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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E01OR-005

Applicant : JACE TECH INC.

Address : 9th Floor, Hyundai Office, 9-4 Soonae-Dong, Bundang-Ku, Seongnam City, Kyungki-Do,
Korea

Manufacturer : JACE TECH INC.

Address : 9th Floor, Hyundai Office, 9-4 Soonae-Dong, Bundang-Ku, Seongnam City, Kyungki-Do,
Korea

Type of Equipment : VGA Card

FCC ID : K37JC9960

Model / Type No. : JC9960

Serial number : None

Total page of Report : 13 pages (including this page)

Date of Incoming : Sep 26, 2001

Date of issuing : October 4, 2001

SUMMARY

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

This test report contains only the result 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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Reviewed by:

Y. K. Nam / Assist. Chief Engineer
EMC Dept.
ONETECH Corp.

Approved by:

Y. K. Kwon / Chief Engineer
EMC Dept.
ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

APPLICANT : JACE TECH INC.
 ADDRESS : 9th Floor, Hyundai Office, 9-4 Soonae-Dong, Bundang-Ku, Seongnam City, Kyungki-Do, Korea
 CONTACT PERSON : K. N. Jeon / General Manager
 TELEPHONE NO : +82-31-710-6571
 FCC ID : K37JC9960
 MODEL NO/NAME : JC9960
 SERIAL NUMBER : None
 DATE : October 4, 2001

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

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.



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2. GENERAL INFORMATION

2.1 Product Description

The JACE TECH INC., Model JC9960 (referred to as the EUT in this report) is a VGA Card which supports AGP 2X/4X mode and built-in a high performance H/W 3D setup engine and the utilities and drivers supplied with the card provide support for additional features, such as greater speed, higher resolution, and more available colors. Product specification described herein was obtained from product data sheet or user's manual.

MEMORY	32M SDRAM
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	14.31818 MHz
MAX. RESOLUTION	1600 x 1200, 85Hz
POWER REQUIREMENTS	DC +12V,+5V,+3.3V,+1.5V supplied from main board
NUMBER OF LAYERS	4 Layers
EXTERNAL CONNECTOR	VGA Port, LCD Port

Model Differences:

-. The following list consists of added model name and their difference. The basic and added models are identical except for model name.

	Model Name	Model Difference
Basic Model Name	JC9960	-
Added Model Name	DVI-I	Model name for LCD Port

2.2 Related Submittal(s) / Grant(s)

Original submittal only

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2.3 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
JC9960	JACE TECH INC.	K37JC9960	VGA Card (EUT)	MONITOR
KDT-3861	KDS	EVOKDT-3863	PC	-
150P	PHILIPS	DoC	LCD MONITOR	EUT
CPD-G220	SONY	DoC	VGA MONITOR	EUT
SKR-1032	SEJIN Elec	GJJKR-1032B	KEYBOARD	PC
9532	ARTEC.	ITEUECMN9532	MOUSE	PC
2225C	HP	DSI6XU2225	PRINTER	PC
020-0470	CARDINAL	GDE0196	MODEM	PC

2.4 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.

2.5 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 12, 1999. (Registration Number: 92819)



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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: None

3.2 EUT exercise Software

The EUT was installed into an AGP slot on the main board in a personal computer and then following window program exercised for getting maximum levels from the EUT. The EUT supports 2 video output ports for an analog and a digital signal. One port was connected to an analog VGA monitor and the other port was connected to a LCD monitor has DVI input.

The windows program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The series of “H” characters are displayed on the LCD monitor and VGA monitor simultaneously until the screen is completely full and print series of “H” characters to printer. The complete cycle is repeated continuously.

The investigated resolution mode of the EUT were 1024 x 768, 85Hz for LCD monitor and 1600 x 1200, 85Hz for VGA monitor for getting maximum emission levels from the EUT.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
PC	N	-	1.5(P)
VGA MONITOR	N	Y	1.5(P), 1.2(D)
LCD MONITOR	N	Y	1.5(P), 1.2(D)
KEYBOARD	N/A	Y	1.5(D)
MOUSE	N/A	Y	1.2(D)
MODEM	N	Y	1.5(P), 1.5(D)
PRINTER	N	Y	1.5(P), 1.5(D)

* The marked “(P)” means the Power Cable, “(D)” means the Data Cable.

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3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
PC	-	-	-	-
VGA MONITOR	N	N/A	Y	EUT END
LCD MONITOR	N	N/A	Y	EUT END
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
MODEM	N	N/A	Y	BOTH END
PRINTER	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 was no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test: The EUT was installed into PCI slot on the main board in a personal computer 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.

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.

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4. PRELIMINARY TEST

4.1 Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Resolution: 640 x 480, 85Hz	
Resolution: 1024 x 768, 85Hz	
Resolution: 1280 x 1024, 85Hz	
Resolution: 1600 x 1200, 85Hz	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)
Resolution: 640 x 480, 85Hz	
Resolution: 1024 x 768, 85Hz	
Resolution: 1280 x 1024, 85Hz	
Resolution: 1600 x 1200, 85Hz	X



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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 : 53 %

Temperature : 24 °

Limits apply to : FCC CFR 47, PART 15, SUBPART B

Type of Test : CLASS B

Result : PASSED BY -10.02 dB at 15.70 MHz

EUT : VGA Card

Date: September 26, 2001

Operating Condition : Continuously "H" characters displayed on the screen of the monitor

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Power Line Conducted Emission			FCC CLASS B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)
0.53	30.32	NEUTRAL	48.00	-17.68
0.60	25.49	NEUTRAL	48.00	-22.51
10.05	28.23	HOT	48.00	-19.77
15.70	37.98	NEUTRAL	48.00	-10.02
17.17	37.55	NEUTRAL	48.00	-10.45
18.42	37.84	HOT	48.00	-10.16
24.01	27.75	NEUTRAL	48.00	-20.25

Line Conducted Emission Tabulated Data

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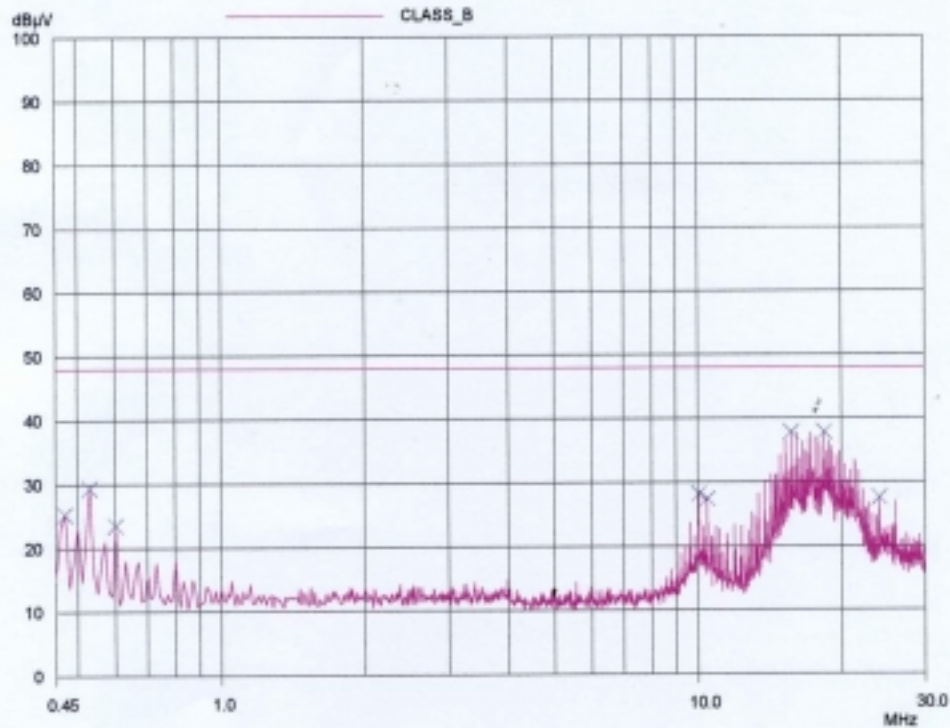
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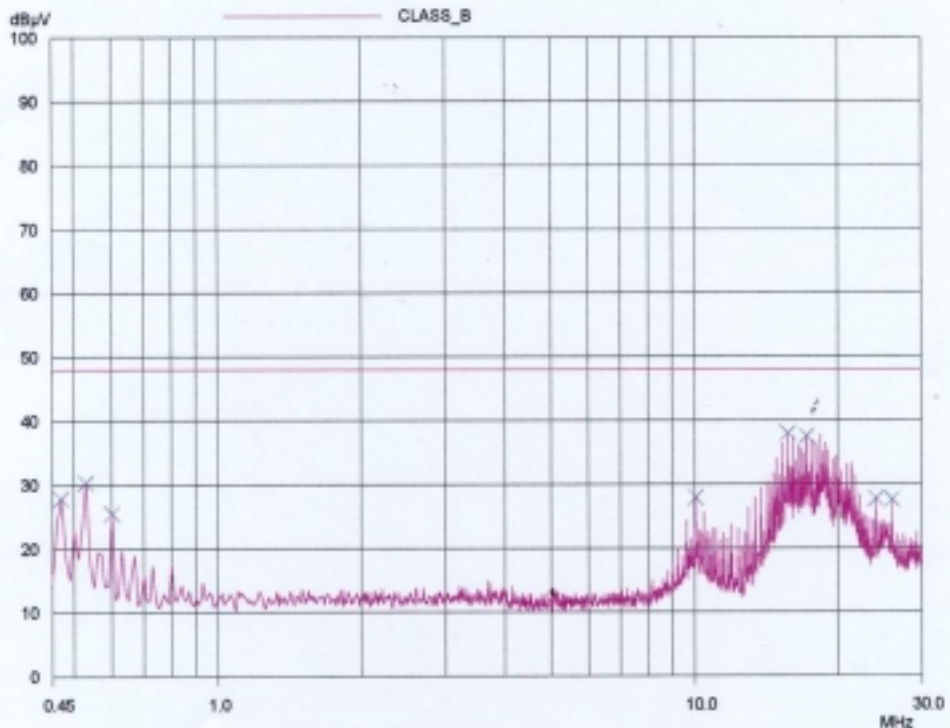
Tested by: Seung-Hyun, Nam / Test Engineer



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HOT LINE



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NEUTRAL LINE



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5.2 Radiated Emission Test

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

Humidity Level : 56 %

Temperature : 24•

Limits apply to : FCC CFR 47, PART 15, SUBPART B

Type of Test : CLASS B

Result : PASSED BY -12.86 Db

at 110.48 MHz

EUT : VGA Card

Date: September 29, 2001

Operating Condition : Continuously "H" characters displayed on the screen of the monitor

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Radiated Emission		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)
110.48	15.50	V	13.94	1.20	30.64	43.50	-12.86
136.03	11.90	V	12.99	1.29	26.18	43.50	-17.32
147.37	13.80	V	13.64	1.34	28.78	43.50	-14.72
226.75	10.50	H	10.76	1.71	22.97	46.00	-23.03
240.40	11.10	H	11.38	1.78	24.26	46.00	-21.74
260.80	12.60	H	12.33	1.86	26.79	46.00	-19.21

Radiated Emission Tabulated Data

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Tested by: Seung-Hyun, Nam / Test Engineer

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6. FIELD STRENGTH CALCULATION

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

$$\begin{aligned}
 &+ \text{ Meter reading} && (\text{dBuV}) \\
 &+ \text{ Cable Loss} && (\text{dB}) \\
 &+ \text{ Antenna Factor (Loss)} && (\text{dB/meter}) \\
 \hline
 &= \text{ Corrected Reading} && (\text{dBuV/meter}) \\
 &- \text{ Specification Limit} && (\text{dBuV/meter}) \\
 &= \text{ dB Relative to Spec} && (+/- \text{ dB})
 \end{aligned}$$

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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	OCT/00	12MONTH	
2.	Test receiver	R/S	ESHS10	834467/007	APR/01	12MONTH	
3.	Spectrum analyzer	HP	8568B	3026A0226	APR/01	12MONTH	
4.	RF preselector	HP	85685A	3107A01264	APR/01	12MONTH	
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/01	12MONTH	
6.	Dipole Antenna	EMCO	3121C	9107-745	JUN/00	12MONTH	
7.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	MAR/01	12MONTH	
8.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	JUN/01	12MONTH	
9.	LISN	EMCO	3825/2	9109-1867 9109-1869	JUN/01	12MONTH	
10.	RF Amplifier	HP	8447F	3113A04554	JUN/01	N/A	
11.	Spectrum Analyzer	HP	8591A	3131A02312	APR/01	12MONTH	
12.	Computer System	HP	98581C	98543A	N/A	N/A	
	Hard disk drive		9153C	CMC762Z9153	N/A	N/A	
13.	Plotter	HP	7475A	30052 22986	N/A	N/A	
14.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	
15.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	
16.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	