



RADIO TEST REPORT

Test Report No. : 12443390S-A

Applicant : **Panasonic Corporation**
Type of Equipment : **Car Audio System**
Model No. : **AT1804**
FCC ID : **ACJ932AT1804**
Test regulation : **FCC Part 15 Subpart C: 2018**
*** Bluetooth BDR/EDR part**
Test Result : **Complied**

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

Date of test: September 7 to 19, 2018

Representative test engineer:

M. Hosaka

Makoto Hosaka
Engineer
Consumer Technology Division

Approved by:

S. Takano

Shinichi Takano
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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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 12443390S-A

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SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-city, 224-8520, Japan
Telephone Number	:	+81-50-3689-6982
Contact Person	:	Tomohiko Nakajo

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio System
Model No.	:	AT1804
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 13.2 V
Receipt Date of Sample	:	September 5, 2018
Country of Mass-production	:	Japan, Czech, Mexico, 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: AT1804 (referred to as the EUT in this report) is a Car Audio System.

Radio Specification

[WLAN]

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS
Antenna type	:	Dipole antenna
Antenna gain with cable loss	:	1.1 dBi
Clock frequency (Maxmum)	:	48 MHz

[Bluetooth]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Antenna type	:	Dipole antenna
Antenna gain with cable loss	:	1.1 dBi
Clock frequency (Maxmum)	:	48 MHz

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	*1)
Carrier Frequency Separation	FCC: KDB 558074 D01 15.247 Meas Guidance v05 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (a)		Complied	Conducted
Number of Hopping Frequency	FCC: KDB 558074 D01 15.247 Meas Guidance v05 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (d)		Complied	Conducted
Dwell time	FCC: KDB 558074 D01 15.247 Meas Guidance v05 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05 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: KDB 558074 D01 15.247 Meas Guidance v05 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	10.3 dB 9608.00 MHz, AV, Vert. Tx, Hopping Off, DH5 2402 MHz	Complied	Conducted/ Radiated (above 30 MHz) *2)
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					
*1) The test is not applicable since the EUT has no AC mains.					
*2) Radiated test was selected over 30 MHz based on section 15.247(d).					
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.
Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The EUT has a unique antenna connector (HFC III connector). Therefore the equipment complies with the requirement of 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 6.7	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 $k=2$.
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Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / 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-18 GHz	5.3 dB	5.3 dB	5.3 dB
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB
Radiated emission (Measurement distance: 1 m)	1 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
Power Measurement above 1 GHz (Average Detector)_SPM-13	0.90 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.04 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

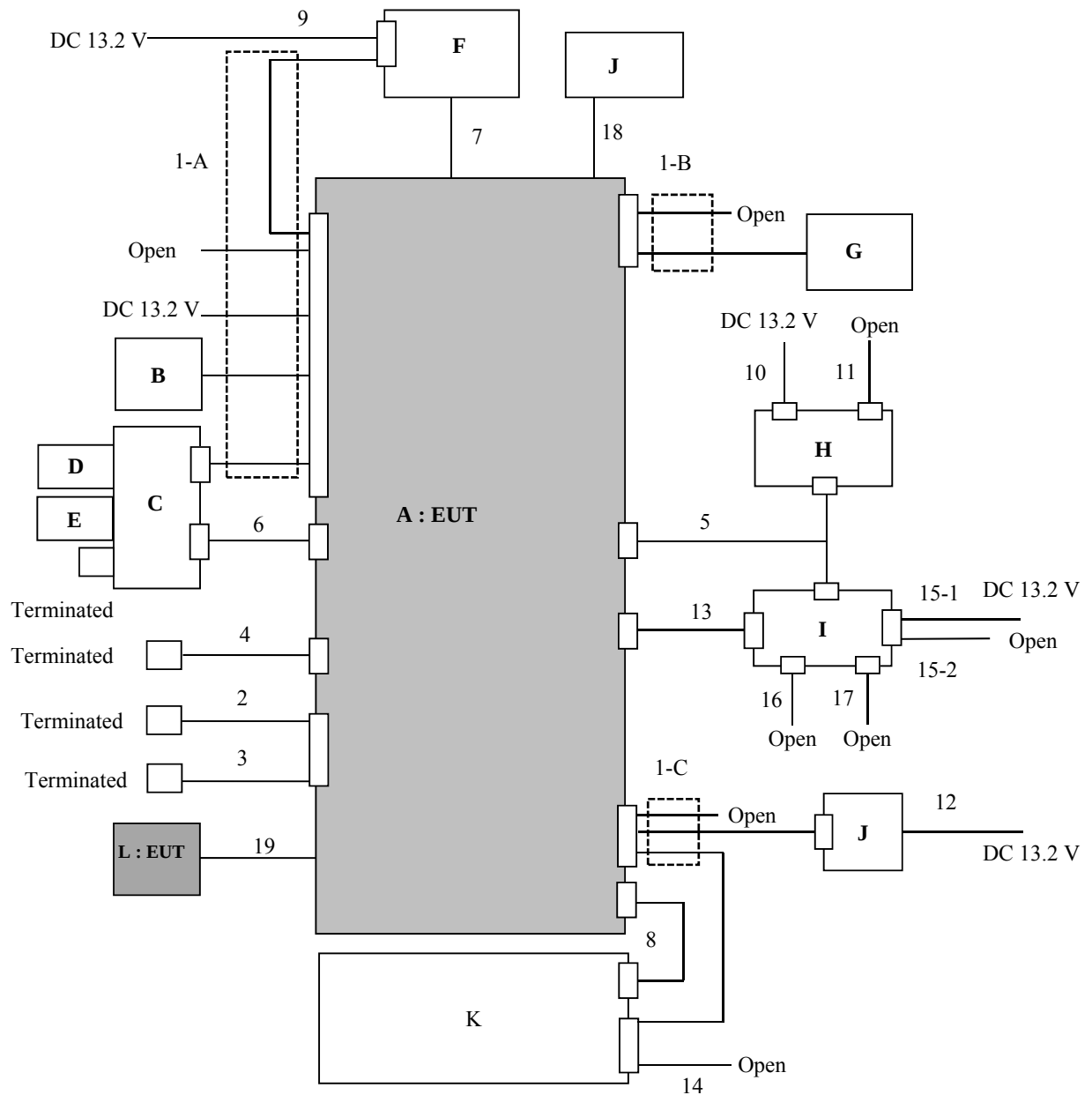
4.1 Operating Mode(s)

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
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test) *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative. * It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: Fixed Software: D17517010700001V0 Ver.1.0 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.		

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Car Audio System	AT1804	500043	Panasonic Corporation	EUT
B	Steering SW	-	0022	-	-
C	IF-Box	CA-UL56X0AJ	3	Panasonic	-
D	USB Memory	SDK-USM4GL(B)	-	SONY	-
E	USB Memory	SDK-USM4GL(B)	-	SONY	-
F	Display	17EMVD	54	DENSO	-
G	Microphone	86730-20050	-	-	-
H	AMP	86280-76050	521343	Panasonic	-
I	RSE-ECU	CV-UL45H0AJ	-	Panasonic	-
J	DCM	86741-53054	8KYLK327398	DENSO	-
K	MEU	CN-SLM8N0AJ	500003	Panasonic	-
L	Antenna	CA-AT29X04J	500063	Panasonic	EUT

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1-A	General-purpose	2.0	Unshielded	Unshielded	-
1-B	General-purpose	2.0	Unshielded	Unshielded	-
1-C	General-purpose	2.0	Unshielded	Unshielded	-
2	Radio antenna	0.15 + 2.0	Shielded	Shielded	-
3	Radio/D-Radio antenna	0.15 + 1.1	Shielded	Shielded	-
4	XM antenna	1.0	Shielded	Shielded	-
5	AVC-LAN Step3	2.0	Unshielded	Unshielded	-
6	USB (IF-BOX)	1.0	Shielded	Shielded	-
7	GVIF	1.0	Shielded	Shielded	-
8	GVIF, USB from MEU	2.0	Shielded	Shielded	-
9	DC Power / Signal	1.0	Unshielded	Unshielded	-
10	DC Power	1.0 + 1.5	Unshielded	Unshielded	-
11	Signal	1.0	Unshielded	Unshielded	-
12	DC Power / Signal	1.0	Unshielded	Unshielded	-
13	GVIF	2.0	Unshielded	Unshielded	-
14	Signal	2.0	Unshielded	Unshielded	-
15-1	DC Power	2.0	Unshielded	Unshielded	-
15-2	Signal	2.0	Unshielded	Unshielded	-
16	Signal	2.0	Unshielded	Unshielded	-
17	Signal	2.0	Unshielded	Unshielded	-
18	Signal	2.0	Unshielded	Unshielded	-
19	Antenna	0.2	Shielded	Shielded	-

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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 2.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 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;

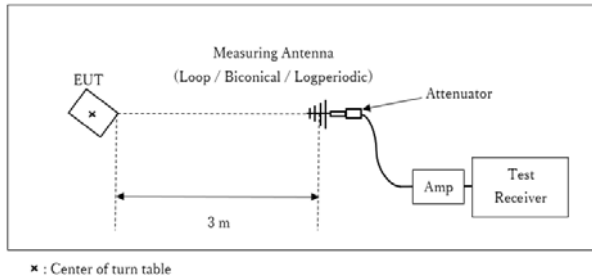
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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).

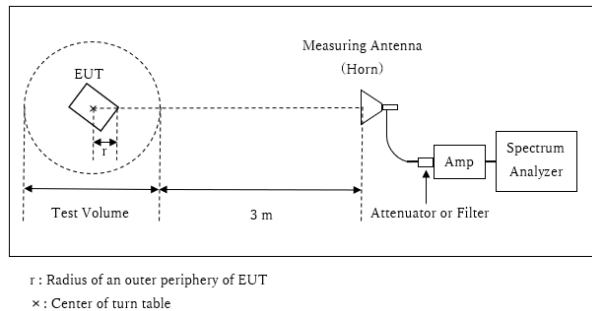
Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz	RBW: 100 kHz VBW: 300 kHz

Below 1 GHz



Test Distance: 3 m

1 GHz - 13 GHz



Distance Factor: $20 \times \log (3.82 \text{ m}^* / 3.0 \text{ m}) = 2.10 \text{ dB}$

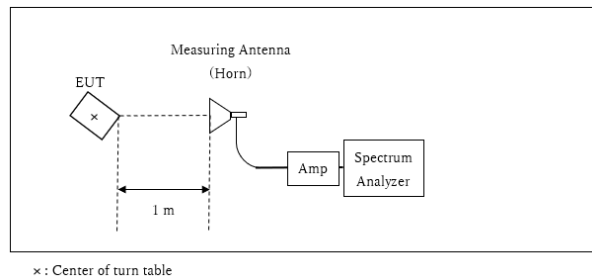
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.82 \text{ m}$

Test Volume: 2 m

(Test Volume has been calibrated based on CISPR 16-1-4.)

r = 0.18 m

13 GHz - 26.5 GHz



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

*Test Distance: 1 m

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

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
20 dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	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 30 MHz, RBW was narrowed to separate the noise contents.

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

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, 99% Occupied Bandwidth and Carrier Frequency Separation

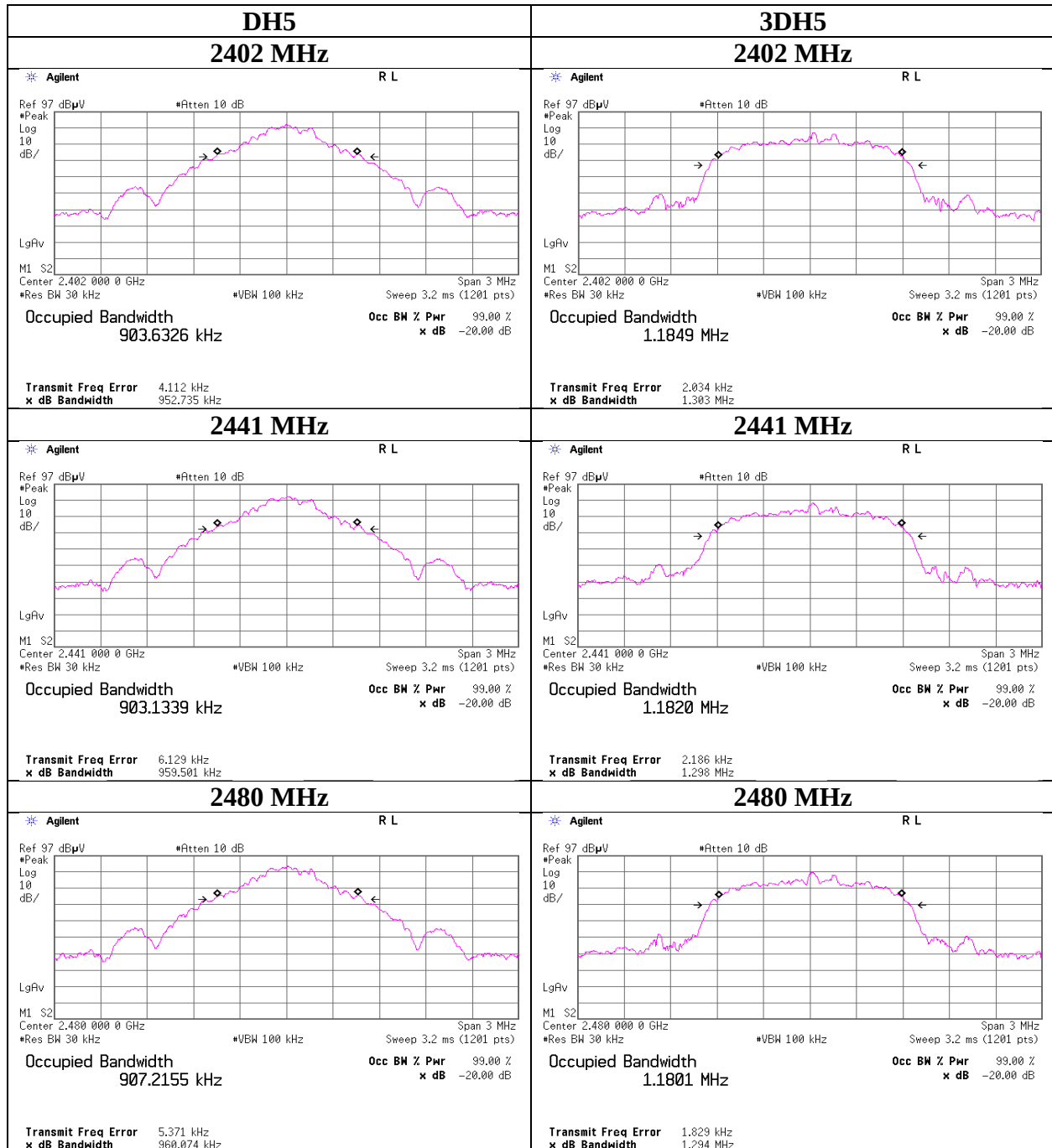
Report No.	12443390S-A	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	September 7, 2018	September 11, 2018
Temperature / Humidity	25 deg. C / 50 % RH	25 deg. C / 53 % RH
Engineer	Kazutaka Takeyama	Makoto Hosaka
Mode	Tx, Hopping Off, Tx, Hopping On	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	99% Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.953	903.633	1.000	≥ 0.635
DH5	2441.0	0.960	903.134	1.000	≥ 0.640
DH5	2480.0	0.960	907.216	1.000	≥ 0.640
DH5	Hopping On	-	78644.2	-	-
3DH5	2402.0	1.303	1184.9	1.000	≥ 0.869
3DH5	2441.0	1.298	1182.0	1.000	≥ 0.865
3DH5	2480.0	1.294	1180.1	1.000	≥ 0.863
3DH5	Hopping On	-	78695.9	-	-

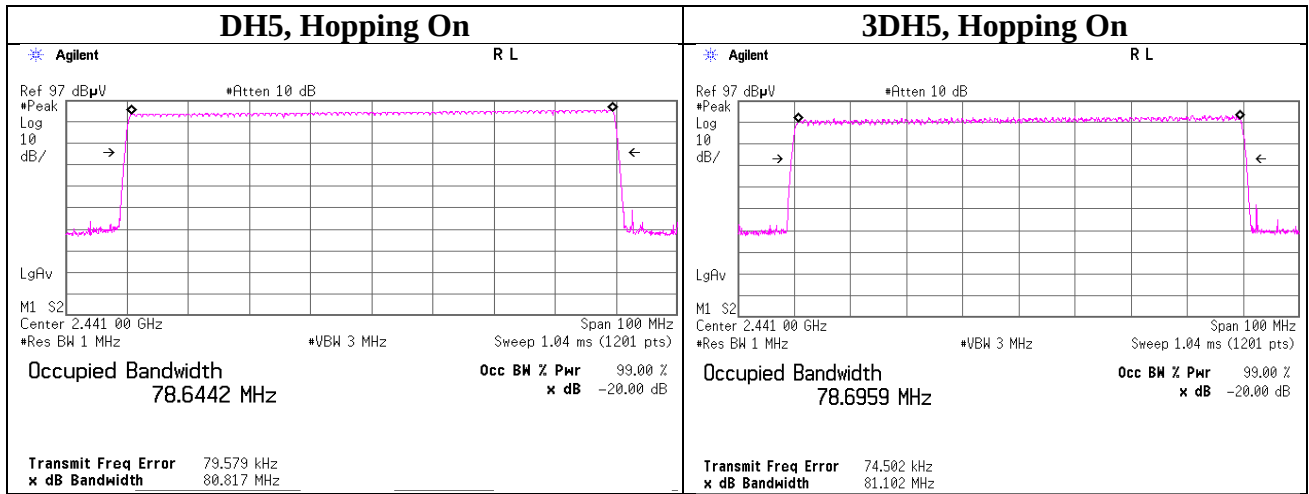
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and 99% Occupied Bandwidth



20dB Bandwidth and 99% Occupied Bandwidth



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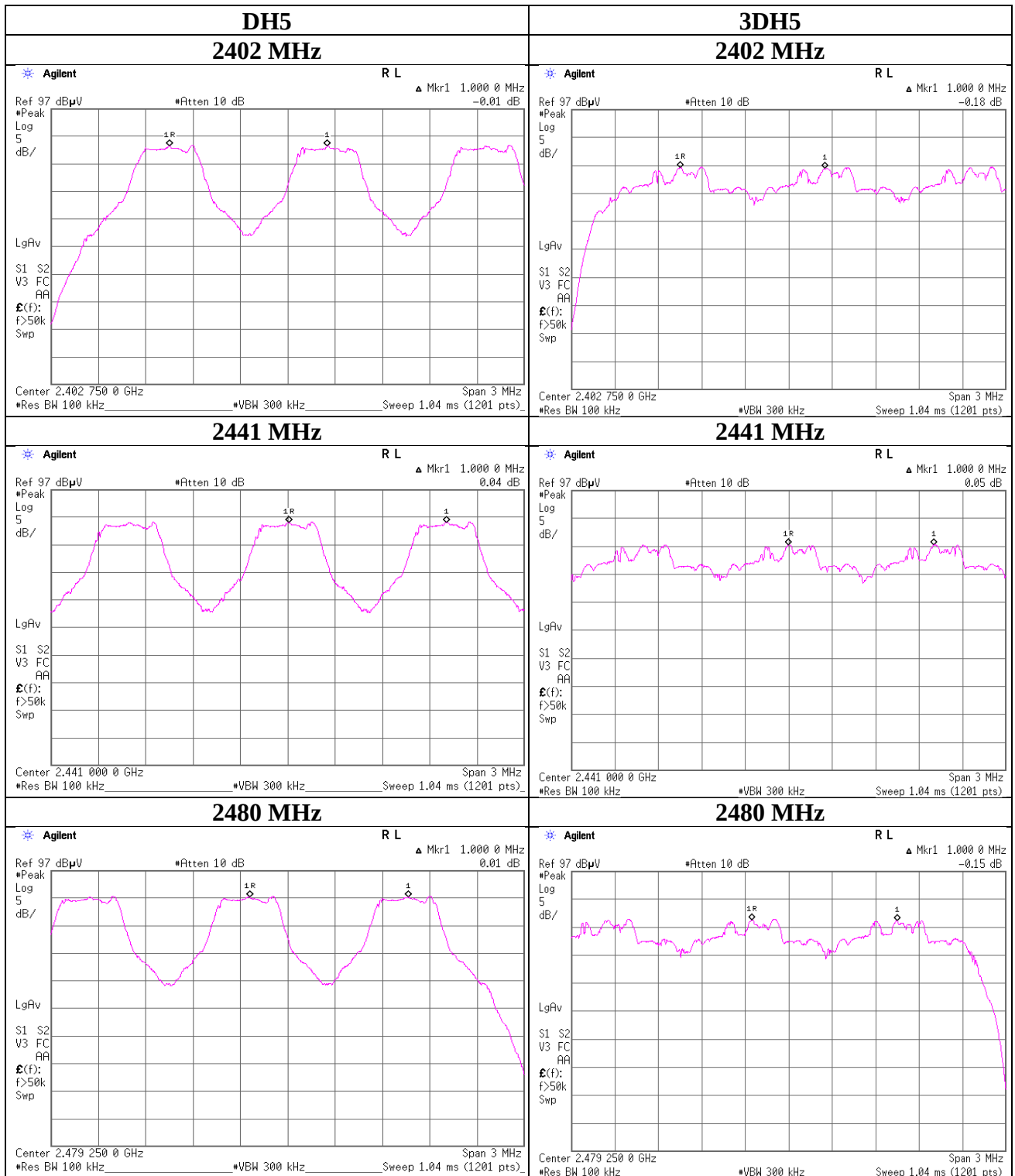
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Carrier Frequency Separation



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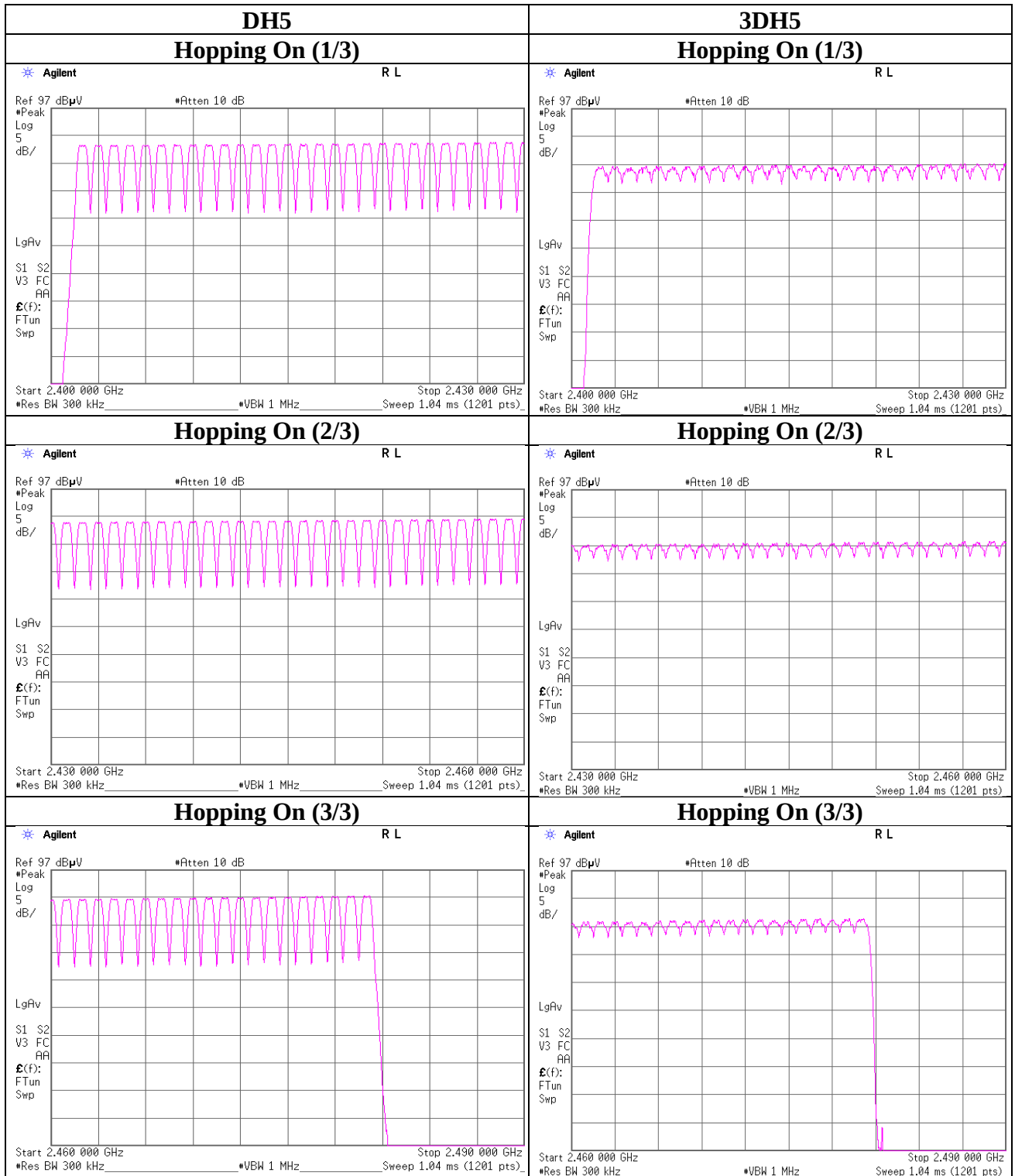
Number of Hopping Frequency

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018 September 11, 2018
Temperature / Humidity 25 deg. C / 50 % RH 25 deg. C / 53 % RH
Engineer Kazutaka Takeyama Makoto Hosaka
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

Report No.	12443390S-A	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	September 7, 2018	September 11, 2018
Temperature / Humidity	25 deg. C / 50 % RH	25 deg. C / 53 % RH
Engineer	Kazutaka Takeyama	Makoto Hosaka
Mode	Tx, Hopping On	

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period			Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	50.4 times	/	5 sec. x	31.6 sec. =	319 times	400
DH3	23.8 times	/	5 sec. x	31.6 sec. =	151 times	400
DH5	19.2 times	/	5 sec. x	31.6 sec. =	122 times	400
3DH1	51.0 times	/	5 sec. x	31.6 sec. =	323 times	400
3DH3	26.8 times	/	5 sec. x	31.6 sec. =	170 times	400
3DH5	17.0 times	/	5 sec. x	31.6 sec. =	108 times	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

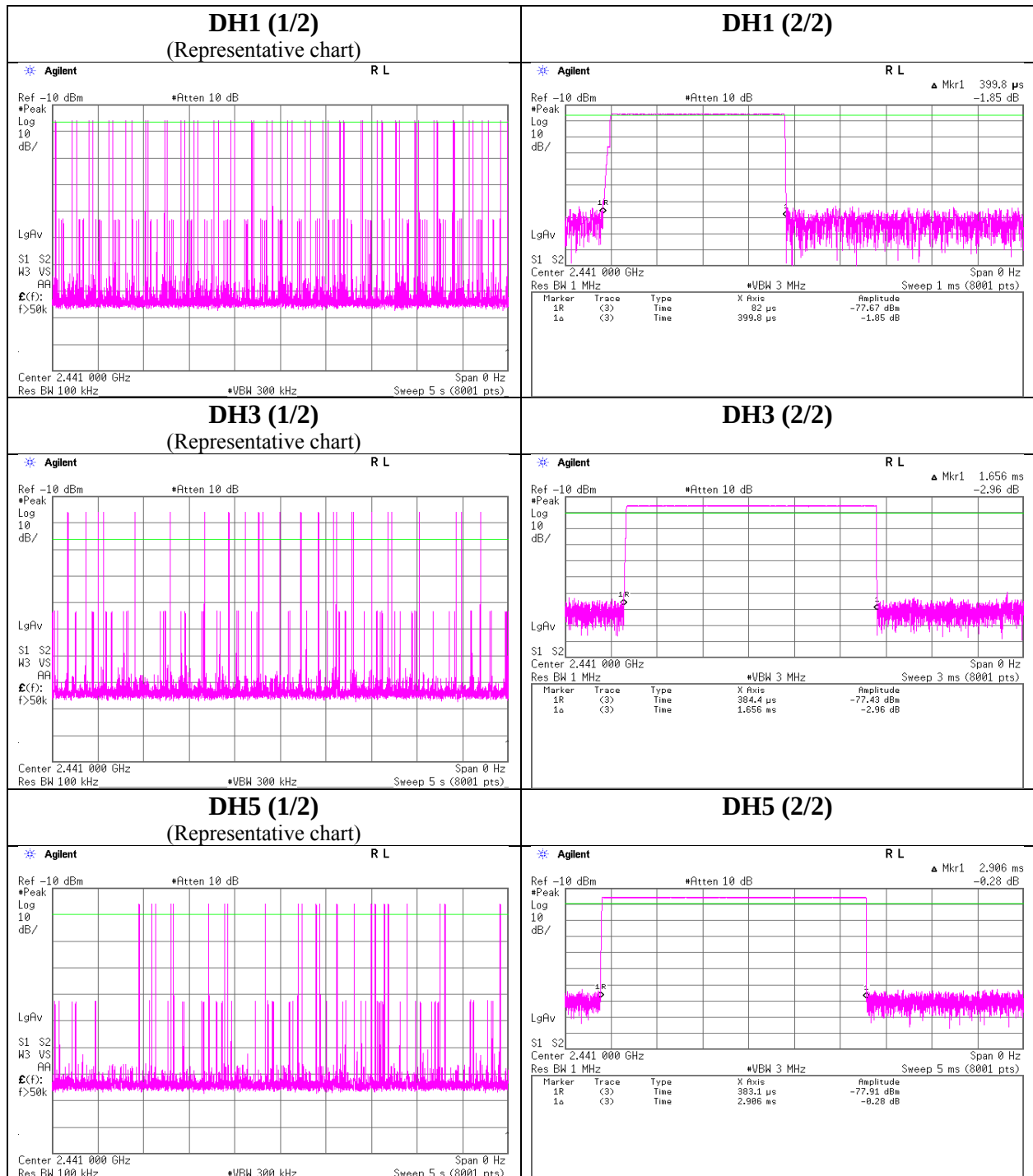
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	50	50	51	51	50.4
DH3	25	27	20	25	22	23.8
DH5	23	22	12	18	21	19.2
3DH1	49	50	52	52	52	51
3DH3	27	29	27	24	27	26.8
3DH5	12	18	17	19	19	17

Sample Calculation

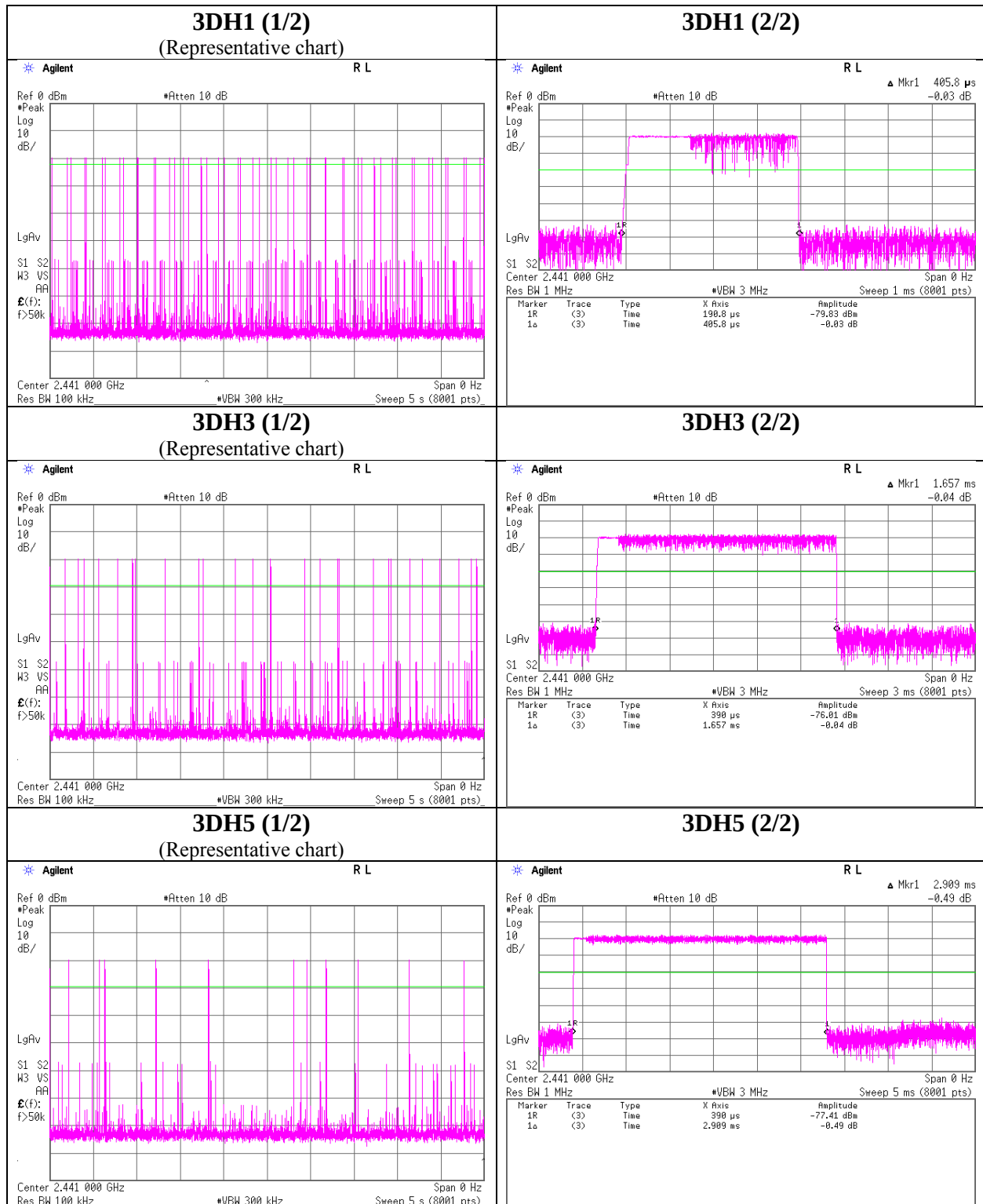
Average = Summation (Sampling 1 to 5) / 5

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



Maximum Peak Output Power

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 19, 2018
Temperature / Humidity 24 deg. C / 52 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Conducted Power					e.i.r.p. for RSS-247							
					Result		Limit		Margin	Antenna Gain	Result		Limit		Margin		
					[dBm]	[mW]	[dBm]	[mW]			[dB]	[dBi]	[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-14.20	1.95	10.18	-2.07	0.62	20.96	125	23.03	1.10	-0.97	0.80	36.02	4000	36.99		
DH5	2441.0	-13.61	1.96	10.18	-1.47	0.71	20.96	125	22.43	1.10	-0.37	0.92	36.02	4000	36.39		
DH5	2480.0	-13.06	1.97	10.18	-0.91	0.81	20.96	125	21.87	1.10	0.19	1.04	36.02	4000	35.83		
2DH5	2402.0	-15.44	1.95	10.18	-3.31	0.47	20.96	125	24.27	1.10	-2.21	0.60	36.02	4000	38.23		
2DH5	2441.0	-14.78	1.96	10.18	-2.64	0.54	20.96	125	23.60	1.10	-1.54	0.70	36.02	4000	37.56		
2DH5	2480.0	-14.26	1.97	10.18	-2.11	0.62	20.96	125	23.07	1.10	-1.01	0.79	36.02	4000	37.03		
3DH5	2402.0	-15.07	1.95	10.18	-2.94	0.51	20.96	125	23.90	1.10	-1.84	0.65	36.02	4000	37.86		
3DH5	2441.0	-14.41	1.96	10.18	-2.27	0.59	20.96	125	23.23	1.10	-1.17	0.76	36.02	4000	37.19		
3DH5	2480.0	-13.74	1.97	10.18	-1.59	0.69	20.96	125	22.55	1.10	-0.49	0.89	36.02	4000	36.51		

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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.

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Average Output Power
(Reference data for RF Exposure)

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 19, 2018
Temperature / Humidity 24 deg. C / 52 % RH
Engineer Yosuke Ishikawa
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	-16.38	1.95	10.18	-4.25	0.38	1.11	-3.14	0.49
DH5	2441.0	-15.63	1.96	10.18	-3.49	0.45	1.11	-2.38	0.58
DH5	2480.0	-14.98	1.97	10.18	-2.83	0.52	1.11	-1.72	0.67
2DH5	2402.0	-20.11	1.95	10.18	-7.98	0.16	1.10	-6.88	0.21
2DH5	2441.0	-19.34	1.96	10.18	-7.20	0.19	1.10	-6.10	0.25
2DH5	2480.0	-18.70	1.97	10.18	-6.55	0.22	1.10	-5.45	0.29
3DH5	2402.0	-20.08	1.95	10.18	-7.95	0.16	1.10	-6.85	0.21
3DH5	2441.0	-19.32	1.96	10.18	-7.18	0.19	1.10	-6.08	0.25
3DH5	2480.0	-18.68	1.97	10.18	-6.53	0.22	1.10	-5.43	0.29

Sample Calculation:

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

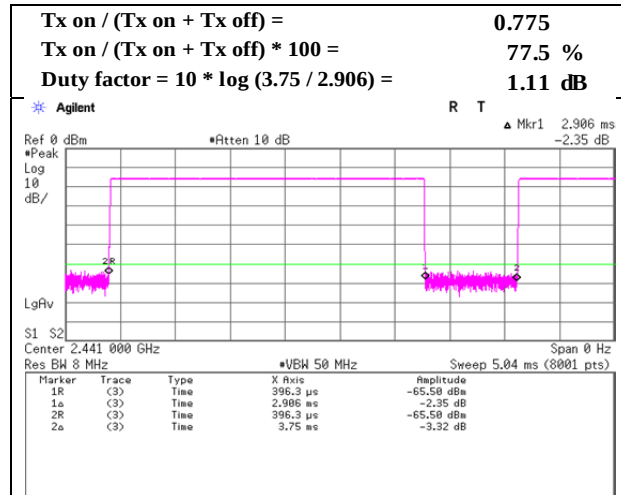
Result (Burst power average) = Time average + Duty factor

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

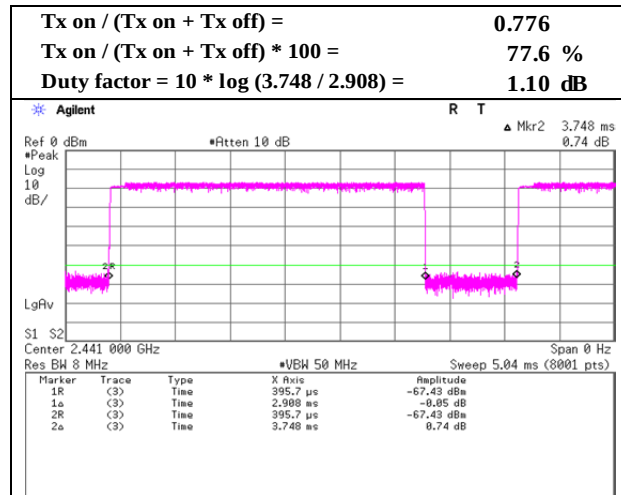
Burst Rate Confirmation

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Kazutaka Takeyama
Mode Tx, Hopping Off

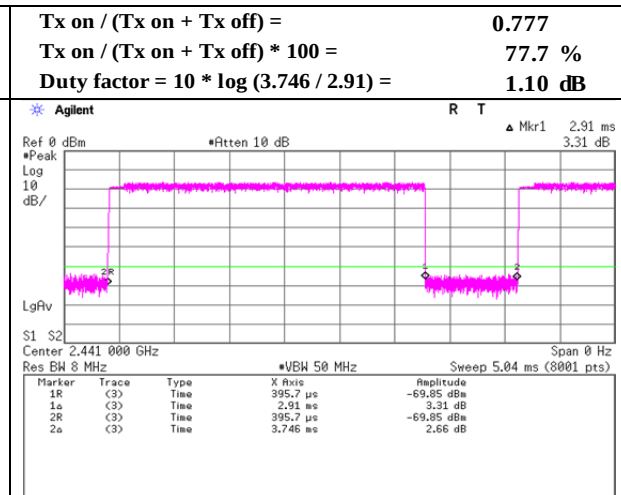
DH5



2DH5



3DH5



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Radiated Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3
Date September 13, 2018 September 12, 2018 September 11, 2018
Temperature / Humidity 25 deg. C / 49 % RH 26 deg. C / 47 % RH 25 deg. C / 52 % RH
Engineer Kazuya Noda Kazuya Noda Kazuya Noda
(30 MHz -1 GHz) (1 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.	444.079	QP	39.57	16.66	9.43	31.97	0.00	33.69	46.00	12.3	100	24	
Hori.	542.401	QP	36.67	17.71	9.79	32.00	0.00	32.17	46.00	13.8	100	228	
Hori.	555.097	QP	35.89	17.94	9.84	32.00	0.00	31.67	46.00	14.3	100	205	
Hori.	666.116	QP	33.34	19.43	10.25	31.94	0.00	31.08	46.00	14.9	100	118	
Hori.	1745.233	PK	50.24	24.99	13.49	43.91	2.10	46.91	73.90	26.9	160	84	
Hori.	2390.000	PK	48.65	27.86	14.13	44.13	2.10	48.61	73.90	25.3	152	92	
Hori.	3330.591	PK	54.86	28.13	5.93	44.44	2.10	46.58	73.90	27.3	348	175	
Hori.	3531.569	PK	54.38	28.92	6.03	44.58	2.10	46.85	73.90	27.0	152	256	
Hori.	4440.765	PK	52.84	30.38	6.32	44.32	2.10	47.32	73.90	26.5	149	186	
Hori.	4804.000	PK	50.28	31.43	6.51	44.45	2.10	45.87	73.90	28.0	170	329	
Hori.	7206.000	PK	47.77	36.79	8.23	43.99	2.10	50.90	73.90	23.0	100	0	
Hori.	9608.000	PK	48.82	38.51	9.21	43.83	2.10	54.81	73.90	19.0	100	0	
Hori.	1745.233	AV	41.78	24.99	13.49	43.91	2.10	38.45	53.90	15.4	160	84	
Hori.	2390.000	AV	36.37	27.86	14.13	44.13	2.10	36.33	53.90	17.5	152	92	
Hori.	3330.591	AV	48.33	28.13	5.93	44.44	2.10	40.05	53.90	13.8	348	175	
Hori.	3531.569	AV	49.81	28.92	6.03	44.58	2.10	42.28	53.90	11.6	152	256	
Hori.	4440.765	AV	44.82	30.38	6.32	44.32	2.10	39.30	53.90	14.6	149	186	
Hori.	4804.000	AV	39.48	31.43	6.51	44.45	2.10	35.07	53.90	18.8	170	329	
Hori.	7206.000	AV	36.23	36.79	8.23	43.99	2.10	39.36	53.90	14.5	100	0	
Hori.	9608.000	AV	36.88	38.51	9.21	43.83	2.10	42.87	53.90	11.0	100	0	
Vert.	175.104	QP	30.94	15.82	7.86	32.10	0.00	22.52	43.50	20.9	100	137	
Vert.	706.308	QP	32.76	19.92	10.41	31.86	0.00	31.23	46.00	14.7	122	344	
Vert.	795.553	QP	31.45	20.88	10.73	31.62	0.00	31.44	46.00	14.5	132	197	
Vert.	851.150	QP	29.45	21.63	10.94	31.38	0.00	30.64	46.00	15.3	109	358	
Vert.	2096.722	PK	50.76	26.93	13.87	44.06	2.10	49.60	73.90	24.3	207	312	
Vert.	2390.000	PK	48.63	27.86	14.13	44.13	2.10	48.59	73.90	25.3	158	80	
Vert.	3330.593	PK	55.42	28.13	5.93	44.44	2.10	47.14	73.90	26.7	357	149	
Vert.	3531.568	PK	54.27	28.92	6.03	44.58	2.10	46.74	73.90	27.1	100	18	
Vert.	4440.814	PK	54.60	30.38	6.32	44.32	2.10	49.08	73.90	24.8	139	219	
Vert.	4804.000	PK	50.13	31.43	6.51	44.45	2.10	45.72	73.90	28.1	204	22	
Vert.	7206.000	PK	48.92	36.79	8.23	43.99	2.10	52.05	73.90	21.8	100	0	
Vert.	9608.000	PK	48.86	38.51	9.21	43.83	2.10	54.85	73.90	19.0	100	0	
Vert.	2096.722	AV	40.25	26.93	13.87	44.06	2.10	39.09	53.90	14.8	207	312	
Vert.	2390.000	AV	36.31	27.86	14.13	44.13	2.10	36.27	53.90	17.6	158	80	
Vert.	3330.593	AV	48.35	28.13	5.93	44.44	2.10	40.07	53.90	13.8	357	149	
Vert.	3531.568	AV	49.99	28.92	6.03	44.58	2.10	42.46	53.90	11.4	100	18	
Vert.	4440.814	AV	46.08	30.38	6.32	44.32	2.10	40.56	53.90	13.3	139	219	
Vert.	4804.000	AV	39.06	31.43	6.51	44.45	2.10	34.65	53.90	19.2	204	22	
Vert.	7206.000	AV	36.68	36.79	8.23	43.99	2.10	39.81	53.90	14.0	100	0	
Vert.	9608.000	AV	37.59	38.51	9.21	43.83	2.10	43.58	53.90	10.3	100	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.82 m / 3.0 m) = 2.10 dB

13 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 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	93.46	27.86	14.14	44.14	2.10	93.42	-	-	Carrier
Hori.	2400.000	PK	41.16	27.86	14.14	44.14	2.10	41.12	73.42	32.3	
Vert.	2402.000	PK	92.99	27.86	14.14	44.14	2.10	92.95	-	-	Carrier
Vert.	2400.000	PK	40.47	27.86	14.14	44.14	2.10	40.43	72.95	32.5	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.82 m / 3.0 m) = 2.10 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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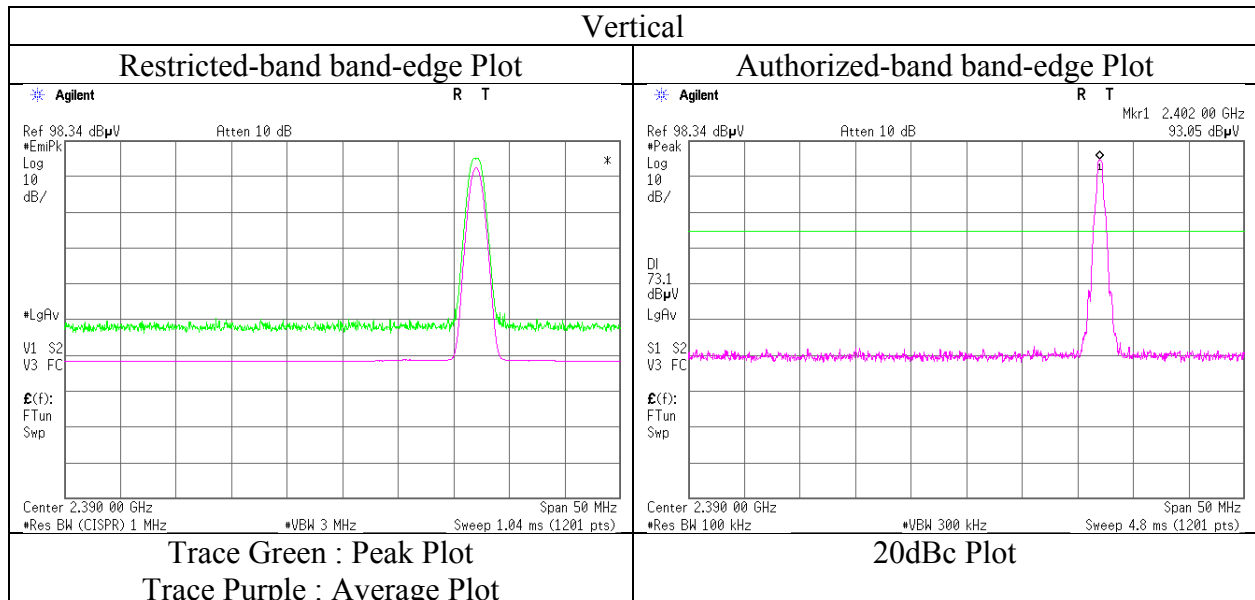
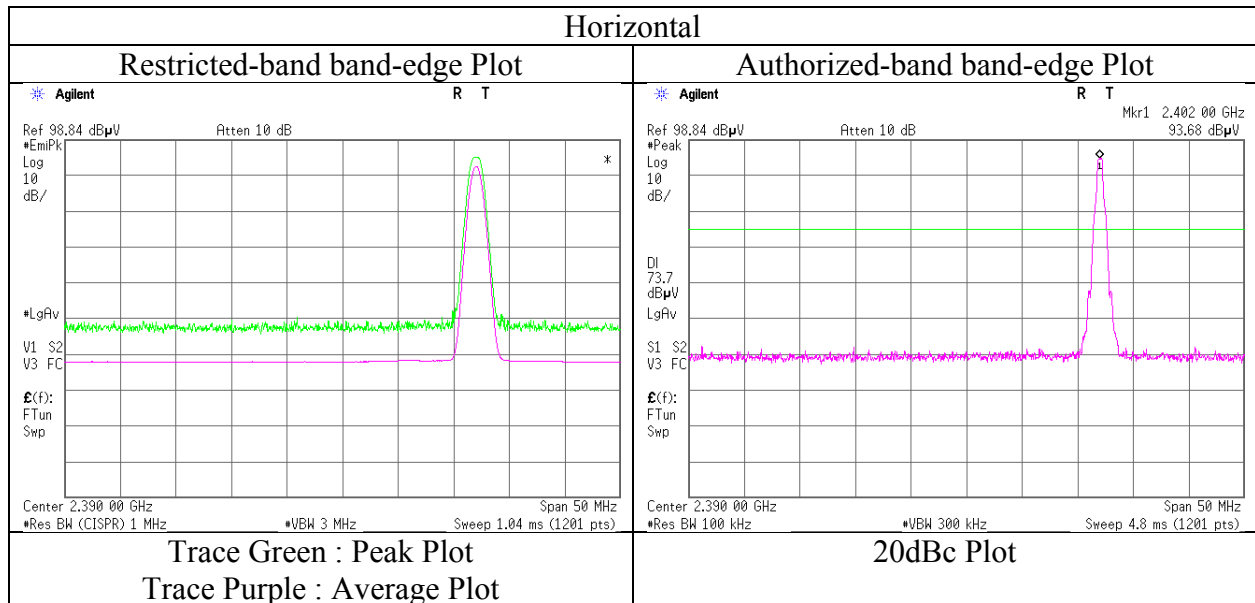
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12443390S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	September 12, 2018
Temperature / Humidity	26 deg. C / 47 % RH
Engineer	Kazuya Noda
	(1 GHz -13 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

Radiated Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3
Date September 13, 2018 September 12, 2018 September 11, 2018
Temperature / Humidity 25 deg. C / 49 % RH 26 deg. C / 47 % RH 25 deg. C / 52 % RH
Engineer Kazuya Noda Kazuya Noda Kazuya Noda
(30 MHz -1 GHz) (1 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.	444.083	QP	39.97	16.66	9.43	31.97	0.00	34.09	46.00	11.9	100	23	
Hori.	542.400	QP	36.82	17.71	9.79	32.00	0.00	32.32	46.00	13.6	100	229	
Hori.	555.095	QP	34.56	17.94	9.84	32.00	0.00	30.34	46.00	15.6	100	196	
Hori.	666.114	QP	33.65	19.43	10.25	31.94	0.00	31.39	46.00	14.6	100	115	
Hori.	1745.224	PK	50.50	24.99	13.49	43.91	2.10	47.17	73.90	26.7	162	84	
Hori.	3330.591	PK	54.93	28.13	5.93	44.44	2.10	46.65	73.90	27.2	349	172	
Hori.	3531.601	PK	54.33	28.92	6.03	44.58	2.10	46.80	73.90	27.1	152	258	
Hori.	4440.799	PK	52.96	30.38	6.32	44.32	2.10	47.44	73.90	26.4	148	187	
Hori.	4882.000	PK	49.33	31.37	6.56	44.48	2.10	44.88	73.90	29.0	176	345	
Hori.	7323.000	PK	47.69	37.01	8.31	44.03	2.10	51.08	73.90	22.8	100	0	
Hori.	9764.000	PK	47.36	38.92	9.21	43.85	2.10	53.74	73.90	20.1	100	0	
Hori.	1745.224	AV	41.90	24.99	13.49	43.91	2.10	38.57	53.90	15.3	162	84	
Hori.	3330.591	AV	48.75	28.13	5.93	44.44	2.10	40.47	53.90	13.4	349	172	
Hori.	3531.601	AV	49.89	28.92	6.03	44.58	2.10	42.36	53.90	11.5	152	258	
Hori.	4440.799	AV	44.78	30.38	6.32	44.32	2.10	39.26	53.90	14.6	148	187	
Hori.	4882.000	AV	37.31	31.37	6.56	44.48	2.10	32.86	53.90	21.0	176	345	
Hori.	7323.000	AV	35.85	37.01	8.31	44.03	2.10	39.24	53.90	14.6	100	0	
Hori.	9764.000	AV	35.88	38.92	9.21	43.85	2.10	42.26	53.90	11.6	100	0	
Vert.	175.099	QP	30.87	15.82	7.86	32.10	0.00	22.45	43.50	21.0	100	126	
Vert.	706.311	QP	32.84	19.92	10.41	31.86	0.00	31.31	46.00	14.6	121	344	
Vert.	795.549	QP	31.33	20.88	10.73	31.62	0.00	31.32	46.00	14.6	133	198	
Vert.	851.151	QP	29.48	21.63	10.94	31.38	0.00	30.67	46.00	15.3	107	358	
Vert.	2096.684	PK	50.22	26.93	13.87	44.06	2.10	49.06	73.90	24.8	212	311	
Vert.	3330.582	PK	55.28	28.13	5.93	44.44	2.10	47.00	73.90	26.9	355	143	
Vert.	3531.541	PK	54.43	28.92	6.03	44.58	2.10	46.90	73.90	27.0	100	16	
Vert.	4440.801	PK	53.88	30.38	6.32	44.32	2.10	48.36	73.90	25.5	141	218	
Vert.	4882.000	PK	48.93	31.37	6.56	44.48	2.10	44.48	73.90	29.4	216	25	
Vert.	7323.000	PK	47.43	37.01	8.31	44.03	2.10	50.82	73.90	23.0	100	0	
Vert.	9764.000	PK	47.90	38.92	9.21	43.85	2.10	54.28	73.90	19.6	100	0	
Vert.	2096.684	AV	40.02	26.93	13.87	44.06	2.10	38.86	53.90	15.0	212	311	
Vert.	3330.582	AV	48.44	28.13	5.93	44.44	2.10	40.16	53.90	13.7	355	143	
Vert.	3531.541	AV	50.01	28.92	6.03	44.58	2.10	42.48	53.90	11.4	100	16	
Vert.	4440.801	AV	46.07	30.38	6.32	44.32	2.10	40.55	53.90	13.3	141	218	
Vert.	4882.000	AV	38.51	31.37	6.56	44.48	2.10	34.06	53.90	19.8	216	25	
Vert.	7323.000	AV	36.24	37.01	8.31	44.03	2.10	39.63	53.90	14.2	100	0	
Vert.	9764.000	AV	36.21	38.92	9.21	43.85	2.10	42.59	53.90	11.3	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.82\text{ m} / 3.0\text{ m}) = 2.10\text{ dB}$

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.

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Radiated Spurious Emission

Report No.	12443390S-A		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	September 13, 2018	September 12, 2018	September 11, 2018
Temperature / Humidity	25 deg. C / 49 % RH	26 deg. C / 47 % RH	25 deg. C / 52 % RH
Engineer	Kazuya Noda	Kazuya Noda	Kazuya Noda
	(30 MHz -1 GHz)	(1 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.	444.081	QP	40.02	16.66	9.43	31.97	0.00	34.14	46.00	11.8	100	28	
Hori.	542.400	QP	36.71	17.71	9.79	32.00	0.00	32.21	46.00	13.7	100	233	
Hori.	555.098	QP	34.56	17.94	9.84	32.00	0.00	30.34	46.00	15.6	100	203	
Hori.	666.123	QP	33.91	19.43	10.25	31.94	0.00	31.65	46.00	14.3	100	114	
Hori.	1745.231	PK	50.54	24.99	13.49	43.91	2.10	47.21	73.90	26.6	162	83	
Hori.	2483.500	PK	49.87	27.65	14.22	44.16	2.10	49.68	73.90	24.2	143	101	
Hori.	3330.588	PK	54.88	28.13	5.93	44.44	2.10	46.60	73.90	27.3	350	171	
Hori.	3531.589	PK	54.25	28.92	6.03	44.58	2.10	46.72	73.90	27.1	152	256	
Hori.	4440.795	PK	52.87	30.38	6.32	44.32	2.10	47.35	73.90	26.5	148	188	
Hori.	4960.000	PK	49.14	31.54	6.61	44.51	2.10	44.88	73.90	29.0	171	347	
Hori.	7440.000	PK	46.84	37.10	8.38	44.08	2.10	50.34	73.90	23.5	100	0	
Hori.	9920.000	PK	47.02	38.97	9.22	43.87	2.10	53.44	73.90	20.4	100	0	
Hori.	1745.231	AV	41.91	24.99	13.49	43.91	2.10	38.58	53.90	15.3	162	83	
Hori.	2483.500	AV	36.61	27.65	14.22	44.16	2.10	36.42	53.90	17.4	143	101	
Hori.	3330.588	AV	48.79	28.13	5.93	44.44	2.10	40.51	53.90	13.3	350	171	
Hori.	3531.589	AV	49.81	28.92	6.03	44.58	2.10	42.28	53.90	11.6	152	256	
Hori.	4440.795	AV	44.81	30.38	6.32	44.32	2.10	39.29	53.90	14.6	148	188	
Hori.	4960.000	AV	37.92	31.54	6.61	44.51	2.10	33.66	53.90	20.2	171	347	
Hori.	7440.000	AV	35.73	37.10	8.38	44.08	2.10	39.23	53.90	14.6	100	0	
Hori.	9920.000	AV	34.91	38.97	9.22	43.87	2.10	41.33	53.90	12.5	100	0	
Vert.	175.101	QP	30.89	15.82	7.86	32.10	0.00	22.47	43.50	21.0	100	136	
Vert.	706.311	QP	32.87	19.92	10.41	31.86	0.00	31.34	46.00	14.6	123	348	
Vert.	795.551	QP	31.35	20.88	10.73	31.62	0.00	31.34	46.00	14.6	134	199	
Vert.	851.152	QP	29.63	21.63	10.94	31.38	0.00	30.82	46.00	15.1	110	358	
Vert.	2096.720	PK	50.78	26.93	13.87	44.06	2.10	49.62	73.90	24.2	213	308	
Vert.	2483.500	PK	50.83	27.65	14.22	44.16	2.10	50.64	73.90	23.2	114	92	
Vert.	3330.591	PK	55.02	28.13	5.93	44.44	2.10	46.74	73.90	27.1	351	144	
Vert.	3531.568	PK	54.47	28.92	6.03	44.58	2.10	46.94	73.90	26.9	100	19	
Vert.	4440.817	PK	53.92	30.38	6.32	44.32	2.10	48.40	73.90	25.5	141	215	
Vert.	4960.000	PK	49.12	31.54	6.61	44.51	2.10	44.86	73.90	29.0	222	23	
Vert.	7440.000	PK	46.62	37.10	8.38	44.08	2.10	50.12	73.90	23.7	100	0	
Vert.	9920.000	PK	46.27	38.97	9.22	43.87	2.10	52.69	73.90	21.2	100	0	
Vert.	2096.720	AV	39.49	26.93	13.87	44.06	2.10	38.33	53.90	15.5	213	308	
Vert.	2483.500	AV	36.75	27.65	14.22	44.16	2.10	36.56	53.90	17.3	114	92	
Vert.	3330.591	AV	48.17	28.13	5.93	44.44	2.10	39.89	53.90	14.0	351	144	
Vert.	3531.568	AV	49.68	28.92	6.03	44.58	2.10	42.15	53.90	11.7	100	19	
Vert.	4440.817	AV	47.02	30.38	6.32	44.32	2.10	41.50	53.90	12.4	141	215	
Vert.	4960.000	AV	37.09	31.54	6.61	44.51	2.10	32.83	53.90	21.0	222	23	
Vert.	7440.000	AV	35.64	37.10	8.38	44.08	2.10	39.14	53.90	14.7	100	0	
Vert.	9920.000	AV	34.73	38.97	9.22	43.87	2.10	41.15	53.90	12.7	100	0	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 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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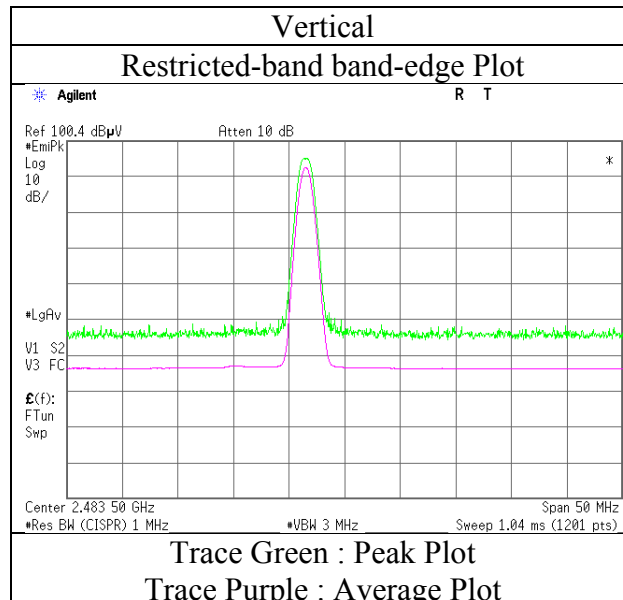
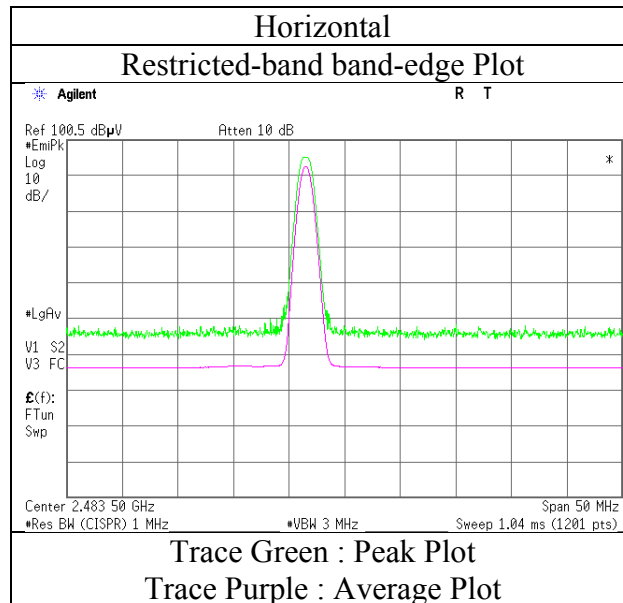
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12443390S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	September 12, 2018
Temperature / Humidity	26 deg. C / 47 % RH
Engineer	Kazuya Noda (1 GHz -13 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3
Date September 13, 2018 September 12, 2018 September 11, 2018
Temperature / Humidity 25 deg. C / 49 % RH 26 deg. C / 47 % RH 25 deg. C / 52 % RH
Engineer Kazuya Noda Kazuya Noda Kazuya Noda
(30 MHz -1 GHz) (1 GHz -13 GHz) (13 GHz-26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2402 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	444.077	QP	40.05	16.66	9.43	31.97	0.00	34.17	46.00	11.8	100	21	
Hori.	542.402	QP	36.61	17.71	9.79	32.00	0.00	32.11	46.00	13.8	100	227	
Hori.	555.104	QP	34.41	17.94	9.84	32.00	0.00	30.19	46.00	15.8	100	198	
Hori.	666.118	QP	34.12	19.43	10.25	31.94	0.00	31.86	46.00	14.1	100	115	
Hori.	1745.230	PK	50.45	24.99	13.49	43.91	2.10	47.12	73.90	26.7	161	80	
Hori.	2390.000	PK	48.77	27.86	14.13	44.13	2.10	48.73	73.90	25.1	154	95	
Hori.	3330.589	PK	54.69	28.13	5.93	44.44	2.10	46.41	73.90	27.4	351	171	
Hori.	3531.621	PK	54.59	28.92	6.03	44.58	2.10	47.06	73.90	26.8	152	255	
Hori.	4440.807	PK	53.02	30.38	6.32	44.32	2.10	47.50	73.90	26.4	148	189	
Hori.	4804.000	PK	48.66	31.43	6.51	44.45	2.10	44.25	73.90	29.6	174	350	
Hori.	7206.000	PK	47.83	36.79	8.23	43.99	2.10	50.96	73.90	22.9	100	0	
Hori.	9608.000	PK	48.47	38.51	9.21	43.83	2.10	54.46	73.90	19.4	100	0	
Hori.	1745.230	AV	41.92	24.99	13.49	43.91	2.10	38.59	53.90	15.3	161	80	
Hori.	2390.000	AV	36.43	27.86	14.13	44.13	2.10	36.39	53.90	17.5	154	95	
Hori.	3330.589	AV	48.56	28.13	5.93	44.44	2.10	40.28	53.90	13.6	351	171	
Hori.	3531.621	AV	48.66	28.92	6.03	44.58	2.10	41.13	53.90	12.7	152	255	
Hori.	4440.807	AV	44.62	30.38	6.32	44.32	2.10	39.10	53.90	14.8	148	189	
Hori.	4804.000	AV	37.23	31.43	6.51	44.45	2.10	32.82	53.90	21.0	174	350	
Hori.	7206.000	AV	36.60	36.79	8.23	43.99	2.10	39.73	53.90	14.1	100	0	
Hori.	9608.000	AV	37.33	38.51	9.21	43.83	2.10	43.32	53.90	10.5	100	0	
Vert.	706.315	QP	32.99	19.92	10.41	31.86	0.00	31.46	46.00	14.5	125	344	
Vert.	795.551	QP	31.29	20.88	10.73	31.62	0.00	31.28	46.00	14.7	134	196	
Vert.	851.154	QP	29.46	21.63	10.94	31.38	0.00	30.65	46.00	15.3	106	359	
Vert.	2096.735	PK	50.12	26.93	13.87	44.06	2.10	48.96	73.90	24.9	211	313	
Vert.	2390.000	PK	48.85	27.86	14.13	44.13	2.10	48.81	73.90	25.0	159	80	
Vert.	3330.582	PK	55.51	28.13	5.93	44.44	2.10	47.23	73.90	26.6	355	149	
Vert.	3531.559	PK	54.83	28.92	6.03	44.58	2.10	47.30	73.90	26.6	100	16	
Vert.	4440.802	PK	54.65	30.38	6.32	44.32	2.10	49.13	73.90	24.7	141	222	
Vert.	4804.000	PK	48.91	31.43	6.51	44.45	2.10	44.50	73.90	29.4	211	19	
Vert.	7206.000	PK	47.85	36.79	8.23	43.99	2.10	50.98	73.90	22.9	100	0	
Vert.	9608.000	PK	48.26	38.51	9.21	43.83	2.10	54.25	73.90	19.6	100	0	
Vert.	2096.735	AV	40.39	26.93	13.87	44.06	2.10	39.23	53.90	14.6	211	313	
Vert.	2390.000	AV	36.28	27.86	14.13	44.13	2.10	36.24	53.90	17.6	159	80	
Vert.	3330.582	AV	48.54	28.13	5.93	44.44	2.10	40.26	53.90	13.6	355	149	
Vert.	3531.559	AV	49.66	28.92	6.03	44.58	2.10	42.13	53.90	11.7	100	16	
Vert.	4440.802	AV	46.11	30.38	6.32	44.32	2.10	40.59	53.90	13.3	141	222	
Vert.	4804.000	AV	37.63	31.43	6.51	44.45	2.10	33.22	53.90	20.6	211	19	
Vert.	7206.000	AV	36.56	36.79	8.23	43.99	2.10	39.69	53.90	14.2	100	0	
Vert.	9608.000	AV	37.18	38.51	9.21	43.83	2.10	43.17	53.90	10.7	100	0	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 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	90.12	27.86	14.14	44.14	2.10	90.08	-	-	Carrier
Hori.	2400.000	PK	41.59	27.86	14.14	44.14	2.10	41.55	70.08	28.5	
Vert.	2402.000	PK	89.71	27.86	14.14	44.14	2.10	89.67	-	-	Carrier
Vert.	2400.000	PK	40.44	27.86	14.14	44.14	2.10	40.40	69.67	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 (3.82 m / 3.0 m) = 2.10 dB

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

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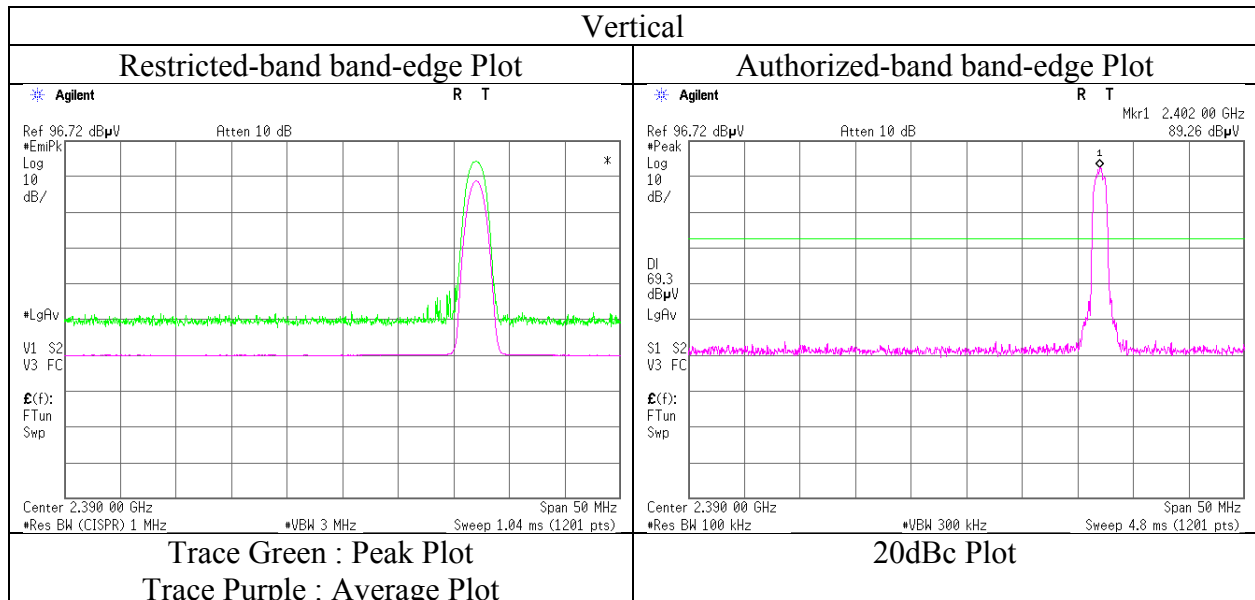
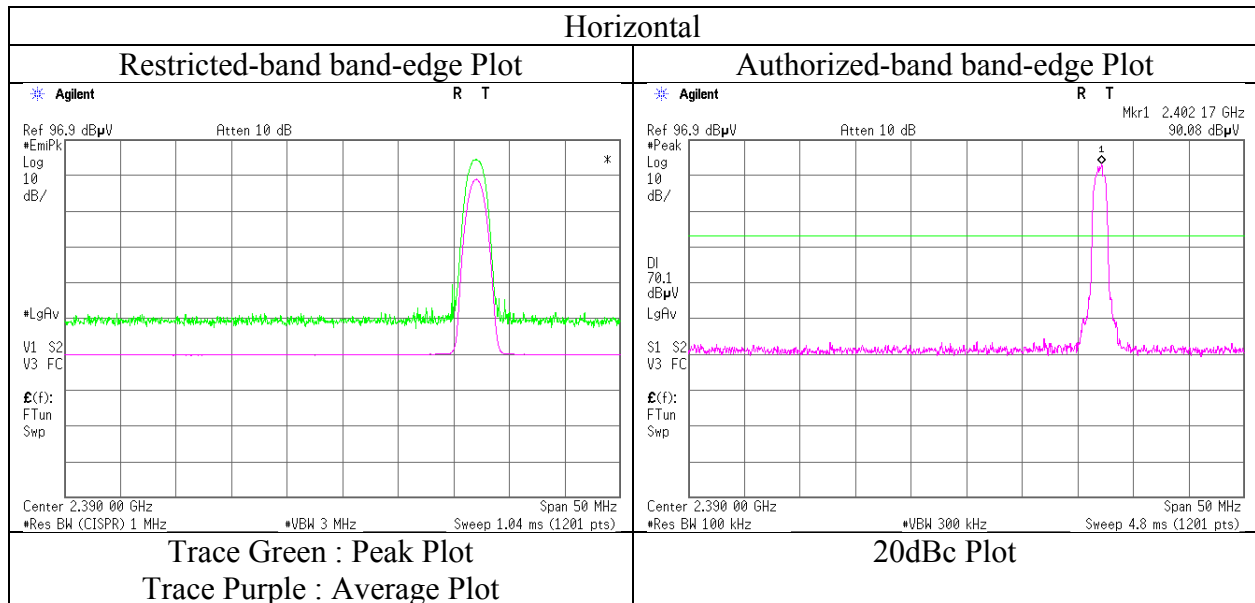
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12443390S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	September 12, 2018
Temperature / Humidity	26 deg. C / 47 % RH
Engineer	Kazuya Noda
	(1 GHz -13 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3 3 3
Date September 13, 2018 September 12, 2018 September 11, 2018
Temperature / Humidity 25 deg. C / 49 % RH 26 deg. C / 47 % RH 25 deg. C / 52 % RH
Engineer Kazuya Noda Kazuya Noda Kazuya Noda
(30 MHz -1 GHz) (1 GHz -13 GHz) (13 GHz-26.5 GHz)
Mode Tx, Hopping Off, 3DH5 2441 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	444.076	QP	40.27	16.66	9.43	31.97	0.00	34.39	46.00	11.6	100	21	
Hori.	542.404	QP	36.31	17.71	9.79	32.00	0.00	31.81	46.00	14.1	100	228	
Hori.	555.099	QP	34.35	17.94	9.84	32.00	0.00	30.13	46.00	15.8	100	210	
Hori.	666.119	QP	34.13	19.43	10.25	31.94	0.00	31.87	46.00	14.1	100	114	
Hori.	1745.230	PK	50.51	24.99	13.49	43.91	2.10	47.18	73.90	26.7	161	80	
Hori.	3330.584	PK	54.67	28.13	5.93	44.44	2.10	46.39	73.90	27.5	345	170	
Hori.	3531.607	PK	54.51	28.92	6.03	44.58	2.10	46.98	73.90	26.9	152	257	
Hori.	4440.810	PK	53.01	30.38	6.32	44.32	2.10	47.49	73.90	26.4	151	188	
Hori.	4882.000	PK	48.82	31.37	6.56	44.48	2.10	44.37	73.90	29.5	184	346	
Hori.	7323.000	PK	48.06	37.01	8.31	44.03	2.10	51.45	73.90	22.4	100	0	
Hori.	9764.000	PK	47.41	38.92	9.21	43.85	2.10	53.79	73.90	20.1	100	0	
Hori.	1745.230	AV	41.71	24.99	13.49	43.91	2.10	38.38	53.90	15.5	161	80	
Hori.	3330.584	AV	47.95	28.13	5.93	44.44	2.10	39.67	53.90	14.2	345	170	
Hori.	3531.607	AV	49.77	28.92	6.03	44.58	2.10	42.24	53.90	11.6	152	257	
Hori.	4440.810	AV	44.79	30.38	6.32	44.32	2.10	39.27	53.90	14.6	151	188	
Hori.	4882.000	AV	37.02	31.37	6.56	44.48	2.10	32.57	53.90	21.3	184	346	
Hori.	7323.000	AV	36.09	37.01	8.31	44.03	2.10	39.48	53.90	14.4	100	0	
Hori.	9764.000	AV	36.24	38.92	9.21	43.85	2.10	42.62	53.90	11.2	100	0	
Vert.	175.109	QP	30.74	15.82	7.86	32.10	0.00	22.32	43.50	21.1	100	133	
Vert.	706.309	QP	32.92	19.92	10.41	31.86	0.00	31.39	46.00	14.6	126	342	
Vert.	795.551	QP	31.33	20.88	10.73	31.62	0.00	31.32	46.00	14.6	134	200	
Vert.	851.149	QP	29.76	21.63	10.94	31.38	0.00	30.95	46.00	15.0	106	358	
Vert.	2096.711	PK	50.61	26.93	13.87	44.06	2.10	49.45	73.90	24.4	201	311	
Vert.	3330.585	PK	54.98	28.13	5.93	44.44	2.10	46.70	73.90	27.2	351	86	
Vert.	3531.538	PK	54.56	28.92	6.03	44.58	2.10	47.03	73.90	26.8	100	18	
Vert.	4440.805	PK	53.79	30.38	6.32	44.32	2.10	48.27	73.90	25.6	141	221	
Vert.	4882.000	PK	48.82	31.37	6.56	44.48	2.10	44.37	73.90	29.5	231	24	
Vert.	7323.000	PK	47.88	37.01	8.31	44.03	2.10	51.27	73.90	22.6	100	0	
Vert.	9764.000	PK	47.49	38.92	9.21	43.85	2.10	53.87	73.90	20.0	100	0	
Vert.	2096.711	AV	40.17	26.93	13.87	44.06	2.10	39.01	53.90	14.8	201	311	
Vert.	3330.585	AV	48.47	28.13	5.93	44.44	2.10	40.19	53.90	13.7	351	86	
Vert.	3531.538	AV	50.21	28.92	6.03	44.58	2.10	42.68	53.90	11.2	100	18	
Vert.	4440.805	AV	45.99	30.38	6.32	44.32	2.10	40.47	53.90	13.4	141	221	
Vert.	4882.000	AV	37.45	31.37	6.56	44.48	2.10	33.00	53.90	20.9	231	24	
Vert.	7323.000	AV	36.61	37.01	8.31	44.03	2.10	40.00	53.90	13.9	100	0	
Vert.	9764.000	AV	36.22	38.92	9.21	43.85	2.10	42.60	53.90	11.3	100	0	

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

Distance factor : 1 GHz - 13 GHz : 20log(3.82 m / 3.0 m) = 2.10 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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Radiated Spurious Emission

Report No.	12443390S-A		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	September 13, 2018	September 12, 2018	September 11, 2018
Temperature / Humidity	25 deg. C / 49 % RH	26 deg. C / 47 % RH	25 deg. C / 52 % RH
Engineer	Kazuya Noda	Kazuya Noda	Kazuya Noda
	(30 MHz -1 GHz)	(1 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.	444.078	QP	40.19	16.66	9.43	31.97	0.00	34.31	46.00	11.6	100	25	
Hori.	542.408	QP	36.78	17.71	9.79	32.00	0.00	32.28	46.00	13.7	100	229	
Hori.	555.101	QP	34.58	17.94	9.84	32.00	0.00	30.36	46.00	15.6	100	209	
Hori.	666.122	QP	33.41	19.43	10.25	31.94	0.00	31.15	46.00	14.8	100	119	
Hori.	1745.233	PK	50.23	24.99	13.49	43.91	2.10	46.90	73.90	27.0	165	80	
Hori.	2483.500	PK	51.58	27.65	14.22	44.16	2.10	51.39	73.90	22.5	148	103	
Hori.	3330.614	PK	54.81	28.13	5.93	44.44	2.10	46.53	73.90	27.3	347	171	
Hori.	3531.563	PK	54.12	28.92	6.03	44.58	2.10	46.59	73.90	27.3	151	250	
Hori.	4440.801	PK	52.71	30.38	6.32	44.32	2.10	47.19	73.90	26.7	145	188	
Hori.	4960.000	PK	48.66	31.54	6.61	44.51	2.10	44.40	73.90	29.5	174	310	
Hori.	7440.000	PK	47.32	37.10	8.38	44.08	2.10	50.82	73.90	23.0	100	0	
Hori.	9920.000	PK	47.02	38.97	9.22	43.87	2.10	53.44	73.90	20.4	100	0	
Hori.	1745.233	AV	41.75	24.99	13.49	43.91	2.10	38.42	53.90	15.4	165	80	
Hori.	2483.500	AV	36.98	27.65	14.22	44.16	2.10	36.79	53.90	17.1	148	103	
Hori.	3330.614	AV	48.71	28.13	5.93	44.44	2.10	40.43	53.90	13.4	347	171	
Hori.	3531.563	AV	49.68	28.92	6.03	44.58	2.10	42.15	53.90	11.7	151	250	
Hori.	4440.801	AV	44.78	30.38	6.32	44.32	2.10	39.26	53.90	14.6	145	188	
Hori.	4960.000	AV	37.21	31.54	6.61	44.51	2.10	32.95	53.90	20.9	174	310	
Hori.	7440.000	AV	35.82	37.10	8.38	44.08	2.10	39.32	53.90	14.5	100	0	
Hori.	9920.000	AV	35.09	38.97	9.22	43.87	2.10	41.51	53.90	12.3	100	0	
Vert.	175.102	QP	31.02	15.82	7.86	32.10	0.00	22.60	43.50	20.9	100	133	
Vert.	706.311	QP	32.75	19.92	10.41	31.86	0.00	31.22	46.00	14.7	128	348	
Vert.	795.552	QP	31.33	20.88	10.73	31.62	0.00	31.32	46.00	14.6	136	196	
Vert.	851.155	QP	29.13	21.63	10.94	31.38	0.00	30.32	46.00	15.6	109	359	
Vert.	2096.712	PK	50.77	26.93	13.87	44.06	2.10	49.61	73.90	24.2	213	312	
Vert.	2483.500	PK	51.99	27.65	14.22	44.16	2.10	51.80	73.90	22.1	114	87	
Vert.	3330.577	PK	55.31	28.13	5.93	44.44	2.10	47.03	73.90	26.8	351	141	
Vert.	3531.551	PK	54.04	28.92	6.03	44.58	2.10	46.51	73.90	27.3	100	19	
Vert.	4440.801	PK	52.99	30.38	6.32	44.32	2.10	47.47	73.90	26.4	352	142	
Vert.	4960.000	PK	48.91	31.54	6.61	44.51	2.10	44.65	73.90	29.2	225	23	
Vert.	7440.000	PK	47.06	37.10	8.38	44.08	2.10	50.56	73.90	23.3	100	0	
Vert.	9920.000	PK	47.05	38.97	9.22	43.87	2.10	53.47	73.90	20.4	100	0	
Vert.	2096.712	AV	39.28	26.93	13.87	44.06	2.10	38.12	53.90	15.7	213	312	
Vert.	2483.500	AV	36.57	27.65	14.22	44.16	2.10	36.38	53.90	17.5	114	87	
Vert.	3330.577	AV	48.51	28.13	5.93	44.44	2.10	40.23	53.90	13.6	351	141	
Vert.	3531.551	AV	49.31	28.92	6.03	44.58	2.10	41.78	53.90	12.1	100	19	
Vert.	4440.801	AV	46.93	30.38	6.32	44.32	2.10	41.41	53.90	12.4	352	142	
Vert.	4960.000	AV	37.18	31.54	6.61	44.51	2.10	32.92	53.90	20.9	225	23	
Vert.	7440.000	AV	35.78	37.10	8.38	44.08	2.10	39.28	53.90	14.6	100	0	
Vert.	9920.000	AV	34.90	38.97	9.22	43.87	2.10	41.32	53.90	12.5	100	0	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.82 m / 3.0 m) = 2.10 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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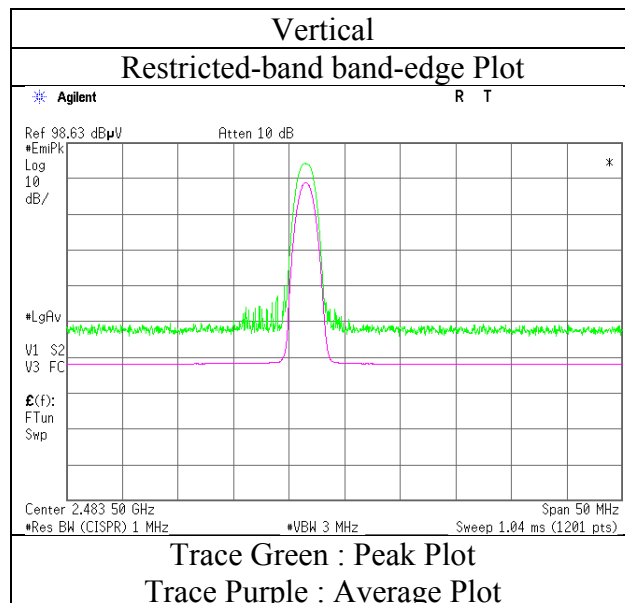
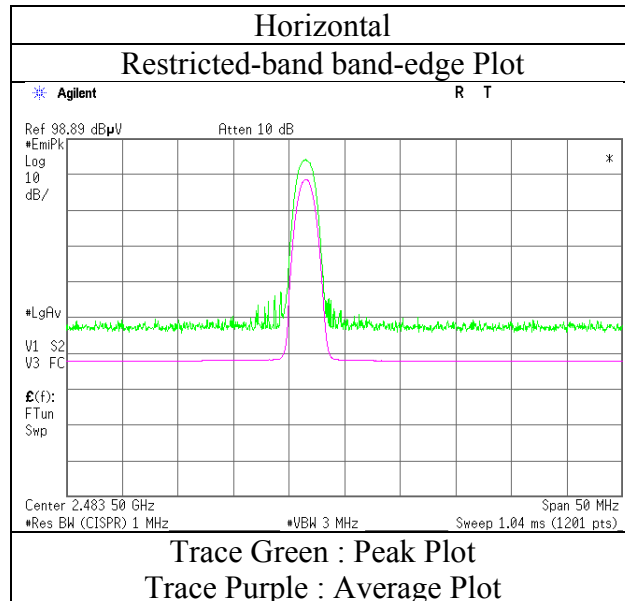
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Radiated Spurious Emission (Reference Plot for band-edge)

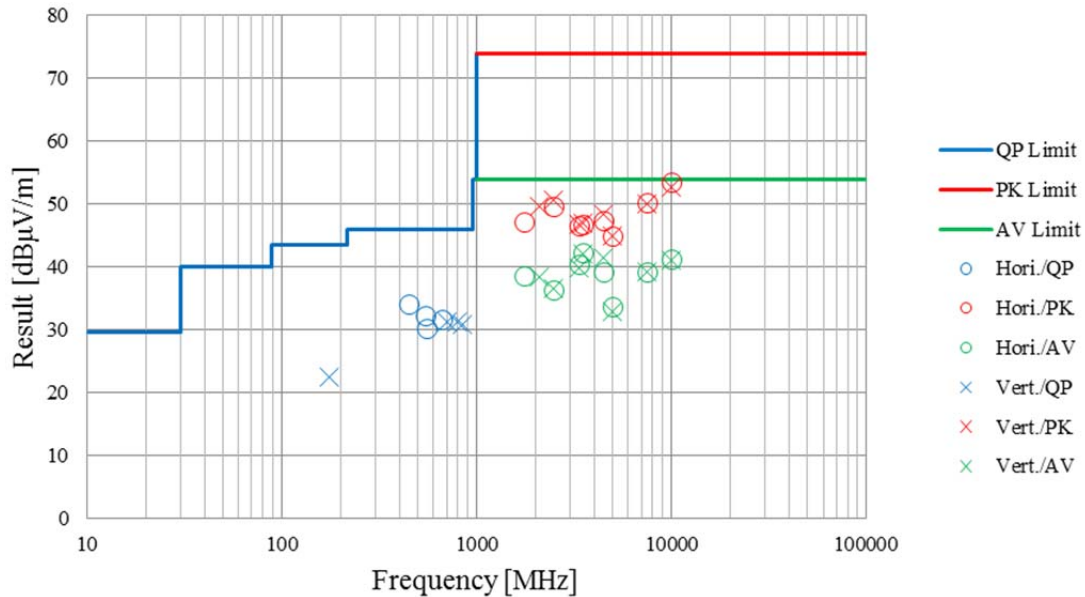
Report No.	12443390S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	September 12, 2018
Temperature / Humidity	26 deg. C / 47 % RH
Engineer	Kazuya Noda
	(1 GHz -13 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12443390S-A		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	September 13, 2018	September 12, 2018	September 11, 2018
Temperature / Humidity	25 deg. C / 49 % RH	26 deg. C / 47 % RH	25 deg. C / 52 % RH
Engineer	Kazuya Noda	Kazuya Noda	Kazuya Noda
	(30 MHz -1 GHz)	(1 GHz -13 GHz)	(13 GHz-26.5 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz		

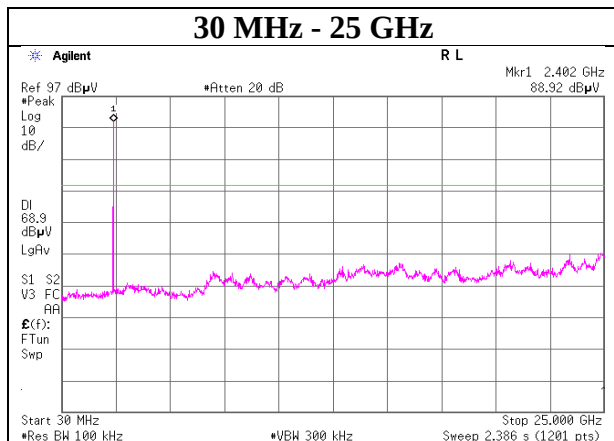
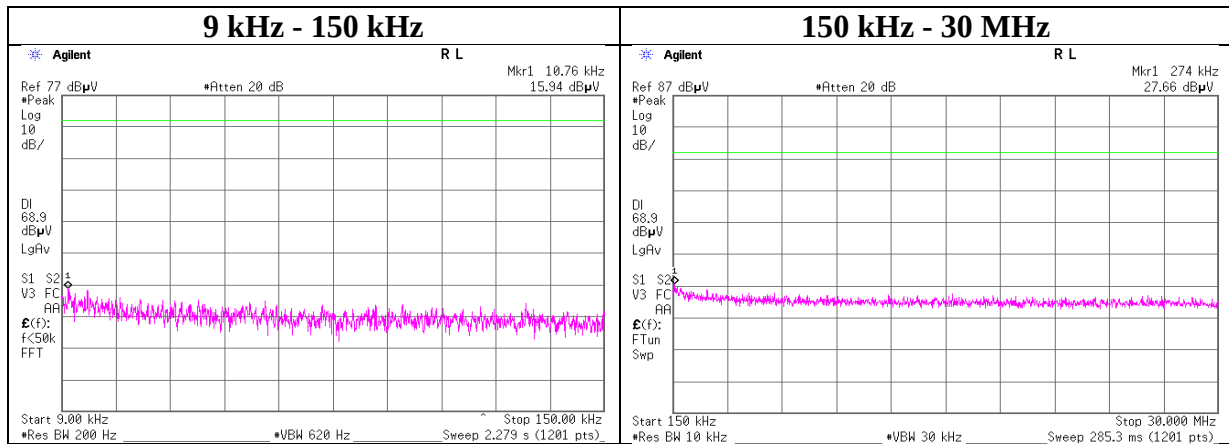


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Kazutaka Takeyama
Mode Tx, Hopping Off, DH5

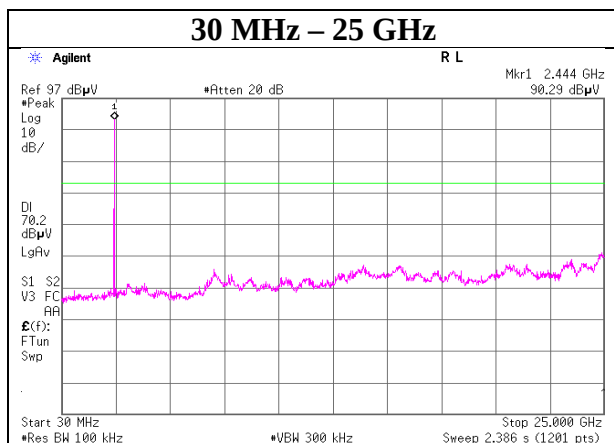
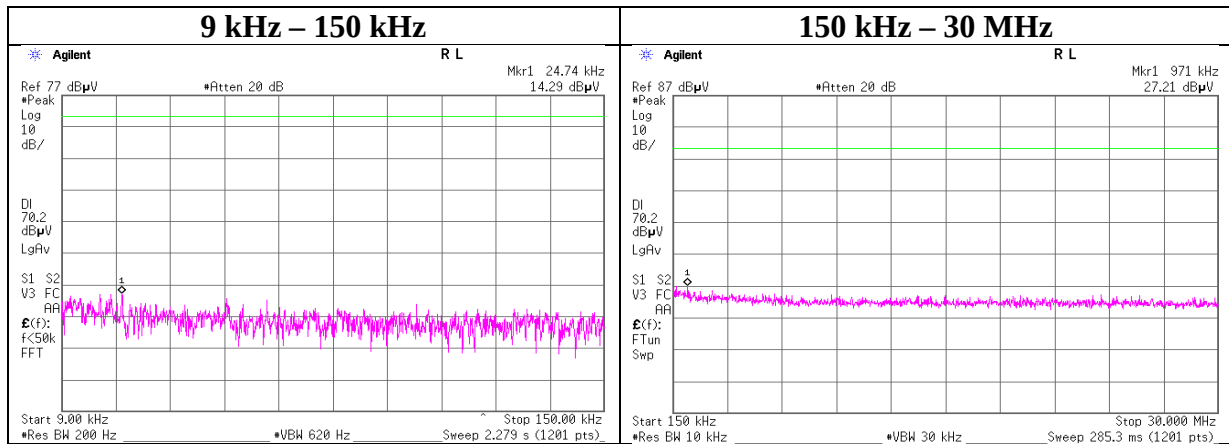
2402 MHz



Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Kazutaka Takeyama
Mode Tx, Hopping Off, DH5

2441 MHz



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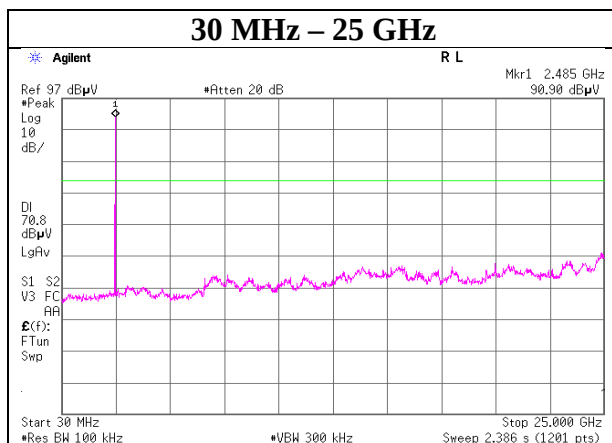
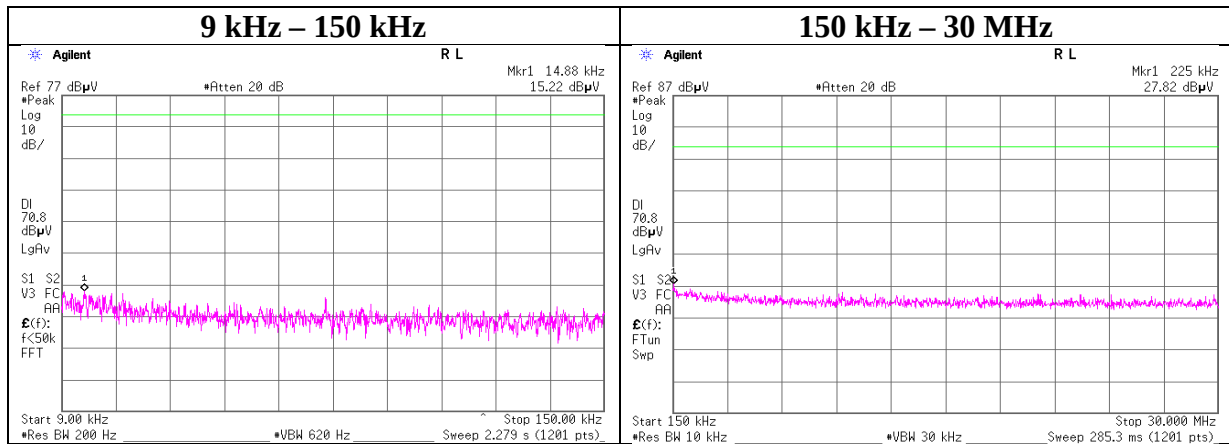
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Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Kazutaka Takeyama
Mode Tx, Hopping Off, DH5

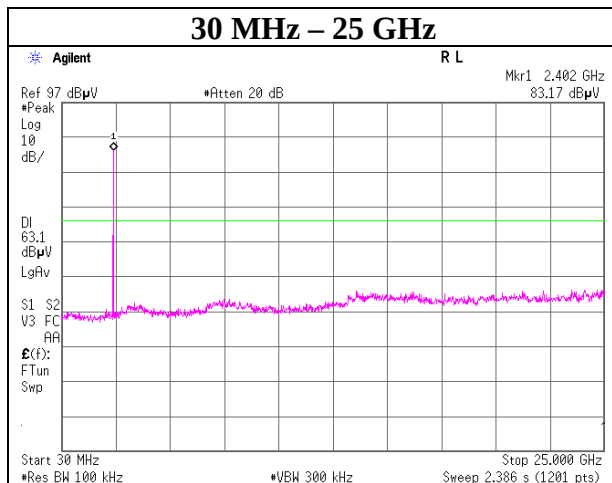
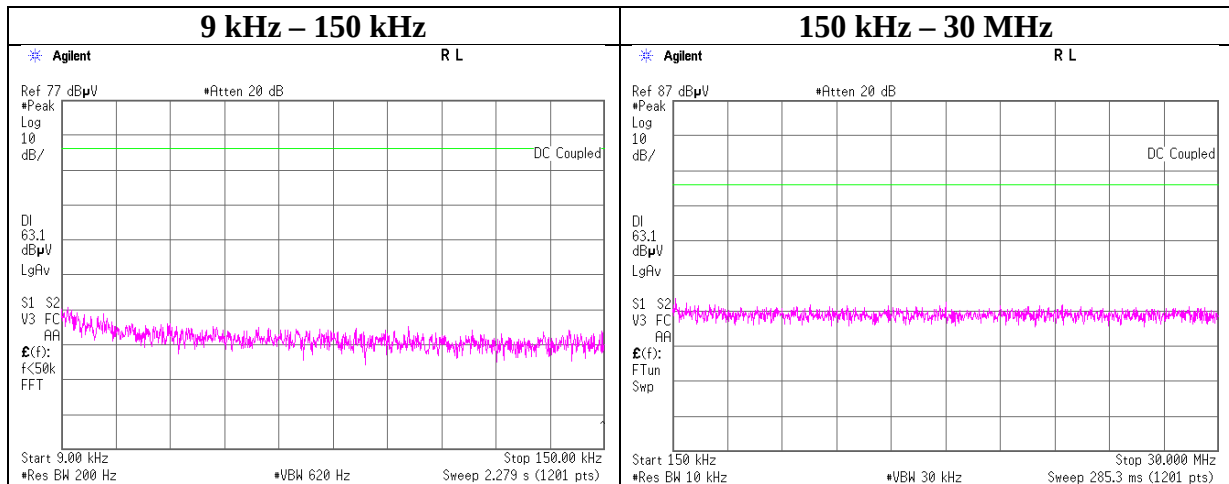
2480 MHz



Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 11, 2018
Temperature / Humidity 25 deg. C / 53 % RH
Engineer Makoto Hosaka
Mode Tx, Hopping Off, 3DH5

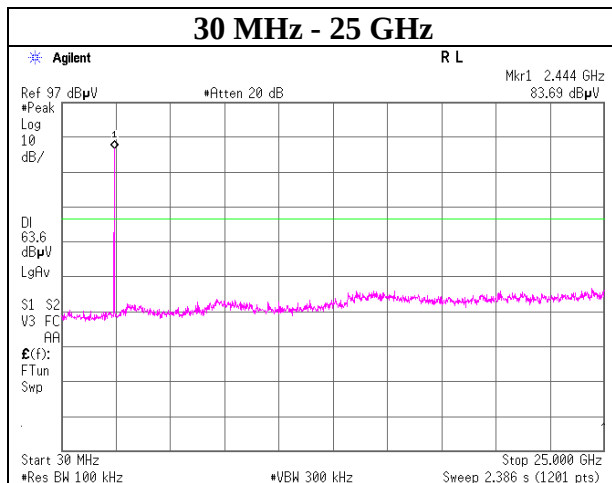
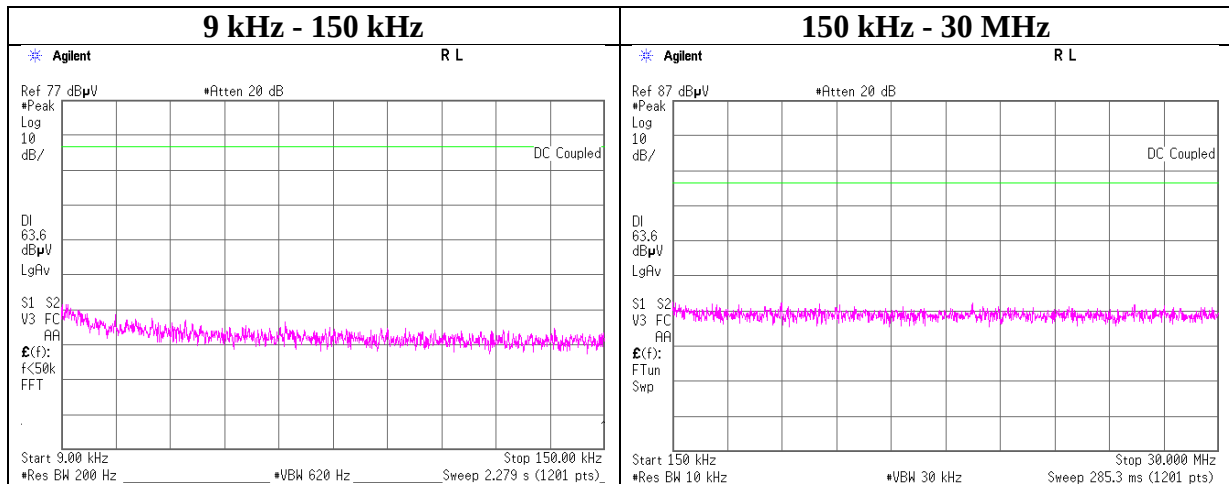
2402 MHz



Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 11, 2018
Temperature / Humidity 25 deg. C / 53 % RH
Engineer Makoto Hosaka
Mode Tx, Hopping Off, 3DH5

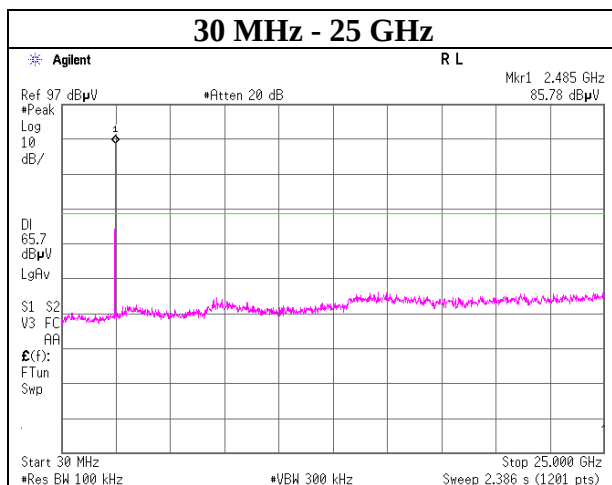
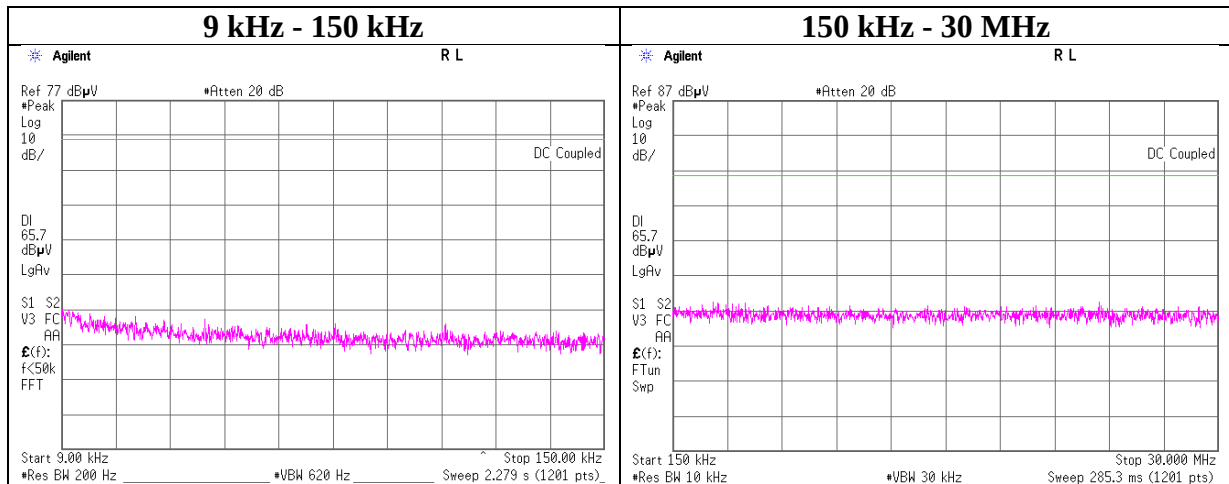
2441 MHz



Conducted Spurious Emission

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 11, 2018
Temperature / Humidity 25 deg. C / 53 % RH
Engineer Makoto Hosaka
Mode Tx, Hopping Off, 3DH5

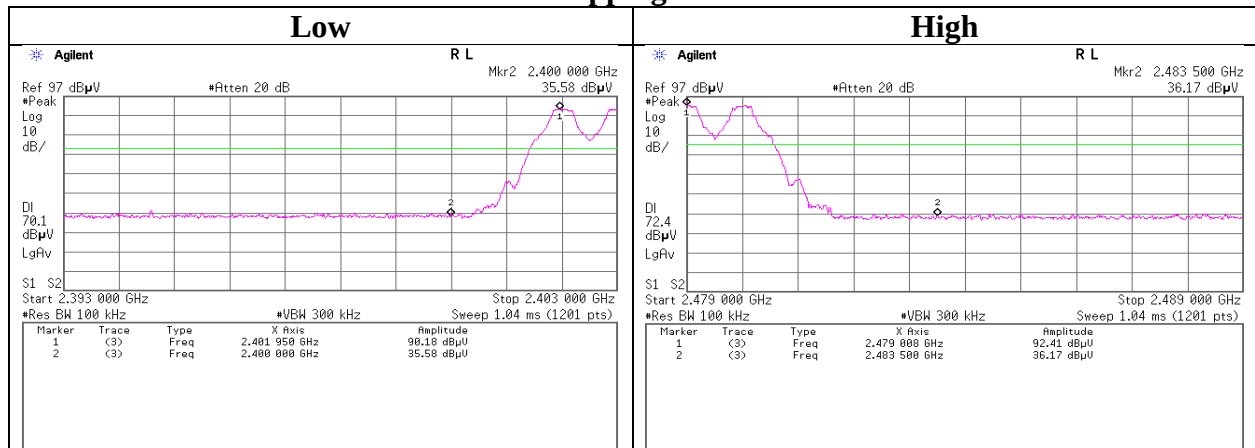
2480 MHz



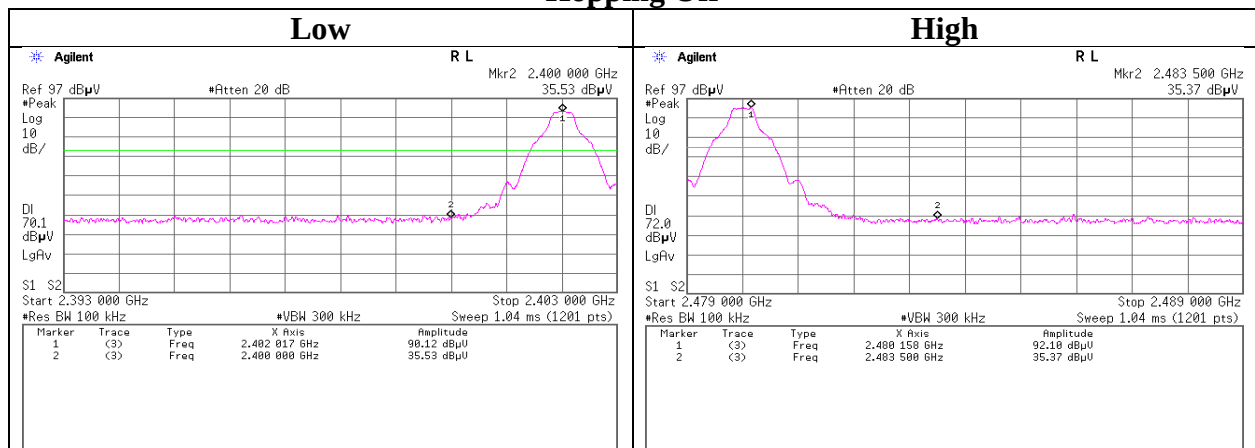
Conducted Emission Band Edge compliance

Report No. 12443390S-A
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 7, 2018
Temperature / Humidity 25 deg. C / 50 % RH
Engineer Kazutaka Takeyama
Mode Tx DH5

Hopping On



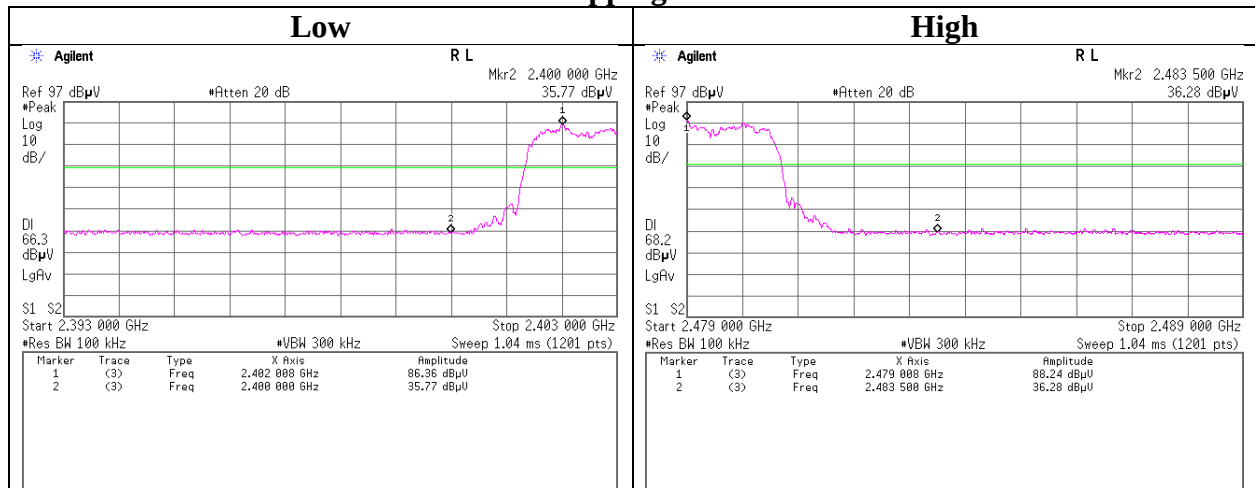
Hopping Off



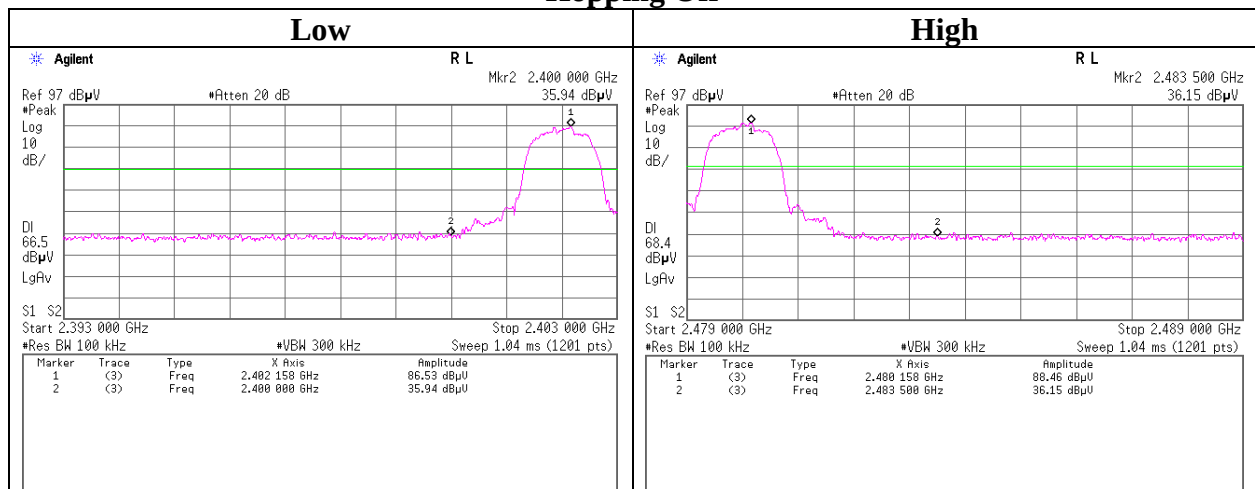
Conducted Emission Band Edge compliance

Report No.	12443390S-A
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 11, 2018
Temperature / Humidity	25 deg. C / 53 % RH
Engineer	Makoto Hosaka
Mode	Tx 3DH5

Hopping On



Hopping Off



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APPENDIX 2: Test instruments

Test Instruments

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
COTS-SEMI-1	RE	144865	EMI Software	TSJ	TEPTO-DV(RE,CE,RFL,MF)	-	-	-	-
SAEC-03(NSA)	RE	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2018/6/2	2019/6/30	12
SAEC-03(SVSWR)	RE	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2018/7/17	2019/7/31	12
SAF-03	RE	145126	Pre Amplifier	SONOMA	310N	290213	2018/2/16	2019/2/28	12
SAF-06	RE	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2018/9/14	2019/9/30	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2018/3/27	2019/3/31	12
SAT6-13	RE	167094	Attenuator	JFW	50HF-006N	-	2018/2/9	2019/2/28	12
SBA-03	RE	145023	Biconical Antenna	Schwarzbeck	BBA9106	91032666	2018/6/17	2019/6/30	12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	RE	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-271(RF Selector)	2018/4/9	2019/4/30	12
SCC-G06	RE	145173	Coaxial Cable	Junkosha	J12J102207-00	MAY-23-16-091	2018/6/1	2019/6/30	12
SCC-G23	RE	145168	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	2018/5/11	2019/5/31	12
SCC-G33	RE	145184	Coaxial Cable	Junkosha	MWX241-0100 0KMSKMS	-	2018/4/20	2019/4/30	12
SCC-G41	RE	151617	Coaxial Cable	Junkosha	MWX221-0100 0NFSNMS/B	1612S006	2018/1/29	2019/1/31	12
SCC-G45	RE	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2EA	2018/3/28	2019/3/31	12
SHA-03	RE	145501	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	2018/7/23	2019/7/31	12
SHA-04	RE	145512	Horn Antenna	ETS LINDGREN	Sep-60	LM3640	2018/7/23	2019/7/31	12
SJM-02	RE	147479	Measure	KOMELON	KMC-36	-	-	-	-
SLA-07	RE	145529	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	2018/6/17	2019/6/30	12
SOS-05	RE	146293	Humidity Indicator	A&D	AD-5681	4062518	2017/10/30	2018/10/31	12
SSA-02	RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2018/3/5	2019/3/31	12
STR-06	RE	146208	Test Receiver	Rohde & Schwarz	ESCI	101259	2018/3/22	2019/3/31	12
STS-03	RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2017/10/16	2018/10/31	12
KSA-08	AT	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2017/10/10	2018/10/31	12
KTS-07	AT	145111	Digital Tester	SANWA	PC500	7019232	2017/10/11	2018/10/31	12
SAT10-15	AT	160493	Attenuator	Weinschel Corp.	54A-10	83406	2017/12/8	2018/12/31	12
SCC-G13	AT	145166	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	2018/3/19	2019/3/31	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2017/12/21	2018/12/31	12
SPM-07	AT	146247	Power Meter	AGILENT	8990B	MY5100272	2018/7/13	2019/7/31	12
SPSS-04	AT	146310	Power sensor	AGILENT	N1923A	MY5326009	2018/7/13	2019/7/31	12
SRENT-09	AT	150461	Spectrum Analyzer	AGILENT (KEYSIGHT)	E4440A	MY46186392	2017/11/8	2018/11/30	12

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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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