

3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read from the storage device (CD-ROM).
2. Send Voice to LINE-OUT device (Speakers).
3. Repeated from 1 to 2 continuously during to "H" pattern exercised each system component from 4 to 7 simultaneously.
4. Read (Write) from(to) the storage devices (HDD, FDD).
5. Send "H" pattern to the video port device (LCD Display and Ext. Monitor or LCD Display and TV Monitor)
6. Send "H" pattern to the parallel port device (Printer).
7. Send "H" pattern to the Serial port device (Modem).
8. Repeated from 4 to 7 continuously.

As the keyboard, mouse and joystick are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

N/A

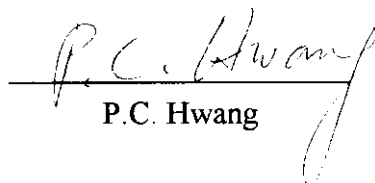
3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to the next page as the modification described and cross reference of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :


P.C. Hwang

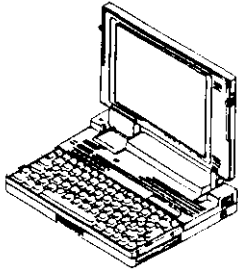
Date :

Feb. 04, 1999

Type/Printed Name :

Position :

Engineer



Smart D & M Technology Co., Ltd.

-SMART-TEC-

Modification Report

Company:

Model No.: NX-6000

Page 1 of 1

FCC ID: LMDNX6000-S-01

Date: Feb. 10 , 1999

- A. Add a toroid core on the LCD's data cable.
- B. Add a shielding on the data cable.
- C. Add capacitors (c: 220pf) on the output data of CON4.
- D. Add capacitors (c: 220pf) on the output data of CON3.
- E. Add capacitors (c: 470pf) on the output data of CON2.
- F. Add a toroid core on the DC output line.

All the above modification will be implemented and relayed in the mass production to meet the FCC Class B requirements.

Smart D & M Technology Co., Ltd.

P.C Hwang
Engineer

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr/Brand	Model/Type No.	Port Connected	FCC ID	Series No.	Note
E-1	Notebook PC	Smart D & M	NX6000		LMDNX6000-S-01	N/A	EUT
E-2	Monitor	Optquest	4500DC-E(80K)	VGA Port	GWGMULTI82	3650200046	
E-3	Modem	Datatronics	AT-1200CK	Com Port	E2O5OV1200CK	06-240088/07-317665	
N/A	Printer	SII	DPU-414	Centronic Port	N/A(3)	N/A	
E-5	Keyboard	Forward	FDA-102A	PS/2 Port	F4Z4K3FDA-102A	N/A	
E-6	Microphone	N/A	KHM-108	Mic Port	N/A	N/A	
E-7	TV Set	BEN-TECH	BT-09MC	Video Out Port	N/A	N/A	
E-8	Walkman	N/A	KT-V860	Audio In Port	N/A	N/A	
E-9	Joystick	A- Dan	Js-308	Game Port	N/A	N/A	
E-10	Mouse	Primax	MUSXT	USB Port	EMJ0000001	N/A	

Note:

- (1) Unless otherwise denoted as EUT in 「Remark」 column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the support equipment(s) to the tested system.
- (3) The support equipment was passed by Declaration of conformity.

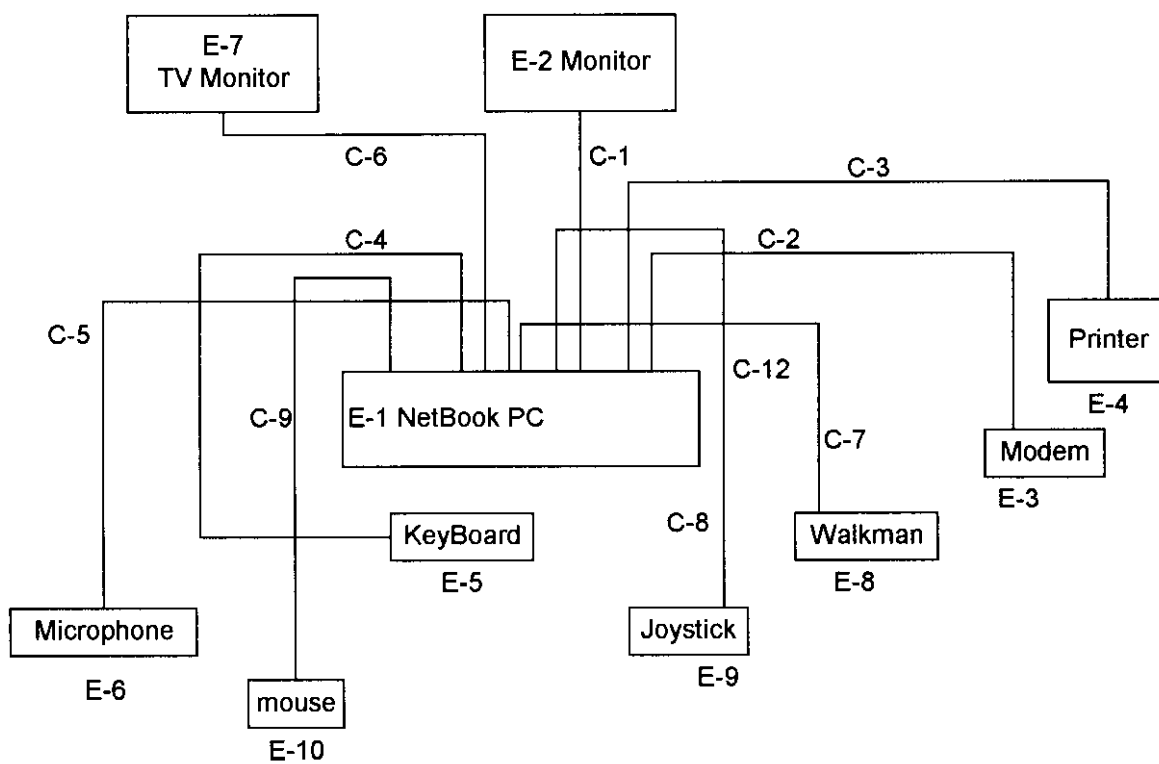
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded	Ferrite Core	Detachable/Permanently	Length	Note
C-1	Video Cable	EUT-Monitor	Yes	No	Permanently attached on Monitor	150 cm	
C-2	RS-232C Cable	EUT -Modem	Yes	No	Part of Modem, Detachable	175 cm	
C-3	Centronics Cable	EUT -Printer	Yes	No	Part of Printer, Detachable	200 cm	
C-4	Keyboard Cable	EUT -Keyboard	Yes	No	Permanently attached on KB	200 cm	
C-5	Microphone Cable	EUT -Microphone	No	No	Permanently attached on microphone	280cm	
C-6	AV Cable	EUT-TV	No	No	Detachable type	120cm	
C-7	Walkman Cable	EUT -Walkman	No	No	Detachable type	150cm	
C-8	Joystick Cable	EUT -Joystick	Yes	No	Permanently attached on Joystick	175 cm	
C-9	Mouse Cable	EUT-Mouse	Yes	No	Detachable type	200cm	

Note:

- (1) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the supporting equipment(s) to the tested system.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

Figure 3.1 Configuration of Tested System



6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-2.68** dB in mode of Line terminal **0.17 MHz**

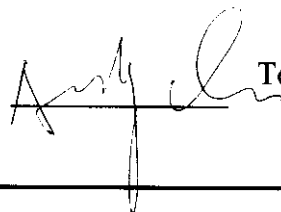
EUT Operation/Configuration Mode : Display devices : LCD panel & TV

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins (dBuV)	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		Note
0.16	Line	57.36	46.20	65.36	55.36	-8.00	(QP)
0.24	Line	52.14	34.20	61.99	51.99	-9.85	(QP)
0.32	Line	48.42	35.42	59.63	49.63	-11.21	(QP)
0.57	Line	40.19	*	56.00	46.00	-15.81	(QP)
26.42	Line	41.15	*	60.00	50.00	-18.85	(QP)
0.17	Neutral	59.15	52.45	65.13	55.13	-2.68	(AV)
0.25	Neutral	53.37	47.07	61.79	51.79	-4.72	(AV)
0.33	Neutral	46.57	*	59.45	49.45	-12.88	(QP)
1.40	Neutral	43.29	*	56.00	46.00	-12.71	(QP)
2.21	Neutral	42.65	*	56.00	46.00	-13.35	(QP)

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz, VBW =100KHz, Swp. Time = 0.3 sec./MHz . Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz, VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a " * " marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review :



Test Personnel :

Riker Hsu

Date:

Feb. 05, 1999

6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-2.06** dB in mode of Line terminal **0.17 MHz**

EUT Operation/Configuration Mode : Display devices : LCD panel & Monitor

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.17	Line	61.03	53.10	65.16	55.16	-2.06	(AV)
0.25	Line	53.70	49.50	61.72	51.72	-2.22	(AV)
0.34	Line	48.77	45.60	59.30	49.30	-3.70	(AV)
0.59	Line	47.65	41.65	56.00	46.00	-4.35	(AV)
1.08	Line	47.86	42.66	56.00	46.00	-3.34	(AV)
0.17	Neutral	60.50	52.10	65.16	55.16	-3.06	(AV)
0.25	Neutral	53.92	48.90	61.79	51.79	-2.89	(AV)
0.33	Neutral	47.18	*	59.40	49.40	-12.22	(QP)
1.49	Neutral	46.22	38.12	56.00	46.00	-7.88	(AV)
1.83	Neutral	45.87	39.60	56.00	46.00	-6.40	(AV)

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz, VBW =100KHz, Swp. Time = 0.3 sec./MHz . Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz, VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a " *" marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review :

Test Personnel :

Date:

Feb. 05, 1999

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -2.10 dB in polarity of Horizon 199.25 MHz

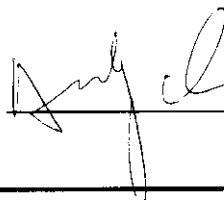
EUT Operation/Configuration Mode Display devices : LCD panel & TV

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
66.55	H	34.81	- 7.11	27.70	30.00	- 2.30	
133.19	H	30.35	- 2.85	27.50	30.00	- 2.50	
195.24	V	24.92	2.57	27.49	30.00	- 2.51	
196.94	V	23.88	2.62	26.50	30.00	- 3.50	
199.25	V	25.22	2.68	27.90	30.00	- 2.10	
199.32	H	24.99	2.68	27.67	30.00	- 2.33	
221.60	V	28.35	- 3.78	24.57	30.00	- 5.43	
221.60	H	28.78	- 3.78	25.00	30.00	- 5.00	
227.20	V	30.11	- 3.72	26.39	30.00	- 3.61	
260.00	V	33.86	- 1.52	32.34	37.00	- 4.66	
260.00	H	30.38	- 1.52	28.86	37.00	- 8.14	
651.20	H	24.26	9.66	33.92	37.00	- 3.08	

Remark :

- (1) Reading inwhich marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in colum of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .

Review :



Test Personnel :

Riley Hsu

Date:

FEB.17,1998

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -2.30 dB in polarity of Horizon 133.19 MHz

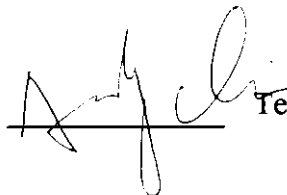
EUT Operation/Configuration Mode : Display Mode : LCD panel & Monitor

Freq. (MHz)	Ant. H/V	Reading(RA) (dBUV)	Corr.Factor(CF) (dB)	Measured(FS) (dBUV/m)	Limits(QP) (dBUV/m)	Safe Margins (dBUV/m)	Note
66.42	V	34.47	- 6.97	27.50	30.00	- 2.50	
66.55	H	33.76	- 7.11	26.65	30.00	- 3.35	
133.19	H	30.55	- 2.85	27.70	30.00	- 2.30	
157.37	V	29.47	- 1.87	27.60	30.00	- 2.40	
161.23	V	28.08	- 1.18	26.90	30.00	- 3.10	
172.29	H	25.86	0.72	26.58	30.00	- 3.42	
221.60	H	28.32	- 3.78	24.54	30.00	- 5.46	
221.60	V	31.14	- 3.78	27.36	30.00	- 2.64	
333.60	H	31.90	1.57	33.47	37.00	- 3.53	
333.60	V	31.03	1.57	32.60	37.00	- 4.40	
487.20	H	26.57	6.44	33.01	37.00	- 3.99	
489.60	V	26.50	6.57	33.07	37.00	- 3.93	

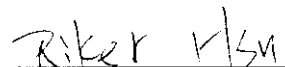
Remark :

- (1) Reading inwhich marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW=1MHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in colum of 'Note' . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .

Review :



Test Personnel :



Date:

FEB. 05,1999

7. Radiated Emission Datas(1GHz~2GHz)

7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -9.29 dB in polarity of Horizon 1003.00 MHz

EUT Operation/Configuration Mode : Didplay mode : LCD panel & TV

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
1003.00	H	36.21	8.50	44.71	54.00	-9.29	
1003.00	V	31.40	8.50	39.90	54.00	-14.10	
1030.00	V	28.75	8.60	37.35	54.00	-16.65	
1039.00	V	30.42	8.60	39.02	54.00	-14.98	
1061.00	H	29.34	8.70	38.04	54.00	-15.96	
1088.00	V	30.32	8.90	39.22	54.00	-14.78	
1105.00	H	31.40	9.00	40.40	54.00	-13.60	
1172.00	V	28.41	9.60	38.01	54.00	-15.99	
1333.00	H	33.26	10.70	43.96	54.00	-10.04	
1368.00	H	29.70	10.80	40.50	54.00	-13.50	

Remark :

- (1) Reading inwhich marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW=1MHz, Swp. Time = 0.3 sec./MHz °
- (2) All readings are Peak unless otherwise stated QP in colum of 『Note 』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform °
- (3) Measuring frequency range from 1000MHz to 2000MHz °
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table °

Review : Angel Test Personnel : Riley Hsu Date: FEB. 05, 1999

7. Radiated Emission Datas(1GHz~2GHz)

7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -9.10 dB in polarity of Horizon 1003.00 MHz

EUT Operation/Configuration Mode : Display mode : LCD panel & Monitor

Freq. (MHz)	Ant. H/V	Reading(RA) (dBUV)	Corr.Factor(CF) (dB)	Measured(FS) (dBUV/m)	Limits(QP) (dBUV/m)	Safe Margins (dBUV/m)	Note
1003.00	H	36.40	8.50	44.90	54.00	-9.10	
1003.00	V	29.12	8.50	37.62	54.00	-16.38	
1030.00	V	27.01	8.60	35.61	54.00	-18.39	
1039.00	V	27.95	8.60	36.55	54.00	-17.45	
1105.00	H	29.42	9.00	38.42	54.00	-15.58	
1172.00	H	32.03	9.60	41.63	54.00	-12.37	
1172.00	V	27.04	9.60	36.64	54.00	-17.36	
1333.00	H	29.47	10.70	40.17	54.00	-13.83	
1333.00	V	28.12	10.70	38.82	54.00	-15.18	
1457.00	H	27.65	11.30	38.95	54.00	-15.05	

Remark :

- (1) Reading inwhich marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in colum of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 1000MHz to 2000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦

Review : Amjila Test Personnel. : Riley Hsu Date: FEB. 05, 1999

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where **FS = Field Strength**

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = $AF + CL - AG$, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dBuV/m)}.$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in

the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1} \left[(32.0 \text{ dBuV/m}) / 20 \right] = 39.8 \text{ (uV/m)}$$

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.90
35.00	10.80	0.50
40.00	11.20	1.00
45.00	11.50	0.80
50.00	11.30	1.00
55.00	10.50	1.30
60.00	9.90	1.00
65.00	8.70	1.50
70.00	7.60	1.20
75.00	6.40	1.40
80.00	6.10	1.30
85.00	7.00	1.40
90.00	8.00	1.70
95.00	10.00	1.50
100.00	11.20	1.90
110.00	12.60	2.00
120.00	13.00	1.80
130.00	12.50	1.80
140.00	12.00	2.00
150.00	12.00	2.20
160.00	13.20	2.40
170.00	14.80	2.50
180.00	16.30	2.50
190.00	17.00	2.50
200.00	17.30	2.40
225.00	10.50	2.70
250.00	11.70	3.10
275.00	12.80	3.70
300.00	14.50	4.00
325.00	14.00	4.50
350.00	14.20	4.50
375.00	14.60	4.60
400.00	15.10	4.80
450.00	16.20	5.40
500.00	17.60	6.50
550.00	17.80	7.00
600.00	18.40	7.10
650.00	19.50	7.10
700.00	20.80	7.20
750.00	20.50	7.50
800.00	21.10	8.00
850.00	22.40	8.60
900.00	23.50	8.90
950.00	24.00	9.70
1000.00	24.80	10.30

8. Photos of Tested EUT:

- 1. Photo # 1 Front View**
- 2. Photo # 2 Rear View**
- 3. Photo # 3 Side View**
- 4. Photo # 4 ~ 44 Unit Partially Disassembled**