

RADIO TEST REPORT

(for NFC)

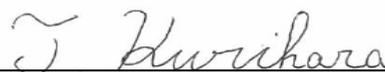
Project No. : JB-Z0144-B
 Client : Sony Corporation
 Address : 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
 Type of Equipment : Digital Music Player
 Model No. : NW-A35
 Serial No. : 1, 2
 FCC ID : AK8NWA30
 IC : 409B-NWA30
 Regulation Applied : 47 CFR Part 15 Subpart C / RSS-Gen Issue 4, RSS-210 Issue 8 + Amd.1
Final Judgment : **Passed**
 Sample Receipt : April 01, 2016
 Testing : June 07, 2016 - July 12, 2016
 Reported : July 12, 2016

Reported by :

Approved Signatory :



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TESTING CERT #3203.01

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Note

- indicates that the listed condition, standard or equipment is applicable for this report.
-indicates that the listed condition, standard or equipment is not applicable for this report.

1.3. Tested Methodology

Test Standard : 47 CFR Part 15 Subpart C
RSS-Gen Issue 4, RSS-210 Issue 8 + Amendment 1

Test Method : ANSI C63.10 - 2013

Test Condition

Radiated Spurious Emissions

Test Distance : 3 m 10m (9kHz - 30 MHz)
 3 m 10m (30 - 1000 MHz)

Dimensions of the EUT table : 0.8m height, 2m width and 1m depth.

AC Power-line Conducted Emissions

Dimensions of the EUT table : 0.8m height, 2m width and 1m depth.

1.4. Measurement Procedures

We performed the measurements in accordance with NV3-14, available upon the request.

- No deviation
 Deviation from the above procedure

The summary of the above procedure is mentioned below

20dB Bandwidth

1. The magnetic field probe was located near the EUT and connected to the spectrum analyzer.
2. For each EUT operation mode, the 20dB Bandwidth was measured with spectrum analyzer.
Detector type : Peak
RBW : 30kHz

99% Occupied Bandwidth

1. Magnetic field probe was placed close to the EUT and connected to the spectrum analyzer.
2. For each EUT operation mode, the 99% Occupied Bandwidth was measured with spectrum analyzer.
Detector type : Sample-peak
RBW : 10kHz

Frequency Tolerance

1. The EUT was placed in the temperature chamber.
2. The magnetic field probe was located near the EUT and connected to the spectrum analyzer.
3. For each EUT operation mode, the Frequency Tolerance was measured with spectrum analyzer at the start-up, and 2, 5, and 10 minutes, after the start-up.
Detector type : Peak
RBW : 100Hz
4. Frequency stability measurement was carried out from the high temperature to low temperature in order.

AC Power-line Conducted Emissions

1. The non-conductive table (EUT table) made of (FRP, wood, other non-conductive material) was placed 0.4 m from its rear to the vertical reference ground plane.
2. The EUT was placed on the center of tabletop and its rear was flush with the rear of the table, connected through a LISN to the input power mains.
3. The LISN was placed in 80 cm from the nearest part of the EUT chassis.
4. The excess length of the AC cable between the EUT and the LISN receptacle, or an adaptor or extension cable connected to and measured with LISN, was folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
5. The connection of the all other equipment to the second LISN was performed. The second LISN was terminated with a 50-ohm terminator.
6. Interconnecting cables that hang closer than 40 cm to the horizontal reference ground plane was folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between the horizontal reference ground plane and the tabletop.
7. Find the worst mode and arrangement of the EUT according to the follows:
 - Connecting all peripherals and change the position of peripherals and cables.
 - Changing the all test operation modes of the EUT.
 - On every condition, exploring the highest emissions with the spectrum analyzer.
(150kHz - 30MHz, peak detector, RBW: 10 kHz)
8. On the worst condition of the EUT found in above, choose the 6 highest emissions on the spectrum data. The final measurements carried out on these emissions with EMI test receiver.
(quasi-peak and average detector, RBW: 9 kHz)

Electric field strength (Fundamental and Spurious emissions)

- The non-conductive table (EUT table) made of (FRP, Styrene Foam, other non-conductive material) was placed in the center of the turntable.
- The EUT was placed on the center of the tabletop.
- The test antenna was placed away from the EUT at test distance.
- Find the worst arrangement of the EUT according to follows:
 - Rotating the turntable and/or scanning the antenna.
 - On every condition, exploring the highest emissions with the spectrum analyzer. (9 kHz - 1 GHz, peak detector)
- On the worst arrangement of the EUT found in above, choose the fundamental emissions and three highest harmonics or spurious emissions on the spectrum data.
The final measurements of all test operating modes carried out on these emissions as follows:

The test antenna and the turntable were performed with follows:

	9kHz - 30MHz	30MHz - 1000MHz
Antenna	Loop Antenna	Bi-conical Antenna, Log-periodic Antenna
Antenna scanning range	1m, Vertical, 360 degrees	1 - 4m, Horizontal and Vertical
Turntable rotating range	360 degrees	360 degrees

Instruments settings were carried out with follows:

	9 kHz - 90 kHz 110 kHz - 490 kHz	90 kHz- 110 kHz 490 kHz - 30 MHz	30 MHz - 1000 MHz
Detector	Peak / Average	Quasi-Peak	Quasi-Peak
RBW	200 Hz (6dB) or 9 kHz (6dB) *1	200 Hz (6dB) or 9 kHz (6dB) *1	120 kHz (6dB)
Instrument	EMI test receiver	EMI test receiver	EMI test receiver

*1: When the measurement frequencies below 150 kHz, RBW: 200 Hz was used.

- The measurement values were compensated the distance factor with follows:

$$9 \text{ kHz} - 490 \text{ kHz} [\text{value at } 300\text{m}] = [\text{value at } 3\text{m}] + 40\log(3[\text{m}] / 300[\text{m}])$$

$$490 \text{ kHz} - 30 \text{ MHz} [\text{value at } 30\text{m}] = [\text{value at } 3\text{m}] + 40\log(3[\text{m}] / 30[\text{m}])$$
- Although these tests were performed other than open field area test site, adequate comparison measurements were confirmed against 30 m open field area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

1.5. Test Facility

Address of Test Facility

Test Facility Name : Sony Global Manufacturing & Operations Corporation
EMC/ RF Test Laboratory, Main Lab.

Address : Kisarazu Site 8-4 Shiomi Kisarazu-shi Chiba, 292-0834 Japan

Phone : +81 438 37 2750

AC Power-line Conducted Emissions

Shielded Room
 4th Site

20dB Bandwidth / 99% Occupied Bandwidth

Shielded Room
 4th Site SR1

Frequency Tolerance

Shielded Room
 4th Site SR1

Electric field strength (Fundamental and Spurious emissions)

Semi-Anechoic chamber
 4th Site

A2LA Accreditation for Test Facility

The above test facility has been fully reported to A2LA and accepted as follows:
Effective dates: 2015-09-15 through 2017-10-31

Canada Registered Test Site

IC Assigned Code : 409R-1

1.6. Uncertainty

Test Item	4th Site SR1
Frequency Tolerance	$\pm 1.77 * 10^{-6}$

Test Item	Frequency	4th Site
AC Power-line Conducted Emissions	150kHz - 30MHz	± 3.34 dB
Radiated Emissions (EUT height 0.8m)	below 30 MHz	3m ± 2.59 dB
	30 - 300 MHz	3m ± 4.18 dB
	300 - 1000 MHz	3m ± 4.04 dB

2. System Test Configuration

2.1. Validation

The system was configured for testing in a typical (as a customer would normally use it).
The tests were conducted with the worst case modes as follows.

2.2. Test Operating Conditions

The tests have been carried out the following conditions.

Test Items	Operating Mode*1	Data Rate	Test Channels
AC Power-line Conducted Emissions	Type F (without Tag) *2, 4	212kbps *4	13.56MHz
Electric field strength (Fundamental and Spurious emissions), 20dB Bandwidth, 99% Occupied Bandwidth	Type A (without Tag) *2	106kbps	13.56MHz
	Type F (without Tag) *2	212kbps *3	
Frequency Tolerance	Unmodulated	-	13.56MHz

Note:

- *1: The operating mode(s) has been configured by the software: Diagnosis ver.1.02.10
- *2: The operating with Tag mode was performed while exploratory testing.
- *3: Data Rate has been decided based on the result of Electric field strength of fundamental emissions.
- *4: The final test was performed with the representative mode that had been found as the worst emission mode while exploratory testing.

Extreme test condition:

Test Items	Test Temperature	Test Voltage
Frequency Tolerance	-30 deg.C to +50 deg.C	3.7 V
	+20 deg.C	3.15 V and 4.26 V

Special accessories needed for connecting the EUT to achieve compliance:

Item	Manufacturer	Model No.	Serial No.	Remark
Tag (Type A)	SONY	-	-	-
Tag (Type F)	SONY	1-894-296-11	-	-

2.3. EUT Modifications

- No equipment modification to achieve compliance to the standard levels was done during the tests.
 Equipment was modified to achieve compliance to the standard level as below.

Responsible Party Signature

Typed/ Print Name :
Responsible Party :
Position :
Date :

2.4. Configuration of Tested System

Electric field strength Measurement

The equipment under test (EUT)

Symbol	Item	Manufacturer	Model No.	Serial No.
A	Digital Music Player	SONY	NW-A35	1

Support equipment for operation

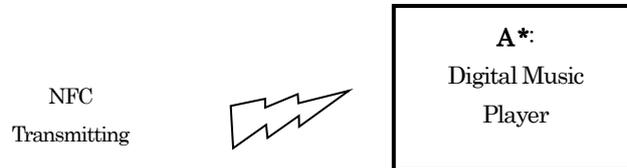
Symbol	Item	Manufacturer	Model No.	Serial No.
-	-	-	-	-

Type of cable

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Bundled	Length (m)
-	-	-	-	-	-	-

System configuration

*: EUT



20dB Bandwidth / 99% Occupied Bandwidth / Frequency Tolerance Measurements

The equipment under test (EUT)

Symbol	Item	Manufacturer	Model No.	Serial No.
A	Digital Music Player	SONY	NW-A35	2

Support equipment for operation

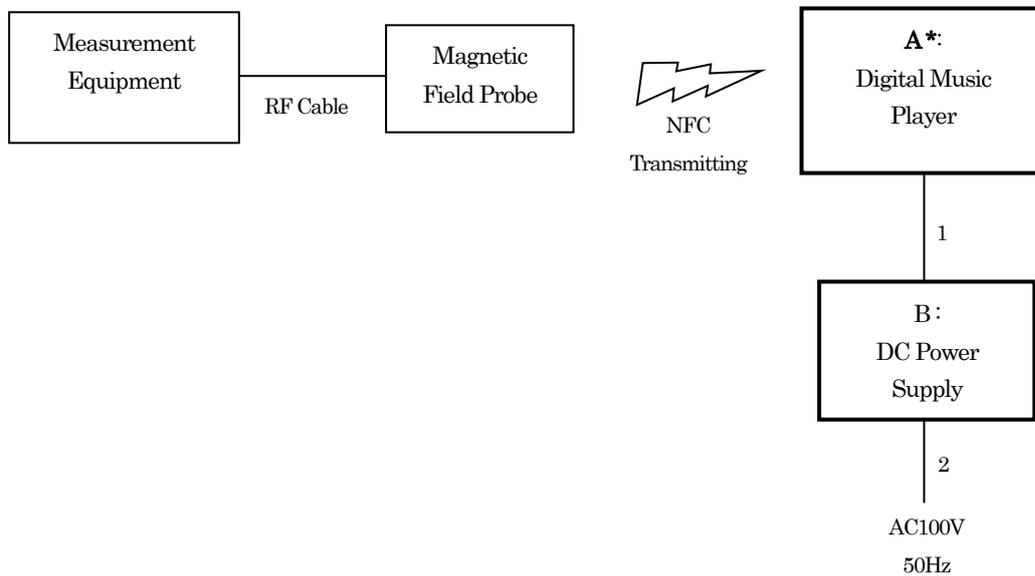
Symbol	Item	Manufacturer	Model No.	Serial No.
B	Regulated DC Power Supply	KENWOOD	PW18-1.3AT	08046429

Type of cable

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Bundled	Length (m)
1	DC Cable	-	NO	NO	NO	0.8
2	AC Cable	-	NO	NO	NO	2.0

System configuration

*: EUT



AC Power-line Conducted Emissions

The equipment under test (EUT)

Symbol	Item	Manufacturer	Model No.	Serial No.
A	Digital Music Player	SONY	NW-A35	1

Support equipment for operation

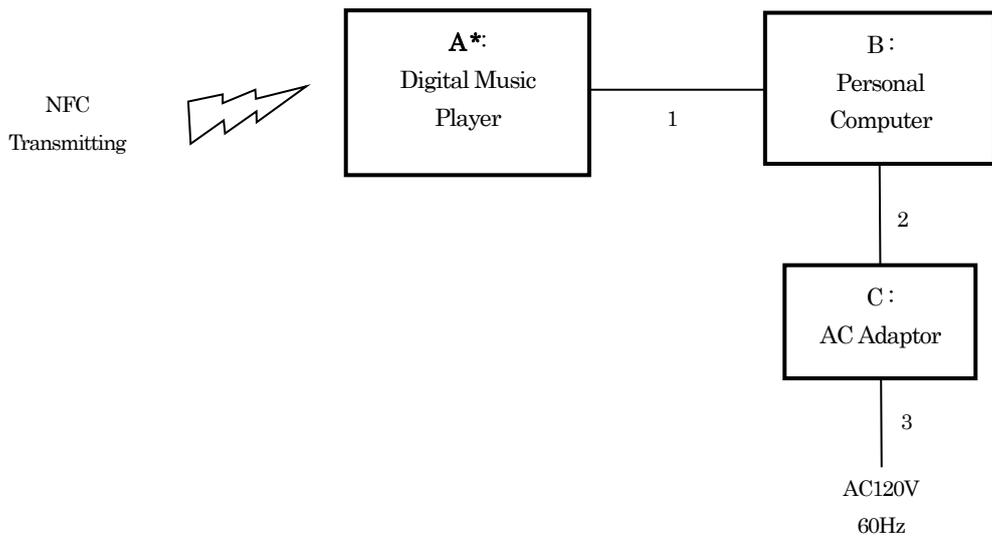
Symbol	Item	Manufacturer	Model No.	Serial No.
B	Personal Computer	HP	Elite Book 820	H10105155
C	AC Adaptor	HP	HSTNN-CA	WDVTPOCGC8X1LY

Type of cable

Symbol	Description	Identification (Manufacturer etc.)	Shielded YES / NO	Ferrite Core	Bundled	Length (m)
1	USB Cable	SONY	YES	NO	-	1.0
2	DC Cable	-	NO	NO	Bundled	2.0
3	AC Cable	-	NO	NO	-	1.0

System configuration

*: EUT



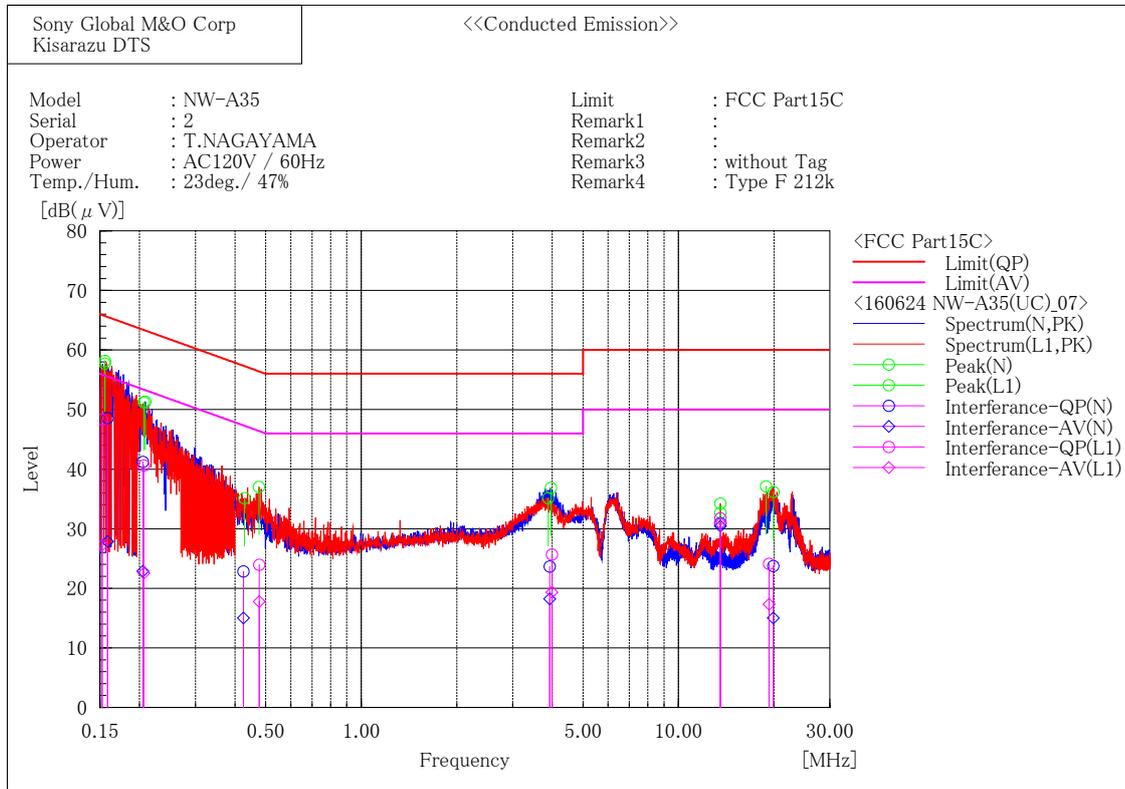
3. Test Data

3.1. AC Power-line Conducted Emissions

150kHz – 30MHz

1) Date of measurement : June 24, 2016

[Type F (212kbps)]



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.159	32.4	11.6	16.2	48.6	27.8	65.5	55.5	16.9	27.7
2	0.205	25.2	6.9	16.0	41.2	22.9	63.4	53.4	22.2	30.5
3	0.425	6.6	-1.2	16.2	22.8	15.0	57.3	47.3	34.5	32.3
4	3.930	7.7	2.2	16.0	23.7	18.2	56.0	46.0	32.3	27.8
5	13.561	14.6	14.1	16.3	30.9	30.4	60.0	50.0	29.1	19.6
6	19.903	7.2	-1.5	16.5	23.7	15.0	60.0	50.0	36.3	35.0

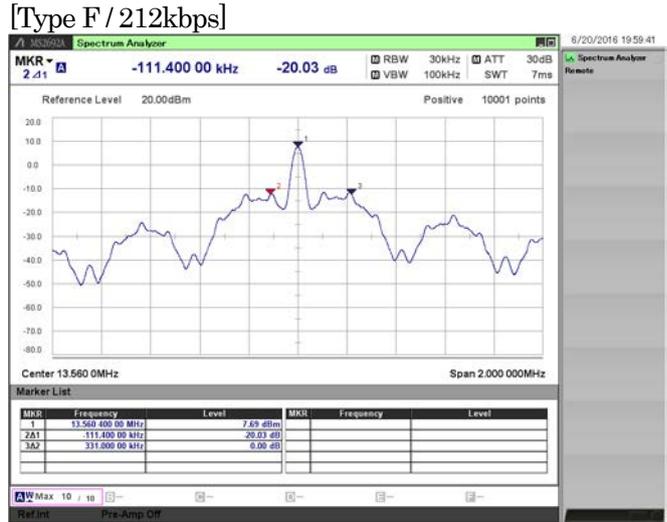
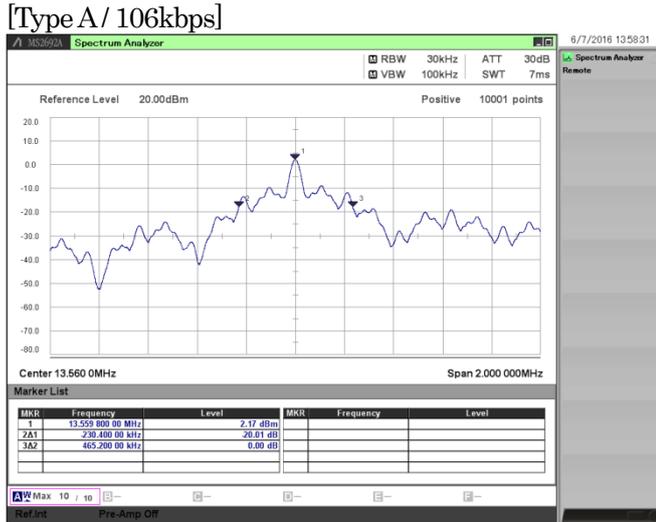
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.152	32.2	11.2	16.1	48.3	27.3	65.9	55.9	17.6	28.6
2	0.206	24.7	6.6	15.9	40.6	22.5	63.4	53.4	22.8	30.9
3	0.477	7.7	1.6	16.2	23.9	17.8	56.4	46.4	32.5	28.6
4	3.992	9.7	3.3	16.0	25.7	19.3	56.0	46.0	30.3	26.7
5	13.560	15.4	14.6	16.3	31.7	30.9	60.0	50.0	28.3	19.1
6	19.296	7.7	0.9	16.4	24.1	17.3	60.0	50.0	35.9	32.7

3.2. 20dB Bandwidth

- 1) Ambient temperature : 20.0deg.C
- 2) Relative humidity : 38.0%
- 3) Date of measurement : June 07, 2016
- 4) Measured by : M.KOUGA
- 5) Operating mode : Transmitting mode

Mode		Channel [MHz]	Result [kHz]	Limit [kHz]
Type A	106kbps	13.56	465.20	-
Type F	212kbps	13.56	331.00	-

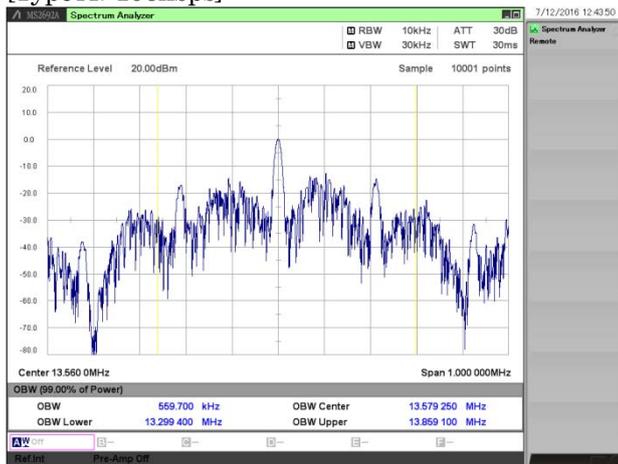


3.3. 99% Occupied Bandwidth

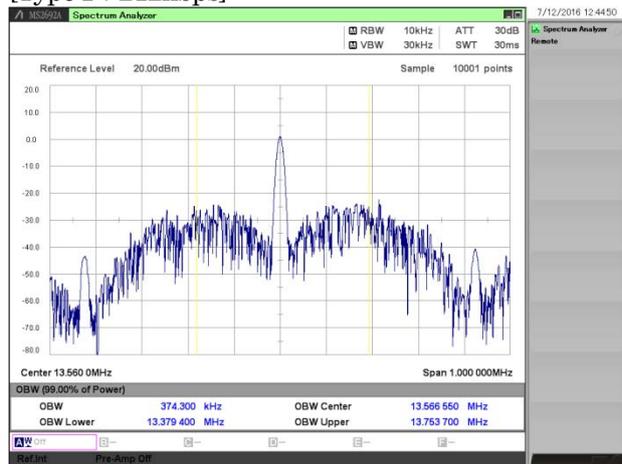
- 1) Ambient temperature : 20.8deg.C
- 2) Relative humidity : 70.0%
- 3) Date of measurement : July 12, 2016
- 4) Measured by : T.OHO
- 5) Operating mode : Transmitting mode

Mode		Channel [MHz]	Result [kHz]	Limit [kHz]
Type A	106kbps	13.56	559.7	-
Type F	212kbps	13.56	374.3	-

[Type A / 106kbps]



[Type F / 212kbps]



3.4. Frequency Tolerance

- 1) Ambient temperature : 20.0deg.C
 2) Relative humidity : 38.0%
 3) Date of measurement : June 07, 2016
 4) Measured by : M.KOUGA
 5) Operating mode : Transmitting mode (Unmodulated)

Test Temperature	Test Voltage	Test Conditions	Frequency [MHz]	Reading [MHz]	Tolerance [MHz]	Tolerance [%]	Limit [%]
50deg.C	3.7V	Start up	13.56	13.559867	-0.000133	-0.000981	± 0.01
		After 2min	13.56	13.559864	-0.000136	-0.001003	± 0.01
		After 5min	13.56	13.559861	-0.000139	-0.001025	± 0.01
		After 10min	13.56	13.559859	-0.000141	-0.001040	± 0.01
40deg.C	3.7V	Start up	13.56	13.559894	-0.000106	-0.000782	± 0.01
		After 2min	13.56	13.559887	-0.000113	-0.000833	± 0.01
		After 5min	13.56	13.559883	-0.000117	-0.000863	± 0.01
		After 10min	13.56	13.559879	-0.000121	-0.000892	± 0.01
30deg.C	3.7V	Start up	13.56	13.559917	-0.000083	-0.000612	± 0.01
		After 2min	13.56	13.559913	-0.000087	-0.000642	± 0.01
		After 5min	13.56	13.559910	-0.000090	-0.000664	± 0.01
		After 10min	13.56	13.559908	-0.000092	-0.000678	± 0.01
20deg.C	3.7V	Start up	13.56	13.559966	-0.000034	-0.000251	± 0.01
		After 2min	13.56	13.559959	-0.000041	-0.000302	± 0.01
		After 5min	13.56	13.559954	-0.000046	-0.000339	± 0.01
		After 10min	13.56	13.559949	-0.000051	-0.000376	± 0.01
10deg.C	3.7V	Start up	13.56	13.559994	-0.000006	-0.000044	± 0.01
		After 2min	13.56	13.559990	-0.000010	-0.000074	± 0.01
		After 5min	13.56	13.559987	-0.000013	-0.000096	± 0.01
		After 10min	13.56	13.559985	-0.000015	-0.000111	± 0.01
0deg.C	3.7V	Start up	13.56	13.560023	0.000023	0.000170	± 0.01
		After 2min	13.56	13.560020	0.000020	0.000147	± 0.01
		After 5min	13.56	13.560017	0.000017	0.000125	± 0.01
		After 10min	13.56	13.560014	0.000014	0.000103	± 0.01
-10deg.C	3.7V	Start up	13.56	13.560015	0.000015	0.000111	± 0.01
		After 2min	13.56	13.560020	0.000020	0.000147	± 0.01
		After 5min	13.56	13.560022	0.000022	0.000162	± 0.01
		After 10min	13.56	13.560023	0.000023	0.000170	± 0.01
-20deg.C	3.7V	Start up	13.56	13.559990	-0.000010	-0.000074	± 0.01
		After 2min	13.56	13.559999	-0.000001	-0.000007	± 0.01
		After 5min	13.56	13.560004	0.000004	0.000029	± 0.01
		After 10min	13.56	13.560008	0.000008	0.000059	± 0.01
-30deg.C	3.7V	Start up	13.56	13.559961	-0.000039	-0.000288	± 0.01
		After 2min	13.56	13.559964	-0.000036	-0.000265	± 0.01
		After 5min	13.56	13.559957	-0.000043	-0.000317	± 0.01
		After 10min	13.56	13.559955	-0.000045	-0.000332	± 0.01
20deg.C	3.15V	Start up	13.56	13.559996	-0.000004	-0.000029	± 0.01
		After 2min	13.56	13.559994	-0.000006	-0.000044	± 0.01
		After 5min	13.56	13.559993	-0.000007	-0.000052	± 0.01
		After 10min	13.56	13.559993	-0.000007	-0.000052	± 0.01
20deg.C	4.26V	Start up	13.56	13.560014	0.000014	0.000103	± 0.01
		After 2min	13.56	13.560007	0.000007	0.000052	± 0.01
		After 5min	13.56	13.560002	0.000002	0.000015	± 0.01
		After 10min	13.56	13.559995	-0.000005	-0.000037	± 0.01

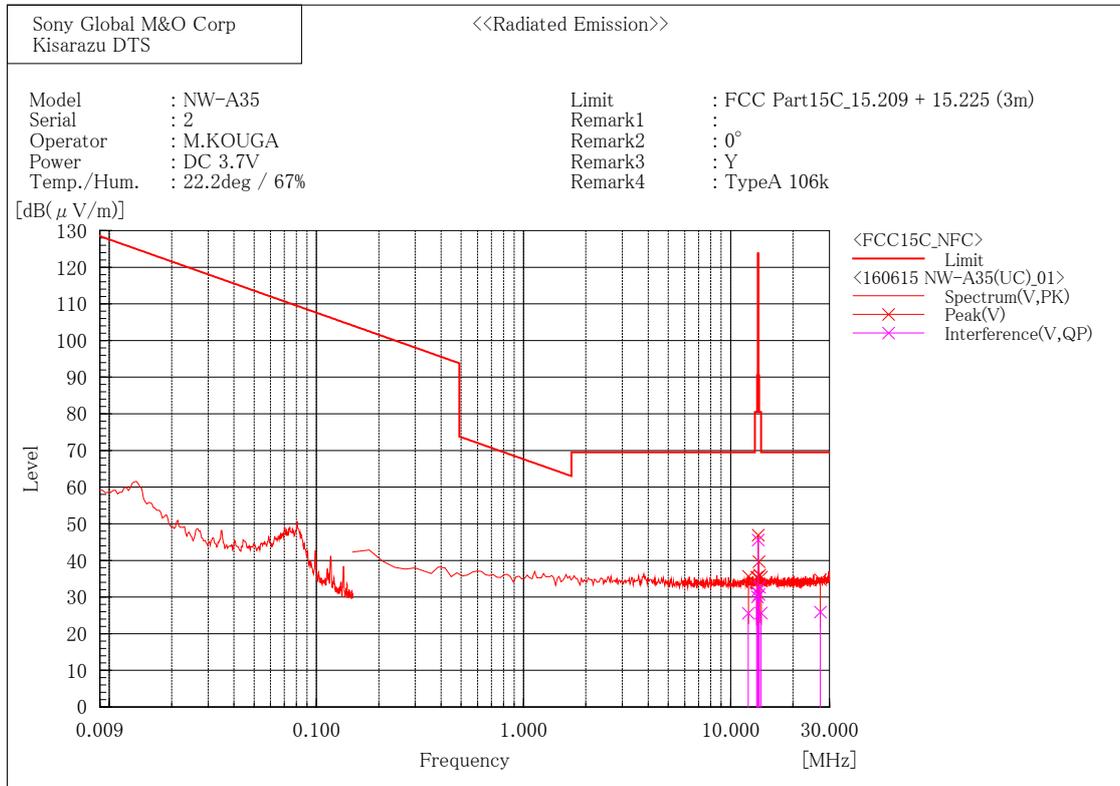
3.5. Electric field strength (Fundamental and Spurious emissions)

1) Date of measurement

9kHz - 30MHz : June 15, 2016 (all mode)
 30MHz - 1000MHz : June 15, 2016 (all mode)

9 kHz - 30 MHz

[Type A (106kbps)]



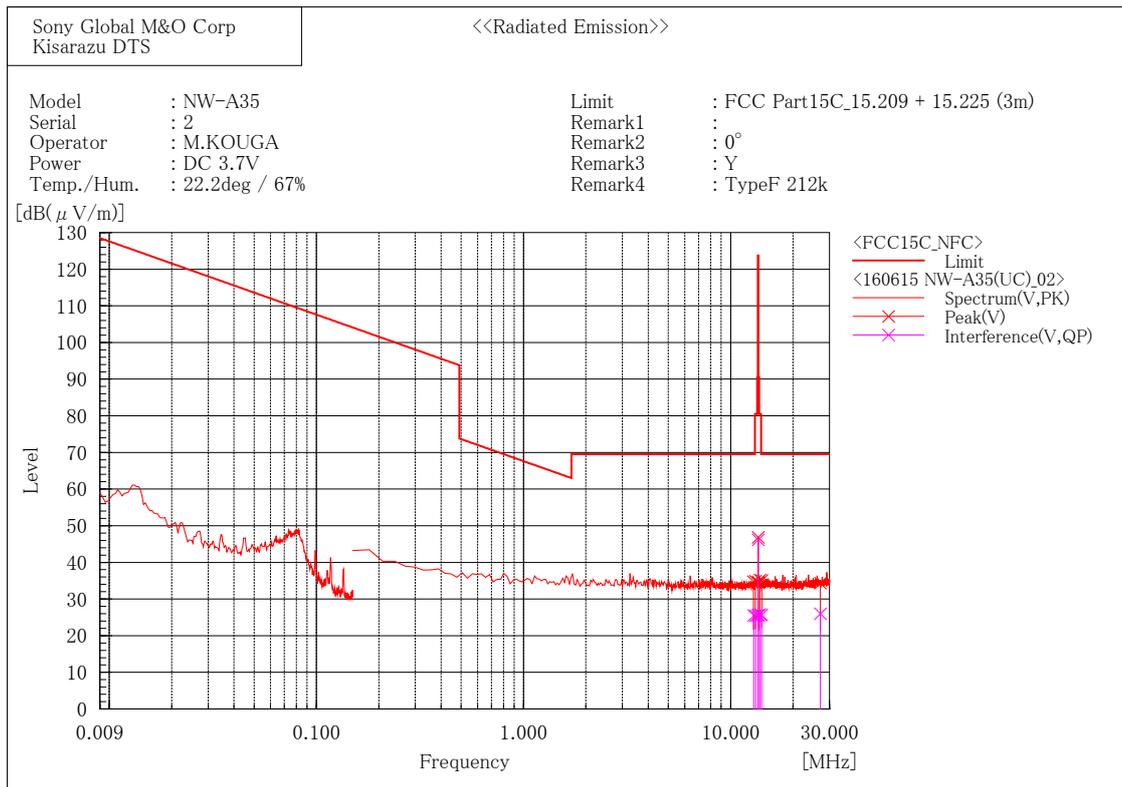
Final Result

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	12.154	5.5	20.1	25.6	69.5	43.9	100.0	269.6
2	13.349	11.4	20.1	31.5	80.5	49.0	100.0	173.9
3	13.452	10.0	20.1	30.1	90.5	60.4	100.0	175.9
4	13.560	25.5	20.1	45.6	124.0	78.4	100.0	190.6
5	13.664	10.7	20.1	30.8	90.5	59.7	100.0	352.9
6	13.772	12.7	20.1	32.8	80.5	47.7	100.0	8.5
7	14.040	5.6	20.1	25.7	69.5	43.8	100.0	43.9
8	27.120	5.4	20.6	26.0	69.5	43.5	100.0	68.6

Mode	Frequency [MHz]	Polar.	Result (3m) [dBuV/m]	Distance Factor [dB]	Result(30m) [dBuV/m]	Limit (30m) [dBuV/m]	Margin [dB]
Type A	106kbps	V	25.60	-40.00	-14.40	29.54	43.94
		V	31.50	-40.00	-8.50	40.51	49.01
		V	30.10	-40.00	-9.90	50.47	60.37
		V	45.60	-40.00	5.60	84.00	78.40
		V	30.80	-40.00	-9.20	50.47	59.67
		V	32.80	-40.00	-7.20	40.51	47.71
		V	25.70	-40.00	-14.30	29.54	43.84
		V	26.00	-40.00	-14.00	29.54	43.54

[Type F (212kbps)]



Final Result

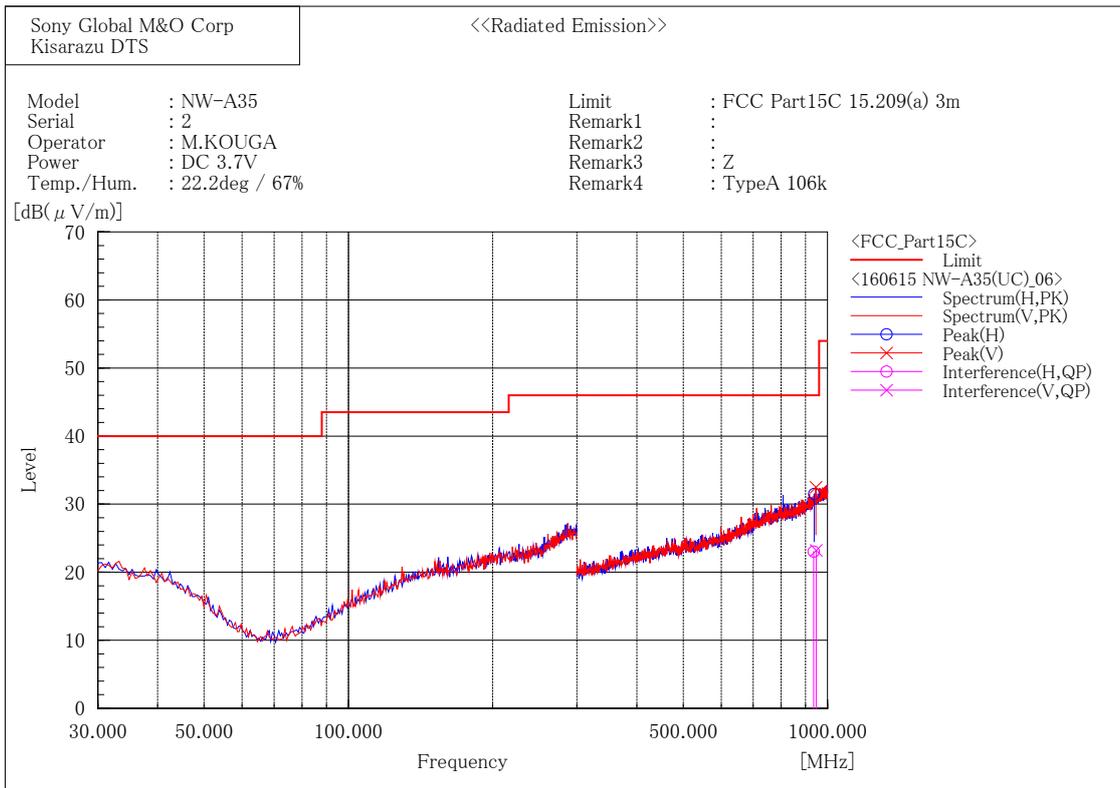
--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	12.923	5.4	20.1	25.5	69.5	44.0	100.0	1.8
2	13.186	5.3	20.1	25.4	80.5	55.1	100.0	106.9
3	13.545	5.4	20.1	25.5	90.5	65.0	100.0	162.3
4	13.560	26.1	20.1	46.2	124.0	77.8	100.0	180.6
5	13.585	5.5	20.1	25.6	90.5	64.9	100.0	154.6
6	13.832	5.7	20.1	25.8	80.5	54.7	100.0	182.3
7	14.117	5.5	20.1	25.6	69.5	43.9	100.0	28.5
8	27.120	5.4	20.6	26.0	69.5	43.5	100.0	119.3

Mode	Frequency [MHz]	Polar.	Result (3m) [dBuV/m]	Distance Factor [dB]	Result(30m) [dBuV/m]	Limit (30m) [dBuV/m]	Margin [dB]
Type F 212kbps	12.923	V	25.50	-40.00	-14.50	29.54	44.04
	13.186	V	25.40	-40.00	-14.60	40.51	55.11
	13.545	V	25.50	-40.00	-14.50	50.47	64.97
	13.560	V	46.20	-40.00	6.20	84.00	77.80
	13.585	V	25.60	-40.00	-14.40	50.47	64.87
	13.832	V	25.80	-40.00	-14.20	40.51	54.71
	14.117	V	25.60	-40.00	-14.40	29.54	43.94
	27.120	V	26.00	-40.00	-14.00	29.54	43.54

30 MHz - 1000 MHz

[Type A (106kbps)]



Final Result

--- Horizontal Polarization (QP)---

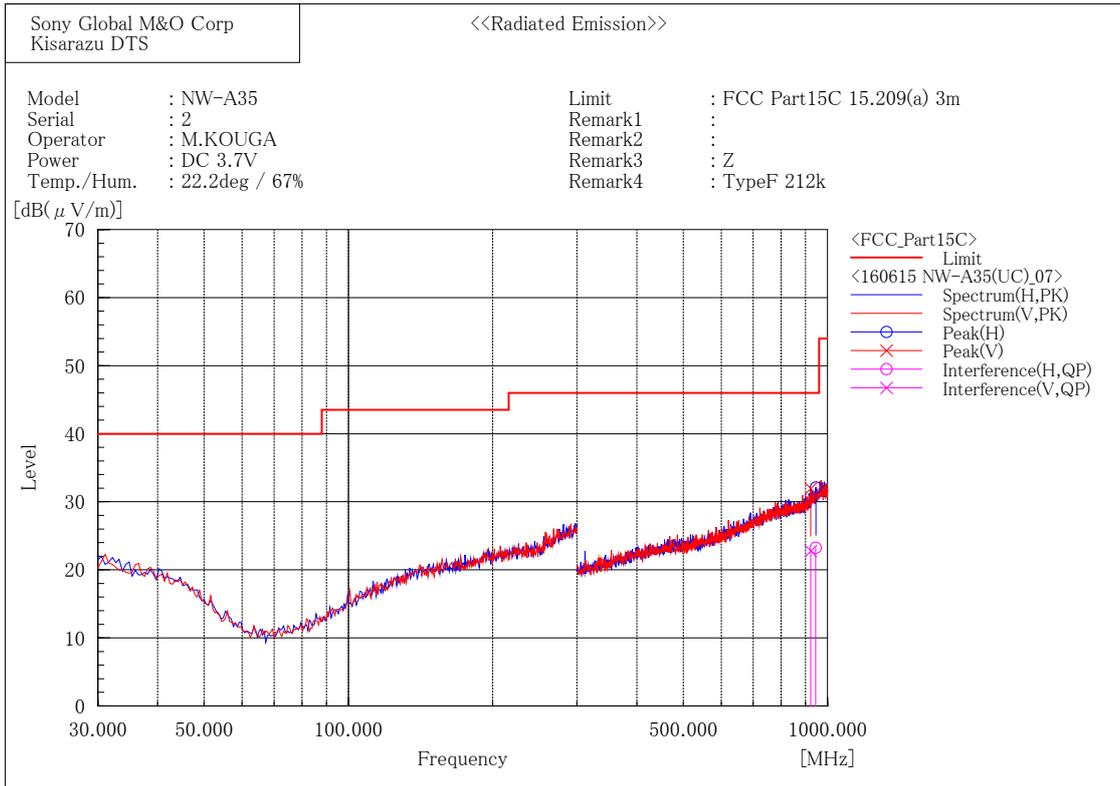
No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	935.220	24.5	-1.5	23.0	46.0	23.0	148.3	256.1

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	946.420	24.4	-1.2	23.2	46.0	22.8	104.0	195.0

Note: This test report is used the same limits of FCC, as FCC limits are stricter than IC for over 14.010MHz.
 (Same limits for below 13.110MHz based on RSS-GEN section 8.10(c))

[Type F (212kbps)]



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	944.680	24.4	-1.2	23.2	46.0	22.8	125.4	256.3

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c. f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	922.400	24.6	-1.8	22.8	46.0	23.2	130.3	309.8

Note: This test report is used the same limits of FCC, as FCC limits are stricter than IC for over 14.010MHz.
 (Same limits for below 13.110MHz based on RSS-GEN section 8.10(c))

4. Method of Calculation

4.1. AC Power-line Conducted Emissions Measurement

Method of calculation : Software
 The Software for Calculation Name : EP5/ CE
 Version : Ver5.0.0

$$\text{Test Result [dBuV]} = \text{Meter Reading [dBuV]} + \text{C.F. [dB]}$$

Notes :

- (a) Meter Reading : Reading of the EMI test receiver or spectrum analyzer.
- (b) C.F. : System Loss + Correction Factor of LISN.

4.2. Frequency Tolerance Measurement

Method of calculation : Software
 The Software for Calculation Name : SW-310
 Version : Ver2.1

$$\text{Test Result [\%]} = (\text{Meter Reading [MHz]} - 13.56 \text{ [MHz]}) / 13.56 \text{ [MHz]} * 100$$

Notes :

- (a) Meter Reading : Reading Frequency of the spectrum analyzer.

4.3. Electric field strength Measurement

Method of calculation : Software
 The Software for Calculation Name : V-Scan
 Version : Ver. 4.0.30

$$\text{Test Result [dBuV/m]} = \text{Meter Reading [dBuV]} + \text{C.F. [dB/m]}$$

Notes :

- (a) Meter Reading : Reading of the EMI test receiver or spectrum analyzer.
- (b) C.F. : Antenna Factor (including Balun Loss) + System GainLoss
 : Antenna Factor (including Balun Loss) + System GainLoss + 20 log (3 m/ 10 m)

5. List of Test Equipment

All test results are traceable to the national and/or international standards.

5.1. AC Power-line Conducted Emissions

4th Site Shielded Room

	Ctrl#	Equipment	Model No.	Serial No.	Manufacturer	Cal. Int.	Last Cal.
<input checked="" type="checkbox"/>	-	Shield Room	-	-	TDK	-	-
<input checked="" type="checkbox"/>	M515	EMI Receiver	ESCI	100606	Rohde & Schwarz	12	15.07.07
<input type="checkbox"/>	M109	EMI Receiver	ESI7	100051	Rohde & Schwarz	12	16.03.15
<input checked="" type="checkbox"/>	CS043	4th Site CE Cable SYSTEM	-	-	EMC/RF Test Lab.	12	15.10.28
<input checked="" type="checkbox"/>	M664	6dB Attenuator	6806.01A	N/A	HUBER+SUHNER AG	12	15.10.28
<input checked="" type="checkbox"/>	M619	HIGH FREQUENCY FUSE	MP612A	N/A	Anritsu	12	15.10.28
<input type="checkbox"/>	M026	LISN	KNW-407	8-541-1	Kyoritsu	12	15.12.10
<input type="checkbox"/>	M420	LISN	ESH3-Z5	829996/008	Rohde & Schwarz	12	16.01.09
<input checked="" type="checkbox"/>	M514	LISN (for EUT)	ENV216	100424	Rohde & Schwarz	12	16.05.25
<input type="checkbox"/>	M152	50 ohm Terminator	CT-01	N/A	TME	12	15.10.28
<input type="checkbox"/>	M158	50 ohm Terminator	T1302	N/A	Stack	12	16.01.27
<input checked="" type="checkbox"/>	M690	Thermometer	AD-5640A	201304	A&D	12	15.11.15

5.2. 20dB Bandwidth / 99% Occupied Bandwidth / Frequency Tolerance

4th Site Shielded Room 1

	Control No.	Equipment	Model No.	Serial No.	Manufacturer	Cal. Int.	Last Cal.
<input checked="" type="checkbox"/>	-	Shield Room	B83117-B2432-T161	P26428	Albatross Project	-	-
<input checked="" type="checkbox"/>	W054	TEMP & HUMID CHAMBER	SH-240	91006788	ESPEC CORP.	-	-
<input checked="" type="checkbox"/>	W100	Signal Analyzer	MS2692A	6201338954	Anritsu	12	16.04.15
<input checked="" type="checkbox"/>	W057	EMI Probe	MA2601C	No.1	Anritsu	12	15.07.29
<input type="checkbox"/>	W029	10dB Attenuator	8493C	76549	Keysight Technologies	12	15.09.24
<input checked="" type="checkbox"/>	W106	Digital Multimeter	R6452A	120600443	ADVANTEST	12	15.09.07
<input checked="" type="checkbox"/>	W724	Stop Watch	HS70W	002	CASIO	12	15.06.10
<input checked="" type="checkbox"/>	M719	Thermo Meter	TH-321	140053	AS ONE	12	15.06.10
<input checked="" type="checkbox"/>	M720	Thermo Meter	TH-321	140044	AS ONE	12	16.06.02
<input checked="" type="checkbox"/>	M722	Thermo Meter	TM-305	140005	AS ONE	12	15.06.10
		Thermo Sensor	LP-200	002	AS ONE	12	15.06.10

5.3. Electric field strength (Fundamental and Spurious emissions)

4th Site 10m Semi-Anechoic Chamber

	Control No.	Equipment	Model No.	Serial No.	Manufacturer	Cal. Int.	Last Cal.
<input checked="" type="checkbox"/>	M506	Semi-Anechoic Chamber	-	-	TDK	12	15.08.03
<input checked="" type="checkbox"/>	M575	EMI Receiver	ESCI	100161	Rohde & Schwarz	12	15.11.09
<input type="checkbox"/>	M669	EMI Receiver	N9038A	MY51210223	Keysight Technologies	12	15.05.19
<input checked="" type="checkbox"/>	A073	Loop Antenna	HFH2-Z2	100171	Rohde & Schwarz	12	15.10.12
<input checked="" type="checkbox"/>	A043	Bi-conical Antenna	BBA9106	V5 (91032598)	Schwarzbeck	12	15.08.04
<input checked="" type="checkbox"/>	A046	Log-periodic Antenna	UHALP9108A1	0830	Schwarzbeck	12	15.08.06
<input type="checkbox"/>	A056	Horn Antenna	BBHA9120D	670	Schwarzbeck	12	16.01.27
<input type="checkbox"/>	A057	Horn Antenna	HAP06-18W	00000037	TOYO Corporation	12	15.08.04
<input type="checkbox"/>	A058	Horn Antenna	HAP18-26W	00000016	TOYO Corporation	12	16.01.26
<input type="checkbox"/>	CS037	4th Site RE Cable SYS1	-	-	EMC/RF Test Lab.	12	15.10.28
<input checked="" type="checkbox"/>	CS039	4th Site RE Cable SYS3	-	-	EMC/RF Test Lab.	12	15.10.28
<input checked="" type="checkbox"/>	CS054	4th Site EMF Cable SYS	-	-	EMC/RF Test Lab.	12	15.10.28
<input type="checkbox"/>	CS064/065	Ref Site RE Cable SYS8	-	-	EMC/RF Test Lab.	12	15.10.28
<input checked="" type="checkbox"/>	M510	RF Selector	NS4900	0802-226	TOYO Corporation	12	15.10.28
<input checked="" type="checkbox"/>	M706	3dB Attenuator	8491A	MY39267782	Keysight Technologies	12	15.10.28
<input checked="" type="checkbox"/>	M620	RF Pre-Amp	8447D	2944A10720	Keysight Technologies	12	15.10.28
<input type="checkbox"/>	M831	GHz Filter Box	FB-G1	002	Sony Global M&O	12	15.10.28
<input checked="" type="checkbox"/>	M689	Thermo Meter	AD-5640A	201303	A&D	12	15.11.05

About calibration interval

Valid until the end of the month listed in "Cal. Int." column.