

# FCC TEST REPORT

**REPORT NO.:** 100830FIA01

**MODEL NO.:** 1805AA1001N

**RECEIVED:** Aug. 19, 2010

**TESTED:** Aug. 19, 2010

**ISSUED:** Aug. 23, 2010

**APPLICANT:** Delphi China Technical Center Co.,Ltd

**ADDRESS:** 118 Delin Road, Waigaoqiao Free Trade  
Zone, Pudong, Shanghai

**ISSUED BY:** BUREAU VERITAS ADT (Shanghai) Corporation

**LAB LOCATION:** 2F, Building C, No.1618, Yishan rd., 201103,  
Shanghai, China

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## 1 CERTIFICATION

**PRODUCT:** MBFM SC/DC  
**BRAND NAME:** N/A  
**MODEL NO.:** 1805AA1001N  
**TEST ITEM:** ENGINEERING SAMPLE  
**APPLICANT:** Delphi China Technical Center Co.,Ltd  
**TESTED:** Aug. 19, 2010  
**STANDARDS:** FCC Part 15: 2008, Subpart B, Class B  
(section 15.31, 15.107 and 15.109)  
ANSI C63.4-2003 (section 7 and 8)

We, BUREAU VERITAS ADT (Shanghai) Corporation, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

**PREPARED BY :** Ray Xue, **DATE:** Aug. 23, 2010  
( Ray XUE /  
Project Engineer)

**TECHNICAL  
ACCEPTANCE :** Joy zhu, **DATE:** Aug. 23, 2010  
( Joy ZHU /  
Lab Manager)

**APPROVED BY :** [Signature], **DATE:** Aug. 23, 2010  
(Wallace PAN /  
Director of operations )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Remarks
FCC Part 15: 2008, Subpart B, Class B	Conducted Test	NA	Refer to 4.1.7
	Radiated Test	PASS	Meets Class B Limit Minimum passing margin is -19.43dB at 3150 MHz

Note: The test data in worst case is when the receiver module in EUT is working, so the test mode in this report is in controller drive door lock/unlock motor and control the left/right turn light flash.

### 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 Ed 1.0.

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

This lab's measurement uncertainty  $U_{Lab}$ , is low than  $U_{Cispr}$ , Table 1 – Values of  $U_{Cispr}$  of CISPR 16-4-2 Ed. 1.0, therefore compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

Measurement		Value
Conducted emissions		2.55 dB
Conducted emissions at telecom port		2.60 dB
Radiated emissions	30 MHz ~ 1GHz	3.22 dB
	Above 1GHz	2.89 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

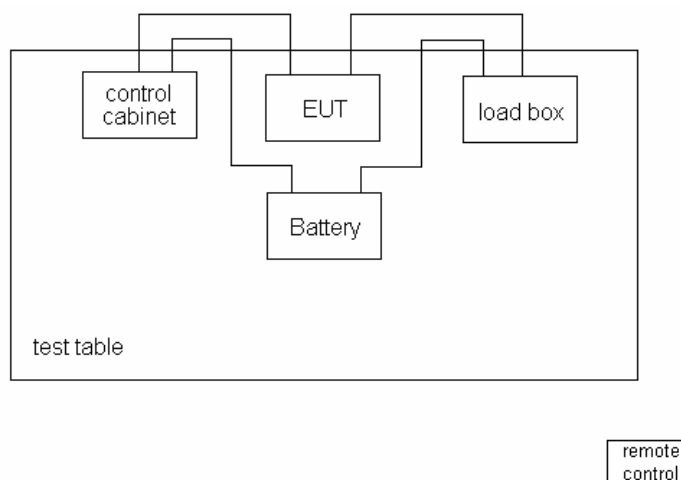
PRODUCT	MBFM SC/DC
MODEL NO.	1805AA1001N
POWER SUPPLY	12V DC
MODULATION TYPE	ASK
CARRIER FREQUENCY	315MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	Print antenna
DATA CABLE SUPPLIED	N/A

**NOTE:** For a more detailed features description, please refer to the manufacturer's specification or the User's Manual.

#### 3.2 DESCRIPTION OF TEST MODES

Test Mode	Description
1	Receiving mode (one channel was provided to this EUT)

##### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT configure mode	Applicable to			Description
	PLC	RE<1G	RE≥1G	
-	-	V	V	-

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

**NOTE**: No need to concern of Conducted Emission due to the EUT is powered by battery.

#### RADIATED EMISSION TEST (BELOW 1 GHz):

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
1	1	ASK	X

#### RADIATED EMISSION TEST (ABOVE 1 GHz):

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

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	AXIS
1	1	ASK	X

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Body Control Module with a receiver. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart B, Class B**  
**ANSI C63.4-2003**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit during the tests.

## 4 EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

##### TEST STANDARD:

FCC Part 15: 2008, Subpart B (Section: 15.107)

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

- NOTES:**
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.



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#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Receiver R&S	ESCS30	E1R1002	Jan. 19, 2011
LISN Schwarzbeck	ENV216	E1L1011	Apr. 11, 2011
RF signal cable Woken	RG-58	E1CBL09	Apr. 01, 2011
Software ADT	ADT_Cond_V7.3.0	N/A	N/A

**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 Shielding Room No. 01  
3. The VCCI Site Registration No. C-2334.



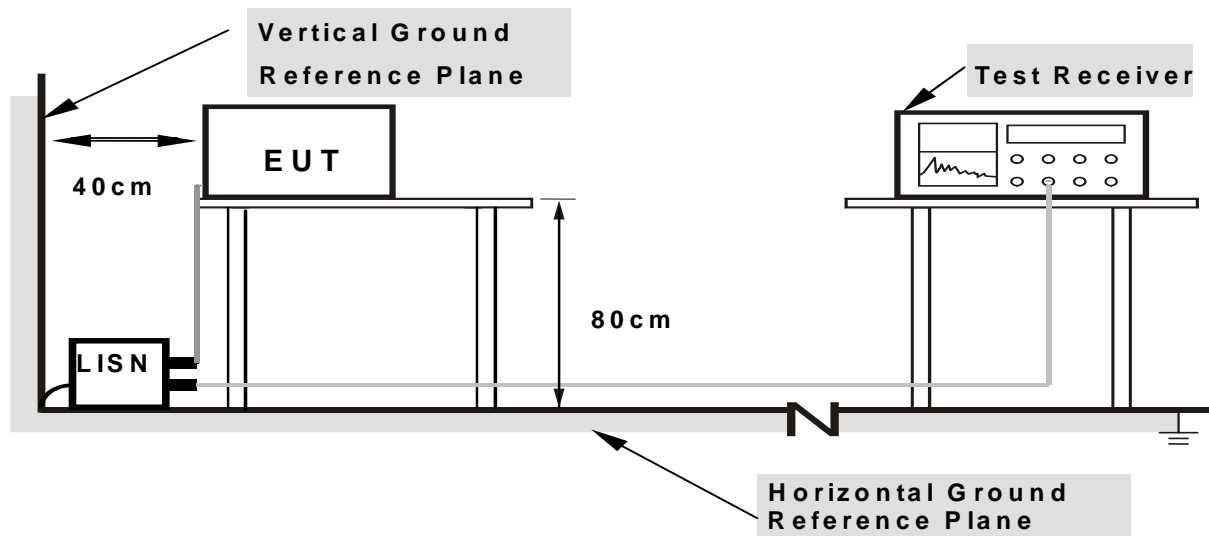
### 4.1.3 TEST PROCEDURE

- 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) 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 cm 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

- Link EUT with the load box and the control cabinet with the harness provided by the manufacturer;
- And power on the load box and control cabinet with 12V battery;
- Use the wireless remote controller send the turning on and off signal, and the EUT may receive the message and work;
- While the EUT is controlling the load to work, we start to do the test.

#### 4.1.7 TEST RESULTS

Since the EUT is powered by dc power, so it's no need to do the test.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

#### TEST STANDARD:

FCC Part 15: 2008, Subpart B (Section: 15.109)

#### FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30 – 88	90	39.1	100	40.0
88 – 216	150	43.5	150	43.5
216 – 960	210	46.4	200	46.0
Above 1000	300	49.5	500	54.0

#### LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

- Note:** (1) The lower limit shall apply at the transition frequencies.  
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).  
(3) All emanation 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 Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



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## 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Spectrum Agilent	E4403B	E1S1001	Aug. 04, 2010
Receiver R&S	ESCS30	E1R1001	Jan. 03, 2011
Trilog Broadband Antenna Schwarzbeck	VULB 9168	E1A1001	Aug. 04, 2010
Horn Antenna Schwarzbeck	BBHA 9120D	E1A1002	Nov. 01, 2010
Preamplifier Agilent	8447D	E1A2001	Nov. 12, 2010
Preamplifier Agilent	8449B	E1A2002	Nov. 01, 2010
Software ADT	ADT_Radiated_V7.5	N/A	N/A

- 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 and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in Semi-Anechoic Chamber No. 1
  4. The VCCI Site Registration No. R-2161
  5. The Industry Canada Reference No. IC 6392

### 4.2.3 TEST PROCEDURE

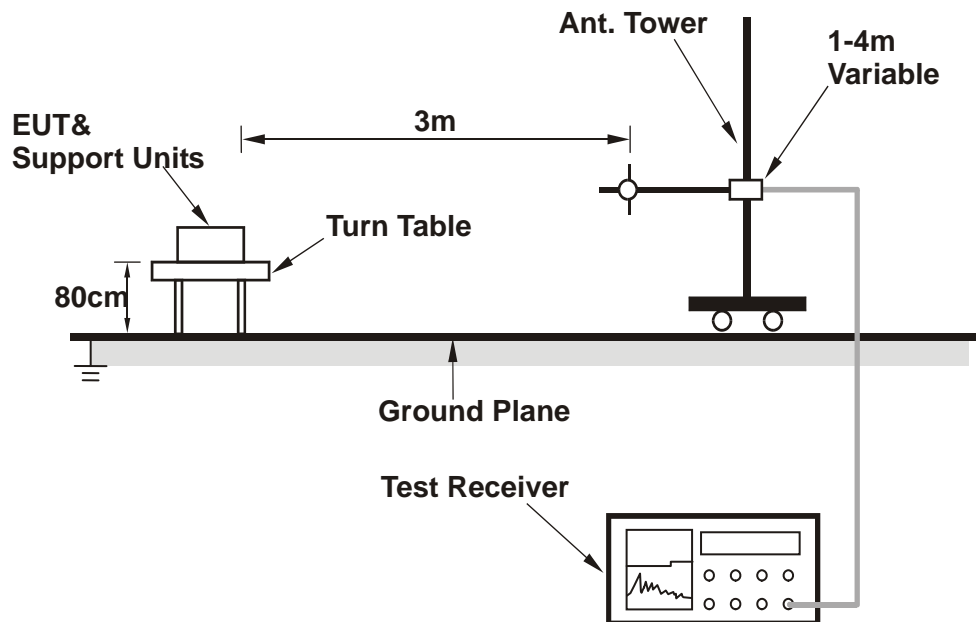
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. All cables leaving the tabletop, the EUT for a connection outside the test site (e.g. mains cables, telephone lines, connections to auxiliary equipment located outside the test area) has been fitted with ferrite clamp.

**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 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

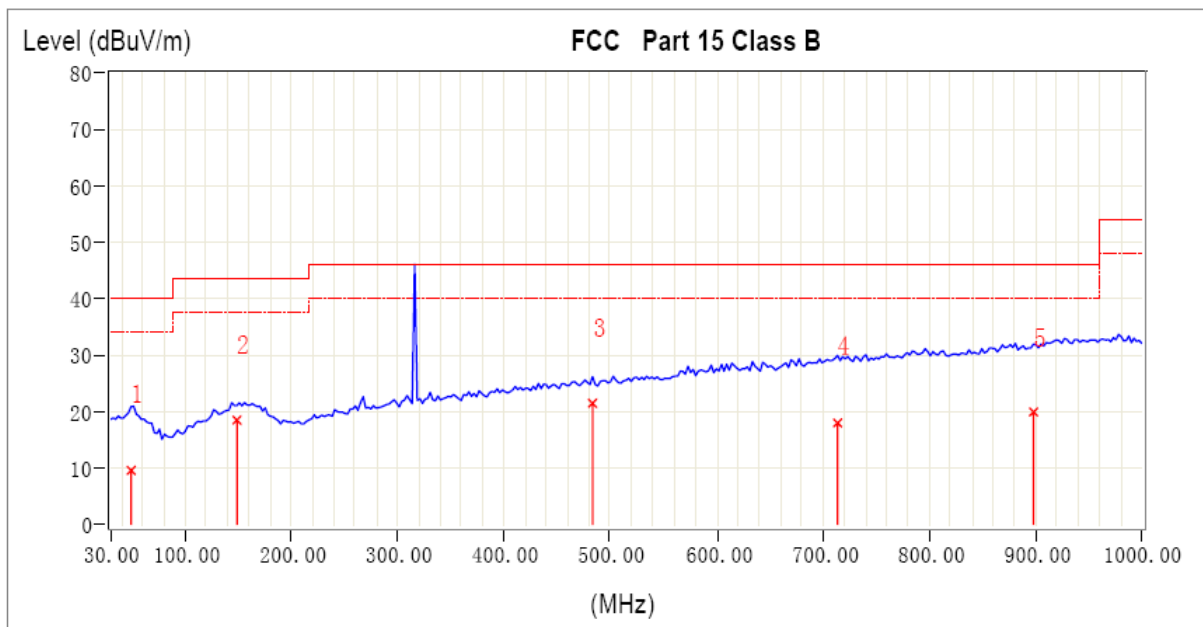
Same as item 4.1.6.

## 4.2.7 TEST RESULTS

<b>TEST MODE</b>	Mode 1	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER</b>	12V DC	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	32 deg. C, 57% RH, 998hPa	<b>TESTED BY:</b> Ray Xue	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Factor (dB)	Reading (dbuv/m)	Emission (dbuv/m)	Limit (dbuv/m)	Margin (dB)	Tower cm	Table deg
1	49.40	15.47	-5.87	9.60	40.00	-30.40	100	147
2	148.82	16.88	1.60	18.48	43.50	-25.02	100	37
3	483.48	20.63	0.86	21.49	46.00	-24.51	100	239
4	713.85	24.86	-6.85	18.01	46.00	-27.99	100	312
5	898.15	27.18	-7.26	19.92	46.00	-26.08	100	0

- 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.







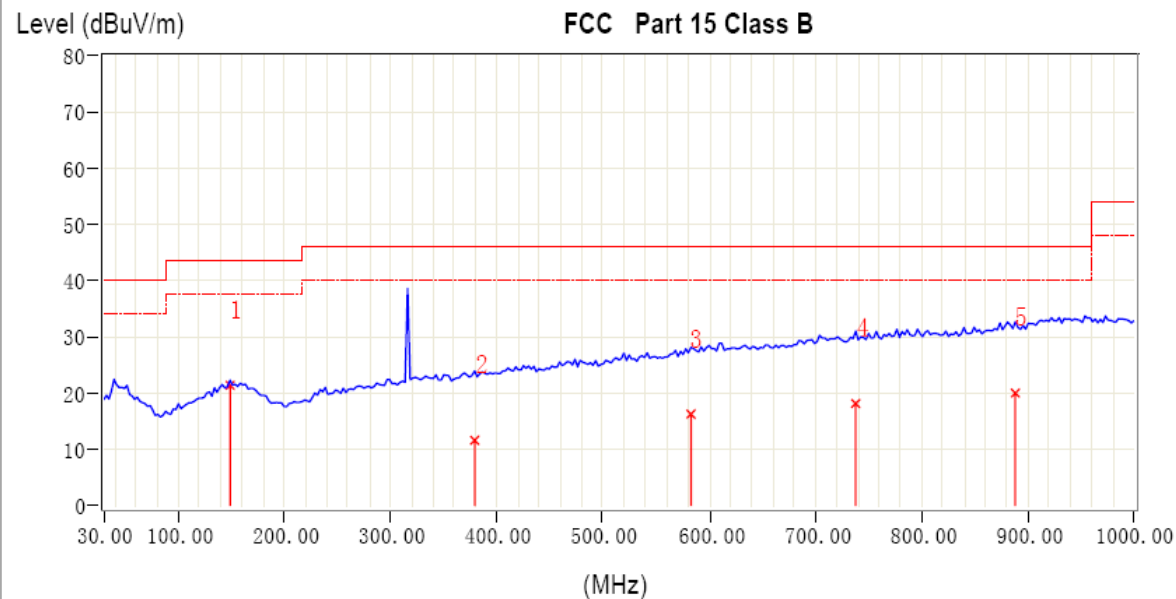
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TEST MODE	Mode 1	FREQUENCY RANGE	30-1000 MHz
INPUT POWER	12V DC	DETECTOR FUNCTION & BANDWIDTH	Quasi-Peak, 120kHz
ENVIRONMENTAL CONDITIONS	32 deg. C, 57% RH, 998hPa	TESTED BY: Ray Xue	

**ANTENNA POLARITY & test distance: VERTICAL at 3 m**

No.	Freq. (MHz)	Factor (dB)	Reading (dbuv/m)	Emission (dbuv/m)	Limit (dbuv/m)	Margin (dB)	Tower cm	Table deg
1	148.82	16.88	4.53	21.41	43.50	-22.09	100	178
2	379.20	18.25	-6.64	11.61	46.00	-34.39	100	111
3	582.90	22.78	-6.52	16.26	46.00	-29.74	100	222
4	738.10	25.22	-7.07	18.15	46.00	-27.85	100	0
5	888.45	26.92	-6.90	20.01	46.00	-25.99	100	247

- 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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<b>TEST MODE</b>	Mode 1	<b>FREQUENCY RANGE</b>	Above 1GHz
<b>INPUT POWER</b>	12V DC	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak & Average, 1MHz
<b>ENVIRONMENTAL CONDITIONS</b>	32 deg. C, 57% RH, 998hPa	<b>TESTED BY:</b> Tom Si	

#### ANTENNA POLARITY & test distance: HORIZONTAL at 3 m

No.	Freq. (MHz)	Detector	Factor (dB)	Reading (dbuv/m)	Emission (dbuv/m)	Limit (dbuv/m)	Margin (dB)	Tower cm	Table deg
1	1260.00	PK	29.45	12.63	42.08	74.00	-31.92	100	357
1	1260.00	AV	29.45	1.25	30.70	54.00	-23.30	100	357
2	1575.00	PK	29.35	11.20	40.56	74.00	-33.44	100	32
2	1575.00	AV	29.35	0.16	29.51	54.00	-24.49	100	32
3	1890.00	PK	29.82	11.71	41.53	74.00	-32.47	100	350
3	1890.00	AV	29.82	0.37	30.19	54.00	-23.81	100	350
4	2205.00	PK	32.93	11.71	44.64	74.00	-29.36	100	0
4	2205.00	AV	32.93	0.16	33.09	54.00	-20.91	100	0
5	2520.00	PK	32.81	12.77	45.59	74.00	-28.41	100	350
5	2520.00	AV	32.81	0.55	33.36	54.00	-20.64	100	350
6	2835.00	PK	33.29	12.28	45.57	74.00	-28.43	100	357
6	2835.00	AV	33.29	0.81	34.10	54.00	-19.90	100	357
7	3150.00	PK	33.92	12.29	46.21	74.00	-27.79	100	345
7	3150.00	AV	33.92	0.40	34.32	54.00	-19.68	100	345

- 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.

<b>TEST MODE</b>	Mode 1	<b>FREQUENCY RANGE</b>	Above 1GHz
<b>INPUT POWER</b>	12V DC	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak & Average, 1MHz
<b>ENVIRONMENTAL CONDITIONS</b>	32 deg. C, 57% RH, 998hPa	<b>TESTED BY:</b> Tom Si	

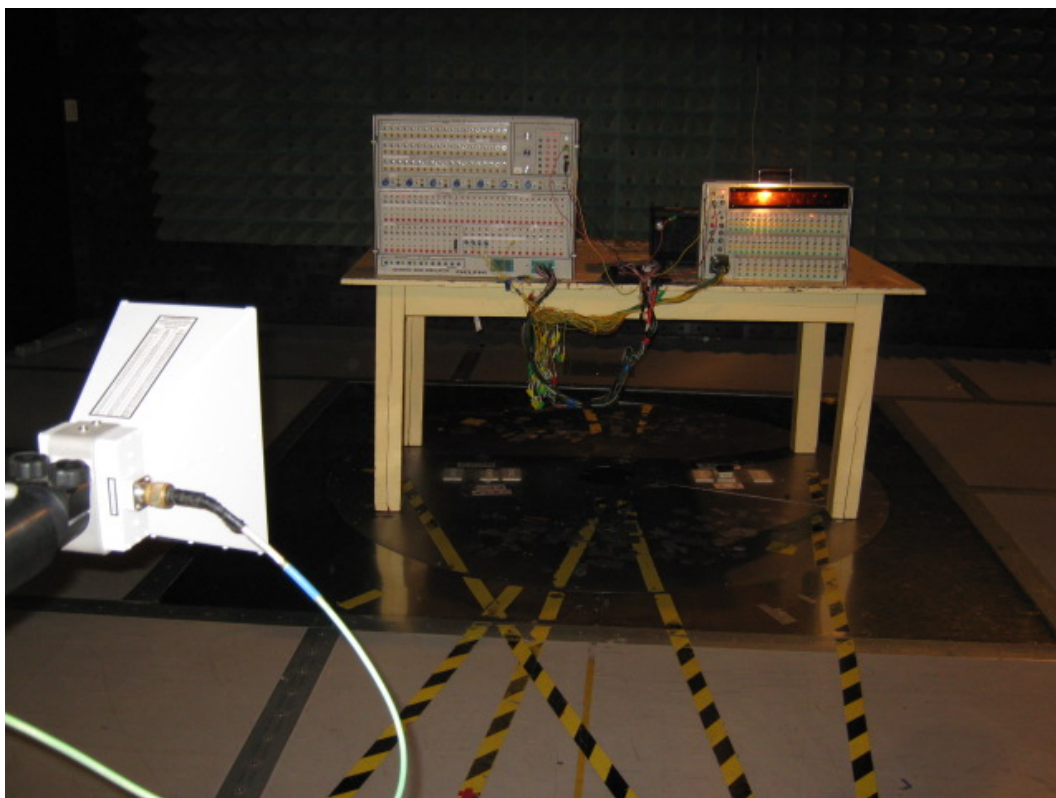
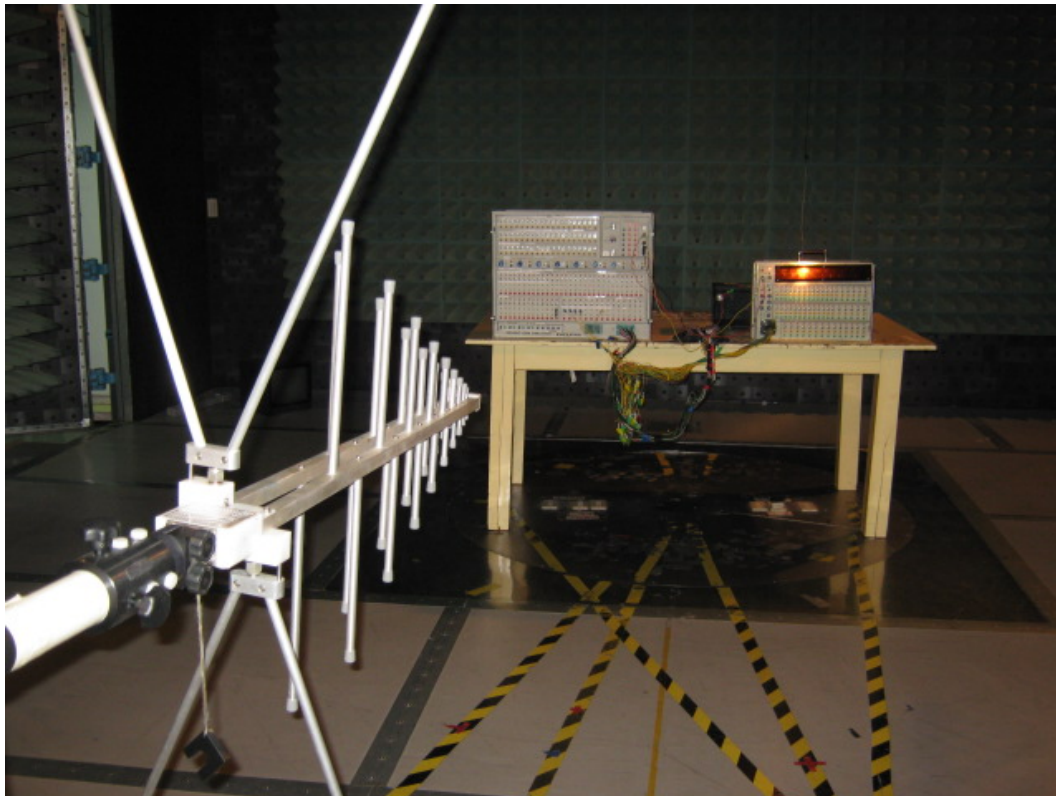
<b>ANTENNA POLARITY &amp; test distance: VERTICAL at 3 m</b>									
No.	Freq. (MHz)	Detector	Factor (dB)	Reading (dbuv/m)	Emission (dbuv/m)	Limit (dbuv/m)	Margin (dB)	Tower cm	Table deg
1	1260.00	PK	29.45	12.84	42.29	74.00	-31.71	100	357
1	1260.00	AV	29.45	1.36	30.81	54.00	-23.19	100	357
2	1575.00	PK	29.35	11.25	40.60	74.00	-33.40	100	32
2	1575.00	AV	29.35	0.28	29.63	54.00	-24.37	100	32
3	1890.00	PK	29.82	11.24	41.06	74.00	-32.94	100	0
3	1890.00	AV	29.82	0.61	30.43	54.00	-23.57	100	0
4	2205.00	PK	32.93	12.13	45.06	74.00	-28.94	100	357
4	2205.00	AV	32.93	0.65	33.58	54.00	-20.42	100	357
5	2520.00	PK	32.81	11.69	44.50	74.00	-29.50	100	350
5	2520.00	AV	32.81	0.90	33.71	54.00	-20.29	100	350
6	2835.00	PK	33.29	11.69	44.98	74.00	-29.02	100	352
6	2835.00	AV	33.29	1.16	34.44	54.00	-19.56	100	352
7	3150.00	PK	33.92	12.33	46.25	74.00	-27.75	100	0
7	3150.00	AV	33.92	0.64	34.57	54.00	-19.43	100	0

REMARKS:

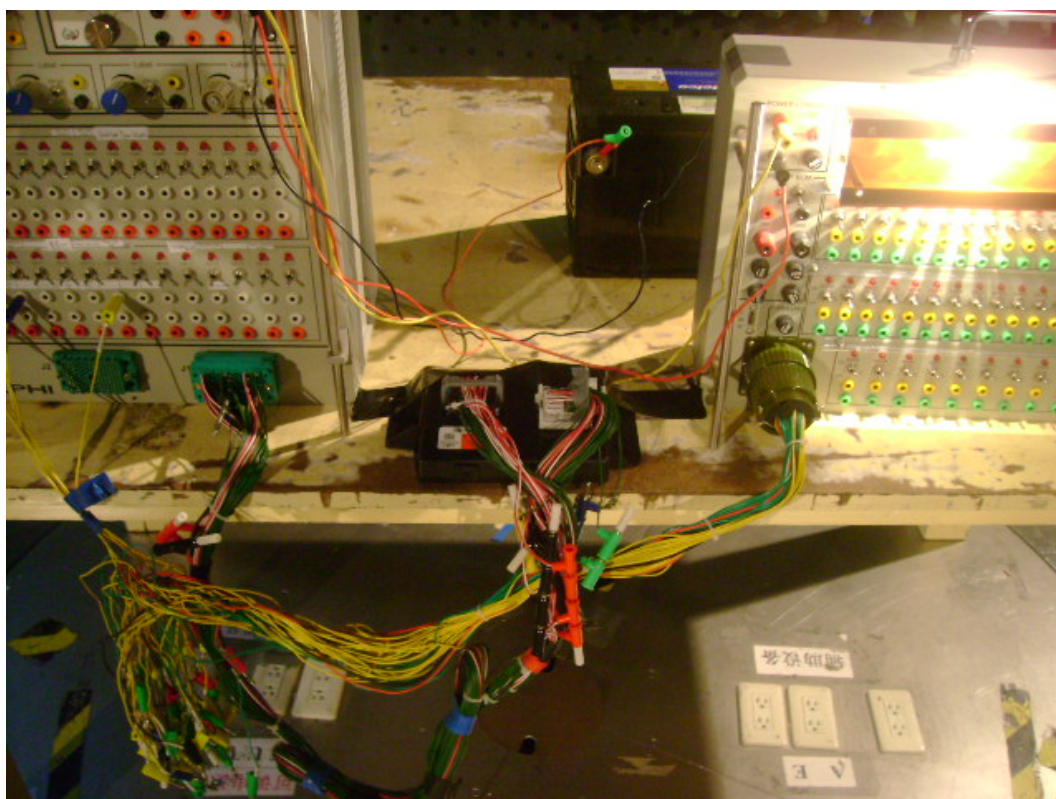
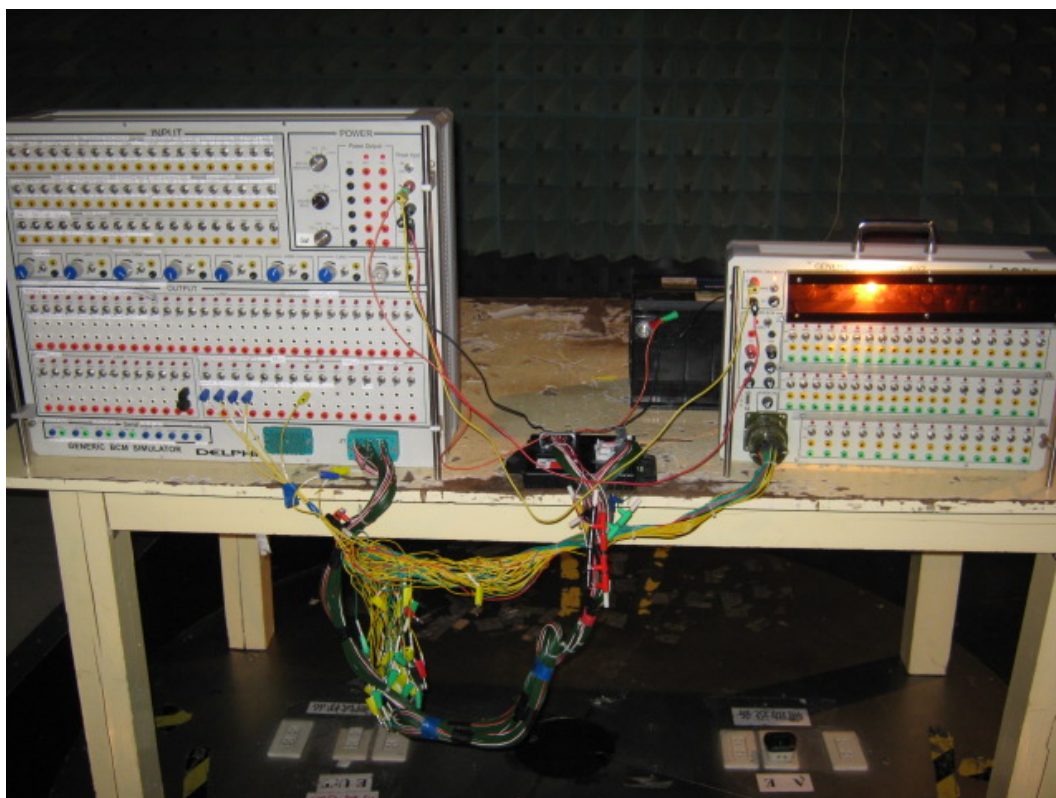
1. Emission level (dBUV/m) = Raw Value (dBUV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

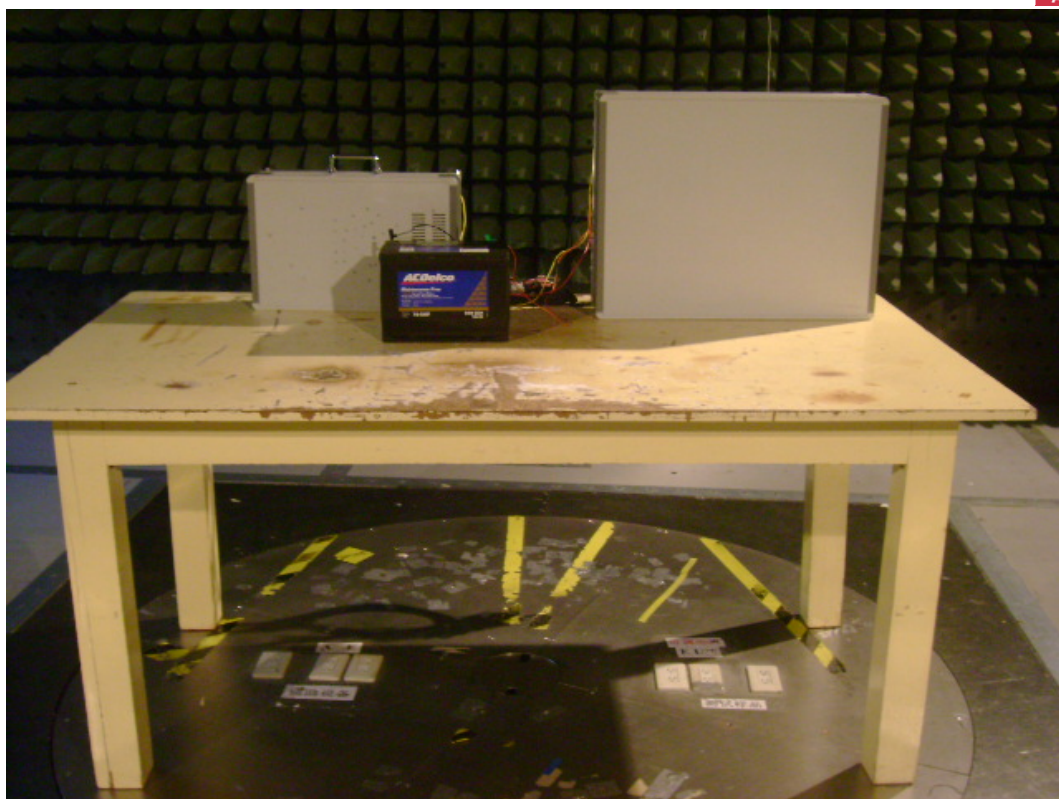
## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

### RADIATED EMISSION TEST









## 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 according to ISO/IEC 17025:

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).

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

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**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: 886-3-3185050

**Email:** [service@adt.com.tw](mailto:service@adt.com.tw)

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

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



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## **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 ---**