



RADIO TEST REPORT

Test Report No. : 11240438H-A

Applicant : Sony Interactive Entertainment Inc.
Type of Equipment : Wireless communication module
Model No. : AW-CB262
FCC ID : AK8M16DAM2
Test regulation : FCC Part 15 Subpart C: 2015
*Bluetooth part
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: April 7 to 13, 2016

Representative test engineer:

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Takayuki Shimada

Engineer

Consumer Technology Division



NVLAP LAB CODE: 200572-0

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13-EM-F0429

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SECTION 1: Customer information

Company Name	Sony Interactive Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-3-6748-6333
Facsimile Number	+81-3-6748-6383
Contact Person	Kiyoto Sasaki

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

2.1 Identification of E.U.T.

Type of Equipment	Wireless communication module
Model No	AW-CB262
Serial No	Refer to Clause 4.2
Country of Manufacture	China/Japan
Receipt Date of Sample	April 12, 2016
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

AW-CB262 is the Wireless communication module.

Product Specification

Clock frequency in the system (radio part)	40MHz
Operating Temperature	-10 - +85 deg. C
Power Supply	DC 3.3 V / DC 1.8 V
Size	20 x 18 x 3.0mm , 55pin LGA

Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Type of Modulation	DSSS, OFDM
Bandwidth & Channel spacing	Less than 20MHz & 5MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3 V / DC 1.8 V / DC 1.1 V
Antenna Type	PIFA (Antenna port WA for 2.4GHz / Antenna port WB)
Antenna Gain: G_{ANT}	5.6dBi (Antenna port WA for 2.4GHz / Antenna port WB)
Directional Gain *1)	8.61dBi

WLAN (IEEE802.11a/11n-20/11ac-20/11n-40/11ac-40/11ac-80)

Equipment Type	Transceiver
Frequency of Operation	W52: 5180-5240MHz W53: 5260-5320MHz W56: 5500-5700MHz W58: 5745-5825MHz
Type of Modulation	OFDM
Bandwidth & Channel spacing	Less than 20MHz/40MHz/80MHz&20MHz/40MHz/80MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3 V / DC 1.8 V / DC 1.1 V
Antenna Type	PIFA (Antenna port WA for 5GHz / Antenna port WC for 5GHz)
Antenna Gain: G_{ANT}	5.0dBi (Antenna port WA for 5GHz) 3.5dBi (Antenna port WC for 5GHz)
Directional Gain *1)	7.29dBi

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Bandwidth & Channel spacing	79MHz & 1MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3 V / DC 1.8 V / DC 1.1 V
Antenna Type	PIFA (Antenna port WC for 2.4 GHz)
Antenna Gain	6.4dBi (Antenna port WC for 2.4 GHz)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3 V / DC 1.8 V / DC 1.1 V
Antenna Type	PIFA (Antenna port WC for 2.4 GHz)
Antenna Gain	6.4dBi (Antenna port WC for 2.4 GHz)

*1) Directional antenna gain = $10 \log \left(\frac{G_{ANT1}}{10^{20}} + \frac{G_{ANT2}}{10^{20}} \right)^2 / 2$

*This test report applies to Bluetooth.

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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

* The EUT complies with FCC Part 15 Subpart B: 2015, final revised on November 23, 2015

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	QP 31.3 dB, 0.15000 MHz, L AV 35.6 dB, 0.66620 MHz, N	Complied	-
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	15.8 dB 4882.000 MHz, AV, Vert.	Complied	Conducted/ Radiated (above 30 MHz) *1)

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

*1) Radiated test was selected over 30 MHz based on section 15.247(d).

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

FCC Part 15.31 (e)

The EUT has the power supply regulator. However one of the input voltages to RF part doesn't go through the regulator. The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique coupling/antenna connector (U.FL). Therefore the equipment complies with the requirement of 15.203/212.

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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	1.7 dB	2.8 dB	2.8 dB	2.9 dB	

Frequency range	Conducted emission using AMN(LISN) (+dB)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	2.9 dB

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

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(+dB)		(10 m*)(+dB)	
	30 – 200 MHz	200 – 1000MHz	30 – 200 MHz	200 – 1000MHz
Horizontal	4.9 dB	5.2 dB	4.9 dB	5.0 dB
Vertical	4.6 dB	5.9 dB	5.0 dB	5.0 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
5.0 dB	5.2 dB	5.1 dB	5.0 dB	5.2 dB

*Measurement distance

Conducted Emission test

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

Radiated emission test

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

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3.5 Test Location

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Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 m x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping 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: Opro_DOS_Labtool_Ver2.0.0.88 *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.		

Simultaneously transmission

Test Item	Mode *1)
Spurious Emission (Radiated)	Tx (Hopping Off) 3DH5 2402 MHz + 11a 5180 MHz Tx (Hopping Off) 3DH5 2441 MHz + 11a 5180 MHz Tx (Hopping Off) 3DH5 2480 MHz + 11a 5180 MHz
*1) The test was performed on the mode as a representative, because it had the highest power of 5GHz band at antenna terminal test.	

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8m above the conducting ground plane.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

[For below 1GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	4.5 m*2) (below 10 GHz), 1 m*3) (above 10 GHz)		4.5 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: $20 \times \log (4.5 \text{ m} / 3.0 \text{ m}) = 3.53 \text{ dB}$

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

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT (Antenna and Module) to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

Measurement range : 30 M - 26.5 GHz

Test data : APPENDIX

Test result : Pass

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SECTION 7: 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 low enough as shown in the chart. (9 kHz - 150 kHz: RBW = 200Hz, 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

APPENDIX 1: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

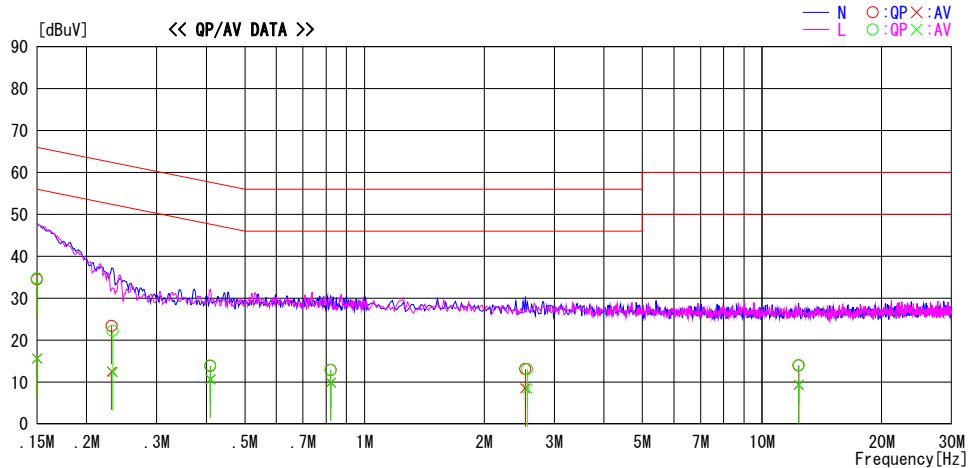
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/04/13

Report No. : 11240438H

Temp./Humi. : 24deg. C / 52% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	21.3	2.4	13.2	34.5	15.6	66.0	56.0	31.5	40.4	N	
0.23120	10.2	-0.7	13.2	23.4	12.5	62.4	52.4	39.0	39.9	N	
0.40955	0.5	-2.7	13.3	13.8	10.6	57.7	47.7	43.9	37.1	N	
0.82280	-0.5	-3.4	13.3	12.9	9.9	56.0	46.0	43.2	36.1	N	
2.53702	-0.3	-4.9	13.4	13.1	8.5	56.0	46.0	42.9	37.5	N	
12.35601	-0.3	-4.9	14.2	13.9	9.3	60.0	50.0	46.1	40.7	N	
0.15000	21.5	2.4	13.2	34.7	15.6	66.0	56.0	31.3	40.4	L	
0.23265	9.0	-0.9	13.2	22.2	12.3	62.4	52.4	40.2	40.1	L	
0.40955	0.6	-2.6	13.3	13.9	10.7	57.7	47.7	43.8	37.0	L	
0.82280	-0.4	-3.4	13.3	12.9	9.9	56.0	46.0	43.1	36.1	L	
2.56725	-0.4	-5.0	13.4	13.0	8.4	56.0	46.0	43.0	37.6	L	
12.38942	-0.2	-4.9	14.2	14.0	9.3	60.0	50.0	46.0	40.7	L	

CHART : WITH FACTOR, Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + ATTN + CABLE)
Except for the above table : adequate margin data below the limits.

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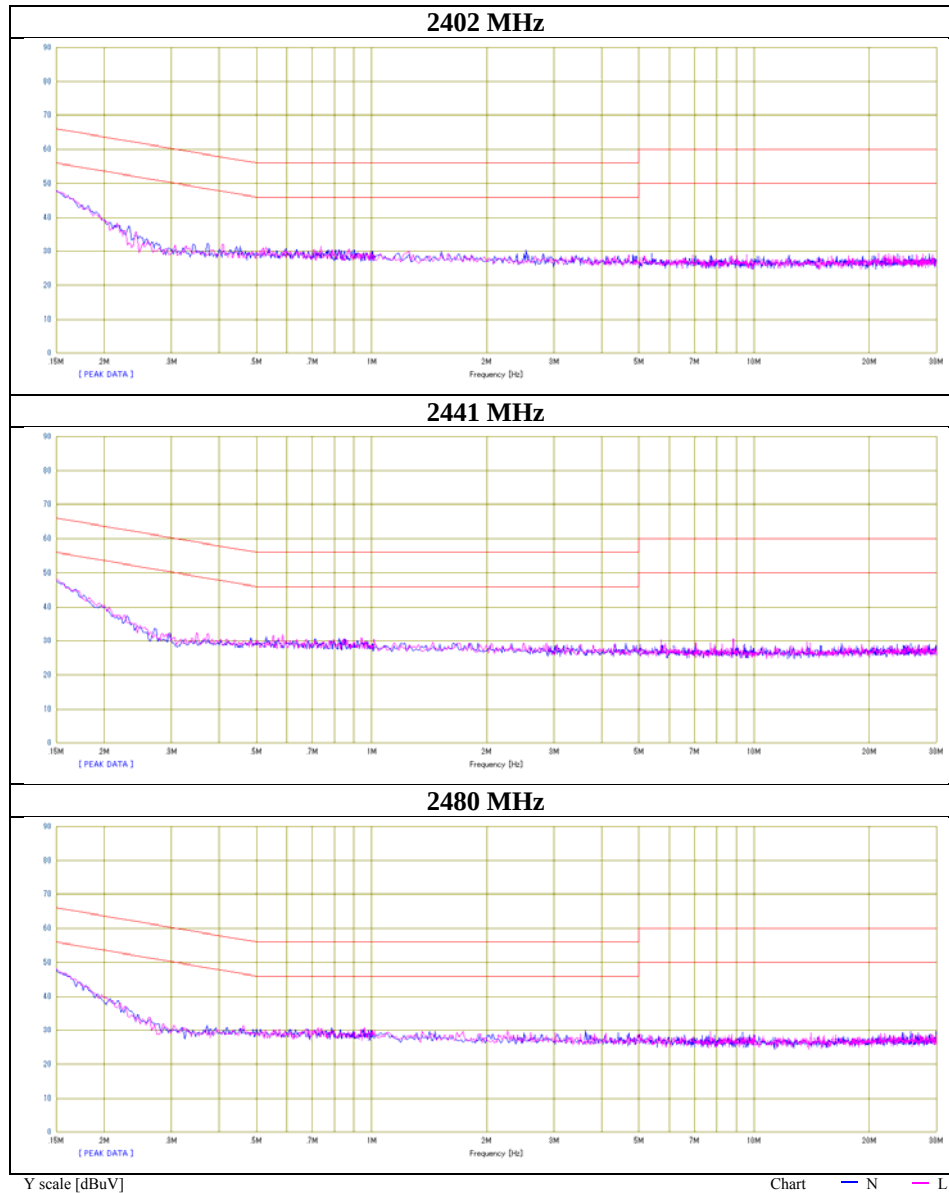
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Conducted Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11240438H
Date	April 13, 2016
Temperature / Humidity	24 deg. C / 52 % RH
Engineer	Yuta Moriya
Mode	Tx, Hopping Off, DH5



Conducted Emission

DATA OF CONDUCTED EMISSION TEST

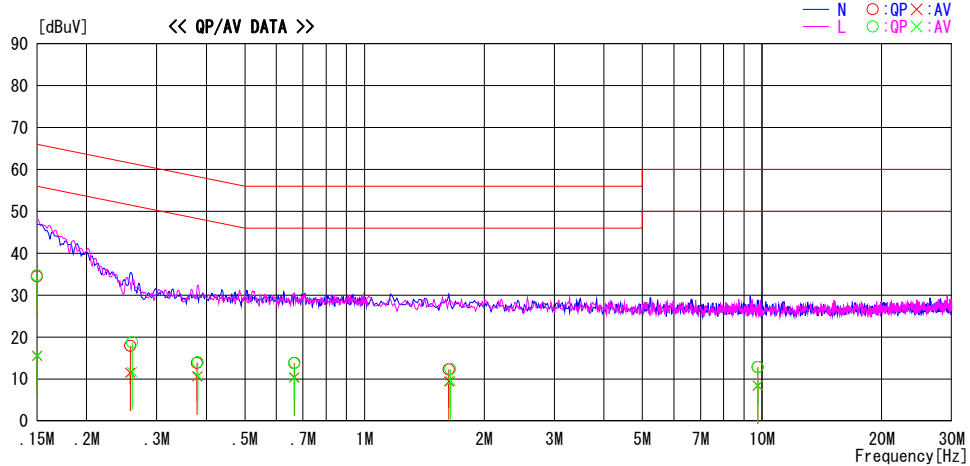
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/04/13

Report No. : 11240438H

Temp./Humi. : 24deg. C / 52% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 3DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP	AV		QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	21.3	2.3	13.2	34.5	15.5	66.0	56.0	31.6	40.5	N	
0.25730	4.7	-1.7	13.2	17.9	11.5	61.5	51.5	43.6	40.0	N	
0.37910	0.5	-2.7	13.3	13.8	10.6	58.3	48.3	44.5	37.7	N	
0.66620	0.5	-2.9	13.3	13.8	10.4	56.0	46.0	42.2	35.6	N	
1.63002	-1.1	-4.0	13.4	12.3	9.4	56.0	46.0	43.7	36.6	N	
9.74768	-1.2	-5.6	14.0	12.8	8.4	60.0	50.0	47.2	41.6	N	
0.15000	21.5	2.4	13.2	34.7	15.6	66.0	56.0	31.3	40.4	L	
0.26020	5.5	-1.5	13.2	18.7	11.7	61.4	51.4	42.7	39.7	L	
0.38055	0.7	-2.6	13.3	14.0	10.7	58.3	48.3	44.3	37.6	L	
0.66475	0.4	-3.0	13.3	13.7	10.3	56.0	46.0	42.3	35.7	L	
1.64513	-1.0	-3.9	13.4	12.4	9.5	56.0	46.0	43.6	36.5	L	
9.76280	-1.2	-5.6	14.0	12.8	8.4	60.0	50.0	47.2	41.6	L	

CHART : WITH FACTOR, Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + ATTN + CABLE)
Except for the above table : adequate margin data below the limits.

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Ise EMC Lab.

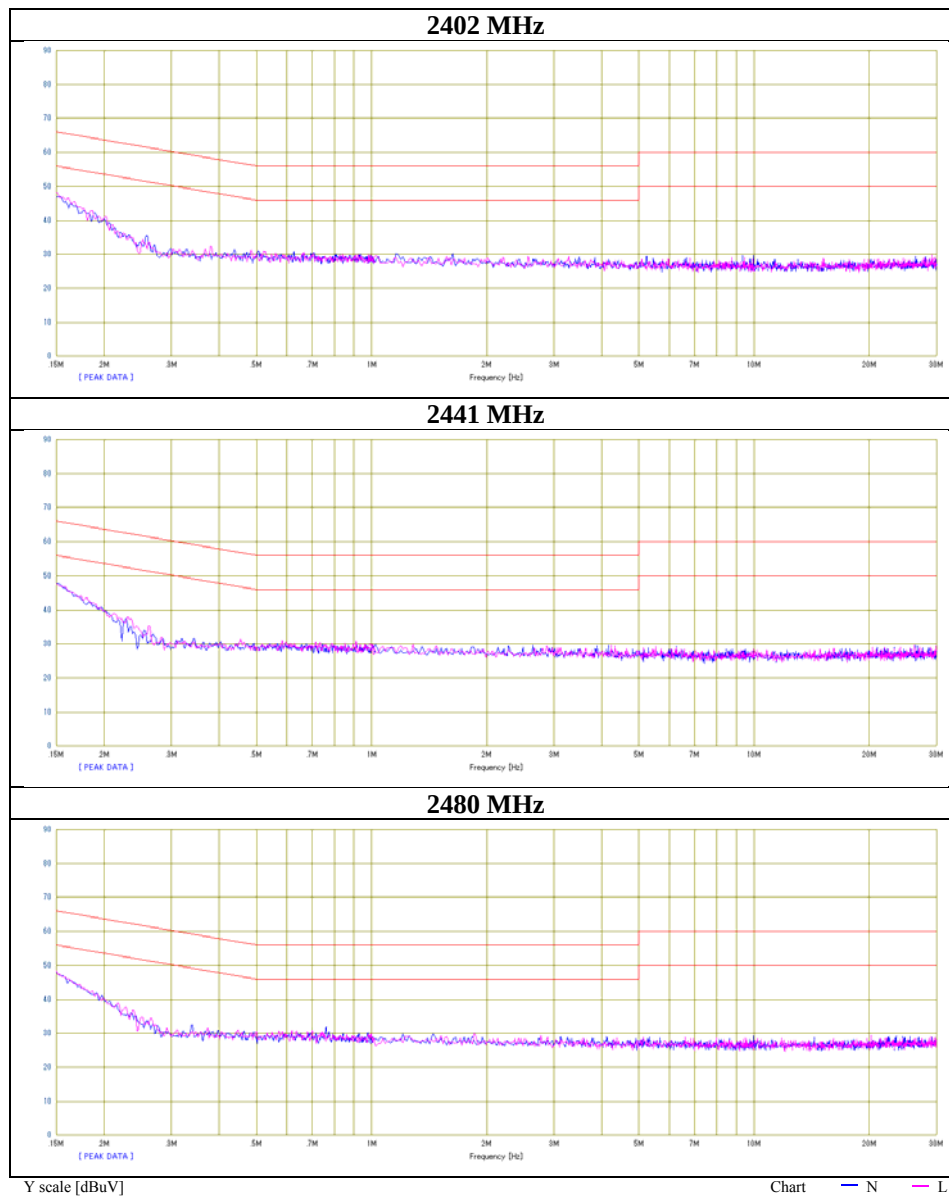
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 13, 2016
Temperature / Humidity : 24 deg. C / 52 % RH
Engineer : Yuta Moriya
Mode : Tx, Hopping Off, 3DH5



20dB Bandwidth and Carrier Frequency Separation

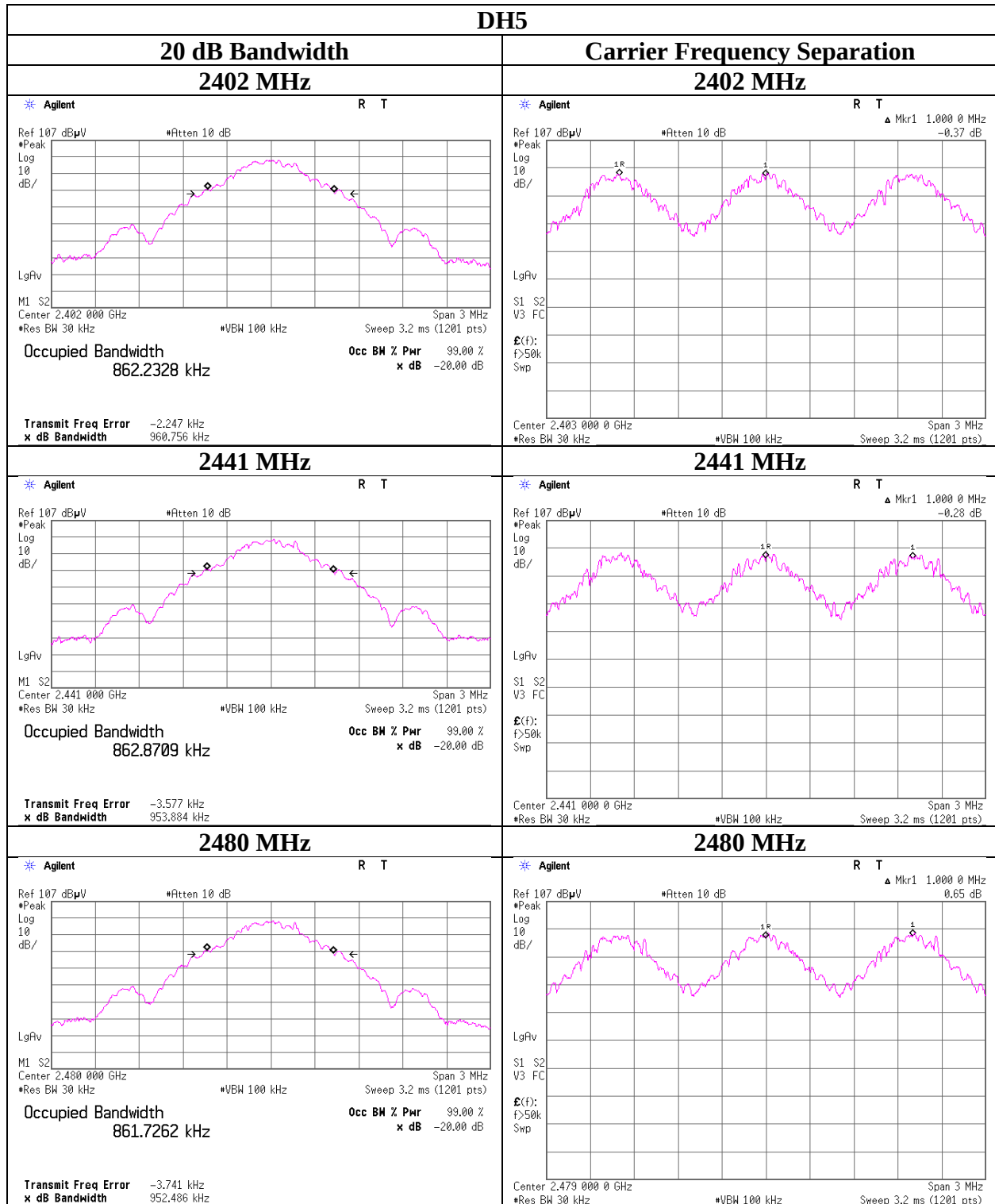
Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11240438H
Date April 8, 2016
Temperature / Humidity 23 deg. C / 51 % RH
Engineer Takumi Shimada
Mode Tx, Hopping Off, DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.961	1.000	>= 0.641
DH5	2441.0	0.954	1.000	>= 0.636
DH5	2480.0	0.952	1.000	>= 0.635
3DH5	2402.0	1.296	1.000	>= 0.864
3DH5	2441.0	1.296	1.000	>= 0.864
3DH5	2480.0	1.298	1.000	>= 0.865

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

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



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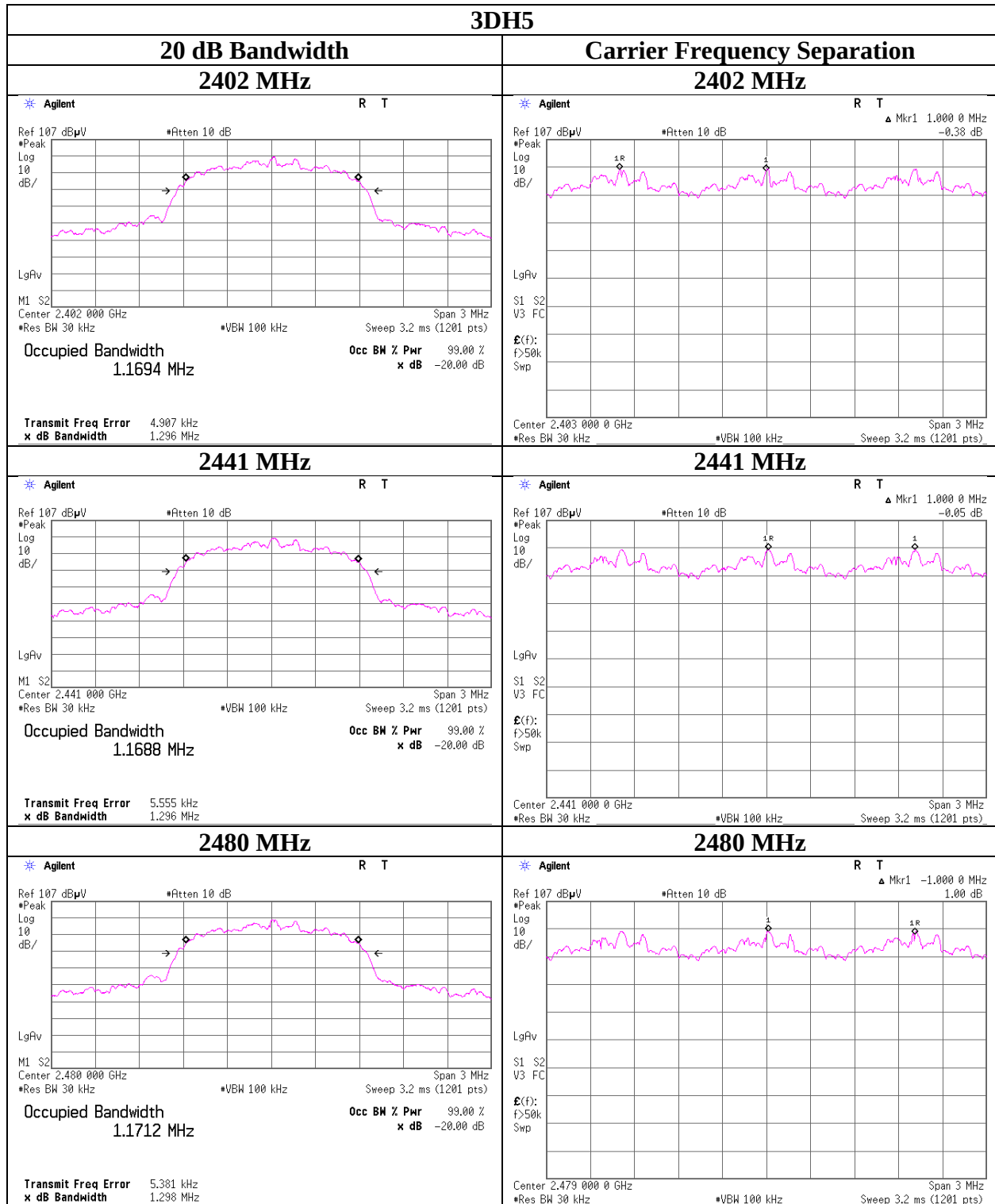
Ise EMC Lab.

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20dB Bandwidth and Carrier Frequency Separation



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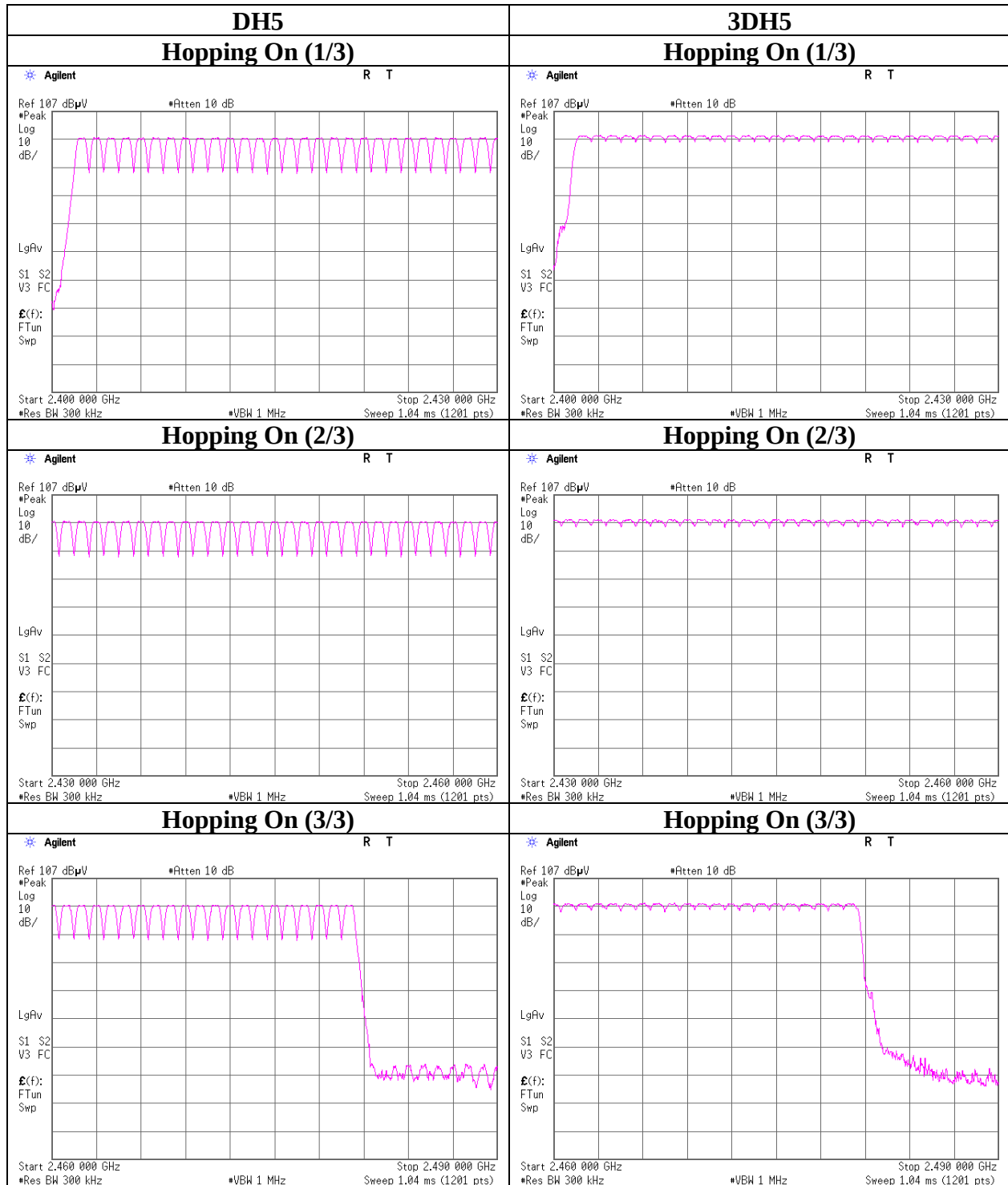
Number of Hopping Frequency

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11240438H
Date April 8, 2016
Temperature / Humidity 23 deg. C / 51 % RH
Engineer Takumi Shimada
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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Ise EMC Lab.

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Dwell time

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11240438H
Date April 8, 2016
Temperature / Humidity 23 deg. C / 51 % RH
Engineer Takumi Shimada
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	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.407	129	400
DH3	24.6 times	/	5 sec.	x 31.6 sec. = 156 times	1.664	260	400
DH5	19.6 times	/	5 sec.	x 31.6 sec. = 124 times	2.932	364	400
3DH1	49.4 times	/	5 sec.	x 31.6 sec. = 313 times	0.407	127	400
3DH3	25.6 times	/	5 sec.	x 31.6 sec. = 162 times	1.667	270	400
3DH5	19.4 times	/	5 sec.	x 31.6 sec. = 123 times	2.919	359	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

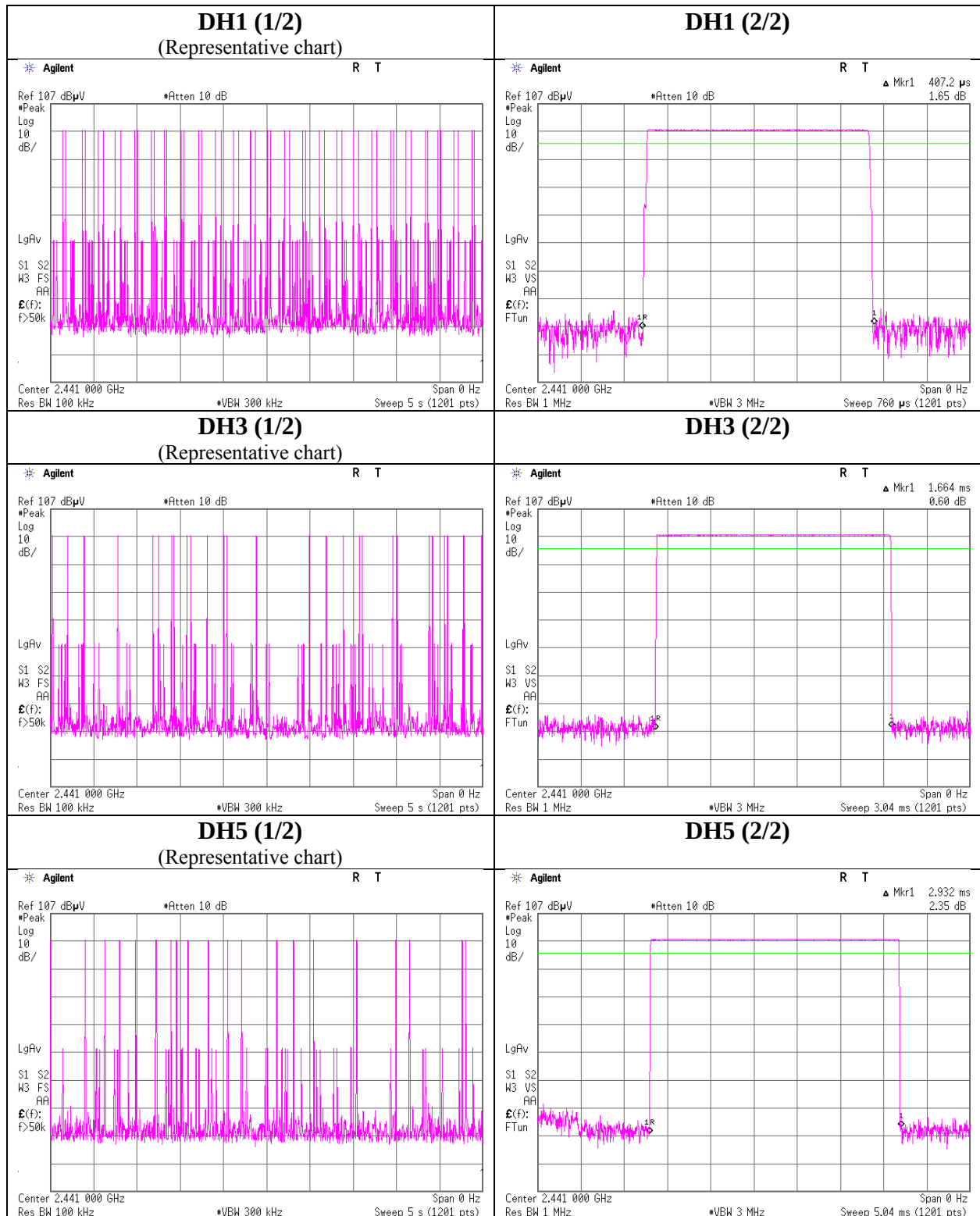
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	49	50	50	51	50
DH3	27	26	23	22	25	24.6
DH5	20	19	21	18	20	19.6
3DH1	49	48	49	50	51	49.4
3DH3	27	26	27	21	27	25.6
3DH5	17	23	18	21	18	19.4

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

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

Dwell time



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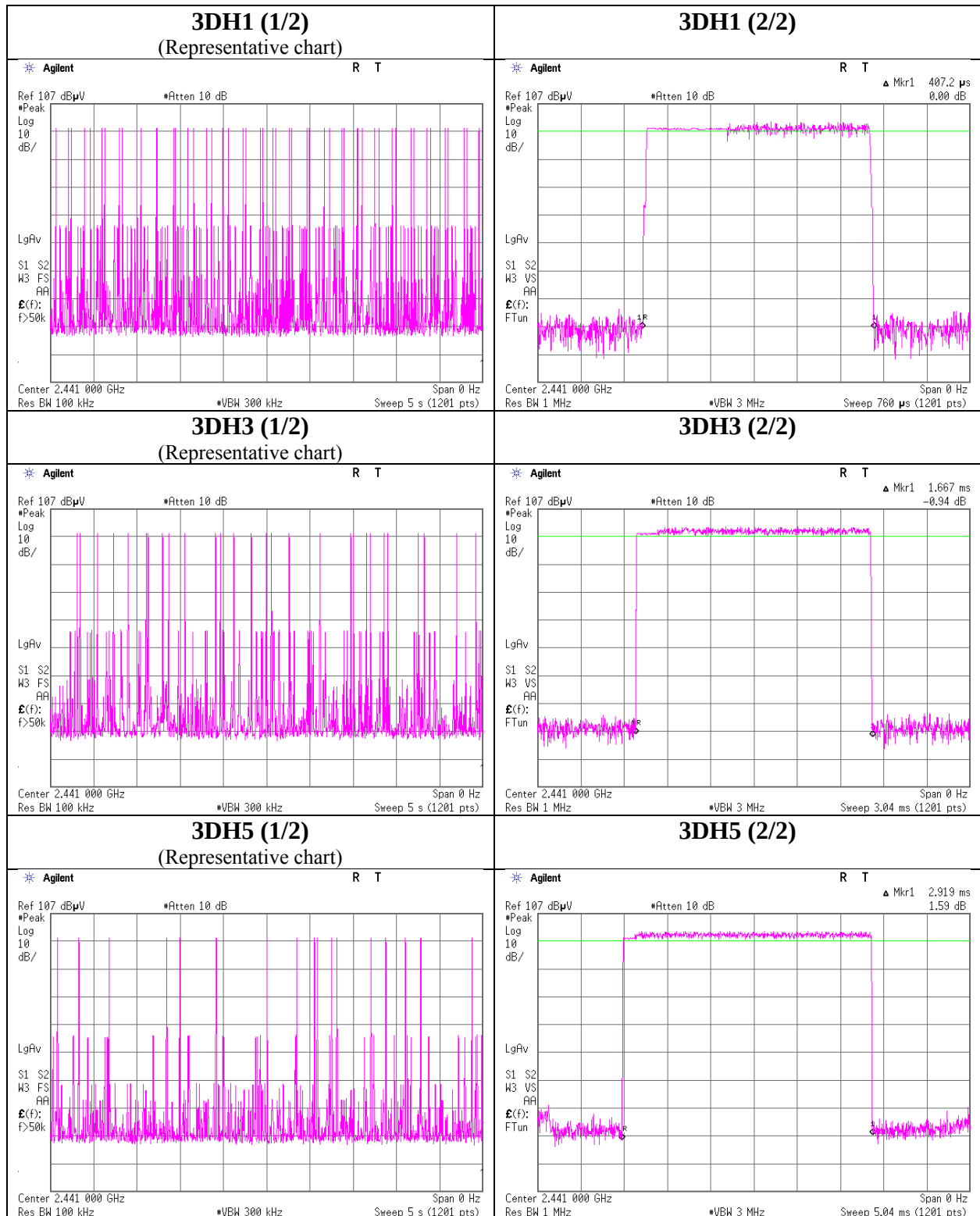
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Dwell time



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Maximum Peak Output Power

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 7, 2016
Temperature / Humidity : 25deg. C / 40% RH
Engineer : Takumi Shimada
Mode : Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-8.20	0.50	9.74	2.04	1.60	20.56	113.76	18.52
DH5	2441.0	-8.22	0.50	9.74	2.02	1.59	20.56	113.76	18.54
DH5	2480.0	-8.25	0.50	9.74	1.99	1.58	20.56	113.76	18.57
2DH5	2402.0	-4.99	0.50	9.74	5.25	3.35	20.56	113.76	15.31
2DH5	2441.0	-5.11	0.50	9.74	5.13	3.26	20.56	113.76	15.43
2DH5	2480.0	-5.25	0.50	9.74	4.99	3.16	20.56	113.76	15.57
3DH5	2402.0	-4.68	0.50	9.74	5.56	3.60	20.56	113.76	15.00
3DH5	2441.0	-4.80	0.50	9.74	5.44	3.50	20.56	113.76	15.12
3DH5	2480.0	-4.95	0.50	9.74	5.29	3.38	20.56	113.76	15.27

Sample Calculation:

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

*This Limit was reduced by 0.4 dB for directional gain of the antenna/antenna array exceeding 6 dBi.

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

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

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11240438H
Date	April 7, 2016
Temperature / Humidity	25deg. C / 40% RH
Engineer	Takumi Shimada
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)	
					[dBm]	[mW]
DH5	2402.0	-9.44	0.50	9.74	0.80	1.20
DH5	2441.0	-9.46	0.50	9.74	0.78	1.20
DH5	2480.0	-9.50	0.50	9.74	0.74	1.19
2DH5	2402.0	-8.77	0.50	9.74	1.47	1.40
2DH5	2441.0	-8.86	0.50	9.74	1.38	1.37
2DH5	2480.0	-9.04	0.50	9.74	1.20	1.32
3DH5	2402.0	-8.72	0.50	9.74	1.52	1.42
3DH5	2441.0	-8.85	0.50	9.74	1.39	1.38
3DH5	2480.0	-8.99	0.50	9.74	1.25	1.33

Sample Calculation:

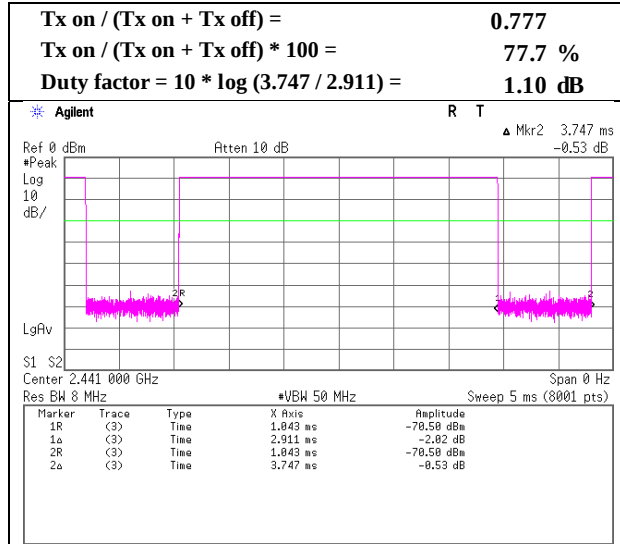
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

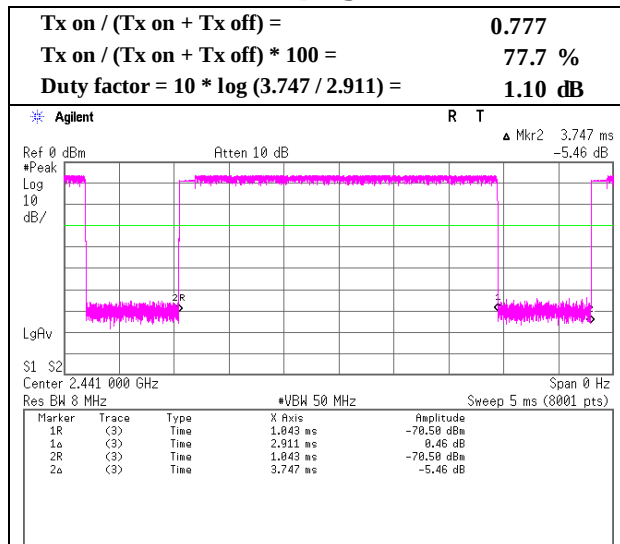
Burst Rate Confirmation

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11240438H
Date	April 7, 2016
Temperature / Humidity	25deg. C / 40% RH
Engineer	Takumi Shimada
Mode	Tx, Hopping Off

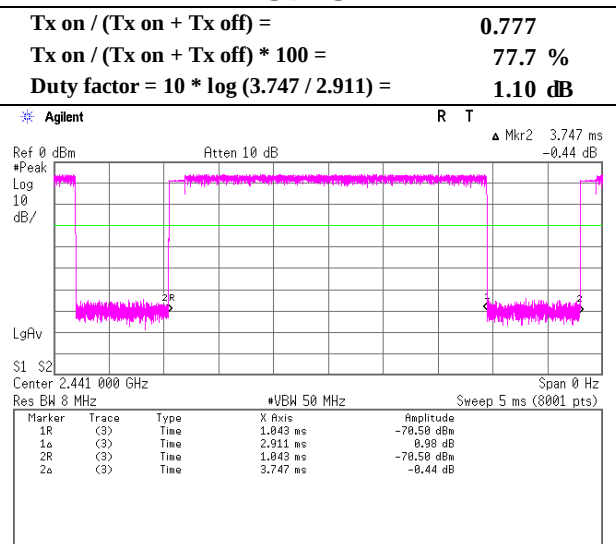
DH5



2DH5



3DH5



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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.7	15.1	7.1	32.2	12.7	40.0	27.3	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	23.3	7.6	7.5	32.2	6.2	40.0	33.8	
Hori	89.350	QP	27.2	8.0	7.9	32.2	10.9	43.5	32.6	
Hori	196.552	QP	22.1	16.5	9.0	32.1	15.5	43.5	28.0	
Hori	951.995	QP	21.0	22.3	13.6	30.7	26.2	46.0	19.8	
Hori	2390.000	PK	41.3	26.9	6.8	32.7	42.3	73.9	31.6	
Hori	4804.000	PK	40.7	31.8	9.0	31.8	49.7	73.9	24.2	
Hori	7206.000	PK	41.0	36.0	10.2	32.6	54.6	73.9	19.3	Floor Noise
Hori	9608.000	PK	40.0	38.2	11.0	33.2	56.0	73.9	17.9	Floor Noise
Hori	2390.000	AV	27.7	26.9	6.8	32.7	28.7	53.9	25.2	
Hori	4804.000	AV	27.7	31.8	9.0	31.8	36.7	53.9	17.2	
Hori	7206.000	AV	26.6	36.0	10.2	32.6	40.2	53.9	13.7	Floor Noise
Hori	9608.000	AV	27.1	38.2	11.0	33.2	43.1	53.9	10.8	Floor Noise
Vert	36.590	QP	33.5	15.1	7.1	32.2	23.5	40.0	16.5	
Vert	54.239	QP	29.2	8.8	7.4	32.2	13.2	40.0	26.8	
Vert	57.997	QP	36.2	7.6	7.5	32.2	19.1	40.0	20.9	
Vert	89.580	QP	28.3	8.1	7.9	32.2	12.1	43.5	31.4	
Vert	196.552	QP	22.1	16.5	9.0	32.1	15.5	43.5	28.0	
Vert	951.995	QP	21.0	22.3	13.6	30.7	26.2	46.0	19.8	
Vert	2390.000	PK	42.0	26.9	6.8	32.7	43.0	73.9	30.9	
Vert	4804.000	PK	40.4	31.8	9.0	31.8	49.4	73.9	24.5	
Vert	7206.000	PK	41.2	36.0	10.2	32.6	54.8	73.9	19.1	Floor Noise
Vert	9608.000	PK	40.3	38.2	11.0	33.2	56.3	73.9	17.6	Floor Noise
Vert	2390.000	AV	29.2	26.9	6.8	32.7	30.2	53.9	23.7	
Vert	4804.000	AV	28.6	31.8	9.0	31.8	37.6	53.9	16.3	
Vert	7206.000	AV	26.6	36.0	10.2	32.6	40.2	53.9	13.7	Floor Noise
Vert	9608.000	AV	27.1	38.2	11.0	33.2	43.1	53.9	10.8	Floor Noise

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	93.2	26.9	6.8	32.0	94.9	-	-	Carrier
Hori	2400.000	PK	35.2	26.9	6.8	32.0	36.9	74.9	38.0	
Vert	2402.000	PK	92.4	26.9	6.8	32.0	94.1	-	-	Carrier
Vert	2400.000	PK	35.8	26.9	6.8	32.0	37.5	74.1	36.6	

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.**

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Ise EMC Lab.

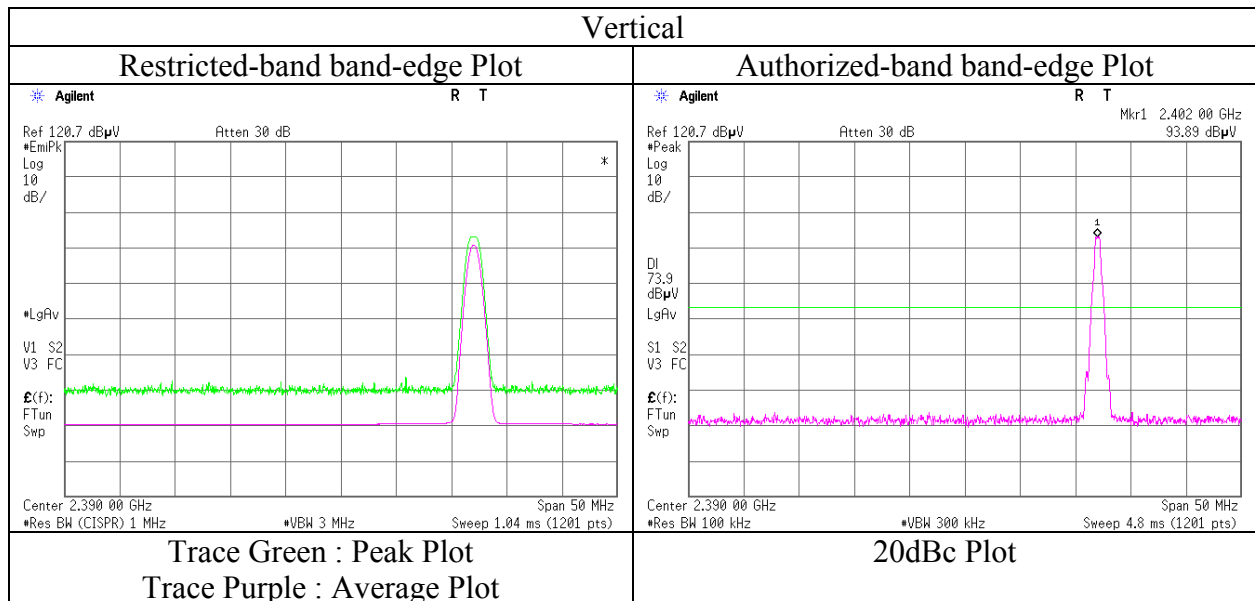
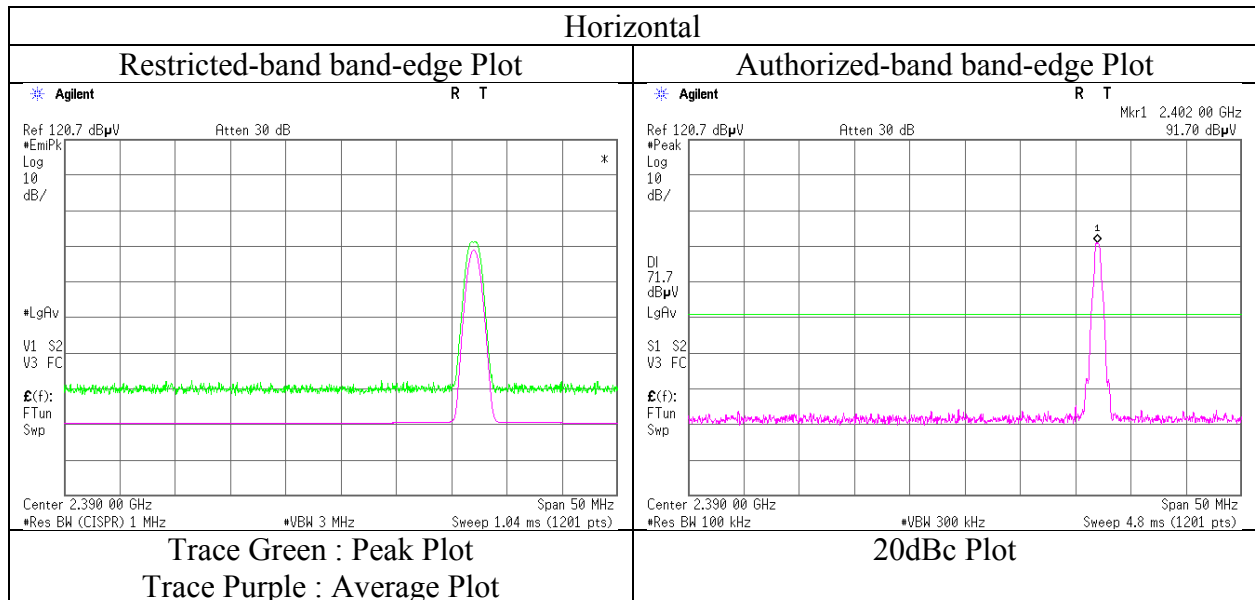
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Telephone : +81 596 24 8999

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.	11240438H
Date	April 9, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazuya Yoshioka
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.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.6	15.1	7.1	32.2	12.6	40.0	27.4	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	23.1	7.6	7.5	32.2	6.0	40.0	34.0	
Hori	89.350	QP	26.4	8.0	7.9	32.2	10.1	43.5	33.4	
Hori	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Hori	951.995	QP	21.2	22.3	13.6	30.7	26.4	46.0	19.6	
Hori	4882.000	PK	39.1	31.9	9.0	31.7	48.3	73.9	25.6	
Hori	7323.000	PK	39.9	36.0	10.3	32.6	53.6	73.9	20.3	Floor Noise
Hori	9764.000	PK	39.6	38.2	11.0	33.3	55.5	73.9	18.4	Floor Noise
Hori	4882.000	AV	28.2	31.9	9.0	31.7	37.4	53.9	16.5	
Hori	7323.000	AV	28.2	36.0	10.3	32.6	41.9	53.9	12.0	Floor Noise
Hori	9764.000	AV	28.2	38.2	11.0	33.3	44.1	53.9	9.8	Floor Noise
Vert	36.590	QP	32.3	15.1	7.1	32.2	22.3	40.0	17.7	
Vert	54.239	QP	28.7	8.8	7.4	32.2	12.7	40.0	27.3	
Vert	58.004	QP	34.7	7.6	7.5	32.2	17.6	40.0	22.4	
Vert	89.580	QP	28.7	8.1	7.9	32.2	12.5	43.5	31.0	
Vert	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Vert	951.995	QP	21.1	22.3	13.6	30.7	26.3	46.0	19.7	
Vert	4882.000	PK	39.8	31.9	9.0	31.7	49.0	73.9	24.9	
Vert	7323.000	PK	40.2	36.0	10.3	32.6	53.9	73.9	20.0	Floor Noise
Vert	9764.000	PK	39.8	38.2	11.0	33.3	55.7	73.9	18.2	Floor Noise
Vert	4882.000	AV	28.9	31.9	9.0	31.7	38.1	53.9	15.8	
Vert	7323.000	AV	28.2	36.0	10.3	32.6	41.9	53.9	12.0	Floor Noise
Vert	9764.000	AV	28.2	38.2	11.0	33.3	44.1	53.9	9.8	Floor Noise

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

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

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

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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.7	15.1	7.1	32.2	12.7	40.0	27.3	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	22.6	7.6	7.5	32.2	5.5	40.0	34.5	
Hori	89.350	QP	27.9	8.0	7.9	32.2	11.6	43.5	31.9	
Hori	196.552	QP	22.1	16.5	9.0	32.1	15.5	43.5	28.0	
Hori	951.995	QP	21.0	22.3	13.6	30.7	26.2	46.0	19.8	
Hori	2483.500	PK	41.8	26.9	6.8	32.6	42.9	73.9	31.0	
Hori	4960.000	PK	40.5	32.1	8.9	31.7	49.8	73.9	24.1	
Hori	7440.000	PK	38.9	36.0	10.2	32.7	52.4	73.9	21.5	Floor Noise
Hori	9920.000	PK	40.0	38.2	11.1	33.4	55.9	73.9	18.0	Floor Noise
Hori	2483.500	AV	28.5	26.9	6.8	32.6	29.6	53.9	24.3	
Hori	4960.000	AV	27.8	32.1	8.9	31.7	37.1	53.9	16.8	
Hori	7440.000	AV	26.5	36.0	10.2	32.7	40.0	53.9	13.9	Floor Noise
Hori	9920.000	AV	26.7	38.2	11.1	33.4	42.6	53.9	11.3	Floor Noise
Vert	36.590	QP	32.5	15.1	7.1	32.2	22.5	40.0	17.5	
Vert	54.239	QP	29.0	8.8	7.4	32.2	13.0	40.0	27.0	
Vert	58.004	QP	36.0	7.6	7.5	32.2	18.9	40.0	21.1	
Vert	89.580	QP	28.6	8.1	7.9	32.2	12.4	43.5	31.1	
Vert	196.552	QP	22.1	16.5	9.0	32.1	15.5	43.5	28.0	
Vert	951.995	QP	21.2	22.3	13.6	30.7	26.4	46.0	19.6	
Vert	2483.500	PK	41.5	26.9	6.8	32.6	42.6	73.9	31.3	
Vert	4960.000	PK	40.1	32.1	8.9	31.7	49.4	73.9	24.5	
Vert	7440.000	PK	39.2	36.0	10.2	32.7	52.7	73.9	21.2	Floor Noise
Vert	9920.000	PK	40.3	38.2	11.1	33.4	56.2	73.9	17.7	Floor Noise
Vert	2483.500	AV	30.0	26.9	6.8	32.6	31.1	53.9	22.8	
Vert	4960.000	AV	27.6	32.1	8.9	31.7	36.9	53.9	17.0	
Vert	7440.000	AV	26.5	36.0	10.2	32.7	40.0	53.9	13.9	Floor Noise
Vert	9920.000	AV	26.7	38.2	11.1	33.4	42.6	53.9	11.3	Floor Noise

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

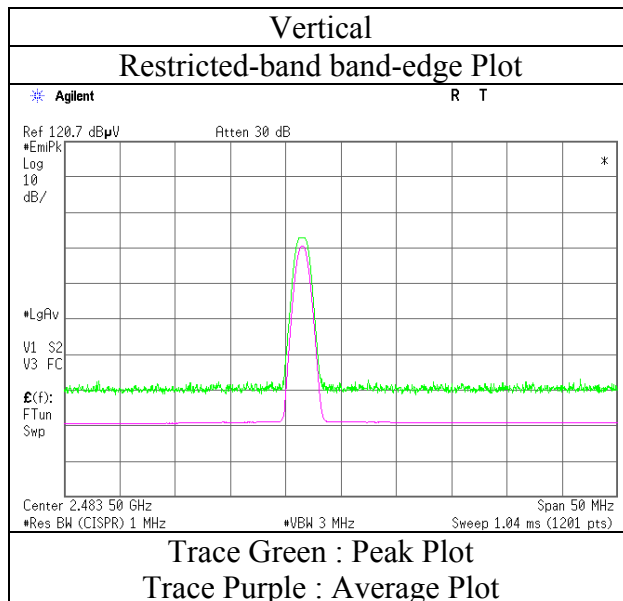
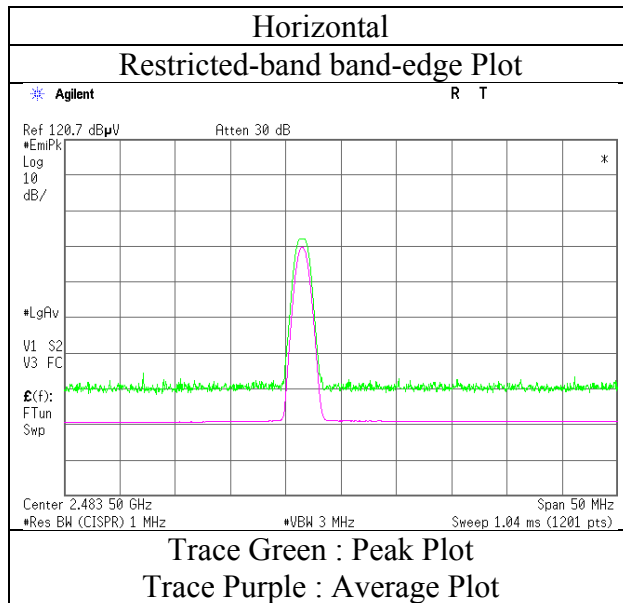
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

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

***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.	11240438H
Date	April 9, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazuya Yoshioka
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. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.6	15.1	7.1	32.2	12.6	40.0	27.4	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	22.6	7.6	7.5	32.2	5.5	40.0	34.5	
Hori	89.350	QP	27.3	8.0	7.9	32.2	11.0	43.5	32.5	
Hori	196.552	QP	22.1	16.5	9.0	32.1	15.5	43.5	28.0	
Hori	951.995	QP	21.2	22.3	13.6	30.7	26.4	46.0	19.6	
Hori	2390.000	PK	40.6	26.9	6.8	32.7	41.6	73.9	32.3	
Hori	4804.000	PK	38.9	31.8	9.0	31.8	47.9	73.9	26.0	Floor Noise
Hori	7206.000	PK	39.8	36.0	10.2	32.6	53.4	73.9	20.5	Floor Noise
Hori	9608.000	PK	39.6	38.2	11.0	33.2	55.6	73.9	18.3	Floor Noise
Hori	2390.000	AV	27.6	26.9	6.8	32.7	28.6	53.9	25.3	
Hori	4804.000	AV	25.8	31.8	9.0	31.8	34.8	53.9	19.1	Floor Noise
Hori	7206.000	AV	26.7	36.0	10.2	32.6	40.3	53.9	13.6	Floor Noise
Hori	9608.000	AV	27.1	38.2	11.0	33.2	43.1	53.9	10.8	Floor Noise
Vert	36.590	QP	32.8	15.1	7.1	32.2	22.8	40.0	17.2	
Vert	53.150	QP	29.7	9.2	7.4	32.2	14.1	40.0	25.9	
Vert	58.004	QP	36.0	7.6	7.5	32.2	18.9	40.0	21.1	
Vert	89.580	QP	27.9	8.1	7.9	32.2	11.7	43.5	31.8	
Vert	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Vert	951.995	QP	21.2	22.3	13.6	30.7	26.4	46.0	19.6	
Vert	2390.000	PK	41.2	26.9	6.8	32.7	42.2	73.9	31.7	
Vert	4804.000	PK	39.2	31.8	9.0	31.8	48.2	73.9	25.7	Floor Noise
Vert	7206.000	PK	40.0	36.0	10.2	32.6	53.6	73.9	20.3	Floor Noise
Vert	9608.000	PK	39.9	38.2	11.0	33.2	55.9	73.9	18.0	Floor Noise
Vert	2390.000	AV	29.0	26.9	6.8	32.7	30.0	53.9	23.9	
Vert	4804.000	AV	25.8	31.8	9.0	31.8	34.8	53.9	19.1	Floor Noise
Vert	7206.000	AV	26.7	36.0	10.2	32.6	40.3	53.9	13.6	Floor Noise
Vert	9608.000	AV	27.1	38.2	11.0	33.2	43.1	53.9	10.8	Floor Noise

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

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

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

20dBc Data Sheet

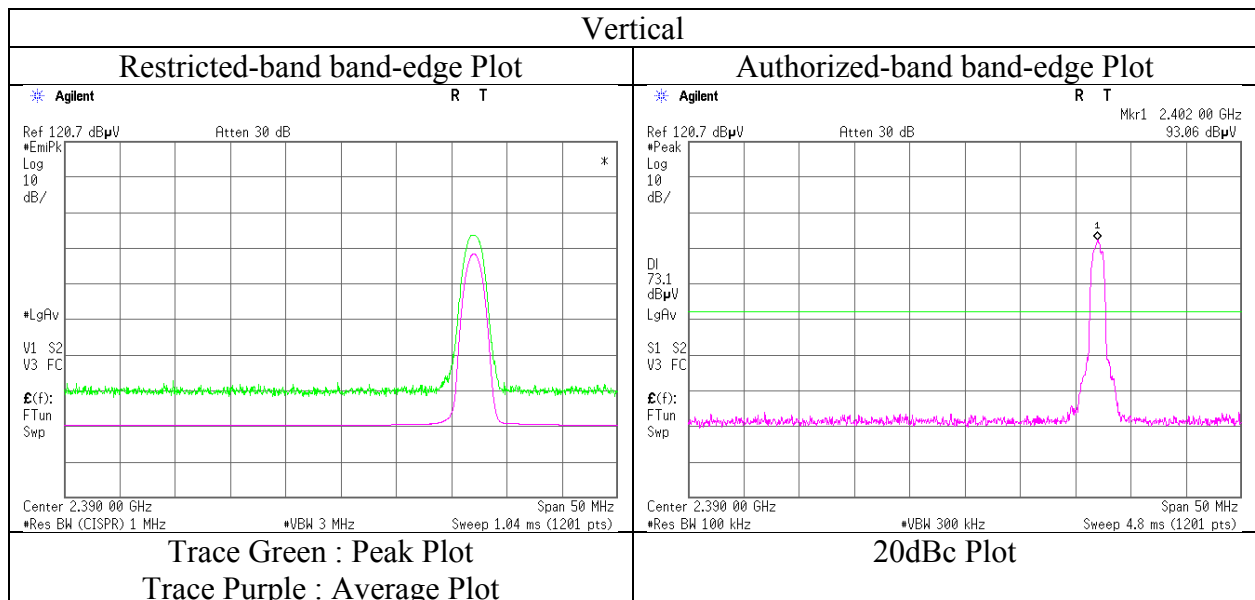
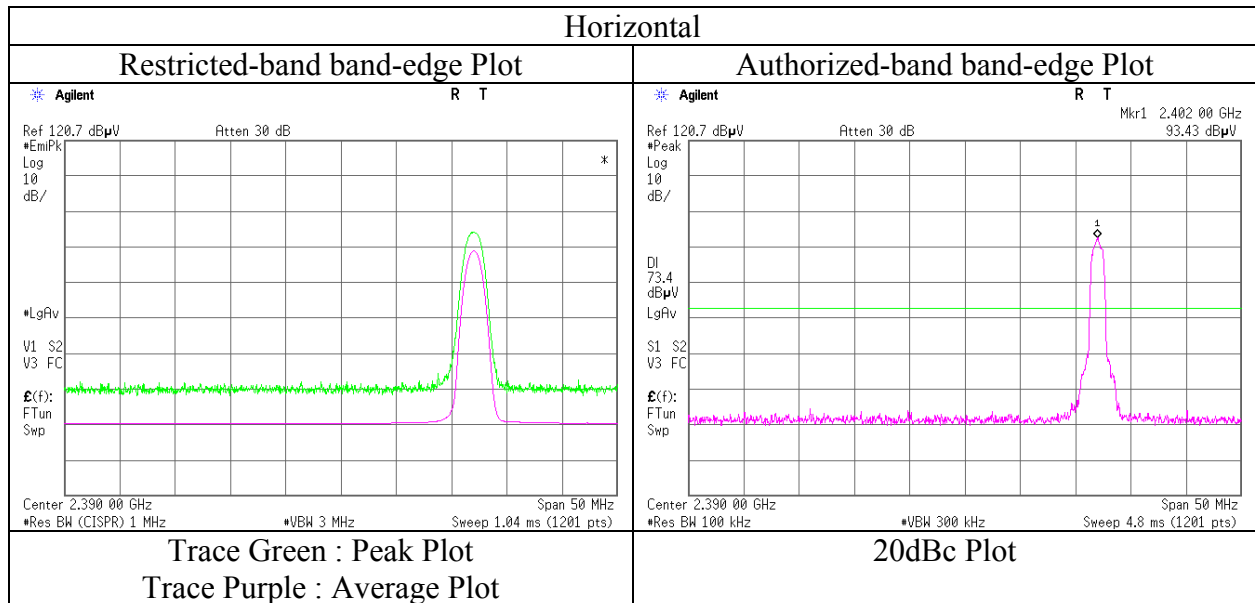
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	93.4	26.9	6.8	32.7	94.4	-	-	Carrier
Hori	2400.000	PK	39.7	26.9	6.8	32.7	40.7	74.4	33.7	
Vert	2402.000	PK	93.1	26.9	6.8	32.7	94.1	-	-	Carrier
Vert	2400.000	PK	42.5	26.9	6.8	32.7	43.5	74.1	30.6	

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.**

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11240438H
Date	April 9, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazuya Yoshioka (1-10GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.6	15.1	7.1	32.2	12.6	40.0	27.4	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	22.6	7.6	7.5	32.2	5.5	40.0	34.5	
Hori	89.350	QP	27.8	8.0	7.9	32.2	11.5	43.5	32.0	
Hori	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Hori	951.995	QP	21.2	22.3	13.6	30.7	26.4	46.0	19.6	
Hori	4882.000	PK	38.9	31.9	9.0	31.7	48.1	73.9	25.8	Floor Noise
Hori	7323.000	PK	39.8	36.0	10.3	32.6	53.5	73.9	20.4	Floor Noise
Hori	9764.000	PK	39.2	38.2	11.0	33.3	55.1	73.9	18.8	Floor Noise
Hori	4882.000	AV	26.8	31.9	9.0	31.7	36.0	53.9	17.9	Floor Noise
Hori	7323.000	AV	28.2	36.0	10.3	32.6	41.9	53.9	12.0	Floor Noise
Hori	9764.000	AV	28.1	38.2	11.0	33.3	44.0	53.9	9.9	Floor Noise
Vert	36.650	QP	33.0	15.1	7.1	32.2	23.0	40.0	17.0	
Vert	54.170	QP	28.7	8.8	7.4	32.2	12.7	40.0	27.3	
Vert	58.004	QP	36.0	7.6	7.5	32.2	18.9	40.0	21.1	
Vert	89.580	QP	27.8	8.1	7.9	32.2	11.6	43.5	31.9	
Vert	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Vert	951.995	QP	21.1	22.3	13.6	30.7	26.3	46.0	19.7	
Vert	4882.000	PK	39.2	31.9	9.0	31.7	48.4	73.9	25.5	Floor Noise
Vert	7323.000	PK	40.0	36.0	10.3	32.6	53.7	73.9	20.2	Floor Noise
Vert	9764.000	PK	39.5	38.2	11.0	33.3	55.4	73.9	18.5	Floor Noise
Vert	4882.000	AV	26.8	31.9	9.0	31.7	36.0	53.9	17.9	Floor Noise
Vert	7323.000	AV	28.2	36.0	10.3	32.6	41.9	53.9	12.0	Floor Noise
Vert	9764.000	AV	28.1	38.2	11.0	33.3	44.0	53.9	9.9	Floor Noise

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

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

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

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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11240438H
Date : April 9, 2016 April 10, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH 23 deg. C / 37 % RH 21 deg. C / 51 % RH
Engineer : Kazuya Yoshioka Yuta Moriya Tomoki Matsui
(1-10GHz) (Above 10GHz) (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	36.590	QP	22.6	15.1	7.1	32.2	12.6	40.0	27.4	
Hori	54.239	QP	22.6	8.8	7.4	32.2	6.6	40.0	33.4	
Hori	57.997	QP	22.7	7.6	7.5	32.2	5.6	40.0	34.4	
Hori	89.060	QP	27.7	8.0	7.9	32.2	11.4	43.5	32.1	
Hori	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Hori	951.995	QP	21.1	22.3	13.6	30.7	26.3	46.0	19.7	
Hori	2483.500	PK	48.4	26.9	6.8	32.6	49.5	73.9	24.4	
Hori	4960.000	PK	38.2	32.1	8.9	31.7	47.5	73.9	26.4	Floor Noise
Hori	7440.000	PK	39.8	36.0	10.2	32.7	53.3	73.9	20.6	Floor Noise
Hori	9920.000	PK	39.7	38.2	11.1	33.4	55.6	73.9	18.3	Floor Noise
Hori	2483.500	AV	32.1	26.9	6.8	32.6	33.2	53.9	20.7	
Hori	4960.000	AV	25.7	32.1	8.9	31.7	35.0	53.9	18.9	Floor Noise
Hori	7440.000	AV	26.5	36.0	10.2	32.7	40.0	53.9	13.9	Floor Noise
Hori	9920.000	AV	26.8	38.2	11.1	33.4	42.7	53.9	11.2	Floor Noise
Vert	36.650	QP	32.5	15.1	7.1	32.2	22.5	40.0	17.5	
Vert	54.170	QP	28.6	8.8	7.4	32.2	12.6	40.0	27.4	
Vert	58.004	QP	36.2	7.6	7.5	32.2	19.1	40.0	20.9	
Vert	89.100	QP	28.9	8.0	7.9	32.2	12.6	43.5	30.9	
Vert	196.552	QP	22.0	16.5	9.0	32.1	15.4	43.5	28.1	
Vert	951.995	QP	21.1	22.3	13.6	30.7	26.3	46.0	19.7	
Vert	2483.500	PK	46.9	26.9	6.8	32.6	48.0	73.9	25.9	
Vert	4960.000	PK	38.6	32.1	8.9	31.7	47.9	73.9	26.0	Floor Noise
Vert	7440.000	PK	40.0	36.0	10.2	32.7	53.5	73.9	20.4	Floor Noise
Vert	9920.000	PK	39.9	38.2	11.1	33.4	55.8	73.9	18.1	Floor Noise
Vert	2483.500	AV	32.8	26.9	6.8	32.6	33.9	53.9	20.0	
Vert	4960.000	AV	25.7	32.1	8.9	31.7	35.0	53.9	18.9	Floor Noise
Vert	7440.000	AV	26.5	36.0	10.2	32.7	40.0	53.9	13.9	Floor Noise
Vert	9920.000	AV	26.8	38.2	11.1	33.4	42.7	53.9	11.2	Floor Noise

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

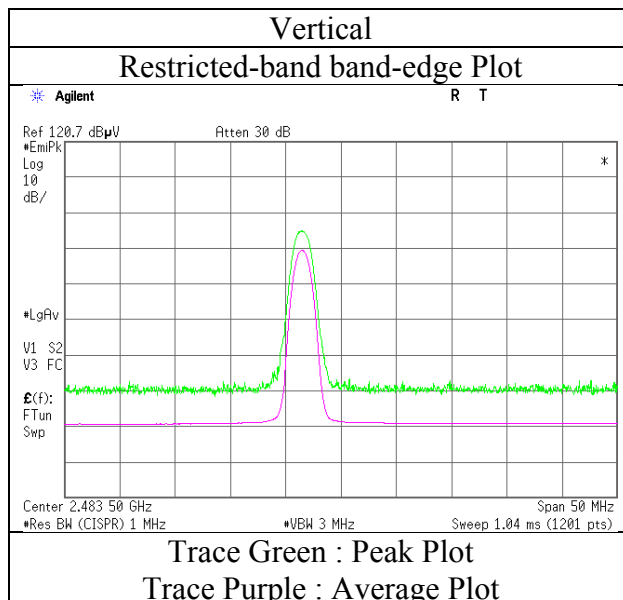
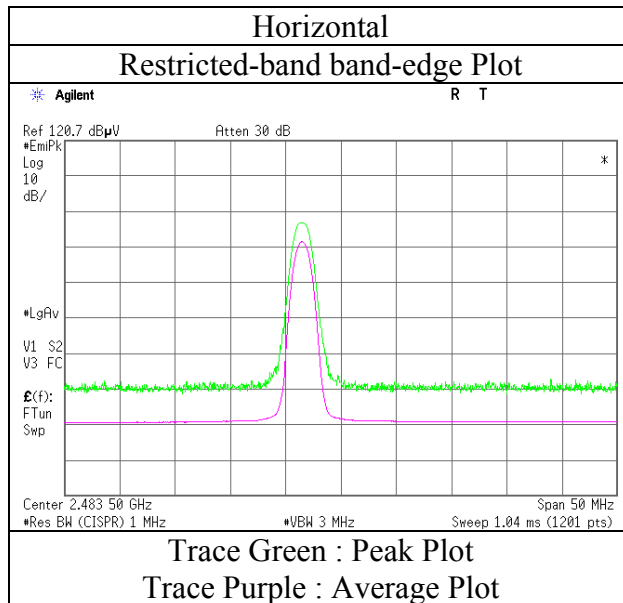
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

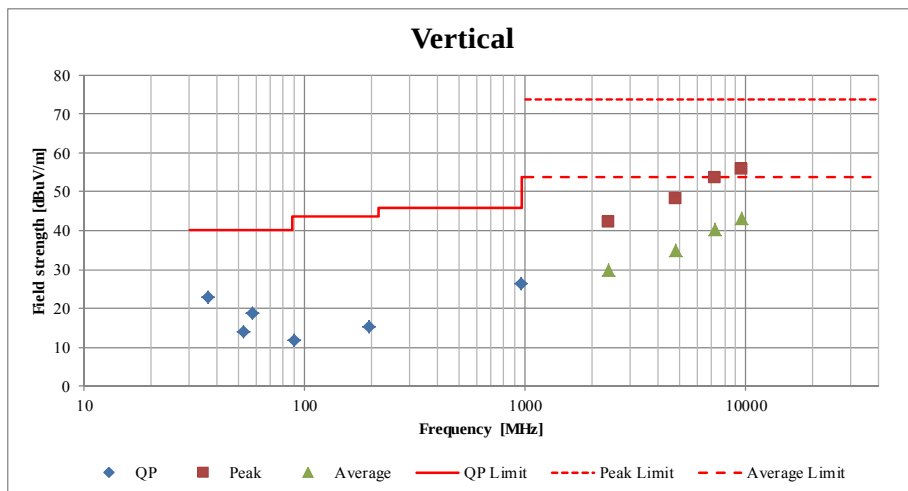
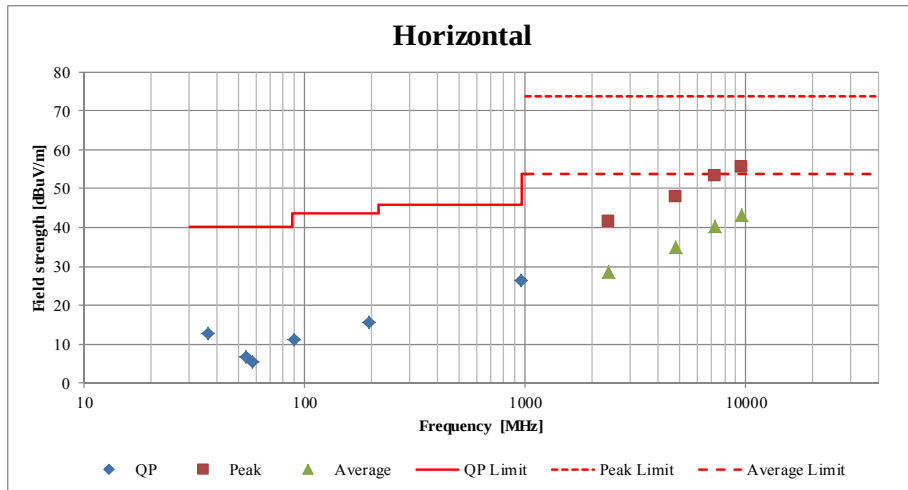
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11240438H
Date	April 9, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazuya Yoshioka (1-10GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



* 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.	11240438H		
Date	April 9, 2016	April 10, 2016	April 13, 2016
Temperature / Humidity	23 deg. C / 46 % RH	23 deg. C / 37 % RH	21 deg. C / 51 % RH
Engineer	Kazuya Yoshioka (1-10GHz)	Yuta Moriya (Above 10GHz)	Tomoki Matsui (Below 1GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz		



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

Radiated Spurious Emission (Reference data)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11240438H
Date	April 12, 2016
Temperature / Humidity	23 deg. C / 32 % RH
Engineer	Yuta Moriya (1-10GHz)
Mode	Tx Hopping Off, 3DH5 2402 MHz and 11a 5180MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	40.3	26.9	6.8	32.7	41.3	73.9	32.6	
Hori	2390.000	AV	28.8	26.9	6.8	32.7	29.8	53.9	24.1	
Vert	2390.000	PK	41.4	26.9	6.8	32.7	42.4	73.9	31.5	
Vert	2390.000	AV	28.8	26.9	6.8	32.7	29.8	53.9	24.1	

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).

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	91.0	26.9	6.8	32.7	92.0	-	-	Carrier
Hori	2400.000	PK	41.2	26.9	6.8	32.7	42.2	72.0	29.8	
Vert	2402.000	PK	92.5	26.9	6.8	32.7	93.5	-	-	Carrier
Vert	2400.000	PK	40.5	26.9	6.8	32.7	41.5	73.5	32.0	

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.**

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Radiated Spurious Emission (Reference data)

Test place : Ise EMC Lab. No.3Semi Anechoic Chamber
Report No. : 11240438H
Date : April 12, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 32 % RH 24 deg. C / 51 % RH
Engineer : Yuta Moriya Yuta Moriya
(Above 1GHz) (Below 1GHz)
Mode : Tx Hopping Off, 3DH5 2441 MHz and 11a 5180MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	36.530	QP	22.7	15.1	7.1	32.2	12.7	40.0	27.3	
Hori	54.231	QP	22.8	8.8	7.4	32.2	6.8	40.0	33.2	
Hori	57.996	QP	22.7	7.6	7.5	32.2	5.6	40.0	34.4	
Hori	89.572	QP	23.4	8.1	7.9	32.2	7.2	43.5	36.3	
Hori	196.552	QP	22.3	16.5	9.0	32.1	15.7	43.5	27.8	
Hori	951.992	QP	21.3	22.3	13.6	30.7	26.5	46.0	19.5	
Hori	4882.000	PK	40.0	31.9	9.0	31.7	49.2	73.9	24.7	Floor Noise
Hori	7323.000	PK	39.9	36.0	10.3	32.6	53.6	73.9	20.3	Floor Noise
Hori	9764.000	PK	39.1	38.2	11.0	33.3	55.0	73.9	18.9	Floor Noise
Hori	4882.000	AV	28.1	31.9	9.0	31.7	37.3	53.9	16.6	Floor Noise
Hori	7323.000	AV	28.4	36.0	10.3	32.6	42.1	53.9	11.8	Floor Noise
Hori	9764.000	AV	28.0	38.2	11.0	33.3	43.9	53.9	10.0	Floor Noise
Vert	36.520	QP	25.6	15.1	7.1	32.2	15.6	40.0	24.4	
Vert	53.022	QP	28.7	9.2	7.4	32.2	13.1	40.0	26.9	
Vert	57.996	QP	35.7	7.6	7.5	32.2	18.6	40.0	21.4	
Vert	89.476	QP	24.6	8.1	7.9	32.2	8.4	43.5	35.1	
Vert	196.552	QP	22.5	16.5	9.0	32.1	15.9	43.5	27.6	
Vert	951.992	QP	21.3	22.3	13.6	30.7	26.5	46.0	19.5	
Vert	4882.000	PK	40.1	31.9	9.0	31.7	49.3	73.9	24.7	Floor Noise
Vert	7323.000	PK	40.0	36.0	10.3	32.6	53.7	73.9	20.2	Floor Noise
Vert	9764.000	PK	39.2	38.2	11.0	33.3	55.1	73.9	18.8	Floor Noise
Vert	4882.000	AV	28.2	31.9	9.0	31.7	37.4	53.9	16.5	Floor Noise
Vert	7323.000	AV	28.4	36.0	10.3	32.6	42.1	53.9	11.8	Floor Noise
Vert	9764.000	AV	28.1	38.2	11.0	33.3	44.0	53.9	9.9	Floor Noise

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

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

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

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

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

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

Radiated Spurious Emission (Reference data)

Test place	Ise EMC Lab. No.3Semi Anechoic Chamber
Report No.	11240438H
Date	April 12, 2016
Temperature / Humidity	23 deg. C / 32 % RH
Engineer	Yuta Moriya (1-10GHz)
Mode	Tx Hopping Off, 3DH5 2480 MHz and 11a 5180MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	45.9	26.9	6.8	32.6	47.0	73.9	26.9	
Hori	2483.500	AV	32.1	26.9	6.8	32.6	33.2	53.9	20.7	
Vert	2483.500	PK	45.8	26.9	6.8	32.6	46.9	73.9	27.0	
Vert	2483.500	AV	31.9	26.9	6.8	32.6	33.0	53.9	20.9	

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).

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

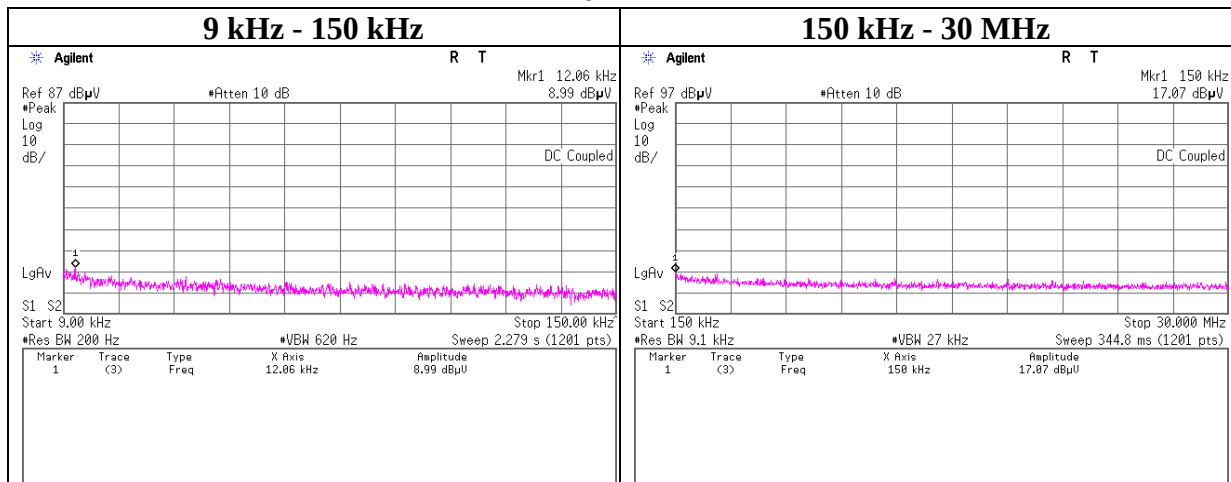
Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

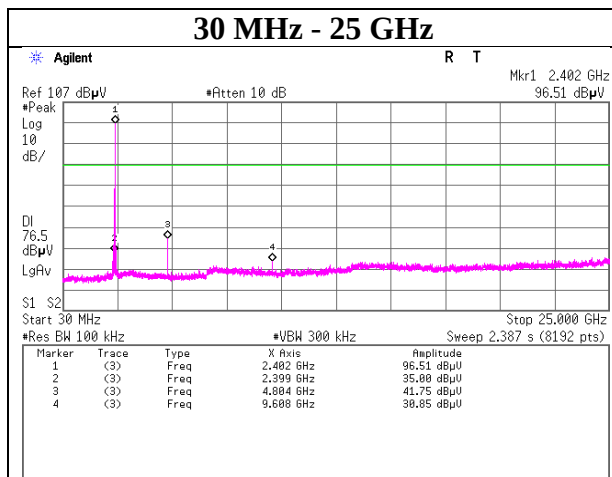
Conducted Spurious Emission

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11240438H
Date April 8, 2016
Temperature / Humidity 23 deg. C / 51 % RH
Engineer Takumi Shimada
Mode Tx, Hopping Off, DH5

2402 MHz



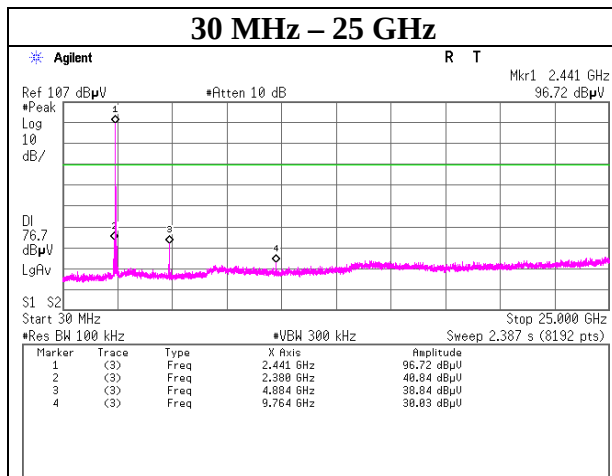
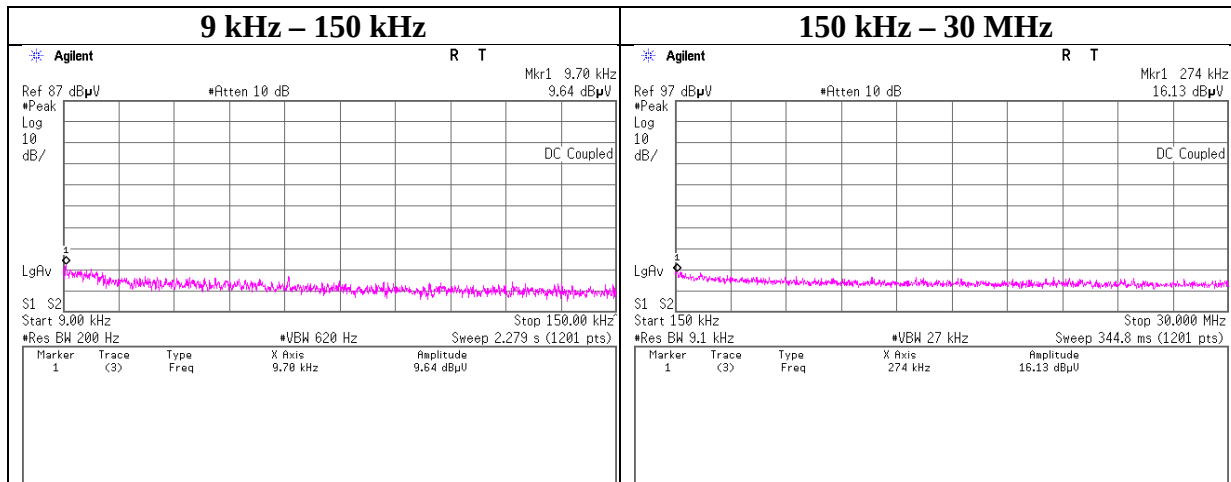
30 MHz - 25 GHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx, Hopping Off, DH5

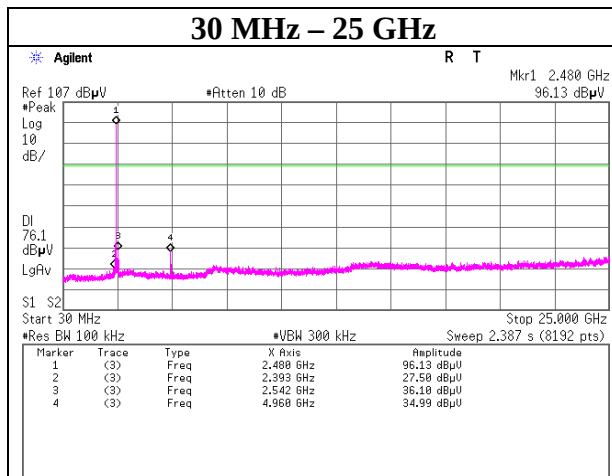
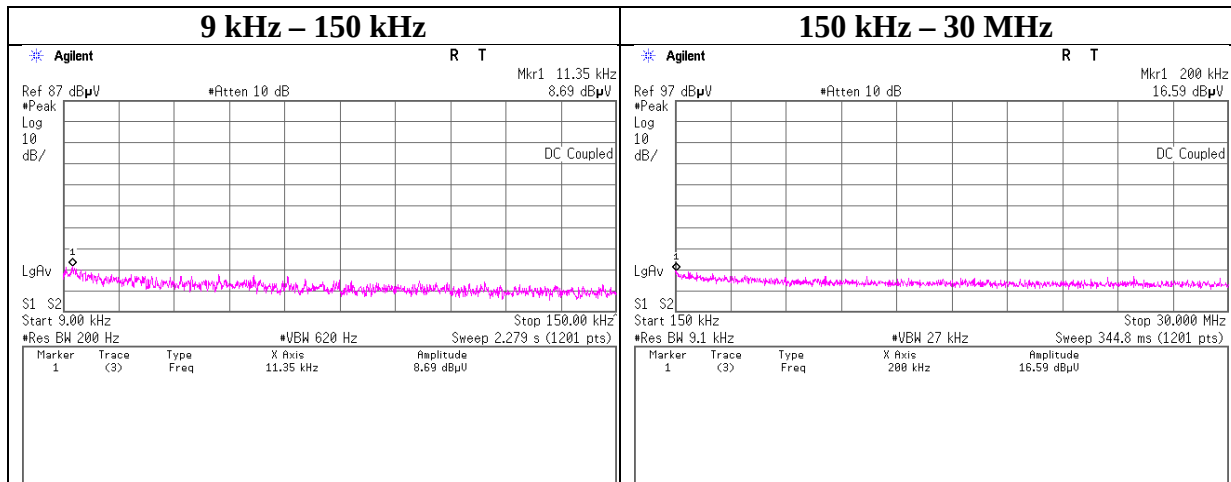
2441 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx, Hopping Off, DH5

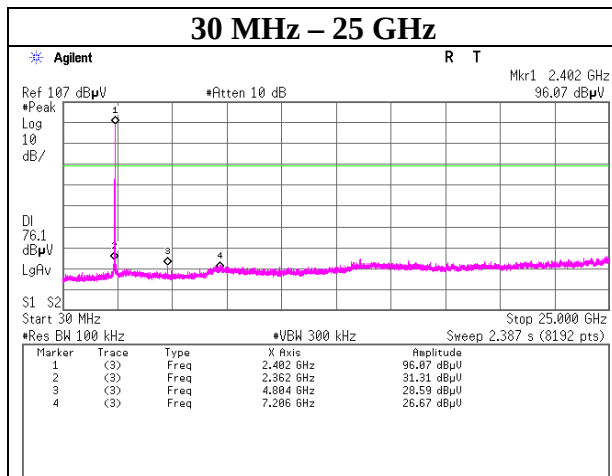
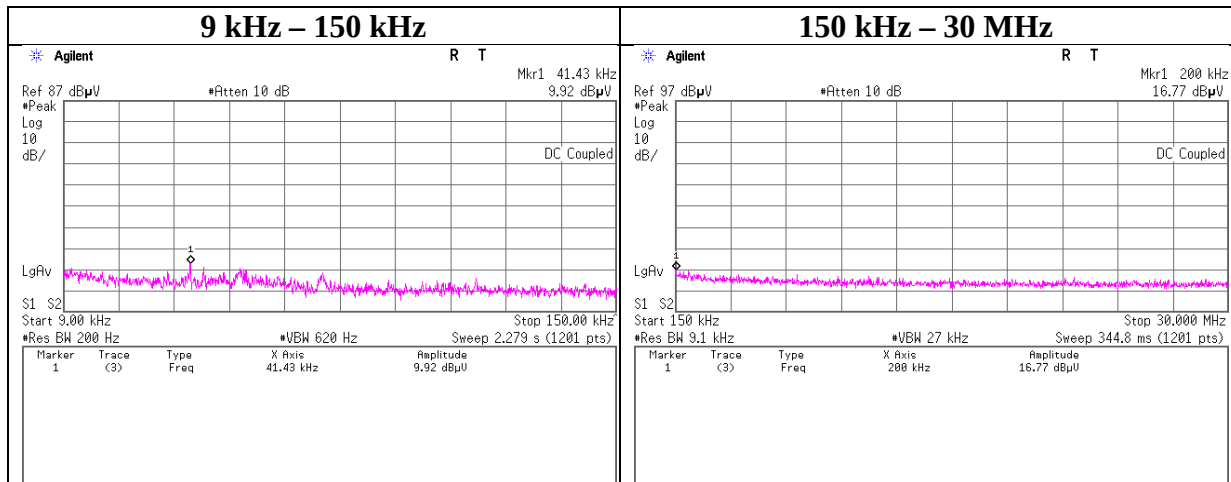
2480 MHz



Conducted Spurious Emission

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11240438H
Date April 8, 2016
Temperature / Humidity 23 deg. C / 51 % RH
Engineer Takumi Shimada
Mode Tx, Hopping Off, 3DH5

2402 MHz



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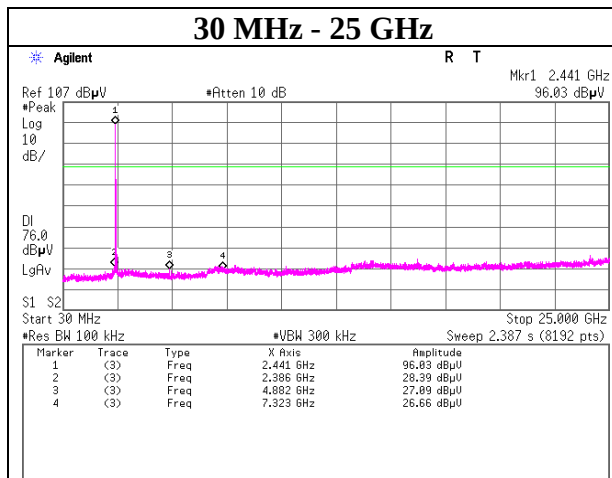
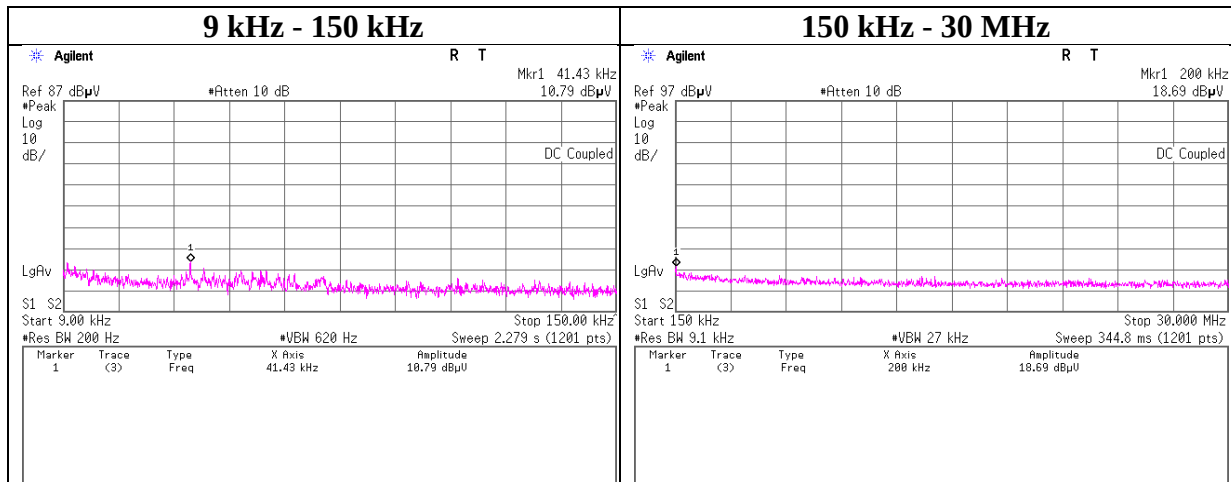
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx, Hopping Off, 3DH5

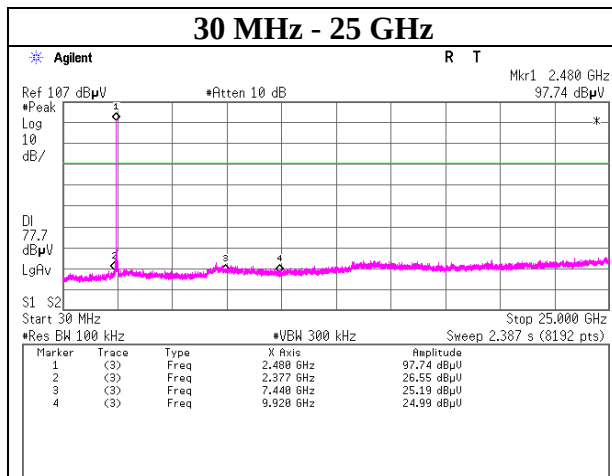
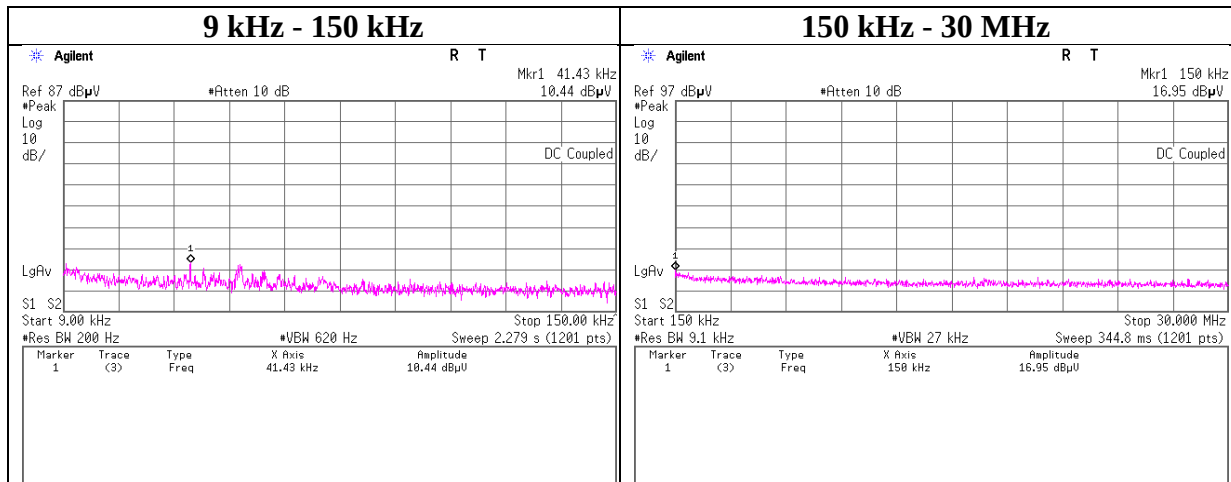
2441 MHz



Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx, Hopping Off, 3DH5

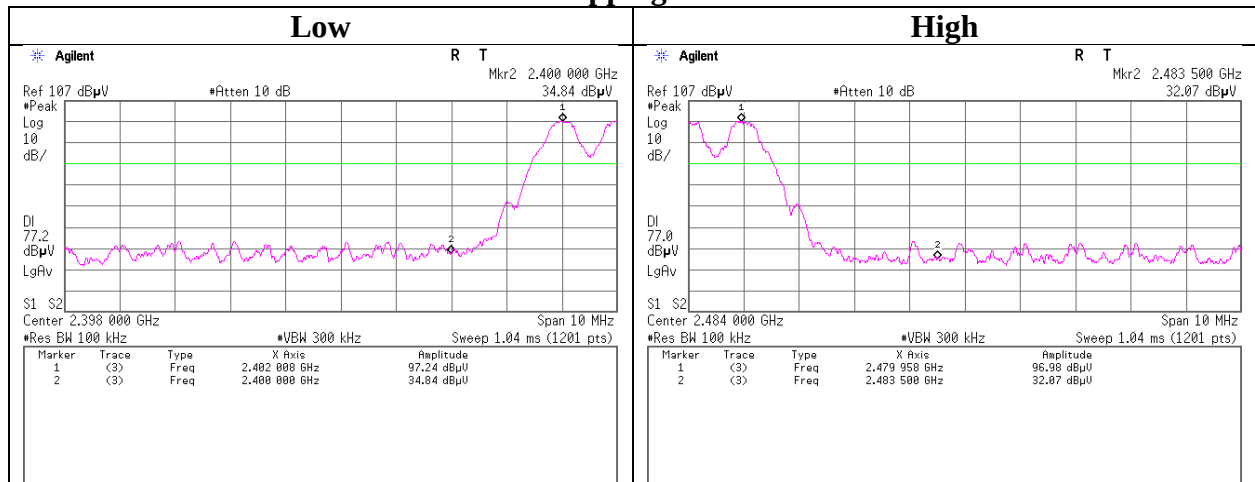
2480 MHz



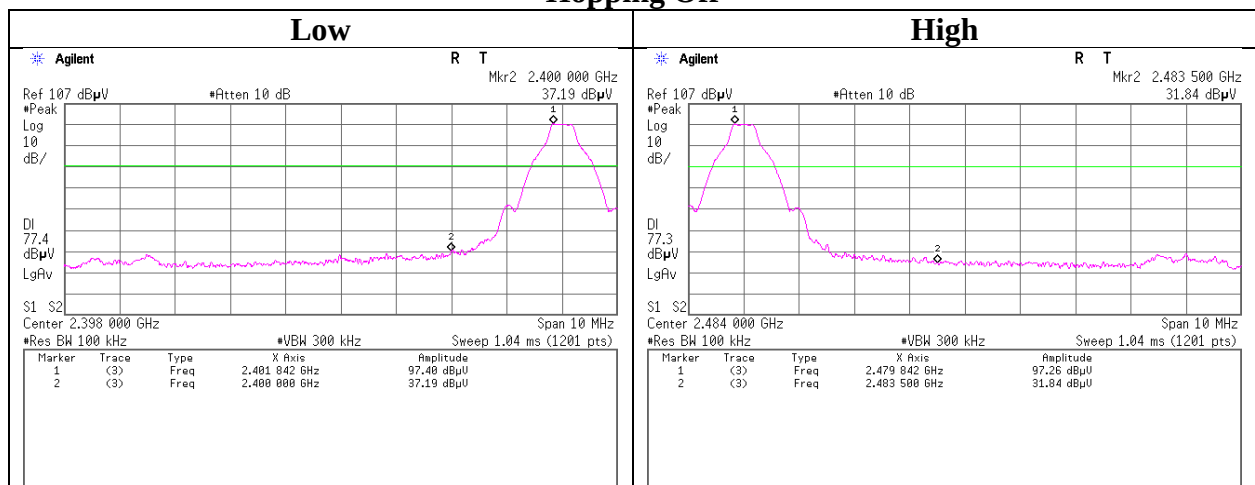
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx DH5

Hopping On



Hopping Off



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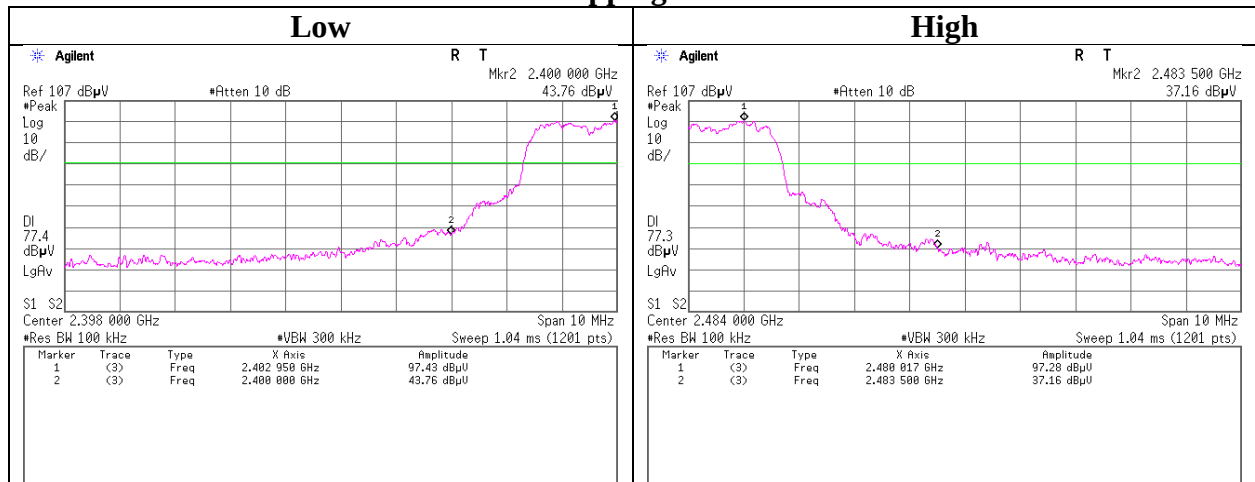
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

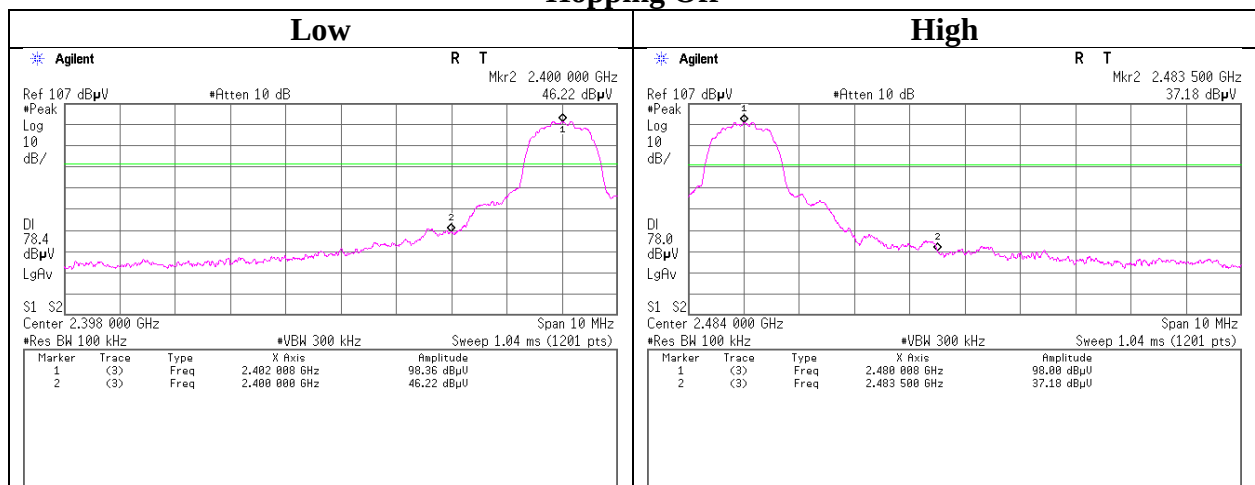
Conducted Emission Band Edge compliance

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11240438H
Date : April 8, 2016
Temperature / Humidity : 23 deg. C / 51 % RH
Engineer : Takumi Shimada
Mode : Tx 3DH5

Hopping On



Hopping Off



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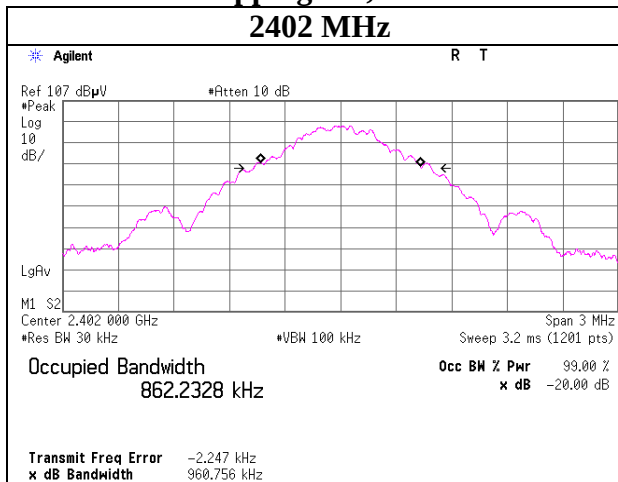
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

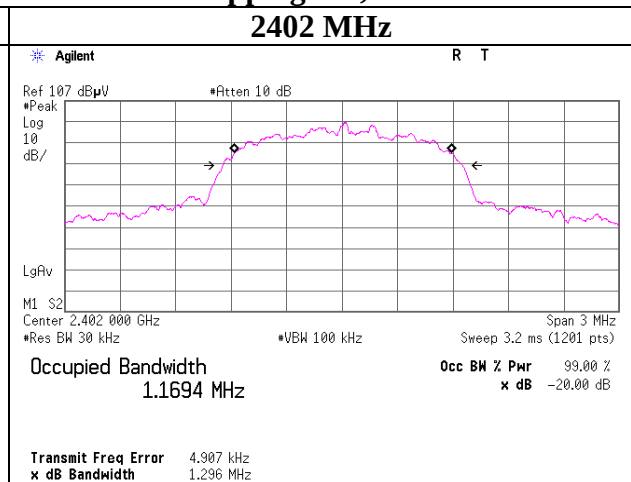
99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11240438H
Date	April 8, 2016
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Takumi Shimada
Mode	Tx Hopping Off

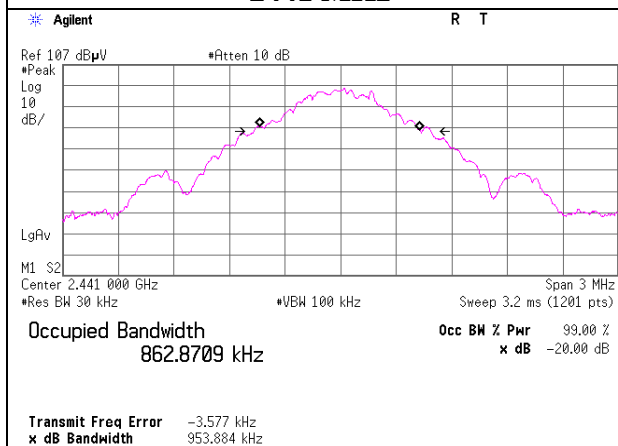
Hopping Off, DH5



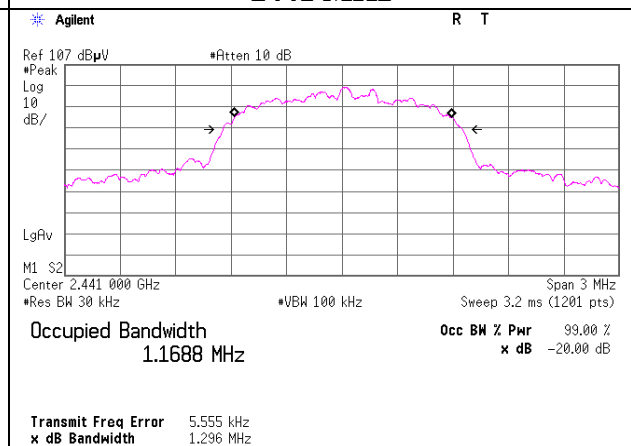
Hopping Off, 3DH5



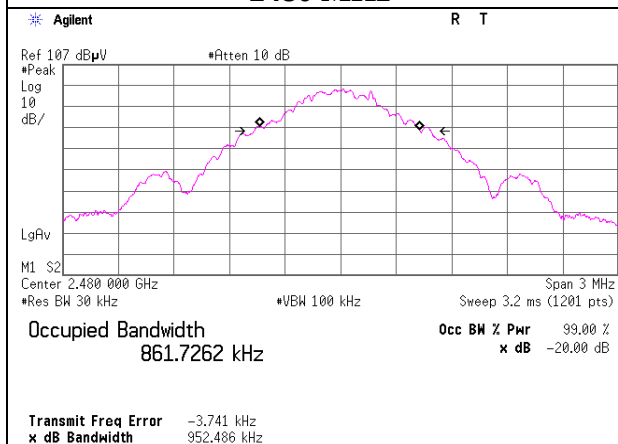
2441 MHz



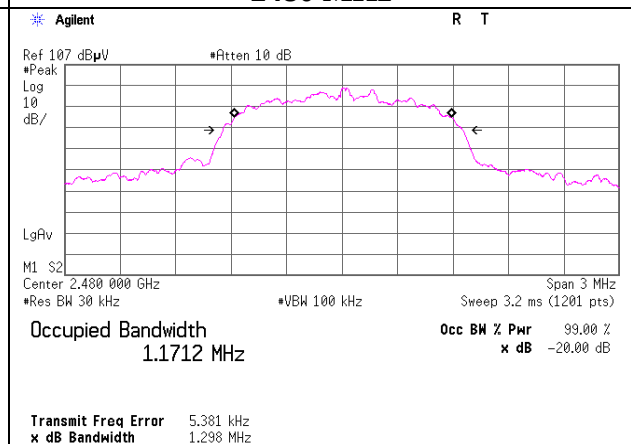
2441 MHz



2480 MHz



2480 MHz



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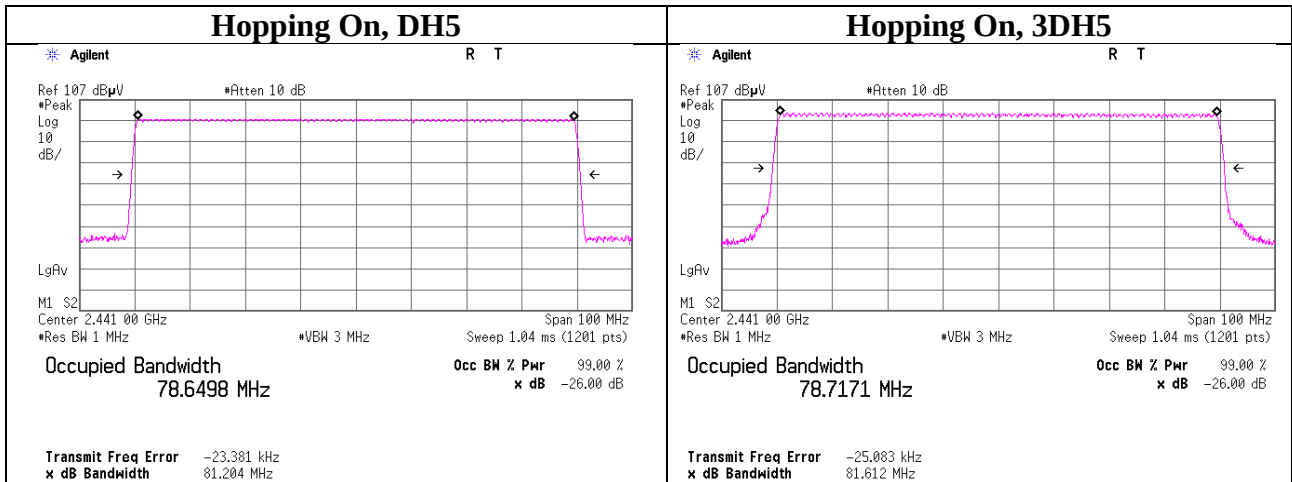
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99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11240438H
Date	April 8, 2016
Temperature / Humidity	23 deg. C / 51 % RH
Engineer	Takumi Shimada
Mode	Tx Hopping On



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APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2015/10/01 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE/CE	2016/01/21 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	RE	2016/02/08 * 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	2016/03/24 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE/CE	2016/01/13 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2015/09/16 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2015/05/15 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2015/10/19 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2015/10/19 * 12
MAT-88	Attenuator	Weinschel Associates	WA56-10	56100304	AT	2015/06/01 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2015/12/08 * 12
MTA-45	Terminator	Mini-Circuits	ANNE-50X+	MUU3460142	AT	Pre Check
MTA-38	Terminator	OMC	BL01-6118-00 (50Ω SMA)	-	AT	Pre Check
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2015/10/08 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2015/05/19 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/CE	2016/02/24 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2015/09/02 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2015/07/13 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2016/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2016/03/24 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2015/07/10 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2015/07/02 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/01/14 * 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: CE: Conducted Emission test
RE: Radiated Emission test
AT: Antenna Terminal Conducted test

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