

# FCC CERTIFICATION TEST REPORT

**REPORT NO.:** FD110905C34

MODEL NO.: F-05D

**RECEIVED:** Sep. 05, 2011

**TESTED:** Sep. 22 ~ Oct. 06, 2011

**ISSUED:** Oct. 13, 2011

**APPLICANT:** FUJITSU LIMITED

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)

Ltd., Taoyuan Branch

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Taipei City, Taiwan (R.O.C)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei

Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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# **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Oct. 13, 2011



# 1. CERTIFICATION

**PRODUCT:** Mobile Phone

MODEL: F-05D

**BRAND**: Xi

**APPLICANT: FUJITSU LIMITED** 

**TEST SAMPLE:** ENGINEERING SAMPLE

**TESTED:** Sep. 22 ~ Oct. 06, 2011

STANDARDS: FCC Part 15, Subpart B, Class B

ANSI C63.4-2003

The above equipment (model: F-05D) 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 : Oct. 13, 2011

Joanna Wang / Senior Specialist

APPROVED BY : Oct. 13, 2011

Gary Chang / Technical Manager



# 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Standard Section	Test Type	Result	Remark
FCC Part 15, Subpart B,	Conducted Emission		Meet the requirement of limit. Minimum passing margin is -8.22dB at 0.545MHz.
Class B	Radiated Emission		Meet the requirement of limit. Minimum passing margin is -3.0dB at 148.50MHz.

#### 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 emissions	150kHz~30MHz	2.44dB
Dadiated emissions	30MHz ~ 200MHz	3.34dB
	200MHz ~1000MHz	3.35dB
Radiated emissions	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

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

EUT	Mobile Phone		
MODEL NO.	F-05D		
POWER SUPPLY	3.7Vdc (Li-ion battery) 5.4Vdc (Adapter)		
	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM	
MODUL ATION TYPE	BLUETOOTH	GFSK, $\pi$ /4-DQPSK, 8DPSK	
MODULATION TYPE	RFID	ASK	
	GSM, GPRS	GMSK	
	WCDMA	BPSK	
	WLAN	2412 ~ 2462MHz	
	BLUETOOTH	2402 ~ 2480MHz	
FREQUENCY RANGE	RFID	13.56MHz	
TREGOLITOT RANGE	WCDMA 850	826.4MHz ~ 846.6MHz	
	GSM 1900, GPRS 1900	1850.2MHz ~ 1909.8MHz	
	WLAN	λ/4 Monopole Antenna with -2.7dBi gain	
	BLUETOOTH	λ/4 Monopole Antenna with -2.7dBi gain	
ANTENNA TYPE	RFID	Loop antenna	
ANTENNATITE	WCDMA 850	λ/4 Monopole antenna with -2.6dBi gain	
	GSM 1900, GPRS 1900	λ/4 Monopole antenna with -1.1dBi gain	
DATA CABLE	NA		
I/O PORTS	Refer to user's manual		
ACCESSORY DEVICES	Battery		

# NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX

2. The EUT use the following internal Li-ion battery:

BRAND	Fujitsu Limited
MODEL	F24
RATING	3.7Vdc, 1400mAh, 5.2Wh



3. The following accessories are for support units only.

PRODUCT	BRAND	DESCRIPTION
Adapter SMK		I/P: 100-240Vac, 50-60Hz, 0.12A
Auaptei	SIVIK	O/P: 5.4Vdc, 700mA
USB cable	NA	0.8m non-shielded cable without core
HDMI cable	NA	1.5m shielded cable without core

4. SW: R20.3.5. HW: V2.0.0.

6. IMEI Code: 357944040010934, 357944040017038 and 357944040017525.

7. The above EUT information was 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

Test modes are presented in the report as below.

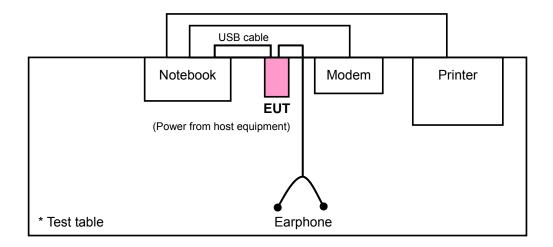
TEST MODE	DESCRIPTION		
А	USB R/W + Idle mode: WiFi/ BT/ WCDMA 850		
В	USB R/W + Idle mode: WiFi/ BT/ GSM 1900		
С	HDMI + Idle mode: WiFi/ BT/ WCDMA 850		
D	HDMI + Idle mode: WiFi/ BT/ GSM 1900		

<sup>\*</sup>For radiated emission test, the EUT has been pre-tested X, Y & Z axis, found X axis is the worst mode.

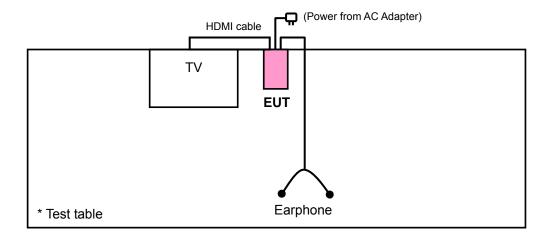


# 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

# **TEST MODE A & B**



# **TEST MODE C & D**





# 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
1	NOTEBOOK	HP	NC6000	CNU4110Y3V	FCC DoC Approved
2	MODEM	ACEEX	1414V/3	0401008270	IFAXDM1414
3	PRINTER	EPSON	LQ-300+	DCGY054146	FCC DoC Approved
4	TV	SANYO	SMT-32KE5	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS		
1	0.8m USB cable.		
2	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.		
3	1.8m braid shielded wire, DB25 connector, w/o core.		
4	1.5m HDMI cable.		

#### NOTE:

- 1. All power cords of the above support units are non shielded (1.8m).
- 2. The USB cable & HDMI cable were supplied from the client.

# 3.4 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 Part 15, Subpart B, Class B ANSI C63.4-2003

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



# 4. TEST TYPES AND RESULTS

#### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.109 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

#### NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. 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.



# 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 02, 2011	Aug. 01, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP 40	100041	Jul. 21, 2011	Jul. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 13, 2011	Apr. 12, 2012
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2011	Aug. 24, 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	295014/4	Aug. 19, 2011	Aug. 18, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	Aug. 19, 2011	Aug. 18, 2012
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 EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### NOTE:

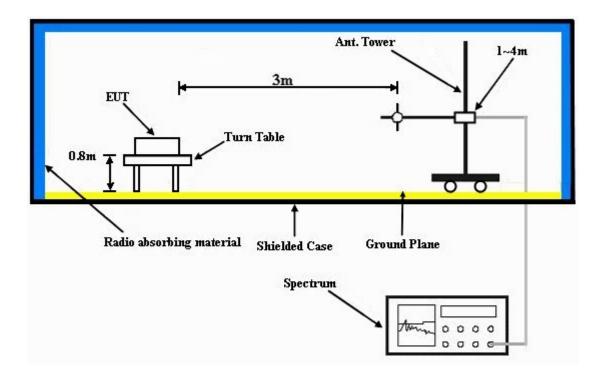
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.1.5 TEST SETUP



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

# 4.1.6 EUT OPERATING CONDITIONS

#### **TEST MODE A & B**

- a. Connected the EUT to a notebook and placed on a testing table.
- b. Set WiFi/ Bluetooth/ WWAN in idle mode.
- c. The notebook executes EMC TEST tool to read data and write data to microSD of EUT via USB cable.
- d. The necessary accessories enable the system in full functions.

#### **TEST MODE C & D**

- a. Connected the EUT to a notebook and placed on a testing table.
- b. Set WiFi/ Bluetooth/ WWAN in idle mode.
- c. EUT send video stream to TV via HDMI cable.
- d. The necessary accessories enable the system in full functions.



# 4.1.7 TEST RESULTS

# **ABOVE 1GHz WORST-CASE DATA:**

<b>EUT TEST CONDITION</b>		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60 Hz		FREQUENCY RANGE	1 ~ 12.5GHz	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	DETECTOR FUNCTION	Peak (PK) Average (AV)	
TESTED BY	Antony Lee	TEST MODE	Α	

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2082.12	43.8 PK	74.0	-30.2	1.00 H	103	12.30	31.50
2	2082.12	33.2 AV	54.0	-20.8	1.00 H	103	1.70	31.50
3	2630.85	44.5 PK	74.0	-29.5	1.00 H	251	10.90	33.60
4	2630.85	30.7 AV	54.0	-23.3	1.00 H	251	-2.90	33.60
5	2974.56	43.6 PK	74.0	-30.4	1.17 H	293	8.90	34.70
6	2974.56	30.9 AV	54.0	-23.1	1.17 H	293	-3.80	34.70
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1636.00	44.9 PK	74.0	-29.1	1.47 V	63	14.80	30.10
2	1636.00	39.4 AV	54.0	-14.6	1.47 V	63	9.30	30.10
3	2380.00	44.6 PK	74.0	-29.4	1.05 V	172	12.00	32.60
4	2380.00	32.4 AV	54.0	-21.6	1.05 V	172	-0.20	32.60
5	2974.61	46.7 PK	74.0	-27.3	1.00 V	79	12.00	34.70
6	2974.61	34.0 AV	54.0	-20.0	1.00 V	79	-0.70	34.70

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60 Hz		FREQUENCY RANGE	1 ~ 12.5GHz	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	DETECTOR FUNCTION	Peak (PK) Average (AV)	
TESTED BY	Antony Lee	TEST MODE	В	

		ANTENNA I	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2081.96	44.2 PK	74.0	-29.8	1.00 V	105	12.70	31.50
2	2081.96	34.7 AV	54.0	-19.3	1.00 V	105	3.20	31.50
3	2631.10	45.2 PK	74.0	-28.8	1.00 V	255	11.60	33.60
4	2631.10	31.3 AV	54.0	-22.7	1.00 V	255	-2.30	33.60
5	2975.10	44.3 PK	74.0	-29.7	1.15 V	295	9.60	34.70
6	2975.10	31.6 AV	54.0	-22.4	1.15 V	295	-3.10	34.70
		ANTENNA	A POLARIT	Y & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1635.80	46.2 PK	74.0	-27.8	1.44 V	58	16.10	30.10
2	1635.80	40.2 AV	54.0	-13.8	1.44 V	58	10.10	30.10
3	2381.60	44.3 PK	74.0	-29.7	1.02 V	177	11.70	32.60
4	2381.60	32.0 AV	54.0	-22.0	1.02 V	177	-0.60	32.60
							1	
5	2974.30	46.8 PK	74.0	-27.2	1.00 V	83	12.10	34.70

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60 Hz		FREQUENCY RANGE	1 ~ 12.5GHz	
ENVIRONMENTAL CONDITIONS	ENVIRONMENTAL 25deg C 65%RH		Peak (PK) Average (AV)	
TESTED BY	Antony Lee	TEST MODE	С	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	1115.40	38.3 PK	74.0	-35.7	1.00 H	156	10.70	27.60	
2	1115.40	29.5 AV	54.0	-24.5	1.00 H	156	1.90	27.60	
3	3627.00	44.4 PK	74.0	-29.6	1.00 H	176	10.50	33.90	
4	3627.00	32.1 AV	54.0	-21.9	1.00 H	176	-1.80	33.90	
5	6624.00	48.0 PK	74.0	-26.0	1.10 H	231	7.00	41.00	
6	6624.00	34.2 AV	54.0	-19.8	1.10 H	231	-6.80	41.00	
		ANTENNA	POLARIT	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M		
NO.	FREQ. (MHz)	EMISSION	LIMIT			TABLE	RAW VALUE	CORRECTION	
	Titled: (IIII12)	LEVEL (dBuV/m)	(dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	ANGLE (Degree)	(dBuV)	FACTOR (dB/m)	
1	1115.40			-36.8	7				
1 2	, ,	(dBuV/m)	(dBuV/m)	,	HEIGHT (m)	(Degree)	(dBuV)	(dB/m)	
•	1115.40	(dBuV/m) 37.2 PK	(dBuV/m) 74.0	-36.8	<b>HEIGHT (m)</b>	<b>(Degree)</b> 76	( <b>dBuV</b> )	(dB/m) 27.60	
2	1115.40 1115.40	(dBuV/m) 37.2 PK 28.3 AV	(dBuV/m) 74.0 54.0	-36.8 -25.7	1.00 V 1.00 V	( <b>Degree</b> ) 76 76	(dBuV) 9.60 0.70	(dB/m) 27.60 27.60	
2	1115.40 1115.40 3627.00	(dBuV/m) 37.2 PK 28.3 AV 43.1 PK	(dBuV/m)  74.0  54.0  74.0	-36.8 -25.7 -30.9	1.00 V 1.00 V 1.00 V	( <b>Degree</b> )  76  76  287	9.60 0.70 9.20	(dB/m) 27.60 27.60 33.90	

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60 Hz		FREQUENCY RANGE	1 ~ 12.5GHz	
ENVIRONMENTAL CONDITIONS	ENVIRONMENTAL 25deg C 65%RH		Peak (PK) Average (AV)	
TESTED BY	Antony Lee	TEST MODE	D	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	1115.40	38.6 PK	74.0	-35.4	1.00 H	143	11.00	27.60	
2	1115.40	29.8 AV	54.0	-24.2	1.00 H	143	2.20	27.60	
3	3627.00	44.7 PK	74.0	-29.3	1.00 H	221	10.80	33.90	
4	3627.00	32.4 AV	54.0	-21.6	1.00 H	221	-1.50	33.90	
5	6624.00	48.3 PK	74.0	-25.7	1.10 H	167	7.30	41.00	
6	6624.00	34.6 AV	54.0	-19.4	1.10 H	167	-6.40	41.00	
		ANTENNA	POLARIT	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M		
NO.	FREQ. (MHz)	EMISSION	LIMIT			TABLE	RAW VALUE	CORRECTION	
	TILES. (WITZ)	LEVEL (dBuV/m)	(dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	ANGLE (Degree)	(dBuV)	FACTOR (dB/m)	
1	1115.40			MARGIN (dB) -36.9	7				
1 2	, ,	(dBuV/m)	(dBuV/m)	,	HEIGHT (m)	(Degree)	(dBuV)	(dB/m)	
-	1115.40	(dBuV/m) 37.1 PK	(dBuV/m) 74.0	-36.9	<b>HEIGHT (m)</b>	(Degree) 241	(dBuV) 9.50	(dB/m) 27.60	
2	1115.40 1115.40	(dBuV/m) 37.1 PK 28.6 AV	(dBuV/m) 74.0 54.0	-36.9 -25.4	1.00 V 1.00 V	(Degree) 241 241	(dBuV) 9.50 1.00	(dB/m) 27.60 27.60	
2	1115.40 1115.40 3627.00	(dBuV/m) 37.1 PK 28.6 AV 43.5 PK	(dBuV/m)  74.0  54.0  74.0	-36.9 -25.4 -30.5	1.00 V 1.00 V 1.00 V	(Degree)  241  241  136	9.50 1.00 9.60	(dB/m) 27.60 27.60 33.90	

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



#### **BELOW 1GHz WORST-CASE DATA:**

EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60Hz		FREQUENCY RANGE	Below 1000MHz	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	DETECTOR FUNCTION	Quasi-Peak	
TESTED BY	David Huang	TEST MODE	Α	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	162.11	31.1 QP	43.5	-12.4	1.50 H	61	16.60	14.50	
2	249.60	39.7 QP	46.0	-6.3	1.00 H	184	26.70	13.00	
3	335.15	34.6 QP	46.0	-11.4	1.00 H	175	18.80	15.80	
4	479.03	32.3 QP	46.0	-13.7	2.00 H	274	12.70	19.60	
5	650.13	29.0 QP	46.0	-17.0	1.50 H	316	5.70	23.30	
6	753.18	28.3 QP	46.0	-17.7	1.00 H	10	3.60	24.70	
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M		
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)	
1	193.22	29.6 QP	43.5	-13.9	1.00 V	97	18.50	11.10	
2	247.66	29.6 QP	46.0	-16.4	1.00 V	28	16.70	12.90	
3	335.15	25.0 QP	46.0	-21.0	2.00 V	211	9.20	15.80	
4	479.03	32.9 QP	46.0	-13.1	2.00 V	283	13.30	19.60	
5	574.30	27.1 QP	46.0	-18.9	1.00 V	73	5.30	21.80	
6	648.18	30.4 QP	46.0	-15.6	1.00 V	10	7.10	23.30	

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM) 120Vac, 60Hz		FREQUENCY RANGE	Below 1000MHz	
ENVIRONMENTAL CONDITIONS	ENVIRONMENTAL 25deg C 65%RH		Quasi-Peak	
TESTED BY	David Huang	TEST MODE	В	

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	247.66	40.1 QP	46.0	-5.9	1.00 H	121	27.20	12.90
2	335.15	33.9 QP	46.0	-12.1	1.00 H	136	18.10	15.80
3	480.97	29.1 QP	46.0	-16.9	1.00 H	196	9.40	19.70
4	500.42	29.9 QP	46.0	-16.1	2.00 H	157	9.70	20.20
5	650.13	31.5 QP	46.0	-14.5	1.00 H	97	8.20	23.30
6	751.23	29.4 QP	46.0	-16.6	1.00 H	16	4.70	24.70
		ANTENNA	POLARIT	Y & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.68	29.1 QP	40.0	-10.9	2.00 V	109	15.60	13.50
2	181.55	29.2 QP	43.5	-14.3	1.00 V	10	16.80	12.40
3	247.66	30.0 QP	46.0	-16.0	1.00 V	25	17.10	12.90
4	335.15	24.7 QP	46.0	-21.3	2.00 V	193	8.90	15.80
5	432.37	27.4 QP	46.0	-18.6	1.00 V	10	9.10	18.30
_	479.03	34.2 QP	46.0	-11.8	1.00 V	10	14.60	19.60

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

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- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM)	120Vac, 60Hz	FREQUENCY RANGE	Below 1000MHz	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	DETECTOR FUNCTION	Quasi-Peak	
TESTED BY	David Huang	TEST MODE	С	

		ANTENNA	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	148.50	40.3 QP	43.5	-3.2	1.50 H	229	25.90	14.40
2	296.27	39.0 QP	46.0	-7.0	1.50 H	316	24.20	14.80
3	372.09	35.1 QP	46.0	-10.9	1.50 H	232	18.40	16.70
4	519.86	39.2 QP	46.0	-6.8	2.00 H	163	18.60	20.60
5	669.57	33.1 QP	46.0	-12.9	1.00 H	151	9.50	23.60
6	786.23	40.5 QP	46.0	-5.5	1.00 H	124	15.40	25.10
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.62	34.6 QP	40.0	-5.4	1.00 V	283	20.30	14.30
2	148.50	40.0 QP	43.5	-3.5	1.00 V	280	25.60	14.40
3	296.27	36.5 QP	46.0	-9.5	1.00 V	304	21.70	14.80
4	519.86	38.6 QP	46.0	-7.4	1.00 V	229	18.00	20.60
_				40.4	4.00.17	074	0.00	00.00
5	669.57	32.9 QP	46.0	-13.1	1.00 V	271	9.30	23.60

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL		
INPUT POWER (SYSTEM)	120Vac, 60Hz	FREQUENCY RANGE	Below 1000MHz	
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	DETECTOR FUNCTION	Quasi-Peak	
TESTED BY	David Huang	TEST MODE	D	

		ANTENNA I	POLARITY	& TEST DIS	TANCE: HO	RIZONTAL	AT 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	148.50	40.5 QP	43.5	-3.0	2.00 H	220	26.10	14.40
2	272.94	36.5 QP	46.0	-9.5	1.50 H	358	22.60	13.90
3	296.27	37.9 QP	46.0	-8.1	1.00 H	310	23.10	14.80
4	372.09	33.0 QP	46.0	-13.0	2.00 H	148	16.30	16.70
5	527.64	36.5 QP	46.0	-9.5	1.00 H	187	15.70	20.80
6	784.28	31.3 QP	46.0	-14.7	1.00 H	268	6.30	25.00
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	148.50	39.2 QP	43.5	-4.3	2.50 V	184	24.80	14.40
2	296.27	35.8 QP	46.0	-10.2	1.00 V	316	21.00	14.80
3	372.09	31.6 QP	46.0	-14.4	2.50 V	130	14.90	16.70
4	525.69	36.8 QP	46.0	-9.2	2.00 V	232	16.00	20.80
	782.34	33.2 QP	46.0	-12.8	1.00 V	187	8.20	25.00
5	702.54	00.2 %	10.0	12.0			0.20	_0.00

- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value.



# 4.2 CONDUCTED EMISSION MEASUREMENT

# 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)			
	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.

#### 4.2.2 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	100312	Jul. 07, 2011	Jul. 06, 2012
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jun. 30, 2011	Jun. 29, 2012
LISN ROHDE & SCHWARZ	ENV216	100072	Jun. 10, 2011	Jun. 09, 2012
Software ADT	ADT_Cond_ 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.



#### 4.2.3 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.

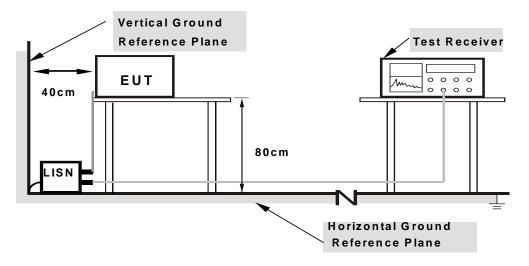
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

# 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



# 4.2.5 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).

# 4.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



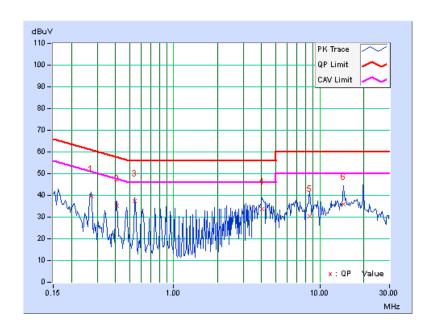
# 4.2.7 TEST RESULTS

#### **CONDUCTED WORST-CASE DATA:**

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Readin	g Value		ssion vel	Lir	nit	Mar	gin
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(d	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.18	39.28	37.60	39.46	37.78	61.08	51.08	-21.62	-13.30
2	0.409	0.20	35.17	34.35	35.37	34.55	57.67	47.67	-22.30	-13.12
3	0.545	0.21	37.24	36.83	37.45	37.04	56.00	46.00	-18.55	-8.96
4	4.023	0.37	33.47	30.67	33.84	31.04	56.00	46.00	-22.16	-14.96
5	8.520	0.55	29.89	26.89	30.44	27.44	60.00	50.00	-29.56	-22.56
6	14.450	0.91	34.96	29.30	35.87	30.21	60.00	50.00	-24.13	-19.79

- 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.

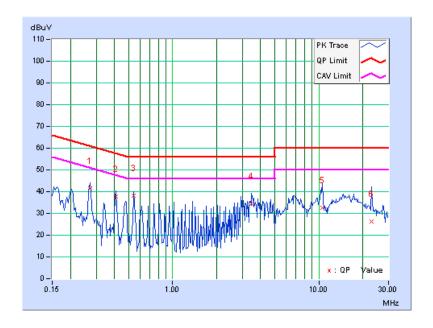




PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Readin	g Value		ssion vel	Lir	nit	Mar	gin
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(dl	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.19	41.47	38.43	41.66	38.62	61.08	51.08	-19.42	-12.46
2	0.408	0.21	37.63	36.12	37.84	36.33	57.69	47.69	-19.85	-11.36
3	0.545	0.21	37.97	37.57	38.18	37.78	56.00	46.00	-17.82	-8.22
4	3.465	0.32	34.24	26.74	34.56	27.06	56.00	46.00	-21.44	-18.94
5	10.612	0.62	32.09	28.15	32.71	28.77	60.00	50.00	-27.29	-21.23
6	22.941	1.10	25.15	21.70	26.25	22.80	60.00	50.00	-33.75	-27.20

- 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.

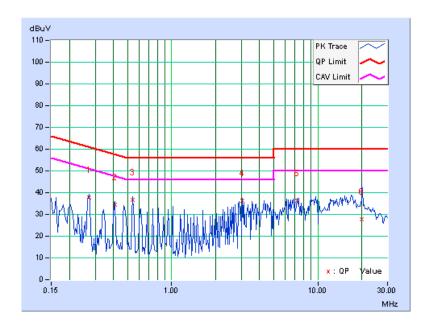




PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	В		

	Freq.	Corr.	Readin	g Value	Emis Le	ssion vel	Limit Marg		gin	
No		Factor	[dB	(uV)]	[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.18	37.76	35.05	37.94	35.23	61.08	51.08	-23.14	-15.85
2	0.408	0.20	34.23	33.15	34.43	33.35	57.69	47.69	-23.26	-14.34
3	0.541	0.21	36.60	36.22	36.81	36.43	56.00	46.00	-19.19	-9.57
4	3.051	0.32	36.05	31.93	36.37	32.25	56.00	46.00	-19.63	-13.75
5	7.190	0.50	35.71	31.49	36.21	31.99	60.00	50.00	-23.79	-18.01
6	19.961	1.24	26.50	21.83	27.74	23.07	60.00	50.00	-32.26	-26.93

- 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.



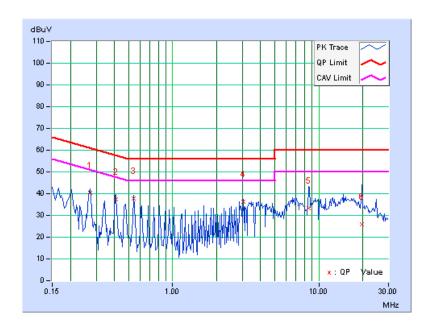
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PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	В		

	Freq.	Corr.	Readin	g Value	Emis Le	ssion vel	Limit Març		gin	
No		Factor	[dB	3 (uV)] [dB (uV)]		[dB (uV)]		(dB)		
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.19	40.01	36.27	40.20	36.46	61.08	51.08	-20.88	-14.62
2	0.408	0.21	37.38	35.96	37.59	36.17	57.69	47.69	-20.10	-11.52
3	0.545	0.21	37.67	37.21	37.88	37.42	56.00	46.00	-18.12	-8.58
4	3.055	0.30	36.17	30.93	36.47	31.23	56.00	46.00	-19.53	-14.77
5	8.581	0.53	32.63	14.67	33.16	15.20	60.00	50.00	-26.84	-34.80
6	19.680	1.01	25.00	20.97	26.01	21.98	60.00	50.00	-33.99	-28.02

- 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.

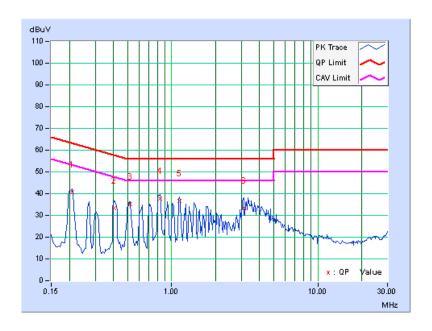




PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	С		

	Freq.	Corr.	Readin	g Value	Emission Level		Lir	nit	Mar	gin
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(d	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.17	40.65	38.10	40.82	38.27	63.26	53.26	-22.44	-14.99
2	0.404	0.20	33.26	24.71	33.46	24.91	57.77	47.77	-24.31	-22.86
3	0.521	0.21	34.97	28.68	35.18	28.89	56.00	46.00	-20.82	-17.11
4	0.830	0.22	37.65	30.19	37.87	30.41	56.00	46.00	-18.13	-15.59
5	1.133	0.23	36.27	27.10	36.50	27.33	56.00	46.00	-19.50	-18.67
6	3.109	0.32	33.06	24.23	33.38	24.55	56.00	46.00	-22.62	-21.45

- 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.

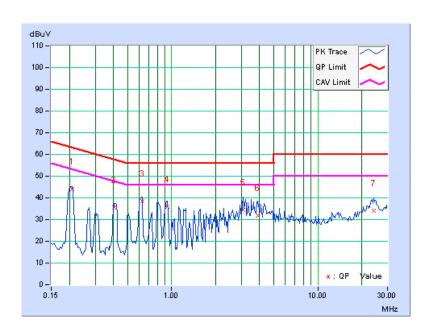




PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	С		

	Freq.	Corr.	Readin	g Value		ssion vel	Limit		Margin	
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(d	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.18	43.85	40.18	44.03	40.36	63.26	53.26	-19.23	-12.90
2	0.404	0.21	35.33	27.15	35.54	27.36	57.77	47.77	-22.23	-20.41
3	0.627	0.21	38.34	30.40	38.55	30.61	56.00	46.00	-17.45	-15.39
4	0.935	0.21	35.73	27.77	35.94	27.98	56.00	46.00	-20.06	-18.02
5	3.098	0.30	34.25	24.39	34.55	24.69	56.00	46.00	-21.45	-21.31
6	3.859	0.34	31.52	23.96	31.86	24.30	56.00	46.00	-24.14	-21.70
7	24.133	1.14	33.04	26.32	34.18	27.46	60.00	50.00	-25.82	-22.54

- 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.

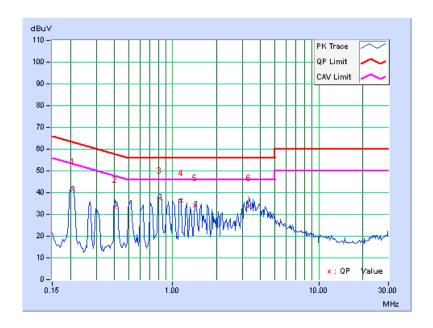




PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	D		

	Freq.	Corr.	Readin	g Value		ssion vel	Lir	nit	Mar	Margin	
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(d	B)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.209	0.17	41.45	37.96	41.62	38.13	63.26	53.26	-21.64	-15.13	
2	0.406	0.20	33.18	27.47	33.38	27.67	57.72	47.72	-24.34	-20.05	
3	0.810	0.22	37.11	27.28	37.33	27.50	56.00	46.00	-18.67	-18.50	
4	1.145	0.23	36.11	27.48	36.34	27.71	56.00	46.00	-19.66	-18.29	
5	1.422	0.24	33.92	22.69	34.16	22.93	56.00	46.00	-21.84	-23.07	
6	3.340	0.33	33.88	26.05	34.21	26.38	56.00	46.00	-21.79	-19.62	

- 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.

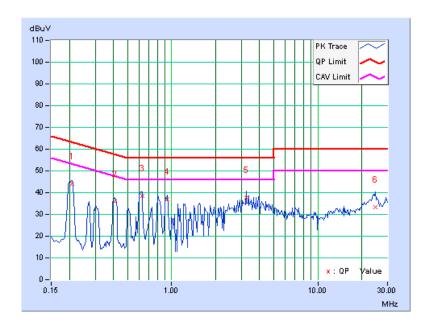




PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	D		

	Freq.	Corr.	Readin	g Value		ssion vel	Lir	nit	Margin	
No		Factor	[dB	(uV)]	[dB	(uV)]	[dB	(uV)]	(d	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.18	43.98	40.20	44.16	40.38	63.26	53.26	-19.10	-12.88
2	0.408	0.21	35.62	30.82	35.83	31.03	57.69	47.69	-21.86	-16.66
3	0.627	0.21	38.32	29.90	38.53	30.11	56.00	46.00	-17.47	-15.89
4	0.939	0.21	36.83	27.96	37.04	28.17	56.00	46.00	-18.96	-17.83
5	3.230	0.31	37.52	28.77	37.83	29.08	56.00	46.00	-18.17	-16.92
6	24.848	1.16	32.20	25.61	33.36	26.77	60.00	50.00	-26.64	-23.23

- 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 and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site: <a href="https://www.adt.com.tw/index.5.phtml">www.adt.com.tw/index.5.phtml</a>. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab: Hsin Chu EMC/RF Lab:

Tel: 886-2-26052180 Tel: 886-3-5935343 Fax: 886-2-26051924 Fax: 886-3-5935342

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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 ---