

**Test Report
Application for Certification**

**On Behalf Of
SPOT Technology Inc.**

**Scanner
FCC ID: MLDFS-12UU2F**

Model No.:FS-12UU2F

**Prepared for:
SPOT Technology Inc.
No. 115, Community 4, Chang 16, Tung Kuang Li,
Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.**



**Report By : Global EMC Standard Tech. Corp.
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GESTEK 98-FO18

1. Test Report Certification

Applicant : SPOT Technology Inc.

Manufacturer : SPOT Technology Inc.

EUT Description : Scanner

(A) Model No. : FS-12UU2F

(B) FCC ID : MLDFS-12UU2F

(C) Serial No. : ProtoType

(D) Power : 110V/60Hz

MEASUREMENT PROCEDURE USED :

CFR 47, Part 15 Radio Frequency Device Subpart B Unintentional Radiators Class B :1996

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

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 MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE FCC LIMITS APPLICABLE.



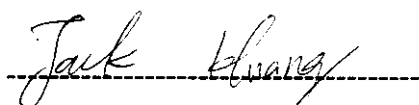
Sample Received Date : Aug. 02, 1998

Final Test Date : Aug. 29, 1998

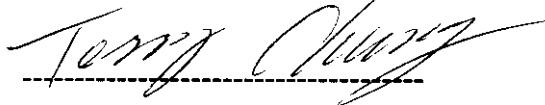
Documented by : Joan Chein

Test Engineer :

Approve & Authorized Signer :



JACK HUANG



TERRY CHUNG

This test data shown below is traceable to NIST.

2. General Information

2.1 Production Description

Description : Scanner

Model Number : FS-12UU2F

FCC ID : MLDSF-12UU2F

Serial Number : ProtoType

Applicant : SPOT Technology Inc.

Address : No. 115, Community 4, Chang 16, Tung Kuang Li,
Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.

Manufacturer : SPOT Technology Inc.

Address : No. 115, Community 4, Chang 16, Tung Kuang Li,
Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.

Adaptor : 1. SYS, Model No.: SYS 1089-1512L-W2
2. DVE, Model No.: DSA-0151A-12S

Test Mode:

Mode 1: FS-12UU2F ,Resolution:640X480 H-sync:31.5KHz V-sync:60MHz

Adaptor: SYS, Model No.: SYS1089-1512L-W2

Mode 2: FS-12UU2F, Resolution:640X480 H-sync:31.5KHz V-sync:60MHz

Adaptor: DVE, Model No.: DSA-0151A-12S

Note : 1.The EUT(Scanner) use two of Adaptor manufacturs as follow.
2. The Adaptor Input AC:100-120V ; Output DC: 12V/1.25A

2.2 Tested System Details

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

☒ Host Personal Computer

Serial Number : N/A
FCC ID : DoC
Manufacturer : Vectra VE,5/200 MMX Series 4DT by HP
CPU : Manufacture: Intel MMX 200MHz, Clock:66MHz.
Mother Board : Manufacture : HP
Model: NR/B A06 753
Floppy Disk Driver : Manufacturer: HP
3.5" #1 Model: D2035-60172
HDD : Manufacturer: Quantum,
Model: D5193-69001
Disk Ctrl Card : On board
I/O Card : On board
VGA Card : On board
Switching Power Supply: Manufacturer: HP
Model: SPW1369
Power Cord : Non-Shielded, Detachable, 1.5m

☒ Monitor M01-009

Model Number : SyncMaster 700p
Serial Number : H3MH903253H
Manufacturer : SAMSUNG
FCC ID : A3LCGH760
BCIQ ID : 3872A230
Data Cable : Shielded, Undetachable, 1.5m
Power Cord : Shielded, Detachable, 1.5m

☒ Keyboard K01-032

Model Number : KB-5923
Serial Number : 8060032216
FCC ID : E8HKB-5923
Manufacturer : TATUNG
BCIQ ID : 3862A177
Data Cable : Sheiled, Undetachable, 2.0 m

☒ Printer P01-009

Model Number : C2642A(DJ-400)
Serial Number : MY7951C4RW
FCC ID : B94C2642X
Manufacturer : HP
Adaptor & Power Cord : AC 110V, 60Hz To DC 30V
: Non-Shielded, Detachable, 1.9m
Data Cable : Shielded, Detachable, 1.8m

☒ Modem M03-010

Model Number : 1414
Serial Number : 960018043
FCC ID : IFAXDM1414
Manufacturer : ACEEX
Adaptor & Power Cord : Non-Shielded, Detachable, 1.5m
Data Cable : Shielded, Detachable, 1.2m

☒ Mouse(PS2) M02-025

Model Number : MUS3P
Serial Number : N/A
FCC ID : JKGMUS3P01
Manufacturer : Tremon Enterpnses Co., Ltd.
Data Cable : Shielded, Undetachable, 1.5m

☒ Scanner (EUT)

Model Number : FS-12UU2F
FCC ID : MLDFS-12UU2F
Serial No. : N/A
Manufacturer : SPOT Technology Inc.
Data Cable : Shielded, Undetachable, 1.5m
Power Cord : Shielded, Detachable, 1.8m

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	25.5-28
Humidity (%RH)	25-75	42-70
Barometric pressure (mbar)	860-1060	950-1000

FCC Site Description : Aug. 10, 1995 File on

Federal Communication Commission

FCC Engineering Laboratory

7435 Oakland Mills Road

Columbia, MD 21046

Reference 31040/SIT1300F2

NVLAP Lab Code : 200085-0

United States Department of commerce

National Institute of Standards and Technology

National Voluntary Laboratory Accreditation Program

Name of firm : Global EMC Standard Tech. Corp.

Site location : No. 3 Pau-Tou Valley, Chia-Pau Tsuen, Lin Kou
Tsiang, Taipei Country, Taiwan, R.O.C.

3. Conducted Power Line Test

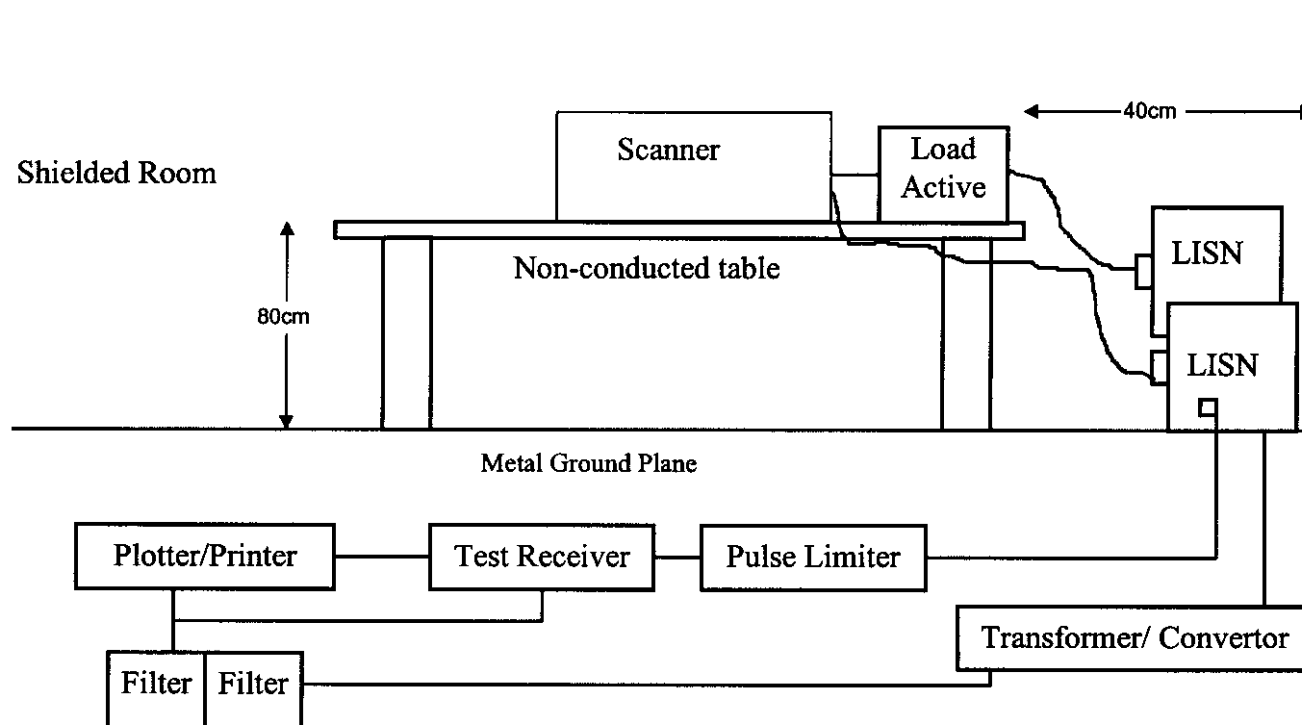
3.1 Test Equipments

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

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Location	C.E.
Test Receiver	Rohde & Schwarz	ESHS 30 / 8281091010	Dec. 24, 1997	Shield Room #1	✓
L.I.S.N.	Kyoritsu	KNW-407	Jul.1997	Shield Room #1	
L.I.S.N.	Solar	8012-50-R24 / 90038	Jun. 02, 1998	Shield Room #1	✓
L.I.S.N.	EMCO	3825/2 / 91111-1902	Jul.1997	Shield Room #1	
L.I.S.N.	Rohde & Schwarz	ESH3-Z5 / 840567/002	Jun. 02, 1998	Shield Room #1	✓
L.I.S.N.	Schwarzbeck	NNLK 8121	Apr. 10, 1998	Shield Room #1	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	Jan. 11, 1998	Shield Room #1	✓

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

3.3.1 FCC Limits

Frequency	Maximum RF Line Voltage			
	Class A		Class B	
MHz	uV	dBuV	uV	dBuV
0.45 - 1.705	1000	60.0	250	48.0
1.705 - 30	3000	69.5	250	48.0

Remarks : 1. RF Line Voltage (dBuV) = $20 \log$ RF Line Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3.3.2 CISPR 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 equipments.
- 3.5.3 Boot the PC from Hard Disk .
- 3.5.4 PC reads video software from the Scanner .
- 3.5.5 The (EUT) will start to operate and read the video figure into PC.
- 3.5.6 PC will display "video figure" on monitor.
- 3.5.7 Printer and modem will keep at standby . mode during Scanner operation.
- 3.5.8 Repeat the above procedure 3.5.4 to 3.5.6

3.6 Conducted Emission Data

The measurement range of conducted emission which is from 0.15 MHz to 30 MHz was investigated. All readings are quasi-peak and average values with a resolution Bandwidth of 9 KHz. 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 total uncertainty for this test is as follows:

- Uncertainty in the field strength measured: $< \pm 2.0$ dB

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

CONDUCTED EMISSION DATA

Date of Test	:	Aug. 26, 1998	Temperature	:	27.4 °C
EUT	:	Scanner	Humidity	:	49 %
Test Mode	:	Mode 1	Display Pattern	:	Video Figure

FREQUENCY MHz	READING LEVEL dBuV				LIMITS	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.81597	39.1	*	33.8	*	56	46
2.10036	36.9	*	34.3	*	56	46
3.35077	37.2	*	30.2	*	56	46
7.44722	31.5	*	26.7	*	60	50
13.61484	28.8	*	26.7	*	60	50

Remarks : 1. All readings are Quasi-peak and average values.

2. " * " means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.

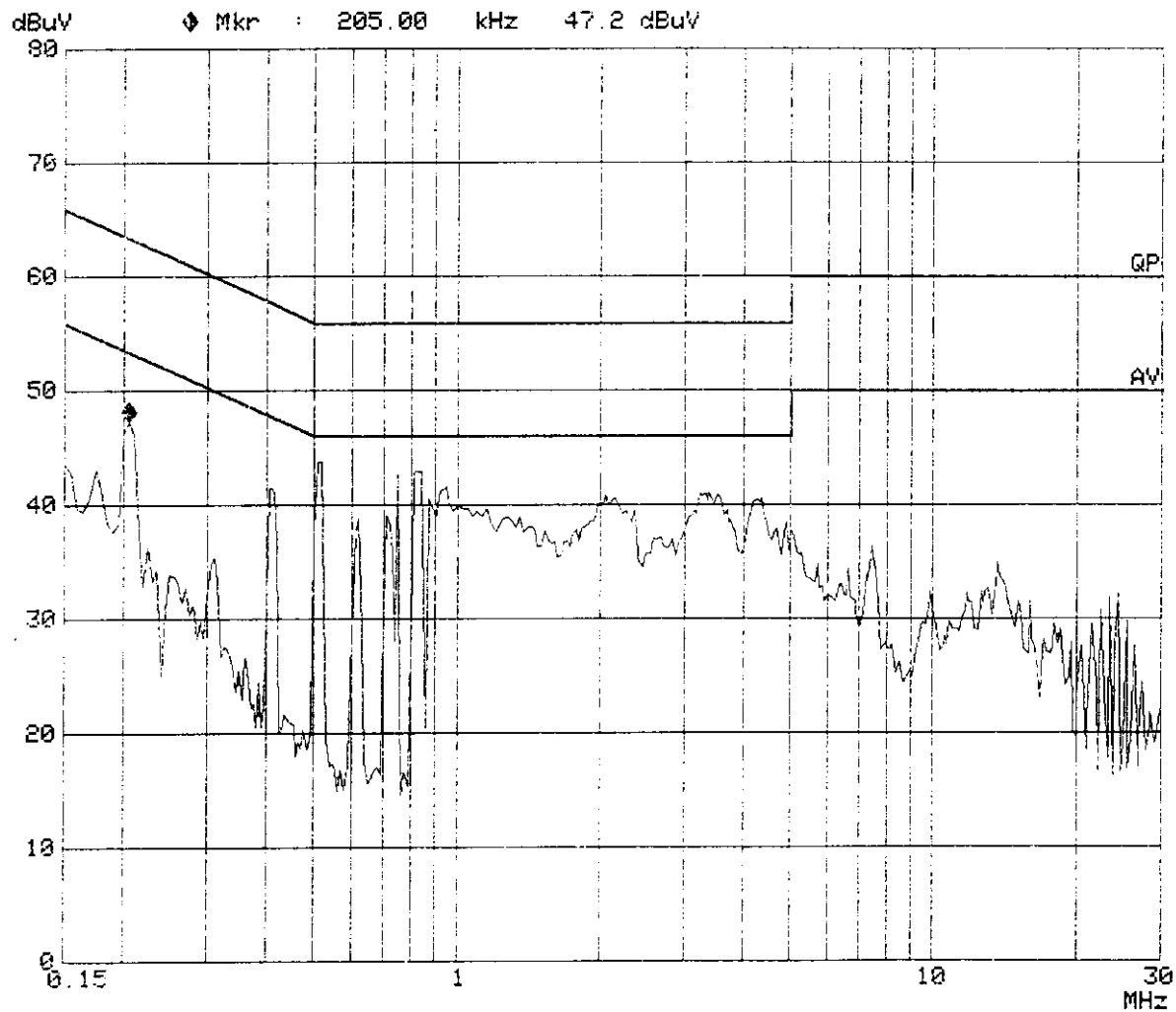
3. " ** " means that this data is the worse case emission level.

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

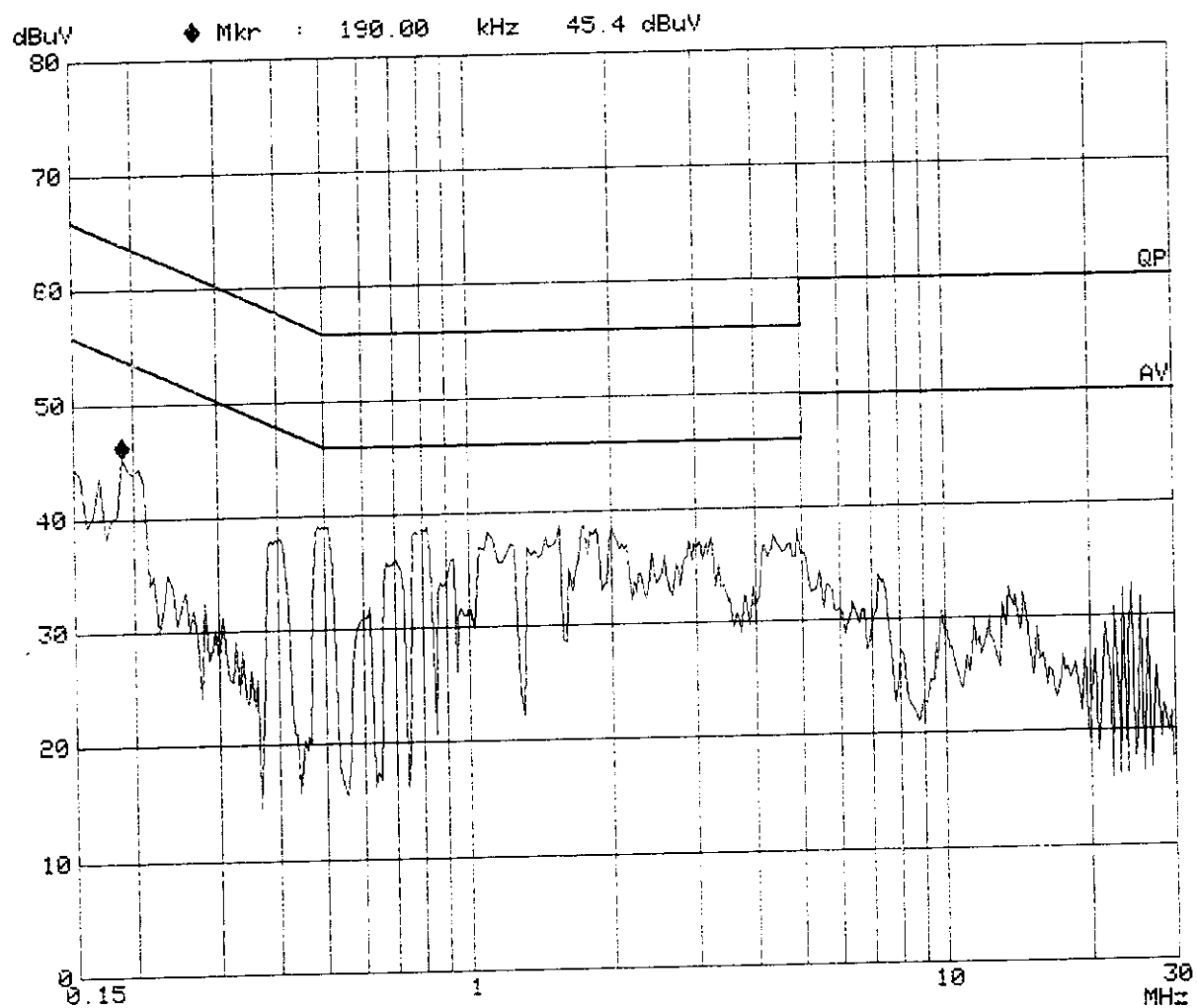
EUT: SCANNER
Manuf: SPOT
Op Cond: MODE 1
Operator: JACK
Test Spec: CNS13438 B
Comment: Line 1
M/N:FS-12UU2F
Date: 26. Aug 98 11:56



ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Op Cond: MODE 1
Operator: JACK
Test Spec: CNS13438 B
Comment: Line 2
M/N:FS-12UU2F
Date: 26. Aug 98 13:13



CONDUCTED EMISSION DATA

Date of Test	:	Aug. 26, 1998	Temperature	:	27.1 °C
EUT	:	Scanner	Humidity	:	49 %
Test Mode	:	Mode 2	Display Pattern	:	Video Figure

FREQUENCY MHz	READING LEVEL dBuV				LIMITS	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
0.55864	40.1	*	35.2	*	56	46
2.49634	28.4	*	27.9	*	56	46
4.27073	31.5	*	33.2	*	56	46
9.99062	30.2	*	21.6	*	60	50
21.50017	32.0	*	28.9	*	60	50

Remarks : 1. All readings are Quasi-peak and average values.

2. " * " means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.

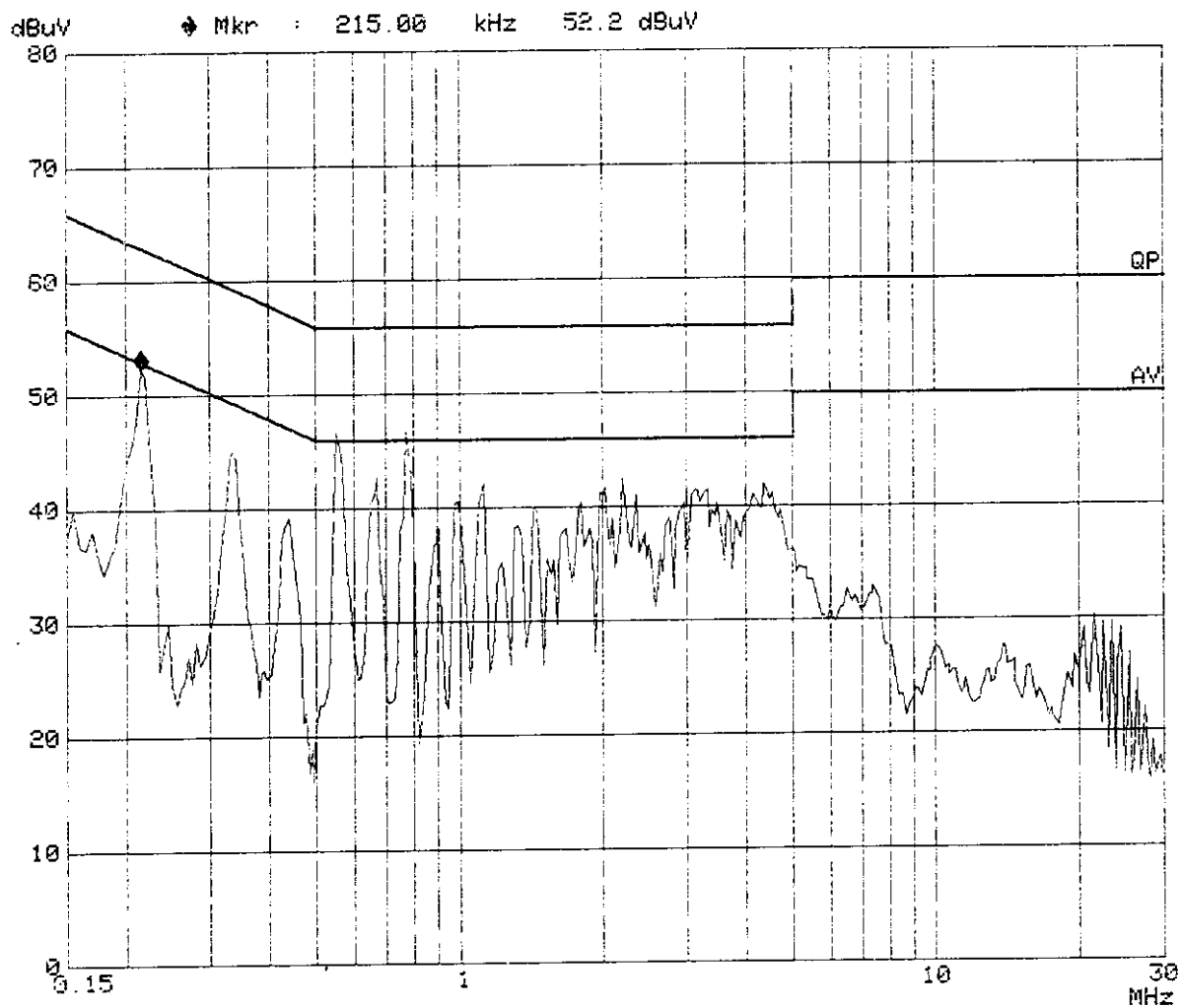
3. " ** " means that this data is the worse case emission level.

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

GesTek, PowerLine Conducted Emission

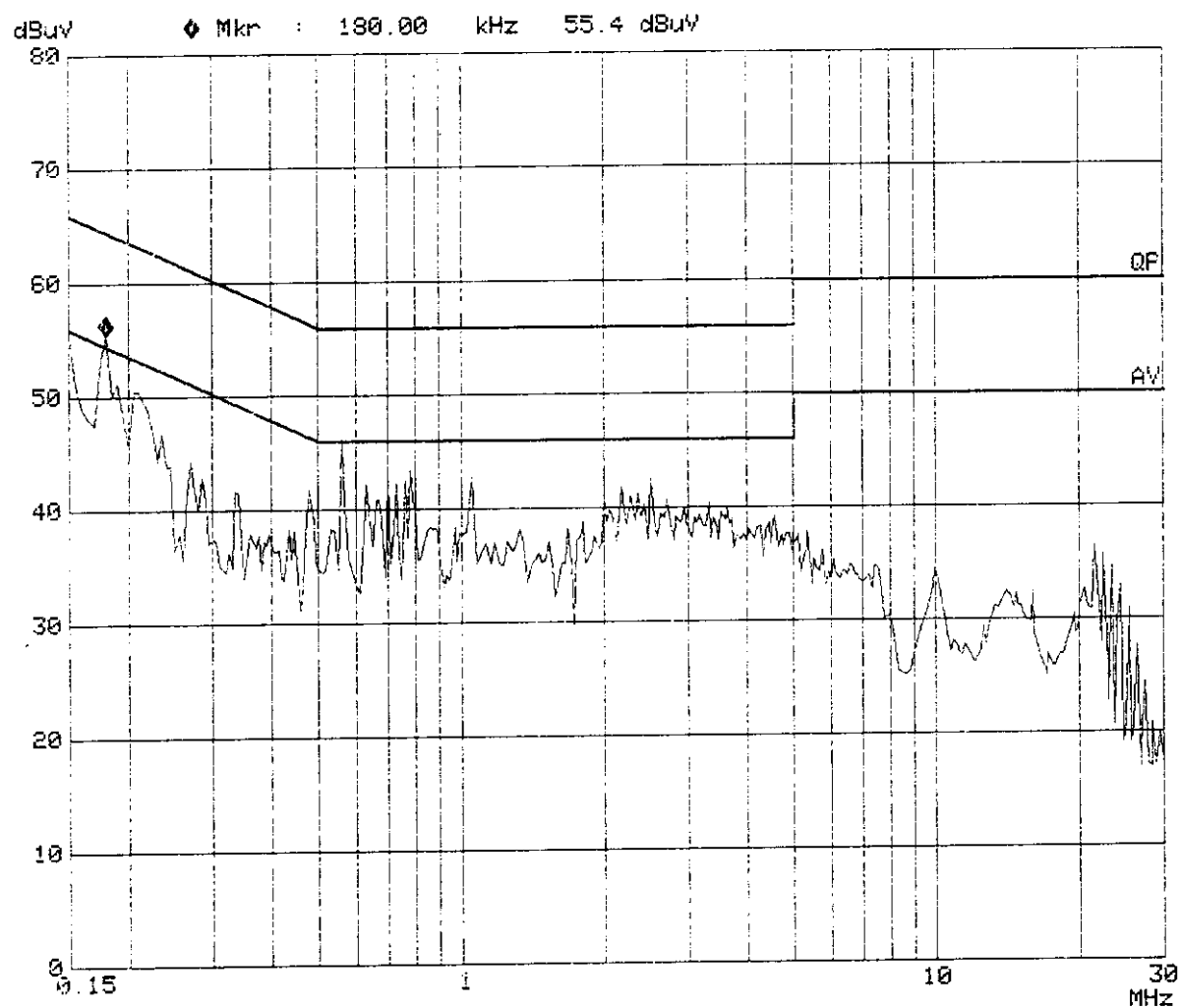
EUT: SCANNER
Manuf: SPOT
Op Cond: MODE 2
Operator: JACK
Test Spec: CNS13438 B
Comment: Line 1
M/N:FS-12UU2F
Date: 26. Aug 98 13:33



ROHDE & SCHWARZ ESHS 30

GeşTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Op Cond: MODE 2
Operator: JACK
Test Spec: CNS13438 B
Comment: Line 2
M/N:FS-12UU2F
Date: 26. Aug 98 13:21



GESTEK 98-F018

4. Radiation Emission Test

4.1 Test Equipment

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

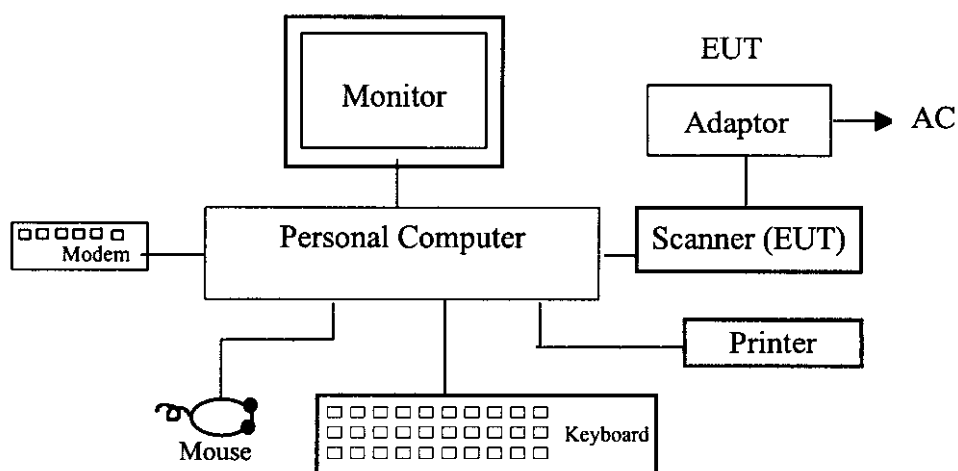
Radiated test was performed on : ☒ Site #1 ☐ Site #2

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Site #1	Site #2
Test Receiver	Rohde & Schwarz	ESVS 30/829007/014	Nov. 15,1997	✓	
Spectrum Analyzer	Anristu	MA2601B/MT16442	Jun. 15,1998	✓	
Pre-Amplifier	HP	7447F/3113A04998	Nov. 16,1997	✓	
Test Receiver	Rohde & Schwarz	ESVS 10/8421122/001	Dec. 26,1997		✓
Spectrum Analyzer	HP	8568B/4315B05847	Jan. 05,1998		✓
Pre Amplifier	HP	8447D/3113A04487	Jan. 05,1998		✓
Antenna 30Mhz-2Ghz	Chase	CBL 6112/2039	May. 16,1998	✓	
Bilog Antenna	Chase	CBL6111/1380	May. 16,1998		✓
Dipole Antenna	Schwarzbeck	VHAP/719,UHAP/736	May.19,1998		

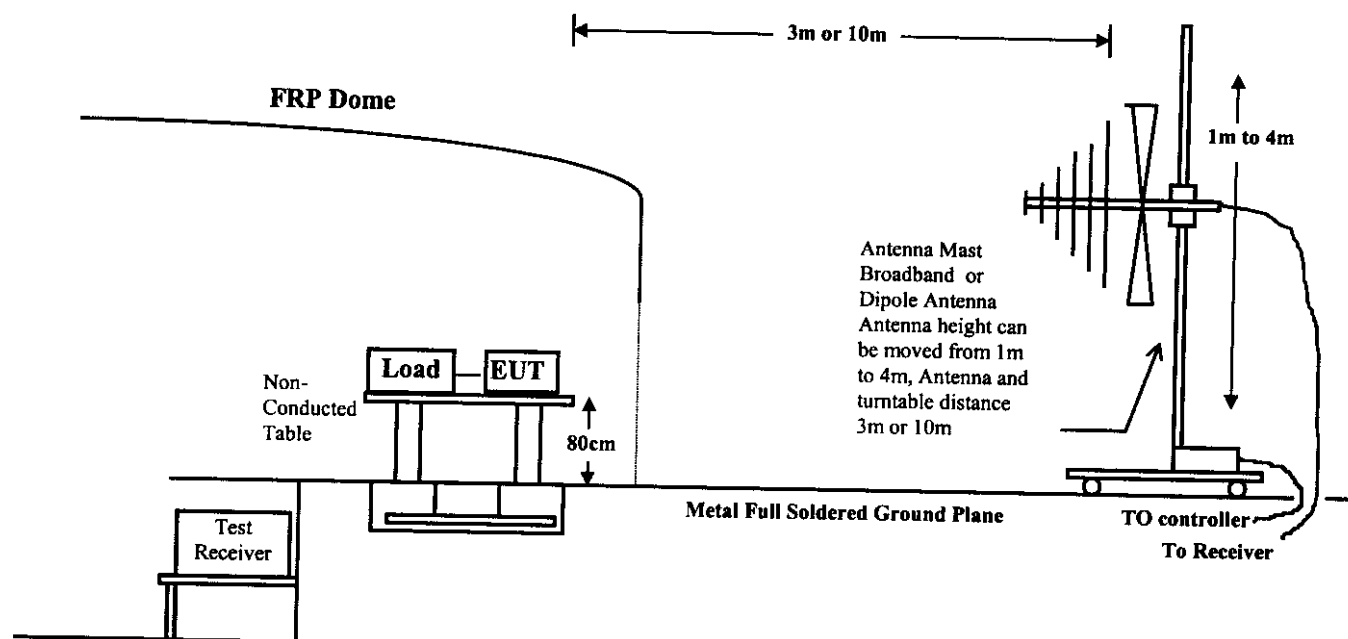
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

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

4.3.1 FCC Class B Limits at 3m

Frequency	Distance	Field Strength	
MHz	Meter	$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
960 - 2000	3	500	54.0

4.3.2 CISPR Class B Limits at 10m

Frequency	Distance	Field Strength
MHz	Meter	$\text{dB}(\mu\text{V/M})$
30 - 230	10	30
230 - 1000	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 Radiated Emission Data

The measurement range of radiated emission which is from 30 MHz to 1 GHz was investigated. All readings are quasi-peak values with a resolution Bandwidth of 120 KHz. The initial step in collecting radiated emission 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 total uncertainty for this test is as follows:

- Uncertainty in the field strength measured (3m antenna distance): $< \pm 4$ dB
- Uncertainty in the field strength measured (10m antenna distance): $< \pm 4$ dB

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

Radiated Emission Data

Date of Test :08-26,1998 Wed

Temperature :27 deg/C

EUT :SCANNER

Humidity :70 %RH

Working Cond.:MODE 1

Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Horizontal (dBuV/m)	Emission Level Horizontal (dBuV/m)	Limits (dBuV/m)
55.254	1.50	6.60	6.58	14.68	30.00
71.599	1.62	6.42	10.26	18.30	30.00
112.018	2.06	12.09	8.25	22.40	30.00
138.021	2.27	11.48	12.69	26.45	30.00
160.024	2.40	9.90	12.39	24.69	30.00
*200.469	2.80	10.20	13.85	26.85	30.00
224.031	2.95	11.29	11.65	25.88	30.00
288.038	3.40	13.32	13.16	29.89	37.00
304.042	3.53	13.67	15.26	32.46	37.00
336.043	3.79	14.24	14.28	32.31	37.00
368.042	4.04	15.39	8.65	28.08	37.00

- Remarks:
1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. " * ", means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :08-26,1998 Wed

Temperature :27 deg/C

EUT :SCANNER

Humidity :70 %RH

Working Cond.:MODE 1

Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Vertical (dBuV/m)	Emission Level Vertical (dBuV/m)	Limits (dBuV/m)
*33.414	1.09	18.40	4.25	23.74	30.00
42.005	1.34	11.55	10.36	23.25	30.00
48.002	1.46	9.73	11.65	22.84	30.00
60.008	1.58	5.90	12.69	20.17	30.00
112.017	2.06	12.09	6.27	20.42	30.00
160.021	2.40	9.90	7.65	19.95	30.00
192.025	2.72	9.87	6.35	18.94	30.00
240.028	3.04	12.01	11.27	26.32	37.00
288.037	3.40	13.32	13.54	30.27	37.00
400.053	4.30	17.00	8.59	29.89	37.00

- Remarks:
1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. " * ", means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :08-26,1998 Wed

Temperature :27 deg/C

EUT :SCANNER

Humidity :70 %RH

Working Cond.:MODE 2

Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Horizontal (dBuV/m)	Emission Level Horizontal (dBuV/m)	Limits (dBuV/m)
55.254	1.50	6.60	7.52	15.62	30.00
71.599	1.62	6.42	10.35	18.39	30.00
138.021	2.27	11.48	12.69	26.45	30.00
160.024	2.40	9.90	12.67	24.97	30.00
*200.469	2.80	10.20	13.57	26.57	30.00
224.031	2.95	11.29	11.63	25.86	30.00
272.036	3.27	12.98	12.25	28.50	37.00
288.038	3.40	13.32	13.52	30.25	37.00
304.043	3.53	13.67	12.84	30.04	37.00
336.042	3.79	14.24	14.28	32.31	37.00
368.043	4.04	15.39	9.54	28.97	37.00
400.053	4.30	17.00	9.52	30.82	37.00

- Remarks: 1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. " * ", means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :08-26,1998 Wed

Temperature :27 deg/C

EUT :SCANNER

Humidity :70 %RH

Working Cond.:MODE 2

Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Vertical (dBuV/m)	Emission Level Vertical (dBuV/m)	Limits (dBuV/m)
33.412	1.09	18.40	4.69	24.18	30.00
45.268	1.40	10.80	11.68	23.88	30.00
59.625	1.58	5.90	16.25	23.73	30.00
112.017	2.06	12.09	6.95	21.10	30.00
160.023	2.40	9.90	6.58	18.88	30.00
192.028	2.72	9.87	7.65	20.24	30.00
*224.031	2.95	11.29	11.67	25.90	30.00
288.038	3.40	13.32	13.28	30.01	37.00
400.053	4.30	17.00	8.67	29.97	37.00

- Remarks: 1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. " * ", means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.

6. EMI Reduction Method During Compliance Testing

1. ADDED L2, L3, L4 CHIP BEAD 100MHz 600Ω.
2. R8, R37 CHANG TO CC 180P.
3. R5, R26 CHANG TO BEAD 100MHz 300Ω.
4. ADDED B1, B2, B12, B16 CC 104PF.
5. A FERRITE CORE IS ADDED TO THE CIS LAME FLEXIBLE FLAT CABLE.