EMC LAB
HomeTek
HomeTek Technology Inc.

ADDRESS: No. 67-9, Shir Men Road, Tu Cheng City,
Taipei Hsien, Taiwan, R. O. C.
PHONE : 886-2-22608375 FAX : 886-2-22748013
E - mail : hometek@ms15.hinet.net

CERTIFICATE OF COMPLIANCE

EUT	: Twisted Pair Transmission Amplifier
MODEL NO.	: TPA0XXX
Receipt Date	: 06/23/2005 Final Test Date: 07/12/2005
REPORT #	: EB4F050
APPLICANT	: SMART CABLING & TRANSMISSION CORP.
ADDRESS	: 7F-1, No. 168, Lien Cheng Rd., Chung-Ho City, Taipei Hsien, Taiwan, R. O. C.

Measurement procedure used:

EMI: EN 61000-6-3 (2001): CISPR 22 Class B (1997),
EN 61000-3-2 (2000), EN 61000-3-3 (1995) + A1 (2001)
EMS: EN 50130-4 (1996) + A1 (1998):
IEC 61000-4-2 (2001), IEC 61000-4-3 (2002), IEC 61000-4-4 (2004),
IEC 61000-4-5 (2001), ENV 50141 (1993), IEC 61000-4-11 (2004)

We hereby show that:

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 89/336/EEC**, and the energy emitted by the equipment was found to be within the limits applicable.

This test result 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 : Frankie FRANKIE WANG DATE : 7/14/2005

CHECK BY : ALAIN LIN / Director DATE : 7/14/2005

APPROVED BY : Tommy Rau TOMMY RAU / Manager DATE : 7/14/2005

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GENERAL INFORMATION

1 APPLICANT : SMART CABLING & TRANSMISSION CORP.

2 ADDRESS : 7F-1, No. 168, Lien Cheng Rd.,
Chung-Ho City, Taipei Hsien, Taiwan, R. O. C.

3 MANUFACTURER : SMART CABLING & TRANSMISSION CORP.

4 ADDRESS : 7F-1, No. 168, Lien Cheng Rd.,
Chung-Ho City, Taipei Hsien, Taiwan, R. O. C.

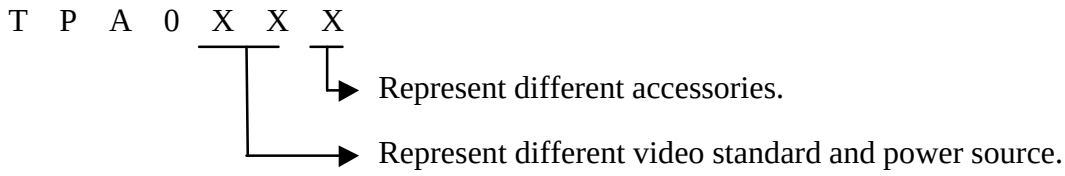
5 DESCRIPTION OF EUT :

EUT : Twisted Pair Transmission Amplifier

Model : TPA0XXX

Serial # : N/A

5.1 The difference between series of models TPA0XXX is shown as below:



The worst case of EMC test model is TPA016 and the final test data were shown in this test report.

6 FEATURES OF EUT :

Please refer to user manual or product specification.

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 844827/007	JAN/2005
2	LISN (for EUT)	50Ω/50uH/100A 150KHz ~ 30MHz	SCHWARZ BECK	NNLK 8121 8121370	OCT/2004
3	LISN (for Support Unit)	50Ω/50uH/10A 9KHz ~ 30MHz	ROHDE & SCHWARZ	ESH3-Z5 846128/007	MAR/2005
4	Terminator	50Ω	N/A	N/A	NOV/2004
5	Attenuation	50Ω/10dB	Mini-Circuit	NAT-10 AT-002	JUL/2004
6	Cable	5.4m	SUHNER	RG-223 CON2-002	AUG/2004
7	ESXS-K1 (software)	Version 2.03b 9KHz ~ 30MHz	ROHDE & SCHWARZ	1082.9678.02 840.913/246	N/A

Note : Items 1 ~ 6 were calibrated within period of 1 year.

2 TEST PROCEDURE

2.1 The EUT was tested according to **EN 61000-6-3.**

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.

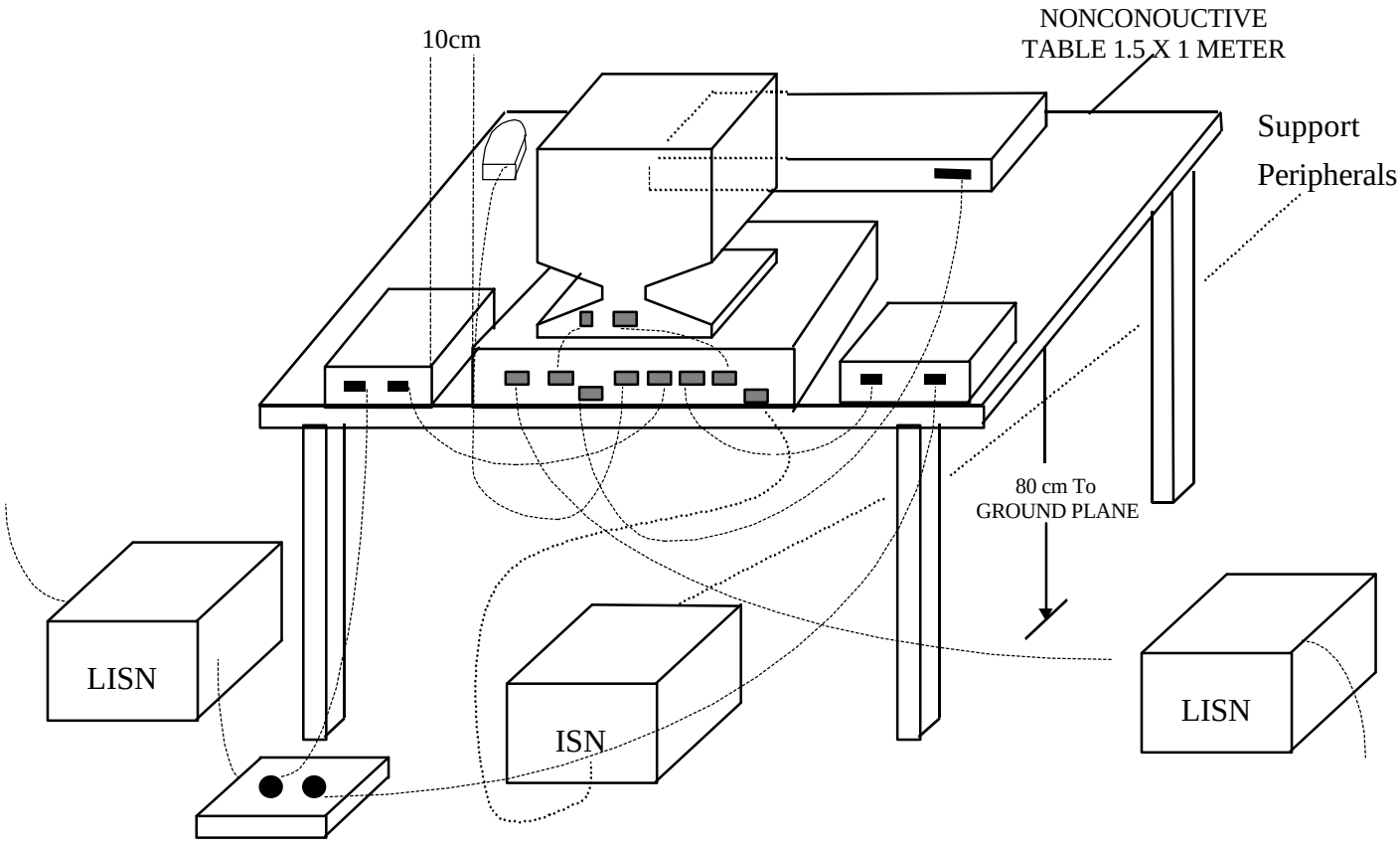
2.4 The LISN used was 50 Ohm / 50 uHenry as specified by **CISPR 22 Class B**.

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.

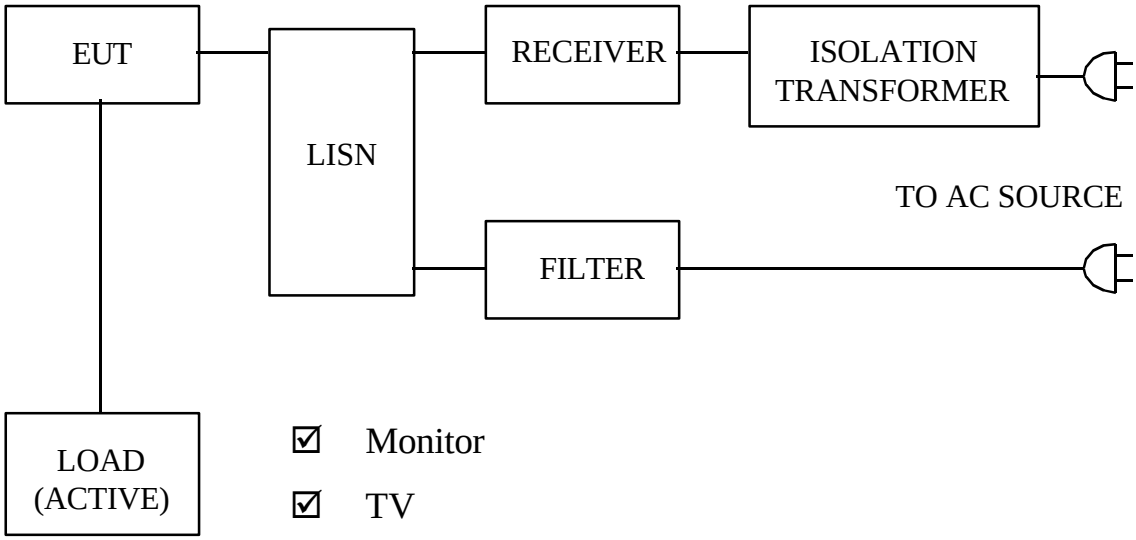
3 TEST SETUP

3.1 Typical : Setup Of Conducted Test



(Details for setup configuration, please refer to appendix A.)

3.2 Block Diagram Of Conducted Test



- ☑ Monitor
- ☑ TV
- ☑ CCD
- ☑ Twisted Pair Transmission x 5 (TTP111XXX)
- ☑ Twisted Pair Transmission x 2 (TTP414XXX)
- ☑ Data Cable

4 CONFIGURATION OF THE EUT

The EUT was configured according to **EN 61000-6-3**. All I/O ports were connected to the appropriate peripherals. All peripherals and cables are listed below (including internal device) :

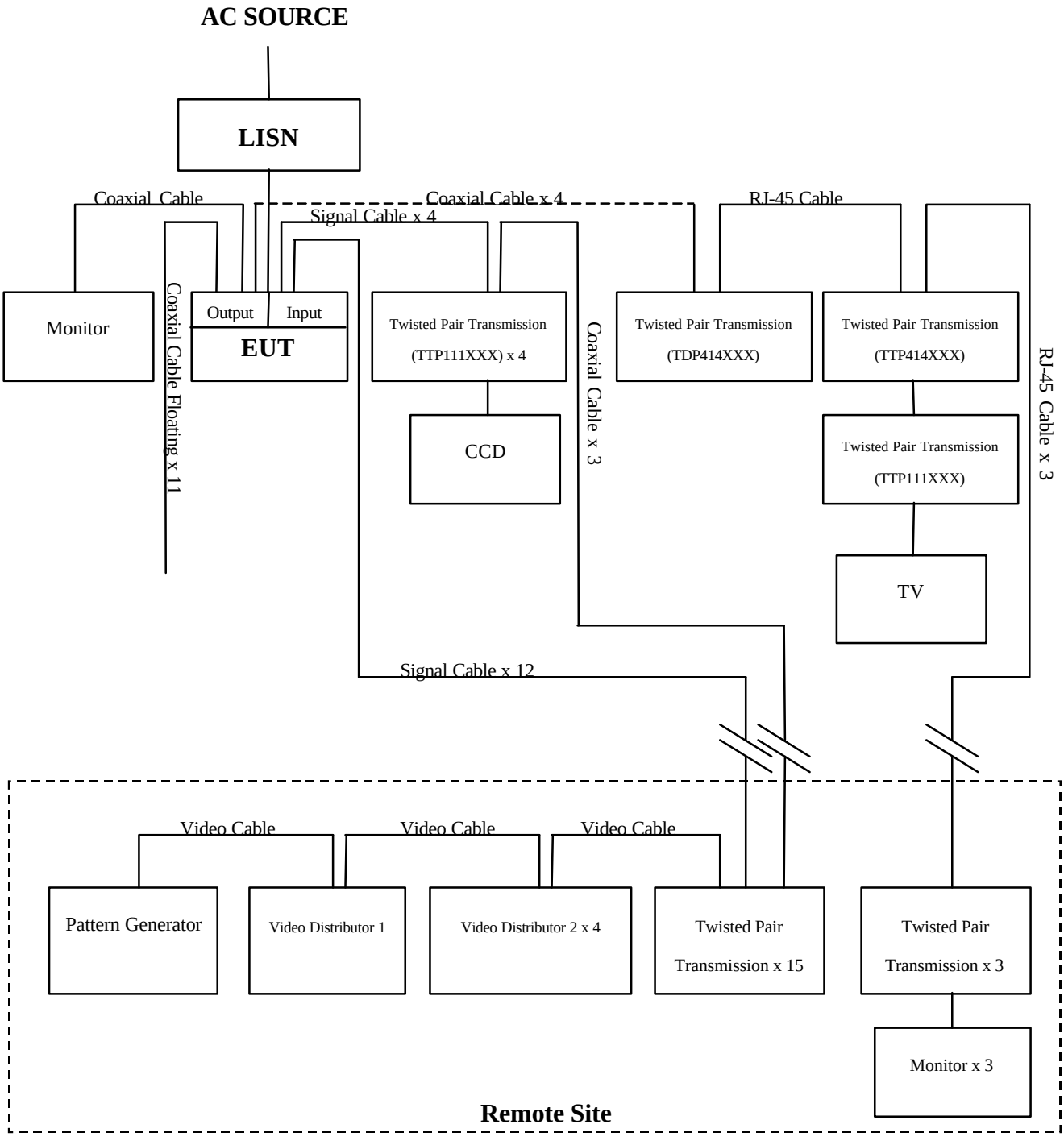


Figure 1

4.1 EUT

EUT Type	:	☐Proto Type ☑Engineer Type ☐Mass Production
Condition when received	:	☑Good ☐Damage : _____
Device	:	Twisted Pair Transmission Amplifier
Applicant	:	SMART CABLING & TRANSMISSION CORP.
Manufacturer	:	SMART CABLING & TRANSMISSION CORP.
Model Number	:	TPA0XXX
Serial Number	:	N/A
FCC ID	:	N/A
Video Input Cable x 16	:	Un-Shielded, 1.8 m, Plastics Type
Video Output Cable x 16	:	Shielded, 2.0 m, Metal Type
Power Cord (AC) Adapter	:	2 pin
Power Cord (DC) Adapter	:	Un-Shielded, 1.8 m, 2 pin
Power Supply Type	:	Linear Power Adapter

4.2 PERIPHERALS

☑ Monitor

Manufacturer	:	SONI
Model Number	:	MT14A
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Shielded, 2.0 m
Power Cord	:	Un-Shielded, 1.8 m

☑ CCD

Manufacturer	:	ADDVTSUAL
Model Number	:	AD1464KC
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Un-Shielded, 1.8 m
Power Cord	:	Un-Shielded, 1.8 m

☑ TV

Manufacturer	:	TCL
Model Number	:	1419A
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Un-Shielded, 1.8 m
Power Cord	:	Un-Shielded, 1.8 m

☑ Twisted Pair Transmission x 5

Manufacturer	:	SMART CABLING
Model Number	:	TTP111XXX
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable 1	:	Un-Shielded, 1.8 m
Data Cable 2	:	Un-Shielded, 10 m
Power Cord	:	N/A

☑ Twisted Pair Transmission

Manufacturer	:	SMART CABLING
Model Number	:	TTP414XXX
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable 1	:	Un-Shielded, 1.8 m
Data Cable 2	:	Un-Shielded, 10 m
Power Cord	:	N/A

☑ Twisted Pair Transmission

Manufacturer	:	SMART CABLING
Model Number	:	TDP414XXX
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Un-Shielded, 1.8 m
Power Cord	:	N/A

☑ Power Adapter

Manufacturer	:	JNELEC
Model Number	:	YAD-1200500E
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	N/A
Power Cord	:	Un-Shielded, 1.8 m

☑ Twisted Pair Transmission x 18 (Remote Site)

Manufacturer	:	SMART CABLING
Model Number	:	TTP111XXX
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Un-Shielded, 10 m
Power Cord	:	N/A

☑ Video Distributor x 5 (Remote Site)

Manufacturer	:	CS Lilin
Model Number	:	PIH-6002
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Shielded, 1.8 m
Power Cord	:	Un-Shielded, 1.8 m

☑ Pattern Generator (Remote Site)

Manufacturer	:	LEADER
Model Number	:	408
Serial Number	:	N/A
FCC ID	:	N/A
Data Cable	:	Shielded, 2.0 m
Power Cord	:	Un-Shielded, 1.8 m

4.3 REMARK : N/A

5 EUT OPERATING CONDITION

5.1 The frequency of the EUT is none.

5.2 Configure the EUT according to the **EN 61000-6-3**.

5.3 Turn on all the power of EUT and peripheral.

5.4 Remote pattern generator sends color bar signal to EUT.

5.5 Observe the output signal of EUT during the test. (For EMS testing)

5.6 The photos of conducted test configuration, please refer to appendix A.

6 LIMIT OF CONDUCTED POWER LINE EMISSION CLASS B

Frequency Range	Quasi Peak	Average
0.15 ~ 0.5 MHz	66 - 56 dBuV	56 - 46 dBuV
0.5 ~ 5 MHz	56 dBuV	46 dBuV
5 ~ 30 MHz	60 dBuV	50 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 : 26 ℃, Humidity : 61 % RH.

7.4 Deviations from the test standards and rules : None.

7.5 The conducted test result were gained by following procedures :
Level = Reading Level + Insertion Loss of LISN + Cable Loss
(All calculation were done by ESHS30 EMI test receiver.)

7.6 Result : **PASSED**

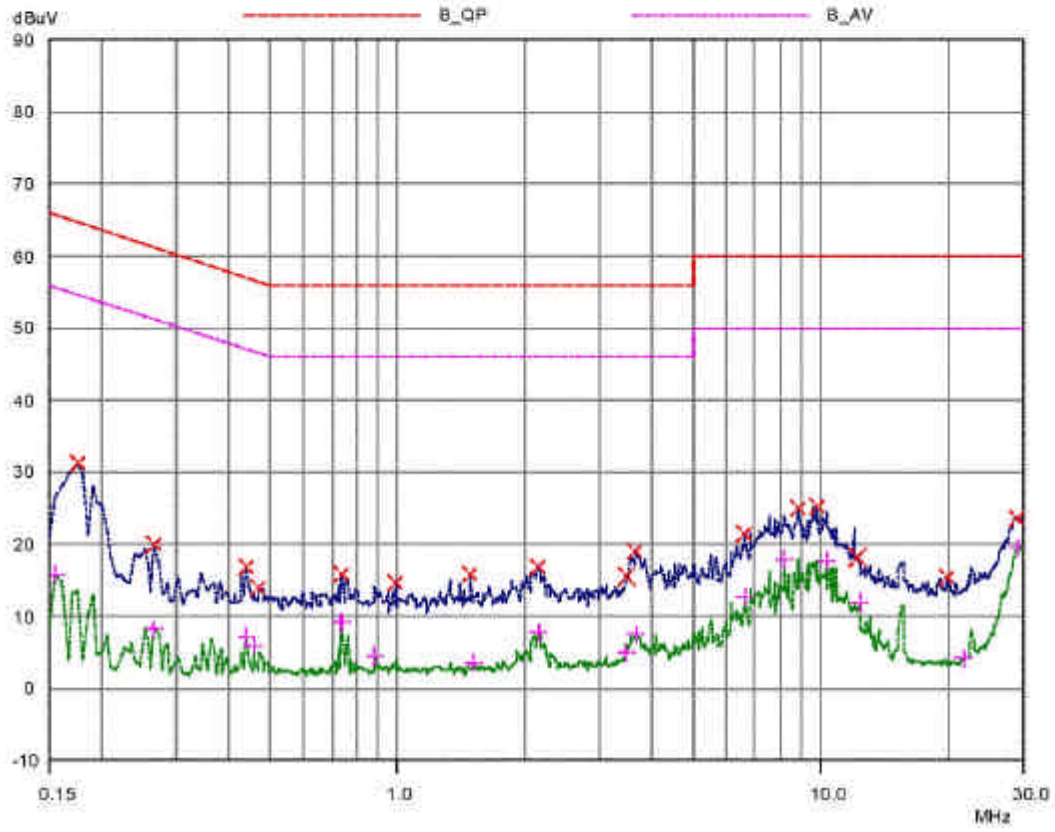
8 CONDUCTED POWER LINE TEST DATA (PAGE 1)

HomeTek EMC LAB. TEL :886-2-22608375 28 Jun 2005 16:03

CONDUCTED EMISSIONS

EUT:	Twisted Pair Transmission Amplifier
Manuf:	4F050
Op Cond:	LINE 1
Operator:	SKY
Test Spec:	FOR CISPR22 CLASS B
Comment:	230V/50Hz
	TPA016
Result File:	4f05011c.dat : TPA016

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Subranges:	16
	Acc Margin:	55 dB



9 CONDUCTED POWER LINE TEST DATA (PAGE 2)

HomeTek EMC LAB. TEL :886-2-22608375 28 Jun 2005 16:03

CONDUCTED EMISSIONS

EUT:	Twisted Pair Transmission Amplifier
Manuf:	4F050
Op Cond:	LINE 1
Operator:	SKY
Test Spec:	FOR CISPR22 CLASS B
Comment:	230V/50Hz
	TPA016
Result File:	4f05011c.dat : TPA016

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Subranges:	16
	Acc Margin:	55 dB

Peak Search Results

Frequency MHz	PK Level dBuV	PK Limit dBuV	PK Delta dB
0.175	31.23	64.72	33.49
0.265	19.92	61.27	41.35
0.44	16.88	57.06	40.18
0.47	13.97	56.51	42.54
0.74	15.83	56.00	40.17
0.99	14.76	56.00	41.24
1.48	15.97	56.00	40.03
2.14	16.89	56.00	39.11
3.46	15.56	56.00	40.44
3.63	19.14	56.00	36.86
6.61	21.48	60.00	38.52
8.81	25.08	60.00	34.92
9.77	25.38	60.00	34.62
12.21	18.21	60.00	41.79
19.8	15.46	60.00	44.54
29.03	23.66	60.00	36.34

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB
0.155	15.82	55.73	39.91
0.265	8.28	51.27	42.99
0.44	7.26	47.06	39.80
0.455	6.02	46.78	40.76
0.74	9.23	46.00	36.77
0.88	4.49	46.00	41.51
1.51	3.60	46.00	42.40
2.14	7.81	46.00	38.19
3.46	4.95	46.00	41.05
3.63	7.58	46.00	38.42
6.56	12.79	50.00	37.21
8.16	17.95	50.00	32.05
10.26	17.83	50.00	32.17
12.29	11.97	50.00	38.03
21.76	4.15	50.00	45.85
29.14	19.61	50.00	30.39

* limit exceeded

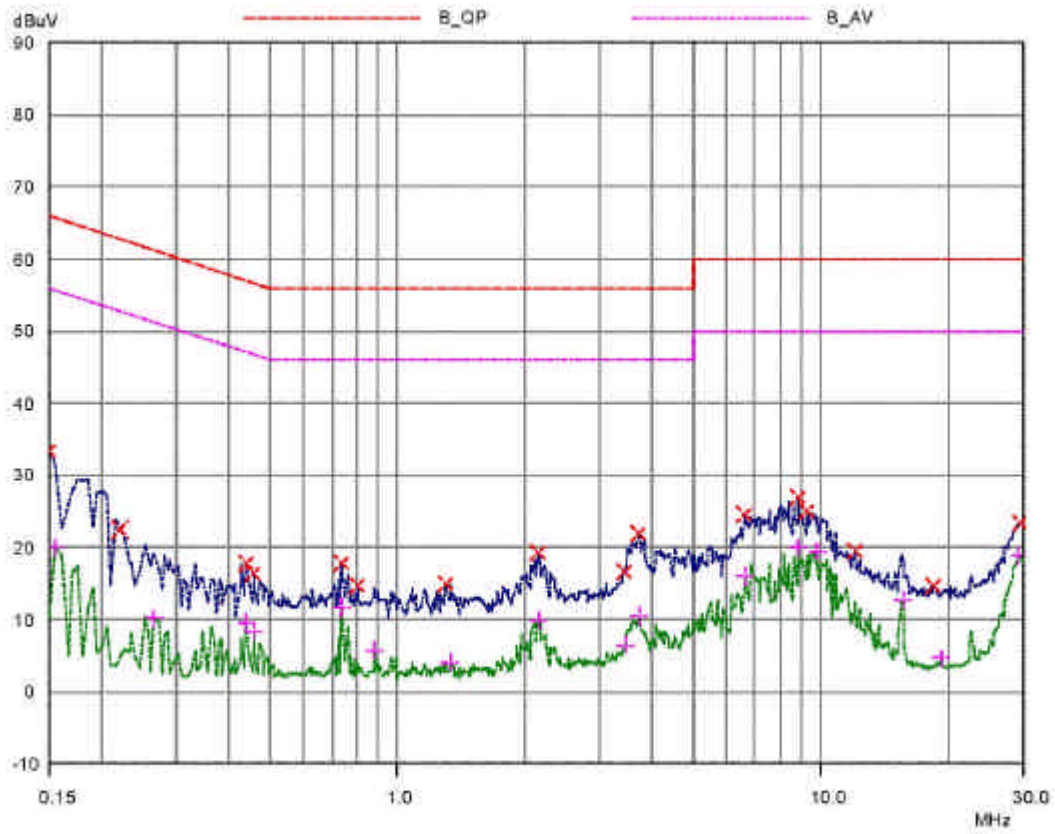
10 CONDUCTED POWER LINE TEST DATA (PAGE 3)

HomeTek EMC LAB. TEL :886-2-22608375 28 Jun 2005 16:07

CONDUCTED EMISSIONS

EUT:	Twisted Pair Transmission Amplifier
Manuf:	4F050
Op Cond:	LINE 2
Operator:	SKY
Test Spec:	FOR CISPR22 CLASS B
Comment:	230V/50Hz
	TPA016
Result File:	4f05021c.dat : TPA016

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Subranges:	16
	Acc Margin:	55 dB



11 CONDUCTED POWER LINE TEST DATA (PAGE 4)

HomeTek EMC LAB. TEL :886-2-22608375 28 Jun 2005 16:07

CONDUCTED EMISSIONS

EUT:	Twisted Pair Transmission Amplifier
Manuf:	4F050
Op Cond:	LINE 2
Operator:	SKY
Test Spec:	FOR CISPR22 CLASS B
Comment:	230V/50Hz
	TPA016
Result File:	4f05021c.dat : TPA016

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Subranges:	16
	Acc Margin:	55 dB

Peak Search Results

Frequency MHz	PK Level dBuV	PK Limit dBuV	PK Delta dB
0.15	33.42	66.00	32.58
0.22	22.53	62.82	40.29
0.44	17.93	57.06	39.13
0.455	18.41	56.78	40.37
0.74	17.81	56.00	38.19
0.8	14.64	56.00	41.36
1.3	15.00	56.00	41.00
2.14	19.22	56.00	36.78
3.45	16.61	56.00	39.39
3.72	22.02	56.00	33.98
6.58	24.62	60.00	35.38
8.84	26.89	60.00	33.11
9.3	25.00	60.00	35.00
12.1	19.59	60.00	40.41
18.41	14.72	60.00	45.28
29.5	23.39	60.00	36.61

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB
0.155	20.03	55.73	35.70
0.265	10.21	51.27	41.06
0.44	9.55	47.06	37.51
0.455	8.38	46.78	38.40
0.74	11.71	46.00	34.29
0.88	5.74	46.00	40.26
1.32	4.09	46.00	41.91
2.14	9.90	46.00	36.10
3.45	6.47	46.00	39.53
3.72	10.50	46.00	35.50
6.56	16.04	50.00	33.96
8.81	20.05	50.00	29.95
9.77	19.51	50.00	30.49
15.52	12.75	50.00	37.25
19.07	4.63	50.00	45.37
29.25	18.87	50.00	31.13

* limit exceeded

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#	Date of Cal.
1	OPEN AREA TEST SITE	☑ OATS 3			JUL/2004
2	EMI TEST RECEIVER	20Hz ~ 26.5GHz	ROHDE & SCHWARZ	ESMI 845442/006	JAN/2005
3	PRE-AMPLIFIER	9KHz ~ 3000MHz	ADVANTEST	BB525C 90081001	SEP/2004
4	ANTENNA (BI-LOG)	25MHz ~ 2GHz	SCHAFFNER	CBL6112B S/N : 2611	JUN/2005
5	Attenuation	50Ω/6dB	JYE BAO	FAT-N (M-F) 001	JUL/2004
6	Cable	10m	SUHNER	RG214/U OS3-003	DEC/2004
7	Cable	14m	BELDEN	9913 OS3-001	DEC/2004
8	EMI 32 (software)	N/A	AUDIX	19991013-0923	N/A

Note : Items 1 ~ 7 were calibrated within period of 1 year.

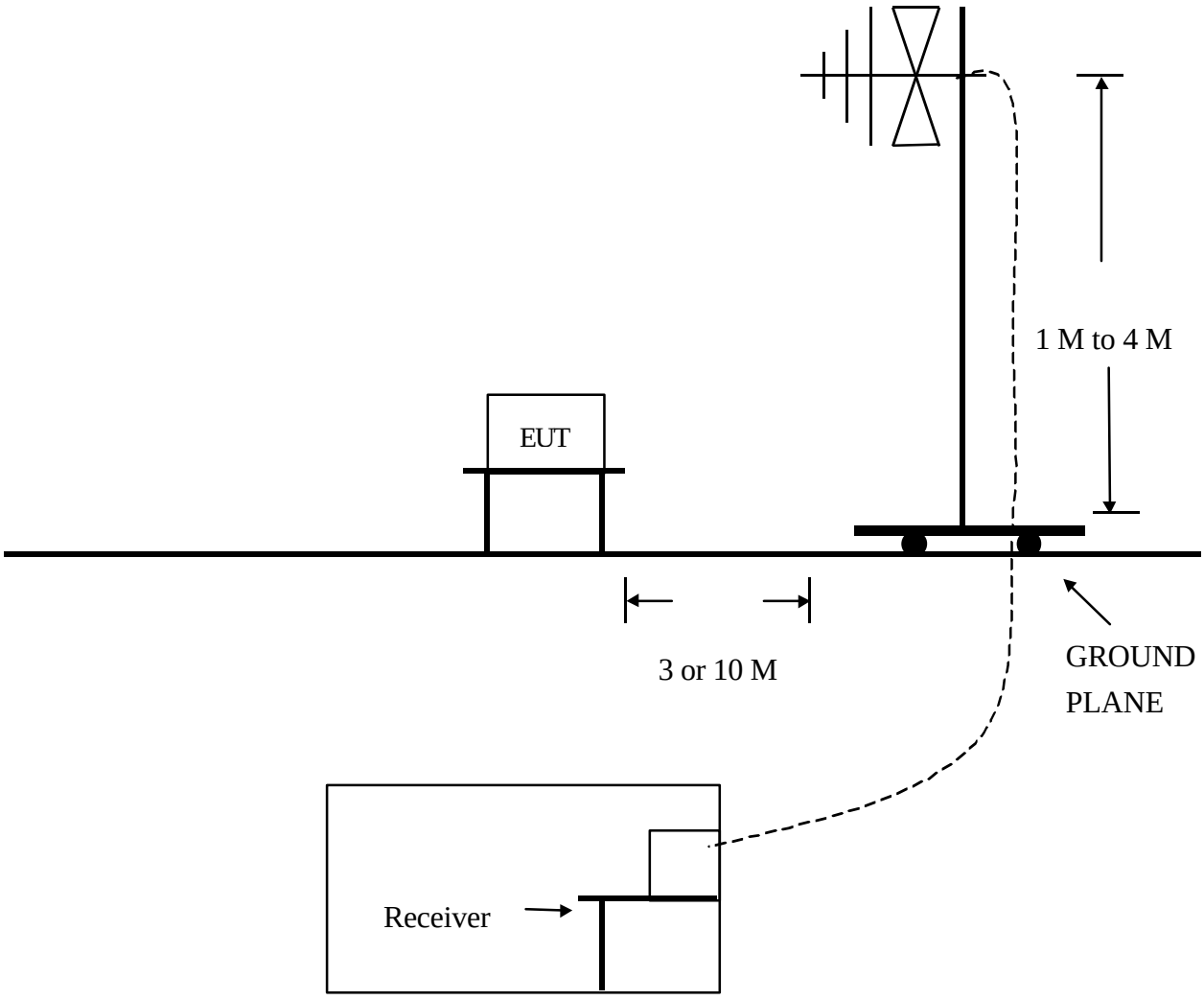
2 TEST PROCEDURE

2.1 The EUT was test according to **CISPR 22 Class B**.

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

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



(Details for setup configuration, please refer to appendix A.)

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 III.

5.3 The photos of radiated test configuration, please refer to appendix A.

6 LIMIT OF RADIATED EMISSION CLASS B

Frequency (MHz)	Measurement Distance	Limit (dBuV/m)
30 - 230	10 (M)	30
230 - 1000	10 (M)	37

7 RESULT OF RADIATED EMISSION TEST

7.1 The frequency range from 30 MHz to 1 GHz was investigated.

7.2 All readings below or equal 1 GHz are quasi-peak or peak values with resolution bandwidth of 120 KHz.

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

7.4 Temperature : 29 ℃, Humidity : 63 % RH.

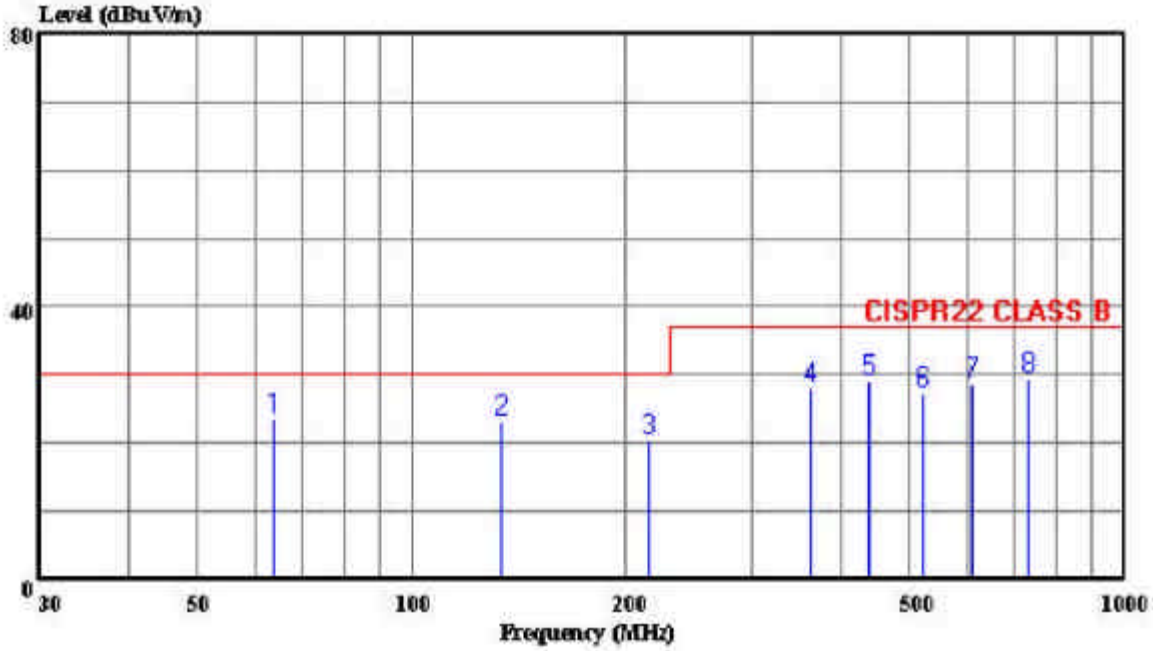
7.5 Deviation form the test standards and rules : None.

7.6 The radiated emission result were gained by the following method :
Level = Reading Level + Probe Factor (Antenna Factor) + Cable Loss – Preamp Factor
Over Limit = Level – Limit Line

7.7 Result : **PASSED**

HomeTek Technology Inc.
No 67-9,Shi-Men Rd;,Tu-Chen City,
Taipei County, Taiwan R.O.C.
Tel:02-22608375
Fax:02-22748013

Data#: 1 File#: 4F050.RMI Date: 2005-07-06 Time: 09:13:12



Trace: Ref Trace:

Condition: CISPR22 CLASS B 10m CHASE 2611 060705 HORIZONTAL
eut : Twisted Pair Transmission Amplifier
power: 230V/50Hz
memo : TPA016

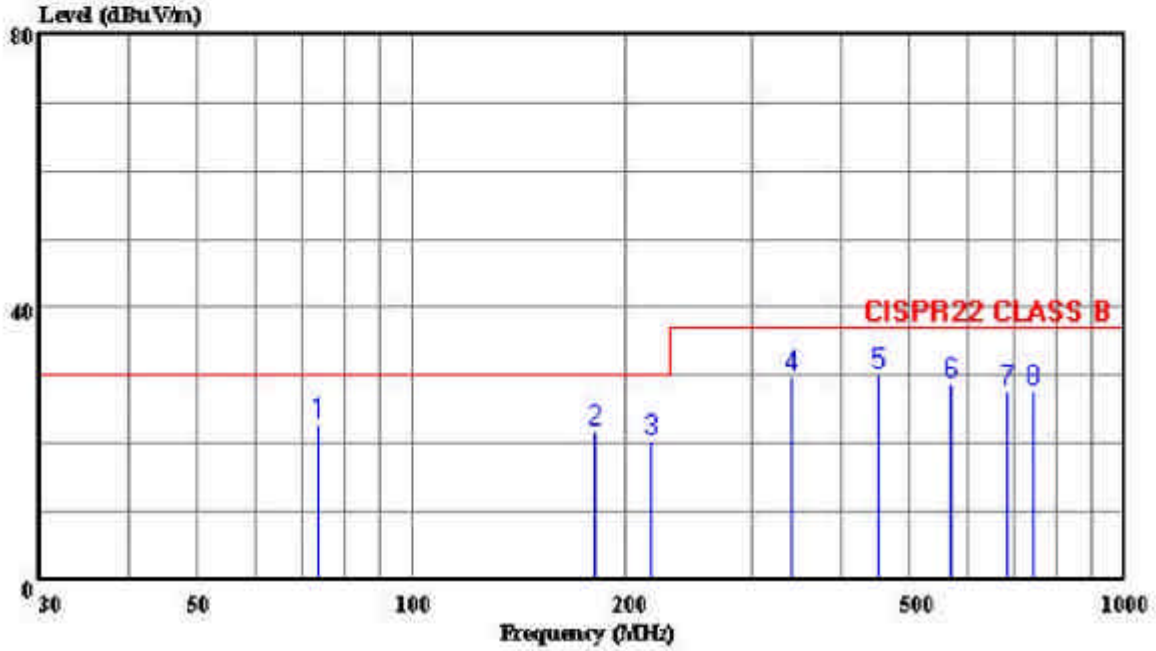
Page: 1

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	
1	64.220	23.44	30.00	-6.56	46.67	5.36	1.05	29.64	Peak
2	133.527	23.14	30.00	-6.86	39.91	10.96	1.51	29.24	Peak
3	215.080	20.37	30.00	-9.63	39.69	8.30	1.99	29.60	Peak
4	362.200	28.08	37.00	-8.92	39.80	14.73	2.81	29.25	Peak
5	439.407	29.06	37.00	-7.94	38.49	16.23	3.18	28.85	Peak
6	519.807	27.34	37.00	-9.66	34.35	17.80	3.56	28.37	Peak
7	609.273	28.72	37.00	-8.28	34.17	18.74	3.84	28.03	Peak
8	732.360	29.38	37.00	-7.62	33.13	19.77	4.25	27.77	Peak

9 RADIATED EMISSION TEST DATA (PAGE 2)

HomeTek Technology Inc.
No 67-9,Shi-Men Rd;,Tu-Chen City,
Taipei County, Taiwan R.O.C.
Tel:02-22608375
Fax:02-22748013

Data#: 2 File#: 4F050.RMI Date: 2005-07-06 Time: 09:45:05



Trace: Ref Trace:

Condition: CISPR22 CLASS B 10m CHASE 2611 060705 VERTICAL
eut : Twisted Pair Transmission Amplifier
power: 230V/50Hz
memo : TPA016

Page: 1

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	
1	73.607	22.71	30.00	-7.29	45.00	6.07	1.12	29.48	Peak
2	181.140	21.76	30.00	-8.24	41.12	9.38	1.78	29.52	Peak
3	216.147	20.42	30.00	-9.58	39.73	9.30	1.99	29.60	Peak
4	340.607	29.89	37.00	-7.11	42.34	14.17	2.72	29.34	Peak
5	449.987	30.21	37.00	-6.79	39.45	16.30	3.23	28.78	Peak
6	569.067	28.69	37.00	-8.31	34.56	18.57	3.71	28.16	Peak
7	682.773	27.87	37.00	-9.13	32.93	18.96	4.06	28.09	Peak
8	741.920	27.85	37.00	-9.15	31.15	20.06	4.31	27.67	Peak

HARMONICS TEST

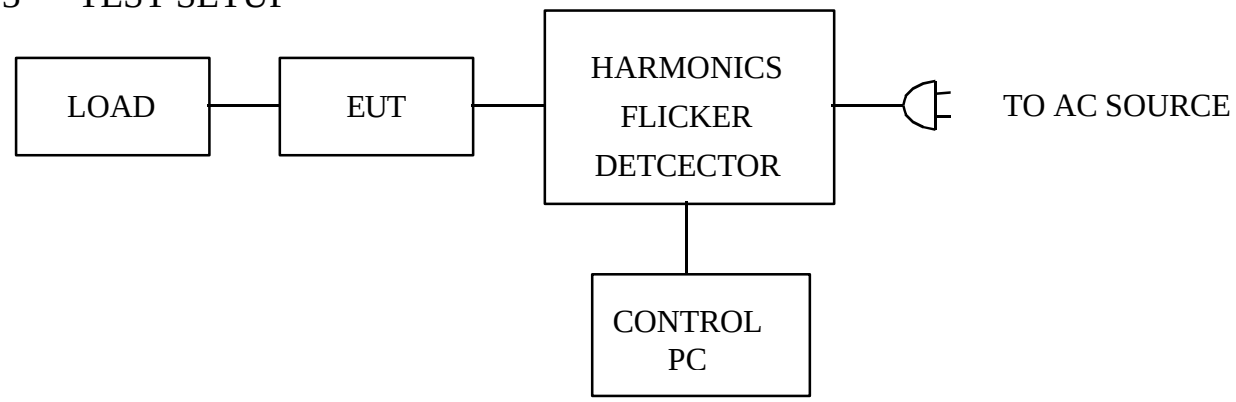
1 TEST INSTRUMENTS & FACILITIES

Instruments/ facilities	Manufacturer	Model # Serial #	Date of Cal.
HARMONICS/ VOLTAGE FLUCTUATIONS TEST	EMC-PARTNER	HAR1000-1P	OCT/2004
CONTROL PC	KB TECH	KB P586/133	N/A

2 TEST PROCEDURE

According to **EN 61000-3-2 (2000) Class A**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

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 DATA & LIMIT

6.1 Temperature : 24 ℃

6.2 Humidity : 66 % RH

7 Photos of test configuration please refer to appendix A.

8 HARMONICS TEST DATA (PAGE 1~2)

EMC PARTNER AG, SWITZERLAND Date : 2005/6/28 06:11:00 A V2.05

File :

Operator : SKY
Unit : Twisted Pair Transmission Amplifier
Serialnumber : TPA016
Remarks 4F050

Urms = 229.9V Freq = 49.984 Range: 0.25 A
Irms = 0.063A Ipk = 0.107A cf = 1.705
P = 11.98W Pap = 14.48VA pf = 0.827
THDi = 33.3 % THDu = 0.10 % Class A

Test - Time : 15min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Imax [A]	Imax%L [%]	Limit [A]	Status
1	50	0.0603			
2	100	0.0002	0.0400	1.0800	
3	150	0.0196	4.2900	2.3000	
4	200	0.0001	0.0167	0.4300	
5	250	0.0081	1.7767	1.1400	
6	300	0.0000	0.0033	0.3000	
7	350	0.0039	0.8467	0.7700	
8	400	0.0000	0.0000	0.2300	
9	450	0.0011	0.2300	0.4000	
10	500	0.0000	0.0000	0.1840	
11	550	0.0011	0.2333	0.3300	
12	600	0.0000	0.0000	0.1533	
13	650	0.0005	0.2616	0.2100	
14	700	0.0000	0.0000	0.1314	
15	750	0.0007	0.4374	0.1500	
16	800	0.0000	0.0000	0.1150	
17	850	0.0004	0.2767	0.1324	
18	900	0.0000	0.0000	0.1022	
19	950	0.0003	0.2835	0.1184	
20	1000	0.0000	0.0000	0.0920	
21	1050	0.0002	0.2136	0.1071	
22	1100	0.0000	0.0000	0.0836	

23	1150	0.0002	0.2340	0.0978
24	1200	0.0000	0.0000	0.0767
25	1250	0.0002	0.2035	0.0900
26	1300	0.0000	0.0000	0.0708
27	1350	0.0001	0.1648	0.0833
28	1400	0.0000	0.0000	0.0657
29	1450	0.0001	0.1770	0.0776
30	1500	0.0000	0.0000	0.0613
31	1550	0.0001	0.1261	0.0726
32	1600	0.0000	0.0000	0.0575
33	1650	0.0001	0.1567	0.0682
34	1700	0.0000	0.0000	0.0541
35	1750	0.0001	0.1187	0.0643
36	1800	0.0000	0.0000	0.0511
37	1850	0.0001	0.1255	0.0608
38	1900	0.0000	0.0000	0.0484
39	1950	0.0001	0.1058	0.0577
40	2000	0.0000	0.0000	0.0460

VOLTAGE FLUCTUATIONS TEST

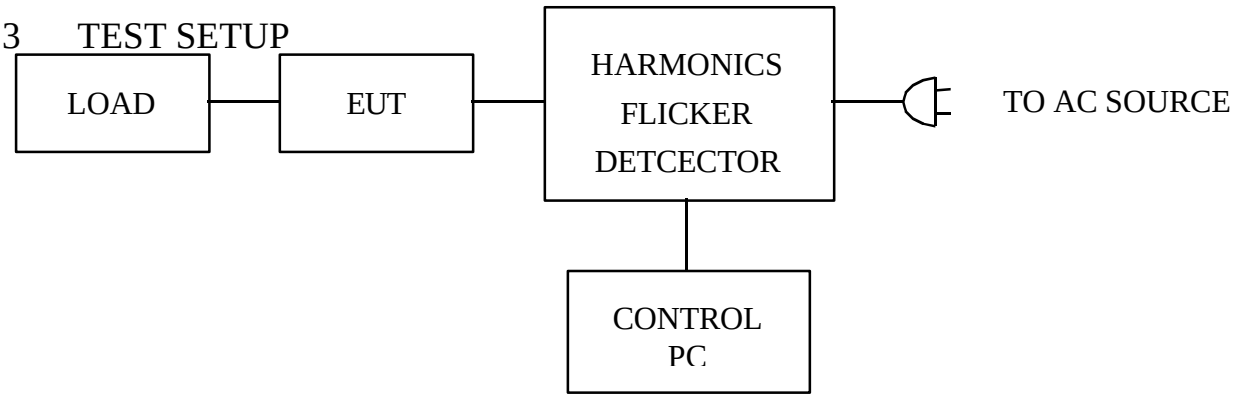
1 TEST INSTRUMENTS & FACILITIES

Instruments/ facilities	Manufacturer	Model # Serial #	Date of Cal.
HARMONICS/ VOLTAGE FLUCTUATIONS TEST	EMC-PARTNER	HAR1000-1P	OCT/2004
CONTROL PC	KB TECH	KB P586/133	N/A

2 TEST PROCEDURE

According to **EN 61000-3-3 (1995) + A1 (2001)**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

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 DATA & LIMIT

6.1 Temperature : 24 ℃

6.2 Humidity : 66 % RH

7 Photos of test configuration please refer to appendix A.

8 VOLTAGE FLUCTUATIONS TEST DATA (PAGE 1)

EMC PARTNER AG, SWITZERLAND Date : 2005/6/28 06:33:06 A V2.05

File :

Operator : SKY
Unit : Twisted Pair Transmission Amplifier
Serialnumber : TPA016
Remarks 4F050

Urms = 229.9V Freq = 49.984 Range: 0.25 A
Irms = 0.062A Ipk = 0.105A cf = 1.697
P = 11.93W Pap = 14.29VA pf = 0.835

Test - Time : 1 x 15min = 15min (100 %)

LIN (Line Impedance Network) : Soft LIN 0.24 Ohm +j 0.15 Ohm N: 0.16 Ohm +j 0.10 Ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.00 %
dtLim: 3.00 % dt>Lim: 200ms

Test completed, Result: PASSED

Plt = 0.072

	Pst	dmax [%]
1	0.072	0.000

ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

1 TEST INSTRUMENTS & FACILITIES

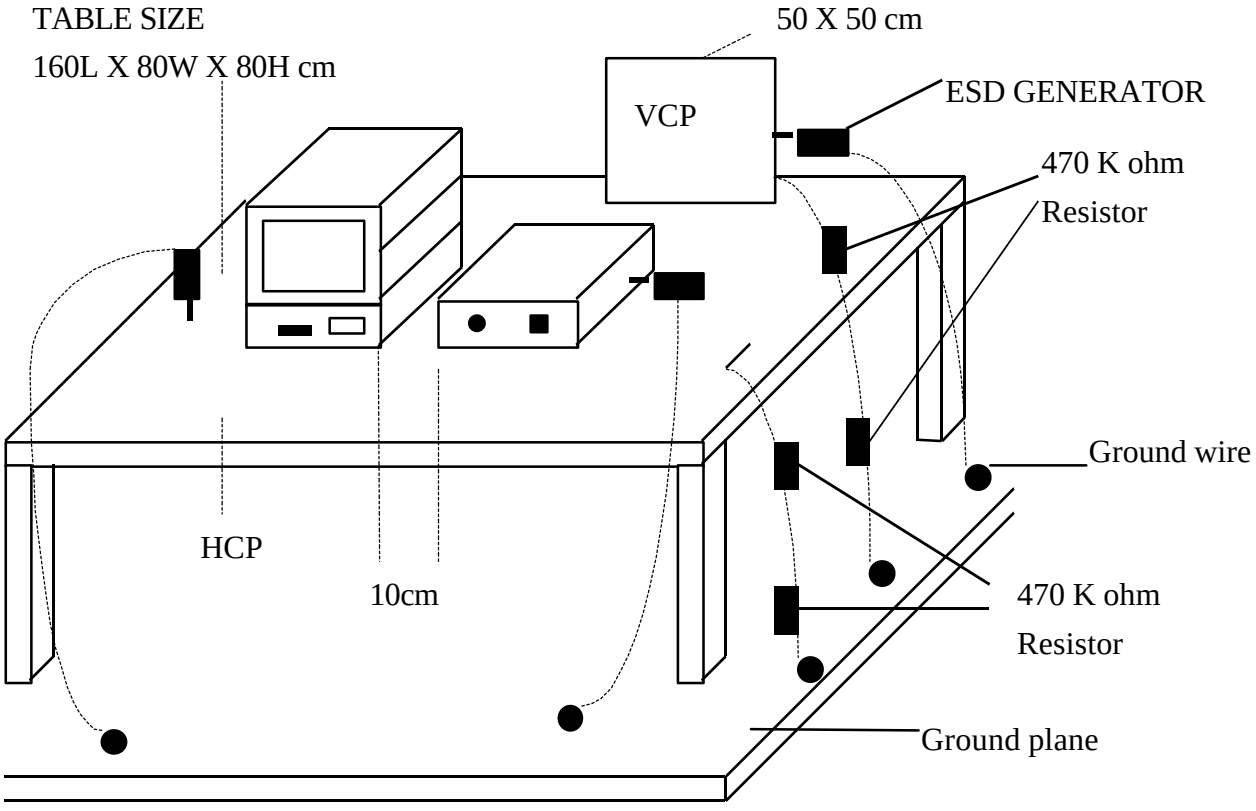
Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
ESD TESTER	NOISEKEN	ESS-100L (A)	OCT/2004
VCP	HOMETEK	--	--

2 TEST PROCEDURE

According to **IEC 61000-4-2 (2001)**

According to **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

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) ±2, 4, 8KV for air discharge.

(B) ±2, 4, 6KV for contact discharge.

6.2 Number of test : 10 Discharges / Test point / Polarity / Level

6.3 Time between test : ≧1 sec.

6.4 Temperature : 24 ℃

6.5 Humidity : 47 % RH.

7 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

8 TEST RESULT

Test Point	Air Discharge	Contact Discharge	Result
HCP	---	±2, 4, 6KV	**PASSED**
VCP	---	±2, 4, 6KV	**PASSED**
CASE	±2, 4, 8KV	±2, 4, 6KV	**PASSED**
I/O PORTS	±2, 4, 8KV	±2, 4, 6KV	**PASSED**
LED	±2, 4, 8KV	±2, 4, 6KV	**PASSED**
SCREWS	±2, 4, 8KV	±2, 4, 6KV	**PASSED**

There is no significant changes during the test.

9 Photos of test configuration please refer to appendix A.

RADIO FREQUENCY ELECTROMAGNETIC FILE IMMUNITY TEST (RS)

1 TEST INSTRUMENTS & FACILITIES

Item	Instruments Facilities	Manufacturer	Model # Serial #	Data Of Cal.
1	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMY02 845181/025	MAR/2005
2	AMPLIFIER	AMPLIFIER RESEARCH	100W1000M1A	N/A
3	FIELD SENSOR	AMPLIFIER RESEARCH	FP2000	AUG/2004
4	FIELD MONITOR	AMPLIFIER RESEARCH	FM2000	AUG/2004
5	RF VOLTMETER	BOONTON	9200C 361701AA	MAR/2005
6	RF PROBE	BOONTON	952001B 37082	MAR/2005
7	DIRECTION COUPLER	AMPLIFIER RESEARCH	DC6180 20521	N/A
8	ANTENNA	EMCO	3142B S/N: 1789	N/A
9	CONTROL PC	KB TECH	KB P586/133	--

Note : Items 3 ~ 4 were calibrated with two years and verified before testing.

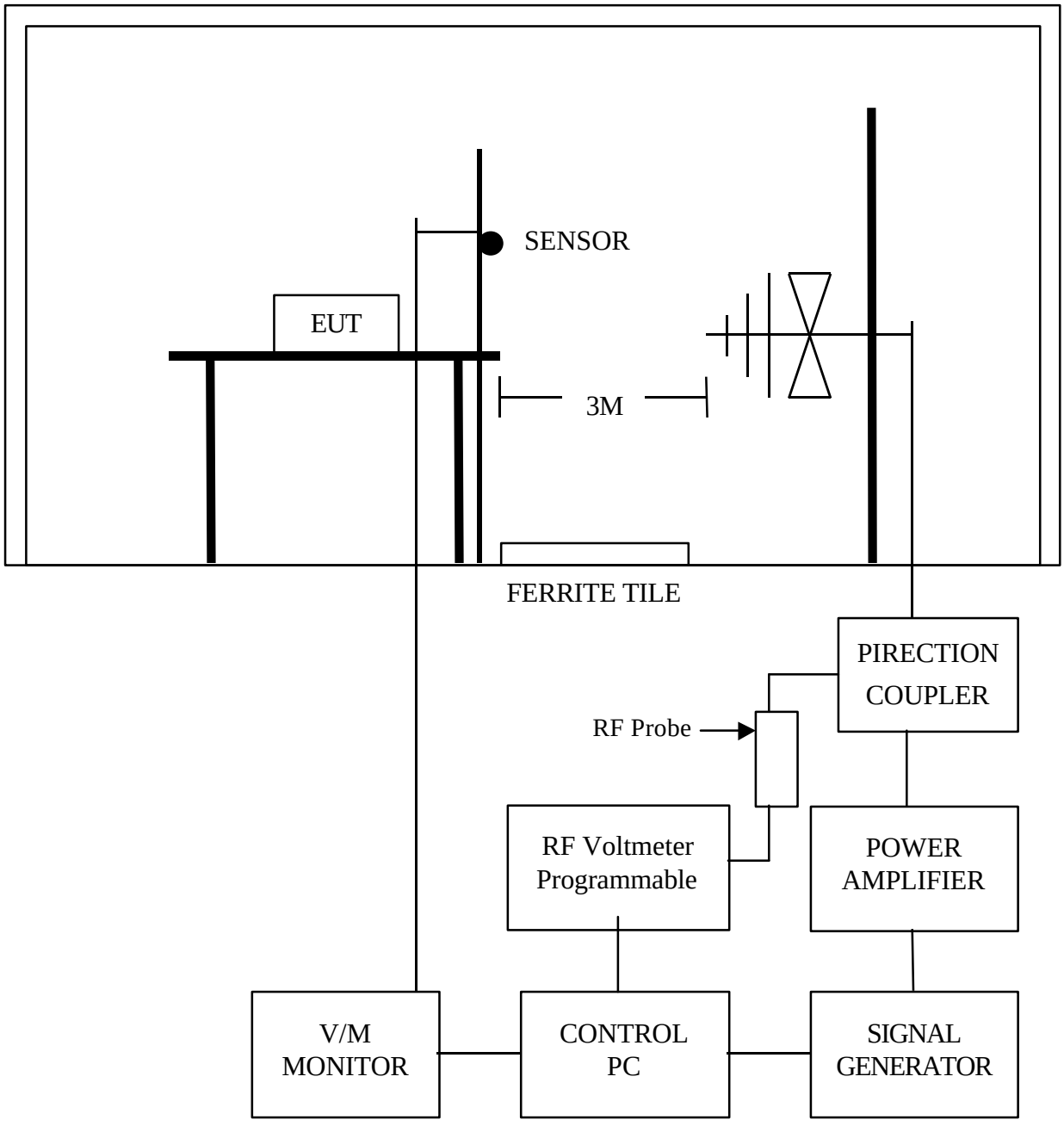
2 TEST PROCEDURE

According to **IEC 61000-4-3 (2002)**

According to **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP

FERRITE TILE



3.1 Chamber Size :

12M x 5M x 5M

(Details for setup configuration, please refer to appendix A.)

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 : 80 MHz ~ 1000 MHz

6.2 Filed Strength : 10 V / M (1KHz 80% Sinusoidal amplitude modulation)
10 V / M (1KHz 0.5s on : 0.5s off pulse modulation)

6.3 Frequency Step : 1 %, 3 sec. / each step size

6.4 Antenna Polarity : HORIZONTAL & VERTICAL

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

6.6 Temperature : 27 ℃

6.7 Humidity : 61 % RH

7 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV system, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing :

a There is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable setting etc.);

b At 3 V/m, any deterioration of the picture is so minor that the system could still be used;

c There is no observable deterioration of the picture at 1 V/m.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

8 TEST RESULT

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

9 Photos of test configuration please refer to appendix A.

ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

1 TEST INSTRUMENTS & FACILITIES

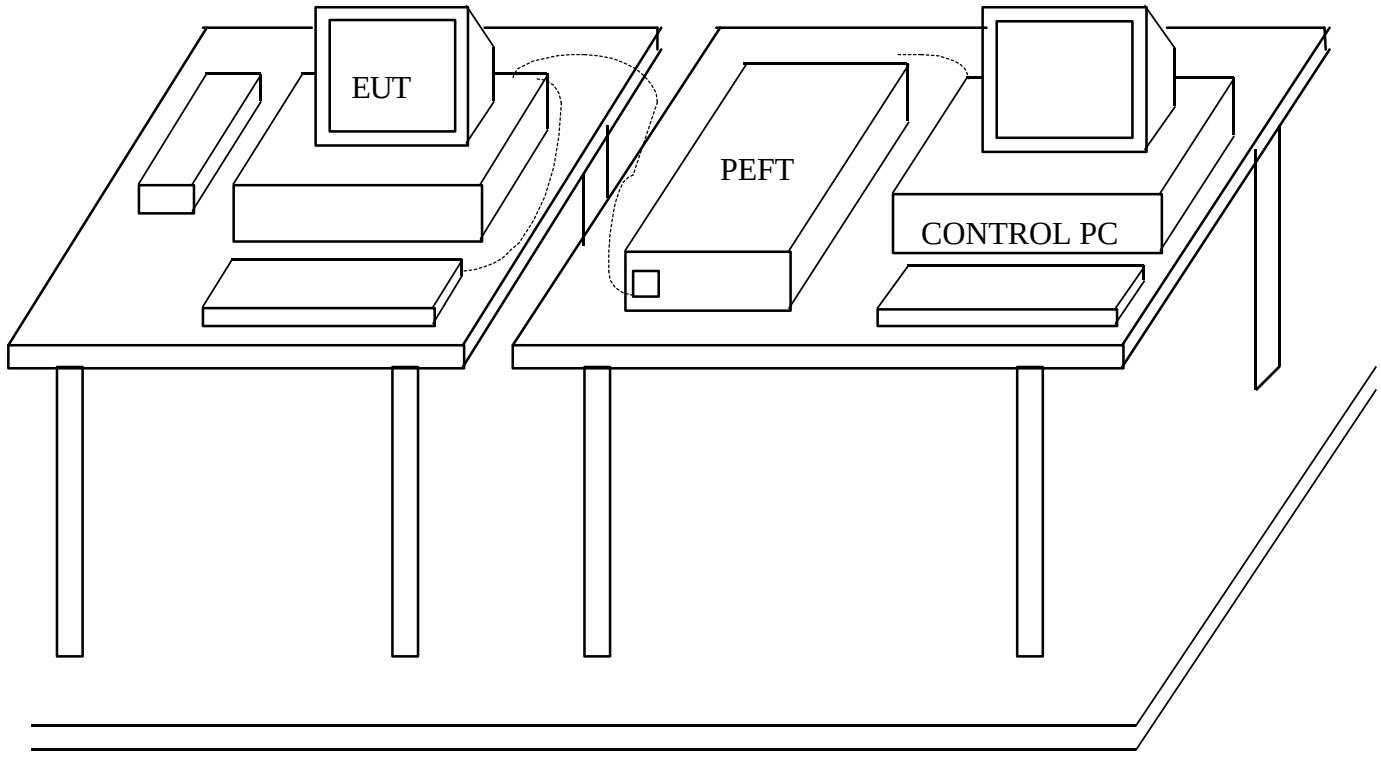
Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
BURST-TESTER	HAEFELY	PEFT/JUNIOR	FEB/2005
CONTROL PC	KB TECH	KB P586/133	--

2 TEST PROCEDURE

According to **IEC 61000-4-4 (2004)**

According to **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP



GROUND PLANE

(Details for setup configuration, please refer to appendix A.)

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 of Power Line : ±0.5KV, ±1KV, ±2KV

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

6.6 Test Voltage of Signal Control Line : ±0.25KV, ±0.5KV, ±1KV

6.7 Temperature : 25 ℃

6.8 Humidity : 49 % RH

7 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the bursts is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

8 TEST RESULT

Power Line :

TEST VOLTAGE	L	N	L+N
±0.5KV	✓	✓	✓
±1KV	✓	✓	✓
±2KV	✓	✓	✓

Signal Control Line :

TEST VOLTAGE	PERFORMACE CRITERIA
±0.25KV	✓
±0.5KV	✓
±1KV	✓

8.1 Model : TPA016

8.2 Final Result : PASSED

8.3 Remark :

9 Photos of test configuration please refer to appendix A.

SURGE IMMUNITY TEST

1 TEST INSTRUMENTS & FACILITIES

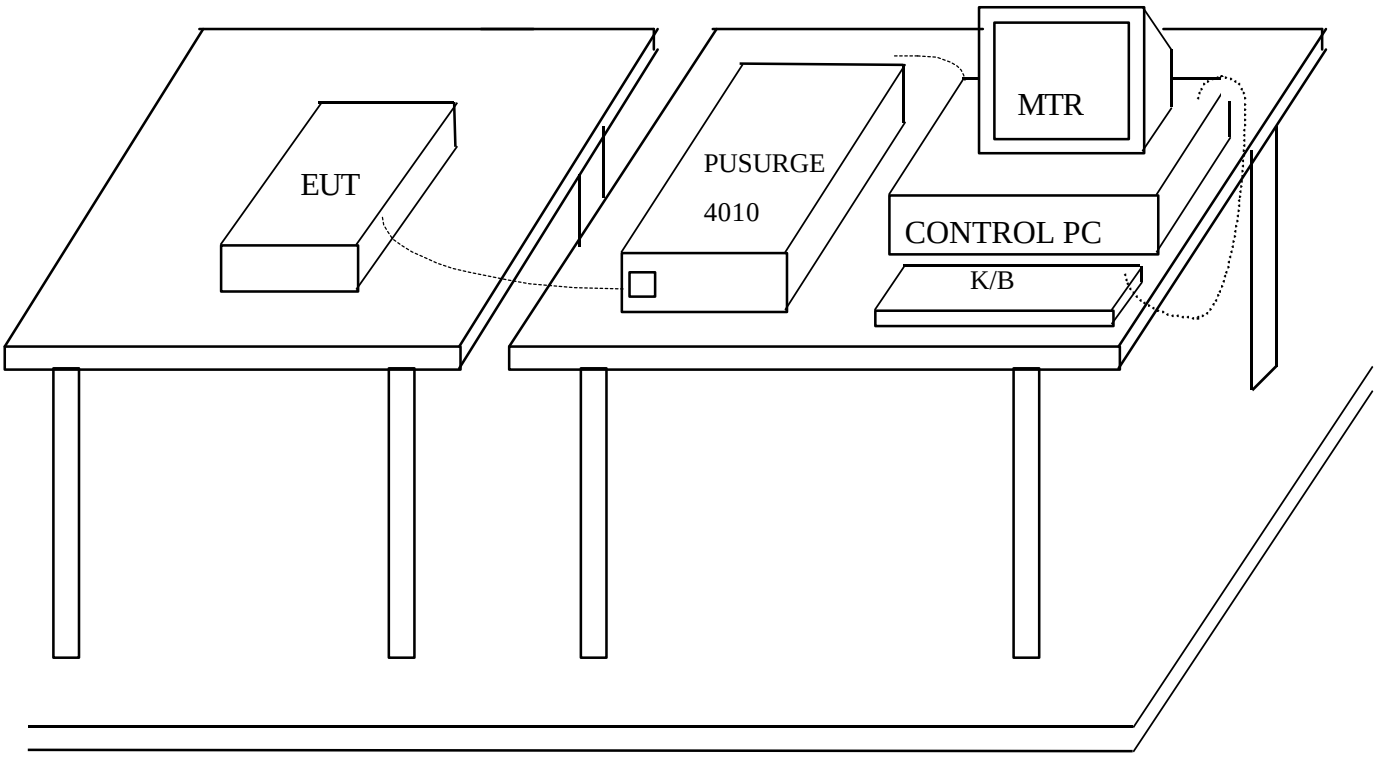
Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
SURGER-TESTER	HAEFELY	PSURGE 4010 583334-38	FEB/2005
CONTROL PC	KB TECH	KB P586/133	--

2 TEST PROCEDURE

According To **IEC 61000-4-5 (2001)**

According To **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

4 TEST LEVELS

☑ Input and Output AC Power Ports.
☐ DC Input and DC Output Power Ports.

Environmental Phenomena	Test Specification		Units
	AC	DC	
Test voltage[1]: a.c. mains supply lines:			
Line to Line	±0.5, 1	N/A	KV (Charge Voltage)
Line to ground[2]	±0.5, 1, 2	N/A	KV (Charge Voltage)
other supply / signal lines:[3]			
Line to ground[4]	N/A	±0.5, 1	KV (Charge Voltage)
Polarity	+ and -		
Minimum number of surges at each polarity, voltage, coupling mode and line:			
a.c. mains supply lines	20[5]		
Other supply / signal lines	5		

1) The test voltages specified are the open-circuit voltages. The test voltages for the lower severity levels are included, because all the lower severity levels must also be satisfied.
2) Via a 10Ω series resistor.
3) No test is required where the manufacturer' s specification indicates that it is not permitted to connect cables >30m long.
4) Via a 40Ω series resistor.
5) Five at each zero-crossing point and at the maximum and minimum points on the mains voltage wave.

5 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

6 EUT OPERATION CONDITION

Same as "Conducted Power Line test", section 5

7 CONDITIONS DURING TESTING

7.1 Coupling of power line :

(A) Line to Line ±0.5KV, ±1KV (AC)

(B) Line to Ground ±0.5KV, ±1KV (DC)

7.2 Test Voltage of Signal Control Line : ±0.5KV, ±1KV (AC)

7.2 Polarity : POSITIVE / NEGATIVE

7.3 Phase shifting in a range between 0 ° to 360 °

7.4 Repetition rate at least 1 per min

7.5 Test times on ac mains supply lines :
5 at each zero-crossing point and at the maximum and minimum point on the mains voltage wave.

7.6 Test times on signal lines : 5

7.7 Temperature : 25 ℃ (15℃ ~ 35℃)
Humidity : 49 % RH.(10 % ~ 75%)

8 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the surges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

9 TEST RESULT

Power Line :

Environmental Phenomena	Test Specification	Units
Line to Line	±0.5, 1	KV (Charge Voltage)

Signal Control Line :

Environmental Phenomena	TEST VOLTAGE	Units
Video Output	±0.5, 1	KV (Charge Voltage)

9.1 Model : TPA016

9.2 Final Result : PASSED

9.3 Remark :

10 Photos of test configuration please refer to appendix A.

IMMUNITY TEST TO CS CONDUCTED DISTURBANCE

1 TEST INSTRUMENTS & FACILITIES

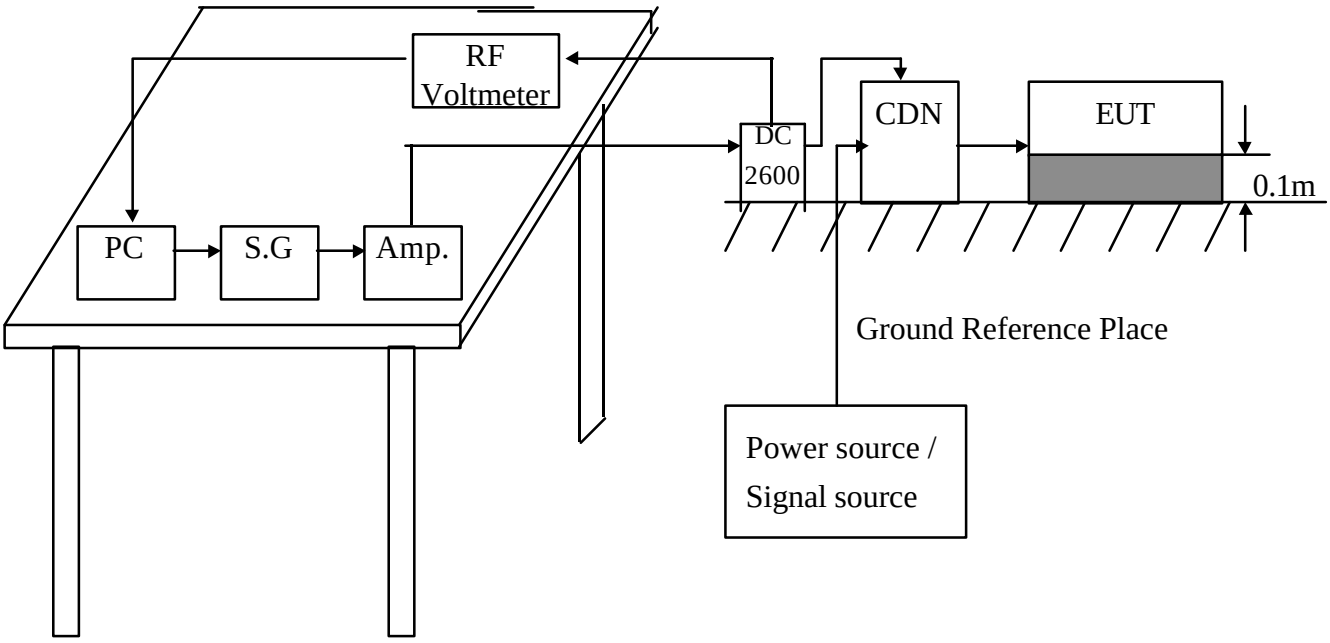
Instruments/ Facilities	Manufacturer	Model # Serial #	Date Of Cal.
SIGNAL GENERATOR	ROHDE & SCHWARZ	SMY02 845181/025	MAR/2005
AMPLIFIER	AMPLIFIER RESEARCH	75A250 25680	N/A
RF VOLTMETER	BOONTON	9200C 361701AA	MAR/2005
RF PROBE	BOONTON	952001B 37082	MAR/2005
DIRECTION COUPLER	AMPLIFIER RESEARCH	DC2600 20508	N/A
COUPLING DECOUPLING NETWORK	FCC	FCC-801-M3-25A 9993	MAR/2005
CONTROL PC	KB TECH	KB P586/133	--

2 TEST PROCEDURE

According To **ENV 50141 (1993)**

According To **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

4 TEST LEVELS

- ☐ Ports for signal lines and control lines.
- ☐ DC input and DC output power ports.
- ☑ Input and Output AC Power Ports.
- ☐ Functional earth Ports.

Environmental	Test Specification	Units
Radio-frequency	0.15 - 100	MHz
Common mode	10	V
Amplitude Modulation	80	% (1KHz)
Pulse Modulation	1	Hz (0.5s on : 0.5s off)

5 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

6 EUT OPERATION CONDITION

Same as "Conducted Power Line test", section 5

7 CONDITIONS DURING TESTING

7.1 The EUT tested type :

- ☑ Single unit
- ☐ Multiple unit

7.2 Dwell time : < 3 Seconds

7.3 Step size : < 1%

7.4 Test times : 3 times (pulse modulation)

7.5 Temperature : 25 ℃ (15℃ ~ 35℃)
Humidity : 49 % RH.(10 % ~ 75%)

8 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of the picture is allowed at 10V, providing :

a There is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.);

b At U_0 = 3V, any deterioration of the picture is so minor that the system could still be used;

c There is no observable deterioration of the picture at U_0 = 1V.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

9 TEST RESULT

TEST Specification	Unit
0.15 - 100	MHz
10	V
80	% (1KHz)
1	Hz (0.5s on : 0.5s off)

9.1 Model : TPA016

9.2 Final Result : PASSED

9.3 Remark :

10 Photos of test configuration please refer to appendix A.

VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITY TEST AND MAIN SUPPLY VARIATIONS

1 TEST INSTRUMENTS & FACILITIES

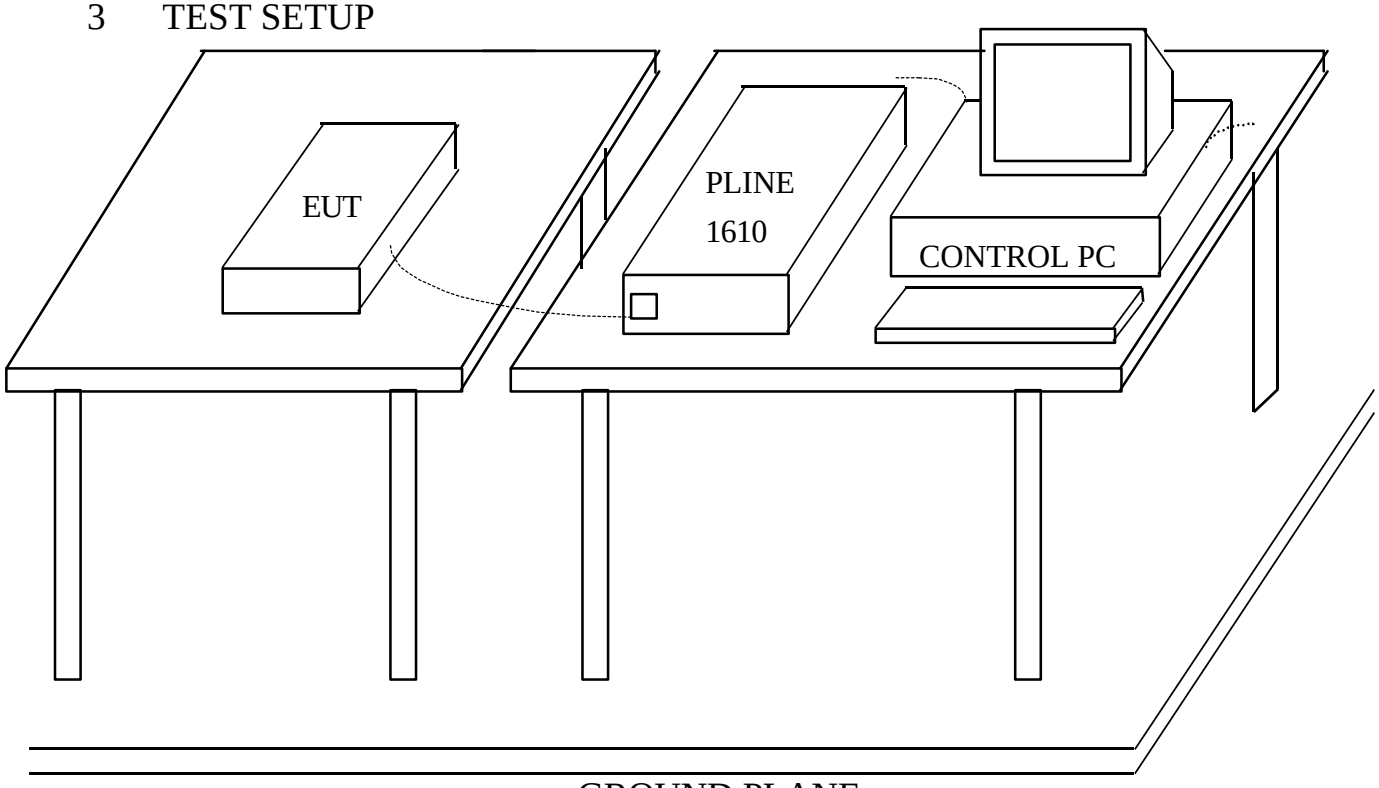
Instruments/ Facilities	Manufacturer	Model # Serial #	Data Of Cal.
LINE INTERFERENCE -TESTER	HAEFELY	PLINE 1610 080166-10	MAR/2005
CONTROL PC	KB TECH	KB P586/133	--
FREQUENCY CONVERTER	EXTECH	CFC-130	--
DIGITAL MULTIMETER	ESCORT	EDM-88 30802175	JUL/2004

2 TEST PROCEDURE

According To **IEC 61000-4-11 (2004)**

According To **EN 50130-4 (1996) + A1 (1998)**

3 TEST SETUP



(Details for setup configuration, please refer to appendix A.)

4 TEST LEVELS FOR DIPS

Input and Output AC Power Ports.

- ☑ Voltage Dips.
- ☑ Voltage Interruptions.

Environmental Phenomena	Test Specification	Units
Voltage Dips	60 0.5, 1, 5, 10	% Reduction periods
	100 0.5, 1, 5	% Reduction periods
Interval between reductions	≧10	Second
Number of reduction at each duration	3 (Voltage Dip 60) 3 (Voltage Dip 100)	Times

5 CONFIGURATION OF THE EUT

Same as "Conducted Power Line test", section 4

6 EUT OPERATION CONDITION

Same as "Conducted Power Line test", section 5

7 CONDITIONS DURING TESTING

7.1 Temperature : 26 ℃ (15℃ ~ 35℃)

Humidity : 50 % RH.(25 % ~ 75%)

8 PERFORMANCE CRITERIA

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

9 TEST RESULT

Same as “Voltage Dips, Short Interruptions Immunity Test and Main Supply Variations”, section 4

9.1 Model : TPA016

9.2 Final Results : PASSED

9.3 Remark

10 TEST LEVELS FOR MAIN SUPPLY VARIATIONS

Extreme Voltages		Voltage Applied	Perform Criteria
Supply voltage max (Umax)	Unom + 10%	253.0V	A
Supply voltage min (Umin)	Unom – 15%	195.5V	A

11 PERFORMANCE CRITERIA

A. The apparatus or system shall continue to operate as intended while performs testing. No degradation of performance or loss of function is allowed below. No degradation or influence for display picture.

B. The apparatus or system might have influence from electrical interference while testing, however there is normal operation after turn off electrical interference. It is allowance that is following phenomenon that is appeared while turn on the elector interference.

C. The apparatus or system lost or temporary lost the function while performs the testing, it shall operate normally after turn off the elector interference or reset the apparatus main power.

12 TEST RESULT

Same as “Voltage Dips, Short Interruptions Immunity Test and Main Supply Variations”, section 10

12.1 Model : TPA016

12.2 Final Results : PASSED

12.3 Remark

13 Photos of test configuration please refer to appendix A.

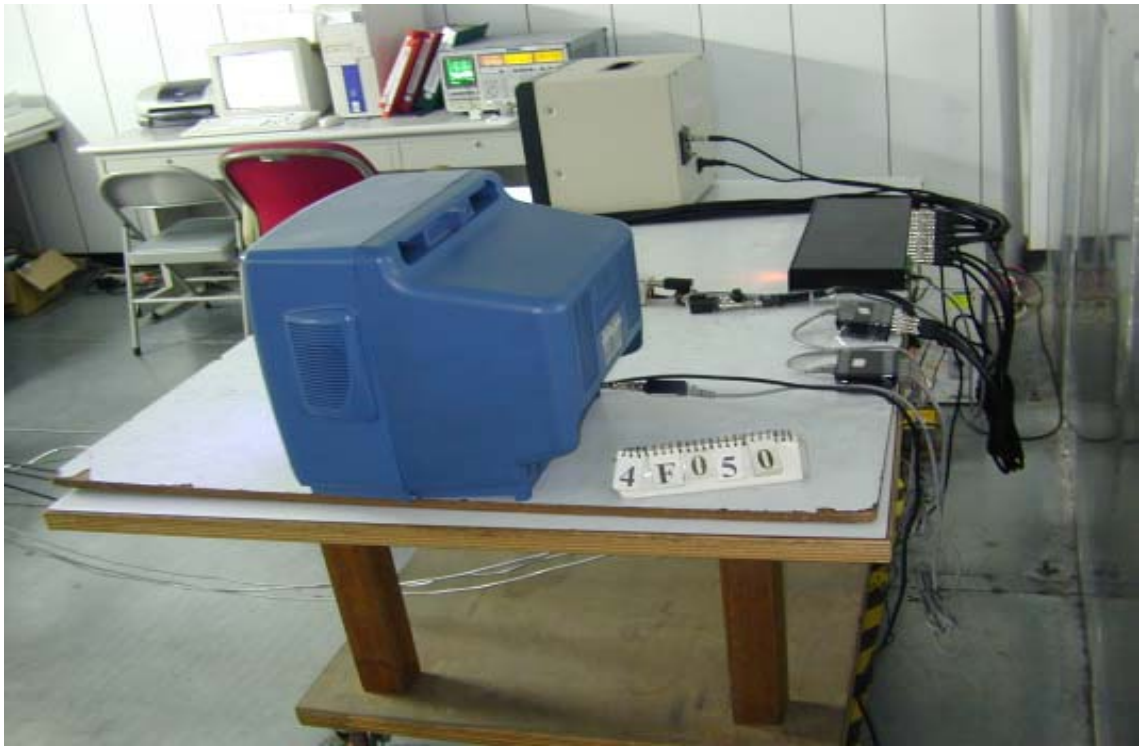
Appendix A

PHOTOS OF TEST CONFIGURATION

PHOTO OF CONDUCTED POWER LINE TEST

Model:TPA016

Front View



Rear View

PHOTO OF RADIATED EMISSION TEST
Model:TPA016

Front View

Rear View

PHOTO OF HARMONICS & VOLTAGE FLUCTUATIONS TEST AND SURGE IMMUNITY TEST AND VOLTAGE DIPS, SHORT INTERRUPTIONS IMMUNITYTEST

Model:TPA016

PHOTO OF ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

PHOTO OF ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

Model:TPA016

PHOTO OF RADIO FREQUENCY ELECTROMAGNETIC FILE IMMUNITY TEST (RS)

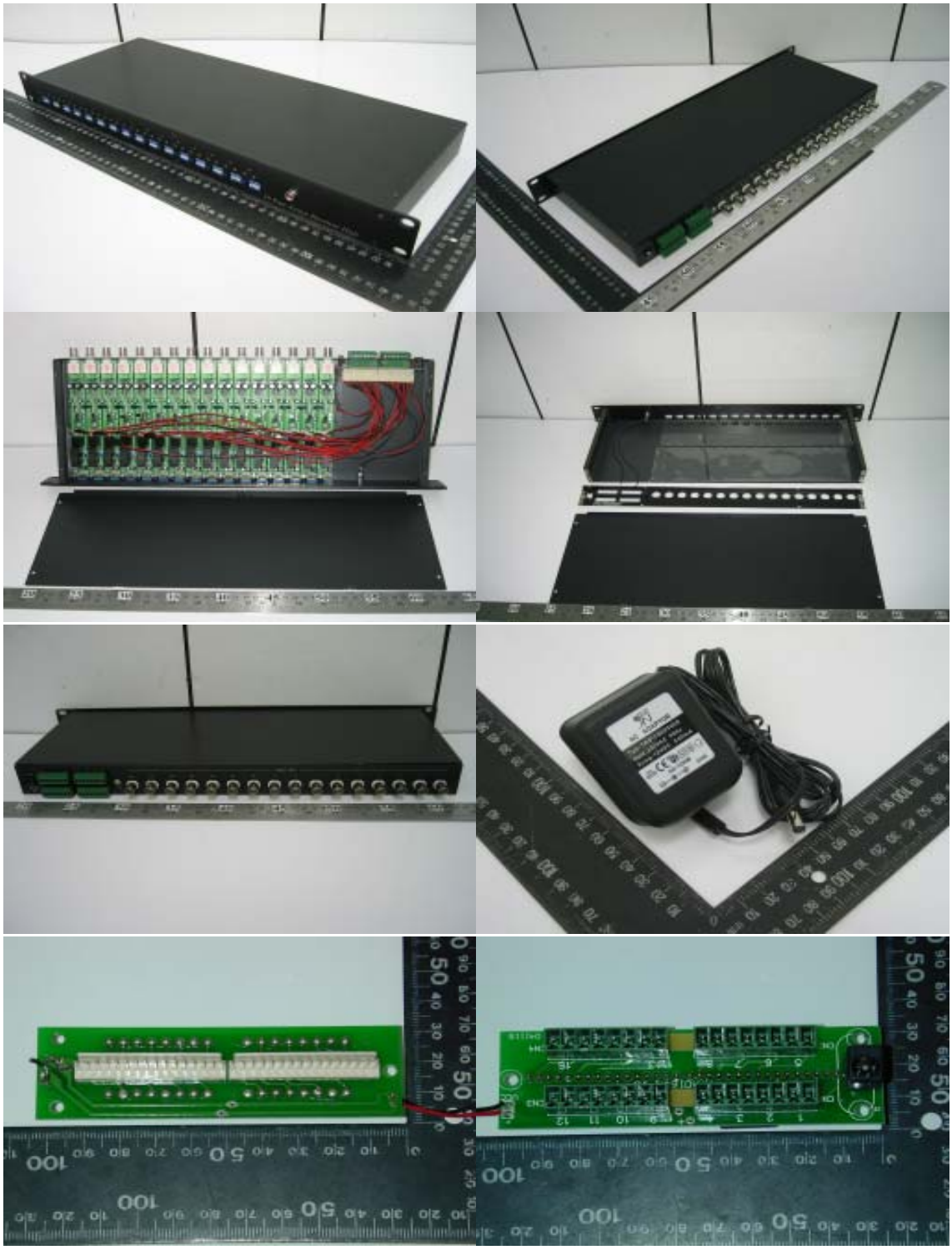
Model:TPA016

PHOTO OF CS CONDUCTED DISTURBANCE IMMUNITY TEST

Appendix B

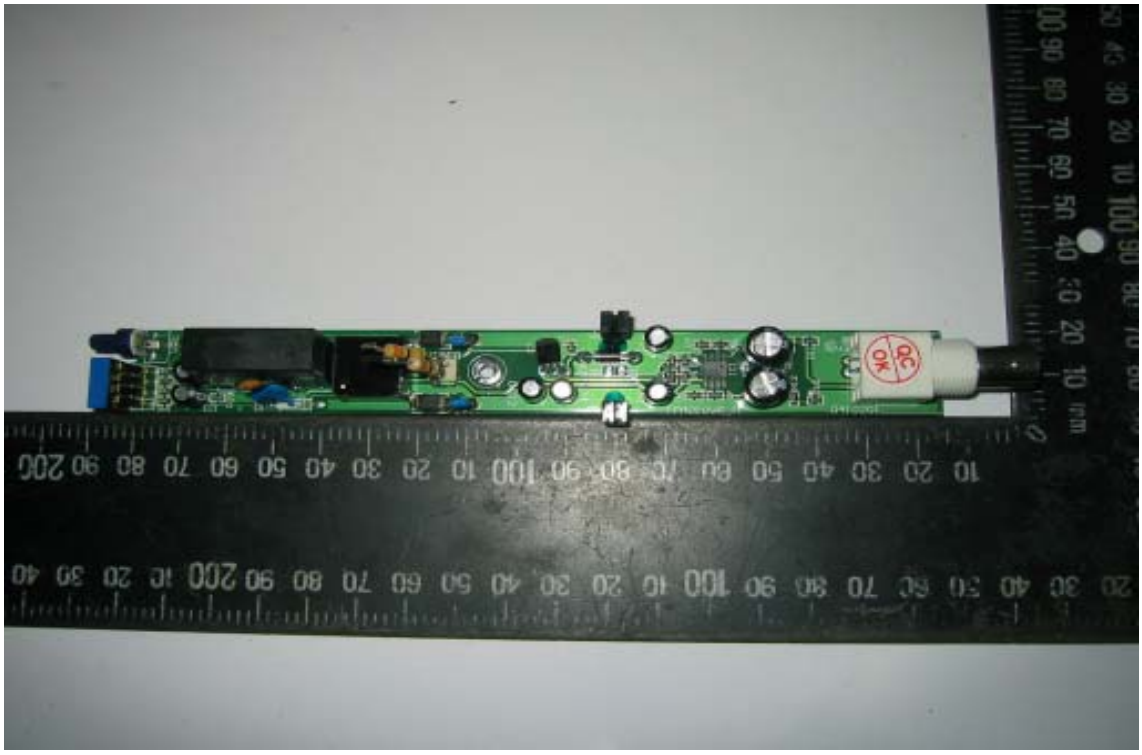
PHOTOS OF EUT

PHOTO OF EUT

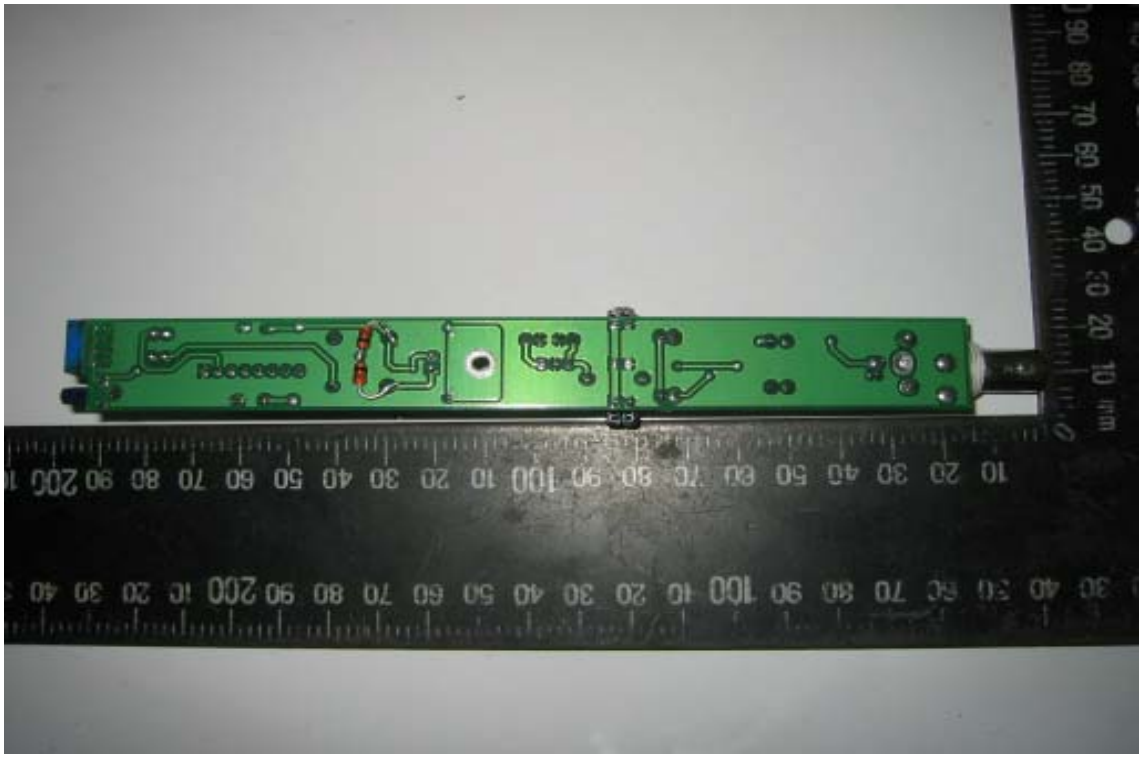


Rear View of EUT

PHOTO OF EUT



Component Side of Main Board



Solder Side of Main Board

Declaration of Conformity

We(Manufacturer/Importer)

_____

(company name)

_____

(address)

declares under our sole responsibility that the product

Product name : Twisted Pair Transmission Amplifier

Model No. : TPA0XXX

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

☑ EN 61000-6-3 (2001)

- ☑ CISPR 22 Class B (1997)
- ☑ EN 61000-3-2 (2000)
- ☑ EN 61000-3-3 (1995) + A1 (2001)

☑ EN 50130-4 (1996) + A1 (1998)

- ☑ IEC 61000-4-2 (2001)
- ☑ IEC 61000-4-3 (2002)
- ☑ IEC 61000-4-4 (2004)
- ☑ IEC 61000-4-5 (2001)
- ☑ ENV 50141 (1993)
- ☑ IEC 61000-4-11 (2004)

following the provisions of 89/336/EEC Directive

Place: _____ Signature: _____

Date : _____ Full name: _____

CE Title: _____

EB4F050

TÜV Rheinland Taiwan Ltd.

TÜV

Certificate

of

Appointment

for the applicant:

Hometek Technology Inc.
No. 67-9, Shir Men Rd., Tu-Cheng City,
Taipei Hsien 236, Taiwan, R.O.C.

has been authorized to carry out EMC tests by order and under supervision of TÜV Rheinland. It has successfully demonstrated capability to conduct measurement and to process test data according to:

European and International EMC Standards as listed in the Scope of Authorization on the attachment to this certificate

An assessment of the facility was conducted by TÜV Rheinland auditors according to the TÜV Rheinland requirements for "Test Site Approval" with reference to

ISO 17 025:1999

Certificate No. : 10012161-2004 **Valid until : Febuary 14, 2006**

TÜV Rheinland Taiwan Ltd.
Taipei, December 21, 2004

Dipl.-Ing. Andreas Klinker
Certification Body

Dipl.-Ing. Bodo Kretzschmar
Product Safety and Quality

TÜV

Attachment to

Certificate

of Appointment

SCOPE OF AUTHORIZATION

Hometek Technology Inc.
No. 67-9, Shir Men Rd., Tu-Cheng City,
Taipei Hsien 236, Taiwan, R.O.C.

European Standards

EN 50081-1	EN 61000-3-2	ENV 50140
EN 50081-2	EN 61000-3-3	ENV 50141
EN 50082-1	EN 61000-6-1	ENV 50204
EN 50130-4	EN 61000-6-2	
EN 50091-2	EN 61000-6-3	
EN 55011	EN 61000-6-4	
EN 55013	EN 61000-3-11	
EN 55014-1	EN 61000-4-2	
EN 55014-2	EN 61000-4-3	
EN 55022	EN 61000-4-4	
EN 55024	EN 61000-4-5	
EN 60601-1-2	EN 61000-4-6	
EN 60801	EN 61000-4-8	
EN 60945	EN 61000-4-11	
	EN 61204-3	

International Standards

CISPR 11	IEC 61000-4-2	IEC 61000-3-2
CISPR 13	IEC 61000-4-3	IEC 61000-3-3
CISPR 14-1	IEC 61000-4-4	IEC 61000-3-11
CISPR 14-2	IEC 61000-4-5	IEC 61000-6-1
CISPR 22	IEC 61000-4-6	IEC 61000-6-2
CISPR 24	IEC 61000-4-8	IEC 61000-6-3
	IEC 61000-4-11	IEC 61000-6-4
IEC 801.2	IEC 61000-4-12	IEC 60945
IEC 801.3		
IEC 801.4		

Certificate No. : 10012161-2004

Taipei, December 21 , 2004

Dipl.-Ing. Bodo Kretzschmar
Product Safety and Quality