

FCC/MELLON

JAN 19 1999

**EXHIBIT 4**  
**RFI/EMI TEST REPORT**



# EMC

## TEST REPORT

REPORT NO. : F87122461

MODEL NO. : APC300

DATE OF TEST : Dec. 24, 1998

PREPARED FOR: AIPTEK INTERNATIONAL INC.

ADDRESS : 3F, NO. 5-1, INNOVATION RD. 1, SCIENCE-BASED  
INDUSTRIAL PARK, HSIN-CHU, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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## **TABLE OF CONTENTS**

1. CERTIFICATION.....	3
2. GENERAL INFORMATION .....	4
2.1    GENERAL DESCRIPTION OF EUT .....	4
2.2    DESCRIPTION OF SUPPORT UNITS .....	5
2.3    TEST METHODOLOGY AND CONFIGURATION.....	5
3. TEST INSTRUMENTS .....	6
3.1    TEST INSTRUMENTS (EMISSION).....	6
3.2    LIMITS OF CONDUCTED AND RADIATED EMISSION.....	7
4. TEST RESULTS (EMISSION) .....	8
4.1    RADIO DISTURBANCE.....	8
4.1.1    EUT OPERATION CONDITION .....	8
4.1.2    TEST DATA OF CONDUCTED EMISSION .....	9
4.1.3    TEST DATA OF RADIATED EMISSION.....	10
5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN.	12
6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT .....	14



1.

**CERTIFICATION**

Issue Date: Jan. 6, 1999

Product : PC Camera  
Trade Name : AIPTEK  
Model No. : APC300  
Applicant : AIPTEK INTERNATIONAL INC.  
Standard : FCC Part 15, Subpart B, Class B  
ANSI C63.4-1992  
CISPR 22: 1993 +A1+A2

We hereby certify that one sample of the designation has been tested in our facility on Dec. 24, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

TESTED BY: James Chen, DATE: 1/6/99  
(James Chen)

CHECKED BY: Rita Yi, DATE: 1/6/99  
(Rita Yi)

APPROVED BY: Stephen W.F. Chen, DATE: 1/6/99  
(Stephen W.F. Chen)

**ADVANCE DATA TECHNOLOGY CORPORATION****NVLAP<sup>®</sup>**

Accredited Laboratory



## **2. GENERAL INFORMATION**

### **2.1 GENERAL DESCRIPTION OF EUT**

Product	:	PC Camera
Model No.	:	APC300
Power Supply	:	DC 5V
Data Cable	:	Shielded (1.8m)

Note: The EUT is a PC Camera with USB connector. It provided user to capture still pictures, live video or stop frame video into their computer, and it can be incorporated into report, presentations and web pages.

For more detailed features, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.

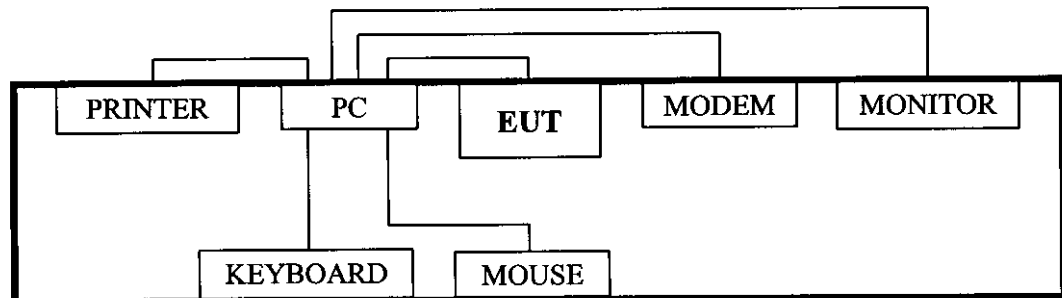


## 2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	IBM	2156-DIJ	FCC DoC	Nonshielded Power (1.8m)
2	MONITOR	ADI	937G	BR8937G	Shielded Signal (1.2m) Nonshielded Power (1.8m)
3	PRINTER	HP	C2642A	B94C2642X	Shielded Signal (1.2m) Nonshielded Power (1.8m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.1m) Nonshielded Power (2.1m)
5	MOUSE	LOGITECH	M-S35	DZL211029	Shielded Signal (1.8m)
6	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104	Shielded Signal (1.4m)

## 2.3 TEST METHODOLOGY AND CONFIGURATION



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 m on an open area test site. Please refer to the photos of test configuration in Item 5.



### 3. TEST INSTRUMENTS

#### 3.1 TEST INSTRUMENTS (EMISSION)

##### RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594E	3710A04861	Sept. 14, 1999
CHASE RF Pre Amplifier	CPA92320	1001	June 01, 1999
ROHDE & SCHWARZ Test Receiver	ESVS 10	846285/012	Dec. 15, 1999
CHASE Broadband Antenna	CBL6112A	2343	June 24, 1999
ROHDE & SCHWARZ Precision Dipole	HZ-12 (30~300MHz)	846932/0003	June 06, 2000
ROHDE & SCHWARZ Precision Dipole	HZ-13 (300~1000MHz)	846556/0007	June 17, 2000
HP Signal Generator	8657A	3225A05037	Sep. 17, 1999
EMCO Antenna Tower	2075-2	9712-2124	N/A
EMCO Turn Table	2081-1.53	9712-2030	N/A
EMCO Controller	2090	9712-1283	N/A
CORCOM AC Filter	MRI2030	107/108	N/A
ANRITSU RF Switch	MP59B	M50867	N/A
BELDEN RF Signal Cable	9913 RG-8/U	N/A	N/A
Open Field Test Site	Site A	ADT-RA	July 08, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.  
And the calibrations are traceable to NML/ROC and NIST/USA.

##### CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Nov. 13, 1999
ROHDE & SCHWARZ LISN	ESHS-Z5	848773/004	Nov. 11, 1999
KYORITSU LISN	KNW-407	8/1395/12	July 15, 1999
Shielded Room	Con A	ADT-CA	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months.  
And the calibrations are traceable to NML/ROC and NIST/USA.



### 3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

#### LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

#### LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.





#### 4. TEST RESULTS (EMISSION)

##### 4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)  
30 - 1000 MHz (Radiated Emission)  
Input Voltage : DC 5V  
Temperature : 22 °C  
Humidity : 60 %  
Atmospheric Pressure : 990 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -14.30 dB at 0.228 MHz Minimum passing margin of radiated emission: -3.9 dB at 48.00 MHz

##### 4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC reads a test program to enable all functions.
3. EUT captures images and sends image messages to PC.
4. PC sends image messages and "H" messages to monitor and monitor displays these messages simultaneously on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.



#### 4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: PC CameraMODEL: APC3006 dB Bandwidth: 10 kHz

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.228	46.60	-	48.20	-	62.50	52.50	-15.90	-	-14.30	-
0.341	35.70	-	41.30	-	59.20	49.20	-23.50	-	-17.90	-
0.681	34.50	-	33.80	-	56.00	46.00	-21.50	-	-22.20	-
1.474	35.90	-	32.50	-	56.00	46.00	-20.10	-	-23.50	-
16.000	37.80	-	32.90	-	60.00	50.00	-22.20	-	-27.10	-
21.503	43.60	-	41.60	-	60.00	50.00	-16.40	-	-18.40	-

- Remarks:
1. "\*": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  4. The emission level of other frequencies were very low against the limit.

# ADT CORP. SHIELDED ROOM A

## CISPR 22 CLASS B

EUT: APC300  
 Operator: JAMES CHEN  
 Test Spec: LISN :L  
 Comment: 120V AC / 60Hz  
 File name: CISPR22B.SPC  
 Date: 24. Dec 98 15:54

Report No.: F87122461

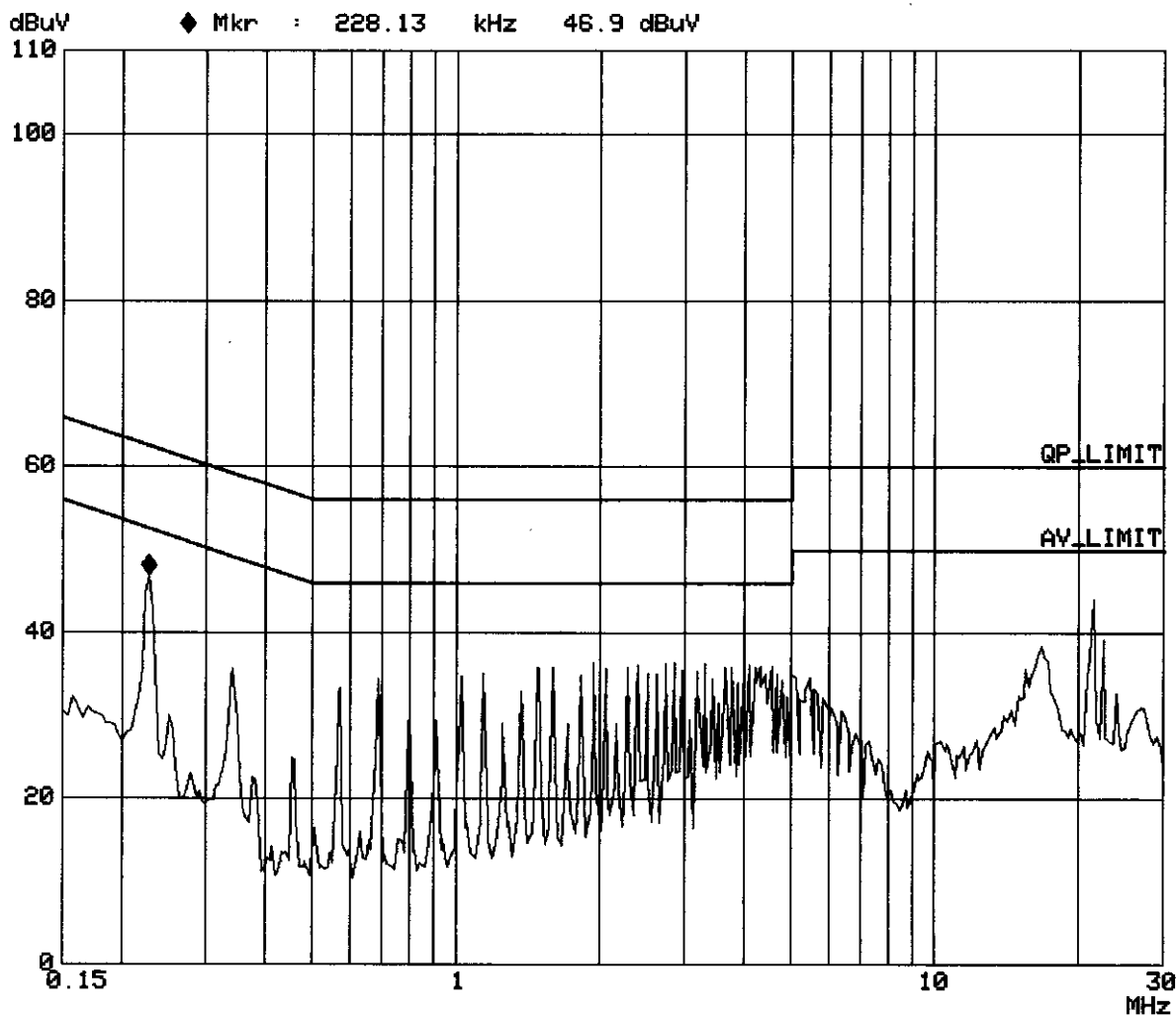
Page: 9-1

Test By: *James Chen*

### Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3.90625k	9k	PK	10ms	10dBLN	OFF
3M	10M	3.90625k	9k	PK	0.10ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.10ms	10dBLN	OFF

Transducer No.	Start	Stop	Name
1	150k	30M	C_CA_01A



# ADT CORP. SHIELDED ROOM A CISPR 22 CLASS B

EUT: APC300  
Operator: JAMES CHEN  
Test Spec: LISN :N  
Comment: 120V AC / 60Hz  
File name: CISPR22B.SPC  
Date: 24. Dec 98 15:47

Report No.: F87122461

Page: 9-2

Test By:

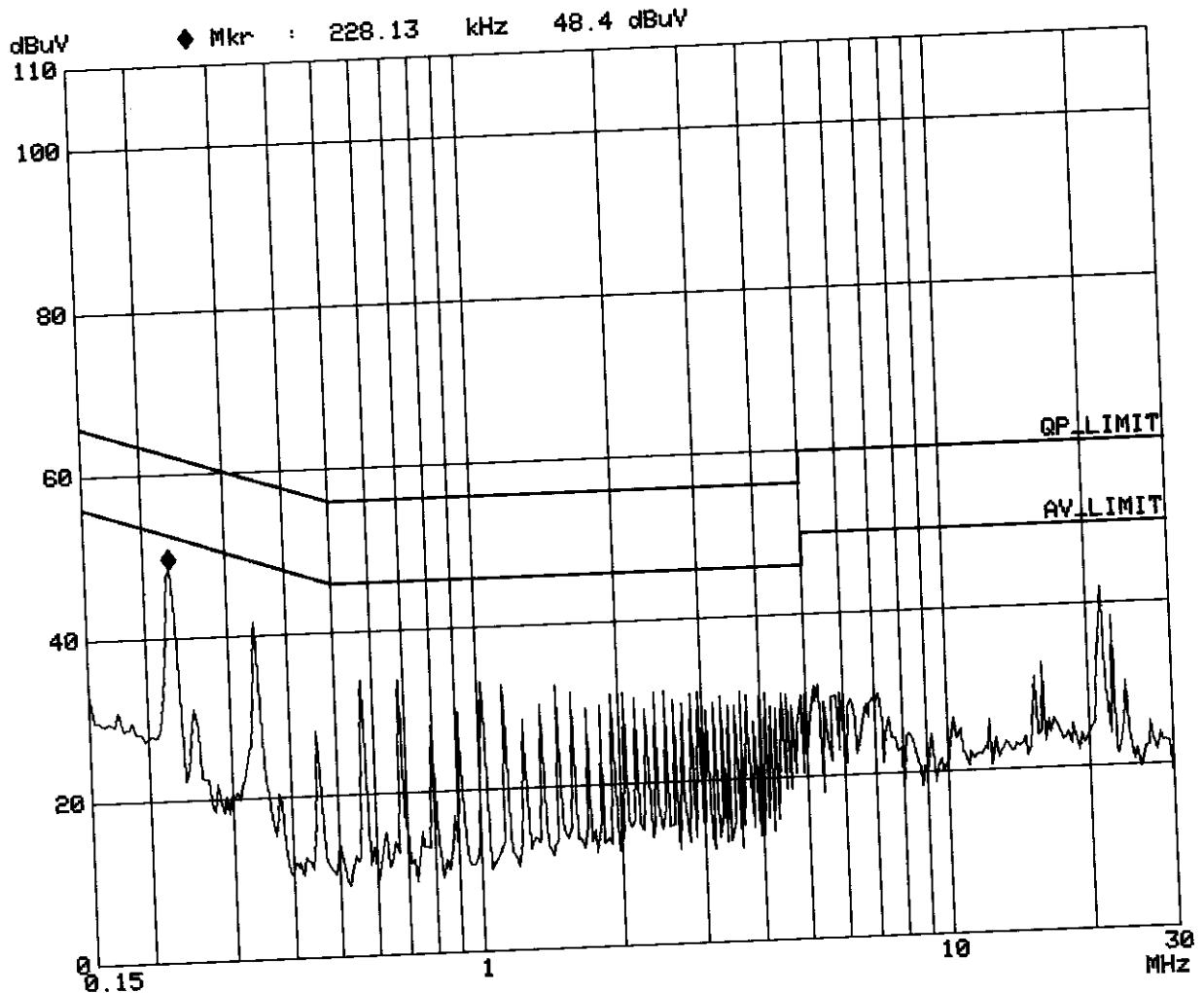
*James Chen*

## Overview Scan Settings (3 Ranges)

Frequencies		
Start	Stop	Step
150k	3M	3.90625k
3M	10M	3.90625k
10M	30M	3.90625k

Receiver Settings				
IF BW	Detector	M-Time	Atten	Preamp
9k	PK	10ms	10dBLN	OFF
9k	PK	0.10ms	10dBLN	OFF
9k	PK	0.10ms	10dBLN	OFF

Transducer No.	Start	Stop	Name
1	150k	30M	C_CA_01A





### 4.1.3 TEST DATA OF RADIATED EMISSION

EUT: PC CameraMODEL: APC300ANT. POLARITY: HorizontalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
48.01	10.1	12.3	22.4	30.0	-7.6
144.03	12.2	5.1	17.3	30.0	-12.7
168.01	12.3	7.8	20.1	30.0	-9.9
180.00	12.1	5.8	17.9	30.0	-12.1
192.01	11.7	9.9	21.6	30.0	-8.4
216.10	12.0	8.0	20.0	30.0	-10.0
240.00	12.7	11.2	23.9	37.0	-13.1
336.01	17.6	8.6	26.2	37.0	-10.8
384.00	18.9	7.5	26.4	37.0	-10.6
504.01	21.4	7.1	28.5	37.0	-8.5

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB/m) + Meter Reading (dBuV).
  2. Correction Factor (dB/m) = Ant. Factor (dB/m) + Cable loss (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level - Limit value



## TEST DATA OF RADIATED EMISSION

EUT: PC CameraMODEL: APC300ANTENNA: CHASE BILOG CBL6112APOLARITY: VerticalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
36.00	15.2	6.9	22.1	30.0	-7.9
48.00	9.9	16.2	26.1	30.0	-3.9
72.16	7.0	15.6	22.6	30.0	-7.4
120.01	12.4	9.8	22.2	30.0	-7.8
144.01	13.9	7.9	21.8	30.0	-8.2
156.00	13.5	8.7	22.2	30.0	-7.8
168.00	12.7	11.8	24.5	30.0	-5.5
180.00	11.8	8.4	20.2	30.0	-9.8
192.01	12.1	13.4	25.5	30.0	-4.5
216.10	12.0	8.0	20.0	30.0	-10.0
336.00	17.6	8.5	26.1	37.0	-10.9
384.01	18.6	8.6	27.2	37.0	-9.8

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB/m) + Meter Reading (dBuV).
  2. Correction Factor (dB/m) = Ant. Factor (dB/m) + Cable loss (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level - Limit value



## 6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT

### Specifications:

<b>Sensor Size</b>	1/3"
<b>Sensor Type</b>	Color COMOS image sensor
<b>Image Format</b>	YUV422
<b>Scan Mode</b>	24-bits RGB, 16-bits RGB
<b>Pixel Number</b>	640 x 480
<b>Frame Rate</b>	Up to 30 frames/second (CIF)
<b>Sensitivity</b>	20 Lux @ F1.4
<b>S/N Ratio</b>	42dB(15fps, 200 Lux, 25C)
<b>F/No</b>	$1.8 \pm 2\%$
<b>Focal Length</b>	$6.00 \pm 2\%$ mm
<b>Lens View Angle</b>	$\pm 28^\circ$
<b>Focus Limit</b>	3cm~Infinity
<b>Interface Type</b>	USB Port Complying with USB Spec1.0
<b>Power Supply</b>	Bus Powered
<b>OS Platform</b>	Win98/ WinNT 5.0
<b>Connector</b>	USB