



RADIO TEST REPORT

Test Report No. : 11107782H-A

Applicant : FUJITSU TEN LIMITED
Type of Equipment : Car Audio
Model No. : FT0077A
FCC ID : BABFT0077A
Test regulation : FCC Part 15 Subpart C: 2015
Test Result : Complied

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

Date of test: January 20 to 25, 2016

Representative test engineer:


Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by:


Takahiro Hatakeda
Leader
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11107782H-A

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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.	:	FT0077A
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12.0 V
Receipt Date of Sample	:	December 24, 2015
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

General Specification

Clock frequency(ies) in the system	:	26 MHz, Main: 792 MHz, 1.833 MHz
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Radio Specification

[Bluetooth (Ver. 3.0 with EDR function)]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V
Antenna type	:	Surface Mountable Dielectric Chip Antenna
Antenna Gain	:	1.1dBi(MAX)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015
 *Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

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

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	-	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	5.3 dB 1920.023 MHz, AV, Horizontal.	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)

The EUT provides stable voltage (DC3.3V) 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.

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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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Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(+dB)		(10 m*)(+dB)	
	30 – 300 MHz	300 – 1000MHz	30 – 300 MHz	300 – 1000MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)(+dB)		(1 m*)(+dB)	(0.5 m*)(+dB)	(10 m*)(+dB)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.1 dB	5.3 dB	5.1 dB	5.1 dB	5.3 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	-	-

* 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)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On/Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping On/Off) 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 test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: Same as production model Software: Diag. mode(BT Certification mode) *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.		

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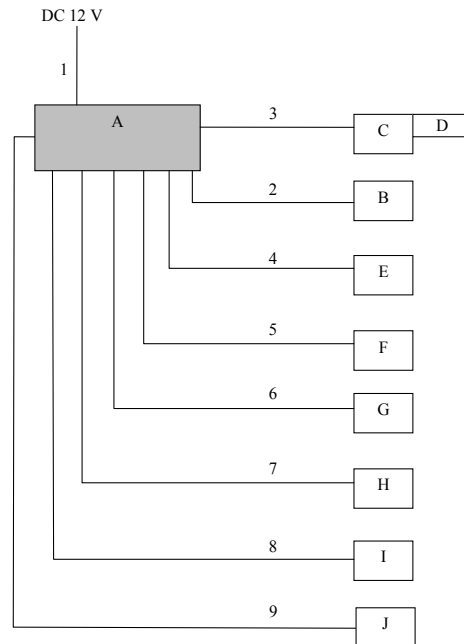
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4.2 Configuration and peripherals



* 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	FT0077A	MMA00049 *1) MMA00021 *2)	FUJITSU TEN LIMITED	EUT
B	Radio ANT-AMP	-	-	FUJITSU TEN LIMITED	-
C	USB Connector	86190-30020	10078	FUJITSU TEN LIMITED	-
D	USB Memory	PD07-WH	090000000014303	KINGMAX	-
E	Steering Switch	-	-	-	-
F	Camera	86790-58111	36C00633	-	-
G	Mic	-	-	-	-
H	Speaker	SGS-1601	153000-154	FUJITSU TEN LIMITED	-
I	Speaker	5GS-1630	153000-3500141	FUJITSU TEN LIMITED	-
J	Switch	-	-	-	-

*1) Used for Antenna Terminal conducted tests

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	4.0	Unshielded	Unshielded	-
2	FM/AM Antenna Cable	2.5	Shielded	Shielded	-
3	Signal Cable	2.0	Shielded	Shielded	-
4	Steering SW Cable	2.8	Unshielded	Unshielded	-
5	Camera Cable	2.8	Unshielded	Unshielded	-
6	Mic Cable	2.8	Unshielded	Unshielded	-
7	Speaker Cable	2.8	Unshielded	Unshielded	-
8	Speaker Cable	2.8	Unshielded	Unshielded	-
9	Signal Cable	2.8	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1GHz]

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 1GHz]

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 300 MHz	300 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	4.4 m*2) (below 10 GHz), 1 m*3) (above 10 GHz)		4.4 m*2) (below 10 GHz), 1 m*3) (above 10 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: $20 \times \log(4.4 \text{ m} / 3.0 \text{ m}) = 3.3 \text{ dB}$

*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 M - 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 *3)	-	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 *2)	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) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.

(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz)

*3) Reference data

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

Test data : APPENDIX

Test result : Pass

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APPENDIX 1: Test data

20dB Bandwidth and Carrier Frequency Separation

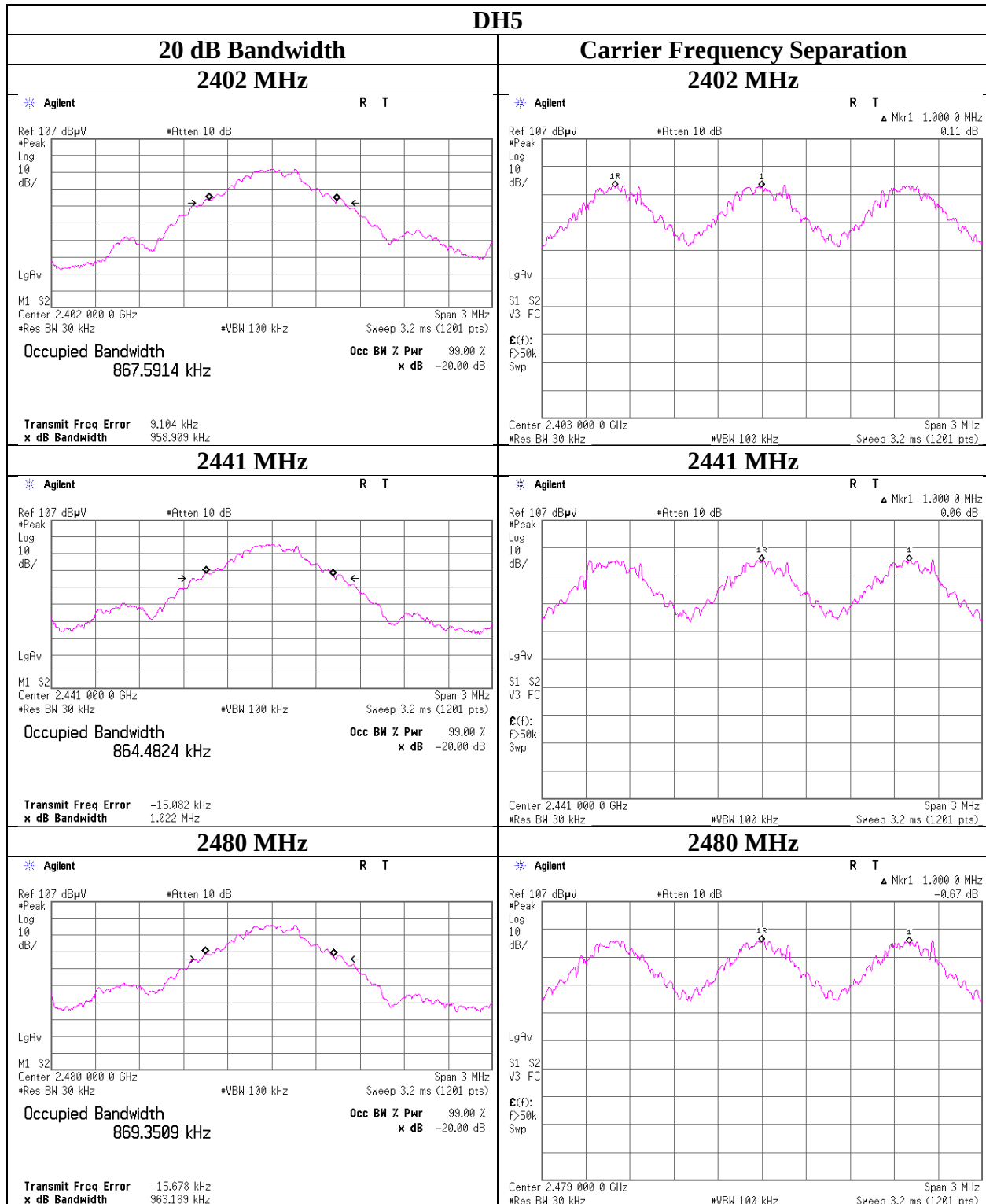
Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11107782H
Date January 20, 2016
Temperature / Humidity 21 deg. C / 27 % RH
Engineer Yutaka Yoshida
Mode Tx (Hopping on/off) DH5/3DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.959	1.000	≥ 0.639
DH5	2441.0	1.022	1.000	≥ 0.681
DH5	2480.0	0.963	1.000	≥ 0.642
3DH5	2402.0	1.287	1.000	≥ 0.858
3DH5	2441.0	1.287	1.000	≥ 0.858
3DH5	2480.0	1.285	1.000	≥ 0.857

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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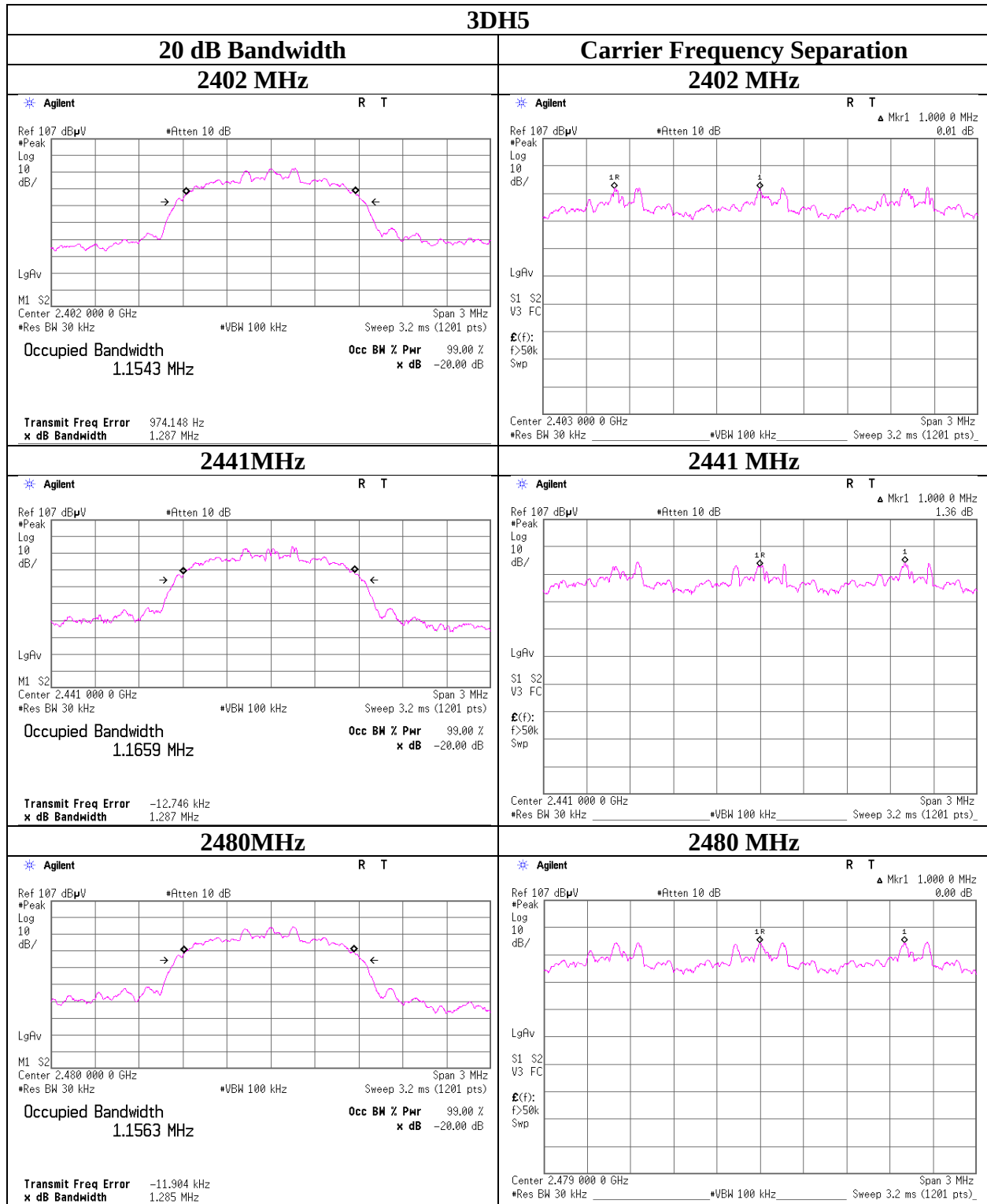
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20dB Bandwidth and Carrier Frequency Separation



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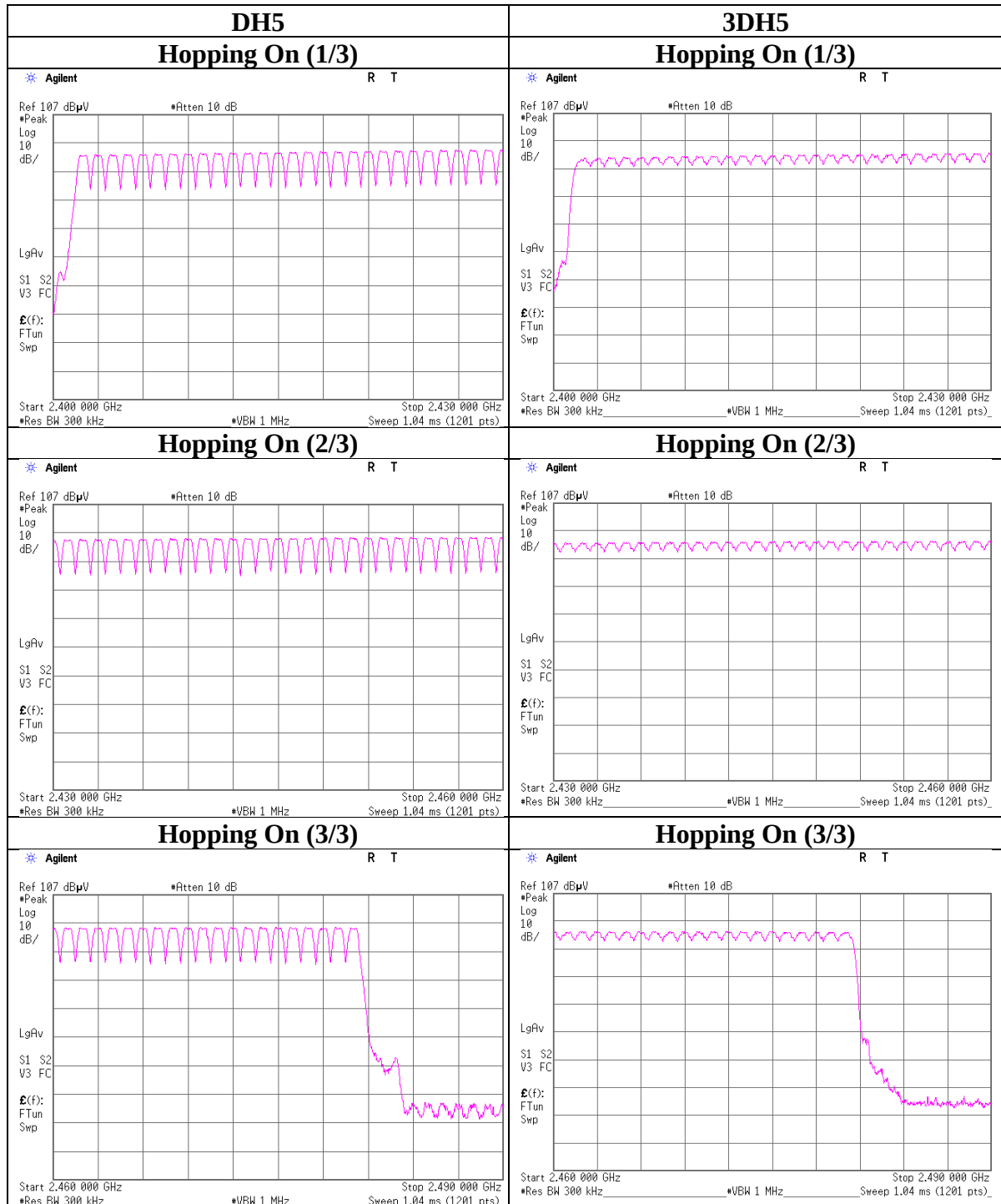
Number of Hopping Frequency

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11107782H
Date January 20, 2016
Temperature / Humidity 21 deg. C / 27 % 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.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % 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	50.6 times	/	5 sec.	x 31.6 sec. = 320 times	0.414	132	400
DH3	25.4 times	/	5 sec.	x 31.6 sec. = 161 times	1.680	270	400
DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.932	317	400
3DH1	50.8 times	/	5 sec.	x 31.6 sec. = 322 times	0.430	138	400
3DH3	25.4 times	/	5 sec.	x 31.6 sec. = 161 times	1.692	272	400
3DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.944	318	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

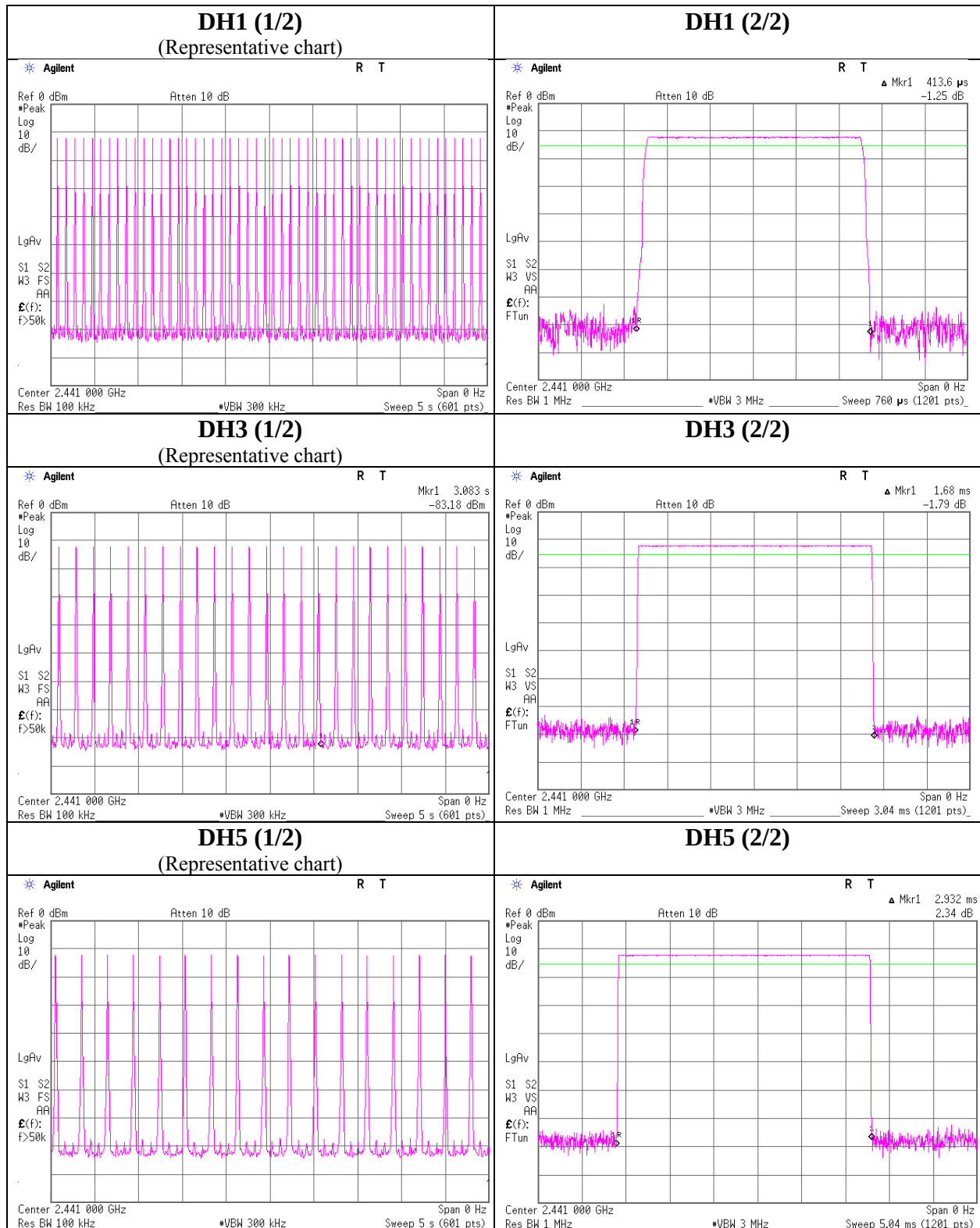
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	51	51	50	51	50.6
DH3	25	25	25	26	26	25.4
DH5	17	17	17	17	17	17
3DH1	51	50	51	51	51	50.8
3DH3	26	26	25	25	25	25.4
3DH5	17	17	17	17	17	17

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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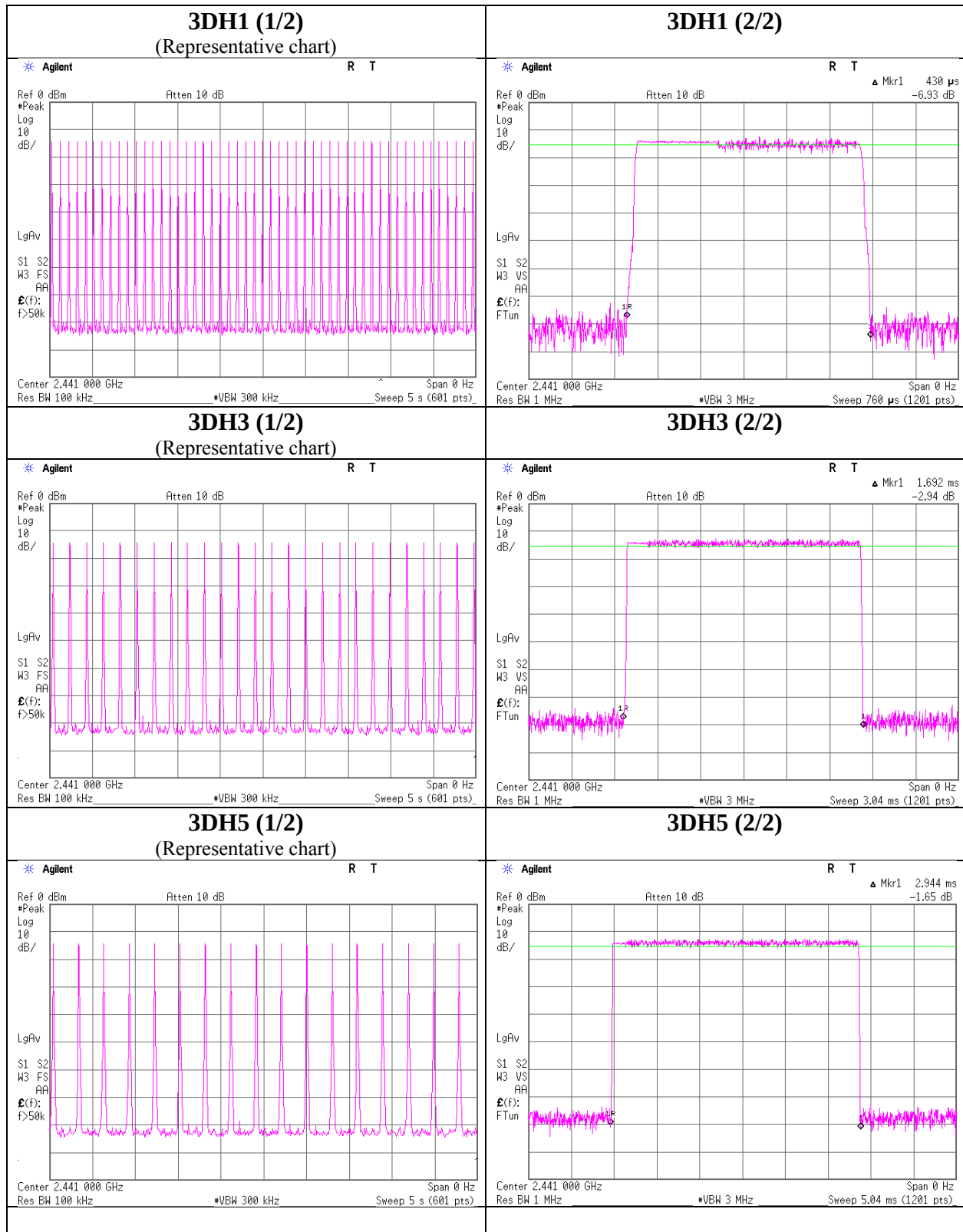
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Dwell time



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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % 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	-13.69	2.33	9.74	-1.62	0.69	20.96	125	22.58
DH5	2441.0	-11.64	2.34	9.74	0.45	1.11	20.96	125	20.51
DH5	2480.0	-11.23	2.35	9.74	0.87	1.22	20.96	125	20.09
2DH5	2402.0	-14.17	2.33	9.74	-2.10	0.62	20.96	125	23.06
2DH5	2441.0	-12.31	2.34	9.74	-0.22	0.95	20.96	125	21.18
2DH5	2480.0	-12.11	2.35	9.74	-0.01	1.00	20.96	125	20.97
3DH5	2402.0	-13.88	2.33	9.74	-1.81	0.66	20.96	125	22.77
3DH5	2441.0	-11.97	2.34	9.74	0.12	1.03	20.96	125	20.84
3DH5	2480.0	-11.70	2.35	9.74	0.40	1.10	20.96	125	20.56

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 / SAR testing)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-15.61	2.33	9.74	-3.54	0.44	1.10	-2.44	0.57
DH5	2441.0	-13.35	2.34	9.74	-1.26	0.75	1.10	-0.16	0.96
DH5	2480.0	-12.91	2.35	9.74	-0.81	0.83	1.10	0.29	1.07
2DH5	2402.0	-18.52	2.33	9.74	-6.45	0.23	1.08	-5.37	0.29
2DH5	2441.0	-16.42	2.34	9.74	-4.33	0.37	1.08	-3.25	0.47
2DH5	2480.0	-16.24	2.35	9.74	-4.14	0.39	1.08	-3.06	0.49
3DH5	2402.0	-18.49	2.33	9.74	-6.42	0.23	1.07	-5.35	0.29
3DH5	2441.0	-16.40	2.34	9.74	-4.31	0.37	1.07	-3.24	0.47
3DH5	2480.0	-16.22	2.35	9.74	-4.12	0.39	1.07	-3.05	0.50

Sample Calculation:

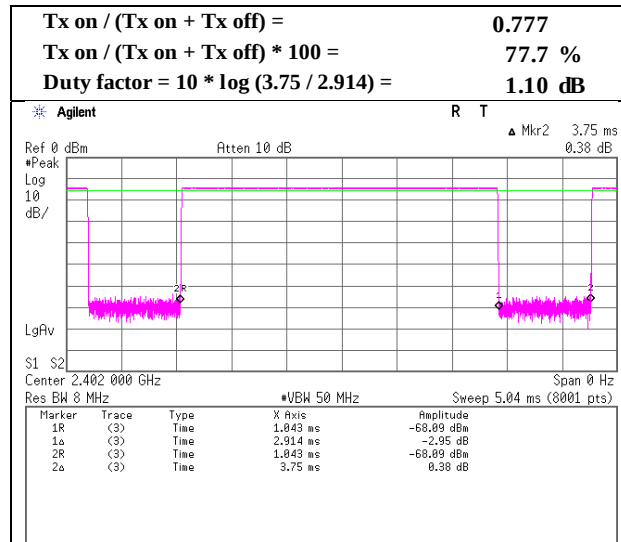
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power) = Frame power + Duty factor

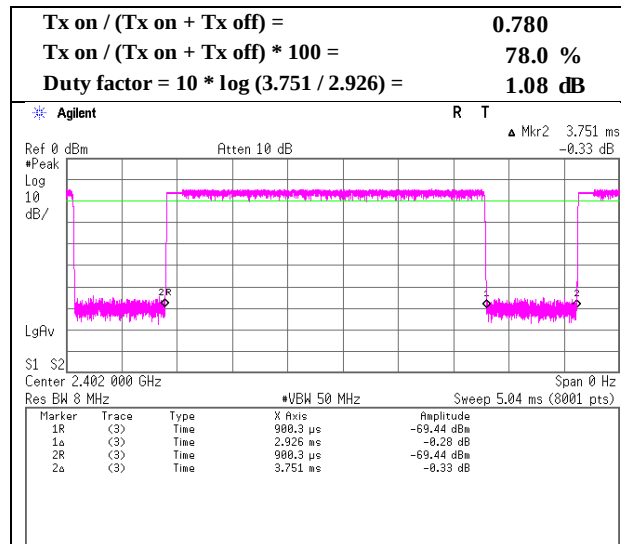
Burst Rate Confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off

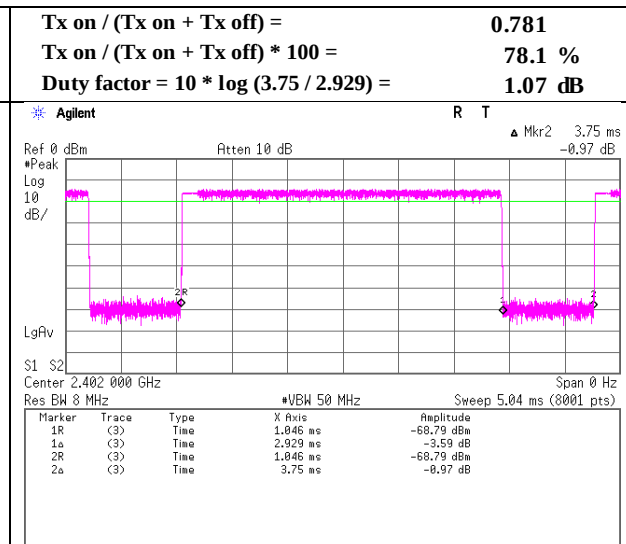
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11107782H
Date : January 23, 2016 January 24, 2016 January 25, 2016
Temperature / Humidity : 21deg. C / 31 % RH 20 deg. C / 27 % RH 23 deg. C / 38 % RH
Engineer : Keisuke Kawamura Yuta Moriya Koji Yamamoto
(1-10GHz) (10-26.5GHz) (Below 1GHz)
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	98.998	QP	30.5	9.6	8.0	32.2	15.9	43.5	27.6	
Hori	173.556	QP	26.2	15.9	8.8	32.2	18.7	43.5	24.8	
Hori	308.122	QP	32.0	14.8	10.0	32.0	24.8	46.0	21.2	
Hori	320.012	QP	32.5	15.2	10.1	32.0	25.8	46.0	20.2	
Hori	479.998	QP	33.6	17.8	11.1	32.1	30.4	46.0	15.6	
Hori	989.989	QP	27.7	23.3	13.7	30.6	34.1	53.9	19.8	
Hori	1920.079	PK	50.4	26.4	6.3	32.6	50.5	73.9	23.4	
Hori	2390.000	PK	42.5	26.9	6.6	32.0	44.0	73.9	29.9	
Hori	4804.000	PK	40.6	31.8	8.8	31.3	49.9	73.9	24.0	Floor Noise
Hori	7206.000	PK	42.6	36.0	10.0	32.0	56.6	73.9	17.4	Floor Noise
Hori	9608.000	PK	42.0	38.2	10.8	32.4	58.6	73.9	15.3	Floor Noise
Hori	1920.079	AV	46.8	26.4	6.3	32.6	46.9	53.9	7.0	
Hori	2390.000	AV	29.7	26.9	6.6	32.0	31.2	53.9	22.7	
Hori	4804.000	AV	29.2	31.8	8.8	31.3	38.5	53.9	15.4	Floor Noise
Hori	7206.000	AV	30.8	36.0	10.0	32.0	44.8	53.9	9.1	Floor Noise
Hori	9608.000	AV	30.7	38.2	10.8	32.4	47.3	53.9	6.7	Floor Noise
Vert	92.170	QP	31.2	8.5	7.9	32.2	15.4	43.5	28.1	
Vert	126.762	QP	27.3	13.0	8.3	32.2	16.4	43.5	27.1	
Vert	159.914	QP	26.6	15.4	8.7	32.2	18.5	43.5	25.0	
Vert	320.001	QP	28.4	15.2	10.1	32.0	21.7	46.0	24.3	
Vert	480.000	QP	30.0	17.8	11.1	32.1	26.8	46.0	19.2	
Vert	594.001	QP	32.1	19.3	11.7	32.1	31.0	46.0	15.0	
Vert	1920.079	PK	47.6	26.4	6.3	32.6	47.7	73.9	26.2	
Vert	2390.000	PK	43.1	26.9	6.6	32.0	44.6	73.9	29.3	
Vert	4804.000	PK	40.6	31.8	8.8	31.3	49.9	73.9	24.0	Floor Noise
Vert	7206.000	PK	42.0	36.0	10.0	32.0	56.0	73.9	17.9	Floor Noise
Vert	9608.000	PK	42.0	38.2	10.8	32.4	58.6	73.9	15.3	Floor Noise
Vert	1920.079	AV	42.6	26.4	6.3	32.6	42.7	53.9	11.2	
Vert	2390.000	AV	29.8	26.9	6.6	32.0	31.3	53.9	22.6	
Vert	4804.000	AV	29.2	31.8	8.8	31.3	38.5	53.9	15.4	Floor Noise
Vert	7206.000	AV	30.9	36.0	10.0	32.0	44.9	53.9	9.0	Floor Noise
Vert	9608.000	AV	30.7	38.2	10.8	32.4	47.3	53.9	6.6	Floor Noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 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	89.8	26.9	6.6	32.0	91.3	-	-	Carrier
Hori	2400.000	PK	41.6	26.9	6.6	32.0	43.1	71.3	28.2	
Vert	2402.000	PK	92.9	26.9	6.6	32.0	94.4	-	-	Carrier
Vert	2400.000	PK	44.4	26.9	6.6	32.0	45.9	74.4	28.5	

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

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

UL Japan, Inc.

Ise EMC Lab.

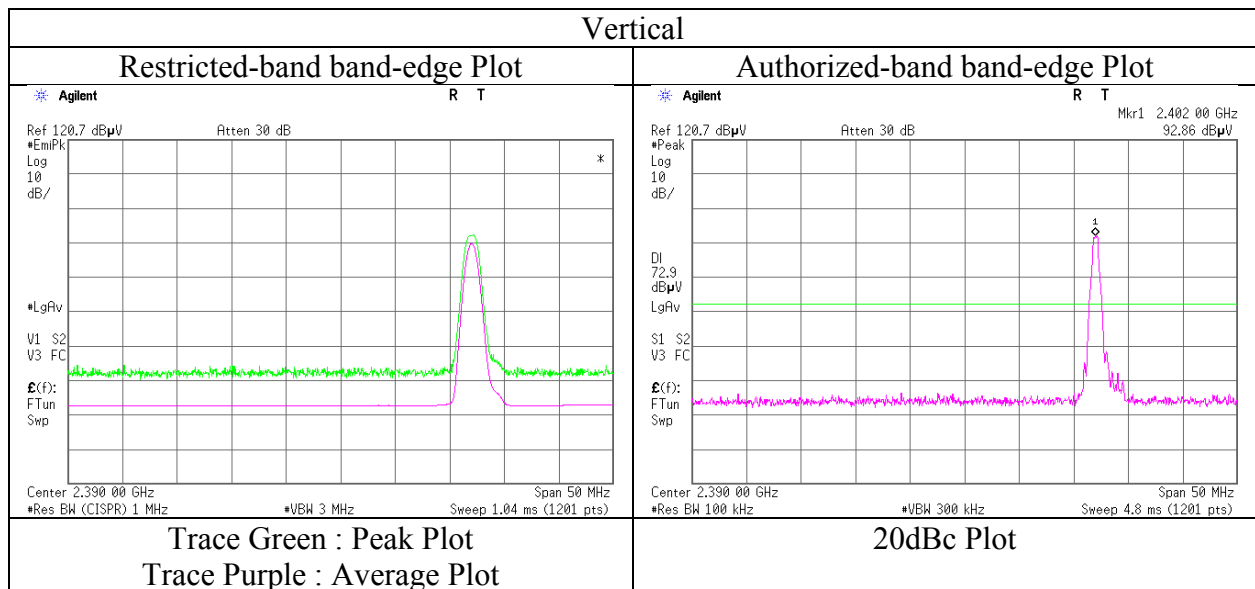
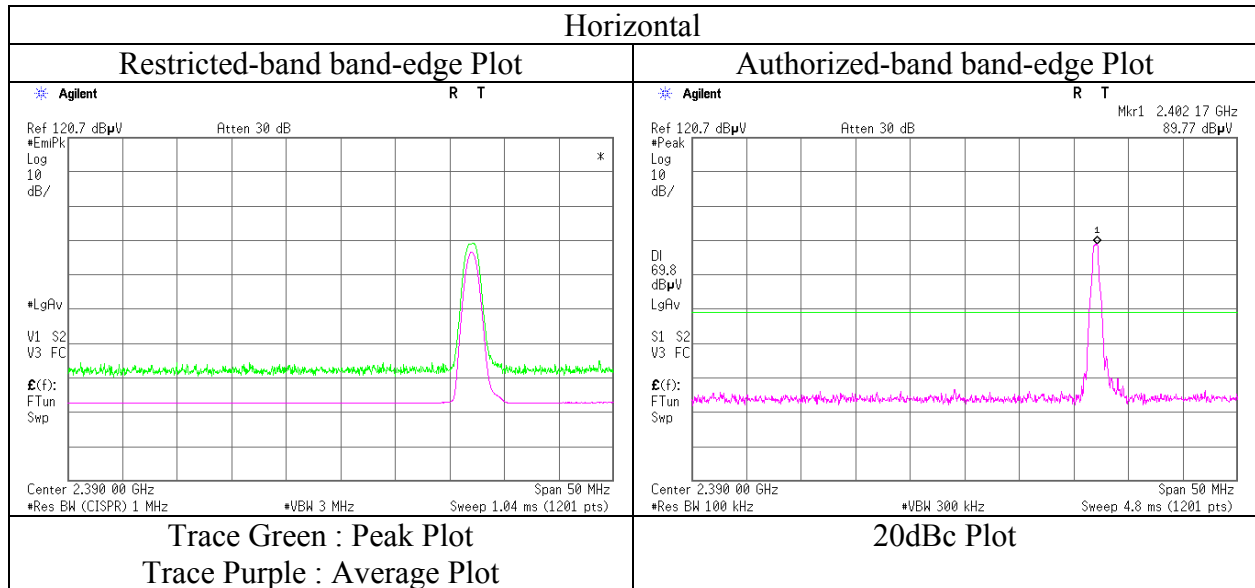
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11107782H
Date	January 23, 2016
Temperature / Humidity	21deg. C / 31 % RH
Engineer	Keisuke Kawamura (1-10GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11107782H		
Date	January 23, 2016	January 24, 2016	January 25, 2016
Temperature / Humidity	21deg. C / 31 % RH	20 deg. C / 27 % RH	23 deg. C / 38 % RH
Engineer	Keisuke Kawamura (1-10GHz)	Yuta Moriya (10-26.5GHz)	Koji Yamamoto (Below 1GHz)
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	98.998	QP	30.3	9.6	8.0	32.2	15.7	43.5	27.8	
Hori	173.556	QP	26.5	15.9	8.8	32.2	19.0	43.5	24.5	
Hori	308.095	QP	31.8	14.8	10.0	32.0	24.6	46.0	21.4	
Hori	320.008	QP	32.2	15.2	10.1	32.0	25.5	46.0	20.5	
Hori	479.998	QP	33.5	17.8	11.1	32.1	30.3	46.0	15.7	
Hori	990.011	QP	27.2	23.3	13.7	30.6	33.6	53.9	20.3	
Hori	1920.096	PK	50.3	26.4	6.3	32.6	50.4	73.9	23.5	
Hori	4882.000	PK	40.5	31.9	8.8	31.3	49.9	73.9	24.0	Floor Noise
Hori	7323.000	PK	42.0	36.0	10.1	32.0	56.1	73.9	17.8	Floor Noise
Hori	9764.000	PK	42.2	38.2	10.8	32.5	58.7	73.9	15.2	Floor Noise
Hori	1920.096	AV	47.6	26.4	6.3	32.6	47.7	53.9	6.2	
Hori	4882.000	AV	29.1	31.9	8.8	31.3	38.5	53.9	15.4	Floor Noise
Hori	7323.000	AV	30.6	36.0	10.1	32.0	44.7	53.9	9.2	Floor Noise
Hori	9764.000	AV	30.4	38.2	10.8	32.5	46.9	53.9	7.1	Floor Noise
Vert	92.168	QP	31.3	8.5	7.9	32.2	15.5	43.5	28.0	
Vert	126.658	QP	27.5	13.0	8.3	32.2	16.6	43.5	26.9	
Vert	159.903	QP	26.2	15.4	8.7	32.2	18.1	43.5	25.4	
Vert	594.001	QP	32.2	19.3	11.7	32.1	31.1	46.0	14.9	
Vert	608.300	QP	28.9	19.4	11.8	32.1	28.0	46.0	18.0	
Vert	618.748	QP	29.1	19.6	11.9	32.1	28.5	46.0	17.5	
Vert	1920.096	PK	47.3	26.4	6.3	32.6	47.4	73.9	26.5	
Vert	4882.000	PK	40.5	31.9	8.8	31.3	49.9	73.9	24.0	Floor Noise
Vert	7323.000	PK	42.3	36.0	10.1	32.0	56.4	73.9	17.5	Floor Noise
Vert	9764.000	PK	42.2	38.2	10.8	32.5	58.7	73.9	15.2	Floor Noise
Vert	1920.096	AV	42.4	26.4	6.3	32.6	42.5	53.9	11.4	
Vert	4882.000	AV	29.6	31.9	8.8	31.3	39.0	53.9	14.9	Floor Noise
Vert	7323.000	AV	30.6	36.0	10.1	32.0	44.7	53.9	9.2	Floor Noise
Vert	9764.000	AV	30.3	38.2	10.8	32.5	46.8	53.9	7.1	Floor Noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 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

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11107782H
Date : January 23, 2016 January 24, 2016 January 25, 2016
Temperature / Humidity : 21deg. C / 31 % RH 20 deg. C / 27 % RH 23 deg. C / 38 % RH
Engineer : Keisuke Kawamura Yuta Moriya Koji Yamamoto
(1-10GHz) (10-26.5GHz) (Below 1GHz)
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	98.998	QP	30.1	9.6	8.0	32.2	15.5	43.5	28.0	
Hori	173.556	QP	26.3	15.9	8.8	32.2	18.8	43.5	24.7	
Hori	308.086	QP	31.9	14.8	10.0	32.0	24.7	46.0	21.3	
Hori	320.008	QP	32.7	15.2	10.1	32.0	26.0	46.0	20.0	
Hori	479.998	QP	33.7	17.8	11.1	32.1	30.5	46.0	15.5	
Hori	990.005	QP	27.3	23.3	13.7	30.6	33.7	53.9	20.2	
Hori	1920.020	PK	50.8	26.4	6.3	32.6	50.9	73.9	23.0	
Hori	2483.500	PK	43.0	26.9	6.6	32.0	44.5	73.9	29.4	
Hori	4960.000	PK	40.5	32.1	8.7	31.2	50.1	73.9	23.8	Floor Noise
Hori	7440.000	PK	41.9	36.0	10.0	32.1	55.8	73.9	18.1	Floor Noise
Hori	9920.000	PK	41.8	38.2	10.9	32.5	58.4	73.9	15.5	Floor Noise
Hori	1920.020	AV	47.7	26.4	6.3	32.6	47.8	53.9	6.1	
Hori	2483.500	AV	30.5	26.9	6.6	32.0	32.0	53.9	21.9	
Hori	4960.000	AV	29.1	32.1	8.7	31.2	38.7	53.9	15.2	Floor Noise
Hori	7440.000	AV	30.6	36.0	10.0	32.1	44.5	53.9	9.4	Floor Noise
Hori	9920.000	AV	30.4	38.2	10.9	32.5	47.0	53.9	7.0	Floor Noise
Vert	92.168	QP	32.7	8.5	7.9	32.2	16.9	43.5	26.6	
Vert	126.658	QP	27.8	13.0	8.3	32.2	16.9	43.5	26.6	
Vert	159.903	QP	26.0	15.4	8.7	32.2	17.9	43.5	25.6	
Vert	594.001	QP	32.7	19.3	11.7	32.1	31.6	46.0	14.4	
Vert	608.300	QP	28.5	19.4	11.8	32.1	27.6	46.0	18.4	
Vert	618.748	QP	28.8	19.6	11.9	32.1	28.2	46.0	17.8	
Vert	1920.020	PK	47.1	26.4	6.3	32.6	47.2	73.9	26.8	
Vert	2483.500	PK	43.4	26.9	6.6	32.0	44.9	73.9	29.0	
Vert	4960.000	PK	41.4	32.1	8.7	31.2	51.0	73.9	22.9	Floor Noise
Vert	7440.000	PK	42.4	36.0	10.0	32.1	56.3	73.9	17.6	Floor Noise
Vert	9920.000	PK	42.0	38.2	10.9	32.5	58.6	73.9	15.3	Floor Noise
Vert	1920.020	AV	41.9	26.4	6.3	32.6	42.0	53.9	11.9	
Vert	2483.500	AV	30.8	26.9	6.6	32.0	32.3	53.9	21.6	
Vert	4960.000	AV	29.5	32.1	8.7	31.2	39.1	53.9	14.8	Floor Noise
Vert	7440.000	AV	30.6	36.0	10.0	32.1	44.5	53.9	9.4	Floor Noise
Vert	9920.000	AV	30.4	38.2	10.9	32.5	47.0	53.9	6.9	Floor Noise

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

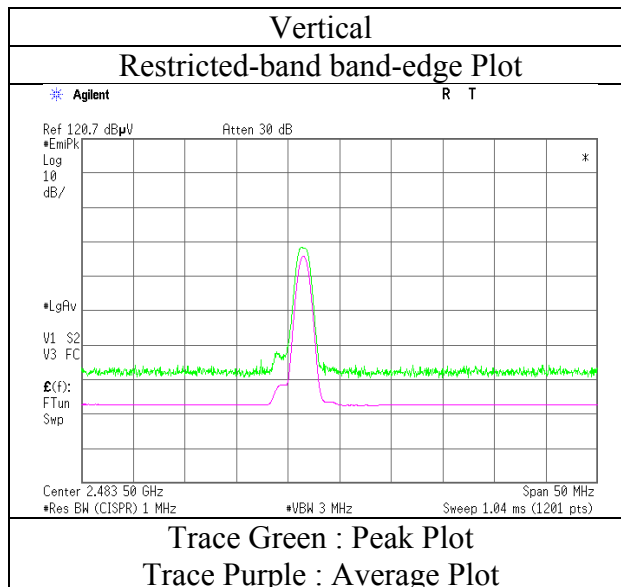
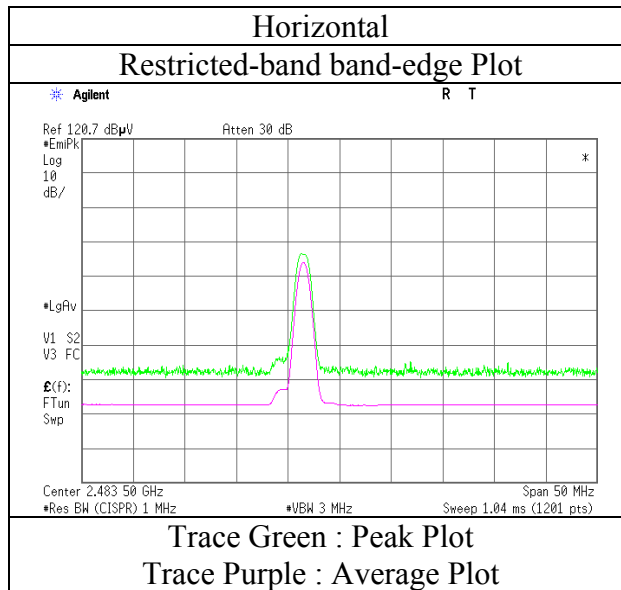
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 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 (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11107782H
Date	January 23, 2016
Temperature / Humidity	21deg. C / 31 % RH
Engineer	Keisuke Kawamura
	(1-10GHz)
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. : 11107782H
Date : January 23, 2016 January 24, 2016 January 25, 2016
Temperature / Humidity : 21deg. C / 31 % RH 20 deg. C / 27 % RH 23 deg. C / 38 % RH
Engineer : Keisuke Kawamura Yuta Moriya Koji Yamamoto
(1-10GHz) (10-26.5GHz) (Below 1GHz)
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	98.998	QP	30.2	9.6	8.0	32.2	15.6	43.5	27.9	
Hori	173.556	QP	26.5	15.9	8.8	32.2	19.0	43.5	24.5	
Hori	308.086	QP	31.5	14.8	10.0	32.0	24.3	46.0	21.7	
Hori	320.008	QP	32.9	15.2	10.1	32.0	26.2	46.0	19.8	
Hori	479.998	QP	33.9	17.8	11.1	32.1	30.7	46.0	15.3	
Hori	990.005	QP	27.5	23.3	13.7	30.6	33.9	53.9	20.0	
Hori	1920.128	PK	51.0	26.4	6.3	32.6	51.1	73.9	22.8	
Hori	2390.000	PK	42.6	26.9	6.6	32.0	44.1	73.9	29.8	
Hori	4804.000	PK	40.4	31.8	8.8	31.3	49.7	73.9	24.2	Floor Noise
Hori	7206.000	PK	42.1	36.0	10.0	32.0	56.1	73.9	17.8	Floor Noise
Hori	9608.000	PK	41.6	38.2	10.8	32.4	58.2	73.9	15.7	Floor Noise
Hori	1920.128	AV	47.6	26.4	6.3	32.6	47.7	53.9	6.2	
Hori	2390.000	AV	28.9	26.9	6.6	32.0	30.4	53.9	23.5	
Hori	4804.000	AV	29.1	31.8	8.8	31.3	38.4	53.9	15.6	Floor Noise
Hori	7206.000	AV	30.7	36.0	10.0	32.0	44.7	53.9	9.2	Floor Noise
Hori	9608.000	AV	30.7	38.2	10.8	32.4	47.3	53.9	6.6	Floor Noise
Vert	92.168	QP	31.8	8.5	7.9	32.2	16.0	43.5	27.5	
Vert	126.658	QP	28.2	13.0	8.3	32.2	17.3	43.5	26.2	
Vert	159.903	QP	25.8	15.4	8.7	32.2	17.7	43.5	25.8	
Vert	594.001	QP	33.3	19.3	11.7	32.1	32.2	46.0	13.8	
Vert	608.300	QP	28.1	19.4	11.8	32.1	27.2	46.0	18.8	
Vert	618.748	QP	28.1	19.6	11.9	32.1	27.5	46.0	18.5	
Vert	1920.128	PK	47.1	26.4	6.3	32.6	47.2	73.9	26.7	
Vert	2390.000	PK	42.6	26.9	6.6	32.0	44.1	73.9	29.8	
Vert	4804.000	PK	40.4	31.8	8.8	31.3	49.7	73.9	24.3	Floor Noise
Vert	7206.000	PK	42.4	36.0	10.0	32.0	56.4	73.9	17.5	Floor Noise
Vert	9608.000	PK	41.7	38.2	10.8	32.4	58.3	73.9	15.6	Floor Noise
Vert	1920.128	AV	42.1	26.4	6.3	32.6	42.2	53.9	11.7	
Vert	2390.000	AV	29.7	26.9	6.6	32.0	31.2	53.9	22.7	
Vert	4804.000	AV	29.1	31.8	8.8	31.3	38.4	53.9	15.6	Floor Noise
Vert	7206.000	AV	30.6	36.0	10.0	32.0	44.6	53.9	9.3	Floor Noise
Vert	9608.000	AV	30.7	38.2	10.8	32.4	47.3	53.9	6.6	Floor Noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 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	87.8	26.9	6.6	32.0	89.3	-	-	Carrier
Hori	2400.000	PK	40.5	26.9	6.6	32.0	42.0	69.3	27.3	
Vert	2402.000	PK	91.0	26.9	6.6	32.0	92.5	-	-	Carrier
Vert	2400.000	PK	43.1	26.9	6.6	32.0	44.6	72.5	27.9	

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

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

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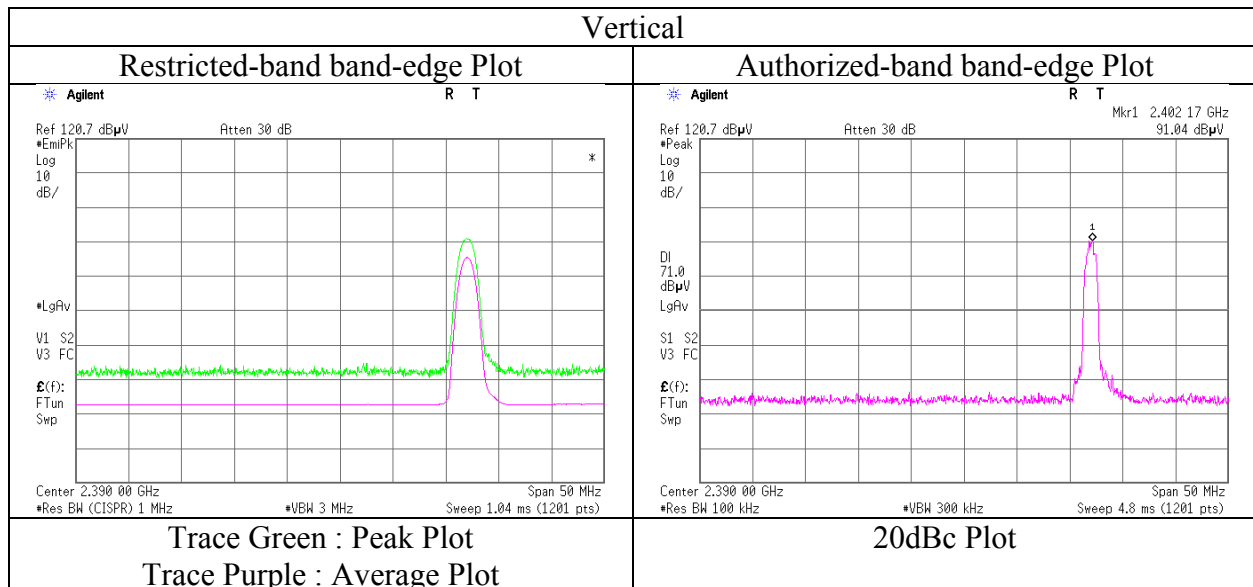
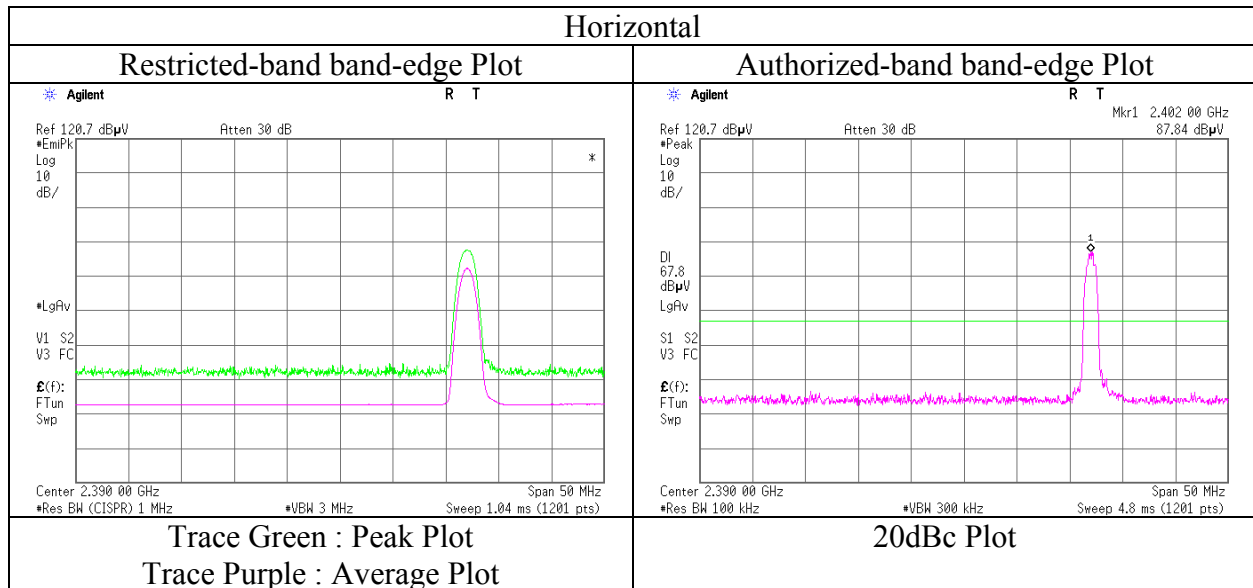
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11107782H
Date	January 23, 2016
Temperature / Humidity	21deg. C / 31 % RH
Engineer	Keisuke Kawamura (1-10GHz)
Mode	Tx, Hopping Off, 3DH5 2402 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. : 11107782H
Date : January 23, 2016 January 24, 2016 January 25, 2016
Temperature / Humidity : 21deg. C / 31 % RH 20 deg. C / 27 % RH 23 deg. C / 38 % RH
Engineer : Keisuke Kawamura Yuta Moriya Koji Yamamoto
(1-10GHz) (10-26.5GHz) (Below 1GHz)
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	98.998	QP	30.1	9.6	8.0	32.2	15.5	43.5	28.0	
Hori	126.752	QP	28.6	13.0	8.3	32.2	17.7	43.5	25.8	
Hori	308.086	QP	31.1	14.8	10.0	32.0	23.9	46.0	22.1	
Hori	320.008	QP	32.3	15.2	10.1	32.0	25.6	46.0	20.4	
Hori	479.998	QP	33.5	17.8	11.1	32.1	30.3	46.0	15.7	
Hori	891.003	QP	28.2	22.3	13.2	31.1	32.6	46.0	13.4	
Hori	1920.096	PK	51.2	26.4	6.3	32.6	51.3	73.9	22.6	
Hori	4882.000	PK	40.6	31.9	8.8	31.3	50.0	73.9	23.9	Floor Noise
Hori	7323.000	PK	42.2	36.0	10.1	32.0	56.3	73.9	17.6	Floor Noise
Hori	9764.000	PK	41.9	38.2	10.8	32.5	58.4	73.9	15.6	Floor Noise
Hori	1920.096	AV	47.9	26.4	6.3	32.6	48.0	53.9	5.9	
Hori	4882.000	AV	29.0	31.9	8.8	31.3	38.4	53.9	15.5	Floor Noise
Hori	7323.000	AV	30.5	36.0	10.1	32.0	44.6	53.9	9.3	Floor Noise
Hori	9764.000	AV	30.3	38.2	10.8	32.5	46.8	53.9	7.1	Floor Noise
Vert	121.870	QP	29.3	12.6	8.3	32.2	18.0	43.5	25.5	
Vert	126.658	QP	30.3	13.0	8.3	32.2	19.4	43.5	24.1	
Vert	159.903	QP	26.4	15.4	8.7	32.2	18.3	43.5	25.2	
Vert	594.001	QP	32.7	19.3	11.7	32.1	31.6	46.0	14.4	
Vert	608.300	QP	28.3	19.4	11.8	32.1	27.4	46.0	18.6	
Vert	618.748	QP	27.8	19.6	11.9	32.1	27.2	46.0	18.8	
Vert	1920.096	PK	47.6	26.4	6.3	32.6	47.7	73.9	26.2	
Vert	4882.000	PK	40.4	31.9	8.8	31.3	49.8	73.9	24.1	Floor Noise
Vert	7323.000	PK	42.3	36.0	10.1	32.0	56.4	73.9	17.5	Floor Noise
Vert	9764.000	PK	41.7	38.2	10.8	32.5	58.2	73.9	15.7	Floor Noise
Vert	1920.096	AV	41.8	26.4	6.3	32.6	41.9	53.9	12.0	
Vert	4882.000	AV	29.0	31.9	8.8	31.3	38.4	53.9	15.5	Floor Noise
Vert	7323.000	AV	30.6	36.0	10.1	32.0	44.7	53.9	9.2	Floor Noise
Vert	9764.000	AV	30.4	38.2	10.8	32.5	46.9	53.9	7.0	Floor Noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 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

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11107782H
Date : January 23, 2016 January 24, 2016 January 25, 2016
Temperature / Humidity : 21deg. C / 31 % RH 20 deg. C / 27 % RH 23 deg. C / 38 % RH
Engineer : Keisuke Kawamura Yuta Moriya Koji Yamamoto
(1-10GHz) (10-26.5GHz) (Below 1GHz)
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	98.998	QP	30.7	9.6	8.0	32.2	16.1	43.5	27.4	
Hori	126.752	QP	29.3	13.0	8.3	32.2	18.4	43.5	25.1	
Hori	308.086	QP	31.6	14.8	10.0	32.0	24.4	46.0	21.6	
Hori	320.008	QP	32.9	15.2	10.1	32.0	26.2	46.0	19.8	
Hori	479.998	QP	33.8	17.8	11.1	32.1	30.6	46.0	15.4	
Hori	891.003	QP	27.6	22.3	13.2	31.1	32.0	46.0	14.0	
Hori	1920.023	PK	52.0	26.4	6.3	32.6	52.1	73.9	21.8	
Hori	2483.500	PK	43.7	26.9	6.6	32.0	45.2	73.9	28.7	
Hori	4960.000	PK	40.9	32.1	8.7	31.2	50.5	73.9	23.4	Floor Noise
Hori	7440.000	PK	41.9	36.0	10.0	32.1	55.8	73.9	18.1	Floor Noise
Hori	9920.000	PK	41.7	38.2	10.9	32.5	58.3	73.9	15.6	Floor Noise
Hori	1920.023	AV	48.5	26.4	6.3	32.6	48.6	53.9	5.3	
Hori	2483.500	AV	30.0	26.9	6.6	32.0	31.5	53.9	22.4	
Hori	4960.000	AV	29.1	32.1	8.7	31.2	38.7	53.9	15.2	Floor Noise
Hori	7440.000	AV	30.7	36.0	10.0	32.1	44.6	53.9	9.3	Floor Noise
Hori	9920.000	AV	30.4	38.2	10.9	32.5	47.0	53.9	6.9	Floor Noise
Vert	121.870	QP	29.3	12.6	8.3	32.2	18.0	43.5	25.5	
Vert	126.658	QP	30.2	13.0	8.3	32.2	19.3	43.5	24.2	
Vert	159.903	QP	28.3	15.4	8.7	32.2	20.2	43.5	23.3	
Vert	594.001	QP	32.8	19.3	11.7	32.1	31.7	46.0	14.3	
Vert	608.300	QP	28.1	19.4	11.8	32.1	27.2	46.0	18.8	
Vert	647.116	QP	29.3	19.9	12.0	32.1	29.1	46.0	16.9	
Vert	1920.023	PK	47.1	26.4	6.3	32.6	47.2	73.9	26.7	
Vert	2483.500	PK	43.1	26.9	6.6	32.0	44.6	73.9	29.3	
Vert	4960.000	PK	41.2	32.1	8.7	31.2	50.8	73.9	23.1	Floor Noise
Vert	7440.000	PK	42.1	36.0	10.0	32.1	56.0	73.9	17.9	Floor Noise
Vert	9920.000	PK	42.2	38.2	10.9	32.5	58.8	73.9	15.1	Floor Noise
Vert	1920.023	AV	42.0	26.4	6.3	32.6	42.1	53.9	11.8	
Vert	2483.500	AV	29.9	26.9	6.6	32.0	31.4	53.9	22.5	
Vert	4960.000	AV	29.0	32.1	8.7	31.2	38.6	53.9	15.3	Floor Noise
Vert	7440.000	AV	30.2	36.0	10.0	32.1	44.1	53.9	9.8	Floor Noise
Vert	9920.000	AV	30.2	38.2	10.9	32.5	46.8	53.9	7.2	Floor Noise

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

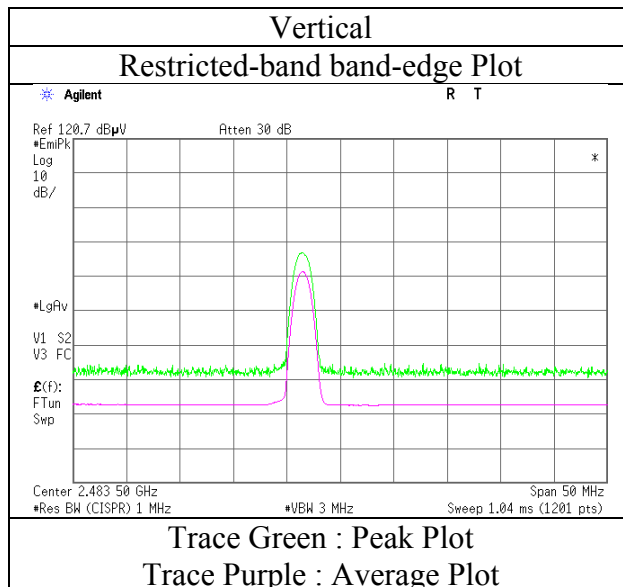
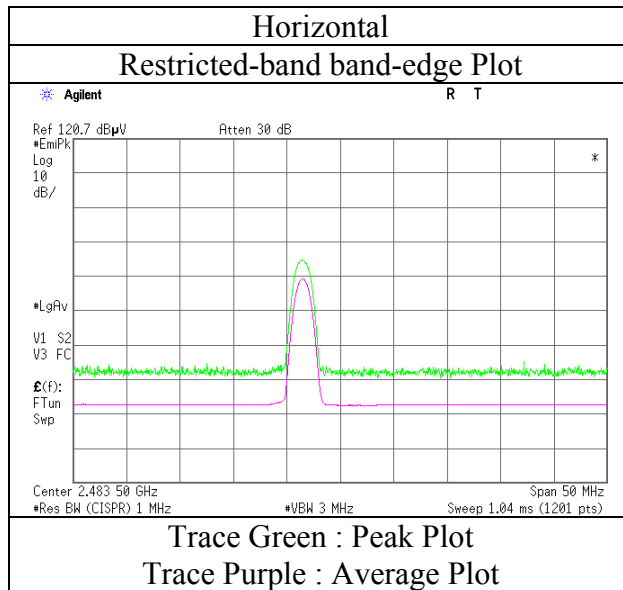
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(4.4 \text{ m} / 3.0 \text{ m}) = 3.3 \text{ dB}$
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)

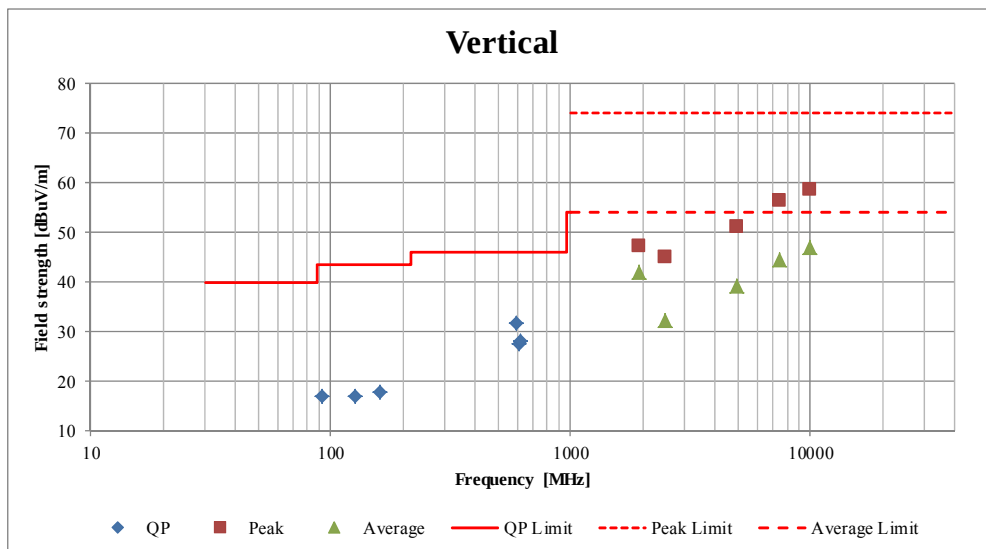
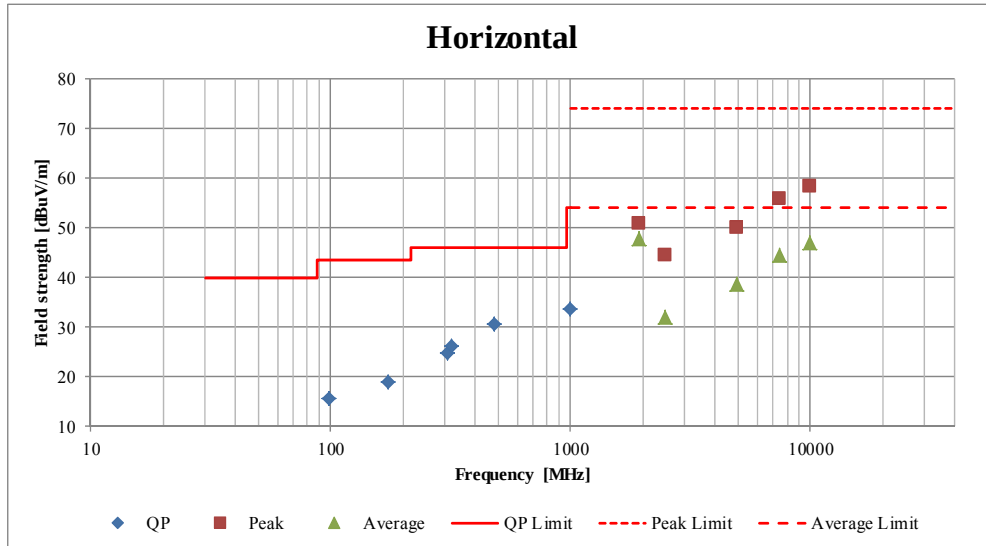
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11107782H
Date	January 23, 2016
Temperature / Humidity	21deg. C / 31 % RH
Engineer	Keisuke Kawamura (1-10GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11107782H		
Date	January 23, 2016	January 24, 2016	January 25, 2016
Temperature / Humidity	21deg. C / 31 % RH	20 deg. C / 27 % RH	23 deg. C / 38 % RH
Engineer	Keisuke Kawamura (1-10GHz)	Yuta Moriya (10-26.5GHz)	Koji Yamamoto (Below 1GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz		

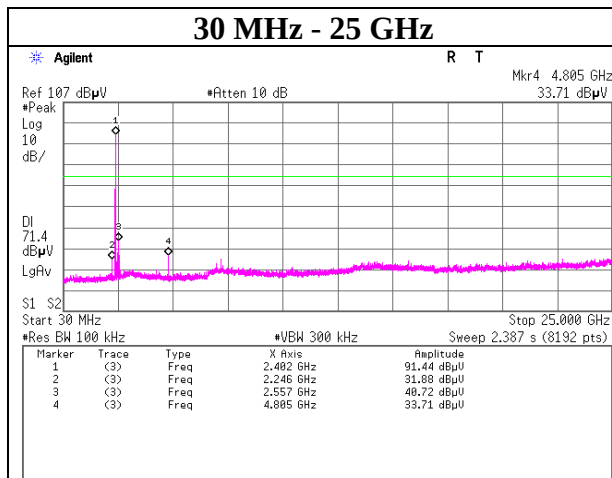
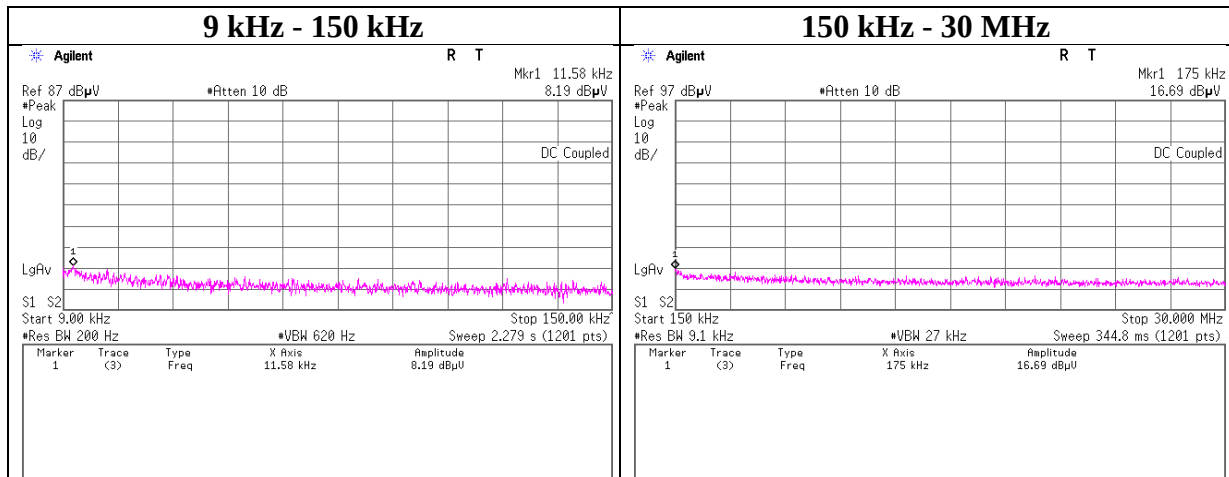


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, DH5

2402 MHz



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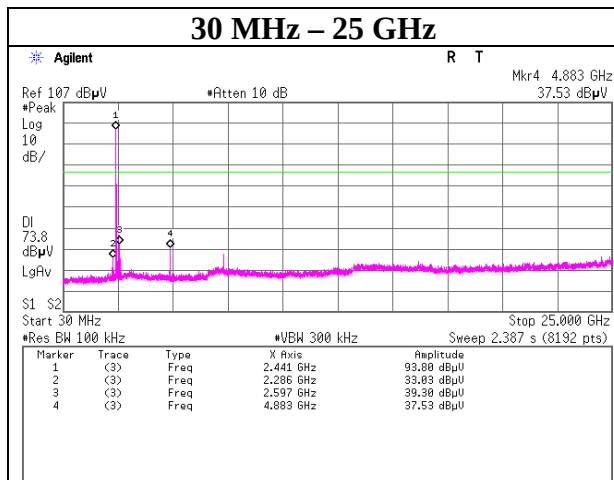
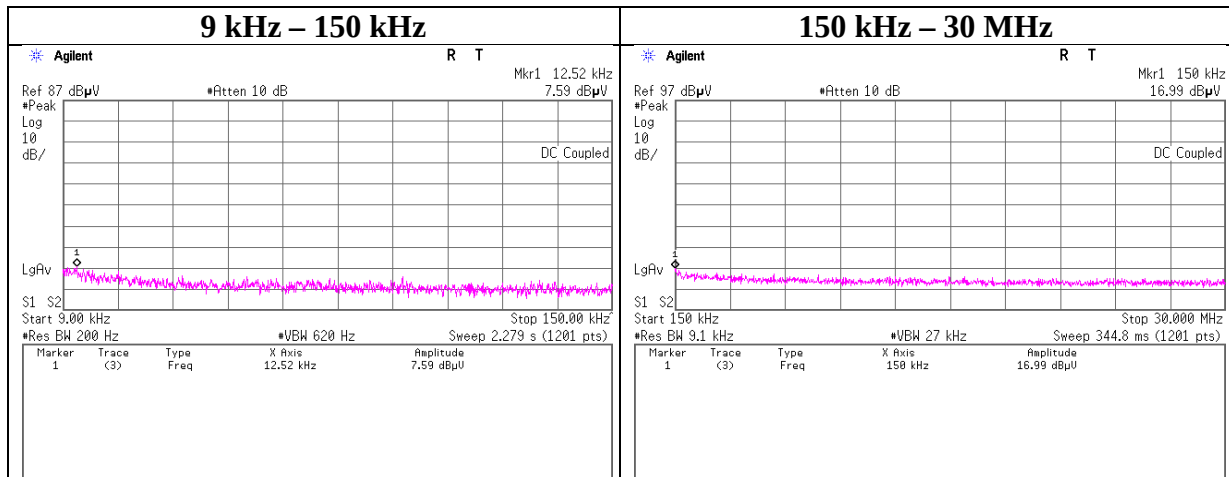
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx, Hopping Off, DH5

2441 MHz



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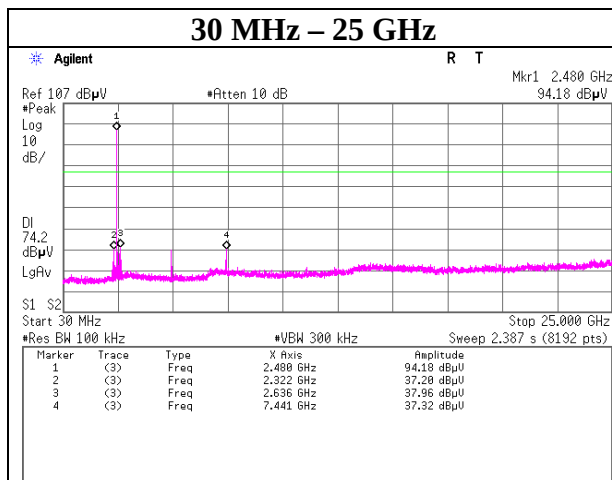
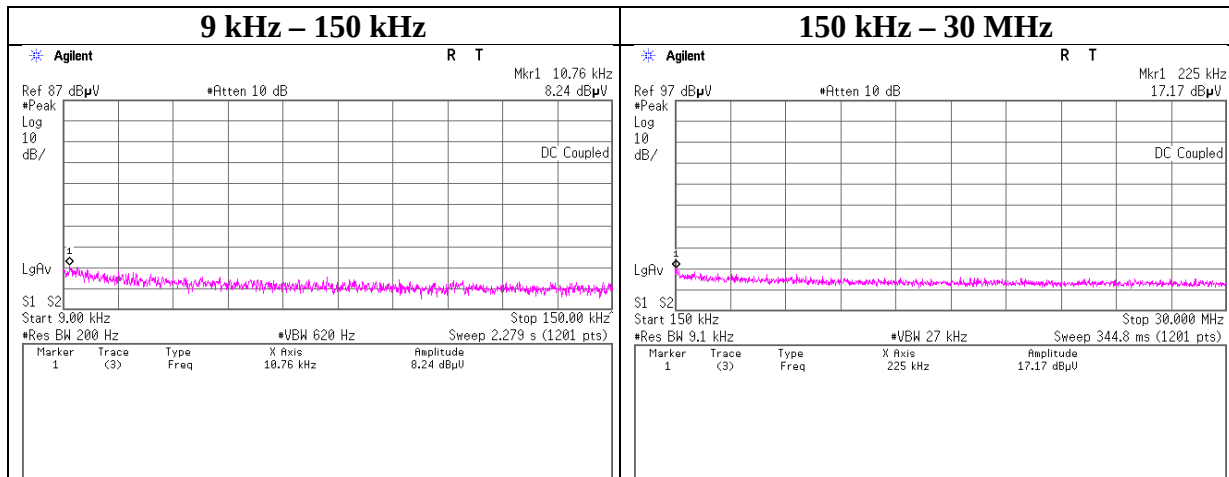
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, DH5

2480 MHz



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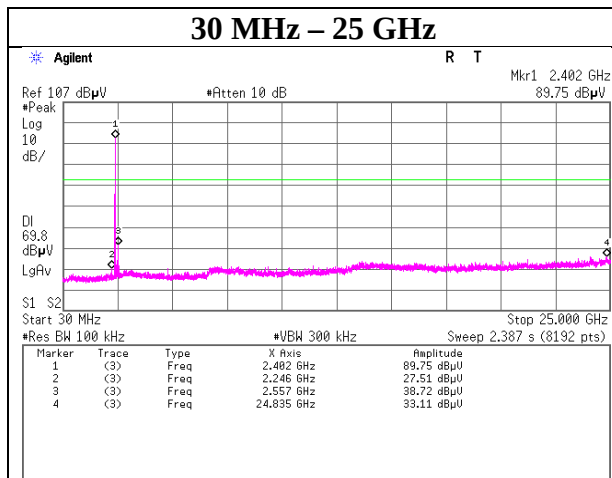
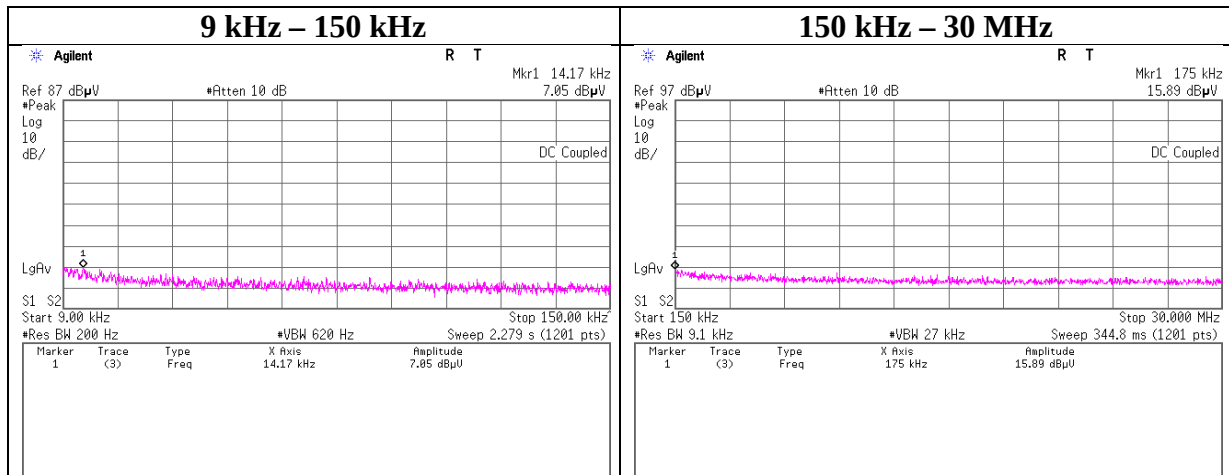
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, 3DH5

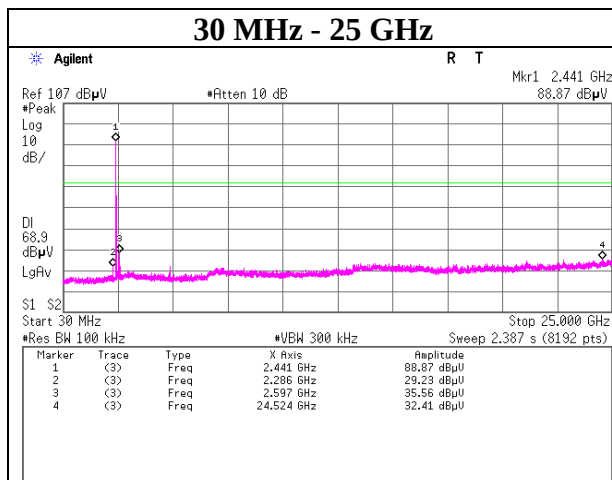
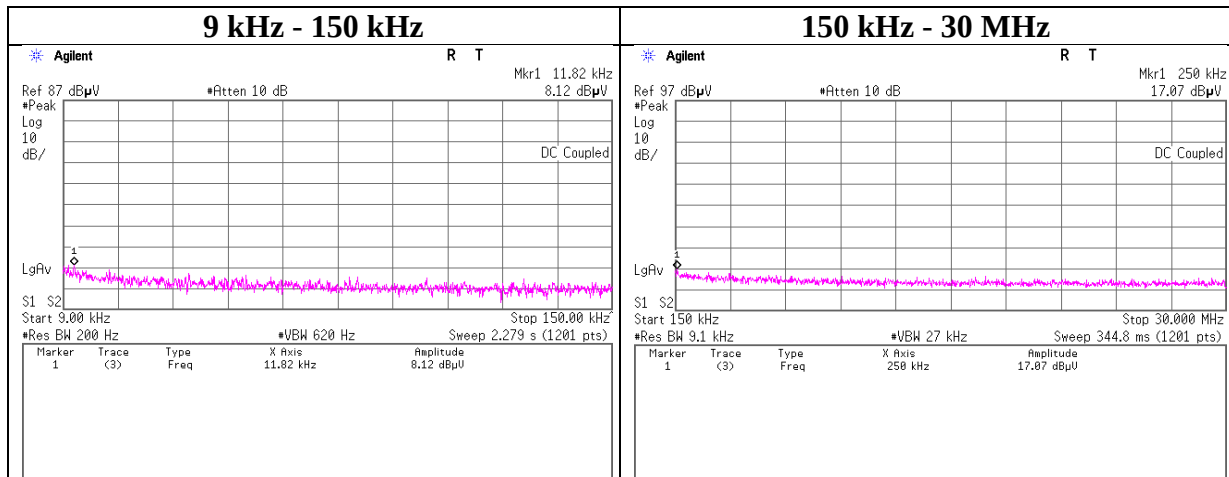
2402 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, 3DH5

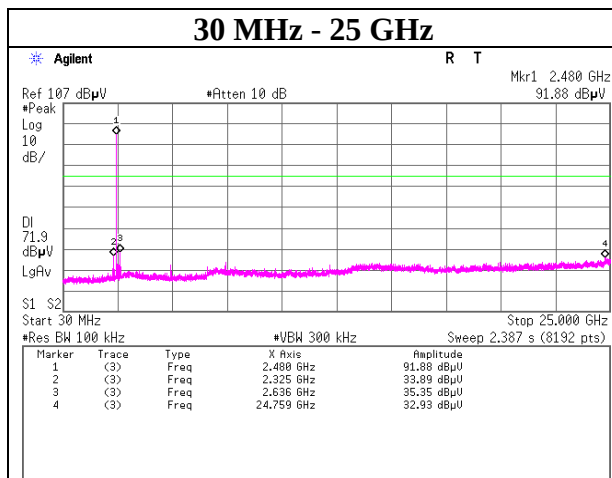
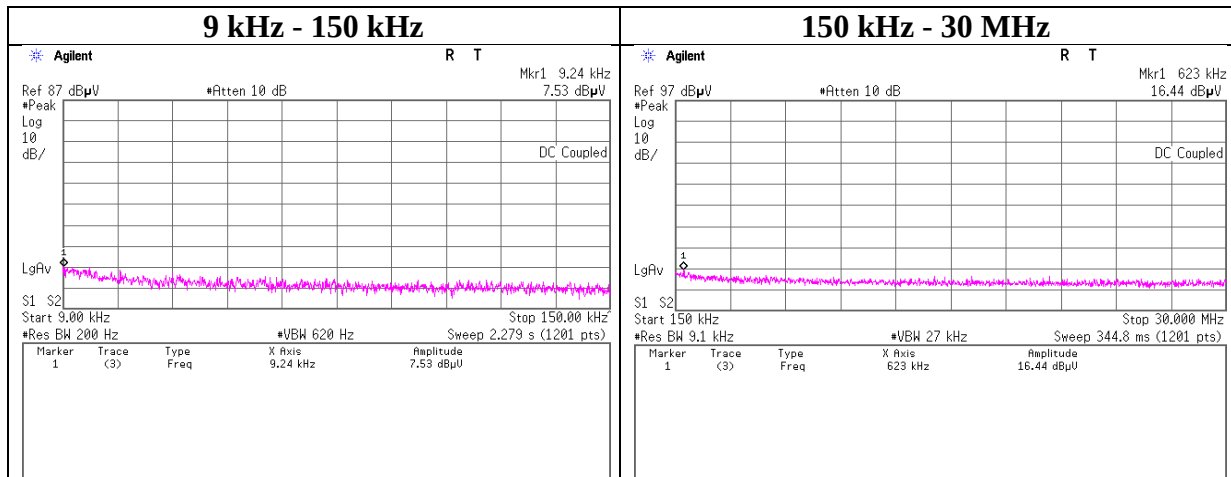
2441 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx, Hopping Off, 3DH5

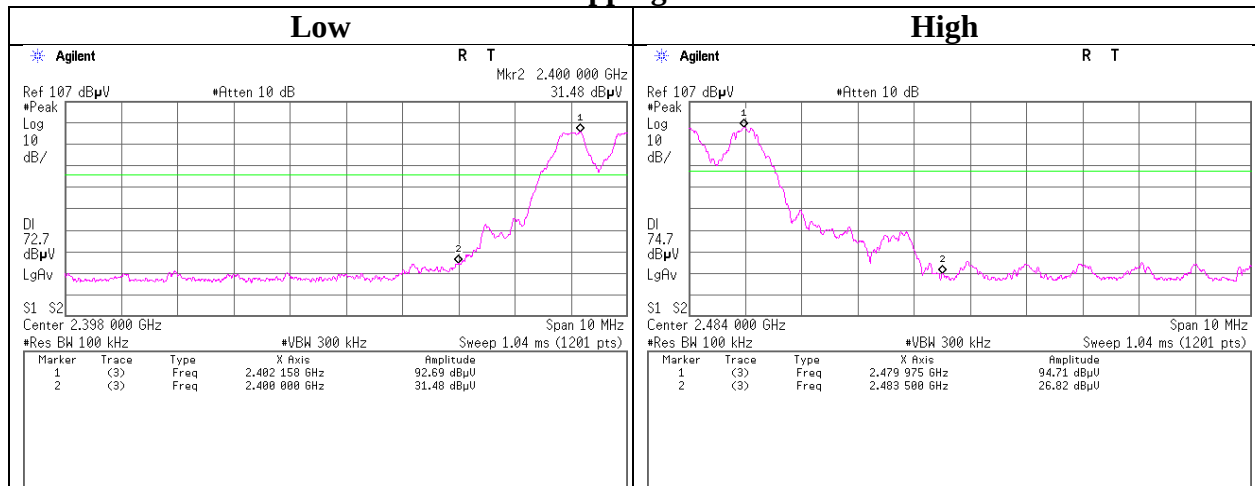
2480 MHz



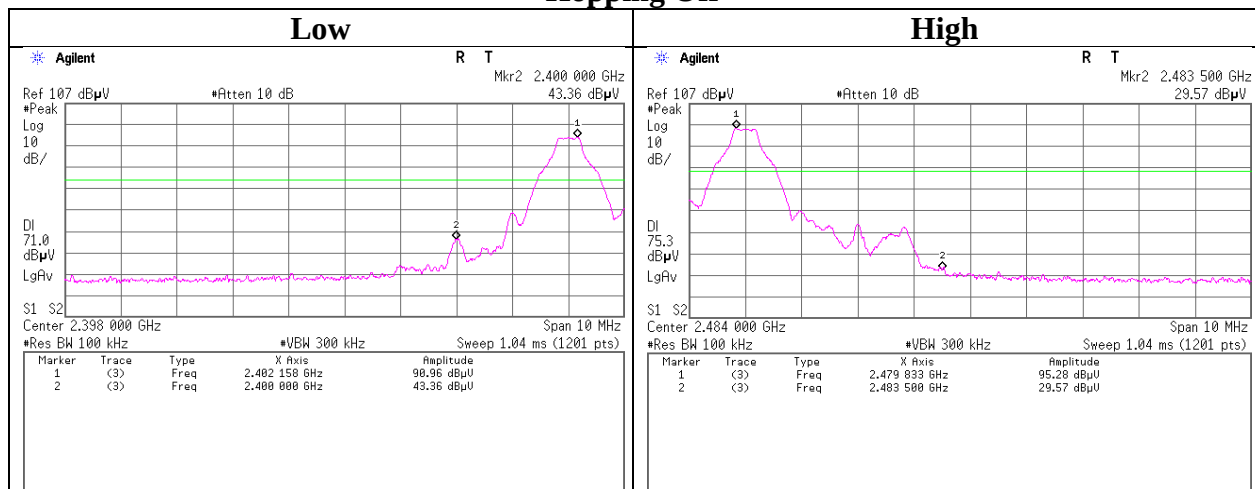
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx DH5

Hopping On



Hopping Off



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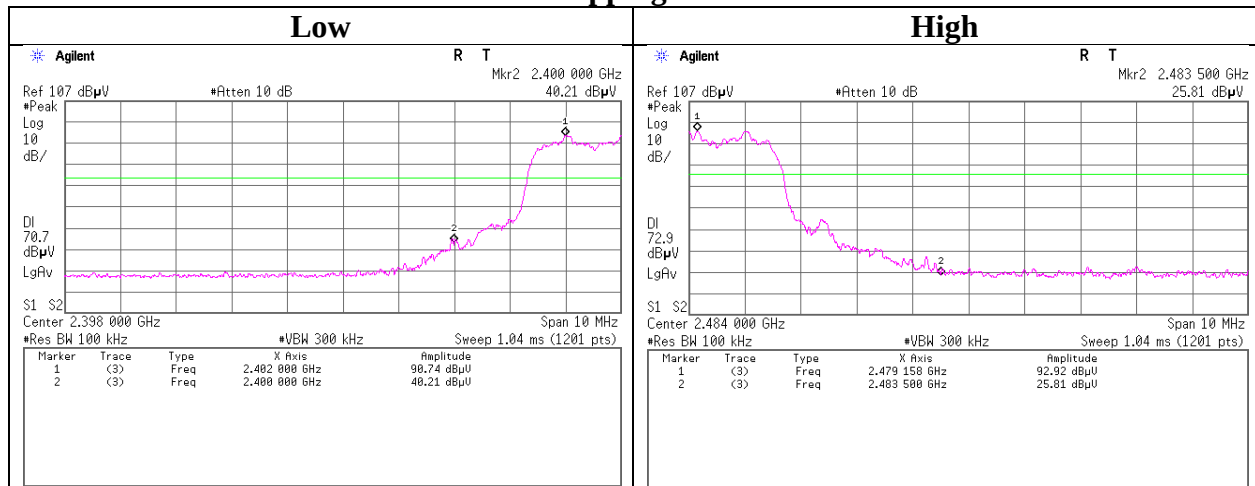
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

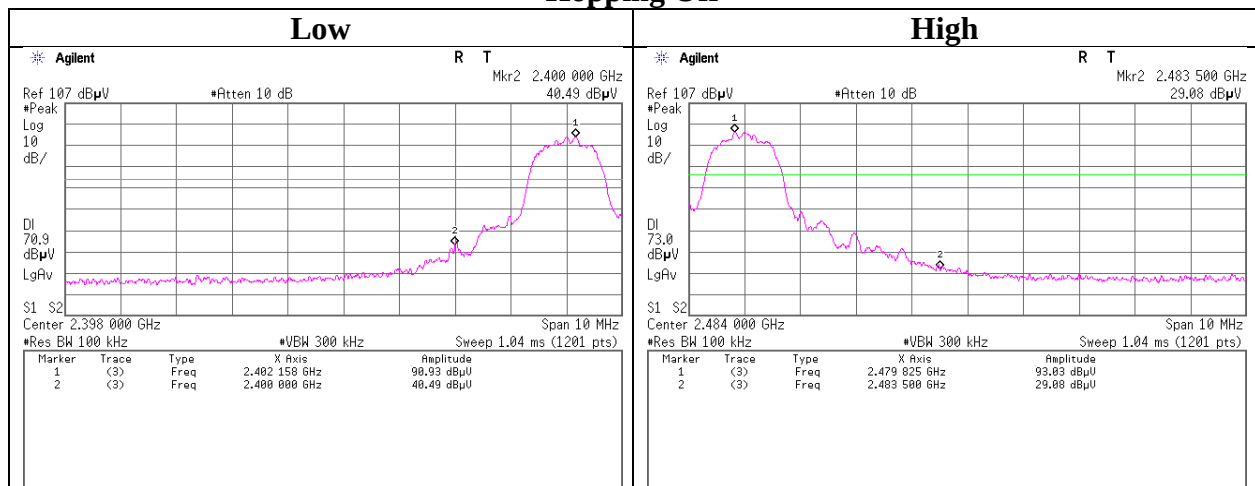
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11107782H
Date : January 20, 2016
Temperature / Humidity : 21 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx 3DH5

Hopping On



Hopping Off



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Ise EMC Lab.

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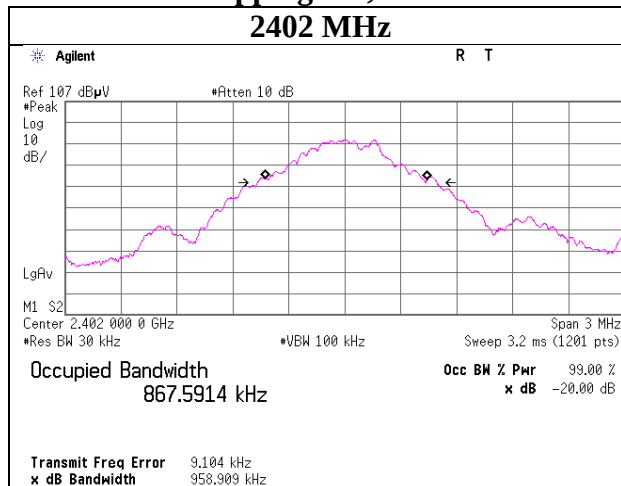
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

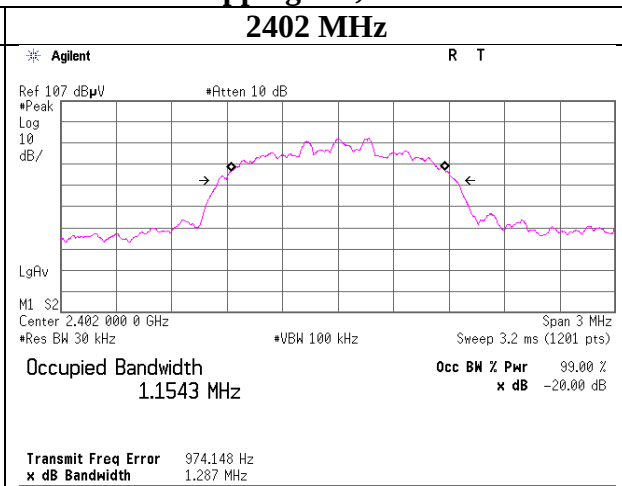
99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx Hopping Off

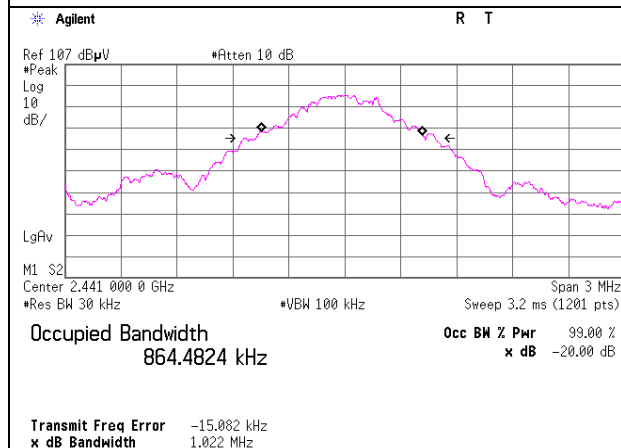
Hopping Off, DH5



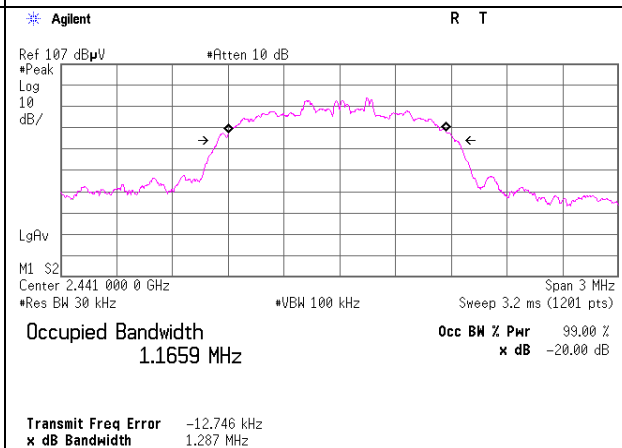
Hopping Off, 3DH5



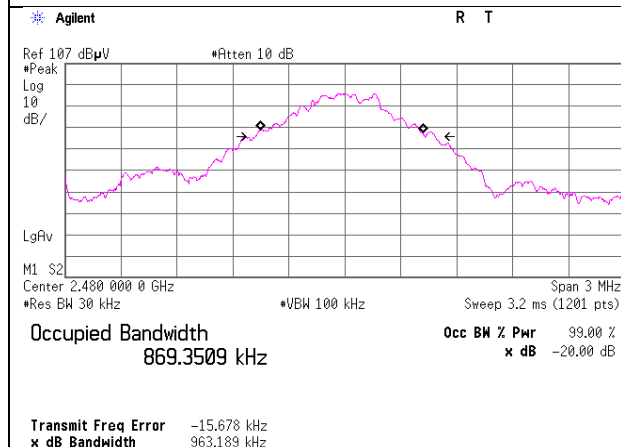
2441 MHz



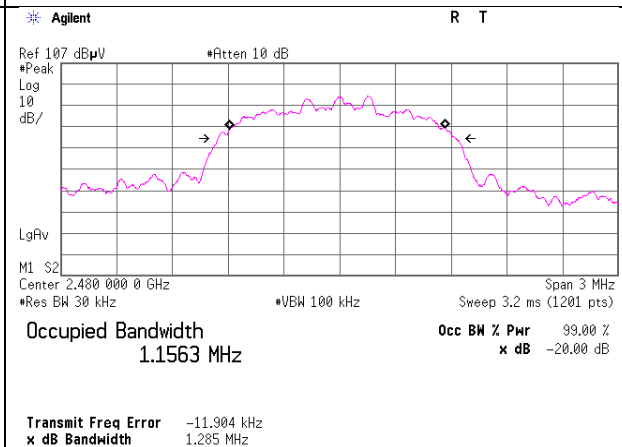
2441 MHz



2480 MHz



2480 MHz



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Ise EMC Lab.

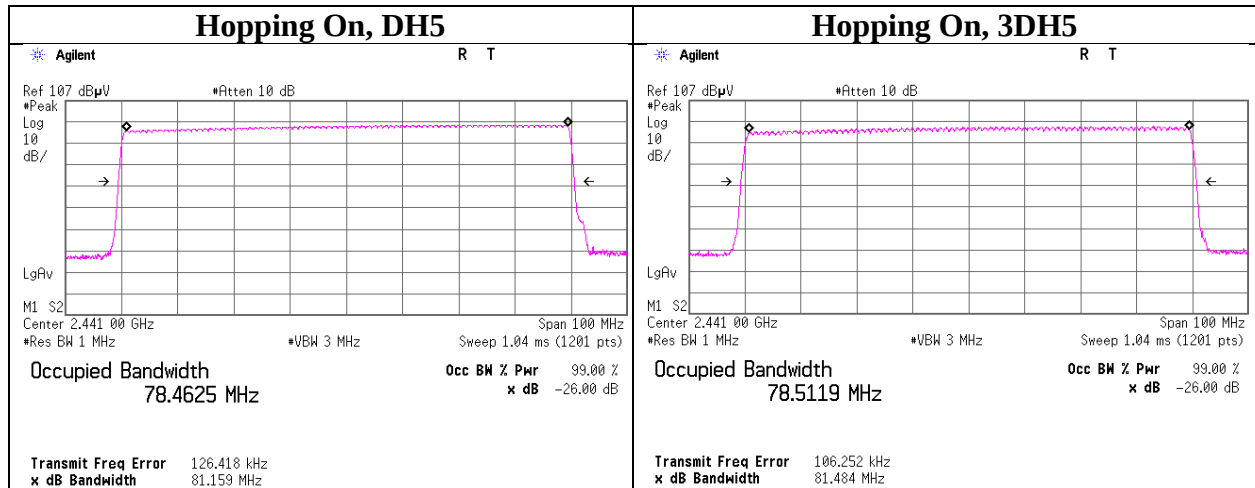
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11107782H
Date	January 20, 2016
Temperature / Humidity	21 deg. C / 27 % 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)
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2015/06/02 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2015/11/11 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2015/11/11 * 12
MCC-66	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28636/2	AT	2015/04/02 * 12
MAT-88	Attenuator	Weinschel Associates	WA56-10	56100304	AT	2015/06/01 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2016/01/21 * 12
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	2015/05/18 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2015/05/18 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2015/05/21 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2015/03/19 * 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
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2015/05/19 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2015/09/02 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2015/10/11 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2015/07/13 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2015/04/08 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2015/03/10 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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

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