RF TEST REPORT

SIEMIC
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Report No.: SL13091001-AER-004-FCC-15.247
Supersede Report No.: None

Applicant	Aerohive Networks, Inc.
Product Name	Digital Transmission System Access Point
Model No.	AP390
Test Standard	47CFR15.247: 2013 RSS 210 Issue8: 2010
Test Method	ANCI C63.4:2009 558074 D01 DTS Meas Guidance v03r01 RSS-Gen Issue 3: 2010
FCC ID	WBV-AP3X0
IC ID	7774A-AP3X0
Date of test	19 - 31 December 2013
Issue Date	1/21/2014
Test result	Pass Fail
Equipment complied with the specification	[x]
The equipment did not comply with the specification	[ ]

Nima Molaei	David Zhang
Test Engineer	Engineer Reviewer

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Test result presented in this test report is applicable to the tested sample only

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

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TESTING CERT # 2742-01

Laboratory Introduction

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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

Accreditations for Product Certifications

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

CONTENTS

1 Report Revision History

Report No.	Report Version	Description	Issue Date
SL13091001-AER-004-FCC-15.247	None	Original	1/21/2014

2 Executive Summary

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

Company: Aerohive Networks, Inc.
Product: Digital Transmission System Access Point
Model: AP390

against the current Stipulated Standards. The FCC certified product (FCC ID: WBV-AP3X0, IC ID: 7774A-AP3X0) with new type of antenna (antenna model: Dual Band MIMO Antenna) has demonstrated to comply with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	Aerohive Networks, Inc.
Applicant Address	330 Gibraltar Drive,Sunnyvale, CA 94089, USA
Manufacturer Name	Aerohive Networks, Inc.
Manufacturer Address	330 Gibraltar Drive,Sunnyvale, CA 94089, USA

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	Digital Transmission System Access Point
Model No.	AP390
Trade Name	Aerohive
Serial No.	510077-03
Input Power	12VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	-
Hardware version	N/A
Software version	N/A
Date of EUT received	12/23/2013
Equipment Class/ Category	DTS, UNII
Clock Frequencies	N/A
Port/Connectors	N/A
Remark	-

6.2 Radio Description

Spec for Radio -

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 5745-5825MHz	2412-2462MHz 5180-5240MHz 5745-5825MHz	2422-2462MHz 5190-5230MHz 5755-5795MHz	5210MHz 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	9	11(2.4GH) 9 (5GHz)	7(2.4GH) 5(5GHz)	2
Antenna Type	Dual Band Sector External Antenna					
Antenna Gain	3 X 5 dBi					
Antenna Connector Type	SMA					

Directional gain calculation (per KDB 662911 D01 Multiple Transmitter Output v02r01)

Type	Freq	Main Ant Gain (cBi)	MIMO Ant1Gain (dBi)	MIMO Ant2Gain (dBi)	Directional Gain (dBi)
PSD	5GHz	5.0	5	5	9.77
Power	5GHz	5.0	5	5	5

Note:

1. EUT employs Cyclic Delay Diversity technique, and all antenna in the same band has same antenna gain, so for power spectral density, the

   Array Gain = 10 log (Nant/Nss) dB

   For power measurements on IEEE 802.11 devices, 1,2

   Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
   Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less, for 20-MHz channel widths with NANT ≥ 5.

   NANT = number of transmit antennas and NSS = number of spatial streams.
   Directional Gain = Antenna gain + Array Gain

2. EUT has a Nss = 1

Channel List

Type		Channel No.	Frequency (MHz)	Available (Y/N)
802.11b/g/n-HT20	2412-2462	1	2412	Y
		2	2417	Y
		3	2422	Y
		4	2427	Y
		5	2432	Y
		6	2437	Y
		7	2442	Y
		8	2447	Y
		9	2452	Y
		10	2457	Y
		11	2462	Y
802.11a/n-HT20	5150-5250MHz	36	5180	Y
		40	5200	Y
		44	5220	Y
		48	5240	Y
	5250-5350MHz	52	5260	N
		56	5280	N
		60	5300	N
		64	5320	N
	5470-5725MHz	100	5500	N
		104	5520	N
		108	5540	N
		112	5560	N
		116	5580	N
		120	5600	N
		124	5620	N
		128	5640	N
		132	5660	N
		136	5680	N
		140	5700	N
	5725-5825MHz	149	5745	Y
		153	5765	Y
		157	5785	Y
		161	5805	Y
		165	5825	Y

802.11n-HT40	2412-2462	1	2412	N
		2	2417	N
		3	2422	Y
		4	2427	Y
		5	2432	Y
		6	2437	Y
		7	2442	Y
		8	2447	Y
		9	2452	Y
		10	2457	N
		11	2462	N
802.11n-HT40	5150-5250MHz	36,40	5190	Y
		40,44	5210	N
		44,48	5230	Y
	5250-5350MHz	52,56	5270	N
		56,60	5290	N
		60,64	5310	N
	5470-5725MHz	100,104	5510	N
		104,108	5530	N
		108,112	5550	N
		112,116	5570	N
		116,120	5590	N
		120,124	5610	N
		124,128	5630	N
		128,132	5650	N
		132,136	5670	N
	5725-5825MHz	149,153	5755	Y
		153,157	5775	Y
		157,161	5795	Y
802.11ac-HT80	5150-5250MHz	38, 46	5210	Y
	5250-5350MHz	54, 62	5290	N
	5470-5725MHz	102, 110	5530	N
		118, 126	5610	N
		134,142	5690	N
	5725-5825MHz	151, 159	5775	Y

6.3 Output Power/PSD Evaluation with New Antenna

Output Power

Type	Freq (MHz)	Test mode	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Port A	Port B	Port C	Combined		
Output power	5745	802.11a (3TX)	149	23.88	24.17	24.22	28.86	30	Pass

Note:
1. No reduction on the power limit for operating in 5725-5850MHz band, since EUT uses this band for for fixed, point-to-point operations
2. Only the maximum power result is shown here as verification.

PSD

Type	Freq (MHz)	Test mode	CH	Conducted Power (dBm/MHz)				Limit (dBm/ 3KHz)	Result
				Port A	Port B	Port C	Combined		
PSD	5745	802.11a (3TX)	149	-1.65	-1.37	-1.86	2.065	4.23	Pass

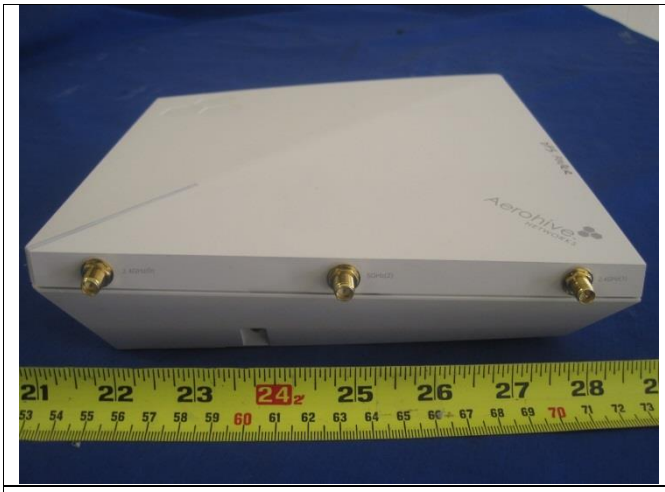
Note:
1. The directional antenna gain is 9.77dBi. The PSD limit is reduced every 1dB that the directional gain exceeds the 6dBi.
2. Only the maximum PSD result is shown here as verification.

6.4 EUT test modes/configuration Description

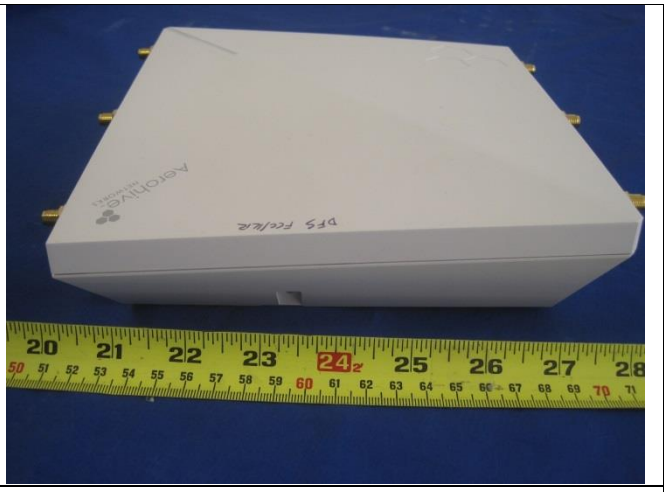
Test mode

Final Test Mode		Note
Final_test_mode_1	WLAN 5.7GHz Cont TX at 802.11n-20MHz (Channel:149)	-
Final_test_mode_2	WLAN 5.7GHz Cont TX at 802.11n-20MHz (Channel:157)	-
Final_test_mode_3	WLAN 5.7GHz Cont TX at 802.11n-20MHz (Channel:165)	-
Final_test_mode_4	WLAN 5.7GHz Cont TX at 802.11n-40MHz (Channel:149)	-
Final_test_mode_5	WLAN 5.7GHz Cont TX at 802.11n-40MHz (Channel:153)	-
Final_test_mode_6	WLAN 5.7GHz Cont TX at 802.11ac-80MHz (Channel:155)	-
Final_test_mode_7	WLAN 5.7GHz Cont TX at 802.11a (Channel:149)	-
Final_test_mode_8	WLAN 5.7GHz Cont TX at 802.11a (Channel:157)	-
Final_test_mode_9	WLAN 5.7GHz Cont TX at 802.11a (Channel:165)	-
Remark:		

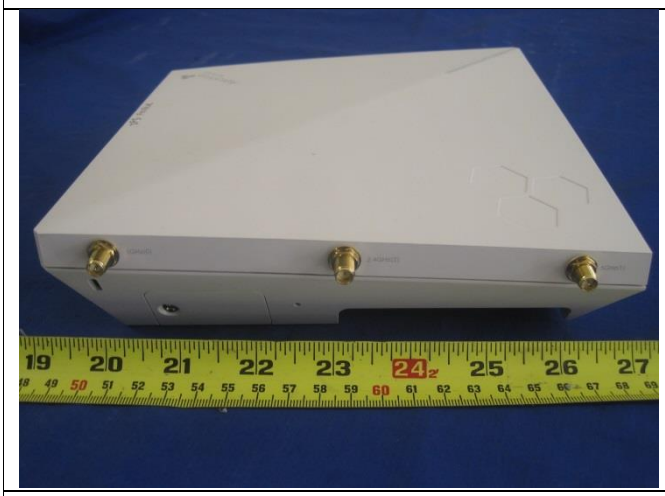
6.5 EUT Photos - External



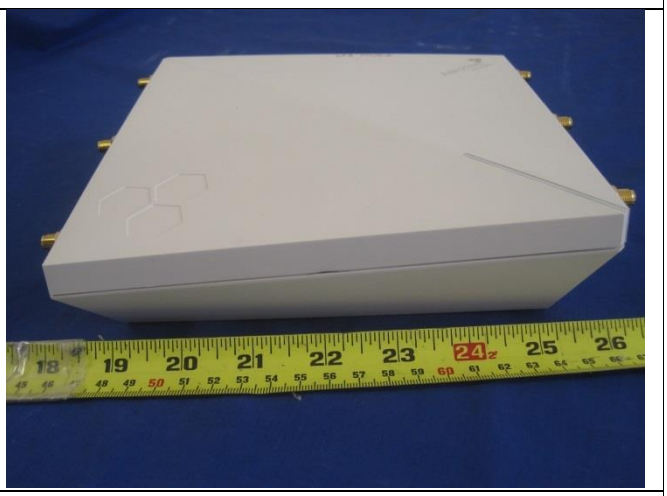
EUT – Front View



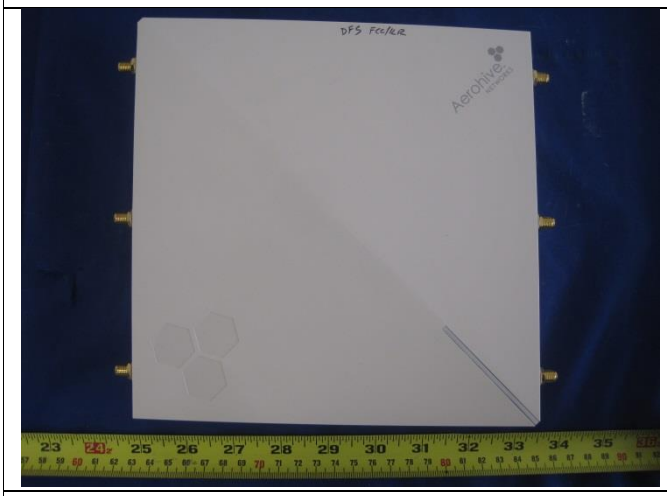
EUT – Rear View



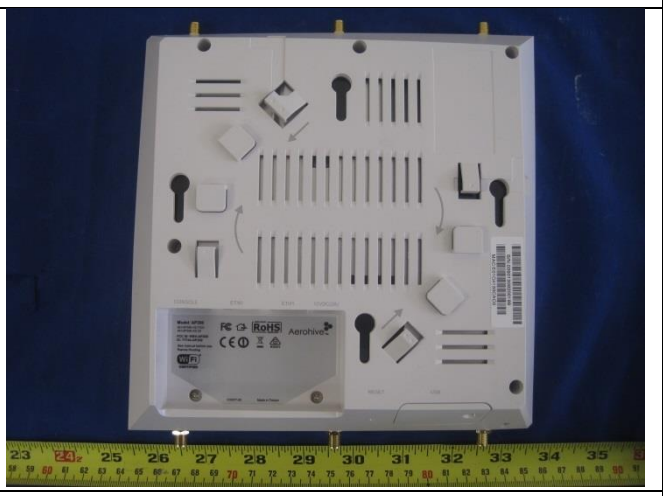
EUT – Left View



EUT – Right View

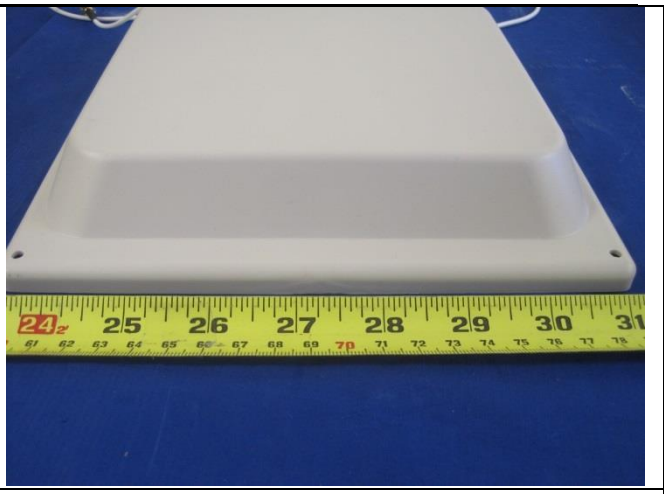


EUT – Top View



EUT – Bottom View

External Antenna- Front View

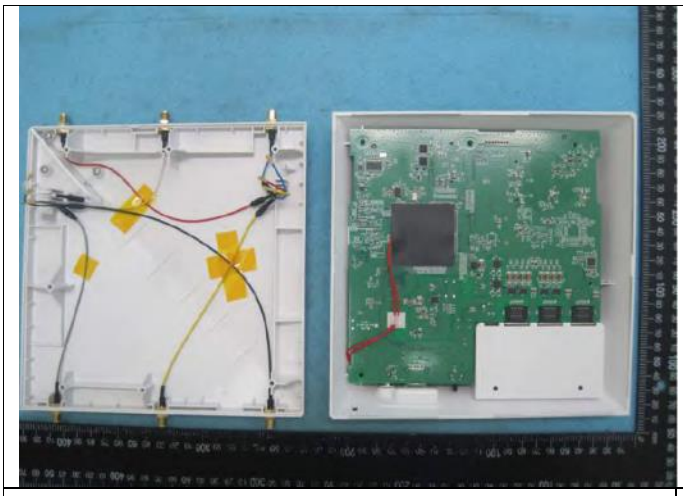


External Antenna- Rear View

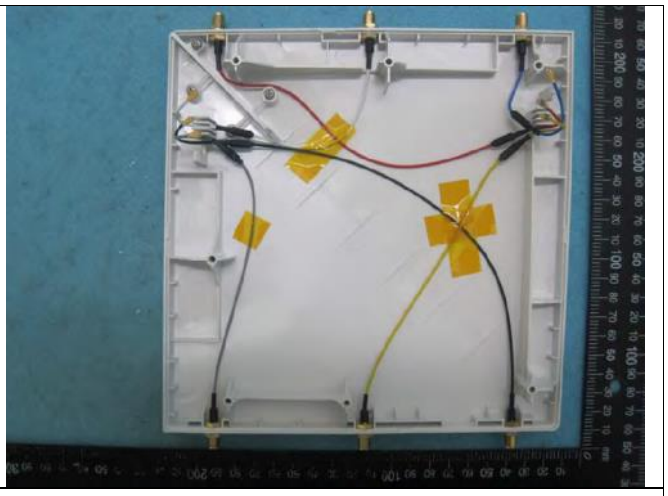
External Antenna- Top View

External Antenna- Bottom View

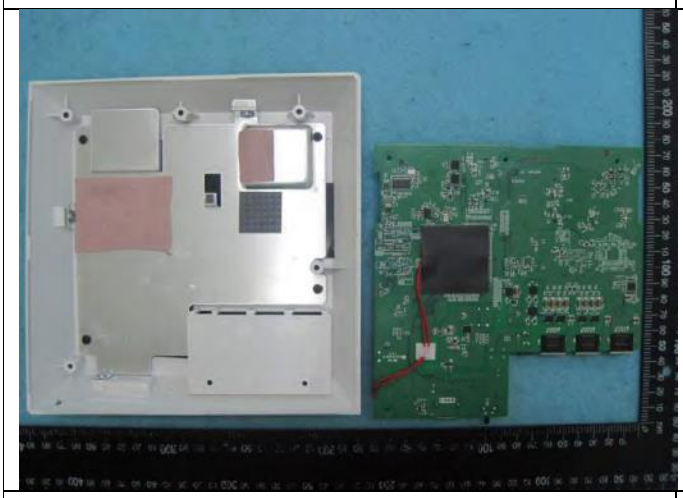
6.6 EUT Photos - Internal



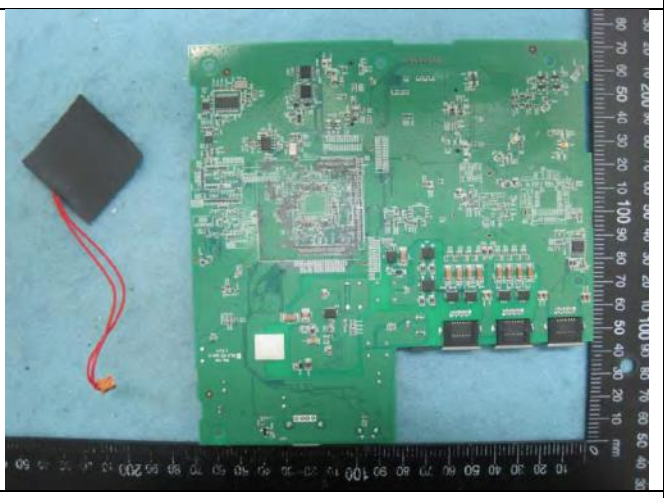
EUT Cover off-1



EUT Cover off-2



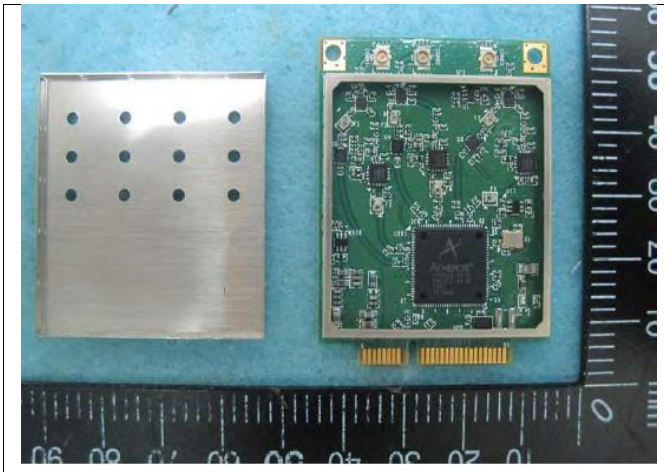
PCB 1 – Top view



PCB 1 – Cover off view

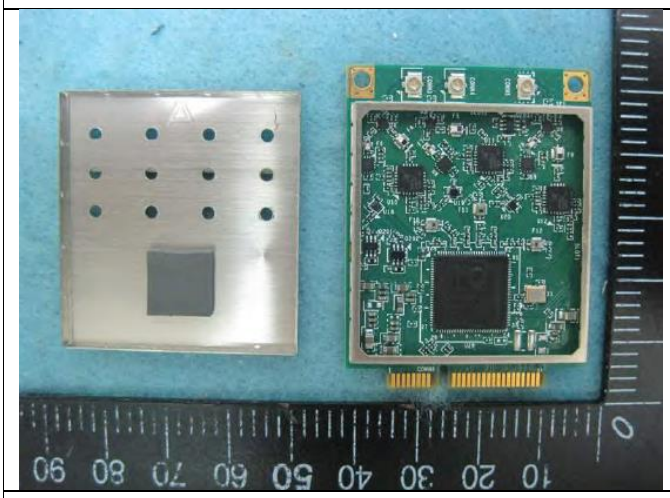
PCB 2 – Top view

PCB 1 – Cover off view



PCB 3 – Top view

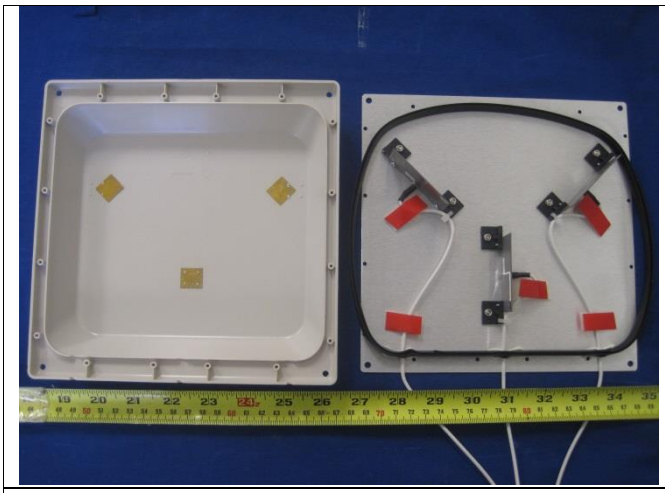
PCB 3 – Bottom view



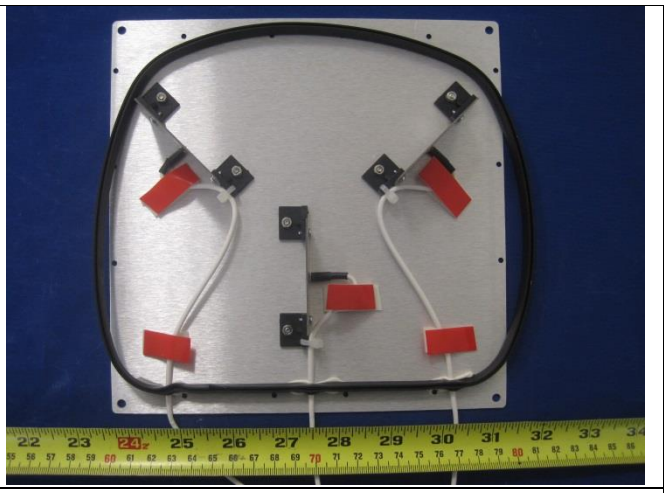
PCB 4 – Top view

PCB 4 – Bottom view

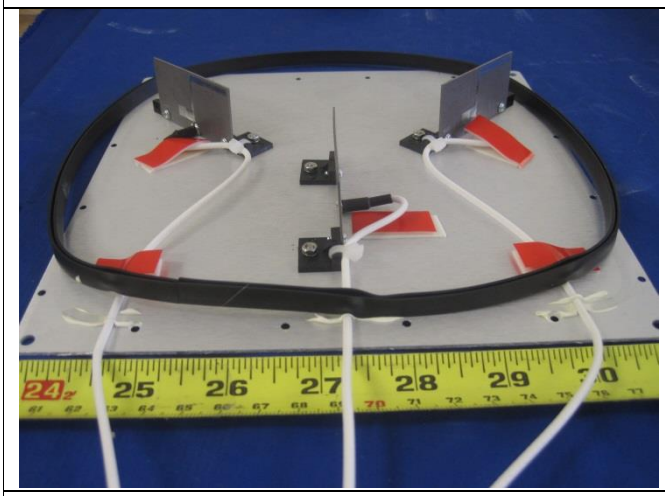
PCB 5 – Top view



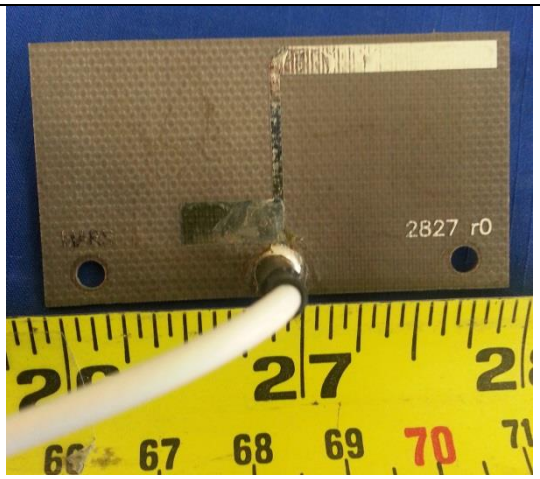
External Antenna- Cover off



External Antenna- Top View



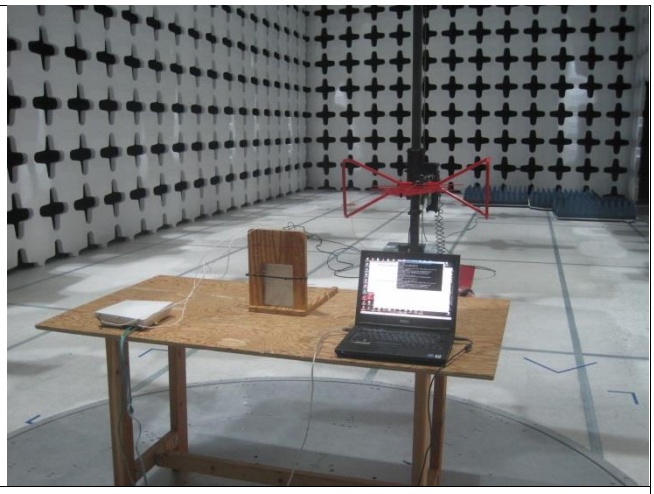
External Antenna- Side View



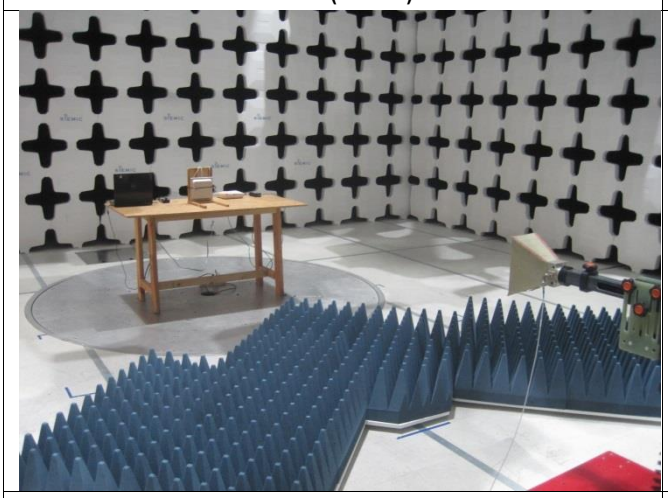
External Antenna-Main PCB

6.7 EUT Test Setup Photos

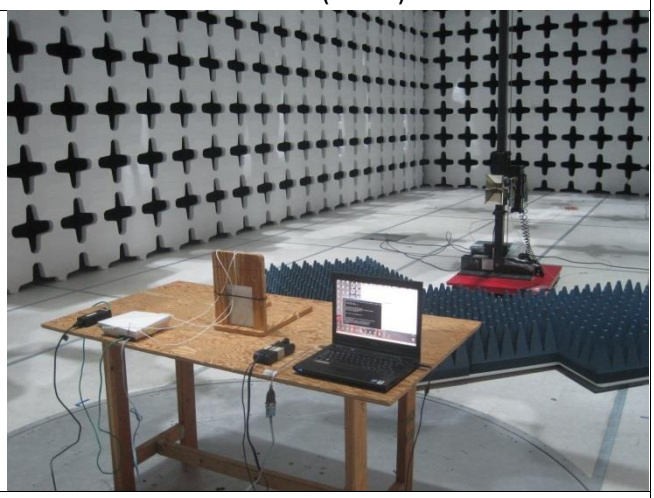
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View

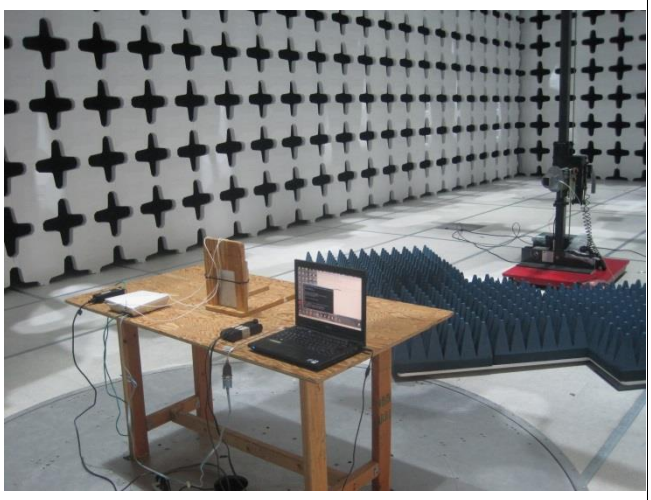


Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

Radiated Emissions (>18 GHz) – Front View



Radiated Emissions (>18 GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	Vostro 1310	07267	DELL	-

7.2 Test Software Description

Test Item	Software	Description
Spurious Emission	Putty	Enable RF Test mode for WLAN

8 Test Summary

Emissions			
Test Item	**Test standard**	**Test Method/Procedure**	**Pass / Fail**
Radiated Spurious Emissions	FCC 15.247 (d)	ANSI C63.4 – 2009 558074 D01 DTS Meas Guidance v03r01	☒ Pass ☐ Fail
	RSS210 (A8.5)	RSS-Gen Issue 3: 2010	
Restricted Band of Operation	15.205	ANSI C63.4 – 2009 558074 D01 DTS Meas Guidance v03r01	☒ Pass ☐ Fail
	RSS 210 (2.2)	RSS-Gen Issue 3: 2010	

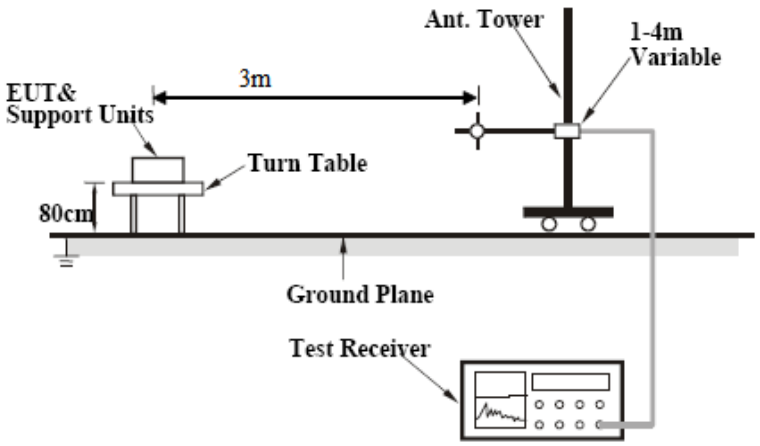
9 Measurement Uncertainty

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 Radiated Emissions below 1GHz

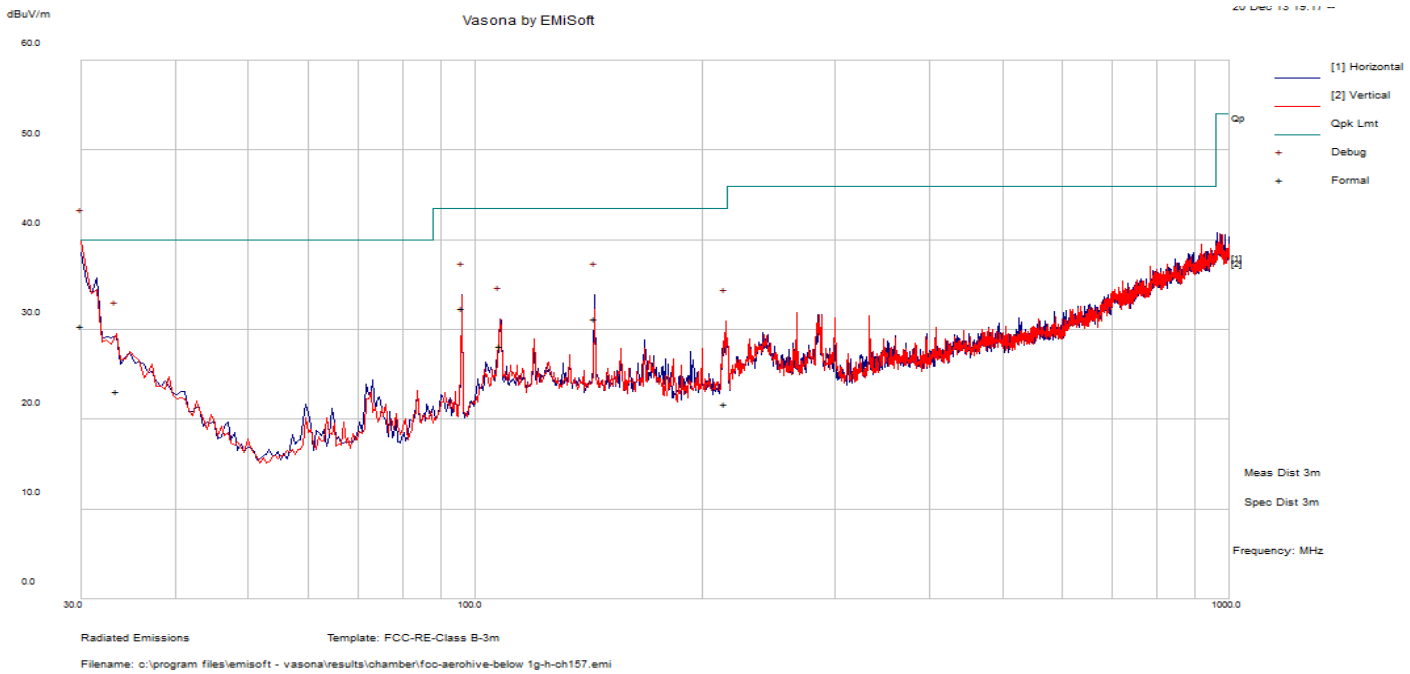
Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.247(d), RSS210(A8.5)</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">Different RF configuration has been evaluated but not much difference was found. The data presented here is the worst case data with EUT under 802.11ac –HT20-5785MHz mode.</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

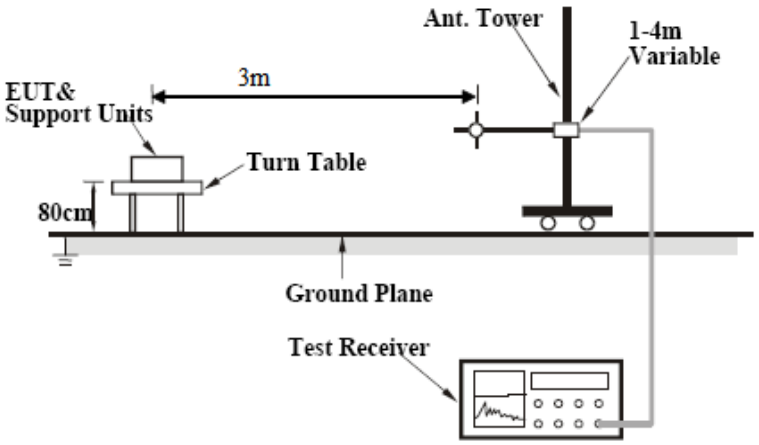
Radiated Emission Test Results (Below 1GHz) at 802.1ac-20 (5785 MHz)



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
30	34.98	0.64	-5.24	30.38	Quasi Max	V	166	65	40	-9.62	Pass
144.04	43.07	2.08	-13.88	31.27	Quasi Max	H	200	96	43.5	-12.23	Pass
96.04	48.07	1.61	-17.31	32.36	Quasi Max	H	357	212	43.5	-11.14	Pass
33.47	30.33	0.68	-7.84	23.16	Quasi Max	V	184	220	40	-16.84	Pass
107.79	40.78	1.75	-14.3	28.23	Quasi Max	V	268	3	43.5	-15.27	Pass
214.66	35.43	2.54	-16.28	21.69	Quasi Max	V	154	38	43.5	-21.81	Pass

10.2 Radiated Spurious Emissions above 1GHz

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, the emission must also comply with the radiated emission limits specified in 2.8	☒
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

Radiated Emission Test Results (Above 1GHz)

WLAN-5.7GHz- 802.11n-20M- Low 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
9487.07	46.36	3.47	6.56	56.39	Peak Max	H	157	190	74	-17.61	Pass
8378.81	45.5	3.23	5.18	53.91	Peak Max	V	365	349	74	-20.09	Pass
5101.46	51.34	2.62	0.47	54.44	Peak Max	V	153	357	74	-19.56	Pass
1535.03	54.29	1.17	-6.14	49.32	Peak Max	V	99	84	74	-24.68	Pass
1330.84	50.91	1.02	-6.55	45.38	Peak Max	H	99	277	74	-28.62	Pass
1600.16	47.7	1.23	-5.89	43.04	Peak Max	H	152	83	74	-30.96	Pass
9487.07	33.3	3.47	6.56	43.32	Average Max	H	157	190	54	-10.68	Pass
8378.81	32.73	3.23	5.18	41.13	Average Max	V	365	349	54	-12.87	Pass
5101.46	38.24	2.62	0.47	41.33	Average Max	V	153	357	54	-12.67	Pass
1535.03	51.37	1.17	-6.14	46.40	Average Max	V	99	84	54	-7.60	Pass
1330.84	32.55	1.02	-6.55	27.03	Average Max	H	99	277	54	-26.97	Pass
1600.16	38.17	1.23	-5.89	33.51	Average Max	H	152	83	54	-20.49	Pass

WLAN-5.7GHz- 802.11n-20M- Mid 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
5372.55	53.66	2.7	0.78	57.14	Peak Max	H	150	352	74	-16.86	Pass
1535.07	54.55	1.17	-6.14	49.58	Peak Max	V	99	165	74	-24.42	Pass
1327.138	55.34	1.02	-6.55	49.8	Peak Max	H	109	325	74	-24.2	Pass
1114.39	45.88	0.85	-6.95	39.78	Peak Max	V	393	241	74	-34.22	Pass
1013.94	48.73	0.75	-7.16	42.32	Peak Max	V	320	271	74	-31.68	Pass
1378.05	45.17	1.06	-6.47	39.76	Peak Max	H	133	315	74	-34.24	Pass
5372.55	40.36	2.7	0.78	43.84	Average Max	H	150	352	54	-10.16	Pass
1535.07	51.85	1.17	-6.14	46.88	Average Max	V	99	165	54	-7.12	Pass
1327.14	32.87	1.02	-6.55	27.34	Average Max	H	109	325	54	-26.66	Pass
1114.39	33.38	0.85	-6.95	27.28	Average Max	V	393	241	54	-26.72	Pass
1013.94	34.03	0.75	-7.16	27.62	Average Max	V	320	271	54	-26.38	Pass
1378.05	31.60	1.06	-6.47	26.18	Average Max	H	133	315	54	-27.82	Pass

WLAN-5.7GHz- 802.11n-20M- High 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
5382.65	53.01	2.71	0.79	56.51	Peak Max	V	144	20	74	-17.49	Pass
7557.21	45.95	3.4	3.73	53.08	Peak Max	V	299	226	74	-20.92	Pass
5091.97	53.09	2.62	0.46	56.17	Peak Max	V	154	351	74	-17.83	Pass
1535.04	56.43	1.17	-6.14	51.46	Peak Max	V	104	335	74	-22.54	Pass
1329.46	57.36	1.02	-6.55	51.83	Peak Max	V	108	237	74	-22.17	Pass
1592.45	46.54	1.22	-5.92	41.85	Peak Max	V	226	164	74	-32.15	Pass
5382.65	39.25	2.71	0.79	42.75	Average Max	V	144	20	54	-11.25	Pass
7557.21	32.83	3.4	3.73	39.96	Average Max	V	299	226	54	-14.04	Pass
5091.97	39.90	2.62	0.46	42.98	Average Max	V	154	351	54	-11.02	Pass
1535.04	54.24	1.17	-6.14	49.27	Average Max	V	104	335	54	-4.73	Pass
1329.46	35.11	1.02	-6.55	29.58	Average Max	V	108	237	54	-24.42	Pass
1592.45	32.00	1.22	-5.92	27.30	Average Max	V	226	164	54	-26.70	Pass

WLAN-5.7GHz- 802.11n-40M- Low 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
1535.07	56.87	1.17	-6.14	51.9	Peak Max	V	99	163	74	-22.1	Pass
1115.72	46.26	0.85	-6.94	40.17	Peak Max	V	223	136	74	-33.83	Pass
1454.02	44.49	1.11	-6.35	39.25	Peak Max	V	298	356	74	-34.75	Pass
1134.91	49.33	0.86	-6.91	43.29	Peak Max	H	116	260	74	-30.71	Pass
1330.58	52.92	1.02	-6.55	47.39	Peak Max	V	201	118	74	-26.61	Pass
1535.07	54.95	1.17	-6.14	49.98	Average Max	V	99	163	54	-4.02	Pass
1115.71	33.67	0.85	-6.94	27.57	Average Max	V	223	136	54	-26.43	Pass
1454.02	31.56	1.11	-6.35	26.32	Average Max	V	298	356	54	-27.68	Pass
1134.91	33.87	0.86	-6.91	27.83	Average Max	H	116	260	54	-26.17	Pass
1330.58	33.32	1.02	-6.55	27.80	Average Max	V	201	118	54	-26.20	Pass

WLAN-5.7GHz- 802.11n-40M- High 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
5371.69	54.3	2.7	0.78	57.78	Peak Max	V	162	5	74	-16.22	Pass
1425.26	44.82	1.09	-6.39	39.52	Peak Max	V	112	2	74	-34.48	Pass
1535.04	56.19	1.17	-6.14	51.22	Peak Max	V	102	163	74	-22.78	Pass
1094.82	47	0.83	-6.99	40.85	Peak Max	V	128	253	74	-33.15	Pass
1617.23	44.39	1.24	-5.82	39.81	Peak Max	V	364	320	74	-34.19	Pass
1547.96	44.03	1.18	-6.09	39.12	Peak Max	H	367	93	74	-34.88	Pass
5371.69	39.64	2.7	0.78	43.12	Average Max	V	162	5	54	-10.88	Pass
1425.2625	31.94	1.09	-6.39	26.63	Average Max	V	112	2	54	-27.37	Pass
1535.04	53.99	1.17	-6.14	49.02	Average Max	V	102	163	54	-4.98	Pass
1094.83	33.46	0.83	-6.99	27.30	Average Max	V	128	253	54	-26.70	Pass
1617.23	31.28	1.24	-5.82	26.70	Average Max	V	364	320	54	-27.30	Pass
1547.96	31.06	1.18	-6.09	26.15	Average Max	H	367	93	54	-27.85	Pass

WLAN-5.7GHz- 802.11n-80M- Low 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
1520.37	44.05	1.16	-6.2	39.01	Peak Max	V	261	345	74	-34.99	Pass
1535.07	56.54	1.17	-6.14	51.57	Peak Max	V	103	161	74	-22.43	Pass
8349.29	44.97	3.23	5.12	53.32	Peak Max	V	378	322	74	-20.68	Pass
1329.68	58.4	1.02	-6.55	52.87	Peak Max	V	109	255	74	-21.13	Pass
1137.53	47.73	0.87	-6.9	41.7	Peak Max	H	200	150	74	-32.3	Pass
4273.31	43.76	2.39	-0.24	45.91	Peak Max	V	388	112	74	-28.09	Pass
1520.37	31.16	1.16	-6.2	26.12	Average Max	V	261	345	54	-27.88	Pass
1535.07	54.44	1.17	-6.14	49.47	Average Max	V	103	161	54	-4.53	Pass
8349.29	32.32	3.23	5.12	40.67	Average Max	V	378	322	54	-13.33	Pass
1329.68	34.85	1.02	-6.55	29.33	Average Max	V	109	255	54	-24.67	Pass
1137.54	33.70	0.87	-6.90	27.66	Average Max	H	200	150	54	-26.34	Pass
4273.31	30.15	2.39	-0.24	32.30	Average Max	V	388	112	54	-21.70	Pass

WLAN-5.7GHz- 802.11a - Low 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
5446.46	52.66	2.73	0.86	56.24	Peak Max	V	123	29	74	-17.76	Pass
7696.50	44.73	3.34	3.95	52.02	Peak Max	V	187	11	74	-21.98	Pass
1535.39	58.37	1.17	-6.14	53.4	Peak Max	V	116	149	74	-20.6	Pass
1329.27	55.97	1.02	-6.55	50.44	Peak Max	V	148	257	74	-23.56	Pass
1437.26	51.46	1.1	-6.38	46.18	Peak Max	V	99	155	74	-27.82	Pass
1599.91	45.76	1.23	-5.89	41.1	Peak Max	H	309	284	74	-32.9	Pass
5446.46	39.83	2.73	0.86	43.42	Average Max	V	123	29	54	-10.58	Pass
7696.50	31.76	3.34	3.95	39.06	Average Max	V	187	11	54	-14.94	Pass
1535.39	56.71	1.17	-6.14	51.74	Average Max	V	116	149	54	-2.26	Pass
1329.28	33.32	1.02	-6.55	27.79	Average Max	V	148	257	54	-26.21	Pass
1437.26	46.35	1.10	-6.38	41.07	Average Max	V	99	155	54	-12.93	Pass
1599.91	35.11	1.23	-5.89	30.44	Average Max	H	309	284	54	-23.56	Pass

WLAN-5.7GHz- 802.11a - Mid 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
5355.14	55.31	2.7	0.76	58.77	Peak Max	V	137	354	74	-15.23	Pass
8387.46	44.98	3.23	5.2	53.4	Peak Max	V	138	234	74	-20.6	Pass
1535.07	52.76	1.17	-6.14	47.79	Peak Max	V	105	212	74	-26.21	Pass
1437.53	51.72	1.1	-6.38	46.44	Peak Max	V	99	157	74	-27.56	Pass
1331.21	57.49	1.02	-6.55	51.96	Peak Max	V	109	230	74	-22.04	Pass
1600.04	49.18	1.23	-5.89	44.52	Peak Max	H	116	83	74	-29.48	Pass
5355.14	42.06	2.7	0.76	45.52	Average Max	V	137	354	54	-8.48	Pass
8387.46	32.19	3.23	5.2	40.62	Average Max	V	138	234	54	-13.38	Pass
1535.07	49.30	1.17	-6.14	44.33	Average Max	V	105	212	54	-9.67	Pass
1437.54	47.40	1.10	-6.38	42.13	Average Max	V	99	157	54	-11.87	Pass
1331.21	33.27	1.02	-6.55	27.74	Average Max	V	109	230	54	-26.26	Pass
1600.04	39.50	1.23	-5.89	34.83	Average Max	H	116	83	54	-19.17	Pass

WLAN-5.7GHz- 802.11a - High 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
8263.42	45.48	3.22	4.96	53.66	Peak Max	V	358	148	74	-20.34	Pass
1535.43	56.19	1.17	-6.14	51.22	Peak Max	V	99	166	74	-22.78	Pass
1328.08	56.79	1.02	-6.55	51.25	Peak Max	V	106	253	74	-22.75	Pass
5052.63	51.98	2.61	0.41	55	Peak Max	V	121	6	74	-19	Pass
1437.34	51.46	1.1	-6.38	46.18	Peak Max	V	99	156	74	-27.82	Pass
1719.88	37.89	1.33	-5.45	33.76	Peak Max	H	124	356	74	-40.24	Pass
8263.42	32.58	3.22	4.96	40.76	Average Max	V	358	148	54	-13.24	Pass
1535.43	54.1	1.17	-6.14	49.13	Average Max	V	99	166	54	-4.87	Pass
1328.08	33.93	1.02	-6.55	28.40	Average Max	V	106	253	54	-25.60	Pass
5052.63	38.38	2.61	0.41	41.40	Average Max	V	121	6	54	-12.60	Pass
1437.34	46.76	1.10	-6.38	41.48	Average Max	V	99	156	54	-12.52	Pass
1719.88	24.89	1.33	-5.45	20.77	Average Max	H	124	356	54	-33.23	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	☐
R&S LISN	ESH2-Z5	861741/013	05/18/2013	1 Year	05/18/2014	☐
CHASE LISN	MN2050B	1018	07/24/2013	1 Year	07/24/2014	☐
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☐
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2013	1 Year	03/01/2014	☑
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	☑
ETS-Lingren Loop Antenna	6512	00049120	05/13/2013	1 Year	05/13/2014	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	02/09/2013	1 Year	02/09/2014	☑
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2013	1 Year	04/26/2014	☑
Horn Antenna (18-40 GHz)	AH-840	101013	04/23/2013	1 Year	04/23/2014	☑
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	05/30/2013	1 Year	05/30/2014	☑
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2013	1 Year	05/30/2014	☑
3 Meters SAC	3M	N/A	10/13/2012	1 Year	10/13/2013	☐
10 Meters SAC	10M	N/A	06/05/2013	1 Year	06/05/2014	☑
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2013	1 Year	05/25/2014	☑
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2013	1 Year	05/30/2014	☐
Spectrum Analyzer	E4407B	US88441016	05/31/2013	1 Year	05/31/2014	☐
R & S Receiver	ESIB 40	100179	04/20/2013	1 Year	04/20/2014	☐

Annex B. USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex C. 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
HongKong 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 Measuremet
Australia CAB Regocnition		**EMC:** AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radiocommunications: 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