



TEST REPORT

**STANDARD : FCC Part 15 Subpart C
Industry Canada RSS-210 Issue 8**

Applicant	Testing Laboratory
NIDEC SANKYO CORPORATION 5329 Shimosuwa-machi, Suwa-gun, Nagano, 393-8511 Japan Tel: +81 266 27 259	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	ID card reader
Trademark	Sankyo
Model(s)	ISI221-0131
Serial No.	DS R-5110006
Equipment Authorization	Certification (FCC ID : WJ6-ISI221013101A / IC ID : 7863A-ISI2210131A)
Test Result	Complied
Report Number	16010006JNA-002
Original Issue Date	January 29, 2016
Revised Issue Date	February 6, 2016

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Approved by

Yoshihide Mimura
[Manager]

Tested by

Naohei Murakami
[Test Engineer]

TABLE OF CONTENTS

	Page
SECTION 1. GENERAL INFORMATION	3
SECTION 2. SUMMARY OF TEST RESULTS	4
SECTION 3. EQUIPMENT UNDER TEST	5
SECTION 4. SUPPORT EQUIPMENT	6
SECTION 5. USED CABLE(S).....	7
SECTION 6. TEST CONFIGURATION	8
SECTION 7. OPERATING CONDITION	9
SECTION 8. TEST PROCEDURE(S)	10
SECTION 9. UNCERTAINTY	16
SECTION 10. EVALUATION OF TEST RESULTS.....	17
SECTION 11. LIST OF MEASURING INSTRUMENTS	25

SECTION 1. GENERAL INFORMATION**Test Performed**

EUT Received	December 9, 2015
Date of Test	From: January 5, 2016 to January 7, 2016
Standard Applied	FCC Part 15 Subpart C RSS-GEN Issue 4 2014
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	Designation Number : JP0010	USA
IC	EMC Testing	2042O-1	CANADA
SAUDI ARABIA	EMC Testing	N/A	

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

Revision Summary

Revised Date	Section	Description of Changes
February 6, 2016	7	Add a comment and change the operation cycle.
February 6, 2016	10	Add a comment to data sheet (Page 19, 20)

SECTION 2. SUMMARY OF TEST RESULTS

See Section9 for the detailed result.

Test	Reference < FCC >	Result
Conducted disturbance at mains terminals	FCC 15.207 IC RSS-GEN Section 8.8	Pass
Radiated disturbance	FCC 15.205 FCC 15.209 IC RSS-GEN Section 7	Pass
Voltage Varied	FCC 15.31 (e)	Pass
Occupied Bandwidth	IC RSS-GEN Section 6.6	Pass
Frequency Stability	IC RSS-GEN Section 8.11	Pass

Note :

1. As for the FCC Part 15 Subpart B-Unintentional Radiators, the EUT has been measured and declared as DoC by NIDEC SANKYO CORPORATION.
2. See Section 10 for details.

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	ID card reader	ISI221-0131	DS R-5110006	NIDEC SANKYO CORPORATION	-
A2	AC adapter	SPU61A-108	S01952571545	SINPRO	Accessories
Rated Power : AC100-240 V, 47-63 Hz, 1.45 A					
Supplied Power : AC120 V, 60 Hz					
Condition of Equipment		PreProduction			
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	Continuous test mode	Highest Frequency

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	D03D	HZD4RBX	DELL	DoC
C	LCD	E1910Hc	CN-0C197P-64180-05L-0ZEU	DELL	DoC
D	Keyboard	L100	CN-0RH657-65890-04M-00N7	DELL	DoC
E	Mouse	M-UAR DEL7	LZ018HC579H	DELL	DoC
F	Modem	C202A	010948	EPSON	BKM552C202A
G	AC Adapter	RD-9416	Y8541	National	N/A
H	ID card	G05A251A01	None	TMP CO.,LTD	N/A
Supplied Power:					
B, C, G	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	2.80	Yes	Yes	
2	Video cable	1.50	Yes	Yes	Fixed x 2
3	Keyboard cable	2.00	Yes	Yes	Fixed x 1
4	Mouse cable	1.80	Yes	Yes	
5	Modem cable	2.10	Yes	Yes	
6	Power cable for EUT (DC)	1.20	No	No	Fixed x 1
7	Power cable for Modem (DC)	2.10	No	No	
8	Power cable for EUT (AC: 3 cores)	1.80	No	No	
9	Power cable for Computer (AC: 3 cores)	1.90	No	No	
10	Power cable for LCD (AC: 3 cores)	1.80	No	No	

Note :

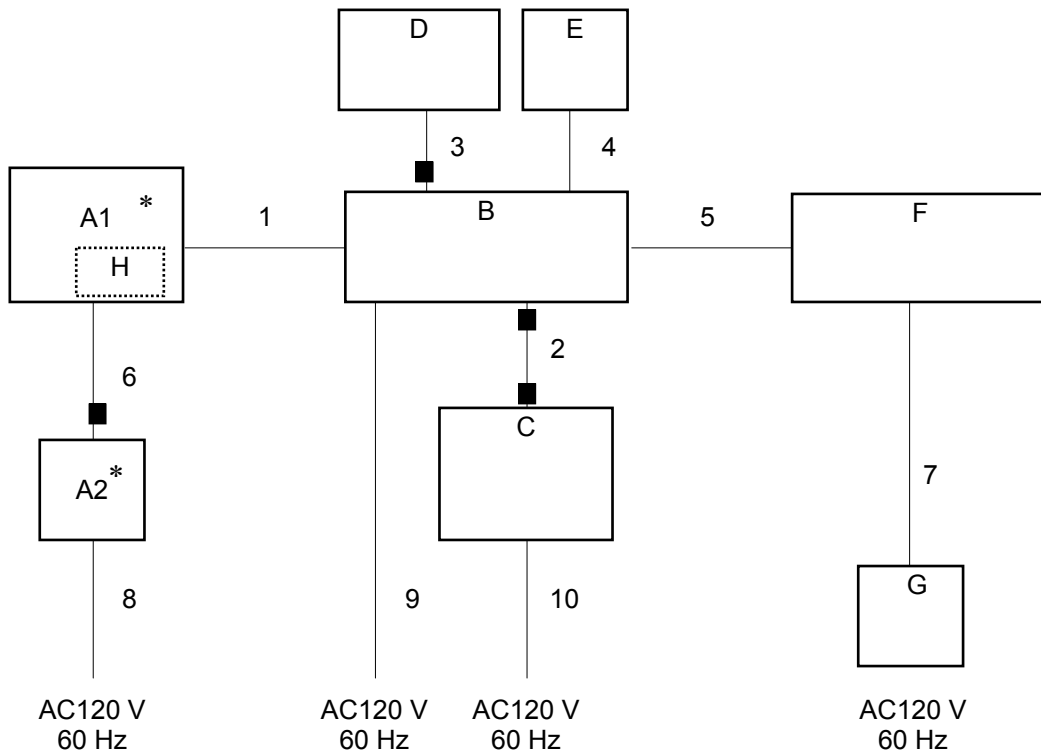
1. No.2 cable is supplied together with LCD.
2. No.3 cable is supplied together with Keyboard.
3. No.6 cable is supplied together with EUT by the applicant.

SECTION 6. TEST CONFIGURATION

6.1 Emission Tests

6.1.1 Continuous test mode

* : EUT
■ : Ferrite core



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

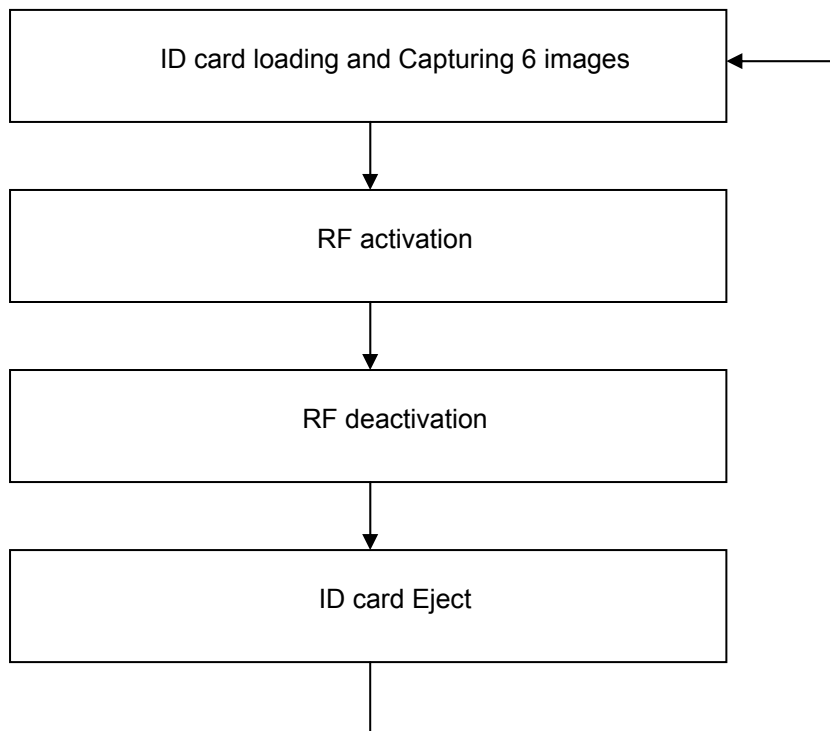
The test was carried out under the following mode.

7.1 Continuous test mode

Cycle time for operation: 10 sec

Test Program: Isi221_test.exe

The operation was repeated consecutively permanently by the cycle of 10 seconds like the following flow. Card loading and eject are automatically carried out by a test program (Isi221_test.exe).



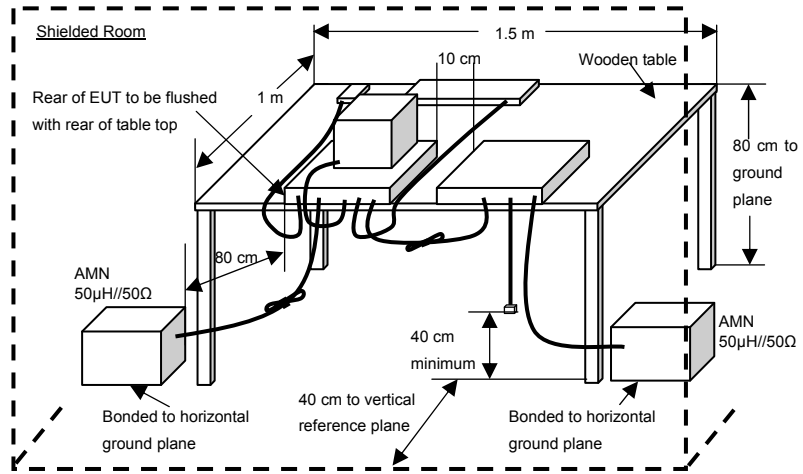
Note ; The test was carried out at the time of RF activation

SECTION 8. TEST PROCEDURE(S)

Test was carried out under the following conditions.

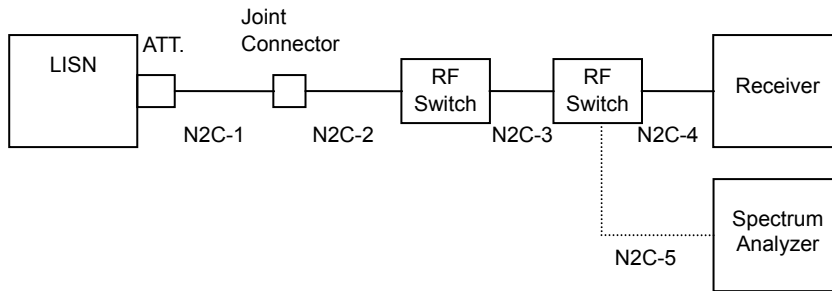
Conducted disturbance at mains terminals

Test setup as per standard



* Reference Ground plane : greater than 2 x 2m

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

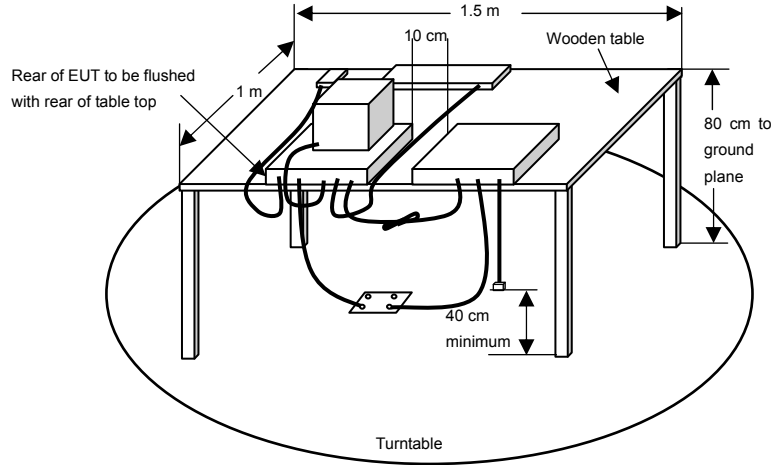
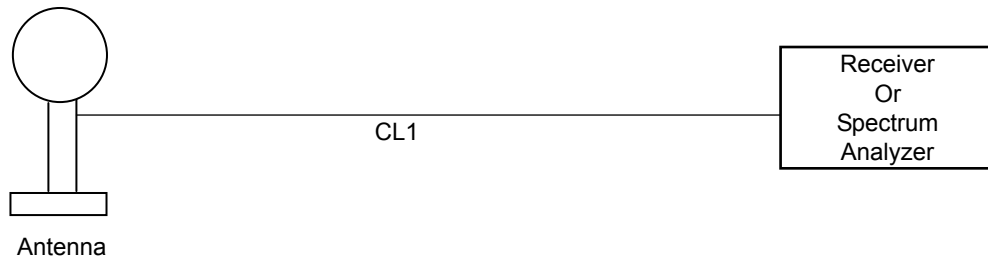
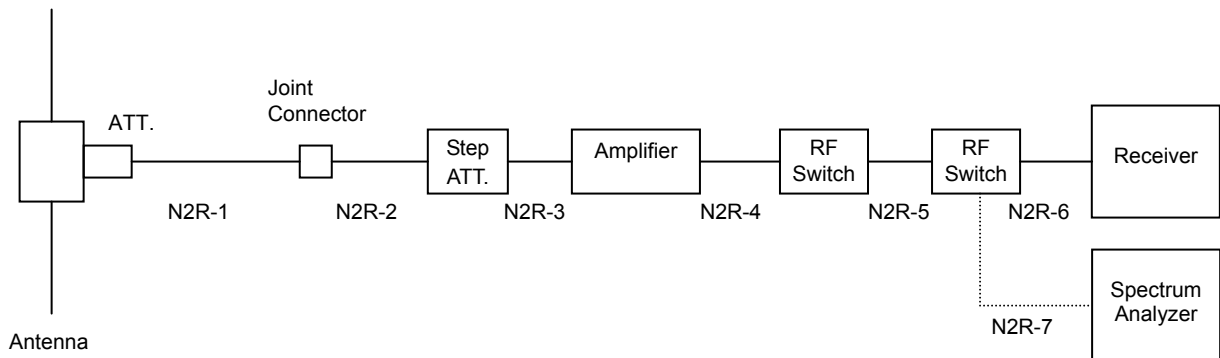


Diagram of the measuring instruments

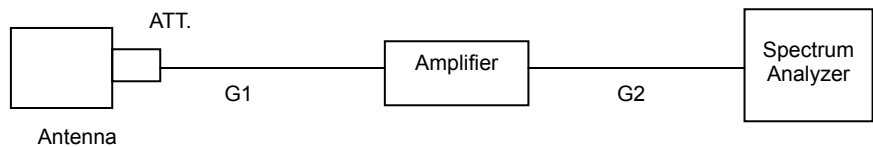
0.009 – 30MHz



30 – 1000 MHz



Above 1GHz



< Below 30MHz >**Setting for the Measuring instruments**

Frequency [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.009 – 0.15	Receiver	Quasi Peak	200 kHz	N/A
0.15 - 30	Receiver	Quasi Peak	10 kHz	N/A

[Preliminary Measurement]

EUT is tested on all operating conditions.

The Loop antenna is used for Magnetic field measurements on the frequency range 0.009 – 30 MHz.

The antenna mast is attachable to the Loop antenna and antenna's center height is set 1 meter above the ground. Antenna angle is adjustable 0 to 360 degree and antenna polarization is also changed. (vertical and horizontal)The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to find the worst emission conditions in configuration, operating mode, or ambient noise notation.

[Final Measurement]

The EUT operated in the worst emission condition found by the preliminary test.

The turntable azimuth (EUT direction) and antenna angle are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. Higher spectrum is measured by the test receiver (quasi-peak)

< 30 - 1000MHz >**Setting for the instruments**

Frequency [MHz]	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
30 – 1000	Receiver	Quasi Peak	120 kHz	N/A
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
		Average	1 MHz	10 Hz

[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree, And find the worst emission conditions in configuration, operating mode, or ambient noise notation.

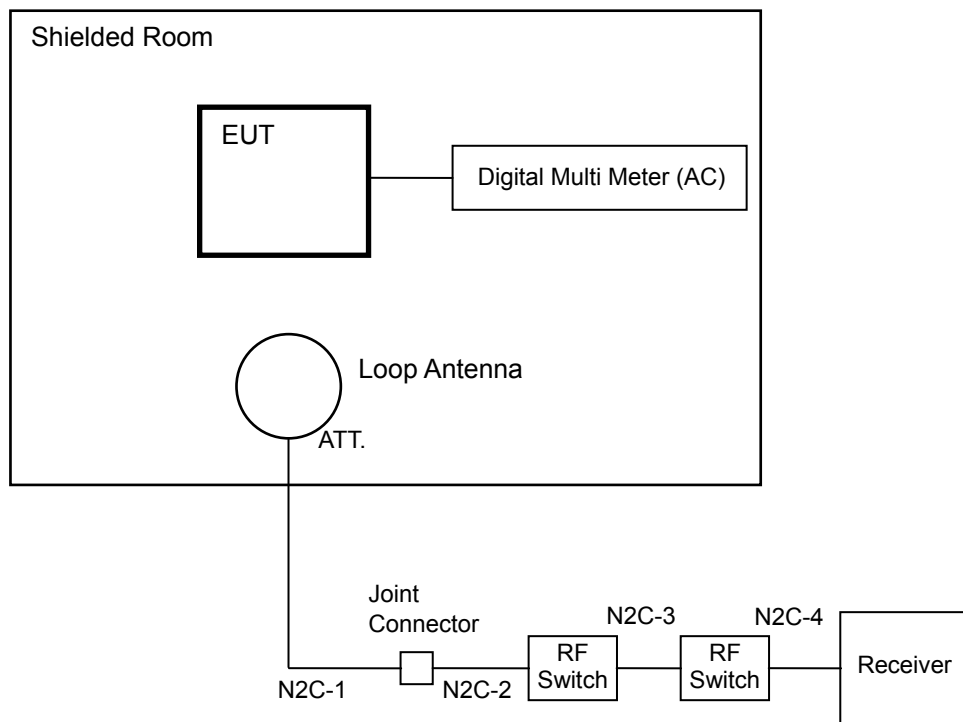
[Final Measurement]

The EUT operated in the worst emission condition found by the preliminary test.

The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. At least six highest spectrums are measured by the test receiver (quasi-peak) and spectrum analyzer (peak and average). When the uncertain result was obtained (30 – 1000 MHz), the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

Voltage Varied



[Preliminary Measurement]

EUT is tested on all operating conditions.

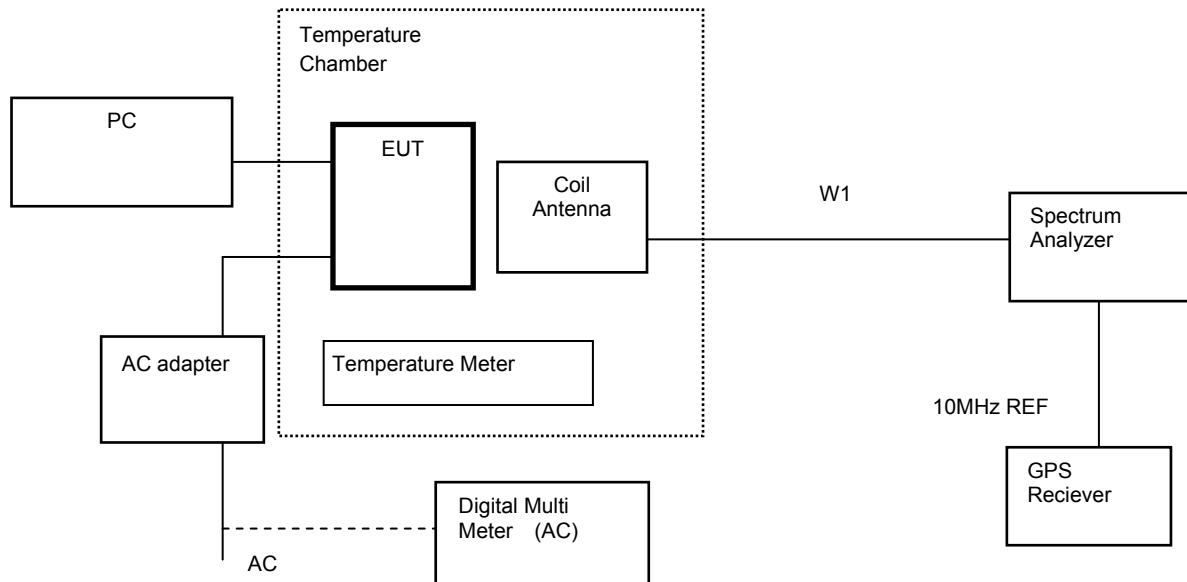
The power supply voltage to the EUT was varied from 85% to 115% of the normal value measured at the input to the EUT.

[Final Measurement]

The EUT operated in the worst emission condition found by the preliminary test.

The power supply voltage to the EUT was varied from 85% to 115% of the normal value measured at the input

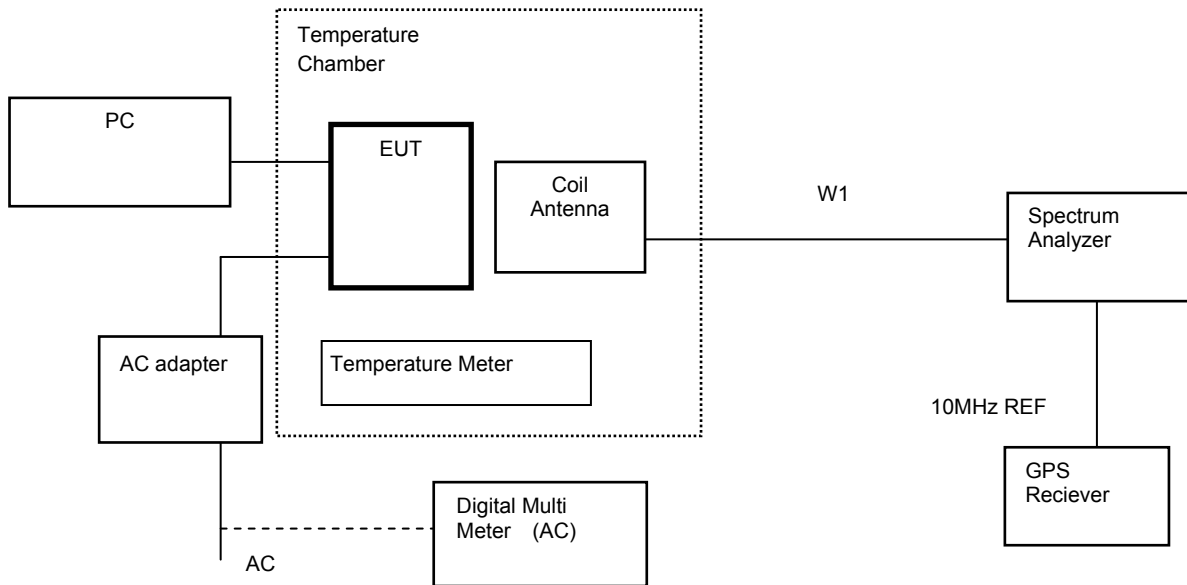
Occupied Bandwidth



Test Procedure

- 1 The EUT and test equipment were set up.
- 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 99% Occupied Bandwidth.

Frequency Stability (Temperature Variation)



Test Procedure

- 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 state.
Measure the output frequency.
- 5 Make the EUT the receiving state.
- 6 Set the temperature +20 degrees C and +50 degrees C.
And repeat test procedure 4 to 6

SECTION 9. 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 CISPR22	+/- 4.80 dB	5.2 dB
ANCI C63.4	+/- 4.44 dB	Nil
Radiated disturbance at 10m		
30 MHz – 1000 MHz	+/- 4.81 dB	6.3 dB
Above 1 GHz	+/- 4.84 dB	Nil
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.

SECTION 10. EVALUATION OF TEST RESULTS

10.1 Conducted disturbance at mains terminals

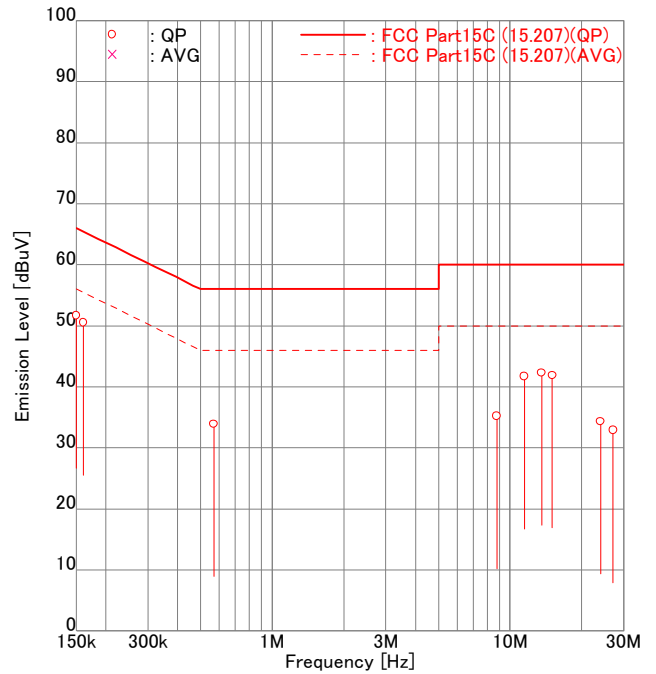
10.1.1 Continuous test mode

Intertek Japan K.K.

Nagano No.2 Test Site

AC Conducted Emission Test

APPLICANT : NIDEC SANKYO CORPORATION
 EUT NAME : ID card reader
 MODEL NO. : ISI221-0131
 SERIAL NO. : DS R-5110006
 TEST MODE : Continuous test mode
 POWER SOURCE : AC120 V, 60 Hz
 DATE TESTED : Jan 06 2016
 FILE NO. : -
 REGULATION : FCC Part15C (15.207)
 TEST METHOD : ANSI C63.10 :2013
 TEMPERATURE : 20.9 [degC]
 HUMIDITY : 32.0 [%]
 NOTE : -



ENGINEER : Naohei Murakami

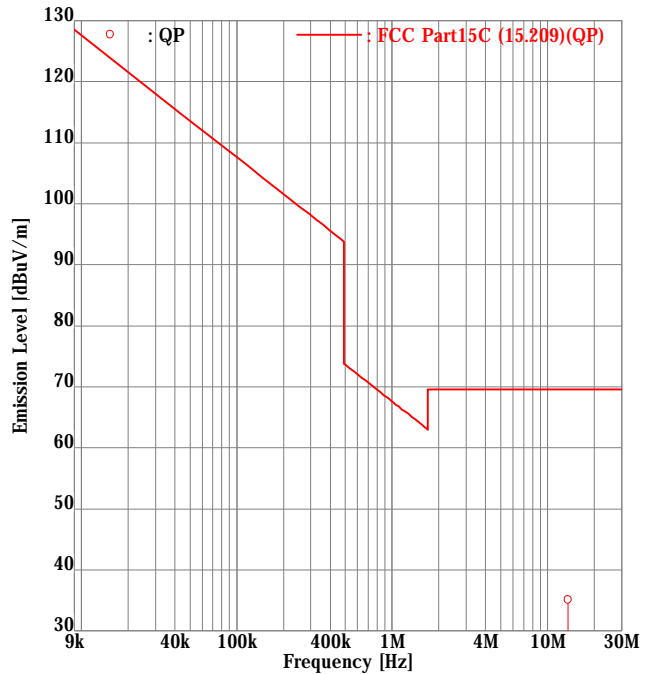
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	<u>41.5</u>	40.1	10.2	10.2	<u>51.7</u>	50.3	66.0	<u>14.3</u>	15.7
2	0.1611	QP	<u>40.3</u>	40.2	10.2	10.2	<u>50.5</u>	50.4	65.4	<u>14.9</u>	15.0
3	0.5681	QP	23.0	<u>23.7</u>	10.2	10.2	33.2	<u>33.9</u>	56.0	22.8	<u>22.1</u>
4	8.7800	QP	13.0	<u>24.5</u>	10.7	10.7	23.7	<u>35.2</u>	60.0	36.3	<u>24.8</u>
5	11.4750	QP	27.2	<u>30.9</u>	10.9	10.8	38.1	<u>41.7</u>	60.0	21.9	<u>18.3</u>
6	13.5600	QP	30.9	<u>31.4</u>	10.9	10.9	41.8	<u>42.3</u>	60.0	18.2	<u>17.7</u>
7	15.0541	QP	29.9	<u>30.9</u>	11.0	11.0	40.9	<u>41.9</u>	60.0	19.1	<u>18.1</u>
8	24.0050	QP	23.1	<u>22.9</u>	11.2	11.2	34.3	<u>34.1</u>	60.0	25.7	<u>25.9</u>
9	27.1200	QP	21.8	<u>20.3</u>	11.1	11.2	32.9	<u>31.5</u>	60.0	27.1	<u>28.5</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15C (15.207) limit
 Emission Level = Read + Factor(LISN,Pad,Cable)

10.2 Radiated disturbance
10.2.1 Continuous test mode
0.009 – 30 MHz

Intertek Japan K.K.
Nagano No.2 Test Site
 Radiated Magnetic Field

APPLICANT : NIDEC SANKYO CORPORATION
 EUT NAME : ID card reader
 MODEL NO. : ISI221-0131
 SERIAL NO. : DS R-5110006
 TEST MODE : Continuous test mode
 POWER SOURCE : AC120 V, 60 Hz
 DATE TESTED : Jan 06 2016
 FILE NO. : -
 REGULATION : FCC Part15C (15.209)
 TEST METHOD : ANSI C63.10 :2013
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.4 [degC]
 HUMIDITY : 26.0 [%]
 NOTE : -



ENGINEER : Naohei Murakami

FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
		Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert		
1	13.5600	31.6	<u>34.6</u>	0.5	0.5	32.1	<u>35.1</u>	69.5	37.4	<u>34.4</u>	

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

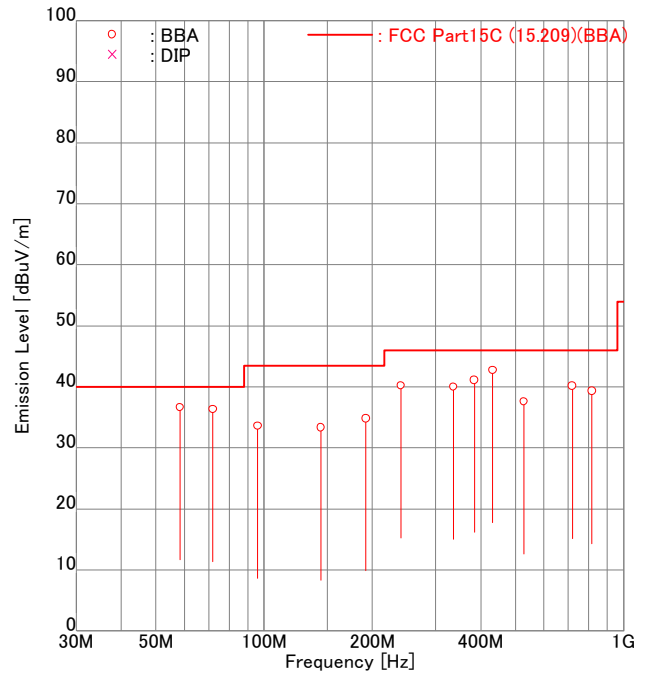
30 - 1000 MHz

Intertek Japan K.K.

Nagano No.2 Test Site

Spurious Emissions - Radiated Test

APPLICANT : NIDEC SANKYO CORPORATION
 EUT NAME : ID card reader
 MODEL NO. : ISI221-0131
 SERIAL NO. : DS R-5110006
 TEST MODE : Continuous test mode
 POWER SOURCE : AC120 V, 60 Hz
 DATE TESTED : Jan 05 2016
 FILE NO. : -
 REGULATION : FCC Part15C (15.209)
 TEST METHOD : ANSI C63.10 :2013
 DISTANCE : 3.00 [m]
 TEMPERATURE : 23.3 [degC]
 HUMIDITY : 26.0 [%]
 NOTE : -



ENGINEER : Naohei Murakami

FREQ [No]	FREQ [MHz]	ANT.	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert
1	58.41	BBA	-	<u>47.2</u>	-10.6	-10.6	-	<u>36.6</u>	40.0	-	<u>3.4</u>	
2	72.00	BBA	-	<u>48.8</u>	-12.5	-12.5	-	<u>36.3</u>	40.0	-	<u>3.7</u>	
3	96.02	BBA	42.9	-	-9.3	-9.3	33.6	-	43.5	9.9	-	
4	144.00	BBA	-	36.7	-3.4	-3.4	-	33.3	43.5	-	10.2	
5	192.00	BBA	35.5	-	-0.7	-0.7	34.8	-	43.5	8.7	-	
6	240.00	BBA	<u>39.3</u>	36.3	0.9	0.9	<u>40.2</u>	37.2	46.0	<u>5.8</u>	8.8	
7	336.00	BBA	40.2	-	-0.2	-0.2	40.0	-	46.0	6.0	-	
8	384.00	BBA	<u>39.8</u>	-	1.3	1.3	<u>41.1</u>	-	46.0	<u>4.9</u>	-	
9	432.00	BBA	<u>40.1</u>	-	2.6	2.6	<u>42.7</u>	-	46.0	<u>3.3</u>	-	
10	528.00	BBA	32.3	-	5.3	5.3	37.6	-	46.0	8.4	-	
11	720.00	BBA	29.3	<u>32.5</u>	7.6	7.6	36.9	<u>40.1</u>	46.0	9.1	<u>5.9</u>	
12	816.00	BBA	30.4	<u>29.2</u>	8.9	8.9	39.3	<u>38.1</u>	46.0	6.7	<u>7.9</u>	

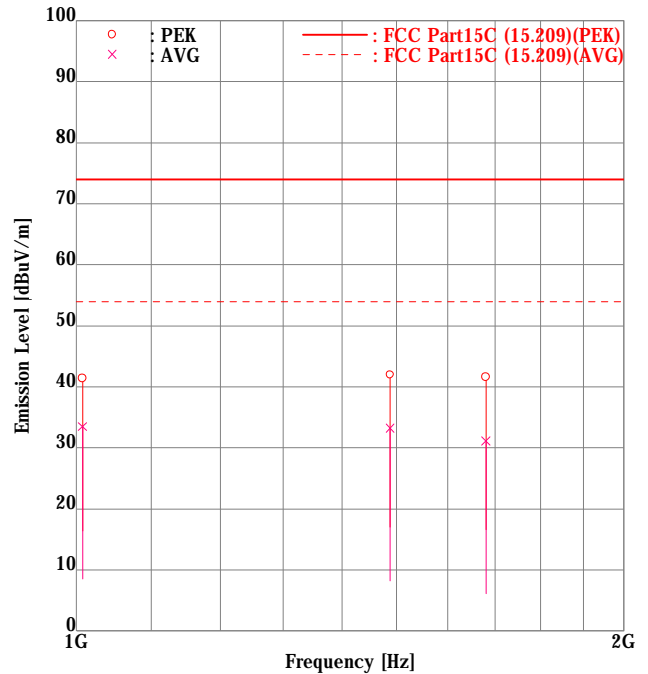
All the emissions reported above are radiated from the host PC and supporting equipment which are un-intentional radiators and these emissions are not radiated from the intentional radiator portion of the EUT.

Higher six points are underlined.
 Other frequencies : Below the FCC Part15C (15.209) limit
 Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

1000 - 2000 MHz

Intertek Japan K.K.
Nagano
 Radiated Electric Field

APPLICANT : NIDEC SANKYO CORPORATION
 EUT NAME : ID card reader
 MODEL NO. : ISI221-0131
 SERIAL NO. : DS R-5110006
 TEST MODE : Continuous test mode
 POWER SOURCE : AC120 V, 60 Hz
 DATE TESTED : Jan 07 2016
 FILE NO. : -
 REGULATION : FCC Part15C (15.209)
 TEST METHOD : ANSI C63.10 :2013
 DISTANCE : 3.80 [m]
 TEMPERATURE : 17.1 [degC]
 HUMIDITY : 41.0 [%]
 NOTE : -



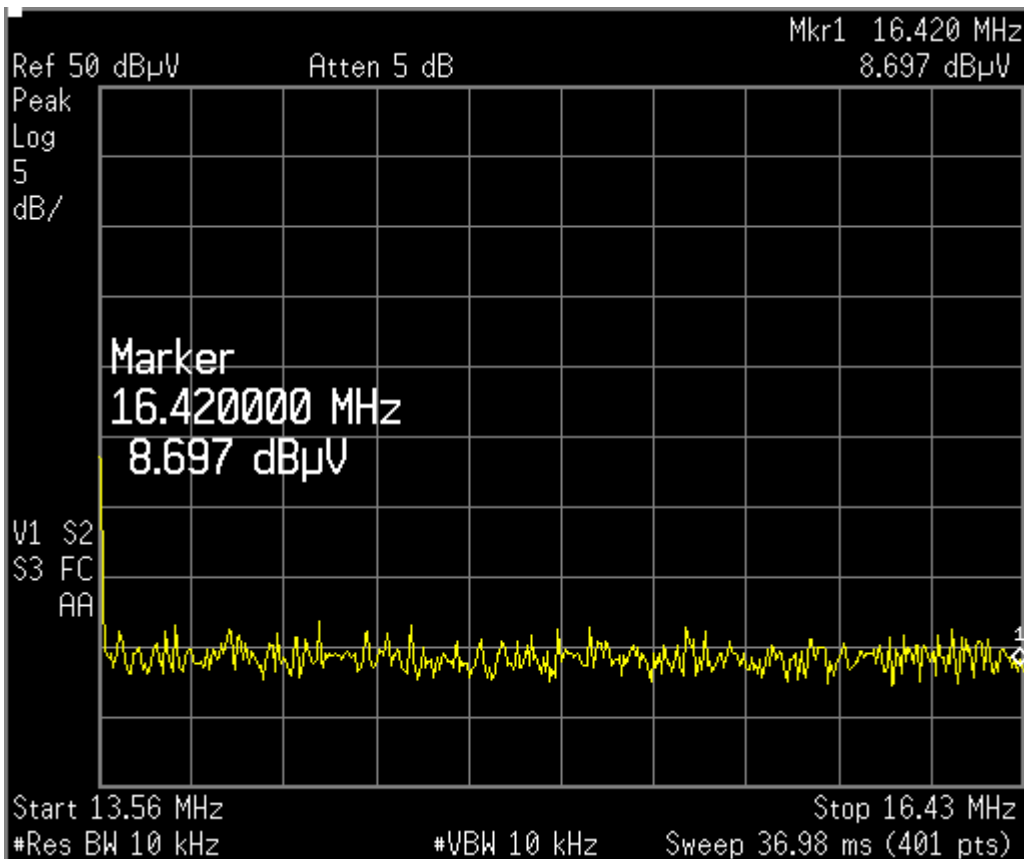
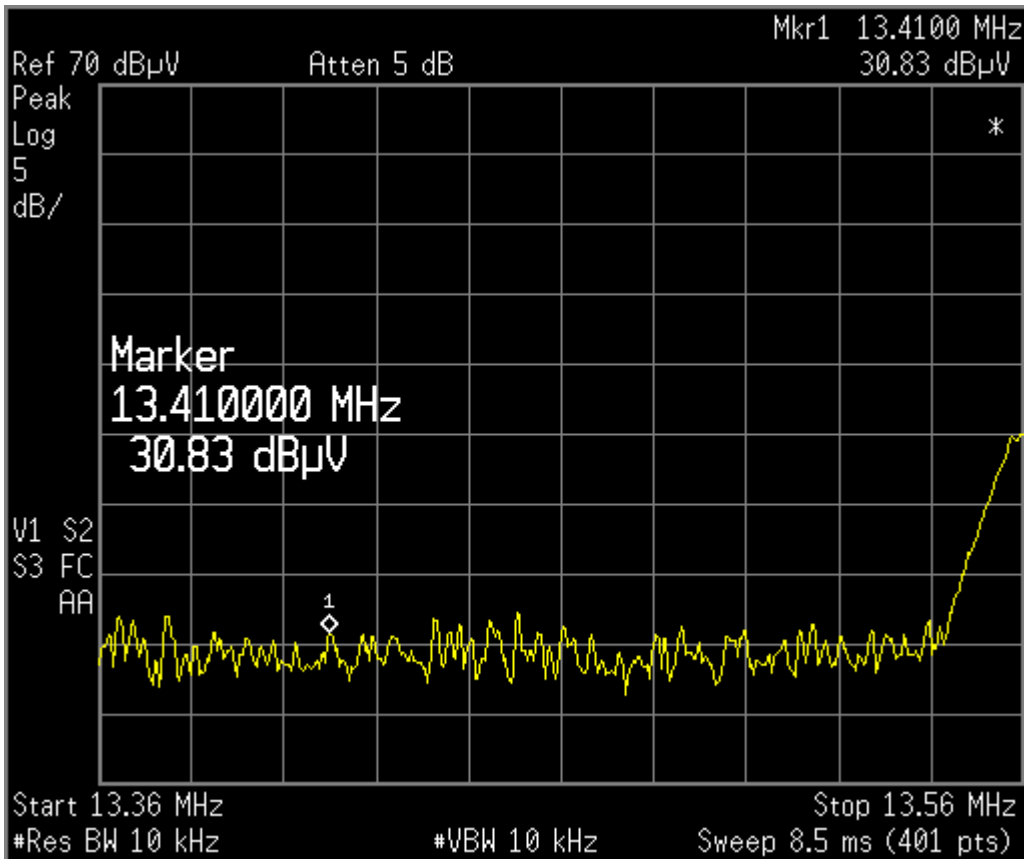
ENGINEER : Naohei Murakami

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert		
1	1008.03	PEK	42.9	<u>43.2</u>	-1.8	-1.8	41.1	<u>41.4</u>	74.0	32.9	<u>32.6</u>	
2	1008.03	AVG	<u>35.3</u>	34.4	-1.8	-1.8	<u>33.5</u>	32.6	54.0	20.5	21.4	
3	1488.01	PEK	-	<u>42.3</u>	-0.3	-0.3	-	<u>42.0</u>	74.0	-	<u>32.0</u>	
4	1488.01	AVG	-	<u>33.5</u>	-0.3	-0.3	-	<u>33.2</u>	54.0	-	<u>20.8</u>	
5	1680.07	PEK	<u>42.3</u>	-	-0.7	-0.7	<u>41.6</u>	-	74.0	<u>32.4</u>	-	
6	1680.07	AVG	<u>31.8</u>	-	-0.7	-0.7	<u>31.1</u>	-	54.0	<u>22.9</u>	-	

All the emissions reported above are radiated from the host PC and supporting equipment which are un-intentional radiators and these emissions are not radiated from the intentional radiator portion of the EUT.

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

10.3 Restricted bands of operation

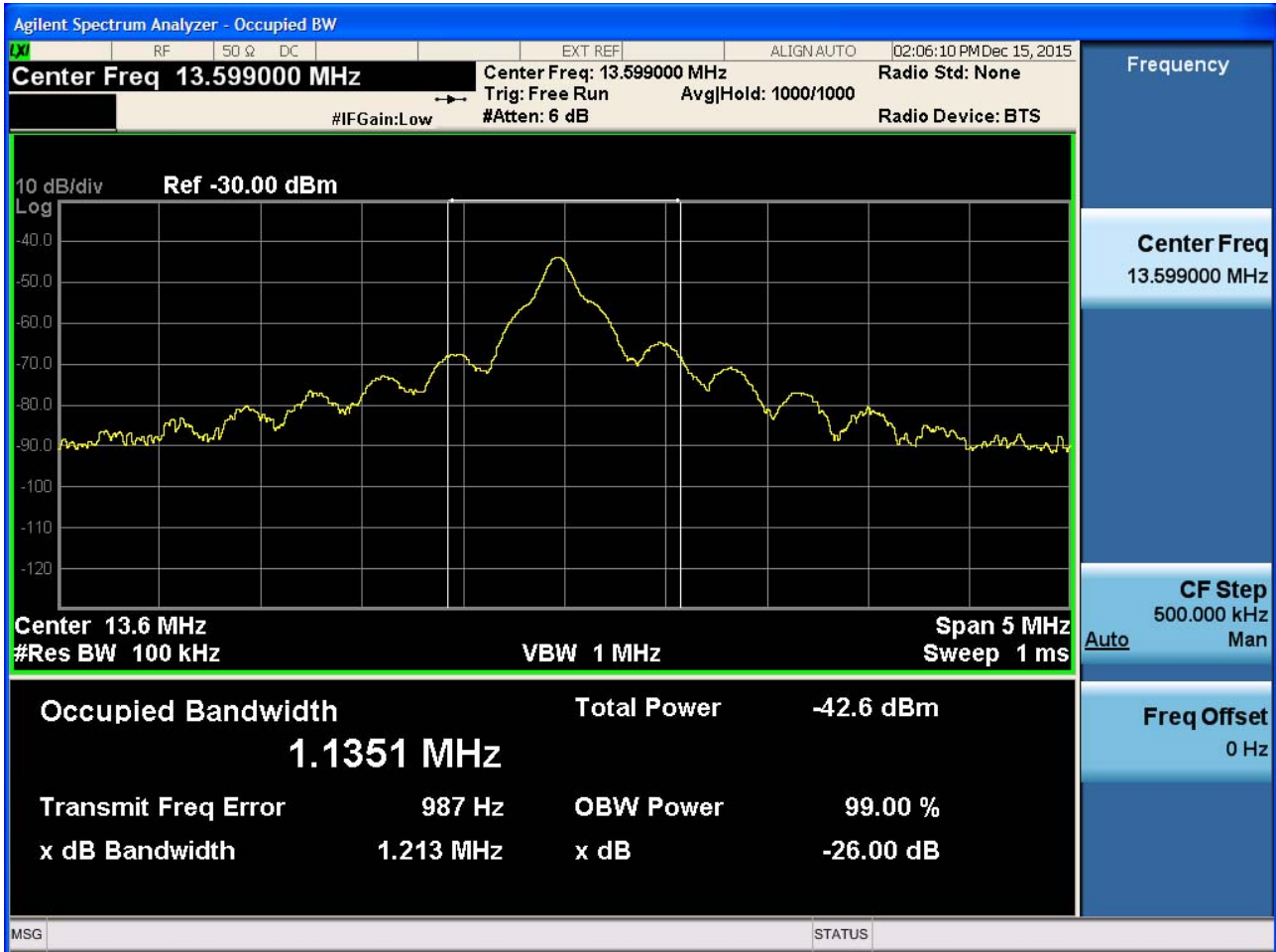


10.4 Voltage Varied

Tested Date : December 8, 2010
 : + 50ppm = 13.560678 [MHz]
 : - 50ppm = 13.559322 [MHz]
 Engineer : Naohei Murakami

Supply Voltage [V]		Operation Frequency [MHz]	Meter Reading [dBμV/m]	Result
85%	102	13.55988	36.8	Pass
100%	120	13.55988	36.8	Pass
115%	138	13.55988	36.8	Pass

10.5 Occupied Bandwidth



Frequency (MHz)	99% Occupied Bandwidth (MHz)
13.599000	1.1351

10.6 Frequency Stability (Temperature Variation)

MHz	Temperature (Degree C)	Voltage (%)	Frequency (MHz)	Deviation (ppm)	Limit (+/-) (ppm)	Margin
13.56	-30		13.559936	2.38	100.0	2.38
	20	100	13.559903	0.00	100.0	0.00
	50		13.559809	-6.94	100.0	6.94

SECTION 11. LIST OF MEASURING INSTRUMENTS

Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.

11.1 Emission tests

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective Period
Conducted disturbance at mains terminals					
LISN (EUT)	ESH2-Z5	843890/007	ROHDE & SCHWARZ	1 Y	Feb. 2016
10 dB Attenuator	CFA-01	CE2025	TAMAGAWA		
LISN (Peripheral)	ESH3-Z5	844982/030	ROHDE & SCHWARZ	1 Y	Jan,2016
10 dB Attenuator	CFA-01	CEC064	TAMAGAWA		
50 Ω Termination	CT-01	CE2012	TAMAGAWA	1 Y	Dec, 2016
Coaxial cable	5D-2W(5.0 m)	N2C-1	Intertek	1 Y	Dec, 2016
Coaxial cable	5D-2W(7.0 m)	N2C-2	Intertek		
Coaxial cable	5D-2W(0.4 m)	N2C-3	Intertek		
Coaxial cable	5D-2W(2.0 m)	N2C-4	Intertek		
RF Switch	ACX-150-1	CE2010	Intertek		
Test receiver	ESS (Firmware Version 1.21)	842886/011	ROHDE & SCHWARZ	1 Y	Nov, 2016
Testing Software	emiT (Version 3,0,0,0)				
Radiated disturbance					
Biconical antenna	BBA9106	CEC008	Schwarzbeck	1 Y	Jun, 2016
Logperiodic antenna	UHALP9108A	0146	Schwarzbeck	1 Y	Jun, 2016
Loop antenna	HFH2-Z2	892665/008	ROHDE & SCHWARZ	1 Y	Oct, 2016
6 dB Attenuator	8491A	36233	HEWLETT PACKARD	1 Y	Dec, 2016
Step Attenuator	8494B	2726A13828	HEWLETT PACKARD		
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		
Coaxial cable	3D-2V(15m)	CL1	Intertek	1 Y	Dec, 2016
Test receiver	ESS (Firmware Version 1.21)	842886/011	ROHDE & SCHWARZ	1 Y	Nov, 2016
Site Attenuation				1 Y	Apr, 2016

Double Ridged antenna	BBHA9120D	278	Schwarzbeck	1 Y	May, 2016
6 dB Attenuator	SFA-01A 6 dB	CEC039	TAMAGAWA	1 Y	May, 2016
Amplifier (1-18 GHz)	EAU-3018GXA	10315	ELENA	1 Y	May, 2016
Coaxial cable	SUCOFLEX 100 (0.2 m)	G2 (1513/2EA) CEC023	SUHNER	1 Y	May, 2016
Coaxial cable	S04272B (8.0m)	G5 (11SMA/8m)	SUHNER	1 Y	Jul, 2016
EMC Analyzer	E7403A (Firmware Rev.: A.11.00)	MY42000068	Agilent	1 Y	May, 2016
Testing Software	emiT (Version 3,0,0,0)				
Restricted bands of operation, Voltage Varied					
Loop antenna	HFH2-Z2	892665/008	ROHDE & SCHWARZ	1 Y	Oct, 2016
Coaxial cable	3D-2V(15m)	CL1	Intertek	1 Y	Dec, 2016
EMC Analyzer	E7403A (Firmware Rev.: A.11.00)	MY42000068	Agilent	1 Y	May, 2016
Occupied Bandwidth, Frequency Stability					
Spectrum Analyzer	N9030A	US51350170	Agilent	1 Y	Mar, 2016
Digital Multi Meter	8846A	9642018	FLUKE	1 Y	Jul, 2016
Temperature Chamber	PL-3F	5103661	Tabai	-	-
Temperature Meter	PC-5000TRH-II	A11999972	Sato		Nov, 2016
Coil antenna	None	None	Intertek Japan	-	-
GPS Receiver	HP Z3801A	3542A02414	Hewlett Packard	-	-