




RADIO TEST REPORT

Test Report No. : 12258310S-B-R2

Applicant : PIONEER CORPORATION
Type of Equipment : Car Audio with Bluetooth / WLAN
Model No. : PVH-3668
(* Bluetooth part)
FCC ID : AJDK107
Test regulation : FCC Part 15 Subpart C: 2018
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
7. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
8. This report is a revised version of 12258310S-B-R1. 12258310S-B-R1 is replaced with this report.

Date of test: April 26 to May 5, 2018

Representative test engineer: 
Kenichi Adachi
Engineer
Consumer Technology Division

Approved by: 
Hikaru Shirasawa
Engineer
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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SECTION 1: Customer information

Company Name : PIONEER CORPORATION
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Telephone Number : +81-49-228-7791
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Contact Person : Masahiro Sato

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-3668
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 13.2 V (car battery)
Receipt Date of Sample : April 20, 2018
Country of Mass-production : Thailand
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model: PVH-3668 (referred to as the EUT in this report) is a Car Audio with Bluetooth / WLAN.

General Specification

Clock frequency(ies) in the system : 49.5 MHz (WLAN/BT combo Module Communication)

Radio Specification

Bluetooth Ver4.1+EDR

Radio Type : Transceiver
Frequency of Operation : 2402 MHz- 2480 MHz
Modulation : GFSK, π /4DQPSK, 8DPSK
Power Supply (radio part input) : DC 3.3 V / 1.8 V
Antenna type : Pattern inverted F type
Antenna Gain : -12.23 dBi (max)
Operating Temperature : -20 deg. C- +65 deg. C

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

Radio Type : Transceiver
Frequency of Operation : 2412 MHz- 2462 MHz
Modulation : DSSS/CCK, OFDM
Power Supply (inner) : DC 3.3 V / 1.8 V
Antenna type : Pattern inverted F type
Antenna Gain : -12.23 dBi (max)
Operating Temperature : -20 deg. C- +65 deg. C

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

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	Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ----- IC: RSS-Gen 8.8	FCC: Section 15.207 ----- IC: RSS-Gen 8.8	N/A	N/A	N/A *1)
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-247 5.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-247 5.1 (a)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) ----- IC: RSS-247 5.1 (d)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) ----- IC: RSS-247 5.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) ----- IC: RSS-247 5.4 (b)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) ----- IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		3.2 dB 1056.000 MHz, AV, Vert. Tx DH5 2441 MHz	Complied#

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

*1) The test is not applicable since the EUT does not have AC power ports.

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

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

FCC Part 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (DC 3.3 V / 1.8 V).

Instead of a new battery, DC power supply (DC 13.2 V) was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 6.6	IC: -	N/A	Complied	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 $k=2$.

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)				
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR	No. 5,6,8 SR
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.2 dB	3.2 dB	3.3 dB	-	-
	30 MHz-200 MHz	4.9 dB	4.8 dB	4.9 dB	-	-
	200 MHz-1 GHz	6.1 dB	6.1 dB	6.1 dB	-	-
	1 GHz-6 GHz	4.7 dB	4.7 dB	4.7 dB	-	-
	6 GHz-13 GHz	5.3 dB	5.3 dB	5.3 dB	-	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 dB	-	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.48 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.66 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.47 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.64 dB
Spurious emission (Conducted) below 1GHz	1.8 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.5 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.7 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

3.5 Test Location

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JAB Accreditation No. RTL02610
FCC Test Firm Registration Number: 839876

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	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

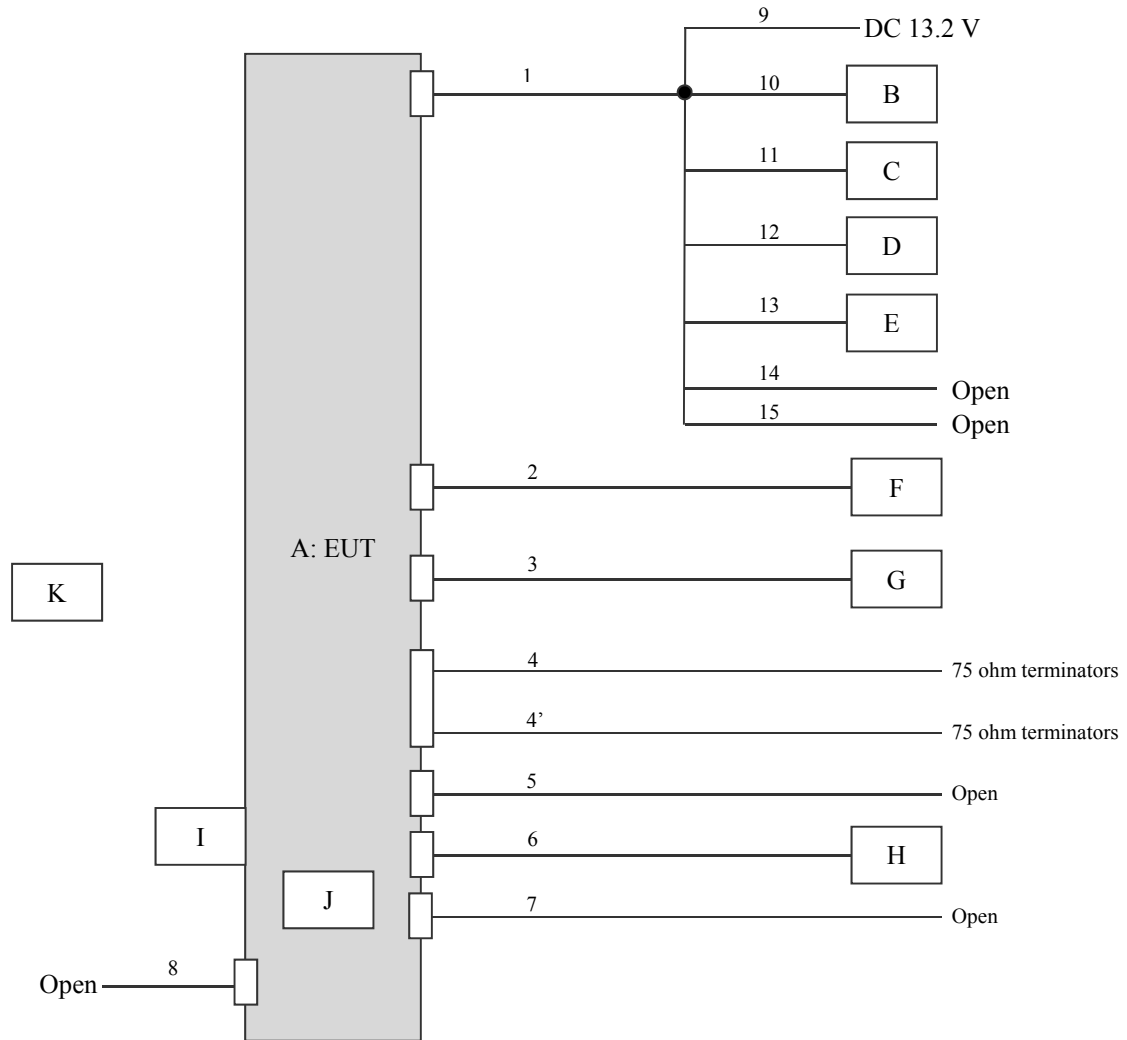
4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20 dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99 % Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
<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 (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative. * It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: Fixed Software: SYSTEM SOFTWARE 1.001300 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p>		

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	PVH-3668ZT	RDTM900003ME *1) RDTM900004ME *2)	PIONEER	EUT
B	Speaker	LV-002	S11014200775	L&V	-
C	Speaker	LV-002	S11014200775	L&V	-
D	Speaker	LV-002	S11014200773	L&V	-
E	Speaker	LV-002	S11014200773	L&V	-
F	Steering SW	-	-	-	-
G	Rear Camera	-	-	-	-
H	USB Memory	USM4GL-W	-	SONY	-
I	USB Memory	RUF2-KR8GA-WH	N3032	Buffalo	-
J	SD Card	SD-K04G	1146UK9398C	TOSHIBA	-
K	Remote control	CXE5722	-	-	-

*1) Used for Radiated Emission test

*2) Used for Antenna Terminal conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Wire Harness Set	0.6	Unshielded	Unshielded	-
2	Wire Harness Set	1.0	Unshielded	Unshielded	-
3	Wire Harness Set	1.0	Unshielded	Unshielded	-
4, 4'	Radio antenna	0.2 + 2.0	Shielded	Shielded	-
5	HDMI for RSE	0.4 + 1.8	Shielded	Shielded	-
6	USB	0.8	Shielded	Shielded	-
7	Steering Sensor	2.8	Unshielded	Unshielded	-
8	HDMI Input	1.0	Shielded	Shielded	-
9	DC	2.5	Unshielded	Unshielded	-
10	Speaker	2.0	Unshielded	Unshielded	-
11	Speaker	2.0	Unshielded	Unshielded	-
12	Speaker	2.0	Unshielded	Unshielded	-
13	Speaker	2.0	Unshielded	Unshielded	-
14	Signal	1.0	Unshielded	Unshielded	-
15	Signal	1.0	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

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

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

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

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

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

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

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

Test Antennas are used as below;

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

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

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

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3.88 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26.5 GHz)		3.88 m*2) (1 GHz – 13 GHz), 1 m*3) (10 GHz – 26.5 GHz)

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

*2) Distance Factor: $20 \times \log(3.88 \text{ m}/3.0 \text{ m}) = 2.23 \text{ dB}$

*3) Distance Factor: $20 \times \log(1.0 \text{ m}/3.0 \text{ m}) = -9.54 \text{ dB}$

The carrier level and noise levels were confirmed at angle of 0 deg. to 30 deg. based on the product specification to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Combinations of the worst case

Antenna polarization	Frequency	Spurious				
		Below 1 GHz	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz-18 GHz	18 GHz-26.5 GHz
Horizontal		0 deg.	0 deg.	30 deg.	0 deg.	0 deg.
Vertical		0 deg.	0 deg.	30 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 MHz - 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 used
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 50 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 *3)	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 %. Peak hold was applied as Worst-case measurement. *2) Reference data *3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)							

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

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Test data

20 dB Bandwidth, 99 % Occupied Bandwidth and Carrier Frequency Separation

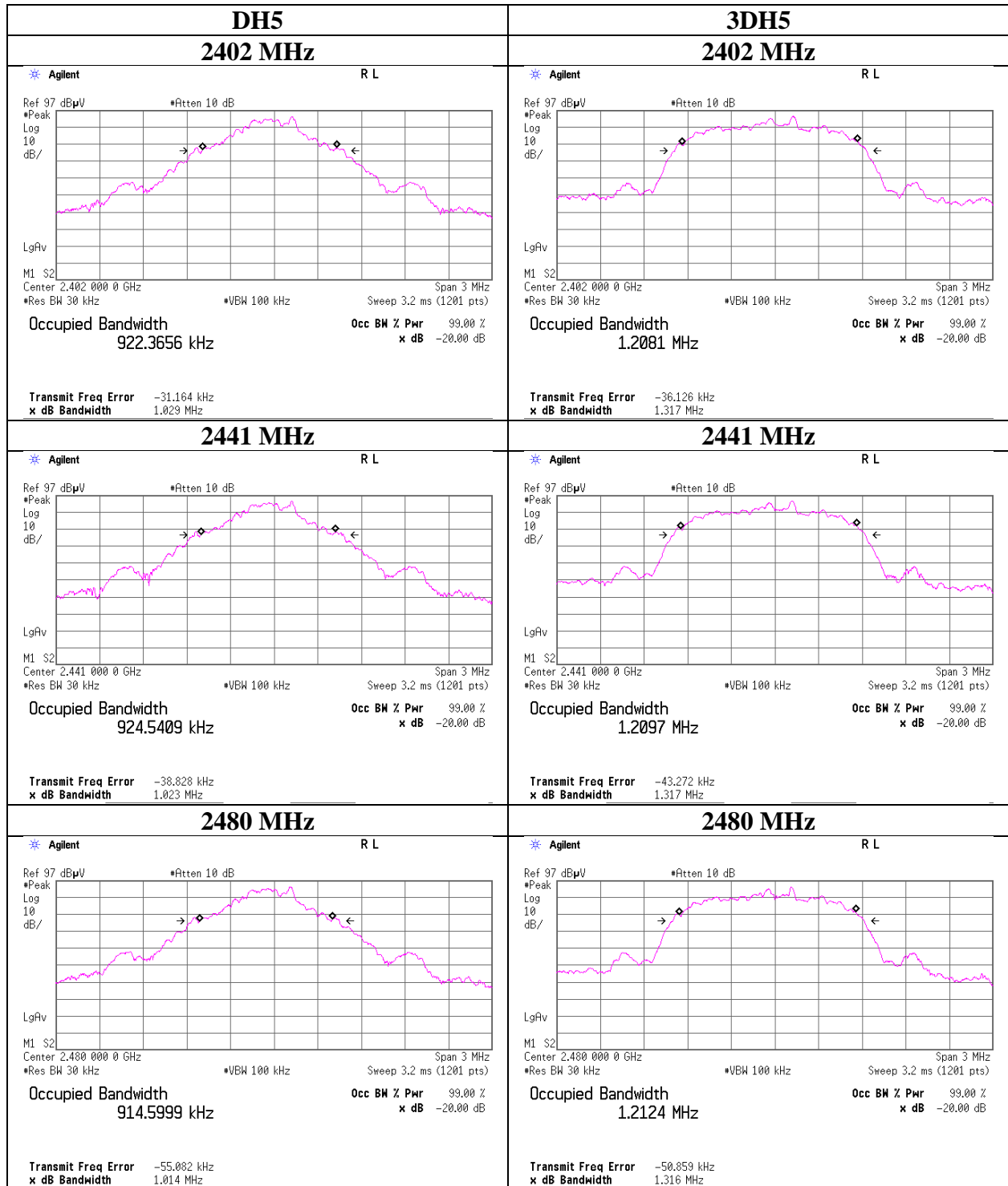
Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Measurement Room
Date April 26, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Kenichi Adachi
Mode Tx, Hopping Off, Tx, Hopping On

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	1.029	922.4	1.000	≥ 0.686
DH5	2441.0	1.023	924.5	1.000	≥ 0.682
DH5	2480.0	1.014	914.6	1.000	≥ 0.676
DH5	Hopping On	-	78568.7	-	-
3DH5	2402.0	1.317	1208.1	1.000	≥ 0.878
3DH5	2441.0	1.317	1209.7	1.000	≥ 0.878
3DH5	2480.0	1.316	1212.4	1.000	≥ 0.878
3DH5	Hopping On	-	78691.8	-	-

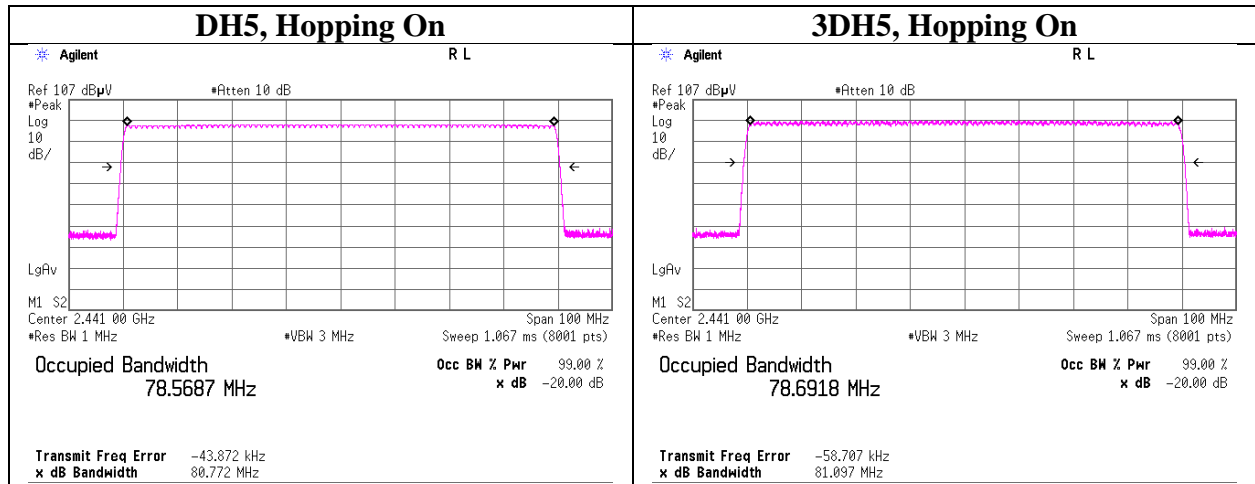
Limit: Two-thirds of 20 dB Bandwidth or 25 kHz (whichever is greater).

No limit applies to 20 dB Bandwidth.

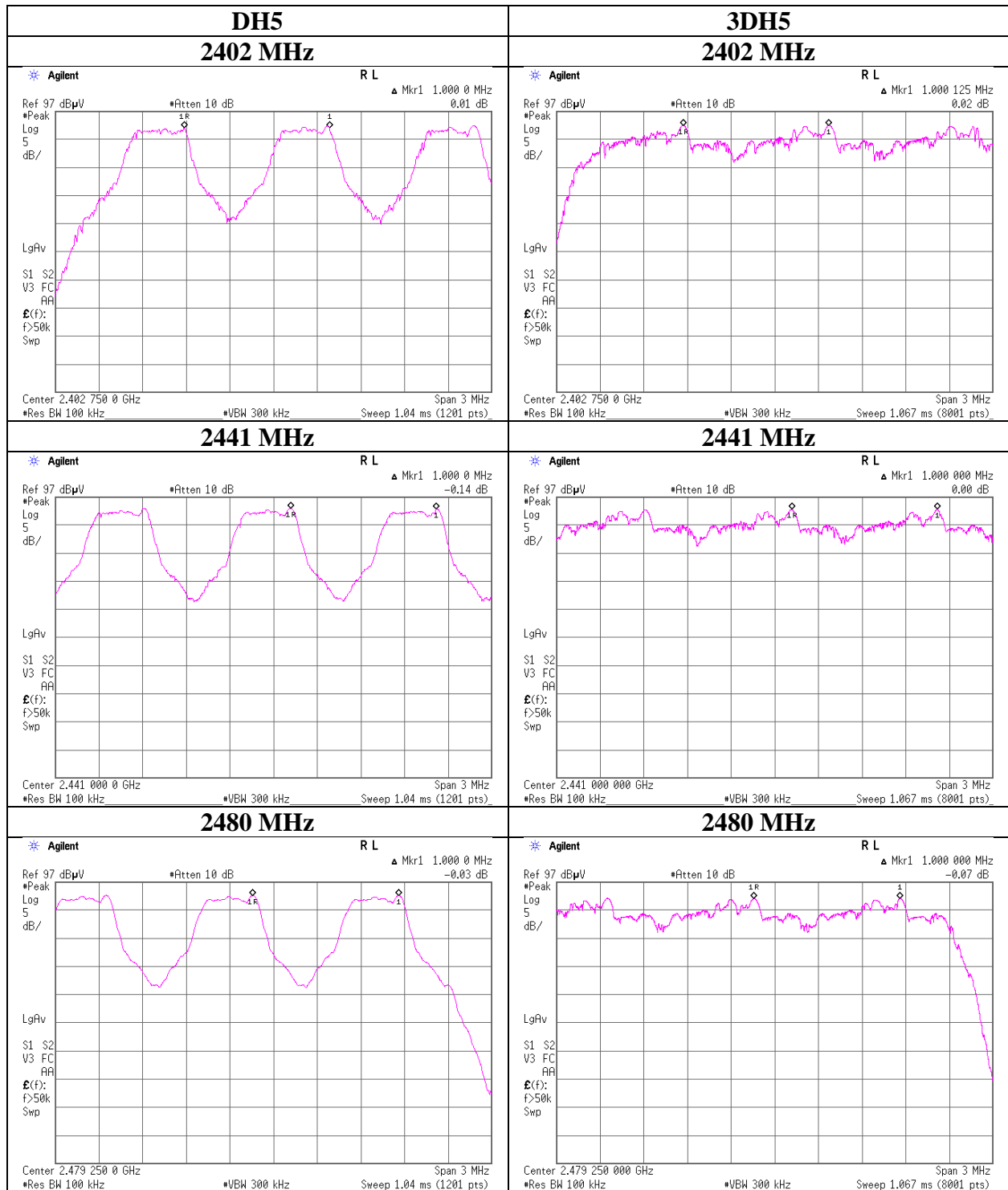
20 dB Bandwidth and 99 % Occupied Bandwidth



20 dB Bandwidth and 99 % Occupied Bandwidth



Carrier Frequency Separation



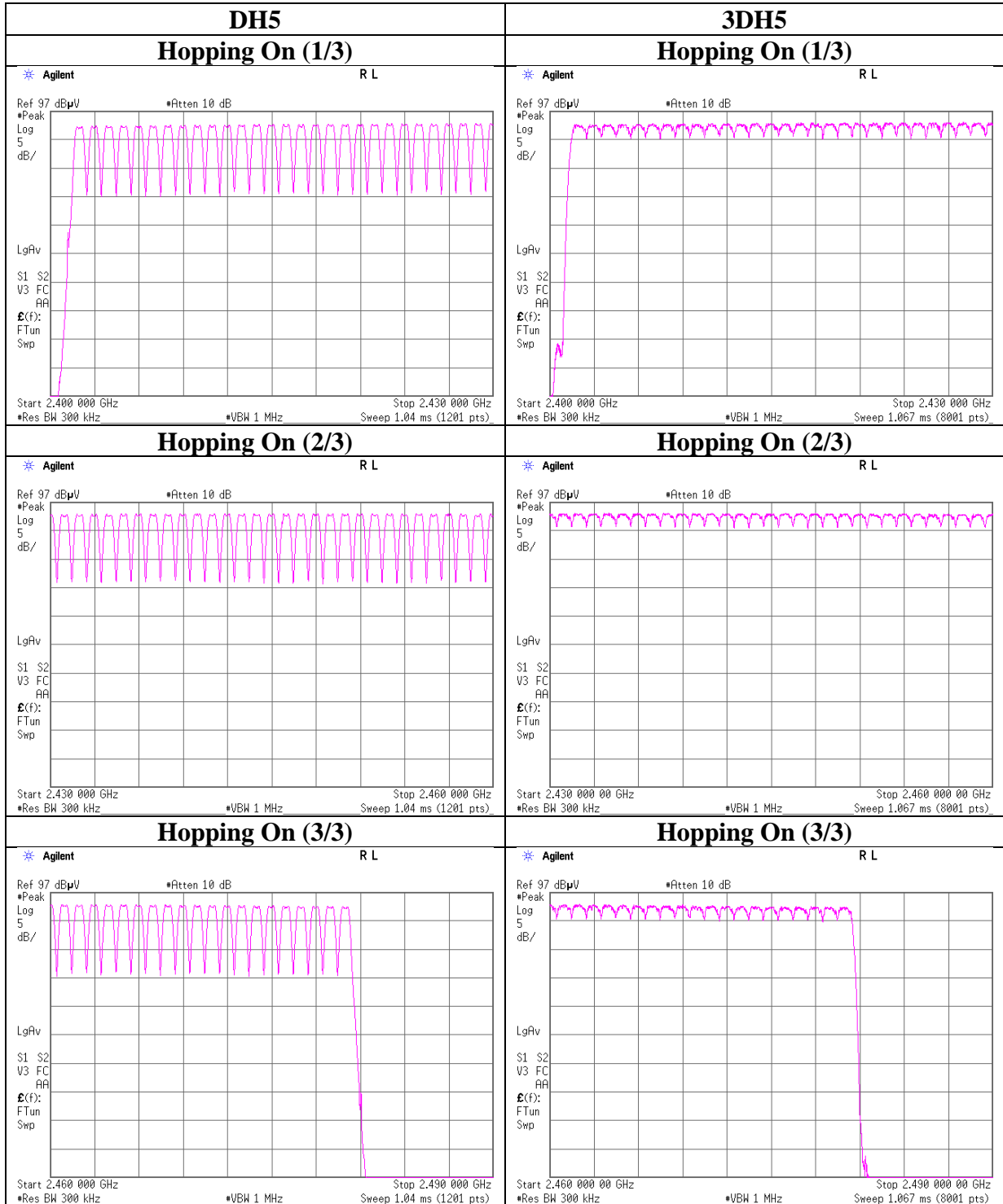
Number of Hopping Frequency

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Measurement Room
Date April 26, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Kenichi Adachi
Mode Tx, Hopping On

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

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

Number of Hopping Frequency



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Dwell time

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Test place Shonan EMC Lab. No.1 Measurement Room
Date April 26, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Kenichi Adachi
Mode Tx, Hopping On

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) second period		Length of transmission [ms]	Result [ms]	Limit [ms]
DH1	49.6 times /	5 s x 31.6 s = 314 times	0.420	132	400
DH3	23.4 times /	5 s x 31.6 s = 148 times	1.675	248	400
DH5	18.8 times /	5 s x 31.6 s = 119 times	2.925	348	400
3DH1	51.4 times /	5 s x 31.6 s = 325 times	0.426	138	400
3DH3	27.2 times /	5 s x 31.6 s = 172 times	1.677	288	400
3DH5	17.8 times /	5 s x 31.6 s = 113 times	2.927	331	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

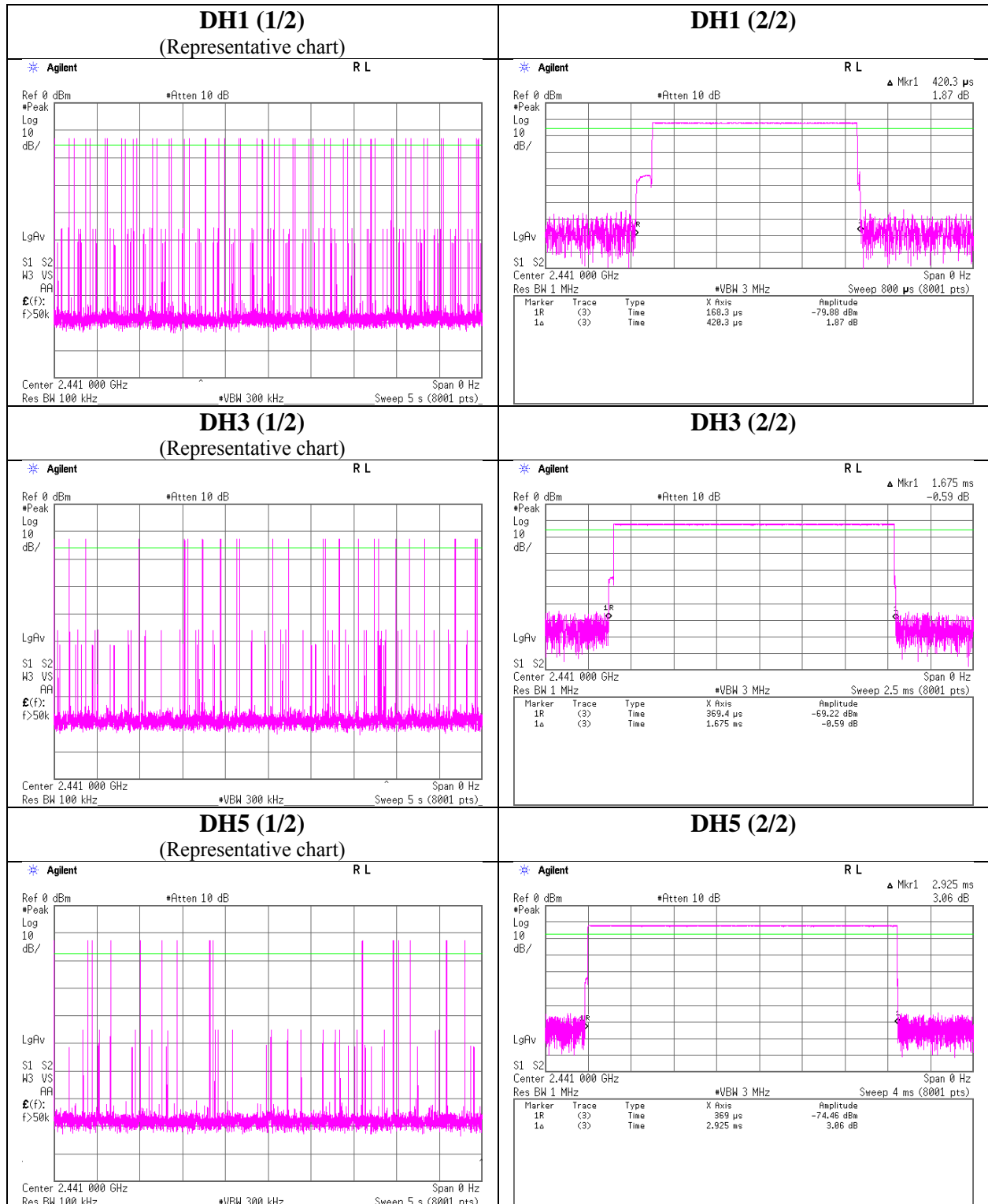
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	48	49	49	51	51	49.6
DH3	24	20	28	21	24	23.4
DH5	15	19	23	17	20	18.8
3DH1	51	52	51	51	52	51.4
3DH3	28	24	27	27	30	27.2
3DH5	15	16	20	19	19	17.8

Sample Calculation

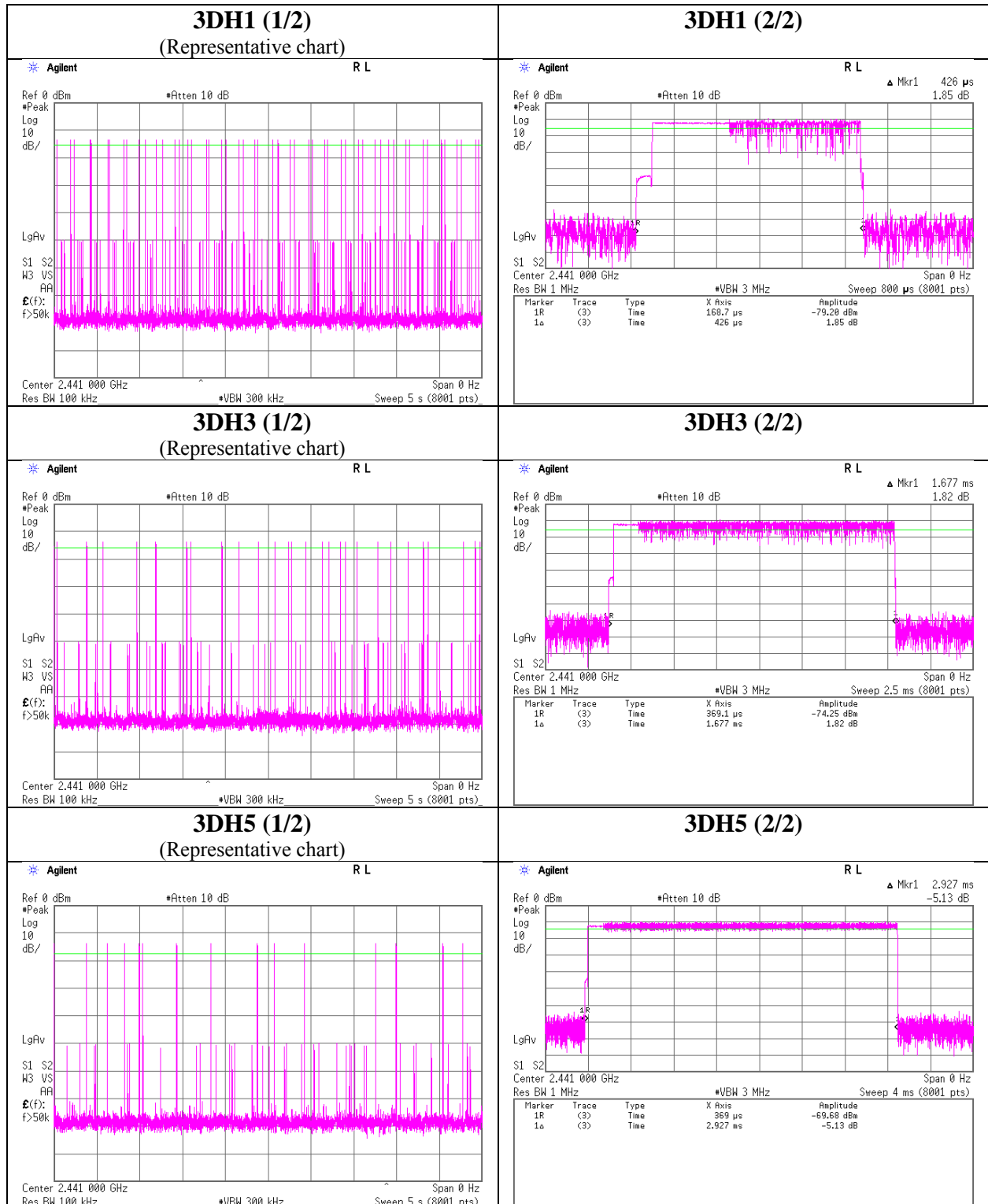
Average = Summation (Sampling 1 to 5) / 5

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 $N = 79$.

Dwell time



Dwell time



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Maximum Peak Output Power

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Measurement Room
Date April 26, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Kenichi Adachi
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-12.51	1.31	9.86	-1.34	0.73	20.96	125	22.30
DH5	2441.0	-11.77	1.31	9.86	-0.60	0.87	20.96	125	21.56
DH5	2480.0	-12.20	1.32	9.85	-1.03	0.79	20.96	125	21.99
2DH5	2402.0	-9.72	1.31	9.86	1.45	1.40	20.96	125	19.51
2DH5	2441.0	-9.32	1.31	9.86	1.85	1.53	20.96	125	19.11
2DH5	2480.0	-9.83	1.32	9.85	1.34	1.36	20.96	125	19.62
3DH5	2402.0	-9.54	1.31	9.86	1.63	1.46	20.96	125	19.33
3DH5	2441.0	-9.15	1.31	9.86	2.02	1.59	20.96	125	18.94
3DH5	2480.0	-9.68	1.32	9.85	1.49	1.41	20.96	125	19.47

Sample Calculation:

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

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

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

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

Average Output Power
(Reference data for RF Exposure / SAR testing)

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Measurement Room
Date April 26, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Kenichi Adachi
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-14.08	1.31	9.86	-2.91	0.51	1.08	-1.83	0.66
DH5	2441.0	-13.36	1.31	9.86	-2.19	0.60	1.08	-1.11	0.77
DH5	2480.0	-13.80	1.32	9.85	-2.63	0.55	1.08	-1.55	0.70
2DH5	2402.0	-13.52	1.31	9.86	-2.35	0.58	1.08	-1.27	0.75
2DH5	2441.0	-13.16	1.31	9.86	-1.99	0.63	1.08	-0.91	0.81
2DH5	2480.0	-13.75	1.32	9.85	-2.58	0.55	1.08	-1.50	0.71
3DH5	2402.0	-13.53	1.31	9.86	-2.36	0.58	1.07	-1.29	0.74
3DH5	2441.0	-13.15	1.31	9.86	-1.98	0.63	1.07	-0.91	0.81
3DH5	2480.0	-13.75	1.32	9.85	-2.58	0.55	1.07	-1.51	0.71

Sample Calculation:

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

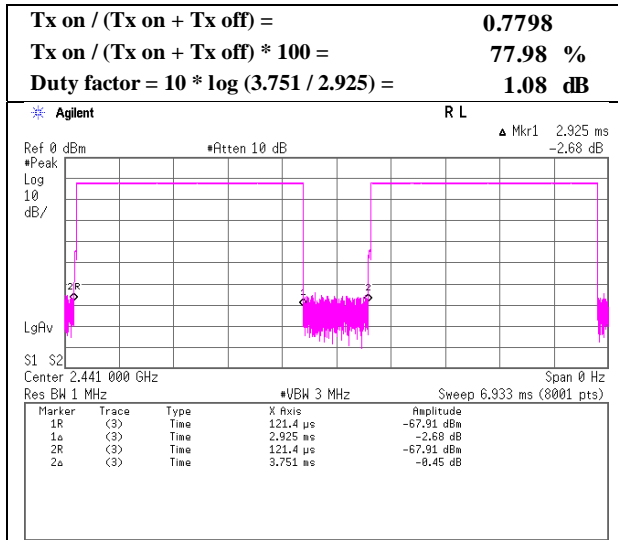
Result (Burst power average) = Time average + Duty factor

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

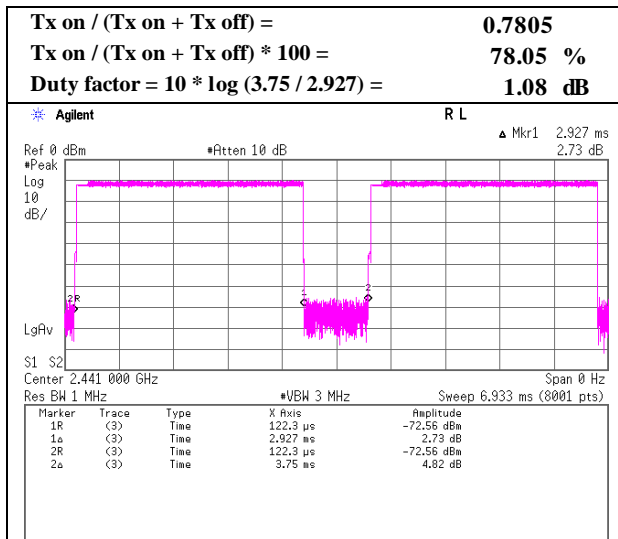
Burst Rate Confirmation

Report No. 12258310S-B-R2
 Test place Shonan EMC Lab. No.1 Measurement Room
 Date April 26, 2018
 Temperature / Humidity 24 deg. C / 46 % RH
 Engineer Kenichi Adachi
 Mode Tx, Hopping Off

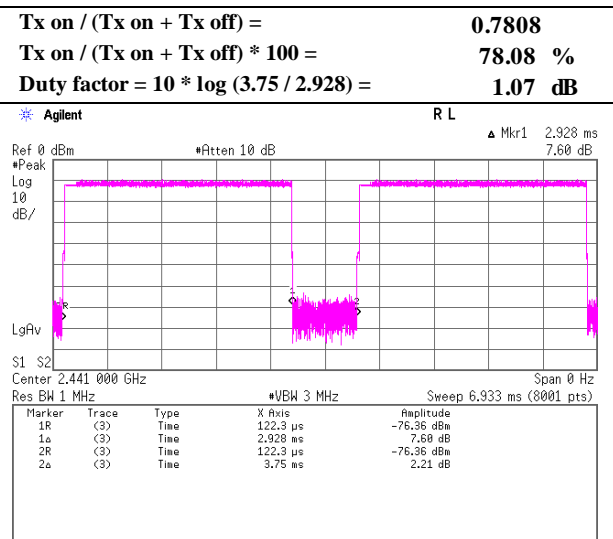
DH5



2DH5



3DH5



Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
(30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)
Mode Tx, Hopping Off, DH5 2402 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	321.315	QP	41.46	13.91	7.05	31.77	0.00	30.65	46.00	15.3	100	50	
Hori.	350.997	QP	39.32	14.54	7.24	31.77	0.00	29.33	46.00	16.6	100	186	
Hori.	364.501	QP	41.56	14.83	7.31	31.79	0.00	31.91	46.00	14.0	100	193	
Hori.	391.242	QP	38.74	15.39	7.44	31.82	0.00	29.75	46.00	16.2	100	175	
Hori.	449.518	QP	32.47	16.61	7.69	31.89	0.00	24.88	46.00	21.1	100	69	
Hori.	514.383	QP	34.25	17.87	7.98	31.94	0.00	28.16	46.00	17.8	100	3	
Hori.	960.832	QP	33.19	22.21	9.87	30.88	0.00	34.39	53.90	19.5	100	307	
Hori.	1056.006	PK	49.65	24.34	13.06	37.08	2.23	52.20	73.90	21.7	147	71	
Hori.	1583.995	PK	48.21	25.14	13.71	36.99	2.23	52.30	73.90	21.6	159	239	
Hori.	2111.998	PK	46.92	26.24	14.28	36.77	2.23	52.90	73.90	21.0	187	220	
Hori.	2390.000	PK	44.63	27.14	14.56	36.58	2.23	51.98	73.90	21.9	138	38	
Hori.	2822.475	PK	47.56	28.23	7.02	36.57	2.23	48.47	73.90	25.4	128	167	
Hori.	3167.986	PK	50.07	28.66	6.45	36.62	2.23	50.79	73.90	23.1	166	343	
Hori.	3695.984	PK	49.10	29.13	6.80	36.59	2.23	50.67	73.90	23.2	163	332	
Hori.	4804.000	PK	43.56	31.13	7.25	36.88	2.23	47.29	73.90	26.6	150	0	
Hori.	7206.000	PK	45.02	36.35	8.89	37.26	2.23	55.23	73.90	18.7	150	0	
Hori.	1056.006	AV	43.61	24.34	13.06	37.08	2.23	46.16	53.90	7.7	147	71	
Hori.	1583.995	AV	40.84	25.14	13.71	36.99	2.23	44.93	53.90	9.0	159	239	
Hori.	2111.998	AV	37.86	26.24	14.28	36.77	2.23	43.84	53.90	10.1	187	220	
Hori.	2390.000	AV	32.49	27.14	14.56	36.58	2.23	39.84	53.90	14.1	138	38	
Hori.	2822.475	AV	39.76	28.23	7.02	36.57	2.23	40.67	53.90	13.2	128	167	
Hori.	3167.986	AV	44.38	28.66	6.45	36.62	2.23	45.10	53.90	8.8	166	343	
Hori.	3695.984	AV	42.07	29.13	6.80	36.59	2.23	43.64	53.90	10.3	163	332	
Hori.	4804.000	AV	31.72	31.13	7.25	36.88	2.23	35.45	53.90	18.5	150	0	
Hori.	7206.000	AV	32.89	36.35	8.89	37.26	2.23	43.10	53.90	10.8	150	0	
Vert.	120.078	QP	34.94	13.21	8.18	31.80	0.00	24.53	43.50	18.9	100	3	
Vert.	144.068	QP	32.57	14.47	8.69	31.78	0.00	23.95	43.50	19.5	100	203	
Vert.	256.806	QP	36.78	11.94	6.44	31.75	0.00	23.41	46.00	22.5	100	19	
Vert.	320.808	QP	38.13	13.90	7.05	31.77	0.00	27.31	46.00	18.6	100	148	
Vert.	514.103	QP	34.25	17.87	7.98	31.94	0.00	28.16	46.00	17.8	127	330	
Vert.	1055.999	PK	51.92	24.34	13.06	37.08	2.23	54.47	73.90	19.4	191	324	
Vert.	2390.000	PK	43.69	27.14	14.56	36.58	2.23	51.04	73.90	22.9	214	110	
Vert.	3167.986	PK	50.12	28.66	6.45	36.62	2.23	50.84	73.90	23.1	153	39	
Vert.	4804.000	PK	44.52	31.13	7.25	36.88	2.23	48.25	73.90	25.7	150	0	
Vert.	7206.000	PK	45.08	36.35	8.89	37.26	2.23	55.29	73.90	18.6	150	0	
Vert.	1055.999	AV	47.42	24.34	13.06	37.08	2.23	49.97	53.90	3.9	191	324	
Vert.	2390.000	AV	32.28	27.14	14.56	36.58	2.23	39.63	53.90	14.3	214	110	
Vert.	3167.986	AV	43.69	28.66	6.45	36.62	2.23	44.41	53.90	9.5	153	39	
Vert.	4804.000	AV	31.67	31.13	7.25	36.88	2.23	35.40	53.90	18.5	150	0	
Vert.	7206.000	AV	32.75	36.35	8.89	37.26	2.23	42.96	53.90	10.9	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

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	81.96	27.18	14.57	36.57	2.23	89.37	-	-	Carrier
Hori.	2400.000	PK	34.71	27.17	14.57	36.58	2.23	42.10	69.37	27.3	
Vert.	2402.000	PK	83.76	27.18	14.57	36.57	2.23	91.17	-	-	Carrier
Vert.	2400.000	PK	34.45	27.17	14.57	36.58	2.23	41.84	71.17	29.3	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

UL Japan, Inc.

Shonan EMC Lab.

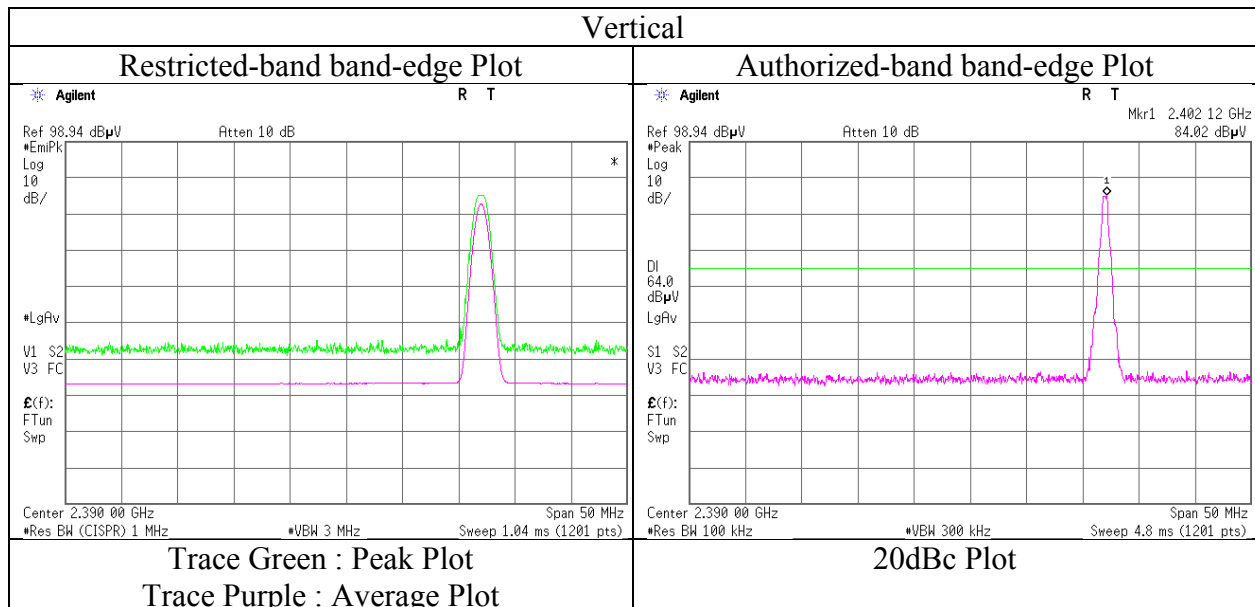
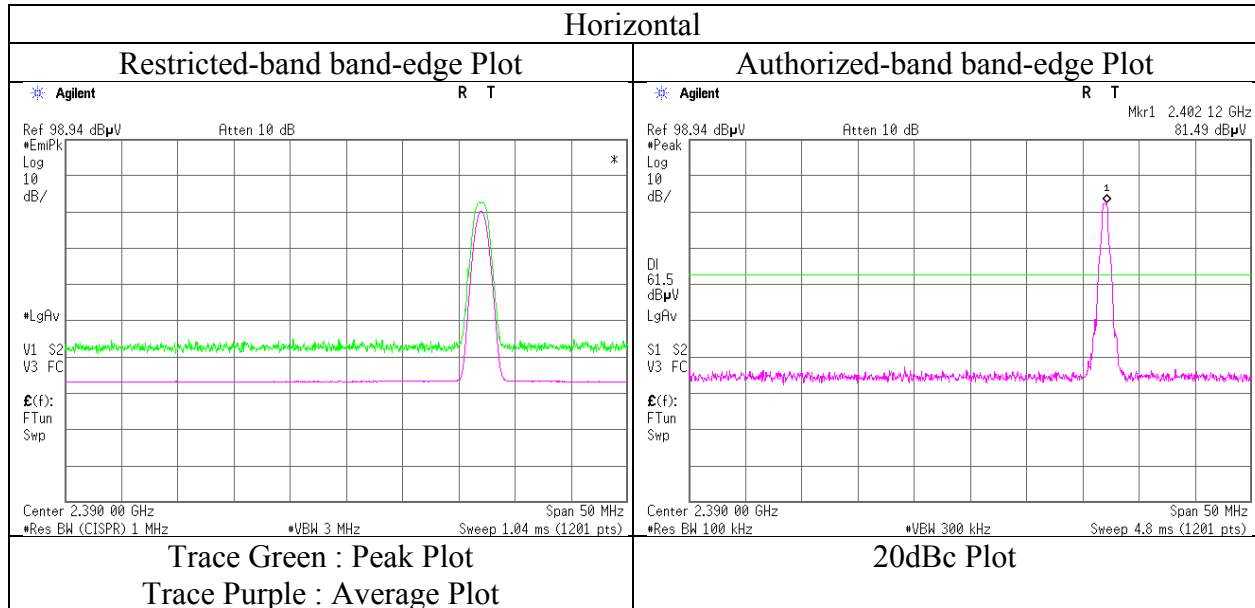
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date	May 1, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Kazuya Noda
	(1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
(30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)
Mode Tx, Hopping Off, DH5 2441 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	320.828	QP	42.12	13.90	7.05	31.77	0.00	31.30	46.00	14.7	100	195	
Hori.	350.438	QP	38.86	14.53	7.24	31.77	0.00	28.86	46.00	17.1	100	213	
Hori.	363.990	QP	41.09	14.82	7.31	31.79	0.00	31.43	46.00	14.5	100	173	
Hori.	391.094	QP	39.24	15.39	7.44	31.82	0.00	30.25	46.00	15.7	100	191	
Hori.	449.640	QP	33.25	16.61	7.69	31.89	0.00	25.66	46.00	20.3	100	165	
Hori.	514.185	QP	34.32	17.87	7.98	31.94	0.00	28.23	46.00	17.7	100	352	
Hori.	960.825	QP	33.58	22.21	9.87	30.88	0.00	34.78	53.90	19.1	100	353	
Hori.	1055.998	PK	49.79	24.34	13.06	37.08	2.23	52.34	73.90	21.6	135	69	
Hori.	1583.995	PK	47.76	25.14	13.71	36.99	2.23	51.85	73.90	22.1	153	228	
Hori.	2112.000	PK	46.58	26.24	14.28	36.77	2.23	52.56	73.90	21.3	186	207	
Hori.	2822.475	PK	47.34	28.23	7.02	36.57	2.23	48.25	73.90	25.7	127	167	
Hori.	3167.963	PK	49.97	28.66	6.45	36.62	2.23	50.69	73.90	23.2	169	347	
Hori.	3695.984	PK	48.92	29.13	6.80	36.59	2.23	50.49	73.90	23.4	157	332	
Hori.	3984.151	PK	47.55	29.72	6.79	36.50	2.23	49.79	73.90	24.1	157	285	
Hori.	4882.000	PK	43.63	31.31	7.35	36.91	2.23	47.61	73.90	26.3	150	0	
Hori.	7323.000	PK	44.18	36.51	9.03	37.44	2.23	54.51	73.90	19.4	150	0	
Hori.	1055.998	AV	43.24	24.34	13.06	37.08	2.23	45.79	53.90	8.1	135	69	
Hori.	1583.995	AV	40.71	25.14	13.71	36.99	2.23	44.80	53.90	9.1	153	228	
Hori.	2112.000	AV	37.63	26.24	14.28	36.77	2.23	43.61	53.90	10.3	186	207	
Hori.	2822.475	AV	39.83	28.23	7.02	36.57	2.23	40.74	53.90	13.2	127	167	
Hori.	3167.963	AV	44.24	28.66	6.45	36.62	2.23	44.96	53.90	8.9	169	347	
Hori.	3695.984	AV	42.14	29.13	6.80	36.59	2.23	43.71	53.90	10.2	157	332	
Hori.	3984.151	AV	39.14	29.72	6.79	36.50	2.23	41.38	53.90	12.5	157	285	
Hori.	4882.000	AV	31.29	31.31	7.35	36.91	2.23	35.27	53.90	18.6	150	0	
Hori.	7323.000	AV	32.25	36.51	9.03	37.44	2.23	42.58	53.90	11.3	150	0	
Vert.	120.040	QP	35.04	13.21	8.18	31.80	0.00	24.63	43.50	18.8	100	347	
Vert.	144.065	QP	32.87	14.47	8.69	31.78	0.00	24.25	43.50	19.2	100	118	
Vert.	256.845	QP	36.32	11.94	6.44	31.75	0.00	22.95	46.00	23.0	100	18	
Vert.	320.795	QP	39.05	13.90	7.05	31.77	0.00	28.23	46.00	17.7	100	133	
Vert.	514.239	QP	34.91	17.87	7.98	31.94	0.00	28.82	46.00	17.1	100	340	
Vert.	1056.000	PK	52.62	24.34	13.06	37.08	2.23	55.17	73.90	18.7	192	339	
Vert.	3167.963	PK	50.40	28.66	6.45	36.62	2.23	51.12	73.90	22.8	160	42	
Vert.	4882.000	PK	44.26	31.31	7.35	36.91	2.23	48.24	73.90	25.7	150	0	
Vert.	7323.000	PK	43.90	36.51	9.03	37.44	2.23	54.23	73.90	19.7	150	0	
Vert.	1056.000	AV	48.12	24.34	13.06	37.08	2.23	50.67	53.90	3.2	192	339	
Vert.	3167.963	AV	44.16	28.66	6.45	36.62	2.23	44.88	53.90	9.0	160	42	
Vert.	4882.000	AV	31.20	31.31	7.35	36.91	2.23	35.18	53.90	18.7	150	0	
Vert.	7323.000	AV	32.29	36.51	9.03	37.44	2.23	42.62	53.90	11.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.88\text{ m} / 3.0\text{ m}) = 2.23\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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

Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
(30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)
Mode Tx, Hopping Off, DH5 2480 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	320.825	QP	41.68	13.90	7.05	31.77	0.00	30.86	46.00	15.1	100	202	
Hori.	350.506	QP	39.12	14.53	7.24	31.77	0.00	29.12	46.00	16.8	100	187	
Hori.	364.092	QP	41.17	14.82	7.31	31.79	0.00	31.51	46.00	14.4	100	220	
Hori.	391.264	QP	38.75	15.39	7.44	31.82	0.00	29.76	46.00	16.2	100	187	
Hori.	449.789	QP	32.66	16.62	7.69	31.89	0.00	25.08	46.00	20.9	100	64	
Hori.	514.166	QP	35.29	17.87	7.98	31.94	0.00	29.20	46.00	16.8	100	1	
Hori.	960.764	QP	33.34	22.21	9.87	30.88	0.00	34.54	53.90	19.3	100	84	
Hori.	1055.997	PK	49.45	24.34	13.06	37.08	2.23	52.00	73.90	21.9	132	67	
Hori.	1583.945	PK	48.57	25.14	13.71	36.99	2.23	52.66	73.90	21.2	153	232	
Hori.	2111.998	PK	46.98	26.24	14.28	36.77	2.23	52.96	73.90	20.9	185	227	
Hori.	2483.500	PK	43.69	27.45	14.66	36.52	2.23	51.51	73.90	22.4	148	317	
Hori.	2822.409	PK	47.11	28.23	7.02	36.57	2.23	48.02	73.90	25.9	124	168	
Hori.	3167.986	PK	50.40	28.66	6.45	36.62	2.23	51.12	73.90	22.8	165	347	
Hori.	3695.984	PK	48.66	29.13	6.80	36.59	2.23	50.23	73.90	23.7	159	331	
Hori.	4960.000	PK	43.25	31.48	7.44	36.93	2.23	47.47	73.90	26.4	150	0	
Hori.	7440.000	PK	44.86	36.68	9.18	37.63	2.23	55.32	73.90	18.6	150	0	
Hori.	1055.997	AV	42.69	24.34	13.06	37.08	2.23	45.24	53.90	8.7	132	67	
Hori.	1583.945	AV	41.89	25.14	13.71	36.99	2.23	45.98	53.90	7.9	153	232	
Hori.	2111.998	AV	38.54	26.24	14.28	36.77	2.23	44.52	53.90	9.4	185	227	
Hori.	2483.500	AV	31.69	27.45	14.66	36.52	2.23	39.51	53.90	14.4	148	317	
Hori.	2822.409	AV	39.90	28.23	7.02	36.57	2.23	40.81	53.90	13.1	124	168	
Hori.	3167.986	AV	44.47	28.66	6.45	36.62	2.23	45.19	53.90	8.7	165	347	
Hori.	3695.984	AV	41.97	29.13	6.80	36.59	2.23	43.54	53.90	10.4	159	331	
Hori.	4960.000	AV	31.32	31.48	7.44	36.93	2.23	35.54	53.90	18.4	150	0	
Hori.	7440.000	AV	31.96	36.68	9.18	37.63	2.23	42.42	53.90	11.5	150	0	
Vert.	120.040	QP	34.23	13.21	8.18	31.80	0.00	23.82	43.50	19.6	100	337	
Vert.	144.076	QP	32.37	14.47	8.69	31.78	0.00	23.75	43.50	19.7	100	357	
Vert.	256.792	QP	36.41	11.94	6.44	31.75	0.00	23.04	46.00	22.9	100	333	
Vert.	320.808	QP	38.28	13.90	7.05	31.77	0.00	27.46	46.00	18.5	100	353	
Vert.	514.359	QP	34.52	17.87	7.98	31.94	0.00	28.43	46.00	17.5	100	298	
Vert.	1056.004	PK	52.37	24.34	13.06	37.08	2.23	54.92	73.90	19.0	201	352	
Vert.	2483.500	PK	43.59	27.45	14.66	36.52	2.23	51.41	73.90	22.5	241	124	
Vert.	3167.986	PK	50.01	28.66	6.45	36.62	2.23	50.73	73.90	23.2	160	44	
Vert.	4960.000	PK	43.19	31.48	7.44	36.93	2.23	47.41	73.90	26.5	150	0	
Vert.	7440.000	PK	44.50	36.68	9.18	37.63	2.23	54.96	73.90	18.9	150	0	
Vert.	1056.004	AV	47.21	24.34	13.06	37.08	2.23	49.76	53.90	4.1	201	352	
Vert.	2483.500	AV	31.73	27.45	14.66	36.52	2.23	39.55	53.90	14.4	241	124	
Vert.	3167.986	AV	44.03	28.66	6.45	36.62	2.23	44.75	53.90	9.2	160	44	
Vert.	4960.000	AV	31.55	31.48	7.44	36.93	2.23	35.77	53.90	18.1	150	0	
Vert.	7440.000	AV	32.20	36.68	9.18	37.63	2.23	42.66	53.90	11.2	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

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Shonan EMC Lab.

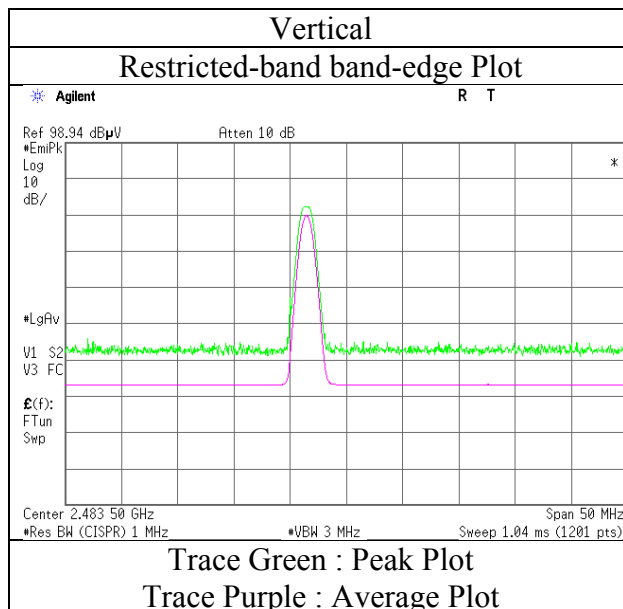
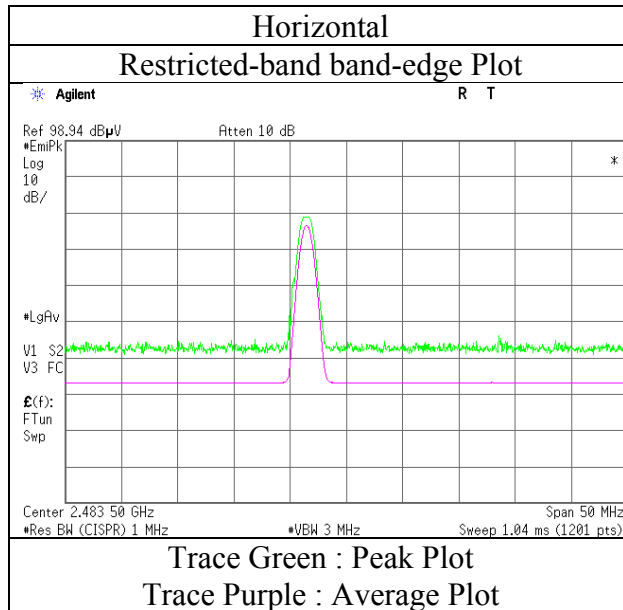
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 1, 2018
Temperature / Humidity 25 deg. C / 48 % RH
Engineer Kazuya Noda
(1 GHz – 2.8 GHz)
Mode Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
Mode Tx, Hopping Off, 3DH5 2402 MHz
(30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)

(* 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.	321.316	QP	41.56	13.91	7.05	31.77	0.00	30.75	46.00	15.2	100	49	
Hori.	350.489	QP	40.12	14.53	7.24	31.77	0.00	30.12	46.00	15.8	100	199	
Hori.	364.505	QP	40.25	14.83	7.31	31.79	0.00	30.60	46.00	15.4	100	196	
Hori.	391.153	QP	37.43	15.39	7.44	31.82	0.00	28.44	46.00	17.5	100	98	
Hori.	449.600	QP	31.76	16.61	7.69	31.89	0.00	24.17	46.00	21.8	100	178	
Hori.	514.103	QP	34.47	17.87	7.98	31.94	0.00	28.38	46.00	17.6	100	357	
Hori.	960.276	QP	31.98	22.20	9.87	30.89	0.00	33.16	53.90	20.7	119	176	
Hori.	1056.000	PK	49.47	24.34	13.06	37.08	2.23	52.02	73.90	21.9	140	73	
Hori.	1584.003	PK	48.69	25.14	13.71	36.99	2.23	52.78	73.90	21.1	149	237	
Hori.	2111.989	PK	46.55	26.24	14.28	36.77	2.23	52.53	73.90	21.4	177	222	
Hori.	2390.000	PK	44.52	27.14	14.56	36.58	2.23	51.87	73.90	22.0	139	37	
Hori.	2822.475	PK	47.70	28.23	7.02	36.57	2.23	48.61	73.90	25.3	133	172	
Hori.	3167.986	PK	50.32	28.66	6.45	36.62	2.23	51.04	73.90	22.9	169	343	
Hori.	3695.984	PK	49.66	29.13	6.80	36.59	2.23	51.23	73.90	22.7	160	330	
Hori.	4804.000	PK	44.70	31.13	7.25	36.88	2.23	48.43	73.90	25.5	150	0	
Hori.	7206.000	PK	44.94	36.35	8.89	37.26	2.23	55.15	73.90	18.8	150	0	
Hori.	1056.000	AV	43.17	24.34	13.06	37.08	2.23	45.72	53.90	8.2	140	73	
Hori.	1584.003	AV	40.67	25.14	13.71	36.99	2.23	44.76	53.90	9.1	149	237	
Hori.	2111.989	AV	37.61	26.24	14.28	36.77	2.23	43.59	53.90	10.3	177	222	
Hori.	2390.000	AV	31.90	27.14	14.56	36.58	2.23	39.25	53.90	14.7	139	37	
Hori.	2822.475	AV	39.08	28.23	7.02	36.57	2.23	39.99	53.90	13.9	133	172	
Hori.	3167.986	AV	44.87	28.66	6.45	36.62	2.23	45.59	53.90	8.3	169	343	
Hori.	3695.984	AV	42.70	29.13	6.80	36.59	2.23	44.27	53.90	9.6	160	330	
Hori.	4804.000	AV	31.74	31.13	7.25	36.88	2.23	35.47	53.90	18.4	150	0	
Hori.	7206.000	AV	32.88	36.35	8.89	37.26	2.23	43.09	53.90	10.8	150	0	
Vert.	120.082	QP	33.95	13.21	8.18	31.80	0.00	23.54	43.50	19.9	100	320	
Vert.	144.068	QP	33.54	14.47	8.69	31.78	0.00	24.92	43.50	18.5	100	191	
Vert.	256.884	QP	36.83	11.94	6.44	31.75	0.00	23.46	46.00	22.5	100	70	
Vert.	320.776	QP	41.99	13.90	7.05	31.77	0.00	31.17	46.00	14.8	100	324	
Vert.	514.158	QP	35.07	17.87	7.98	31.94	0.00	28.98	46.00	17.0	100	344	
Vert.	1056.011	PK	52.21	24.34	13.06	37.08	2.23	54.76	73.90	19.1	189	348	
Vert.	2390.000	PK	43.88	27.14	14.56	36.58	2.23	51.23	73.90	22.7	215	112	
Vert.	3167.986	PK	50.29	28.66	6.45	36.62	2.23	51.01	73.90	22.9	162	42	
Vert.	4804.000	PK	44.54	31.13	7.25	36.88	2.23	48.27	73.90	25.6	150	0	
Vert.	7206.000	PK	45.19	36.35	8.89	37.26	2.23	55.40	73.90	18.5	150	0	
Vert.	1056.011	AV	47.75	24.34	13.06	37.08	2.23	50.30	53.90	3.6	189	348	
Vert.	2390.000	AV	31.91	27.14	14.56	36.58	2.23	39.26	53.90	14.6	215	112	
Vert.	3167.986	AV	44.11	28.66	6.45	36.62	2.23	44.83	53.90	9.1	162	42	
Vert.	4804.000	AV	31.73	31.13	7.25	36.88	2.23	35.46	53.90	18.4	150	0	
Vert.	7206.000	AV	32.84	36.35	8.89	37.26	2.23	43.05	53.90	10.9	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

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	81.63	27.18	14.57	36.57	2.23	89.04	-	-	Carrier
Hori.	2400.000	PK	34.55	27.17	14.57	36.58	2.23	41.94	69.04	27.1	
Vert.	2402.000	PK	84.20	27.18	14.57	36.57	2.23	91.61	-	-	Carrier
Vert.	2400.000	PK	35.33	27.17	14.57	36.58	2.23	42.72	71.61	28.9	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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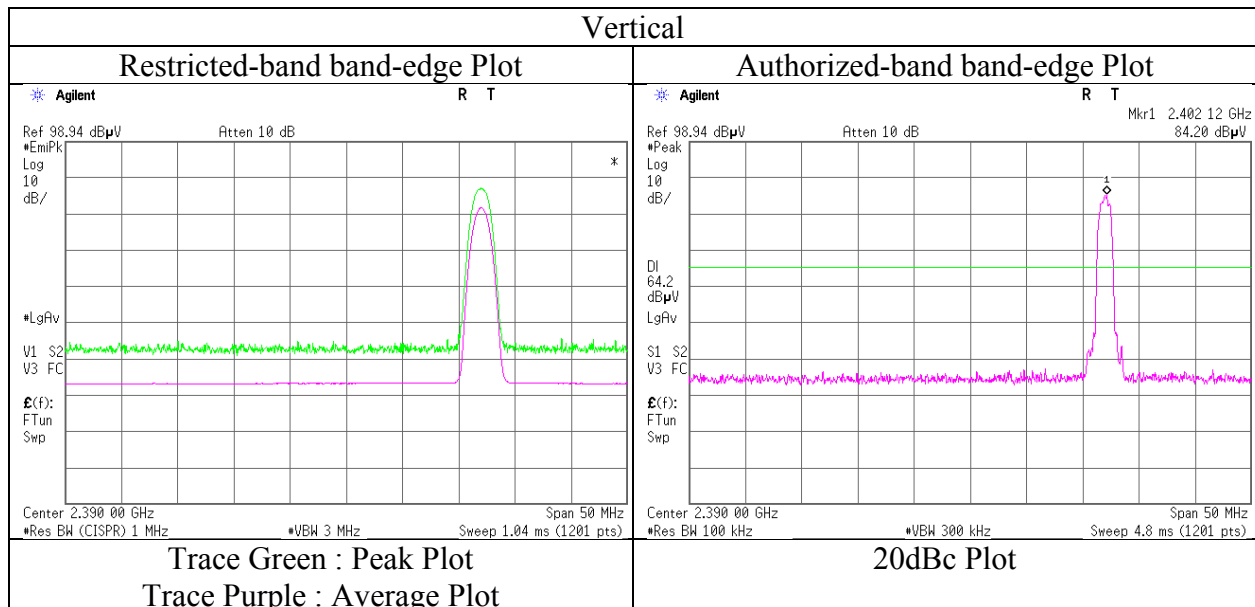
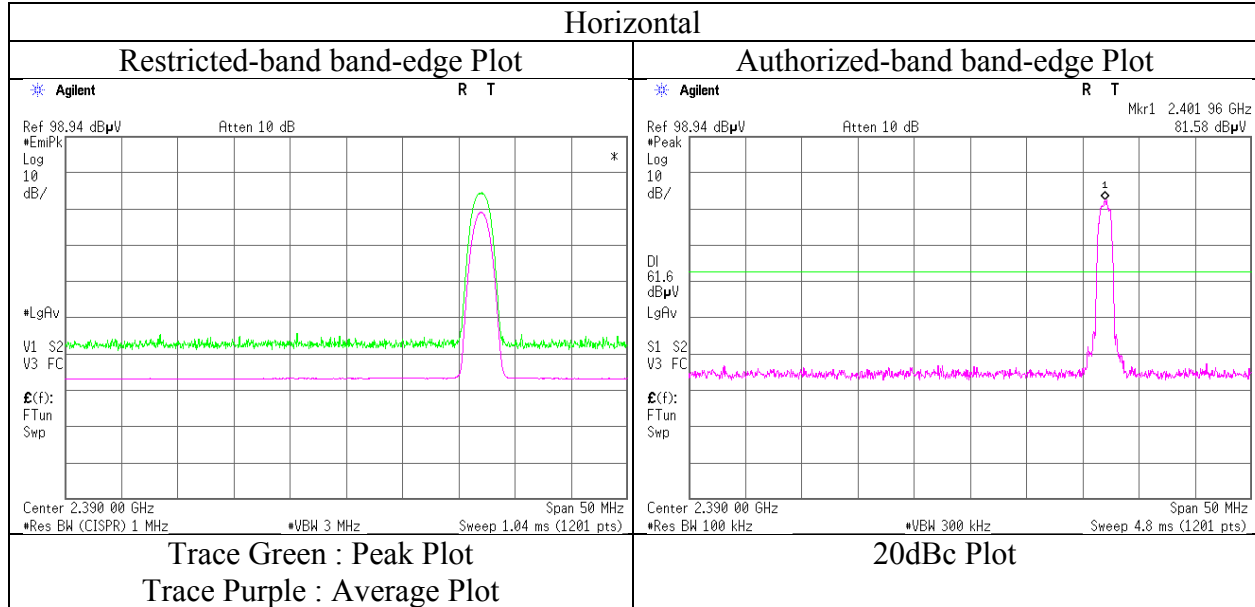
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 12258310S-B-R2
 Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date May 1, 2018
 Temperature / Humidity 25 deg. C / 48 % RH
 Engineer Kazuya Noda
 (1 GHz – 2.8 GHz)
 Mode Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
Mode Tx, Hopping Off, 3DH5 2441 MHz (30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)

(* 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.	321.317	QP	41.19	13.91	7.05	31.77	0.00	30.38	46.00	15.6	100	48	
Hori.	350.995	QP	39.78	14.54	7.24	31.77	0.00	29.79	46.00	16.2	100	194	
Hori.	364.502	QP	40.44	14.83	7.31	31.79	0.00	30.79	46.00	15.2	100	202	
Hori.	391.490	QP	37.63	15.40	7.44	31.82	0.00	28.65	46.00	17.3	100	204	
Hori.	449.840	QP	31.25	16.62	7.69	31.89	0.00	23.67	46.00	22.3	100	158	
Hori.	514.203	QP	33.86	17.87	7.98	31.94	0.00	27.77	46.00	18.2	100	348	
Hori.	960.744	QP	32.78	22.21	9.87	30.88	0.00	33.98	53.90	19.9	100	181	
Hori.	1055.992	PK	49.20	24.34	13.06	37.08	2.23	51.75	73.90	22.2	137	71	
Hori.	1584.005	PK	48.45	25.14	13.71	36.99	2.23	52.54	73.90	21.4	152	234	
Hori.	2111.967	PK	46.72	26.24	14.28	36.77	2.23	52.70	73.90	21.2	199	225	
Hori.	2822.475	PK	47.12	28.23	7.02	36.57	2.23	48.03	73.90	25.9	124	171	
Hori.	3167.986	PK	50.80	28.66	6.45	36.62	2.23	51.52	73.90	22.4	172	344	
Hori.	3695.984	PK	49.34	29.13	6.80	36.59	2.23	50.91	73.90	23.0	162	333	
Hori.	4882.000	PK	43.43	31.31	7.35	36.91	2.23	47.41	73.90	26.5	150	0	
Hori.	7323.000	PK	45.09	36.51	9.03	37.44	2.23	55.42	73.90	18.5	150	0	
Hori.	1055.992	AV	43.24	24.34	13.06	37.08	2.23	45.79	53.90	8.1	137	71	
Hori.	1584.005	AV	41.47	25.14	13.71	36.99	2.23	45.56	53.90	8.3	152	234	
Hori.	2111.967	AV	37.82	26.24	14.28	36.77	2.23	43.80	53.90	10.1	199	225	
Hori.	2822.475	AV	39.53	28.23	7.02	36.57	2.23	40.44	53.90	13.5	124	171	
Hori.	3167.986	AV	44.59	28.66	6.45	36.62	2.23	45.31	53.90	8.6	172	344	
Hori.	3695.984	AV	41.87	29.13	6.80	36.59	2.23	43.44	53.90	10.5	162	333	
Hori.	4882.000	AV	31.39	31.31	7.35	36.91	2.23	35.37	53.90	18.5	150	0	
Hori.	7323.000	AV	32.30	36.51	9.03	37.44	2.23	42.63	53.90	11.3	150	0	
Vert.	120.024	QP	33.89	13.21	8.18	31.80	0.00	23.48	43.50	20.0	100	3	
Vert.	144.029	QP	33.35	14.47	8.69	31.78	0.00	24.73	43.50	18.7	100	201	
Vert.	256.822	QP	37.09	11.94	6.44	31.75	0.00	23.72	46.00	22.2	100	69	
Vert.	321.316	QP	42.03	13.91	7.05	31.77	0.00	31.22	46.00	14.7	100	52	
Vert.	514.104	QP	34.76	17.87	7.98	31.94	0.00	28.67	46.00	17.3	100	353	
Vert.	1056.009	PK	52.35	24.34	13.06	37.08	2.23	54.90	73.90	19.0	190	343	
Vert.	3167.986	PK	49.93	28.66	6.45	36.62	2.23	50.65	73.90	23.3	163	40	
Vert.	4882.000	PK	43.24	31.31	7.35	36.91	2.23	47.22	73.90	26.7	150	0	
Vert.	7323.000	PK	44.82	36.51	9.03	37.44	2.23	55.15	73.90	18.8	150	0	
Vert.	1056.009	AV	47.63	24.34	13.06	37.08	2.23	50.18	53.90	3.7	190	343	
Vert.	3167.986	AV	43.77	28.66	6.45	36.62	2.23	44.49	53.90	9.4	163	40	
Vert.	4882.000	AV	31.46	31.31	7.35	36.91	2.23	35.44	53.90	18.5	150	0	
Vert.	7323.000	AV	32.31	36.51	9.03	37.44	2.23	42.64	53.90	11.3	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

Radiated Spurious Emission

Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 2, 2018 May 1, 2018 May 4, 2018 May 5, 2018
Temperature / Humidity 23 deg. C / 47 % RH 25 deg. C / 48 % RH 22 deg. C / 50 % RH 22 deg. C / 31 % RH
Engineer Takahiro Suzuki Kazuya Noda Shiro Kobayashi Shiro Kobayashi
(30 MHz – 1000 MHz) (1 GHz – 2.8 GHz) (2.8 GHz – 13 GHz) (13 GHz – 26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2480 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	321.313	QP	40.62	13.91	7.05	31.77	0.00	29.81	46.00	16.1	100	191	
Hori.	350.999	QP	37.67	14.54	7.24	31.77	0.00	27.68	46.00	18.3	100	184	
Hori.	364.497	QP	39.73	14.83	7.31	31.79	0.00	30.08	46.00	15.9	100	198	
Hori.	391.498	QP	38.15	15.40	7.44	31.82	0.00	29.17	46.00	16.8	100	200	
Hori.	449.844	QP	32.00	16.62	7.69	31.89	0.00	24.42	46.00	21.5	100	52	
Hori.	514.100	QP	35.28	17.87	7.98	31.94	0.00	29.19	46.00	16.8	100	303	
Hori.	960.273	QP	32.84	22.20	9.87	30.89	0.00	34.02	53.90	19.8	116	80	
Hori.	1056.006	PK	49.38	24.34	13.06	37.08	2.23	51.93	73.90	22.0	137	71	
Hori.	1583.998	PK	48.73	25.14	13.71	36.99	2.23	52.82	73.90	21.1	155	235	
Hori.	2111.989	PK	47.02	26.24	14.28	36.77	2.23	53.00	73.90	20.9	183	229	
Hori.	2483.500	PK	43.68	27.45	14.66	36.52	2.23	51.50	73.90	22.4	146	320	
Hori.	2822.475	PK	47.39	28.23	7.02	36.57	2.23	48.30	73.90	25.6	121	169	
Hori.	3167.986	PK	50.68	28.66	6.45	36.62	2.23	51.40	73.90	22.5	172	344	
Hori.	3695.954	PK	49.52	29.13	6.80	36.59	2.23	51.09	73.90	22.8	164	329	
Hori.	4960.000	PK	43.97	31.48	7.44	36.93	2.23	48.19	73.90	25.7	150	0	
Hori.	7440.000	PK	44.25	36.68	9.18	37.63	2.23	54.71	73.90	19.2	150	0	
Hori.	1056.006	AV	42.56	24.34	13.06	37.08	2.23	45.11	53.90	8.8	137	71	
Hori.	1583.998	AV	42.05	25.14	13.71	36.99	2.23	46.14	53.90	7.8	155	235	
Hori.	2111.989	AV	38.21	26.24	14.28	36.77	2.23	44.19	53.90	9.7	183	229	
Hori.	2483.500	AV	31.70	27.45	14.66	36.52	2.23	39.52	53.90	14.4	146	320	
Hori.	2822.475	AV	39.96	28.23	7.02	36.57	2.23	40.87	53.90	13.0	121	169	
Hori.	3167.986	AV	44.81	28.66	6.45	36.62	2.23	45.53	53.90	8.4	172	344	
Hori.	3695.954	AV	41.90	29.13	6.80	36.59	2.23	43.47	53.90	10.4	164	329	
Hori.	4960.000	AV	31.49	31.48	7.44	36.93	2.23	35.71	53.90	18.2	150	0	
Hori.	7440.000	AV	33.08	36.68	9.18	37.63	2.23	43.54	53.90	10.4	150	0	
Vert.	120.034	QP	35.19	13.21	8.18	31.80	0.00	24.78	43.50	18.7	100	340	
Vert.	144.080	QP	33.89	14.47	8.69	31.78	0.00	25.27	43.50	18.2	100	121	
Vert.	256.829	QP	35.95	11.94	6.44	31.75	0.00	22.58	46.00	23.4	100	143	
Vert.	320.784	QP	41.34	13.90	7.05	31.77	0.00	30.52	46.00	15.4	100	120	
Vert.	514.212	QP	34.57	17.87	7.98	31.94	0.00	28.48	46.00	17.5	100	342	
Vert.	1055.964	PK	52.11	24.34	13.06	37.08	2.23	54.66	73.90	19.2	199	357	
Vert.	2483.500	PK	44.01	27.45	14.66	36.52	2.23	51.83	73.90	22.1	243	121	
Vert.	3167.986	PK	49.92	28.66	6.45	36.62	2.23	50.64	73.90	23.3	157	40	
Vert.	4960.000	PK	43.52	31.48	7.44	36.93	2.23	47.74	73.90	26.2	150	0	
Vert.	7440.000	PK	44.07	36.68	9.18	37.63	2.23	54.53	73.90	19.4	150	0	
Vert.	1055.964	AV	47.79	24.34	13.06	37.08	2.23	50.34	53.90	3.6	199	357	
Vert.	2483.500	AV	31.94	27.45	14.66	36.52	2.23	39.76	53.90	14.1	243	121	
Vert.	3167.986	AV	44.02	28.66	6.45	36.62	2.23	44.74	53.90	9.2	157	40	
Vert.	4960.000	AV	31.56	31.48	7.44	36.93	2.23	35.78	53.90	18.1	150	0	
Vert.	7440.000	AV	32.22	36.68	9.18	37.63	2.23	42.68	53.90	11.2	150	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.88 m / 3.0 m) = 2.23 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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

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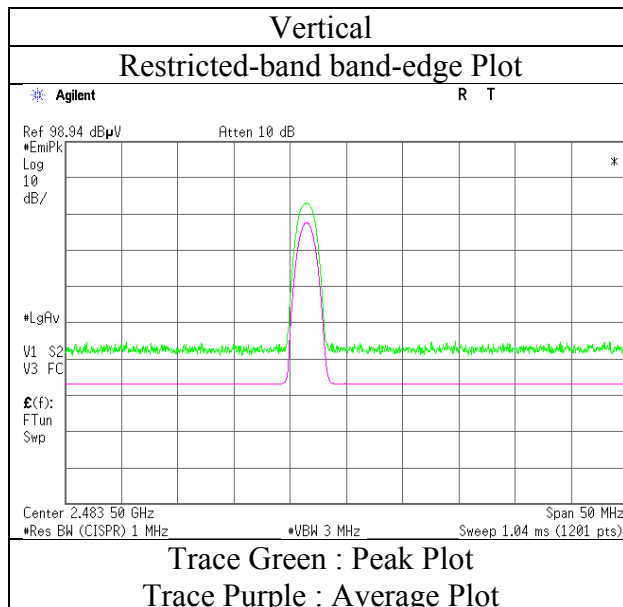
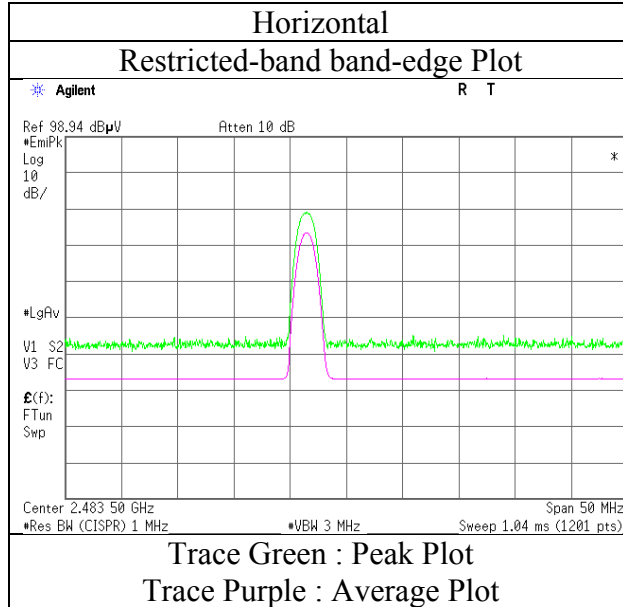
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Radiated Spurious Emission
(Reference Plot for band-edge)

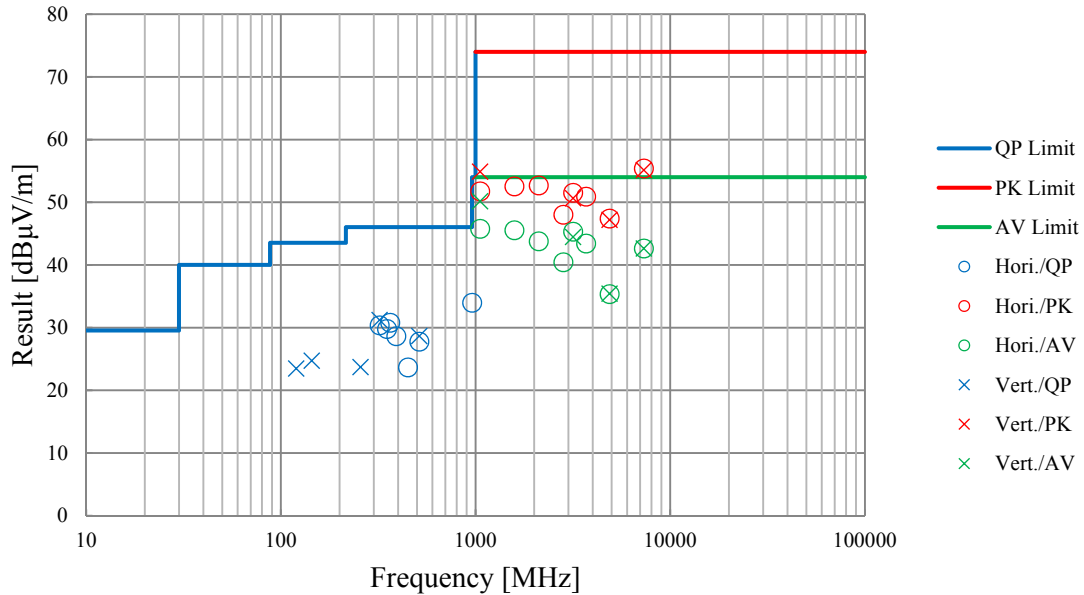
Report No. 12258310S-B-R2
Test place Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 1, 2018
Temperature / Humidity 25 deg. C / 48 % RH
Engineer Kazuya Noda
(1 GHz – 2.8 GHz)
Mode Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12258310S-B-R2			
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber			
Date	May 2, 2018	May 1, 2018	May 4, 2018	May 5, 2018
Temperature / Humidity	23 deg. C / 47 % RH	25 deg. C / 48 % RH	22 deg. C / 50 % RH	22 deg. C / 31 % RH
Engineer	Takahiro Suzuki	Kazuya Noda	Shiro Kobayashi	Shiro Kobayashi
Mode	(30 MHz – 1000 MHz) Tx, Hopping Off, 3DH5 2441 MHz	(1 GHz – 2.8 GHz)	(2.8 GHz – 13 GHz)	(13 GHz – 26.5 GHz)

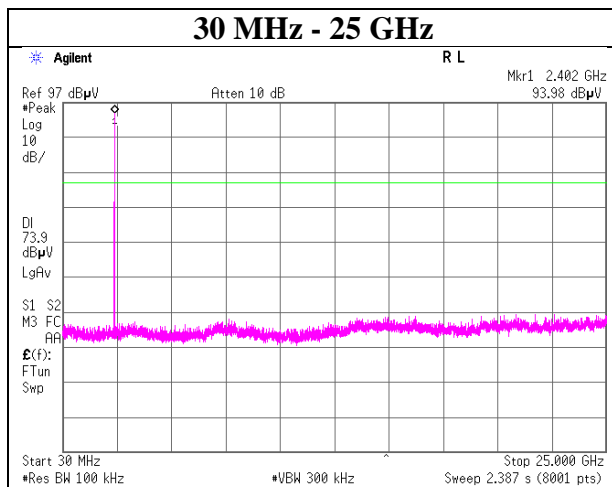
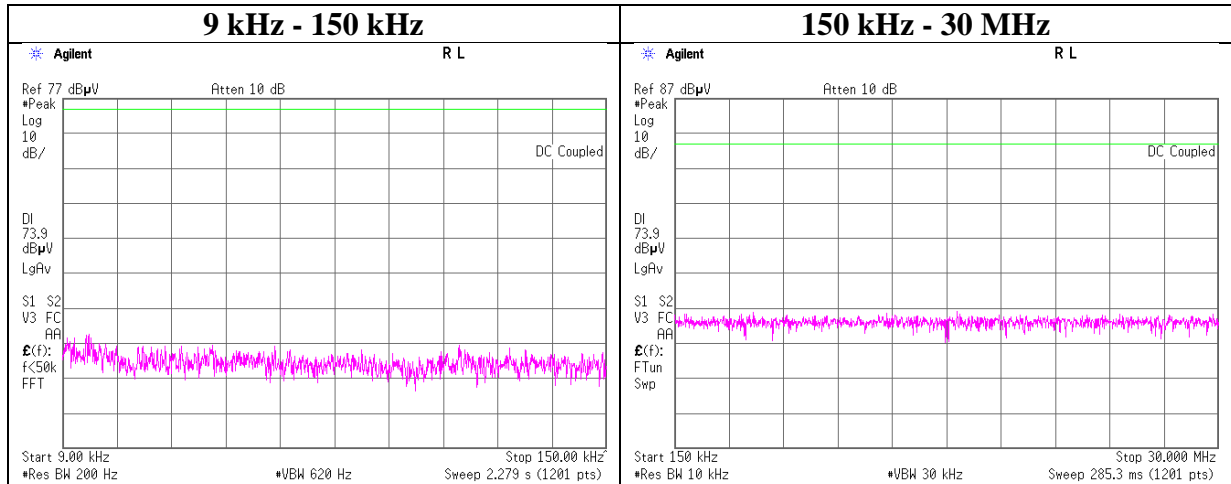


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5, 2402 MHz

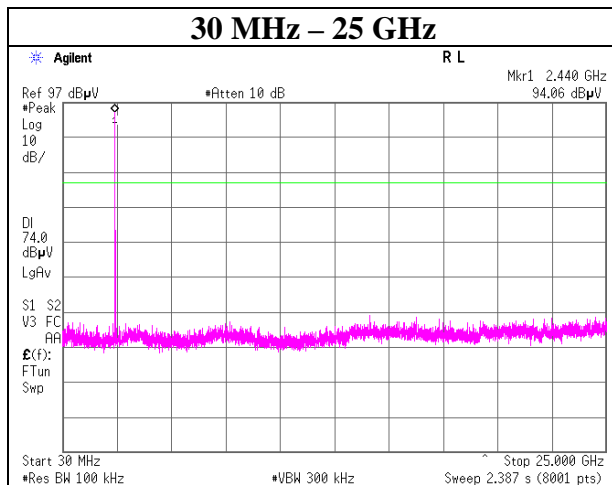
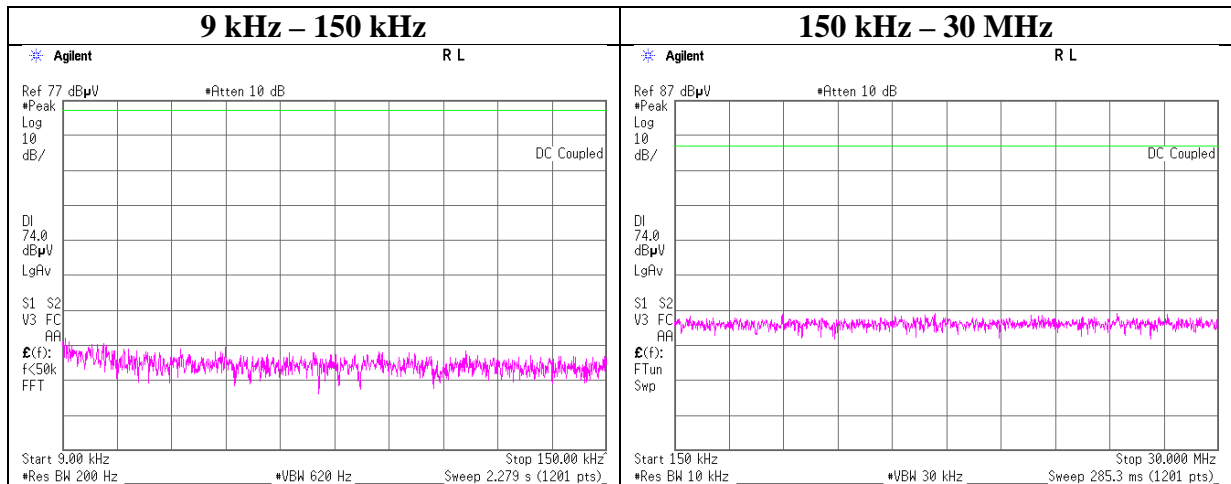
2402 MHz



Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5, 2441 MHz

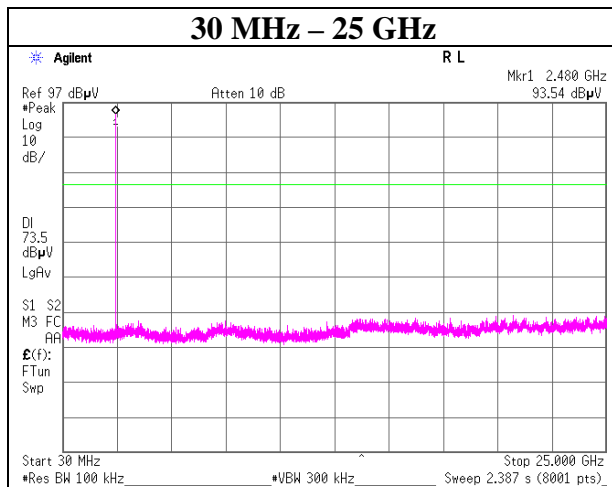
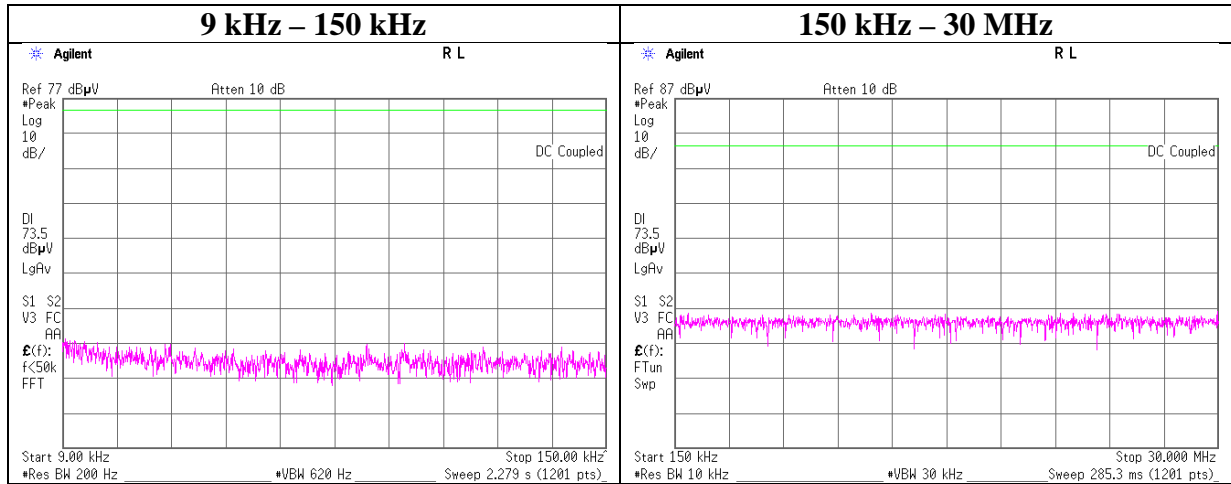
2441 MHz



Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5, 2480 MHz

2480 MHz



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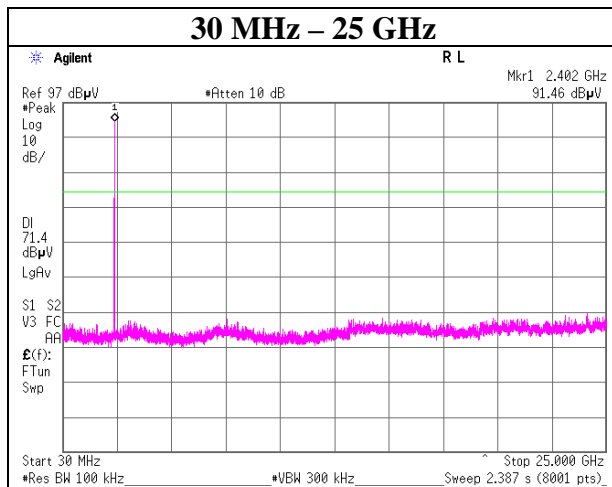
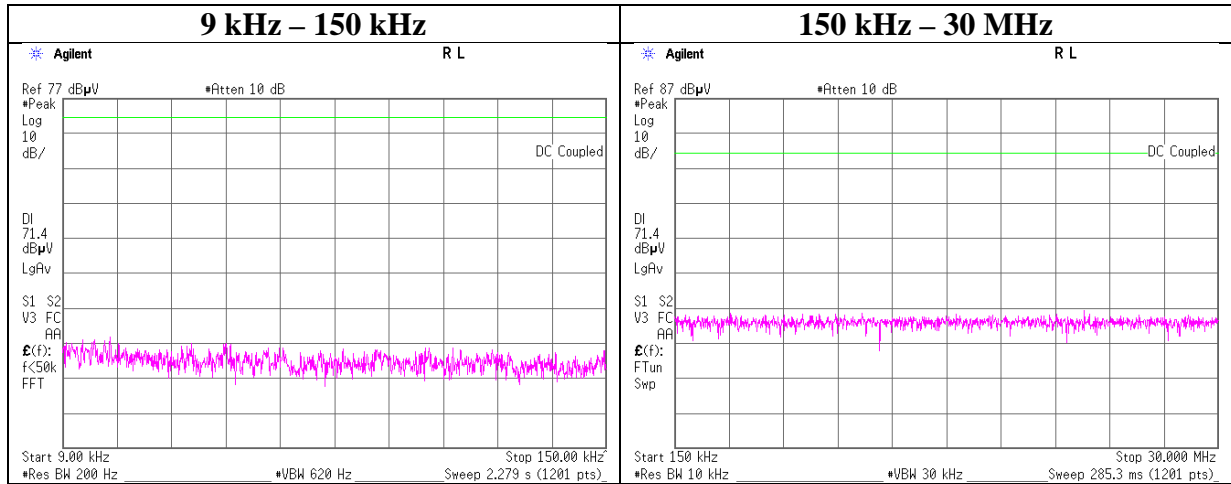
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5, 2402 MHz

2402 MHz



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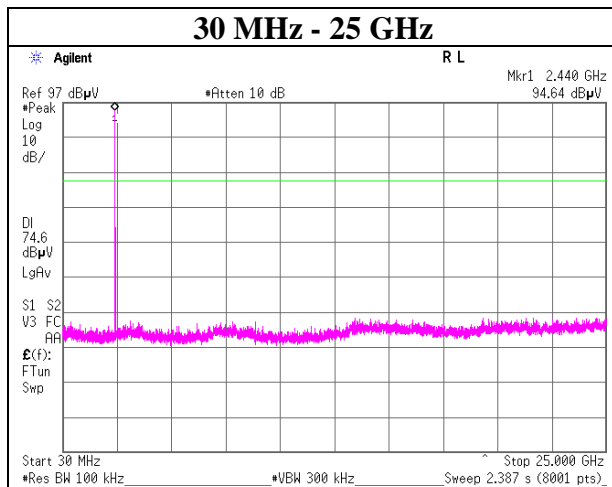
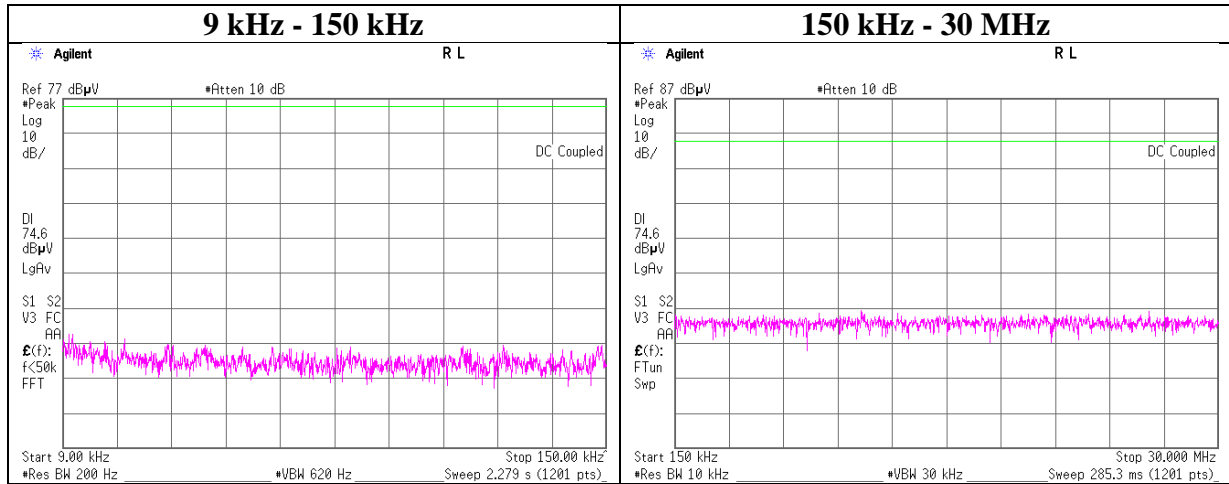
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5

2441 MHz



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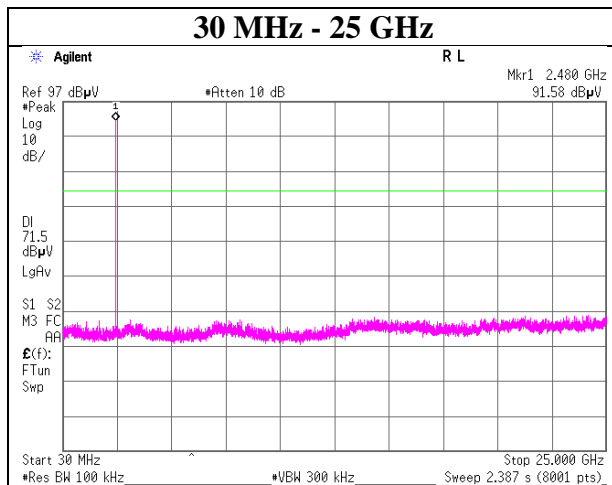
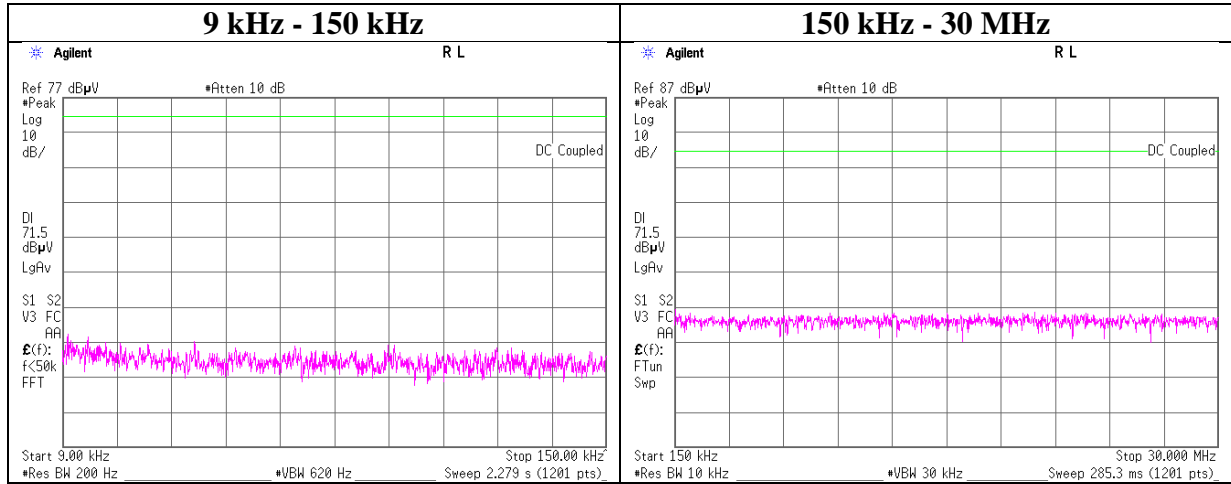
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5, 2480 MHz

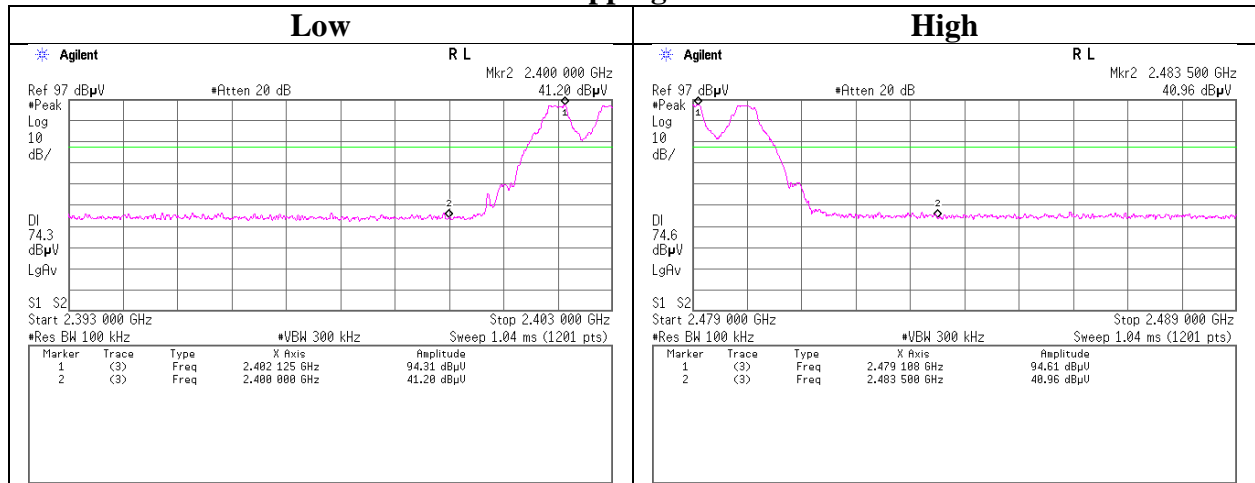
2480 MHz



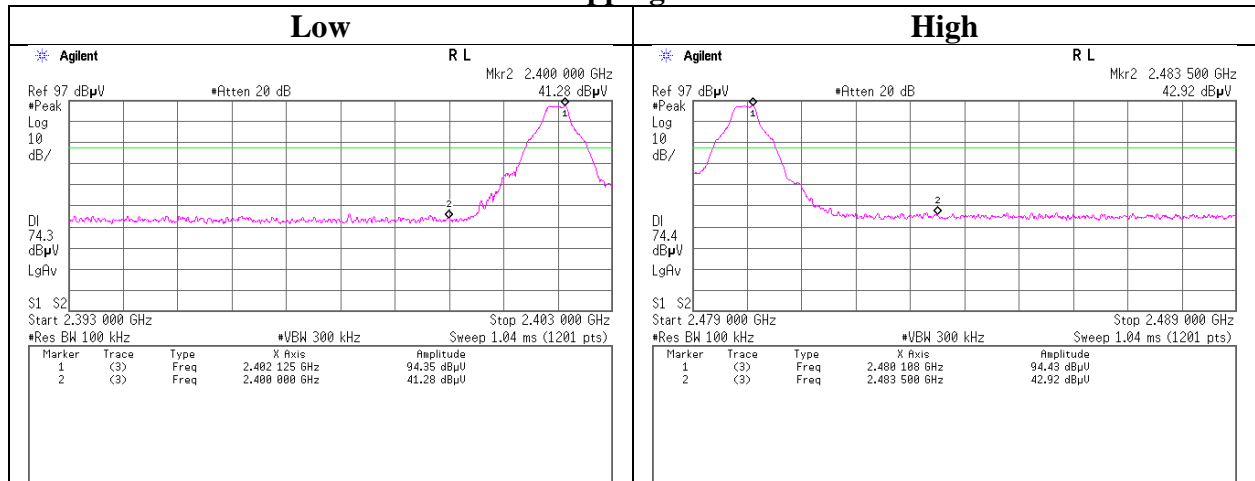
Conducted Emission Band Edge compliance

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off/On, DH5

Hopping On



Hopping Off



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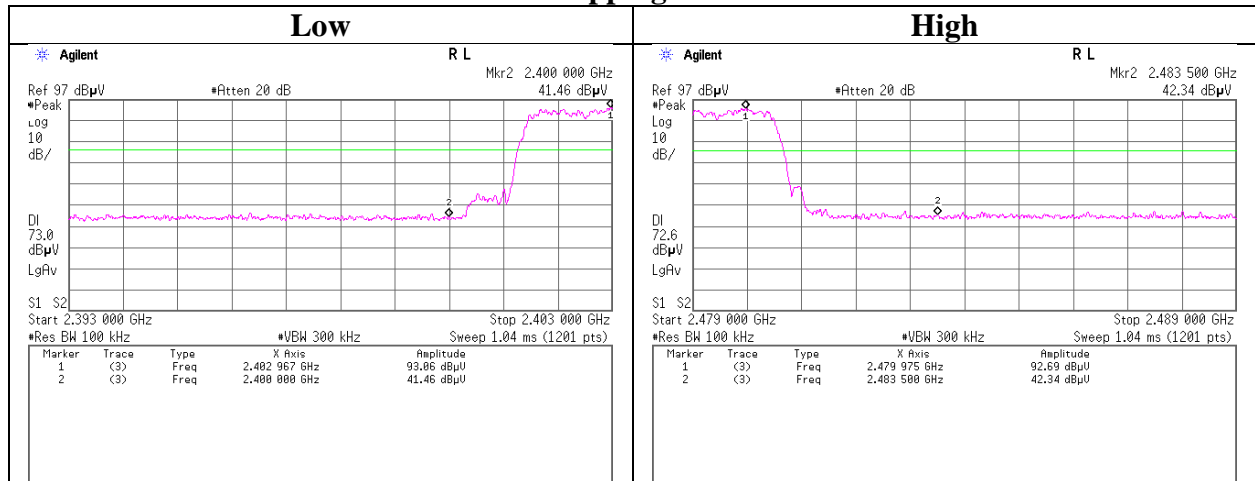
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

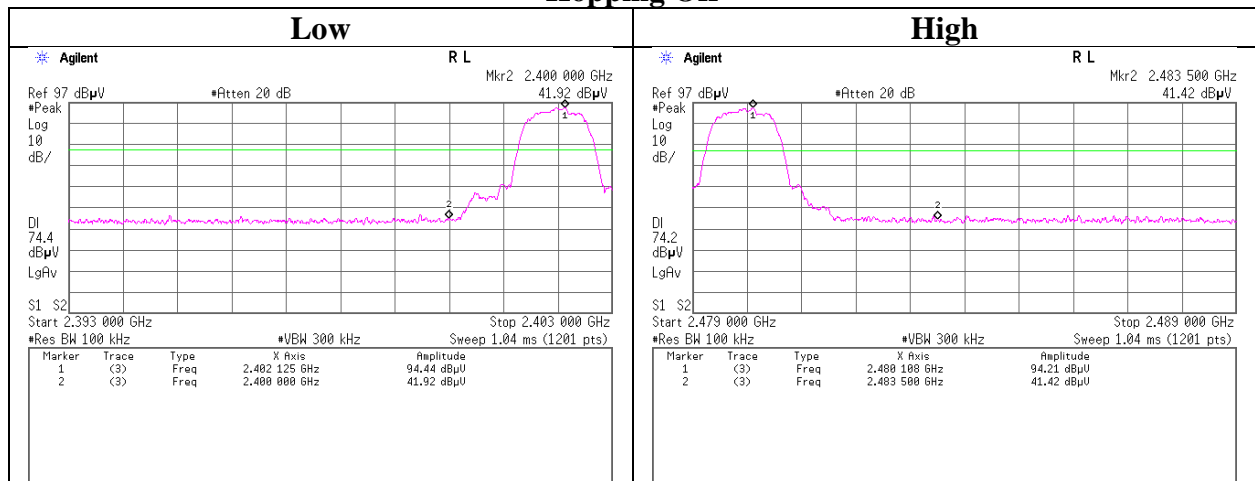
Conducted Emission Band Edge compliance

Report No.	12258310S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	April 26, 2018
Temperature / Humidity	24 deg. C / 46 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off/On, DH5

Hopping On



Hopping Off



APPENDIX 2: Test instruments

Test Instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2017/04/25 * 12 *1)
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2017/04/25 * 12 *1)
SRENT-09	Spectrum Analyzer	Agilent	E4440A	MY46186392	AT	2017/11/08 * 12
SAT10-12	Attenuator	Weinschel Corp.	54A-10	81601	AT	2018/03/22 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2018/03/19 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2017/12/21 * 12
KTS-08	Digital Tester	SANWA	PC500	7019224	AT	2018/03/05 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2018/02/15 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2018/01/29 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2017/05/08 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2017/08/14 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2017/10/30 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2017/10/10 * 12
KJM-09	Measure	KOMELON	KMC-36	-	RE	-
SAEC-01(SVS WR)	Semi-Anechoic Chamber	TDK	SAEC-01(SVSW R)	1	RE	2017/07/20 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE, CE,RFI,MF)	-	RE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2017/10/16 * 12
SAT10-05	Attenuator(above 1 GHz)	Agilent	8493C-010	74864	RE	2017/11/22 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2018/04/20 * 12
SCC-G41	Coaxial Cable	Junkosha	MWX221-01000 NFSNMS/B	1612S006	RE	2018/01/29 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2018/03/20 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2017/09/22 * 12
SCC-G20	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-003	RE	2018/04/20 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000 KMSKMS	-	RE	2018/04/20 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2018/02/16 * 12
KAT6-04	Attenuator	INMET	18N-6dB	-	RE	2017/12/14 * 12
SAT3-09	Attenuator	JFW	50HF-003N	-	RE	2017/08/24 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2017/10/21 * 12
SCC-A1/A3/A5/A7/A8/A13/SRS E-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2018/04/12 * 12
SCC-A2/A4/A6/A7/A8/A13/SRS E-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2018/04/12 * 12
SLA-05	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	193	RE	2017/12/10 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2018/04/13 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2017/06/09 * 12

*1) This test equipment was used for the tests before the expiration date of the calibration.

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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