.22	Peak Max	H	237	77	74	-29.78	Pass
1537.25	66.21	4.77	-29.18	41.80	Peak Max	V	234	258	74	-32.20	Pass
17233.42	37.52	9.36	-4.44	42.43	Average Max	H	158	333	54	-11.57	Pass
4874.39	40.27	7.06	-17.09	30.23	Average Max	H	237	77	54	-23.77	Pass
1537.25	63.31	4.77	-29.18	38.91	Average Max	V	234	258	54	-15.1	Pass

802.11n20 - 2462MHz

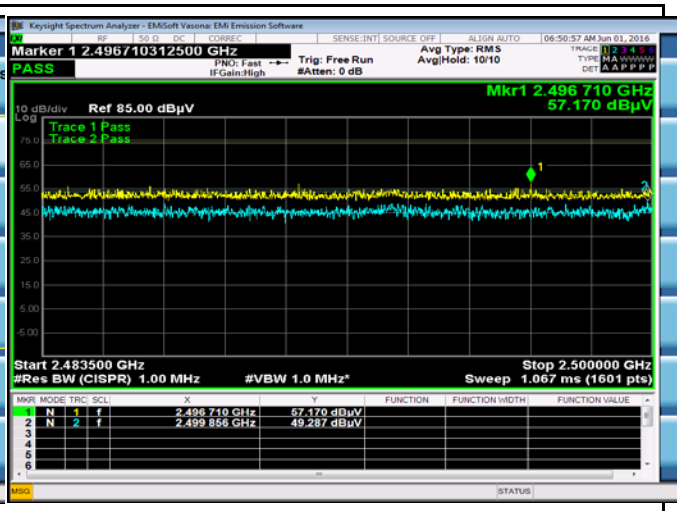
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
17702.36	48.77	9.43	-3.08	55.13	Peak Max	V	200	331	74	-18.88	Pass
12289.66	49.46	8.88	-7.36	50.98	Peak Max	V	120	284	74	-23.03	Pass
1756.24	54.05	4.76	-28.66	30.15	Peak Max	H	204	151	74	-43.85	Pass
17702.36	36.55	9.43	-3.08	42.91	Average Max	V	200	331	54	-11.09	Pass
12289.66	38.01	8.88	-7.36	39.53	Average Max	V	120	284	54	-14.47	Pass
1756.24	43.05	4.76	-28.66	19.15	Average Max	H	204	151	54	-34.85	Pass

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

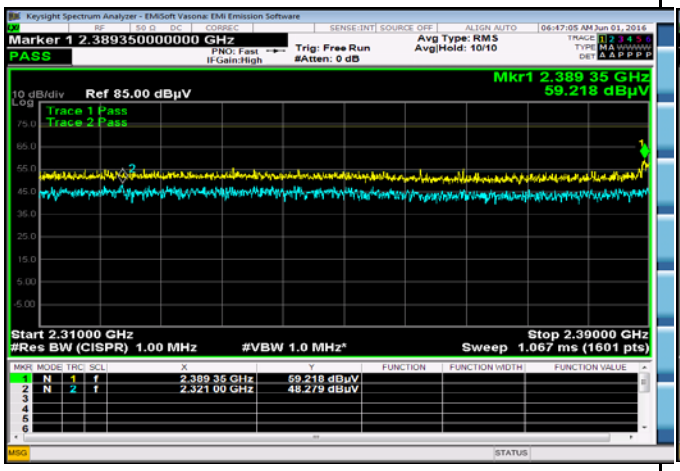
Restricted Band Measurement Plot



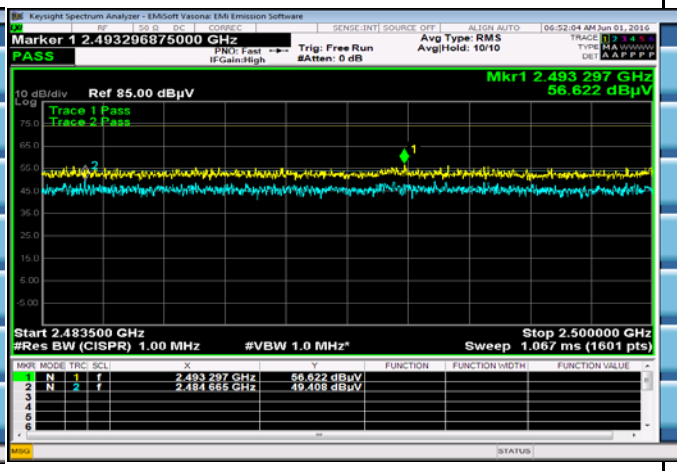
Restricted Band 802.11b 2412MHz



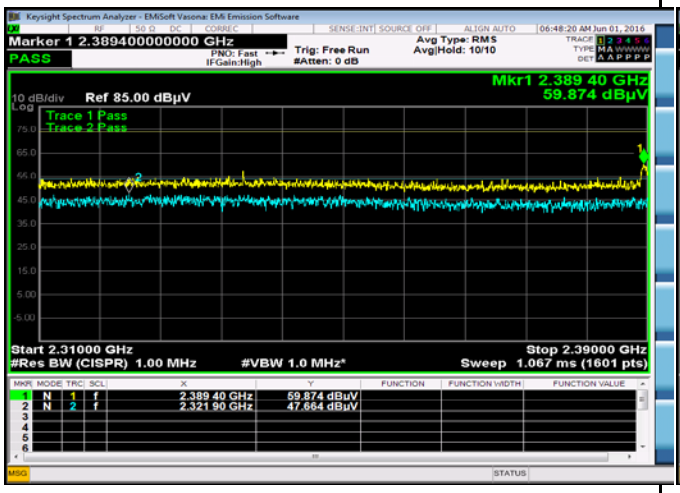
Restricted Band 802.11b 2462MHz



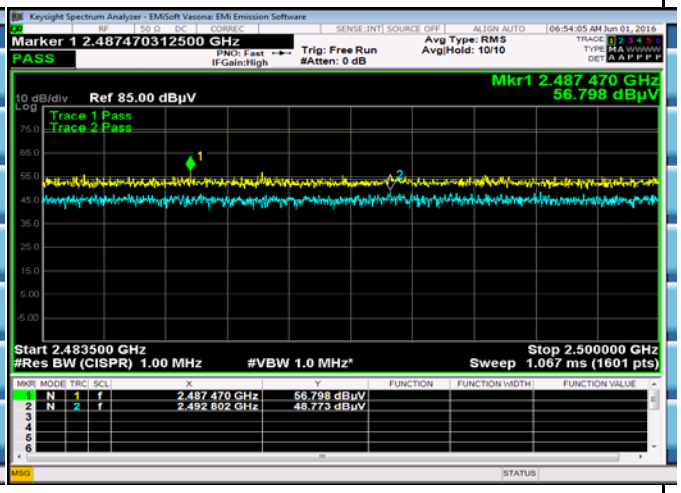
Restricted Band 802.11g 2412MHz



Restricted Band 802.11g 2462MHz



Restricted Band 802.11n-20M 2412MHz



Restricted Band 802.11n-20M 2462MHz

Annex A. TEST INSTRUMENT

Instrument	Model	Manufacturer	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2016	1 Year	06/08/2017	☐
CHASE LISN (9k-30MHz)	MN2050B	Chase	1018	08/07/2015	1 Year	08/07/2016	☐
Radiated Emissions							
R & S Receiver	ESIB 40	Rohde & Schwarz	100179	06/08/2016	1 Year	06/08/2017	☑
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2015	1 Year	08/20/2016	☑
Pre-Amplifier (1-26.5GHz)	8449B	Hewlett Packard	3008A00715	03/30/2016	1 Year	03/30/2017	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	RF Bay, Inc.	11140711	02/10/2016	1 Year	02/10/2017	☑
ETS-Lingren Loop Antenna	6512	ETS-Lingren	00049120	05/12/2015	1 Year	05/12/2016	☐
Bi-Log antenna (30MHz~2GHz)	JB1	Sunol Sciences	A030702	08/15/2015	1 Year	08/15/2016	☑
Horn Antenna (1-26.5GHz)	3115	EMCO	10SL0059	08/25/2015	1 Year	08/25/2016	☑
3 Meters SAC	3M	ETS-Lingren	N/A	06/09/2016	1 Year	06/09/2017	☑
10 Meters SAC	10M	ETS-Lingren	N/A	09/05/2015	1 Year	09/05/2016	☑
RF Conducted Measurement							
Spectrum Analyzer	N9010A	Keysight	10SL0219	08/20/2015	1 Year	08/20/2016	☑
USB RF Power Sensor	7002-006	ETS-Lingren	10SL0190	09/03/2015	1 Year	09/03/2016	☑

Test Software Version

Test Item	Vendor	Software	Version
Radiated Emission	EMISoft	EMISoft Vasona	V5.0

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		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