RADIO TEST REPORT

Test Report No. : 11579640H-R2

Applicant	:	**Oki Electric Industry Co., Ltd.**
Type of Equipment	:	**MH920-MOD-F**
Model No.	:	**MH920-MOD-F**
FCC ID	:	**2AKGW-1TD3016A1**
Test regulation	:	**FCC Part 15 Subpart C: 2016**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11579640H-R1. 11579640H-R1 is replaced with this report.

Date of test: December 22 to February 7, 2017

Representative test engineer:

Masafumi Niwa
Engineer
Consumer Technology Division

Approved by:

Tsubasa Takayama
Engineer
Consumer Technology Division

NVLAP TESTING
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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http://japan.ul.com/resources/emc_accredited/

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REVISION HISTORY

Original Test Report No.: 11579640H

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11579640H	March 15, 2017	-	-
1	11579640H-R1	April 10, 2017	P.4	Correction of Radio Specification: Power Supply (radio part input (inner)) in Clause 2.2
1	11579640H-R1	April 10, 2017	P.5	Correction of "FCC Part 15.31 (e)" in Clause 3.2.
1	11579640H-R1	April 10, 2017	P.5	Correction of FCC Part 15.203 Antenna requirement [External antenna] in Clause 3.2.
1	11579640H-R1	April 10, 2017	P.6	Correction of Uncertainty of Radiated emission test in Clause 3.4.
1	11579640H-R1	April 10, 2017	P.9	Correction of Configuration and peripherals in Clause 4.2.
2	11579640H-R2	April 20, 2017	P.9	Addition of the following sentence in Clause 4.2; The antenna gain becomes peak by using a ground plate with the size of the specification.
2	11579640H-R2	April 20, 2017	P.9	Correction of the cable length in Clause 4.2.

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SECTION 1: Customer information

Company Name	:	Oki Electric Industry Co., Ltd.
Address	:	1-16-8 Chuou Warabi-shi, Saitama 335-8510 Japan
Telephone Number	:	+81-48-420-7168
Facsimile Number	:	+81-48-420-7016
Contact Person	:	Masahiko Kaneko

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

2.1 Identification of E.U.T.

Type of Equipment	:	MH920-MOD-F
Model No.	:	MH920-MOD-F
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	December 22, 2016
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	902.4 MHz - 927.6 MHz
Modulation	:	GFSK
Power Supply (radio part input (inner))	:	DC 2.6 V
Antenna type	:	Pattern antenna (Internal) Sleeve antenna (External) λ4 Monopole antenna (External)
Antenna Gain	:	Pattern antenna (Internal) : -2 dBi Sleeve antenna (External) : 2dBi λ4 Monopole antenna (External):0 dBi (including Cable)
Clock frequency (Maximum)	:	CPU: 48 MHz, 32.768 kHz

* The EUT does not transmit simultaneously with each antenna.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**QP** 17.4 dB, 0.19211 MHz, L **AV** 25.3 dB, 13.29213 MHz, N	Complied	-
6dB Bandwidth	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** -	**FCC:** Section 15.247(a)(2) **IC:** RSS-247 5.2(1)	See data.	Complied	Conducted
Maximum Peak Output Power	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** RSS-Gen 6.12	**FCC:** Section 15.247(b)(3) **IC:** RSS-247 5.4(4)		Complied	Conducted
Power Density	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** -	**FCC:** Section 15.247(e) **IC:** RSS-247 5.2(2)		Complied	Conducted
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	5.0 dB 6493.200 MHz, AV, Vertical	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r05 12.2.7.

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)
The RF Module has its own regulator.
The RF Module is constantly provided voltage (DC 2.6 V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
[Internal antenna]
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

[External antenna]
The EUT has a unique coupling/antenna connector (UFL). Therefore the equipment complies with the requirement of 15.203. Module has UFL Connector, and antenna Cable has RP-SMA Connector.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	N/A	-	Conducted

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

3.4 Uncertainty

EMI

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

Ise EMC Lab.

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.5 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

Frequency range	Conducted emission using AMN(LISN) (+/-)
0.009 MHz - 0.15 MHz	3.5 dB
0.15 MHz - 30 MHz	3.0 dB

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3 m	3.8 dB
10 m	3.7 dB

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*) (+/-)		(10 m*) (+/-)	
	30 MHz - 200 MHz	200 MHz - 1000 MHz	30 MHz - 200 MHz	200 MHz - 1000 MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	4.7 dB	5.9 dB	5.0 dB	5.1 dB

Radiated emission (Above 1 GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 GHz - 6 GHz	6 GHz - 18 GHz	10 GHz - 26.5 GHz	26.5 GHz - 40 GHz	1 GHz - 18 GHz
5.2 dB	5.4 dB	5.5 dB	5.5 dB	5.4 dB

*Measurement distance

Conducted Emission test

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

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 m x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

Mode	Remarks*
Transmitting mode	-

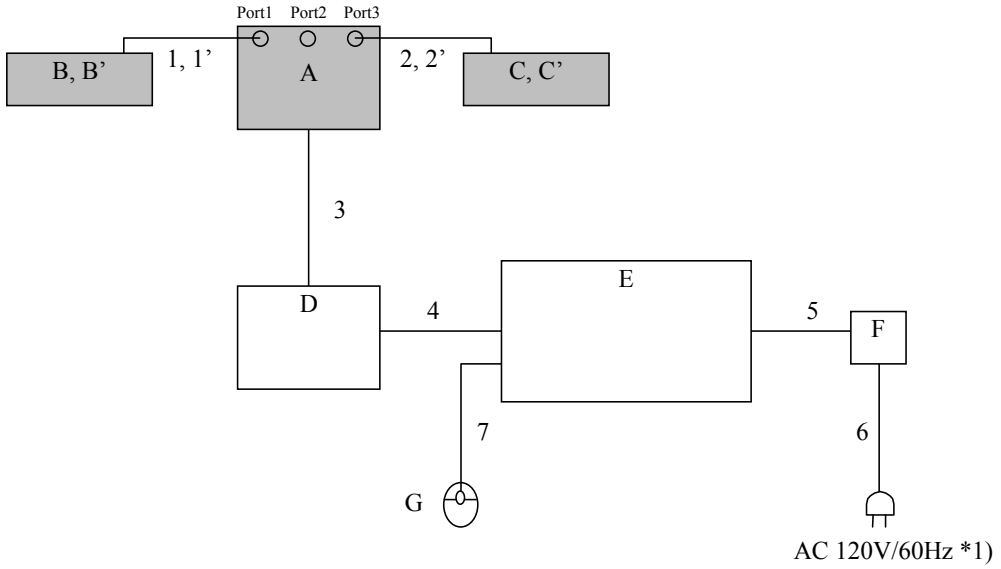
*Power of the EUT was set by the software as follows;
Power settings: +13dBm
Software: MH920-Mod-F Software Ver.14
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*The details of Operating mode(s)

Test Item	Operating Mode	Antenna port*	Tested frequency
Conducted Emission	Tx	1 (External antenna) 2 (Internal antenna)	902.4 MHz 915.0 MHz 927.6 MHz
Radiated Spurious Emission	Tx	1 (External antenna) 2 (Internal antenna)	902.4 MHz 915.0 MHz 927.6 MHz
6dB Bandwidth Conducted Spurious Emission Power Density 99% Occupied Bandwidth	Tx	1 (External antenna)	902.4 MHz 915.0 MHz 927.6 MHz
Maximum Peak Output Power	Tx	1 (External antenna) 2 (Internal antenna)	902.4 MHz 915.0 MHz 927.6 MHz

* Although Port 1, 3 are for external antenna port, Port 3 is used only receiving.
* Port 2 is for internal antenna port (temporary for test).

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
*1) Conducted emission test was performed with this port.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	RF Module	MH920-MOD-F	16Z0FA00001	Oki Electric Industry Co., Ltd.	EUT
B	Sleeve Antenna	MH920-Node-ANT <S>-F	001	Oki Electric Industry Co., Ltd.	EUT
B'	λ/4 Monopole Antenna *1)	MH920-Node-ANT <R>-F	001	Oki Electric Industry Co., Ltd.	EUT with ground plate (size; 10 cm x 20 cm)
C	Sleeve Antenna	MH920-Node-ANT <S>-F	002	Oki Electric Industry Co., Ltd.	EUT
C'	λ/4 Monopole Antenna	MH920-Node-ANT <R>-F	002	Oki Electric Industry Co., Ltd.	EUT
D	Jig	YU1260-1081	102	Oki Electric Industry Co., Ltd.	-
E	Laptop PC	ProBook 4530S	-	hp	-
F	AC Adapter	PPP009H	F12921204052593	hp	-
G	USB Mouse	M-K4URWH/RS	36114439A	ELECOM	-

*1) The test was performed with the ground plate described in the specification.
The antenna gain becomes peak by using a ground plate with the size of the specification.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1, 2	Antenna Cable	0.07	Shielded	Shielded	for Sleeve Antenna
1', 2'	Antenna Cable	2.50	Shielded	Shielded	for λ/4 Monopole Antenna
3	Flat Cable	0.20	Unshielded	Unshielded	-
4	USB Cable	1.50	Shielded	Shielded	-
5	DC Cable	1.60	Unshielded	Unshielded	-
6	AC Cable	1.80	Unshielded	Unshielded	-
7	USB Cable	1.00	Shielded	Shielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector	**: QP and CISPR AV**
Measurement range	**: 0.15 MHz – 30 MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r05".

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98%, a duty factor was added to the results.	RBW: 100 kHz VBW: 300kHz
Test Distance	3 m	4.5 m *2) (1 GHz – 10 GHz)		4.5 m *2) (1 GHz – 10 GHz)

*1) Average Power Measurement was performed based on 6. 0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r05".
*2) Distance Factor: 20 x log (4.5 m / 3.0 m) = 3.53 dB

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 MHz - 10 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	1 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	10 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1 kHz	27 kHz				

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r05".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz)

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission
(Internal Antenna)

DATA OF CONDUCTED EMISSION TEST

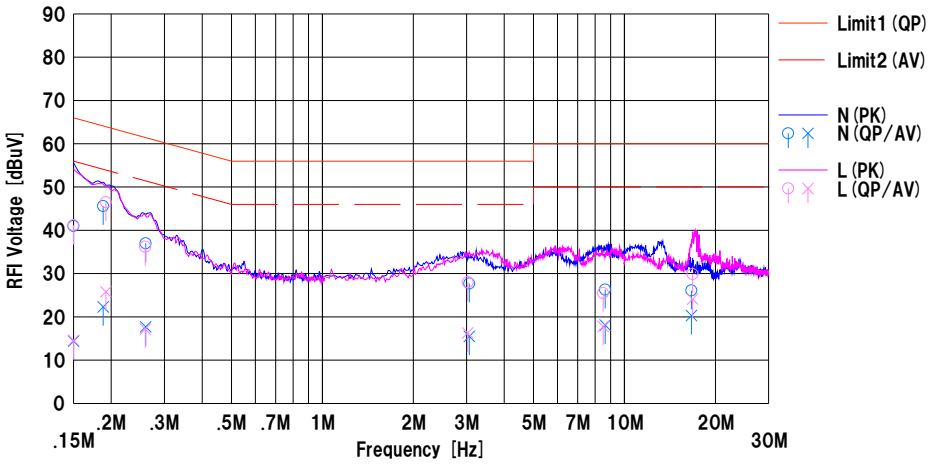
UL Japan, Inc. Ise EMC Lab. No.4 Semi Anechoic Chamber
Date : 2017/02/07

Report No. : 11579640H

Temp./Humi. : 22deg. C / 31% RH
Engineer : Takumi Shimada

Mode / Remarks : Tx 915.0MHz Ex-Ant1

Limit1 : FCC15.207 QP
Limit2 : FCC15.207 AV



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
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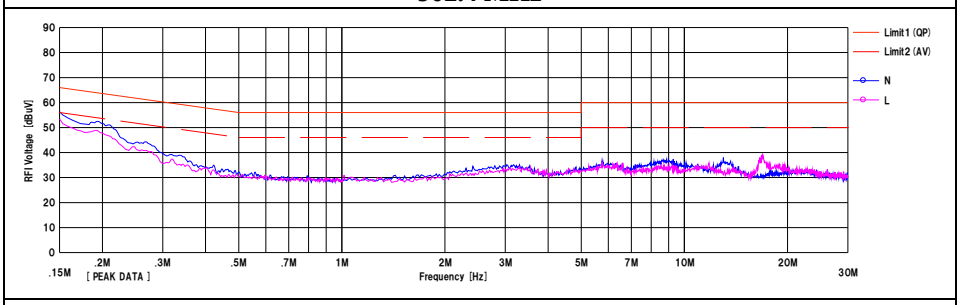
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	27.6	1.0	13.4	41.0	14.4	66.0	56.0	25.0	41.6	N	
2	0.18815	32.2	8.9	13.4	45.6	22.3	64.1	54.1	18.5	31.8	N	
3	0.25996	23.6	4.3	13.4	37.0	17.7	61.4	51.4	24.4	33.7	N	
4	3.06672	14.1	1.9	13.6	27.7	15.5	56.0	46.0	28.3	30.5	N	
5	8.63580	12.5	4.3	13.8	26.3	18.1	60.0	50.0	33.7	31.9	N	
6	16.66796	12.1	6.3	14.0	26.1	20.3	60.0	50.0	33.9	29.7	N	
7	0.15000	27.8	1.2	13.4	41.2	14.6	66.0	56.0	24.8	41.4	L	
8	0.19211	33.1	12.4	13.4	46.5	25.8	63.9	53.9	17.4	28.1	L	
9	0.25933	22.8	3.8	13.4	36.2	17.2	61.4	51.4	25.2	34.2	L	
10	3.02998	14.4	2.7	13.6	28.0	16.3	56.0	46.0	28.0	29.7	L	
11	8.49911	11.7	4.0	13.8	25.5	17.8	60.0	50.0	34.5	32.2	L	
12	16.80609	15.9	10.1	14.0	29.9	24.1	60.0	50.0	30.1	25.9	L	

CHART:WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE)
Except for the above table : adequate margin data below the limits.

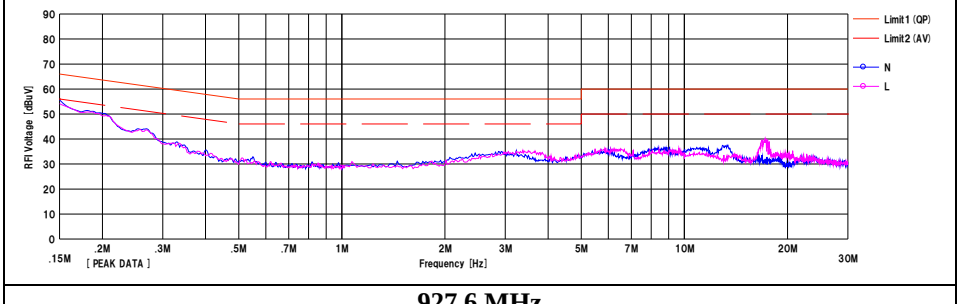
Conducted Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11579640H
Date	February 7, 2017
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Takumi Shimada
Mode	Tx

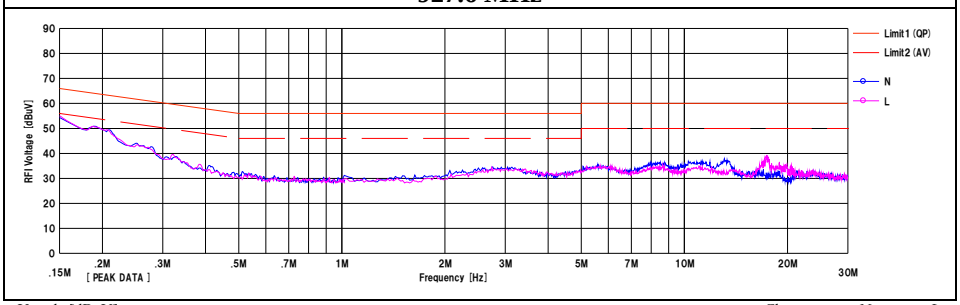
902.4 MHz



915.0 MHz



927.6 MHz



Y scale [dBuV] Chart — N — L

Conducted Emission
(External Antenna)

DATA OF CONDUCTED EMISSION TEST

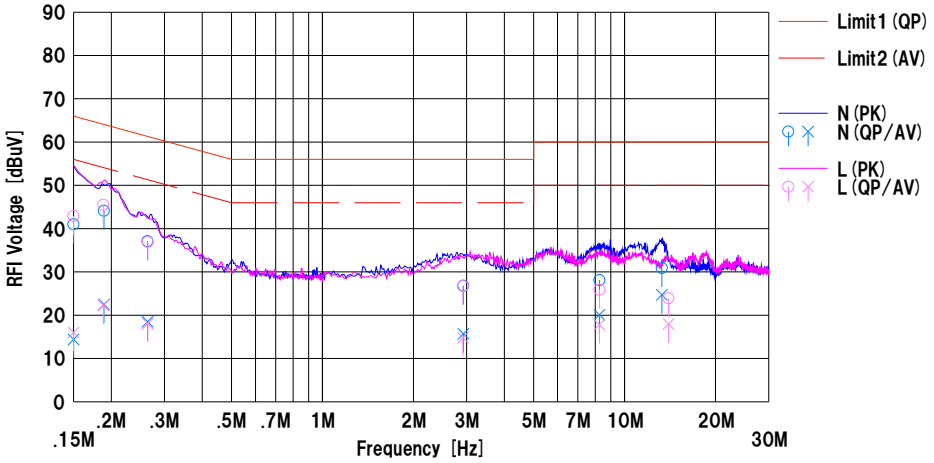
UL Japan, Inc. Ise EMC Lab. No.4 Semi Anechoic Chamber
Date : 2017/02/07

Report No. : 11579640H

Temp./Humi. : 22deg. C / 31% RH
Engineer : Takumi Shimada

Mode / Remarks : Tx 915.0MHz In-Ant2

Limit1 : FCC15.207 QP
Limit2 : FCC15.207 AV



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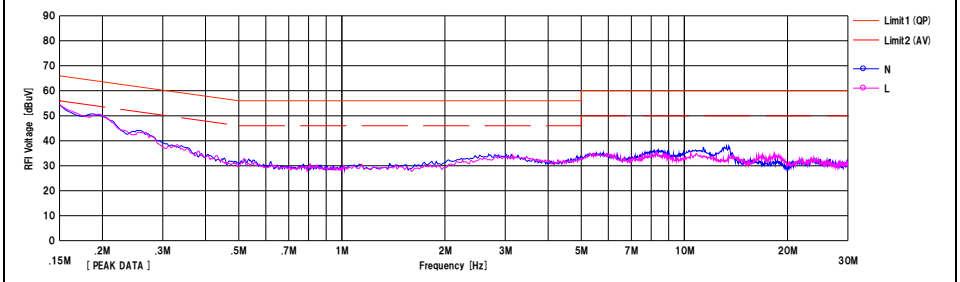
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	27.6	1.0	13.4	41.0	14.4	66.0	56.0	25.0	41.6	N	
2	0.18925	30.7	9.1	13.4	44.1	22.5	64.0	54.0	19.9	31.5	N	
3	0.26369	23.7	5.1	13.4	37.1	18.5	61.3	51.3	24.2	32.8	N	
4	2.92772	13.2	2.1	13.6	26.8	15.7	56.0	46.0	29.2	30.3	N	
5	8.26014	14.3	6.3	13.8	28.1	20.1	60.0	50.0	31.9	29.9	N	
6	13.29213	17.0	10.8	13.9	30.9	24.7	60.0	50.0	29.1	25.3	N	
7	0.15000	29.5	2.6	13.4	42.9	16.0	66.0	56.0	23.1	40.0	L	
8	0.18819	32.1	8.9	13.4	45.5	22.3	64.1	54.1	18.6	31.8	L	
9	0.26415	23.5	4.7	13.4	36.9	18.1	61.3	51.3	24.4	33.2	L	
10	2.91818	13.1	1.2	13.6	26.7	14.8	56.0	46.0	29.3	31.2	L	
11	8.25922	12.1	4.0	13.8	25.9	17.8	60.0	50.0	34.1	32.2	L	
12	13.98171	9.9	4.0	14.0	23.9	18.0	60.0	50.0	36.1	32.0	L	

CHART:WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE)
Except for the above table : adequate margin data below the limits.

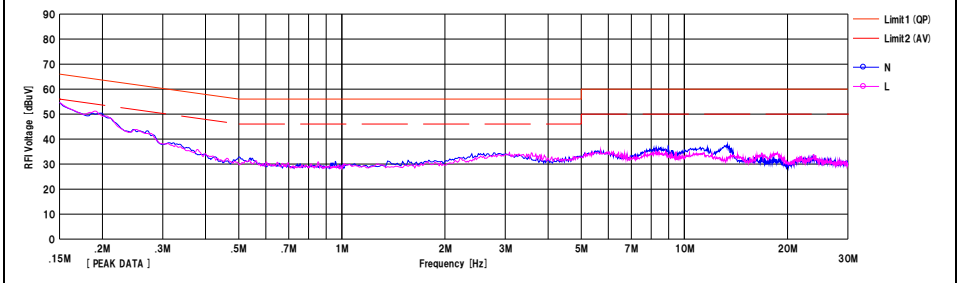
Conducted Emission

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11579640H
Date	February 7, 2017
Temperature / Humidity	22 deg. C / 31 % RH
Engineer	Takumi Shimada
Mode	Tx

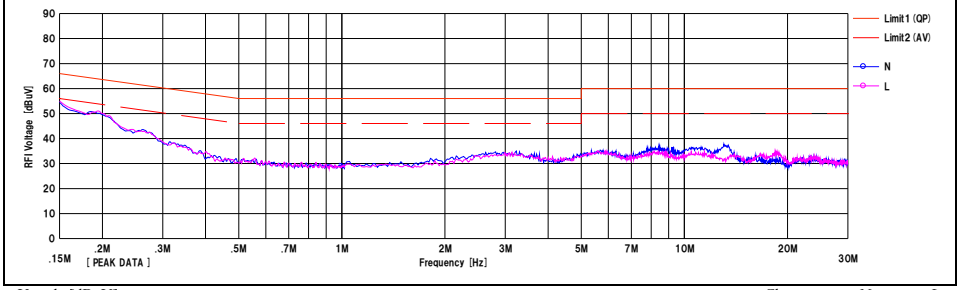
902.4 MHz



915.0 MHz



927.6 MHz



Y scale [dBuV] Chart — N — L

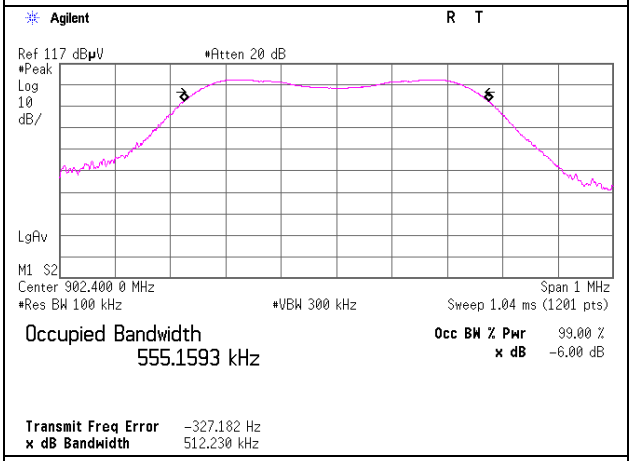
6dB Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

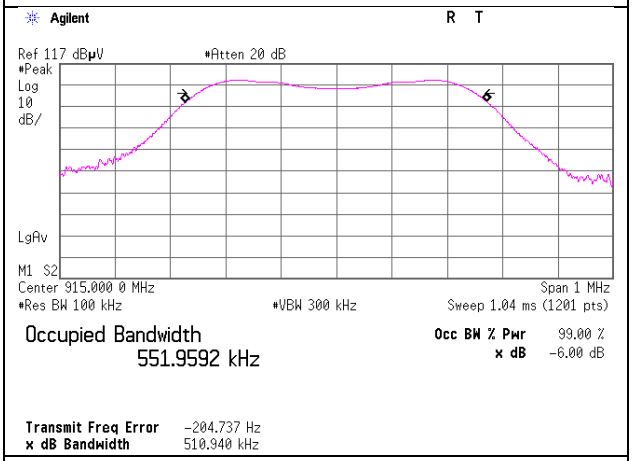
Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
902.4	0.512	> 500
915.0	0.511	> 500
927.6	0.512	> 500

6dB Bandwidth

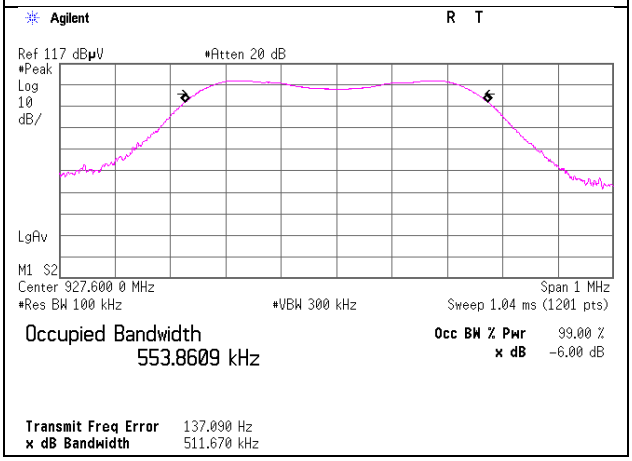
902.4 MHz



915.0 MHz



927.6 MHz



Maximum Peak Output Power

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

Antenna port 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
902.4	2.22	0.30	9.95	12.47	17.66	30.00	1000	17.53
915.0	2.07	0.30	9.95	12.32	17.06	30.00	1000	17.68
927.6	1.87	0.30	9.95	12.12	16.29	30.00	1000	17.88

Antenna port 2

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
902.4	1.38	0.50	9.95	11.83	15.24	30.00	1000	18.17
915.0	1.21	0.50	9.95	11.66	14.66	30.00	1000	18.34
927.6	1.04	0.50	9.95	11.49	14.09	30.00	1000	18.51

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

Antenna port 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
902.4	2.15	0.30	9.95	12.40	17.38	0.00	12.40	17.38
915.0	2.01	0.30	9.95	12.26	16.83	0.00	12.26	16.83
927.6	1.80	0.30	9.95	12.05	16.03	0.00	12.05	16.03

Antenna port 2

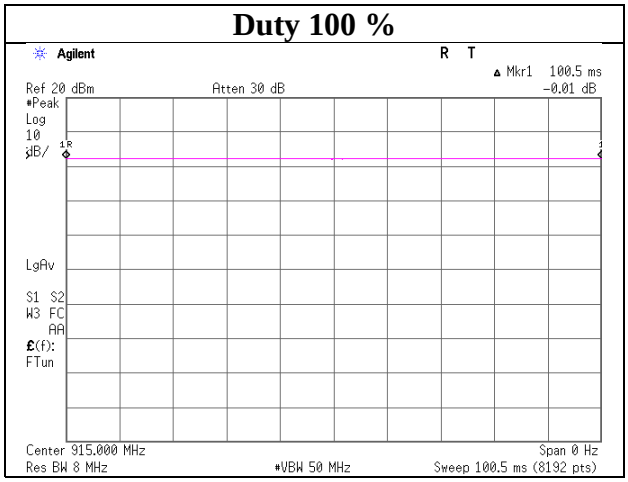
Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
902.4	1.30	0.50	9.95	11.75	14.96	0.00	11.75	14.96
915.0	1.16	0.50	9.95	11.61	14.49	0.00	11.61	14.49
927.6	0.98	0.50	9.95	11.43	13.90	0.00	11.43	13.90

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

Burst rate confirmation

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

Duty 100 %



Radiated Spurious Emission
(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 902.4 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.5	17.1	17.0	32.3	-	24.3	40.0	15.7	
Hori	96.112	QP	24.2	9.4	18.0	32.2	-	19.4	43.5	24.1	
Hori	114.485	QP	25.9	12.1	18.2	32.2	-	24.0	43.5	19.5	
Hori	191.926	QP	30.0	16.4	19.0	32.1	-	33.3	43.5	10.2	
Hori	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Hori	1804.800	PK	42.5	25.9	6.8	33.3	-	41.9	73.9	32.0	Floor noise
Hori	2707.200	PK	45.6	27.2	7.0	32.5	-	47.3	73.9	26.6	
Hori	3609.600	PK	41.2	28.6	7.4	32.1	-	45.1	73.9	28.8	Floor noise
Hori	4512.000	PK	40.4	30.0	7.8	31.8	-	46.4	73.9	27.5	Floor noise
Hori	5414.400	PK	40.7	31.2	8.4	31.8	-	48.5	73.9	25.4	Floor noise
Hori	6316.800	PK	41.0	33.2	8.8	32.1	-	50.9	73.9	23.0	
Hori	7219.200	PK	40.0	35.7	9.0	32.6	-	52.1	73.9	21.8	Floor noise
Hori	8121.600	PK	42.3	36.2	9.2	32.8	-	54.9	73.9	19.0	Floor noise
Hori	9024.000	PK	40.8	36.5	9.6	33.0	-	53.9	73.9	20.0	Floor noise
Hori	1804.800	AV	33.4	25.9	6.8	33.3	-	32.8	53.9	21.1	Floor noise
Hori	2707.200	AV	38.4	27.2	7.0	32.5	-	40.1	53.9	13.8	
Hori	3609.600	AV	32.6	28.6	7.4	32.1	-	36.5	53.9	17.4	Floor noise
Hori	4512.000	AV	31.9	30.0	7.8	31.8	-	37.9	53.9	16.0	Floor noise
Hori	5414.400	AV	32.0	31.2	8.4	31.8	-	39.8	53.9	14.1	Floor noise
Hori	6316.800	AV	32.2	33.2	8.8	32.1	-	42.1	53.9	11.8	
Hori	7219.200	AV	31.7	35.7	9.0	32.6	-	43.8	53.9	10.1	Floor noise
Hori	8121.600	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Hori	9024.000	AV	31.8	36.5	9.6	33.0	-	44.9	53.9	9.0	Floor noise
Vert	30.000	QP	22.3	17.1	17.0	32.3	-	24.1	40.0	15.9	
Vert	44.262	QP	30.1	12.8	17.3	32.2	-	28.0	40.0	12.0	
Vert	49.152	QP	29.8	11.1	17.3	32.2	-	26.0	40.0	14.0	
Vert	96.122	QP	31.0	9.4	18.0	32.2	-	26.2	43.5	17.3	
Vert	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Vert	1804.800	PK	42.5	25.9	6.8	33.3	-	41.9	73.9	32.0	Floor noise
Vert	2707.200	PK	45.9	27.2	7.0	32.5	-	47.6	73.9	26.3	
Vert	3609.600	PK	41.2	28.6	7.4	32.1	-	45.1	73.9	28.8	Floor noise
Vert	4512.000	PK	40.4	30.0	7.8	31.8	-	46.4	73.9	27.5	Floor noise
Vert	5414.400	PK	40.7	31.2	8.4	31.8	-	48.5	73.9	25.4	Floor noise
Vert	6316.800	PK	42.4	33.2	8.8	32.1	-	52.3	73.9	21.6	
Vert	7219.200	PK	40.0	35.7	9.0	32.6	-	52.1	73.9	21.8	Floor noise
Vert	8121.600	PK	42.3	36.2	9.2	32.8	-	54.9	73.9	19.0	Floor noise
Vert	9024.000	PK	40.8	36.5	9.6	33.0	-	53.9	73.9	20.0	Floor noise
Vert	1804.800	AV	33.4	25.9	6.8	33.3	-	32.8	53.9	21.1	Floor noise
Vert	2707.200	AV	38.8	27.2	7.0	32.5	-	40.5	53.9	13.4	
Vert	3609.600	AV	32.6	28.6	7.4	32.1	-	36.5	53.9	17.4	Floor noise
Vert	4512.000	AV	31.9	30.0	7.8	31.8	-	37.9	53.9	16.0	Floor noise
Vert	5414.400	AV	32.0	31.2	8.4	31.8	-	39.8	53.9	14.1	Floor noise
Vert	6316.800	AV	35.1	33.2	8.8	32.1	-	45.0	53.9	8.9	
Vert	7219.200	AV	31.7	35.7	9.0	32.6	-	43.8	53.9	10.1	Floor noise
Vert	8121.600	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Vert	9024.000	AV	31.8	36.5	9.6	33.0	-	44.9	53.9	9.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission

(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 902.4 MHz Antenna port1

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	902.400	PK	99.5	22.1	23.3	30.9	114.0	-	-	Carrier
Hori	902.000	PK	64.9	22.1	23.3	30.9	79.4	94.0	14.6	
Vert	902.400	PK	98.2	22.1	23.3	30.9	112.7	-	-	Carrier
Vert	902.000	PK	64.1	22.1	23.3	30.9	78.6	92.7	14.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

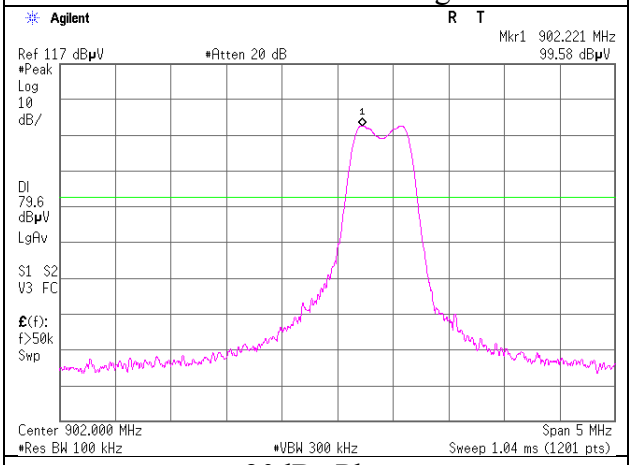
Radiated Spurious Emission

Reference Plot for band-edge(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 902.4 MHz Antenna port1

Horizontal

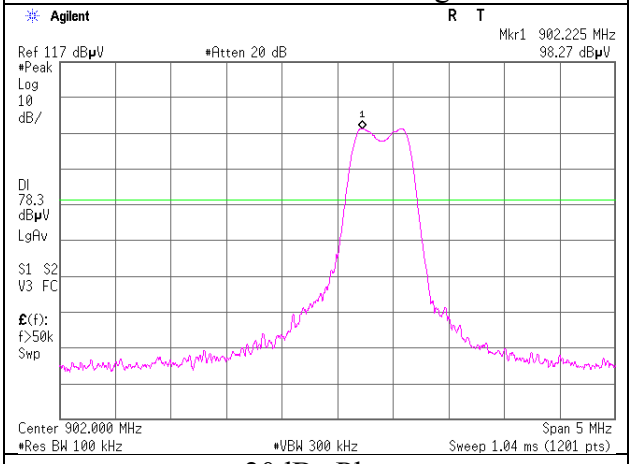
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 915.0 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Hori	96.003	QP	23.9	9.4	18.0	32.2	-	19.1	43.5	24.4	
Hori	114.519	QP	27.1	12.1	18.2	32.2	-	25.2	43.5	18.3	
Hori	191.892	QP	29.4	16.4	19.0	32.1	-	32.7	43.5	10.8	
Hori	960.000	QP	20.0	22.3	23.6	30.6	-	35.3	46.0	10.7	
Hori	1000.000	QP	19.8	22.5	23.9	30.4	-	35.8	53.9	18.1	
Hori	1830.000	PK	41.4	25.9	6.8	33.2	-	40.9	73.9	33.0	Floor noise
Hori	2745.000	PK	45.6	27.2	7.0	32.5	-	47.3	73.9	26.6	
Hori	3660.000	PK	40.4	28.7	7.4	32.1	-	44.4	73.9	29.5	Floor noise
Hori	4575.000	PK	39.2	30.3	7.9	31.8	-	45.6	73.9	28.3	Floor noise
Hori	5490.000	PK	39.7	31.1	8.4	31.8	-	47.4	73.9	26.5	Floor noise
Hori	6405.000	PK	43.0	33.6	8.8	32.1	-	53.3	73.9	20.6	
Hori	7320.000	PK	40.2	35.6	9.0	32.6	-	52.2	73.9	21.7	Floor noise
Hori	8235.000	PK	41.9	36.2	9.2	32.8	-	54.5	73.9	19.4	Floor noise
Hori	9150.000	PK	40.4	36.7	9.6	33.0	-	53.7	73.9	20.2	Floor noise
Hori	1830.000	AV	33.0	25.9	6.8	33.2	-	32.5	53.9	21.4	Floor noise
Hori	2745.000	AV	38.8	27.2	7.0	32.5	-	40.5	53.9	13.4	
Hori	3660.000	AV	31.8	28.7	7.4	32.1	-	35.8	53.9	18.1	Floor noise
Hori	4575.000	AV	30.8	30.3	7.9	31.8	-	37.2	53.9	16.7	Floor noise
Hori	5490.000	AV	30.6	31.1	8.4	31.8	-	38.3	53.9	15.6	Floor noise
Hori	6405.000	AV	35.0	33.6	8.8	32.1	-	45.3	53.9	8.6	
Hori	7320.000	AV	31.9	35.6	9.0	32.6	-	43.9	53.9	10.0	Floor noise
Hori	8235.000	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Hori	9150.000	AV	32.4	36.7	9.6	33.0	-	45.7	53.9	8.2	Floor noise
Vert	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Vert	44.878	QP	29.3	12.6	17.3	32.2	-	27.0	40.0	13.0	
Vert	49.152	QP	28.5	11.1	17.3	32.2	-	24.7	40.0	15.3	
Vert	96.003	QP	31.4	9.4	18.0	32.2	-	26.6	43.5	16.9	
Vert	108.017	QP	27.4	11.2	18.2	32.2	-	24.6	43.5	18.9	
Vert	960.000	QP	20.1	22.3	23.6	30.6	-	35.4	46.0	10.6	
Vert	1830.000	PK	41.4	25.9	6.8	33.2	-	40.9	73.9	33.0	Floor noise
Vert	2745.000	PK	45.2	27.2	7.0	32.5	-	46.9	73.9	27.0	
Vert	3660.000	PK	40.4	28.7	7.4	32.1	-	44.4	73.9	29.5	Floor noise
Vert	4575.000	PK	39.2	30.3	7.9	31.8	-	45.6	73.9	28.3	Floor noise
Vert	5490.000	PK	39.7	31.1	8.4	31.8	-	47.4	73.9	26.5	Floor noise
Vert	6405.000	PK	44.2	33.6	8.8	32.1	-	54.5	73.9	19.4	
Vert	7320.000	PK	40.2	35.6	9.0	32.6	-	52.2	73.9	21.7	Floor noise
Vert	8235.000	PK	41.9	36.2	9.2	32.8	-	54.5	73.9	19.4	Floor noise
Vert	9150.000	PK	40.4	36.7	9.6	33.0	-	53.7	73.9	20.2	Floor noise
Vert	1830.000	AV	33.0	25.9	6.8	33.2	-	32.5	53.9	21.4	Floor noise
Vert	2745.000	AV	37.8	27.2	7.0	32.5	-	39.5	53.9	14.4	
Vert	3660.000	AV	31.8	28.7	7.4	32.1	-	35.8	53.9	18.1	Floor noise
Vert	4575.000	AV	30.8	30.3	7.9	31.8	-	37.2	53.9	16.7	Floor noise
Vert	5490.000	AV	30.6	31.1	8.4	31.8	-	38.3	53.9	15.6	Floor noise
Vert	6405.000	AV	36.5	33.6	8.8	32.1	-	46.8	53.9	7.1	
Vert	7320.000	AV	31.9	35.6	9.0	32.6	-	43.9	53.9	10.0	Floor noise
Vert	8235.000	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Vert	9150.000	AV	32.4	36.7	9.6	33.0	-	45.7	53.9	8.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission

(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 927.6 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.3	17.1	17.0	32.3	-	24.1	40.0	15.9	
Hori	96.024	QP	23.7	9.4	18.0	32.2	-	18.9	43.5	24.6	
Hori	107.763	QP	27.0	11.1	18.2	32.2	-	24.1	43.5	19.4	
Hori	191.178	QP	30.0	16.4	19.0	32.1	-	33.3	43.5	10.2	
Hori	960.000	QP	19.8	22.3	23.6	30.6	-	35.1	46.0	10.9	
Hori	1855.200	PK	42.0	26.0	6.8	33.2	-	41.6	73.9	32.3	Floor noise
Hori	2782.800	PK	44.3	27.3	7.0	32.5	-	46.1	73.9	27.8	
Hori	3710.400	PK	40.7	28.7	7.4	32.1	-	44.7	73.9	29.2	Floor noise
Hori	4638.000	PK	38.7	30.5	7.9	31.8	-	45.3	73.9	28.6	Floor noise
Hori	5565.600	PK	41.1	31.2	8.4	31.8	-	48.9	73.9	25.0	
Hori	6493.200	PK	44.3	34.0	8.8	32.2	-	54.9	73.9	19.0	
Hori	7420.800	PK	41.4	35.5	9.1	32.7	-	53.3	73.9	20.6	Floor noise
Hori	8348.399	PK	41.2	36.2	9.2	32.8	-	53.8	73.9	20.1	Floor noise
Hori	9276.000	PK	40.6	36.9	9.6	33.1	-	54.0	73.9	19.9	Floor noise
Hori	1855.200	AV	33.6	26.0	6.8	33.2	-	33.2	53.9	20.7	Floor noise
Hori	2782.800	AV	37.5	27.3	7.0	32.5	-	39.3	53.9	14.6	
Hori	3710.400	AV	31.6	28.7	7.4	32.1	-	35.6	53.9	18.3	Floor noise
Hori	4638.000	AV	30.8	30.5	7.9	31.8	-	37.4	53.9	16.5	Floor noise
Hori	5565.600	AV	31.5	31.2	8.4	31.8	-	39.3	53.9	14.6	
Hori	6493.200	AV	36.9	34.0	8.8	32.2	-	47.5	53.9	6.4	
Hori	7420.800	AV	32.1	35.5	9.1	32.7	-	44.0	53.9	9.9	Floor noise
Hori	8348.399	AV	32.4	36.2	9.2	32.8	-	45.0	53.9	8.9	Floor noise
Hori	9276.000	AV	32.0	36.9	9.6	33.1	-	45.4	53.9	8.5	Floor noise
Vert	30.000	QP	22.3	17.1	17.0	32.3	-	24.1	40.0	15.9	
Vert	39.982	QP	22.5	14.3	17.2	32.2	-	21.8	40.0	18.2	
Vert	49.241	QP	29.7	11.1	17.3	32.2	-	25.9	40.0	14.1	
Vert	96.024	QP	32.2	9.4	18.0	32.2	-	27.4	43.5	16.1	
Vert	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Vert	1855.200	PK	42.0	26.0	6.8	33.2	-	41.6	73.9	32.3	Floor noise
Vert	2782.800	PK	45.6	27.3	7.0	32.5	-	47.4	73.9	26.5	
Vert	3710.400	PK	40.7	28.7	7.4	32.1	-	44.7	73.9	29.2	Floor noise
Vert	4638.000	PK	38.7	30.5	7.9	31.8	-	45.3	73.9	28.6	Floor noise
Vert	5565.600	PK	40.6	31.2	8.4	31.8	-	48.4	73.9	25.5	
Vert	6493.200	PK	44.5	34.0	8.8	32.2	-	55.1	73.9	18.8	
Vert	7420.800	PK	41.4	35.5	9.1	32.7	-	53.3	73.9	20.6	Floor noise
Vert	8348.399	PK	41.2	36.2	9.2	32.8	-	53.8	73.9	20.1	Floor noise
Vert	9276.000	PK	40.6	36.9	9.6	33.1	-	54.0	73.9	19.9	Floor noise
Vert	1855.200	AV	33.6	26.0	6.8	33.2	-	33.2	53.9	20.7	Floor noise
Vert	2782.800	AV	38.5	27.3	7.0	32.5	-	40.3	53.9	13.6	
Vert	3710.400	AV	31.6	28.7	7.4	32.1	-	35.6	53.9	18.3	Floor noise
Vert	4638.000	AV	30.8	30.5	7.9	31.8	-	37.4	53.9	16.5	Floor noise
Vert	5565.600	AV	32.8	31.2	8.4	31.8	-	40.6	53.9	13.3	
Vert	6493.200	AV	37.7	34.0	8.8	32.2	-	48.3	53.9	5.6	
Vert	7420.800	AV	32.1	35.5	9.1	32.7	-	44.0	53.9	9.9	Floor noise
Vert	8348.399	AV	32.4	36.2	9.2	32.8	-	45.0	53.9	8.9	Floor noise
Vert	9276.000	AV	32.0	36.9	9.6	33.1	-	45.4	53.9	8.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission

(Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 927.6 MHz Antenna port1

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	927.600	PK	95.5	22.2	23.4	30.8	110.3	-	-	Carrier
Hori	928.000	PK	58.1	22.2	23.4	30.8	72.9	90.3	17.4	
Vert	927.600	PK	96.1	22.2	23.4	30.8	110.9	-	-	Carrier
Vert	928.000	PK	57.8	22.2	23.4	30.8	72.6	90.9	18.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

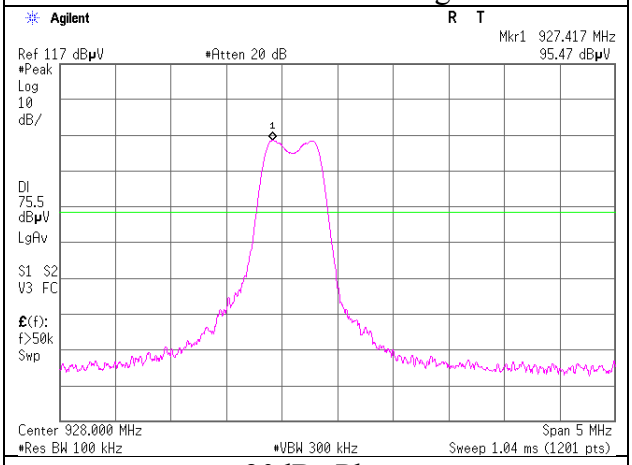
Radiated Spurious Emission

Reference Plot for band-edge (Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 927.6 MHz Antenna port1

Horizontal

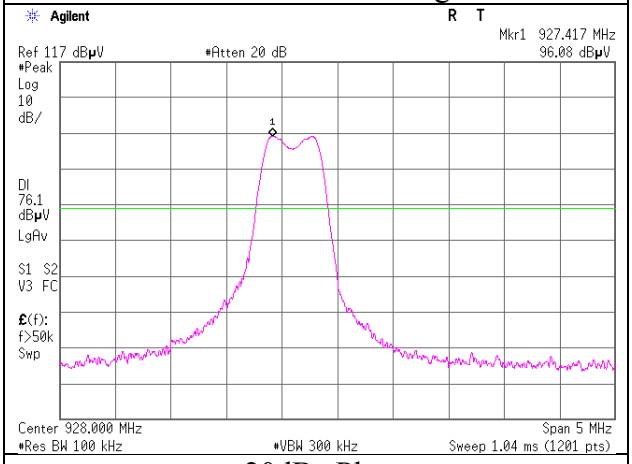
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 902.4 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Hori	96.017	QP	23.8	9.4	18.0	32.2	-	19.0	43.5	24.5	
Hori	114.677	QP	26.2	12.1	18.2	32.2	-	24.3	43.5	19.2	
Hori	192.007	QP	29.0	16.4	19.0	32.1	-	32.3	43.5	11.2	
Hori	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Hori	1804.800	PK	42.5	25.9	6.8	33.3	-	41.9	73.9	32.0	Floor noise
Hori	2707.200	PK	44.9	27.2	7.0	32.5	-	46.6	73.9	27.3	
Hori	3609.600	PK	41.2	28.6	7.4	32.1	-	45.1	73.9	28.8	Floor noise
Hori	4512.000	PK	40.4	30.0	7.8	31.8	-	46.4	73.9	27.5	Floor noise
Hori	5414.400	PK	40.7	31.2	8.4	31.8	-	48.5	73.9	25.4	Floor noise
Hori	6316.800	PK	41.3	33.2	8.8	32.1	-	51.2	73.9	22.7	
Hori	7219.200	PK	40.0	35.7	9.0	32.6	-	52.1	73.9	21.8	Floor noise
Hori	8121.600	PK	42.3	36.2	9.2	32.8	-	54.9	73.9	19.0	Floor noise
Hori	9024.000	PK	40.8	36.5	9.6	33.0	-	53.9	73.9	20.0	Floor noise
Hori	1804.800	AV	33.4	25.9	6.8	33.3	-	32.8	53.9	21.1	Floor noise
Hori	2707.200	AV	37.5	27.2	7.0	32.5	-	39.2	53.9	14.7	
Hori	3609.600	AV	32.6	28.6	7.4	32.1	-	36.5	53.9	17.4	Floor noise
Hori	4512.000	AV	31.9	30.0	7.8	31.8	-	37.9	53.9	16.0	Floor noise
Hori	5414.400	AV	32.0	31.2	8.4	31.8	-	39.8	53.9	14.1	Floor noise
Hori	6316.800	AV	32.6	33.2	8.8	32.1	-	42.5	53.9	11.4	
Hori	7219.200	AV	31.7	35.7	9.0	32.6	-	43.8	53.9	10.1	Floor noise
Hori	8121.600	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Hori	9024.000	AV	31.8	36.5	9.6	33.0	-	44.9	53.9	9.0	Floor noise
Vert	30.000	QP	22.7	17.1	17.0	32.3	-	24.5	40.0	15.5	
Vert	44.762	QP	29.5	12.7	17.3	32.2	-	27.3	40.0	12.7	
Vert	49.151	QP	27.5	11.1	17.3	32.2	-	23.7	40.0	16.3	
Vert	96.017	QP	31.3	9.4	18.0	32.2	-	26.5	43.5	17.0	
Vert	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Vert	1804.800	PK	42.5	25.9	6.8	33.3	-	41.9	73.9	32.0	Floor noise
Vert	2707.200	PK	46.3	27.2	7.0	32.5	-	48.0	73.9	25.9	
Vert	3609.600	PK	41.2	28.6	7.4	32.1	-	45.1	73.9	28.8	Floor noise
Vert	4512.000	PK	40.4	30.0	7.8	31.8	-	46.4	73.9	27.5	Floor noise
Vert	5414.400	PK	40.7	31.2	8.4	31.8	-	48.5	73.9	25.4	Floor noise
Vert	6316.800	PK	43.0	33.2	8.8	32.1	-	52.9	73.9	21.0	
Vert	7219.200	PK	40.0	35.7	9.0	32.6	-	52.1	73.9	21.8	Floor noise
Vert	8121.600	PK	42.3	36.2	9.2	32.8	-	54.9	73.9	19.0	Floor noise
Vert	9024.000	PK	40.8	36.5	9.6	33.0	-	53.9	73.9	20.0	Floor noise
Vert	1804.800	AV	33.4	25.9	6.8	33.3	-	32.8	53.9	21.1	Floor noise
Vert	2707.200	AV	39.6	27.2	7.0	32.5	-	41.3	53.9	12.6	
Vert	3609.600	AV	32.6	28.6	7.4	32.1	-	36.5	53.9	17.4	Floor noise
Vert	4512.000	AV	31.9	30.0	7.8	31.8	-	37.9	53.9	16.0	Floor noise
Vert	5414.400	AV	32.0	31.2	8.4	31.8	-	39.8	53.9	14.1	Floor noise
Vert	6316.800	AV	35.2	33.2	8.8	32.1	-	45.1	53.9	8.8	
Vert	7219.200	AV	31.7	35.7	9.0	32.6	-	43.8	53.9	10.1	Floor noise
Vert	8121.600	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Vert	9024.000	AV	31.8	36.5	9.6	33.0	-	44.9	53.9	9.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 902.4 MHz

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	902.400	PK	94.4	22.1	23.3	30.9	108.9	-	-	Carrier
Hori	902.000	PK	59.7	22.1	23.3	30.9	74.2	88.9	14.7	
Vert	902.400	PK	95.5	22.1	23.3	30.9	110.0	-	-	Carrier
Vert	902.000	PK	63.0	22.1	23.3	30.9	77.5	90.0	12.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

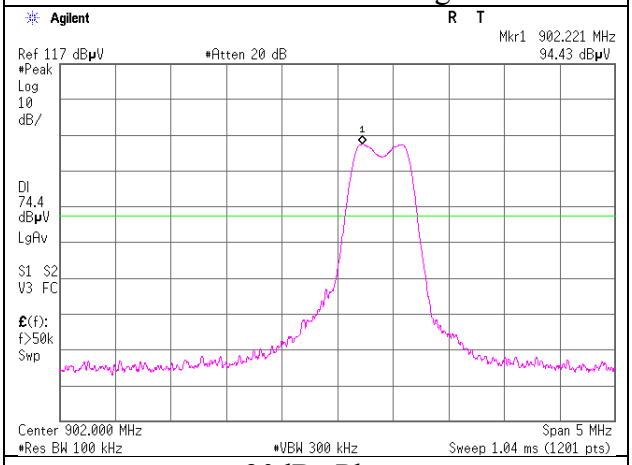
Radiated Spurious Emission

Reference Plot for band-edge (Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 902.4 MHz

Horizontal

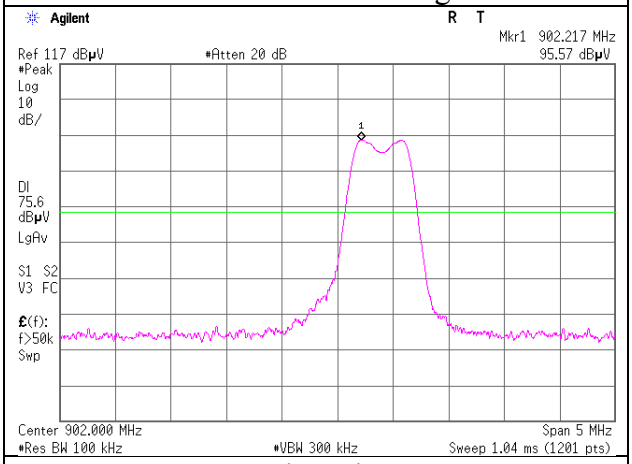
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 915.0 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.3	17.1	17.0	32.3	-	24.1	40.0	15.9	
Hori	96.017	QP	23.5	9.4	18.0	32.2	-	18.7	43.5	24.8	
Hori	114.862	QP	27.0	12.1	18.2	32.2	-	25.1	43.5	18.4	
Hori	192.114	QP	28.9	16.4	19.0	32.1	-	32.2	43.5	11.3	
Hori	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Hori	1000.000	QP	20.0	22.5	23.9	30.4	-	36.0	53.9	17.9	
Hori	1830.000	PK	41.4	25.9	6.8	33.2	-	40.9	73.9	33.0	Floor noise
Hori	2745.000	PK	45.5	27.2	7.0	32.5	-	47.2	73.9	26.7	
Hori	3660.000	PK	40.4	28.7	7.4	32.1	-	44.4	73.9	29.5	Floor noise
Hori	4575.000	PK	39.2	30.3	7.9	31.8	-	45.6	73.9	28.3	Floor noise
Hori	5490.000	PK	39.7	31.1	8.4	31.8	-	47.4	73.9	26.5	Floor noise
Hori	6405.000	PK	42.3	33.6	8.8	32.1	-	52.6	73.9	21.3	
Hori	7320.000	PK	40.2	35.6	9.0	32.6	-	52.2	73.9	21.7	Floor noise
Hori	8235.000	PK	41.9	36.2	9.2	32.8	-	54.5	73.9	19.4	Floor noise
Hori	9150.000	PK	40.4	36.7	9.6	33.0	-	53.7	73.9	20.2	Floor noise
Hori	1830.000	AV	33.0	25.9	6.8	33.2	-	32.5	53.9	21.4	Floor noise
Hori	2745.000	AV	39.1	27.2	7.0	32.5	-	40.8	53.9	13.1	
Hori	3660.000	AV	31.8	28.7	7.4	32.1	-	35.8	53.9	18.1	Floor noise
Hori	4575.000	AV	30.8	30.3	7.9	31.8	-	37.2	53.9	16.7	Floor noise
Hori	5490.000	AV	30.6	31.1	8.4	31.8	-	38.3	53.9	15.6	Floor noise
Hori	6405.000	AV	34.9	33.6	8.8	32.1	-	45.2	53.9	8.7	
Hori	7320.000	AV	31.9	35.6	9.0	32.6	-	43.9	53.9	10.0	Floor noise
Hori	8235.000	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Hori	9150.000	AV	32.4	36.7	9.6	33.0	-	45.7	53.9	8.2	Floor noise
Vert	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Vert	44.532	QP	29.0	12.7	17.3	32.2	-	26.8	40.0	13.2	
Vert	49.164	QP	28.6	11.1	17.3	32.2	-	24.8	40.0	15.2	
Vert	96.003	QP	31.4	9.4	18.0	32.2	-	26.6	43.5	16.9	
Vert	108.117	QP	27.5	11.2	18.2	32.2	-	24.7	43.5	18.8	
Vert	960.000	QP	19.9	22.3	23.6	30.6	-	35.2	46.0	10.8	
Vert	1830.000	PK	41.4	25.9	6.8	33.2	-	40.9	73.9	33.0	Floor noise
Vert	2745.000	PK	45.3	27.2	7.0	32.5	-	47.0	73.9	26.9	
Vert	3660.000	PK	40.4	28.7	7.4	32.1	-	44.4	73.9	29.5	Floor noise
Vert	4575.000	PK	39.2	30.3	7.9	31.8	-	45.6	73.9	28.3	Floor noise
Vert	5490.000	PK	39.7	31.1	8.4	31.8	-	47.4	73.9	26.5	Floor noise
Vert	6405.000	PK	43.8	33.6	8.8	32.1	-	54.1	73.9	19.8	
Vert	7320.000	PK	40.2	35.6	9.0	32.6	-	52.2	73.9	21.7	Floor noise
Vert	8235.000	PK	41.9	36.2	9.2	32.8	-	54.5	73.9	19.4	Floor noise
Vert	9150.000	PK	40.4	36.7	9.6	33.0	-	53.7	73.9	20.2	Floor noise
Vert	1830.000	AV	33.0	25.9	6.8	33.2	-	32.5	53.9	21.4	Floor noise
Vert	2745.000	AV	38.7	27.2	7.0	32.5	-	40.4	53.9	13.5	
Vert	3660.000	AV	31.8	28.7	7.4	32.1	-	35.8	53.9	18.1	Floor noise
Vert	4575.000	AV	30.8	30.3	7.9	31.8	-	37.2	53.9	16.7	Floor noise
Vert	5490.000	AV	30.6	31.1	8.4	31.8	-	38.3	53.9	15.6	Floor noise
Vert	6405.000	AV	35.8	33.6	8.8	32.1	-	46.1	53.9	7.8	
Vert	7320.000	AV	31.9	35.6	9.0	32.6	-	43.9	53.9	10.0	Floor noise
Vert	8235.000	AV	33.0	36.2	9.2	32.8	-	45.6	53.9	8.3	Floor noise
Vert	9150.000	AV	32.4	36.7	9.6	33.0	-	45.7	53.9	8.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 927.6 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Hori	96.017	QP	24.3	9.4	18.0	32.2	-	19.5	43.5	24.0	
Hori	114.862	QP	26.9	12.1	18.2	32.2	-	25.0	43.5	18.5	
Hori	192.114	QP	29.9	16.4	19.0	32.1	-	33.2	43.5	10.3	
Hori	960.000	QP	20.0	22.3	23.6	30.6	-	35.3	46.0	10.7	
Hori	1855.200	PK	42.0	26.0	6.8	33.2	-	41.6	73.9	32.3	Floor noise
Hori	2782.800	PK	46.2	27.3	7.0	32.5	-	48.0	73.9	25.9	
Hori	3710.400	PK	40.7	28.7	7.4	32.1	-	44.7	73.9	29.2	Floor noise
Hori	4638.000	PK	38.7	30.5	7.9	31.8	-	45.3	73.9	28.6	Floor noise
Hori	5565.600	PK	39.7	31.2	8.4	31.8	-	47.5	73.9	26.4	
Hori	6493.200	PK	42.0	34.0	8.8	32.2	-	52.6	73.9	21.3	
Hori	7420.800	PK	41.4	35.5	9.1	32.7	-	53.3	73.9	20.6	Floor noise
Hori	8348.399	PK	41.2	36.2	9.2	32.8	-	53.8	73.9	20.1	Floor noise
Hori	9276.000	PK	40.6	36.9	9.6	33.1	-	54.0	73.9	19.9	Floor noise
Hori	1855.200	AV	33.6	26.0	6.8	33.2	-	33.2	53.9	20.7	Floor noise
Hori	2782.800	AV	39.8	27.3	7.0	32.5	-	41.6	53.9	12.3	
Hori	3710.400	AV	31.6	28.7	7.4	32.1	-	35.6	53.9	18.3	Floor noise
Hori	4638.000	AV	30.8	30.5	7.9	31.8	-	37.4	53.9	16.5	Floor noise
Hori	5565.600	AV	30.8	31.2	8.4	31.8	-	38.6	53.9	15.3	
Hori	6493.200	AV	34.0	34.0	8.8	32.2	-	44.6	53.9	9.3	
Hori	7420.800	AV	32.1	35.5	9.1	32.7	-	44.0	53.9	9.9	Floor noise
Hori	8348.399	AV	32.4	36.2	9.2	32.8	-	45.0	53.9	8.9	Floor noise
Hori	9276.000	AV	32.0	36.9	9.6	33.1	-	45.4	53.9	8.5	Floor noise
Vert	30.000	QP	22.4	17.1	17.0	32.3	-	24.2	40.0	15.8	
Vert	44.512	QP	30.0	12.7	17.3	32.2	-	27.8	40.0	12.2	
Vert	49.131	QP	29.5	11.1	17.3	32.2	-	25.7	40.0	14.3	
Vert	96.123	QP	31.2	9.4	18.0	32.2	-	26.4	43.5	17.1	
Vert	960.000	QP	19.8	22.3	23.6	30.6	-	35.1	46.0	10.9	
Vert	1855.200	PK	42.0	26.0	6.8	33.2	-	41.6	73.9	32.3	Floor noise
Vert	2782.800	PK	46.6	27.3	7.0	32.5	-	48.4	73.9	25.5	
Vert	3710.400	PK	40.7	28.7	7.4	32.1	-	44.7	73.9	29.2	Floor noise
Vert	4638.000	PK	38.7	30.5	7.9	31.8	-	45.3	73.9	28.6	Floor noise
Vert	5565.600	PK	41.6	31.2	8.4	31.8	-	49.4	73.9	24.5	
Vert	6493.200	PK	43.3	34.0	8.8	32.2	-	53.9	73.9	20.0	
Vert	7420.800	PK	41.4	35.5	9.1	32.7	-	53.3	73.9	20.6	Floor noise
Vert	8348.399	PK	41.2	36.2	9.2	32.8	-	53.8	73.9	20.1	Floor noise
Vert	9276.000	PK	40.6	36.9	9.6	33.1	-	54.0	73.9	19.9	Floor noise
Vert	1855.200	AV	33.6	26.0	6.8	33.2	-	33.2	53.9	20.7	Floor noise
Vert	2782.800	AV	39.6	27.3	7.0	32.5	-	41.4	53.9	12.5	
Vert	3710.400	AV	31.6	28.7	7.4	32.1	-	35.6	53.9	18.3	Floor noise
Vert	4638.000	AV	30.8	30.5	7.9	31.8	-	37.4	53.9	16.5	Floor noise
Vert	5565.600	AV	31.8	31.2	8.4	31.8	-	39.6	53.9	14.3	
Vert	6493.200	AV	35.5	34.0	8.8	32.2	-	46.1	53.9	7.8	
Vert	7420.800	AV	32.1	35.5	9.1	32.7	-	44.0	53.9	9.9	Floor noise
Vert	8348.399	AV	32.4	36.2	9.2	32.8	-	45.0	53.9	8.9	Floor noise
Vert	9276.000	AV	32.0	36.9	9.6	33.1	-	45.4	53.9	8.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 927.6 MHz

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	927.600	PK	88.6	22.2	23.4	30.8	103.4	-	-	Carrier
Hori	928.000	PK	50.4	22.2	23.4	30.8	65.2	83.4	18.2	
Vert	927.600	PK	91.6	22.2	23.4	30.8	106.4	-	-	Carrier
Vert	928.000	PK	53.5	22.2	23.4	30.8	68.3	86.4	18.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

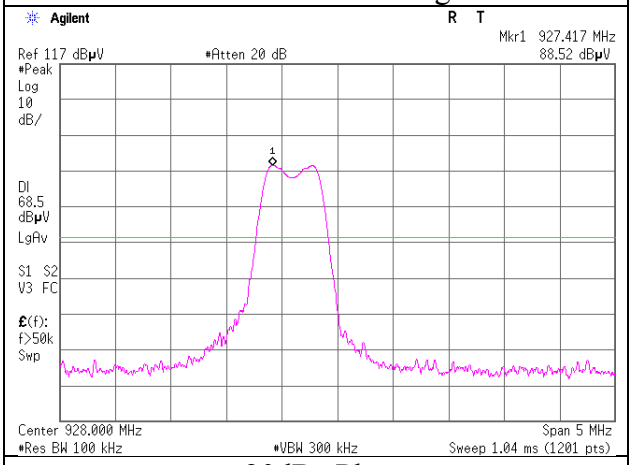
Radiated Spurious Emission

Reference Plot for band-edge (Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Ryota Yamanaka (below 1GHz)
Mode	Tx 927.6 MHz

Horizontal

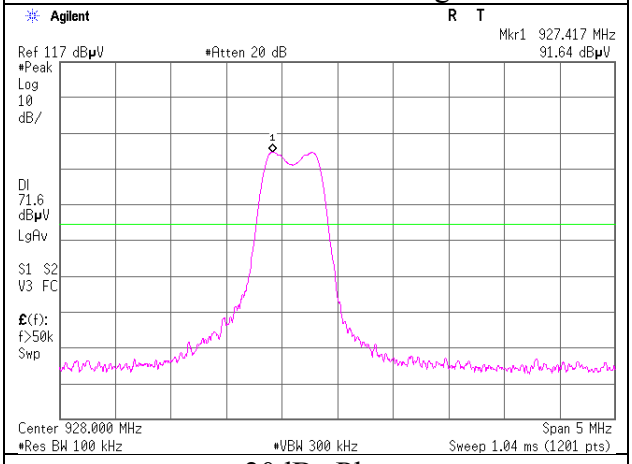
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	February 20, 2017	February 21, 2017
Temperature / Humidity	18 deg. C / 30 % RH	20 deg. C / 31 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
	(below 1GHz)	(Above 1GHz)
Mode	Tx 902.4 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	59.467	QP	28.3	7.6	17.5	38.7	-	14.7	40.0	25.3	
Hori	96.000	QP	48.7	9.4	18.0	38.8	-	37.3	43.5	6.2	
Hori	207.350	QP	27.7	11.7	19.1	38.7	-	19.8	43.5	23.7	
Hori	276.473	QP	31.2	13.0	19.7	38.8	-	25.1	46.0	20.9	
Hori	400.001	QP	37.0	15.7	20.6	38.4	-	34.9	46.0	11.1	
Hori	960.000	QP	25.4	22.3	23.6	37.7	-	33.6	46.0	12.4	
Hori	1804.800	PK	42.4	25.8	6.7	33.4	-	41.5	73.9	32.4	Floor noise
Hori	2707.200	PK	50.0	27.2	7.1	32.6	-	51.7	73.9	22.2	
Hori	3609.600	PK	41.9	28.6	7.5	32.1	-	45.9	73.9	28.0	Floor noise
Hori	4512.000	PK	41.9	30.0	7.9	31.8	-	48.0	73.9	25.9	Floor noise
Hori	5414.400	PK	41.2	31.2	8.4	31.8	-	49.0	73.9	24.9	Floor noise
Hori	6316.800	PK	43.7	33.2	8.7	32.1	-	53.5	73.9	20.4	
Hori	7219.200	PK	41.7	35.7	8.9	32.6	-	53.7	73.9	20.2	Floor noise
Hori	8121.600	PK	41.7	36.2	9.3	32.8	-	54.4	73.9	19.5	Floor noise
Hori	9024.000	PK	41.5	36.5	9.5	33.0	-	54.5	73.9	19.4	Floor noise
Hori	1804.800	AV	34.1	25.8	6.7	33.4	-	33.2	53.9	20.7	Floor noise
Hori	2707.200	AV	44.4	27.2	7.1	32.6	-	46.1	53.9	7.8	
Hori	3609.600	AV	32.8	28.6	7.5	32.1	-	36.8	53.9	17.1	Floor noise
Hori	4512.000	AV	32.4	30.0	7.9	31.8	-	38.5	53.9	15.4	Floor noise
Hori	5414.400	AV	32.4	31.2	8.4	31.8	-	40.2	53.9	13.7	Floor noise
Hori	6316.800	AV	36.9	33.2	8.7	32.1	-	46.7	53.9	7.2	
Hori	7219.200	AV	33.9	35.7	8.9	32.6	-	45.9	53.9	8.0	Floor noise
Hori	8121.600	AV	33.6	36.2	9.3	32.8	-	46.3	53.9	7.6	Floor noise
Hori	9024.000	AV	33.5	36.5	9.5	33.0	-	46.5	53.9	7.4	Floor noise
Vert	59.467	QP	30.5	7.6	17.5	38.7	-	16.9	40.0	23.1	
Vert	96.017	QP	41.9	9.4	18.0	38.8	-	30.5	43.5	13.0	
Vert	207.350	QP	33.6	11.7	19.1	38.7	-	25.7	43.5	17.8	
Vert	276.473	QP	30.9	13.0	19.7	38.8	-	24.8	46.0	21.2	
Vert	400.001	QP	35.8	15.7	20.6	38.4	-	33.7	46.0	12.3	
Vert	960.000	QP	25.4	22.3	23.6	37.7	-	33.6	46.0	12.4	
Vert	1804.800	PK	43.3	25.8	6.7	33.4	-	42.4	73.9	31.5	Floor noise
Vert	2707.200	PK	47.6	27.2	7.1	32.6	-	49.3	73.9	24.6	
Vert	3609.600	PK	41.6	28.6	7.5	32.1	-	45.6	73.9	28.3	Floor noise
Vert	4512.000	PK	40.8	30.0	7.9	31.8	-	46.9	73.9	27.0	Floor noise
Vert	5414.400	PK	41.6	31.2	8.4	31.8	-	49.4	73.9	24.5	Floor noise
Vert	6316.800	PK	45.2	33.2	8.7	32.1	-	55.0	73.9	18.9	
Vert	7219.200	PK	42.5	35.7	8.9	32.6	-	54.5	73.9	19.4	Floor noise
Vert	8121.600	PK	42.8	36.2	9.3	32.8	-	55.5	73.9	18.4	Floor noise
Vert	9024.000	PK	41.6	36.5	9.5	33.0	-	54.6	73.9	19.3	Floor noise
Vert	1804.800	AV	34.0	25.8	6.7	33.4	-	33.1	53.9	20.8	Floor noise
Vert	2707.200	AV	41.4	27.2	7.1	32.6	-	43.1	53.9	10.8	
Vert	3609.600	AV	32.8	28.6	7.5	32.1	-	36.8	53.9	17.1	Floor noise
Vert	4512.000	AV	32.2	30.0	7.9	31.8	-	38.3	53.9	15.6	Floor noise
Vert	5414.400	AV	32.3	31.2	8.4	31.8	-	40.1	53.9	13.8	Floor noise
Vert	6316.800	AV	37.8	33.2	8.7	32.1	-	47.6	53.9	6.3	
Vert	7219.200	AV	33.9	35.7	8.9	32.6	-	45.9	53.9	8.0	Floor noise
Vert	8121.600	AV	34.7	36.2	9.3	32.8	-	47.4	53.9	6.5	Floor noise
Vert	9024.000	AV	33.7	36.5	9.5	33.0	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	February 20, 2017
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Yutaka Yoshida (below 1GHz)
Mode	Tx 902.4 MHz Antenna port1

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	902.400	PK	103.4	22.1	23.3	38.0	110.8	-	-	Carrier
Hori	902.000	PK	68.9	22.1	23.3	38.0	76.3	90.8	14.5	
Vert	902.400	PK	102.3	22.1	23.3	38.0	109.7	-	-	Carrier
Vert	902.000	PK	66.9	22.1	23.3	38.0	74.3	89.7	15.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

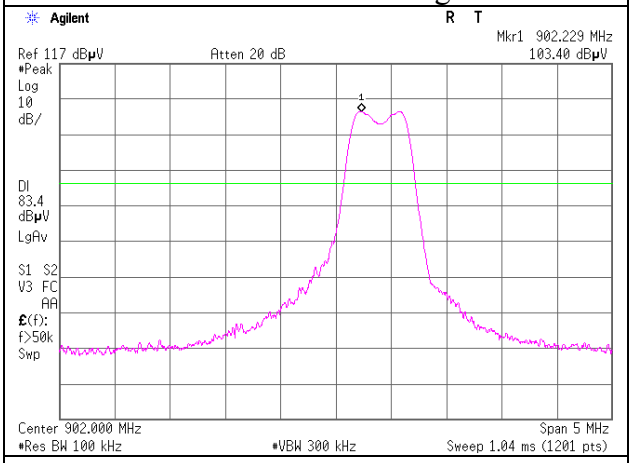
Radiated Spurious Emission

Reference Plot for band-edge (λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	February 20, 2017
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Yutaka Yoshida (below 1GHz)
Mode	Tx 902.4 MHz Antenna port1

Horizontal

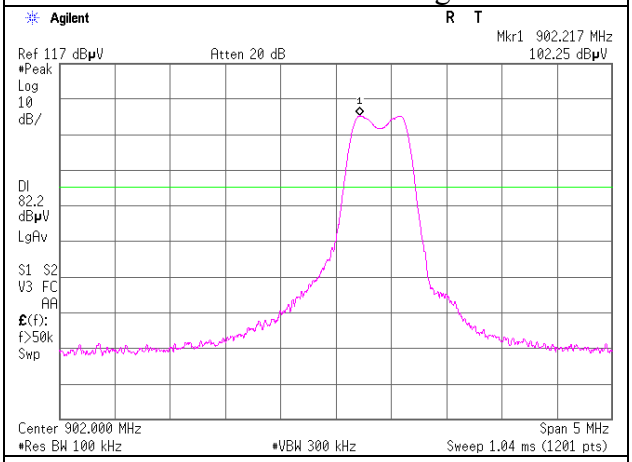
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	February 20, 2017	February 21, 2017
Temperature / Humidity	18 deg. C / 30 % RH	20 deg. C / 31 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
	(below 1GHz)	(Above 1GHz)
Mode	Tx 915.0 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	53.809	QP	30.7	9.5	17.4	38.7	-	18.9	40.0	21.1	
Hori	93.580	QP	34.4	9.0	18.0	38.8	-	22.6	43.5	20.9	
Hori	96.000	QP	48.4	9.4	18.0	38.8	-	37.0	43.5	6.5	
Hori	207.417	QP	27.7	11.7	19.1	38.7	-	19.8	43.5	23.7	
Hori	400.008	QP	36.5	15.7	20.6	38.4	-	34.4	46.0	11.6	
Hori	960.000	QP	25.3	22.3	23.6	37.7	-	33.5	46.0	12.5	
Hori	1830.000	PK	43.0	25.9	6.8	33.3	-	42.4	73.9	31.5	
Hori	2745.000	PK	48.1	27.2	7.1	32.5	-	49.9	73.9	24.0	
Hori	3660.000	PK	41.8	28.7	7.5	32.1	-	45.9	73.9	28.0	Floor noise
Hori	4575.000	PK	40.4	30.2	8.0	31.8	-	46.8	73.9	27.1	Floor noise
Hori	5490.000	PK	41.1	31.1	8.4	31.8	-	48.8	73.9	25.1	Floor noise
Hori	6405.000	PK	43.3	33.6	8.7	32.1	-	53.5	73.9	20.4	
Hori	7320.000	PK	41.7	35.6	8.9	32.6	-	53.6	73.9	20.3	Floor noise
Hori	8235.000	PK	41.5	36.2	9.3	32.8	-	54.2	73.9	19.7	Floor noise
Hori	9150.000	PK	42.3	36.7	9.6	33.0	-	55.6	73.9	18.3	Floor noise
Hori	1830.000	AV	35.0	25.9	6.8	33.3	-	34.4	53.9	19.5	
Hori	2745.000	AV	42.6	27.2	7.1	32.5	-	44.4	53.9	9.5	
Hori	3660.000	AV	32.8	28.7	7.5	32.1	-	36.9	53.9	17.0	Floor noise
Hori	4575.000	AV	32.3	30.2	8.0	31.8	-	38.7	53.9	15.2	Floor noise
Hori	5490.000	AV	32.1	31.1	8.4	31.8	-	39.8	53.9	14.1	Floor noise
Hori	6405.000	AV	35.8	33.6	8.7	32.1	-	46.0	53.9	7.9	
Hori	7320.000	AV	33.5	35.6	8.9	32.6	-	45.4	53.9	8.5	Floor noise
Hori	8235.000	AV	33.9	36.2	9.3	32.8	-	46.6	53.9	7.3	Floor noise
Hori	9150.000	AV	33.3	36.7	9.6	33.0	-	46.6	53.9	7.3	Floor noise
Vert	53.809	QP	34.6	9.5	17.4	38.7	-	22.8	40.0	17.2	
Vert	93.580	QP	29.7	9.0	18.0	38.8	-	17.9	43.5	25.6	
Vert	96.000	QP	41.4	9.4	18.0	38.8	-	30.0	43.5	13.5	
Vert	207.417	QP	32.9	11.7	19.1	38.7	-	25.0	43.5	18.5	
Vert	400.008	QP	38.2	15.7	20.6	38.4	-	36.1	46.0	9.9	
Vert	960.000	QP	25.4	22.3	23.6	37.6	-	33.7	53.9	20.2	
Vert	1830.000	PK	45.8	25.9	6.8	33.3	-	45.2	73.9	28.7	
Vert	2745.000	PK	46.1	27.2	7.1	32.5	-	47.9	73.9	26.0	
Vert	3660.000	PK	41.7	28.7	7.5	32.1	-	45.8	73.9	28.1	Floor noise
Vert	4575.000	PK	41.6	30.2	8.0	31.8	-	48.0	73.9	25.9	Floor noise
Vert	5490.000	PK	40.9	31.1	8.4	31.8	-	48.6	73.9	25.3	Floor noise
Vert	6405.000	PK	44.0	33.6	8.7	32.1	-	54.2	73.9	19.7	
Vert	7320.000	PK	41.4	35.6	8.9	32.6	-	53.3	73.9	20.6	Floor noise
Vert	8235.000	PK	42.6	36.2	9.3	32.8	-	55.3	73.9	18.6	Floor noise
Vert	9150.000	PK	41.4	36.7	9.6	33.0	-	54.7	73.9	19.2	Floor noise
Vert	1830.000	AV	37.6	25.9	6.8	33.3	-	37.0	53.9	16.9	
Vert	2745.000	AV	39.5	27.2	7.1	32.5	-	41.3	53.9	12.6	
Vert	3660.000	AV	32.7	28.7	7.5	32.1	-	36.8	53.9	17.1	Floor noise
Vert	4575.000	AV	32.4	30.2	8.0	31.8	-	38.8	53.9	15.1	Floor noise
Vert	5490.000	AV	32.6	31.1	8.4	31.8	-	40.3	53.9	13.6	Floor noise
Vert	6405.000	AV	35.2	33.6	8.7	32.1	-	45.4	53.9	8.5	
Vert	7320.000	AV	33.7	35.6	8.9	32.6	-	45.6	53.9	8.3	Floor noise
Vert	8235.000	AV	33.7	36.2	9.3	32.8	-	46.4	53.9	7.5	Floor noise
Vert	9150.000	AV	33.2	36.7	9.6	33.0	-	46.5	53.9	7.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	February 20, 2017	February 21, 2017
Temperature / Humidity	18 deg. C / 30 % RH	20 deg. C / 31 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
	(below 1GHz)	(Above 1GHz)
Mode	Tx 927.6 MHz Antenna port1	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	53.803	QP	27.9	9.5	17.4	38.7	-	16.1	40.0	23.9	
Hori	96.000	QP	48.6	9.4	18.0	38.8	-	37.2	43.5	6.3	
Hori	207.500	QP	27.7	11.7	19.1	38.7	-	19.8	43.5	23.7	
Hori	400.000	QP	36.6	15.7	20.6	38.4	-	34.5	46.0	11.5	
Hori	960.000	QP	25.3	22.3	23.6	37.7	-	33.5	46.0	12.5	
Hori	1855.200	PK	42.6	26.0	6.8	33.3	-	42.1	73.9	31.8	Floor noise
Hori	2782.800	PK	47.4	27.3	7.0	32.5	-	49.2	73.9	24.7	
Hori	3710.400	PK	41.3	28.7	7.5	32.1	-	45.4	73.9	28.5	Floor noise
Hori	4638.000	PK	41.3	30.5	8.0	31.8	-	48.0	73.9	25.9	Floor noise
Hori	5565.600	PK	40.9	31.2	8.4	31.8	-	48.7	73.9	25.2	Floor noise
Hori	6493.200	PK	45.2	34.0	8.7	32.2	-	55.7	73.9	18.2	
Hori	7420.800	PK	41.5	35.5	8.9	32.7	-	53.2	73.9	20.7	Floor noise
Hori	8348.400	PK	41.1	36.2	9.3	32.8	-	53.8	73.9	20.1	Floor noise
Hori	9276.000	PK	41.5	36.9	9.6	33.1	-	54.9	73.9	19.0	Floor noise
Hori	1855.200	AV	34.0	26.0	6.8	33.3	-	33.5	53.9	20.4	Floor noise
Hori	2782.800	AV	42.3	27.3	7.0	32.5	-	44.1	53.9	9.8	
Hori	3710.400	AV	32.9	28.7	7.5	32.1	-	37.0	53.9	16.9	Floor noise
Hori	4638.000	AV	32.3	30.5	8.0	31.8	-	39.0	53.9	14.9	Floor noise
Hori	5565.600	AV	32.4	31.2	8.4	31.8	-	40.2	53.9	13.7	Floor noise
Hori	6493.200	AV	38.4	34.0	8.7	32.2	-	48.9	53.9	5.0	
Hori	7420.800	AV	34.1	35.5	8.9	32.7	-	45.8	53.9	8.1	Floor noise
Hori	8348.400	AV	33.8	36.2	9.3	32.8	-	46.5	53.9	7.4	Floor noise
Hori	9276.000	AV	33.4	36.9	9.6	33.1	-	46.8	53.9	7.1	Floor noise
Vert	53.803	QP	36.6	9.5	17.4	38.7	-	24.8	40.0	15.2	
Vert	96.000	QP	43.4	9.4	18.0	38.8	-	32.0	43.5	11.5	
Vert	207.500	QP	34.3	11.7	19.1	38.7	-	26.4	43.5	17.1	
Vert	400.000	QP	38.6	15.7	20.6	38.4	-	36.5	46.0	9.5	
Vert	960.000	QP	25.4	22.3	23.6	37.7	-	33.6	46.0	12.4	
Vert	1855.200	PK	44.0	26.0	6.8	33.3	-	43.5	73.9	30.4	
Vert	2782.800	PK	46.0	27.3	7.0	32.5	-	47.8	73.9	26.1	
Vert	3710.400	PK	40.6	28.7	7.5	32.1	-	44.7	73.9	29.2	Floor noise
Vert	4638.000	PK	40.9	30.5	8.0	31.8	-	47.6	73.9	26.3	Floor noise
Vert	5565.600	PK	40.7	31.2	8.4	31.8	-	48.5	73.9	25.4	Floor noise
Vert	6493.200	PK	44.9	34.0	8.7	32.2	-	55.4	73.9	18.5	
Vert	7420.800	PK	41.8	35.5	8.9	32.7	-	53.5	73.9	20.4	Floor noise
Vert	8348.400	PK	41.0	36.2	9.3	32.8	-	53.7	73.9	20.2	Floor noise
Vert	9276.000	PK	41.2	36.9	9.6	33.1	-	54.6	73.9	19.3	Floor noise
Vert	1855.200	AV	35.8	26.0	6.8	33.3	-	35.3	53.9	18.6	
Vert	2782.800	AV	40.1	27.3	7.0	32.5	-	41.9	53.9	12.0	
Vert	3710.400	AV	32.9	28.7	7.5	32.1	-	37.0	53.9	16.9	Floor noise
Vert	4638.000	AV	32.2	30.5	8.0	31.8	-	38.9	53.9	15.0	Floor noise
Vert	5565.600	AV	32.6	31.2	8.4	31.8	-	40.4	53.9	13.5	Floor noise
Vert	6493.200	AV	37.9	34.0	8.7	32.2	-	48.4	53.9	5.5	
Vert	7420.800	AV	34.1	35.5	8.9	32.7	-	45.8	53.9	8.1	Floor noise
Vert	8348.400	AV	33.8	36.2	9.3	32.8	-	46.5	53.9	7.4	Floor noise
Vert	9276.000	AV	33.4	36.9	9.6	33.1	-	46.8	53.9	7.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

Radiated Spurious Emission
(λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	February 20, 2017
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Yutaka Yoshida (below 1GHz)
Mode	Tx 927.6 MHz Antenna port1

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	927.600	PK	101.2	22.2	23.4	37.9	108.9	-	-	Carrier
Hori	928.000	PK	62.3	22.2	23.4	37.9	70.0	88.9	18.9	
Vert	927.600	PK	102.3	22.2	23.4	37.9	110.0	-	-	Carrier
Vert	928.000	PK	62.7	22.2	23.4	37.9	70.4	90.0	19.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

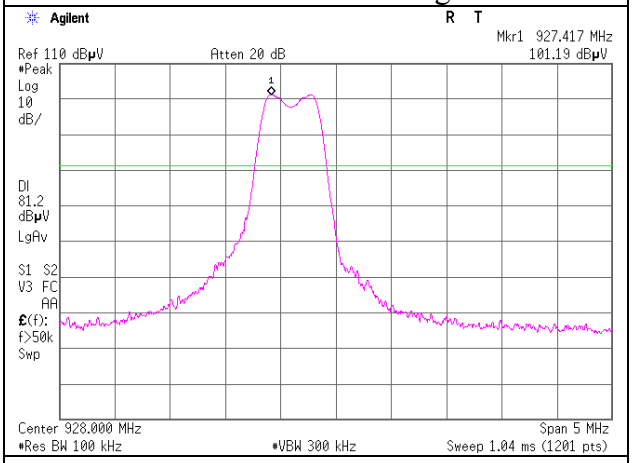
Radiated Spurious Emission

Reference Plot for band-edge ((λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11579640H
Date	February 20, 2017
Temperature / Humidity	18 deg. C / 30 % RH
Engineer	Yutaka Yoshida (below 1GHz)
Mode	Tx 927.6 MHz Antenna port1

Horizontal

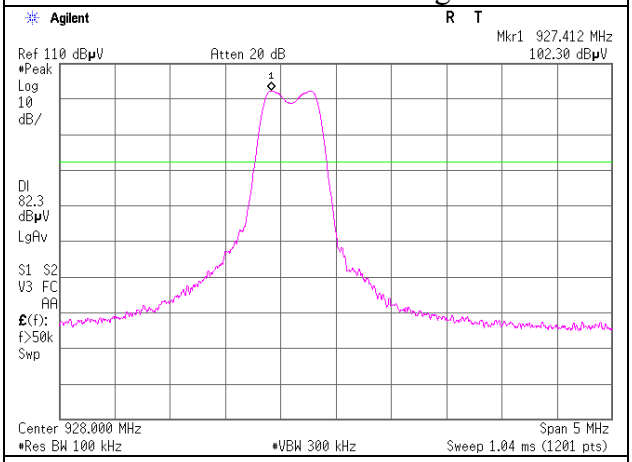
Authorized-band band-edge Plot



20dBc Plot

Vertical

Authorized-band band-edge Plot



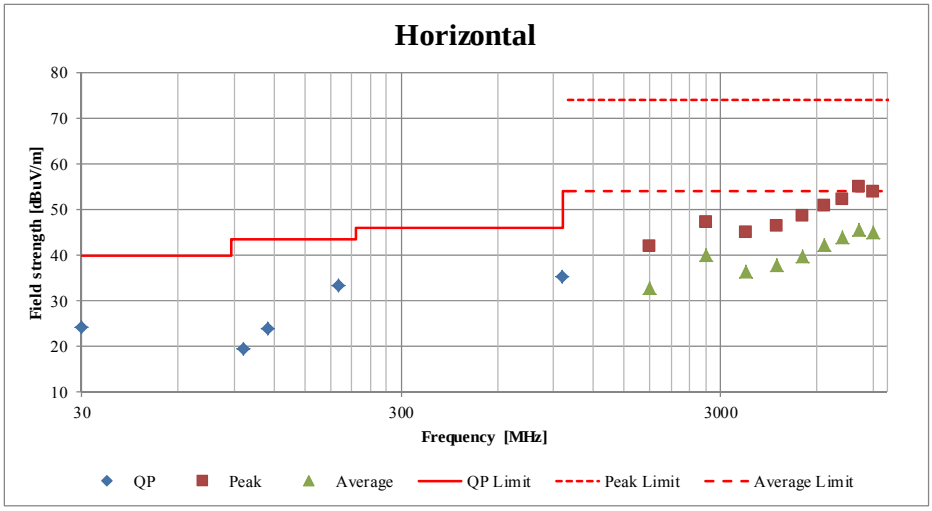
20dBc Plot

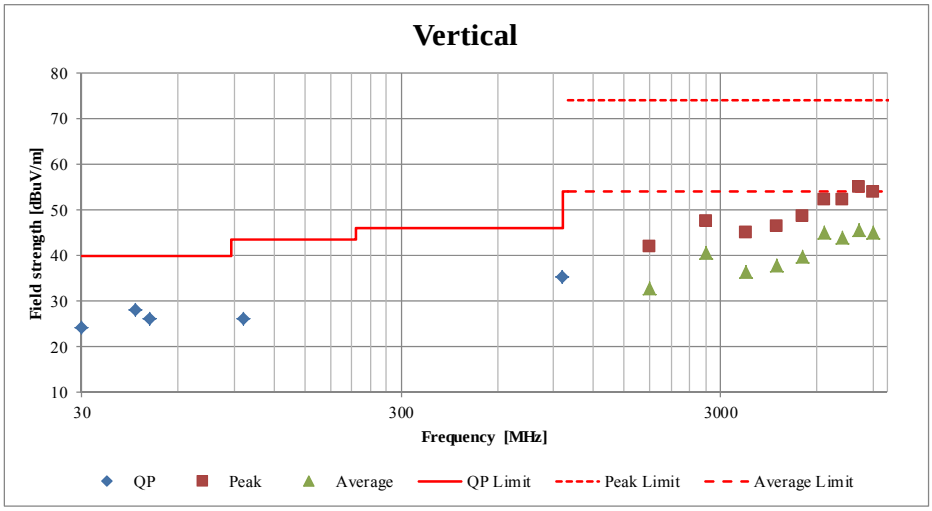
* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Plot data, Worst case (Sleeve Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 902.4 MHz Antenna port1	



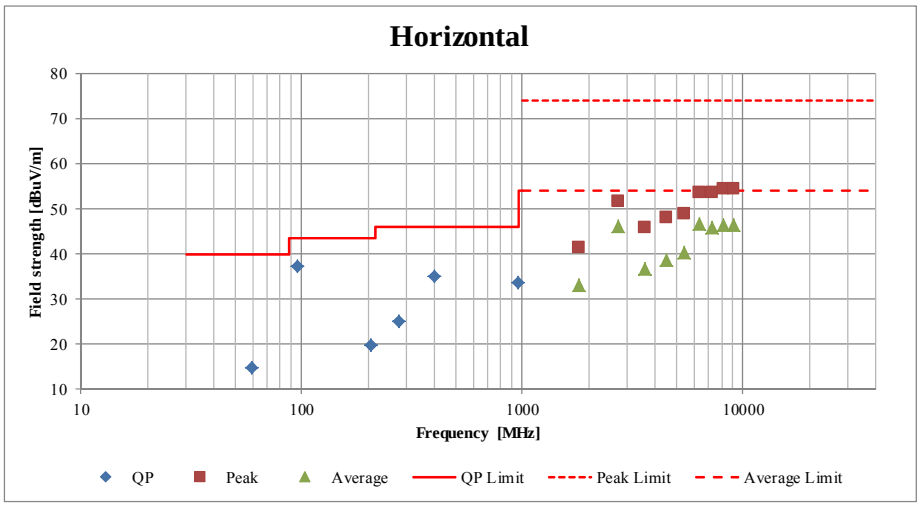


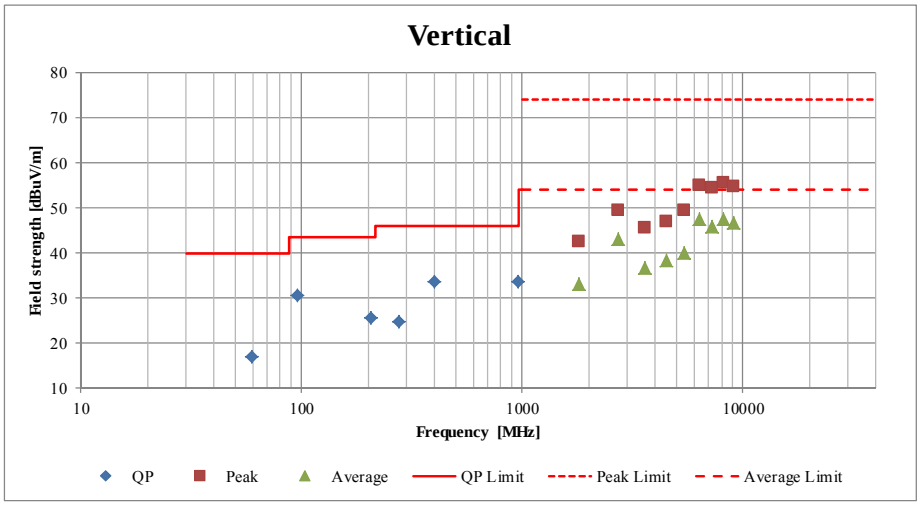
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission

Plot data, Worst case (λ/4 Monopole Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	February 20, 2017	February 21, 2017
Temperature / Humidity	18 deg. C / 30 % RH	20 deg. C / 31 % RH
Engineer	Yutaka Yoshida (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 902.4 MHz Antenna port1	



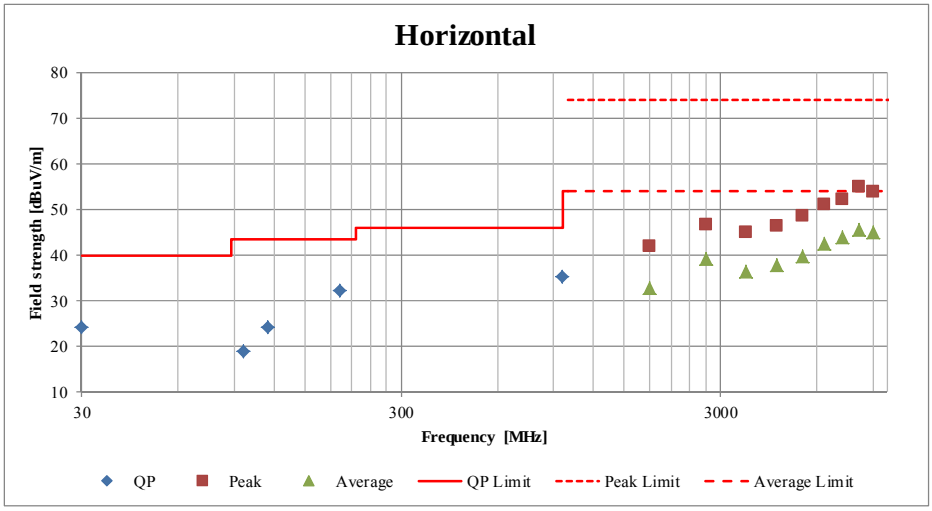


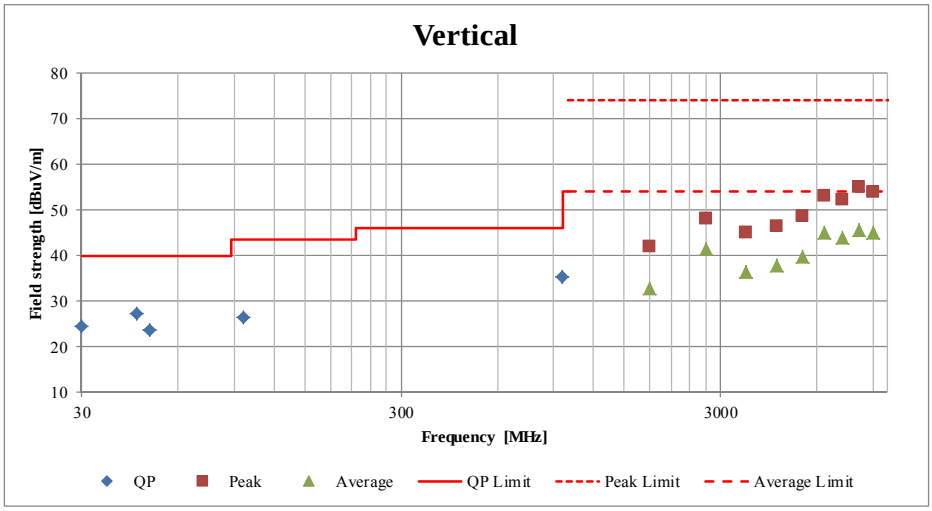
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission

Plot data, Worst case (Internal Antenna)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11579640H	
Date	December 23, 2016	December 23, 2016
Temperature / Humidity	24 deg. C / 40 % RH	25 deg. C / 30 % RH
Engineer	Ryota Yamanaka (below 1GHz)	Tomoki Matsui (Above 1GHz)
Mode	Tx 902.4 MHz	



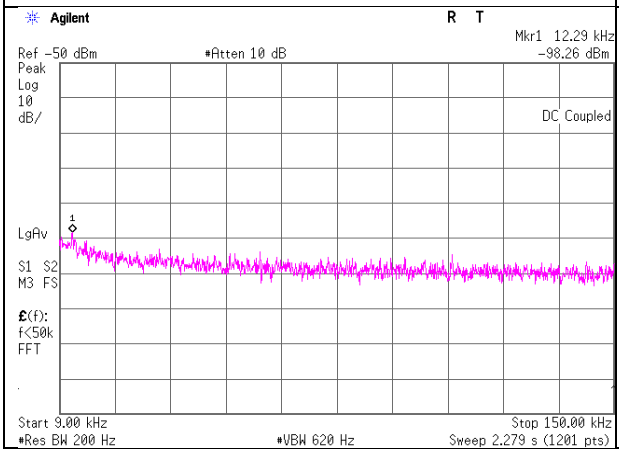


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

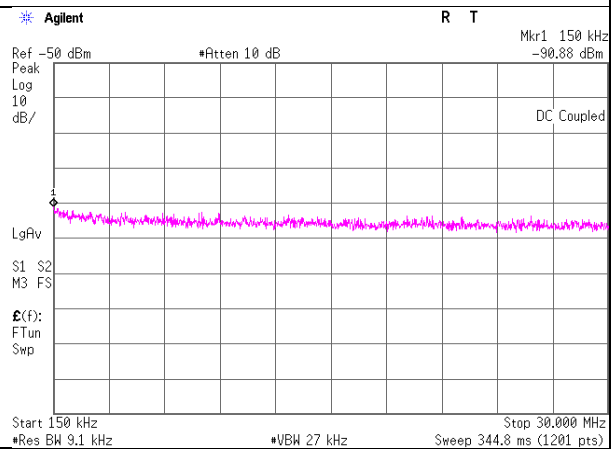
Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx 902.4 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
12.29	-98.3	0.01	9.8	2.0	1	-86.4	300	6.0	-25.2	45.8	71.0	
150.00	-90.9	0.01	9.8	2.0	1	-79.0	300	6.0	-17.8	24.0	41.8	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

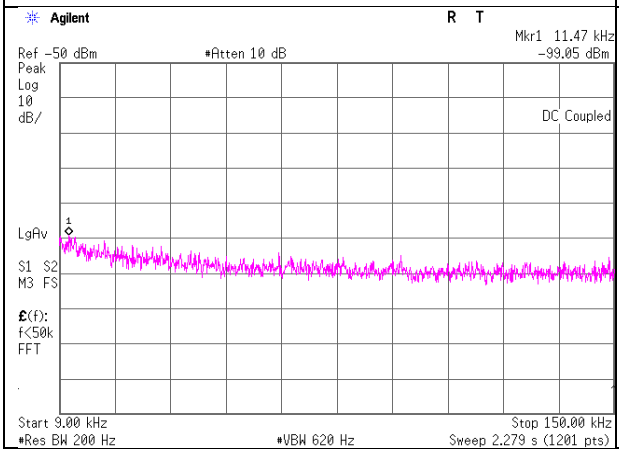
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

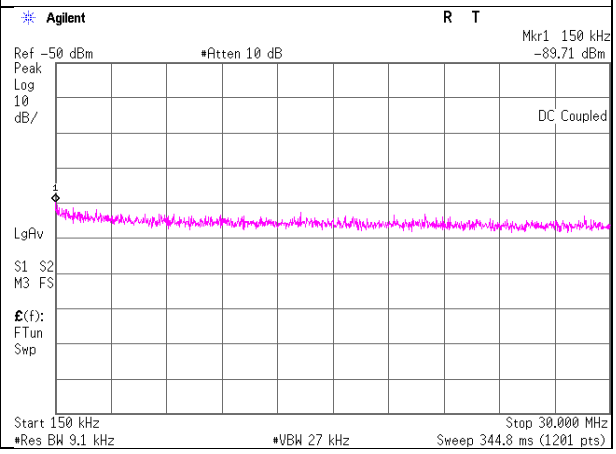
Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx 915.0 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
11.47	-99.1	0.01	9.8	2.0	1	-87.2	300	6.0	-26.0	46.4	72.4	
150.00	-89.7	0.01	9.8	2.0	1	-77.9	300	6.0	-16.6	24.0	40.6	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

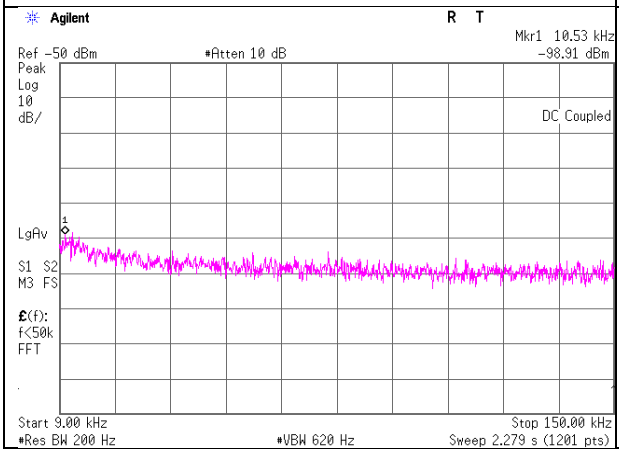
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

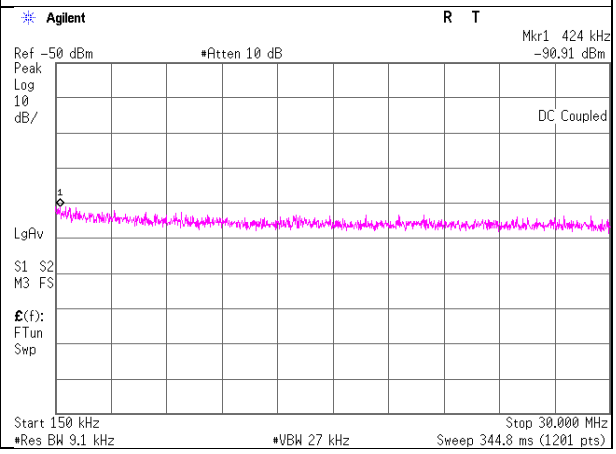
Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx 927.6 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.53	-98.9	0.01	9.8	2.0	1	-87.1	300	6.0	-25.8	47.1	72.9	
424.00	-90.9	0.01	9.8	2.0	1	-79.1	300	6.0	-17.8	15.0	32.8	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
N: Number of output

Power Density

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

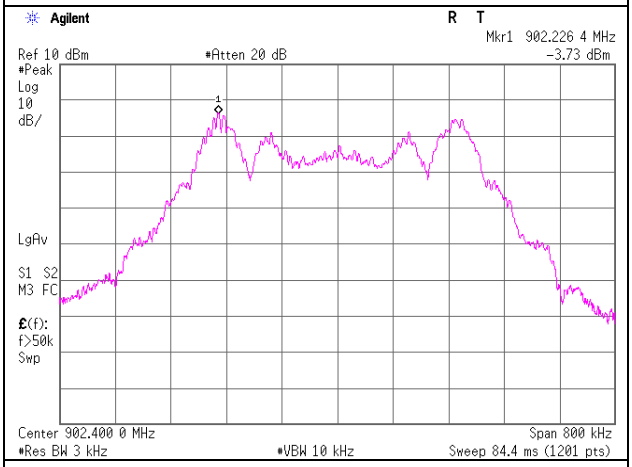
Antenna Port1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
902.4	-3.73	0.30	9.95	6.52	8.00	1.48
915.0	-3.63	0.30	9.95	6.62	8.00	1.38
927.6	-3.93	0.30	9.95	6.32	8.00	1.68

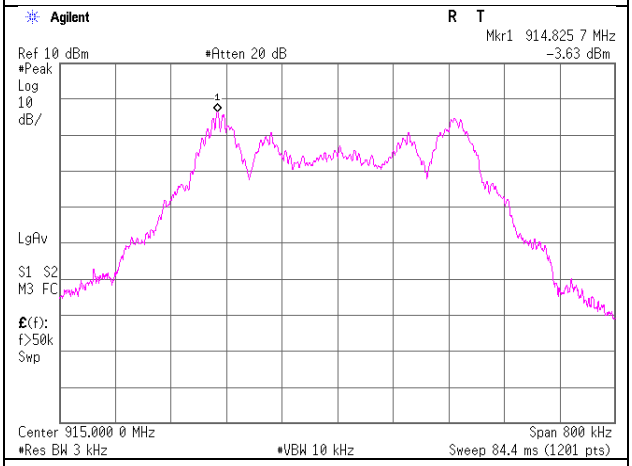
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuato

Power Density

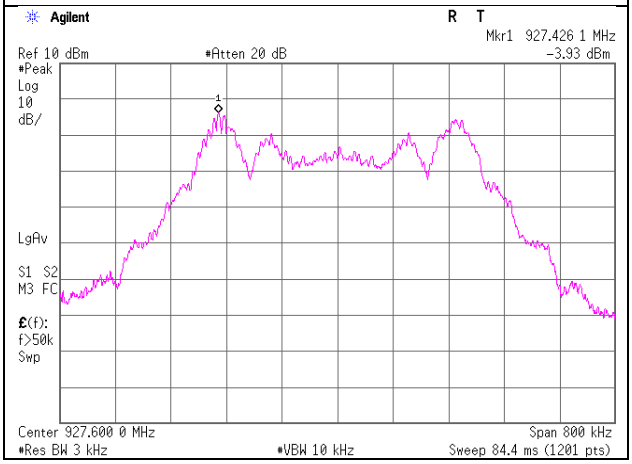
902.4 MHz



915.0 MHz



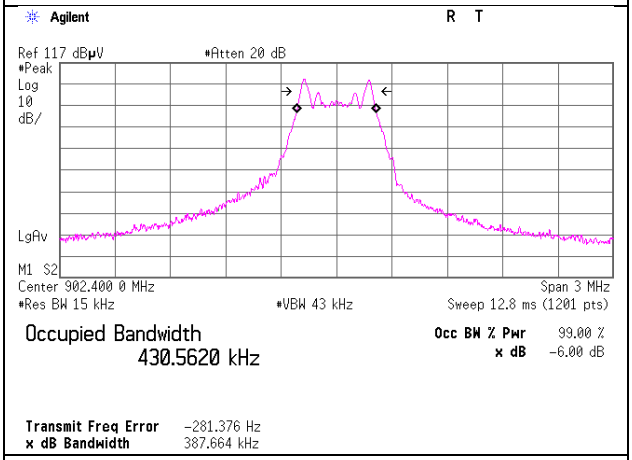
927.6 MHz



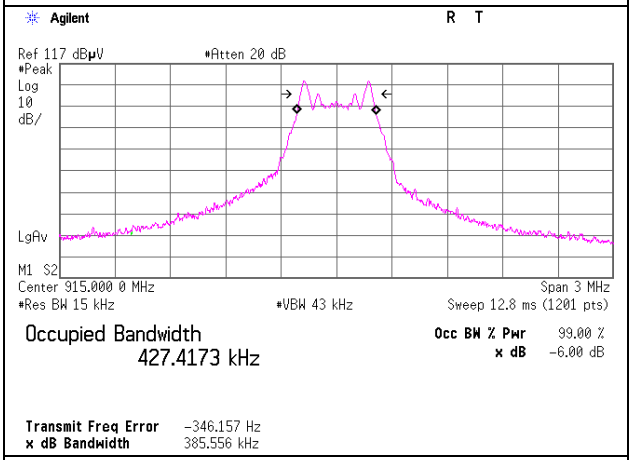
99%Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11579640H
Date	December 22, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Masafumi Niwa
Mode	Tx

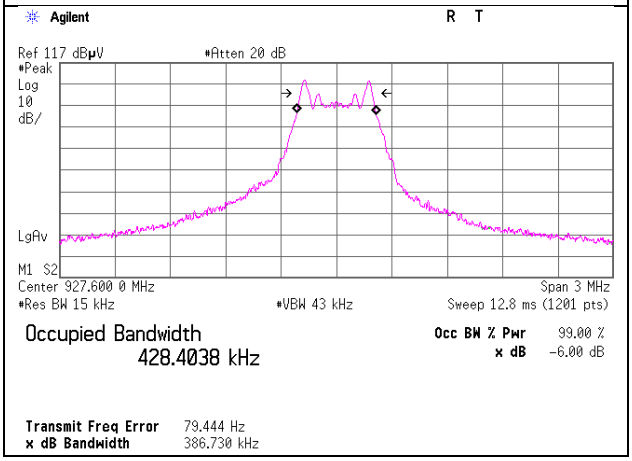
902.4 MHz



915.0 MHz



927.6 MHz



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2016/10/19 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	CE	2017/01/20 * 12
MJM-26	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MTR-10	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	CE	2017/01/12 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2016/07/07 * 12
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/12/24 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ sucoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2016/07/20 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	CE	2017/01/19 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2016/10/20 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2016/01/21 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
MSA-14	Spectrum Analyzer	Agilent	E4440A	MY48250080	RE	2016/10/14 * 12
MSA-10	Spectrum Analyzer	Agilent	E4440A	MY46180655	RE	2016/08/17 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2016/09/15 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2016/10/15 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2016/07/26 * 12
MAT-98	Attenuator	KEYSIGHT	8491A	MY52462349	RE	2016/12/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2016/03/24 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2017/02/08 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2016/01/13 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	RE/AT	2016/11/28 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2016/05/29 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2016/05/20 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2016/03/24 * 12
MHF-27	High Pass Filter(1.1-10GHz)	TOKYO KEIKI	TF219CD1	1001	RE	2016/01/19 * 12
MTA-47	Terminator	Pasternack Enterprises	PE6071	8376	RE	Pre Check
MOS-34	Thermo-Hygrometer	Custom	CTH-201	3401	AT	2016/01/21 * 12
MRENT-130	Spectrum Analyzer	Agilent	E4440A	MY46187750	AT	2016/06/03 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2016/11/02 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2016/11/02 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	AT	2016/03/10 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: **CE: Conducted Emission test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test