



RADIO TEST REPORT

Test Report No. : 12905370H-A


Applicant : Panasonic Avionics Corporation
Type of Equipment : Bluetooth v5 Dual-Mode USB Module
Model No. : R8U4FJ5168Z
FCC ID : U6YBT850
Test regulation : **FCC Part 15 Subpart C: 2019**
For Permissive Change
*** Bluetooth part**
(Maximum Peak Output Power and Radiated Spurious Emission tests only)

Test Result : **Complied (Refer to SECTION 3.2)**

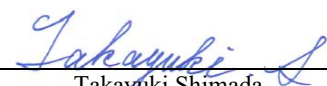
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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. 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.
8. The information provided from the customer for this report is identified in SECTION 1.

Date of test: May 28 to June 13, 2019

Representative test engineer:


Takumi Shimada
Engineer
Consumer Technology Division

Approved by:


Takayuki Shimada
Leader
Consumer Technology Division



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.

*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
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- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
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REVISION HISTORY

Original Test Report No.: 12905370H-A

[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

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth v5 Dual-Mode USB Module
Model No.	:	R8U4FJ5168Z
Serial No.	:	Refer to SECTION 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample (Information from test lab.)	:	May 28, 2019
Country of Mass-production	:	Japan
Condition of EUT	:	Production 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: R8U4FJ5168Z (referred to as the EUT in this report) is a Bluetooth v5 Dual-Mode USB Module.

Radio Specification

[Bluetooth (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
Antenna type	:	Microstrip Antenna
Antenna Gain	:	-3.4 dBi
Clock frequency (Maximum)	:	40 MHz

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

<Contents of the change from original model>

Antenna of the EUT is new type.

The maximum output level of Bluetooth module is changed from +8dBm to +2dBm.

The radio specification except above is identical to the original.

Therefore only Radiated Spurious Emission test were performed in this report.

Additionally, only the information of modified antenna is described in this report.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on June 4, 2019 and effective July 5, 2019 except 15.258

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 June 4, 2019, 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: KDB 558074 D01 15.247 Meas Guidance v05r02 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) ----- IC: RSS-247 5.4 (b)	-	Complied a)	Conducted
Spurious Emission & Band Edge Compliance	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 IC: RSS-Gen 6.13	FCC: Section15.247(d) ----- IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	16.3 dB 48.695 MHz, QP, Vert.	Complied b)	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).					
a) Refer to APPENDIX 1 (data of Maximum Peak Output Power) b) Refer to APPENDIX 1 (data of Radiated Spurious Emission)					
Symbols: Complied The data of this test item has enough margin, more than the measurement uncertainty. Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.					

* 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 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

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

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

Test Item	Uncertainty (+/-)
Maximum Peak Output Power / Average Output Power	1.3 dB

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		5.0 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.2 dB
		6.3 dB
10 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		4.9 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.0 dB
		5.0 dB
3 m	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.3 dB
1 m	10 GHz to 26.5 GHz	5.8 dB
	26.5 GHz to 40 GHz	5.8 dB
10 m	1 GHz to 18 GHz	5.2 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

*NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967 / ISED Lab Company Number: 2973C

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Test site	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	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	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	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	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.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
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	3.1 x 5.0	-	-
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	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

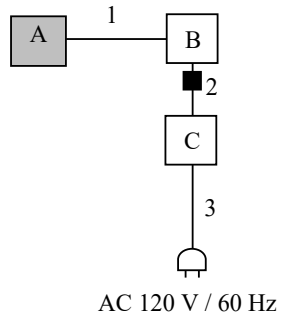
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

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

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 settings: BDR: 2 dBm EDR: 2 dBm</p> <p>Software: cybluetool ver Version 0.1.55.1</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 v5 Dual-Mode USB Module	R8U4FJ5168Z	4A1A03 *1) 4A1C20 *2)	Panasonic Corporation	EUT
B	Laptop PC	CF-SZ5ADCVS	6JKSA17867	Panasonic Corporation	-
C	AC adaptor	CF-AA64L2C M1	64L2CM116904226A	Panasonic Corporation	-

*1) Used for Maximum Peak Output Power test

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	0.90	Shielded	Shielded	-
2	DC Cable	0.90	Unshielded	Unshielded	-
3	AC Cable	0.70	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.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

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	RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz

*1) Average Power Measurement was performed based on KDB 558074 D01 15.247 Meas Guidance v05r02.

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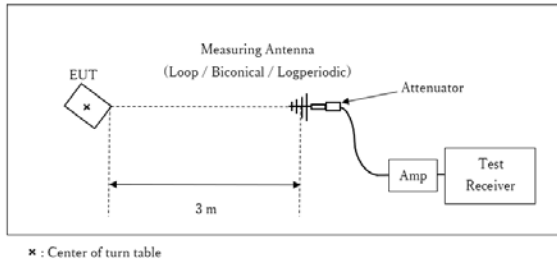
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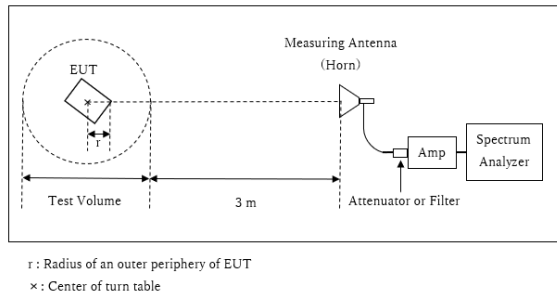
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz - 10 GHz



Distance Factor: $20 \times \log (3.7 \text{ m} / 3.0 \text{ m}) = 1.83 \text{ dB}$

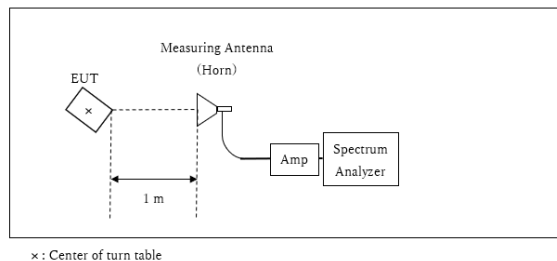
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.9 \text{ m}$

Test Volume : 2.0 m

(Test Volume has been calibrated based on CISPR 16-1-4.)

$r = 0.1 \text{ m}$

10 GHz - 26.5 GHz



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

*Test Distance: 1 m

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

Test data : APPENDIX

Test result : Pass

APPENDIX 1: Test data

Maximum Peak Output Power

Report No. 12905370H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 13, 2019
Temperature / Humidity 23 deg. C / 64 % RH
Engineer Takumi Shimada
Mode Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Conducted Power					e.i.r.p. for RSS-247						
					Result		Limit		Margin	Antenna Gain	Result		Limit		Margin	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]				
													[dBm]	[mW]		[dBm]
DH5	2402.0	-9.10	0.03	10.09	1.02	1.26	20.96	125	19.94	-3.40	-2.38	0.58	36.02	4000	38.40	
DH5	2441.0	-8.57	0.03	10.09	1.55	1.43	20.96	125	19.41	-3.40	-1.85	0.65	36.02	4000	37.87	
DH5	2480.0	-8.75	0.03	10.09	1.37	1.37	20.96	125	19.59	-3.40	-2.03	0.63	36.02	4000	38.05	
2DH5	2402.0	-6.10	0.03	10.09	4.02	2.52	20.96	125	16.94	-3.40	0.62	1.15	36.02	4000	35.40	
2DH5	2441.0	-5.69	0.03	10.09	4.43	2.77	20.96	125	16.53	-3.40	1.03	1.27	36.02	4000	34.99	
2DH5	2480.0	-5.99	0.03	10.09	4.13	2.59	20.96	125	16.83	-3.40	0.73	1.18	36.02	4000	35.29	
3DH5	2402.0	-5.92	0.03	10.09	4.20	2.63	20.96	125	16.76	-3.40	0.80	1.20	36.02	4000	35.22	
3DH5	2441.0	-5.45	0.03	10.09	4.67	2.93	20.96	125	16.29	-3.40	1.27	1.34	36.02	4000	34.75	
3DH5	2480.0	-5.76	0.03	10.09	4.36	2.73	20.96	125	16.60	-3.40	0.96	1.25	36.02	4000	35.06	

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

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Average Output Power (Reference data for RF Exposure)

Report No.	12905370H
Test place	Ise EMC Lab. No.6 Measurement Room
Date	June 13, 2019
Temperature / Humidity	23 deg. C / 64 % 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	-10.41	0.03	10.09	-0.29	0.94	1.11	0.82	1.21
DH5	2441.0	-9.92	0.03	10.09	0.20	1.05	1.11	1.31	1.35
DH5	2480.0	-10.06	0.03	10.09	0.06	1.01	1.11	1.17	1.31
2DH5	2402.0	-9.97	0.03	10.09	0.15	1.04	1.11	1.26	1.34
2DH5	2441.0	-9.41	0.03	10.09	0.71	1.18	1.11	1.82	1.52
2DH5	2480.0	-9.77	0.03	10.09	0.35	1.08	1.11	1.46	1.40
3DH5	2402.0	-9.87	0.03	10.09	0.25	1.06	1.11	1.36	1.37
3DH5	2441.0	-9.38	0.03	10.09	0.74	1.19	1.11	1.85	1.53
3DH5	2480.0	-9.99	0.03	10.09	0.13	1.03	1.11	1.24	1.33

Sample Calculation:

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

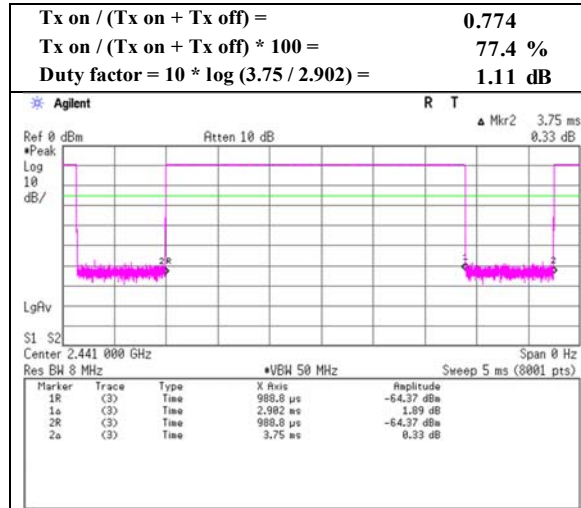
Result (Burst power average) = Time average + Duty factor

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

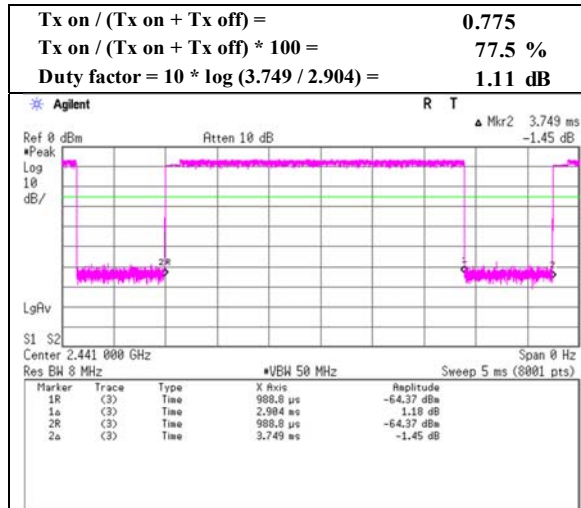
Burst Rate Confirmation

Report No. 12905370H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 13, 2019
Temperature / Humidity 23 deg. C / 64 % RH
Engineer Takumi Shimada
Mode Tx, Hopping Off

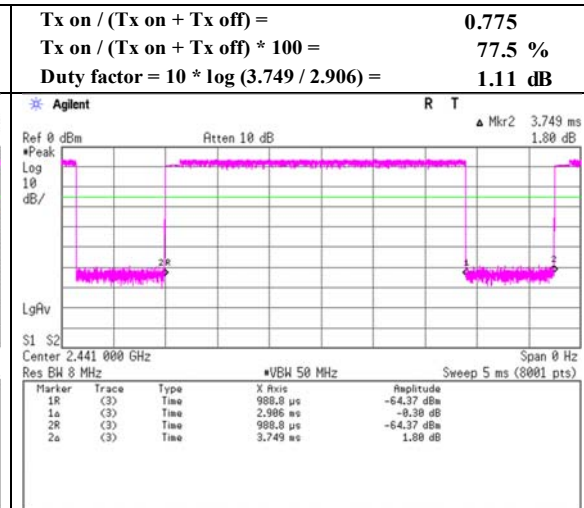
DH5



2DH5



3DH5



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Radiated Spurious Emission

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 28, 2019	May 28, 2019	June 12, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	22 deg. C / 70 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takafumi Noguchi
	(1 - 10 GHz)	(10 - 26.5 GHz)	(Below 1 GHz)
Mode	Tx, Hopping Off, DH5 2402 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.	31.664	QP	22.5	17.6	7.2	32.2	-	15.1	40.0	24.9	
Hori.	50.080	QP	22.8	11.0	7.5	32.2	-	9.1	40.0	30.9	
Hori.	85.180	QP	29.2	7.2	8.0	32.1	-	12.3	40.0	27.7	
Hori.	182.338	QP	27.8	16.3	9.0	32.0	-	21.1	43.5	22.4	
Hori.	225.280	QP	26.8	11.1	9.4	32.0	-	15.3	46.0	30.7	
Hori.	454.560	QP	23.9	16.5	11.0	32.0	-	19.4	46.0	26.6	
Hori.	2390.000	PK	43.0	27.3	5.1	34.3	-	41.1	73.9	32.8	
Hori.	4804.000	PK	42.4	31.6	7.2	33.5	-	47.7	73.9	26.2	Floor noise
Hori.	7206.000	PK	42.8	36.4	8.3	33.4	-	54.1	73.9	19.9	Floor noise
Hori.	9608.000	PK	42.0	38.5	9.4	33.8	-	56.1	73.9	17.8	Floor noise
Hori.	2390.000	AV	35.3	27.3	5.1	34.3	1.1	34.5	53.9	19.4	*1)
Hori.	4804.000	AV	31.6	31.6	7.2	33.5	-	36.9	53.9	17.0	Floor noise
Hori.	7206.000	AV	32.9	36.4	8.3	33.4	-	44.2	53.9	9.8	Floor noise
Hori.	9608.000	AV	32.5	38.5	9.4	33.8	-	46.6	53.9	7.3	Floor noise
Vert.	32.220	QP	28.1	17.4	7.2	32.2	-	20.5	40.0	19.5	
Vert.	49.984	QP	34.6	11.0	7.5	32.2	-	21.0	40.0	19.0	
Vert.	84.230	QP	31.5	6.9	8.0	32.1	-	14.2	40.0	25.8	
Vert.	181.680	QP	30.2	16.3	9.0	32.0	-	23.5	43.5	20.0	
Vert.	226.240	QP	27.2	11.1	9.4	32.0	-	15.8	46.0	30.2	
Vert.	454.500	QP	30.7	16.5	11.0	32.0	-	26.2	46.0	19.8	
Vert.	2390.000	PK	43.5	27.3	5.1	34.3	-	41.6	73.9	32.3	
Vert.	4804.000	PK	42.2	31.6	7.2	33.5	-	47.5	73.9	26.4	Floor noise
Vert.	7206.000	PK	42.7	36.4	8.3	33.4	-	54.0	73.9	20.0	Floor noise
Vert.	9608.000	PK	42.3	38.5	9.4	33.8	-	56.4	73.9	17.5	Floor noise
Vert.	2390.000	AV	35.7	27.3	5.1	34.3	1.1	34.9	53.9	19.0	*1)
Vert.	4804.000	AV	31.8	31.6	7.2	33.5	-	37.1	53.9	16.8	Floor noise
Vert.	7206.000	AV	33.0	36.4	8.3	33.4	-	44.3	53.9	9.7	Floor noise
Vert.	9608.000	AV	32.5	38.5	9.4	33.8	-	46.6	53.9	7.3	Floor noise

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

*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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

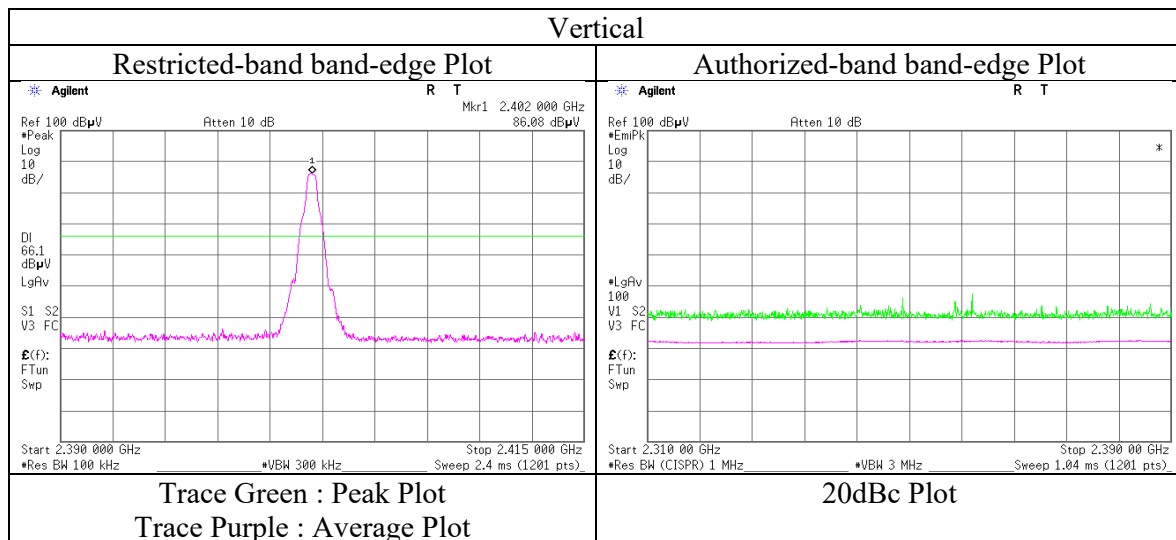
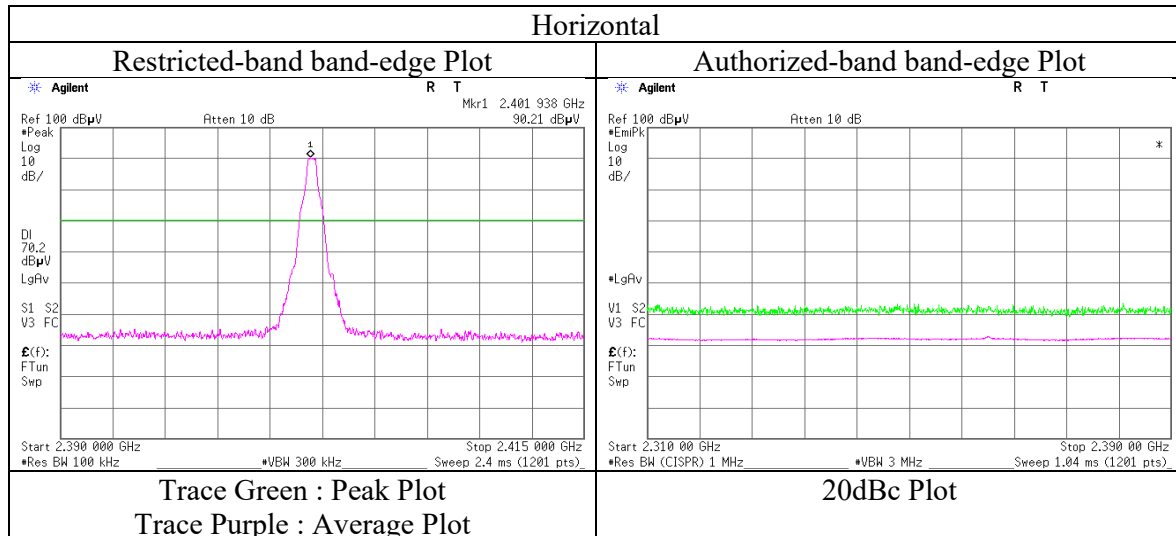
20dBc Data Sheet

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	90.2	27.0	5.1	34.3	88.1	-	-	Carrier
Hori.	2400.000	PK	36.5	27.0	5.1	34.3	34.3	68.1	33.7	
Vert.	2402.000	PK	86.1	27.0	5.1	34.3	84.0	-	-	Carrier
Vert.	2400.000	PK	34.9	27.0	5.1	34.3	32.7	64.0	31.2	

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.	12905370H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Yuta Moriya
	(1 - 10 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

Radiated Spurious Emission

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	May 28, 2019	May 28, 2019	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	24 deg. C / 56 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takumi Shimada
	(1 - 10 GHz)	(10 - 26.5 GHz)	(below 1GHz)
Mode	Tx, Hopping Off, DH5 2441 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.	31.023	QP	25.3	17.7	6.7	30.5	-	19.2	40.0	20.8	
Hori.	48.523	QP	25.4	11.5	6.9	30.5	-	13.3	40.0	26.7	
Hori.	89.758	QP	30.9	8.3	7.4	30.3	-	16.3	43.5	27.2	
Hori.	172.173	QP	26.6	15.6	8.0	29.8	-	20.3	43.5	23.2	
Hori.	226.408	QP	24.0	11.2	8.4	29.5	-	14.1	46.0	31.9	
Hori.	466.152	QP	24.0	16.7	9.7	29.9	-	20.5	46.0	25.5	
Hori.	4882.000	PK	41.7	31.7	7.2	33.5	-	47.2	73.9	26.7	Floor noise
Hori.	7323.000	PK	43.1	36.0	8.3	33.5	-	54.0	73.9	19.9	Floor noise
Hori.	9764.000	PK	42.4	38.8	9.4	33.8	-	56.8	73.9	17.1	Floor noise
Hori.	4882.000	AV	34.0	31.7	7.2	33.5	-	39.5	53.9	14.4	Floor noise
Hori.	7323.000	AV	34.5	36.0	8.3	33.5	-	45.4	53.9	8.5	Floor noise
Hori.	9764.000	AV	32.3	38.8	9.4	33.8	-	46.7	53.9	7.2	Floor noise
Vert.	31.023	QP	27.8	17.7	6.7	30.5	-	21.7	40.0	18.3	
Vert.	48.523	QP	36.1	11.5	6.9	30.5	-	24.0	40.0	16.0	
Vert.	89.120	QP	30.6	8.1	7.4	30.3	-	15.8	43.5	27.7	
Vert.	172.173	QP	31.3	15.6	8.0	29.8	-	25.0	43.5	18.5	
Vert.	226.408	QP	26.4	11.2	8.4	29.5	-	16.5	46.0	29.5	
Vert.	466.152	QP	24.3	16.7	9.7	29.9	-	20.8	46.0	25.2	
Vert.	4882.000	PK	42.1	31.7	7.2	33.5	-	47.6	73.9	26.3	Floor noise
Vert.	7323.000	PK	42.8	36.0	8.3	33.5	-	53.7	73.9	20.2	Floor noise
Vert.	9764.000	PK	42.2	38.8	9.4	33.8	-	56.6	73.9	17.3	Floor noise
Vert.	4882.000	AV	34.3	31.7	7.2	33.5	-	39.8	53.9	14.1	Floor noise
Vert.	7323.000	AV	34.5	36.0	8.3	33.5	-	45.4	53.9	8.5	Floor noise
Vert.	9764.000	AV	32.5	38.8	9.4	33.8	-	46.9	53.9	7.0	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 (3.7 m / 3.0 m) = 1.83 dB
 10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 28, 2019	May 28, 2019	June 12, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	22 deg. C / 70 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takafumi Noguchi
	(1 - 10 GHz)	(10 - 26.5 GHz)	(Below 1 GHz)
Mode	Tx, Hopping Off, DH5 2480 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.	32.026	QP	22.5	17.4	7.2	32.2	-	15.0	40.0	25.0	
Hori.	50.414	QP	22.8	10.8	7.6	32.2	-	9.0	40.0	31.0	
Hori.	85.100	QP	29.9	7.2	8.0	32.1	-	13.0	40.0	27.1	
Hori.	185.680	QP	28.8	16.4	9.1	32.0	-	22.3	43.5	21.2	
Hori.	245.965	QP	31.6	11.7	9.5	32.0	-	20.9	46.0	25.1	
Hori.	454.640	QP	27.2	16.5	11.0	32.0	-	22.7	46.0	23.3	
Hori.	2483.500	PK	45.8	28.1	5.1	34.2	-	44.8	73.9	29.1	
Hori.	4960.000	PK	40.6	31.9	7.3	33.5	-	46.3	73.9	27.6	Floor noise
Hori.	7440.000	PK	42.4	36.3	8.4	33.5	-	53.6	73.9	20.3	Floor noise
Hori.	9920.000	PK	42.3	38.7	9.5	33.8	-	56.7	73.9	17.2	Floor noise
Hori.	2483.500	AV	35.6	28.1	5.1	34.2	1.1	35.7	53.9	18.2	*1)
Hori.	4960.000	AV	33.2	31.9	7.3	33.5	-	38.9	53.9	15.0	Floor noise
Hori.	7440.000	AV	33.9	36.3	8.4	33.5	-	45.1	53.9	8.8	Floor noise
Hori.	9920.000	AV	32.0	38.7	9.5	33.8	-	46.4	53.9	7.5	Floor noise
Vert.	31.962	QP	28.5	17.5	7.2	32.2	-	21.0	40.0	19.0	
Vert.	49.840	QP	35.0	11.1	7.5	32.2	-	21.4	40.0	18.6	
Vert.	84.451	QP	31.3	6.9	8.0	32.1	-	14.1	40.0	25.9	
Vert.	181.520	QP	31.0	16.3	9.0	32.0	-	24.3	43.5	19.2	
Vert.	226.220	QP	27.1	11.1	9.4	32.0	-	15.7	46.0	30.3	
Vert.	454.520	QP	31.2	16.5	11.0	32.0	-	26.7	46.0	19.3	
Vert.	2483.500	PK	43.6	28.1	5.1	34.2	-	42.6	73.9	31.3	
Vert.	4960.000	PK	40.6	31.9	7.3	33.5	-	46.3	73.9	27.6	Floor noise
Vert.	7440.000	PK	41.4	36.3	8.4	33.5	-	52.6	73.9	21.3	Floor noise
Vert.	9920.000	PK	41.7	38.7	9.5	33.8	-	56.1	73.9	17.8	Floor noise
Vert.	2483.500	AV	32.9	28.1	5.1	34.2	1.1	33.0	53.9	20.9	*1)
Vert.	4960.000	AV	31.8	31.9	7.3	33.5	-	37.5	53.9	16.4	Floor noise
Vert.	7440.000	AV	31.8	36.3	8.4	33.5	-	43.0	53.9	10.9	Floor noise
Vert.	9920.000	AV	32.2	38.7	9.5	33.8	-	46.6	53.9	7.3	Floor noise

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

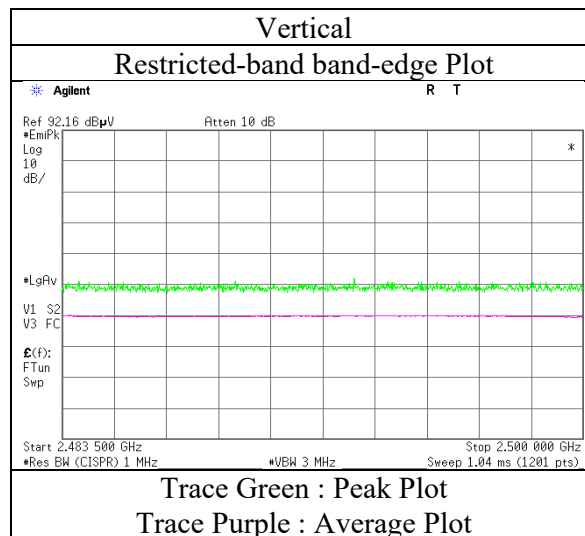
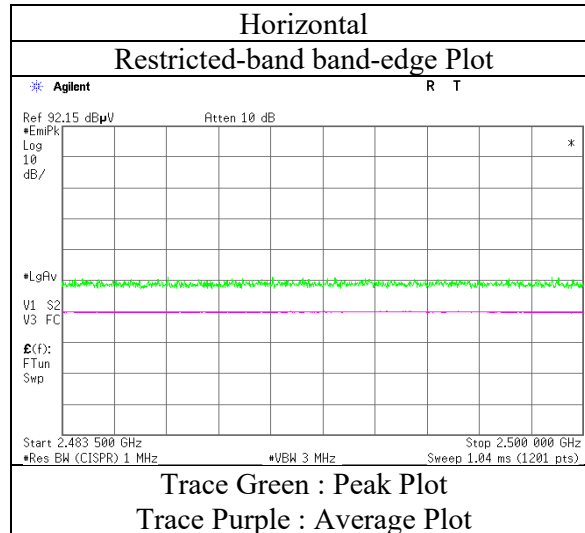
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 12905370H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date May 28, 2019
Temperature / Humidity 24 deg. C / 56 % RH
Engineer Yuta Moriya
(1 - 10 GHz)
Mode Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Report No. 12905370H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.2 No.4
Date May 28, 2019 May 28, 2019 June 12, 2019
Temperature / Humidity 24 deg. C / 56 % RH 24 deg. C / 56 % RH 22 deg. C / 70 % RH
Engineer Yuta Moriya Takumi Shimada Takafumi Noguchi
(1 - 10 GHz) (10 - 26.5 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]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	33.036	QP	22.5	17.1	7.3	32.2	-	14.7	40.0	25.4	
Hori.	50.133	QP	22.7	10.9	7.5	32.2	-	9.0	40.0	31.0	
Hori.	83.513	QP	30.0	6.7	8.0	32.1	-	12.6	40.0	27.4	
Hori.	186.421	QP	28.9	16.5	9.1	32.0	-	22.4	43.5	21.1	
Hori.	247.636	QP	31.6	11.7	9.6	32.0	-	20.9	46.0	25.1	
Hori.	454.340	QP	27.2	16.5	11.0	32.0	-	22.7	46.0	23.3	
Hori.	2390.000	PK	43.4	27.3	5.1	34.3	-	41.5	73.9	32.4	
Hori.	4804.000	PK	41.9	31.6	7.2	33.5	-	47.2	73.9	26.7	Floor noise
Hori.	7206.000	PK	43.0	36.4	8.3	33.4	-	54.3	73.9	19.7	Floor noise
Hori.	9608.000	PK	42.2	38.5	9.4	33.8	-	56.3	73.9	17.6	Floor noise
Hori.	2390.000	AV	35.1	27.3	5.1	34.3	1.1	34.2	53.9	19.7	*1)
Hori.	4804.000	AV	31.8	31.6	7.2	33.5	-	37.1	53.9	16.8	Floor noise
Hori.	7206.000	AV	33.1	36.4	8.3	33.4	-	44.4	53.9	9.5	Floor noise
Hori.	9608.000	AV	32.3	38.5	9.4	33.8	-	46.4	53.9	7.5	Floor noise
Vert.	34.188	QP	29.5	16.5	7.3	32.2	-	21.1	40.0	18.9	
Vert.	49.574	QP	34.5	11.2	7.5	32.2	-	21.0	40.0	19.0	
Vert.	83.302	QP	31.3	6.7	8.0	32.1	-	13.9	40.0	26.1	
Vert.	186.426	QP	30.6	16.5	9.1	32.0	-	24.1	43.5	19.4	
Vert.	237.261	QP	27.1	11.4	9.5	32.0	-	16.0	46.0	30.0	
Vert.	454.500	QP	31.2	16.5	11.0	32.0	-	26.7	46.0	19.3	
Vert.	2390.000	PK	44.3	27.3	5.1	34.3	-	42.4	73.9	31.5	
Vert.	4804.000	PK	42.4	31.6	7.2	33.5	-	47.7	73.9	26.2	Floor noise
Vert.	7206.000	PK	42.9	36.4	8.3	33.4	-	54.2	73.9	19.8	Floor noise
Vert.	9608.000	PK	42.7	38.5	9.4	33.8	-	56.8	73.9	17.1	Floor noise
Vert.	2390.000	AV	35.0	27.3	5.1	34.3	1.1	34.1	53.9	19.8	*1)
Vert.	4804.000	AV	31.9	31.6	7.2	33.5	-	37.2	53.9	16.7	Floor noise
Vert.	7206.000	AV	32.6	36.4	8.3	33.4	-	43.9	53.9	10.1	Floor noise
Vert.	9608.000	AV	32.3	38.5	9.4	33.8	-	46.4	53.9	7.5	Floor noise

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

*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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

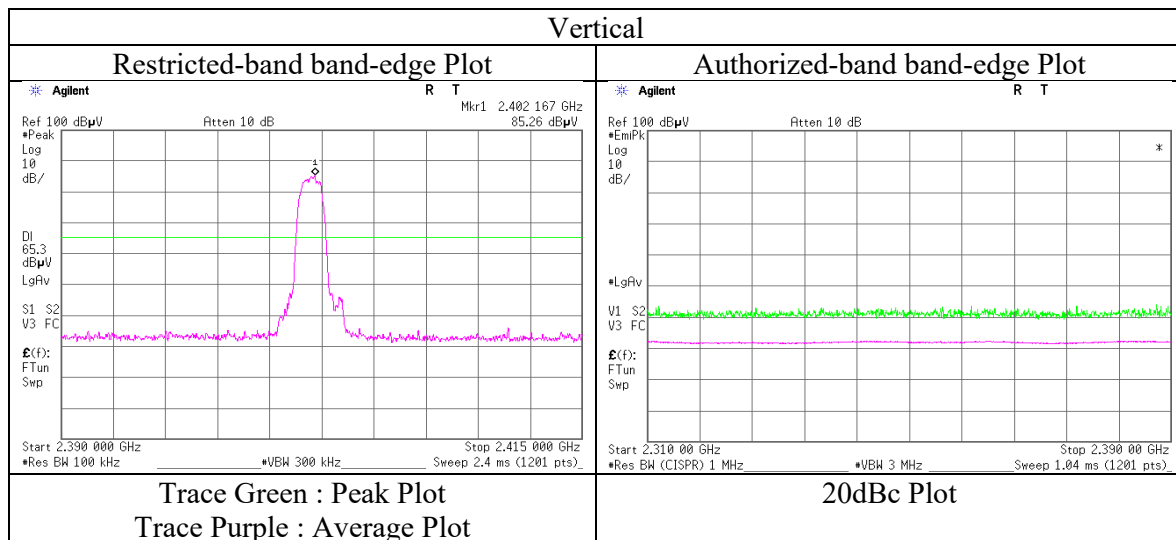
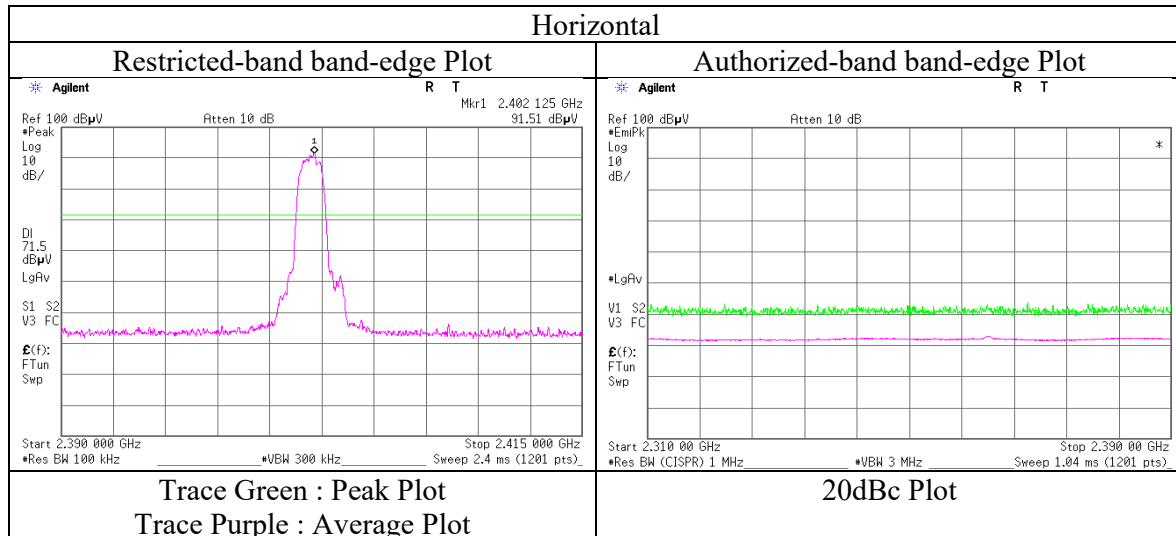
20dBc Data Sheet

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	91.5	27.0	5.1	34.3	89.4	-	-	Carrier
Hori.	2400.000	PK	36.6	27.0	5.1	34.3	34.4	69.4	34.9	
Vert.	2402.000	PK	85.3	27.0	5.1	34.3	83.2	-	-	Carrier
Vert.	2400.000	PK	35.2	27.0	5.1	34.3	33.0	63.2	30.1	

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.	12905370H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Yuta Moriya
	(1 - 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	May 28, 2019	May 28, 2019	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	24 deg. C / 56 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takumi Shimada
	(1 - 10 GHz)	(10 - 26.5 GHz)	(below 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 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.	32.154	QP	25.5	17.1	6.7	30.5	-	18.9	40.0	21.2	
Hori.	48.695	QP	25.6	11.4	7.0	30.5	-	13.5	40.0	26.5	
Hori.	89.499	QP	30.8	8.2	7.4	30.3	-	16.1	43.5	27.4	
Hori.	171.815	QP	25.7	15.5	8.0	29.8	-	19.4	43.5	24.1	
Hori.	292.825	QP	26.0	13.4	8.8	29.2	-	19.0	46.0	27.0	
Hori.	522.736	QP	23.9	17.6	9.9	29.9	-	21.4	46.0	24.6	
Hori.	4882.000	PK	41.7	31.7	7.2	33.5	-	47.2	73.9	26.7	Floor noise
Hori.	7323.000	PK	42.2	36.0	8.3	33.5	-	53.1	73.9	20.8	Floor noise
Hori.	9764.000	PK	41.8	38.8	9.4	33.8	-	56.2	73.9	17.7	Floor noise
Hori.	4882.000	AV	33.8	31.7	7.2	33.5	-	39.3	53.9	14.6	Floor noise
Hori.	7323.000	AV	34.4	36.0	8.3	33.5	-	45.3	53.9	8.6	Floor noise
Hori.	9764.000	AV	32.4	38.8	9.4	33.8	-	46.8	53.9	7.1	Floor noise
Vert.	32.154	QP	28.1	17.1	6.7	30.5	-	21.5	40.0	18.6	
Vert.	48.695	QP	35.8	11.4	7.0	30.5	-	23.7	40.0	16.3	
Vert.	89.499	QP	31.1	8.2	7.4	30.3	-	16.4	43.5	27.1	
Vert.	171.815	QP	31.3	15.5	8.0	29.8	-	25.0	43.5	18.5	
Vert.	292.825	QP	26.0	13.4	8.8	29.2	-	19.0	46.0	27.0	
Vert.	522.736	QP	23.9	17.6	9.9	29.9	-	21.4	46.0	24.6	
Vert.	4882.000	PK	40.9	31.7	7.2	33.5	-	46.4	73.9	27.5	Floor noise
Vert.	7323.000	PK	42.0	36.0	8.3	33.5	-	52.9	73.9	21.0	Floor noise
Vert.	9764.000	PK	41.0	38.8	9.4	33.8	-	55.4	73.9	18.5	Floor noise
Vert.	4882.000	AV	33.8	31.7	7.2	33.5	-	39.3	53.9	14.6	Floor noise
Vert.	7323.000	AV	34.4	36.0	8.3	33.5	-	45.3	53.9	8.6	Floor noise
Vert.	9764.000	AV	32.3	38.8	9.4	33.8	-	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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 28, 2019	May 28, 2019	June 12, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	22 deg. C / 70 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takafumi Noguchi
	(1 - 10 GHz)	(10 - 26.5 GHz)	(Below 1 GHz)
Mode	Tx, Hopping Off, 3DHS 2480 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.	31.988	QP	22.5	17.4	7.2	32.2	-	15.0	40.0	25.0	
Hori.	49.721	QP	22.7	11.1	7.5	32.2	-	9.2	40.0	30.8	
Hori.	83.423	QP	29.8	6.7	8.0	32.1	-	12.4	40.0	27.6	
Hori.	182.897	QP	28.7	16.2	9.0	32.0	-	21.9	43.5	21.6	
Hori.	225.962	QP	31.7	11.1	9.4	32.0	-	20.3	46.0	25.7	
Hori.	457.018	QP	28.0	16.5	11.0	32.0	-	23.5	46.0	22.5	
Hori.	2483.500	PK	46.4	28.1	5.1	34.2	-	45.4	73.9	28.5	
Hori.	4960.000	PK	41.9	31.9	7.3	33.5	-	47.6	73.9	26.3	Floor noise
Hori.	7440.000	PK	42.0	36.3	8.4	33.5	-	53.2	73.9	20.7	Floor noise
Hori.	9920.000	PK	42.4	38.7	9.5	33.8	-	56.8	73.9	17.1	Floor noise
Hori.	2483.500	AV	34.2	28.1	5.1	34.2	1.1	34.3	53.9	19.6	*1)
Hori.	4960.000	AV	31.2	31.9	7.3	33.5	-	36.9	53.9	17.0	Floor noise
Hori.	7440.000	AV	31.8	36.3	8.4	33.5	-	43.0	53.9	10.9	Floor noise
Hori.	9920.000	AV	32.4	38.7	9.5	33.8	-	46.8	53.9	7.1	Floor noise
Vert.	32.281	QP	29.4	17.4	7.2	32.2	-	21.8	40.0	18.2	
Vert.	49.805	QP	35.2	11.1	7.5	32.2	-	21.6	40.0	18.4	
Vert.	83.533	QP	31.3	6.7	8.0	32.1	-	13.9	40.0	26.1	
Vert.	183.139	QP	30.7	16.2	9.0	32.0	-	23.9	43.5	19.6	
Vert.	224.842	QP	27.1	11.1	9.4	32.0	-	15.6	46.0	30.4	
Vert.	454.455	QP	31.3	16.5	11.0	32.0	-	26.8	46.0	19.2	
Vert.	2483.500	PK	43.8	28.1	5.1	34.2	-	42.8	73.9	31.1	
Vert.	4960.000	PK	41.0	31.9	7.3	33.5	-	46.7	73.9	27.2	Floor noise
Vert.	7440.000	PK	41.6	36.3	8.4	33.5	-	52.8	73.9	21.1	Floor noise
Vert.	9920.000	PK	41.8	38.7	9.5	33.8	-	56.2	73.9	17.7	Floor noise
Vert.	2483.500	AV	35.7	28.1	5.1	34.2	1.1	35.8	53.9	18.1	*1)
Vert.	4960.000	AV	31.4	31.9	7.3	33.5	-	37.1	53.9	16.8	Floor noise
Vert.	7440.000	AV	31.7	36.3	8.4	33.5	-	42.9	53.9	11.0	Floor noise
Vert.	9920.000	AV	32.2	38.7	9.5	33.8	-	46.6	53.9	7.3	Floor noise

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

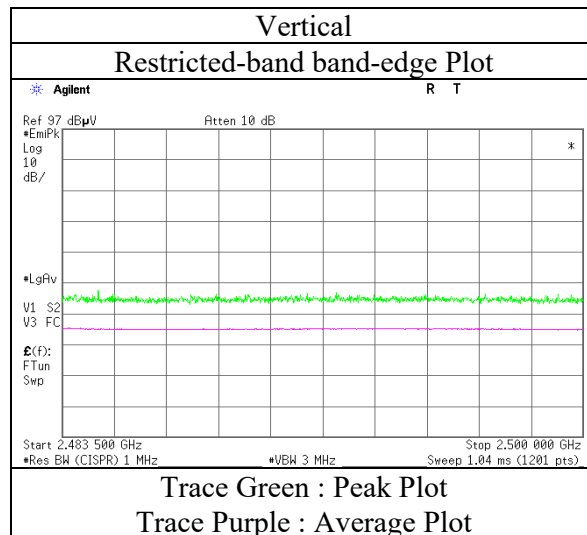
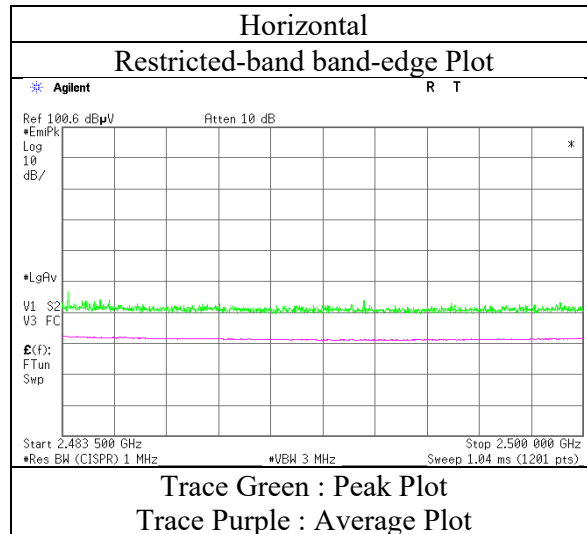
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

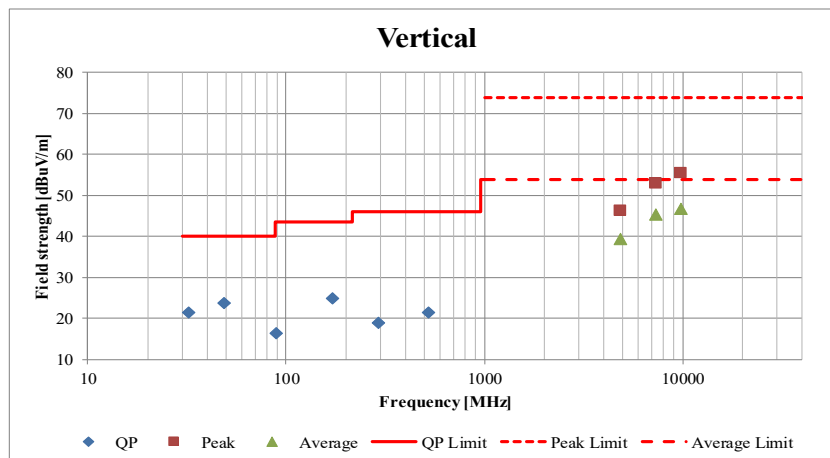
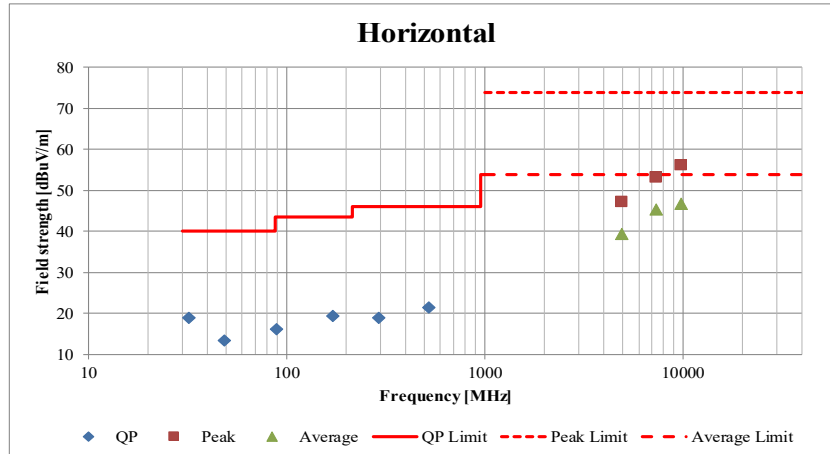
Report No.	12905370H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Yuta Moriya (1 - 10 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Report No.	12905370H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	May 28, 2019	May 28, 2019	May 28, 2019
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 56 % RH	24 deg. C / 56 % RH
Engineer	Yuta Moriya	Takumi Shimada	Takumi Shimada
	(1 - 10 GHz)	(10 - 26.5 GHz)	(below 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 MHz		



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

APPENDIX 2: Test instruments

Test Instruments

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	142229	Measure	KOMELON	KMC-36	-	-	-	-
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/21/2018	08/31/2019	12
RE	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/05/2018	12/31/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	01/21/2019	01/31/2020	12
RE	141392	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	08/08/2018	08/31/2019	12
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	05/09/2019	05/31/2020	12
RE	141296	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	09/19/2018	09/30/2019	12
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	06/29/2018	06/30/2020	24
RE	141855	Spectrum Analyzer	AGILENT	E4440A	MY46187750	11/09/2018	11/30/2019	12
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/01/2019	04/30/2020	12
RE	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/08/2018	08/31/2019	12
RE	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/05/2018	11/30/2019	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	04/12/2019	04/30/2020	12
RE	141265	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	03/25/2019	03/31/2020	12
RE	141578	Pre Amplifier	AGILENT	8447D	2944A10845	09/19/2018	09/30/2019	12
RE	141513	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	05/10/2019	05/31/2020	12
RE	141317	Coaxial Cable	Fujikura/Agilent	-	-	02/25/2019	02/29/2020	12
AT	141805	Power Meter	ANRITSU	ML2495A	6K00003338	10/16/2018	10/31/2019	12
AT	141840	Power sensor	ANRITSU	MA2411B	11737	10/16/2018	10/31/2019	12
AT	141902	Spectrum Analyzer	AGILENT	E4440A	MY46187105	10/04/2018	10/31/2019	12
RE	142011	AC4_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	06/28/2018	06/30/2020	24
RE	142227	Measure	KOMELON	KMC-36	-	-	-	-
AT	141173	Attenuator(10dB)(above 1 GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	12/17/2018	12/31/2019	12
RE	141562	Thermo-Hygrometer	CUSTOM	CTH-201	0010	01/11/2019	01/31/2020	12
RE	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	02/08/2019	02/29/2020	12
RE	141267	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-192	03/21/2019	03/31/2020	12
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
RE	141545	DIGITAL HiTESTER	HIOKI	3805	51201148	01/29/2019	01/31/2020	12
RE	141397	Coaxial Cable	UL Japan	-	-	06/13/2018	06/30/2019	12
RE	148898	Attenuator	KEYSIGHT	8491A	MY52462282	10/03/2018	10/31/2019	12
RE	141425	Biconical Antenna	Schwarzbeck	BBA9106	1302	05/24/2019	05/31/2020	12

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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 Spurious Emission test
AT: Antenna Terminal Conducted test

UL Japan, Inc.

Ise EMC Lab.

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

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APPENDIX 3: Photographs of test setup

Radiated Spurious Emission

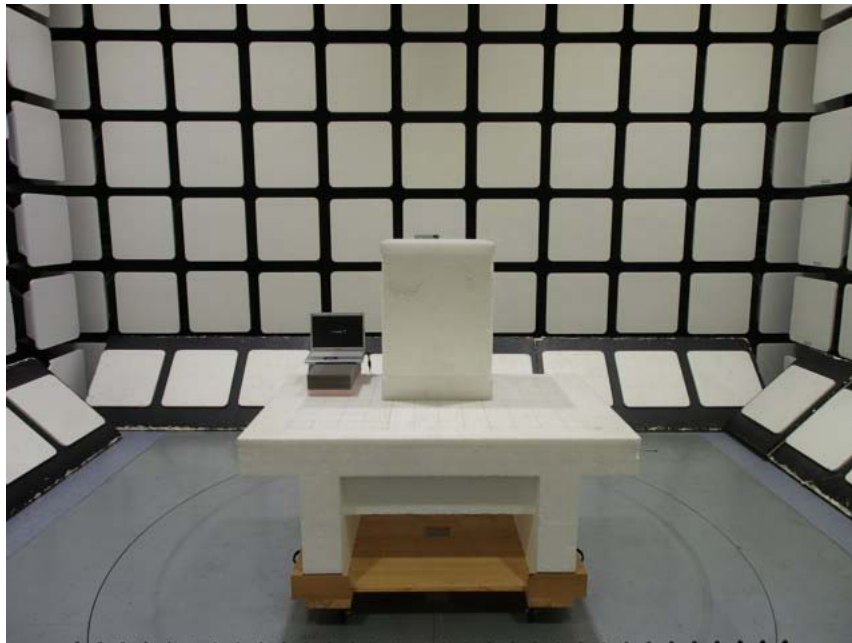


Photo 1

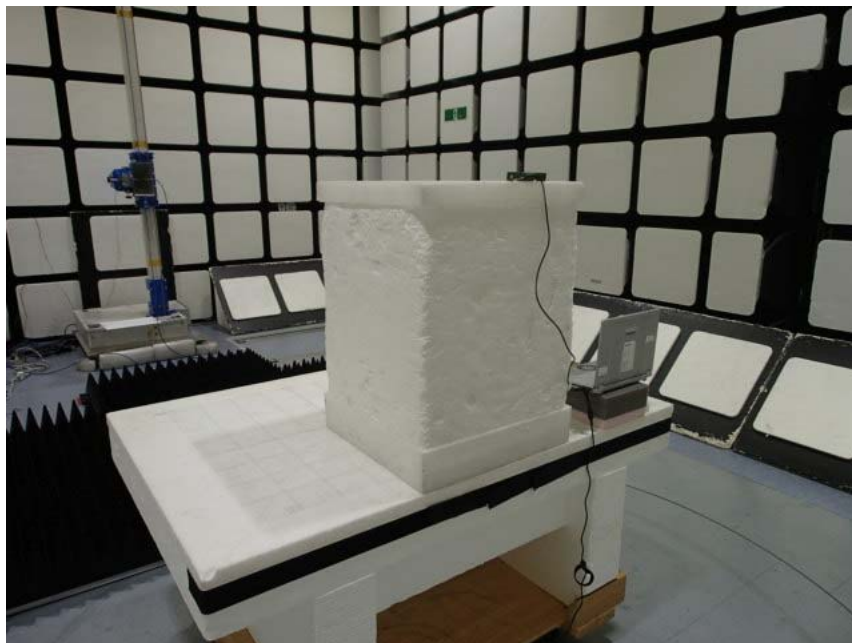


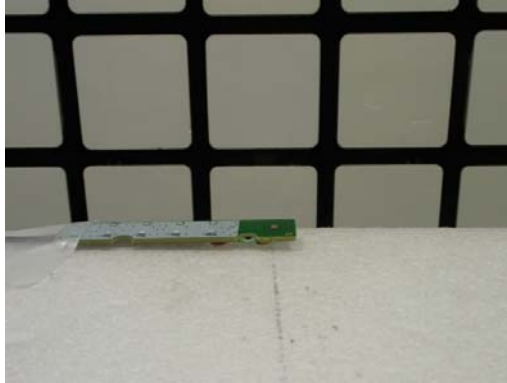
Photo 2

Worst Case Position

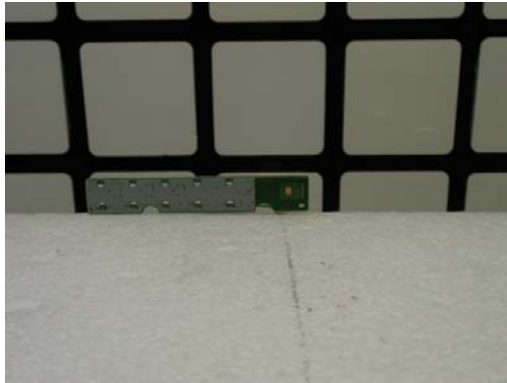
Below 1 GHz (Horizontal: X-axis/ Vertical:X-axis)

Above 1 GHz (Horizontal: Y-axis/ Vertical:Z-axis)

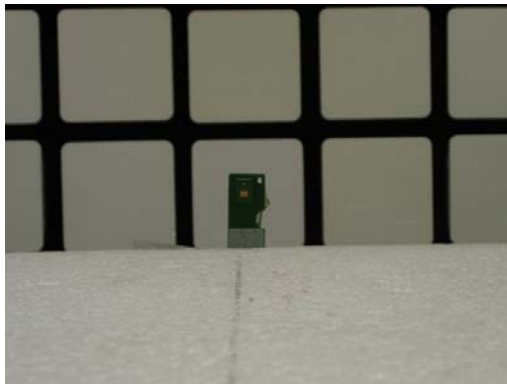
X-axis



Y-axis



Z-axis



End of Report