

EMISSION -- TEST REPORT

TEST REPORT No. : **TR1-05121F** Date of Issue: March 2, 2005

KIND OF EQUIPMENT : Card Printer

MODEL : CX-120* (DCP360*)
* is an optional suffix up to 7 letters and/or numbers

APPLICANT : Victor Company of Japan Ltd

FCC ID : ASIK2T001

IC : 5702A-001

TEST STANDARD(S) : FCC Part 15 Subpart C, Section 15.225

TEST RESULT : Complied

This test report with appendix consists of 22 pages. The test result only responds to the tested sample. It is not allowed to copy this report even partly without the written allowance of the test laboratory. The engineers of EMC Kashima Corporation were not involved in modification for the tested sample.

TEST DATE(S) : February 7-9, 2005

TEST ENGINEER(S) : 
Kazuhiro Ando
Manager

APPROVED BY : 
Ken'ichi Suda
Director

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GENERAL INFORMATION

APPLICANT : Victor Company of Japan Ltd

ADDRESS : 3-12, Moriya-cho, Kanagawa-ku, Yokohama 221-0022, Japan

MANUFACTURER : Victor Data Systems Co., Ltd.

KIND OF EQUIPMENT : Card Printer

MODEL : CX-120* (DCP360*)
* is an optional suffix up to 7 letters and/or numbers

POWER RATING : AC100-120V 50/60Hz, 1.6A

PROTECTION CLASS : Class I

TESTING VOLTAGE : AC120V 60Hz

CONDITION OF EUT : Pre-Production

OPETATING FREQUENCY : 13.56MHz

TYPE OF MODURATION : ASK

OPETATING TEMPERATUR : 15 °C to 30 °C

TEST STANDARD(S) : FCC Part 15 Subpart C, Section 15.225

TEST METHOD(S) : ANSI C63.4: 2003

TEST DATE(S) : February 7-9, 2005

REMARK(S) : Although CX-120* and DCP360* are different in the model names,
those specifications are entirely same.

SUMMARY OF TEST RESULT

FCC Part 15 Section	RSS-210 Section	Test Item	Worst margin	Condition	Result
15.203	5.5	Antenna requirement	-	-	Pass ^{Note1}
15.207	6.6	Conducted emissions 9kHz - 30MHz	17.7dB at 13.56MHz	-	Pass
15.225(a)(b)(c)	6.2.2 (e)	Radiated emissions 9kHz - 30MHz	87.8dB at 13.56MHz	Radiated	Pass
15.225(d)	6.2.2 (e)	Radiated emissions 9kHz - 30MHz	46.8dB at 20.00MHz	Radiated	Pass
15.225(d) 15.209	6.2.2 (e)	Radiated emissions 30MHz - 1GHz	14.3dB at 933.13MHz	Radiated	Pass
15.225(e)	6.2.2 (e)	Frequency stability	0.008260%	Radiated	Pass
15.215(c)	5.9.1	20dB Bandwidth	3.86kHz	Radiated	Pass

Note 1: This device has a permanently attached antenna.

Note 2: "Pass" is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.

- The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
- Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

EQUIPMENT UNDER TEST

Description of The EUT:

Product features

This card printer allows printing of high-quality full color images equivalent to photographic quality onto standard size (ISO7810 compliance) plastic cards using sublimation type transfer printing.

Able to print both side of a card.

Print Speed: Max 180 pcs. of cards per hour. (Standard mode single side printing.)

Lamination is possible by using optional laminator.

Purpose of using the radio device

In this printer a special ink ribbon for sublimation type printing used. The ink ribbon bobbin has a RF-ID tag built inside. The radio communication between the printer and the ink ribbon bobbin give the following functions, of which no user is informed.

1. Discerning the type of ink ribbon

This printer can automatically discern what type of ink ribbon is installed out of the various options, for example, both sides full color, one side full color rear side monochrome, and so on.

2. Managing the number of used picture frames in a ink ribbon. The information on the number of used/remained picture frames can be got by writing the number of used picture frame into the RFID tag, even when ink ribbons are exchanged.

Operation - mode of The EUT:

The equipment under test was operated during the measurement under following conditions:

- Transmit mode

TEST CONFIGURATION

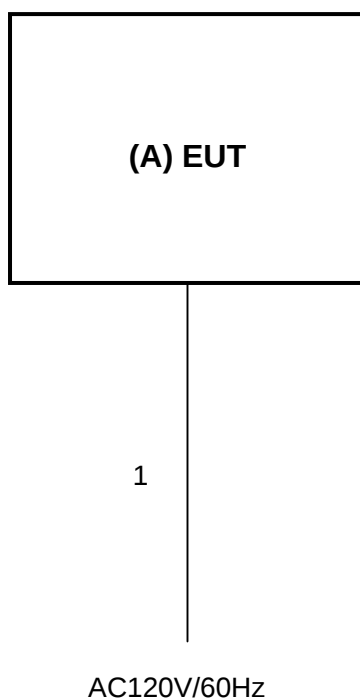
EUT(s) and Peripheral(s):

Equipment Name	Model	Serial	Company
(A) Card Printer (EUT)	CX-120	57050010	Victor Data Systems

Cable(s) Used:

Cable Name	Length	Shielded	Model	Remarks (company, etc.)
(1) AC Power	2.5 m	no	KDH 40058	HIRAKAWA

TEST CONFIGURATION



TEST FACILITIES

All measurement facilities in EMC Kashima Corporation are located in 1614, Mushihata, Omigawa-machi, Katori-gun, Chiba-ken, 289-0341 Japan.

Accredited by American Association for Laboratory Accreditation (A2LA) for the emission and immunity tests stated in the scope of the certificate under Certificate Number 1266-01.

Authorized by NEMKO for the emission and immunity tests stated in the scope of the authorization under Authorization Number ELA172.

Recognized by TUV Product Service for the emission and immunity tests stated in the scope of the certificate under Certificate No. JPN9803C.

Registered by Federal Communications Commission (FCC). Each registered facility number is as follows;

Test site No. 1 90558 / Test site No. 2 510504 / Test site No. 4 90557
Test site No. 5 99356 / Test site No. 6 372431

Registered by Industry Canada (IC). Each registered facility number is as follows;

Test site No. 1 IC 4659-1 / Test site No. 2 IC 4659-2 / Test site No. 5 IC 4659-5
Test site No. 6 IC 4659-6

Approved by Saudi Arabian Standards Organization (SASO).

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI).

Each registered facility number is as follows;

Test site No. 1 R-188, C-785 (Open site) / C-187 (Shielded room)
Test site No. 2 R-189 (Open site) / C-188 (Shielded room)
Test site No. 4 R-656 (Open site) / C-613 (Shielded room)
Test site No. 5 R-1227, C-1290 (Open site) / C-1291 (Shielded room)
Test site No. 6 R-1895, C-2042 (Anechoic chamber)

MEASUREMENT UNCERTAINTY

The treatment of uncertainty is based on the general matters on the definition of uncertainty in "Guide to the expression of uncertainty in measurement (GUM)" published by ISO. The Lab's uncertainty is determined by referring UKAS Publication LAB34:2002 "The Expression of Uncertainty in EMC Testing" and CISPR16-4-2:2003 "Uncertainty in EMC Measurements".

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission test : ± 2.41 dB
Radiated emission test (9kHz - 30MHz) : ± 3.25 dB
Radiated emission test (30MHz - 1000MHz) : ± 4.34 dB

TEST CONDITIONS

Section 15.207 Conducted Emissions

Test Location:

Test site No. 1 (Shielded room)

Used Test Instruments:

Model	Name	Manufacturer	Code No.	Last Cal.	Remarks
ESCS30	Test Receiver	Rohde & Schwarz	RCV05	2004.05	
ESH3-Z5	AMN	Rohde & Schwarz	LSN02	2005.01	
8567A	Spectrum Analyzer	Hewlett Packard	SPR12	2004.05	
5D-2W	Coaxial cable	FUJIKURA	1CSR	2004.07	

All used test instruments are calibrated at least once a year.

Test Procedure:

The test setup and measurements were implemented according to the test method of ANSI C63.4: 2003 7. AC power line conducted emission measurements.

Final measurements were made on the conditions described on this page, and photographs shown in Appendix indicate the final conducted emissions.

Limit:

Frequency (MHz)	Quasi-peak (dBuV)	Average (dBuV)
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

TEST CONDITIONS

Section 15.225(a)(b)(c)(d) Radiated Emissions (9kHz - 30MHz)

Test Location:

Test site No. 1 (Open site) 3 meters distance

Used Test Instruments:

Model	Name	Manufacturer	Code No.	Last Cal.	Remarks
ESH2	Test Receiver	Rohde & Schwarz	RCH01	2005.01	
HFH2-Z2	Loop Antenna	Rohde & Schwarz	LPA01	2004.03	
5D-2W	Coaxial cable	FUJIKURA	MG5m	2004.10	

All used test instruments are calibrated at least once a year.

Test Procedure:

The test setup and measurements were implemented according to the test method of ANSI C63.4: 2003 8. Radiated emission measurements.

The test was performed at 3 meter distance and its result was converted into the one at specified 30 meter distance according to 15.31(f). The turntable was rotated and the center point of the loop antenna was fixed at 1 meter above ground level to investigate the maximum radiated emission, positioning the loop antenna in vertical and horizontal. Final measurements were made on the conditions described on this page, and photographs shown in Appendix indicate the final radiated emissions.

Limit:

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
Below 13.110	30	29.5	69.5
13.110 - 13.410	106	40.5	80.5
13.410 - 13.553	334	50.5	90.5
13.553 - 13.567	15,848	84	124
13.567 - 13.710	334	50.5	90.5
13.710 - 14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

dBuV/m = 20 x log (uV/m)

Distance factor = 40dB / decade (15.31(f))

TEST CONDITIONS

Section 15.225(d) Radiated Emissions (30MHz - 1000MHz)

Test Location:

Test site No. 1 (Open site) 3 meters distance

Used Test Instruments:

Model	Name	Manufacturer	Code No.	Last Cal.	Remarks
ESCS30	Test Receiver	Rohde & Schwarz	RCV05	2004.05	
VULB 9168	Logbicon Antenna	Schwarzbeck	LGBC01	2004.07	
8567A	Spectrum Analyzer	Hewlett Packard	SPR12	2004.05	
8447D	Pre-Amplifier	Hewlett Packard	PRA03	2004.12	
12DSFA/5D-2W	Coaxial cable	FUJIKURA	1R10m	2004.12	

All used test instruments are calibrated at least once a year.

Test Procedure:

The test setup and measurements were implemented according to the test method of ANSI C63.4: 2003 8. Radiated emission measurements.

They were performed at the measurement distance that specified for compliance to determine the frequency producing the maximum emissions. The turntable was rotated and the antenna height was varied 1 to 4 meters to investigate the maximum radiated emission for the horizontal and vertical polarization. Final measurements were made on the conditions described on this page, and photographs shown in Appendix indicate the final radiated emissions.

Limit:

Frequency (MHz)	Field strength @3m (uV/m)	Field strength @3m (dBuV/m)
30 - 88	100	40
88 - 216	150	43.5
216 -960	200	46
Above 960	500	54

 $\text{dBuV/m} = 20 \times \log (\text{uV/m})$

TEST CONDITIONS

Section 15.225(e) Frequency Stability

Test Location:

Test site No. 6

Used Test Instruments:

Model	Name	Manufacturer	Code No.	Last Cal.	Remarks
R3162	Spectrum Analyzer	ADVANTEST	SPTG02	2004.12	
PR-4KPH	Temperature Chamber	ESPEC	TMPC02	2004.02	
3631	Humidity Logger	HIOKI	TMHUST	2004.03	
9631-01	Sensor	HIOKI	TMS01	2004.03	
LP01	Loop Antenna	EMC Kashima	LPA02	2004.03	

All used test instruments are calibrated at least once a year.

Test Procedure:

The test setup and measurements were implemented according to the test method of ANSI C63.4: 2003 Annex H5.

The EUT was measured with the condition that the measuring instrument was connected to the antenna through the coaxial cable, whose antenna was placed near the EUT. The measurement started with the Temperature chamber sufficiently stabilized.

Limit:

Item	Variation	Limit (%)
Temperature variation	-20°C - +50°C	+/- 0.01
Voltage variation	85% - 115%	+/- 0.01

TEST CONDITIONS

Section 15.215(c) 20dB Bandwidth

Test Location:

Test site No. 6

Used Test Instruments:

Model	Name	Manufacturer	Code No.	Last Cal.	Remarks
R3162	Spectrum Analyzer	ADVANTEST	SPTG02	2004.12	
LP01	Loop Antenna	EMC Kashima	LPA02	2004.03	
5D-2W	Coaxial cable	FUJIKURA	MG5m	2004.10	

All used test instruments are calibrated at least once a year.

Test Procedure:

The test setup and measurements were implemented according to the test method of ANSI C63.4: 2003 Annex H6.

The spectrum analyzer RBW and VBW were set as follows. The marker-to-peak function of the spectrum analyzer was used to measure to peak level and the marker-delta function was used to measure the emission 20dB below the peak. It has been plotted.

Spectrum Analyzer Setup

RBW	VBW	Detector
1kHz	3kHz	Peak

TEST DATA

Section 15.207 Conducted Emissions

Company	: Victor Company of Japan, Limited	Tested Date	: February 8, 2005
Equipment	: Card Printer	Temperature	: 22 °C
Model	: CX-120	Humidity	: 35 %
Power	: AC120V 60Hz	Atmos. Press	: 1025 hPa
Test Mode	: Transmit	Engineer	: Kazuhiro Ando

Freq. (MHz)	Phase	Reading (dBuV)		Corr. Factor (dB)	Result (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV		QP	AV	QP	AV	QP	AV
0.1500	N	34.5	-	0.5	35.0	-	66.0	56.0	31.0	
0.1655	N	39.7	-	0.5	40.2	-	65.2	55.2	25.0	-
0.2475	N	34.0	-	0.5	34.5	-	61.8	51.8	27.3	-
0.3310	N	39.7	-	0.5	40.2	-	59.4	49.4	19.2	-
0.4136	N	33.3	-	0.5	33.8	-	57.6	47.6	23.8	-
13.5600	N	40.7	-	1.6	42.3	-	60.0	50.0	17.7	-
0.1500	L	34.7	-	0.5	35.2	-	66.0	56.0	30.8	-
0.1655	L	40.7	-	0.5	41.2	-	65.2	55.2	24.0	-
0.2475	L	34.3	-	0.5	34.8	-	61.8	51.8	27.0	-
0.3310	L	39.7	-	0.5	40.2	-	59.4	49.4	19.2	-
0.4136	L	33.3	-	0.5	33.8	-	57.6	47.6	23.8	-
13.5600	L	40.7	-	1.6	42.3	-	60.0	50.0	17.7	-

Correction Factor(dB) = AMN Factor(dB) + Cable Loss(dB)
Result(dBuV) = Reading (dBuV) + Correction Factor(dB)

TEST DATA**Section 15.225(a)(b)(c) Radiated Emissions (9kHz - 30MHz)**

Company : Victor Company of Japan, Limited
Equipment : Card Printer
Model : CX-120
Power : AC120V 60Hz
Test Mode : Transmit
Test Distance : 3m
Tested Date : February 7, 2005
Temperature : 22 °C
Humidity : 42 %
Atmos. Press : 1026 hPa
Engineer : Kazuhiro Ando

Freq. (MHz)	Reading @3m (dBuV)	Detector (QP/Pk)	Corr. Factor (dB)	Result (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
13.5600	36.0	QP	0.2	36.2	124.0	87.8

Correction Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB)
Result(dBuV/m) = Reading(dBuV) + Correction Factor(dB)

TEST DATA**Section 15.225(d) Radiated Emissions (9kHz - 30MHz)**

Company : Victor Company of Japan, Limited
Equipment : Card Printer
Model : CX-120
Power : AC120V 60Hz
Test Mode : Transmit
Test Distance : 3m
Tested Date : February 7, 2005
Temperature : 22 °C
Humidity : 42 %
Atmos. Press : 1026 hPa
Engineer : Kazuhiro Ando

Freq. (MHz)	Reading @3m (dBuV)	Detector (QP/Pk)	Corr. Factor (dB)	Result (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
20.0000	22.5	QP	0.2	22.7	69.5	46.8
27.1200	19.5	QP	0.2	19.7	69.5	49.8

Correction Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB)
Result(dBuV/m) = Reading(dBuV) + Correction Factor(dB)

TEST DATA**Section 15.225(d) Radiated Emissions (30MHz - 1000MHz)**

Company : Victor Company of Japan, Limited
Equipment : Card Printer
Model : CX-120
Power : AC120V 60Hz
Test Mode : Transmit
Test Distance : 3m

Tested Date : February 7, 2005
Temperature : 22 °C
Humidity : 42 %
Atmos. Press : 1026 hPa

Engineer : Kazuhiro Ando

Freq. (MHz)	Pol. (H/V)	Reading (dBuV)	Detector (QP/Pk)	Corr. Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
57.28	V	37.0	QP	-12.4	24.6	40.0	15.4
114.65	H	36.5	QP	-14.0	22.5	43.5	21.0
143.31	H	31.7	QP	-11.2	20.5	43.5	23.0
143.31	V	32.3	QP	-11.2	21.1	43.5	22.4
240.00	V	35.0	QP	-10.3	24.7	46.0	21.3
599.89	V	29.5	QP	-1.4	28.1	46.0	17.9
799.84	H	28.5	QP	1.7	30.2	46.0	15.8
933.13	H	26.5	QP	5.2	31.7	46.0	14.3
933.13	V	23.7	QP	5.2	28.9	46.0	17.1

Correction Factor(dB) = Antenna Factor(dB/m) + Cable Loss(dB) – Preamplifier Gain(dB)
Result(dBuV/m) = Reading(dBuV) + Correction Factor(dB)

TEST DATA**Section 15.225(e) Frequency Stability**

Company : Victor Company of Japan, Limited
Equipment : Card Printer
Model : CX-120
Power : AC120V 60Hz
Test Mode : Transmit

Tested Date : February 9, 2005
Temperature : 21 °C
Humidity : 43 %
Atmos. Press : 1022 hPa

Engineer : Kazuhiro Ando

Temperature Variations

Temp. (°C)	Voltage (V)	Measured Frequency (MHz)				Worst Deviation (%)	Limit (%)
		Start-up	2 min.	5 min.	10 min.		
50	120	13.56111	13.56112	13.56112	13.56112	0.008260	+/- 0.01
40	120	13.56108	13.56108	13.56111	13.56112	0.008260	+/- 0.01
30	120	13.56108	13.56108	13.56108	13.56108	0.007965	+/- 0.01
20	120	13.56108	13.56108	13.56108	13.56108	0.007965	+/- 0.01
10	120	13.56108	13.56109	13.56108	13.56109	0.008038	+/- 0.01
0	120	13.56106	13.56107	13.56107	13.56108	0.007965	+/- 0.01
-10	120	13.56103	13.56105	13.56106	13.56106	0.007817	+/- 0.01
-20	120	13.56097	13.56100	13.56101	13.56102	0.007522	+/- 0.01

Voltage Variations

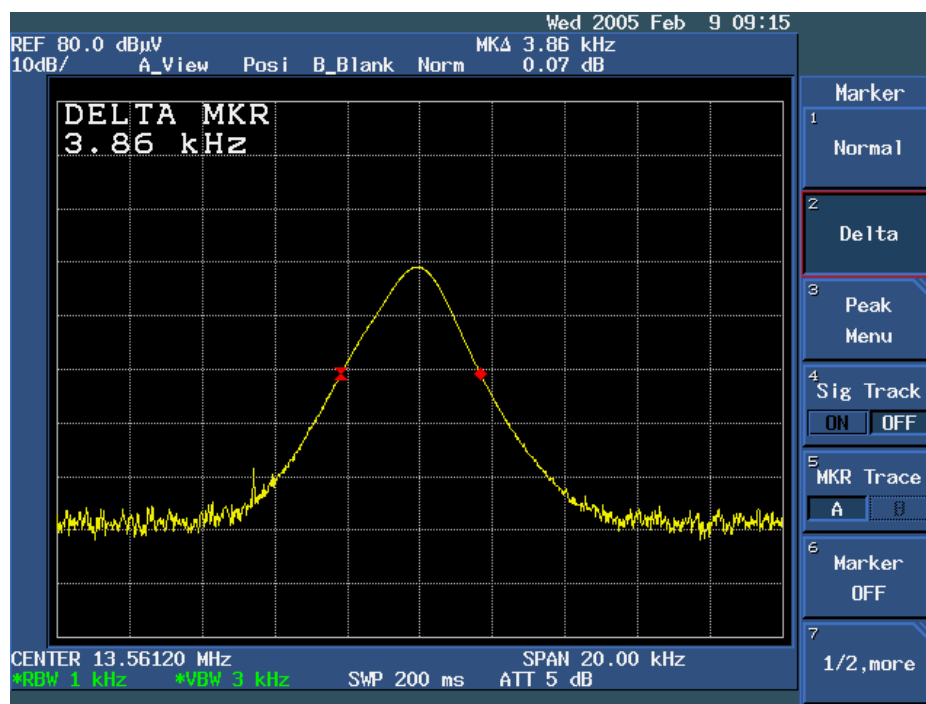
Temp. (°C)	Voltage (V)	Measured Frequency (MHz)				Worst Deviation (%)	Limit (%)
		Start-up	2 min.	5 min.	10 min.		
20	102	13.56108	13.56108	13.56108	13.56109	0.008038	+/- 0.01
20	120	13.56108	13.56108	13.56108	13.56108	0.007965	+/- 0.01
20	138	13.56109	13.56108	13.56108	13.56108	0.008038	+/- 0.01

TEST DATA

Section 15.215(c) 20dB Bandwidth

Company	: Victor Company of Japan, Limited	Tested Date	: February 9, 2005
Equipment	: Card Printer	Temperature	: 21 °C
Model	: CX-120	Humidity	: 43 %
Power	: AC120V 60Hz	Atmos. Press	: 1022 hPa
Test Mode	: Transmit	Engineer	: Kazuhiro Ando

Freq. (MHz)	20dB Bandwidth (kHz)
13.56	3.86



THE PHOTOS OF TEST-SETUP



Conducted Emission 150 kHz - 30 MHz (Mains ports)

THE PHOTOS OF TEST-SETUP



Radiated Emission 9 kHz - 1000 MHz

THE PHOTOS OF TEST-SETUP



Frequency Stability