

TEST REPORT

Report number : Z071C-08395

Issue date : February 2, 2009

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

- Class II Permissive Change -

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	: KHZ001M33331A
Trade name	: FUJITSU ISOTEC
Model number	: M33331A
Serial number	: VX144588, VX147268
EUT condition	: Pre-production

Date of test : October 2, 2008, January 13,15, 2009

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

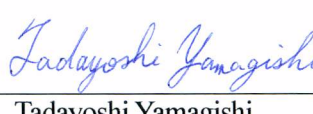
[EUT complies with Canadian Interference-Causing Equipment Standard ICES-003.]

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 Tadayoshi Yamagishi

Authorized by:


Katsumi Sumiyoshi
Manager of Quality Control Division

NVLAP[®]
NVLAP LAB CODE 200306-0

Table of contents

	Page
1. Summary of Test.....	4
1.1 Purpose of test.....	4
1.2 Standards.....	4
1.3 Emission measurement	4
1.4 Deviation from the standard.....	4
1.5 Modification to the EUT by laboratory	4
2. Equipment Under Test	5
2.1 General Description of equipment.....	5
2.2 EUT information	5
2.3 Operating mode.....	5
3. Configuration of equipment.....	6
3.1 Peripheral(s) used [H print, Centronics I/F mode].....	6
3.2 Cable(s) used [H Print, Centronics I/F mode].....	6
3.3 System configuration [H Print, Centronics I/F mode].....	7
3.4 Peripheral(s) used [H Print, USB I/F mode]	8
3.5 Cable(s) used [H Print, USB I/F mode]	8
3.6 System configuration [H Print, USB I/F mode].....	9
3.7 Peripheral(s) used [H Print, RS232C I/F mode]	10
3.8 Cable(s) used [H Print, RS232C I/F mode].....	10
3.9 System configuration [H Print, RS232C I/F mode].....	11
3.10 Peripheral(s) used [H Print, LAN I/F mode]	12
3.11 Cable(s) used [H Print, LAN I/F mode]	12
3.12 System configuration [H Print, LAN I/F mode]	13
4. Conducted emission at mains port test information.....	14
4.1 Measurement procedure.....	14
4.2 Test equipment for Conducted emission at mains port.....	15
4.3 Limit.....	16
4.4 Calculation method	16
4.5 Test data	17
5. Radiated emission test information.....	21
5.1 Measurement procedure.....	21
5.2 Test equipment for Radiated emission.....	22
5.3 Limit.....	23
5.4 Calculation method	23
5.5 Test data	24
6. Uncertainty of measurement	28
7. Laboratory description.....	28
8. Configuration photographs.....	29
Conducted emission at mains port [H Print, Centronics I/F mode].....	29
Radiated emission [H Print, Centronics I/F mode]	29
Conducted emission at mains port [H Print, RS232C I/F mode]	30
Radiated emission [H Print, RS232C I/F mode].....	30
Conducted emission at mains port [H Print, USB /FI mode]	31
Radiated emission [H Print, USB I/F mode].....	31

Conducted emission at mains port [H Print, LAN I/F mode].....32
Radiated emission [H Print, LAN I/F mode]32

1. Summary of Test

1.1 Purpose of test

EUT, FCC ID : KHZ001M33331A, has been granted on Feb. 20, 2004 and January 24, 2005.
Purpose of test is retest of EUT by changing AC power supply unit.

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 General Description of equipment

The EUT is Dot matrix Printer.

2.2 EUT information

No.	EUT	Company	Model No.	Serial No.	DoC/FCC ID	Comment
1	Dot Matrix Printer	FUJITSU ISOTEC LIMITED	M33331A	VX144588	KHZ001M33331A	*1,*3
				VX147268		*2,*4
2	RS232C Board	FUJITSU ISOTEC LIMITED	CA20160-B81X	N/A	N/A	Option
3	LAN Card	FUJITSU ISOTEC LIMITED	KA02004-0225	N/A	N/A	Option

*1: Used for Centronics I/F mode

*2: Used for USB I/F mode

*3: Used for RS232C I/F mode

*4: Used for LAN I/F mode

Max. used frequency : 33MHz

Oscillator(s)/Crystal(s) : Oscillator 4.0MHz (for Main) /6.0MHz (for USB) /
Operating frequency 4.125MHz, 25MHz (for LAN)
Processor clock 16MHz (for Main) /12MHz (for USB) /
33MHz, 25MHz (for LAN)
Switching 37KHz to 56KHz
Frequencies

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

Size : (W) 415 × (D) 330 × (H) 120 mm

Variation of model(s) : Not applicable

2.3 Operating mode

[H print, Centronics I/F mode]

[H print, USB I/F mode]

[H print, RS232C I/F mode]

[H print, LAN I/F mode]

- i) Print-data are transferred from personal computer to EUT
- ii) Printer feeds a paper from tractor unit
- iii) EUT prints "H" letters on the paper
- iv) i) to iii) is repeated.

3. Configuration of equipment

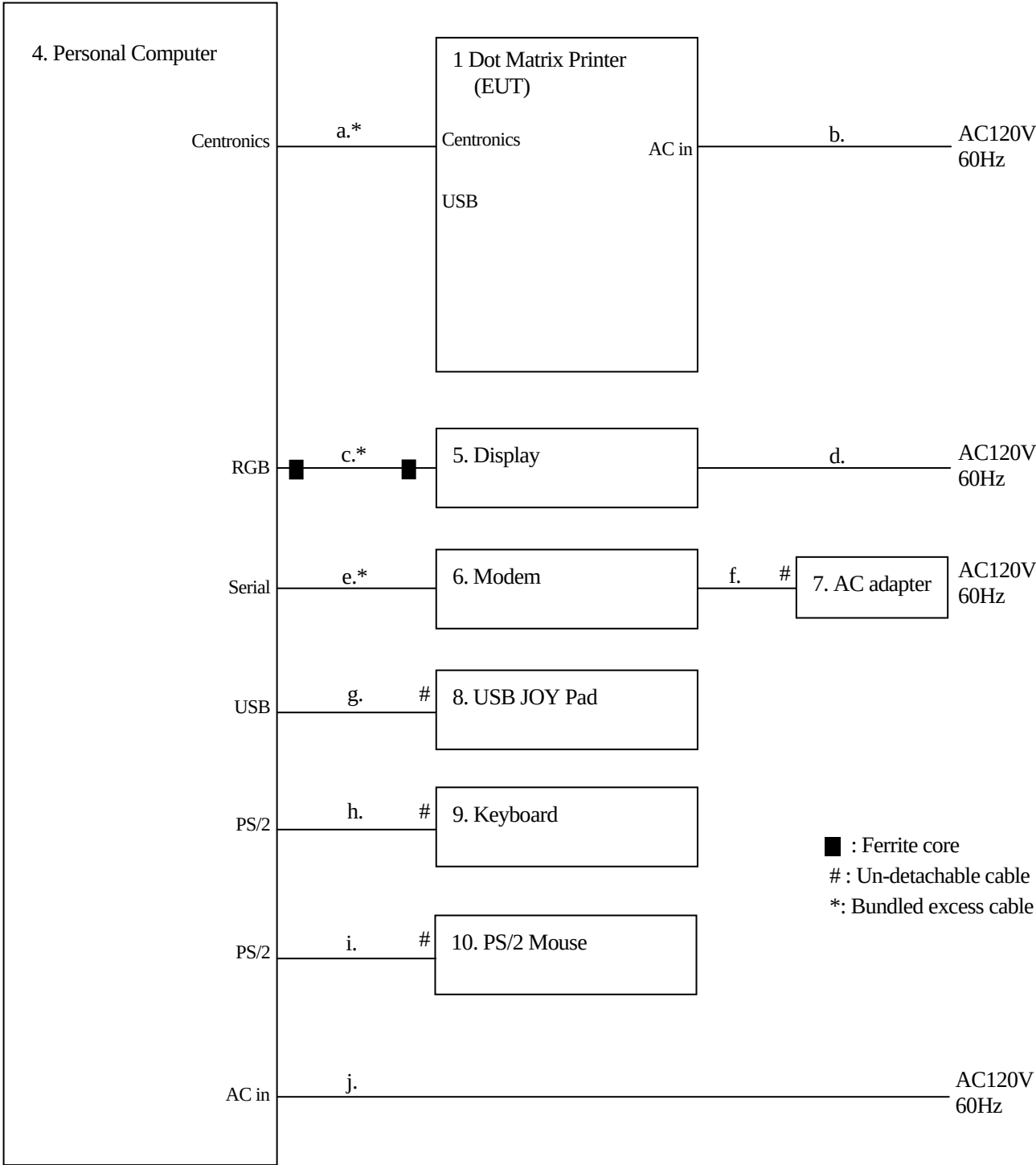
3.1 Peripheral(s) used [H print, Centronics I/F mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
4	Personal Computer	DELL	MCM	9LX841S	DoC	-
5	Display	MITSUBISHI	L202EV	5Z304093YJ	DoC	-
6	Modem	US. Robotics	Sport_Ster 33.6Kbps	000839032BK6YV4J	DoC	-
7	AC Adaptor for Modem	US. Robotics	N/A	N/A	N/A	-
8	USB JOY Pad	Logitech	G-UF13	N/A	DoC	-
9	Keyboard	DELL	SK-8000	N/A	DoC	-
10	PS/2 Mouse	Logitech	M-S34	23-279294	N/A	-

3.2 Cable(s) used [H Print, Centronics I/F mode]

No.	Cable	Length[m]	Shield	Connector	Comment
a	Centronics cable	1.5	Yes	Metal	-
b	AC power cord for EUT	2.0	No	Plastic	-
c	RGB cable	1.5	Yes	Metal	-
d	AC power cord for Display	1.7	No	Plastic	-
e	Serial cable	3.0	Yes	Metal	-
f	DC cable for Modem AC adaptor	1.7	No	Plastic	-
g	Joy pad cable	1.8	Yes	Metal	-
h	Keyboard cable	2.2	No	Metal	-
i	Mouse cable	1.8	No	Metal	-
j	AC power cord for PC	1.8	No	Plastic	-

3.3 System configuration [H Print, Centronics I/F mode]



Note 1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.2 EUT information”, “3.1 Peripheral(s) used” and “3.2 Cable(s) used”.

Note 2: RGB cable (No.c) with two ferrite cores is accessory of Display (No.5).

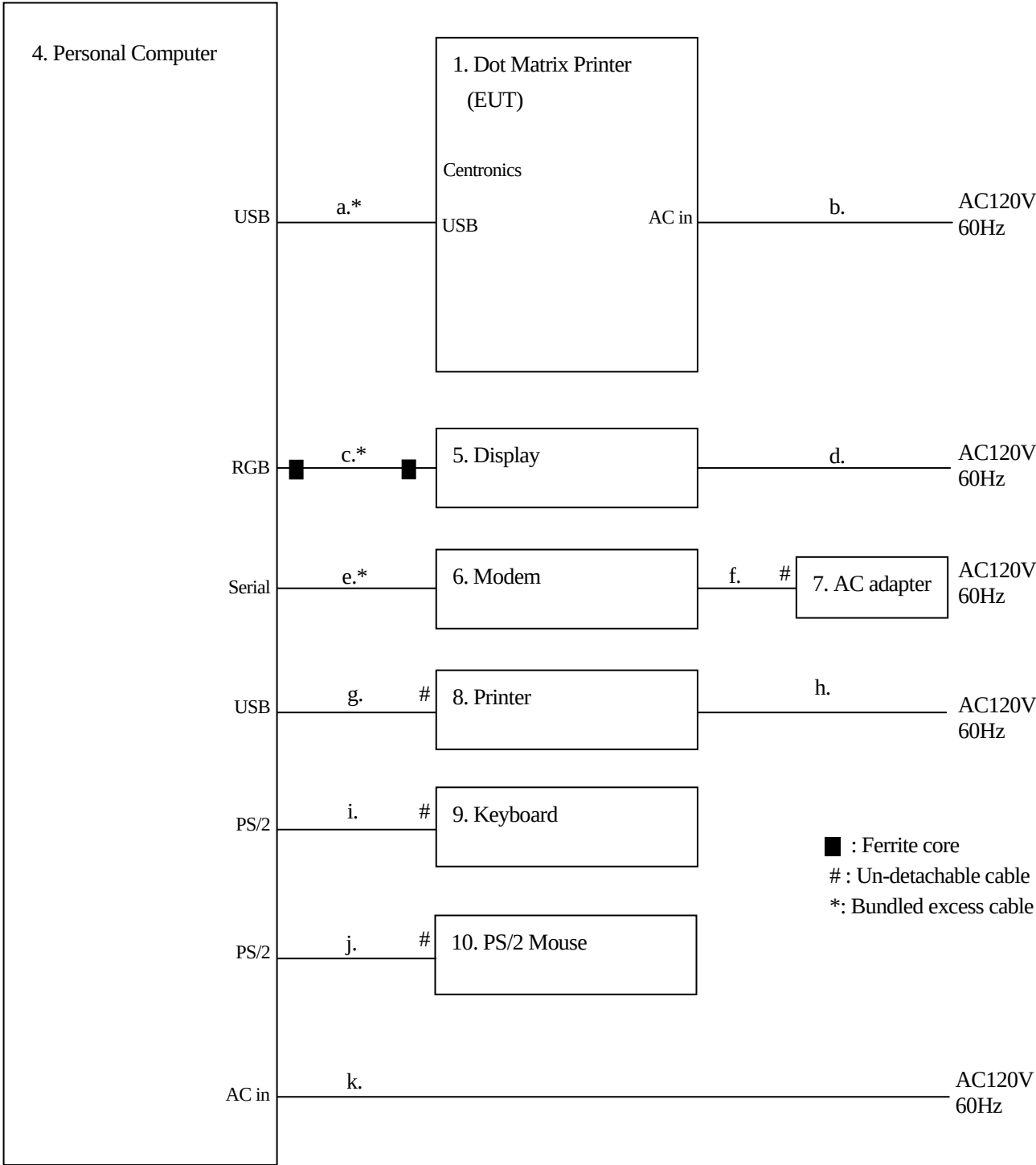
3.4 Peripheral(s) used [H Print, USB I/F mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
4	Personal Computer	DELL	MCM	9LX841S	DoC	-
5	Display	MITSUBISHI	L202EV	5Z304093YJ	DoC	-
6	Modem	US. Robotics	Sport_Ster 33.6Kbps	000839032BK6YV4J	DoC	-
7	AC Adaptor for Modem	US. Robotics	N/A	N/A	N/A	-
8	Printer	HP	C4555A	US6BC212N	B94C4555X	-
9	Keyboard	DELL	SK-8000	N/A	DoC	-
10	PS/2 Mouse	Logitech	M-S34	23-279294	N/A	-

3.5 Cable(s) used [H Print, USB I/F mode]

No.	Cable	Length[m]	Shield	Connector	Comment
a	USB cable	1.4	Yes	Metal	-
b	AC power cord for EUT	2.0	No	Plastic	-
c	RGB cable	1.5	Yes	Metal	-
d	AC power cord for Display	1.7	No	Plastic	-
e	Serial cable	3.0	Yes	Metal	-
f	DC cable for Modem AC adaptor	1.7	No	Plastic	-
g	Parallel cable	3.0	Yes	Metal	-
h	AC power cord for Printer	2.8	No	Plastic	-
i	Keyboard cable	2.2	No	Metal	-
j	Mouse cable	1.8	No	Metal	-
k	AC power cord for PC	1.8	No	Plastic	-

3.6 System configuration [H Print, USB I/F mode]



Note 1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.2 EUT information”, “3.4 Peripheral(s) used” and “3.5 Cable(s) used”.

Note 2: RGB cable (No.c) with two ferrite cores is accessory of Display (No.5).

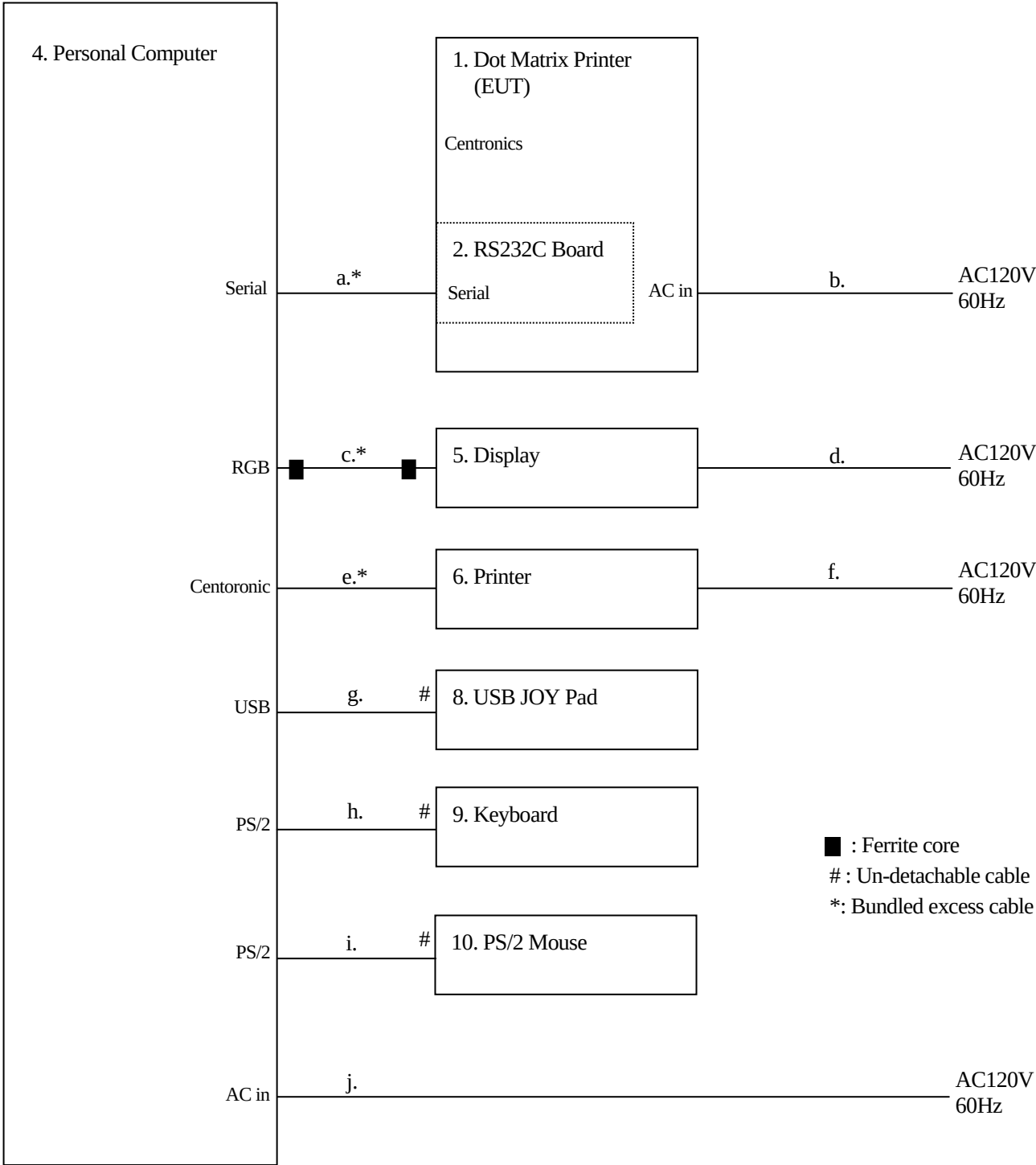
3.7 Peripheral(s) used [H Print, RS232C I/F mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
4	Personal Computer	DELL	MCM	9LX841S	DoC	-
5	Display	MITSUBISHI	L202EV	5Z304093YJ	DoC	-
6	Printer	HP	C4555A	US6BC212N	B94C4555X	-
7	USB JOY Pad	Logitech	G-UF13	N/A	DoC	-
8	Keyboard	DELL	SK-8000	N/A	DoC	-
9	PS/2 Mouse	Logitech	M-S34	23-279294	N/A	-

3.8 Cable(s) used [H Print, RS232C I/F mode]

No.	Cable	Length[m]	Shield	Connector	Comment
a	RS232C cable	1.5	Yes	Metal	-
b	AC power cord for EUT	2.0	No	Plastic	-
c	RGB cable	1.5	Yes	Metal	-
d	AC power cord for Display	1.7	No	Plastic	-
e	Parallel cable	3.0	Yes	Metal	-
f	AC power cord for Printer	2.8	No	Plastic	-
g	Joy pad cable	1.8	Yes	Metal	-
h	Keyboard cable	2.2	No	Metal	-
i	Mouse cable	1.8	No	Metal	-
j	AC power cord for PC	1.8	No	Plastic	-

3.9 System configuration [H Print, RS232C I/F mode]



Note 1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.2 EUT information”, “3.7 Peripheral(s) used” and “3.8 Cable(s) used”.

Note 2: RGB cable (No.c) with two ferrite cores is accessory of Display (No.5).

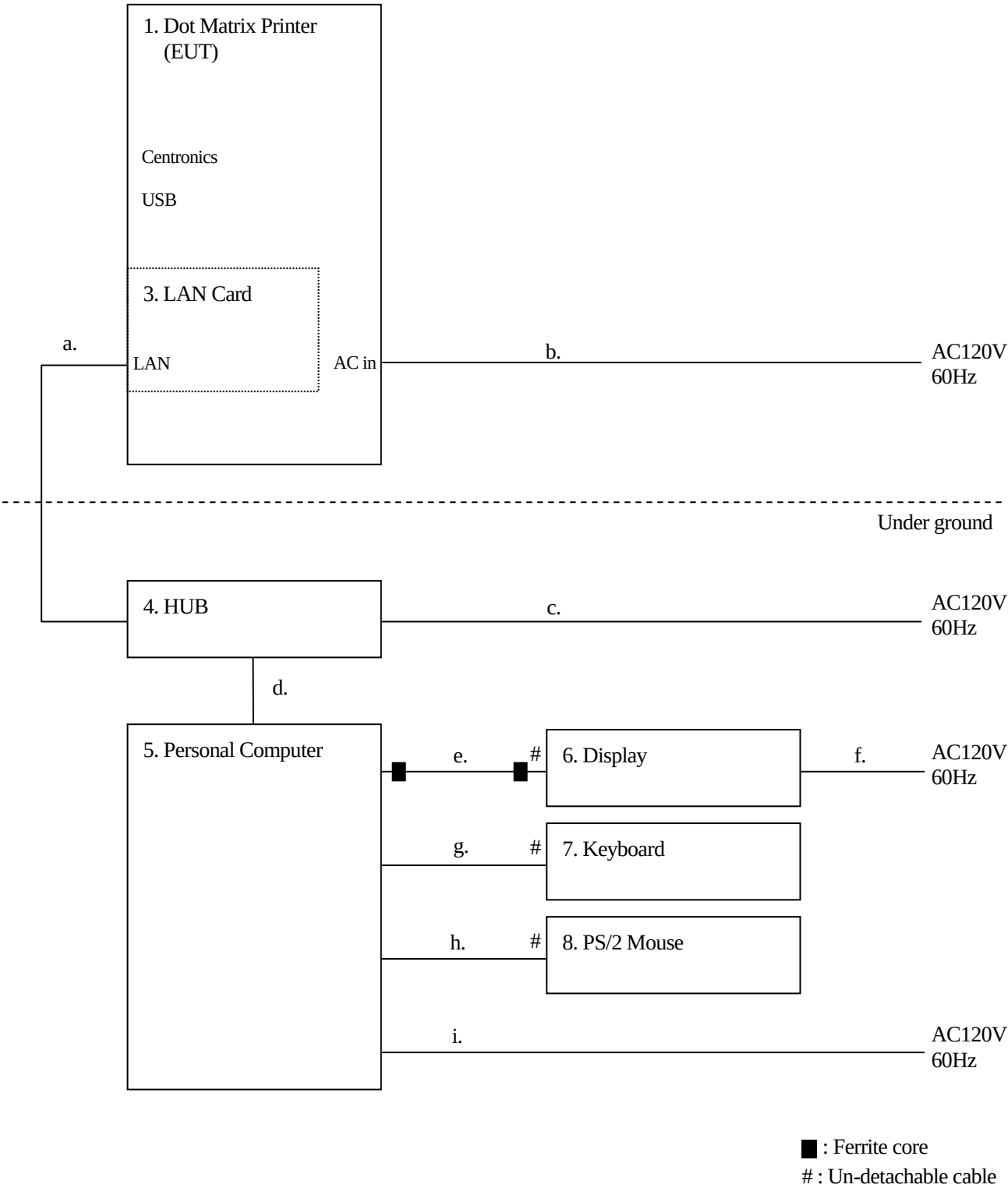
3.10 Peripheral(s) used [H Print, LAN I/F mode]

No.	Equipment	Company	Model No.	Serial No.	DoC/FCC ID	Comment
4	HUB	corega	CG-SW05GTR	1103750070201017 Rev.A2	N/A	-
5	Personal Computer	DELL	MCM	9LX841S	DoC	-
6	Display	MITSUBISHI	L202EV	5Z304093YJ	DoC	-
7	Keyboard	DELL	SK-8000	N/A	DoC	-
8	PS/2 Mouse	Logitech	M-S34	23-279294	N/A	-

3.11 Cable(s) used [H Print, LAN I/F mode]

No.	Cable	Length[m]	Shield	Connector	Comment
a	LAN cable	10.0	No	Plastic	-
b	AC power cord for EUT	2.0	Yes	Plastic	-
c	AC power cord for HUB	1.8	No	Plastic	-
d	LAN cable	1.2	No	Plastic	-
e	RGB cable	1.5	Yes	Metal	-
f	AC power cord for Display	1.7	No	Plastic	-
g	Keyboard cable	2.2	No	Metal	-
h	Mouse cable	1.8	No	Metal	-
i	AC power cord for PC	1.8	No	Plastic	-

3.12 System configuration [H Print, LAN I/F mode]



Note 1: Numbers assigned to equipment or cables on this diagram correspond to the list in “2.2 EUT information”, “3.10 Peripheral(s) used” and “3.11 Cable(s) used”.

Note 2: RGB cable (No.e) with two ferrite cores is accessory of Display (No.6).

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

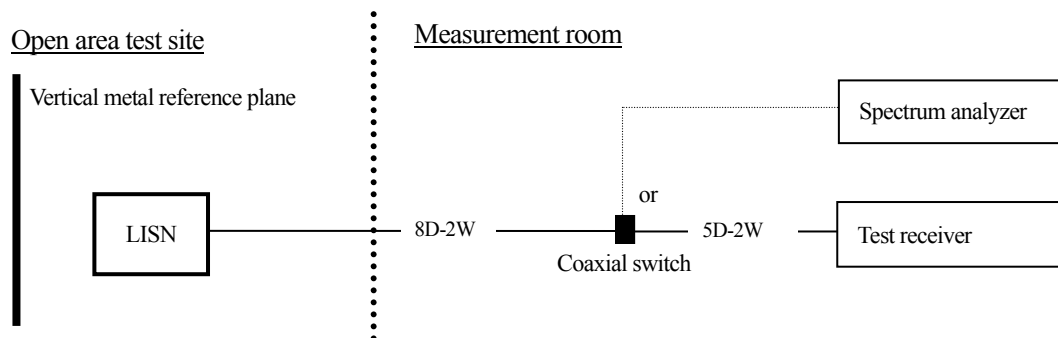
Conducted emission at AC mains port measurements are performed at open area test site according to ANSI C63.4 section 7.

EUT is placed on wooden table of 2.3m(W) × 1.0m(D) × 0.8m(H) in size. EUT is connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) 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. LISN for peripheral is terminated in 50Ω.

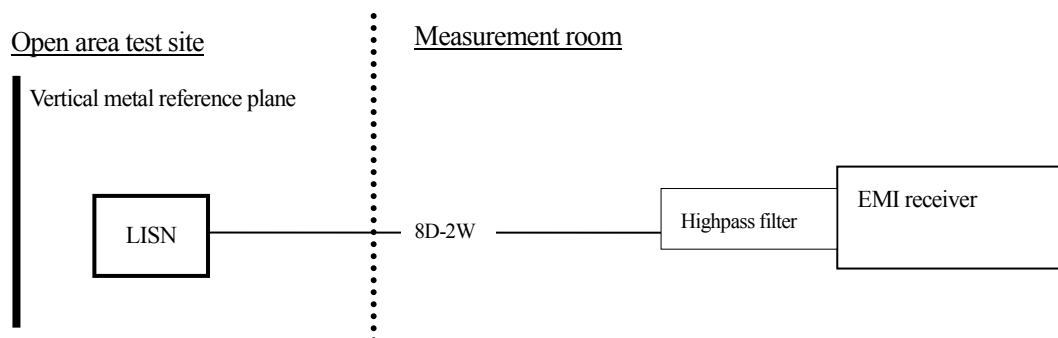
EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, support equipment, interconnecting cables. Then, emission measurements are performed with 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

[Test site 2]



[Test site 3]



4.2 Test equipment for Conducted emission at mains port

[Test site 2]

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. Date
Spectrum analyzer	Agilent Technologies	8568B 85662A	2732A03847 3026A19352	Jul.2009	Jul. 31, 2008
Test receiver	ROHDE&SCHWARZ	ESHS10	842884/009	Feb.2009	Feb. 27, 2008
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407	8-663-4	Mar.2009	Mar. 13, 2008
Line impedance stabilization network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-242C	8-1094-5	Mar.2009	Mar. 31, 2008
Coaxial cable	FUJIKURA	8D-2W/15m	YTCRFC#2C	May.2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R,2C-001	May.2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R,2C-002	May.2009	May. 31, 2008
Coaxial switch	ANRITSU	MP59B	6200331882	May.2009	May. 31, 2008
Transient limiter	Agilent Technologies	11947A	3107A03917	Jan.2010	Jan. 7, 2009
50Ω terminator	SUHNER	65-BNC-50-0-7	N/A	Mar.2009	Mar. 5, 2008
PC	IBM	6892-44J	97-42089	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

[Test site 3]

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100451	May.2009	May. 12, 2008
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407	8-693-19	Mar.2009	Mar. 13, 2008
Line impedance stabilization network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-242C	8-1094-5	Mar.2009	Mar. 13, 2008
Highpass filter	ROHDE&SCHWARZ	EZ-25	100007	Jan.2009	Jan. 7, 2008
Coaxial cable	FUJIKURA	8D-2W/15m	YTCRFC#3C	May.2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#3R,3C-001	May.2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#3R,3C-002	May.2009	May. 31, 2008
Coaxial switch	ANRITSU	MP59B	6200331883	May.2009	May. 31, 2008
Transient limiter	Agilent Technologies	11947A	3107A03923	Jan.2009	Jan. 7, 2008
50Ω terminator	RS	090-0510	N/A	Mar.2009	Mar. 5, 2008
PC	IBM	6892-44J	97-43012	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

4.3 Limit

Frequency	Class B limit	
	QP(dB μ V)	AV(dB μ V)
0.15MHz to 0.5MHz	66 to 56*	56 to 46*
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.

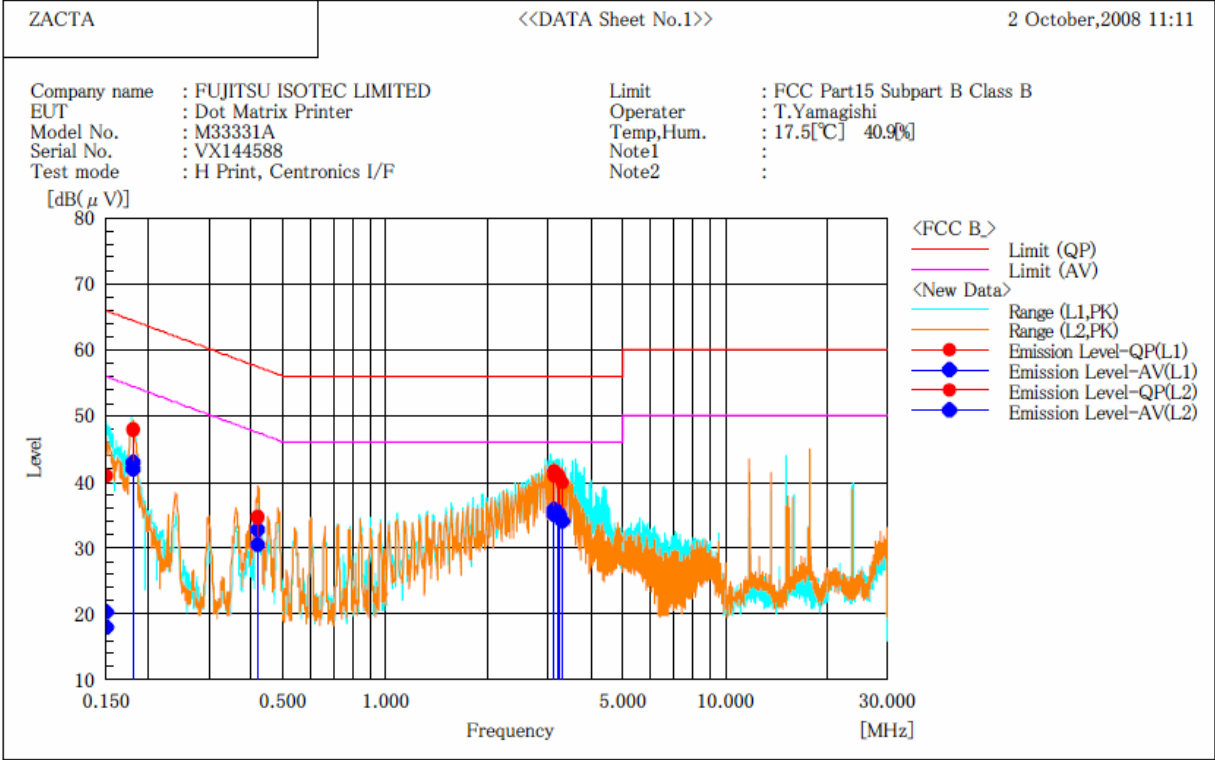
4.4 Calculation method

Emission level = Reading + (AMN. factor + Cable system loss)

Margin = Limit – Emission level

4.5 Test data

***** CONDUCTED EMISSION at MAINS PORT *****
 << Test site 3 >>



Final Result

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c. f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	30.0	9.3	11.0	41.0	20.3	66.0	56.0	25.0	35.7
2	0.180	37.2	32.2	10.8	48.0	43.0	64.5	54.5	16.5	11.5
3	0.421	25.2	23.0	9.7	34.9	32.7	57.4	47.4	22.5	14.7
4	3.123	31.9	26.1	9.7	41.6	35.8	56.0	46.0	14.4	10.2
5	3.182	31.4	25.8	9.7	41.1	35.5	56.0	46.0	14.9	10.5
6	3.241	31.1	25.4	9.7	40.8	35.1	56.0	46.0	15.2	10.9

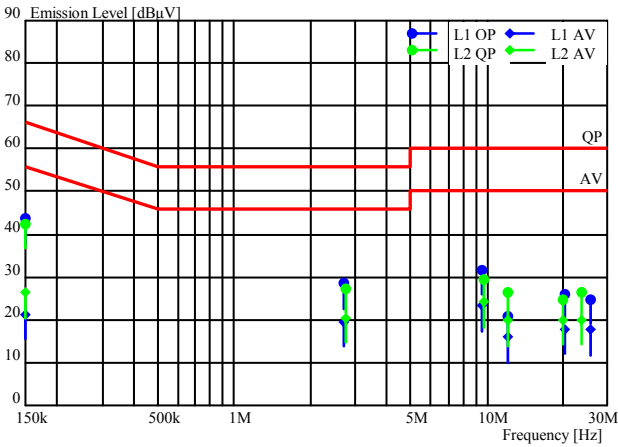
--- L2 Phase ---

No.	Frequency	Reading QP	Reading AV	c. f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	29.7	6.9	11.1	40.8	18.0	66.0	56.0	25.2	38.0
2	0.180	37.0	31.0	10.9	47.9	41.9	64.5	54.5	16.6	12.6
3	0.420	24.8	20.8	9.7	34.5	30.5	57.4	47.4	22.9	16.9
4	3.124	31.3	25.4	9.7	41.0	35.1	56.0	46.0	15.0	10.9
5	3.182	31.3	25.5	9.7	41.0	35.2	56.0	46.0	15.0	10.8
6	3.304	30.3	24.3	9.7	40.0	34.0	56.0	46.0	16.0	12.0

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

Sheet number : 2

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2009/1/15
Test site : 2
Temperature [°C] : 16.2
Humidity [%] : 23.1
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX147268
Test mode : H Print
Comment : USB I/F



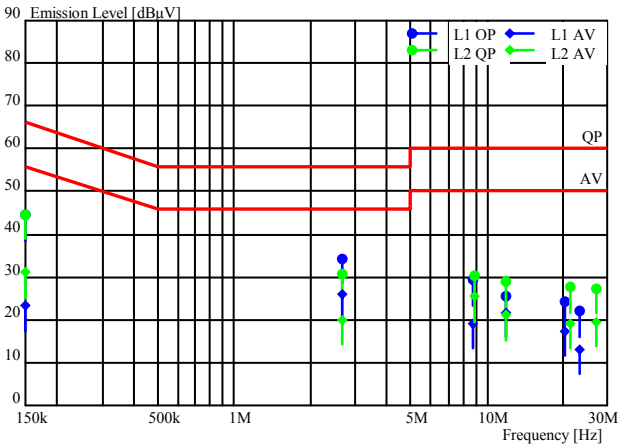
Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP	AV		QP	AV	QP	AV	QP	AV	
		[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
L1	0.150	43.4	21.1	0.2	43.6	21.3	66.0	56.0	22.4	34.7	*
L1	2.698	28.2	19.4	0.2	28.4	19.6	56.0	46.0	27.6	26.4	
L1	9.524	31.2	22.7	0.5	31.7	23.2	60.0	50.0	28.3	26.8	
L1	12.047	20.1	15.2	0.7	20.8	15.9	60.0	50.0	39.2	34.1	
L1	20.244	24.7	16.5	1.2	25.9	17.7	60.0	50.0	34.1	32.3	
L1	25.465	23.3	16.2	1.4	24.7	17.6	60.0	50.0	35.3	32.4	
L2	0.150	42.3	26.0	0.2	42.5	26.2	66.0	56.0	23.5	29.8	
L2	2.764	27.0	20.1	0.2	27.2	20.3	56.0	46.0	28.8	25.7	
L2	9.690	28.9	23.6	0.5	29.4	24.1	60.0	50.0	30.6	25.9	
L2	12.051	25.6	19.1	0.7	26.3	19.8	60.0	50.0	33.7	30.2	
L2	20.033	23.4	18.8	1.2	24.6	20.0	60.0	50.0	35.4	30.0	
L2	23.700	25.0	18.6	1.3	26.3	19.9	60.0	50.0	33.7	30.1	

* : The worst emission. Factor : LISN Factor + Cable Loss Ver.2.81 F2#034

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

Sheet number : 3

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2009/1/15
Test site : 2
Temperature [°C] : 16.2
Humidity [%] : 23.1
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX144588
Test mode : H Print
Comment : RS232C I/F



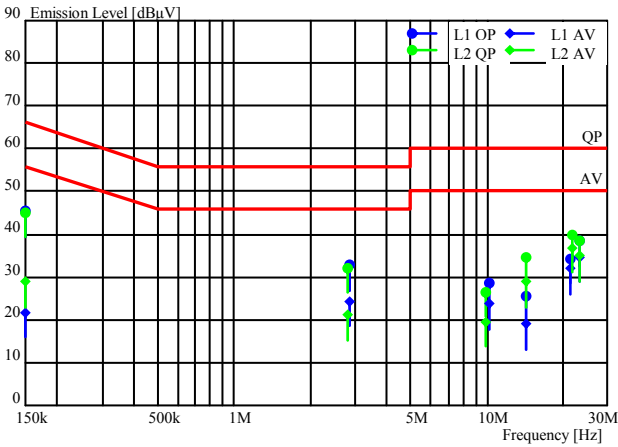
Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
L1	0.150	44.3	23.0	0.2	44.5	23.2	66.0	56.0	21.5	32.8	
L1	2.665	34.1	25.8	0.2	34.3	26.0	56.0	46.0	21.7	20.0	*
L1	8.839	28.8	18.5	0.5	29.3	19.0	60.0	50.0	30.7	31.0	
L1	11.903	25.1	21.2	0.6	25.7	21.8	60.0	50.0	34.3	28.2	
L1	20.429	23.1	16.2	1.2	24.3	17.4	60.0	50.0	35.7	32.6	
L1	23.047	20.6	11.7	1.3	21.9	13.0	60.0	50.0	38.1	37.0	
L2	0.150	44.4	30.8	0.2	44.6	31.0	66.0	56.0	21.4	25.0	
L2	2.672	30.4	19.9	0.2	30.6	20.1	56.0	46.0	25.4	25.9	
L2	8.959	30.0	24.9	0.5	30.5	25.4	60.0	50.0	29.5	24.6	
L2	11.927	28.2	20.4	0.6	28.8	21.0	60.0	50.0	31.2	29.0	
L2	21.485	26.4	17.8	1.2	27.6	19.0	60.0	50.0	32.4	31.0	
L2	27.007	25.8	18.0	1.5	27.3	19.5	60.0	50.0	32.7	30.5	

* : The worst emission. Factor : LISN Factor + Cable Loss Ver.2.81 F2#034

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

Sheet number : 4

Standard : FCC Part 15 Subpart B
Class : B
Terminal : Mains
Date of test : 2009/1/15
Test site : 2
Temperature [°C] : 16.2
Humidity [%] : 23.1
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX147268
Test mode : H Print
Comment : LAN I/F



Phase	Frequency [MHz]	Reading		Factor	Emission level		Limit		Margin		Comment
		QP	AV		QP	AV	QP	AV	QP	AV	
		[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
L1	0.150	45.1	21.4	0.2	45.3	21.6	66.0	56.0	20.7	34.4	
L1	2.856	32.5	24.1	0.2	32.7	24.3	56.0	46.0	23.3	21.7	
L1	10.255	28.1	23.1	0.6	28.7	23.7	60.0	50.0	31.3	26.3	
L1	14.180	24.6	18.1	0.8	25.4	18.9	60.0	50.0	34.6	31.1	
L1	21.172	33.0	30.7	1.2	34.2	31.9	60.0	50.0	25.8	18.1	
L1	23.128	37.1	33.3	1.3	38.4	34.6	60.0	50.0	21.6	15.4	
L2	0.150	45.0	28.7	0.2	45.2	28.9	66.0	56.0	20.8	27.1	
L2	2.791	31.8	20.8	0.2	32.0	21.0	56.0	46.0	24.0	25.0	
L2	9.883	26.0	19.0	0.5	26.5	19.5	60.0	50.0	33.5	30.5	
L2	14.214	33.7	28.0	0.8	34.5	28.8	60.0	50.0	25.5	21.2	
L2	21.662	38.8	35.7	1.2	40.0	36.9	60.0	50.0	20.0	13.1	*
L2	23.128	37.3	33.6	1.3	38.6	34.9	60.0	50.0	21.4	15.1	

* : The worst emission. Factor : LISN Factor + Cable Loss Ver.2.81 F2#034

5. Radiated emission test information

5.1 Measurement procedure

- Frequency range: 30MHz to 1000MHz

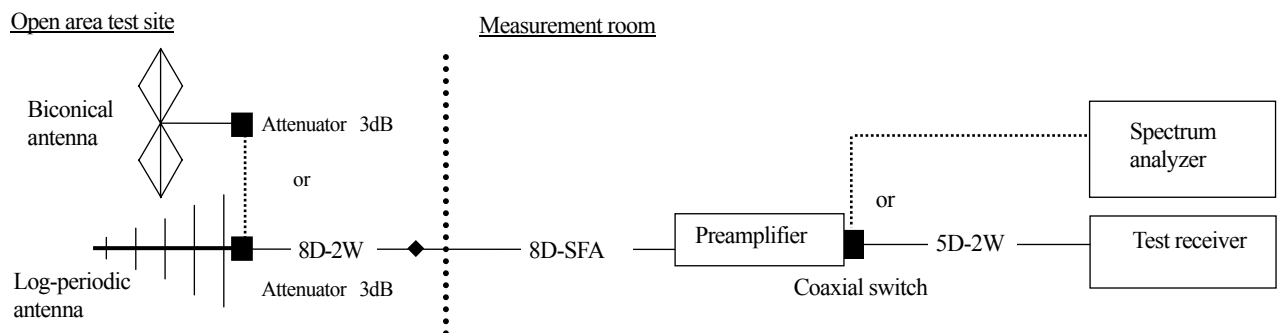
- Test receiver setting
Detector: Quasi-peak
Bandwidth: 120 kHz

- 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

[Test site 2]

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum analyzer	Agilent Technologies	8568B	2732A03847	Jul. 2009	Jul. 31, 2008
		85662A	3026A19352		
Test receiver	ROHDE&SCHWARZ	ESVS10	832655/012	Oct. 2009	Oct. 21, 2008
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	1563	Jun. 2009	Jun. 14, 2008
Log periodic antenna	Schwarzbeck	UHALP9108A	0438	Jun. 2009	Jun. 14, 2008
Attenuator	TDC	TAT-43B-03	N/A	Aug. 2009	Aug. 8, 2008
Attenuator	TDC	TAT-43B-03	N/A	Aug. 2009	Aug. 8, 2008
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#2R-001	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#2R-002	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	8D-2W/8m	YTCRFC#2R-003	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R,2C-001	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#2R,2C-002	May. 2009	May. 31, 2008
Preamplifier	ANRITSU	MH648A	M96157	May. 2009	May. 31, 2008
Coaxial switch	ANRITSU	MP59B	6200331882	May. 2009	May. 31, 2008
Site attenuation	ZACTA Technology Corp.	N/A	N/A	Jul. 2009	Jul. 5, 2008
PC	IBM	6892-44J	97-42089	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

[Test site 3]

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum analyzer	Agilent Technologies	8568B	2634A03228	Jun. 2009	Jun. 11, 2008
		85662A	2648A14093		
Test receiver	ROHDE&SCHWARZ	ESVS10	827864/004	May. 2009	May. 27, 2008
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2322	Jun. 2009	Jun. 14, 2008
Log periodic antenna	Schwarzbeck	UHALP9108A	0398	Jun. 2009	Jun. 14, 2008
Attenuator	TDC	TAT-43B-03	N/A	Aug. 2009	Aug. 8, 2008
Attenuator	TDC	TAT-43B-03	N/A	Aug. 2009	Aug. 8, 2008
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#3R-001	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	8D-SFA/15m	YTCRFC#3R-002	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	8D-2W/8m	YTCRFC#3R-003	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#3R,3C-001	May. 2009	May. 31, 2008
Coaxial cable	FUJIKURA	5D-2W/1m	YTCRFC#3R,3C-002	May. 2009	May. 31, 2008
Preamplifier	ANRITSU	MH648A	M96257	May. 2009	May. 31, 2008
Coaxial switch	ANRITSU	MP59B	6200331883	May. 2009	May. 31, 2008
Site attenuation	ZACTA Technology Corp.	N/A	N/A	Jul. 2009	Jul. 5, 2008
PC	IBM	6892-44J	97-43012	N/A	N/A
Software	ZACTA	EMI Data Sheet	Ver.2.81	N/A	N/A

5.3 Limit

Frequency	Class B limit
	(dB μ V/m)
30MHz to 88MHz	40.0
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 Calculation method

Emission level=Reading+(Ant. factor+Cable loss+Attenuator–Amp. Gain)

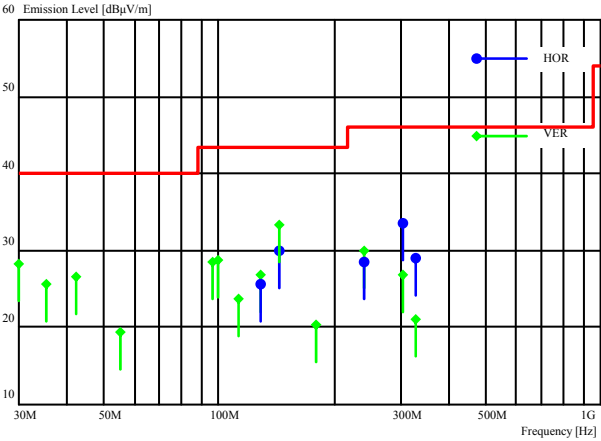
Margin = Limit – Emission level

5.5 Test data

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

Sheet number : 1

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2008/10/2
Test site : 3
Temperature [°C] : 17.5
Humidity [%] : 40.9
Operator : T.Yamagishi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX144588
Test mode : H Print
Comment : Centronics I/F



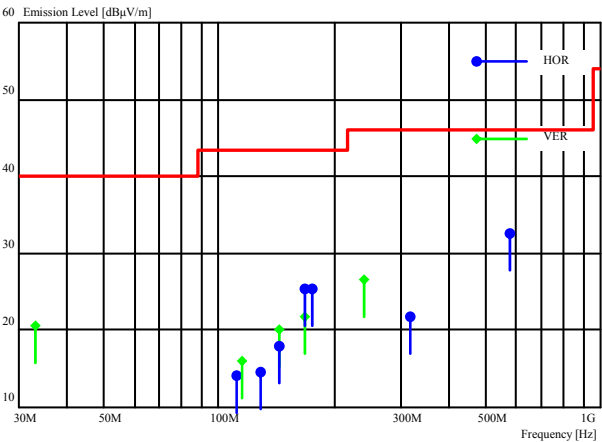
Antenna		Table	Reading		Factor	Emission	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level		Level			
HOR/VER	[m]	[Deg.]	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	[dBuV/m]	[dB]	
VER	1.0	320	30.00	35.9	-7.7	28.2	40.0	11.8	
VER	1.0	10	35.31	35.1	-9.5	25.6	40.0	14.4	
VER	1.0	310	42.00	39.0	-12.3	26.7	40.0	13.3	
VER	1.0	260	55.00	35.5	-16.2	19.3	40.0	20.7	
VER	1.0	120	96.60	44.6	-16.1	28.5	43.5	15.0	
VER	1.0	100	100.00	44.0	-15.2	28.8	43.5	14.7	
VER	1.0	145	112.00	36.8	-13.1	23.7	43.5	19.8	
VER	1.0	200	128.33	38.3	-11.5	26.8	43.5	16.7	
HOR	2.0	230	128.35	37.2	-11.5	25.7	43.5	17.8	
HOR	2.0	55	144.05	40.5	-10.5	30.0	43.5	13.5	
VER	1.0	55	144.05	43.8	-10.5	33.3	43.5	10.2	*
VER	1.0	10	180.00	28.9	-8.6	20.3	43.5	23.2	
VER	1.0	285	240.01	37.4	-7.4	30.0	46.0	16.0	
HOR	1.5	160	240.05	35.9	-7.4	28.5	46.0	17.5	
HOR	1.0	175	304.87	44.0	-10.5	33.5	46.0	12.5	
VER	1.0	50	305.00	37.2	-10.4	26.8	46.0	19.2	
HOR	1.0	110	328.00	39.0	-10.0	29.0	46.0	17.0	
VER	1.0	50	328.00	31.1	-10.0	21.1	46.0	24.9	

* : The worst emission. Factor : Antenna Factor + Attenuator + Cable Loss - Amp Gain Ver.2.81 F3#036

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

Sheet number : 2

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2009/1/13
Test site : 2
Temperature [°C] : 15.3
Humidity [%] : 32.2
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX147268
Test mode : H Print
Comment : USB I/F



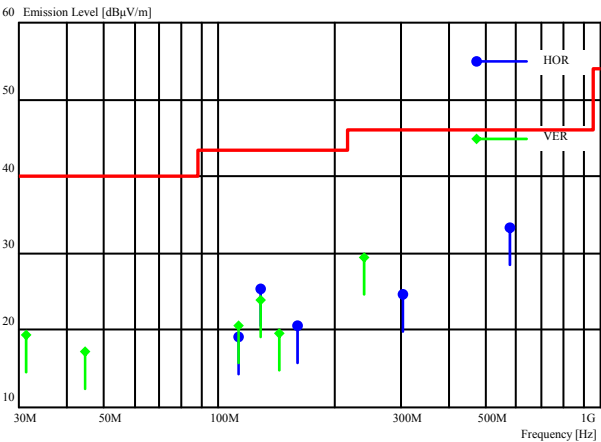
Antenna		Table	Reading		Factor	Emission	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level		Level			
HOR/VER	[m]	[Deg.]	[MHz]	[dBμV]	[dB/m]	[dBμV/m]	[dBμV/m]	[dB]	
VER	1.0	205	32.88	29.1	-8.6	20.5	40.0	19.5	
HOR	2.3	90	111.86	27.4	-13.3	14.1	43.5	29.4	
VER	1.0	45	115.54	28.7	-12.8	15.9	43.5	27.6	
HOR	2.2	310	128.11	26.2	-11.6	14.6	43.5	28.9	
VER	1.0	275	143.99	30.8	-10.7	20.1	43.5	23.4	
HOR	2.3	315	144.04	28.5	-10.6	17.9	43.5	25.6	
VER	1.0	70	168.19	31.1	-9.3	21.8	43.5	21.7	
HOR	2.1	295	168.25	34.6	-9.3	25.3	43.5	18.2	
HOR	2.0	305	175.86	34.3	-8.9	25.4	43.5	18.1	
VER	1.0	355	240.05	33.8	-7.3	26.5	46.0	19.5	
HOR	1.1	165	315.82	31.8	-10.0	21.8	46.0	24.2	
HOR	1.1	135	576.06	36.6	-4.1	32.5	46.0	13.5	*

* : The worst emission. Factor : Antenna Factor + Attenuator + Cable Loss - Amp Gain Ver.2.81 F2#034

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

Sheet number : 3

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2009/1/13
Test site : 2
Temperature [°C] : 15.3
Humidity [%] : 32.2
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX144588
Test mode : H Print
Comment : RS232C I/F



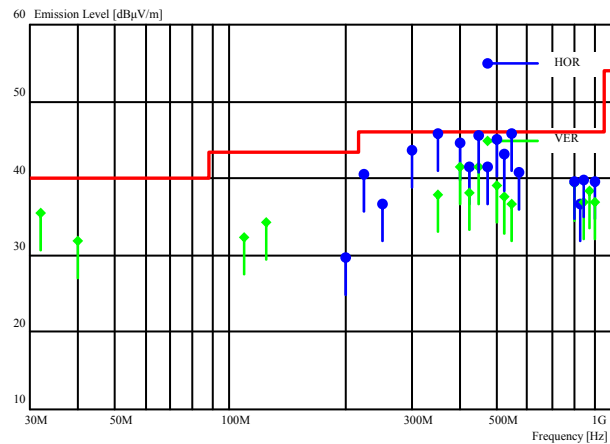
Antenna		Table	Reading		Factor	Emission	Limit	Margin	Comment
Pol.	Height	Radian	Frequency	Level		Level			
HOR/VER	[m]	[Deg.]	[MHz]	[dBμV]	[dB/m]	[dBμV/m]	[dBμV/m]	[dB]	
VER	1.0	315	31.31	27.6	-8.2	19.4	40.0	20.6	
VER	1.0	325	44.59	30.0	-12.9	17.1	40.0	22.9	
HOR	1.7	130	112.12	32.4	-13.2	19.2	43.5	24.3	
VER	1.0	20	112.13	33.7	-13.2	20.5	43.5	23.0	
HOR	2.2	110	128.03	37.0	-11.6	25.4	43.5	18.1	
VER	1.0	65	128.22	35.6	-11.6	24.0	43.5	19.5	
VER	1.0	65	144.01	30.2	-10.6	19.6	43.5	23.9	
HOR	2.3	75	160.20	30.3	-9.8	20.5	43.5	23.0	
VER	1.0	5	240.03	36.8	-7.3	29.5	46.0	16.5	
HOR	1.1	150	304.27	35.1	-10.5	24.6	46.0	21.4	
HOR	1.3	145	576.06	37.3	-4.1	33.2	46.0	12.8	*

* : The worst emission. Factor : Antenna Factor + Attenuator + Cable Loss - Amp Gain Ver.2.81 F2#034

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

Sheet number : 4

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2009/1/13
Test site : 2
Temperature [°C] : 15.3
Humidity [%] : 32.2
Operator : Y.Takahashi
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33331A
Serial number : VX14726B
Test mode : H Print
Comment : LAN I/F



Antenna Pol.	Antenna Height [m]	Table Radian [Deg.]	Reading Frequency [MHz]	Reading Level [dBuV]	Factor [dB/m]	Emission Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Comment
VER	1.0	205	32.06	44.2	-8.6	35.6	40.0	4.4	
VER	1.0	210	40.06	43.2	-11.4	31.8	40.0	8.2	
VER	1.0	240	108.82	46.2	-13.8	32.4	43.5	11.1	
VER	1.0	255	125.01	46.0	-11.8	34.2	43.5	9.3	
HOR	2.6	15	200.02	37.9	-8.2	29.7	43.5	13.8	
HOR	1.7	160	225.00	47.8	-7.3	40.5	46.0	5.5	
HOR	1.6	135	250.03	43.4	-6.8	36.6	46.0	9.4	
HOR	1.3	155	300.01	54.2	-10.5	43.7	46.0	2.3	
HOR	1.3	140	350.00	55.4	-9.6	45.8	46.0	0.2	*
VER	1.4	185	350.00	47.4	-9.6	37.8	46.0	8.2	
HOR	1.1	295	400.00	52.5	-7.8	44.7	46.0	1.3	
VER	1.1	195	400.01	49.3	-7.8	41.5	46.0	4.5	
HOR	1.1	295	424.99	48.6	-7.0	41.6	46.0	4.4	
VER	1.1	185	425.00	44.8	-6.7	38.1	46.0	7.9	
VER	1.3	280	450.00	47.8	-6.4	41.4	46.0	4.6	
HOR	1.1	195	450.01	51.9	-6.4	45.5	46.0	0.5	
HOR	1.0	190	474.99	47.4	-5.9	41.5	46.0	4.5	
VER	1.3	115	500.02	45.0	-5.8	39.2	46.0	6.8	
HOR	1.0	175	500.03	50.9	-5.8	45.1	46.0	0.9	
VER	1.2	325	525.00	42.9	-5.3	37.6	46.0	8.4	
HOR	1.0	160	525.01	48.4	-5.3	43.1	46.0	2.9	
VER	1.3	100	550.01	41.4	-4.7	36.7	46.0	9.3	
HOR	1.0	155	550.02	50.5	-4.7	45.8	46.0	0.2	*
HOR	1.0	160	575.02	44.8	-4.1	40.7	46.0	5.3	
VER	1.4	45	800.00	40.2	-0.9	39.3	46.0	6.7	
HOR	1.7	175	800.01	40.4	-0.9	39.5	46.0	6.5	
HOR	1.5	240	825.01	36.9	-0.3	36.6	46.0	9.4	
VER	1.1	45	850.00	36.4	0.6	37.0	46.0	9.0	
HOR	2.5	175	850.01	39.1	0.6	39.7	46.0	6.3	
VER	1.7	220	875.03	37.4	0.9	38.3	46.0	7.7	
HOR	1.5	190	900.03	38.2	1.3	39.5	46.0	6.5	
VER	1.7	220	900.03	35.7	1.3	37.0	46.0	9.0	

* : The worst emission. Factor : Antenna Factor + Attenuator + Cable Loss - Amp Gain Ver.2.81 F2#034

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)	$\pm 3.7\text{dB}$
Radiated emission (30MHz - 1000MHz)	$\pm 5.3\text{dB}$

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:

Site name	Registration Number	Expiry Date
Site 2, Site 3	91065	November 19, 2011
3m Semi-anechoic chamber 10m Semi-anechoic chamber Shielded room No.1	540072	March 12, 2010

3) Industry Canada Oats site filing:

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:

Site name	Radiated emission	Conducted emission for mains port	Expiry Date	Conducted emission for telecom port	Expiry Date
Site 2	R-137	C-133	Nov. 16, 2011	T-1477	Oct. 8, 2011
Site 3	R-138	C-134	Nov. 16, 2011	T-1478	Oct. 8, 2011
10m Semi-anechoic chamber	R-2480	C-2722	Dec. 19, 2009	T-1474	Oct. 8, 2011
3m Semi-anechoic chamber	R-2481	C-2723	Dec. 19, 2009	T-1475	Oct. 8, 2011
Shielded room No.1	-	C-2724	Dec. 19, 2009	T-1476	Oct. 8, 2011

5) Intertek authorization:

Authorized as an EMC test laboratory.

6) TUV Rheinland authorization:

Authorized as an EMC test laboratory.

7) BUREAU VERITAS certification:

Certified as an EMC test laboratory

8. Configuration photographs

Conducted emission at mains port [H Print, Centronics I/F mode]



The photographs show maximized emission configuration.

Radiated emission [H Print, Centronics I/F mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [H Print, RS232C I/F mode]



The photographs show maximized emission configuration.

Radiated emission [H Print, RS232C I/F mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [H Print, USB /FI mode]



The photographs show maximized emission configuration.

Radiated emission [H Print, USB I/F mode]



The photographs show maximized emission configuration.

Conducted emission at mains port [H Print, LAN I/F mode]



The photographs show maximized emission configuration.

Radiated emission [H Print, LAN I/F mode]



The photographs show maximized emission configuration.