



RADIO TEST REPORT

Test Report No. : 11961637H-B-R1

Applicant : **Panasonic Avionics Corporation**
Type of Equipment : **BTv4.0 Dual Mode USB HCI Module**
Model No. : **R8U1FA6550Z**
FCC ID : **U6YBT800**
Test regulation : **FCC Part 15 Subpart C: 2017**
Class II Permissive Change
*** Bluetooth part**
(Maximum Peak Output Power and Radiated Spurious Emission tests only)
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 11961637H-B. 11961637H-B is replaced with this report.

Date of test: September 19 and 20, 2017

Representative test engineer:

Masafumi Niwa
Engineer
Consumer Technology Division

Approved by:

Takayuki Shimada
Engineer
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11961637H-B

[illegible]

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SECTION 1: Customer information

Company Name	:	Panasonic Avionics Corporation
Address	:	26200 Enterprise Way Lake Forest, CA 92630 USA
Telephone Number	:	+1-949-672-2000
Facsimile Number	:	+1-949-462-7100
Contact Person	:	David O'Reilly

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

2.1 Identification of E.U.T.

Type of Equipment	:	BTv4.0 Dual Mode USB HCI Module
Model No.	:	R8U1FA6550Z
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5 V
Receipt Date of Sample	:	September 19, 2017
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

Model: R8U1FA6550Z (referred to as the EUT in this report) is a BTv4.0 Dual Mode USB HCI Module.

Radio Specification

[Bluetooth (Ver.4.0 Dual mode (Classic Bluetooth and BLE))]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) LE: GFSK
Channel spacing	:	BT: 1 MHz LE: 2 MHz
Power Supply (radio part input)	:	DC 3.3 V / DC 1.8 V
Antenna type	:	Microstrip Antenna
Antenna Gain	:	-2.3 dBi
Clock frequency (Maximum)	:	48 MHz

* This test report applies to Bluetooth Ver.4.0 with EDR function (2402 MHz - 2480 MHz) except for Bluetooth Low Energy.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on September 1, 2017 and effective October 2, 2017

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

* The revision on September 1, 2017, does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) IC: RSS-247 5.4 (b)	See data	Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	8.3 dB 4960.000 MHz, AV, Hori.	Complied	Conducted/ 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).

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

FCC Part 15.31 (e)

This EUT provides stable voltage (DC3.3 V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The antenna is not removable from the EUT.

Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

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 $k=2$.
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Antenna terminal test	Uncertainty (+/-)
RF output power	1.2 dB
Antenna terminal conducted emission / Power density / Burst power	3.1 dB
Adjacent channel power / Channel power	
Below 3 GHz	1.8 dB
3 GHz to 6 GHz	2.7 dB

Frequency range	Conducted emission using AMN(LISN) (+/-)
0.009 MHz - 0.15 MHz	3.1 dB
0.15 MHz - 30 MHz	2.5 dB

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3 m	3.8 dB
10 m	3.6 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	5.2 dB	6.3 dB	5.0 dB	5.0 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	5.5 dB	5.5 dB	5.4 dB	5.5 dB

*Measurement distance

Radiated emission test

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

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3.5 Test Location

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NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

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

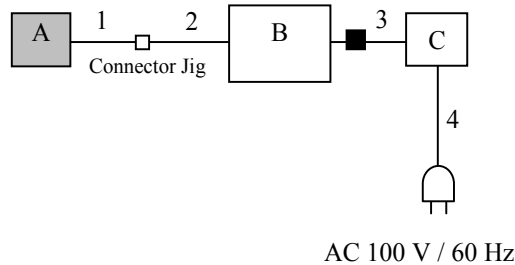
4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Radiated Spurious Emission	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>* It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification.</p> <p>*EUT has the power settings by the software as follows;</p> <p>*Power of the EUT was set by the software as follows;</p> <p>Power settings: BDR: 8 dBm EDR: 8 dBm</p> <p>Software: Blue Test3</p> <p>*This setting of software is the worst case.</p> <p>Any conditions under the normal use do not exceed the condition of setting.</p> <p>In addition, end users cannot change the settings of the output power of the product.</p>		

4.2 Configuration and peripherals



■ : Standard Ferrite Core

* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Bluetooth BTv4.0 Dual Mode USB HCI Module	R8U1FA6550Z	11F10E	Laird Technologies	EUT
B	Laptop PC	CF-W7	8AKSA23756	Panasonic	-
C	AC adaptor	CF-AA1632A	1632AM106X03538B	Panasonic	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	1.1	Unshielded	Unshielded	-
2	USB Cable	2.1	Shielded	Shielded	-
3	DC Cable	1.3	Unshielded	Unshielded	-
4	AC Cable	0.8	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

[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	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3.75 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 26.5 GHz), 0.5 m*4) (above 26.5 GHz)		3.75 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 26.5 GHz), 0.5 m*4) (above 26.5 GHz)

*1) Although DA 00-705 accepts VBW = 10 Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

*2) Distance Factor: $20 \times \log(3.75 \text{ m}/3.0 \text{ m}) = 1.94 \text{ dB}$

*3) Distance Factor: $20 \times \log(1.0 \text{ m}/3.0 \text{ m}) = -9.5 \text{ dB}$

*4) Distance Factor: $20 \times \log(0.5 \text{ m}/3.0 \text{ m}) = -15.6 \text{ dB}$

- 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 - 26.5 GHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: 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
Maximum Peak Output Power	-	-	-	Auto	Peak Average *1)	-	Power Meter (Sensor: 50MHz BW)
*1) Reference data							

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

Maximum Peak Output Power

Test place	Ise EMC Lab. No.2 Measurement Room
Report No.	11961637H
Date	September 19, 2017
Temperature / Humidity	27 deg. C / 55 % RH
Engineer	Takumi Shimada
Mode	Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-3.79	0.66	10.09	6.96	4.97	20.96	125	14.00
DH5	2441.0	-2.93	0.66	10.09	7.82	6.06	20.96	125	13.14
DH5	2480.0	-2.25	0.66	10.09	8.50	7.09	20.96	125	12.46
2DH5	2402.0	-5.42	0.66	10.09	5.33	3.42	20.96	125	15.63
2DH5	2441.0	-4.21	0.66	10.09	6.54	4.51	20.96	125	14.42
2DH5	2480.0	-3.28	0.66	10.09	7.47	5.59	20.96	125	13.49
3DH5	2402.0	-5.01	0.66	10.09	5.74	3.75	20.96	125	15.22
3DH5	2441.0	-3.91	0.66	10.09	6.84	4.84	20.96	125	14.12
3DH5	2480.0	-3.02	0.66	10.09	7.73	5.93	20.96	125	13.23

Sample Calculation:

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

*The equipment and cables were not used for factor 0 dB of the data sheets.

Average Output Power

(Reference data for RF Exposure / SAR testing)

Test place	Ise EMC Lab. No.2 Measurement Room
Report No.	11961637H
Date	September 19, 2017
Temperature / Humidity	27 deg. C / 55 % RH
Engineer	Takumi Shimada
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-5.23	0.66	10.09	5.52	3.57	1.06	6.58	4.55
DH5	2441.0	-4.32	0.66	10.09	6.43	4.40	1.06	7.49	5.62
DH5	2480.0	-3.58	0.66	10.09	7.17	5.22	1.06	8.23	6.66
2DH5	2402.0	-8.95	0.66	10.09	1.80	1.51	1.04	2.84	1.92
2DH5	2441.0	-7.69	0.66	10.09	3.06	2.02	1.04	4.10	2.57
2DH5	2480.0	-6.49	0.66	10.09	4.26	2.67	1.04	5.30	3.39
3DH5	2402.0	-8.93	0.66	10.09	1.82	1.52	1.03	2.85	1.93
3DH5	2441.0	-7.67	0.66	10.09	3.08	2.03	1.03	4.11	2.58
3DH5	2480.0	-6.47	0.66	10.09	4.28	2.68	1.03	5.31	3.40

Sample Calculation:

Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

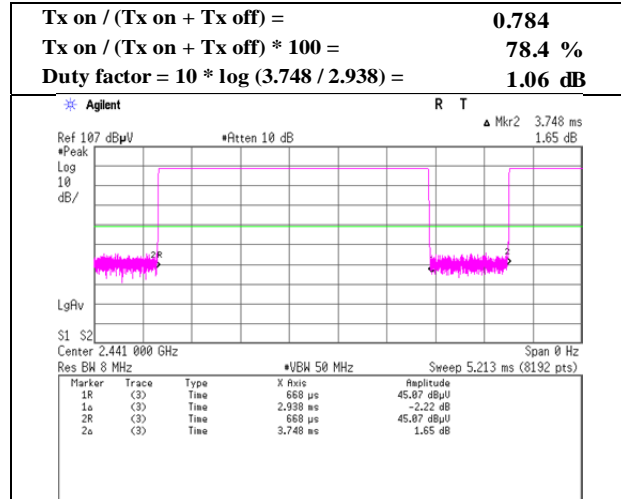
Result (Burst power average) = Time average + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

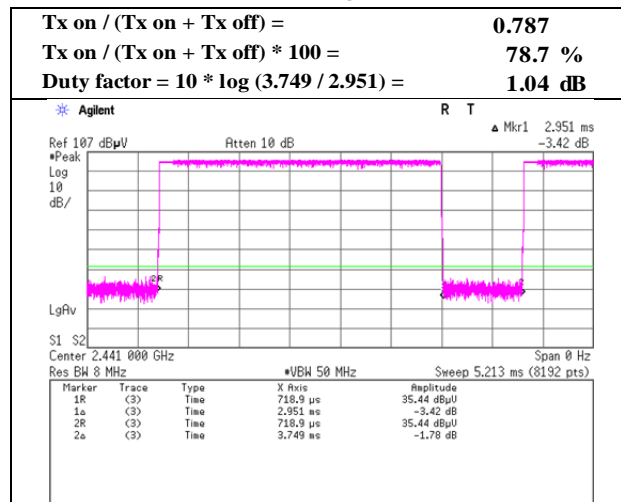
Burst Rate Confirmation

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber	
Report No.	11961637H	
Date	September 19, 2017	September 19, 2017
Temperature / Humidity	20 deg. C / 60 % RH	27 deg. C / 55 % RH
Engineer	Masafumi Niwa	Takumi Shimada
Mode	Tx, Hopping Off	

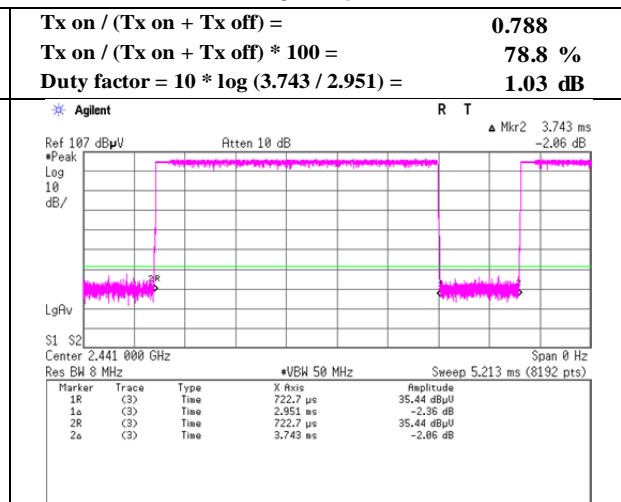
DH5



2DH5



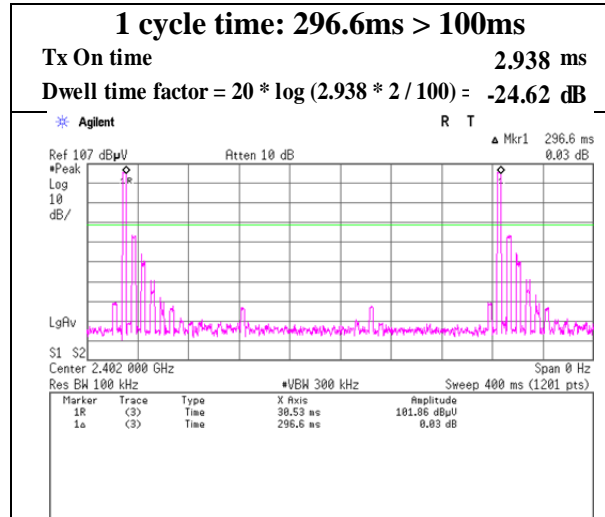
3DH5



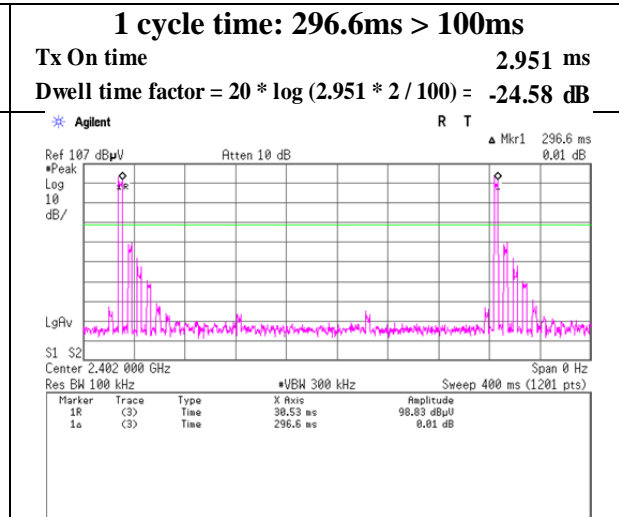
Dwell time factor

Test place : Ise EMC Lab. No.2 Measurement Room
Report No. : 11961637H
Date : September 19, 2017
Temperature / Humidity : 27 deg. C / 55 % RH
Engineer : Takumi Shimada
Mode : Tx, Hopping On

DH5



3DH5



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Radiated Spurious Emission

Report No. 11961637H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date September 19, 2017
Temperature / Humidity 20 deg. C / 60 % RH
Engineer Masafumi Niwa
(1 GHz -10 GHz)
Mode Tx, Hopping Off, DH5 2402 MHz

No.2
September 19, 2017
27 deg. C / 55 % RH
Takumi Shimada
(Above 10 GHz)
No.2
September 20, 2017
24 deg. C / 60 % RH
Yuta Moriya
(Below 1 GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	65.620	QP	24.7	6.9	7.1	28.1	10.6	40.0	29.4	
Hori	85.201	QP	25.9	7.2	7.3	28.0	12.4	40.0	27.6	
Hori	185.495	QP	23.3	16.4	8.0	27.5	20.2	43.5	23.3	
Hori	236.180	QP	26.3	11.6	8.4	27.2	19.1	46.0	26.9	
Hori	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Hori	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Hori	2390.000	PK	45.5	27.0	5.1	34.6	43.0	73.9	30.9	
Hori	4804.000	PK	53.4	31.3	7.3	33.8	58.2	73.9	15.7	
Hori	7206.000	PK	44.7	35.6	8.6	33.9	55.0	73.9	18.9	Floor noise
Hori	9608.000	PK	45.4	38.2	9.3	34.5	58.4	73.9	15.5	Floor noise
Hori	2390.000	AV	31.7	27.0	5.1	34.6	29.2	53.9	24.7	
Hori	7206.000	AV	32.0	35.6	8.6	33.9	42.3	53.9	11.6	Floor noise
Hori	9608.000	AV	33.6	38.2	9.3	34.5	46.6	53.9	7.3	Floor noise
Vert	65.620	QP	33.3	6.9	7.1	28.1	19.2	40.0	20.8	
Vert	85.201	QP	28.6	7.2	7.3	28.0	15.1	40.0	24.9	
Vert	185.495	QP	24.2	16.4	8.0	27.5	21.1	43.5	22.4	
Vert	236.180	QP	26.3	11.6	8.4	27.2	19.1	46.0	26.9	
Vert	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	2390.000	PK	44.0	27.0	5.1	34.6	41.5	73.9	32.4	
Vert	4804.000	PK	52.7	31.3	7.3	33.8	57.5	73.9	16.4	
Vert	7206.000	PK	44.6	35.6	8.6	33.9	54.9	73.9	19.0	Floor noise
Vert	9608.000	PK	46.2	38.2	9.3	34.5	59.2	73.9	14.7	Floor noise
Vert	2390.000	AV	32.2	27.0	5.1	34.6	29.7	53.9	24.2	
Vert	7206.000	AV	32.1	35.6	8.6	33.9	42.4	53.9	11.5	Floor noise
Vert	9608.000	AV	34.0	38.2	9.3	34.5	47.0	53.9	6.9	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 $20\log(3.75\text{ m} / 3.0\text{ m}) = 1.94\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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	2402.000	PK	96.2	27.0	5.1	34.6	93.7	-	-	Carrier
Hori	2400.000	PK	54.6	27.0	5.1	34.6	52.1	73.7	21.6	
Vert	2402.000	PK	92.7	27.0	5.1	34.6	90.2	-	-	Carrier
Vert	2400.000	PK	52.1	27.0	5.1	34.6	49.6	70.2	20.6	

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
Hori	4804.000	AV	47.9	31.3	7.3	33.8	-24.6	28.1	53.9	25.8
Vert	4804.000	AV	47.0	31.3	7.3	33.8	-24.6	27.2	53.9	26.7

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

*Above noise was synchronized with carrier frequency.

Distance factor: 1 GHz - 10 GHz $20\log(3.75\text{ m} / 3.0\text{ m}) = 1.94\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Ise EMC Lab.

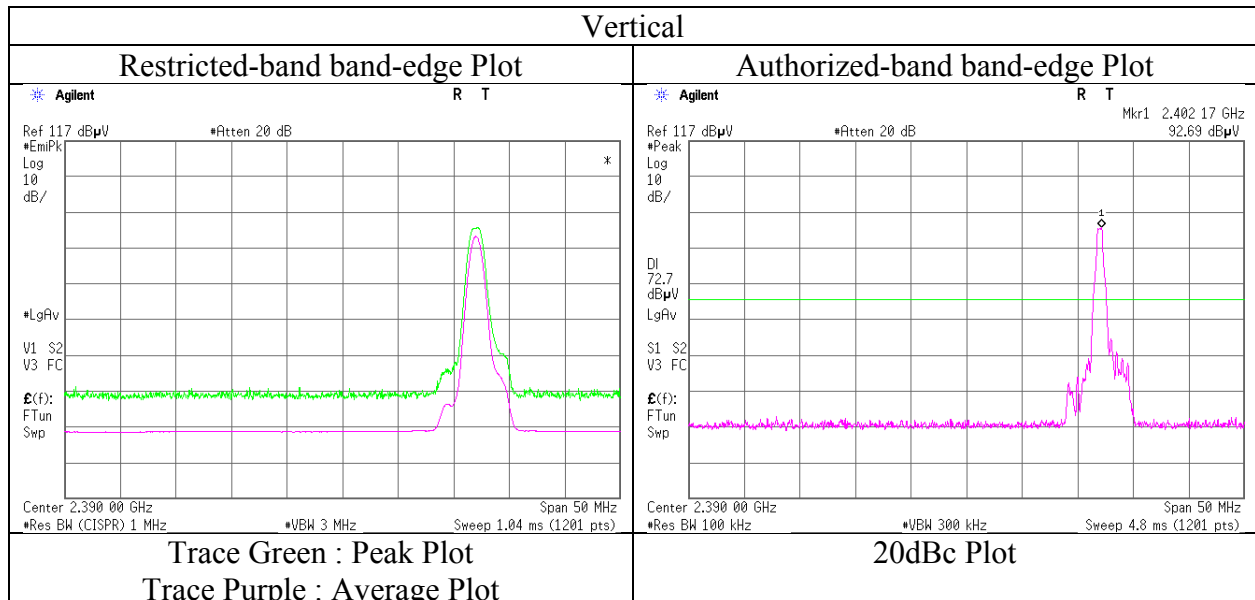
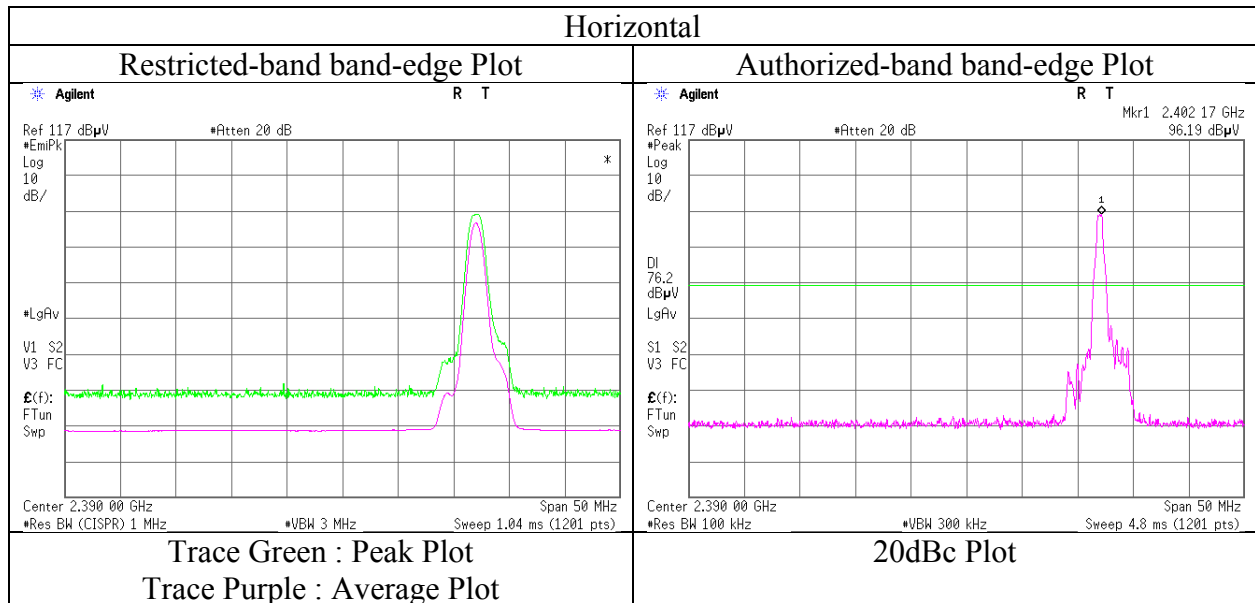
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	11961637H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	September 19, 2017
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Masafumi Niwa (1 GHz -10 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

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Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Radiated Spurious Emission

Report No. 11961637H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date September 19, 2017
Temperature / Humidity 20 deg. C / 60 % RH
Engineer Masafumi Niwa
(1 GHz -10 GHz)
Mode Tx, Hopping Off, DH5 2441 MHz

No.2
September 19, 2017
27 deg. C / 55 % RH
Takumi Shimada
(Above 10 GHz)

No.2
September 20, 2017
24 deg. C / 60 % RH
Yuta Moriya
(Below 1 GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	65.620	QP	24.3	6.9	7.1	28.1	10.2	40.0	29.8	
Hori	85.201	QP	24.9	7.2	7.3	28.0	11.4	40.0	28.6	
Hori	185.495	QP	23.3	16.4	8.0	27.5	20.2	43.5	23.3	
Hori	236.180	QP	28.0	11.6	8.4	27.2	20.8	46.0	25.2	
Hori	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Hori	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Hori	4882.000	PK	52.1	31.4	7.3	33.8	57.0	73.9	16.9	
Hori	7323.000	PK	43.3	35.8	8.6	33.9	53.8	73.9	20.1	Floor noise
Hori	9764.000	PK	45.4	38.2	9.3	34.5	58.4	73.9	15.5	Floor noise
Hori	7323.000	AV	31.8	35.8	8.6	33.9	42.3	53.9	11.6	Floor noise
Hori	9764.000	AV	33.4	38.2	9.3	34.5	46.4	53.9	7.5	Floor noise
Vert	65.620	QP	28.4	6.9	7.1	28.1	14.3	40.0	25.7	
Vert	85.201	QP	24.9	7.2	7.3	28.0	11.4	40.0	28.6	
Vert	185.495	QP	23.4	16.4	8.0	27.5	20.3	43.5	23.2	
Vert	236.180	QP	36.7	11.6	8.4	27.2	29.5	46.0	16.5	
Vert	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	4882.000	PK	51.3	31.4	7.3	33.8	56.2	73.9	17.7	
Vert	7323.000	PK	43.9	35.8	8.6	33.9	54.4	73.9	19.5	Floor noise
Vert	9764.000	PK	45.2	38.2	9.3	34.5	58.2	73.9	15.7	Floor noise
Vert	7323.000	AV	31.1	35.8	8.6	33.9	41.6	53.9	12.3	Floor noise
Vert	9764.000	AV	33.4	38.2	9.3	34.5	46.4	53.9	7.5	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 (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
Hori	4882.000	AV	46.7	31.4	7.3	33.8	-24.6	27.0	53.9	26.9
Vert	4882.000	AV	45.3	31.4	7.3	33.8	-24.6	25.6	53.9	28.3

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

*Above noise was synchronized with carrier frequency.

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5dB

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Telephone : +81 596 24 8999

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Radiated Spurious Emission

Report No. 11961637H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date September 19, 2017
Temperature / Humidity 20 deg. C / 60 % RH
Engineer Masafumi Niwa
(1 GHz -10 GHz)
Mode Tx, Hopping Off, DH5 2480 MHz

No.2
September 19, 2017
27 deg. C / 55 % RH
Takumi Shimada
(Above 10 GHz)
No.2
September 20, 2017
24 deg. C / 60 % RH
Yuta Moriya
(Below 1 GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	65.620	QP	24.3	6.9	7.1	28.1	10.2	40.0	29.8	
Hori	91.746	QP	24.3	8.4	7.4	28.0	12.1	43.5	31.4	
Hori	189.360	QP	23.3	16.4	8.1	27.5	20.3	43.5	23.2	
Hori	225.220	QP	34.2	11.5	8.3	27.2	26.8	46.0	19.2	
Hori	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Hori	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Hori	2483.500	PK	46.8	27.0	5.2	34.6	44.4	73.9	29.5	
Hori	4960.000	PK	52.6	31.6	7.4	33.8	57.8	73.9	16.1	
Hori	7440.000	PK	43.5	35.9	8.6	34.0	54.0	73.9	19.9	Floor noise
Hori	9920.000	PK	45.2	38.2	9.4	34.6	58.2	73.9	15.7	Floor noise
Hori	2483.500	AV	34.4	27.0	5.2	34.6	32.0	53.9	21.9	
Hori	7440.000	AV	31.4	35.9	8.6	34.0	41.9	53.9	12.0	Floor noise
Hori	9920.000	AV	33.2	38.2	9.4	34.6	46.2	53.9	7.7	Floor noise
Vert	63.420	QP	28.5	7.2	7.1	28.1	14.7	40.0	25.3	
Vert	91.746	QP	26.6	8.4	7.4	28.0	14.4	43.5	29.1	
Vert	189.360	QP	29.1	16.4	8.1	27.5	26.1	43.5	17.4	
Vert	223.120	QP	43.3	11.5	8.3	27.2	35.9	46.0	10.1	
Vert	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	2483.500	PK	46.5	27.0	5.2	34.6	44.1	73.9	29.8	
Vert	4960.000	PK	53.3	31.6	7.4	33.8	58.5	73.9	15.4	
Vert	7440.000	PK	43.1	35.9	8.6	34.0	53.6	73.9	20.3	Floor noise
Vert	9920.000	PK	43.4	38.2	9.4	34.6	56.4	73.9	17.5	Floor noise
Vert	2483.500	AV	33.2	27.0	5.2	34.6	30.8	53.9	23.1	
Vert	7440.000	AV	31.3	35.9	8.6	34.0	41.8	53.9	12.1	Floor noise
Vert	9920.000	AV	33.0	38.2	9.4	34.6	46.0	53.9	7.9	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 (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
Hori	4960.000	AV	47.3	31.6	7.4	33.8	-24.6	27.9	53.9	26.0
Vert	4960.000	AV	45.6	31.6	7.4	33.8	-24.6	26.2	53.9	27.7

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

*Above noise was synchronized with carrier frequency.

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5dB

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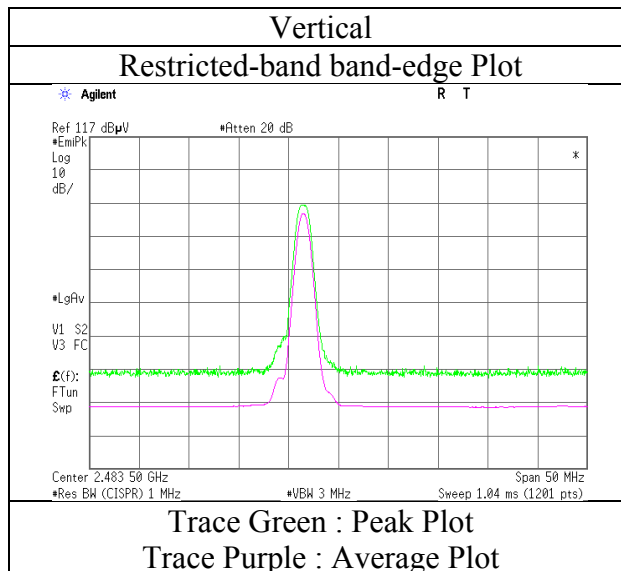
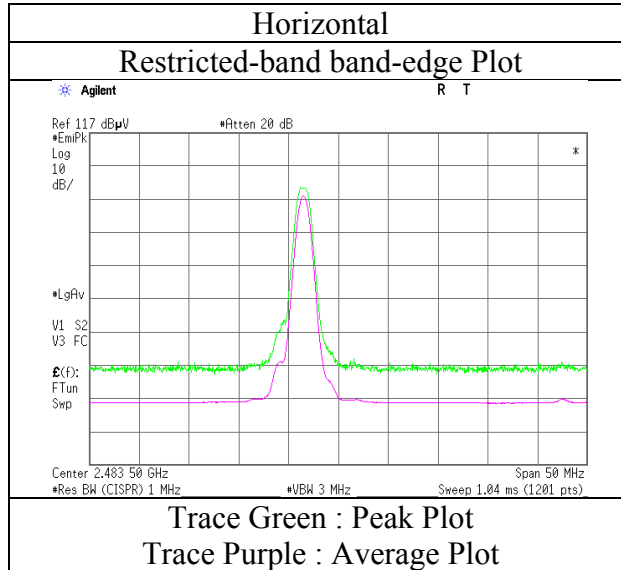
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	11961637H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	September 19, 2017
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Masafumi Niwa
	(1 GHz -10 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No. 11961637H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date September 19, 2017 September 20, 2017
Temperature / Humidity 27 deg. C / 55 % RH 24 deg. C / 60 % RH
Engineer Takumi Shimada Yuta Moriya
(Above 1 GHz) (Below 1 GHz)
Mode Tx, Hopping Off, 3DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	54.960	QP	24.2	9.2	7.0	28.1	12.3	40.0	27.7	
Hori	81.461	QP	24.1	6.5	7.3	28.0	9.9	40.0	30.1	
Hori	185.495	QP	23.3	16.4	8.0	27.5	20.2	43.5	23.3	
Hori	236.010	QP	31.4	11.6	8.4	27.2	24.2	46.0	21.8	
Hori	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Hori	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Hori	2390.000	PK	44.0	27.0	5.1	34.6	41.5	73.9	32.4	
Hori	4804.000	PK	48.5	31.3	7.3	33.8	53.3	73.9	20.6	
Hori	7206.000	PK	44.1	35.6	8.6	33.9	54.4	73.9	19.5	Floor noise
Hori	9608.000	PK	45.4	38.2	9.3	34.5	58.4	73.9	15.5	Floor noise
Hori	2390.000	AV	31.7	27.0	5.1	34.6	29.2	53.9	24.7	
Hori	4804.000	AV	39.0	31.3	7.3	33.8	43.8	53.9	10.1	
Hori	7206.000	AV	31.8	35.6	8.6	33.9	42.1	53.9	11.8	Floor noise
Hori	9608.000	AV	33.3	38.2	9.3	34.5	46.3	53.9	7.6	Floor noise
Vert	54.960	QP	29.8	9.2	7.0	28.1	17.9	40.0	22.1	
Vert	81.461	QP	34.2	6.5	7.3	28.0	20.0	40.0	20.0	
Vert	185.495	QP	23.8	16.4	8.0	27.5	20.7	43.5	22.8	
Vert	235.940	QP	37.1	11.6	8.4	27.2	29.9	46.0	16.1	
Vert	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	2390.000	PK	43.8	27.0	5.1	34.6	41.3	73.9	32.6	
Vert	4804.000	PK	48.7	31.3	7.3	33.8	53.5	73.9	20.4	
Vert	7206.000	PK	44.5	35.6	8.6	33.9	54.8	73.9	19.1	Floor noise
Vert	9608.000	PK	46.0	38.2	9.3	34.5	59.0	73.9	14.9	Floor noise
Vert	2390.000	AV	31.6	27.0	5.1	34.6	29.1	53.9	24.8	
Vert	4804.000	AV	36.4	31.3	7.3	33.8	41.2	53.9	12.7	
Vert	7206.000	AV	31.9	35.6	8.6	33.9	42.2	53.9	11.7	Floor noise
Vert	9608.000	AV	32.3	38.2	9.3	34.5	45.3	53.9	8.6	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 $20\log(3.75\text{ m} / 3.0\text{ m}) = 1.94\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

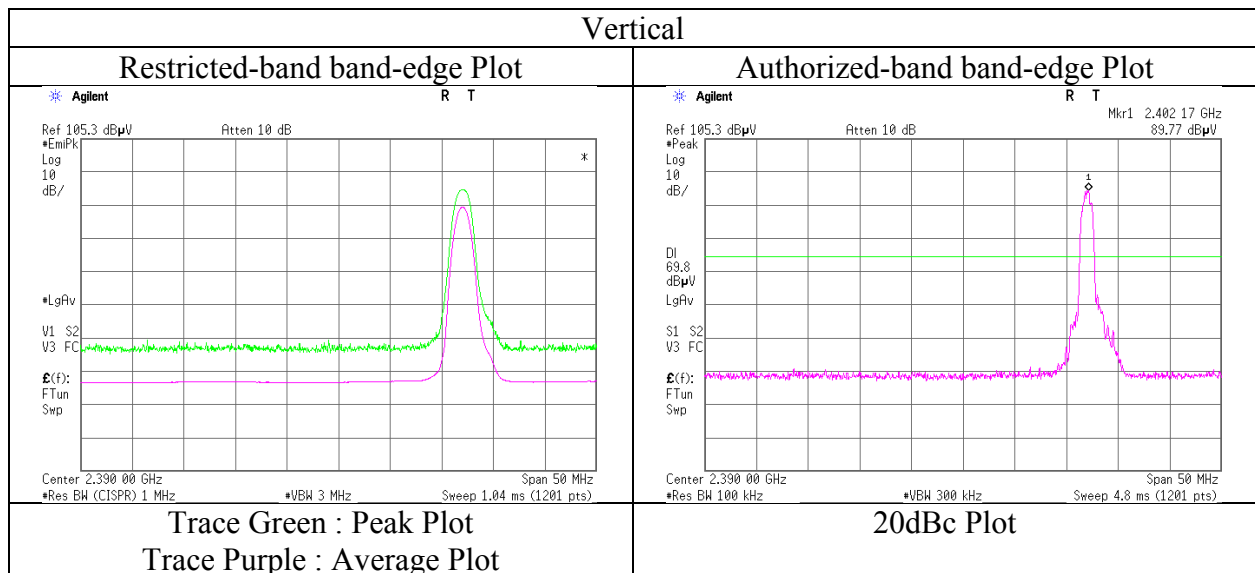
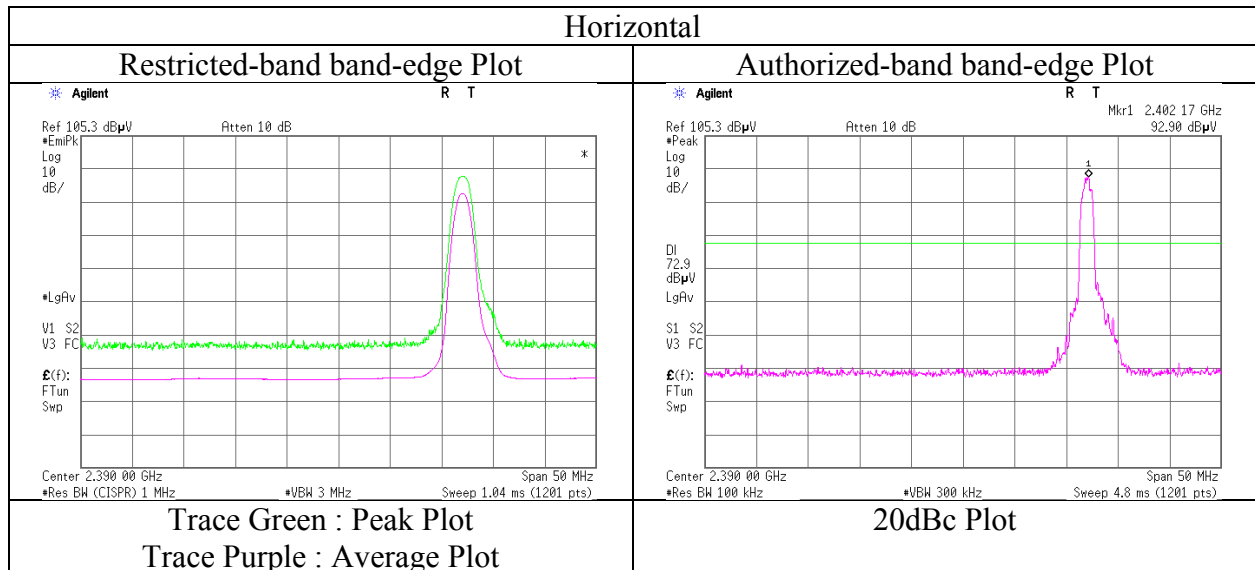
20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	92.9	27.0	5.1	34.6	90.4	-	-	Carrier
Hori	2400.000	PK	45.8	27.0	5.1	34.6	43.3	70.4	27.1	
Vert	2402.000	PK	89.8	27.0	5.1	34.6	87.3	-	-	Carrier
Vert	2400.000	PK	43.4	27.0	5.1	34.6	40.9	67.3	26.4	

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

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	11961637H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	September 19, 2017
Temperature / Humidity	27 deg. C / 55 % RH
Engineer	Takumi Shimada
	(Above 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No.	11961637H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	September 19, 2017
Temperature / Humidity	27 deg. C / 55 % RH
Engineer	Takumi Shimada
Mode	Tx, Hopping Off, 3DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.450	QP	24.4	8.5	7.0	28.1	11.8	40.0	28.2	
Hori	78.681	QP	24.7	6.3	7.3	28.0	10.3	40.0	29.7	
Hori	185.495	QP	23.3	16.4	8.0	27.5	20.2	43.5	23.3	
Hori	235.140	QP	31.8	11.6	8.4	27.2	24.6	46.0	21.4	
Hori	472.455	QP	23.5	17.2	9.6	28.0	22.3	46.0	23.7	
Hori	908.136	QP	21.7	22.2	11.3	26.7	28.5	46.0	17.5	
Hori	4882.000	PK	49.7	31.4	7.3	33.8	54.6	73.9	19.3	
Hori	7323.000	PK	42.9	35.8	8.6	33.9	53.4	73.9	20.5	Floor noise
Hori	9764.000	PK	45.1	38.2	9.3	34.5	58.1	73.9	15.8	Floor noise
Hori	4882.000	AV	39.7	31.4	7.3	33.8	44.6	53.9	9.3	
Hori	7323.000	AV	31.4	35.8	8.6	33.9	41.9	53.9	12.0	Floor noise
Hori	9764.000	AV	32.9	38.2	9.3	34.5	45.9	53.9	8.0	Floor noise
Vert	57.450	QP	35.1	8.5	7.0	28.1	22.5	40.0	17.5	
Vert	78.681	QP	34.3	6.3	7.3	28.0	19.9	40.0	20.1	
Vert	185.495	QP	23.5	16.4	8.0	27.5	20.4	43.5	23.1	
Vert	235.140	QP	37.8	11.6	8.4	27.2	30.6	46.0	15.4	
Vert	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	4882.000	PK	48.4	31.4	7.3	33.8	53.3	73.9	20.6	
Vert	7323.000	PK	43.4	35.8	8.6	33.9	53.9	73.9	20.0	Floor noise
Vert	9764.000	PK	45.9	38.2	9.3	34.5	58.9	73.9	15.0	Floor noise
Vert	4882.000	AV	38.5	31.4	7.3	33.8	43.4	53.9	10.5	
Vert	7323.000	AV	30.9	35.8	8.6	33.9	41.4	53.9	12.5	Floor noise
Vert	9764.000	AV	32.9	38.2	9.3	34.5	45.9	53.9	8.0	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 (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No. 11961637H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date September 19, 2017 September 20, 2017
Temperature / Humidity 27 deg. C / 55 % RH 24 deg. C / 60 % RH
Engineer Takumi Shimada Yuta Moriya
(Above 1 GHz) (Below 1 GHz)
Mode Tx, Hopping Off, 3DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.610	QP	24.3	8.5	7.0	28.1	11.7	40.0	28.3	
Hori	78.633	QP	31.9	6.3	7.3	28.0	17.5	40.0	22.5	
Hori	185.495	QP	23.3	16.4	8.0	27.5	20.2	43.5	23.3	
Hori	228.920	QP	28.1	11.6	8.3	27.2	20.8	46.0	25.2	
Hori	472.455	QP	23.3	17.2	9.6	28.0	22.1	46.0	23.9	
Hori	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Hori	2483.500	PK	47.3	27.0	5.2	34.6	44.9	73.9	29.0	
Hori	4960.000	PK	49.5	31.6	7.4	33.8	54.7	73.9	19.2	
Hori	7440.000	PK	43.0	35.9	8.6	34.0	53.5	73.9	20.4	Floor noise
Hori	9920.000	PK	44.9	38.2	9.4	34.6	57.9	73.9	16.0	Floor noise
Hori	2483.500	AV	33.9	27.0	5.2	34.6	31.5	53.9	22.4	
Hori	4960.000	AV	40.4	31.6	7.4	33.8	45.6	53.9	8.3	
Hori	7440.000	AV	31.3	35.9	8.6	34.0	41.8	53.9	12.1	Floor noise
Hori	9920.000	AV	32.9	38.2	9.4	34.6	45.9	53.9	8.0	Floor noise
Vert	57.610	QP	32.3	8.5	7.0	28.1	19.7	40.0	20.3	
Vert	78.633	QP	32.2	6.3	7.3	28.0	17.8	40.0	22.2	
Vert	185.495	QP	23.5	16.4	8.0	27.5	20.4	43.5	23.1	
Vert	228.280	QP	33.5	11.6	8.3	27.2	26.2	46.0	19.8	
Vert	472.455	QP	23.4	17.2	9.6	28.0	22.2	46.0	23.8	
Vert	908.136	QP	21.8	22.2	11.3	26.7	28.6	46.0	17.4	
Vert	2483.500	PK	44.6	27.0	5.2	34.6	42.2	73.9	31.7	
Vert	4960.000	PK	49.2	31.6	7.4	33.8	54.4	73.9	19.5	
Vert	7440.000	PK	43.0	35.9	8.6	34.0	53.5	73.9	20.4	Floor noise
Vert	9920.000	PK	43.9	38.2	9.4	34.6	56.9	73.9	17.0	Floor noise
Vert	2483.500	AV	32.7	27.0	5.2	34.6	30.3	53.9	23.6	
Vert	4960.000	AV	39.4	31.6	7.4	33.8	44.6	53.9	9.3	
Vert	7440.000	AV	30.9	35.9	8.6	34.0	41.4	53.9	12.5	Floor noise
Vert	9920.000	AV	32.6	38.2	9.4	34.6	45.6	53.9	8.3	Floor noise

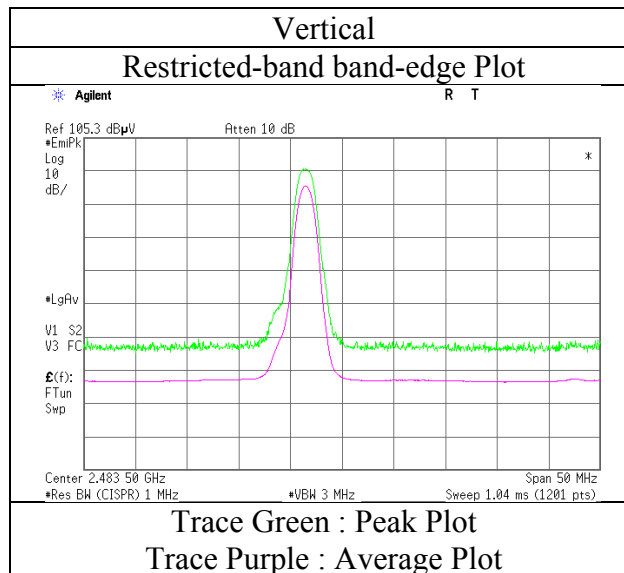
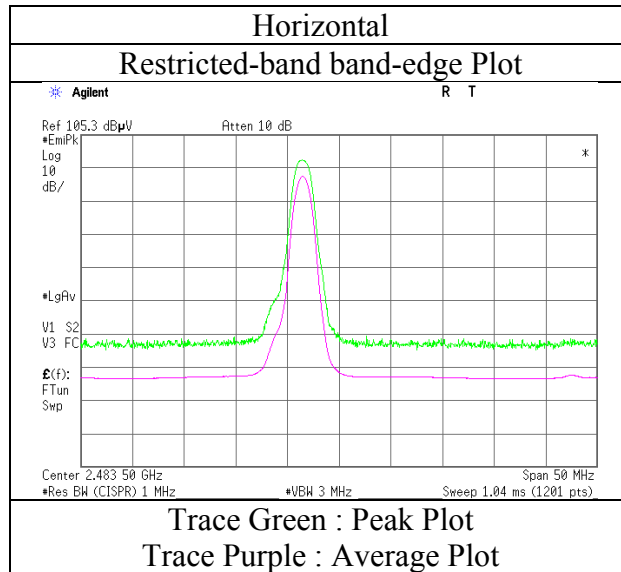
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*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 (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	11961637H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	September 19, 2017
Temperature / Humidity	27 deg. C / 55 % RH
Engineer	Takumi Shimada (Above 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

UL Japan, Inc.

Ise EMC Lab.

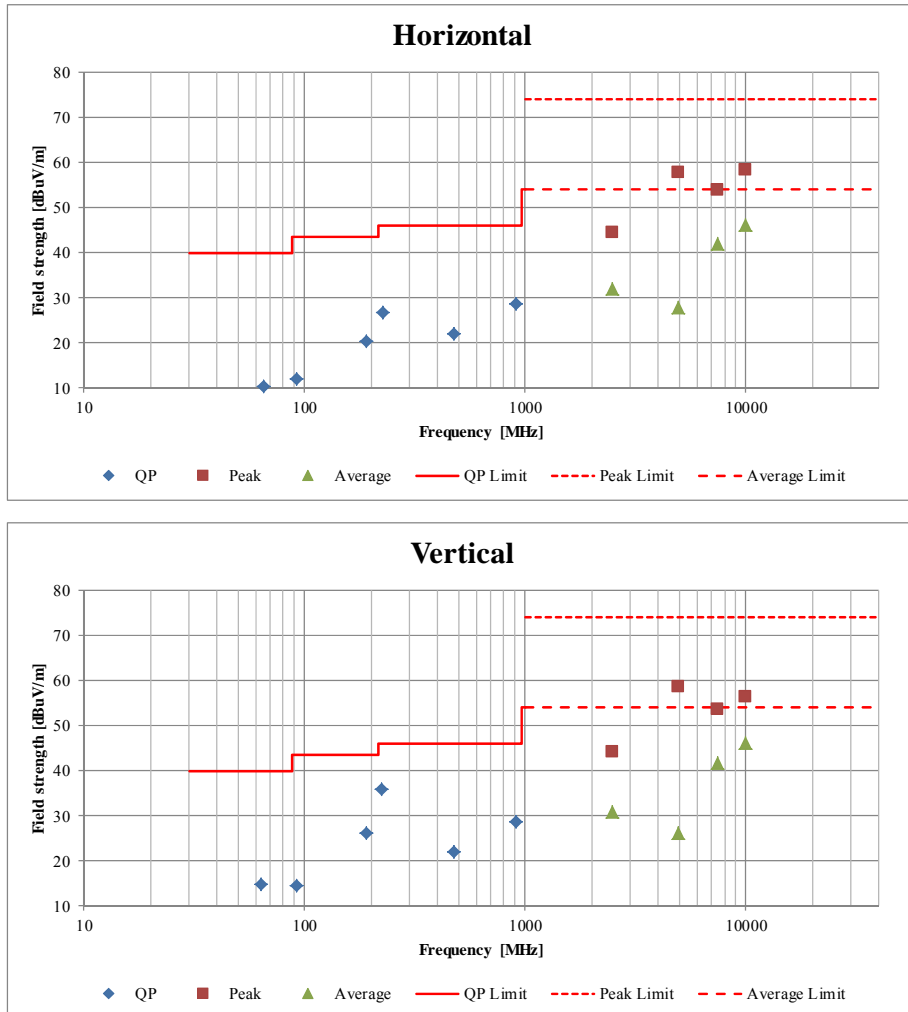
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	11961637H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	September 19, 2017	September 19, 2017	September 20, 2017
Temperature / Humidity	20 deg. C / 60 % RH	27 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Masafumi Niwa (1 GHz -10 GHz)	Takumi Shimada (Above 10 GHz)	Yuta Moriya (Below 1 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz		



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

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2017/08/31 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2016/12/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2016/11/10 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2017/02/24 * 12
MCC-216	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	RE	2017/08/04 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2017/01/16 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	RE	2017/08/07 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2016/09/21 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2017/02/24 * 12
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2017/06/21 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2017/06/20 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2017/06/20 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2017/03/21 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2016/11/10 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2017/08/21 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2016/11/23 * 12
MLA-21	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	RE	2017/01/05 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2017/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2016/11/28 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2016/09/13 * 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: RE: Radiated Emission test
AT: Antenna Terminal Conducted test

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APPENDIX 3: Photographs of test setup

Radiated Spurious Emission

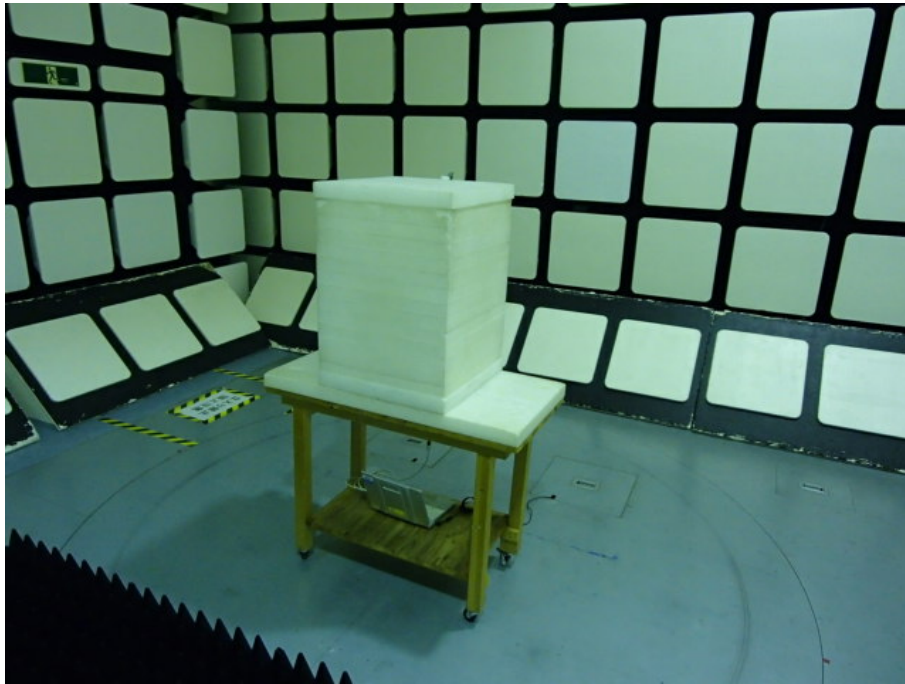


Photo 1

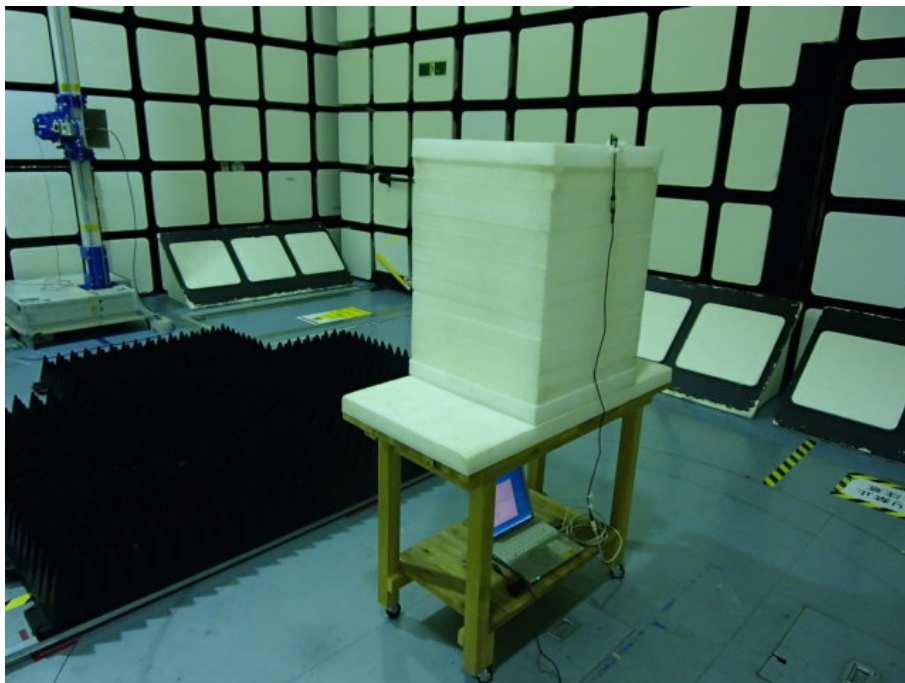


Photo 2

UL Japan, Inc.

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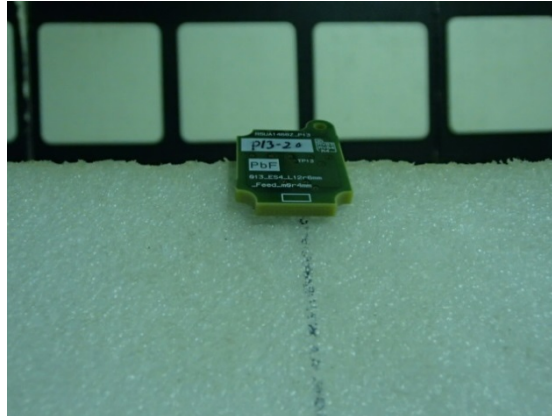
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

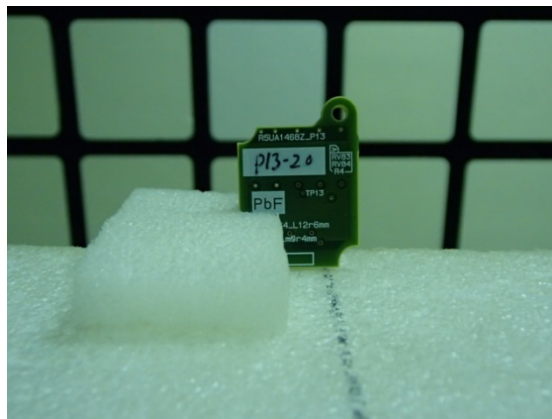
Worst Case Position

(Band Edge Horizontal: Z-axis/ Vertical:Y-axis)
(2nd harmonic Horizontal: Y-axis/ Vertical:Z-axis)
(Above 10 GHz Horizontal: X-axis/ Vertical:X-axis)
(Below 1 GHz Horizontal: X-axis/ Vertical:X-axis)

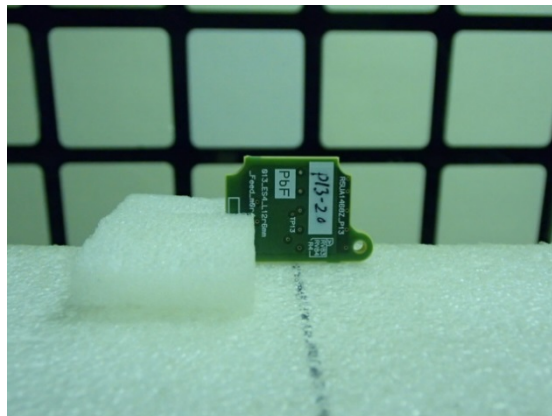
X-axis



Y-axis



Z-axis



End of Report