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RFI MEASUREMENT TEST REPORT

FCC PART 15B CLASS B

********** CLASS B DIGITAL DEVICES AND PERIPHERALS **********

APPLICANT	:	**SEIKO EPSON CORPORATION**
EQUIPMENT	:	**PRINTER**
TRADE NAME	:	**EPSON**
MODEL NUMBER	:	**P120A**
FCC ID NUMBER	:	**BKMFBP120A**
TEST REPORT No.	:	**E-103-98249**

NVLAP LAB CODE 200157-0

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TEST CERTIFICATION

Applicant Information

Company	: SEIKO EPSON Corporation
Division/Section	: TP Product Safety Design Group
	Imaging & Information Products Operations
Address	: 80, Harashinden, Hirooka, Shiojiri-shi, Nagano, 399-0785 Japan
	PHONE : +81-263-53-6024 FAX : +81-263-53-3544

Test Performed

Company	: SEIKO EPSON Corporation
Division/Section	: EMC Group, CS/Quality Assurance Office
Location	: 80, Harashinden, Hirooka, Shiojiri-shi, Nagano, 399-0785 Japan
	PHONE: +81-263-52-5094 FAX : +81-263-54-5806
	10 meter Semi-anechoic Chamber
	FCC File No. : 31040 / SIT 1300F2
	NVLAP Lab Code : 200157-0
Test started	: 10 September, 1998
Test completed	: 14 September, 1998
Purpose of test	: Compliance with standards
Test specification(s)	: FCC Part 15B Class B (Unintentional Radiators)
Test procedure(s)	: ANSI C63.4-1992
Test engineer	: Toshiyuki Omori
	EMC group, CS/Quality Assurance Office
Report checked by	: Atsushi Shinozaki
	Chief Engineer, EMC group, CS/Quality Assurance Office
Report approved by	: Yoshiyuki Sakurai
	Manager, EMC group, CS/Quality Assurance Office, NVLAP signatory
Report issue date	: 14 September, 1998

The test item under the test conditions and configuration shown in this test report complies with above standard.

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Test Report Contents

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1. DETAILED DESCRIPTION OF TEST ITEM

1-1 Equipment Under Test (EUT)

Kind of equipment	: Printer
Shape	: Table-top type
Manufacturer	: SEIKO EPSON Corporation
Trade Name	: EPSON
Model Number	: P120A
FCC ID	: BKMFBP120A
Serial Number	: 98090100
Voltage input	: AC 120 V / 60 Hz
Rated current	: 0.7 A
Port(s) / Connector(s)	: Parallel (Centronics)
	Serial (RS-422)
	USB (Universal serial bus)
	Serial (RS-232C, optional)
Oscillator(s) / Crystal(s)	: 48.00 MHz, 28.00 MHz
Maximum used frequency	: 48.00 MHz
Remarks	: With serial I/F card (C82307)

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1-2 Auxiliary equipment (AE)

AE	Name	Model (Serial number)	Manufacturer	FCC ID	Voltage input Power consumption	
1	Personal computer	D5605A (SG81151767)	Hewlett-Packard	N/A	AC 120 V/ 60 Hz 5.0 A	
2	CRT monitor	D2825 (MY80833366)	Hewlett-Packard	JVP7154E	AC 120 V/ 60 Hz 2.0 A	
3	Keyboard	SK-2502 (M9802147789)	Hewlett-Packard	GYUR41SK	DC 5.0 V 60 mA	a)
4	Mouse	M-S34 (LZA75287348)	Hewlett-Packard	DZL211029	DC 5.0 V 15 mA	a)
5	Printer	P850A (1YLY185764)	SEIKO EPSON Corp.	MKMP850A	AC 120 V/ 60 Hz 1.0 A	
6	Serial I/F card	C82307 (N/A)	SEIKO EPSON Corp.	BKMC82307	DC 5.0 V 160 mA	b)
7	Personal computer	M2118 (SG3388VQ1LZ)	Apple	BCGM2118	AC 120 V/ 60 Hz 6.0 A	
8	CRT monitor	M1212 (S13285V6E09)	Apple	BCGM1212	AC 120 V/ 60 Hz 1.3 A	
9	Keyboard	M0487 (SI33265R03N)	Apple	BCGM0487	DC 5.0 V 40 mA	c)
10	Mouse	M2706 (LT330W56T18)	Apple	BCGM2706	- -	c)
11	Film scanner	G621B (AB20003380)	SEIKO EPSON Corp.	BKMFBG621B	AC 120 V/ 60 Hz 0.5 A	

a) Supplied from AE1

b) Supplied from EUT

c) Supplied from AE7

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1-3 Relevant Signal and Power lines

AE = Auxiliary equipment, EUT = Equipment Under Test = Test item

Configuration 1

Line	Name	From	To	Length	Shield	Remarks
1	Parallel I/F cable	EUT Parallel in / AE5 Parallel in	AE1 Parallel out	2.0 m	Yes	Metal connector
2	Serial I/F cable	AE5 Serial in / AE6 Serial in	AE1 Serial out	2.0 m	Yes	Metal connector
3	Video I/F cable	AE2 Video in	AE1 Video out	1.4 m	Yes	Metal connector
4	Keyboard I/F cable	AE3 Keyboard	AE1 Keyboard out	1.8 m	Yes	Metal connector
5	Mouse I/F cable	AE4 Mouse	AE1 Mouse out	1.8 m	Yes	Metal connector
6	Printer AC cable	EUT AC 120 V in	Main AC 120 V	1.8 m	No	
7	Computer AC cable	AE1 AC 120 V in	Main AC 120 V	1.9 m	No	
8	CRT AC cable	AE2 AC 120 V in	Main AC 120 V	1.9 m	No	
9	Printer AC cable	AE5 AC 120 V in	Main AC 120 V	1.9 m	No	

Configuration 2

Line	Name	From	To	Length	Shield	Remarks
10	Serial I/F cable	EUT Serial in	AE7 Serial out	2.0 m	Yes	Metal connector
11	SCSI I/F cable	AE11 SCSI	AE7 SCSI	1.0 m	Yes	Metal connector
12	Video I/F cable	AE8 Video in	AE7 Video out	1.5 m	Yes	Metal connector
13	Keyboard I/F cable	AE9 Keyboard	AE7 Keyboard	0.9 m	Yes	Metal connector
14	Mouse I/F cable	AE10 Mouse	AE9 Mouse out	0.8 m	Yes	Metal connector
15	Printer AC cable	EUT AC 120 V in	Main AC 120 V	1.8 m	No	
16	Computer AC cable	AE7 AC 120 V in	Main AC 120 V	1.9 m	No	
17	CRT AC cable	AE8 AC 120 V in	AE7 AC 120 V	1.9 m	No	
18	Film scanner AC cable	AE11 AC 120 V in	Main AC 120 V	1.8 m	No	

Note : Line 21 (video I/F cable) has a ferrite core permanently attached.

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Configuration 3

Line	Name	From	To	Length	Shield	Remarks
19	USB I/F cable	EUT USB in	AE1 USB out	2.0 m	Yes	Metal connector
20	Parallel I/F cable	AE5 Parallel in	AE1 Parallel out	2.0 m	Yes	Metal connector
21	Video I/F cable	AE2 Video in	AE1 Video out	1.4 m	Yes	Metal connector
22	Keyboard I/F cable	AE3 Keyboard	AE1 Keyboard out	1.8 m	Yes	Metal connector
23	Mouse I/F cable	AE4 Mouse	AE1 Mouse out	1.8 m	Yes	Metal connector
24	Printer AC cable	EUT AC 120 V in	Main AC 120 V	1.8 m	No	
25	Computer AC cable	AE1 AC 120 V in	Main AC 120 V	1.9 m	No	
26	CRT AC cable	AE2 AC 120 V in	Main AC 120 V	1.9 m	No	
27	Printer AC cable	AE5 AC 120 V in	Main AC 120 V	1.9 m	No	

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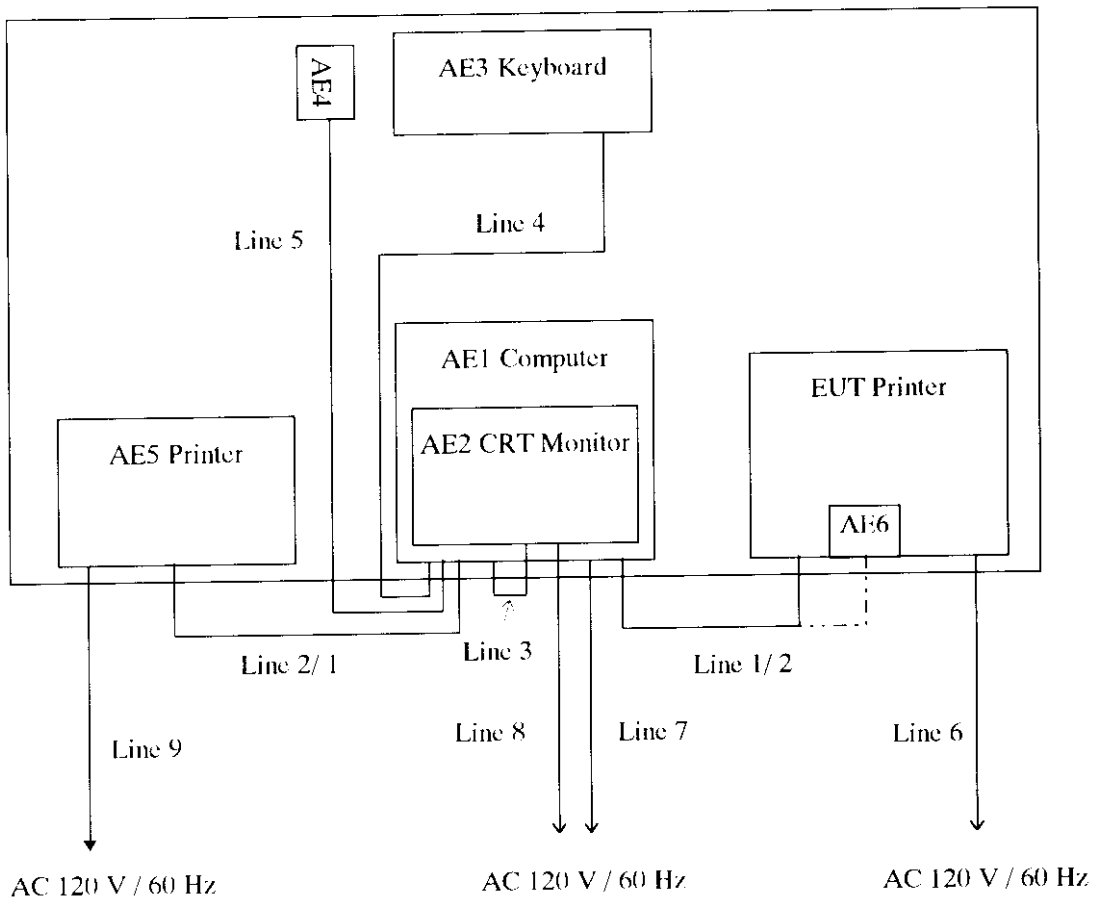
1-4 Positioning of Equipment

The positioning of EUT during testing is as follows.

Configuration 1

Testing table top view



Abbreviations shown in the above diagram correspond to equipment or cables in tables in Section 1-1, 1-2, 1-3.

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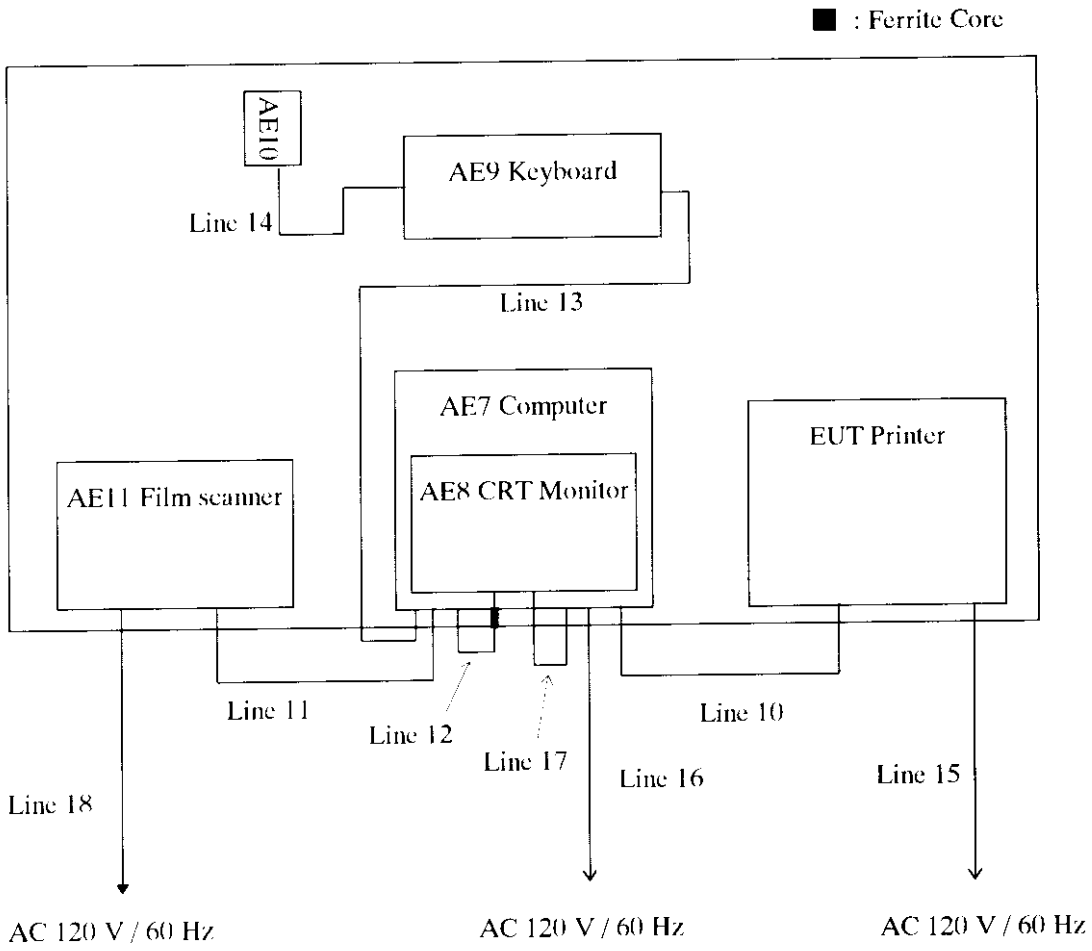
Configuration 2

Testing table top view



Abbreviations shown in the above diagram correspond to equipment or cables in tables in Section 1-1, 1-2,1-3.

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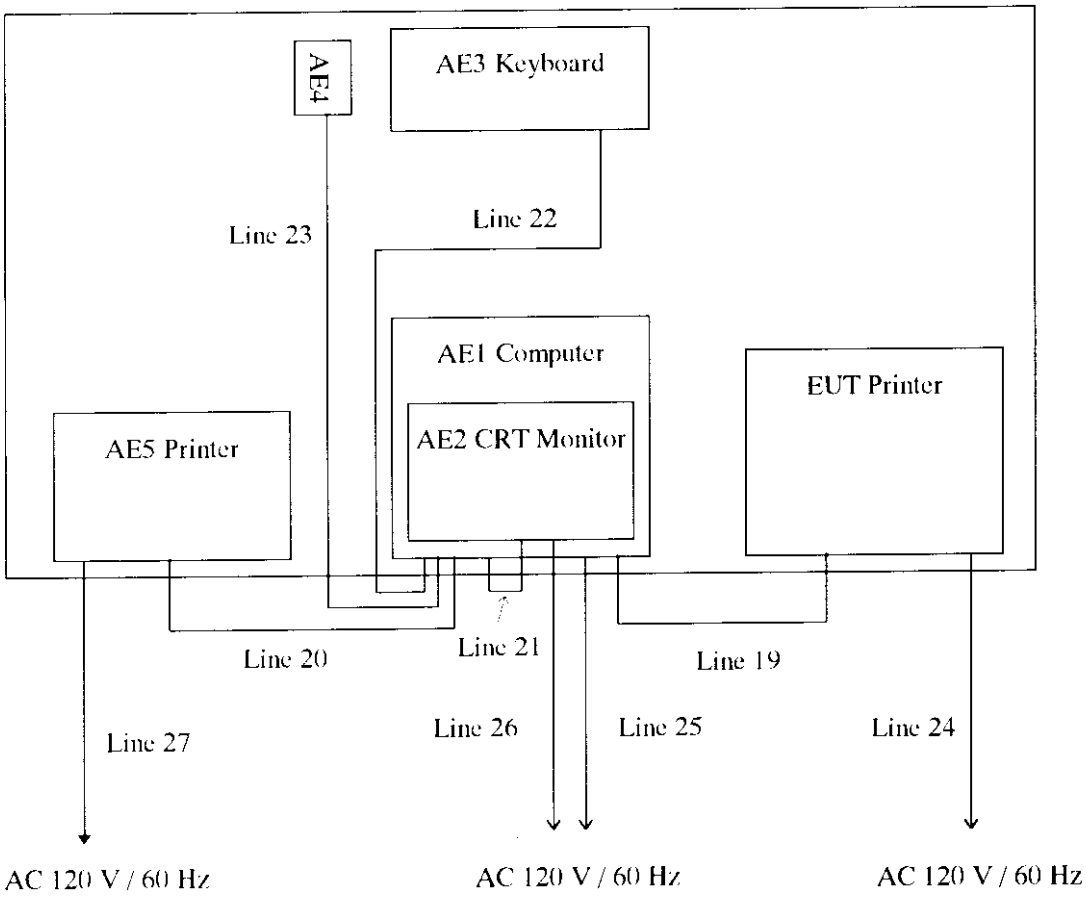
Configuration 3

Testing table top view



Abbreviations shown in the above diagram correspond to equipment or cables in tables in Section 1-1, 1-2, 1-3.

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2. OPERATING CONDITIONS

The EUT has been operated under the following conditions during the tests.

2-1 Operating modes

Mode 1 : Parallel interface mode

The EUT continuously prints character 'H' via the parallel interface (line 1) with below operating cycles in configuration 1.

Mode 2 : Serial interface mode

The EUT continuously prints character 'H' via the option serial interface (line 10) with below operating cycles in configuration 2.

Mode 3 : USB interface mode

The EUT continuously prints character 'H' via the USB interface (line 19) with below operating cycles in configuration 3.

Mode 4 : Option serial interface mode

The EUT continuously prints character 'H' via the serial interface (line 2) with below operating cycles in configuration 1.

2-2 Operating cycles

Performed following operation continuously.

Configuration 1 and 3

1: The Data transferred from computer(AE1)

2: 'H' characters printed by EUT

3: 'H' characters displayed on the full screen of monitor (AE2)

Configuration 2

1: The Data transferred from computer(AE7)

2: 'H' characters printed by EUT

3: 'H' characters displayed on the full screen of monitor (AE8)

Note The data transfer rate on the serial I/F (RS-422) is 1.8 M bps.

The data transfer rate on the USB I/F is 12 M bps.

The data transfer rate on the option serial I/F (RS-232C) is 9600 bps.

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3. TEST PROCEDURE(S)

These tests have been carried out with the test procedure(s) drawn up by our laboratory based on the following test procedure(s).

Test Item	Test procedure used	Scanned Frequency Range
Conducted Emission	ANSI C63.4 - 1992	0.45 - 30 MHz
Radiated Emission	ANSI C63.4 - 1992	30 - 1000 MHz

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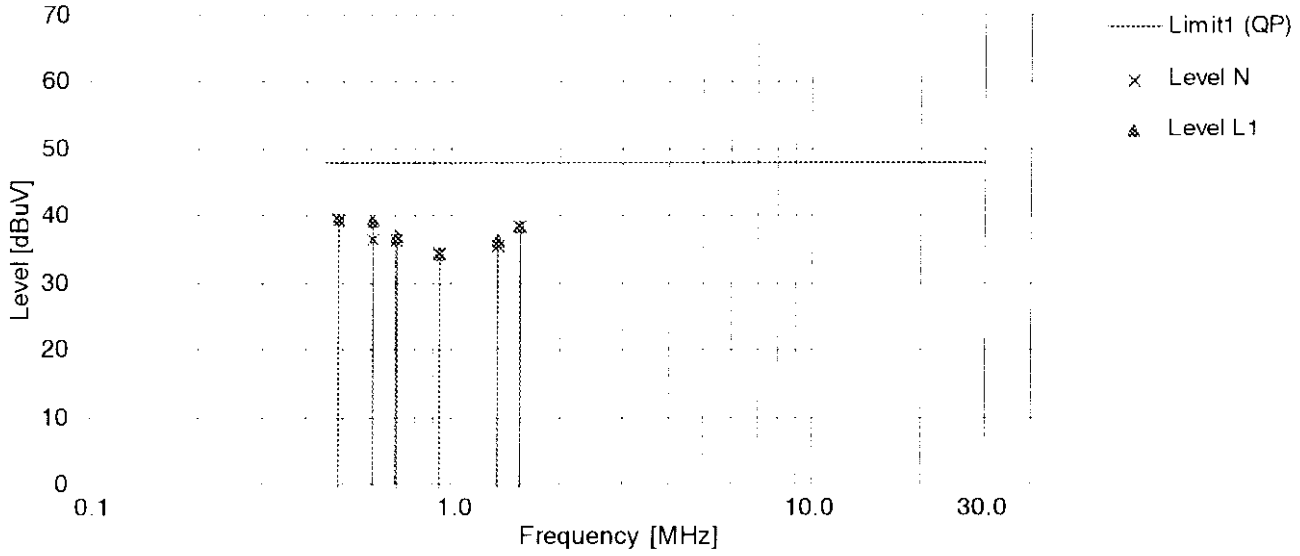
4. EVALUATION OF TEST RESULTS

4-1 Conducted Emission Test

Mode 1 : Parallel interface

Kind of Equipment	:	Printer	Temperature	:	22 °C
Model Name	:	P120A	Humidity	:	55 %
Serial No.	:	98090100	Engineer	:	T. Omori
Comment	:	Parallel I/F			
Detector	:	QP	Date	:	98/9/14
Points	:	6	EMI Receiver(s)	:	R/S ESH 2

Limit1 : [FCC] Class B



Frequency	Reading N		Reading L1		QP-AVE	QP/AVE -13	Correction Factor	Level N	Level L1	Limit	Margin
	QP	AVE	QP	AVE							
[MHz]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.4900	39.0	-	39.0	-	-	-	0.4	39.4	39.4	48.0	8.6
0.6077	36.0	-	39.0	-	-	-	0.3	36.3	39.3	48.0	8.7
0.7094	36.0	-	36.5	-	-	-	0.3	36.3	36.8	48.0	11.2
0.9309	34.0	-	34.0	-	-	-	0.3	34.3	34.3	48.0	13.7
1.3466	35.0	-	36.0	-	-	-	0.3	35.3	36.3	48.0	11.7
1.5446	38.0	-	38.0	-	-	-	0.3	38.3	38.3	48.0	9.7

Note :All other frequencies in the range from 450 kHz to 30 MHz have emission level of more than 10 dB below the limit.

Level = Reading + Correction Factor Correction Factor = LISN factor + Cable Loss

Level is rounded off to one decimal place.

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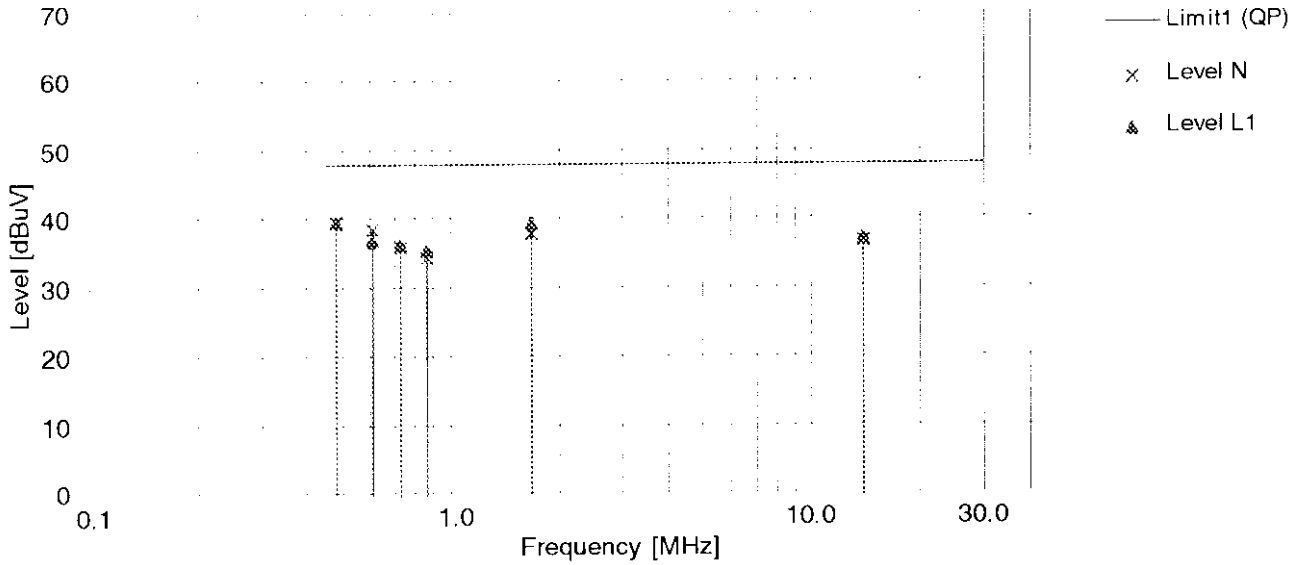
Mode 2 : Serial interface

Kind of Equipment	:	Printer	Temperature	:	22 °C
Model Name	:	P120A	Humidity	:	55 %
Serial No.	:	98090100	Engineer	:	T. Omori
Comment	:	Serial I/F			
Detector	:	QP	Date	:	98/9/14
Points	:	6	EMI Receiver(s)	:	R/S ESH 2

Limit1 : [FCC] Class B



Frequency	Reading N		Reading L1		QP-AVE	QP/AVE -13	Correction Factor	Level N	Level L1	Limit	Margin
	QP	AVE	QP	AVE							
[MHz]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.4865	39.0	-	39.0	-	-	-	0.4	39.4	39.4	48.0	8.6
0.6110	38.0	-	36.5	-	-	-	0.3	38.3	36.8	48.0	9.7
0.7271	35.5	-	36.0	-	-	-	0.3	35.8	36.3	48.0	11.7
0.8595	34.0	-	35.0	-	-	-	0.3	34.3	35.3	48.0	12.7
1.6740	37.5	-	39.0	-	-	-	0.3	37.8	39.3	48.0	8.7
13.9419	34.5	-	35.0	-	-	-	2.1	36.6	37.1	48.0	10.9

Note :All other frequencies in the range from 450 kHz to 30 MHz have emission level of more than 10 dB below the limit.

Level = Reading + Correction Factor Correction Factor = LISN factor + Cable Loss

Level is rounded off to one decimal place.

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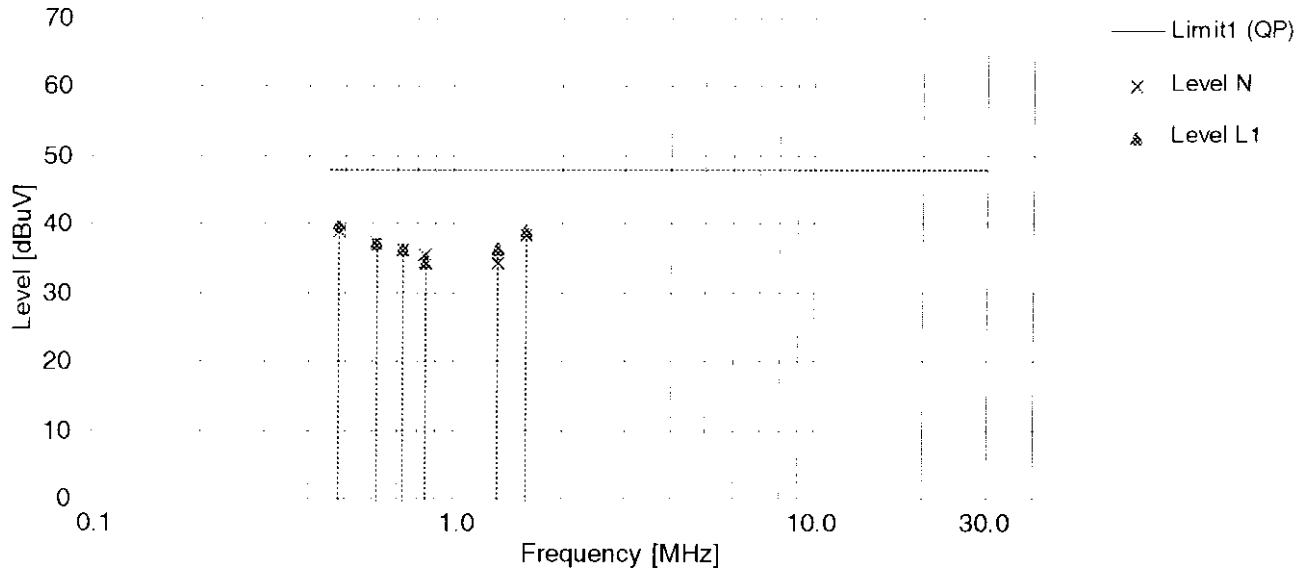
Mode 3 : USB interface

Kind of Equipment	:	Printer	Temperature	:	22 °C
Model Name	:	P120A	Humidity	:	55 %
Serial No.	:	98090100	Engineer	:	T. Omori
Comment	:	Serial I/F			
Detector	:	QP	Date	:	98/9/14
Points	:	6	EMI Receiver(s)	:	R/S ESH 2

Limit1 : [FCC] Class B



Frequency	Reading N		Reading L1		QP-AVE	QP/AVE -13	Correction Factor	Level N	Level L1	Limit	Margin
	QP	AVE	QP	AVE							
[MHz]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.4867	38.5	-	39.5	-	-	-	0.4	38.9	39.9	48.0	8.1
0.6145	37.0	-	37.0	-	-	-	0.3	37.3	37.3	48.0	10.7
0.7280	36.0	-	36.0	-	-	-	0.3	36.3	36.3	48.0	11.7
0.8434	35.0	-	34.0	-	-	-	0.3	35.3	34.3	48.0	12.7
1.3250	34.0	-	36.0	-	-	-	0.3	34.3	36.3	48.0	11.7
1.5874	38.0	-	38.5	-	-	-	0.3	38.3	38.8	48.0	9.2

Note :All other frequencies in the range from 450 kHz to 30 MHz have emission level of more than 10 dB below the limit.

Level = Reading + Correction Factor Correction Factor = LISN factor + Cable Loss

Level is rounded off to one decimal place.

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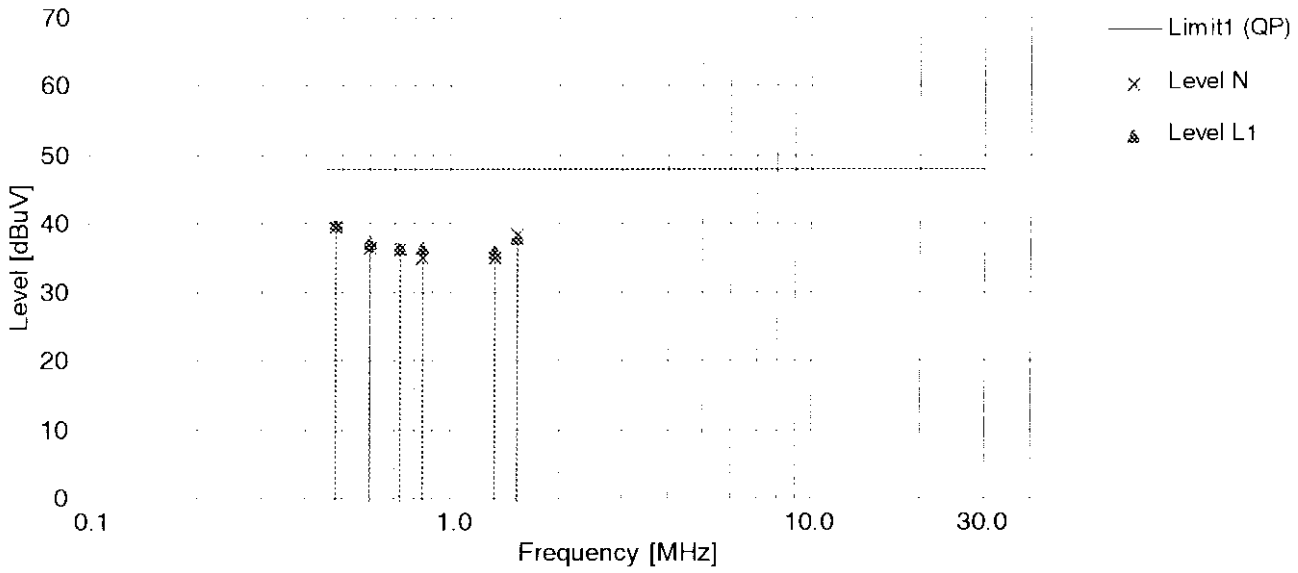
Mode 4 : Option serial interface

Kind of Equipment	:	Printer	Temperature	:	22 °C
Model Name	:	P120A	Humidity	:	55 %
Serial No.	:	98090100	Engineer	:	T. Omori
Comment	:	Serial I/F			
Detector	:	QP	Date	:	98/9/14
Points	:	6	EMI Receiver(s)	:	R/S ESH 2

Limit1 : [FCC] Class B



Frequency	Reading N		Reading L1		QP-AVE	QP/AVE -13	Correction Factor	Level N	Level L1	Limit	Margin
	QP	AVE	QP	AVE							
[MHz]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.4856	39.0	-	39.5	-	-	-	0.4	39.4	39.9	48.0	8.1
0.6035	36.0	-	37.0	-	-	-	0.3	36.3	37.3	48.0	10.7
0.7330	36.0	-	36.0	-	-	-	0.3	36.3	36.3	48.0	11.7
0.8416	34.5	-	36.0	-	-	-	0.3	34.8	36.3	48.0	11.7
1.3301	34.5	-	35.5	-	-	-	0.3	34.8	35.8	48.0	12.2
1.5253	38.0	-	37.5	-	-	-	0.3	38.3	37.8	48.0	9.7

Note :All other frequencies in the range from 450 kHz to 30 MHz have emission level of more than 10 dB below the limit.

Level = Reading + Correction Factor Correction Factor = LISN factor + Cable Loss

Level is rounded off to one decimal place.

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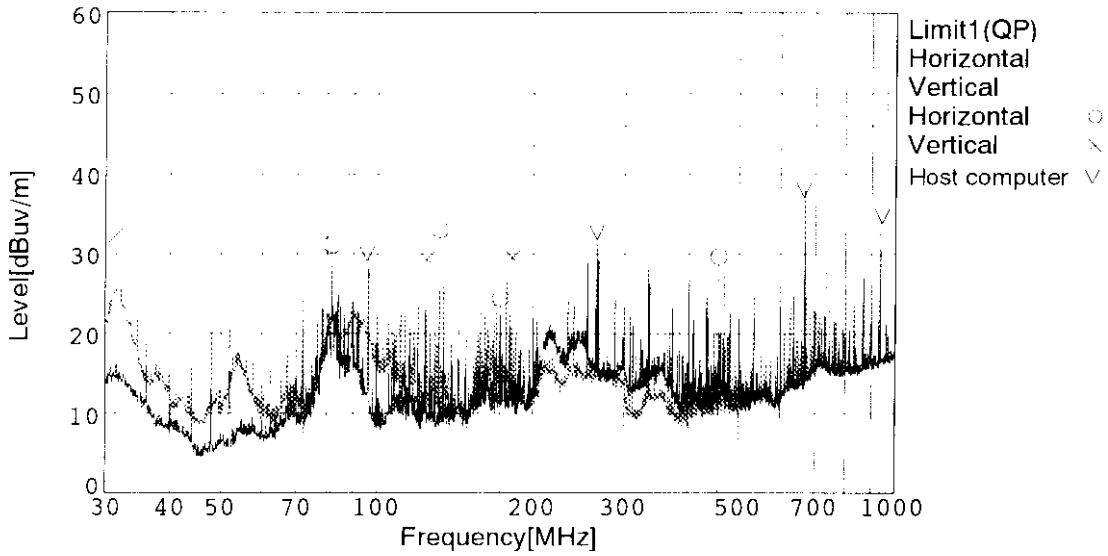
4-3 Radiated Emission Test

Mode 1 : Parallel interface

Kind of Equipment	: Printer	Temperature	: 22 °C
Model Name	: P120A	Humidity	: 55 %
Serial No.	: 98090100	Engineer	: T. Omori
Comment	: Parallel I/F		
Detector	: QP	Date	: 1998/9/10 18:25
Points	: 8	EMI Receiver(s)	: ESS

Limit1: [FCC] Class B<3m>



Frequency [MHz]	Meter Reading [dBuV]	Ant. Type	Antenna Factor [dB]	Total Loss [dB]	Level [dBuV/m]	Angle [degree]	Height [cm]	Pola.	Limit [dBuV/m]	Margin [dB]
31.419	34.0	BC	18.8	-20.5	32.3	359	100	Vert.	40.0	7.7
72.003	42.0	BC	7.0	-19.4	29.6	47	100	Vert.	40.0	10.4
81.615	43.5	BC	6.8	-19.2	31.1	216	400	Hori.	40.0	8.9
124.800	34.5	BC	13.5	-18.6	29.4	164	100	Vert.	43.5	14.1
131.994	37.8	BC	13.7	-18.5	33.0	10	252	Hori.	43.5	10.5
172.810	26.5	BC	16.1	-18.1	24.5	240	331	Hori.	43.5	19.0
182.403	31.0	BC	16.4	-17.9	29.5	185	100	Vert.	43.5	14.0
456.006	29.5	LP	15.8	-15.6	29.7	345	100	Hori.	46.0	16.3

Note : All other frequencies in the range from 30 MHz to 1000 MHz have emission level of more than 10 dB below the limit.

Level = Meter Reading + Antenna Factor + Total Loss (Total Loss = Cable Loss + Antenna Pad Loss - Amplifier Gain)

Level is rounded off to one decimal place.

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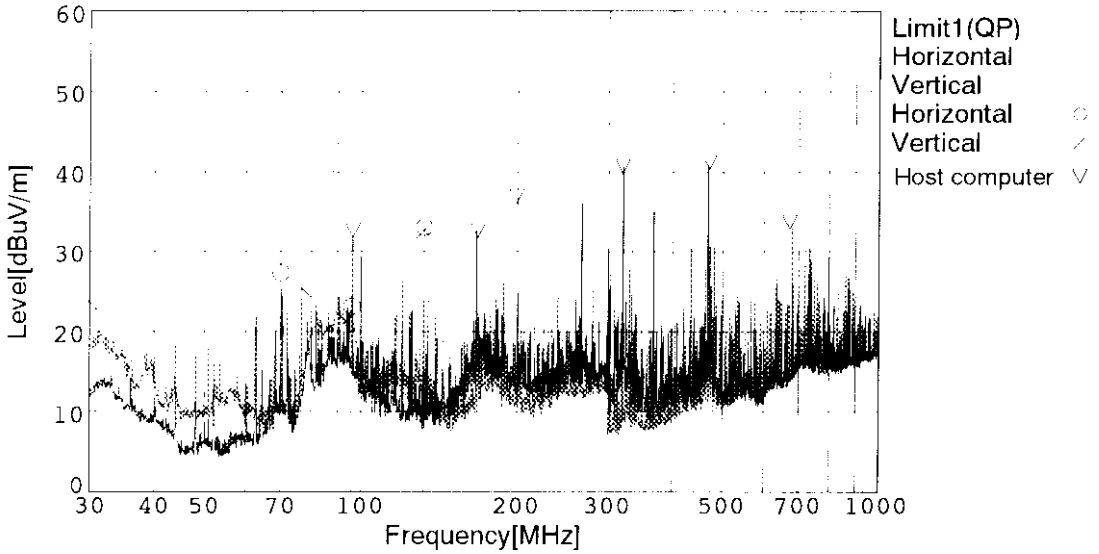
Mode 2 : Serial interface

Kind of Equipment	: Printer	Temperature	: 22 °C
Model Name	: P120A	Humidity	: 55 %
Serial No.	: 98090100	Engineer	: T. Omori
Comment	: Serial I/F		
Detector	: QP	Date	: 1998/9/10 22:04
Points	: 6	EMI Receiver(s)	: ESS

Limit1: [FCC] Class B<3m>



Frequency [MHz]	Meter Reading [dBuV]	Ant. Type	Antenna Factor [dB]	Total Loss [dB]	Level [dBuV/m]	Angle [degree]	Height [cm]	Pola.	Limit [dBuV/m]	Margin [dB]
30.795	24.5	BC	19.0	-20.5	23.0	84	100	Vert.	40.0	17.0
70.004	39.8	BC	7.1	-19.5	27.4	3	256	Hori.	40.0	12.6
76.798	38.0	BC	6.8	-19.3	25.5	102	100	Vert.	40.0	14.5
95.998	33.0	BC	9.2	-19.0	23.2	37	323	Hori.	43.5	20.3
131.994	37.4	BC	13.7	-18.5	32.6	144	100	Vert.	43.5	10.9
132.001	37.9	BC	13.7	-18.5	33.1	36	256	Hori.	43.5	10.4

Note : All other frequencies in the range from 30 MHz to 1000 MHz have emission level of more than 10 dB below the limit.

Level = Meter Reading + Antenna Factor + Total Loss (Total Loss = Cable Loss + Antenna Pad Loss - Amplifier Gain)

Level is rounded off to one decimal place.

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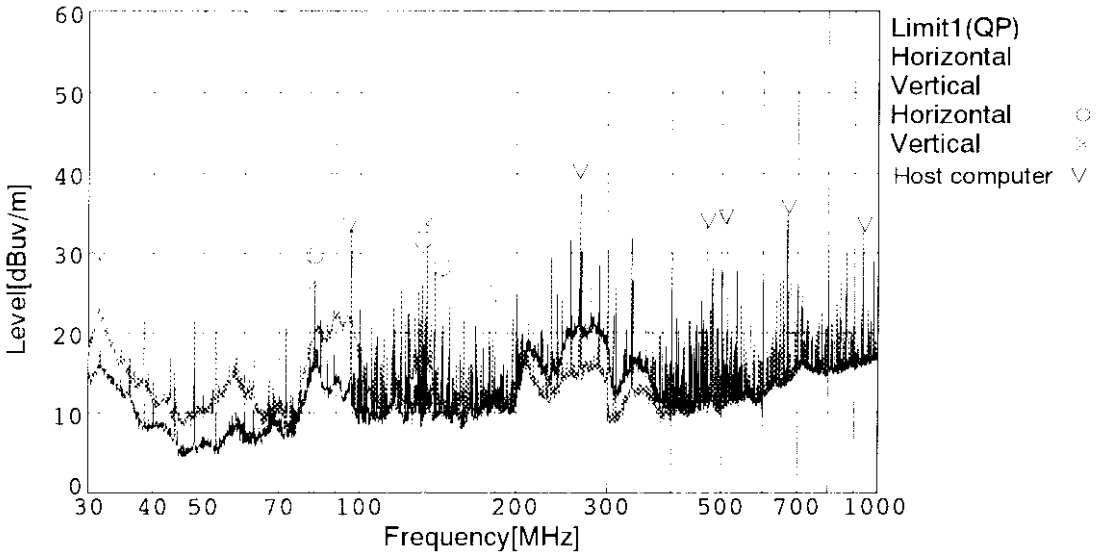
Mode 3 : USB interface

Kind of Equipment	: Printer	Temperature	: 22 °C
Model Name	: P120A	Humidity	: 55 %
Serial No.	: 98090100	Engineer	: T. Omori
Comment	: USB I/F		
Detector	: QP	Date	: 1998/9/10 20:56
Points	: 7	EMI Receiver(s)	: ESS

Limit1: [FCC] Class B<3m>



Frequency [MHz]	Meter Reading [dBuV]	Ant. Type	Antenna Factor [dB]	Total Loss [dB]	Level [dBuV/m]	Angle [degree]	Height [cm]	Pola.	Limit [dBuV/m]	Margin [dB]
31.440	31.0	BC	18.8	-20.5	29.3	77	100	Vert.	40.0	10.7
81.602	42.0	BC	6.8	-19.2	29.6	231	222	Hori.	40.0	10.4
81.664	38.5	BC	6.8	-19.2	26.1	110	143	Vert.	40.0	13.9
132.014	36.4	BC	13.7	-18.5	31.6	3	342	Hori.	43.5	11.9
134.401	38.5	BC	13.7	-18.5	33.7	165	100	Vert.	43.5	9.8
144.008	32.5	BC	14.2	-18.5	28.2	260	213	Hori.	43.5	15.3
182.398	26.5	BC	16.4	-17.9	25.0	95	234	Hori.	43.5	18.5

Note : All other frequencies in the range from 30 MHz to 1000 MHz have emission level of more than 10 dB below the limit.

Level = Meter Reading + Antenna Factor + Total Loss (Total Loss = Cable Loss + Antenna Pad Loss - Amplifier Gain)

Level is rounded off to one decimal place.

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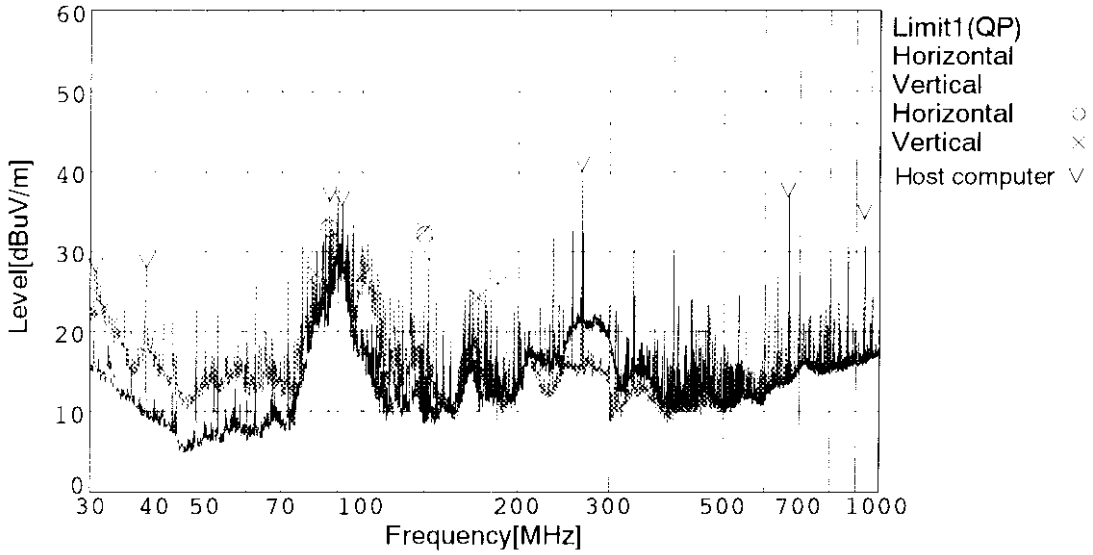
Mode 4 : Option serial interface

Kind of Equipment	: Printer	Temperature	: 22 °C
Model Name	: P120A	Humidity	: 55 %
Serial No.	: 98090100	Engineer	: T. Omori
Comment	: Option serial I/F		
Detector	: QP	Date	: 1998/9/10 19:21
Points	: 8	EMI Receiver(s)	: ESS

Limit1: [FCC] Class B<3m>



Frequency [MHz]	Meter Reading [dBuV]	Ant. Type	Antenna Factor [dB]	Total Loss [dB]	Level [dBuV/m]	Angle [degree]	Height [cm]	Pola.	Limit [dBuV/m]	Margin [dB]
31.980	25.0	BC	18.5	-20.4	23.1	102	100	Vert.	40.0	16.9
81.597	39.5	BC	6.8	-19.2	27.1	346	100	Vert.	40.0	12.9
86.404	44.4	BC	7.6	-19.1	32.9	253	400	Hori.	40.0	7.1
100.807	36.0	BC	10.0	-18.9	27.1	131	100	Vert.	43.5	16.4
131.997	36.9	BC	13.7	-18.5	32.1	357	400	Hori.	43.5	11.4
132.012	37.4	BC	13.7	-18.5	32.6	135	100	Vert.	43.5	10.9
168.008	26.5	BC	15.9	-18.2	24.2	174	100	Vert.	43.5	19.3
182.403	28.5	BC	16.4	-17.9	27.0	92	170	Hori.	43.5	16.5

Note : All other frequencies in the range from 30 MHz to 1000 MHz have emission level of more than 10 dB below the limit.

Level = Meter Reading + Antenna Factor + Total Loss (Total Loss = Cable Loss + Antenna Pad Loss - Amplifier Gain)

Level is rounded off to one decimal place.

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5. SUMMARY

5-1 Test Results

This test report clearly shows that the EUT complies with the FCC Part 15B Class B specification.

The minimum margins to the limits are as follows:

- Conducted measurement	8.1 dB	at	0.4867 MHz	(Mode 3)
			0.4856 MHz	(Mode 4)
- Radiation measurement	7.1 dB	at	86.404 MHz	(Mode 4)

This data represent the worst case emissions.

5-2 Sample Calculations

5-2-1 Conducted Emission

Example 0.4867 MHz (Mode 3)

Emission Level	=	Meter Reading			39.5	dBuV
	+	Correction Factor		+	0.4	dB
				=	39.9	dBuV
Margin	=	Limit			48.0	dBuV
	-	Emission Level		-	39.9	dBuV
				=	8.1	dB

Meter reading = Test receiver reading

The numerical value are rounded off to one decimal place.

5-2-2 Radiated Emission

Example 86.404 MHz (Mode 4)

Emission Level	=	Meter Reading			44.4	dBuV
	+	Antenna Factor		+	7.6	dB
	+	Total Loss		-	19.1	dB
				=	32.9	dBuV/m
Margin	=	Limit			40.0	dBuV/m
	-	Emission Level		-	32.9	dBuV/m
				=	7.1	dB

Meter reading = Test Receiver reading

The numerical values are rounded off to one decimal place.

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6. LIST OF UTILIZED TEST EQUIPMENT

6-1 Conducted Emission Measurement

Instrument	Manufacturer	Model Number	Serial Number	Last Calibration Date	Period
Spectrum Analyzer	Hewlett Packard	8567A	2718A00363	April 28, 1998	1 Year
Quasi-peak Adapter	Hewlett Packard	85650A	2521A00798	April 3, 1998	1 Year
Test Receiver	Rhode & Schwarz	ESH2	879013/027	April 1, 1998	1 Year
LISN	Rhode & Schwarz	ESH2-Z5	890484/004	September 4, 1998	1 Year

6-2 Radiated Emission Measurement

Instrument	Manufacturer	Model Number	Serial Number	Last Calibration Date	Period
Spectrum Analyzer	Hewlett Packard	8566B	2332A02675	August 24, 1998	1 Year
Quasi-peak Adapter	Hewlett Packard	85650A	2043A00284	August 24, 1998	1 Year
Pre-amplifier	Hewlett-Packard	87405A	3207A00888	March 18,1998	1 Year
Test Receiver	Rhode & Schwarz	ESS	845420/010	January 8, 1998	1 Year
Biconical Antenna	Schwarzbeck	BBA9106	-	February 11, 1998	1 Year
Log-periodic Antenna	EMCO	3146	8910-2511	November 24, 1997	1 Year

Note : The utilized instruments are calibrated by a body that can provide traceability to a national standard.

The abbreviation of antenna types which indicate on the radiated emission test table are follows:

BC : Biconical Antenna LP : Log-periodic Antenna

6-3 Measurement Uncertainties

Measurement uncertainties are shown as below.

Conducted Emission Measurement	±2.33 dB
Radiated Emission Measurement	5.15 dB / −4.56 dB

Repeating and reproducing maximum emission set-up are not discussed herein.

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7. VALIDITY OF TEST REPORT

1: The test result of this report is effective for equipment under test itself and test configuration described on the report.

2: This test report shall not be reproduced without the written approval of the laboratory.

3: This test report must not be used by client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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8. DESCRIPTION OF TEST LABORATORY

Bibliography

Since commencing operation in 1942 as a watch manufacturer, Seiko Epson Corporation has utilized its own original micromechatronics technologies, gained while developing quartz watches, to diversify into a variety of fields, as computers, printers and electronic devices, including semiconductors and liquid crystal displays. The phase "highly functional and highly compact" best describes the policy of our product development activities.

Since the initial electrical printer was manufactured in 1971, Seiko Epson Corporation has been working for EMC field. It is a combination of precise machine technology and electric technology.

Now EMC group has 3 semi-anechoic chambers and 8 EMI/EMC test facilities and full responsibilities on EMC testing. It is independent from any other business organizations and admired by the president as neutral and it's independency.

Filing, Certification and Accreditation List

EMC testing

FCC	(USA)
NVLAP (Lab. Code: 200157-0)	(USA)
NMi	(Netherlands)
VCCI	(Japan)
NEMKO	(Norway)