

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standards:** 47 CFR FCC Part 15, Subpart B, Class B  
ANSI C63.4:2014

**Report No.:** FC201119E01 R1

**FCC ID:** J9C-QCNFA765

**Model No:** QCNFA765

**Received Date:** Nov. 19, 2020

**Test Date:** Mar. 15 to 17, 2021

**Issued Date:** Apr. 09, 2021

**Applicant:** Qualcomm Technologies, Inc.

**Address:** 5775 Morehouse Drive, San Diego, CA 92121-1714

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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan.

**FCC Registration /** 810758 / TW1085 for Test Location (1)

**Designation Number:** 960022 / TW1058 for Test Location (2)

**Approved by :**



Ken Lu / Manager

, **Date:** Apr. 09, 2021

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Prepared by : Cherry Chuo / Specialist

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## Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1 Certification .....</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 Description of EUT .....	6
3.2 Primary Clock Frequencies of Internal Source.....	6
3.3 Features of EUT .....	6
3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode .....	7
3.5 Test Program Used and Operation Descriptions.....	7
3.6 Connection Diagram of EUT and Peripheral Devices .....	8
3.7 Configuration of Peripheral Devices and Cable Connections .....	9
<b>4 Test Instruments .....</b>	<b>10</b>
4.1 Conducted Emissions from input power ports.....	10
4.2 Radiated Emissions up to 1 GHz .....	11
4.3 Radiated Emissions above 1 GHz .....	12
<b>5 Test Arrangement.....</b>	<b>13</b>
5.1 Conducted Emissions from input power ports.....	13
5.2 Radiated Emissions up to 1 GHz .....	14
5.3 Radiated Emissions above 1 GHz .....	15
<b>6 Limits of Emission .....</b>	<b>16</b>
6.1 Conducted Emissions from input power ports.....	16
6.2 Radiated Emissions up to 1 GHz .....	16
6.3 Radiated Emissions above 1 GHz .....	16
<b>7 Test Results of Emission .....</b>	<b>17</b>
7.1 Conducted Emissions from input power ports.....	17
7.1.1 Test Mode 1 .....	17
7.2 Radiated Emissions up to 1 GHz .....	19
7.2.1 Test Mode 1 .....	19
7.3 Radiated Emissionse above 1 GHz .....	21
7.3.1 Test Mode 1 .....	21
<b>8 Pictures of Test Arrangements .....</b>	<b>25</b>
<b>9 Information of the Testing Laboratories .....</b>	<b>26</b>

## Release Control Record

Issue No.	Description	Date Issued
FD201119E01	Original release.	Mar. 23, 2021
FC201119E01 R1	Modified the report no. to FC201119E01 R1.	Apr. 09, 2021

## 1 Certification

**Product:** Wi-Fi 6E BT 5.2 M.2 2230 Module

**Brand:** Qualcomm

**Test Model:** QCNFA765

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Qualcomm Technologies, Inc.

**Test Date:** Mar. 15 to 17, 2021

**Standards:** 47 CFR FCC Part 15, Subpart B, Class B

ANSI C63.4:2014

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.

## 2 Summary of Test Results

FCC Part 15 Clause	Test Item	Result/Remarks	Verdict
15.107	Conducted Emissions from input power ports	Minimum passing Class B margin is -8.46 dB at 0.41953 MHz	Pass
15.109	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -0.57 dB at 299.32 MHz	Pass
	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -7.30 dB at 34655.29 MHz	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.0 dB
Radiated Emissions above 1 GHz	1GHz~6GHz	5.1 dB
	6GHz~18GHz	4.8 dB
	18GHz~40GHz	5.3 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 Description of EUT

Product	Wi-Fi 6E BT 5.2 M.2 2230 Module
Brand	Qualcomm
Test Model	QCNFA765
Sample Status	ENGINEERING SAMPLE
Operating Software	NA
Power Supply Rating	3.3Vdc from host equipment
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The module has two variant designs as following table:

SKU No.	Description
SKU #1	M.2 2230 E-key
SKU #2	M.2 2230 AE-key

2. The product provides option to depopulate external LNA (Low-Noise amplifier) from 5GHz/6GHz receive path. This test report covers variation of with/without external LNA and test was conducted to confirm no change in RF compliance and EMC. And worst case was found in without external LNA.

#### 3.2 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 7125 MHz, provided by Qualcomm Technologies, Inc., for detailed internal source, please refer to the manufacturer's specifications.

#### 3.3 Features of EUT

The tests reported herein were performed according to the method specified by Qualcomm Technologies, Inc., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

### 3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode

For radiated emission test, the EUT has been pre-tested under following test modes, and test mode A was the worst case for final test.

Test Condition				
Radiated emission test				
Mode	Oper Mode	Test conditon mode	Antenna mode	PCB Type
<b>A</b>	<b>Hotspot</b>	<b>WiFi 5G+BT</b>	<b>260-25094(Antenna A)</b>	<b>PCIe with E Key</b>
B	Hotspot	WiFi 2.4G+BT	260-25094(Antenna A)	PCIe with E Key
C	Client	WiFi 6e(6GHz)+BT	260-25094(Antenna A)	PCIe with E Key
D	Client	WiFi 2.4G+BT	260-25094(Antenna A)	PCIe with E Key
E	Client	WiFi 5G+BT	260-25094(Antenna A)	PCIe with E Key
F	Client	WiFi 5G+BT	260-25083	PCIe with E Key
G	Client	WiFi 5G+BT	260-25084	PCIe with E Key
H	Hotspot	WiFi 5G+BT	260-25094(Antenna A)	PCIe with A-E Key
I	Hotspot	WiFi 5G+BT	260-25094(Antenna A)	PCIe with E Key (Removed xLNA)

Note: The test configurations are defined by the applicant requirement.

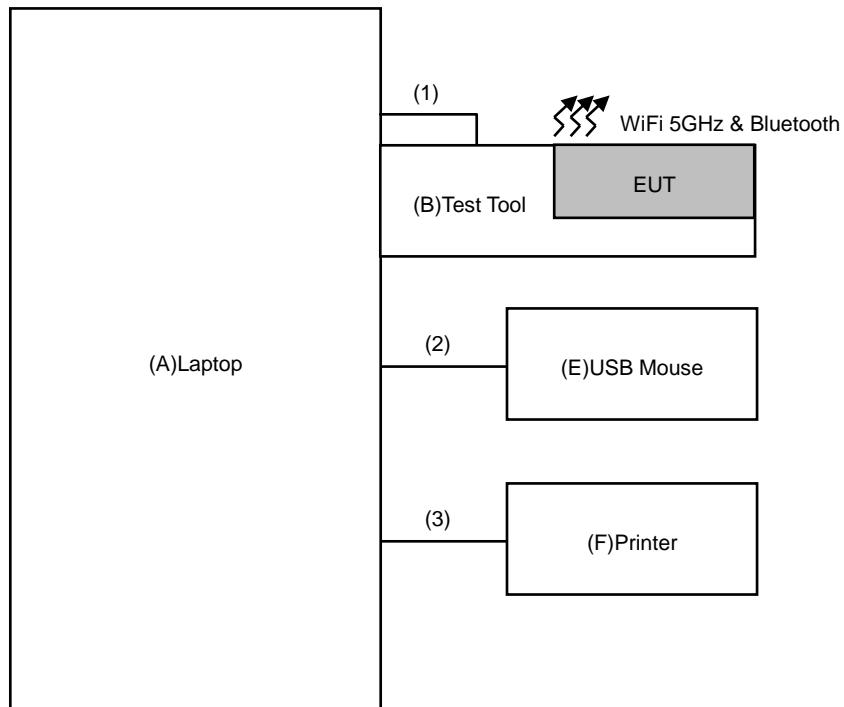
Test mode is presented in the report as below.

Test Condition				
Conducted emission / Radiated emission test				
Mode	Oper Mode	Test conditon mode	Antenna mode	PCB Type
1	Hotspot	WiFi 5G+BT	260-25094(Antenna A)	PCIe with E Key

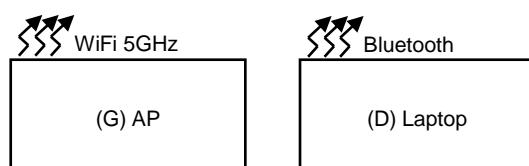
### 3.5 Test Program Used and Operation Descriptions

- 1 Turn on the power of all equipment.
- 2 Support unit A (Laptop) runs "ping.exe" programs to communicate with support unit G (AP) via EUT wireless 5GHz link.
- 3 Support unit A (Laptop) links with support unit D (Laptop) via EUT Bluetooth link.
- 4 Support unit A (Laptop) runs "EMC test.exe" then sends "H" messages to itself.

### 3.6 Connection Diagram of EUT and Peripheral Devices



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### 3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	DELL	E5530	NA	NA	Supplied by applicant
B	Test tool	NA	NA	NA	NA	Supplied by applicant
D	Laptop	HP	Elite Desk 800G4	4CE9251SMQ	NA	Provided by Lab
E	USB Mouse	Logithch	M-U0026	NA	NA	Provided by Lab
F	Printer	EPSON	LQ-300+II	G88Y074085	FCC DoC	Provided by Lab
G	AP	NA	NA	NA	NA	Supplied by applicant

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	USB Cable	1	1.5	Yes	0	Provided by Lab
2	USB Cable	1	1.8	Yes	0	Provided by Lab
3	USB Cable	1	1.8	Yes	0	Provided by Lab

## 4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.1 Conducted Emissions from input power ports

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2020	Apr. 15, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV 216	100072	June 13, 2020	June 12, 2021
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 08, 2020	Sep. 07, 2021
RF Cable	5D-FB	COACAB-001	Mar. 12, 2021	Mar. 11, 2022
10 dB PAD EMEC	STI02-2200-10	006	Aug. 28, 2020	Aug. 27, 2021
50 ohms Terminator	N/A	EMC-02	Sep. 16, 2020	Sep. 15, 2021
50 ohms Terminator	N/A	EMC-03	Sep. 30, 2020	Sep. 29, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

**Note:**

1. The test was performed in Conducted Room C
2. The VCCI Con C Registration No. is C-13611.
3. Tested Date: Mar. 15, 2021



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#### 4.2 Radiated Emissions up to 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	Jun 17, 2020	Jun 16, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-03	Oct. 20, 2020	Oct. 19, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Nov. 04, 2020	Nov. 03, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-04	Jan. 11, 2021	Jan. 10, 2022
RF Cable	8D-FB	CHFCAB-003-2	Sep. 24, 2020	Sep. 23, 2021
	8D-FB	CHGCAB-001-2	Sep. 24, 2020	Sep. 23, 2021
	RF-141	CHGCAB-004	Sep. 24, 2020	Sep. 23, 2021
Software BVADT	ADT_Radiated _V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

**Note:**

1. The test was performed in Chamber G room
2. The VCCI Site Registration No. is R-20009.
3. Tested Date: Mar. 16, 2021

#### 4.3 Radiated Emissions above 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210105	July 17, 2020	July 16, 2021
Horn Antenna FT-RF	HA-07M18G-NF	0000320091110	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier Agilent	8449B	3008A02578	June 09, 2020	June 08, 2021
RF Cable EMCI	EMC104-SM-SM-2000	181208	Aug. 25, 2020	Aug. 24, 2021
RF Cable EMCI	EMC104-SM-SM-6000	181209	Aug. 25, 2020	Aug. 24, 2021
RF Cable EMCI	EMC104-SM-SM-8500	181211	Aug. 25, 2020	Aug. 24, 2021
Spectrum Analyzer Agilent	E4446A	MY48250254	Nov. 20, 2020	Nov. 19, 2021
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Aug. 26, 2020	Aug. 25, 2021
Horn Antenna SCHWARZBECK	BBHA 9170	9170-424	Nov. 22, 2020	Nov. 21, 2021
RF Cable EMCI	EMC101G-KM-KM-1000	201262	Dec. 30, 2020	Dec. 29, 2021
RF Cable EMCI	EMC101G-KM-KM-4500	201263	Dec. 30, 2020	Dec. 29, 2021
Software BVADT	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Fix tool for Boresight antenna tower	BAF-01	5	NA	NA

**Note:**

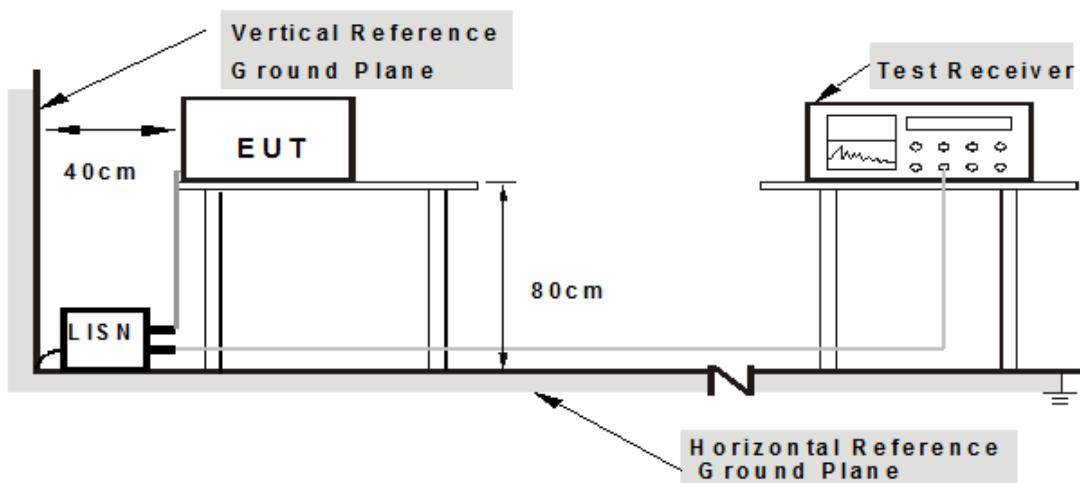
1. The test was performed in Chamber G room
2. Tested Date: Mar. 16 to 17, 2021

## 5 Test Arrangement

### 5.1 Conducted Emissions from input power ports

- a. 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.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

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.



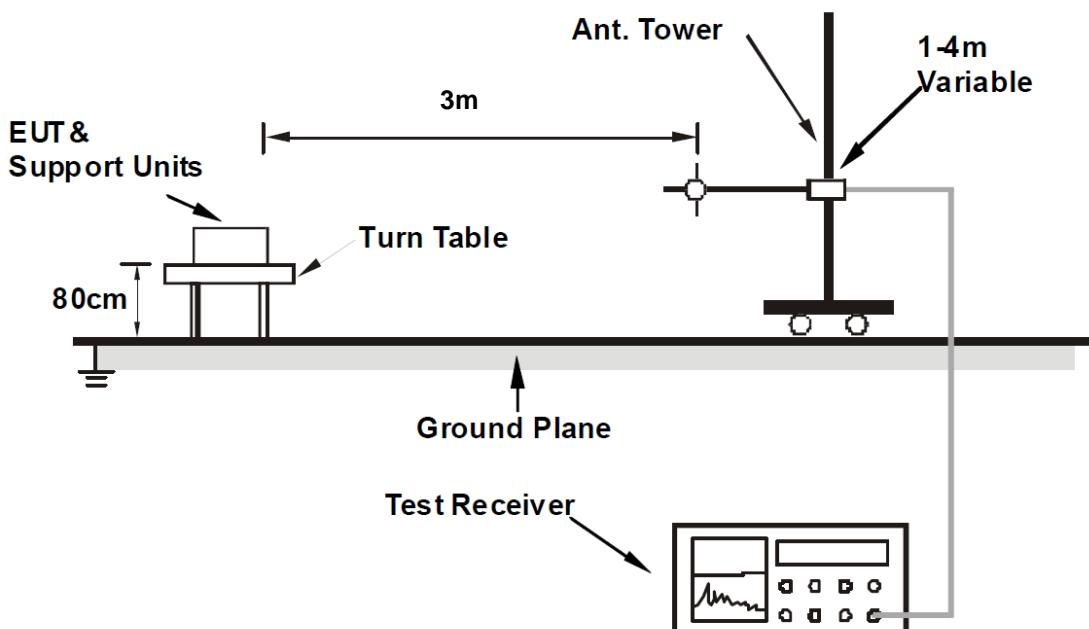
Note: 1. Support units were connected to second LISN.

For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

## 5.2 Radiated Emissions up to 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. 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 antenna is a broadband antenna, and its height 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 up to 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.

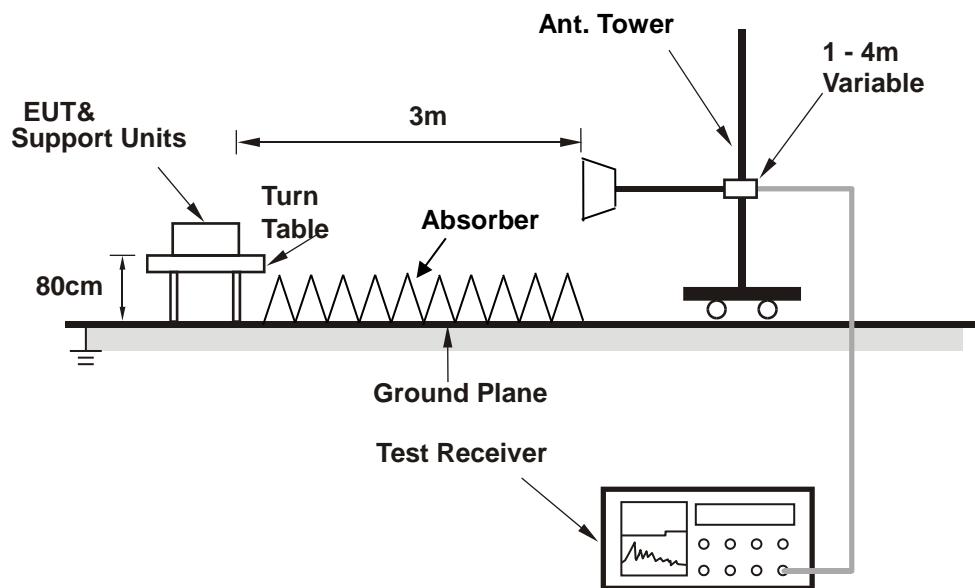


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 5.3 Radiated Emissions above 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited 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. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The spectrum analyzer system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.



The test arrangement is in accordance with ANSI C63.4:2014. For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 6 Limits of Emission

### 6.1 Conducted Emissions from input power ports

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.5 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

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

### 6.2 Radiated Emissions up to 1 GHz

Radiated Emissions Limits at 10 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5		
88-216	43.5	33.1	40	30
216-230				
230-960	46.4	35.6		
960-1000	49.5	43.5	47	37

Radiated Emissions Limits at 3 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40		
88-216	54	43.5	50.5	40.5
216-230				
230-960	56.9	46		
960-1000	60	54	57.5	47.5

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

### 6.3 Radiated Emissions above 1 GHz

#### Frequency Range (For unintentional radiators)

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, whichever is lower

Radiated Emissions Limits at 3 meters (dB $\mu$ V/m)		
Frequency range	Class A	Class B
Above 1GHz	Avg: 60 Peak: 80	Avg: 54 Peak: 74

Notes: 1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far field of the ITE or digital apparatus under test.

## 7 Test Results of Emission

### 7.1 Conducted Emissions from input power ports

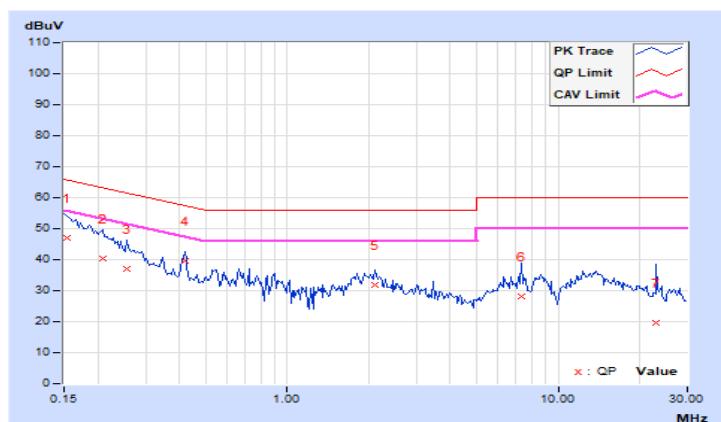
#### 7.1.1 Test Mode 1

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	20°C, 68%RH
Tested by	Eagle Chen		

No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.94	37.01	15.04	46.95	24.98	65.79	55.79	-18.84	-30.81
2	0.20859	9.94	30.33	15.41	40.27	25.35	63.26	53.26	-22.99	-27.91
3	0.25547	9.94	26.95	21.77	36.89	31.71	61.58	51.58	-24.69	-19.87
4	<b>0.41953</b>	<b>9.95</b>	<b>29.59</b>	<b>29.05</b>	<b>39.54</b>	<b>39.00</b>	<b>57.46</b>	<b>47.46</b>	<b>-17.92</b>	<b>-8.46</b>
5	2.09766	10.01	21.99	16.23	32.00	26.24	56.00	46.00	-24.00	-19.76
6	7.28906	10.15	18.01	10.60	28.16	20.75	60.00	50.00	-31.84	-29.25
7	23.10547	10.57	9.23	4.78	19.80	15.35	60.00	50.00	-40.20	-34.65

#### 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

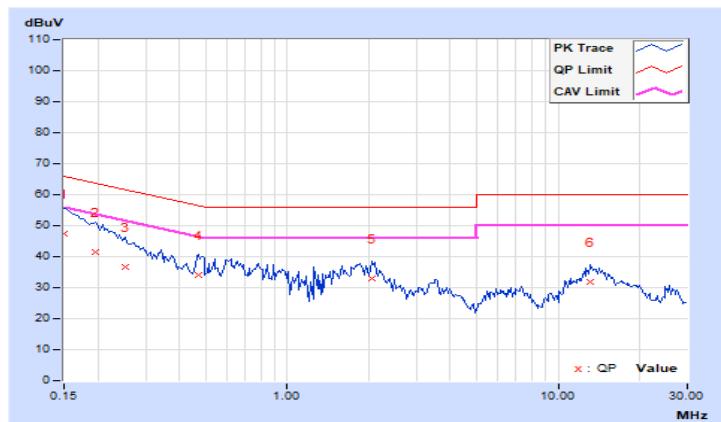


<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz
<b>Input Power (System)</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	20°C, 68%RH
<b>Tested by</b>	Eagle Chen		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	37.40	20.05	47.35	30.00	66.00	56.00	-18.65	-26.00
2	0.19687	9.95	31.68	21.45	41.63	31.40	63.74	53.74	-22.11	-22.34
3	0.25156	9.95	26.89	15.51	36.84	25.46	61.71	51.71	-24.87	-26.25
4	0.47031	9.96	24.03	16.19	33.99	26.15	56.51	46.51	-22.52	-20.36
5	2.06250	10.01	22.94	17.83	32.95	27.84	56.00	46.00	-23.05	-18.16
6	13.21875	10.33	21.48	17.75	31.81	28.08	60.00	50.00	-28.19	-21.92

**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



## 7.2 Radiated Emissions up to 1 GHz

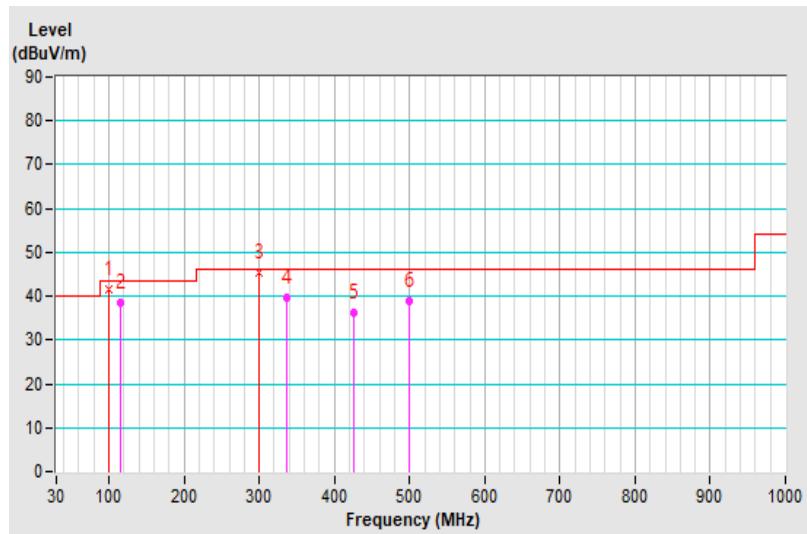
### 7.2.1 Test Mode 1

<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP), 120kHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	20°C, 58%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	99.77	41.43 QP	43.50	-2.07	4.00 H	53	54.00	-12.57
2	114.66	38.62 QP	43.50	-4.88	3.00 H	55	49.20	-10.58
<b>3</b>	<b>299.32</b>	<b>45.43 QP</b>	<b>46.00</b>	<b>-0.57</b>	<b>1.06 H</b>	<b>200</b>	<b>52.39</b>	<b>-6.96</b>
4	336.01	39.72 QP	46.00	-6.28	1.00 H	241	45.59	-5.87
5	425.78	36.06 QP	46.00	-9.94	1.00 H	210	39.41	-3.35
6	498.87	38.94 QP	46.00	-7.06	2.00 H	235	40.64	-1.70

#### 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

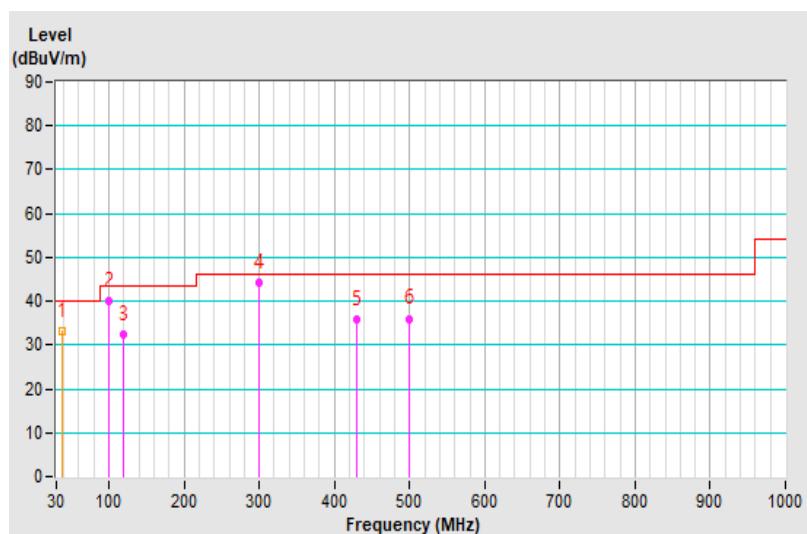


<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP), 120kHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	20°C, 58%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	38.00	33.13 QP	40.00	-6.87	2.06 V	360	42.29	-9.16
2	99.69	39.95 QP	43.50	-3.55	2.00 V	120	52.53	-12.58
3	119.94	32.40 QP	43.50	-11.10	1.00 V	47	42.46	-10.06
4	298.74	44.30 QP	46.00	-1.70	1.10 V	157	51.29	-6.99
5	430.29	35.81 QP	46.00	-10.19	2.00 V	304	39.00	-3.19
6	498.87	36.02 QP	46.00	-9.98	2.00 V	281	37.72	-1.70

**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



### 7.3 Radiated Emissionse above 1 GHz

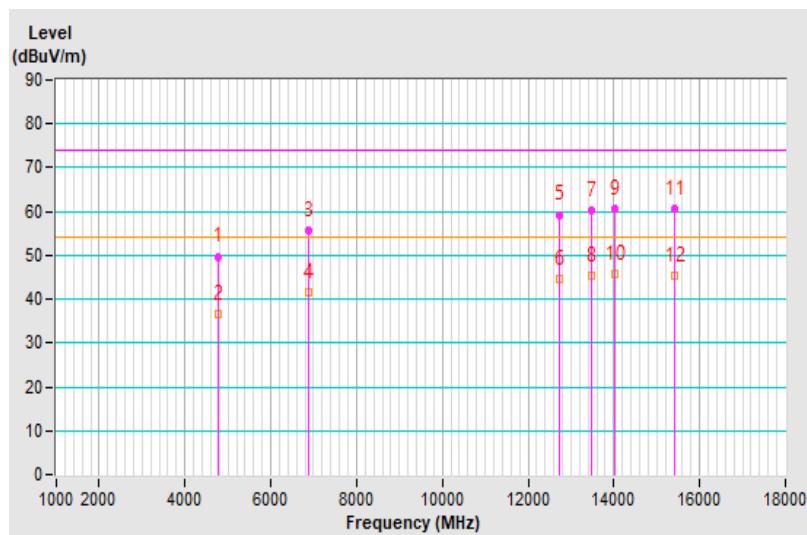
#### 7.3.1 Test Mode 1

<b>Frequency Range</b>	1GHz ~ 18GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Peak (PK) / Average (AV), 1MHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	19°C, 58%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4775.24	49.74 PK	74.00	-24.26	2.00 H	360	41.52	8.22
2	4775.24	36.44 AV	54.00	-17.56	1.89 H	92	28.22	8.22
3	6894.27	55.77 PK	74.00	-18.23	1.00 H	232	44.04	11.73
4	6894.27	41.50 AV	54.00	-12.50	1.12 H	360	29.77	11.73
5	12726.28	59.28 PK	74.00	-14.72	2.00 H	360	44.83	14.45
6	12726.28	44.60 AV	54.00	-9.40	2.35 H	308	30.15	14.45
7	13492.13	60.08 PK	74.00	-13.92	1.00 H	360	44.27	15.81
8	13492.13	45.28 AV	54.00	-8.72	1.20 H	231	29.47	15.81
9	14017.21	60.53 PK	74.00	-13.47	1.50 H	265	44.48	16.05
10	14017.21	45.69 AV	54.00	-8.31	1.60 H	180	29.64	16.05
11	15399.46	60.48 PK	74.00	-13.52	2.00 H	360	45.45	15.03
12	15399.46	45.29 AV	54.00	-8.71	2.24 H	141	30.26	15.03

#### 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





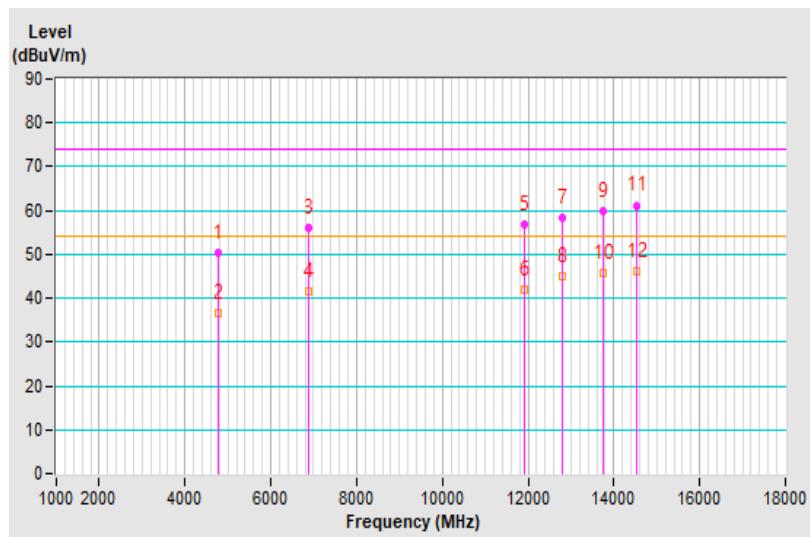
BUREAU  
VERITAS

<b>Frequency Range</b>	1GHz ~ 18GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Peak (PK) / Average (AV), 1MHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	19°C, 58%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4762.79	50.46 PK	74.00	-23.54	1.50 V	0	42.72	7.74
2	4762.79	36.42 AV	54.00	-17.58	1.42 V	104	28.68	7.74
3	6896.35	55.98 PK	74.00	-18.02	1.00 V	360	44.23	11.75
4	6896.35	41.48 AV	54.00	-12.52	1.09 V	253	29.73	11.75
5	11925.16	56.94 PK	74.00	-17.06	2.00 V	56	44.56	12.38
6	11925.16	42.02 AV	54.00	-11.98	2.14 V	180	29.64	12.38
7	12809.30	58.25 PK	74.00	-15.75	1.50 V	0	43.69	14.56
8	12809.30	44.82 AV	54.00	-9.18	1.73 V	201	30.26	14.56
9	13751.56	59.91 PK	74.00	-14.09	2.00 V	20	44.16	15.75
10	13751.56	45.83 AV	54.00	-8.17	2.39 V	241	30.08	15.75
11	14534.00	61.20 PK	74.00	-12.80	1.50 V	325	45.70	15.50
12	14534.00	46.03 AV	54.00	-7.97	1.64 V	329	30.53	15.50

**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

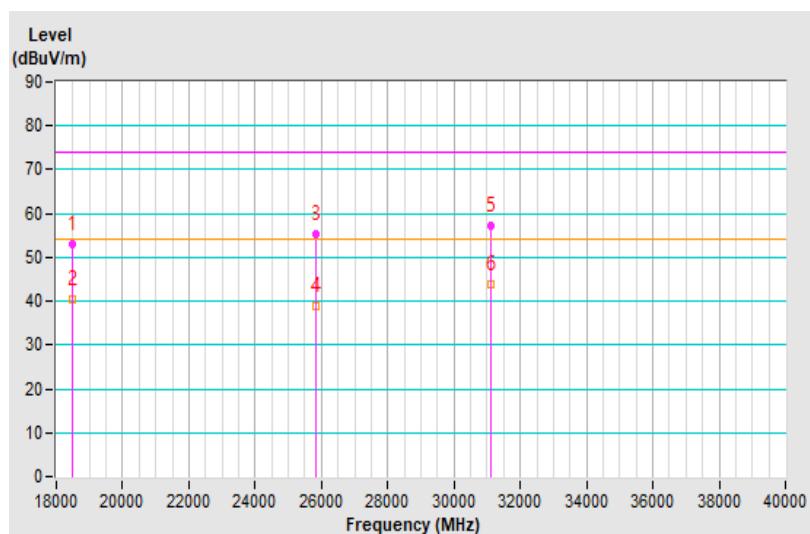


<b>Frequency Range</b>	18GHz ~ 36.625GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Peak (PK) / Average (AV), 1MHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	15°C, 60%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	18480.56	53.08 PK	74.00	-20.92	1.52 H	263	57.04	-3.96
2	18480.56	40.31 AV	54.00	-13.69	1.52 H	218	44.27	-3.96
3	25845.44	55.18 PK	74.00	-18.82	1.33 H	107	58.07	-2.89
4	25845.44	38.71 AV	54.00	-15.29	1.33 H	166	41.60	-2.89
5	31111.35	57.31 PK	74.00	-16.69	1.09 H	263	57.03	0.28
6	31111.35	43.69 AV	54.00	-10.31	1.09 H	321	43.41	0.28

**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

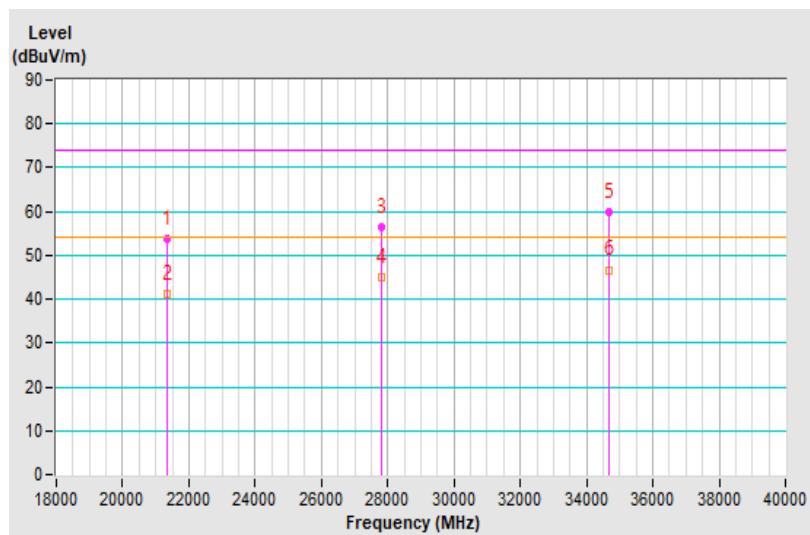


<b>Frequency Range</b>	18GHz ~ 36.625GHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Peak (PK) / Average (AV), 1MHz
<b>Input Power</b>	3.3Vdc from host equipment	<b>Environmental Conditions</b>	15°C, 60%RH
<b>Tested By</b>	Abner Chang		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	21355.71	53.90 PK	74.00	-20.10	1.22 V	274	56.87	-2.97
2	21355.71	41.26 AV	54.00	-12.74	1.22 V	236	44.23	-2.97
3	27799.13	56.57 PK	74.00	-17.43	1.01 V	321	58.94	-2.37
4	27799.13	44.96 AV	54.00	-9.04	1.01 V	294	47.33	-2.37
5	34655.29	59.90 PK	74.00	-14.10	1.56 V	43	55.87	4.03
6	34655.29	46.70 AV	54.00	-7.30	1.56 V	75	42.67	4.03

**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



## 8 Pictures of Test Arrangements

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

## 9 Information of 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:

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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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