



# Test Report

Product Name : 2G 2PORT Serial Device Server

Model No. : NPort 5230, 5230-N, NPort 5230-P, NPort 5230-T

FCC ID. : DoC

Applicant : Moxa Technologies CO., Ltd

Address : Fl.4, No. 135, Lane 235, Pao-Chiao Rd., Shing  
Tien City, Taipei, Taiwan, R.O.C.

Date of Receipt : Mar. 14, 2003

Issued Date : Jul. 26, 2005

Report No. : 033L112F

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

# DECLARATION OF CONFORMITY

Per FCC Part 2 Section 2. 1077(a)



The following equipment:

Product Name : 2G 2PORT Serial Device Server  
Trade Name : Moxa  
Model Number : NPort 5230, 5230-N, NPort 5230-P, NPort 5230-T

It's herewith confirmed to comply with the requirements of FCC Part 15 Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

The result of electromagnetic emission has been evaluated by QuieTek EMC laboratory (NVLAP Lab. Code : 200533-0 ) and showed in the test report.

( Report No. : QTK-033L112F

It is understood that each unit marketed is identical to the device as tested, and Any changes to the device that could adversely affect the emission Characteristics will require retest.

The following importer / manufacturer is responsible for this declaration:

Company Name \_\_\_\_\_

Company Address \_\_\_\_\_

Telephone \_\_\_\_\_ Facsimile : \_\_\_\_\_

Person is responsible for marking this declaration:

\_\_\_\_\_  
Name ( Full name )

\_\_\_\_\_  
Position / Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Legal Signature

# Test Report Certification

Issued Date : Jul. 26, 2005

Report No. : 033L112F



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : 2G 2PORT Serial Device Server  
Applicant : Moxa Technologies CO., Ltd  
Address : Fl.4, No. 135, Lane 235, Pao-Chiao Rd., Shing Tien City, Taipei, Taiwan,  
R.O.C.  
Manufacturer : Moxa Technologies CO., Ltd  
Model No. : NPort 5230, 5230-N, NPort 5230-P, NPort 5230-T  
FCC ID. : DoC  
Rated Voltage : 12Vdc  
Trade Name : Moxa  
Measurement Standard : FCC Part 15 Subpart B:2002, CISPR22: 1997  
Measurement Procedure : ANSI C63.4:1992  
Classification : Class A  
Test Result : Complied



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Documented By :



( Gina Chen )

Tested By :



( Sky Hsu )

Approved By :



( Gene Chang )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	: 2G 2PORT Serial Device Server
Trade Name	: Moxa
Model No.	: NPort 5230, 5230-N, NPort 5230-P, NPort 5230-T
Rated Voltage	: 12Vdc
PC Chassis	: Chenbro, B6251-200
Mother Board	: Biostar, M6TSS
CPU	: CELERON(TM)500MHZ , Clock: 100MHz
HDD	: Seagate , ST310212A
CD-ROM	: HITACHI, CDR-7930
FDD	: MISUMI, D353M3D
VGA Card	: ASUS, AGPV3000ZX
Sound Card	: On Board
LAN Card	: Dlink , DFE-530TX
SPS	DELTA , Dsp-200PB-126A
Power Cord	: Non-Shielded, 1.8m

#### Note:

1. The EUT is including four models for different marketing requirement.
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      Model1: Simulate Test Program

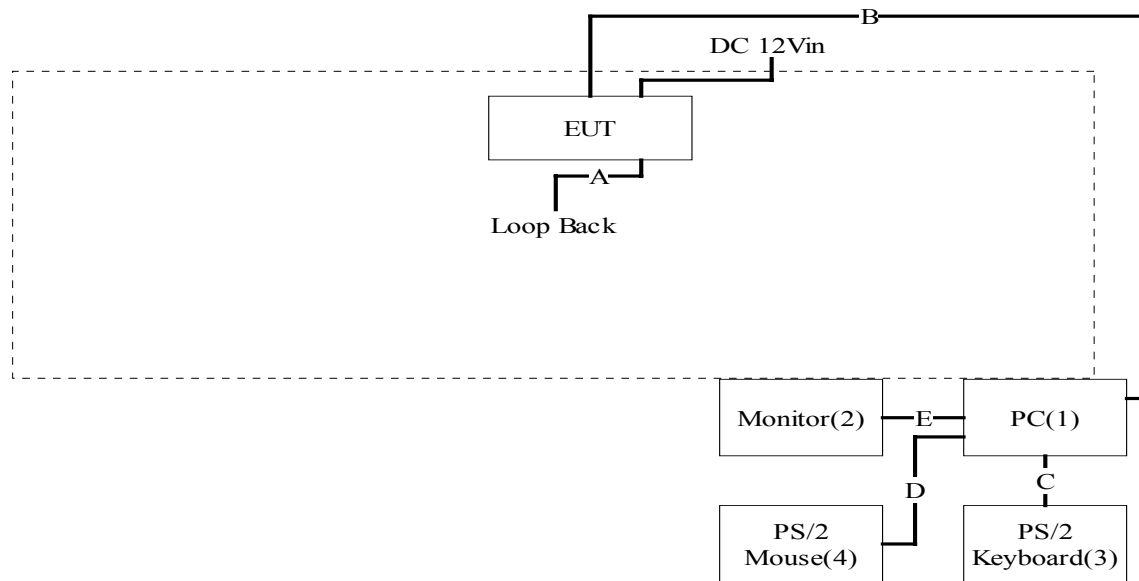
## 1.2. Tested System Details

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.	FCC ID	Power Cord
(1.)	PC	N/A	N/A	N/A	N/A	N/A
(2.)	Monitor	ADI	CM703	038054T10203891A	DoC	Non-Shielded, 1.8m
(3.)	PS/2Keyboard	Acer	6311-TW4C/6	N/A	DoC	N/A
(4.)	Mouse	HITACHI	PC-KM1300	N/A	JNZ201213	N/A

Signal Cable Type		Signal Cable Description
A.	Lan Cable ( Loop Back )	Shielded, 0.8m
B.	Lan Cable	Shielded, 7m
C.	PS/2 Keyboard Cable	Shielded, 1m
D.	PS/2 Mouse Cable	Shielded, 1m
E.	VGA Cable	Shielded, 1.8m , a ferrite core bonded

### 1.3. Configuration of Tested System



### 1.4. EUT Exercise Software

- (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).

## 1.5. 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 22, 2001 File on  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Reference 31040/SIT1300F2  
 July 03, 2001 Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation  
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## 2. Conducted Emission

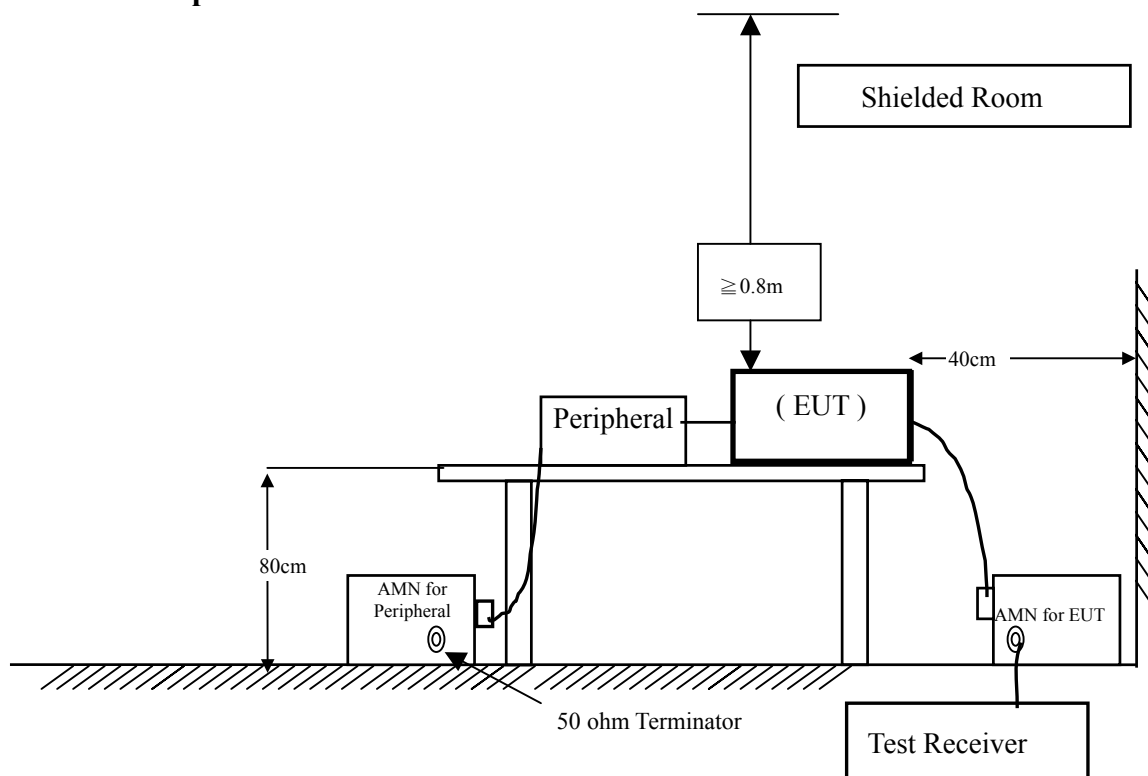
### 2.1. Test Equipment List

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, 2002	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2002	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2002	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2002	
5	No. 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

FCC Part 15 Subpart B 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 Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 5. The acceptance criterion was met and the EUT passed the test.

### 3. Radiated Emission

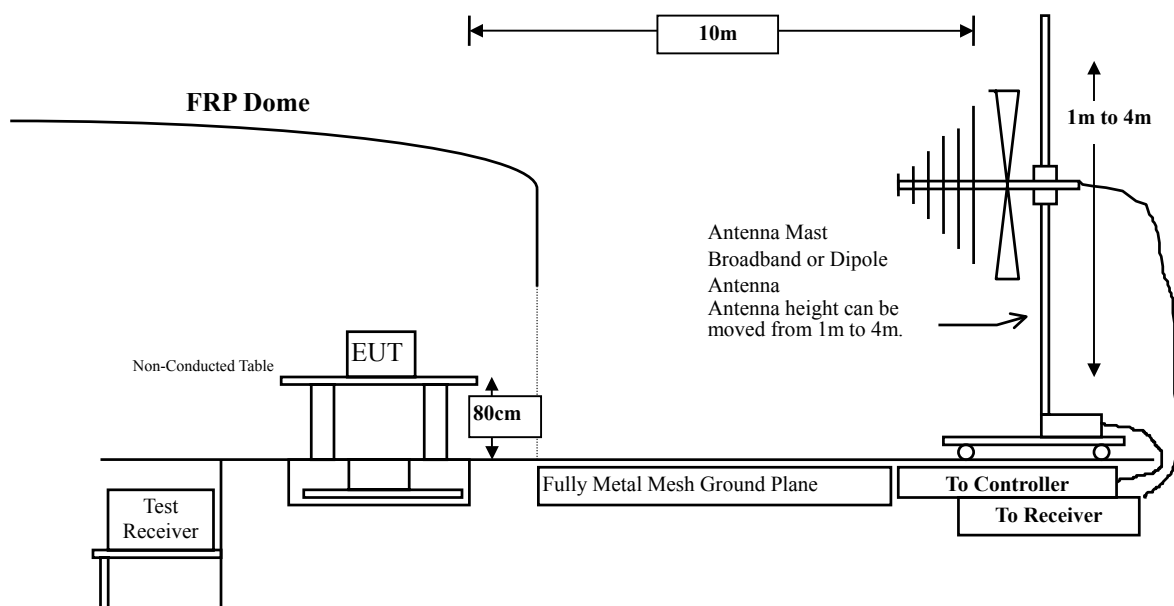
#### 3.1. Test Equipment

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	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2002
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2002
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2002
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2002
<input type="checkbox"/> Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2002
	Spectrum Analyzer	Advantest	3162 / 100803466	May, 2002
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2002
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2002
	Horn Antenna	ETS	3115 / 0005-6160	July, 2002
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2002
<input checked="" type="checkbox"/> Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2002
	Spectrum Analyzer	Advantest	3162 / 100803480	May, 2002
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2002
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2002
	Horn Antenna	ETS	3115 / 0005-6160	July, 2002
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2002

- 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

According to CISPR 22 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
FCC Part 15 Subpart B Limits (dBuV)				
Above 960	10	49.5	3	54

- 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 Line Voltage (dBuV/m) = 20 log RF Line Voltage (uV/m)

### 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 ANSI C63.4:1992 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 Result

The emission from the EUT was below the specified limits. The worst-case emissions are shown in section 5. The acceptance criterion was met and the EUT passed the test.

#### **4. EMI Reduction Method During Compliance Testing**

No modification was made during testing.

## 5. Summary of Test Datas

The test results in the emission was 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:

Test Mode:

EMI Mode      Mode1: Simulate Test Program

### 5.1. Test Result of Conducted Emission

Product : 2G 2PORT Serial Device Server  
Test Item : Conducted Emission Test

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

## 5.2. Test Result of Radiated Emission

Product : 2G 2PORT Serial Device Server  
Test Item : Radiated Emission  
Test Site : No.2 OATS  
Test Mode : Mode1: Simulate Test Program

Freq.	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
MHz	Loss	Factor	dB	Level	Level	dB	dBuV/m
	dB	dB/m		dBuV	dBuV/m		
Horizontal							
66.205	1.05	5.66	0.00	10.86	17.58	22.42	40.00
116.235	1.31	11.96	0.00	5.12	18.39	21.61	40.00
124.958	1.36	11.64	0.00	9.26	22.26	17.74	40.00
177.670	1.63	8.53	0.00	9.09	19.25	20.75	40.00
200.004	1.74	8.40	0.00	15.01	25.15	14.85	40.00
* 399.995	2.78	14.85	0.00	16.06	33.69	13.31	47.00
499.995	3.29	16.34	0.00	13.59	33.22	13.78	47.00
643.328	4.03	18.61	0.00	10.42	33.05	13.95	47.00
799.995	4.83	19.39	0.00	8.99	33.21	13.79	47.00
Vertical							
43.520	0.94	9.57	0.00	11.02	21.53	18.47	40.00
49.490	0.97	6.90	0.00	16.19	24.06	15.94	40.00
51.885	0.98	6.39	0.00	14.34	21.72	18.28	40.00
75.120	1.10	6.93	0.00	15.11	23.15	16.85	40.00
110.728	1.28	11.12	0.00	8.97	21.37	18.63	40.00
124.995	1.36	10.19	0.00	15.01	26.56	13.44	40.00
161.915	1.55	8.53	0.00	13.66	23.74	16.26	40.00
184.569	1.66	8.31	0.00	16.22	26.19	13.81	40.00
* 200.133	1.74	8.40	0.00	16.49	26.63	13.37	40.00
399.995	2.78	16.45	0.00	13.21	32.44	14.56	47.00
593.330	3.77	19.76	0.00	8.13	31.65	15.35	47.00
643.335	4.03	18.04	0.00	10.12	32.19	14.81	47.00

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ \* ” means this data is the worst emission level.
3. Measurement Level = Reading Level + LISN Factor + Cable loss.
4. “--“ mean the average measurement was not performed when the peak measured data under the limit of average detection.



## **Attachment 1 : EUT Test Photographs**

## Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test



Back View of Radiated Test



## **Attachment 2 : EUT Detailed Photographs**

## Attachment 2 : EUT Detailed Photographs

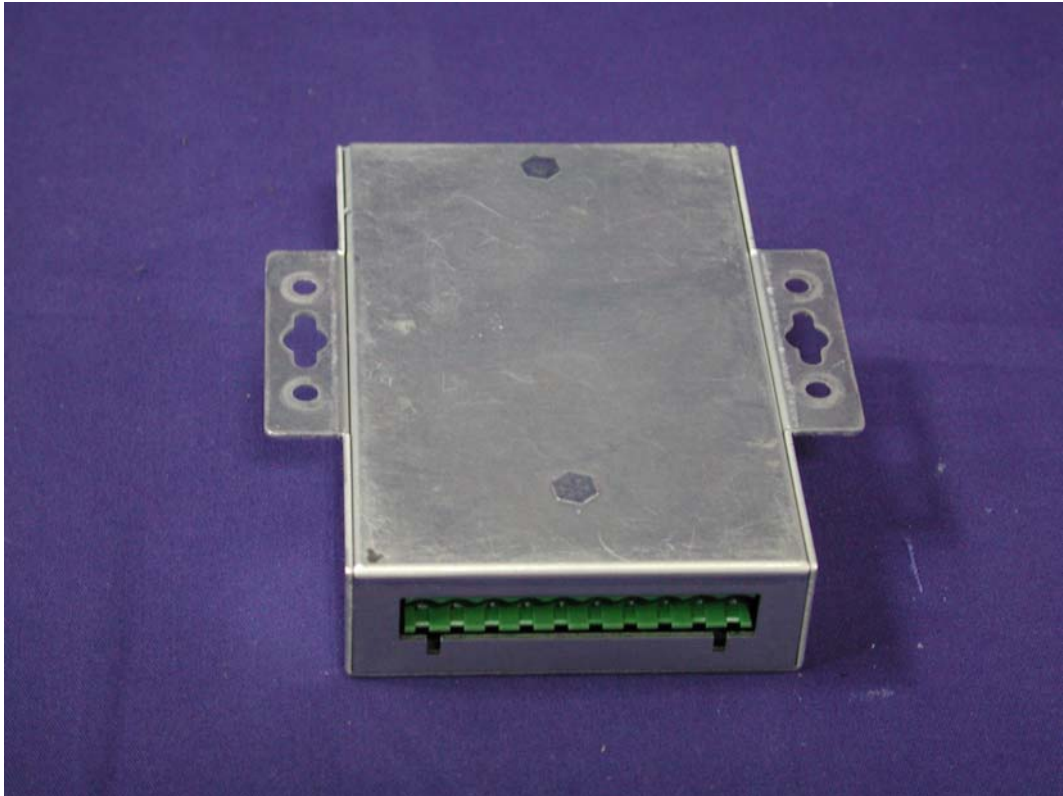
(1) EUT Photo



(2) EUT Photo



(3) EUT Photo



(4) EUT Photo





(5) EUT Photo

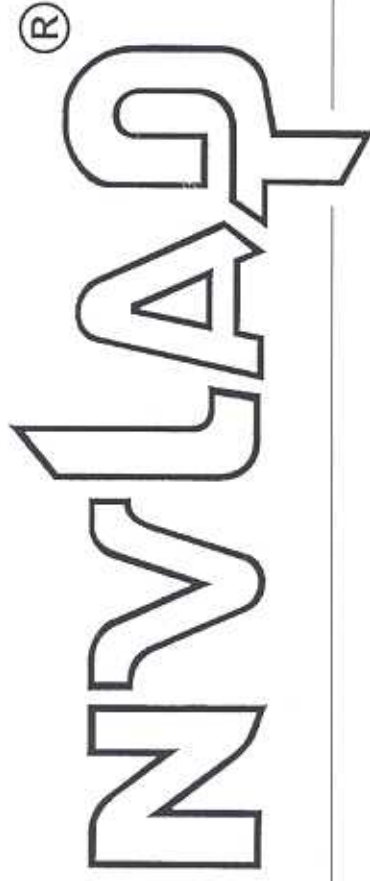


(6) EUT Photo



## Reference : Laboratory of License

United States Department of Commerce  
National Institute of Standards and Technology



## Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 2005333-0

### Quietek Corporation

Lin Kou Shiang, Taipei 244  
TAIWAN

is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in  
NIST Handbook 150:2001 and all requirements of ISO/IEC Guide 17025:1999.  
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:

### ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

2005-07-01 through 2006-06-30

Effective dates



A handwritten signature in black ink, appearing to read "W. P. Marshall".

For the National Institute of Standards and Technology





**SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999**

**Quietek Corporation**

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Lin Kou Shiang, Taipei 244

TAIWAN

Mr. Gene Chang

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URL: <http://www.quietek.com>

**ELECTROMAGNETIC COMPATIBILITY  
AND TELECOMMUNICATIONS**

**NVLAP LAB CODE 200533-0**

***NVLAP Code Designation / Description***

**Emissions Test Methods:**

- |           |  |
|-----------|--|
| 12/CIS22  | IEC/CISPR 22 (1997) & EN 55022 (1998) + A1(2000): Limits and methods of measurement of radio disturbance characteristics of information technology equipment                                   |
| 12/CIS22a | IEC/CISPR 22 (1993) and EN 55022 (1994): 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 (2003) with FCC Method 47 CFR Part 15, Subpart B: Unintentional Radiators   |
| 12/T51    | AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment  |

**Immunity Test Methods:**

- |        |   |
|--------|---|
| 12/I01 | IEC 61000-4-2, Ed. 1.2 (2001) + A1, A2; EN 61000-4-2: Electrostatic Discharge Immunity Test                         |
| 12/I02 | IEC 61000-4-3, Ed. 2.0 (2002-03); EN 61000-4-3 (2002): Radiated Radio-Frequency Electromagnetic Field Immunity Test |

2005-07-01 through 2006-06-30

*Effective dates*

*For the National Institute of Standards and Technology*



# National Voluntary Laboratory Accreditation Program



## ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200533-0

### *NVLAP Code    Designation / Description*

12/I03	IEC 61000-4-4(1995), A1(2000), A2(2001); EN 61000-4-4: Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/I04	IEC 61000-4-5, Ed. 1.1 (2001-04); EN 61000-4-5: Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
12/I05	IEC 61000-4-6, Ed. 2.0 (2003-05); EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I06	IEC 61000-4-8, Ed. 1.1 (2001); EN 61000-4-8: Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
12/I07	IEC 61000-4-11, Ed. 1.1 (2001-03); EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

2005-07-01 through 2006-06-30

*Effective dates*

*For the National Institute of Standards and Technology*