



RADIO TEST REPORT

Test Report No. : 12322067S-H-R2

Applicant : Canon Inc.
Type of Equipment : Communication Module
Model No. : WM601
FCC ID : AZD601
Test regulation : FCC Part 15 Subpart C: 2018
* Bluetooth BDR/EDR part
Test Result : Complied (Refer to Section 3.2)

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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.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 12322067S-H-R1. 12322067S-H-R1 is replaced with this report.

Date of test: October 16 to November 20, 2018

Representative test engineer:

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Consumer Technology Division



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RTL02610

- ☐ 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

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SECTION 1: Customer information

Company Name	:	Canon Inc.
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Facsimile Number	:	+81-3-3757-8431
Contact Person	:	Tomohiro Suzuki

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No. on the cover and other relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the information in SECTION 2 and 4.

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

2.1 Identification of E.U.T.

Type of Equipment	:	Communication Module
Model No.	:	WM601
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample (Information from test lab.)	:	September 13, 2018
Country of Mass-production	:	Japan
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: WM601 (referred to as the EUT in this report) is a Communication Module.

Radio Specification

WLAN (IEEE 802.11 b/g/n)

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS DBPSK / DQPSK / CCK OFDM BPSK / QPSK / 16 - QAM / 64 - QAM
Antenna type	:	Meander antenna
Antenna Gain	:	1.67 dBi
Clock frequency (Maximum)	:	37.4 MHz Crystal Oscillator embedded

Bluetooth (BR / EDR,Bluetooth LE, Version 4.2)

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS GFSK / $\pi/4$ - DQPSK / 8 - DPSK GFSK
Antenna type	:	Meander antenna
Antenna Gain	:	1.67 dBi
Clock frequency (Maximum)	:	37.4 MHz Crystal Oscillator embedded

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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	26.2 dB 0.19002 MHz, N, QP, Tx BT DH5 2480 MHz	Complied a)	-
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 b)	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 b)	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 c)	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 d)	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 e)	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	8.5 dB 4882.00 MHz, AV, Hori. Tx, Hopping Off, 3DH5 2441 MHz	Complied f)/g)	Conducted/ Radiated (above 30 MHz) *1)

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

*1) Radiated test was selected over 30 MHz based on section 15.247(d).a) Refer to APPENDIX 1 (data of Conducted Emission)

b) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)

c) Refer to APPENDIX 1 (data of Number of Hopping Frequency)

d) Refer to APPENDIX 1 (data of Dwell time)

e) Refer to APPENDIX 1 (data of Maximum Peak Output Power)

f) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

g) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

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 RF Module has its own regulator. The RF Module is constantly provided voltage through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	RSS-Gen 6.7	IC: -	N/A	Complied b)	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. b) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)					

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

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Item	Frequency range	Uncertainty (+/-)				
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.5 dB	2.5 dB	2.5 dB	2.6 dB	2.6 dB
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	-	-
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 %

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3.5 Test Location

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JAB Accreditation No. RTL02610

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

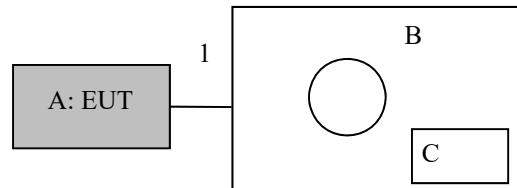
Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

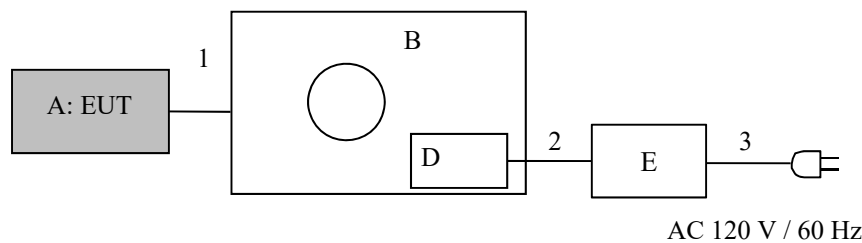
Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number 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: 7.0 Software: RFtest , Ver7.13.52.6 *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

Antenna Terminal conducted test and Radiated Emission test



Conducted Emission test



* 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	Communication Module	WM601	2 *1) 13 *2)	Canon	EUT
B	Digital Camera	PC2328	001049000041 *1) 003049000049 *2)	Canon	-
C	Battery Pack	LP-E12	-	Canon	-
D	DC Coupler	DR-E12	-	Canon	-
E	AC Adapter	CA-PS700	-	Canon	-

*1) Used for Antenna Terminal conducted test

*2) Used for Conducted Emission test and Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal	0.15	Unshielded	Unshielded	-
2	DC Cable	2.0	Unshielded	Unshielded	-
3	AC Cable	2.0	Unshielded	Unshielded	-

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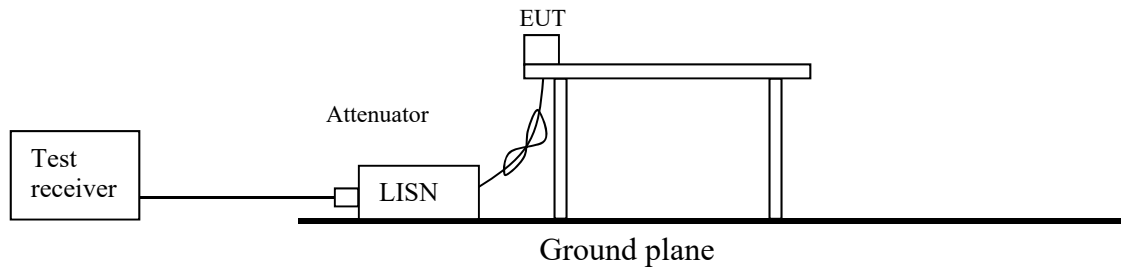
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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a table of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.



For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 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;

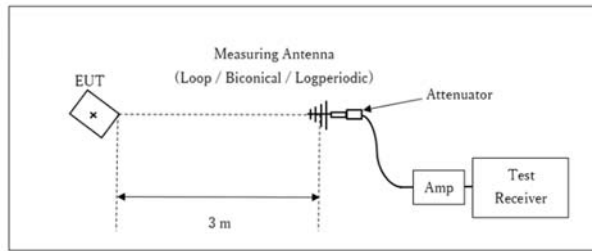
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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	Synchronous noise for RF carrier duty cycle RBW: 1 MHz VBW: 10 Hz Synchronous noise for frequency hopping Peak with Duty (Dwell time) factor	RBW: 100 kHz VBW: 300 kHz

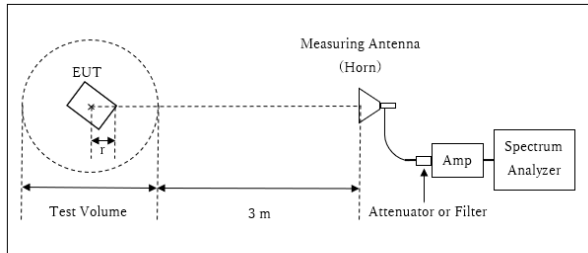
Below 1 GHz



x : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz



r : Radius of an outer periphery of EUT

x : Center of turn table

Distance Factor: $20 \times \log (3.99 \text{ m}^*/3.0 \text{ m}) = 2.48 \text{ dB}$

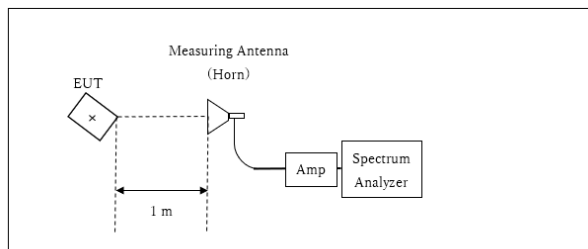
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.99 \text{ m}$

Test Volume: 2 m

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

$r = 0.01 \text{ m}$

13 GHz - 26.5 GHz



x : Center of turn table

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 EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Antenna polarization	Carrier	Spurious (Below 1 GHz)	Spurious (1 GHz – 2.8 GHz)	Spurious (2.8 GHz – 13 GHz)	Spurious (13 GHz – 18 GHz)	Spurious (18 GHz – 26.5 GHz)
Horizontal	Y	Z	Y	X	Y	X
Vertical	Z	X	Z	Z	Y	X

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

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20 dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 50MHz 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	9.1 kHz	27 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) 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.

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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber

Date : 2018/11/20

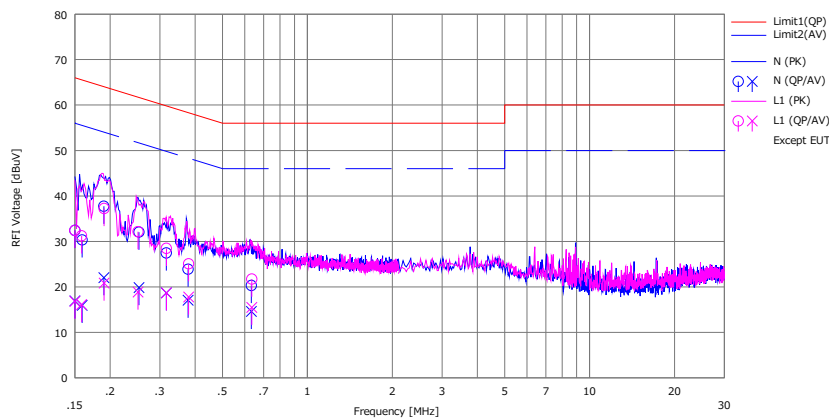
Mode : Tx_BT_DH5_2480 MHz

Power : AC 120 V / 60 Hz

Temp./Humi. : 23 deg.C / 36 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Shiro Kobayashi



No.	Freq. [MHz]	Reading		LISN	LOSS	Results		Limit		Margin		Phase	Comment
		[dBP]	[dBP]			[dBP]	[dBP]	[dBP]	[dBP]	[dBP]	[dBP]		
1	0.15000	20.00	4.50	9.55	2.87	32.42	16.92	66.00	56.00	33.5	39.0	N	
2	0.15925	17.90	3.50	9.56	2.87	30.33	15.93	65.50	55.50	35.1	39.5	N	
3	0.19002	25.30	9.60	9.55	2.88	37.73	22.03	64.00	54.00	26.2	31.9	N	
4	0.25300	19.60	7.40	9.56	2.89	32.05	19.85	61.70	51.70	29.6	31.8	N	
5	0.31632	15.00	6.20	9.57	2.90	27.47	18.67	59.80	49.80	32.3	31.1	N	
6	0.37793	11.40	4.60	9.57	2.91	23.88	17.08	58.30	48.30	34.4	31.2	N	
7	0.63306	7.80	2.10	9.57	2.94	20.31	14.61	56.00	46.00	35.6	31.3	N	
8	0.15000	20.00	4.40	9.55	2.87	32.42	16.82	66.00	56.00	33.5	39.1	L1	
9	0.15846	18.80	3.70	9.56	2.87	31.23	16.13	65.50	55.50	34.2	39.3	L1	
10	0.19036	24.80	8.40	9.56	2.88	37.24	20.84	64.00	54.00	26.7	33.1	L1	
11	0.25109	19.70	6.40	9.56	2.89	32.15	18.85	61.70	51.70	29.5	32.8	L1	
12	0.31658	16.00	6.20	9.57	2.90	28.47	18.67	59.80	49.80	31.3	31.1	L1	
13	0.37951	12.60	5.30	9.57	2.91	25.08	17.78	58.30	48.30	33.2	30.5	L1	
14	0.63524	9.20	3.00	9.57	2.94	21.71	15.51	56.00	46.00	34.2	30.4	L1	

Calculation: Result[dBP]=Reading[dBP]+C.Fac(LISN(AMN))+Cable+ATT[dBP]
LISN(AMN):SLS-05

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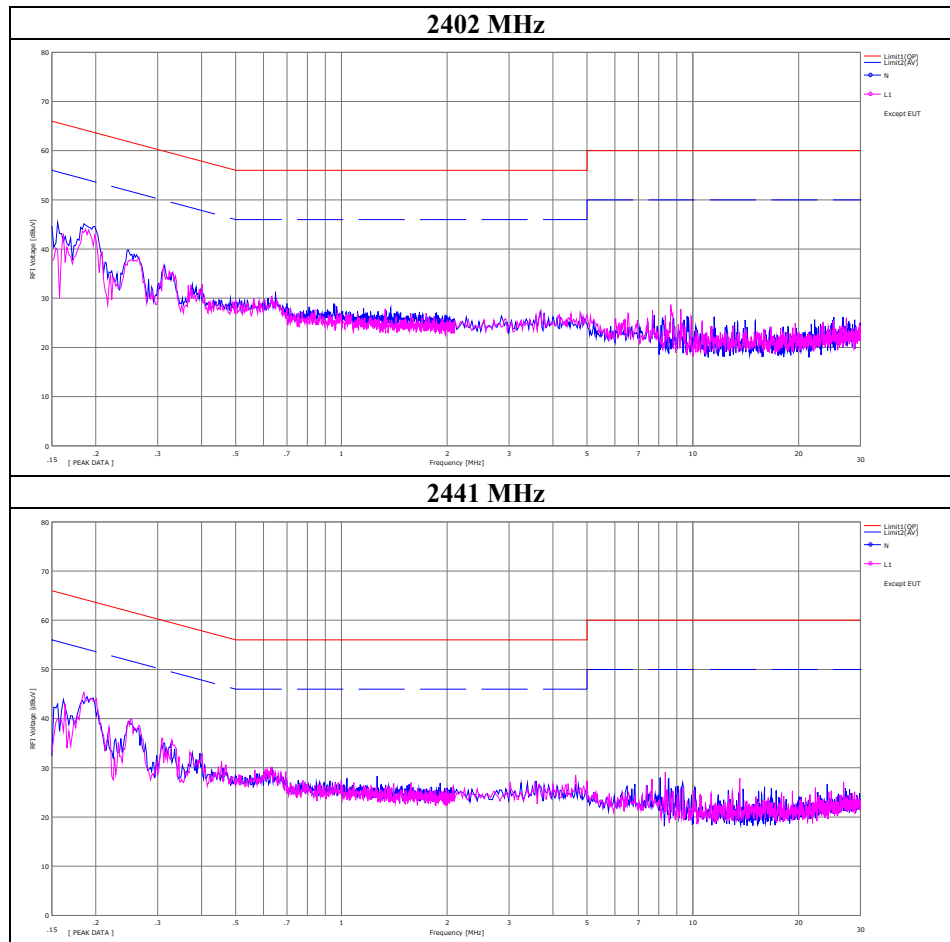
Shonan EMC Lab.

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Conducted Emission



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Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber

Date : 2018/11/20

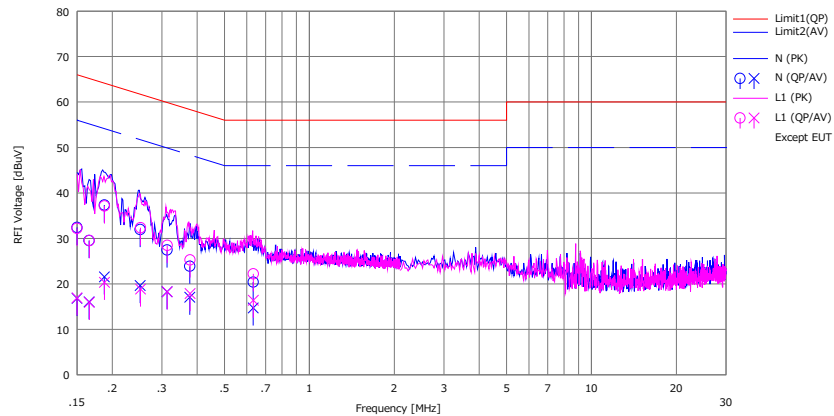
Mode : Tx_BT_3DH5_2402 MHz

Power : AC 120 V / 60 Hz

Temp./Humi. : 23 deg.C / 36 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Shiro Kobayashi



No.	Freq. [MHz]	Reading		USN	LOSS	Results		Limit		Margin		Phase	Comment
		[dBuV]	[dBA]			[dBuV]	[dBA]	[dBuV]	[dBA]	[dB]	[dB]		
1	0.15000	20.00	4.40	9.55	2.87	32.42	16.82	66.00	56.00	33.5	39.1	N	
2	0.16559	17.10	3.60	9.57	2.87	29.54	16.04	65.20	55.20	35.6	39.1	N	
3	0.18760	24.90	9.10	9.56	2.88	37.34	21.54	64.10	54.10	26.7	32.5	N	
4	0.25134	19.50	7.20	9.56	2.89	31.95	19.65	61.70	51.70	29.7	32.0	N	
5	0.31303	15.00	5.80	9.57	2.90	27.47	18.27	59.90	49.90	32.4	31.6	N	
6	0.37684	11.40	4.60	9.57	2.91	23.88	17.08	58.30	48.30	34.4	31.2	N	
7	0.63234	7.90	2.20	9.57	2.94	20.41	14.71	56.00	46.00	35.5	31.2	N	
8	0.15000	19.80	4.50	9.55	2.87	32.22	16.92	66.00	56.00	33.7	39.0	L1	
9	0.16588	17.10	3.50	9.57	2.87	29.54	15.94	65.20	55.20	35.6	39.2	L1	
10	0.18766	24.70	7.90	9.56	2.88	37.14	20.34	64.10	54.10	26.9	33.7	L1	
11	0.25192	19.90	6.40	9.56	2.89	32.35	18.85	61.70	51.70	29.3	32.8	L1	
12	0.31353	16.00	5.80	9.57	2.90	28.47	18.27	59.90	49.90	31.4	31.6	L1	
13	0.37767	12.80	5.40	9.57	2.91	25.28	17.88	58.30	48.30	33.0	30.4	L1	
14	0.63288	9.70	3.90	9.57	2.94	22.21	16.41	56.00	46.00	33.7	29.5	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]
LISN(AMN): SLS-05

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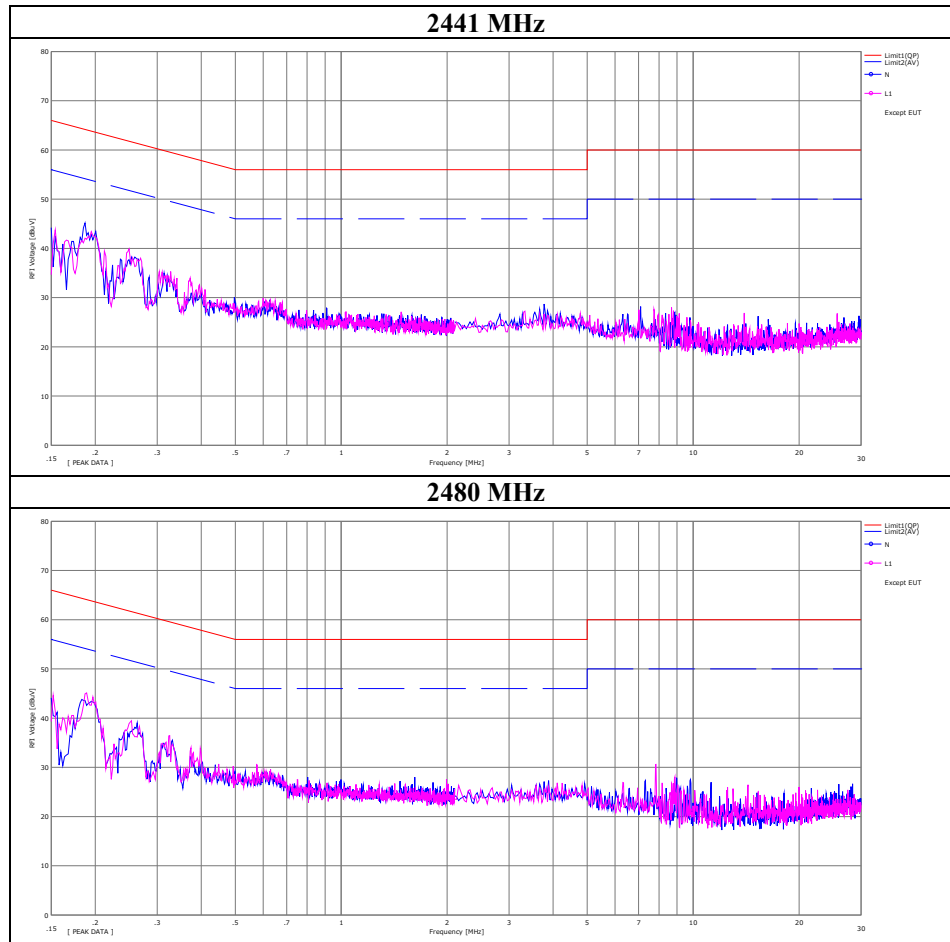
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Conducted Emission



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

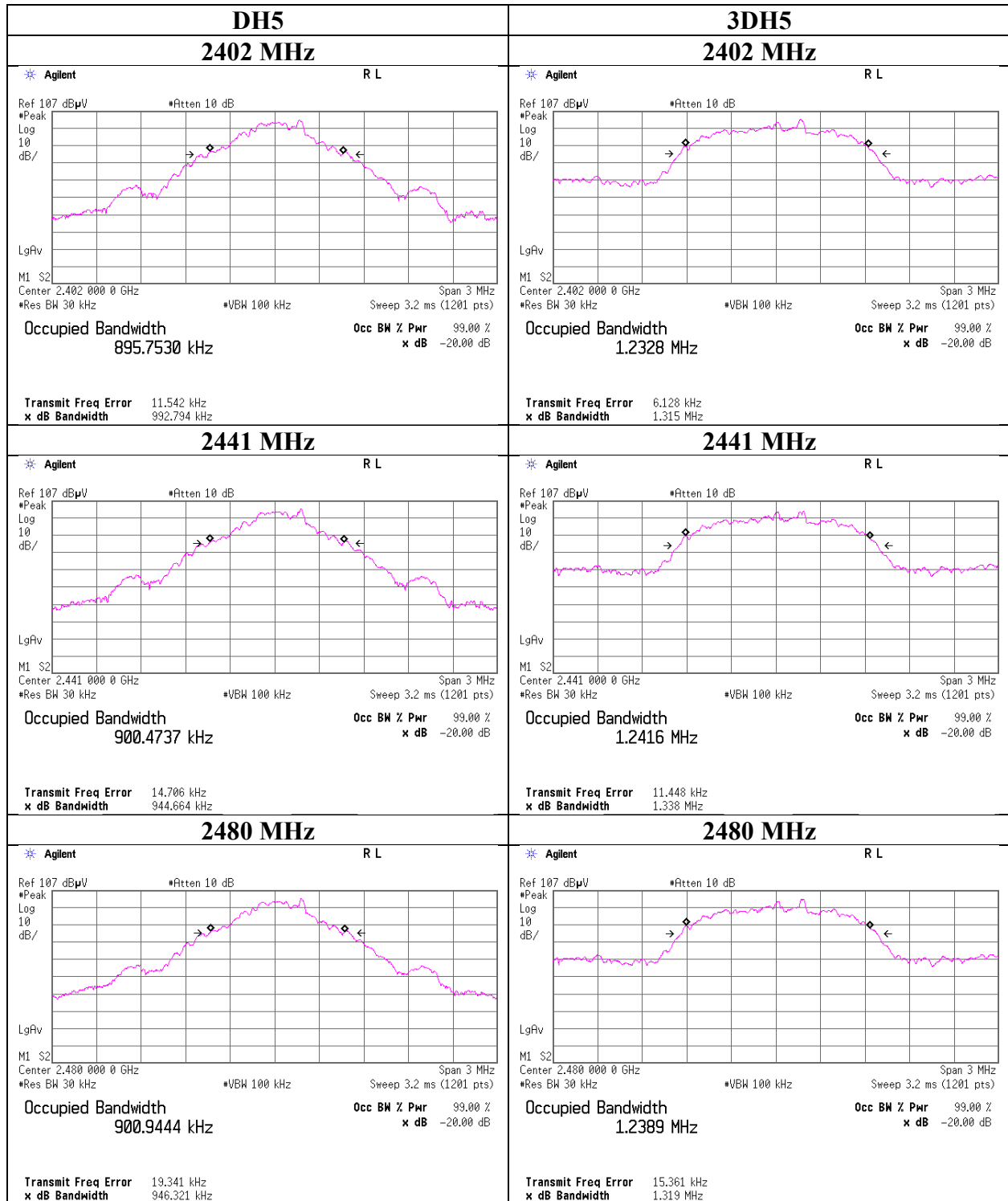
Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	99% Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.993	895.753	1.013	≥ 0.662
DH5	2441.0	0.945	900.474	1.035	≥ 0.630
DH5	2480.0	0.946	900.944	1.020	≥ 0.631
DH5	Hopping On	-	78649.4	-	-
3DH5	2402.0	1.315	1232.8	1.028	≥ 0.877
3DH5	2441.0	1.338	1241.6	1.015	≥ 0.892
3DH5	2480.0	1.319	1238.9	1.000	≥ 0.879
3DH5	Hopping On	-	78790.4	-	-

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

No limit applies to 20dB Bandwidth.

20dB Bandwidth and 99% Occupied Bandwidth



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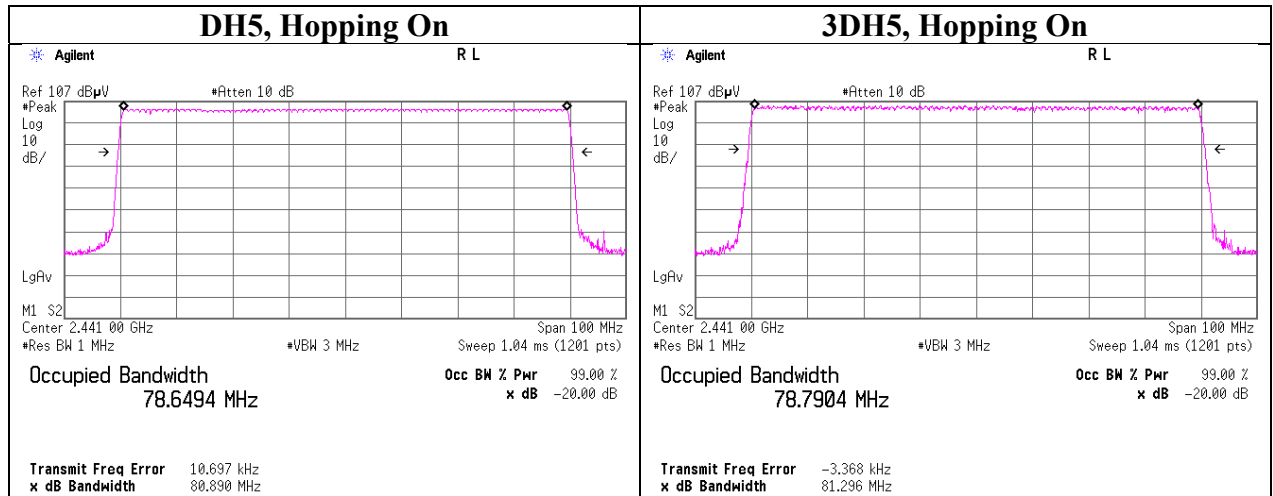
Shonan EMC Lab.

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20dB Bandwidth and 99% Occupied Bandwidth



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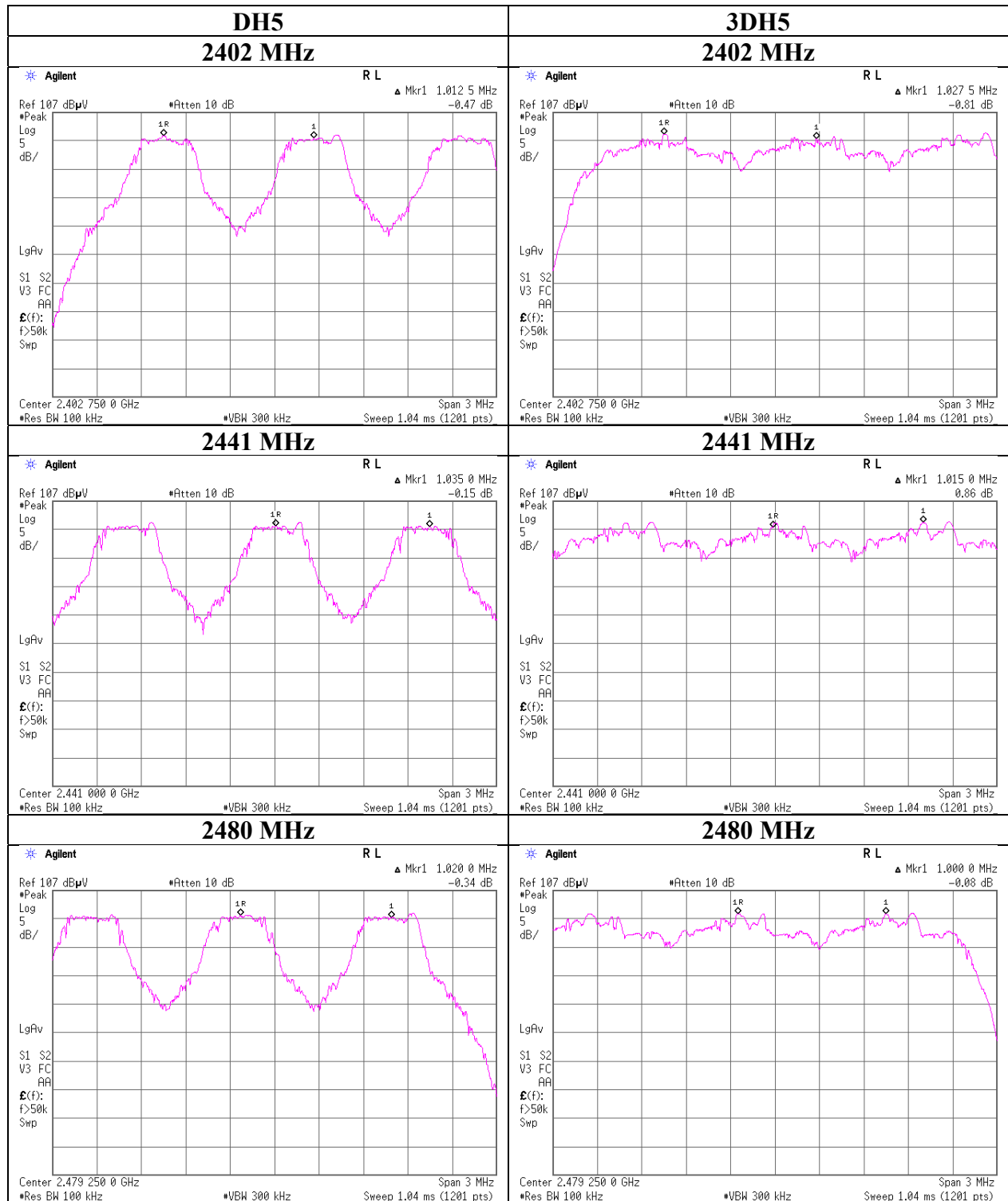
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Carrier Frequency Separation



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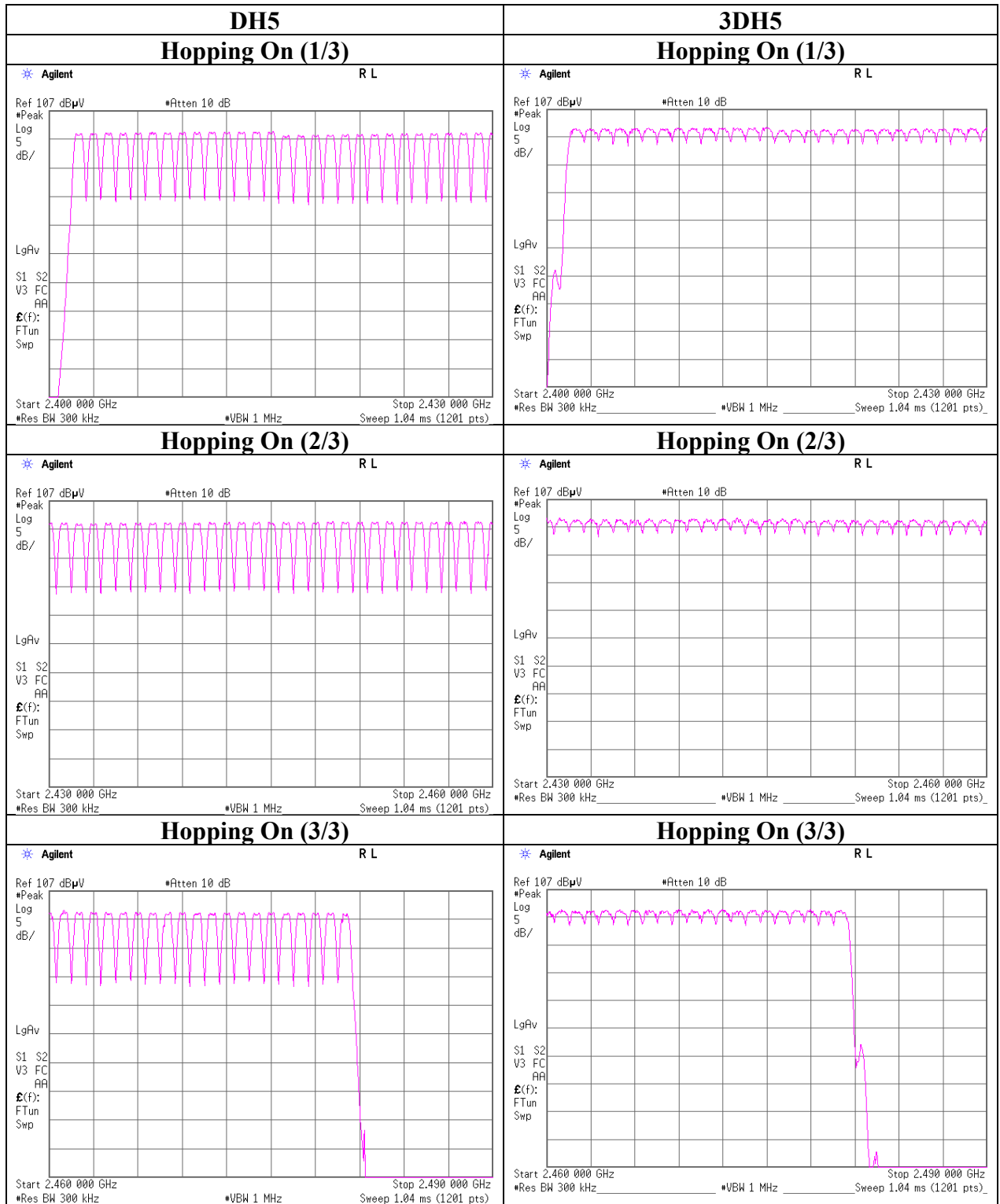
Number of Hopping Frequency

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
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. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping On

Mode	Number of transmission in a 31.6(79 Hopping x 0.4)				Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	48.6 times /	5 sec. x	31.6 sec. =	308 times	0.423	130	400
DH3	25.0 times /	5 sec. x	31.6 sec. =	158 times	1.678	265	400
DH5	15.8 times /	5 sec. x	31.6 sec. =	100 times	2.928	293	400
3DH1	49.8 times /	5 sec. x	31.6 sec. =	315 times	0.428	135	400
3DH3	26.6 times /	5 sec. x	31.6 sec. =	169 times	1.679	284	400
3DH5	15.4 times /	5 sec. x	31.6 sec. =	98 times	2.932	287	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

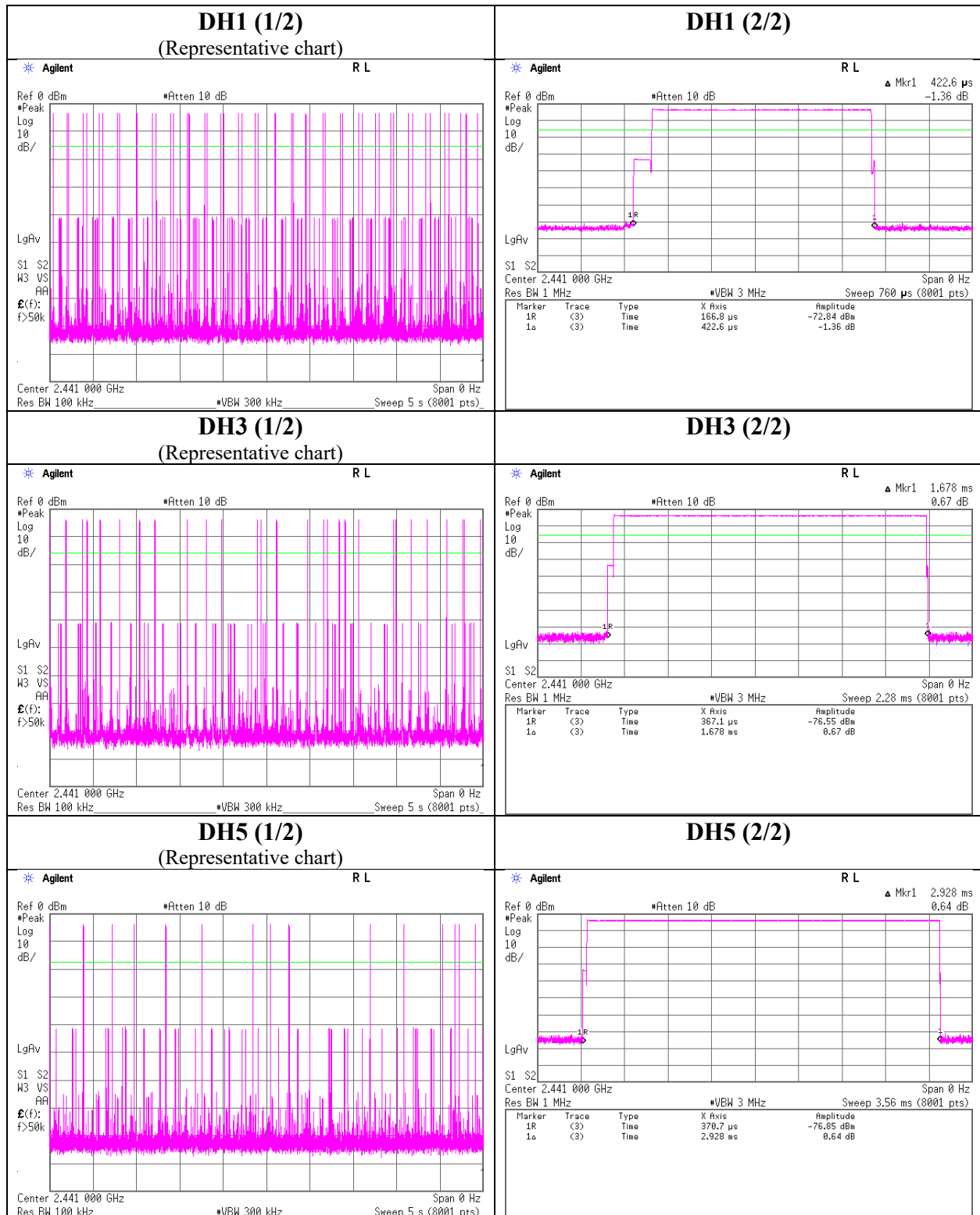
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	47	49	49	50	48	48.6
DH3	26	20	27	27	25	25.0
DH5	14	19	16	16	14	15.8
3DH1	50	50	50	50	49	49.8
3DH3	25	27	30	25	26	26.6
3DH5	13	15	17	17	15	15.4

Sample Calculation

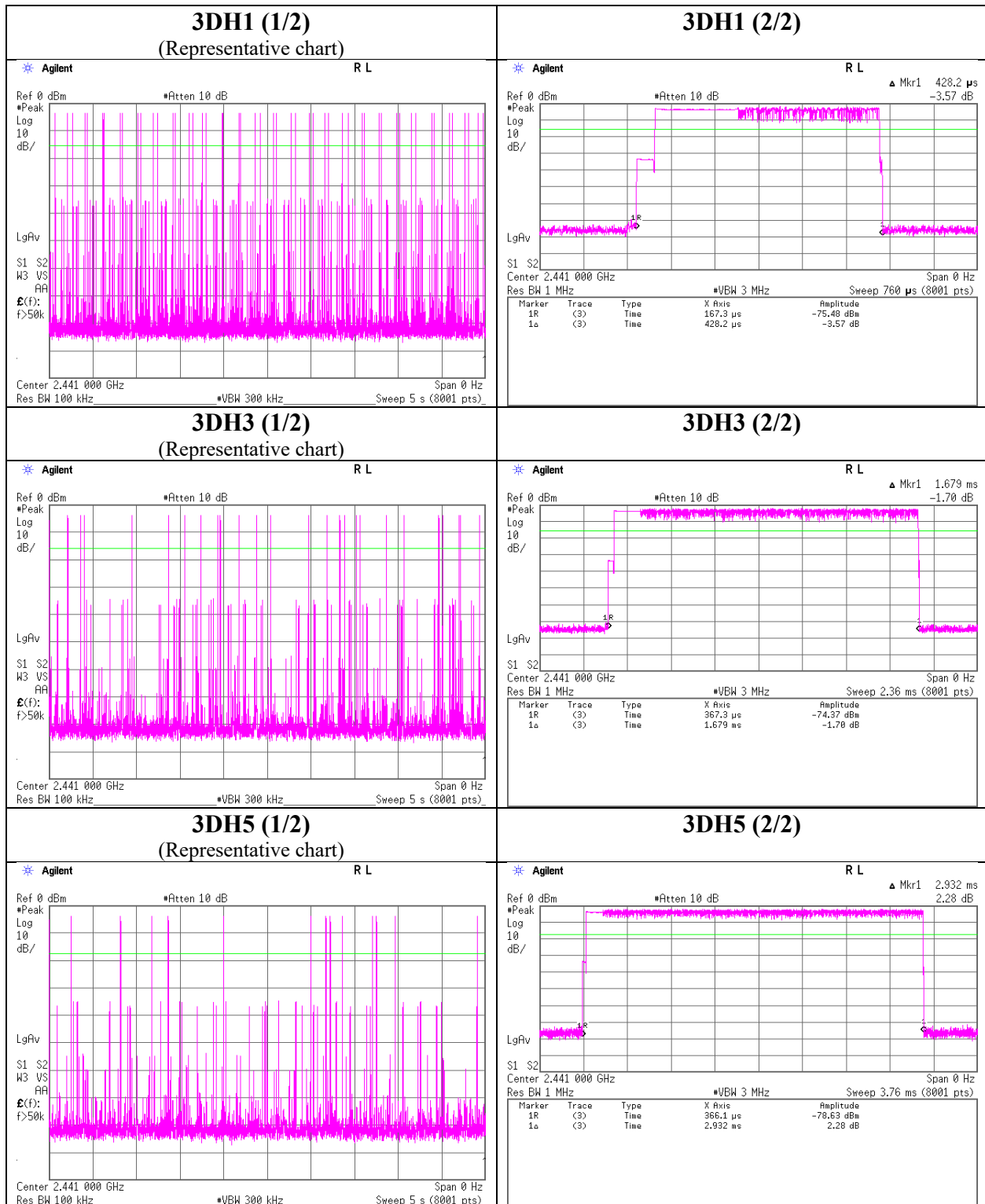
Average = Summation (Sampling 1 to 5) / 5

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. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 17, 2018
Temperature / Humidity 24 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
					Result		Limit		Margin	Antenna Gain [dBi]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]		[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-3.64	1.48	9.86	7.70	5.89	20.96	125	13.26	1.67	9.37	8.65	36.02	4000	26.65
DH5	2441.0	-3.42	1.49	9.86	7.93	6.21	20.96	125	13.03	1.67	9.60	9.12	36.02	4000	26.42
DH5	2480.0	-3.36	1.50	9.85	7.99	6.30	20.96	125	12.97	1.67	9.66	9.25	36.02	4000	26.36
2DH5	2402.0	-1.76	1.48	9.86	9.58	9.08	20.96	125	11.38	1.67	11.25	13.34	36.02	4000	24.77
2DH5	2441.0	-1.89	1.49	9.86	9.46	8.83	20.96	125	11.50	1.67	11.13	12.97	36.02	4000	24.89
2DH5	2480.0	-2.14	1.50	9.85	9.21	8.34	20.96	125	11.75	1.67	10.88	12.25	36.02	4000	25.14
3DH5	2402.0	-1.64	1.48	9.86	9.70	9.33	20.96	125	11.26	1.67	11.37	13.71	36.02	4000	24.65
3DH5	2441.0	-1.76	1.49	9.86	9.59	9.10	20.96	125	11.37	1.67	11.26	13.37	36.02	4000	24.76
3DH5	2480.0	-2.01	1.50	9.85	9.34	8.59	20.96	125	11.62	1.67	11.01	12.62	36.02	4000	25.01

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.

However, the limit level 125mW of AFH mode was used for the test.

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Average Output Power (Reference data for RF Exposure)

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 17, 2018
Temperature / Humidity	24 deg. C / 46 % 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	-5.20	1.48	9.86	6.14	4.11	1.06	7.20	5.25
DH5	2441.0	-5.09	1.49	9.86	6.26	4.23	1.06	7.32	5.40
DH5	2480.0	-5.14	1.50	9.85	6.21	4.18	1.06	7.27	5.33
2DH5	2402.0	-4.97	1.48	9.86	6.37	4.34	1.05	7.42	5.52
2DH5	2441.0	-4.96	1.49	9.86	6.39	4.36	1.05	7.44	5.55
2DH5	2480.0	-5.18	1.50	9.85	6.17	4.14	1.05	7.22	5.27
3DH5	2402.0	-4.98	1.48	9.86	6.36	4.33	1.05	7.41	5.51
3DH5	2441.0	-4.96	1.49	9.86	6.39	4.36	1.05	7.44	5.55
3DH5	2480.0	-5.21	1.50	9.85	6.14	4.11	1.05	7.19	5.24

Sample Calculation:

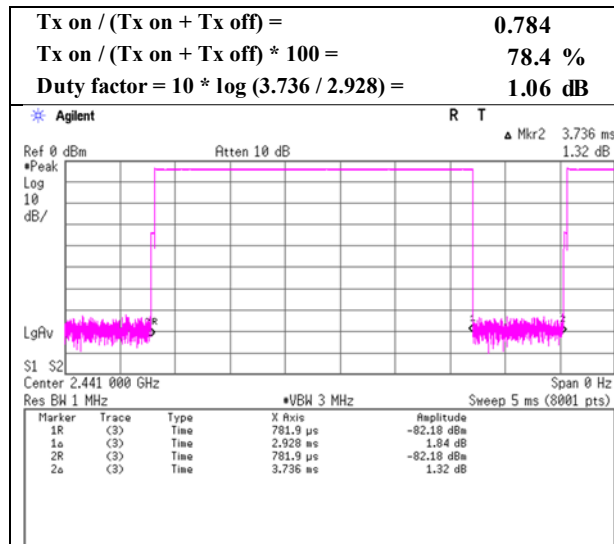
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

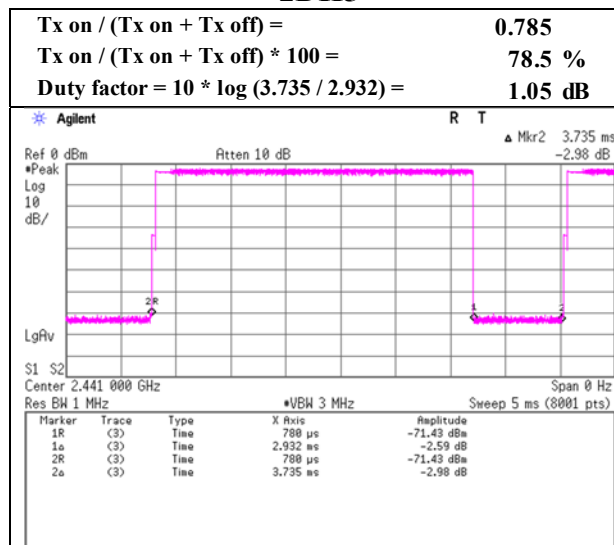
Burst Rate Confirmation

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 16, 2018
Temperature / Humidity	25 deg. C / 46 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

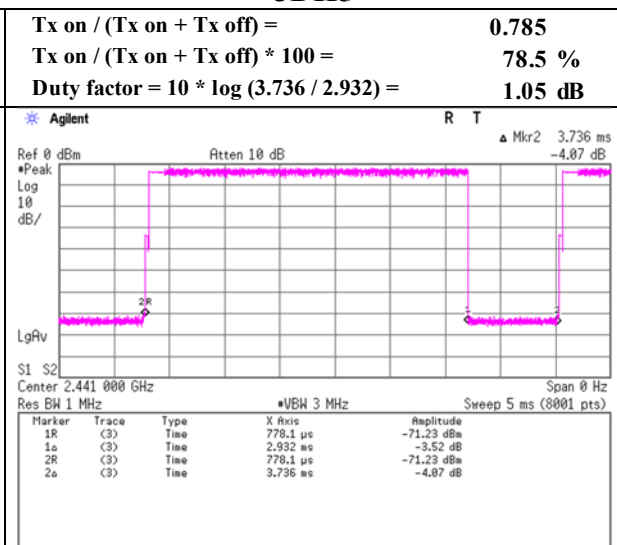
DH5



2DH5



3DH5



Radiated Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 3
Date November 19, 2018 October 21, 2018 October 27, 2018
Temperature / Humidity 23 deg. C / 40 % RH 23 deg. C / 46 % RH 24 deg. C / 48 % RH
Engineer Yosuke Ishikawa Kazutaka Takeyama Kazuya Noda
(30 MHz – 1000 MHz) (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.	324.005	QP	39.24	14.32	6.44	31.68	0.00	28.32	46.00	17.6	100	320	
Hori.	377.997	QP	46.63	15.14	6.88	31.66	0.00	36.99	46.00	9.0	100	140	
Hori.	432.000	QP	38.90	16.18	7.18	31.67	0.00	30.59	46.00	15.4	100	143	
Hori.	486.000	QP	38.56	17.37	7.38	31.65	0.00	31.66	46.00	14.3	229	294	
Hori.	594.005	QP	35.83	19.07	7.82	31.65	0.00	31.07	46.00	14.9	175	292	
Hori.	702.004	QP	34.83	19.81	8.28	31.59	0.00	31.33	46.00	14.6	150	293	
Hori.	2390.000	PK	41.40	27.91	13.93	36.58	2.48	49.14	73.90	24.7	286	242	
Hori.	4804.000	PK	45.00	31.31	6.53	36.88	2.48	48.44	73.90	25.4	106	334	
Hori.	7206.000	PK	42.20	36.77	7.58	37.26	2.48	51.77	73.90	22.1	100	0	
Hori.	9608.000	PK	41.10	38.11	8.65	38.47	2.48	51.87	73.90	22.0	100	0	
Hori.	2390.000	AV	31.60	27.91	13.93	36.58	2.48	39.34	53.90	14.5	286	242	
Hori.	4804.000	AV	36.70	31.31	6.53	36.88	2.48	40.14	53.90	13.7	106	334	
Hori.	7206.000	AV	32.40	36.77	7.58	37.26	2.48	41.97	53.90	11.9	100	0	
Hori.	9608.000	AV	33.00	38.11	8.65	38.47	2.48	43.77	53.90	10.1	100	0	
Vert.	323.997	QP	29.03	14.32	6.44	31.68	0.00	18.11	46.00	27.8	100	227	
Vert.	377.999	QP	36.76	15.14	6.88	31.66	0.00	27.12	46.00	18.8	100	224	
Vert.	485.999	QP	33.73	17.37	7.38	31.65	0.00	26.83	46.00	19.1	121	51	
Vert.	540.002	QP	27.68	17.70	7.60	31.71	0.00	21.27	46.00	24.7	100	320	
Vert.	2390.000	PK	41.00	27.91	13.93	36.58	2.48	48.74	73.90	25.1	140	38	
Vert.	4804.000	PK	43.40	31.31	6.53	36.88	2.48	46.84	73.90	27.0	100	356	
Vert.	7206.000	PK	42.40	36.77	7.58	37.26	2.48	51.97	73.90	21.9	100	0	
Vert.	9608.000	PK	42.44	38.11	8.65	38.47	2.48	53.21	73.90	20.6	100	0	
Vert.	2390.000	AV	31.60	27.91	13.93	36.58	2.48	39.34	53.90	14.5	140	38	
Vert.	4804.000	AV	32.70	31.31	6.53	36.88	2.48	36.14	53.90	17.7	100	356	
Vert.	7206.000	AV	32.30	36.77	7.58	37.26	2.48	41.87	53.90	12.0	100	0	
Vert.	9608.000	AV	32.90	38.11	8.65	38.47	2.48	43.67	53.90	10.2	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	92.70	27.90	13.94	36.57	2.48	100.45	-	-	Carrier
Hori.	2400.000	PK	35.60	27.91	13.94	36.58	2.48	43.35	80.45	37.1	
Vert.	2402.000	PK	92.70	27.90	13.94	36.57	2.48	100.45	-	-	Carrier
Vert.	2400.000	PK	35.80	27.91	13.94	36.58	2.48	43.55	80.45	36.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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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Shonan EMC Lab.

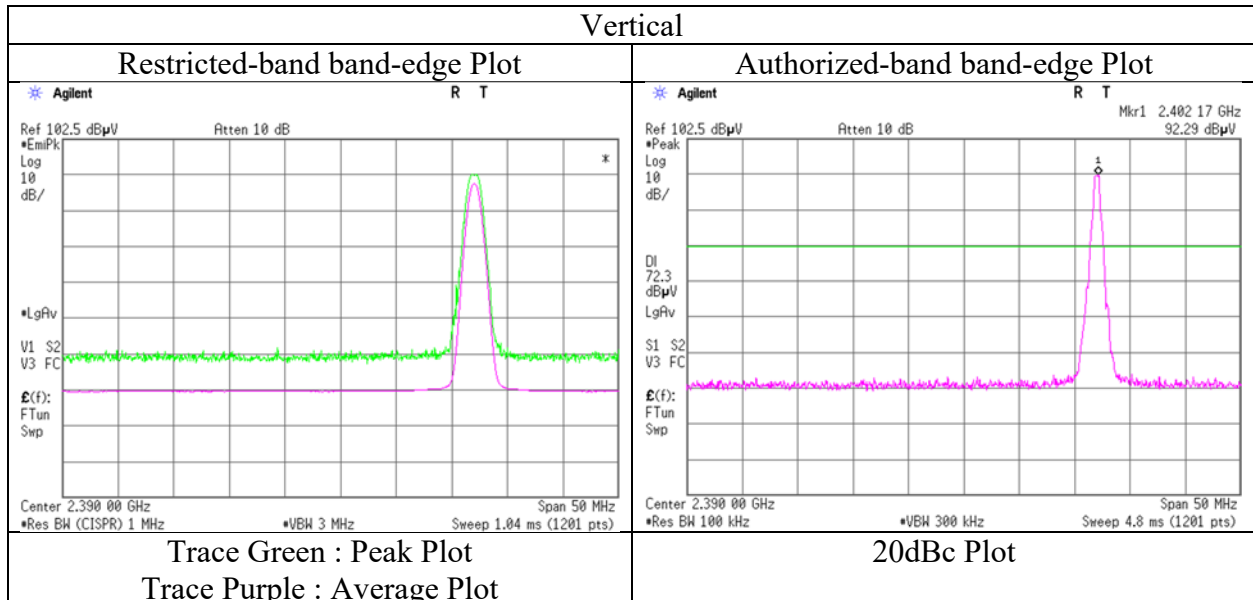
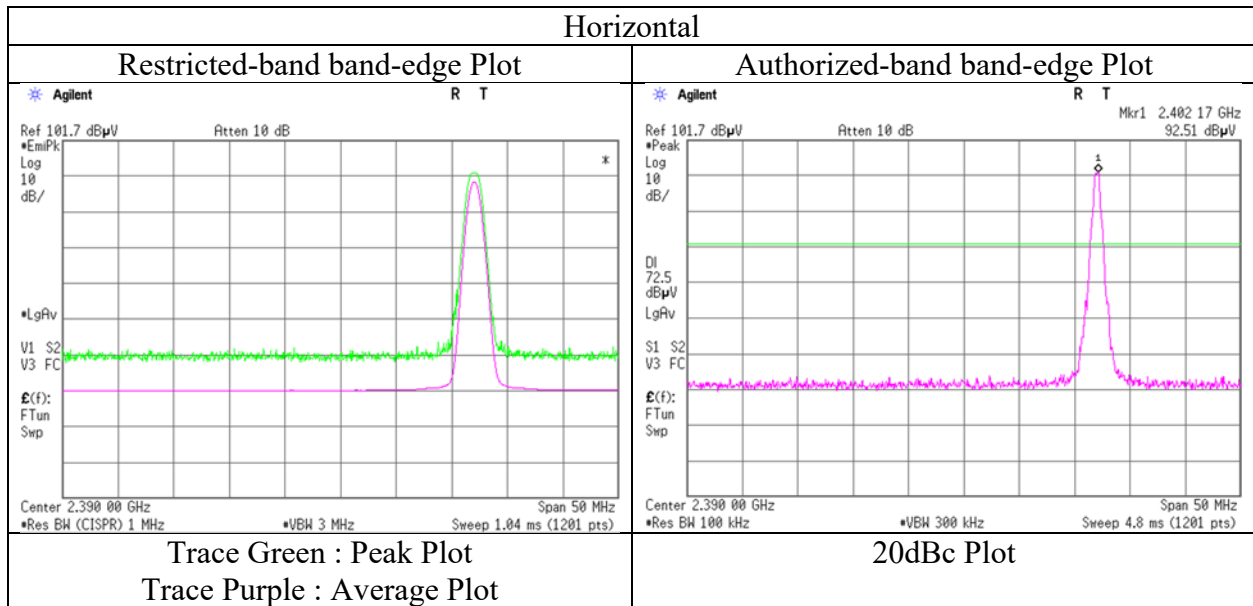
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	October 22, 2018
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Makoto Hosaka
	(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.	12322067S-H-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	2	2	3
Date	November 19, 2018	October 21, 2018	October 27, 2018
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 46 % RH	24 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Kazutaka Takeyama	Kazuya Noda
	(30 MHz – 1000 MHz)	(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.	324.001	QP	39.09	14.32	6.44	31.68	0.00	28.17	46.00	17.8	100	317	
Hori.	377.998	QP	46.64	15.14	6.88	31.66	0.00	37.00	46.00	9.0	100	142	
Hori.	432.002	QP	38.80	16.18	7.18	31.67	0.00	30.49	46.00	15.5	100	130	
Hori.	486.005	QP	39.15	17.37	7.38	31.65	0.00	32.25	46.00	13.7	228	308	
Hori.	594.002	QP	34.61	19.07	7.82	31.65	0.00	29.85	46.00	16.1	172	331	
Hori.	701.998	QP	34.79	19.81	8.28	31.59	0.00	31.29	46.00	14.7	136	311	
Hori.	4882.000	PK	46.00	31.14	6.56	36.91	2.48	49.27	73.90	24.6	190	208	
Hori.	7323.000	PK	42.00	36.84	7.64	37.44	2.48	51.52	73.90	22.3	100	0	
Hori.	9764.000	PK	43.20	38.59	8.80	38.66	2.48	54.41	73.90	19.4	100	0	
Hori.	4882.000	AV	38.40	31.14	6.56	36.91	2.48	41.67	53.90	12.2	190	208	
Hori.	7323.000	AV	32.00	36.84	7.64	37.44	2.48	41.52	53.90	12.3	100	0	
Hori.	9764.000	AV	32.10	38.59	8.80	38.66	2.48	43.31	53.90	10.5	100	0	
Vert.	323.993	QP	29.66	14.32	6.44	31.68	0.00	18.74	46.00	27.2	123	238	
Vert.	378.004	QP	36.85	15.14	6.88	31.66	0.00	27.21	46.00	18.7	100	225	
Vert.	486.005	QP	35.10	17.37	7.38	31.65	0.00	28.20	46.00	17.8	128	6	
Vert.	540.000	QP	27.61	17.70	7.60	31.71	0.00	21.20	46.00	24.8	100	309	
Vert.	4882.000	PK	43.60	31.14	6.56	36.91	2.48	46.87	73.90	27.0	100	354	
Vert.	7323.000	PK	41.90	36.84	7.64	37.44	2.48	51.42	73.90	22.4	100	0	
Vert.	9764.000	PK	43.00	38.59	8.80	38.66	2.48	54.21	73.90	19.6	100	0	
Vert.	4882.000	AV	33.30	31.14	6.56	36.91	2.48	36.57	53.90	17.3	100	354	
Vert.	7323.000	AV	32.20	36.84	7.64	37.44	2.48	41.72	53.90	12.1	100	0	
Vert.	9764.000	AV	32.00	38.59	8.80	38.66	2.48	43.21	53.90	10.6	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(3.99 m / 3.0 m) = 2.48 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.	12322067S-H-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	2	2	3
Date	November 19, 2018	October 21, 2018	October 27, 2018
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 46 % RH	24 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Kazutaka Takeyama	Kazuya Noda
	(30 MHz – 1000 MHz)	(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.	324.000	QP	39.54	14.32	6.44	31.68	0.00	28.62	46.00	17.3	100	320	
Hori.	377.998	QP	46.54	15.14	6.88	31.66	0.00	36.90	46.00	9.1	100	135	
Hori.	432.000	QP	38.74	16.18	7.18	31.67	0.00	30.43	46.00	15.5	100	128	
Hori.	486.003	QP	39.24	17.37	7.38	31.65	0.00	32.34	46.00	13.6	229	302	
Hori.	594.009	QP	35.35	19.07	7.82	31.65	0.00	30.59	46.00	15.4	164	316	
Hori.	702.004	QP	35.04	19.81	8.28	31.59	0.00	31.54	46.00	14.4	136	300	
Hori.	2483.500	PK	43.40	27.67	14.00	36.52	2.48	51.03	73.90	22.8	269	115	
Hori.	4960.000	PK	47.00	31.33	6.61	36.93	2.48	50.49	73.90	23.4	121	1	
Hori.	7440.000	PK	41.40	36.97	7.69	37.63	2.48	50.91	73.90	22.9	100	0	
Hori.	9920.000	PK	43.00	38.80	8.97	38.84	2.48	54.41	73.90	19.4	100	0	
Hori.	2483.500	AV	33.10	27.67	14.00	36.52	2.48	40.73	53.90	13.1	269	115	
Hori.	4960.000	AV	39.20	31.33	6.61	36.93	2.48	42.69	53.90	11.2	121	1	
Hori.	7440.000	AV	32.00	36.97	7.69	37.63	2.48	41.51	53.90	12.3	100	0	
Hori.	9920.000	AV	32.20	38.80	8.97	38.84	2.48	43.61	53.90	10.2	100	0	
Vert.	324.005	QP	29.43	14.32	6.44	31.68	0.00	18.51	46.00	27.4	124	228	
Vert.	377.997	QP	37.42	15.14	6.88	31.66	0.00	27.78	46.00	18.2	100	230	
Vert.	486.006	QP	35.60	17.37	7.38	31.65	0.00	28.70	46.00	17.3	136	0	
Vert.	540.001	QP	27.70	17.70	7.60	31.71	0.00	21.29	46.00	24.7	100	333	
Vert.	2483.500	PK	43.00	27.67	14.00	36.52	2.48	50.63	73.90	23.2	138	311	
Vert.	4960.000	PK	45.10	31.33	6.61	36.93	2.48	48.59	73.90	25.3	100	335	
Vert.	7440.000	PK	41.80	36.97	7.69	37.63	2.48	51.31	73.90	22.5	100	0	
Vert.	9920.000	PK	43.50	38.80	8.97	38.84	2.48	54.91	73.90	18.9	100	0	
Vert.	2483.500	AV	32.50	27.67	14.00	36.52	2.48	40.13	53.90	13.7	138	311	
Vert.	4960.000	AV	36.50	31.33	6.61	36.93	2.48	39.99	53.90	13.9	100	335	
Vert.	7440.000	AV	31.90	36.97	7.69	37.63	2.48	41.41	53.90	12.4	100	0	
Vert.	9920.000	AV	32.30	38.80	8.97	38.84	2.48	43.71	53.90	10.1	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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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Shonan EMC Lab.

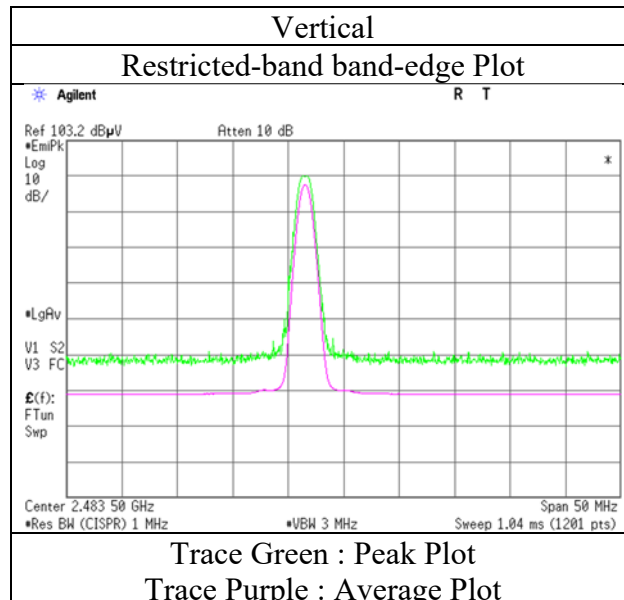
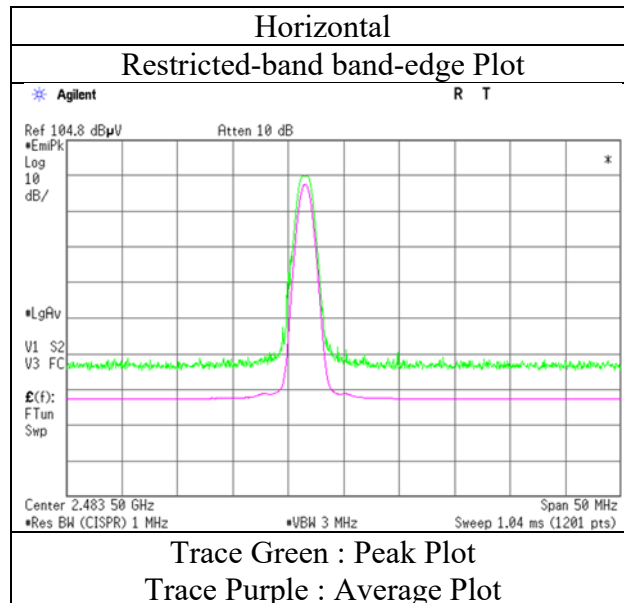
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	October 21, 2018
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazutaka Takeyama (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. 12322067S-H-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 2 2 3
Date November 19, 2018 October 22, 2018 October 27, 2018
Temperature / Humidity 23 deg. C / 40 % RH 22 deg. C / 36 % RH 24 deg. C / 48 % RH
Engineer Yosuke Ishikawa Makoto Hosaka Kazuya Noda
(30 MHz – 1000 MHz) (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.	324.002	QP	39.51	14.32	6.44	31.68	0.00	28.59	46.00	17.4	100	312	
Hori.	378.000	QP	46.55	15.14	6.88	31.66	0.00	36.91	46.00	9.0	100	134	
Hori.	432.003	QP	38.84	16.18	7.18	31.67	0.00	30.53	46.00	15.4	100	135	
Hori.	485.993	QP	39.18	17.37	7.38	31.65	0.00	32.28	46.00	13.7	226	304	
Hori.	594.006	QP	35.63	19.07	7.82	31.65	0.00	30.87	46.00	15.1	167	300	
Hori.	702.000	QP	35.04	19.81	8.28	31.59	0.00	31.54	46.00	14.4	133	299	
Hori.	2390.000	PK	43.78	27.91	13.89	36.58	2.48	51.48	73.90	22.4	184	100	
Hori.	4804.000	PK	48.67	31.31	6.51	36.88	2.48	52.09	73.90	21.8	111	142	
Hori.	7206.000	PK	44.70	36.77	7.66	37.26	2.48	54.35	73.90	19.5	100	0	
Hori.	9608.000	PK	45.59	38.11	8.64	38.47	2.48	56.35	73.90	17.5	100	0	
Hori.	2390.000	AV	31.40	27.91	13.89	36.58	2.48	39.10	53.90	14.8	184	100	
Hori.	4804.000	AV	37.94	31.31	6.51	36.88	2.48	41.36	53.90	12.5	111	142	
Hori.	7206.000	AV	33.28	36.77	7.66	37.26	2.48	42.93	53.90	10.9	100	0	
Hori.	9608.000	AV	33.98	38.11	8.64	38.47	2.48	44.74	53.90	9.1	100	0	
Vert.	323.996	QP	30.59	14.32	6.44	31.68	0.00	19.67	46.00	26.3	126	227	
Vert.	377.996	QP	35.97	15.14	6.88	31.66	0.00	26.33	46.00	19.6	100	222	
Vert.	486.000	QP	35.39	17.37	7.38	31.65	0.00	28.49	46.00	17.5	122	11	
Vert.	540.004	QP	27.76	17.70	7.60	31.71	0.00	21.35	46.00	24.6	100	305	
Vert.	2390.000	PK	44.21	27.91	13.89	36.58	2.48	51.91	73.90	21.9	100	28	
Vert.	4804.000	PK	44.31	31.31	6.51	36.88	2.48	47.73	73.90	26.1	147	353	
Vert.	7206.000	PK	45.14	36.77	7.66	37.26	2.48	54.79	73.90	19.1	100	0	
Vert.	9608.000	PK	45.77	38.11	8.64	38.47	2.48	56.53	73.90	17.3	100	0	
Vert.	2390.000	AV	31.40	27.91	13.89	36.58	2.48	39.10	53.90	14.8	100	28	
Vert.	4804.000	AV	33.44	31.31	6.51	36.88	2.48	36.86	53.90	17.0	147	353	
Vert.	7206.000	AV	33.04	36.77	7.66	37.26	2.48	42.69	53.90	11.2	100	0	
Vert.	9608.000	AV	34.03	38.11	8.64	38.47	2.48	44.79	53.90	9.1	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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.

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	93.35	27.90	13.90	36.57	2.48	101.06	-	-	Carrier
Hori.	2400.000	PK	37.74	27.91	13.90	36.58	2.48	45.45	81.06	35.6	
Vert.	2402.000	PK	93.18	27.90	13.90	36.57	2.48	100.89	-	-	Carrier
Vert.	2400.000	PK	38.33	27.91	13.90	36.58	2.48	46.04	80.89	34.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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

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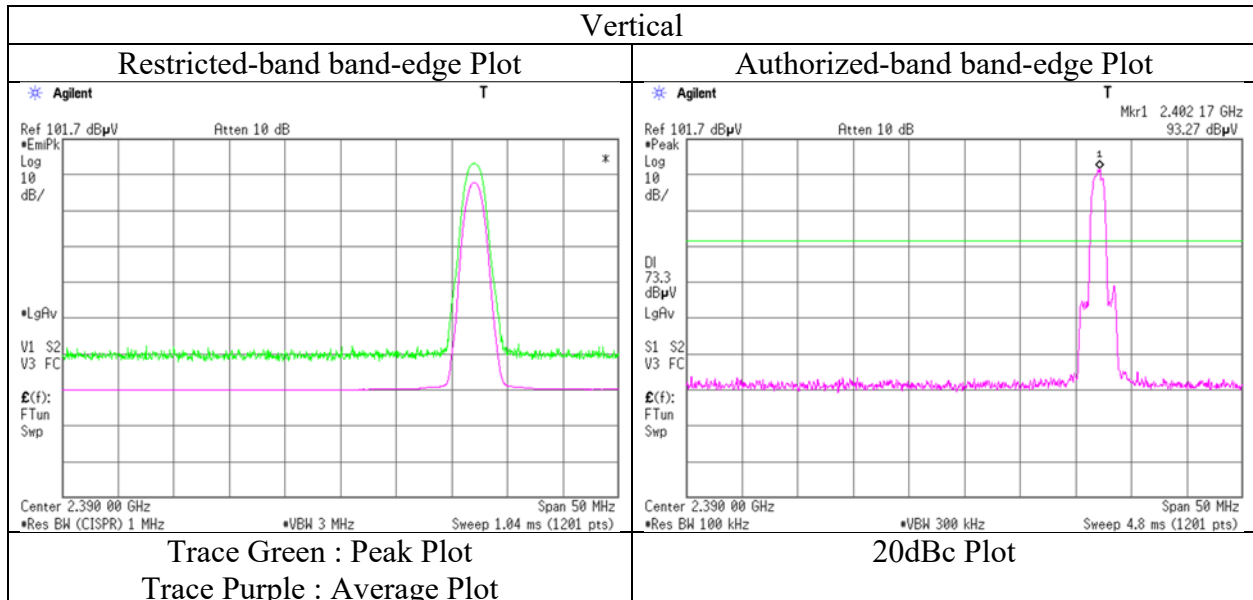
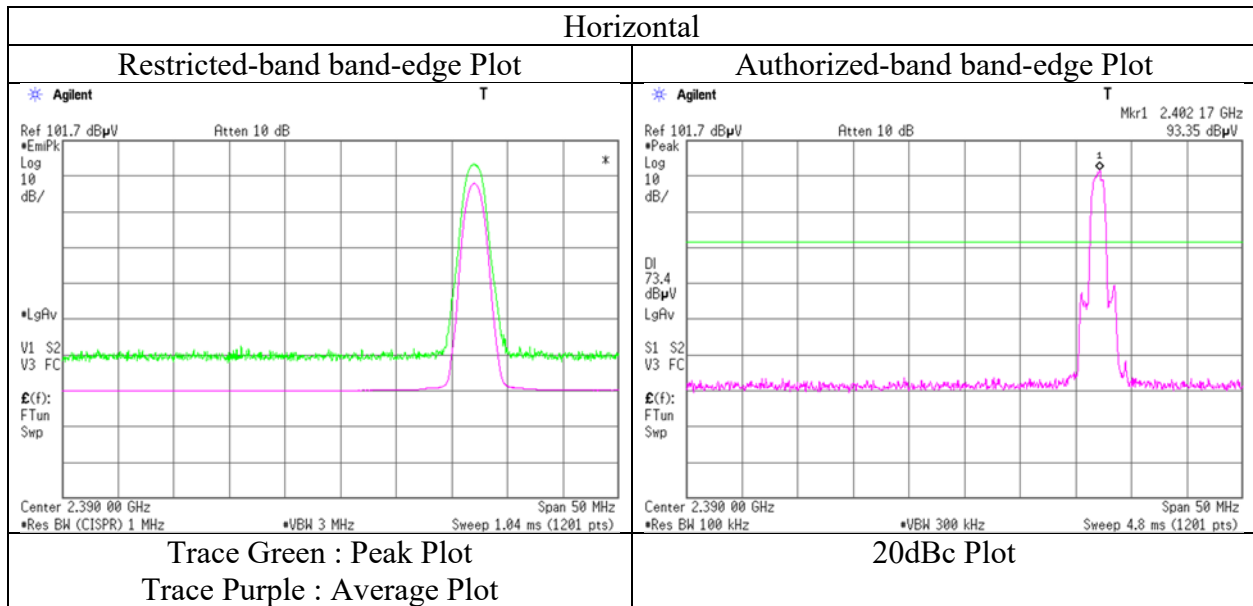
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	October 22, 2018
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Makoto Hosaka
	(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.	12322067S-H-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	2	2	3
Date	November 19, 2018	October 22, 2018	October 27, 2018
Temperature / Humidity	23 deg. C / 40 % RH	22 deg. C / 36 % RH	24 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Makoto Hosaka	Kazuya Noda
	(30 MHz – 1000 MHz)	(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.	324.005	QP	39.38	14.32	6.44	31.68	0.00	28.46	46.00	17.5	100	323	
Hori.	378.000	QP	46.57	15.14	6.88	31.66	0.00	36.93	46.00	9.0	100	141	
Hori.	432.002	QP	38.88	16.18	7.18	31.67	0.00	30.57	46.00	15.4	100	134	
Hori.	485.999	QP	39.24	17.37	7.38	31.65	0.00	32.34	46.00	13.6	229	299	
Hori.	594.005	QP	35.08	19.07	7.82	31.65	0.00	30.32	46.00	15.6	159	320	
Hori.	702.006	QP	34.93	19.81	8.28	31.59	0.00	31.43	46.00	14.5	141	291	
Hori.	4882.000	PK	50.66	31.14	6.53	36.91	2.48	53.90	73.90	20.0	148	350	
Hori.	7323.000	PK	43.80	36.84	7.73	37.44	2.48	53.41	73.90	20.4	100	0	
Hori.	9764.000	PK	44.87	38.59	8.81	38.66	2.48	56.09	73.90	17.8	100	0	
Hori.	4882.000	AV	42.09	31.14	6.53	36.91	2.48	45.33	53.90	8.5	148	350	
Hori.	7323.000	AV	32.14	36.84	7.73	37.44	2.48	41.75	53.90	12.1	100	0	
Hori.	9764.000	AV	33.07	38.59	8.81	38.66	2.48	44.29	53.90	9.6	100	0	
Vert.	324.003	QP	30.15	14.32	6.44	31.68	0.00	19.23	46.00	26.7	110	238	
Vert.	378.005	QP	36.12	15.14	6.88	31.66	0.00	26.48	46.00	19.5	100	227	
Vert.	486.003	QP	35.60	17.37	7.38	31.65	0.00	28.70	46.00	17.3	126	4	
Vert.	540.007	QP	27.85	17.70	7.60	31.71	0.00	21.44	46.00	24.5	100	317	
Vert.	4882.000	PK	44.89	31.14	6.53	36.91	2.48	48.13	73.90	25.7	177	352	
Vert.	7323.000	PK	44.27	36.84	7.73	37.44	2.48	53.88	73.90	20.0	100	0	
Vert.	9764.000	PK	44.76	38.59	8.81	38.66	2.48	55.98	73.90	17.9	100	0	
Vert.	4882.000	AV	33.72	31.14	6.53	36.91	2.48	36.96	53.90	16.9	177	352	
Vert.	7323.000	AV	32.26	36.84	7.73	37.44	2.48	41.87	53.90	12.0	100	0	
Vert.	9764.000	AV	33.14	38.59	8.81	38.66	2.48	44.36	53.90	9.5	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(3.99 m / 3.0 m) = 2.48 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.	12322067S-H-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	2	2	3
Date	November 19, 2018	October 21, 2018	October 27, 2018
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 46 % RH	24 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Kazutaka Takeyama	Kazuya Noda
	(30 MHz – 1000 MHz)	(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.	324.007	QP	38.81	14.32	6.44	31.68	0.00	27.89	46.00	18.1	100	327	
Hori.	377.998	QP	46.69	15.14	6.88	31.66	0.00	37.05	46.00	8.9	100	131	
Hori.	432.000	QP	38.87	16.18	7.18	31.67	0.00	30.56	46.00	15.4	100	130	
Hori.	486.003	QP	38.92	17.37	7.38	31.65	0.00	32.02	46.00	13.9	230	308	
Hori.	594.002	QP	34.72	19.07	7.82	31.65	0.00	29.96	46.00	16.0	161	325	
Hori.	701.997	QP	34.87	19.81	8.28	31.59	0.00	31.37	46.00	14.6	138	294	
Hori.	2483.500	PK	41.70	27.67	14.00	36.52	2.48	49.33	73.90	24.5	100	200	
Hori.	4960.000	PK	47.00	31.33	6.61	36.93	2.48	50.49	73.90	23.4	120	229	
Hori.	7440.000	PK	42.10	36.97	7.69	37.63	2.48	51.61	73.90	22.2	100	0	
Hori.	9920.000	PK	41.60	38.80	8.97	38.84	2.48	53.01	73.90	20.8	100	0	
Hori.	2483.500	AV	32.00	27.67	14.00	36.52	2.48	39.63	53.90	14.2	100	200	
Hori.	4960.000	AV	39.20	31.33	6.61	36.93	2.48	42.69	53.90	11.2	120	229	
Hori.	7440.000	AV	31.80	36.97	7.69	37.63	2.48	41.31	53.90	12.5	100	0	
Hori.	9920.000	AV	32.60	38.80	8.97	38.84	2.48	44.01	53.90	9.8	100	0	
Vert.	323.997	QP	30.71	14.32	6.44	31.68	0.00	19.79	46.00	26.2	100	228	
Vert.	378.008	QP	35.78	15.14	6.88	31.66	0.00	26.14	46.00	19.8	100	241	
Vert.	485.999	QP	35.17	17.37	7.38	31.65	0.00	28.27	46.00	17.7	124	0	
Vert.	540.002	QP	28.44	17.70	7.60	31.71	0.00	22.03	46.00	23.9	115	324	
Vert.	2483.500	PK	42.40	27.67	14.00	36.52	2.48	50.03	73.90	23.8	100	313	
Vert.	4960.000	PK	44.30	31.33	6.61	36.93	2.48	47.79	73.90	26.1	100	2	
Vert.	7440.000	PK	42.00	36.97	7.69	37.63	2.48	51.51	73.90	22.3	100	0	
Vert.	9920.000	PK	42.30	38.80	8.97	38.84	2.48	53.71	73.90	20.1	100	0	
Vert.	2483.500	AV	32.40	27.67	14.00	36.52	2.48	40.03	53.90	13.8	100	313	
Vert.	4960.000	AV	35.90	31.33	6.61	36.93	2.48	39.39	53.90	14.5	100	2	
Vert.	7440.000	AV	31.80	36.97	7.69	37.63	2.48	41.31	53.90	12.5	100	0	
Vert.	9920.000	AV	32.20	38.80	8.97	38.84	2.48	43.61	53.90	10.2	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

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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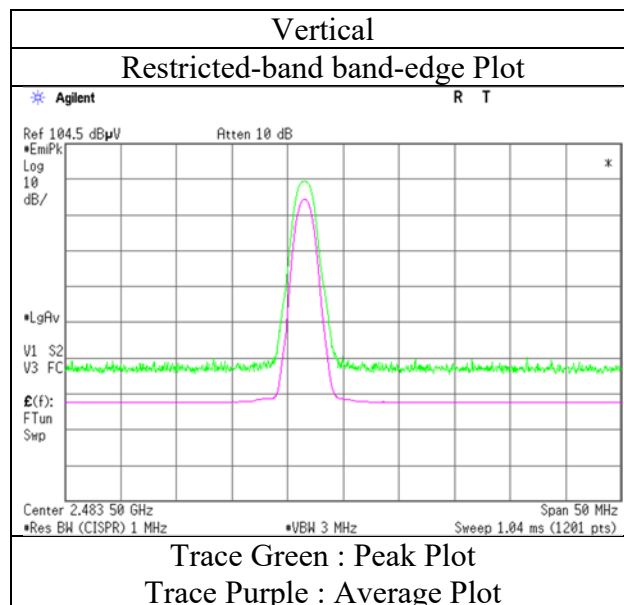
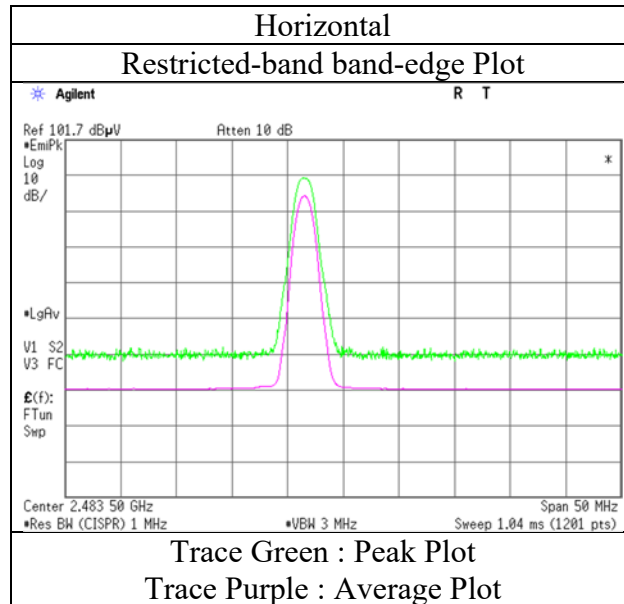
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Radiated Spurious Emission (Reference Plot for band-edge)

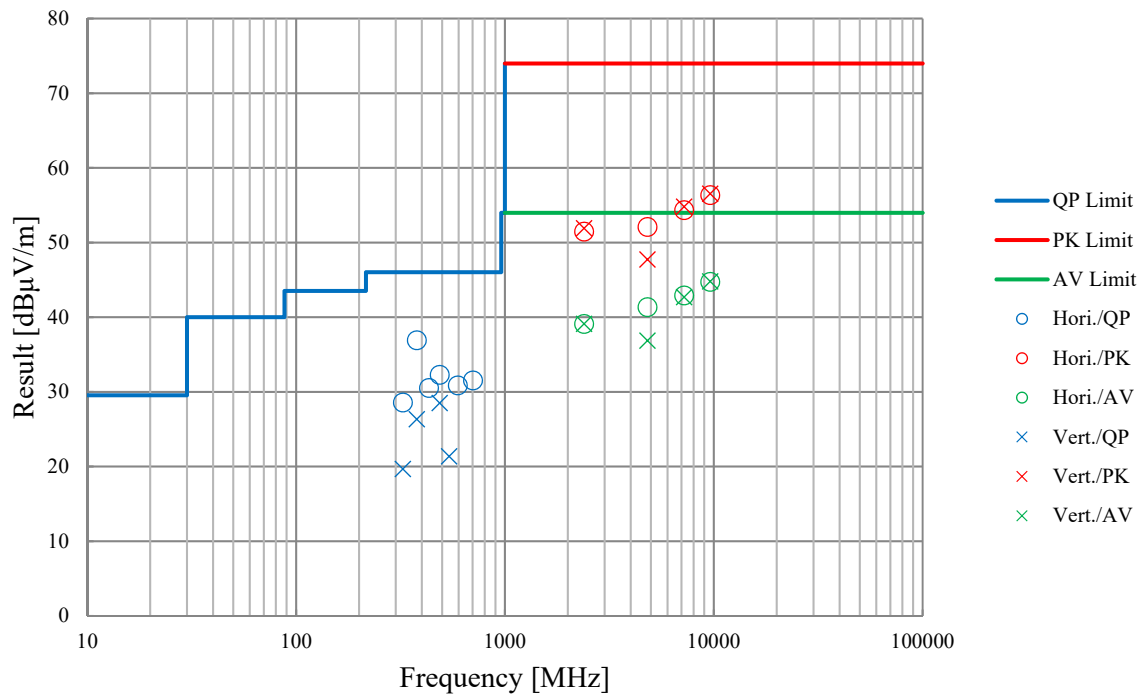
Report No.	12322067S-H-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	October 21, 2018
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Kazutaka Takeyama (1 GHz ~2.8 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12322067S-H-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	2	2	3
Date	November 19, 2018	October 22, 2018	October 27, 2018
Temperature / Humidity	23 deg. C / 40 % RH	22 deg. C / 36 % RH	24 deg. C / 48 % RH
Engineer	Yosuke Ishikawa	Makoto Hosaka	Kazuya Noda
	(30 MHz – 1000 MHz)	(1 GHz – 13 GHz)	(13 GHz – 26.5 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz		

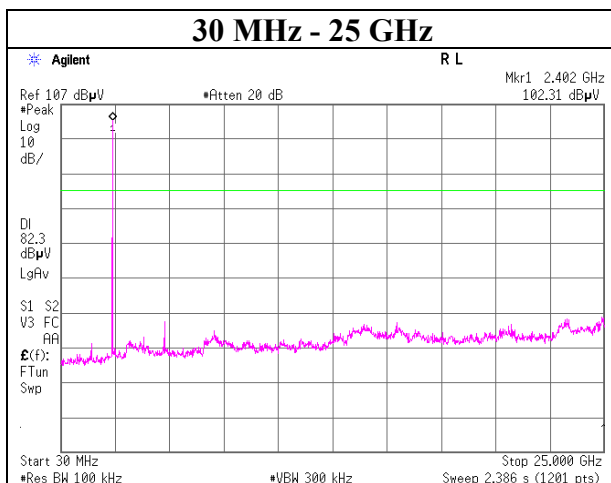
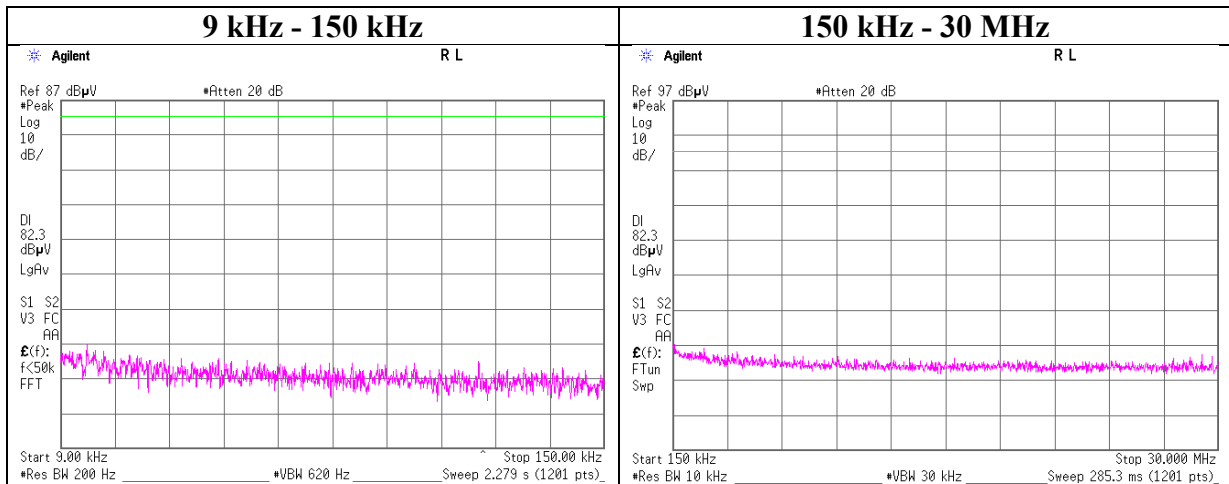


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, DH5,

2402 MHz



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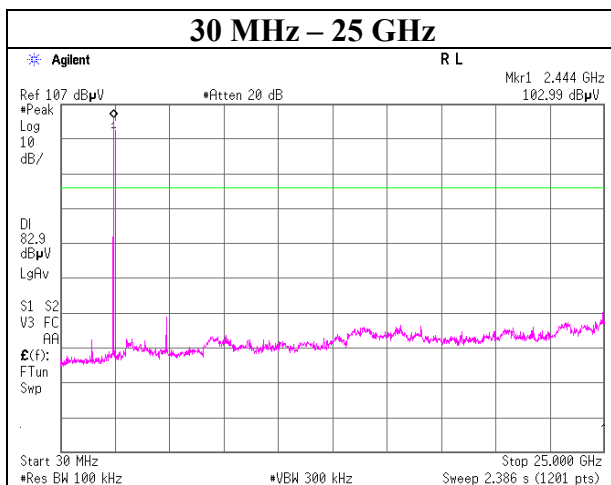
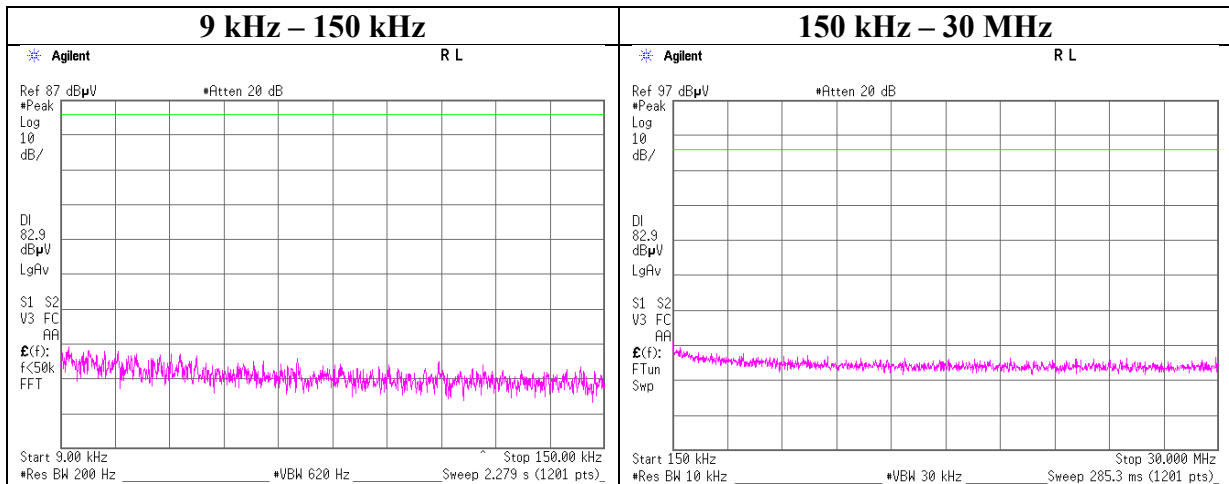
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Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, DH5,

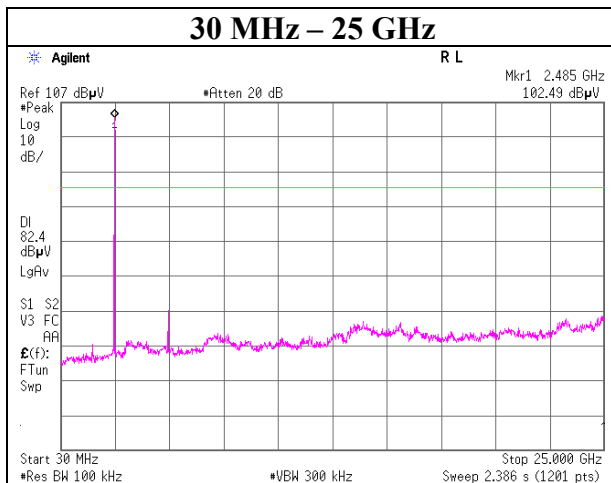
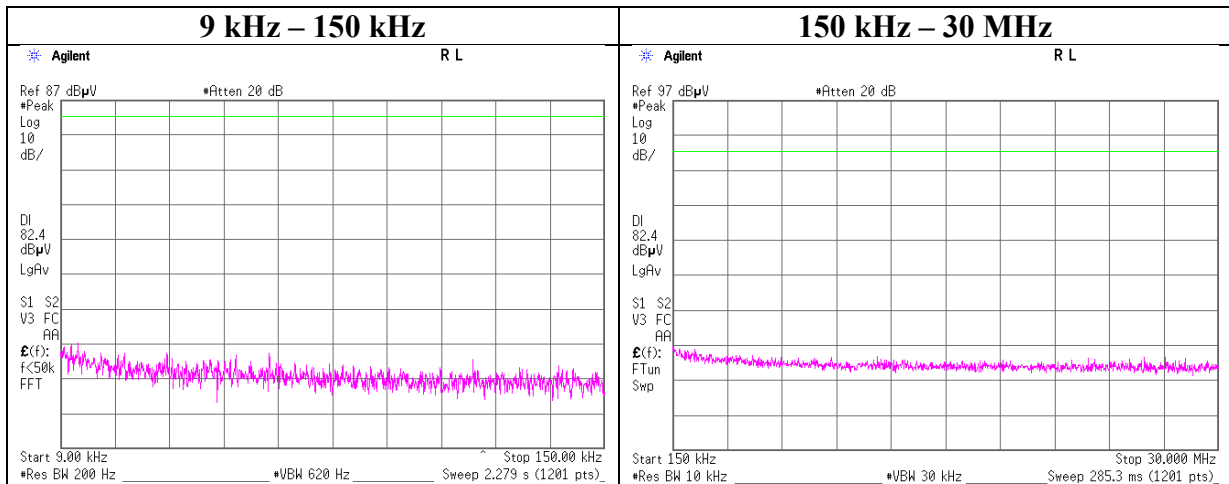
2441 MHz



Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, DH5,

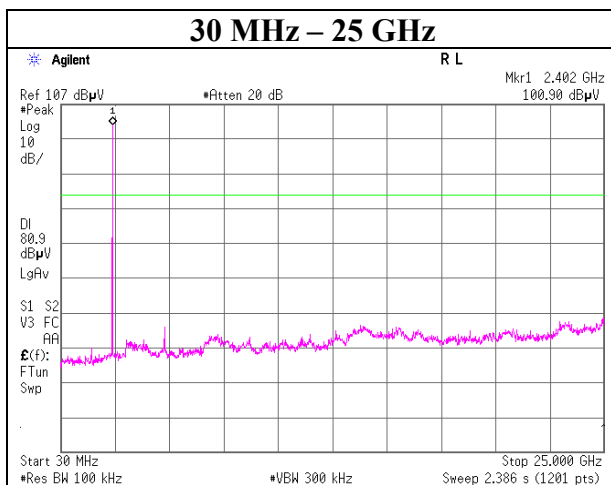
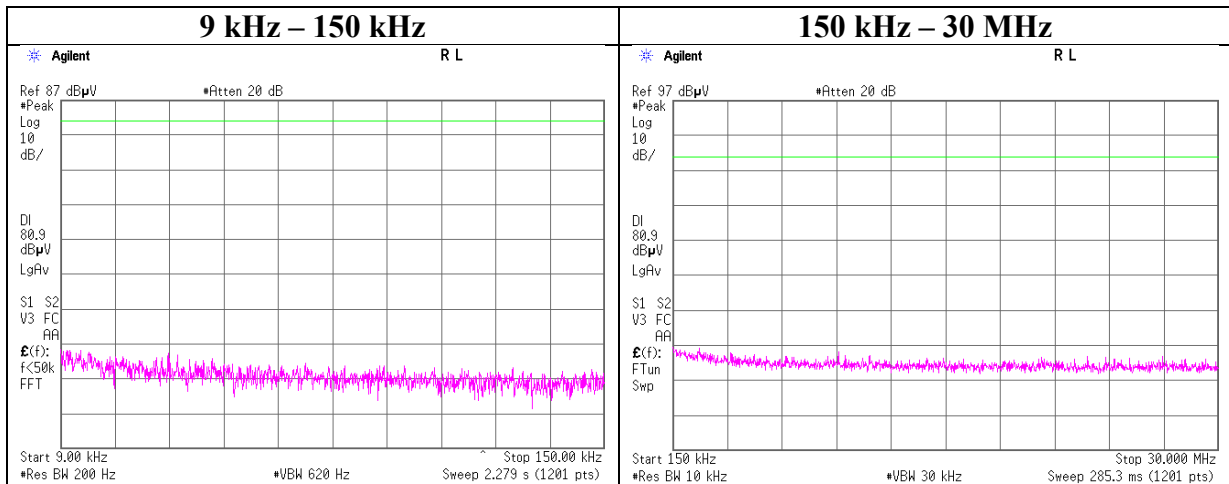
2480 MHz



Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, 3DH5,

2402 MHz



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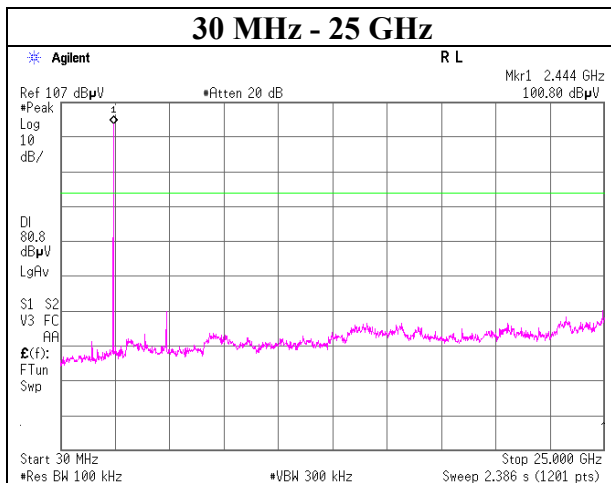
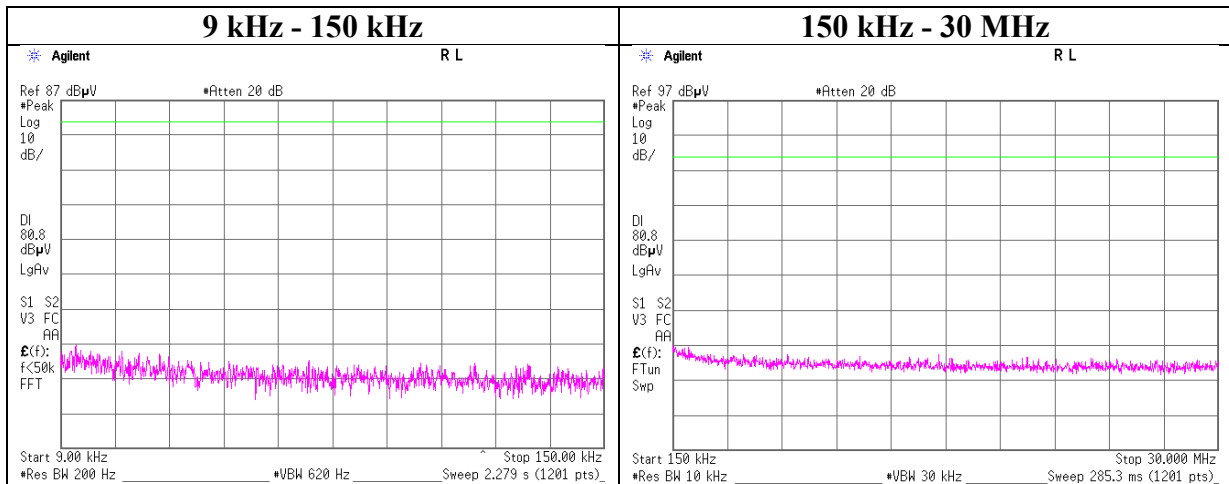
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, 3DH5,

2441 MHz



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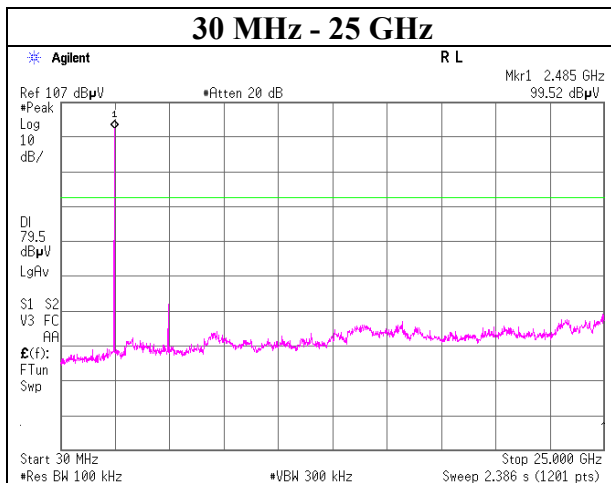
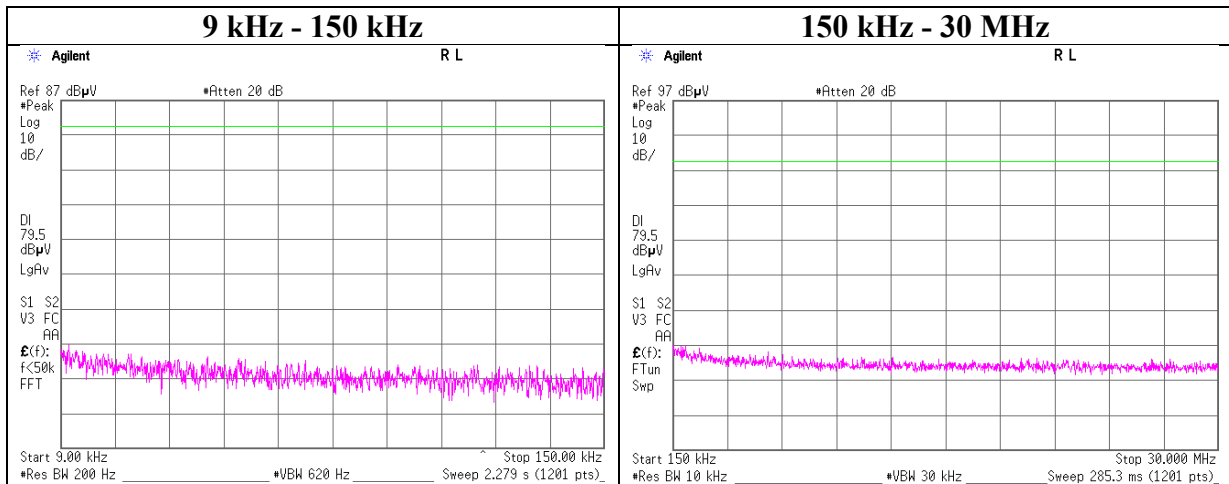
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No. 12322067S-H-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 16, 2018
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Yosuke Ishikawa
Mode Tx, Hopping Off, 3DH5,

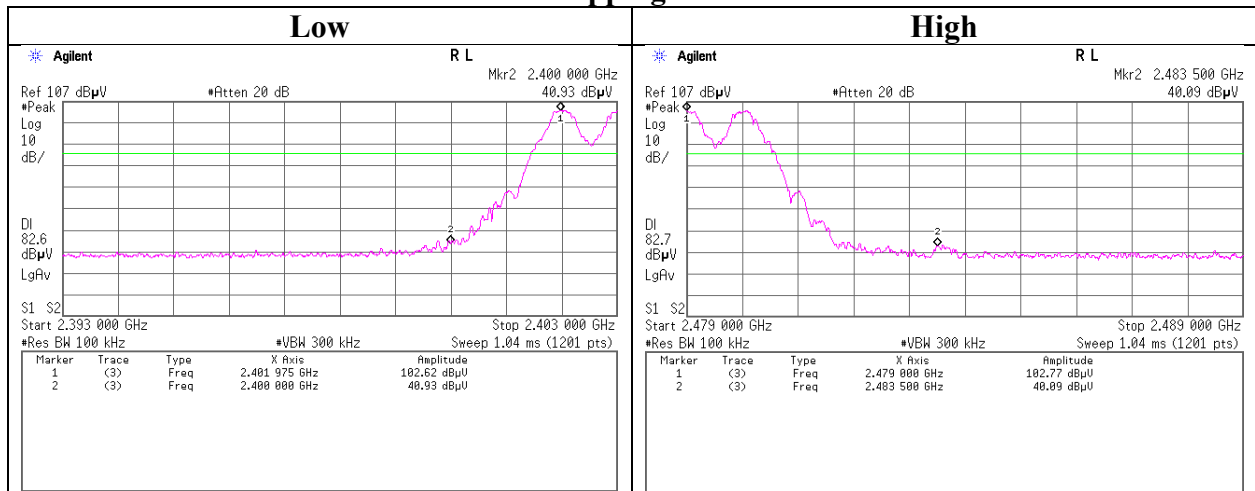
2480 MHz



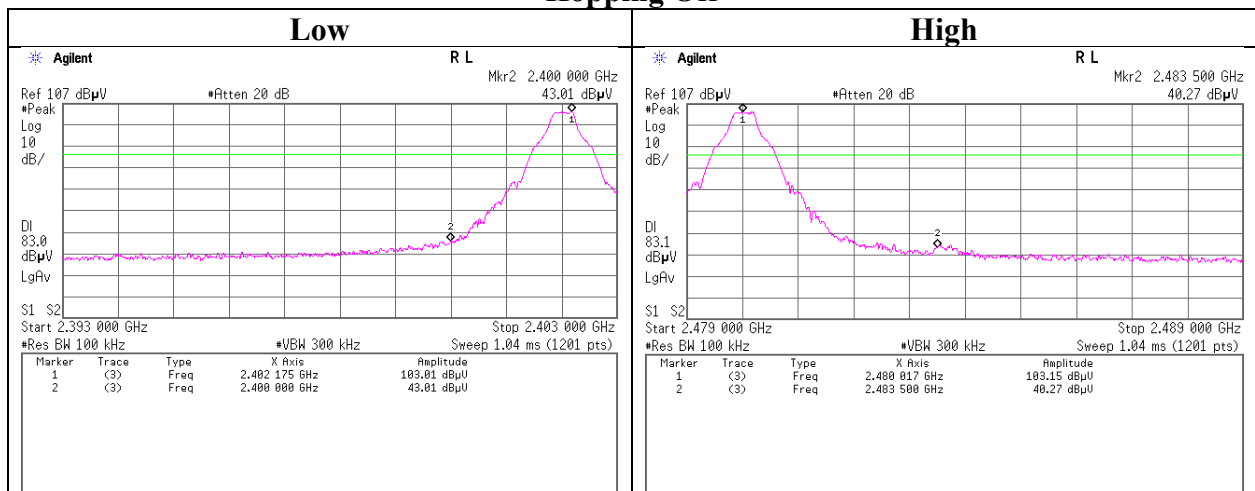
Conducted Emission Band Edge compliance

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 16, 2018
Temperature / Humidity	25 deg. C / 46 % RH
Engineer	Yosuke Ishikawa
Mode	Tx DH5

Hopping On



Hopping Off



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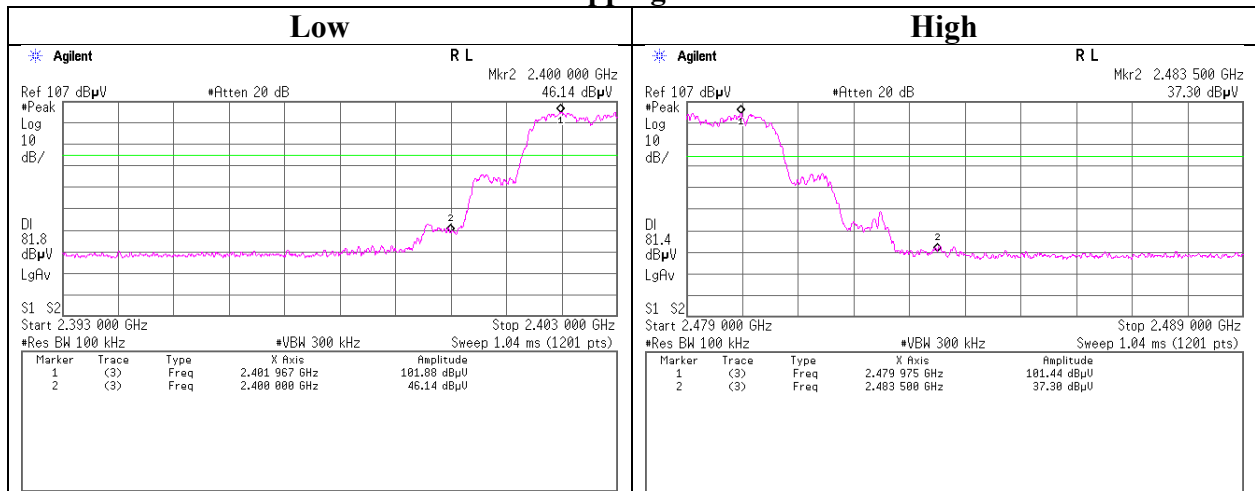
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

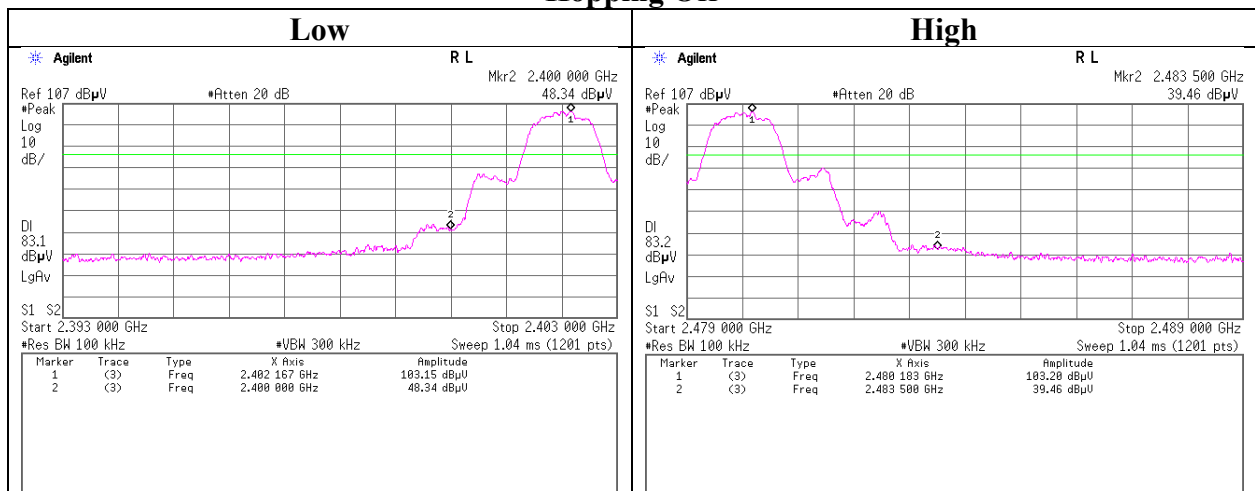
Conducted Emission Band Edge compliance

Report No.	12322067S-H-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 16, 2018
Temperature / Humidity	25 deg. C / 46 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 3DH5

Hopping On



Hopping Off



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APPENDIX 2: Test instruments

Test Instruments (1/2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SAT10-12	AT	151609	Attenuator	Weinschel Corp.	54A-10	81601	2018/3/22	2019/3/31	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
SSA-03	AT	145801	Spectrum Analyzer	AGILENT	E4448A	MY48250152	2018/8/30	2019/8/31	12
SAT3-10	CE	144960	Attenuator	JFW	50HF-003N	-	2018/8/23	2019/8/31	12
SCC-C6/C7/C8/C10/SRSE-03	CE	145034	Coaxial Cable&RF Selector	Suhner/Fujikura/Suhner/Suhner/TOYO	141PE/12DSF A/141PE/141PE/NS4906	-/0901-271(RF Selector)	2018/4/9	2019/4/30	12
SLS-05	CE	145542	LISN	Rohde & Schwarz	ENV216	100516	2018/2/26	2019/2/28	12
STR-07	CE	146209	Test Receiver	Rohde & Schwarz	ESU26	100484	2018/9/26	2019/9/30	12
COTS-SEM I-1	CE,RE	144865	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,M F)	-	-	-	-
KJM-02	CE,RE	146432	Measure	TAJIMA	GL19-55	-	-	-	-
SOS-06	CE,RE	146294	Humidity Indicator	A&D	AD-5681	4062118	2017/12/21	2018/12/31	12
STS-03	CE,RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2018/10/16	2019/10/31	12
KSA-08	RE	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2018/10/7	2019/10/31	12
SAEC-02(N SA)	RE	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NS A)	2	2018/5/31	2019/5/31	12
SAEC-02(S VSWR)	RE	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SV SWR)	2	2018/7/15	2019/7/31	12
SAEC-03(N SA)	RE	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NS A)	3	2018/6/2	2019/6/30	12
SAF-02	RE	145004	Pre Amplifier	SONOMA	310N	290212	2018/2/16	2019/2/28	12
SAF-04	RE	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2018/6/26	2019/6/30	12
SAF-05	RE	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2018/2/15	2019/2/28	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2018/3/27	2019/3/31	12
SAT10-05	RE	145136	Attenuator(ab ove1GHz)	AGILENT	8493C-010	74864	2018/11/25	2019/11/30	12
SAT3-11	RE	150921	Attenuator	JFW	50HF-003N	-	2018/2/22	2019/2/28	12
SAT6-02	RE	145045	Attenuator	JFW	50HF-006N	-	2018/2/16	2019/2/28	12
SBA-02	RE	145022	Biconical Antenna	Schwarzbeck	BBA9106	91032665	2018/6/5	2019/6/30	12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	RE	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/TOYO	8D2W/12DSF A/141PE/141PE/141PE/141P	-/0901-270(RF Selector)	2018/4/9	2019/4/30	12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	RE	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/TOYO	8D2W/12DSF A/141PE/141PE/141PE/141P	-/0901-270(RF Selector)	2018/4/7	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	MWX241-01000KMSKMS	-	2018/4/20	2019/4/30	12

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Test Instruments (2/2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SCC-G40	RE	166491	Coaxial Cable	Junkosha	MWX221-01 000NFSNMS/ B	1612S005	2018/1/29	2019/1/31	12
SCC-G41	RE	151617	Coaxial Cable	Junkosha	MWX221-01 000NFSNMS/ B	1612S006	2018/1/29	2019/1/31	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104 E	SN MY 13406/4E	2018/7/10	2019/7/31	12
SCC-G44	RE	168300	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800070/4A	2018/3/28	2019/3/31	12
SCC-G45	RE	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2E A	2018/3/28	2019/3/31	12
SFL-02	RE	145301	Highpass Filter	MICRO-TRONICS	HPM50111	51	2018/11/16	2019/11/30	12
SFL-18	RE	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2018/4/20	2019/4/30	12
SHA-02	RE	145384	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	2018/7/23	2019/7/31	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-09	RE	145336	Measure	PROMART	SEN1935	-	-	-	-
SLA-06	RE	145528	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	195	2018/6/5	2019/6/30	12
SOS-03	RE	146317	Humidity Indicator	A&D	AD-5681	4063325	2018/10/25	2019/10/31	12
SRENT-15	RE	160899	Spectrum Analyzer	AGILENT (KEYSIGHT)	E4440A	MY46185516	2017/12/26	2018/12/31	12
SSA-02	RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2018/3/5	2019/3/31	12
STR-01	RE	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2018/4/13	2019/4/30	12
STS-02	RE	145793	Digital Hitester	HIOKI	3805-50	80997819	2018/3/8	2019/3/31	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: CE: Conducted Emission test
RE: Radiated Emission test
AT: Antenna Terminal Conducted test

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