



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E038R-048

Applicant : OPTICIS CO., LTD.

Address : Suite A 906-2, Techno-Park, 150 Yatap-Dong, Sungnam-City, Kyungki-Do,
463-070, Korea

Manufacturer : OPTICIS CO., LTD.

Address : Suite A 906-2, Techno-Park, 150 Yatap-Dong, Sungnam-City, Kyungki-Do,
463-070, Korea

Type of Equipment : Optical Graphic Extension Module (Class B Computing Device Peripheral)

FCC ID : PPNJWS030821KJW

Model Name : M1-2R2-TR

Multiple Model Name : M1-2RX-TR, M1-2RS-TR, M1-2RU-TR

Serial number : N/A

Total page of Report : 15 pages (including this page)

Date of Incoming : August 13, 2003

Date of Issuing : August 20, 2003

SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : OPTICIS CO., LTD.
- ADDRESS : Suite A 906-2, Techno-Park, 150 Yatap-Dong, Sungnam-City, Kyungki-Do, 463-070, Korea
- CONTACT PERSON : Mr. Wonseok, Jung / Principal Engineer
- TELEPHONE NO : +82-31-737-8033~9
- FCC ID : PPNJWS030821KJW
- MODEL NO/NAME : M1-2R2-TR
- SERIAL NUMBER : N/A
- DATE : August 20, 2003

DEVICE TYPE	Peripheral Device for Class B Computing Device - Unintentional Radiator
E.U.T. DESCRIPTION	Optical Graphic Extension Module
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. GENERAL INFORMATION

2.1 Product Description

The OPTICIS CO., LTD., Model M1-2R2-TR (referred to as the EUT in this report) is a Optical Graphic Extension Module that offers 100meters extension of high-resolution digital graphic data over fiber, directly connected between computers or media receivers and displays. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Metal
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	None
EXTENSION LIMIT	100m (330feet) for UXGA (1,6000x1,2000) at 60Hz refresh rate in ultimate operation.
POWER REQUIREMENT	DC12V, 3A from AC/DC Adaptor
NUMBER OF LAYERS	4 Layers

2.2 Model Differences:

- The difference(s) compared to the EUT is as follows:

	Model Name	Model Difference
Basic Model	M1-2R2-TR	
Added Model	M1-2RX-TR M1-2RS-TR M1-2RU-TR	Only type designation according to firmware inside of the EUT.

2.3 Related Submittal(s) / Grant(s)

Original submittal only



2.4 Test System Details

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
M1-2R2-TR	OPTICIS CO., LTD.	PPNJWS030821KJW	EUT (TX)	PC EUT (RX)
M1-2R2-TR	OPTICIS CO., LTD.	PPNJWS030821KJW	EUT (RX)	LCD Monitor EUT (TX)
AEC-3530	ANOMA ELECTRONIC CO., LTD	N/A	ADAPTOR	EUT
MP25	SAMSUNG	DOC	PC	-
SDM4600P	SAMSUNG	DOC	KEYBOARD	PC
MO42KO	SAMSUNG	DOC	MOUSE	PC
GH17US	SAMSUNG	DOC	LCD MONITOR	PC
AP04214-UV	SAMSUNG	N/A	ADAPTER	LCD Monitor
2225C	HP	DSI6XU2225	PRINTER	PC
020-0470	CARDINAL	GDE0196	MODEM	PC

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
TX MAIN BOARD	OPTICIS	M1-2U2-TX-10	N/A
RX MAIN BOARD	OPTICIS	M1-2U2-RX-10	N/A

3.2 EUT Operating Condition

- The EUT was connected between PC and LCD monitor with optical fiber and then the video data of the PC was continuously displayed on the screen of the LCD monitor.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Optical Graphic Extension Module (TX)	N	Y N (Fiber-Optic)	1.2 (P), 1.2 (D) 10 (D)
Optical Graphic Extension Module (RX)	N	Y N (Fiber-Optic)	1.2 (P), 1.2 (D) 10 (D)
AC/DC ADAPTER (for EUT)	N	N (DC OUT)	1.5 (P), 1.2 (D)
PC	N	-	1.5 (P), -
KEYBOARD	N/A	Y	1.3 (D)
MOUSE	N/A	Y	1.3 (D)
LCD MONITOR	N	Y	1.5 (P), 1.2(D)
ADAPTER (for LCD Monitor)	N	N (DC OUT)	1.5 (P), 1.2 (D)
PRINTER	N	Y	1.5 (P), 1.5 (D)
MODEM	N	Y	1.5 (P), 1.5 (D)

* The marked "(P)" means the Power Cable and "D" means the I/O Cable.



3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Optical Graphic Extension Module (TX)	Y	BOTH END	Y	BOTH END
	N	N/A (Fiber-Optic)	N	N/A (Fiber-Optic)
Optical Graphic Extension Module (RX)	Y	BOTH END	Y	BOTH END
	N	N/A (Fiber-Optic)	N	N/A (Fiber-Optic)
AC/DC ADAPTER (for EUT)	Y	EUT END	Y	EUT END
PC	-	-	-	-
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
LCD MONITOR	Y	BOTH END	Y	BOTH END
ADAPTER (for LCD Monitor)	N	N/A	Y	PC END
PRINTER	N	N/A	Y	BOTH END
MODEM	N	N/A	Y	BOTH END

3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There were no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test : The EUT was connected to PC and the power line of PC was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Remark: Conducted emission test was performed at each mode on AC/DC adaptor of the EUT and PC.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Connecting adapter on the EUT (TX) side	
Connecting adapter on the EUT (RX) side	
Power supply of the PC	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
The EUT transmit video data to LCD monitor.	X

**5. FINAL RESULT OF MEASUREMENT**

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

Humidity Level : 51 % Temperature : 20 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
 Type of Test : CLASS B
 Result : PASSED BY -2.74 dB at 8.30 MHz (at average mode)

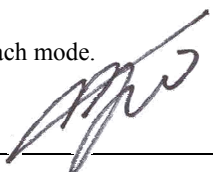
EUT : Optical Graphic Extension Module Date: August 21, 2003
 Operating Condition : Transmit video data to LCD monitor
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)
 Remark : Power supply of PC

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.46	H	46.52	56.69	-10.17
8.30	H	52.69	60.00	-7.31
8.90	H	52.03	60.00	-7.97
13.41	N	48.06	60.00	-11.94
22.39	H	50.09	60.00	-9.91
26.96	H	46.72	60.00	-13.28
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.40	N	36.86	47.85	-10.99
8.30	H	47.26	50.00	-2.74
8.90	H	46.79	50.00	-3.21
22.39	N	46.54	50.00	-3.46

Line Conducted Emissions Tabulated Data

Remark : "H": Hot Line, "N": Neutral line, "P": Peak detect

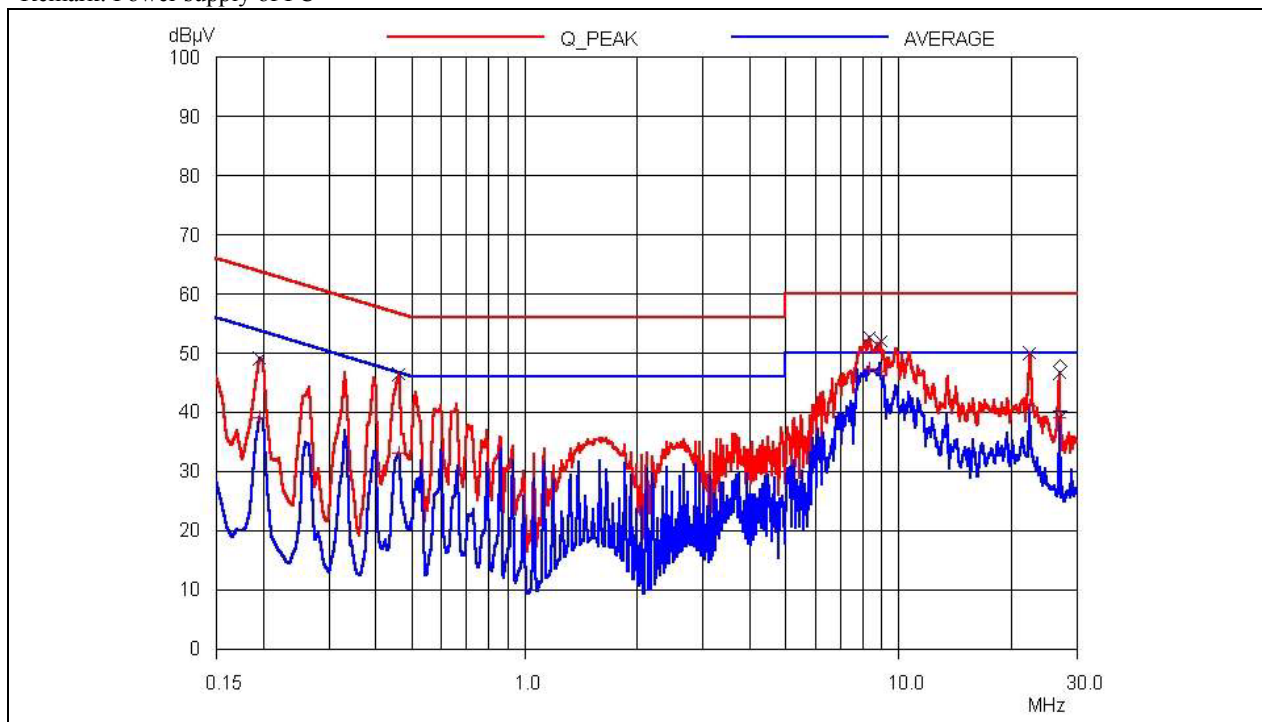
See next page for an overview sweep performed with peak and average detector at each mode.



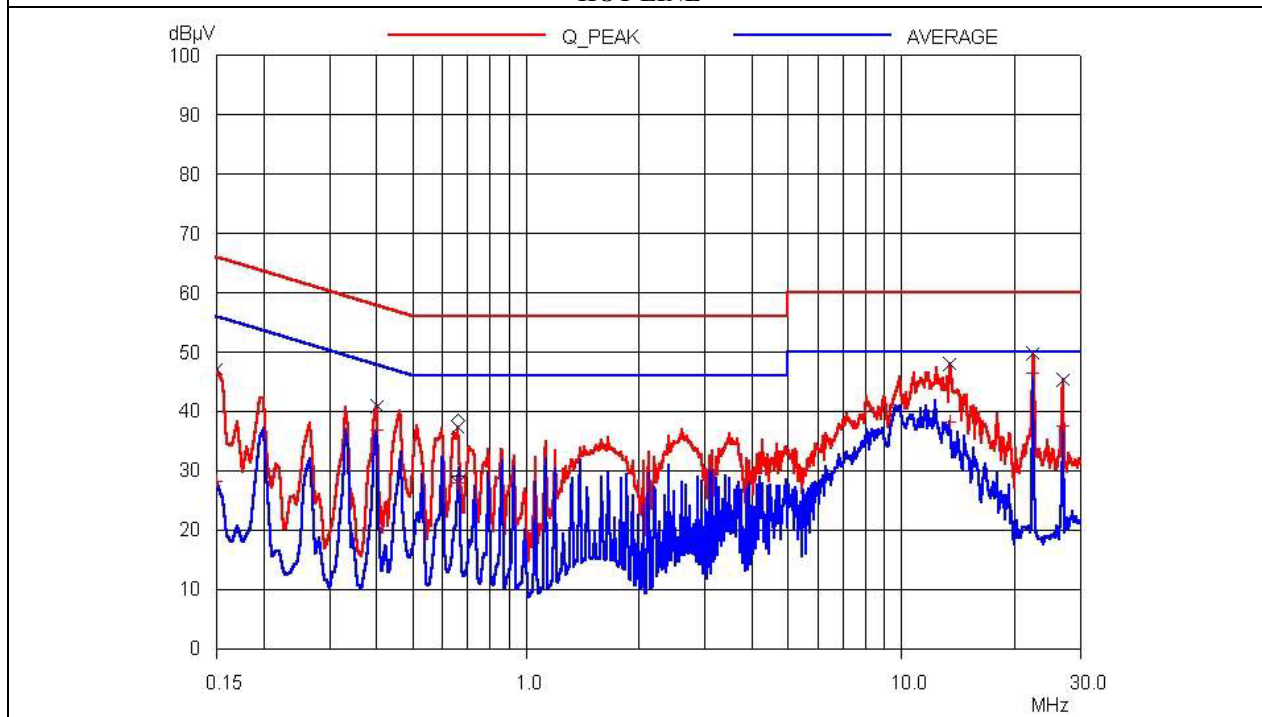
 Tested by: Eung-Chan, Kim / Test Engineer



Remark: Power supply of PC



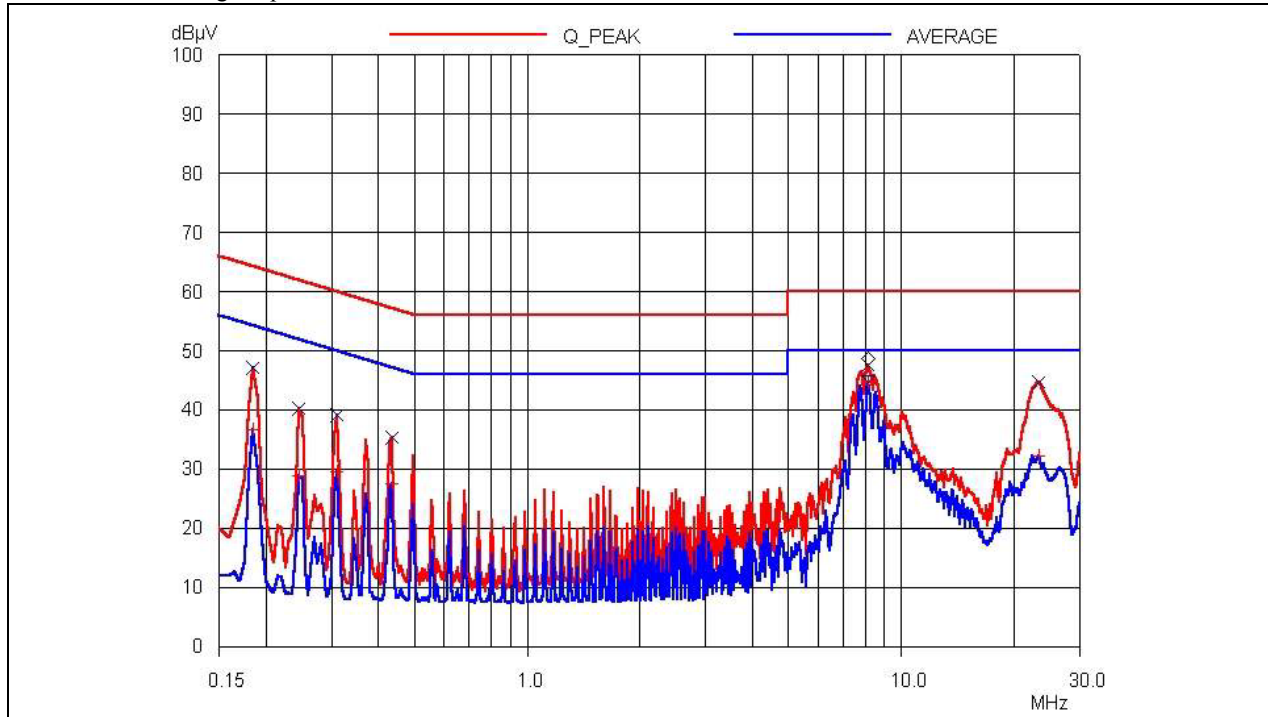
HOT LINE



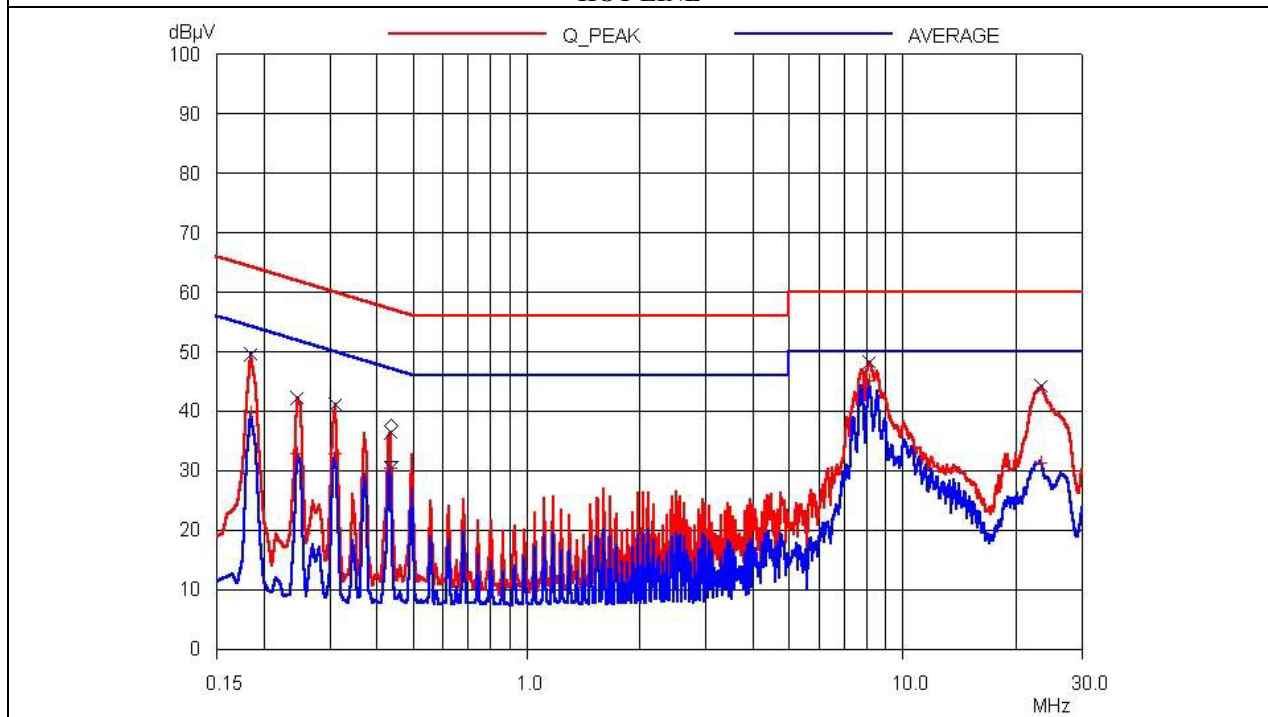
NEUTRAL LINE



Remark: Connecting adaptor on TX side of the EUT



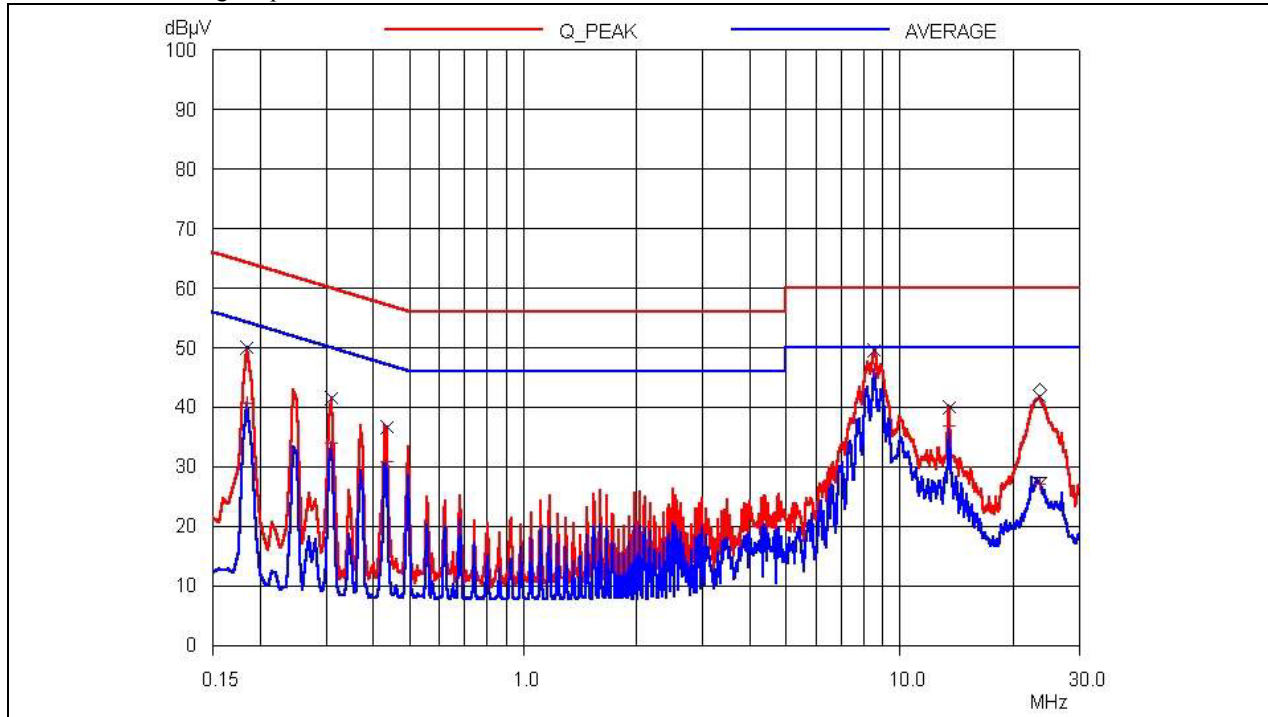
HOT LINE



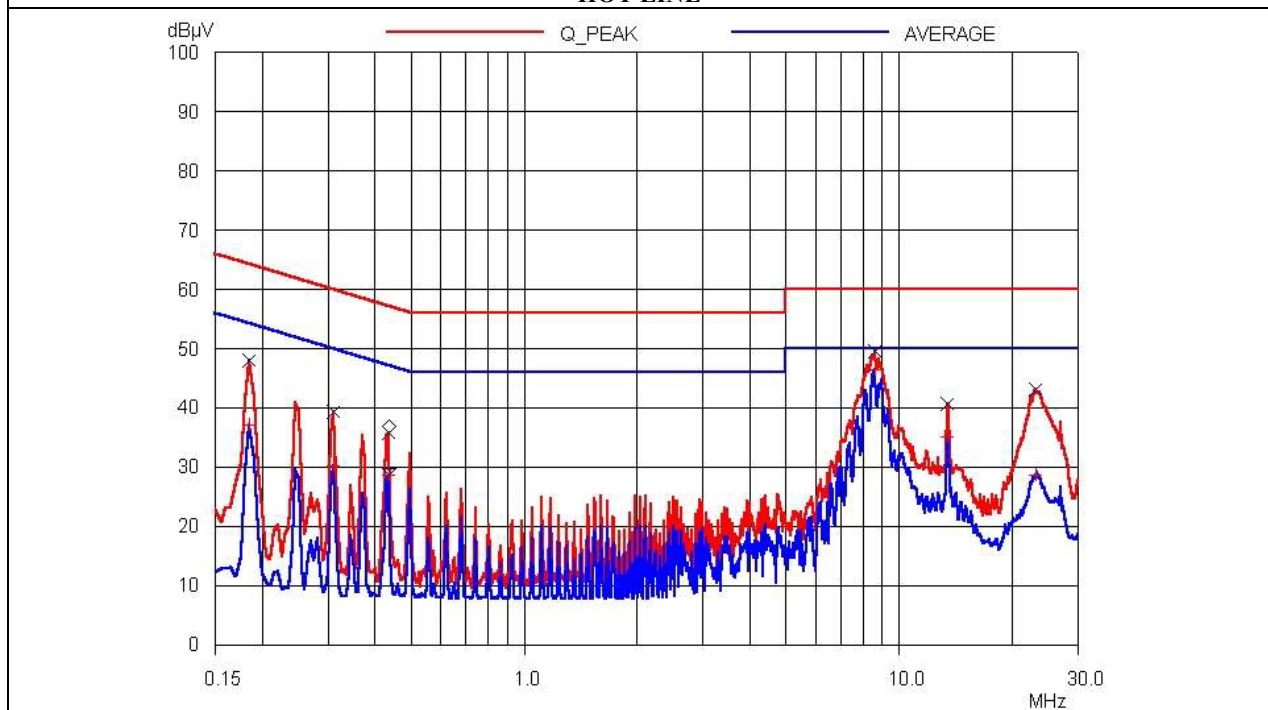
NEUTRAL LINE



Remark: Connecting adaptor on RX side of the EUT



HOT LINE



NEUTRAL LINE

**5.2 Radiated Emission Test**

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 49 % Temperature : 23 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
 Type of Test : CLASS B
 Result : PASSED BY -4.62 dB at 541.65 MHz

EUT : Optical Graphic Extension Module Date: August 19, 2003
 Operating Condition : Transmit video data to LCD monitor
 Frequency of Emission : 30MHz – 1000MHz
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
107.52	23.65	V	11.41	0.59	35.65	43.52	-7.87
137.56	19.50	V	14.34	0.60	34.44	43.52	-9.08
324.59	24.65	H	14.03	0.96	39.64	46.02	-6.38
401.14	23.70	H	15.78	0.80	40.28	46.02	-5.74
541.65	21.89	H	18.38	1.13	41.40	46.02	-4.62
973.82	20.20	V	22.30	1.40	43.90	53.97	-10.07

Radiated Emissions Tabulated Data

Tested by: Eung-Chan, Kim / Test Engineer



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**7. LIST OF TEST EQUIPMENT**

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	NOV/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	MAY/03	12MONTH	■
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/03	12MONTH	■
				9109-4444	JUL/03		
		Schwarzbeck	VHA9103	91031852	AUG/02		
9.	Log Periodic antenna	EMCO	3146	9109-3213	AUG/02	12MONTH	■
				9109-3214	JUL/03		
				9109-3217	MAY/03		
10.	LISN	EMCO	3825/2	9109-1867	AUG/03	12MONTH	■
				9109-1869	OCT/02		■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■