



# FCC CERTIFICATION TEST REPORT

**REPORT NO.:** FC140326C05

**MODEL NO.:** F-06F

**FCC ID:** VQK-F06F

**RECEIVED:** Mar. 26, 2014

**TESTED:** May 06 ~ May 08, 2014

**ISSUED:** May 09, 2014

**APPLICANT:** FUJITSU LIMITED

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FC140326C05	Original release	May 09, 2014



## 1 CERTIFICATION

**PRODUCT:** Smart Phone  
**MODEL:** F-06F  
**BRAND:** FUJITSU  
**APPLICANT:** FUJITSU LIMITED  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TESTED:** May 06 ~ May 08, 2014  
**STANDARD:** **FCC Part 15, Subpart B, Class B**  
**ICES-003:2012 Issue 5, Class B**  
ANSI C63.4:2009

The above equipment (Model: F-06F) 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** : Celine Chou , **DATE** : May 09, 2014  
Celine Chou / Specialist

**APPROVED BY** : Ken Liu , **DATE** : May 09, 2014  
Ken Liu / Senior Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications.

EMISSION			
Standard	Test Type	Result	Remarks
FCC Part 15, Subpart B, Class B	Conducted emissions test	PASS	Meet the requirement of limit. Minimum passing margin is -14.36dB at 0.25166MHz.
ICES-003:2012 Issue 5, Class B	Radiated emissions test (30MHz~40GHz)	PASS	Meet the requirement of limit. Minimum passing margin is -7.83dB at 38123.64MHz.

### 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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Measurement	Frequency	Uncertainty
Conducted emissions	150kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 1GHz	4.70 dB
	Above 1GHz	2.26 dB

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.

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Smart Phone
<b>MODEL NO.</b>	F-06F
<b>POWER SUPPLY</b>	3.8Vdc (Battery) 5.0Vdc (Adapter or cradle or host equipment)
<b>I/O PORTS</b>	Refer to users' manual
<b>ACCESSORY DEVICES</b>	Refer to Note as below

**NOTE:**

1. The EUT contains the following accessories.

No.	Product	Brand	Model	Description
1	Battery	NTT docomo	F30	3.8Vdc, 2100mA , 8.0Wh Type: Li-on
2	Cradle	NTT docomo	F46	Input : 5.0Vdc, 1.5A Output : 5.0Vdc, 1.5A

2. SW version is R06.2e.
3. HW version is V2.1.0.
4. IMEI Code: 352295060014776.
5. The EUT's highest operating frequency is 5GHz. Therefore the radiated emissions tests are tested up to 40GHz.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

The EUT consumes power from adapter, which is designed with AC power supply of 100-240Vac, 50-60Hz or from cradle with AC power supply of 100-240Vac.

For radiated emissions below 1GHz test, the EUT has been pre-tested under the following test modes, and **test mode 4** was found to be the worst case for final test.

Test Mode	Test Condition
1	GSM 850 Idle + WIFI Idle + BT Idle + GPS RX + MP4 (SD card) + Earphone + Adapter
2	GSM 1900 Idle + WIFI Idle + BT Idle + GPS RX + MP4 (SD card) + Adapter
3	WCDMA Band 5 Idle + WIFI Idle + BT Idle + GPS RX + Camera (Front) + Earphone + Adapter
4	GSM 1900 Idle + WIFI Idle + BT Idle + GPS RX + Camera (Back) + Earphone + Adapter
5	GSM 1900 Idle + WIFI Idle + BT Idle + GPS RX + RFID Idle + Battery
6	EUT Charging + Adapter + Cradle

Test results are presented in the report as below.

Test Result	Test Condition
<b>Conducted emissions test</b>	
A	GSM 1900 Idle + WIFI Idle + BT Idle + GPS RX + Camera (Back) + Earphone + Adapter
B	EUT Charging + Adapter + Cradle
<b>Radiated emissions test</b>	
A	GSM 1900 Idle + WIFI Idle + BT Idle + GPS RX + Camera (Back) + Earphone + Adapter

### 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.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A.	Universal Radio Communication Tester	R&S	CMU200	122554	NA	-
B.	GPS simulator	PENDULUM	GSG-54	191121	NA	-
C.	Bluetooth Earphone	ELECOM	LBT-MPHS400	NA	NA	-
D.	Wireless N Dual band Router	D-LINK	DIR-815	PVK21B5000399	KA21R815A1	-
E.	Adapter	NTT docomo	AC Adapter 04	NA	NA	I/P: 100-240Vac, 0.22A, 50-60Hz O/P: 5.0Vdc, 1.8A
F.	Earphone / Mic	Apple	M3770FE/B	NA	NA	-
G.	SIM Card	R&S	CMW-Z04	NA	NA	-

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8 m).
2. Items A-D acted as communication partners to transfer data.
3. Item E was provided by the client.

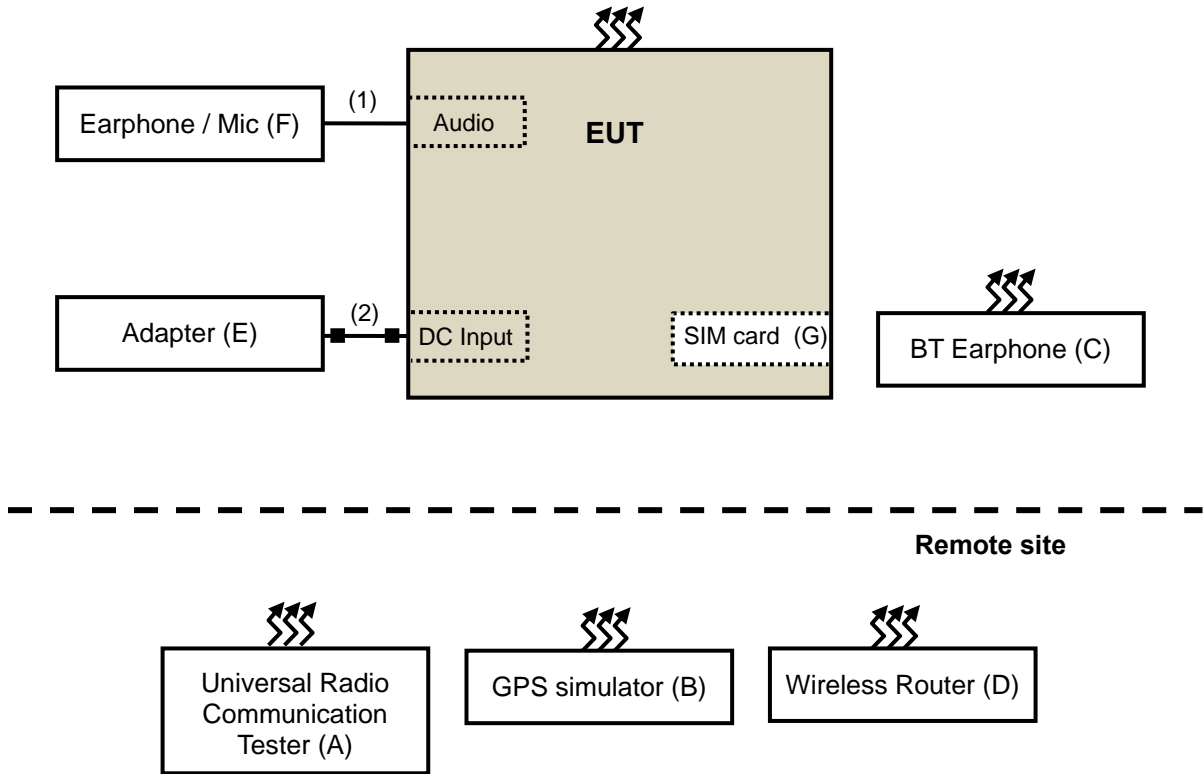
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1.	Earphone cable	1	1.10	N	0	-
2.	Power cable	1	1.05	N	2	Attached on adapter

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

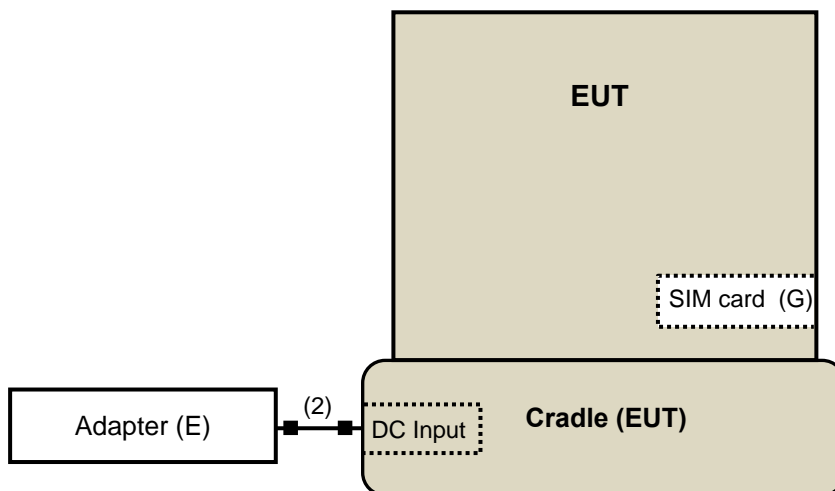


### 3.4 CONFIGURATION OF SYSTEM UNDER TEST

#### TEST MODE A



#### TEST MODE B



## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSIONS MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

**TEST STANDARD:**

**FCC Part 15, Subpart B (section: 15.107)**

**ICES-003:2012 Issue 5 (section: 6.1)**

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	73	60	56	46
5-30	73	60	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 0.50 MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
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 1.
  3. The VCCI Site Registration No. is C-2040.

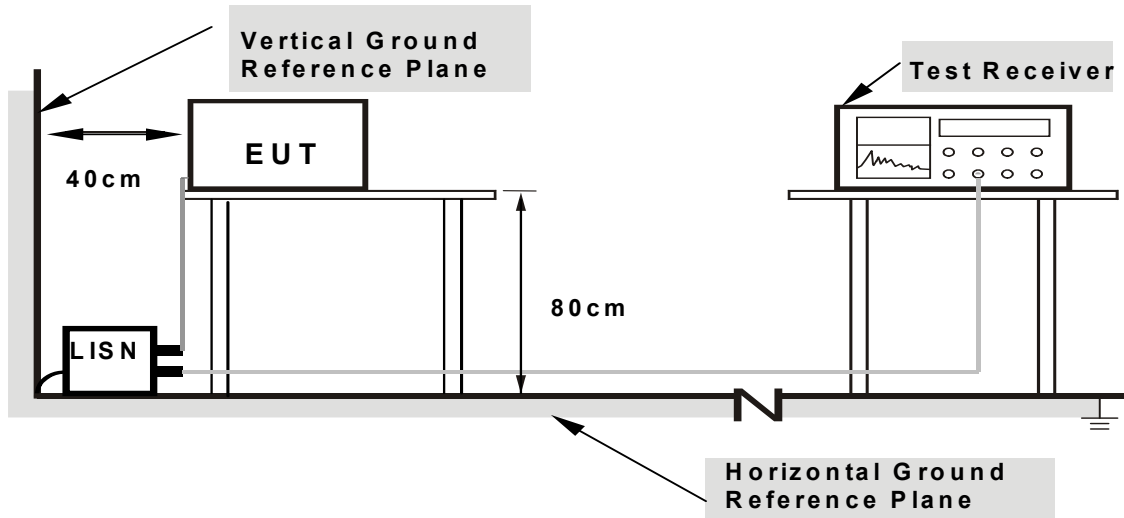
#### 4.1.3 TEST PROCEDURES

- 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 frequency range from 150 kHz to 30 MHz was searched. Emission levels under Limit - 20dB was not recorded.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 TEST SETUP



**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**

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

#### 4.1.6 EUT OPERATING CONDITIONS

##### TEST MODE A

- Placed the EUT on the test table.
- The EUT linked with the Universal Radio Communication Tester, Wireless Router, Bluetooth Earphone and GPS Simulator, which acted as communication partners, and then set the GSM, WIFI and Bluetooth functions in idle condition.
- The EUT played MP4 function and sent audio signals to the earphone.

##### TEST MODE B

- Placed the EUT on the cradle and located it on the test table, the EUT was powered by cradle at charging mode.

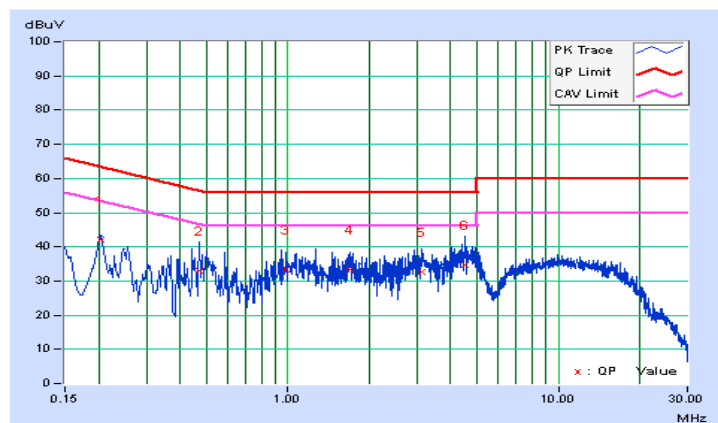
#### 4.1.7 TEST RESULTS

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	18°C, 53%RH
Tested by	Pon Tsai	Test Date	2014/5/6
Test Mode	Mode A		

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	0.20297	0.09	41.84	36.89	41.93	36.98	63.49	53.49	-21.56	-16.51
2	0.47062	0.12	32.76	22.67	32.88	22.79	56.50	46.50	-23.62	-23.71
3	0.98674	0.21	33.18	24.09	33.39	24.30	56.00	46.00	-22.61	-21.70
4	1.69445	0.24	33.25	23.67	33.49	23.91	56.00	46.00	-22.51	-22.09
5	3.12160	0.26	32.33	23.01	32.59	23.27	56.00	46.00	-23.41	-22.73
6	4.49792	0.28	34.26	22.78	34.54	23.06	56.00	46.00	-21.46	-22.94

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

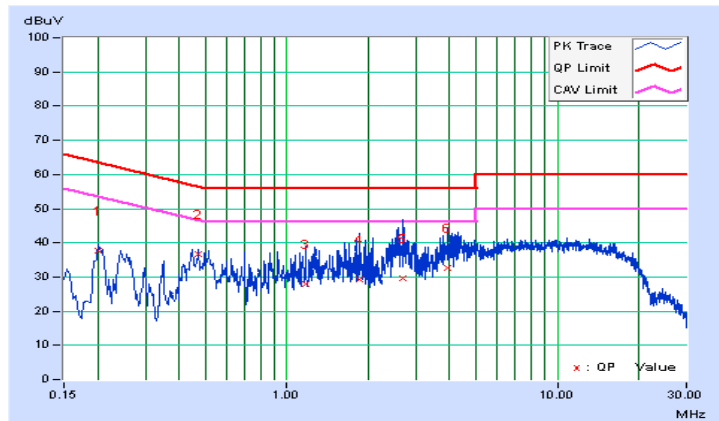


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	18°C, 53%RH
Tested by	Pon Tsai	Test Date	2014/5/6
Test Mode	Mode A		

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	0.20084	0.09	37.70	29.04	37.79	29.13	63.58	53.58	-25.79	-24.45
2	0.47039	0.18	36.50	29.75	36.68	29.93	56.51	46.51	-19.83	-16.58
3	1.17833	0.22	27.89	18.17	28.11	18.39	56.00	46.00	-27.89	-27.61
4	1.85476	0.22	29.12	20.00	29.34	20.22	56.00	46.00	-26.66	-25.78
5	2.66804	0.23	29.30	20.39	29.53	20.62	56.00	46.00	-26.47	-25.38
6	3.94270	0.26	32.52	22.85	32.78	23.11	56.00	46.00	-23.22	-22.89

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

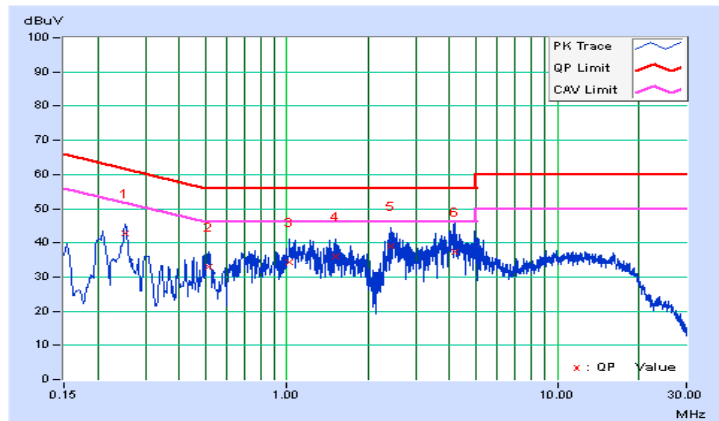


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	18°C, 53%RH
Tested by	Pon Tsai	Test Date	2014/5/6
Test Mode	Mode B		

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	0.25166	0.10	42.54	37.25	42.64	37.35	61.70	51.70	-19.07	-14.36
2	0.51754	0.13	32.86	24.70	32.99	24.83	56.00	46.00	-23.01	-21.17
3	1.02584	0.21	34.11	25.80	34.32	26.01	56.00	46.00	-21.68	-19.99
4	1.51459	0.23	35.76	28.09	35.99	28.32	56.00	46.00	-20.01	-17.68
5	2.42562	0.25	38.93	30.04	39.18	30.29	56.00	46.00	-16.82	-15.71
6	4.17730	0.27	37.10	26.23	37.37	26.50	56.00	46.00	-18.63	-19.50

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

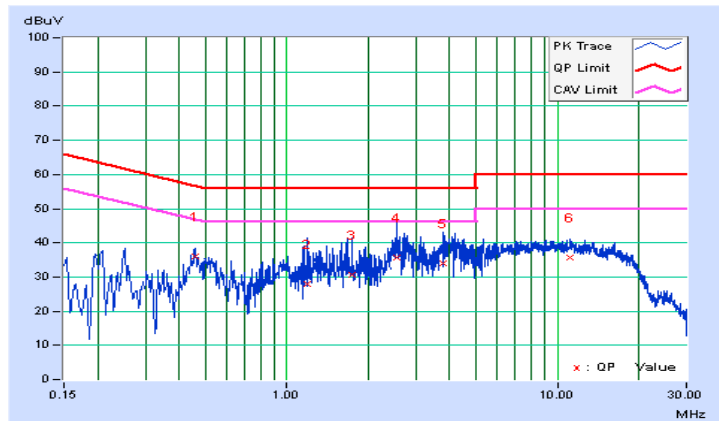


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	18°C, 53%RH
Tested by	Pon Tsai	Test Date	2014/5/6
Test Mode	Mode B		

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	0.45695	0.17	35.77	29.88	35.94	30.05	56.75	46.75	-20.80	-16.69
2	1.19006	0.22	27.66	18.73	27.88	18.95	56.00	46.00	-28.12	-27.05
3	1.74919	0.22	30.45	21.00	30.67	21.22	56.00	46.00	-25.33	-24.78
4	2.55856	0.23	35.51	26.04	35.74	26.27	56.00	46.00	-20.26	-19.73
5	3.79803	0.26	33.88	23.98	34.14	24.24	56.00	46.00	-21.86	-21.76
6	11.12537	0.59	35.08	29.78	35.67	30.37	60.00	50.00	-24.33	-19.63

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





## 4.2 RADIATED EMISSIONS MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSIONS MEASUREMENT

#### TEST STANDARD:

**FCC Part 15, Subpart B (section: 15.109)**

**ICES-003:2012 Issue 5 (section: 6.2)**

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
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	Not defined	Not defined
1000-3000	Avg: 49.5	Avg: 43.5		
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
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960			57.5	47.5
960-1000	60	54	Avg: 56 Peak: 76	Avg: 50 Peak: 70
1000-3000	Avg: 60	Avg: 54		
Above 3000	Peak: 80	Peak: 74	Avg: 60 Peak: 80	Avg: 54 Peak: 74

- NOTE:**
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 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.
  4. QP detector shall be applied if not specified.

Radiated Emissions Limits at 1.5 meter (dB $\mu$ V/m)		
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B
18000-40000	Avg: 66 Peak: 86	Avg: 60 Peak: 80

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

**FREQUENCY RANGE OF RADIATED MEASUREMENT (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 40 GHz, whichever is lower

## 4.2.2 TEST INSTRUMENTS

### Frequency range 30MHz~1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ (V)	ESR-7	101240	Sep. 23, 2013	Sep. 22, 2014
Test Receiver ROHDE & SCHWARZ (H)	ESR-7	101264	Nov. 29, 2013	Nov. 28, 2014
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-148	Feb. 25, 2014	Feb. 24, 2015
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-149	Feb. 25, 2014	Feb. 24, 2015
Preamplifier Agilent (V)	8447D	2944A10636	Oct. 18, 2013	Oct. 17, 2014
Preamplifier Agilent (H)	8447D	2944A10637	Oct. 18, 2013	Oct. 17, 2014
Preamplifier Agilent	8449B	3008A01959	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Woken (V)	8D-FB	Cable-Hych1-01	Oct. 26, 2013	Oct. 25, 2014
RF signal cable Woken (H)	8D-FB	Cable-Hych1-02	Oct. 26, 2013	Oct. 25, 2014
Software BV ADT	BV ADT_Radiated_ V 8.7.07	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 FCC Site Registration No. is 477732.
4. The IC Site Registration No. is IC 7450F-1.
5. The VCCI Site Registration No. is R-1893.

### Frequency range above 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Oct. 24, 2013	Oct. 23, 2014
Spectrum Analyzer Agilent	E4446A	MY44360124	Feb. 12, 2014	Feb. 11, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Feb. 26, 2014	Feb. 25, 2015
RF signal cable Woken	8D-FB	NA	Mar. 21, 2014	Mar. 20, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-404	Jan. 05, 2014	Jan. 04, 2015
Preamplifier Agilent (Below 1GHz)	8447D	2944A10629	Oct. 18, 2013	Oct. 17, 2014
Preamplifier Agilent (Above 1GHz)	8449B	3008A01959	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MWX322+MW X2211308S029 5	Sep. 09, 2013	Sep. 08, 2014
Software BV ADT	BV ADT_Radiated_ V7.6.15.9.4	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
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 09, 2014	Jan. 08, 2015
RF signal cable HUBER+SUHNER	SUCOFLEX 102	38218/2+ 37433/2	Oct. 26, 2013	Oct. 25, 2014
Fix tool for Boresight antenna tower	BAF-01	2	NA	NA
26GHz ~ 40GHz Amplifier	EMC26400	815221	Oct. 18, 2013	Oct. 17, 2014

- 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 FCC Site Registration No. is 686814.
  5. The IC Site Registration No. is IC 7450F-2.
  6. The VCCI Site Registration No. is G-18.

### 4.2.3 TEST PROCEDURES

#### Frequency range 30MHz~1GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 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 1 meter to 4 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 1GHz.

**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-Peak (QP) detection at frequency below 1GHz.

### Frequency range above 1GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For frequency range 1GHz ~ 18GHz, 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. For frequency range 18GHz ~ 40GHz, 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.
- d. The height of antenna can be varied from 1 meter to 4 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.
- e. 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.
- 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 1GHz.

#### NOTE:

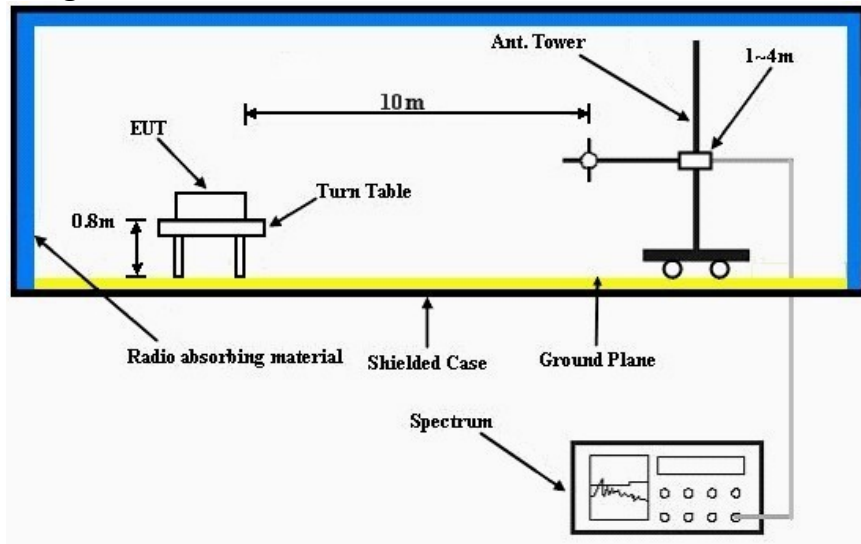
1. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak (PK) detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz for Average (AV) detection at frequency above 1GHz.
2. For measurement of frequency above 1000MHz, the EUT was set 3 meters away from the receiver antenna.

### 4.2.4 DEVIATION FROM TEST STANDARD

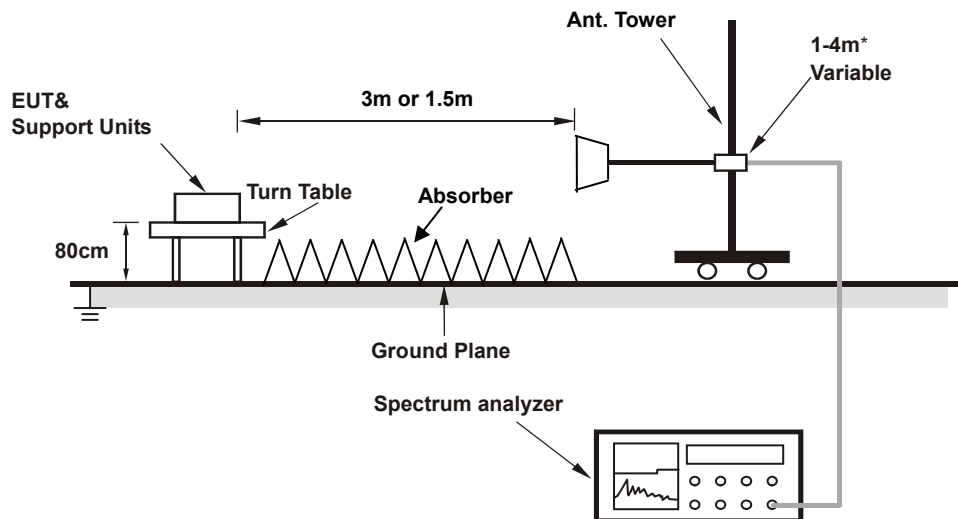
No deviation.

## 4.2.5 TEST SETUP

### Frequency range 30MHz~1GHz



### Frequency range above 1GHz



\* : depends on the EUT height and the antenna 3dB beamwidth both.

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

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

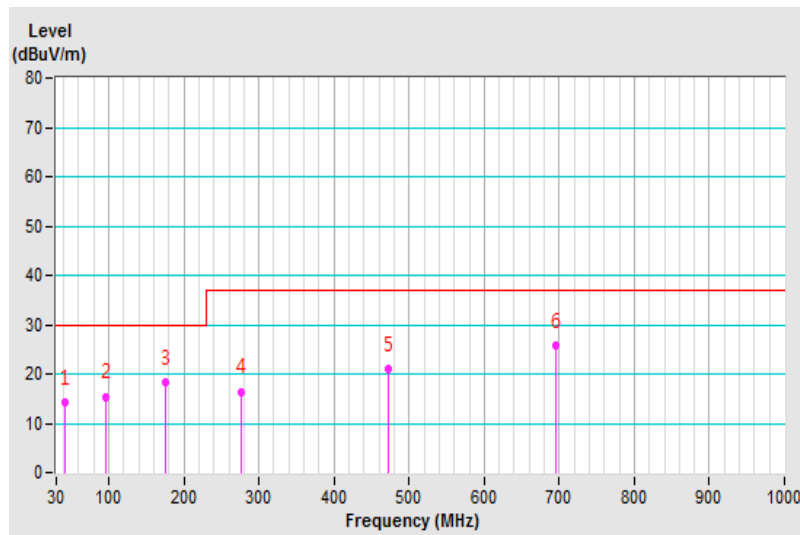
#### 4.2.7 TEST RESULTS

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	21°C, 67%RH
Tested by	Rolan Zheng	Test Date	2014/5/7

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	41.50	14.14 QP	30.00	-15.86	3.50 H	290	29.25	-15.11
2	96.30	15.23 QP	30.00	-14.77	2.00 H	16	34.95	-19.72
3	176.04	18.22 QP	30.00	-11.78	3.00 H	101	33.07	-14.85
4	276.93	16.26 QP	37.00	-20.74	3.50 H	247	29.08	-12.82
5	473.02	20.86 QP	37.00	-16.14	3.50 H	349	28.87	-8.01
6	695.99	25.65 QP	37.00	-11.35	1.00 H	63	29.16	-3.51

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



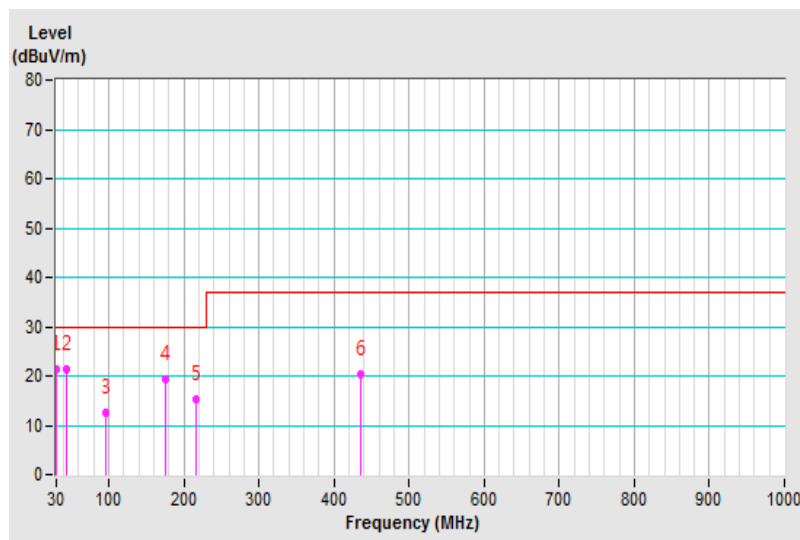


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Input Power	120Vac, 60Hz	Environmental Conditions	21°C, 67%RH
Tested by	Rolan Zheng	Test Date	2014/5/7

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	30.53	21.52 QP	30.00	-8.48	1.50 V	346	37.09	-15.57
2	44.11	21.28 QP	30.00	-8.72	2.50 V	2	35.37	-14.09
3	96.30	12.48 QP	30.00	-17.52	2.00 V	343	31.62	-19.14
4	175.51	19.28 QP	30.00	-10.72	2.50 V	2	33.33	-14.05
5	215.47	15.20 QP	30.00	-14.80	1.00 V	359	31.07	-15.87
6	436.35	20.48 QP	37.00	-16.52	3.00 V	342	28.54	-8.06

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

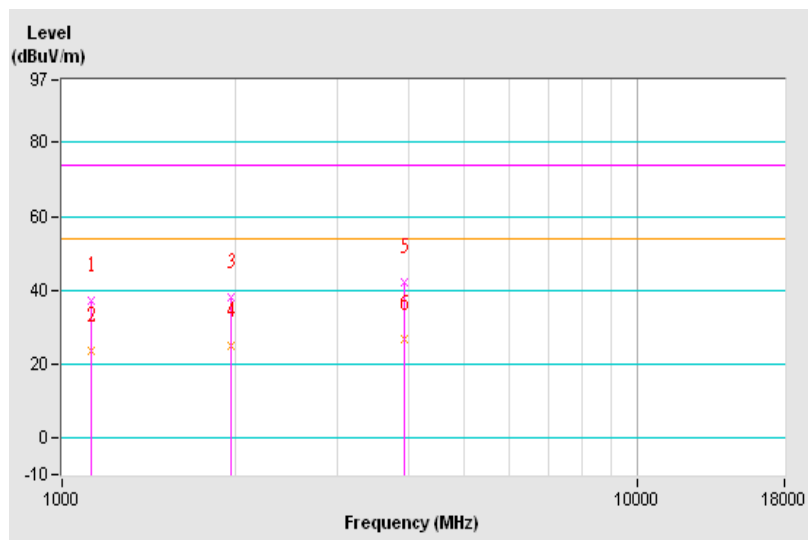


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 65%RH
Tested by	Ben Huang	Test Date	2014/5/8

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	1125.03	37.13 PK	74.00	-36.87	1.00 H	89	45.92	-8.79
2	1125.03	23.62 AV	54.00	-30.38	1.00 H	89	32.41	-8.79
3	1966.40	37.98 PK	74.00	-36.02	1.00 H	0	43.65	-5.67
4	1966.40	25.10 AV	54.00	-28.90	1.00 H	0	30.77	-5.67
5	3941.02	42.26 PK	74.00	-31.74	1.59 H	11	42.16	0.10
6	3941.02	26.95 AV	54.00	-27.05	1.59 H	11	26.85	0.10

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

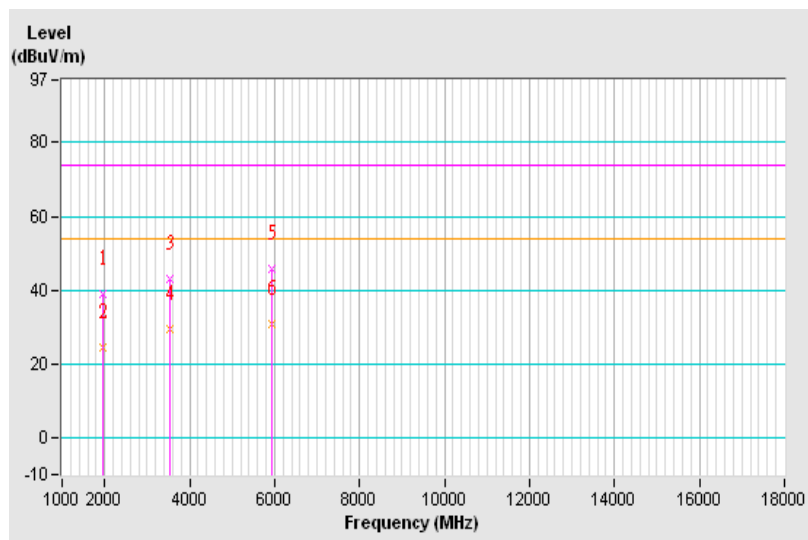


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 65%RH
Tested by	Ben Huang	Test Date	2014/5/8

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	1945.61	39.18 PK	74.00	-34.82	2.03 V	244	44.89	-5.71
2	1945.61	24.51 AV	54.00	-29.49	2.03 V	244	30.22	-5.71
3	3541.02	42.85 PK	74.00	-31.15	1.00 V	12	43.89	-1.04
4	3541.02	29.63 AV	54.00	-24.37	1.00 V	12	30.67	-1.04
5	5933.15	45.92 PK	74.00	-28.08	1.42 V	295	40.71	5.21
6	5933.15	30.64 AV	54.00	-23.36	1.42 V	295	25.43	5.21

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

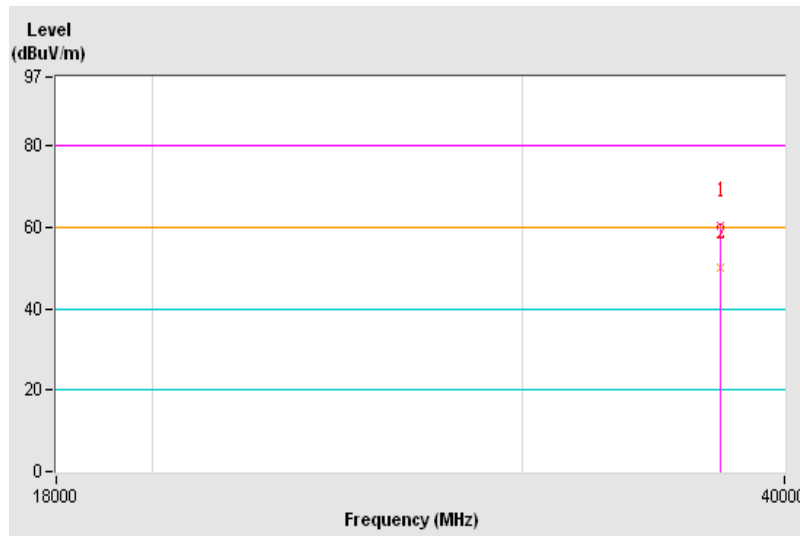


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 65%RH
Tested by	Ben Huang	Test Date	2014/5/8

Antenna Polarity & Test Distance : Horizontal at 1.5 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	37256.37	60.28 PK	80.00	-19.72	1.00 H	54	57.07	3.21
2	37256.37	50.02 AV	60.00	-9.98	1.00 H	54	46.81	3.21

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

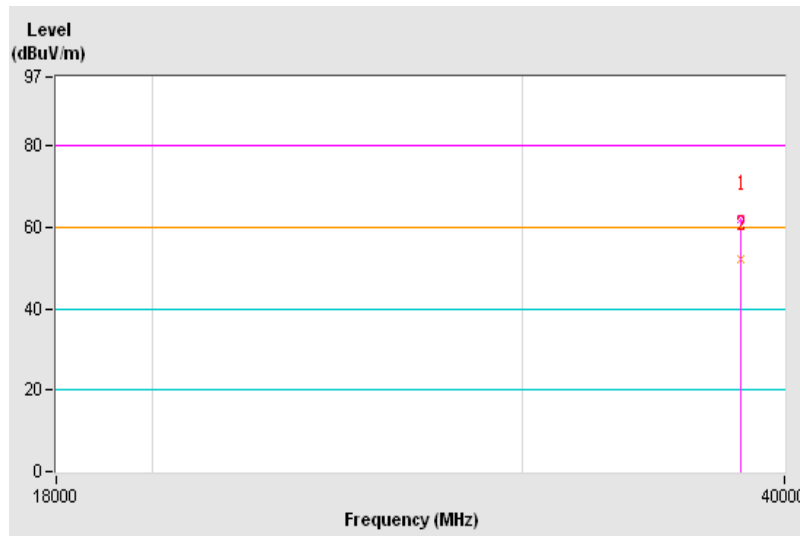


Frequency Range	18GHz ~ 40GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Input Power	120Vac, 60Hz	Environmental Conditions	23°C, 65%RH
Tested by	Ben Huang	Test Date	2014/5/8

Antenna Polarity & Test Distance : Vertical at 1.5 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	38123.64	62.01 PK	80.00	-17.99	1.00 V	221	58.54	3.47
<b>2</b>	<b>38123.64</b>	<b>52.17 AV</b>	<b>60.00</b>	<b>-7.83</b>	<b>1.00 V</b>	<b>221</b>	<b>48.70</b>	<b>3.47</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





## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



## 6 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.

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

## **7 APPENDIX A – MODIFICATION RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications were made to the EUT by the lab during the test.

**--- END ---**