

TEST REPORT

Applicant : Panasonic Appliances Company of America, Kitchen Appliances Certification Liaison

Address : 1701 Golf Road Suite 3-106 Rolling Meadows, IL 60008 USA

Products : Microwave Oven

Model No. : MCES

Serial No. : FES-021

FCC ID : ACLAP7M71

Test Standard : FCC Rules and Regulations Title 47 CFR Part 18

Test Results : **Passed**

Date of Test : January 25 ~ February 18, 2016



A handwritten signature in black ink, appearing to read 'K. Shibata', written over a horizontal line.

Kousei Shibata
Manager
Japan Quality Assurance Organization
KITA-KANSAI Testing Center
SAITO EMC Branch
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and National Institute of Information and Communications Technology (NICT) of Japan.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
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- VLAC does not approve, certify or warrant the product by this test report.

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DEFINITIONS FOR ABBREVIATION AND SYMBOLS USED IN THIS TEST REPORT**EUT** : Equipment Under Test**EMC** : Electromagnetic Compatibility**AE** : Associated Equipment**EMI** : Electromagnetic Interference**N/A** : Not Applicable**EMS** : Electromagnetic Susceptibility**N/T** : Not Tested - 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 Description of the Equipment Under Test

1. Manufacturer : Panasonic Corporation Appliances Company
Kitchen Appliances Business Division
5-1 Takatsukadai 1-chome Nishi-ku Kobe-shi, Hyogo Japan
2. Products : Microwave Oven
3. Model No. : MCES
4. Serial No. : FES-021
5. Product Type : Prototype
6. Date of Manufacture : September 25, 2015
7. Power Rating : 120VAC 60Hz, 1450 W (Microwave Oven)
8. Rated RF Power Output : 1000W
9. EUT Grounding : Grounded at the plug end of the power line
10. Type of Device : Any type unless otherwise specified (miscellaneous)
11. EUT Authorization : Certification
12. Operating Frequency : 2450 MHz
13. Received Date of EUT : January 15, 2016

2 Summary of Test Results

Applied Standard : FCC Rules and Regulations Title 47 CFR Part 18
Industrial, Scientific, and Medical Equipment

The EUT described in clause 1 was tested according to the applied standard shown above.
Details of the test configuration is shown in clause 6.

The conclusion for the test items of which are required by the applied standard is indicated under the test result.

- The test result was **passed** for the test requirements of the applied standard.
- The test result was **failed** for the test requirements of the applied standard.
- The test result was **not judged** the test requirements of the applied standard.

In the approval of test results,

- Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- No deviations were employed from the applied standard.
- No modifications were conducted by JQA to achieve compliance to the limitations.

Reviewed by:



Yasuhisa Sakai
Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

Tested by:



Shigeru Kinoshita
Assistant Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

3 Test Procedure

The tests documented in this report were performed in accordance with FCC/OET MP-5 (1986).

4 Test Location

Japan Quality Assurance Organization (JQA)

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-chome, Minoh-shi, Osaka, 562-0027, Japan

SAITO EMC Branch

7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

5 Recognition of Test Laboratory

JQA KITA-KANSAI Testing Center SAITO EMC Branch is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility is registered by the following bodies.

VLAC Accreditation No. : VLAC-001-2 (Expiry date : March 30, 2016)

VCCI Registration No. : A-0002 (Expiry date : March 30, 2016)

BSMI Registration No. : SL2-IS-E-6006, SL2-IN-E-6006, SL2-R1/R2-E-6006, SL2-A1-E-6006
(Expiry date : September 14, 2016)

IC Registration No. : 2079E-3, 2079E-4 (Expiry date : July 16, 2017)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI.
(Expiry date : February 22, 2019)

6 Description of Test Setup

6.1 Test Configuration

The equipment under test (EUT) consists of :

	Item	Manufacturer	Model No.	Serial No.	FCC ID
A	Microwave Oven	Panasonic	MCES	FES-021	ACLAP7M71

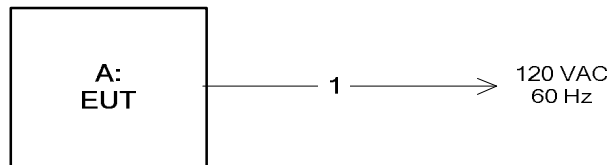
The auxiliary equipment used for testing :

None

Type of Cable:

No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	AC Power Cable	--	--	No	No	1.0

6.2 Test Arrangement (Drawings)



6.3 Operating Condition

Power Supply Voltage : 120VAC 60Hz

Operation Mode

The EUT is tested with the dummy load located in the center of the oven.

The load consists of a quantity of tap water in a beaker, which is as follows.

Power output measurement	: 1000 ml
ISM frequency measurement	: 1000 ml
Conducted powerline measurement	: 1000 ml(IEC)
Radiated emission measurement	: 700 ml

For measurement of radiation on 2nd and 3rd harmonic, two loads, one of 700 ml and the other of 300 ml, of water are used. Each load is tested both with the beaker located in the center of the oven and with it in the right front corner.

Type of Magnetron

Cat No. 2M261-M1 (manufactured by Panasonic)

Clock Frequency

Magnetron	: 2450 MHz
CPU	: 8 MHz

7 Test Requirements

7.1 Power Output

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.1.1 Test Results

Power Output (calorimetric method) 702 watts

Field Strength Limit 29.4 $\mu\text{V/m}$ at 300 meters

AC Power Input 1435 watts

Remarks : Field strength may not exceed 10 $\mu\text{V/m}$ at 1600 meters.

7.1.2 Test Instruments

KITA-KANASI Testing Center 3 rd Floor Testing Room				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Digital Power Meter	2533-21	08011090	HIOKI	2015/4/7
Stopwatch	S111-5000	Q47097350	SEIKO	2015/3/9
Thermometer	245506X	Q47097361	YOKOGAWA	2015/4/7

NOTE : The calibration interval of the above test instruments is 12 months.

7.1.3 Test Procedure

The power output is measured by the calorimetric method, computing from the observed temperature rise of the load over a period of time. The measured value of power output is used to determine the allowable out-of-band field strength.

7.1.4 Test Data

Test Date: February 18, 2016

Temp.: 25 °C, Humi: 60 %

The power output was measured by the calorimetric method, computing the power output from the observed temperature rise of the load over a period of time.

Rated RF Power: 1000W
 Load(water): 1000ml
 Time: 42sec $T = \frac{4.2 \times Load(ml) \times 10}{RFPower}$

	t_1 (before test)		t_2 (after test)	$t_2 - t_1$	RF Power**
1st	10.3°C	→	16.9°C	6.6°C	660.0W
2nd	9.5°C	→	16.4°C	6.9°C	690.0W
3rd	9.9°C	→	17.3°C	7.4°C	740.0W
4th	9.5°C	→	16.5°C	7.0°C	700.0W
5th	9.8°C	→	17.0°C	7.2°C	720.0W

$$**RFPower = \frac{4.2 \times Load(ml) \times (t_2 - t_1)}{T}$$

Results of Average RF Power: 702.0W

The limit of the radiated emission at 300m : $25\sqrt{702/500}[\mu V/m]=29.6[\mu V/m]$
 $25\sqrt{702/500}[\mu V/m]=29.4[dB(\mu V/m)]$

The AC power input to the oven is measured to determine if the oven is operating in accordance with the manufacturer's specifications.

Rated Power Supply : AC120V/60Hz, 1450W

Measured Input Power : AC120V60Hz 12.1A, 1435W

7.2 ISM Frequency

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.2.1 Test Results

For the standard, - Passed - Failed - Not judged

Remarks : _____

7.2.2 Test Instruments

Anechoic Chamber A2				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2016/04/25
Horn Antenna	91889-2	568 (C-41-2)	EATON	2016/06/16
Attenuator	2-10	BA6214 (D-79)	Weinschel	2016/11/19
RF Cable	SUCOFLEX104	267414/4 (C-67)	HUBER+SUHNER	2017/01/06

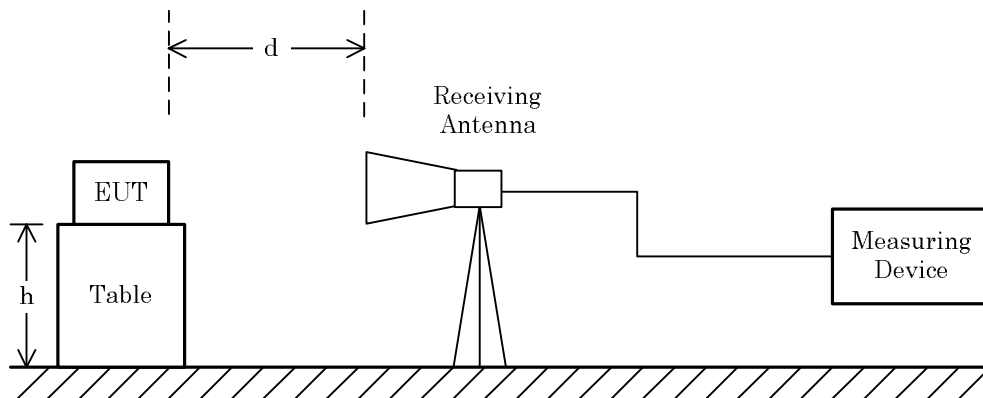
NOTE : The calibration interval of the above test instruments is 12 months.

7.2.3 Test Method and Test Setup (Diagrammatic illustration)

For the EUT was operated with a fundamental frequency in one of the designated band listed in International Telecommunication Union for use as ISM frequencies, the frequency was checked with measuring equipment.

The variation of frequency with time, starting with the EUT and load at the room temperature and continuing until the load quantity has been reduced by evaporation to approximately 20 % of the original quantity. This test is made with nominal rated ac supply voltage.

The variation of frequency for line voltage variation from 80 % to 125 % of nominal rated voltage, starting from the EUT warm from at least 10 minutes use, with the load at room temperature at the beginning of the test.



NOTE

d : Arbitrary distance

h : Arbitrary height

7.2.4 Test Data

Test Date : February 3, 2016

Temp. : 23°C Humi. : 34 %

The maximum frequency deviation was measured at -26dB with respect to the maximum level.

Maximum Frequency		Voltage Variations	Remarks
Lower Frequency	Upper Frequency		
2462.5	2480.7	96.0V(80%)	A
2459.3	2479.8	120.0V(100%)	A
2460.2	2482.6	150.0V(125%)	A

The results were within 2450MHz±50MHz.

Remarks					
	Detector Function	RES B.W.	V.B.W.	Sweep Time	Span
A	Peak	100 kHz	300 kHz	AUTO	200 MHz

7.3 AC Powerline Conducted Emission

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.3.1 Test Results

For the standard, - Passed - Failed - Not judged

Min. Limit Margin (Quasi-Peak) 15.3 dB at 0.15 MHz

Uncertainty of Measurement Results ± 2.6 dB(2σ)

Remarks : _____

7.3.2 Test Instruments

Shielded Room S1				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Test Receiver	ESCI	100453 (A-42)	Rohde & Schwarz	2016/12/09
AMN (main)	KNW-407FR	8-2019-1 (D-103)	Kyoritsu	2016/10/15
RF Cable	RG223/U	--- (H-35)	HUBER+SUHNER	2016/06/04

NOTE : The calibration interval of the above test instruments is 12 months.

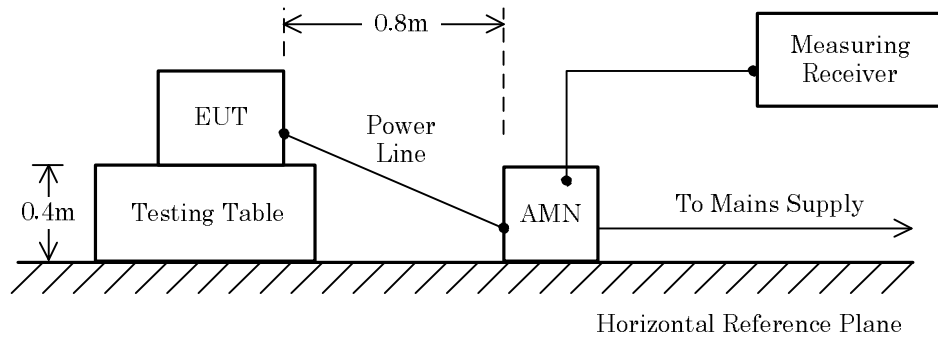
7.3.3 Test Method and Test Setup (Diagrammatic illustration)

The preliminary tests were performed using the scan mode of test receiver or spectrum analyzer to observe the emissions characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for final tests.

(Reference divisional instruction No. G703649)



NOTE

AMN : Artificial Mains Network

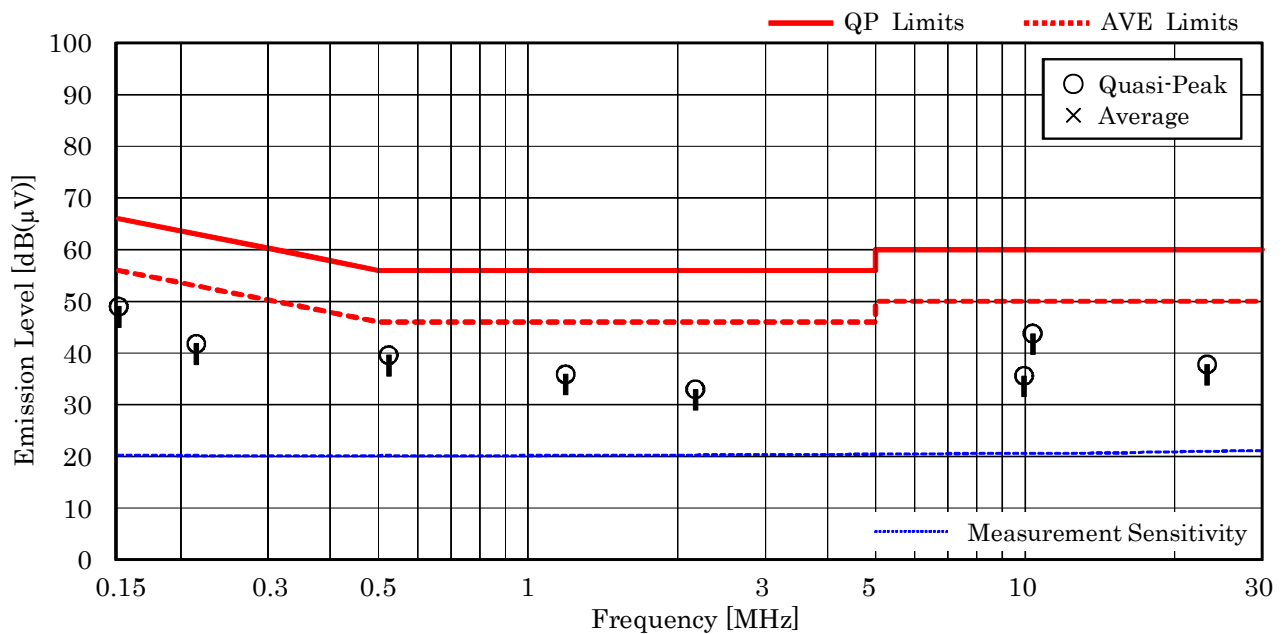
7.3.4 Test Data

Test voltage : 120VAC 60Hz

Test Date: January 25, 2016
Temp.: 25 °C, Humi.: 28 %

Measured phase : L1

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)]		Limits [dB(μV)]		Results [dB(μV)]		Margin [dB]		Remarks
		QP	AVE	QP	AVE	QP	AVE	QP	AVE	
0.150	10.3	38.7	--	66.0	56.0	49.0	--	+17.0	--	-
0.215	10.2	31.6	--	63.0	53.0	41.8	--	+21.2	--	-
0.524	10.2	29.4	--	56.0	46.0	39.6	--	+16.4	--	-
1.190	10.2	25.7	--	56.0	46.0	35.9	--	+20.1	--	-
2.170	10.3	22.7	--	56.0	46.0	33.0	--	+23.0	--	-
9.960	10.6	25.0	--	60.0	50.0	35.6	--	+24.4	--	-
<u>10.360</u>	<u>10.6</u>	<u>33.2</u>	<u>--</u>	<u>60.0</u>	<u>50.0</u>	<u>43.8</u>	<u>--</u>	<u>+16.2</u>	<u>--</u>	<u>-</u>
23.240	11.0	26.8	--	60.0	50.0	37.8	--	+22.2	--	-



NOTES

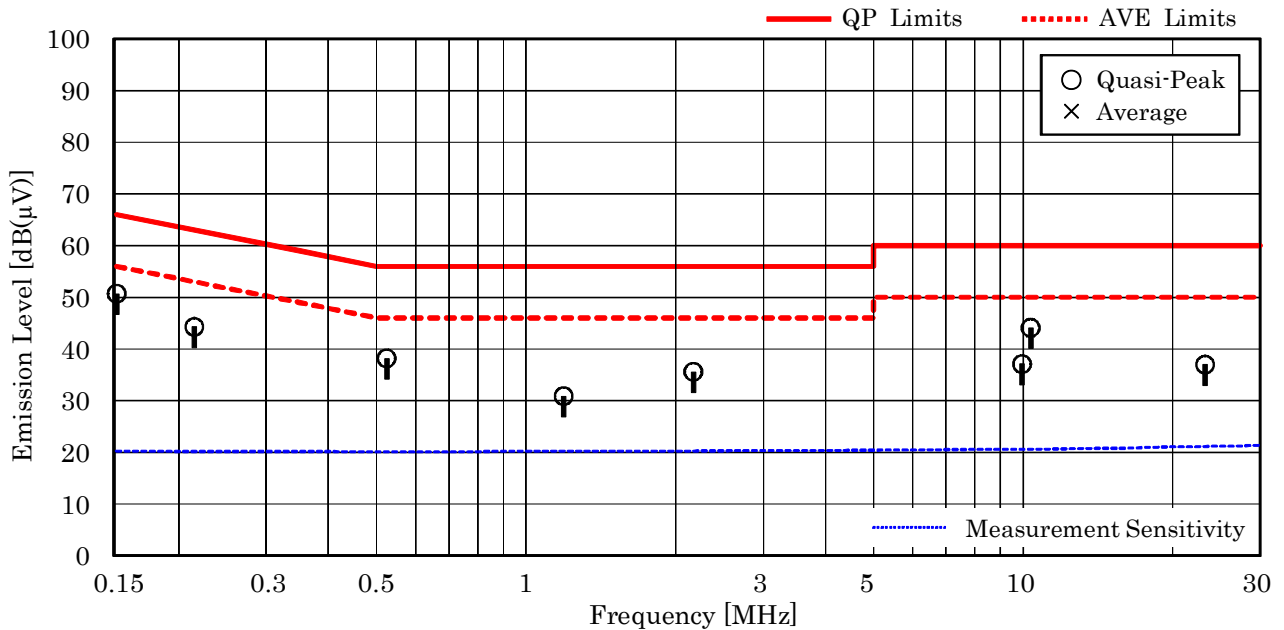
1. The spectrum was checked from 150 kHz to 30 MHz.
2. The correction factor includes the AMN insertion loss and the cable loss.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. The symbol of "--" means "not applicable".
6. Calculated result at 10.360 MHz, as the worst point shown on underline:
 Correction Factor + Meter Reading (QP) = 10.6 + 33.2 = 43.8 dB(μV)
7. QP : Quasi-Peak Detector / AVE : Average Detector
8. Test receiver setting(s) : CISPR QP 9 kHz / Average 9 kHz

Test voltage : 120VAC 60Hz

Test Date: January 25, 2016
Temp.: 25 °C, Humi.: 28 %

Measured phase : L2

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)]		Limits [dB(μV)]		Results [dB(μV)]		Margin [dB]		Remarks
		QP	AVE	QP	AVE	QP	AVE	QP	AVE	
<u>0.150</u>	10.3	40.4	--	66.0	56.0	50.7	--	+15.3	--	-
0.215	10.2	34.1	--	63.0	53.0	44.3	--	+18.7	--	-
0.524	10.1	28.1	--	56.0	46.0	38.2	--	+17.8	--	-
1.190	10.3	20.6	--	56.0	46.0	30.9	--	+25.1	--	-
2.170	10.3	25.3	--	56.0	46.0	35.6	--	+20.4	--	-
9.960	10.6	26.5	--	60.0	50.0	37.1	--	+22.9	--	-
10.360	10.6	33.5	--	60.0	50.0	44.1	--	+15.9	--	-
23.240	11.2	25.8	--	60.0	50.0	37.0	--	+23.0	--	-



NOTES

1. The spectrum was checked from 150 kHz to 30 MHz.
2. The correction factor includes the AMN insertion loss and the cable loss.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. The symbol of "--" means "not applicable".
6. Calculated result at 0.150 MHz, as the worst point shown on underline:
 Correction Factor + Meter Reading (QP) = 10.3 + 40.4 = 50.7 dB(μV)
7. QP : Quasi-Peak Detector / AVE : Average Detector
8. Test receiver setting(s) : CISPR QP 9 kHz / Average 9 kHz

7.4 Radiated Emission 9 kHz – 30 MHz

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.4.1 Test Results

For the standard, - Passed - Failed - Not judged

Min. Limit Margin (Average) 0.7 dB at 0.048 MHz

Uncertainty of Measurement Results ± 3.0 dB(2σ)

Test Distance 10.0 m

Remarks : The measurement result is within the range of measurement uncertainty.

7.4.2 Test Instruments

Anechoic Chamber A1				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Test Receiver	ESCI 7	100811 (A-8)	Rohde & Schwarz	2017/01/11
Loop Antenna	HFH2-Z2	860605/030 (C-3)	Rohde & Schwarz	2016/07/26
RF Cable	S 10162 B-11 etc.	--- (H-3)	HUBER+SUHNER	2016/04/15
RF Cable	RG213/U	--- (H-29)	HUBER+SUHNER	2016/07/26

NOTE : The calibration interval of the above test instruments is 12 months.

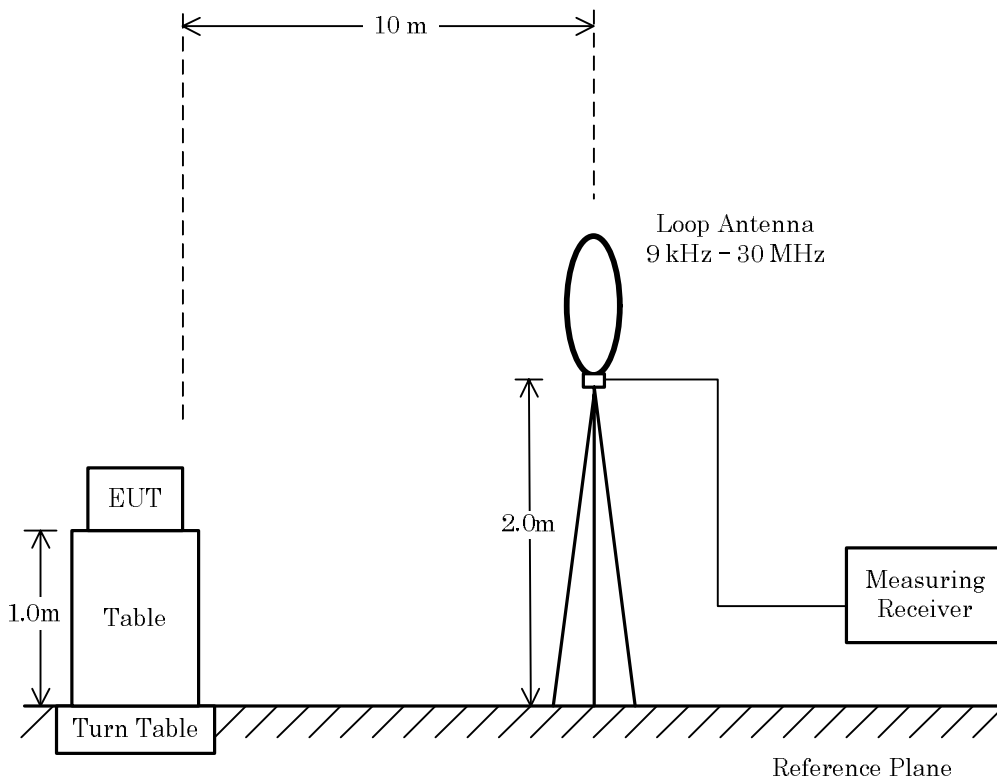
7.4.3 Test Method and Test Setup (Diagrammatic illustration)

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final tests.

(Reference divisional instruction No. G70364B)

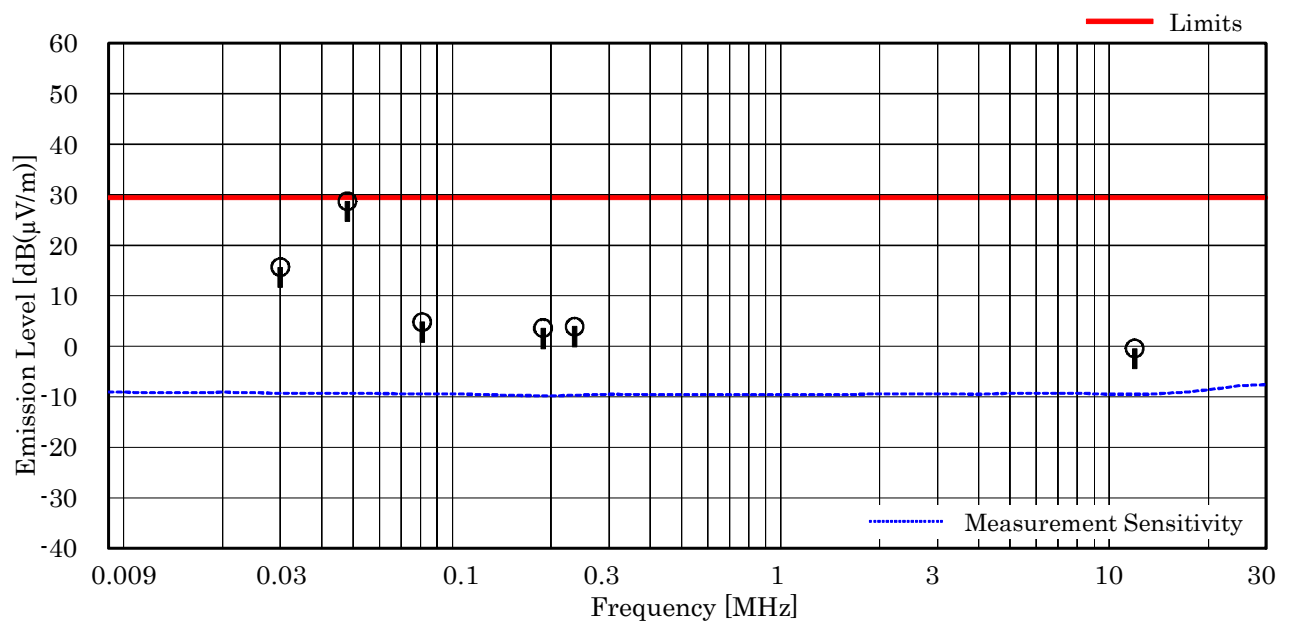


7.4.4 Test Data

Test voltage : 120VAC 60Hz

Test Date: February 1, 2016
Temp.: 16 °C, Humi: 40 %

Frequency [MHz]	Correction Factor [dB(1/m)]	Meter Readings at 10 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
0.030	20.2	25.0	29.4	15.7	+13.7	-
0.048	20.2	38.0	29.4	28.7	+ 0.7	-
0.081	20.1	14.2	29.4	4.8	+24.6	-
0.189	19.7	13.4	29.4	3.6	+25.8	-
0.236	19.9	13.5	29.4	3.9	+25.5	-
11.950	20.0	9.1	29.4	- 0.4	+29.8	-



NOTES

1. Test Distance : 10 m (Specified Distance : 300 m)
2. The spectrum was checked from 9 kHz to 30 MHz.
3. The correction factor includes the antenna factor and the cable loss.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 0.048 MHz, as the worst point shown on underline:
 Correction Factor + Meter Reading = 20.2 + 38.0 = 58.2 dB(μV/m)
 Result at 300 m = -29.5 + 58.2 = 28.7 dB(μV/m) = 27.2 μV/m (Conversion Factor : 20dB/decade)
 Turntable Angle : 6 °
7. Test receiver setting(s) : Average 200 Hz (9 kHz to 150 kHz), Average 9 kHz (150 kHz to 30 MHz)

7.5 Radiated Emission 30 MHz – 1000 MHz

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.5.1 Test Results

For the standard, - Passed - Failed - Not judged

Min. Limit Margin (Average) >38.8 dB at 30.00 MHz

Uncertainty of Measurement Results
 30 MHz – 200 MHz ± 4.2 dB(2σ)
 200 MHz – 1000 MHz ± 3.7 dB(2σ)

Test Distance 10.0 m

Remarks : _____

7.5.2 Test Instruments

Anechoic Chamber A1				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Test Receiver	ESCI 7	100811 (A-8)	Rohde & Schwarz	2017/01/11
Hybrid Antenna	CBL6111D	30644 (C-71)	TESEQ	2016/11/26
RF Cable	S 10162 B-11 etc.	--- (H-3)	HUBER+SUHNER	2016/04/15

NOTE : The calibration interval of the above test instruments is 12 months.

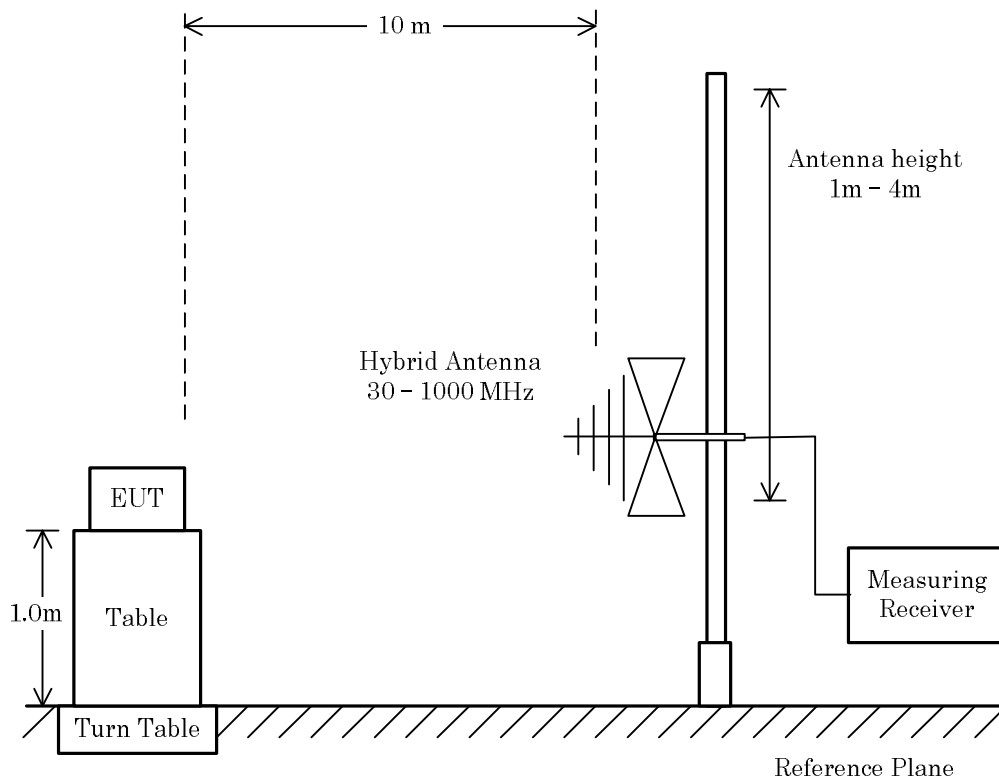
7.5.3 Test Method and Test Setup (Diagrammatic illustration)

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final tests.

(Reference divisional instruction No. G70364B)



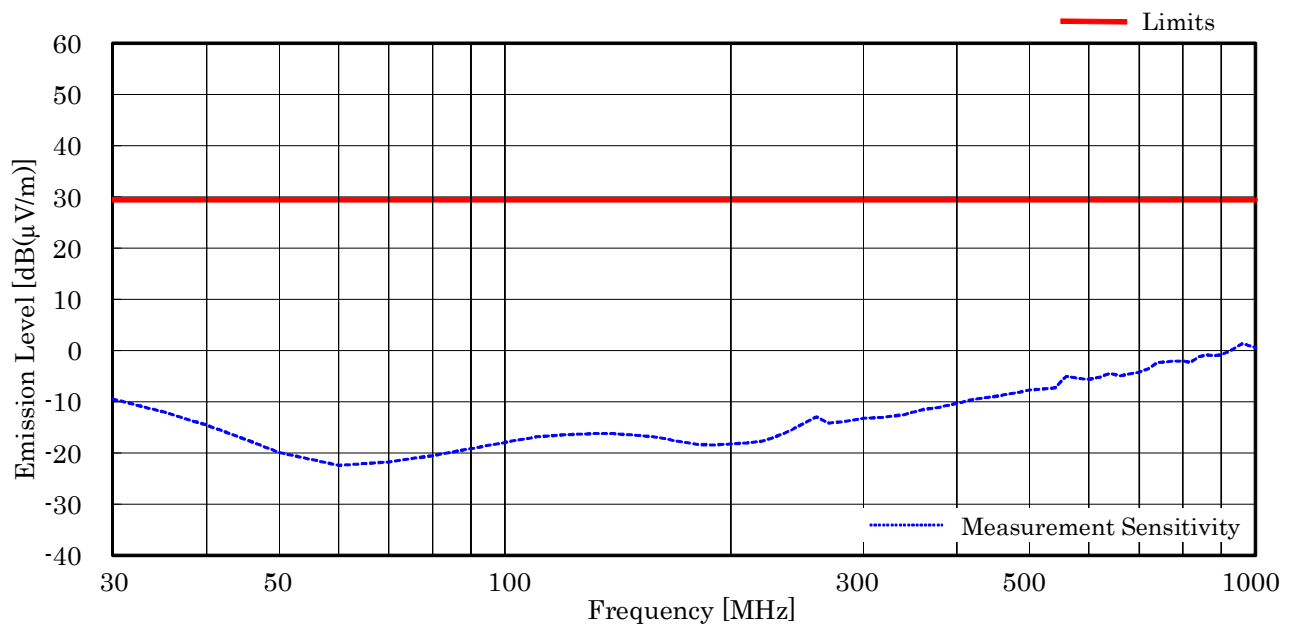
7.5.4 Test Data

Test voltage : 120VAC 60Hz

Test Date: February 1, 2016
Temp.: 16 °C, Humi: 40 %

Antenna pole : Horizontal

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 10 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
198.10	8.8	2.5	< 0.0	29.4	< -18.2	> +47.6	-
281.90	12.8	2.9	< 0.0	29.4	< -13.8	> +43.2	-



NOTES

1. Test Distance : 10 m (Specified Distance : 300 m)
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 281.90 MHz, as the worst point shown on underline:
 Antenna Factor + Cable Loss + Meter Reading = 12.8 + 2.9 + <0.0 = <15.7 dB(μV/m)
 Result at 300 m = -29.5 + <15.7 = <-13.8 dB(μV/m) = <0.2 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 150 cm, Turntable Angle : 121 °
7. Test receiver setting(s) : Average 120 kHz

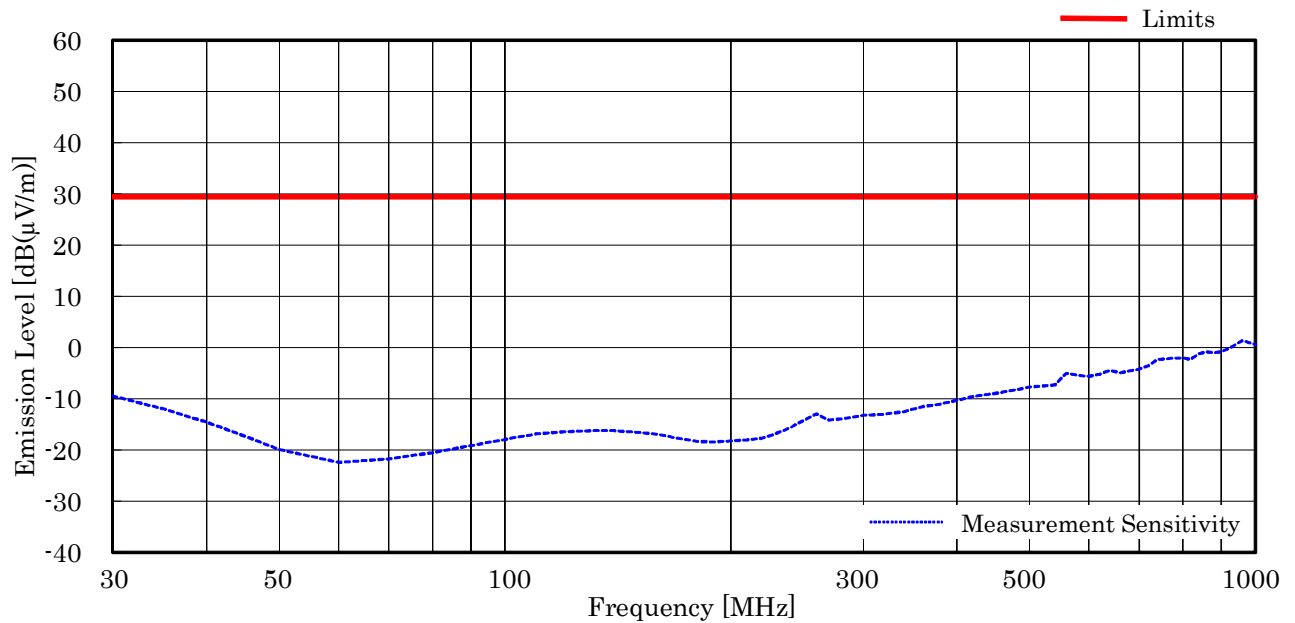
Test voltage : 120VAC 60Hz

Test Date: February 1, 2016

Temp.: 16 °C, Humi: 40 %

Antenna pole : Vertical

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 10 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
30.00	19.2	0.9	< 0.0	29.4	< - 9.4	> +38.8	-
58.26	5.9	1.3	< 0.0	29.4	< -22.3	> +51.7	-
117.05	11.2	1.8	< 0.0	29.4	< -16.5	> +45.9	-
277.40	12.6	2.9	< 0.0	29.4	< -14.0	> +43.4	-



NOTES

1. Test Distance : 10 m (Specified Distance : 300 m)
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 30.00 MHz, as the worst point shown on underline:
 $\text{Antenna Factor} + \text{Cable Loss} + \text{Meter Reading} = 19.2 + 0.9 + <0.0 = <20.1 \text{ dB}(\mu\text{V/m})$
 $\text{Result at 300 m} = -29.5 + <20.1 = <-9.4 \text{ dB}(\mu\text{V/m}) = <0.3 \mu\text{V/m}$ (Conversion Factor : 20dB/decade)
 Antenna Height : 100 cm, Turntable Angle : 272 °
7. Test receiver setting(s) : Average 120 kHz

7.6 Radiated Emission 1 GHz – 25 GHz

For the requirements, - Applicable [- Tested. - Not tested by applicant request.]
 - Not Applicable

7.6.1 Test Results

For the standard, - **Passed** - **Failed** - **Not judged**

Min. Limit Margin (Average) 6.6 dB at 2369.0 MHz

Uncertainty of Measurement Results
1 GHz – 6 GHz ± 4.7 dB(2 σ)
6 GHz – 18 GHz ± 4.6 dB(2 σ)
18 GHz – 40 GHz ± 5.5 dB(2 σ)

Test Distance 3.0 m

Remarks : _____

7.6.2 Test Instruments

Anechoic Chamber A2				
Type	Model	Serial No. (ID)	Manufacturer	Cal. Due
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2016/04/25
Pre-Amplifier	WJ-6882-824	0048 (A-21)	Watkins Johnson	2017/01/06
Pre-Amplifier	WJ-6611-513	0289 (A-23)	Watkins Johnson	2017/01/06
Pre-Amplifier	DBL-0618N515	001 9830 (A-33)	DBS Microwave	2017/01/06
Pre-Amplifier	TPA0118-36	1010 (A-37)	TOYO	2016/05/11
Horn Antenna	91888-2	562 (C-41-1)	EATON	2016/06/16
Horn Antenna	91889-2	568 (C-41-2)	EATON	2016/06/16
Horn Antenna	3160-04	9903-1053 (C-55)	EMCO	2016/06/29
Horn Antenna	3160-05	9902-1061 (C-56)	EMCO	2016/06/29
Horn Antenna	3160-06	9712-1045 (C-57)	EMCO	2016/06/29
Horn Antenna	3160-07	9902-1113 (C-58)	EMCO	2016/06/29
Horn Antenna	3160-08	9904-1099 (C-59)	EMCO	2016/06/29
Horn Antenna	3160-09	9808-1117 (C-48)	EMCO	2016/06/28
Pre-Amplifier	RP1826G-45H	RP140121-11 (A-53)	EMCS	2016/06/28
Attenuator	2-10	BA6214 (D-79)	Weinschel	2016/11/19
RF Cable	SUCOFLEX104	267479/4 (C-66)	HUBER+SUHNER	2017/01/06
RF Cable	SUCOFLEX104	267414/4 (C-67)	HUBER+SUHNER	2017/01/06
RF Cable	SUCOFLEX102EA	3041/2EA (C-69)	HUBER+SUHNER	2017/01/06

NOTE : The calibration interval of the above test instruments is 12 months.

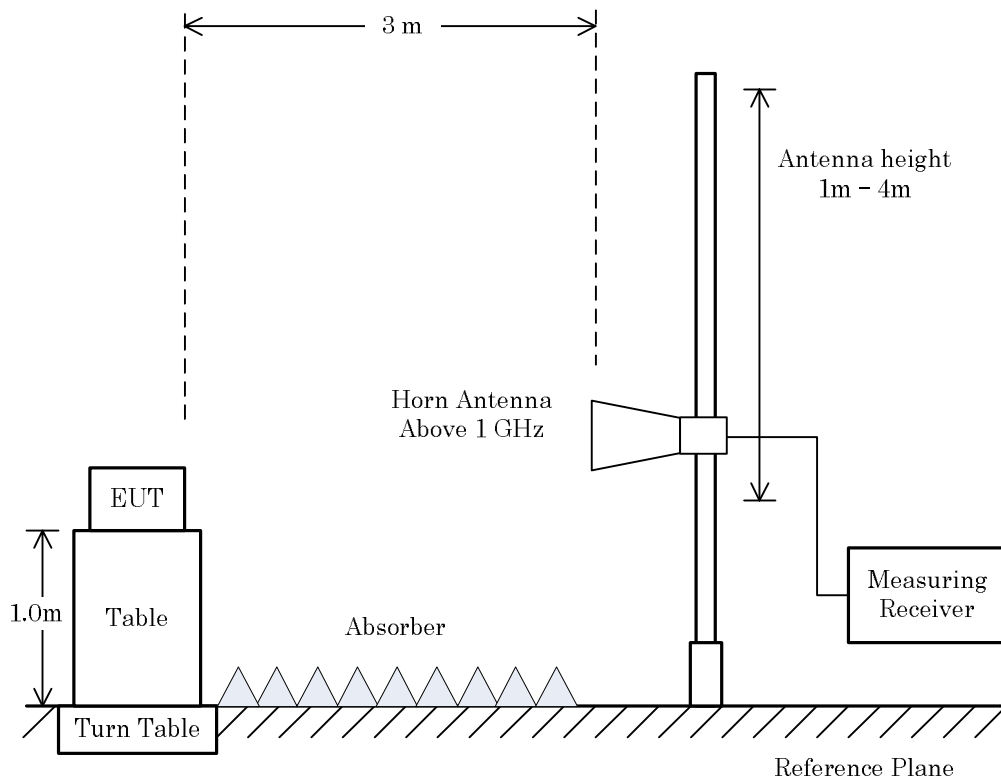
7.6.3 Test Method and Test Setup (Diagrammatic illustration)

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.

The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.

This configurations was used for the final tests.

(Reference divisional instruction No. G70364C)

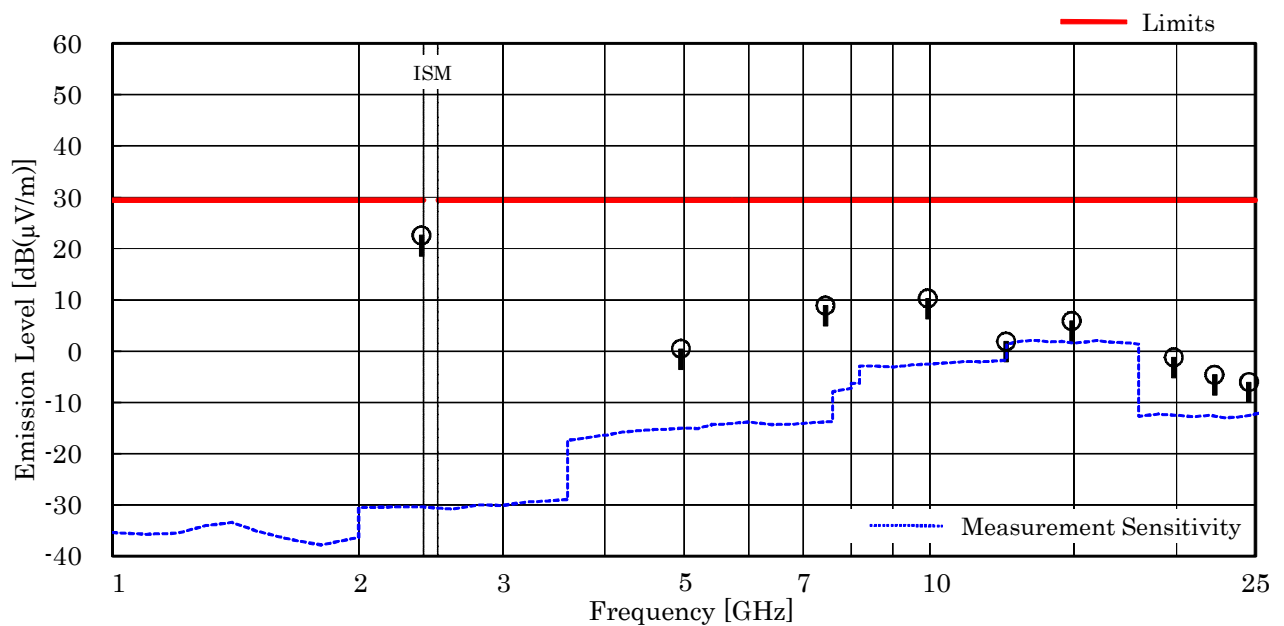


7.6.4 Test Data

Test voltage : 120VAC 60Hz
Test condition : Center 700ml
Antenna Pole : Horizontal

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
2385.6	21.6	10.7	30.3	29.4	22.6	+ 6.8	-
4954.9	27.3	-30.5	43.7	29.4	0.5	+28.9	-
7445.4	29.8	-28.7	47.8	29.4	8.9	+20.5	-
9933.1	33.5	-25.8	42.6	29.4	10.3	+19.1	-
12382.8	33.5	-25.4	33.8	29.4	1.9	+27.5	-
14898.1	37.0	-25.5	34.4	29.4	5.9	+23.5	-
19861.5	40.4	-42.8	41.2	29.4	-1.2	+30.6	-
22273.0	40.6	-43.2	38.0	29.4	-4.6	+34.0	-
24551.5	40.5	-43.2	36.7	29.4	-6.0	+35.4	-



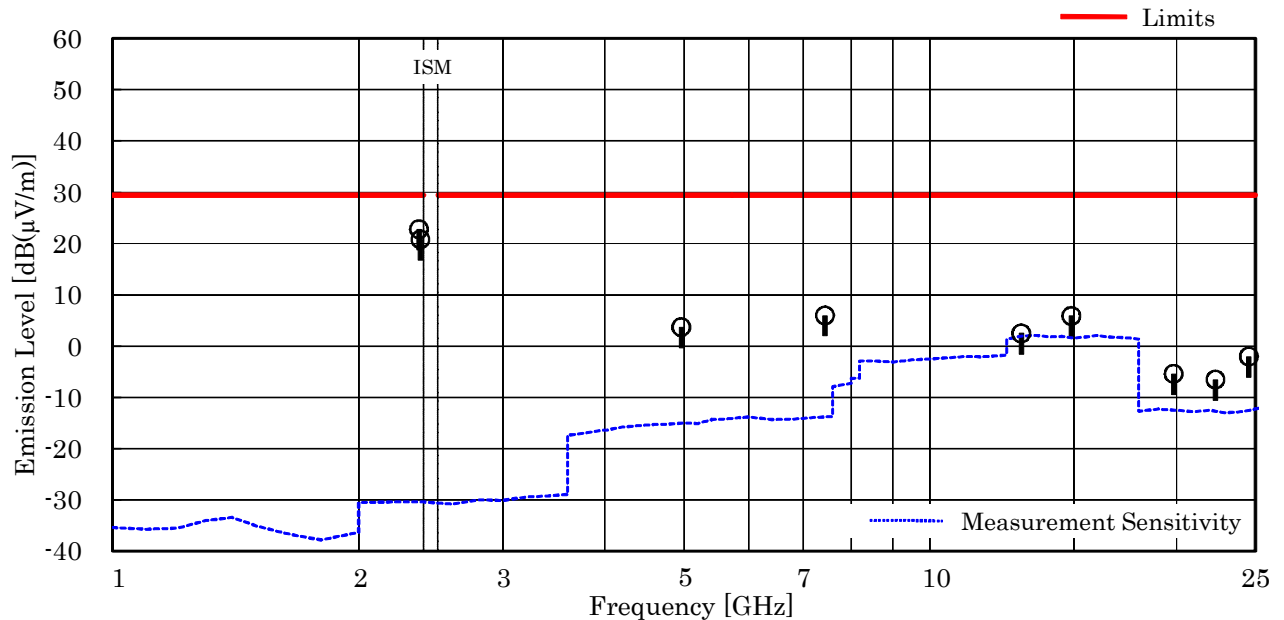
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 2385.6 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 21.6 + 10.7 + 30.3 = 62.6 dB(μV/m)
 Result at 300 m = -40.0 + 62.6 = 22.6 dB(μV/m) (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 42 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Center 700ml
Antenna Pole : Vertical

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
2369.0	21.6	10.7	30.5	29.4	22.8	+ 6.6	-
2378.7	21.6	10.7	28.5	29.4	20.8	+ 8.6	-
4960.3	27.3	-30.5	46.9	29.4	3.7	+25.7	-
7437.4	29.8	-28.7	44.9	29.4	6.0	+23.4	-
12925.1	37.1	-25.1	30.5	29.4	2.5	+26.9	-
14881.1	37.0	-25.4	34.3	29.4	5.9	+23.5	-
19852.1	40.4	-42.8	37.0	29.4	-5.4	+34.8	-
22335.8	40.6	-43.2	36.1	29.4	-6.5	+35.9	-
24545.1	40.5	-43.2	40.7	29.4	-2.0	+31.4	-



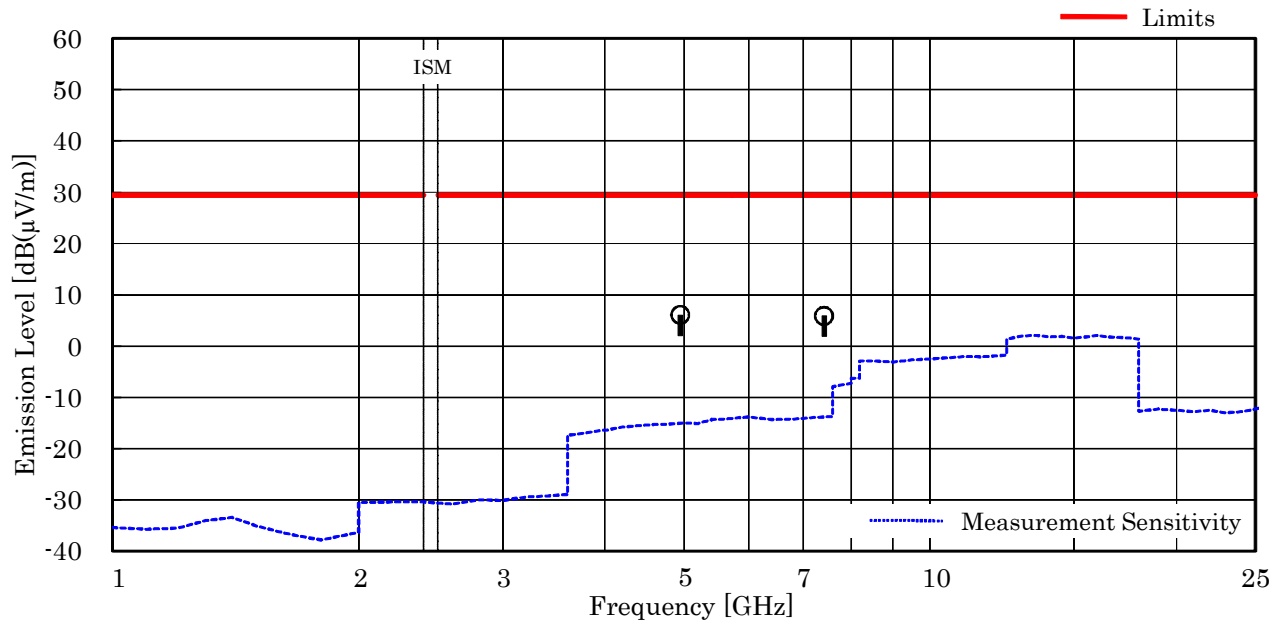
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 2369.0 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 21.6 + 10.7 + 30.5 = 62.8 dB(μV/m)
 Result at 300 m = -40.0 + 62.8 = 22.8 dB(μV/m) = 13.8 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 352 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Center 300ml
Antenna Pole : Horizontal

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4945.9	27.3	-30.5	49.3	29.4	6.1	+23.3	-
7414.8	29.8	-28.7	44.8	29.4	5.9	+23.5	-



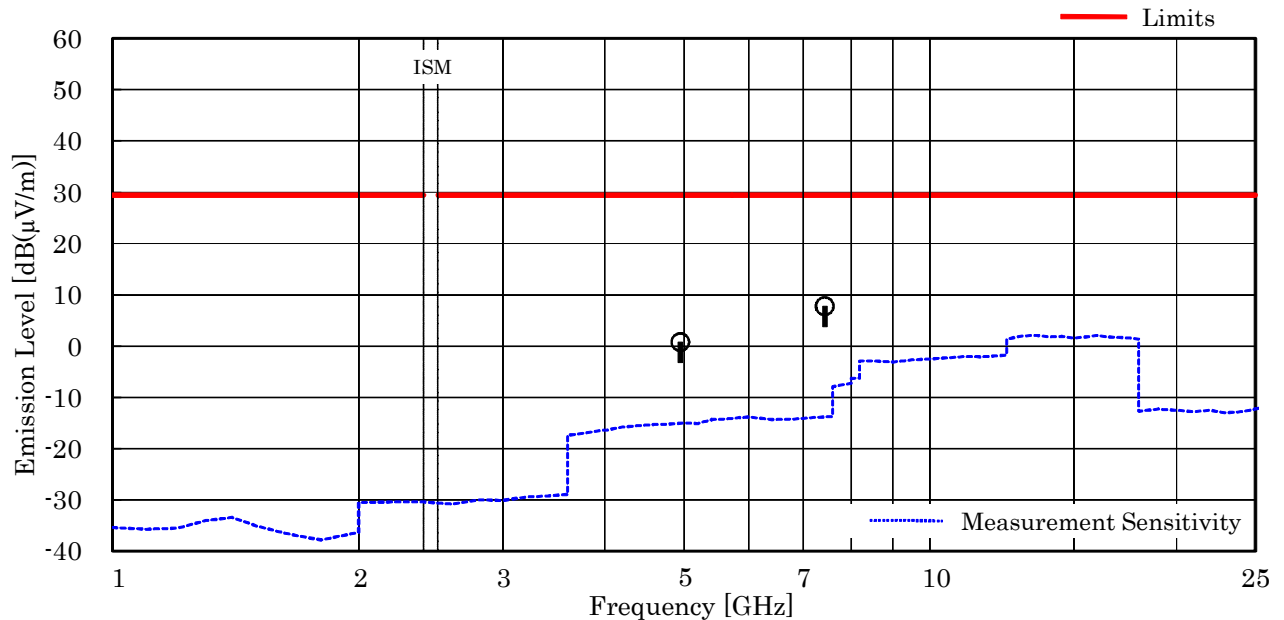
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 4945.9 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 27.3 + (-30.5) + 49.3 = 46.1 dB(μV/m)
 Result at 300 m = -40.0 + 46.1 = 6.1 dB(μV/m) = 2.0 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 241 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Center 300ml
Antenna Pole : Vertical

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4948.3	27.3	-30.5	44.0	29.4	0.8	+28.6	-
7430.4	29.8	-28.7	46.7	29.4	7.8	+21.6	-



NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 7430.4 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 29.8 + (-28.7) + 46.7 = 47.8 dB(μV/m)
 Result at 300 m = -40.0 + 47.8 = 7.8 dB(μV/m) = 2.5 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 12 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz

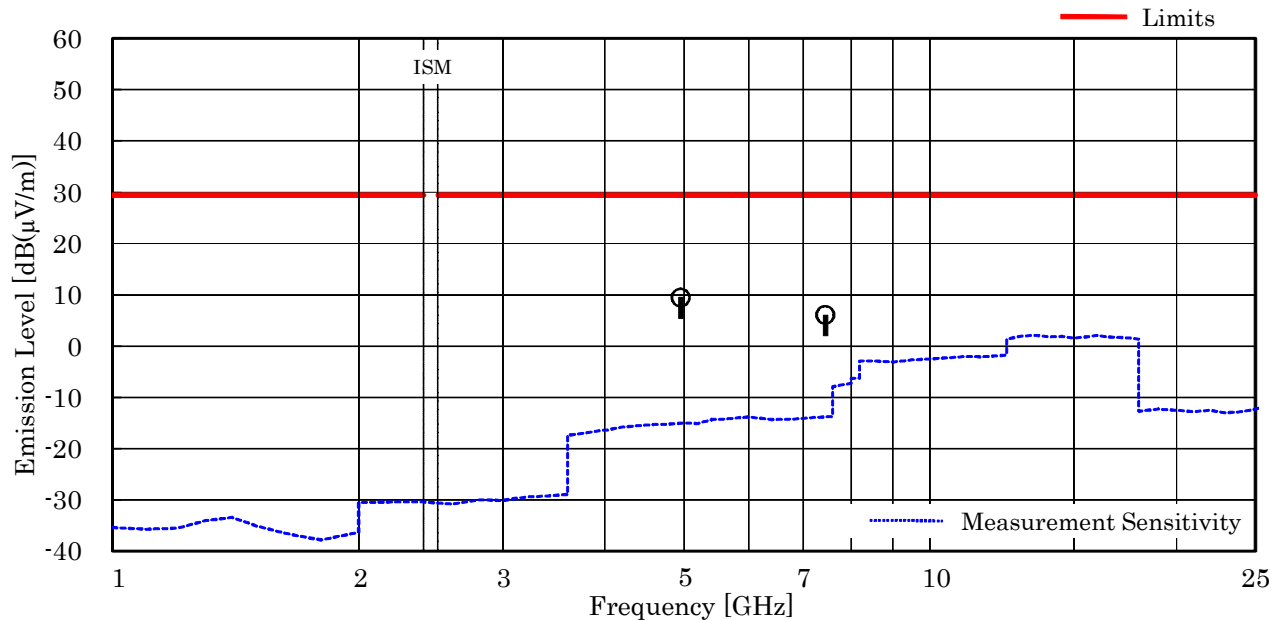
Test Date: February 2, 2016

Test condition : Right Front Corner 700ml

Temp.: 24 °C, Humi: 32 %

Antenna Pole : Horizontal

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4952.0	27.3	-30.5	52.7	29.4	9.5	+19.9	-
7441.7	29.8	-28.7	45.0	29.4	6.1	+23.3	-



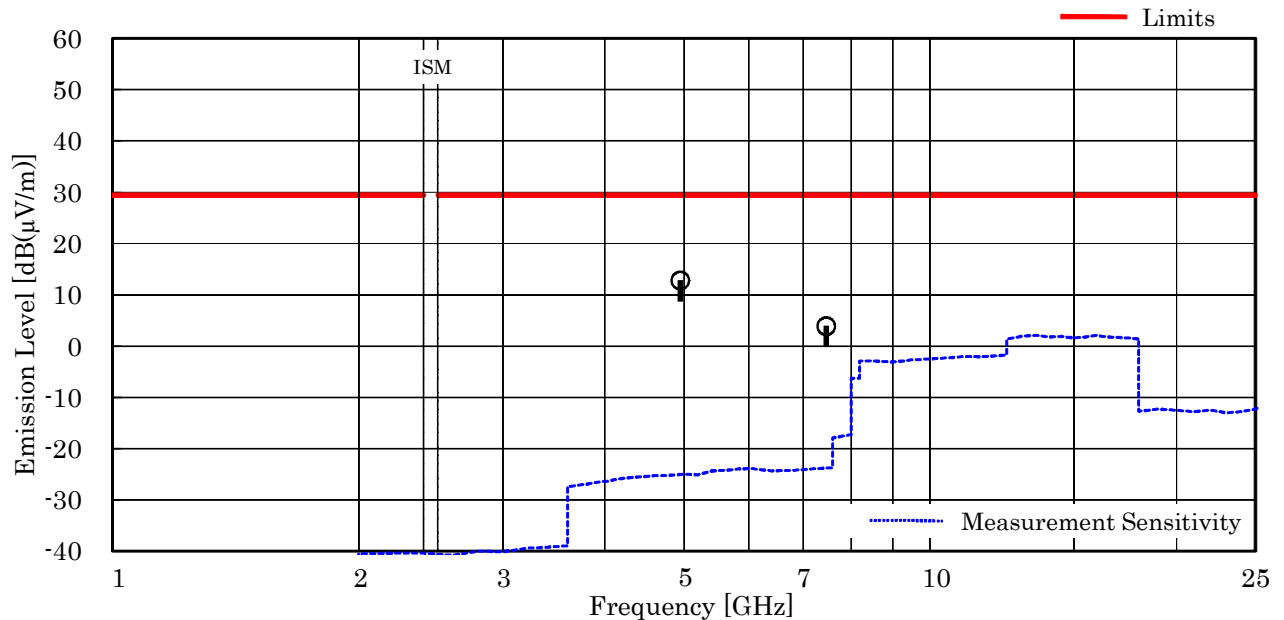
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 4952.0 MHz, as the worst point shown on underline:
 $\text{Antenna Factor} + \text{Correction Factor} + \text{Meter Reading} = 27.3 + (-30.5) + 52.7 = 49.5 \text{ dB}(\mu\text{V}/\text{m})$
 $\text{Result at 300 m} = -40.0 + 49.5 = 9.5 \text{ dB}(\mu\text{V}/\text{m}) = 3.0 \mu\text{V}/\text{m}$ (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 314 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Right Front Corner 700ml
Antenna Pole : Vertical

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4947.3	27.3	-30.4	55.9	29.4	12.8	+16.6	-
7461.7	29.8	-28.7	42.8	29.4	3.9	+25.5	-



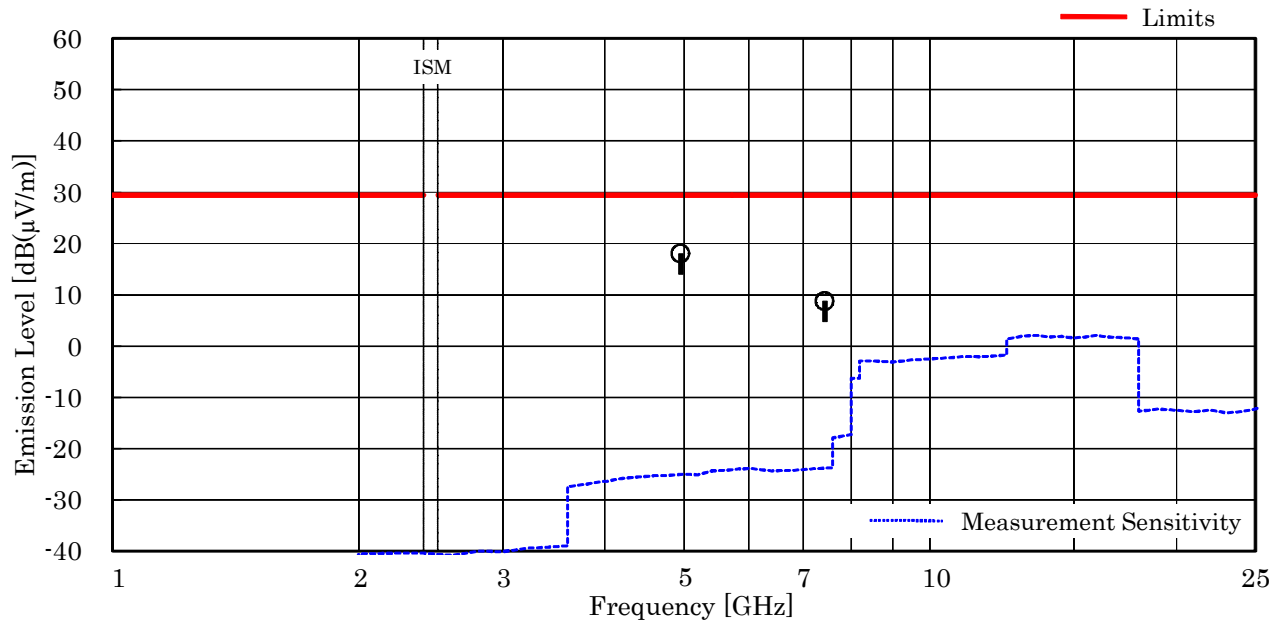
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 4947.3 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 27.3 + (-30.4) + 55.9 = 52.8 dB(μV/m)
 Result at 300 m = -40.0 + 52.8 = 12.8 dB(μV/m) = 4.4 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 340 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Right Front Corner 300ml
Antenna Pole : Horizontal

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4948.5	27.3	-30.4	61.2	29.4	18.1	+11.3	-
7427.3	29.8	-28.7	47.7	29.4	8.8	+20.6	-



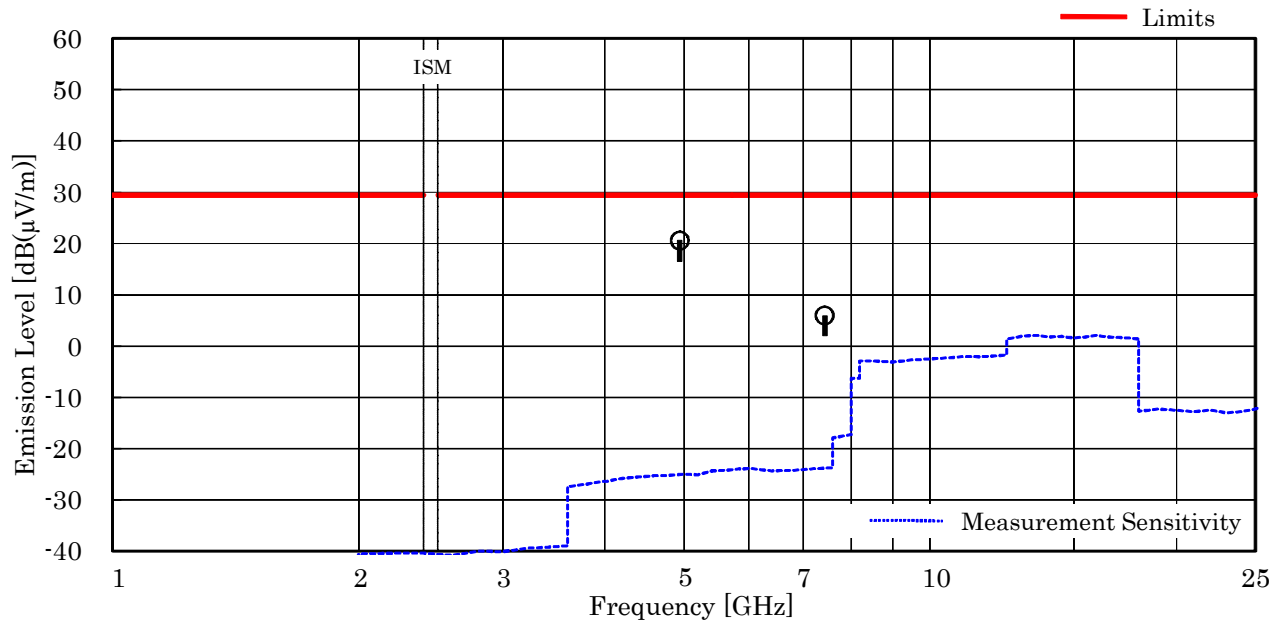
NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 4948.5 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 27.3 + (-30.4) + 61.2 = 58.1 dB(μV/m)
 Result at 300 m = -40.0 + 58.1 = 18.1 dB(μV/m) = 8.0 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 32 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO

Test voltage : 120VAC 60Hz
Test condition : Right Front Corner 300ml
Antenna Pole : Vertical

Test Date: February 2, 2016
Temp.: 24 °C, Humi: 32 %

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings at 3 m [dB(μV)]	Limits at 300 m [dB(μV/m)]	Results at 300 m [dB(μV/m)]	Margin [dB]	Remarks
4941.0	27.3	-30.4	63.7	29.4	20.6	+ 8.8	-
7428.5	29.8	-28.7	44.9	29.4	6.0	+23.4	-



NOTES

1. Test Distance : 3 m (Specified Distance : 300 m)
2. The spectrum was checked from 1 GHz to 24.5 GHz (10th harmonic of the operating frequency).
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of “<” means “or less”.
5. The symbol of “>” means “more than”.
6. Calculated result at 4941.0 MHz, as the worst point shown on underline:
 Antenna Factor + Correction Factor + Meter Reading = 27.3 + (-30.4) + 63.7 = 60.6 dB(μV/m)
 Result at 300 m = -40.0 + 60.6 = 20.6 dB(μV/m) = 10.7 μV/m (Conversion Factor : 20dB/decade)
 Antenna Height : 118 cm, Turntable Angle : 337 °
7. Spectrum analyzer setting(s) :
 Average : Resolution Bandwidth = 1 MHz, Video Bandwidth = 10 Hz, Sweep Time = AUTO