



RADIO TEST REPORT

Test Report No. : 11355858H-A-R1

Applicant : FUJITSU TEN LIMITED
Type of Equipment : Car Audio
Model No. : FT0093A
FCC ID : BABFT0093A
Test regulation : FCC Part 15 Subpart C: 2016
(Radiated Spurious Emission test above 1 GHz only)
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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 11355858H-A. 11355858H-A is replaced with this report.

Date of test: July 29, 2016

Representative test engineer:

Shinichi Miyazono
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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UL Japan, Inc.

Ise EMC Lab.

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13-EM-F0429

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SECTION 1: Customer information

Company Name : FUJITSU TEN LIMITED
Address : 2-28, Goshō-dori 1-Chome, Hyogo-ku, Kobe, 652-8510 JAPAN
Telephone Number : +81-78-682-2159
Facsimile Number : +81-78-671-7160
Contact Person : Daisuke Fukii

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

2.1 Identification of E.U.T.

Type of Equipment : Car Audio
Model No. : FT0093A
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 12.0 V
Receipt Date of Sample : July 29, 2016
Country of Mass-production : Thailand
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: FT0093A (referred to as the EUT in this report) is a Car Audio.

Radio Specification

[Bluetooth (Ver. 2.1 with EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402 MHz to 2480 MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.3 V
Antenna type : Inverted - F PCB antenna
Antenna Gain : -7.8 dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC part 15 final revised on April 6, 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
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	6.4 dB 4882.000 MHz, AV, Vertical.	Complied	Radiated (above 1 GHz) *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) Radiated test was selected over 1 GHz based on section 15.247(d).

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

*The test was performed based on the requirement differs between the existing regulation and the old regulation applied to the test report : 10709614H-A-R1.

*By comparing with the result of the original test report, there is a level difference that is over 3 dB.

However it was verified as the difference was in the height of the measurement setup of the test method.

FCC Part 15.31 (e)

The EUT provides stable voltage (DC3.3 V) constantly to the wireless transmitter regardless of input voltage.

Instead of a new battery, DC power supply was used for the test.

That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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.

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

*Measurement distance

Radiated emission test

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

3.5 Test Location

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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	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

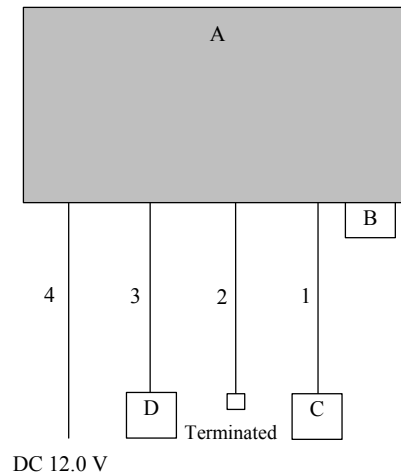
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Radiated)	Tx (Hopping Off) DH5, 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; - Power settings: BDR: Ext.=255, Int.=50 EDR: Ext.=255, Int.=50 - Software: CSR BlueSuite BlueTest Version 2.5.0.93 *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.</p>		

4.2 Configuration and peripherals



* 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	Car Audio	FT0093A	001	FUJITSU TEN	EUT
B	USB Memory	-	-	imation	-
C	Terminal resistance (4Ω x 4)	-	-	-	-
D	Earphone	-	-	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Audio Cable	1.0	Unshielded	Unshielded	-
2	BNC Cable	1.0	Shielded	Shielded	-
3	Earphone Cable	1.0	Unshielded	Unshielded	-
4	DC Cable	2.0	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

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	Above 1 GHz
Antenna Type	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	Above 1 GHz		20 dBc
Instrument used	Spectrum Analyzer		Spectrum Analyzer
Detector	PK	AV	PK
IF Bandwidth	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 26.5 GHz)		3 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 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: $20 \times \log(4.5 \text{ m}/3.0 \text{ m}) = 3.5 \text{ dB}$

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

The test was made on EUT at the normal use position.

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

Measurement range : 1 GHz - 26.5 GHz
Test data : APPENDIX
Test result : Pass

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APPENDIX 1: Test data

Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono (1-26.5GHz)
Mode Tx, Hopping Off, DH5 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	2390.000	PK	41.8	26.7	3.3	32.7	39.1	73.9	34.8	
Hori	4804.000	PK	46.3	31.0	5.6	31.8	51.1	73.9	22.9	
Hori	7206.000	PK	41.0	35.7	6.8	32.6	50.9	73.9	23.0	Foor noise
Hori	9608.000	PK	41.9	37.2	7.5	33.2	53.4	73.9	20.5	Foor noise
Hori	2390.000	AV	28.3	26.7	3.3	32.7	25.6	53.9	28.3	
Hori	4804.000	AV	39.1	31.0	5.6	31.8	43.9	53.9	10.0	
Hori	7206.000	AV	28.7	35.7	6.8	32.6	38.6	53.9	15.3	Foor noise
Hori	9608.000	AV	29.7	37.2	7.5	33.2	41.2	53.9	12.7	Foor noise
Vert	2390.000	PK	41.9	26.7	3.3	32.7	39.2	73.9	34.7	
Vert	4804.000	PK	47.9	31.0	5.6	31.8	52.7	73.9	21.2	
Vert	7206.000	PK	41.1	35.7	6.8	32.6	51.0	73.9	22.9	Foor noise
Vert	9608.000	PK	42.2	37.2	7.5	33.2	53.7	73.9	20.2	Foor noise
Vert	2390.000	AV	28.3	26.7	3.3	32.7	25.6	53.9	28.3	
Vert	4804.000	AV	40.5	31.0	5.6	31.8	45.3	53.9	8.6	
Vert	7206.000	AV	28.7	35.7	6.8	32.6	38.6	53.9	15.3	Foor noise
Vert	9608.000	AV	29.7	37.2	7.5	33.2	41.2	53.9	12.7	Foor 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).

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.5 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

***These results have sufficient margin without taking account Dwell time factor.**

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	91.7	26.7	3.3	32.7	89.0	-	-	Carrier
Hori	2400.000	PK	53.4	26.7	3.3	32.7	50.7	69.0	18.3	
Vert	2402.000	PK	89.9	26.7	3.3	32.7	87.2	-	-	Carrier
Vert	2400.000	PK	52.0	26.7	3.3	32.7	49.3	67.2	17.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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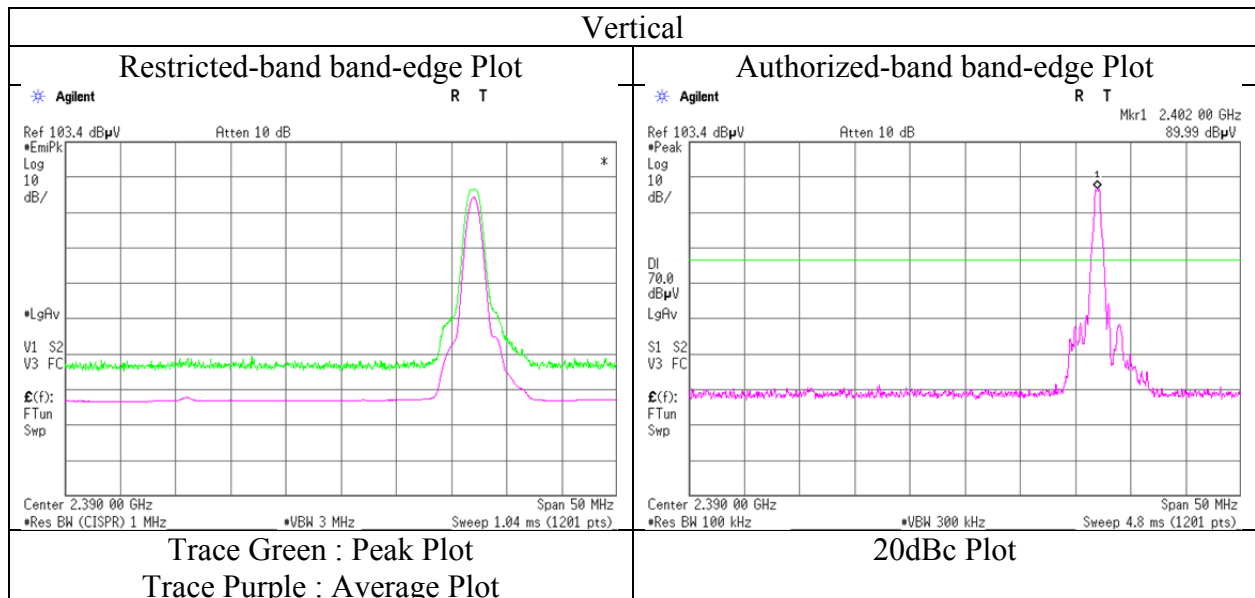
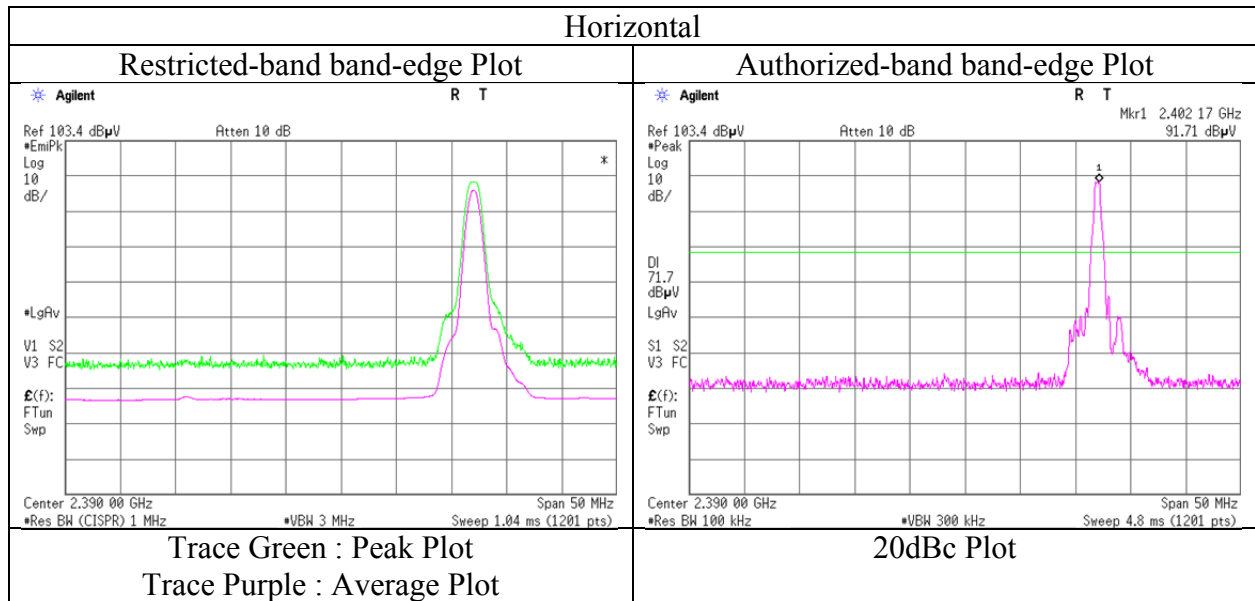
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	11355858H
Test place	Ise EMC Lab. Semi Anechoic Chamber No.3
Date	July 29, 2016
Temperature / Humidity	24 deg. C / 65 % RH
Engineer	Shinichi Miyazono (1-26.5GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

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Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber
No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
Mode Tx, Hopping Off, DH5 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	4882.000	PK	45.8	31.3	5.6	31.7	51.0	73.9	22.9	
Hori	7323.000	PK	41.0	35.6	6.8	32.6	50.8	73.9	23.1	Floor noise
Hori	9764.000	PK	40.0	37.2	7.5	33.3	51.4	73.9	22.5	Floor noise
Hori	4882.000	AV	39.4	31.3	5.6	31.7	44.6	53.9	9.3	
Hori	7323.000	AV	29.3	35.6	6.8	32.6	39.1	53.9	14.8	Floor noise
Hori	9764.000	AV	28.9	37.2	7.5	33.3	40.3	53.9	13.6	Floor noise
Vert	4882.000	PK	48.4	31.3	5.6	31.7	53.6	73.9	20.3	
Vert	7323.000	PK	41.0	35.6	6.8	32.6	50.8	73.9	23.1	Floor noise
Vert	9764.000	PK	39.9	37.2	7.5	33.3	51.3	73.9	22.6	Floor noise
Vert	4882.000	AV	42.3	31.3	5.6	31.7	47.5	53.9	6.4	
Vert	7323.000	AV	29.1	35.6	6.8	32.6	38.9	53.9	15.0	Floor noise
Vert	9764.000	AV	28.8	37.2	7.5	33.3	40.2	53.9	13.7	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).

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

***These results have sufficient margin without taking account Dwell time factor.**

Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber
No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
Mode Tx, Hopping Off, DH5 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	2483.500	PK	44.5	26.8	3.4	32.6	42.1	73.9	31.8	
Hori	4960.000	PK	43.3	31.5	5.5	31.7	48.6	73.9	25.3	
Hori	7440.000	PK	40.0	35.5	6.8	32.7	49.6	73.9	24.3	Floor noise
Hori	9920.000	PK	40.3	37.2	7.6	33.4	51.7	73.9	22.2	Floor noise
Hori	2483.500	AV	29.9	26.8	3.4	32.6	27.5	53.9	26.4	
Hori	4960.000	AV	33.2	31.5	5.5	31.7	38.5	53.9	15.4	
Hori	7440.000	AV	28.2	35.5	6.8	32.7	37.8	53.9	16.1	Floor noise
Hori	9920.000	AV	28.5	37.2	7.6	33.4	39.9	53.9	14.0	Floor noise
Vert	2483.500	PK	43.4	26.8	3.4	32.6	41.0	73.9	32.9	
Vert	4960.000	PK	45.6	31.5	5.5	31.7	50.9	73.9	23.0	
Vert	7440.000	PK	40.0	35.5	6.8	32.7	49.6	73.9	24.3	Floor noise
Vert	9920.000	PK	40.5	37.2	7.6	33.4	51.9	73.9	22.0	Floor noise
Vert	2483.500	AV	30.0	26.8	3.4	32.6	27.6	53.9	26.3	
Vert	4960.000	AV	35.4	31.5	5.5	31.7	40.7	53.9	13.2	
Vert	7440.000	AV	28.1	35.5	6.8	32.7	37.7	53.9	16.2	Floor noise
Vert	9920.000	AV	28.5	37.2	7.6	33.4	39.9	53.9	14.0	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).

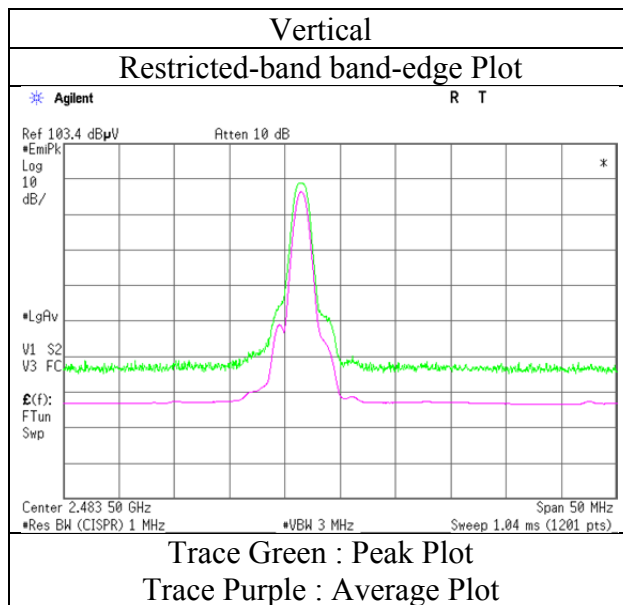
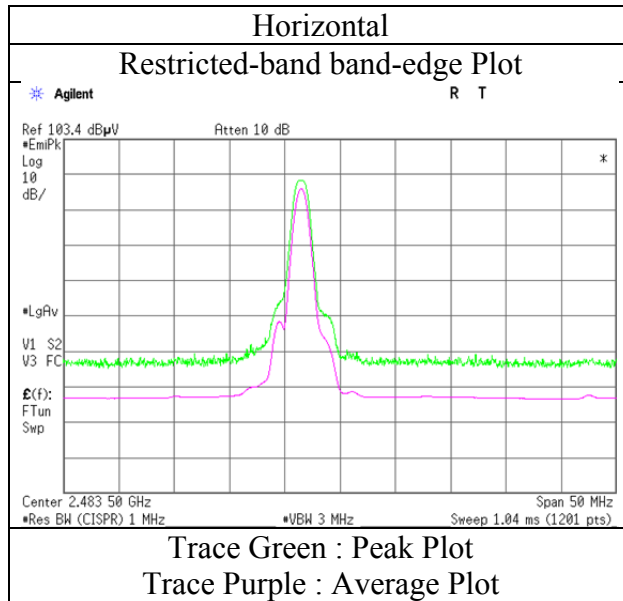
*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

***These results have sufficient margin without taking account Dwell time factor.**

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono (1-26.5GHz)
Mode Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber
No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
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	2390.000	PK	40.9	26.7	3.3	32.7	38.2	73.9	35.7	
Hori	4804.000	PK	39.3	31.0	5.6	31.8	44.1	73.9	29.8	
Hori	7206.000	PK	41.0	35.7	6.8	32.6	50.9	73.9	23.0	Floor noise
Hori	9608.000	PK	42.0	37.2	7.5	33.2	53.5	73.9	20.4	Floor noise
Hori	2390.000	AV	28.9	26.7	3.3	32.7	26.2	53.9	27.7	
Hori	4804.000	AV	27.3	31.0	5.6	31.8	32.1	53.9	21.8	
Hori	7206.000	AV	28.7	35.7	6.8	32.6	38.6	53.9	15.3	Floor noise
Hori	9608.000	AV	29.6	37.2	7.5	33.2	41.1	53.9	12.8	Floor noise
Vert	2390.000	PK	41.3	26.7	3.3	32.7	38.6	73.9	35.3	
Vert	4804.000	PK	41.3	31.0	5.6	31.8	46.1	73.9	27.8	
Vert	7206.000	PK	41.2	35.7	6.8	32.6	51.1	73.9	22.8	Floor noise
Vert	9608.000	PK	42.1	37.2	7.5	33.2	53.6	73.9	20.3	Floor noise
Vert	2390.000	AV	28.3	26.7	3.3	32.7	25.6	53.9	28.3	
Vert	4804.000	AV	29.7	31.0	5.6	31.8	34.5	53.9	19.4	
Vert	7206.000	AV	28.9	35.7	6.8	32.6	38.8	53.9	15.1	Floor noise
Vert	9608.000	AV	29.6	37.2	7.5	33.2	41.1	53.9	12.8	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).

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$

10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

***These results have sufficient margin without taking account Dwell time factor.**

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	83.3	26.7	3.3	32.7	80.6	-	-	Carrier
Hori	2400.000	PK	41.6	26.7	3.3	32.7	38.9	60.6	21.7	
Vert	2402.000	PK	86.1	26.7	3.3	32.7	83.4	-	-	Carrier
Vert	2400.000	PK	43.5	26.7	3.3	32.7	40.8	63.4	22.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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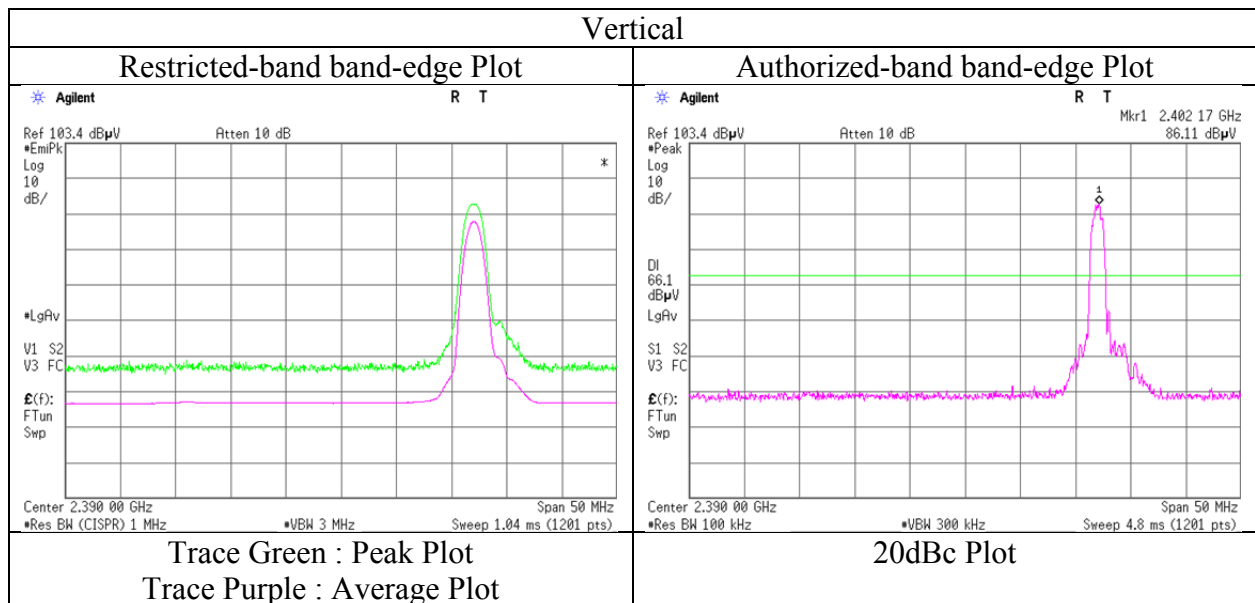
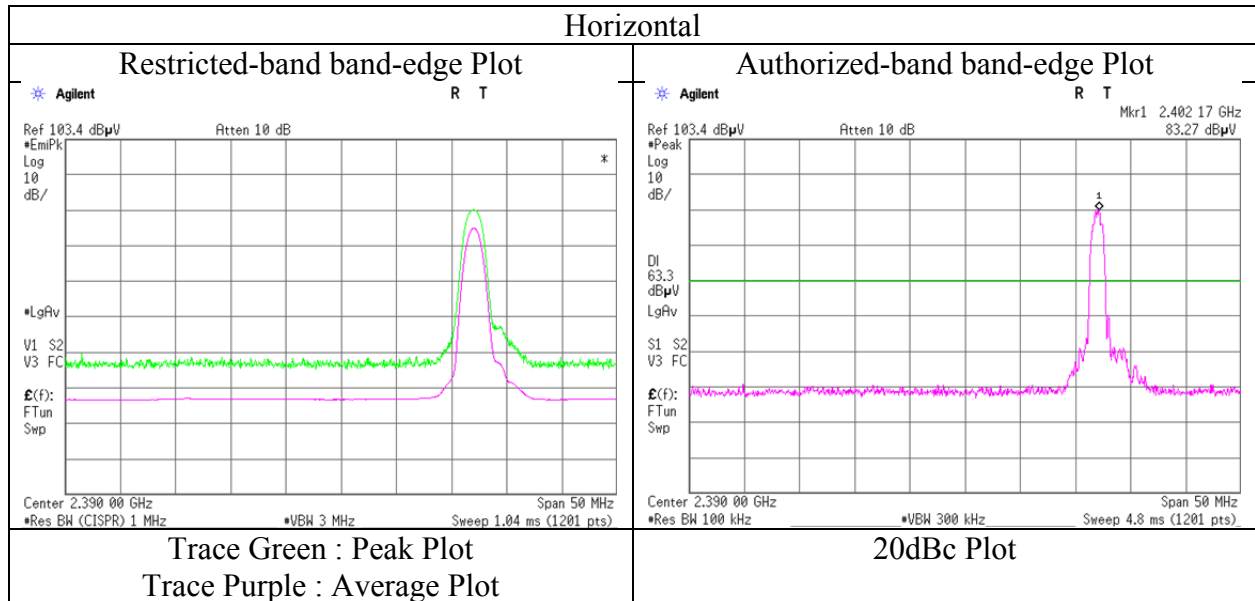
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 11355858H
 Test place Ise EMC Lab. Semi Anechoic Chamber No.3
 Date July 29, 2016
 Temperature / Humidity 24 deg. C / 65 % RH
 Engineer Shinichi Miyazono (1-26.5GHz)
 Mode Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber
No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
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	4882.000	PK	40.0	31.3	5.6	31.7	45.2	73.9	28.7	Floor noise
Hori	7323.000	PK	41.1	35.6	6.8	32.6	50.9	73.9	23.0	Floor noise
Hori	9764.000	PK	39.9	37.2	7.5	33.3	51.3	73.9	22.6	Floor noise
Hori	4882.000	AV	28.0	31.3	5.6	31.7	33.2	53.9	20.7	Floor noise
Hori	7323.000	AV	29.2	35.6	6.8	32.6	39.0	53.9	14.9	Floor noise
Hori	9764.000	AV	28.7	37.2	7.5	33.3	40.1	53.9	13.8	Floor noise
Vert	4882.000	PK	39.7	31.3	5.6	31.7	44.9	73.9	29.0	Floor noise
Vert	7323.000	PK	41.1	35.6	6.8	32.6	50.9	73.9	23.0	Floor noise
Vert	9764.000	PK	40.0	37.2	7.5	33.3	51.4	73.9	22.5	Floor noise
Vert	4882.000	AV	28.0	31.3	5.6	31.7	33.2	53.9	20.7	Floor noise
Vert	7323.000	AV	29.0	35.6	6.8	32.6	38.8	53.9	15.1	Floor noise
Vert	9764.000	AV	28.9	37.2	7.5	33.3	40.3	53.9	13.6	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).

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

***These results have sufficient margin without taking account Dwell time factor.**

Radiated Spurious Emission

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber
No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
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	2483.500	PK	43.2	26.8	3.4	32.6	40.8	73.9	33.1	
Hori	4960.000	PK	42.7	31.5	5.5	31.7	48.0	73.9	25.9	
Hori	7440.000	PK	40.7	35.5	6.8	32.7	50.3	73.9	23.6	Floor noise
Hori	9920.000	PK	40.2	37.2	7.6	33.4	51.6	73.9	22.3	Floor noise
Hori	2483.500	AV	30.6	26.8	3.4	32.6	28.2	53.9	25.7	
Hori	4960.000	AV	32.5	31.5	5.5	31.7	37.8	53.9	16.1	
Hori	7440.000	AV	28.6	35.5	6.8	32.7	38.2	53.9	15.7	Floor noise
Hori	9920.000	AV	29.0	37.2	7.6	33.4	40.4	53.9	13.5	Floor noise
Vert	2483.500	PK	42.6	26.8	3.4	32.6	40.2	73.9	33.7	
Vert	4960.000	PK	45.1	31.5	5.5	31.7	50.4	73.9	23.5	
Vert	7440.000	PK	41.0	35.5	6.8	32.7	50.6	73.9	23.3	Floor noise
Vert	9920.000	PK	40.8	37.2	7.6	33.4	52.2	73.9	21.7	Floor noise
Vert	2483.500	AV	28.9	26.8	3.4	32.6	26.5	53.9	27.4	
Vert	4960.000	AV	34.2	31.5	5.5	31.7	39.5	53.9	14.4	
Vert	7440.000	AV	28.6	35.5	6.8	32.7	38.2	53.9	15.7	Floor noise
Vert	9920.000	AV	29.0	37.2	7.6	33.4	40.4	53.9	13.5	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).

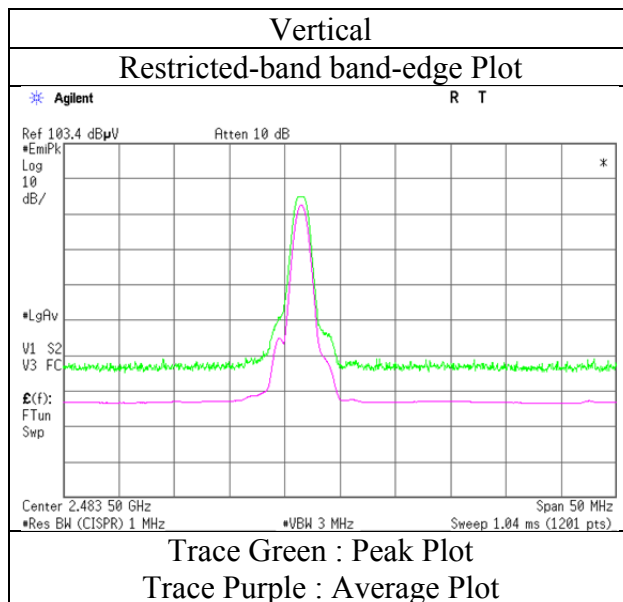
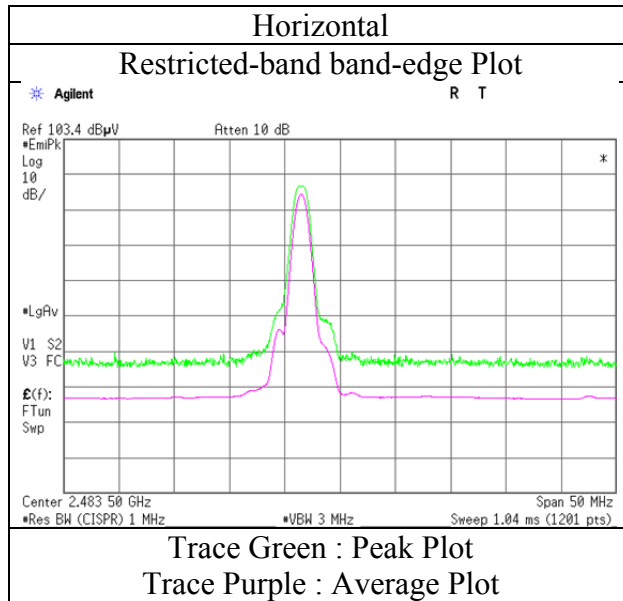
*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

***These results have sufficient margin without taking account Dwell time factor.**

Radiated Spurious Emission
(Reference Plot for band-edge)

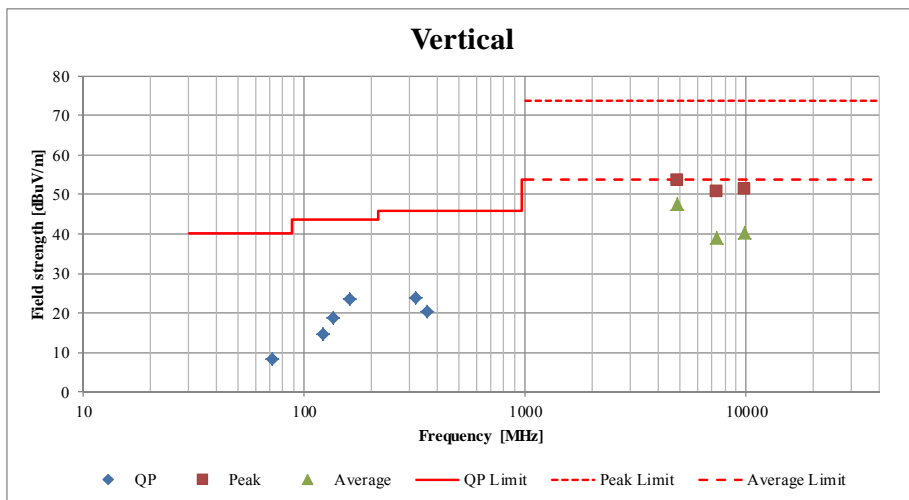
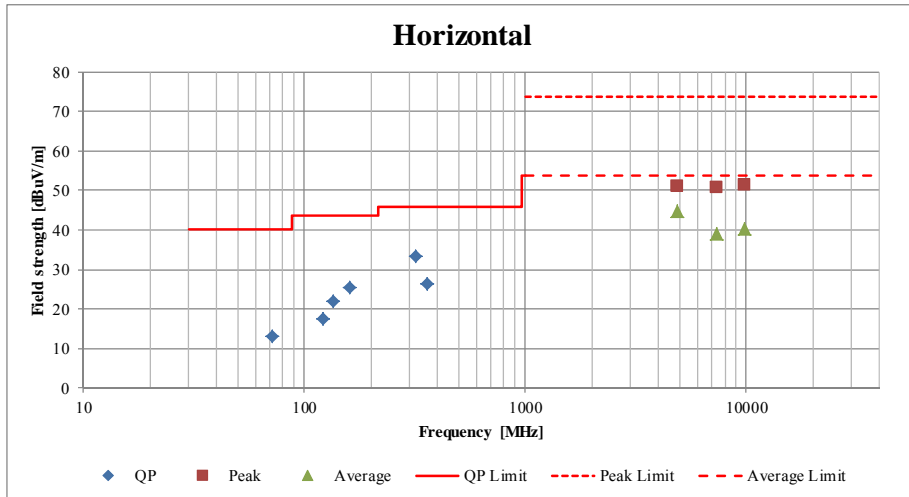
Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono (1-26.5GHz)
Mode Tx, Hopping Off, 3DH5 2408 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No. 11355858H
Test place Ise EMC Lab. Semi Anechoic Chamber No.3
Date July 29, 2016
Temperature / Humidity 24 deg. C / 65 % RH
Engineer Shinichi Miyazono
(1-26.5GHz)
Mode Tx, Hopping Off, DH5 2441 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-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/01 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2016/01/21 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2016/05/19 * 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
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2016/05/29 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2016/01/13 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2015/09/16 * 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

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