QTK98-F004

Test Report
Application for Certification
On Behalf Of
PRETEC CORPORATION
PC CAMERA
Model : PCC-300

FCC ID : NJB98100115

Prepared For:
PRETEC CORPORATION
6F, No. 10, Li-Shin Rd., Science-Based Industrial Park,
Hisn-Chu , Taiwan, R.O.C.

Report By : **QuieTek Corporation**
No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
Tel : (03) 592-8858
Fax : (03) 592-8859

TABLE OF CONTENTS

	Description	Page
1.	**TEST REPORT CERTIFICATION**	**3**
2.	**ENERAL INFORMATION**	**4**
2.1	PRODUCTION DESCRIPTION	4
2.2	TESTED SYSTEM DETAILS	5
2.3	TEST METHODOLOGY	7
2.4	TEST FACILITY	8
3.	**CONDUCTED POWER LINE TEST**	**9**
3.1	TEST EQUIPMENTS	9
3.2	BLOCK DIAGRAM OF TEST SETUP	9
3.3	CONDUCTED POWERLINE EMISSION LIMIT	10
3.4	EUT CONFIGURATION ON MEASUREMENT	10
3.5	EUT EXERCISE SOFTWARE	10
3.6	TEST PROCEDURE	11
3.7	CONDUCTED EMISSION DATA	11
4.	**RADIATION EMISSION TEST**	**14**
4.1	TEST EQUIPMENT	14
4.2	TEST SETUP	14
4.3	RADIATED EMISSION LIMIT	15
4.4	EUT CONFIGURATION	15-
4.5	OPERATING CONDITION OF EUT	15
4.6	TEST PROCEDURE	16
4.7	RADIATED EMISSION DATA	16
5.	**SUMMARIZATION OF TEST RESULTS**	**19**
6.	**EMI REDUCTION METHOD DURING COMPLIANCE TESTING**	**20**
7.	**PHOTOGRAPHS**	**21**
7.1	TEST PHOTOGRAPHS	21
8.	**EUT PHOTOGRAPHS**	**23**

1. Test Report Certification

Applicant : **PRETEC CORPORATION**

Manufacturer : **PRETEC CORPORATION**

EUT Description

(A) Model Name : PC CAMERA

(B) Model No. : **PCC-300**

(C) Serial Number : ProtoType

(D) Power : 120V/60Hz AC

MEASUREMENT STANDARD USED :

CISPR 22 Limits and methods of measurement of radio disturbance characteristics of information technology equipment: 1993

MEASUREMENT PROCEDURE USED :

ANSI C63.4 Methods of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40GHz. :1992

The device described above was tested by QuieTek Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the CISPR 22 limits for both radiated and conducted emissions.
The measurement results are contained in this test report and QuieTek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the CISPR 22 limits.

Sample Received Date : October 22, 1998

Test Date : October 26, 1998

Documented by : Cindy Chiu

Test Engineer: ROBIN LIN

Approve & Authorized Signer: GENE CHANG

2. eneral Information

2.1 Production Description

Description	:	PC CAMERA
Model Number	:	**PCC-300**
Serial Number	:	ProtoType
Applicant	:	**PRETEC CORPORATION**
Address	:	6F, No. 10, Li-Shin Rd., Science-Based Industrial Park, Hisn-Chu , Taiwan, R.O.C.
Manufacturer	:	**PRETEC CORPORATION**
Address	:	6F, No. 10, Li-Shin Rd., Science-Based Industrial Park, Hisn-Chu , Taiwan, R.O.C.
Data cable	:	Shielded, Detachable, 1.2m Bonded one ferrite cores

Note: The data show in this test report reflects the worst-case data for each operation mode.

2.2 Tested System Details

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

2.2.1 The types for all peripheral devices

☒ Host Personal Computer

Model Number	:	VE/5 200
Manufacturer	:	HP
CPU	:	Pentium II 233MHz, Clock: 66MHz
FDD	:	NEC, FD1231H
		S/N: 687732105
HDD	:	Maxtor, HAD/Uplevel
		S/N: L4046DYW
CD-ROM	:	TEAC, CD-532E
		S/N: 1000659
VGA Card	:	On board

☒ PC CAMERA (EUT)

Model Number	:	PCC-300
Serial Number	:	Prototype
FCC ID	:	NJB98100115
Manufacturer	:	PRETEC

☒ Monitor

Model Number	:	CM752ET-311
Serial Number	:	T8E006364
FCC ID	:	N/A
Manufacturer	:	HITACHI

☒ Keyboard

Model Number	:	6311-TW2C
Serial Number	:	N/A
Manufacturer	:	ACER

☒ Printer

Model Number	:	C2642A
Serial Number	:	MY75N1D2BC
FCC ID	:	B94C2642X
Manufacturer	:	HP

☒ Modem

Model Number	:	1414
Serial Number	:	980033035
FCC ID	:	IFAXDM1414
Manufacturer	:	ACEEX

☒ Modem

Model Number	:	1414
Serial Number	:	980033036
FCC ID	:	IFAXDM1414
Manufacturer	:	ACEEX

☒ Mouse

Model Number	:	M-S34
Serial Number	:	LZB75078428
FCC ID	:	DZL211029
Manufacturer	:	HP

2.2.2 Description of the used cable in tested system

Item	Name	Shielded	Detachable	Length	Port Name	
					From	TO
1	PC Power Cord	No	Yes	1.2m	PC	AC Socket
2	Monitor Cable	Yes	No	1.2m	Monitor	PC
3	Monitor Power Cord	Yes	Yes	1.2m	Monitor	AC Socket
4	Keyboard Cable	No	No	1.5m	Keyboard	PC
5	Modem Adaptor	No	Yes	1.8m	Modem	AC Socket
6	Modem Data Cable	No	Yes	1.8m	Modem	PC Com1
9	Printer Adaptor	No	Yes	2.0m	Printer	AC Socket
10	Printer Data Cable	Yes	Yes	1.5m	Printer	PC Parallel
11	Mouse Data Cable	No	No	1.5m	Mouse	PC PS2

2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992.

Radiated testing was performed at an antenna to EUT distance of __10__ meters.

2.4 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	24-27
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description : July 16, 1998 Accreditation on NVLAP
NVLAP Lab Code: 200347-0

September 9, 1998 Registration on VCCI
Registration No.: 1153

Name of firm : QuieTek Corporation

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

3. Conducted Power Line Test

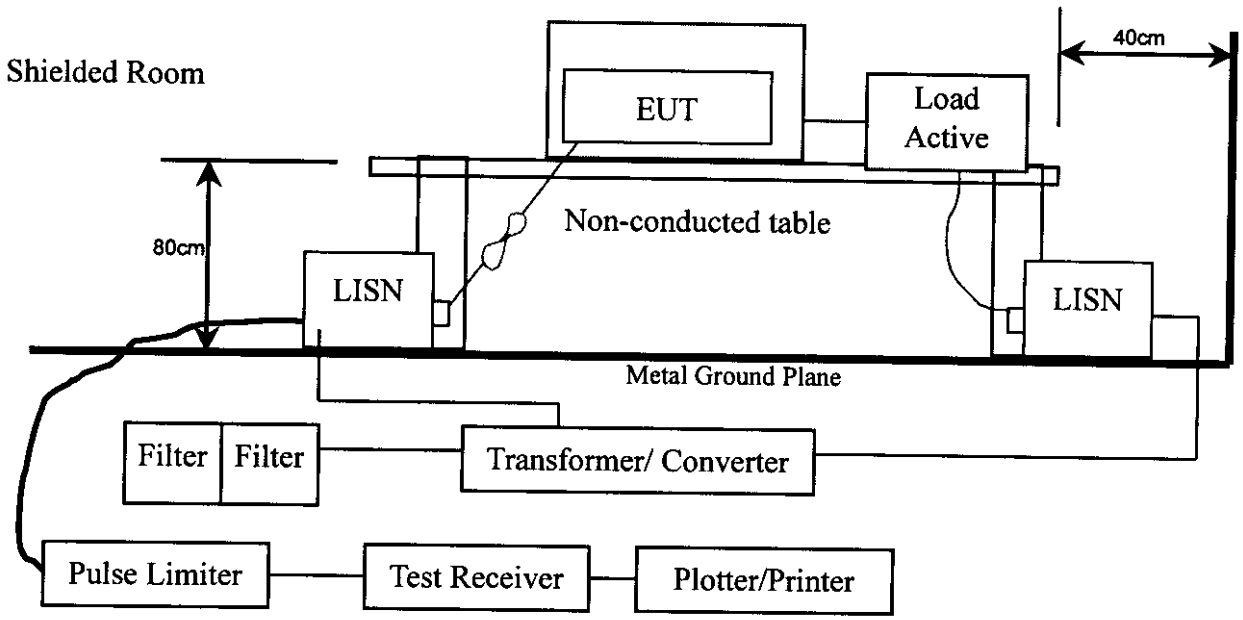
3.1 Test Equipments

The following test equipments are used during the conducted power line tests:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal..	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 1998	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 1998	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 1998	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	N/A	
5	N0.2 Shielded Room			N/A	

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

3.2 Block Diagram of Test Setup



3.3 Conducted Powerline Emission Limit

[] CISPR 22 Limits

Frequency	Maximum RF Line Voltage dB(uV)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
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.

3.4 EUT Configuration on Measurement

The equipments which is listed 3.2 are installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5 EUT Exercise Software

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

3.5.1 Setup the EUT and simulators as shown on 3.2

3.5.2 Turn on the power of all equipment.

3.5.3 Boot the PC from Hard Disk .

3.5.4 The camera (EUT) will start to operate and send the video figure into PC.

3.5.5 PC will display "video figure" on monitor.

3.5.6 Printer and modem will keep at standby mode during Scanner operation.

3.5.7 Repeat the above procedure 3.5.4 to 3.5.7

3.6 Test Procedure

The EUT is 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 refer 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 equipments and all of the interface cables must be changed according to ANSI C63.4-1992 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 10Khz.

The frequency range from **0.15 MHz to 30 MHz** is checked.

3.7 Conducted Emission Data

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

The uncertainty is calculated in accordance with NAMAS NIS 81. The total uncertainty for this test is as follows:
- Uncertainty in the field strength measured: $< \pm 2.0$ dB

CONDUCTED EMISSION DATA

Date of Test	:	Oct. 26, 1998	Temperature	:	26 ℃
EUT	:	PC CAMERA	Humidity	:	52 %
Test Mode	:	Normal	Display Pattern	:	H Pattern
Detector Mode	:	Quasi-Peak & Average			

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line1 dBuV	Measurement Level Line1 dBuV	Limits dBuV
0.151	0.00	0.10	36.94	37.04	65.97
0.229	0.02	0.10	31.47	31.59	62.50
0.402	0.05	0.10	27.20	27.35	57.81
15.360	0.33	0.36	34.67	35.35	60.00
* 21.505	0.36	0.48	46.11	46.95	60.00
28.039	0.39	0.57	44.44	45.41	60.00

Average:

The quasi-peak reading level is lower than the average limits, it is not necessary to measure the average level.

Remarks :

1. " * " means that this data is the worse emission level.
2. All readings are Quasi-peak and average values.

Attached individual pages of peak scan curve data sheets.

CONDUCTED EMISSION DATA

Date of Test	:	Oct. 26, 1998	Temperature	:	26 ℃
EUT	:	PC CAMERA	Humidity	:	52 %
Test Mode	:	Normal	Display Pattern	:	H Pattern
Detector Mode	:	Quasi-Peak & Average			

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line2 dBuV	Measurement Level Line2 dBuV	Limits dBuV
0.201	0.02	0.10	32.90	33.02	63.55
0.402	0.05	0.10	27.04	27.19	57.82
0.504	0.06	0.10	24.58	24.74	56.00
15.361	0.33	0.36	34.89	35.57	60.00
* 21.503	0.36	0.48	45.97	46.81	60.00
28.089	0.39	0.58	44.09	45.06	60.00

Average:

The quasi-peak reading level is lower than the average limits, it is not necessary to measure the average level.

Remarks :

1. " * " means that this data is the worse emission level.
2. All readings are Quasi-peak values.

Attached individual pages of peak scan curve data sheets.

QTK98-F004

4. Radiation Emission Test

4.1 Test Equipment

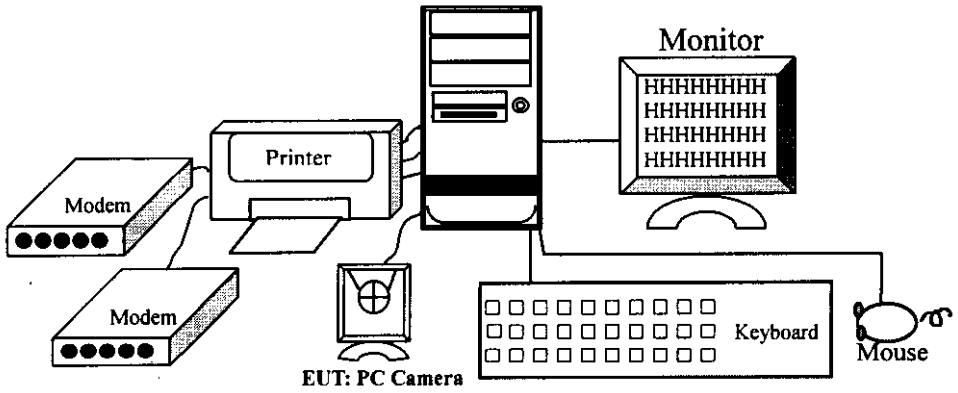
The following test equipments are used during the radiated emission tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Remark
SITE # 1	Test Receiver	R & S	ESCS 30 / 825442/14	May, 1998	
	Spectrum Analyzer	Advantest	R3261C / 71720140	May, 1998	
	Pre-Amplifier	HP	8447D/3307A01812	May, 1998	
	Bilog Antenna	Chase	CBL6112B / 12452	Sep.., 1998	
	Horn Antenna	EM	EM6917 / 103325	May, 1998	
	Dipole Antenna	Schwarzbeck	VHAP/866,UHAP/543	May, 1998	
SITE # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 1998	
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 1998	
	Pre-Amplifier	HP	8447D/3307A01814	May, 1998	
	Bilog Antenna	Chase	CBL6112B / 2455	Sep.., 1998	
	Horn Antenna	EM	EM6917 / 103325	May, 1998	
	Dipole Antenna	Schwarzbeck	VHAP/866,UHAP/543	May, 1998	

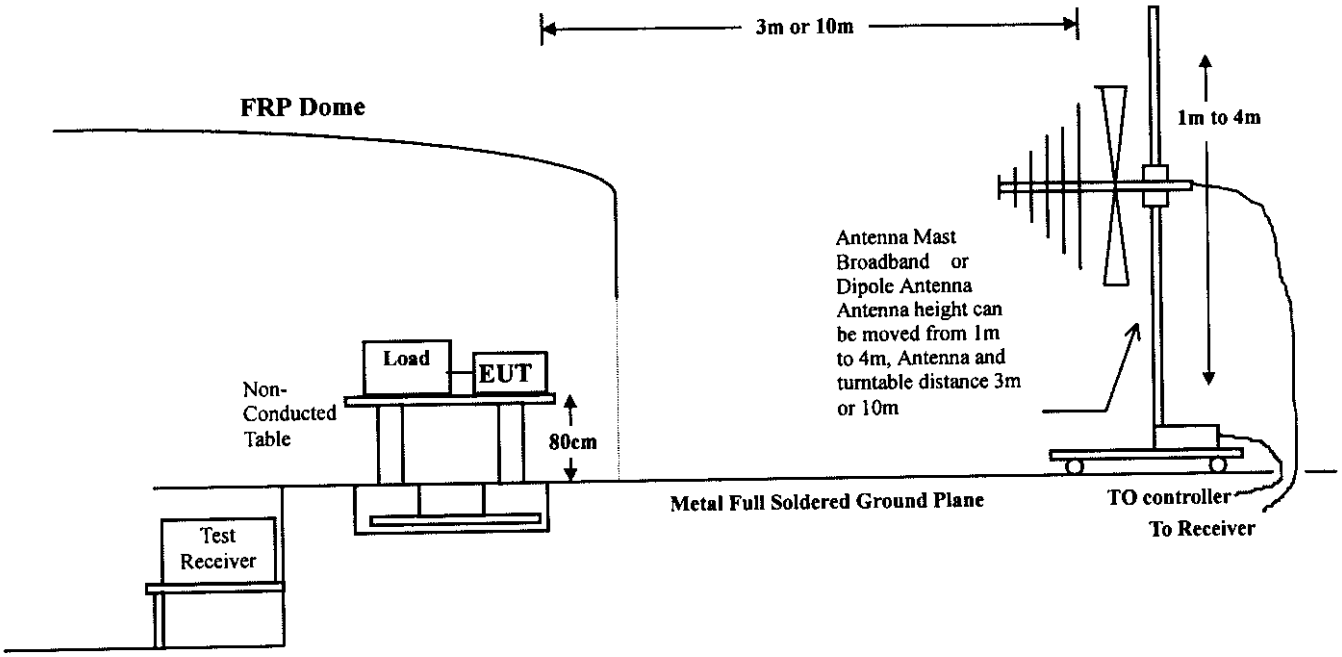
Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
2. Test Site : ☒ Site #1 , ☐ Site #2

4.2 Test Setup

4.2.1 Block Diagram of Connections between EUT and simulators



4.2.2 Open Test Site Setup Diagram



4.3 Radiated Emission Limit

[] CISPR 22 Limits:

Frequency	Class A		Class B	
MHz	Distance (m)	Limits (dBuV/m)	Distance (m)	Limits (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.

4.4 EUT Configuration

The equipments which is listed 4.2.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.5 Operating Condition of EUT

Same as Conducted Power Line Test which is listed in 3.5.

4.6 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. EUT is set 10 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Broadband antenna (calibrated bi-log and horn antenna) are used as a eceiving antenna. 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.

The bandwidth below 1Ghz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 KHz, above 1Ghz are 1 MHz.

The frequency range from **30Mhz to 1000Mhz** is checked.

4.7 Radiated Emission Data

The initial step in collecting radiated data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

The uncertainty is calculated in accordance with Namas NIS 81.The total uncertainty for this test is as follows:
- Uncertainty in the field strength measured: $< \pm 4.0$ dB

Radiated Emission Data

Test of Mode	:	Oct. 03, 1998	Temperature	:	26 ℃
EUT	:	PC CAMERA	Humidity	:	56 %
Test Mode	:	Normal	Display Pattern	:	H Pattern

Frequency	Cable Loss	Ant Factor	Reading Level Horizontal	Emission Level Horizontal	Limits	Ant Table	
MHz	dB	dB/m	dBuV/m	dBuV/m	dBuV/m	cm	deg
48.002	1.33	8.92	7.23	17.48	30	401	95
144.006	2.24	11.16	12.40	25.80	30	401	45
192.007	2.71	9.00	14.22	25.93	30	401	67
204.007	2.83	9.38	10.09	22.30	30	401	67
372.012	4.13	14.84	13.32	32.29	37	272	175
396.016	4.26	15.59	13.55	33.40	37	268	183
432.016	4.44	16.31	12.82	33.57	37	226	203
444.016	4.50	16.42	10.59	31.51	37	232	197
* 492.016	4.76	17.37	12.62	34.75	37	189	102
504.016	4.82	17.29	10.87	32.97	37	160	95

Remarks:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. " * ", means this data is the worse emission level.
3. Emission Level = Reading Level + Antenna Factor + Cable loss

Radiated Emission Data

Test of Mode	:	Oct. 03, 1998	Temperature	:	26 ℃
EUT	:	PC CAMERA	Humidity	:	56 %
Test Mode	:	Normal	Display Pattern	:	H Pattern

Frequency	Cable Loss	Ant Factor	Reading Level Vertical	Emission Level Vertical	Limits	Ant Table	
MHz	dB	dB/m	dBuV/m	dBuV/m	dBuV/m	cm	deg
48.009	1.33	8.03	12.15	21.51	30	100	40
144.000	2.24	10.86	10.29	23.39	30	100	28
204.006	2.83	9.46	7.70	19.99	30	100	181
228.006	3.06	10.01	10.97	24.03	30	100	125
* 240.006	3.17	11.22	17.02	31.41	37	100	125
252.006	3.29	12.79	13.23	29.31	37	100	126
324.006	3.88	14.29	9.36	27.53	37	127	142
336.011	3.94	14.63	8.45	27.02	37	100	141
396.009	4.26	15.81	6.60	26.67	37	100	104

Remarks:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. " * ", means this data is the worse emission level.
3. Emission Level = Reading Level + Antenna Factor + Cable loss

5. Summarization of Test Results

The test results in the conducted and radiated emission 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 summarization of the worst value of conducted and radiated emission test is described as below:

[] The worse value of Conducted Emission Test

Frequency (MHz)	Line	Measurement Level dB(uV)	Limit Level dB(uV)	Comment
21.505	L1	46.95	60	Pass
21.503	L2	46.81	60	Pass

[] The worse value of Radiated Emission Test

Frequency (MHz)	Polarization	Measurement Level dB(uV)	Limit Level dB(uV)	Comment
492.016	H	34.75	37	Pass
240.006	V	31.41	37	Pass

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.

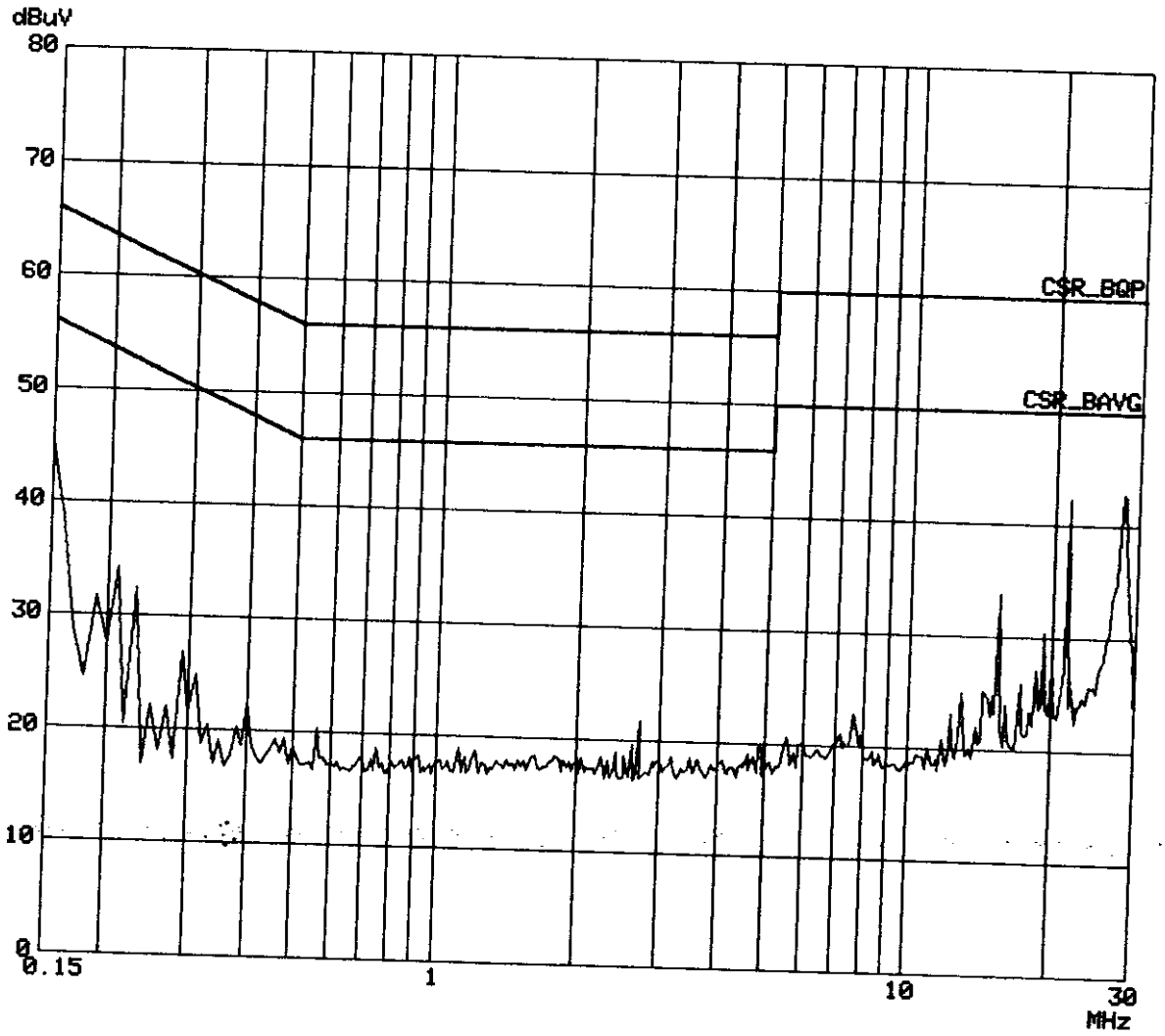
Quietek Corporation
ESCS 30 Test Receiver

EUT:	PC CAMERA
Manuf:	Pretec Corporation
Operator:	Jeff
Test Spec:	AC 110/60Hz
Comment:	M/N:PC-300
	Line L1
File name:	CISPR22B.SPC
Date:	26. Oct 98 13:34

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	10k	9k	PK	1ms	10dBLN	OFF

Final Measurement: x QP
Meas Time: 1 s



Manuf: Protec Corporation
Operator: Jeff
Test Spec: AC 110/60Hz
Comment: M/N:PC-300
Line N
File name: CISPR22B.SPC
Date: 26. Oct 98 13:44

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	10k	9k	PK	1ms	10dBLN	OFF

Final Measurement: x QP
Meas Time: 1 s