



RADIO TEST REPORT

Test Report No. : 11074880S-E-R2

Applicant : Sony Corporation
Type of Equipment : FM/AM Digital Media Player
Model No. : DSX-M55BT
FCC ID : AK8DSXM55BT
Test regulation : FCC Part 15 Subpart C: 2015
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11074880S-E-R1. 11074880S-E-R1 is replaced with this report.

Date of test: January 5 to 21, 2016

Representative test engineer:

W. Kojima

Wataru Kojima
Engineer
Consumer Technology Division

Approved by:

A. Hayashi

Akio Hayashi
Leader
Consumer Technology Division



- ☒ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☐ There is no testing item of "Non-accreditation".

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11074880S-E

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SECTION 1: Customer information

Company Name	:	Sony Corporation
Address	:	2-10-1 Osaki, Shinagawa-ku, Tokyo 141-8610 Japan
Telephone Number	:	+81-50-3750-7634
Contact Person	:	Shigeru Higai

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

2.1 Identification of E.U.T.

Type of Equipment	:	FM/AM Digital Media Player
Model No.	:	DSX-M55BT
Serial No.	:	Refer to Section 4.2
Rating	:	DC 12 V
Country of Mass-production	:	Thailand
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.
Receipt Date of Sample	:	December 7, 2015

2.2 Product Description

Model: DSX-M55BT (referred to as the EUT in this report) is an FM/AM Digital Media Player.

General Specification

Clock frequencies: 26 MHz

Radio Specification

[Bluetooth (Ver. 3.0)]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V
Antenna type	:	Top-GND-coupled loop
Antenna Gain	:	-6.259 dBi

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 MHz-928 MHz,
 2400 MHz-2483.5 MHz, and 5725 MHz-5850 MHz

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 (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)		-	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	10.5 dB 9608.000 MHz, AV, Vert. Tx 3DH5 2402 MHz	Complied	Conducted/ Radiated *2)
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) The test is not applicable since the EUT has no AC mains. *2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 12.2.7.					

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred. (ANSI C63.10: 2013 is Non-accreditation)

FCC 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (DC 3.3 V).

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 15.203

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users.

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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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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Radiated emission test

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

3.5 Test Location

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JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

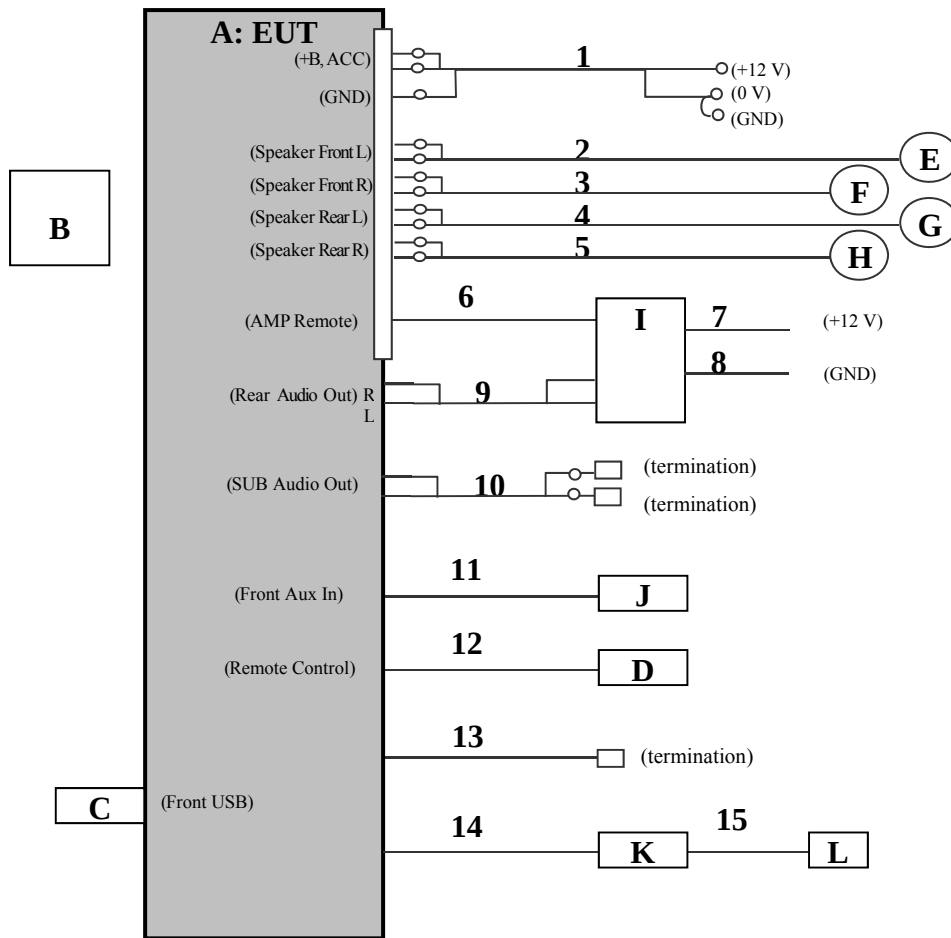
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) 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: BDR: Ext.=23, Int.=39 EDR: Ext.=73, Int.=48 Software: CSR BlueSuite BlueTest Version 2.5.0.93 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.		

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	FM/AM Digital Media Player	DSX-M55BT	9 *1) 7 *2)	Sony	EUT
B	Remote commander	RM-X231	-	Sony	-
C	USB memory	-	-	Sony	-
D	Wired Remote Controller	RM-X2S	-	Sony	-
E	Speaker 1	IS-10	-	Sony	-
F	Speaker 2	IS-10	-	Sony	-
G	Speaker 3	XS-GTF1625R	-	Sony	-
H	Speaker 4	XS-GTF1625R	-	Sony	-
I	Monaural Power Amplifier	XM-4S-020	-	Sony	-
J	Walkman	NW-A829	5017289	Sony	-
K	Sirius XM tuner	SXV100	REG004RR	Sirius	-
L	Antenna for Sirius XM tuner	XVANT1	1046	Sirius	-

*1) Used for Antenna Terminal conducted test

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Power	0.15+2.0	Unshielded	Unshielded	-
2	Speaker (1)	0.15+3.0	Unshielded	Unshielded	-
3	Speaker (2)	0.15+3.0	Unshielded	Unshielded	-
4	Speaker (3)	0.15+3.0	Unshielded	Unshielded	-
5	Speaker (4)	0.15+3.0	Unshielded	Unshielded	-
6	AMP Remote	0.15+1.5	Unshielded	Unshielded	-
7	DC Power(+)	1.3	Unshielded	Unshielded	-
8	DC Power(-)	1.3	Unshielded	Unshielded	-
9	RCA (Rear Audio Out)	5.0	Shielded	Shielded	-
10	RCA (SUB Audio Out)	2.5	Shielded	Shielded	-
11	Stereo mini(Front AUX)	2.0	Shielded	Shielded	-
12	REMOTE Control	2.0	Shielded	Shielded	-
13	Tuner Antenna In	1.5	Shielded	Shielded	-
14	XM tuner	0.6	Shielded	Shielded	-
15	Antenna	7.0	Shielded	Shielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

Below 1 GHz

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

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 a ground plane.

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

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

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

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

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

Test Antennas are used as below;

Frequency	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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

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

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3 m (below 13 GHz), 1 m*2) (above 13 GHz),		3 m (below 13 GHz), 1 m*2) (above 13 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: $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

The carrier level and noise levels were confirmed at an angle of 0 to 45 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (0 deg.) the 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 - 25 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
20 dB 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 *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 50 MHz 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 30 MHz, 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.

*3) Reference data

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

Test data : APPENDIX
Test result : Pass

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APPENDIX 1: Test data

20dB Bandwidth and Carrier Frequency Separation

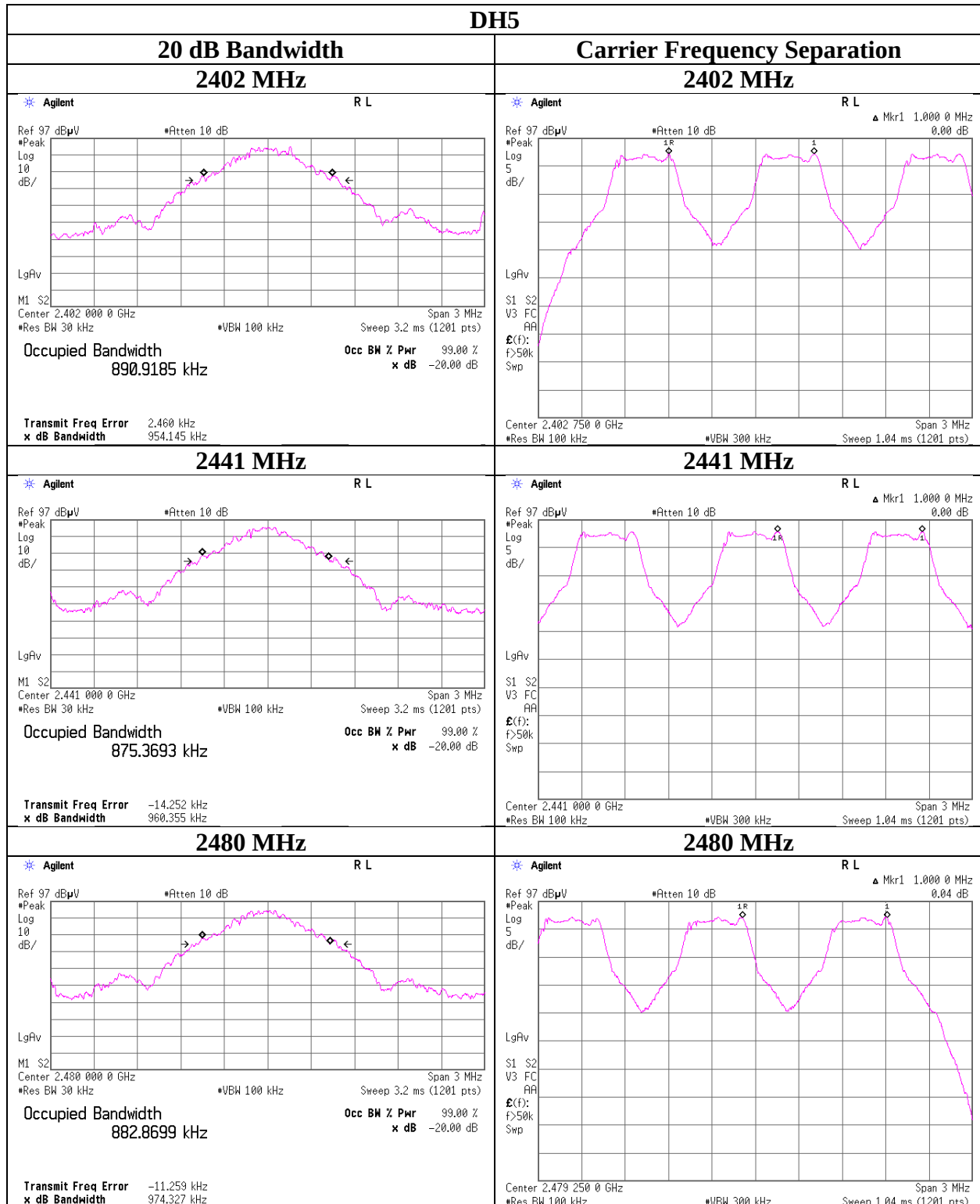
Test place	Shonan EMC Lab. No.5 Shielded Room		
Report No.	11074880S-E-R2		
Date	January 5, 2016	January 6, 2016	
Temperature / Humidity	23 deg. C / 61 % RH	23 deg. C / 60 % RH	
Engineer	Wataru Kojima	Wataru Kojima	
Mode	Tx, Hopping Off, DH5		

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.954	1.000	≥ 0.636
DH5	2441.0	0.960	1.000	≥ 0.640
DH5	2480.0	0.974	1.000	≥ 0.650
3DH5	2402.0	1.288	1.000	≥ 0.859
3DH5	2441.0	1.288	1.000	≥ 0.859
3DH5	2480.0	1.284	1.000	≥ 0.856

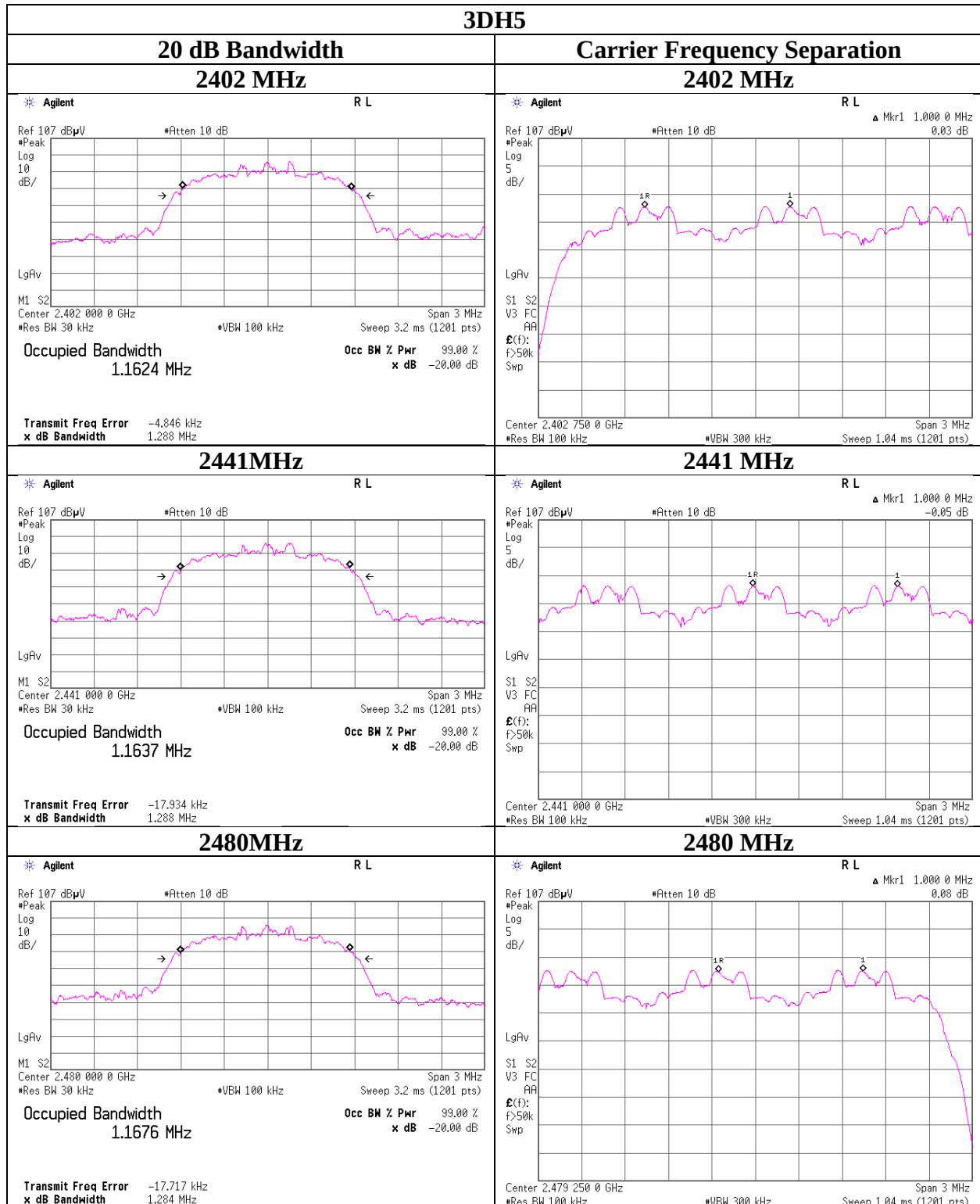
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



20dB Bandwidth and Carrier Frequency Separation



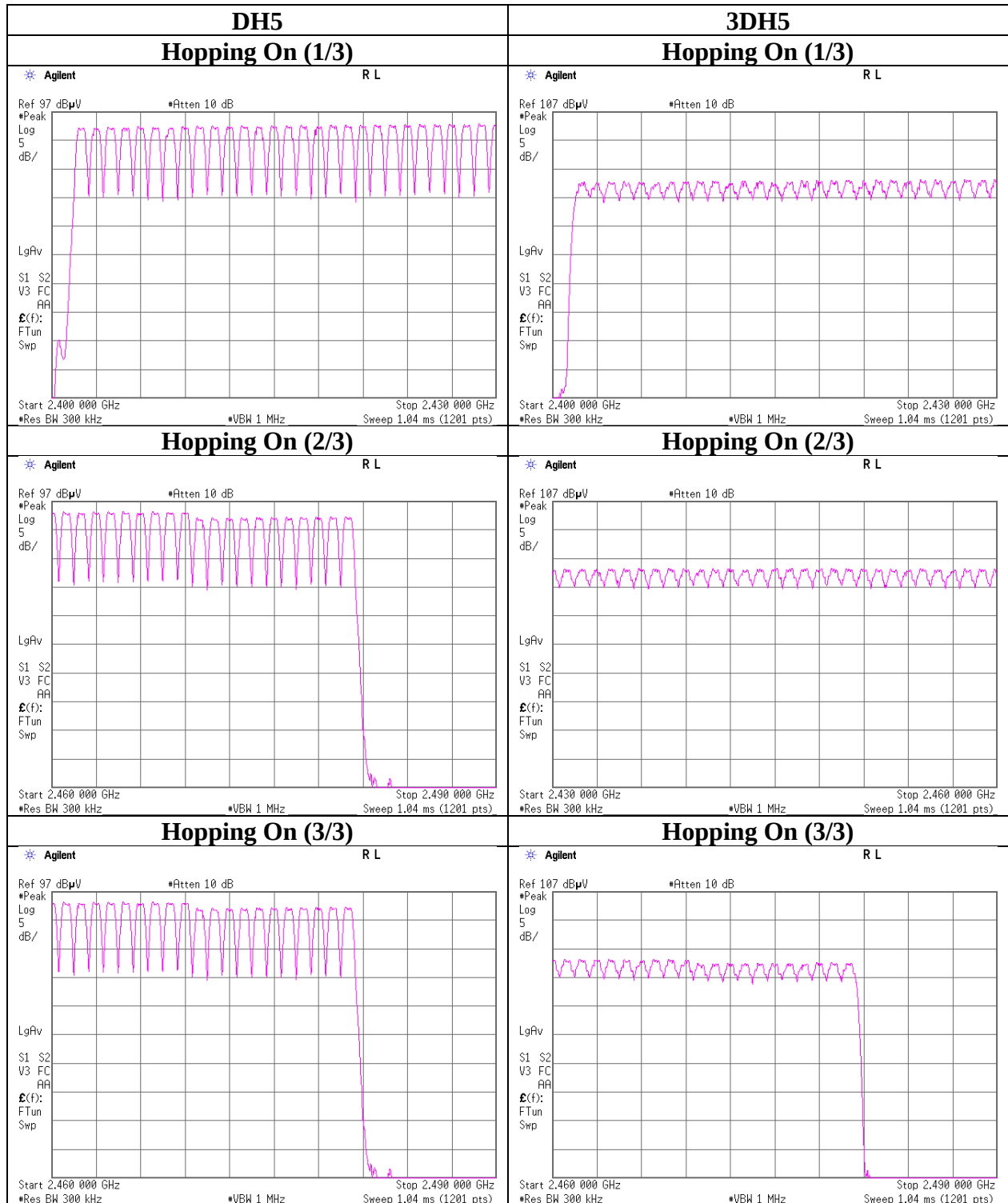
Number of Hopping Frequency

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
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



Dwell time

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping On

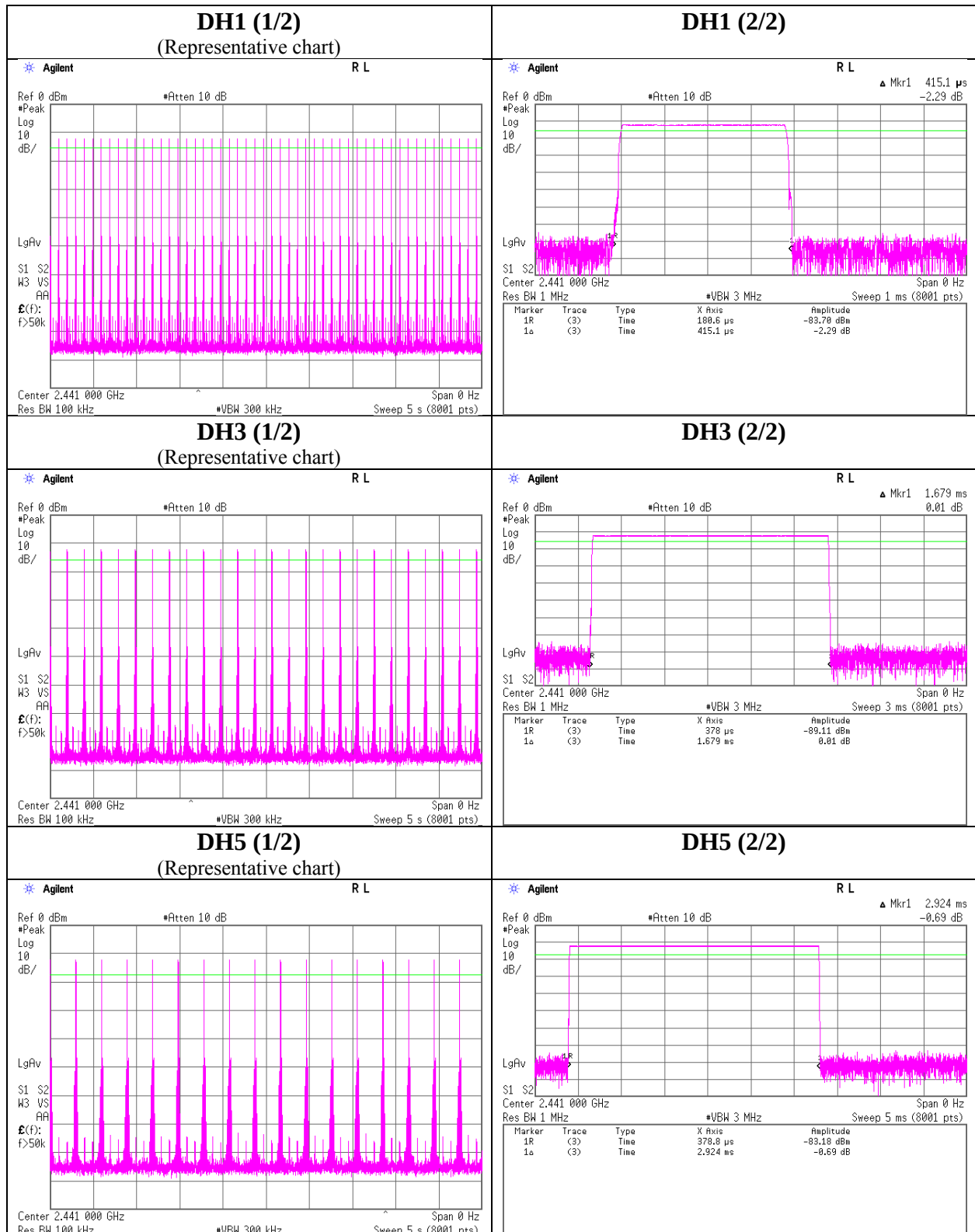
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period				Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	51.0 times	/	5 sec.	x 31.6 sec. = 323 times	0.415	134	400
DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.679	277	400
DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.924	316	400
3DH1	51.0 times	/	5 sec.	x 31.6 sec. = 323 times	0.431	139	400
3DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.683	278	400
3DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	2.939	317	400

Sample Calculation

Result = Number of transmission x Length of transmission

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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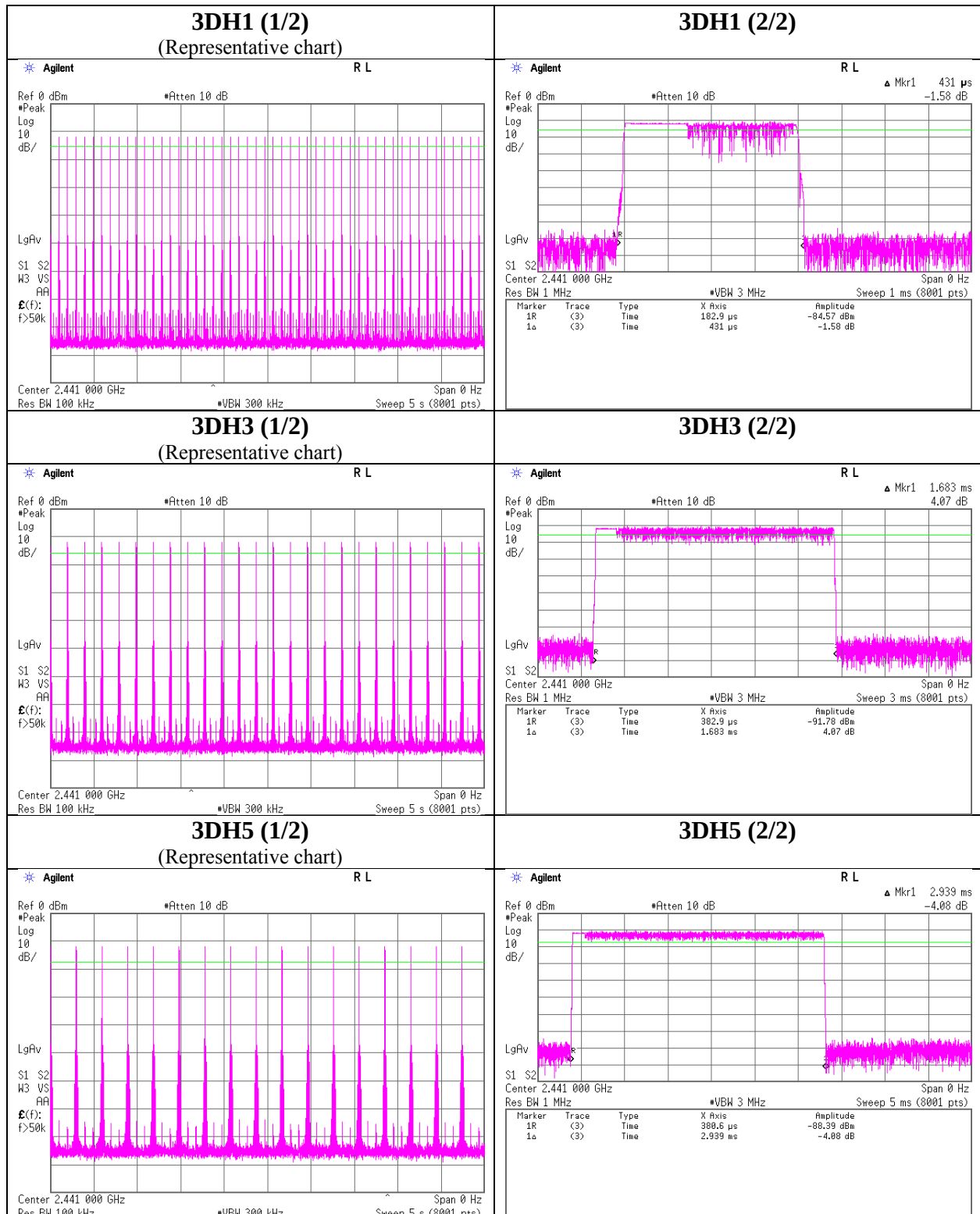
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Dwell time



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11074880S-E-R2
Date	January 5, 2016
Temperature / Humidity	23 deg. C / 61 % RH
Engineer	Wataru Kojima
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	-12.04	1.79	10.01	-0.24	0.95	20.96	125	21.20
DH5	2441.0	-11.30	1.80	10.01	0.51	1.12	20.96	125	20.45
DH5	2480.0	-11.88	1.81	10.01	-0.06	0.99	20.96	125	21.02
2DH5	2402.0	-10.76	1.79	10.01	1.04	1.27	20.96	125	19.92
2DH5	2441.0	-10.23	1.80	10.01	1.58	1.44	20.96	125	19.38
2DH5	2480.0	-10.82	1.81	10.01	1.00	1.26	20.96	125	19.96
3DH5	2402.0	-10.27	1.79	10.01	1.53	1.42	20.96	125	19.43
3DH5	2441.0	-9.78	1.80	10.01	2.03	1.60	20.96	125	18.93
3DH5	2480.0	-10.41	1.81	10.01	1.41	1.38	20.96	125	19.55

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 : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11074880S-E-R2
Date : January 5, 2016
Temperature / Humidity : 23 deg. C / 61 % RH
Engineer : Wataru Kojima
Mode : Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-13.80	1.79	10.01	-2.00	0.63	1.07	-0.93	0.81
DH5	2441.0	-13.20	1.80	10.01	-1.39	0.73	1.07	-0.32	0.93
DH5	2480.0	-13.90	1.81	10.01	-2.08	0.62	1.07	-1.01	0.79
2DH5	2402.0	-14.68	1.79	10.01	-2.88	0.52	1.07	-1.81	0.66
2DH5	2441.0	-14.20	1.80	10.01	-2.39	0.58	1.07	-1.32	0.74
2DH5	2480.0	-14.81	1.81	10.01	-2.99	0.50	1.07	-1.92	0.64
3DH5	2402.0	-14.70	1.79	10.01	-2.90	0.51	1.07	-1.83	0.66
3DH5	2441.0	-14.22	1.80	10.01	-2.41	0.57	1.07	-1.34	0.73
3DH5	2480.0	-14.84	1.81	10.01	-3.02	0.50	1.07	-1.95	0.64

Sample Calculation:

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

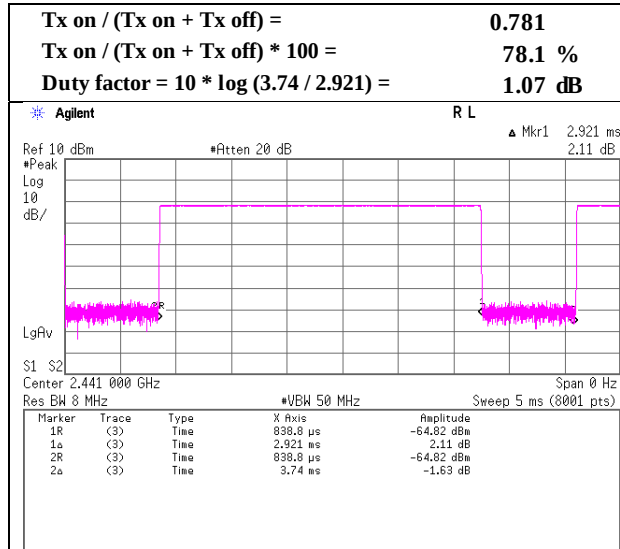
Result (Burst power) = Frame power + Duty factor

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

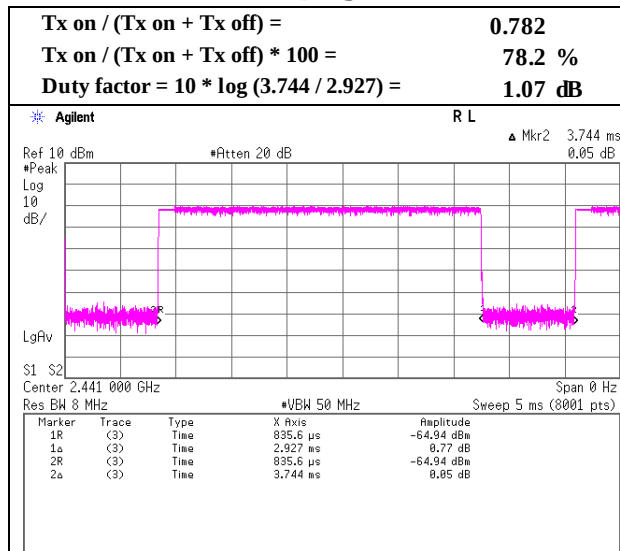
Burst Rate Confirmation

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11074880S-E-R2
Date : January 5, 2016
Temperature / Humidity : 23 deg. C / 61 % RH
Engineer : Wataru Kojima
Mode : Tx, Hopping Off

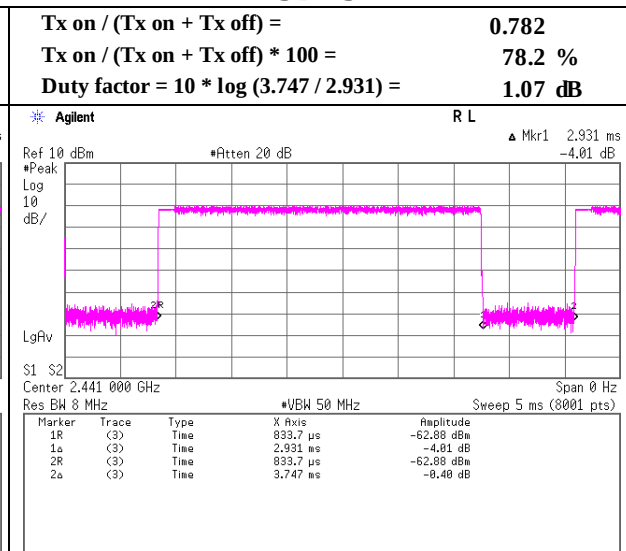
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, DH5 2402 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	61.477	QP	33.3	7.1	6.7	32.1	0.0	15.0	40.0	25.0	288	255	
Hori.	125.971	QP	33.6	13.0	7.5	32.1	0.0	22.0	43.5	21.5	341	285	
Hori.	163.993	QP	41.2	15.3	8.0	32.1	0.0	32.4	43.5	11.1	195	40	
Hori.	354.046	QP	29.3	15.0	8.9	31.9	0.0	21.3	46.0	24.7	100	222	
Hori.	2390.000	PK	45.2	27.8	13.7	41.0	2.5	48.2	73.9	25.7	100	229	
Hori.	4804.000	PK	46.8	31.4	5.8	39.6	2.5	46.9	73.9	27.0	100	244	
Hori.	7206.000	PK	45.5	36.9	7.2	40.1	2.5	52.0	73.9	21.9	100	0	
Hori.	9608.000	PK	45.2	38.5	8.2	39.6	2.5	54.8	73.9	19.1	100	0	
Hori.	19219.890	PK	44.9	40.5	13.3	47.9	-9.5	41.3	73.9	32.6	150	176	
Hori.	2390.000	AV	33.5	27.8	13.7	41.0	2.5	36.5	53.9	17.4	100	229	
Hori.	4804.000	AV	36.3	31.4	5.8	39.6	2.5	36.4	53.9	17.5	100	244	
Hori.	7206.000	AV	33.6	36.9	7.2	40.1	2.5	40.1	53.9	13.8	100	0	
Hori.	9608.000	AV	33.2	38.5	8.2	39.6	2.5	42.8	53.9	11.1	100	0	
Hori.	19219.890	AV	35.7	40.5	13.3	47.9	-9.5	32.1	53.9	21.8	150	176	
Vert.	32.365	QP	27.1	16.4	6.7	32.2	0.0	18.0	40.0	22.0	100	4	
Vert.	44.395	QP	34.1	12.2	6.9	32.1	0.0	21.1	40.0	18.9	100	136	
Vert.	162.463	QP	36.6	15.2	8.0	32.1	0.0	27.7	43.5	15.8	100	284	
Vert.	168.139	QP	36.7	15.4	8.0	32.0	0.0	28.1	43.5	15.4	100	144	
Vert.	384.011	QP	32.2	15.7	9.1	31.9	0.0	25.1	46.0	20.9	100	67	
Vert.	2390.000	PK	45.7	27.8	13.7	41.0	2.5	48.7	73.9	25.2	100	129	
Vert.	4804.000	PK	47.4	31.4	5.8	39.6	2.5	47.5	73.9	26.4	384	329	
Vert.	7206.000	PK	46.1	36.9	7.2	40.1	2.5	52.6	73.9	21.3	100	0	
Vert.	9608.000	PK	44.9	38.5	8.2	39.6	2.5	54.5	73.9	19.4	100	0	
Vert.	19219.890	PK	44.5	40.5	13.3	47.9	-9.5	40.9	73.9	33.0	144	167	
Vert.	2390.000	AV	33.6	27.8	13.7	41.0	2.5	36.6	53.9	17.3	100	129	
Vert.	4804.000	AV	38.5	31.4	5.8	39.6	2.5	38.6	53.9	15.3	384	329	
Vert.	7206.000	AV	33.5	36.9	7.2	40.1	2.5	40.0	53.9	13.9	100	0	
Vert.	9608.000	AV	33.2	38.5	8.2	39.6	2.5	42.8	53.9	11.1	100	0	
Vert.	19219.890	AV	37.0	40.5	13.3	47.9	-9.5	33.4	53.9	20.5	144	167	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	76.5	27.8	13.7	41.0	2.5	79.5	-	-	Carrier
Hori.	2400.000	PK	35.1	27.8	13.7	41.0	2.5	38.1	59.5	21.4	
Vert.	2402.000	PK	79.2	27.8	13.7	41.0	2.5	82.2	-	-	Carrier
Vert.	2400.000	PK	36.0	27.8	13.7	41.0	2.5	39.0	62.2	23.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

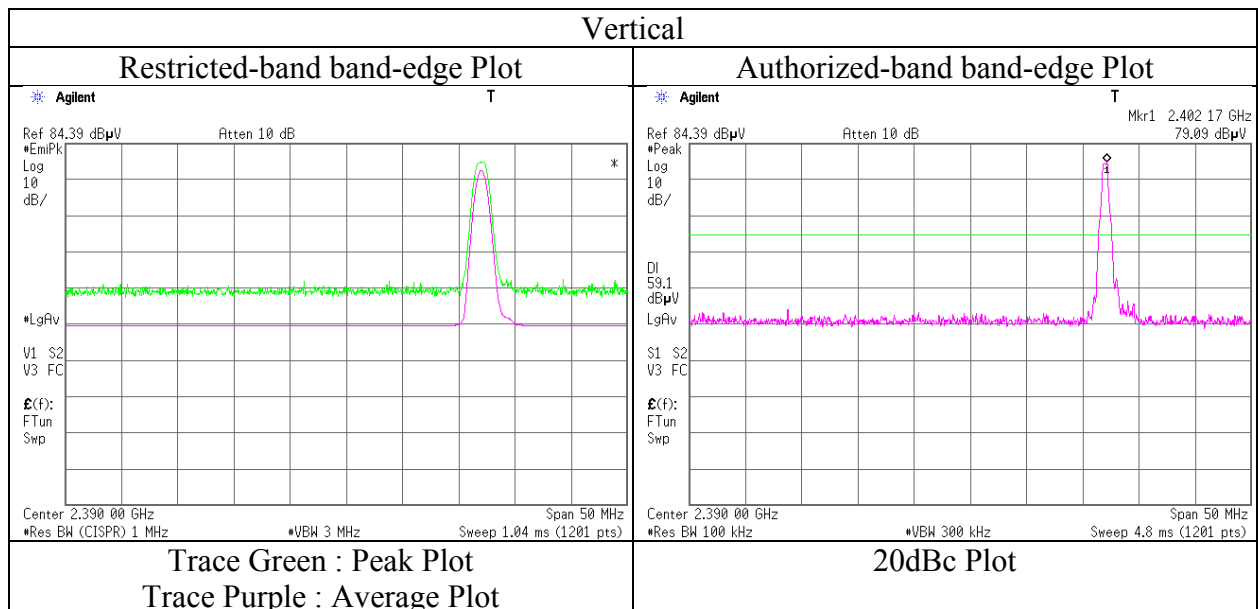
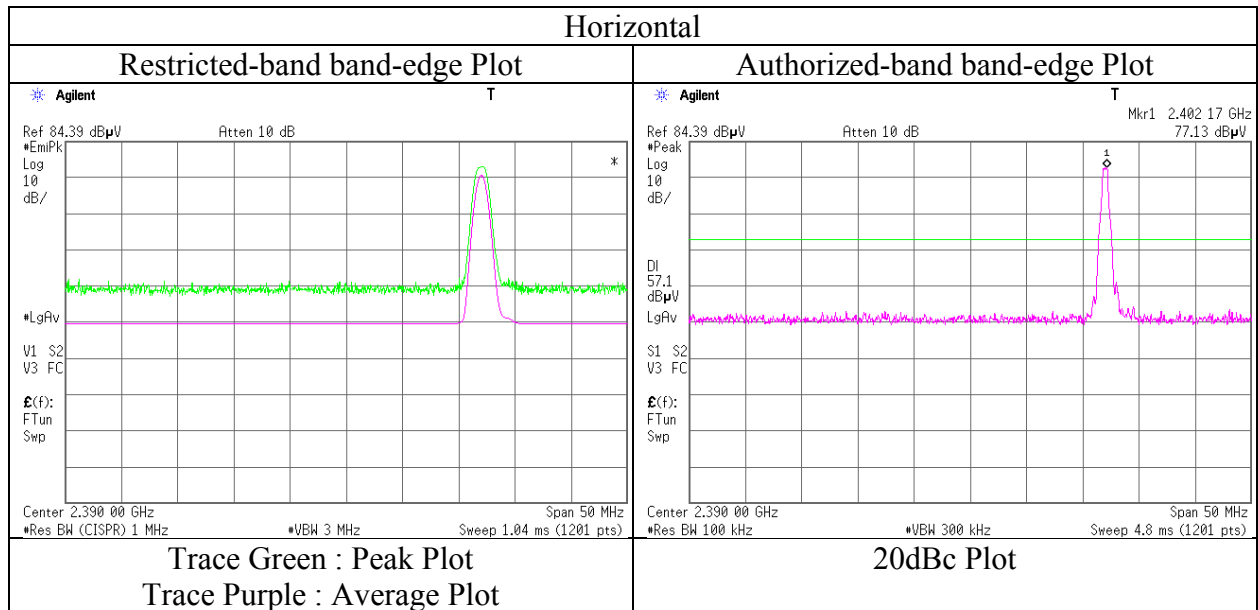
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11074880S-E-R2
Date	January 20, 2016
Temperature / Humidity	28 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa (1-13GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, DH5 2441 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	61.688	QP	33.2	7.1	6.7	32.1	0.0	14.9	40.0	25.1	342	255	
Hori.	161.419	QP	41.3	15.2	8.0	32.1	0.0	32.4	43.5	11.1	197	44	
Hori.	210.034	QP	27.7	16.4	8.2	32.0	0.0	20.3	43.5	23.2	149	124	
Hori.	329.989	QP	27.5	14.5	8.8	31.9	0.0	18.9	46.0	27.1	100	254	
Hori.	4882.000	PK	46.1	31.7	5.9	39.5	2.5	46.7	73.9	27.2	400	352	
Hori.	7323.000	PK	44.8	36.9	7.3	40.2	2.5	51.3	73.9	22.6	100	0	
Hori.	9764.000	PK	43.4	38.5	8.3	39.5	2.5	53.2	73.9	20.7	100	0	
Hori.	19523.880	PK	45.0	40.4	13.5	47.6	-9.5	41.8	73.9	32.1	150	178	
Hori.	4882.000	AV	36.3	31.7	5.9	39.5	2.5	36.9	53.9	17.0	400	352	
Hori.	7323.000	AV	33.0	36.9	7.3	40.2	2.5	39.5	53.9	14.4	100	0	
Hori.	9764.000	AV	32.3	38.5	8.3	39.5	2.5	42.1	53.9	11.8	100	0	
Hori.	19523.880	AV	36.9	40.4	13.5	47.6	-9.5	33.7	53.9	20.2	150	178	
Vert.	43.894	QP	33.0	12.4	6.9	32.1	0.0	20.2	40.0	19.8	100	158	
Vert.	102.008	QP	26.0	10.0	7.5	32.1	0.0	11.4	43.5	32.1	100	281	
Vert.	159.334	QP	37.7	15.1	8.0	32.1	0.0	28.7	43.5	14.8	100	263	
Vert.	167.060	QP	37.3	15.4	8.0	32.0	0.0	28.7	43.5	14.8	100	9	
Vert.	384.007	QP	33.4	15.7	9.1	31.9	0.0	26.3	46.0	19.7	100	68	
Vert.	4882.000	PK	47.8	31.7	5.9	39.5	2.5	48.4	73.9	25.5	393	324	
Vert.	7323.000	PK	45.0	36.9	7.3	40.2	2.5	51.5	73.9	22.4	100	0	
Vert.	9764.000	PK	44.3	38.5	8.3	39.5	2.5	54.1	73.9	19.8	100	0	
Vert.	19523.880	PK	45.3	40.4	13.5	47.6	-9.5	42.1	73.9	31.8	150	160	
Vert.	4882.000	AV	39.1	31.7	5.9	39.5	2.5	39.7	53.9	14.2	393	324	
Vert.	7323.000	AV	33.1	36.9	7.3	40.2	2.5	39.6	53.9	14.3	100	0	
Vert.	9764.000	AV	32.7	38.5	8.3	39.5	2.5	42.5	53.9	11.4	100	0	
Vert.	19523.880	AV	37.6	40.4	13.5	47.6	-9.5	34.4	53.9	19.5	150	160	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, DH5 2480 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	102.007	QP	28.8	10.0	7.5	32.1	0.0	14.2	43.5	29.3	310	270	
Hori.	162.936	QP	41.0	15.2	8.0	32.1	0.0	32.1	43.5	11.4	192	43	
Hori.	305.652	QP	27.2	14.0	8.7	31.9	0.0	18.0	46.0	28.0	129	45	
Hori.	354.053	QP	28.1	15.0	8.9	31.9	0.0	20.1	46.0	25.9	100	226	
Hori.	2483.500	PK	46.0	27.9	13.8	41.0	2.5	49.2	73.9	24.7	100	295	
Hori.	4960.000	PK	46.0	32.0	6.0	39.4	2.5	47.1	73.9	26.8	100	135	
Hori.	7440.000	PK	44.6	37.0	7.5	40.4	2.5	51.2	73.9	22.7	100	0	
Hori.	9920.000	PK	43.0	38.4	8.4	39.4	2.5	52.9	73.9	21.0	100	0	
Hori.	19835.870	PK	43.7	40.3	13.6	47.5	-9.5	40.6	73.9	33.3	149	163	
Hori.	2483.500	AV	33.6	27.9	13.8	41.0	2.5	36.8	53.9	17.1	100	295	
Hori.	4960.000	AV	36.2	32.0	6.0	39.4	2.5	37.3	53.9	16.6	100	135	
Hori.	7440.000	AV	32.3	37.0	7.5	40.4	2.5	38.9	53.9	15.0	100	0	
Hori.	9920.000	AV	30.9	38.4	8.4	39.4	2.5	40.8	53.9	13.1	100	0	
Hori.	19835.870	AV	35.5	40.3	13.6	47.5	-9.5	32.4	53.9	21.5	149	163	
Vert.	33.745	QP	27.4	16.0	6.7	32.2	0.0	17.9	40.0	22.1	100	26	
Vert.	45.148	QP	34.0	12.0	6.9	32.1	0.0	20.8	40.0	19.2	100	129	
Vert.	159.337	QP	37.2	15.1	8.0	32.1	0.0	28.2	43.5	15.3	100	268	
Vert.	166.534	QP	38.1	15.3	8.0	32.0	0.0	29.4	43.5	14.1	100	26	
Vert.	384.001	QP	32.3	15.7	9.1	31.9	0.0	25.2	46.0	20.8	100	66	
Vert.	2483.500	PK	45.1	27.9	13.8	41.0	2.5	48.3	73.9	25.6	100	141	
Vert.	4960.000	PK	47.7	32.0	6.0	39.4	2.5	48.8	73.9	25.1	382	323	
Vert.	7440.000	PK	43.6	37.0	7.5	40.4	2.5	50.2	73.9	23.7	100	0	
Vert.	9920.000	PK	42.7	38.4	8.4	39.4	2.5	52.6	73.9	21.3	100	0	
Vert.	19835.870	PK	42.7	40.3	13.6	47.5	-9.5	39.6	73.9	34.3	148	185	
Vert.	2483.500	AV	33.5	27.9	13.8	41.0	2.5	36.7	53.9	17.2	100	141	
Vert.	4960.000	AV	38.5	32.0	6.0	39.4	2.5	39.6	53.9	14.3	382	323	
Vert.	7440.000	AV	32.4	37.0	7.5	40.4	2.5	39.0	53.9	14.9	100	0	
Vert.	9920.000	AV	31.0	38.4	8.4	39.4	2.5	40.9	53.9	13.0	100	0	
Vert.	19835.870	AV	34.5	40.3	13.6	47.5	-9.5	31.4	53.9	22.5	148	185	

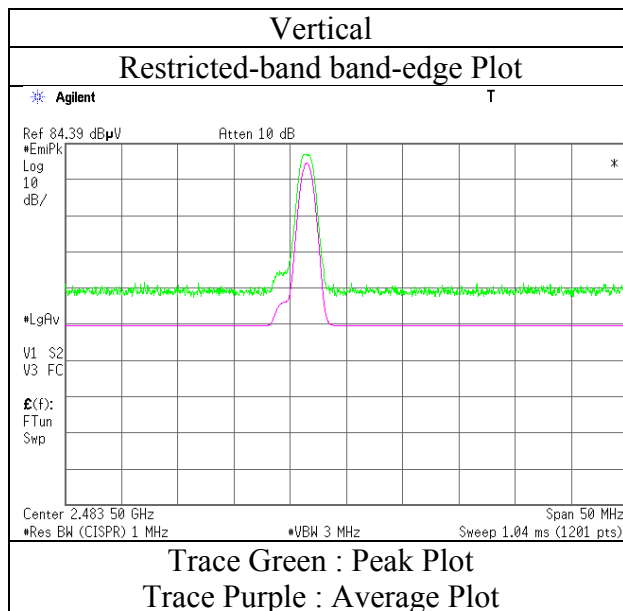
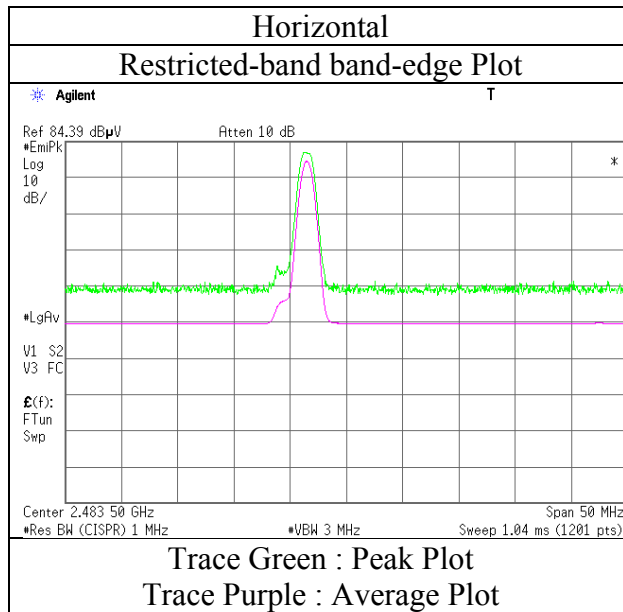
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission **(Reference Plot for band-edge)**

Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 11074880S-E-R2
Date January 20, 2016
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Hiroyuki Morikawa
(1-13GHz)
Mode Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	65.804	QP	30.9	6.5	6.7	32.1	0.0	12.0	40.0	28.0	100	266	
Hori.	84.001	QP	32.3	6.6	7.7	32.1	0.0	14.5	40.0	25.5	228	279	
Hori.	161.917	QP	41.4	15.2	8.0	32.1	0.0	32.5	43.5	11.0	280	45	
Hori.	371.821	QP	29.2	15.4	9.0	31.9	0.0	21.7	46.0	24.3	100	166	
Hori.	2390.000	PK	45.4	27.8	13.7	41.0	2.5	48.4	73.9	25.5	210	294	
Hori.	4804.000	PK	45.0	31.4	5.8	39.6	2.5	45.1	73.9	28.8	100	241	
Hori.	7206.000	PK	44.8	36.9	7.2	40.1	2.5	51.3	73.9	22.6	100	0	
Hori.	9608.000	PK	45.5	38.5	8.2	39.6	2.5	55.1	73.9	18.8	100	0	
Hori.	19219.890	PK	44.1	40.5	13.3	47.9	-9.5	40.5	73.9	33.4	152	176	
Hori.	2390.000	AV	33.7	27.8	13.7	41.0	2.5	36.7	53.9	17.2	210	294	
Hori.	4804.000	AV	33.9	31.4	5.8	39.6	2.5	34.0	53.9	19.9	100	241	
Hori.	7206.000	AV	33.5	36.9	7.2	40.1	2.5	40.0	53.9	13.9	100	0	
Hori.	9608.000	AV	33.7	38.5	8.2	39.6	2.5	43.3	53.9	10.6	100	0	
Hori.	19219.890	AV	36.9	40.5	13.3	47.9	-9.5	33.3	53.9	20.6	152	176	
Vert.	32.558	QP	29.2	16.3	6.7	32.2	0.0	20.0	40.0	20.0	100	337	
Vert.	44.013	QP	34.0	12.4	6.9	32.1	0.0	21.2	40.0	18.8	102	144	
Vert.	107.950	QP	32.6	10.9	7.4	32.1	0.0	18.8	43.5	24.7	100	-1	
Vert.	160.379	QP	37.7	15.1	8.0	32.1	0.0	28.7	43.5	14.8	100	266	
Vert.	383.986	QP	30.7	15.7	9.1	31.9	0.0	23.6	46.0	22.4	136	309	
Vert.	2390.000	PK	44.9	27.8	13.7	41.0	2.5	47.9	73.9	26.0	104	43	
Vert.	4804.000	PK	46.3	31.4	5.8	39.6	2.5	46.4	73.9	27.5	361	323	
Vert.	7206.000	PK	45.7	36.9	7.2	40.1	2.5	52.2	73.9	21.7	100	0	
Vert.	9608.000	PK	45.4	38.5	8.2	39.6	2.5	55.0	73.9	18.9	100	0	
Vert.	19219.890	PK	45.0	40.5	13.3	47.9	-9.5	41.4	73.9	32.5	144	168	
Vert.	2390.000	AV	33.6	27.8	13.7	41.0	2.5	36.6	53.9	17.3	104	43	
Vert.	4804.000	AV	35.6	31.4	5.8	39.6	2.5	35.7	53.9	18.2	361	323	
Vert.	7206.000	AV	33.5	36.9	7.2	40.1	2.5	40.0	53.9	13.9	100	0	
Vert.	9608.000	AV	33.8	38.5	8.2	39.6	2.5	43.4	53.9	10.5	100	0	
Vert.	19219.890	AV	37.4	40.5	13.3	47.9	-9.5	33.8	53.9	20.1	144	168	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	78.5	27.8	13.7	41.0	2.5	81.5	-	-	Carrier
Hori.	2400.000	PK	36.8	27.8	13.7	41.0	2.5	39.8	61.4	21.6	
Vert.	2402.000	PK	81.5	27.8	13.7	41.0	2.5	84.5	-	-	Carrier
Vert.	2400.000	PK	35.8	27.8	13.7	41.0	2.5	38.8	64.5	25.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Shonan EMC Lab.

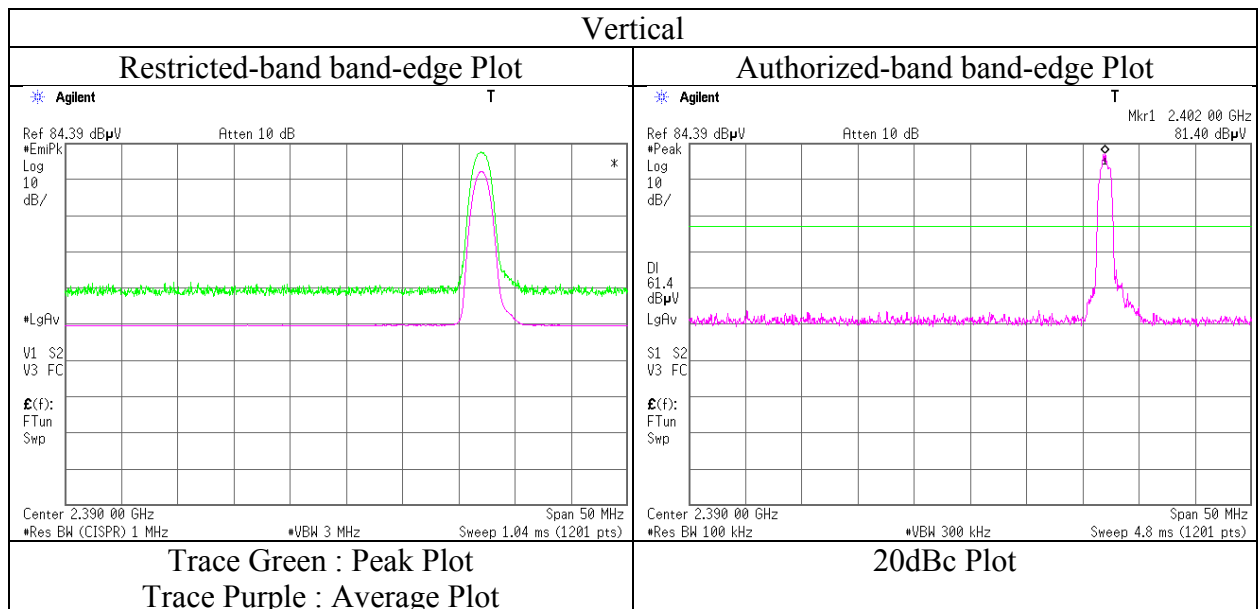
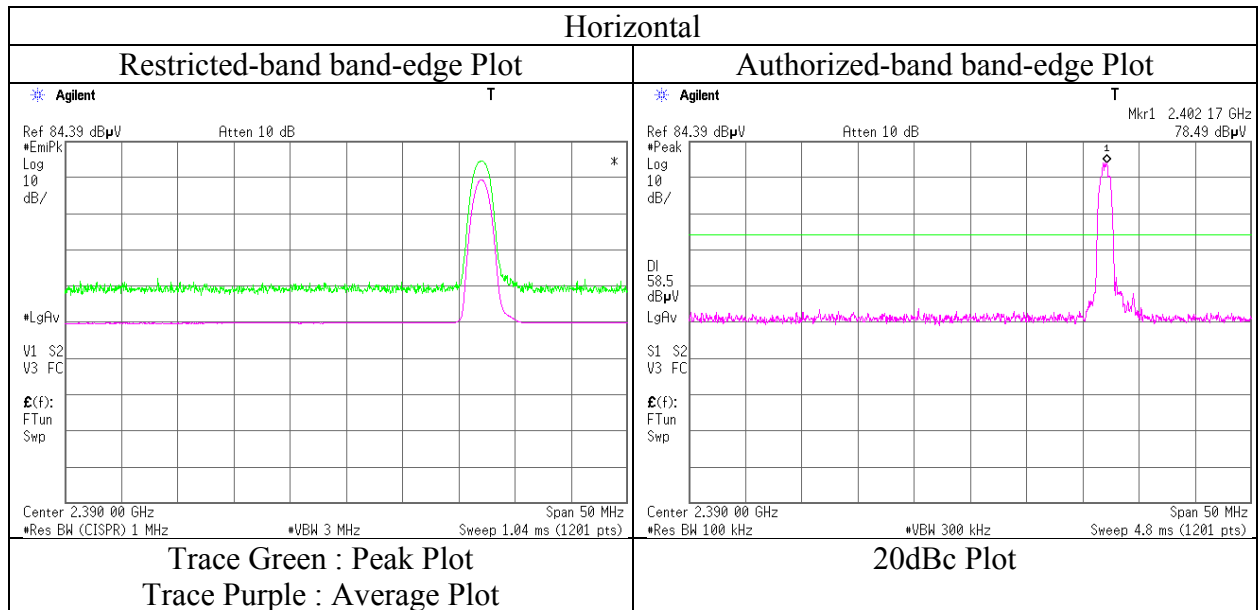
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11074880S-E-R2
Date	January 20, 2016
Temperature / Humidity	28 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa (1-13GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, 3DH5 2441 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	141.879	QP	39.6	14.2	7.8	32.1	0.0	29.5	43.5	14.0	200	28	
Hori.	161.941	QP	41.7	15.2	8.0	32.1	0.0	32.8	43.5	10.7	201	40	
Hori.	246.004	QP	24.0	17.0	8.4	32.0	0.0	17.4	46.0	28.6	138	132	
Hori.	384.011	QP	33.1	15.7	9.1	31.9	0.0	26.0	46.0	20.0	100	164	
Hori.	4882.000	PK	45.2	31.7	5.9	39.5	2.5	45.8	73.9	28.1	400	353	
Hori.	7323.000	PK	43.9	36.9	7.3	40.2	2.5	50.4	73.9	23.5	100	0	
Hori.	9764.000	PK	44.7	38.5	8.3	39.5	2.5	54.5	73.9	19.4	100	0	
Hori.	19523.860	PK	43.5	40.4	13.5	47.6	-9.5	40.3	73.9	33.6	133	166	
Hori.	4882.000	AV	33.9	31.7	5.9	39.5	2.5	34.5	53.9	19.4	400	353	
Hori.	7323.000	AV	32.6	36.9	7.3	40.2	2.5	39.1	53.9	14.8	100	0	
Hori.	9764.000	AV	32.4	38.5	8.3	39.5	2.5	42.2	53.9	11.7	100	0	
Hori.	19523.860	AV	34.6	40.4	13.5	47.6	-9.5	31.4	53.9	22.5	133	166	
Vert.	32.447	QP	28.9	16.3	6.7	32.2	0.0	19.7	40.0	20.3	100	311	
Vert.	44.351	QP	34.5	12.3	6.9	32.1	0.0	21.6	40.0	18.4	100	147	
Vert.	160.386	QP	36.7	15.1	8.0	32.1	0.0	27.7	43.5	15.8	100	274	
Vert.	222.185	QP	28.1	16.6	8.2	32.0	0.0	20.9	46.0	25.1	100	184	
Vert.	384.011	QP	31.4	15.7	9.1	31.9	0.0	24.3	46.0	21.7	123	237	
Vert.	4882.000	PK	45.6	31.7	5.9	39.5	2.5	46.2	73.9	27.7	392	322	
Vert.	7323.000	PK	44.4	36.9	7.3	40.2	2.5	50.9	73.9	23.0	100	0	
Vert.	9764.000	PK	44.4	38.5	8.3	39.5	2.5	54.2	73.9	19.7	100	0	
Vert.	19523.860	PK	44.7	40.4	13.5	47.6	-9.5	41.5	73.9	32.4	151	162	
Vert.	4882.000	AV	35.3	31.7	5.9	39.5	2.5	35.9	53.9	18.0	392	322	
Vert.	7323.000	AV	32.7	36.9	7.3	40.2	2.5	39.2	53.9	14.7	100	0	
Vert.	9764.000	AV	32.5	38.5	8.3	39.5	2.5	42.3	53.9	11.6	100	0	
Vert.	19523.860	AV	37.1	40.4	13.5	47.6	-9.5	33.9	53.9	20.0	151	162	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11074880S-E-R2
Date : January 20, 2016 January 21, 2016
Temperature / Humidity : 28 deg. C / 30 % RH 26 deg. C / 30 % RH
Engineer : Hiroyuki Morikawa Hikaru Shirasawa
(1-13 GHz) (30-1000 MHz)
(13-18 GHz) (18-26.5 GHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	40.232	QP	29.5	13.8	6.8	32.1	0.0	18.0	40.0	22.0	327	215	
Hori.	63.865	QP	33.5	6.8	6.6	32.1	0.0	14.8	40.0	25.2	275	247	
Hori.	164.476	QP	40.8	15.3	8.0	32.1	0.0	32.0	43.5	11.5	185	33	
Hori.	294.036	QP	24.2	19.0	8.6	32.0	0.0	19.8	46.0	26.2	121	248	
Hori.	318.039	QP	25.7	14.3	8.8	31.9	0.0	16.9	46.0	29.1	107	276	
Hori.	2483.500	PK	46.7	27.9	13.8	41.0	2.5	49.9	73.9	24.0	100	295	
Hori.	4960.000	PK	45.3	32.0	6.0	39.4	2.5	46.4	73.9	27.5	100	136	
Hori.	7440.000	PK	44.6	37.0	7.5	40.4	2.5	51.2	73.9	22.7	100	0	
Hori.	9920.000	PK	42.8	38.4	8.4	39.4	2.5	52.7	73.9	21.2	100	0	
Hori.	19835.860	PK	43.2	40.3	13.6	47.5	-9.5	40.1	73.9	33.8	155	169	
Hori.	2483.500	AV	33.7	27.9	13.8	41.0	2.5	36.9	53.9	17.0	100	295	
Hori.	4960.000	AV	34.1	32.0	6.0	39.4	2.5	35.2	53.9	18.7	100	136	
Hori.	7440.000	AV	32.7	37.0	7.5	40.4	2.5	39.3	53.9	14.6	100	0	
Hori.	9920.000	AV	31.7	38.4	8.4	39.4	2.5	41.6	53.9	12.3	100	0	
Hori.	19835.860	AV	35.2	40.3	13.6	47.5	-9.5	32.1	53.9	21.8	155	169	
Vert.	32.373	QP	28.9	16.4	6.7	32.2	0.0	19.8	40.0	20.2	100	345	
Vert.	62.185	QP	30.3	7.0	6.7	32.1	0.0	11.9	40.0	28.1	100	289	
Vert.	162.434	QP	38.4	15.2	8.0	32.1	0.0	29.5	43.5	14.0	100	137	
Vert.	384.002	QP	28.5	15.7	9.1	31.9	0.0	21.4	46.0	24.6	146	246	
Vert.	2483.500	PK	46.2	27.9	13.8	41.0	2.5	49.4	73.9	24.5	100	140	
Vert.	4960.000	PK	47.1	32.0	6.0	39.4	2.5	48.2	73.9	25.7	384	325	
Vert.	7440.000	PK	44.8	37.0	7.5	40.4	2.5	51.4	73.9	22.5	100	0	
Vert.	9920.000	PK	43.5	38.4	8.4	39.4	2.5	53.4	73.9	20.5	100	0	
Vert.	19835.860	PK	43.7	40.3	13.6	47.5	-9.5	40.6	73.9	33.3	152	186	
Vert.	2483.500	AV	33.6	27.9	13.8	41.0	2.5	36.8	53.9	17.1	100	140	
Vert.	4960.000	AV	35.4	32.0	6.0	39.4	2.5	36.5	53.9	17.4	384	325	
Vert.	7440.000	AV	32.8	37.0	7.5	40.4	2.5	39.4	53.9	14.5	100	0	
Vert.	9920.000	AV	31.9	38.4	8.4	39.4	2.5	41.8	53.9	12.1	100	0	
Vert.	19835.860	AV	34.7	40.3	13.6	47.5	-9.5	31.6	53.9	22.3	152	186	

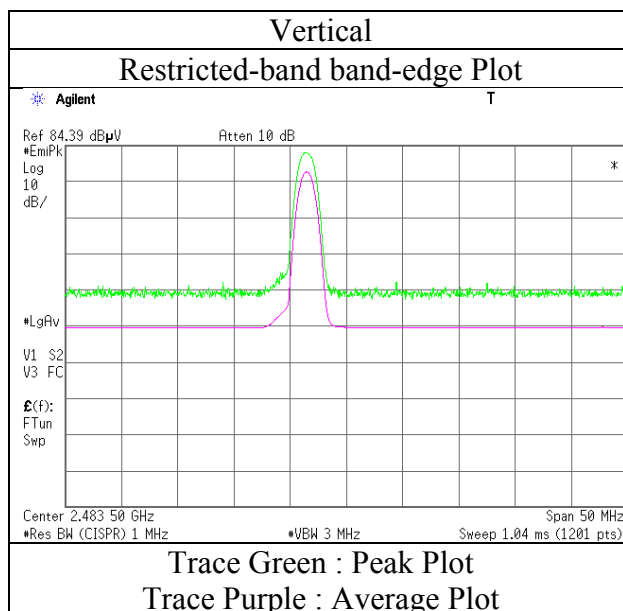
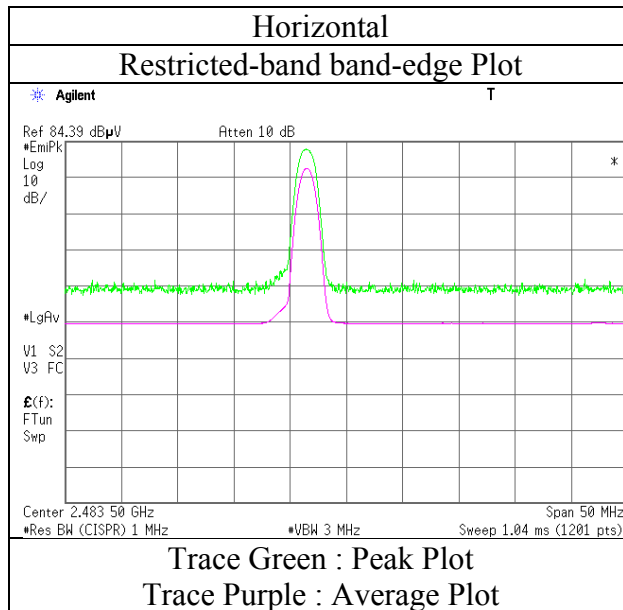
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.25\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

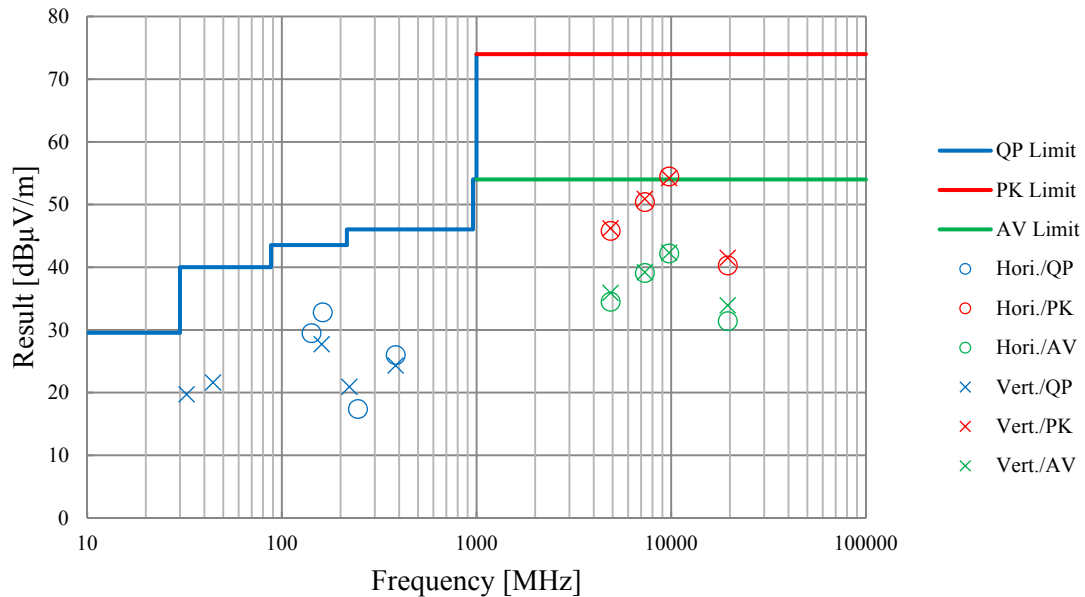
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11074880S-E-R2
Date	January 20, 2016
Temperature / Humidity	28 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa (1-13GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11074880S-E-R2	
Date	January 20, 2016	January 21, 2016
Temperature / Humidity	28 deg. C / 30 % RH	26 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa (1-13 GHz)	Hikaru Shirasawa (30-1000 MHz)
	(13-18 GHz)	(18-26.5 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 MHz	

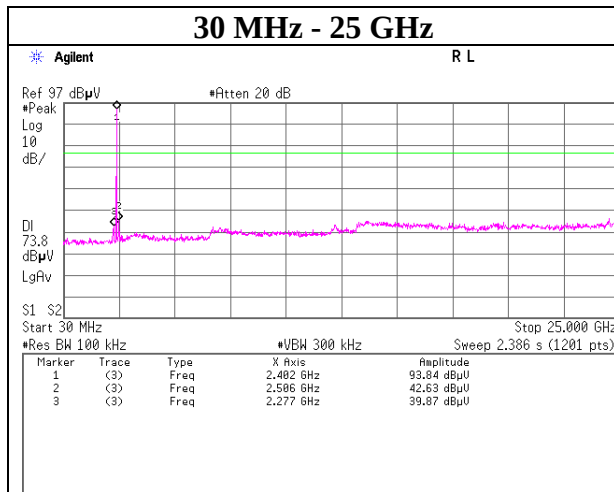
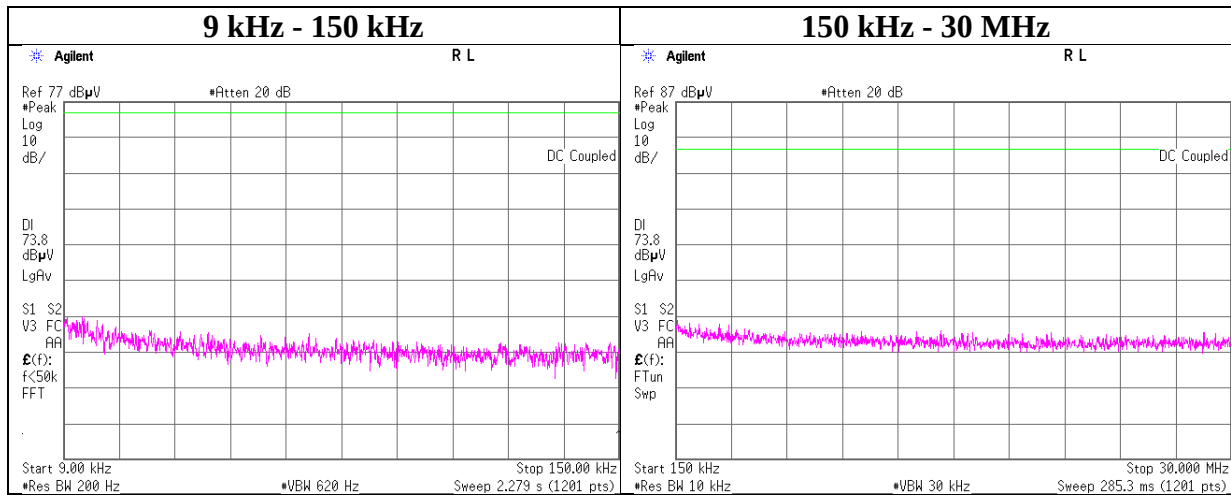


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, DH5

2402 MHz



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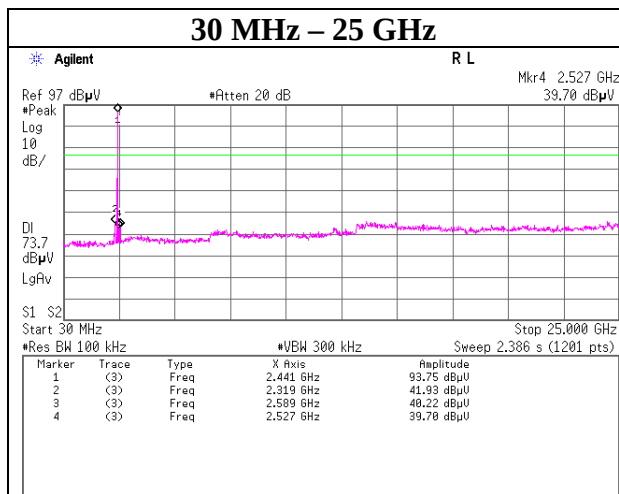
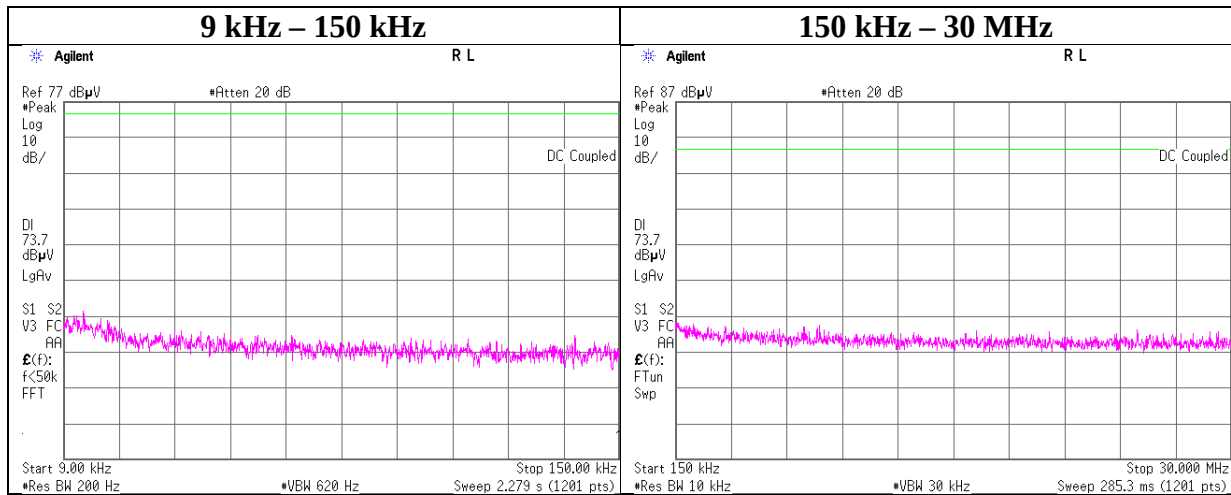
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, DH5

2441 MHz



UL Japan, Inc.

Shonan EMC Lab.

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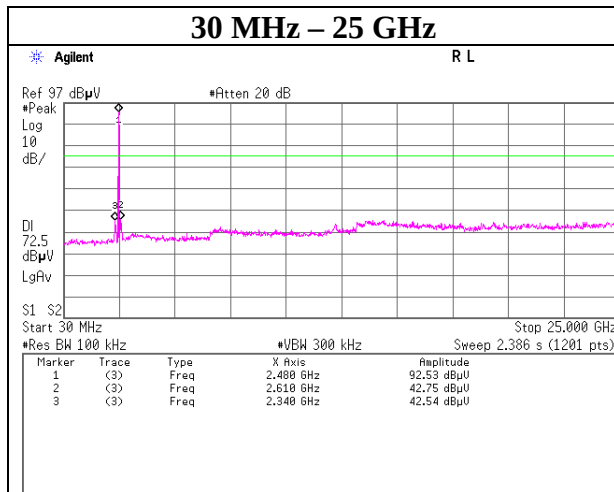
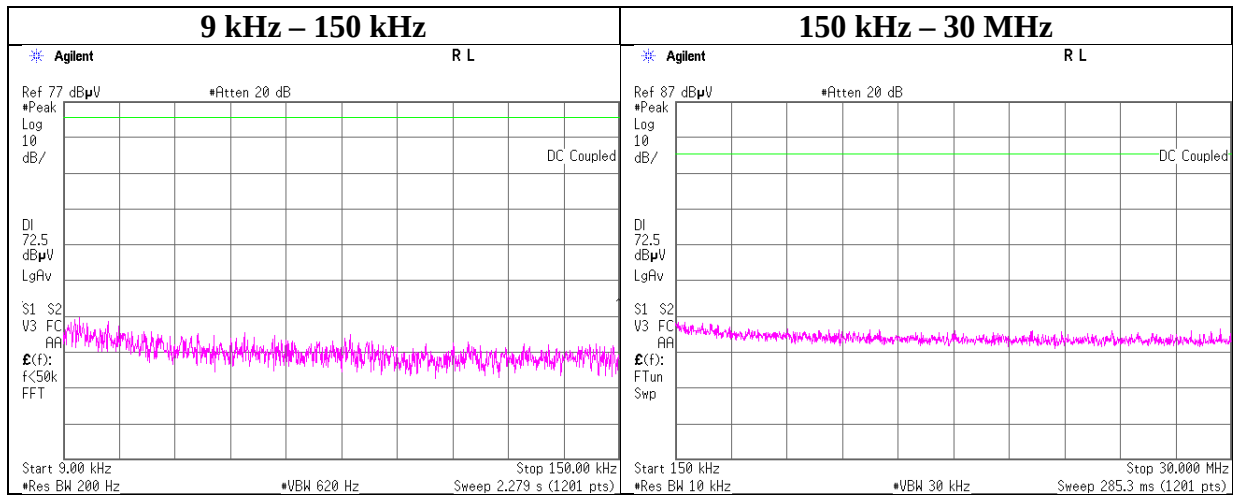
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, DH5

2480 MHz



UL Japan, Inc.

Shonan EMC Lab.

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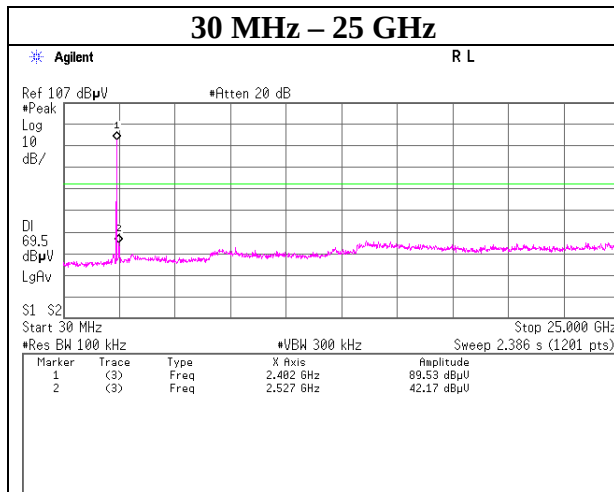
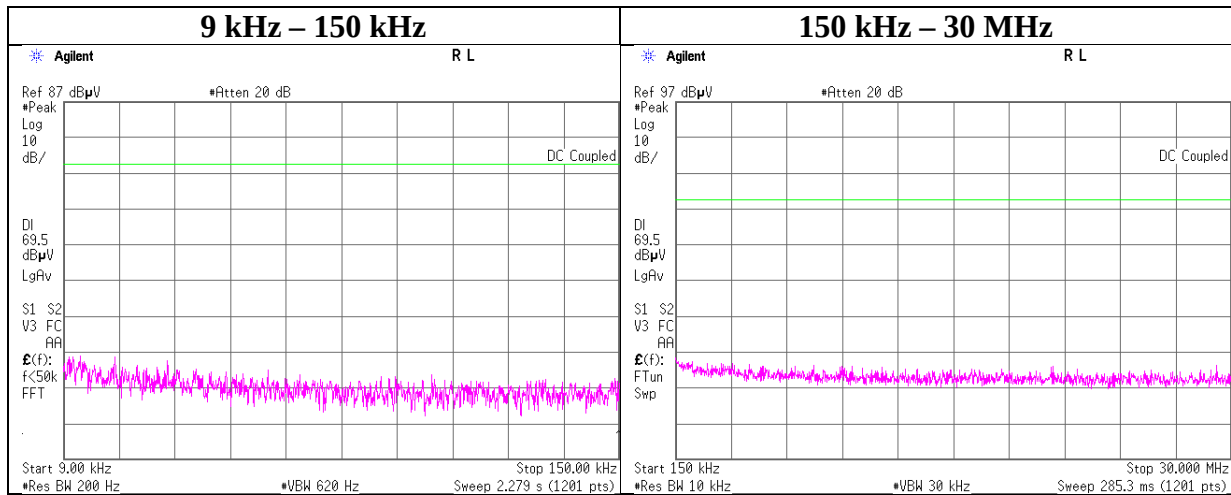
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, 3DH5

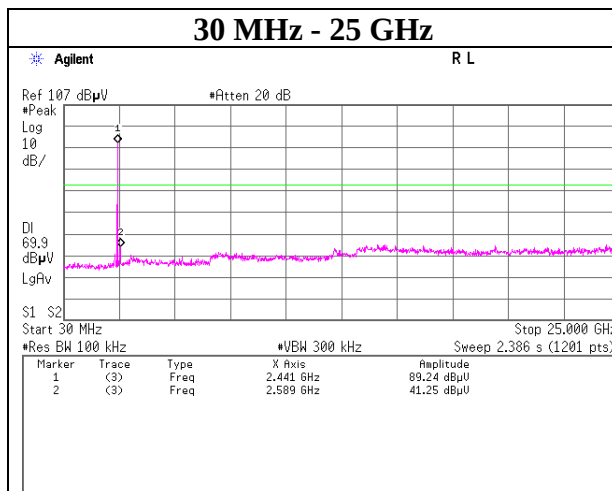
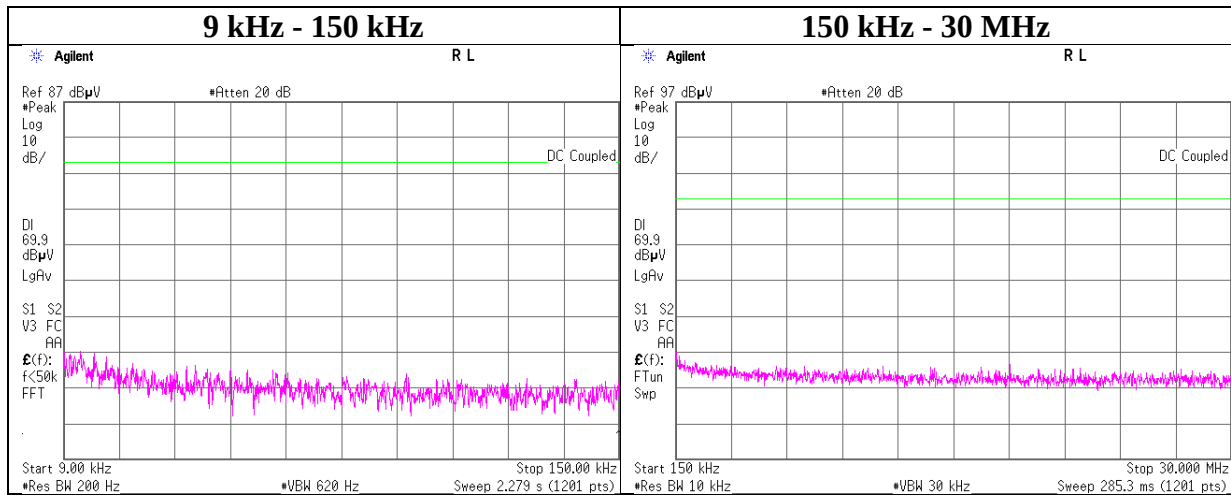
2402 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, 3DH5

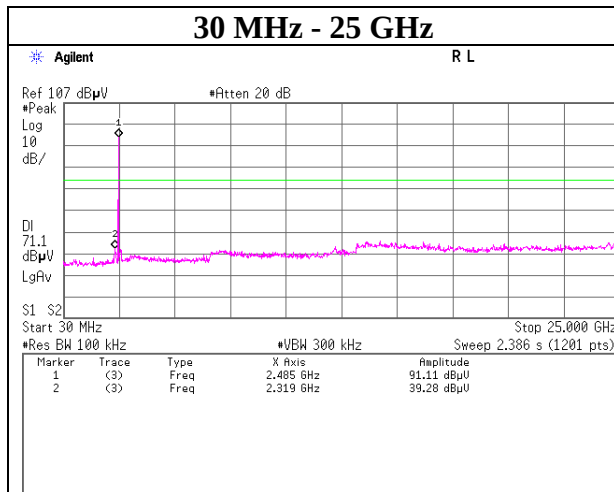
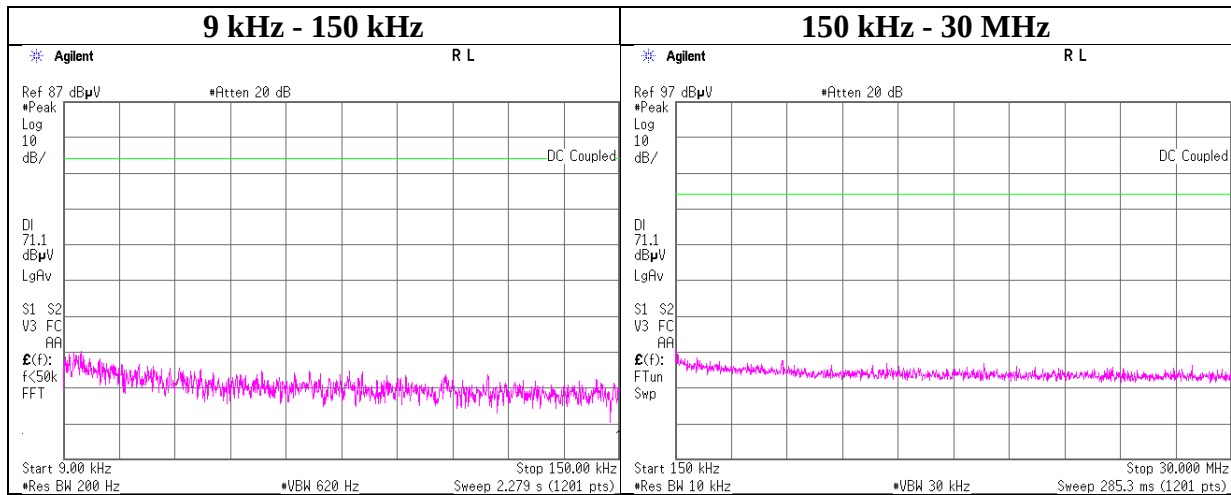
2441 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11074880S-E-R2
Date January 5, 2016
Temperature / Humidity 23 deg. C / 61 % RH
Engineer Wataru Kojima
Mode Tx, Hopping Off, 3DH5

2480 MHz



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

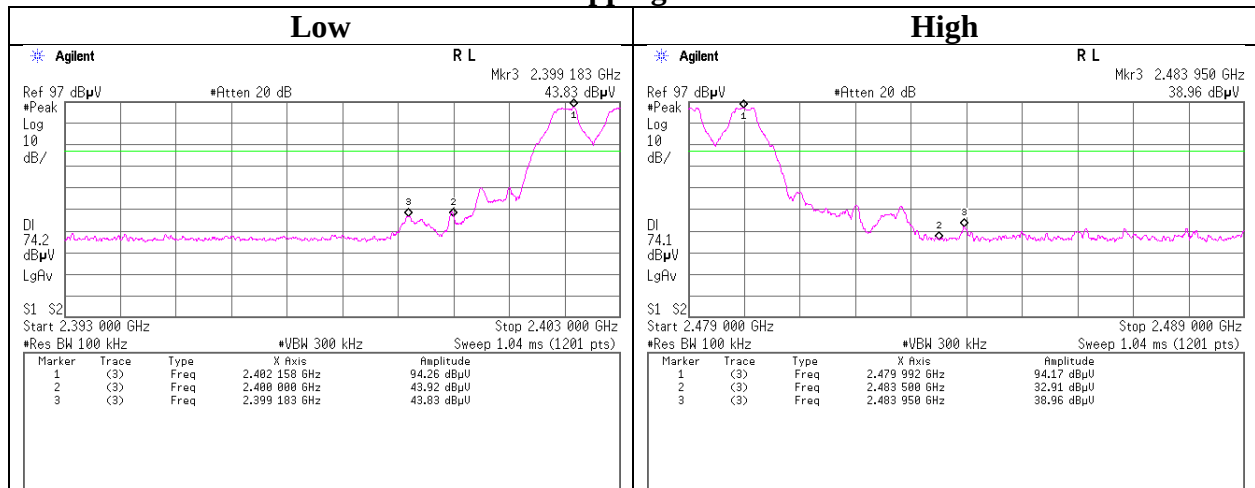
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

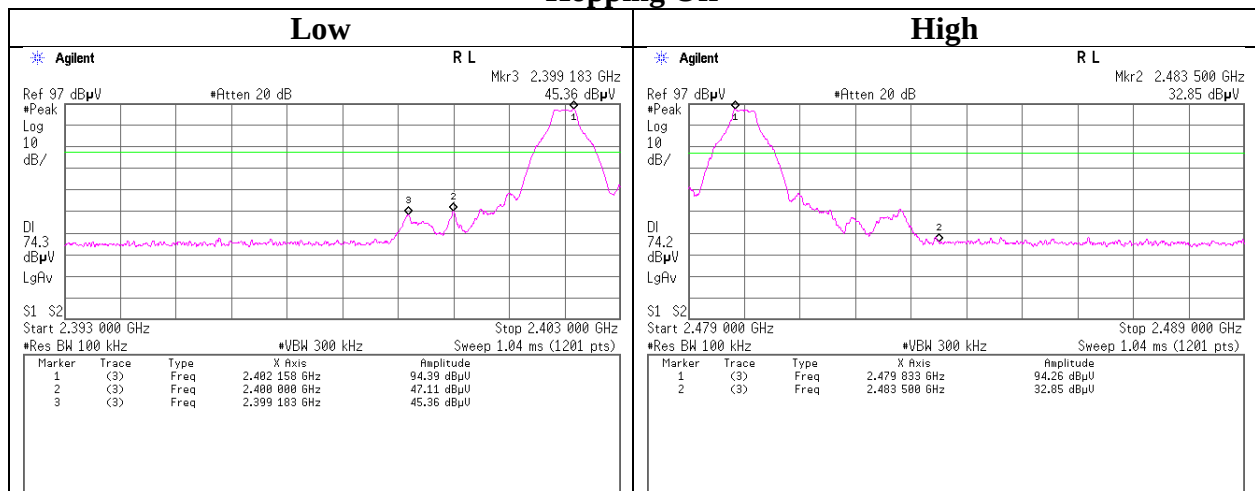
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11074880S-E-R2
Date : January 5, 2016
Temperature / Humidity : 23 deg. C / 61 % RH
Engineer : Wataru Kojima
Mode : Tx DH5

Hopping On



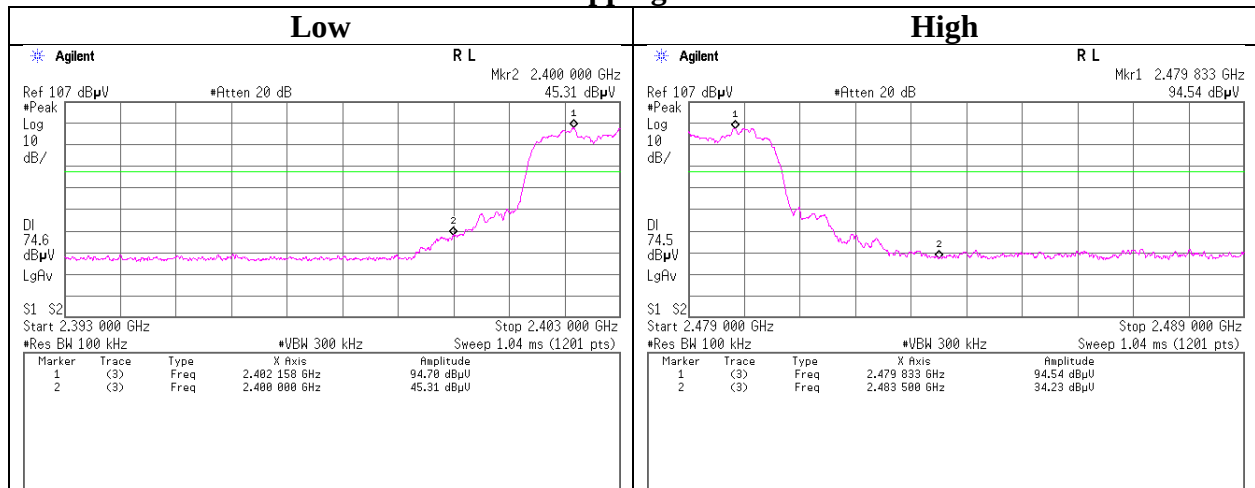
Hopping Off



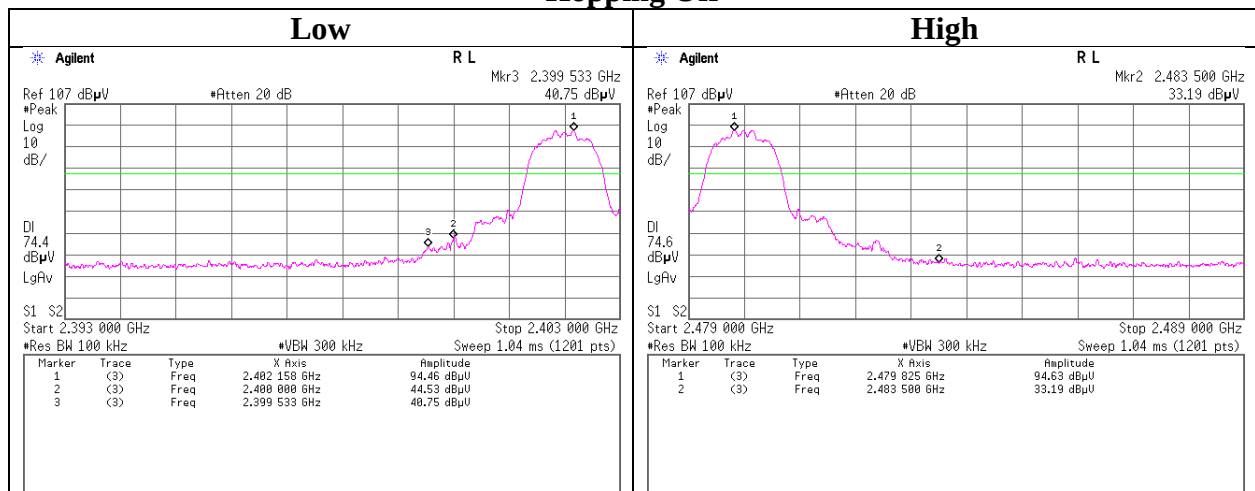
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11074880S-E-R2
Date : January 5, 2016
Temperature / Humidity : 23 deg. C / 61 % RH
Engineer : Wataru Kojima
Mode : Tx 3DH5

Hopping On



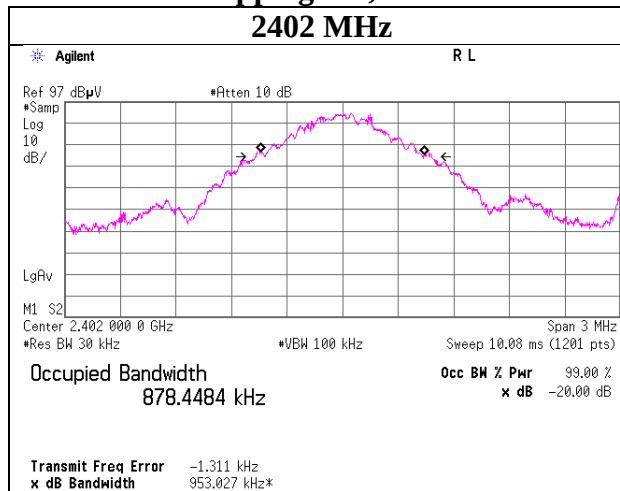
Hopping Off



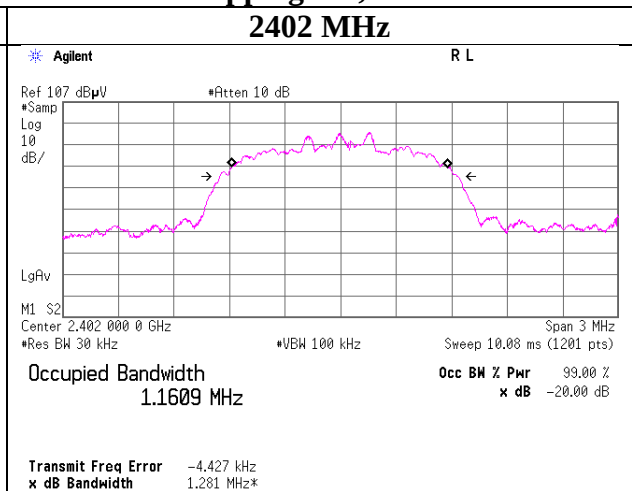
99% Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11074880S-E-R2
Date : January 5, 2016
Temperature / Humidity : 23 deg. C / 61 % RH
Engineer : Wataru Kojima
Mode : Tx Hopping Off

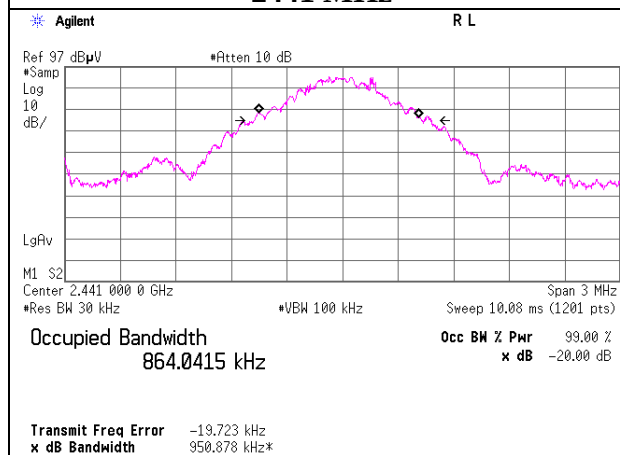
Hopping Off, DH5



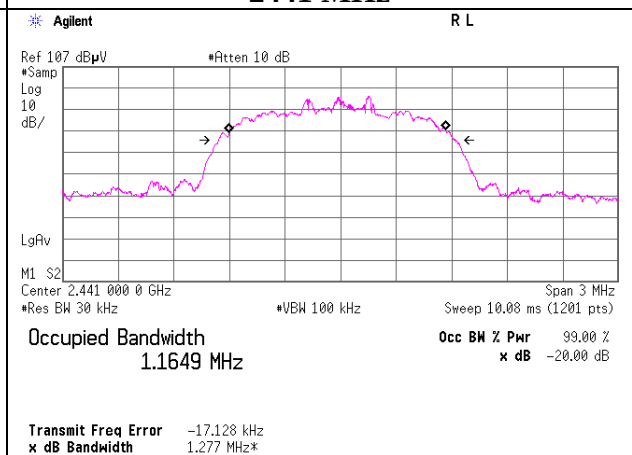
Hopping Off, 3DH5



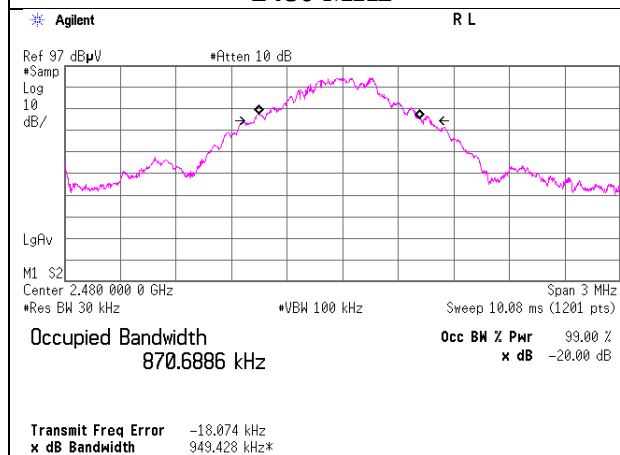
2441 MHz



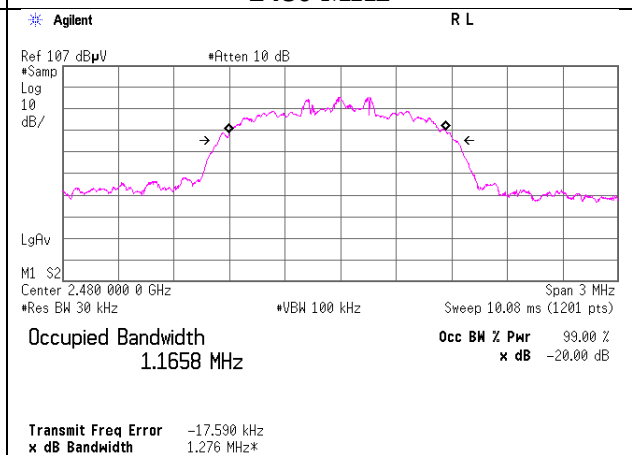
2441 MHz



2480 MHz



2480 MHz



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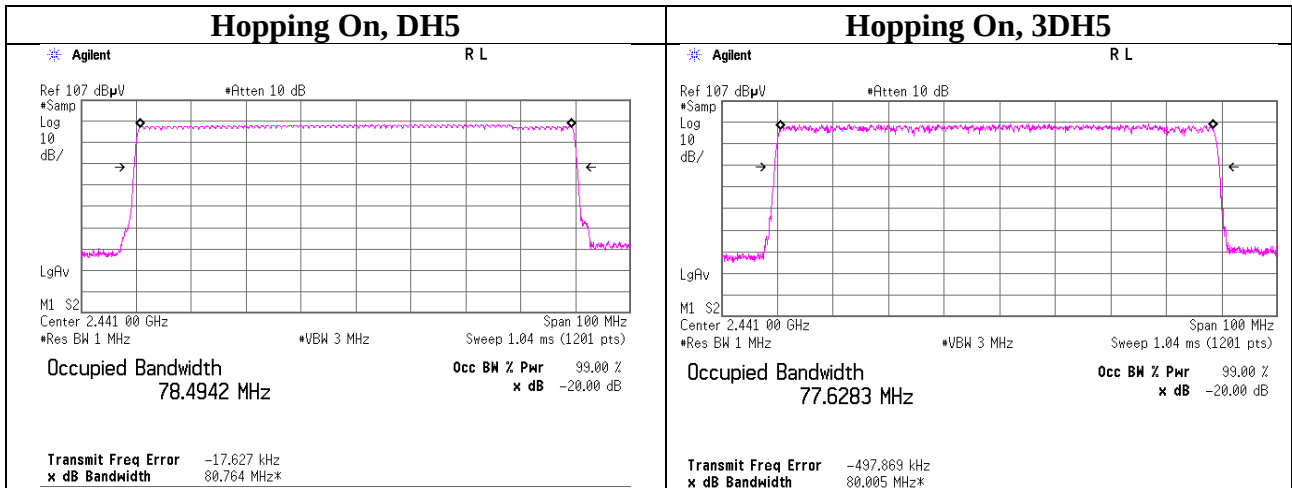
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99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11074880S-E-R2
Date	January 5, 2016
Temperature / Humidity	23 deg. C / 61 % RH
Engineer	Wataru Kojima
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)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/09/16 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	AT,RE	2015/11/04 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2015/03/11 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2015/04/02 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2015/04/02 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2015/12/07 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT	2015/11/18 * 12
SRENT-04	Spectrum Analyzer	KEYSIGHT	E4440A	MY46186388	AT	2015/10/06 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2015/07/16 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2015/03/26 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,C E,RFI,MF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2015/11/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2015/11/16 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2015/03/17 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2015/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2015/03/11 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000K MSKMS	-	RE	2015/04/09 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2015/10/11 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2015/10/11 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2015/08/31 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2015/04/17 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2015/02/18 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2015/03/24 * 12
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 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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