

FCC Test Report (Co-Located)

Report No.: RF171005C05-2

FCC ID: REP-8020-1

Test Model: HotPort 8020

Received Date: Oct. 05, 2017

Test Date: Nov. 27 ~ Dec. 05, 2017

Issued Date: Dec. 26, 2017

Applicant: Firetide Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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R.O.C.

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN (R.O.C.)

FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF171005C05-2	Original release.	Dec. 26, 2017

1 Certificate of Conformity

Product: Firetide Wireless Mesh Node

Brand: Firetide

Test Model: HotPort 8020

Sample Status: Engineering sample

Applicant: Firetide Inc.

Test Date: Nov. 27 ~ Dec. 05, 2017

Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)

ANSI C63.10:2013

FCC Part 90, Subpart Y

FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Sunt Lee , **Date:** Dec. 26, 2017
Sunt Lee / Specialist

Approved by : Ken Liu , **Date:** Dec. 26, 2017
Ken Liu / Senior Manager

2 Summary of Test Results

Applied Standard	47 CFR FCC Part 15, Subpart E (Section 15.407) FCC Part 90 & Part 2		
FCC Clause	Test Item	Result	Remarks
15.407(b) (1/2/3/4(i/ii)/6) Part 2.1053 Part 90.210	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -0.5dB at 189.83MHz.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

WLAN 5GHz

Product	Firetide Wireless Mesh Node
Brand	Firetide
Test Model	HotPort 8020
Sample Status	Engineering sample
Power Supply Rating	54Vdc (POE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 600Mbps 802.11ac: up to 1734Mbps
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	Refer to Note
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	1.8m non-shielded ground cable without core

WLAN 4.9GHz

Product	Firetide Wireless Mesh Node
Brand	Firetide
Test Model	HotPort 8020
Status of EUT	Engineering sample
Power Supply Rating	54Vdc (POE)
Modulation Type & Data Rate	Channel Bandwidth 5MHz: BPSK: 1.5 and 2.25Mbps QPSK: 3 and 4.5Mbps 16QAM: 6 and 9Mbps 64QAM: 12 and 13.5Mbps Channel Bandwidth 10MHz: BPSK: 3 and 4.5Mbps QPSK: 6 and 9Mbps 16QAM: 12 and 18Mbps 64QAM: 24 and 27Mbps Channel Bandwidth 20MHz: BPSK: 6 and 9Mbps QPSK: 12 and 18Mbps 16QAM: 24 and 36Mbps 64QAM: 48 and 54Mbps
Operating Frequency	Channel Bandwidth 5MHz: 4942.5~4987.5MHz Channel Bandwidth 10MHz: 4945~4985MHz Channel Bandwidth 20MHz: 4950~4980MHz
Number of Channel	Channel Bandwidth 5MHz: 10 Channel Bandwidth 10MHz: 9 Channel Bandwidth 20MHz: 7
Conducted Output Power	Radio 1, Antenna 1 & 2: Channel Bandwidth 5MHz: 16.64dBm (0.046W) Channel Bandwidth 10MHz: 14.54dBm (0.028W) Channel Bandwidth 20MHz: 17.62dBm (0.058W) Radio 2, Antenna 1 & 2: Channel Bandwidth 5MHz: 17.22dBm (0.053W) Channel Bandwidth 10MHz: 15.00dBm (0.032W) Channel Bandwidth 20MHz: 19.15dBm (0.082W)
Emission Designator	Radio 1, Antenna 1 & 2: Channel Bandwidth 5MHz: 4M17G7D Channel Bandwidth 10MHz: 8M44G7D Channel Bandwidth 20MHz: 16M7G7D Radio 2, Antenna 1 & 2: Channel Bandwidth 5MHz: 4M21G7D Channel Bandwidth 10MHz: 8M44G7D Channel Bandwidth 20MHz: 16M6G7D
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA

Cable Supplied	1.8m non-shielded ground cable without core
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Note:

- The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	TX Function	Beamforming
802.11a	4TX	Not Support
802.11n (HT20)	4TX	Support
802.11n (HT40)	4TX	Support
802.11ac (VHT20)	4TX	Support
802.11ac (VHT40)	4TX	Support
802.11ac (VHT80)	4TX	Support

* The modulation and bandwidth are similar for 802.11n mode for HT20/HT40 and 802.11ac mode for VHT20/VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

* CDD mode is the worst case for final tests after pretesting CDD mode and beamforming mode except output power test.

- The EUT consumes power from following POE. (Support units only)

POE	
Brand	EnGenius
Model	EPA5006GAT
Input Power	100-240Vac, 0.8A, 50-60Hz
Output Power	54Vdc, 0.6A
Power Cable	0.5m non-shielded AC cable without core

- The EUT uses following antennas.

No.	Function	Antenna Type	Connector	Gain (dBi)		Remark
				4.9G	5G	
1	WLAN	Dipole	N Plug	6.5	7	Radio 1 / Radio 2
2	WLAN	Panel	N Plug	17.5	18.5	Radio 1 / Radio 2

- Radio 1, 5GHz & Radio 2, 5GHz / Radio 1, 4.9GHz & Radio 2, 4.9GHz can transmit at same time but cannot transmit at same channel.

- Spurious emission of the simultaneous operation (Radio 1, 5GHz & Radio 2, 5GHz / Radio 1, 4.9GHz & Radio 2, 4.9GHz) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

WLAN 5GHz

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

WLAN 4.9GHz

10 channels are for the Channel Bandwidth 5MHz bandwidth of EUT:

Channel	Frequency (MHz)
1	4942.5
2	4947.5
3	4952.5
4	4957.5
5	4962.5
6	4967.5
7	4972.5
8	4977.5
9	4982.5
10	4987.5

9 channels are for the Channel Bandwidth 10MHz bandwidth of EUT:

Channel	Frequency (MHz)
11	4945
12	4950
13	4955
14	4960
15	4965
16	4970
17	4975
18	4980
19	4985

7 channels are for the Channel Bandwidth 20MHz bandwidth of EUT:

Channel	Frequency (MHz)
20	4950
21	4955
22	4960
23	4965
24	4970
25	4975
26	4980

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to		Description
	RE $\geq$ 1G	RE<1G	
-	√	√	-

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement RE<1G: Radiated Emission below 1GHz

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Antenna	Radio	Mode	Tested Channel	Remark
1	1	1	802.11n (HT20)	157	-
		2	802.11a	149	-
2	1	1	4.9G, 5MHz	5	-
		2	4.9G, 5MHz	1	-
3	1	1	802.11n (HT20)	157	-
		2	4.9G, 5MHz	1	-
4	1	1	4.9G, 5MHz	5	-
		2	802.11a	149	-
5	2	1	802.11a	149	-
		2	802.11n (HT20)	153	-
6	2	1	4.9G, 5MHz	1	-
		2	4.9G, 5MHz	10	-
7	2	1	802.11a	149	-
		2	4.9G, 5MHz	10	-
8	2	1	4.9G, 5MHz	1	-
		2	802.11a	149	-

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Antenna	Radio	Mode	Tested Channel	Remark
1	1	1	802.11n (HT20)	157	-
		2	802.11a	149	-
2	1	1	4.9G, 5MHz	5	-
		2	4.9G, 5MHz	1	-
3	1	1	802.11n (HT20)	157	-
		2	4.9G, 5MHz	1	-
4	1	1	4.9G, 5MHz	5	-
		2	802.11a	149	-
5	2	1	802.11a	149	-
		2	802.11n (HT20)	153	-
6	2	1	4.9G, 5MHz	1	-
		2	4.9G, 5MHz	10	-
7	2	1	802.11a	149	-
		2	4.9G, 5MHz	10	-
8	2	1	4.9G, 5MHz	1	-
		2	802.11a	149	-

Test Condition:

Applicable to	Environmental Conditions	Input Power (system)	Tested by
RE $\geq$ 1G	23 deg. C, 69% RH	120Vac, 60Hz	Willy Cheng
RE<1G	21 deg. C, 66% RH	120Vac, 60Hz	Adair Peng

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

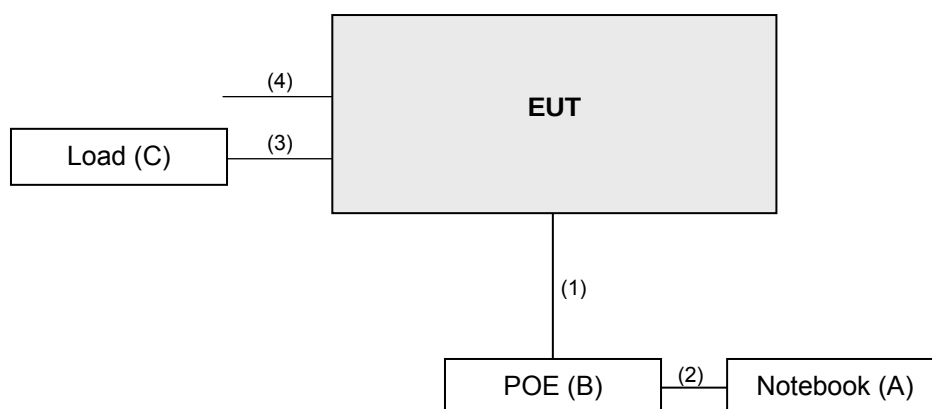
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	POE	EnGenius	EPA5006GAT	NA	NA	Supplied by the manufacturer
C.	Load	NA	NA	NA	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	1	10	N	0	-
2.	RJ45, Cat5e	1	1.5	N	0	-
3.	RJ45, Cat5e	1	1.5	N	0	-
4.	RJ45, Cat5e	1	1.5	N	0	-

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

FCC 47 CFR Part 2

FCC 47 CFR Part 90

ANSI/TIA/EIA-603-D 2010

All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC).
The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

FCC PART 15.209:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 18, 2017	Aug. 17, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	9120D	209	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2017	Aug. 20, 2018
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 05, 2017	Apr. 04, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8 000	Cable-CH3-03 (309224+170907)	Sep.11, 2017	Sep. 10, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier Agilent	8449B	3008A1960	Aug. 08, 2017	Aug. 07, 2018
High Speed Peak Power Meter	ML2495A	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 2018
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 07, 2017	Jun. 06, 2018

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

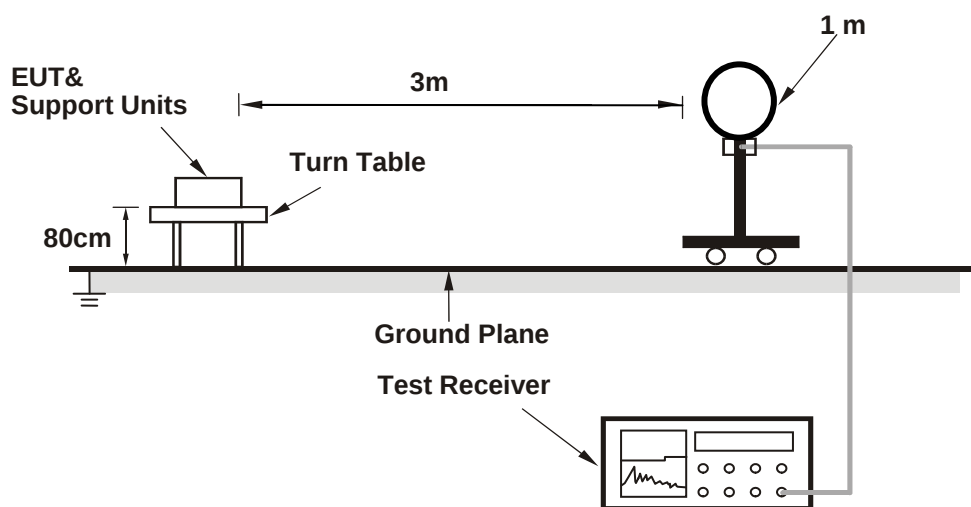
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

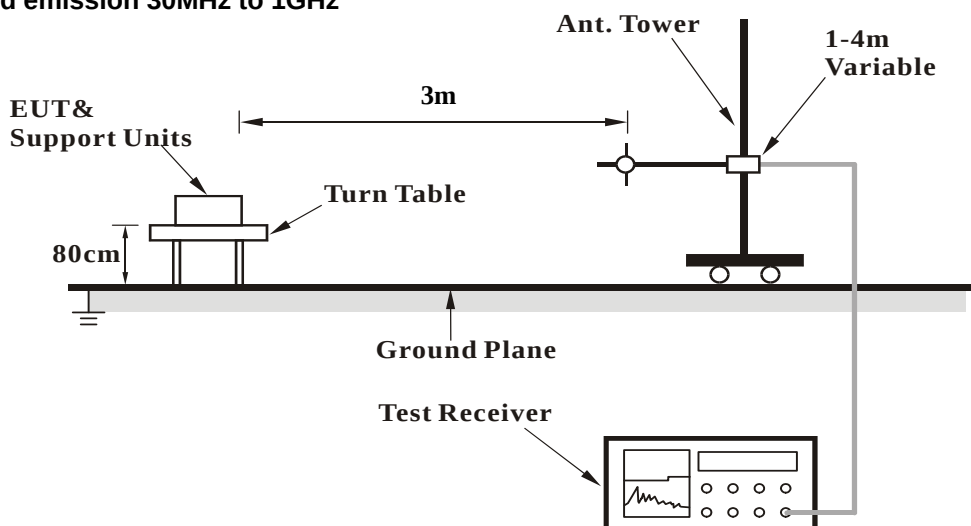
No deviation.

4.1.5 Test Setup

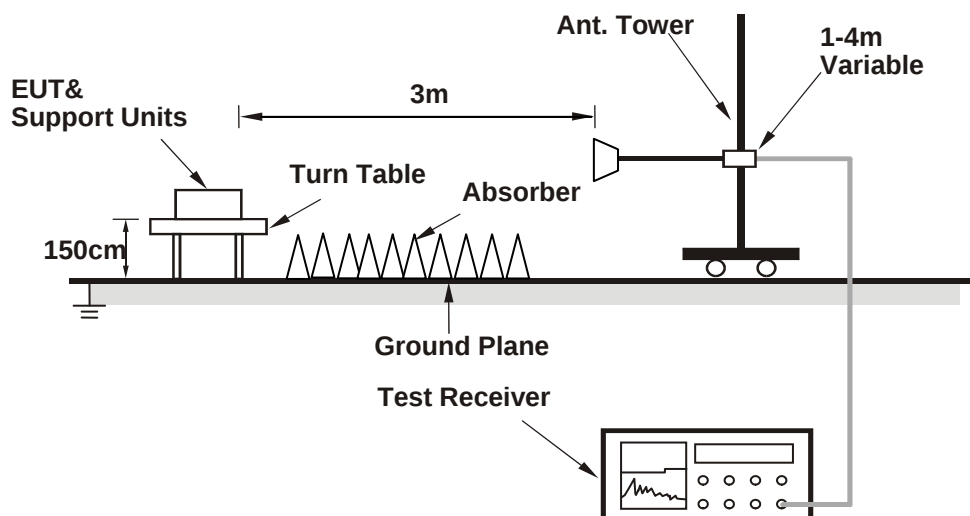
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared a notebook to act as a communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

Mode 1

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 802.11a, CH 149

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5650.00	59.4 PK	68.2	-8.8	1.45 H	349	55.1	4.3
2	*5745.00	128.6 PK			1.45 H	349	88.2	40.4
3	*5745.00	117.1 AV			1.45 H	349	76.7	40.4
4	*5785.00	130.0 PK			1.74 H	357	89.5	40.5
5	*5785.00	118.2 AV			1.74 H	357	77.7	40.5
6	#5975.00	59.2 PK	68.2	-9.0	1.46 H	349	54.0	5.2
7	11490.00	60.6 PK	74.0	-13.4	1.56 H	344	42.4	18.2
8	11490.00	47.7 AV	54.0	-6.3	1.56 H	344	29.5	18.2
9	11570.00	64.3 PK	74.0	-9.7	1.52 H	359	46.0	18.3
10	11570.00	50.1 AV	54.0	-3.9	1.52 H	359	31.8	18.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5635.90	54.1 PK	68.2	-14.1	3.61 V	10	49.8	4.3
2	*5745.00	107.0 PK			3.61 V	10	66.6	40.4
3	*5745.00	95.7 AV			3.61 V	10	55.3	40.4
4	*5785.00	110.1 PK			4.00 V	15	69.6	40.5
5	*5785.00	98.4 AV			4.00 V	15	57.9	40.5
6	#5950.64	55.6 PK	68.2	-12.6	3.61 V	10	50.5	5.1
7	11490.00	62.0 PK	74.0	-12.0	2.86 V	261	43.8	18.2
8	11490.00	47.3 AV	54.0	-6.7	2.86 V	261	29.1	18.2
9	11570.00	62.2 PK	74.0	-11.8	1.77 V	184	43.9	18.3
10	11570.00	48.9 AV	54.0	-5.1	1.77 V	184	30.6	18.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Mode 2

Antenna 1,

Radio 1, 4.9G, 5MHz, CH 5 +

Radio 2, 4.9G, 5MHz, CH 1

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-60.32	-36.85	3.75	-33.10	-27.71	-5.39
2	9925.00	-60.89	-37.31	3.71	-33.60	-30.18	-3.42

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-59.36	-36.85	3.75	-33.10	-27.71	-5.39
2	9925.00	-60.48	-38.01	3.71	-34.30	-30.18	-4.12

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 22.29dBm - 50dB = -27.71dBm.
Limit = EIRP 19.82dBm - 50dB = -30.18dBm.

Mode 3

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 4.9G, 5MHz, CH 1

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5632.00	55.4 PK	68.2	-12.8	2.07 H	352	51.1	4.3
2	*5785.00	130.9 PK			2.07 H	352	90.4	40.5
3	*5785.00	120.2 AV			2.07 H	352	79.7	40.5
4	#5984.00	57.0 PK	68.2	-11.2	2.07 H	352	51.8	5.2
5	11570.00	63.0 PK	74.0	-11.0	2.31 H	222	44.7	18.3
6	11570.00	50.3 AV	54.0	-3.7	2.31 H	222	32.0	18.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5620.80	55.2 PK	68.2	-13.0	1.97 V	254	50.9	4.3
2	*5785.00	113.9 PK			1.97 V	254	73.4	40.5
3	*5785.00	103.0 AV			1.97 V	254	62.5	40.5
4	#5969.60	57.0 PK	68.2	-11.2	1.97 V	254	51.8	5.2
5	11570.00	62.9 PK	74.0	-11.1	1.77 V	291	44.6	18.3
6	11570.00	49.6 AV	54.0	-4.4	1.77 V	291	31.3	18.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-62.42	-38.95	3.75	-35.20	-27.71	-7.49
Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-60.06	-37.55	3.75	-33.80	-27.71	-6.09

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 22.29dBm - 50dB = -27.71dBm.

Mode 4

Antenna 1,

Radio 1, 4.9G, 5MHz, CH 5 +

Radio 2, 802.11a, CH 149

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9925.00	-59.99	-36.41	3.71	-32.70	-30.18	-2.52

Antenna Polarity & Test Distance: Vertical at 3 m

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9925.00	-60.68	-38.21	3.71	-34.50	-30.18	-4.32

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 19.82dBm - 50dB = -30.18dBm.

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5636.80	57.0 PK	68.2	-11.2	1.53 H	346	52.7	4.3
2	*5745.00	130.7 PK			1.53 H	346	90.3	40.4
3	*5745.00	119.7 AV			1.53 H	346	79.3	40.4
4	#5931.20	57.0 PK	68.2	-11.2	1.53 H	346	52.0	5.0
5	11490.00	58.4 PK	74.0	-15.6	1.77 H	222	40.2	18.2
6	11490.00	48.1 AV	54.0	-5.9	1.77 H	222	29.9	18.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.20	50.3 PK	68.2	-17.9	2.76 V	266	46.0	4.3
2	*5745.00	116.4 PK			2.75 V	266	76.0	40.4
3	*5745.00	105.7 AV			2.75 V	266	65.3	40.4
4	#5947.20	51.9 PK	68.2	-16.3	2.76 V	266	46.8	5.1
5	11490.00	60.5 PK	74.0	-13.5	2.11 V	293	42.3	18.2
6	11490.00	49.7 AV	54.0	-4.3	2.11 V	293	31.5	18.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Mode 5

Antenna 2,

Radio 1, 802.11a, CH 149 +

Radio 2, 802.11n (HT20), CH 153

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5646.40	53.6 PK	68.2	-14.6	1.74 H	343	49.3	4.3
2	*5745.00	124.7 PK			1.74 H	343	84.3	40.4
3	*5745.00	113.7 AV			1.74 H	343	73.3	40.4
4	*5765.00	124.7 PK			1.63 H	356	84.2	40.5
5	*5765.00	113.8 AV			1.63 H	356	73.3	40.5
6	#5925.60	54.4 PK	68.2	-13.8	1.74 H	343	49.5	4.9
7	11490.00	55.6 PK	74.0	-18.4	3.47 H	198	37.4	18.2
8	11490.00	41.7 AV	54.0	-12.3	3.47 H	198	23.5	18.2
9	11530.00	54.6 PK	74.0	-19.4	2.17 H	188	36.3	18.3
10	11530.00	41.5 AV	54.0	-12.5	2.17 H	188	23.2	18.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5608.80	54.7 PK	68.2	-13.5	1.75 V	350	50.4	4.3
2	*5745.00	123.7 PK			1.75 V	350	83.3	40.4
3	*5745.00	112.2 AV			1.75 V	350	71.8	40.4
4	*5765.00	124.1 PK			1.38 V	353	83.6	40.5
5	*5765.00	112.8 AV			1.38 V	353	72.3	40.5
6	#5964.00	55.7 PK	68.2	-12.5	1.75 V	350	50.5	5.2
7	11490.00	55.9 PK	74.0	-18.1	1.71 V	327	37.7	18.2
8	11490.00	42.7 AV	54.0	-11.3	1.71 V	327	24.5	18.2
9	11530.00	56.0 PK	74.0	-18.0	2.41 V	283	37.7	18.3
10	11530.00	42.9 AV	54.0	-11.1	2.41 V	283	24.6	18.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Mode 6

Antenna 2,

Radio 1, 4.9G, 5MHz, CH 1 +

Radio 2, 4.9G, 5MHz, CH 10

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-60.32	-36.85	3.75	-33.10	-19.18	-13.92
2	9975.00	-61.39	-37.45	3.55	-33.90	-16.71	-17.19

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-60.16	-37.65	3.75	-33.90	-19.18	-14.72
2	9975.00	-61.79	-39.25	3.55	-35.70	-16.71	-18.99

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 30.82dBm - 50dB = -19.18dBm.
Limit = EIRP 33.29dBm - 50dB = -16.71dBm.

Mode 7

Antenna 2,

Radio 1, 802.11a, CH 149 +

Radio 2, 4.9G, 5MHz, CH 10

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5622.40	54.3 PK	68.2	-13.9	1.98 H	344	50.0	4.3
2	*5745.00	126.1 PK			1.98 H	344	85.7	40.4
3	*5745.00	114.9 AV			1.98 H	344	74.5	40.4
4	#5965.60	55.0 PK	68.2	-13.2	1.98 H	344	49.8	5.2
5	11490.00	56.0 PK	74.0	-18.0	2.32 H	179	37.8	18.2
6	11490.00	42.6 AV	54.0	-11.4	2.32 H	179	24.4	18.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5642.40	57.4 PK	68.2	-10.8	1.96 V	342	53.1	4.3
2	*5745.00	122.3 PK			1.96 V	342	81.9	40.4
3	*5745.00	112.0 AV			1.96 V	342	71.6	40.4
4	#5932.80	57.6 PK	68.2	-10.6	1.96 V	342	52.6	5.0
5	11490.00	59.7 PK	74.0	-14.3	2.71 V	172	41.5	18.2
6	11490.00	46.5 AV	54.0	-7.5	2.71 V	172	28.3	18.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9975.00	-62.69	-38.75	3.55	-35.20	-16.71	-18.49
Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9975.00	-61.89	-39.35	3.55	-35.80	-16.71	-19.09

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 33.29dBm - 50dB = -16.71dBm.

Mode 8

Antenna 2,

Radio 1, 4.9G, 5MHz, CH 1 +

Radio 2, 802.11a, CH 149

Frequency Range	Above 1000MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-59.42	-35.95	3.75	-32.20	-19.18	-13.02

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	9885.00	-58.56	-36.05	3.75	-32.30	-19.18	-13.12

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 30.82dBm - 50dB = -19.18dBm.

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5647.20	57.5 PK	68.2	-10.7	1.81 H	352	53.2	4.3
2	*5745.00	126.3 PK			1.81 H	352	85.9	40.4
3	*5745.00	115.2 AV			1.81 H	352	74.8	40.4
4	#5974.40	57.2 PK	68.2	-11.0	1.81 H	352	52.0	5.2
5	11490.00	59.5 PK	74.0	-14.5	1.55 H	333	41.3	18.2
6	11490.00	46.4 AV	54.0	-7.6	1.55 H	333	28.2	18.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.20	57.0 PK	68.2	-11.2	1.95 V	350	52.7	4.3
2	*5745.00	123.6 PK			1.95 V	350	83.2	40.4
3	*5745.00	113.9 AV			1.95 V	350	73.5	40.4
4	#5952.00	56.9 PK	68.2	-11.3	1.95 V	350	51.8	5.1
5	11490.00	59.2 PK	74.0	-14.8	1.87 V	253	41.0	18.2
6	11490.00	46.6 AV	54.0	-7.4	1.87 V	253	28.4	18.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz data:

Mode 1

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 802.11a, CH 149

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	113.50	29.9 QP	43.5	-13.6	1.50 H	261	46.7	-16.8
2	191.28	41.0 QP	43.5	-2.5	1.50 H	16	57.4	-16.4
3	374.04	25.1 QP	46.0	-20.9	2.00 H	309	36.7	-11.6
4	541.25	21.2 QP	46.0	-24.8	1.50 H	16	30.1	-8.9
5	624.85	26.3 QP	46.0	-19.7	1.00 H	279	33.3	-7.0
6	891.22	28.0 QP	46.0	-18.0	2.00 H	33	31.4	-3.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	55.18	34.1 QP	40.0	-5.9	1.01 V	13	48.6	-14.5
2	113.50	28.5 QP	43.5	-15.0	1.01 V	164	45.3	-16.8
3	160.17	37.4 QP	43.5	-6.1	1.01 V	141	51.2	-13.8
4	218.50	34.9 QP	46.0	-11.1	2.00 V	351	51.0	-16.1
5	344.87	24.9 QP	46.0	-21.1	1.51 V	5	37.0	-12.1
6	811.50	26.1 QP	46.0	-19.9	1.01 V	15	30.3	-4.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Mode 2

Antenna 1,

Radio 1, 4.9G, 5MHz, CH 5 +

Radio 2, 4.9G, 5MHz, CH 1

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	37.78	-60.56	-48.07	-11.18	-59.25	-30.18	-29.07
2	111.64	-55.63	-64.32	0.41	-63.91	-30.18	-33.73
3	197.17	-48.13	-61.45	5.11	-56.34	-30.18	-26.16
4	271.04	-61.54	-70.81	5.29	-65.52	-30.18	-35.34
5	479.04	-65.49	-70.55	4.96	-65.59	-30.18	-35.41
6	531.52	-58.78	-63.06	4.74	-58.32	-30.18	-28.14

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	43.61	-48.23	-46.49	-10.29	-56.78	-30.18	-26.60
2	181.62	-52.42	-58.96	3.12	-55.84	-30.18	-25.66
3	203.01	-44.65	-51.33	5.46	-45.87	-30.18	-15.69
4	280.76	-64.60	-68.30	5.23	-63.07	-30.18	-32.89
5	395.45	-60.89	-66.17	5.26	-60.91	-30.18	-30.73
6	636.49	-68.84	-67.35	4.73	-62.62	-30.18	-32.44

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 19.82dBm - 50dB = -30.18dBm.

Mode 3

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 4.9G, 5MHz, CH 1

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	61.01	21.6 QP	40.0	-18.4	1.99 H	105	36.6	-15.0
2	162.11	33.7 QP	43.5	-9.8	1.49 H	132	47.6	-13.9
3	204.89	38.7 QP	43.5	-4.8	1.49 H	160	55.5	-16.8
4	469.31	22.7 QP	46.0	-23.3	1.49 H	309	32.6	-9.9
5	585.97	23.8 QP	46.0	-22.2	1.00 H	294	31.6	-7.8
6	825.11	26.0 QP	46.0	-20.0	1.99 H	271	29.9	-3.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.62	28.7 QP	40.0	-11.3	1.01 V	244	44.0	-15.3
2	175.72	34.7 QP	43.5	-8.8	1.01 V	10	49.3	-14.6
3	290.43	22.8 QP	46.0	-23.2	1.50 V	160	35.8	-13.0
4	405.15	20.3 QP	46.0	-25.7	1.50 V	35	31.5	-11.2
5	632.63	24.1 QP	46.0	-21.9	1.01 V	4	30.9	-6.8
6	840.67	25.8 QP	46.0	-20.2	1.01 V	10	29.7	-3.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	41.66	-59.67	-45.47	-10.61	-56.08	-27.71	-28.37
2	113.59	-50.79	-59.36	0.34	-59.02	-27.71	-31.31
3	201.06	-39.54	-52.95	5.47	-47.48	-27.71	-19.77
4	263.27	-52.70	-62.81	5.33	-57.48	-27.71	-29.77
5	471.26	-61.23	-66.46	5.00	-61.46	-27.71	-33.75
6	508.20	-58.11	-62.71	4.85	-57.86	-27.71	-30.15

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	53.33	-49.15	-47.04	-9.03	-56.07	-27.71	-28.36
2	203.01	-37.38	-44.06	5.46	-38.60	-27.71	-10.89
3	339.08	-55.97	-61.40	5.19	-56.21	-27.71	-28.50
4	447.94	-62.08	-66.77	5.08	-61.69	-27.71	-33.98
5	626.77	-66.92	-66.14	4.65	-61.49	-27.71	-33.78
6	959.18	-66.48	-60.51	3.91	-56.60	-27.71	-28.89

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 22.29dBm - 50dB = -27.71dBm.

Mode 4

Antenna 1,

Radio 1, 4.9G, 5MHz, CH 5 +

Radio 2, 802.11a, CH 149

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-59.95	-47.17	-10.93	-58.10	-30.18	-27.92
2	113.59	-53.49	-62.06	0.34	-61.72	-30.18	-31.54
3	203.01	-41.54	-54.90	5.46	-49.44	-30.18	-19.26
4	309.92	-50.55	-59.47	5.15	-54.32	-30.18	-24.14
5	506.25	-64.69	-69.37	4.86	-64.51	-30.18	-34.33
6	626.77	-65.76	-68.01	4.65	-63.36	-30.18	-33.18

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	37.78	-43.79	-41.91	-11.18	-53.09	-30.18	-22.91
2	107.76	-54.06	-62.50	0.57	-61.93	-30.18	-31.75
3	203.01	-39.11	-45.79	5.46	-40.33	-30.18	-10.15
4	300.20	-61.08	-65.50	5.13	-60.37	-30.18	-30.19
5	346.85	-59.42	-65.14	5.21	-59.93	-30.18	-29.75
6	445.99	-62.85	-67.57	5.10	-62.47	-30.18	-32.29

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 19.82dBm - 50dB = -30.18dBm.

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	96.01	22.2 QP	43.5	-21.3	1.99 H	170	41.2	-19.0
2	193.22	39.5 QP	43.5	-4.0	1.49 H	162	56.0	-16.5
3	235.99	28.5 QP	46.0	-17.5	1.00 H	170	44.0	-15.5
4	496.53	22.3 QP	46.0	-23.7	1.49 H	304	31.9	-9.6
5	628.74	22.2 QP	46.0	-23.8	1.00 H	330	29.2	-7.0
6	751.23	25.1 QP	46.0	-20.9	1.99 H	237	30.0	-4.9

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.57	27.9 QP	40.0	-12.1	1.01 V	291	42.9	-15.0
2	201.00	34.7 QP	43.5	-8.8	1.01 V	70	51.4	-16.7
3	321.54	24.7 QP	46.0	-21.3	1.50 V	40	37.0	-12.3
4	578.19	22.4 QP	46.0	-23.6	1.01 V	358	30.4	-8.0
5	690.96	24.8 QP	46.0	-21.2	1.01 V	345	31.0	-6.2
6	885.39	26.6 QP	46.0	-19.4	1.01 V	340	30.0	-3.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Mode 5

Antenna 2,

Radio 1, 802.11a, CH 149 +

Radio 2, 802.11n (HT20), CH 153

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	27.2 QP	40.0	-12.8	2.00 H	1	41.8	-14.6
2	189.83	43.0 QP	43.5	-0.5	1.01 H	289	59.2	-16.2
3	195.16	42.3 QP	43.5	-1.2	1.01 H	267	58.9	-16.6
4	294.32	25.6 QP	46.0	-20.4	1.01 H	193	38.5	-12.9
5	500.42	23.8 QP	46.0	-22.2	1.51 H	196	33.3	-9.5
6	634.57	24.3 QP	46.0	-21.7	2.00 H	16	31.1	-6.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	80.45	27.8 QP	40.0	-12.2	1.49 V	294	46.4	-18.6
2	175.72	34.4 QP	43.5	-9.1	1.00 V	69	49.0	-14.6
3	274.88	27.1 QP	46.0	-18.9	1.99 V	193	40.4	-13.3
4	374.04	23.8 QP	46.0	-22.2	1.49 V	173	35.4	-11.6
5	624.85	26.9 QP	46.0	-19.1	1.49 V	131	33.9	-7.0
6	848.45	27.4 QP	46.0	-18.6	1.99 V	329	31.3	-3.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Mode 6

Antenna 2,

Radio 1, 4.9G, 5MHz, CH 1 +

Radio 2, 4.9G, 5MHz, CH 10

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	41.66	-62.55	-48.35	-10.61	-58.96	-19.18	-39.78
2	150.52	-48.74	-53.20	-0.13	-53.33	-19.18	-34.15
3	187.45	-38.38	-50.72	3.88	-46.84	-19.18	-27.66
4	238.00	-48.07	-60.66	5.42	-55.24	-19.18	-36.06
5	323.53	-53.71	-62.59	5.16	-57.43	-19.18	-38.25
6	457.66	-64.82	-69.69	5.04	-64.65	-19.18	-45.47

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	53.33	-52.21	-50.10	-9.03	-59.13	-19.18	-39.95
2	154.41	-50.68	-53.27	0.09	-53.18	-19.18	-34.00
3	189.40	-41.29	-48.40	4.12	-44.28	-19.18	-25.10
4	247.72	-54.86	-59.79	5.40	-54.39	-19.18	-35.21
5	276.87	-59.02	-62.68	5.25	-57.43	-19.18	-38.25
6	504.31	-62.86	-67.05	4.87	-62.18	-19.18	-43.00

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 30.82dBm - 50dB = -19.18dBm.

Mode 7

Antenna 2,

Radio 1, 802.11a, CH 149 +

Radio 2, 4.9G, 5MHz, CH 10

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.62	23.8 QP	40.0	-16.2	2.00 H	164	39.1	-15.3
2	72.67	29.9 QP	40.0	-10.1	2.00 H	78	46.7	-16.8
3	187.52	42.6 QP	43.5	-0.9	1.34 H	289	58.7	-16.1
4	307.93	26.5 QP	46.0	-19.5	1.00 H	220	39.1	-12.6
5	500.42	25.3 QP	46.0	-20.7	1.49 H	188	34.8	-9.5
6	624.85	24.9 QP	46.0	-21.1	1.00 H	77	31.9	-7.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.57	33.0 QP	40.0	-7.0	1.01 V	279	48.0	-15.0
2	154.33	31.5 QP	43.5	-12.0	1.51 V	196	45.4	-13.9
3	191.28	39.2 QP	43.5	-4.3	1.01 V	29	55.6	-16.4
4	309.88	23.4 QP	46.0	-22.6	1.01 V	230	36.0	-12.6
5	500.42	26.8 QP	46.0	-19.2	1.01 V	146	36.3	-9.5
6	867.89	29.7 QP	46.0	-16.3	1.51 V	346	33.5	-3.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	31.94	-56.28	-41.93	-11.93	-53.86	-16.71	-37.15
2	61.10	-54.29	-52.27	-7.31	-59.58	-16.71	-42.87
3	148.58	-46.95	-51.42	-0.19	-51.61	-16.71	-34.90
4	191.34	-37.07	-49.81	4.37	-45.44	-16.71	-28.73
5	267.15	-56.79	-66.41	5.31	-61.10	-16.71	-44.39
6	455.71	-64.36	-69.26	5.06	-64.20	-16.71	-47.49

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	41.66	-37.25	-35.37	-10.61	-45.98	-16.71	-29.27
2	146.63	-52.23	-54.66	-0.21	-54.87	-16.71	-38.16
3	191.34	-43.99	-51.04	4.37	-46.67	-16.71	-29.96
4	274.93	-61.18	-64.74	5.26	-59.48	-16.71	-42.77
5	438.22	-61.21	-66.10	5.12	-60.98	-16.71	-44.27
6	480.98	-62.23	-66.97	4.96	-62.01	-16.71	-45.30

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 33.29dBm - 50dB = -16.71dBm.

Mode 8

Antenna 2,

Radio 1, 4.9G, 5MHz, CH 1 +

Radio 2, 802.11a, CH 149

Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance: Horizontal at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-61.68	-48.90	-10.93	-59.83	-19.18	-40.65
2	146.63	-49.68	-54.20	-0.21	-54.41	-19.18	-35.23
3	162.18	-47.39	-54.07	0.66	-53.41	-19.18	-34.23
4	191.34	-41.19	-53.93	4.37	-49.56	-19.18	-30.38
5	234.11	-51.77	-65.01	5.42	-59.59	-19.18	-40.41
6	269.10	-58.60	-67.99	5.29	-62.70	-19.18	-43.52

Antenna Polarity & Test Distance: Vertical at 3 m							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-48.04	-46.38	-10.93	-57.31	-19.18	-38.13
2	154.41	-52.98	-55.57	0.09	-55.48	-19.18	-36.30
3	189.40	-42.77	-49.88	4.12	-45.76	-19.18	-26.58
4	276.87	-60.40	-64.06	5.25	-58.81	-19.18	-39.63
5	480.98	-60.41	-65.15	4.96	-60.19	-19.18	-41.01
6	496.53	-60.39	-64.76	4.90	-59.86	-19.18	-40.68

Remarks:

1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).
3. Limit = EIRP 30.82dBm - 50dB = -19.18dBm.

Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
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ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.57	20.1 QP	40.0	-19.9	1.49 H	13	35.1	-15.0
2	80.45	25.5 QP	40.0	-14.5	2.00 H	158	44.1	-18.6
3	179.61	42.1 QP	43.5	-1.4	1.49 H	289	57.2	-15.1
4	280.71	24.2 QP	46.0	-21.8	1.00 H	225	37.3	-13.1
5	603.47	22.8 QP	46.0	-23.2	1.00 H	213	30.2	-7.4
6	821.23	26.3 QP	46.0	-19.7	2.00 H	16	30.3	-4.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.45	29.7 QP	40.0	-10.3	1.01 V	13	44.4	-14.7
2	181.55	35.2 QP	43.5	-8.3	1.01 V	36	50.6	-15.4
3	235.99	28.0 QP	46.0	-18.0	1.01 V	115	43.5	-15.5
4	405.15	20.7 QP	46.0	-25.3	2.00 V	9	31.9	-11.2
5	578.19	23.7 QP	46.0	-22.3	1.01 V	10	31.7	-8.0
6	716.23	23.9 QP	46.0	-22.1	2.00 V	297	29.8	-5.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

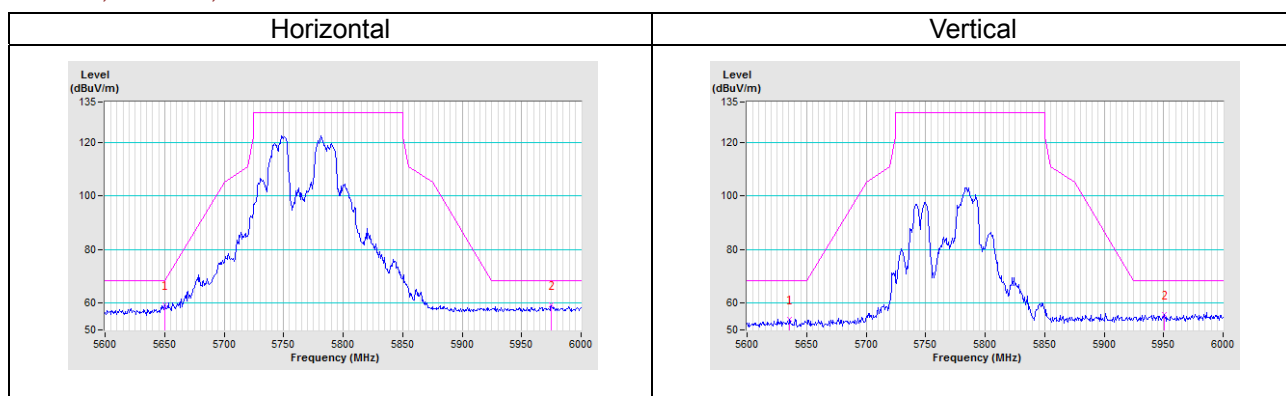
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

Mode 1

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 802.11a, CH 149

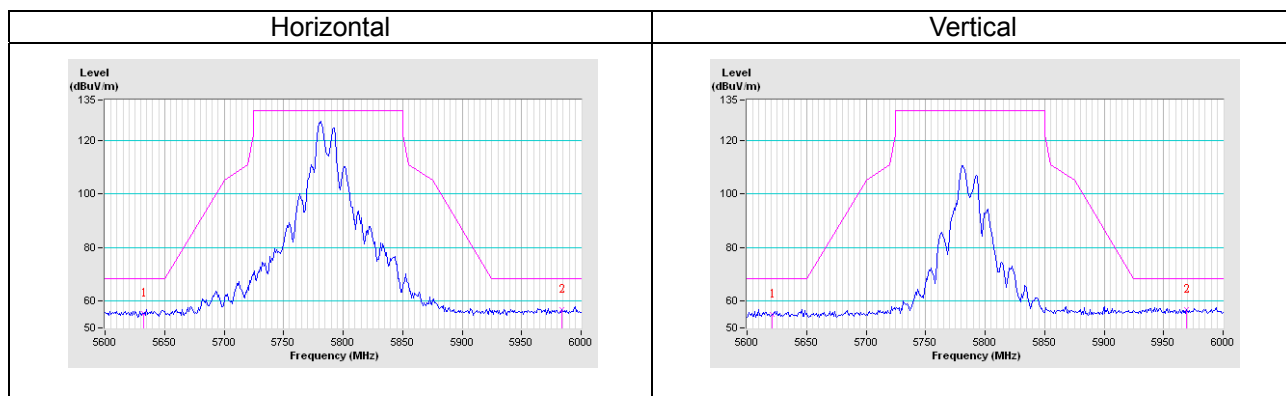


Mode 3

Antenna 1,

Radio 1, 802.11n (HT20), CH 157 +

Radio 2, 4.9G, 5MHz, CH 1



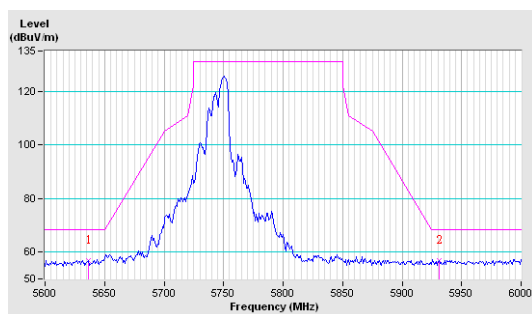
Mode 4

Antenna 1,

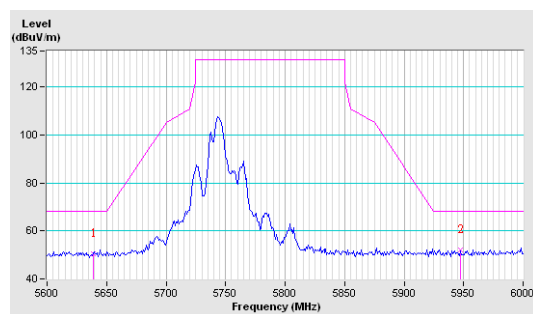
Radio 1, 4.9G, 5MHz, CH 5 +

Radio 2, 802.11a, CH 149

Horizontal



Vertical



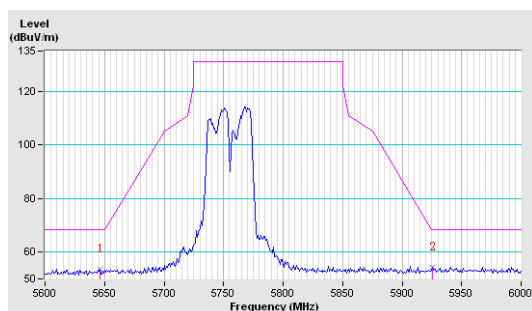
Mode 5

Antenna 2,

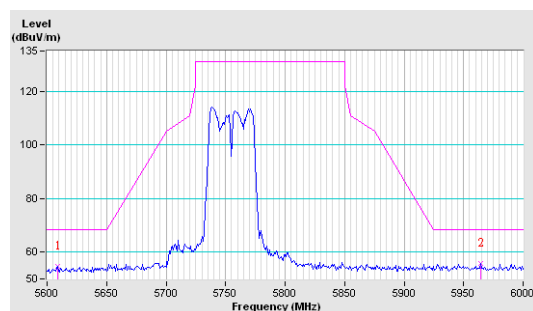
Radio 1, 802.11a, CH 149 +

Radio 2, 802.11n (HT20), CH 153

Horizontal



Vertical

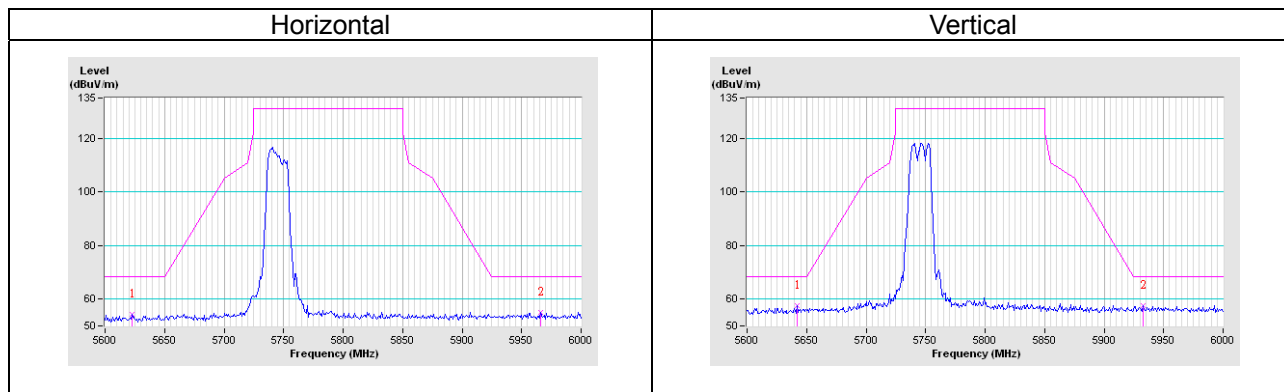


Mode 7

Antenna 2,

Radio 1, 802.11a, CH 149 +

Radio 2, 4.9G, 5MHz, CH 10

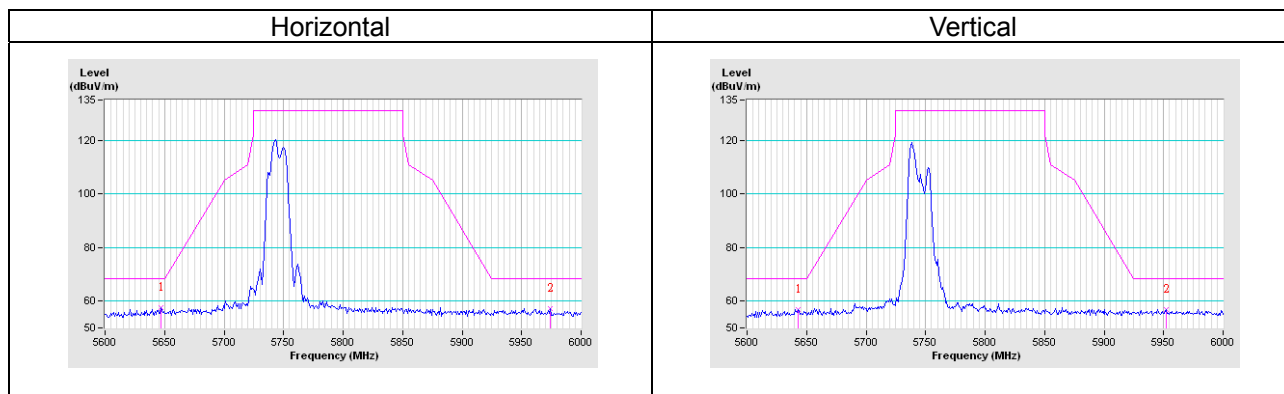


Mode 8

Antenna 2,

Radio 1, 4.9G, 5MHz, CH 1 +

Radio 2, 802.11a, CH 149



Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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