

TEST REPORT

Report number : Z071C-07430

Issue date : January 24, 2008

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart B

Canada ICES-003

The test results are traceable to the international or national standards.

Applicant	: FUJITSU ISOTEC LIMITED 135, Higashinozaki, Hobara-machi, Date-shi, Fukushima 960-0695 Japan Phone: +81-24-574-2214 Fax: +81-24-574-2277
Equipment under test (EUT)	: Dot Matrix Printer
FCC ID	: KHZ018M33325A
Trade name	: FUJITSU ISOTEC
Model number	: M33325A
Serial number	: N/A
EUT condition	: Pre-production

Date of test : January 11, 15, 2008

Test place : OATS

ZACTA Technology Corporation Yonezawa Testing Center
4149-7 Hachimanpara 5-chome
Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888

Test results : Complied

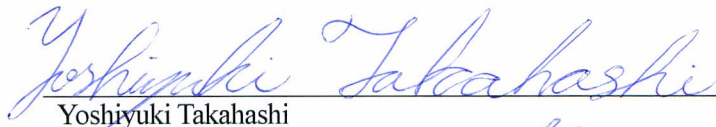
[EUT complies with Canadian Interference-Causing Equipment Standard ICES-003.]

The results in this report are applicable only to the equipment tested.

This report shall not be re-produced except in full without the written approval of ZACTA Technology Corporation.

This test report must not be used by client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by:


Yoshiyuki Takahashi

Authorized by:


Jun Shimanuki
General Manager of Technical Division

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1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart B.

1.2 Standards

CFR47 FCC Part 15 Subpart B

1.3 Emission measurement

Test item	Test method	Classification of EUT	Test
Conducted emission at mains port	ANSI C63.4-2003	Class B	Applied
Radiated emission	ANSI C63.4-2003	Class B	Applied

Note : None.

1.4 Deviation from the standard

None

1.5 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 EUT information

No.	EUT	Company	Model No.	Serial No.	DoC/FCC ID	Comment
1	Dot Matrix Printer	FUJITSU ISOTEC LIMITED	M33325A	N/A	KHZ018M33325A	#1 #2
2	Front Cut Sheet Feeder	FUJITSU ISOTEC LIMITED	KA02027-D750	N/A	N/A	Option
3	Rear Cut Sheet Feeder	FUJITSU ISOTEC LIMITED	KA02027-D750	N/A	N/A	Option
4	LAN card	FUJITSU ISOTEC LIMITED	KA02012-C103	N/A	N/A	Option #3

#1: Centronics, Serial I/F

#2: Centronics, USB, LAN I/F

#3: Option of M33325A #2

Max. frequency : Oscillator : 12.5MHz (for Main)/6.0MHz (for USB)/4.125MHz, 25MHz (for LAN)
Processor clock : 25MHz (for Main)/12MHz (for USB)/33MHz, 25MHz (for LAN)

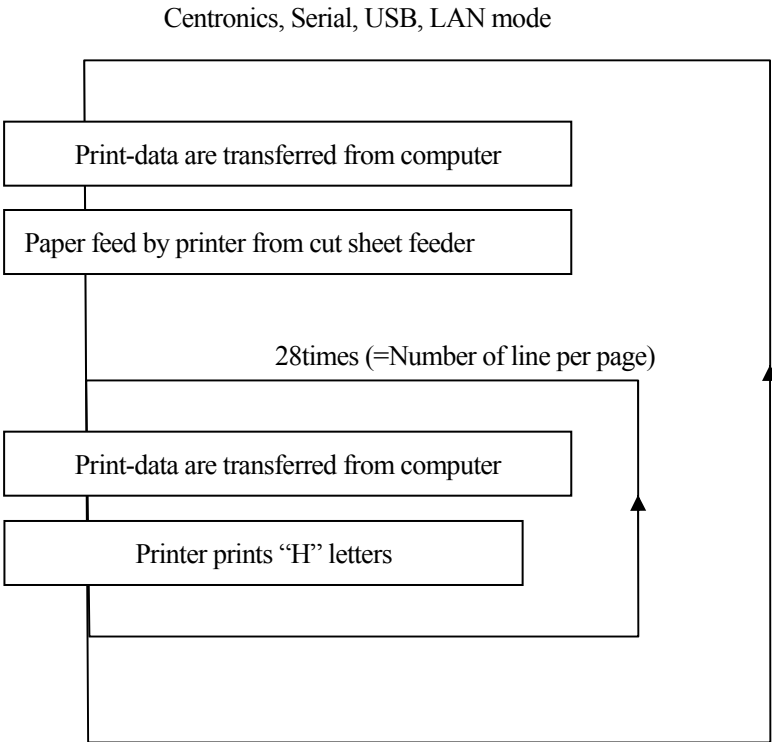
Power ratings :
AC 100-120V 50/60Hz
[Power supply for EUT in testing was AC 120V 60Hz.]

Port(s) : Centronics
Serial
USB
LAN

Size : (W)600 × (D)350 × (H)290 mm

Variation of model(s) : Not applicable

2.2 Operating mode



3. Configuration of equipment

3.1 Peripheral(s) used [EUT #1 Centronics model]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
5	Personal Computer	DELL	DHM	CY4W31X	DoC	1)
		DELL	MCM	DWZB41S	DoC	2)
6	Display	SAMSUNG	712N D	MJ17HMDY308 893A	DoC	-
7	Modem	US. Robotics	Sport_Ster 33.6Kbps	000839032BK6 YV4J	DoC	-
8	AC adapter for Modem	US. Robotics	N/A	N/A	N/A	-
9	Keyboard	DELL	054EXM	TH-054EXM-37 171-19A-1537	AQ6-7D0080COB	-
10	PS/2 Mouse	Logitech	M-S34	LNA13032232	DZL211029	-
11	USB JOY Pad	Logitech	G-UF13	N/A	DoC	-

1): Conducted emission at mains port test only

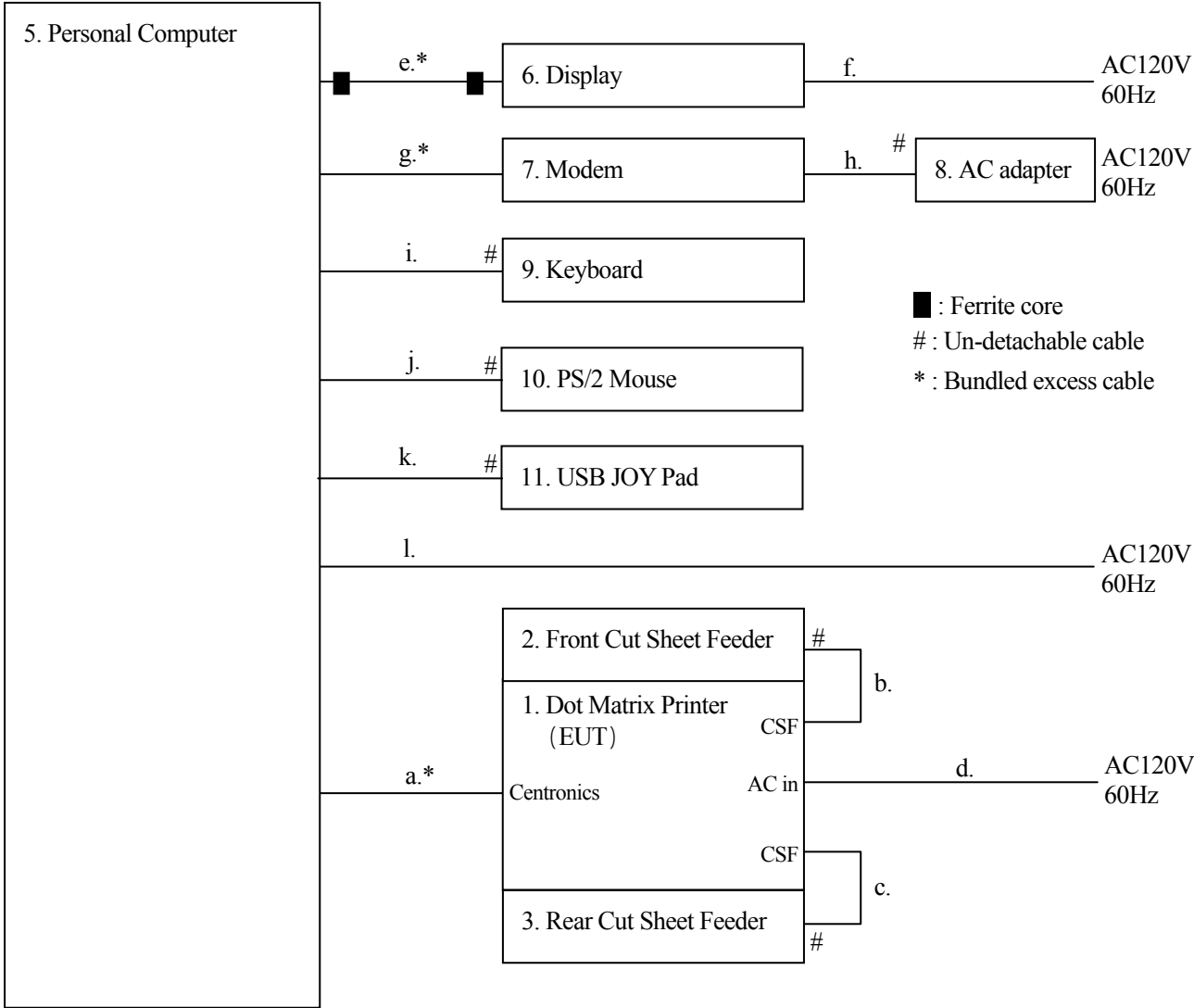
2): Radiated emission test only

3.2 Cable(s) used [EUT #1 Centronics model]

No.	Cable	Length[m]	Shield	Connector	From	To	Comment
a	Centronics cable	1.5	Shielded	Metal	EUT	PC	-
b	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Front CSF	-
c	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Rear CSF	-
d	AC power cord for EUT	3.0	Unshielded	Plastic	EUT	AC outlet	-
e	RGB cable	2.0	Shielded	Metal	PC	Display	-
f	AC power cord for Display	1.8	Unshielded	Plastic	Display	AC outlet	-
g	Serial cable	1.5	Shielded	Metal	PC	Modem	-
h	DC cable for Modem AC adapter	1.7	Unshielded	Plastic	Modem	AC adapter	-
i	Keyboard cable	1.8	Unshielded	Metal	PC	Keyboard	-
j	Mouse cable	1.8	Unshielded	Metal	PC	PS/2 Mouse	-
k	Joy pad cable	1.8	Shielded	Metal	PC	USB JOY Pad	-
l	AC power cord for PC	1.8	Unshielded	Plastic	PC	AC outlet	-

CSF: Cut Sheet Feeder

3.3 System configuration [EUT #1 Centronics mode]



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.1 EUT information”, “3.1 Peripheral(s) used” and “3.2 Cable(s) used”.

Note2: RGB cable(No.e) with two ferrite cores is accessory for Display(No.6).

3.4 Peripheral(s) used [EUT #1 Serial mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
5	Personal Computer	DELL	DHM	CY4W31X	DoC	1)
		DELL	MCM	DWZB41S	DoC	2)
6	Display	SAMSUNG	712N D	MJ17HMDY308 893A	DoC	-
7	Printer	Canon	BJ F780	N/A	DoC	-
8	Keyboard	DELL	054EXM	TH-054EXM-37 171-19A-1537	AQ6-7D0080COB	-
9	PS/2 Mouse	Logitech	M-S34	LNA13032232	DZL211029	-
10	USB JOY Pad	Logitech	G-UF13	N/A	DoC	-

1): Conducted emission at mains port test only

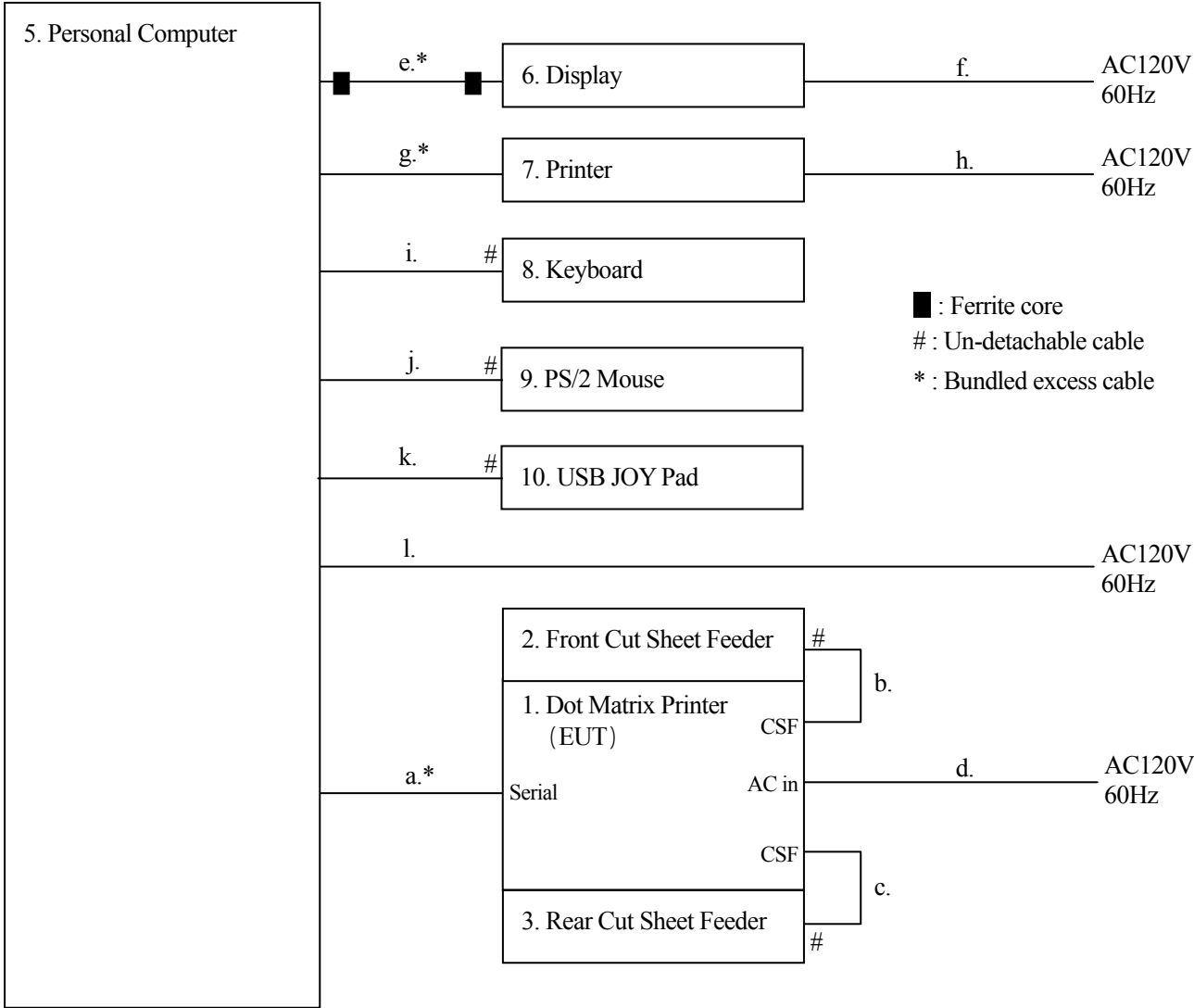
2): Radiated emission test only

3.5 Cable(s) used [EUT #1 Serial mode]

No.	Cable	Length[m]	Shield	Connector	From	To	Comment
a	Serial cable	1.5	Shielded	Metal	EUT	PC	-
b	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Front CSF	-
c	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Rear CSF	-
d	AC power cord for EUT	3.0	Unshielded	Plastic	EUT	AC outlet	-
e	RGB cable	2.0	Shielded	Metal	PC	Display	-
f	AC power cord for Display	1.8	Unshielded	Plastic	Display	AC outlet	-
g	Parallel cable	1.8	Shielded	Metal	PC	Printer	-
h	AC power cord for Printer	1.8	Unshielded	Plastic	Printer	AC outlet	-
i	Keyboard cable	1.8	Unshielded	Metal	PC	Keyboard	-
j	Mouse cable	1.8	Unshielded	Metal	PC	PS/2 Mouse	-
k	Joy pad cable	1.8	Shielded	Metal	PC	USB JOY Pad	-
l	AC power cord for PC	1.8	Unshielded	Plastic	PC	AC outlet	-

CSF: Cut Sheet Feeder

3.6 System configuration [EUT #1 Serial mode]



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.1 EUT information”, “3.4 Peripheral(s) used” and “3.5 Cable(s) used”.

Note2: RGB cable(No.e) with two ferrite cores is accessory for Display(No.6).

3.7 Peripheral(s) used [EUT #2 USB mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
5	Personal Computer	DELL	DHM	CY4W31X	DoC	1)
		DELL	MCM	DWZB41S	DoC	2)
6	Display	SAMSUNG	712N D	MJ17HMDY308893A	DoC	-
7	Modem	US. Robotics	Sport_Ster 33.6Kbps	000839032BK6YV4J	DoC	-
8	AC adapter for Modem	US. Robotics	N/A	N/A	N/A	-
9	Keyboard	DELL	054EXM	TH-054EXM-37171-19A-1537	AQ6-7D0080COB	-
10	PS/2 Mouse	Logitech	M-S34	LNA13032232	DZL211029	-
11	Printer	Canon	BJ F780	N/A	DoC	-

1): Conducted emission at mains port test only

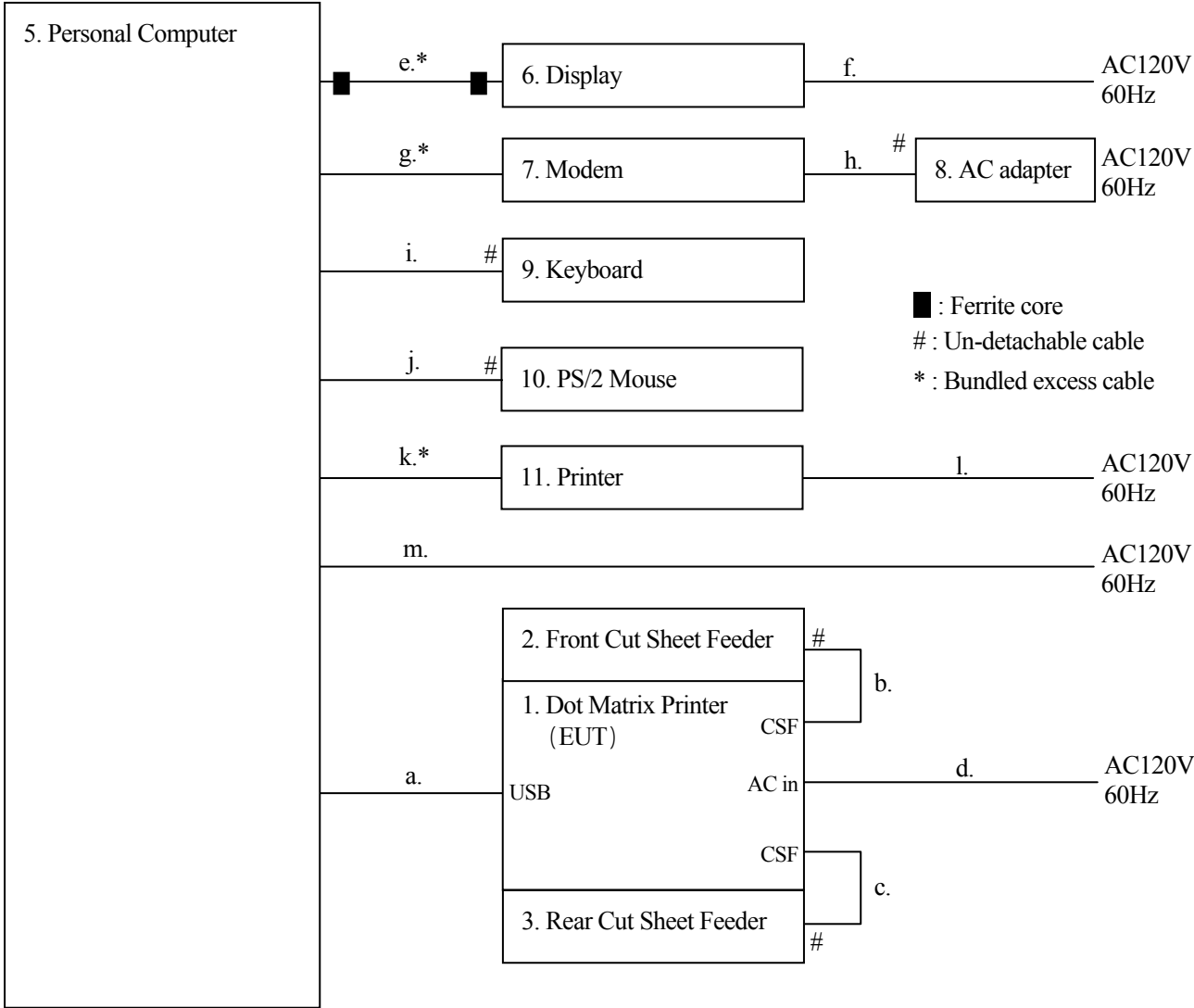
2): Radiated emission test only

3.8 Cable(s) used [EUT #2 USB mode]

No.	Cable	Length[m]	Shield	Connector	From	To	Comment
a	USB cable	1.5	Shielded	Metal	EUT	PC	-
b	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Front CSF	-
c	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Rear CSF	-
d	AC power cord for EUT	3.0	Unshielded	Plastic	EUT	AC outlet	-
e	RGB cable	2.0	Shielded	Metal	PC	Display	-
f	AC power cord for Display	1.8	Unshielded	Plastic	Display	AC outlet	-
g	Serial cable	1.5	Shielded	Metal	PC	Modem	-
h	DC cable for Modem AC adapter	1.7	Unshielded	Plastic	Modem	AC adapter	-
i	Keyboard cable	1.8	Unshielded	Metal	PC	Keyboard	-
j	Mouse cable	1.8	Unshielded	Metal	PC	PS/2 Mouse	-
k	Parallel cable	1.8	Shielded	Metal	PC	Printer	-
l	AC power cord for Printer	1.8	Unshielded	Plastic	Printer	AC outlet	-
m	AC power cord for PC	1.8	Unshielded	Plastic	PC	AC outlet	-

CSF: Cut Sheet Feeder

3.9 System configuration [EUT #2 USB mode]



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.1 EUT information”, “3.7 Peripheral(s) used” and “3.8 Cable(s) used”.

Note2: RGB cable(No.e) with two ferrite cores is accessory for Display(No.6).

3.10 Peripheral(s) used [EUT #2 LAN mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
5	Personal Computer	DELL	DHM	CY4W31X	DoC	1)
		DELL	MCM	DWZB41S	DoC	2)
6	Display	NEC	PC-KM171	3804503CA	N/A	-
7	Keyboard	DELL	054EXM	TH-054EXM-37 171-19A-1537	AQ6-7D0080COB	-
8	PS/2 Mouse	Logitech	M-S34	LNA13032232	DZL211029	-
9	HUB	corega	CG-SW05GTR	1103750070201 017 Rev.A2	N/A	-

1): Conducted emission at mains port test only

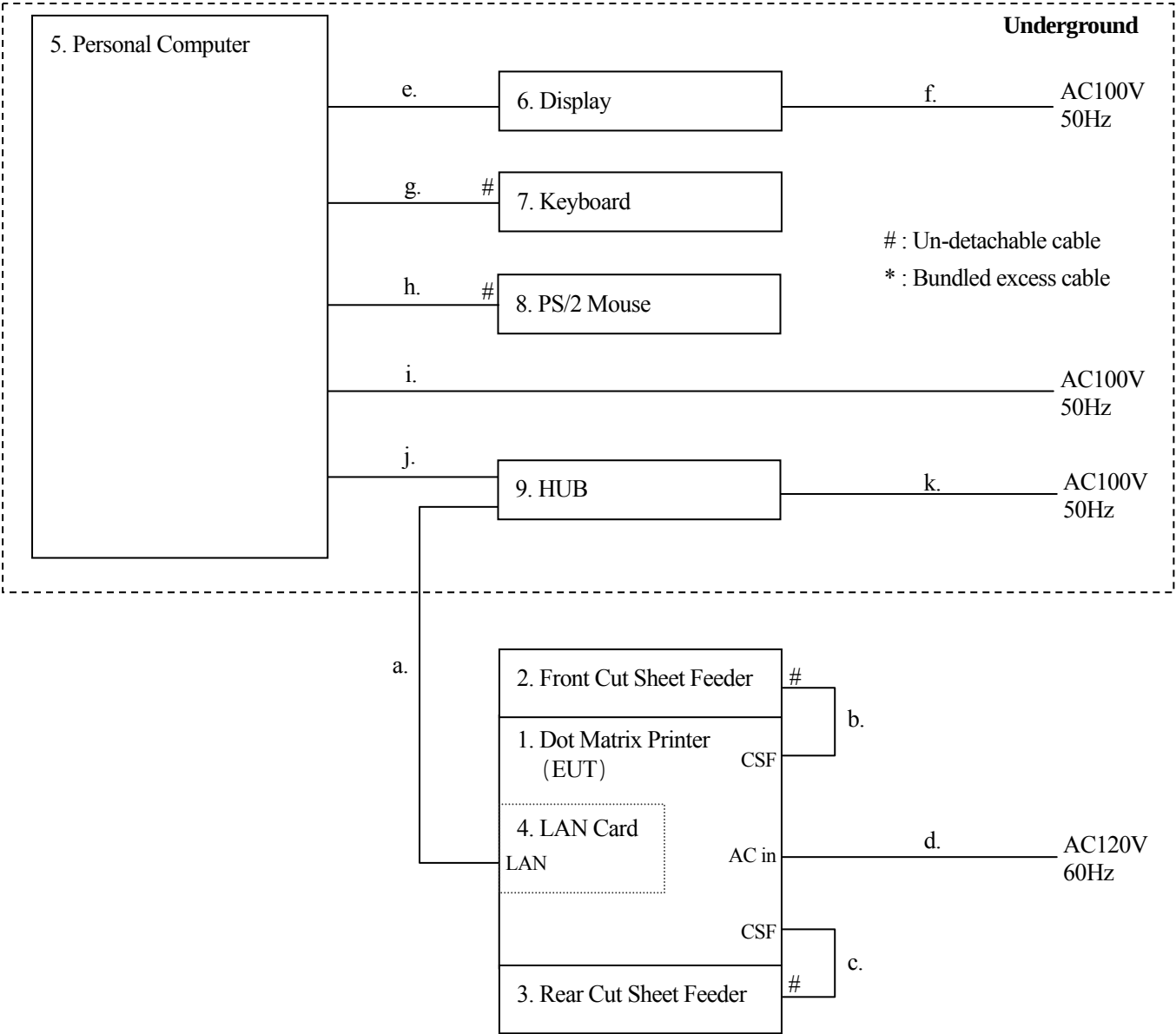
2): Radiated emission test only

3.11 Cable(s) used [EUT #2 LAN mode]

No.	Cable	Length[m]	Shield	Connector	From	To	Comment
a	LAN cable	5.0	Unshielded	Plastic	EUT	HUB	-
b	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Front CSF	-
c	Cut Sheet Feeder cable	0.2	Shielded	Metal	EUT	Rear CSF	-
d	AC power cord for EUT	3.0	Unshielded	Plastic	EUT	AC outlet	-
e	RGB cable	1.8	Shielded	Metal	PC	Display	-
f	AC power cord for Display	1.8	Unshielded	Plastic	Display	AC outlet	-
g	Keyboard cable	1.8	Unshielded	Metal	PC	Keyboard	-
h	Mouse cable	1.8	Unshielded	Metal	PC	PS/2 Mouse	-
i	AC power cord for PC	1.8	Unshielded	Plastic	PC	AC outlet	-
j	LAN cable	1.0	Unshielded	Plastic	PC	HUB	-
k	AC power cord for HUB	1.8	Unshielded	Plastic	HUB	AC outlet	-

CSF: Cut Sheet Feeder

3.12 System configuration [EUT #2 LAN mode]



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.1 EUT information”, “3.10 Peripheral(s) used” and “3.11 Cable(s) used”.

4. Conducted emission at mains port test information

4.1 Measurement procedure

- Frequency range: 0.15MHz to 30MHz
- Test receiver setting
 - Detector: Quasi-peak, Average
 - Bandwidth: 9 kHz

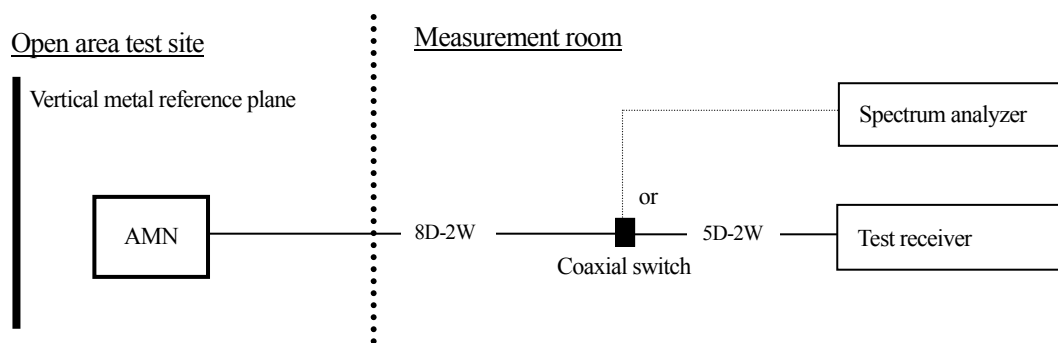
- Test procedure

Conducted emission at AC mains port measurements are performed at open area test site according to ANSI C63.4 section 7.

EUT is placed on wooden table of 2.3m(W) × 1.0m(D) × 0.8m(H) in size. EUT is connected to 50Ω/50μH Artificial Mains Network (AMN) which is placed on reference ground plane, and was placed 80cm away from EUT. Excess of AC power cable is bundled in center. Vertical Metal Reference Plane 2.4m (W) × 2.7m (H) in size is placed 0.4m away from EUT. AMN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, support equipment, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, support equipment and test equipment are provided in order for them to warm up to their normal operating condition.

- Test configuration for Conducted emission at mains port



4.2 Test equipment for Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. Date
Spectrum analyzer	Agilent Technologies	8568B 85662A	2634A03228 2648A14093	Jan. 2009	Jan. 7, 2008
Test receiver	ROHDE&SCHWARZ	ESHS10	842884/009	Jan. 2008	Jan. 30, 2007
Artificial mains network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-242C	8-1096-3	Mar. 2008	Mar. 14, 2007
Artificial mains network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-407	8-663-4	Mar. 2008	Mar. 14, 2007
Highpass filter	ROHDE&SCHWARZ	EZ-25	100007	Jan. 2009	Jan. 7, 2008
Coaxial cable	FUJIKURA	8D-2W/15m	YTCRFC#2C	Jun. 2008	Jun. 23, 2007
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R,2C-001	Jun. 2008	Jun. 23, 2007
Coaxial switch	ANRITSU	MP59B	6200331882	Jun. 2008	Jun. 23, 2007
Transient limiter	Agilent Technologies	11947A	3107A03917	Jan. 2009	Jan. 7, 2008
50Ω terminator	SUHNER	65-BNC-50-0-7	N/A	Mar. 2008	Mar. 14, 2007
PC	IBM	6892-44J	97-42089	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

4.3 Sample calculation

Conducted emission at mains port [Sample calculation]

Frequency	Class B limit		Sample of field strength calculation
	QP(dBμV)	AV(dBμV)	
0.15MHz to 0.5MHz	66 to 56*	56 to 46*	$\text{dB}\mu\text{V} = 20\log_{10}(\mu\text{V})$ Limit @ 6.770MHz : 60.0dBμV(Quasi-peak) : 50.0dBμV(Average) (Quasi peak) Reading = 51.2dBμV Cable loss + AMN factor = 0.3dB Total = 51.2 + 0.3 = 51.5dBμV Margin = 60.0 – 51.5 = 8.5dB (Average) Reading = 45.0dBμV Cable loss + AMN factor = 0.3dB Total = 45.0 + 0.3 = 45.3dBμV Margin = 50.0 – 45.3 = 4.7dB
0.5MHz to 5MHz	56	46	
5MHz to 30MHz	60	50	

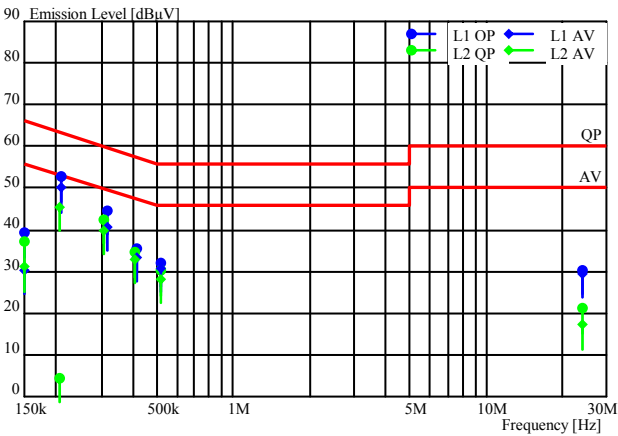
*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

4.4 Test data

***** CONDUCTED EMISSION at MAINS PORT *****

Sheet number : 1

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2008/1/15
Test site : 2
Temperature [] : 16.3
Humidity [%] : 40.6
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : Centronics mode
Comment :



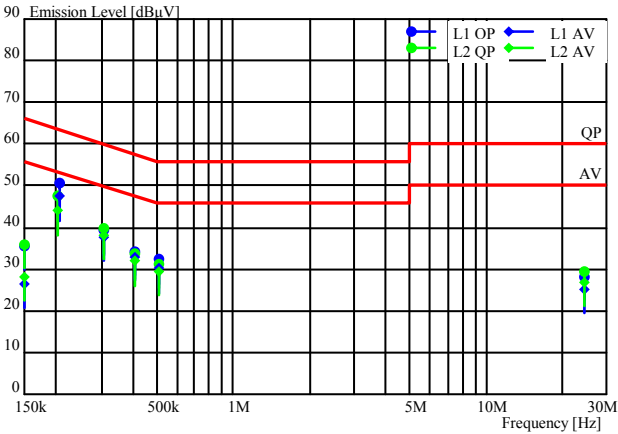
Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
L1	0.150	39.1	30.1	0.2	39.3	30.3	66.0	56.0	26.7	25.7	
L1	0.208	52.5	50.0	0.1	52.6	50.1	63.3	53.3	10.7	3.2	*
L1	0.317	44.6	40.7	0.1	44.7	40.8	59.8	49.8	15.1	9.0	
L1	0.413	35.5	33.2	0.1	35.6	33.3	57.6	47.6	22.0	14.3	
L1	0.514	32.0	30.6	0.1	32.1	30.7	56.0	46.0	23.9	15.3	
L1	24.018	28.9	28.1	1.5	30.4	29.6	60.0	50.0	29.6	20.4	
L2	0.150	36.9	30.8	0.2	37.1	31.0	66.0	56.0	28.9	25.0	
L2	0.205	4.2	45.3	0.1	4.3	45.4	63.4	53.4	59.1	8.0	
L2	0.307	42.4	39.7	0.1	42.5	39.8	60.1	50.1	17.6	10.3	
L2	0.411	34.4	32.9	0.1	34.5	33.0	57.6	47.6	23.1	14.6	
L2	0.513	30.0	28.1	0.1	30.1	28.2	56.0	46.0	25.9	17.8	
L2	24.014	19.6	15.6	1.5	21.1	17.1	60.0	50.0	38.9	32.9	

* : The worst emission Factor : LISN Factor + Cable Loss

***** CONDUCTED EMISSION at MAINS PORT *****

Sheet number : 2

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2008/1/15
Test site : 2
Temperature [] : 16.3
Humidity [%] : 40.6
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : Serial mode
Comment :



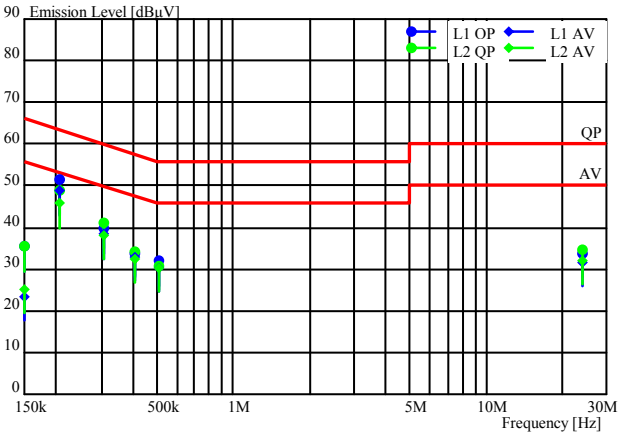
Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
L1	0.150	35.4	26.2	0.2	35.6	26.4	66.0	56.0	30.4	29.6	
L1	0.205	50.5	47.3	0.1	50.6	47.4	63.4	53.4	12.8	6.0	*
L1	0.305	39.2	37.5	0.1	39.3	37.6	60.1	50.1	20.8	12.5	
L1	0.407	34.1	33.0	0.1	34.2	33.1	57.7	47.7	23.5	14.6	
L1	0.507	32.2	30.0	0.1	32.3	30.1	56.0	46.0	23.7	15.9	
L1	24.515	26.7	23.8	1.5	28.2	25.3	60.0	50.0	31.8	24.7	
L2	0.150	35.7	28.0	0.2	35.9	28.2	66.0	56.0	30.1	27.8	
L2	0.202	47.4	43.9	0.1	47.5	44.0	63.5	53.5	16.0	9.5	
L2	0.306	39.5	38.1	0.1	39.6	38.2	60.1	50.1	20.5	11.9	
L2	0.408	33.5	31.8	0.1	33.6	31.9	57.7	47.7	24.1	15.8	
L2	0.508	31.0	29.5	0.1	31.1	29.6	56.0	46.0	24.9	16.4	
L2	24.514	28.0	25.3	1.5	29.5	26.8	60.0	50.0	30.5	23.2	

* : The worst emission Factor : LISN Factor + Cable Loss

***** CONDUCTED EMISSION at MAINS PORT *****

Sheet number : 3

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2008/1/15
Test site : 2
Temperature [] : 16.3
Humidity [%] : 40.6
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : USB mode
Comment :



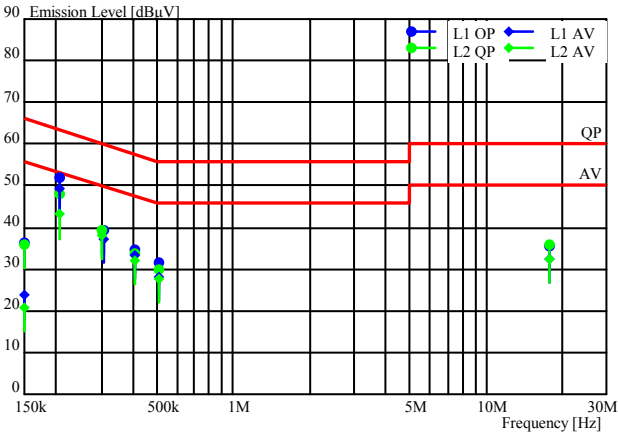
Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
L1	0.150	35.2	23.2	0.2	35.4	23.4	66.0	56.0	30.6	32.6	
L1	0.204	51.5	48.7	0.1	51.6	48.8	63.4	53.4	11.8	4.6	*
L1	0.306	39.6	38.2	0.1	39.7	38.3	60.1	50.1	20.4	11.8	
L1	0.406	33.7	33.0	0.1	33.8	33.1	57.7	47.7	23.9	14.6	
L1	0.510	31.8	30.4	0.1	31.9	30.5	56.0	46.0	24.1	15.5	
L1	24.004	32.3	30.2	1.5	33.8	31.7	60.0	50.0	26.2	18.3	
L2	0.150	35.1	25.0	0.2	35.3	25.2	66.0	56.0	30.7	30.8	
L2	0.204	48.8	45.6	0.1	48.9	45.7	63.4	53.4	14.5	7.7	
L2	0.307	40.8	38.1	0.1	40.9	38.2	60.1	50.1	19.2	11.9	
L2	0.409	34.2	32.5	0.1	34.3	32.6	57.7	47.7	23.4	15.1	
L2	0.510	30.7	30.2	0.1	30.8	30.3	56.0	46.0	25.2	15.7	
L2	24.002	33.0	30.7	1.5	34.5	32.2	60.0	50.0	25.5	17.8	

* : The worst emission Factor : LISN Factor + Cable Loss

***** CONDUCTED EMISSION at MAINS PORT *****

Sheet number : 4

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2008/1/15
Test site : 2
Temperature [] : 16.3
Humidity [%] : 40.6
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : LAN mode
Comment :



Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
L1	0.150	36.1	23.5	0.2	36.3	23.7	66.0	56.0	29.7	32.3	
L1	0.204	51.9	49.4	0.1	52.0	49.5	63.4	53.4	11.4	3.9	*
L1	0.307	39.3	37.1	0.1	39.4	37.2	60.1	50.1	20.7	12.9	
L1	0.408	34.6	33.3	0.1	34.7	33.4	57.7	47.7	23.0	14.3	
L1	0.508	31.6	28.2	0.1	31.7	28.3	56.0	46.0	24.3	17.7	
L1	17.693	34.4	31.2	1.2	35.6	32.4	60.0	50.0	24.4	17.6	
L2	0.150	35.9	20.5	0.2	36.1	20.7	66.0	56.0	29.9	35.3	
L2	0.204	48.1	43.0	0.1	48.2	43.1	63.4	53.4	15.2	10.3	
L2	0.304	39.4	38.0	0.1	39.5	38.1	60.1	50.1	20.6	12.0	
L2	0.406	33.7	32.1	0.1	33.8	32.2	57.7	47.7	23.9	15.5	
L2	0.506	29.9	27.8	0.1	30.0	27.9	56.0	46.0	26.0	18.1	
L2	17.694	34.5	31.3	1.2	35.7	32.5	60.0	50.0	24.3	17.5	

* : The worst emission Factor : LISN Factor + Cable Loss

Ver.2.81 F2#028

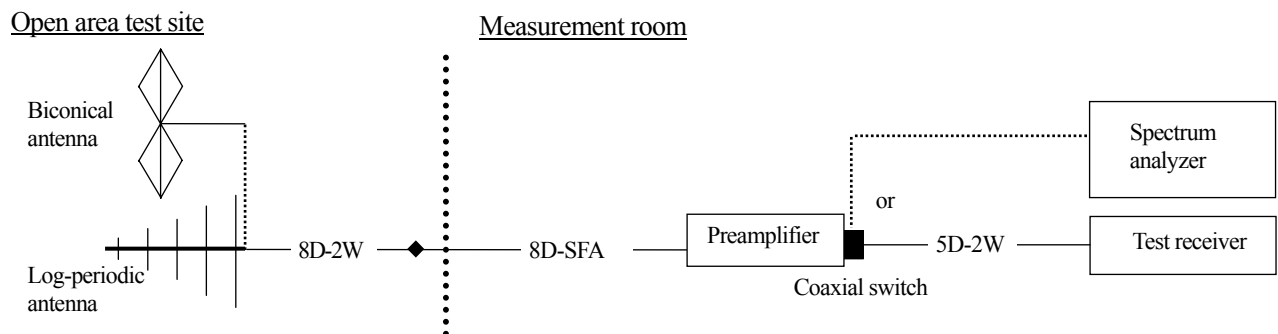
5. Radiated emission test information

5.1 Measurement procedure

- Frequency range: 30MHz to 1000MHz
- Test receiver setting
 - Detector: Quasi-peak
 - Bandwidth: 120 kHz
- Test procedure

Radiated emission measurements are performed at open area test site according to ANSI C63.4 section 8. EUT is placed on wooden table of 2.3m(W) × 1.0m(D) × 0.8m(H) in size. Distance from antenna to EUT is 3m. EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, support equipment and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration for Radiated emission



5.2 Test equipment for Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum analyzer	Agilent Technologies	8568B 85662A	2634A03228 2648A14093	Jan. 2009	Jan. 7, 2008
Test receiver	ROHDE&SCHWARZ	ESVS10	849231/0010	Aug. 2008	Aug. 27, 2007
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	1563	Jun. 2008	Jun. 16, 2007
Log periodic antenna	Schwarzbeck	UHALP9108A	0438	Jun. 2008	Jun. 16, 2007
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#2R-001	Jun. 2008	Jun. 23, 2007
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#2R-002	Jun. 2008	Jun. 23, 2007
Coaxial cable	FUJIKURA	8D-2W/8m	YTCRFC#2R-003	Jun. 2008	Jun. 23, 2007
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R, 2C-001	Jun. 2008	Jun. 23, 2007
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R ,2C-002	Jun. 2008	Jun. 23, 2007
Preamplifier	ANRITSU	MH648A	M96157	Jun. 2008	Jun. 23, 2007
Coaxial switch	ANRITSU	MP59B	6200331882	Jun. 2008	Jun. 23, 2007
Site attenuation	ZACTA Technology Corp.	N/A	N/A	Jul. 2008	Jul. 14, 2007
PC	IBM	6892-44J	97-42089	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

5.3 Sample calculation

Radiated emission [Sample calculation]

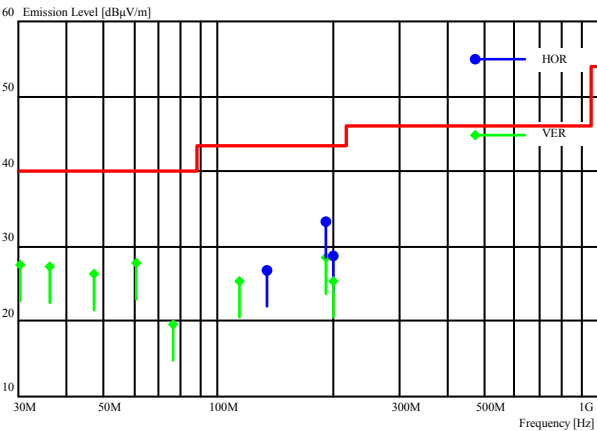
Frequency	Class B limit	Sample of field strength calculation
	(dBμV/m)	
30MHz to 88MHz	40.0	$\text{dB}\mu\text{V}/\text{m} = 20\log_{10}(\mu\text{V}/\text{m})$ Limit @ 147.6MHz : 43.5dBμV/m Reading = 42.8dBμV Ant.factor + Cable loss – Amp. Gain= 14.2 + 3.0 – 30.0= 12.8dB/m Total = 42.8 – 12.8 = 30.0dBμV/m Margin = 43.5 – 30.0 = 13.5dB
88MHz to 216MHz	43.5	
216MHz to 960MHz	46.0	
960MHz to 1000MHz	54.0	
Above 1000MHz	Peak:74.0 Average:54.0	

5.4 Test data

***** RADIATED EMISSION *****

Sheet number : 1

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2008/1/11
Test site : 2
Temperature [] : 16.4
Humidity [%] : 23.4
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : Centronics mode
Comment :



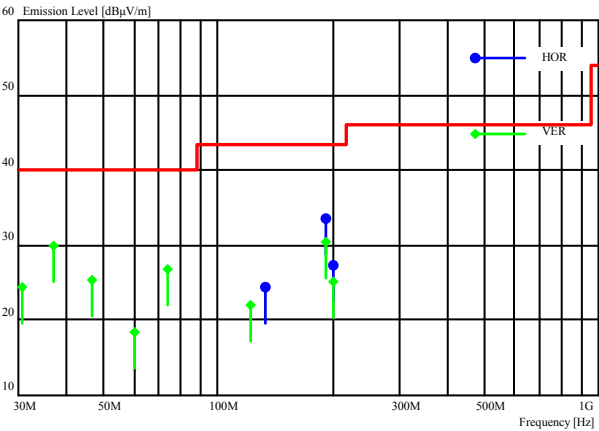
Antenna		Table	Reading		Factor	Emission Level	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level					
HOR/VER	[m]	[Deg.]	[MHz]	[dBμV]	[dB/m]	[dBμV/m]	[dBμV/m]	[dB]	
VER	1.0	245	30.30	37.8	-10.3	27.5	40.0	12.5	
VER	1.0	195	36.11	40.1	-12.7	27.4	40.0	12.6	
VER	1.0	240	47.18	43.2	-16.8	26.4	40.0	13.6	
VER	1.0	260	60.97	48.2	-20.5	27.7	40.0	12.3	
VER	1.0	100	75.78	41.7	-22.2	19.5	40.0	20.5	
VER	1.0	15	114.28	40.9	-15.6	25.3	43.5	18.2	
HOR	4.0	40	134.94	40.9	-14.0	26.9	43.5	16.6	
VER	1.0	280	192.04	39.8	-11.3	28.5	43.5	15.0	
HOR	2.5	35	192.61	44.6	-11.3	33.3	43.5	10.2	*
HOR	2.5	345	200.38	40.0	-11.3	28.7	43.5	14.8	
VER	1.0	50	201.28	36.6	-11.2	25.4	43.5	18.1	

* : The worst emission. Factor : Antenna Factor + Cable Loss - Amp Gain Ver.2.81 F2#028

***** RADIATED EMISSION *****

Sheet number : 2

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2008/1/11
Test site : 2
Temperature [] : 16.4
Humidity [%] : 23.4
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : Serial mode
Comment :



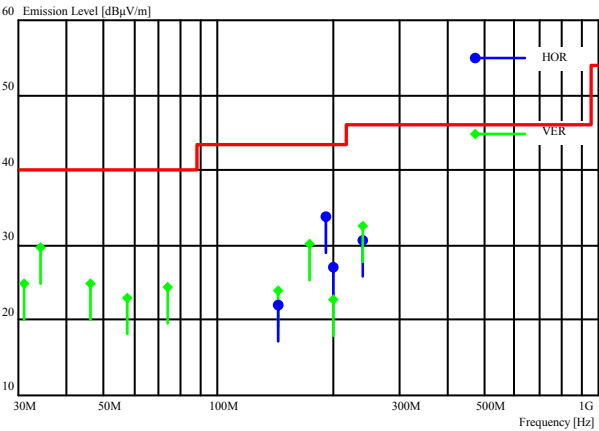
Antenna		Table	Reading		Factor	Emission	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level		Level			
HOR/VER	[m]	[Deg.]	[MHz]	[dBμV]	[dB/m]	[dBμV/m]	[dBμV/m]	[dB]	
VER	1.0	235	30.44	34.7	-10.3	24.4	40.0	15.6	
VER	1.0	325	36.89	42.6	-12.7	29.9	40.0	10.1	
VER	1.0	160	46.81	42.0	-16.5	25.5	40.0	14.5	
VER	1.0	130	60.45	38.8	-20.5	18.3	40.0	21.7	
VER	1.0	130	74.08	49.2	-22.3	26.9	40.0	13.1	
VER	1.0	235	122.28	36.8	-14.7	22.1	43.5	21.4	
HOR	2.2	220	133.32	38.4	-14.0	24.4	43.5	19.1	
HOR	2.5	350	191.18	44.9	-11.4	33.5	43.5	10.0	*
VER	1.0	30	192.30	41.8	-11.3	30.5	43.5	13.0	
HOR	2.2	170	200.44	38.5	-11.3	27.2	43.5	16.3	
VER	1.0	25	201.20	36.3	-11.2	25.1	43.5	18.4	

* : The worst emission. Factor : Antenna Factor + Cable Loss - Amp Gain Ver.2.81 F2#028

***** RADIATED EMISSION *****

Sheet number : 3

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2008/1/11
Test site : 2
Temperature [] : 16.4
Humidity [%] : 23.4
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : USB mode
Comment :



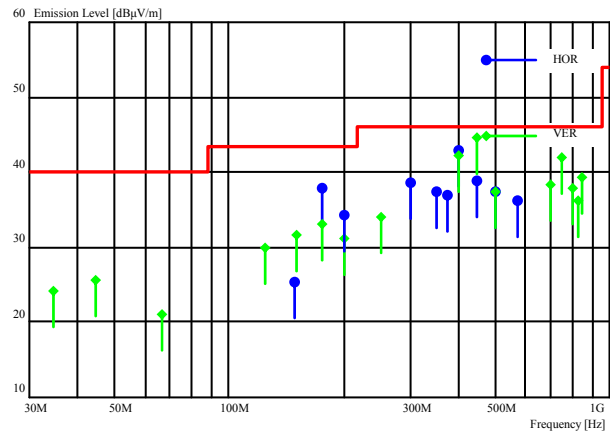
Antenna		Table	Reading		Factor	Emission	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level		Level			
HOR/VER	[m]	[Deg.]	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	
VER	1.0	175	30.95	35.2	-10.3	24.9	40.0	15.1	
VER	1.0	125	34.33	41.9	-12.1	29.8	40.0	10.2	
VER	1.0	330	45.91	41.1	-16.1	25.0	40.0	15.0	
VER	1.0	280	57.57	42.8	-19.8	23.0	40.0	17.0	
VER	1.0	95	74.01	46.8	-22.3	24.5	40.0	15.5	
VER	1.0	10	144.01	37.4	-13.4	24.0	43.5	19.5	
HOR	2.3	150	144.04	35.5	-13.4	22.1	43.5	21.4	
VER	1.0	40	172.95	42.0	-11.8	30.2	43.5	13.3	
HOR	2.6	0	191.85	45.2	-11.4	33.8	43.5	9.7	*
HOR	2.1	335	200.40	38.4	-11.3	27.1	43.5	16.4	
VER	1.0	35	201.38	34.0	-11.2	22.8	43.5	20.7	
HOR	1.5	180	240.03	40.7	-10.1	30.6	46.0	15.4	
VER	1.0	45	240.04	42.6	-10.1	32.5	46.0	13.5	

* : The worst emission. Factor : Antenna Factor + Cable Loss - Amp Gain Ver.2.81 F2#028

***** RADIATED EMISSION *****

Sheet number : 4

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2008/1/11
Test site : 2
Temperature [] : 16.4
Humidity [%] : 23.4
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33325A
Serial number : N/A
Test mode : LAN mode
Comment :



Antenna Pol.	Height	Table Radian	Reading Frequency	Level	Factor	Emission Level	Limit	Margin	Comment
HOR/VER	[m]	[Deg.]	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	
VER	1.0	155	34.72	36.3	-12.1	24.2	40.0	15.8	
VER	1.0	95	44.42	41.5	-15.8	25.7	40.0	14.3	
VER	1.0	140	66.31	42.7	-21.6	21.1	40.0	18.9	
VER	1.0	170	125.02	44.4	-14.4	30.0	43.5	13.5	
HOR	1.9	190	148.11	38.8	-13.4	25.4	43.5	18.1	
VER	1.0	155	150.00	44.8	-13.2	31.6	43.5	11.9	
HOR	2.0	225	175.00	49.6	-11.8	37.8	43.5	5.7	
VER	1.0	175	175.02	45.0	-11.8	33.2	43.5	10.3	
VER	1.0	320	200.00	42.5	-11.3	31.2	43.5	12.3	
HOR	2.0	35	200.01	45.5	-11.3	34.2	43.5	9.3	
VER	1.0	0	250.02	43.7	-9.6	34.1	46.0	11.9	
HOR	1.2	50	300.00	51.7	-13.2	38.5	46.0	7.5	
HOR	1.0	195	350.01	49.2	-11.9	37.3	46.0	8.7	
HOR	1.0	225	375.02	48.0	-11.1	36.9	46.0	9.1	
HOR	1.0	225	400.00	53.0	-10.0	43.0	46.0	3.0	
VER	1.7	230	400.01	52.2	-10.0	42.2	46.0	3.8	
HOR	1.0	215	450.00	48.0	-9.1	38.9	46.0	7.1	
VER	1.7	145	450.00	53.7	-9.1	44.6	46.0	1.4	*
HOR	1.0	70	500.00	45.9	-8.4	37.5	46.0	8.5	
VER	1.4	175	500.00	45.9	-8.4	37.5	46.0	8.5	
HOR	1.0	90	575.01	42.9	-6.7	36.2	46.0	9.8	
VER	1.2	230	700.00	43.1	-4.7	38.4	46.0	7.6	
VER	1.2	225	750.01	46.1	-4.2	41.9	46.0	4.1	
VER	1.0	230	800.00	41.4	-3.5	37.9	46.0	8.1	
VER	1.0	230	825.00	39.2	-2.9	36.3	46.0	9.7	
VER	1.0	230	850.00	41.4	-2.0	39.4	46.0	6.6	

* : The worst emission. Factor : Antenna Factor + Cable Loss - Amp Gain Ver.2.81 F2#028

6. Uncertainty of measurement

Expanded uncertainties stated were calculated with a coverage Factor k=2.

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission at mains port (150kHz - 30MHz)	±2.9dB
Radiated emission (30MHz - 1000MHz)	±5.2dB
Radiated emission (1000MHz - 26GHz)	±3.6dB

7. Laboratory description

1. Location: ZACTA Technology Corporation Yonezawa Testing Center

4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan

Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) FCC filing: Pursuant to Section 2.948 of the FCC rules.

Site name	Registration Number	Expiry Date
Site 1, Site 2, Site3	91065	November 16, 2008
3m Semi-anechoic chamber 10m Semi-anechoic chamber	540072	March 12, 2010

3) Industry Canada Oats site filing: Pursuant to RSS 212, Issue 1(Provisional)

Site name	Sites on file: Oats 3m/10m	Expiry Date
Site 2	4224A-2	January 24, 2010
Site 3	4224A-3	January 24, 2010
3m Semi-anechoic chamber	4224A-4	January 24, 2010
10m Semi-anechoic chamber	4224A-5	January 24, 2010

4) VCCI site filing: Pursuant to V-5/2006.04 VCCI regulations for registration of measurement facilities

Site name	Radiated emission registration No.	Conducted emission registration No.	Duration of registration
Site 1	R-136	C-132	November 16, 2008
Site 2	R-137	C-133	November 16, 2008
Site 3	R-138	C-134	November 16, 2008
10m Semi-anechoic chamber	R-2480	C-2722	December 19, 2009
3m Semi-anechoic chamber	R-2481	C-2723	December 19, 2009
Shielded room No.1	-	C-2724	December 19, 2009

5) ETL SEMKO authorization:

Authorized as an EMC test laboratory.

6) TUV Rheinland authorization:

Authorized as an EMC test laboratory.

8. Configuration photographs

Conducted emission at mains port [Centronics mode]



The photographs show maximized emission configuration.

Radiated emission [Centronics mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [Serial mode]



The photographs show maximized emission configuration.

Radiated emission [Serial mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [USB mode]



The photographs show maximized emission configuration.

Radiated emission [USB mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [LAN mode]



The photographs show maximized emission configuration.

Radiated emission [LAN mode]



The photographs show maximized emission configuration.