

TEST REPORT

Report number : Z01C-04215

Issue date : September 2, 2004

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

FCC Part15 Subpart B

The EUT complies with section 15.37 "Transition provision for compliance with the rules".

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

Applicant	: FUJITSU ISOTEC LIMITED 135, Higashinozaki, Hobara-machi, Date-gun, Fukushima 960-0695 Japan Phone: +81-24-575-2191 Fax: +81-24-574-2277
Equipment under test (EUT)	: Dot Matrix Printer
FCC ID	: KHZ004M33332A
Trade name	: FUJITSU ISOTEC
Model number	: M33332A
Serial number	: N/A
EUT condition	: Pre-production

Date of test : August 3, 9, 2004

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

Zacta Technology Corporation certifies that no party to the application is subject to a denial of federal benefits, that include FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21U.S.C. 853(a).

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

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

Authorized by: Kiyoshi Endo 
General Manager of EMC Technical Division

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1. Summary of Test

1.1 Test standards

FCC Part 15 Subpart B

1.2 Emission measurement

Test item	Test method	Classification of EUT	Test
Conducted emission at mains port	ANSI C63.4-2001	Class B	Applied
Radiated emission	ANSI C63.4-2001	Class B	Applied

Note : None.

1.3 Note

EUT has similar model: M33333A (FCC ID: KHZ003M33333A). Model: M33333A was tested in full mode (Centronics I/F mode, USB mode, RS232C mode, LAN mode), please refer to Report No.:Z01C-04214. Because the difference between the EUT and model: M33333A is printing speed only, the worst mode test only (LAN mode) was applied to the EUT.

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	M33332A	N/A	KHZ004M33332A	-
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

Max. used frequency : 16MHz

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 42KHz to 63KHz
 Frequencies

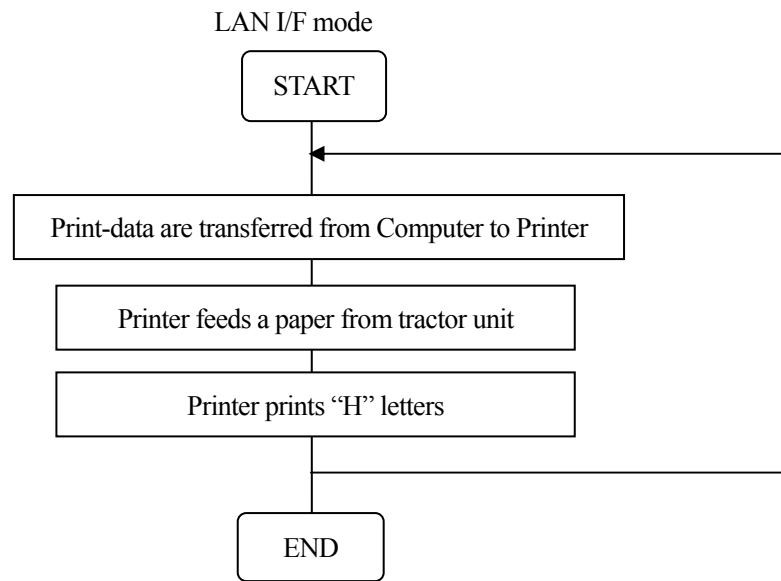
Power ratings : AC 100-120V 50/60Hz
 [Power supply for EUT in testing was AC 120V 60Hz.]

Port(s) : Centronics I/F
 USB I/F
 RS232C I/F
 LAN I/F

Size : (W) 570 x (D) 330 x (H) 120 mm

Variation of model(s) : Not applicable

2.2 Operating mode



3. Configuration of equipment

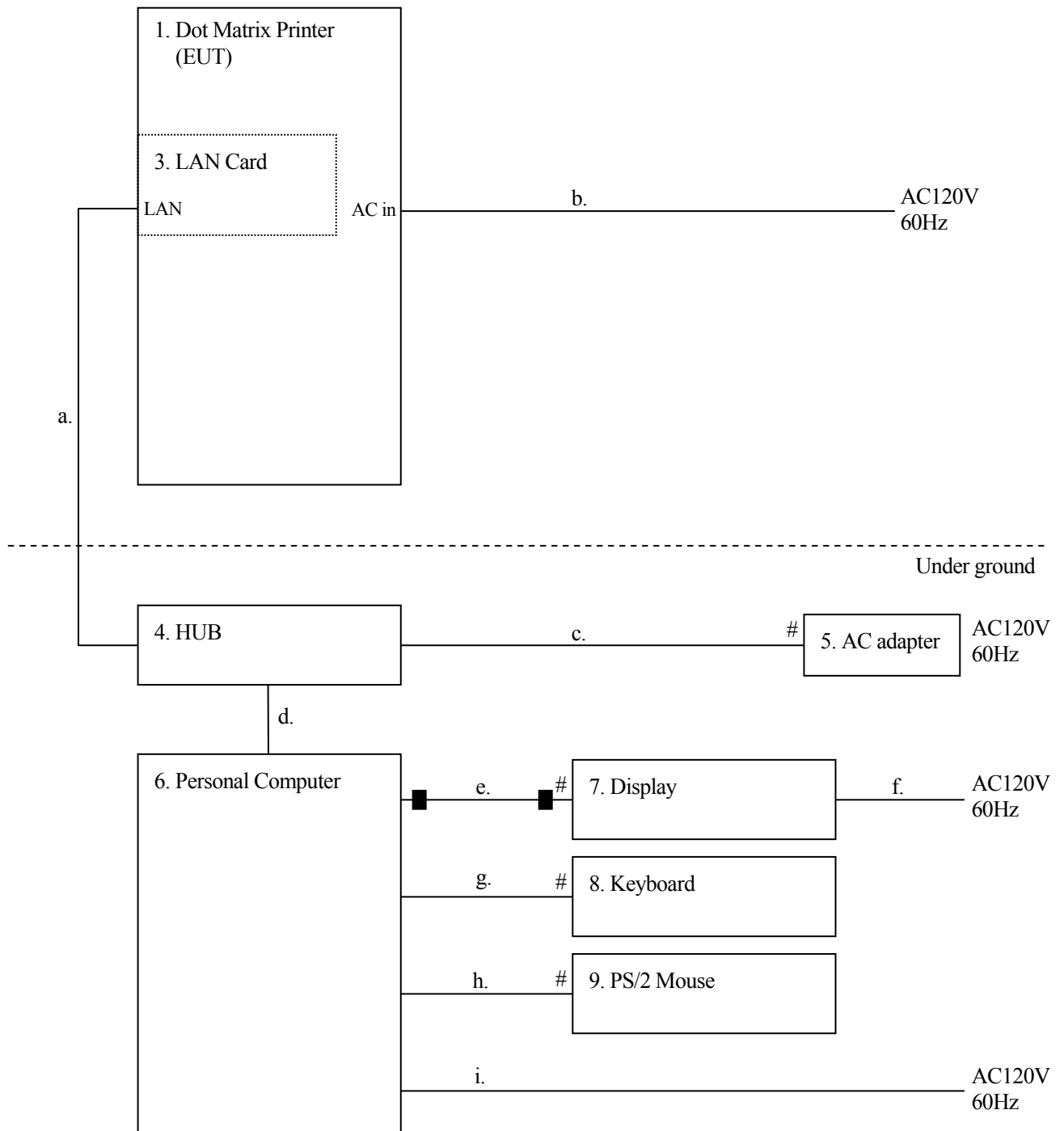
3.1 Peripheral(s) used [LAN I/F mode]

No.	Equipment	Company	Model No.	Serial No.	DoC / FCC ID	Comment
4	HUB	BUFFALO	LSW-TX-SEP	16481435017299	N/A	FCC class A approved
5	AC adapter for HUB	BUFFALO	US100320	309-013708	N/A	-
6	Personal Computer	DELL	MMS	DZP3216	DoC	-
7	Display	ACER	AF715	EU.F0108.007420 0008FPK01	DoC	-
8	Keyboard	DELL	SK-1000REW	M970312886	GYUR36SK	-
9	PS/2 Mouse	Microsoft	Mouse Port Compatible Mouse2.1A	855729	C3KKMP3	-

3.2 Cable(s) used [LAN I/F mode]

No.	Cable	Length[m]	Shield	Connector	From	To	Comment
a	LAN cable	5.0	Unshielded	Plastic	EUT	HUB	-
b	AC power cord for EUT	2.0	Unshielded	Plastic	EUT	AC outlet	-
c	DC cable for AC adapter	1.2	Unshielded	Plastic	HUB	AC adapter	-
d	LAN cable	1.0	Unshielded	Plastic	HUB	PC	-
e	RGB cable	1.5	Shielded	Metal	PC	Display	-
f	AC power cord for Display	1.5	Unshielded	Plastic	Display	AC outlet	-
g	Keyboard cable	1.9	Unshielded	Metal	PC	Keyboard	-
h	Mouse cable	1.9	Unshielded	Metal	PC	PS/2 Mouse	-
i	AC power cord for PC	2.9	Unshielded	Plastic	PC	AC outlet	-

3.3 System configuration [LAN I/F mode]



Note 1: 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".

Note 2: RGB cable (No.e) with two ferrite cores is accessory of Display (No.7).

4. Conducted emission at mains port test information

4.1 Measurement procedure

Test receiver setting

- Detector: Quasi-peak, Average
- Bandwidth: 9kHz

Frequency range: 0.15MHz to 30MHz

Vertical Metal Reference Plane: 2.4m(W) × 2.7m(H) in size was placed 0.4m away from EUT.

Line Impedance Stabilization Network

- LISN for EUT was placed 80cm away from EUT.

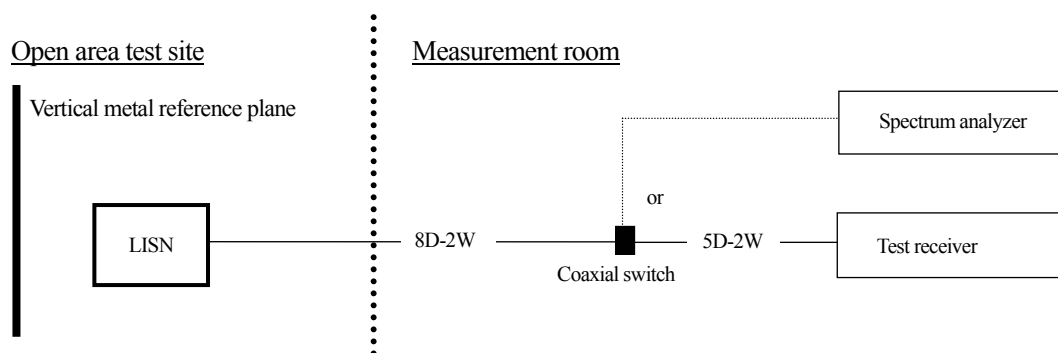
Reported emissions

- At least 6 points of maximum emission are reported.
- Maximum emission configuration was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation.

Others

- Table: Wooden table of 2.3m(W) × 1.0m(D) × 0.8m(H) in size
- Sufficient time for EUT, support equipment and test equipment were 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
Spectrum analyzer	Agilent Technologies	8568B 85662A	2634A03228 2648A14093	Oct. 2004
Test receiver	Kyoritsu Electrical Works, Ltd.	KNM-2402	4N-220-1	Feb. 2005
Line impedance stabilization Network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407	8-663-4	Mar. 2005
Coaxial cable	FUJIKURA	8D-2W/15m 5D-2W/1m	YTCRFC#3C	May. 2005
Coaxial switch	ANRITSU	MP59B	6100097270	May. 2005

*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

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)
0.5MHz to 5MHz	56	46	(Quasi peak) Reading = 51.2dBμV Cable loss + LISN factor = 0.3dB Total = 51.2 + 0.3 = 51.5dBμV Margin = 60.0 – 51.5 = 8.5dB
5MHz to 30MHz	60	50	(Average) Reading = 45.0dBμV Cable loss + LISN factor = 0.3dB Total = 45.0 + 0.3 = 45.3dBμV Margin = 50.0 – 45.3 = 4.7dB

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

4.4 Uncertainty

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

±3.0dB

··· For Conducted emission

4.5 Test data

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

Sheet number : 1

Standard : FCC Part 15 Subpart B

Class : B

Terminal : Mains

Date of test : 2004/8/3

Test site : 3

Temperature [°C] : 27.5

Humidity [%] : 42.5

Operator : T.Osato

Signature : *T. Osato*

Company name : FUJITSU ISOTEC LIMITED

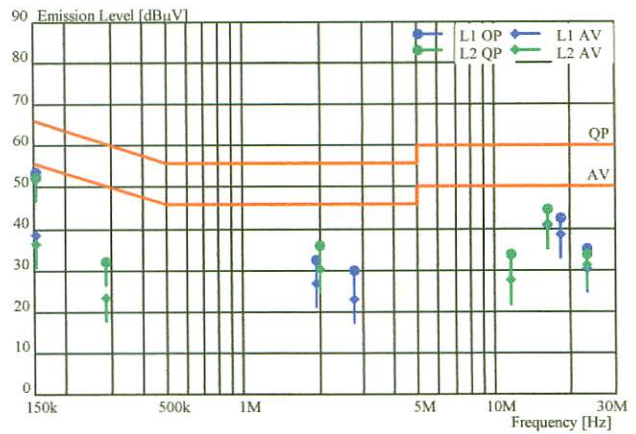
EUT : Dot Matrix Printer

Model number : M33332A

Serial number : N/A

Test mode : LAN I/F mode

Comment :



Phase	Frequency [MHz]	Reading		Factor [dB]	Emission level		Limit		Margin		Comment
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
L1	0.151	52.2	37.2	1.3	53.5	38.5	65.9	55.9	12.4	17.4	
L1	1.952	32.0	26.5	0.4	32.4	26.9	56.0	46.0	23.6	19.1	
L1	2.766	29.6	22.7	0.4	30.0	23.1	56.0	46.0	26.0	22.9	
L1	16.230	43.7	40	0.8	44.5	40.8	60.0	50.0	15.5	9.2	
L1	18.305	41.2	37.6	1.0	42.2	38.6	60.0	50.0	17.8	11.4	
L1	23.188	34.0	29.4	1.0	35.0	30.4	60.0	50.0	25.0	19.6	
L2	0.151	51.2	35.2	1.3	52.5	36.5	65.9	55.9	13.4	19.4	
L2	0.287	31.2	22.4	0.9	32.1	23.3	60.6	50.6	28.5	27.3	
L2	1.997	35.4	29.9	0.4	35.8	30.3	56.0	46.0	20.2	15.7	
L2	11.694	32.9	26.8	0.7	33.6	27.5	60.0	50.0	26.4	22.5	
L2	16.227	43.8	40.1	0.8	44.6	40.9	60.0	50.0	15.4	9.1	*
L2	23.193	32.7	30.3	1.0	33.7	31.3	60.0	50.0	26.3	18.7	

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

Ver.2.73 F3#010

5. Radiated emission test information

5.1 Measurement procedure

Test receiver setting

- Detector: Quasi-peak
- Band width: 120kHz

Frequency range: 30MHz to 1000MHz

Distance: 3 m

Turntable rotated: 0 to 360 degrees

Antenna position

- Height: 1m to 4m
- Polarity: Horizontal and Vertical

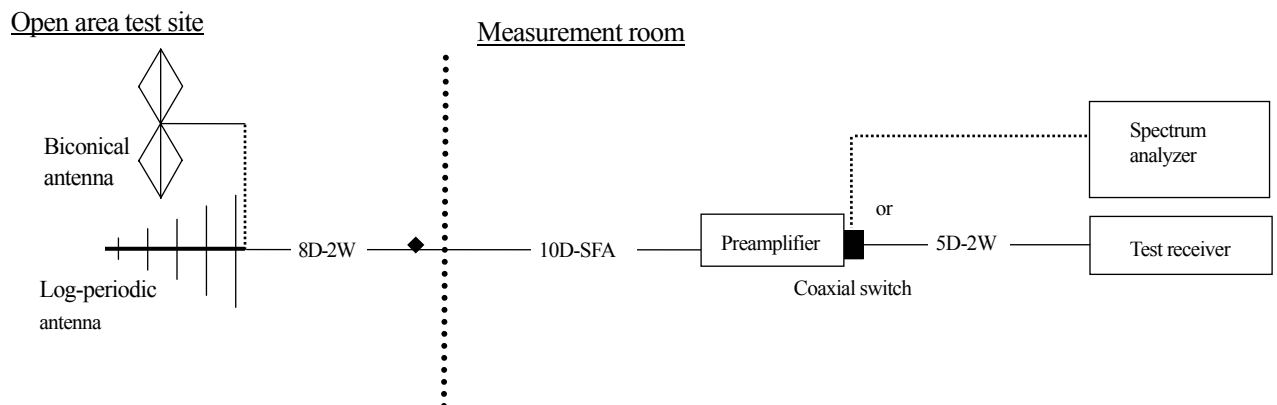
Reported emissions

- At least 6 points of maximum emission are reported.
- Maximum emission configuration was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation.

Others

- Table: Wooden table of 2.3m(W) × 1.0m(D) × 0.8m(H) in size
- Sufficient time for EUT, support equipment and test equipment were 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
Spectrum analyzer	Agilent Technologies	8568B 85662A	2634A03228 2648A14093	Oct. 2004
Preamplifier	Anritsu	MH648A	M96257	May. 2005
Test receiver	ROHDE&SCHWARZ	ESVS10	825475/0012	Jun. 2005
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	1100	Apr. 2005
Log Periodic antenna	Schwarzbeck	UHALP9108A	0398	Apr. 2005
Coaxial cable	FUJIKURA	8D-2W/8m 8D-SFA/30m 5D-2W/1m	YTCRFC#3R	May. 2005
Coaxial switch	ANRITSU	MP59B	6100097270	May. 2005
Site attenuation	ZACTA Technology Corp.	Site 3	N/A	Jul. 2005

*The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

5.3 Sample calculation

Radiated emission [Sample calculation]

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

5.4 Uncertainty

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

± 5.2dB

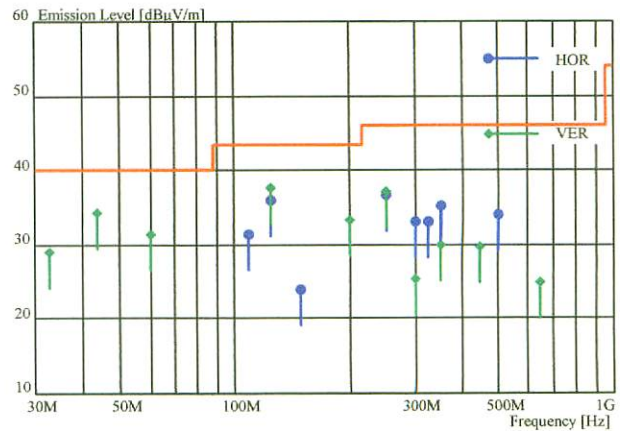
... For 3m Radiated emission

5.5 Test data

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

Sheet number : 1

Standard : FCC Part 15 Subpart B
Class : B
Distance [m] : 3
Date of test : 2004/8/9
Test site : 3
Temperature [°C] : 29.5
Humidity [%] : 49.2
Operator : T.Seino
Signature : *Tadahiro Seino*
Company name : FUJITSU ISOTEC LIMITED
EUT : Dot Matrix Printer
Model number : M33332A
Serial number : N/A
Test mode : LAN I/F mode
Comment :



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
HOR/VER									
VER	1.0	285	32.60	40.4	-11.3	29.1	40.0	10.9	
VER	1.0	230	43.75	48.8	-14.8	34.0	40.0	6.0	
VER	1.0	295	60.23	51.7	-20.3	31.4	40.0	8.6	
HOR	1.6	145	108.81	48.5	-17.2	31.3	43.5	12.2	
HOR	2.6	155	125.00	50.5	-14.5	36.0	43.5	7.5	
VER	1.0	35	125.01	52.2	-14.5	37.7	43.5	5.8	*
HOR	2.1	135	148.14	37.2	-13.3	23.9	43.5	19.6	
VER	1.0	315	200.00	44.0	-10.8	33.2	43.5	10.3	
HOR	1.3	80	250.00	46.2	-9.4	36.8	46.0	9.2	
VER	1.0	0	250.00	46.6	-9.4	37.2	46.0	8.8	
HOR	1.0	155	300.00	46.0	-13.0	33.0	46.0	13.0	
VER	1.9	320	300.00	38.3	-13.0	25.3	46.0	20.7	
HOR	1.0	85	325.01	45.9	-12.9	33.0	46.0	13.0	
HOR	1.0	65	350.00	47.5	-12.2	35.3	46.0	10.7	
VER	2.2	320	350.01	42.2	-12.2	30.0	46.0	16.0	
VER	2.3	70	450.00	39.1	-9.5	29.6	46.0	16.4	
HOR	1.0	340	500.00	42.5	-8.4	34.1	46.0	11.9	
VER	1.3	80	650.00	30.7	-5.7	25.0	46.0	21.0	

* : The worst emission.

Factor : Antenna Factor + Cable Loss - Amp Gain

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6. 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 type:

Site name: Site 1, Site 2 and Site 3 - Total 3 sites.

Site type : Whether protected site

*3m/10m Radiated emission & Conducted emission testing can be performed on each site

3m anechoic chamber

Shielded room

3. Facility filing information:

1) FCC site filing: Pursuant to CFR47 § 2.948

Site name	Filing date (Terms of validity: 3 years)
Site 1, Site 2 and Site 3	December 17, 2002

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

Site name	Sites on file: Oats 3m/10m	Filing date (Terms of validity: 3 years)
Site 1	4224-1	January 31, 2002
Site 2	4224-2	January 31, 2002
Site 3	4224-3	January 31, 2002

3) VCCI site filing: Pursuant to V-5/2003.04 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	September 30, 2006
Site 2	R-137	C-133	September 30, 2006
Site 3	R-138	C-134	September 30, 2006

4) NVLAP accreditation:

NVLAP Lab. code: 200306-0

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.

5) ETL SEMKO authorization:

Authorized as an EMC test laboratory.

6) TUV Rheinland authorization:

Authorized as an EMC test laboratory.