



**FCC 47 CFR PART 15 SUBPART B**

**TEST REPORT**

**FOR**

Gaming mouse

Model : Corsair Vengeance M90 gaming mouse

Trade Name: Corsair

Issued to

DEXIN Corporation

14F-8, NO 258, Lian Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

Issued by

Global Certification Corp.

<b>EMC Test Site</b>	<b>Xizhi Office and Lab</b>	<b>No.146, Sec. 2, Xiangzhang Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)</b>
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**1. GENERAL INFORMATION**

**Applicant** : DEXIN Corporation

**Address** : 14F-8, NO 258, Lian Cheng Rd., Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

**Manufacturer** : DEXIN ELECTRONIC.

**Address** : ShiTan Pu Industrail, Tangxia Town, Donggun, Guangdong, China

**EUT** : Gaming mouse

**Model Name** : Corsair Vengeance M90 gaming mouse

**Model Differences** : N/A

Is herewith confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart B and CISPR PUB. 22 and the measurement procedures were according to ANSI C63.4-2003. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

**FCC part 15 subpart B**                      **ICES-003**                      **Class B**

Receipt Date : 10/05/2011

Final Test Date : 10/17/2011

**Tested by:**

**Reviewed by:**

**Oct. 17, 2011**

**Oct. 17, 2011**

(Date)

Jason Yeh / Vice Manager

(Date)

Alex Chou / Manager

Designation Number: TW1030





### **1.3 TEST METHODOLOGY**

#### **EUT SYSTEM OPERATION**

1. The EUT was configured according to ANSI C63.4 – 2003 Section 5.2, 7.1, 7.2 & CISPR 22 - 2005.
2. Photos of test configuration please refer to appendix 1.
3. Connect the EUT to PC.
4. Perform the EMC testing procedures.
5. Measure the maximum emission noise.



**1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS**

**Setup Diagram**

See test photographs attached in appendix I for the actual connections between EUT and support equipment.

**Support Equipment**

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	PC	A13	L3AB112	R33B65	leveno	N/A	Unshielded 1.8m
2.	MONITOR	2212Ph	E9379JA0 00842	R33037	AOC	Shielded 1.8m	Unshielded 1.8m
3.	PRINTER	STYLUS PHOTO750	BDEK017 629	3872P011	EPSON	Shielded 1.8m	Unshielded 1.8m
4.	USB storage	TS2GJFV3 0	156511-64 00	DOC/ D33193	TRANSCE ND	Shielded 1m	N/A
5.	KEY BOARD	ACK-260V	N/A	T51160	Solid Year	Shielded 1.8m/USB	N/A
EUT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	Main Board-1	FZ-DE3220 72	ML206AA XG-SW1	N/A	N/A	N/A	N/A
2.	Main Board-2	FZ-DE3220 72	ML206AA XG-SW2	N/A	N/A	N/A	N/A
3.	Main Board-3	FZ-DE3220 72	ML206AA XG-Encoder	N/A	N/A	N/A	N/A
4.	Main Board-4	FZ-DE3220 72	ML206AA XG-MAIN	N/A	N/A	N/A	N/A
5.	Main Board-5	FZ-DE3220 72	N/A	N/A	N/A	N/A	N/A

**Note:** All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

**Grounding:** Grounding was in accordance with the manufacturer’s requirement and conditions for the intended use.

**1.5 FEATURES OF EUT: PLEASE REFER TO USER MANUAL OR PRODUCT SPECIFICATION.**



## 2. INSTRUMENT AND CALIBRATION

### 2.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 2.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLE 1 LIST OF TEST AND MEASUREMENT EQUIPMENT**

Conducted Emission Measurement					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
EMC Test Receiver	R&S	ESCI	100438	Jun 29, 2012	
LISN	SCHAFFNER	NNB41	03/10026	Oct 20, 2012	For EUT
LISN	EMCO	3825/2	9001-1589	Nov 10, 2011	For Support Unit
RF Cable	Huber+Suhner	RG223/U	001	Nov 11, 2011	
50ohm Terminal	N/A	50Ω	QC-TM001	Sep 10, 2012	
Impedance Stabilization	Teseq GmbH	ISN T8	23334	May 18, 2012	
Radiated Emission Measurement					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
EMC Test Receiver	LIG NEX1	ER-265	L0907B006	Oct 01, 2012	



Bilog Antenna	SUNOL	JB1	A052204	Nov 10, 2011	
Turn table	EMCO	2080	9508-1805	N/A	
Controller	EMCO	2090	9804-1328	N/A	
Preamplifier	WIRELESS	FPA6592G	60017	May 11, 2012	
RF Cable	JYE BAO	RG214/U	25M-002	Nov 10, 2011	
Thermo-Hygro meter	WISEWIND	4-INU-1	050100378	Dec 01, 2011	
Double Ridged Guide HORN ANTENNA	SCHWRZBECK	BBHA 9120D	491	Nov 10 2011	
Microwave Preamplifier	SCHWRZBECK	BBV 9718	9718-008	Sep 01 2012	
Microflex Cable	HUBER SUHNER	SUCOFLEX 104	302339/4	Jun 02 2012	
Microflex Cable	HUBER SUHNER	SUCOFLEX 104	n/a	Sep 01 2012	

✧ Calibration interval of instruments listed above is one year

### 2.3 TEST PERFORMED

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver which bandwidth is set at 9KHz.

Radiated emissions were investigated over the frequency range from 30MHz to 1000MHz using a receiver which bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 10meters.

### 2.4 APPENDIX

#### Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

The measurements are performed in a Global lab's room; The EUT was placed on non-conductive 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Powers to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.





If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

## **Appendix B: Test Procedure for Radiated Emissions**

### **Preliminary Measurements in the Anechoic Chamber**

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is 1m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

### **Measurements on the Open Site or Chamber**

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipments are set up on the turntable. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both readings are recorded with the quasi-peak detector with 120KHz bandwidth. For frequency between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.



## **Appendix C: Warning Labels**

### **Label Requirements**

A Class B digital device subject to certification by the FCC shall carry a warning label which includes the following statement:

**\*\*\* WARNING \*\*\***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## **Appendix D: Warning Statement**

### **Statement Requirements**

The operator's manual for a Class A digital device shall contain the following statements or their equivalent:

**\*\*\* WARNING \*\*\***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

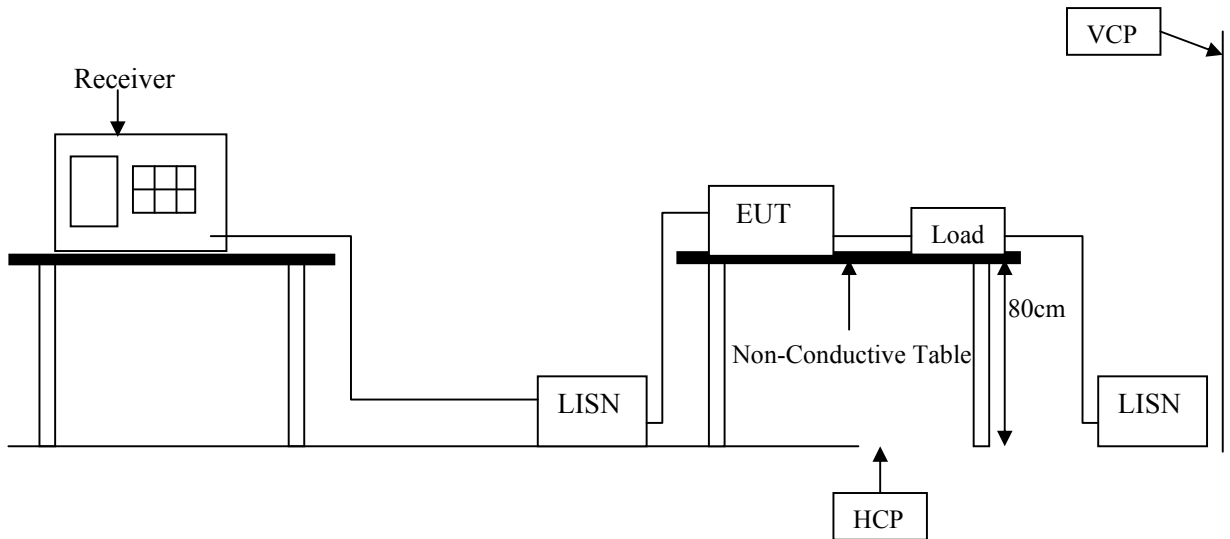
\* \* \* \* \*

If the EUT was tested with special shielded cables the operator's manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

### 3. CONDUCTED EMISSION MEASUREMENT

#### 3.1 TEST SET-UP (PLEASE REFER TO APPENDIX 1)



#### 3.2 LIMIT

Frequency range (MHz)	CLASS A		CLASS B	
	QP dB(uV)	Average dB(uV)	QP dB(uV)	Average dB(uV)
0.15-0.5	79 dBuV	66 dBuV	66 - 56 dBuV	56 - 46 dBuV
0.5-5.0	73 dBuV	60 dBuV	56 dBuV	46 dBuV
5.0-30.0	73 dBuV	60 dBuV	60 dBuV	50 dBuV

Remark: In the above table, the tighter limit applies at the band edges.

#### 3.3 TEST PROCEDURE

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50  $\mu$ H coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50  $\mu$ H coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to CISPR22 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter is set at 9KHz



**3.4 TEST SPECIFICATION**

ANSI C63.4 – 2003 Section 5.2, 7.1, 7.2 & CISPR 22 – 2005 CLASS B

**3.5 RESULT: PASSED**

EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

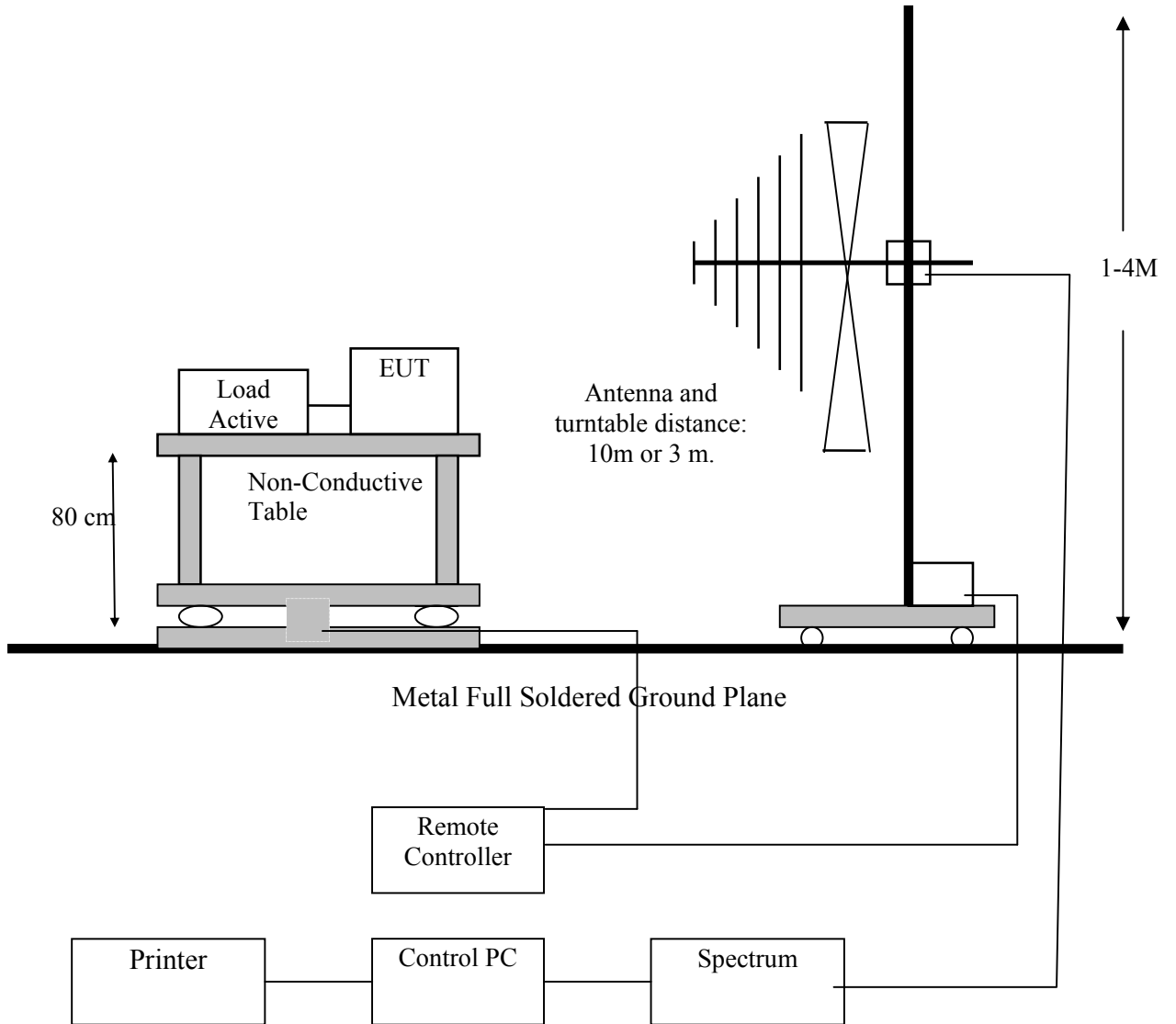
Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

**3.6 TEST DATA:**

**Please refer to appendix 2.**

#### 4. RADIATED EMISSION MEASUREMENT

##### 4.1 TEST SETUP (PLEASE REFER TO APPENDIX 1)





**4.2 LIMIT**

Frequency MHz	Class A		Class B	
	Distance (Meter)	Limit dB $\mu$ V/m	Distance (Meter)	Limit dB $\mu$ V/m
30 ~ 230	10	40	10	30
230 ~ 1000	10	47	10	37

Remark: In the above table, the tighter limit applies at the band edges

**4.3 TEST PROCEDURE**

The EUT and its simulators are placed on turn table, non-conductive and wooden table, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 10 meters.

The antenna is moved up and down between 1 meter to 4 meter to receive the maximum emission level.

Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be manipulated according to CISPR regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120 KHz when the frequency range is below 1GHz

**4.4 TEST SPECIFICATION**

ANSI C63.4 – 2003 Section 5.2, 7.1, 7.2 & CISPR 22 – 2005 CLASS B

**4.5 RESULT: PASSED**

The radiated mission test was passed at minimum margin :  
Vertical 240.64 MHz/ 30.34 dBuV/m, Antenna Height 1.6 Meter,  
Turn Table 175 degree.

**4.6 TEST DATA:**

**Please refer to appendix 2.**



### 5. MODIFICATION LIST FOR EMC COMPLYING TEST

The modification is solely made by the applicant.

Appendix

Appendix A: Summary of Test Result

Appendix B: The test photograph of EUT

Appendix C: The Detail Photograph of EUT

Appendix A: Summary of Test Result

\*\*\*\* EMC Test Result: The EUT has been pass the all measurements. \*\*\*\*

The uncertainty is calculated in accordance with CISPR16-4-2, the total uncertainty for this test is as follows:

#### Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Receiver reading	Normal (k=2)	±0.2
Cable loss	Normal (k=2)	±0.1
AMN insertion loss	Rectangular	±0.2
RCV/SPA specification	Rectangular	±0.9
combined standard uncertainty Ue(y)	normal	±1.0
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±2.0

#### Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	30MHz~1GHz
Receiver reading	Normal (k=2)	±0.2
Cable loss calibration	Normal (k=2)	±0.1
Antenna factor calibration	Rectangular	±0.4
Pre Amplifier Gain calibration	Rectangular	±0.3
RCV/SPA specification	Rectangular	±0.9
combined standard uncertainty Ue(y)	normal	±1.1
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±2.2



**SAMPLE OF FCC VERIFICATION LABEL 1**

This device complies with part 15 of the FCC Rules.  
Operation is subject to the following two conditions: (1)  
This device may not cause harmful interference. And (2)  
this device must accept any interference received, including  
interference that may cause undesired operation.

**SAMPLE OF FCC DOC LABEL 2**



Trade Name  
Model Number





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## **Appendix 1**

### **PHOTOS OF TEST CONFIGURATION**

01 CE Front View



02 CE Rear View



03 RE Front View



04 RE Rear View





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## **Appendix 2**

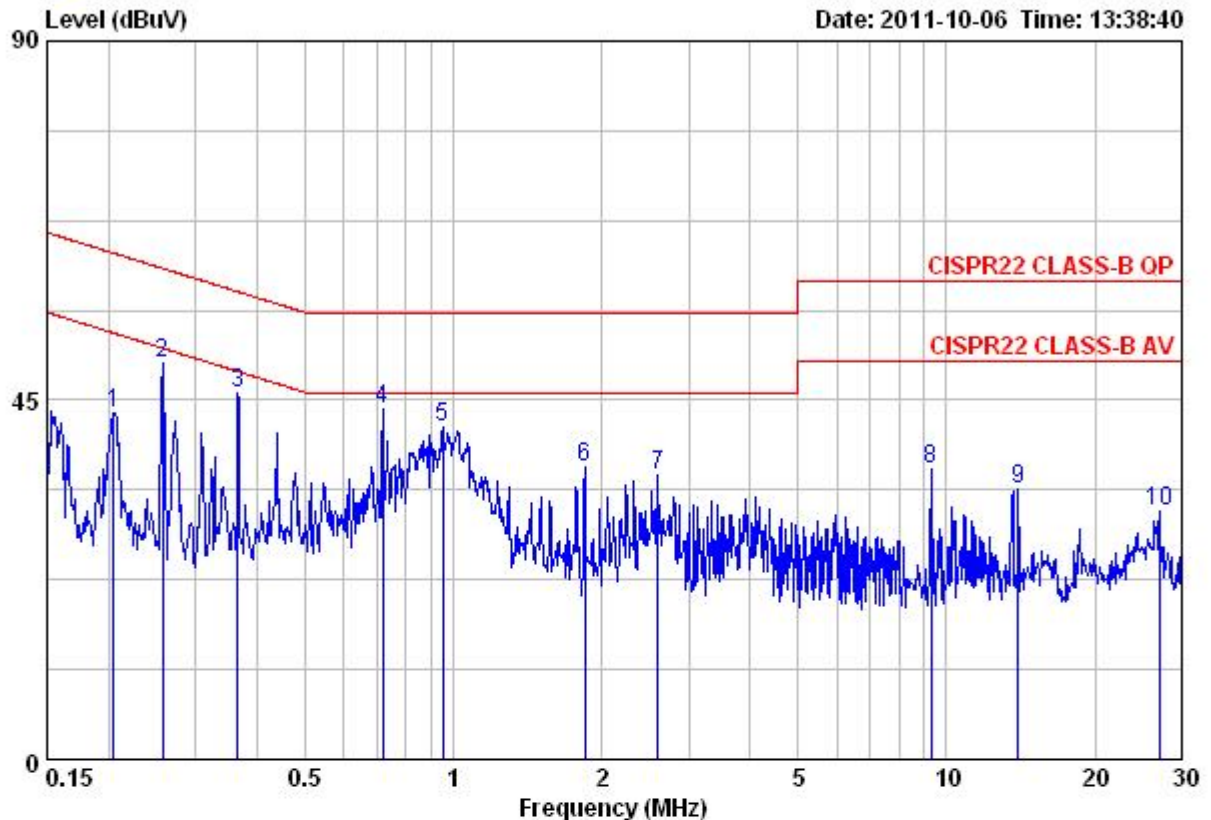
### **TEST DATA**



Data: 3

File: C:\測試數據\CON TEST\2011年\10月份\100501\100501.EM6 (6)

Date: 2011-10-06 Time: 13:38:40



Site : Conducted  
Condition : CISPR22 CLASS-B OP CON-LISN-99 NEUTRAL  
: RBW:9KHz VBW:300KHz SWT:Auto  
EUT : Please refer to page 1 of report  
MODEL : Please refer to page 1 of report  
MEMO :  
T/H : 26 ℃ 58%

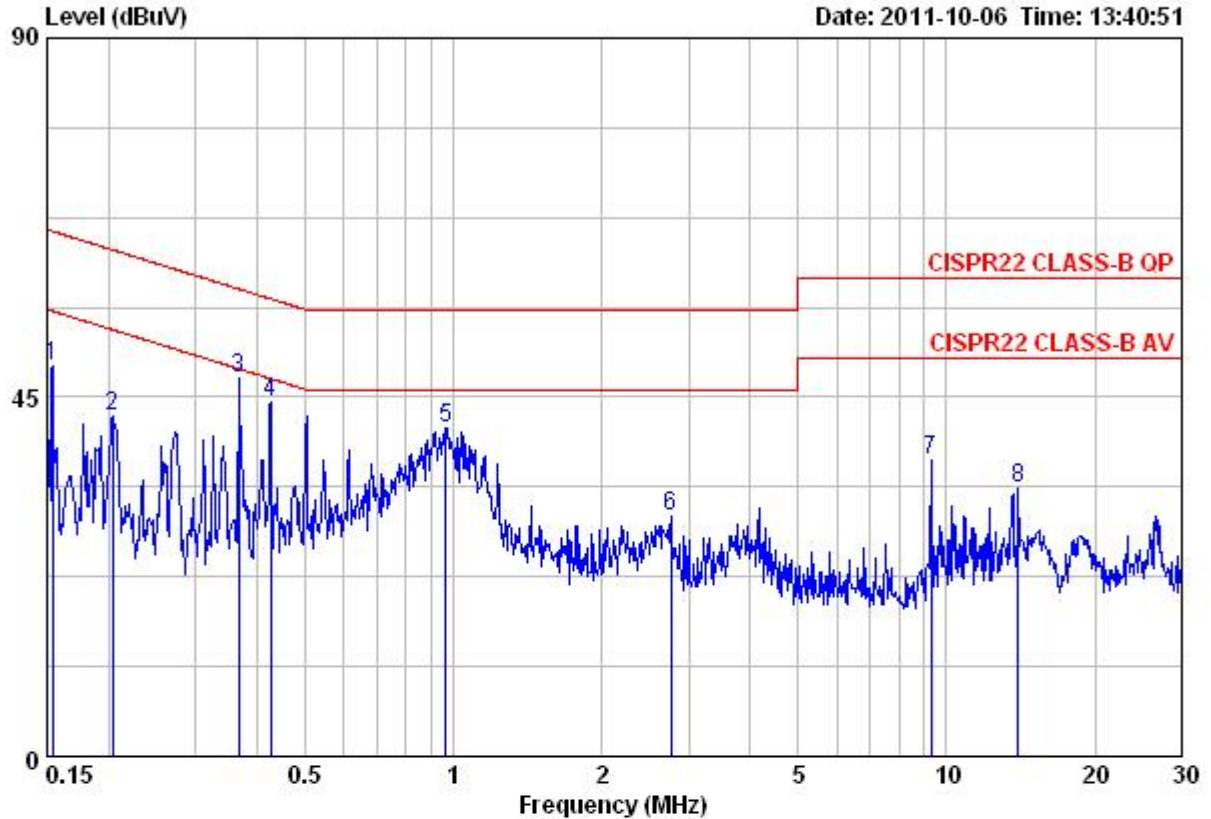
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.21	32.13	11.14	43.27	63.40	-20.13	Peak
2	0.26	38.57	11.14	49.71	61.51	-11.80	Peak
3	0.37	34.63	11.13	45.76	58.61	-12.85	Peak
4	0.72	32.67	11.12	43.79	56.00	-12.21	Peak
5	0.95	30.46	11.12	41.58	56.00	-14.42	Peak
6	1.85	25.58	11.13	36.71	56.00	-19.29	Peak
7	2.59	24.46	11.12	35.58	56.00	-20.42	Peak
8	9.30	25.35	11.10	36.45	60.00	-23.55	Peak
9	13.99	22.74	11.05	33.79	60.00	-26.21	Peak
10	26.98	20.20	10.79	30.99	60.00	-29.01	Peak



Data: 4

File: C:\測試數據\CON TEST\2011年\10月份\100501\100501.EM6 (6)

Date: 2011-10-06 Time: 13:40:51



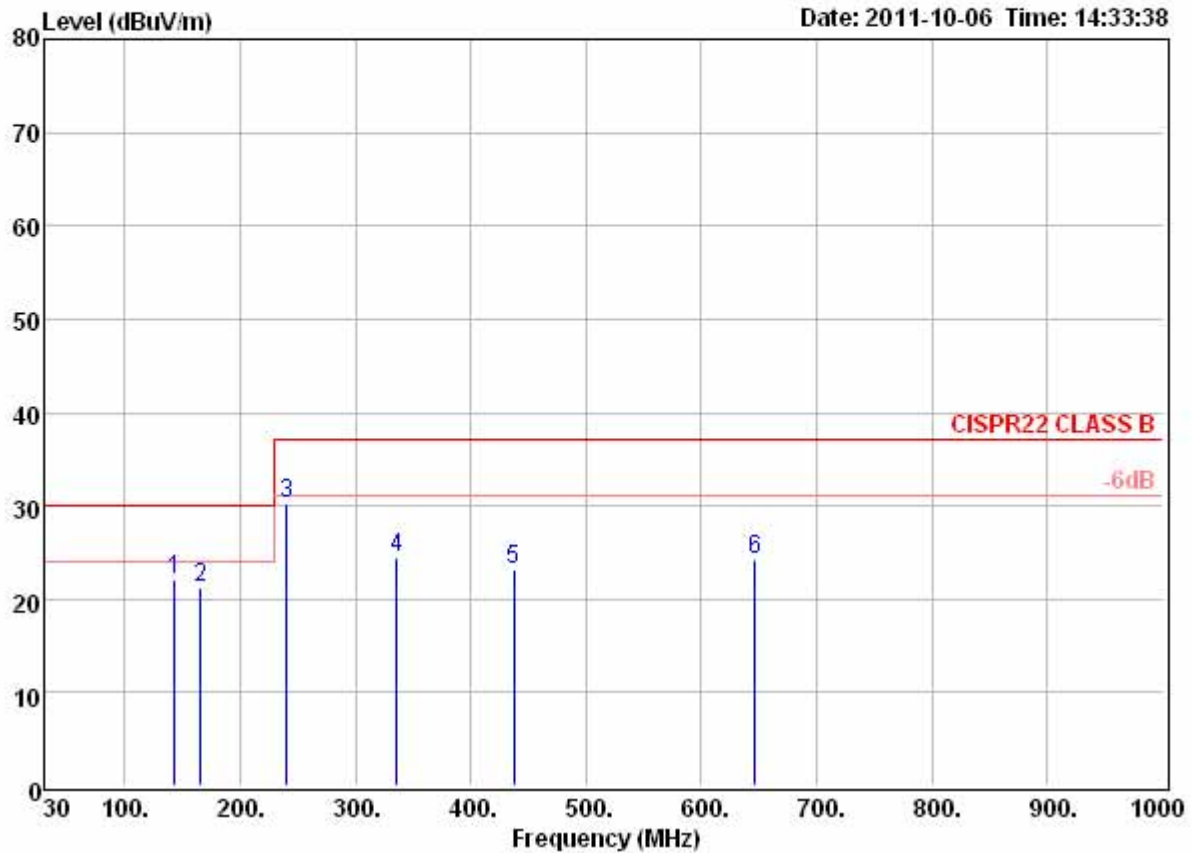
Site : Conducted  
Condition : CISPR22 CLASS-B OP CON-LISN-99 LINE  
: RBW:9KHz VBW:300KHz SWT:Auto  
EUT : Please refer to page 1 of report  
MODEL : Please refer to page 1 of report  
MEMO :  
T/H : 26 °C 58%

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.15	38.76	10.25	49.01	65.78	-16.77	Peak
2	0.20	32.49	10.24	42.73	63.45	-20.72	Peak
3	0.37	37.11	10.25	47.36	58.56	-11.20	Peak
4	0.43	34.00	10.25	44.25	57.33	-13.08	Peak
5	0.96	30.87	10.25	41.12	56.00	-14.88	Peak
6	2.76	19.78	10.25	30.03	56.00	-25.97	Peak
7	9.30	26.89	10.25	37.14	60.00	-22.86	Peak
8	13.99	23.23	10.25	33.48	60.00	-26.52	Peak



Data: 3

File: D:\Andy\數據\100501.EM6 (6)



Site : OPEN SITE TEST SITE 1

Condition: CISPR22 CLASS B 10m JB1(30M-1G)-100 HORIZONTAL

EUT : Please refer to page 1 of report

MODE : Please refer to page 1 of report

MEMO :

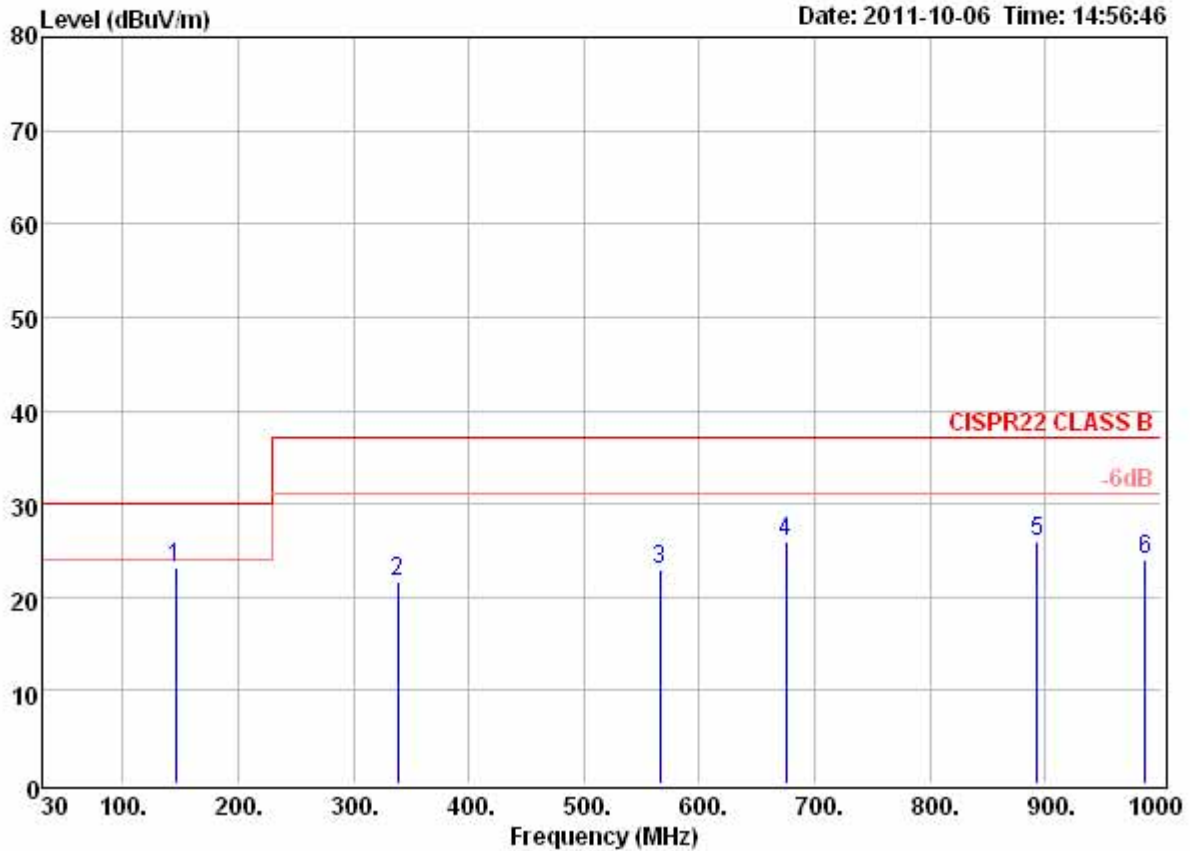
T/H : 26°C58%

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	143.58	34.69	-12.61	22.08	30.00	-7.92	QP
2	165.80	34.85	-13.70	21.15	30.00	-8.85	QP
3	240.64	43.65	-13.31	30.34	37.00	-6.66	QP
4	335.58	34.68	-10.14	24.54	37.00	-12.46	QP
5	437.50	30.14	-6.98	23.16	37.00	-13.84	QP
6	646.52	26.14	-1.90	24.24	37.00	-12.76	QP



Data: 4

File: D:\Andy\數據\100501.EM6 (6)



Site : OPEN SITE TEST SITE 1  
Condition: CISPR22 CLASS B 10m JB1(30M-1G)-100 VERTICAL  
EUT : Please refer to page 1 of report  
MODE : Please refer to page 1 of report  
MEMO :  
T/H : 26°C58%

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	145.46	35.80	-12.74	23.06	30.00	-6.94	QP
2	338.60	31.81	-10.06	21.75	37.00	-15.25	QP
3	565.44	26.66	-3.71	22.95	37.00	-14.05	QP
4	675.32	27.37	-1.34	26.03	37.00	-10.97	QP
5	893.15	22.49	3.51	26.00	37.00	-11.00	QP
6	986.42	18.20	5.83	24.03	37.00	-12.97	QP