RADIO TEST REPORT

Test Report No. : 12622648S-B-R2

Applicant	:	**JVC KENWOOD Corporation**
Type of Equipment	:	**GPS NAVIGATION SYSTEM**
Model No.	:	**DNX996XR**
FCC ID	:	**IOMJ5220**
Test regulation	:	**FCC Part 15 Subpart C: 2018** * Bluetooth BDR/EDR part
Test Result	:	**Complied (Refer to Section 3.2)**

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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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
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.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 12622648S-B-R1. 12622648S-B-R1 is replaced with this report.

Date of test: December 3 and 7, 2018
and February 22, 2019

Representative test engineer:

Shiro Kobayashi
Engineer
Consumer Technology Division

Approved by:

Hikaru Shirasawa
Engineer
Consumer Technology Division

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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REVISION HISTORY

Original Test Report No.: 12622648S-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12622648S-B	January 23, 2019	-	-
1	12622648S-B-R1	February 18, 2019	1, 4 4 5	Correction of "Type of Equipment" Addition of Comment "The information provided…" Correction of Antenna Gain
2	12622648S-B-R2	February 25, 2019	4 37-44, 46	Correction of Similar model Addition of Data

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SECTION 1: Customer information

Company Name	:	JVC KENWOOD Corporation
Address	:	2967-3, Ishikawa-machi, Hachioji, Tokyo 192-8525 Japan
Telephone Number	:	+81-42-646-5525
Facsimile Number	:	+81-42-646-1440
Contact Person	:	Seigo Tsutsumi

The information provided from the customer is as follows:
- Applicant, Type of Equipment, Model No. on the cover page 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 above information in Section 2 and 4.

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

2.1 Identification of E.U.T.

Type of Equipment	:	GPS NAVIGATION SYSTEM
Model No.	:	DNX996XR
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample (Information from test lab.)	:	November 27, 2018
Country of Mass-production	:	Indonesia
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: DNX996XR (referred to as the EUT in this report) is a GPS NAVIGATION SYSTEM.

There are eight variant models DDX9906XR, DDX8906S, DDX8706S, DNR876S, DMX906S, DMX9706S, KW-V950BW, KW-M855BW, These models are identical except for the presence of Navigation function, Panel, DVD Slot, DVD, Dashboard Camera terminal, HD Radio, Display or SD card, and these differences do not affect the radio.

Radio Specification

Type of radio	Bluetooth (BDR/EDR)	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 M band)	IEEE802.11n (40 M band)	IEEE802.11ac
Frequency of operation	2402 MHz - 2480 MHz	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5745 MHz - 5805 MHz	2412 MHz - 2462 MHz 5745 MHz - 5805 MHz	5755 MHz - 5795 MHz	5745 MHz-5805 MHz (20M) 5755 MHz-5795 MHz (40M) 5775 MHz (80M)
Type of modulation	FHSS	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)			OFDM (256QAM,16QAM,QPSK,BPSK)
Channel spacing	1 MHz	5 MHz		20 MHz	2.4 GHz band 5 MHz 5 GHz band 20 MHz	2.4 GHz band 5 MHz 5 GHz band 40 MHz	20 MHz (20M) 40 MHz (40M) 80 MHz (80M)

Antenna type	Internal Antenna (Chip Antenna)
Antenna Gain	Antenna 0 (ANT-0) : -4.4 dBi (2.4 GHz Wireless LAN only), -2.8 dBi (5 GHz) Antenna 1 (ANT-1) : -2.3 dBi (2.4 GHz Bluetooth only), -4.2 dBi (5 GHz),
Power Supply (radio art input)	DC 3.6 V/ 3.3 V/1.8 V
Clock frequency (Maximum)	37.4 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	cification	Worst Margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods	**FCC:** Section 15.207	**N/A**	N/A*1)	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
Carrier Frequency Separation	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)	See data.	Complied a)	Conducted
	IC: -	**IC:** RSS-247 5.1 (b)			
20dB Bandwidth	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)		Complied a)	Conducted
	IC: -	**IC:** RSS-247 5.1 (a)			
Number of Hopping Frequency	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)(iii)		Complied b)	Conducted
	IC: -	**IC:** RSS-247 5.1 (d)			
Dwell time	FCC: FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(1)(iii)		Complied c)	Conducted
	IC: -	**IC:** RSS-247 5.1 (d)			
Maximum Peak Output Power	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(a)(b)(1)		Complied d)	Conducted
	IC: RSS-Gen 6.12	**IC:** RSS-247 5.4 (b)			
Spurious Emission & Band Edge Compliance	**FCC:** FCC Public Notice DA 00-705	**FCC:** Section15.247(d)	5.8 dB 73.728 MHz, QP, Hori. Tx, Hopping Off, 3DH5 2441 MHz	Complied e)/f)	Conducted/ Radiated (above 30 MHz) *2)
	IC: RSS-Gen 6.13	**IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) The test is not applicable since the EUT does not have AC Mains.
*2) Radiated test was selected over 30 MHz based on section 15.247(d).
a) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)
b) Refer to APPENDIX 1 (data of Number of Hopping Frequency)
c) Refer to APPENDIX 1 (data of Dwell time)
d) Refer to APPENDIX 1 (data of Maximum Peak Output Power)
e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
f) 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 EUT provides stable voltage constantly to the wireless transmitter regardless of input voltage.
Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	RSS-Gen 6.7	**IC:** -	N/A	Complied a)	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. a) 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.
Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	3.0 dB	3.1 dB	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.7 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.1 dB	-
	1 GHz-6 GHz	4.8 dB	4.8 dB	4.8 dB	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 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

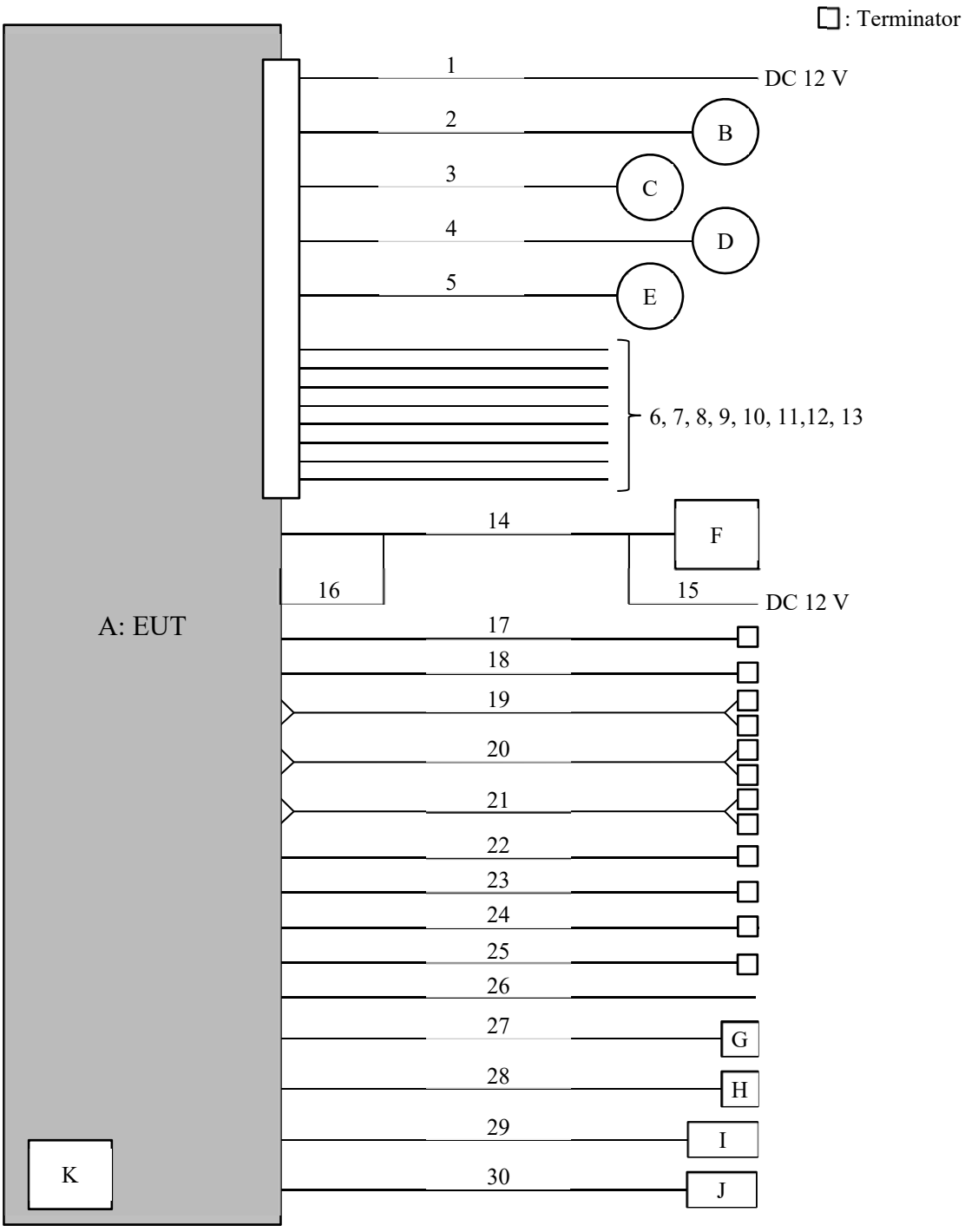
Details of Operating Mode(s)

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 the test items based on Bluetooth Core specification.

*EUT has the power settings by the software as follows;
Power settings: Fixed
Software : Syscom : 0.0.0189.3100
Panel CPU : 0.0.0139.3700
SoC : 0.0.2509.3700 Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GPS NAVIGATION SYSTEM	DNX996XR	PK-X0001 *1) PK-X0003 *2)	JVC KENWOOD	EUT
B	Speaker	LV-002	-	L&V	-
C	Speaker	LV-002	-	L&V	-
D	Speaker	LV-002	-	L&V	-
E	Speaker	LV-002	-	L&V	-
F	DASH BOARD CAMERA	DRV-N520	082T1224	JVC KENWOOD	-
G	GPS Antenna	-	-	JVC KENWOOD	-
H	Microphone	-	-	JVC KENWOOD	-
I	USB Memory	AH321	-	Apacer	-
J	USB Memory	USM1GL	-	SONY	-
K	SDHC MEMORY CARD	MF-FSDH08GC6	-	ELECOM	-

*1) Used for Antenna Terminal conducted test
*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC (ACC, B+, GND)	3.0 + 0.5	Unshielded	Unshielded	-
2	Speaker	1.8 + 2.0	Unshielded	Unshielded	-
3	Speaker	1.8 + 2.0	Unshielded	Unshielded	-
4	Speaker	1.8 + 2.0	Unshielded	Unshielded	-
5	Speaker	1.8 + 2.0	Unshielded	Unshielded	-
6	ANT. CONT	0.15 + 1.0	Unshielded	Unshielded	-
7	P. CONT	0.15 + 1.0	Unshielded	Unshielded	-
8	ILLUMI	0.15 + 1.0	Unshielded	Unshielded	-
9	REMOTE CONT	0.15 + 1.0	Unshielded	Unshielded	-
10	CAM +	0.15 + 1.0	Unshielded	Unshielded	-
11	CAM -	0.15 + 1.0	Unshielded	Unshielded	-
12	PRK SW	0.15 + 1.0	Unshielded	Unshielded	-
13	REVERSE	0.15 + 1.0	Unshielded	Unshielded	-
14	DASH CAM	3.5	Unshielded	Unshielded	-
15	DC	1.9	Unshielded	Unshielded	-
16	FRONT VIEW CAMERA	0.2	Shielded	Shielded	-
17	REAR VIEW CAMERA	0.2 + 1.5	Shielded	Shielded	-
18	VIDEO OUT	0.2 + 1.0	Shielded	Shielded	-
19	AUDIO (FRONT)	3.0	Shielded	Shielded	-
20	AUDIO (REAR)	3.0	Shielded	Shielded	-
21	AUDIO (SW)	2.0	Shielded	Shielded	-
22	AV-OUT AUDIO	1.0	Shielded	Shielded	-
23	AV-IN	0.2 + 2.0	Shielded	Shielded	-
24	Antenna	0.15 + 1.5	Shielded	Shielded	-
25	Data Link	0.8	Shielded	Shielded	-
26	EXT-I/F	1.0	Shielded	Shielded	-
27	GPS	3.5	Shielded	Shielded	-
28	Microphone	3.0	Shielded	Shielded	-
29	USB	0.2 + 1.0	Shielded	Shielded	-
30	USB	0.2 + 1.0	Shielded	Shielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 1.5 m by 1.0 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.

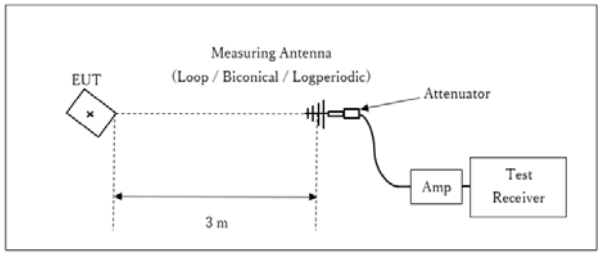
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

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 *1)	RBW: 100 kHz VBW: 300 kHz

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

Figure 2: Test Setup

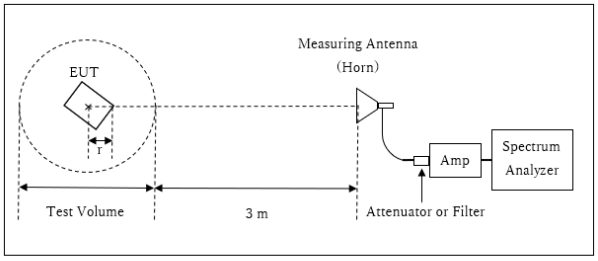
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz

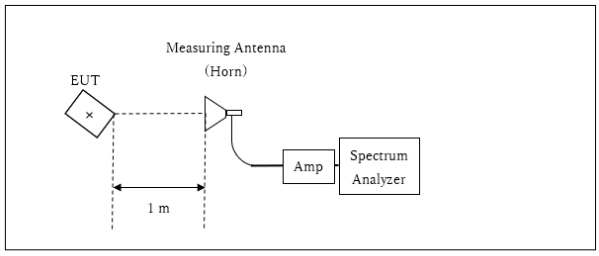


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.88 m / 3.0 m) = 2.24 dB
* Test Distance: (3 + Test Volume /2) - r = 3.88 m

Test Volume : 2.0 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.12 m

13 GHz - 40 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.54 dB
*Test Distance: 1 m

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

Frequency	30 MHz - 1000 MHz	1 GHz – 13 GHz	13 GHz – 40 GHz
Worst angle	0 deg.	0 deg.	0 deg.

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

Measurement range : 30 MHz - 40 GHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold *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	10 kHz	30 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

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

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, Tx, Hopping On

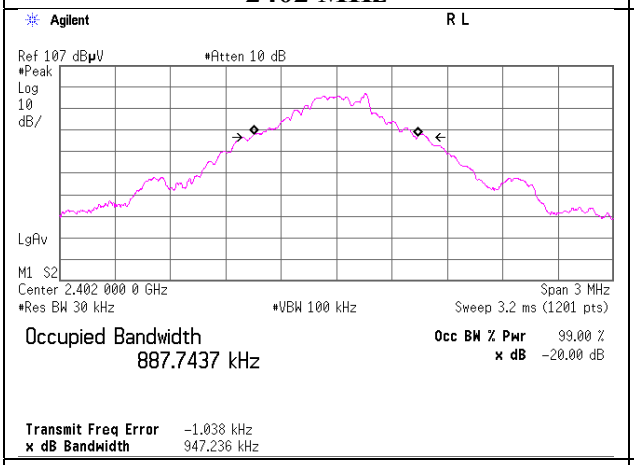
Mode	Freq. [MHz]	20dB Bandwidth [MHz]	99% Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.947	887.744	1.000	>= 0.631
DH5	2441.0	0.943	884.429	1.000	>= 0.629
DH5	2480.0	0.943	881.150	1.000	>= 0.628
DH5	Hopping On	-	78602.3	-	-
3DH5	2402.0	1.317	1214.2	1.000	>= 0.878
3DH5	2441.0	1.320	1218.3	1.000	>= 0.880
3DH5	2480.0	1.315	1207.4	1.000	>= 0.877
3DH5	Hopping On	-	78687.5	-	-

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

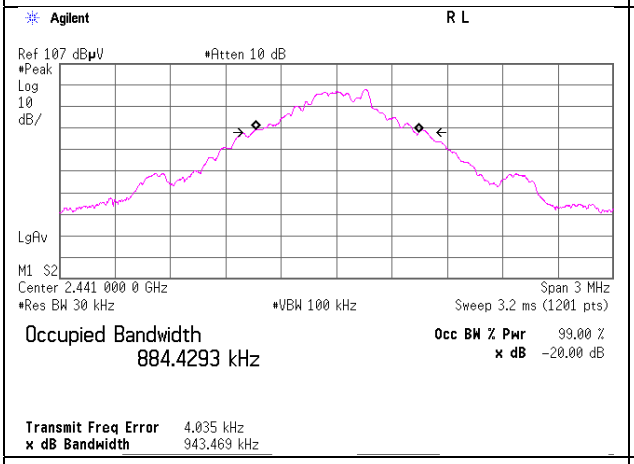
20dB Bandwidth and 99% Occupied Bandwidth

DH5

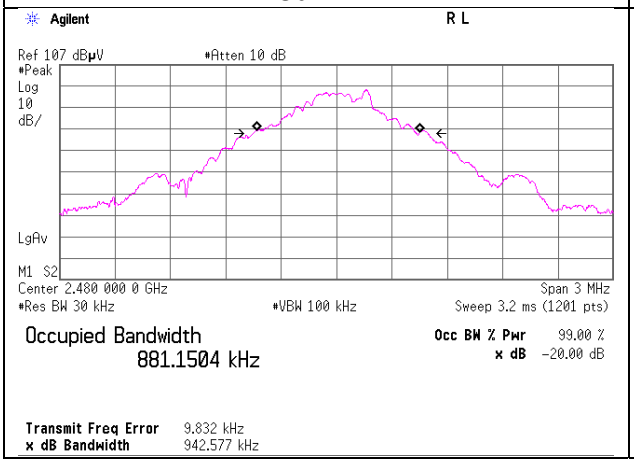
2402 MHz



2441 MHz

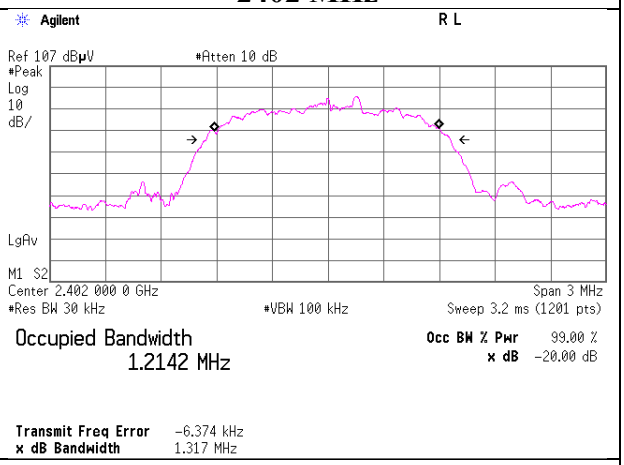


2480 MHz

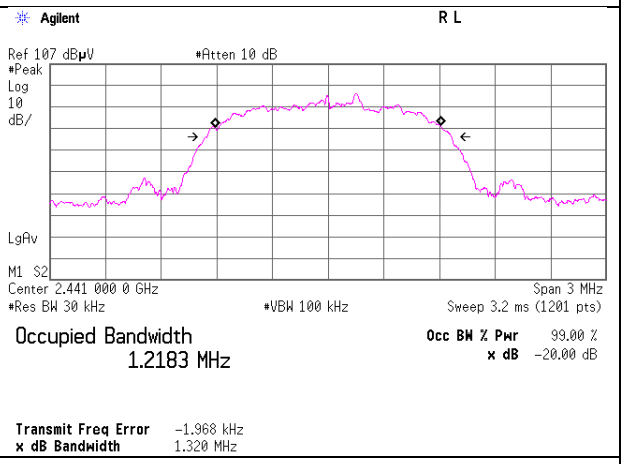


3DH5

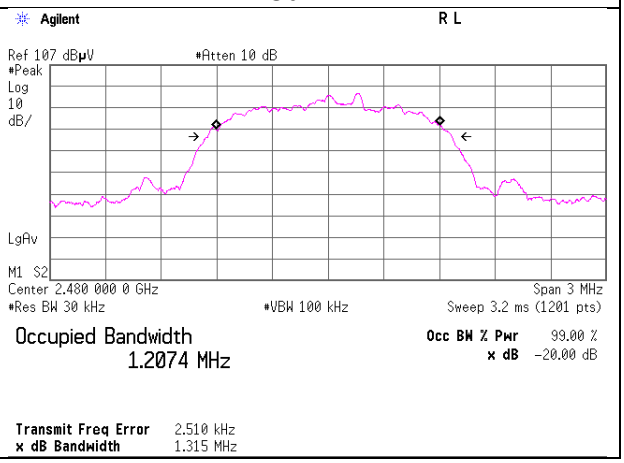
2402 MHz



2441 MHz

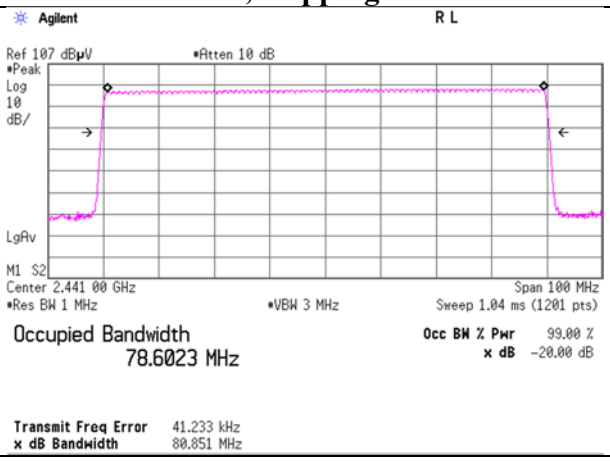


2480 MHz

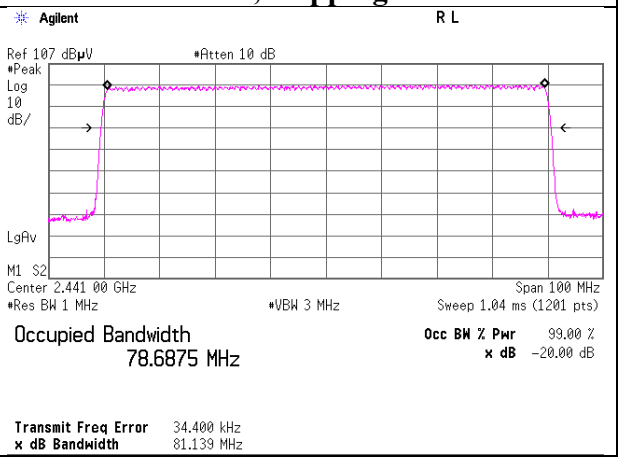


20dB Bandwidth and 99% Occupied Bandwidth

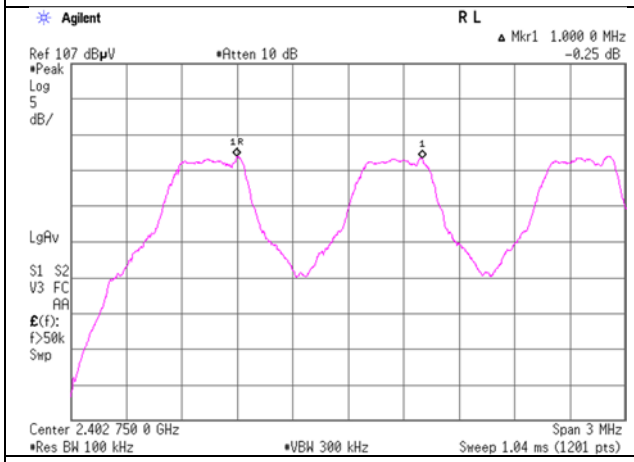
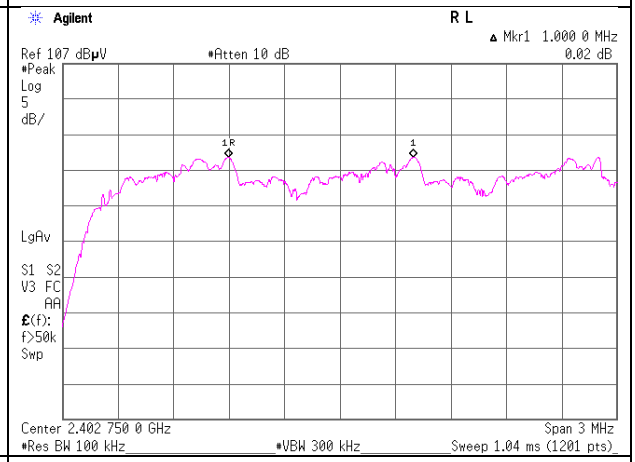
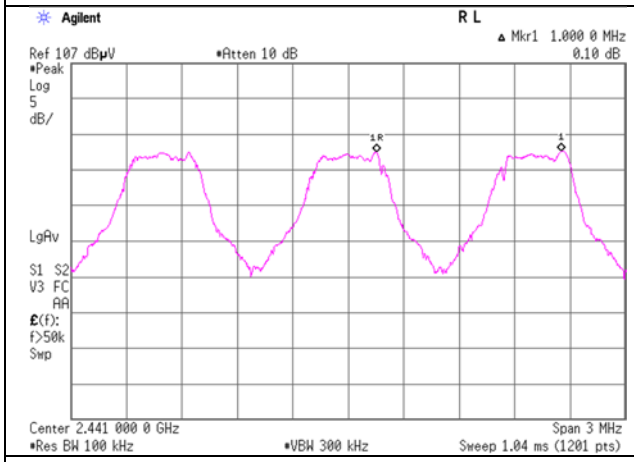
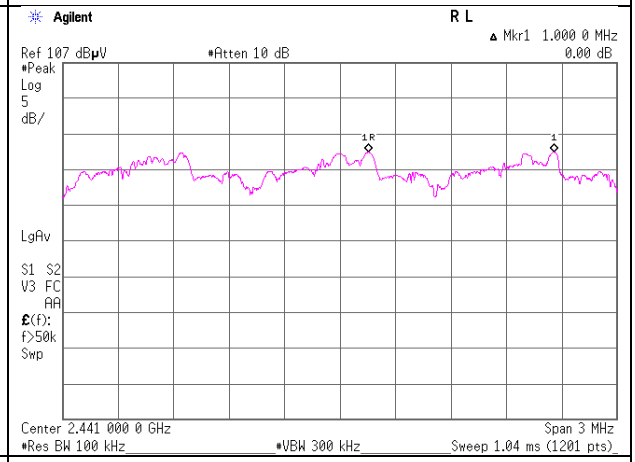
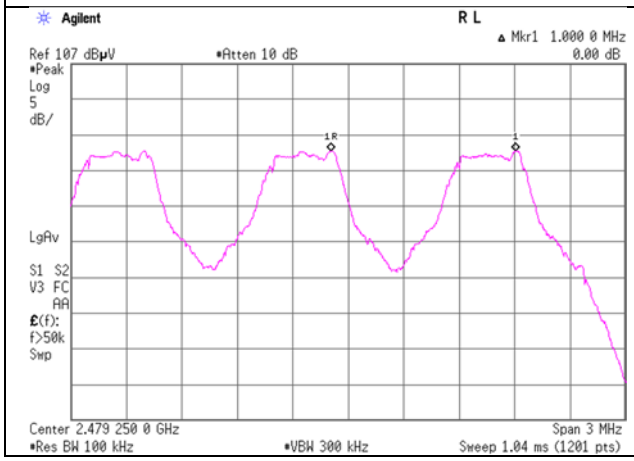
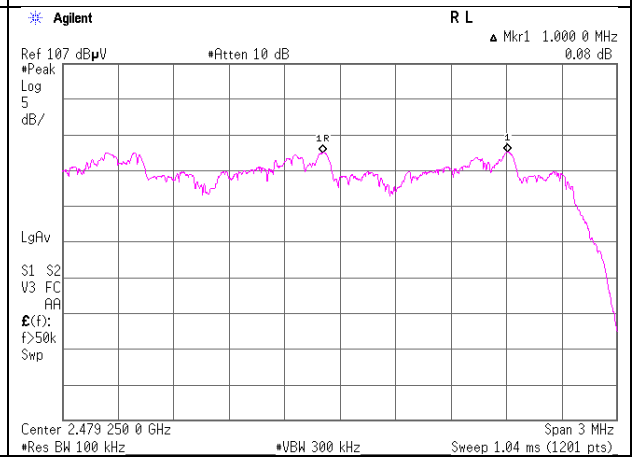
DH5, Hopping On



3DH5, Hopping On



Carrier Frequency Separation

DH5	3DH5
2402 MHz	2402 MHz
	
2441 MHz	2441 MHz
	
2480 MHz	2480 MHz
	

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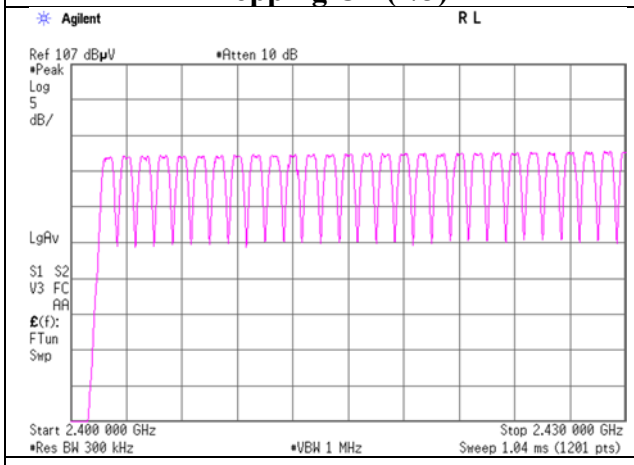
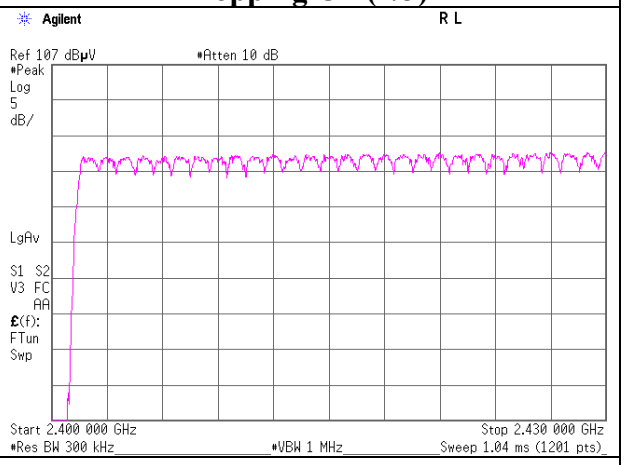
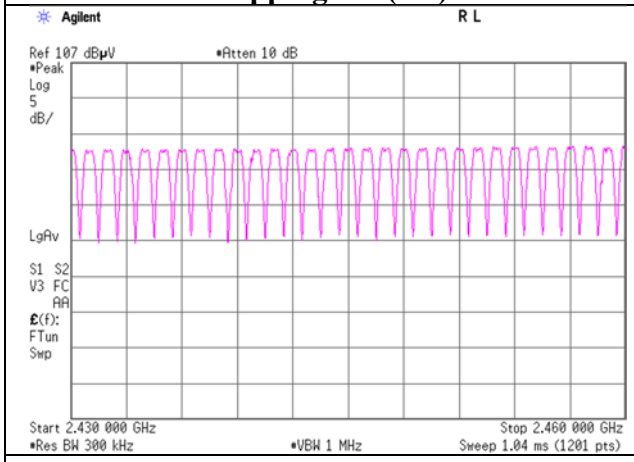
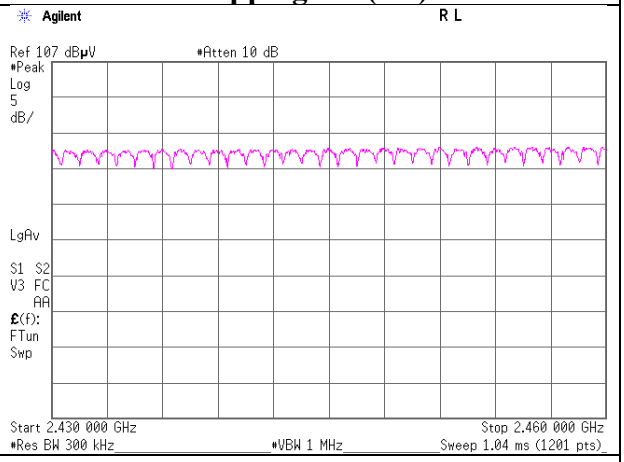
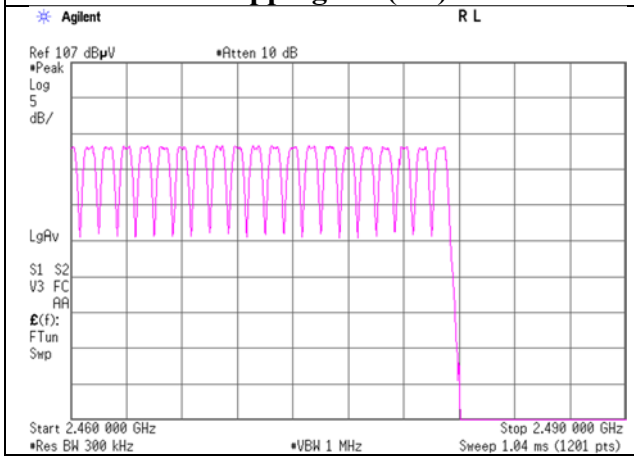
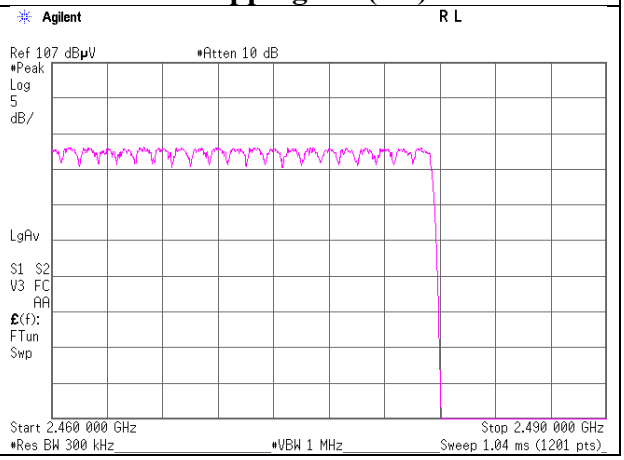
Number of Hopping Frequency

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % 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

DH5	3DH5
Hopping On (1/3)	**Hopping On (1/3)**
	
Hopping On (2/3)	**Hopping On (2/3)**
	
Hopping On (3/3)	**Hopping On (3/3)**
	

Dwell time

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
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	49.8 times / 5 sec. x 31.6 sec. = 315 times	0.421	133	400
DH3	25.6 times / 5 sec. x 31.6 sec. = 162 times	1.679	272	400
DH5	21.4 times / 5 sec. x 31.6 sec. = 136 times	2.926	398	400
3DH1	50.0 times / 5 sec. x 31.6 sec. = 316 times	0.428	135	400
3DH3	24.4 times / 5 sec. x 31.6 sec. = 155 times	1.681	261	400
3DH5	20.0 times / 5 sec. x 31.6 sec. = 127 times	2.931	372	400

Sample Calculation
Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

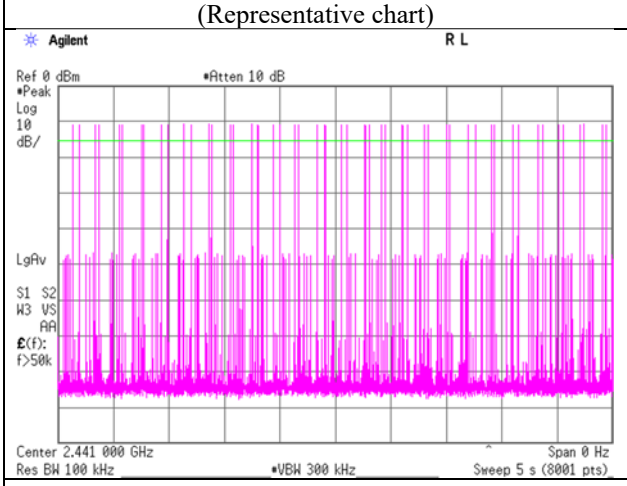
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	49	49	52	50	49	49.8
DH3	26	26	22	29	25	25.6
DH5	22	21	20	19	25	21.4
3DH1	49	50	51	49	51	50
3DH3	28	25	25	25	19	24.4
3DH5	20	17	24	22	17	20

Sample Calculation
Average = Summation (Sampling 1 to 5) / 5

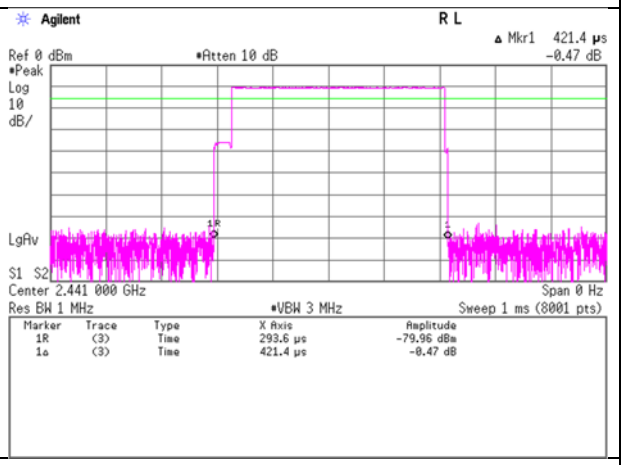
This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless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

Dwell time

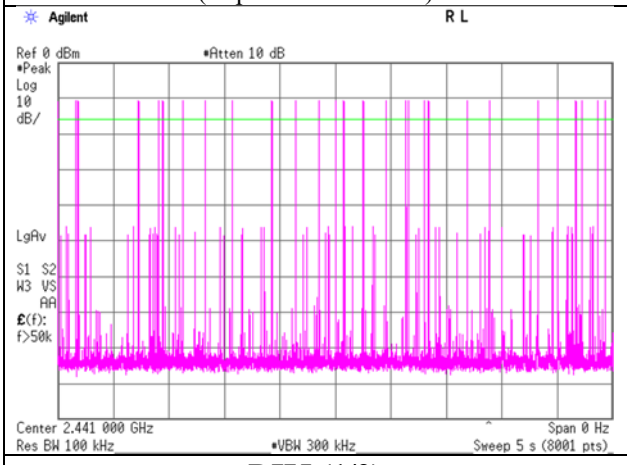
DH1 (1/2)
(Representative chart)



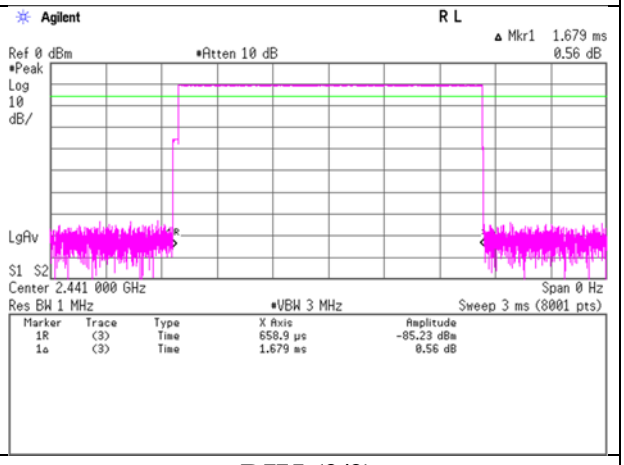
DH1 (2/2)



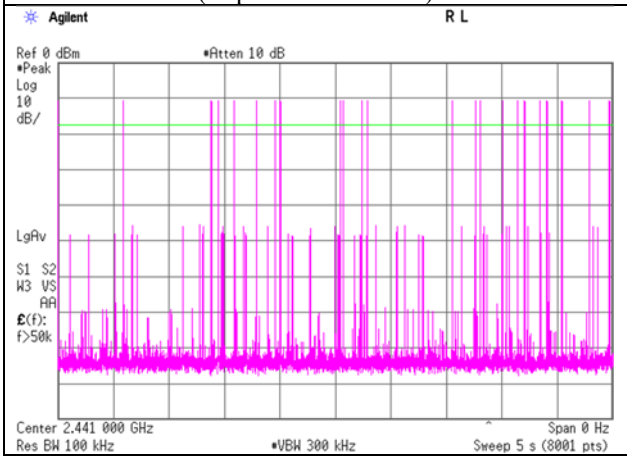
DH3 (1/2)
(Representative chart)



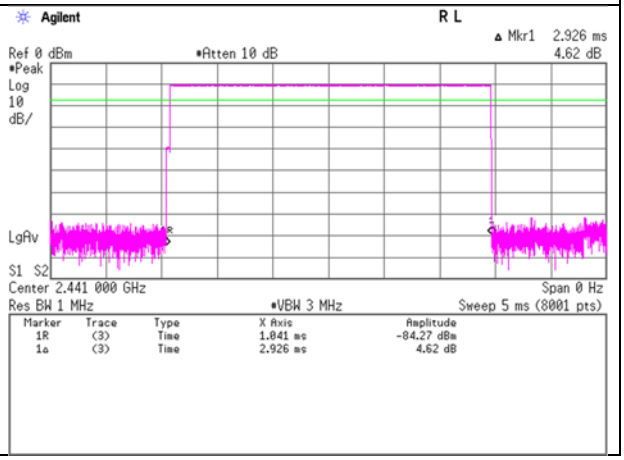
DH3 (2/2)



DH5 (1/2)
(Representative chart)

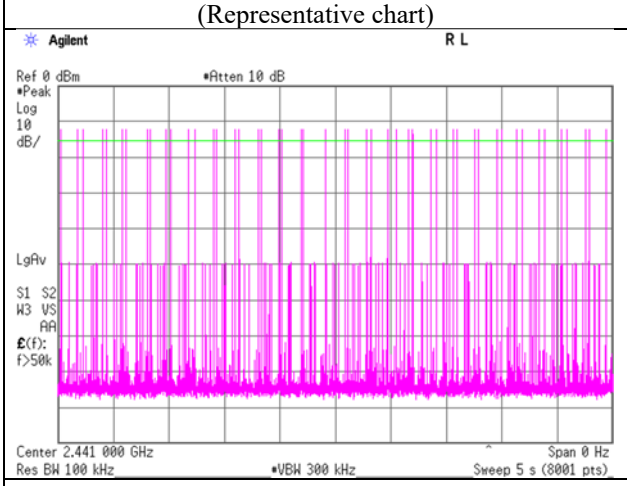


DH5 (2/2)

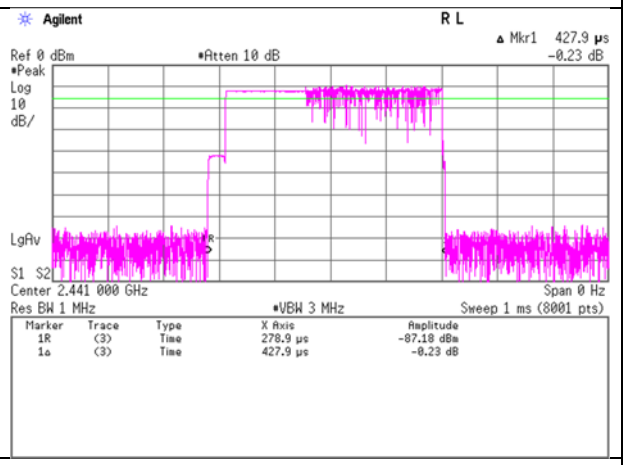


Dwell time

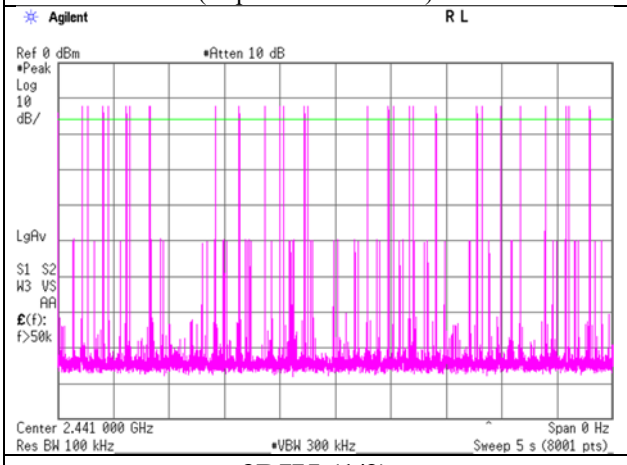
3DH1 (1/2)
(Representative chart)



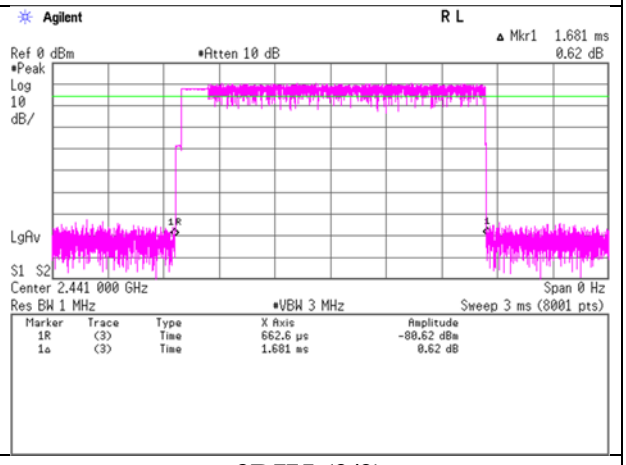
3DH1 (2/2)



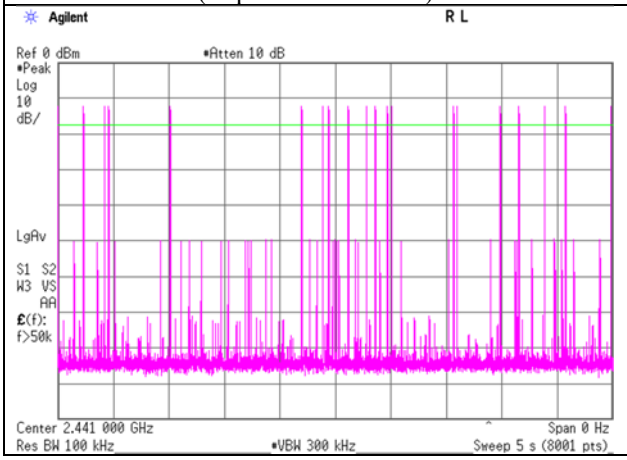
3DH3 (1/2)
(Representative chart)



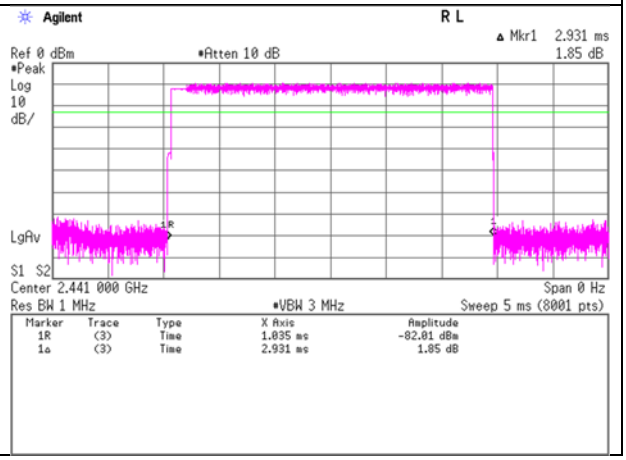
3DH3 (2/2)



3DH5 (1/2)
(Representative chart)



3DH5 (2/2)



Maximum Peak Output Power

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 40 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

					Conducted Power					e.i.r.p. for RSS-247					
Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-11.60	2.36	9.82	0.58	1.14	20.96	125	20.38	-2.30	-1.72	0.67	36.02	4000	37.74
DH5	2441.0	-10.72	2.38	9.82	1.48	1.41	20.96	125	19.48	-2.30	-0.82	0.83	36.02	4000	36.84
DH5	2480.0	-10.52	2.39	9.82	1.69	1.48	20.96	125	19.27	-2.30	-0.61	0.87	36.02	4000	36.63
2DH5	2402.0	-9.95	2.36	9.82	2.23	1.67	20.96	125	18.73	-2.30	-0.07	0.98	36.02	4000	36.09
2DH5	2441.0	-9.35	2.38	9.82	2.85	1.93	20.96	125	18.11	-2.30	0.55	1.14	36.02	4000	35.47
2DH5	2480.0	-9.22	2.39	9.82	2.99	1.99	20.96	125	17.97	-2.30	0.69	1.17	36.02	4000	35.33
3DH5	2402.0	-9.84	2.36	9.82	2.34	1.71	20.96	125	18.62	-2.30	0.04	1.01	36.02	4000	35.98
3DH5	2441.0	-9.22	2.38	9.82	2.98	1.99	20.96	125	17.98	-2.30	0.68	1.17	36.02	4000	35.34
3DH5	2480.0	-9.10	2.39	9.82	3.11	2.05	20.96	125	17.85	-2.30	0.81	1.21	36.02	4000	35.21

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.

Average Output Power
(Reference data for RF Exposure)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 40 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
DH5	2402.0	-13.30	2.36	9.82	-1.12	0.77	1.07	-0.05	0.99
DH5	2441.0	-12.39	2.38	9.82	-0.19	0.96	1.07	0.88	1.22
DH5	2480.0	-12.19	2.39	9.82	0.02	1.00	1.07	1.09	1.29
2DH5	2402.0	-13.96	2.36	9.82	-1.78	0.66	1.07	-0.71	0.85
2DH5	2441.0	-13.29	2.38	9.82	-1.09	0.78	1.07	-0.02	1.00
2DH5	2480.0	-13.12	2.39	9.82	-0.91	0.81	1.07	0.16	1.04
3DH5	2402.0	-13.94	2.36	9.82	-1.76	0.67	1.07	-0.69	0.85
3DH5	2441.0	-13.28	2.38	9.82	-1.08	0.78	1.07	-0.01	1.00
3DH5	2480.0	-13.10	2.39	9.82	-0.89	0.81	1.07	0.18	1.04

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

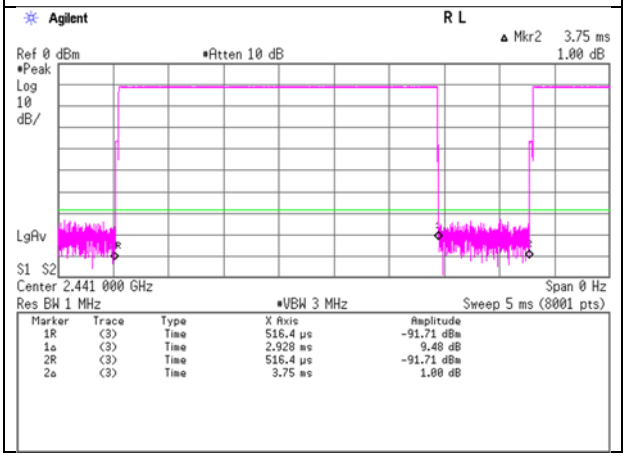
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst Rate Confirmation

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 40 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off

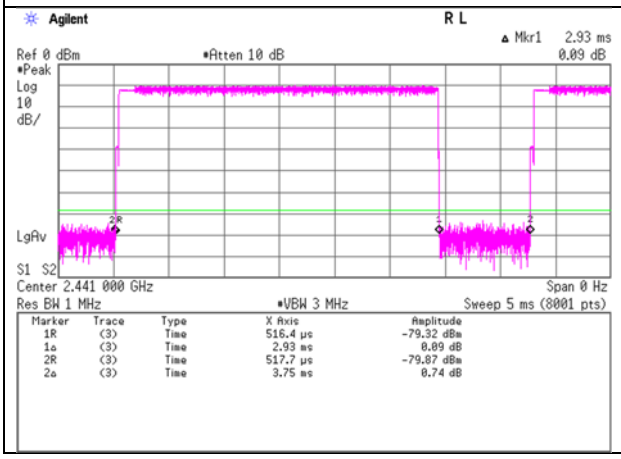
DH5

Tx on / (Tx on + Tx off) =	0.781
Tx on / (Tx on + Tx off) * 100 =	78.1 %
Duty factor = 10 * log (3.75 / 2.928) =	1.07 dB



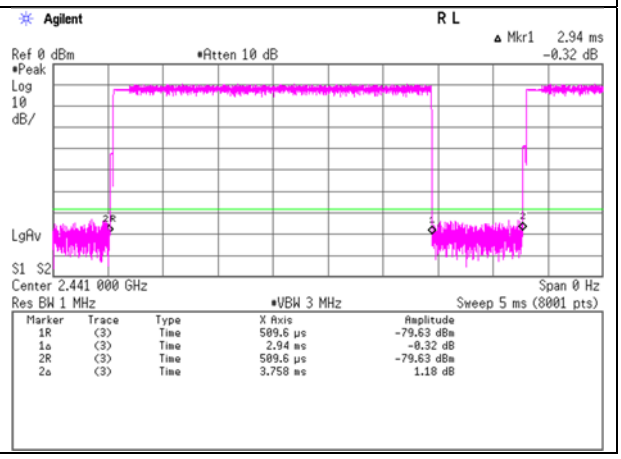
2DH5

Tx on / (Tx on + Tx off) =	0.781
Tx on / (Tx on + Tx off) * 100 =	78.1 %
Duty factor = 10 * log (3.75 / 2.93) =	1.07 dB



3DH5

Tx on / (Tx on + Tx off) =	0.782
Tx on / (Tx on + Tx off) * 100 =	78.2 %
Duty factor = 10 * log (3.758 / 2.94) =	1.07 dB



Radiated Spurious Emission

Report No.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	3	1	1
Date	December 5, 2018	December 3, 2018	December 4, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	23 deg. C / 43 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Kazuya Noda (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.728	QP	47.29	6.35	7.85	31.82	0.00	29.67	40.00	10.3	261	314	
Hori.	165.234	QP	36.92	15.47	8.96	31.78	0.00	29.57	43.50	13.9	193	131	
Hori.	242.998	QP	44.85	11.61	6.29	31.75	0.00	31.00	46.00	15.0	167	145	
Hori.	419.999	QP	45.33	16.08	7.57	31.85	0.00	37.13	46.00	8.8	100	63	
Hori.	466.943	QP	46.49	16.96	7.76	31.89	0.00	39.32	46.00	**6.6**	100	340	
Hori.	960.266	QP	42.05	22.06	9.87	30.89	0.00	43.09	53.90	10.8	110	220	
Hori.	1440.033	PK	48.01	24.97	13.13	39.08	2.24	49.27	73.90	24.6	276	211	
Hori.	2390.000	PK	45.51	27.89	14.06	39.46	2.24	50.24	73.90	23.6	395	256	
Hori.	4804.000	PK	45.80	31.35	6.45	39.50	2.24	46.34	73.90	27.5	120	346	
Hori.	7206.000	PK	45.13	36.78	8.39	39.29	2.24	53.25	73.90	20.6	204	19	
Hori.	1440.033	AV	40.28	24.97	13.13	39.08	2.24	41.54	53.90	12.3	276	211	
Hori.	2390.000	AV	33.82	27.89	14.06	39.46	2.24	38.55	53.90	15.3	395	256	
Hori.	4804.000	AV	33.26	31.35	6.45	39.50	2.24	33.80	53.90	20.1	120	346	
Hori.	7206.000	AV	33.29	36.78	8.39	39.29	2.24	41.41	53.90	12.4	204	19	
Vert.	33.867	QP	34.29	17.12	7.11	31.84	0.00	26.68	40.00	13.3	100	328	
Vert.	73.728	QP	46.95	6.35	7.85	31.82	0.00	29.33	40.00	10.6	100	295	
Vert.	165.234	QP	34.55	15.47	8.96	31.78	0.00	27.20	43.50	16.3	100	223	
Vert.	242.998	QP	47.07	11.61	6.29	31.75	0.00	33.22	46.00	12.7	100	168	
Vert.	419.999	QP	43.11	16.08	7.57	31.85	0.00	34.91	46.00	11.0	151	142	
Vert.	466.943	QP	40.77	16.96	7.76	31.89	0.00	33.60	46.00	12.4	121	319	
Vert.	840.006	QP	38.84	21.28	9.42	31.65	0.00	37.89	46.00	8.1	100	313	
Vert.	960.266	QP	32.76	22.06	9.87	30.89	0.00	33.80	53.90	20.1	123	183	
Vert.	1440.033	PK	47.51	24.97	13.13	39.08	2.24	48.77	73.90	25.1	118	254	
Vert.	2390.000	PK	45.62	27.89	14.06	39.46	2.24	50.35	73.90	23.5	169	153	
Vert.	4804.000	PK	45.13	31.35	6.45	39.50	2.24	45.67	73.90	28.2	176	255	
Vert.	7206.000	PK	45.32	36.78	8.39	39.29	2.24	53.44	73.90	20.4	177	309	
Vert.	1440.033	AV	38.21	24.97	13.13	39.08	2.24	39.47	53.90	14.4	118	254	
Vert.	2390.000	AV	33.83	27.89	14.06	39.46	2.24	38.56	53.90	15.3	169	153	
Vert.	4804.000	AV	33.24	31.35	6.45	39.50	2.24	33.78	53.90	20.1	176	255	
Vert.	7206.000	AV	33.27	36.78	8.39	39.29	2.24	41.39	53.90	12.5	177	309	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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.

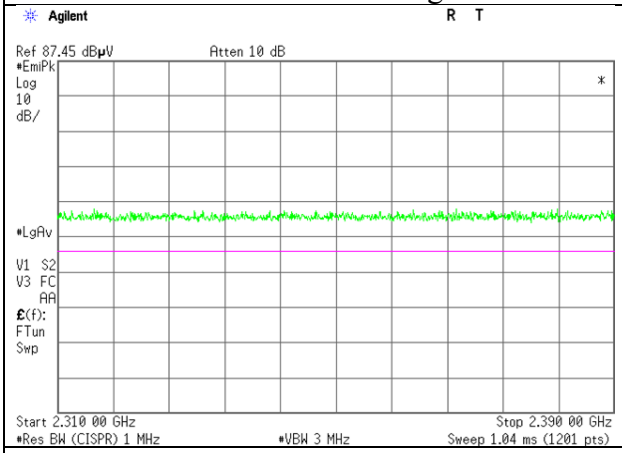
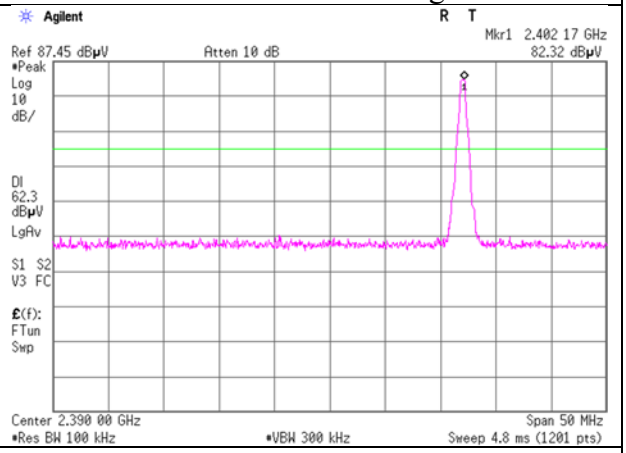
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

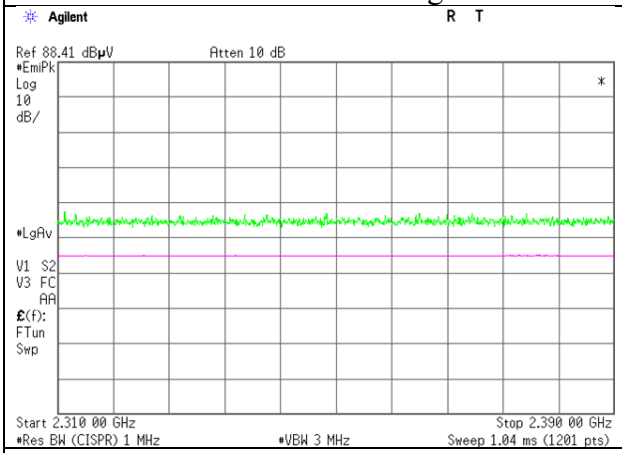
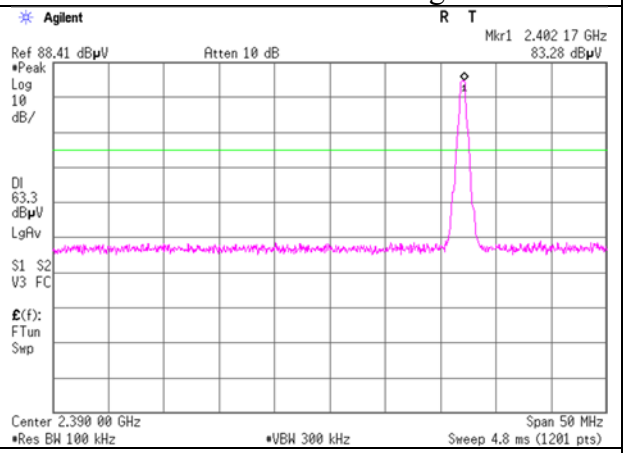
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	82.28	27.88	14.07	39.46	2.24	87.01	-	-	Carrier
Hori.	2400.000	PK	36.29	27.89	14.07	39.46	2.24	41.03	67.01	25.9	
Vert.	2402.000	PK	83.28	27.88	14.07	39.46	2.24	88.01	-	-	Carrier
Vert.	2400.000	PK	36.26	27.89	14.07	39.46	2.24	41.00	68.01	27.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Test Place(AC No)	1
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Shiro Kobayashi
	(1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	3	1	1
Date	December 5, 2018	December 3, 2018	December 4, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	23 deg. C / 43 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Kazuya Noda (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.728	QP	47.28	6.35	7.85	31.82	0.00	29.66	40.00	10.3	249	306	
Hori.	165.264	QP	36.22	15.48	8.96	31.78	0.00	28.88	43.50	14.6	197	115	
Hori.	242.998	QP	44.75	11.61	6.29	31.75	0.00	30.90	46.00	15.1	164	142	
Hori.	419.999	QP	45.21	16.08	7.57	31.85	0.00	37.01	46.00	8.9	100	64	
Hori.	466.941	QP	46.36	16.96	7.76	31.89	0.00	39.19	46.00	**6.8**	100	338	
Hori.	960.267	QP	42.22	22.06	9.87	30.89	0.00	43.26	53.90	10.6	111	222	
Hori.	1440.011	PK	48.54	24.97	13.13	39.08	2.24	49.80	73.90	24.1	265	211	
Hori.	4882.000	PK	45.01	31.19	6.46	39.50	2.24	45.40	73.90	28.5	118	343	
Hori.	7323.000	PK	44.64	36.71	8.38	39.35	2.24	52.62	73.90	21.2	201	12	
Hori.	1440.011	AV	40.24	24.97	13.13	39.08	2.24	41.50	53.90	12.4	265	211	
Hori.	4882.000	AV	33.34	31.19	6.46	39.50	2.24	33.73	53.90	20.1	118	343	
Hori.	7323.000	AV	32.91	36.71	8.38	39.35	2.24	40.89	53.90	13.0	201	12	
Vert.	33.869	QP	34.22	17.12	7.11	31.84	0.00	26.61	40.00	13.3	100	347	
Vert.	73.728	QP	47.02	6.35	7.85	31.82	0.00	29.40	40.00	10.6	100	296	
Vert.	165.235	QP	34.72	15.47	8.96	31.78	0.00	27.37	43.50	16.1	100	255	
Vert.	242.998	QP	46.77	11.61	6.29	31.75	0.00	32.92	46.00	13.0	100	263	
Vert.	419.999	QP	43.74	16.08	7.57	31.85	0.00	35.54	46.00	10.4	185	292	
Vert.	466.941	QP	40.78	16.96	7.76	31.89	0.00	33.61	46.00	12.3	118	322	
Vert.	840.002	QP	39.12	21.28	9.42	31.65	0.00	38.17	46.00	7.8	100	312	
Vert.	960.267	QP	32.65	22.06	9.87	30.89	0.00	33.69	53.90	20.2	121	185	
Vert.	1440.011	PK	46.74	24.97	13.13	39.08	2.24	48.00	73.90	25.9	123	250	
Vert.	4882.000	PK	45.38	31.19	6.46	39.50	2.24	45.77	73.90	28.1	181	254	
Vert.	7323.000	PK	45.38	36.71	8.38	39.35	2.24	53.36	73.90	20.5	182	297	
Vert.	1440.011	AV	37.86	24.97	13.13	39.08	2.24	39.12	53.90	14.7	123	250	
Vert.	4882.000	AV	33.29	31.19	6.46	39.50	2.24	33.68	53.90	20.2	181	254	
Vert.	7323.000	AV	32.98	36.71	8.38	39.35	2.24	40.96	53.90	12.9	182	297	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	3	1	1
Date	December 5, 2018	December 3, 2018	December 4, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	23 deg. C / 43 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Kazuya Noda (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.729	QP	46.85	6.35	7.85	31.82	0.00	29.23	40.00	10.7	254	297	
Hori.	165.236	QP	34.94	15.47	8.96	31.78	0.00	27.59	43.50	15.9	193	129	
Hori.	242.996	QP	45.44	11.61	6.29	31.75	0.00	31.59	46.00	14.4	169	141	
Hori.	419.999	QP	47.25	16.08	7.57	31.85	0.00	39.05	46.00	6.9	100	201	
Hori.	466.940	QP	46.44	16.96	7.76	31.89	0.00	39.27	46.00	**6.7**	100	338	
Hori.	840.003	QP	37.83	21.28	9.42	31.65	0.00	36.88	46.00	9.1	100	126	
Hori.	960.265	QP	42.04	22.06	9.87	30.89	0.00	43.08	53.90	10.8	117	218	
Hori.	1440.017	PK	48.06	24.97	13.13	39.08	2.24	49.32	73.90	24.5	267	211	
Hori.	2483.500	PK	45.28	27.64	14.13	39.46	2.24	49.83	73.90	24.0	379	242	
Hori.	4960.000	PK	45.21	31.40	6.46	39.50	2.24	45.81	73.90	28.0	117	339	
Hori.	7440.000	PK	45.16	36.84	8.37	39.42	2.24	53.19	73.90	20.7	198	18	
Hori.	1440.017	AV	40.28	24.97	13.13	39.08	2.24	41.54	53.90	12.3	267	211	
Hori.	2483.500	AV	33.86	27.64	14.13	39.46	2.24	38.41	53.90	15.4	379	242	
Hori.	4960.000	AV	33.31	31.40	6.46	39.50	2.24	33.91	53.90	19.9	117	339	
Hori.	7440.000	AV	32.97	36.84	8.37	39.42	2.24	41.00	53.90	12.9	198	18	
Vert.	33.868	QP	34.34	17.12	7.11	31.84	0.00	26.73	40.00	13.2	100	313	
Vert.	73.729	QP	47.12	6.35	7.85	31.82	0.00	29.50	40.00	10.5	100	297	
Vert.	165.236	QP	34.93	15.47	8.96	31.78	0.00	27.58	43.50	15.9	100	235	
Vert.	242.996	QP	47.05	11.61	6.29	31.75	0.00	33.20	46.00	12.8	100	154	
Vert.	419.999	QP	43.69	16.08	7.57	31.85	0.00	35.49	46.00	10.5	133	147	
Vert.	466.940	QP	40.97	16.96	7.76	31.89	0.00	33.80	46.00	12.2	121	334	
Vert.	840.004	QP	39.04	21.28	9.42	31.65	0.00	38.09	46.00	7.9	100	308	
Vert.	960.265	QP	33.35	22.06	9.87	30.89	0.00	34.39	53.90	19.5	100	307	
Vert.	1440.017	PK	47.55	24.97	13.13	39.08	2.24	48.81	73.90	25.0	121	253	
Vert.	2483.500	PK	45.34	27.64	14.13	39.46	2.24	49.89	73.90	24.0	199	160	
Vert.	4960.000	PK	45.28	31.40	6.46	39.50	2.24	45.88	73.90	28.0	178	248	
Vert.	7440.000	PK	44.84	36.84	8.37	39.42	2.24	52.87	73.90	21.0	176	298	
Vert.	1440.017	AV	38.14	24.97	13.13	39.08	2.24	39.40	53.90	14.5	121	253	
Vert.	2483.500	AV	33.86	27.64	14.13	39.46	2.24	38.41	53.90	15.4	199	160	
Vert.	4960.000	AV	33.34	31.40	6.46	39.50	2.24	33.94	53.90	19.9	178	248	
Vert.	7440.000	AV	32.89	36.84	8.37	39.42	2.24	40.92	53.90	12.9	176	298	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB

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

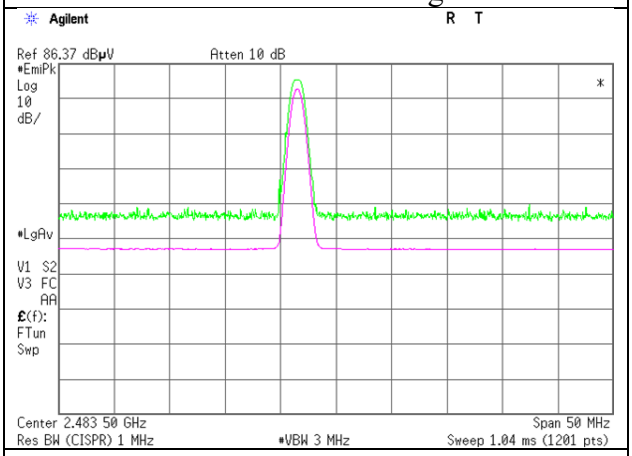
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Test Place(AC No)	1
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Shiro Kobayashi (1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

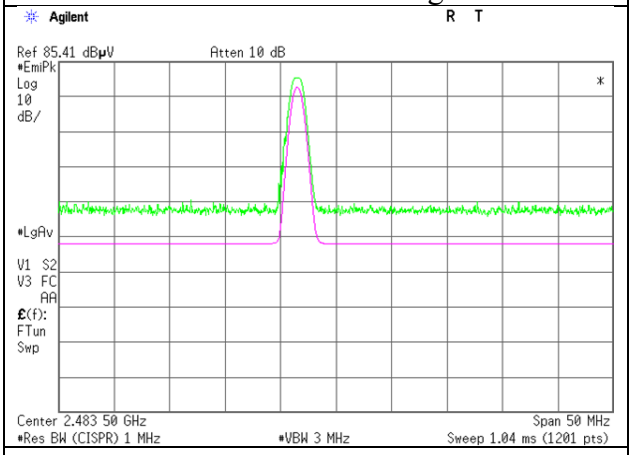
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	1	1	1
Date	December 5, 2018	December 3, 2018	December 6, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	24 deg. C / 35 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Makoto Hosaka (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.727	QP	48.54	6.35	7.85	31.82	0.00	30.92	40.00	9.0	230	310	
Hori.	165.319	QP	38.78	15.48	8.96	31.78	0.00	31.44	43.50	12.0	193	128	
Hori.	242.997	QP	45.33	11.61	6.29	31.75	0.00	31.48	46.00	14.5	233	123	
Hori.	419.999	QP	45.65	16.08	7.57	31.85	0.00	37.45	46.00	8.5	100	66	
Hori.	466.942	QP	46.10	16.96	7.76	31.89	0.00	38.93	46.00	**7.0**	100	95	
Hori.	960.265	QP	41.91	22.06	9.87	30.89	0.00	42.95	53.90	10.9	109	219	
Hori.	1440.005	PK	48.48	24.97	13.13	39.08	2.24	49.74	73.90	24.1	275	212	
Hori.	2390.000	PK	45.22	27.89	14.06	39.46	2.24	49.95	73.90	23.9	400	252	
Hori.	4804.000	PK	44.66	31.35	7.17	36.64	2.24	48.78	73.90	25.1	114	9	
Hori.	7206.000	PK	44.92	36.78	9.03	36.92	2.24	56.05	73.90	17.8	159	347	
Hori.	1440.005	AV	40.36	24.97	13.13	39.08	2.24	41.62	53.90	12.2	275	212	
Hori.	2390.000	AV	33.84	27.89	14.06	39.46	2.24	38.57	53.90	15.3	400	252	
Hori.	4804.000	AV	32.24	31.35	7.17	36.64	2.24	36.36	53.90	17.5	114	9	
Hori.	7206.000	AV	33.15	36.78	9.03	36.92	2.24	44.28	53.90	9.6	159	347	
Vert.	33.869	QP	34.44	17.12	7.11	31.84	0.00	26.83	40.00	13.1	100	348	
Vert.	73.727	QP	45.68	6.35	7.85	31.82	0.00	28.06	40.00	11.9	178	166	
Vert.	165.319	QP	32.31	15.48	8.96	31.78	0.00	24.97	43.50	18.5	100	262	
Vert.	242.997	QP	47.11	11.61	6.29	31.75	0.00	33.26	46.00	12.7	100	169	
Vert.	419.999	QP	43.21	16.08	7.57	31.85	0.00	35.01	46.00	10.9	146	143	
Vert.	466.942	QP	37.32	16.96	7.76	31.89	0.00	30.15	46.00	15.8	168	88	
Vert.	960.265	QP	32.33	22.06	9.87	30.89	0.00	33.37	53.90	20.5	124	182	
Vert.	1440.005	PK	47.69	24.97	13.13	39.08	2.24	48.95	73.90	24.9	116	255	
Vert.	2390.000	PK	45.24	27.89	14.06	39.46	2.24	49.97	73.90	23.9	165	152	
Vert.	4804.000	PK	44.84	31.35	7.17	36.64	2.24	48.96	73.90	24.9	172	270	
Vert.	7206.000	PK	44.77	36.78	9.03	36.92	2.24	55.90	73.90	18.0	151	153	
Vert.	1440.005	AV	38.14	24.97	13.13	39.08	2.24	39.40	53.90	14.5	116	255	
Vert.	2390.000	AV	33.82	27.89	14.06	39.46	2.24	38.55	53.90	15.3	165	152	
Vert.	4804.000	AV	32.22	31.35	7.17	36.64	2.24	36.34	53.90	17.5	172	270	
Vert.	7206.000	AV	33.08	36.78	9.03	36.92	2.24	44.21	53.90	9.6	151	153	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

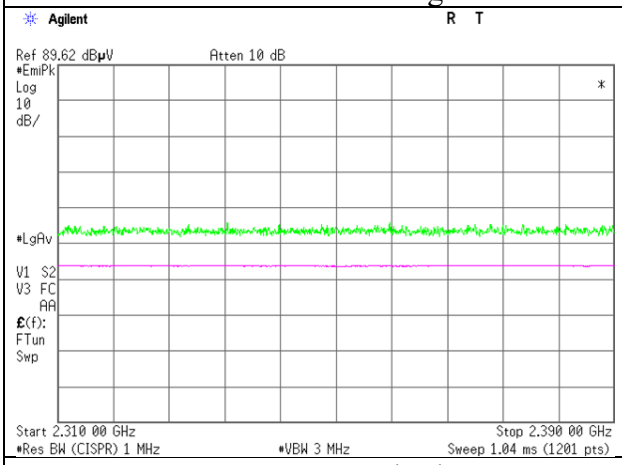
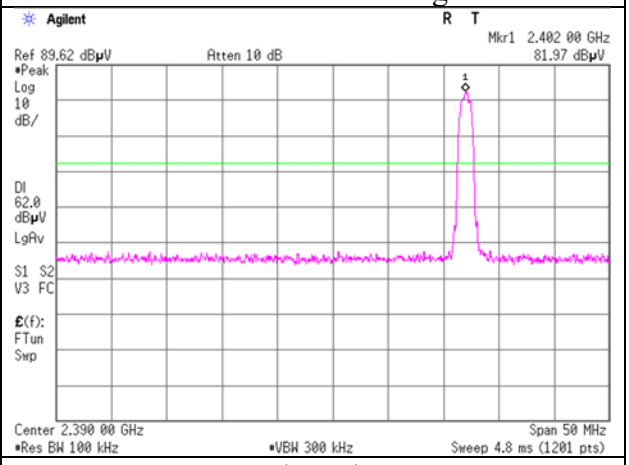
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

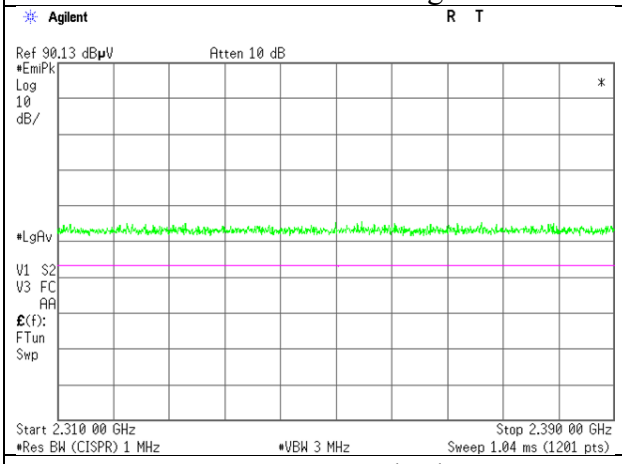
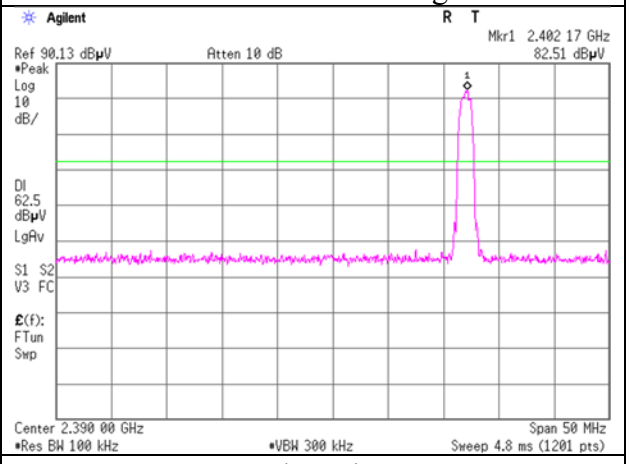
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	81.93	27.88	14.07	39.46	2.24	86.66	-	-	Carrier
Hori.	2400.000	PK	36.43	27.89	14.07	39.46	2.24	41.17	66.66	25.4	
Vert.	2402.000	PK	82.51	27.88	14.07	39.46	2.24	87.24	-	-	Carrier
Vert.	2400.000	PK	36.50	27.89	14.07	39.46	2.24	41.24	67.24	26.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Shiro Kobayashi
	(1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	1	1	1
Date	December 5, 2018	December 3, 2018	December 6, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	24 deg. C / 35 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Makoto Hosaka (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.728	QP	51.82	6.35	7.85	31.82	0.00	34.20	40.00	**5.8**	251	308	
Hori.	147.499	QP	34.22	14.86	8.75	31.78	0.00	26.05	43.50	17.4	213	304	
Hori.	165.322	QP	38.11	15.48	8.96	31.78	0.00	30.77	43.50	12.7	196	116	
Hori.	242.997	QP	45.22	11.61	6.29	31.75	0.00	31.37	46.00	14.6	159	144	
Hori.	419.999	QP	47.31	16.08	7.57	31.85	0.00	39.11	46.00	6.8	100	183	
Hori.	466.942	QP	46.43	16.96	7.76	31.89	0.00	39.26	46.00	6.7	100	97	
Hori.	960.267	QP	41.75	22.06	9.87	30.89	0.00	42.79	53.90	11.1	110	222	
Hori.	1440.000	PK	48.39	24.97	13.13	39.08	2.24	49.65	73.90	24.2	264	208	
Hori.	4882.000	PK	44.34	31.19	7.23	36.63	2.24	48.37	73.90	25.5	121	14	
Hori.	7323.000	PK	44.03	36.71	9.08	36.90	2.24	55.16	73.90	18.7	154	345	
Hori.	1440.000	AV	40.20	24.97	13.13	39.08	2.24	41.46	53.90	12.4	264	208	
Hori.	4882.000	AV	32.01	31.19	7.23	36.63	2.24	36.04	53.90	17.8	121	14	
Hori.	7323.000	AV	32.34	36.71	9.08	36.90	2.24	43.47	53.90	10.4	154	345	
Vert.	33.863	QP	34.45	17.12	7.11	31.84	0.00	26.84	40.00	13.1	100	307	
Vert.	73.728	QP	46.41	6.35	7.85	31.82	0.00	28.79	40.00	11.2	100	141	
Vert.	165.322	QP	32.44	15.48	8.96	31.78	0.00	25.10	43.50	18.4	100	261	
Vert.	242.997	QP	46.94	11.61	6.29	31.75	0.00	33.09	46.00	12.9	100	266	
Vert.	419.999	QP	43.29	16.08	7.57	31.85	0.00	35.09	46.00	10.9	193	291	
Vert.	466.942	QP	38.38	16.96	7.76	31.89	0.00	31.21	46.00	14.7	115	319	
Vert.	960.267	QP	33.84	22.06	9.87	30.89	0.00	34.88	53.90	19.0	100	298	
Vert.	1440.000	PK	47.36	24.97	13.13	39.08	2.24	48.62	73.90	25.2	123	254	
Vert.	4882.000	PK	44.02	31.19	7.23	36.63	2.24	48.05	73.90	25.8	173	267	
Vert.	7323.000	PK	43.22	36.71	9.08	36.90	2.24	54.35	73.90	19.5	152	156	
Vert.	1440.000	AV	38.13	24.97	13.13	39.08	2.24	39.39	53.90	14.5	123	254	
Vert.	4882.000	AV	31.96	31.19	7.23	36.63	2.24	35.99	53.90	17.9	173	267	
Vert.	7323.000	AV	31.99	36.71	9.08	36.90	2.24	43.12	53.90	10.7	152	156	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	1	1	1
Date	December 5, 2018	December 3, 2018	December 6, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	24 deg. C / 35 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Makoto Hosaka (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 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.	73.728	QP	45.59	6.35	7.85	31.82	0.00	27.97	40.00	12.0	258	317	
Hori.	90.317	QP	41.49	8.25	8.36	31.81	0.00	26.29	43.50	17.2	195	291	
Hori.	165.249	QP	37.64	15.47	8.96	31.78	0.00	30.29	43.50	13.2	193	118	
Hori.	269.997	QP	49.76	12.83	6.59	31.76	0.00	37.42	46.00	8.5	117	188	
Hori.	419.999	QP	47.23	16.08	7.57	31.85	0.00	39.03	46.00	**6.9**	100	180	
Hori.	960.266	QP	42.85	22.06	9.87	30.89	0.00	43.89	53.90	10.0	111	221	
Hori.	1440.040	PK	48.18	24.97	13.13	39.08	2.24	49.44	73.90	24.4	266	211	
Hori.	2483.500	PK	45.29	27.64	14.13	39.46	2.24	49.84	73.90	24.0	380	248	
Hori.	4960.000	PK	44.03	31.40	7.28	36.62	2.24	48.33	73.90	25.5	119	12	
Hori.	7440.000	PK	43.81	36.84	9.15	36.87	2.24	55.17	73.90	18.7	160	347	
Hori.	1440.040	AV	40.37	24.97	13.13	39.08	2.24	41.63	53.90	12.2	266	211	
Hori.	2483.500	AV	33.87	27.64	14.13	39.46	2.24	38.42	53.90	15.4	380	248	
Hori.	4960.000	AV	32.01	31.40	7.28	36.62	2.24	36.31	53.90	17.5	119	12	
Hori.	7440.000	AV	32.21	36.84	9.15	36.87	2.24	43.57	53.90	10.3	160	347	
Vert.	33.869	QP	36.33	17.12	7.11	31.84	0.00	28.72	40.00	11.2	100	316	
Vert.	73.728	QP	43.18	6.35	7.85	31.82	0.00	25.56	40.00	14.4	100	317	
Vert.	165.249	QP	33.46	15.47	8.96	31.78	0.00	26.11	43.50	17.3	100	315	
Vert.	269.997	QP	46.05	12.83	6.59	31.76	0.00	33.71	46.00	12.2	100	252	
Vert.	419.999	QP	42.88	16.08	7.57	31.85	0.00	34.68	46.00	11.3	147	158	
Vert.	960.266	QP	33.69	22.06	9.87	30.89	0.00	34.73	53.90	19.1	100	295	
Vert.	1440.040	PK	47.70	24.97	13.13	39.08	2.24	48.96	73.90	24.9	121	256	
Vert.	2483.500	PK	45.43	27.64	14.13	39.46	2.24	49.98	73.90	23.9	162	158	
Vert.	4960.000	PK	44.11	31.40	7.28	36.62	2.24	48.41	73.90	25.4	175	272	
Vert.	7440.000	PK	44.03	36.84	9.15	36.87	2.24	55.39	73.90	18.5	148	157	
Vert.	1440.040	AV	38.14	24.97	13.13	39.08	2.24	39.40	53.90	14.5	121	256	
Vert.	2483.500	AV	33.83	27.64	14.13	39.46	2.24	38.38	53.90	15.5	162	158	
Vert.	4960.000	AV	31.95	31.40	7.28	36.62	2.24	36.25	53.90	17.6	175	272	
Vert.	7440.000	AV	32.20	36.84	9.15	36.87	2.24	43.56	53.90	10.3	148	157	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB

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

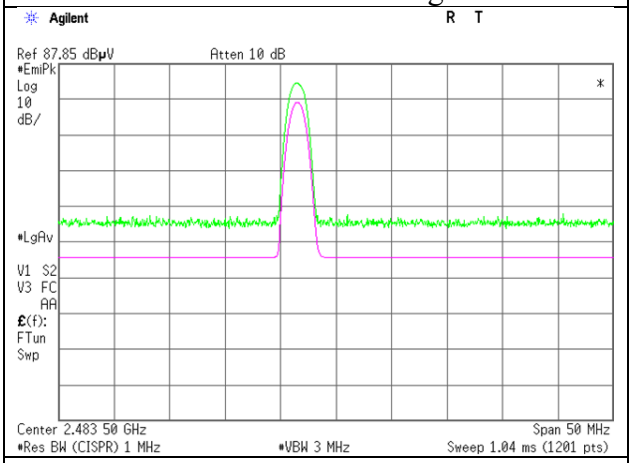
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Test Place(AC No)	1
Date	December 3, 2018
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Shiro Kobayashi (1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

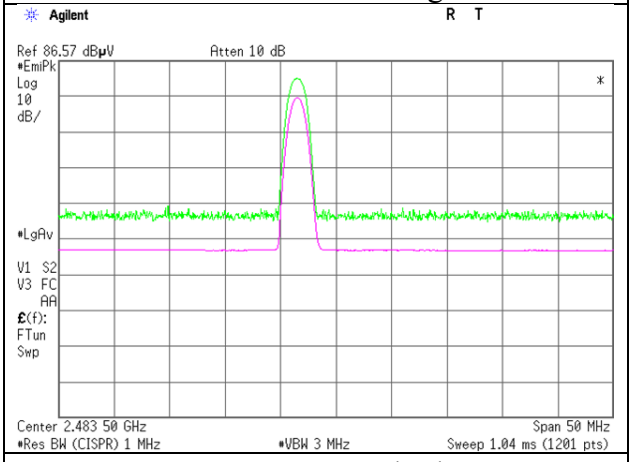
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Test Place(AC No)	3
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 13 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz with Tx 11ac -80(MIMO) 5755 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.	2390.000	PK	46.79	27.86	14.78	41.59	2.24	50.08	73.90	23.8	321	250	
Hori.	2390.000	AV	34.87	27.86	14.78	41.59	2.24	38.16	53.90	15.7	321	250	
Vert.	2390.000	PK	46.92	27.86	14.78	41.59	2.24	50.21	73.90	23.6	376	297	
Vert.	2390.000	AV	35.36	27.86	14.78	41.59	2.24	38.65	53.90	**15.2**	376	297	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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.

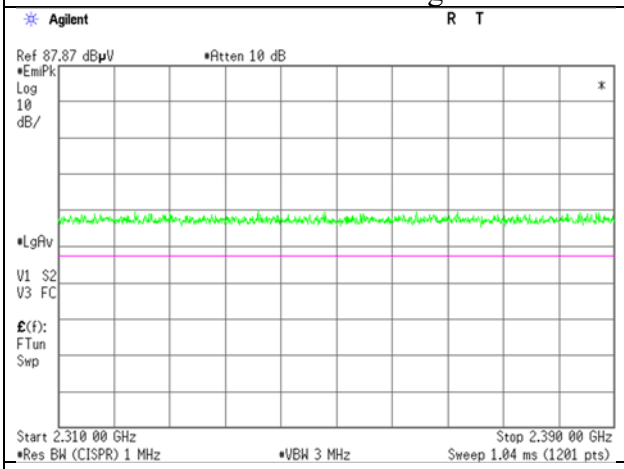
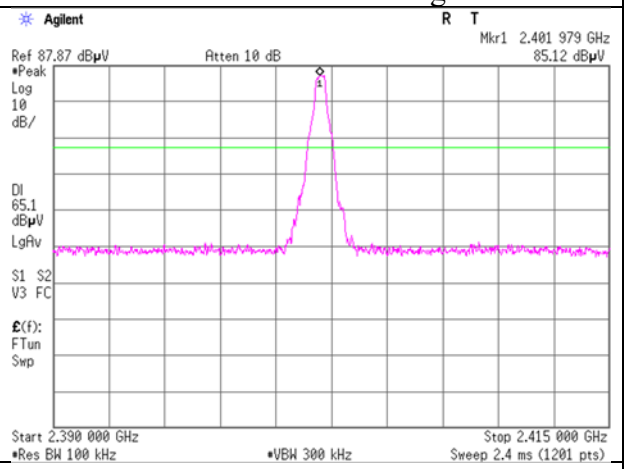
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

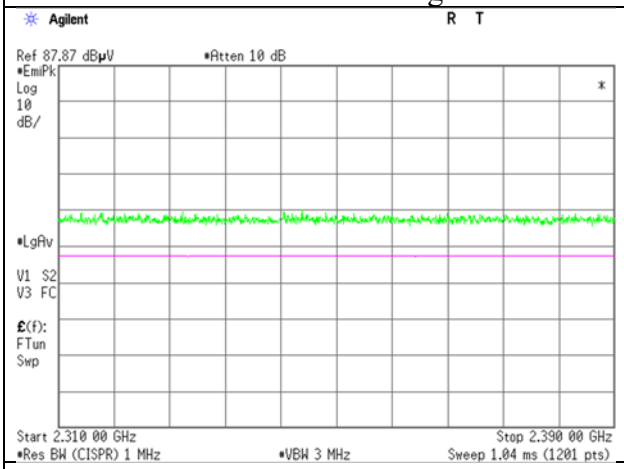
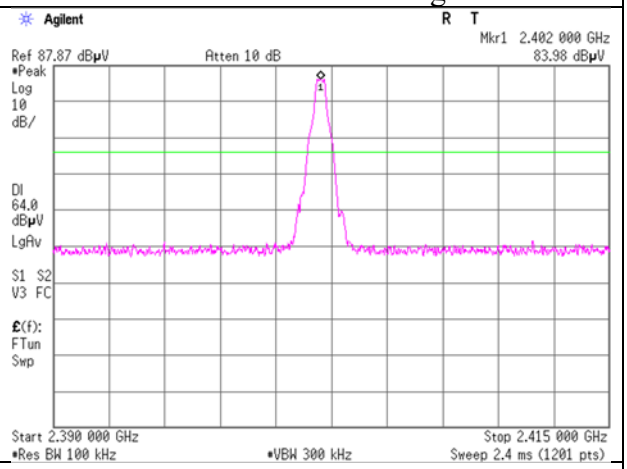
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	83.68	27.86	14.79	41.60	2.24	86.97	-	-	Carrier
Hori.	2400.000	PK	38.04	27.86	14.79	41.60	2.24	41.33	66.97	25.6	
Vert.	2402.000	PK	84.15	27.86	14.79	41.60	2.24	87.44	-	-	Carrier
Vert.	2400.000	PK	37.93	27.86	14.79	41.60	2.24	41.22	67.44	26.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa (1 GHz – 13 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz with Tx 11ac -80(MIMO) 5755 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Test Place(AC No)	3
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 13 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz with Tx 11ac -80(MIMO) 5755 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.	2483.500	PK	47.46	27.65	14.87	41.62	2.24	50.60	73.90	23.3	327	239	
Hori.	2483.500	AV	35.54	27.65	14.87	41.62	2.24	38.68	53.90	**15.2**	327	239	
Vert.	2483.500	PK	48.36	27.65	14.87	41.62	2.24	51.50	73.90	22.4	227	341	
Vert.	2483.500	AV	34.94	27.65	14.87	41.62	2.24	38.08	53.90	15.8	227	341	

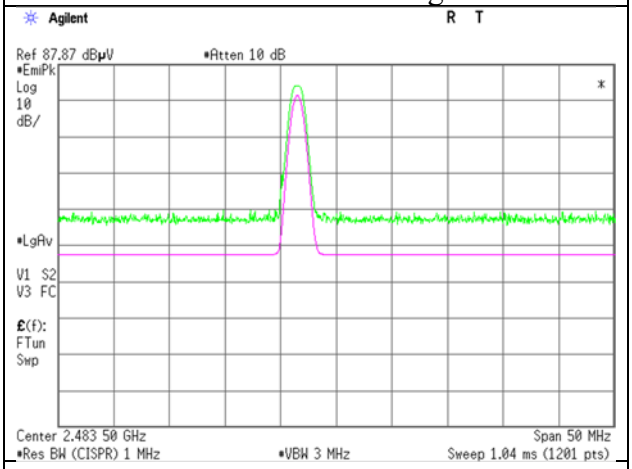
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 13 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz with Tx 11ac -80(MIMO) 5755 MHz

Horizontal

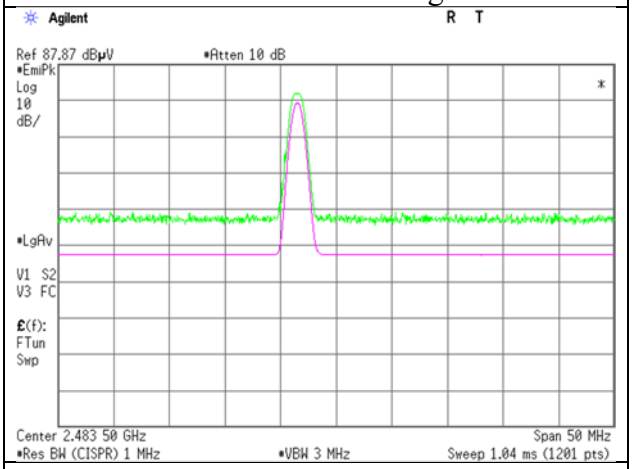
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Test Place(AC No)	3
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 13 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz with Tx 11ac -80(MIMO) 5755 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.	2390.000	PK	46.97	27.86	14.78	41.59	2.24	50.26	73.90	23.6	351	246	
Hori.	2390.000	AV	34.99	27.86	14.78	41.59	2.24	38.28	53.90	**15.6**	351	246	
Vert.	2390.000	PK	46.78	27.86	14.78	41.59	2.24	50.07	73.90	23.8	368	299	
Vert.	2390.000	AV	34.90	27.86	14.78	41.59	2.24	38.19	53.90	15.7	368	299	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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.

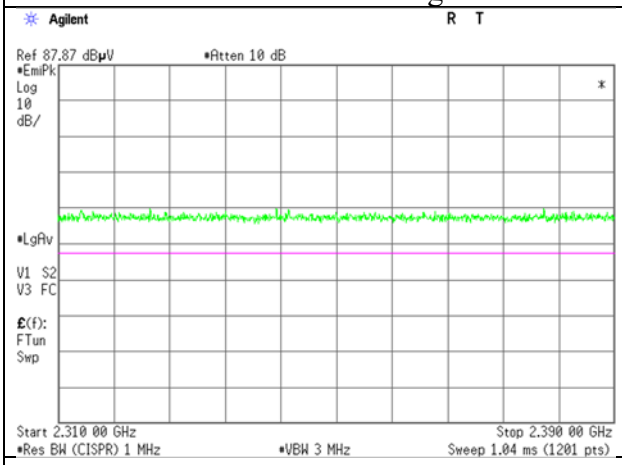
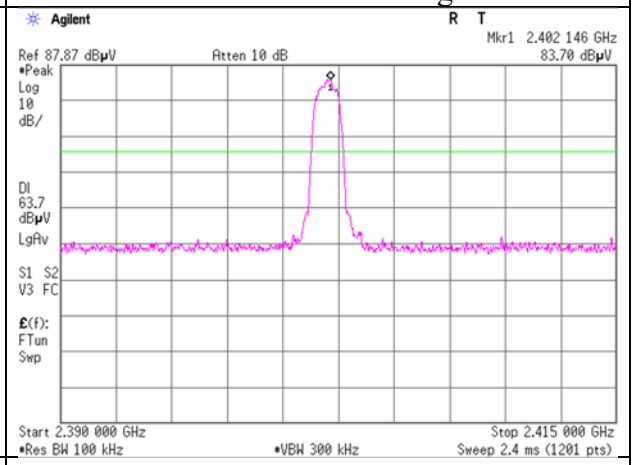
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

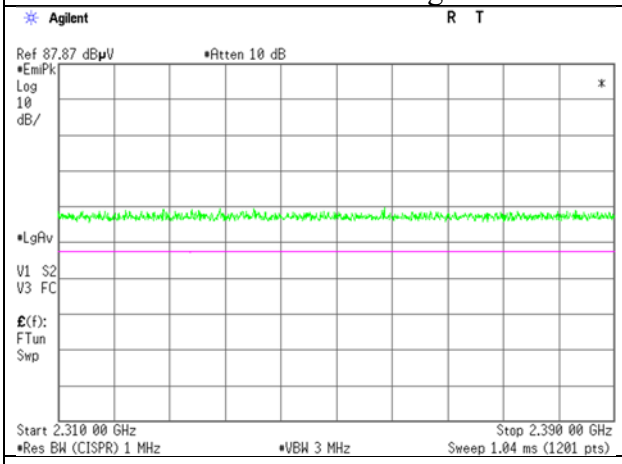
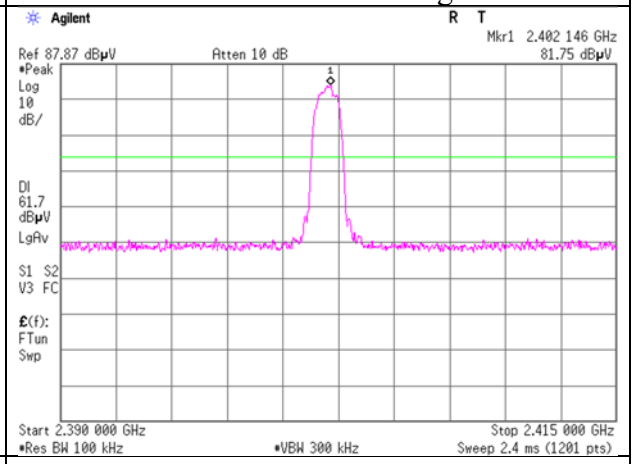
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	82.97	27.86	14.79	41.60	2.24	86.26	-	-	Carrier
Hori.	2400.000	PK	37.21	27.86	14.79	41.60	2.24	40.50	66.26	25.7	
Vert.	2402.000	PK	82.88	27.86	14.79	41.60	2.24	86.17	-	-	Carrier
Vert.	2400.000	PK	37.46	27.86	14.79	41.60	2.24	40.75	66.17	25.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa (1 GHz – 13 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz with Tx 11ac -80(MIMO) 5755 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Test Place(AC No)	3
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa (30 MHz – 40 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz with Tx 11ac -80(MIMO) 5755 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.	73.730	QP	52.01	6.37	7.05	32.18	0.00	33.25	40.00	**6.7**	400	298	
Hori.	319.504	QP	43.72	14.25	8.83	31.99	0.00	34.81	46.00	11.1	100	125	
Hori.	417.798	QP	41.88	16.14	9.32	31.98	0.00	35.36	46.00	10.6	100	147	
Hori.	466.957	QP	41.31	16.94	9.51	31.97	0.00	35.79	46.00	10.2	100	133	
Hori.	742.528	QP	32.86	20.24	10.55	31.82	0.00	31.83	46.00	14.1	150	181	
Hori.	960.218	QP	37.87	22.22	11.28	30.57	0.00	40.80	53.90	13.1	100	303	
Hori.	1440.040	PK	47.32	24.98	13.70	41.05	2.24	47.19	73.90	26.7	263	209	
Hori.	2483.500	PK	46.52	27.65	14.87	41.62	2.24	49.66	73.90	24.2	325	240	
Hori.	4960.000	PK	47.10	31.54	7.61	42.91	2.24	45.58	73.90	28.3	116	336	
Hori.	7440.000	PK	46.59	37.10	9.39	43.38	2.24	51.94	73.90	21.9	197	16	
Hori.	1440.040	AV	39.11	24.98	13.70	41.05	2.24	38.98	53.90	14.9	263	209	
Hori.	2483.500	AV	34.94	27.65	14.87	41.62	2.24	38.08	53.90	15.8	325	240	
Hori.	4960.000	AV	35.65	31.54	7.61	42.91	2.24	34.13	53.90	19.7	116	336	
Hori.	7440.000	AV	34.56	37.10	9.39	43.38	2.24	39.91	53.90	13.9	197	16	
Vert.	47.765	QP	36.41	12.02	6.79	32.19	0.00	23.03	40.00	16.9	100	13	
Vert.	221.173	QP	45.23	11.16	8.18	32.05	0.00	32.52	46.00	13.4	100	179	
Vert.	417.705	QP	35.63	16.14	9.32	31.98	0.00	29.11	46.00	16.8	100	147	
Vert.	840.011	QP	33.66	21.38	10.90	31.43	0.00	34.51	46.00	11.4	100	15	
Vert.	960.256	QP	33.62	22.22	11.28	30.57	0.00	36.55	53.90	17.3	181	32	
Vert.	1440.040	PK	46.24	24.98	13.70	41.05	2.24	46.11	73.90	27.7	120	257	
Vert.	2483.500	PK	46.61	27.65	14.87	41.62	2.24	49.75	73.90	24.1	396	333	
Vert.	4960.000	PK	47.33	31.54	7.61	42.91	2.24	45.81	73.90	28.0	177	246	
Vert.	7440.000	PK	46.37	37.10	9.39	43.38	2.24	51.72	73.90	22.1	174	294	
Vert.	1440.040	AV	37.32	24.98	13.70	41.05	2.24	37.19	53.90	16.7	120	257	
Vert.	2483.500	AV	34.95	27.65	14.87	41.62	2.24	38.09	53.90	15.8	396	333	
Vert.	4960.000	AV	35.86	31.54	7.61	42.91	2.24	34.34	53.90	19.5	177	246	
Vert.	7440.000	AV	34.57	37.10	9.39	43.38	2.24	39.92	53.90	13.9	174	294	

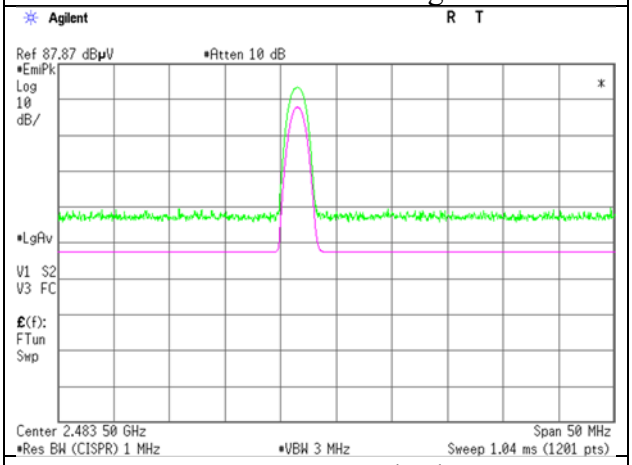
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa
	(1 GHz – 13 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz with Tx 11ac -80(MIMO) 5755 MHz

Horizontal

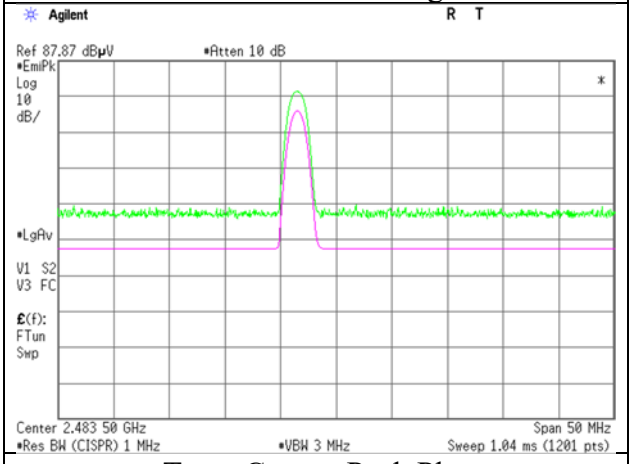
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

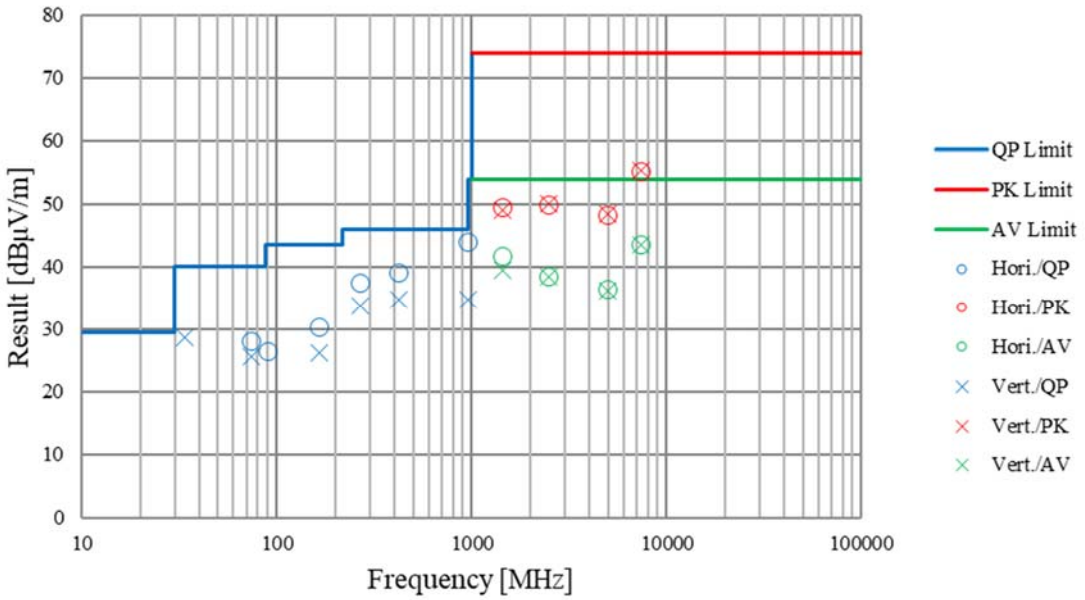


Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

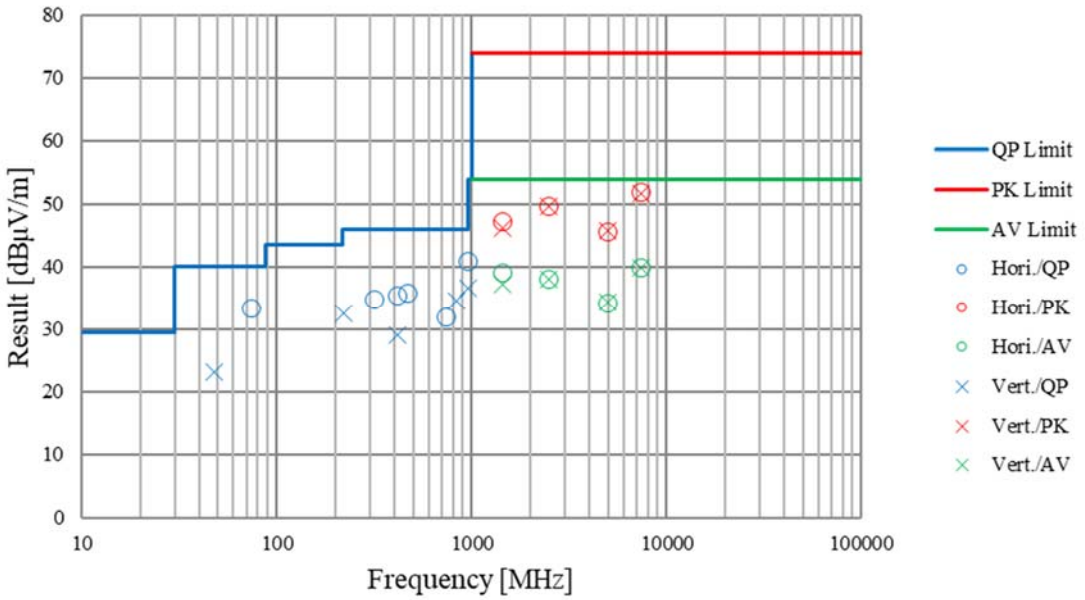
Report No.	12622648S-B-R2				
Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber				
Test Place(AC No)	1	1	1	1	1
Date	December 5, 2018	December 3, 2018	December 6, 2018	December 7, 2018	December 4, 2018
Temperature / Humidity	23 deg. C / 57 % RH	21 deg. C / 41 % RH	24 deg. C / 35 % RH	21 deg. C / 43 % RH	21 deg. C / 41 % RH
Engineer	Kenichi Adachi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz – 2.8 GHz)	Makoto Hosaka (2.8 GHz – 13 GHz)	Kazuya Noda (13 GHz – 18 GHz)	Shiro Kobayashi (18 GHz – 40 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz				



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Test Place(AC No)	3
Date	February 22, 2019
Temperature / Humidity	25 deg. C / 30 % RH
Engineer	Yosuke Ishikawa (30 MHz – 40 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz with Tx 11ac -80(MIMO) 5755 MHz



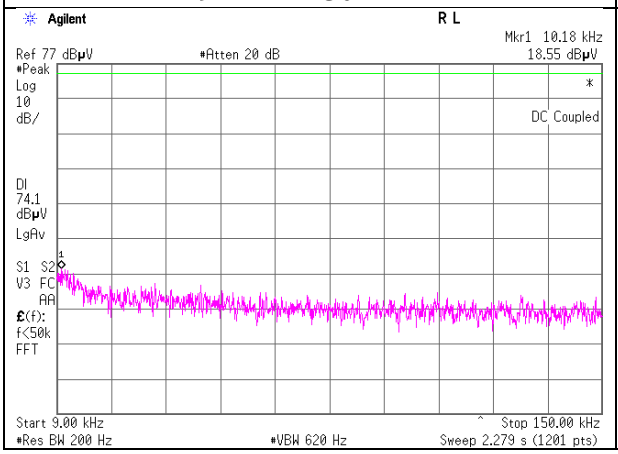
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

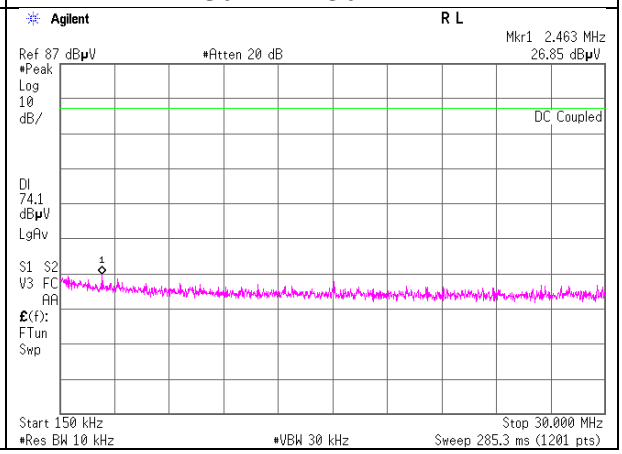
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, DH5 2402 MHz

2402 MHz

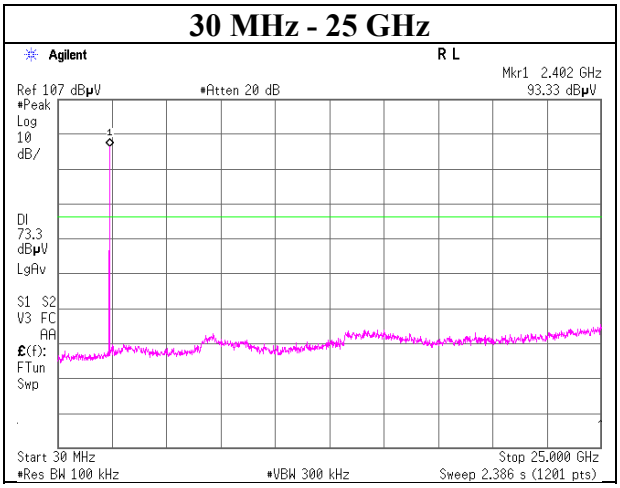
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

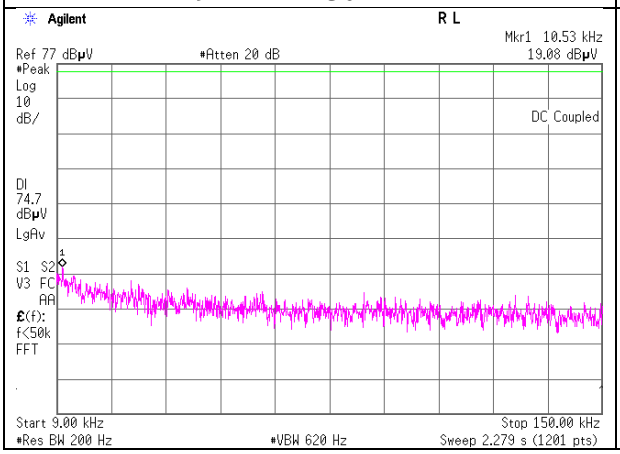


Conducted Spurious Emission

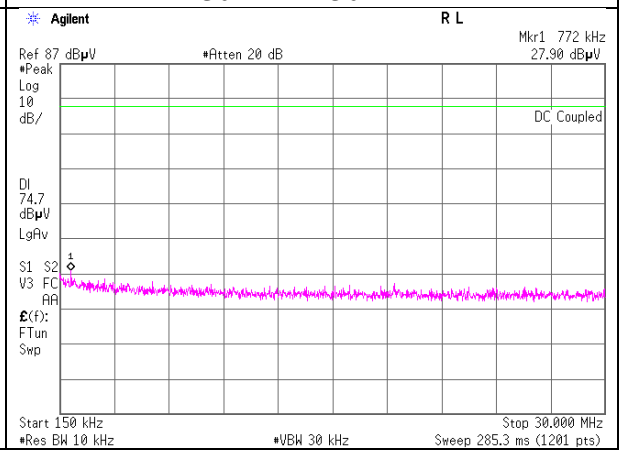
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, DH5 2441 MHz

2441 MHz

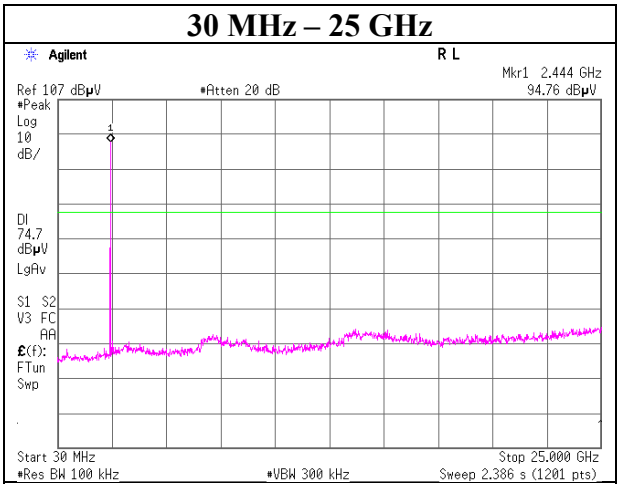
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

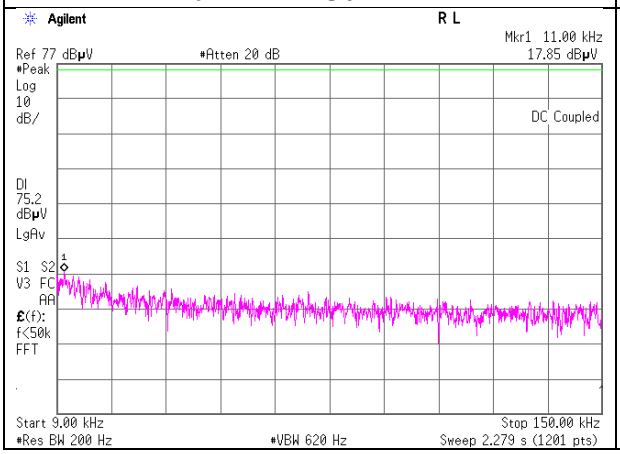


Conducted Spurious Emission

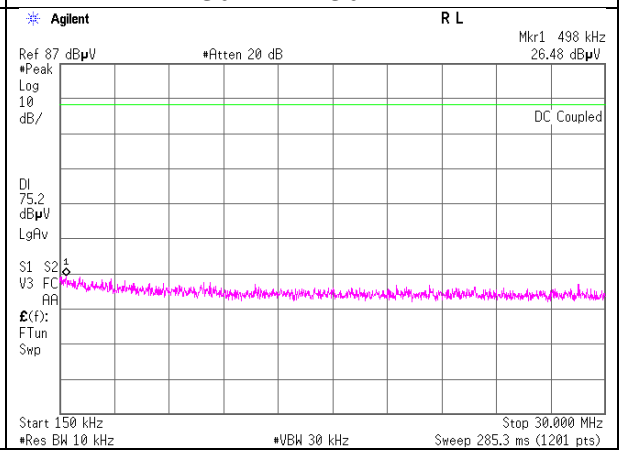
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, DH5 2480 MHz

2480 MHz

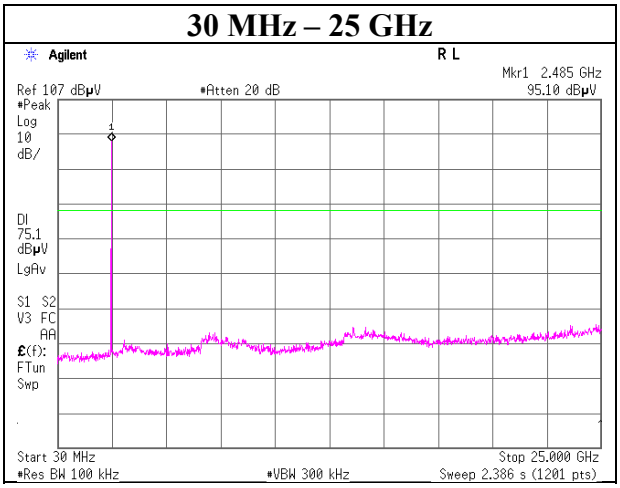
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

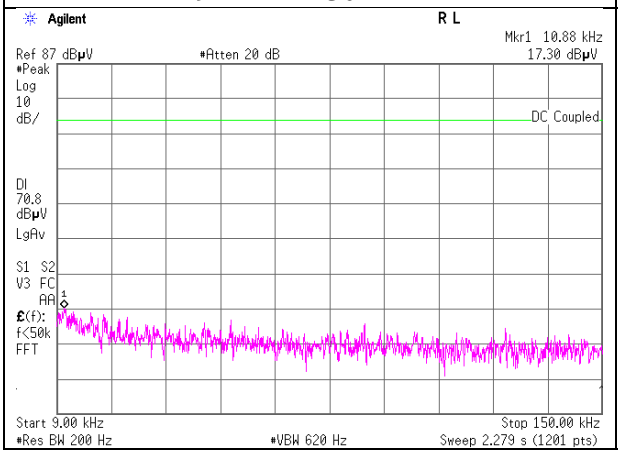


Conducted Spurious Emission

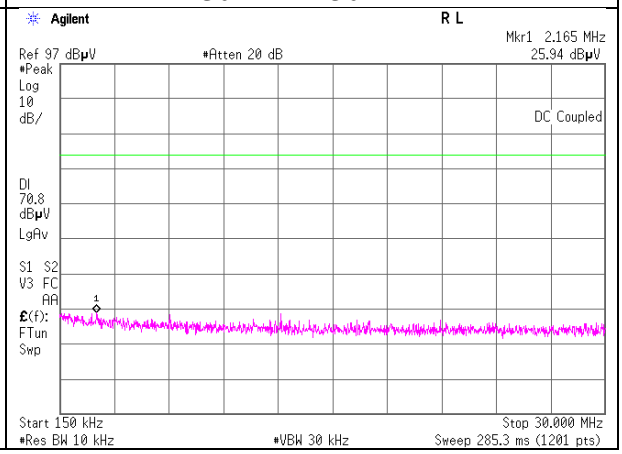
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, 3DH5 2402 MHz

2402 MHz

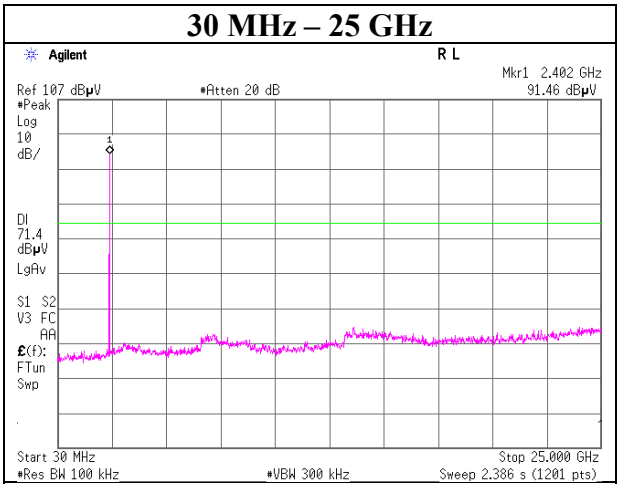
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz

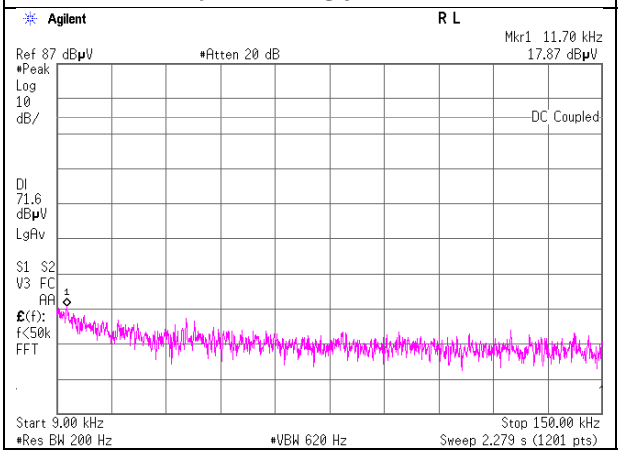


Conducted Spurious Emission

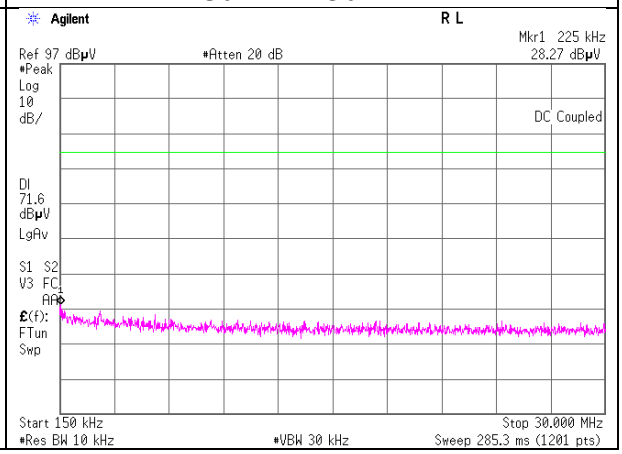
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, 3DH5 2441 MHz

2441 MHz

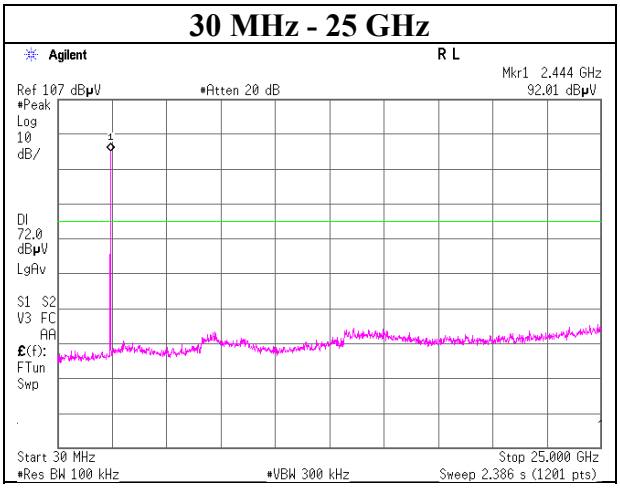
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

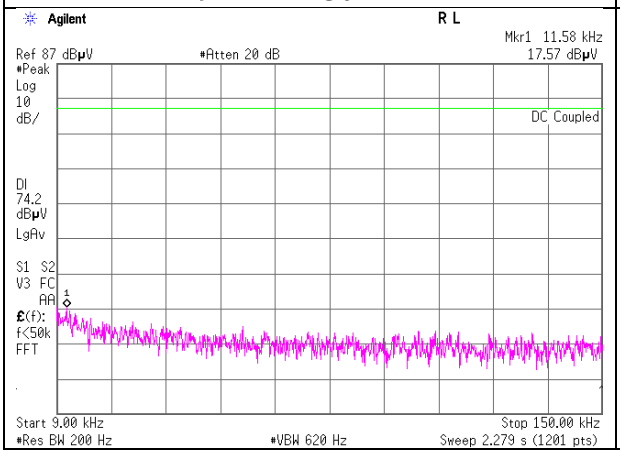


Conducted Spurious Emission

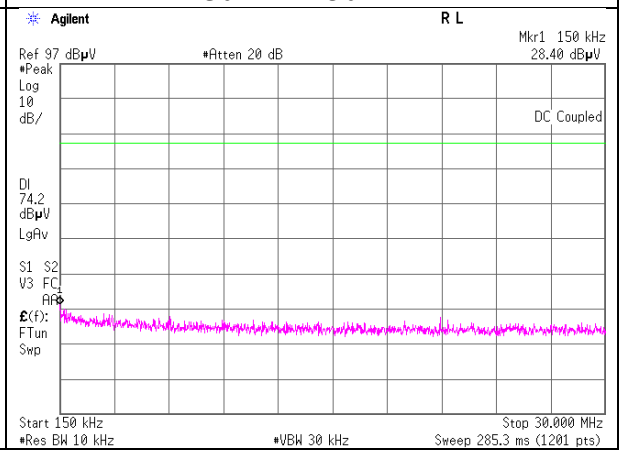
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx, Hopping Off, 3DH5 2480 MHz

2480 MHz

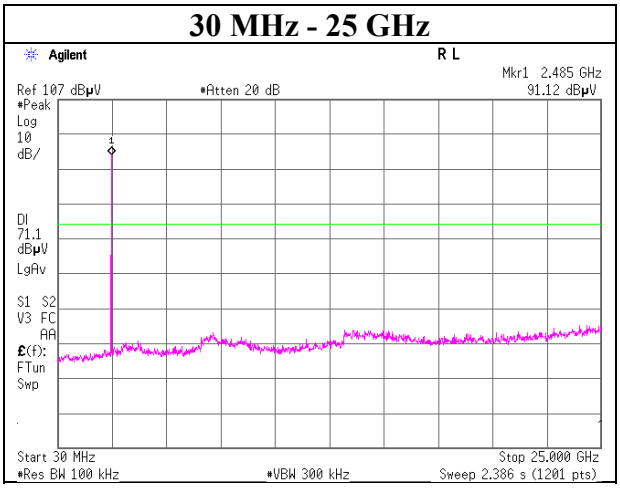
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz

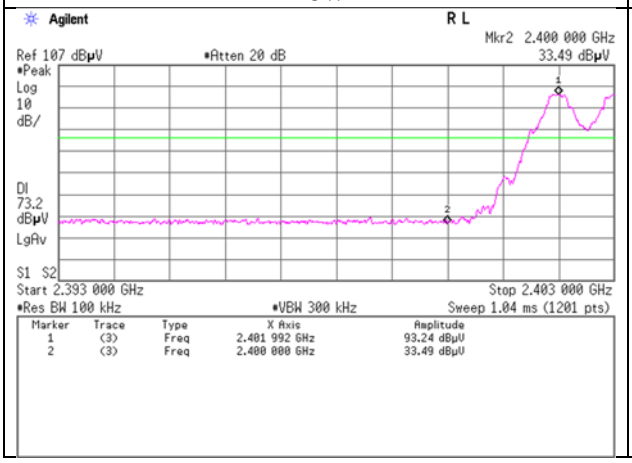


Conducted Emission Band Edge compliance

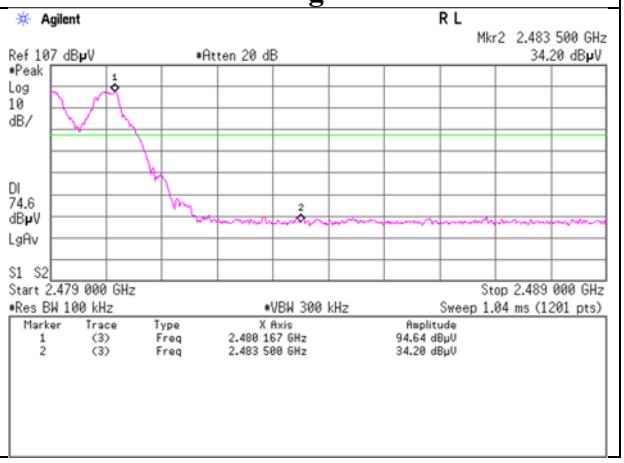
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx DH5

Hopping On

Low

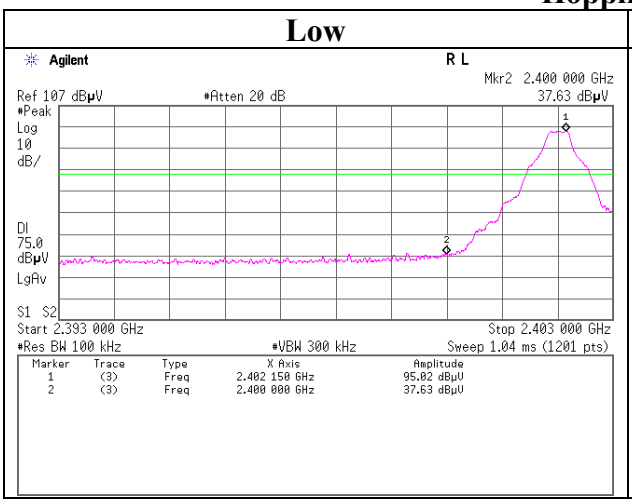


High

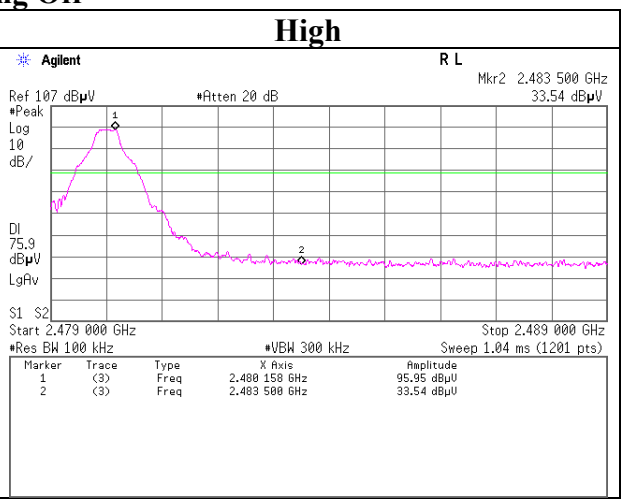


Hopping Off

Low



High

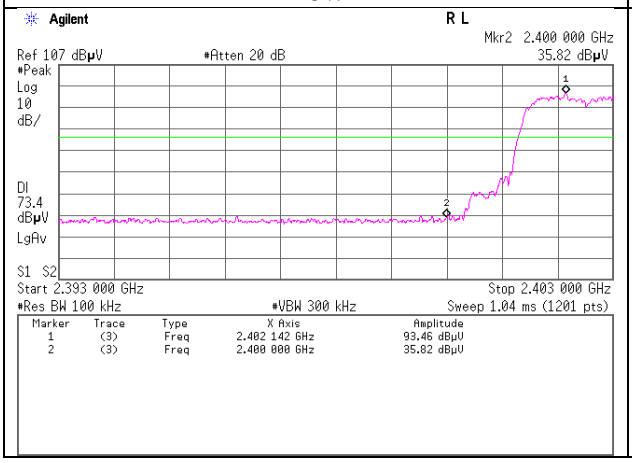


Conducted Emission Band Edge compliance

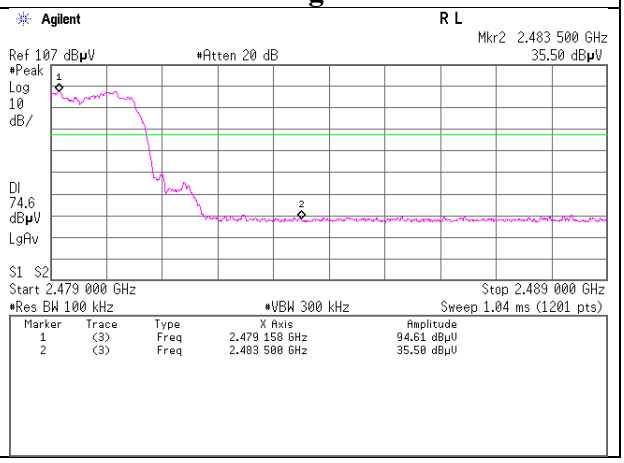
Report No.	12622648S-B-R2
Test place	Shonan EMC Lab. No.1 Measurement Room
Date	December 5, 2018
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 3DH5

Hopping On

Low

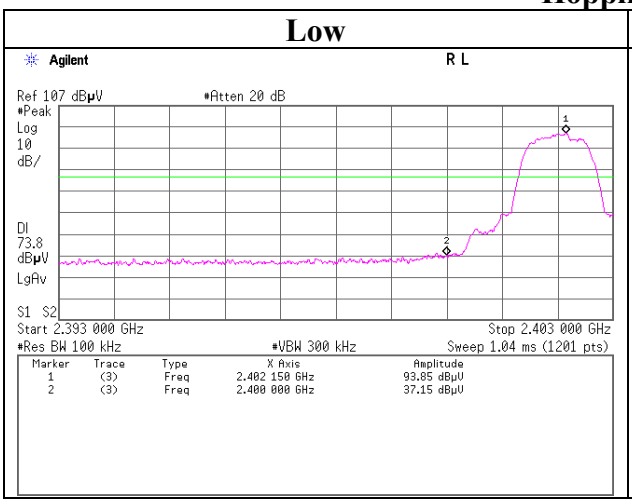


High

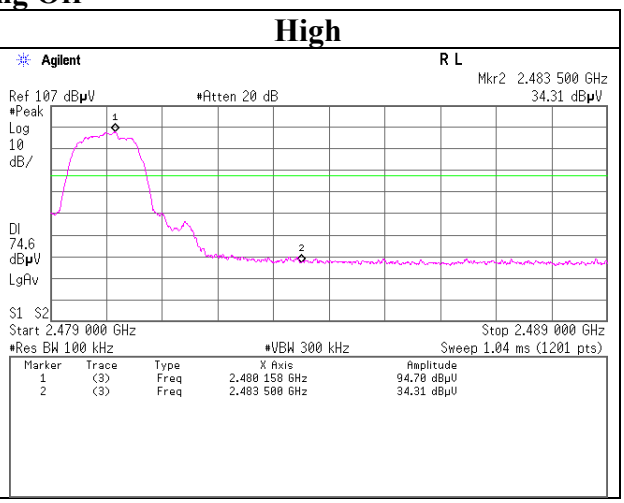


Hopping Off

Low



High



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)
KTS-08	AT	145095	Digital Tester	SANWA	PC500	7019224	2018/3/5	2019/3/31	12
SAT10-14	AT	154591	Attenuator	Weinschel Corp.	54A-10	81595	2018/4/20	2019/4/30	12
SCC-G14	AT	145175	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	2018/3/19	2019/3/31	12
SOS-10	AT	146319	Humidity Indicator	A&D	AD-5681	4064561	2018/10/25	2019/10/31	12
SOS-13	AT	146321	Humidity Indicator	CUSTOM	CTH-202	Q.C.17	2018/12/5	2019/12/31	12
SPM-07	AT	146247	Power Meter	AGILENT	8990B	MY51002702	2018/7/13	2019/7/31	12
SPSS-04	AT	146310	Power sensor	AGILENT	N1923A	MY53260009	2018/7/13	2019/7/31	12
SSA-03	AT	145801	Spectrum Analyzer	AGILENT	E4448A	MY48250152	2018/8/30	2019/8/31	12
STM-G6	AT	146207	Terminator	JFW	50T-128	-	2018/11/25	2019/11/30	12
COTS-SEMI-5	RE	170932	EMI Software	TSJ	TEPTO-DV3(RE,CE,ME,PE)	-	-	-	-
KAT6-04	RE	144899	Attenuator	Inmet	18N-6dB	-	2018/12/25	2019/12/31	12
KJM-02	RE	146432	Measure	TAJIMA	GL19-55	-	-	-	-
KJM-09	RE	145929	Measure	KOMELON	KMC-36	-	-	-	-
KSA-08	RE	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2018/10/7	2019/10/31	12
SAEC-01(NSA)	RE	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2018/5/29	2019/5/31	12
SAEC-01(SVSWR)	RE	145561	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	2018/7/19	2019/7/31	12
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-01	RE	145003	Pre Amplifier	SONOMA	310N	290211	2018/2/16	2019/2/28	12
SAF-03	RE	145126	Pre Amplifier	SONOMA	310N	290213	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-06	RE	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2019/2/8	2020/2/29	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2018/3/27	2019/3/31	12
SAF-09	RE	145008	Pre Amplifier	Toyo Corporation	HAP18-26W	18	2018/9/21	2019/9/30	12
SAF-10	RE	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	10	2018/3/27	2019/3/31	12
SAT10-06	RE	145137	Attenuator	AGILENT	8493C-010	74865	2018/11/25	2019/11/30	12
SAT3-09	RE	144959	Attenuator	JFW	50HF-003N	-	2018/8/23	2019/8/31	12
SAT6-13	RE	167094	Attenuator	JFW	50HF-006N		2018/2/9	2019/2/28	12
SBA-01	RE	145161	Biconical Antenna	Schwarzbeck	BBA9106	91032664	2018/6/5	2019/6/30	12
SBA-03	RE	145023	Biconical Antenna	Schwarzbeck	BBA9106	91032666	2018/6/17	2019/6/30	12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	RE	144967	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12

Test Instruments (2/2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	RE	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	RE	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-271(RF Selector)	2018/4/9	2019/4/30	12
SCC-G05	RE	145039	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	2019/1/25	2020/1/31	12
SCC-G06	RE	145173	Coaxial Cable	Junkosha	J12J102207-00	MAY-23-16-091	2018/6/1	2019/6/30	12
SCC-G22	RE	145180	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	2018/5/11	2019/5/31	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
SCC-G40	RE	166491	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S005	2018/1/29	2019/1/31	12
SCC-G41	RE	151617	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/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	800137/2EA	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-01	RE	145383	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	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
SHA-05	RE	145513	Horn Antenna	ETS LINDGREN	Sep-60	LM4210	2018/7/23	2019/7/31	12
SHA-06	RE	145514	Horn Antenna	ETS LINDGREN	Oct-60	LM3459	2018/7/23	2019/7/31	12
SLA-05	RE	145527	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	193	2018/6/5	2019/6/30	12
SLA-07	RE	145529	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	2018/6/17	2019/6/30	12
SOS-01	RE	146316	Humidity Indicator	A&D	AD-5681	4062555	2018/10/25	2019/10/31	12
SOS-05	RE	146293	Humidity Indicator	A&D	AD-5681	4062518	2018/10/25	2019/10/31	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
STR-08	RE	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2018/11/28	2019/11/30	12
STS-01	RE	145792	Digital Hitester	HIOKI	3805-50	80997812	2018/10/16	2019/10/31	12
STS-03	RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2018/10/16	2019/10/31	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: **RE: Radiated Emission test**
AT: Antenna Terminal Conducted test