

## FCC Certification Test Report

**Report No.:** FC171221C06 R1

**Test Model:** F-04K

**FCC ID:** VQK-F04K

**Received Date:** Dec. 21, 2017

**Test Date:** Feb. 09, 2018 ~ Feb. 27, 2018

**Issued Date:** Apr. 16, 2018

**Applicant:** Fujitsu Limited

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

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**FCC Registration /  
Designation Number:** 328930 / TW1050



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### Release Control Record

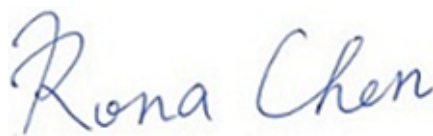
Issue No.	Description	Date Issued
FC171221C06	Original Release	Mar. 06, 2018
FC171221C06 R1	Revise battery rating	Apr. 16, 2018

## 1 Certificate of Conformity

**Product:** Smart Phone  
**Brand:** FUJITSU  
**Test Model:** F-04K  
**Sample Status:** Identical Prototype  
**Applicant:** Fujitsu Limited  
**Test Date:** Feb. 09, 2018 ~ Feb. 27, 2018  
**Standards:** 47 CFR FCC Part 15, Subpart B, Class B  
ICES-003:2016 Issue 6, 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.

Prepared by :



, Date:

Apr. 16, 2018

Rona Chen / Specialist

Approved by :



, Date:

Apr. 16, 2018

Carl Chen / Project Engineer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart B / ICES-003:2016 Issue 6, Class B

ANSI C63.4:2014

FCC Clause	ICES-003 Clause	Test Item	Result/Remarks	Verdict
15.107	6.1	AC Power Line Conducted Emissions	Minimum passing Class B margin is -4.07 dB at 0.51719 MHz	Pass
15.109	6.2.1	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -6.47 dB at 176.28 MHz	Pass
	6.2.2	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -19.12 dB at 21189.56 MHz	Pass

Note: There is no deviation to the applied test methods and requirements covered by the scope of this report.

### 2.1 Measurement Uncertainty

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

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	4.70 dB
Radiated Emissions above 1 GHz	Above 1 GHz	2.26 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 Features of EUT

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

#### 3.2 General Description of EUT

Product	Smart Phone
Brand	FUJITSU
Test Model	F-04K
Status of EUT	Identical Prototype
Operating Software	Android
Power Supply Rating	5.0 Vdc (adapter or host equipment) 3.8 Vdc (Li-ion battery)
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	FUJITSU CONNECTED TECHNOLOGIES Ltd.	CA54310-0067	3.8 Vdc, 2580 mAh

2. The EUT uses following adapter which provided by client as support unit.

Product	Brand	Model	Description
Adapter	NTT docomo	AC Adapter 01	I/P: 100-240Vac, 0.8A, O/P: 5.0Vdc, 3.0A

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

Test modes are presented in the report as below.

Mode	Test Condition
Conducted Emission	
1	GSM 1900 Link + BT Link + WLAN (2.4G) Link + GPS & GLONASS Rx + Earphone + Adapter
2	WCDMA 850 Link + BT Link + WLAN (5G) Link + Camera + Earphone + Adapter
3	LTE Band 5 Link + BT Link + WLAN (2.4G) Link + MPEG 4 + USB Cable + Earphone + USB Link to Notebook
Radiated Emission	
1	GSM 1900 Link + BT Link + WLAN (2.4G) Link + GPS & GLONASS Rx + Earphone + Adapter
2	WCDMA 850 Link + BT Link + WLAN (5G) Link + Camera + Earphone + Adapter
3	LTE Band 5 Link + BT Link + WLAN (2.4G) Link + MPEG 4 + USB Cable + Earphone + USB Link to Notebook
4	NFC On + (Stand-alone)
Remark:	
1. For conducted emission test, test mode 1 was the worst case and only this mode was presented in the report.	
2. For radiated emission test, test mode 4 was the worst case and only this mode was presented in the report.	

### 3.4 Test Program Used and Operation Descriptions

Conducted Emission:

- The EUT was charged from the adapter.
- The EUT linked Bluetooth earphone.
- The EUT sent audio signal to the earphone.
- The EUT communicated data with the Radio Communication Analyzer / GPS Simulator / Wireless AP, which acted as communication partners.

Radiated Emission:

- The EUT was charged from the battery.
- The NFC function was activated.

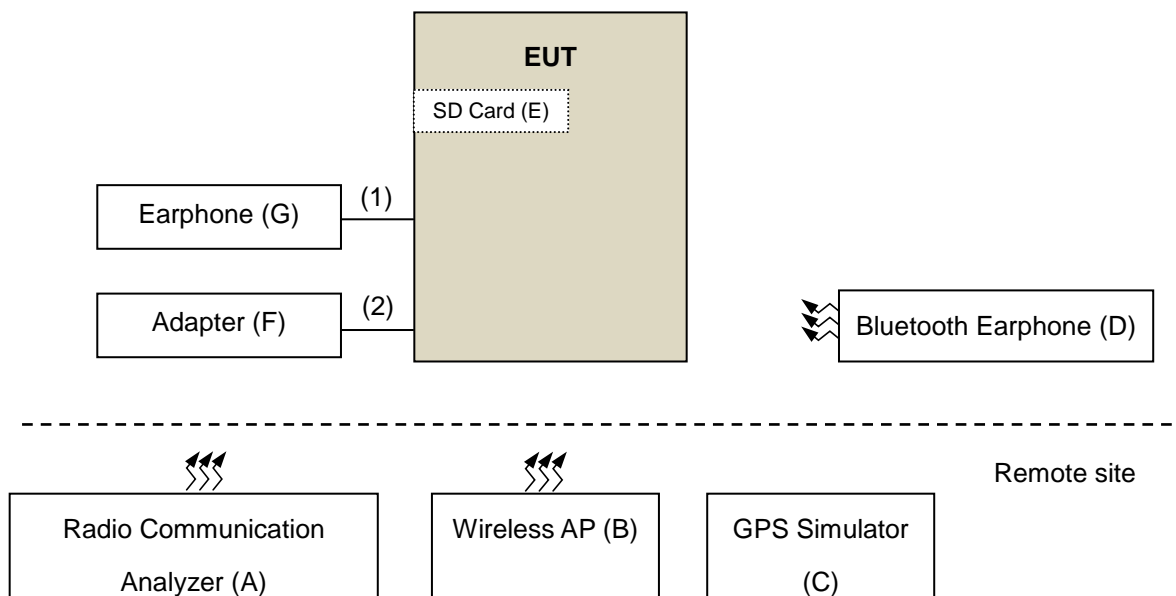
### 3.5 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 5 GHz, provided by Fujitsu Limited, for detailed internal source, please refer to the manufacturer's specifications.

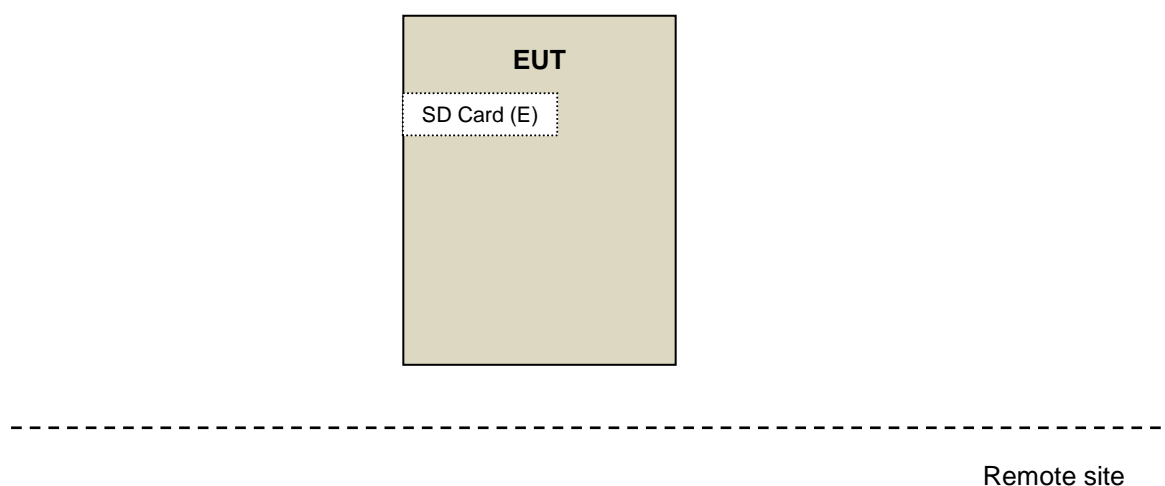
## 4 Configuration and Connections with EUT

### 4.1 Connection Diagram of EUT and Peripheral Devices

Conducted Emission:



Radiated Emission:





## 4.2 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	N/A	--
B.	Wireless N Dual band Router	D-LINK	DIR-815	PV/K21B5000399	KA21R815A1	--
C.	GPS simulator	PENDULUM	GSG-54	191121	N/A	--
D.	BLUETOOTH EARPHONE	ELECOM	LBT-MPHS400	N/A	N/A	--
E.	SD Card	Transcend	N/A	N/A	N/A	--
F.	Adapter	NTT docomo	AC Adapter 01	N/A	N/A	Provided by client
G.	Earphone	APPLE	N/A	N/A	N/A	--

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A~D acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Earphone Cable	1	1.2	N	0	--
2.	Adapter Cable	1	1.15	Y	0	Provided by client

Note: The core(s) is(are) originally attached to the cable(s).

## 5 Conducted Emissions at Mains Ports

### 5.1 Limits

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 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.

### 5.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Aug. 17, 2017	Aug. 16, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 08, 2017	Sep. 07, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Feb. 05, 2018	Feb. 04, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 02, 2017	Aug. 01, 2018
Software ADT	BV ADT_Cond_ 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.

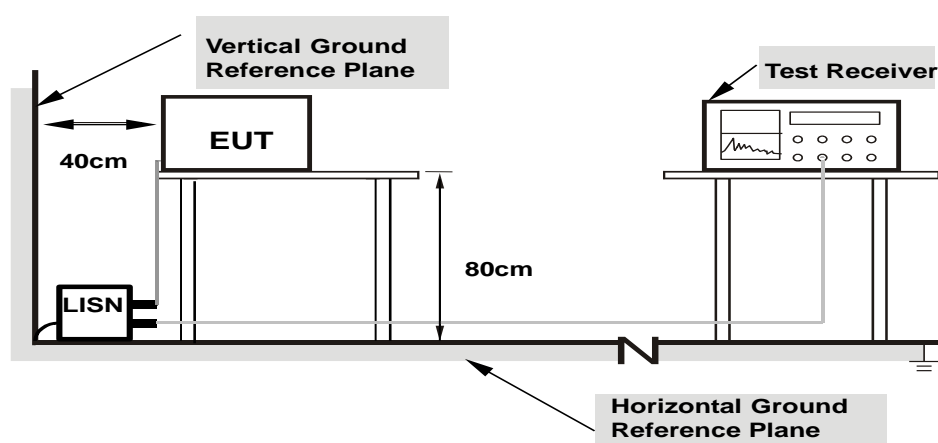
2. The test was performed in HwaYa Shielded Room 2.

3. The VCCI Site Registration No. is C-2047.

### 5.3 Test Arrangement

- 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/ 50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.



- Note:**
- 1.Support units were connected to second LISN.
  - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

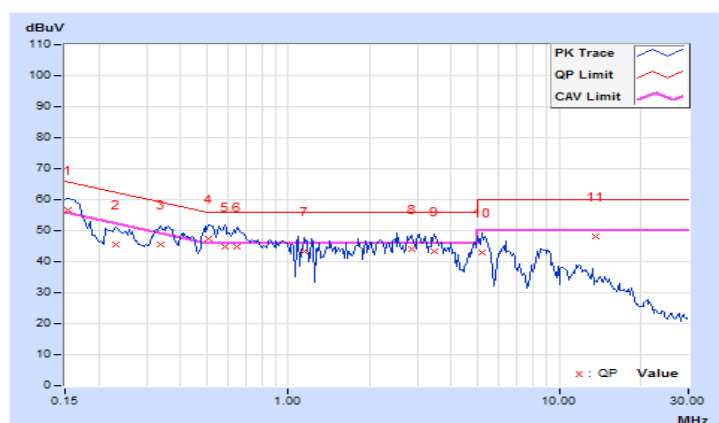
## 5.4 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 60%RH
Tested by	Daniel Lin	Test Date	2018/2/13
Test Mode	Mode 1		

Phase Of Power : Line (L)										
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	10.28	46.29	33.79	56.57	44.07	65.79	55.79	-9.22	-11.72
2	0.23203	10.32	35.25	22.59	45.57	32.91	62.38	52.38	-16.81	-19.47
3	0.33750	10.33	35.38	20.39	45.71	30.72	59.26	49.26	-13.55	-18.54
4	0.50938	10.35	37.16	22.19	47.51	32.54	56.00	46.00	-8.49	-13.46
5	0.58359	10.36	34.54	17.20	44.90	27.56	56.00	46.00	-11.10	-18.44
6	0.65000	10.37	34.33	18.58	44.70	28.95	56.00	46.00	-11.30	-17.05
7	1.14063	10.42	32.74	19.15	43.16	29.57	56.00	46.00	-12.84	-16.43
8	2.85938	10.47	33.44	21.76	43.91	32.23	56.00	46.00	-12.09	-13.77
9	3.47266	10.50	32.84	20.31	43.34	30.81	56.00	46.00	-12.66	-15.19
10	5.20703	10.55	32.40	19.64	42.95	30.19	60.00	50.00	-17.05	-19.81
11	13.56000	10.72	37.27	11.99	47.99	22.71	60.00	50.00	-12.01	-27.29

### 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

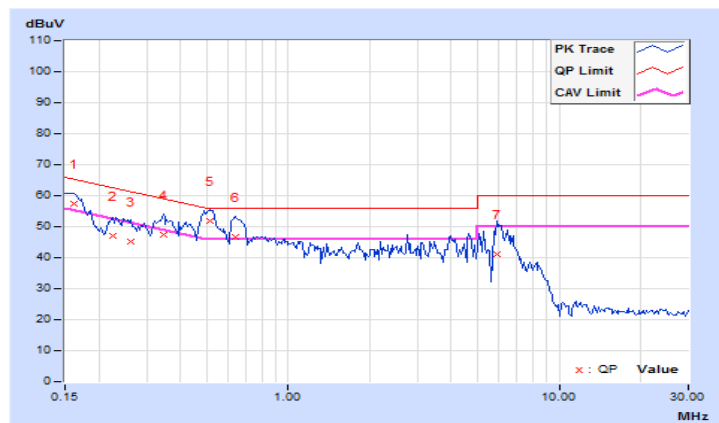


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 60%RH
Tested by	Daniel Lin	Test Date	2018/2/13
Test Mode	Mode 1		

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	0.16172	10.33	46.92	33.93	57.25	44.26	65.38	55.38	-8.13	-11.12
2	0.22422	10.30	36.56	23.09	46.86	33.39	62.66	52.66	-15.80	-19.27
3	0.26328	10.31	34.84	21.07	45.15	31.38	61.33	51.33	-16.18	-19.95
4	0.34531	10.31	37.05	23.08	47.36	33.39	59.07	49.07	-11.71	-15.68
<b>5</b>	<b>0.51719</b>	<b>10.33</b>	<b>41.60</b>	<b>26.05</b>	<b>51.93</b>	<b>36.38</b>	<b>56.00</b>	<b>46.00</b>	<b>-4.07</b>	<b>-9.62</b>
6	0.63828	10.35	36.26	15.95	46.61	26.30	56.00	46.00	-9.39	-19.70
7	5.92188	10.61	30.52	17.99	41.13	28.60	60.00	50.00	-18.87	-21.40

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



## 6 Radiated Emissions up to 1 GHz

### 6.1 Limits

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960				
960-1000	60	54	57.5	47.5

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).
3. QP detector shall be applied if not specified.

## 6.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ (V)	ESR	101240	Oct. 24, 2017	Oct. 23, 2018
Test Receiver ROHDE & SCHWARZ (H)	ESR	101264	Dec. 25, 2017	Dec. 24, 2018
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-160	Nov. 29, 2017	Nov. 28, 2018
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-156	Nov. 29, 2017	Nov. 28, 2018
Preamplifier Sonoma (V)	310N	352924	Jul. 12, 2017	Jul. 11, 2018
Preamplifier Sonoma (H)	310N	352923	Jul. 12, 2017	Jul. 11, 2018
RF signal cable (with 5dB PAD) Times (V)	LMR-600 (18M) +LMR-400 (7M)	CABLE-CH1 (VER) -01	Oct. 24, 2017	Oct. 23, 2018
RF signal cable (with 5dB PAD) Times (H)	LMR-600 (11.8M) +LMR-400 (7M)	CABLE-CH1 (HOR) -01	Oct. 24, 2017	Oct. 23, 2018
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower (V)	MFA-440	9707	NA	NA
Antenna Tower (H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller (V)	MF7802	074	NA	NA
Controller (H)	MF7802	08093	NA	NA

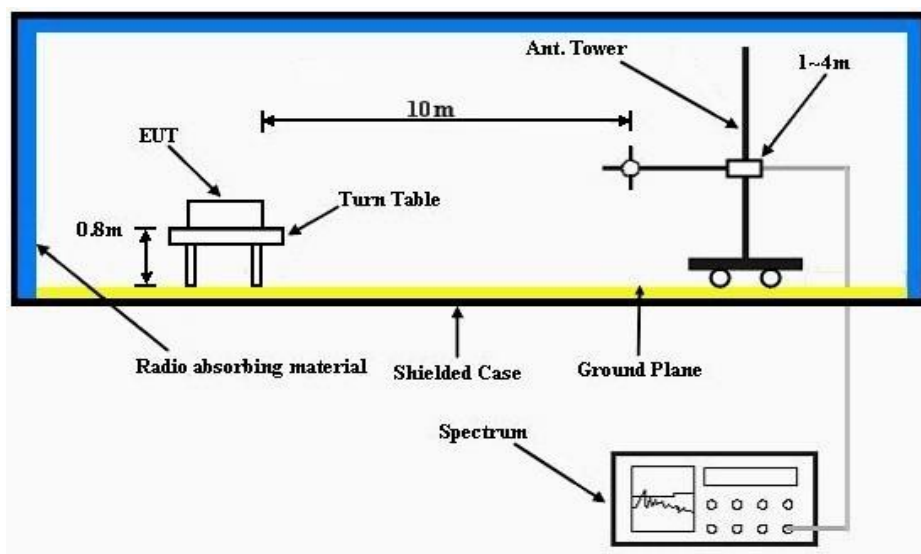
NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 1.
3. The IC Site Registration No. is IC 7450F-1.
4. The VCCI Site Registration No. is R-1893.

### 6.3 Test Arrangement

- 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.
- The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.

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





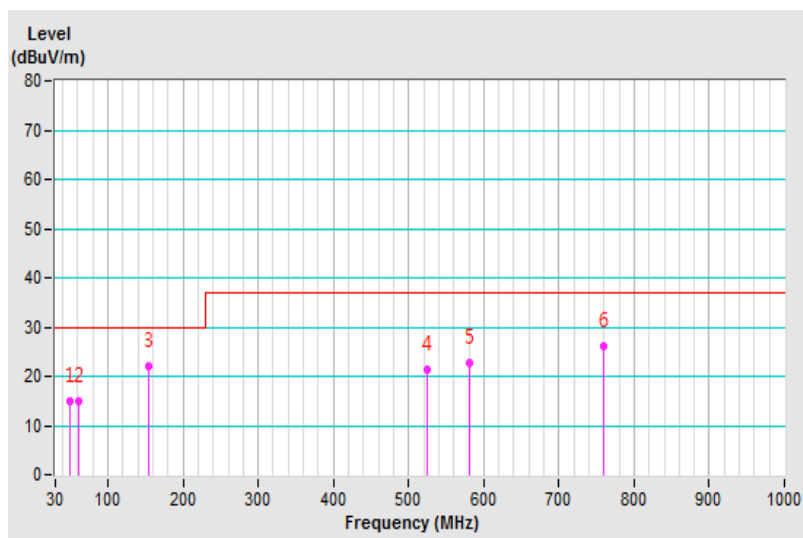
## 6.4 Test Results

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22°C, 60%RH
Tested by	Jim Lee	Test Date	2018/2/27
Test Mode	Mode 4		

Antenna Polarity & Test Distance : Horizontal at 10 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	49.74	15.08 QP	30.00	-14.92	2.50 H	123	28.56	-13.48
2	60.80	15.05 QP	30.00	-14.95	2.00 H	164	28.81	-13.76
3	154.80	21.96 QP	30.00	-8.04	1.00 H	336	35.10	-13.14
4	524.19	21.40 QP	37.00	-15.60	3.00 H	188	28.82	-7.42
5	580.65	22.72 QP	37.00	-14.28	3.50 H	136	28.90	-6.18
6	758.99	26.14 QP	37.00	-10.86	2.00 H	16	29.00	-2.86

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

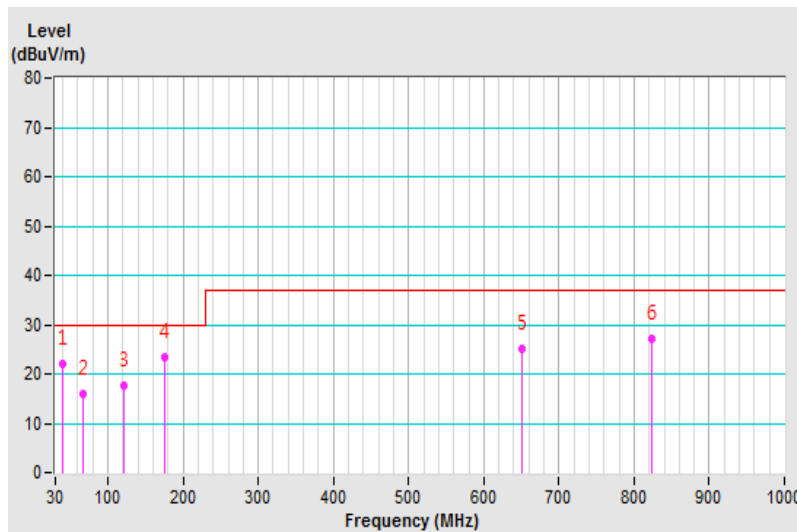


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22°C, 60%RH
Tested by	Jim Lee	Test Date	2018/2/27
Test Mode	Mode 4		

Antenna Polarity & Test Distance : Vertical at 10 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	38.97	22.14 QP	30.00	-7.86	2.50 V	34	36.17	-14.03
2	67.78	16.01 QP	30.00	-13.99	3.00 V	101	30.54	-14.53
3	122.01	17.60 QP	30.00	-12.40	1.00 V	112	32.96	-15.36
<b>4</b>	<b>176.28</b>	<b>23.53 QP</b>	<b>30.00</b>	<b>-6.47</b>	<b>1.00 V</b>	<b>271</b>	<b>37.56</b>	<b>-14.03</b>
5	650.78	25.16 QP	37.00	-11.84	1.50 V	299	29.46	-4.30
6	823.11	27.28 QP	37.00	-9.72	2.50 V	16	28.41	-1.13

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 Radiated Emissions above 1 GHz

### 7.1 Limits

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 49.5	Avg: 43.5	Not defined	Not defined
Above 3000	Peak: 69.5	Peak: 63.5	Not defined	Not defined

Radiated Emissions Limits at 3 meters (dB $\mu$ V/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
1000-3000	Avg: 60	Avg: 54	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000	Peak: 80	Peak: 74	Avg: 60 Peak: 80	Avg: 54 Peak: 74

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB $\mu$ V/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000 MHz, 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 20 dB under any condition of modulation.

Radiated Emissions Limits at 1.5 meters (dB $\mu$ V/m)		
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B
Above 18000	Avg: 66 Peak: 86	Avg: 60 Peak: 80

Note: Limit@1.5m = Limit@3m + 20log(3/1.5)

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	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

## 7.2 Test Instruments

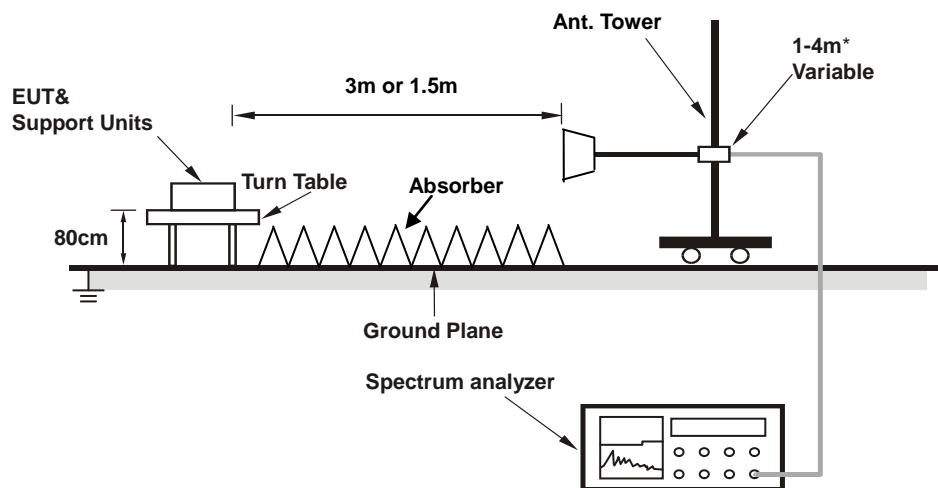
Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ (Above 1GHz)	ESR7	101471	Feb. 23, 2017	Feb. 22, 2018
Spectrum Analyzer Agilent	E4446A	MY51100039	Sep. 05, 2017	Sep. 04, 2018
RF signal cable (with 5dB PAD) Times	LMR-400 (18M)	CABLE-CH2-01	Apr. 28, 2017	Apr. 27, 2018
HORN Antenna (with 4dB PAD) SCHWARZBECK	BBHA 9120 D	9120D-405	Dec. 01, 2017	Nov. 30, 2018
Preamplifier Agilent (Above 1GHz)	8449B	3008A01922	Sep. 15, 2017	Sep. 14, 2018
RF signal cable ALLTEST & EMC	JUNFLON+EMC10 4-SM-SM-6000	Cable-CH2-02(MWX3221308 G003+130710)	Jun. 12, 2017	Jun. 11, 2018
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Controller BV ADT	SC100	SC93021702	NA	NA
RF Coaxial Cable EMCI	EMC102-KM-KM-1 000	170820	Aug. 29, 2017	Aug. 28, 2018
RF Coaxial Cable EMCI	EMC102-KM-KM-3 000	170818	Aug. 29, 2017	Aug. 28, 2018
Fix tool for Boresight antenna	BAF-01	2	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2017	Nov. 13, 2018
HORN Antenna (with 3dB PAD) SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 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 2.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC 7450F-2.
5. The VCCI Site Registration No. is G-18.

### 7.3 Test Arrangement

- 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.
- For frequency range 1 GHz ~ 18 GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- For frequency range 18 GHz ~ 40 GHz, the EUT was set 1.5 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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 3 dB 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.
- 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.
- The spectrum analyzer system was set to peak and average detect 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 1 MHz and video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1 GHz.



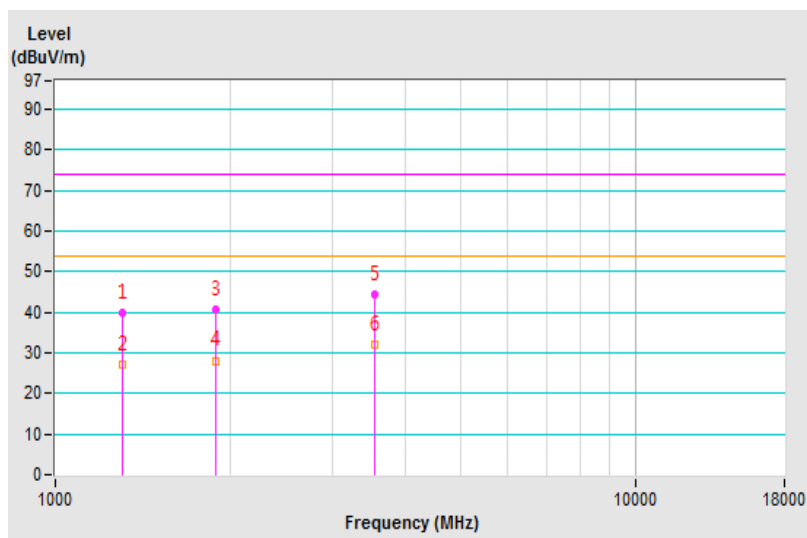
## 7.4 Test Results

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	20°C, 60%RH
Tested by	Pon Tsai	Test Date	2018/2/9
Test Mode	Mode 4		

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	1303.40	39.85 PK	74.00	-34.15	1.99 H	321	42.70	-2.85
2	1303.40	27.10 AV	54.00	-26.90	1.99 H	321	29.95	-2.85
3	1887.72	40.75 PK	74.00	-33.25	3.00 H	0	41.93	-1.18
4	1887.72	28.09 AV	54.00	-25.91	3.00 H	0	29.27	-1.18
5	3553.29	44.29 PK	74.00	-29.71	1.99 H	0	40.71	3.58
6	3553.29	32.06 AV	54.00	-21.94	1.99 H	0	28.48	3.58

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

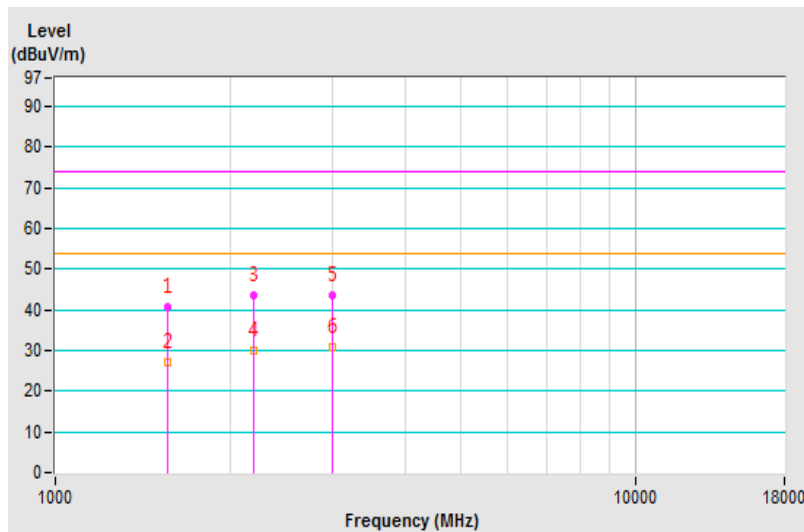


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	20°C, 60%RH
Tested by	Pon Tsai	Test Date	2018/2/9
Test Mode	Mode 4		

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	1563.28	40.59 PK	74.00	-33.41	4.00 V	197	43.11	-2.52
2	1563.28	26.93 AV	54.00	-27.07	4.00 V	197	29.45	-2.52
3	2195.42	43.47 PK	74.00	-30.53	1.49 V	360	41.94	1.53
4	2195.42	30.12 AV	54.00	-23.88	1.49 V	360	28.59	1.53
5	3007.62	43.59 PK	74.00	-30.41	2.50 V	178	40.85	2.74
6	3007.62	30.63 AV	54.00	-23.37	2.50 V	178	27.89	2.74

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

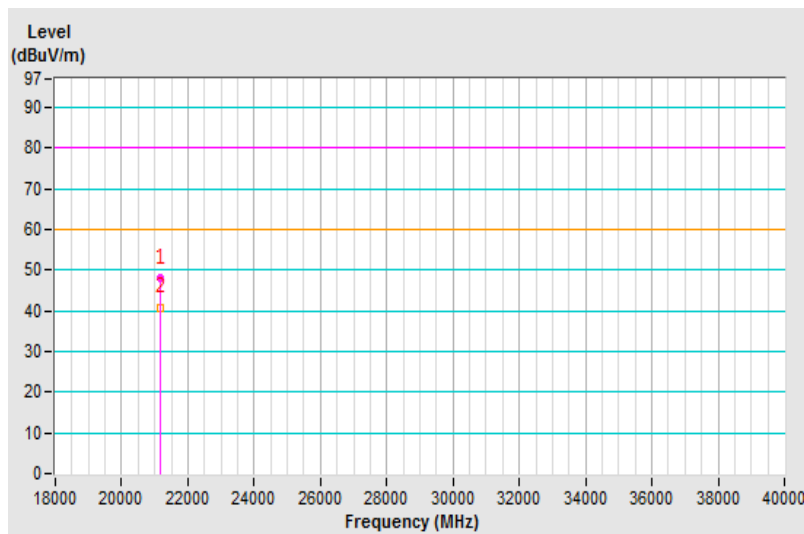


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	20°C, 60%RH
Tested by	Pon Tsai	Test Date	2018/2/9
Test Mode	Mode 4		

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	21189.56	47.98 PK	80.00	-32.02	1.22 H	115	49.28	-1.30
2	<b>21189.56</b>	<b>40.88 AV</b>	<b>60.00</b>	<b>-19.12</b>	<b>1.22 H</b>	<b>115</b>	<b>42.18</b>	<b>-1.30</b>

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



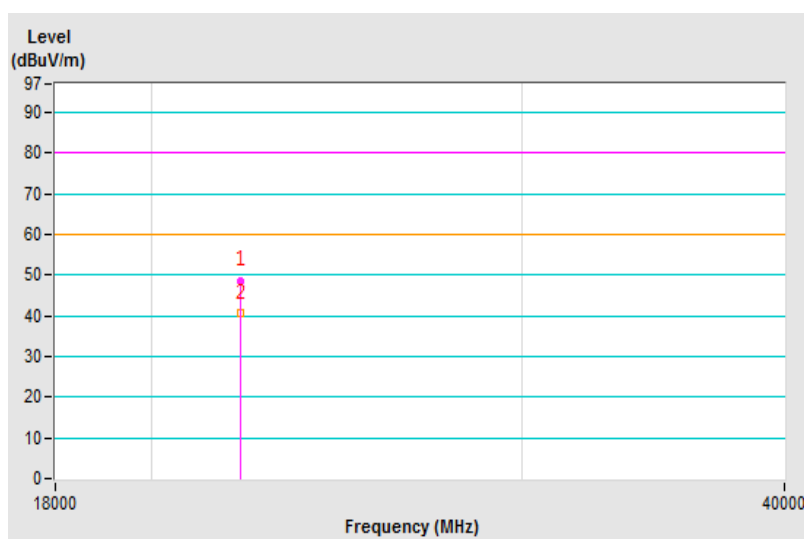


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	20°C, 60%RH
Tested by	Pon Tsai	Test Date	2018/2/9
Test Mode	Mode 4		

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	22051.26	48.65 PK	80.00	-31.35	1.50 V	238	48.81	-0.16
2	22051.26	40.56 AV	60.00	-19.44	1.50 V	238	40.72	-0.16

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).

## 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 according to ISO/IEC 17025.

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**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.

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