

## FCC Test Report

### (Co-Located)

**Report No.:** RF170620C22-4

**FCC ID:** Y6S-IOTADV

**Model:** IoT Platform Advance

**Series Model:** 72201R Lumewave IoT Platform

**Received Date:** Apr. 26, 2017

**Test Date:** Nov. 14 ~ Nov. 27, 2017

**Issued Date:** Nov. 28, 2017

**Applicant:** Ionics EMS, Inc.

**Address:** 14 Mountain Drive, Light Industry and Science Park II, Brgy. La Mesa,  
Calamba, Laguna 4027, Philippines

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan,  
R.O.C.

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

## Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1 Certificate of Conformity .....</b>	<b>4</b>
<b>2 Summary of Test Results .....</b>	<b>5</b>
2.1 Measurement Uncertainty .....	5
2.2 Modification Record .....	5
<b>3 General Information .....</b>	<b>6</b>
3.1 General Description of EUT .....	6
3.2 Description of Test Modes .....	8
3.2.1 Test Mode Applicability and Tested Channel Detail .....	10
3.3 Description of Support Units .....	11
3.3.1 Configuration of System under Test .....	12
3.4 General Description of Applied Standards .....	12
<b>4 Test Types and Results .....</b>	<b>13</b>
4.1 Radiated Emission and Bandedge Measurement .....	13
4.1.1 Limits of Radiated Emission and Bandedge Measurement .....	13
4.1.2 Test Instruments .....	14
4.1.3 Test Procedures .....	15
4.1.4 Deviation from Test Standard .....	15
4.1.5 Test Setup .....	16
4.1.6 EUT Operating Conditions .....	17
4.1.7 Test Results .....	18
4.2 Conducted Emission Measurement .....	24
4.2.1 Limits of Conducted Emission Measurement .....	24
4.2.2 Test Instruments .....	24
4.2.3 Test Procedures .....	25
4.2.4 Deviation from Test Standard .....	25
4.2.5 Test Setup .....	25
4.2.6 EUT Operating Conditions .....	25
4.2.7 Test Results .....	26
<b>5 Pictures of Test Arrangements .....</b>	<b>30</b>
<b>Appendix – Information on the Testing Laboratories .....</b>	<b>31</b>

### Release Control Record

Issue No.	Description	Date Issued
RF170620C22-4	Original release	Nov. 28, 2017

## 1 Certificate of Conformity

**Product:** IOT PLATFORM

**Brand:** Ionics, Lumewave

**Model:** IoT Platform Advance

**Series Model:** 72201R Lumewave IoT Platform

**Sample Status:** Engineering sample

**Applicant:** Ionics EMS, Inc.

**Test Date:** Nov. 14 ~ Nov. 27, 2017

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)

47 CFR FCC Part 15, Subpart C (Section 15.249)

ANSI C63.10-2013

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 :**



**Date:**

Nov. 28, 2017

Pettie Chen / Senior Specialist

**Approved by :**



**Date:**

Nov. 28, 2017

Ken Liu / Senior Manager

## 2 Summary of Test Results

Applied Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247) 47 CFR FCC Part 15, Subpart C (Section 15.249)		
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -10.52dB at 0.38099MHz.
15.205 / 15.209 / 15.247(d) 15.249 15.249 (d)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -1.2dB at 3656.00MHz.

### 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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 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

Product	IOT PLATFORM	
Brand	Ionics, Lumewave	
Model	IoT Platform Advance	
Series Model	72201R Lumewave IoT Platform	
Model Difference	Refer to Note	
Status of EUT	Engineering sample	
Power Supply Rating	9Vdc or 12Vdc (adapter)	
Modulation Type	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	Bluetooth EDR	GFSK, $\pi/4$ -DQPSK, 8DPSK
	Bluetooth LE	GFSK
	RFID: 908MHz	GFSK
	RFID: 906~924MHz	BPSK
Modulation Technology	WLAN	DSSS, OFDM
	Bluetooth EDR	FHSS
Transfer Rate	WLAN	802.11b: 11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 150Mbps
	Bluetooth EDR	1/2/3Mbps
	Bluetooth LE	1Mbps
	RFID: 908MHz	50kbps
Operating Frequency	WLAN	2412 ~ 2462MHz
	Bluetooth EDR	2402 ~ 2480MHz
	Bluetooth LE	2402 ~ 2480MHz
	RFID: 908MHz	908MHz
	RFID: 906~924MHz	906~924MHz
Number of Channel	WLAN	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
	Bluetooth EDR	79
	Bluetooth LE	40
	RFID: 908MHz	1
	RFID: 906~924MHz	3
Output Power	WLAN	149.279mW
	Bluetooth EDR	2.793mW
	Bluetooth LE	7.096mW
Antenna Type	WLAN	PCB printed antenna with -0.06dBi gain
	Bluetooth EDR	PCB printed antenna with -0.06dBi gain
	Bluetooth LE	PCB printed antenna with -0.06dBi gain
	RFID: 908MHz	PCB printed antenna with -2.91dBi gain
	RFID: 906~924MHz	Dipole antenna with 5.34dBi gain
Antenna Connector	NA	

Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. All models are listed as below.

Description	Sample 1	Sample 2
Brand	Ionics	Lumewave
Model	IoT Platform Advance	72201R Lumewave IoT Platform
Processor	NXP I.MX6 Dual Lite	NXP I.MX6 Dual Lite
Memory	2GB DDR3L SDRAM, 400 MHz	2GB DDR3L SDRAM, 400 MHz
Internal Storage	8GB eMMC	8GB eMMC
LAN	2 x Gigabit Ethernet	2 x Gigabit Ethernet
Button	1 x Hardware Reset Button	1 x Hardware Reset Button
	1 x Software Reset Button	1 x Software Reset Button
USB	2 x USB2.0 Port	2 x USB 2.0 Port
MicroSD	2 x microSD Card Port	2 x microSD Card Port
Audio	-	-
Debug	1 x Debug Console Port	1 x Debug Console Port
Debug LED	1 x Programming Port	1 x Programming Port
	6 x Status LED	6 x Status LED
Wi-Fi/BT	1 x 802.11 b/g/n 2.4 GHz / BT 2.1 +EDR, BT 4.0	1 x 802.11 b/g/n 2.4 GHz / BT 2.1 +EDR, BT 4.0
IEEE 802.15.4 Sub GHz	1 x 908 MHz Module	1 x 908 MHz Module
RFM900	1 x 915 MHz RFM900 Module	1 x 915 MHz RFM900 Module
Power Supply	Flypower PS30D120K2000UD	XP-Power ECL25US09-S
	12.0V, 2.0 A	9.0 V, 2.8A
	Tma= 40°C	Tma=70°C

2. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX

3. The EUT consumes power from the following adapters

Adapter 1	
Brand	FLYPOWER
Model	PS30D120K2000UD
Input Power	100-240Vac~50/60Hz 800mA
Output Power	12.0Vdc / 2000mA
Power Line	1.5m power cable with one core

Adapter 2	
Brand	XP Power
Model	ECL25US09-S
Input Power	100-240Vac~0.8A 50/60Hz
Output Power	9Vdc / 2.8A
Power Line	AC: 0.7m non-shielded power cable without core
	DC: 0.25m non-shielded power cable without core

4. WLAN, BT and RFID technologies can transmit at same time.

### 3.2 Description of Test Modes

#### For WLAN

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

#### For BT EDR

79 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		



### For BT LE

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

### For 908MHz

1 channel is provided to this EUT:

Channel	Freq. (MHz)
1	908.00

### For 906~924MHz

10 channels are provided to this EUT:

Channel	Freq. (MHz)
1	906
2	908
3	910
4	912
5	914
6	916
7	918
8	920
9	922
10	924

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	
-	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz & Bandedge Measurement  
**RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

#### 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	MODE	FREQ. RANGE (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	802.11g + BT EDR + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 78		8DPSK
		908	1		GFSK
		906~924	1 to 10		BPSK
-	802.11g + BT LE + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 39		GFSK
		908	1		GFSK
		906~924	1 to 10		BPSK

#### 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	MODE	FREQ. RANGE (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	802.11g + BT EDR + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 78		8DPSK
		908	1		GFSK
		906~924	1 to 10		BPSK
-	802.11g + BT LE + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 39		GFSK
		908	1		GFSK
		906~924	1 to 10		BPSK

### Power Line Conducted Emission Test:

- ☒ 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	MODE	FREQ. RANGE (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	802.11g + BT EDR + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 78		8DPSK
		908	1		GFSK
		906~924	1 to 10		BPSK
-	802.11g + BT LE + 908MHz + 906~924MHz	2412 ~ 2462	1 to 11	6 + 0 + 1 + 5	OFDM
		2402 ~ 2480	0 to 39		GFSK
		908	1		GFSK
		906~924	1 to 10		BPSK

### Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Greg Lin
RE<1G	20deg. C, 66%RH	120Vac, 60Hz	Greg Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Greg Lin

### 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.

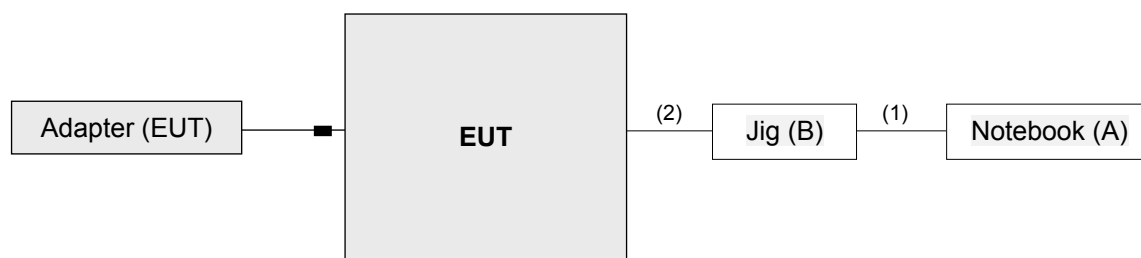
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	D531	CN-0XM006-48643-81U-2610	QDS-BRCM1020	-
B.	Jig	NA	NA	NA	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Micro USB	1	0.6	Y	0	Provided by manufacturer
2.	Flat cable	1	0.2	N	0	Provided by manufacturer

### 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 C (15.247)**

**FCC Part 15, Subpart C (15.249)**

ANSI C63.10-2013

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:

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 v01r04			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	<input checked="" type="checkbox"/>	15.407(b)(4)(i)	PK:-27 (dBm/MHz) <sup>*1</sup> PK:10 (dBm/MHz) <sup>*2</sup> PK:15.6 (dBm/MHz) <sup>*3</sup> PK:27 (dBm/MHz) <sup>*4</sup>	PK: 68.2(dBµV/m) <sup>*1</sup> PK:105.2 (dBµV/m) <sup>*2</sup> PK: 110.8(dBµV/m) <sup>*3</sup> PK:122.2 (dBµV/m) <sup>*4</sup>
	<input type="checkbox"/>	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
<sup>*1</sup> beyond 75 MHz or more above of the band edge.			<sup>*2</sup> below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
<sup>*3</sup> below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			<sup>*4</sup> 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 KEYSIGHT	N9038A	MY55420137	Mar. 27, 2017	Mar. 26, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May 11, 2017	May 10, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA

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 9.

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-9.

#### 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:

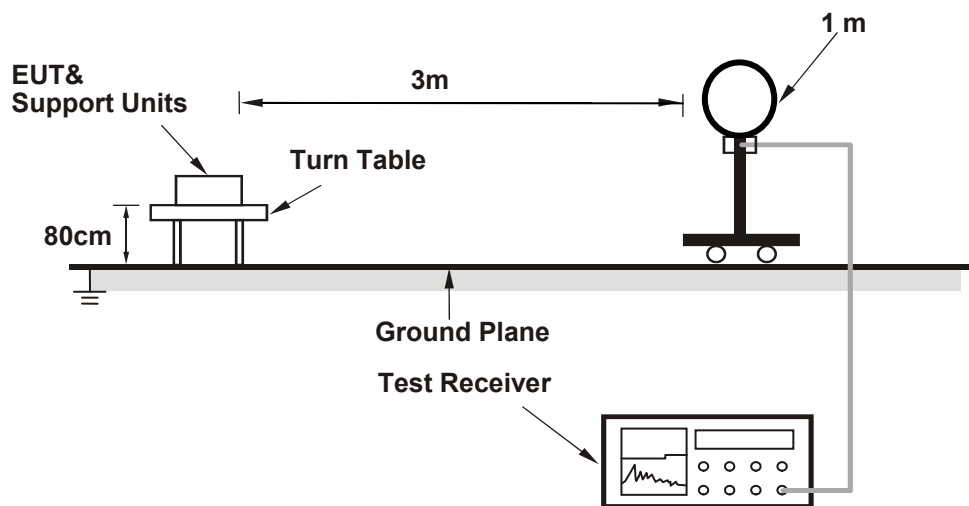
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

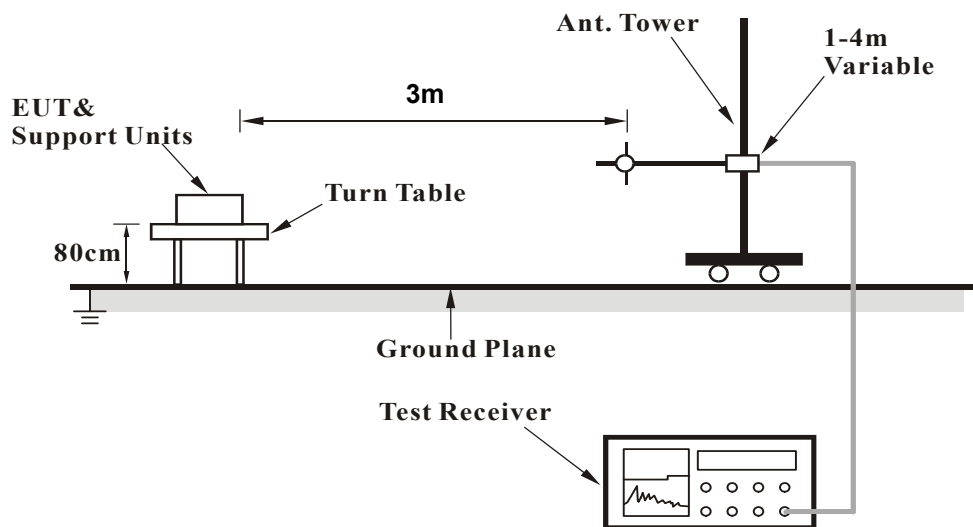
No deviation.

#### 4.1.5 Test Setup

##### For Radiated emission below 30MHz

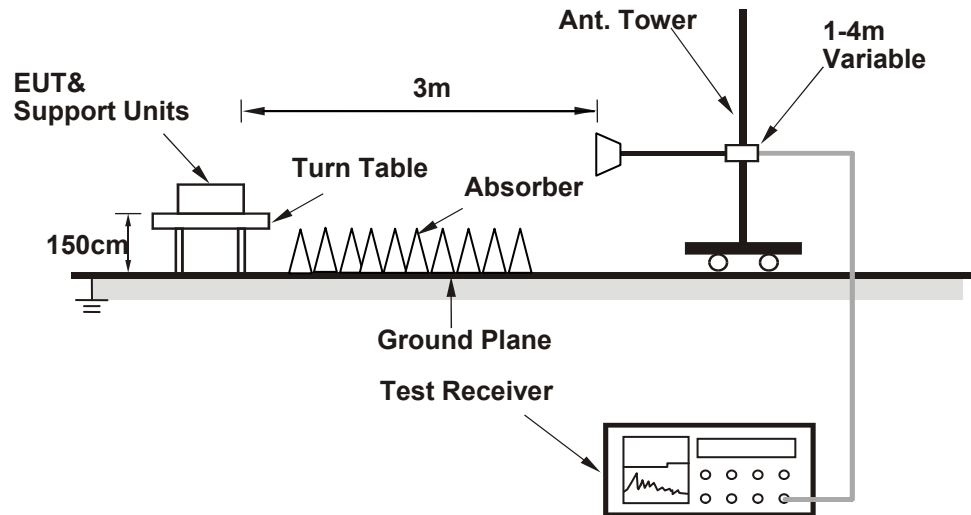


##### For Radiated emission 30MHz to 1GHz





### 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

- Connected the EUT with the notebook and placed them on the testing table.
- The notebook ran a test program to enable EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

Above 1GHz Data:

802.11g + BT EDR + 908MHz + 906~924MHz

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*908.00	85.0 PK			1.53 H	172	87.8	-2.8
2	*908.00	84.6 AV			1.53 H	172	87.4	-2.8
3	*914.00	126.2 PK			1.58 H	163	100.9	25.3
4	*914.00	125.7 AV			1.58 H	163	100.4	25.3
5	#1816.00	48.1 PK	74.0	-25.9	1.32 H	11	54.3	-6.2
6	#1816.00	44.9 AV	54.0	-9.1	1.32 H	11	51.1	-6.2
7	#1828.00	72.2 PK	106.2	-34.0	1.00 H	178	78.3	-6.1
8	#1828.00	70.4 AV	106.2	-35.8	1.00 H	178	76.5	-6.1
9	2390.00	59.1 PK	74.0	-14.9	1.09 H	224	25.7	33.4
10	2390.00	47.9 AV	54.0	-6.1	1.09 H	224	14.5	33.4
11	#2400.00	54.3 PK	74.0	-19.7	1.16 H	234	57.7	-3.4
12	#2400.00	24.2 AV	54.0	-29.8	1.16 H	234	27.6	-3.4
13	*2402.00	100.2 PK			1.16 H	234	66.7	33.5
14	*2402.00	70.1 AV			1.16 H	234	36.6	33.5
15	*2437.00	102.4 PK			1.78 H	231	68.8	33.6
16	*2437.00	92.3 AV			1.78 H	231	58.7	33.6
17	2742.00	53.2 PK	74.0	-20.8	1.10 H	36	55.5	-2.3
18	2742.00	49.3 AV	54.0	-4.7	1.10 H	36	51.6	-2.3
19	2724.00	50.7 PK	74.0	-23.3	1.74 H	311	53.1	-2.4
20	2724.00	46.8 AV	54.0	-7.2	1.74 H	311	49.2	-2.4
21	3656.00	56.0 PK	74.0	-18.0	1.06 H	124	55.9	0.1
22	3656.00	52.5 AV	54.0	-1.5	1.06 H	124	52.4	0.1
23	4540.00	49.7 PK	74.0	-24.3	1.02 H	337	47.1	2.6
24	4540.00	38.9 AV	54.0	-15.1	1.02 H	337	36.3	2.6
25	4804.00	44.7 PK	74.0	-29.3	1.27 H	263	41.0	3.7
26	4804.00	14.6 AV	54.0	-39.4	1.27 H	263	10.9	3.7
27	4874.00	43.7 PK	74.0	-30.3	3.31 H	76	39.8	3.9
28	4874.00	31.3 AV	54.0	-22.7	3.31 H	76	27.4	3.9
29	5448.00	51.6 PK	74.0	-22.4	1.00 H	71	47.1	4.5
30	5448.00	42.7 AV	54.0	-11.3	1.00 H	71	38.2	4.5

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)
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.

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*908.00	86.3 PK			1.02 V	7	89.1	-2.8
2	*908.00	86.0 AV			1.02 V	7	88.8	-2.8
3	*914.00	124.9 PK			1.79 V	136	99.6	25.3
4	*914.00	124.3 AV			1.79 V	136	99.0	25.3
5	#1816.00	48.3 PK	74.0	-25.7	2.18 V	22	54.5	-6.2
6	#1816.00	44.6 AV	54.0	-9.4	2.18 V	22	50.8	-6.2
7	#1828.00	71.9 PK	104.9	-33.0	1.24 V	78	78.0	-6.1
8	#1828.00	70.1 AV	104.9	-34.8	1.24 V	78	76.2	-6.1
9	2390.00	58.3 PK	74.0	-15.7	3.47 V	179	24.9	33.4
10	2390.00	46.6 AV	54.0	-7.4	3.47 V	179	13.2	33.4
11	#2400.00	51.9 PK	74.0	-22.1	3.71 V	189	55.3	-3.4
12	#2400.00	21.8 AV	54.0	-32.2	3.71 V	189	25.2	-3.4
13	*2402.00	100.8 PK			3.71 V	189	67.3	33.5
14	*2402.00	70.7 AV			3.71 V	189	37.2	33.5
15	*2437.00	94.9 PK			2.87 V	51	61.3	33.6
16	*2437.00	84.7 AV			2.87 V	51	51.1	33.6
17	2724.00	51.5 PK	74.0	-22.5	2.39 V	334	53.9	-2.4
18	2724.00	48.2 AV	54.0	-5.8	2.39 V	334	50.6	-2.4
19	2742.00	53.0 PK	74.0	-21.0	1.17 V	86	55.3	-2.3
20	2742.00	49.2 AV	54.0	-4.8	1.17 V	86	51.5	-2.3
21	3656.00	55.8 PK	74.0	-18.2	1.35 V	107	55.7	0.1
22	3656.00	52.4 AV	54.0	-1.6	1.35 V	107	52.3	0.1
23	4540.00	49.5 PK	74.0	-24.5	1.55 V	43	46.9	2.6
24	4540.00	41.0 AV	54.0	-13.0	1.55 V	43	38.4	2.6
25	4804.00	50.5 PK	74.0	-23.5	2.91 V	103	46.8	3.7
26	4804.00	20.4 AV	54.0	-33.6	2.91 V	103	16.7	3.7
27	4874.00	42.1 PK	74.0	-31.9	2.51 V	112	38.2	3.9
28	4874.00	29.7 AV	54.0	-24.3	2.51 V	112	25.8	3.9
29	5448.00	51.6 PK	74.0	-22.4	1.19 V	343	47.1	4.5
30	5448.00	45.7 AV	54.0	-8.3	1.19 V	343	41.2	4.5

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)
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.

802.11g + BT LE + 908MHz + 906~924MHz

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*908.00	84.9 PK			1.55 H	169	87.7	-2.8
2	*908.00	84.5 AV			1.55 H	169	87.3	-2.8
3	*914.00	126.5 PK			1.86 H	173	101.2	25.3
4	*914.00	125.9 AV			1.86 H	173	100.6	25.3
5	#1816.00	48.3 PK	74.0	-25.7	1.34 H	13	54.5	-6.2
6	#1816.00	45.1 AV	54.0	-8.9	1.34 H	13	51.3	-6.2
7	#1828.00	72.4 PK	106.5	-34.1	1.02 H	166	78.5	-6.1
8	#1828.00	70.7 AV	106.5	-35.8	1.02 H	166	76.8	-6.1
9	2390.00	61.0 PK	74.0	-13.0	1.17 H	196	27.6	33.4
10	2390.00	48.2 AV	54.0	-5.8	1.17 H	196	14.8	33.4
11	*2402.00	103.8 PK			1.28 H	211	70.3	33.5
12	*2402.00	102.1 AV			1.28 H	211	68.6	33.5
13	*2437.00	102.5 PK			1.68 H	234	68.9	33.6
14	*2437.00	92.1 AV			1.68 H	234	58.5	33.6
15	2724.00	50.5 PK	74.0	-23.5	1.84 H	303	52.9	-2.4
16	2724.00	46.6 AV	54.0	-7.4	1.84 H	303	49.0	-2.4
17	2742.00	53.5 PK	74.0	-20.5	1.11 H	45	55.8	-2.3
18	2742.00	49.5 AV	54.0	-4.5	1.11 H	45	51.8	-2.3
19	3656.00	56.3 PK	74.0	-17.7	1.04 H	119	56.2	0.1
20	3656.00	52.8 AV	54.0	-1.2	1.04 H	119	52.7	0.1
21	4540.00	49.8 PK	74.0	-24.2	1.11 H	336	47.2	2.6
22	4540.00	38.8 AV	54.0	-15.2	1.11 H	336	36.2	2.6
23	4804.00	54.6 PK	74.0	-19.4	1.43 H	267	50.9	3.7
24	4804.00	44.5 AV	54.0	-9.5	1.43 H	267	40.8	3.7
25	4874.00	43.5 PK	74.0	-30.5	3.52 H	88	39.6	3.9
26	4874.00	31.1 AV	54.0	-22.9	3.52 H	88	27.2	3.9
27	5448.00	51.9 PK	74.0	-22.1	1.02 H	67	47.4	4.5
28	5448.00	43.0 AV	54.0	-11.0	1.02 H	67	38.5	4.5

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)
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.

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*908.00	86.1 PK			1.00 V	12	88.9	-2.8
2	*908.00	85.8 AV			1.00 V	12	88.6	-2.8
3	*914.00	125.2 PK			1.83 V	144	99.9	25.3
4	*914.00	124.6 AV			1.83 V	144	99.3	25.3
5	#1816.00	48.5 PK	74.0	-25.5	2.20 V	25	54.7	-6.2
6	#1816.00	44.8 AV	54.0	-9.2	2.20 V	25	51.0	-6.2
7	#1828.00	72.2 PK	105.2	-33.0	1.34 V	66	78.3	-6.1
8	#1828.00	70.5 AV	105.2	-34.7	1.34 V	66	76.6	-6.1
9	2390.00	59.7 PK	74.0	-14.3	3.77 V	179	26.3	33.4
10	2390.00	47.5 AV	54.0	-6.5	3.77 V	179	14.1	33.4
11	*2402.00	101.3 PK			3.81 V	191	67.8	33.5
12	*2402.00	99.0 AV			3.81 V	191	65.5	33.5
13	*2437.00	94.7 PK			2.99 V	68	61.1	33.6
14	*2437.00	84.4 AV			2.99 V	68	50.8	33.6
15	2724.00	51.6 PK	74.0	-22.4	2.47 V	328	54.0	-2.4
16	2724.00	48.4 AV	54.0	-5.6	2.47 V	328	50.8	-2.4
17	2742.00	53.2 PK	74.0	-20.8	1.24 V	79	55.5	-2.3
18	2742.00	49.5 AV	54.0	-4.5	1.24 V	79	51.8	-2.3
19	3656.00	56.0 PK	74.0	-18.0	1.33 V	106	55.9	0.1
20	3656.00	52.6 AV	54.0	-1.4	1.33 V	106	52.5	0.1
21	4540.00	49.3 PK	74.0	-24.7	1.58 V	49	46.7	2.6
22	4540.00	40.9 AV	54.0	-13.1	1.58 V	49	38.3	2.6
23	4804.00	52.9 PK	74.0	-21.1	2.77 V	111	49.2	3.7
24	4804.00	42.2 AV	54.0	-11.8	2.77 V	111	38.5	3.7
25	4874.00	42.1 PK	74.0	-31.9	2.59 V	117	38.2	3.9
26	4874.00	29.8 AV	54.0	-24.2	2.55 V	117	25.9	3.9
27	5448.00	51.8 PK	74.0	-22.2	1.23 V	338	47.3	4.5
28	5448.00	45.6 AV	54.0	-8.4	1.23 V	338	41.1	4.5

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)
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

802.11g + BT EDR + 908MHz + 906~924MHz

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	119.24	27.0 QP	43.5	-16.5	1.50 H	281	42.7	-15.7
2	239.52	37.7 QP	46.0	-8.3	1.24 H	165	52.4	-14.7
3	590.66	29.0 QP	46.0	-17.0	1.24 H	15	36.8	-7.8
4	697.36	36.6 QP	46.0	-9.4	1.00 H	220	42.8	-6.2
5	769.14	40.9 QP	46.0	-5.1	1.00 H	219	45.4	-4.5
6	864.20	37.1 QP	46.0	-8.9	1.00 H	57	40.6	-3.5
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	51.34	30.5 QP	40.0	-9.5	1.50 V	169	44.4	-13.9
2	249.22	31.9 QP	46.0	-14.1	1.50 V	332	45.1	-13.2
3	375.32	42.9 QP	46.0	-3.1	1.99 V	137	52.3	-9.4
4	600.36	37.9 QP	46.0	-8.1	1.50 V	196	41.7	-3.8
5	697.36	37.8 QP	46.0	-8.2	1.24 V	199	39.7	-1.9
6	875.84	44.0 QP	46.0	-2.0	1.24 V	180	41.8	2.2

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

802.11g + BT LE + 908MHz + 906~924MHz

CHANNEL	CH 6 + CH 0 + CH 1 + CH 5	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	64.92	26.2 QP	40.0	-13.8	2.00 H	268	41.2	-15.0
2	185.20	33.3 QP	43.5	-10.2	2.00 H	23	48.3	-15.0
3	288.02	35.0 QP	46.0	-11.0	1.01 H	337	46.4	-11.4
4	600.36	38.4 QP	46.0	-7.6	1.26 H	221	42.2	-3.8
5	769.14	39.1 QP	46.0	-6.9	1.01 H	210	39.0	0.1
6	864.20	37.8 QP	46.0	-8.2	1.01 H	48	35.8	2.0
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	35.82	32.4 QP	40.0	-7.6	1.00 V	149	48.1	-15.7
2	173.56	29.6 QP	43.5	-13.9	1.00 V	346	43.3	-13.7
3	301.60	30.2 QP	46.0	-15.8	1.00 V	182	41.3	-11.1
4	551.86	35.9 QP	46.0	-10.1	1.50 V	187	41.4	-5.5
5	697.36	39.1 QP	46.0	-6.9	1.24 V	192	41.0	-1.9
6	908.82	44.3 QP	46.0	-1.7	1.50 V	222	41.3	3.0

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

**Note:** 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Conc_ V7.3.7.3	NA	NA	NA

**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 Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.



### 4.2.3 Test Procedures

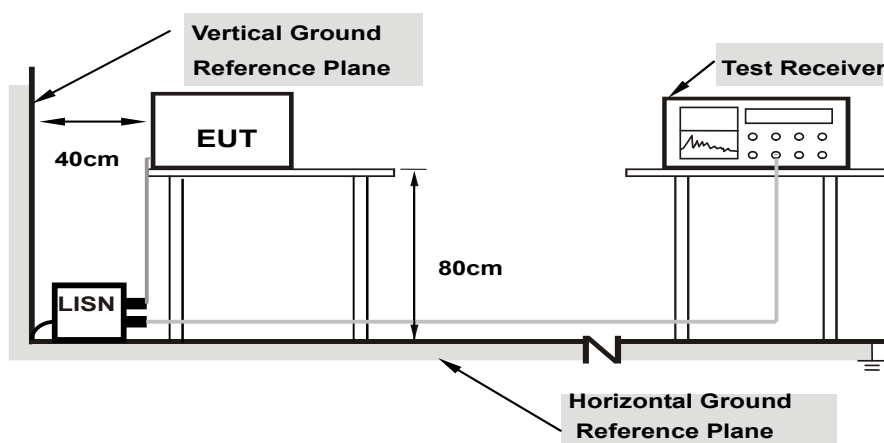
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

### 4.2.4 Deviation from Test Standard

No deviation.

### 4.2.5 Test Setup



**Note:** 1.Support units were connected to second LISN.

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

### 4.2.6 EUT Operating Conditions

Same as 4.1.6.

#### 4.2.7 Test Results

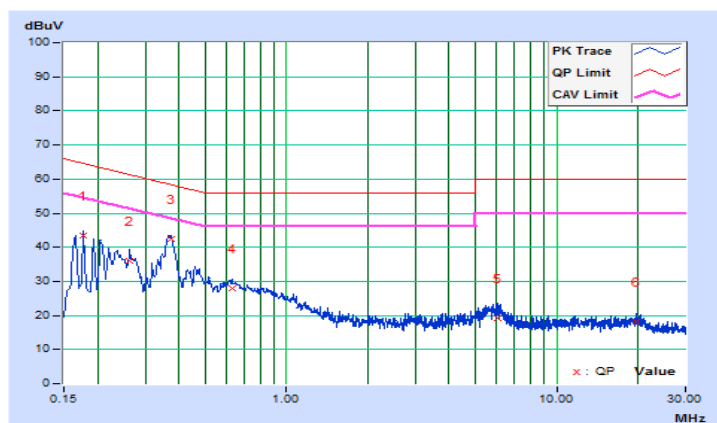
802.11g + BT EDR + 908MHz + 906~924MHz

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 0 + CH 1 + CH 5		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17737	10.45	32.98	18.97	43.43	29.42	64.61	54.61	-21.18	-25.19
2	0.26346	10.47	25.72	18.16	36.19	28.63	61.32	51.32	-25.13	-22.69
3	0.37304	10.51	31.77	25.98	42.28	36.49	58.43	48.43	-16.15	-11.94
4	0.62689	10.50	17.50	12.97	28.00	23.47	56.00	46.00	-28.00	-22.53
5	6.01891	10.74	8.42	2.03	19.16	12.77	60.00	50.00	-40.84	-37.23
6	19.61789	11.40	6.72	1.24	18.12	12.64	60.00	50.00	-41.88	-37.36

#### Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

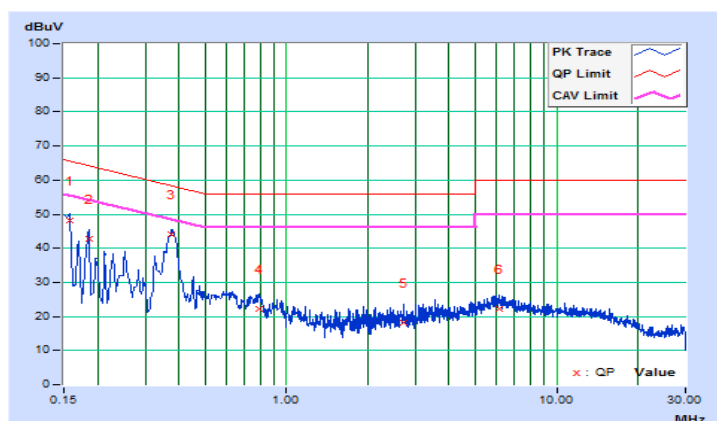


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 0 + CH 1 + CH 5		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	10.21	37.77	23.61	47.98	33.82	65.61	55.61	-17.63	-21.79
2	0.18519	10.22	32.45	17.85	42.67	28.07	64.25	54.25	-21.58	-26.18
3	0.37678	10.23	33.75	27.48	43.98	37.71	58.35	48.35	-14.37	-10.64
4	0.79515	10.25	12.14	8.01	22.39	18.26	56.00	46.00	-33.61	-27.74
5	2.72669	10.35	7.70	2.53	18.05	12.88	56.00	46.00	-37.95	-33.12
6	6.12448	10.50	11.67	6.16	22.17	16.66	60.00	50.00	-37.83	-33.34

#### Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



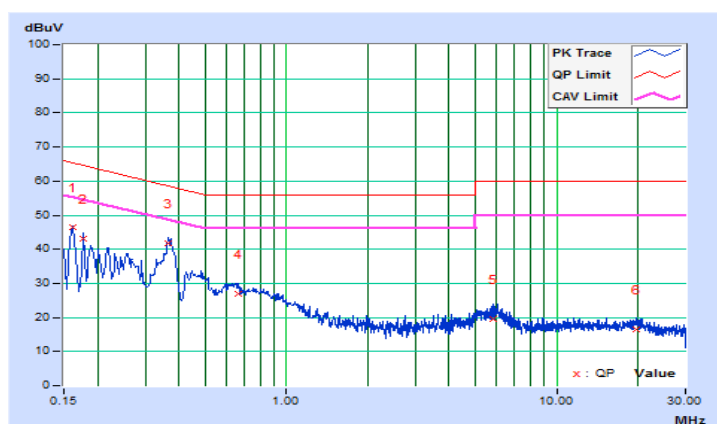
802.11g + BT LE + 908MHz + 906~924MHz

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 0 + CH 1 + CH 5		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	10.45	35.96	20.82	46.41	31.27	65.37	55.37	-18.96	-24.10
2	0.17737	10.45	32.58	18.58	43.03	29.03	64.61	54.61	-21.58	-25.58
3	0.36505	10.51	31.37	24.71	41.88	35.22	58.61	48.61	-16.73	-13.39
4	0.66605	10.50	16.42	11.65	26.92	22.15	56.00	46.00	-29.08	-23.85
5	5.82732	10.73	8.93	2.42	19.66	13.15	60.00	50.00	-40.34	-36.85
6	19.73910	11.41	4.99	1.34	16.40	12.75	60.00	50.00	-43.60	-37.25

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

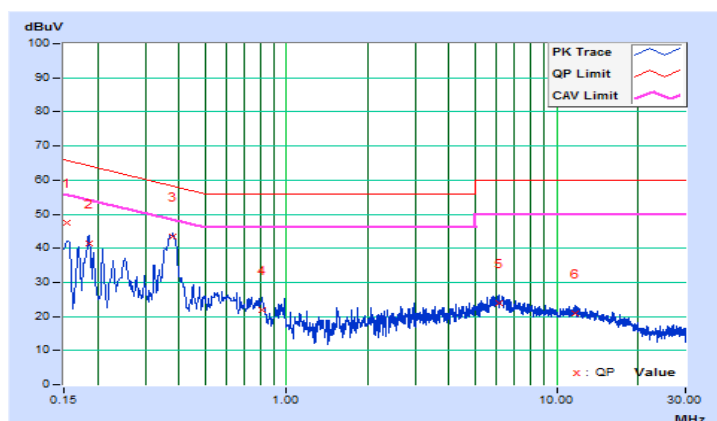


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	CH 6 + CH 0 + CH 1 + CH 5		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.21	37.35	23.19	47.56	33.40	65.79	55.79	-18.23	-22.39
2	0.18508	10.22	31.14	17.09	41.36	27.31	64.25	54.25	-22.89	-26.94
<b>3</b>	<b>0.38099</b>	<b>10.23</b>	<b>33.27</b>	<b>27.51</b>	<b>43.50</b>	<b>37.74</b>	<b>58.26</b>	<b>48.26</b>	<b>-14.76</b>	<b>-10.52</b>
4	0.81079	10.25	11.47	6.77	21.72	17.02	56.00	46.00	-34.28	-28.98
5	6.12839	10.50	13.51	7.93	24.01	18.43	60.00	50.00	-35.99	-31.57
6	11.65713	10.73	10.31	5.82	21.04	16.55	60.00	50.00	-38.96	-33.45

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



## 5 Pictures of Test Arrangements

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

## 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 accredited and approved according to ISO/IEC 17025.

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

### Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

### Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

### Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---