

# **FCC TEST REPORT**

**REPORT NO.:** RF990510C12

MODEL NO.: TRK-RF-03

**RECEIVED:** May 10, 2010

**TESTED:** May 11 ~ May 14, 2010

**ISSUED:** May 18, 2010

**APPLICANT:** Teraoka Weigh-System Pte Ltd.

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**ISSUED BY:** Bureau Veritas Consumer Products Services

(H.K.) Ltd., Taoyuan Branch

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# 1. CERTIFICATION

**PRODUCT:** RF\_CC2500 Module

**MODEL NO.:** TRK-RF-03

**BRAND: DIGI** 

**APPLICANT:** Teraoka Weigh-System Pte Ltd.

**TESTED:** May 11 ~ May 14, 2010

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 15, Subpart C (Section 15.249)

ANSI C63.4-2003

The above equipment (model: TRK-RF-03) have 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 : May 18, 2010

Joanna Wang / Senior Specialist

**TECHNICAL** 

ACCEPTANCE: Long Ches , DATE: May 18, 2010

Responsible for RF Long Chen / Senior Engineer

Gary Chang'/ Assistant Manager



# 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

AF	APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.249)						
STANDARD PARAGRAPH	REMARK						
15.207	Conducted Emission Test		Meet the requirement of limit. Minimum passing margin is -37.87dB at 0.170MHz.				
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -2.9dB at 7440.00MHz.				

# 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
	30MHz ~ 200MHz	2.93dB
Radiated emissions	200MHz ~1000MHz	2.95dB
Nadiated 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	RF_CC2500 Module
MODEL NO.	TRK-RF-03
FCC ID	SUFTRKRF03
POWER SUPPLY	3Vdc
MODULATION TYPE	MSK, FSK
TRANSFER RATE	Effective data 1.2kps to 500kps
RECEIVER SENSITIVITY	-105dBm(1.2kps FSK) or -82dBm(500kps MSK)
OPERATING FREQUENCY	2406MHz ~ 2480MHz
NUMBER OF CHANNEL	75
ANTENNA TYPE	One surface mount chip antenna with 1dBi gain
ANTENNA CONNECTOR	NA
DATA CABLE	NA
I/O PORT	NA
ACCESSORY DEVICES	NA

**NOTE:** 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.

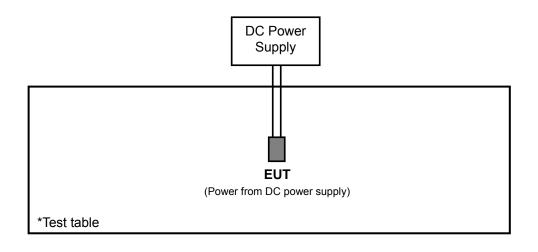


# 3.2 DESCRIPTION OF TEST MODES

75 channels are provided to this EUT.

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	2406	20	2425	39	2444	58	2463
2	2407	21	2426	40	2445	59	2464
3	2408	22	2427	41	2446	60	2465
4	2409	23	2428	42	2447	61	2466
5	2410	24	2429	43	2448	62	2467
6	2411	25	2430	44	2449	63	2468
7	2412	26	2431	45	2450	64	2469
8	2413	27	2432	46	2451	65	2470
9	2414	28	2433	47	2452	66	2471
10	2415	29	2434	48	2453	67	2472
11	2416	30	2435	49	2454	68	2473
12	2417	31	2436	50	2455	69	2474
13	2418	32	2437	51	2456	70	2475
14	2419	33	2438	52	2457	71	2476
15	2420	34	2439	53	2458	72	2477
16	2421	35	2440	54	2459	73	2478
17	2422	36	2441	55	2460	74	2479
18	2423	37	2442	56	2461	75	2480
19	2424	38	2443	57	2462		

# 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





# 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE		APPLICABLE TO			DESCRIPTION	
MODE	RE≥1G	RE<1G	PLC	вм	DESCINII TION	
Α	<b>√</b>	$\checkmark$	<b>√</b>	$\checkmark$	MSK	
В	V	√	<b>V</b>	√	FSK	

Where **PLC**: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

**RE≥1G:** Radiated Emission above 1GHz

BM: Bandedge Measurement

# **RADIATED EMISSION TEST (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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
А	1 to 75	1, 35, 75	MSK	Х
В	1 to 75	1, 35, 75	FSK	Х

# **RADIATED EMISSION TEST (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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
А	1 to 75	1	MSK	X
В	1 to 75	1	FSK	Х

# **POWER LINE CONDUCTED EMISSION TEST:**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
А	1 to 75	1	MSK
В	1 to 75	1	FSK



# **BANDEDGE MEASUREMENT:**

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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
А	1 to 75	1, 75	MSK	X
В	1 to 75	1, 75	FSK	Х

# **TEST CONDITION:**

APPLICABLE TO	APPLICABLE TO ENVIRONMENTAL CONDITIONS		TESTED BY
RE≥1G	23deg. C, 70%RH, 1011 hPa	120Vac, 60Hz	Lori Chiu
RE<1G	23deg. C, 70%RH, 1012 hPa	120Vac, 60Hz	Lori Chiu
PLC	25deg. C, 65%RH, 1009 hPa	120Vac, 60Hz	Mark Liao
ВМ	23deg. C, 70%RH, 1012 hPa	120Vac, 60Hz	Lori Chiu



# 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 Part 15, Subpart C (Section 15.249) ANSI C63.4-2003

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

#### 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	DC POWER SUPPLY	TOP WARD	6603A	725906	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 1 was under test table during test.



# 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 15.209, 15.249 as following:

15.209 Limit		
Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3
15.249 Limit		
Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

# 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	May 25, 2009	May 24, 2010
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 07, 2009	Jul. 06, 2010
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 30, 2010	Apr. 29, 2011
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Aug. 10, 2009	Aug. 09, 2010
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Dec. 25, 2009	Dec. 24, 2010
Preamplifier Agilent	8449B	3008A01910	Sep. 11, 2009	Sep. 10, 2010
Preamplifier Agilent	8447D	2944A10638	Dec. 21, 2009	Dec. 20, 2010
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274041/4	Aug. 28, 2009	Aug. 27, 2010
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283397/4	Aug. 28, 2009	Aug. 27, 2010
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 17, 2009	Aug. 16, 2010
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn Table Controller EMCO	2090	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 Chamber 9.
- 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 460141.
- 5. The IC Site Registration No. is IC 7450F-4.



#### 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:

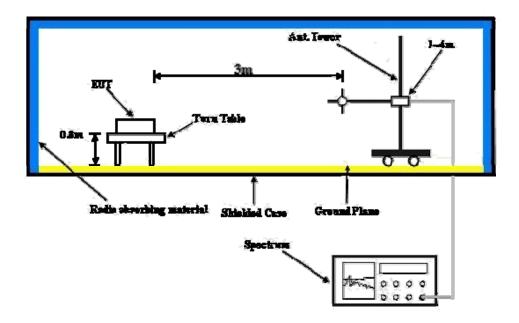
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. All modes 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

Set the EUT under transmission condition continuously at specific channel frequency.

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# 4.1.7 TEST RESULTS

#### **ABOVE 1GHz DATA**

<b>EUT TEST CONDITION</b>		MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	A			

	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	2380.00	43.8 PK	74.0	-30.2	1.10 H	20	11.60	32.20		
2	2380.00	35.4 AV	54.0	-18.6	1.10 H	20	3.20	32.20		
3	2398.00	43.4 PK	74.0	-30.6	1.10 H	20	11.10	32.30		
4	2398.00	31.6 AV	54.0	-22.4	1.10 H	20	-0.70	32.30		
5	2400.00	38.6 PK	74.0	-35.4	1.10 H	360	6.30	32.30		
6	2400.00	38.0 AV	54.0	-16.0	1.10 H	360	5.70	32.30		
7	*2406.00	90.3 PK	114.0	-23.7	1.10 H	360	58.00	32.30		
8	*2406.00	89.7 AV	94.0	-4.3	1.10 H	360	57.40	32.30		
9	4812.00	49.3 PK	74.0	-24.7	1.09 H	180	10.90	38.40		
10	4812.00	38.9 AV	54.0	-15.1	1.09 H	180	0.50	38.40		
11	7218.00	51.9 PK	74.0	-22.1	1.11 H	90	7.40	44.50		
12	7218.00	39.8 AV	54.0	-14.2	1.11 H	90	-4.70	44.50		

- 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.
- 5. " \* ": Fundamental frequency.



EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	A			

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL 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	2380.00	52.4 PK	74.0	-21.6	1.11 V	34	20.20	32.20		
2	2380.00	35.0 AV	54.0	-19.0	1.11 V	34	2.80	32.20		
3	2398.00	43.1 PK	74.0	-30.9	1.11 V	34	10.80	32.30		
4	2398.00	31.2 AV	54.0	-22.8	1.11 V	34	-1.10	32.30		
5	2400.00	32.5 PK	74.0	-41.5	1.11 V	34	0.20	32.30		
6	2400.00	32.1 AV	54.0	-21.9	1.11 V	34	-0.20	32.30		
7	*2406.00	84.2 PK	114.0	-29.8	1.11 V	34	51.90	32.30		
8	*2406.00	83.8 AV	94.0	-10.2	1.11 V	34	51.50	32.30		
9	4812.00	47.0 PK	74.0	-27.0	1.06 V	336	8.60	38.40		
10	4812.00	34.2 AV	54.0	-19.8	1.06 V	336	-4.20	38.40		
11	7218.00	51.7 PK	74.0	-22.3	1.24 V	5	7.20	44.50		
12	7218.00	39.6 AV	54.0	-14.4	1.24 V	5	-4.90	44.50		

- 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.
- 5. " \* ": Fundamental frequency.



EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 35	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
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	*2440.00	90.0 PK	114.0	-24.0	1.02 H	35	57.50	32.50	
2	*2440.00	89.5 AV	94.0	-4.5	1.02 H	35	57.00	32.50	
3	4880.00	48.9 PK	74.0	-25.1	1.33 H	206	10.40	38.50	
4	4880.00	48.5 AV	54.0	-5.5	1.33 H	206	10.00	38.50	
5	7320.00	53.3 PK	74.0	-20.7	1.00 H	6	8.60	44.70	
6	7320.00	44.0 AV	54.0	-10.0	1.00 H	6	-0.70	44.70	
		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	*2440.00	83.7 PK	114.0	-30.3	1.00 V	197	51.20	32.50	
2	*2440.00	83.2 AV	94.0	-10.8	1.00 V	197	50.70	32.50	
3	4880.00	47.2 PK	74.0	-26.8	1.41 V	208	8.70	38.50	
4	4880.00	36.3 AV	54.0	-17.7	1.41 V	208	-2.20	38.50	
5	7320.00	52.1 PK	74.0	-21.9	1.11 V	190	7.40	44.70	
6	7320.00	40.1 AV	54.0	-13.9	1.11 V	190	-4.60	44.70	

- 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.
- 5. " \* ": Fundamental frequency.



EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 75	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	A			

	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	*2480.00	89.7 PK	114.0	-24.3	1.01 H	100	57.10	32.60	
2	*2480.00	89.3 AV	94.0	-4.7	1.01 H	100	56.70	32.60	
3	2483.50	36.4 PK	74.0	-37.6	1.01 H	100	3.80	32.60	
4	2483.50	36.0 AV	54.0	-18.0	1.01 H	100	3.40	32.60	
5	2485.50	43.9 PK	74.0	-30.1	1.01 H	100	11.30	32.60	
6	2485.50	32.3 AV	54.0	-21.7	1.01 H	100	-0.30	32.60	
7	4960.00	50.4 PK	74.0	-23.6	1.01 H	192	11.70	38.70	
8	4960.00	43.7 AV	54.0	-10.3	1.01 H	192	5.00	38.70	
9	7440.00	56.7 PK	74.0	-17.3	1.22 H	21	11.70	45.00	
10	7440.00	48.5 AV	54.0	-5.5	1.22 H	21	3.50	45.00	
		ANTENNA	A 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	*2480.00	83.2 PK	114.0	-30.8	1.22 V	204	50.60	32.60	
2	*2480.00	82.8 AV	94.0	-11.2	1.22 V	204	50.20	32.60	
3	2483.50	30.4 PK	74.0	-43.6	1.22 V	204	-2.20	32.60	
4	2483.50	30.0 AV	54.0	-24.0	1.22 V	204	-2.60	32.60	
5	2485.50	42.5 PK	74.0	-31.5	1.22 V	204	9.90	32.60	
6	2485.50	31.9 AV	54.0	-22.1	1.22 V	204	-0.70	32.60	
7	4960.00	48.2 PK	74.0	-25.8	1.00 V	163	9.50	38.70	
8	4960.00	38.1 AV	54.0	-15.9	1.00 V	163	-0.60	38.70	
9	7440.00	54.8 PK	74.0	-19.2	1.28 V	360	9.80	45.00	
10	7440.00	44.4 AV	54.0	-9.6	1.28 V	360	-0.60	45.00	

- 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.
- 5. " \* ": Fundamental frequency.



<b>EUT TEST CONDITION</b>		MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	В			

	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	2380.00	43.0 PK	74.0	-31.0	1.06 H	351	10.80	32.20		
2	2380.00	36.5 AV	54.0	-17.5	1.06 H	351	4.30	32.20		
3	2398.00	40.5 PK	74.0	-33.5	1.06 H	351	8.20	32.30		
4	2398.00	29.6 AV	54.0	-24.4	1.06 H	351	-2.70	32.30		
5	2400.00	37.5 PK	74.0	-36.5	1.06 H	351	5.20	32.30		
6	2400.00	37.2 AV	54.0	-16.8	1.06 H	351	4.90	32.30		
7	*2406.00	91.3 PK	114.0	-22.7	1.06 H	351	59.00	32.30		
8	*2406.00	91.0 AV	94.0	-3.0	1.06 H	351	58.70	32.30		
9	4812.00	49.1 PK	74.0	-24.9	1.00 H	19	10.70	38.40		
10	4812.00	40.1 AV	54.0	-13.9	1.00 H	19	1.70	38.40		
11	7218.00	53.2 PK	74.0	-20.8	1.22 H	145	8.70	44.50		
12	7218.00	44.0 AV	54.0	-10.0	1.22 H	145	-0.50	44.50		
	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
		ANTENNA	POLARITY	/ & TEST DI	STANCE: V	ERTICAL A	T 3 M	•		
NO.	FREQ. (MHz)	ANTENNA EMISSION LEVEL (dBuV/m)	LIMIT	/ & TEST DI	STANCE: V ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	T 3 M RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)		
<b>NO</b> .	FREQ. (MHz) 2380.00	EMISSION LEVEL	LIMIT		ANTENNA	TABLE ANGLE	RAW VALUE	FACTOR		
	` ′	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	FACTOR (dB/m)		
1	2380.00	EMISSION LEVEL (dBuV/m) 42.8 PK	LIMIT (dBuV/m) 74.0	<b>MARGIN (dB)</b> -31.2	ANTENNA HEIGHT (m) 1.09 V	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	FACTOR (dB/m) 32.20		
1 2	2380.00 2380.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV	LIMIT (dBuV/m) 74.0 54.0	-31.2 -17.7	ANTENNA HEIGHT (m) 1.09 V 1.09 V	TABLE ANGLE (Degree) 21	RAW VALUE (dBuV) 10.60 4.10	FACTOR (dB/m) 32.20 32.20		
1 2 3	2380.00 2380.00 2398.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK	LIMIT (dBuV/m) 74.0 54.0 74.0	-31.2 -17.7 -34.3	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree) 21 21 21	RAW VALUE (dBuV) 10.60 4.10 7.40	FACTOR (dB/m) 32.20 32.20 32.30		
1 2 3 4	2380.00 2380.00 2398.00 2398.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0	-31.2 -17.7 -34.3 -25.5	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree) 21 21 21 21	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80	FACTOR (dB/m) 32.20 32.20 32.30 32.30		
1 2 3 4 5	2380.00 2380.00 2398.00 2398.00 2400.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV 31.8 PK	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0 74.0	-31.2 -17.7 -34.3 -25.5 -42.2	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree) 21 21 21 21 21	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80 -0.50	FACTOR (dB/m)  32.20  32.20  32.30  32.30  32.30		
1 2 3 4 5	2380.00 2380.00 2398.00 2398.00 2400.00 2400.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV 31.8 PK 31.3 AV	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0 74.0 54.0	-31.2 -17.7 -34.3 -25.5 -42.2 -22.7	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree) 21 21 21 21 21 21 21	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80 -0.50 -1.00	FACTOR (dB/m)  32.20  32.20  32.30  32.30  32.30  32.30		
1 2 3 4 5 6	2380.00 2380.00 2398.00 2398.00 2400.00 2400.00 *2406.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV 31.8 PK 31.3 AV 85.3 PK	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0 74.0 54.0 114.0	-31.2 -17.7 -34.3 -25.5 -42.2 -22.7 -28.7	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree)  21  21  21  21  21  21  21  21  21	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80 -0.50 -1.00 53.00	FACTOR (dB/m) 32.20 32.20 32.30 32.30 32.30 32.30 32.30		
1 2 3 4 5 6 7 8	2380.00 2380.00 2398.00 2398.00 2400.00 2400.00 *2406.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV 31.8 PK 31.3 AV 85.3 PK 84.8 AV	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0 74.0 54.0 114.0 94.0	-31.2 -17.7 -34.3 -25.5 -42.2 -22.7 -28.7 -9.2	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree) 21 21 21 21 21 21 21 21	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80 -0.50 -1.00 53.00 52.50	FACTOR (dB/m)  32.20  32.20  32.30  32.30  32.30  32.30  32.30  32.30  32.30		
1 2 3 4 5 6 7 8	2380.00 2380.00 2398.00 2398.00 2400.00 2400.00 *2406.00 *2406.00 4812.00	EMISSION LEVEL (dBuV/m) 42.8 PK 36.3 AV 39.7 PK 28.5 AV 31.8 PK 31.3 AV 85.3 PK 84.8 AV 47.2 PK	LIMIT (dBuV/m) 74.0 54.0 74.0 54.0 74.0 54.0 114.0 94.0 74.0	-31.2 -17.7 -34.3 -25.5 -42.2 -22.7 -28.7 -9.2 -26.8	ANTENNA HEIGHT (m) 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V 1.09 V	TABLE ANGLE (Degree)  21  21  21  21  21  21  21  21  21  310	RAW VALUE (dBuV)  10.60 4.10 7.40 -3.80 -0.50 -1.00 53.00 52.50 8.80	FACTOR (dB/m)  32.20  32.20  32.30  32.30  32.30  32.30  32.30  32.30  32.30  32.30  32.30		

- 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.
- 5. " \* ": Fundamental frequency.



EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 35	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	В			

	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	*2440.00	90.8 PK	114.0	-23.2	1.00 H	120	58.30	32.50		
2	*2440.00	90.3 AV	94.0	-3.7	1.00 H	120	57.80	32.50		
3	4880.00	49.1 PK	74.0	-24.9	1.04 H	204	10.60	38.50		
4	4880.00	41.1 AV	54.0	-12.9	1.04 H	204	2.60	38.50		
5	7320.00	53.7 PK	74.0	-20.3	1.32 H	7	9.00	44.70		
6	7320.00	44.2 AV	54.0	-9.8	1.32 H	7	-0.50	44.70		
		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	*2440.00	84.9 PK	114.0	-29.1	1.29 V	10	52.40	32.50		
2	*2440.00	84.5 AV	94.0	-9.5	1.29 V	10	52.00	32.50		
3	4880.00	47.5 PK	74.0	-26.5	1.01 V	115	9.00	38.50		
4	4880.00	36.4 AV	54.0	-17.6	1.01 V	115	-2.10	38.50		
5	7320.00	52.3 PK	74.0	-21.7	1.20 V	250	7.60	44.70		
6	7320.00	40.5 AV	54.0	-13.5	1.20 V	250	-4.20	44.70		

- 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.
- 5. " \* ": Fundamental frequency.



EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 75	FREQUENCY RANGE	1 ~ 25GHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1011 hPa	TESTED BY	Lori Chiu	
TEST MODE	В			

	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	*2480.00	90.5 PK	114.0	-23.5	1.00 H	18	57.90	32.60		
2	*2480.00	90.1 AV	94.0	-3.9	1.00 H	18	57.50	32.60		
3	2483.50	37.8 PK	74.0	-36.2	1.00 H	18	5.20	32.60		
4	2483.50	37.4 AV	54.0	-16.6	1.00 H	18	4.80	32.60		
5	2485.50	44.0 PK	74.0	-30.0	1.00 H	18	11.40	32.60		
6	2485.50	32.4 AV	54.0	-21.6	1.00 H	18	-0.20	32.60		
7	4960.00	50.7 PK	74.0	-23.3	1.02 H	200	12.00	38.70		
8	4960.00	44.7 AV	54.0	-9.3	1.02 H	200	6.00	38.70		
9	7440.00	57.0 PK	74.0	-17.0	1.02 H	6	12.00	45.00		
10	7440.00	51.1 AV	54.0	-2.9	1.02 H	6	6.10	45.00		
		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	*2480.00	84.5 PK	114.0	-29.5	1.30 V	9	51.90	32.60		
2	*2480.00	84.0 AV	94.0	-10.0	1.30 V	9	51.40	32.60		
3	2483.50	31.8 PK	74.0	-42.2	1.30 V	9	-0.80	32.60		
4	2483.50	31.3 AV	54.0	-22.7	1.30 V	9	-1.30	32.60		
5	2485.50	43.7 PK	74.0	-30.3	1.30 V	9	11.10	32.60		
6	2485.50	32.0 AV	54.0	-22.0	1.30 V	9	-0.60	32.60		
7	4960.00	48.9 PK	74.0	-25.1	1.00 V	203	10.20	38.70		
8	4960.00	38.8 AV	54.0	-15.2	1.00 V	203	0.10	38.70		
9	7440.00	54.6 PK	74.0	-19.4	1.02 V	224	9.60	45.00		

- 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.
- 5. " \* ": Fundamental frequency.



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

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1012 hPa	TESTED BY	Lori Chiu	
TEST MODE	Α	A		

	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	99.89	17.8 QP	43.5	-25.7	2.00 H	10	8.50	9.33		
2	189.33	17.8 QP	43.5	-25.7	2.00 H	346	6.39	11.45		
3	545.14	25.2 QP	46.0	-20.8	1.00 H	283	4.58	20.62		
4	813.45	25.7 QP	46.0	-20.3	1.50 H	133	0.27	25.41		
5	895.11	25.8 QP	46.0	-20.2	1.25 H	298	-0.31	26.07		
6	926.22	26.2 QP	46.0	-19.8	1.00 H	136	-0.11	26.31		
		ANTENNA	POLARITY	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	30.00	23.7 QP	40.0	-16.4	1.00 V	25	11.37	12.28		
2	134.89	23.2 QP	43.5	-20.3	1.00 V	10	10.84	12.34		
3	243.77	25.9 QP	46.0	-20.1	1.00 V	10	13.38	12.56		
4	772.62	25.0 QP	46.0	-21.0	1.50 V	121	0.46	24.57		
5	838.72	25.7 QP	46.0	-20.3	1.50 V	319	0.14	25.57		
6	906.77	28.5 QP	46.0	-17.5	2.00 V	46	2.32	26.17		

**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).

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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		
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak	
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1012 hPa	TESTED BY	Lori Chiu	
TEST MODE	В			

	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	99.89	18.1 QP	43.5	-25.4	1.75 H	19	8.78	9.33		
2	189.33	19.1 QP	43.5	-24.4	2.00 H	106	7.66	11.45		
3	243.77	16.0 QP	46.0	-30.0	1.75 H	358	3.47	12.56		
4	545.14	25.8 QP	46.0	-20.2	2.00 H	133	5.17	20.62		
5	895.11	25.5 QP	46.0	-20.5	1.75 H	316	-0.59	26.07		
6	916.50	25.9 QP	46.0	-20.1	1.25 H	196	-0.34	26.24		
		ANTENNA	A 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	31.84	23.6 QP	40.0	-16.4	1.50 V	7	11.33	12.23		
^	404.00									
2	134.89	22.8 QP	43.5	-20.7	1.25 V	166	10.42	12.34		
3	134.89 243.77	22.8 QP 25.1 QP	43.5 46.0	-20.7 -20.9	1.25 V 1.25 V	166 154	10.42 12.54	12.34 12.56		
3	243.77	25.1 QP	46.0	-20.9	1.25 V	154	12.54	12.56		

- 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	100288	Sep. 24, 2009	Sep. 23, 2010
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 31, 2009	Dec. 30, 2010
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Aug. 24, 2009	Aug. 23, 2010
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 29, 2009	Jul. 28, 2010
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.

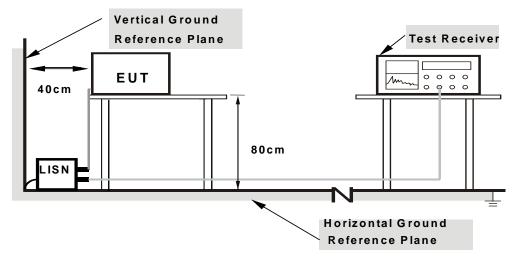
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

# 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 4.1.6.



# 4.2.7 TEST RESULTS

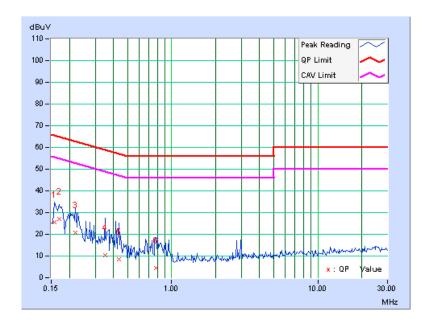
# **CONDUCTED WORST-CASE DATA:**

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)]	(dl	B)
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.16	25.30	-	25.46	-	65.58	55.58	-40.12	-
2	0.170	0.16	26.96	•	27.12	-	64.98	54.98	-37.87	-
3	0.220	0.16	20.58	-	20.74	-	62.81	52.81	-42.07	-
4	0.349	0.17	10.37	-	10.54	-	58.98	48.98	-48.44	-
5	0.435	0.18	8.49	-	8.67	-	57.15	47.15	-48.48	-
6	0.779	0.21	4.19	-	4.40	-	56.00	46.00	-51.60	-

**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.



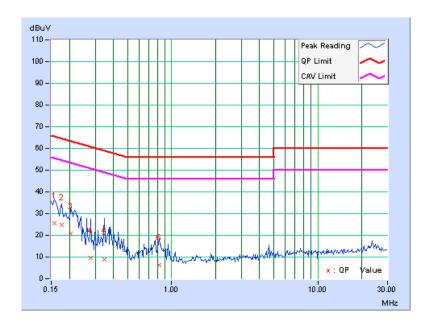


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Readin	g Value		sion 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	0.158	0.13	25.38	-	25.51	-	65.58	55.58	-40.07	-
2	0.177	0.13	24.59	-	24.72	-	64.61	54.61	-39.89	-
3	0.205	0.13	20.70	-	20.83	-	63.42	53.42	-42.59	-
4	0.279	0.14	9.46	-	9.60	-	60.85	50.85	-51.25	-
5	0.345	0.15	8.78	-	8.93	-	59.07	49.07	-50.14	-
6	0.826	0.20	6.18	-	6.38	-	56.00	46.00	-49.62	-

**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.



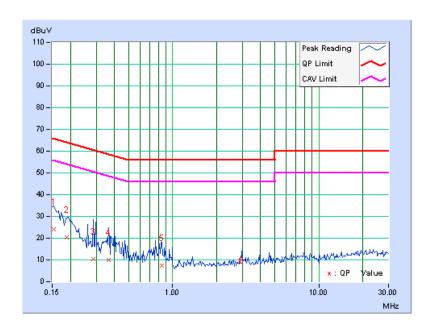


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	В		

	Freq.	Corr.	Reading Value		ue Emission Level		Limit		Margin	
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	0.154	0.16	23.86	-	24.02	-	65.79	55.79	-41.77	-
2	0.189	0.16	20.30	-	20.46	-	64.08	54.08	-43.62	-
3	0.287	0.17	10.18	-	10.35	-	60.62	50.62	-50.27	-
4	0.365	0.18	9.74	-	9.92	-	58.62	48.62	-48.70	-
5	0.845	0.22	7.27	-	7.49	-	56.00	46.00	-48.51	-
6	2.988	0.33	-3.12	-	-2.79	-	56.00	46.00	-58.79	-

**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.



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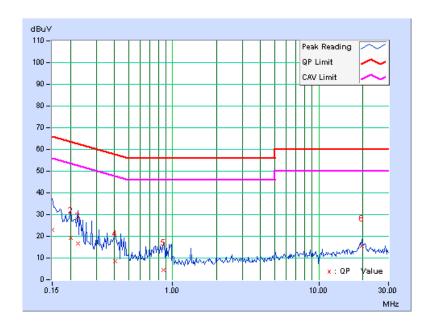


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	В		

	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	0.150	0.12	22.97	-	23.09	-	66.00	56.00	-42.91	-
2	0.201	0.13	18.95	-	19.08	-	63.58	53.58	-44.50	-
3	0.224	0.13	16.44	-	16.57	-	62.66	52.66	-46.09	-
4	0.404	0.16	8.38	-	8.54	-	57.77	47.77	-49.23	-
5	0.861	0.21	4.12	-	4.33	-	56.00	46.00	-51.67	_
6	19.707	0.90	14.54	-	15.44	-	60.00	50.00	-44.56	-

**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.



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#### 4.3 BAND EDGES MEASUREMENT

# 4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Below –50dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MODEL NO.		SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION	
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 07, 2009	Jul. 06, 2010	

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

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots are attached on the following pages.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

# 4.3.5 EUT OPERATING CONDITION

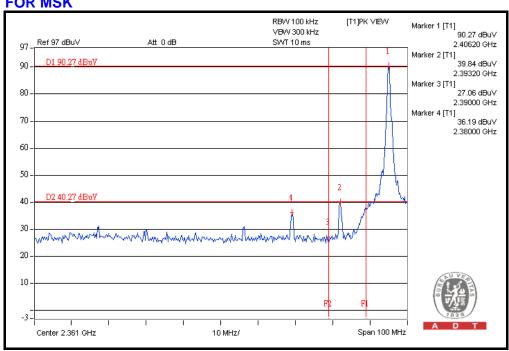
The software provided by client to enable the EUT under transmission condition continuously at lowest and highest channel frequencies individually.

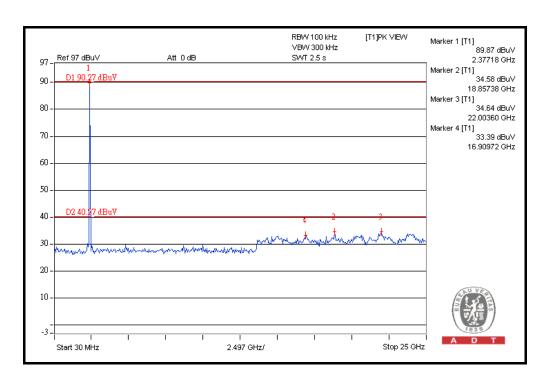


# 4.3.6 TEST RESULTS

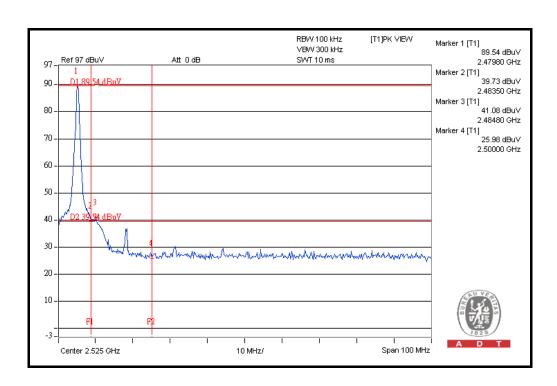
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 50dB offset below D1. It shows compliance with the requirement in part 15.249 (d).

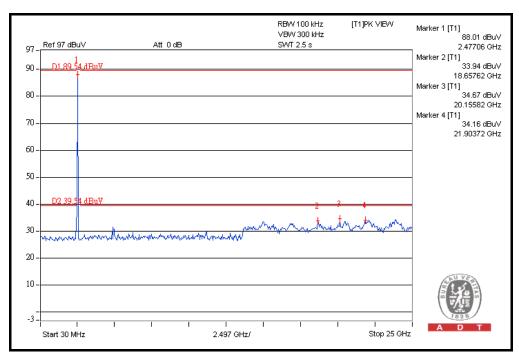
# **FOR MSK**





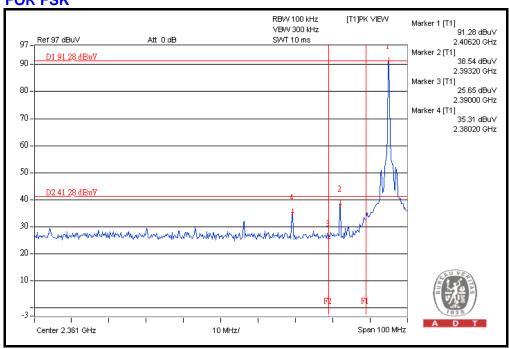


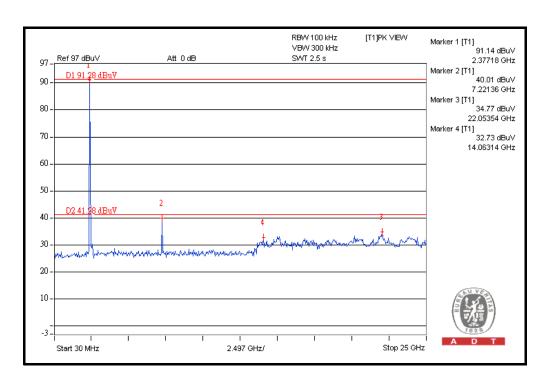




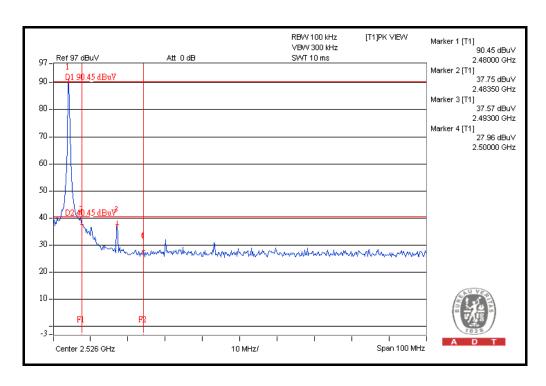


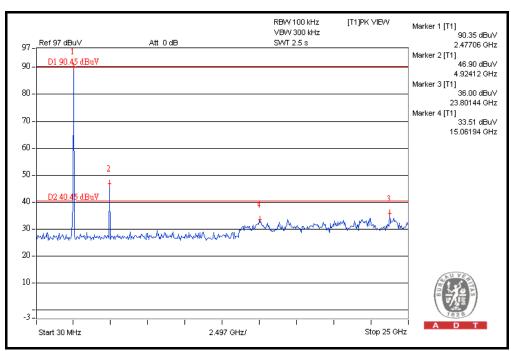
# **FOR FSK**













# 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: <a href="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:

Hsin Chu EMC/RF Lab

Linko EMC/RF Lab

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

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232 Fax: 886-3-3185050

Web Site: 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 ---