



FCC TEST REPORT

REPORT NO.: RF120217E04A

MODEL NO.: PBP2, AirDraw II

FCC ID: SUZ-PBP2

RECEIVED: Apr. 24, 2012

TESTED: May 10 to 22, 2012

ISSUED: May 23, 2012

APPLICANT: Coretronic Corp.

ADDRESS: No. 11, Li Hsing Rd, Science-Based Industrial Park,
Hsinchu, Taiwan.

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

LAB ADDRESS : No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen,
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120217E04A	Original release	May 23, 2012



1. CERTIFICATION

PRODUCT : Interactive Pen
BRAND NAME : Optoma,Coretronic
MODEL NO. : PBP2, AirDraw II
TEST SAMPLE : ENGINEERING SAMPLE
APPLICANT : Coretronic Corp.
TESTED : May 10 to 22, 2012
STANDARDS : **FCC Part 15, Subpart C (Section 15.249)**
ANSI C63.10-2009

The above equipment (Model: PBP2) 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 : Phoenix Huang , **DATE**: May 23, 2012
(Phoenix Huang, Specialist)

APPROVED BY : May Chen , **DATE**: May 23, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.249)			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	PASS	Meet the requirement of limit. Minimum passing margin is -13.00dB at 0.19687MHz.
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 -2.5dB at 2400.00MHz

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:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz ~ 30MHz	2.98dB
	30MHz ~ 1GHz	5.69 dB
Radiated emission	1GHz ~6GHz	5.12 dB
	6GHz ~ 18GHz	5.32 dB
	18GHz ~ 40GHz	5.37 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Interactive Pen
MODEL NO.	PBP2, AirDraw II
POWER SUPPLY	DC 5V from host equipment or DC 1.2V from battery
MODULATION TYPE	MSK
CARRIER FREQUENCY OF EACH CHANNEL	2402.3MHz ~ 2481.3MHz
NUMBER OF CHANNEL	26
ANTENNA TYPE	Chip antenna (Antenna Gain : 2.5dBi)
DATA CABLE	USB Cable, 1.8m, shielded with two cores
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Battery x 1

NOTE:

- There is one antenna provided to this EUT, please refer to the following table:

Brand	Model	Gain (dBi)	Antenna Type
ACX	AT8010-EZR9HAA	2.5	chip

- The EUT must be supplied with one battery supply:

Brand	Model No.	Spec.
FDK	HR-4U-SECT-F15	Nominal Voltage : 1.2V _{dc} Typical Capacity : 1000mAh Charging Current : 1000mA Charging Time : Approx 65 min End Voltage of Discharge : 1.0V

- The USB port of EUT only has charging function; it doesn't have any connection function.
- The EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	With battery Mode
Mode B	With charged Mode

From the above modes, the worst emission level was found in **Mode B**. Therefore only the test data of the modes were recorded in this report individually.

- 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

26 channels are provided in this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2482.3	8	2432.3	15	2462.3	22	2477.3
2	2407.3	9	2433.3	16	2463.3	23	2478.3
3	2408.3	10	2442.3	17	2467.3	24	2479.3
4	2417.3	11	2443.3	18	2468.3	25	2480.3
5	2422.3	12	2447.3	19	2472.3	26	2481.3
6	2423.3	13	2448.3	20	2473.3		
7	2427.3	14	2458.3	21	2476.3		

3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	PLC	RE<1G	RE ³ 1G	
-	√	√	√	-

Where **RE<1G**: Radiated Emission below 1GHz **RE³1G**: Radiated Emission above 1GHz
PLC: Power Line Conducted Emission

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

POWER LINE CONDUCTED EMISSION TEST:

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
1 to 26	26	MSK

RADIATED EMISSION TEST (BELOW 1 GHz):

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
1 to 26	26	MSK

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
1 to 26	1, 12, 26	MSK

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	26deg. C, 68%RH	120Vac, 60Hz	Wen Yu
RE ³ 1G	28deg. C, 66%RH	120Vac, 60Hz	Kent Liu
RE<1G	25deg. C, 66%RH	120Vac, 60Hz	Kent Liu

3.4 DESCRIPTION OF SUPPORT UNITS

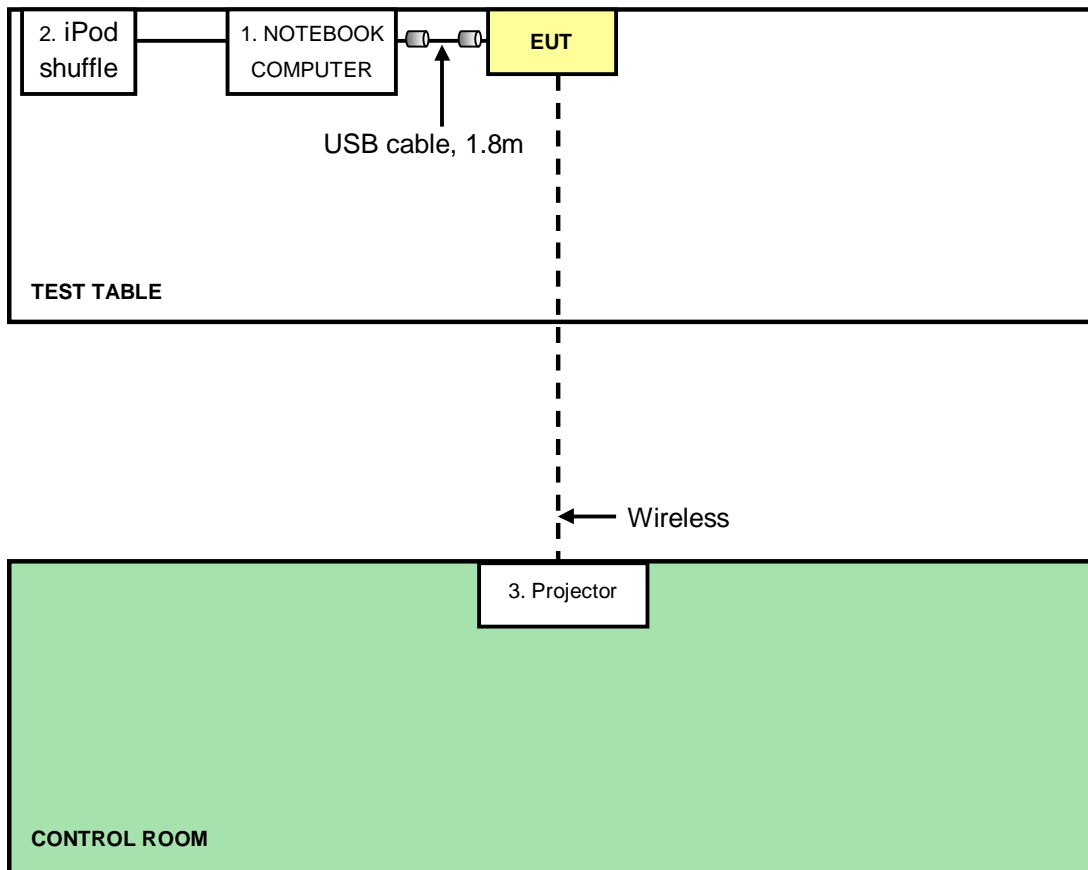
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP27L	6YLB32S	FCC DoC
2	iPod shuffle	Apple	MC749TA/A	CC4DMFJUDFD M	NA
3	Projector	Optoma	EW675UTi	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Cable, shielded 1.8m with two core
2	USB Cable ,0.1m
3	NA

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

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST





3.5 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 C63.10-2009

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

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Feb. 29, 2012	Feb. 28, 2013
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYBAO)	5DFB	COACAB-002	Aug. 06, 2011	Aug. 05, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
Software	BV 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 Shielded Room No. A.
- 3 The VCCI Con A Registration No. is C-817.
4. Tested Date: May 10, 2012

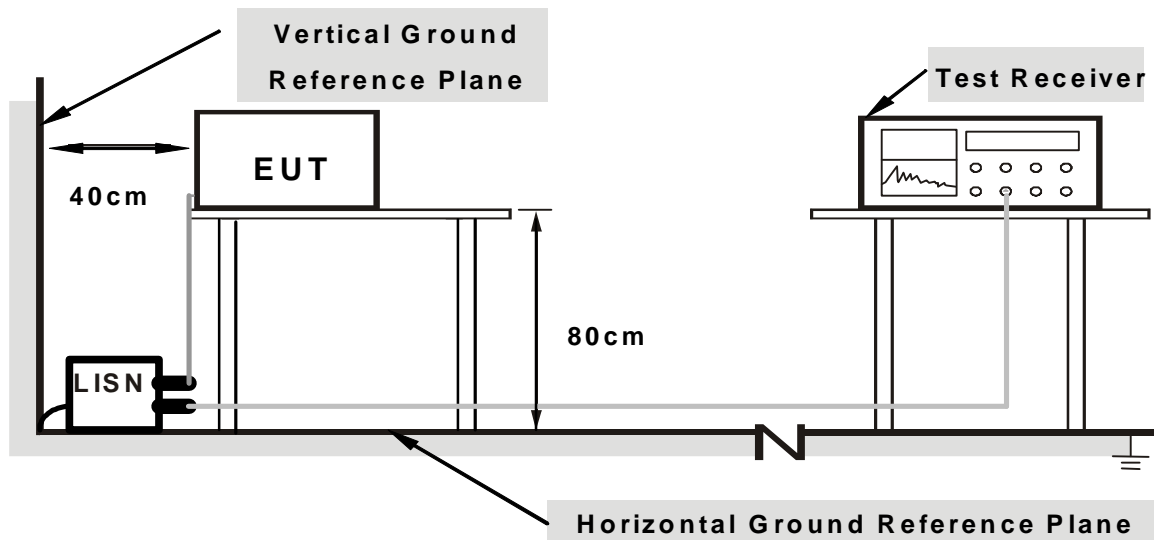
4.1.3 TEST PROCEDURES

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of all equipment.
2. The EUT link with support unit 3 (Projector) via wireless.

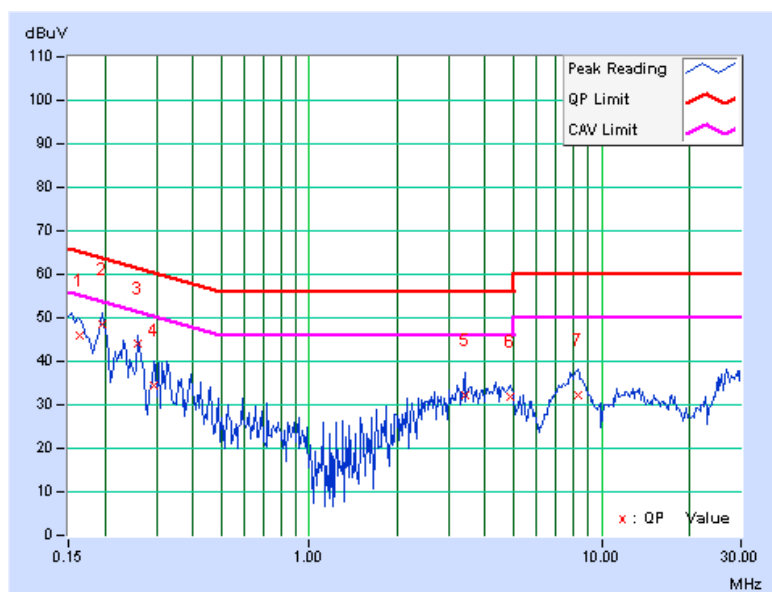
4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16495	0.06	45.95	38.12	46.01	38.18	65.21
2	0.19687	0.06	48.44	40.68	48.50	40.74	63.74	53.74	-15.24	-13.00
3	0.25938	0.06	44.06	36.67	44.12	36.73	61.45	51.45	-17.33	-14.72
4	0.29453	0.06	34.36	20.71	34.42	20.77	60.40	50.40	-25.97	-29.62
5	3.40625	0.25	31.97	27.54	32.22	27.79	56.00	46.00	-23.78	-18.21
6	4.84766	0.29	31.51	27.88	31.80	28.17	56.00	46.00	-24.20	-17.83
7	8.27344	0.36	32.04	13.21	32.40	13.57	60.00	50.00	-27.60	-36.43

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.





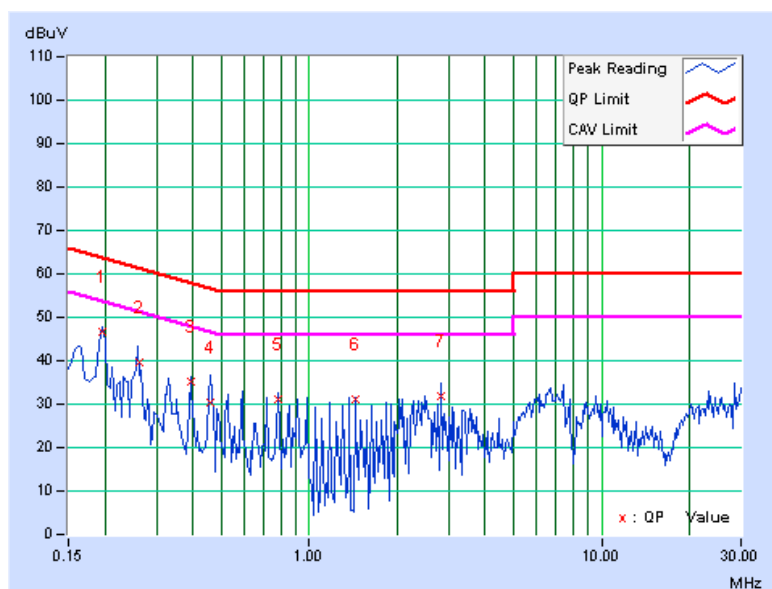
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PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.19687	0.07	46.60	37.49	46.67	37.56	63.74	53.74	-17.07
2	0.26325	0.07	39.59	31.37	39.66	31.44	61.33	51.33	-21.67	-19.89
3	0.39219	0.08	35.11	29.93	35.19	30.01	58.02	48.02	-22.83	-18.01
4	0.45859	0.08	30.34	22.39	30.42	22.47	56.72	46.72	-26.29	-24.24
5	0.78672	0.11	31.11	30.69	31.22	30.80	56.00	46.00	-24.78	-15.20
6	1.44141	0.15	31.03	29.97	31.18	30.12	56.00	46.00	-24.82	-15.88
7	2.81462	0.21	31.70	27.77	31.91	27.98	56.00	46.00	-24.09	-18.02

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION AND BAND EDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BAND EDGE MEASUREMENT

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

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

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. H.

4. The FCC Site Registration No. is 797305.

5. The CANADA Site Registration No. is IC 7450H-3.

6. Tested date: May 22, 2012

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. 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 height of antenna 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 detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

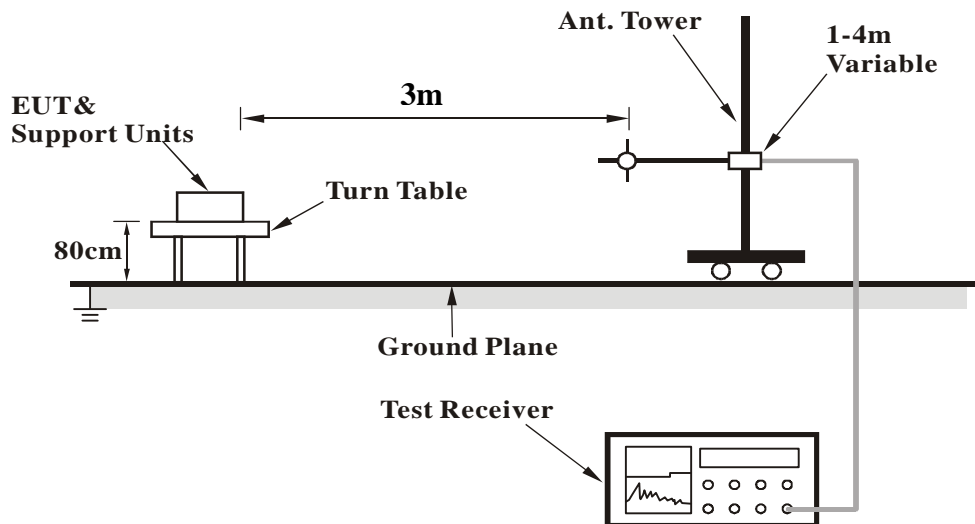
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) 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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

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

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

SRD_MSK

CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

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	53.68	28.7 QP	40.0	-11.3	1.50 H	0	14.92	13.81
2	120.00	27.0 QP	43.5	-16.5	1.50 H	50	14.67	12.34
3	265.19	37.5 QP	46.0	-8.5	1.25 H	147	23.57	13.90
4	416.06	31.1 QP	46.0	-14.9	1.50 H	311	13.05	18.07
5	582.32	30.6 QP	46.0	-15.4	1.00 H	287	8.79	21.84
6	642.84	34.7 QP	46.0	-11.4	1.00 H	247	11.88	22.77

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	32.84	34.4 QP	40.0	-5.6	1.00 V	277	21.35	13.03
2	51.55	31.9 QP	40.0	-8.1	1.00 V	112	17.98	13.88
3	90.99	33.1 QP	43.5	-10.5	1.50 V	39	24.46	8.59
4	268.98	33.7 QP	46.0	-12.3	1.00 V	106	19.66	14.07
5	315.99	34.7 QP	46.0	-11.3	1.00 V	73	18.99	15.67
6	541.82	29.8 QP	46.0	-16.2	1.25 V	251	8.83	20.96
7	635.97	35.2 QP	46.0	-10.8	1.50 V	218	12.49	22.68

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.



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ABOVE 1GHz DATA

SRD_MSK

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2400.00	71.5 PK	74.0	-2.5	1.53 H	248	40.26	31.24
2	2400.00	37.5 AV	54.0	-16.5	1.53 H	248	6.26	31.24
3	*2402.30	94.5 PK	114.0	-19.5	1.53 H	248	63.25	31.25
4	*2402.30	60.5 AV	94.0	-33.5	1.53 H	248	29.25	31.25
5	4804.60	54.2 PK	74.0	-19.8	1.52 H	65	14.85	39.35
6	4804.60	20.2 AV	54.0	-33.8	1.52 H	65	-19.15	39.35
7	7206.90	53.8 PK	74.0	-20.2	1.14 H	37	9.80	44.00
8	7206.90	19.8 AV	54.0	-34.2	1.14 H	37	-24.20	44.00

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	2400.00	67.5 PK	74.0	-6.5	1.00 V	117	36.26	31.24
2	2400.00	33.5 AV	54.0	-20.5	1.00 V	117	2.26	31.24
3	*2402.30	89.7 PK	114.0	-24.3	1.00 V	117	58.45	31.25
4	*2402.30	55.7 AV	94.0	-38.3	1.00 V	117	24.45	31.25
5	4804.60	47.2 PK	74.0	-26.8	1.70 V	288	7.85	39.35
6	4804.60	13.2 AV	54.0	-40.8	1.70 V	288	-26.15	39.35
7	7206.90	54.2 PK	74.0	-19.8	1.42 V	227	10.20	44.00
8	7206.90	20.2 AV	54.0	-33.8	1.42 V	227	-23.80	44.00

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.
5. " * " : Fundamental frequency.
6. The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
 $20 \log (\text{Duty cycle}) = 20 \log (0.3333 \text{ ms} / 16.63 \text{ ms}) = -34.0 \text{ dB}$
Please see page 25 for plotted duty.



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CHANNEL	TX Channel 12	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2447.30	95.1 PK	114.0	-18.9	1.52 H	243	63.74	31.36
2	*2447.30	61.1 AV	94.0	-32.9	1.52 H	243	29.74	31.36
3	4894.60	54.3 PK	74.0	-19.7	1.57 H	80	14.60	39.70
4	4894.60	20.3 AV	54.0	-33.7	1.57 H	80	-19.40	39.70
5	7341.90	54.3 PK	74.0	-19.7	1.16 H	36	10.16	44.14
6	7341.90	20.3 AV	54.0	-33.7	1.16 H	36	-23.84	44.14
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	*2447.30	90.0 PK	114.0	-24.0	1.00 V	112	58.64	31.36
2	*2447.30	56.0 AV	94.0	-38.0	1.00 V	112	24.64	31.36
3	4894.60	46.7 PK	74.0	-27.3	1.75 V	274	7.00	39.70
4	4894.60	12.7 AV	54.0	-41.3	1.75 V	274	-27.00	39.70
5	7341.90	54.3 PK	74.0	-19.7	1.47 V	214	10.16	44.14
6	7341.90	20.3 AV	54.0	-33.7	1.47 V	214	-23.84	44.14

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.
5. " * ": Fundamental frequency.
6. The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
$$20 \log (\text{Duty cycle}) = 20 \log (0.3333 \text{ ms} / 16.63 \text{ ms}) = -34.0 \text{ dB}$$

Please see page 25 for plotted duty.



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CHANNEL	TX Channel 26	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2481.30	95.7 PK	114.0	-18.3	1.52 H	232	64.25	31.45
2	*2481.30	61.7 AV	94.0	-32.3	1.52 H	232	30.25	31.45
3	2483.50	71.1 PK	74.0	-2.9	1.52 H	232	39.64	31.46
4	2483.50	37.1 AV	54.0	-16.9	1.52 H	232	5.64	31.46
5	4962.60	53.8 PK	74.0	-20.2	1.55 H	55	13.82	39.98
6	4962.60	19.8 AV	54.0	-34.2	1.55 H	55	-20.18	39.98
7	7443.90	53.8 PK	74.0	-20.2	1.16 H	44	9.55	44.25
8	7443.90	19.8 AV	54.0	-34.2	1.16 H	44	-24.45	44.25

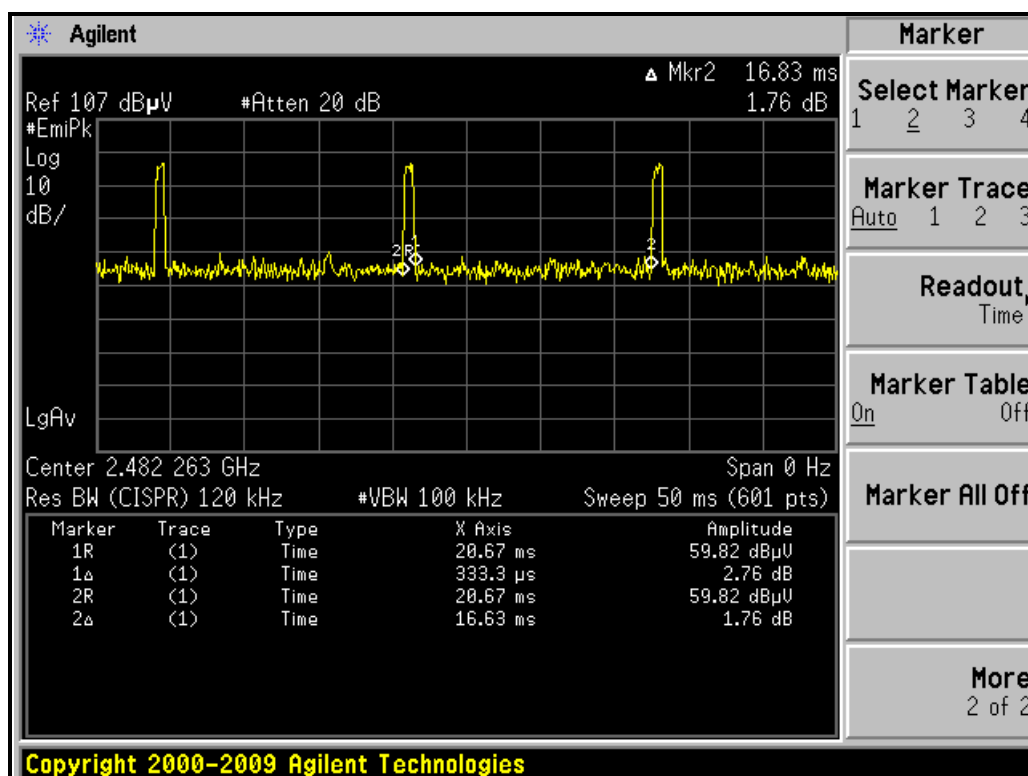
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

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	*2481.30	90.3 PK	114.0	-23.7	1.00 V	112	58.85	31.45
2	*2481.30	56.3 AV	94.0	-37.7	1.00 V	112	24.85	31.45
3	2483.50	69.6 PK	74.0	-4.4	1.00 V	112	38.14	31.46
4	2483.50	35.6 AV	54.0	-18.4	1.00 V	112	4.14	31.46
5	4962.60	47.6 PK	74.0	-26.4	1.67 V	272	7.62	39.98
6	4962.60	13.6 AV	54.0	-40.4	1.67 V	272	-26.38	39.98
7	7443.90	54.1 PK	74.0	-19.9	1.45 V	226	9.85	44.25
8	7443.90	20.1 AV	54.0	-33.9	1.45 V	226	-24.15	44.25

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.
5. " * " : Fundamental frequency.
6. The average value of fundamental frequency is: Average = Peak value + 20 log(Duty cycle) Where the duty factor is calculated from following formula:
 $20 \log (\text{Duty cycle}) = 20 \log (0.3333 \text{ ms} / 16.63 \text{ ms}) = -34.0 \text{ dB}$
Please see page 25 for plotted duty.

Duty Cycle



$$20 \log (\text{Duty cycle}) = 20 \log (0.3333\text{ms} / 16.63\text{ms}) = -34\text{dB}$$



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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:

<http://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

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

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 – MODIFICATION RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

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