



RADIO TEST REPORT

Test Report No. : 10763065S-A-R1

Applicant : **Panasonic Corporation**
Type of Equipment : **Car Radio**
Model No. : **AT1601**
FCC ID : **ACJ932AT1601**
Test regulation : **FCC Part 15 Subpart C: 2015**
Test Result : **Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. 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 " 10763065S-A ". " 10763065S-A " is replaced with this report.
- 8.

Date of test: June 1 to July 12, 2015

Representative test engineer:

Hikaru Shirasawa
Engineer
Consumer Technology Division

Approved by:

Ichiro Isozaki
Manager
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".

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

13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10763065S-A

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 6: Radiated Spurious Emission	10
SECTION 7: Antenna Terminal Conducted Tests.....	11
APPENDIX 1: Test data	12
20dB Bandwidth and Carrier Frequency Separation.....	12
Number of Hopping Frequency	15
Dwell time.....	17
Maximum Peak Output Power	20
Average Output Power	21
Radiated Spurious Emission	24
Conducted Spurious Emission	35
Conducted Emission Band Edge compliance	41
99%Occupied Bandwidth	43
APPENDIX 2: Test instruments	45
APPENDIX 3: Photographs of test setup	46
Radiated Spurious Emission	46

SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-city, 224-8520, Japan
Telephone Number	:	+81-50-3689-7126
Facsimile Number	:	+81-45-931-0806
Contact Person	:	Takahisa Sakai

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Radio
Model No.	:	AT1601
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	June 4, 2015
Country of Mass-production	:	Czech Republic, Thailand, Taiwan
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

2.2 Product Description

Model: AT1601 (referred to as the EUT in this report) is a Car Radio.

General Specification

Clock frequency(ies) in the system	:	Radio DSP: 36.4 MHz Bluetooth: 26 MHz
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Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	GFSK, $\pi/4$ DQPSK, 8DQPSK
Antenna type	:	Monopole antenna
Antenna connector	:	None
Antenna Gain	:	+ 3.60 dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on June 12, 2015 and effective July 13, 2015

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

* The revision on June 12, 2015 does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4-2009 7. AC powerline conducted emission measurements IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	*1)	N/A	-
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(b)(1) IC: RSS-247 5.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	5.3 dB 145.593 MHz, QP, Hori. Tx DH5 2402 MHz 2350.026 MHz, AV, Vert Tx DH5 2402MHz	Complied	Conducted/ Radiated

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

* In case any questions arise about test procedure, ANSI C63.4: 2009 is also referred.

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

*1) The test is not applicable since the EUT has no AC mains.

FCC Part 15.31 (e)

This EUT provides stable voltage (DC3.3V) constantly to RF Parts regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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
Conducted emission (AC Mains) LISN	150kHz - 30MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3m)	9kHz - 30MHz	3.7 dB	3.5 dB	3.5 dB
	30MHz - 300MHz	4.9 dB	4.9 dB	4.7 dB
	300MHz - 1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz - 15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz - 18GHz	5.7 dB	5.7 dB	5.7 dB
	18GHz - 40GHz	4.5 dB	4.3 dB	4.3 dB

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1GHz	0.68dB
Spurious emission (Conducted) below 1GHz	1.5dB
Spurious emission (Conducted) 1GHz - 3GHz	1.7dB
Spurious emission (Conducted) 3GHz - 18GHz	2.4dB
Spurious emission (Conducted) 18GHz - 26.5GHz	2.5dB
Bandwidth Measurement	0.66%

Radiated emission test

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

3.5 Test Location

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
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

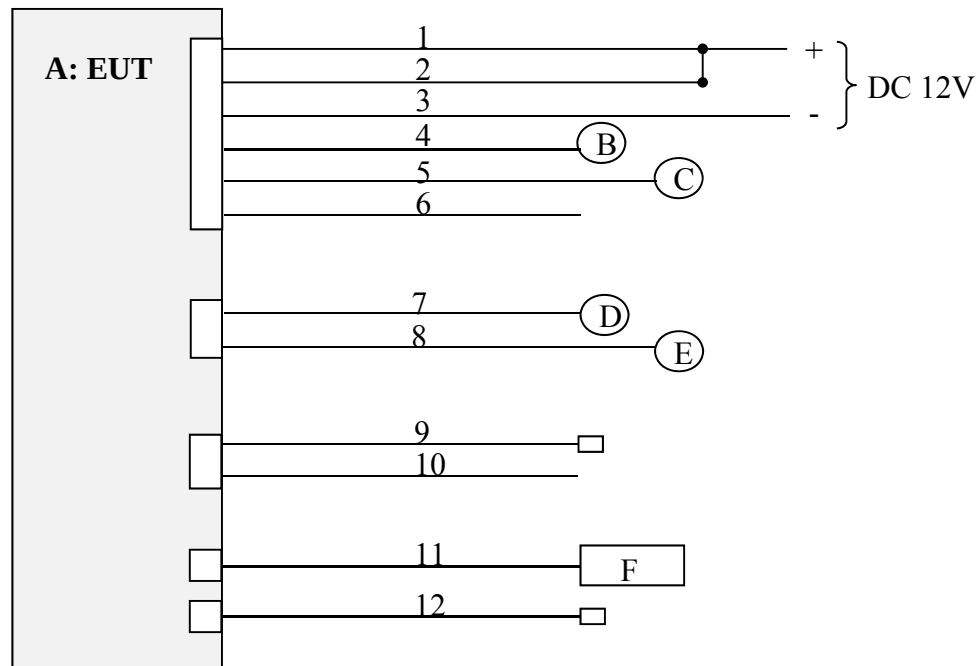
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	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. *EUT has the power settings by the software as follows; Power settings: BDR: Fix EDR: Fix Software: HCITester2 version 0.99kx *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	Car Audio	AT1601	*1)	Panasonic	EUT
B	Speaker	LV-002	S11014200775	L&V	-
C	Speaker	LV-002	S11014200775	L&V	-
D	Speaker	LV-002	S11014200775	L&V	-
E	Speaker	LV-002	S11014200775	L&V	-
F	USB memory	SDK-USM4GL(B)	10503MEDB	Sony	-

*1) Pre1S_04: Radiated emission, Pre0S_43: Antenna port conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	ACC	1.45+1.4	Unshielded	Unshielded	10P connector
2	+B	1.45+1.4	Unshielded	Unshielded	10P connector
3	GND	1.45+1.4	Unshielded	Unshielded	10P connector
4	Speaker FR	2.0+3.0	Unshielded	Unshielded	10P connector
5	Speaker FL	2.0+3.0	Unshielded	Unshielded	10P connector
6	ILL +	1.45	Unshielded	Unshielded	10P connector
7	Speaker RR	2.0+3.0	Unshielded	Unshielded	6P connector
8	Speaker RL	2.0+3.0	Unshielded	Unshielded	6P connector
9	Antenna	0.2+1.0	Shielded	Shielded	Antenna connector
10	DC Out	0.15+1.0	Unshielded	Unshielded	Antenna connector
11	USB	2.0	Shielded	Shielded	Front USB connector
12	AUX	3.0	Shielded	Shielded	Front AUX connector

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 6: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

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

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	Below 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	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	3m*2) (below 15GHz), 1m*3) (above 15GHz)		3m*2) (below 15GHz), 1m*3) (above 15GHz)

*1) Although DA 00-705 accepts VBW = 10 Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

*2) Distance Factor: $20 \times \log(4.0\text{m}/3.0\text{m}) = 2.5\text{dB}$

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

The noise levels were confirmed at 0 to 30° to see the position of maximum noise, and the test was made at the worst position.

Antenna polarization \ Test item	Carrier	Spurious emission (Below 1GHz)	Spurious emission (1-15GHz)	Spurious emission (Above 15GHz)
Horizontal	0 deg.	0 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	0 deg.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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	5 MHz or 3 MHz	100 kHz	300 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.

① Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.

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

*3) Reference data

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

Test data : APPENDIX

Test result : Pass

APPENDIX 1: Test data

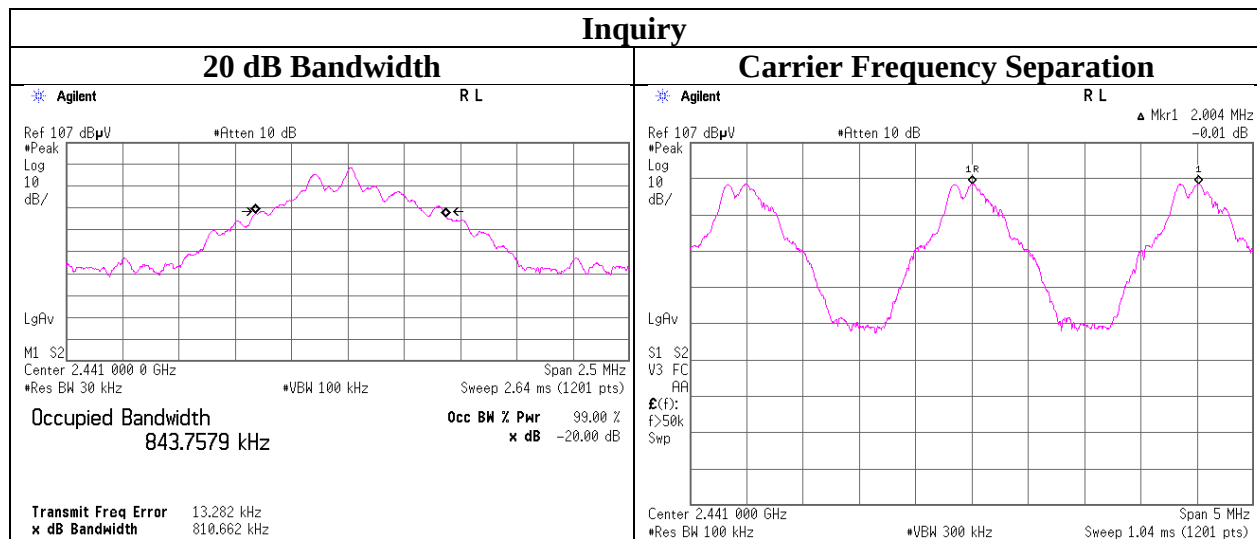
20dB Bandwidth and Carrier Frequency Separation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
Mode	Tx Hopping On

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.924	1.005	≥ 0.616
DH5	2441.0	0.923	1.003	≥ 0.615
DH5	2480.0	0.957	1.003	≥ 0.638
3DH5	2402.0	1.266	1.005	≥ 0.844
3DH5	2441.0	1.268	1.005	≥ 0.845
3DH5	2480.0	1.265	1.005	≥ 0.844
Inquiry	2441.0	0.811	2.004	≥ 0.540

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

No limit applies to 20dB Bandwidth.



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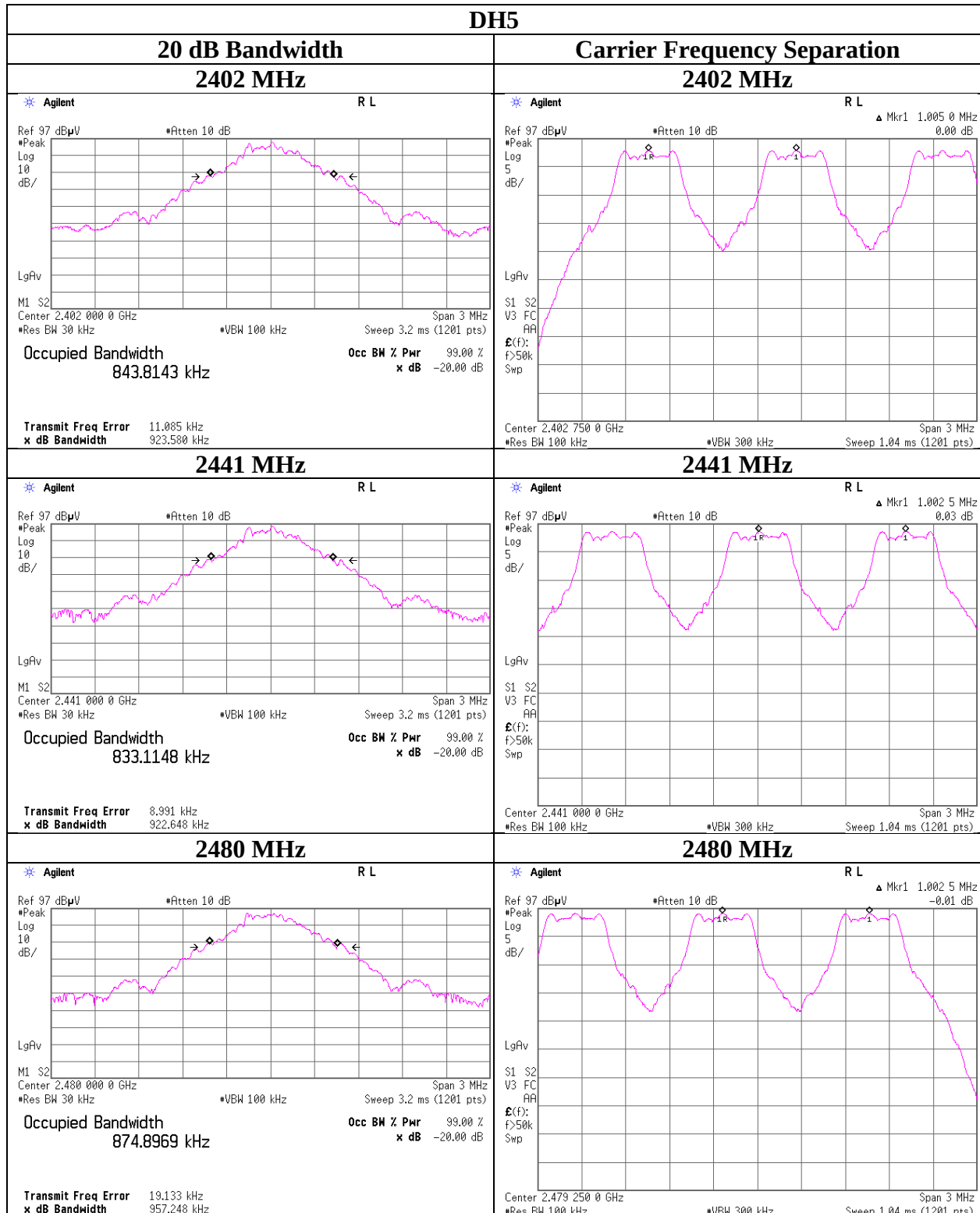
Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth and Carrier Frequency Separation



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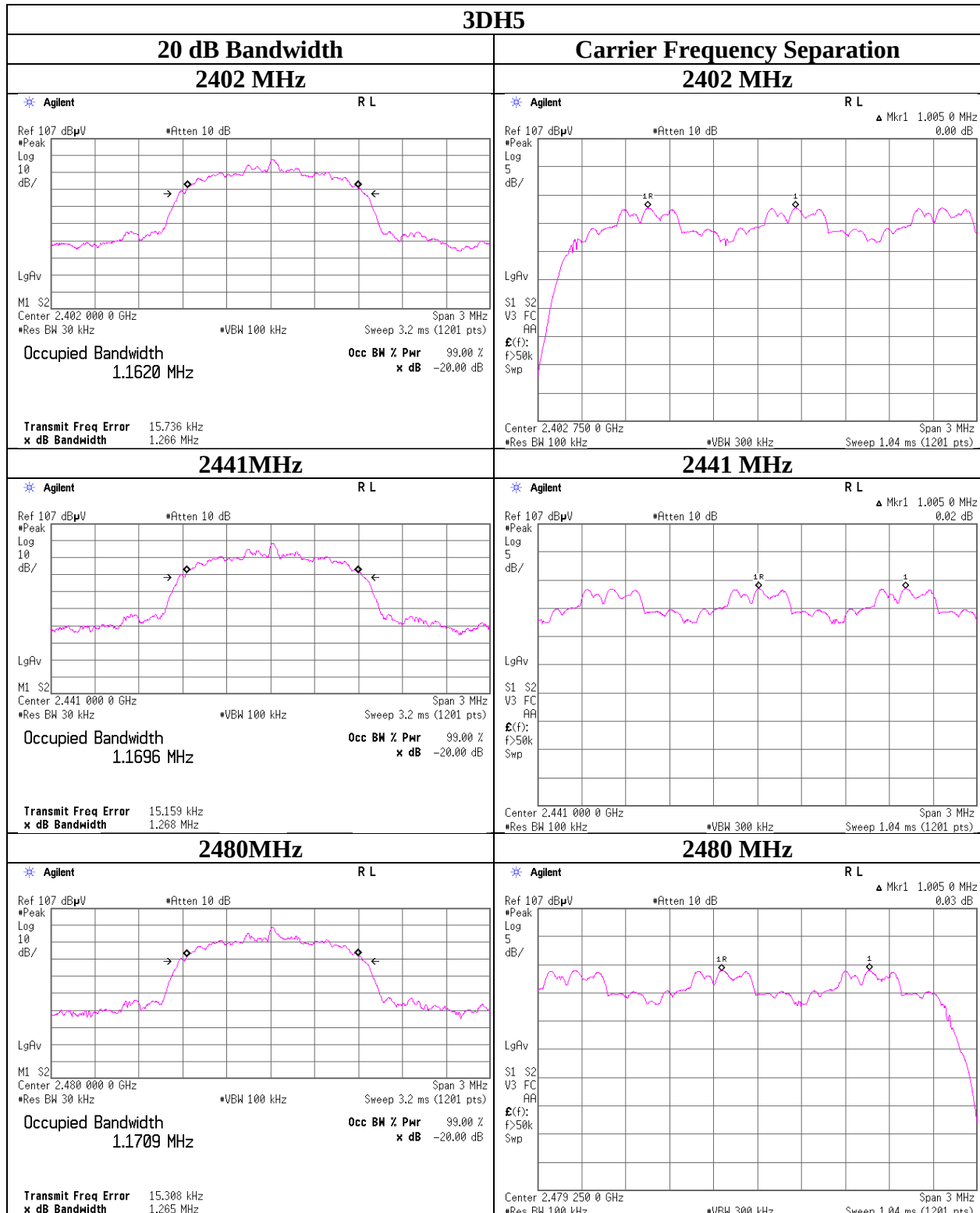
Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

20dB Bandwidth and Carrier Frequency Separation



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

Telephone : +81 596 24 8999

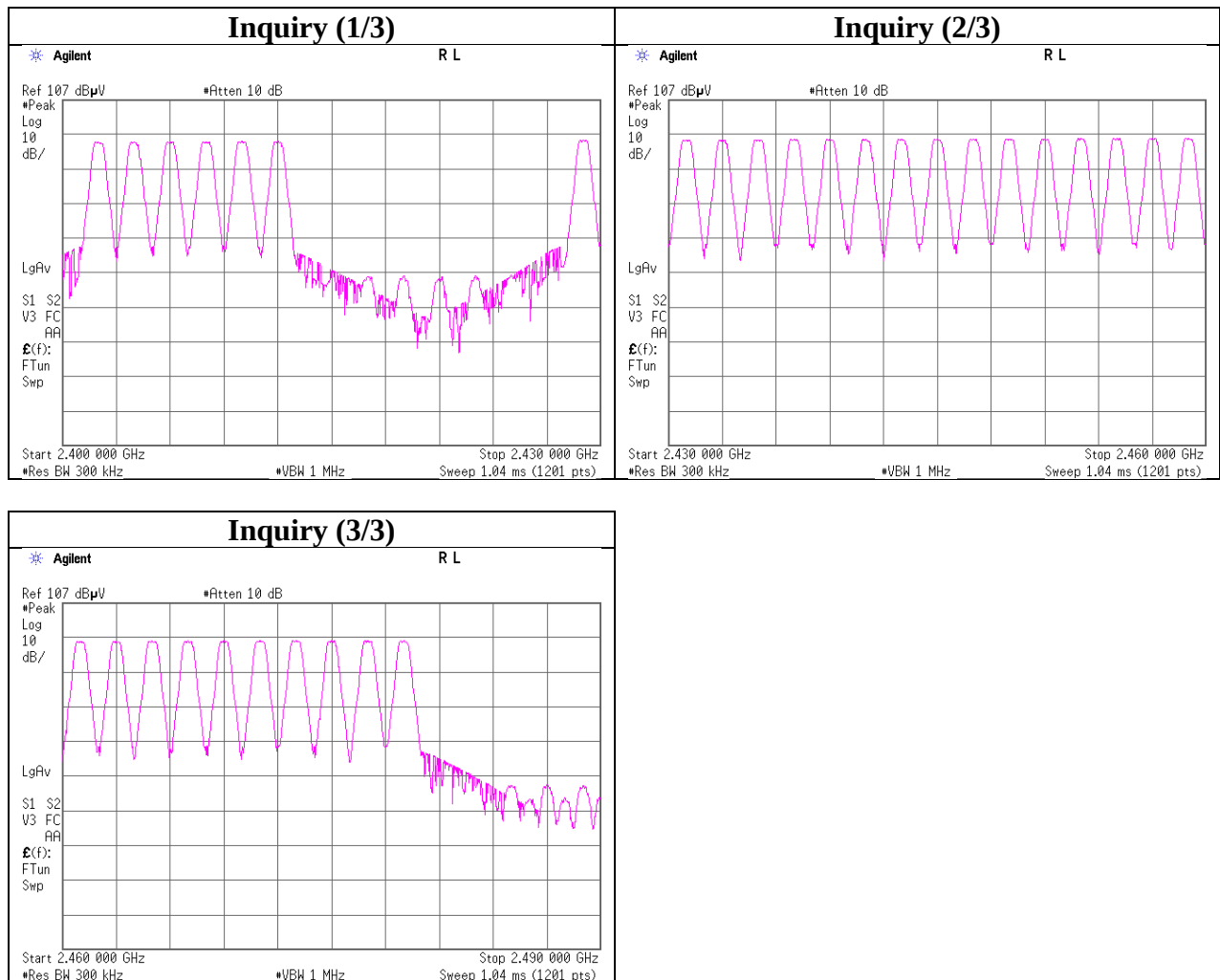
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Number of Hopping Frequency

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
Mode	Tx Hopping On

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

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



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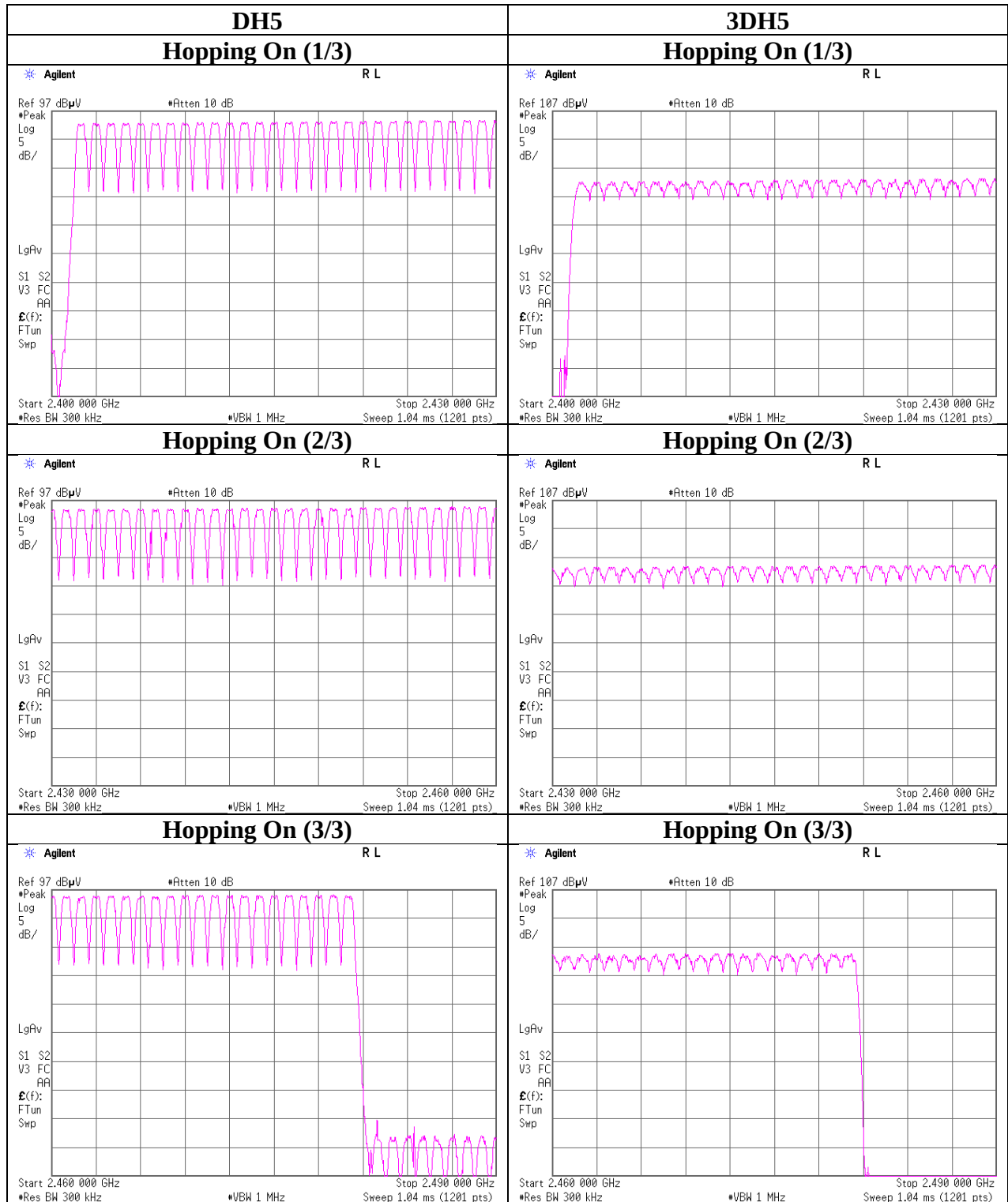
Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Number of Hopping Frequency



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Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Dwell time

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
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	48.4 times	/	5 sec. x	31.6 sec. = 306 times	0.459	141	400
DH3	25.0 times	/	5 sec. x	31.6 sec. = 158 times	1.717	271	400
DH5	18.8 times	/	5 sec. x	31.6 sec. = 119 times	2.965	353	400
3DH1	49.0 times	/	5 sec. x	31.6 sec. = 310 times	0.456	141	400
3DH3	26.0 times	/	5 sec. x	31.6 sec. = 165 times	1.715	283	400
3DH5	20.8 times	/	5 sec. x	31.6 sec. = 132 times	2.965	391	400
Inquiry	100.0 times	/	1 sec. x	12.8 sec. = 1280 times	0.150	192	400

Sample Calculation

Result = Number of transmission x Length of transmittion

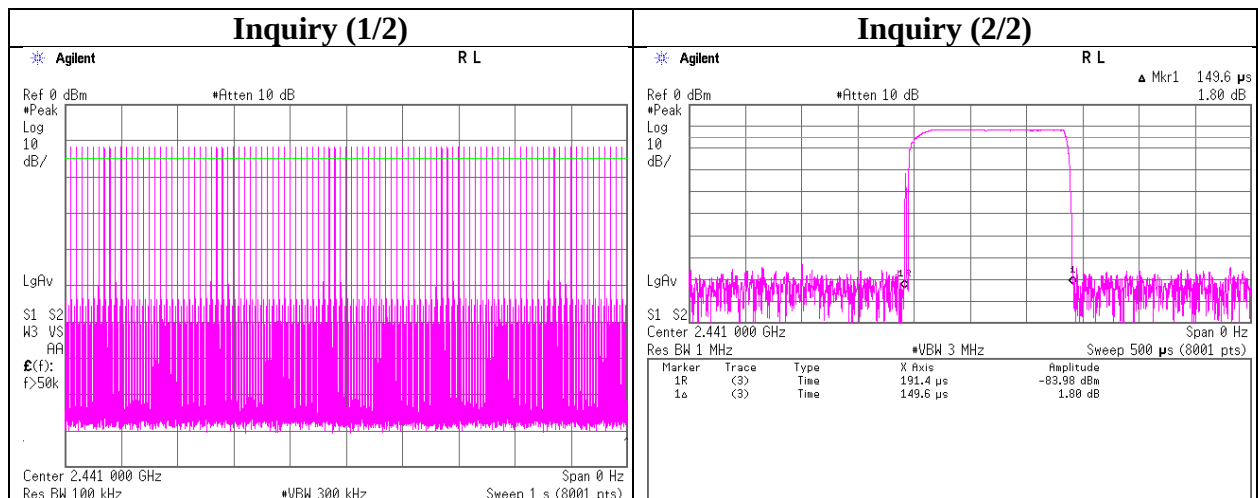
*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	47	48	49	51	47	48.4
DH3	26	25	27	24	23	25.0
DH5	20	17	18	20	19	18.8
3DH1	51	48	51	47	48	49.0
3DH3	26	27	30	25	22	26.0
3DH5	23	18	21	19	23	20.8

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

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



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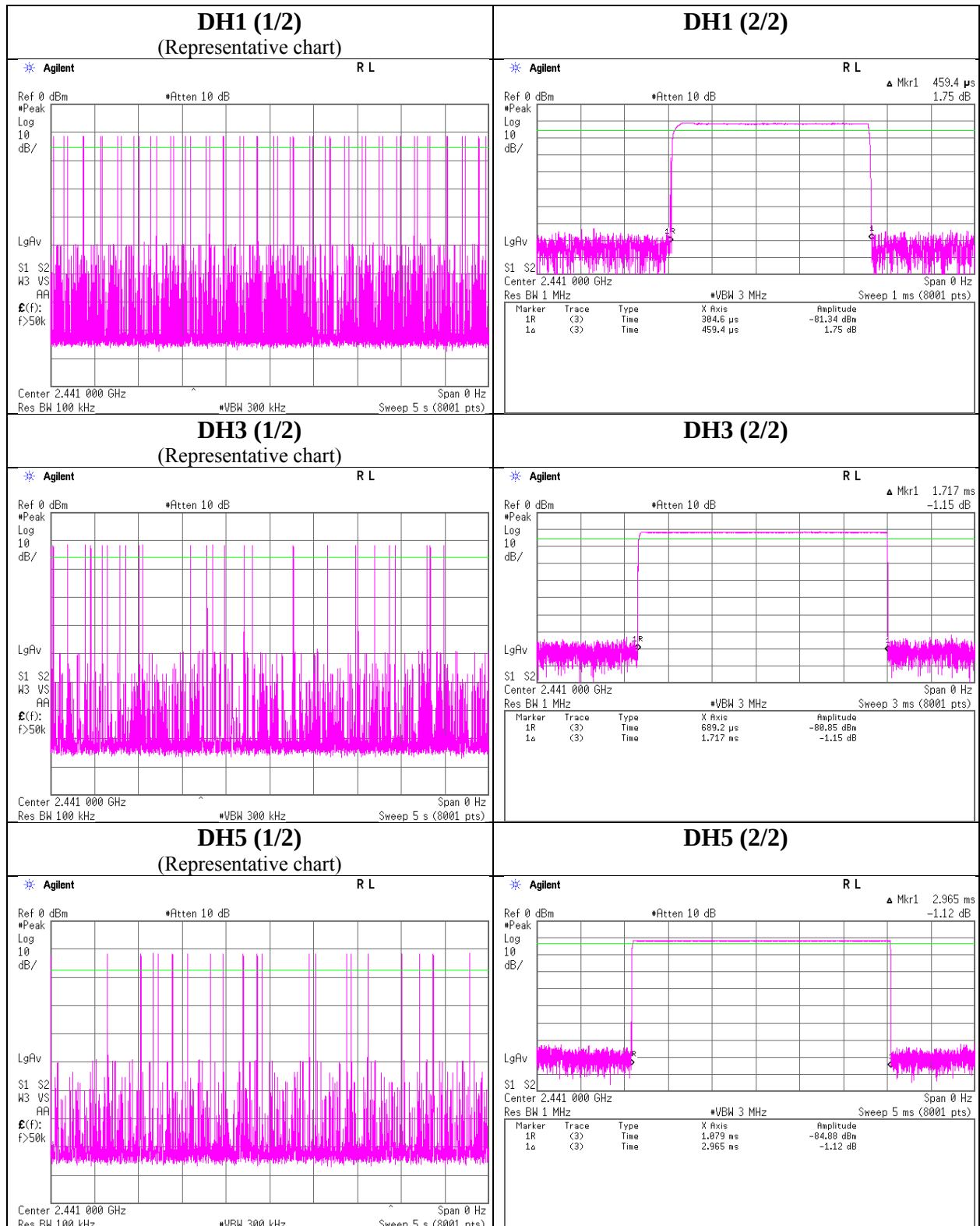
Shonan EMC Lab.

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

Telephone : +81 596 24 8999

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Dwell time



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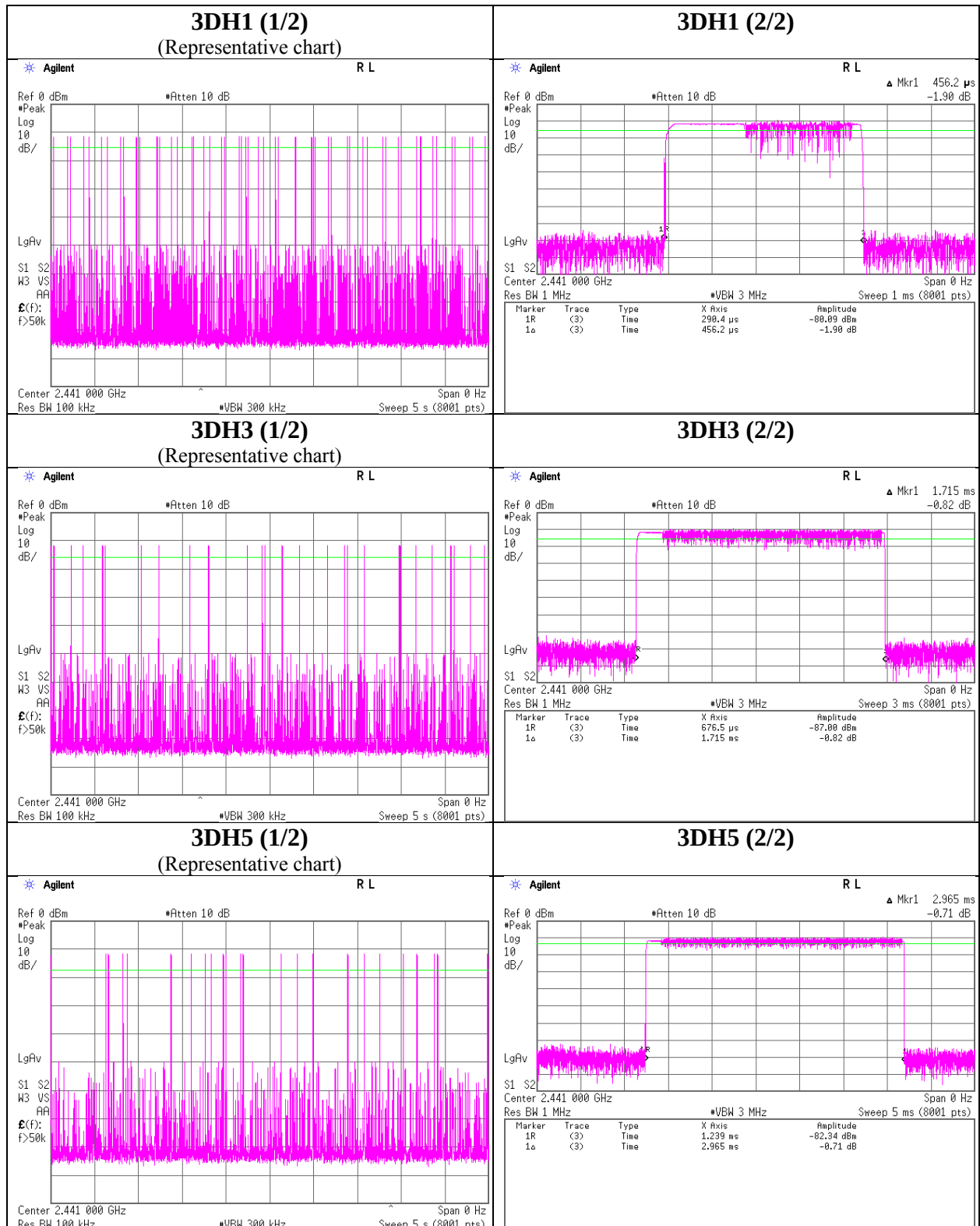
Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Dwell time



UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
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	-11.86	2.84	9.63	0.61	1.15	20.96	125	20.35
DH5	2441.0	-11.08	2.85	9.63	1.40	1.38	20.96	125	19.56
DH5	2480.0	-10.66	2.86	9.63	1.83	1.52	20.96	125	19.13
2DH5	2402.0	-10.13	2.84	9.63	2.34	1.71	20.96	125	18.62
2DH5	2441.0	-9.47	2.85	9.63	3.01	2.00	20.96	125	17.95
2DH5	2480.0	-9.03	2.86	9.63	3.46	2.22	20.96	125	17.50
3DH5	2402.0	-9.63	2.84	9.63	2.84	1.92	20.96	125	18.12
3DH5	2441.0	-8.91	2.85	9.63	3.57	2.28	20.96	125	17.39
3DH5	2480.0	-8.44	2.86	9.63	4.05	2.54	20.96	125	16.91

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.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
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	-13.51	2.84	9.63	-1.04	0.79	1.02	-0.02	1.00
DH5	2441.0	-12.73	2.85	9.63	-0.25	0.94	1.02	0.77	1.19
DH5	2480.0	-12.24	2.86	9.63	0.25	1.06	1.02	1.27	1.34
2DH5	2402.0	-13.98	2.84	9.63	-1.51	0.71	1.03	-0.48	0.90
2DH5	2441.0	-13.21	2.85	9.63	-0.73	0.85	1.03	0.30	1.07
2DH5	2480.0	-12.75	2.86	9.63	-0.26	0.94	1.03	0.77	1.19
3DH5	2402.0	-14.00	2.84	9.63	-1.53	0.70	1.03	-0.50	0.89
3DH5	2441.0	-13.22	2.85	9.63	-0.74	0.84	1.03	0.29	1.07
3DH5	2480.0	-12.73	2.86	9.63	-0.24	0.95	1.03	0.79	1.20

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

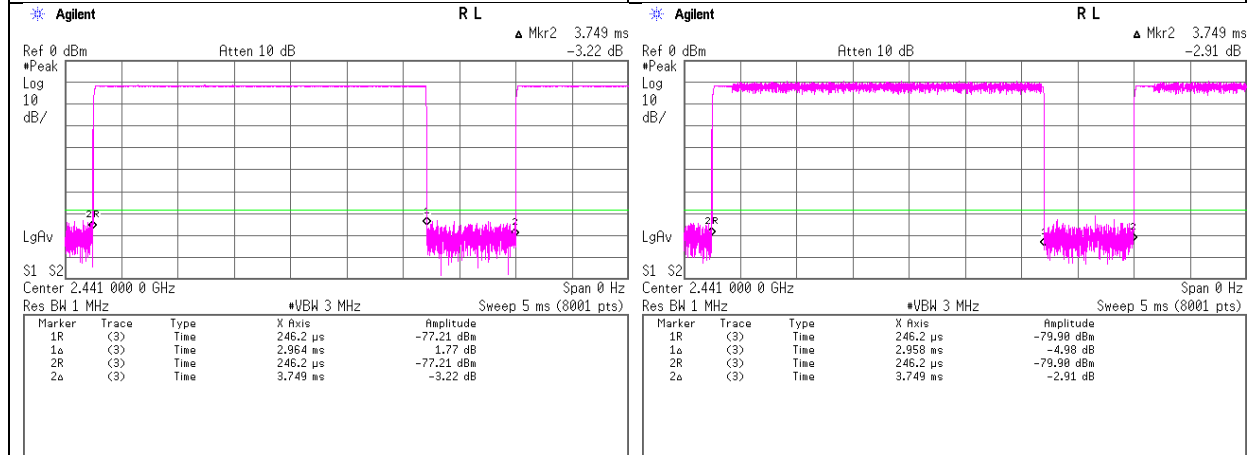
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 10763065S-A-R1
Date June 5, 2015
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Hikaru Shirasawa
Mode Tx Hopping Off

DH5

$Tx\ on / (Tx\ on + Tx\ off) = 0.791$
 $Tx\ on / (Tx\ on + Tx\ off) * 100 = 79.1\ \%$
 $Duty\ factor = 10 * \log (3.749 / 2.964) = 1.02\ dB$

3DH5

$Tx\ on / (Tx\ on + Tx\ off) = 0.789$
 $Tx\ on / (Tx\ on + Tx\ off) * 100 = 78.9\ \%$
 $Duty\ factor = 10 * \log (3.749 / 2.958) = 1.03\ dB$



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

Telephone : +81 596 24 8999

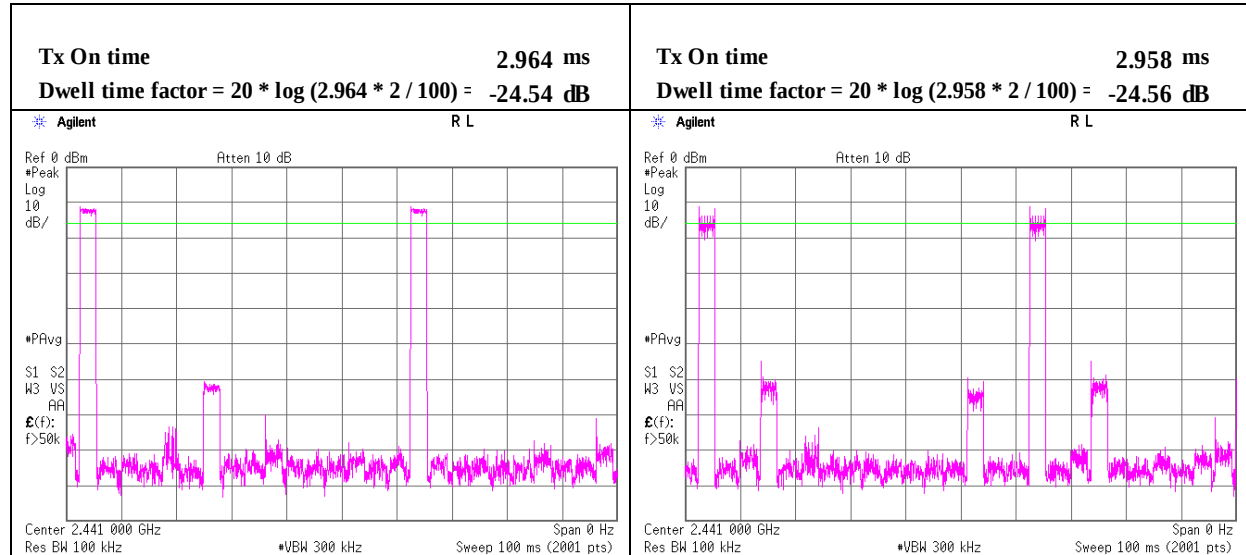
Facsimile : +81 596 24 8124

Dwell time factor

Test place	Shonan EMC Lab. No. 5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
Mode	Tx Hopping On

DH5

3DH5



A hopping channel might be occupied 2 times within 100ms on minimum hopping mode (AFH). Therefore Tx On time was multiplied by 2. As for Tx On time, refer to “Burst Rate Confirmation”.

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Shonan EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10763065S-A-R1
Date : July 11, 2015 July 12, 2015
Temperature / Humidity : 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer : Shinichi Takano Hiroyuki Morikawa

Mode : Tx 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.	145.593	QP	47.9	14.6	7.8	32.1	0.0	38.2	43.5	5.3	224	257	
Hori.	218.399	QP	45.5	16.6	8.2	32.0	0.0	38.3	46.0	7.7	229	311	
Hori.	324.020	QP	44.4	14.6	8.8	31.9	0.0	35.9	46.0	10.1	100	209	
Hori.	480.029	QP	37.7	17.5	9.5	31.9	0.0	32.8	46.0	13.2	100	133	
Hori.	2350.022	PK	52.7	26.3	13.6	41.0	2.1	53.7	73.9	20.2	100	312	
Hori.	2376.021	PK	49.1	26.4	13.7	41.0	2.1	50.3	73.9	23.6	100	312	
Hori.	2390.000	PK	45.7	26.4	13.7	41.0	2.1	46.9	73.9	27.0	100	312	
Hori.	4804.000	PK	45.9	30.6	5.7	39.6	2.1	44.7	73.9	29.2	100	12	
Hori.	7206.000	PK	59.3	36.6	7.1	40.1	2.1	65.0	73.9	8.9	100	306	
Hori.	9608.000	PK	44.8	38.5	8.2	39.6	2.1	54.0	73.9	19.9	100	0	
Hori.	12010.000	PK	45.4	39.5	9.3	39.3	2.1	57.0	73.9	16.9	100	0	
Hori.	2350.022	AV	46.6	26.3	13.6	41.0	2.1	47.6	53.9	6.3	100	312	
Hori.	2376.021	AV	40.5	26.4	13.7	41.0	2.1	41.7	53.9	12.2	100	312	
Hori.	2390.000	AV	34.1	26.4	13.7	41.0	2.1	35.3	53.9	18.6	100	312	
Hori.	4804.000	AV	34.4	30.6	5.7	39.6	2.1	33.2	53.9	20.7	100	12	
Hori.	9608.000	AV	33.2	38.5	8.2	39.6	2.1	42.4	53.9	11.5	100	0	
Hori.	12010.000	AV	33.8	39.5	9.3	39.3	2.1	45.4	53.9	8.5	100	0	
Vert.	194.132	QP	38.8	16.2	7.9	32.0	0.0	30.9	43.5	12.6	100	351	
Vert.	218.408	QP	40.3	16.6	8.2	32.0	0.0	33.1	46.0	12.9	100	197	
Vert.	221.181	QP	31.6	16.6	8.2	32.0	0.0	24.4	46.0	21.6	100	202	
Vert.	696.885	QP	37.6	20.4	10.3	31.8	0.0	36.5	46.0	9.5	100	198	
Vert.	2350.026	PK	53.9	26.3	13.6	41.0	2.1	54.9	73.9	19.0	100	313	
Vert.	2376.015	PK	49.9	26.4	13.7	41.0	2.1	51.1	73.9	22.8	100	313	
Vert.	2390.000	PK	46.9	26.4	13.7	41.0	2.1	48.1	73.9	25.8	100	313	
Vert.	4804.000	PK	47.3	30.6	5.7	39.6	2.1	46.1	73.9	27.8	100	344	
Vert.	7206.000	PK	54.4	36.6	7.1	40.1	2.1	60.1	73.9	13.8	100	253	
Vert.	9608.000	PK	44.8	38.5	8.2	39.6	2.1	54.0	73.9	19.9	100	0	
Vert.	12010.000	PK	46.0	39.5	9.3	39.3	2.1	57.6	73.9	16.3	100	0	
Vert.	2350.026	AV	47.6	26.3	13.6	41.0	2.1	48.6	53.9	5.3	100	313	
Vert.	2376.015	AV	40.9	26.4	13.7	41.0	2.1	42.1	53.9	11.8	100	313	
Vert.	2390.000	AV	34.1	26.4	13.7	41.0	2.1	35.3	53.9	18.6	100	313	
Vert.	4804.000	AV	37.7	30.6	5.7	39.6	2.1	36.5	53.9	17.4	100	344	
Vert.	9608.000	AV	33.3	38.5	8.2	39.6	2.1	42.5	53.9	11.4	100.0	0.0	
Vert.	12010.000	AV	33.8	39.5	9.3	39.3	2.1	45.4	53.9	8.5	100.0	0.0	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant. Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7206.000	AV	54.9	36.6	7.1	40.1	-24.5	2.1	36.1	53.9	17.8	
Vert.	7206.000	AV	48.7	36.6	7.1	40.1	-24.5	2.1	29.9	53.9	24.0	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

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	88.7	26.4	13.7	41.0	2.1	89.9	-	-	Carrier
Hori.	2400.000	PK	49.5	26.4	13.7	41.0	2.1	50.7	69.9	19.2	
Vert.	2402.000	PK	90.3	26.4	13.7	41.0	2.1	91.5	-	-	Carrier
Vert.	2400.000	PK	49.5	26.4	13.7	41.0	2.1	50.7	71.5	20.8	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

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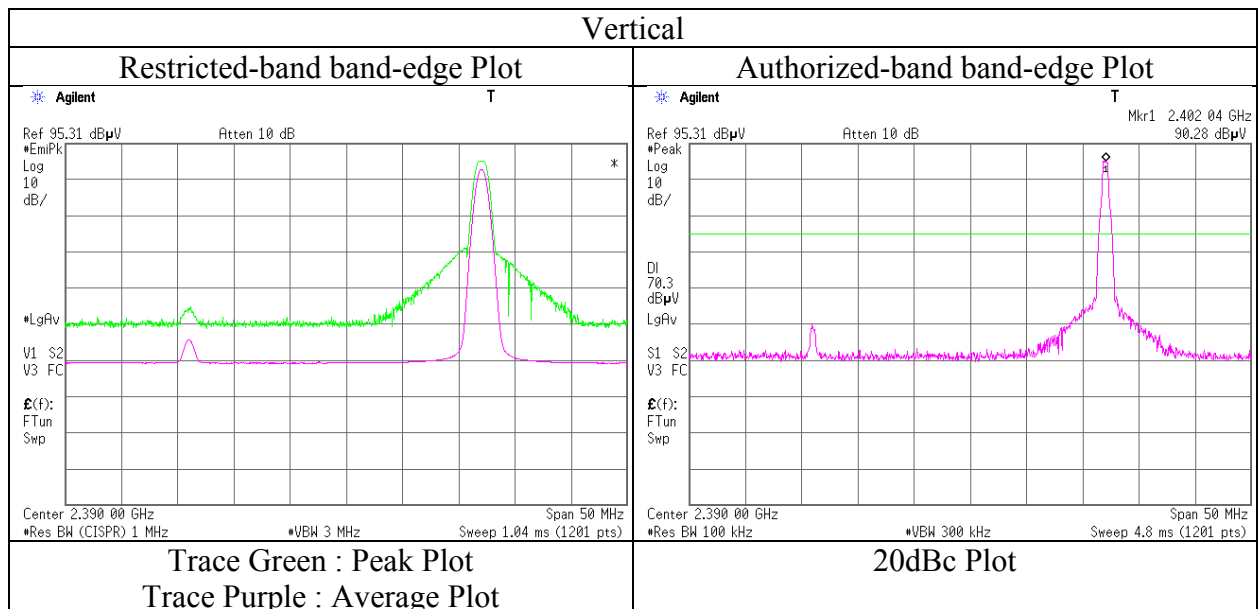
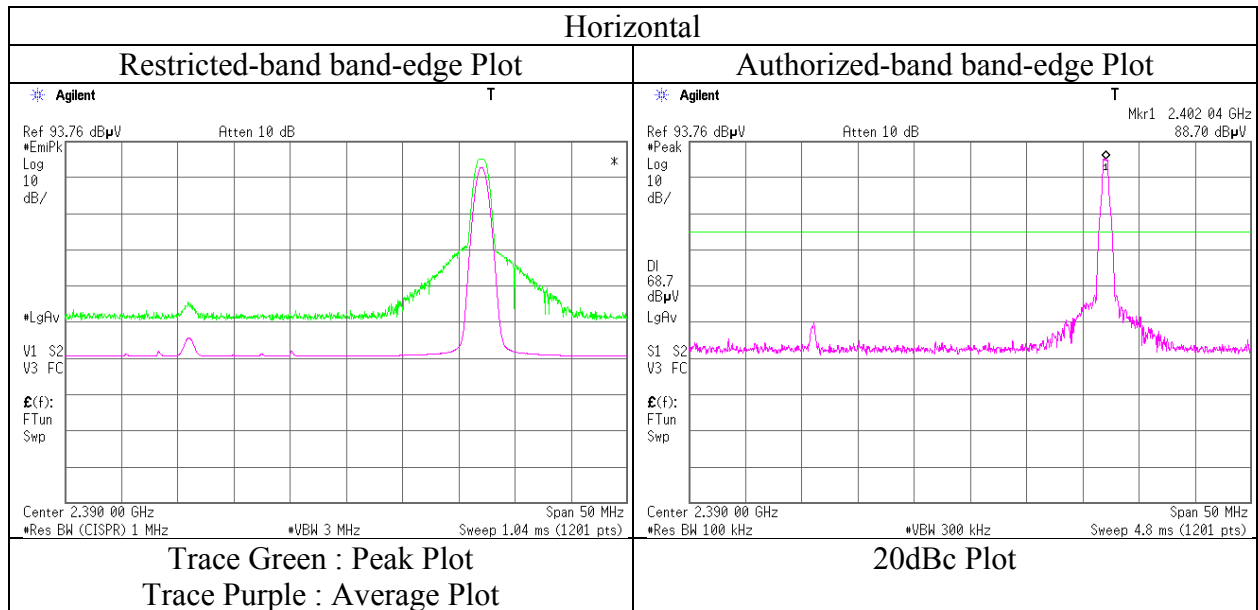
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10763065S-A-R1
Date	July 11, 2015
Temperature / Humidity	25 deg. C / 56 % RH
Engineer	Shinichi Takano
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. : 10763065S-A-R1
Date : July 11, 2015 July 12, 2015
Temperature / Humidity : 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer : Shinichi Takano Hiroyuki Morikawa
Mode : Tx 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.	145.593	QP	45.2	14.6	7.8	32.1	0.0	35.5	43.5	8.0	224	261	
Hori.	218.399	QP	46.8	16.6	8.2	32.0	0.0	39.6	46.0	6.4	213	304	
Hori.	324.020	QP	41.3	14.6	8.8	31.9	0.0	32.8	46.0	13.2	100	141	
Hori.	480.029	QP	38.2	17.5	9.5	31.9	0.0	33.3	46.0	12.7	100	136	
Hori.	696.885	QP	34.2	20.4	10.3	31.8	0.0	33.1	46.0	12.9	100	147	
Hori.	2389.026	PK	53.2	26.4	13.7	41.0	2.1	54.4	73.9	19.5	100	313	
Hori.	2493.031	PK	50.7	26.6	13.7	41.0	2.1	52.1	73.9	21.8	100	313	
Hori.	2519.048	PK	48.8	26.6	13.8	41.0	2.1	50.3	73.9	23.6	100	313	
Hori.	4882.000	PK	45.8	30.9	5.8	39.5	2.1	45.1	73.9	28.8	100	37	
Hori.	7323.000	PK	60.1	36.8	7.2	40.2	2.1	66.0	73.9	7.9	100	309	
Hori.	9764.000	PK	44.3	38.6	8.2	39.5	2.1	53.7	73.9	20.2	100	0	
Hori.	12205.000	PK	45.8	39.4	9.4	39.4	2.1	57.3	73.9	16.6	100	0	
Hori.	2389.026	AV	46.9	26.4	13.7	41.0	2.1	48.1	53.9	5.8	100	313	
Hori.	2493.031	AV	43.0	26.6	13.7	41.0	2.1	44.4	53.9	9.5	100	313	
Hori.	2519.048	AV	39.9	26.6	13.8	41.0	2.1	41.4	53.9	12.5	100	313	
Hori.	4882.000	AV	34.5	30.9	5.8	39.5	2.1	33.8	53.9	20.1	100	37	
Hori.	9764.000	AV	33.2	38.6	8.2	39.5	2.1	42.6	53.9	11.3	100	0	
Hori.	12205.000	AV	34.0	39.4	9.4	39.4	2.1	45.5	53.9	8.4	100	0	
Vert.	194.132	QP	43.9	16.2	7.9	32.0	0.0	36.0	43.5	7.5	100	0	
Vert.	218.408	QP	41.6	16.6	8.2	32.0	0.0	34.4	46.0	11.6	100	199	
Vert.	221.181	QP	39.4	16.6	8.2	32.0	0.0	32.2	46.0	13.8	100	203	
Vert.	696.885	QP	38.4	20.4	10.3	31.8	0.0	37.3	46.0	8.7	100	188	
Vert.	2389.010	PK	53.6	26.4	13.7	41.0	2.1	54.8	73.9	19.1	100	311	
Vert.	2493.004	PK	53.1	26.6	13.7	41.0	2.1	54.5	73.9	19.4	100	311	
Vert.	2519.025	PK	51.6	26.6	13.8	41.0	2.1	53.1	73.9	20.8	100	311	
Vert.	4882.000	PK	47.5	30.9	5.8	39.5	2.1	46.8	73.9	27.1	100	356	
Vert.	7323.000	PK	54.4	36.8	7.2	40.2	2.1	60.3	73.9	13.6	100	244	
Vert.	9764.000	PK	45.3	38.6	8.2	39.5	2.1	54.7	73.9	19.2	100	0	
Vert.	12205.000	PK	45.6	39.4	9.4	39.4	2.1	57.1	73.9	16.8	100	0	
Vert.	2389.010	AV	47.3	26.4	13.7	41.0	2.1	48.5	53.9	5.4	100	311	
Vert.	2493.004	AV	46.9	26.6	13.7	41.0	2.1	48.3	53.9	5.6	100	311	
Vert.	2519.025	AV	43.8	26.6	13.8	41.0	2.1	45.3	53.9	8.6	100	311	
Vert.	4882.000	AV	36.9	30.9	5.8	39.5	2.1	36.2	53.9	17.7	100	356	
Vert.	9764.000	AV	33.7	38.6	8.2	39.5	2.1	43.1	53.9	10.8	100	0	
Vert.	12205.000	AV	34.0	39.4	9.4	39.4	2.1	45.5	53.9	8.4	100	0	

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

Distance factor : 1 GHz - 15 GHz : 20log (3.8 m / 3.0 m) = 2.1 dB

15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7323.000	AV	55.7	36.8	7.2	40.2	-24.5	2.1	37.1	53.9	16.8	
Vert.	7323.000	AV	49.4	36.8	7.2	40.2	-24.5	2.1	30.8	53.9	23.1	

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

Distance factor : 1 GHz - 15 GHz : 20log (3.8 m / 3.0 m) = 2.1 dB

15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 596 24 8999

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10763065S-A-R1
Date : July 11, 2015 July 12, 2015
Temperature / Humidity : 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer : Shinichi Takano Hiroyuki Morikawa
Mode : Tx 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.	145.593	QP	45.6	14.6	7.8	32.1	0.0	35.9	43.5	7.6	224	270	
Hori.	218.399	QP	44.0	16.6	8.2	32.0	0.0	36.8	46.0	9.2	223	293	
Hori.	324.020	QP	41.5	14.6	8.8	31.9	0.0	33.0	46.0	13.0	100	144	
Hori.	480.029	QP	38.0	17.5	9.5	31.9	0.0	33.1	46.0	12.9	100	133	
Hori.	696.885	QP	34.7	20.4	10.3	31.8	0.0	33.6	46.0	12.4	100	149	
Hori.	2483.500	PK	58.6	26.6	13.7	41.0	2.1	60.0	73.9	13.9	100	315	
Hori.	2506.012	PK	50.1	26.6	13.8	41.0	2.1	51.6	73.9	22.3	100	315	
Hori.	2532.025	PK	51.0	26.7	13.8	41.0	2.1	52.6	73.9	21.3	100	315	
Hori.	2558.011	PK	49.6	26.7	13.8	41.0	2.1	51.2	73.9	22.7	100	315	
Hori.	4960.000	PK	45.5	31.2	5.8	39.4	2.1	45.2	73.9	28.7	100	11	
Hori.	7440.000	PK	59.3	37.0	7.2	40.4	2.1	65.2	73.9	8.7	100	309	
Hori.	9920.000	PK	45.0	38.6	8.2	39.4	2.1	54.5	73.9	19.4	100	0	
Hori.	12400.000	PK	44.9	39.3	9.6	39.6	2.1	56.3	73.9	17.6	100	0	
Hori.	2483.500	AV	34.5	26.6	13.7	41.0	2.1	35.9	53.9	18.0	100	315	
Hori.	2506.012	AV	38.2	26.6	13.8	41.0	2.1	39.7	53.9	14.2	100	315	
Hori.	2532.025	AV	43.7	26.7	13.8	41.0	2.1	45.3	53.9	8.6	100	315	
Hori.	2558.011	AV	40.3	26.7	13.8	41.0	2.1	41.9	53.9	12.0	100	315	
Hori.	4960.000	AV	34.5	31.2	5.8	39.4	2.1	34.2	53.9	19.7	100	11	
Hori.	9920.000	AV	33.5	38.6	8.2	39.4	2.1	43.0	53.9	10.9	100	0	
Hori.	12400.000	AV	34.0	39.3	9.6	39.6	2.1	45.4	53.9	8.5	100	0	
Vert.	194.132	QP	45.5	16.2	7.9	32.0	0.0	37.6	43.5	5.9	100	0	
Vert.	218.408	QP	39.0	16.6	8.2	32.0	0.0	31.8	46.0	14.2	100	209	
Vert.	221.181	QP	38.5	16.6	8.2	32.0	0.0	31.3	46.0	14.7	100	203	
Vert.	696.885	QP	38.5	20.4	10.3	31.8	0.0	37.4	46.0	8.6	100	191	
Vert.	2483.500	PK	61.9	26.6	13.7	41.0	2.1	63.3	73.9	10.6	100	311	
Vert.	2506.027	PK	48.1	26.6	13.8	41.0	2.1	49.6	73.9	24.3	100	311	
Vert.	2532.020	PK	53.4	26.7	13.8	41.0	2.1	55.0	73.9	18.9	100	311	
Vert.	2558.033	PK	52.1	26.7	13.8	41.0	2.1	53.7	73.9	20.2	100	311	
Vert.	4960.000	PK	48.2	31.2	5.8	39.4	2.1	47.9	73.9	26.0	100	359	
Vert.	7440.000	PK	54.8	37.0	7.2	40.4	2.1	60.7	73.9	13.2	100	101	
Vert.	9920.000	PK	45.4	38.6	8.2	39.4	2.1	54.9	73.9	19.0	100	0	
Vert.	12400.000	PK	45.1	39.3	9.6	39.6	2.1	56.5	73.9	17.4	100	0	
Vert.	2483.500	AV	35.2	26.6	13.7	41.0	2.1	36.6	53.9	17.3	100	311	
Vert.	2506.027	AV	38.9	26.6	13.8	41.0	2.1	40.4	53.9	13.5	100	311	
Vert.	2532.020	AV	46.6	26.7	13.8	41.0	2.1	48.2	53.9	5.7	100	311	
Vert.	2558.033	AV	44.5	26.7	13.8	41.0	2.1	46.1	53.9	7.8	100	311	
Vert.	4960.000	AV	37.2	31.2	5.8	39.4	2.1	36.9	53.9	17.0	100	359	
Vert.	9920.000	AV	33.9	38.6	8.2	39.4	2.1	43.4	53.9	10.5	100	0	
Vert.	12400.000	AV	33.9	39.3	9.6	39.6	2.1	45.3	53.9	8.6	100	0	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7440.000	AV	55.1	37.0	7.2	40.4	-24.5	2.1	36.5	53.9	17.4	
Vert.	7440.000	AV	49.1	37.0	7.2	40.4	-24.5	2.1	30.5	53.9	23.4	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

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Shonan EMC Lab.

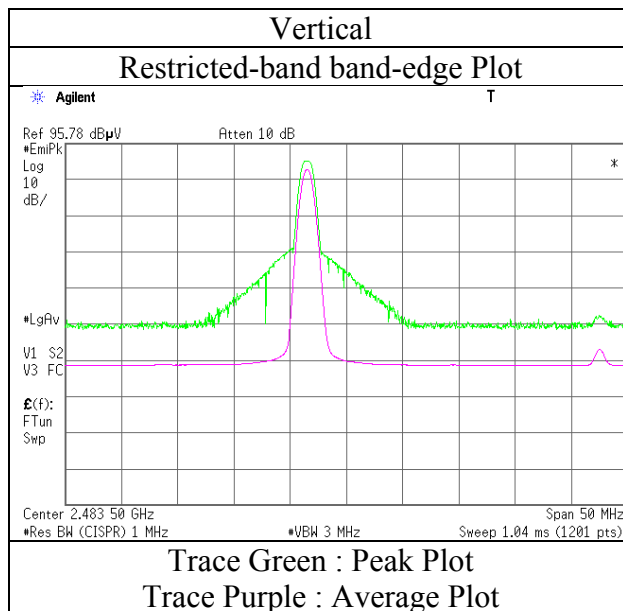
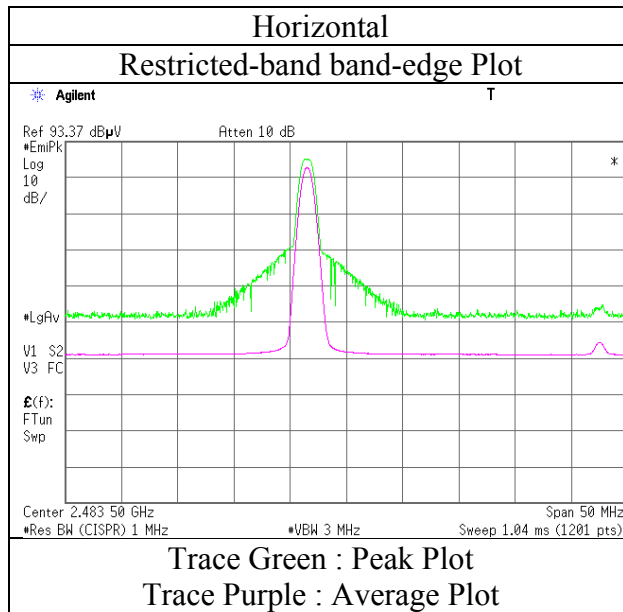
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10763065S-A-R1
Date July 11, 2015
Temperature / Humidity 25 deg. C / 56 % RH
Engineer Shinichi Takano
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. 10763065S-A-R1
Date July 11, 2015 July 12, 2015
Temperature / Humidity 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer Shinichi Takano Hiroyuki Morikawa
Mode Tx 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.	145.593	QP	45.4	14.6	7.8	32.1	0.0	35.7	43.5	7.8	224	176	
Hori.	218.399	QP	43.4	16.6	8.2	32.0	0.0	36.2	46.0	9.8	223	282	
Hori.	324.020	QP	41.0	14.6	8.8	31.9	0.0	32.5	46.0	13.5	100	147	
Hori.	480.029	QP	38.2	17.5	9.5	31.9	0.0	33.3	46.0	12.7	100	136	
Hori.	696.885	QP	34.6	20.4	10.3	31.8	0.0	33.5	46.0	12.5	100	149	
Hori.	2350.013	PK	52.9	26.3	13.6	41.0	2.1	53.9	73.9	20.0	100	313	
Hori.	2376.001	PK	48.9	26.4	13.7	41.0	2.1	50.1	73.9	23.8	100	313	
Hori.	2390.000	PK	46.0	26.4	13.7	41.0	2.1	47.2	73.9	26.7	100	313	
Hori.	4804.000	PK	45.0	30.6	5.7	39.6	2.1	43.8	73.9	30.1	100	15	
Hori.	7206.000	PK	59.2	36.6	7.1	40.1	2.1	64.9	73.9	9.0	100	306	
Hori.	9608.000	PK	44.9	38.5	8.2	39.6	2.1	54.1	73.9	19.8	100	0	
Hori.	12010.000	PK	45.8	39.5	9.3	39.3	2.1	57.4	73.9	16.5	100	0	
Hori.	2350.013	AV	44.9	26.3	13.6	41.0	2.1	45.9	53.9	8.0	100	313	
Hori.	2376.001	AV	39.1	26.4	13.7	41.0	2.1	40.3	53.9	13.6	100	313	
Hori.	2390.000	AV	35.2	26.4	13.7	41.0	2.1	36.4	53.9	17.5	100	313	
Hori.	4804.000	AV	34.1	30.6	5.7	39.6	2.1	32.9	53.9	21.0	100	15	
Hori.	9608.000	AV	32.9	38.5	8.2	39.6	2.1	42.1	53.9	11.8	100	0	
Hori.	12010.000	AV	33.8	39.5	9.3	39.3	2.1	45.4	53.9	8.5	100	0	
Vert.	194.132	QP	44.4	16.2	7.9	32.0	0.0	36.5	43.5	7.0	100	0	
Vert.	218.408	QP	40.8	16.6	8.2	32.0	0.0	33.6	46.0	12.4	100	192	
Vert.	221.181	QP	39.2	16.6	8.2	32.0	0.0	32.0	46.0	14.0	100	203	
Vert.	696.885	QP	38.8	20.4	10.3	31.8	0.0	37.7	46.0	8.3	100	190	
Vert.	2350.041	PK	54.3	26.3	13.6	41.0	2.1	55.3	73.9	18.6	100	314	
Vert.	2376.014	PK	48.8	26.4	13.7	41.0	2.1	50.0	73.9	23.9	100	314	
Vert.	2390.000	PK	46.5	26.4	13.7	41.0	2.1	47.7	73.9	26.2	100	314	
Vert.	4804.000	PK	46.7	30.6	5.7	39.6	2.1	45.5	73.9	28.4	100	346	
Vert.	7206.000	PK	55.2	36.6	7.1	40.1	2.1	60.9	73.9	13.0	100	102	
Vert.	9608.000	PK	44.1	38.5	8.2	39.6	2.1	53.3	73.9	20.6	100	0	
Vert.	12010.000	PK	45.1	39.5	9.3	39.3	2.1	56.7	73.9	17.2	100	0	
Vert.	2350.041	AV	46.1	26.3	13.6	41.0	2.1	47.1	53.9	6.8	100	314	
Vert.	2376.014	AV	39.4	26.4	13.7	41.0	2.1	40.6	53.9	13.3	100	314	
Vert.	2390.000	AV	33.9	26.4	13.7	41.0	2.1	35.1	53.9	18.8	100	314	
Vert.	4804.000	AV	37.2	30.6	5.7	39.6	2.1	36.0	53.9	17.9	100	346	
Vert.	9608.000	AV	33.6	38.5	8.2	39.6	2.1	42.8	53.9	11.1	100	0	
Vert.	12010.000	AV	33.8	39.5	9.3	39.3	2.1	45.4	53.9	8.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$
15 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7206.000	AV	52.6	36.6	7.1	40.1	-24.5	2.1	33.8	53.9	20.1	
Vert.	7206.000	AV	47.9	36.6	7.1	40.1	-24.5	2.1	29.1	53.9	24.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Dwell(time)factor + Distance factor
Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$
15 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$
Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

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	89.3	26.4	13.7	41.0	2.1	90.5	-	-	Carrier
Hori.	2400.000	PK	49.1	26.4	13.7	41.0	2.1	50.3	70.5	20.2	
Vert.	2402.000	PK	90.1	26.4	13.7	41.0	2.1	91.3	-	-	Carrier
Vert.	2400.000	PK	49.0	26.4	13.7	41.0	2.1	50.2	71.3	21.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$
15 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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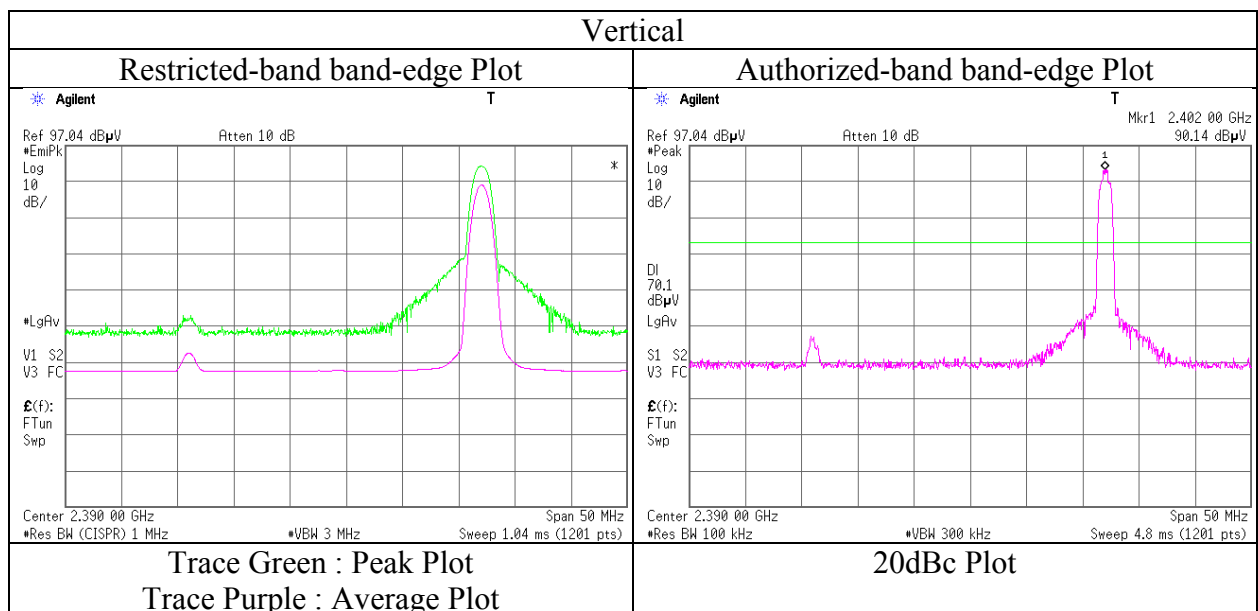
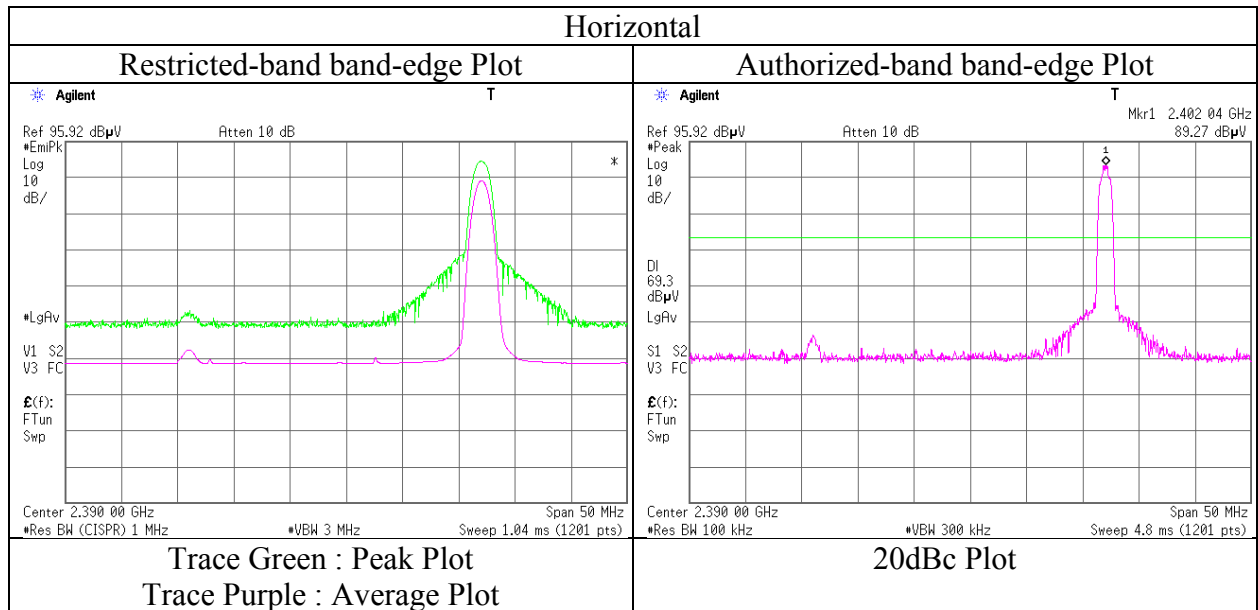
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10763065S-A-R1
Date	July 11, 2015
Temperature / Humidity	25 deg. C / 56 % RH
Engineer	Shinichi Takano
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. : 10763065S-A-R1
Date : July 11, 2015 July 12, 2015
Temperature / Humidity : 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer : Shinichi Takano Hiroyuki Morikawa
Mode : Tx 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.	145.593	QP	45.0	14.6	7.8	32.1	0.0	35.3	43.5	8.2	224	279	
Hori.	218.399	QP	44.3	16.6	8.2	32.0	0.0	37.1	46.0	8.9	223	288	
Hori.	324.020	QP	41.1	14.6	8.8	31.9	0.0	32.6	46.0	13.4	100	142	
Hori.	480.029	QP	38.1	17.5	9.5	31.9	0.0	33.2	46.0	12.8	100	133	
Hori.	696.885	QP	34.5	20.4	10.3	31.8	0.0	33.4	46.0	12.6	100	150	
Hori.	2389.034	PK	52.7	26.4	13.7	41.0	2.1	53.9	73.9	20.0	100	315	
Hori.	2493.004	PK	50.4	26.6	13.7	41.0	2.1	51.8	73.9	22.1	100	315	
Hori.	2519.050	PK	49.6	26.6	13.8	41.0	2.1	51.1	73.9	22.8	100	315	
Hori.	4882.000	PK	45.3	30.9	5.8	39.5	2.1	44.6	73.9	29.3	100	0	
Hori.	7323.000	PK	60.5	36.8	7.2	40.2	2.1	66.4	73.9	7.5	100	309	
Hori.	9764.000	PK	44.5	38.6	8.2	39.5	2.1	53.9	73.9	20.0	100	0	
Hori.	12205.000	PK	45.5	39.4	9.4	39.4	2.1	57.0	73.9	16.9	100	0	
Hori.	2389.034	AV	44.9	26.4	13.7	41.0	2.1	46.1	53.9	7.8	100	315	
Hori.	2493.004	AV	41.9	26.6	13.7	41.0	2.1	43.3	53.9	10.6	100	315	
Hori.	2519.050	AV	39.1	26.6	13.8	41.0	2.1	40.6	53.9	13.3	100	315	
Hori.	4882.000	AV	33.7	30.9	5.8	39.5	2.1	33.0	53.9	20.9	100	0	
Hori.	9764.000	AV	33.1	38.6	8.2	39.5	2.1	42.5	53.9	11.4	100	0	
Hori.	12205.000	AV	33.9	39.4	9.4	39.4	2.1	45.4	53.9	8.5	100	0	
Vert.	194.132	QP	44.4	16.2	7.9	32.0	0.0	36.5	43.5	7.0	100	0	
Vert.	218.408	QP	40.0	16.6	8.2	32.0	0.0	32.8	46.0	13.2	100	193	
Vert.	221.181	QP	38.9	16.6	8.2	32.0	0.0	31.7	46.0	14.3	100	201	
Vert.	696.885	QP	39.2	20.4	10.3	31.8	0.0	38.1	46.0	7.9	100	187	
Vert.	2389.021	PK	53.6	26.4	13.7	41.0	2.1	54.8	73.9	19.1	100	310	
Vert.	2493.025	PK	52.6	26.6	13.7	41.0	2.1	54.0	73.9	19.9	100	310	
Vert.	2519.030	PK	50.8	26.6	13.8	41.0	2.1	52.3	73.9	21.6	100	310	
Vert.	4882.000	PK	47.3	30.9	5.8	39.5	2.1	46.6	73.9	27.3	100	355	
Vert.	7323.000	PK	54.9	36.8	7.2	40.2	2.1	60.8	73.9	13.1	100	244	
Vert.	9764.000	PK	44.9	38.6	8.2	39.5	2.1	54.3	73.9	19.6	100	0	
Vert.	12205.000	PK	45.5	39.4	9.4	39.4	2.1	57.0	73.9	16.9	100	0	
Vert.	2389.021	AV	45.7	26.4	13.7	41.0	2.1	46.9	53.9	7.0	100	310	
Vert.	2493.025	AV	44.6	26.6	13.7	41.0	2.1	46.0	53.9	7.9	100	310	
Vert.	2519.030	AV	41.2	26.6	13.8	41.0	2.1	42.7	53.9	11.2	100	310	
Vert.	4882.000	AV	36.4	30.9	5.8	39.5	2.1	35.7	53.9	18.2	100	355	
Vert.	9764.000	AV	33.7	38.6	8.2	39.5	2.1	43.1	53.9	10.8	100	0	
Vert.	12205.000	AV	33.9	39.4	9.4	39.4	2.1	45.4	53.9	8.5	100	0	

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

Distance factor : 1 GHz - 15 GHz : 20log (3.8 m / 3.0 m) = 2.1 dB

15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7323.000	AV	53.9	36.8	7.2	40.2	-24.5	2.1	35.3	53.9	18.6	
Vert.	7323.000	AV	47.2	36.8	7.2	40.2	-24.5	2.1	28.6	53.9	25.3	

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

Distance factor : 1 GHz - 15 GHz : 20log (3.8 m / 3.0 m) = 2.1 dB

15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 596 24 8999

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10763065S-A-R1
Date : July 11, 2015 July 12, 2015
Temperature / Humidity : 25 deg. C / 56 % RH 23 deg. C / 60 % RH
Engineer : Shinichi Takano Hiroyuki Morikawa
Mode : Tx 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.	145.598	QP	44.7	14.6	7.8	32.1	0.0	35.0	43.5	8.5	224	281	
Hori.	218.399	QP	44.5	16.6	8.2	32.0	0.0	37.3	46.0	8.7	223	292	
Hori.	324.020	QP	41.0	14.6	8.8	31.9	0.0	32.5	46.0	13.5	100	143	
Hori.	480.029	QP	38.1	17.5	9.5	31.9	0.0	33.2	46.0	12.8	100	132	
Hori.	696.885	QP	34.9	20.4	10.3	31.8	0.0	33.8	46.0	12.2	100	150	
Hori.	2483.500	PK	58.5	26.6	13.7	41.0	2.1	59.9	73.9	14.0	100	315	
Hori.	2506.003	PK	48.6	26.6	13.8	41.0	2.1	50.1	73.9	23.8	100	315	
Hori.	2532.047	PK	51.6	26.7	13.8	41.0	2.1	53.2	73.9	20.7	100	315	
Hori.	2558.051	PK	49.5	26.7	13.8	41.0	2.1	51.1	73.9	22.8	100	315	
Hori.	4960.000	PK	45.7	31.2	5.8	39.4	2.1	45.4	73.9	28.5	100	0	
Hori.	7440.000	PK	60.3	37.0	7.2	40.4	2.1	66.2	73.9	7.7	100	309	
Hori.	9920.000	PK	44.9	38.6	8.2	39.4	2.1	54.4	73.9	19.5	100	0	
Hori.	12400.000	PK	46.1	39.3	9.6	39.6	2.1	57.5	73.9	16.4	100	0	
Hori.	2483.500	AV	34.8	26.6	13.7	41.0	2.1	36.2	53.9	17.7	100	315	
Hori.	2506.003	AV	36.8	26.6	13.8	41.0	2.1	38.3	53.9	15.6	100	315	
Hori.	2532.047	AV	42.2	26.7	13.8	41.0	2.1	43.8	53.9	10.1	100	315	
Hori.	2558.051	AV	39.4	26.7	13.8	41.0	2.1	41.0	53.9	12.9	100	315	
Hori.	4960.000	AV	34.0	31.2	5.8	39.4	2.1	33.7	53.9	20.2	100	0	
Hori.	9920.000	AV	33.5	38.6	8.2	39.4	2.1	43.0	53.9	10.9	100	0	
Hori.	12400.000	AV	34.0	39.3	9.6	39.6	2.1	45.4	53.9	8.5	100	0	
Vert.	194.132	QP	45.0	16.2	7.9	32.0	0.0	37.1	43.5	6.4	100	0	
Vert.	218.408	QP	39.7	16.6	8.2	32.0	0.0	32.5	46.0	13.5	100	205	
Vert.	221.181	QP	38.8	16.6	8.2	32.0	0.0	31.6	46.0	14.4	100	207	
Vert.	696.885	QP	39.0	20.4	10.3	31.8	0.0	37.9	46.0	8.1	100	185	
Vert.	2483.500	PK	61.9	26.6	13.7	41.0	2.1	63.3	73.9	10.6	100	313	
Vert.	2506.014	PK	48.9	26.6	13.8	41.0	2.1	50.4	73.9	23.5	100	313	
Vert.	2532.033	PK	54.1	26.7	13.8	41.0	2.1	55.7	73.9	18.2	100	313	
Vert.	2558.008	PK	52.8	26.7	13.8	41.0	2.1	54.4	73.9	19.5	100	313	
Vert.	4960.000	PK	47.6	31.2	5.8	39.4	2.1	47.3	73.9	26.6	100	356	
Vert.	7440.000	PK	55.4	37.0	7.2	40.4	2.1	61.3	73.9	12.6	100	100	
Vert.	9920.000	PK	45.4	38.6	8.2	39.4	2.1	54.9	73.9	19.0	100	0	
Vert.	12400.000	PK	45.4	39.3	9.6	39.6	2.1	56.8	73.9	17.1	100	0	
Vert.	2483.500	AV	35.7	26.6	13.7	41.0	2.1	37.1	53.9	16.8	100	313	
Vert.	2506.014	AV	37.9	26.6	13.8	41.0	2.1	39.4	53.9	14.5	100	313	
Vert.	2532.033	AV	46.3	26.7	13.8	41.0	2.1	47.9	53.9	6.0	100	313	
Vert.	2558.008	AV	43.3	26.7	13.8	41.0	2.1	44.9	53.9	9.0	100	313	
Vert.	4960.000	AV	37.4	31.2	5.8	39.4	2.1	37.1	53.9	16.8	100	356	
Vert.	9920.000	AV	33.9	38.6	8.2	39.4	2.1	43.4	53.9	10.5	100	0	
Vert.	12400.000	AV	34.0	39.3	9.6	39.6	2.1	45.4	53.9	8.5	100	0	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	7440.000	AV	53.5	37.0	7.2	40.4	-24.5	2.1	34.9	53.9	19.0	
Vert.	7440.000	AV	47.7	37.0	7.2	40.4	-24.5	2.1	29.1	53.9	24.8	

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

Distance factor : 1 GHz - 15 GHz : $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.1\text{ dB}$

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

Dwell (time) factor refer to "Dwell time factor Calculation chart" sheet.

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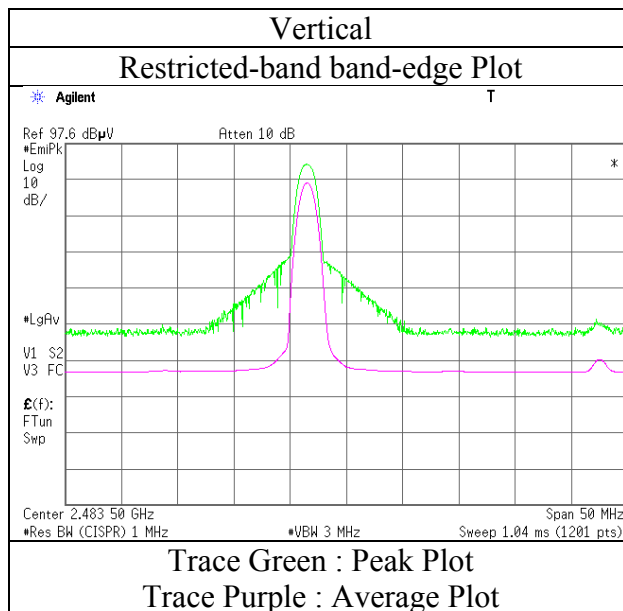
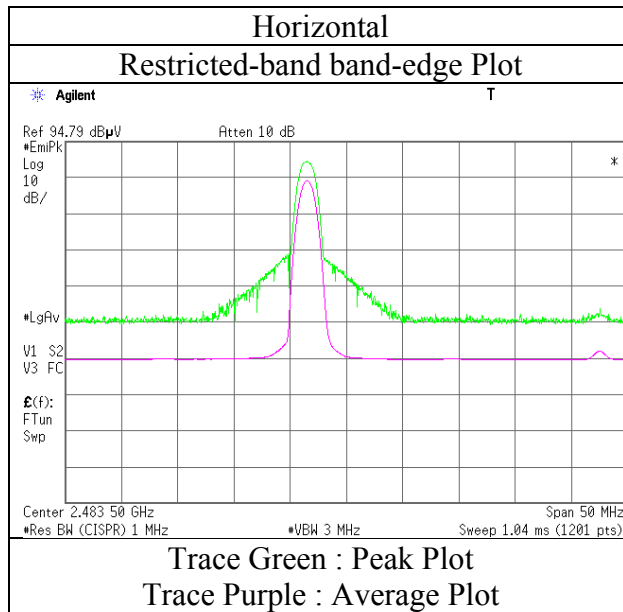
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

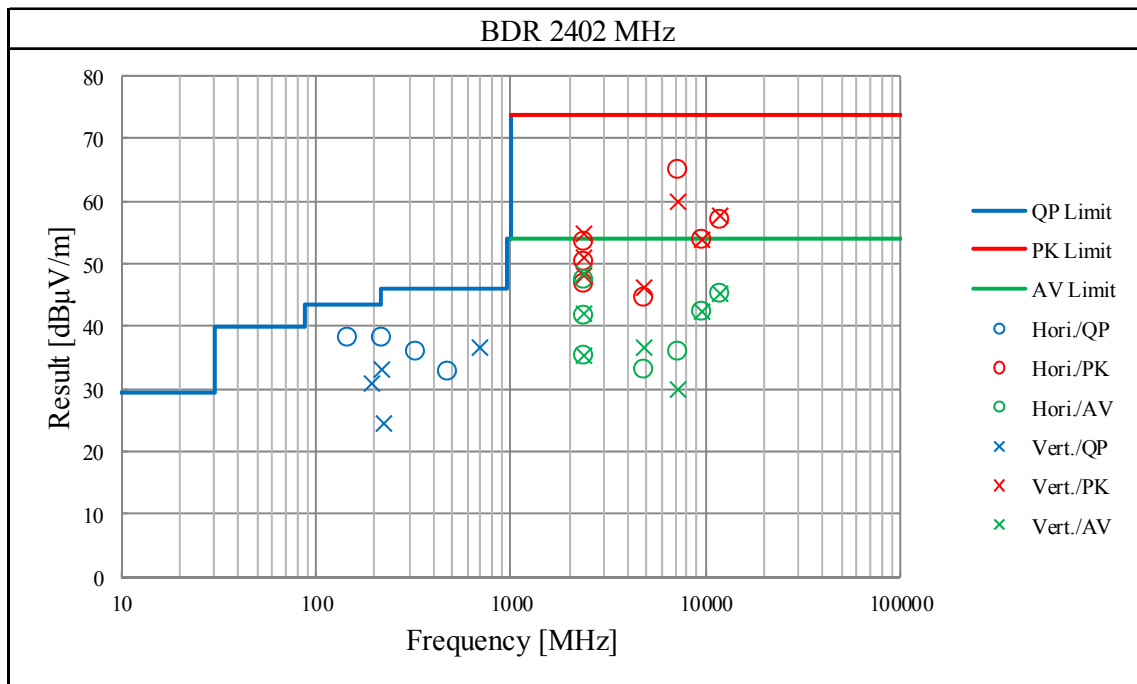
Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10763065S-A-R1
Date July 11, 2015
Temperature / Humidity 25 deg. C / 56 % RH
Engineer Shinichi Takano
Mode Tx, Hopping Off, 3DH5 2480 MHz



* 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.	10763065S-A-R1		
Date	July 11, 2015	July 12, 2015	
Temperature / Humidity	25 deg. C / 56 % RH	23 deg. C / 60 % RH	
Engineer	Shinichi Takano	Hiroyuki Morikawa	



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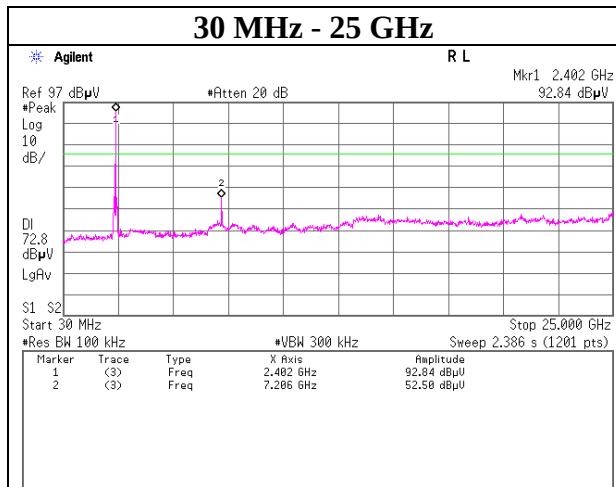
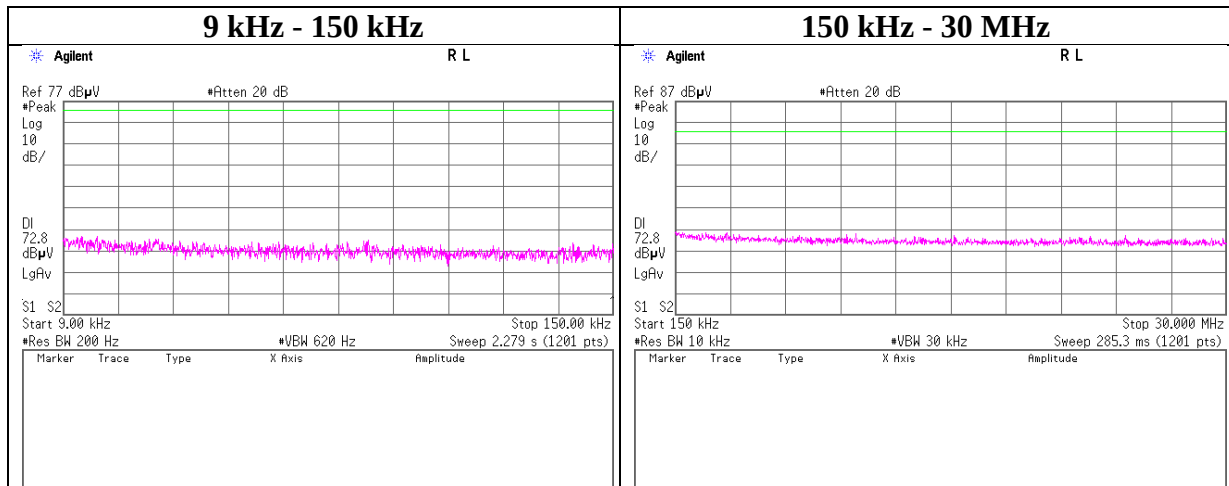
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx DH5

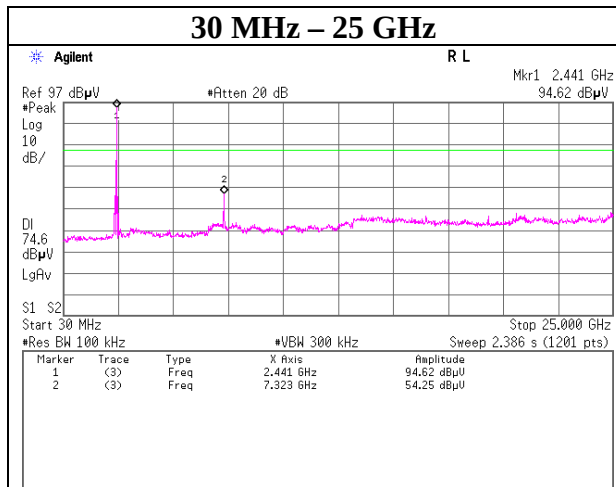
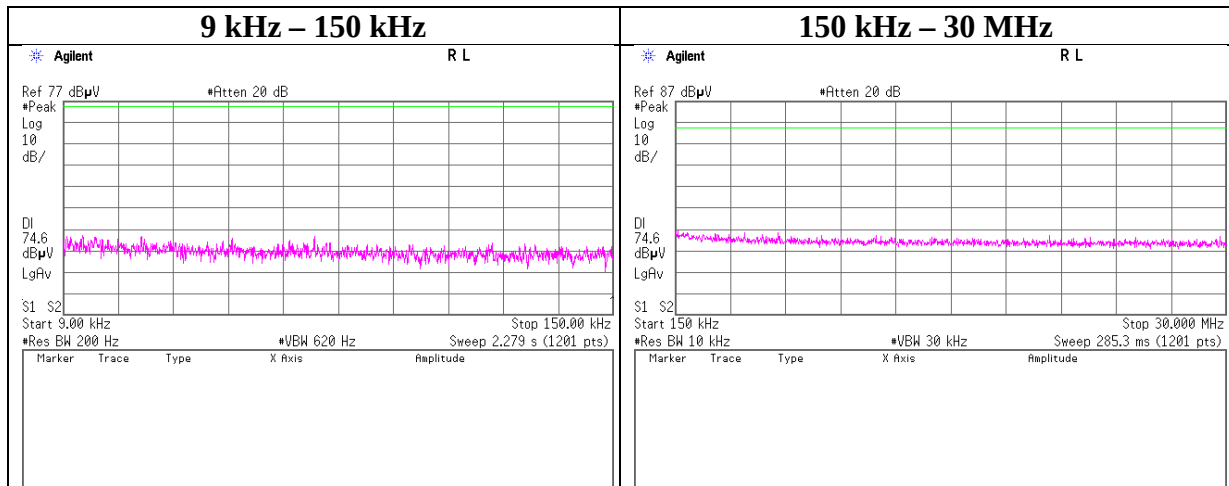
2402 MHz



Conducted Spurious Emission

Test place Shonan EMC Lab. No. No.5 Shielded Room
Report No. 10763065S-A-R1
Date June 5, 2015
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Hikaru Shirasawa
Mode Tx DH5

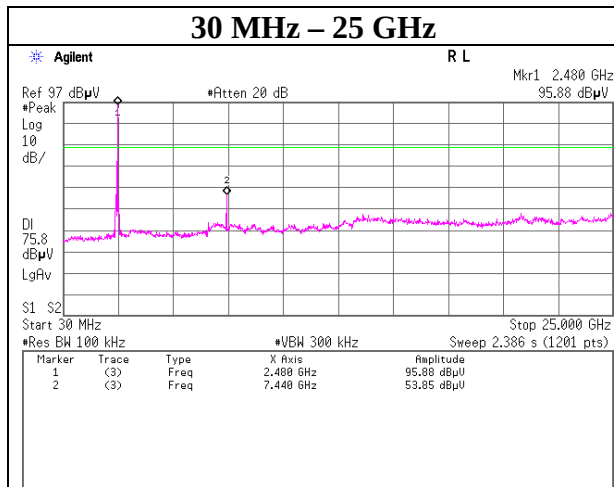
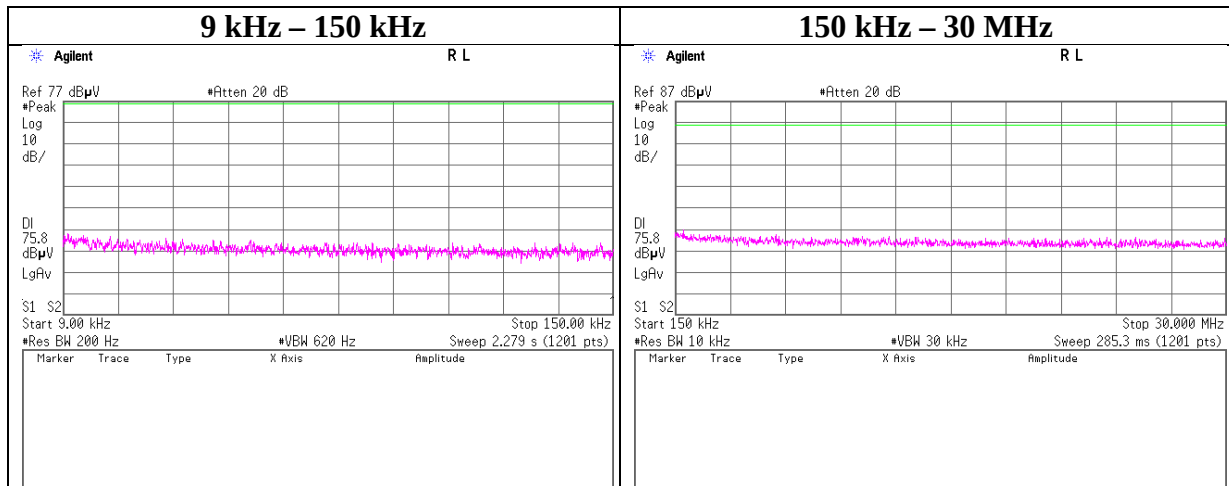
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx DH5

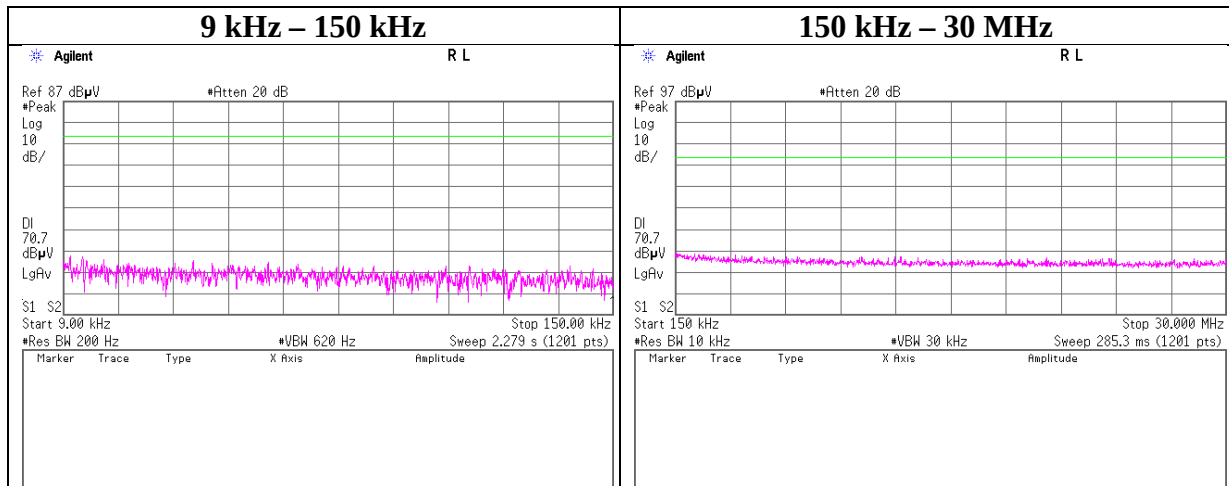
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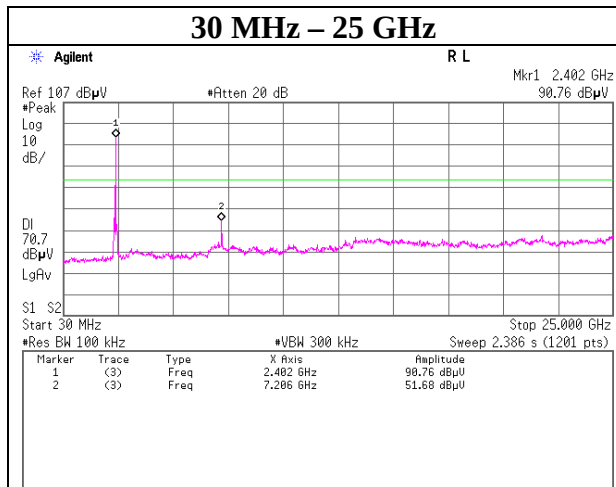
Conducted Spurious Emission

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx 3DH5

2402 MHz



30 MHz – 25 GHz



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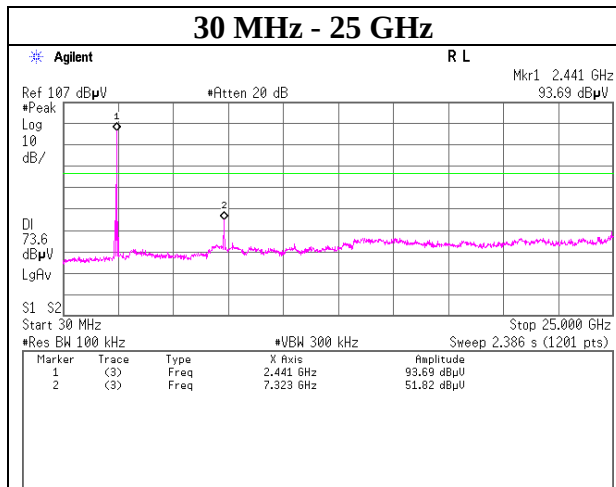
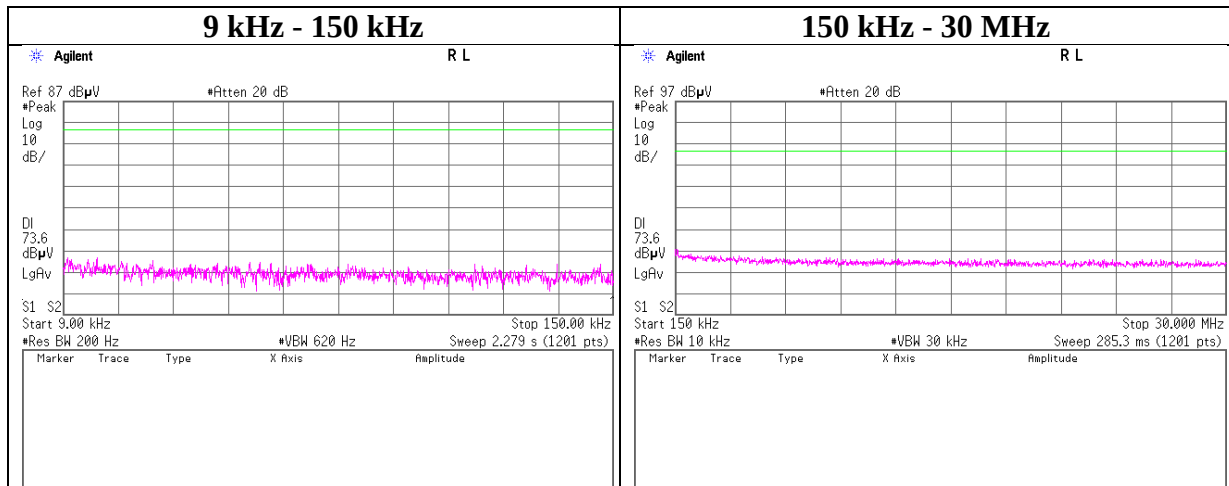
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx 3DH5

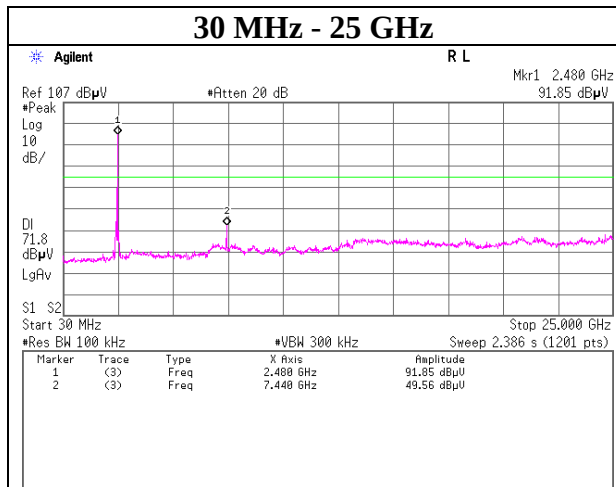
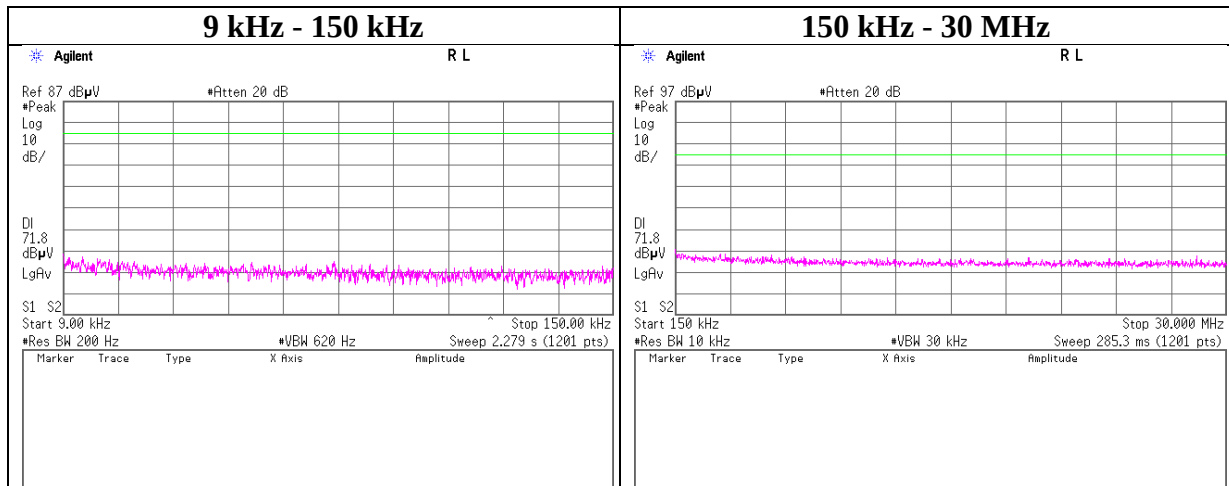
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx 3DH5

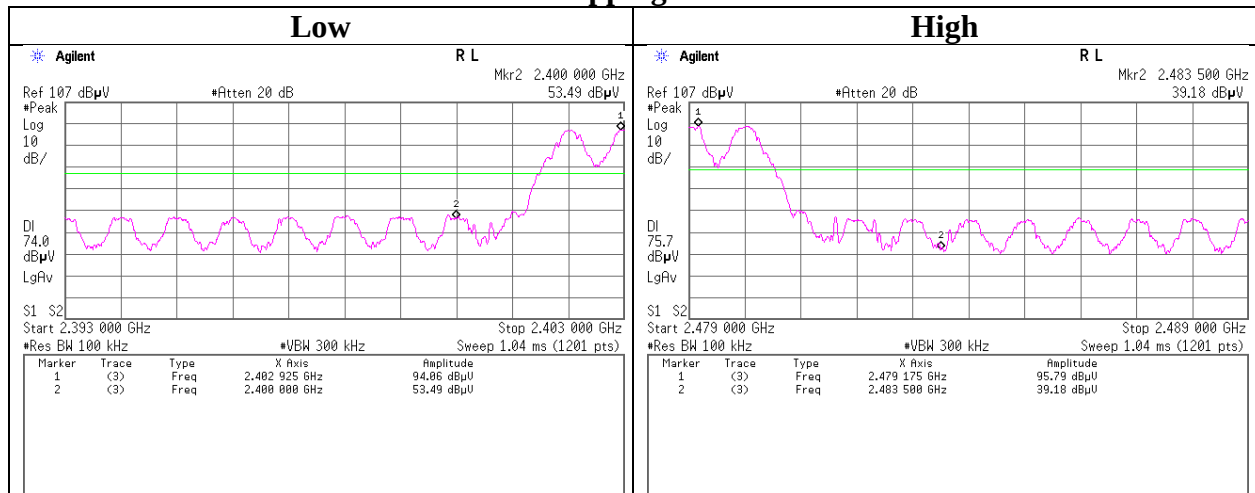
2480 MHz



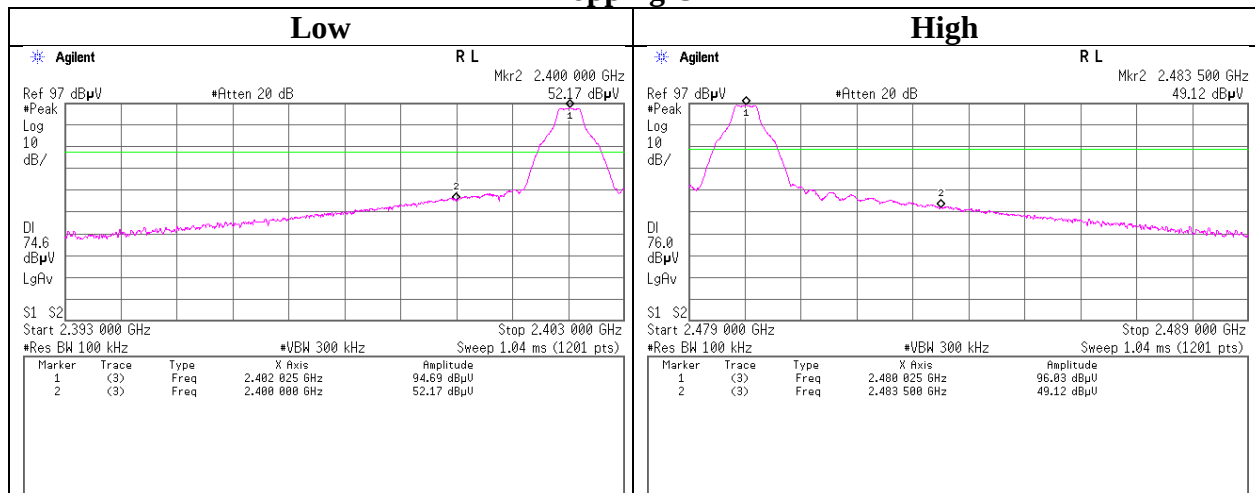
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No. 5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx DH5

Hopping On



Hopping Off



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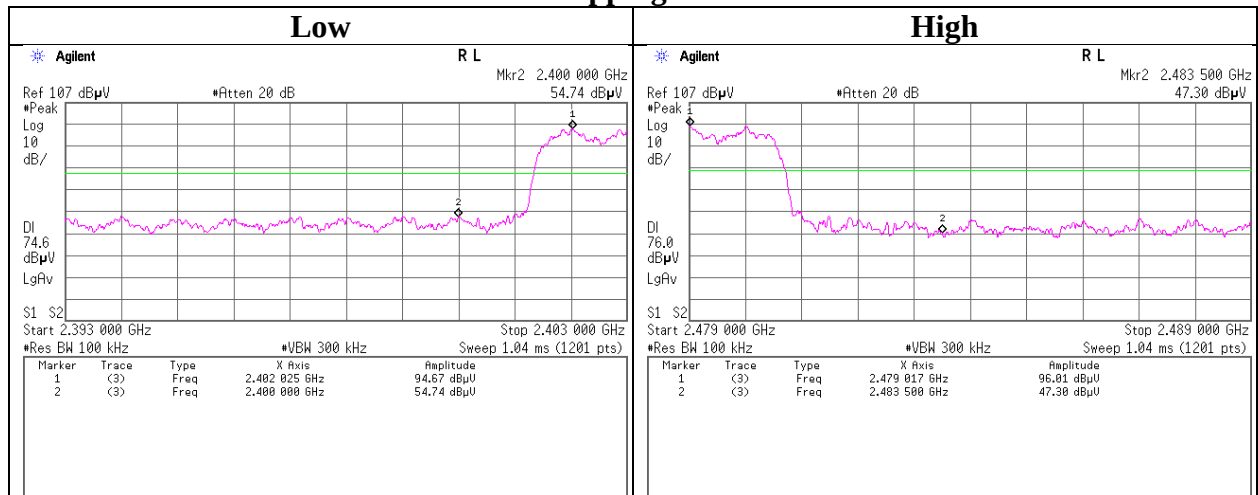
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

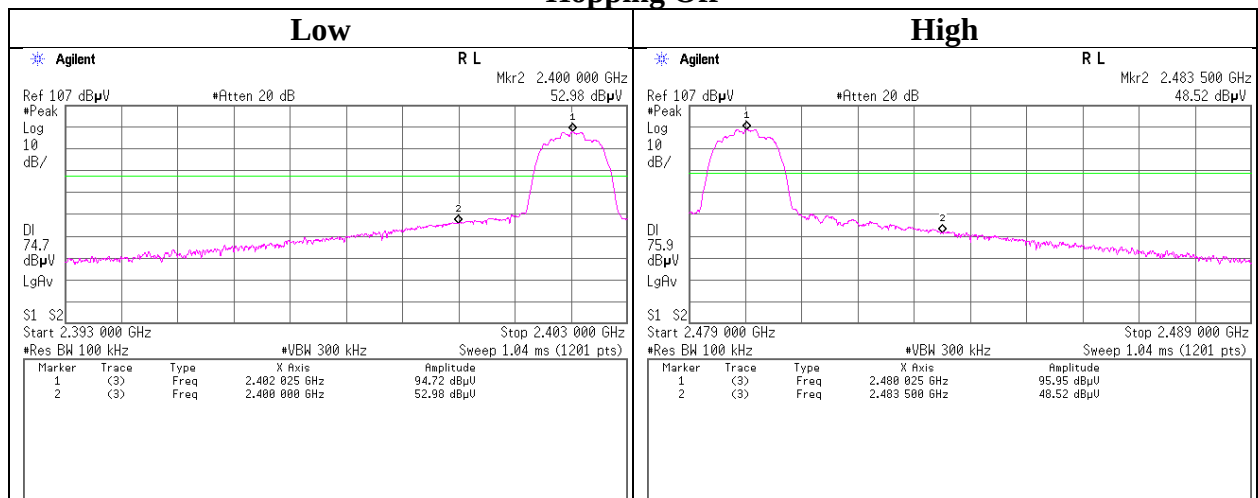
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 10763065S-A-R1
Date : June 5, 2015
Temperature / Humidity : 26 deg. C / 45 % RH
Engineer : Hikaru Shirasawa
Mode : Tx 3DH5

Hopping On



Hopping Off



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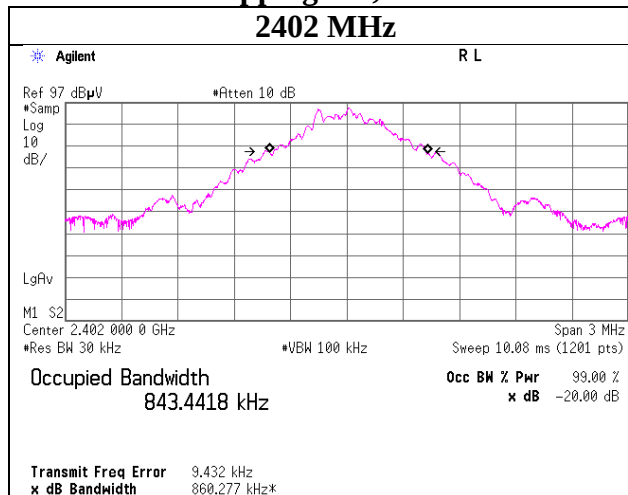
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

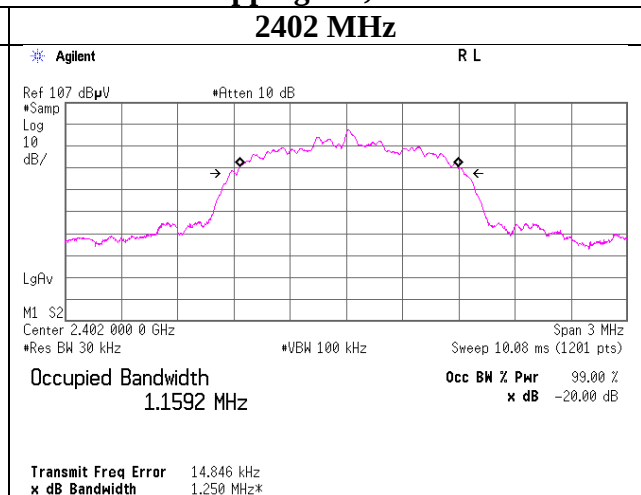
99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10763065S-A-R1
Date	June 5, 2015
Temperature / Humidity	26 deg. C / 45 % RH
Engineer	Hikaru Shirasawa
Mode	Tx Hopping Off

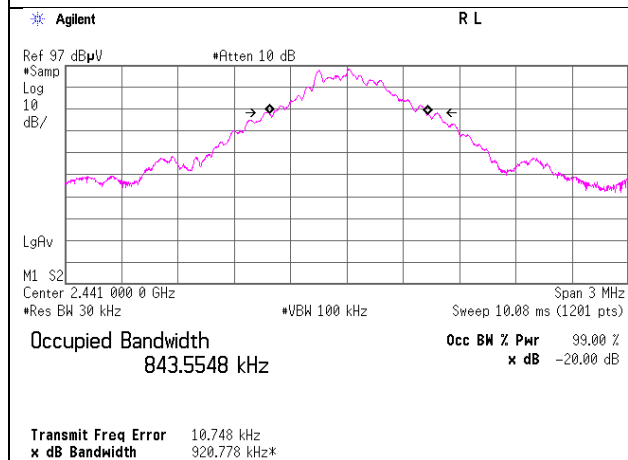
Hopping Off, DH5



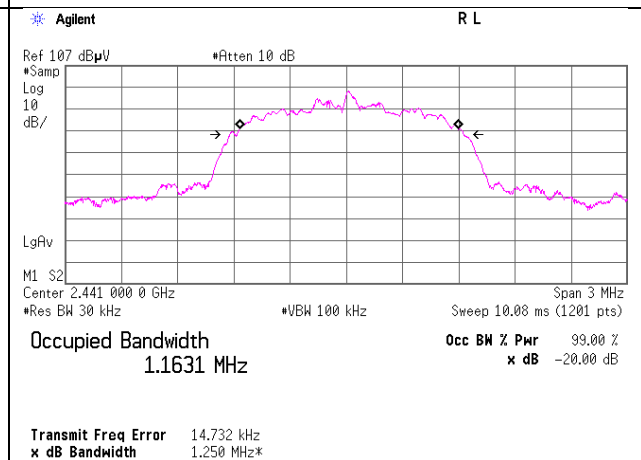
Hopping Off, 3DH5



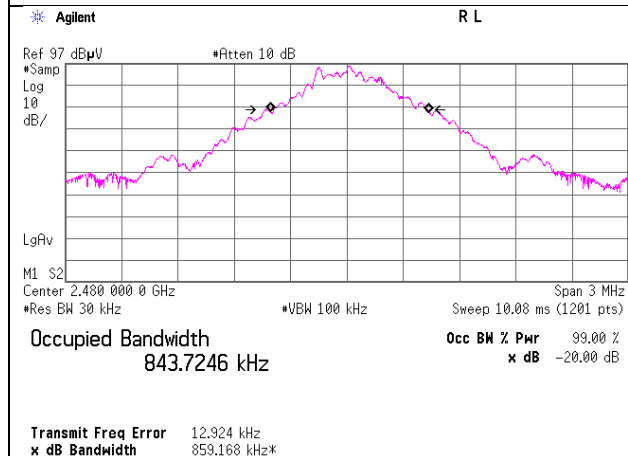
2441 MHz



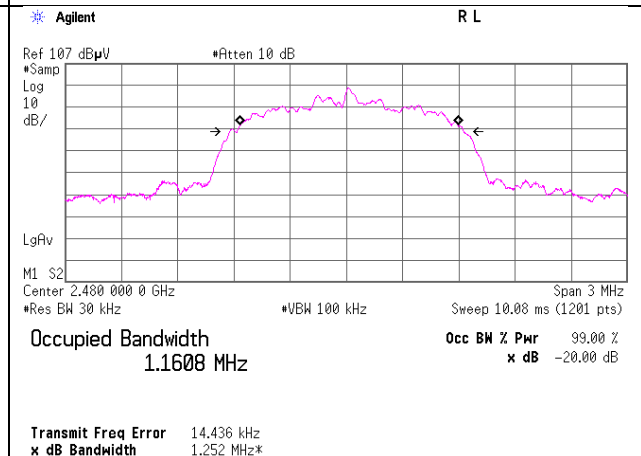
2441 MHz



2480 MHz



2480 MHz



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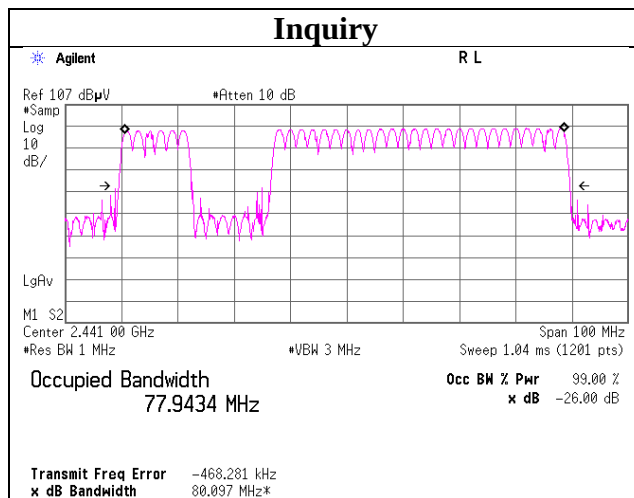
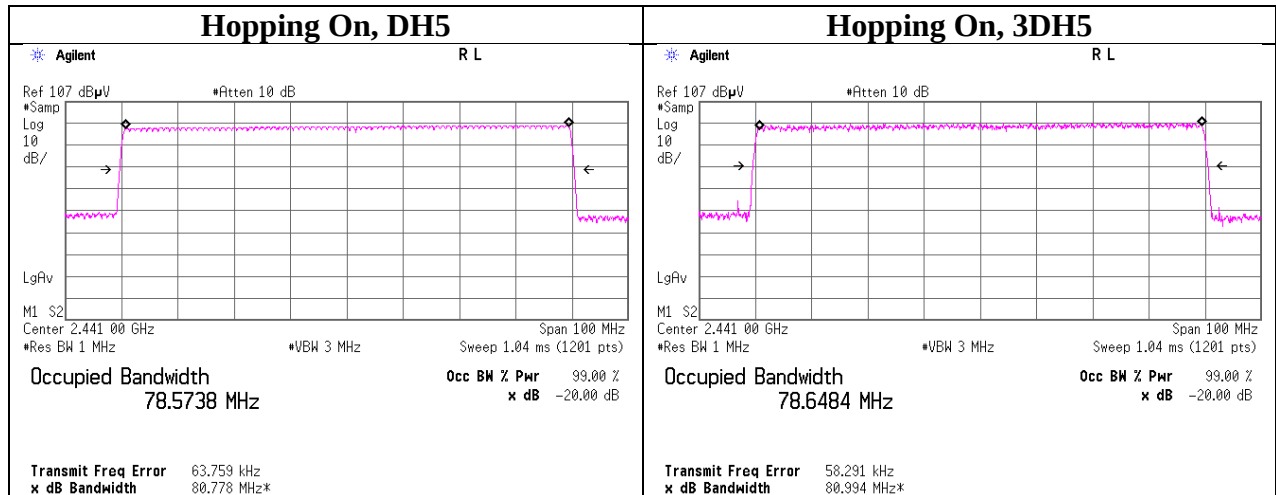
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place Shonan EMC Lab. No. 5 Shielded Room
Report No. 10763065S-A-R1
Date June 5, 2015
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Hikaru Shirasawa
Mode Tx Hopping On



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2015/03/26 * 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
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2014/11/21 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2015/03/11 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2014/07/14 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-01 8	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	2014/08/12 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/10/30 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2015/03/23 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,C E,RFI,MF)	-	RE	-
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2014/11/21 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2014/11/21 * 12
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2014/11/11 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	RE	2015/03/11 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	RE	2015/03/11 * 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
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2014/10/18 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2014/10/18 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2014/08/27 * 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

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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Telephone : +81 596 24 8999

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