



# Test Report

For

**Applicant** : MICROTEK INTERNATIONAL INC.  
**Equipment Type** : Image Scanner  
**Model** : DuoScan HiD  
**FCC ID** : EF9DUOSCANHID

**Report No. : 995021F**

# Test Report Certification

## QuieTek Corporation

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Accredited by NIST(NVLAP), VCCI, BSMI, DNV, TUV

Applicant : MICROTEK INTERNATIONAL INC.  
Address : No. 6, Industry East Rd. III, Science-based Industrial Park, Hsin  
Chu, Taiwan, R.O.C.  
Equipment Type : Image Scanner  
Model : DuoScan HiD  
Measurement Standard : CISPR 22/1994  
Measurement Procedure : ANSI C63.4 /1992  
FCC ID : EF9DUOSCANHID  
Operation Voltage : 120Vac/60Hz  
Classification : Class B  
Test Result : Complied  
Test Date : May 25, 1999  
Report No. : 995021F

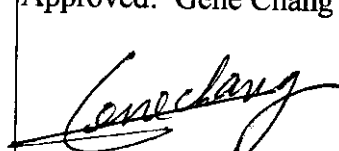
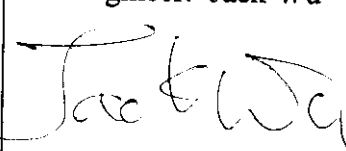
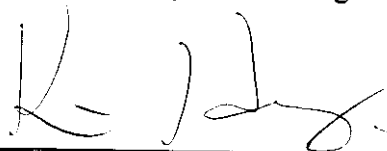
The Test Results relate only to the samples tested.

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Documented by: Kim Hung

Test Engineer: Jack Wu

Approved: Gene Chang



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## 1. General Information

### 1.1 EUT Description

Applicant : MICROTEK INTERNATIONAL INC.  
Address : No. 6, Industry East Rd. III, Science-based Industrial  
Park, Hsin Chu, Taiwan, R.O.C.  
Equipment Type : Image Scanner  
Model : DuoScan HiD  
FCC ID : EF9DUOSCANHID  
Operation Voltage : 120Vac/60Hz  
Power Cord : Shielded, 1.8m

*SCSI INTERFACE CABLE WITH ONE BONDED FERRITE CORE,  
SHIELDED 1.8M*

## **1.2 Tested System Details**

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

### **1.2.1 Host Personal Computer**

Model Number : P2L97  
Serial Number : 92M4Y00768  
FCC ID : DoC  
Manufacturer : ASUS  
Power Cord : Non-Shielded, 1.8m

### **1.2.2 Monitor**

Model Number : CM752ET-311  
Serial Number : T8F006364  
FCC ID : DoC  
Manufacturer : HITACHI  
Data Cable : Shielded, 1.5m  
Power Cord : Shielded, 1.8m

### **1.2.3 Keyboard**

Model Number : 6311-TW2C  
Serial Number : N/A  
FCC ID : DoC  
Manufacturer : ACER  
Data Cable : Shielded, 1.8m

### **1.2.4 Mouse**

Model Number : M-S34  
Serial Number : LZB75078463  
FCC ID : DZL211029  
Manufacturer : HP  
Data Cable : Shielded, 1.8m

### **1.2.5 CD-R**

Model Number : CD-R55S  
Serial Number : N/A  
FCC ID : DoC  
Manufacturer : TEAC  
Data Cable (SCSI) : Shielded, 1.5m

### 1.2.6 Printer

Model Number : C2642A  
Serial Number : MY75J1D1D0  
FCC ID : B94C2642X  
Manufacturer : HP  
Data Cable : Shielded, 1.2m  
Power Adapter : NMB, M/N: C2175A  
Cable for AC IN: Non-Shielded, 0.7m  
Cable for AC Out: Non-Shielded, 1.5m

### 1.2.7 Modem

Model Number : 1414  
Serial Number : 980033035  
FCC ID : IFAXDM1414  
Manufacturer : ACEEX  
Data Cable : Shielded, 1.5m  
Power Adapter : ACCEX, M/N: SCP41-91000A  
Cable Output : Shielded, 1.5m

### 1.2.8 Modem

Model Number : 1414  
Serial Number : 980033036  
FCC ID : IFAXDM1414  
Manufacturer : ACEEX  
Data Cable : Shielded, 1.5m  
Power Adapter : ACCEX, M/N: SCP41-91000A  
Cable Output : Shielded, 1.5m

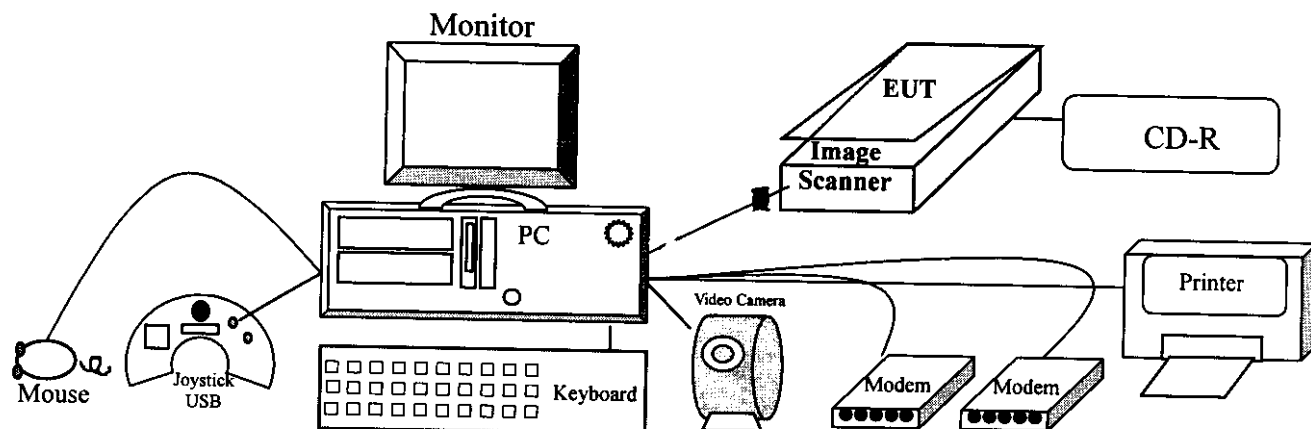
### 1.2.9 Joystick

Model Number : JPD110  
Serial Number : 9814A15646  
FCC ID : DoC  
Manufacturer : Maxxtro  
Data Cable : Shielded, 1.7m

### 1.2.10 Video Camera

Model Number : Vcam 3X  
Serial Number : N/A  
FCC ID : DoC  
Manufacturer : Mustek  
Data Cable (USB) : Shielded, 1.5m

### 1.3 EUT Configuration



### 1.4 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:

- 1.4.1 Setup the EUT and simulators as shown on 1.3
- 1.4.2 Turn on the power of all equipment.
- 1.4.3 Boot the PC from Hard Disk.
- 1.4.4 PC reads test software from disk and then sent to scanner.
- 1.4.5 The Scanner (EUT) will start to operate and scan the video figure into PC.
- 1.4.6 PC will display "video figure" on monitor.
- 1.4.7 Printer and modem will keep at standby mode during Scanner operation.
- 1.4.8 Repeat the above procedure 1.4.4 to 1.4.7

### 1.5 Test performed

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

Radiated emissions were investigated over the frequency range from **30MHz to 1000MHz** using a receiver bandwidth of 120kHz. Radiated testing was performed at an antenna to EUT distance of 10 meters .

## 1.6 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: November 3, 1998 File on

Federal Communications Commission

FCC Engineering Laboratory

7435 Oakland Mills Road

Columbia, MD 21046

Reference 31040/SIT1300F2



September 30, 1998 Accreditation on NVLAP

NVLAP Lab Code: 200347-0

February 23, 1999 Accreditation on DNV

Statement No. : 413-99-LAB11



December 8, 1998 Registration on VCCI

Registration No. for No.2 Shielded Room C-858

Registration No. for No.1 Open Area Test Site R-823

Registration No. for No.2 Open Area Test Site R-835



January 04, 1999 Accreditation on TÜV Rheinland

Certificate No.: I9865712-9901



Name of firm : QuieTek Corporation

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





## 2. Conducted Emission

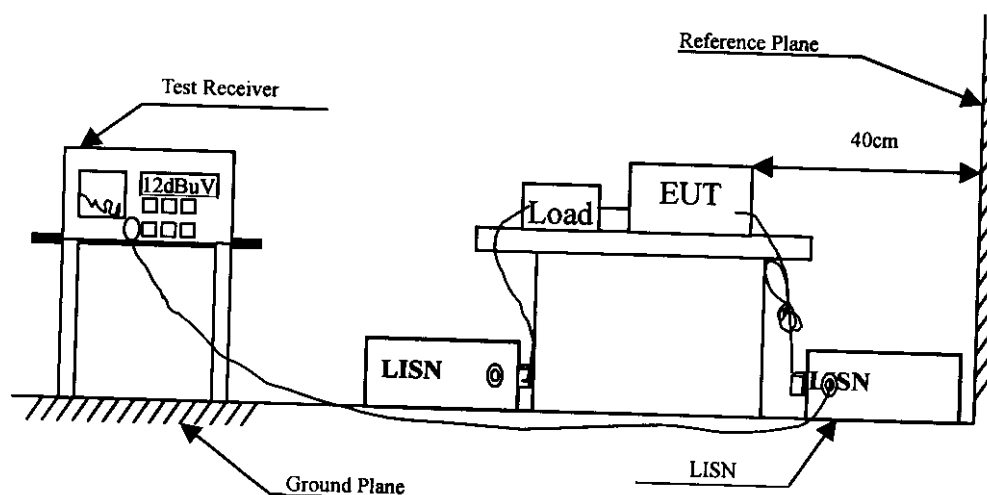
### 2.1 Test Equipment List

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 30/825442/17	May, 1999	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 1999	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 1999	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.

### 2.2 Test Setup



### 2.3 Limits

CISPR 22 Limits (dBuV)					FCC Part 15 Subpart B (dBuV)				
Frequency MHz	Class A		Class B		Frequency MHz	Class A		Class B	
	QP	AV	MHz	AV		uV	dBuV	uV	dBuV
0.15 - 0.50	79	66	66-56	56-46	0.45-1.705	1000	60.0	250	48.0
0.50-5.0	73	60	56	46	1.705-30	3000	69.5	250	48.0
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.

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

## **2.5 Test Results**

The emission from the EUT was below the specified limits. The worst case emissions are shown in Chapter 4. The acceptance criterion was met and the EUT passed the test.

### 3.3 Limits

CISPR 22 Limits (dBuV)					FCC Part 15 Subpart B (dBuV)				
Frequency MHz	Class A		Class B		Frequency	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m		uV	dBuV	uV	dBuV
30 – 230	10	40	10	30	30 – 88	90	39	100	40.0
230 – 1000	10	47	10	37	88 – 216	150	43.5	150	43.5
					216 – 960	210	46.5	200	46.0
					960 - 2000	300	49.5	500	54.0

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) =  $20 \log \text{RF Line Voltage (uV)}$

### 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.

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

### 3.5 Test Results

The emission from the EUT was below the specified limits. The worst case emissions are shown in Chapter 4. The acceptance criterion was met and the EUT passed the test.

#### 4. Summary of Test Results

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 the attached data.

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

(1) Mode 1 : Normal Operation

**The EUT passed all the tests.**

The uncertainty is calculated in accordance with NAMAS NIS 81, The total uncertainty for this test is as follows:

➤ **Emission Test**

- Uncertainty in the Conducted Emission Test:  $< \pm 2.0 \text{ dB}$
- Uncertainty in the field strength measured:  $< \pm 4.0 \text{ dB}$

## CONDUCTED EMISSION DATA

Date of Test	:	May 25, 1999	EUT	:	Image Scanner
Test Mode	:	Mode 1	Detect Mode	:	Quasi-Peak & Average

Frequency	Cable	LISN	Reading Level	Measurement Level	Limits
MHz	Loss	Factor	Line1	Line1	
	dB	dB	dBuV	dBuV	dBuV
*0.151	0.00	0.10	49.91	50.01	65.93
0.188	0.01	0.10	43.61	43.72	64.11
0.223	0.02	0.10	37.11	37.23	62.69
0.263	0.03	0.10	37.21	37.34	61.34
4.832	0.20	0.17	31.93	32.30	56.00
11.275	0.29	0.24	30.63	31.16	60.00

**Average:**

0.151	0.00	0.10	40.50	40.60	55.94
0.188	0.01	0.10	34.80	34.91	54.12
0.224	0.02	0.10	28.90	29.02	52.67
0.262	0.03	0.10	30.70	30.83	51.37
4.830	0.20	0.17	27.60	27.97	46.00
21.270	0.36	0.47	26.80	27.64	50.00

**Remarks :**

1. " \* " means that this data is the worst emission level.



## CONDUCTED EMISSION DATA

Date of Test	May 25, 1999	EUT	Image Scanner
Test Mode	Mode 1	Detect Mode	Quasi-Peak & Average

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line2 dBuV	Measurement Level Line2 dBuV	Limits dBuV
*0.151	0.00	0.10	49.49	49.59	65.97
0.184	0.01	0.10	40.33	40.44	64.31
0.222	0.02	0.10	37.95	38.07	62.75
2.280	0.15	0.14	34.15	34.44	56.00
5.978	0.22	0.18	31.83	32.23	60.00
12.406	0.30	0.28	37.85	38.43	60.00

**Average:**

0.151	0.00	0.10	40.50	40.60	55.94
0.183	0.01	0.10	31.80	31.91	54.35
0.222	0.02	0.10	30.20	30.32	52.74
2.270	0.15	0.14	30.20	30.49	46.00
5.970	0.22	0.18	26.40	26.80	50.00
12.470	0.30	0.28	33.20	33.78	50.00

**Remarks :**

1. " \* " means that this data is the worst emission level.



## Radiated Emission Data

Date of Test : May 25, 1999 EUT : Image Scanner  
 Test Mode : Mode 1 Detect Mode : Quasi-Peak

Freq.	Cable	Probe	PreAMP	Reading	Measurement	Margin	Limit	Ant	Turn
	Loss	Factor		Level	Horizontal				
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m	cm	deg
*200.000	2.78	9.30	0.00	13.57	25.65	4.35	30.00	400	24
240.000	3.17	11.32	0.00	17.05	31.54	5.46	37.00	400	68
270.000	3.47	13.00	0.00	10.36	26.82	10.18	37.00	400	20
315.000	3.83	13.63	0.00	10.61	28.07	8.93	37.00	400	12
330.000	3.91	13.61	0.00	10.92	28.44	8.56	37.00	400	31
390.000	4.22	15.29	0.00	8.22	27.72	9.28	37.00	400	13
405.000	4.30	15.88	0.00	8.68	28.86	8.14	37.00	368	23

Remarks:

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

## Radiated Emission Data

Date of Test : May 25, 1999 EUT : Image Scanner  
 Test Mode : Mode 1 Detect Mode : Quasi-Peak

Freq.	Cable	Probe	PreAMP	Reading	Measurement	Margin	Limit	Ant	Turn
MHz	Loss	Factor		Level	Vertical			cm	deg
	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m		
150.000	2.31	10.43	0.00	12.54	25.28	4.72	30.00	99	10
195.000	2.74	9.01	0.00	13.57	25.32	4.68	30.00	99	12
210.000	2.89	9.35	0.00	14.01	26.24	3.76	30.00	99	10
240.000	3.17	11.22	0.00	18.24	32.63	4.37	37.00	99	11
300.000	3.76	13.56	0.00	13.51	30.82	6.18	37.00	99	10
315.000	3.83	14.16	0.00	13.97	31.96	5.04	37.00	99	20
*330.000	3.91	14.36	0.00	15.70	33.97	3.03	37.00	99	15

### Remarks:

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





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

No modification was made during testing.

