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Test Report

Test Report Number	TUVOTEL032
Applied Standard(s)	FCC Part15 Subpart C / IC RSS-210
Date of Issue	19th September, 2013
Testing Laboratory Address	TÜV SÜD Ohtama, Ltd., Tokyo Laboratory 2-8-20 Kuriki, Asao-ku Kawasaki-shi, Kanagawa, Japan
Test Date(s)	22th 23th 26th 27th 28th August, 2013
Product Name	Card Printer
Model Number	Avansia
Serial Number	-
Applicant (Client) Address	Nisca Corporation 430-1 Kobayashi, Fujikawa-cho, Minamikoma-gun, Yamanashi 400-0593, Japan
Manufacturer Address	Canon Finetech Nisca (Shenzhen) Inc. Building A, KeFa Industrial Park, Xintian Community, Guanlan Street, Baoan District,Shenzhen, Guangdong Province, P.R.China.

Test Result

The test result for the electromagnetic compatibility tests
as described in the section 1 to 2 and in this page was:

Pass

Tested by: Katsutoshi Hatanaka
Katsutoshi Hatanaka
Test Enginner

Approved by:
Koji Imai
Testing Group Leader

Checked box (☒) indicates that the listed condition, standard or equipment is applicable for this Report.
Blank box (☐) indicates that the listed condition, standard or equipment is not applicable for this Report.

Test results of this report refer only to the EUT tested here.

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1. Summary

1.1 Terms and definitions

AV
Average

DoC
Declaration of Conformity

EUT
Equipment Under Test

QP
Quasi-peak

1.2 Standard(s) and Result

Applied Standard(s)	Normative Reference(s)	Test Limit	FCC Part and RSS Section(s)	Result	Reference Clause No.
FCC Part15 Subpart C IC	20dB Bandwidth 99% Bandwidth	within 13.110 - 14.010MHz	15.215(c) N/A	Pass	3.2
	Frequency Stability Tolerance	±0.01% of Operating Frequency	15.225(e) RSS-210 A2.6	Pass	3.3
	In-Band Emissions	15.843μV/m @30m 13.553 - 13.567 MHz 334μV/m @30m 13.410 - 13.553 MHz 13.567 - 13.710 MHz 106μV/m @30m 13.110 - 13.410 MHz 13.710 – 14.010 MHz	15.225 (a)(b)(c) RSS-210 A2.6	Pass	3.4
	Out-of-Band Emissions	Emissions outside of the specified band (13.110 - 14.010 MHz) must meet the radiated limits detailed in 15.209	15.225(d), 15.209 RSS-210 A2.6	Pass	3.5
	AC Conducted Emission 150 kHz - 30 MHz	< FCC 15.207 limits or RSS-Gen table 2 limits>	15.207 RSS-Gen 7.2.2	Pass	3.6

Table1 Standard and result

1.3 Deviations from Standard(s)

There was no deviation from the standard.

1.4 Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

The antennas of the Nisca Corporation's Card Printer are permanently attached.
There are no provisions for connection to an external antenna

Conclusion:
The Nisca Card Printer FCC ID: ISX-0020 equipment complies with the requirement of §15.203.

2. Equipment Under Test (EUT)

2.1 General Descriptions

The Avensia printers print on CR80 plastic cards. The printing could be color or monochrome depending of ribbon inserted in printer and printing options.
Anxious to make these printers easier to use, we decide to use RFID tag in there consumables. This RFID tag is used by the printer to identify the ribbon and to set automatically the parameters.
The link between the RFID tag and the printer motherboard is provided by the RFID module CP010901.
The communication with RFID tag is provided by the Atmel reader AT88RF1354.
The AT88RF1354 is a smart, high performance ISO/IEC 14443 Type B RF Reader IC.

2.2 Detailed Descriptions

Product Name	Card Printer
Model Number	Avansia
Serial Number	—
Power Supply	120 V AC 60Hz
Dimension	340mm(W) × 436mm(H) × 297mm(D)
Operating Frequency	13.56MHz
Equipment Category	Indoor equipment
Normal Placement	Office-use
Condition of the EUT	Trial product on production line
FCC ID	ISX-0020
Industry Canada Company Number and UPN Number	11341A-0020

Table2 Dateiled Description

2.3 Operation Mode(s) of the EUT for EMC the Test(s)

EUT transmits constantly when powered.

Operation Mode Name	Description
normal operation send mode	modulated carrier

Table3 Operation Mode(s) of the EUT for EMC the Test(s)

2.4 Labeling Requirements

Per 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).
Please see attachment for FCC ID label and label location.

2.5 Measurement Condition

2.5.1 EUT Operation

The EUT was measured by transmitter mode continuously.

2.5.2 Configuration and Peripherals

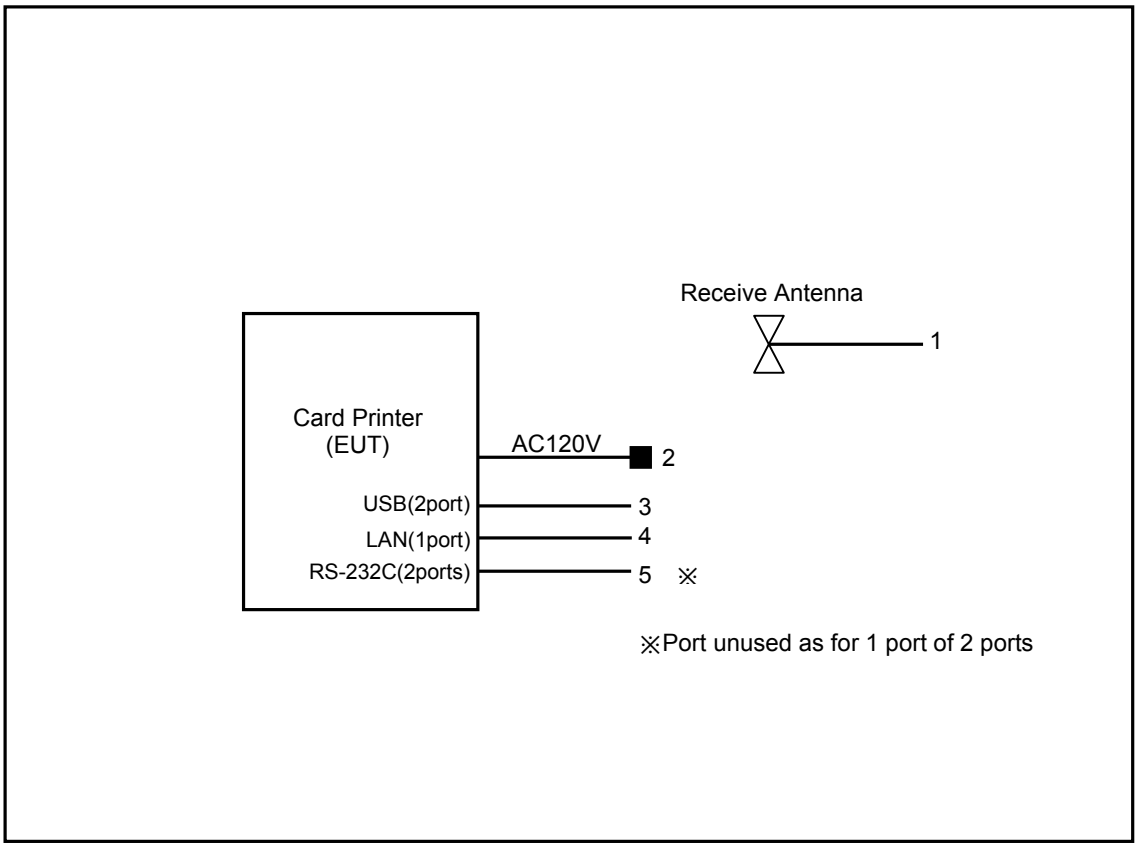

Figure 1 configuration and Peripherals

2.5.3 EUT

Mark	Description	Model number	Serial Number	FCC ID Code or DoC status	Manufacturer
1	Card Printer	Avansia	-	ISX0020	Nisca Corporetion

Table4 EUT

2.5.4 Peripheral Devices

Mark	Description	Model number	Serial Number	FCC ID Code or DoC status	Manufacturer
1	Personal computer	dx7300	JPA7040917	DoC	HP Compaq
2	Personal computer	Vostro3360	32777795521	DoC	Dell

Table5 Peripheral Devices

2.5.5 Interconnecting Cables

Mark	Description	Length (m)	Shielded		Tested Port(s) (Note:1)	
			Cable	Connector	Applicable	Interface
1	Antenna cable	12.0	Shielded	Shielded	No	RF Signal
2	Power cable	1.5	None	None	No	AC Power
3	USB cable	2.0	None	None	No	I/O Signal
4	Lan cable	3.0	None	None	No	I/O Signal
5	RS-232C cable	3.0	None	None	No	I/O Signal

Note1: Tested port(s) required for applicable standard(s).
Remarks: The length described here is the length of the cable typically used in the tests, but different length of the cable may be used in some tests to satisfy the requirements for the test.

Table6 Interconnecting Cables

3.Test Data

3.1 Test specification

Standard	FCC Part15 Subpart C / IC RSS-210
Tested Frequency	13.56 MHz
Test Date	22th August 2013 – 27th August 2013
Test Location	TÜV SÜD Ohtama, Ltd. Tokyo Laboratory Thermostatic chamber
Test Engineer	Koji Imai, Hatanaka Katsutoshi, Akihide Nano
Temperature	21.2 °C – 22.1°C
Humidity	59.4 % RH – 63.8% RH
Power Supply	
Normal	AC120.0V 60Hz
High	AC132.0V 60Hz *1
Low	AC108.0V 60Hz *1
Tested Temperature	
Normal	+20 ℃
High	+30 ℃ *1
Low	+10 ℃ *1

Remark: *1 : Frequency Stability only.

Table7 Test specification

3.2 20dB Bandwidth / 99% Bandwidth

3.2.1 Test Result

Pass

3.2.2 Test Detail

The measurement was performed in the antenna height to gain the maximum of Electric field strength

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3.2.3 Test data

Item	Limit	Result		UNIT
		20dB	99%	
Lower	13.110	13.420	13.450	MHz
Upper	14.010	13.700	13.668	
Total	0.900	0.280	0.218	

Table8 20dB Bandwidth / 99% Bandwidth

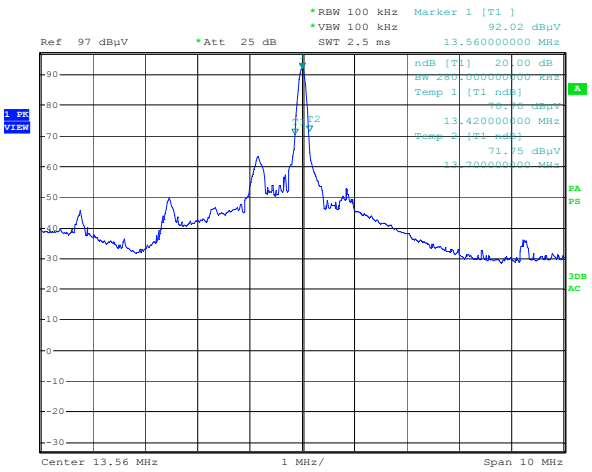

Figure 2 20dB Bandwidth Plot

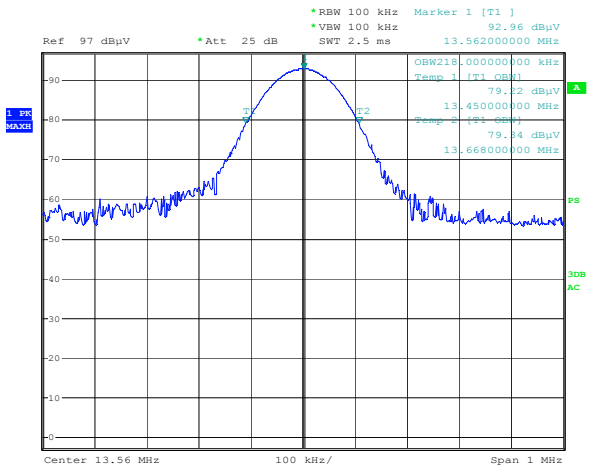

Figure 3 99% Bandwidth Plot

3.3 Frequency Stability Tolerance

3.3.1 Test Result

Pass

3.3.2 Test Detail

The frequency stability of the transmitter is measured by:

1. Temperature: The temperature is varied from +10℃ to +30℃ using an environmental chamber.
2. Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within ±0.01% of the operating Frequency

3.3.3 Test data

Operating Frequency: 13,560,000 Hz

Reference Voltage: AC120V 60Hz

Deviation Limit: ± 0.01 % = 1356Hz

Voltage (%)	Power Supply (V_AC)	Temp (°C)	Frequency (MHz)	Freq. Dev. (Hz)	Deviation (%)
100	120	+20 (Ref)	13.5597321	-267.9	-0.00198
		+10	13.5597289	-271.1	-0.00200
		+15	13.5597286	-271.4	-0.00200
		+25	13.5597320	-268.0	-0.00198
		+30	13.5597322	-267.8	-0.00197
85	108	+20	13.5597322	-267.8	-0.00197
115	132	+20	13.5597323	-267.7	-0.00197

Table 9 Frequency Stability Tolerance

3.4 In-Band Radiated Spurious Emission

3.4.1 Test Result

Pass

3.4.2 Test Detail

Radiated emission testing was performed in the band 13.110 - 14.010 MHz.

3.4.3 Test data

Frequency (MHz)	Level (dBμV)	Factor (dB)	Antenna Position (m)	EUT Pol. (H/2H/V)	3m Field Strength (dBμV/m)	30m Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
13.560	40.2	16.3	1.00	H	56.5	36.5	84.0	47.5
13.562	42.8	16.3	1.12	V	59.1	39.1	84.0	44.9
13.529	9.0	16.3	1.10	H	25.3	5.3	50.5	45.2
13.592	8.5	16.3	1.88	H	24.8	4.8	50.5	45.7

Table 10 In-Band Radiated Spurious Emission

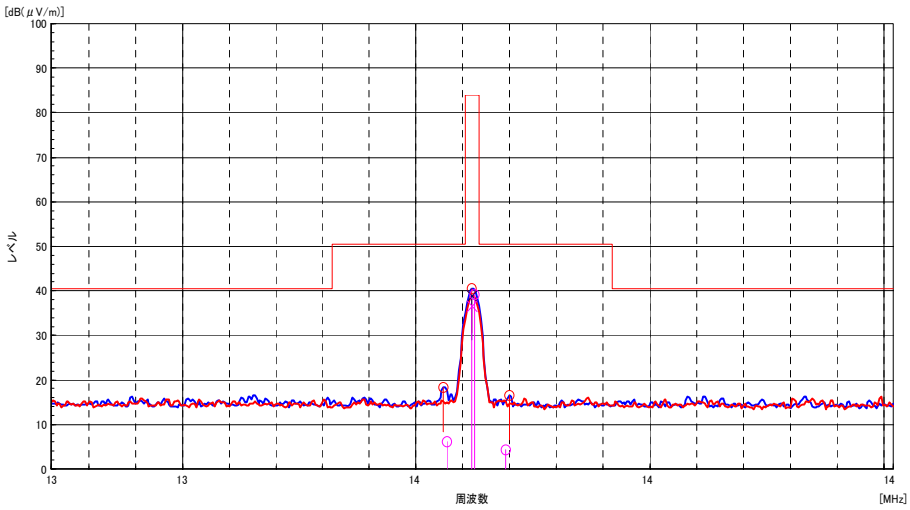

Figure 4 In-Band Radiated Spurious Emission Plot

Notes:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
   The EUT was positioned in three orthogonal planes to determine the orientation resulting in the worst case emissions.
2. The EUT is supplied with nominal AC voltage.
   Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in
   §15.31(f)(2). Extrapolation Factor = 20 $\log_{10}(30/3)^2$ = 40 [dB]
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
   Field Strength Level [dBμV/m]= Analyzer Level [dBμV] + Factor [dB/m].
   Factor [dB/m] = Antenna Factor [dBm] + Cable Loss [dB] - Extrapolation Factor [dB]
   Margin [dB]= Field Strength Level [dBμV/m] - Limit [dBμV/m]

3.5 Out-of-Band Radiated Spurious Emission

3.5.1 Test Result

Pass

3.5.2 Test Detail

The EUT was tested from 9 kHz up to the 140MHz excluding the band 13.110 - 14.010 MHz. All measurements up to 140 MHz were recorded with a spectrum analyzer employing a quasi-peak detector. All out-of-band emissions must not exceed the limits shown in the following table. A loop antenna was used to investigate emissions below 30 MHz.

Frequency (MHz)	Field Strength (μV/m)	Measured Distance (Meters)
0.009 - 0.490	2400/F (kHz)	300 *1
0.490 - 1.705	24000/F (kHz)	30 *2
1.705 - 30.00	30	30 *2
30.00 - 88.00	100	3
88.00 – 140.0	150	3

Table 11 Radiated Limits, Out-of-Band

3.5.3 Test data

Frequency (MHz)	Level (dBμV)	Factor (dB/m)	Antenna Position (m)	EUT Pol. (H/2H/V)	3m Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.608	34.9	-4.2	2.10	H	30.7	31.6	0.9
14.880	7.8	-3.2	2.25	V	4.6	29.5	24.9
32.368	30.6	-9.4	1.50	V	21.2	40.0	18.8
58.097	42.8	-17.0	1.15	V	25.8	40.0	14.2
101.550	39.8	-14.8	1.57	H	25.0	43.5	18.5
130.967	37.0	-10.6	1.55	V	26.4	43.5	17.1

Table 11 Radiated Spurious Emission measurements, Out-of-Band

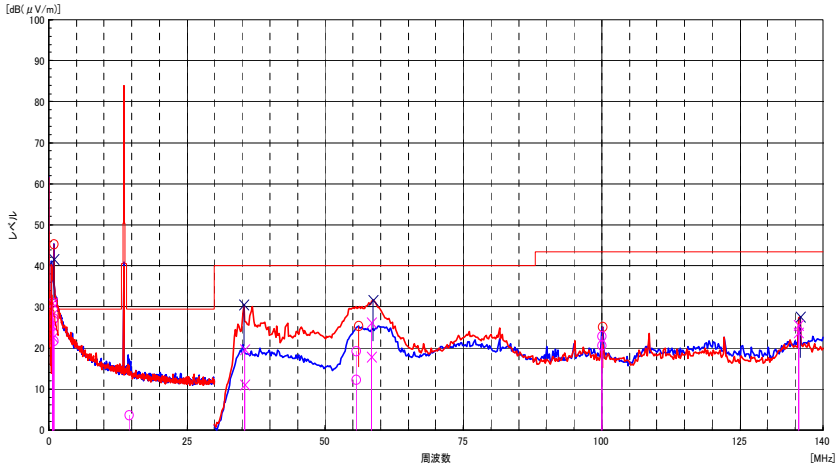

Figure 5 Radiated Spurious Emission, Out-of-Band Plot

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Notes:

1. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30 MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m or 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in

   §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(300/3)^2 = 80_{[dB]}$ *1

   $= 20 \log_{10}(30/3)^2 = 40_{[dB]}$ *2
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 140.0 MHz.

   But quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz Radiated emission limits in these two bands are based on measurements employing an average detector.

   Field Strength Level $_{[dB\mu V/m]}$= Analyzer Level $_{[dB\mu V]}$ + Factor $_{[dB/m]}$.

   Factor $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$ + Priamp Gain$_{[dB]}$ - Extrapolation Factor $_{[dB]}$

   Margin $_{[dB]}$= Field Strength Level $_{[dB\mu V/m]}$ - Limit $_{[dB\mu V/m]}$
4. The EUT is supplied with nominal AC voltabge .
5. The spectrum is measured from 9 kHz to the 10th harmonic and the worst-case emissions are reported.

3.6 Line Conducted Measurement Data

3.6.1 Test Result

Pass

3.6.2 Test Detail

Onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

3.6.3 Test data

【Line A】

Frequency [MHz]	Factor [dB]	Level[dBμV] QP	Level[dBμV] AV	Result[dBμV] QP	Result[dBμV] AV	Limit[dBμV] QP	Limit[dBμV] AV	Margin[dB] QP	Margin[dB] AV
0.1500	**9.9**	**17.4**	**4.0**	**27.3**	**13.9**	**66.0**	**56.0**	**38.7**	**42.1**
0.1690	**10.3**	**40.2**	**28.6**	**50.5**	**38.9**	**65.0**	**55.0**	**14.5**	**16.1**
0.2553	**9.7**	**31.1**	**21.0**	**40.8**	**30.7**	**61.6**	**51.6**	**20.8**	**20.9**
0.3401	**10.0**	**31.0**	**24.8**	**41.0**	**34.8**	**59.2**	**49.2**	**18.2**	**14.4**
0.9525	**9.9**	**17.4**	**17.2**	**27.3**	**27.1**	**56.0**	**46.0**	**28.7**	**18.9**
12.4877	**10.1**	**23.2**	**33.3**	**33.3**	**32.1**	**60.0**	**50.0**	**26.7**	**17.9**

Table 12 Line-Conducted Test Data(Line A)

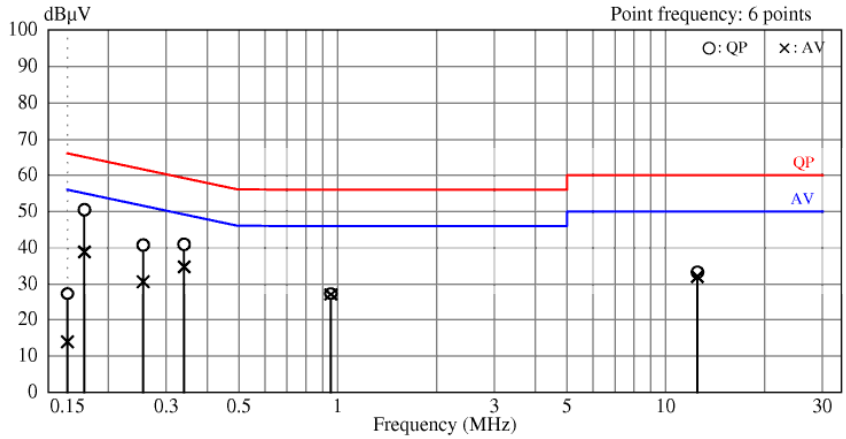

Figure 6 Line-Conducted Test Plot(Line A)

【Line B】

Frequency [MHz]	Factor [dB]	Level[dBμV] QP	Level[dBμV] AV	Result[dBμV] QP	Result[dBμV] AV	Limit[dBμV] QP	Limit[dBμV] AV	Margin[dB] QP	Margin[dB] AV
0.1500	**9.9**	**15.3**	**3.0**	**25.2**	**12.9**	**66.0**	**56.0**	**40.8**	**43.1**
0.1684	**10.3**	**39.7**	**28.3**	**50.0**	**38.6**	**65.0**	**55.0**	**15.0**	**16.4**
0.2533	**9.7**	**31.4**	**21.3**	**41.1**	**31.0**	**61.6**	**51.6**	**20.5**	**20.6**
0.3422	**10.0**	**27.8**	**22.0**	**37.8**	**32.0**	**59.1**	**49.1**	**21.3**	**17.1**
0.9514	**9.9**	**17.7**	**17.2**	**27.6**	**27.1**	**56.0**	**46.0**	**28.4**	**18.9**
12.4886	**10.1**	**23.5**	**23.0**	**33.6**	**33.1**	**60.0**	**50.0**	**26.4**	**16.9**

Table 13 Line-Conducted Test Data(Line B)

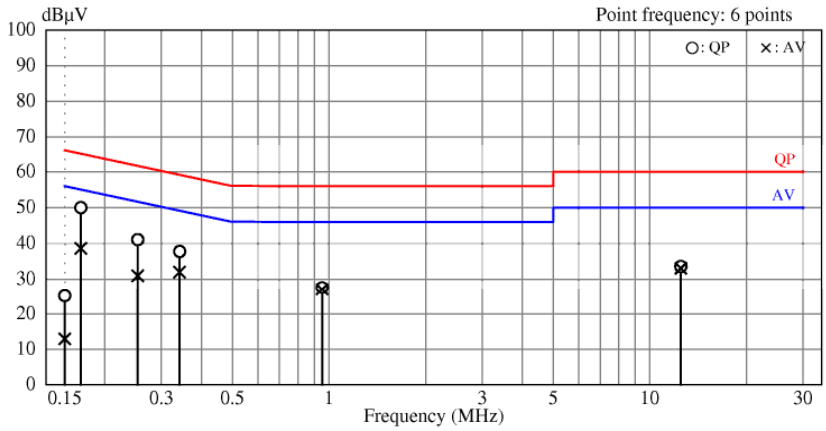

Figure 7 Line-Conducted Test Plot(Line B)

Note:

1. All modes of operation were investigated and the worst-case emissions are reported.
The limit for Class B device(s) from 150 kHz to 30 MHz are specified in section 15.207 of the Title 47 CFR.
Line A = Phase; Line B = Neutral
Factor (dB) = Cable loss (dB) + LISN insertion factor (dB)
Result (dBμV) = Level (dBμV) + Factor (dB)
Margin (dB) = Limit (dBμV) - Result (dBμV)
Traces shown in plot are made using a peak detector.

4.Photographs

4.1 Photographs of Test Setup

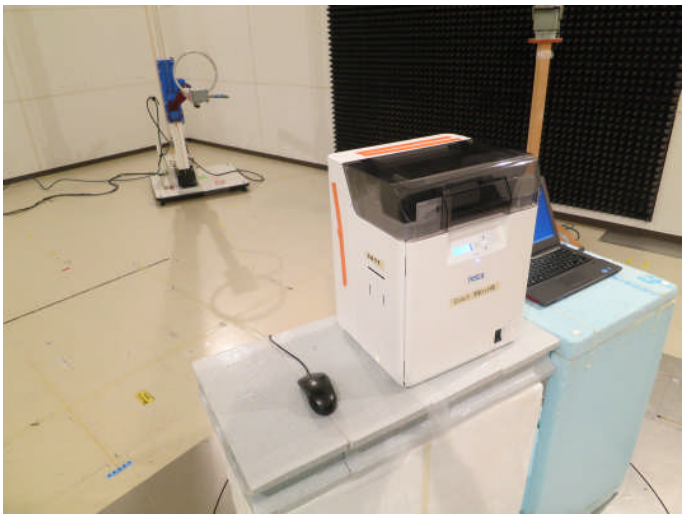

Photo1 Test setup for below 30 MHz
(Front)

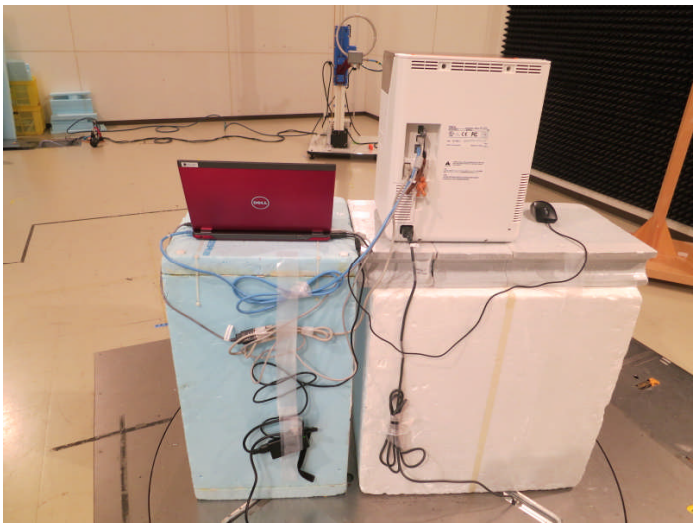

Photo2 Test setup for below 30 MHz
(Back)

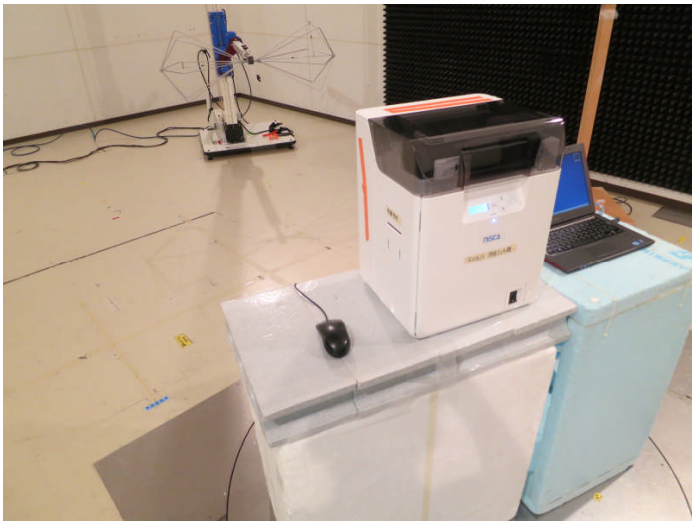

Photo3 Test setup for above 30 MHz
(Front)

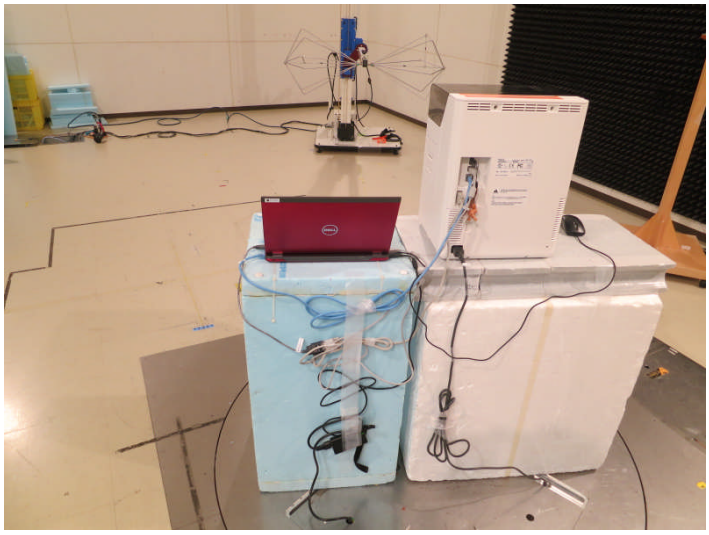

Photo4 Test setup for above 30 MHz
(Back)

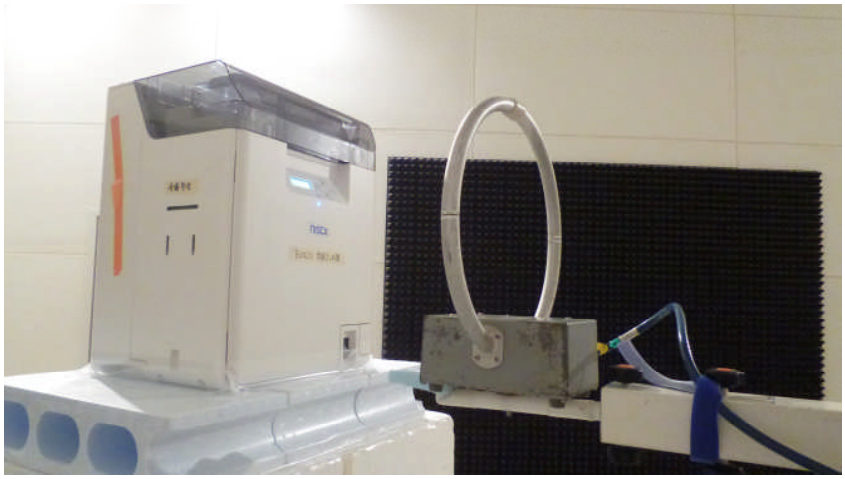

Photo5　Test Setup for 20dB/99% Bandwidth

Photo6　Test Setup for Conducted Test_1
（Front）

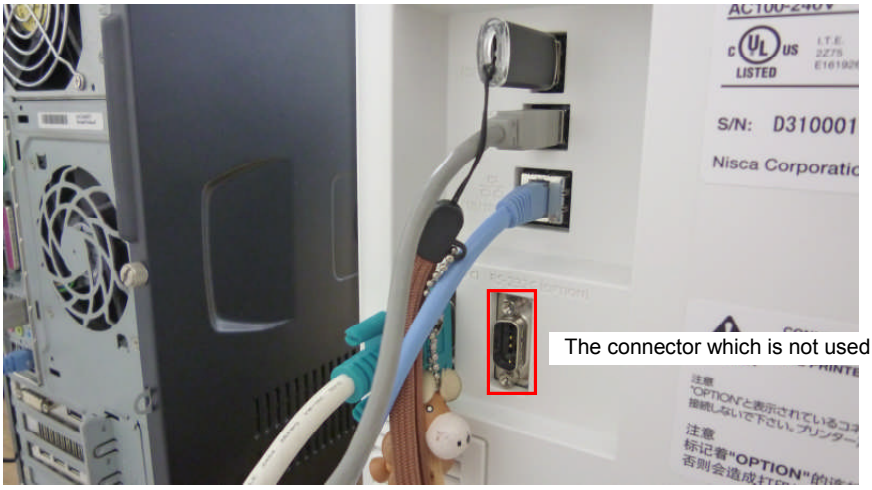

Photo7 Test Setup for Conducted Test_2
(Back)

Photo8 Test Setup for Conducted Test_3
(Back)

5.Test facility

5.1 Test Instruments

5.1.1 Conducted Emissions

Product Name	Manufacturer	Model Number	Serial Number	Calibration Date	Due Date
Receiver	Rohde&Schwarz	ESIB7	100211	2013/6/26	2014/6/30
LISN	Rohde&Schwarz	ENV216/02	100168	2013/7/25	2014/7/31
LISN	Rohde&Schwarz	ENV216/02	100466	2012/10/25	201310/31

Table 14 Conducted Emissions

5.1.2 Radiated Spurious Emissions

Product Name	Manufacturer	Model Number	Serial Number	Calibration Date	Due Date
Receiver	Rohde&Schwarz	ESCI	100498	2013/6/26	2014/6/30
Pre-Amplifier	Hewlett Packard	8447D	2944A07182	2013/3/4	2014/3/31
Roop Antenna	EMCO	6507	9108-1268	2013/4/3	2014/4/30
Biconical Antenna	Schwarzbeck	VHA9103B+BBA9106	91032511	2013/6/10	2014/6/30
Temp/Humidity Chamber	ESPEC	PL-3SP	13004002	2012/12/03	2013/12/31

Table 15 Radiated Spurious Emissions

5.2 Test equipment

Dimension	Material	Measurement
0.69m(W) × 0.80m(H) × 0.43m(D)	Foamed Styrol	Radiated Spurious Emission
2.50m(W) × 1.00m(H) × 0.80m(D)	Wood	AC Conducted Emission

Table 16 Test equipment