EMC LAB
HomeTek
HomeTek Technology Inc.

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CERTIFICATE OF COMPLIANCE

EUT : Industrial Display Panel
MODEL NO. : AMB-218T, AMB-218HT
Final Test Date : 3/24/99 REPORT #: EA8C018
APPLICANT : ASTECH TECHNOLOGY CO., LTD.
ADDRESS : 6F-4, No. 351, Chung-Shan Rd.,
Sec. 2, Chung-Ho City, Taipei,
Taiwan, R. O. C.

MEASUREMENT PROCEDURE USED :

- ☑ EN50081-1 (1992)
- ☐ EN50081-2 (1992)
  - ☐ EN55011 (1994)
  - ☑ EN55022 (1994)
  - ☐ EN60555-2 (1987)
  - ☐ EN60555-3 (1987)
- ☑ EN50082-1 (1992)
- ☐ EN50082-2 (1992)
  - ☑ IEC 801-2 (1984)
  - ☑ IEC 801-3 (1984)
  - ☑ IEC 801-4 (1988)

WE HEREBY SHOW THAT :

THE MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE LIMITS APPLICABLE.

THIS TEST RESULTS OF THIS REPORT APPLIES TO ABOVE TESTED SAMPLE ONLY.

THIS TEST REPORT SHALL NOT BE REPRODUCE IN PART WITHOUT WRITTEN APPROVAL OF HOMETEK TECHNOLOGY INC.

PREPARED BY : Angel CHEN DATE : 3/26/'99

CHECK BY : JOSEPH CHOU DATE : 3/29/99

APPROVED BY : Grant Huang GRANT HUANG/Manager DATE : 3/29/99

Declaration of Conformity

We(Manufacturer/Importer)

ASTECH TECHNOLOGY CO., LTD.
(company name)

6F-4, No. 351, Chung-Shan Rd., Sec. 2, Chung-Ho City,
Taipei, Taiwan, R. O. C.
(address)

declares under our sole responsibility that the product

Product name : Industrial Display Panel

Model No. : AMB-218T, AMB-218HT

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

- ☑ EN50081-1 (1992)
- ☐ EN50081-2 (1992)
  - ☐ EN55011 (1994)
  - ☑ EN55022 (1994)
  - ☐ EN60555-2 (1987)
  - ☐ EN60555-3 (1987)
- ☑ EN50082-1 (1992)
- ☐ EN50082-2 (1992)
  - ☑ IEC 801-2 (1984)
  - ☑ IEC 801-3 (1984)
  - ☑ IEC 801-4 (1988)
  - ☐ IEC 1000-4-5
  - ☐ IEC 1000-4-6
  - ☐ IEC 1000-4-8
  - ☐ IEC 1000-4-11

following the provisions of 89/336/EEC Directive

Place: _____ Signature: _____

Date : _____ Full name: _____

CE Title: _____

EA8C018

TABLE OF CONTENTS

GENERAL INFORMATION

1	APPLICANT	:	ASTECH TECHNOLOGY CO., LTD.
2	ADDRESS	:	6F-4, No. 351, Chung-Shan Rd., Sec. 2, Chung-Ho City, Taipei, Taiwan, R. O. C.
3	MANUFACTURER	:	ASTECH TECHNOLOGY CO., LTD.
4	ADDRESS	:	6F-4, No. 351, Chung-Shan Rd., Sec. 2, Chung-Ho City, Taipei, Taiwan, R. O. C.

5 DESCRIPTION OF EUT :

EUT	:	Industrial Display Panel
Model	:	AMB-218T, AMB-218HT
Serial #	:	N/A
Data Cable	:	SHIELDED
Power Cord	:	N/A
Power Supply Type	:	N/A

6 FEATURES OF EUT :

6.1 Heavy-duty steel chassis, aluminum alloy front panel

6.2 10.4" color TFT LCD display (RESOLUTION 640 x 480)

6.3 59-data key and 10-function key keypads on the front panel

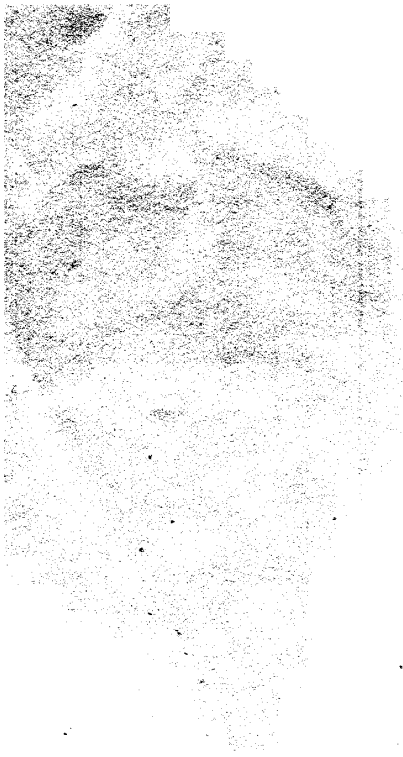
6.4 Analog resistive touchscreen (option)

6.5 ISA-bus (default) graphic card

6.6 SCSI II-36 cable (1.8 meters)

6.7 Brightness and contrast controls, external keyboard connector on the front panel

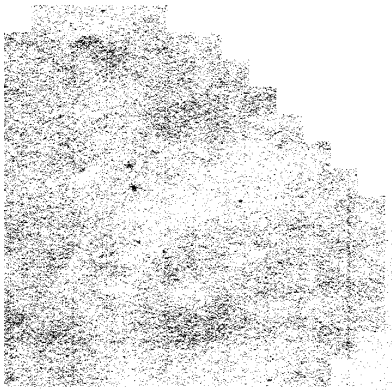
6.8 SCSI II-36, DIN-9, and DB-9 connectors on the back panel



MODIFICATION LIST

THE FOLLOWING ACCESSORIES WERE ADDED TO THE EUT DURING TESTING :

NO MODIFICATION BY HOMETEK TECHNOLOGY INC.



CONDUCTED POWER LINE TEST

1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the conducted test :

Item	Instruments/ Facilities	Specification	Manufacturer	Model #	Date Of Cal.
1	EMI Receiver	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESHS 30	FEB/99
2	LISN	50 Ω/50uH/100A 9KHz ~ 30MHz	SCHWARZ BECK	NNLK 8121	FEB/99
3	LISN	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESH3-Z5	FEB/99
4	ESXS-K1	Version 2.03b	ROHDE & SCHWARZ	1082.9678.02 840.913/246	FEB/99
5	Cables	10KHz ~ 30MHz		NO : 10	JUL/98
6	Pulse Limiter	9KHz ~ 30MHz	ROHDE & SCHWARZ	ESH3Z2 357.8810.52	JUL/98

2 TEST PROCEDURE

2.1 The EUT was tested according to **EN55022 Class A.**

2.2 The EUT was placed 0.4 meter from the conducting wall of shielding room and kept at least 0.8 meter from any other grounded conducting surface.

2.3 The frequency range form 0.15 MHz to 30 MHz was investigated.

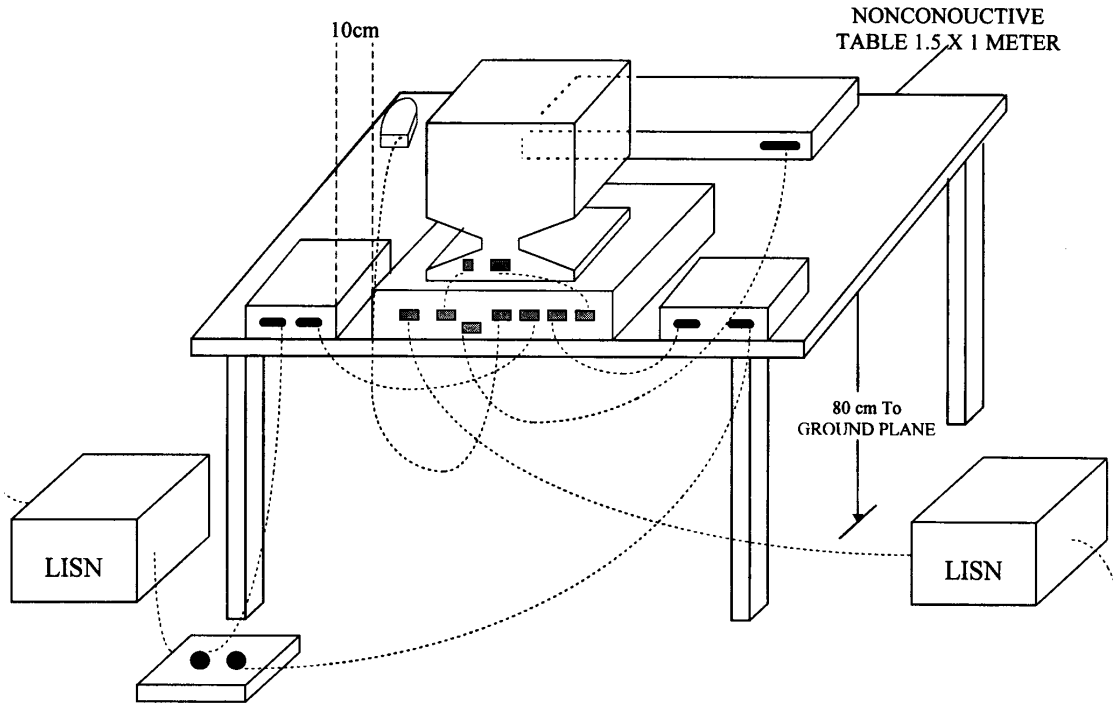
2.4 The LISN used was 50 Ohm / 50 uHenry as specified by **EN55022 Class A.**

2.5 All the support peripherals are connect to the other LISN.

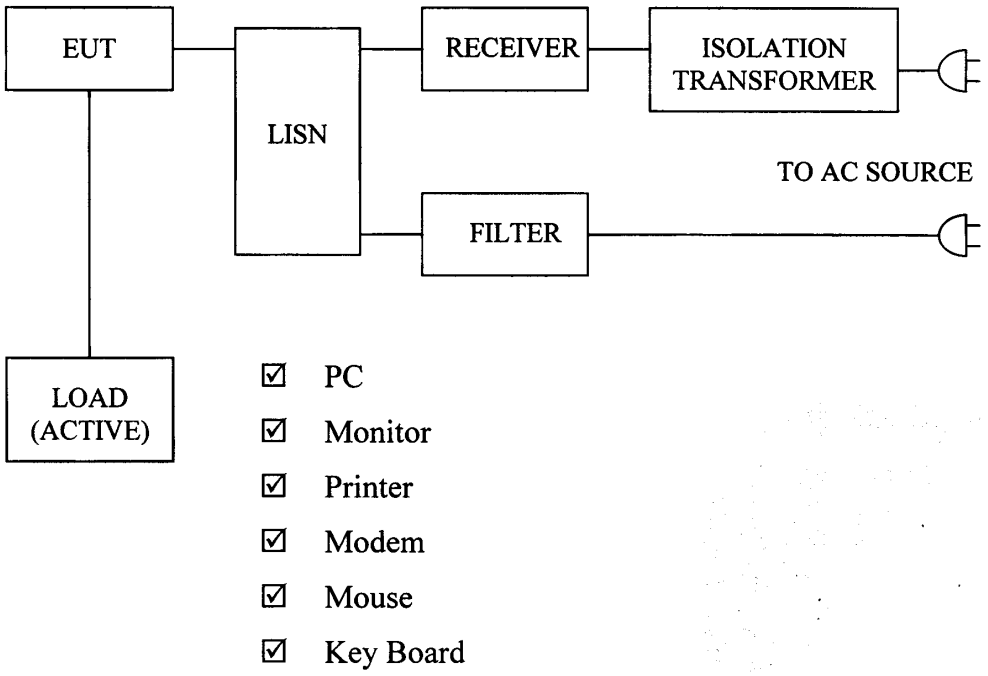
2.6 Cables and peripherals were moved to find the maximum emission levels for each frequency.

3 TEST SETUP

3.1 Typical : Setup Of Conducted Test



3.2 Block Diagram Of Conducted Test



4 CONFIGURATION OF THE EUT

The EUT was configured according to **EN55022 Class A.** All I/O ports were connected to the appropriate peripherals. All peripherals and cables are listed below (including internal device) :

4.1 EUT

EUT Type	:	☐Proto Type ☑Engineer Type ☐Mass Production
Condition when received	:	☑Good ☐Damage : _____
Connector Type	:	☑Metal Type ☐Plastic Type
Device	:	Industrial Display Panel
Manufacturer	:	ASTECH
Model Number	:	AMB-218T, AMB-218HT
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Shielded
Power Cord	:	N/A

4.2 PERIPHERALS

☑ Host Personal Computer

Manufacturer	:	Chaintech
Model Number	:	6LTL-S101
Serial Number	:	N/A
FCC ID	:	FCC DoC
Data Cable	:	Shielded
Power Cord	:	Un-Shielded, 1.8 m

☑ Monitor

Manufacturer	:	ATEC
Model Number	:	G450DU
Serial Number	:	714PD000Q0002
FCC ID	:	GKR450
Data Cable	:	Shielded, 1.5 m, Connected to the VGA port
Power Cord	:	Un-Shielded, 1.8 m

☑ Printer

Manufacturer	:	HP
Model Number	:	DJ400
Serial Number	:	MY77V1C0DD
FCC ID	:	B94C2642X
Data Cable	:	Shielded, 1.5 m, Connected to the Printer port
Power Cord	:	Un-Shielded, 1.8 m

☑ Modem

Manufacturer	:	DATATRONIC
Model Number	:	2814CX
Serial Number	:	1150541132
FCC ID	:	FCC DoC
Data Cable	:	Shielded, 1.5 m, Connected to the COM port
Power Cord & Adaptor	:	Un-Shielded, 1.8 m

☑ Mouse (PSII)

Manufacturer	:	LOGITECH
Model Number	:	M-S34
Serial Number	:	LZA73037418
FCC ID	:	DZL211029
Data Cable	:	Shielded, 1.8 m, Connected to the PSII port
Power Cord	:	N/A

☑ KeyBoard (USB)

Manufacturer	:	SILITEK
Model Number	:	SK-2000U
Serial Number	:	N/A
FCC ID	:	GYUR50SK
Data Cable	:	Shielded, 1.5 m, Connected to the USB port
Power Cord	:	N/A

4.3 Internal Devices

☑ VGA Card

Manufacturer	:	Astech
Model Number	:	MBC-265B
Serial Number	:	9903727
FCC ID	:	N/A
Data Cable	:	Shielded, 2 m
Power Cord	:	N/A

4.4 REMARK :

5 OPERATING CONDITION OF EUT

5.1 Operating condition is according to **EN55022 Class A**.

5.2 CPU : Pentium II- 233 MHz
CPU Clock : 66 MHz

5.3 Turn on the power of all equipments.

5.4 Test program sent "H" pattern to peripherals as following :

5.4.1 Printer

5.4.2 Monitor

5.4.3 Modem

5.4.4 Keyboard

6 LIMIT OF CONDUCTED POWER LINE EMISSION CLASS A :

Frequency Range	Quasi Peak	Average
0.15 ~ 0.5 MHz	79 dBuV	66 dBuV
0.5 ~ 5 MHz	73 dBuV	60 dBuV
5 ~ 30 MHz	73 dBuV	60 dBuV

7 RESULT OF CONDUCTED POWER LINE TEST

7.1 The frequency range from 0.15 MHz to 30 MHz was investigated. All readings are quasi-peak values and average.

7.2 IF bandwidth : 9 kHz, Meas Time : 1 sec.

7.3 Temperature : 21 ℃, Humidity : 72 % RH.

7.4 Deviations from the specifications : None

7.5 Quasi-Peak :

Frequency (MHz)	Line 1 (dBuV)	Line 2 (dBuV)	Limit (dBuV)
0.239	43.74	48.57	79.00
0.377	41.12	41.89	79.00
0.850	37.96	38.45	73.00
2.495	29.46	29.94	73.00
5.120	28.49	31.60	73.00
12.000	29.45	30.59	73.00

7.6 Average :

Frequency (MHz)	Line 1 (dBuV)	Line 2 (dBuV)	Limit (dBuV)
0.172	44.53	50.60	66.00
0.307	43.80	45.92	66.00
1.165	31.76	31.90	60.00
4.945	29.20	28.48	60.00
7.340	25.84	23.44	60.00
19.350	17.32	21.95	60.00

REMARK :

1. Model : AMB-218HT
2. Measuring mode :
3. Uncertainty in conduction emission measured : $< \pm 2.0$dB.
4. " * ", means this data is worse case emission level.
5. Result : **PASSED**

8 PHOTO OF CONDUCTED POWER LINE TEST

Model : AMB-218HT

Front View

Rear View

RADIATED EMISSION TEST

1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the radiated emission test :

Item	Instruments /facilities	Specification	Manufacturer	Model # / S/N#	Location	Date of Cal.
1	OPEN AREA TEST SITE	☐ OATS 1 ☑ OATS 2				JUN/98 JUN/98
2	SPECTRUM ANALYZER	9KHz ~ 1.8GHz	HP	HP8591 3710A06158	Open Site I	APR/98
3	EMI TEST RECEIVER	20MHz ~ 1GHz	ROHDE & SCHWARZ	ESVS10 845165/017	Open Site I	FEB/99
4	PRE-AMPLIFIER	0.1MHz ~ 1.3 GHz	HP	8447D 1937A02095	Open Site I	MAY/98
5	EMI TEST RECEIVER	20Hz ~ 26.5GHz	ROHDE & SCHWARZ	ESMI 845442/006	Open Site II	FEB/99
6	PRE-AMPLIFIER	20MHz ~ 7GHz	ROHDE & SCHWARZ	ESMI-Z7 846363/001	Open Site II	FEB/99
7	ANTENNA (BI-LOG)	25MHz ~ 2GHz	ARA	LPB2520 S/N:1096	Open Site II	MAR/99
8	ANTENNA (BI-LOG)	25MHz ~ 2GHz	ARA	LPB2520 S/N:1095	Open Site I	MAR/99
9	CABLES	30MHz ~ 1GHz		No. 2, No. 4 No. 1, No. 3	OATS 1 OATS 2	JUL/98 JUL/98
10	ANTENNA (DIPOLE)	30 ~ 300MHz	ROHDE & SCHWARZ	HZ-12 842899/08		JAN/99
11	ANTENNA (DIPOLE)	300 ~ 1000MHz	ROHDE & SCHWARZ	HZ-13 842007/0004		JAN/99
12	EMIVM	30 ~ 1000MHz	AUDIX	A582445 A582443	OATS 1 OATS 2	N/A

Note : 1. Items 1 ~ 9 upon which need to calibrated are with period of 1 year, except item 10-11.
2. Items 5 is used for the final measurement.

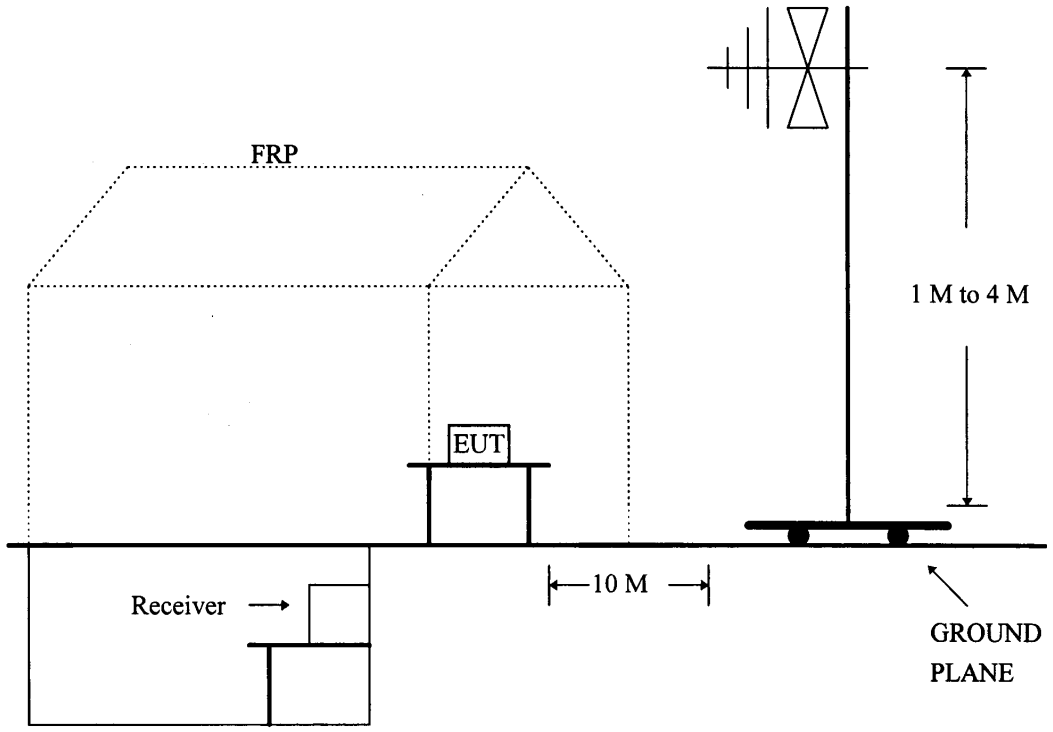
2 TEST PROCEDURE

2.1 The EUT was test according to **EN55022 Class A**.

2.2 The radiated test was performed at HomeTek Lab's Open Site II.

2.3 The frequency range from 30 MHz to 1 GHz, the measurement were made at 10 meters, with a BI-log antenna.

3 TEST SETUP



4 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

5 EUT OPERATING CONDITION

5.1 Same as "Conducted Power Line test", section 5

5.2 The radiated emission in the frequency range from 30 MHz - 1000 MHz was test in a horizontal and vertical polarization at HomeTek Lab's open site II.

6 LIMIT OF RADIATED EMISSION CLASS A :

Frequency (MHz)	Measurement Distance	Limit (dBuV/m)
30 - 230	10 (M)	40
230 - 1000	10 (M)	47

7 RESULT OF RADIATED EMISSION TEST

7.1 The frequency range from 30 MHz to 1 GHz was investigated. All readings are quasi-peak values with resolution bandwidth of 120 kHz.

7.2 The measurements above 1 GHz with a resolution bandwidth of 1 MHz are peak reading at 10 meters.

7.3 The measurements were made at 10 meters of HomeTek Lab's open site II.

7.4 Temperature : 21 ℃, Humidity : 72 % RH.

7.5 Radiated Emission data : **Horizontal**

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dB/m)	Cable Loss (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)
70.48	17.97	5.41	0.81	24.19	40
95.13	21.64	8.53	0.89	31.06	40
116.30	21.21	10.53	0.94	32.68	40
183.28	23.43	9.29	1.14	33.86	40
193.83	20.08	10.70	1.17	31.95	40
207.94	22.92	10.18	1.22	34.32	40
609.26	6.90	20.42	2.27	29.59	47
935.12	4.43	22.77	2.84	30.04	47

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 935.12 MHz .
- Corrected Reading : (4.43) + (22.77) + (2.84) = 30.04 . (Emission Level)

7.6 Radiated Emission data : **Vertical**

Frequency (MHz)	Reading Level (dBuV)	ANT factor (dB/m)	Cable Loss (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)
49.35	9.42	14.38	0.63	24.43	40
67.00	10.30	9.29	0.79	20.38	40
134.00	7.99	12.04	1.02	21.05	40
151.56	14.92	7.53	1.03	23.48	40
184.78	16.01	8.63	1.14	25.78	40
246.54	9.87	13.14	1.32	24.33	47
513.48	6.34	17.62	2.01	25.97	47
934.64	0.32	23.12	2.84	26.28	47

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 934.64 MHz .
- Corrected Reading : (0.32) + (23.12) + (2.84) = 26.28 . (Emission Level)

REMARK :

1. Model : AMB-218HT
2. Measuring mode :
3. Uncertainty in radiated emission measured : < ± 4.0dB.
4. " * ", means this data is worse case emission level.
5. Result : **PASSED**

8 PHOTO OF RADIATED EMISSION TEST

Model : AMB-218HT

Front View

Rear View

ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

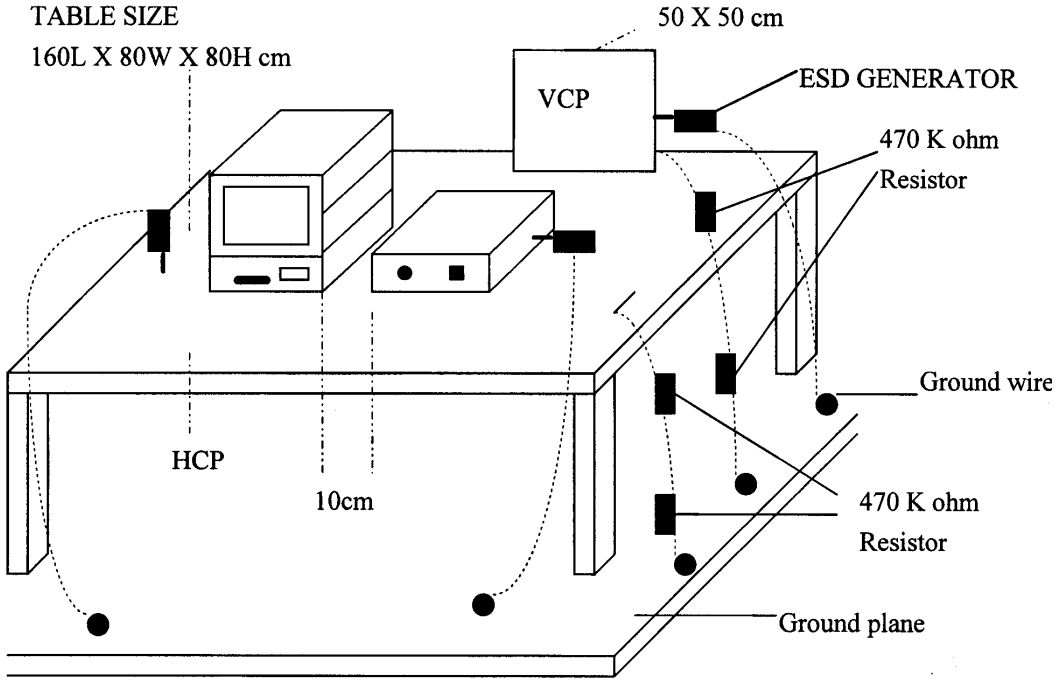
1 TEST INSTRUMENTS & FACILITIES

Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
ESD TESTER	HAEFELY	PESD 1600	MAR/99
VCP	HOMETEK	--	--

2 TEST PROCEDURE

According to **IEC 801-2**

3 TEST SETUP



4 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

5 EUT OPERATION CONDITION

Same as "Conducted Power Line test", section 5

6 TEST CONDITION

6.1 Test Level :

(A) ± 8KV for air discharge.

(B) ± 4KV for contact discharge.

6.2 Number of test : 10 Discharge / Level

6.3 Time between test : 1 sec.

6.4 Temperature : 21 ℃

6.5 Humidity : 58 % RH.

7 PERFORMANCE CRITERIA

A. Normal performance within the specification.

B. Temporary degradation or loss function or performance which is self-recoverable.

C. Temporary degradation or loss function or performance which requires operator intervention system reset.

D. Degradation or loss function which is not recoverable due to damage of EUT or software, or loss of data.

8 TEST RESULT

Test Point	Air Discharge	Contact Discharge	Performance Criteria	Result
VCP	--	± 4KV	B	PASSED
HCP	--	± 4KV	B	PASSED
CASE	± 8KV	± 4KV	B	PASSED
LED	± 8KV	± 4KV	B	PASSED
LCD	± 8KV	± 4KV	B	PASSED
I/O PORTS	± 8KV	± 4KV	B	PASSED
SCREWS	± 8KV	± 4KV	B	PASSED
FDD BUTTON	± 8KV	± 4KV	B	PASSED
COVER PLATE	± 8KV	± 4KV	B	PASSED
AC SOCKET	± 8KV	± 4KV	B	PASSED
Power Switch	± 8KV	± 4KV	B	PASSED

9 PHOTO OF ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)
Model : AMB-218HT

RADIO FREQUENCY ELECTROMAGNETIC FILE IMMUNITY TEST

(RS)

1 TEST INSTRUMENTS & FACILITIES

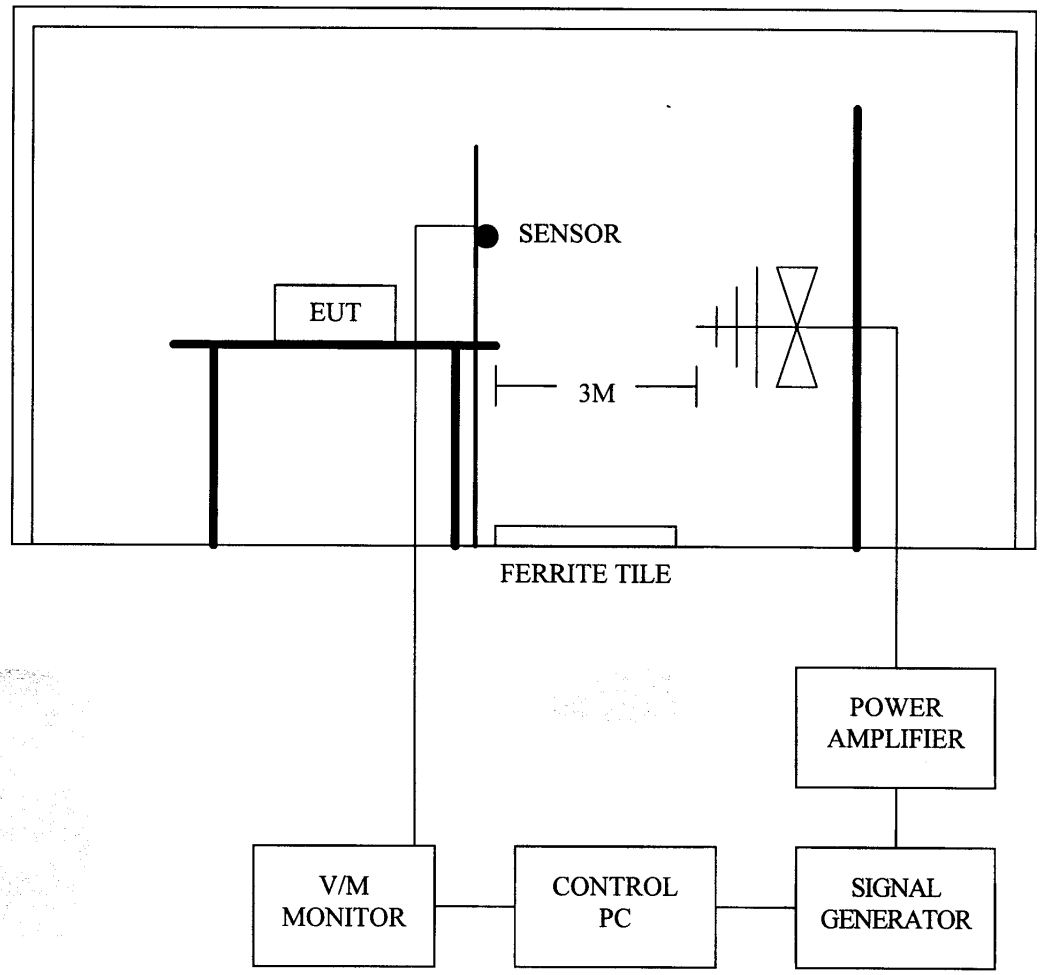
Instruments Facilities	Manufacturer	Model # Serial #	Data Of Cal.
SIGNAL GENERATOR	ROHDE & SCHWARZ	SMY02	FEB/99
AMPLIFIER	AMPLIFIER RESEACH	100W1000M1A	MAR/99
FIELD SENSOR	AMPLIFIER RESEACH	FP2000	MAR/99
FIELD MONITOR	AMPLIFIER RESEACH	FM2000	MAR/99
ANTENNA (BI-LOG)	ARA	LPB2520	MAR/99
CONTROL PC	KB TECH	KB P586/133	--

2 TEST PROCEDURE

According to **IEC 801-3**

3 TEST SETUP

FERRITE TILE



3.1 Chamber Size :

8M x 4M x 3M

4 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

5 OPERATION CONDITION OF EUT

Same as "Conducted Power Line test", section 5

6 TEST CONDITION

6.1 Frequency Range : 27 MHz ~ 500 MHz

6.2 Filed Strength : 3 V / M

6.3 Frequency Step : 1 %

6.4 Antenna Polarity : HORIZONTAL & VERTICAL

6.5 The four sides of EUT are tested
(FRONT, REAR, RIGHT, LEFT)

6.6 Temperature : 21 ℃

6.7 Humidity : 72 % RH

7 PERFORMANCE CRITERIA

A. Normal performance within the specification.

B. Temporary degradation or loss function or performance which is self-recoverable.

C. Temporary degradation or loss function or performance which requires operator intervention system reset.

D. Degradation or loss function which is not recoverable due to damage of EUT or software, or loss of data.

8 TEST RESULT

ANT / SIDE	HORIZONTAL	VERTICAL	RESULT
FRONT	A	A	PASSED
REAR	A	A	PASSED
RIGHT	A	A	PASSED
LEFT	A	A	PASSED

9 PHOTO OF RADIO FREQUENCY ELECTROMAGNETIC FILE IMMUNITY TEST (RS)

Model : AMB-218HT

Front View

Rear View

ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

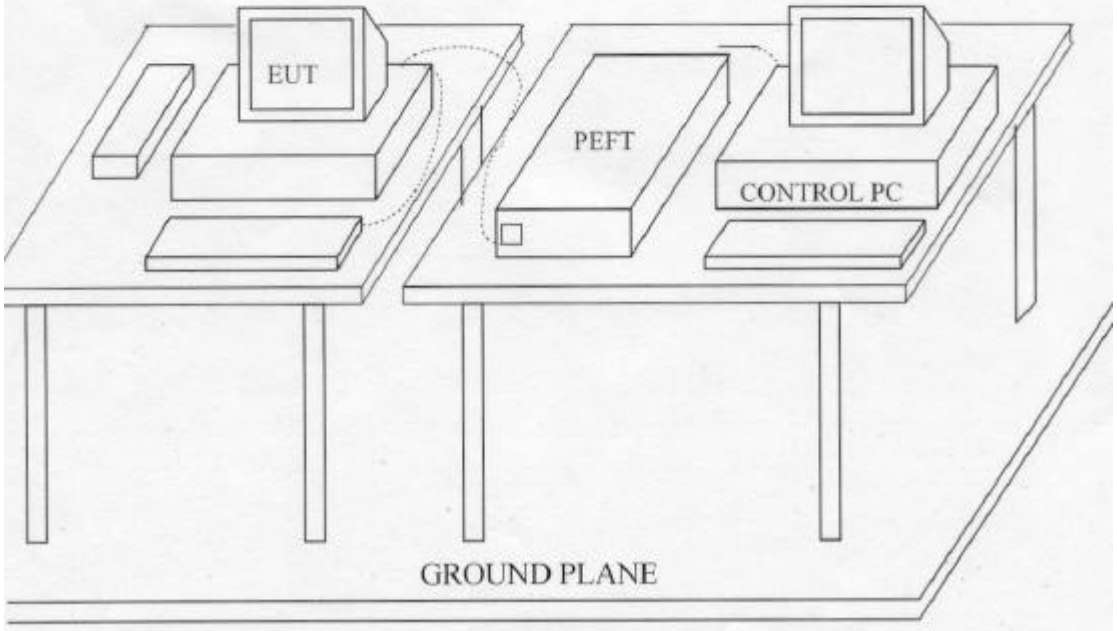
1 TEST INSTRUMENTS & FACILITIES

Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
BURST-TESTER	HAEFELY	PEFT/JUNIOR	MAR/99
CONTROL PC	KB TECH	KB P586/133	--

2 TEST PROCEDURE

According to **IEC 801-4**

3 TEST SETUP



4 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

5 OPERATION CONDITION OF EUT

Same as "Conducted Power Line test", section 5

6 TEST CONDITION

6.1 Pulse Rise time & Duration : 5 nS / 50 nS

6.2 Pulse Repetition : 5 kHz

6.3 Polarity : POSITIVE / NEGATIVE

6.4 Test Voltage : ± 0.5KV, ± 1KV

6.5 Coupling of power line :
L, N, PE, L+N, L+PE, N+PE, L+N+PE

6.6 Temperature : 21 ℃

6.7 Humidity : 72 % RH

7 PERFORMANCE CRITERIA

A. Normal performance within the specification.

B. Temporary degradation or loss function or performance which is self-recoverable.

C. Temporary degradation or loss function or performance which requires operator intervention system reset.

D. Degradation or loss function which is not recoverable due to damage of EUT or software, or loss of data.

8 TEST RESULT

TEST VOLTAGE	L	N	PE	L+N	L+PE	N+PE	L+N+PE
± 0.5KV	B	B	B	B	B	B	B
± 1KV	B	B	B	B	B	B	B

8.1 Model : AMB-218HT

8.2 Final Result : PASSED

8.3 Remark :

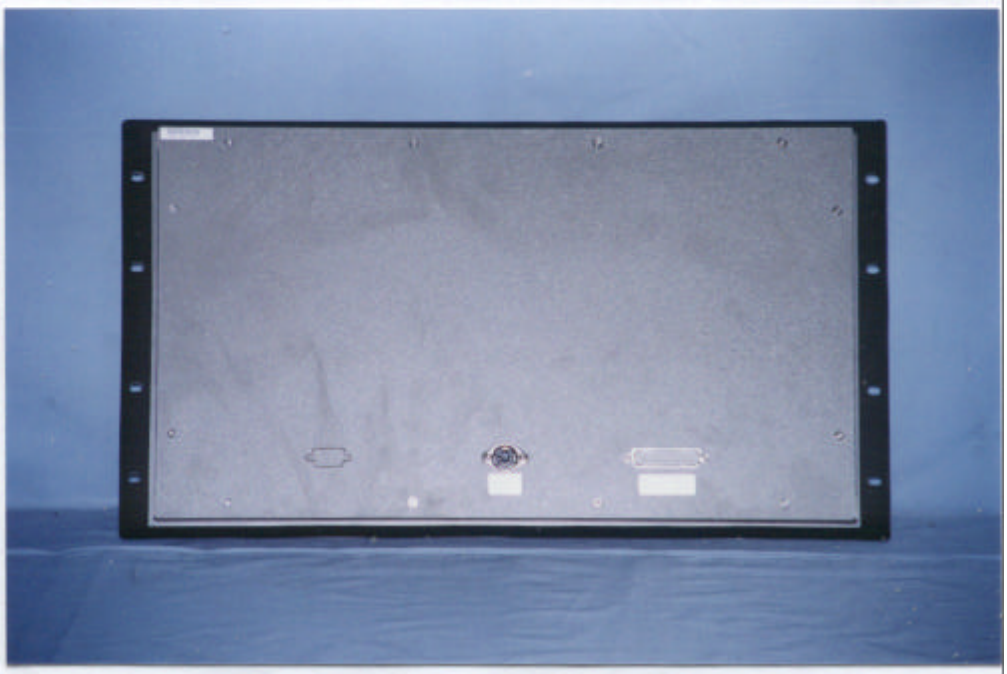
9 PHOTO OF ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

Model : AMB-218HT

PHOTOS OF EUT

Model : AMB-218HT

EUT Front View



EUT Rear View