



RADIO TEST REPORT

Test Report No. : 11577935H-A

Applicant : MITSUBISHI ELECTRIC CORPORATION SANDA WORKS

Type of Equipment : Car Audio

Model No. : AR-0M


FCC ID : UJHAR0M


Test regulation : FCC Part 15 Subpart C: 2016

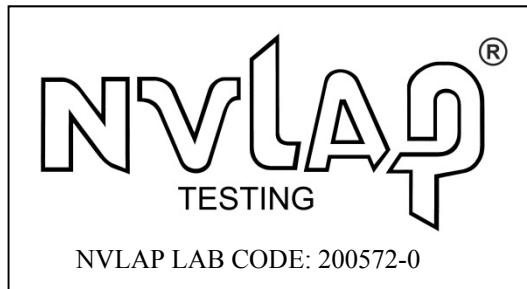
Test Result : Complied

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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 18 and 19, 2017

Representative test engineer: 
Hiroyuki Furutaka
Engineer
Consumer Technology Division

Approved by: 
Tsubasa Takayama
Engineer
Consumer Technology Division



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

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SECTION 1: Customer information

Company Name : MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Address : 2-3-33, Miwa, Sanda-city, Hyogo, 669-1513, Japan
Telephone Number : +81-79-559-3623
Facsimile Number : +81-79-559-3875
Contact Person : Kenji Otani

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

2.1 Identification of E.U.T.

Type of Equipment : Car Audio
Model No. : AR-0M
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 12 V
Receipt Date of Sample : January 18, 2017
Country of Mass-production : Thailand
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: AR-0M (referred to as the EUT in this report) is a Car Audio.

Radio Specification

[Bluetooth (Ver. 2.1 with EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402 MHz - 2480 MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.3 V
Antenna type : Pattern Antenna
Antenna Gain : -7.4 dBi
Clock frequency (Crystal) : 26 MHz

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

* 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	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (a)		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 (d)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (d)		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 (b)		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		3.6 dB 87.551 MHz, QP, Vert.	Complied

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 15.31 (e)

The EUT provides stable voltage (DC 3.3 V) constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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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	

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

Polarity	Radiated emission (Below 1GHz)			
	(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 1GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 GHz - 6GHz	6 GHz - 18GHz	10 GHz - 26.5 GHz	26.5 GHz - 40GHz	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 report meets the limits unless the uncertainty is taken into consideration.

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

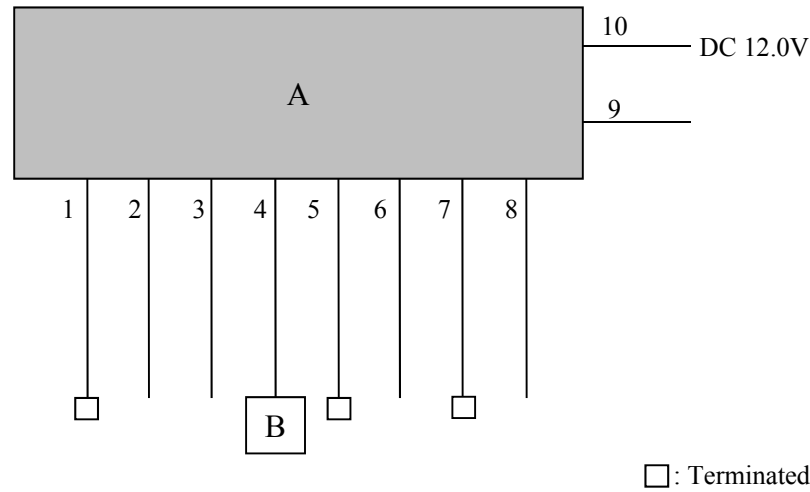
4.1 Operating Mode(s)

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

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) DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5 Inquiry	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 Inquiry	2402 MHz 2441 MHz 2480 MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>*EUT has the power settings by the software as follows; Power settings: Same as production model Software: HCI Tester2.1.00 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p>		

4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio	AR-0M	96ZM6049 for AT* 96ZM6056 for RE*	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	USB Memory	RUF-C/U2	A7110101237	BUFFALO	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	FM Antenna Cable	5.0	Shielded	Shielded	-
2	Maintenance Cable	0.3	Unshielded	Unshielded	-
3	Control Cable	1.0	Unshielded	Unshielded	-
4	USB Cable	1.4	Shielded	Shielded	-
5	Camera Cable	2.0	Shielded	Shielded	-
6	Power Cable	0.8	Unshielded	Unshielded	-
7	Speaker Cable	1.1	Unshielded	Unshielded	-
8	Signal Cable	0.8	Unshielded	Unshielded	-
9	Signal Cable	0.8	Unshielded	Unshielded	-
10	DC Cable	2.0	Unshielded	Unshielded	-

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

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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	3.75 m*2) (1 GHz – 10 GHz), 1 m*3) (10 GHz – 26.5 GHz)		3.75 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: $20 \times \log(3.75 \text{ m}/3.0 \text{ m}) = 1.94 \text{ dB}$

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

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	5 MHz or 3 MHz	100 kHz or 30 kHz	300 kHz or 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 not detected as shown in the chart. (9 kHz -150 kHz: RBW = 200 Hz, 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

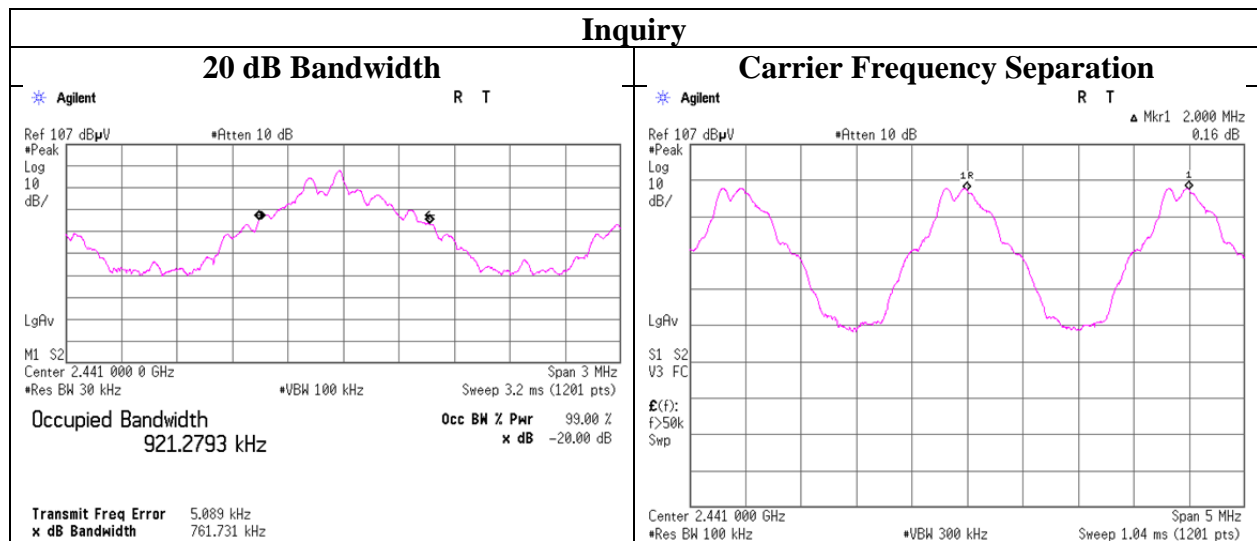
APPENDIX 1: Test data

20dB Bandwidth and Carrier Frequency Separation

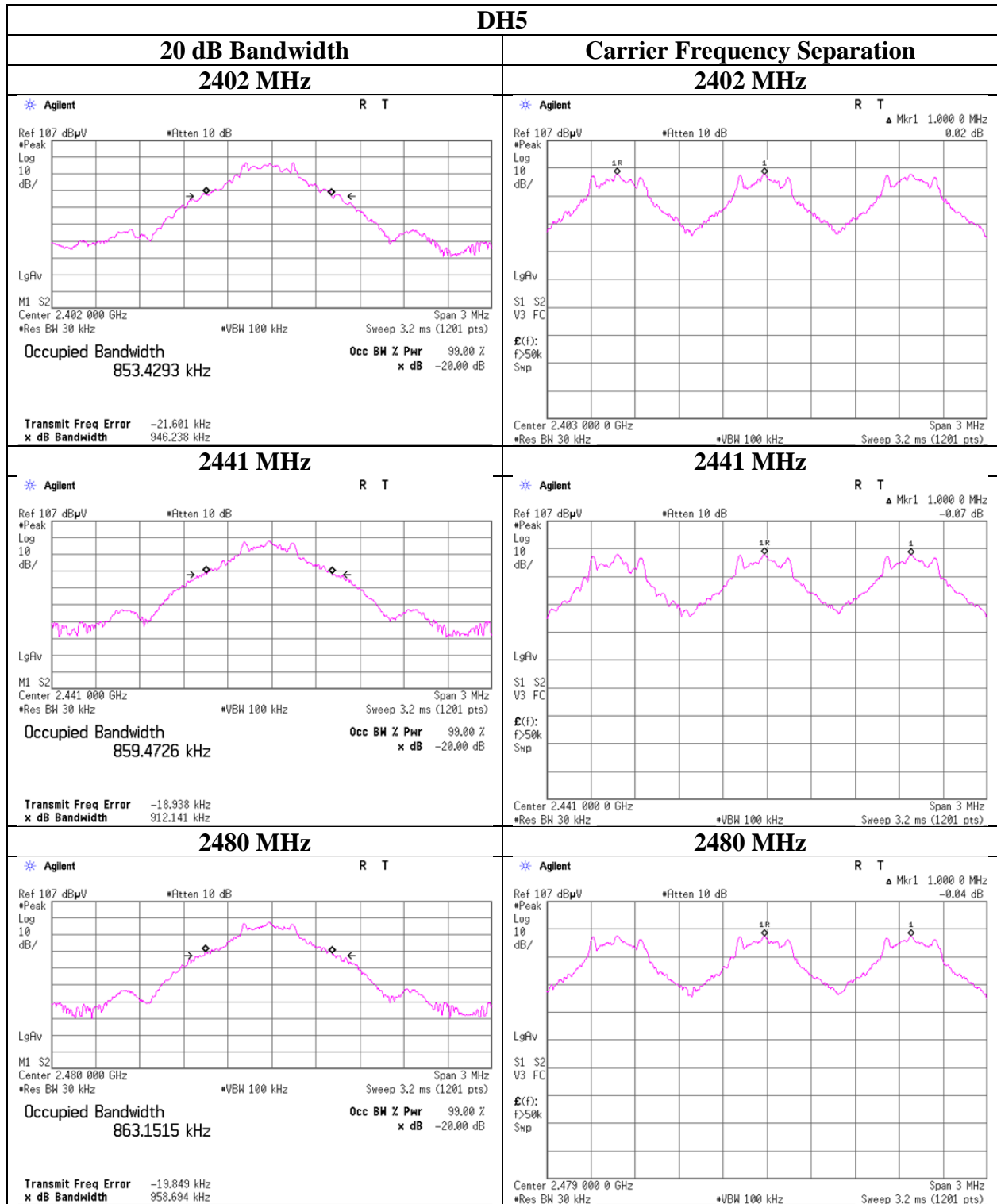
Test place : Ise EMC Lab. No.7 Shielded Room
Report No. : 11577935H
Date : January 18, 2017
Temperature / Humidity : 22 deg. C /35 % RH
Engineer : Hiroyuki Furutaka
Mode : Tx, Hopping On/Off, DH5/3DH5/Inquiry

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.946	1.000	>= 0.631
DH5	2441.0	0.912	1.000	>= 0.608
DH5	2480.0	0.959	1.000	>= 0.639
3DH5	2402.0	1.264	1.000	>= 0.843
3DH5	2441.0	1.270	1.000	>= 0.847
3DH5	2480.0	1.284	1.000	>= 0.856
Inquiry	2441.0	0.761	2.000	>= 0.508

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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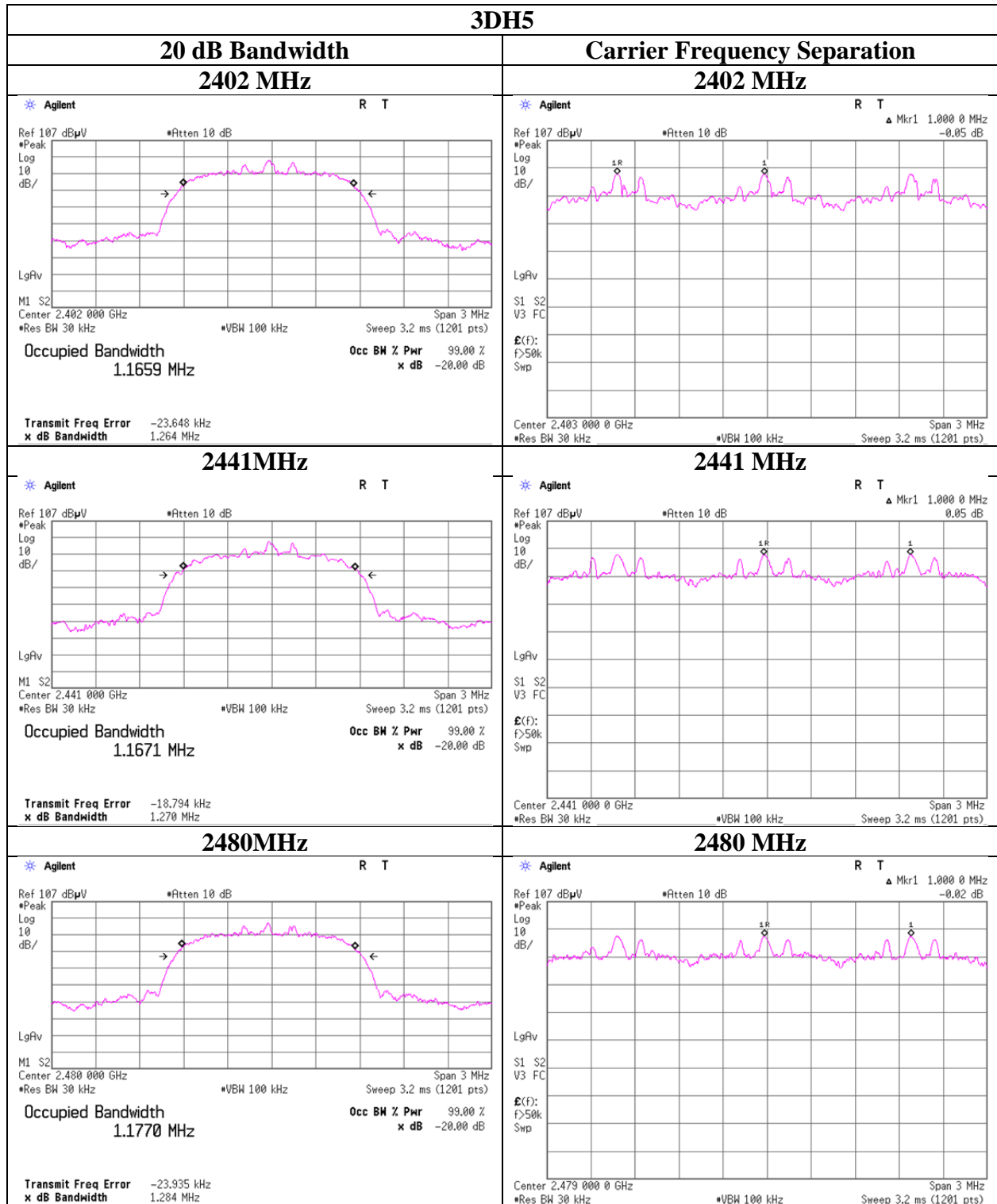
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20dB Bandwidth and Carrier Frequency Separation



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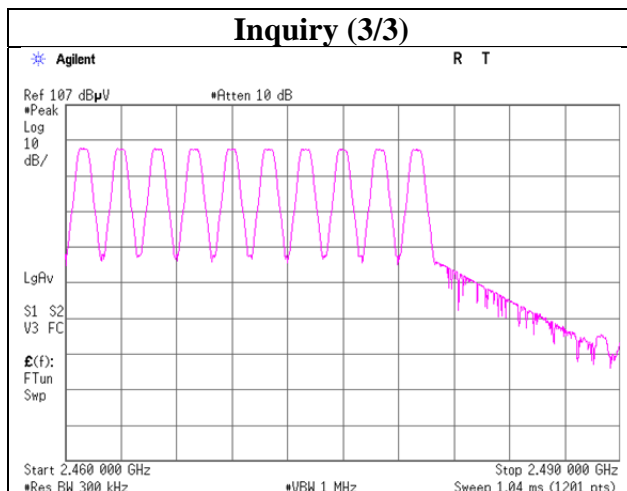
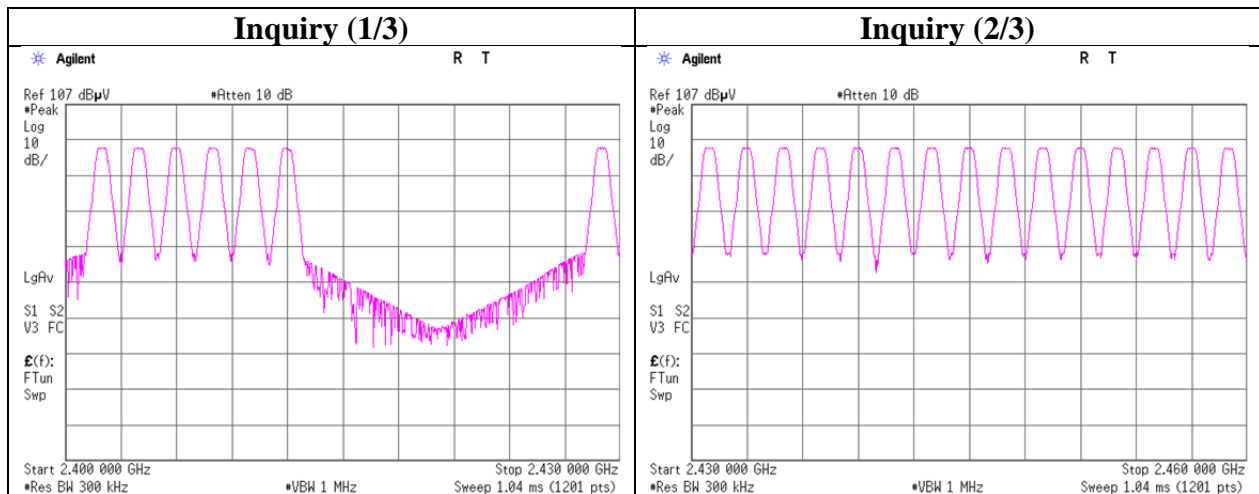
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Number of Hopping Frequency

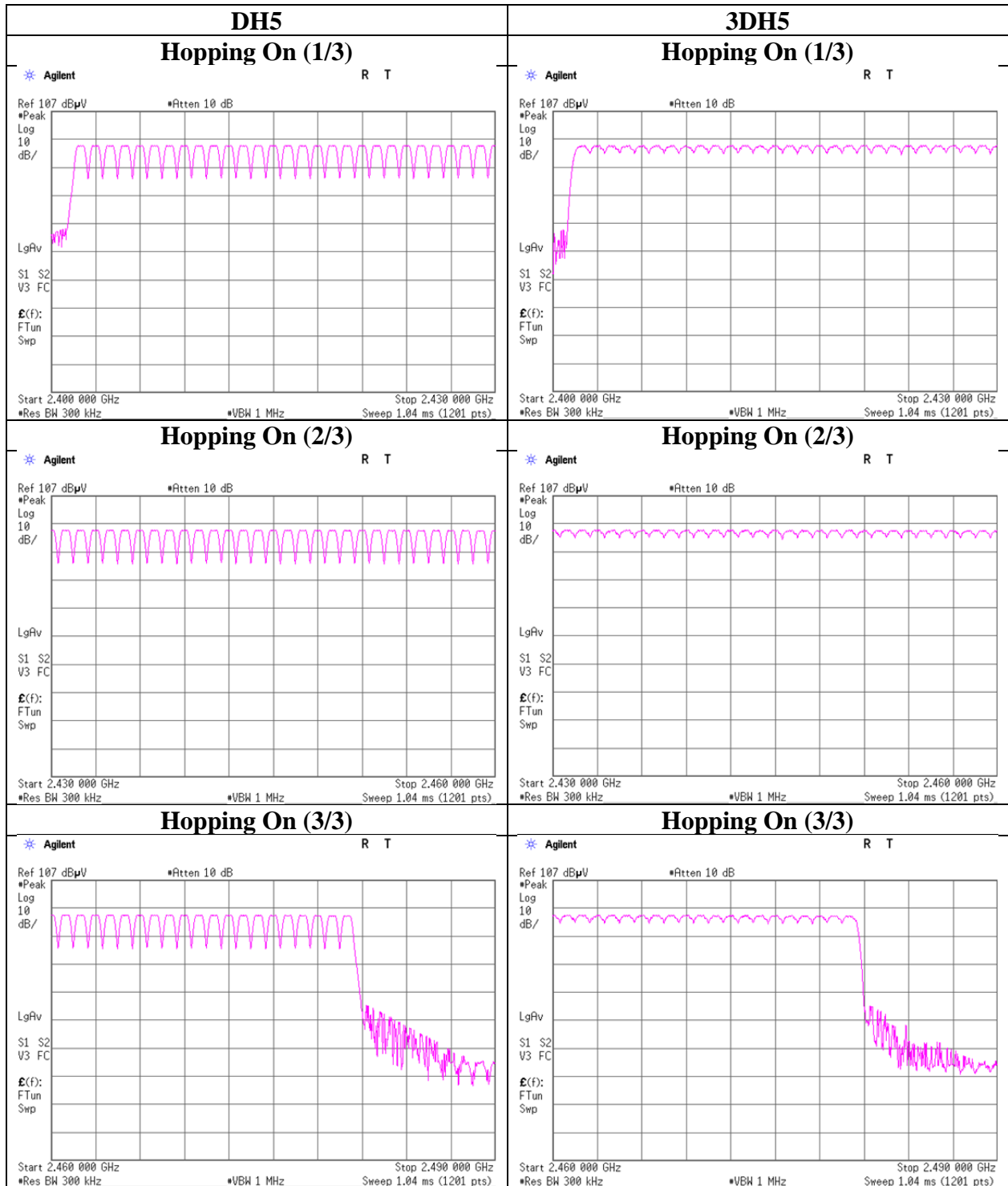
Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping On, DH5/3DH5/Inquiry

Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
3DH5	79	≥ 15
Inquiry	32	≥ 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



Dwell time

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping On DH1 - 5/3DH1 - 5/Inquiry

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	48.6 times / 5 sec. x 31.6 sec. = 308 times	0.465	143	400
DH3	23.2 times / 5 sec. x 31.6 sec. = 147 times	1.730	254	400
DH5	16.0 times / 5 sec. x 31.6 sec. = 102 times	2.997	306	400
3DH1	48.6 times / 5 sec. x 31.6 sec. = 308 times	0.461	142	400
3DH3	23.8 times / 5 sec. x 31.6 sec. = 151 times	1.719	260	400
3DH5	14.8 times / 5 sec. x 31.6 sec. = 94 times	2.967	279	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.150	192	400

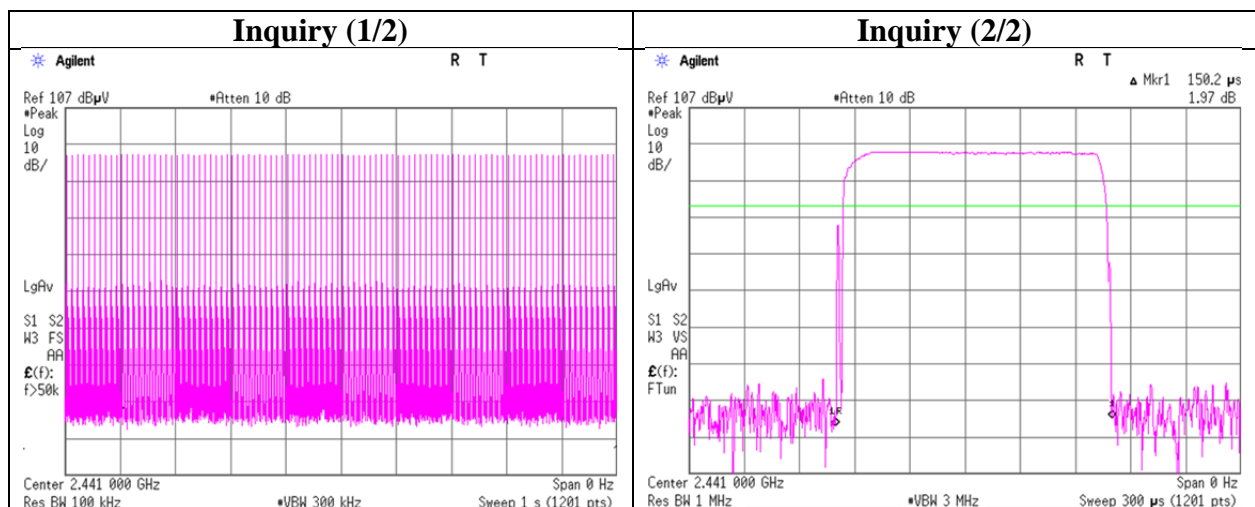
Sample Calculation
Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	52	46	48	50	47	48.6
DH3	20	22	25	22	27	23.2
DH5	17	18	13	13	19	16
3DH1	50	49	48	48	48	48.6
3DH3	21	23	25	23	27	23.8
3DH5	12	19	12	14	17	14.8

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 $N = 79$.



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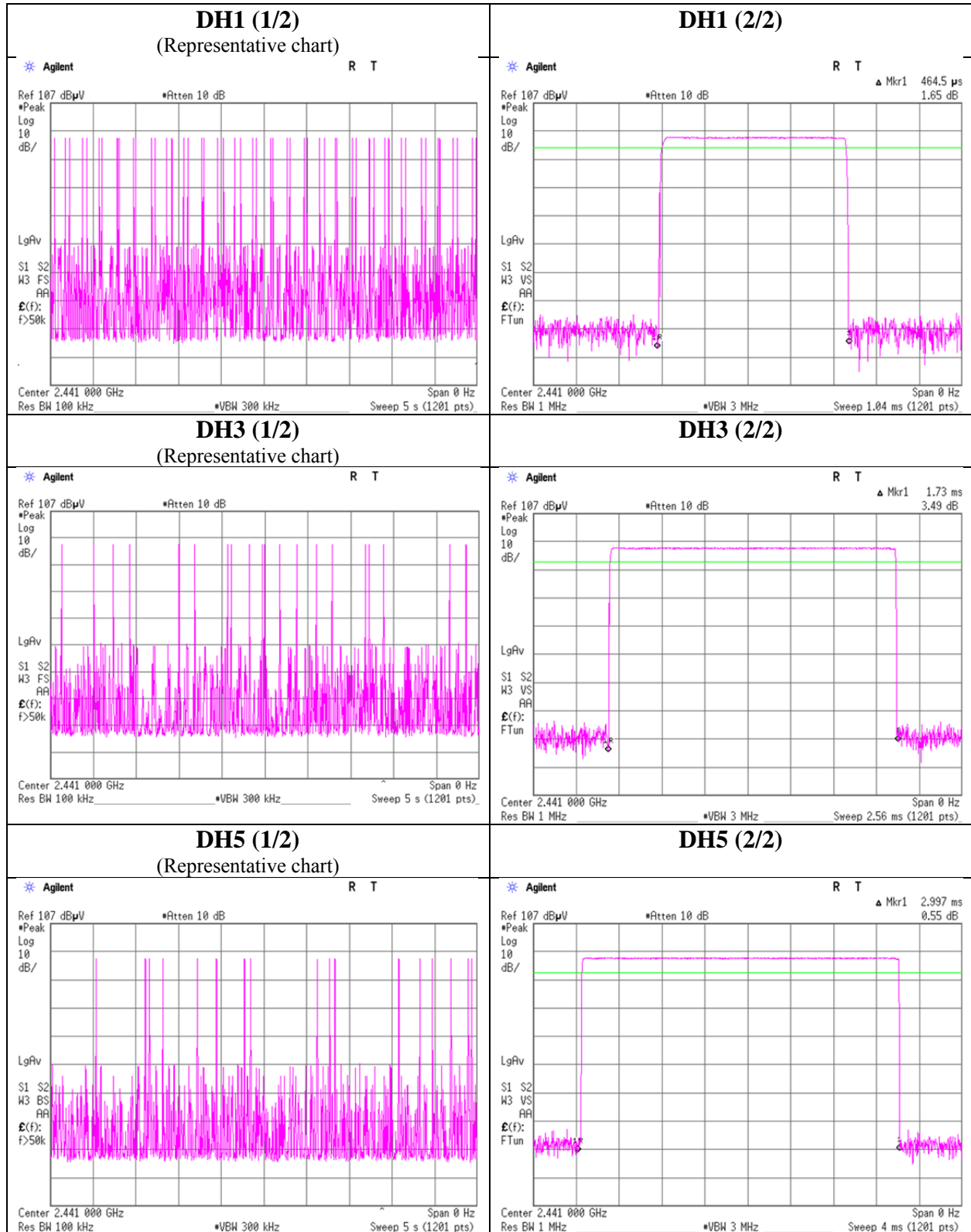
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Dwell time



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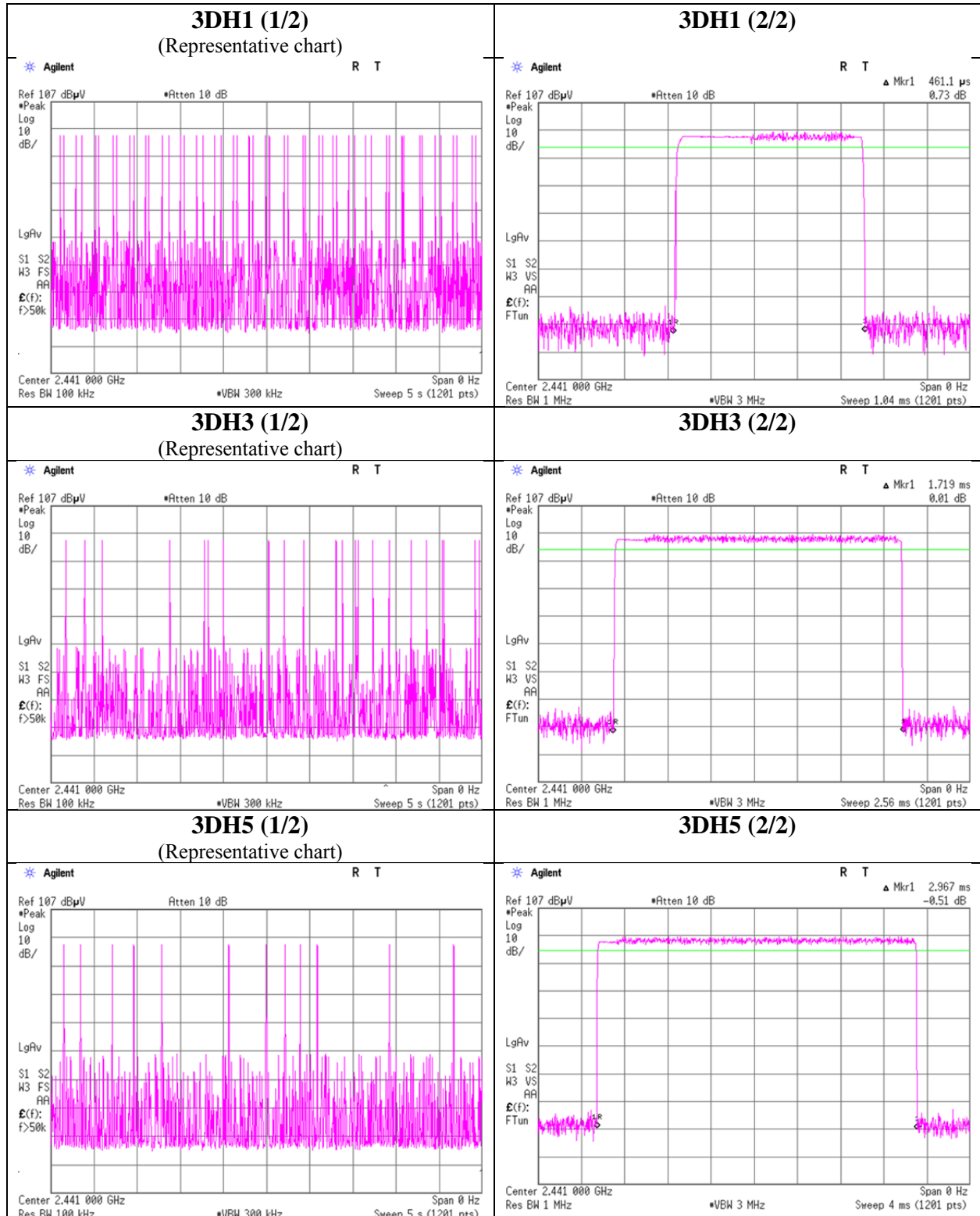
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Dwell time



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Maximum Peak Output Power

Test place : Ise EMC Lab. No.7 Shielded Room
Report No. : 11577935H
Date : January 18, 2017
Temperature / Humidity : 22 deg. C / 35 % RH
Engineer : Hiroyuki Furutaka
Mode : Tx, Hopping Off, DH5/2DH5/3DH5/Inquiry

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-11.89	1.57	10.08	-0.24	0.95	20.96	125	21.20
DH5	2441.0	-11.84	1.58	10.08	-0.18	0.96	20.96	125	21.14
DH5	2480.0	-12.20	1.59	10.08	-0.53	0.89	20.96	125	21.49
2DH5	2402.0	-10.22	1.57	10.08	1.43	1.39	20.96	125	19.53
2DH5	2441.0	-10.19	1.58	10.08	1.47	1.40	20.96	125	19.49
2DH5	2480.0	-10.54	1.59	10.08	1.13	1.30	20.96	125	19.83
3DH5	2402.0	-9.70	1.57	10.08	1.95	1.57	20.96	125	19.01
3DH5	2441.0	-9.66	1.58	10.08	2.00	1.58	20.96	125	18.96
3DH5	2480.0	-10.07	1.59	10.08	1.60	1.45	20.96	125	19.36
Inquiry	2441.0	-12.17	1.58	10.08	-0.51	0.89	20.96	125	21.47

Sample Calculation:

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

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

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.7 Shielded Room
Report No. : 11577935H
Date : January 18, 2017
Temperature / Humidity : 22 deg. C /35 % RH
Engineer : Hiroyuki Furutaka
Mode : Tx, Hopping Off, DH5/2DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-13.60	1.57	10.08	-1.95	0.64	1.00	-0.95	0.80
DH5	2441.0	-13.55	1.58	10.08	-1.89	0.65	1.00	-0.89	0.81
DH5	2480.0	-13.95	1.59	10.08	-2.28	0.59	1.00	-1.28	0.74
2DH5	2402.0	-14.10	1.57	10.08	-2.45	0.57	1.01	-1.44	0.72
2DH5	2441.0	-14.06	1.58	10.08	-2.40	0.58	1.01	-1.39	0.73
2DH5	2480.0	-14.45	1.59	10.08	-2.78	0.53	1.01	-1.77	0.67
3DH5	2402.0	-14.09	1.57	10.08	-2.44	0.57	1.02	-1.42	0.72
3DH5	2441.0	-14.06	1.58	10.08	-2.40	0.58	1.02	-1.38	0.73
3DH5	2480.0	-14.48	1.59	10.08	-2.81	0.52	1.02	-1.79	0.66

Sample Calculation:

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

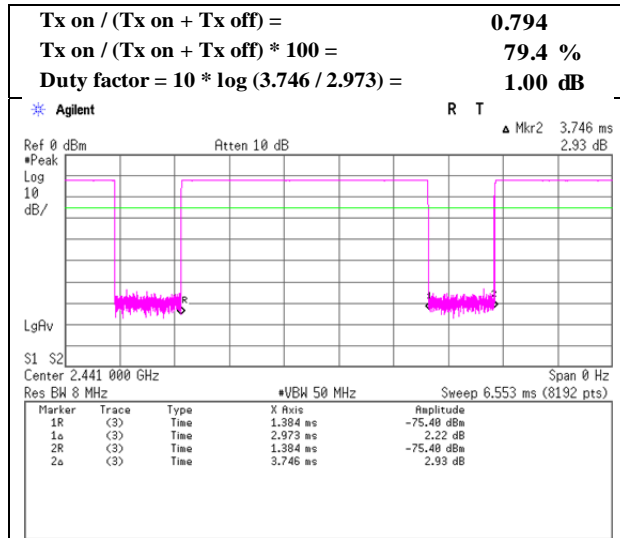
Result (Burst power average) = Time average + Duty factor

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

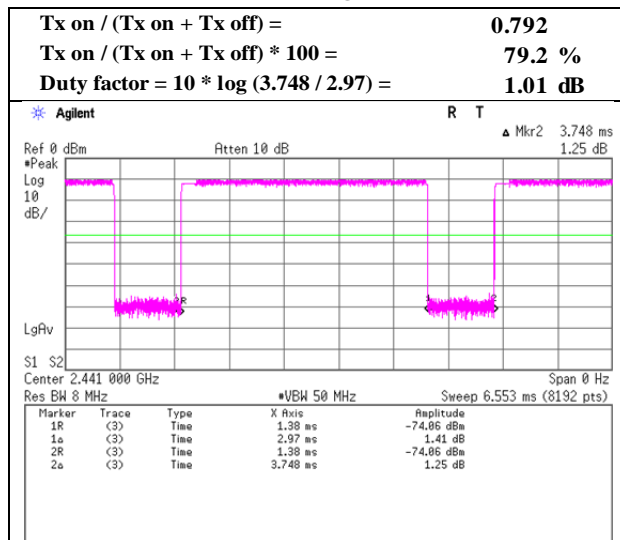
Burst Rate Confirmation

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off

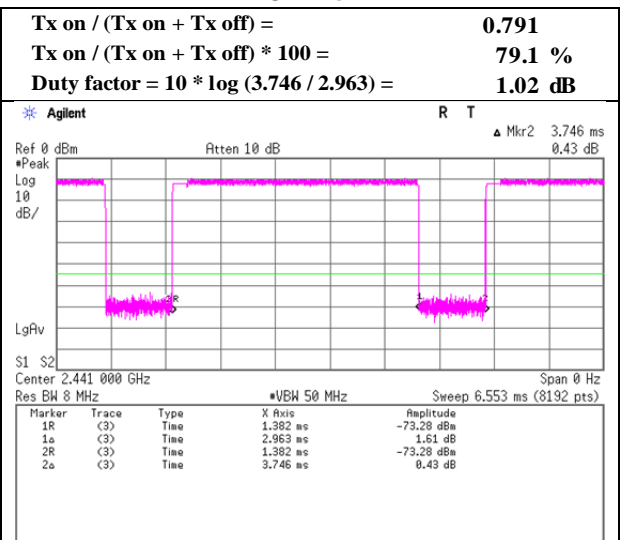
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
 (Above 1 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.	87.551	QP	41.4	7.9	7.3	28.0	28.6	40.0	11.4	
Hori.	177.839	QP	36.8	16.1	8.0	27.5	33.4	43.5	10.1	
Hori.	204.286	QP	47.0	11.4	8.1	27.4	39.1	43.5	4.4	
Hori.	379.389	QP	42.3	15.2	9.3	27.7	39.1	46.0	6.9	
Hori.	554.492	QP	39.3	18.4	10.0	28.1	39.6	46.0	6.4	
Hori.	703.485	QP	34.6	19.8	10.5	27.6	37.3	46.0	8.7	
Hori.	2390.000	PK	44.2	27.6	4.3	34.6	41.5	73.9	32.4	
Hori.	4804.000	PK	43.0	31.5	6.2	33.8	46.9	73.9	27.0	
Hori.	5276.092	PK	48.1	32.0	6.4	33.7	52.8	73.9	21.1	
Hori.	7206.000	PK	48.7	36.1	7.0	33.9	57.9	73.9	16.0	
Hori.	9608.000	PK	42.9	38.5	7.6	34.5	54.5	73.9	19.4	
Hori.	2390.000	AV	32.2	27.6	4.3	34.6	29.5	53.9	24.4	
Hori.	4804.000	AV	31.3	31.5	6.2	33.8	35.2	53.9	18.7	
Hori.	5276.092	AV	43.3	32.0	6.4	33.7	48.0	53.9	5.9	
Hori.	7206.000	AV	40.8	36.1	7.0	33.9	50.0	53.9	3.9	
Hori.	9608.000	AV	31.5	38.5	7.6	34.5	43.1	53.9	10.8	
Vert.	87.551	QP	48.2	7.9	7.3	28.0	35.4	40.0	4.6	
Vert.	177.839	QP	34.2	16.1	8.0	27.5	30.8	43.5	12.7	
Vert.	204.286	QP	45.4	11.4	8.1	27.4	37.5	43.5	6.0	
Vert.	379.389	QP	39.5	15.2	9.3	27.7	36.3	46.0	9.7	
Vert.	554.492	QP	38.7	18.4	10.0	28.1	39.0	46.0	7.0	
Vert.	703.485	QP	32.9	19.8	10.5	27.6	35.6	46.0	10.4	
Vert.	2390.000	PK	45.3	27.6	4.3	34.6	42.6	73.9	31.3	
Vert.	4804.000	PK	43.1	31.5	6.2	33.8	47.0	73.9	26.9	
Vert.	5275.712	PK	48.3	32.0	6.4	33.7	53.0	73.9	20.9	
Vert.	7206.000	PK	47.2	36.1	7.0	33.9	56.4	73.9	17.5	
Vert.	9608.000	PK	44.3	38.5	7.6	34.5	55.9	73.9	18.0	
Vert.	2390.000	AV	32.4	27.6	4.3	34.6	29.7	53.9	24.2	
Vert.	4804.000	AV	32.4	31.5	6.2	33.8	36.3	53.9	17.6	
Vert.	5275.712	AV	43.8	32.0	6.4	33.7	48.5	53.9	5.4	
Vert.	7206.000	AV	39.1	36.1	7.0	33.9	48.3	53.9	5.6	
Vert.	9608.000	AV	32.6	38.5	7.6	34.5	44.2	53.9	9.7	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	89.7	27.6	4.4	34.6	87.1	-	-	Carrier
Hori	2400.000	PK	49.6	27.6	4.4	34.6	47.0	67.1	20.1	
Vert	2402.000	PK	94.0	27.6	4.4	34.6	91.4	-	-	Carrier
Vert	2400.000	PK	53.6	27.6	4.4	34.6	51.0	71.4	20.4	

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

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

UL Japan, Inc.

Ise EMC Lab.

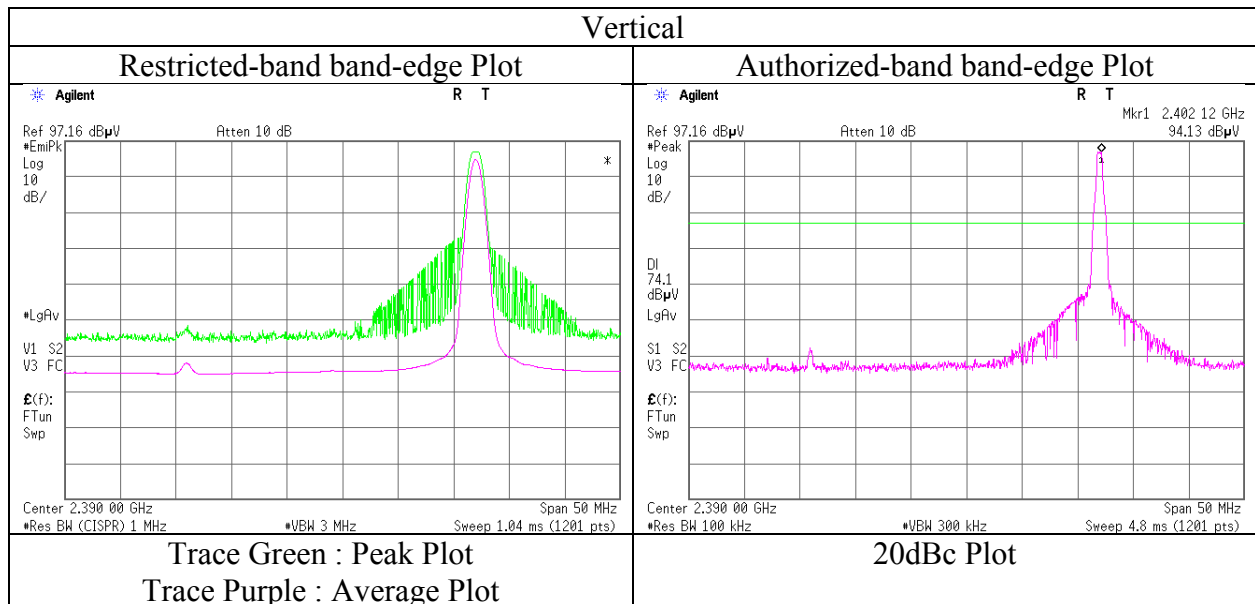
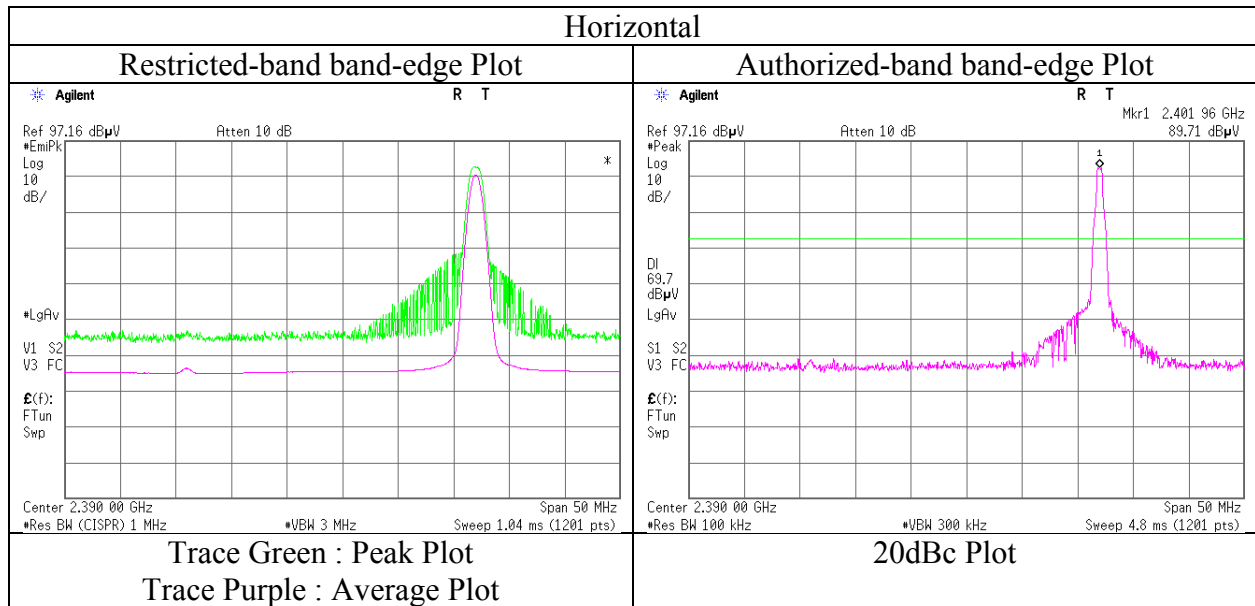
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Radiated Spurious Emission
(Reference Plot for band-edge)

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH
Engineer : Ryota Yamanaka
(1GHz - 10 GHz)
Mode : Tx, Hopping Off, DH5 2402 MHz



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
 (Above 1 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.	87.551	QP	41.5	7.9	7.3	28.0	28.7	40.0	11.3	
Hori.	177.839	QP	34.0	16.1	8.0	27.5	30.6	43.5	12.9	
Hori.	204.286	QP	46.3	11.4	8.1	27.4	38.4	43.5	5.1	
Hori.	379.389	QP	42.3	15.2	9.3	27.7	39.1	46.0	6.9	
Hori.	554.492	QP	37.5	18.4	10.0	28.1	37.8	46.0	8.2	
Hori.	703.485	QP	34.5	19.8	10.5	27.6	37.2	46.0	8.8	
Hori.	4882.000	PK	43.1	31.7	6.2	33.8	47.2	73.9	26.7	
Hori.	5276.092	PK	48.3	32.0	6.4	33.7	53.0	73.9	20.9	
Hori.	7323.000	PK	44.4	36.3	7.1	33.9	53.9	73.9	20.0	
Hori.	9764.000	PK	44.2	38.5	7.6	34.5	55.8	73.9	18.1	
Hori.	4882.000	AV	31.2	31.7	6.2	33.8	35.3	53.9	18.6	
Hori.	5276.092	AV	43.4	32.0	6.4	33.7	48.1	53.9	5.8	
Hori.	7323.000	AV	35.5	36.3	7.1	33.9	45.0	53.9	8.9	
Hori.	9764.000	AV	31.6	38.5	7.6	34.5	43.2	53.9	10.7	
Vert.	87.551	QP	48.8	7.9	7.3	28.0	36.0	40.0	4.0	
Vert.	177.839	QP	31.0	16.1	8.0	27.5	27.6	43.5	15.9	
Vert.	204.286	QP	43.9	11.4	8.1	27.4	36.0	43.5	7.5	
Vert.	379.389	QP	39.0	15.2	9.3	27.7	35.8	46.0	10.2	
Vert.	554.492	QP	37.4	18.4	10.0	28.1	37.7	46.0	8.3	
Vert.	703.485	QP	33.2	19.8	10.5	27.6	35.9	46.0	10.1	
Vert.	4882.000	PK	43.1	31.7	6.2	33.8	47.2	73.9	26.7	
Vert.	5276.250	PK	48.0	32.0	6.4	33.7	52.7	73.9	21.2	
Vert.	7323.000	PK	44.7	36.3	7.1	33.9	54.2	73.9	19.7	
Vert.	9764.000	PK	44.1	38.5	7.6	34.5	55.7	73.9	18.2	
Vert.	4882.000	AV	32.3	31.7	6.2	33.8	36.4	53.9	17.5	
Vert.	5276.250	AV	43.6	32.0	6.4	33.7	48.3	53.9	5.6	
Vert.	7323.000	AV	35.8	36.3	7.1	33.9	45.3	53.9	8.6	
Vert.	9764.000	AV	32.2	38.5	7.6	34.5	43.8	53.9	10.1	

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

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

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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
 (Above 1 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.	87.551	QP	42.0	7.9	7.3	28.0	29.2	40.0	10.8	
Hori.	177.839	QP	39.9	16.1	8.0	27.5	36.5	43.5	7.0	
Hori.	204.286	QP	47.0	11.4	8.1	27.4	39.1	43.5	4.4	
Hori.	379.389	QP	42.1	15.2	9.3	27.7	38.9	46.0	7.1	
Hori.	554.492	QP	37.8	18.4	10.0	28.1	38.1	46.0	7.9	
Hori.	703.485	QP	34.2	19.8	10.5	27.6	36.9	46.0	9.1	
Hori.	2483.500	PK	54.2	27.7	4.4	34.6	51.7	73.9	22.2	
Hori.	4960.000	PK	43.4	32.0	6.3	33.8	47.9	73.9	26.0	
Hori.	5276.123	PK	48.9	32.0	6.4	33.7	53.6	73.9	20.3	
Hori.	7440.000	PK	44.9	36.4	7.1	34.0	54.4	73.9	19.5	
Hori.	9920.000	PK	43.0	38.6	7.7	34.6	54.7	73.9	19.2	
Hori.	2483.500	AV	32.5	27.7	4.4	34.6	30.0	53.9	23.9	
Hori.	4960.000	AV	31.3	32.0	6.3	33.8	35.8	53.9	18.1	
Hori.	5276.123	AV	43.9	32.0	6.4	33.7	48.6	53.9	5.3	
Hori.	7440.000	AV	35.1	36.4	7.1	34.0	44.6	53.9	9.3	
Hori.	9920.000	AV	31.1	38.6	7.7	34.6	42.8	53.9	11.1	
Vert.	87.551	QP	48.9	7.9	7.3	28.0	36.1	40.0	3.9	
Vert.	177.839	QP	36.5	16.1	8.0	27.5	33.1	43.5	10.4	
Vert.	204.286	QP	44.5	11.4	8.1	27.4	36.6	43.5	6.9	
Vert.	379.389	QP	38.9	15.2	9.3	27.7	35.7	46.0	10.3	
Vert.	554.492	QP	34.7	18.4	10.0	28.1	35.0	46.0	11.0	
Vert.	703.485	QP	32.7	19.8	10.5	27.6	35.4	46.0	10.6	
Vert.	2483.500	PK	55.9	27.7	4.4	34.6	53.4	73.9	20.5	
Vert.	4960.000	PK	43.2	32.0	6.3	33.8	47.7	73.9	26.2	
Vert.	5276.155	PK	48.5	32.0	6.4	33.7	53.2	73.9	20.7	
Vert.	7440.000	PK	44.8	36.4	7.1	34.0	54.3	73.9	19.6	
Vert.	9920.000	PK	43.7	38.6	7.7	34.6	55.4	73.9	18.5	
Vert.	2483.500	AV	32.9	27.7	4.4	34.6	30.4	53.9	23.5	
Vert.	4960.000	AV	32.2	32.0	6.3	33.8	36.7	53.9	17.2	
Vert.	5276.155	AV	44.1	32.0	6.4	33.7	48.8	53.9	5.1	
Vert.	7440.000	AV	34.8	36.4	7.1	34.0	44.3	53.9	9.6	
Vert.	9920.000	AV	32.5	38.6	7.7	34.6	44.2	53.9	9.7	

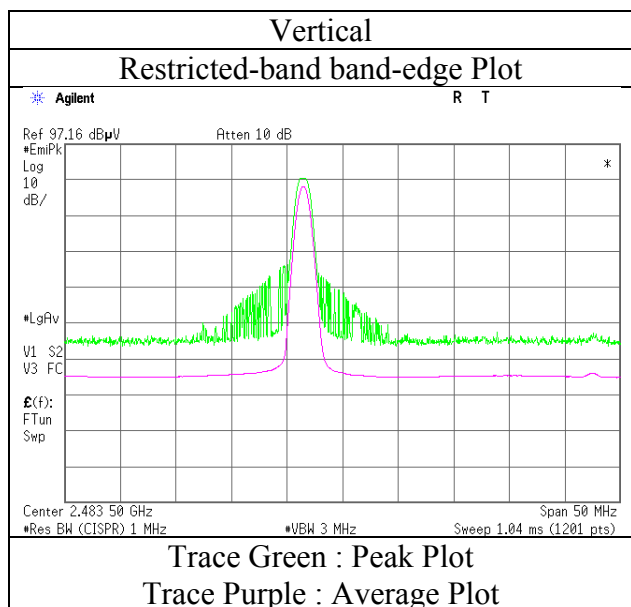
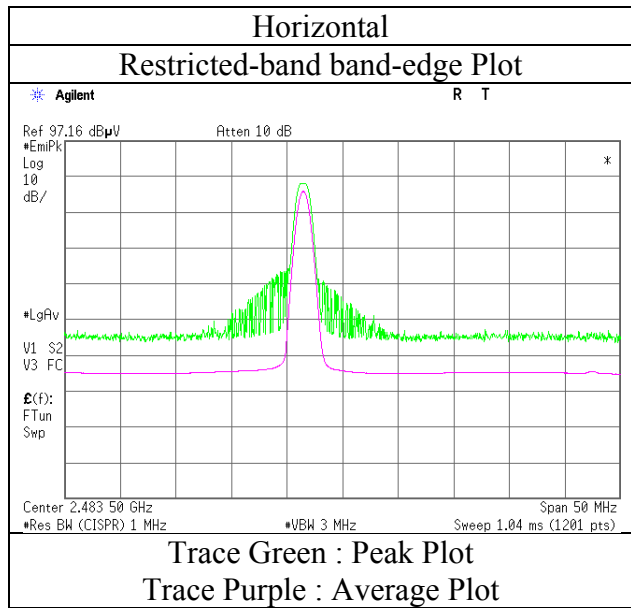
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11577935H
Date	January 19, 2017
Temperature / Humidity	25 deg. C / 36 % RH
Engineer	Ryota Yamanaka (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.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
(Above 1 GHz) (Below 1 GHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	87.551	QP	42.2	7.9	7.3	28.0	29.4	40.0	10.6	
Hori.	177.839	QP	37.4	16.1	8.0	27.5	34.0	43.5	9.5	
Hori.	204.286	QP	46.9	11.4	8.1	27.4	39.0	43.5	4.5	
Hori.	379.389	QP	42.0	15.2	9.3	27.7	38.8	46.0	7.2	
Hori.	554.492	QP	39.2	18.4	10.0	28.1	39.5	46.0	6.5	
Hori.	703.485	QP	34.3	19.8	10.5	27.6	37.0	46.0	9.0	
Hori.	2390.000	PK	44.5	27.6	4.3	34.6	41.8	73.9	32.1	
Hori.	4804.000	PK	43.4	31.5	6.2	33.8	47.3	73.9	26.6	
Hori.	5276.092	PK	49.0	32.0	6.4	33.7	53.7	73.9	20.2	
Hori.	7206.000	PK	47.9	36.1	7.0	33.9	57.1	73.9	16.8	
Hori.	9608.000	PK	42.4	38.5	7.6	34.5	54.0	73.9	19.9	
Hori.	2390.000	AV	32.3	27.6	4.3	34.6	29.6	53.9	24.3	
Hori.	4804.000	AV	31.4	31.5	6.2	33.8	35.3	53.9	18.6	
Hori.	5276.092	AV	44.3	32.0	6.4	33.7	49.0	53.9	4.9	
Hori.	7206.000	AV	40.9	36.1	7.0	33.9	50.1	53.9	3.8	
Hori.	9608.000	AV	31.4	38.5	7.6	34.5	43.0	53.9	10.9	
Vert.	87.551	QP	49.1	7.9	7.3	28.0	36.3	40.0	3.7	
Vert.	177.839	QP	34.1	16.1	8.0	27.5	30.7	43.5	12.8	
Vert.	204.286	QP	44.4	11.4	8.1	27.4	36.5	43.5	7.0	
Vert.	379.389	QP	38.7	15.2	9.3	27.7	35.5	46.0	10.5	
Vert.	554.492	QP	37.9	18.4	10.0	28.1	38.2	46.0	7.8	
Vert.	703.485	QP	33.5	19.8	10.5	27.6	36.2	46.0	9.8	
Vert.	2390.000	PK	44.9	27.6	4.3	34.6	42.2	73.9	31.7	
Vert.	4804.000	PK	43.4	31.5	6.2	33.8	47.3	73.9	26.6	
Vert.	5275.712	PK	49.1	32.0	6.4	33.7	53.8	73.9	20.1	
Vert.	7206.000	PK	47.1	36.1	7.0	33.9	56.3	73.9	17.6	
Vert.	9608.000	PK	44.4	38.5	7.6	34.5	56.0	73.9	17.9	
Vert.	2390.000	AV	32.4	27.6	4.3	34.6	29.7	53.9	24.2	
Vert.	4804.000	AV	32.6	31.5	6.2	33.8	36.5	53.9	17.4	
Vert.	5275.712	AV	44.2	32.0	6.4	33.7	48.9	53.9	5.0	
Vert.	7206.000	AV	38.5	36.1	7.0	33.9	47.7	53.9	6.2	
Vert.	9608.000	AV	32.5	38.5	7.6	34.5	44.1	53.9	9.8	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	90.1	27.6	4.4	34.6	87.5	-	-	Carrier
Hori	2400.000	PK	49.8	27.6	4.4	34.6	47.2	67.5	20.3	
Vert	2402.000	PK	94.1	27.6	4.4	34.6	91.5	-	-	Carrier
Vert	2400.000	PK	53.2	27.6	4.4	34.6	50.6	71.5	20.9	

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

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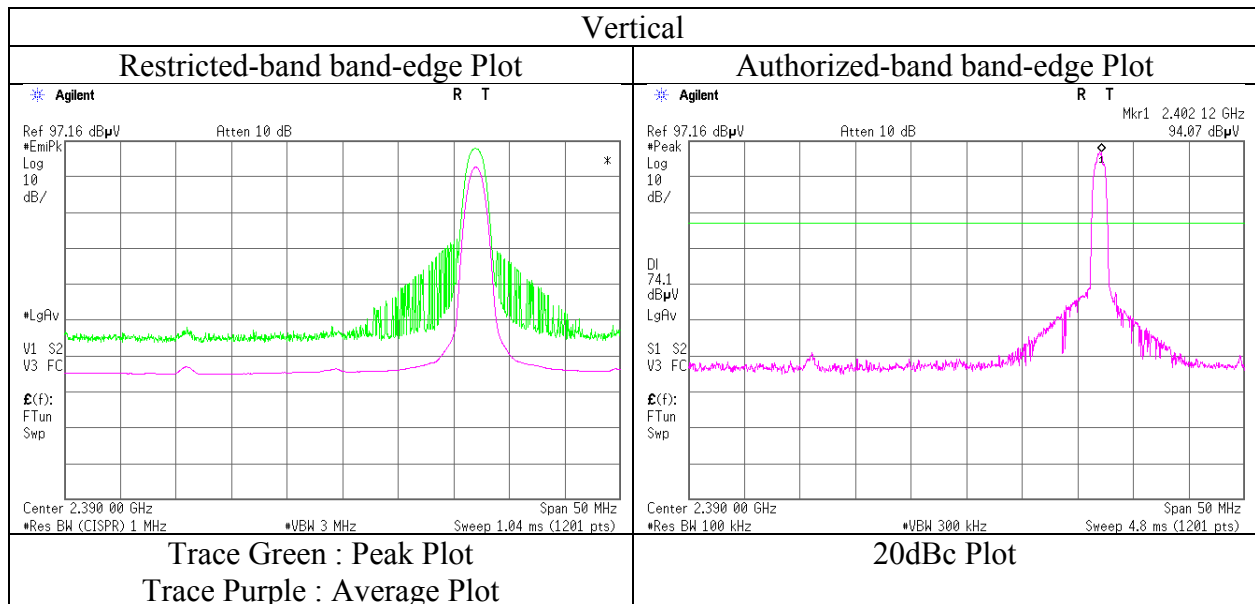
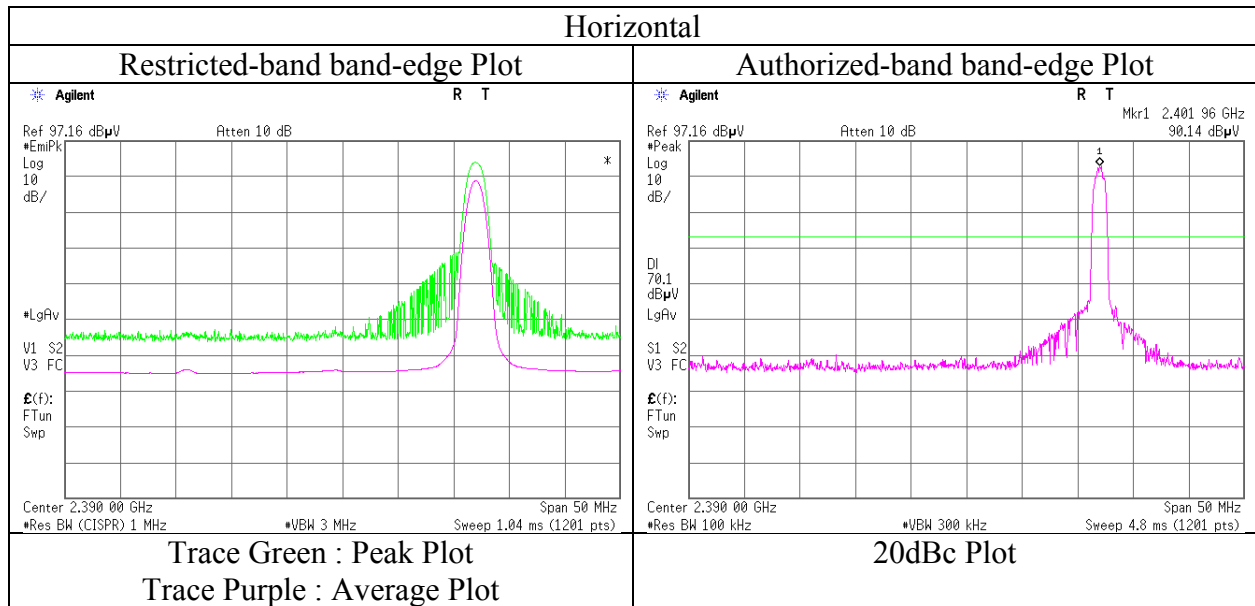
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11577935H
Date	January 19, 2017
Temperature / Humidity	25 deg. C / 36 % RH
Engineer	Ryota Yamanaka
	(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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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
(Above 1 GHz) (Below 1 GHz)
Mode : Tx, Hopping Off, 3DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	87.551	QP	42.4	7.9	7.3	28.0	29.6	40.0	10.4	
Hori.	177.839	QP	34.7	16.1	8.0	27.5	31.3	43.5	12.2	
Hori.	204.286	QP	46.7	11.4	8.1	27.4	38.8	43.5	4.7	
Hori.	379.389	QP	42.0	15.2	9.3	27.7	38.8	46.0	7.2	
Hori.	554.492	QP	37.9	18.4	10.0	28.1	38.2	46.0	7.8	
Hori.	703.485	QP	34.3	19.8	10.5	27.6	37.0	46.0	9.0	
Hori.	4882.000	PK	43.2	31.7	6.2	33.8	47.3	73.9	26.6	
Hori.	5276.092	PK	48.4	32.0	6.4	33.7	53.1	73.9	20.8	
Hori.	7323.000	PK	44.2	36.3	7.1	33.9	53.7	73.9	20.2	
Hori.	9764.000	PK	44.1	38.5	7.6	34.5	55.7	73.9	18.2	
Hori.	4882.000	AV	31.6	31.7	6.2	33.8	35.7	53.9	18.2	
Hori.	5276.092	AV	43.9	32.0	6.4	33.7	48.6	53.9	5.3	
Hori.	7323.000	AV	35.3	36.3	7.1	33.9	44.8	53.9	9.1	
Hori.	9764.000	AV	31.7	38.5	7.6	34.5	43.3	53.9	10.6	
Vert.	87.551	QP	49.1	7.9	7.3	28.0	36.3	40.0	3.7	
Vert.	177.839	QP	31.2	16.1	8.0	27.5	27.8	43.5	15.7	
Vert.	204.286	QP	44.1	11.4	8.1	27.4	36.2	43.5	7.3	
Vert.	379.389	QP	38.7	15.2	9.3	27.7	35.5	46.0	10.5	
Vert.	554.492	QP	37.2	18.4	10.0	28.1	37.5	46.0	8.5	
Vert.	703.485	QP	33.6	19.8	10.5	27.6	36.3	46.0	9.7	
Vert.	4882.000	PK	42.9	31.7	6.2	33.8	47.0	73.9	26.9	
Vert.	5276.250	PK	48.6	32.0	6.4	33.7	53.3	73.9	20.6	
Vert.	7323.000	PK	44.5	36.3	7.1	33.9	54.0	73.9	19.9	
Vert.	9764.000	PK	44.2	38.5	7.6	34.5	55.8	73.9	18.1	
Vert.	4882.000	AV	31.3	31.7	6.2	33.8	35.4	53.9	18.5	
Vert.	5276.250	AV	44.0	32.0	6.4	33.7	48.7	53.9	5.2	
Vert.	7323.000	AV	35.9	36.3	7.1	33.9	45.4	53.9	8.5	
Vert.	9764.000	AV	32.4	38.5	7.6	34.5	44.0	53.9	9.9	

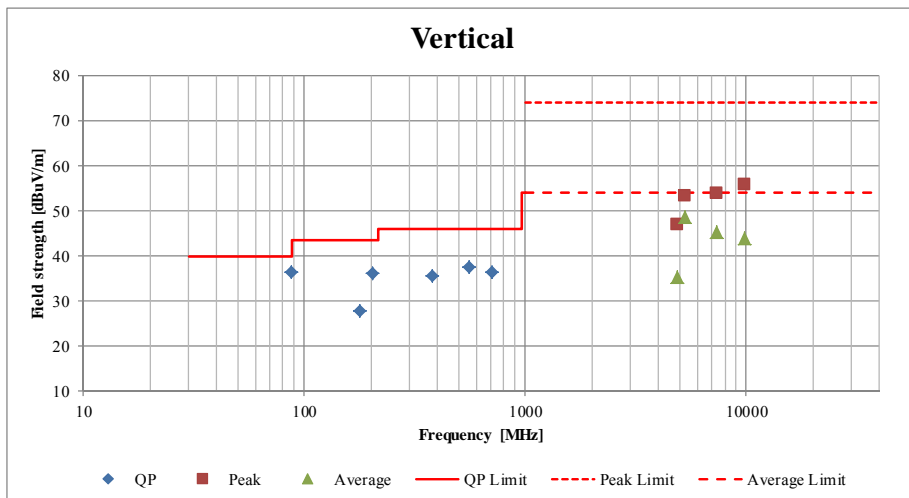
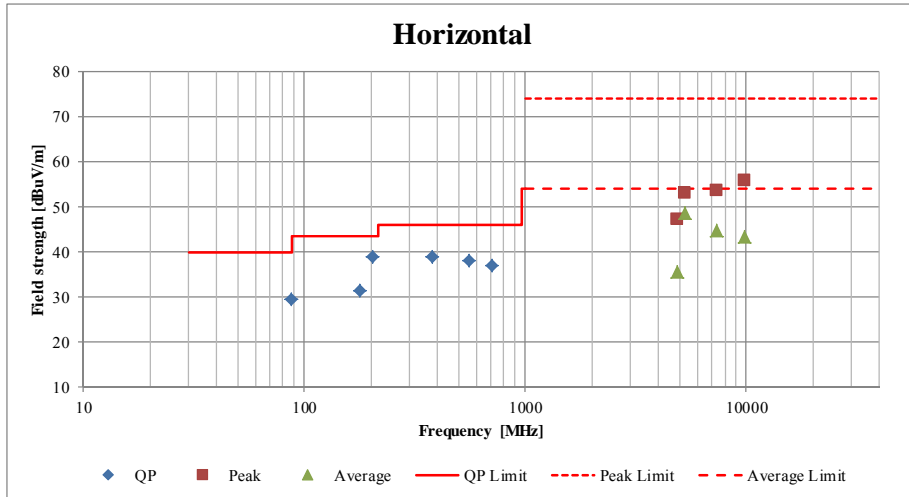
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber	
Report No.	11577935H	
Date	January 19, 2017	January 19, 2017
Temperature / Humidity	25 deg. C / 36 % RH	25 deg. C / 33 % RH
Engineer	Ryota Yamanaka	Takafumi Noguchi
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 MHz	



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 11577935H
Date : January 19, 2017 January 19, 2017
Temperature / Humidity : 25 deg. C / 36 % RH 25 deg. C / 33 % RH
Engineer : Ryota Yamanaka Takafumi Noguchi
 (Above 1 GHz) (Below 1 GHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	87.551	QP	42.2	7.9	7.3	28.0	29.4	40.0	10.6	
Hori.	177.839	QP	35.2	16.1	8.0	27.5	31.8	43.5	11.7	
Hori.	204.286	QP	46.7	11.4	8.1	27.4	38.8	43.5	4.7	
Hori.	379.389	QP	42.2	15.2	9.3	27.7	39.0	46.0	7.0	
Hori.	554.492	QP	38.2	18.4	10.0	28.1	38.5	46.0	7.5	
Hori.	703.485	QP	34.4	19.8	10.5	27.6	37.1	46.0	8.9	
Hori.	2483.500	PK	54.1	27.7	4.4	34.6	51.6	73.9	22.3	
Hori.	4960.000	PK	43.7	32.0	6.3	33.8	48.2	73.9	25.7	
Hori.	5276.123	PK	48.8	32.0	6.4	33.7	53.5	73.9	20.4	
Hori.	7440.000	PK	44.6	36.4	7.1	34.0	54.1	73.9	19.8	
Hori.	9920.000	PK	43.4	38.6	7.7	34.6	55.1	73.9	18.8	
Hori.	2483.500	AV	32.4	27.7	4.4	34.6	29.9	53.9	24.0	
Hori.	4960.000	AV	31.5	32.0	6.3	33.8	36.0	53.9	17.9	
Hori.	5276.123	AV	44.5	32.0	6.4	33.7	49.2	53.9	4.7	
Hori.	7440.000	AV	35.2	36.4	7.1	34.0	44.7	53.9	9.2	
Hori.	9920.000	AV	31.5	38.6	7.7	34.6	43.2	53.9	10.7	
Vert.	87.551	QP	49.2	7.9	7.3	28.0	36.4	40.0	3.6	
Vert.	177.839	QP	32.5	16.1	8.0	27.5	29.1	43.5	14.4	
Vert.	204.286	QP	43.7	11.4	8.1	27.4	35.8	43.5	7.7	
Vert.	379.389	QP	38.5	15.2	9.3	27.7	35.3	46.0	10.7	
Vert.	554.492	QP	37.4	18.4	10.0	28.1	37.7	46.0	8.3	
Vert.	703.485	QP	33.6	19.8	10.5	27.6	36.3	46.0	9.7	
Vert.	2483.500	PK	56.2	27.7	4.4	34.6	53.7	73.9	20.2	
Vert.	4960.000	PK	43.1	32.0	6.3	33.8	47.6	73.9	26.3	
Vert.	5276.155	PK	48.9	32.0	6.4	33.7	53.6	73.9	20.3	
Vert.	7440.000	PK	44.8	36.4	7.1	34.0	54.3	73.9	19.6	
Vert.	9920.000	PK	43.6	38.6	7.7	34.6	55.3	73.9	18.6	
Vert.	2483.500	AV	32.9	27.7	4.4	34.6	30.4	53.9	23.5	
Vert.	4960.000	AV	32.0	32.0	6.3	33.8	36.5	53.9	17.4	
Vert.	5276.155	AV	44.7	32.0	6.4	33.7	49.4	53.9	4.5	
Vert.	7440.000	AV	34.9	36.4	7.1	34.0	44.4	53.9	9.5	
Vert.	9920.000	AV	32.5	38.6	7.7	34.6	44.2	53.9	9.7	

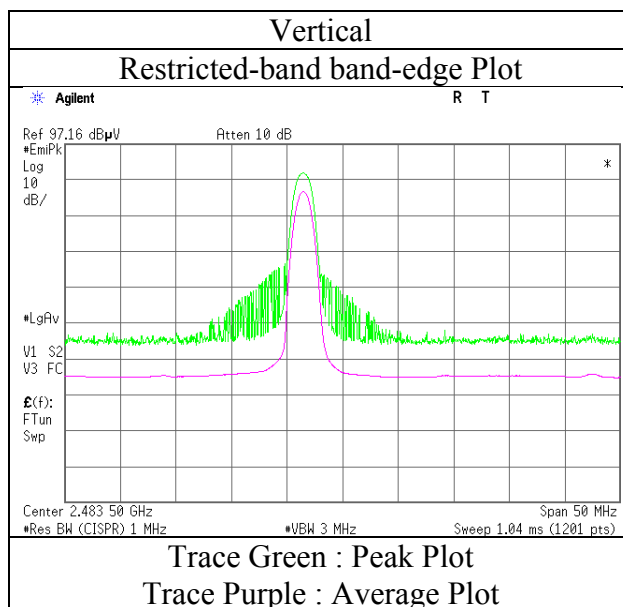
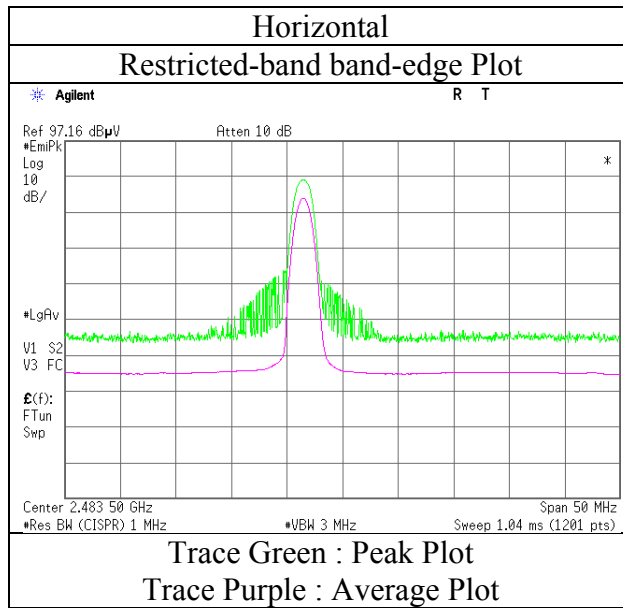
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11577935H
Date	January 19, 2017
Temperature / Humidity	25 deg. C / 36 % RH
Engineer	Ryota Yamanaka (1 GHz -10 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz

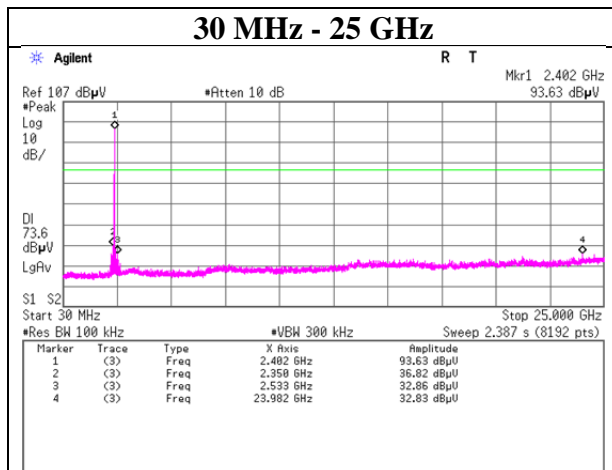
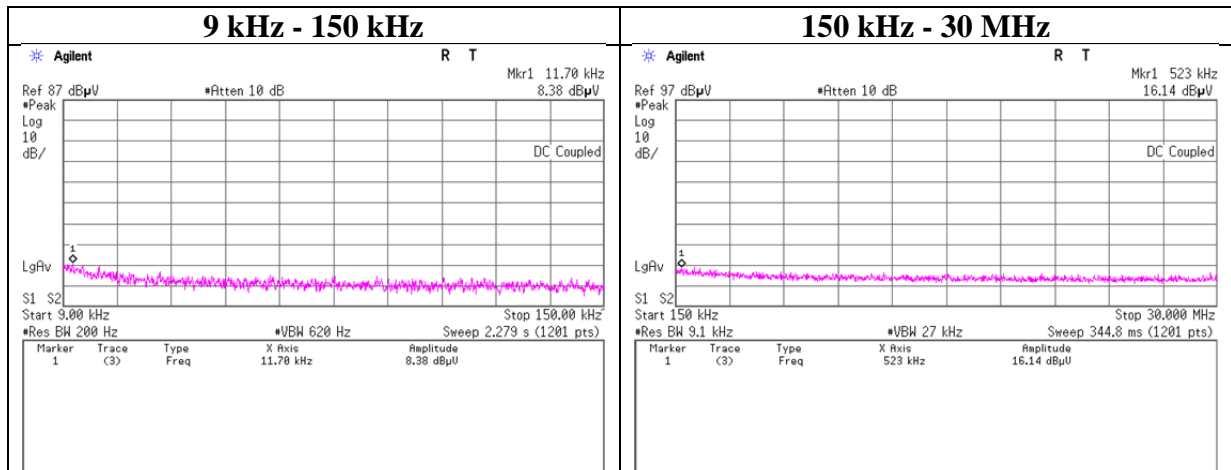


* Final result of restricted band edge was shown in tabular data.

Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, DH5

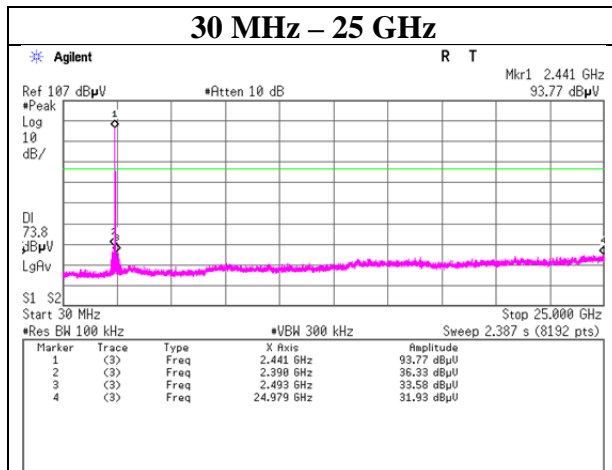
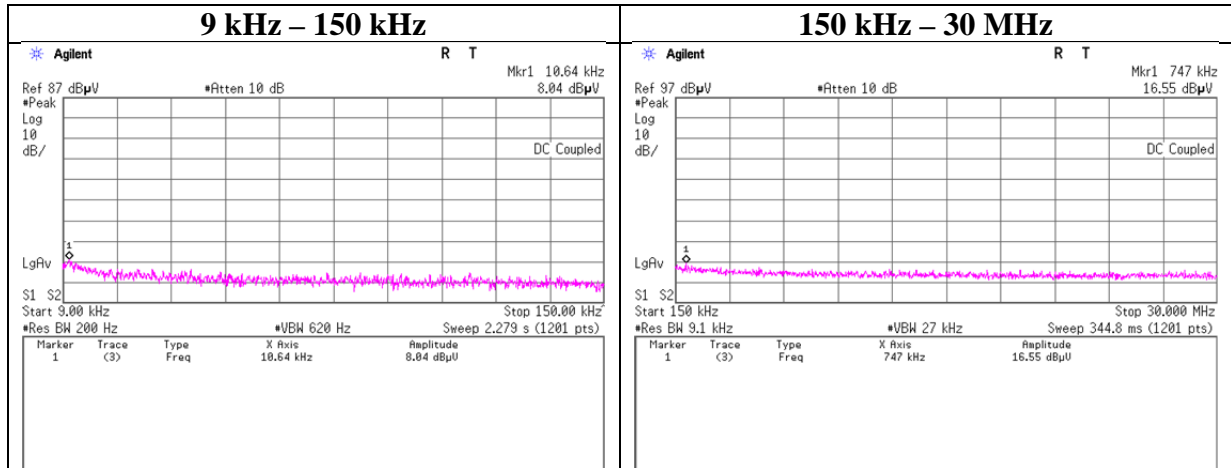
2402 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, DH5

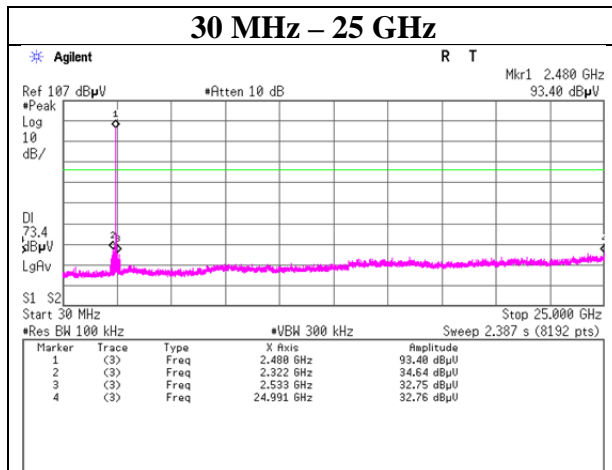
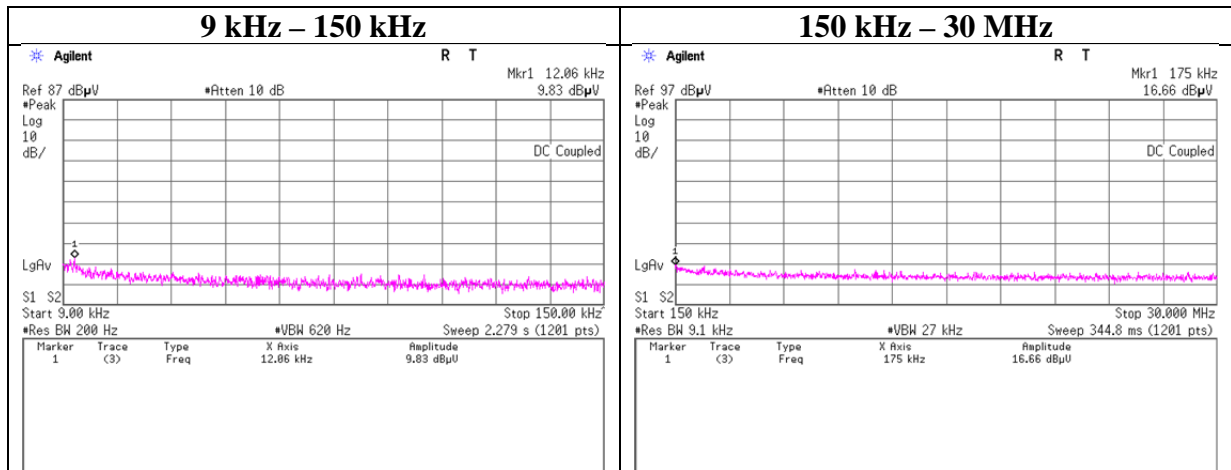
2441 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, DH5

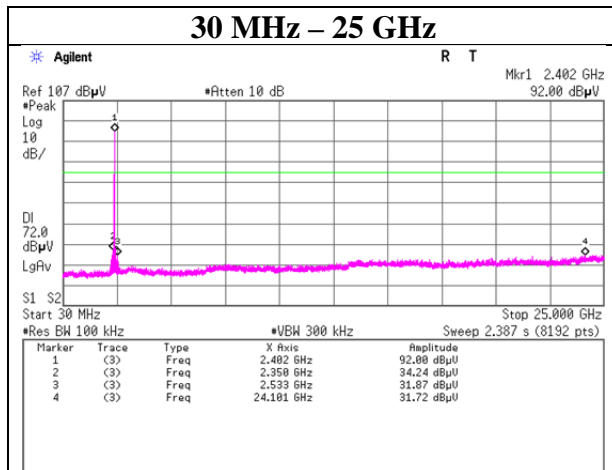
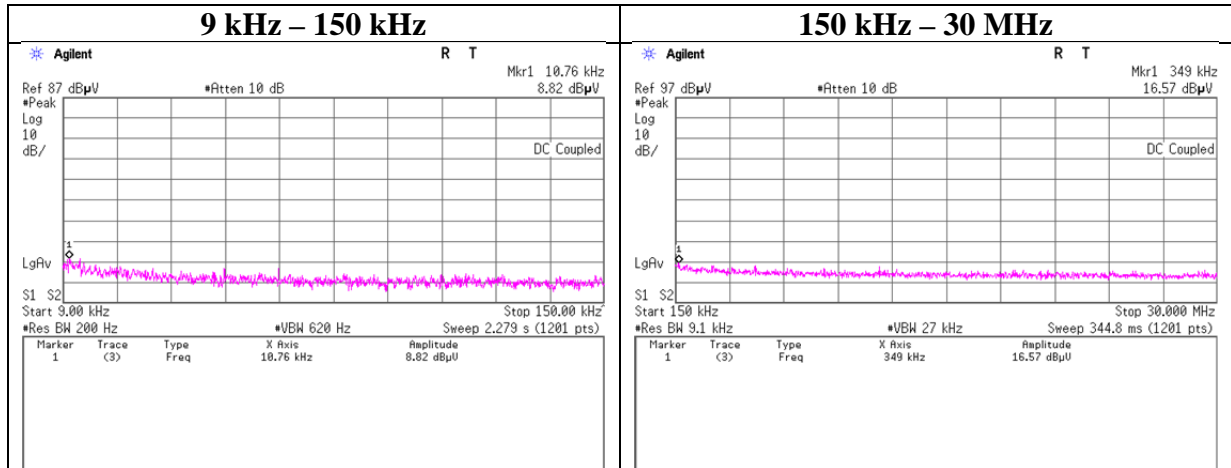
2480 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, 3DH5

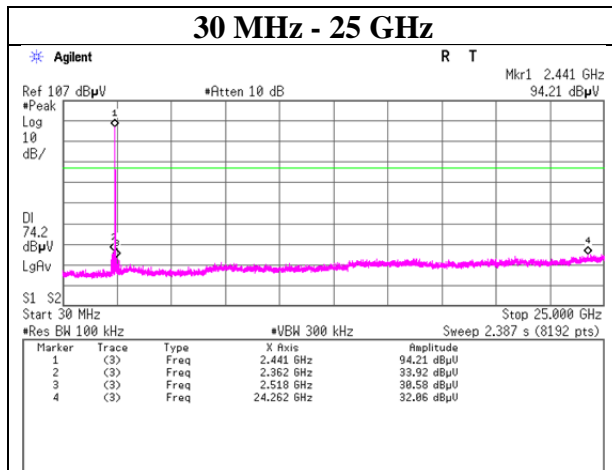
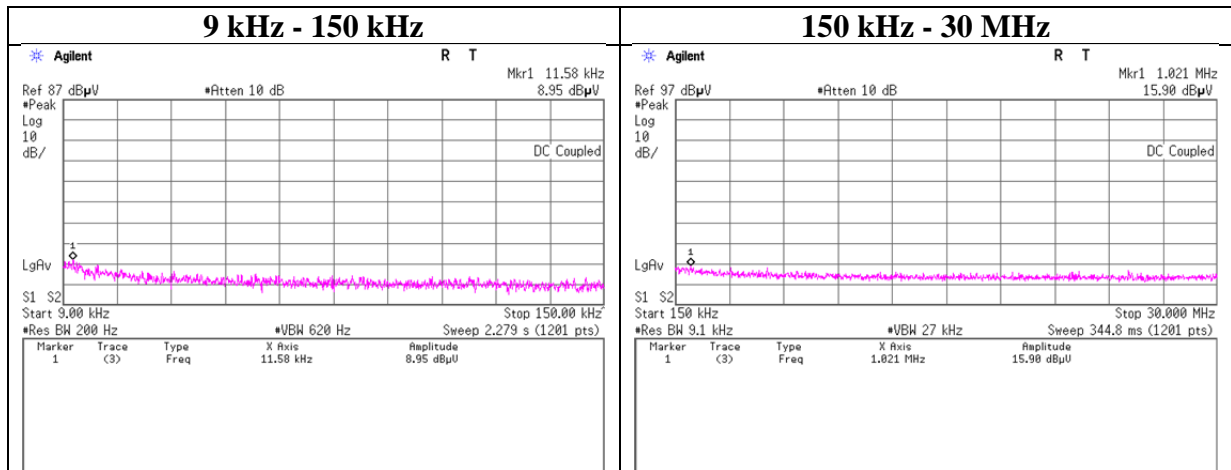
2402 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, 3DH5

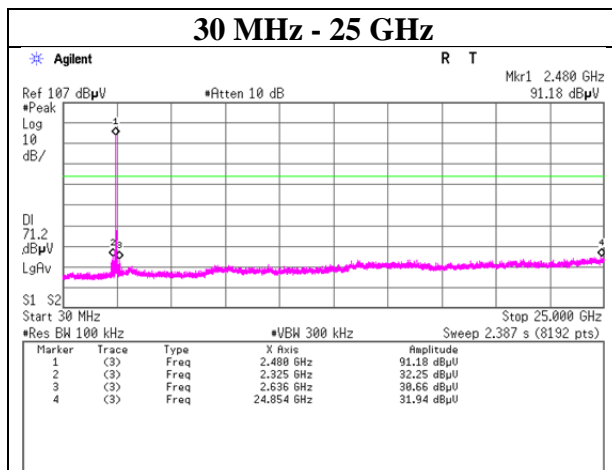
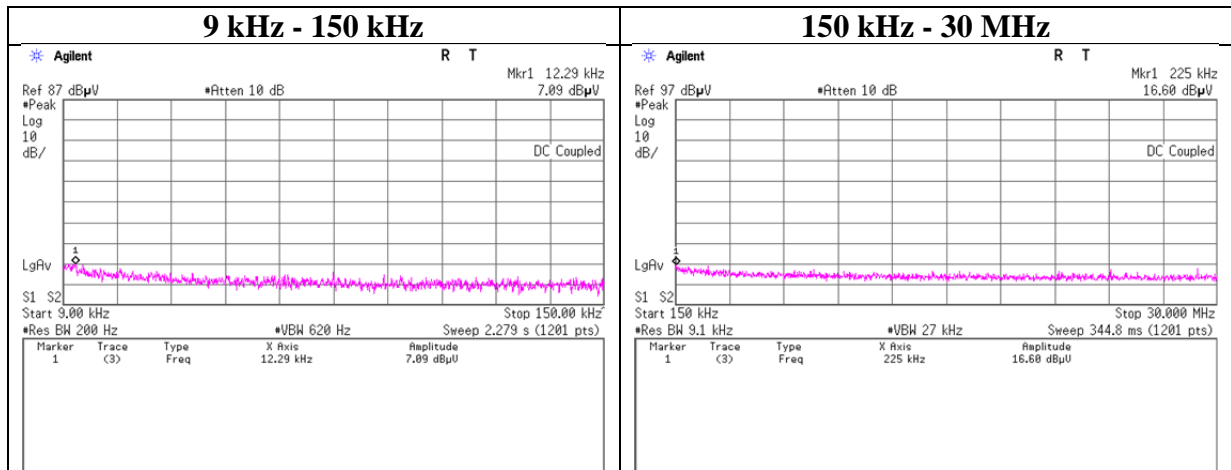
2441 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, 3DH5

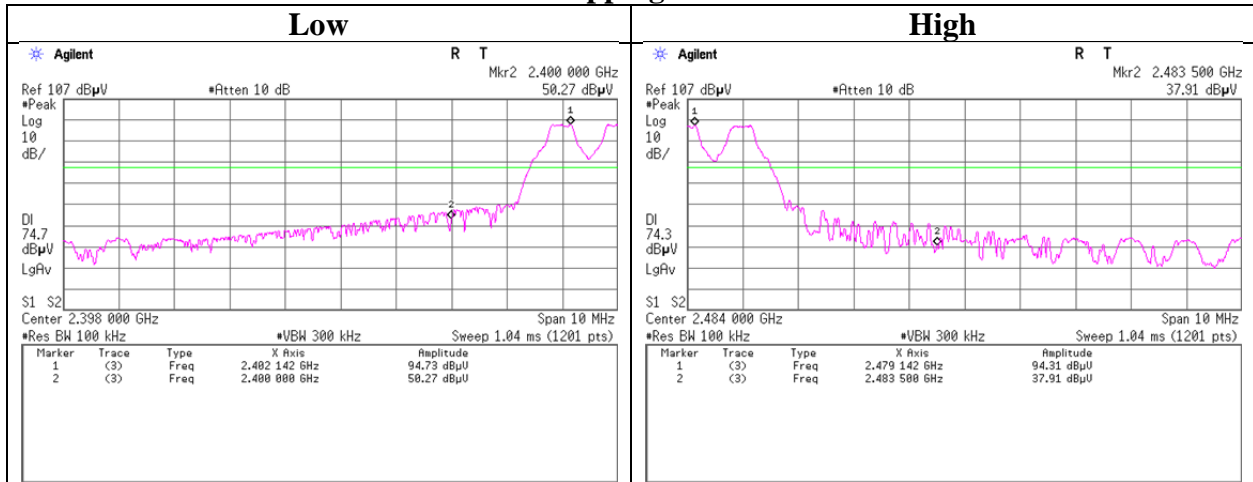
2480 MHz



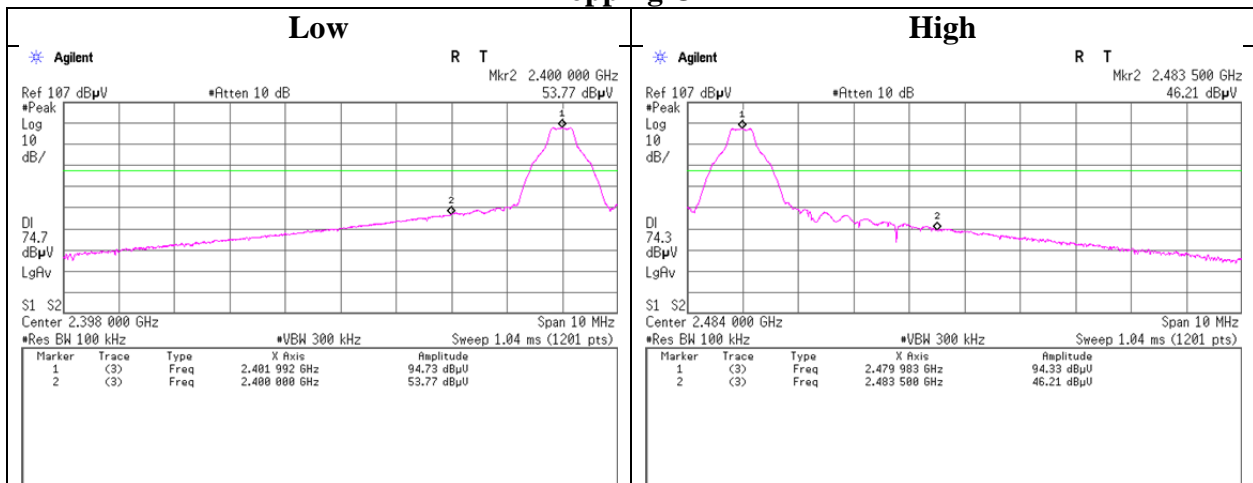
Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, DH5

Hopping On



Hopping Off



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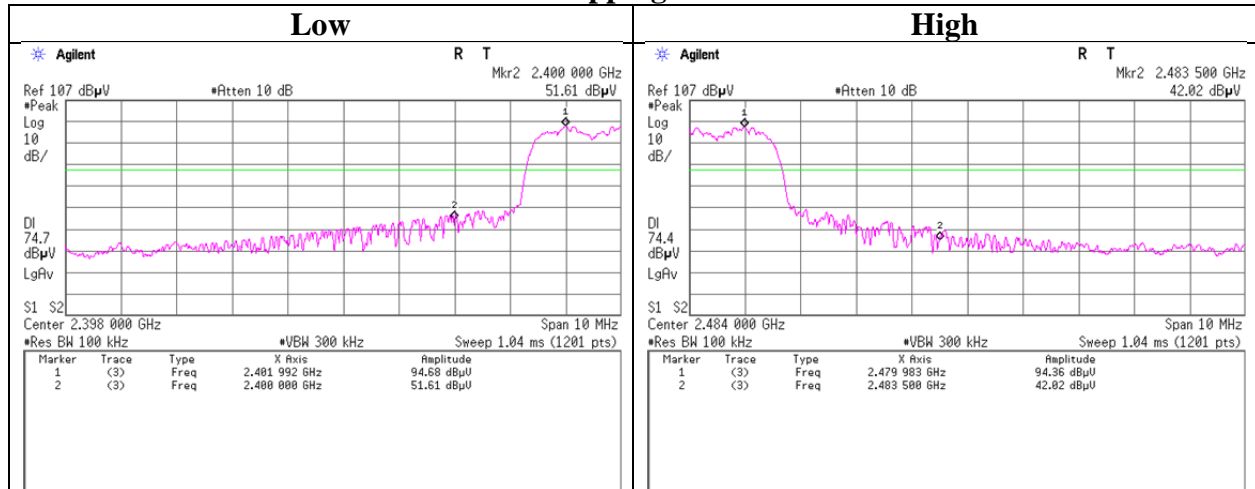
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

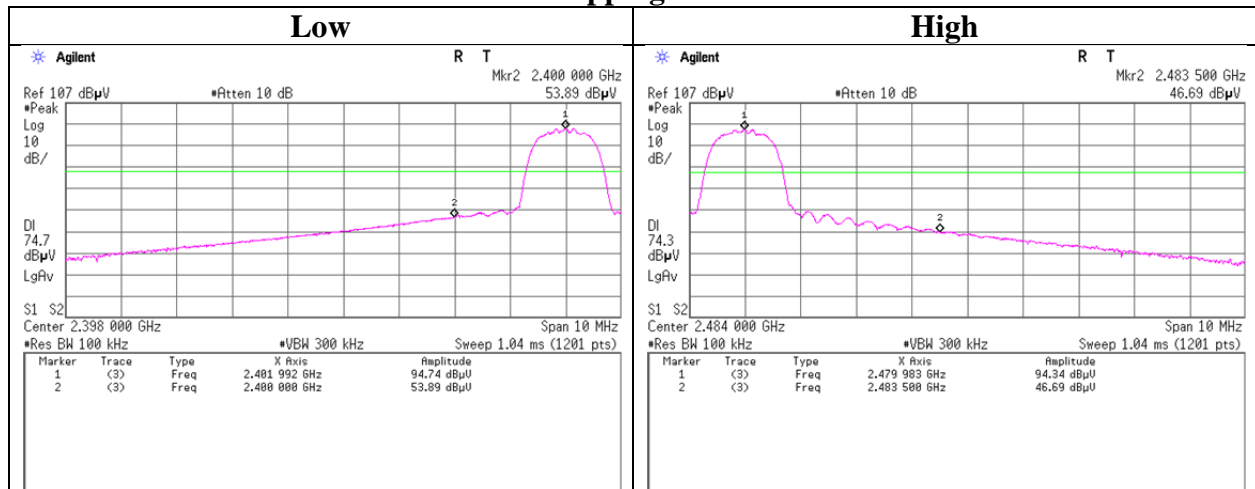
Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, 3DH5

Hopping On



Hopping Off



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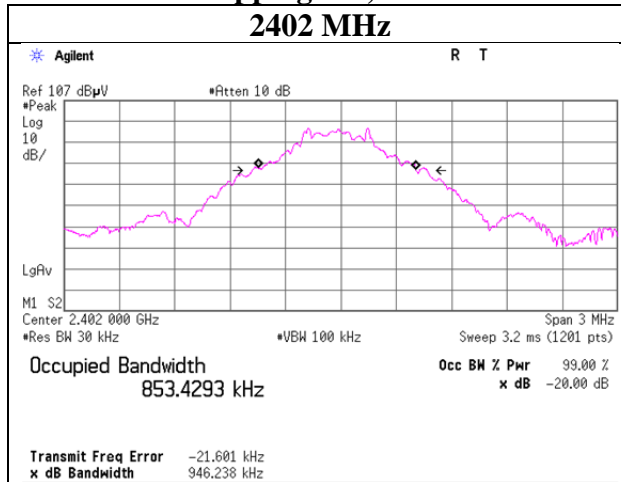
Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping Off, DH5/3DH5

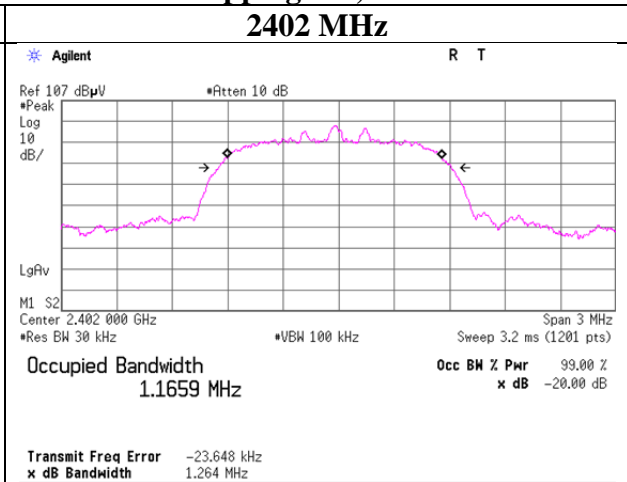
Hopping Off, DH5

2402 MHz

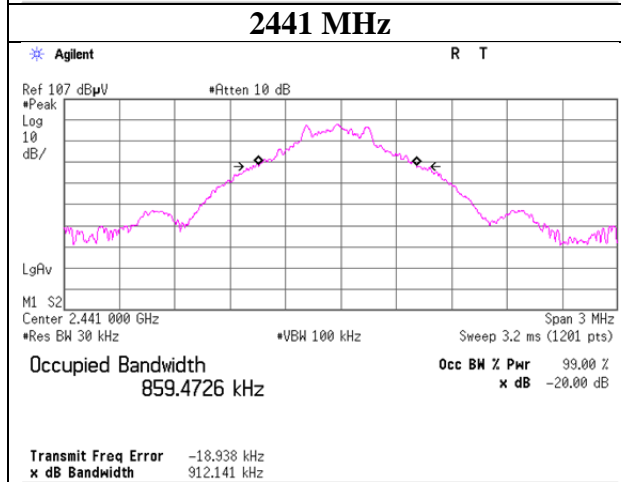


Hopping Off, 3DH5

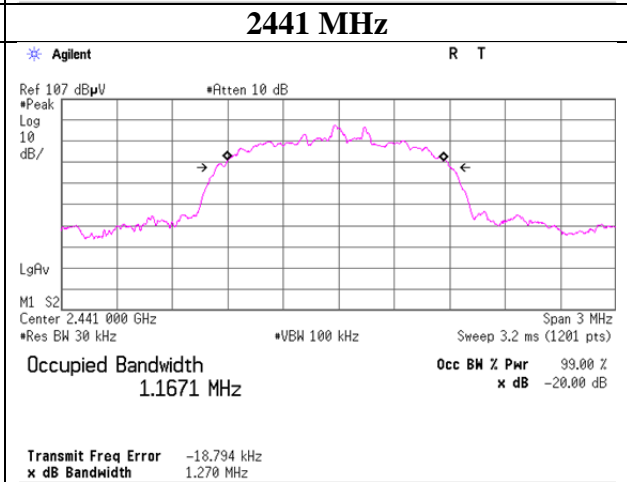
2402 MHz



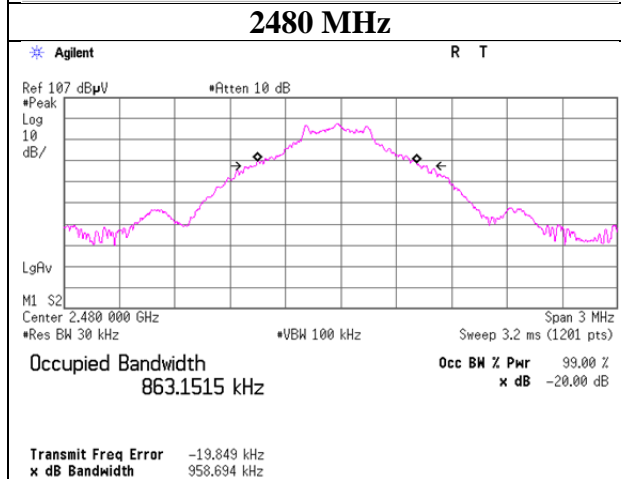
2441 MHz



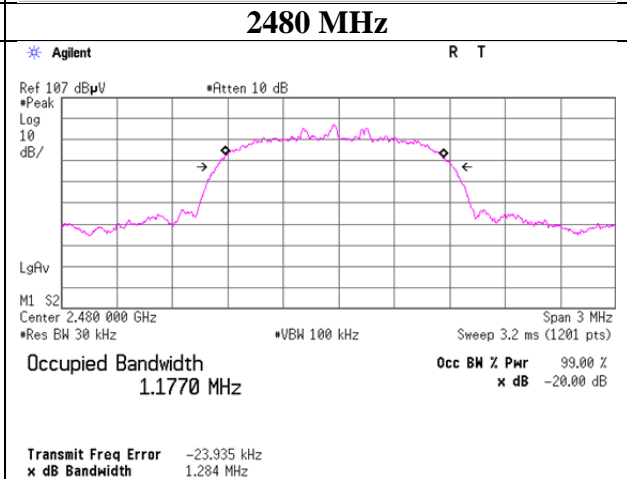
2441 MHz



2480 MHz



2480 MHz



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Ise EMC Lab.

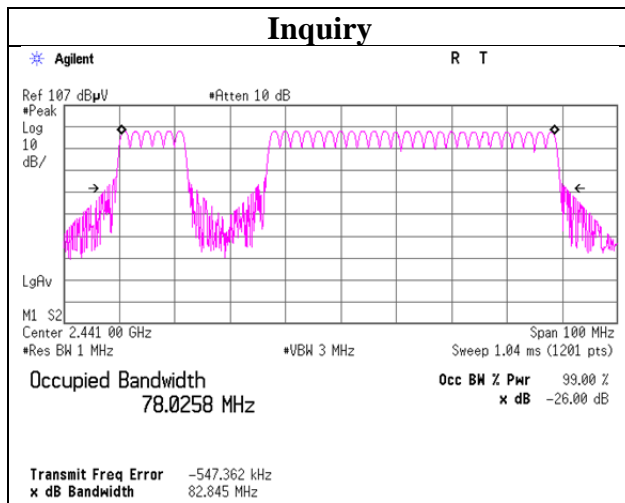
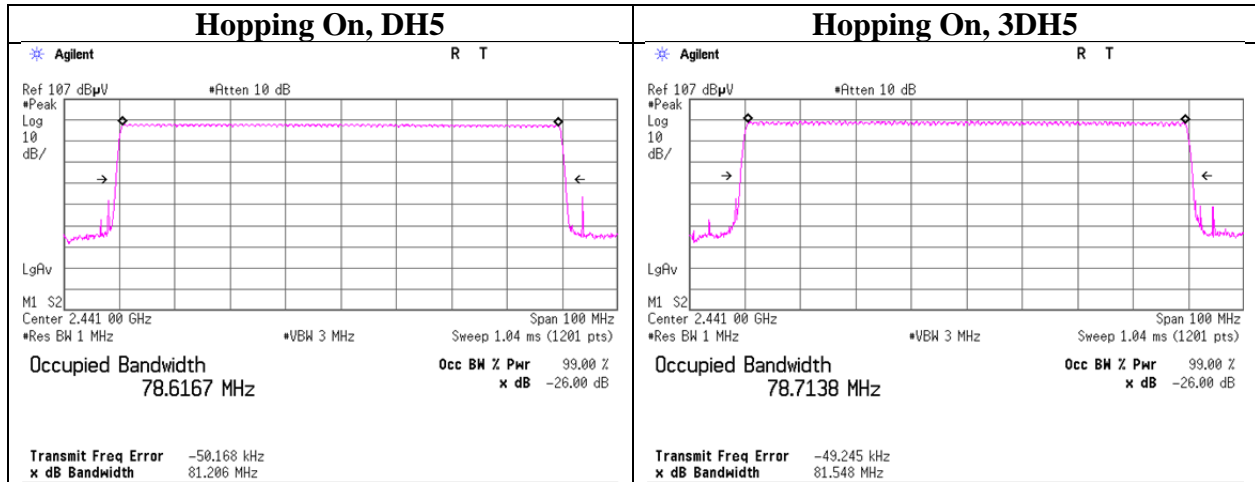
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.7 Shielded Room
Report No.	11577935H
Date	January 18, 2017
Temperature / Humidity	22 deg. C / 35 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx, Hopping On, DH5/3DH5/Inquiry



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APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2016/06/06 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2016/06/06 * 12
MRENT-126	Spectrum Analyzer	KEYSIGHT	E4440A	MY46185516	AT	2016/07/01 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	AT	2016/11/28 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	AT	2016/03/10 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2016/12/15 * 12
MCC-171	Microwave Cable	Junkosha	MWX221	1409S494	AT	2016/03/11 * 12
MOS-34	Thermo-Hygrometer	Custom	CTH-201	3401	AT	2016/01/21 * 12
MMM-16	DIGITAL HiTESTER	Hioki	3805	070900532	AT	2017/01/19 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2016/08/02 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2016/12/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2016/11/10 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2016/02/29 * 12
MCC-216	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	RE	2016/08/29 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2017/01/16 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2016/02/29 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	RE	2016/08/23 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2016/05/16 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2016/10/21 * 12
MBA-08	Biconical Antenna	Schwarzbeck	VHA9103B	08031	RE	2016/09/29 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2016/02/08 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2016/11/28 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2016/09/13 * 12

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

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

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

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

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