



RADIO TEST REPORT

Test Report No. : 29CE0202-YK-01

Applicant : NIDEC SANKYO Corporation
Type of Equipment : Contactless IC card dispenser
Model No. : SCT0M0-0130
FCC ID : WJ6-0M0013001A
Test regulation : FCC Part15 Subpart C: 2008
Test result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: November 27 and 28, 2008

Tested by: T. Arai & G. Ishiwata
Tatsuya Arai Go Ishiwata

Approved by: T. Amamura
Toyokazu Imamura
Engineer of Yamakita EMC Lab.

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Table of Contents	Page
1 Applicant information	3
2 Equipment under test (E.U.T.)	3
3 Test specification, procedures and results	4
4 System test configuration	6
5 Conducted emission	7
6 Radiated emissions (Fundamental, Spurious and Outside the Allocated bands)	8
7 20dB bandwidth & Occupied bandwidth (99%)	10
8 Frequency tolerance	10
<u>Contents of Appendixes</u>	11
APPENDIX 1: Photographs of test setup	12
APPENDIX 2: Test data	15
APPENDIX 3: Test instruments	25

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1 Applicant information

Company Name : NIDEC SANKYO CORPORATION
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Contact Person : Junro Takeuchi

2 Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Contactless IC card dispenser
Model No. : SCT0M0-0130
Serial No. : R-8100005
Rating : DC24V, 10A
Country of Mass-production : Japan
Receipt Date of Sample : November 26, 2008
Condition of EUT : Production model
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: SCT0M0-0130 (referred to as the EUT in this report) is Contactless IC card dispenser.

It is dispenser in which the function of the Contactless IC card is provided.

Contactless IC card read and write it by transporting the card from card hopper.

When success reading and writing can be done, it transports it to gate. And, transports it to reject stacker in case of failure.

Equipment type : Transceiver
Frequency of operation : 13.56MHz
Clock frequency : 13.56MHz
Type of modulation : ASK
Antenna type : Loop antenna
Antenna connector type : U. FL
ITU code : A1D
Operation temperature range : 0 ~ +50 deg.C.

FCC Part15.31 (e)

Host device provides the RFID Module with stable power supply, and the power is not changed when voltage of the device is varied. Therefore, the equipment complies power supply regulation.

FCC Part15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted on the board integrally. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3 Test specification, procedures and results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2008, final revised on May 19, 2008
 Title : FCC 47CFR Part15 Radio Frequency Device, Subpart C Intentional Radiators
 Section 15.207 Conducted limits
 Section 15.209 Radiated emission limits, general requirements
 Section 15.215 Additional provisions to the general radiated emission limitations.
 Section 15.225 Operation within the bands 13.110-14.010MHz.

3.2 Procedures & results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC Section15.207	-	N/A	16.5dB (21.3361MHz, QP, N)	Complied
Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.225 (a)	Radiated	N/A	65.2dB (Horizontal)	Complied
Electric Field Strength of Outside the Allocated bands	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.225 (b)(c)	Radiated	N/A	42.5dB (13.553MHz, Horizontal)	Complied
Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.209 FCC Section15.225 (d)	Radiated	N/A	5.9dB (901.73MHz, Horizontal)	Complied
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.215 (c)	Radiated	N/A	-	Complied
Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.225 (e)	Radiated	N/A	-	Complied

Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators RSS-Gen 4.6.1	RSS-Gen 4.6.1	Radiated	-	Complied

* Other than above, no addition, exclusion nor deviation has been made from the standard.

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3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

	No.1 open site (±)	No.2 open site (±)	No.1 anechoic chamber (±)
Conducted emission			
150kHz-30MHz	2.7 dB	2.7 dB	2.8 dB
Radiated emission (3m)			
<30MHz	2.4 dB	2.4 dB	2.7 dB
30-300MHz	4.3 dB	4.3 dB	4.6 dB
300-1000MHz	4.3 dB	4.3 dB	4.5 dB

Conducted emission test

The data listed in this test report has enough margin, more than site margin.

Radiated Emission Test

The data listed in this test report has enough margin, more than site margin.

Frequency tolerance	(±)
	0.000014dB

3.5 Test location

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NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on July 23, 2008 (Registration No.: 95486).

IC Registration No. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on February 27, 2008 (Registration No.: 466226).

IC Registration No. : 2973B-3

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on October 22, 2008 (Registration No.: 95967).

IC Registration No. : 2973B-2

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1 Semi-anechoic chamber	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
No.3 shielded room	4.0 x 5.0 x 2.7		

Open test site	Maximum measurement distance
No.1 open test site	30m
No.2 open test site	10m

3.8 Test Configuration Photographs, Data of EMI test and Test instruments

Refer to APPENDIX 1 to 3, in this report

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4 System test configuration

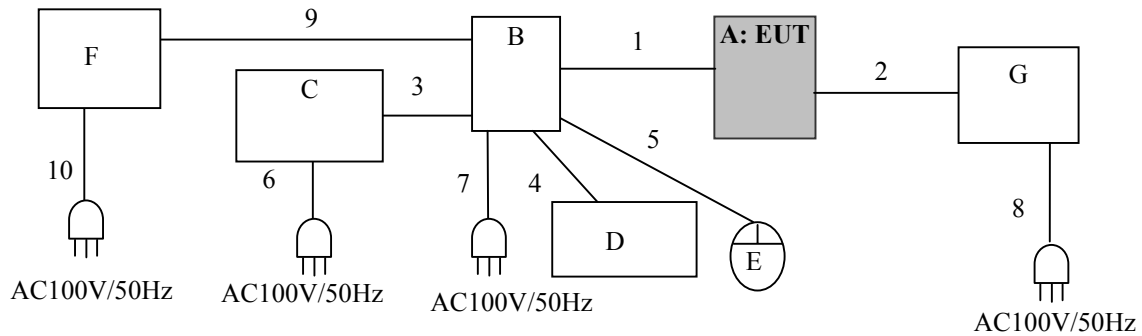
4.1 Operating mode

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Operation: Fully – automatic operation mode
 Fully - automatic content
 1. The card is transported from Card Hopper to communication part.
 2. The card communicates.
 3. It ejects the card.
 4. The card is taken and it communicates.
 5. And, it ejects the card.

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Contactless IC card dispenser	SCT0M0-130	R-8100005	NIDEC SANKYO	EUT
B	Personal Computer	d330 ST	DN994P#ABJ	hp compac	-
C	Display	E772P	CN-04P123-47803-2A8-C71N	hp	-
D	Keyboard	KB-0133	323686-291	hp	-
E	Mouse	334684-002	323614-001	hp	-
F	Printer	BJ F600	K10180	Canon	
G	Power supply	PAN35-10A	DE001677	KIKUSUI	

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	I/F (RS232C) cable	3.0	Shielded	Unshield	-
2	DC Power cable	1.3	Unshield	Unshield	-
3	RGB cable	2.0	Unshield	Unshield	-
4	Keyboard cable	2.0	Unshield	Unshield	-
5	Mouse cable	2.0	Unshield	Unshield	-
6	AC Power Cable	2.0	Unshield	Unshield	-
7	AC Power Cable	2.0	Unshield	Unshield	-
8	AC Power Cable	2.0	Unshield	Unshield	-
9	Parallel Cable	2.0	Shielded	Unshield	-
10	AC Power Cable	1.9	Unshield	Unshield	-

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5 Conducted emissions

5.1 Operating environment

The test was carried out in No.2 shielded room.

5.2 Test configuration

EUT was placed on a wooden platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

Photographs of the set up are shown in Appendix 1.

5.3 Test conditions

Frequency range : 0.15 - 30MHz

5.4 Test procedure

The EUT was connected to a LISN (AMN). An overview sweep with peak detection has been performed. The Conducted emission measurements were made with the following detector function of the test receiver.

Detector: QP/AV

IF Bandwidth: 9kHz

5.5 Results

Summary of the test results : Pass

Date : November 27, 2008 Test engineer : Tatsuya Arai

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6 Radiated emissions (Fundamental, Spurious and Outside the Allocated bands)

6.1 Operating environment

The test was carried out in No.1 anechoic chamber.

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.8m, raised 80cm above the conducting ground plane to prevent the reflection influence. Photographs of the setup are shown in Appendix 1.

6.3 Test conditions

Frequency range : 9kHz - 1GHz
 Test distance : 3m

6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m.

Frequency: From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for vertical polarization (antenna angle: 0deg.to 360deg.) and horizontal polarization. Drawing of the antenna direction is shown in Figure 1.

Frequency: From 30MHz to 1GHz at distance 3m

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

	9kHz to 90kHz & 110kHz to 150kHz	90kHz to 110kHz	150kHz to 490kHz	490kHz to 30MHz	30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	10kHz	9kHz	120kHz
Measuring antenna	Loop antenna				Biconical (30-299.99MHz) Logperiodic (300MHz-1GHz)

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)

9kHz – 490kHz [Limit at 3m]= [Limit at 300m]-40log (3[m]/300[m])

490kHz – 30MHz [Limit at 3m]= [Limit at 30m]-40log (3[m]/30[m])

6.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.

Date : November 27, 2008 Test engineer : Tatsuya Arai

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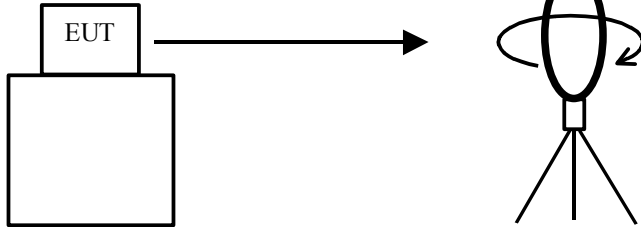
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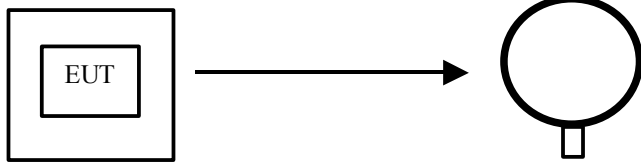
Figure 1: Direction of the Loop Antenna

Side View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

Top View (Horizontal)



Antenna was not rotated.

7 20dB bandwidth & Occupied bandwidth (99%)

Test procedure

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

Summary of the test results: Pass

Date : November 28, 2008 Test engineer : Tatsuya Arai

8 Frequency tolerances

Test procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.
The temperature test was started after the temperature stabilization time of 30 minutes.

Summary of the test results: Pass

Date : November 27, 2008 Test engineer : Go Ishiwata

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APPENDIX 1: Photographs of test setup

Page 12 : Conducted emission
Page 13 - 14 : Radiated emission

APPENDIX 2: Test data

Page 15 - 17 : Conducted emission
Page 18 - 20 : Radiated emission
18 : Fundamental and Outside the Allocated bands
19 - 20 : Spurious emission
Page 21 : Bandwidth
Page 22 - 24 : Frequency tolerance

APPENDIX 3: Test instruments

Page 25 : Test instruments

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