



Test Report

Product Name :PC System

Model No. : Terminator Tualatin

Applicant	:	ASUSTeK COMPUTER INC.
Address	:	4Fl., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

Date of Receipt	:	September 24, 2001
Date of Test	:	October 5, 2001
Report No.	:	019L036E

The Test Results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.



EMC/Safety Test Laboratory
Accredited by DNV, TUV, Nemko and NVLAP

Date: October 5, 2001
QTK No.: 019L036E



Statement of Conformity

The certifies that the following designated product

Product : PC System
Trade Name : ASUS
Model Number : Terminator Tualatin
Company Name : ASUSTeK COMPUTER INC.

This product is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility Directive (89/336/EEC). For the evaluation regarding EMC, the following standards were applied:

RFI Emission:

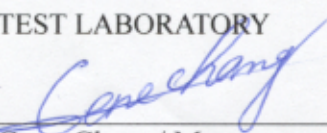
EN 55022:1998 Class B : Product family standard
EN 61000-3-2:1995 Class D : Limits for harmonic current emission
Amendment 1:1998
Amendment 2:1998
EN 61000-3-3:1995 : Limitation of voltage fluctuation and flicker in low-voltage supply system

Immunity :

EN 55024:1998 : Product family standard



TEST LABORATORY

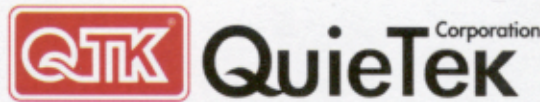

Gene Chang/ Manager

The verification is based on a single evaluation of one sample of above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. Logo.

Test Report Certification

Test Date : October 5, 2001

Report No. : 019L036E



Accredited by TUV, DNV, Nemko and NIST (NVLAP)

Product Name : PC System

Applicant : ASUSTeK COMPUTER INC.

Address : 4Fl., No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

Manufacturer : ASUSTeK COMPUTER INC.

Model No. : Terminator Tualatin

Rated Voltage : AC 230V/50Hz

Trade Name : ASUS

Measurement Standard : EN 55022:1998 Class B
 EN 61000-3-2:1995, Amendment 1:1998, Amendment 2:1998
 EN 61000-3-3:1995
 EN 55024:1998

Measurement Procedure : EN 55022:1998, EN 61000-3-2:1995, EN 61000-3-3:1995,
 IEC 61000-4-2:1995, IEC 61000-4-3:1995, IEC 61000-4-4:1995,
 IEC 61000-4-5:1995, IEC 61000-4-6:1996, IEC 61000-4-8:1993,
 IEC 61000-4-11:1994

Test Result : Complied

The Test Results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.

Documented By : Melody Hsu
(Melody Hsu)

Tested By : Miller Lee
(Miller Lee)

Approved By : Gene Chang
(Gene Chang)



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ATTACHMENT 1: EUT TEST PHOTOGRAPHS

ATTACHMENT 2: EUT DETAILED PHOTOGRAPHS

REFERENCE : LABORATORY OF LICENSE

1. General Information

1.1. EUT Description

Product Name	:	PC System
Trade Name	:	ASUS
Model No.	:	Terminator Tualatin
Mother Board	:	ASUS, TUSC
CPU	:	PIII 1.2GHz/133MHz
HDD	:	Western Digital, WD400BB-00AUA1
CD-ROM	:	ASUS, CD-S520/A
FDD	:	ALPS, DF354N116F
VGA Card	:	On Board
Sound Card	:	On Board
Lan Card	:	On Board
Switch Power Supply	:	ASUS, ATP-1505-NP
Power Cord	:	Non-shielded, 1.8m

Note:

1.The PC System support Pentium III CPU the main measurement is 1.2GHz/133MHz detail as below:

Ports & Type	Quantity
PCI Slot	2
AMR Slot	1
PS/2 Keyboard Port	1
VGA Port	1
Front Audio (Earphone & Mic)	1
PS/2 Mouse Port	1
Game Port	1
LAN Port	1
USB Port	2
Line Out	1
Front USB	2
Line In	1
Mic In	1
Printer Port	1
Com Port	1

2. Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

EMI Mode	:	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz
EMS Mode	:	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz

1.2. Tested System Details

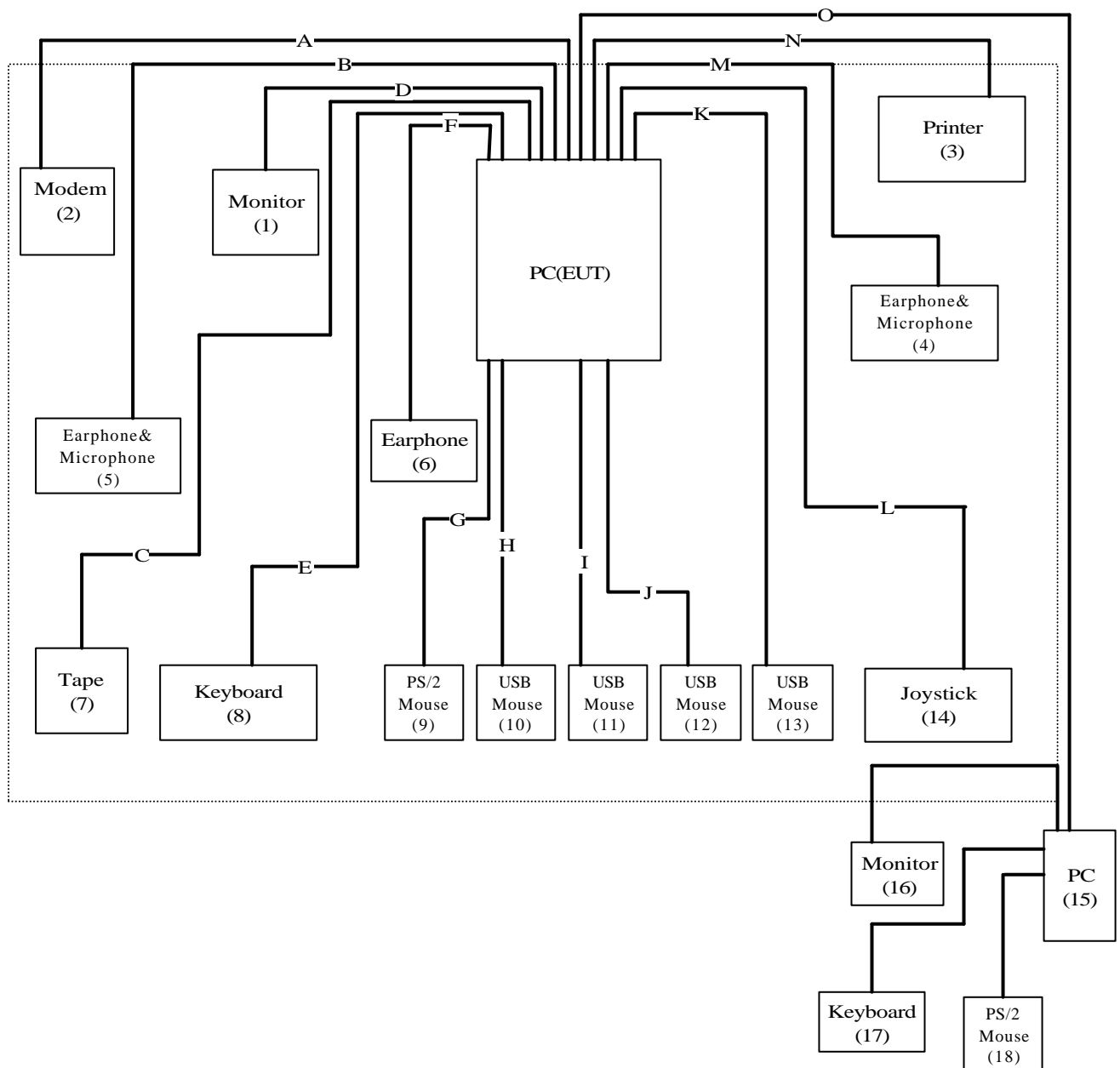
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.
(1)	Monitor	SONY	CPD-G500	2738406
(2)	Modem	ACEEX	DM-1414	0102027559
(3)	Printer	EPSON	Color 680	015999
(4)	Microphone & Earphone	TOKTO	SX-MI	N/A
(5)	Microphone & Earphone	TOKTO	SX-MI	N/A
(6)	Earphone	AIWA	N/A	N/A
(7)	Walkman	AIWA	HS-TA164	N/A
(8)	Keyboard	HP	SK-2506	C00083358
(9)	Mouse	HITACHI	PC-KM1300	N/A
(10)	USB Mouse	ASUS	MOUSE	000011795
(11)	USB Mouse	Logitech	M-BE58	LZE10151096
(12)	USB Mouse	Logitech	M-BE58	LZE11405342
(13)	USB Mouse	Logitech	M-UE55	LZE11405343
(14)	Joystick	GENIUS	MAXFIRE FORCE G-09D	CJ0100200575
(15)	PC	IBM	2187-16W	BNL6772
(16)	Monitor	ADI	CM703	038054T10203875A
(17)	Keyboard	HP	SK-2506	C00083358
(18)	Mouse	HITACHI	PC-KM1300	N/A

Note : 1. The power cord of the device 1,15are 16 non-shielded power cord.

Signal Cable Type		Signal cable Description
A.	RS232 Cable	Shielded, 1.5m
B.	Earphone & Microphone	Non-shielded, 1.5m
C.	Audio Cable	Non-shielded, 1.5m
D.	VGA Cable	Shielded, 1.8m, two ferrite core bonded
E.	Keyboard Data Cable	Non-shielded, 1.8m
F.	Earphone Cable	Non-shielded, 1.5m
G.	PS/2 Mouse Cable	Non-shielded, 1.0m
H.	USB Mouse Cable	Non-shielded, 0.8m
I.	USB Mouse Cable	Non-shielded, 0.8m
J.	USB Mouse Cable	Non-shielded, 1.5m
K.	USB Mouse Cable	Non-shielded, 1.5m
L.	Joystick Cable	Shielded, 1.8m
M.	Earphone & Microphone	Non-shielded, 1.5m
N.	Printer Cable	Shielded, 1.5m
O.	LAN Cable	Non-shielded, 3.0m

1.3. Configuration of tested System



1.4. EUT Exercise Software

- (1) Setup the EUT and simulators as shown on 1.4.
- (2) Turn on the power of all equipment.
- (3) Personal Computer (EUT) reads data from disk.
- (4) EUT will sends “H” pattern to monitor, the monitor will show “H” pattern on the screen.
- (5) EUT sends “H” pattern to printer, the printer will print “H” pattern on paper.
- (6) EUT reads and writes data into and from modem.
- (7) EUT will read data from floppy disk and then writes the data into floppy disk, same operation for hard disk.
- (8) EUT Connect another simulation PC through LAN port and carry out Read/Write work each other.
- (9) Repeat the above procedure (3) to (7).
- (10) The CD ROM of EUT play the audio signal and video picture during the test.

1.5. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description:

June 29, 2001 Accreditation on NVLAP
 NVLAP Lab Code: 200347-0



June 11, 2001 Accreditation on DNV
 Statement No. : 413-99-LAB11



January 04, 1999 Accreditation on TUV Rheinland
 Certificate No.: I9865712-9901



April 18, 2001 Accreditation on Nemko
 Certificate No.: ELA 165
 Certificate No.: ELA 162



Site Name: Quietek Corporation

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E-Mail : service@quietek.com

2. Conducted Emission

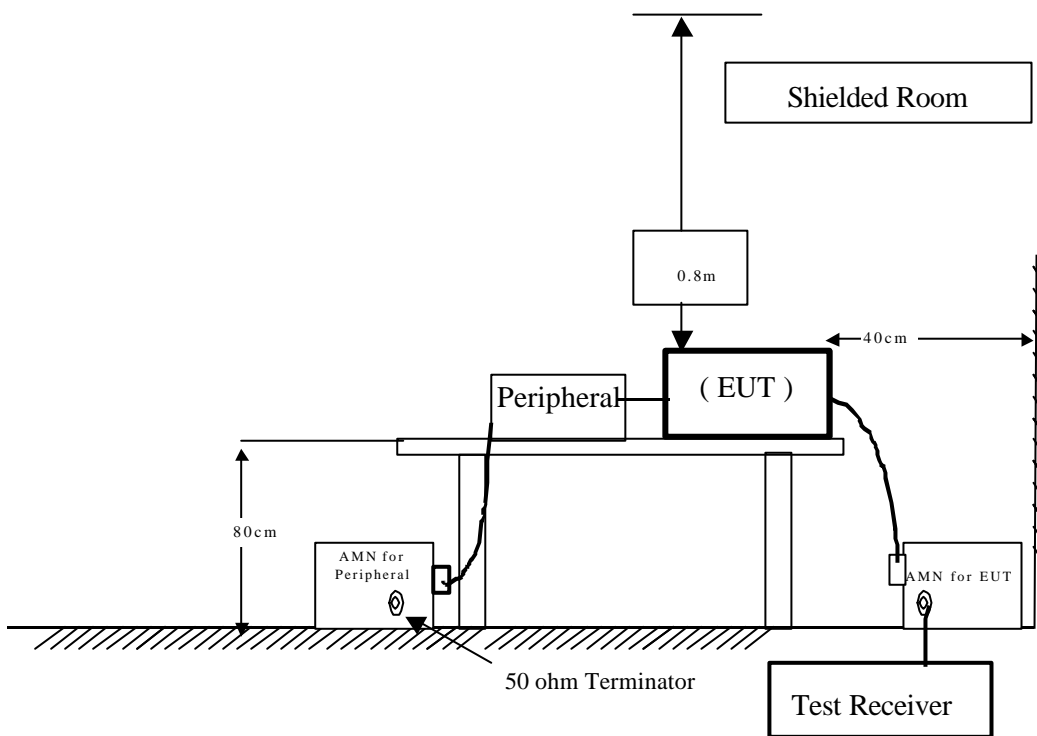
2.1. Test Equipment List

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal..	Remark
1	Test Receiver	R & S	ESCS 30/838251/0001	May, 2001	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2001	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2001	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2001	
5	N0.4 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

EN 55022 Limits (dBuV)				
Frequency MHz	Class A		Class B	
	QP	AV	QP	AV
0.15 - 0.50	79	66	66-56	56-46
0.50-5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN 55022:1998 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to EN 55022:1998

2.6. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

3. Radiated Emission

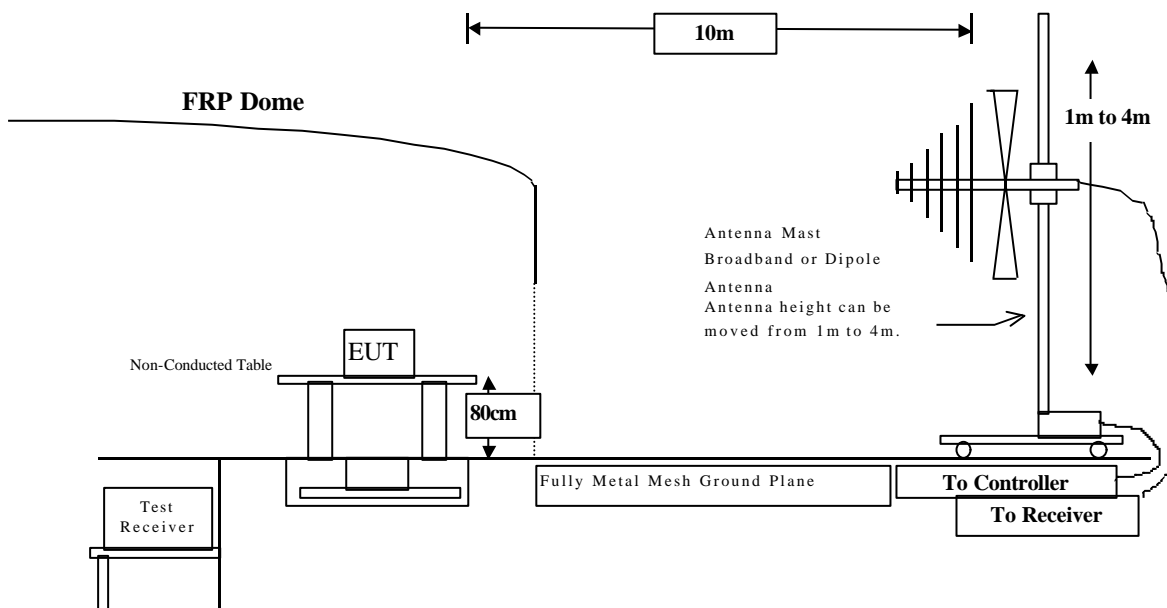
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input type="checkbox"/> Site # 1	X Test Receiver	R & S	ESVS 10 / 834468/003	July, 2001
	X Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2001
	X Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2001
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2000
	X Test Receiver	R & S	ESCS 30 / 836858/022	Nov., 2001
<input checked="" type="checkbox"/> Site # 2	X Spectrum Analyzer	Advantest	3162 / 100803466	May, 2001
	X Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2001
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2001
	X Horn Antenna	ETS	3115 / 0005-6160	July, 2001
	X Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2001

- Note:
1. All equipments that need to calibrate are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Limits

EN 55022 Limits (dBuV)				
Frequency MHz	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30 – 230	10	40	10	30
230 – 1000	10	47	10	37

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to EN55022:1998 on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

3.5. Test Specification

According to EN 55022:1998

3.6. Test Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

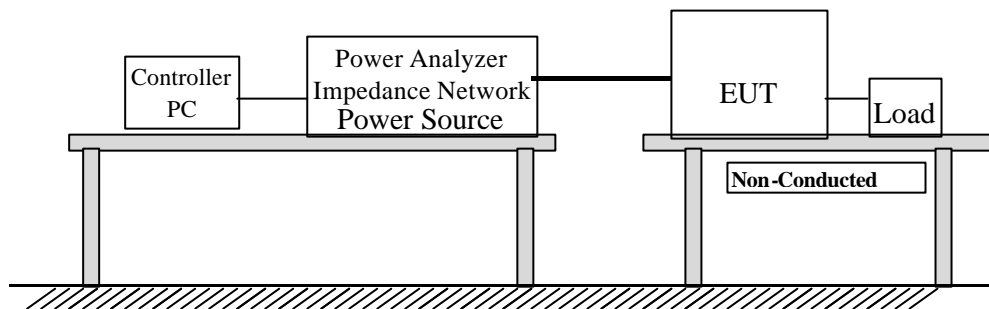
4. Power Harmonics and Voltage Fluctuation

4.1. Power Harmonics and Voltage Fluctuation Test Equipment List

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Power Harmonics Tester	SCHAFFNER	Proflin 2105-400 S/N: HK54148	Jun., 2001
2	Analyzer	SCHAFFNER	CCN 1000-1/X71887	Jun., 2001
3	No.3 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

4.2. Test Setup



4.3. Limits

➤Limits of Harmonics Currents

Harmonics Order	Maximum Permissible harmonic current (in amperes)	Harmonics Order	Maximum Permissible harmonic current (in amperes)
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	8 ≤ n ≤ 40	0.23 * 8/n
11	0.33		
13	0.21		
15 ≤ n ≤ 39	0.15 * 15/n		

4.4. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

4.5. Test Specification

According to EN 61000-3-2:1995, , Amendment 1:1998, Amendment 2:1998 and EN 61000-3-3:1995

4.6. Test Result

The measurement of the power harmonics, which test at the extremes of EUT' s supply range, was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

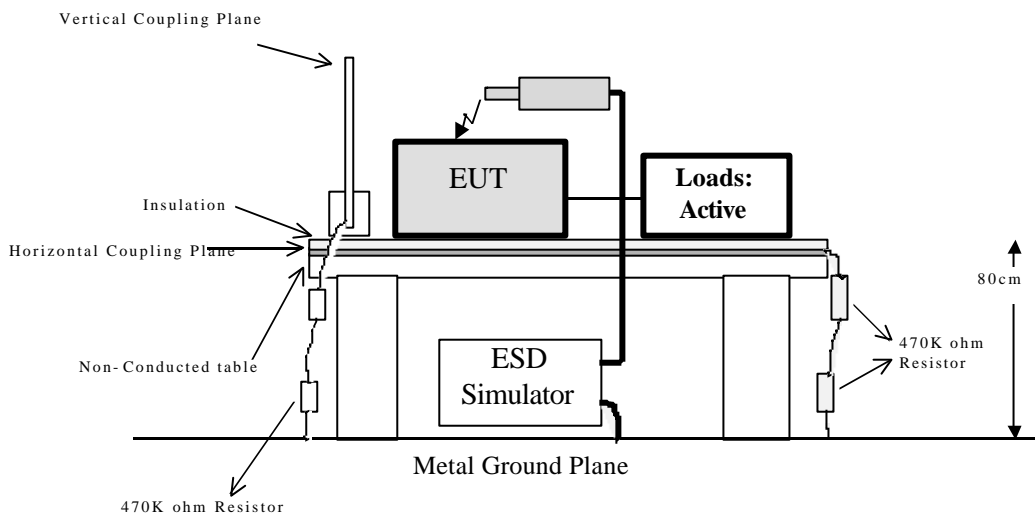
5. Electrostatic Discharge (ESD)

5.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	ESD Simulator System	SCHAFFNER	NSG 432 S/N: 1453	Jun., 2001
2	Horizontal Coupling Plane(HCP)	Quietek	HCP AL50	Jun., 2001
3	Vertical Coupling Plane(VCP)	Quietek	VCP AL50	Jun., 2001
4	No.1 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

5.2. Test Setup



5.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure Port				
	Electrostatic Discharge	kV(Charge Voltage)	8 Air Discharge 4 Contact Discharge	B

5.4. Test Procedure

Direct application of discharges to the EUT:

Contact discharge was applied only to conductive surfaces of the EUT.

Air discharges were applied only to non-conductive surfaces of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges will be keep longer 1 second. It was at least ten single discharges with positive and negative at the same selected point.

The selected point, which was performed with electrostatic discharge, was marked on the red label of the EUT.

Indirect application of discharges to the EUT:

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

5.5. Test Specification

According to EN 61000-4-2:1995

5.6. Test Result

The measurement of the electrostatic discharge was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

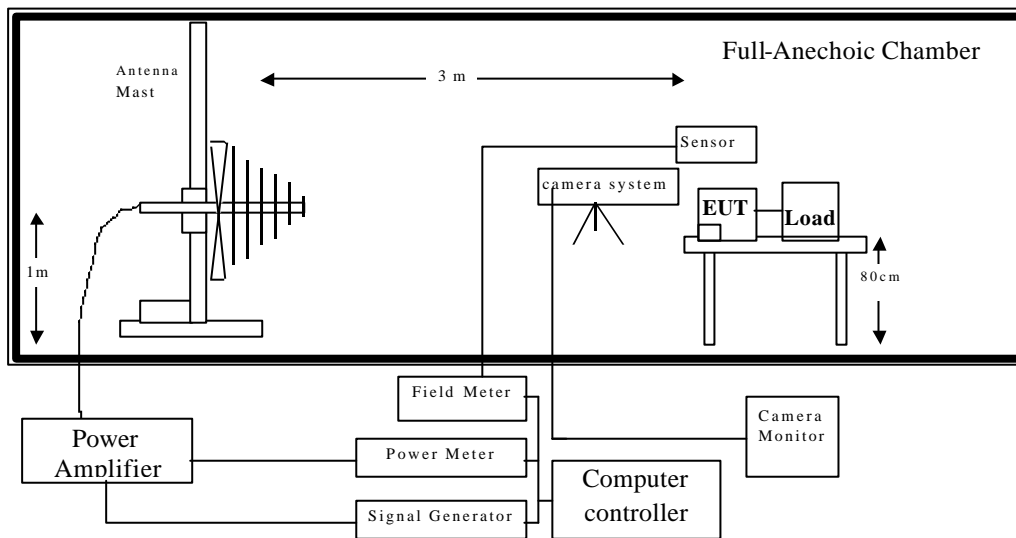
6. Radiated Susceptibility (RS)

6.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Signal Generator	IFR	2023B / 202302/581	May, 2001
2	Power Amplifier	A & R	500A100AM3 /29369	Aug., 2001
3	Power Amplifier	SCHAFFNER	CBA9413B / 0006	June, 2001
4	Field Strength Sensor	SCHAFFNER	EMC 20 / Y-0028/ Z-0003	June, 2001
5	Power Antenna	SCHWARZBECK	VULB 9166 / 1073	Sep., 2001
6	Power Meter	BOONTON	4232A / 42201	May, 2001
7	No.2 EMC Fully Chamber			July, 2001

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

6.2. Test Setup



6.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure Port				
	Radio-Frequency	MHz	80-1000	
	Electromagnetic Field	V/m(Un-modulated, rms)	3	A
	Amplitude Modulated	% AM (1kHz)	80	

6.4. Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.

In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

All the scanning conditions are as follows:

Condition of Test	Remarks
EN 55024:1998	
1. Field Strength	3 V/M Level 2
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	80MHz - 1000MHz
4 Dwell Time	3 Seconds
5. Frequency step size Δf :	1%
6. The rate of Swept of Frequency	1.5×10^{-3} decades/s

6.5. Test Specification

According to EN 61000-4-3:1995

6.6. Test Result

The measurement of the radiated susceptibility was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

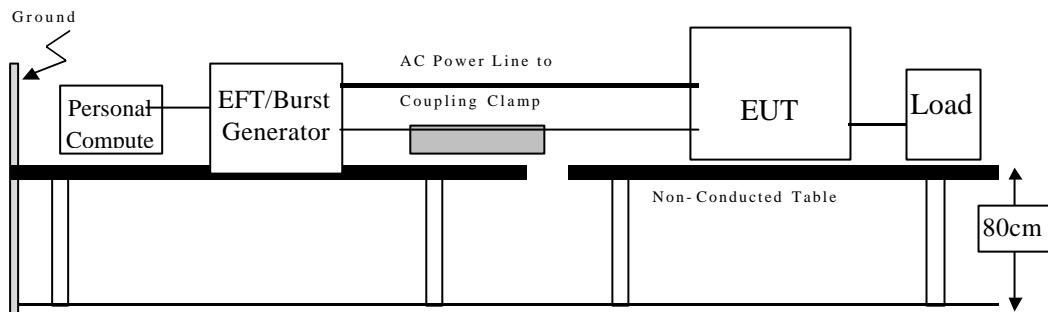
7. Electrical Fast Transient/Burst (EFT/B)

7.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Fast Transient/Burst Generator	SCHAFFNER	BEST S/N: 300035-008SC	Jun., 2001
2	No.3 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

7.2. Test Setup



7.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Signal Ports and Telecommunication Ports				
	Fast Transients Common Mode	kV (Peak) Tr/Ts ns Rep. Frequency kHz	0.5 5/50 5	B
Input DC Power Ports				
	Fast Transients Common Mode	kV (Peak) Tr/Ts ns Rep. Frequency kHz	0.5 5/50 5	B
Input AC Power Ports				
	Fast Transients Common Mode	kV (Peak) Tr/Ts ns Rep. Frequency kHz	1 5/50 5	B

7.4. Test Procedure

The EUT and load are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides.

For Signal Ports and Telecommunication Ports:

The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1min.

For Input DC and AC Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the EFT interference signal.

Each of the Line and Neutral conductors is impressed with burst noise for 1 min.

The length of power cord between the coupling device and the EUT shall be 1m.

7.5. Test Specification

According to EN 61000-4-4:1995

7.6. Test Result

The measurement of the Electrical Fast Transient/Burst was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

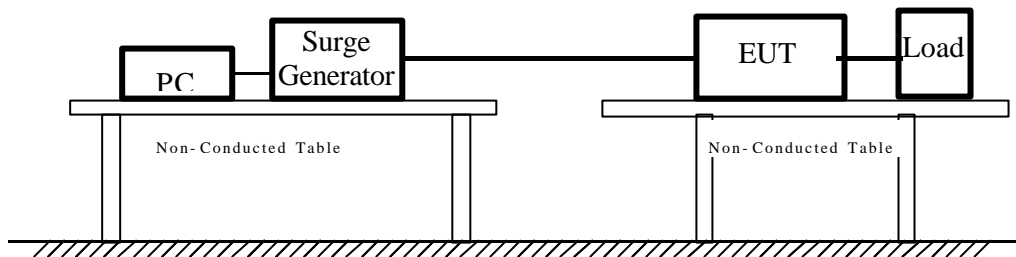
8. Surge

8.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Surge Generator	SCHAFFNER	BEST S/N: 300035-008SC	Jun., 2001
2	No.3 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

8.2. Test Setup



8.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Signal Ports and Telecommunication Ports				
	Surges	Tr/Ts uS	1.2/50 (8/20)	
	Line to Ground	KV	± 1	B
Input DC Power Ports				
	Surges	Tr/Ts uS	1.2/50 (8/20)	
	Line to Ground	kV	± 0.5	B
AC Input and AC Output Power Ports				
	Surges	Tr/Ts uS	1.2/50 (8/20)	
	Line to Line	kV	± 1	B
	Line to Ground	kV	± 2	

8.4. Test Procedure

The EUT and its load are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The length of power cord between the coupling device and the EUT shall be 2m or less.

For Input and Output AC Power or DC Input and DC Output Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The surge noise shall be applied synchronized to the voltage phase at 0° , 90° , 180° , 270° and the peak value of the a.c. voltage wave. (Positive and negative)

Each of Line-Earth and Line-Line is impressed with a sequence of five surge voltages with interval of 1 min.

8.5. Test Specification

According to EN 61000-4-5:1995

8.6. Test Result

The measurement of the Surge was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

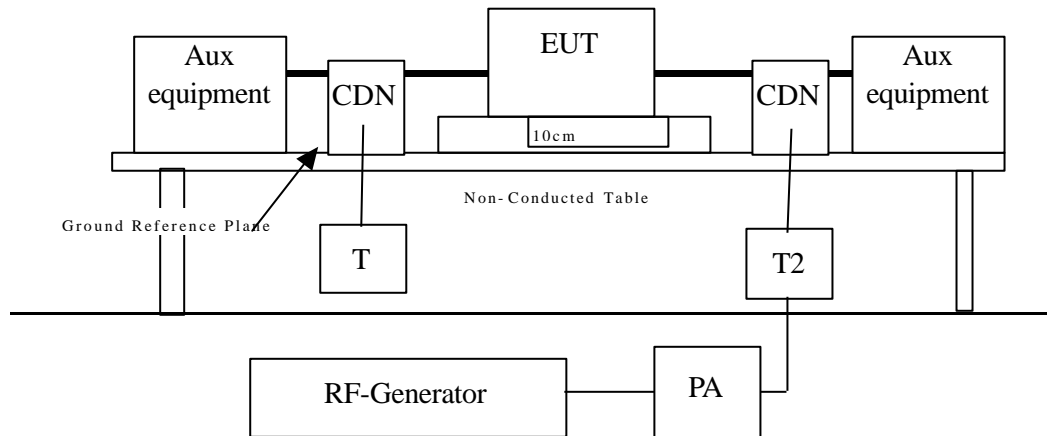
9. Conducted Susceptibility (CS)

9.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Signal Generator	IFR	2023B / 202302/581	May, 2001
2	Power Amplifier	A & R	500A100AM3 /29369	Aug., 2001
3	Power Amplifier	SCHAFFNER	CBA9413B / 0006	June, 2001
4	CDN 1	Schwarzbeck	L801 M2/3 / 1549	Jun, 2001
5	CDN 2	Schwarzbeck	L801 S1 / 1574	Jun, 2001
6	CDN 3	Schwarzbeck	L801 AF4 / 1064	Jun, 2001
7	CDN 4	Schwarzbeck	L801 AF8 / 1070	Jun, 2001
8	CDN 5	FCC	FCC-801-S9 / 9837	Jun, 2001
9	CDN 6	FCC	FCC-801-S15 / 9838	Jun, 2001
10	CDN 7	FCC	FCC-801-S25 / 9839	Jun, 2001
11	50 ohm Terminator	RES-NET	RCX6BM	Jun, 2001
12	6dB Attenuator	BIRD	RFA250NFF10	Jun, 2001
13	EM Clamp	Schwarzbeck	KEMZ 801 / 15928	Jun, 2001
14	No.2 EMC Fully Chamber			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

9.2. Test Setup



9.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Signal Ports and Telecommunication Ports				
	Radio-Frequency	MHz	0.15-80	
	Continuous Conducted	V (rms, Un-modulated)	3	A
		% AM (1kHz)	80	
Input DC Power Ports				
	Radio-Frequency	MHz	0.15-80	
	Continuous Conducted	V (rms, Un-modulated)	3	A
		% AM (1kHz)	80	
Input AC Power Ports				
	Radio-Frequency	MHz	0.15-80	
	Continuous Conducted	V (rms, Un-modulated)	3	A
		% AM (1kHz)	80	

9.4. Test Procedure

The EUT are placed on a table that is 0.8 meter height, and a Ground reference plane on the table, EUT are placed upon table and use a 10cm insulation between the EUT and Ground reference plane.

For Signal Ports and Telecommunication Ports

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and Telecommunication lines of the EUT.

For Input DC and AC Power Ports

The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. And directly couples the disturbances signal into EUT.

Used CDN-M2 for two wires or CDN-M3 for three wires.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	130dBuV(3V) Level 2
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	0.15MHz – 80MHz
4 Dwell Time	3 Seconds
5. Frequency step size Δf :	1%
6. The rate of Swept of Frequency	1.5×10^{-3} decades/s

9.5. Test Specification

According to EN 61000-4-6:1996

9.6. Test Result

The measurement of the Conducted Susceptibility was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

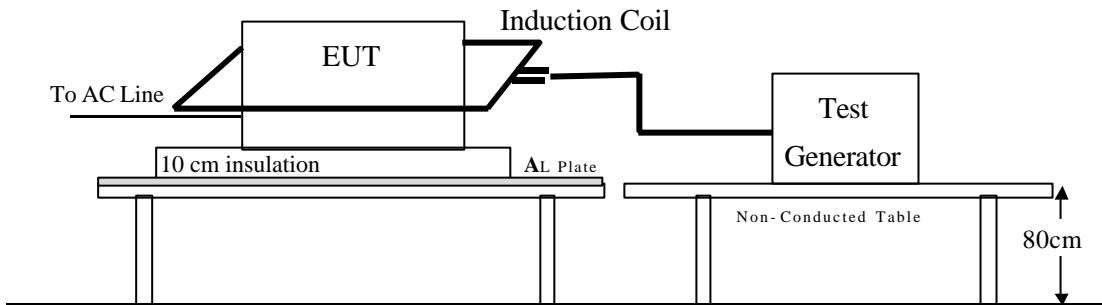
10. Power Frequency Magnetic Field

10.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Voltage Dips Generator	Haefely	PLINE 1610 S/N: 080 938-05	Jun., 2001
2	Gauss Meter	F.W.BELL	4090	Jun., 2001
3	No.3 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

10.2. Test Setup



10.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure Port				
	Power-Frequency Magnetic Field	50 1	Hz A/m (r.m.s.)	A

10.4. Test Procedure

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured at least 1m*1m min. The test magnetic field shall be placed at central of the induction coil.

The test magnetic Field shall be applied 10minutes by the immersion method to the EUT. And the induction coil shall be rotated by 90° in order to expose the EUT to the test field with different orientation (X, Y, Z Orientations).

10.5. Test Specification

According to EN 61000-4-8:1993

10.6. Test Result

The measurement of the Power Frequency Magnetic Field was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

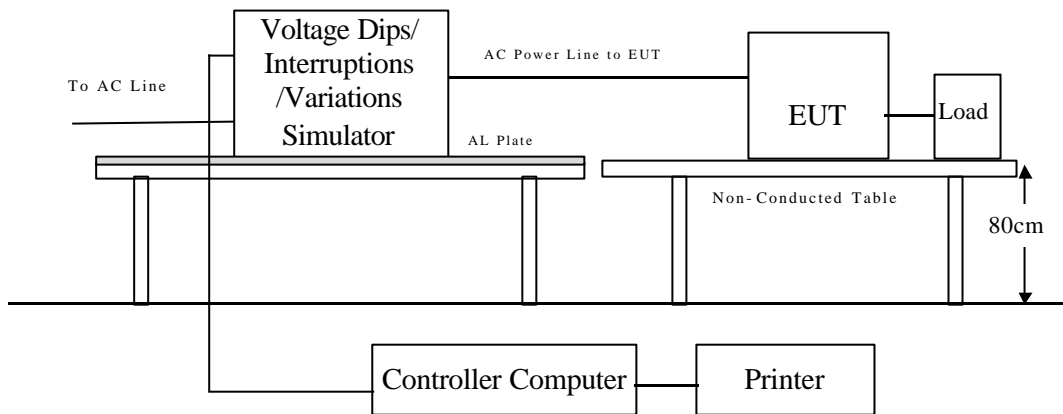
11. Voltage Dips and Interruption Measurement

11.1. Test Equipment

Item	Instrument	Manufacturer	Type No/Serial No.	Last Calibration
1	Voltage Dips Generator	Haefely	PLINE 1610 S/N: 080 938-05	Jun., 2001
2	No.3 Shielded Room			N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

11.2. Test Setup



11.3. Test Level

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Input AC Power Ports				
	Voltage Dips	>95	% Reduction	B
		0.5	Period	
		30	% Reduction	C
25	Periods			
	Voltage Interruptions	> 95	% Reduction	C
		250	Periods	

11.4. Test Procedure

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured 1m*1m min. And 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips/ Interruptions test:

The selection of test voltage is based on the rated power range. If the operation range is large than 20% of lower power range, both end of specified voltage shall be tested. Otherwise, the typical voltage specification is selected as test voltage.

The EUT is connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

The EUT shall be tested for 30% voltage dip of supplied voltage and duration 10ms, for 60% voltage dip of supplied voltage and duration 100ms with a sequence of three voltage dips with intervals of 10 seconds, and for 95% voltage interruption of supplied voltage and duration 5000ms with a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage phase shifting are shall occur at 0° , 45° , 90° , 135° , 180° , 225° , 270° , 315° of the voltage.

11.5. Test Specification

According to EN 61000-4-11:1994

11.6. Test Result

The measurement of the Voltage Dips and Interruption was investigated and test result was shown in [section 13](#). The acceptance criterion was met and the EUT passed the test.

12. EMC Reduction Method During Compliance Testing

No modification was made during testing.

13. Test Result

The test results in the emission and the immunity were performed according to the requirements of measurement standard and process. Quietek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. The test data of the emission is listed as below.

All the tests were carried out with the EUT in normal operation, which was defined as:

EMI Mode	:	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz
EMS Mode	:	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz

Note :

- No Deviation from standard procedure
- Deviations from standard procedure

13.1. Test Data of Conducted Emission

Date of Test	October 5, 2001	Test Room	No.4 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Line1 & Line2	Test Range	0.15MHz – 30MHz

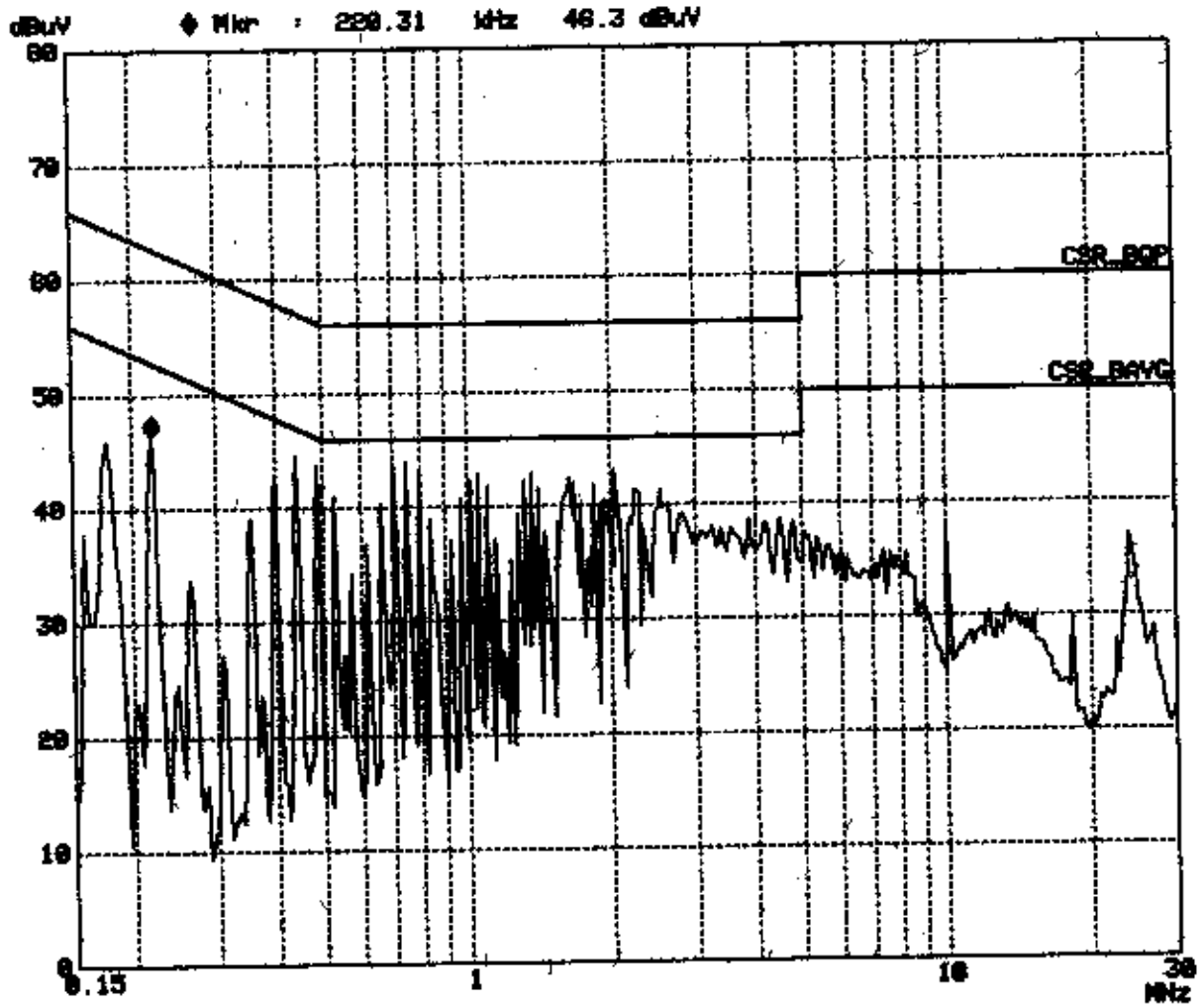
Frequency MHz	Measurement Level (dBuV)				Limits (dBuV)	
	Line1 QP	Line1 AV	Line2 QP	Line2 AV	QP	AV
0.220	46.15	45.51	45.88	45.71	62.81	52.81
0.439	44.35	44.11	43.51	43.31	57.08	47.08
0.705	43.39	43.26	42.32	41.46	56.00	46.00
1.056	42.42	42.27	42.40	42.07	56.00	46.00
1.365	42.35	37.32	42.37	42.18	56.00	46.00
0.029	40.89	42.34	41.17	38.52	56.00	46.00

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. Measurement Level = Reading Level + LISN Factor + Cable loss.
3. "--", means the average measurement was not performed when the Quasi-Peak measured data under the limit of average detection.

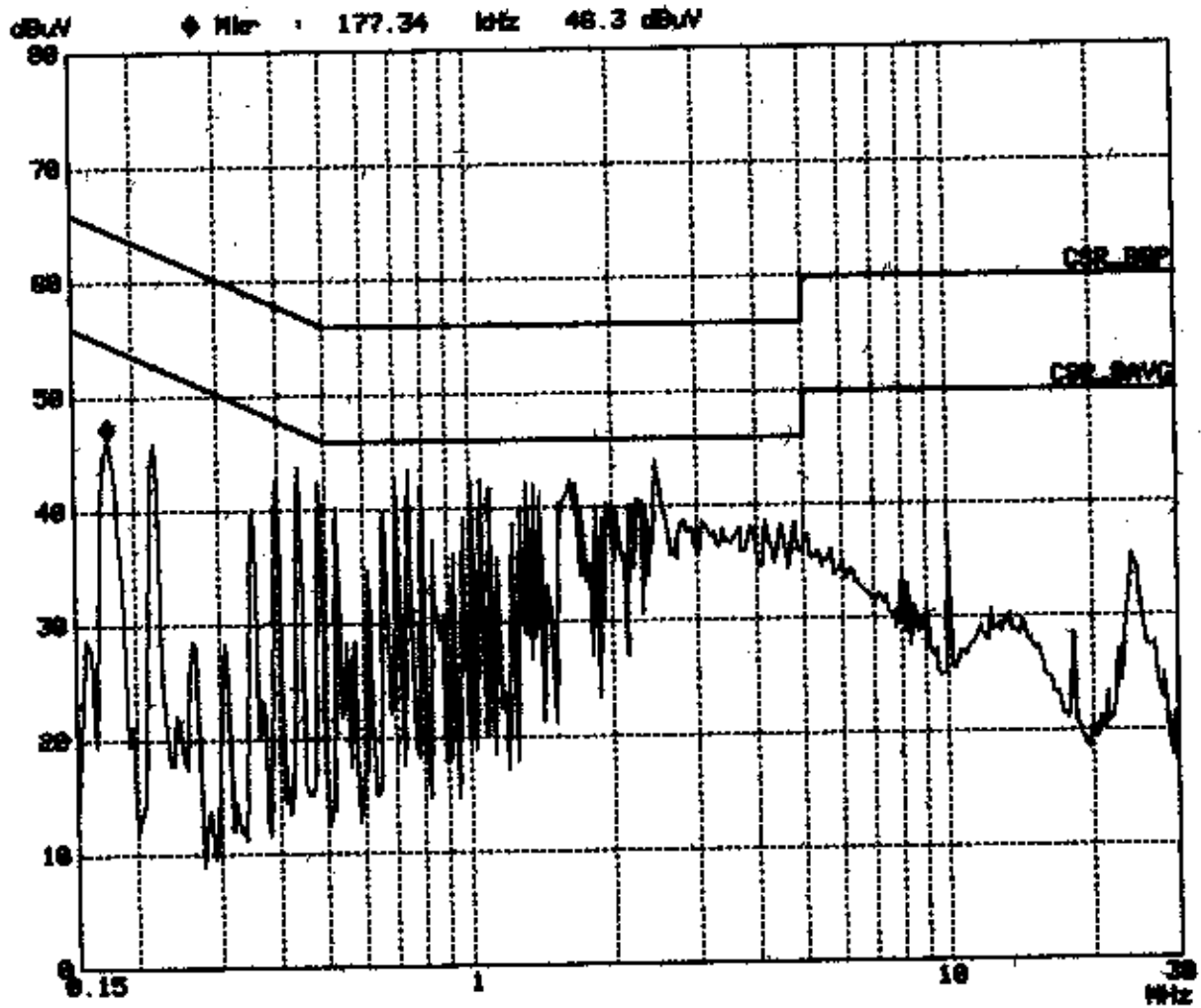
QUIETEK CORPORATION
EMI TEST RECEIVER

EUT: PC SYSTEM
Manuf: ASUS
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: 230Vac/50Hz
Comment: LINE 1
M/N:TF3 MODE:1
Date: 25. Aug 29 11:32



QUIETEK CORPORATION
EMI TEST RECEIVER

EUT: PC SYSTEM
Manuf: ASUS
Op Cond: FULL SYSTEM
Operator: MILLER
Test Spec: 230Vac/50Hz
Comment: LINE 2
M/N:TF3 MODE:1
Date: 25. Aug 29 11:39



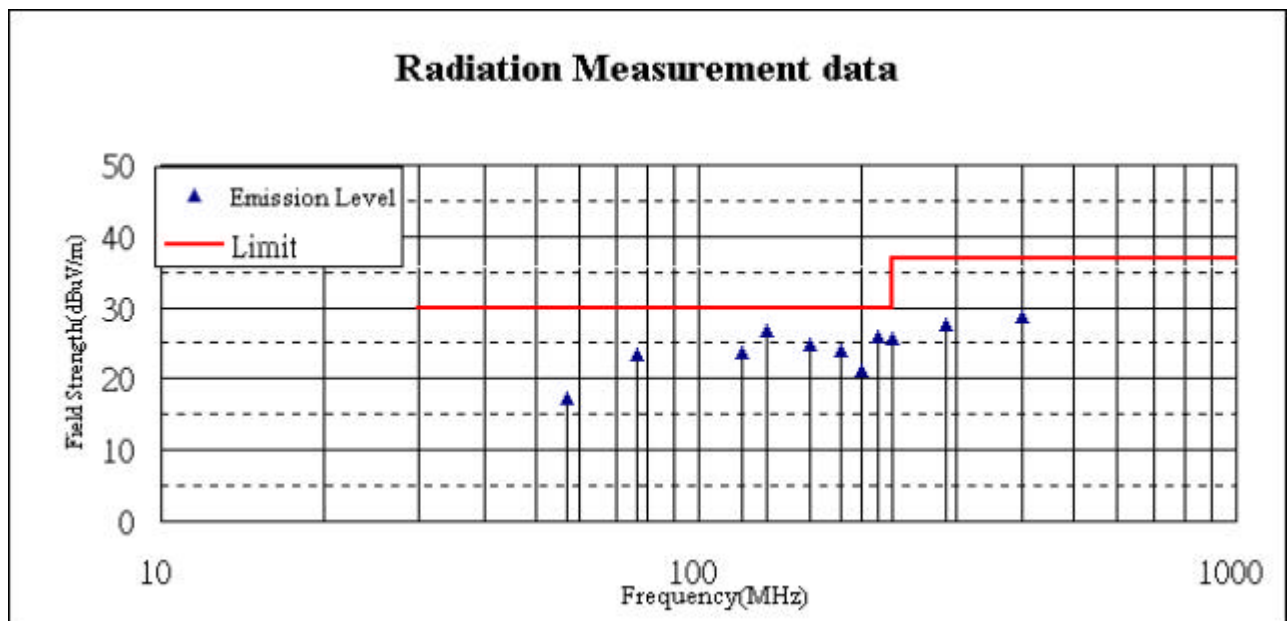
13.2. Test Data of Radiated Emission

Date of Test	October 5, 2001	Test Site	No.2 OATS
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	10m & Horizontal	Test Range	30MHz – 1GHz

Frequency MHz	Cable Loss (dB)	Probe Factor (dB/m)	Pre-Amp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)
56.680	1.00	5.93	0.00	10.51	17.44	-12.56	30
76.620	1.11	7.32	0.00	15.16	23.59	-6.41	30
120.005	1.33	11.84	0.00	10.50	23.67	-6.33	30
133.480	1.40	11.39	0.00	14.16	26.95	-3.05	30
160.371	1.55	9.62	0.00	13.77	24.94	-5.06	30
183.287	1.67	8.12	0.00	14.28	24.07	-5.93	30
200.464	1.74	8.40	0.00	10.98	21.12	-8.88	30
214.786	1.82	7.97	0.00	16.24	26.03	-3.97	30
229.101	1.90	9.52	0.00	14.33	25.75	-4.25	30
288.018	2.20	11.91	0.00	13.65	27.76	-9.24	37
400.920	2.78	14.85	0.00	11.08	28.71	-8.29	37

Note:

1. All Reading Levels below 1GHz are Quasi-Peak.
2. Emission Level = Reading Level + Probe Factor + Cable loss – Preamp.
3. Margin = Limit - Emission Level

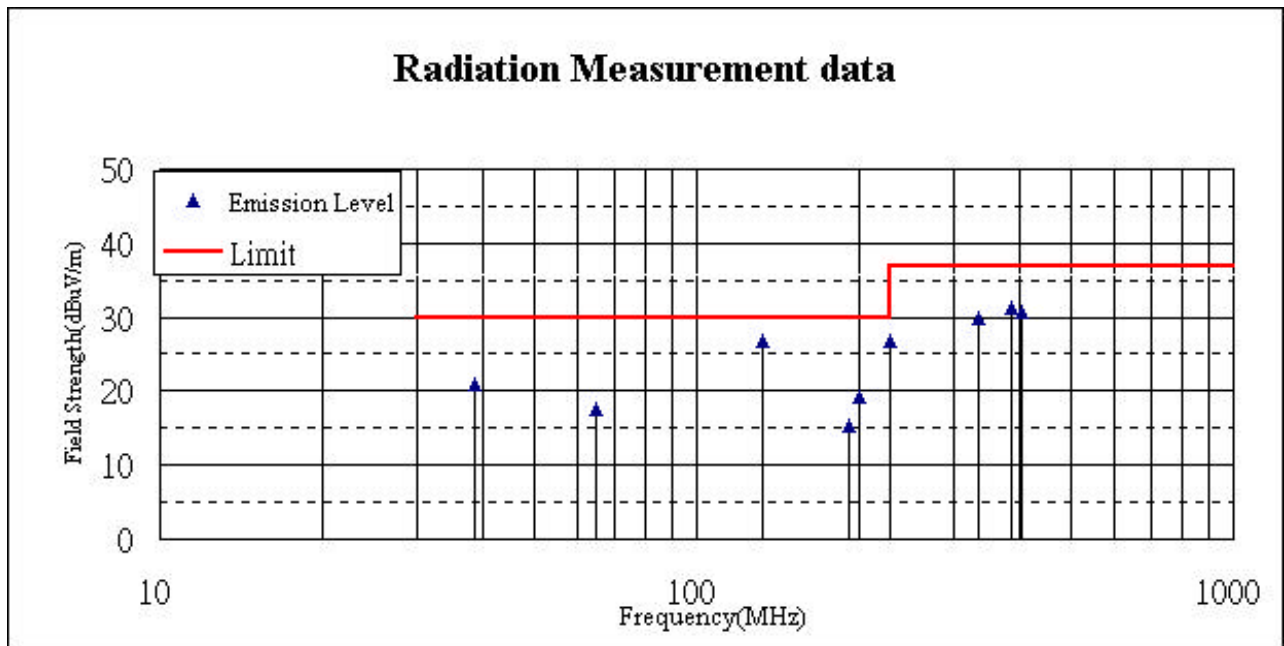


Date of Test	October 5, 2001	Test Site	No.2 OATS
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	10m & Vertical	Test Range	30MHz – 1GHz

Frequency MHz	Cable Loss (dB)	Probe Factor (dB/m)	Pre-Amp Factor (dB)	Reading Level (dBuV/m)	Emission Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)
38.460	0.91	12.84	0.00	7.12	20.87	-9.13	30
65.120	1.06	5.93	0.00	10.71	17.70	-12.30	30
133.058	1.40	10.55	0.00	14.76	26.71	-3.29	30
192.005	1.70	8.08	0.00	5.58	15.36	-14.64	30
200.459	1.74	8.30	0.00	9.12	19.16	-10.84	30
229.101	1.90	9.73	0.00	15.17	26.80	-3.20	30
336.002	2.45	12.63	0.00	14.80	29.88	-7.12	37
384.015	2.70	15.08	0.00	13.43	31.21	-5.79	37
401.920	2.79	16.47	0.00	11.34	30.60	-6.40	37

Note:

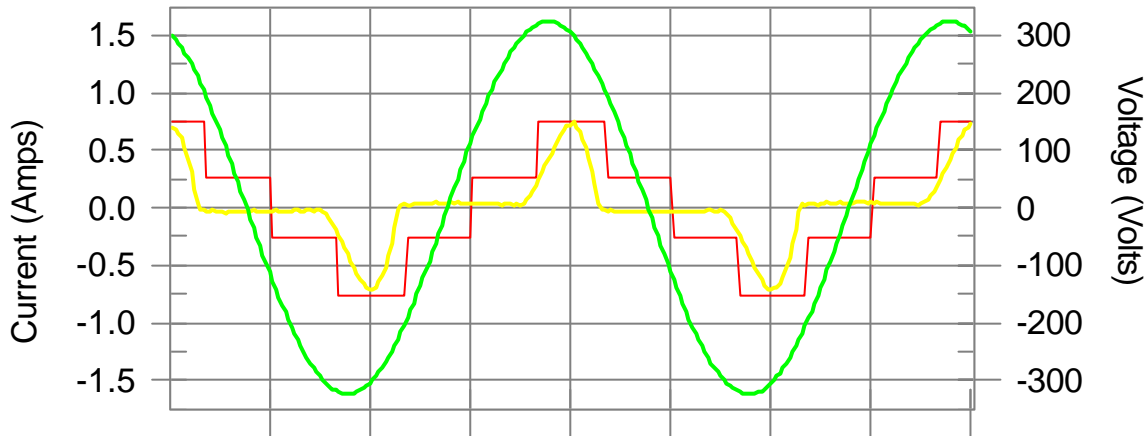
1. All Reading Levels below 1GHz are Quasi-Peak.
2. Emission Level = Reading Level + Probe Factor + Cable loss – Preamp.
3. Margin = Limit - Emission Level



13.3. Test Data of Power Harmonics

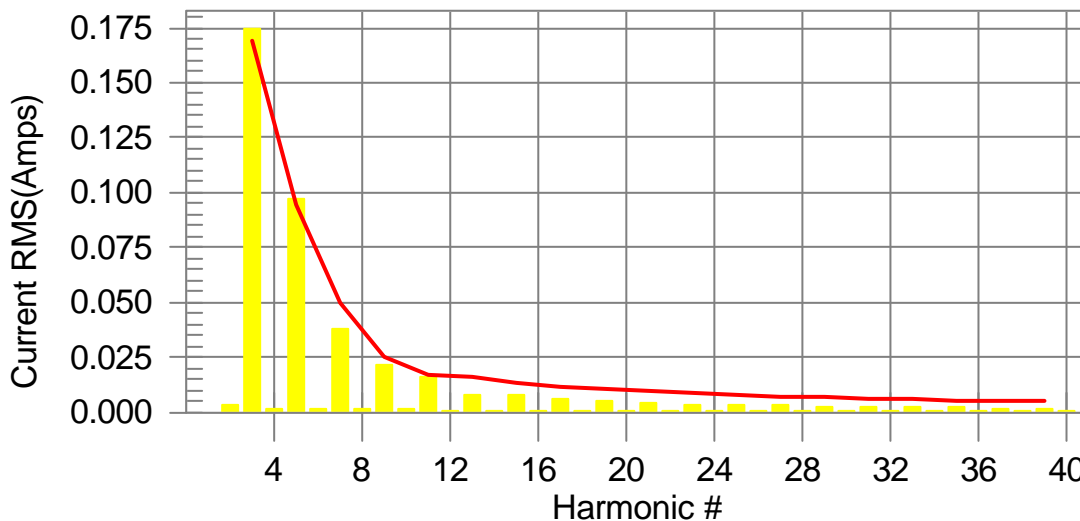
Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Power Harmonics (Classification : Class D)		

EUT: PC SYSTEM
 Test category: Class D Steady State (European limits)
 Test date: 2001/10/8 Start time: PM 10:37:28 End time: PM 10:40:09
 Test duration (min): 2.5 Data file name: H-000570.cts_data
 Comment: M/N:Terminator Tualatin
 Customer: ASUS
 Test Result: Pass Source qualification: Normal
Current & voltage waveforms It is 0.0% outside Class-D envelope



Harmonics and Class D limit line

European Limits



Test result: Pass Worst harmonic was #0 with 0.00 % of the limit.

Current Test Result Summary (Run time)

EUT: PC SYSTEM Tested by: MILLER
 Test category: Class D Steady State (European limits) Test Margin: 100
 Test date: 2001/10/8 Start time: PM 10:37:28 End time: PM 10:40:09
 Test duration (min): 2.5 Data file name: H-000570.cts_data
 Comment: M/N:Terminator Tualatin
 Customer: ASUS

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

V_RMS (Volts):	229.65	I_RMS (Amps):	0.297
I_Peak (Amps):	0.756	Crest Factor:	2.568
I_Fund (Amps):	0.222	Power Factor:	0.738
Power (Watts):	50		

Harm#	Harmonics	Limit	% of Limit	Status
2	0.003			
3	0.174	--	--	Pass
4	0.001			
5	0.097	--	--	Pass
6	0.002			
7	0.038	--	--	Pass
8	0.001			
9	0.021	--	--	Pass
10	0.001			
11	0.016	--	--	Pass
12	0.001			
13	0.008	--	--	Pass
14	0.001			
15	0.008	--	--	Pass
16	0.001			
17	0.006	--	--	Pass
18	0.001			
19	0.005	--	--	Pass
20	0.001			
21	0.004	--	--	Pass
22	0.001			
23	0.003	--	--	Pass
24	0.001			
25	0.003	--	--	Pass
26	0.001			
27	0.003	--	--	Pass
28	0.001			
29	0.002	--	--	Pass
30	0.001			
31	0.002	--	--	Pass
32	0.001			
33	0.002	--	--	Pass
34	0.001			
35	0.002	--	--	Pass
36	0.001			
37	0.002	--	--	Pass
38	0.001			
39	0.002	--	--	Pass
40	0.001			

Note :

1.Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

2:According to EN61000-3-2 pavagraph 7.4 the limits given in table 3 are valid for all applications having an active input power >75W.

3." --" mean the limit is not applicable/

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Voltage Fluctuations and Flicker		

Flicker Test Summary (Run time)

EUT: PC SYSTEM

Tested by: MILLER

Test category: All parameters (European limits)

Test Margin: 100

Test date: 2001/10/8

Start time: PM 10:46:39

End time: PM 10:57:00

Test duration (min): 10

Data file name: F-000571.cts_data

Comment: M/N:Terminator Tualatin

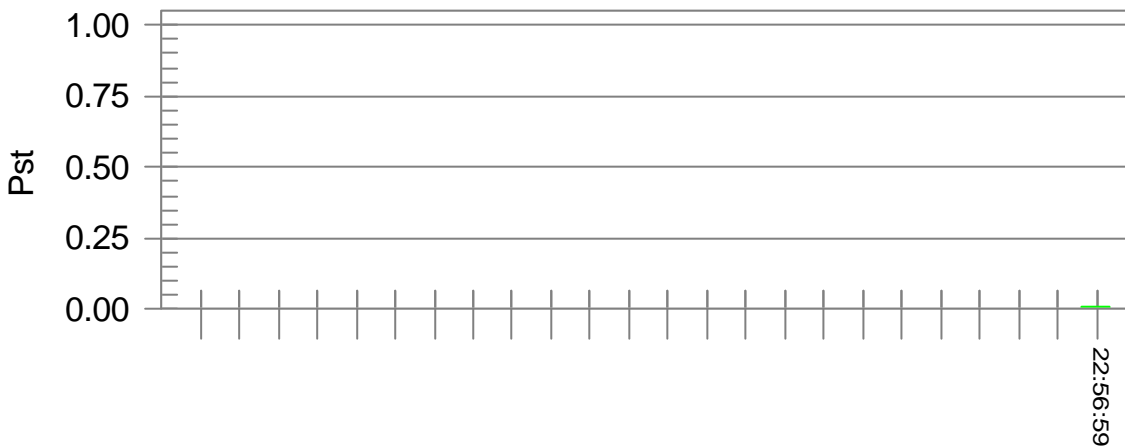
Customer: ASUS

Test Result: Pass

Status: Test Completed

Pst and limit line

European Limits



Time is too short for Plt plot

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.57		
Highest dt (%):	-0.14	Test limit (%):	4.00
Highest dc (%):	0.00	Test limit (%):	3.30
Highest dmax (%):	-0.16	Test limit (%):	4.00
Highest Pst (10 min. period):	0.008	Test limit:	1.000
Highest Plt (2 hr. period):	0.004	Test limit:	0.650

13.4. Test Data of Electrostatic Discharge

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Electrostatic Discharge (Performance Criteria: B)		

Test point	Polarity	Number of Discharges	Observation	Result
Seams	+/-8kV Air	10	Normal function	PASS
Switch	+/-4kV Air	10	Normal function	PASS
Knobs	+/-4kV Con	10	Normal function	PASS
Metal Plate	+/-4kV Con	10	Normal function	PASS
Screws	+/-4kV Con	10	Normal function	PASS
H.C.P.	+/-4kV	10	Normal function	PASS
V.C.P.	+/-4kV	10	Normal function	PASS

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.5. Test Data of Radiated Susceptibility

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Radiated Susceptibility (Performance Criteria: A)		

Frequency (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Observation	Results
80-1000	0	H	3	Normal Function	Pass
80-1000	0	V	3	Normal Function	Pass
80-1000	90	H	3	Normal Function	Pass
80-1000	90	V	3	Normal Function	Pass
80-1000	180	H	3	Normal Function	Pass
80-1000	180	V	3	Normal Function	Pass
80-1000	270	H	3	Normal Function	Pass
80-1000	270	V	3	Normal Function	Pass

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.6. Test Data of Electrical Fast Transient

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Electrical Fast Transient (Performance Criteria: B)		

Inject Line	Polarity	Voltage kV	Inject Time (Second)	Inject Method	Observation	Result
L	±	1kV	60	Direct	Normal Function	Pass
N	±	1kV	60	Direct	Normal Function	Pass
PE	±	1kV	60	Direct	Normal Function	Pass
L+N	±	1kV	60	Direct	Normal Function	Pass
L+PE	±	1kV	60	Direct	Normal Function	Pass
N+PE	±	1kV	60	Direct	Normal Function	Pass
L+N+PE	±	1kV	60	Direct	Normal Function	Pass
DataLine (LAN)	±	0.5kV	60	Clamp	Normal Function	Pass

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.7. Test Data of Surge

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Surge (Performance Criteria: A)		

Inject Line	Polarity	Angle	Voltage kV	Time Interval (Second)	Inject Method	Observation	Result
L-N	±	0	1kV	60	Direct	Normal Function	Pass
L-N	±	90	1kV	60	Direct	Normal Function	Pass
L-N	±	180	1kV	60	Direct	Normal Function	Pass
L-N	±	270	1kV	60	Direct	Normal Function	Pass
L-PE	±	0	2kV	60	Direct	Normal Function	Pass
L-PE	±	90	2kV	60	Direct	Normal Function	Pass
L-PE	±	180	2kV	60	Direct	Normal Function	Pass
L-PE	±	270	2kV	60	Direct	Normal Function	Pass
N-PE	±	0	2kV	60	Direct	Normal Function	Pass
N-PE	±	90	2kV	60	Direct	Normal Function	Pass
N-PE	±	180	2kV	60	Direct	Normal Function	Pass
N-PE	±	270	2kV	60	Direct	Normal Function	Pass

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.8. Test Data of Conducted Susceptibility

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Conducted Susceptibility (Performance Criteria: A)		

Frequency Range (MHz)	Voltage Applied dBuV(V)	Inject Method	Tested Port of EUT	Observation	Result
0.15 ~ 80	130(3V)	CDN 1	AC IN	Normal Function	PASS
0.15 ~ 80	130(3V)	CDN 1	Signal Line	Normal Function	PASS

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.9. Test Data of Power Frequency Magnetic Field

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Power Frequency Magnetic Field (Performance criteria: A)		

Polarization	Frequency (Hz)	Magnetic Strength (A/m)	Observation	Test Result
X Orientation	50	1	Normal Function	PASS
Y Orientation	50	1	Normal Function	PASS
Z Orientation	50	1	Normal Function	PASS

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could / could not be reset by operator at ____ kV.
 - No false alarms or other malfunctions were observed during or after the test.

13.10. Test Data of Voltage Dips and Interruption

Date of Test	October 5, 2001	Test Room	No.3 Shielded Room
Test Mode	Mode 1: PIII 1.2GHz/133MHz, 1600*1200/85Hz	Product	PC System
Test Condition	Voltage Dips and Interruption		

Voltage Dips and Interruption Reduction(%)	Angle	Test Duration (Periods)	Required Performance Criteria	Observation	Test Result
>95(0V)	0	0.5	B	A	PASS
>95(0V)	45	0.5	B	A	PASS
>95(0V)	90	0.5	B	A	PASS
>95(0V)	135	0.5	B	A	PASS
>95(0V)	180	0.5	B	A	PASS
>95(0V)	225	0.5	B	A	PASS
>95(0V)	270	0.5	B	A	PASS
>95(0V)	315	0.5	B	A	PASS
30(161V)	0	25	C	A	PASS
30(161V)	45	25	C	A	PASS
30(161V)	90	25	C	A	PASS
30(161V)	135	25	C	A	PASS
30(161V)	180	25	C	A	PASS
30(161V)	225	25	C	A	PASS
30(161V)	270	25	C	A	PASS
30(161V)	315	25	C	A	PASS
>95(0V)	0	250	C	C	PASS
>95(0V)	45	250	C	C	PASS
>95(0V)	90	250	C	C	PASS
>95(0V)	135	250	C	C	PASS
>95(0V)	180	250	C	C	PASS
>95(0V)	225	250	C	C	PASS
>95(0V)	270	250	C	C	PASS
>95(0V)	315	250	C	C	PASS

Criteria judgment of Test result:

- Meet criteria A: No abnormalities were observed during and directly after the test.
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - EUT stopped operation and could be reset by operator.
 - No false alarms or other malfunctions were observed during or after the test.

Attachment 1 : EUT Test Photographs

Attachment 1 : EUT Test Photographs

Front View of Conducted Test (Mode 1)



Back View of Conducted Test (Mode 1)



Front View of Radiated Test (Mode 1)



Back View of Radiated Test (Mode 1)



Harmonics Test Setup



ESD Test Setup



RS Test Setup



EFT/B Test Setup



Surge Test Setup



CS Test Setup



Power Frequency Magnetic Field Test Setup



Dips Test Setup



Attachment 2 : EUT Detailed Photographs

Attachment 2 : EUT Detailed Photographs

- (1) EUT Photo



- (2) EUT Photo



(3) EUT Photo



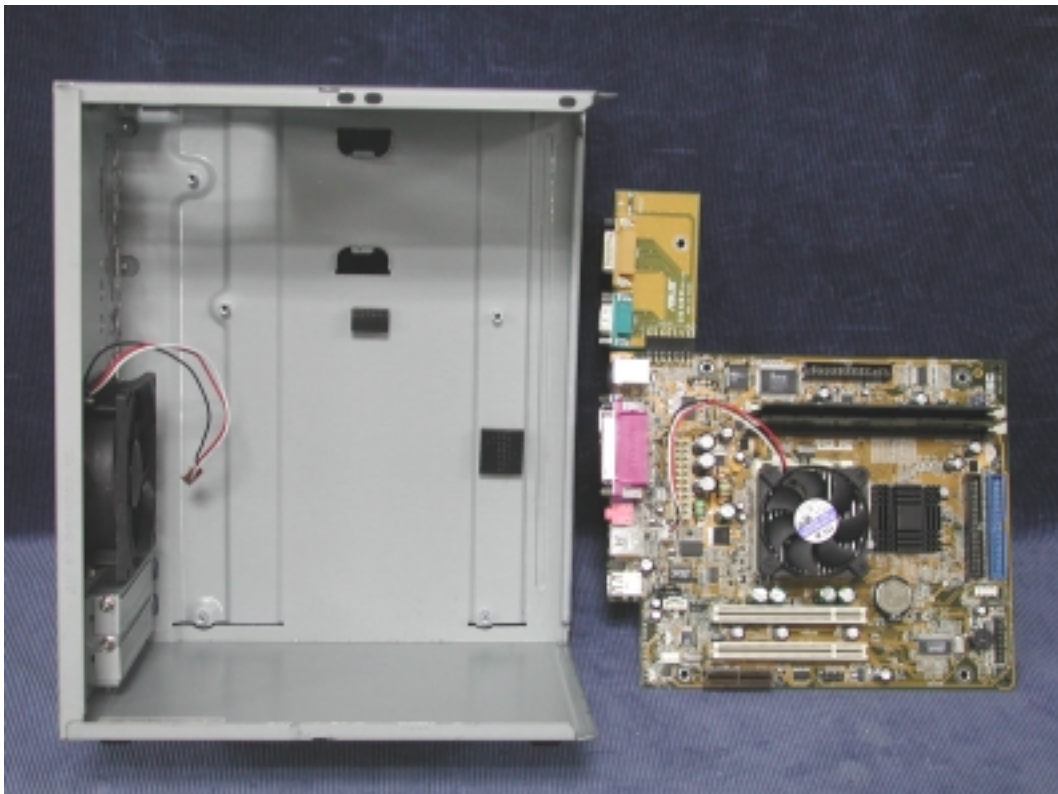
(4) EUT Photo



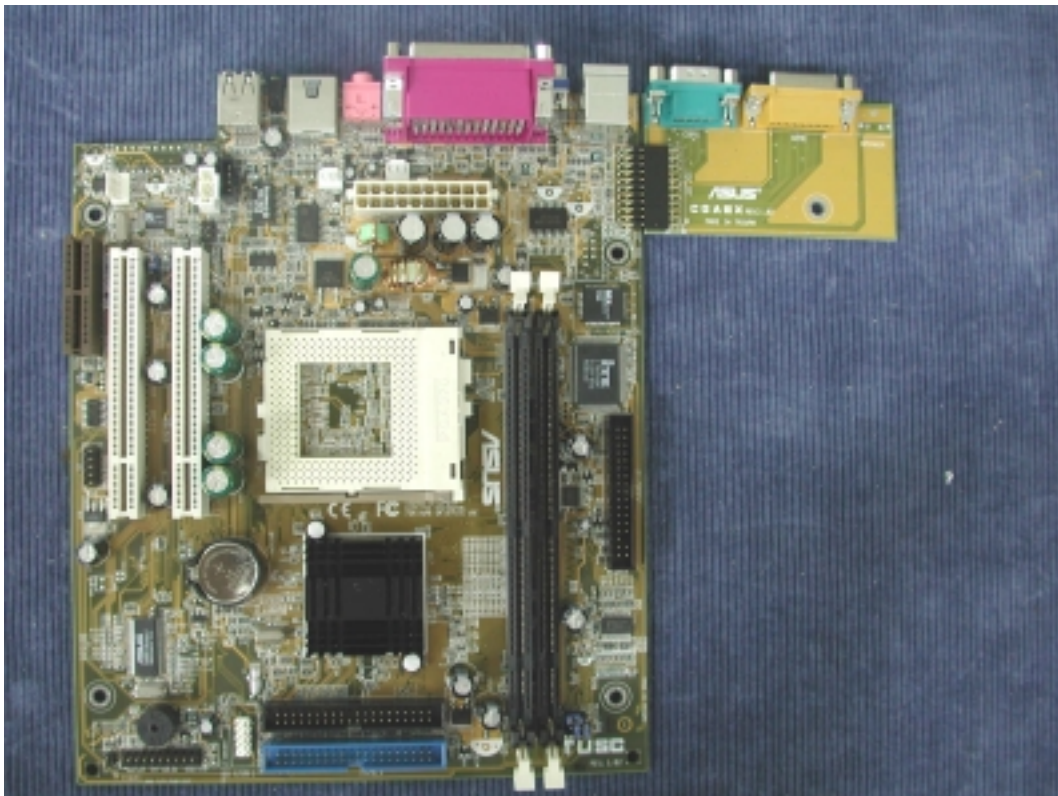
(5) EUT Photo



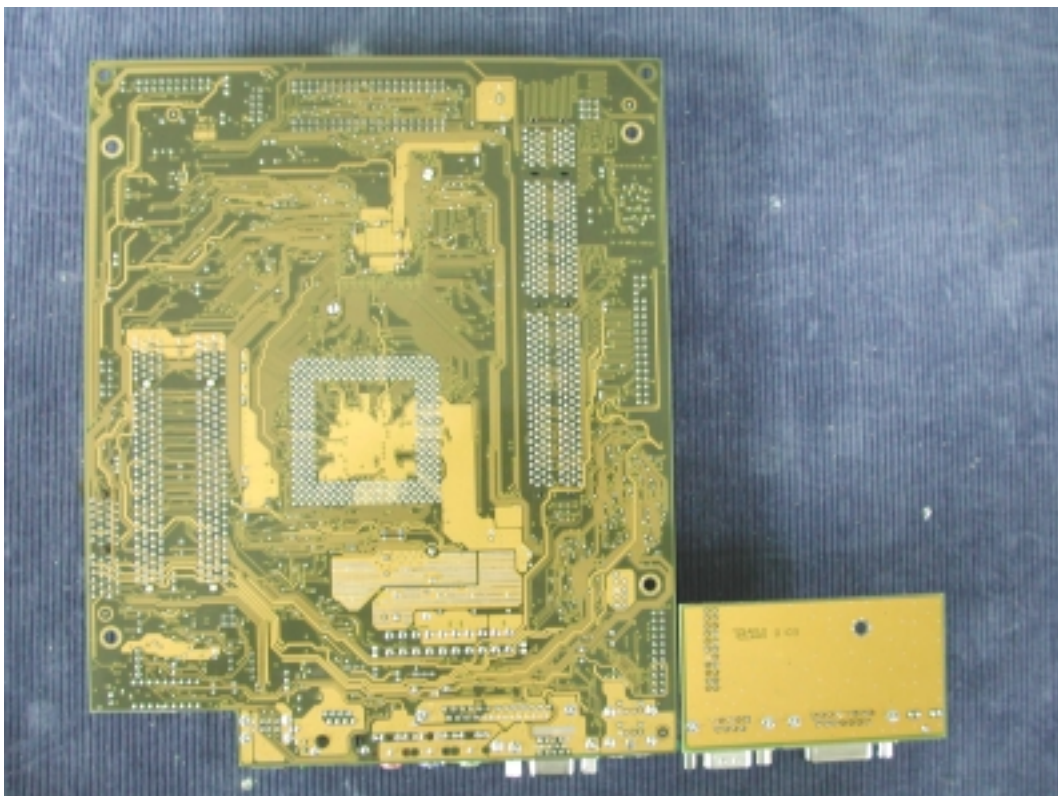
(6) EUT Photo



(7) EUT Photo



(8) EUT Photo



(9) EUT Photo



(10) EUT Photo



(11) EUT Photo



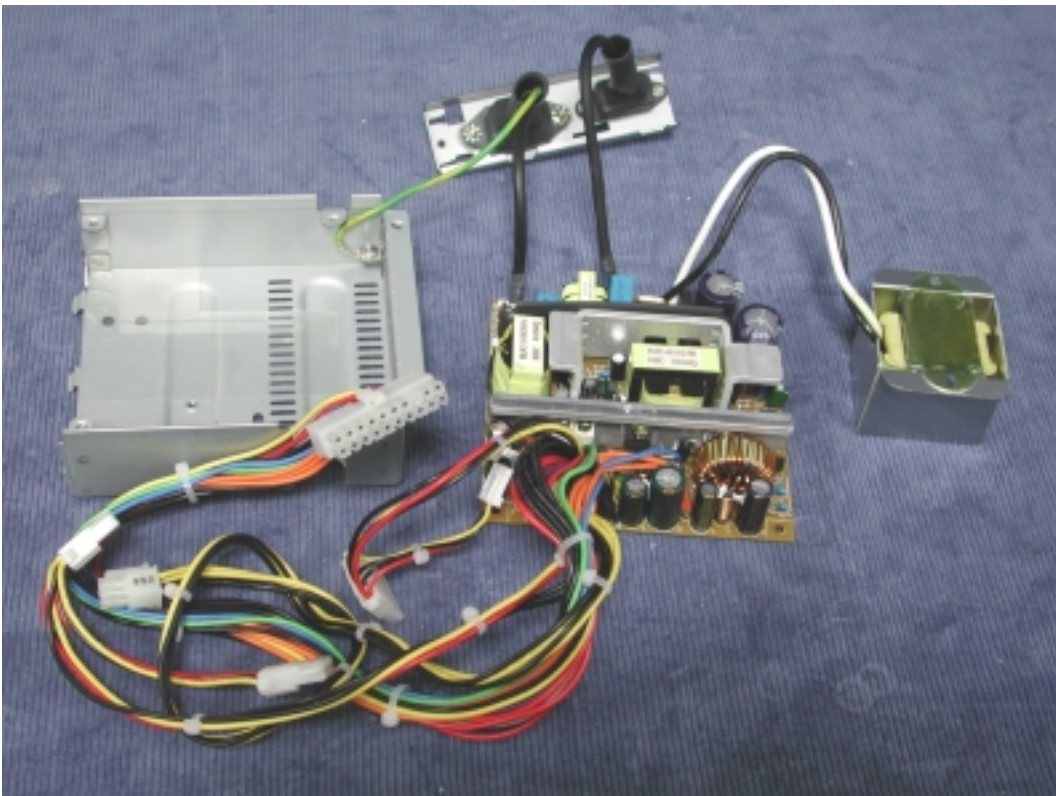
(12) EUT Photo



(13) EUT Photo



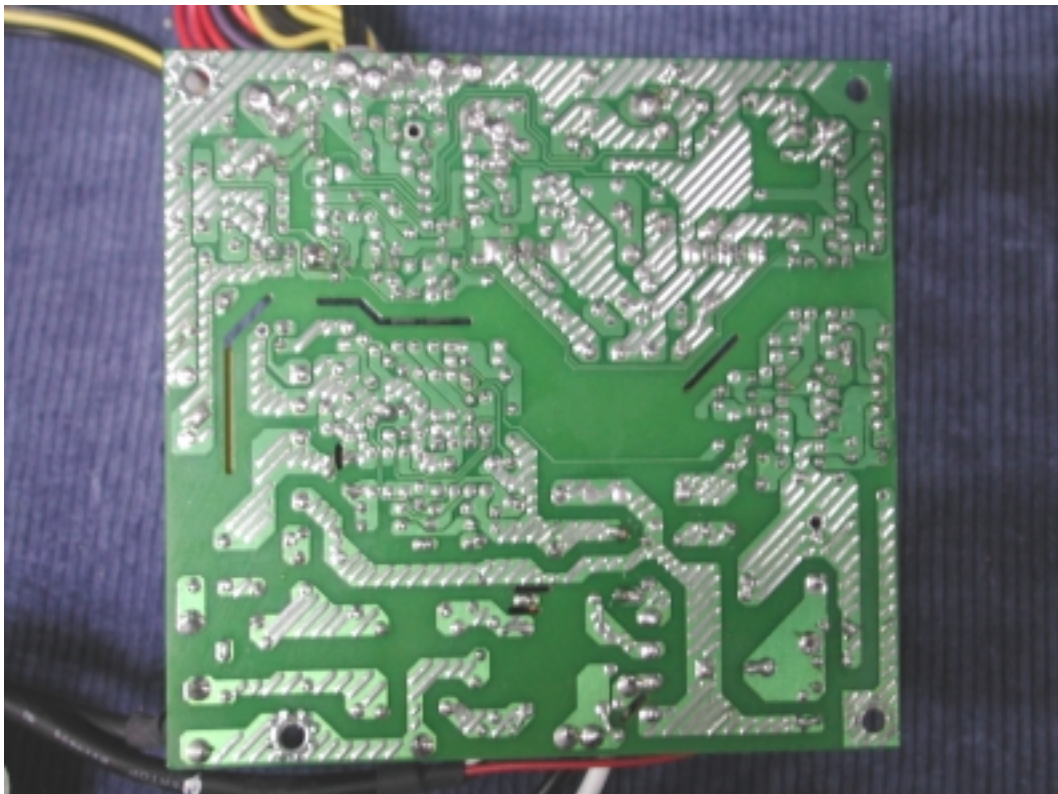
(14) EUT Photo



(15) EUT Photo



(16) EUT Photo



Reference : Laboratory of License



DET NORSKE VERITAS

STATEMENT OF RECOGNITION

STATEMENT NO. 413 - 99 - LAB11 (FIRST ISSUED: 1999-02-23)
The statement consists of 3 pages

This is to confirm that the
EMC AND SAFETY LABORATORIES

within
QuieTek

with legal identity
QuieTek Corporation

1. Head office (EMC site): No. 5, Ruci-Shu Valley, Ruci-Ping Tsuen,
Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
2. (EMC site): No.75-2 Wang-Yeh Valley, Yung-Hsing
Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.
3. (Safety site): 6F, No. 5, Alley 16, Lane 235, Pao Chaio Road,
Hsin-Tien City, Taipei, Taiwan, R.O.C.

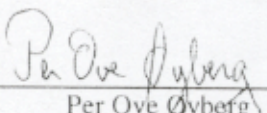
has been found to comply with the requirements of DNV towards subcontractors of EMC testing services in conjunction with the EMC Directive and in the voluntary field.

The acceptance is based on a formal Quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (1998), EN 45001 and ISO/IEC Guide 25, in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors.

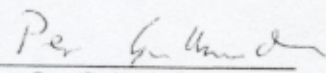
Place and date
Høvik, 11 June, 2001
for Det Norske Veritas AS
(Competent and Notified Body no. 575)



This Statement is valid until
11 June, 2004


Per Ove Øyberg
Head of Section

DNV local office:
DNV Taipei


Per Gulbrandsen
Principal Engineer

Notice: This Statement is subject to terms and conditions overleaf. Any significant change in the laboratory facilities or in the quality system may render this Statement invalid.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision 'Det Norske Veritas' shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Statement No.: 413 - 99 - LAB11

Audit information

Initial audit:

- Date of Audit: 1998-11-17
- Initial Audit Report: 1998-11-22
- Closing of Non-conformities: 99-01-25

Re-Certification Audit:

- Date of Quality Audit: 2001-04-4, -5
- Re-Certification Audit Report: 2001-05-09
- Audit Report Identification: IAR 2001-0014
- Closing of non-conformities: 2001-05-08

Scope of recognition

EMC testing according to the following standards:

- EN 50081-1 / -2
- EN 50082-1 / -2
- EN 55011 / CISPR 11
- EN 55013 / CISPR 13
- EN 55014-1/-2 / CISPR 14-1/-2
- EN 55015 / CISPR 15
- EN 55022 / CISPR 22
- EN 55024 / CISPR 24
- EN 61000-3-2 / IEC 1000-3-2 / EN 60555-2 / IEC 555-2
- EN 61000-3-3 / IEC 1000-3-3 / EN 60555-3 / IEC 555-3
- EN 61000-4-2 / IEC 1000-4-2 / IEC 801-2
- EN 61000-4-3 / IEC 1000-4-3 / ENV 50140 / IEC 801-3
- EN 61000-4-4 / IEC 1000-4-4 / IEC 801-4
- EN 61000-4-5 / IEC 1000-4-5 / ENV 50142
- EN 61000-4-6 / IEC 1000-4-6 / ENV 50141
- EN 61000-4-8 / IEC 1000-4-8
- EN 61000-4-11 / IEC 1000-4-11
- EN 60601-1-2
- ETS 300 Series



Phu



Statement No.: 413 - 99 - LAB11

Safety testing according to the following standards:

- EN 60950
- EN 60065
- EN 61010
- EN 60335
- EN 60598
- EN 60601-1
- EN 50091-1
- EN 60204

Application/Limitations

Testing of three phase systems

Documentation

QuieTek Laboratory Quality Manual, version A, Revision 3

END OF STATEMENT



P. G. H.

EMC Laboratory Authorisation

Aut. No. : ELA 191

**Testing of
Radio & Telecommunications Terminal Equipment**

EMC
Laboratory: **QuieTek Corporation**
No. 75-2, Wang-Yeh Valley,
Yung-Hsing, Chiung-Lin, Hsin-Chu,
Hsin-Chu County, Taiwan R.O.C.

Scope of
Authorisation: All CENELEC and ETSI standards [ENs and ETs that are listed on the accompanying page, and, all of the corresponding CISPR, IEC, and ISO EMC standards]. This authorisation covers all of the EMC-related testing and documentation within the scope of the *Radio and Telecommunications Terminal Equipment [R&TTE] Directive [i.e. 1999/5/EC]*.

NOTE: This authorisation also covers EMC-related testing and documentation that is within the scope of Article 10.5 of the *EMC Directive [i.e. 89/336/EEC as amended by 92/31/EEC]*

This Authorisation Document confirms that the above mentioned EMC Laboratory has been validated against EN 45001 and found to be compliant. The laboratory also fulfils the conditions described in Nemko Document ELA 10. During Nemko's visit to the laboratory, an assessment was made of the relevant parts of your organisation - i.e. facilities, personnel qualifications, test equipment, and testing practices. It was found that the EMC Laboratory is capable of performing tests within the Scope of Authorisation given on the accompanying page. Accordingly, Nemko will accept your test reports as a basis for attesting conformity to these EMC Standards for the products in question under the European Union's Directives specified above

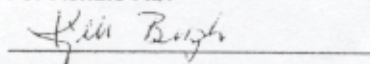
For Type Examination Certification(s) to be issued by Nemko, your EMC Laboratory's test report(s) will be accepted by Nemko if they are enclosed with the Application Form submitted by the manufacturer.

In order to maintain the Authorisation, the information given in the enclosed ELA-INFOs (if any) must be carefully followed. Nemko is to be promptly notified about any changes in the situation at your EMC Laboratory which may affect the basis for this Authorisation. The Authorisation may at any time be withdrawn if the conditions are no longer considered to be fulfilled.

The Authorisation is valid through **31. December 2003**.

Oslo, 24. April 2001

For Nemko AS:



Kjell Bergh, Nemko Group EMC Co-ordinator

EMC Laboratory Authorisation

Aut. No. : ELA 191

(Page 2 of 2)

SCOPE OF AUTHORISATION

Generic and product-family standards – R&TTE Directive

EN 300 220-3 :2000	ETS 300 328:1996 + A1:97 EN 300 328-2:2000	I-ETS 300 330:1994 + A1:97 (Not harmonised for R&TTE-D)
EN 300 422-2 :2000	I-ETS 300 440:1995 (Not harmonised for R&TTE-D)	ETS 300 445 :1996 + A1 :97 EN 301 489-09 :2000
ETS 300 683 :1997 EN 301 489-03 :2000	ETS 300 826 :1997 EN 301 489-17 :2000	EN 301 489-01:2000

Basic standards

EN 61000-4-2:1995 + A1:98 IEC 61000-4-2:1995 + A1:98 (EN 60801-1:1993 IEC 801.2:1991 IEC 801.2:1984)	EN 61000-4-3:1996 + A1:98 IEC 61000-4-3:1995 + A1:98 (IEC 801.3:1984 ENV 50140:1993 + ENV 50204:1995)	EN 61000-4-4:1995 IEC 61000-4-4:1995 (IEC 801.4:1990)
EN 61000-4-5:1995 IEC 61000-4-5:1995 (ENV 50142:1994)	EN 61000-4-6:1996 IEC 61000-4-6:1996 (ENV 50141:1993)	EN 61000-4-8:1993 IEC 61000-4-8:1993
EN 61000-4-11:1994 IEC 61000-4-11:1994		

Oslo, 24 April 2001

Kjell Bergh, Nemko Group EMC Co-ordinator

**EMC Laboratory
Authorisation****Aut. No. : ELA 165**

EMC Laboratory: QuieTek Corporation
No. 75-2, Wang-Yeh Valley,
Yung-Hsing, Chiung-Lin, Hsin-Chu,
Hsin-Chu County, Taiwan R.O.C.

Scope of Authorization: All CENELEC standards [ENs] for EMC that are listed on the accompanying page, and, all of the corresponding CISPR, IEC, and ISO EMC standards that are listed on the accompanying page.

This Authorisation Document confirms that the above mentioned EMC Laboratory has been validated against EN 45001 and found to be compliant. The laboratory also fulfils the conditions described in Nemko Document ELA 10. During Nemko's visit to the laboratory, an assessment was made of the relevant parts of your organisation - i.e. facilities, personnel qualifications, test equipment, and testing practices. It was found that the EMC Laboratory is capable of performing tests within the Scope of Authorisation given on the accompanying page. Accordingly, Nemko will accept your test reports as a basis for attesting conformity to these EMC Standards for the products in question under the European Union EMC Directive [89/336/EEC as amended by 92/31/EEC and 98/13/EC].

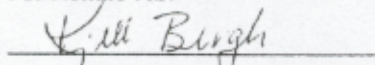
In case of applications for Product Certification(s) to be issued by Nemko, your EMC Laboratory's test report(s) will be accepted by Nemko if they are enclosed with the Application Form submitted by the manufacturer.

In order to maintain this Authorization, the information given in the enclosed ELA-INFOs (if any) must be carefully followed. Nemko is to be promptly notified about any changes in the situation at your EMC Laboratory which may affect the basis for this Authorization. The Authorization may at any time be withdrawn if the conditions are no longer considered to be fulfilled.

The Authorisation is valid through **31. December 2003**.

Oslo, 24. April 2001

For Nemko AS:



Kjell Bergh, Nemko Group EMC Co-ordinator

EMC Laboratory Authorisation
Aut. No. : ELA 165
(Page 2 of 2)
SCOPE OF AUTHORIZATION
GENERIC & PRODUCT-FAMILY STANDARDS

EN 50081-1:1992 IEC 61000-6-3 EN 50081-2:1993 IEC 61000-6-4:1997	EN 50082-1:1992 EN 50082-1:1997 IEC 61000-6-1:1997 EN 50082-2:1995 EN 61000-6-2:1999 IEC 61000-6-2:1999	EN 50091-2:1995
EN 50130-4:1995 + A1:98	EN 55011:1991 + A1:97 + A2:96 CISPR 11:1990 + A1:96 + A2:96 EN 55011:1998 + CISPR 11:97	EN 55013:90 + A12:94 + A13:96 + A14:99 CISPR 13:75 + A1:83
EN 55014-1:1993 + A1:97 + A2:99 CISPR 14:1993 + A1:96 + A2:	EN 55014-2:1997 CISPR 14-2:1997 EN 55104:1995	EN 55015:1993, CISPR 15:1992 EN 55015:1996 + A1:97 CISPR 15:96 + A1:97
EN 55022:1994 + A1:95 + A2:97 CISPR 22:1993 + A1:95 + A2:96 EN 55022:1998, CISPR 22:1997	EN 55024:1998 CISPR 24:1997	EN 55103-1:1996
EN 55103-2:1996		
EN 61000-3-2:1995 + A1:98 + A2:98 + A14:00 IEC 61000-3-2:1995 + A1:97 + A2:98 IEC 61000-3-2:2000	EN 61000-3-3:1995, IEC 61000-3-3:1994 EN 61000-3-11:2000 IEC 61000-3-11:2000	EN 61326-1:1997 + A1:98 IEC 61326:1997 + A1:98

BASIC STANDARDS

EN 61000-4-2:1995 + A1:98 IEC 61000-4-2:1995 + A1:98 (EN 60801-1:1993 IEC 801.2:1991 IEC 801.2:1984)	EN 61000-4-3:1996 + A1:98 IEC 61000-4-3:1995 + A1:98 (IEC 801.3:1984 ENV 50140:1993 + ENV 50204:1995)	EN 61000-4-4:1995 IEC 61000-4-4:1995 (IEC 801.4:1990)
EN 61000-4-5:1995 IEC 61000-4-5:1995 (ENV 50142:1994)	EN 61000-4-6:1996 IEC 61000-4-6:1996 (ENV 50141:1993)	EN 61000-4-8:1993 IEC 61000-4-8:1993
EN 61000-4-11:1994 IEC 61000-4-11:1994		

Oslo, 24 April 2001

Kjell Bergh, Nemko Group EMC Co-ordinator

Postal address:
Telephone: +47 22 96 03 30

P.O.Box 71 Blindern

Fax: +47 22 96 05 56

N-0314 OSLO, NORWAY

EMC Laboratory Authorisation

Aut. No. : ELA 162

EMC Laboratory:

Quietek Corporation
No. 75-2, Wang-Yeh Valley,
Yung-Hsing, Chiung-Lin, Hsin-Chu,
Hsin-Chu County, Taiwan R.O.C.

Scope of Authorization:

EN 60601-1-2 and IEC 60601-1-2, the Collateral Standards
for electromedical products, with particular application to
EMC requirements only.

This Authorisation Document confirms that the above mentioned EMC Laboratory has been validated against EN 45001 and found to be compliant. The laboratory also fulfils the conditions described in Nemko Document ELA 10. During Nemko's visit to the laboratory, an assessment was made of the relevant parts of your organisation - i.e. facilities, personnel qualifications, test equipment, and testing practices. It was found that the EMC Laboratory is capable of performing tests within the Scope of Authorisation listed above. Accordingly, Nemko will accept your test reports as a basis for attesting conformity to these EMC Standards for the products in question under either the European Union Medical Device Directive [MDD], 93/42/EEC, or the European Union Active Implantable Medical Device Directive [AIMD], 90/385/EEC, (as applicable).

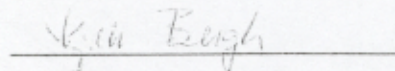
In case of applications for Product Certification(s) to be issued by Nemko, your EMC Laboratory's test report(s) will be accepted by Nemko if they are enclosed with the Application Form submitted by the manufacturer.

In order to maintain the Authorisation, the information given in the enclosed ELA-INFOs (if any) must be carefully followed. Nemko is to be promptly notified about any changes in the situation at your EMC Laboratory which may affect the basis for this Authorisation. The Authorisation may at any time be withdrawn if the conditions are no longer considered to be fulfilled.

The Authorisation is valid through 31. December 2001.

Oslo, 18. April 2001

For Nemko AS:



Kjell Bergh, Nemko Group EMC Co-ordinator

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

June 22, 2001

Registration Number: 92195

Quie Tek Corporation
No. 5-22, Ruei-Shu Valley
Ruei-Ping Tsuen, Lin Kou Shiang
Taipei
Taiwan, R.O.C.
Attention: Gene Chang

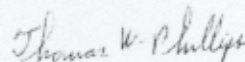
Re: Measurement facility located at Lin Kou
3 & 10 meter sites
Date of Listing: May 15, 2001

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,



Thomas W Phillips
Electronics Engineer

National Institute
of Standards and Technology



National Voluntary
Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Scope of Accreditation



Page: 1 of 2

**ELECTROMAGNETIC COMPATIBILITY
AND TELECOMMUNICATIONS**

NVLAP LAB CODE 200533-0

QUITEK CORPORATION

No. 5, Ruei-shu Valley, Ruei-ping, Tsuen

Lin Kou Shiang, Taipei 244

TAIWAN

Mr. Gene Chang

Phone: 886-2-8601-3788 Fax: 886-2-8601-3789

E-Mail: gene@quietek.com

NVLAP Code Designation / Description

Emissions Test Methods:

12/CIS22	IEC/CISPR 22:1997: Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22:1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1:1995, and Amendment 2:1996.
12/CIS22b	CNS 13438:1997: Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/F01	FCC Method - 47 CFR Part 15 - Digital Devices
12/F01a	Conducted Emissions, Power Lines, 450 KHz to 30 MHz
12/F01b	Radiated Emissions

June 30, 2002

Effective through

A handwritten signature in cursive script that reads 'David F. Alderman'.

For the National Institute of Standards and Technology

National Institute
of Standards and Technology



National Voluntary
Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Scope of Accreditation



Page: 2 of 2

ELECTROMAGNETIC COMPATIBILITY
AND TELECOMMUNICATIONS

NVLAP LAB CODE 200533-0

QUITEK CORPORATION

NVLAP Code Designation / Description

12/T51 AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

Immunity Test Methods:

12/I01 IEC 61000-4-2 (1995) and Amendment 1 (1998): Electrostatic Discharge Immunity Test

12/I02 IEC 61000-4-3 (1995) and Amendment 1 (1998): Radiated, Radio-Frequency Electromagnetic Field Immunity Test

12/I03 IEC 61000-4-4 (1995): Electrical Fast Transient/Burst Immunity Test

12/I04 IEC 61000-4-5 (1995): Surge Immunity Test

12/I05 IEC 61000-4-6 (1996): Immunity to Conducted Disturbances, Induced Radio-Frequency Fields

12/I06 IEC 61000-4-8 (1993): Power Frequency Magnetic Field Immunity Test

12/I07 IEC 61000-4-11 (1994): Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

June 30, 2002

Effective through

A handwritten signature in black ink that reads 'David F. Alderman'.

For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation



QUITEK CORPORATION
LIN KOU SHIANG, TAIPEI 244
TAIWAN

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

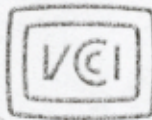
June 30, 2002

Effective through

David F. Alderman

For the National Institute of Standards and Technology

NVLAP Lab Code: 200533-0



CERTIFICATE

Facility : No.1 Open Area Test Site
(Radiation 3 and 10 meter site)

Company : QuieTek Corporation

Address : No.75-1, Wang-Yeh Valley, Yung-Hsing, Chiung-Lin,
Hsin-Chu County, Taiwan

*This is to certify that the following measuring facility
has been registered in accordance with the Regulations
for Voluntary Control Measures*

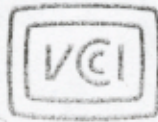
Registration No. : R-823

Date of Registration : December 8, 1998

This Certificate is valid until December 31, 2001

*Voluntary Control Council for Interference by
Information Technology Equipment*





CERTIFICATE

Facility : No.2 Shielded Room

(Conducted Interference Measurement)

Company : Quietek Corporation

Address : No.75-1, Wang-Yeh Valley, Yung-Hsing, Chiung-Lin,
Hsin-Chu County, Taiwan

*This is to certify that the following measuring facility
has been registered in accordance with the Regulations
for Voluntary Control Measures*

Registration No. : C-858

Date of Registration : December 8, 1998

This Certificate is valid until December 31, 2001

*Voluntary Control Council for Interference by
Information Technology Equipment*





CERTIFICATE

Facility : No.2 Open Area Test Site

(Radiation 3 and 10 meter site)

Company : QuiTek Corporation

Address : No.75-1, Wang-Yeh Valley, Yung-Hsing, Chiung-Lin,
Hsin-Chu County, Taiwan

*This is to certify that the following measuring facility
has been registered in accordance with the Regulations
for Voluntary Control Measures*

Registration No. : R-835

Date of Registration : January 11, 1999

This Certificate is valid until March 31, 2002

*Voluntary Control Council for Interference by
Information Technology Equipment*





中華民國經濟部標準檢驗局

臺北市濟南路一段四號

BUREAU OF STANDARDS, METROLOGY AND INSPECTION

MINISTRY OF ECONOMIC AFFAIRS, REPUBLIC OF CHINA

4, SEC. 1, CHINAN ROAD, TAIPEI, TAIWAN, R. O. C.

Tel: 886-2-23431700 FAX: 886-2-23932324

To: QuieTek Corporation

IN REPLY REFER TO
90-3-3000384

No.75-1 Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin Chu County, Taiwan, R.O.C.

This Designation Document confirms that your subject measurement facility has been validated according to the **ISO 17025-1999** and found to be in compliance with the requirements of "BSMI's Operation Guidelines of the Approval and Management of Designated Laboratories."

The description of your facility has, therefore, been placed on file and the name of your organization added to the Bureau's list of facilities whose measurement data and test reports will be accepted as a basis for attesting conformity to CNS13803-1997, CNS13438-1997, CNS13783-1-1998, CNS13439-1997, CNS14115-1998 for Industrial, Scientific and Medical Instrument · Information Technology Equipment · household appliances/tools · broadcast receivers and related equipments and fluorescent lights/luminaries.

It is located at: <http://www.bsmi.gov.tw>

Please reference the file numbers below in the body of all test reports containing measurements made on the corresponding facility.

For your **EMI Testing Lab**, use reference " **SL2-IS-E-0020, SL2-IN-E-0020, SL2-R1-E-0020, SL2-R2-E-0020, SL2-A1-E-0020, SL2-L1-E-0020** "

Note that this filing must be updated for any changes made to the documentation and / or facility and whenever major modifications to your documentation or major construction or repairs to your facility are completed, re-submission of the related information or the site attenuation characteristics will be required within 2 weeks.

The Designation is valid through October 31, 2001.

Taipei, June 5, 2000
For BSMI, MOEA

Neng-Jong Lin



中華民國經濟部標準檢驗局

臺北市濟南路一段四號

BUREAU OF STANDARDS, METROLOGY AND INSPECTION

MINISTRY OF ECONOMIC AFFAIRS, REPUBLIC OF CHINA

4, SEC. 1, CHINAN ROAD, TAIPEI, TAIWAN, R. O. C.

Tel : 886-2-23431700 FAX : 886-2-23932324

致：快特電波股份有限公司

IN REPLY REFER TO

90-3-3000384

新竹縣芎林鄉永興村王爺坑3鄰75之1號

本證書係確認貴公司之電磁相容檢測設備業已符合ISO 17025-1999及「經濟部標準檢驗局指定試驗室認可管理作業要點」

貴公司試驗室之資訊已納入本局的指定試驗室名單中，本局將接受由貴公司試驗室為工業、科學、醫療儀器、資訊設備產品、家庭用電器產品、廣播接收機與相關設備及燈具產品類依CNS13803-1997, CNS13438-1997, CNS13783-1-1998, CNS13439-1997, CNS14115-1998所作出的檢測資料與測試報告。

相關試驗室資訊已建置於本局網頁中 <http://www.bsmi.gov.tw>

貴公司EMI測試場地之認可編號為" SL2-IS-E-0020, SL2-IN-E-0020, SL2-R1-E-0020, SL2-R2-E-0020, SL2-A1-E-0020, SL2-L1-E-0020 "，並應於全部測試報告加註本項認可編號。

已被認可之測試領域及檢測設備如有任何變更事項，應於變更日起二週內函送相關資料至本局辦理。

本證書有效期間至西元2001年10月31日。

經濟部標準檢驗局

林能中

局長

林能中

中華民國九十年六月五日



Industry Canada Industrie Canada

<http://strategies.ic.gc.ca>

Certification and Engineering Bureau
3701 Carling Ave., Building 94
P.O. Box 11490, Station "H"
Ottawa, Ontario
K2H 8S2

Tel. No. (613) 990-5320
Fax. No. (613) 990-4752

August 2, 2001

Our File: 46405- 4075
Submission: 39037

Mr. Gene Chang
QuieTek Corporation
No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen
Lin Kou Shiang, Taipei, Taiwan R.O.C.

Dear Mr. Chang,

The Bureau has received your test report for the Open Area Test Site located at Taipei, Taiwan R.O.C. dated February 13, 2001. I have reviewed the report and find it complies with RSS 212, Issue 1 (Provisional).

The site is acceptable to Industry Canada for the performance of radiated measurements.

Please reference the file number "IC 4075-1" in the body of all test reports containing measurements made on the site you have designated No. 1 Test Site and "IC 4075-2" and "IC 4075-3" for No. 2 and No. 3 Test Sites respectively.

This reference number is the indication to the Industry Canada Certification Officers that the site meets the requirements of RSS 212, Issue 1 (Provisional). Your company has been added to our published list of filed sites on the Bureau's web page. Please keep the contact information current by notifying us if it changes or is in error.

Keep informed of the latest Industry Canada regulations by visiting the Bureau's site on the World Wide Web;

<http://spectrum.ic.gc.ca/deblab/english/debintre.html>

Whenever major construction or repairs to the site are completed, a re-submission of the site attenuation characteristics will be required, or every three years.

Yours sincerely,

Brian Kasper

Brian Kasper
Head, EMC and Wireless Evaluation
Certification and Engineering Bureau

Canada