

ORIGINAL



TEST REPORT

REPORT NUMBER : AKL-398110
APPLICANT : FUJITSU LIMITED
MODEL NUMBER : M385420WA
FCC ID : C9SDP049M385420W
REGULATION : FCC Part15B Class B
Canada ICES-003 Class B

Conducted Emission Test
Radiated Emission Test



NVLAP accreditation is valid only
FCC Part15(Digital Devices),
CISPR22, and AS/NZS 3548
test reports.

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SECTION 1. TEST CERTIFICATION

APPLICANT INFORMATION

Company : FUJITSU LIMITED
Address : Marunouchi Center Bldg. 6-1 Marunouchi 1-chome Chiyoda-ku
Tokyo 100-0005 Japan
Telephone number : +81 3 3215 5101
Fax number : +81 3 3216 9352

DESCRIPTION OF TEST ITEM

Kind of equipment : Page Printer
Condition of equipment : Pre-Production
Type : Table-Top
Trademark : FUJITSU
FCC ID : C9SDP049M385420W
Model number : M385420WA
Serial number : 85006422

TEST PERFORMED

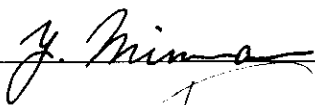
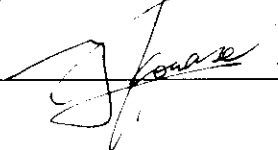
Location : Nagano No. 3 Test Site (FCC File No. : 31040/SIT)
Test started : July 8, 1998
Test completed : July 9, 1998
Purpose of test : FCC Docket 87-389
and Canadian Interference-Causing Equipment Regulations
Regulation : FCC Part15B Class B and Canada ICES-003 Class B
Unintentional Radiators
Test setup : ANSI C63.4-1992

Report file number : AKL-398110

Report issue date : July 10, 1998

Test engineer : Yoshihide Mimura

Report approved by : Yoshio Kowase
[Site Manager]

This equipment complies with above standard or regulation under the test condition or test configuration shown on this test report.

SECTION 2. CONCLUSION

This test report clearly shows that the EUT is in compliance with the FCC Part 15B Class B specification and the Canada ICES-003 Class B specification.

Traceability to national standards of test result is achieved by means of calibration traceability to national standards.

The minimum margins to the limits are as follows:

Conduction measurement

Centronics (type-C) I/F mode	5.0 dB	at	20.7514 MHz
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Radiation measurement

IrDA I/F (600dpi) mode	3.1 dB	at	330.00 MHz
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Note : See Section 9 for details.

SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following equipment.
Indication in the following left side column corresponds to Section 6.

Symbo Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
A) Printer	M385420WA	85006422	C9SDP049M385420W	FUJITSU LIMITED	EUT
B) IrDA kit	CA04040-C890	None	N.A.	FUJITSU LIMITED	Option
C) Memory expansion card	CA04040-C853	None	N.A.	FUJITSU LIMITED	Option
D) Memory expansion card	CA04040-C853	None	N.A.	FUJITSU LIMITED	Option
E) Emulation card	CA04291-C830	None	N.A.	FUJITSU LIMITED	Option
F) Duplex unit	CA02946-E830	None	N.A.	FUJITSU LIMITED	Option
G) Paper feeder	CA02946-F950	6Z000024	N.A.	FUJITSU LIMITED	Option
H) Paper feeder	CA02946-F770	7Z003701	N.A.	FUJITSU LIMITED	Option
I) Paper feeder	CA02946-F770	7Z003682	N.A.	FUJITSU LIMITED	Option

Power ratings of EUT : AC 100 - 120V, 50/60 Hz, 8.0A

DoC : Device for Declaration of Conformity

Abbreviations : IrDA = Infrared Data Association

3.1 Port(s)/Connector(s) :

Port name	Connector type	Connector pin	Remarks
Parallel	Amphenol	36 pin	Centronics B-type
Parallel	Half Centronics	36 pin	Centronics C-type
Serial	D-sub	9 pin	RS-232C
IrDA	Mini-DIN	8 pin	IrDA

3.2 Oscillator(s)/Crystal(s) :

Oscillator	Operating frequency	Board name	Remarks
30 MHz	150.00 MHz	Controller board	Main processor, Highest frequency
	30.00 MHz	Controller board	Main LSI
24 MHz	24.00 MHz	Controller board	Main LSI
	24.00 MHz	Controller board	Mechanism control processor
	24.00 MHz	Controller board	Mechanism control LSI
44.6200 MHz	22.3100 MHz	Controller board	Image enhancement LSI
6.692283 MHz	6.692283 MHz	Optical unit	
48.00 MHz	48.00 MHz	IrDA board	
20.00 MHz	10.00 MHz	IrDA board	

SECTION 4. SUPPORT EQUIPMENT USED

The EUT was supported by the following equipment during the test.
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer
J)	Computer	3563V5	7724HVU41588	CNT75MDEBV5	COMPAQ
K)	CRT Display	611	718BC02UX036	DoC	COMPAQ
L)	Keyboard	RT6656TWJP	B2080G39F31P7	AQ6-MTN4C15	COMPAQ
M)	Modem	C202A	010539	BKM552C202A	EPSON
N)	Printer	M3359A	002192	C9S69NDP012A1	FUJITSU LIMITED
O)	Computer	PA1247C9	87014879	DoC	TOSHIBA CORPORATION
P)	Mouse	M-S34	B04AB0H5BF233JK	DZL211029	COMPAQ
Q)	AC Adaptor	HOOCAA	020108	N.A.	EPSON
R)	AC Adaptor	PA2450U	None	N.A.	TOSHIBA
S)	Computer	8550-031	90-5012094	ANO9SA8550-S	IBM
T)	CRT Display	8512-001	72-1134046	C5F7NF13CM14	IBM
U)	Keyboard	M	None	N.A.	IBM

DoC : Device was tested and authorized under a Declaration of Conformity to the applicable FCC rules.

SECTION 5. CABLE (S) USED

The following cable(s) was used for the test.

Indication number in the following left side column corresponds to Section 6.

Number	Name	Length	Shield	Connector
1)	Centronics cable (B-type)	3.00 m	Yes	Metal
2)	Centronics cable (C-type)	3.00 m	Yes	Metal
3)	RS-232C cable	3.00 m	Yes	Metal
4)	IrDA cable	1.50 m	Yes	Metal
5)	Keyboard cable	2.00 m	Yes	Metal
6)	Video cable	1.50 m	Yes	Metal
7)	Modem cable	1.50 m	Yes	Metal
8)	Mouse cable	1.85 m	Yes	Metal
9)	Keyboard cable (Curl cord)	1.10 m	Yes	Metal
10)	Video cable	1.70 m	Yes	Metal
11)	Power cord for Modem	1.90 m	None	
12)	Power cord for EUT	3.00 m	None	
13)	Power cord for Computer	2.00 m	None	
14)	Power cord for CRT Display	2.00 m	None	
15)	Power cord for Printer	3.00 m	None	
16)	Power cord for Computer(AC)	2.00 m	None	
17)	Power cord for Computer(DC)	1.80 m	None	
18)	Power cord for Computer	1.80 m	None	
19)	Power cord for CRT Display	1.90 m	None	

Note :

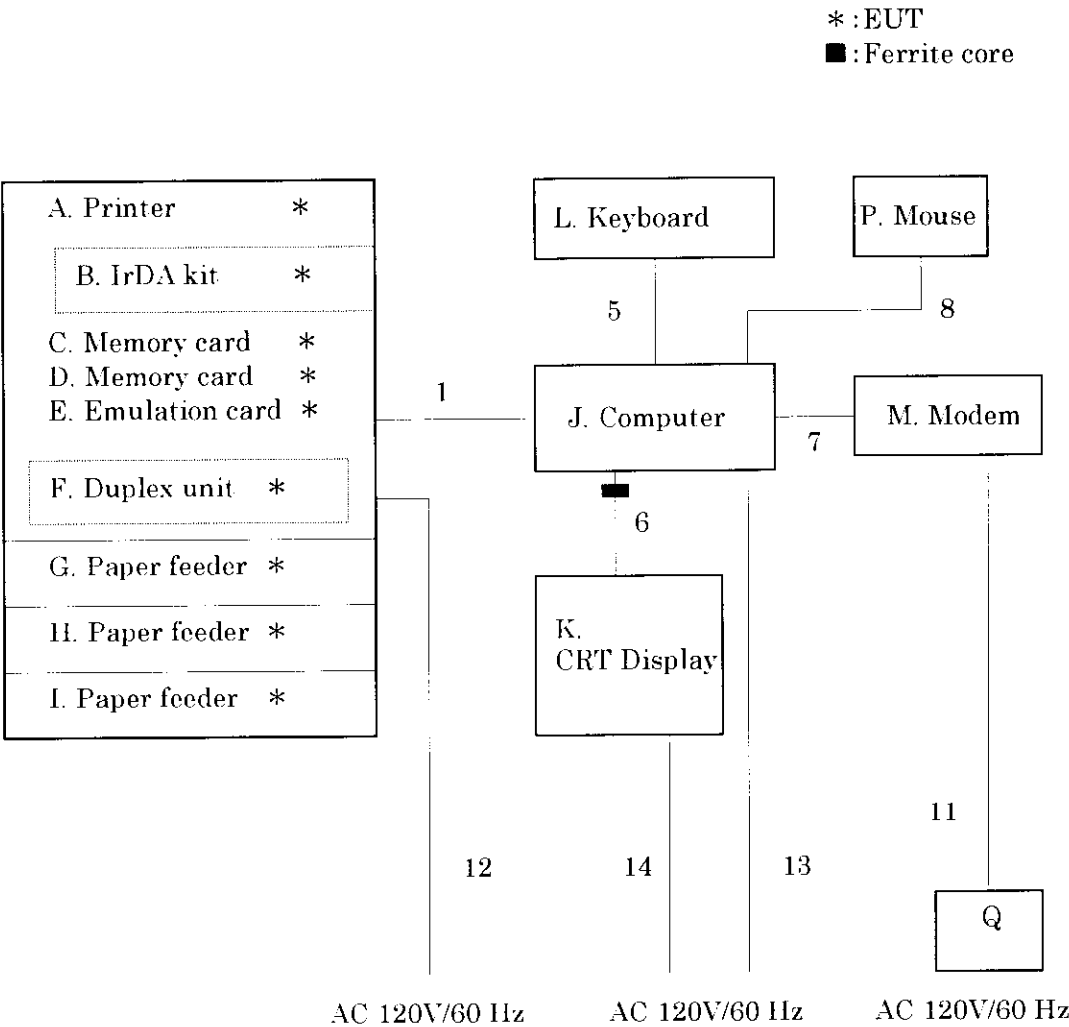
- a. One ferrite core is permanently attached to Video cable(6).

SECTION 6. CONSTRUCTION OF EQUIPMENT

The construction of EUT during the test was as follows.

6.1 Parallel interface. “H” print mode
Centronics type-B

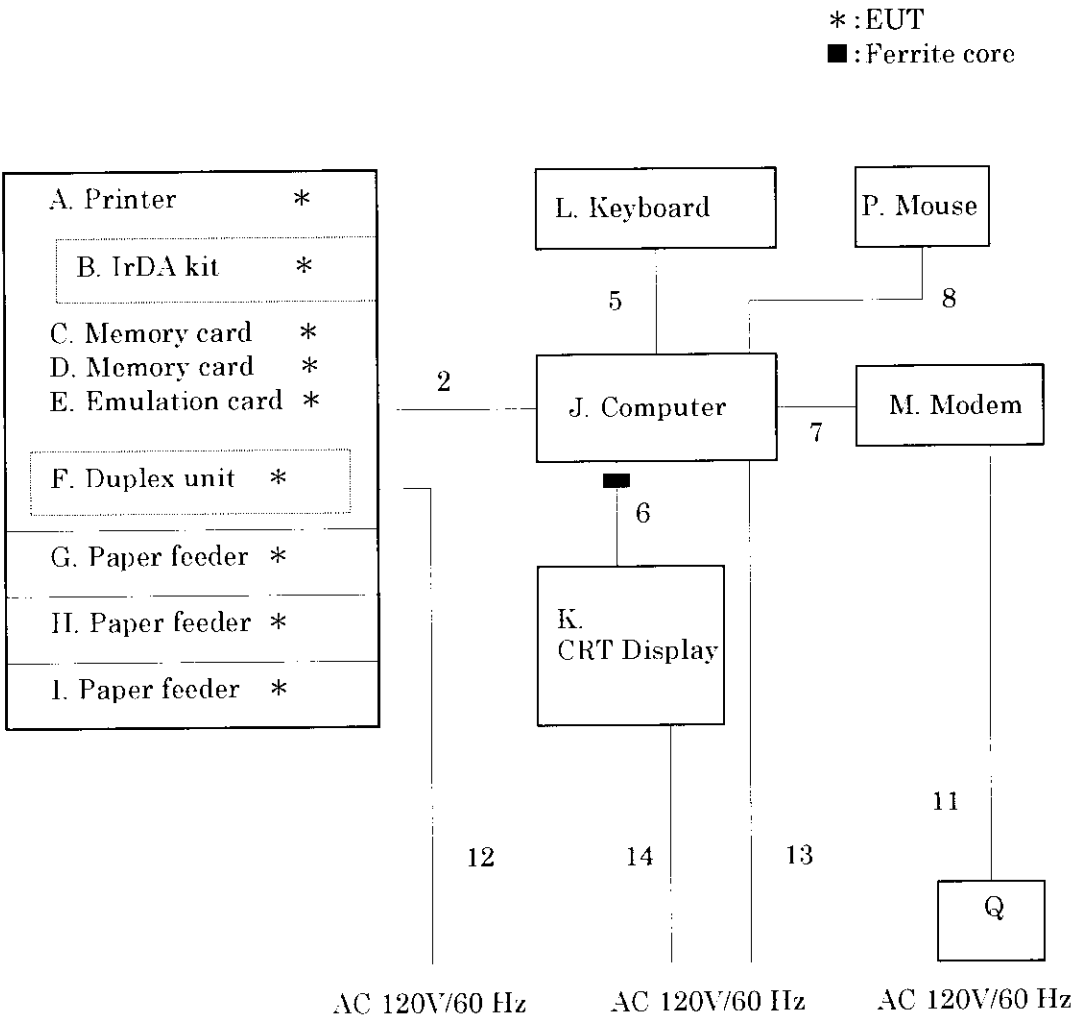
System configuration



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

6.2 Parallel interface, “H” print mode
Centronics type-C

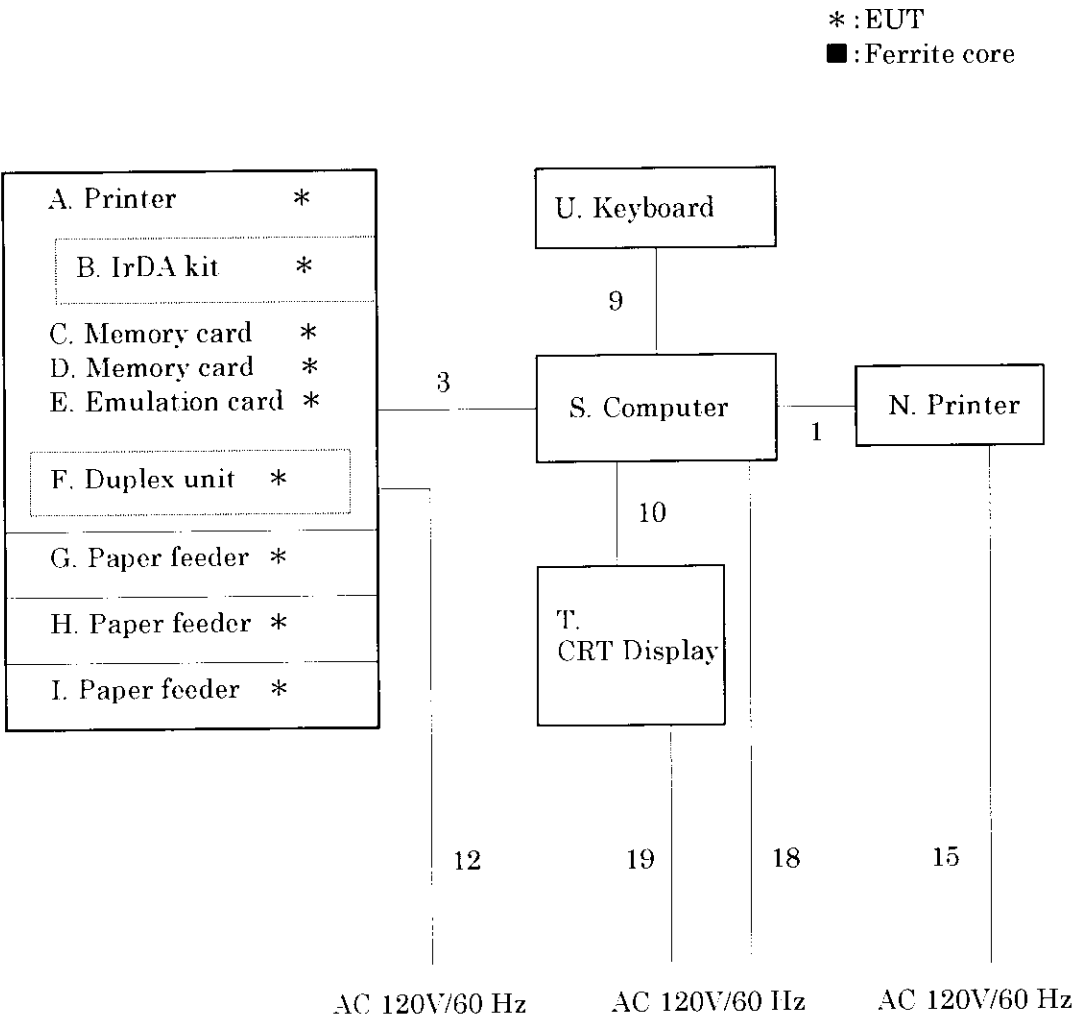
System configuration



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

6.3 Serial interface, “H” print mode
RS-232C

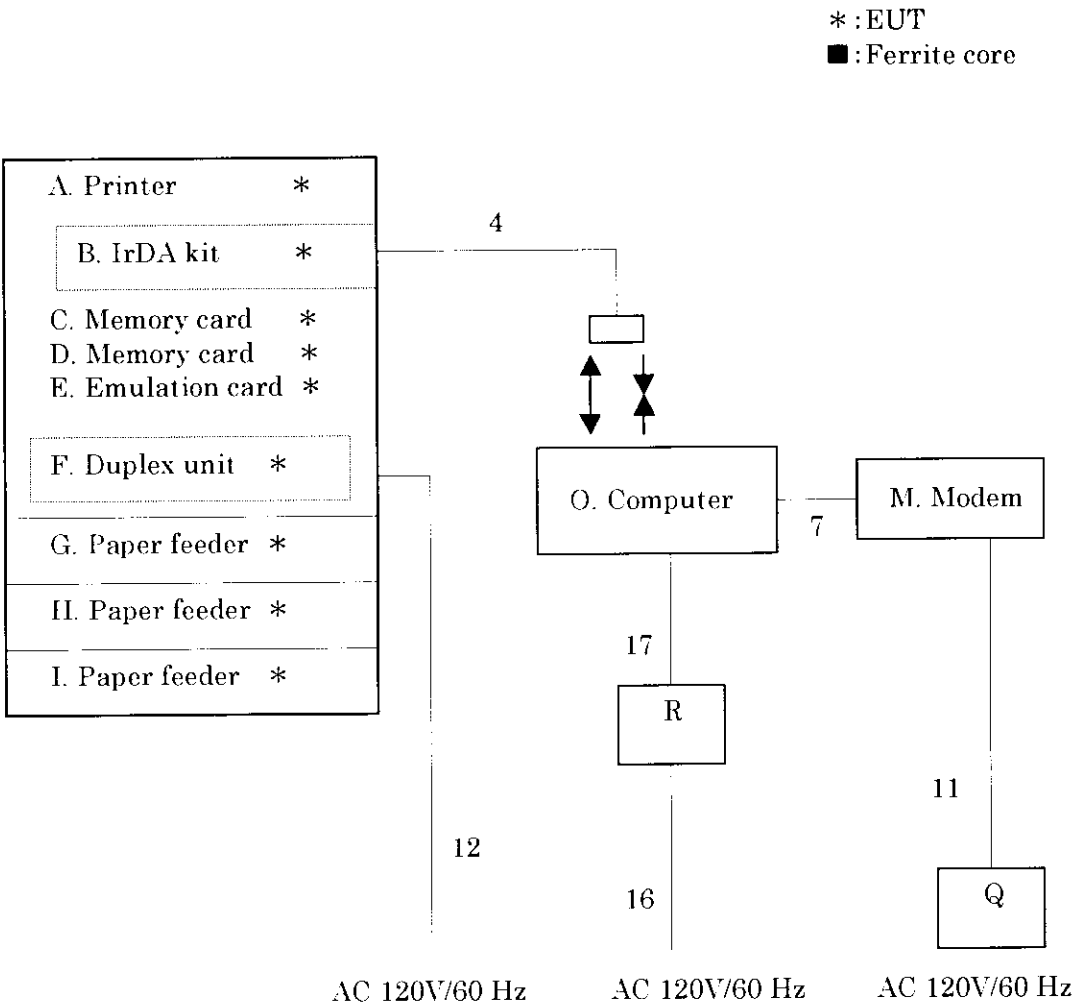
System configuration



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

6.4 IrDA interface, “H” print mode

System configuration



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

SECTION 7. OPERATING CONDITIONS

The EUT was operated under the following conditions during the test.

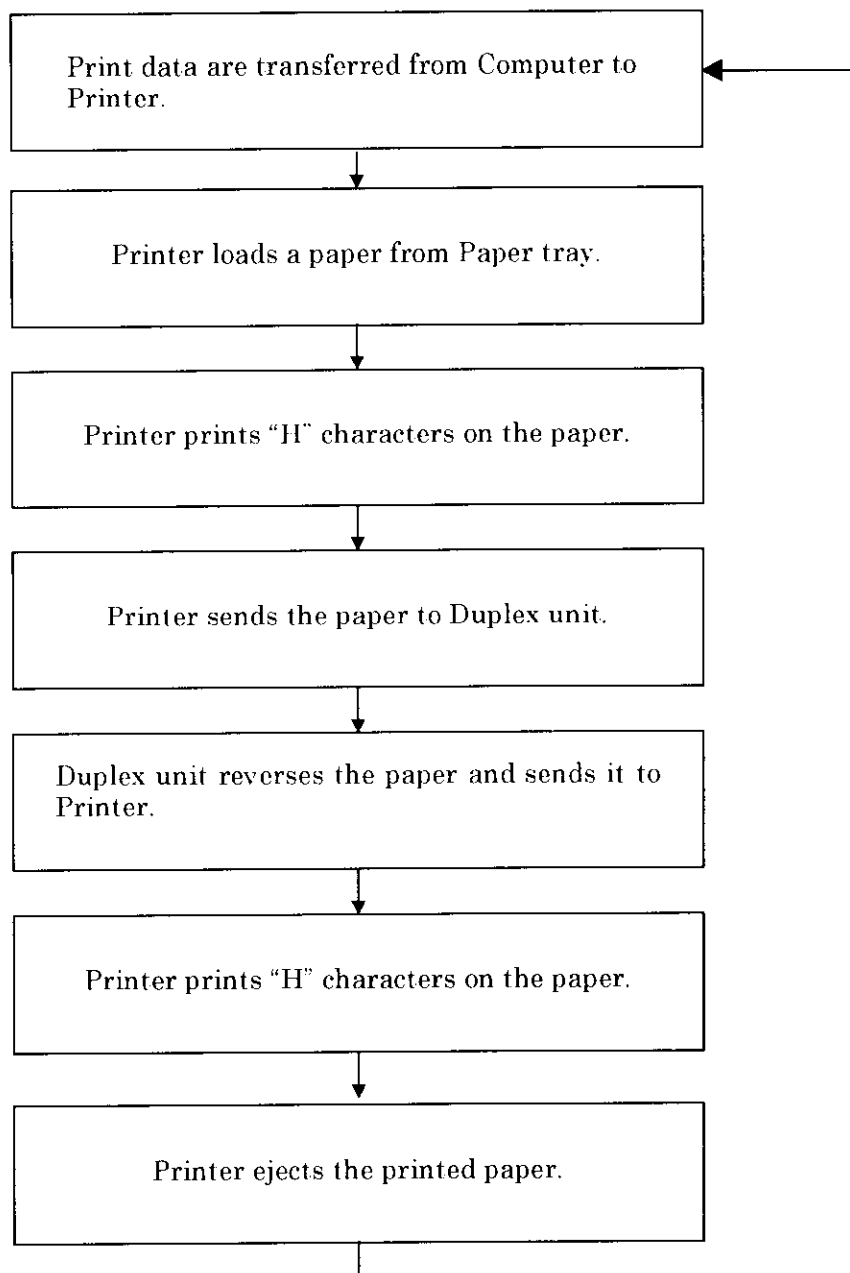
7.1 Operating condition

The tests was carried out under Centronics(type-B) mode, Centronics(type-C) mode, RS-232C mode and IrDA mode.

EUT was examined in the operating conditions that had maximum emissions.

7.2 Operating flow

Cycle time 600dpi: 14seconds
1200dpi: 22seconds

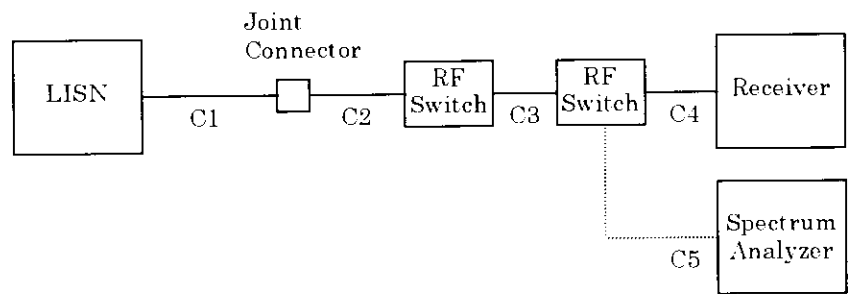


SECTION 8. TEST PROCEDURE(S)

Tests were carried out under the following conditions.
Tests were carried out with no deviations from standards and test methods.

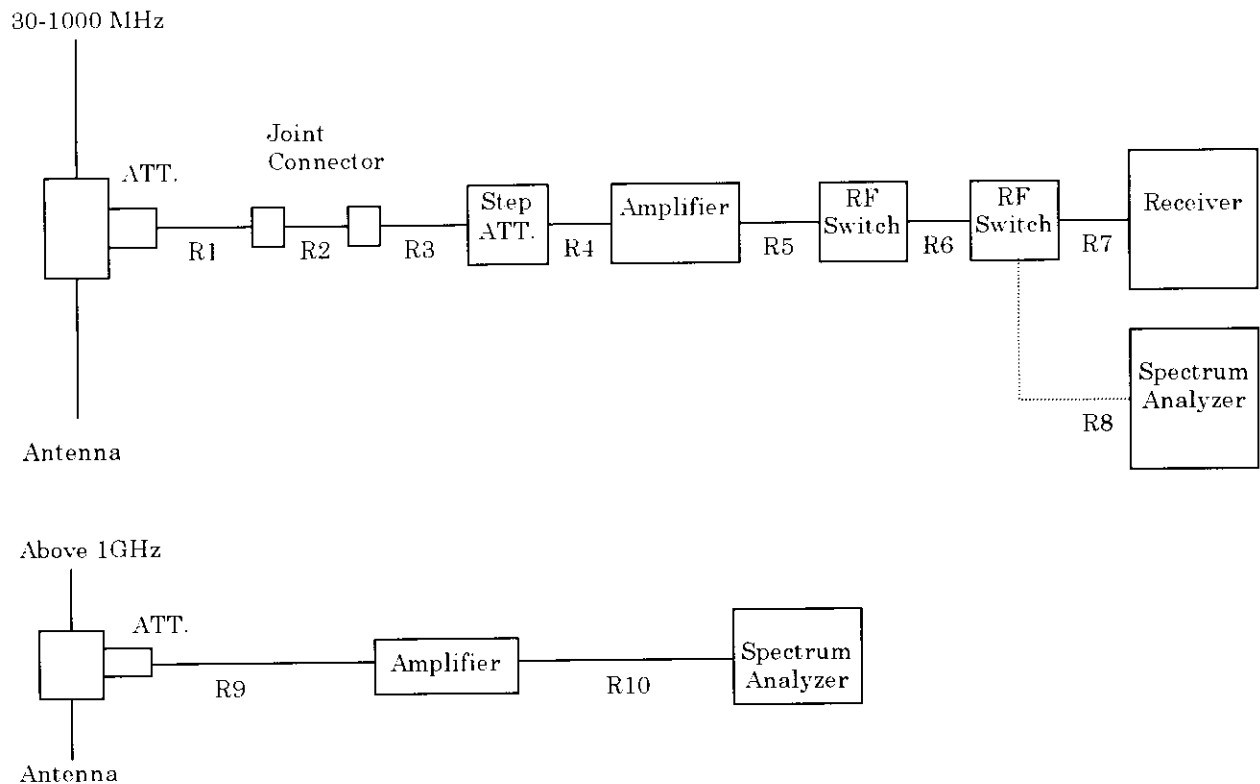
Subject	Test procedure	Measurement software	Scan frequency
Conducted Emission	Akzo Kashima Document number : 03-10-004	Ver. 1, 3, 2, 1	0.45 - 30 MHz
Radiated Emission	Akzo Kashima Document number : 03-10-003	Ver. 1, 3, 2, 1	30 - 2000 MHz

Schema for the conducted measurement



Abbreviations : LISN = Line Impedance Stabilization Network
Line Impedance Stabilization Network(LISN) = Artificial Mains Network(A.M.N.)

Schema for the radiated measurement



Abbreviations : ATT. = Attenuator

Summary :

8.1 Conducted Emission Test

8.1.1 Equipment Setup

System configuration and Equipment setup are shown on Section 6 and Section 10.

8.1.1.1 Table-Top Equipment

EUT is placed on the wooden table of size, 1.0meter(d) by 2.1meter(w), raised 0.8meter above the metal ground plane.

8.1.1.2 Interconnecting Cables

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

8.1.1.3 AC Power Cord

AC power cord for EUT is connected to one LISN which is placed on top of ground plane. The LISN is placed in 80 cm from the nearest part of EUT chassis.

The excess power cable is bundled in the center, or shortened to appropriate length. AC cables except from the EUT are connected second LISN.

8.1.2 Measuring Instruments

Measuring instruments list and calibration schedule are shown on Section 11, and brief description are as follows:

8.1.2.1 Spectrum Analyzer

The Spectrum analyzer is used for preliminary measurement.

8.1.2.2 EMI Test Receiver

The Quasi-peak detector(Resolution bandwidth : 10 kHz) and average detector (Resolution bandwidth : 10 kHz) built in test receiver is used for final measurement. The test receiver is complied with the specification of the CISPR publication 16.

8.1.2.3 LISN

The 50 μ H/50 Ω LISN is used. The chassis of the LISN is bonded to the ground plane by the copper blade.

The lead to be tested is selectable by switch, and the terminals which are not connected to the EUT are terminated in 50 Ω resistor termination.

8.1.3 Test Procedure

8.1.3.1 Preliminary Measurement

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep regulation frequency, then spectrum chart are plotted out to detect the worst conditions in operating mode and/or configuration for the final test.

All leads other than safety ground are tested.

8.1.3.2 Final Measurement

The EUT is operated in the worst condition where maximum emission is detected by the preliminary test. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

The each spectrum to be tested are measured in quasi-peak using the test receiver. When the value in the quasi-peak mode is higher than the limit in the standard, the measurement in the average mode is done to compare to the value in the quasi-peak mode. If the value in the quasi-peak mode exceeds the value in the average mode by more than 6 dB, the value reducing 13 dB from the value in the quasi mode is used to compare to the limit.

8.2 Radiated Emission Test

8.2.1 Equipment Setup

System configuration and Equipment setup are shown on Section 6 and Section 10.

8.2.1.1 Table-Top Equipment

EUT is placed on the wooden table of size. 1.0meter(d) by 2.0meter(w). raised 0.8meter above the metal ground plane(turntable).

8.2.1.2 Interconnecting Cables

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long. hanging approx. in the middle between ground plane and table.

8.2.2 Measuring Instruments

Measuring instruments list and calibration schedule are shown on Section 11. and brief description are as follows:

8.2.2.1 Antennas

The broadband Bi-cog antenna is used for measurement on the frequency range 30 – 1000 MHz.

The Double ridged guide antenna is used for frequency higher than 1000 MHz.

If uncertain result was obtained, the broadband antenna is replaced by the half wave length dipole, then measurement is carried out over again.

8.2.2.2 Pre-amplifier

The broadband pre-amplifier is used for radiated emission measurement.

The signal to noise ratio is improved by using pre-amplifier.

8.2.2.3 Spectrum Analyzer

The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz (Resolution bandwidth : 1 MHz).

8.2.2.4 EMI Test Receiver

The Quasi-peak detector(Resolution bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30 – 1000 MHz.

The test receiver is complied with the specification of the CISPR publication 16.

8.2.2.5 Turntable

The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.

8.2.2.6 Antenna Mast

The antenna mast is attachable to all antennas described on clause 8.2.2.1 and antenna height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.

8.2.3 Test Procedure

8.2.3.1 Preliminary Measurement

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to detect the worst conditions in configuration, operating mode, or ambient noise notation.

8.2.3.2 Final Measurement

The EUT operated in the condition where maximum emission is detected in the preliminary test.

The turntable azimuth(EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

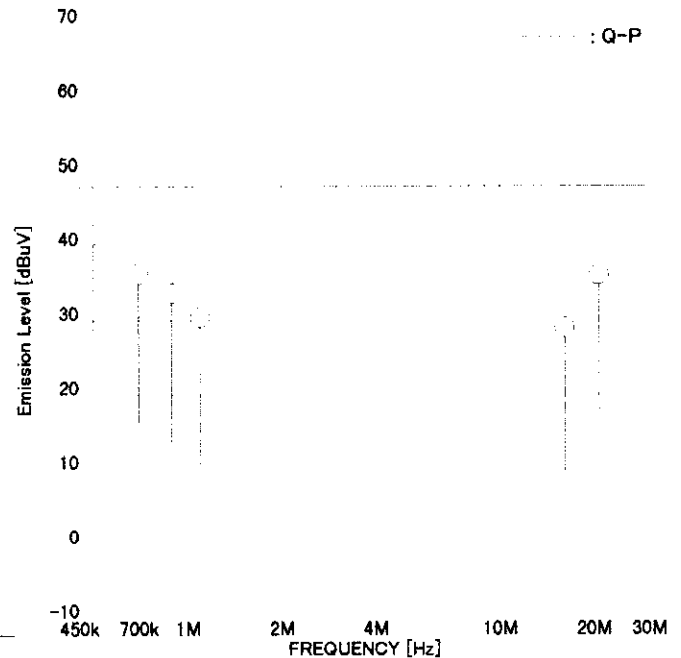
SECTION 9. EVALUATION OF TEST RESULTS

9.1 Conducted Emission Test

9.1.1 Centronics (type-B) I/F mode

Akzo Kashima Ltd.
Nagano No.3 Test Site
INTERFERENCE CONDUCTION TEST

APPLICANT : FUJITSU LIMITED
EUT NAME : Page printer
MODEL NO. : M385420WA
SERIAL NO. : 85006422
TEST MODE : Centronics (type-B) I/F
POWER SOURCE : AC120V/60Hz
DATE TESTED : Jul 09 1998
FILE NO. : AKL-398110
REGULATION : FCC Part15B CLASS B
TEST METHOD : ANSI C63.4-1992



ENGINEER :

Y. Mimura
Yoshihide Mimura

No.	FREQUENCY [MHz]	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.4998	Q-P	40.0	<u>41.0</u>	0.5	0.5	40.5	<u>41.5</u>	48.0	7.5	<u>6.5</u>
2	0.6970	Q-P	35.2	<u>35.8</u>	0.4	0.4	35.6	<u>36.2</u>	48.0	12.4	<u>11.8</u>
3	0.8904	Q-P	33.1	<u>33.2</u>	0.4	0.4	33.5	<u>33.6</u>	48.0	14.5	<u>14.4</u>
4	1.1000	Q-P	30.0	<u>29.5</u>	0.4	0.4	30.4	<u>29.9</u>	48.0	17.6	<u>18.1</u>
5	16.1311	Q-P	27.9	<u>28.1</u>	0.9	0.9	28.8	<u>29.0</u>	48.0	19.2	<u>19.0</u>
6	20.7514	Q-P	34.7	<u>35.1</u>	0.9	0.9	35.6	<u>36.0</u>	48.0	12.4	<u>12.0</u>

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(LISN, Pad, Cable)

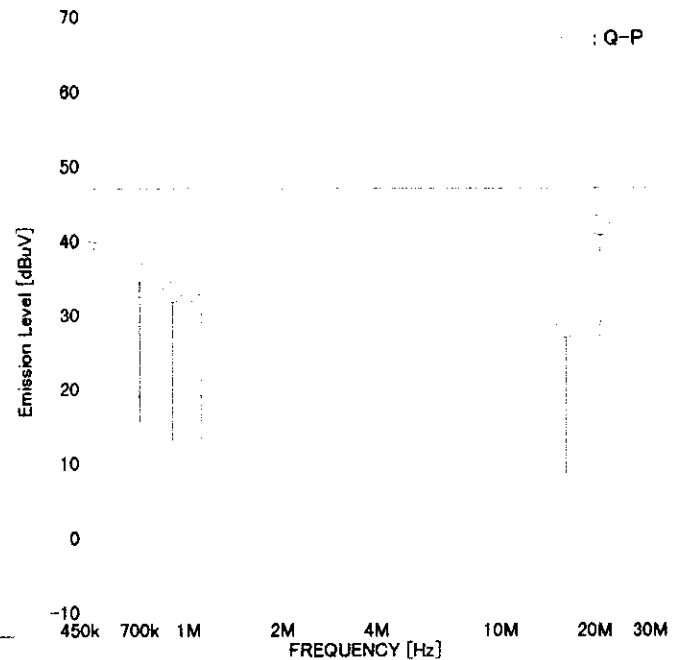
9.1.2 Centronics (type-C) I/F mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE CONDUCTION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : Centronics (type-C) I/F
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 09 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992



ENGINEER :

Y. Mimura
Yoshihide Mimura

No.	FREQUENCY [MHz]	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.4998	Q-P	<u>41.5</u>	40.1	0.5	0.5	<u>42.0</u>	40.6	48.0	<u>6.0</u>	7.4
2	0.6985	Q-P	<u>36.2</u>	35.6	0.4	0.4	<u>36.6</u>	36.0	48.0	<u>11.4</u>	12.0
3	0.8904	Q-P	<u>33.4</u>	<u>33.6</u>	0.4	0.4	<u>33.8</u>	<u>34.0</u>	48.0	<u>14.2</u>	<u>14.0</u>
4	1.1000	Q-P	<u>32.0</u>	<u>30.2</u>	0.4	0.4	<u>32.4</u>	30.6	48.0	<u>15.6</u>	17.4
5	16.1311	Q-P	<u>28.2</u>	27.9	0.9	0.9	<u>29.1</u>	28.8	48.0	<u>18.9</u>	19.2
6	20.7514	Q-P	<u>42.0</u>	<u>42.1</u>	0.9	0.9	<u>42.9</u>	<u>43.0</u>	48.0	5.1	<u>5.0</u>

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(LISN, Pad, Cable)

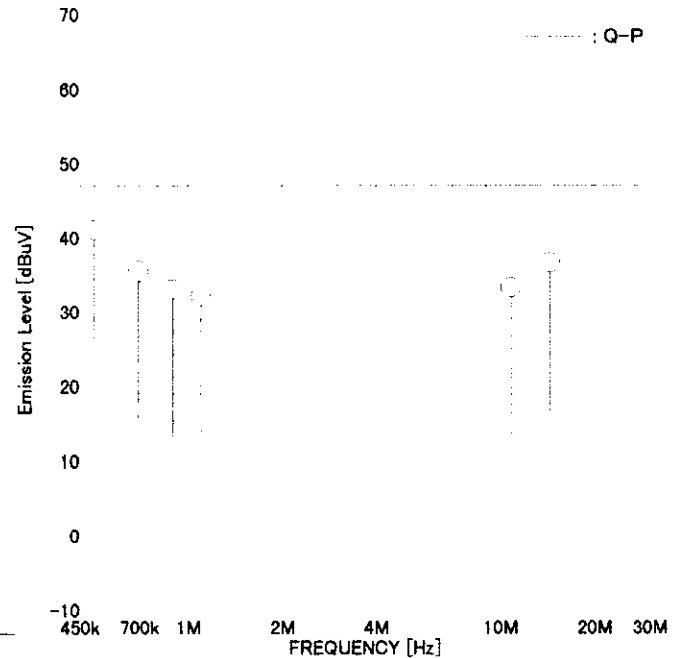
9.1.3 RS-232C I/F mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE CONDUCTION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : RS232C I/F
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 09 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992



ENGINEER :

Y. Mimura
Yoshihide Mimura

No.	FREQUENCY [MHz]	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.4998	Q-P	40.2	<u>41.6</u>	0.5	0.5	40.7	<u>42.1</u>	48.0	7.3	<u>5.9</u>
2	0.6931	Q-P	35.6	<u>36.1</u>	0.4	0.4	36.0	<u>36.5</u>	48.0	12.0	<u>11.5</u>
3	0.8928	Q-P	33.7	33.5	0.4	0.4	34.1	33.9	48.0	13.9	14.1
4	1.1000	Q-P	<u>32.8</u>	30.3	0.4	0.4	<u>33.2</u>	30.7	48.0	<u>14.8</u>	17.3
5	10.7939	Q-P	<u>33.6</u>	31.2	0.7	0.7	<u>34.3</u>	31.9	48.0	<u>13.7</u>	16.1
6	14.3814	Q-P	<u>36.8</u>	33.0	0.8	0.8	<u>37.6</u>	33.8	48.0	<u>10.4</u>	14.2

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(LISN, Pad, Cable)

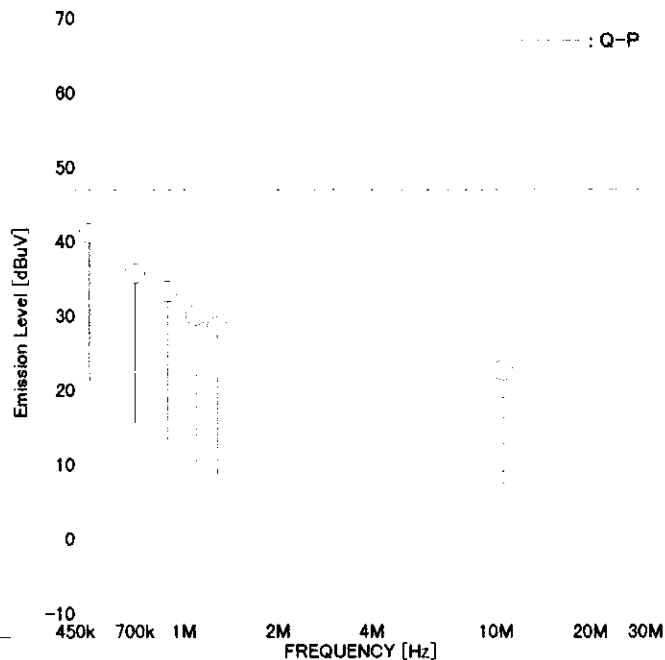
9.1.4 IrDA I/F (600dpi) mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE CONDUCTION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : IrDA I/F (600dpi)
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 09 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992



ENGINEER :

Y. Mimura
Yoshihide Mimura

No.	FREQUENCY [MHz]	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.4973	Q-P	41.0	<u>41.6</u>	0.5	0.5	41.5	<u>42.1</u>	48.0	6.5	<u>5.9</u>
2	0.6983	Q-P	36.0	<u>36.2</u>	0.4	0.4	36.4	<u>36.6</u>	48.0	11.6	<u>11.4</u>
3	0.8874	Q-P	<u>33.8</u>	33.5	0.4	0.4	<u>34.2</u>	33.9	48.0	<u>13.8</u>	14.1
4	1.0934	Q-P	<u>30.6</u>	29.8	0.4	0.4	<u>31.0</u>	30.2	48.0	<u>17.0</u>	17.8
5	1.2800	Q-P	<u>29.1</u>	28.3	0.4	0.4	<u>29.5</u>	28.7	48.0	<u>18.5</u>	19.3
6	10.5082	Q-P	22.0	<u>22.9</u>	0.7	0.7	22.7	<u>23.6</u>	48.0	25.3	<u>24.4</u>

Higher six points are underlined.

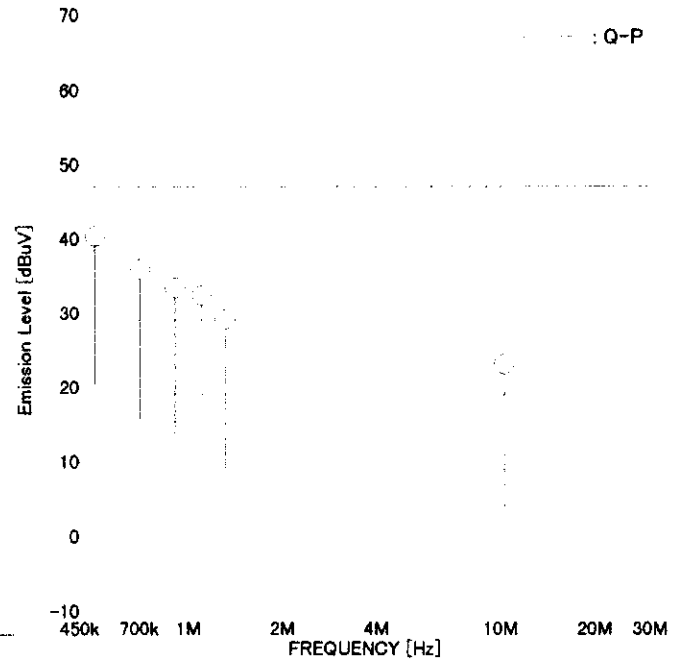
Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(LISN, Pad, Cable)

9.1.5 IrDA I/F (1200dpi) mode

Akzo Kashima Ltd.
Nagano No.3 Test Site
INTERFERENCE CONDUCTION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : IrDA I/F (1200dpi)
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 09 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992



ENGINEER :

Y. Mimura
 Yoshihide Mimura

FREQUENCY MODE			READING		FACTOR		EMISSION		LIMIT	MARGIN	
[MHz]			[dBuV]		[dB]		[dBuV]		[dBuV]	[dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.5050	Q-P	40.7	<u>40.9</u>	0.4	0.4	41.1	<u>41.3</u>	48.0	6.9	<u>6.7</u>
2	0.7041	Q-P	35.9	<u>36.4</u>	0.4	0.4	36.3	<u>36.8</u>	48.0	11.7	<u>11.2</u>
3	0.9114	Q-P	<u>33.9</u>	33.8	0.4	0.4	<u>34.3</u>	34.2	48.0	<u>13.7</u>	13.8
4	1.1092	Q-P	<u>32.9</u>	32.4	0.4	0.4	<u>33.3</u>	32.8	48.0	<u>14.7</u>	15.2
5	1.3163	Q-P	<u>29.7</u>	28.3	0.4	0.4	<u>30.1</u>	28.7	48.0	<u>17.9</u>	19.3
6	10.2540	Q-P	21.5	<u>23.4</u>	0.7	0.7	22.2	<u>24.1</u>	48.0	25.8	<u>23.9</u>

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

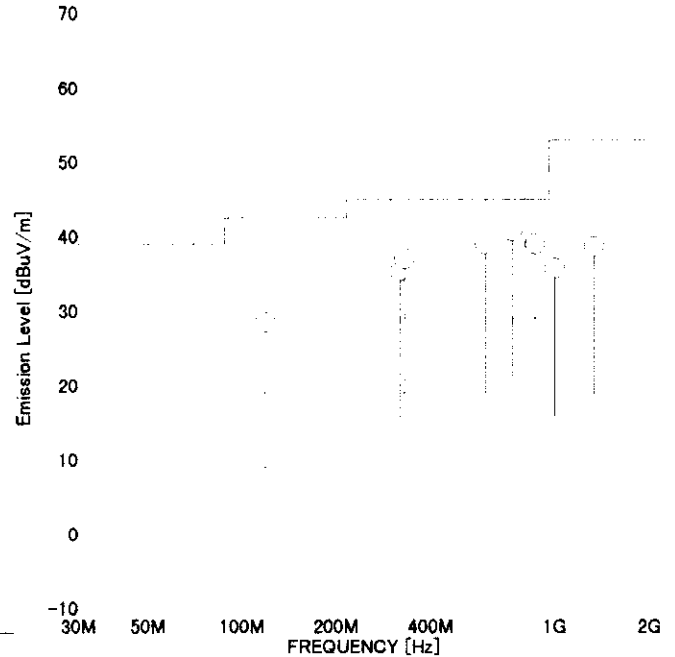
Emission Level = Read + Factor(LISN, Pad, Cable)

9.2 Radiated Emission Test

9.2.1 Centronics (type-B) I/F mode

Akzo Kashima Ltd.
Nagano No.3 Test Site
INTERFERENCE RADIATION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : Centronics (type-B) I/F
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 08 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992
 DISTANCE : 3.0 [m]
 TEMPERATURE : 25.0 [°C]
 HUMIDITY : 50.0 [%]



ENGINEER :

Y. Minura
 Yoshihide Mimura

FREQ.	FREQ. [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	118.68	BBA	-	<u>40.4</u>	-10.9	-10.9	-	<u>29.5</u>	43.5	-	<u>14.0</u>
2	320.05	BBA	<u>42.0</u>	-	-5.7	-5.7	<u>36.3</u>	-	46.0	<u>9.7</u>	-
3	330.00	BBA	40.3	<u>43.5</u>	-5.5	-5.5	34.8	<u>38.0</u>	46.0	11.2	<u>8.0</u>
4	597.94	BBA	-	<u>41.2</u>	-1.2	-1.2	-	<u>40.0</u>	46.0	-	<u>6.0</u>
5	730.82	BBA	-	<u>39.6</u>	2.1	2.1	-	<u>41.7</u>	46.0	-	<u>4.3</u>
6	863.70	BBA	<u>35.7</u>	-	4.3	4.3	<u>40.0</u>	-	46.0	<u>6.0</u>	-
7	996.58	BBA	29.3	-	7.4	7.4	36.7	-	54.0	17.3	-
8	1328.80	BBA	44.5	-	-4.9	-4.9	39.6	-	54.0	14.4	-

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

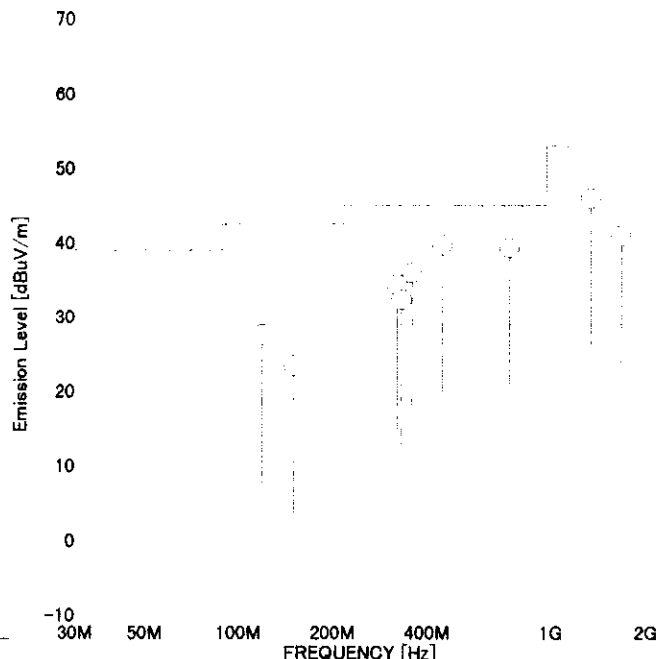
9.2.2 Centronics (type-C) I/F mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE RADIATION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : Centronics (type-C) I/F
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 08 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992
 DISTANCE : 3.0 [m]
 TEMPERATURE : 25.0 [°C]
 HUMIDITY : 50.0 [%]



ENGINEER :

Y. Mimura
Yoshihide Mimura

FREQUENCY [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]		
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert	
1	118.68	BBA	-	39.5	-10.9	-10.9	-	28.6	43.5	-	14.9
2	150.00	BBA	-	38.2	-13.7	-13.7	-	24.5	43.5	-	19.0
3	320.05	BBA	<u>41.0</u>	-	-5.7	-5.7	<u>35.3</u>	-	46.0	<u>10.7</u>	-
4	330.00	BBA	<u>37.2</u>	38.8	-5.5	-5.5	<u>31.7</u>	33.3	46.0	<u>14.3</u>	12.7
5	356.95	BBA	-	<u>42.0</u>	-5.1	-5.1	-	<u>36.9</u>	46.0	-	<u>9.1</u>
6	446.19	BBA	-	<u>44.1</u>	-3.4	-3.4	-	<u>40.7</u>	46.0	-	<u>5.3</u>
7	730.82	BBA	-	<u>38.2</u>	2.1	2.1	-	<u>40.3</u>	46.0	-	<u>5.7</u>
8	1328.75	BBA	46.5	<u>51.8</u>	-4.9	-4.9	41.6	<u>46.9</u>	54.0	12.4	<u>7.1</u>
9	1661.01	BBA	<u>44.8</u>	-	-2.9	-2.9	41.9	-	54.0	12.1	-

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

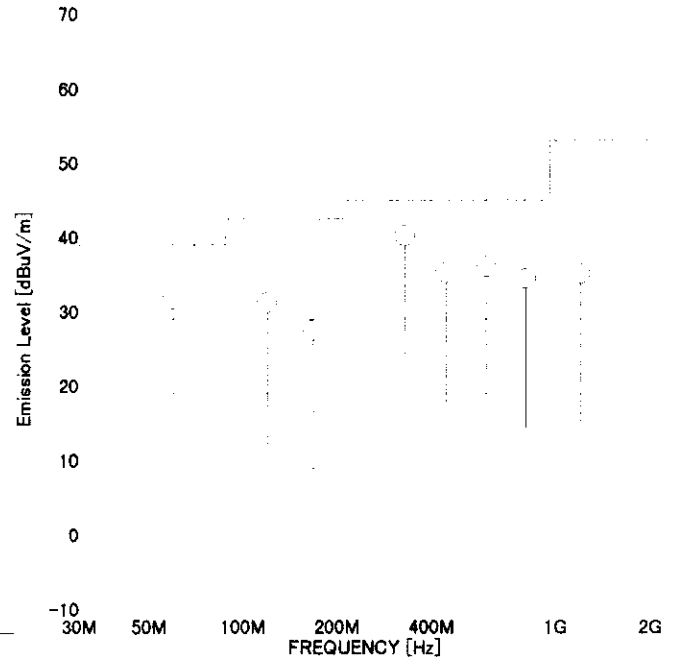
9.2.3 RS-232C I/F mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE RADIATION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : RS232C I/F
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 08 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992
 DISTANCE : 3.0 [m]
 TEMPERATURE : 25.0 [°C]
 HUMIDITY : 50.0 [%]



ENGINEER :

Y. Mimura
Yoshihide Mimura

FREQUENCY [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]		
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert	
1	60.00	BBA	-	<u>44.0</u>	-11.3	-11.3	-	<u>32.7</u>	40.0	-	<u>7.3</u>
2	119.75	BBA	-	<u>43.0</u>	-10.8	-10.8	-	<u>32.2</u>	43.5	-	<u>11.3</u>
3	167.66	BBA	-	<u>40.5</u>	-12.0	-12.0	-	<u>28.5</u>	43.5	-	<u>15.0</u>
4	330.00	BBA	-	<u>46.7</u>	-5.5	-5.5	-	<u>41.2</u>	46.0	-	<u>4.8</u>
5	446.19	BBA	-	<u>39.6</u>	-3.4	-3.4	-	<u>36.2</u>	46.0	-	<u>9.8</u>
6	600.00	BBA	-	<u>38.1</u>	-1.1	-1.1	-	<u>37.0</u>	46.0	-	<u>9.0</u>
7	803.15	BBA	-	<u>32.0</u>	3.4	3.4	-	<u>35.4</u>	46.0	-	<u>10.6</u>
8	1200.14	BBA	41.6	-	-5.6	-5.6	36.0	-	54.0	18.0	-

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

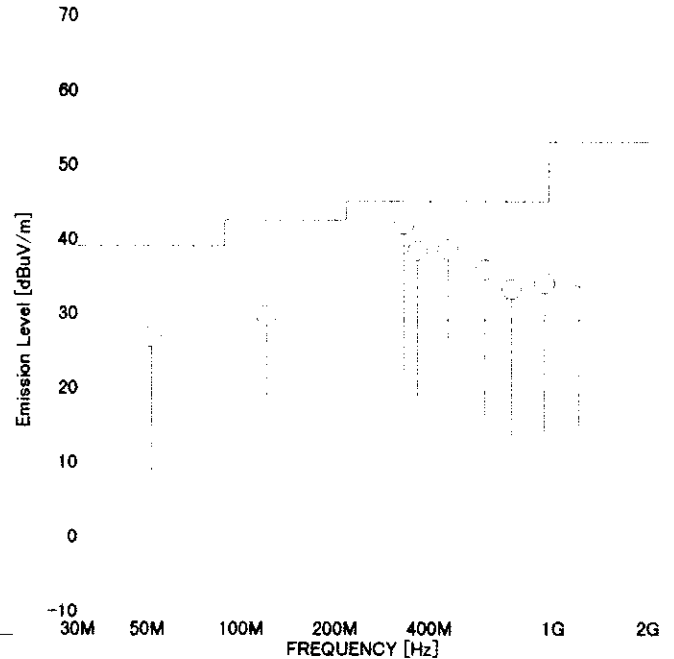
9.2.4 IrDA I/F (600dpi) mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE RADIATION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : IrDA I/F (600dpi)
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 08 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992
 DISTANCE : 3.0 [m]
 TEMPERATURE : 25.0 [°C]
 HUMIDITY : 50.0 [%]



ENGINEER :

Y. Mimura
Yoshihide Mimura

FREQUENCY [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]		
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert	
1	51.50	BBA	-	37.0	-9.3	-9.3	-	27.7	40.0	-	12.3
2	120.00	BBA	-	41.3	-10.7	-10.7	-	30.6	43.5	-	12.9
3	330.00	BBA	40.1	<u>48.4</u>	-5.5	-5.5	34.6	<u>42.9</u>	46.0	11.4	<u>3.1</u>
4	364.71	BBA	<u>44.3</u>	-	-5.0	-5.0	<u>39.3</u>	-	46.0	<u>6.7</u>	-
5	455.54	BBA	-	<u>42.8</u>	-3.3	-3.3	-	<u>39.5</u>	46.0	-	<u>6.5</u>
6	600.00	BBA	<u>37.8</u>	36.9	-1.1	-1.1	<u>36.7</u>	<u>35.8</u>	46.0	<u>9.3</u>	10.2
7	729.42	BBA	-	<u>32.0</u>	2.1	2.1	-	<u>34.1</u>	46.0	-	<u>11.9</u>
8	928.36	BBA	<u>29.6</u>	-	5.3	5.3	<u>34.9</u>	-	46.0	<u>11.1</u>	-
9	1200.12	BBA	41.4	-	-5.6	-5.6	35.8	-	54.0	18.2	-

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

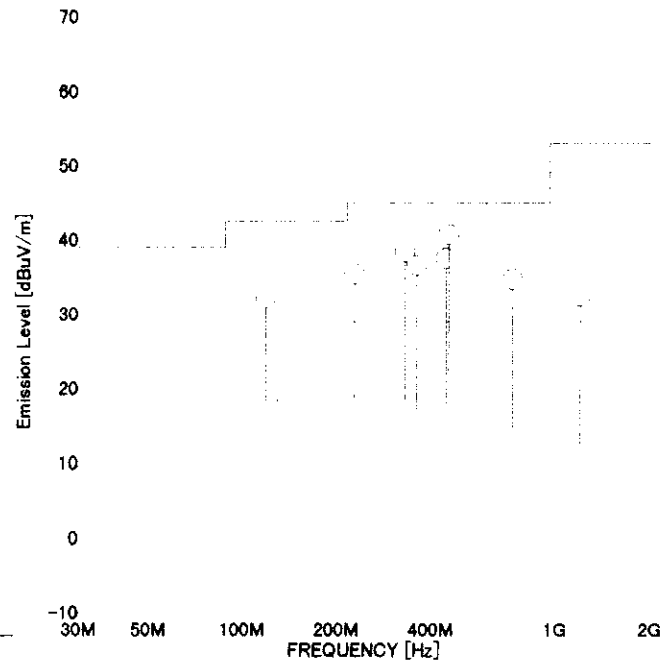
9.2.5 IrDA I/F (1200dpi) mode

Akzo Kashima Ltd.

Nagano No.3 Test Site

INTERFERENCE RADIATION TEST

APPLICANT : FUJITSU LIMITED
 EUT NAME : Page printer
 MODEL NO. : M385420WA
 SERIAL NO. : 85006422
 TEST MODE : IrDA I/F (1200dpi)
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jul 08 1998
 FILE NO. : AKL-398110
 REGULATION : FCC Part15B CLASS B
 TEST METHOD : ANSI C63.4-1992
 DISTANCE : 3.0 [m]
 TEMPERATURE : 25.0 [°C]
 HUMIDITY : 50.0 [%]



ENGINEER : Yoshihide Mimura

FREQUENCY [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]		
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert	
1	118.73	BBA	-	<u>44.1</u>	-10.9	-10.9	-	<u>33.2</u>	43.5	-	<u>10.3</u>
2	227.76	BBA	<u>44.8</u>	43.4	-8.4	-8.4	<u>36.4</u>	35.0	46.0	<u>9.6</u>	11.0
3	330.00	BBA	-	<u>44.8</u>	-5.5	-5.5	-	<u>39.3</u>	46.0	-	<u>6.7</u>
4	360.00	BBA	-	<u>42.5</u>	-5.0	-5.0	-	<u>37.5</u>	46.0	-	<u>8.5</u>
5	446.19	BBA	-	<u>41.9</u>	-3.4	-3.4	-	<u>38.5</u>	46.0	-	<u>7.5</u>
6	455.54	BBA	-	<u>45.0</u>	-3.3	-3.3	-	<u>41.7</u>	46.0	-	<u>4.3</u>
7	729.42	BBA	-	<u>33.6</u>	2.1	2.1	-	<u>35.7</u>	46.0	-	<u>10.3</u>
8	1200.19	BBA	39.0	-	-5.6	-5.6	33.4	-	54.0	20.6	-

Higher six points are underlined.

Other frequencies : Below the FCC Part15B CLASS B limit

Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.3 Sample Calculations

9.3.1 Conducted Emission

Example @ 20.7514 MHz

$$\begin{array}{rcl} \text{Emission Level} & = & \text{Meter Reading} \quad 42.1 \text{ dBuV} \\ & + & \text{Factor} \quad \underline{+ 0.9 \text{ dB}} \\ & & = 43.0 \text{ dBuV} \end{array}$$

$$\begin{array}{rcl} \text{Margin} & = & \text{Limit} \quad 48.0 \text{ dBuV} \\ & - & \text{Emission Level} \quad \underline{- 43.0 \text{ dBuV}} \\ & & = 5.0 \text{ dB} \end{array}$$

Factor = LISN Factor + Cable Loss

9.3.2 Radiated Emission

Example @ 330.00 MHz

$$\begin{array}{rcl} \text{Emission Level} & = & \text{Meter Reading} \quad 48.4 \text{ dBuV} \\ & + & \text{Factor} \quad \underline{- 5.5 \text{ dB}} \\ & & = 42.9 \text{ dBuV/m} \end{array}$$

$$\begin{array}{rcl} \text{Margin} & = & \text{Limit} \quad 46.0 \text{ dBuV/m} \\ & - & \text{Emission Level} \quad \underline{- 42.9 \text{ dBuV/m}} \\ & & = 3.1 \text{ dB} \end{array}$$

Factor = Antenna Factor + Cable Loss - Amplifier Gain + Pad Loss
- Distance Factor

SECTION 11. INSTRUMENTS USED FOR FINAL TEST

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Amplifier	8447D	2727A05731	HEWLETT PACKARD	Jan.21, 98	1 Year
	8449B	3008A00615	HEWLETT PACKARD	Apr. 8, 98	1 Year
Test receiver	ESS	844362/007	ROHDE & SCHWARZ	May.18, 98	1 Year
Broad Band antenna	LPB-2513/A	1092	A.R.A.	May.27, 98	1 Year
Double Ridged antenna	3115	3024	EMCO	Apr. 8, 98	1 Year
LISN	ESH3-Z5	844982/001	ROHDE & SCHWARZ	Oct.14, 97	1 Year
	KNW-407	8-1395-4	KYORITSU	Sep. 2, 97	1 Year
Step Attenuator	8494B	2812A15596	HEWLETT PACKARD	Apr.30, 98	1 Year
6dB Attenuator	8491A	36306	HEWLETT PACKARD	Jan.21, 98	1 Year
RF Switch	MP59B	M21548	ANRITSU	Apr.30, 98	1 Year
RF Switch	ACX-150-1	C03301501	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (5.5 m)	C1	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (1.6 m)	C2	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (0.7 m)	C3	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (1.6 m)	C4	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (15.0 m)	R1	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (8.0 m)	R2	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (1.6 m)	R3	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (0.4 m)	R4	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (0.4 m)	R5	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (0.7 m)	R6	AKZO	Apr.30, 98	1 Year
Coaxial cable	5D-2W (1.6 m)	R7	AKZO	Apr.30, 98	1 Year
Coaxial cable	SUCOFLEX	R9 (82311/4)	SUHNER	Apr. 8, 98	1 Year
Coaxial cable	SUCOFLEX	R10 (83212/4)	SUHNER	Apr. 8, 98	1 Year
Spectrum Analyzer	8563E	3337A01513	HEWLETT PACKARD	Apr. 7, 98	1 Year
Site Attenuation				Apr. 3, 98	1 Year

Note : Test instruments are calibrated according to Quality Manual and Calibration Rules of EMC division.

SECTION 12. UNCERTAINTY OF MEASUREMENT

Uncertainty of measurement

The uncertainty of the measurements performed for this report lies:

Radiated emission at 3m

30 MHz – 1000 MHz ± 3.6 dB

Above 1 GHz ± 3.9 dB

Conducted emission

9 kHz – 30 MHz ± 1.8 dB

These figures indicate the uncertainty of the measurements when the same staff performs the test with the same testing equipment and facility.

The uncertainty of the measurements when a different staff with different equipment and facility are under study.

Please note that these uncertainty are not reflected to the compliance judgement of the test results in this report.

SECTION 13. VALIDITY OF TEST REPORT

- 13.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 13.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 13.3 Copying of this report without permission is prohibited.

SECTION 14. DESCRIPTION OF TEST LABORATORY

14.1 Outline of Akzo Kashima Limited. EMC Division

Akzo Kashima Ltd. was established in 1975 for manufacturing specialty chemicals. The shares are owned by Akzo Nobel KK (70%), the country organization in Japan for Akzo Nobel nv., and TOSOH Corporation (30%), one of the leading petrochemical manufacturers in Japan. Akzo Nobel, headquartered in the Netherlands, is one of the world's leading companies in selected areas of chemicals, coatings, healthcare products and fibers with work force of approximately 70,000 people in over 50 countries.

In 1984, in order to respond to the growing testing demand, in particular, for FCC filing, Akzo Kashima started EMI testing business, installing the first open air test site in Kashima, Ibaraki prefecture. Further the business has been expanded by installing additional testing facilities not only in Kashima but also in other areas such as Shizuoka, Nagano, Kanagawa and Tochigi. As results, Akzo Kashima has now 16 open air test sites and 4 anechoic chambers for EMI/EMC testing. As the largest EMC testing laboratory in number of testing facilities and staffs, EMC Division has been organized separately in the company and independently operated in conformity with the requirements of ISO Guide 25 (EN 45000) for its competency as a testing laboratory.

Akzo Kashima EMC Division is the first foreign private laboratory accredited by NVLAP, National Voluntary Laboratory Accreditation Program-NIST, USA. The division has been certified, authorized and/or filed as a competent testing laboratory by various testing organizations/authorities as described below.

14.2 Filing, certification, authorization and accreditation list

EMI/EMC testing

FCC	(USA)
NVLAP	(USA)
AUSTEL	(Australia)
NEMKO	(Norway)
VCCI	(Japan)
NMi	(The Netherlands)
TÜV PRODUCT SERVICE	(Germany)

Telecommunications terminal testing

FCC	(USA)
NVLAP	(USA)
AUSTEL	(Australia)
IC	(Canada)

Note : NVLAP accreditation does not constitute any product endorsement by NVLAP or any agent of the U.S. Government.