RADIO TEST REPORT

Test Report No. : 13294722S-A-R1

Applicant	:	**JVCKENWOOD Corporation**
Type of EUT	:	**GPS NAVIGATION SYSTEM**
Model Number of EUT	:	**DNR1007XR**
FCC ID	:	**IOMJ5240**
Test regulation	:	**FCC Part 15 Subpart C: 2020** *** Bluetooth BR/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.
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6. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13294722S-A. 13294722S-A is replaced with this report.

Date of test: April 2 to 14, 2020

Representative test engineer: T. Kawakami
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Engineer
Consumer Technology Division

CERTIFICATE 1266.03

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 13294722S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13294722S-A	May 25, 2020	-	-
1	13294722S-A-R1	June 1, 2020	P.6	Correction of "Clock frequency in the system (Maximum)" from: 6.2208 GHz to: 5.0 GHz

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
Amp, AMP	Amplifier
ANSI	American National Standards Institute
Ant, ANT	Antenna
AP	Access Point
ASK	Amplitude Shift Keying
Atten., ATT	Attenuator
AV	Average
BPSK	Binary Phase-Shift Keying
BR	Bluetooth Basic Rate
BT	Bluetooth
BT LE	Bluetooth Low Energy
BW	BandWidth
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	Effective Radiated Power
EU	European Union
EUT	Equipment Under Test
Fac.	Factor
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
Freq.	Frequency
FSK	Frequency Shift Keying
GFSK	Gaussian Frequency-Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
Hori.	Horizontal
ICES	Interference-Causing Equipment Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IF	Intermediate Frequency
ILAC	International Laboratory Accreditation Conference
ISED	Innovation, Science and Economic Development Canada
ISO	International Organization for Standardization
JAB	Japan Accreditation Board
LAN	Local Area Network
LIMS	Laboratory Information Management System
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
NIST	National Institute of Standards and Technology
NS	No signal detect.
NSA	Normalized Site Attenuation
NVLAP	National Voluntary Laboratory Accreditation Program
OBW	Occupied Band Width
OFDM	Orthogonal Frequency Division Multiplexing
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadri-Phase Shift Keying
RBW	Resolution Band Width
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN

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SECTION 1: Customer information

Company Name	:	JVCKENWOOD 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 EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT 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 (EUT)

2.1 Identification of EUT

Type	:	GPS NAVIGATION SYSTEM
Model Number	:	DNR1007XR
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 12 V
Receipt Date	:	April 1, 2020
Country of Mass-production	:	Indonesia
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product Description

Model: DNR1007XR (referred to as the EUT in this report) is a GPS NAVIGATION SYSTEM.

There are three variant models DMX1057XR, DMX1037S, KW-Z1000W.
These models are identical except for the presence of Volume type, Navigation function, SD card, Preout level, and these differences do not affect the radio.

Radio Specification

Type of radio	Bluetooth (BR/EDR)	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 MHz BW)	IEEE802.11n (40 MHz BW)	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 (20 MHz BW) 5755 MHz-5795 MHz (40 MHz BW) 5775 MHz (80 MHz BW)
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	40 MHz	20 MHz (20 MHz BW) 40 MHz (40 MHz BW) 80 MHz (80 MHz BW)

Antenna type	Internal Antenna (Chip Antenna)
Antenna Gain	Antenna 0 (ANT-0) : -1.6 dBi (2.4 GHz Wireless LAN only), -3.5 dBi (5 GHz) Antenna 1 (ANT-1) : -5.7 dBi (2.4 GHz Bluetooth only), -3.6 dBi (5 GHz),
Power Supply (radio art input)	DC 3.6 V/ 3.3 V/1.8 V
Clock frequency (Maximum)	37.4 MHz
Clock frequency in the system (Maximum)	5.0 GHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on April 1, 2020 and effective June 1, 2020 except 15.258
* The revision does not affect the test result conducted before its effective date.

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods	**FCC:** Section 15.207	N/A	N/A *1)	-
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
Carrier Frequency Separation	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(a)(1)	See data.	Complied a)	Conducted
	ISED: -	**ISED:** RSS-247 5.1 (b)			
20 dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(a)(1)		Complied a)	Conducted
	ISED: -	**ISED:** RSS-247 5.1 (a)			
Number of Hopping Frequency	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(a)(1)(iii)		Complied b)	Conducted
	ISED: -	**ISED:** RSS-247 5.1 (d)			
Dwell time	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(a)(1)(iii)		Complied c)	Conducted
	ISED: -	**ISED:** RSS-247 5.1 (d)			
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(a)(b)(1)		Complied d)	Conducted
	ISED: RSS-Gen 6.12	**ISED:** RSS-247 5.4 (b)			
Spurious Emission & Band Edge Compliance	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(d)	8.1 dB 516.091 MHz, QP, Hori. Mode: Tx, 3DH5 2402 MHz	Complied e) / f)	Conducted/ Radiated (above 30 MHz) *2)
	ISED: RSS-Gen 6.13	**ISED:** 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 20 dB 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	**ISED:** RSS-Gen 6.7	**ISED:** -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 20 dB 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

There is no applicable rule of uncertainty in this applied standard. Therefore, the 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. 4,5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.5 dB	2.6 dB
Radiated emission	9 kHz-30 MHz	3.0 dB	3.0 dB	3.0 dB	-
(Measurement distance: 3 m)	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB	-
	1 GHz-6 GHz	4.9 dB	4.9 dB	4.9 dB	-
	6 GHz-18 GHz	5.5 dB	5.5 dB	5.5 dB	-
	18 GHz-40 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission	1 GHz-18 GHz	5.8 dB	5.8 dB	5.8 dB	-
(Measurement distance: 1 m)	18 GHz-40 GHz	5.7 dB	5.7 dB	5.7 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	0.98 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.75 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.12 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	1.06 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.24 dB
Spurious emission (Conducted) below 1GHz	0.9 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.9 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.9 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.0 dB
Bandwidth Measurement	0.07 %
Duty cycle and Time Measurement	0.262 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	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 EUT during testing

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

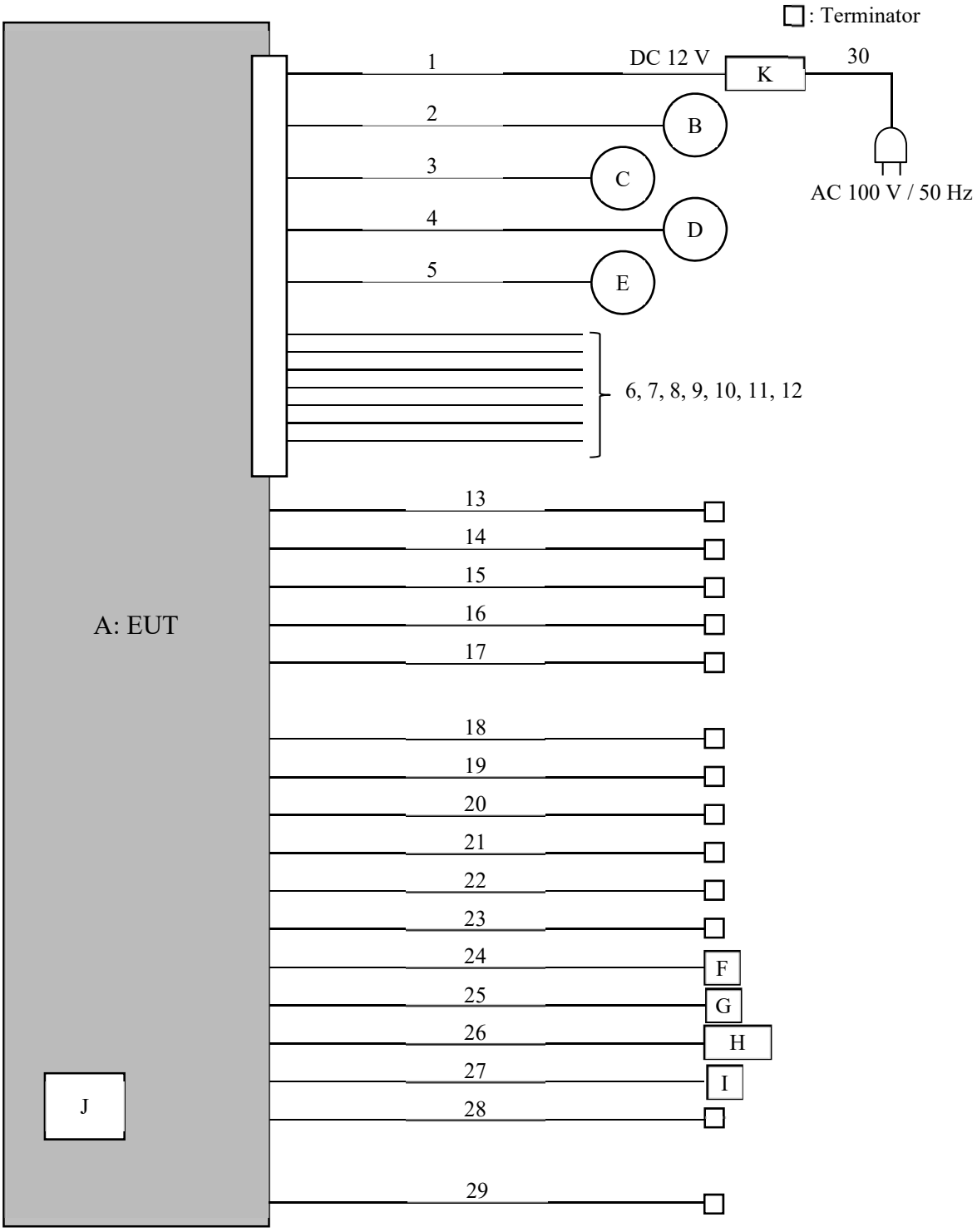
Test Item	Mode	Tested frequency
Spurious Emission (Conducted)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Spurious Emission (Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
	Tx (Hopping Off) DH5, 3DH5 with 11ac-20 MIMO 5745 MHz	2441 MHz
Spurious Emission (Radiated / Band Edge)	Tx (Hopping Off) DH5, 3DH5 with 11ac-20 MIMO 5745 MHz	2402 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20 dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99 % Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)
*2DH mode (2 Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.
* 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 :	0.1.0403.1000
	Panel CPU :	1.0.0209.3100
	SoC :	0.0.2303.1000
	(Date: 2020.4.2, Storage location: EUT memory)	

*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GPS NAVIGATION SYSTEM	DNX1007XR	PK-X0035 *1) PK-X0020 *2)	JVCKENWOOD	EUT
B	Speaker Dummy	-	-	-	-
C	Speaker Dummy	-	-	-	-
D	Speaker Dummy	-	-	-	-
E	Speaker Dummy	-	-	-	-
F	GPS ANTENNA	T9A-0070-00	-	JVCKENWOOD	-
G	USB Memory	JetFlash 128MB	-	Transcend	-
H	Microphone	T9B-0066-00	-	JVCKENWOOD	-
I	iPhone 7	A1779	F71WF850HG81	Apple Inc.	-
J	MicroSDHC Card	4GB	-	TDK	-
K	DC Power Supply	PAN35-10A	DE001677	KIKUSUI	-

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

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC (ACC, B+, GND)	1.5 + 1.5	Unshielded	Unshielded	-
2	Speaker (Front-L) +/-	1.5	Unshielded	Unshielded	-
3	Speaker (Front-R) +/-	1.5	Unshielded	Unshielded	-
4	Speaker (Rear-L) +/-	1.5	Unshielded	Unshielded	-
5	Speaker (Rear-R) +/-	1.5	Unshielded	Unshielded	-
6	ANT. CONT	0.1 + 1.0	Unshielded	Unshielded	-
7	ILLUMI	0.1 + 1.0	Unshielded	Unshielded	-
8	P-CONT	0.1 + 1.0	Unshielded	Unshielded	-
9	REMOTE CONT	0.1 + 1.0	Unshielded	Unshielded	-
10	MUTE	0.1 + 1.0	Unshielded	Unshielded	-
11	REVERSE	5.5	Unshielded	Unshielded	-
12	PRK SW	2.0	Unshielded	Unshielded	-
13	VIDEO IN	0.2 + 1.5	Shielded	Shielded	-
14	VIDEO OUT	0.2 + 1.8	Shielded	Shielded	-
15	FRONT View CAM/DASH CAM	0.1 + 1.0	Shielded	Shielded	-
16	REAR VIEW CAMERA	0.1 + 1.0	Shielded	Shielded	-
17	3rd VIEW CAMERA	0.1 + 1.0	Shielded	Shielded	-
18	Front Preout	1.0	Shielded	Shielded	-
19	Rear Preout	1.0	Shielded	Shielded	-
20	Subwoofer Preout	1.2	Shielded	Shielded	-
21	AV OUT(Audio)	1.5	Shielded	Shielded	-
22	AV IN(Audio)	1.5	Shielded	Shielded	-
23	FM/AM ANT	0.1 + 2.0	Shielded	Shielded	-
24	GPS	3.5	Shielded	Shielded	-
25	USB	0.2 + 1.0	Shielded	Shielded	-
26	MIC	3.0	Shielded	Shielded	-
27	HDMI / Lightning	1.0 + 0.1	Shielded	Shielded	-
28	EXT I/F	1.0	Shielded	Shielded	-
29	iDATA I/F	1.0	Shielded	Shielded	-
30	AC	2.0	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 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 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
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.

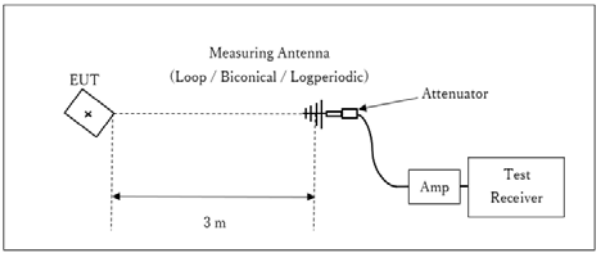
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet) Detector: Peak	RBW: 100 kHz VBW: 300 kHz

*1) Average Power Measurement was performed based on KDB 558074 D01 15.247 Meas Guidance v05r02.

Figure 2: Test Setup

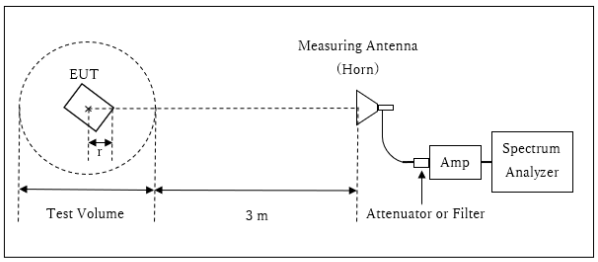
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz

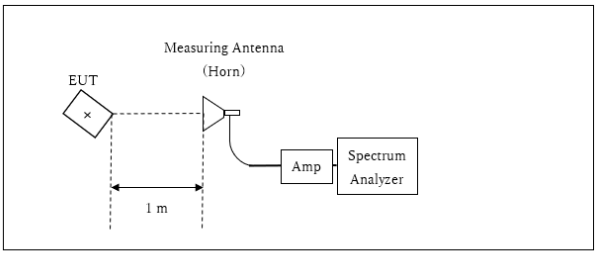


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.85 m / 3.0 m) = 2.17dB
* Test Distance: (3 + Test Volume /2) - r = 3.85 m

Test Volume : 2.0 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.15 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 each position of 0 deg. and 30 deg. of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Antenna polarization	Carrier	Spurious (30 MHz - 1 GHz)	Spurious (1 GHz – 2.8 GHz)	Spurious (2.8 GHz – 13 GHz)	Spurious (13 GHz – 18 GHz)	Spurious (18 GHz – 26.5 GHz)	Spurious (26.5 GHz – 40 GHz)
Horizontal	30 deg.	30 deg.	30 deg.	30 deg.	0 deg.	0 deg.	0 deg.
Vertical	30 deg.	30 deg.	30 deg.	30 deg.	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
20 dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 160MHz BW)
Carrier Frequency Separation	3 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	100 kHz	300 kHz	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) 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

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

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, Tx, Hopping On

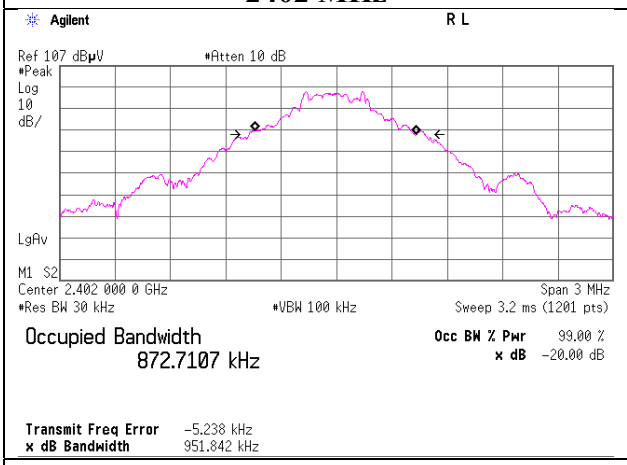
Mode	Freq. [MHz]	20dB Bandwidth [MHz]	99% Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.952	872.711	1.000	>= 0.635
DH5	2441.0	0.951	869.501	1.000	>= 0.634
DH5	2480.0	0.944	869.212	1.000	>= 0.629
DH5	Hopping On	-	78608.3	-	-
3DH5	2402.0	1.323	1215.1	1.000	>= 0.882
3DH5	2441.0	1.317	1202.2	1.000	>= 0.878
3DH5	2480.0	1.317	1206.9	1.000	>= 0.878
3DH5	Hopping On	-	78710.0	-	-

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

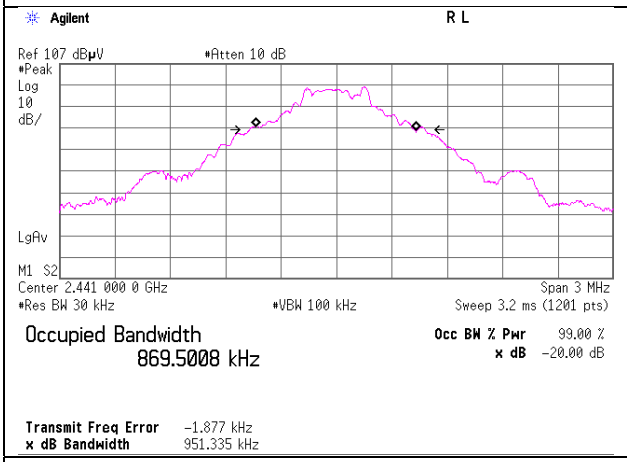
20 dB Bandwidth and 99 % Occupied Bandwidth

DH5

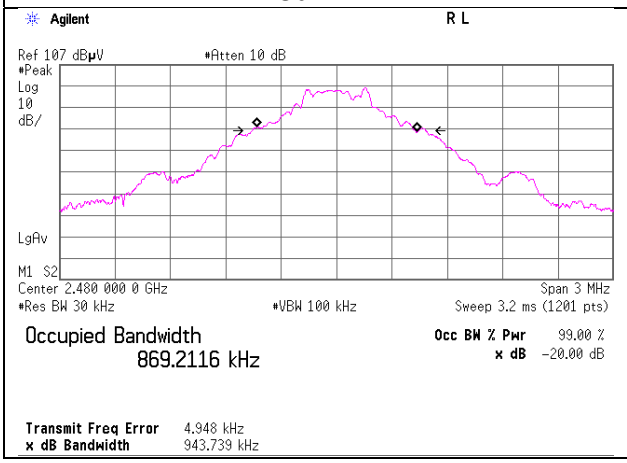
2402 MHz



2441 MHz

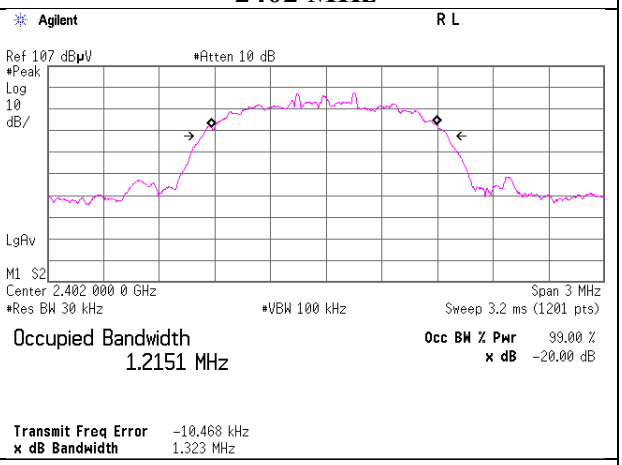


2480 MHz

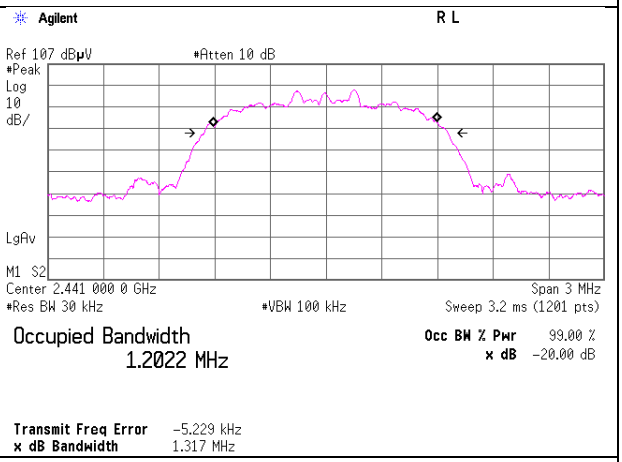


3DH5

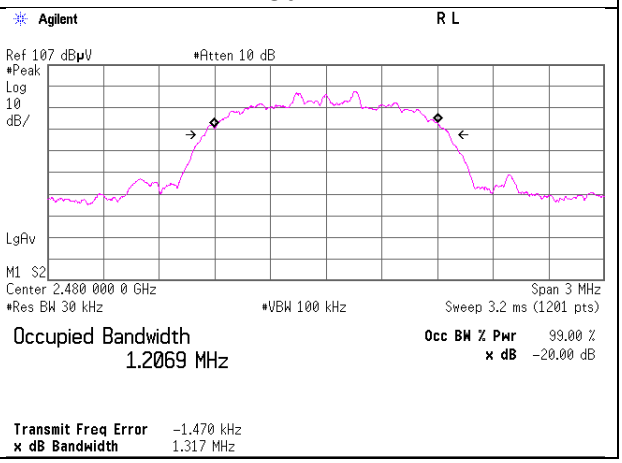
2402 MHz



2441 MHz

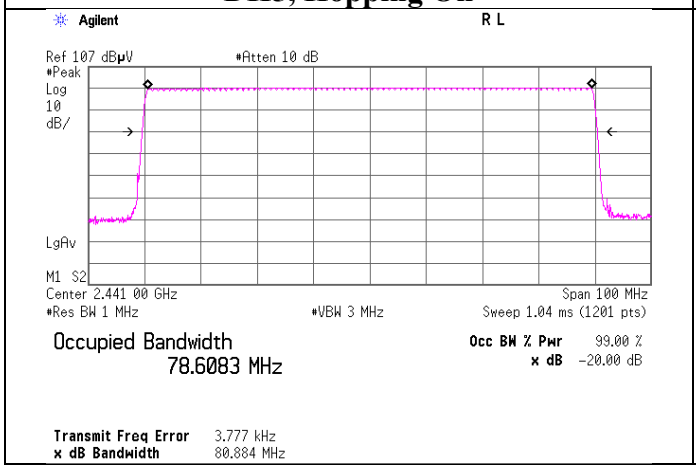


2480 MHz

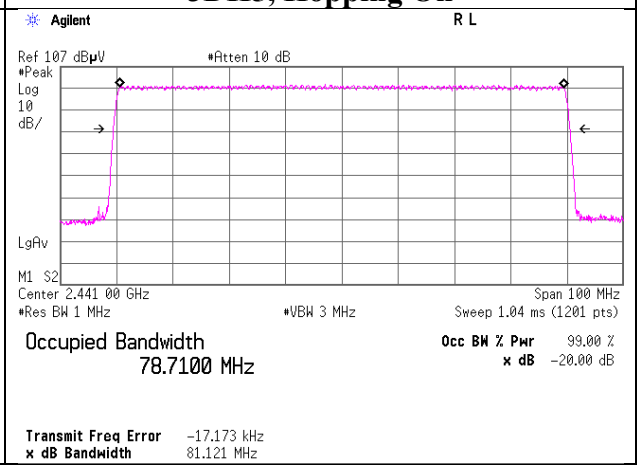


20dB Bandwidth and 99% Occupied Bandwidth

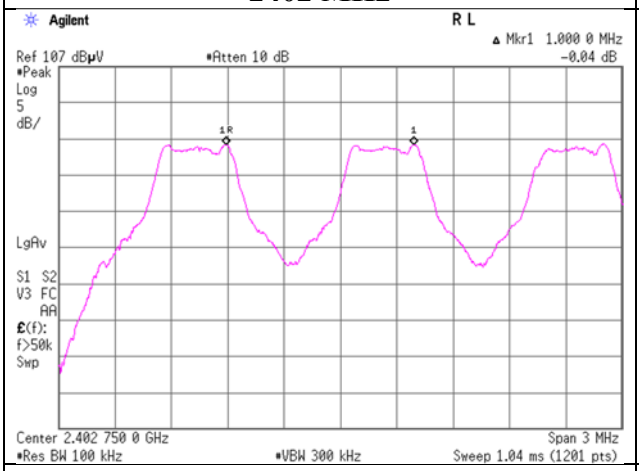
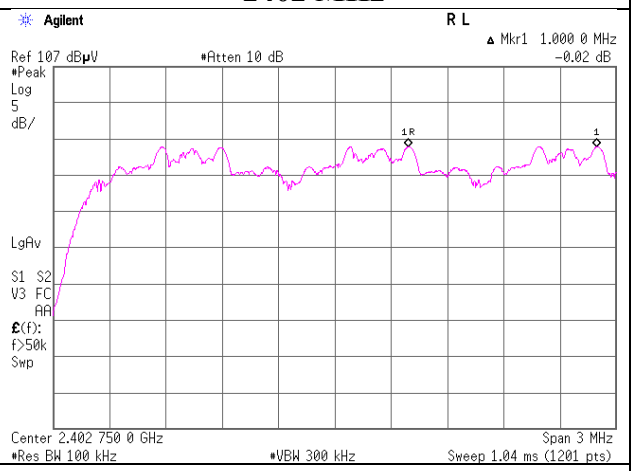
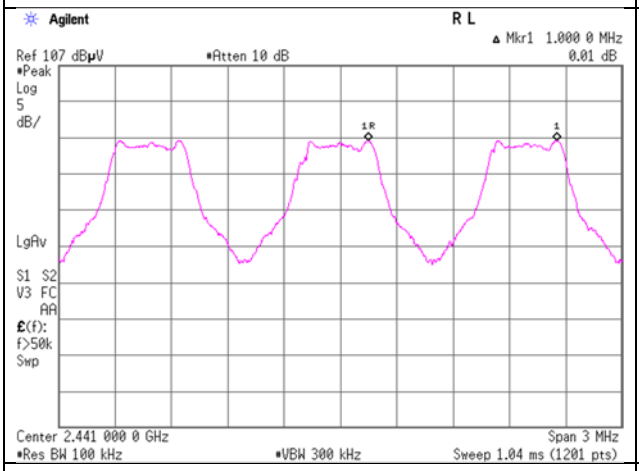
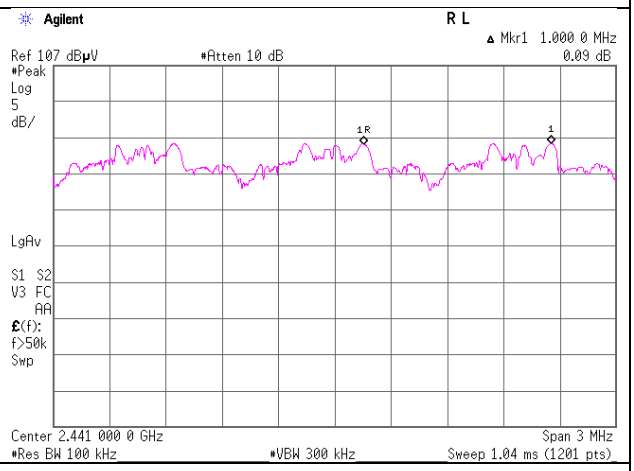
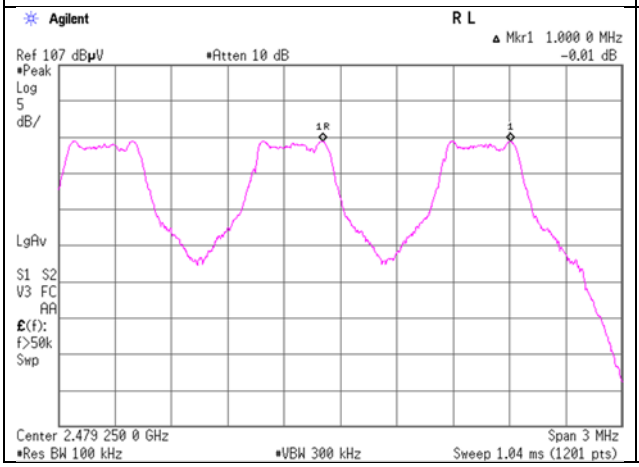
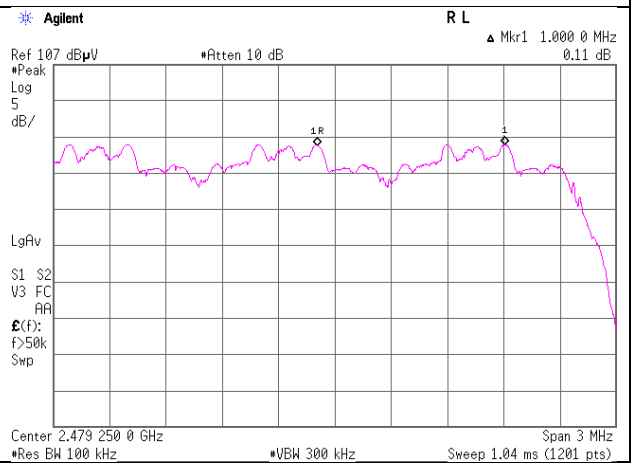
DH5, Hopping On



3DH5, Hopping On



Carrier Frequency Separation

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

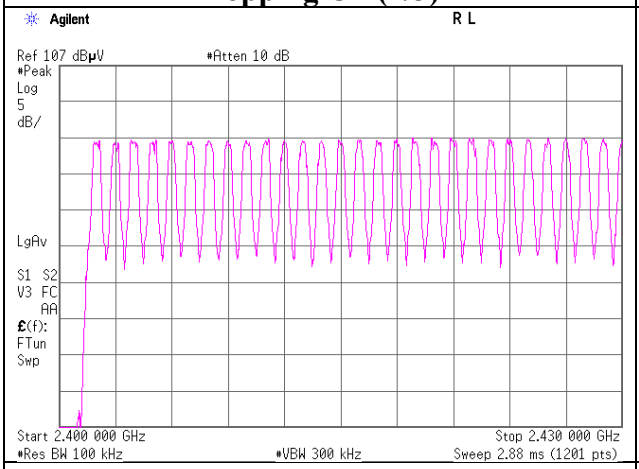
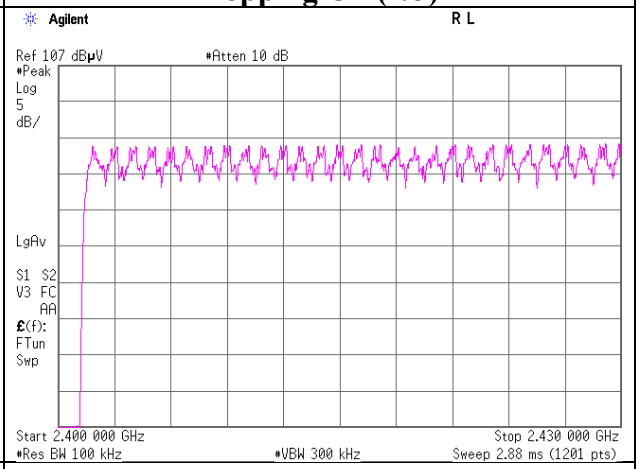
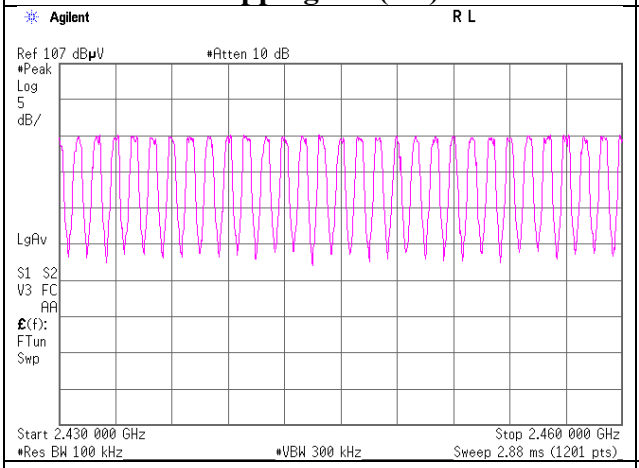
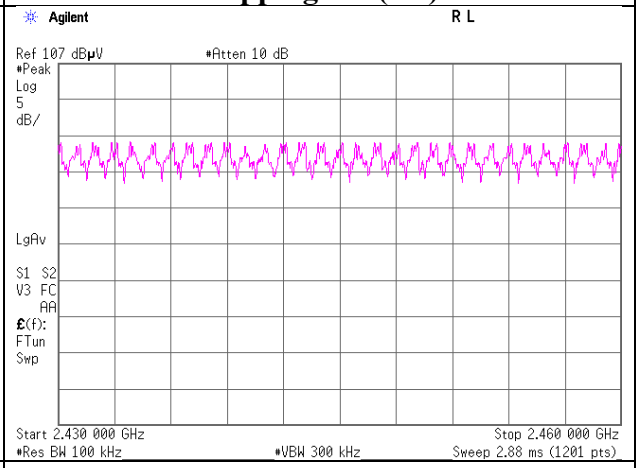
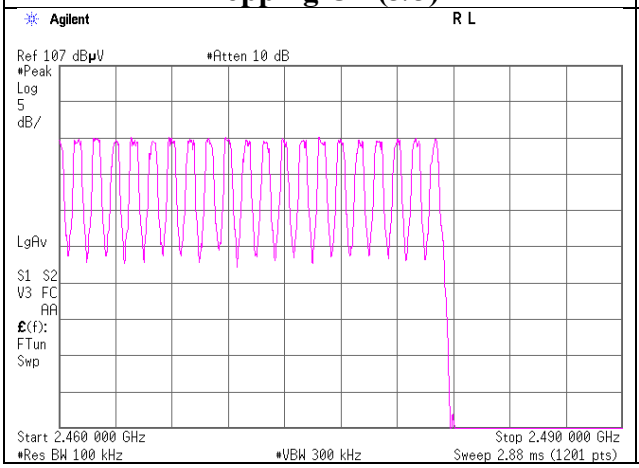
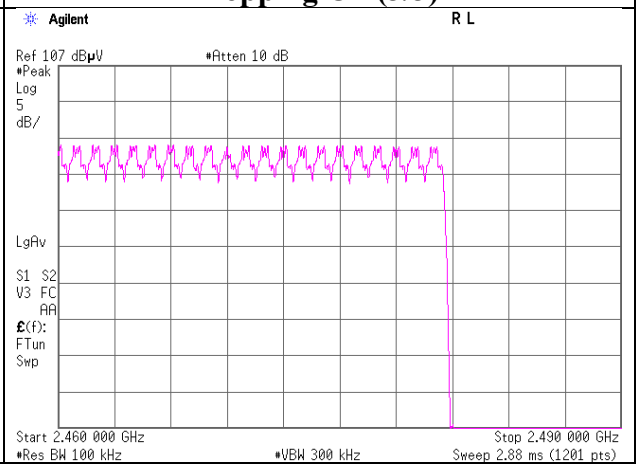
Number of Hopping Frequency

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
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.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
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	46.6 times / 5 sec. x 31.6 sec. = 295 times	0.422	124	400
DH3	25.2 times / 5 sec. x 31.6 sec. = 160 times	1.681	269	400
DH5	20.2 times / 5 sec. x 31.6 sec. = 128 times	2.927	375	400
3DH1	49.8 times / 5 sec. x 31.6 sec. = 315 times	0.428	135	400
3DH3	26.6 times / 5 sec. x 31.6 sec. = 169 times	1.680	284	400
3DH5	19.2 times / 5 sec. x 31.6 sec. = 122 times	2.931	358	400

Sample Calculation
Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

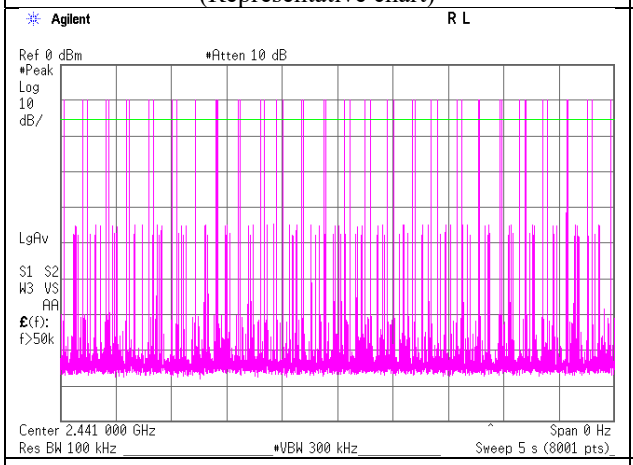
Mode	Sampling [times] 1	2	3	4	5	Average [times]
DH1	41	45	50	50	47	46.6
DH3	24	26	27	25	24	25.2
DH5	18	21	23	21	18	20.2
3DH1	50	49	51	49	50	49.8
3DH3	21	30	29	25	28	26.6
3DH5	24	23	12	19	18	19.2

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

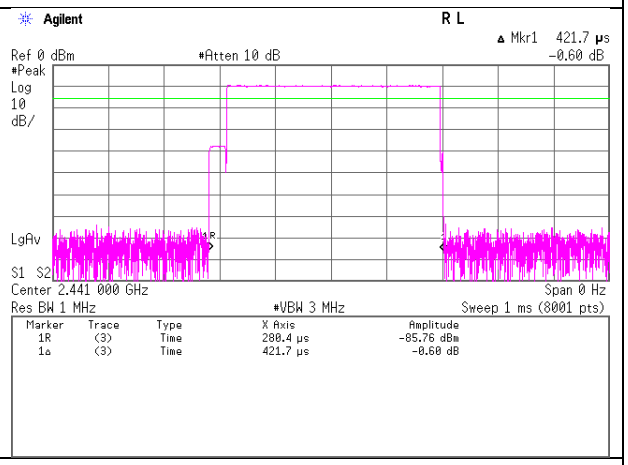
This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless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

Dwell time

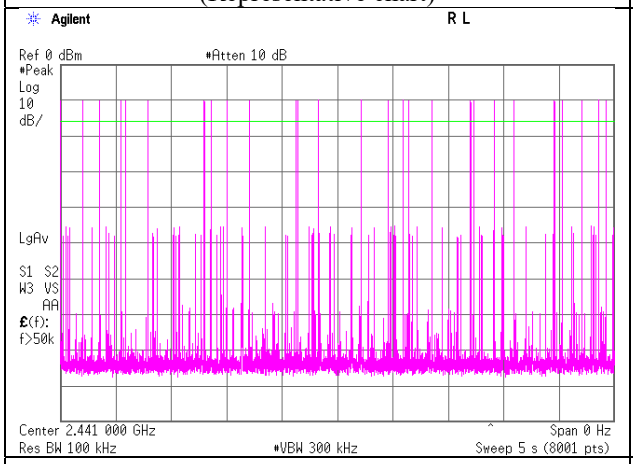
DH1 (1/2)
(Representative chart)



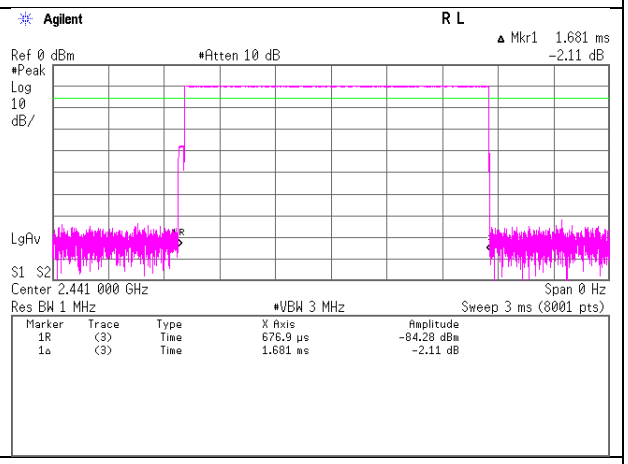
DH1 (2/2)



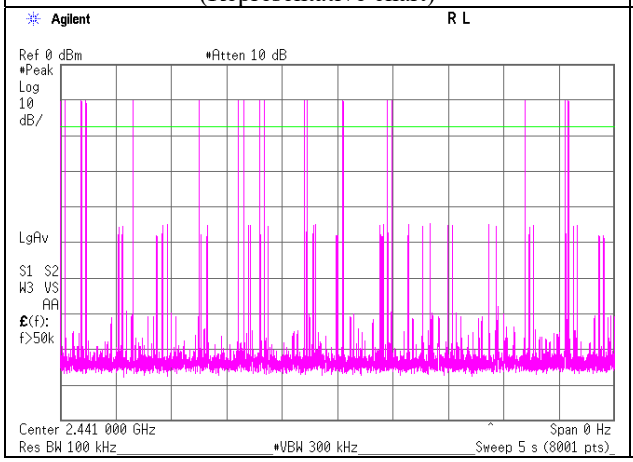
DH3 (1/2)
(Representative chart)



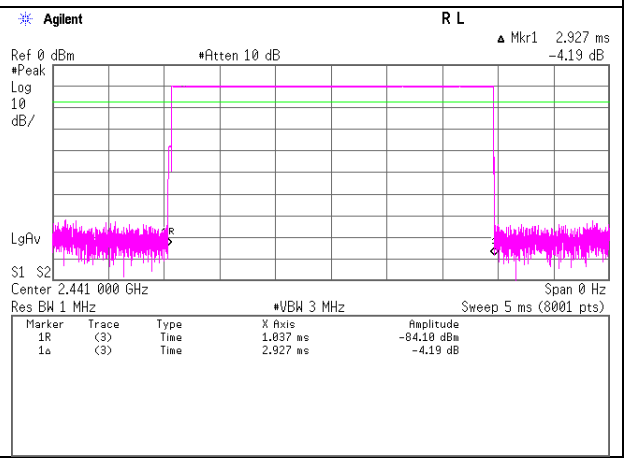
DH3 (2/2)



DH5 (1/2)
(Representative chart)

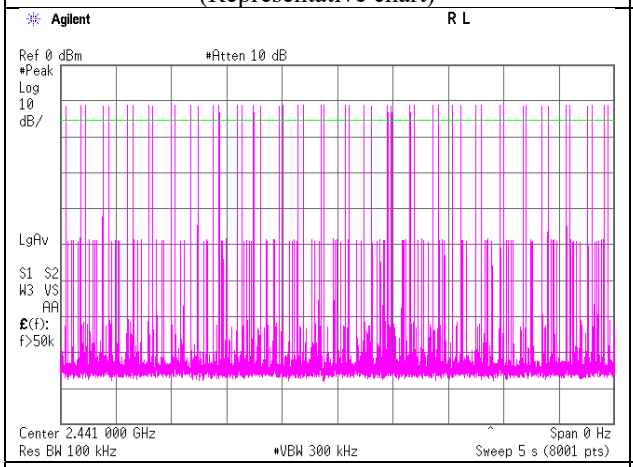


DH5 (2/2)

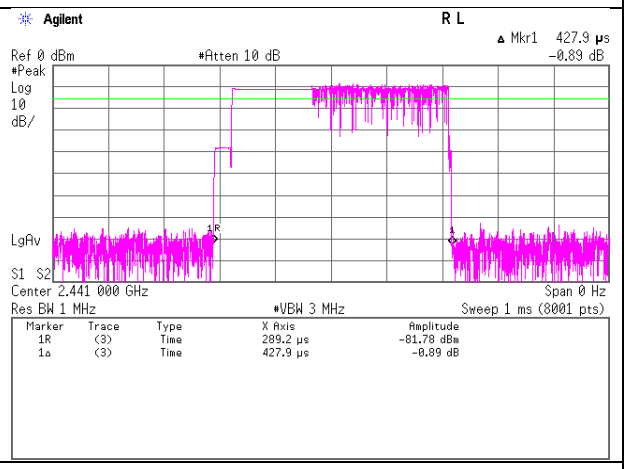


Dwell time

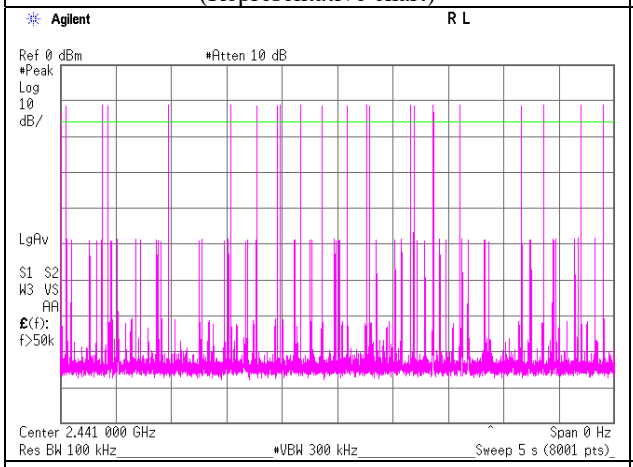
3DH1 (1/2)
(Representative chart)



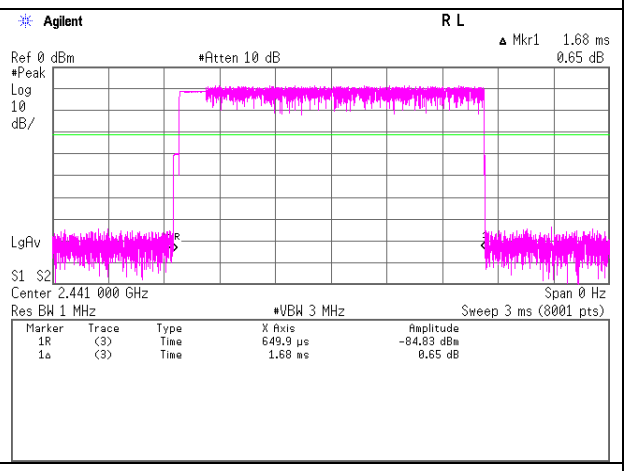
3DH1 (2/2)



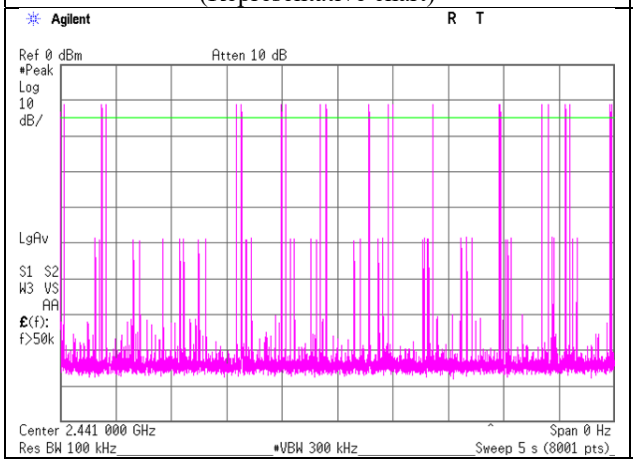
3DH3 (1/2)
(Representative chart)



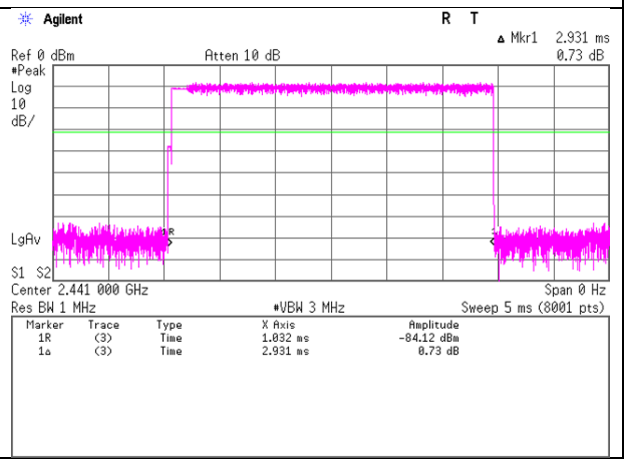
3DH3 (2/2)



3DH5 (1/2)
(Representative chart)



3DH5 (2/2)



Maximum Peak Output Power

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 6, 2020
Temperature / Humidity	22 deg. C / 23 % RH
Engineer	Shiro Kobayashi
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	-10.39	1.66	9.63	0.90	1.23	20.96	125	20.06	-5.70	-4.80	0.33	36.02	4000	40.82
DH5	2441.0	-9.86	1.66	9.63	1.43	1.39	20.96	125	19.53	-5.70	-4.27	0.37	36.02	4000	40.29
DH5	2480.0	-9.93	1.67	9.63	1.37	1.37	20.96	125	19.59	-5.70	-4.33	0.37	36.02	4000	40.35
2DH5	2402.0	-8.74	1.66	9.63	2.55	1.80	20.96	125	18.41	-5.70	-3.15	0.48	36.02	4000	39.17
2DH5	2441.0	-8.48	1.66	9.63	2.81	1.91	20.96	125	18.15	-5.70	-2.89	0.51	36.02	4000	38.91
2DH5	2480.0	-8.69	1.67	9.63	2.61	1.82	20.96	125	18.35	-5.70	-3.09	0.49	36.02	4000	39.11
3DH5	2402.0	-8.63	1.66	9.63	2.66	1.85	20.96	125	18.30	-5.70	-3.04	0.50	36.02	4000	39.06
3DH5	2441.0	-8.41	1.66	9.63	2.88	1.94	20.96	125	18.08	-5.70	-2.82	0.52	36.02	4000	38.84
3DH5	2480.0	-8.57	1.67	9.63	2.73	1.87	20.96	125	18.23	-5.70	-2.97	0.50	36.02	4000	38.99

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
However, the limit level 125mW of AFH mode was used for the test.

Average Output Power
(Reference data for RF Exposure)

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 6, 2020
Temperature / Humidity	22 deg. C / 23 % RH
Engineer	Shiro Kobayashi
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	-11.99	1.66	9.63	-0.70	0.85	1.07	0.37	1.09
DH5	2441.0	-11.40	1.66	9.63	-0.11	0.97	1.07	0.96	1.25
DH5	2480.0	-11.46	1.67	9.63	-0.16	0.96	1.07	0.91	1.23
2DH5	2402.0	-12.67	1.66	9.63	-1.38	0.73	1.07	-0.31	0.93
2DH5	2441.0	-12.49	1.66	9.63	-1.20	0.76	1.07	-0.13	0.97
2DH5	2480.0	-12.65	1.67	9.63	-1.35	0.73	1.07	-0.28	0.94
3DH5	2402.0	-12.67	1.66	9.63	-1.38	0.73	1.07	-0.31	0.93
3DH5	2441.0	-12.37	1.66	9.63	-1.08	0.78	1.07	-0.01	1.00
3DH5	2480.0	-12.64	1.67	9.63	-1.34	0.73	1.07	-0.27	0.94

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

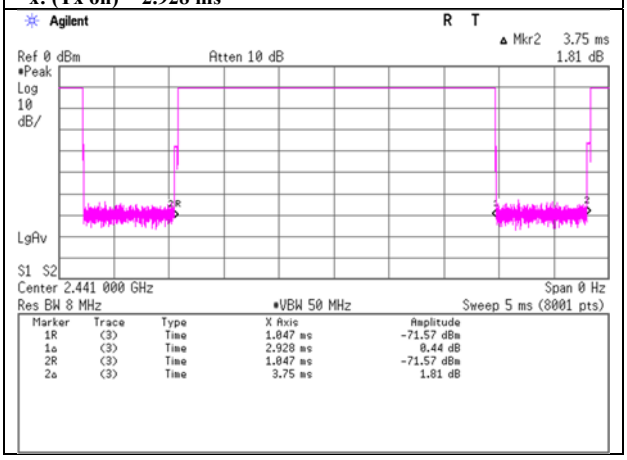
*The equipment and cables were not used for factor 0 dB of the data sheets.

Burst Rate Confirmation

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 7, 2020
Temperature / Humidity	24 deg. C / 30 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off

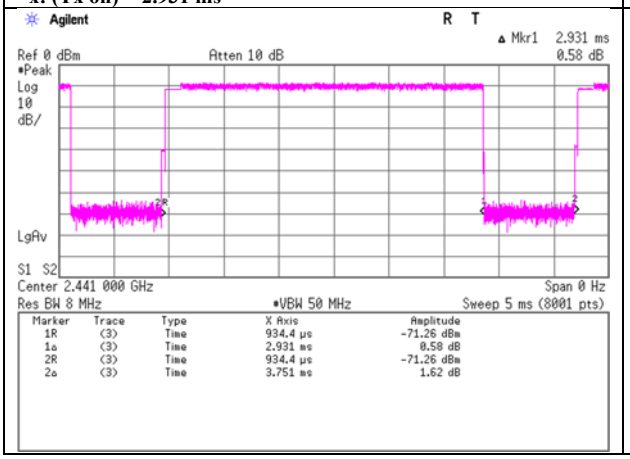
DH5

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**
VBW: 1/x = 342 Hz < 360 Hz	
x: (Tx on) = 2.928 ms	



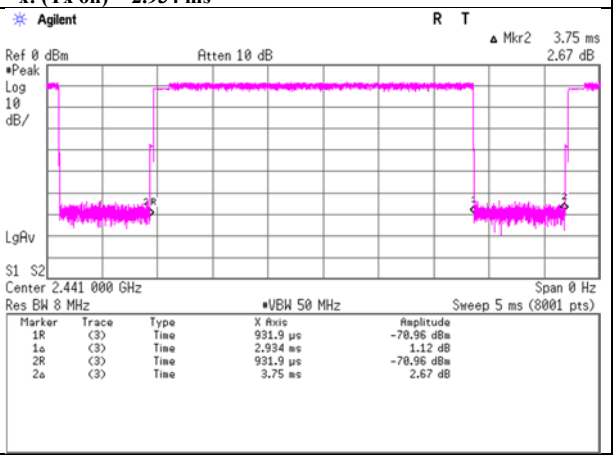
2DH5

Tx on / (Tx on + Tx off) =	**0.781**
Tx on / (Tx on + Tx off) * 100 =	**78.1 %**
Duty factor = 10 * log (3.751 / 2.931) =	**1.07 dB**
VBW: 1/x = 341 Hz < 360 Hz	
x: (Tx on) = 2.931 ms	



3DH5

Tx on / (Tx on + Tx off) =	**0.782**
Tx on / (Tx on + Tx off) * 100 =	**78.2 %**
Duty factor = 10 * log (3.75 / 2.934) =	**1.07 dB**
VBW: 1/x = 341 Hz < 360 Hz	
x: (Tx on) = 2.934 ms	



Radiated Spurious Emission

Report No.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (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.	196.606	QP	36.10	16.47	9.01	31.76	0.00	29.82	43.5	13.6	166	24	
Hori.	347.755	QP	45.20	15.04	7.23	31.63	0.00	35.84	46.0	10.1	100	80	
Hori.	480.047	QP	40.00	17.24	7.99	31.61	0.00	33.62	46.0	12.3	100	149	
Hori.	503.805	QP	41.60	17.73	8.08	31.60	0.00	35.81	46.0	10.1	100	77	
Hori.	516.092	QP	41.90	17.68	8.14	31.62	0.00	36.10	46.0	9.9	100	62	
Hori.	528.378	QP	41.70	17.58	8.20	31.64	0.00	35.84	46.0	10.1	100	57	
Hori.	2390.000	PK	45.30	28.31	14.38	39.59	2.17	50.57	73.9	23.3	149	281	
Hori.	4804.000	PK	44.93	31.60	6.84	39.75	2.17	45.79	73.9	28.1	150	0	
Hori.	7206.000	PK	44.73	37.15	8.47	39.53	2.17	52.99	73.9	20.9	150	0	
Hori.	9608.000	PK	45.49	38.53	9.98	39.67	2.17	56.50	73.9	17.4	150	0	
Hori.	2390.000	AV	32.30	28.31	14.38	39.59	2.17	37.57	53.9	16.3	149	281	VBW: 360 Hz
Hori.	4804.000	AV	33.61	31.60	6.84	39.75	2.17	34.47	53.9	19.4	150	0	VBW: 360 Hz
Hori.	7206.000	AV	34.20	37.15	8.47	39.53	2.17	42.46	53.9	11.4	150	0	VBW: 360 Hz
Hori.	9608.000	AV	33.69	38.53	9.98	39.67	2.17	44.70	53.9	**9.2**	150	0	VBW: 360 Hz
Vert.	187.498	QP	34.30	16.23	8.95	31.77	0.00	27.71	43.5	15.7	100	334	
Vert.	495.000	QP	40.30	17.64	8.04	31.60	0.00	34.38	46.0	11.6	106	232	
Vert.	2390.000	PK	44.93	28.31	14.38	39.59	2.17	50.20	73.9	23.7	100	267	
Vert.	4804.000	PK	45.12	31.60	6.84	39.75	2.17	45.98	73.9	27.9	150	0	
Vert.	7206.000	PK	44.53	37.15	8.47	39.53	2.17	52.79	73.9	21.1	150	0	
Vert.	9608.000	PK	46.27	38.53	9.98	39.67	2.17	57.28	73.9	16.6	150	0	
Vert.	2390.000	AV	33.71	28.31	14.38	39.59	2.17	38.98	53.9	14.9	100	267	VBW: 360 Hz
Vert.	4804.000	AV	33.54	31.60	6.84	39.75	2.17	34.40	53.9	19.5	150	0	VBW: 360 Hz
Vert.	7206.000	AV	33.45	37.15	8.47	39.53	2.17	41.71	53.9	12.1	150	0	VBW: 360 Hz
Vert.	9608.000	AV	33.29	38.53	9.98	39.67	2.17	44.30	53.9	9.6	150	0	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.

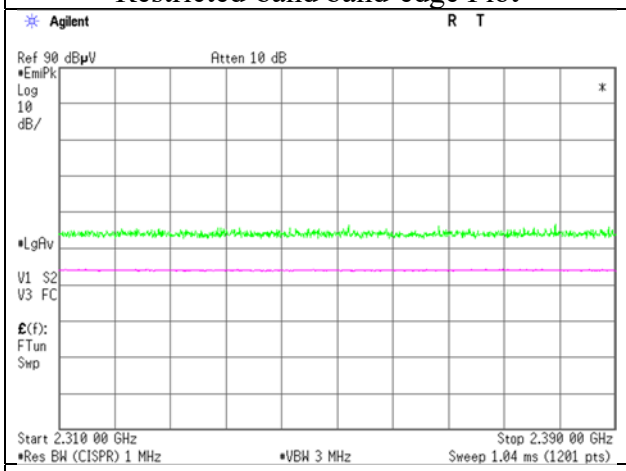
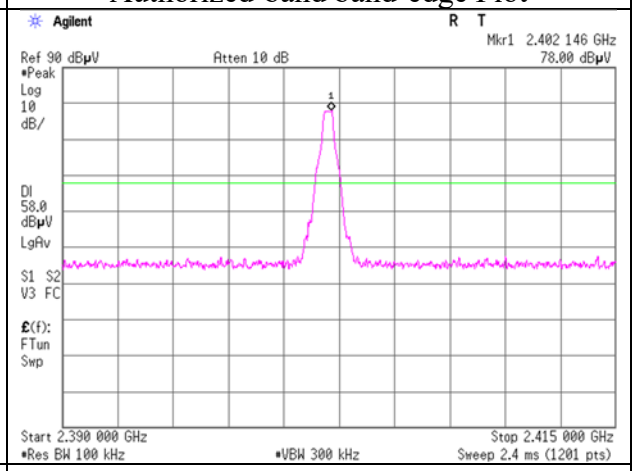
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

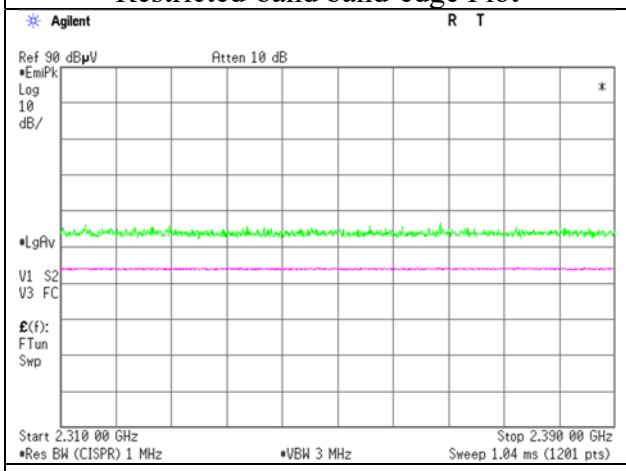
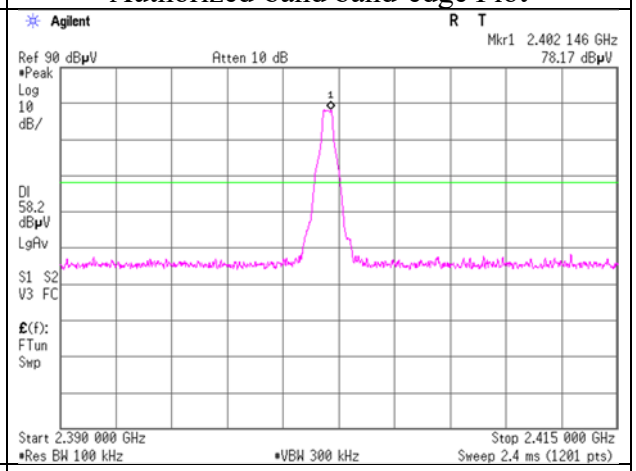
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	77.71	28.28	14.39	39.59	2.17	82.96	-	-	Carrier
Hori.	2400.000	PK	36.15	28.29	14.39	39.59	2.17	41.41	62.96	21.5	
Vert.	2402.000	PK	78.15	28.28	14.39	39.59	2.17	83.40	-	-	Carrier
Vert.	2400.000	PK	36.48	28.29	14.39	39.59	2.17	41.74	63.40	21.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 2, 2020
Temperature / Humidity	20 deg. C / 55 % RH
Engineer	Makoto Hosaka
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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami	Makoto Hosaka	Toshinori Yamada
	(30 MHz - 1 GHz)	(1 GHz - 18 GHz)	(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.	184.321	QP	37.50	16.13	8.93	31.77	0.00	30.79	43.5	12.7	176	33	
Hori.	187.496	QP	34.50	16.23	8.95	31.77	0.00	27.91	43.5	15.5	176	227	
Hori.	347.788	QP	45.40	15.04	7.23	31.63	0.00	36.04	46.0	9.9	100	79	
Hori.	480.000	QP	40.30	17.24	7.99	31.61	0.00	33.92	46.0	12.0	100	149	
Hori.	503.803	QP	41.70	17.73	8.08	31.60	0.00	35.91	46.0	10.0	100	74	
Hori.	516.092	QP	42.10	17.68	8.14	31.62	0.00	36.30	46.0	9.7	100	63	
Hori.	528.383	QP	41.60	17.58	8.20	31.64	0.00	35.74	46.0	10.2	100	60	
Hori.	4882.000	PK	45.58	31.66	6.89	39.74	2.17	46.56	73.9	27.3	150	0	
Hori.	7323.000	PK	45.30	37.24	8.55	39.60	2.17	53.66	73.9	20.2	150	0	
Hori.	9764.000	PK	45.90	39.13	10.01	39.48	2.17	57.73	73.9	16.1	150	0	
Hori.	4882.000	AV	33.52	31.66	6.89	39.74	2.17	34.50	53.9	19.4	150	0	VBW: 360 Hz
Hori.	7323.000	AV	33.19	37.24	8.55	39.60	2.17	41.55	53.9	12.3	150	0	VBW: 360 Hz
Hori.	9764.000	AV	33.78	39.13	10.01	39.48	2.17	45.61	53.9	**8.2**	150	0	VBW: 360 Hz
Vert.	187.496	QP	34.30	16.23	8.95	31.77	0.00	27.71	43.5	15.7	100	335	
Vert.	495.002	QP	40.30	17.64	8.04	31.60	0.00	34.38	46.0	11.6	108	233	
Vert.	4882.000	PK	45.75	31.66	6.89	39.74	2.17	46.73	73.9	27.1	150	0	
Vert.	7323.000	PK	45.48	37.24	8.55	39.60	2.17	53.84	73.9	20.0	150	0	
Vert.	9764.000	PK	46.23	39.13	10.01	39.48	2.17	58.06	73.9	15.8	150	0	
Vert.	4882.000	AV	33.30	31.66	6.89	39.74	2.17	34.28	53.9	19.6	150	0	VBW: 360 Hz
Vert.	7323.000	AV	33.11	37.24	8.55	39.60	2.17	41.47	53.9	12.4	150	0	VBW: 360 Hz
Vert.	9764.000	AV	33.77	39.13	10.01	39.48	2.17	45.60	53.9	8.3	150	0	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (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.	184.319	QP	37.60	16.13	8.93	31.77	0.00	30.89	43.5	12.6	170	34	
Hori.	347.697	QP	45.30	15.04	7.23	31.63	0.00	35.94	46.0	10.0	100	79	
Hori.	466.941	QP	40.80	16.96	7.95	31.62	0.00	34.09	46.0	11.9	100	98	
Hori.	503.804	QP	42.10	17.73	8.08	31.60	0.00	36.31	46.0	9.6	100	75	
Hori.	516.093	QP	42.80	17.68	8.14	31.62	0.00	37.00	46.0	9.0	100	66	
Hori.	528.400	QP	42.10	17.58	8.20	31.64	0.00	36.24	46.0	9.7	100	57	
Hori.	2483.500	PK	45.22	28.16	14.48	39.62	2.17	50.41	73.9	23.4	125	290	
Hori.	4960.000	PK	45.24	31.83	6.95	39.72	2.17	46.47	73.9	27.4	150	0	
Hori.	7440.000	PK	45.12	37.38	8.62	39.68	2.17	53.61	73.9	20.2	150	0	
Hori.	9920.000	PK	45.21	39.17	10.04	39.28	2.17	57.31	73.9	16.5	150	0	
Hori.	2483.500	AV	33.93	28.16	14.48	39.62	2.17	39.12	53.9	14.7	125	290	VBW: 360 Hz
Hori.	4960.000	AV	33.30	31.83	6.95	39.72	2.17	34.53	53.9	19.3	150	0	VBW: 360 Hz
Hori.	7440.000	AV	33.29	37.38	8.62	39.68	2.17	41.78	53.9	12.1	150	0	VBW: 360 Hz
Hori.	9920.000	AV	33.20	39.17	10.04	39.28	2.17	45.30	53.9	**8.6**	150	0	VBW: 360 Hz
Vert.	187.505	QP	34.40	16.24	8.94	31.77	0.00	27.81	43.5	15.6	100	334	
Vert.	495.000	QP	40.30	17.64	8.04	31.60	0.00	34.38	46.0	11.6	106	233	
Vert.	2483.500	PK	45.38	28.16	14.48	39.62	2.17	50.57	73.9	23.3	146	269	
Vert.	4960.000	PK	45.25	31.83	6.95	39.72	2.17	46.48	73.9	27.4	150	0	
Vert.	7440.000	PK	44.36	37.38	8.62	39.68	2.17	52.85	73.9	21.0	150	0	
Vert.	9920.000	PK	45.33	39.17	10.04	39.28	2.17	57.43	73.9	16.4	150	0	
Vert.	2483.500	AV	33.85	28.16	14.48	39.62	2.17	39.04	53.9	14.8	146	269	VBW: 360 Hz
Vert.	4960.000	AV	33.29	31.83	6.95	39.72	2.17	34.52	53.9	19.3	150	0	VBW: 360 Hz
Vert.	7440.000	AV	33.11	37.38	8.62	39.68	2.17	41.60	53.9	12.3	150	0	VBW: 360 Hz
Vert.	9920.000	AV	33.19	39.17	10.04	39.28	2.17	45.29	53.9	**8.6**	150	0	VBW: 360 Hz

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

Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 dB

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

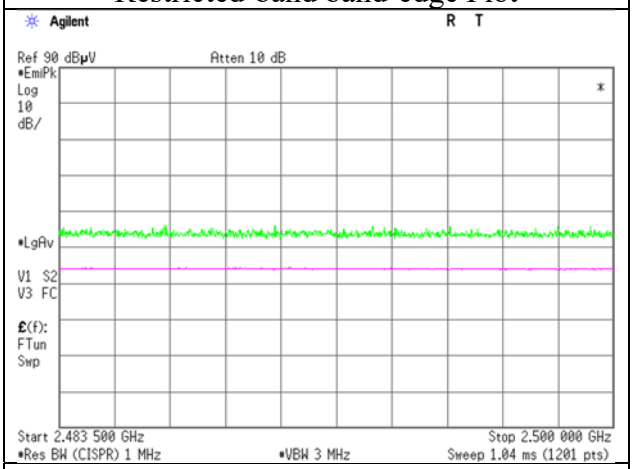
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 2, 2020
Temperature / Humidity	20 deg. C / 55 % RH
Engineer	Makoto Hosaka
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

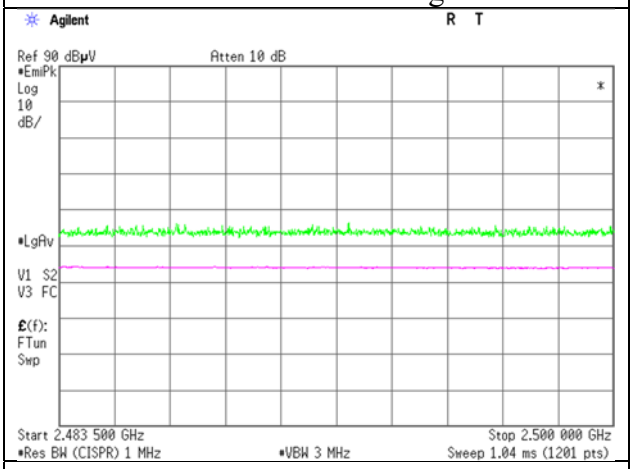
Restricted-band band-edge Plot



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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (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.	184.320	QP	37.60	16.13	8.93	31.77	0.00	30.89	43.5	12.6	182	31	
Hori.	347.766	QP	45.50	15.04	7.23	31.63	0.00	36.14	46.0	9.8	100	80	
Hori.	480.048	QP	40.10	17.24	7.99	31.61	0.00	33.72	46.0	12.2	100	149	
Hori.	503.805	QP	42.50	17.73	8.08	31.60	0.00	36.71	46.0	9.2	100	76	
Hori.	516.091	QP	43.70	17.68	8.14	31.62	0.00	37.90	46.0	**8.1**	100	68	
Hori.	528.400	QP	43.10	17.58	8.20	31.64	0.00	37.24	46.0	8.7	100	61	
Hori.	2390.000	PK	47.79	28.31	14.38	39.59	2.17	53.06	73.9	20.8	150	280	
Hori.	4804.000	PK	45.87	31.60	6.84	39.75	2.17	46.73	73.9	27.1	150	0	
Hori.	7206.000	PK	45.59	37.15	8.47	39.53	2.17	53.85	73.9	20.0	150	0	
Hori.	9608.000	PK	44.35	38.53	9.98	39.67	2.17	55.36	73.9	18.5	150	0	
Hori.	2390.000	AV	36.48	28.31	14.38	39.59	2.17	41.75	53.9	12.1	150	280	VBW: 360 Hz
Hori.	4804.000	AV	33.75	31.60	6.84	39.75	2.17	34.61	53.9	19.2	150	0	VBW: 360 Hz
Hori.	7206.000	AV	33.46	37.15	8.47	39.53	2.17	41.72	53.9	12.1	150	0	VBW: 360 Hz
Hori.	9608.000	AV	33.08	38.53	9.98	39.67	2.17	44.09	53.9	9.8	150	0	VBW: 360 Hz
Vert.	187.497	QP	34.40	16.23	8.95	31.77	0.00	27.81	43.5	15.6	100	331	
Vert.	495.002	QP	40.30	17.64	8.04	31.60	0.00	34.38	46.0	11.6	107	235	
Vert.	2390.000	PK	45.49	28.31	14.39	39.59	2.17	50.76	73.9	23.1	100	264	
Vert.	4804.000	PK	45.37	31.60	6.84	39.75	2.17	46.23	73.9	27.6	150	0	
Vert.	7206.000	PK	45.54	37.15	8.47	39.53	2.17	53.80	73.9	20.1	150	0	
Vert.	9608.000	PK	44.46	38.53	9.98	39.67	2.17	55.47	73.9	18.4	150	0	
Vert.	2390.000	AV	33.88	28.31	14.39	39.59	2.17	50.76	53.9	14.7	100	264	VBW: 360 Hz
Vert.	4804.000	AV	33.59	31.60	6.84	39.75	2.17	34.45	53.9	19.4	150	0	VBW: 360 Hz
Vert.	7206.000	AV	33.61	37.15	8.47	39.53	2.17	41.87	53.9	12.0	150	0	VBW: 360 Hz
Vert.	9608.000	AV	33.14	38.53	9.98	39.67	2.17	44.15	53.9	9.7	150	0	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.

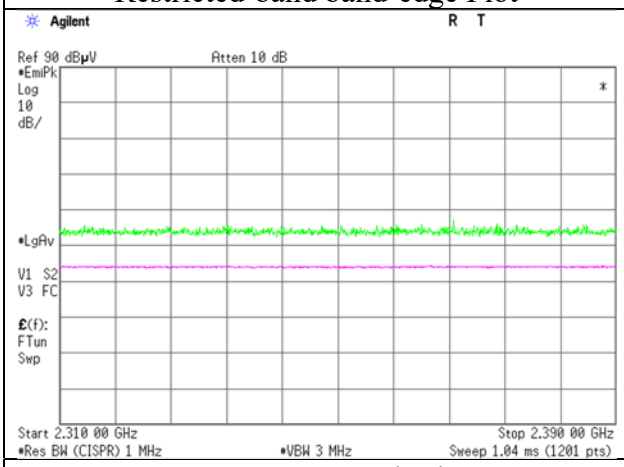
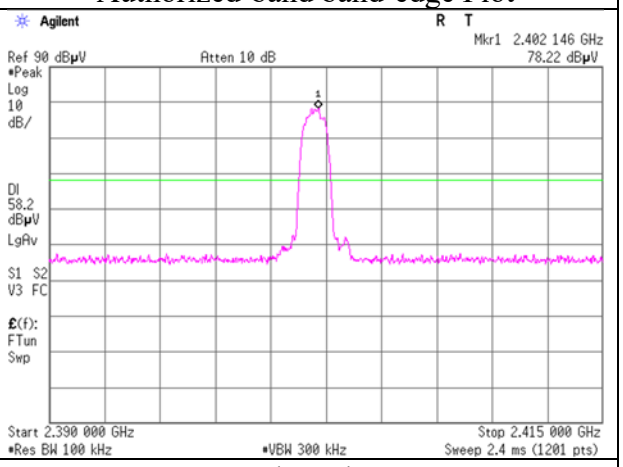
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

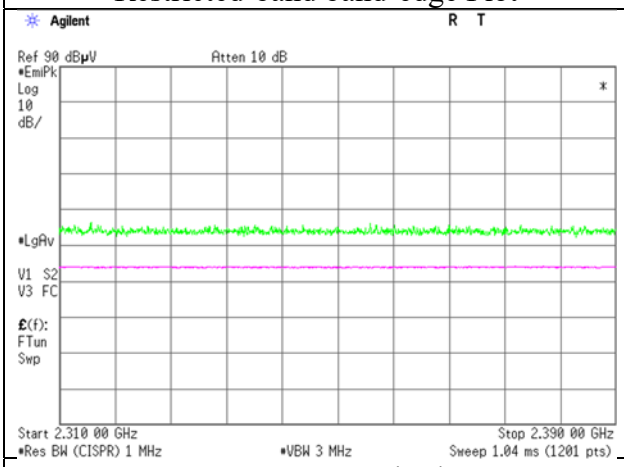
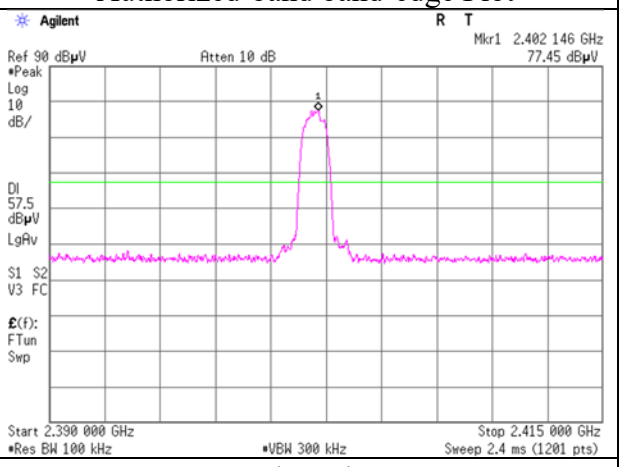
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	78.09	28.28	14.39	39.59	2.17	83.34	-	-	Carrier
Hori.	2400.000	PK	38.23	28.29	14.39	39.59	2.17	43.49	63.34	19.8	
Vert.	2402.000	PK	77.32	28.28	14.39	39.59	2.17	82.57	-	-	Carrier
Vert.	2400.000	PK	35.36	28.29	14.39	39.59	2.17	40.62	62.57	21.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 2, 2020
Temperature / Humidity	20 deg. C / 55 % RH
Engineer	Makoto Hosaka
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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (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.	184.319	QP	37.30	16.13	8.93	31.77	0.00	30.59	43.5	12.9	179	29	
Hori.	347.511	QP	45.70	15.04	7.23	31.63	0.00	36.34	46.0	9.6	100	81	
Hori.	479.226	QP	39.80	17.22	7.99	31.61	0.00	33.40	46.0	12.6	100	145	
Hori.	503.801	QP	42.50	17.73	8.08	31.60	0.00	36.71	46.0	9.2	100	77	
Hori.	516.092	QP	43.50	17.68	8.14	31.62	0.00	37.70	46.0	**8.3**	100	66	
Hori.	528.379	QP	43.20	17.58	8.20	31.64	0.00	37.34	46.0	8.6	100	62	
Hori.	4882.000	PK	45.48	31.66	6.89	39.74	2.17	46.46	73.9	27.4	100	0	
Hori.	7323.000	PK	44.82	37.24	8.55	39.60	2.17	53.18	73.9	20.7	100	0	
Hori.	9764.000	PK	45.04	39.13	10.01	39.48	2.17	56.87	73.9	17.0	100	0	
Hori.	4882.000	AV	33.60	31.66	6.89	39.74	2.17	34.58	53.9	19.3	100	0	VBW: 360 Hz
Hori.	7323.000	AV	33.08	37.24	8.55	39.60	2.17	41.44	53.9	12.4	100	0	VBW: 360 Hz
Hori.	9764.000	AV	33.44	39.13	10.01	39.48	2.17	45.27	53.9	8.6	100	0	VBW: 360 Hz
Vert.	187.495	QP	34.20	16.23	8.95	31.77	0.00	27.61	43.5	15.8	100	329	
Vert.	495.002	QP	40.20	17.64	8.04	31.60	0.00	34.28	46.0	11.7	108	233	
Vert.	4882.000	PK	45.81	31.66	6.89	39.74	2.17	46.79	73.9	27.1	150	0	
Vert.	7323.000	PK	45.26	37.24	8.55	39.60	2.17	53.62	73.9	20.2	150	0	
Vert.	9764.000	PK	44.59	39.13	10.01	39.48	2.17	56.42	73.9	17.4	150	0	
Vert.	4882.000	AV	33.44	31.66	6.89	39.74	2.17	34.42	53.9	19.4	150	0	VBW: 360 Hz
Vert.	7323.000	AV	33.19	37.24	8.55	39.60	2.17	41.55	53.9	12.3	150	0	VBW: 360 Hz
Vert.	9764.000	AV	33.48	39.13	10.01	39.48	2.17	45.31	53.9	8.5	150	0	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (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.	184.319	QP	38.00	16.13	8.93	31.77	0.00	31.29	43.5	12.2	172	35	
Hori.	347.732	QP	45.70	15.04	7.23	31.63	0.00	36.34	46.0	9.6	100	83	
Hori.	480.050	QP	40.20	17.24	7.99	31.61	0.00	33.82	46.0	12.1	100	148	
Hori.	503.801	QP	40.90	17.73	8.08	31.60	0.00	35.11	46.0	10.8	100	76	
Hori.	516.091	QP	42.20	17.68	8.14	31.62	0.00	36.40	46.0	9.6	100	67	
Hori.	528.401	QP	42.20	17.58	8.20	31.64	0.00	36.34	46.0	9.6	100	62	
Hori.	2483.500	PK	44.97	28.16	14.48	39.62	2.17	50.16	73.9	23.7	119	290	
Hori.	4960.000	PK	44.58	31.83	6.95	39.72	2.17	45.81	73.9	28.0	150	0	
Hori.	7440.000	PK	44.12	37.38	8.62	39.68	2.17	52.61	73.9	21.2	150	0	
Hori.	9920.000	PK	44.24	39.17	10.04	39.28	2.17	56.34	73.9	17.5	150	0	
Hori.	2483.500	AV	33.80	28.16	14.48	39.62	2.17	38.99	53.9	14.9	119	290	VBW: 360 Hz
Hori.	4960.000	AV	33.24	31.83	6.95	39.72	2.17	34.47	53.9	19.4	150	0	VBW: 360 Hz
Hori.	7440.000	AV	33.08	37.38	8.62	39.68	2.17	41.57	53.9	12.3	150	0	VBW: 360 Hz
Hori.	9920.000	AV	32.94	39.17	10.04	39.28	2.17	45.04	53.9	8.8	150	0	VBW: 360 Hz
Vert.	187.496	QP	34.40	16.23	8.95	31.77	0.00	27.81	43.5	15.6	100	339	
Vert.	495.002	QP	40.10	17.64	8.04	31.60	0.00	34.18	46.0	11.8	107	234	
Vert.	2483.500	PK	44.92	28.16	14.48	39.62	2.17	50.11	73.9	23.7	147	268	
Vert.	4499.986	PK	47.76	30.95	6.62	39.82	2.17	47.68	73.9	26.2	154	276	
Vert.	7440.000	PK	44.14	37.38	8.62	39.68	2.17	52.63	73.9	21.2	150	0	
Vert.	9920.000	PK	45.12	39.17	10.04	39.28	2.17	57.22	73.9	16.6	150	0	
Vert.	2483.500	AV	33.77	28.16	14.48	39.62	2.17	38.96	53.9	14.9	147	268	VBW: 360 Hz
Vert.	4960.000	AV	33.29	31.83	6.95	39.72	2.17	34.52	53.9	19.3	150	0	VBW: 360 Hz
Vert.	7440.000	AV	33.64	37.38	8.62	39.68	2.17	42.13	53.9	11.7	150	0	VBW: 360 Hz
Vert.	9920.000	AV	33.03	39.17	10.04	39.28	2.17	45.13	53.9	**8.7**	150	0	VBW: 360 Hz

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

Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 dB

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

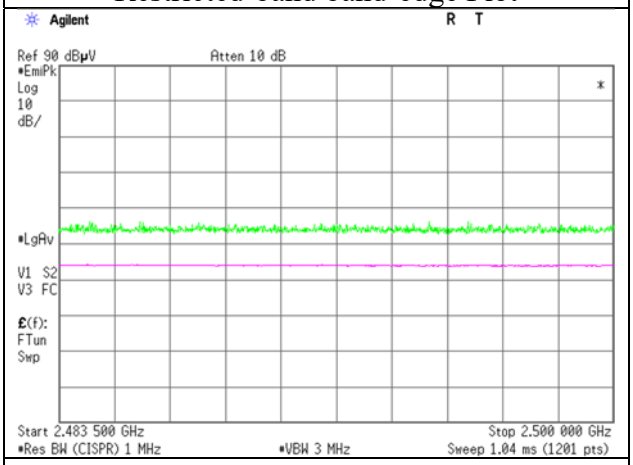
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.1
Date	April 2, 2020
Temperature / Humidity	20 deg. C / 55 % RH
Engineer	Makoto Hosaka
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

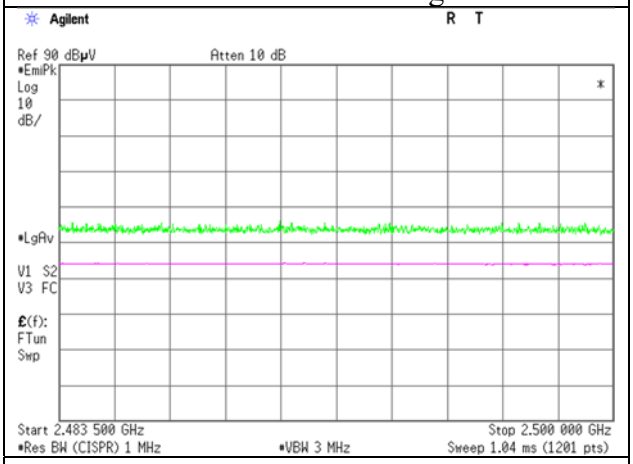
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

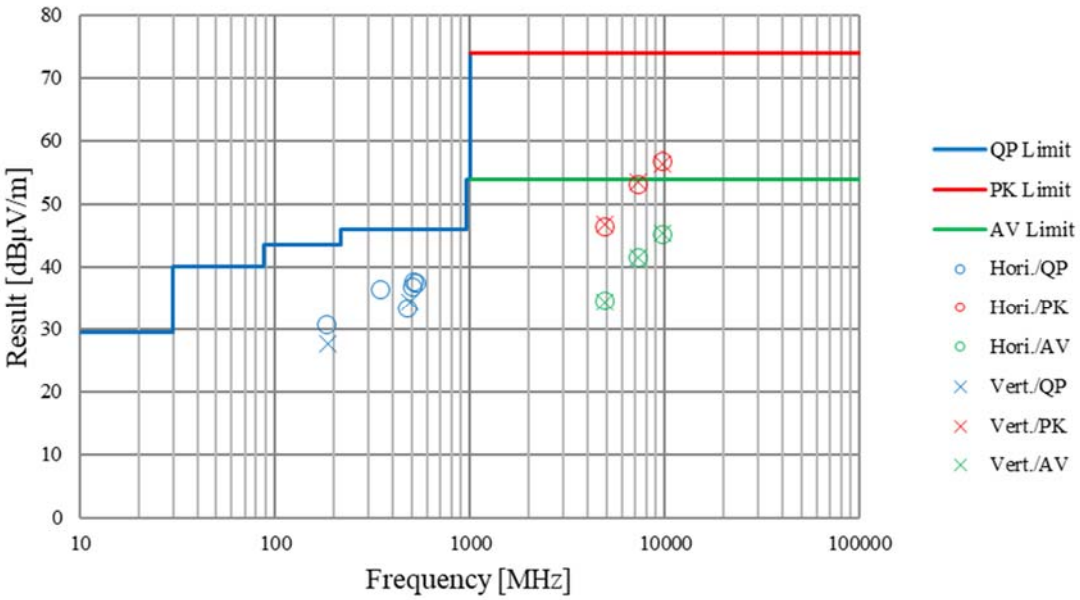


Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(Plot data, Worst case)

Report No.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.1	No.1
Date	April 14, 2020	April 2, 2020	April 4, 2020
Temperature / Humidity	26 deg. C / 23 % RH	20 deg. C / 55 % RH	21 deg. C / 41 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Makoto Hosaka (1 GHz - 18 GHz)	Toshinori Yamada (18 GHz – 40 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 MHz		



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

Radiated Spurious Emission

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda (1 GHz - 2.8 GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz with 11ac-20 MIMO 5745 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	44.55	28.51	14.04	38.68	2.17	50.59	73.9	23.3	225	278	
Hori.	2390.000	AV	33.04	28.51	14.04	38.68	2.17	39.08	53.9	**14.8**	225	278	VBW: 360 Hz
Vert.	2390.000	PK	44.51	28.51	14.04	38.68	2.17	50.55	73.9	23.3	186	172	
Vert.	2390.000	AV	33.06	28.51	14.04	38.68	2.17	39.10	53.9	**14.8**	186	172	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.

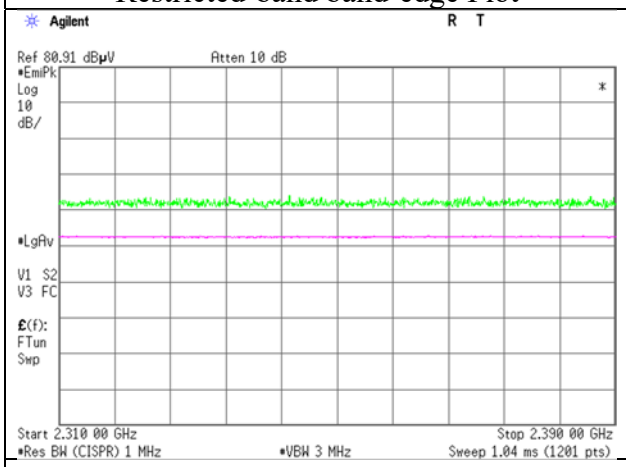
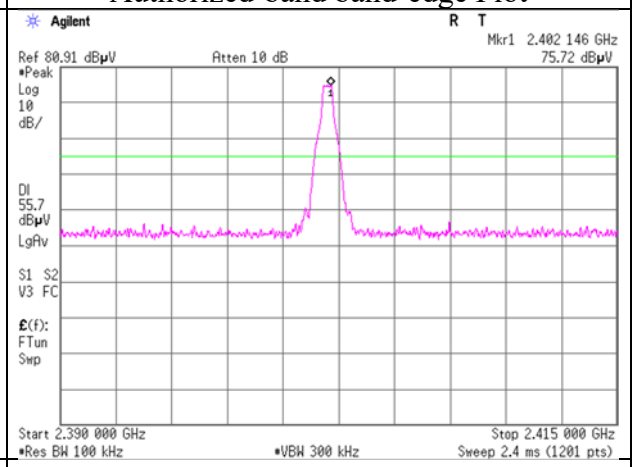
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

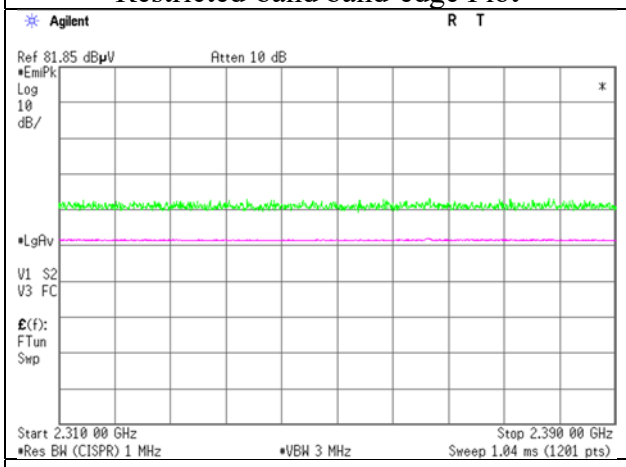
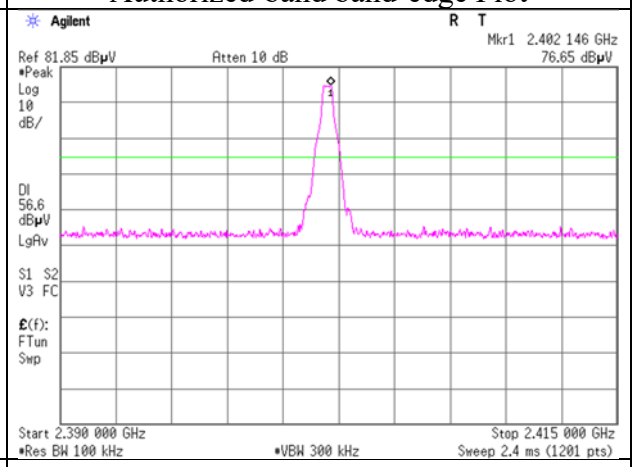
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	75.84	28.48	14.05	38.67	2.17	81.87	-	-	Carrier
Hori.	2400.000	PK	35.48	28.48	14.05	38.67	2.17	41.51	61.87	20.3	
Vert.	2402.000	PK	76.62	28.48	14.05	38.67	2.17	82.65	-	-	Carrier
Vert.	2400.000	PK	35.96	28.48	14.05	38.67	2.17	41.99	62.65	20.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
Mode	Tx, Hopping Off, DH5 2402 MHz with 11ac-20 MIMO 5745 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda (1 GHz - 2.8 GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz with 11ac-20 MIMO 5745 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	45.12	28.35	14.13	38.62	2.17	51.15	73.9	22.7	164	289	
Hori.	2483.500	AV	33.04	28.35	14.13	38.62	2.17	39.07	53.9	**14.8**	164	289	VBW: 360 Hz
Vert.	2483.500	PK	45.25	28.35	14.13	38.62	2.17	51.28	73.9	22.6	169	174	
Vert.	2483.500	AV	33.01	28.35	14.13	38.62	2.17	39.04	53.9	**14.8**	169	174	VBW: 360 Hz

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

Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 dB

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

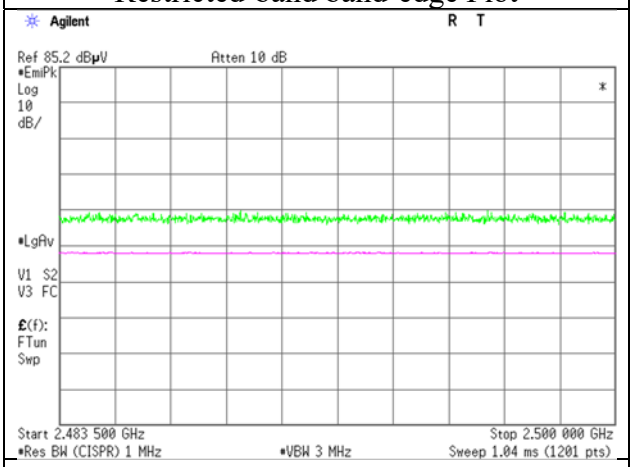
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
Mode	Tx, Hopping Off, DH5 2480 MHz with 11ac-20 MIMO 5745 MHz

Horizontal

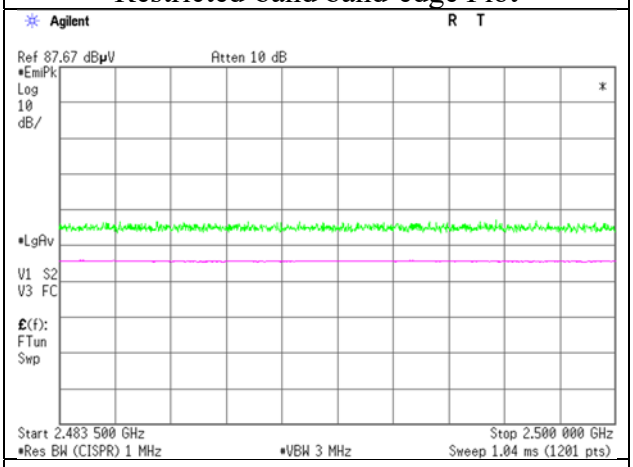
Restricted-band band-edge Plot



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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
	(1 GHz - 2.8 GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz with 11ac-20 MIMO 5745 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	45.89	28.51	14.04	38.68	2.17	51.93	73.9	21.9	219	277	
Hori.	2390.000	AV	33.12	28.51	14.04	38.68	2.17	39.16	53.9	**14.7**	219	277	VBW: 360 Hz
Vert.	2390.000	PK	45.24	28.51	14.04	38.68	2.17	51.28	73.9	22.6	187	169	
Vert.	2390.000	AV	33.05	28.51	14.04	38.68	2.17	39.09	53.9	**14.8**	187	169	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.

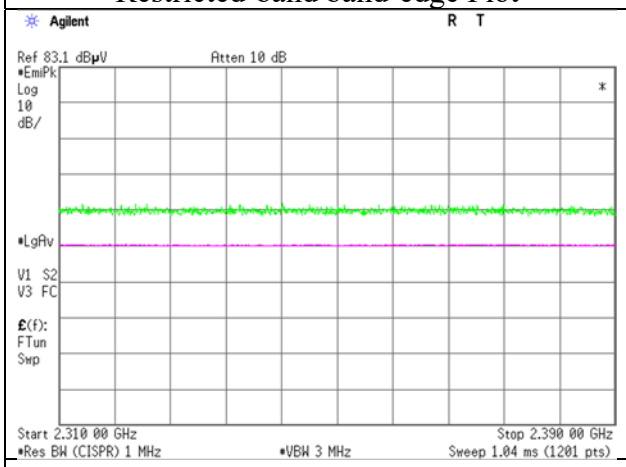
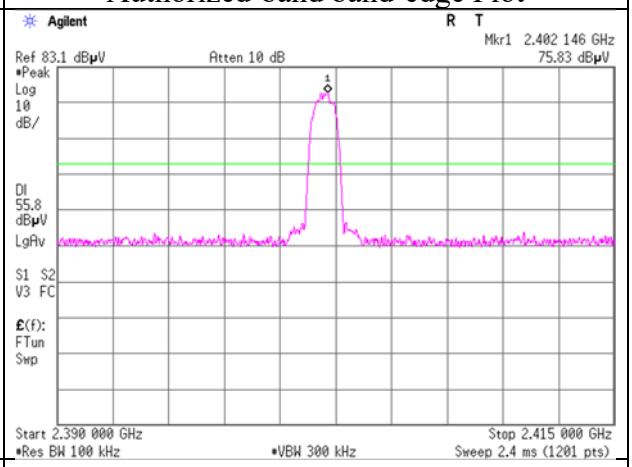
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

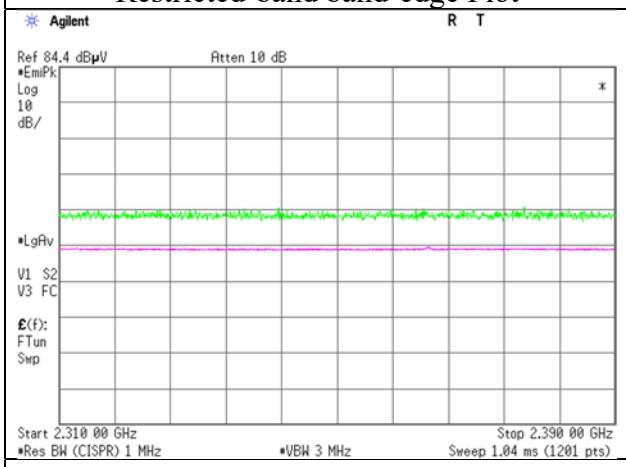
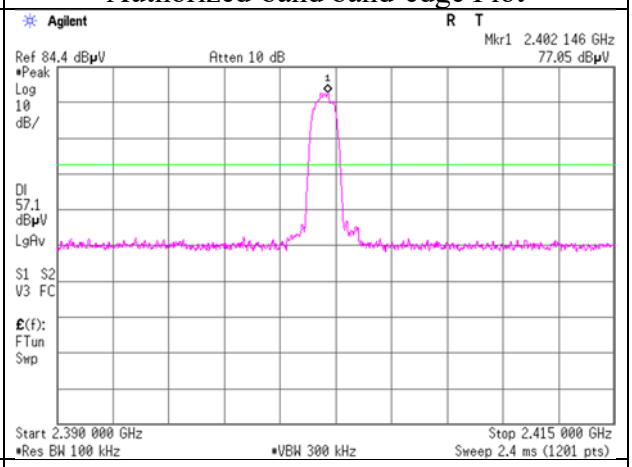
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	75.81	28.48	14.05	38.67	2.17	81.84	-	-	Carrier
Hori.	2400.000	PK	36.63	28.48	14.05	38.67	2.17	42.66	61.84	19.1	
Vert.	2402.000	PK	77.07	28.48	14.05	38.67	2.17	83.10	-	-	Carrier
Vert.	2400.000	PK	35.71	28.48	14.05	38.67	2.17	41.74	63.10	21.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
Mode	Tx, Hopping Off, 3DH5 2402 MHz with 11ac-20 MIMO 5745 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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.3
Date	April 14, 2020	April 9, 2020	April 10, 2020
Temperature / Humidity	26 deg. C / 23 % RH	22 deg. C / 45 % RH	23 deg. C / 33 % RH
Engineer	Takahiro Kawakami (30 MHz - 1 GHz)	Kazuya Noda (1 GHz - 13 GHz)	Makoto Hosaka (13 GHz – 40 GHz)
Mode	Tx, Hopping Off, 3DH5 2441 MHz with 11ac-20 MIMO 5745 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.	184.319	QP	37.60	16.13	8.93	31.77	0.00	30.89	43.5	12.6	175	37	
Hori.	346.113	QP	45.70	15.02	7.21	31.64	0.00	36.29	46.0	9.7	100	79	
Hori.	480.047	QP	41.70	17.24	7.99	31.61	0.00	35.32	46.0	10.6	100	72	
Hori.	503.804	QP	40.60	17.73	8.08	31.60	0.00	34.81	46.0	11.1	100	74	
Hori.	516.092	QP	41.90	17.68	8.14	31.62	0.00	36.10	46.0	9.9	100	66	
Hori.	528.380	QP	41.80	17.58	8.20	31.64	0.00	35.94	46.0	10.0	100	59	
Hori.	4882.000	PK	44.12	31.74	15.97	38.55	2.17	55.45	73.9	18.4	100	0	
Hori.	7323.000	PK	45.69	37.42	8.00	39.33	2.17	53.95	73.9	19.9	100	0	
Hori.	9764.000	PK	45.97	39.37	9.06	39.62	2.17	56.95	73.9	16.9	100	0	
Hori.	4882.000	AV	32.51	31.74	15.97	38.55	2.17	43.84	53.9	10.0	100	0	VBW: 360 Hz
Hori.	7323.000	AV	34.05	37.42	8.00	39.33	2.17	42.31	53.9	11.5	100	0	VBW: 360 Hz
Hori.	9764.000	AV	34.32	39.37	9.06	39.62	2.17	45.30	53.9	8.6	100	0	VBW: 360 Hz
Vert.	187.498	QP	34.20	16.23	8.95	31.77	0.00	27.61	43.5	15.8	100	334	
Vert.	494.999	QP	39.70	17.64	8.04	31.60	0.00	33.78	46.0	12.2	106	234	
Vert.	4882.000	PK	44.06	31.74	15.97	38.55	2.17	55.39	73.9	18.5	100	0	
Vert.	7323.000	PK	45.59	37.42	8.00	39.33	2.17	53.85	73.9	20.0	100	0	
Vert.	9764.000	PK	45.76	39.37	9.06	39.62	2.17	56.74	73.9	17.1	100	0	
Vert.	4882.000	AV	32.44	31.74	15.97	38.55	2.17	43.77	53.9	10.1	100	0	VBW: 360 Hz
Vert.	7323.000	AV	33.98	37.42	8.00	39.33	2.17	42.24	53.9	11.6	100	0	VBW: 360 Hz
Vert.	9764.000	AV	34.33	39.37	9.06	39.62	2.17	45.31	53.9	**8.5**	100	0	VBW: 360 Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 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.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
	(1 GHz – 2.8 GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz with 11ac-20 MIMO 5745 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	44.87	28.35	14.13	38.62	2.17	50.90	73.9	23.0	147	158	
Hori.	2483.500	AV	33.04	28.35	14.13	38.62	2.17	39.07	53.9	14.8	147	158	VBW: 360 Hz
Vert.	2483.500	PK	44.83	28.35	14.13	38.62	2.17	50.86	73.9	23.0	168	173	
Vert.	2483.500	AV	33.08	28.35	14.13	38.62	2.17	39.11	53.9	**14.7**	168	173	VBW: 360 Hz

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

Distance factor : 1 GHz - 13 GHz : 20log (3.85 m / 3.0 m) = 2.17 dB

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

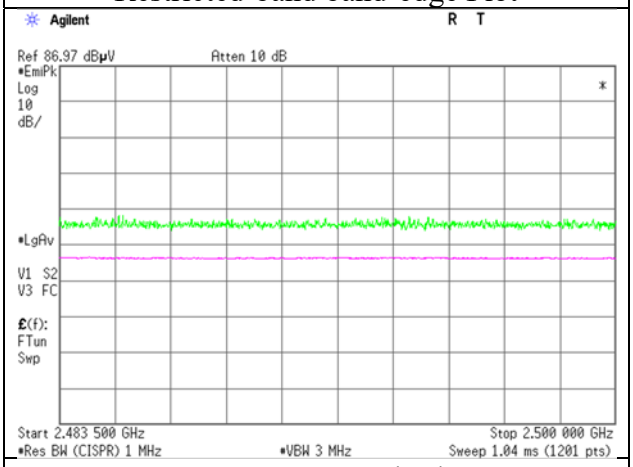
* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13294722S-A-R1
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	April 9, 2020
Temperature / Humidity	22 deg. C / 45 % RH
Engineer	Kazuya Noda
Mode	Tx, Hopping Off, 3DH5 2480 MHz with 11ac-20 MIMO 5745 MHz

Horizontal

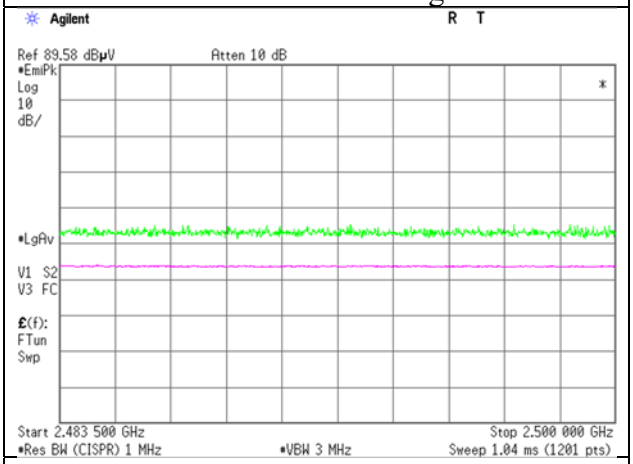
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

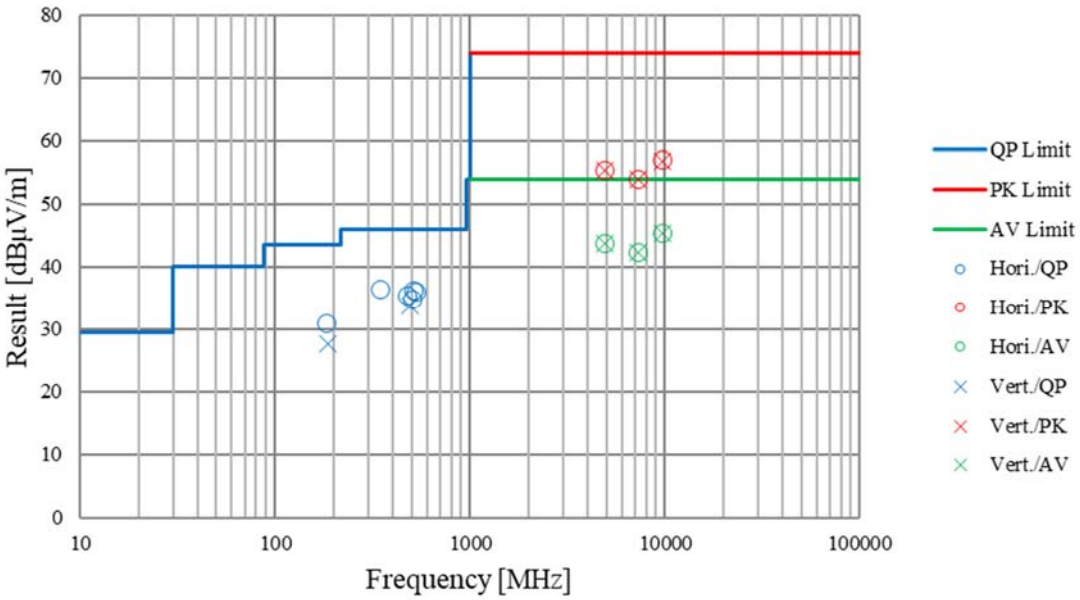


Trace Green : Peak Plot
Trace Purple : Average Plot

* 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.	13294722S-A-R1		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.3
Date	April 14, 2020	April 9, 2020	April 10, 2020
Temperature / Humidity	26 deg. C / 23 % RH (30 MHz - 1 GHz)	22 deg. C / 45 % RH (1 GHz - 13 GHz)	23 deg. C / 33 % RH (13 GHz – 40 GHz)
Engineer	Takahiro Kawakami	Kazuya Noda	Makoto Hosaka
Mode	Tx, Hopping Off, 3DH5 2441 MHz with 11ac-20 MIMO 5745 MHz		



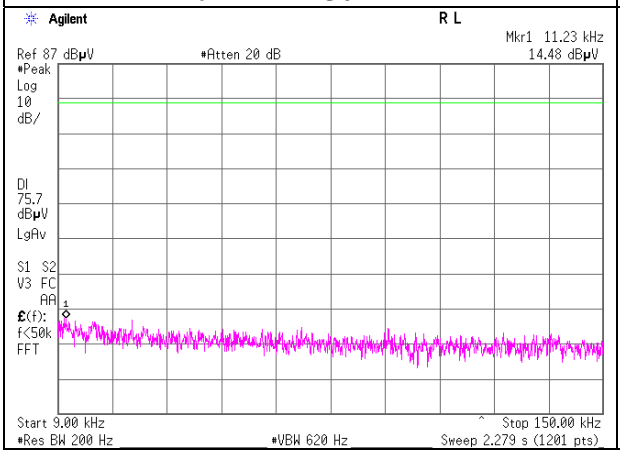
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

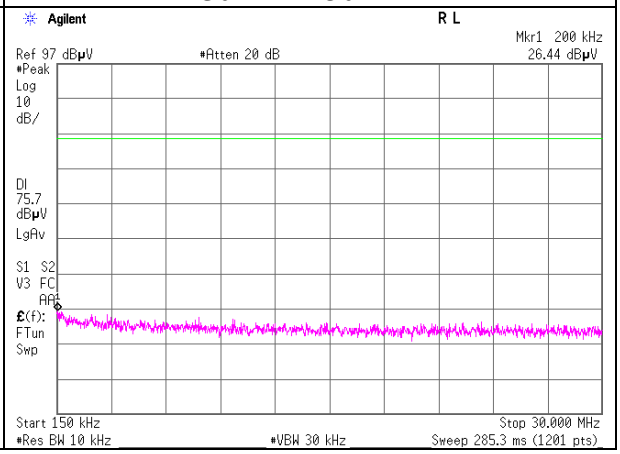
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, DH5

2402 MHz

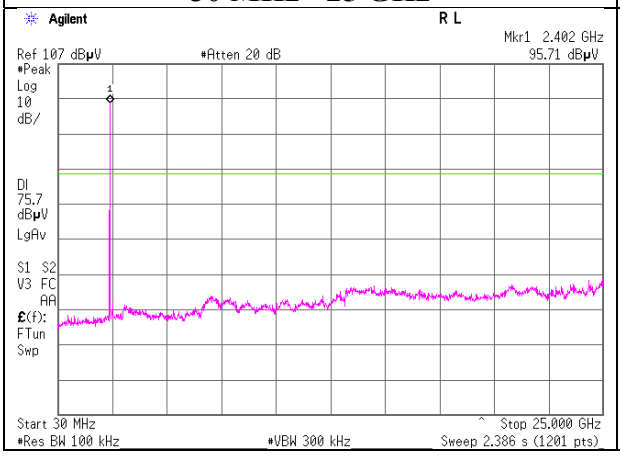
9 kHz - 150 kHz



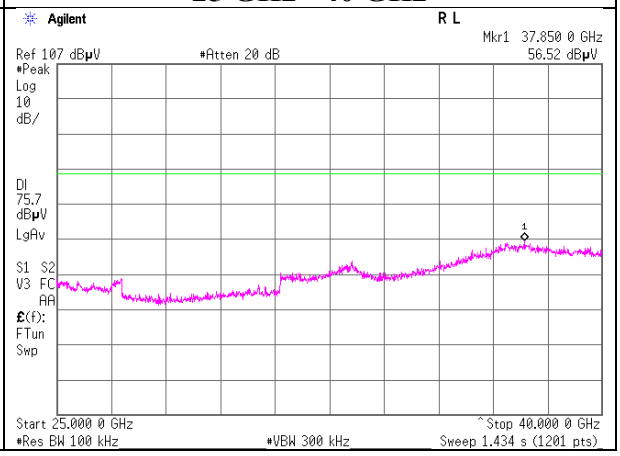
150 kHz - 30 MHz



30 MHz - 25 GHz



25 GHz - 40 GHz

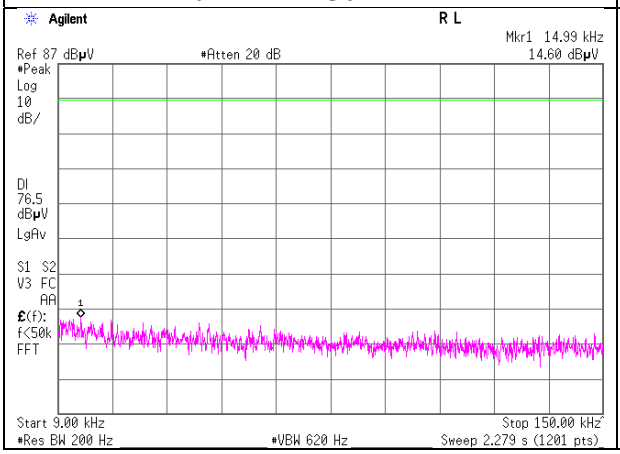


Conducted Spurious Emission

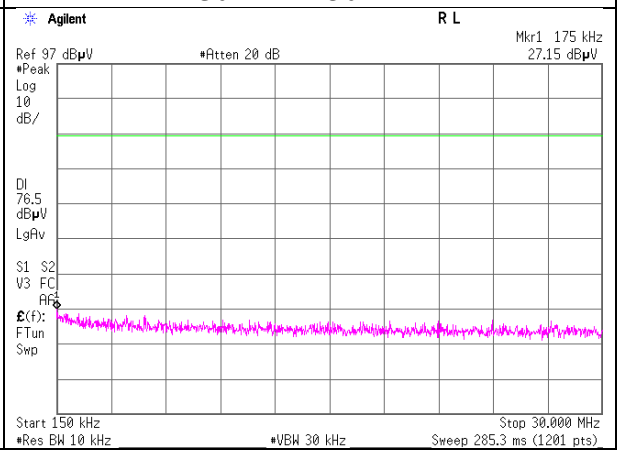
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, DH5

2441 MHz

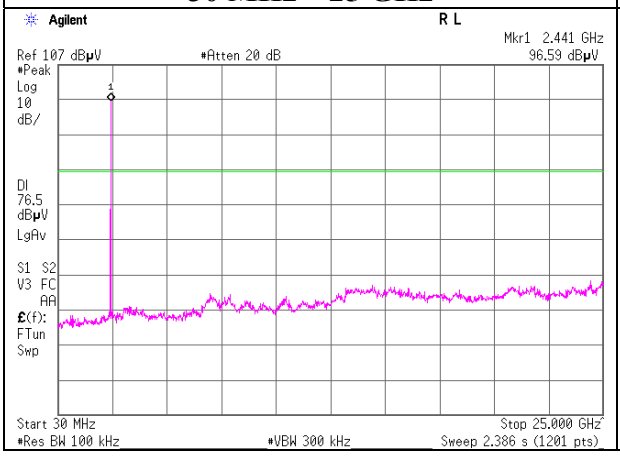
9 kHz – 150 kHz



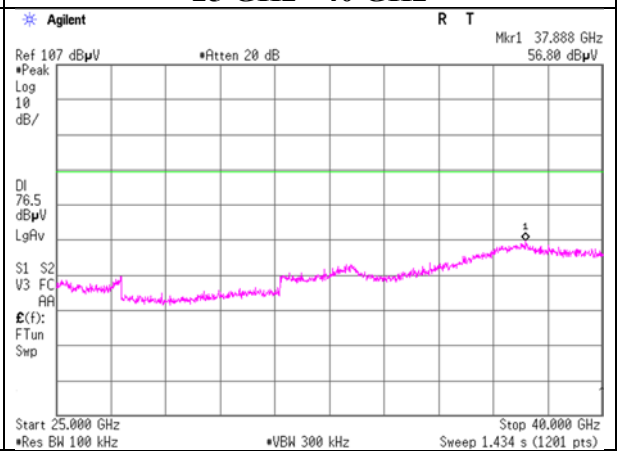
150 kHz – 30 MHz



30 MHz – 25 GHz



25 GHz - 40 GHz

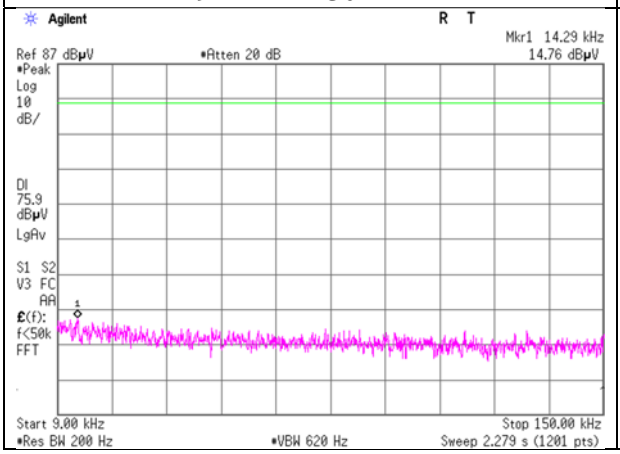


Conducted Spurious Emission

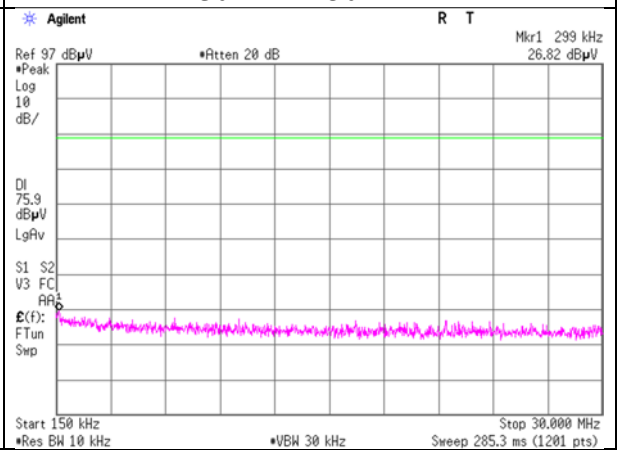
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, DH5

2480 MHz

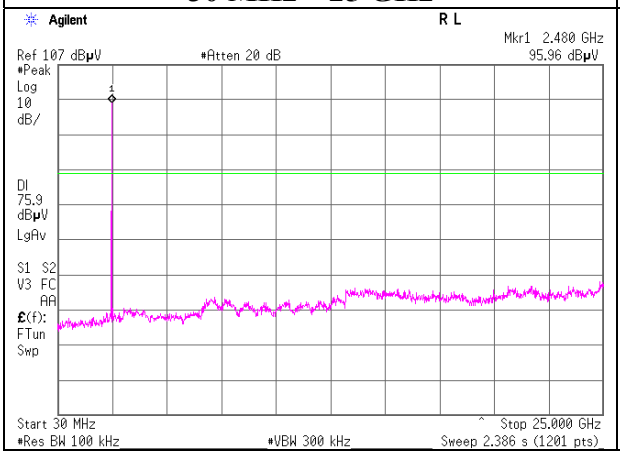
9 kHz – 150 kHz



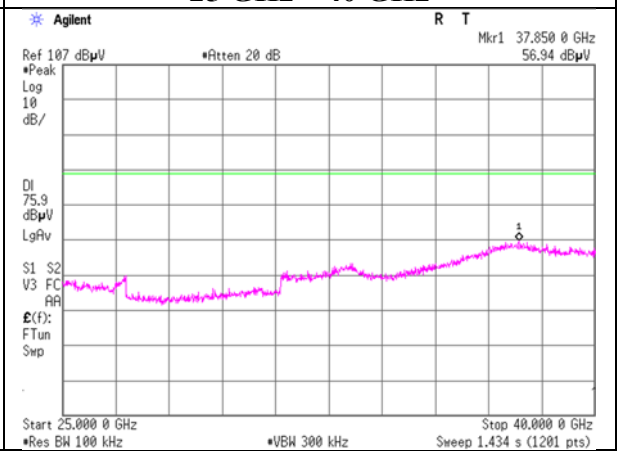
150 kHz – 30 MHz



30 MHz – 25 GHz



25 GHz – 40 GHz

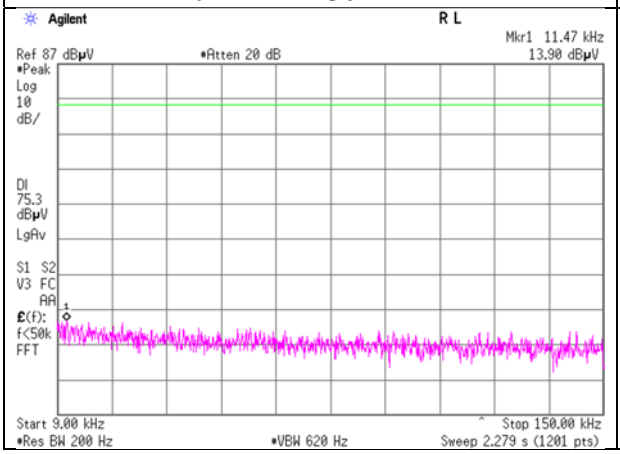


Conducted Spurious Emission

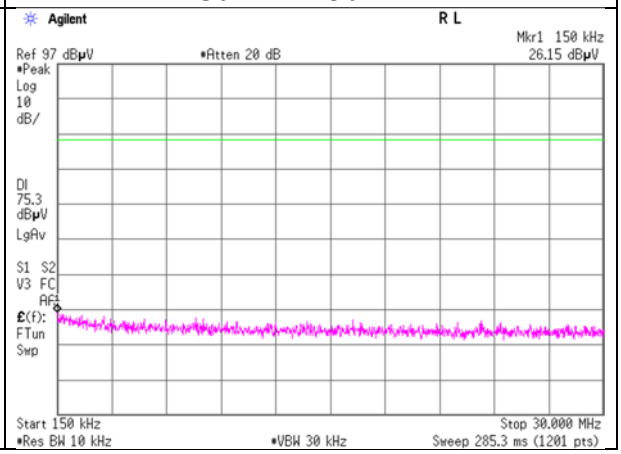
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, 3DH5

2402 MHz

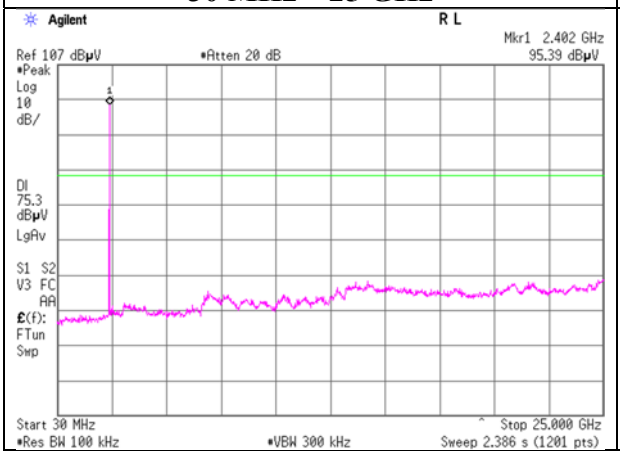
9 kHz – 150 kHz



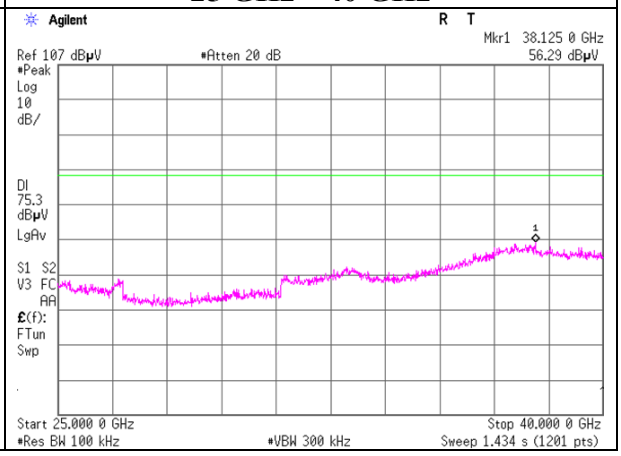
150 kHz – 30 MHz



30 MHz – 25 GHz



25 GHz – 40 GHz

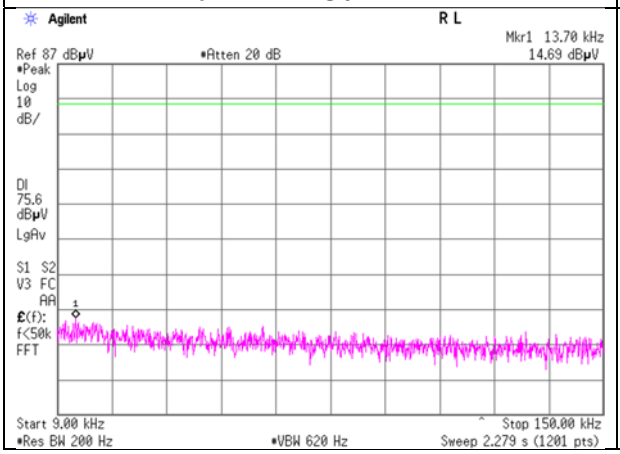


Conducted Spurious Emission

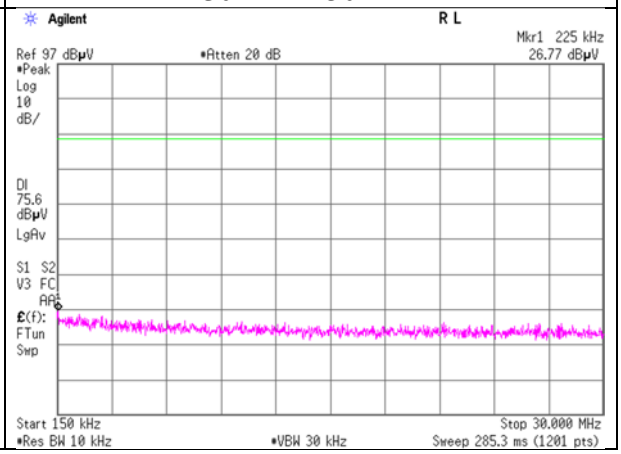
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, 3DH5

2441 MHz

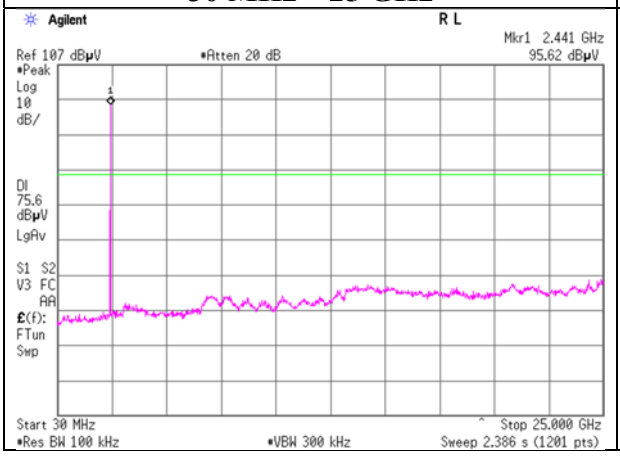
9 kHz - 150 kHz



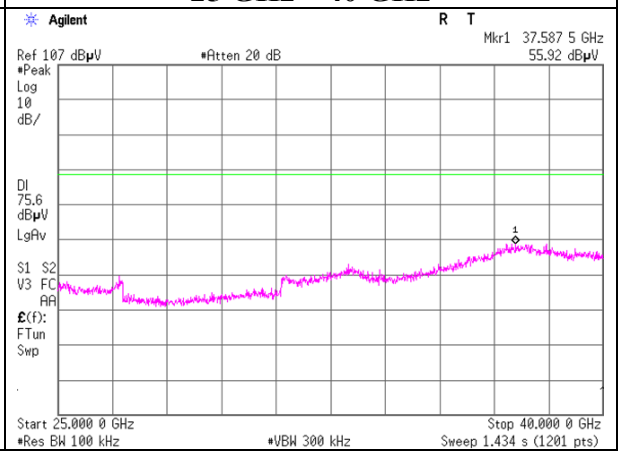
150 kHz - 30 MHz



30 MHz – 25 GHz



25 GHz – 40 GHz

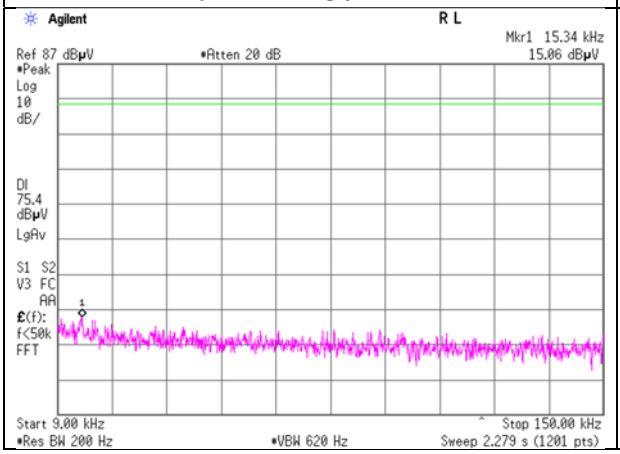


Conducted Spurious Emission

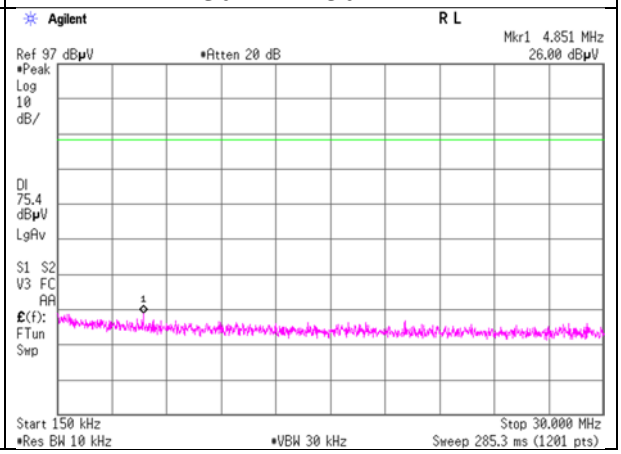
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx, Hopping Off, 3DH5

2480 MHz

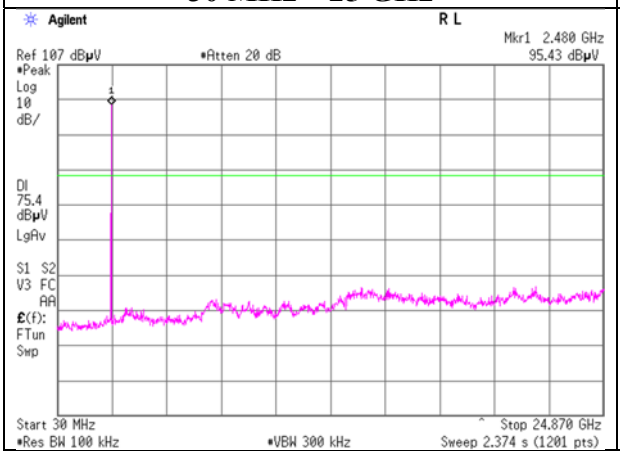
9 kHz - 150 kHz



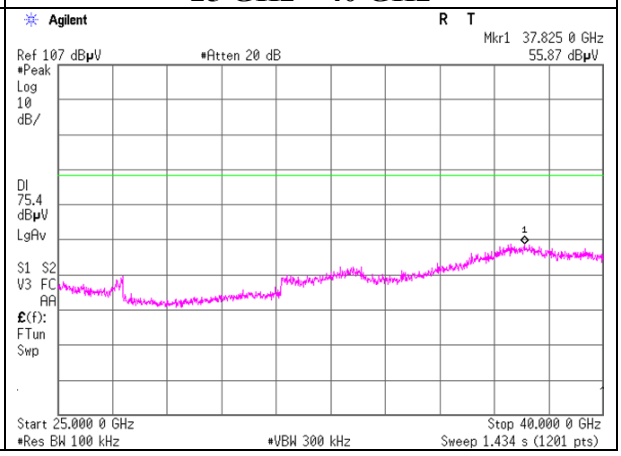
150 kHz - 30 MHz



30 MHz – 25 GHz



25 GHz – 40 GHz

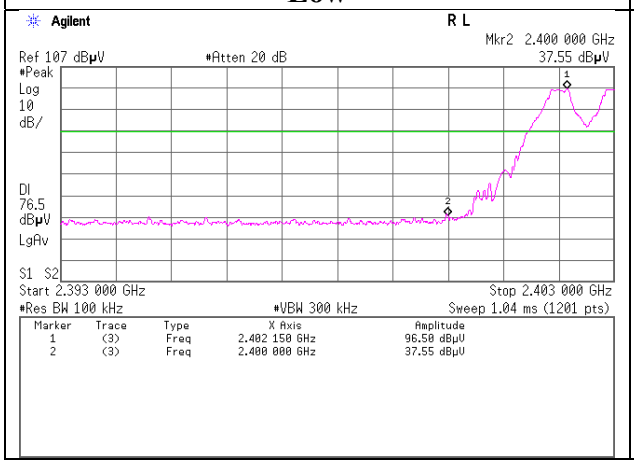


Conducted Emission Band Edge compliance

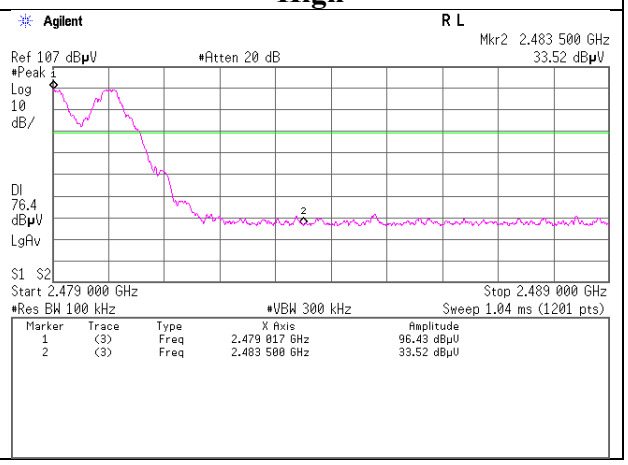
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx DH5

Hopping On

Low

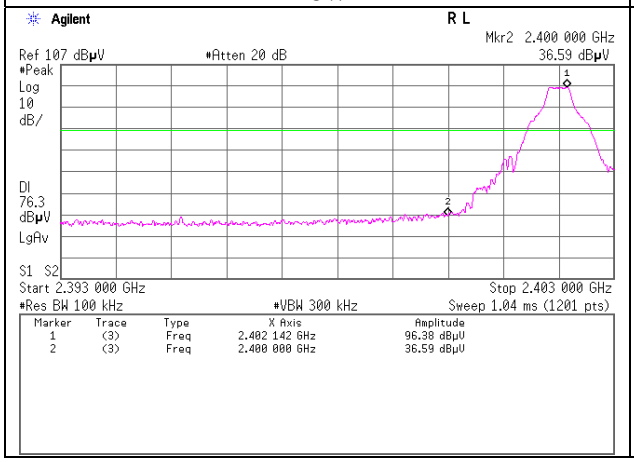


High

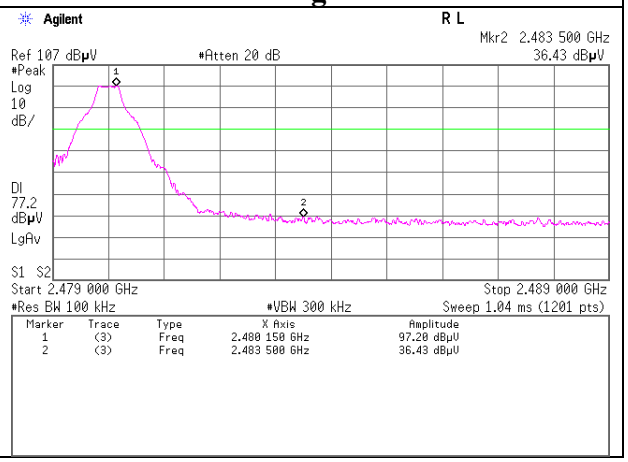


Hopping Off

Low



High

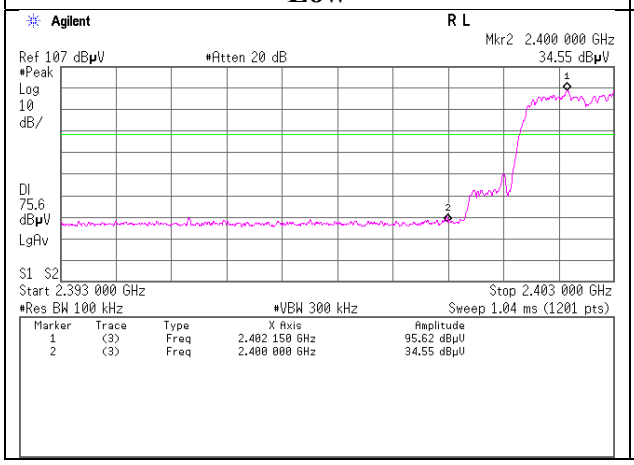


Conducted Emission Band Edge compliance

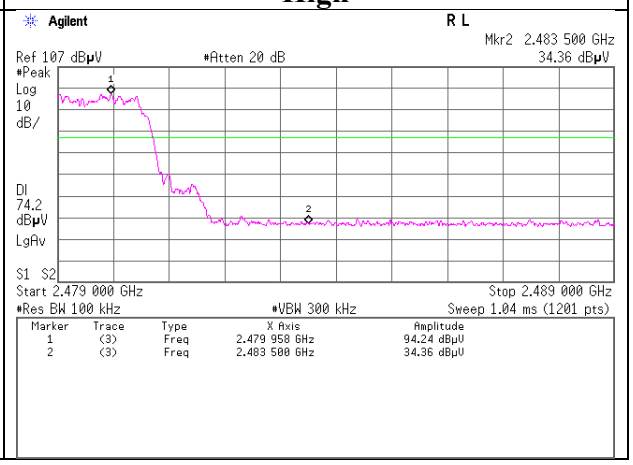
Report No.	13294722S-A-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	April 8, 2020
Temperature / Humidity	23 deg. C / 42 % RH
Engineer	Hiromasa Sato
Mode	Tx 3DH5

Hopping On

Low

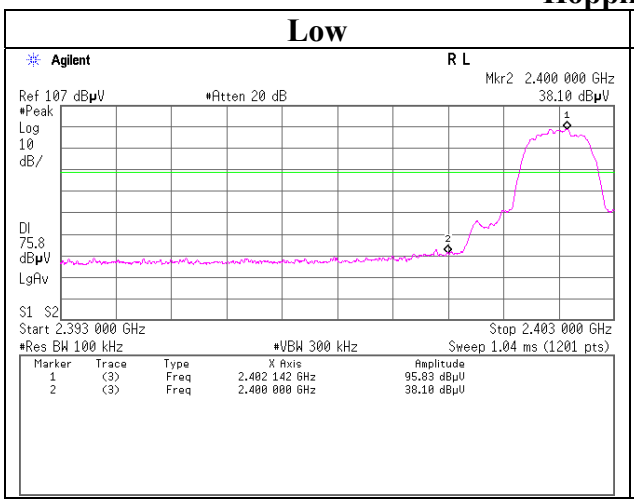


High

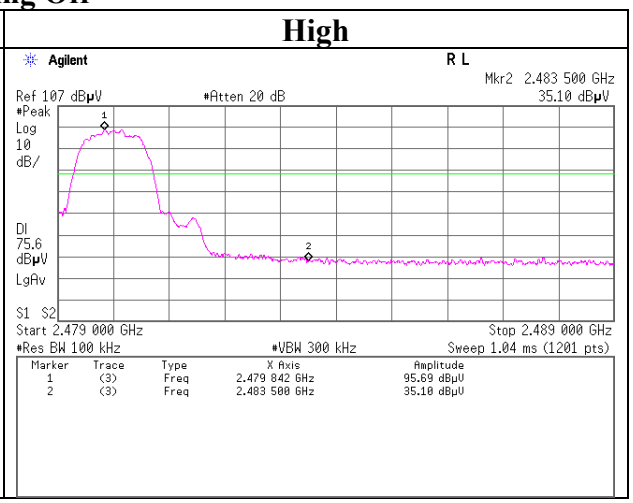


Hopping Off

Low



High



APPENDIX 2: Test instruments

Test equipment [1/2]

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
AT	SAT10-09	145132	Attenuator	Weinschel Corp.	54A-10	W5692	2019/11/05	12
AT	SCC-G63	196946	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102	803411/2	2020/03/10	12
AT	SOS-27	191845	Humidity Indicator	CUSTOM	CTH-201	-	2019/12/12	12
AT	SPM-07	146247	Power Meter	Keysight Technologies Inc	8990B	MY5100272	2019/07/16	12
AT	SPSS-04	146310	Power sensor	Keysight Technologies Inc	N1923A	MY5326009	2019/07/16	12
AT	SRENT-15	160899	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185516	2020/01/15	12
AT	STM-G10	171617	Terminator	Weinschel - API Technologies Corp	M1459A	92420	2019/07/04	12
AT	STS-05	146212	Digital Hitester	Hioki	3805-50	80997828	2019/10/01	12
RE	COTS-SEMI-5	170932	EMI Software	TSJ	TEPTO-DV3(RE,CE,ME,PE)	-	-	-
RE	KJM-09	145929	Measure	KOMELON	KMC-36	-	-	-
RE	KSA-08	145089	Spectrum Analyzer	Keysight Technologies Inc	E4446A	MY46180525	2019/11/05	12
RE	SAEC-01(NSA)	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2020/04/08	12
RE	SAEC-01(SVSWR)	145561	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	2019/05/07	12
RE	SAEC-02(NSA)	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	2020/03/20	12
RE	SAEC-02(SVSWR)	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2019/05/09	12
RE	SAF-02	145004	Pre Amplifier	SONOMA	310N	290212	2020/02/19	12
RE	SAF-04	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2019/06/04	12
RE	SAF-05	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2019/07/12	12
RE	SAF-08	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2020/03/03	12
RE	SAF-10	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	10	2020/03/03	12
RE	SAT10-06	145137	Attenuator	Keysight Technologies Inc	8493C-010	74865	2019/11/06	12
RE	SAT3-11	150921	Attenuator	JFW	50HF-003N	-	2020/01/30	12
RE	SAT6-14	167095	Attenuator	JFW	50HF-006N	-	2020/02/21	12
RE	SBA-02	145022	Biconical Antenna	Schwarzbeck Mess - Elektronik	BBA9106	91032665	2020/04/04	12
RE	SCC-B1/B3/B5/B7/B8/B13/SRSE-02	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2020/04/17	12
RE	SCC-B2/B4/B6/B7/B8/B13/SRSE-02	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	2020/04/17	12
RE	SCC-G05	145039	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	2020/01/31	12
RE	SCC-G15	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2020/03/04	12
RE	SCC-G41	151617	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S006	2020/01/08	12
RE	SCC-G45	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2EA	2020/03/04	12

Test equipment [2/2]

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
RE	SCC-G50	178573	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104_E	MY13407/4E	2020/03/09	12
RE	SCC-G51	178572	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800288 /4A	2020/03/09	12
RE	SCC-G56	179539	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	803289/4	2019/05/16	12
RE	SCC-G57	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2019/05/16	12
RE	SFL-03	145377	Highpass Filter	MICRO-TRONICS	HPM50112	28	2019/11/06	12
RE	SFL-18	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2020/04/03	12
RE	SHA-01	145383	Horn Antenna	Schwarzbeck Mess - Elektronik	BBHA9120D	9120D-725	2019/05/09	12
RE	SHA-02	145384	Horn Antenna	Schwarzbeck Mess - Elektronik	BBHA9120D	9120D-726	2019/06/26	12
RE	SHA-04	145512	Horn Antenna	ETS LINDGREN	3160-09	00094868	2019/06/26	12
RE	SHA-06	145514	Horn Antenna	ETS LINDGREN	3160-10	00092383	2019/06/26	12
RE	SJM-09	145336	Measure	PROMART	SEN1935	-	-	-
RE	SLA-06	145528	Logperiodic Antenna	Schwarzbeck Mess - Elektronik	VUSLP9111B	195	2020/04/04	12
RE	SOS-20	191837	Humidity Indicator	CUSTOM	CTH-201	-	2019/12/12	12
RE	SOS-21	191838	Humidity Indicator	CUSTOM	CTH-201	-	2019/12/12	12
RE	SSA-03	145801	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250152	2019/08/08	12
RE	STR-07	146209	Test Receiver	Rohde & Schwarz	ESU26	100484	2019/09/13	12
RE	STR-08	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2019/11/22	12
RE	STS-01	145792	Digital Hitester	Hioki	3805-50	80997812	2019/10/01	12
RE	STS-02	145793	Digital Hitester	Hioki	3805-50	80997819	2020/04/09	12
RE	STS-03	146210	Digital Hitester	Hioki	3805-50	80997823	2019/10/01	12

***Hyphens for Last Calibration 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.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item: **RE: Radiated Emission test**
AT: Antenna Terminal Conducted test