TEST REPORT

STANDARD : FCC Part15C
RSS-210 Issue 9

Applicant	Testing Laboratory
NIDEC SANKYO CORPORATION 5329 Shimosuwa-machi, Suwa-gun, Nagano, 393-8511 Japan Tel: +81 266 27 5259	Intertek Japan K.K. Nagano Laboratory URL: http://www.japan.intertek-etlsemko.com 3226 Yokokawa, Tatsuno-machi, Kamiina-gun, Nagano 399-0511 Japan Tel. +81 266 47 5311

Equipment Type	Multi ID Scanner
Trademark	Sankyo
Model(s)	ISI300-0231
Serial No.	7120012
Equipment Authorization	Certification
FCC ID	WJ6-ISI300023101A
ISED CN and UPN	7863A-ISI3000231A
Test Result	Complied
Report Number	18010203JNA-001
Original Issue Date	March 26, 2018
Revised Issue Date	June 8, 2018

Approved by

Hideaki Kosemura
[Reviewer]

Tested by

Yoshihide Mimura
[Test Engineer]

Responsible Party of Test Item (Product)

Responsible Party	:
Add.	:
Tel.	:
Fax.	:
Contact Person	:

TABLE OF CONTENTS

SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	January 22, 2018
Date of Test	From January 25, 2018 to February 13, 2018
Standard Applied	FCC Part15C RSS-210 Issue 9
Test methods	ANSI C63.10-2013
Deviation from Standard(s)	None

Qualifications of Testing Laboratory

Accreditation	**Scope**	**Lab. Code**	**Remarks**
VLAC	EMC Testing	VLAC-008-4	JAPAN
BSMI	EMC Testing	SL2-IN-E-6007	TAIWAN
Filing			
VCCI	EMC Testing	A-0128	JAPAN
FCC	EMC Testing	JP0010	USA
IC	EMC Testing	2042O-1	CANADA

Abbreviations

EUT	Equipment Under Test	DoC	Declaration of Conformity
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
LISN	Line Impedance Stabilization Network	Q-P	Quasi-peak
AMP	Amplifier	AVG	Average
ATT	Attenuator	PK	Peak
ANT	Antenna	Cal	Calibration
BBA	Broadband Antenna	N/A	Not applicable or Not available
DIP	Dipole Antenna	LCD	Liquid-Crystal Display
AE	Associated Equipment	HDMI	High-Definition Multimedia Interface
OBW	Occupied Bandwidth		

Revision Summary

Revised Date	Section	Description of Changes
June 4, 2018	7	The operation explanation was corrected.
June 8, 2018	9.3.1 9.3.2	The data has been changed.

SECTION 2. SUMMARY OF TEST RESULTS

See Section9 for the detailed result.

Emission Tests

Standard Applied	FCC Part15C (15.207, 15.225, 15.209) RSS-210 Issue 9 (B.6)	
Test Item	**Minimum margin**	**Remarks**
Conducted disturbance at mains terminals	14.7 dB (0.1500 MHz) [Q-P] IC communication (Upper Antenna) mode	-
Radiated disturbance (IN band)	21.5 dB (13.5530 MHz) IC communication (Upper Antenna) mode	-
Radiated disturbance (OUT band)	1.2 dB (480.00 MHz) IC communication (Upper Antenna) mode 1.2 dB (480.00 MHz) IC communication (Lower Antenna) mode	-

Standard Applied	FCC Part15C (15.225) RSS-210 Issue 9 (B.6)	
Test Item	**Result**	**Remarks**
Frequency Tolerance	PASS	-

Standard Applied	FCC Part15C(15.215(c)) RSS-Gen Issue 4 (6.6)	
Test Item	**Result**	**Remarks**
20dB OBW 99%OBW	N/A	See Note

Note : None Limit (for reporting purposes only)

SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following apparatus.

3.1 System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks
A1	Multi ID Scanner	ISI300-0231	7120012	NIDEC SANKYO CORPORATION	-
A2	AC Adapter	SPU41A-106	S02185591735	SINPRO	Accessories

Rated Power : Multi ID Scanner: DC13 V-16 V AC Adapter: AC100 V-240 V, 47-63 Hz, 0.93 A	
Supplied Power : AC 120V, 60Hz	
Condition of Equipment	Production
Type	Tabletop type
Suppression Devices	No Modifications by the laboratory were made to the device

3.2 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
USB	USB Type A	4 pin	-

3.3 Highest Frequency Generated / Used

Operating Frequency	Operating mode	Remarks
360 MHz	IC Communication	–

3.4 RFID module specification

Model No.	MFRC531
Operating Frequency	13.56 MHz
Number of Channel	1 ch (2 places)
Communication method	ISO/IEC 14443 Type A, Type B ICAO/ 9301
Modulation Technology	ASK100% and ASK 10%.
Transfer rate	106 / 212 / 424 kbps

SECTION 4. SUPPORT EQUIPMENT

The EUT was supported by the following equipment during the test.

Symbol	Item	Model No.	Serial No.	Manufacturer	FCC ID
B	Computer	HSTND-2B07	CNK74816JH	HP	DoC
C	LCD	HSTNC-014P-SF	JPA70502JS	HP	DoC
D	Keyboard	KB-0316	BC3480GGAWI5UZ	HP	DoC
E	Mouse	M071KC	447015302	DELL	DoC
F	ID card	AIC-0164	001	TOPPAN TDK LABEL CO., LTD.	N/A
Supplied Power:					
B, C	AC120 V, 60 Hz				

SECTION 5. USED CABLE(S)

The following cable(s) was used for the test.

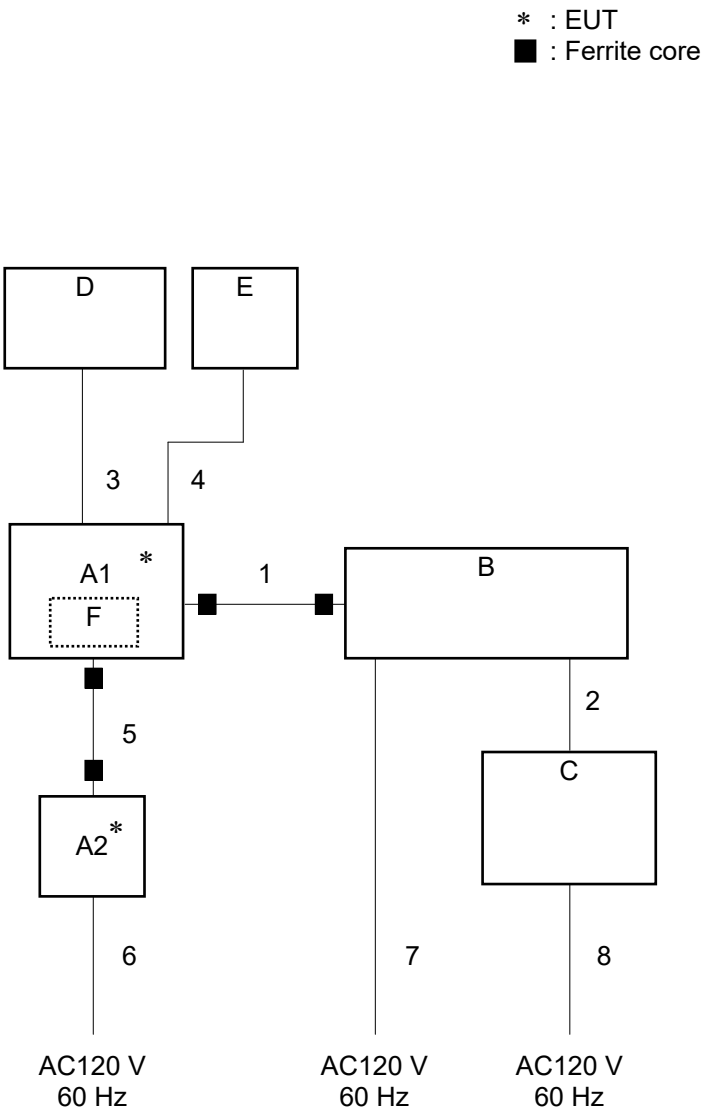
No.	Name	Length (m)	Shield	Metal Connector	Ferrite Core
1	USB cable	2.60	Yes	Yes	Fixed x 2
2	Video cable	1.80	Yes	Yes	-
3	Keyboard cable	1.80	Yes	Yes	-
4	Mouse cable	1.80	Yes	Yes	-
5	Power cable for EUT (DC)	1.00	No	No	Fixed x 2
6	Power cable for EUT (AC: 3 cores)	1.80	No	No	-
7	Power cable for Computer (AC: 3 cores)	1.80	No	No	-
8	Power cable for LCD (AC: 3 cores)	1.80	No	No	-

Note :

1. No.1 and No.5 cable are supplied together with EUT by the applicant.

SECTION 6. TEST CONFIGURATION

6.1 Conducted disturbance at mains terminals Tests and Radiated disturbance tests



The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.
This operation mode is the worst.

7.1 IC Communication (Upper Antenna) mode

Cycle time for operation: Continuity

- Select the Upper antenna using the test tool
- The method of the modulation are ASK 10%.
- The communication speed is 106 kbps.

The microprocessor unit communicates to RFID via the driver IC MFRC531. At first, the microprocessor unit activates the Upper antenna, and sets ASK 100% modulation. If the microprocessor unit can receive answer to request, the microprocessor unit detects type A RFID. But if the microprocessor unit can not receive answer to request, the microprocessor unit sets ASK 10% modulation after 100msec, and waits for 100msec receiving answer to request. If the microprocessor unit can receive answer to request, the microprocessor unit detects type B RFID.

7.2 IC Communication (Lower Antenna) mode

Cycle time for operation: Continuity

- Select the Lower antenna using the test tool
- The method of the modulation are ASK 10%.
- The communication speed is 106 kbps.

The microprocessor unit communicates to RFID via the driver IC MFRC531. At first, the microprocessor unit activates the lower antenna, and sets ASK 100% modulation. If the microprocessor unit can receive answer to request, the microprocessor unit detects type A RFID. But if the microprocessor unit can not receive answer to request, the microprocessor unit sets ASK 10% modulation after 100msec, and waits for 100msec receiving answer to request. If the microprocessor unit can receive answer to request, the microprocessor unit detects type B RFID.

SECTION 8. UNCERTAINTY

Traceability to national standard in SI units is ensured with these values.
Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

8.1 Emission tests

Radiated disturbance at 3m	**U_{lab} [*k* = 2]**	**U_{cispr}**
30 MHz – 1000 MHz	+/- 4.28 dB	6.3 dB
Above 1 GHz	+/- 4.80 dB	5.2 dB
Radiated disturbance at 10m		
30 MHz – 1000 MHz	+/- 4.81 dB	6.3 dB
Radiated disturbance at 30m		
	N/A	Nil
Conducted disturbance at mains terminals		
9 kHz – 150 kHz	+/- 1.77 dB	3.8 dB
150 kHz – 30 MHz		3.4 dB
Conducted disturbance at telecommunication ports (ISN)		
150 kHz – 30 MHz	+/- 3.11 dB	5.0 dB
Conducted disturbance at telecommunication ports (Capacitive Voltage Probe)		
150 kHz – 30 MHz	+/- 3.06 dB	3.9 dB
Conducted disturbance at telecommunication ports (Current Probe)		
150 kHz – 30 MHz	+/- 1.89 dB	2.9 dB
Conducted disturbance at terminals		
150 kHz – 30 MHz	+/- 1.77 dB	2.9 dB
Disturbance power		
30 MHz – 300 MHz	+/- 2.49 dB	4.5 dB

The above expanded instrumentation uncertainty, $U_{lab.}$, is estimated in accordance with CISPR 16-4-2:2011.

The following uncertainty represents the expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of *k* = 2.
Traceability to national standard in SI units is ensured with these values.
Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

Parameter	**U_{lab}**	**Limit**
RF frequency	±0.98 Hz	±1 x 10-7
RF power, conducted	±0.29 dB	±1 dB
RF power, radiated	±5.14 dB (Below 1 GHz) ±5.03 dB (Above 1 GHz)	±6 dB
Temperature	±0.40 °C	±1°C
Humidity	±2 %	±5 %

SECTION 9. EVALUATION OF TEST RESULTS

9.1 Emission tests

9.1.1 Conducted disturbance at mains terminals

Location	Nagano No.3 Test Site
Test Engineer	Yoshihide Mimura

Frequency Range of Measurements

Required Measurement Frequency Range	Measured Frequency Range
0.15 – 30 MHz	0.15 – 30 MHz

Test Procedure

Item	Document number
Conducted disturbance at mains terminals	LEN-RJP-TE003

Setting for the Measuring instruments

Instrument	Detector	Resolution Bandwidth	Video Bandwidth
Receiver	Quasi Peak	10 kHz	N/A
	Average	10 kHz	N/A

< Measurement data correction >

Emission Level = Meter Reading + Factor

Margin = Limit- Emission Level

Factor = LISN Factor + Cable Loss + Attenuator

< Sample Calculations >

Sample @0.1500 MHz (IC Communication (Upper Antenna) mode)

Emission Level = 40.5 [dBuV] + 10.3 [dB] = 50.8 [dBuV]

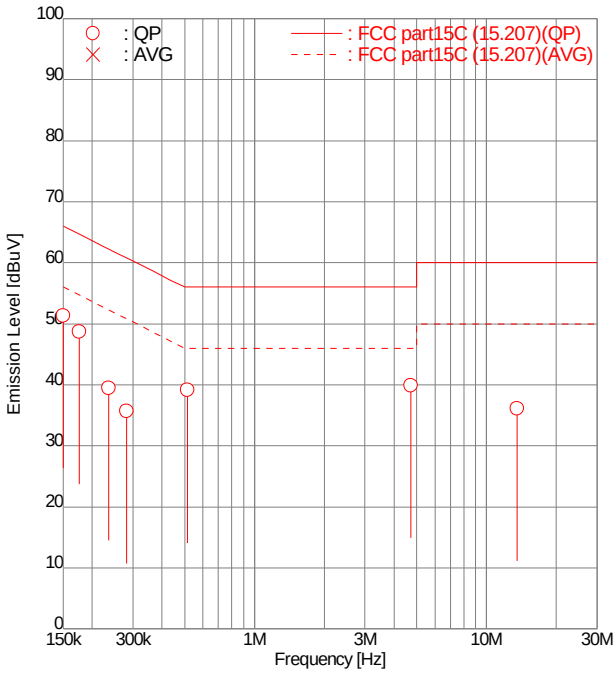
Result of Conducted disturbance at mains terminals
9.1.1.1 IC Communication (Upper Antenna) mode

Intertek Japan K.K.

Nagano No.3 Test Site

AC Conducted Emission Test

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 14 2018
FILE NO.	: -
REGULATION	: FCC part15C (15.207)
TEST METHOD	: ANSI C63.10-2013
TEMPERATURE	: 18.9 [degC]
HUMIDITY	: 28.0 [%]
NOTE	: Upper Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Line1	READING [dBuV] Line2	FACTOR [dB] Line1	FACTOR [dB] Line2	EMISSION [dBuV] Line1	EMISSION [dBuV] Line2	LIMIT [dBuV]	MARGIN [dB] Line1	MARGIN [dB] Line2
1	0.1500	QP	40.5	41.0	10.3	10.3	50.8	51.3	66.0	15.2	**14.7**
2	0.1761	QP	38.0	38.4	10.3	10.3	48.3	48.7	64.7	16.4	16.0
3	0.2357	QP	28.9	29.2	10.3	10.3	39.2	39.5	62.2	23.0	22.7
4	0.2809	QP	25.4	25.2	10.3	10.3	35.7	35.5	60.8	25.1	25.3
5	0.5130	QP	27.6	28.8	10.3	10.3	37.9	39.1	56.0	18.1	16.9
6	4.7364	QP	24.9	29.4	10.5	10.5	35.4	39.9	56.0	20.6	16.1
7	13.5596	QP	25.5	25.0	10.6	10.5	36.1	35.5	60.0	23.9	24.5

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.207) limit
Emission Level = Read + Factor(LISN,Pad,Cable)

emiT 3, 0, 0, 0

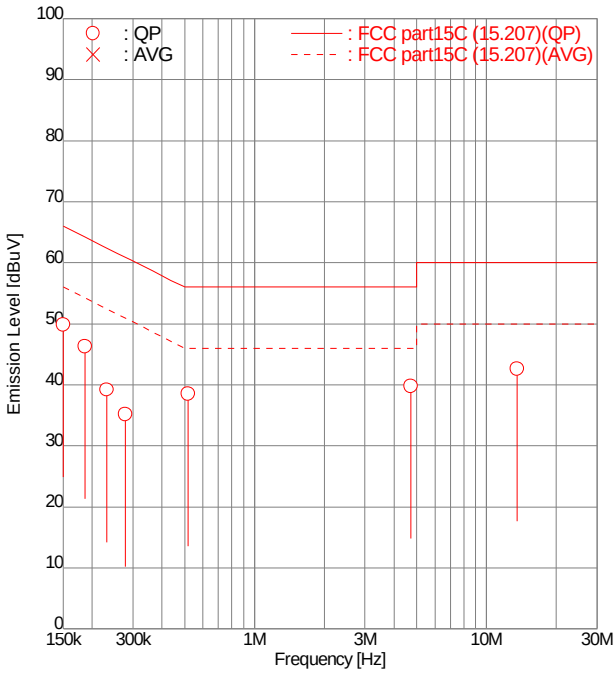
9.1.1.2 IC Communication (Lower Antenna) mode

Intertek Japan K.K.

Nagano No.3 Test Site

AC Conducted Emission Test

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 14 2018
FILE NO.	: -
REGULATION	: FCC part15C (15.207)
TEST METHOD	: ANSI C63.10-2013
TEMPERATURE	: 18.9 [degC]
HUMIDITY	: 28.0 [%]
NOTE	: Lower Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Line1	READING [dBuV] Line2	FACTOR [dB] Line1	FACTOR [dB] Line2	EMISSION [dBuV] Line1	EMISSION [dBuV] Line2	LIMIT [dBuV]	MARGIN [dB] Line1	MARGIN [dB] Line2
1	0.1500	QP	39.1	39.6	10.3	10.3	49.4	49.9	66.0	16.6	**16.1**
2	0.1865	QP	35.4	36.0	10.3	10.3	45.7	46.3	64.2	18.5	17.9
3	0.2307	QP	28.9	28.6	10.3	10.3	39.2	38.9	62.4	23.2	23.5
4	0.2787	QP	24.9	24.9	10.3	10.3	35.2	35.2	60.9	25.7	25.7
5	0.5189	QP	26.8	28.2	10.3	10.3	37.1	38.5	56.0	18.9	17.5
6	4.7311	QP	24.6	29.3	10.5	10.5	35.1	39.8	56.0	20.9	16.2
7	13.5598	QP	29.9	32.1	10.6	10.5	40.5	42.6	60.0	19.5	17.4

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.207) limit
Emission Level = Read + Factor(LISN,Pad,Cable)

emiT 3, 0, 0, 0

9.1.2 Radiated disturbance (IN band and OUT band)

Location	Nagano No.2 Test Site
Test Engineer	Yoshihide Mimura

Frequency Range of Measurements

Operating mode	Required Frequency Range	Measured Frequency Range
IC Communication	0.0090 – 2000 MHz	0.0090 – 2000 MHz

Test Procedure

Item	Document number
Radiated disturbance	LEN-RJP-TE003

Setting for the Measuring instruments

Frequency [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.009 - 30	Receiver	AVG : 0.009 - 0.090 MHz QP : 0.090 - 0.110 MHz AVG : 0.110 - 0.490 MHz QP : 0.490 - 30 MHz	200 Hz : 0.009 - 0.15 MHz 10 kHz : 0.15 – 30 MHz	N/A
30 – 1000	Receiver	Quasi Peak	120 kHz	N/A
Above 1000	Receiver	Peak	1 MHz	N/A
		Average	1 MHz	N/A

< Measurement data correction >

Emission Level = Meter Reading + Factor

Margin = Limit - Emission Level

Factor = Antenna Factor + Cable Loss - Amplifier Gain + Attenuator (+ Distance Conversion Factor)*

For In band Measurement

* For other than Standard distance:
Distance Conversion Factor = 20 log (Measurement distance / Standard distance)

Limit@10m = Limit@Xm + 40 log (X /10)
X: Standard distance

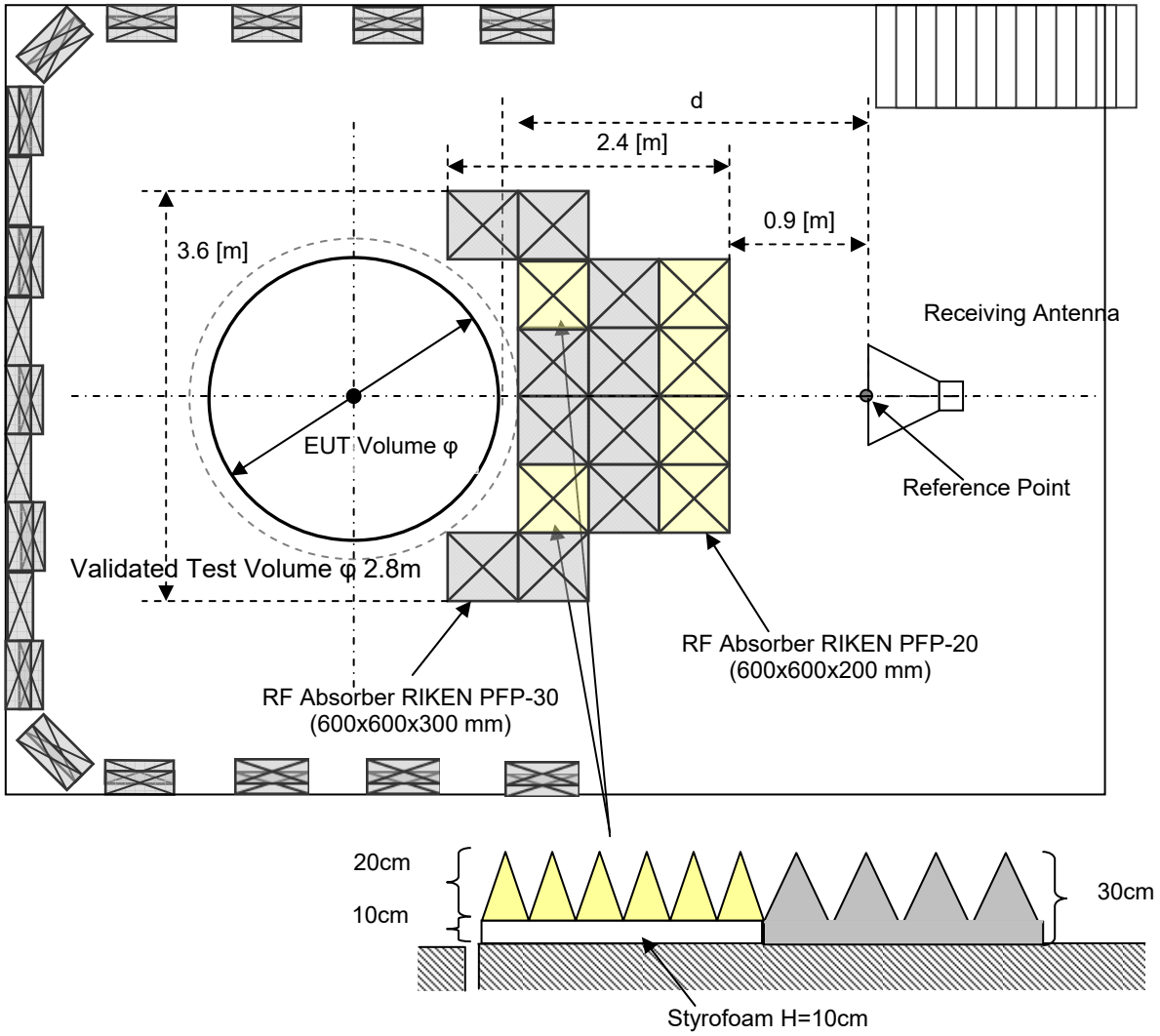
< Sample Calculations >

Sample @40.68 MHz (IC Communication (Upper Antenna) mode)

Emission Level = 37.4 [dBuV] - 3.1 [dB/m] = 34.3 [dBuV/m]

Operating Condition	EUT Volume	Frequency Range	Measurement distance
IC Communication mode	-	0.009 - 30 MHz	10.00 m
	-	30 – 1000 MHz	3.00 m
	0.75 m	Above 1 GHz	3.65 m

Absorber placement and Receive Antenna location in Radiated disturbance above 1 GHz



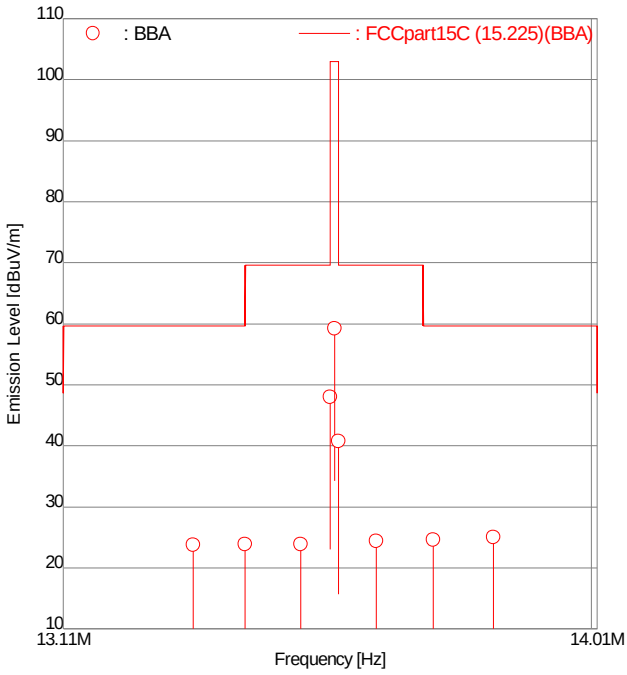
Result of Radiated disturbances
9.1.2.1 IN band (Upper Antenna)

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Magnetic Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 01 2018
FILE NO.	: -
REGULATION	: FCCpart15C (15.225)
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 10.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 25.0 [%]
NOTE	: Upper Ant.



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV] Hori	Vert	FACTOR [dB] Hori	Vert	EMISSION [dBuV/m] Hori	Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	Vert
1	13.3238	24.1	23.1	-0.3	-0.3	23.8	22.8	59.6	35.8	36.8
2	13.4097	24.2	23.1	-0.3	-0.3	23.9	22.8	59.6	35.7	36.8
3	13.5028	24.2	23.0	-0.3	-0.3	23.9	22.7	69.5	45.6	46.8
4	13.5530	48.3	29.8	-0.3	-0.3	48.0	29.5	69.5	**21.5**	40.0
5	13.5600	59.5	39.5	-0.3	-0.3	59.2	39.2	103.0	43.8	63.8
6	13.5670	41.0	25.3	-0.3	-0.3	40.7	25.0	69.5	28.8	44.5
7	13.6301	24.7	23.1	-0.3	-0.3	24.4	22.8	69.5	45.1	46.7
8	13.7276	24.9	23.1	-0.3	-0.3	24.6	22.8	59.6	35.0	36.8
9	13.8312	25.3	23.2	-0.3	-0.3	25.0	22.9	59.6	34.6	36.7

Higher six points are underlined.
Other frequencies : Below the FCCpart15C (15.225) limit
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

emiT 3, 0, 0, 0

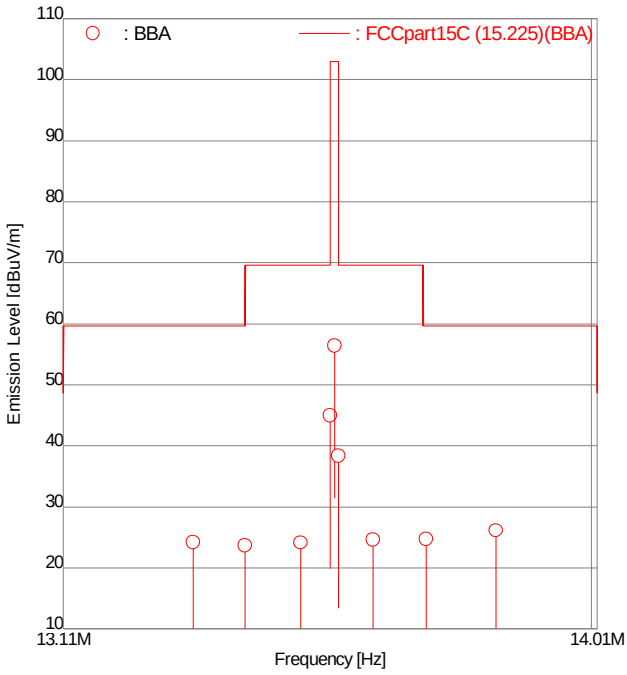
9.1.2.2 IN band (Lower Antenna)

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Magnetic Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 01 2018
FILE NO.	: -
REGULATION	: FCCpart15C (15.225)
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 10.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 25.0 [%]
NOTE	: Lower Ant.



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV] Hori	Vert	FACTOR [dB] Hori	Vert	EMISSION [dBuV/m] Hori	Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	Vert
1	13.3238	24.5	23.1	-0.3	-0.3	24.2	22.8	59.6	35.4	36.8
2	13.4097	24.0	23.0	-0.3	-0.3	23.7	22.7	59.6	35.9	36.9
3	13.5028	24.4	23.0	-0.3	-0.3	24.1	22.7	69.5	45.4	46.8
4	13.5530	45.2	26.6	-0.3	-0.3	44.9	26.3	69.5	**24.6**	43.2
5	13.5600	56.7	34.7	-0.3	-0.3	56.4	34.4	103.0	46.6	68.6
6	13.5670	38.6	24.0	-0.3	-0.3	38.3	23.7	69.5	31.2	45.8
7	13.6250	24.9	23.1	-0.3	-0.3	24.6	22.8	69.5	44.9	46.7
8	13.7160	25.0	23.2	-0.3	-0.3	24.7	22.9	59.6	34.9	36.7
9	13.8350	26.4	23.2	-0.3	-0.3	26.1	22.9	59.6	33.5	36.7

Higher six points are underlined.
Other frequencies : Below the FCCpart15C (15.225) limit
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

emiT 3, 0, 0, 0

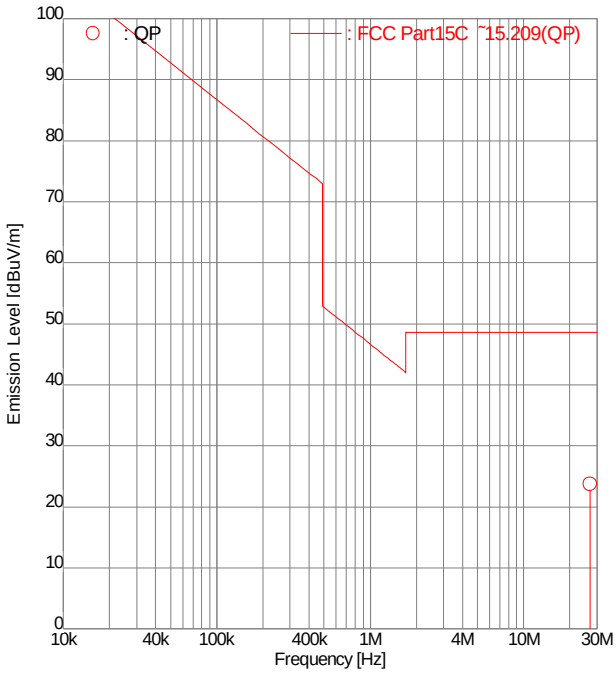
9.1.2.3 Out band
0.009 – 30 MHz (Upper Antenna)

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Magnetic Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 01 2018
FILE NO.	: -
REGULATION	: FCC Part15C § 15.209
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 10.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 25.0 [%]
NOTE	: Upper Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]
1	27.1200	23.1	0.6	23.7	48.6	**24.9**

Higher six points are underlined.
Other frequencies : Below the FCC Part15C § 15.209 limit
Emisson Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

emiT 3, 0, 0, 0

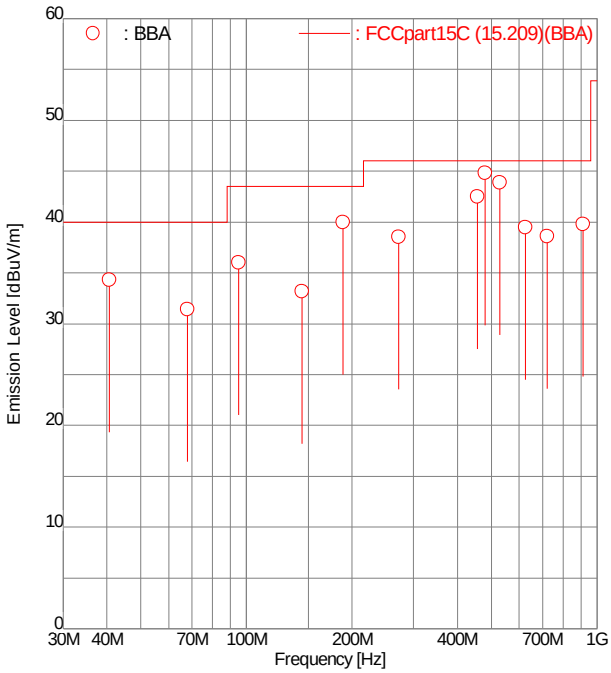
30 – 1000 MHz

Intertek Japan K.K.

Nagano No.2 Test Site

Spurious Emissions - Radiated Test

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Jan 31 2018
FILE NO.	: -
REGULATION	: FCCpart15C (15.209)
TEST METHOD	: ANSI C63.4:2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 17.6 [degC]
HUMIDITY	: 36.0 [%]
NOTE	: Upper Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV] Hori	Vert	FACTOR [dB/m] Hori	Vert	EMISSION [dBuV/m] Hori	Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	Vert
1	40.68	-	37.4	-3.1	-3.1	-	34.3	40.0	-	5.7
2	67.80	41.4	-	-10.0	-10.0	31.4	-	40.0	8.6	-
3	94.92	45.0	45.2	-9.2	-9.2	35.8	36.0	43.5	7.7	7.5
4	144.00	-	41.5	-8.3	-8.3	-	33.2	43.5	-	10.3
5	188.26	46.9	45.7	-6.9	-6.9	40.0	38.8	43.5	3.5	4.7
6	271.19	40.9	-	-2.4	-2.4	38.5	-	46.0	7.5	-
7	456.00	39.4	39.6	2.9	2.9	42.3	42.5	46.0	3.7	3.5
8	480.00	41.4	40.5	3.4	3.4	44.8	43.9	46.0	**1.2**	2.1
9	528.00	37.5	39.7	4.2	4.2	41.7	43.9	46.0	4.3	2.1
10	624.00	-	34.0	5.5	5.5	-	39.5	46.0	-	6.5
11	720.00	-	31.5	7.1	7.1	-	38.6	46.0	-	7.4
12	912.00	29.3	28.4	10.5	10.5	39.8	38.9	46.0	6.2	7.1

Higher six points are underlined.
Other frequencies : Below the FCCpart15C (15.209) limit
Emisson Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

emiT 3, 0, 0, 0

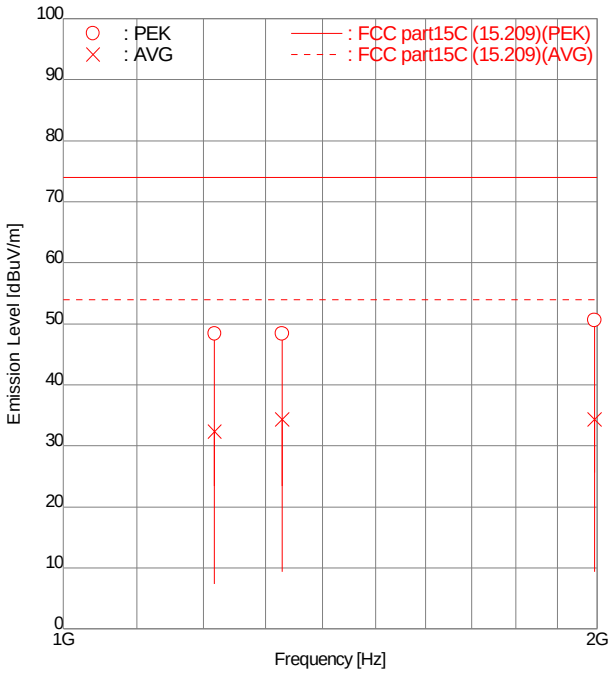
1000 – 2000 MHz

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Electric Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Jan 25 2018
FILE NO.	: -
REGULATION	: FCC part15C (15.209)
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 3.65 [m]
TEMPERATURE	: 14.3 [degC]
HUMIDITY	: 36.0 [%]
NOTE	: Upper Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1217.33	PEK	-	50.6	-2.2	-2.2	-	48.4	74.0	-	25.6
2	1217.33	AVG	-	34.5	-2.2	-2.2	-	32.3	54.0	-	21.7
3	1328.97	PEK	-	50.2	-1.8	-1.8	-	48.4	74.0	-	25.6
4	1328.97	AVG	-	36.1	-1.8	-1.8	-	34.3	54.0	-	**19.7**
5	1994.07	PEK	-	51.6	-1.0	-1.0	-	50.6	74.0	-	23.4
6	1994.07	AVG	-	35.3	-1.0	-1.0	-	34.3	54.0	-	19.7

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.209) limit
Emission Level=Read+Fact.
Fact.=Ant. Fact.+Cable Loss-Amp. Gain+ATT-Dist. Conversion

emiT 3, 0, 0, 0

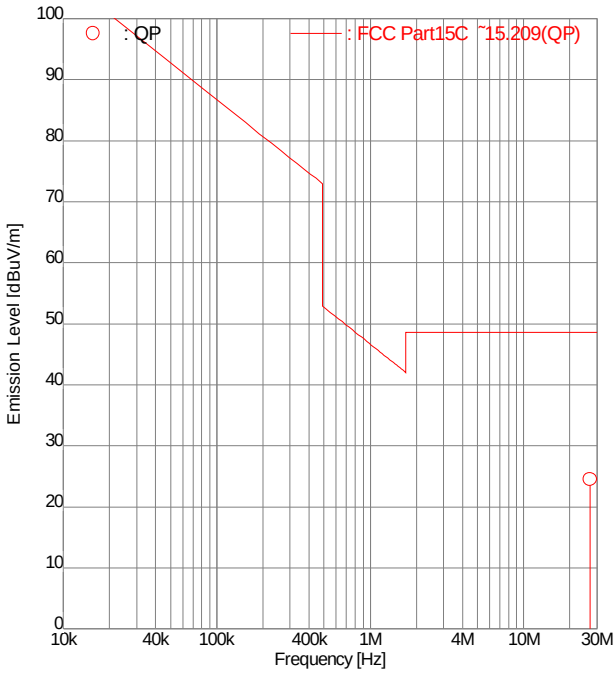
9.1.2.4 Out band
0.009 – 30 MHz (Lower Antenna)

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Magnetic Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Feb 01 2018
FILE NO.	: -
REGULATION	: FCC Part15C § 15.209
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 10.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 25.0 [%]
NOTE	: Lower Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]
1	27.1200	23.9	0.6	24.5	48.6	**24.1**

Higher six points are underlined.

Other frequencies : Below the FCC Part15C § 15.209 limit

Emisson Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)

emiT 3, 0, 0, 0

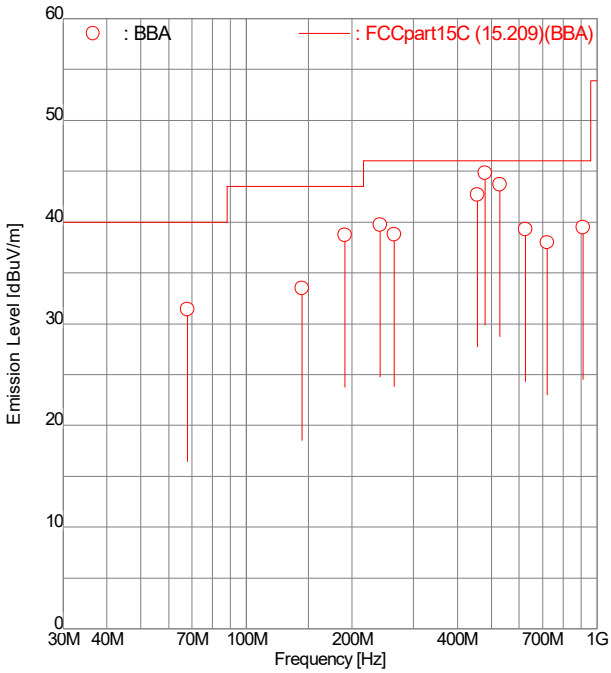
30 – 1000 MHz

Intertek Japan K.K.

Nagano No.2 Test Site

Spurious Emissions - Radiated Test

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Jan 31 2018
FILE NO.	: -
REGULATION	: FCCpart15C (15.209)
TEST METHOD	: ANSI C63.4:2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 17.6 [degC]
HUMIDITY	: 36.0 [%]
NOTE	: Lower Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	READING [dBuV] Hori	Vert	FACTOR [dB/m] Hori	Vert	EMISSION [dBuV/m] Hori	Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	Vert
1	67.80	41.4	-	-10.0	-10.0	31.4	-	40.0	8.6	-
2	144.00	-	41.8	-8.3	-8.3	-	33.5	43.5	-	10.0
3	190.85	45.4	44.4	-6.7	-6.7	38.7	37.7	43.5	4.8	5.8
4	240.00	43.4	-	-3.7	-3.7	39.7	-	46.0	6.3	-
5	264.00	41.4	-	-2.6	-2.6	38.8	-	46.0	7.2	-
6	456.00	39.0	39.8	2.9	2.9	41.9	42.7	46.0	4.1	3.3
7	480.00	41.4	40.6	3.4	3.4	44.8	44.0	46.0	**1.2**	2.0
8	528.00	38.1	39.5	4.2	4.2	42.3	43.7	46.0	3.7	2.3
9	624.00	-	33.8	5.5	5.5	-	39.3	46.0	-	6.7
10	720.00	-	30.9	7.1	7.1	-	38.0	46.0	-	8.0
11	912.00	29.0	-	10.5	10.5	39.5	-	46.0	6.5	-

Higher six points are underlined.
Other frequencies : Below the FCCpart15C (15.209) limit
Emisson Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

emiT 3, 0, 0, 0

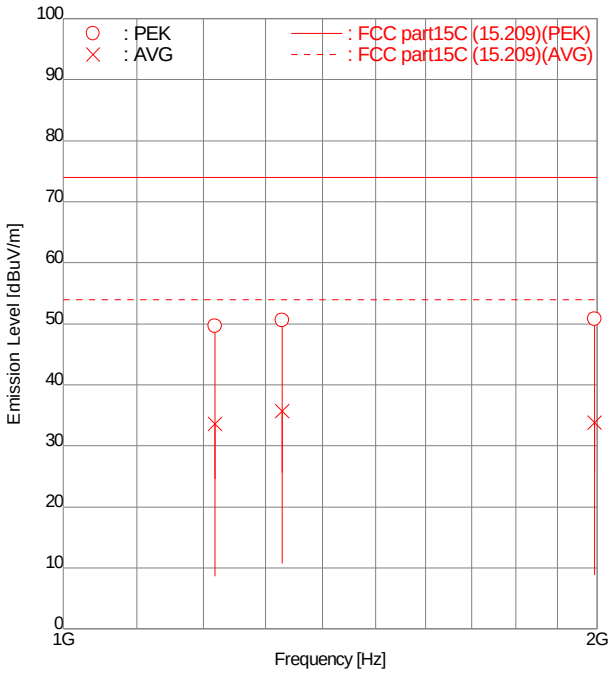
1000 – 2000 MHz

Intertek Japan K.K.

Nagano No.2 Test Site

Radiated Electric Field

APPLICANT	: NIDEC SANKYO CORPORATION
EUT NAME	: Multi ID Scanner
MODEL NO.	: ISI300-0231
SERIAL NO.	: 7120012
TEST MODE	: IC Communication
POWER SOURCE	: AC120 V, 60 Hz
DATE TESTED	: Jan 25 2018
FILE NO.	: -
REGULATION	: FCC part15C (15.209)
TEST METHOD	: ANSI C63.10-2013
DISTANCE	: 3.65 [m]
TEMPERATURE	: 14.3 [degC]
HUMIDITY	: 36.0 [%]
NOTE	: Lower Antenna



ENGINEER : Yoshihide Mimura

[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1217.42	PEK	-	51.8	-2.2	-2.2	-	49.6	74.0	-	24.4
2	1217.42	AVG	-	35.8	-2.2	-2.2	-	33.6	54.0	-	20.4
3	1329.13	PEK	-	52.4	-1.8	-1.8	-	50.6	74.0	-	23.4
4	1329.13	AVG	-	37.5	-1.8	-1.8	-	35.7	54.0	-	**18.3**
5	1993.53	PEK	-	51.8	-1.0	-1.0	-	50.8	74.0	-	23.2
6	1993.53	AVG	-	34.8	-1.0	-1.0	-	33.8	54.0	-	20.2

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.209) limit
Emission Level=Read+Fact.
Fact.=Ant. Fact.+Cable Loss-Amp. Gain+ATT-Dist. Conversion

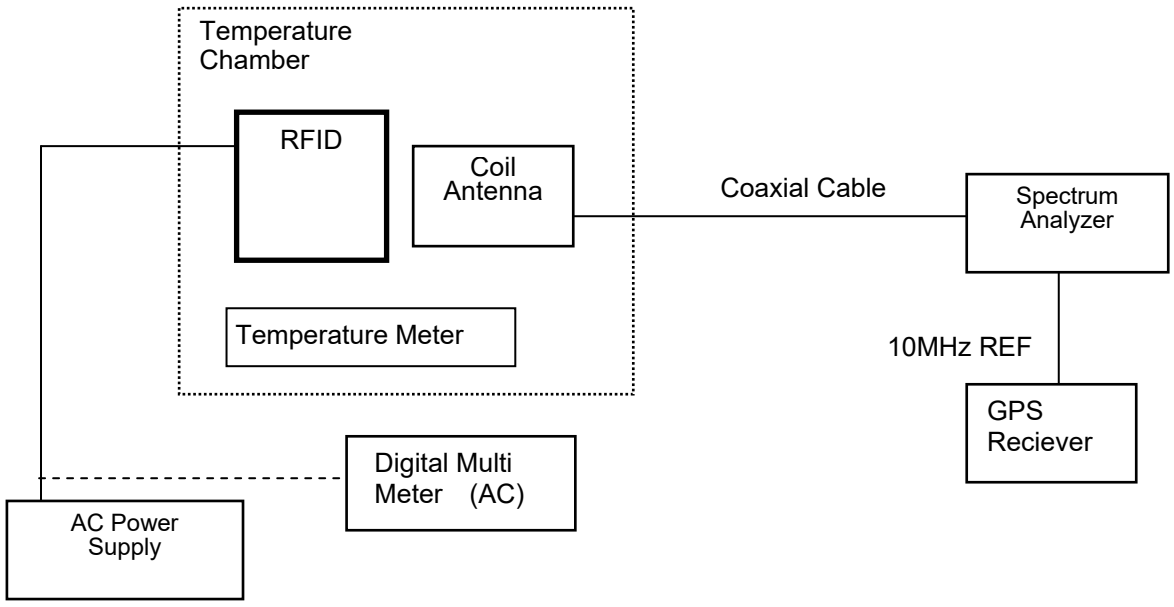
emiT 3, 0, 0, 0

9.2 Frequency Tolerance (Temperature Variation and Voltage Variation)

Location	Kashima No.12
Test date	March 13, 2018
Test Engineer	Yoshihide Mimura
Test Procedure	LEN-RJP-TE003

Test Procedure
Frequency Tolerance (Temperature Variation)
1. The EUT and test equipment were set up as shown on the following page.
2. Set the temperature -30 degrees C.
3. Leave the EUT for 1 hour after it became the temperature that was set up.
4. Make the EUT the transmitting.
5. Measure the output frequency. (Startup, 2min, 5min and 10min)
6. Set the temperature -20 degrees C to +50 degrees C.
7. Repeat test procedure 4 to 6

Frequency Tolerance (Voltage Variation)
1. The EUT and test equipment (Set the Supply Voltage 100%) were set up as shown on the following page.
2. Set the temperature +20 degrees C.
3. Leave the EUT for 1 hour after it became the temperature that was set up.
4. Make the EUT the transmitting.
5. Measure the output frequency.
6. Set the Supply Voltage 85% and 115%.
7. Repeat test procedure 4 to 6



Result of Frequency Tolerance (Temperature Variation and Voltage Variation)
9.2.1 Temperature Variation (Upper antenna)

Reference Frequency: 13.560000 MHz (FCC Stability) /13.559559 MHz (RSS Stability)

MHz	Temperature	Voltage	Frequency (MHz)				Deviation (ppm)								Limit (+/−)
							StartUP		2min		5min		10min		
	(Degree C)	(%)	StartUP	2min	5min	10min	FCC	RSS	FCC	RSS	FCC	RSS	FCC	RSS	(ppm)
13.56	-30	100	13.559589	13.559586	13.559583	13.559580	-30.31	2.21	-30.53	1.99	-30.75	1.77	-30.97	1.55	100.0
	-20	100	13.559580	13.559589	13.559592	13.559593	-30.97	1.55	-30.31	2.21	-30.09	2.43	-30.01	2.51	100.0
	-10	100	13.559597	13.559600	13.559602	13.559604	-29.72	2.80	-29.50	3.02	-29.35	3.17	-29.20	3.32	100.0
	0	100	13.559598	13.559595	13.559594	13.559593	-29.65	2.88	-29.87	2.65	-29.94	2.58	-30.01	2.51	100.0
	10	100	13.559566	13.559567	13.559569	13.559568	-32.01	0.52	-31.93	0.59	-31.78	0.74	-31.86	0.66	100.0
	20	100	13.559559	13.559547	13.559542	13.559535	-32.52	0.00	-33.41	-0.88	-33.78	-1.25	-34.29	-1.77	100.0
	30	100	13.559522	13.559509	13.559502	13.559495	-35.25	-2.73	-36.21	-3.69	-36.73	-4.20	-37.24	-4.72	100.0
	40	100	13.559480	13.559467	13.559459	13.559452	-38.35	-5.83	-39.31	-6.78	-39.90	-7.37	-40.41	-7.89	100.0
	50	100	13.559434	13.559431	13.559429	13.559429	-41.74	-9.22	-41.96	-9.44	-42.11	-9.59	-42.11	-9.59	100.0

9.2.2 Temperature Variation (Lower antenna)

Reference Frequency: 13.560000 MHz (FCC Stability) /13.559549 MHz (RSS Stability)

MHz	Temperature	Voltage	Frequency (MHz)				Deviation (ppm)								Limit (+/−)
							StartUP		2min		5min		10min		
	(Degree C)	(%)	StartUP	2min	5min	10min	FCC	RSS	FCC	RSS	FCC	RSS	FCC	RSS	(ppm)
13.56	-30	100	13.559580	13.559579	13.559577	13.559575	-30.97	2.29	-31.05	2.21	-31.19	2.06	-31.34	1.92	100.0
	-20	100	13.559582	13.559587	13.559589	13.559590	-30.83	2.43	-30.46	2.80	-30.31	2.95	-30.24	3.02	100.0
	-10	100	13.559593	13.559596	13.559597	13.559597	-30.01	3.24	-29.79	3.47	-29.72	3.54	-29.72	3.54	100.0
	0	100	13.559592	13.559584	13.559580	13.559578	-30.09	3.17	-30.68	2.58	-30.97	2.29	-31.12	2.14	100.0
	10	100	13.559569	13.559559	13.559555	13.559553	-31.78	1.47	-32.52	0.74	-32.82	0.44	-32.96	0.29	100.0
	20	100	13.559549	13.559533	13.559528	13.559524	-33.26	0.00	-34.44	-1.18	-34.81	-1.55	-35.10	-1.84	100.0
	30	100	13.559522	13.559507	13.559501	13.559497	-35.25	-1.99	-36.36	-3.10	-36.80	-3.54	-37.09	-3.83	100.0
	40	100	13.559495	13.559479	13.559474	13.559470	-37.24	-3.98	-38.42	-5.16	-38.79	-5.53	-39.09	-5.83	100.0
	50	100	13.559426	13.559454	13.559450	13.559448	-42.33	-9.07	-40.27	-7.01	-40.56	-7.30	-40.71	-7.45	100.0

9.2.3 Voltage Variation (Upper antenna)

Reference Frequency: 13.560000 MHz (FCC Stability) /13.5599478 MHz (RSS Stability)

MHz	Temperature (Degree C)	Voltage	Frequency (MHz)	Deviation (ppm)		Supply Voltage		Limit (+/-) (ppm)
				FCC	RSS			
13.56	20	Lower	13.559474	-38.79	-0.29	85.00 V	AC	100.0
		Normal	13.559478	-38.50	0.00	120.00 V	AC	100.0
		Upper	13.559510	-36.14	2.36	276.00 V	AC	100.0

Note:

Lower Voltage = 100 V – 15%, Upper Voltage = 240 V + 15%

9.2.4 Voltage Variation (Lower antenna)

Reference Frequency: 13.560000 MHz (FCC Stability) /13.559503 MHz (RSS Stability)

MHz	Temperature (Degree C)	Voltage	Frequency (MHz)	Deviation (ppm)		Supply Voltage		Limit (+/-) (ppm)
				FCC	RSS			
13.56	20	Lower	13.559499	-36.95	-0.29	85.00 V	AC	100.0
		Normal	13.559503	-36.65	0.00	120.00 V	AC	100.0
		Upper	13.559530	-34.66	1.99	276.00 V	AC	100.0

Note:

Lower Voltage = 100 V – 15%, Upper Voltage = 240 V + 15%

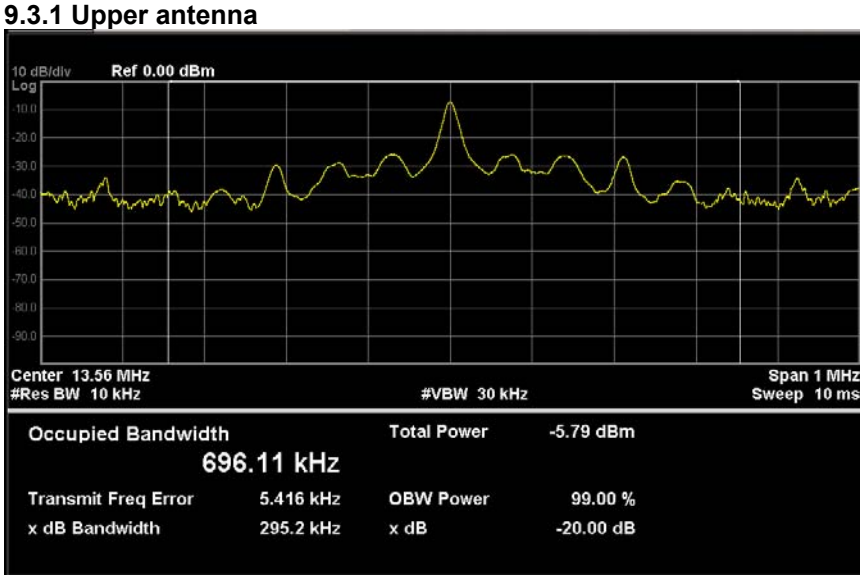
9.3 20dB OBW , 99% OBW

Location	Kashima No.12
Test date	February 2, 2018
Test Engineer	Naohei Murakami
Test Procedure	LEN-RJP-TE003

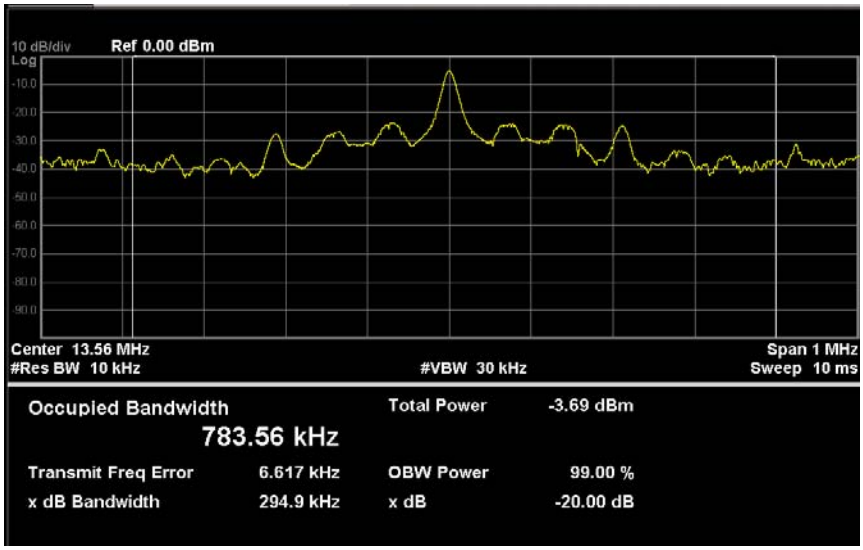
Test Procedure

1 The EUT and test equipment were set up as shown on the following page.
2 Adjust the test instrument for the following setting:
RBW : 1 % to 5 % of the Necessary bandwidth
VBW : at least 3 times the RBW
Detector : Peak
Sweep Time : Auto
Trace mode : Max Hold
3 Allow trace to fully stabilize.
4 Use “Occupied Bandwidth Measurement” function to measure the Occupied Bandwidth.

9.3.1 Upper antenna



9.3.2 Lower antenna



SECTION 10. LIST OF MEASURING INSTRUMENTS

Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.
All measurements equipment used for the measurement is calibrated based on standard.
Each measurement result is traceable to national or international standards.
Antenna used for the measurement is calibrated based on the ANSI C63.5-2006.

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Conducted disturbance at mains terminals					
LISN (EUT)	ESH2-Z5	892377/022	ROHDE & SCHWARZ	1 Y	Aug. 31, 18
10 dB Attenuator	CFA-01	CEC052	TAMAGAWA		
LISN (Peripheral)	ESH3-Z5	844982/001	ROHDE & SCHWARZ	1 Y	Oct. 31, 18
10 dB Attenuator	CFA-01	CEC1022	TAMAGAWA		
50 Ω Termination	CT-01	CE2012	TAMAGAWA	1 Y	May. 31, 18
Coaxial cable	5D-2W(5.5 m)	N3C-1	Intertek	1 Y	Jan. 31,19
Coaxial cable	5D-2W(1.6 m)	N3C-2	Intertek		
Coaxial cable	5D-2W(0.7 m)	N3C-3	Intertek		
Coaxial cable	5D-2W(1.6 m)	N3C-4	Intertek		
RF Switch	ACX-150-1	CE3010	Intertek		
Test receiver	ESS (Firmware Version 1.21)	842123/008	ROHDE & SCHWARZ	1 Y	Mar. 31, 18
Radiated disturbance (9 kHz-1000 MHz)					
Loop Antenna	HFH2-Z2	892665/008	ROHDE & SCHWARZ	1 Y	Apr. 30, 18
Coaxial cable	3D-2V(15m)	CL1	Intertek	1 Y	Feb. 28, 18
Broad Band antenna	LPB-2513/A	1092	A.R.A.	1 Y	Jul. 31, 18
6 dB Attenuator	8491A	36306	HEWLETT PACKARD		
Step Attenuator	8494B	2726A13828	HEWLETT PACKARD	1 Y	Jan. 31, 19
Amplifier	8447D	2727A05048	HEWLETT PACKARD		
Coaxial cable	5D-2W(20.0 m)	N2R-1	Intertek		
Coaxial cable	5D-2W(3.1 m)	N2R-2	Intertek		
Coaxial cable	5D-2W(0.4 m)	N2R-3	Intertek		
Coaxial cable	5D-2W(0.4 m)	N2R-4	Intertek		
Coaxial cable	5D-2W(0.4 m)	N2R-5	Intertek		
Coaxial cable	5D-2W(2.0 m)	N2R-6	Intertek		
RF Switch	ACX-150-1	CE2010	Intertek		
Test receiver	ESS (Firmware Version 1.08)	845637/001	ROHDE & SCHWARZ	1 Y	Aug. 31, 18
Site Attenuation	-	-	-	1 Y	May. 31, 18

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Radiated disturbance (Above 1 GHz)					
Double Ridged antenna	BBHA9120D	278	Schwarzbeck	1 Y	Jun. 30, 18
6 dB Attenuator	SFA-01A 6 dB	CEC039	TAMAGAWA	1 Y	Jul. 31, 18
Amplifier (1-18 GHz)	EAU-3018GXA	10315	ELENA	1 Y	Jul. 31, 18
Coaxial cable	S04272B (0.7m)	G3 (11SMA/0.7N)	SUHNER	1 Y	Apr. 30, 18
Coaxial cable	S04272B (8.0m)	G5 (11SMA/8m)	SUHNER	1 Y	Sep. 30, 18
Spectrum Analyzer	8563E (ROM revision 960830)	3650A06436	HEWLETT PACKARD	1 Y	Aug. 31, 18
SVSWR	-	-	-	1 Y	Sep. 30, 18
Common					
Testing Software	emiT (Version 3,0,0,0)	-	-	-	-
Frequency Tolerance					
Spectrum Analyzer	N9000A	MY51260520	Agilent	1 Y	May. 31, 18
Digital Multi Meter	8846A	9642018	FLUKE	1 Y	Jul. 31, 18
Temperature Chamber	PL-3F	5103661	Tabai	-	None
Temperature Meter	TR-71nW	52160B67	T&D	1 Y	Dec. 31, 18
Coil antenna	None	None	Intertek Japan	-	None
GPS Receiver	HP Z3801A	3542A02414	Hewlett Packard	-	None
Coaxial Cable	3D-2V	KSR00101	Daiyu Densen	-	Mar. 28, 19
Occupied Bandwidth					
Spectrum Analyzer	N9030A	MY52350520	Agilent	1 Y	Mar. 31, 18

ANNEX

A. TEST PROCEDURE(S)

Test was carried out under the following conditions.

Conducted disturbance at mains terminals

Test setup as per standard

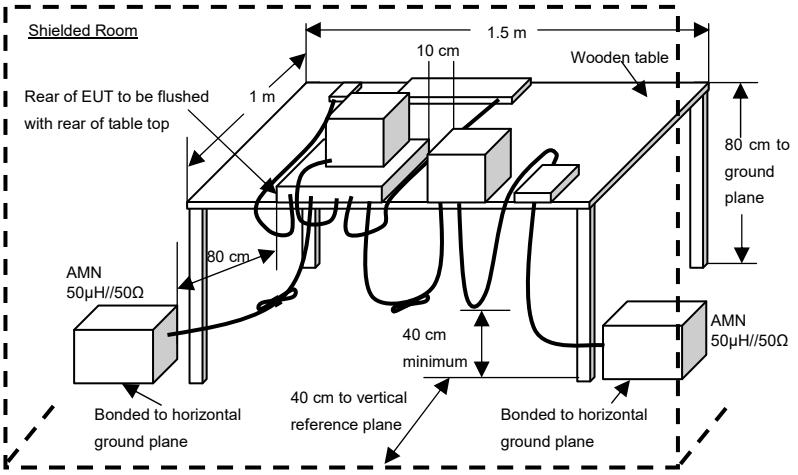
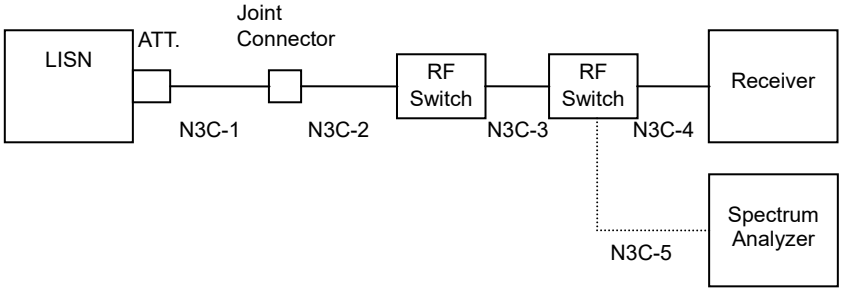


Diagram of the measuring instruments



Setting for the instruments

Frequency [MHz]	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
0.15 – 30	Receiver	Quasi Peak	10 kHz	N/A
		Average	10 kHz	N/A

[Preliminary Measurement]
EUT is tested on all operating conditions.
The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart is plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.
All leads other than safety ground are tested.

[Final Measurement]
The EUT is operated in the worst emission condition found by the preliminary test.
The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.
At least six highest spectrum are measured in quasi-peak and average (if necessary) using the test receiver.

Radiated disturbance

Test setup as per standard

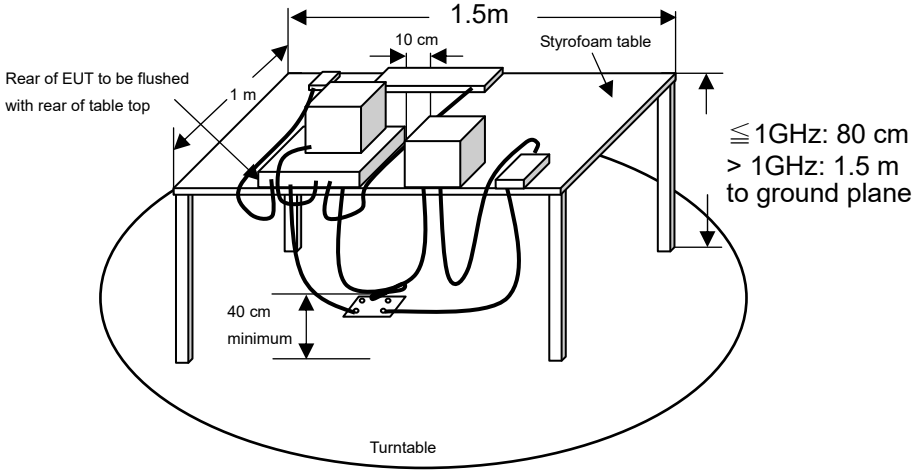
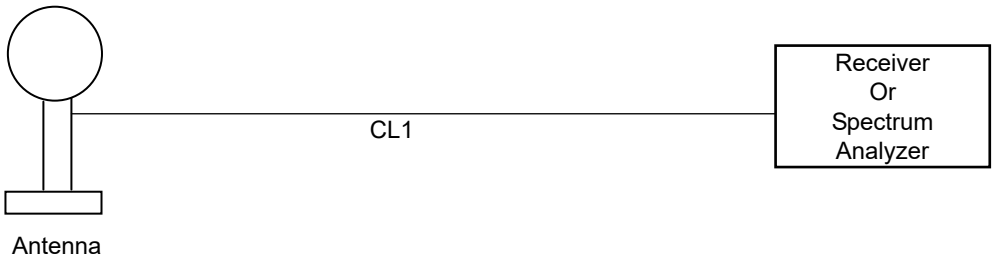
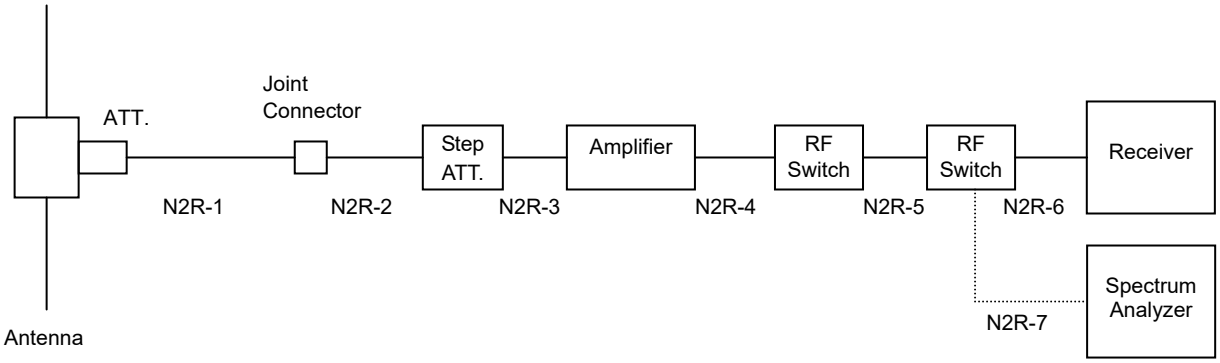


Diagram of the measuring instruments

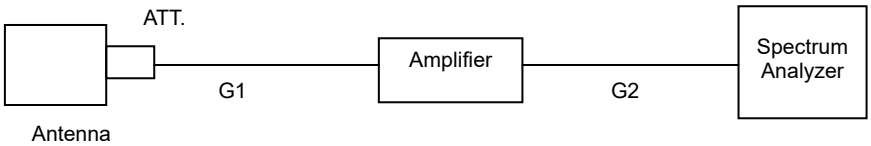
0.009 – 30MHz



30 – 1000 MHz



Above 1GHz



Test was carried out under the following conditions.