Test Report

Product Name : Image Scanner

Model No. : MRS-1200T48U

FCC ID.: EF9MRS-1200T48U

Applicant : Microtek International Inc.

Address : No.6, Industry East Rd.3, Science-Based Industrial Park, Hsin Chu, Taiwan, R.O.C.

Date of Receipt : May 16, 2001

Date of Test : June 05, 2001

Report No. : 015H056FI

The Test Results relate only to the samples tested.

Test Report Certification

Test Date : June 05, 2001
Report No. : 015H056FI

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

Product Name	:	Image Scanner
Applicant	:	Microtek International Inc.
Address	:	No.6, Industry East Rd.3, Science-Based Industrial Park, Hsin Chu, Taiwan, R.O.C.
Manufacturer	:	Microtek International Inc.
Model No.	:	MRS-1200T48U
FCC ID.	:	EF9MRS-1200T48U
Rated Voltage	:	AC 120V/60Hz
Trade Name	:	Microtek
Measurement Standard	:	CISPR 22:1997
Measurement Procedure	:	ANSI C63.4:1992
Classification	:	Class B
Test Result	:	Complied

NVLAP 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 : Lisa Chen (Lisa Chen)

Tested By : Jison (Jison Chung)

Approved By : Gene Chang (Gene Chang)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	:	Image Scanner
Trade Name	:	Microtek
FCC ID.	:	EF9MRS-1200T48U
Model No.	:	MRS-1200T48U
USB Cable	:	Shielded, 1.5m, a ferrite core bonded
MTMA	:	Non-shielded, 0.9m, a ferrite core bonded
Power Adapter	:	High Power, HPW-1512A, Cable Out: Non-shielded, 1.8m, a ferrite core bonded
Power Adapter	:	Li Shin, LSE9801B12 (USA), Cable Out: Non-shielded, 1.8m, a ferrite core bonded
Power Adapter	:	DVE, DSA-0151A-12S, Cable Out: Non-shielded, 1.8m, a ferrite core bonded

Note:

1. The EUT is an Image Scanner with max resolution 1200*2400dpi.
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: Conducted Test Mode & Radiated Test Mode:

   Mode 1: Link PC, W/USB, W/MTMA, Adapter: High Power, HPW-1512A

   Mode 2: Link PC, W/USB, W/MTMA, Adapter: Li Shin, LSE9801B12 (USA)

   Mode 3: Link PC, W/USB, W/MTMA, Adapter: DVE, DSA-0151A-12S

1.2. Tested System Details

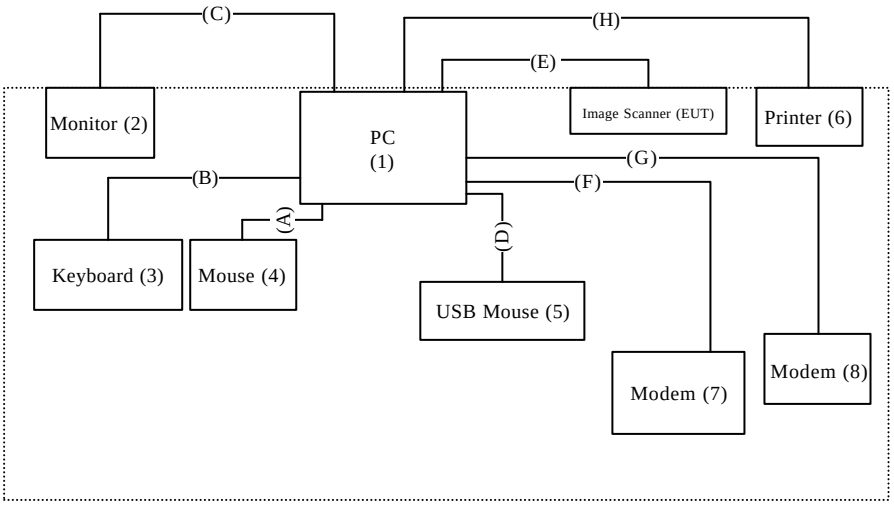
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID.
(1)	PC	ASUS	P2L97	92M4Y00777	DoC
(2)	Monitor	HITACHI	CM752ET-311	T8E004439	DoC
(3)	Keyboard	ACER	6311-TW4C	916590704C91F24343	--
(4)	Mouse	HP	M-S34	LZB75078428	--
(5)	USB Mouse	Logitech	M-UE55	LTC93813273	--
(6)	Printer	HP	C2642A	MY75N1D2Y1	B94C2642X
(7)	Modem	ACEEX	1414	980033035	--
(8)	Modem	ACEEX	1414	980033041	--

Note:
1. The power coed of The device. (2) is Shielded power cord.
2. The power coed of The device. (1)、(16) are Non-shielded power cord.

Signal Cable Type		Signal cable Description
A.	PS2 Data Cable	Non-shielded, 1.8m
B.	PS2 Data Cable	Non-shielded, 1.8m
C.	VGA Cable	Shielded, 1.8m, a ferrite Core bonded
D.	USB Data Cable	Shielded, 0.9m
E.	USB Cable	Shielded, 1.5m, a ferrite Core bonded
F.	RS232 Cable	Non-shielded, 1.8m
G.	RS232 Cable	Non-shielded, 1.8m
H.	Printer Cable	Shielded, 1.8m
I.	MTMA Cable	Non-shielded, 0.9m, 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) PC reads test software from the control BIOS of scanner and then sent to scanner.

(5) The Scanner (EUT) will start to operate and scan the video figure into PC.

(6) PC will display "video figure" on monitor.

(7) Printer and modem will keep at standby mode during EUT operation.

(8) Repeat the above procedure (4) to (7).

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: 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

NVLAP Lab Code : 200347-0

Site Name: Quietek Corporation

Site Address: N0.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwa, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

2. Conducted Emission

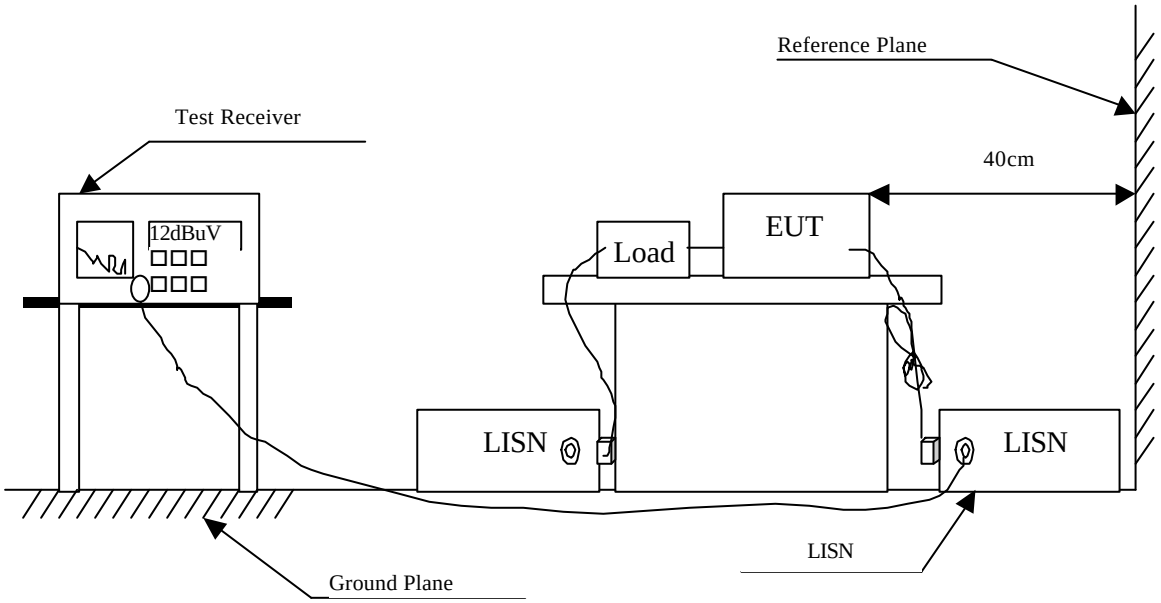
2.1. Test Equipment List

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, 2001	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2001	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2001	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)				
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

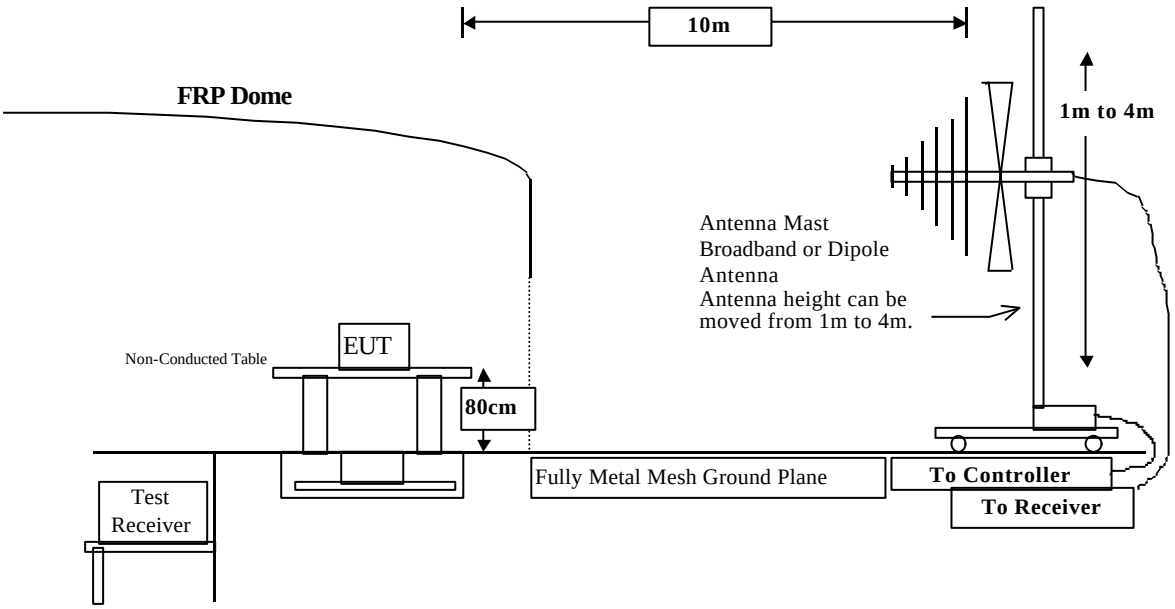
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	X	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2001
		Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2001
		Pre-Amplifier	HP	8447D/3307A01812	May, 2001
	X	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2000
	X	Horn Antenna	EM	EM6917 / 103325	May, 2001
Site # 2	X	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2001
		Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2001
		Pre-Amplifier	HP	8447D/3307A01814	May, 2001
	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2000
	X	Horn Antenna	EM	EM6917 / 103325	May, 2001

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

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

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 invested over the frequency range from 30MHz to1GHz 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:

Conducted Test Mode & Radiated Test Mode:

Mode 1: Link PC, W/USB, W/MTMA, Adapter: High Power, HPW-1512A

Mode 2: Link PC, W/USB, W/MTMA, Adapter: Li Shin, LSE9801B12 (USA)

Mode 3: Link PC, W/USB, W/MTMA, Adapter: DVE, DSA-0151A-12S

5.1. Test Data of Conducted Emission

Product : Image Scanner
Test Item : Conducted Emission Test
Test Mode : Mode 1: Link PC, W/USB, W/MTMA, Adapter: High Power, HPW-1512A

Frequency	Cable Loss	LISN Factor	Reading Level	Measurement Level	Limits
MHz	dB	dB	dBuV	dBuV	dBuV
Line 1					
Quasi-Peak					
*0.158	0.00	0.10	52.89	52.99	65.55
0.174	0.01	0.10	44.24	44.35	64.77
0.216	0.02	0.10	45.55	45.67	62.96
0.380	0.05	0.10	38.91	39.06	58.27
1.029	0.10	0.10	41.60	41.80	56.00
3.177	0.17	0.15	41.33	41.65	56.00
Average					
0.158	0.00	0.10	42.40	42.50	55.57
0.174	0.01	0.10	22.00	22.11	54.77
0.216	0.02	0.10	28.60	28.72	52.97
0.380	0.05	0.10	25.80	25.95	48.28
1.029	0.10	0.10	24.30	24.50	46.00
3.177	0.17	0.15	29.10	29.42	46.00
Line 2					
Quasi-Peak					
*0.163	0.00	0.10	56.62	56.72	65.31
0.189	0.01	0.10	46.18	46.29	64.08
0.404	0.05	0.10	48.39	48.54	57.77
0.459	0.06	0.10	36.80	36.96	56.72
1.849	0.14	0.13	42.84	43.10	56.00
3.341	0.18	0.15	38.89	39.22	56.00
Average					
0.163	0.00	0.10	50.10	50.20	55.31
0.189	0.01	0.10	31.70	31.81	54.08
0.404	0.05	0.10	38.80	38.95	47.77
0.459	0.06	0.10	21.50	21.66	46.71
1.849	0.14	0.13	29.50	29.76	46.00
3.341	0.18	0.15	28.20	28.53	46.00

Note:

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

Product : Image Scanner
Test Item : Conducted Emission Test
Test Mode : Mode 2: Link PC, W/USB, W/MTMA, Adapter: Li Shin, LSE9801B12 (USA)

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Measurement Level dBuV	Limits dBuV
Line 1					
Quasi-Peak					
0.160	0.00	0.10	40.94	41.04	65.44
*0.209	0.02	0.10	40.96	41.08	63.26
0.369	0.05	0.10	34.57	34.72	58.53
0.519	0.07	0.10	37.79	37.96	56.00
2.748	0.16	0.14	31.96	32.27	56.00
9.002	0.27	0.20	30.43	30.89	60.00
Average					
0.160	0.00	0.10	23.60	23.70	55.46
0.209	0.02	0.10	31.30	31.42	53.24
0.369	0.05	0.10	22.00	22.15	48.52
0.519	0.07	0.10	29.90	30.07	46.00
2.748	0.16	0.14	15.70	16.01	46.00
9.002	0.27	0.20	27.80	28.26	50.00
Line 2					
Quasi-Peak					
*0.168	0.01	0.10	46.72	46.83	65.05
0.204	0.02	0.10	44.38	44.50	63.47
0.463	0.06	0.10	35.64	35.80	56.65
1.248	0.11	0.11	29.29	29.51	56.00
2.656	0.16	0.14	34.79	35.09	56.00
8.998	0.27	0.20	26.84	27.30	60.00
Average					
0.168	0.01	0.10	34.30	34.41	55.06
0.204	0.02	0.10	38.60	38.72	53.45
0.463	0.06	0.10	23.30	23.46	46.64
1.248	0.11	0.11	23.40	23.62	46.00
2.656	0.16	0.14	27.00	27.30	46.00
8.998	0.27	0.20	23.20	23.66	50.00

Note:

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

Product : Image Scanner
Test Item : Conducted Emission Test
Test Mode : Mode 3: Link PC, W/USB, W/MTMA, Adapter: DVE, DSA-0151A-12S

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Measurement Level dBuV	Limits dBuV
Line 1					
Quasi-Peak					
*0.158	0.00	0.10	55.45	55.55	65.59
0.197	0.01	0.10	46.84	46.95	63.73
0.238	0.02	0.10	49.58	49.70	62.18
0.296	0.04	0.10	42.06	42.20	60.35
2.276	0.15	0.14	44.15	44.44	56.00
3.534	0.18	0.15	33.48	33.81	56.00
Average					
0.158	0.00	0.10	35.60	35.70	55.57
0.197	0.01	0.10	39.10	39.21	53.74
0.238	0.02	0.10	26.30	26.42	52.17
0.296	0.04	0.10	24.10	24.24	50.35
2.277	0.15	0.14	31.90	32.19	46.00
3.534	0.18	0.15	25.30	25.63	46.00
Line 2					
Quasi-Peak					
*0.150	0.01	0.10	52.19	52.30	66.00
0.177	0.01	0.10	46.79	46.90	64.61
0.259	0.03	0.10	34.81	34.94	61.46
0.941	0.10	0.10	37.30	37.50	56.00
2.275	0.15	0.14	41.69	41.98	56.00
3.209	0.17	0.15	32.84	33.16	56.00
Average					
0.150	0.01	0.10	36.00	36.11	56.00
0.177	0.01	0.10	35.10	35.21	54.63
0.259	0.03	0.10	23.00	23.13	51.46
0.941	0.10	0.10	23.80	24.00	46.00
2.275	0.15	0.14	34.60	34.89	46.00
3.209	0.17	0.15	26.00	26.32	46.00

Note:

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

5.2. Test Data of Radiated Emission

Product : Image Scanner
Test Item : Radiated Emission
Test Site : No.1 OATS
Test Mode : Mode 1: Link PC, W/USB, W/MTMA, Adapter: High Power, HPW-1512A

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal							
132.008	2.13	11.39	0.00	6.90	20.43	9.57	30.00
144.012	2.24	11.16	0.00	11.40	24.80	5.20	30.00
193.512	2.73	9.15	0.00	13.40	25.28	4.72	30.00
*207.025	2.86	9.46	0.00	16.50	28.82	1.18	30.00
243.025	3.20	11.82	0.00	14.30	29.32	7.68	37.00
360.038	4.07	14.70	0.00	12.00	30.77	6.23	37.00
378.038	4.16	14.85	0.00	13.80	32.81	4.19	37.00
576.063	5.20	18.72	0.00	7.40	31.31	5.69	37.00
744.075	6.07	20.07	0.00	7.20	33.35	3.65	37.00
Vertical							
*144.000	2.24	10.86	0.00	15.10	28.20	1.80	30.00
180.012	2.60	9.21	0.00	10.70	22.51	7.49	30.00
189.020	2.68	8.91	0.00	11.20	22.79	7.21	30.00
198.020	2.77	8.97	0.00	15.00	26.74	3.26	30.00
216.025	2.94	9.13	0.00	10.60	22.67	7.33	30.00
378.038	4.16	15.43	0.00	7.80	27.39	9.61	37.00
414.038	4.35	16.64	0.00	5.80	26.79	10.21	37.00

Note:

1. All Reading Levels 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 – Preamp.

Product : Image Scanner
Test Item : Radiated Emission
Test Site : No.1 OATS
Test Mode : Mode 2: Link PC, W/USB, W/MTMA, Adapter: Li Shin, LSE9801B12 (USA)

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal							
136.510	2.18	11.70	0.00	6.60	20.47	9.53	30.00
144.000	2.24	11.16	0.00	12.60	26.00	4.00	30.00
156.015	2.36	10.67	0.00	12.60	25.63	4.37	30.00
162.015	2.42	10.09	0.00	16.20	28.71	1.29	30.00
178.520	2.58	9.60	0.00	10.60	22.78	7.22	30.00
*198.020	2.77	9.15	0.00	16.80	28.72	1.28	30.00
216.020	2.94	9.11	0.00	16.00	28.05	1.95	30.00
324.030	3.88	13.64	0.00	10.30	27.83	9.17	37.00
450.050	4.53	16.51	0.00	11.80	32.84	4.16	37.00
504.055	4.82	17.29	0.00	13.20	35.30	1.70	37.00
Vertical							
60.025	1.44	6.00	0.00	11.40	18.84	11.16	30.00
*132.000	2.13	11.49	0.00	15.20	28.83	1.17	30.00
144.000	2.24	10.86	0.00	13.60	26.70	3.30	30.00
156.015	2.36	10.39	0.00	8.60	21.35	8.65	30.00
180.018	2.60	9.21	0.00	9.70	21.51	8.49	30.00
198.020	2.77	8.97	0.00	12.80	24.54	5.46	30.00
216.025	2.94	9.13	0.00	12.30	24.37	5.63	30.00
414.040	4.35	16.64	0.00	4.50	25.49	11.51	37.00
432.038	4.44	16.83	0.00	6.80	28.08	8.92	37.00
468.050	4.63	17.15	0.00	9.90	31.68	5.32	37.00

Note:

1. All Reading Levels 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 – Preamp.

Product : Image Scanner
Test Item : Radiated Emission
Test Site : No.1 OATS
Test Mode : Mode 3: Link PC, W/USB, W/MTMA, Adapter: DVE, DSA-0151A-12S

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal							
132.000	2.13	11.39	0.00	5.60	19.13	10.87	30.00
144.015	2.24	11.16	0.00	11.90	25.30	4.70	30.00
156.000	2.36	10.67	0.00	10.60	23.63	6.37	30.00
162.015	2.42	10.09	0.00	12.70	25.21	4.79	30.00
178.515	2.58	9.60	0.00	11.30	23.48	6.52	30.00
193.520	2.73	9.15	0.00	14.90	26.78	3.22	30.00
*198.020	2.77	9.15	0.00	16.10	28.02	1.98	30.00
216.030	2.94	9.11	0.00	15.03	27.08	2.92	30.00
324.035	3.88	13.64	0.00	9.10	26.63	10.37	37.00
450.450	4.54	16.51	0.00	11.60	32.65	4.35	37.00
504.050	4.82	17.29	0.00	12.60	34.70	2.30	37.00
Vertical							
114.007	1.96	11.35	0.00	11.20	24.51	5.49	30.00
124.512	2.06	11.39	0.00	11.20	24.65	5.35	30.00
144.000	2.24	10.86	0.00	10.20	23.30	6.70	30.00
156.000	2.36	10.39	0.00	10.40	23.15	6.85	30.00
162.000	2.42	10.23	0.00	11.80	24.45	5.55	30.00
180.015	2.60	9.21	0.00	12.70	24.51	5.49	30.00
189.015	2.68	8.91	0.00	10.20	21.79	8.21	30.00
*216.000	2.94	9.13	0.00	13.80	25.87	4.13	30.00
432.045	4.44	16.83	0.00	9.80	31.08	5.92	37.00
468.050	4.63	17.15	0.00	10.10	31.88	5.12	37.00

Note:

1. All Reading Levels 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 – Preamp.

Attachment 1 : EUT Test Photographs

Attachment 2 : EUT Detailed Photographs