



RADIO TEST REPORT

Test Report No. : 11463343H-B-R1

Applicant : FUJITSU TEN LIMITED
Type of Equipment : Car Audio
Model No. : FT0106B
FCC ID : BABFT0106B
Test regulation : FCC Part 15 Subpart C: 2016
*Bluetooth part
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 11463343H-B. 11463343H-B is replaced with this report.

Date of test: December 12 to 19, 2016

Representative test engineer:


Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by:


Tsubasa Takayama
Engineer
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.
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Ise EMC Lab.

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11463343H-B

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio
Model No.	:	FT0106B
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	November 30, 2016
Country of Mass-production	:	Mexico
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: FT0106B (referred to as the EUT in this report) is a Car Audio.

General Specification

Clock frequency(ies)	: 48 MHz (Crystal)
Operating Temperature	: -20 deg. C- +65 deg. C

Radio Specification

WLAN (IEEE802.11b/g/n-20)

Radio Type	: Transceiver
Frequency of Operation	: 2412 MHz - 2462 MHz
Modulation	: DSSS/OFDM
Power Supply (inner)	: DC 1.8 V, DC 3.3 V
Antenna type	: Inverted F Antenna
Antenna Gain	: 0.47 dBi

Bluetooth (Ver.4.1 + EDR)

Equipment Type	: Transceiver
Frequency of Operation	: 2402 MHz - 2480 MHz
Type of Modulation	: FHSS, GFSK, $\pi/4$ DQPSK, 8 DPSK
Power Supply (inner)	: DC 1.8 V, DC 3.3 V
Antenna Type	: Inverted F Antenna
Antenna Gain	: 0.47 dBi

GPS Receiver

Type of Receiver	: GPS Receiver
Frequency of Operation	: 1575.42 MHz
Modulation	: DSSS
Power Supply (inner)	: DC 1.8 V
Antenna type	: GPS Antenna
Antenna Gain	: 29 dBi

*This test report applies to Bluetooth Ver.4.1 with EDR function.

*Wireless LAN and Bluetooth do not transmit simultaneously.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

* The revision on November 14, 2016, does not affect the test specification applied to the EUT.

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	-	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (2)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (1)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
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 (2)		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, Vertical, AV	Complied	Conducted/ Radiated (above 30 MHz) *2)

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

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

*2) 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 (DC 1.8 V, 3.3 V) constantly to RF Module regardless of input voltage. Therefore, this 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.

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3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.5 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

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

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

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

*Measurement distance

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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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 2.0 m 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.

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

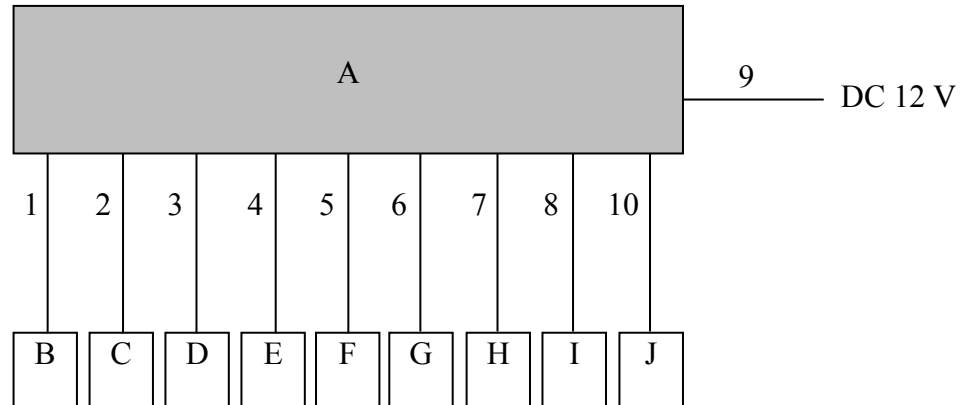
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted / Radiated), 20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
*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) *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. * It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all the test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows (setting value might be different from product specification value); - Power settings: 0 dBm - Software: BSDT Ver. 2.0.0.12 *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.		

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 Suppor equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio	FT0106B	06A161274F92K for RE* MNA00094 for AT*	FUJITSU TEN LIMITED	EUT
B	USB Memory	PD-07WH8GB	-	KINGMAX	-
C	Termination	-	-	-	-
D	XM Radio Antenna	-	1032	-	-
E	GPS Antenna	-	31720398	-	-
F	Speaker	-	-	-	-
G	Microphone	-	46	-	-
H	Camera	GP-KD3325S	69B01957	-	-
I	Steering switch	75E717	-	-	-
J	DCM	ATVAA00000000	TVAA000002	Continental	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	FM Antenna Cable	0.8	Shielded	Shielded	-
3	Signal Cable	7.2	Unshielded	Unshielded	-
4	Signal Cable	4.4	Unshielded	Unshielded	-
5	Signal Cable	3.5	Unshielded	Unshielded	-
6	Signal Cable	3.6	Unshielded	Unshielded	-
7	Signal Cable	3.75	Unshielded	Unshielded	-
8	Signal Cable	3.5	Unshielded	Unshielded	-
9	DC Cable	4.5	Unshielded	Unshielded	-
10	Signal Cable	2.0	Unshielded	Unshielded	-

*RE: Radiated Spurious Emission Test, AT: Antenna Terminal Conducted Tests

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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, 1.0 m by 1.5 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	4.5 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 26.5 GHz)		4.5 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: $20 \times \log(4.5 \text{ m}/3.0 \text{ m}) = 3.53 \text{ dB}$

*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 : 30 MHz - 26.5 GHz

Test data : APPENDIX

Test result : Pass

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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
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *3)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	9.1 kHz	27 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Peak hold was applied as Worst-case measurement.
 *2) Reference data
 *3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
 Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.
 (9 kHz - 150 kHz: RBW = 200Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz).

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

Test data : **APPENDIX**
Test result : **Pass**

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APPENDIX 1: Test data

20dB Bandwidth and Carrier Frequency Separation

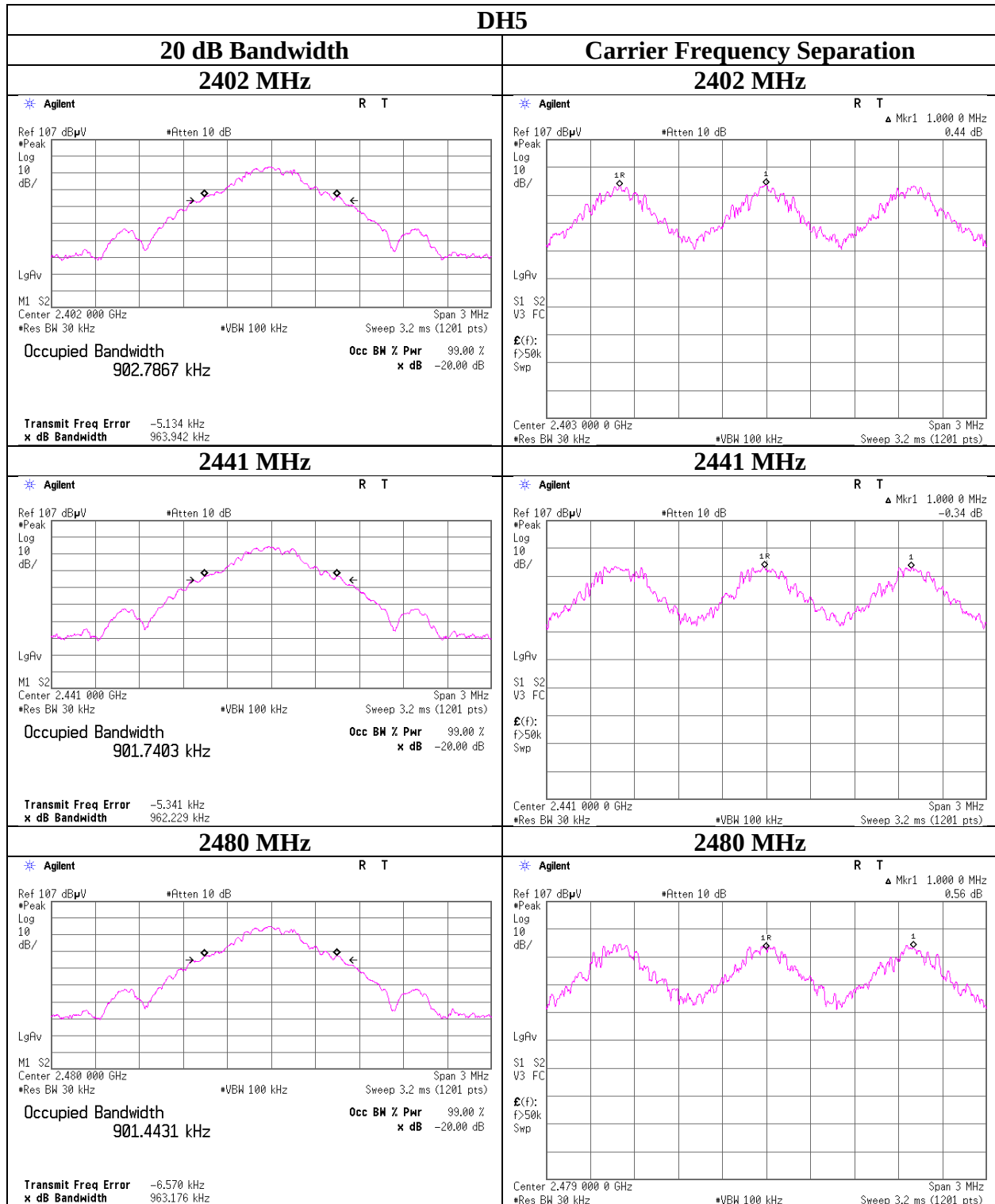
Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11463343H
Date December 19, 2016
Temperature / Humidity 24 deg. C / 26 % RH
Engineer Yutaka Yoshida
Mode Tx, Hopping On (20dB Bandwidth)
 Tx, Hopping Off (Carrier Frequency Separation)

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.964	1.000	≥ 0.643
DH5	2441.0	0.962	1.000	≥ 0.641
DH5	2480.0	0.963	1.000	≥ 0.642
3DH5	2402.0	1.297	1.000	≥ 0.865
3DH5	2441.0	1.304	1.000	≥ 0.869
3DH5	2480.0	1.298	1.000	≥ 0.865

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



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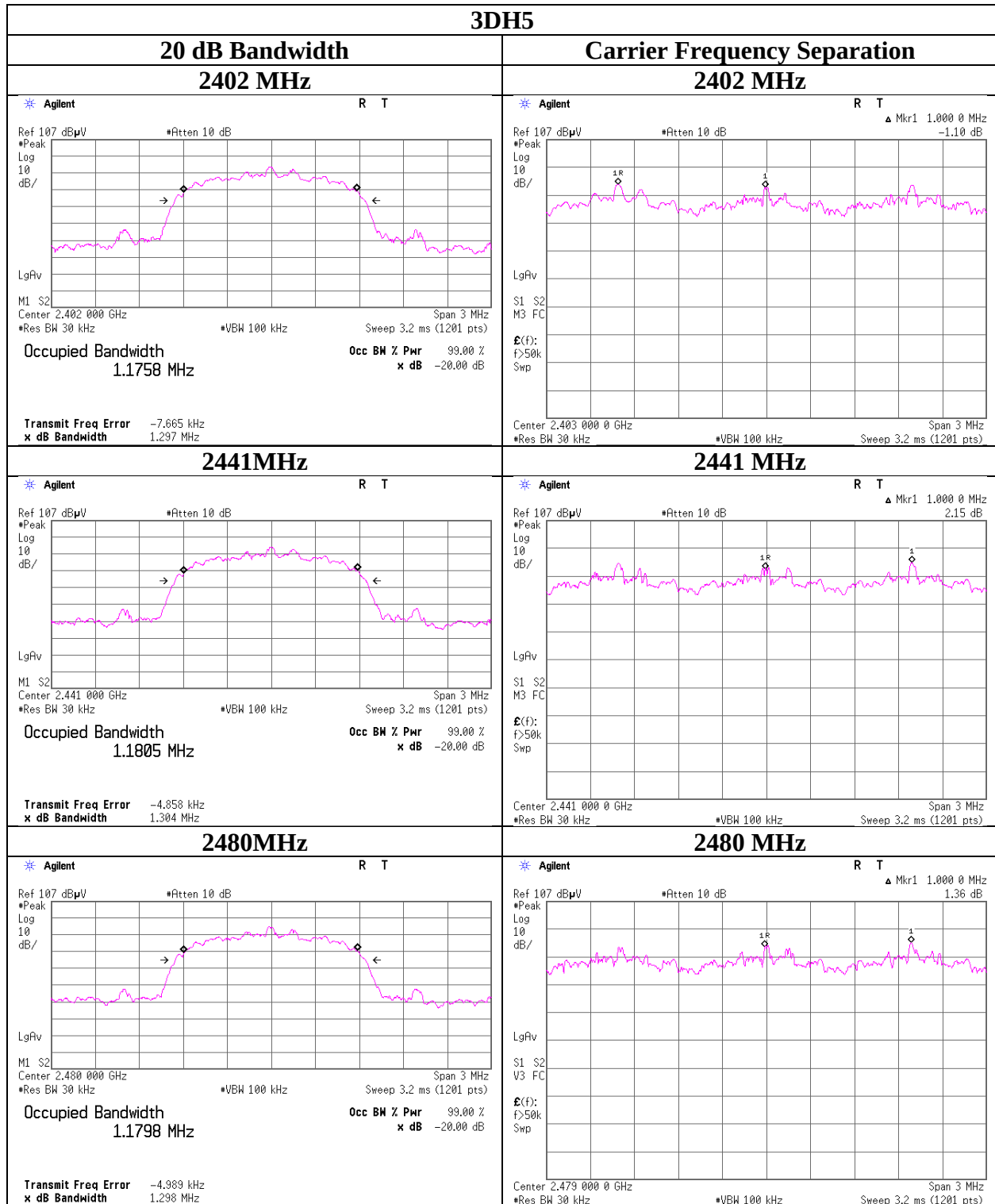
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20dB Bandwidth and Carrier Frequency Separation



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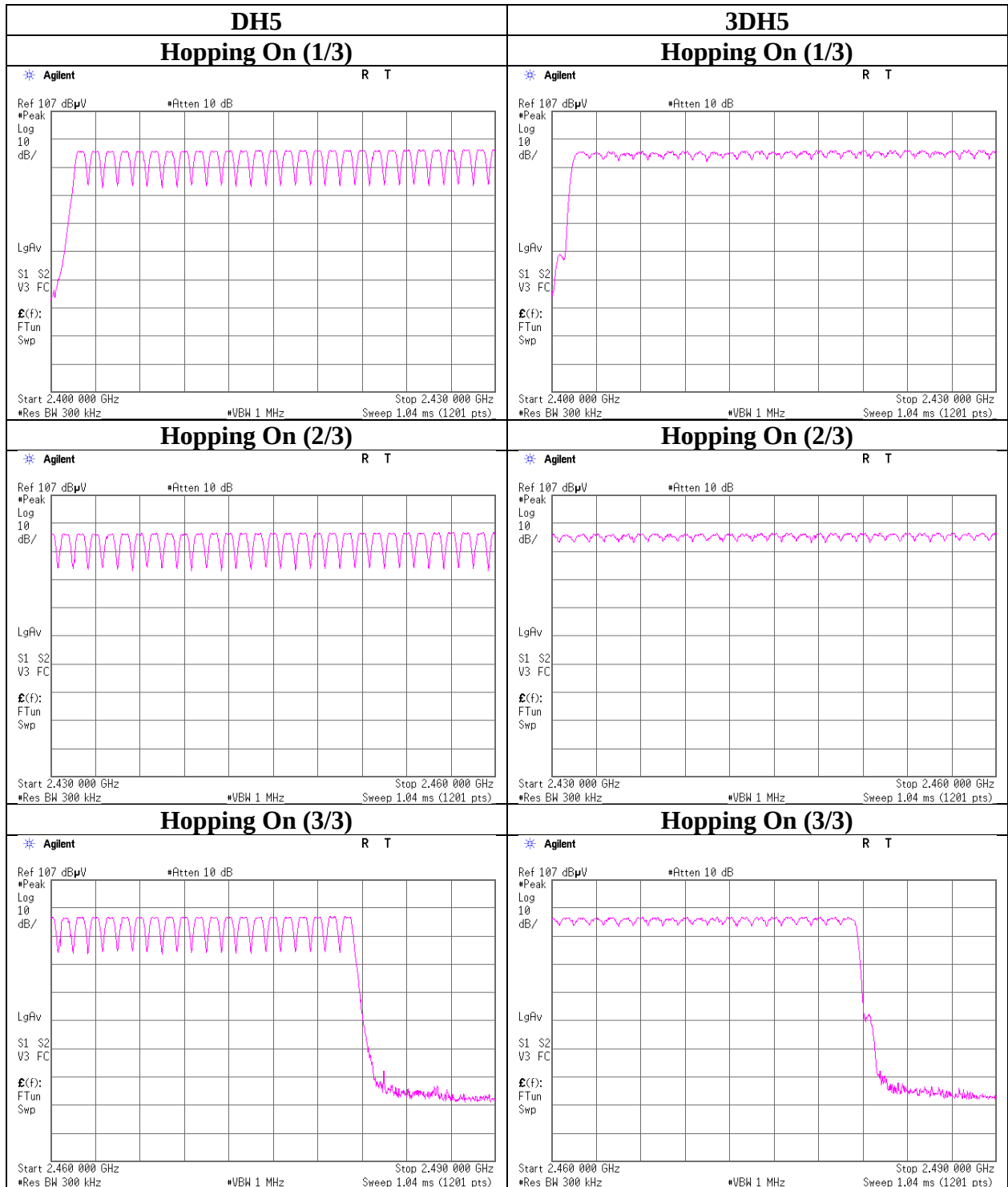
Number of Hopping Frequency

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11463343H
Date December 19, 2016
Temperature / Humidity 24 deg. C / 26 % RH
Engineer Yutaka Yoshida
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
3DH5	79	≥ 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



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Dwell time

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11463343H
Date December 19, 2016
Temperature / Humidity 24 deg. C / 26 % RH
Engineer Yutaka Yoshida
Mode Tx, Hopping On

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period				Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	50.4 times	/	5 sec.	x	31.6 sec. =	319 times	400
DH3	25.6 times	/	5 sec.	x	31.6 sec. =	162 times	400
DH5	19.8 times	/	5 sec.	x	31.6 sec. =	126 times	400
3DH1	50.6 times	/	5 sec.	x	31.6 sec. =	320 times	400
3DH3	26.4 times	/	5 sec.	x	31.6 sec. =	167 times	400
3DH5	18.6 times	/	5 sec.	x	31.6 sec. =	118 times	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

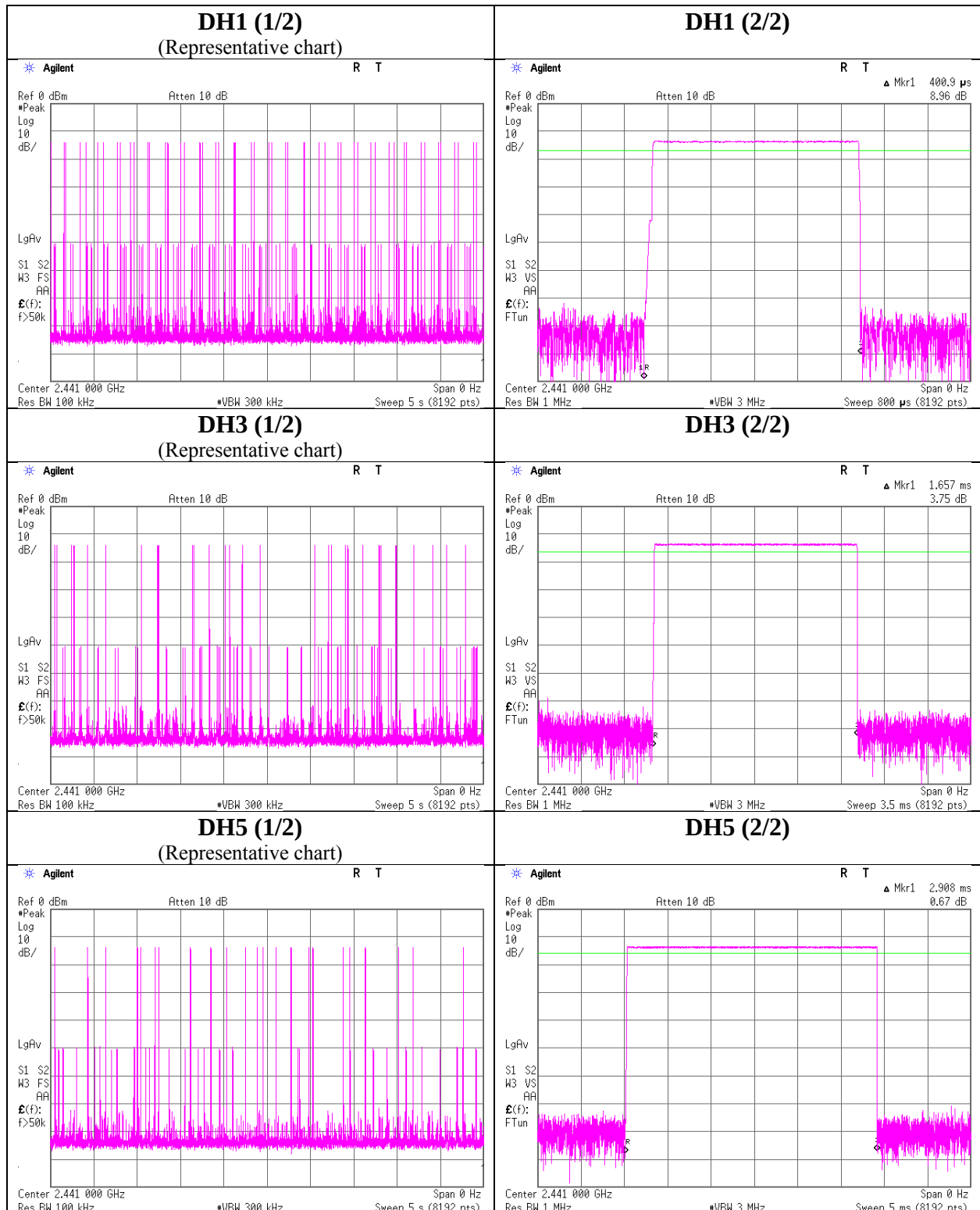
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	50	50	51	50	50.4
DH3	28	22	26	26	26	25.6
DH5	23	21	16	20	19	19.8
3DH1	51	51	50	50	51	50.6
3DH3	25	29	28	27	23	26.4
3DH5	15	19	21	17	21	18.6

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in $N \times 0.4s$, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than $0.4s$ regardless of packet size. This is confirmed in the test report for $N = 79$.

Dwell time



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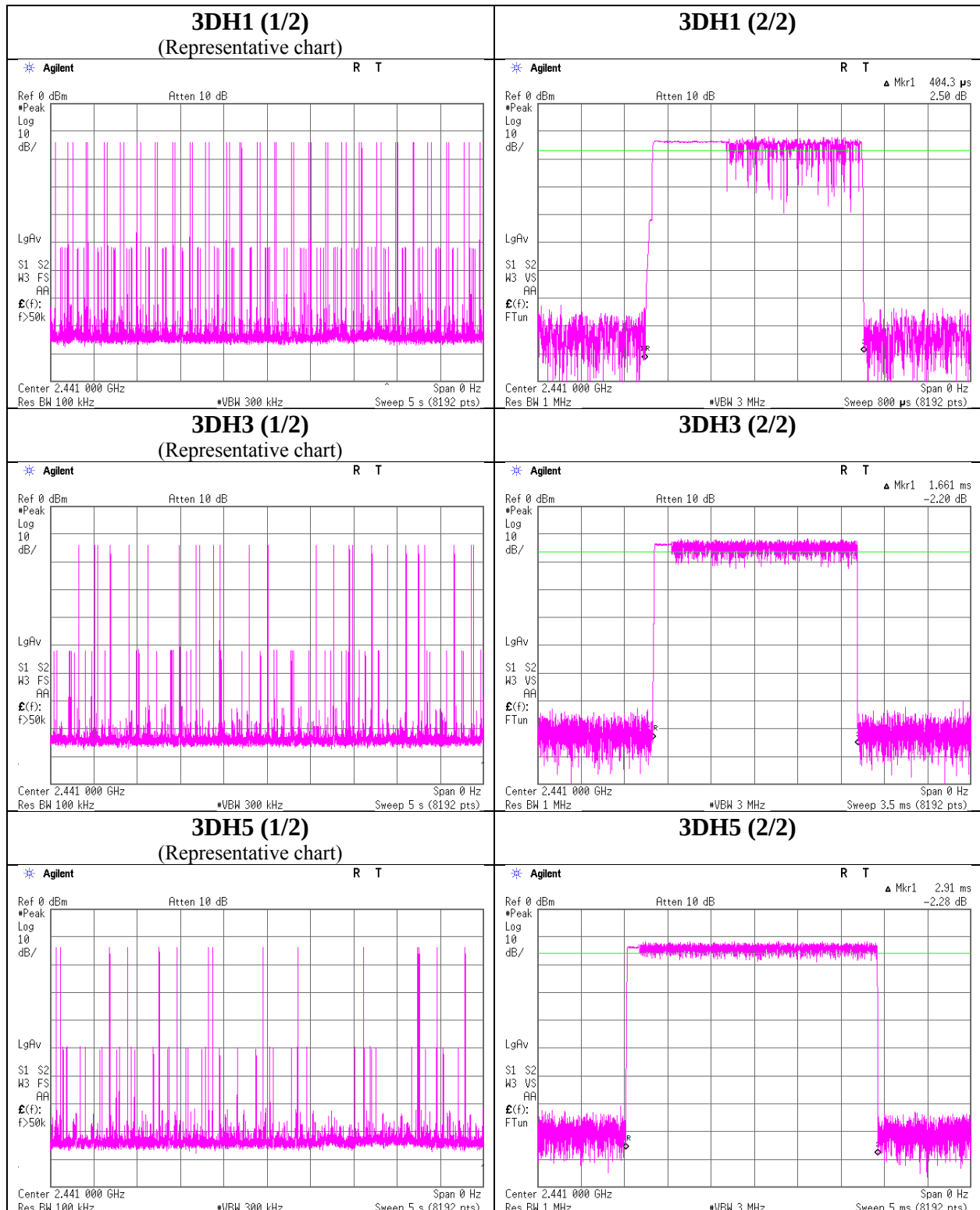
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Dwell time



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Maximum Peak Output Power

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11463343H
Date December 19, 2016
Temperature / Humidity 24 deg. C / 26 % RH
Engineer Yutaka Yoshida
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-12.40	2.33	10.08	0.01	1.00	20.96	125	20.95
DH5	2441.0	-12.95	2.34	10.08	-0.53	0.88	20.96	125	21.49
DH5	2480.0	-12.56	2.35	10.08	-0.13	0.97	20.96	125	21.09
2DH5	2402.0	-12.10	2.33	10.08	0.31	1.07	20.96	125	20.65
2DH5	2441.0	-11.46	2.34	10.08	0.96	1.25	20.96	125	20.00
2DH5	2480.0	-11.10	2.35	10.08	1.33	1.36	20.96	125	19.63
3DH5	2402.0	-11.75	2.33	10.08	0.66	1.16	20.96	125	20.30
3DH5	2441.0	-11.15	2.34	10.08	1.27	1.34	20.96	125	19.69
3DH5	2480.0	-10.78	2.35	10.08	1.65	1.46	20.96	125	19.31

Sample Calculation:

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

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.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11463343H
Date	December 19, 2016
Temperature / Humidity	24 deg. C / 26 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)	
					[dBm]	[mW]
DH5	2402.0	-14.24	2.33	10.08	-1.83	0.66
DH5	2441.0	-14.86	2.34	10.08	-2.44	0.57
DH5	2480.0	-14.40	2.35	10.08	-1.97	0.64
2DH5	2402.0	-16.14	2.33	10.08	-3.73	0.42
2DH5	2441.0	-15.35	2.34	10.08	-2.93	0.51
2DH5	2480.0	-14.89	2.35	10.08	-2.46	0.57
3DH5	2402.0	-16.13	2.33	10.08	-3.72	0.42
3DH5	2441.0	-15.34	2.34	10.08	-2.92	0.51
3DH5	2480.0	-14.88	2.35	10.08	-2.45	0.57

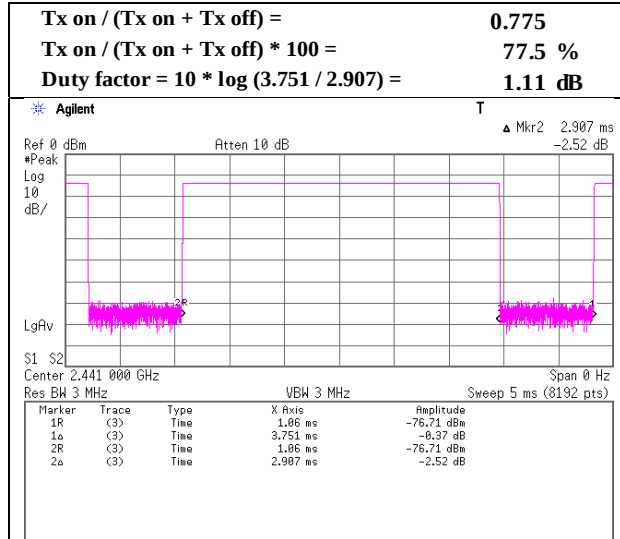
Sample Calculation:

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

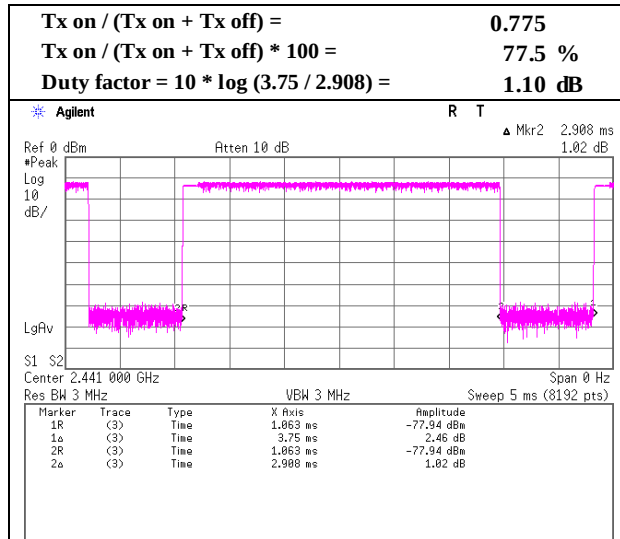
Burst Rate Confirmation

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off

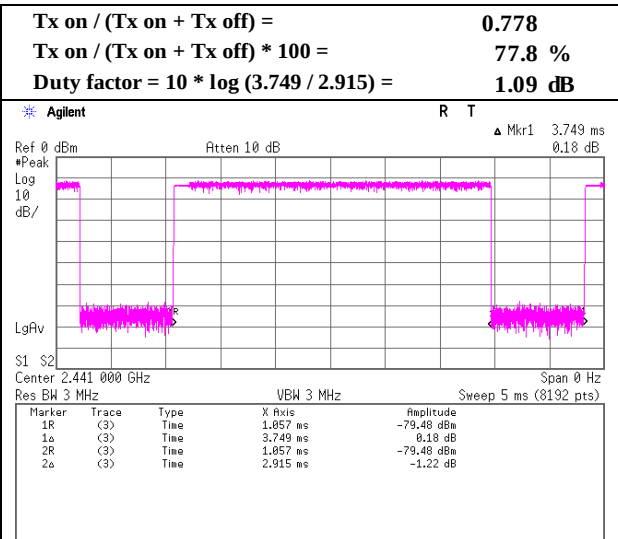
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11463343H
Date : December 12, 2016 December 13, 2016 December 14, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 23 deg. C / 40 % RH 20 deg. C / 40 % RH
Engineer : Takumi Shimada Takumi Shimada Shuichi Ohyama
(1 GHz -10 GHz) (Above 10 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]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.148	QP	30.0	11.1	7.4	28.1	20.4	40.0	19.6	
Hori	62.583	QP	25.0	7.1	7.7	28.1	11.7	40.0	28.3	
Hori	150.752	QP	26.9	15.1	8.7	27.7	23.0	43.5	20.5	
Hori	333.064	QP	32.8	14.3	10.2	27.4	29.9	46.0	16.1	
Hori	405.500	QP	31.2	15.7	10.7	27.8	29.8	46.0	16.2	
Hori	487.507	QP	31.1	17.4	11.3	28.1	31.7	46.0	14.3	
Hori	2390.000	PK	43.1	26.7	6.9	32.7	44.0	73.9	29.9	
Hori	4804.000	PK	43.0	31.0	9.1	31.8	51.3	73.9	22.6	
Hori	7206.000	PK	41.3	35.7	10.4	32.6	54.8	73.9	19.1	Floor noise
Hori	9608.000	PK	43.2	37.2	11.0	33.2	58.2	73.9	15.7	Floor noise
Hori	2390.000	AV	30.0	26.7	6.9	32.7	30.9	53.9	23.0	
Hori	4804.000	AV	33.2	31.0	9.1	31.8	41.5	53.9	12.4	
Hori	7206.000	AV	29.4	35.7	10.4	32.6	42.9	53.9	11.0	Floor noise
Hori	9608.000	AV	31.6	37.2	11.0	33.2	46.6	53.9	7.3	Floor noise
Vert	49.148	QP	34.5	11.1	7.4	28.1	24.9	40.0	15.1	
Vert	62.583	QP	24.3	7.1	7.7	28.1	11.0	40.0	29.0	
Vert	150.752	QP	24.7	15.1	8.7	27.7	20.8	43.5	22.7	
Vert	333.064	QP	28.6	14.3	10.2	27.4	25.7	46.0	20.3	
Vert	405.500	QP	28.0	15.7	10.7	27.8	26.6	46.0	19.4	
Vert	487.507	QP	29.3	17.4	11.3	28.1	29.9	46.0	16.1	
Vert	2390.000	PK	42.9	26.7	6.9	32.7	43.8	73.9	30.1	
Vert	4804.000	PK	43.7	31.0	9.1	31.8	52.0	73.9	21.9	
Vert	7206.000	PK	41.6	35.7	10.4	32.6	55.1	73.9	18.8	Floor noise
Vert	9608.000	PK	42.0	37.2	11.0	33.2	57.0	73.9	16.9	Floor noise
Vert	2390.000	AV	29.8	26.7	6.9	32.7	30.7	53.9	23.2	
Vert	4804.000	AV	33.0	31.0	9.1	31.8	41.3	53.9	12.6	
Vert	7206.000	AV	29.3	35.7	10.4	32.6	42.8	53.9	11.1	Floor noise
Vert	9608.000	AV	30.7	37.2	11.0	33.2	45.7	53.9	8.2	Floor noise

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

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

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

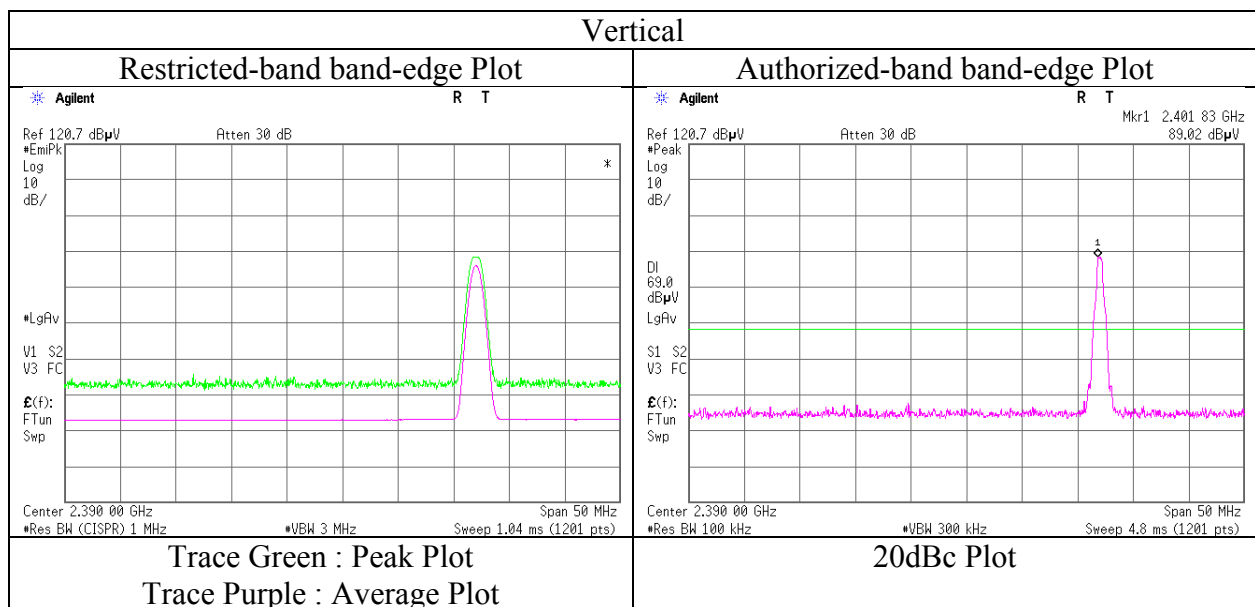
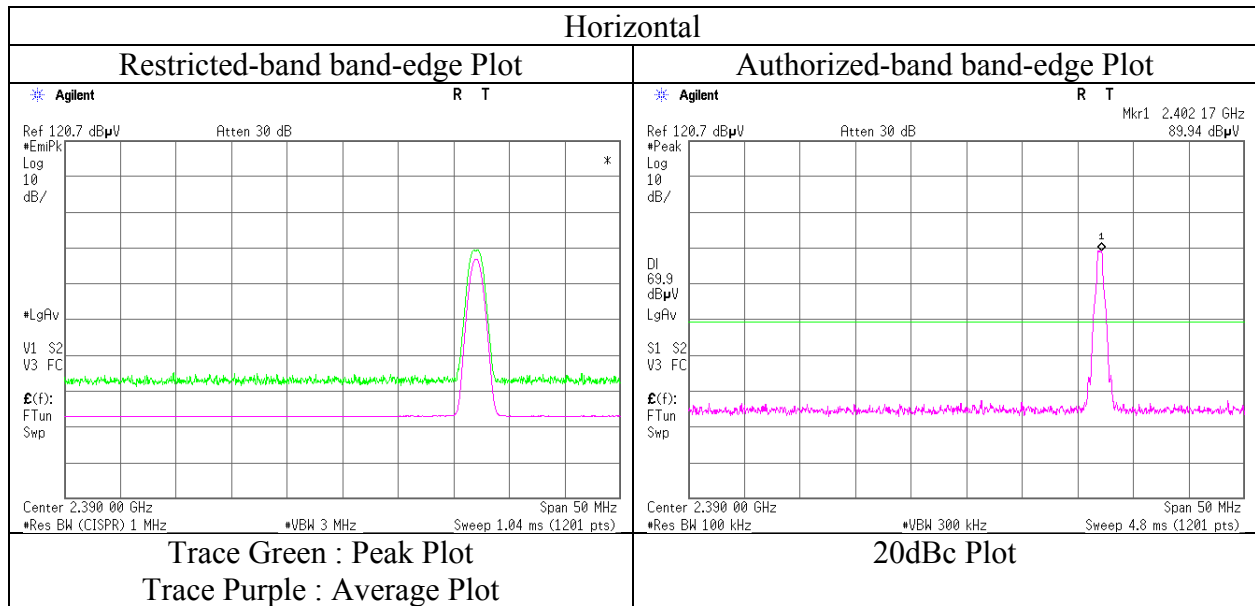
20dBc Data Sheet

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	89.9	26.7	6.9	32.7	90.8	-	-	Carrier
Hori	2400.000	PK	36.7	26.7	6.9	32.7	37.6	70.8	33.2	
Vert	2402.000	PK	89.7	26.7	6.9	32.7	90.6	-	-	Carrier
Vert	2400.000	PK	37.2	26.7	6.9	32.7	38.1	70.6	32.5	

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11463343H
Date	December 12, 2016
Temperature / Humidity	21 deg. C / 38 % RH
Engineer	Takumi Shimada (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.

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11463343H
Date : December 12, 2016 December 13, 2016 December 14, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 23 deg. C / 40 % RH 20 deg. C / 40 % RH
Engineer : Takumi Shimada Takumi Shimada Shuichi Ohyama
(1 GHz -10 GHz) (Above 10 GHz) (Below 1 GHz)
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	49.147	QP	30.2	11.1	7.4	28.1	20.6	40.0	19.4	
Hori	58.617	QP	25.4	7.9	7.6	28.1	12.8	40.0	27.2	
Hori	150.784	QP	26.3	15.1	8.7	27.7	22.4	43.5	21.1	
Hori	333.066	QP	33.0	14.3	10.2	27.4	30.1	46.0	15.9	
Hori	405.500	QP	30.8	15.7	10.7	27.8	29.4	46.0	16.6	
Hori	487.502	QP	32.1	17.4	11.3	28.1	32.7	46.0	13.3	
Hori	4882.000	PK	40.7	31.3	9.1	31.7	49.4	73.9	24.5	
Hori	7323.000	PK	40.0	35.6	10.3	32.6	53.3	73.9	20.6	Floor noise
Hori	9764.000	PK	41.7	37.2	11.0	33.3	56.6	73.9	17.3	Floor noise
Hori	4882.000	AV	29.2	31.3	9.1	31.7	37.9	53.9	16.0	
Hori	7323.000	AV	28.7	35.6	10.3	32.6	42.0	53.9	11.9	Floor noise
Hori	9764.000	AV	30.3	37.2	11.0	33.3	45.2	53.9	8.7	Floor noise
Vert	49.147	QP	34.4	11.1	7.4	28.1	24.8	40.0	15.2	
Vert	58.617	QP	24.8	7.9	7.6	28.1	12.2	40.0	27.8	
Vert	150.784	QP	24.8	15.1	8.7	27.7	20.9	43.5	22.6	
Vert	333.066	QP	28.7	14.3	10.2	27.4	25.8	46.0	20.2	
Vert	405.500	QP	26.9	15.7	10.7	27.8	25.5	46.0	20.5	
Vert	487.502	QP	32.0	17.4	11.3	28.1	32.6	46.0	13.4	
Vert	4882.000	PK	41.4	31.3	9.1	31.7	50.1	73.9	23.8	
Vert	7323.000	PK	40.5	35.6	10.3	32.6	53.8	73.9	20.1	Floor noise
Vert	9764.000	PK	41.4	37.2	11.0	33.3	56.3	73.9	17.6	Floor noise
Vert	4882.000	AV	29.1	31.3	9.1	31.7	37.8	53.9	16.1	
Vert	7323.000	AV	28.6	35.6	10.3	32.6	41.9	53.9	12.0	Floor noise
Vert	9764.000	AV	30.1	37.2	11.0	33.3	45.0	53.9	8.9	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 $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11463343H
Date : December 12, 2016 December 13, 2016 December 14, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 23 deg. C / 40 % RH 20 deg. C / 40 % RH
Engineer : Takumi Shimada Takumi Shimada Shuichi Ohyama
(1 GHz - 10 GHz) (Above 10 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]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.147	QP	30.0	11.1	7.4	28.1	20.4	40.0	19.6	
Hori	58.050	QP	25.0	8.1	7.6	28.1	12.6	40.0	27.4	
Hori	150.700	QP	26.8	15.1	8.7	27.7	22.9	43.5	20.6	
Hori	333.068	QP	33.1	14.3	10.2	27.4	30.2	46.0	15.8	
Hori	405.500	QP	30.0	15.7	10.7	27.8	28.6	46.0	17.4	
Hori	487.512	QP	30.9	17.4	11.3	28.1	31.5	46.0	14.5	
Hori	2483.500	PK	43.7	26.8	7.0	32.6	44.9	73.9	29.0	
Hori	4960.000	PK	42.2	31.5	9.1	31.7	51.1	73.9	22.8	
Hori	7440.000	PK	42.1	35.5	10.4	32.7	55.3	73.9	18.6	Floor noise
Hori	9920.000	PK	45.3	37.2	11.1	33.4	60.2	73.9	13.7	Floor noise
Hori	2483.500	AV	30.1	26.8	7.0	32.6	31.3	53.9	22.6	
Hori	4960.000	AV	32.3	31.5	9.1	31.7	41.2	53.9	12.7	
Hori	7440.000	AV	30.5	35.5	10.4	32.7	43.7	53.9	10.2	Floor noise
Hori	9920.000	AV	31.9	37.2	11.1	33.4	46.8	53.9	7.1	Floor noise
Vert	49.147	QP	34.5	11.1	7.4	28.1	24.9	40.0	15.1	
Vert	58.050	QP	25.2	8.1	7.6	28.1	12.8	40.0	27.2	
Vert	150.700	QP	24.7	15.1	8.7	27.7	20.8	43.5	22.7	
Vert	333.068	QP	28.8	14.3	10.2	27.4	25.9	46.0	20.1	
Vert	405.500	QP	26.9	15.7	10.7	27.8	25.5	46.0	20.5	
Vert	487.512	QP	29.4	17.4	11.3	28.1	30.0	46.0	16.0	
Vert	2483.500	PK	42.5	26.8	7.0	32.6	43.7	73.9	30.2	
Vert	4960.000	PK	44.8	31.5	9.1	31.7	53.7	73.9	20.2	
Vert	7440.000	PK	41.3	35.5	10.4	32.7	54.5	73.9	19.4	Floor noise
Vert	9920.000	PK	42.5	37.2	11.1	33.4	57.4	73.9	16.5	Floor noise
Vert	2483.500	AV	29.9	26.8	7.0	32.6	31.1	53.9	22.8	
Vert	4960.000	AV	36.7	31.5	9.1	31.7	45.6	53.9	8.3	
Vert	7440.000	AV	29.0	35.5	10.4	32.7	42.2	53.9	11.7	Floor noise
Vert	9920.000	AV	30.5	37.2	11.1	33.4	45.4	53.9	8.5	Floor noise

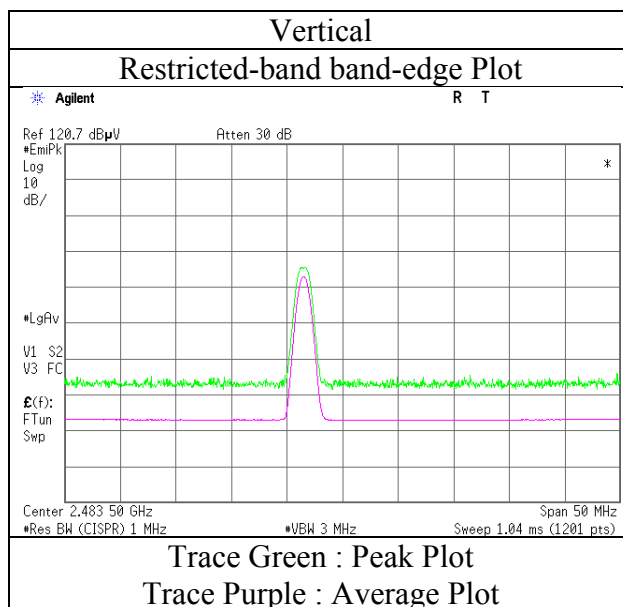
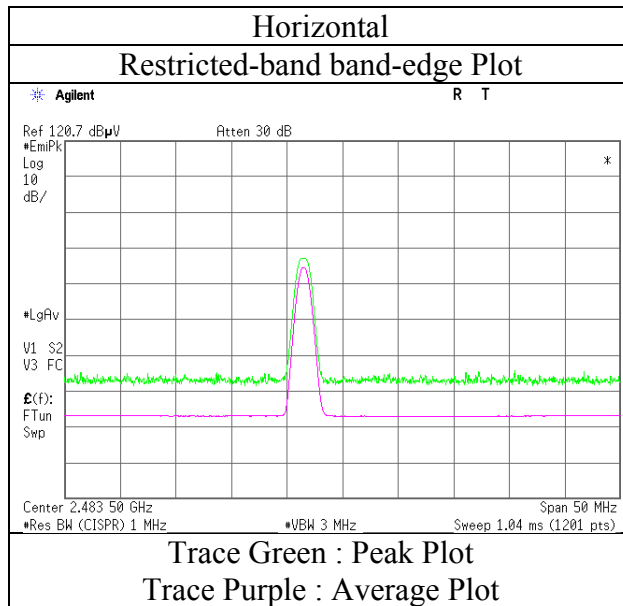
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11463343H
Date	December 12, 2016
Temperature / Humidity	21 deg. C / 38 % RH
Engineer	Takumi Shimada (1 GHz -10 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11463343H
Date : December 12, 2016 December 13, 2016 December 14, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 23 deg. C / 40 % RH 20 deg. C / 40 % RH
Engineer : Takumi Shimada Takumi Shimada Shuichi Ohyama
(1 GHz - 10 GHz) (Above 10 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	49.147	QP	30.2	11.1	7.4	28.1	20.6	40.0	19.4	
Hori	58.987	QP	29.3	7.8	7.6	28.1	16.6	40.0	23.4	
Hori	150.700	QP	26.0	15.1	8.7	27.7	22.1	43.5	21.4	
Hori	333.068	QP	33.2	14.3	10.2	27.4	30.3	46.0	15.7	
Hori	341.249	QP	35.7	14.4	10.3	27.4	33.0	46.0	13.0	
Hori	487.502	QP	30.7	17.4	11.3	28.1	31.3	46.0	14.7	
Hori	2390.000	PK	43.3	26.7	6.9	32.7	44.2	73.9	29.7	
Hori	4804.000	PK	43.4	31.0	9.1	31.8	51.7	73.9	22.2	
Hori	7206.000	PK	40.6	35.7	10.4	32.6	54.1	73.9	19.8	Floor noise
Hori	9608.000	PK	42.5	37.2	11.0	33.2	57.5	73.9	16.4	Floor noise
Hori	2390.000	AV	29.9	26.7	6.9	32.7	30.8	53.9	23.1	
Hori	4804.000	AV	31.0	31.0	9.1	31.8	39.3	53.9	14.6	
Hori	7206.000	AV	28.0	35.7	10.4	32.6	41.5	53.9	12.4	Floor noise
Hori	9608.000	AV	28.7	37.2	11.0	33.2	43.7	53.9	10.2	Floor noise
Vert	49.147	QP	34.7	11.1	7.4	28.1	25.1	40.0	14.9	
Vert	58.987	QP	28.9	7.8	7.6	28.1	16.2	40.0	23.8	
Vert	150.700	QP	25.2	15.1	8.7	27.7	21.3	43.5	22.2	
Vert	333.068	QP	28.6	14.3	10.2	27.4	25.7	46.0	20.3	
Vert	341.249	QP	32.1	14.4	10.3	27.4	29.4	46.0	16.6	
Vert	487.502	QP	29.3	17.4	11.3	28.1	29.9	46.0	16.1	
Vert	2390.000	PK	43.2	26.7	6.9	32.7	44.1	73.9	29.8	
Vert	4804.000	PK	44.0	31.0	9.1	31.8	52.3	73.9	21.6	
Vert	7206.000	PK	42.5	35.7	10.4	32.6	56.0	73.9	17.9	Floor noise
Vert	9608.000	PK	43.4	37.2	11.0	33.2	58.4	73.9	15.5	Floor noise
Vert	2390.000	AV	29.8	26.7	6.9	32.7	30.7	53.9	23.2	
Vert	4804.000	AV	32.8	31.0	9.1	31.8	41.1	53.9	12.8	
Vert	7206.000	AV	29.1	35.7	10.4	32.6	42.6	53.9	11.3	Floor noise
Vert	9608.000	AV	30.6	37.2	11.0	33.2	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 $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

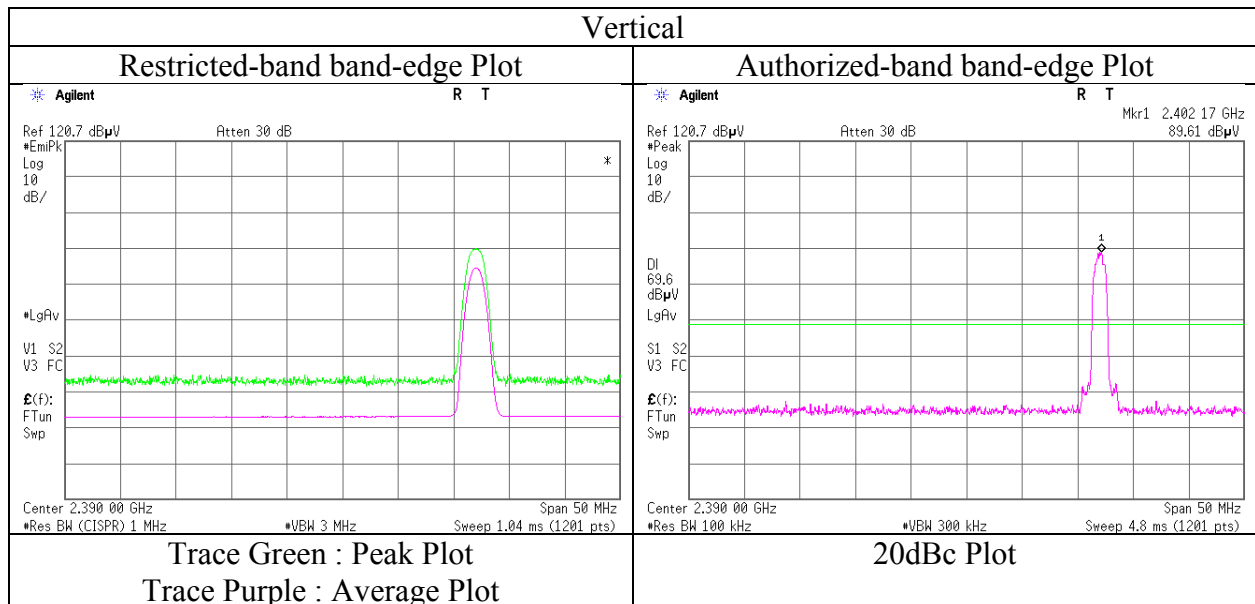
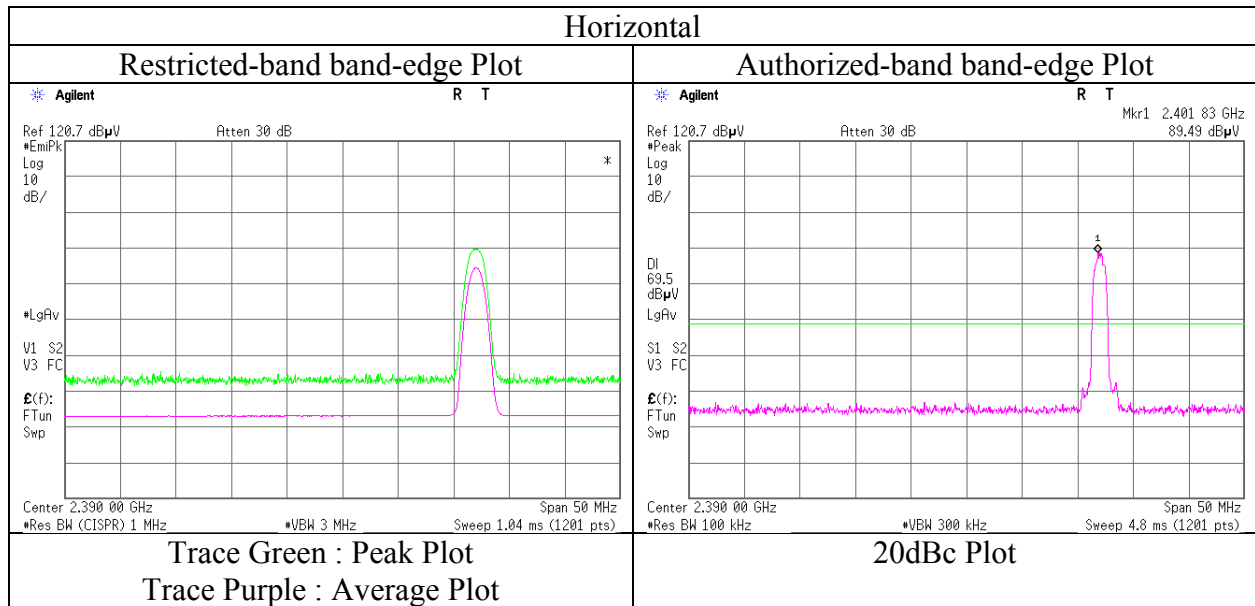
20dBc Data Sheet

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	89.4	26.7	6.9	32.7	90.3	-	-	Carrier
Hori	2400.000	PK	37.4	26.7	6.9	32.7	38.3	70.3	32.0	
Vert	2402.000	PK	89.6	26.7	6.9	32.7	90.5	-	-	Carrier
Vert	2400.000	PK	37.4	26.7	6.9	32.7	38.3	70.5	32.2	

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11463343H
Date	December 12, 2016
Temperature / Humidity	21 deg. C / 38 % RH
Engineer	Takumi Shimada (1 GHz -10 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

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Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11463343H		
Date	December 12, 2016	December 13, 2016	December 14, 2016
Temperature / Humidity	21 deg. C / 38 % RH	23 deg. C / 40 % RH	20 deg. C / 40 % RH
Engineer	Takumi Shimada (1 GHz -10 GHz)	Takumi Shimada (Above 10 GHz)	Shuichi Ohyama (Below 1 GHz)
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	49.147	QP	29.8	11.1	7.4	28.1	20.2	40.0	19.8	
Hori	58.617	QP	26.7	7.9	7.6	28.1	14.1	40.0	25.9	
Hori	150.700	QP	25.8	15.1	8.7	27.7	21.9	43.5	21.6	
Hori	333.069	QP	33.3	14.3	10.2	27.4	30.4	46.0	15.6	
Hori	341.244	QP	35.1	14.4	10.3	27.4	32.4	46.0	13.6	
Hori	487.502	QP	31.1	17.4	11.3	28.1	31.7	46.0	14.3	
Hori	4882.000	PK	41.2	31.3	9.1	31.7	49.9	73.9	24.0	
Hori	7323.000	PK	40.7	35.6	10.3	32.6	54.0	73.9	19.9	Floor noise
Hori	9764.000	PK	42.1	37.2	11.0	33.3	57.0	73.9	16.9	Floor noise
Hori	4882.000	AV	28.9	31.3	9.1	31.7	37.6	53.9	16.3	
Hori	7323.000	AV	28.3	35.6	10.3	32.6	41.6	53.9	12.3	Floor noise
Hori	9764.000	AV	28.9	37.2	11.0	33.3	43.8	53.9	10.1	Floor noise
Vert	49.147	QP	33.6	11.1	7.4	28.1	24.0	40.0	16.0	
Vert	58.617	QP	29.4	7.9	7.6	28.1	16.8	40.0	23.2	
Vert	150.700	QP	25.0	15.1	8.7	27.7	21.1	43.5	22.4	
Vert	333.069	QP	28.4	14.3	10.2	27.4	25.5	46.0	20.5	
Vert	341.244	QP	32.4	14.4	10.3	27.4	29.7	46.0	16.3	
Vert	487.502	QP	30.4	17.4	11.3	28.1	31.0	46.0	15.0	
Vert	4882.000	PK	41.1	31.3	9.1	31.7	49.8	73.9	24.1	
Vert	7323.000	PK	41.1	35.6	10.3	32.6	54.4	73.9	19.5	Floor noise
Vert	9764.000	PK	41.6	37.2	11.0	33.3	56.5	73.9	17.4	Floor noise
Vert	4882.000	AV	29.1	31.3	9.1	31.7	37.8	53.9	16.1	
Vert	7323.000	AV	28.6	35.6	10.3	32.6	41.9	53.9	12.0	Floor noise
Vert	9764.000	AV	29.0	37.2	11.0	33.3	43.9	53.9	10.0	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 $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11463343H
Date : December 12, 2016 December 13, 2016 December 14, 2016
Temperature / Humidity : 21 deg. C / 38 % RH 23 deg. C / 40 % RH 20 deg. C / 40 % RH
Engineer : Takumi Shimada Takumi Shimada Shuichi Ohyama
(1 GHz - 10 GHz) (Above 10 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	49.147	QP	29.5	11.1	7.4	28.1	19.9	40.0	20.1	
Hori	58.900	QP	27.8	7.8	7.6	28.1	15.1	40.0	24.9	
Hori	150.700	QP	26.3	15.1	8.7	27.7	22.4	43.5	21.1	
Hori	333.064	QP	33.3	14.3	10.2	27.4	30.4	46.0	15.6	
Hori	341.251	QP	34.2	14.4	10.3	27.4	31.5	46.0	14.5	
Hori	487.502	QP	31.0	17.4	11.3	28.1	31.6	46.0	14.4	
Hori	2483.500	PK	42.9	26.8	7.0	32.6	44.1	73.9	29.8	
Hori	4960.000	PK	42.1	31.5	9.1	31.7	51.0	73.9	22.9	
Hori	7440.000	PK	40.5	35.5	10.4	32.7	53.7	73.9	20.2	Floor noise
Hori	9920.000	PK	42.5	37.2	11.1	33.4	57.4	73.9	16.5	Floor noise
Hori	2483.500	AV	30.0	26.8	7.0	32.6	31.2	53.9	22.7	
Hori	4960.000	AV	30.8	31.5	9.1	31.7	39.7	53.9	14.2	
Hori	7440.000	AV	29.2	35.5	10.4	32.7	42.4	53.9	11.5	Floor noise
Hori	9920.000	AV	30.2	37.2	11.1	33.4	45.1	53.9	8.8	Floor noise
Vert	49.147	QP	34.0	11.1	7.4	28.1	24.4	40.0	15.6	
Vert	58.900	QP	27.5	7.8	7.6	28.1	14.8	40.0	25.2	
Vert	150.700	QP	25.6	15.1	8.7	27.7	21.7	43.5	21.8	
Vert	333.064	QP	28.8	14.3	10.2	27.4	25.9	46.0	20.1	
Vert	341.251	QP	30.0	14.4	10.3	27.4	27.3	46.0	18.7	
Vert	487.502	QP	30.4	17.4	11.3	28.1	31.0	46.0	15.0	
Vert	2483.500	PK	40.9	26.8	7.0	32.6	42.1	73.9	31.8	
Vert	4960.000	PK	44.6	31.5	9.1	31.7	53.5	73.9	20.4	
Vert	7440.000	PK	41.2	35.5	10.4	32.7	54.4	73.9	19.5	Floor noise
Vert	9920.000	PK	42.6	37.2	11.1	33.4	57.5	73.9	16.4	Floor noise
Vert	2483.500	AV	29.9	26.8	7.0	32.6	31.1	53.9	22.8	
Vert	4960.000	AV	34.8	31.5	9.1	31.7	43.7	53.9	10.2	
Vert	7440.000	AV	29.1	35.5	10.4	32.7	42.3	53.9	11.6	Floor noise
Vert	9920.000	AV	29.5	37.2	11.1	33.4	44.4	53.9	9.5	Floor noise

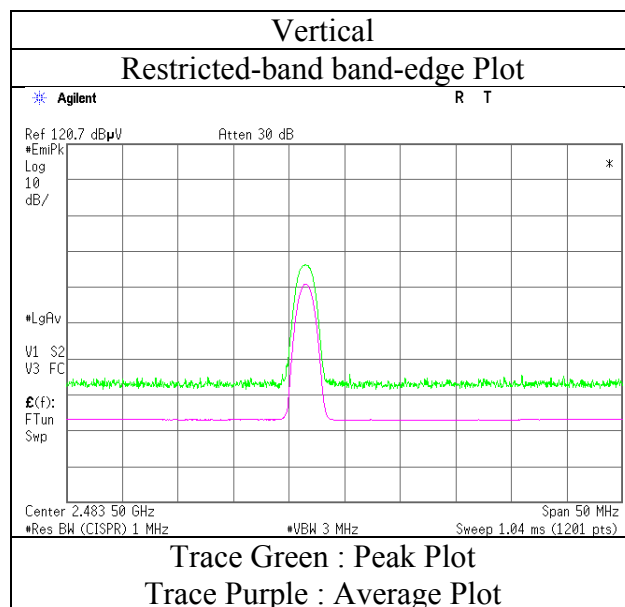
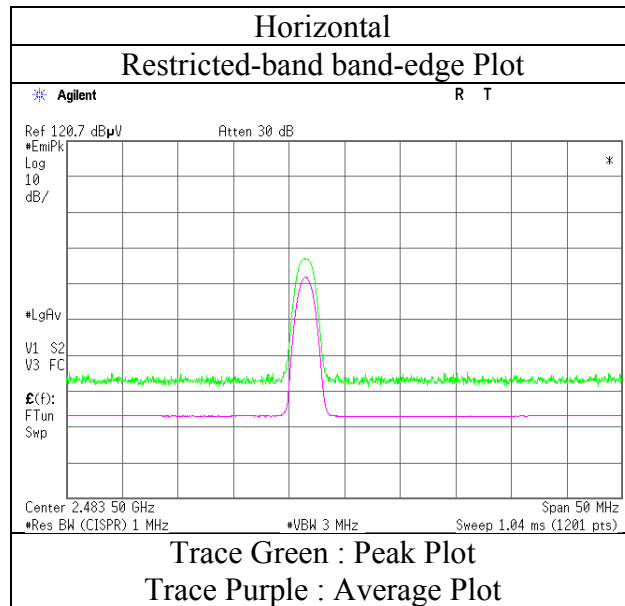
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11463343H
Date	December 12, 2016
Temperature / Humidity	21 deg. C / 38 % RH
Engineer	Takumi Shimada (1 GHz -10 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

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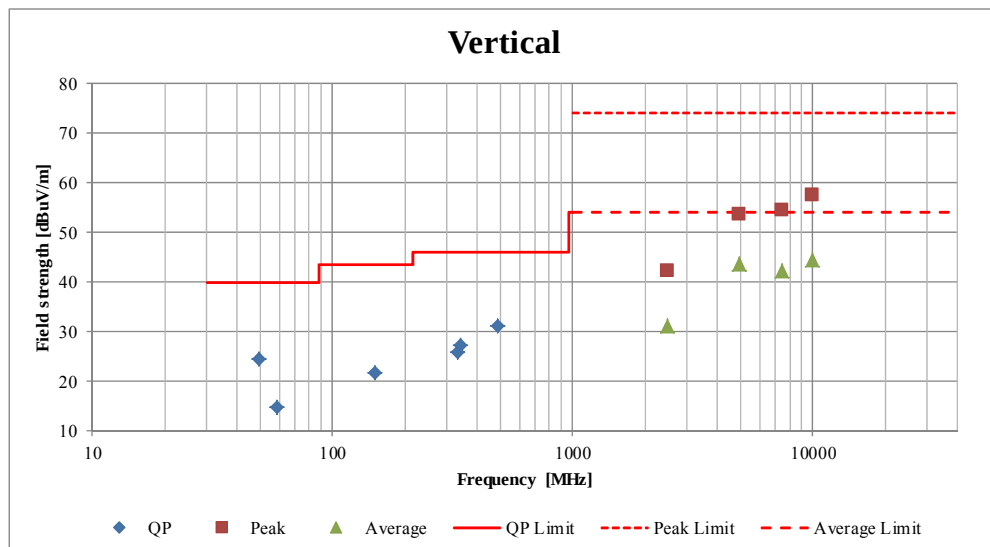
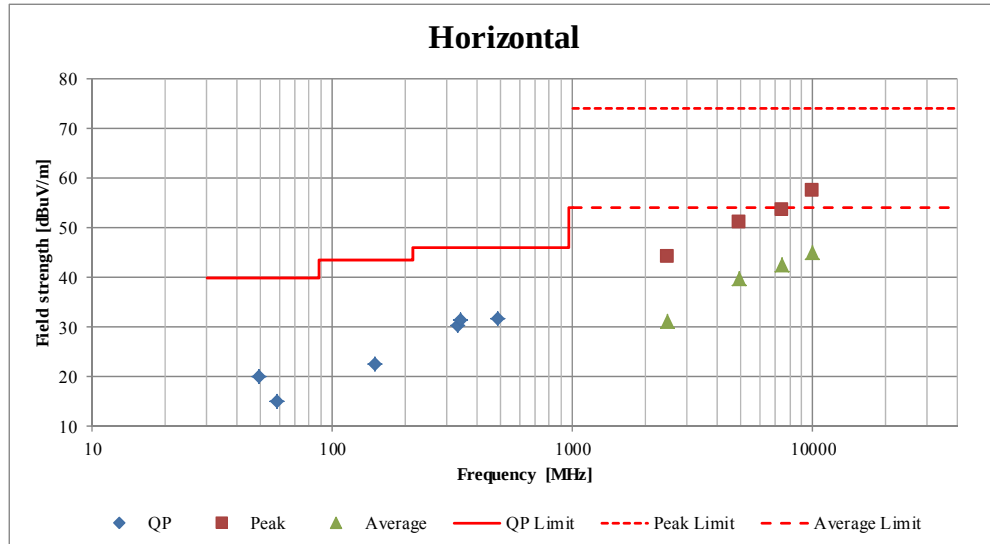
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Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11463343H		
Date	December 12, 2016	December 13, 2016	December 14, 2016
Temperature / Humidity	21 deg. C / 38 % RH	23 deg. C / 40 % RH	20 deg. C / 40 % RH
Engineer	Takumi Shimada (1 GHz -10 GHz)	Takumi Shimada (Above 10 GHz)	Shuichi Ohyama (Below 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz		

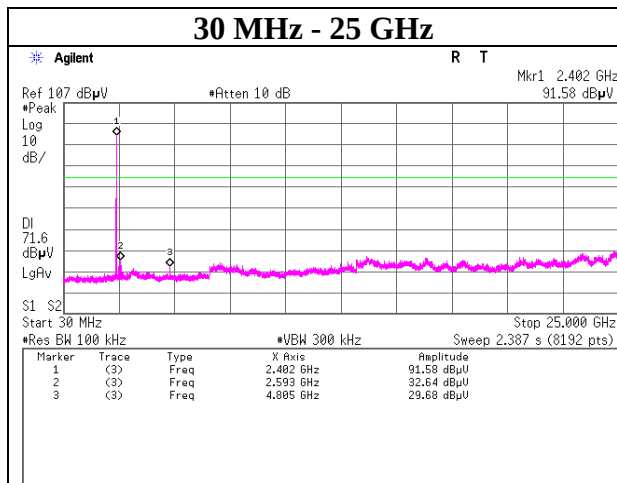
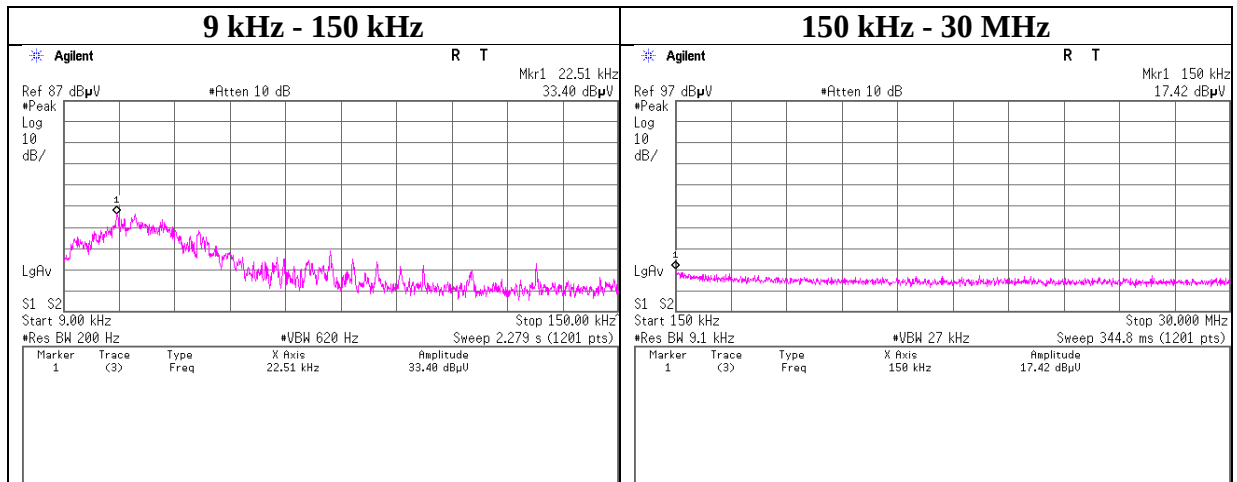


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11463343H
Date	December 19, 2016
Temperature / Humidity	24 deg. C / 26 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, DH5

2402 MHz



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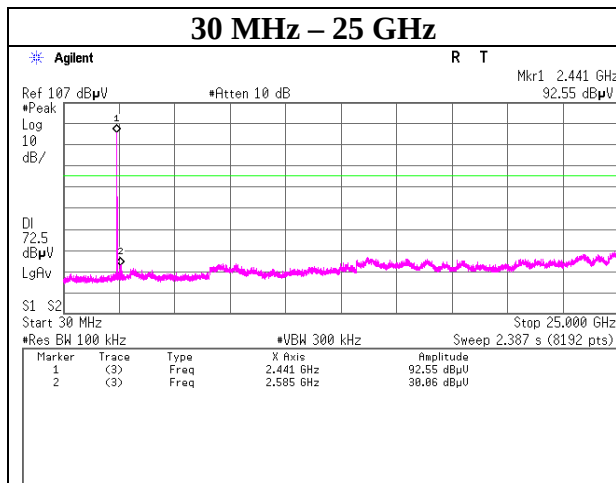
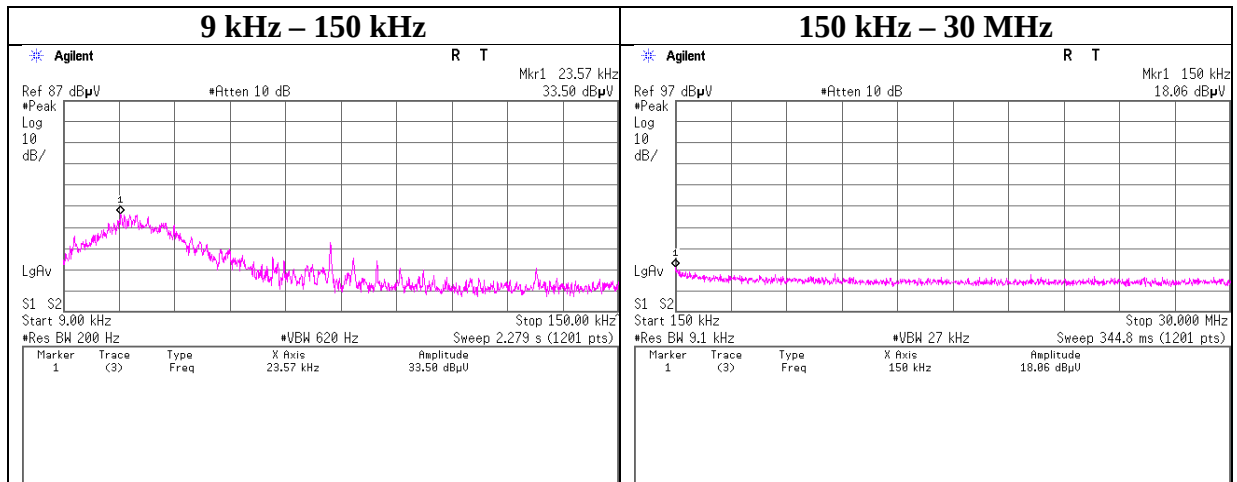
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, DH5

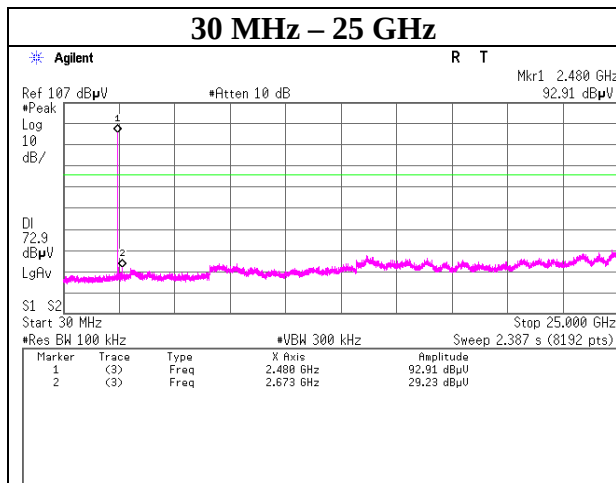
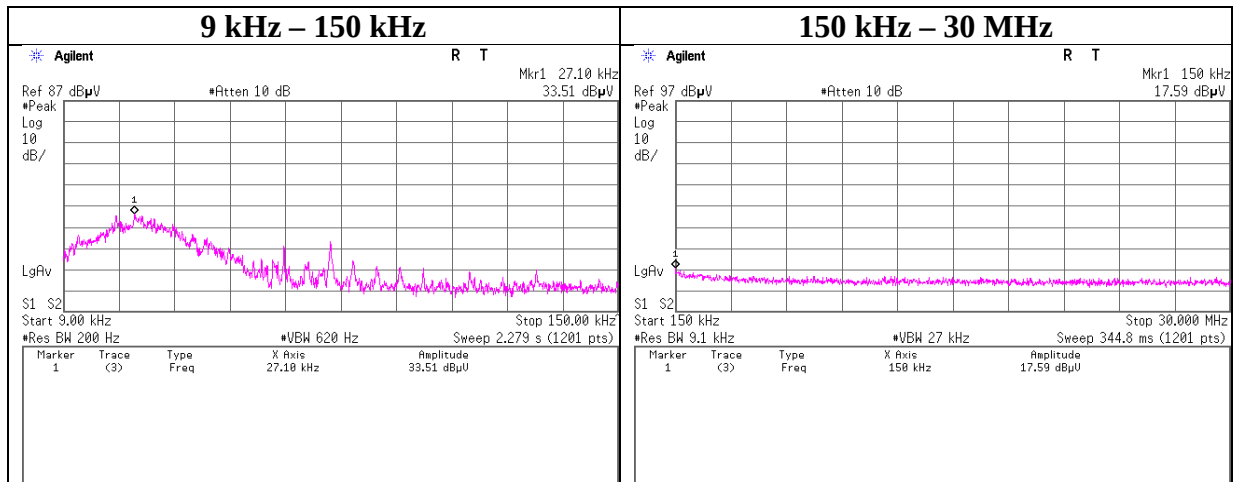
2441 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, DH5

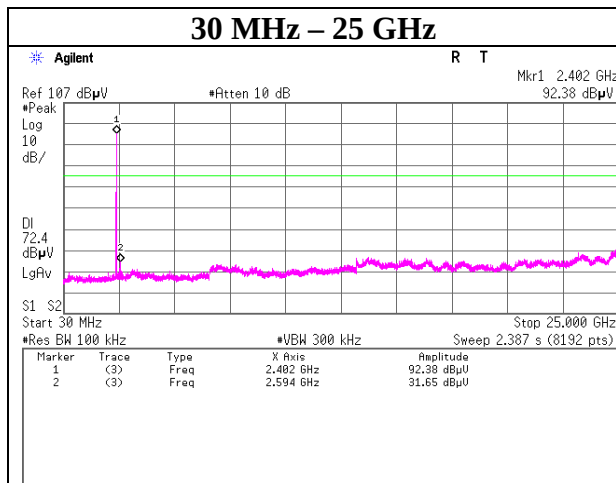
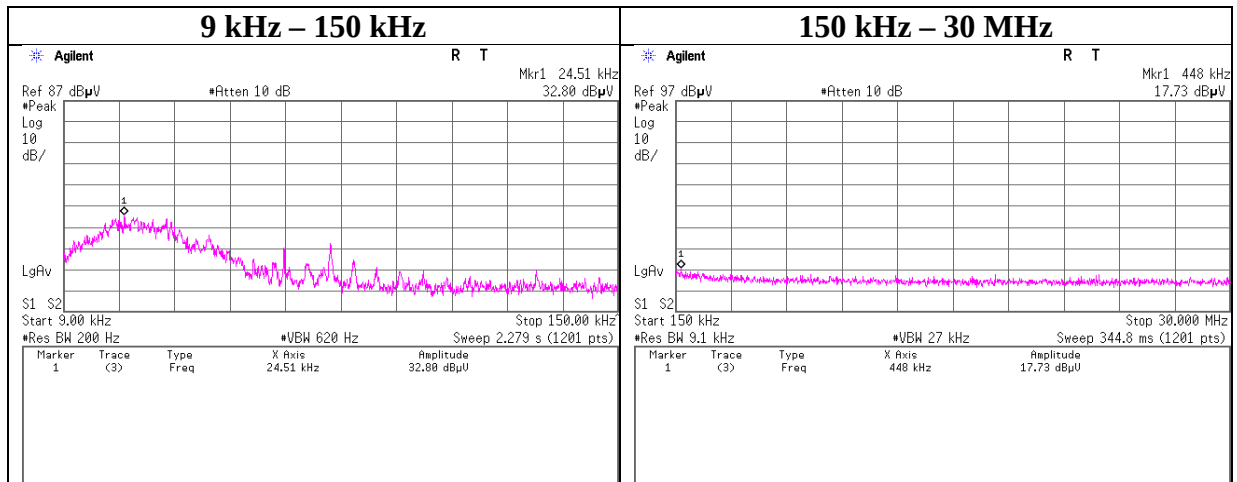
2480 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, 3DH5

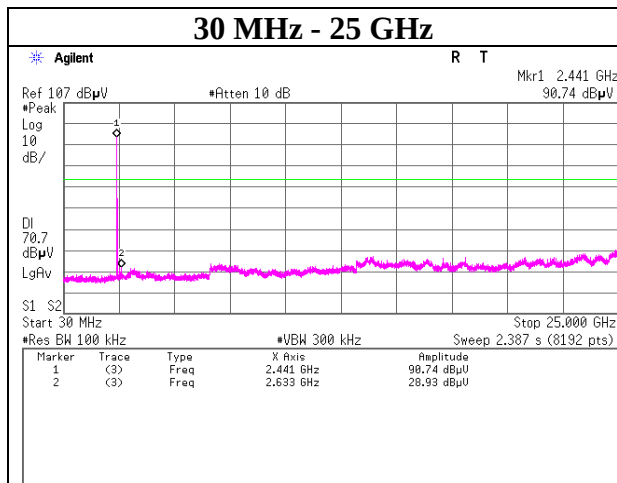
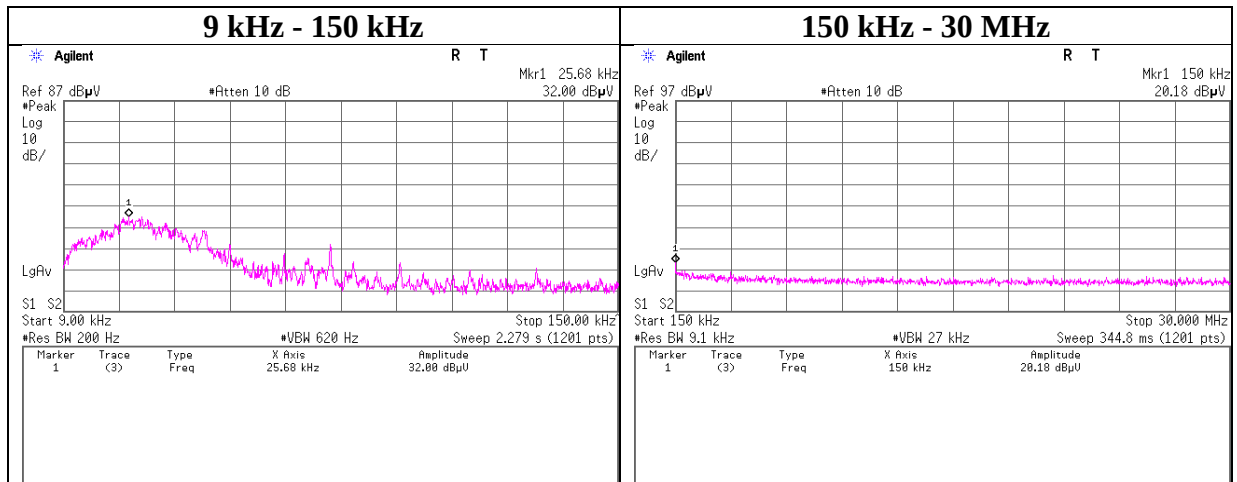
2402 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, 3DH5

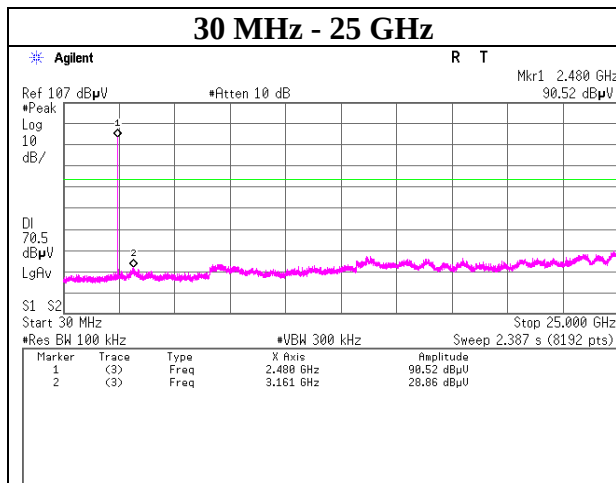
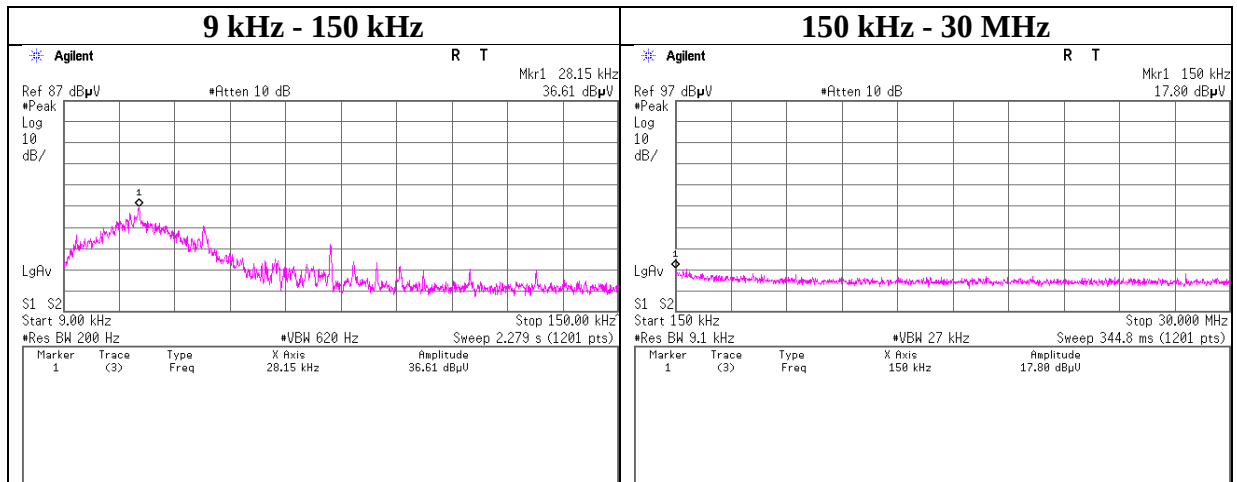
2441 MHz



Conducted Spurious Emission

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11463343H
Date December 19, 2016
Temperature / Humidity 24 deg. C / 26 % RH
Engineer Yutaka Yoshida
Mode Tx, Hopping Off, 3DH5

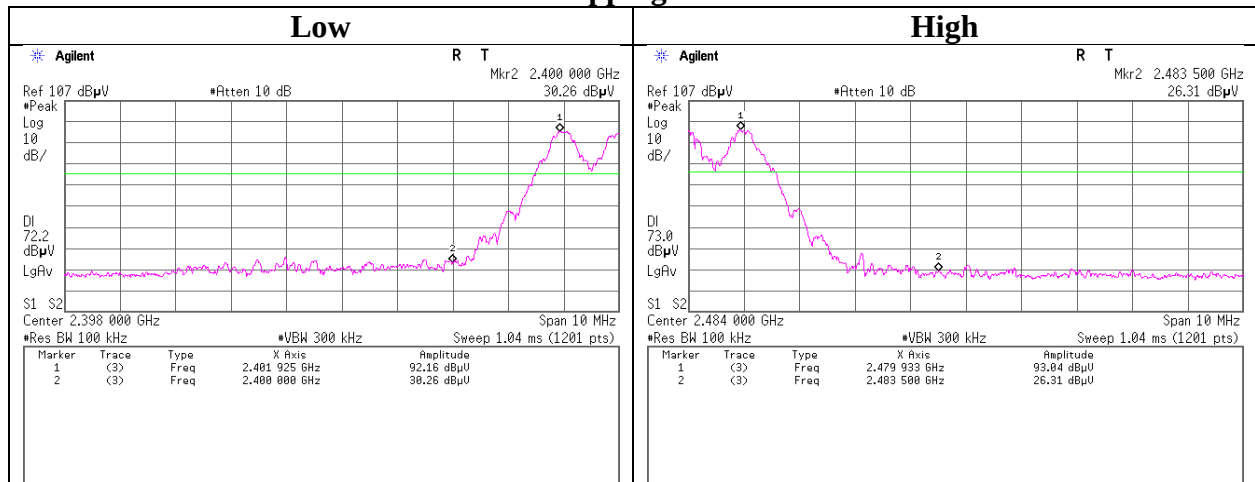
2480 MHz



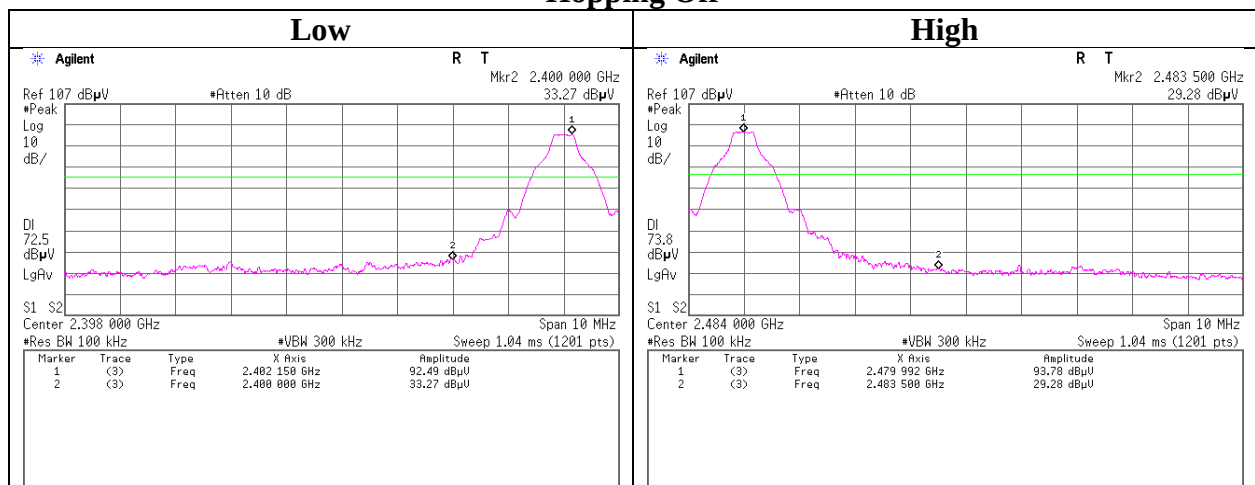
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx DH5

Hopping On



Hopping Off



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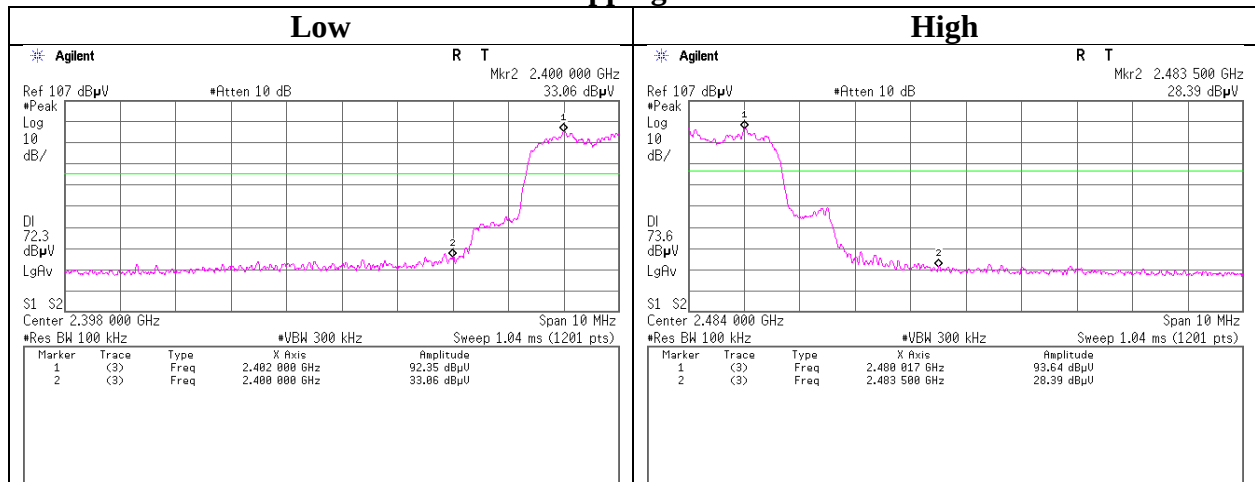
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

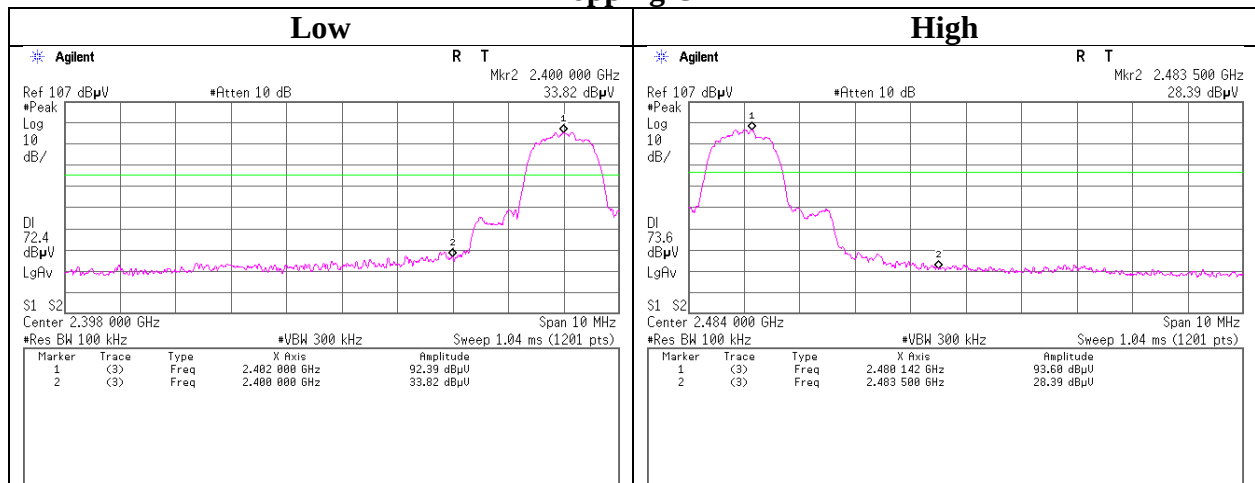
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11463343H
Date : December 19, 2016
Temperature / Humidity : 24 deg. C / 26 % RH
Engineer : Yutaka Yoshida
Mode : Tx 3DH5

Hopping On



Hopping Off



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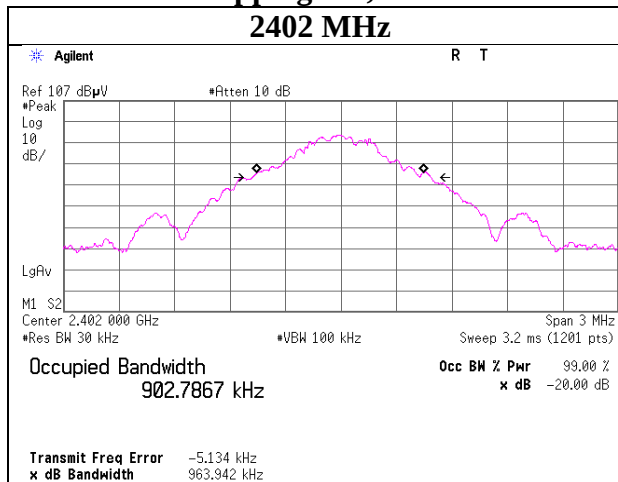
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

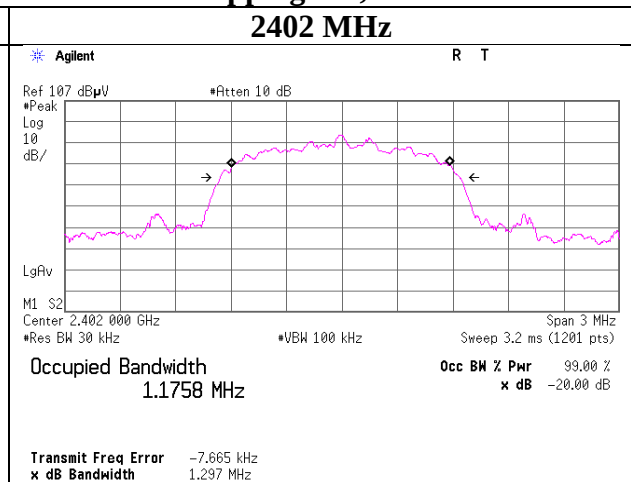
99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11463343H
Date	December 19, 2016
Temperature / Humidity	24 deg. C / 26 % RH
Engineer	Yutaka Yoshida
Mode	Tx Hopping Off

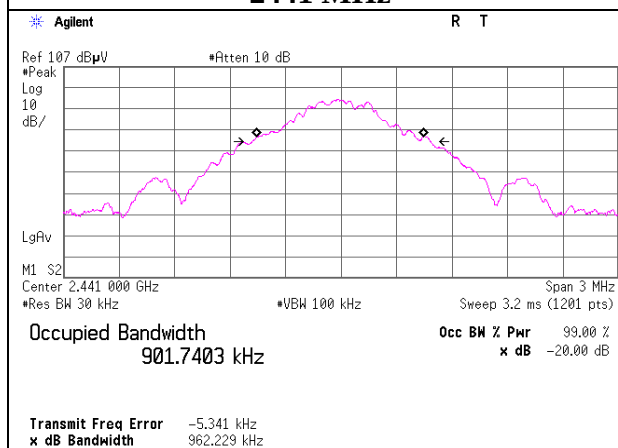
Hopping Off, DH5



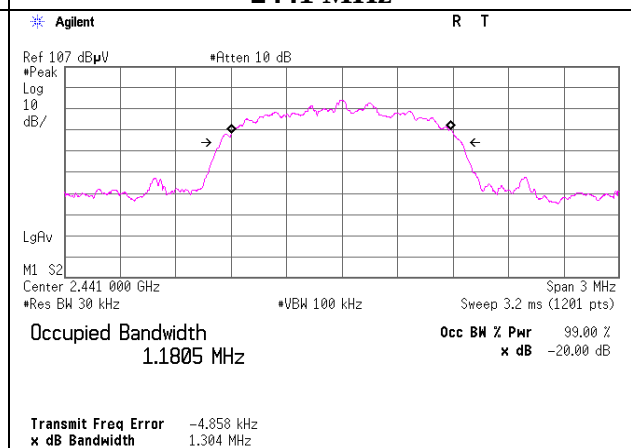
Hopping Off, 3DH5



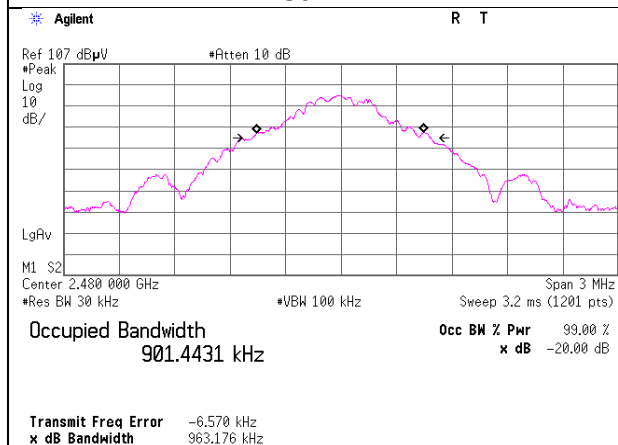
2441 MHz



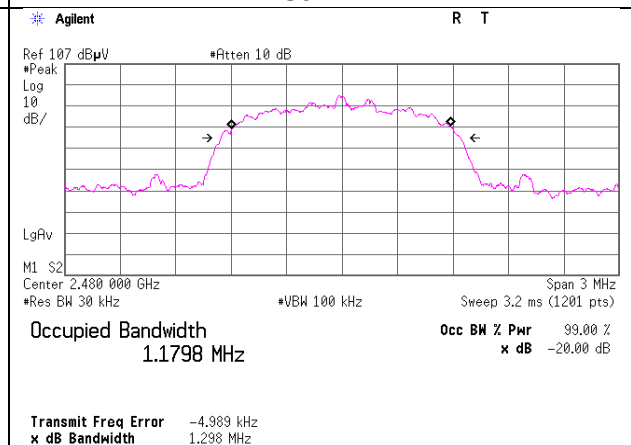
2441 MHz



2480 MHz



2480 MHz



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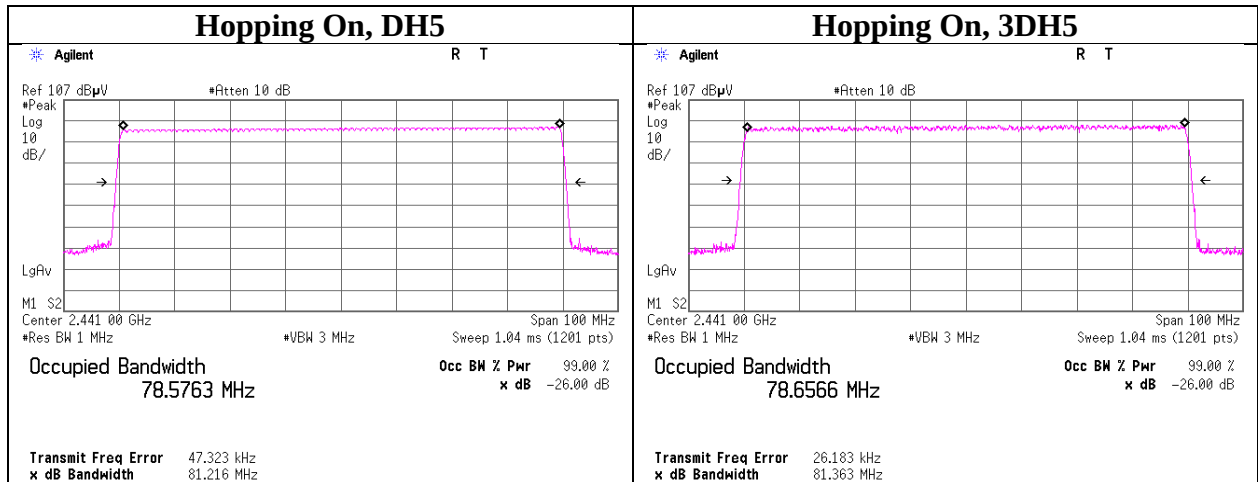
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11463343H
Date	December 19, 2016
Temperature / Humidity	24 deg. C / 26 % RH
Engineer	Yutaka Yoshida
Mode	Tx Hopping On



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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	2016/10/20 * 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-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2016/11/10 * 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
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	2016/09/21 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2016/05/29 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2016/09/15 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2016/10/15 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2016/07/26 * 12
MAT-98	Attenuator	KEYSIGHT	8491A	MY52462349	RE	2016/12/05 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2016/09/13 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2016/08/17 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2016/04/07 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2016/04/07 * 12
MCC-66	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28636/2	AT	2016/04/18 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2016/12/15 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2016/12/13 * 12
MMM-17	DIGITAL HiTESTER	Hioki	3805	070900530	AT	2016/01/13 * 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

UL Japan, Inc.

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