

FCC DoC TEST REPORT

REPORT NO.: FD980123L07

MODEL NO.: 1383 (Refer to item 3.1 for mode details)

RECEIVED: Jan. 23, 2009

TESTED: Mar. 10 ~ Mar. 12, 2009

ISSUED: Mar. 16, 2009

APPLICANT: Microsoft Corporation

ADDRESS: One Microsoft Way, Redmond WA
98052-6399, U.S.A

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

LAB LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen,
Kwei Shan Hsiang, Taoyuan Hsien 333,
Taiwan

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1 CERTIFICATION

PRODUCT: Microsoft® Wireless Mouse (Refer to item 3.1 for mode details)
BRAND NAME: Microsoft®
MODEL NO: 1383 (Refer to item 3.1 for mode details)
APPLICANT: Microsoft Corporation
TESTED: Mar. 10 ~ Mar. 12, 2009
TEST ITEM: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart B, Class B**
CISPR 22: 1997, Class B
ICES-003: 2004, Class B
ANSI C63.4: 2003

The above equipment (Model: 1383 & 1384) 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 : Ivy Lin , **DATE :** Mar. 16, 2009
Ivy Lin / Specialist

TECHNICAL
ACCEPTANCE : Ban Hsieh , **DATE :** Mar. 16, 2009
Responsible for EMI Ban Hsieh / Supervisor

APPROVED BY : David Liu , **DATE:** Mar. 16, 2009
David Liu / Senior Engineer

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Remarks
FCC Part 15, Subpart B, Class B CISPR 22: 1997, Class B ICES-003: 2004, Class B	Conducted Test	PASS	Meets the requirements of limit. Minimum passing margin is -17.49 dB at 0.210MHz
	Radiated Test	PASS	Meet the requirement of limit. Minimum passing margin is -2.24dB at 930.02MHz.

Note: The limit for radiated test was performed according to CISPR 22: 1997, which was specified in FCC PART 15 Subpart B 15.109(g). Also the limits of ICES-003: 2004 and CISPR 22: 1997 are same.

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	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.69 dB
	200MHz ~1000MHz	3.84 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

PRODUCT	Microsoft Wireless Mouse (Refer to Note for mode details)
MODEL NO.	1383 (Refer to Note for mode details)
POWER SUPPLY	Refer to Note for more details
DATA CABLE SUPPLIED	NA
ACCESSORY DEVICES	NA

NOTE:

1. The EUT's highest working frequency is 2480MHz.
2. The EUT include Mouse and Dongle, and mouse has two kinds of outer appearance, which the details are as below :

Product Name	Model	Power Supply	Outer Appearance
Microsoft® Wireless Mouse	1383	1.5Vdc from alkaline battery	
			
Microsoft® USB Dongle	1384	5.0Vdc from host equipment	-

3. The EUT has the following samples and their series no. are as below:

Sample	Mouse		Dongle	
	Serial No.	Remark	Serial No.	Remark
Sample 1	087	Stream-EV2-087	119	EV1-D119
Sample 2	093	Stream-EV2-093	270	EV1-D270
Sample 3	098	Stream-EV2-098	264	EV1-D264

4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

1. The EUT is designed for power from host with AC power supply of rating 100-240V, 50/60Hz. For EMI evaluation, 230Vac/50Hz (for EN 55022), 120Vac/60Hz (for FCC Part 15), 110Vac/60Hz (for BSMI CNS 13438) and 100Vac/50Hz (For VCCI) had been covered during the pre-test. The worst radiated emission data was founded at **230Vac/50Hz** and recorded in the applied test report.
2. The following test modes were presented in the report.

Test mode	Mouse Serial No.	Dongle Serial No.	Conducted Emission	Radiated Emission
A	087	119	-	√
B	093	270	√	√
C	098	264	-	√

3.3 DESCRIPTION OF SUPPORT UNITS

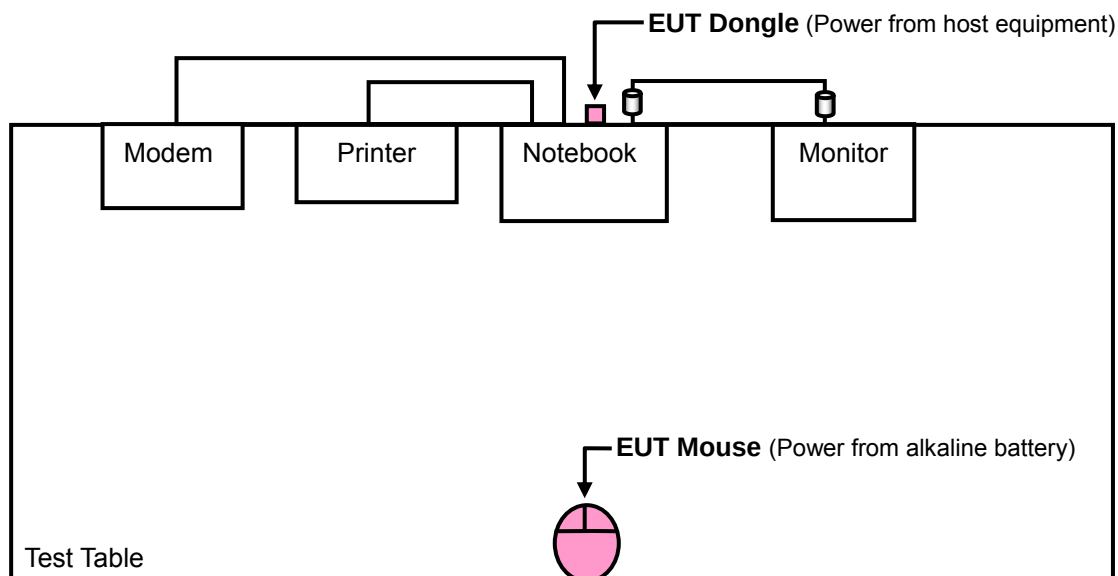
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP18L	D1T5W1S 28407620224	QDS-BRCM1019
2	LCD MONITOR	DELL	2407WFPb	CN-0FC255-46633-6 65-07US	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008252	IFAXDM1414
4	PRINTER	EPSON	B241A	FAPY139300	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8m braid shielded wire , VGA & DVI connector , with two cores.
3	1.2m braid shielded wire , DB25 & DB9 connector , w/o core.
4	1.8 m shielded cable, terminated with USB connector, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

3.4 CONFIGURATION OF SYSTEM UNDER TEST



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD:

FCC Part 15, Subpart B (Section: 15.107)

CISPR 22: 1997 (section 5)

**ICES-003: 2004 (Class A: section 5.2)
(Class B: section 5.3)**

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTE:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 22, 2008	Sep. 21, 2009
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 31, 2008	Dec. 30, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Dec. 29, 2008	Dec. 28, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 30, 2008	Jul. 29, 2009
Software ADT	ADT_Conf_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.

4.1.3 TEST PROCEDURE

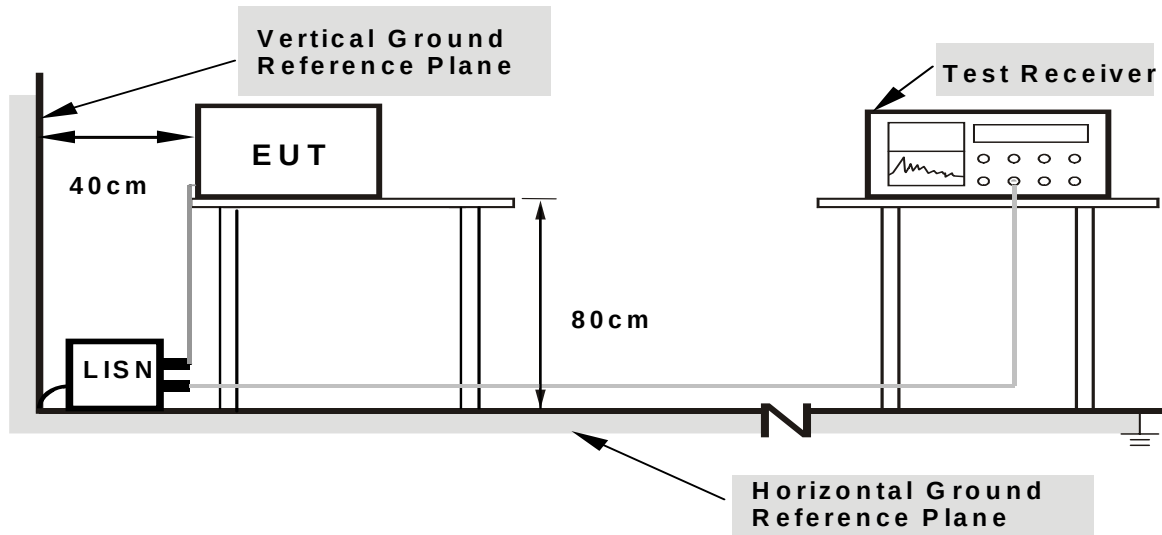
The basic test procedure was in accordance with ANSI C63.4-2003 (section 7), CISPR 22 (section 9) and ICES-003: 2004 (section 4).

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit - 20dB) was not reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

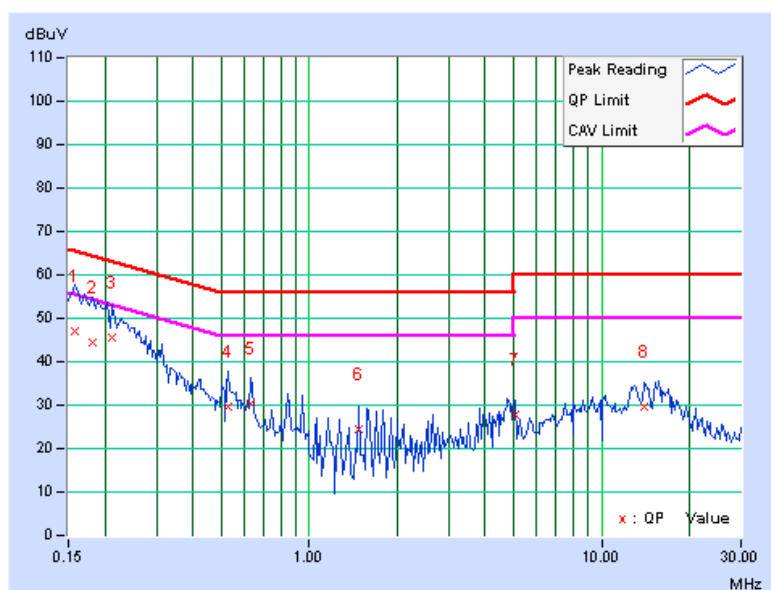
- Inserted the EUT (dongle) into the Notebook and placed on the testing table.
- The Notebook ran a test program to enable EUT in all functions.
- Set the EUT (mouse) and the EUT (dongle) under transmitting and receiving condition at specific channel.
- The Notebook sent “H” messages to the printer and the printer printed “H” patterns.
- The Notebook sent “H” messages to the monitor and the monitor displayed “H” patterns.
- Steps d ~ e were repeated.

4.1.7 TEST RESULTS

INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 76% RH, 1020 hPa	PHASE	Line 1
TESTED BY	Ariel Lin	TEST MODE	B

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.13	46.81	-	46.94	-	65.58	55.58	-18.64	-
2	0.181	0.13	44.41	-	44.54	-	64.43	54.43	-19.89	-
3	0.210	0.13	45.58	-	45.71	-	63.20	53.20	-17.49	-
4	0.529	0.15	29.36	-	29.51	-	56.00	46.00	-26.49	-
5	0.634	0.15	30.26	-	30.41	-	56.00	46.00	-25.59	-
6	1.484	0.18	24.39	-	24.57	-	56.00	46.00	-31.43	-
7	5.074	0.31	27.53	-	27.84	-	60.00	50.00	-32.16	-
8	13.961	0.53	29.18	-	29.71	-	60.00	50.00	-30.29	-

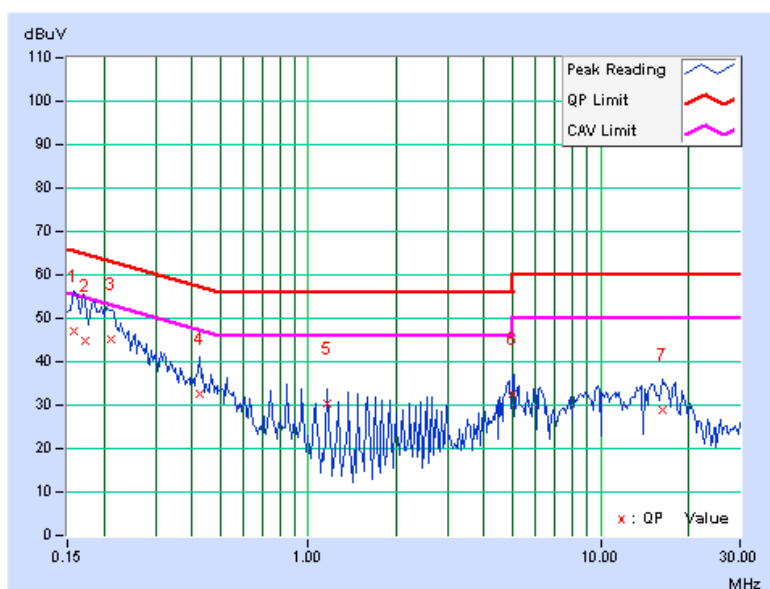
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 76% RH, 1020 hPa	PHASE	Line 2
TESTED BY	Ariel Lin	TEST MODE	B

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.13	46.75	-	46.88	-	65.58	55.58	-18.70	-
2	0.173	0.13	44.69	-	44.82	-	64.80	54.80	-19.98	-
3	0.212	0.13	45.00	-	45.13	-	63.11	53.11	-17.98	-
4	0.423	0.15	32.30	-	32.45	-	57.38	47.38	-24.93	-
5	1.164	0.17	30.08	-	30.25	-	56.00	46.00	-25.75	-
6	4.973	0.33	32.29	-	32.62	-	56.00	46.00	-23.38	-
7	16.289	0.70	28.26	-	28.96	-	60.00	50.00	-31.04	-

- 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.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD:

FCC Part 15, Subpart B (section: 15.109)

CISPR 22: 1997 (section 6)

ICES-003: 2004 (Class A: section 5.4)
(Class B: section 5.5)

Frequency (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-peak (dBuV/m)	Quasi-peak (dBuV/m)
30-230	40	30
230-1000	47	37

NOTE: The limit for radiated test was performed according to CISPR 22:1997, which was specified in FCC PART 15B 15.109(g). Also the limits of CISPR 22:1997 is same.

Frequency (MHz)	Class A (at 3m)		Class B (at 3m)	
	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	80	60	74	54

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

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

4.2.2 TEST INSTRUMENTS

For frequency below 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100186	Dec. 05, 2008	Dec. 04, 2009
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Sep. 22, 2008	Sep. 21, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 22, 2008	Oct. 21, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Apr. 29, 2008	Apr. 28, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Apr. 29, 2008	Apr. 28, 2009
Preamplifier Agilent	8447D	2944A10637	Dec. 04, 2008	Dec. 03, 2009
Preamplifier Agilent	8447D	2944A10636	Dec. 04, 2008	Dec. 03, 2009
RF signal cable Woken	8D-FB	Cable-Hych1-01	Jul. 09, 2008	Jul. 08, 2009
RF signal cable Woken	8D-FB	Cable-Hych1-02	Jul. 09, 2008	Jul. 08, 2009
Software ADT	ADT_Radiated_ V 7.7.03.6	NA	NA	NA
Antenna Tower HD Deisel GmbH	MA240	11030	NA	NA
Antenna Tower HD Deisel GmbH	MA240	12030	NA	NA
Turn Table HD Deisel GmbH	DS430	50303	NA	NA
Controller HD Deisel GmbH	HD2000	18303	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 1.
 3. The FCC Site Registration No. is 477732.
 4. The IC Site Registration No. is IC 7450F-1.
 5. The VCCI Site Registration No. is R-1893.

For frequency above 1 GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 22, 2008	Dec. 21, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Oct. 22, 2008	Oct. 21, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Apr. 30, 2008	Apr. 29, 2009
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-405	Jan. 12, 2009	Jan. 11, 2010
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170148	Jul. 03, 2008	Jul. 02, 2009
Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
Preamplifier Agilent	8449B	3008A01961	Oct. 03, 2008	Oct. 02, 2009
Preamplifier Agilent	8447D	2944A10629	Oct. 23, 2008	Oct. 22, 2009
RF signal cable HUBER+SUHNER	SUCOFLEX 104	23636/6	Aug. 21, 2008	Aug. 20, 2009
RF signal cable HUBER+SUHNER	SUCOFLEX 104	283402/4	Aug. 21, 2008	Aug. 20, 2009
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA	NA
Turn Table ADT.	TT100.	TT93021702	NA	NA
Controller ADT.	SC100.	SC93021702	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 2.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 686814.
 5. The IC Site Registration No. is IC 7450F-2.

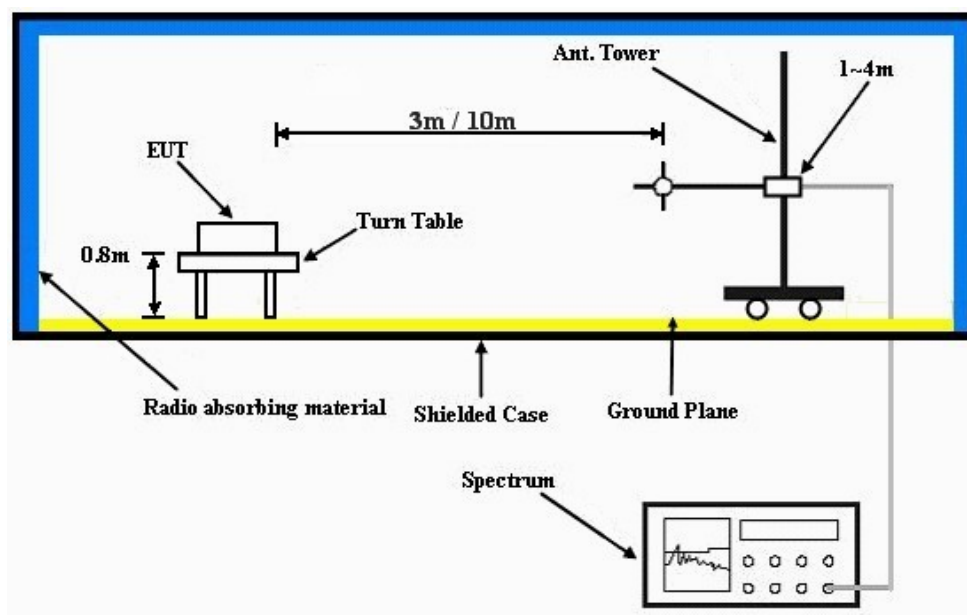
4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 / 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 / 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for peak detection (PK) at frequency above 1 GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for average detection (AV) at frequency above 1 GHz.
3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference-receiving antenna.

4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

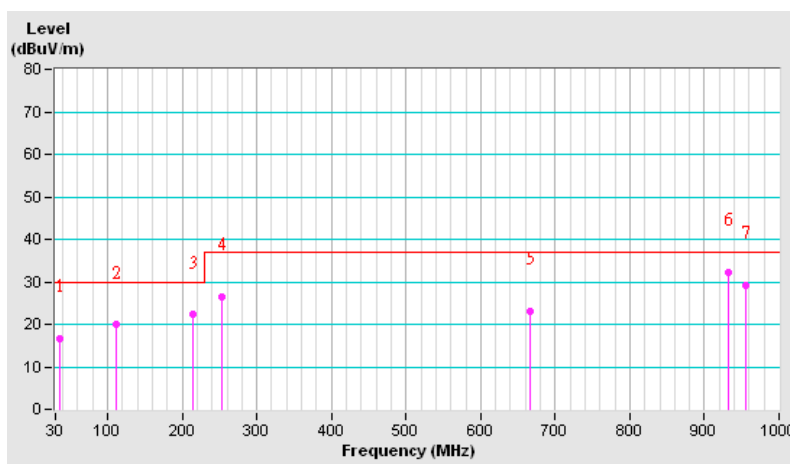
Same as item 4.1.6

4.2.6 TEST RESULTS

FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1022 hPa	TEST MODE	A
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 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	35.83	16.59 QP	30.00	-13.41	4.00 H	110	3.22	13.37
2	111.64	19.84 QP	30.00	-10.16	4.00 H	140	9.32	10.52
3	214.67	22.29 QP	30.00	-7.71	4.00 H	296	10.82	11.47
4	253.55	26.39 QP	37.00	-10.61	3.00 H	305	12.98	13.41
5	665.65	22.99 QP	37.00	-14.01	1.00 H	354	0.10	22.89
6	931.96	32.24 QP	37.00	-4.76	1.00 H	132	4.43	27.81
7	955.29	29.08 QP	37.00	-7.92	1.00 H	310	0.93	28.15

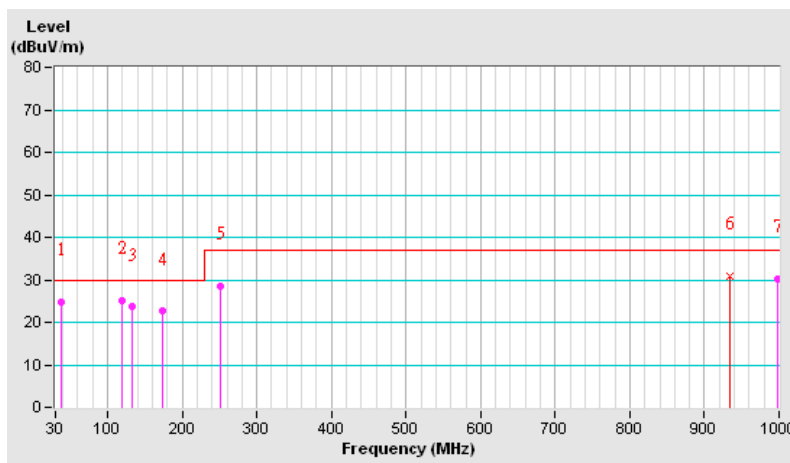
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1022 hPa	TEST MODE	A
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 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	37.78	24.90 QP	30.00	-5.10	1.00 V	308	11.79	13.11
2	119.42	25.07 QP	30.00	-4.93	1.00 V	288	13.14	11.93
3	133.03	23.56 QP	30.00	-6.44	1.00 V	203	10.77	12.79
4	173.85	22.58 QP	30.00	-7.42	1.00 V	244	8.87	13.71
5	251.60	28.55 QP	37.00	-8.45	1.00 V	152	14.71	13.85
6	933.88	30.98 QP	37.00	-6.02	4.00 V	114	2.18	28.80
7	998.06	30.11 QP	37.00	-6.89	2.00 V	241	0.21	29.90

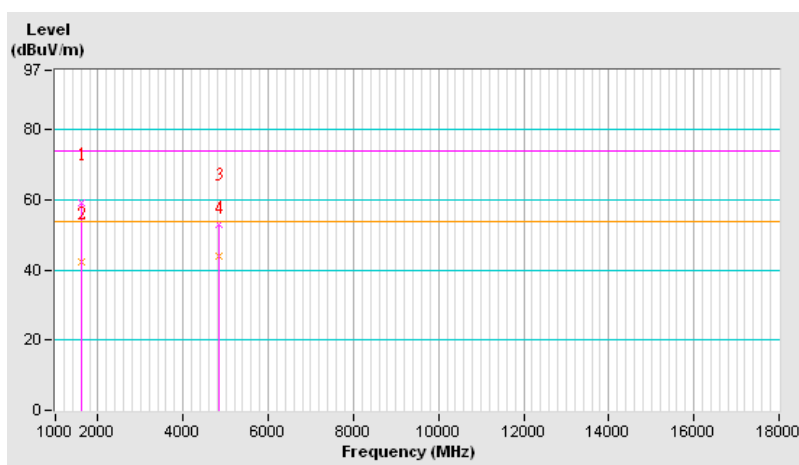
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	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	1601.210	59.01 PK	74.00	-14.99	1.00 H	311	30.85	28.16
2	1601.210	42.28 AV	54.00	-11.72	1.00 H	311	14.12	28.16
3	4837.670	53.20 PK	74.00	-20.80	1.00 H	101	16.84	36.36
4	4837.670	43.93 AV	54.00	-10.07	1.00 H	101	7.57	36.36

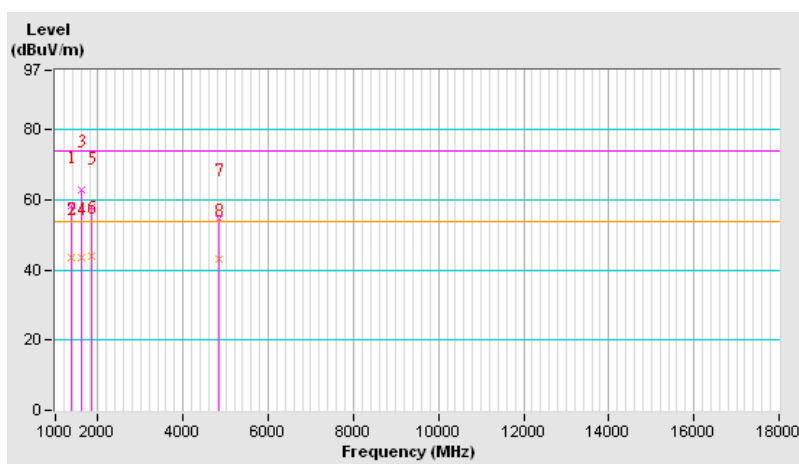
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	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	1360.070	58.30 PK	74.00	-15.70	1.00 V	201	30.80	27.50
2	1360.070	43.69 AV	54.00	-10.31	1.00 V	201	16.19	27.50
3	1601.200	62.74 PK	74.00	-11.26	1.00 V	125	34.58	28.16
4	1601.200	43.60 AV	54.00	-10.40	1.00 V	125	15.44	28.16
5	1851.700	57.81 PK	74.00	-16.19	1.00 V	102	29.10	28.71
6	1851.700	43.84 AV	54.00	-10.16	1.00 V	102	15.13	28.71
7	4837.760	54.50 PK	74.00	-19.50	1.00 V	285	18.14	36.36
8	4837.760	43.20 AV	54.00	-10.80	1.00 V	285	6.84	36.36

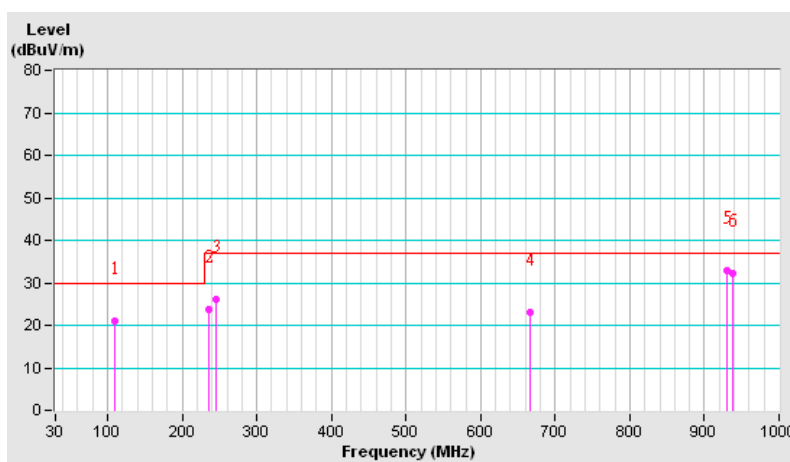
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1022 hPa	TEST MODE	B
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 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	109.70	21.09 QP	30.00	-8.91	4.00 H	162	10.84	10.25
2	236.05	23.86 QP	37.00	-13.14	3.00 H	289	11.23	12.63
3	245.77	26.09 QP	37.00	-10.91	3.00 H	289	12.93	13.16
4	665.65	23.09 QP	37.00	-13.91	1.00 H	346	0.20	22.89
5	930.02	32.93 QP	37.00	-4.07	1.00 H	128	5.15	27.78
6	937.80	32.35 QP	37.00	-4.65	1.00 H	307	4.46	27.89

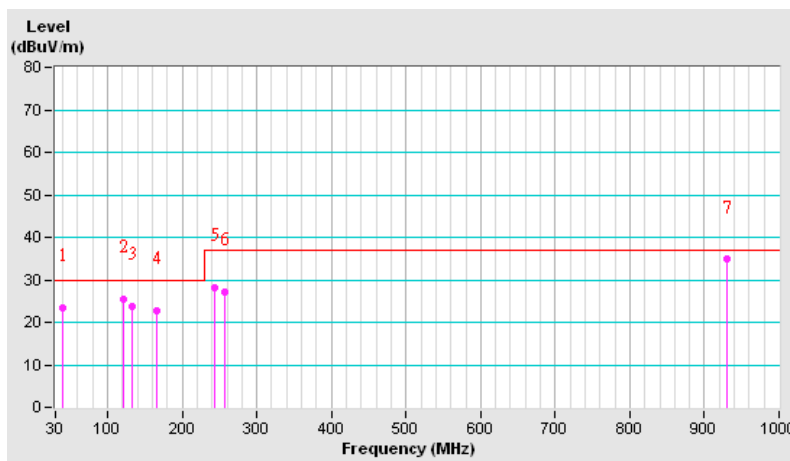
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1022 hPa	TEST MODE	B
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 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	39.72	23.33 QP	30.00	-6.67	4.00 V	76	10.37	12.96
2	121.36	25.59 QP	30.00	-4.41	1.00 V	319	13.50	12.09
3	133.03	23.87 QP	30.00	-6.13	1.00 V	206	11.07	12.79
4	166.07	22.83 QP	30.00	-7.17	1.00 V	196	8.45	14.38
5	243.83	28.29 QP	37.00	-8.71	1.00 V	167	14.81	13.48
6	257.43	27.13 QP	37.00	-9.87	1.00 V	159	13.24	13.90
7	930.02	34.76 QP	37.00	-2.24	4.00 V	109	6.03	28.73

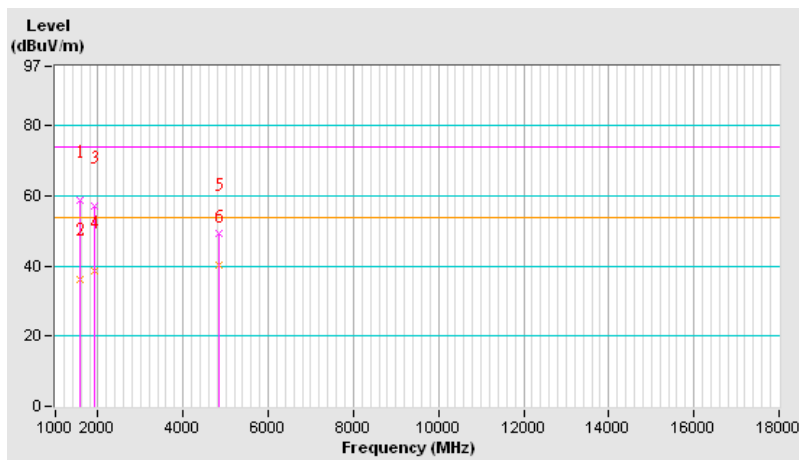
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	TEST MODE	B

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	1591.180	58.89 PK	74.00	-15.11	1.00 H	102	30.74	28.15
2	1591.180	36.35 AV	54.00	-17.65	1.00 H	102	8.20	28.15
3	1901.810	56.96 PK	74.00	-17.04	1.00 H	300	28.15	28.80
4	1901.810	38.52 AV	54.00	-15.48	1.00 H	300	9.71	28.80
5	4836.470	49.21 PK	74.00	-24.79	1.00 H	122	12.85	36.36
6	4836.470	40.21 AV	54.00	-13.79	1.00 H	122	3.85	36.36

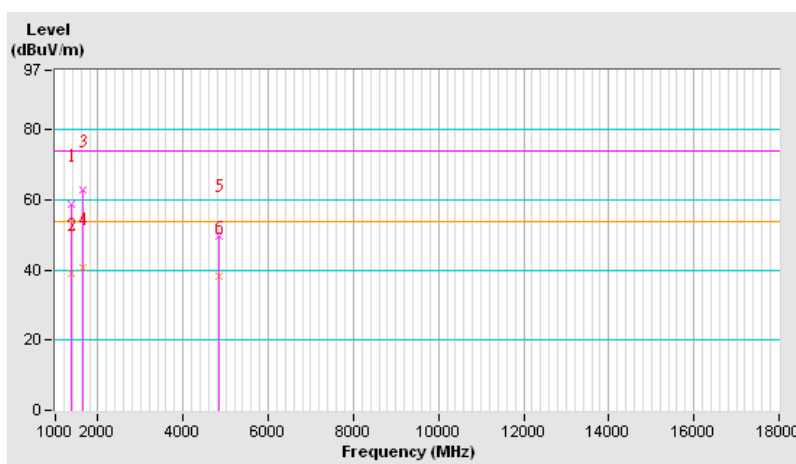
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	TEST MODE	B

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	1360.720	58.69 PK	74.00	-15.31	1.00 V	20	31.19	27.50
2	1360.720	39.13 AV	54.00	-14.87	1.00 V	20	11.63	27.50
3	1641.280	62.87 PK	74.00	-11.13	1.00 V	183	34.59	28.28
4	1641.280	40.53 AV	54.00	-13.47	1.00 V	183	12.25	28.28
5	4837.150	49.90 PK	74.00	-24.10	1.00 V	253	13.54	36.36
6	4837.150	38.23 AV	54.00	-15.77	1.00 V	253	1.87	36.36

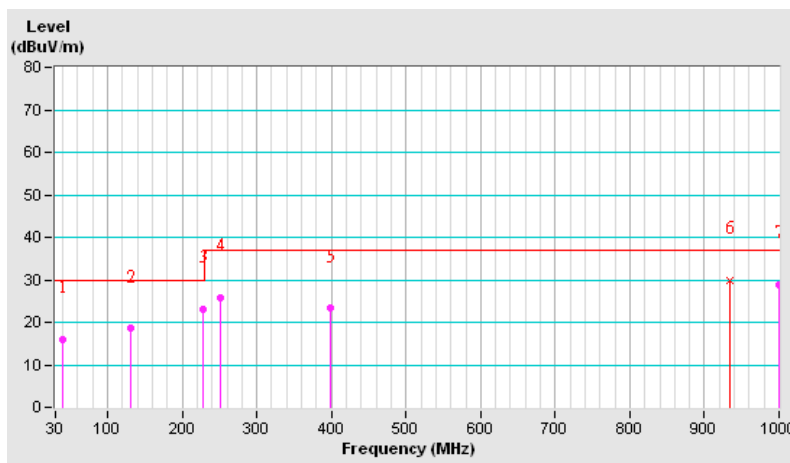
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1022 hPa	TEST MODE	C
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 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	39.72	15.97 QP	30.00	-14.03	4.00 H	229	3.09	12.87
2	131.08	18.49 QP	30.00	-11.51	3.00 H	139	6.15	12.34
3	228.28	23.18 QP	30.00	-6.82	3.00 H	280	10.97	12.21
4	251.60	25.88 QP	37.00	-11.12	4.00 H	299	12.48	13.40
5	399.34	23.30 QP	37.00	-13.70	2.00 H	215	6.59	16.71
6	933.90	29.75 QP	37.00	-7.25	1.00 H	129	1.92	27.84
7	1000.00	28.96 QP	37.00	-8.04	1.00 H	15	0.16	28.81

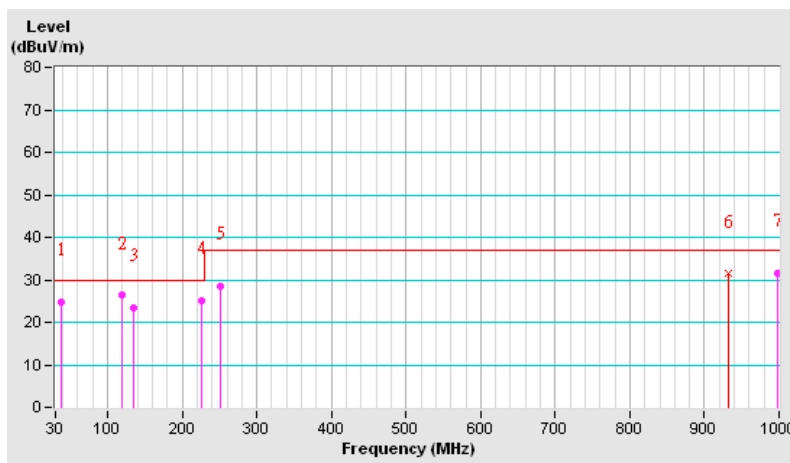
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



FREQUENCY RANGE	30-1000 MHz	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120 kHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 1023 hPa	TEST MODE	C
TESTED BY	Eason Chen		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 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	37.78	24.77 QP	30.00	-5.23	1.00 V	356	11.66	13.11
2	119.42	26.34 QP	30.00	-3.66	1.00 V	313	14.41	11.93
3	134.97	23.35 QP	30.00	-6.65	1.00 V	234	10.44	12.91
4	226.33	25.10 QP	30.00	-4.90	2.00 V	3	12.62	12.48
5	251.60	28.47 QP	37.00	-8.53	1.00 V	168	14.62	13.85
6	931.45	31.37 QP	37.00	-5.63	4.00 V	126	2.61	28.76
7	998.06	31.59 QP	37.00	-5.41	2.00 V	116	1.69	29.90

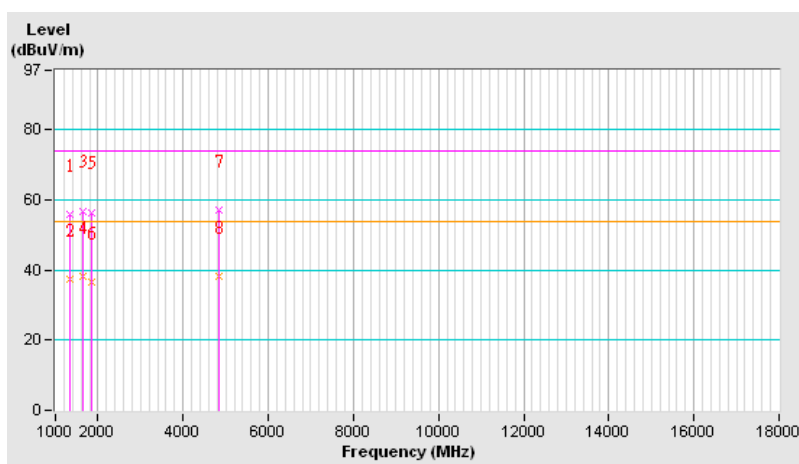
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	TEST MODE	C

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	1350.700	55.98 PK	74.00	-18.02	1.00 H	102	28.51	27.47
2	1350.700	37.21 AV	54.00	-16.79	1.00 H	102	9.74	27.47
3	1641.180	56.90 PK	74.00	-17.10	1.00 H	150	28.62	28.28
4	1641.180	38.30 AV	54.00	-15.70	1.00 H	150	10.02	28.28
5	1851.700	56.50 PK	74.00	-17.50	1.00 H	180	27.79	28.71
6	1851.700	36.43 AV	54.00	-17.57	1.00 H	180	7.72	28.71
7	4837.100	57.21 PK	74.00	-16.79	1.00 H	95	20.85	36.36
8	4837.100	38.11 AV	54.00	-15.89	1.00 H	95	1.75	36.36

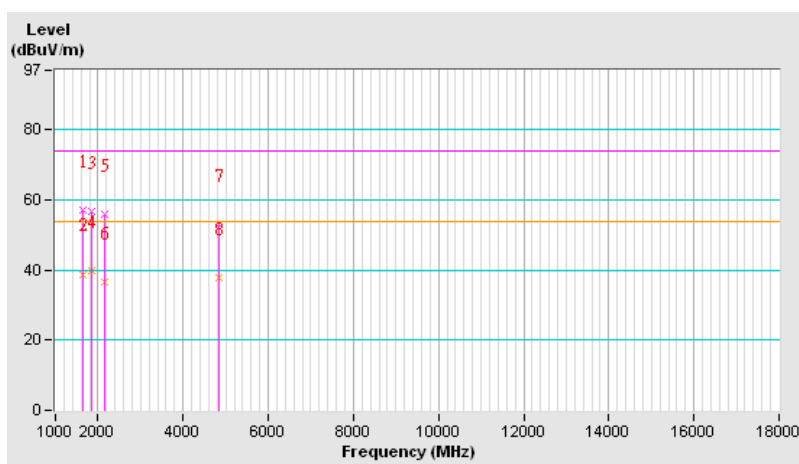
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



INPUT POWER (SYSTEM)	120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	22deg. C, 66% RH, 1021 hPa	DETECTOR FUNCTION & BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Kevin Chen	TEST MODE	C

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	1641.280	57.17 PK	74.00	-16.83	1.00 V	101	28.89	28.28
2	1641.280	38.79 AV	54.00	-15.21	1.00 V	101	10.51	28.28
3	1861.740	56.53 PK	74.00	-17.47	1.00 V	54	27.80	28.73
4	1861.740	39.74 AV	54.00	-14.26	1.00 V	54	11.01	28.73
5	2152.300	55.70 PK	74.00	-18.30	1.00 V	150	26.15	29.55
6	2152.300	36.69 AV	54.00	-17.31	1.00 V	150	7.14	29.55
7	4837.150	53.08 PK	74.00	-20.92	1.02 V	95	16.72	36.36
8	4837.150	37.90 AV	54.00	-16.10	1.02 V	95	1.54	36.36

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



6 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA(MOU)
Russia	CERTIS(MOU)

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.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

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Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service@adt.com.tw

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 ---