

# FCC TEST REPORT

## (PART 24)

**REPORT NO.:** RF991202C08-4  
**MODEL NO.:** F-07C  
**FCC ID:** VQK-F07C  
**RECEIVED:** Mar. 01, 2011  
**TESTED:** Mar. 15 ~ Mar. 24, 2011  
**ISSUED:** Mar. 30, 2011

**APPLICANT:** FUJITSU LIMITED

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

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Mar. 30, 2011

## 1 CERTIFICATION

**PRODUCT:** Mobile phone  
**MODEL NO.:** F-07C  
**BRAND:** FOMA  
**APPLICANT:** FUJITSU LIMITED  
**TESTED:** Mar. 15 ~ Mar. 24, 2011  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TEST STANDARDS:** **FCC Part 24, Subpart E**  
ANSI C63.4-2003  
**TEST ITEM:** **Maximum Peak Output Power (Section 2.1046 24.232)**  
**Radiated Spurious Emissions (Section 2.1053 24.238)**  
**AC Power Conducted Emission (Section 15.207)**

The above equipment (Model: F-07C) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**. 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 :**   
Andrea Hsia / Specialist , **DATE:** Mar. 30, 2011

**APPROVED BY :**   
Gary Chang / Assistant Manager , **DATE:** Mar. 30, 2011

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
2.1046 24.232	Maximum Peak Output Power Limit: max. 2 watts e.i.r.p peak power	PASS	Meet the requirement of limit. Minimum passing margin is 28.9dBm at 1850.2MHz.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -22.4dB at 5550.60MHz.
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.30dB at 0.431MHz.

### 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	UNCERTAINTY
Conducted Emission	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Mobile phone
<b>MODEL NO.</b>	F-07C
<b>FCC ID</b>	VQK-F07C
<b>POWER SUPPLY</b>	3.7Vdc (Li-ion battery) 5.0Vdc (Adapter)
<b>MODULATION TYPE</b>	GMSK
<b>OPERATING FREQUENCY</b>	1850.2MHz ~ 1909.8MHz
<b>NUMBER OF CHANNEL</b>	299
<b>ANTENNA TYPE</b>	$\lambda/4$ monopole antenna with -1dBi gain
<b>DATA CABLE</b>	1.5m USB cable
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Battery, Adapter, Micphone (Brand: DoCoMo, 0.7m)

**NOTE:**

1. In this report, only included test items of output power, radiated spurious emissions and AC power conducted emissions per client's requests.
2. The EUT is a Mobile phone. The test data are separated into following test reports.

	TEST STANDARD	REFERENCE REPORT
<b>WLAN</b>	FCC Part 15, Subpart C (Section 15.247)	RF991202C08
<b>BLUETOOTH</b>	FCC Part 15, Subpart C (Section 15.247)	RF991202C08-1
<b>RFID</b>	FCC Part 15, Subpart C (Section 15.225, 15.215)	RF991202C08-2
<b>WCDMA 850</b>	FCC Part 22	RF991202C08-3
<b>PCS 1900</b>	FCC Part 24	RF991202C08-4

3. The EUT uses the following Li-ion battery & Adapter:

<b>BATTERY</b>	
<b>BRAND</b>	Fujitsu Limited
<b>MODEL</b>	F20
<b>RATING</b>	3.7Vdc, 1400mAh

<b>ADAPTER</b>	
<b>BRAND</b>	Fujitsu Limited
<b>MODEL</b>	F04
<b>INPUT POWER</b>	100-240Vac
<b>OUTPUT POWER</b>	5Vdc, 1A

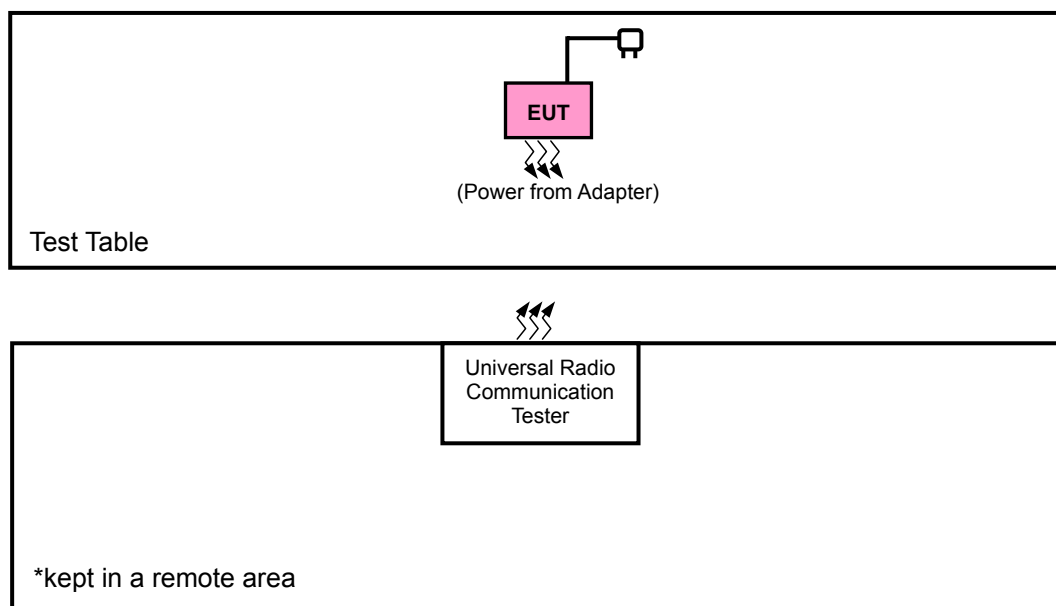
4. IMEI Code: 354128040010440
5. SW: R55.1
6. HW: V 3.0.0.
7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

299 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

	CHANNEL	FREQUENCY	TX MODE
LOW	512	1850.2 MHz	GSM, GPRS
MIDDLE	661	1880.0 MHz	GSM, GPRS
HIGH	810	1909.8 MHz	GSM, GPRS

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	OP	RE<1G	RE≥1G	PLC	
-	√	√	√	√	-

Where **OP**: Output Power Measurement **RE<1G**: Radiated emission below 1GHz  
**RE≥1G**: Radiated emission above 1GHz **PLC**: Power Line Conducted Emission

#### **OUTPUT POWER MEASUREMENT:**

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS	EUT MONITOR
512 to 810	512, 661, 810	GSM, GPRS	X, Y, Z	Open

#### **RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):**

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS	EUT MONITOR
512 to 810	512	GSM, GPRS	X, Y, Z	Open

#### **RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):**

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS	EUT MONITOR
512 to 810	512	GSM	X, Y, Z	Open

#### **POWER LINE CONDUCTED EMISSION TEST:**

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	EUT MONITOR
512 to 810	512	GSM	Open



#### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
OP	25deg. C, 65%RH, 1010hPa	120Vac, 60Hz	Mark Liao
RE $\geq$ 1G	25deg. C, 65%RH, 1010hPa	120Vac, 60Hz	Sun Lin
RE $<$ 1G	25deg. C, 65%RH, 1010hPa	120Vac, 60Hz	Sun Lin
PLC	23deg. C, 63%RH, 1000hPa	120Vac, 60Hz	Brad Wu

### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**  
**FCC 47 CFR Part 24**  
**ANSI C63.4-2003**  
**ANSI/TIA/EIA-603-C 2004**

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

### **3.4 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
1	SIMULATOR	R&S	CMU 200	118914	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).
2. Item 2 was supplied from the client.

## **4 TEST TYPES AND RESULTS**

### **4.1 OUTPUT POWER MEASUREMENT**

#### **4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT**

The radiated peak output power shall be according to the specific rule Part 24.232(b) that “Mobile / Portable station are limited to 2 watts e.i.r.p” and 24.232(c) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100033	Jul. 29, 2010	Jul. 28, 2011
Spectrum Analyzer Agilent	E4446A	MY48250266	Aug. 11, 2010	Aug. 10, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 27, 2010	Apr. 26, 2011
HORN Antenna SCHWARZBECK	9120D	9120D-405	Feb. 08, 2011	Feb. 07, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8447D	2944A10633	Nov. 02, 2010	Nov. 01, 2011
Preamplifier Agilent	8449B	3008A01964	Nov. 02, 2010	Nov. 01, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 14, 2010	May 13, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 14, 2010	May 13, 2011
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA	NA

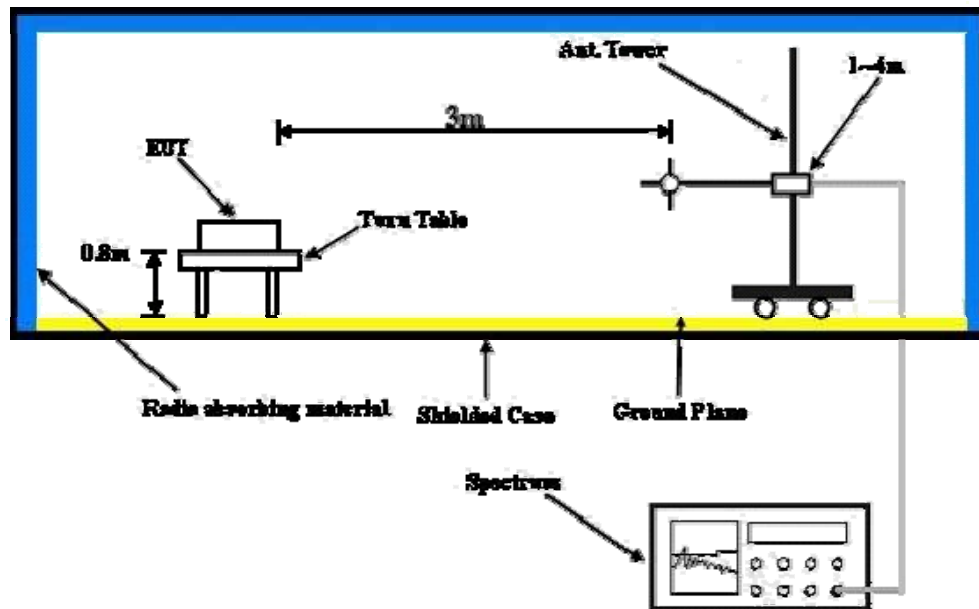
- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 3.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 988962.
  5. The IC Site Registration No. is IC 7450F-3.

#### 4.1.3 TEST PROCEDURES

- a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810 (GSM) (low, middle and high operational frequency range.)
- b. The conducted peak output power used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. The path loss included the splitter loss, cable loss and 20dB pad loss. The spectrum set RB/VB 1MHz (GSM), then read peak power value and record to the test. (All transmitted path loss shall be considered in the test report data.)
- c. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- d. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step c. Record the power level of S.G
- e.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

#### 4.1.4 TEST SETUP

##### EIRP POWER MEASUREMENT:



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

#### 4.1.5 EUT OPERATING CONDITIONS

- The EUT makes a phone call to the communication simulator.
- The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

#### 4.1.6 TEST RESULTS

##### X-AXIS

##### FOR GSM

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	20.1	8.4	28.5	707.9
661	1880.0	19.7	8.6	28.3	676.1
810	1909.8	19.6	8.5	28.1	645.7

##### FOR GPRS-T1

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	20.4	8.4	28.8	758.6
661	1880.0	20.1	8.6	28.7	741.3
810	1909.8	20.0	8.5	28.5	707.9

##### Y-AXIS

##### FOR GSM

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	20.0	8.4	28.4	691.8
661	1880.0	19.4	8.6	28.0	631.0
810	1909.8	18.6	8.5	27.1	512.9

##### FOR GPRS-T1

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	20.5	8.4	28.9	776.2
661	1880.0	19.8	8.6	28.4	691.8
810	1909.8	19.0	8.5	27.5	562.3

**REMARKS:** 1. Peak Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = Substitution Antenna Gain (dBi) + Cable Loss (dB)

**Z-AXIS**  
**FOR GSM**

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	18.0	8.4	26.4	436.5
661	1880.0	17.7	8.6	26.3	426.6
810	1909.8	16.9	8.5	25.4	346.7

**FOR GPRS-T1**

EIRP					
CHANNEL NO.	FREQUENCY (MHz)	S.G VALUE (dBm)	CORRECTION FACTOR (dB)	OUTPUT POWER	
				dBm	mW
512	1850.2	18.5	8.4	26.9	489.8
661	1880.0	18.0	8.6	26.6	457.1
810	1909.8	18.0	8.5	26.5	446.7

**REMARKS:** 1. Peak Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).  
2. Correction Factor (dB) = Substitution Antenna Gain (dBi) + Cable Loss (dB)

## **4.2 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)**

### **4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT**

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The specified minimum attenuation becomes 43dB and the limit of emission equal to  $-13\text{dBm}$ .

### **4.2.2 TEST INSTRUMENTS**

Same as 4.1.2.



#### 4.2.3 TEST PROCEDURES

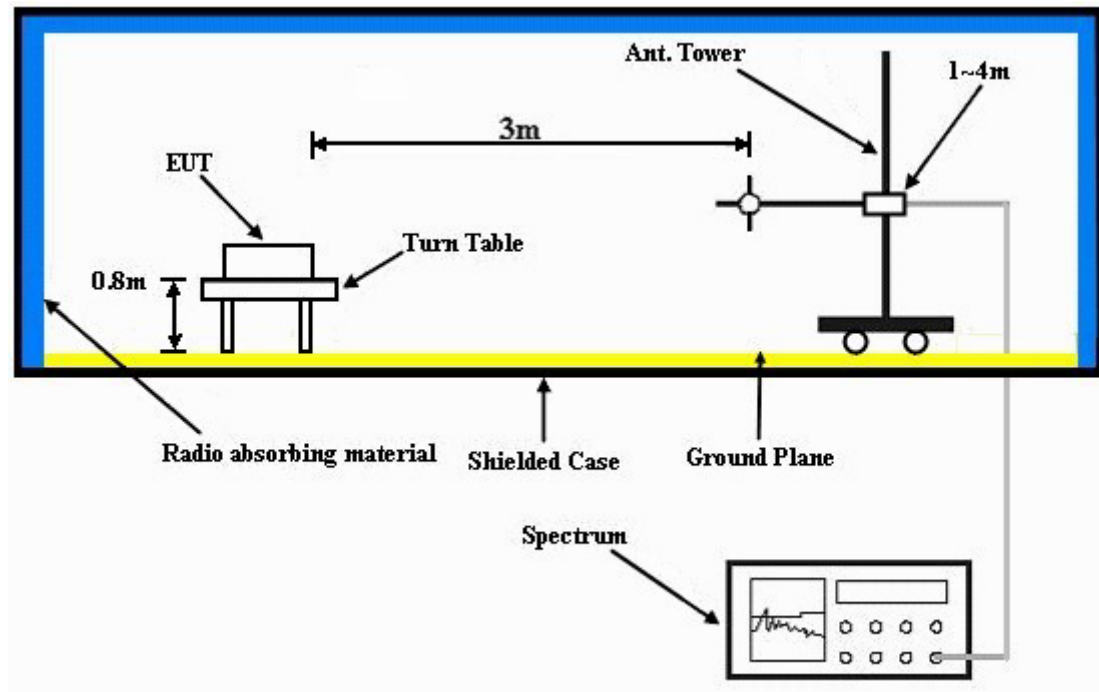
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

- The EUT makes a phone call to the communication simulator.
- The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.

## 4.2.7 TEST RESULTS

### X-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	45.55	43.6	-13.0	-43.3	-7.7	-51.0
2	119.42	52.0	-13.0	-34.6	-7.7	-42.3
3	160.24	41.9	-13.0	-44.7	-7.7	-52.4
4	216.61	38.4	-13.0	-48.8	-7.7	-56.5
5	480.98	33.3	-13.0	-53.3	-7.8	-61.1
6	836.71	36.5	-13.0	-49.7	-7.9	-57.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	45.55	53.8	-13.0	-32.5	-7.7	-40.2
2	64.99	53.0	-13.0	-33.6	-7.7	-41.3
3	117.47	49.8	-13.0	-37.2	-7.7	-44.9
4	162.18	35.3	-13.0	-51.1	-7.7	-58.8
5	339.08	35.6	-13.0	-50.7	-7.8	-58.5
6	836.71	37.7	-13.0	-48.8	-7.9	-56.7

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

## Y-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	45.55	43.5	-13.0	-43.4	-7.7	-51.1
2	119.42	51.8	-13.0	-35.2	-7.7	-42.9
3	158.30	43.4	-13.0	-42.9	-7.7	-50.6
4	210.78	39.5	-13.0	-47.4	-7.7	-55.1
5	436.27	39.0	-13.0	-47.7	-7.8	-55.5
6	871.70	36.3	-13.0	-49.6	-7.9	-57.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	45.55	53.6	-13.0	-33.4	-7.7	-41.1
2	64.99	52.6	-13.0	-34.2	-7.7	-41.9
3	115.53	50.3	-13.0	-36.2	-7.7	-43.9
4	160.24	36.3	-13.0	-50.8	-7.7	-58.5
5	203.01	34.4	-13.0	-53.0	-7.7	-60.7
6	939.74	37.6	-13.0	-48.7	-7.9	-56.6

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

## Z-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	43.61	43.4	-13.0	-43.6	-7.7	-51.3
2	66.93	42.3	-13.0	-44.0	-7.7	-51.7
3	117.47	52.0	-13.0	-35.1	-7.7	-42.8
4	210.78	40.5	-13.0	-46.3	-7.7	-54.0
5	749.24	34.6	-13.0	-52.2	-7.9	-60.1
6	914.47	37.1	-13.0	-49.8	-7.9	-57.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	45.55	54.3	-13.0	-32.2	-7.7	-39.9
2	64.99	52.7	-13.0	-34.4	-7.7	-42.1
3	119.42	50.9	-13.0	-35.8	-7.7	-43.5
4	243.83	46.9	-13.0	-40.0	-7.7	-47.7
5	325.47	34.6	-13.0	-51.9	-7.8	-59.7
6	906.69	37.3	-13.0	-49.0	-7.9	-56.9

**NOTE:** Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

### **4.3 RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)**

#### **4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT**

Same as 4.2.1.

#### **4.3.2 TEST INSTRUMENTS**

Same as 4.2.2.

#### **4.3.3 TEST PROCEDURES**

Same as 4.2.3.

#### **4.3.4 DEVIATION FROM TEST STANDARD**

No deviation

#### **4.3.5 TEST SETUP**

Same as 4.2.5.

#### **4.3.6 EUT OPERATING CONDITIONS**

Same as 4.2.6.

#### 4.3.7 TEST RESULTS

##### X-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	51.1	-13.0	-53.0	9.9	-43.1
2	5550.6	54.0	-13.0	-50.1	9.7	-40.4
3	7400.8	54.8	-13.0	-47.3	7.9	-39.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	52.9	-13.0	-51.2	9.9	-41.3
2	5550.6	56.1	-13.0	-48.0	9.7	-38.3
3	7400.8	54.5	-13.0	-47.6	7.9	-39.7
MODE		TX channel 661				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	52.0	-13.0	-53.6	9.9	-43.7
2	5640	51.7	-13.0	-53.5	9.6	-43.9
3	7520	54.5	-13.0	-49.2	7.9	-41.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	54.7	-13.0	-50.9	9.9	-41.0
2	5640	56.1	-13.0	-49.1	9.6	-39.5
3	7520	55.0	-13.0	-48.7	7.9	-40.8
MODE		TX channel 810				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	52.8	-13.0	-52.9	9.9	-43.0
2	5729.4	54.1	-13.0	-51.3	9.6	-41.7
3	7639.2	53.3	-13.0	-50.5	7.9	-42.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	55.0	-13.0	-50.7	9.9	-40.8
2	5729.4	55.4	-13.0	-50.0	9.6	-40.4
3	7639.2	54.0	-13.0	-49.8	7.9	-41.9

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

## Y-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	52.5	-13.0	-53.1	9.9	-43.2
2	5550.6	60.2	-13.0	-45.1	9.7	-35.4
3	7400.8	53.3	-13.0	-50.4	7.9	-42.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	51.4	-13.0	-54.2	9.9	-44.3
2	5550.6	60.0	-13.0	-45.3	9.7	-35.6
3	7400.8	54.4	-13.0	-49.3	7.9	-41.4
MODE		TX channel 661				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	52.0	-13.0	-53.6	9.9	-43.7
2	5640	60.1	-13.0	-45.1	9.6	-35.5
3	7520	54.9	-13.0	-48.8	7.9	-40.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	50.5	-13.0	-55.1	9.9	-45.2
2	5640	59.9	-13.0	-45.3	9.6	-35.7
3	7520	54.2	-13.0	-49.5	7.9	-41.6
MODE		TX channel 810				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	49.9	-13.0	-55.8	9.9	-45.9
2	5729.4	53.5	-13.0	-51.9	9.6	-42.3
3	7639.2	53.4	-13.0	-50.4	7.9	-42.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	54.3	-13.0	-51.4	9.9	-41.5
2	5729.4	58.9	-13.0	-46.5	9.6	-36.9
3	7639.2	54.9	-13.0	-48.9	7.9	-41.0

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).



## Z-AXIS

MODE		TX channel 512				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	52.1	-13.0	-53.5	9.9	-43.6
2	5550.6	56.0	-13.0	-49.3	9.7	-39.6
3	7400.8	54.5	-13.0	-49.2	7.9	-41.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3700.4	51.5	-13.0	-54.1	9.9	-44.2
2	5550.6	51.8	-13.0	-53.5	9.7	-43.8
3	7400.8	54.3	-13.0	-49.4	7.9	-41.5
MODE		TX channel 661				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	52.8	-13.0	-52.8	9.9	-42.9
2	5640	53.0	-13.0	-52.2	9.6	-42.6
3	7520	54.5	-13.0	-49.2	7.9	-41.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3760	52.6	-13.0	-53.0	9.9	-43.1
2	5640	52.6	-13.0	-52.6	9.6	-43.0
3	7520	54.8	-13.0	-48.9	7.9	-41.0
MODE		TX channel 810				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	53.7	-13.0	-52.0	9.9	-42.1
2	5729.4	56.3	-13.0	-49.1	9.6	-39.5
3	7639.2	54.8	-13.0	-49.0	7.9	-41.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV)	Limit (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	Power Value (dBm)
1	3819.6	53.3	-13.0	-52.4	9.9	-42.5
2	5729.4	52.8	-13.0	-52.6	9.6	-43.0
3	7639.2	54.7	-13.0	-49.1	7.9	-41.2

**NOTE:** Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

## 4.4 CONDUCTED EMISSION MEASUREMENT

### 4.4.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	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.

### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 23, 2010	Nov. 22, 2011
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 06, 2011	Jan. 05, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 08, 2010	Jul. 07, 2011
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jul. 12, 2010	Jul. 11, 2011
LISN ROHDE & SCHWARZ	ENV216	100072	Jun. 11, 2010	Jun. 10, 2011
Software ADT	ADT_Conc_ V7.3.7	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.

#### 4.4.3 TEST PROCEDURES

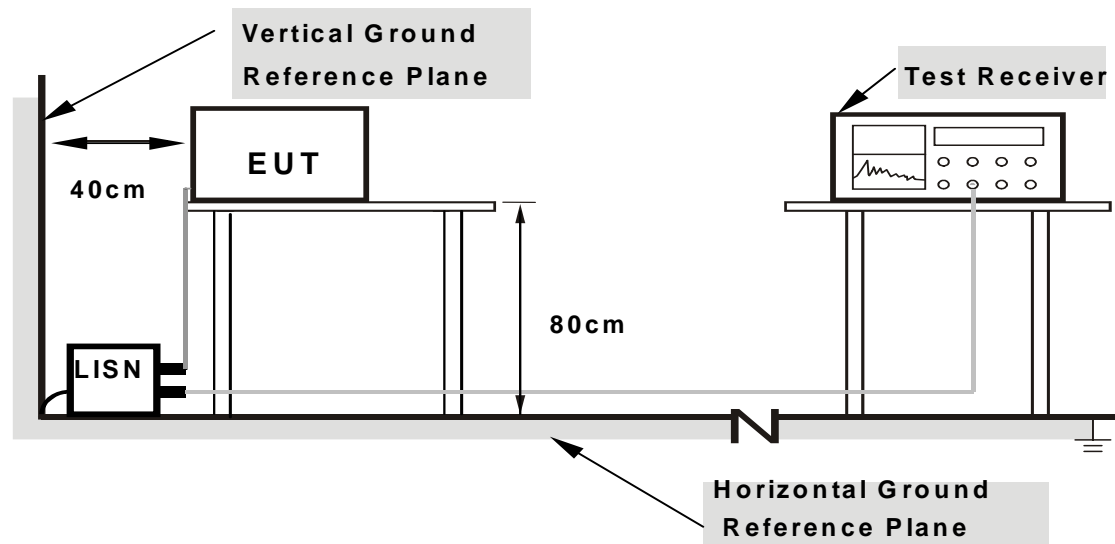
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.5 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 from other units and other metal planes

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

#### 4.4.6 EUT OPERATING CONDITIONS

Set the EUT under transmitting condition.

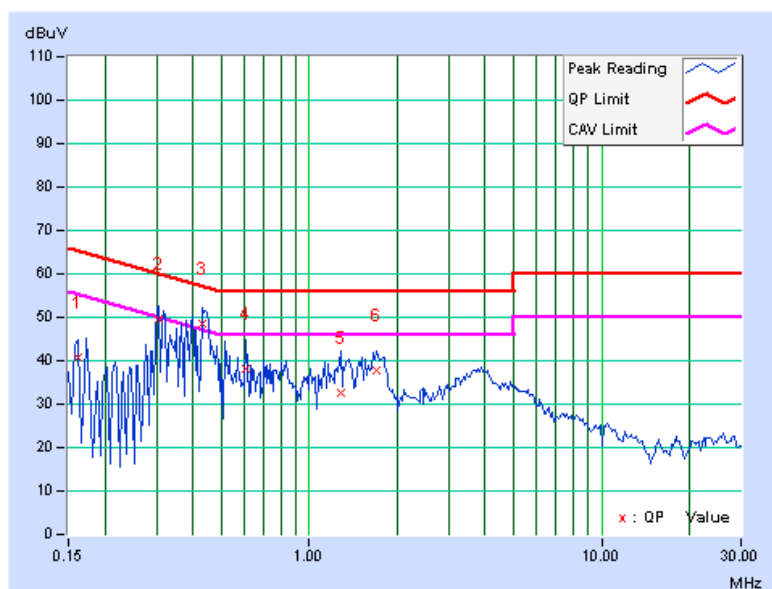
#### 4.4.7 TEST RESULTS

##### CONDUCTED WORST CASE DATA:

PHASE	Line 1	6dB BANDWIDTH	9kHz
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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	0.162	0.14	40.73	-	40.87	-	65.38	55.38	-24.50	-
2	0.306	0.15	49.43	-	49.58	-	60.07	50.07	-10.50	-
3	<b>0.431</b>	<b>0.15</b>	<b>48.37</b>	<b>40.78</b>	<b>48.52</b>	<b>40.93</b>	<b>57.23</b>	<b>47.23</b>	<b>-8.71</b>	<b>-6.30</b>
4	0.607	0.16	37.88	-	38.04	-	56.00	46.00	-17.96	-
5	1.277	0.20	32.34	-	32.54	-	56.00	46.00	-23.46	-
6	1.699	0.21	37.51	-	37.72	-	56.00	46.00	-18.28	-

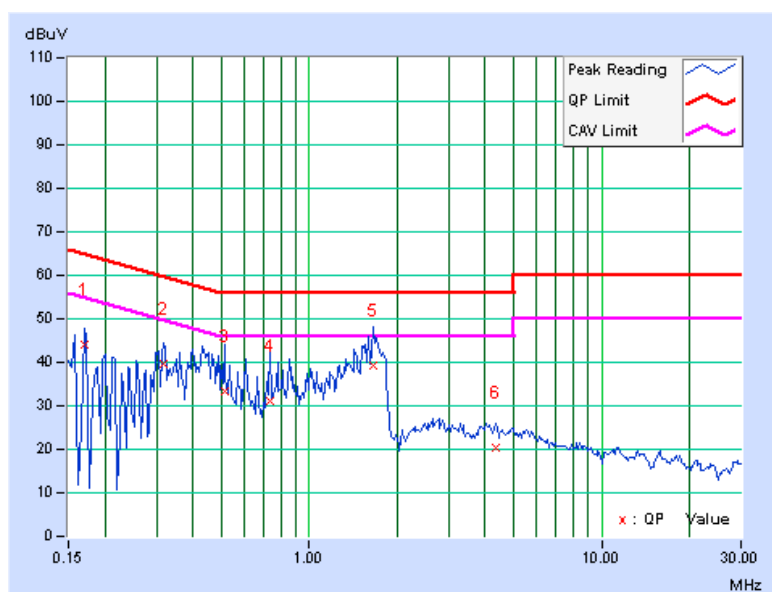
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.13	44.07	-	44.20	-	64.98	54.98	-20.79	-
2	0.318	0.14	39.47	-	39.61	-	59.76	49.76	-20.15	-
3	0.513	0.15	33.28	-	33.43	-	56.00	46.00	-22.57	-
4	0.736	0.16	31.02	-	31.18	-	56.00	46.00	-24.82	-
5	1.664	0.20	39.04	-	39.24	-	56.00	46.00	-16.76	-
6	4.336	0.35	20.11	-	20.46	-	56.00	46.00	-35.54	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading 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.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5.phtml](http://www.adt.com.tw/index.5.phtml).  
If you have any comments, please feel free to contact us at the following:

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**Hwa Ya EMC/RF/Safety/Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

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

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



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

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

**---END---**