



# RADIO TEST REPORT

**Test Report No. : 10762865S-A**

**Applicant** : PIONEER CORPORATION  
**Type of Equipment** : Car Audio with Bluetooth / WLAN  
**Model No.** : PVH-5558  
**FCC ID** : AJDK091  
**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)

**Date of test:** May 12 to June 25, 2015

**Representative test engineer:**

*Y. Ishikawa*

Yosuke Ishikawa  
Engineer  
Consumer Technology Division

**Approved by:**

*T. Imamura*

Toyokazu Imamura  
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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<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1: Customer information .....</b>	<b>4</b>
<b>SECTION 2: Equipment under test (E.U.T.).....</b>	<b>4</b>
<b>SECTION 3: Test specification, procedures &amp; results.....</b>	<b>5</b>
<b>SECTION 4: Operation of E.U.T. during testing.....</b>	<b>8</b>
<b>SECTION 5: Radiated Spurious Emission.....</b>	<b>11</b>
<b>SECTION 6: Antenna Terminal Conducted Tests .....</b>	<b>12</b>
<b>APPENDIX 1: Test data .....</b>	<b>13</b>
20dB Bandwidth and Carrier Frequency Separation .....	13
Number of Hopping Frequency .....	16
Dwell time .....	18
Maximum Peak Output Power .....	21
Average Output Power .....	22
Radiated Spurious Emission.....	24
Conducted Spurious Emission.....	32
Conducted Emission Band Edge compliance .....	38
99%Occupied Bandwidth.....	40
<b>APPENDIX 2: Test instruments .....</b>	<b>42</b>
<b>APPENDIX 3: Photographs of test setup .....</b>	<b>43</b>

## **SECTION 1: Customer information**

Company Name : PIONEER CORPORATION  
Address : 25-1 Yamada, Kawagoe-shi, Saitama-ken 350-8555, JAPAN  
Telephone Number : +81-49-228-6415  
Facsimile Number : +81-49-228-6493  
Contact Person : Tomoyuki Tanaka

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Car Audio with Bluetooth / WLAN  
Model No. : PVH-5558  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 12 V  
Receipt Date of Sample : May 11, 2015  
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.

### **2.2 Product Description**

Model: PVH-5558 (referred to as the EUT in this report) is a Car Audio with Bluetooth / WLAN.

#### **General Specification**

Clock frequency(ies) in the system : 26 MHz

#### **Radio Specification**

##### **Bluetooth (Ver. 3.0 with EDR function):**

Radio Type : Transceiver  
Frequency of Operation : 2402 MHz - 2480 MHz  
Modulation : FHSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : F pattern type  
Antenna Gain : -1.98 dBi

##### **Wireless LAN:**

Radio Type : Transceiver  
Frequency of Operation : 2412 MHz - 2462 MHz  
Modulation : DSSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : F pattern type  
Antenna Gain : -0.38 dBi

\* Refer to the test report: 10762865S-B for Wireless LAN part.

## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2015, final revised on January 21, 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

### **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	-	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	11.0 dB 12400.00 MHz, AV, Hori.	Complied	Conducted/ Radiated

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.

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

#### **FCC 15.31 (e)**

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

#### **FCC 15.203**

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

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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

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

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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)**

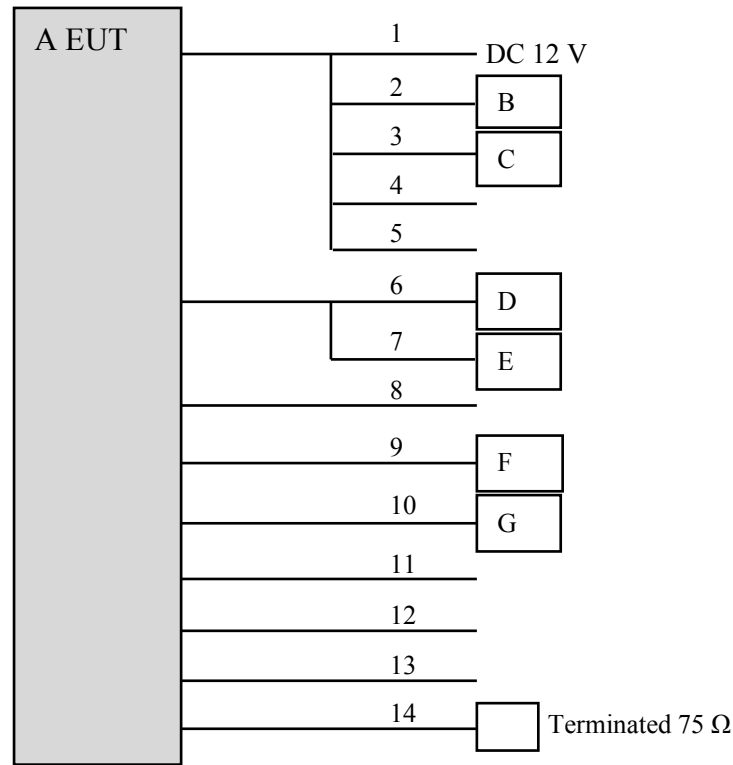
Bluetooth: Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

<b>Test Item</b>	<b>Mode</b>	<b>Tested frequency</b>
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 On) DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5 Inquiry	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off Inquiry	2402 MHz 2441 MHz 2480 MHz
<p>* As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)  * 2DH mode (2 Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>Power setting: Fixed  Firmware version: 0.040203</p>		



## 4.2 Configuration and peripherals



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

### Description of EUT and auxiliary equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	PVH-5558	AABB000027CS *1) AABB000029CS *2)	PIONEER CORPORATION	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	USM4GU	-	SONY	-
G	GPS antenna	-	-	MITSUMI ELECTRONICS	-

\*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 cable	1.4	Unshielded	Unshielded	-
2	Speaker cable	3.4	Unshielded	Unshielded	-
3	Speaker cable	3.4	Unshielded	Unshielded	-
4	Cable	1.4	Unshielded	Unshielded	-
5	Cable	1.4	Unshielded	Unshielded	-
6	Speaker cable	3.4	Unshielded	Unshielded	-
7	Speaker cable	3.4	Unshielded	Unshielded	-
8	Cable	1.0	Shielded	Shielded	-
9	USB cable	2.1	Shielded	Shielded	-
10	GPS antenna cable	1.3	Unshielded	Unshielded	-
11	Cable	1.0	Shielded	Shielded	-
12	Cable	1.0	Unshielded	Unshielded	-
13	Cable	1.4	Unshielded	Unshielded	-
14	FM antenna cable	1.7	Shielded	Shielded	-

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## **SECTION 5: Radiated Spurious Emission**

### **Test Procedure**

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.

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 15 GHz), 1 m*2) (above 15 GHz),		3 m (below 15 GHz), 1 m*2) (above 15 GHz),

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

\*2) Distance Factor:  $20 \times \log(3.0 \text{ m} / 1.0 \text{ m}) = 9.5 \text{ dB}$

The EUT was set at 30 degree as normal position according to the EUT's specification.

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

**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 use
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Sample	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 160 MHz BW)
Carrier Frequency Separation	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	10 kHz	30 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) The measurement was performed with Max Hold since the duty cycle was not 100 %. *2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 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**

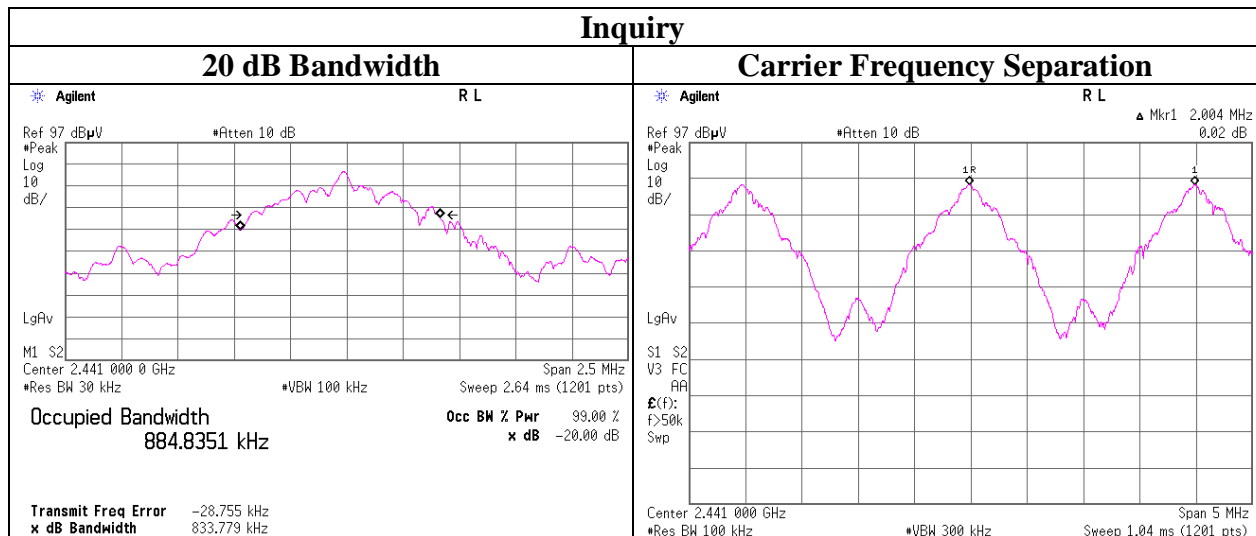
**APPENDIX 1: Test data**

**20dB Bandwidth and Carrier Frequency Separation**

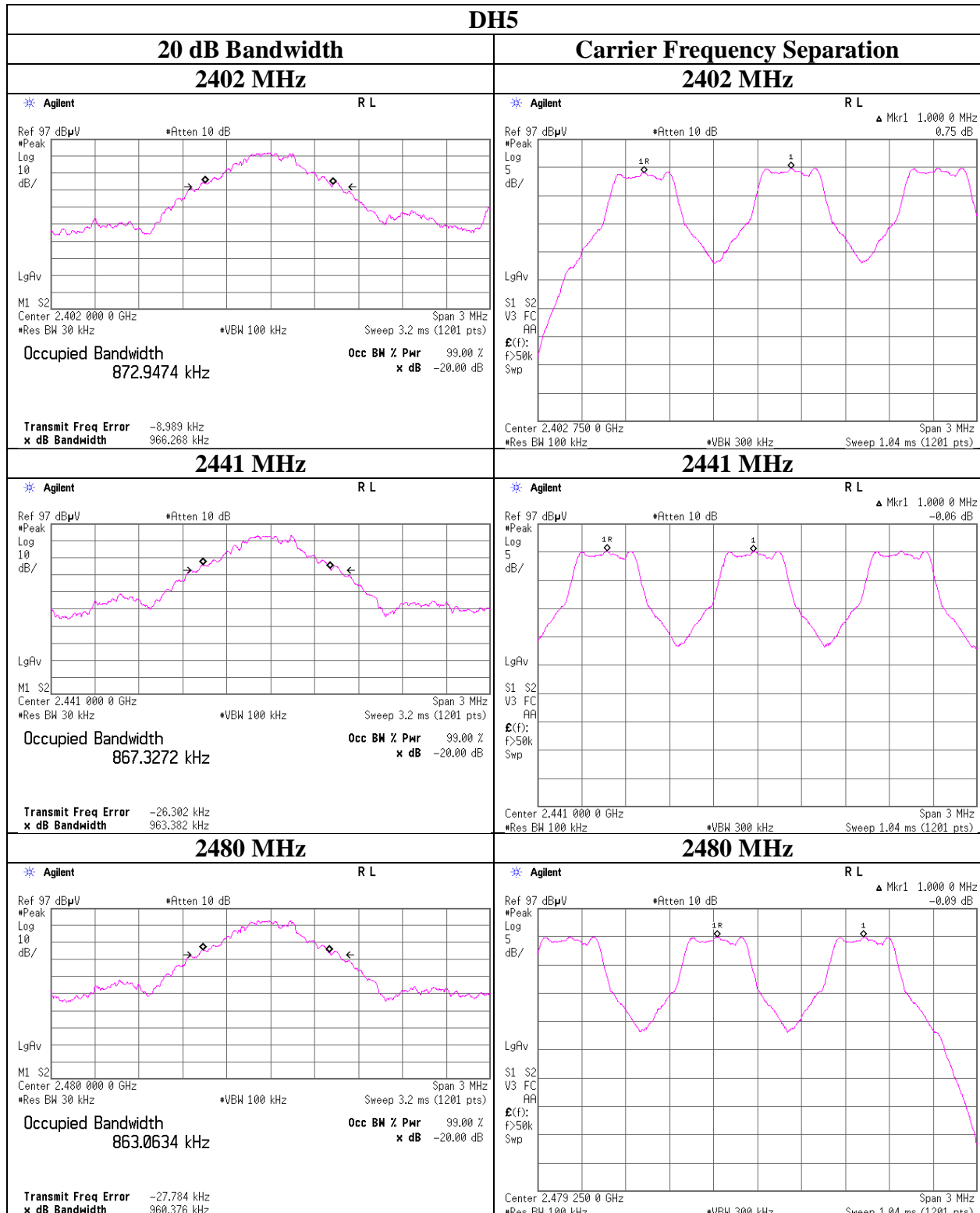
Test place : Shonan EMC Lab. No.5 Shielded Room  
Report No. : 10762865S-A  
Date : May 12, 2015 June 25, 2015  
Temperature / Humidity : 25 deg. C / 37 % RH 30 deg. C / 38 % RH  
Engineer : Shinichi Takano Hikaru Shirasawa  
Mode : Tx Hopping On

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.966	1.000	>= 0.644
DH5	2441.0	0.963	1.000	>= 0.642
DH5	2480.0	0.960	1.000	>= 0.640
3DH5	2402.0	1.294	1.000	>= 0.863
3DH5	2441.0	1.283	1.000	>= 0.856
3DH5	2480.0	1.284	1.000	>= 0.856
Inquiry	2441.0	0.834	2.004	>= 0.556

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).  
No limit applies to 20dB Bandwidth.



## 20dB Bandwidth and Carrier Frequency Separation



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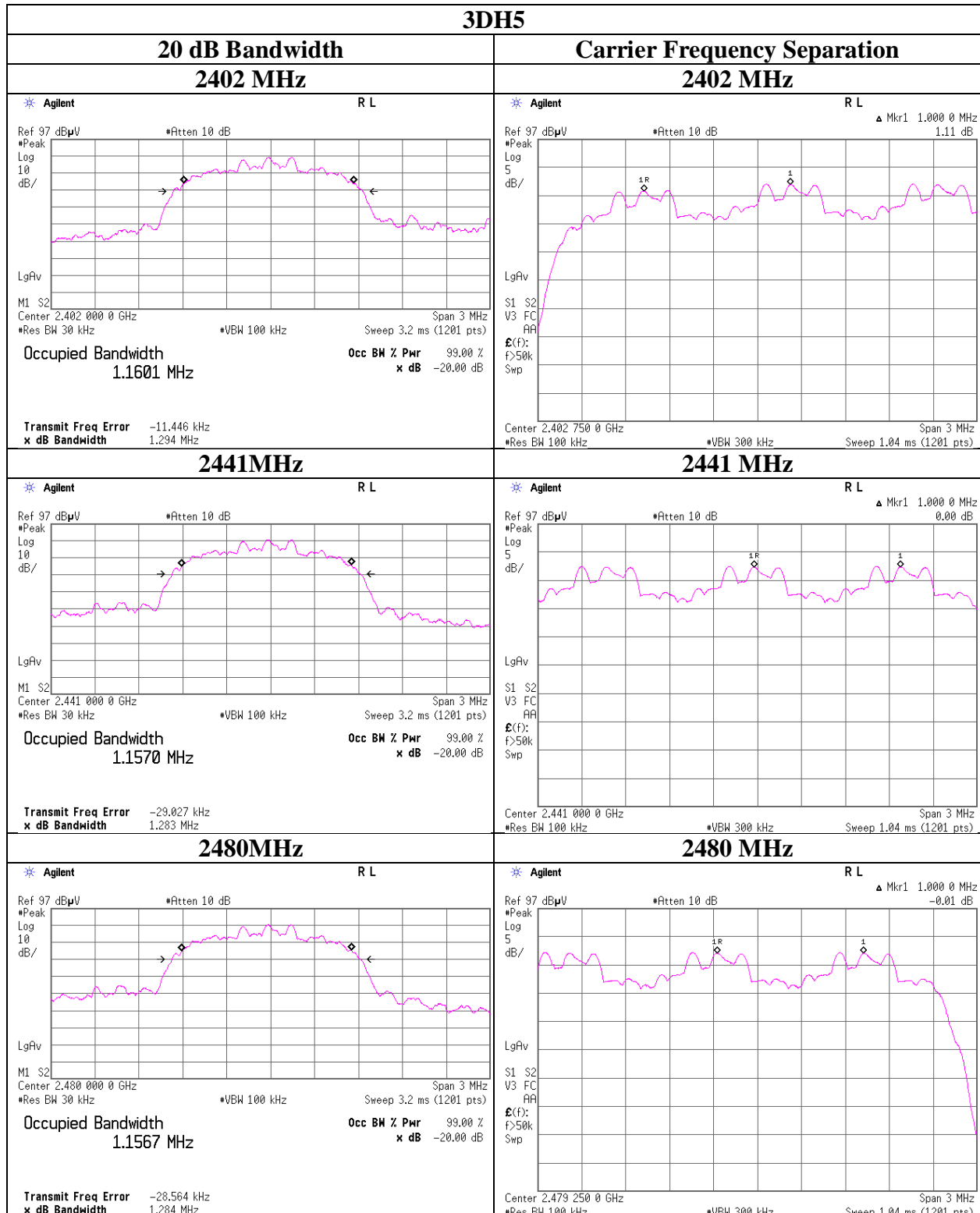
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## 20dB Bandwidth and Carrier Frequency Separation



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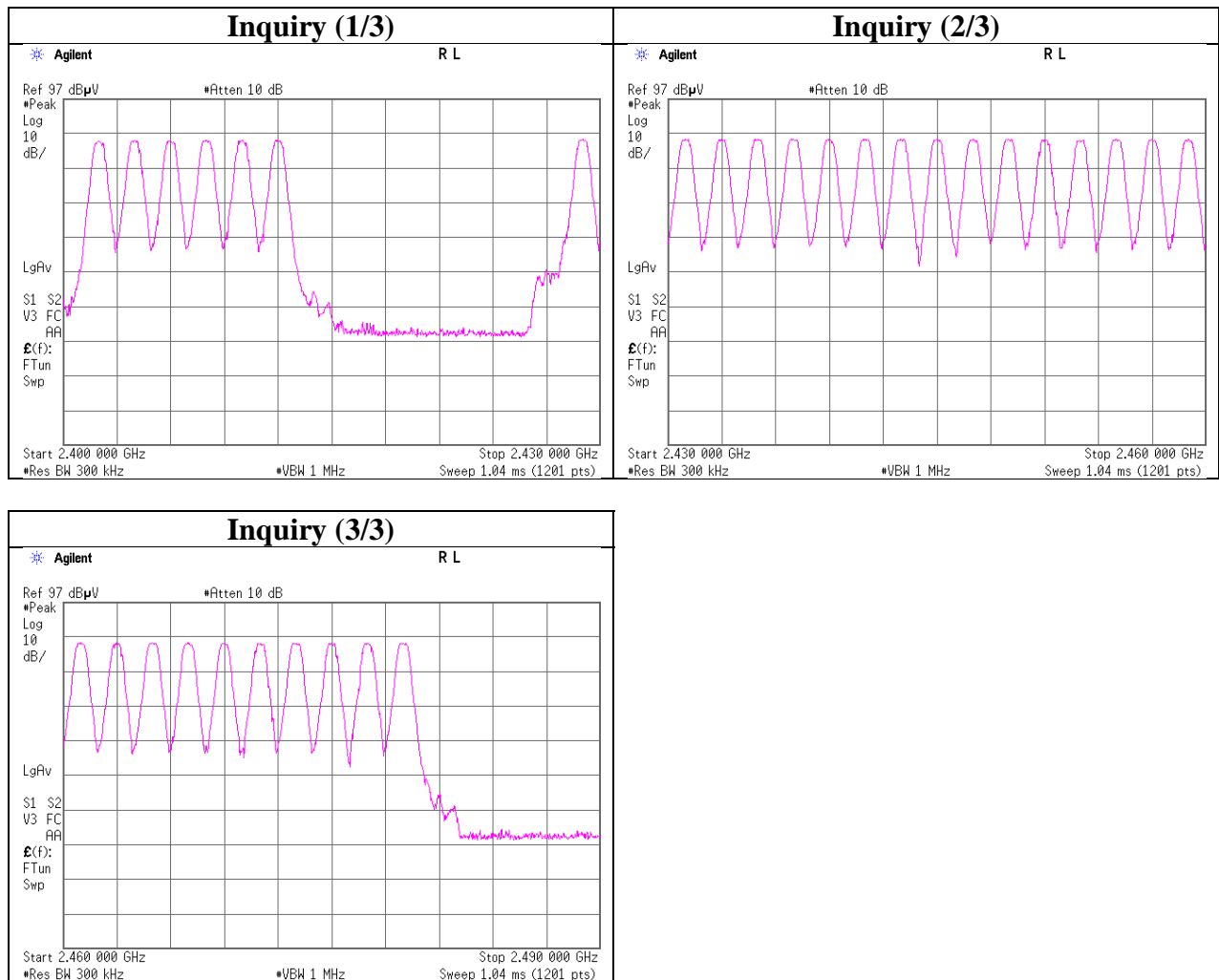
Facsimile : +81 596 24 8124

## Number of Hopping Frequency

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	10762865S-A	
Date	May 12, 2015	June 25, 2015
Temperature / Humidity	25 deg. C / 37 % RH	30 deg. C / 38 % RH
Engineer	Shinichi Takano	Hikaru Shirasawa
Mode	Tx Hopping On	

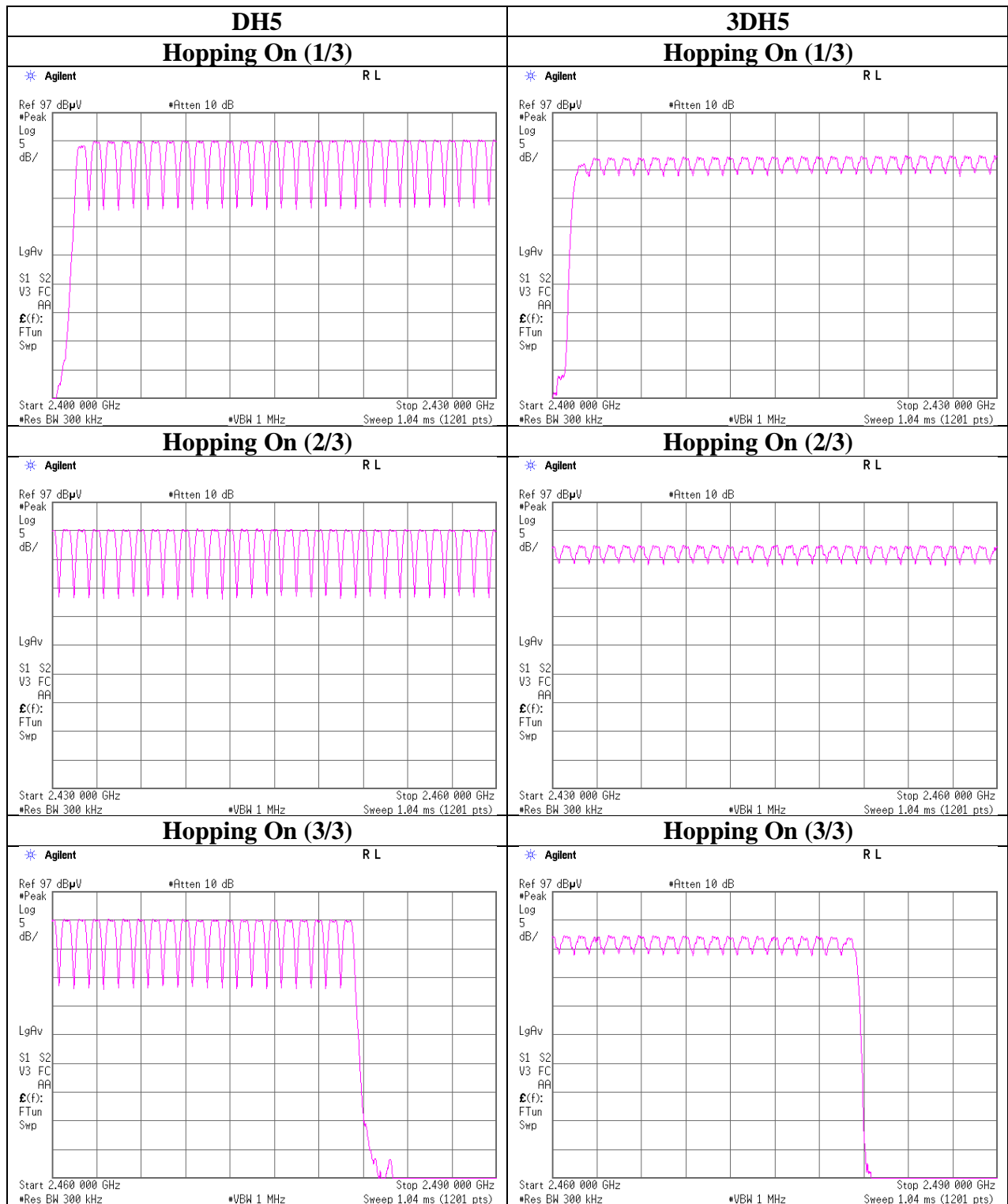
Mode	Number of channel [channels]	Limit [channels]
DH5	79	≥ 15
3DH5	79	≥ 15
Inquiry	32	≥ 15

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.





**Number of Hopping Frequency**



### Dwell time

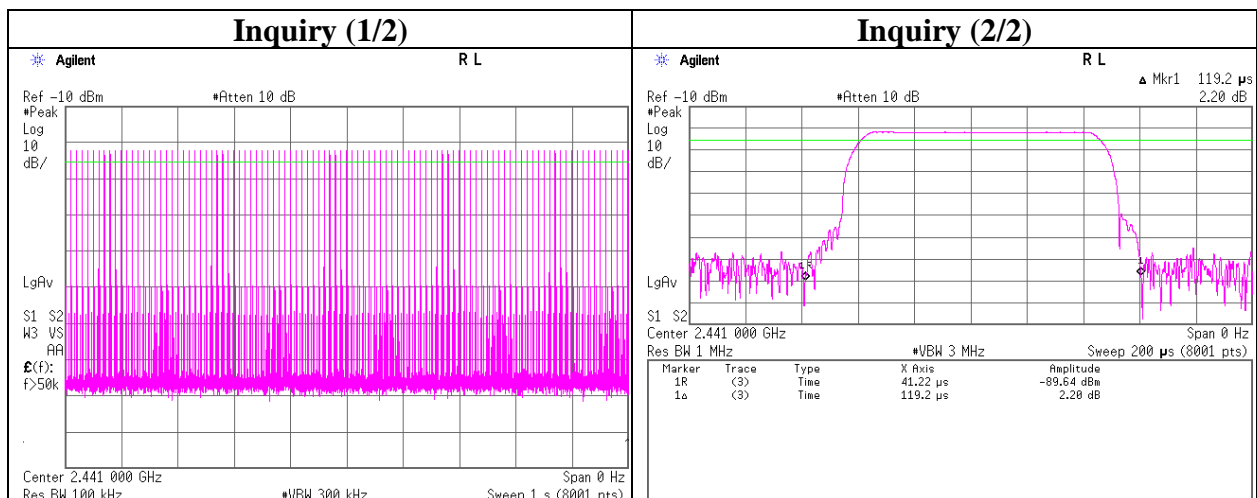
Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	10762865S-A	
Date	May 12, 2015	June 25, 2015
Temperature / Humidity	25 deg. C / 37 % RH	30 deg. C / 38 % RH
Engineer	Shinichi Takano	Hikaru Shirasawa
Mode	Tx Hopping On	

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	53.0 times / 5 sec. x 31.6 sec. = 335 times	0.416	139	400
DH3	26.0 times / 5 sec. x 31.6 sec. = 165 times	1.673	276	400
DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.920	315	400
3DH1	51.0 times / 5 sec. x 31.6 sec. = 323 times	0.421	136	400
3DH3	26.0 times / 5 sec. x 31.6 sec. = 165 times	1.678	277	400
3DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.937	317	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.119	153	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  $N = 79$ .



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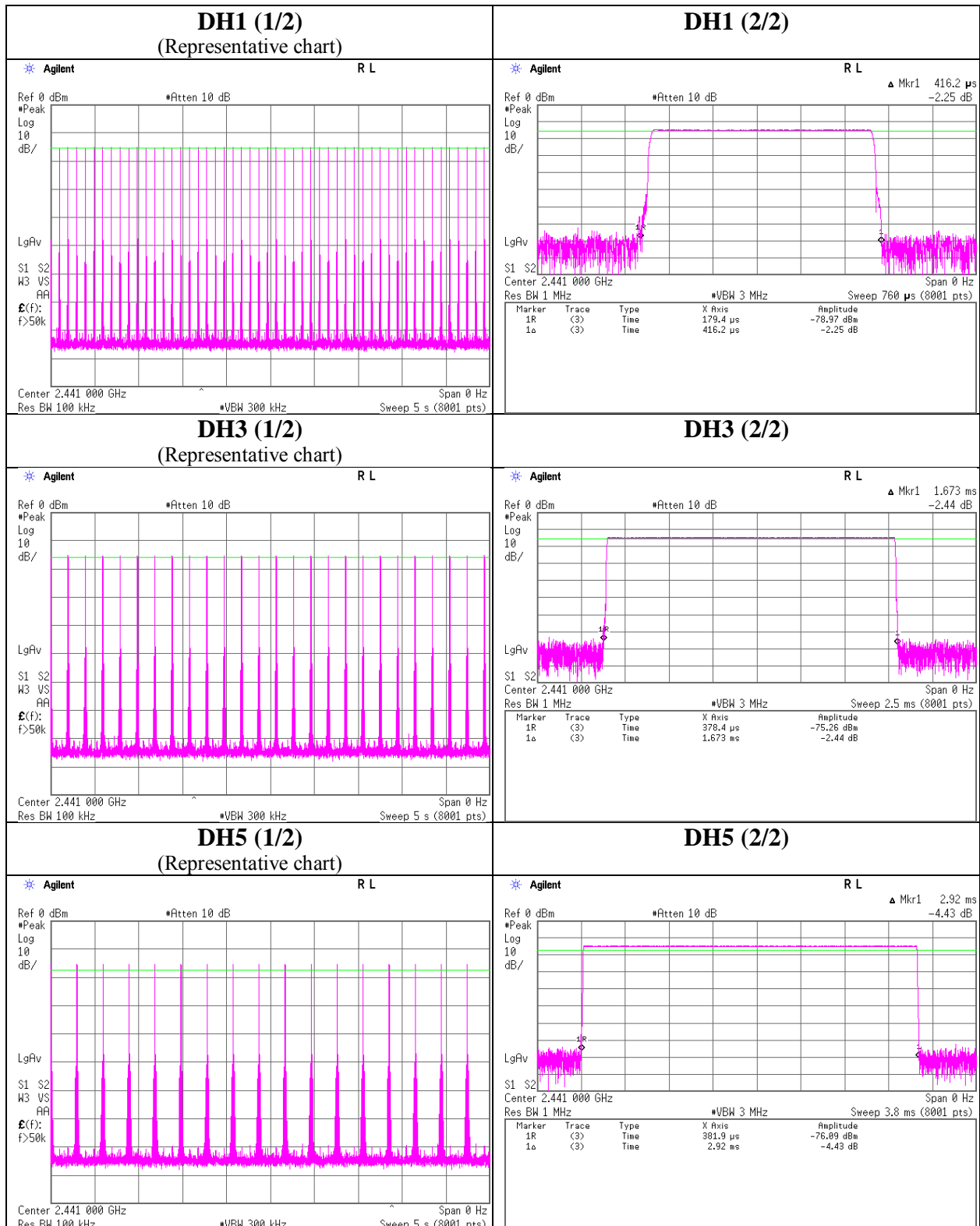
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### Dwell time



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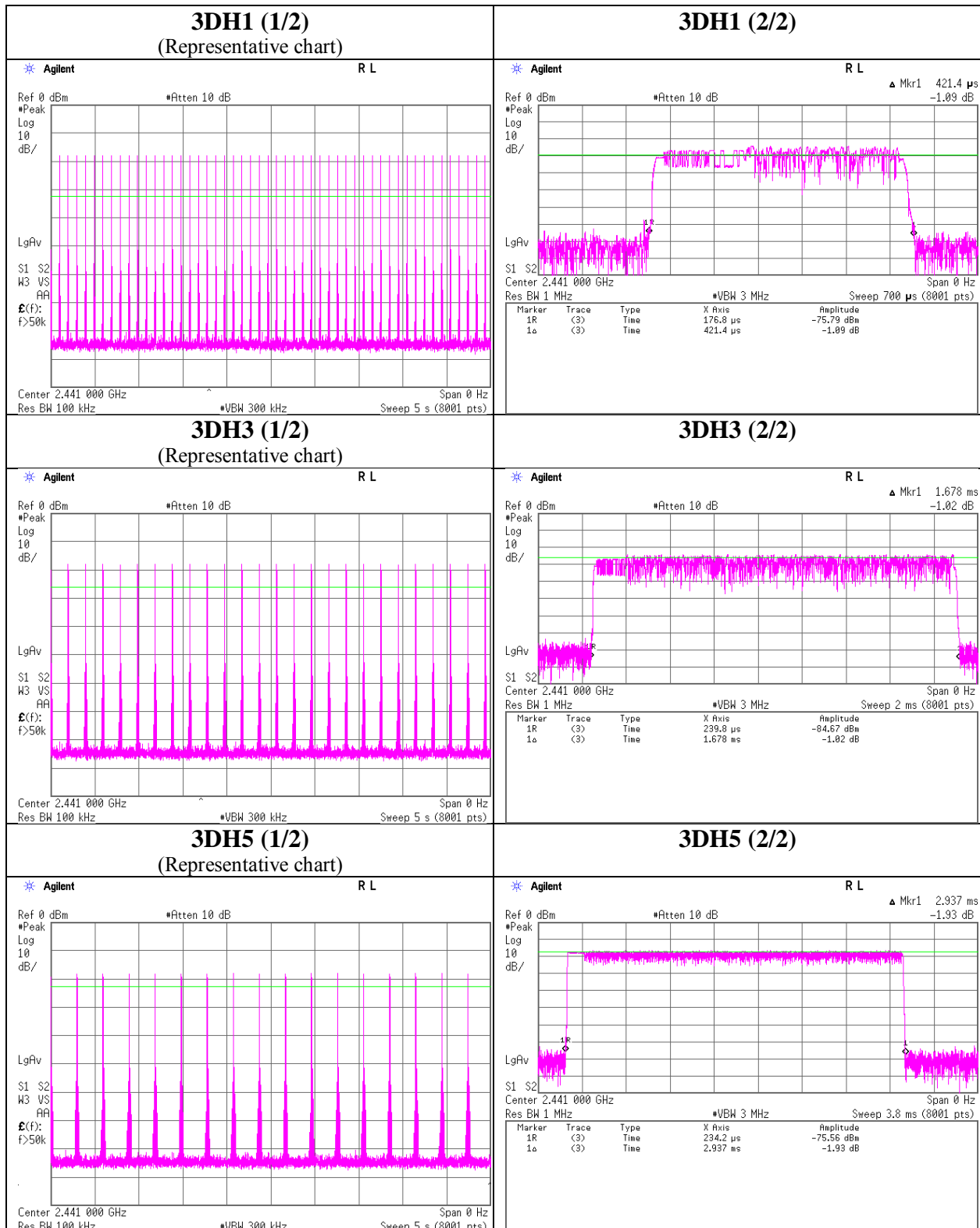
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### Dwell time



## Maximum Peak Output Power

Test place : Shonan EMC Lab. No.5 Shielded Room  
Report No. : 10762865S-A  
Date : May 12, 2015  
Temperature / Humidity : 25 deg. C / 37 % RH  
Engineer : Shinichi Takano  
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	-14.80	1.34	20.13	6.67	4.65	20.96	125	14.29
DH5	2441.0	-14.03	1.35	20.13	7.45	5.56	20.96	125	13.51
DH5	2480.0	-14.11	1.36	20.13	7.38	5.47	20.96	125	13.58
2DH5	2402.0	-16.40	1.34	20.13	5.07	3.21	20.96	125	15.89
2DH5	2441.0	-15.36	1.35	20.13	6.12	4.09	20.96	125	14.84
2DH5	2480.0	-15.59	1.36	20.13	5.90	3.89	20.96	125	15.06
3DH5	2402.0	-16.42	1.34	20.13	5.05	3.20	20.96	125	15.91
3DH5	2441.0	-15.12	1.35	20.13	6.36	4.33	20.96	125	14.60
3DH5	2480.0	-15.52	1.36	20.13	5.97	3.95	20.96	125	14.99

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)**

Test place                      Shonan EMC Lab. No.5 Shielded Room  
Report No.                     10762865S-A  
Date                             May 12, 2015  
Temperature / Humidity      25 deg. C / 37 % RH  
Engineer                      Shinichi Takano  
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	-8.33	0.15	9.98	1.80	1.51	1.15	2.95	1.97
DH5	2441.0	-8.36	0.15	9.98	1.77	1.50	1.15	2.92	1.96
DH5	2480.0	-8.38	0.15	9.98	1.75	1.50	1.15	2.90	1.95
2DH5	2402.0	-8.33	0.15	9.98	1.80	1.51	1.13	2.93	1.96
2DH5	2441.0	-8.36	0.15	9.98	1.77	1.50	1.13	2.90	1.95
2DH5	2480.0	-8.38	0.15	9.98	1.75	1.50	1.13	2.88	1.94
3DH5	2402.0	-8.33	0.15	9.98	1.80	1.51	1.13	2.93	1.96
3DH5	2441.0	-8.36	0.15	9.98	1.77	1.50	1.13	2.90	1.95
3DH5	2480.0	-8.38	0.15	9.98	1.75	1.50	1.13	2.88	1.94

Sample Calculation:

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

Result (Burst power) = Frame power + Duty factor

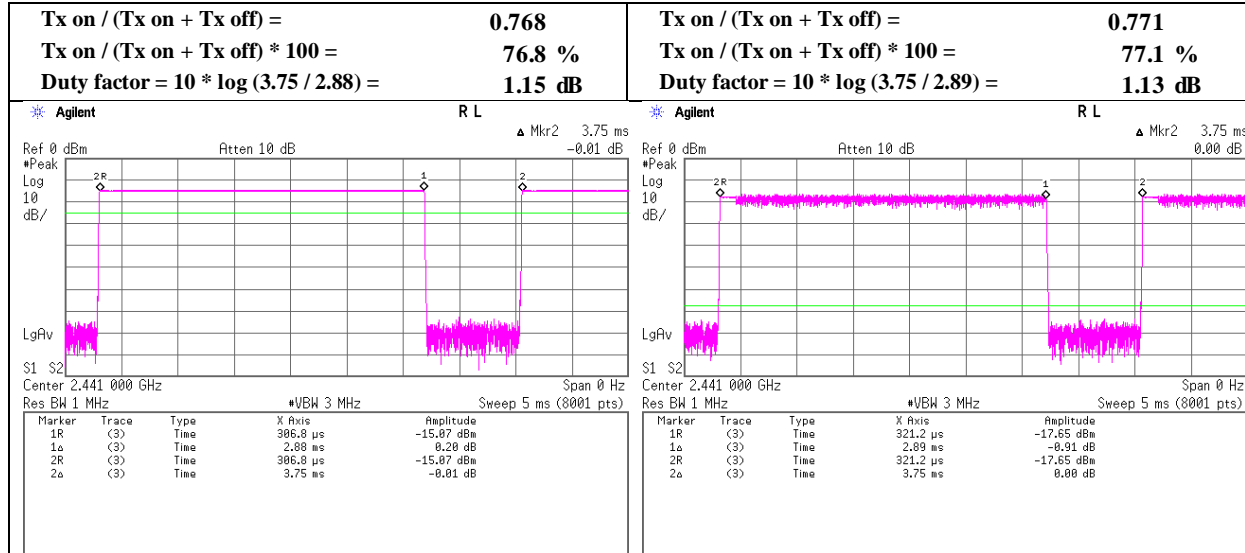
\*The equipment and cables were not used for factor 0 dB of the data sheets.

### Burst Rate Confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx Hopping Off

#### DH5

#### 3DH5



## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. : 10762865S-A  
Date : May 14, 2015      May 15, 2015  
Temperature / Humidity : 25 deg. C / 48 % RH      23 deg. C / 63 % RH  
Engineer : Yosuke Ishikawa      Yosuke Ishikawa  
(1-18 GHz)      (30-1000MHz,  
18-26.5 GHz)  
Mode : Tx DH5 2402MHz

(\* 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.	90.003	QP	41.7	8.2	7.8	31.9	0.0	25.8	43.5	17.7	191	200	
Hori.	350.997	QP	38.8	15.1	6.9	31.6	0.0	29.2	46.0	16.8	100	236	
Hori.	701.992	QP	34.6	20.3	8.7	31.5	0.0	32.1	46.0	13.9	127	200	
Hori.	1583.992	PK	48.2	24.6	12.9	40.6	0.7	45.8	73.9	28.1	100	0	
Hori.	1979.976	PK	49.5	25.7	13.3	40.7	0.7	48.5	73.9	25.4	100	1	
Hori.	2245.963	PK	48.2	25.8	13.7	40.7	0.7	47.7	73.9	26.2	249	298	
Hori.	2390.000	PK	45.3	25.9	13.8	40.7	0.7	45.0	73.9	28.9	239	357	
Hori.	2822.473	PK	51.6	26.6	6.1	40.7	0.7	44.3	73.9	29.6	100	198	
Hori.	4804.000	PK	48.1	30.4	6.2	41.7	0.7	43.7	73.9	30.2	131	106	
Hori.	7206.000	PK	44.7	36.3	7.6	41.2	0.7	48.1	73.9	25.8	100	0	
Hori.	9608.000	PK	44.5	38.3	8.7	40.1	0.7	52.1	73.9	21.8	100	0	
Hori.	12010.000	PK	45.5	39.3	9.3	39.4	0.7	55.4	73.9	18.5	100	0	
Hori.	1583.992	AV	37.4	24.6	12.9	40.6	0.7	35.0	53.9	18.9	100	0	
Hori.	1979.976	AV	42.4	25.7	13.3	40.7	0.7	41.4	53.9	12.5	100	1	
Hori.	2245.963	AV	39.0	25.8	13.7	40.7	0.7	38.5	53.9	15.4	249	298	
Hori.	2390.000	AV	33.6	25.9	13.8	40.7	0.7	33.3	53.9	20.6	239	357	
Hori.	2822.473	AV	45.4	26.6	6.1	40.7	0.7	38.1	53.9	15.8	100	198	
Hori.	4804.000	AV	36.5	30.4	6.2	41.7	0.7	32.1	53.9	21.8	131	106	
Hori.	7206.000	AV	33.4	36.3	7.6	41.2	0.7	36.8	53.9	17.1	100	0	
Hori.	9608.000	AV	32.3	38.3	8.7	40.1	0.7	39.9	53.9	14.0	100	0	
Hori.	12010.000	AV	32.8	39.3	9.3	39.4	0.7	42.7	53.9	11.2	100	0	
Vert.	89.993	QP	33.5	8.1	7.8	31.9	0.0	17.5	43.5	26.0	138	11	
Vert.	350.993	QP	31.8	15.1	6.9	31.6	0.0	22.2	46.0	23.8	100	358	
Vert.	701.995	QP	35.4	20.3	8.7	31.5	0.0	32.9	46.0	13.1	166	225	
Vert.	1584.062	PK	50.7	24.6	12.9	40.6	0.7	48.3	73.9	25.6	100	53	
Vert.	1979.988	PK	49.5	25.7	13.3	40.7	0.7	48.5	73.9	25.4	100	48	
Vert.	2390.000	PK	45.8	25.9	13.8	40.7	0.7	45.5	73.9	28.4	100	316	
Vert.	2822.464	PK	50.9	26.6	6.1	40.7	0.7	43.6	73.9	30.3	100	339	
Vert.	4804.000	PK	46.5	30.4	6.2	41.7	0.7	42.1	73.9	31.8	154	336	
Vert.	7206.000	PK	46.3	36.3	7.6	41.2	0.7	49.7	73.9	24.2	100	0	
Vert.	9608.000	PK	45.3	38.3	8.7	40.1	0.7	52.9	73.9	21.0	100	0	
Vert.	12010.000	PK	45.6	39.3	9.3	39.4	0.7	55.5	73.9	18.4	100	0	
Vert.	1584.062	AV	42.0	24.6	12.9	40.6	0.7	39.6	53.9	14.3	100.0	53.0	
Vert.	1979.988	AV	41.8	25.7	13.3	40.7	0.7	40.8	53.9	13.1	100.0	48.0	
Vert.	2390.000	AV	33.7	25.9	13.8	40.7	0.7	33.4	53.9	20.5	100.0	316.0	
Vert.	2822.464	AV	44.5	26.6	6.1	40.7	0.7	37.2	53.9	16.7	100.0	339.0	
Vert.	4804.000	AV	34.7	30.4	6.2	41.7	0.7	30.3	53.9	23.6	154.0	336.0	
Vert.	7206.000	AV	33.1	36.3	7.6	41.2	0.7	36.5	53.9	17.4	100.0	0.0	
Vert.	9608.000	AV	32.2	38.3	8.7	40.1	0.7	39.8	53.9	14.1	100.0	0.0	
Vert.	12010.000	AV	32.7	39.3	9.3	39.4	0.7	42.6	53.9	11.3	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 : 20log(3.25 m / 3.0 m) = 0.7 dB

15 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 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	92.5	25.9	13.8	40.7	0.7	92.2	-	-	Carrier
Hori.	2400.000	PK	48.8	25.9	13.8	40.7	0.7	48.5	72.2	23.7	
Vert.	2402.000	PK	89.2	25.9	13.8	40.7	0.7	88.9	-	-	Carrier
Vert.	2400.000	PK	46.4	25.9	13.8	40.7	0.7	46.1	68.9	22.8	

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

Distance factor : 1 GHz - 15 GHz : 20log(3.25 m / 3.0 m) = 0.7 dB

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

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## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. : 10762865S-A  
Date : May 14, 2015      May 15, 2015  
Temperature / Humidity : 25 deg. C / 48 % RH      23 deg. C / 63 % RH  
Engineer : Yosuke Ishikawa      Yosuke Ishikawa  
(1-18 GHz)      (30-1000MHz,  
18-26.5 GHz)  
Mode : Tx DH5 2480MHz

(\* 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.	90.001	QP	41.5	8.2	7.8	31.9	0.0	25.6	43.5	17.9	209	220	
Hori.	350.990	QP	37.0	15.1	6.9	31.6	0.0	27.4	46.0	18.6	100	247	
Hori.	701.989	QP	34.5	20.3	8.7	31.5	0.0	32.0	46.0	14.0	126	200	
Hori.	1583.968	PK	47.6	24.6	12.9	40.6	0.7	45.2	73.9	28.7	100	44	
Hori.	1980.040	PK	48.9	25.7	13.3	40.7	0.7	47.9	73.9	26.0	100	1	
Hori.	2298.005	PK	47.5	25.8	13.7	40.7	0.7	47.0	73.9	26.9	240	286	
Hori.	2323.982	PK	49.3	25.8	13.7	40.7	0.7	48.8	73.9	25.1	220	270	
Hori.	2483.500	PK	48.2	25.9	13.9	40.7	0.7	48.0	73.9	25.9	119	295	
Hori.	2822.487	PK	49.8	26.6	6.1	40.7	0.7	42.5	73.9	31.4	100	199	
Hori.	4960.000	PK	47.7	31.0	6.5	41.5	0.7	44.4	73.9	29.5	153	75	
Hori.	7440.000	PK	45.1	36.5	7.7	41.3	0.7	48.7	73.9	25.2	100	0	
Hori.	9920.000	PK	44.7	38.4	8.9	40.0	0.7	52.7	73.9	21.2	100	0	
Hori.	12400.000	PK	44.4	39.1	9.5	39.0	0.7	54.7	73.9	19.2	100	0	
Hori.	1583.968	AV	40.0	24.6	12.9	40.6	0.7	37.6	53.9	16.3	100	44	
Hori.	1980.040	AV	41.6	25.7	13.3	40.7	0.7	40.6	53.9	13.3	100	1	
Hori.	2298.005	AV	40.4	25.8	13.7	40.7	0.7	39.9	53.9	14.0	240	286	
Hori.	2323.982	AV	41.2	25.8	13.7	40.7	0.7	40.7	53.9	13.2	220	270	
Hori.	2483.500	AV	36.0	25.9	13.9	40.7	0.7	35.8	53.9	18.1	119	295	
Hori.	2822.487	AV	45.0	26.6	6.1	40.7	0.7	37.7	53.9	16.2	100	199	
Hori.	4960.000	AV	35.2	31.0	6.5	41.5	0.7	31.9	53.9	22.0	153	75	
Hori.	7440.000	AV	33.6	36.5	7.7	41.3	0.7	37.2	53.9	16.7	100	0	
Hori.	9920.000	AV	32.2	38.4	8.9	40.0	0.7	40.2	53.9	13.7	100	0	
Hori.	12400.000	AV	32.6	39.1	9.5	39.0	0.7	42.9	53.9	11.0	100	0	
Vert.	89.998	QP	45.1	8.1	7.8	31.9	0.0	29.1	43.5	14.4	100	213	
Vert.	350.985	QP	32.3	15.1	6.9	31.6	0.0	22.7	46.0	23.3	100	359	
Vert.	701.989	QP	35.0	20.3	8.7	31.5	0.0	32.5	46.0	13.5	165	226	
Vert.	1584.010	PK	49.3	24.6	12.9	40.6	0.7	46.9	73.9	27.0	100	53	
Vert.	1980.011	PK	49.2	25.7	13.3	40.7	0.7	48.2	73.9	25.7	100	57	
Vert.	2483.500	PK	47.4	25.9	13.9	40.7	0.7	47.2	73.9	26.7	100	214	
Vert.	2822.480	PK	49.3	26.6	6.1	40.7	0.7	42.0	73.9	31.9	100	340	
Vert.	4960.000	PK	48.5	31.0	6.5	41.5	0.7	45.2	73.9	28.7	145	8	
Vert.	7440.000	PK	45.5	36.5	7.7	41.3	0.7	49.1	73.9	24.8	100	0	
Vert.	9920.000	PK	45.2	38.4	8.9	40.0	0.7	53.2	73.9	20.7	100	0	
Vert.	12400.000	PK	44.0	39.1	9.5	39.0	0.7	54.3	73.9	19.6	100	0	
Vert.	1584.010	AV	42.3	24.6	12.9	40.6	0.7	39.9	53.9	14.0	100	53	
Vert.	1980.011	AV	42.9	25.7	13.3	40.7	0.7	41.9	53.9	12.0	100	57	
Vert.	2483.500	AV	35.3	25.9	13.9	40.7	0.7	35.1	53.9	18.8	100	214	
Vert.	2822.480	AV	44.1	26.6	6.1	40.7	0.7	36.8	53.9	17.1	100	340	
Vert.	4960.000	AV	36.8	31.0	6.5	41.5	0.7	33.5	53.9	20.4	145	8	
Vert.	7440.000	AV	33.7	36.5	7.7	41.3	0.7	37.3	53.9	16.6	100	0	
Vert.	9920.000	AV	32.1	38.4	8.9	40.0	0.7	40.1	53.9	13.8	100	0	
Vert.	12400.000	AV	32.5	39.1	9.5	39.0	0.7	42.8	53.9	11.1	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 (3.25 m / 3.0 m) = 0.7 dB

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

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**Shonan EMC Lab.**

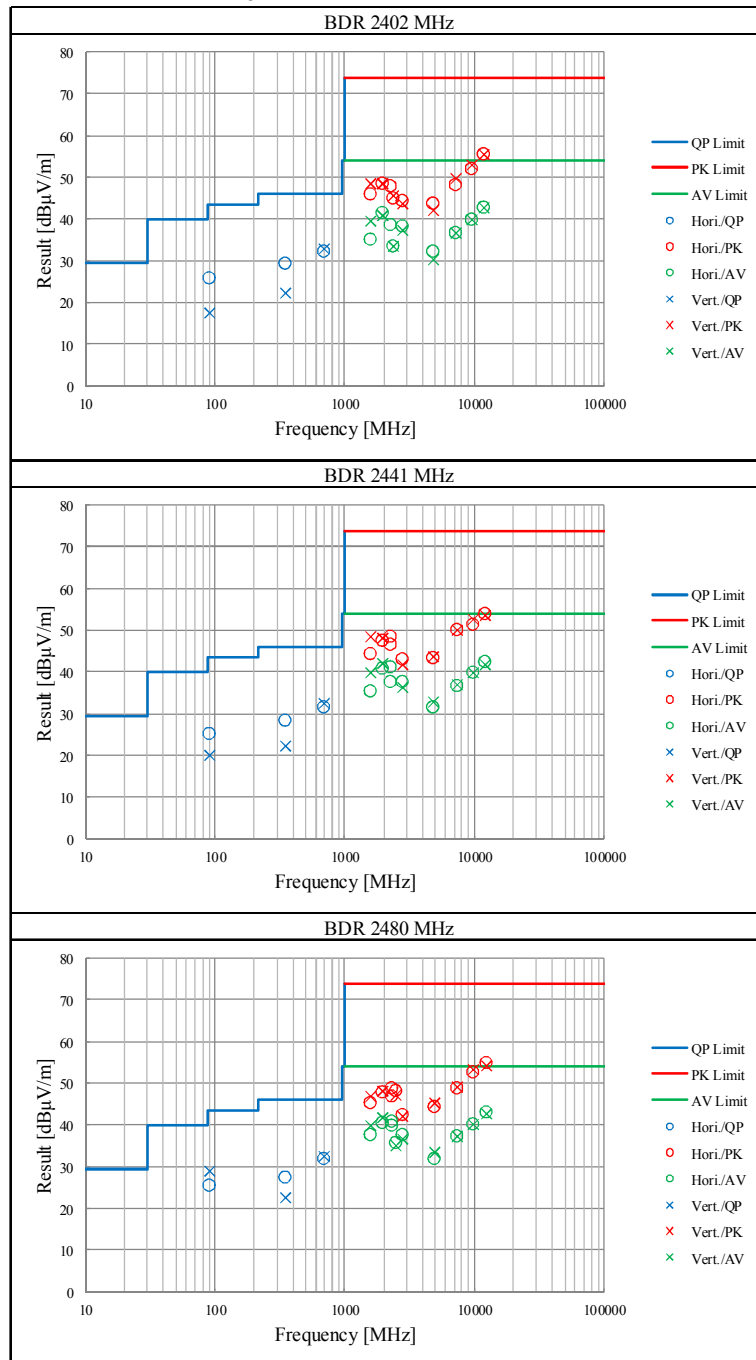
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## Radiated Spurious Emission (All band chart)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10762865S-A		
Date	May 14, 2015	May 15, 2015	
Temperature / Humidity	25 deg. C / 48 % RH	23 deg. C / 63 % RH	
Engineer	Yosuke Ishikawa (1-18 GHz)	Yosuke Ishikawa (30-1000MHz, 18-26.5 GHz)	
Mode	Tx DH5		



## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. : 10762865S-A  
Date : May 14, 2015      May 15, 2015  
Temperature / Humidity : 25 deg. C / 48 % RH      23 deg. C / 63 % RH  
Engineer : Yosuke Ishikawa      Yosuke Ishikawa  
(1-18 GHz)      (30-1000MHz,  
18-26.5 GHz)  
Mode : Tx 3DH5 2402MHz

(\* 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.	89.996	QP	41.6	8.1	7.8	31.9	0.0	25.6	43.5	17.9	211	211	
Hori.	350.987	QP	37.0	15.1	6.9	31.6	0.0	27.4	46.0	18.6	100	236	
Hori.	701.992	QP	34.4	20.3	8.7	31.5	0.0	31.9	46.0	14.1	127	203	
Hori.	1583.945	PK	48.2	24.6	12.9	40.6	0.7	45.8	73.9	28.1	100	55	
Hori.	1979.981	PK	48.9	25.7	13.3	40.7	0.7	47.9	73.9	26.0	100	1	
Hori.	2390.000	PK	45.0	25.9	13.8	40.7	0.7	44.7	73.9	29.2	235	357	
Hori.	2822.471	PK	50.4	26.6	6.1	40.7	0.7	43.1	73.9	30.8	100	200	
Hori.	4804.000	PK	47.8	30.4	6.2	41.7	0.7	43.4	73.9	30.5	139	94	
Hori.	7206.000	PK	44.4	36.3	7.6	41.2	0.7	47.8	73.9	26.1	100	0	
Hori.	9608.000	PK	44.7	38.3	8.7	40.1	0.7	52.3	73.9	21.6	100	0	
Hori.	12010.000	PK	44.0	39.3	9.3	39.4	0.7	53.9	73.9	20.0	100	0	
Hori.	1583.945	AV	40.5	24.6	12.9	40.6	0.7	38.1	53.9	15.8	100	55	
Hori.	1979.981	AV	41.5	25.7	13.3	40.7	0.7	40.5	53.9	13.4	100	1	
Hori.	2390.000	AV	33.2	25.9	13.8	40.7	0.7	32.9	53.9	21.0	235	357	
Hori.	2822.471	AV	45.2	26.6	6.1	40.7	0.7	37.9	53.9	16.0	100	200	
Hori.	4804.000	AV	35.0	30.4	6.2	41.7	0.7	30.6	53.9	23.3	139	94	
Hori.	7206.000	AV	32.7	36.3	7.6	41.2	0.7	36.1	53.9	17.8	100	0	
Hori.	9608.000	AV	32.2	38.3	8.7	40.1	0.7	39.8	53.9	14.1	100	0	
Hori.	12010.000	AV	32.5	39.3	9.3	39.4	0.7	42.4	53.9	11.5	100	0	
Vert.	89.998	QP	42.4	8.1	7.8	31.9	0.0	26.4	43.5	17.1	100	194	
Vert.	350.989	QP	32.4	15.1	6.9	31.6	0.0	22.8	46.0	23.2	100	360	
Vert.	701.987	QP	35.0	20.3	8.7	31.5	0.0	32.5	46.0	13.5	158	226	
Vert.	1584.005	PK	47.5	24.6	12.9	40.6	0.7	45.1	73.9	28.8	100	57	
Vert.	1980.000	PK	48.8	25.7	13.3	40.7	0.7	47.8	73.9	26.1	100	52	
Vert.	2390.000	PK	45.4	25.9	13.8	40.7	0.7	45.1	73.9	28.8	100	321	
Vert.	2822.509	PK	49.2	26.6	6.1	40.7	0.7	41.9	73.9	32.0	100	341	
Vert.	4804.000	PK	46.4	30.4	6.2	41.7	0.7	42.0	73.9	31.9	100	0	
Vert.	7206.000	PK	44.7	36.3	7.6	41.2	0.7	48.1	73.9	25.8	100	0	
Vert.	9608.000	PK	45.6	38.3	8.7	40.1	0.7	53.2	73.9	20.7	100	0	
Vert.	12010.000	PK	44.5	39.3	9.3	39.4	0.7	54.4	73.9	19.5	100	0	
Vert.	1584.005	AV	38.9	24.6	12.9	40.6	0.7	36.5	53.9	17.4	100	57	
Vert.	1980.000	AV	42.6	25.7	13.3	40.7	0.7	41.6	53.9	12.3	100	52	
Vert.	2390.000	AV	33.2	25.9	13.8	40.7	0.7	32.9	53.9	21.0	100	321	
Vert.	2822.509	AV	43.8	26.6	6.1	40.7	0.7	36.5	53.9	17.4	100	341	
Vert.	4804.000	AV	33.2	30.4	6.2	41.7	0.7	28.8	53.9	25.1	100	0	
Vert.	7206.000	AV	32.7	36.3	7.6	41.2	0.7	36.1	53.9	17.8	100	0	
Vert.	9608.000	AV	32.2	38.3	8.7	40.1	0.7	39.8	53.9	14.1	100	0	
Vert.	12010.000	AV	32.5	39.3	9.3	39.4	0.7	42.4	53.9	11.5	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(3.25 m / 3.0 m) = 0.7 dB

15 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.5 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	87.3	25.9	13.8	40.7	0.7	87.0	-	-	Carrier
Hori.	2400.000	PK	40.0	25.9	13.8	40.7	0.7	39.7	67.0	27.3	
Vert.	2402.000	PK	86.3	25.9	13.8	40.7	0.7	86.0	-	-	Carrier
Vert.	2400.000	PK	38.8	25.9	13.8	40.7	0.7	38.5	66.0	27.5	

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

Distance factor : 1 GHz - 15 GHz : 20log(3.25 m / 3.0 m) = 0.7 dB

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

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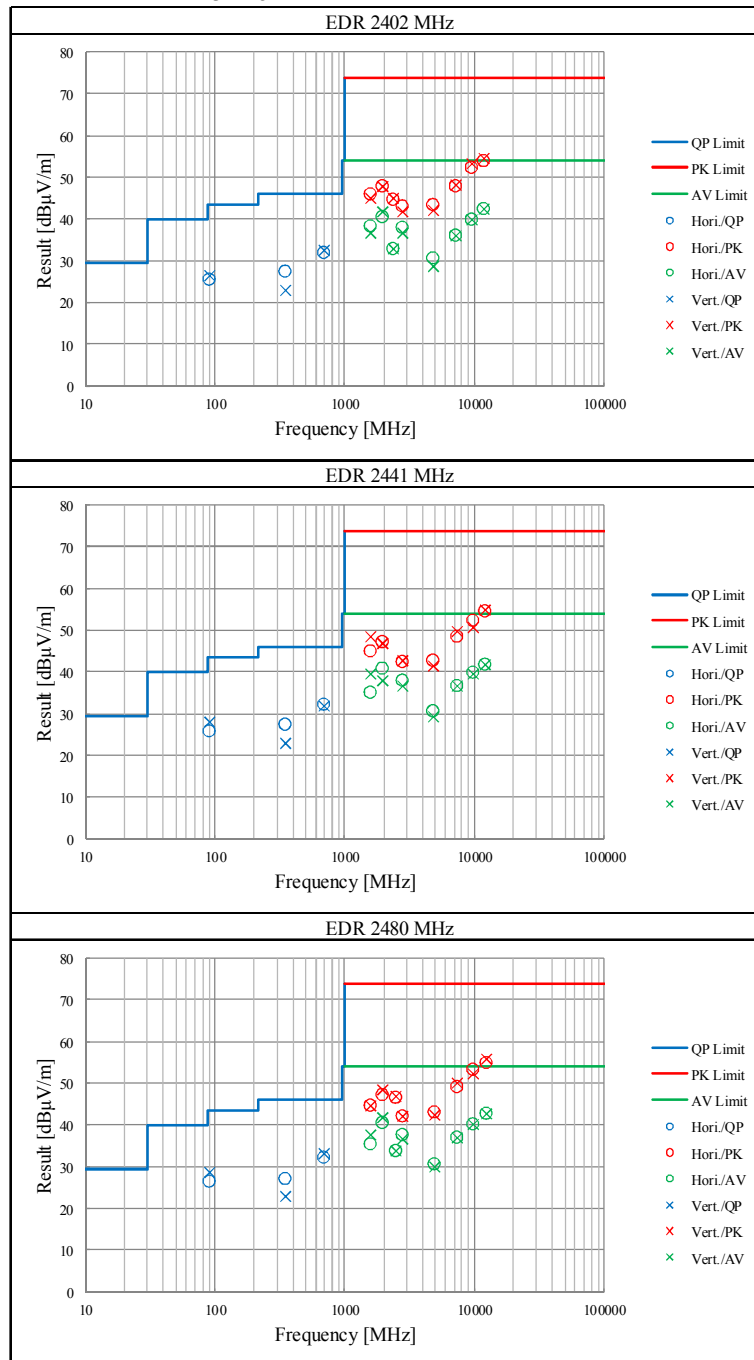
Facsimile : +81 596 24 8124





## Radiated Spurious Emission (All band chart)

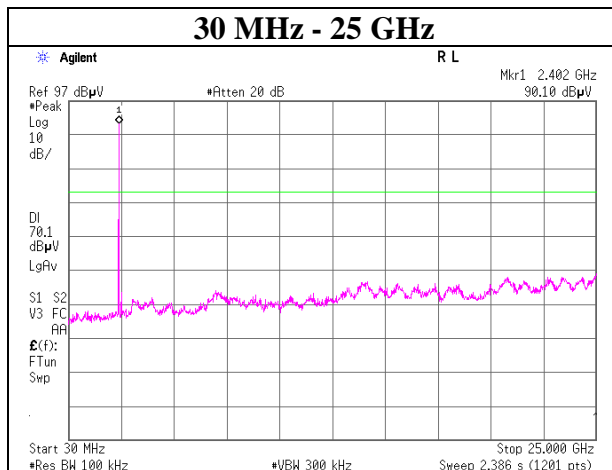
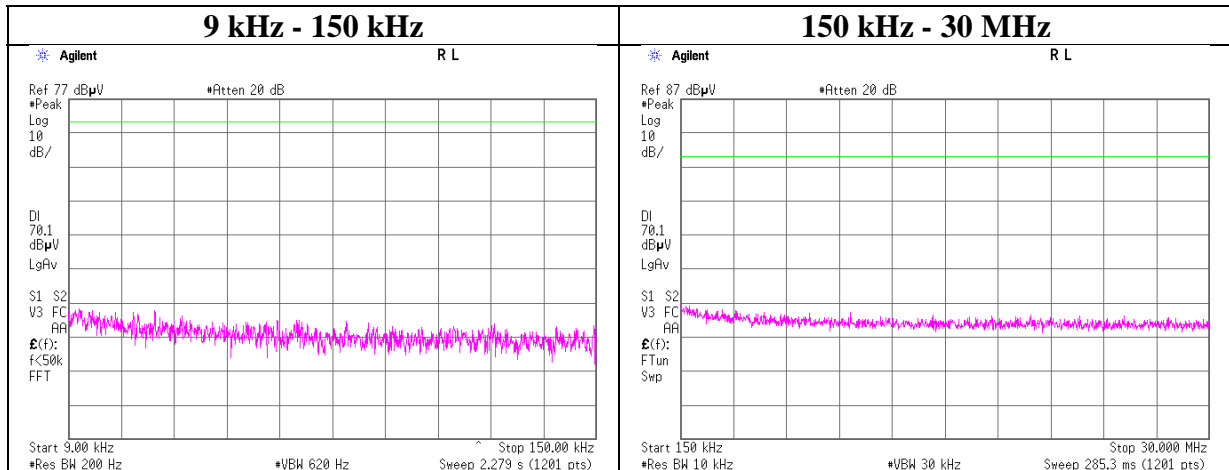
Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10762865S-A		
Date	May 14, 2015	May 15, 2015	
Temperature / Humidity	25 deg. C / 48 % RH	23 deg. C / 63 % RH	
Engineer	Yosuke Ishikawa (1-18 GHz)	Yosuke Ishikawa (30-1000MHz, 18-26.5 GHz)	
Mode	Tx 3DH5		



## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx DH5

### 2402 MHz

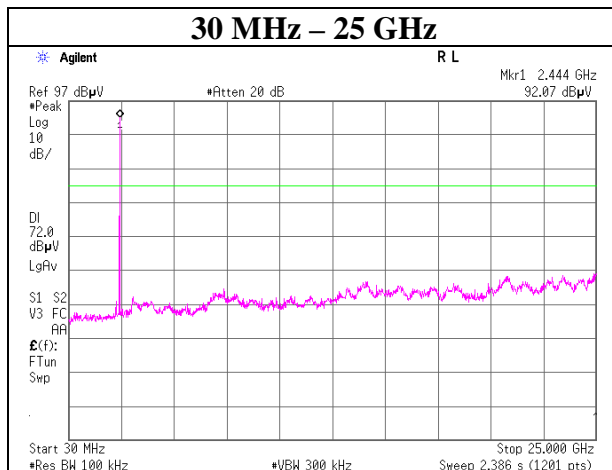
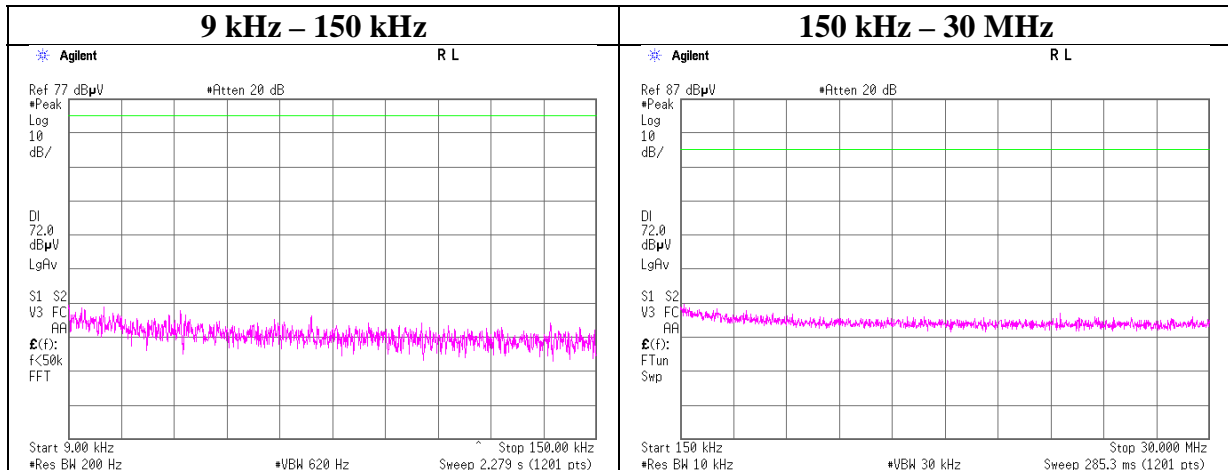




## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx DH5

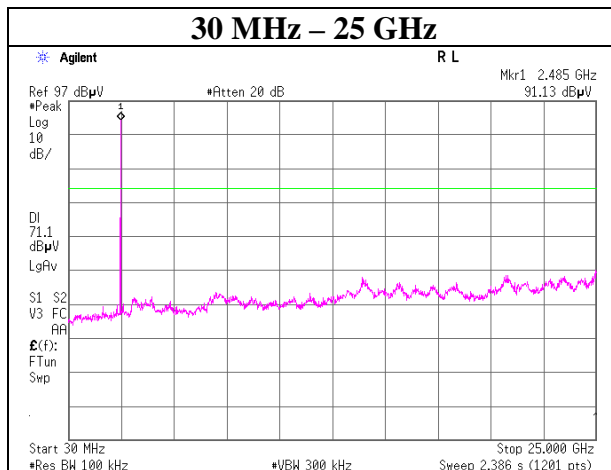
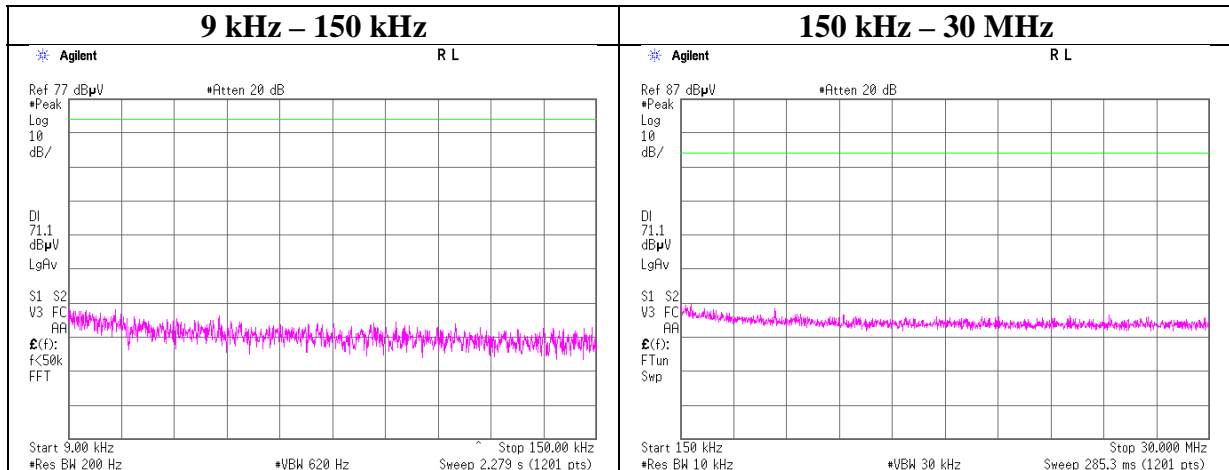
### 2441 MHz



## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx DH5

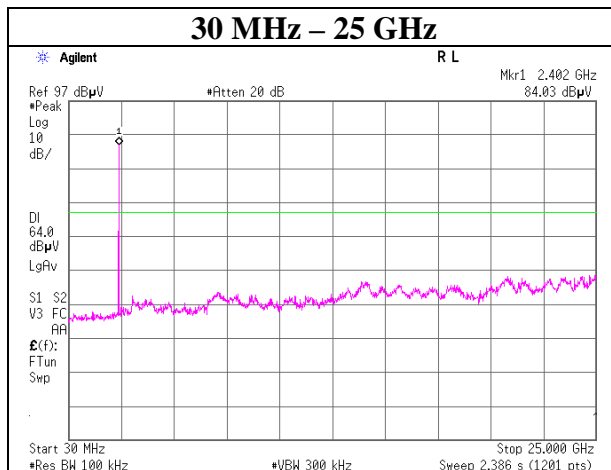
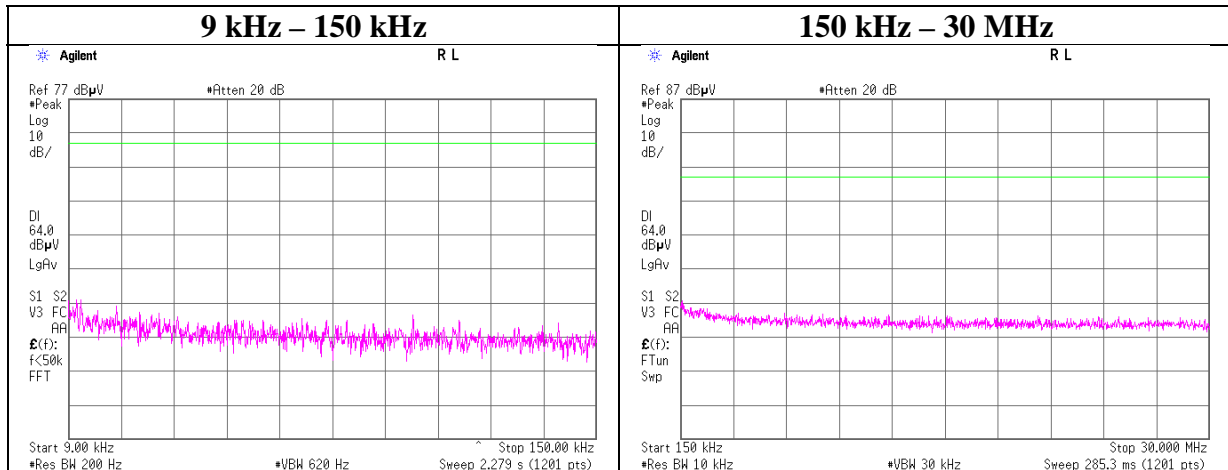
### 2480 MHz



## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx 3DH5

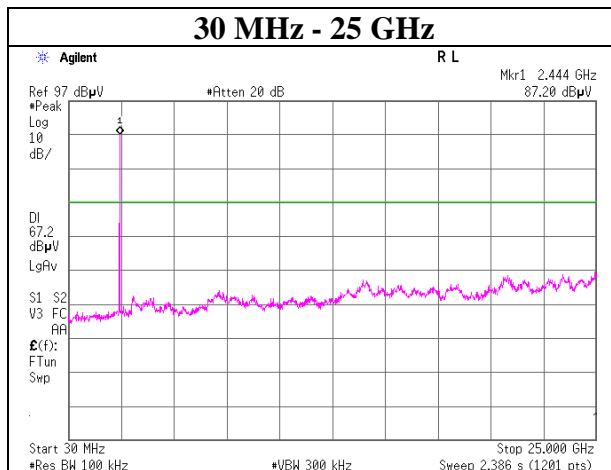
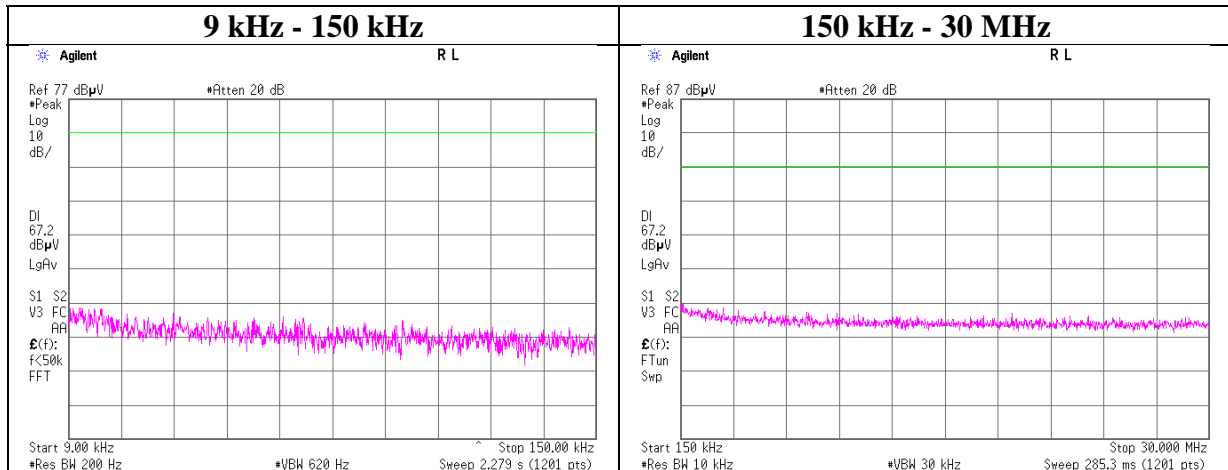
### 2402 MHz



## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx 3DH5

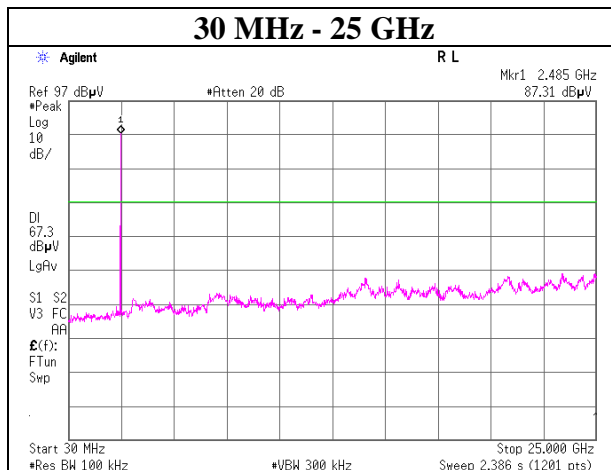
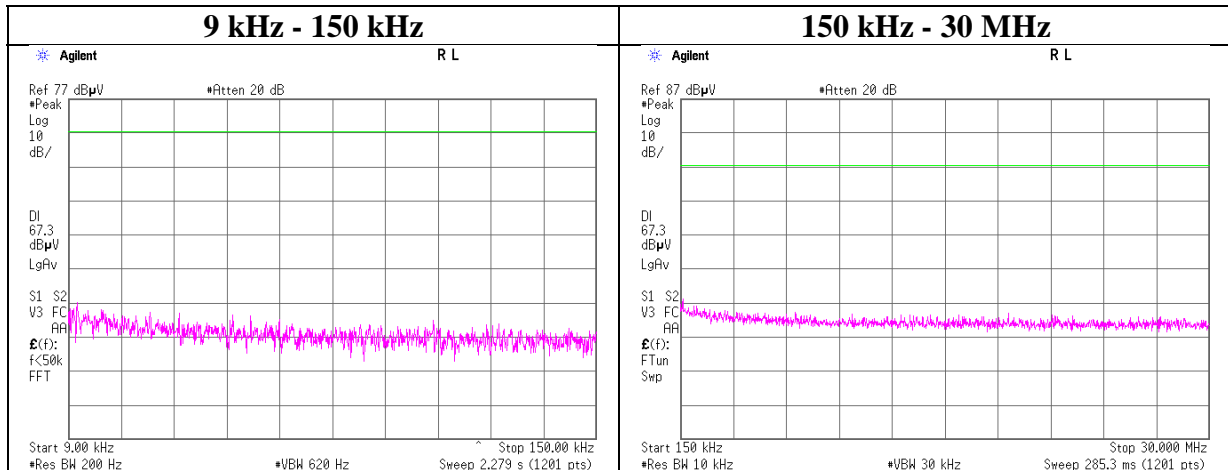
### 2441 MHz



## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx 3DH5

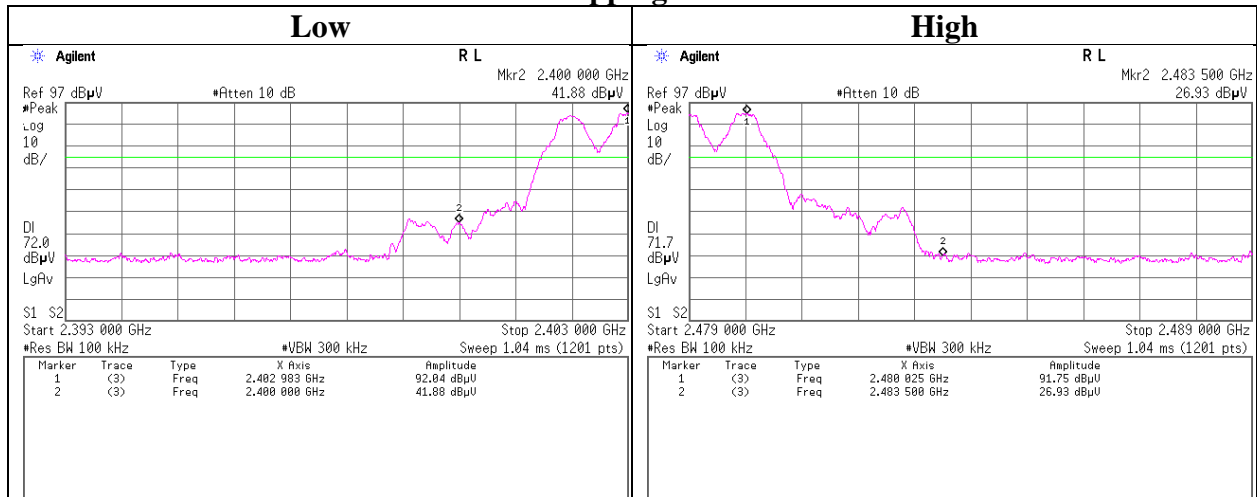
### 2480 MHz



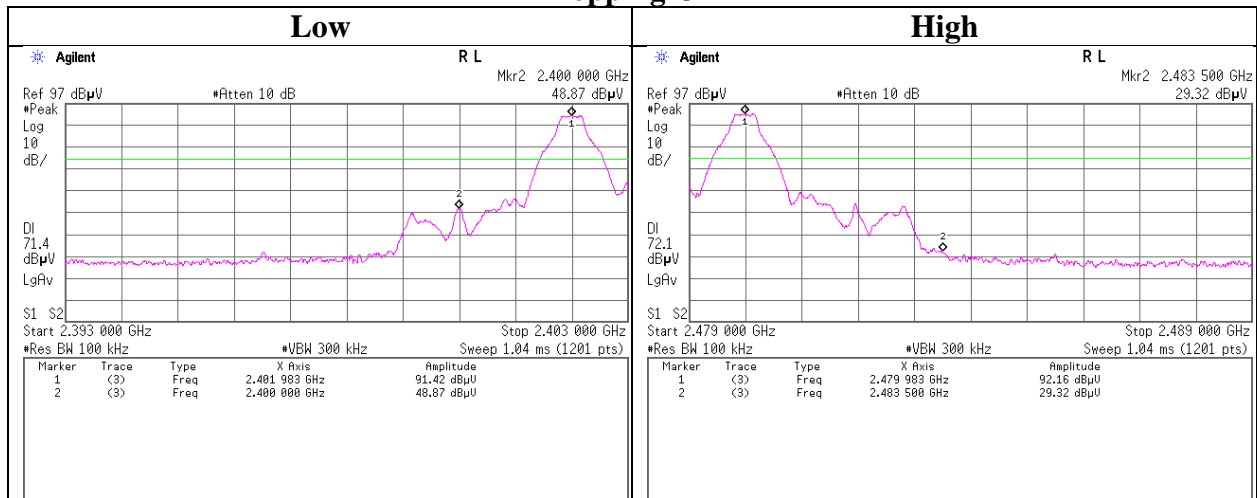
## Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx DH5

### Hopping On



### Hopping Off



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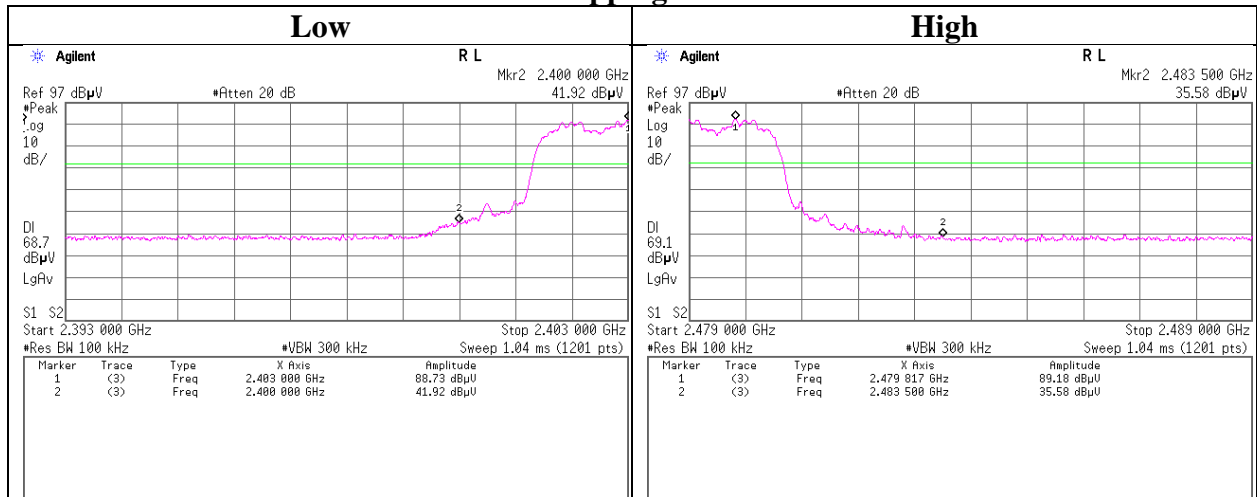
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

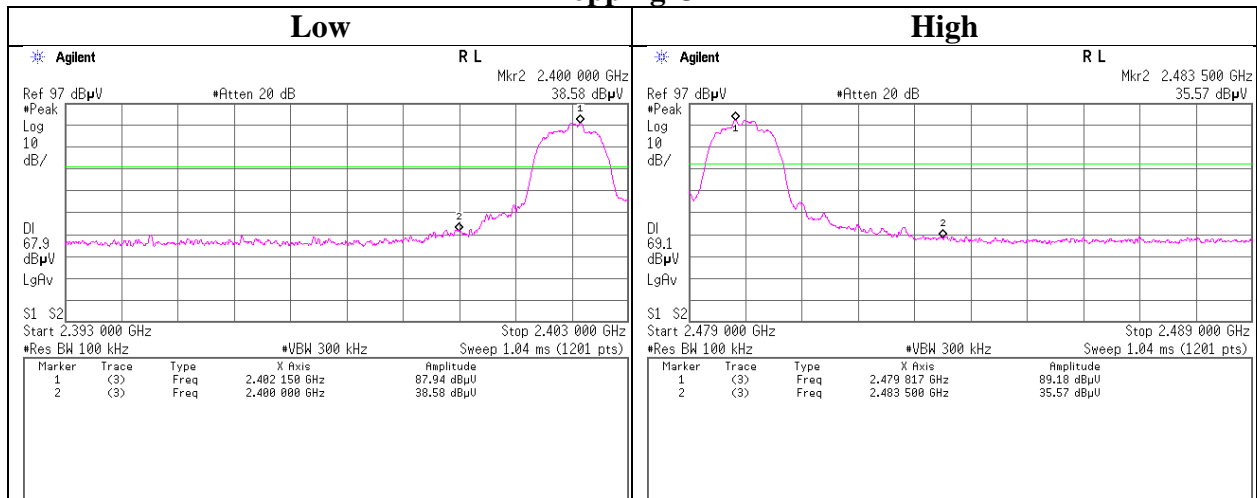
## Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx 3DH5

### Hopping On



### Hopping Off

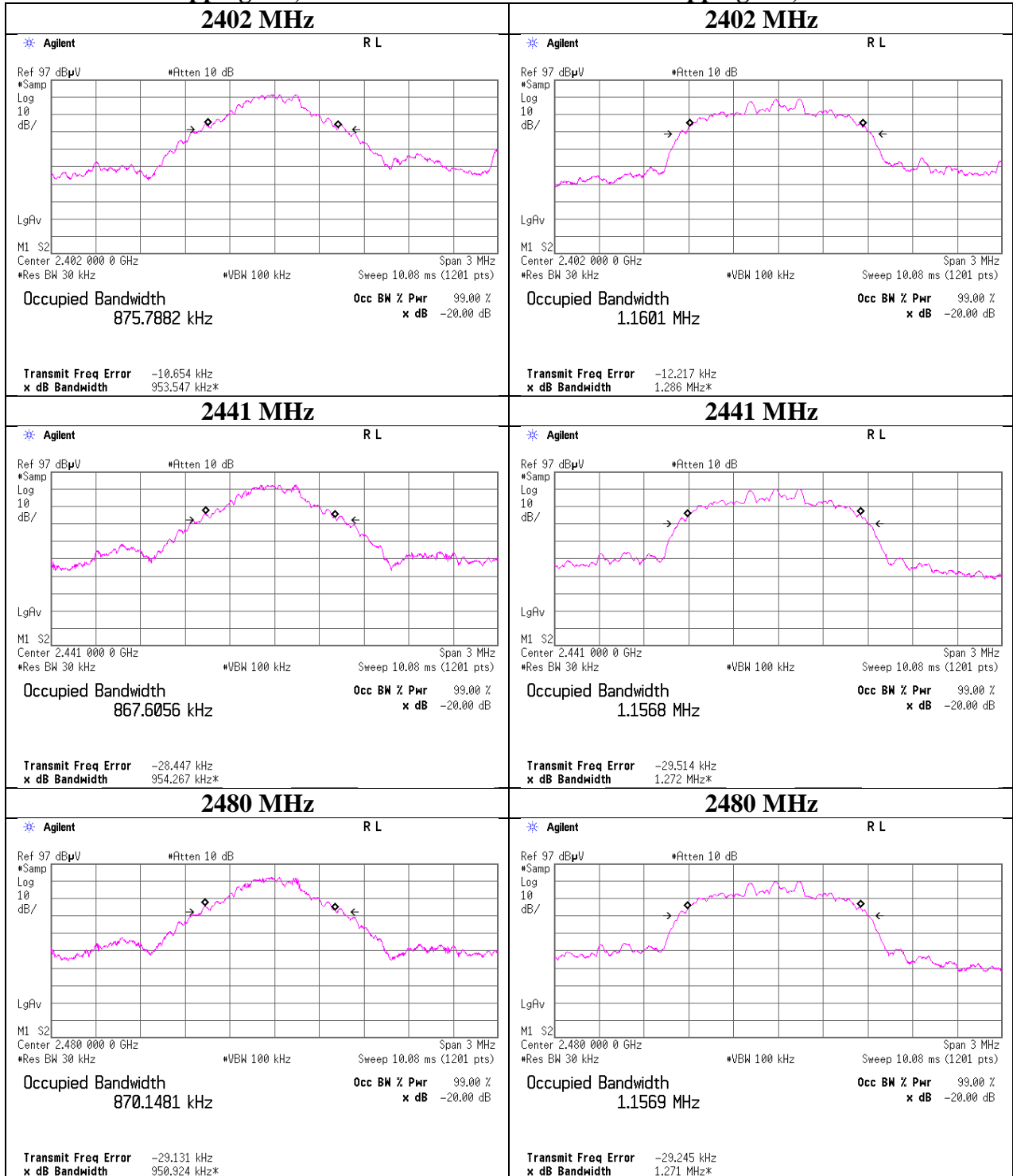


### 99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-A
Date	May 12, 2015
Temperature / Humidity	25 deg. C / 37 % RH
Engineer	Shinichi Takano
Mode	Tx Hopping Off

#### Hopping Off, DH5

#### Hopping Off, 3DH5



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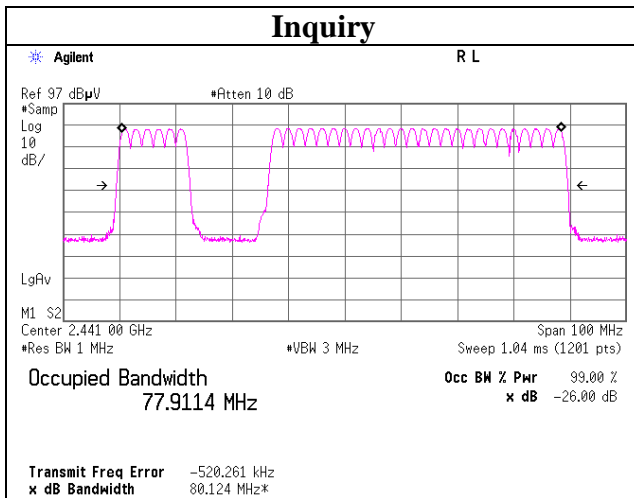
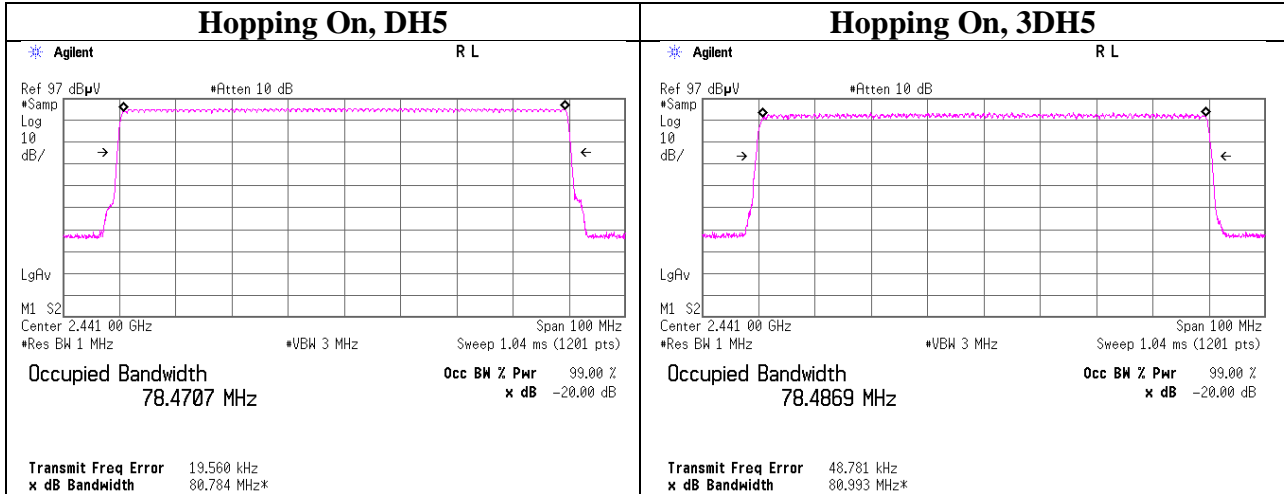
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124



## 99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	10762865S-A	
Date	May 12, 2015	June 25, 2015
Temperature / Humidity	25 deg. C / 37 % RH	30 deg. C / 38 % RH
Engineer	Shinichi Takano	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-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT, RE	2015/02/24 * 12
SAT20-03	Attenuator	Agilent	8493C-020	74891	AT	2015/03/11 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	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	2014/12/24 * 12
SAEC-02(NSA )	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2014/07/08 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2015/03/23 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2015/05/11 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2014/05/15 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2014/08/12 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2014/10/30 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2014/09/03 * 12
SJM-14	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2014/11/21 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2015/04/09 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2015/03/23 * 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
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2015/02/18 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2015/02/18 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2014/08/27 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2014/11/22 * 12
SCC-B1/B3/B5/B7/B8/B13/SR SE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2015/04/17 * 12
SCC-B2/B4/B6/B7/B8/B13/SR SE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2015/04/17 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2014/11/22 * 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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