

TEST CERTIFICATE [Personal Computer # 2]

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Report No.	G0535(E)/48
Operation No.	4804BG546
Name and address of customer	SVOA Public Co., Ltd 279 Moo 7 Ratburana Rd., Ratburana, Ratburana, Bangkok Thailand 10140 Tel: +66 2462 5827 Ext. 2511 Fax: +66 2462 7141
Sample description	Personal Computer "SVOA" CPU Celeron 2.4 GHz 17" SVOA Monitor 1 set with mouse and keyboard
Sample No.	BG546
Sample characteristic and condition	Normal
Sample receipted date	April 26, 2005
Test date	June 22, 2005
Test standard	FCC Part 15 Class B
Test report	Details of the test report as shown on the following pages
<div> <div> <p>Certified by</p> <p>(Mr. Thossaphorn Udomsinsirikul)</p> <p>Group Manager</p> <p>Electromagnetic Compatibility Test Group</p> </div> <div> <p>(Mr.Udomsak Kanjanarajit)</p> <p>Senior Section Manager</p> <p>Operation and Administration Manager</p> </div> </div>	

Test personnel : PP.(DSi.)

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TEST EQUIPMENTS

Radiated Disturbance Measurement 30 MHz – 1 GHz			
Order	TEST ITEM	I.D number	Calibration dated
1	EMI Receiver HP8542E	EMC 1011	31-12-2004
2	Bilog Antenna, 2310	EMC 1003	24-08-2004
3	Horn Antenna, 3115	TISI.603/1-9	19-07-2004
4	TOYO EMI Software, EPS/RE	EMC 3002	-
5	Cable Path 10 m Chamber Path 10 m	-	18-02-2005
Conducted Disturbance Measurement 450 kHz – 30 MHz			
Order	TEST ITEM	I.D number	Calibration dated
1	EMI Receiver HP8542E	EMC 1001	31-12-2004
2	LISN # NNB42 S/N 0001	EMC 1008	26-07-2004
3	TOYO EMI Software, EPS/CE	EMC 3001	-
4	Cable Path Shielded Room	-	18-02-2005

AUX EQUIPMENT

Order	TEST ITEM	Model
1	Inkjet Printer,	CANON BJ S500

TEST REQUIREMENT

EUT	TEST REQUIREMENTS	
	CE	RE
Personal Computer	✓	✓

CE: Conducted disturbance measurement

RE: Radiated disturbance measurement

TEST RESULT CONCLUSION

TEST METHOD	TEST RESULT	
	CE	RE
FCC Part 15 Class B	P	P

Remark P: The test result complied with the limit specified in the test requirement

X: The test result didn't comply with the limit specified in the test requirement

N/A: No need to be tested

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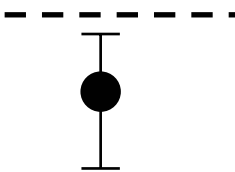
TEST CONDITIONS

Operation Mode

- A : EMC test software was used for operating.

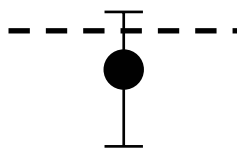
Standard rules for judging compliance testing result for emission testing (According to the NIS 81)

Pass Case A



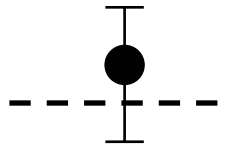
The measured result is within the limit, even when extended by the uncertainty interval. The product therefore complies with the specification.

Unjudge in Case B



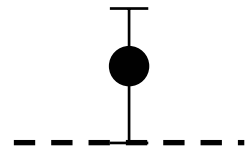
The measured result is below the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance.

Unjudged in Case C



The measured result is above the upper limit, but by a margin less than half of the uncertainty interval; it is therefore not possible to state non-compliance based on the 95% level of confidence. However, the result indicates that non-compliance is more probable than compliance.

Fail Case D



The measured result is beyond the upper limit, even when extended downwards by half of the uncertainty interval. The product therefore does not comply with the specification.

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EUT DESCRIPTION

Table of EUT Description

General Description	
EUT Name	Personal Computer
Model	SVOA Celeron 2.4 GHz
Technical Description	
Voltage	230 Volt 50 Hz
Clock/Oscillator	2.4 GHz

Cables

Ref	Cable type	Shield	Length (meters)	Ferrite	Connector	Connection Point 1	Connection Point 2
1	Power Line	No	1.5 m	No	AC	CPU Case	AC Main
2	Power Line	No	1.5 m	No	AC	Monitor Case	AC Main

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EUT SET UP



Figure 1 Test set up for radiated disturbance measurement

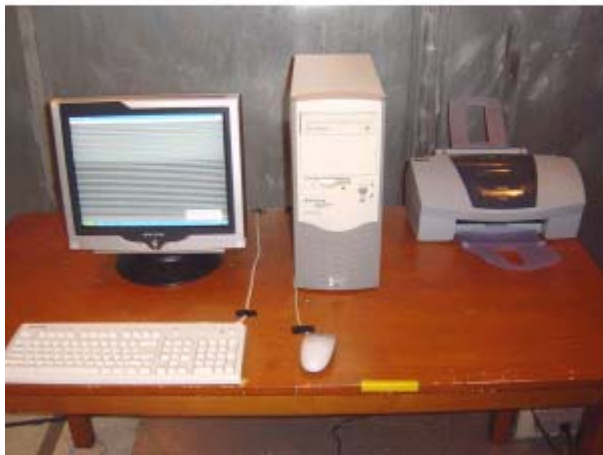


Figure 2 Test set up for conducted disturbance measurement

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TEST SET UP

Conducted Emission

The Conducted emission measurement was performed with EMI receiver to observe the emission characteristic and identify the frequency of emission that has the highest amplitude relative to limit by operating the EUT with a typical configuration. The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

The EUT was placed on 80 cm. Height non-metallic table in-side shielded room. The EUT was on a real operation mode, read-write disk, hard disk, memory, display on the screen and simulate the communication signal. The power cord of the EUT was connected to a LISN. The signal noises from the EUT were transferred to the EMI receiver in control room. The testing method and The EUT setup were performed according to ANSI C63.4. The EUT configuration setup is shown in figures 2 and 3, respectively.

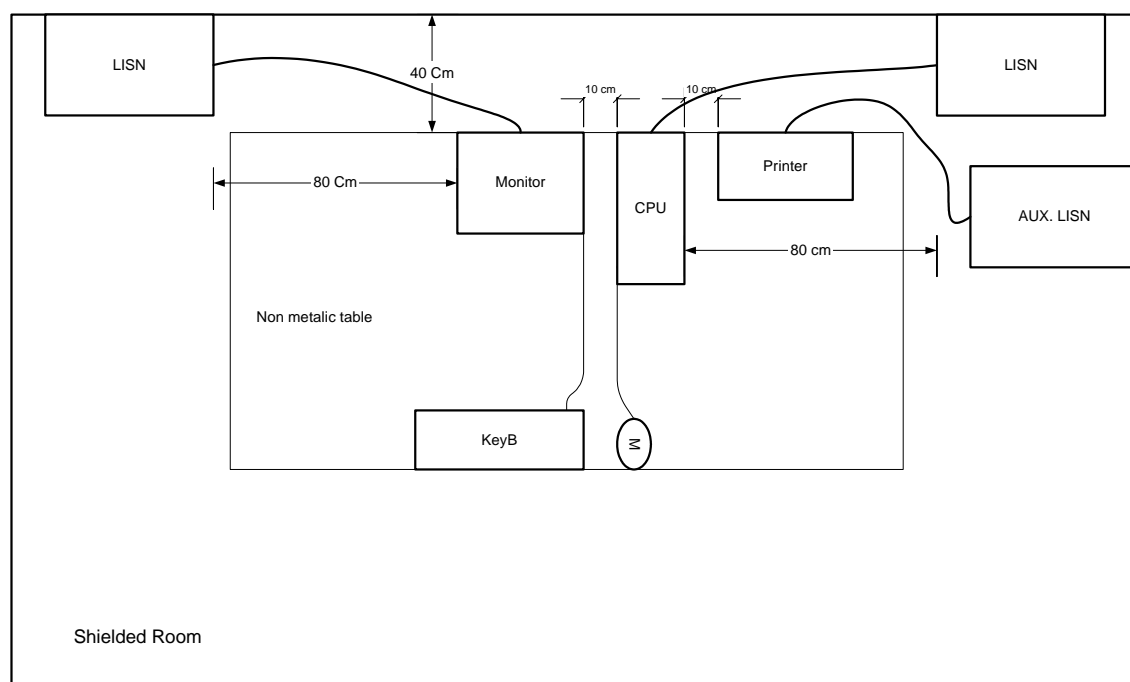


Figure 3 The diagram of setup for conducted emission testing

TEST SET UP (Continue)

Radiated Emission

The Radiated emission measurement was performed with EMI receiver to observe the emission characteristic and identify the frequency of emission that has the highest amplitude relative to limit by operating the EUT with a typical configuration. The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

The EUT was placed on 80 cm. Height non-metallic table on 2 m radius turn-table. The EUT was on a real operation mode, read-write disk, hard disk, memory, display on the screen and simulate the communication signal.

The Bi-Log antenna (30 MHz – 2 GHz) was used for received the noise of EUT and put on the antenna mast, which they were in side the semi-according to ANSI C63.4. The EUT configuration setup is shown in figures 1 and 4, respectively.

The Double Rigid Horn antenna (1GHz – 18GHz) was used for received the noise at EUT and put on the antenna 1 m above ground plane (Cause of the antenna bandwidth is less than 30 degree, therefore the measurement above 1 m don't necessary to test). They were in side the semi-anechoic chambers. The testing method and the EUT setup wee performed according to ANSI C63.4.

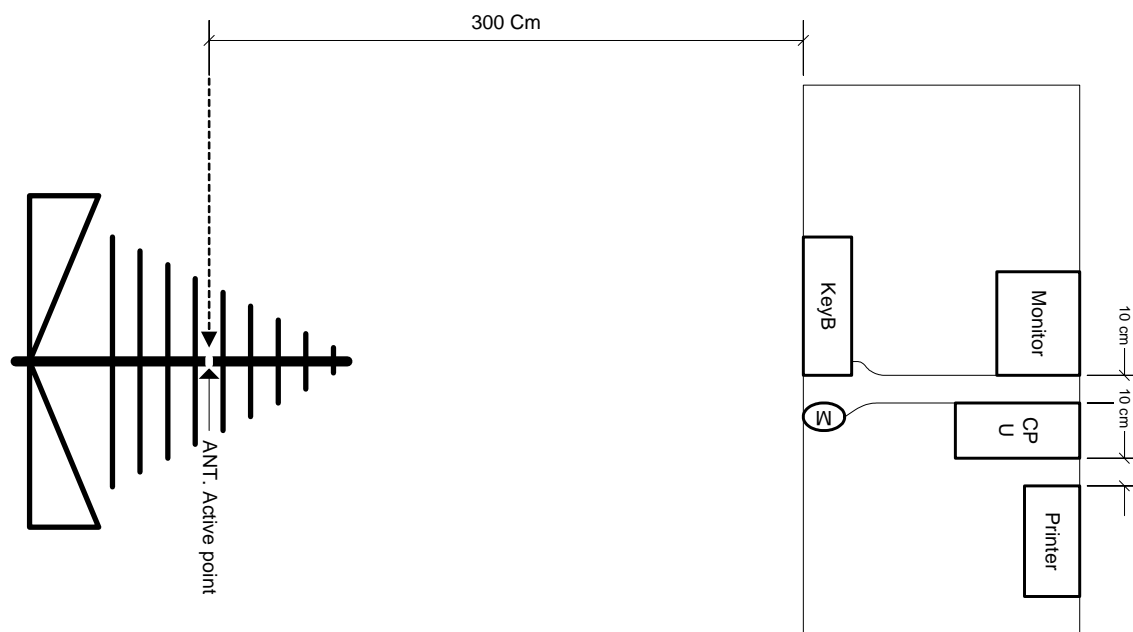



Figure 4 The diagram of setup for radiated emissions testing

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1	Test method	Conducted Disturbance Measurement 450 kHz – 30 MHz			
	Test point	MAIN TERMINAL	Limit	FCC Part 15 Class B	

Measuring terminal		Frequency MHz	Result QP (dB μ V)	Result AV (dB μ V)	Limit QP (dB μ V)	Limit AV (dB μ V)
CPU	Line	0.152	55.9	50.1	65.9	55.9
		0.189	50.0	48.3	64.1	54.1
		0.227	53.2	51.7	62.6	52.6
		0.455	44.6	44.3	56.8	46.8
		0.679	40.7	39.7	56.0	46.0
		0.908	36.1	34.3	56.0	46.0
		12.090	33.3	25.8	60.0	50.0
		28.395	31.0	24.2	60.0	50.0
	Neutral	0.150	53.6	42.8	66.0	56.0
		0.174	40.8	13.8	64.8	54.8
		0.191	52.1	51.2	64.0	54.0
		0.227	52.9	51.5	62.6	52.6
		0.454	43.3	43.0	56.8	46.8
		0.682	39.0	37.8	56.0	46.0
		0.908	36.3	34.8	56.0	46.0
		12.572	31.7	23.2	60.0	50.0
		28.355	31.6	25.0	60.0	50.0


 The test result complied with FCC Part 15 Class B limit (see test data in the paper attached in the back of this report <<Conducted Emission>>).

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2	Test method	Conducted Disturbance Measurement 450 kHz – 30 MHz			
	Test point	MAIN TERMINAL	Limit	FCC Part 15 Class B	

Measuring terminal		Frequency MHz	Result QP (dB μ V)	Result AV (dB μ V)	Limit QP (dB μ V)	Limit AV (dB μ V)
Monitor	Line	0.150	48.2	40.2	66.0	56.0
		0.172	20.5	2.3	64.9	54.9
		0.195	49.7	45.1	63.8	53.8
		0.579	38.8	35.1	56.0	46.0
		2.225	31.9	28.8	56.0	46.0
		5.946	33.0	28.1	60.0	50.0
		12.524	50.1	43.1	60.0	50.0
	Neutral	0.150	47.2	37.9	66.0	56.0
		0.172	19.7	0.00	64.9	54.9
		0.193	46.3	40.8	63.9	53.9
		0.581	34.2	32.4	56.0	46.0
		2.176	32.6	29.1	56.0	46.0
		6.141	33.4	29.8	60.0	50.0
		12.277	41.4	34.7	60.0	50.0


 The test result complied with FCC Part 15 Class B limit (see test data in the paper attached in the back of this report <<Conducted Emission>>).

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3	RESULT	Radiated disturbance measurement 30 MHz – 2 GHz		
	Test point	ENCLOSURE	Limit	FCC Part 15 Class B

Measuring terminal	Frequency MHz	Result QP (dB μ V)	Limit QP (dB μ V)
Vertical	51.990	23.3	40.0
	172.410	21.3	43.5
	267.219	24.9	46.0
	573.850	26.0	46.0
	796.530	28.2	46.0
Horizontal	173.400	25.7	43.5
	214.430	25.8	43.5
	311.930	30.6	46.0
	359.889	32.2	46.0
High Frequency	1008.000	47.6	53.9
	1024.000	43.8	53.9
	1066.000	42.7	53.9
	1132.000	44.7	53.9
	1132.000	40.4	53.9
	1332.000	41.6	53.9
	1399.000	46.5	53.9
	1487.000	41.4	53.9
	1601.000	43.8	53.9
	1967.000	45.3	53.9

 The test result complied with FCC Part 15 Class B limit (see test data in the paper attached in the back of this report <<Radiated Emission>>).

Note

- The frequencies above 1 GHz up to fifth harmonic of the internal clock were measured.
- The level of frequencies above 2.0 GHz are very small compared to the noise floor level then the signal cannot display.