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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E015R-048

Applicant : Autodata System Co., Ltd.

Address : 465-7 Neadan-Ni, Kigye-Myun, Pohang-City, Kyung-Buk, 791-820, Korea

Manufacturer : Autodata System Co., Ltd.

Address : 465-7 Neadan-Ni, Kigye-Myun, Pohang-City, Kyung-Buk, 791-820, Korea

Type of Equipment : Multi Function Keyboard

FCC ID : PJBPFK-201S

Model / Type No. : PFK-201S

Serial number : N/A

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

Date of Incoming : May 11, 2001

Date of issuing : May 30, 2001

SUMMARY

The equipment complies with the regulation; **FCC CFR 47 PART 15 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.

Prepared by:

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

Reviewed by:

Y. K. Kwon / Chief Engineer
EMC Dept.

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ONETECH Corp.

ONETECH Corp.



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1. VERIFICATION OF COMPLIANCE

APPLICANT : Autodata System Co., Ltd.
 ADDRESS : 465-7 Neadan-Ni, Kigye-Myun, Pohang-City, Kyung-Buk, 791-820, Korea
 CONTACT PERSON : Young-Sik, Joung / Manager
 TELEPHONE NO : +82-54-246-9090
 FCC ID : PJBPFK-201S
 MODEL NO/NAME : PFK-201S
 SERIAL NUMBER : N/A
 DATE : February 24, 2001

DEVICE TYPE	Peripheral Device for Class B Computing Device -Unintentional Radiator
E.U.T. DESCRIPTION	Multi Function Keyboard
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

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 Autodata System Co., Ltd., Model PFK-201S (referred to as the EUT in this report) is a Multi Function Keyboard, which has function for Ear set, Memory dialing, Mute, Redial, Internet calls and Tone/Pulse as well as keyboard function. Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	PLASTIC – Non coated
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	3.58 MHz on the main board
POWER REQUIREMENTS	DC 5V supplied from a PC
NUMBER OF LAYERS	Main board, Modular board and Serial board: 1 Layer, Telephone board: 2 Layers
EXTERNAL CONNECTOR	RS-232C – 9Pin, PS/2 Keyboard Jack – 6Pin, Mic. Jack – 1Pin, Sound Jack – 1Pin, Telephone Modular Jack – 4Pin

Model Differences:

-. None

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
PFK-201S	Autodata System Co., Ltd.	PJBPFK-201S	Multi Function Keyboard (EUT)	NOTE PC
PAT800U	TOSHIBA	DoC	NOTE PC	-
PA2450U	TOSHIBA	N/A	AC/DC Adapter	NOTE PC
N/A	N/A	N/A	EAR Phone	EUT
2225C	HP	DSI6XU2225	PRINTER	NOTE 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.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	Autodata System Co., Ltd.	Ezon-ver 1.0	N/A
MODULAR BOARD	Autodata System Co., Ltd.	Ezon-ver 1.0	N/A
SERIAL BOARD	Autodata System Co., Ltd.	AUTODATA SYS. V3.0	N/A
TELEPHONE BOARD	Autodata System Co., Ltd.	PLUS-PHONE V3.0	N/A

3.2 EUT exercise Software

The each cables of EUT were connected to proper ports of PC and then EUT was operated as follows for getting maximum emission levels from the EUT.

- (1) The series of “H” characters are printed on the monitor until the screen is completely full.
- (2) The print series of “H” characters to printer.
- (3) Calling to other phone using PSTN line.

During the operating above conditions, conducted and radiated emissions were tested.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Multi Function Keyboard (EUT)	N/A	Y	1.8(D)
NOTE PC	N	-	1.5(P)
EAR Phone	N/A	N	1.5(D)
PRINTER	N	Y	1.5(P), 1.2 (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
Multi Function Keyboard (EUT)	N	N/A	Y	PC END
NOTE PC	N	N/A	-	-
EAR Phone	N	N/A	Y	EUT END
PRINTER	N	N/A	Y	BOTH END

3.5 Equipment Modifications

None

3.6 Configuration of Test System

Line Conducted Test: The each cables of the EUT was connected to proper ports of the PC and the power of the PC was connected to LISN, all supporting equipment 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)
Continuously “H” pattern scrolling and Calling to other phone	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)
Continuously “H” pattern scrolling and Calling to other phone	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 : 48 %

Temperature : 22 °C

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

Type of Test : CLASS B

Result : PASSED BY -11.91 dB at 4.22 MHz

EUT : Multi Function Keyboard

Date: May 21, 2001

Operating Condition : Continuously "H" pattern scrolling and calling to other phone

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)
0.45	32.58	NEUTRAL	48.00	-15.42
0.55	23.54	NEUTRAL	48.00	-24.46
0.91	24.98	NEUTRAL	48.00	-23.02
3.40	30.53	NEUTRAL	48.00	-17.47
4.22	36.09	NEUTRAL	48.00	-11.91
5.68	29.95	HOT	48.00	-18.05
23.78	30.16	HOT	48.00	-17.84

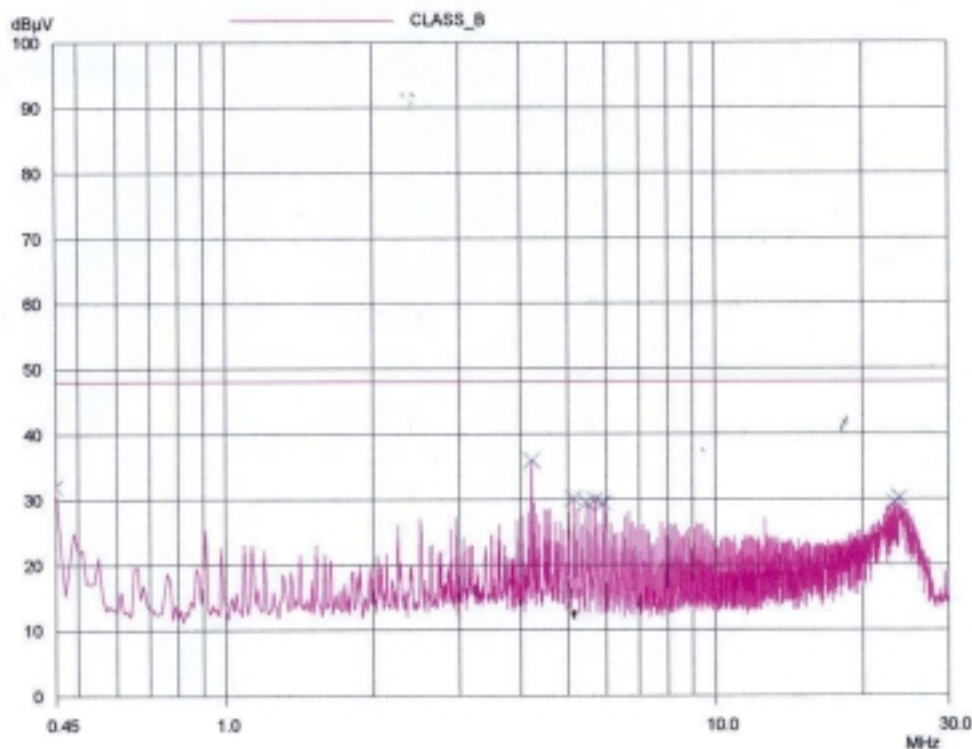
Line Conducted Emission Tabulated Data

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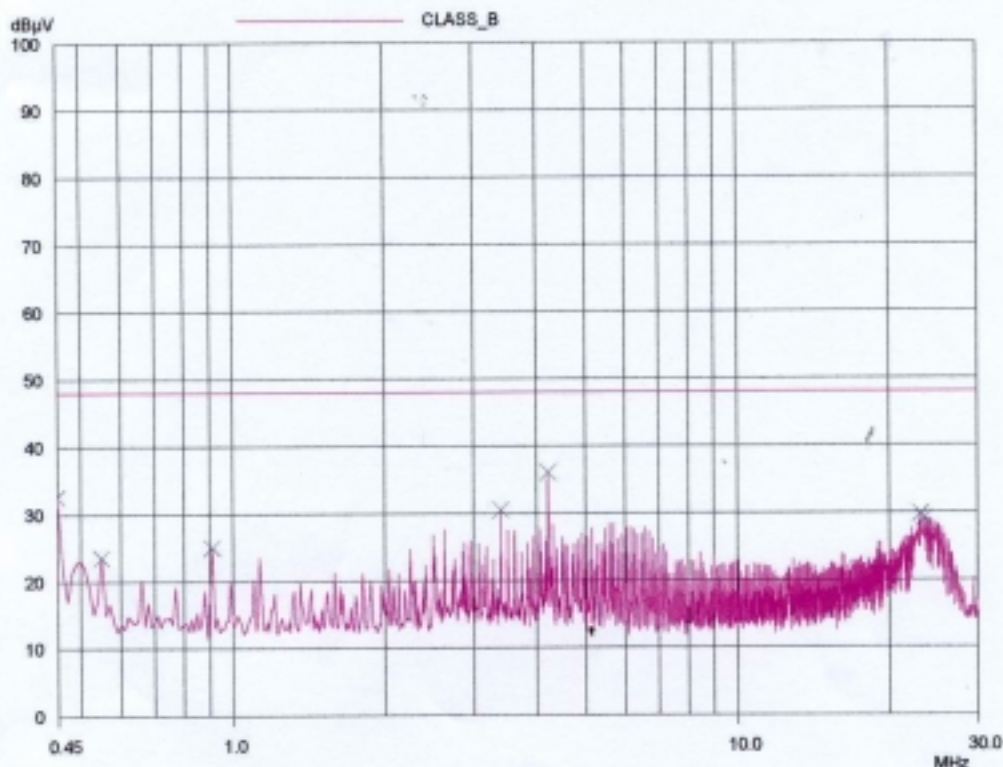
Tested by: Seung-Hyun, Nam / Test Engineer



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HOT LINE



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FCC-004 (Rev.0)

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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 : 41 %

Temperature : 22 °C

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

Type of Test : CLASS B

Result : PASSED BY -22.48 dB at 47.00 MHz

EUT : Multi Function Keyboard

Date: May 22, 2001

Operating Condition : Continuously "H" pattern scrolling and calling to other phone

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)
34.21	3.50	V	12.32	0.80	16.62	40.00	-23.38
42.74	4.20	V	11.59	0.85	16.64	40.00	-23.36
47.00	5.30	V	11.32	0.90	17.52	40.00	-22.48
51.25	4.20	V	11.02	0.94	16.16	40.00	-23.84
55.60	5.20	V	10.66	0.98	16.84	40.00	-23.16
59.95	3.80	V	9.64	0.98	14.42	40.00	-25.58
64.16	3.90	V	8.76	1.00	13.66	40.00	-26.34
68.51	4.10	V	7.68	1.00	12.78	40.00	-27.22
72.61	3.50	V	6.78	1.00	11.28	40.00	-28.72
89.92	5.30	V	8.47	1.10	14.87	43.50	-28.63
115.54	6.10	H	13.01	1.22	20.33	43.50	-23.17
123.98	5.20	H	13.20	1.25	19.65	43.50	-23.85

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	SEP/00	12MONTH	
4.	RF preselector	HP	85685A	3107A01264	SEP/00	12MONTH	
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	SEP/00	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	