

# CE EMC TEST REPORT

**REPORT NO.:** CE901207A08

**MODEL NO.:** MPC-100

**RECEIVED:** Dec. 7, 2001

**TESTED:** Dec. 7 ~ 17, 2001

**APPLICANT:** ADVANTECH CO., LTD.

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**ISSUED BY:** Advance Data Technology Corporation

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0528  
ILAC MRA

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## 1 CERTIFICATION

**PRODUCT:** Mobi Panel  
**BRAND NAME:** ADVANTECH  
**MODEL NO:** MPC-100  
**TEST ITEM:** ENGINEERING SAMPLE  
**APPLICANT:** ADVANTECH CO., LTD.  
**STANDARDS:** **EN 55022:1998, Class B** IEC 61000-4-3:1995  
**EN 61000-3-2:1995+A1:1998** IEC 61000-4-4:1995  
**+A2:1998, Class A** IEC 61000-4-5:1995  
**EN 61000-3-3:1995** IEC 61000-4-6:1996  
IEC 61000-4-8:1993  
IEC 61000-4-11:1994

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Dec. 7 to 17, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

**TESTED BY:**  
(Emission) Kent Chen, **DATE:** Jan. 5, 2002  
( Kent Chen )

**TESTED BY:**  
(Immunity) S.S. Wang, **DATE:** Jan. 7, 2002  
( S. S. Wang )

**CHECKED BY:** Vickie Yu, **DATE:** Jan. 2, 2002  
( Vickie Yu )

**APPROVED BY:** Mike Su, **DATE:** Jan. 2, 2002  
( Mike Su, Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
EN 55022:1998, Class B	Conducted Test	PASS	Meets Class B Limit Minimum passing margin is -13.78 dB at 0.468 MHz
	Radiated Test	PASS	Meets Class B Limit Minimum passing margin is -2.6 dB at 221.19 MHz
EN61000-3-2:1995 +A1:1998+A2:1998, Class A	Harmonic current emissions	PASS	Meets Class A Limit
EN61000-3-3:1995	Voltage fluctuations & flicker	PASS	Meets the requirements.

IMMUNITY			
Standard	Test Type	Result	Remarks
IEC 61000-4-3: 1995	Radiated, radio- frequency, electromagnetic field immunity test	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-4: 1995	Electrical fast transient / burst immunity test.	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-5: 1995	Surge immunity test	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-6: 1996	Immunity to conducted disturbances, induced by radio- frequency fields	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-8: 1993	Power frequency magnetic field immunity test.	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-11: 1994	Voltage dips, short interruptions and voltage variations immunity tests	PASS	Meets the requirements of <b>Voltage Dips:</b> 1. >95% reduction - Performance Criterion A 2. 30% reduction - Performance Criterion A <b>Voltage Interruptions:</b> 1. >95% reduction - Performance Criterion C

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Mobi Panel
<b>MODEL NO.</b>	MPC-100
<b>POWER SUPPLY</b>	Switching Power Adapter Brand: LIEN Model: LE-9702B-01 Input rating: 100-240V, 1.5A, 50-60Hz Output rating: 19V, 3.16A Power Cord: Nonshielded, AC (1.8m) Nonshielded DC (1.8m)
<b>DATA CABLE</b>	NA

**NOTE:** The EUT is a 10.4" TFT Panel with SVGA resolution up to 800x600.

The resolution during the test was 800x600.

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

#### 3.2 DESCRIPTION OF TEST MODES

The following parts of EUT are used to establish a basic configuration of system and during the test:

<b>COMPONENT</b>	<b>BRAND &amp; MODEL NO.</b>
CPU	Intel Strong ARM 1110 206MHz
LCD	UNIPAC, model: UB104S01-1
MEMORY	On board
MOTHER BOARD	Abocom, model: M01-MA13M-X30
SWITCHING BOARD	Abocom, model: M01-MA13S-X30
FLASH BOARD	Abocom, model: M01-MA1KF-X30

The test mode with worst EMI was chosen for all immunity test items and current harmonic and flicker tests.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of ITE equipment and, according to the specifications of the manufacturers, must comply with the requirements of the following standards:

<b>EN 55022:1998, Class B</b>	IEC 61000-4-3:1995
<b>EN 61000-3-2:1995+</b>	IEC 61000-4-4:1995
<b>A1:1998+A2:1998, Class A</b>	IEC 61000-4-5:1995
<b>EN 61000-3-3:1995</b>	IEC 61000-4-6:1996
	IEC 61000-4-8:1993
	IEC 61000-4-11:1994

All tests have been performed and recorded as per the above standards.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

#### 3.4.1 FOR EMISSION TEST

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	COLOR MONITOR	ADI	CM100	020058T10200184	FCC DoC Approved
2	MODEM	ACEEX	1414	980020523	IFAXDM1414
3	USB KEYBOARD	SiliconGraphis	SK-2502U	M990207273	GYUR58SK
4	KEYBOARD PS/2	FORWARD	FDA-104GA	FDKB8110113	F4ZDA-104G
5	USB MOUSE	LOGITECH	M-BE58	LZE10152286	FCC DoC Approved
6	PS/2 MOUSE	LOGITECH	M-S43	LZE000703132	DZL211106
7	MICROPHONE	CAROL	MUD-329	NA	NA
8	SPEAKER	JAZZ	J-008	J791005	NA
9	Personal Computer	HP	Brio BA410	SG12106031	FCC DoC Approved
10	LAN CARD	HP	EN1207D-TX-4A-18	ACC000285575	FCC DoC Approved
11	COLOR MONITOR	ADI	CM100	024058T10200346	FCC DoC Approved
12	PRINTER	HP	2225C+	3208S05355	DSI6XU2225
13	MODEM	ACEEX	1414	980020502	IFAXDM1414
14	PS/2 KEYBOARD	BTC	5121W	A00801378	E5XKB5121WTH0110
15	PS/2 KEYBOARD	BTC	5121W	A00801372	E5XKB5121WTH0110
16	USB MOUSE	LOGITECH	M-BB48	LZE00651079	DOC
17	PS/2 MOUSE	LOGITECH	M-S43	LZE93502451	DZL211106
18	PERSONAL COMPUTER	IBM	2187-12W	1S218714ABNA000D	FCC DoC Approved
19	COLOR MONITOR	ADI	CM100	020058T10200182	FCC DoC Approved
20	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110128	F4ZDA-104G
21	PS/2 MOUSE	LOGITECH	M-S43	LZE00703123	DZL211106
22	Wireless Access Point	SMC	SMC2655W	NA	NA



NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
2	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
3	2.5 m braid shielded wire, terminated with USB connector via drain wire, w/o core.
4	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
5	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
6	1.8 m foil shielded wire, terminated with PS/2 connector via drain wire, w/o core.
7	3.0 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
8	1.1 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
9	NA
10	NA
11	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
12	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
13	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
14	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
15	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
16	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
17	1.8 m foil shielded wire, terminated with PS/2 connector via drain wire, w/o core.
18	NA
19	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
20	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
21	1.8 m foil shielded wire, terminated with PS/2 connector via drain wire, w/o core.
22	NA

**NOTE:** 1. All power cords of the above support units are non-shielded (1.8m).

2. The EUT acted as SERVER PC and communicated with support units 9-17( via USB cable and LAN cable) & support units 18-22 (kept in a remote area), which acted as WORKSTATION and partners of communication system via wireless communication.

### 3.4.2 FOR HARMONICS / FLICKER / IMMUNITY TEST

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	MONITOR	NEC	V520	NA	FCC DoC Approved
2	PRINTER	HP	C2145A	SG59N16035	B94C2145X
3	MODEM	GVC	F-1128V1R6	96-191-113004	DK4F1128VR6
4	PS2 KEYBOARD	HP	6511-PK	99P468101CY1 W06S012296	FCC DoC Approved
5	USB KEYBOARD	Silicon Graphis	SK-2502U	M990207208	GYUR58SK

6	PS2/MOUSE	HP	M-S48a	LZE11308398A W	JNZ201213
7	USB MOUSE	LOGITECH	M-BE58	LZA04523289	FCC DoC Approved
8	USB MOUSE	LOGITECH	M-BE58	LZA04523740	FCC DoC Approved
9	SPEAKER	J-S	J-009	NA	FCC DoC Approved
10	MICROPHONE	L	UDM-535	S/N	FCC DoC Approved
11	NOTEBOOK COMPUTER	COMPAQ	Armada 1500C	NA	FCC DoC Approved
12	Personal Computer	HP	BRIO BA410	SG10602695	DOC
13	LAN CARD	3 COM	3C905-TXM ETHERLINK 10/100 PCI	HKQD46B282	FCC DoC Approved
14	COLOR MONITOR	ACER	7254e	9171602008	JVP7254E
15	PS/2 KEYBOARD	HP	C3758A	C3758-60223	CIGE03633
16	USB MOUSE	DEXIN Corp.	A2U800A	71001821	NIYA2U800A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5 m braid shielded wire, terminated with VGA connector via metallic frame, one core.
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	1.8 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core
5	2.5 m braid shielded wire, terminated with USB connector via drain wire, w/o core.
6	1.8 m non shielded wire, terminated with PS/2 connector via drain wire, w/o core.
7	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
8	1.8 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
9	1.5 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
10	2.2 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
11	NA
12	NA
13	NA
14	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
15	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
16	1.5 m foil shielded wire, terminated with USB connector via drain wire, w/o core.

- NOTE:**
1. All power cords of the above support units are non shielded (1.8m).
  2. The EUT with support units 1-10 communicated with support unit 11 via a USB cable (1.8m)
  3. The EUT had wireless LAN communication with support unit 11.
  4. The EUT with support units 1-10 communicated with support units via a LAN cable (10m).

## 4 EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTE:**
- (1) The lower limit shall apply at the transition frequencies.
  - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
  - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 4, 2002
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C02.01	July 5, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

- NOTE:**
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. “\*”: These equipment are used for conducted telecom port test only (if tested).

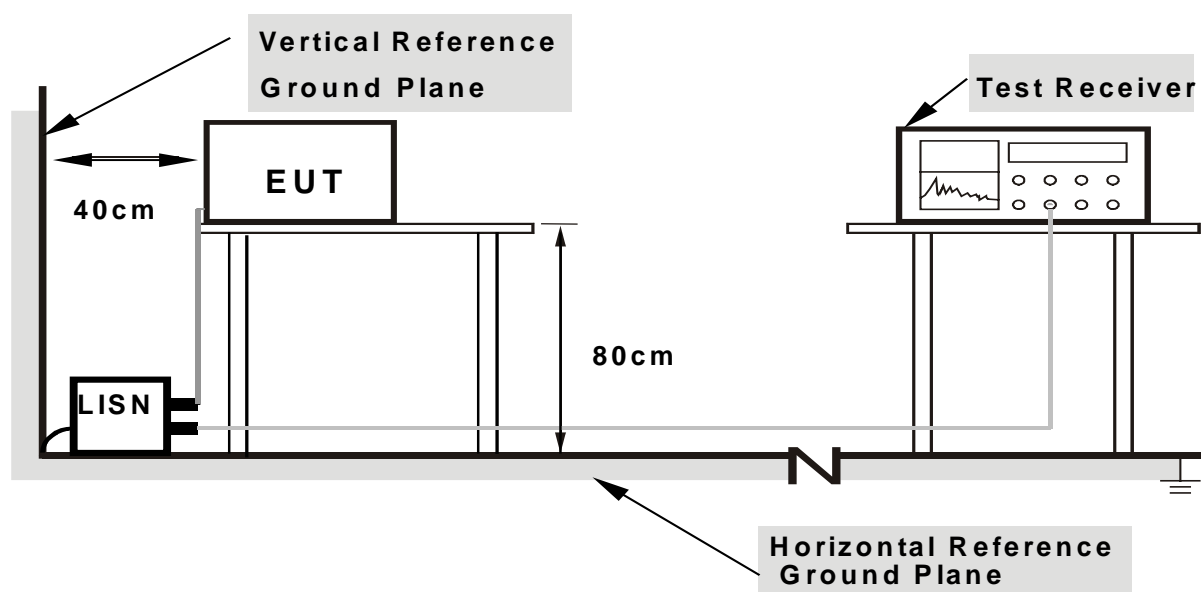
### 4.1.3 TEST PROCEDURE

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.1.5 TEST SETUP



- Note:**
- Support units were connected to second LISN.
  - Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### **4.1.6 EUT OPERATING CONDITIONS**

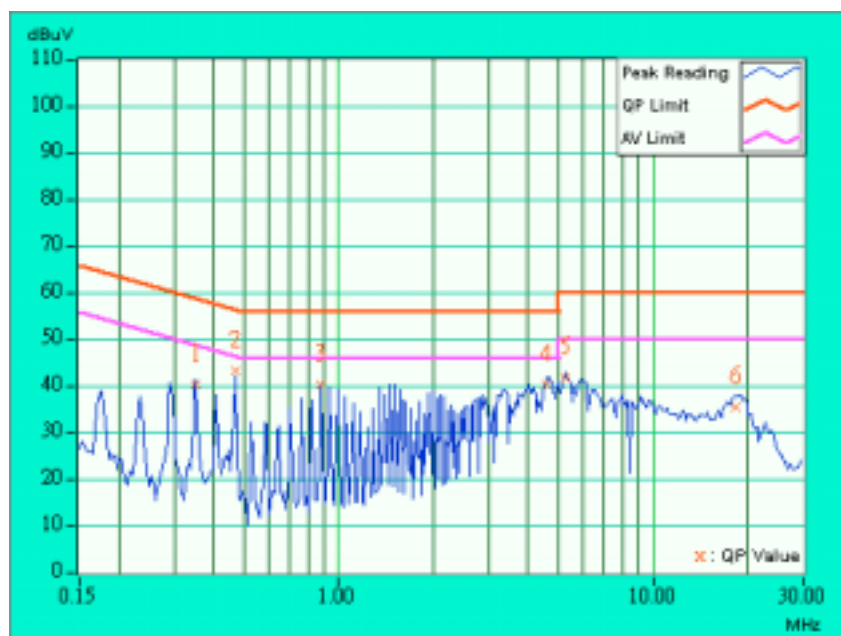
- a. Turned on the power of all equipment.
- b. EUT ran a test program to enable all functions of EUT.
- c. EUT read and wrote messages from PC via USB cable and LAN cable.
- d. EUT sent and received messages from WORKSTATION PC via wireless moulder.
- e. EUT sent "H" messages to LCD panel and external monitor. Then they displayed "H" patterns on their screens simultaneously.
- f. EUT sent messages to printer, and then printer printed them on paper.
- g. EUT sent audio messages to speaker.
- h. Steps c-h were repeated.



<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>6dB BANDWIDTH</b>	10 kHz
<b>INPUT POWER</b>	230Vac, 50 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 70 % RH, 1000 hPa	<b>TESTED BY:</b> Kent Chen	

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.351	0.10	39.46	-	39.56	-	58.93	48.93	-19.37	-
2	0.468	0.10	42.67	-	42.77	-	56.55	46.55	-13.78	-
3	0.879	0.10	39.76	-	39.86	-	56.00	46.00	-16.14	-
4	4.569	0.31	39.57	-	39.88	-	56.00	46.00	-16.12	-
5	5.274	0.32	41.02	-	41.34	-	60.00	50.00	-18.66	-
6	18.278	0.73	34.98	-	35.71	-	60.00	50.00	-24.29	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 - 1000	47	37

**NOTE:** (1) The lower limit shall apply at the transition frequencies.  
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).  
 (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3544A00941	Dec.10, 2002
HP Pre-Amplifier	8447D	2944A08312	Feb. 28, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* R&S Receiver	ESI7	100033	May 30, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
* CHASE BILOG Antenna	CBL6111A	1500	Aug. 30, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 15, 2002
* EMCO Turn Table	1060-04	1196	NA
* EMCO Tower	1051	1264	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M06089	Aug. 30, 2002
* TIMES RF cable	LMR-600	CABLE-ST1-01	Aug. 30, 2002
Open Field Test Site	Site 1	ADT-R01	June 15, 2002
VCCI Site Registration No.	Site 1	R-236	NA

**NOTE:** 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.  
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.  
 3. "\*" = These equipment are used for the final measurement.  
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.



### 4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

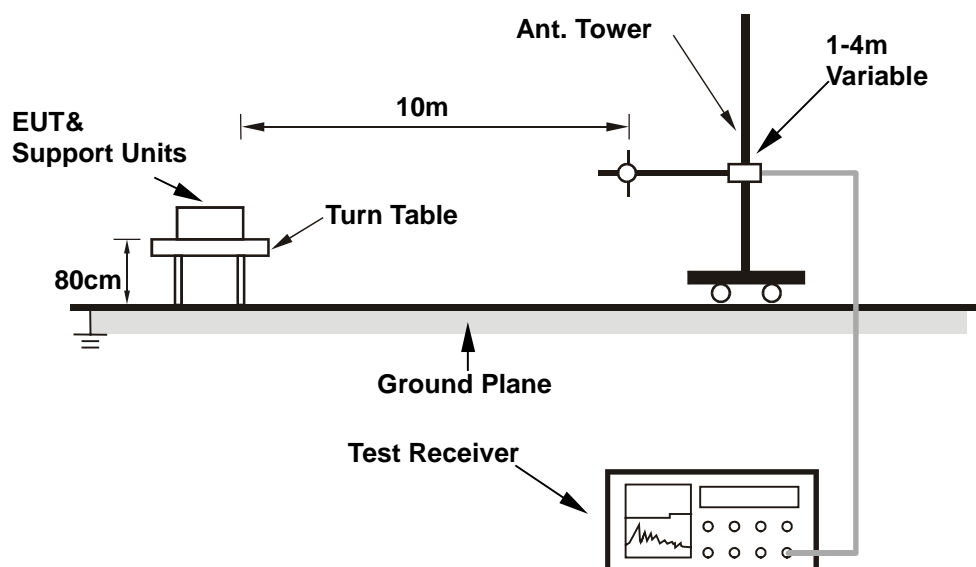
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

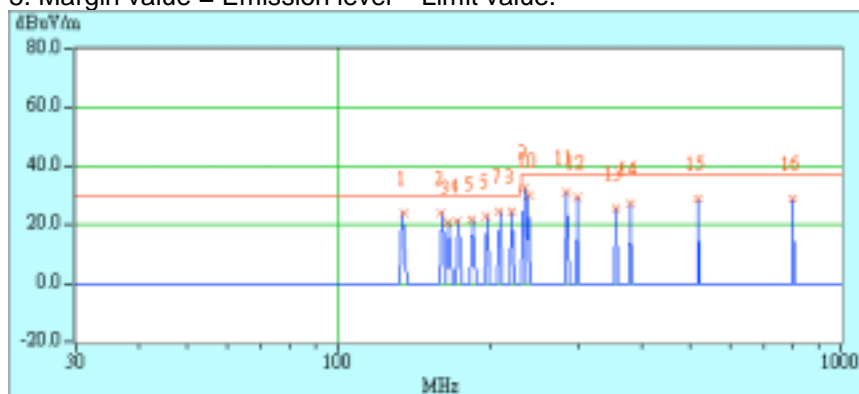
## 4.2.7 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 70 % RH, 1000 hPa	<b>TESTED BY:</b> Kent Chen	

### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB/m)
1	135.16	24.1 QP	30.00	-5.90	4.00H	319	11.23	11.20	1.67	0.00	-12.87
2	159.74	23.9 QP	30.00	-6.10	4.00H	182	12.28	9.85	1.78	0.00	-11.63
3	164.67	20.8 QP	30.00	-9.20	4.00H	37	9.52	9.52	1.76	0.00	-11.29
4	172.07	21.4 QP	30.00	-8.60	4.00H	181	10.63	9.03	1.74	0.00	-10.78
5	184.35	21.5 QP	30.00	-8.50	4.00H	276	11.11	8.61	1.78	0.00	-10.40
6	196.62	22.7 QP	30.00	-7.30	4.00H	308	12.06	8.72	1.91	0.00	-10.65
7	208.91	24.7 QP	30.00	-5.30	3.76H	121	13.43	9.28	1.99	0.00	-11.28
8	221.19	24.3 QP	30.00	-5.70	2.82H	259	12.29	9.96	2.05	0.00	-12.02
9	233.50	33.0 QP	37.00	-4.00	3.28H	165	20.25	10.64	2.11	0.00	-12.75
10	239.53	29.8 QP	37.00	-7.20	3.63H	157	16.76	10.91	2.13	0.00	-13.04
11	284.49	31.3 QP	37.00	-5.70	2.80H	83	16.91	12.11	2.28	0.00	-14.39
12	299.48	29.6 QP	37.00	-7.40	2.28H	174	14.56	12.73	2.31	0.00	-15.04
13	356.55	25.8 QP	37.00	-11.20	2.08H	286	9.32	13.81	2.67	0.00	-16.48
14	380.95	27.2 QP	37.00	-9.80	2.55H	141	9.81	14.58	2.81	0.00	-17.40
15	519.05	29.0 QP	37.00	-8.00	3.55H	287	7.09	18.56	3.35	0.00	-21.92
16	802.65	28.8 QP	37.00	-8.20	2.51H	268	1.60	22.58	4.63	0.00	-27.22

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
  2. Correction Factor(dB/m) = Pre-Amplifier Gain (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
  3. Pre-Amplifier Gain (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
  4. The other emission levels were very low against the limit.
  5. Margin value = Emission level – Limit value.

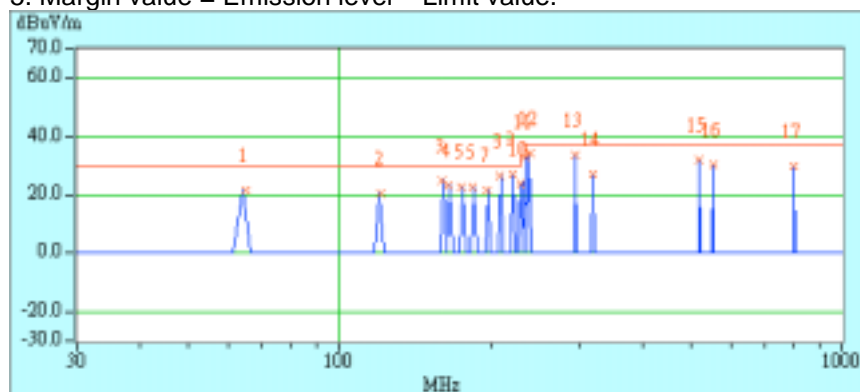


<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER</b>	230Vac, 50 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 70 % RH, 1000 hPa	<b>TESTED BY:</b> Kent Chen	

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Gain (dB)	Correction Factor (dB/m)
1	64.78	21.6 QP	30.00	-8.40	1.00V	258	14.26	5.61	1.73	0.00	-7.34
2	120.62	20.5 QP	30.00	-9.50	1.00V	159	7.64	11.22	1.62	0.00	-12.84
3	159.76	25.1 QP	30.00	-4.90	1.00V	305	13.45	9.85	1.78	0.00	-11.62
4	164.71	23.4 QP	30.00	-6.60	1.00V	37	12.17	9.52	1.76	0.00	-11.28
5	174.91	22.7 QP	30.00	-7.30	1.00V	354	12.07	8.86	1.73	0.00	-10.60
6	184.33	22.8 QP	30.00	-7.20	1.00V	63	12.41	8.61	1.78	0.00	-10.39
7	196.62	21.5 QP	30.00	-8.50	1.00V	226	10.85	8.72	1.91	0.00	-10.64
8	208.91	26.4 QP	30.00	-3.60	1.00V	67	15.16	9.28	1.99	0.00	-11.27
9	221.19	27.4 QP	30.00	-2.60	1.00V	76	15.36	9.96	2.05	0.00	-12.01
10	229.58	23.7 QP	30.00	-6.30	1.00V	307	11.29	10.37	2.08	0.00	-12.45
11	233.49	33.2 QP	37.00	-3.80	1.00V	67	20.44	10.64	2.11	0.00	-12.76
12	239.56	34.3 QP	37.00	-2.70	1.00V	71	21.30	10.91	2.13	0.00	-13.05
13	294.57	34.0 QP	37.00	-3.00	1.00V	344	19.13	12.53	2.30	0.00	-14.83
14	319.36	27.0 QP	37.00	-10.00	1.00V	352	11.48	13.07	2.43	0.00	-15.50
15	519.09	32.3 QP	37.00	-4.70	2.31V	16	10.40	18.56	3.35	0.00	-21.91
16	552.98	30.5 QP	37.00	-6.50	3.07V	24	6.88	20.23	3.38	0.00	-23.61
17	802.85	30.1 QP	37.00	-6.90	2.31V	181	2.93	22.58	4.63	0.00	-27.22

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) – Correction Factor(dB)
  2. Correction Factor(dB/m) = Pre-Amplifier Gain (dB) - Antenna Factor (dB/m) - Cable Factor (dB)
  3. Pre-Amplifier Gain (dB) = 0, when the test receiver is used to read the value and because it did not use the Pre-Amplifier.
  4. The other emission levels were very low against the limit.
  5. Margin value = Emission level – Limit value.



## 4.3 HARMONICS CURRENT MEASUREMENT

### 4.3.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	0.23x8/n

Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15 ≤ n ≤ 39	3.85/n	0.15x15/n

- NOTE:** 1. Class A and Class D are judged by test equipment automatically as per Section 5 of EN 61000-3-2:1995.
2. The above limits for Class D equipment are for all applications having an active input power > 75 W. No limits apply for equipment with an active input power up to and including 75 W.

### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
KeyTek, Power Arb Waveform Generator	EP72HF	9508346	April 20, 2002
KIKUSUI AC SWITCHING POWER SUPPLY	PCR 4000L	9508355	April 20, 2002

- NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

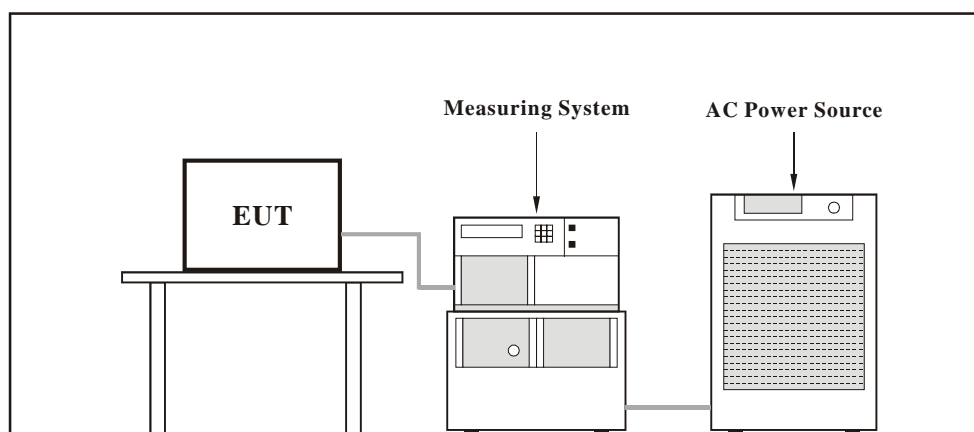
### 4.3.3 TEST PROCEDURE

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- b. The classification of EUT is according to section 5 of EN 61000-3-2:1995.

The EUT is classified as follows:

- Class A: Balanced three-phase equipment and all other equipment, except that stated in one of the following classes.
  - Class B: Portable tools.
  - Class C: Lighting equipment, including dimming devices.
  - Class D: Equipment having an input current with “special wave shape” and an active input power,  $P \leq 600 \text{ W}$
- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 4.3.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### **4.3.5 EUT OPERATING CONDITIONS**

- a. EUT ran a test program to enable all functions.
- b. EUT sent messages to Notebook PC and messages were displayed on EUT panel and external monitor.
- c. EUT sent messages to printer and printer printed them out on paper.
- d. EUT sent messages to modem.
- e. EUT sent audio signals to speaker.
- f. Steps b-f were repeated.

### 4.3.6 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
<b>FUNDAMENTAL VOLTAGE/AMPERE</b>	229.366 Vrms/ 0.367 Arms	<b>POWER FREQUENCY</b>	50.000 Hz
<b>RATED POWER CONSUMPTION</b>	68.946 W	<b>POWER FACTOR</b>	0.456
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 75 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

Harm. Order	Reading Data (A)	Limit (A)
1	-	-
3	0.04	2.30
5	0.05	1.14
7	0.04	0.77
9	0.04	0.40
11	0.04	0.33
13	0.04	0.21
15	0.03	0.15
17	0.03	0.13
19	0.03	0.12
21	0.02	0.11
23	0.02	0.10
25	0.02	0.09
27	0.01	0.08
29	0.01	0.08
31	0.01	0.07
33	0.01	0.07
35	0.02	0.06
37	0.01	0.06
39	0.00	0.06

Harm. Order	Reading Data (A)	Limit (A)
2	0.00	1.08
4	0.00	0.43
6	0.00	0.30
8	0.00	0.23
10	0.00	0.18
12	0.00	0.15
14	0.00	0.13
16	0.00	0.12
18	0.00	0.10
20	0.00	0.09
22	0.00	0.08
24	0.00	0.08
26	0.00	0.07
28	0.00	0.07
30	0.00	0.06
32	0.00	0.06
34	0.00	0.05
36	0.02	0.05
38	0.00	0.05
40	0.00	0.05

**NOTE:** Steady state values on AC mains are recorded in the table.



## 4.4 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

## 4.5 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

TEST ITEM	LIMIT	NOTE
$P_{st}$	1.0	$P_{st}$ means short-term flicker indicator.
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator.
$T_{dt}$ (ms)	200	$T_{dt}$ means maximum time that $dt$ exceeds 3 %.
$d_{max}$ (%)	4%	$d_{max}$ means maximum relative voltage change.
$dc$ (%)	3%	$dc$ means relative steady-state voltage change

### 4.5.1 TEST INSTRUMENTS

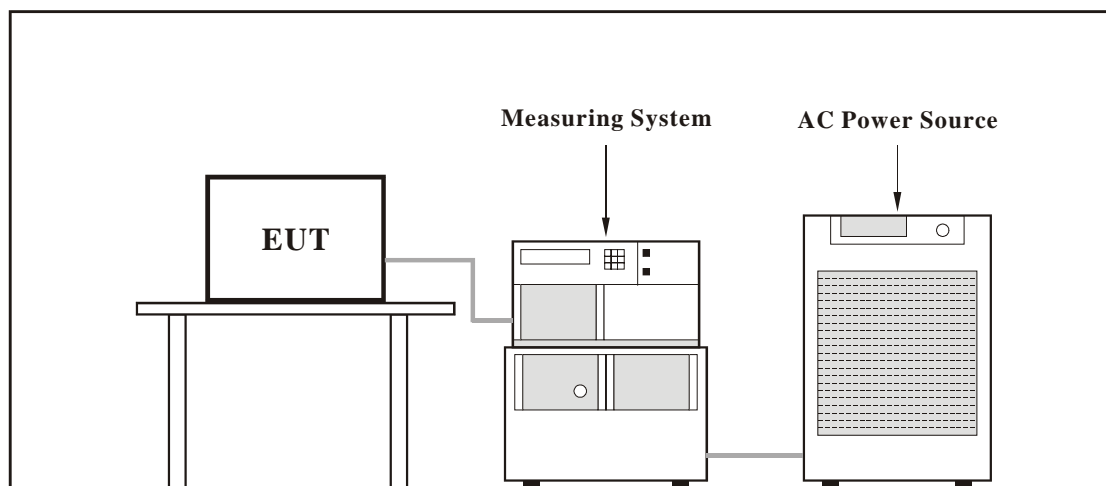
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
KeyTek, Power Arb Waveform Generator	EP72HF	9508346	April 20, 2002
KIKUSUI AC SWITCHING POWER SUPPLY	PCR 4000L	9508355	April 20, 2002

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.5.2 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### 4.5.3 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 4.5.4 EUT OPERATING CONDITIONS

Same as 4.3.5

## 4.5.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
<b>INPUT VOLTAGE/AMPERE</b>	229.366 Vrms / 0.153 Arms	<b>POWER FREQUENCY</b>	50.000 Hz
<b>OBSERVATION PERIOD (Tp)</b>	2 hours	<b>POWER FACTOR</b>	0.367
<b>ENVIRONMENTAL CONDITIONS</b>	20 deg. C, 55 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

TEST PARAMETER	MEASUREMENT VALUE	LIMIT	REMARKS
$P_{st}$	0.090	1.0	Pass
$P_{lt}$	0.088	0.65	Pass
$T_{dt}$ (ms)	0	200	Pass
$d_{max}$ (%)	0	4%	Pass
dc (%)	0	3%	Pass

**NOTE:**

- (1)  $P_{st}$  means short-term flicker indicator.
- (2)  $P_{lt}$  means long-term flicker indicator.
- (3)  $T_{dt}$  means maximum time that dt exceeds 3 %.
- (4)  $d_{max}$  means maximum relative voltage change.
- (5) dc means relative steady-state voltage change.

## 5 IMMUNITY TEST

### 5.1 GENERAL DESCRIPTION

<b>Basic Standard, specification requirement, and Performance Criteria:</b>	IEC 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80-1000 MHz, 3V/m, 80% AM (1kHz), Performance Criterion A
	IEC 61000-4-4	Electrical Fast Transient/Burst - EFT, Power line: 1kV, Signal line: 0.5kV, Performance Criterion B
	IEC 61000-4-5	Surge Immunity Test: 1.2/50 us Open Circuit Voltage, 8 /20 us Short Circuit Current, Power Line - 1 kV, line to earth - 2kV, Performance Criterion B
	IEC 61000-4-6	Conducted Radio Frequency Disturbances Test – CS: 0.15-80 MHz, 3V, 80% AM, 1kHz, Performance Criterion A
	IEC 61000-4-8	Power Frequency Magnetic Field Test, 50 Hz, 1A/m, Performance Criterion A
	IEC 61000-4-11	Voltage Dips: i) >95% reduction -0.5 period, Performance Criterion B ii) 30% reduction – 25 period, Performance Criterion C Voltage Interruptions: i) >95% reduction – 250 period, Performance Criterion C

## 5.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION

According to Clause 7.1 of EN 55024: 1998 standard, the following describes the general performance criteria.

<b>CRITERION A</b>	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
<b>CRITERION B</b>	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state if stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
<b>CRITERION C</b>	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 5.3 EUT OPERATING CONDITION

Same as item 4.3.5.

## 5.4 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

### 5.4.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-3
<b>Frequency Range:</b>	80 MHz - 1000 MHz
<b>Field Strength:</b>	3 V/m
<b>Modulation:</b>	1kHz Sine Wave, 80%, AM Modulation
<b>Frequency Step:</b>	1 % of fundamental
<b>Polarity of Antenna:</b>	Horizontal and Vertical
<b>Test Distance:</b>	3 m
<b>Antenna Height:</b>	1.5m
<b>Dwell Time:</b>	at least 3 seconds

### 5.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Signal Generator	SMY01	840490/009	Aug. 03, 2002
KALMUS Power Amplifier	LA1000V	091995-1	NA
KALMUS Power Amplifier	757LC	091995-2	NA
HOLADAY Field Probe	HI-4422	89915	Aug. 13, 2002
EMCO BiconiLog Antenna	3141	1001	NA
COMTEST Compact Full Anechoic Chamber (7x3x3 m)	CFAC	ADT-S01	Aug. 17, 2002

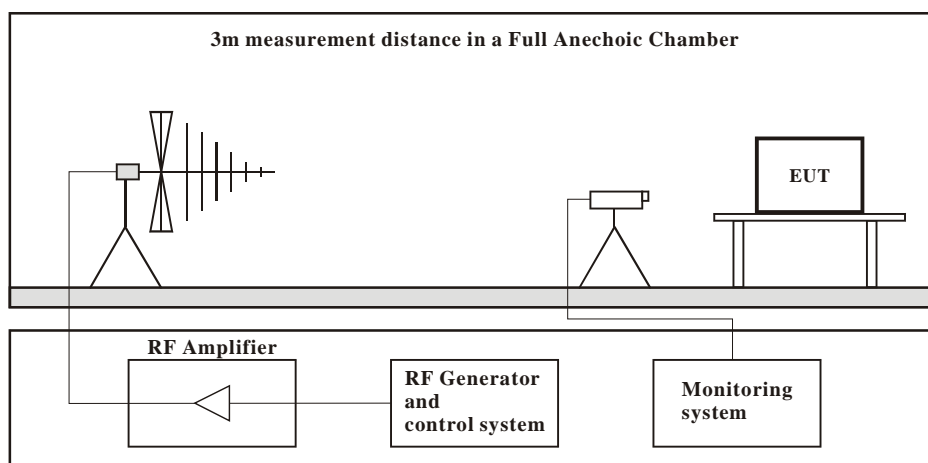
**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.4.3 TEST PROCEDURE

The test procedure was in accordance with IEC 61000-4-3

- The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sinewave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The field strength level was 3V/m.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### 5.4.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### NOTE:

#### TABLETOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3:1995 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

#### FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-3:1995 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

## 5.4.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

Frequency (MHz)	Result	Polarity	Azimuth	Field Strength (V/m)	Observation	Performance Criterion
80 -1000 MHz	PASS	V&H	0	3	Note	A
80 -1000 MHz	PASS	V&H	90	3		
80 -1000 MHz	PASS	V&H	180	3		
80 -1000 MHz	PASS	V&H	270	3		

**NOTE:** There was no change compared with the initial operation during the test.



## 5.5 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

### 5.5.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-4
<b>Test Voltage:</b>	Power Line - 1 kV Signal/Control Line – 0.5 kV
<b>Polarity:</b>	Positive & Negative
<b>Impulse Frequency:</b>	5 kHz
<b>Impulse Waveshape :</b>	5/50 ns
<b>Burst Duration:</b>	15 ms
<b>Burst Period:</b>	300 ms
<b>Test Duration:</b>	Not less than 1 min.

### 5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
KeyTek, EFT Generator	CE-40	9508257	Aug. 28, 2002
KeyTek, Capacitive Clamp	CE-40-CCL	9508259	NA

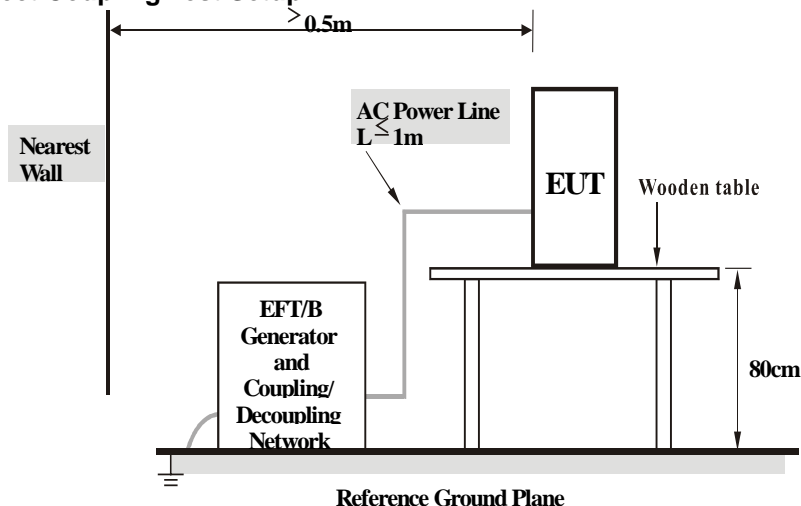
**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.5.3 TEST PROCEDURE

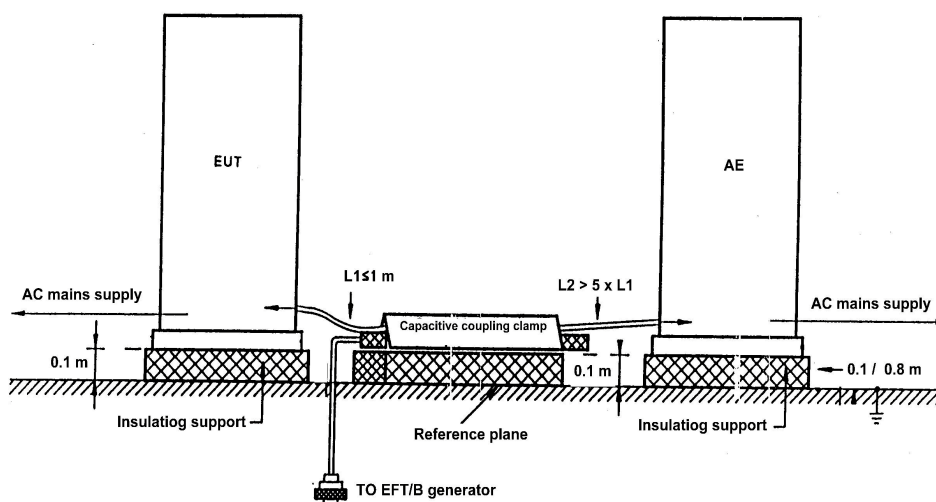
- The EUT was tested with 1000 volt discharges to the AC power input leads and 500 volt discharges to the interconnect cables.
- Both positive and negative polarity discharges were applied.
- The length of the “hot wire” from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.
- The duration time of each test sequential was 1 minute.
- The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

## 5.5.4 TEST SETUP

### a. Direct Coupling Test Setup



### b. Capacitive Clamp Test Setup (if any)



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### NOTE:

##### TABLETOP EQUIPMENT

The configuration consisted of a wooden table ( $0.8\text{m}$  high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least  $0.25\text{mm}$  thick and  $2.5\text{m}$  square) connected to the protective grounding system. A minimum distance of  $0.5\text{m}$  was provided between the EUT and the walls of the laboratory or any other metallic structure.

##### FLOOR STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC 61000-4-4:1995 and its cables, were isolated from the Ground Reference Plane by an insulating support that is  $0.1\text{-meter}$  thick. The GRP consisted of a sheet of aluminum (at least  $0.25\text{mm}$  thick and  $2.5\text{m}$  square) connected to the protective grounding system.

## 5.5.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

Test Point	Polarity	Test Level (kV)	Observation	Performance Criterion
L1	+/-	1	Note	A
L2	+/-	1	Note	A
GND	+/-	1	Note	A
Signal/Control Line	+/-	0.5	Note	A

**NOTE:** There was no change compared with the initial operation during the test.

## 5.6 SURGE IMMUNITY TEST

### 5.6.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-5
<b>Wave-Shape:</b>	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
<b>Test Voltage:</b>	Power Line - 1 kV / 2 kV
<b>Surge</b>	L1-L2 / L1-G / L2-G / L1, L2-G
<b>Input/Output:</b>	
<b>Generator Source</b>	2 ohm between networks
<b>Impedance:</b>	12 ohm between network and ground
<b>Polarity:</b>	Positive/Negative
<b>Phase Angle:</b>	0° /90°/180°/270°
<b>Pulse Repetition</b>	1 time / min. (maximum)
<b>Rate:</b>	
<b>Number of Tests:</b>	5 positive and 5 negative at selected points

### 5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION UNTIL
KeyTek, Control Center	E103	9508347	NA
KeyTek, Surge Combination Wave	E501A	9508349	Aug. 28, 2002
KeyTek, Surge Coupler/Decoupler	E551	9508350	Aug. 28, 2002
KeyTek External Coupler/Decoupler for Telecom Lines	CM-TELCD	9906194	NA
KeyTek I/O Signal Line Coupler/Decoupler	CM-I/OCD	9907177	NA

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.6.3 TEST PROCEDURE

- a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive

coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

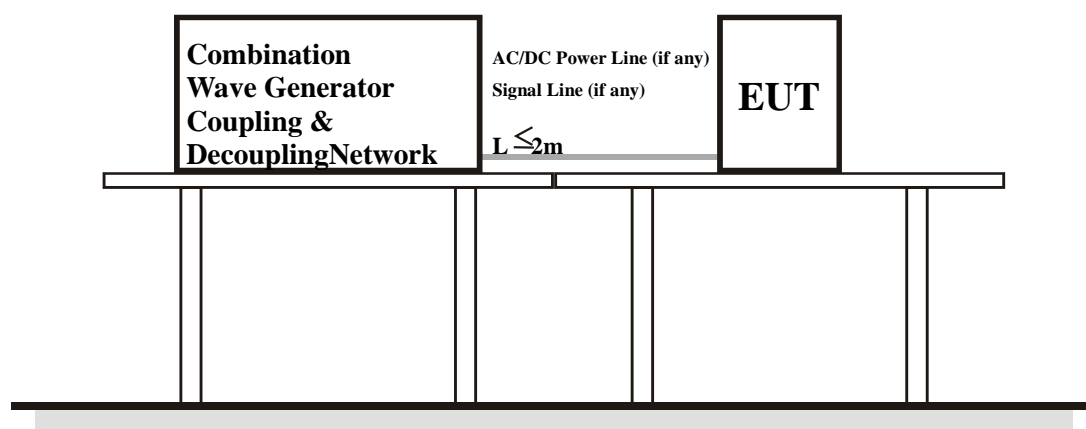
- b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling / decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

- c. For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

#### 5.6.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 5.6.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

<b>VOLTAGE (kV)</b>	<b>TEST POINT</b>	<b>POLARITY (+/-)</b>	<b>OBSERVATION</b>	<b>PERFORMANCE CRITERION</b>
1	L1-L2	+/-	NOTE	A
2	L1-G	+/-	NOTE	A
2	L2-G	+/-	NOTE	A
2	L1, L2-G	+/-	NOTE	A

**NOTE:** There was no change compared with the initial operation during the test.

## 5.7 IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS (CS)

### 5.7.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-6
<b>Frequency Range:</b>	0.15 MHz - 80 MHz
<b>Field Strength:</b>	3 V <sub>r.m.s.</sub>
<b>Modulation:</b>	1kHz Sine Wave, 80%, AM Modulation
<b>Frequency Step:</b>	1 % of fundamental
<b>Coupled Cable:</b>	Power Mains, Unshielded
<b>Coupling Device:</b>	CDN-M3 (3 wires), CDN-T4 (RJ45)

### 5.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Signal Generator	SMY01	848027/030	Feb. 15, 2002
COMTEST Power Amplifier	GPA301	BCS320-1038	NA
FCC Coupling Decoupling Network	FCC-801- M3-25	48	NA
FCC Coupling Decoupling Network	FCC-801- M2-16A	01047	NA
FISCHER CUSTOM COMMUNICATIONS EM Injection Clamp	FCC-203I	50	NA
FCC Coupling Decoupling Network	FCC-801- M1-25	17	NA
BOONTON RF Voltage Meter	9200B	331801AE	Aug. 03, 2002
SCHAFFNER Coupling Decoupling Network	CDN T400	16909	NA
SCHAFFNER Arranging adapter set for RJ45	ADR T444	NA	NA
SCHAFFNER Arranging adapter set for RJ11	ADR T411	NA	NA

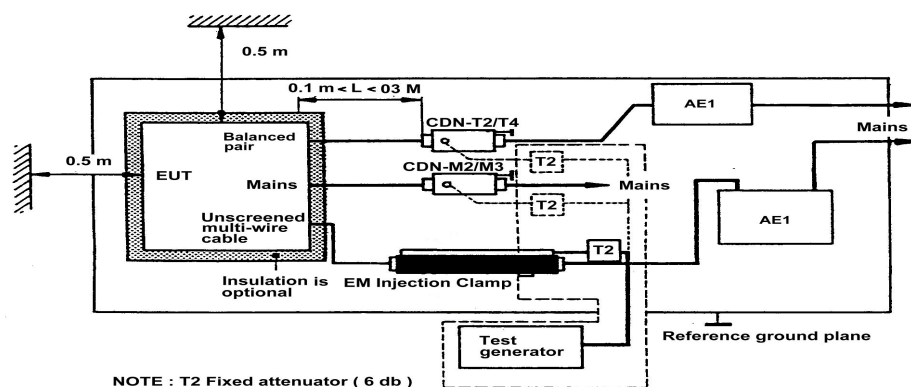
**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.7.3 TEST PROCEDURE

- a. The EUT shall be tested within its intended operating and climatic conditions.
- b. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.
- c. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate shall not exceed  $1.5 \times 10^{-3}$  decades/s. The step size shall not exceed 1 % of the start and thereafter 1 % of the preceding frequency value where the frequency is swept incrementally.
- d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, shall be analyzed separately.
- e. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.



## 5.7.4 TEST SETUP



Note: 1. The EUT is setup 0.1m above Reference Ground Plane

2. The CDNs and / or EM clamp used for real test depends on ports and cables configuration of EUT.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

## 5.7.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

FREQUENCY (MHz)	RESULTS	FIELD STRENGTH (V <sub>rms</sub> )	CABLE	OBSER- VATION	INJECTION METHOD	PERFORMANCE CRITERION
0.15 –80 MHz	PASS	3	AC power line	Note	CDN-M3	A
0.15 –80 MHz	PASS	3	LAN	Note	CDN-T4	A

**NOTE:** There is no change compared with the initial operation during the test.

## 5.8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

### 5.8.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-8
<b>Frequency Range:</b>	50Hz
<b>Field Strength:</b>	1 A/m
<b>Observation Time:</b>	1 minute
<b>Inductance Coil:</b>	Rectangular type, 1mx1m

### 5.8.2 TEST INSTRUMENTS

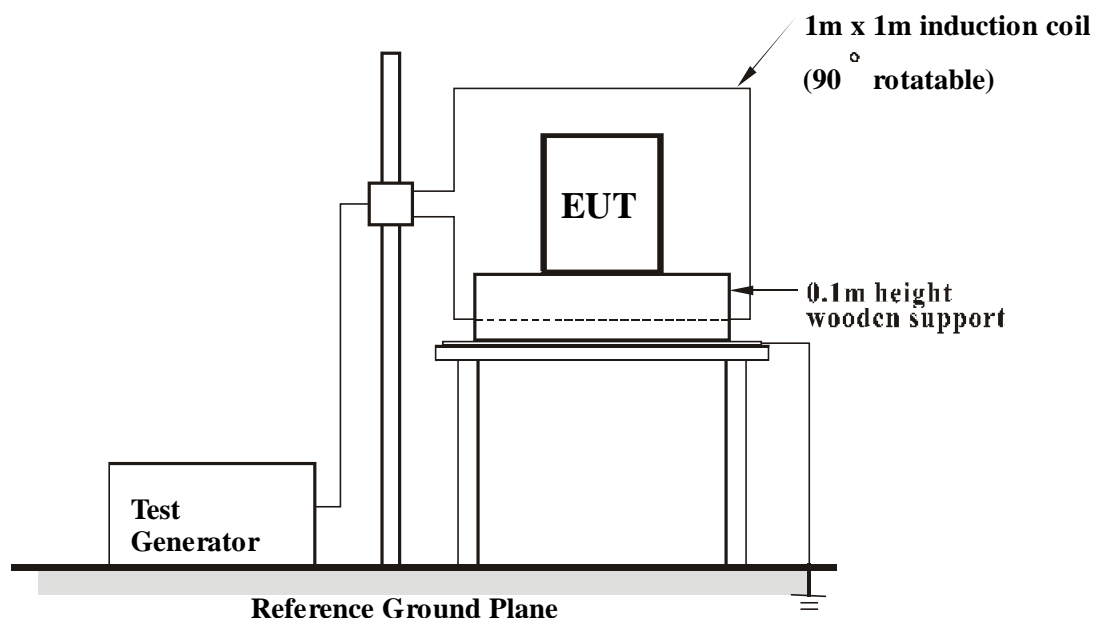
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HAEFELY Magnetic Field Tester	MAG 100.1	083794-06	NA
COMBINOVA Magnetic Field Meter	MFM10	224	Oct. 24, 2002

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.8.3 TEST PROCEDURE

- The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

## 5.8.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### NOTE:

#### TABLETOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

#### FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

## 5.8.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

<b>DIRECTION</b>	<b>RESULTS</b>	<b>OBSERVATION</b>	<b>PERFORMANCE CRITERION</b>
X	PASS	Note	A
Y	PASS	Note	A
Z	PASS	Note	A

**NOTE:** There was no change compared with the initial operation during the test.

## 5.9 VOLTAGE DIP/SHORT INTERRUPTIONS/VOLTAGE VARIATIONS (DIP) IMMUNITY TEST

### 5.9.1 TEST SPECIFICATION

<b>Basic Standard:</b>	IEC 61000-4-11
<b>Test Duration Time:</b>	Minimum three test events in sequence
<b>Interval between Event:</b>	Minimum ten seconds
<b>Phase Angle:</b>	0°/45°/90°/135°/180°/225°/270°/315°/360°
<b>Test Cycle:</b>	3 times

### 5.9.2 TEST INSTRUMENTS

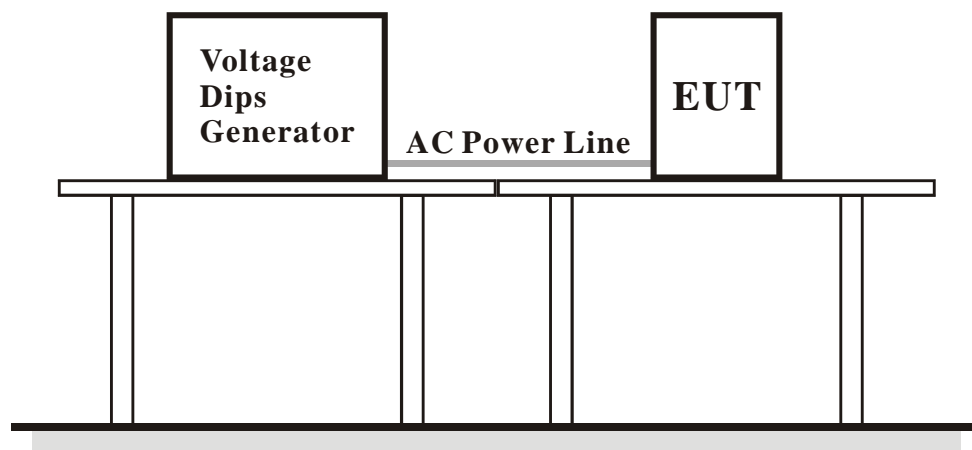
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HAEFELY Mains Interference Simulator	PLINE 1610	083690-17	March 2, 2002

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.9.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

## 5.9.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 5.9.5 TEST RESULTS

<b>EUT</b>	Mobi Panel	<b>MODEL</b>	MPC-100
		<b>INPUT POWER</b>	230Vac, 50 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 60 % RH, 1005 hPa	<b>TESTED BY:</b> S. S. Wang	

<b>VOLTAGE % REDUCTION</b>	<b>PERIODS</b>	<b>RESULTS</b>	<b>OBSERVATION</b>	<b>PERFORMANCE CRITERION</b>
>95	0.5	PASS	Note (1)	A
30	25	PASS	Note (1)	A
>95	250	PASS	Note (2)	C

**NOTE:** (1) There was no change compared with the initial operation during the test.  
(2) The EUT shut down.

## 6 PHOTOGRAPHS OF THE TEST CONFIGURATION

### CONDUCTED EMISSION TEST





## RADIATED EMISSION TEST



## HARMONICS EMISSION TEST & VOLTAGE FLUCTUATIONS AND FLICKER TEST



## RS TEST



## EFT TEST



## SURGE TEST



## CONDUCTED SUSCEPTIBILITY TEST





## POWER-FREQUENCY MAGNETIC FIELDS TEST



## VOLTAGE DIPS AND INTERRUPTIONS TEST



## 7 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

<b>USA</b>	FCC, NVLAP, UL
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>New Zealand</b>	MoC
<b>Norway</b>	NEMKO, DNV
<b>Canada</b>	INDUSTRY CANADA
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Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).

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