Test Report

Product Name ： ICPCON CPU with Converter
Model No. ： I-7560, I-7561, I-7563, I-7513, I-7551, I-7017R, I-7017C, I-7018R, SG-3071, SG-3081, PW-3090-24S, PW-3090-12S, PW-3090-5S, PW-3090-5D, PW-3090-15D, I-7188E3D-232, I-7188E5D-485, I-7188E3-232, I-7188E5-485, NS-108
FCC ID. ： DoC

Applicant ： ICP DAS CO., LTD.
Address ： No. 111, Kuangfu N. Rd., Hukou Shiang, Hsinchu, Taiwan 303, R.O.C.

Date of Receipt ： 2003/12/23
Date of Test ： 2003/12/23
Report No. ： 03CH075F

Test Report Certification

Test Date : 2003/12/23
Report No. : 03CH075F

QTK QuieTek Corporation

Accredited by NIST (NVLAP)
NVLAP Lab Code: 200347-0

Product Name	:	ICPCON CPU with Converter
Applicant	:	ICP DAS CO., LTD.
Address	:	No. 111, Kuangfu N. Rd., Hukou Shiang, Hsinchu, Taiwan 303, R.O.C.
Manufacturer	:	ICP DAS CO., LTD.
Model No.	:	I-7560, I-7561, I-7563, I-7513, I-7551, I-7017R, I-7017C, I-7018R, SG-3071, SG-3081, PW-3090-24S, PW-3090-12S, PW-3090-5S, PW-3090-5D, PW-3090-15D, I-7188E3D-232, I-7188E5D-485, I-7188E3-232, I-7188E5-485, NS-108
FCC ID.	:	DoC
Rated Voltage	:	AC 120 V / 60 Hz
Trade Name	:	ICP DAS
Measurement Standard	:	FCC Part 15 Subpart B:2002, CISPR 22:1997
Measurement Procedure	:	ANSI.C63.4:1992
Classification	:	A
Test Result	:	Complied

NVLAP Lab Code : 200347-0

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.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By : Joyce Lin
(Joyce Lin)

Tested By : Mate Tseng
(Mate Tseng)

Approved By :
(Kevin Wang)

TABLE OF CONTENTS

Reference ： Laboratory of License

1. General Information

1.1. EUT Description

Product Name	ICPCON CPU with Converter
Trade Name	ICP DAS
Model No.	I-7560, I-7561, I-7563, I-7513, I-7551, I-7017R, I-7017C, I-7018R, SG-3071, SG-3081, PW-3090-24S, PW-3090-12S, PW-3090-5S, PW-3090-5D, PW-3090-15D, I-7188E3D-232, I-7188E5D-485, I-7188E3-232, I-7188E5-485, NS-108
EUT Voltage	AC 120 V / 60 Hz

Component	
USB Cable	Shielded, 1.2m, a ferrite core bonded.
LAN Cable	Non-Shielded, 1.4m, a ferrite core bonded.

Note:

1. Regarding to the different construction of the EUT, the model number were shown in the table as following:

Model NO.	Description
I-7560	USB to RS-232 Converter
I-7561	USB to RS-232/422/485 Converter
I-7563	USB to 3-channel RS-485 Converter Hub
I-7513	Three-way Isolated RS-485 to 3 port RS-485 Hub
I-7551	Isolated RS-232 to RS-232 Converter
I-7017R	8-channel Analog Input Module (Robust version)
I-7017C	8-channel Current input Module
I-7018R	8-channel Analog Input Module (Robust version)
I-7188E3-232	I-7188E3D-232 without LED display
I-7188E3D-232	Internet communication controller with two RS-232, one RS-485 and one Ethernet
I-7188E5-485	I-7188E5D-485 without LED display
I-7188E5D-485	Internet Communication Controller with one RS-232 , four RS-485 and one Ethernet
SG-3071	Isolated DC Voltage Input, Voltage / Current Output Module
SG-3081	Isolated DC Current Input, Voltage / Current Output Module
PW-3090-24S	Isolated Power Supply Module, Output Power Voltage +24V
PW-3090-12S	Isolated Power Supply Module, Output Power Voltage +12V
PW-3090-5S	Isolated Power Supply Module, Output Power Voltage +5V
PW-3090-15D	Isolated Power Supply Module, Output Power Voltage ±15V
PW-3090-5D	Isolated Power Supply Module, Output Power Voltage ±5V
NS-108	Industrial Ethernet Switch Hub

1.2. Test Mode

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:

Pre-Test Mode	
EMC	Normal operation
Final Test Mode	
EMI	Normal operation
EMI	Normal operation

1.3. Tested System Details

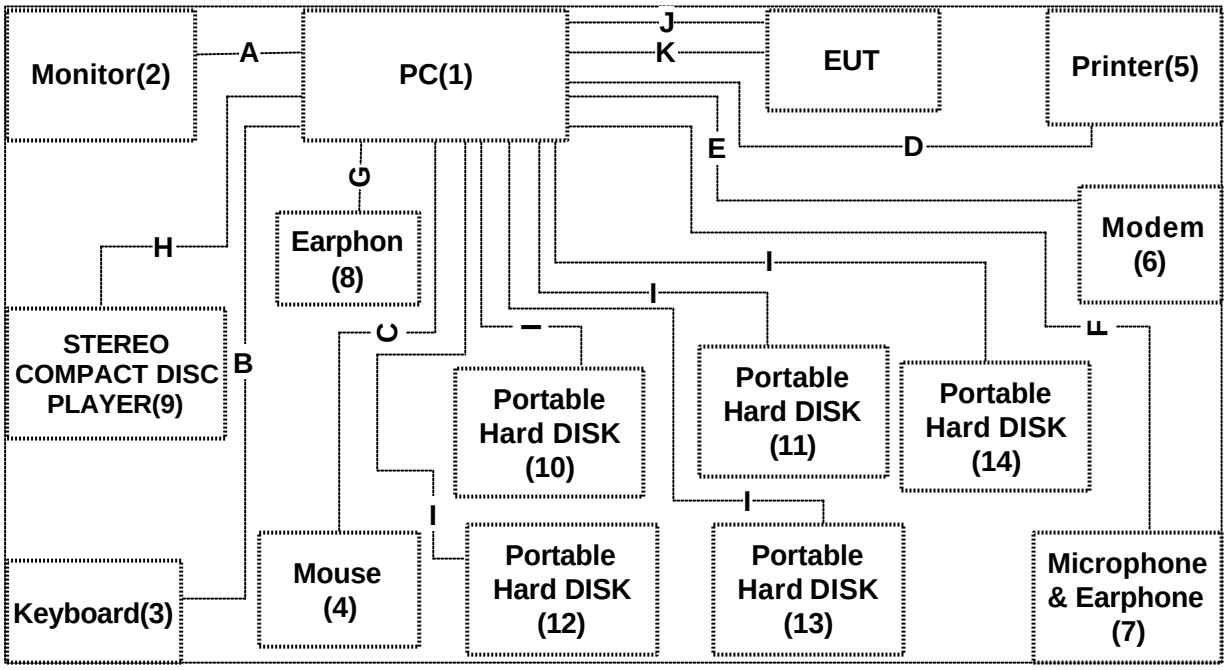
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Test Mode		Video transmit				
Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	PC	COMPAQ	PD1100	SG30801006	DoC	Non-Shielded, 1.8m
2	Monitor	VIEWSNOIC	VCDT21490-1P	ER01502850	DoC	Non-Shielded, 1.8m
3	Keyboard	ACER	6311-TW4C/6	N/A	DoC	--
4	Mouse	HP	M-S69	FbAB70S5B0S2SSK	DoC	--
5	Printer	HP	C2642A	MY75L1D2XN	DoC	Non-Shielded, 0.7m
6	Modem	ACEEX	DM-1414	980033034	DoC	Non-Shielded, 1.6m
7	Microphone & Earphone	TOKTO	SX-MI	N/A	DoC	--
8	Earphone	KOKA	CD-1200	N/A	DoC	--
9	STEREO COMPACT DISC PLAYER	MIZDA	CD-11	N/A	DoC	--
10	Portable Hard DISK	FUJITSU	MMA2200VB	R129Y19003JC	DoC	Non-Shielded, 1.8m
11	Portable Hard DISK	Top Disk Enterprise	Me-910	217974	DoC	--
12	Portable Hard DISK	Top Disk Enterprise	Me-910	217975		--
13	Portable Hard DISK	Top Disk Enterprise	Me-910	220948		--
14	Portable Hard DISK	Top Disk Enterprise	Me-910	220949		--

1.4. Configuration of tested System

Test Mode	Normal operation

Connection Diagram



Signal Cable Type		Signal cable Description
A	VGA Cable	Shielded, 1.6m, with one ferrite core bonded
B	Keyboard Cable	Shielded, 1.8m
C	Mouse Cable	Shielded, 1.8m
D	Printer Cable	Shielded, 1.2m
E	Modem Cable	Shielded, 1.5m
F	Earphone & Microphone Cable	Non-Shielded, 1.2m
G	Earphone & Microphone Cable	Non-Shielded, 1.2m
H	Walkman Cable	Non-Shielded, 1.6m
I	USB Hard Disk Cable	Shielded, 1.2m, five PCS.
J	LAN Cable	Non-Shielded, 1.4m, with one ferrite core bonded
K	USB Cable	Shielded, 1.2m, with one ferrite core bonded

1.5. EUT Exercise Software

Test Mode	Normal operation
1	Setup the EUT and simulators as shown on 1.3.
2	Turn on the power of all equipment.
3	Boot the PC from Hard Disk.
4	Data will be communicated between computer and EUT.
5	The personal computer monitors ’ will show the transmitting and receiving characteristics when the communication is success.
6	Repeat the above procedure (4) to (5).

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	ANSI.C63.4 CE	15 - 35	23
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	ANSI.C63.4 RE	15 -35	19
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description: November 3, 1998 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2
September 30, 2003 Accreditation on NVLAP
NVLAP Lab Code: 200347-0

Site Name: Quietek Corporation

Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail: service@quietek.com

2. Conducted Emission

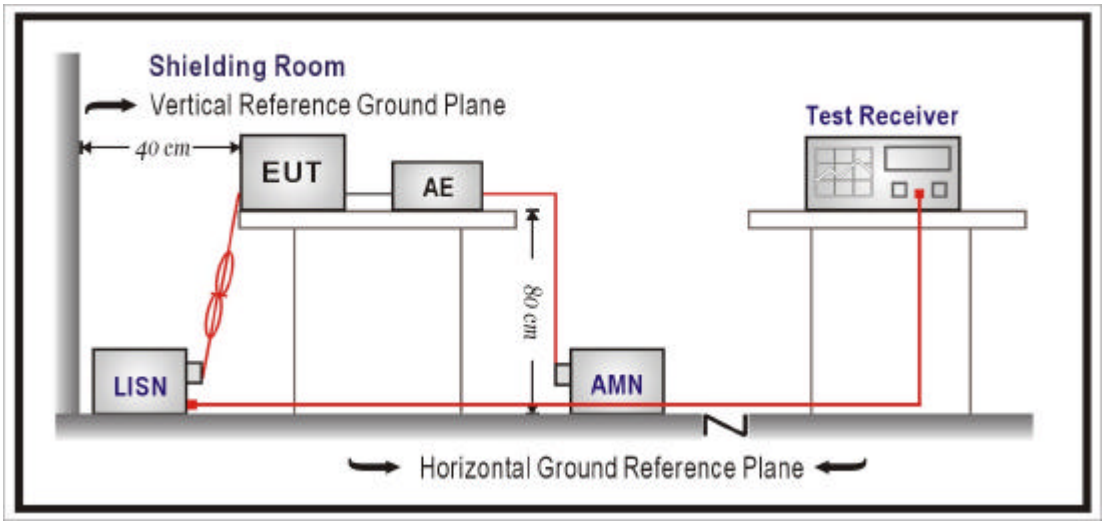
2.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/018	Sep.,2003	
2	Artificial Mains Network	R & S	ENV4200/848411/10	Feb.,2003	Peripherals
3	LISN	R & S	ESH3-Z5/825562/002	Feb.,2003	EUT
4	Pulse Limiter	R & S	ESH3-Z2/357.8810.52	Feb.,2003	
5	No.2 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

FCC Part 15 Subpart B Paragraph 15.107 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 ANSI C63.4: 1992 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart B: 2002

2.6. Test Result

Product	ICPCON CPU with Converter		
Test Mode	Normal operation		
Date of Test	2003/12/23	Test Site	SR2
Test Condition	Line1	Test Range	0.15~30MHz

Owing to the DC operation of EUT, this test item is not performed.

3. Radiated Emission

3.1. Test Equipment

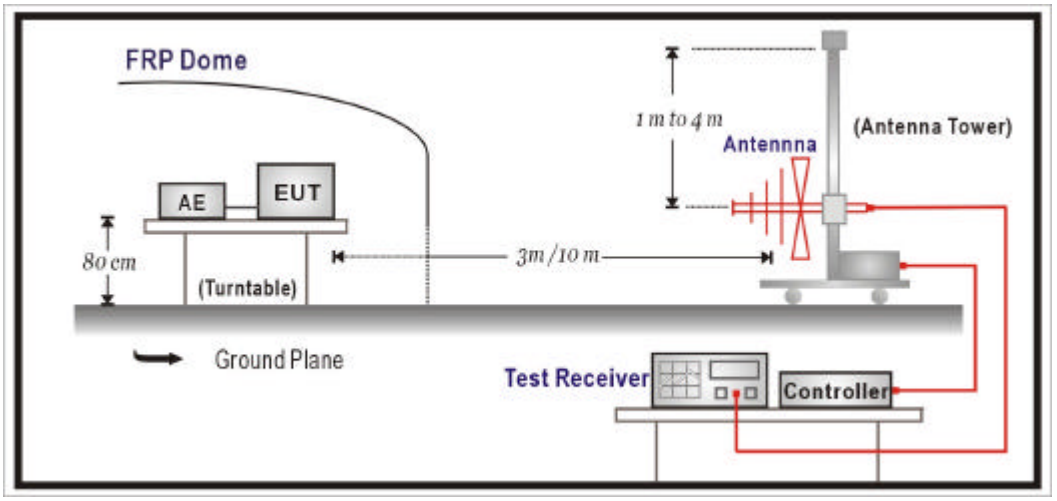
The following test equipment are used during the test:

Item	Equipment		Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Test Receiver	R & S	ESCS 30 / 825442/017	Jan.,2003
2	X	Spectrum Analyzer	Advantest	R3261C / 81720266	N/A
3	X	Pre-Amplifier	HP	8447D / 2944A09276	N/A
4	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep.,2003
5	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug.,2003
6	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb.,2003
7	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Jul.,2003
8	No.1 OATS				Sep.,2003

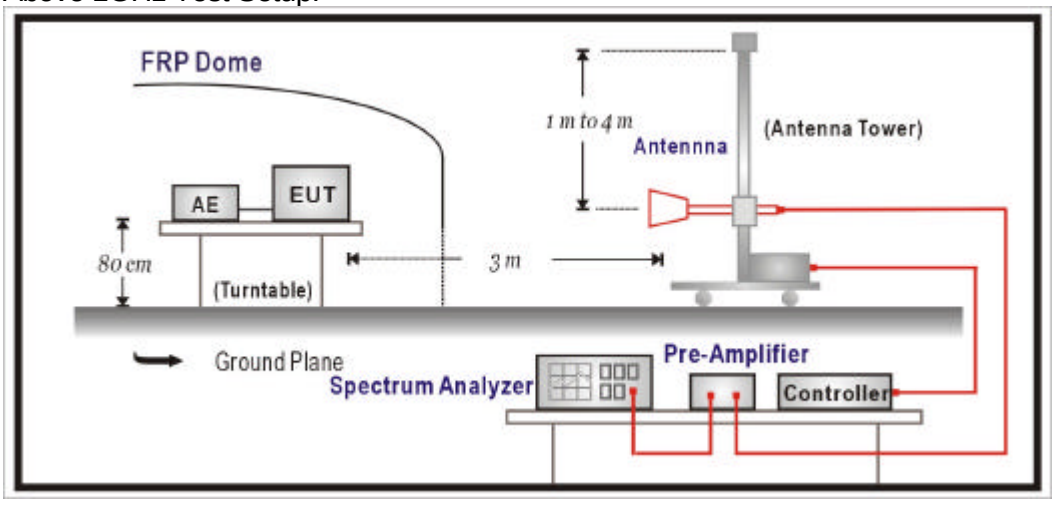
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark " X" test instruments are used to measure the final test results.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. Limits

Under 1GHz test shall not exceed the following value:

CISPR 22 Limits (dBuV/m)				
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

Remark: 1. The tighter limit shall apply at the edge between two frequency bands.

2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)				
Frequency MHz	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m
30-88	10	39	3	40
88-216	10	43.5	3	43.5
216-960	10	46.4	3	46
Above 960	10	49.5	3	54

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

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 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 ANSI C63.4:1992 on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the folowing table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

For class A, the EUT was positioned such that the distance from antenna to the EUT was 10 meters for under 1GHz and above 1GHz.

For class B, the EUT was positioned such that the distance from antenna to the EUT was 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

3.5. Test Specification

According to FCC Part 15 Subpart B: 2002, CISPR 22:1997

3.6. Test Result

Product	ICPCON CPU with Converter		
Test Mode	Normal operation		
Date of Test	2003/12/23	Test Site	Site2
Test Condition	Horizontal	Test Range	30~1000MHz

	Frequency	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:								
	43.325	1.28	11.49	0.00	7.00	19.77	20.23	40.00
	66.000	1.50	6.16	0.00	11.78	19.44	20.56	40.00
	125.000	2.07	11.84	0.00	9.99	23.90	16.10	40.00
	200.025	2.78	9.30	0.00	9.99	22.07	17.93	40.00
	250.025	3.27	12.61	0.00	9.42	25.30	21.70	47.00
	360.025	4.07	14.70	0.00	4.16	22.93	24.07	47.00
*	500.045	4.79	17.34	0.00	10.15	32.28	14.72	47.00
	625.045	5.44	19.30	0.00	3.54	28.29	18.71	47.00

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product	PC Camera		
Test Mode	Video transmit		
Date of Test	2003/12/24	Test Site	Site1
Test Condition	Vertical	Test Range	30~1000MHz

	Frequency	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical:								
	35.050	1.20	14.68	0.00	15.58	31.45	8.55	40.00
	45.050	1.30	9.96	0.00	16.84	28.10	11.90	40.00
	76.000	1.59	7.23	0.00	16.57	25.39	14.61	40.00
	123.900	2.06	11.39	0.00	17.63	31.08	8.92	40.00
*	200.025	2.78	9.07	0.00	21.72	33.58	6.42	40.00
	250.025	3.27	12.26	0.00	10.04	25.57	21.43	47.00
	360.025	4.07	15.48	0.00	6.50	26.04	20.96	47.00
	500.025	4.79	17.14	0.00	6.63	28.56	18.44	47.00
	625.050	5.44	18.50	0.00	3.76	27.71	19.29	47.00

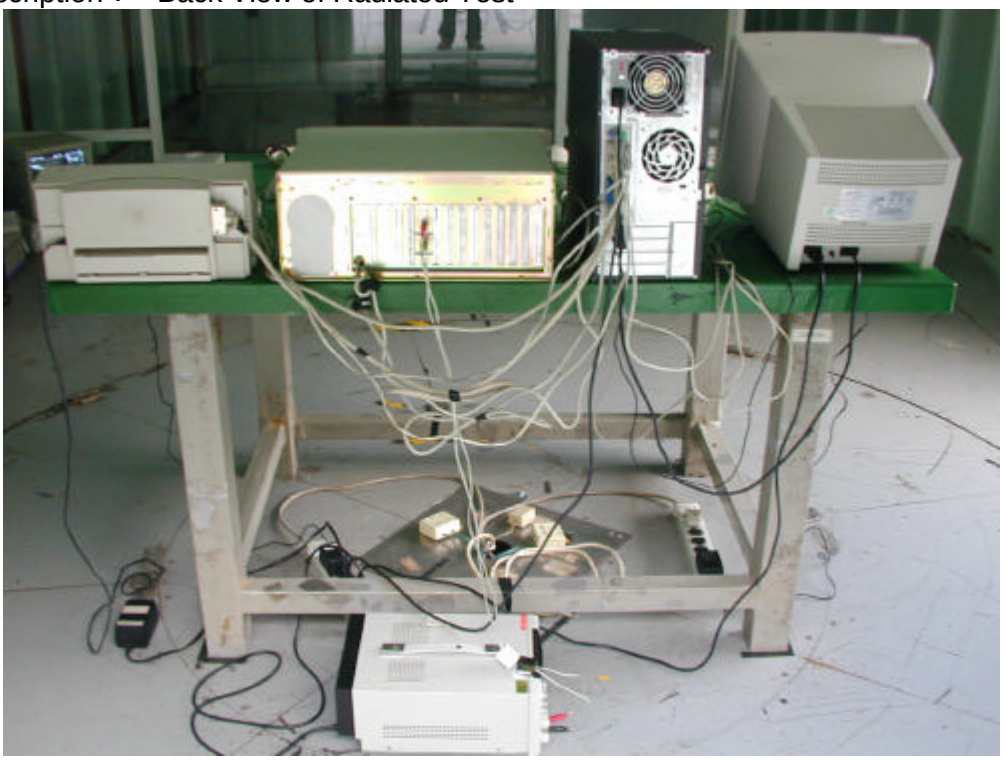
Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

3.7. Test Photo

Test Mode ： Normal operation
Description： Front View of Radiated Test

Test Mode ： Normal operation
Description： Back View of Radiated Test



Attachement

➢ EUT Photograph

(1) EUT Photo

(2) EUT Photo

Reference : Laboratory of License

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200347-0

QUIETEK CORPORATION
No. 75-2 Wang-Yeh Velley, Yung-Hsing
Chiung-Lin
Hsin-Chu Country
TAIWAN
Mr. Gene Chang
Phone: 886-3-5928858 Fax: 886-3-5928859
E-Mail: gene@quietek.com
URL: http://www.quietek.com

NVLAP Code	*Designation / Description*
Emissions Test Methods:	
12/CIS22	IEC/CISPR 22 (1997) and EN 55022 (1998): 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/FCC15b	ANSI C63.4 (2001) with FCC Method - 47 CFR Part 15, Subpart B: Unintentional Radiators

September 30, 2004

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ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200347-0

QUIETEK CORPORATION

NVLAP Code	*Designation / Description*
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

September 30, 2004

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Certificate of Accreditation

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

September 30, 2004

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