



# RADIO TEST REPORT

**Test Report No. : 13682531S-A-R2**

**Applicant** : DENSO CORPORATION  
**Type of EUT** : Cockpit Control Unit  
**Model Number of EUT** : DNNS127  
**FCC ID** : HYQDNN127  
**Test regulation** : FCC Part 15 Subpart C: 2021  
**Test Result** : Complied (Refer to SECTION 3.2)

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
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 13682531S-A-R1. 13682531S-A-R1 is replaced with this report.

**Date of test:** January 20 to 22, 2021

**Representative test engineer:** K. Adachi  
Kenichi Adachi  
Engineer  
Consumer Technology Division

**Approved by:** K. Noda  
Kazuya Noda  
Leader  
Consumer Technology Division



CERTIFICATE 1266.03

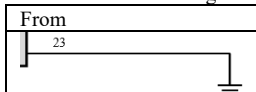

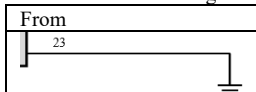

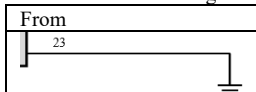

- The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.  
 There is no testing item of "Non-accreditation".

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# REVISION HISTORY

**Original Test Report No.: 13682531S-A**

Revision	Test report No.	Date	Page revised	Contents																																																												
- (Original)	13682531S-A	February 24, 2021	-	-																																																												
1	13682531S-A-R1	April 12, 2021	5 7	<p>Correction of clock frequency: 1.8 GHz → 40 MHz</p> <p>Correction of worst margin on Section 3.2:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td>3.3 dB 216.000 MHz, QP, Vert., Tx, 3DH5 2441 MHz</td> <td>3.1 dB 200.001 MHz, QP, Vert., Tx, DH5 2441 MHz</td> </tr> <tr> <td>200.002 MHz, QP, Vert., Tx, DH5 2480 MHz</td> <td></td> </tr> </tbody> </table> <p>Reduction of remarks:  “*1) Radiated test was selected over 30 MHz based on section 15.247(d).”</p> <p>Update of remarks to the FCC Part 15.31 (e):  From “This EUT provides the stable voltage constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.”  To “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. Therefore, this EUT complies with the requirement.”</p>	From	To	3.3 dB 216.000 MHz, QP, Vert., Tx, 3DH5 2441 MHz	3.1 dB 200.001 MHz, QP, Vert., Tx, DH5 2441 MHz	200.002 MHz, QP, Vert., Tx, DH5 2480 MHz																																																							
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			10	<p>Correction of Item name of the EUT and Support equipment:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th colspan="2">From</th> <th colspan="2">To</th> </tr> <tr> <th>No.</th> <th>Item</th> <th>No.</th> <th>Item</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>CID</td> <td>A</td> <td>Cockpit Control Unit</td> </tr> <tr> <td>B</td> <td>DISP</td> <td>B</td> <td>CID</td> </tr> </tbody> </table>	From		To		No.	Item	No.	Item	A	CID	A	Cockpit Control Unit	B	DISP	B	CID																																												
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			13	<p>Reduction of remarks “*a)” from Section 5:  “*a) The Spectrum Analyzer was used in 3 dB resolution bandwidth.”</p> <p>Addition of table between 9 kHz - 30 MHz:</p> <p>From</p> <p>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).</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>Below 1 GHz</th> <th>Above 1 GHz</th> <th colspan="2">20 dBc</th> </tr> <tr> <th>Instrument used</th> <th>Test Receiver</th> <th>Spectrum Analyzer</th> <th>PK</th> <th>AV *1)</th> </tr> </thead> <tbody> <tr> <td>Detector</td> <td>QP</td> <td>PK</td> <td>PK</td> <td>PK</td> </tr> <tr> <td>IF Bandwidth</td> <td>BW 120 kHz</td> <td>RBW 1 MHz VBW 3 MHz</td> <td>RBW 1 MHz VBW 1/T (T: burst length, refer to Burst rate confirmation sheet)</td> <td>RBW 100 kHz VBW 300 kHz</td> </tr> </tbody> </table> <p>Detector: Peak</p> <p>To</p> <p>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).</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>9 kHz to 90 kHz &amp; 110 kHz to 150 kHz</th> <th>90 kHz to 110 kHz</th> <th>150 kHz to 490 kHz</th> <th>490 kHz to 30 MHz</th> </tr> <tr> <th>Instrument used</th> <th>Spectrum Analyzer</th> <th>Test Receiver</th> <th>Spectrum Analyzer</th> <th>Test Receiver</th> </tr> </thead> <tbody> <tr> <td>Detector</td> <td>PK/AV</td> <td>QP</td> <td>PK/AV</td> <td>QP</td> </tr> <tr> <td>IF Bandwidth</td> <td>RBW: 200 Hz VBW: 620 Hz</td> <td>BW 200 Hz</td> <td>RBW: 10 kHz VBW: 30 kHz</td> <td>BW 9 kHz</td> </tr> </tbody> </table> <table border="1" style="width: 100%;"> <thead> <tr> <th>Frequency</th> <th>30 MHz to 1 GHz</th> <th>Above 1 GHz</th> <th colspan="2">20 dBc</th> </tr> <tr> <th>Instrument used</th> <th>Test Receiver</th> <th>Spectrum Analyzer</th> <th>PK</th> <th>AV *1)</th> </tr> </thead> <tbody> <tr> <td>Detector</td> <td>QP</td> <td>PK</td> <td>PK</td> <td>PK</td> </tr> <tr> <td>IF Bandwidth</td> <td>BW 120 kHz</td> <td>RBW: 1 MHz VBW: 3 MHz</td> <td>RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet)</td> <td>RBW: 100 kHz VBW: 300 kHz</td> </tr> </tbody> </table> <p>Detector: Peak</p>	Frequency	Below 1 GHz	Above 1 GHz	20 dBc		Instrument used	Test Receiver	Spectrum Analyzer	PK	AV *1)	Detector	QP	PK	PK	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)	RBW 100 kHz VBW 300 kHz	Frequency	9 kHz to 90 kHz & 110 kHz to 150 kHz	90 kHz to 110 kHz	150 kHz to 490 kHz	490 kHz to 30 MHz	Instrument used	Spectrum Analyzer	Test Receiver	Spectrum Analyzer	Test Receiver	Detector	PK/AV	QP	PK/AV	QP	IF Bandwidth	RBW: 200 Hz VBW: 620 Hz	BW 200 Hz	RBW: 10 kHz VBW: 30 kHz	BW 9 kHz	Frequency	30 MHz to 1 GHz	Above 1 GHz	20 dBc		Instrument used	Test Receiver	Spectrum Analyzer	PK	AV *1)	Detector	QP	PK	PK	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)	RBW: 100 kHz VBW: 300 kHz
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			26, 46 - 45	<p>The attenuation value used at 2.4 GHz for the customer-supplied cable has changed.  0.56 dB → 0.86 dB</p>																																																												
			29, 31, 32, 34, 36, 37, 39	<p>Addition of the information for the 9 kHz -30 MHz testing: Semi Anechoic Chamber No., Date, Temperature / Humidity, Engineer name</p>																																																												
2	13682531S-A-R2	April 26, 2021	11	<p>Correction of 4.2 Configuration and peripherals: Cable No.23 “GND”</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	From	To																																																										
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## Reference: Abbreviations (Including words undescribed in this report)

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

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## **SECTION 1: Customer information**

Company Name : DENSO CORPORATION  
Address : 1-1 Showa-cho, Kariya-shi, Aichi ken, 448-8661 Japan  
Telephone Number : +81-566-20-3304  
Facsimile Number : +81-566-25-4920  
Contact Person : Naoto Makino

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 : Cockpit Control Unit  
Model Number : DNNS127  
Serial Number : Refer to SECTION 4.2  
Rating : DC 13.2 V  
Receipt Date : January 19, 2021  
Country of Mass-production : USA, Japan  
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: DNNS127 (referred to as the EUT in this report) is a Cockpit Control Unit.

### **Radio Specification**

Clock frequency(Maximum) : 40 MHz

### **Bluetooth (BDR / EDR function)**

Radio Type : Transceiver  
Frequency of Operation : 2402 MHz - 2480 MHz  
Modulation : FHSS (GFSK,  $\pi/4$ -DQPSK, 8DPSK)  
Antenna type : ASSEMBLY Bluetooth Antenna (External Antenna)  
Antenna Gain : -0.88 dBi (Max) (Including cable loss)

FM tuner specification

Frequency of operation: 87.75 MHz - 107.9 MHz

Intermediate frequency: 220 kHz

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C  
FCC Part 15 final revised on January 12, 2021 and effective February 11, 2021

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

### 3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ----- ISED: RSS-Gen 8.8	FCC: Section 15.207 ----- ISED: RSS-Gen 8.8	-	N/A	-
Carrier Frequency Separation	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(a)(1) ----- ISED: RSS-247 5.1 (b)	See data.	Complied a)	Conducted
20 dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(a)(1) ----- ISED: RSS-247 5.1 (a)		Complied a)	Conducted
Number of Hopping Frequency	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(a)(1)(iii) ----- ISED: RSS-247 5.1 (d)		Complied b)	Conducted
Dwell time	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(a)(1)(iii) ----- ISED: RSS-247 5.1 (d)		Complied c)	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: RSS-Gen 6.12	FCC: Section 15.247(a)(b)(1) ----- ISED: RSS-247 5.4 (b)		Complied d)	Conducted
Spurious Emission & Band Edge Compliance	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: RSS-Gen 6.13	FCC: Section 15.247(d) ----- ISED: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		3.1 dB 200.001 MHz, QP, Vert., Tx, DH5 2441 MHz	Complied# e) / f)

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

- 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. Therefore, this 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 vehicle. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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### 3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	- 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  $k = 2$ .

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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	2.56dB	2.9 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	2.7 dB	2.7 dB	-
	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	4.8 dB	4.8 dB	4.8 dB	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission (Measurement distance: 1 m)	18 GHz-40 GHz	5.3 dB	5.3 dB	5.3 dB	-
	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 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	1.4 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.6 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	0.91 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.2 dB
Spurious emission (Conducted) below 1GHz	0.87 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.96 dB
Spurious emission (Conducted) 3 GHz-18 GHz	3.0 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.2 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.95 deg.C.
Humidity_SCH-01	0.83 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.86 %

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### 3.5 Test Location

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A2LA Certificate Number: 1266.03

(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

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

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

## **SECTION 4: Operation of EUT during testing**

### **4.1 Operating Mode(s)**

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

Details of Operating Mode(s)

<b>Test Item</b>	<b>Mode</b>	<b>Tested frequency</b>
Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20 dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99 % Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>* 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.</p> <p>*EUT has the power settings by the software as follows;  Power settings: BR (Burst power): -3 dBm ±2 dB (Deviation)  EDR (Burst power): -5 dBm ±2 dB (Deviation)  Software: MSoC Ver: F61WBM010-707 (Date: 2020.Nov-9th)  (Storage location: EUT memory)</p> <p>*This setting of software is the worst case.  Any conditions under the normal use do not exceed the condition of setting.  In addition, end users cannot change the settings of the output power of the product.</p>		

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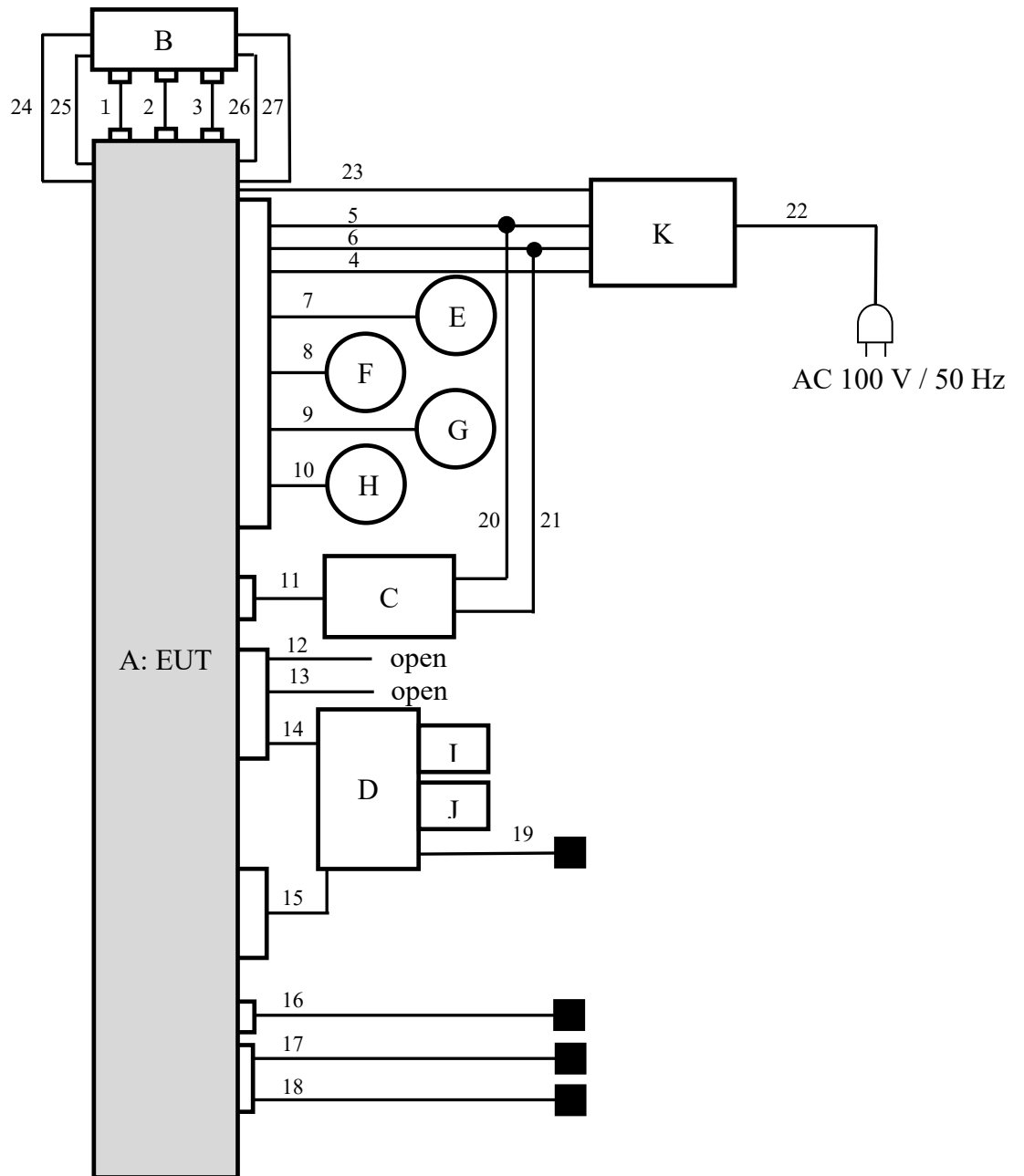
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## 4.2 Configuration and peripherals



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

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**Description of EUT and Support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Cockpit Control Unit	DNNS127	CP1.5-K3-GZ1-US-Base-106 *1) CP1.5-K3-GZ1-US-Base-105 *2)	DENSO	EUT
B	CID	86213AN500	GC7YEU-K3-BASE LHD-021	DENSO	-
C	Meter	85002AN02A	-	DENSO	-
D	AUX-BOX	86257 A00A	5	DENSO	-
E	Speaker L	20FHI-SPRE-03	-	DENSO	-
F	Speaker R	20FHI-SPRE-03	-	DENSO	-
G	Speaker Rear L	20FHI-SPRE-03	-	DENSO	-
H	Speaker Rear R	20FHI-SPRE-03	-	DENSO	-
I	USB Memory	USM4GL-W	-	SONY	-
J	USB Memory	USM4GU	-	SONY	-
K	DC Power Supply	PAN60-10A	NL002383	KIKUSUI	-

\*1) Used for Antenna Terminal conducted test

\*2) Used for Radiated Emission test

**List of cables used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	CCU-CID-POW	0.2	Unshielded	Unshielded	-
2	CCU-CID-LVDS	0.2	Unshielded	Unshielded	-
3	CCU-CID-BT	0.2	Unshielded	Unshielded	-
4	DC power(+B)	1.8	Unshielded	Unshielded	-
5	DC power(+IG)	1.8	Unshielded	Unshielded	-
6	DC power(GND)	1.8	Unshielded	Unshielded	-
7	Speaker L	1.8	Unshielded	Unshielded	-
8	Speaker R	1.8	Unshielded	Unshielded	-
9	Speaker Rear L	1.8	Unshielded	Unshielded	-
10	Speaker Rear R	1.8	Unshielded	Unshielded	-
11	Meter	1.8	Unshielded	Unshielded	-
12	USB(Blue)	1.5	Shielded	Shielded	-
13	USB(Brown)	0.15	Shielded	Shielded	-
14	USB(Green)	0.5	Shielded	Shielded	-
15	Power Supply	1.0	Unshielded	Unshielded	-
16	XM	1.0	Shielded	Shielded	-
17	AM/FM	2.0	Shielded	Shielded	-
18	AM/FM	2.0	Shielded	Shielded	-
19	Mini Jack	2.0	Unshielded	Unshielded	-
20	DC power(+IG)	1.2	Unshielded	Unshielded	-
21	DC power(GND)	1.2	Unshielded	Unshielded	-
22	AC	3.0	Unshielded	Unshielded	-
23	GND	2.4	Unshielded	Unshielded	-
24	GND	0.2	Unshielded	Unshielded	-
25	GND	0.2	Unshielded	Unshielded	-
26	GND	0.2	Unshielded	Unshielded	-
27	GND	0.2	Unshielded	Unshielded	-

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## **SECTION 5: Radiated Spurious Emission**

### **Test Procedure**

[For below 1 GHz]

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

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 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	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	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	9 kHz to 90 kHz & 110 kHz to 150 kHz	90 kHz to 110 kHz	150 kHz to 490 kHz	490 kHz to 30 MHz
Instrument used	Spectrum Analyzer	Test Receiver	Spectrum Analyzer	Test Receiver
Detector	PK/AV	QP	PK/AV	QP
IF Bandwidth	RBW: 200 Hz VBW: 620 Hz	BW 200 Hz	RBW: 10 kHz VBW: 30 kHz	BW 9 kHz

Frequency	30 MHz to 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyze
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) Measurement with Average detector was not performed. The limit for Average detector is applied to the measurement value with Peak detector used Duty cycle correction factor (DCCF).

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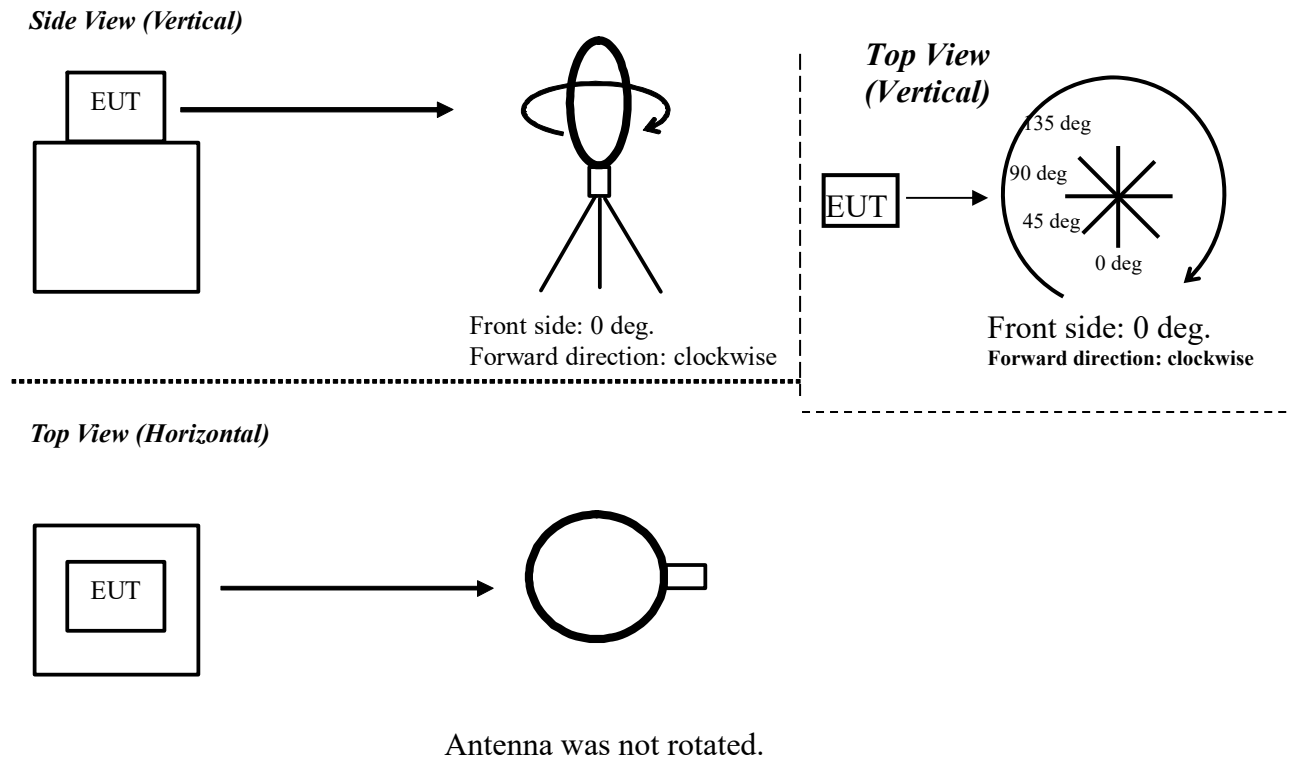
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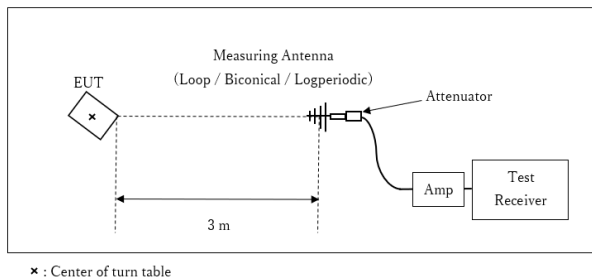
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Figure 1: Direction of the Loop Antenna



**Figure 2: Test Setup**

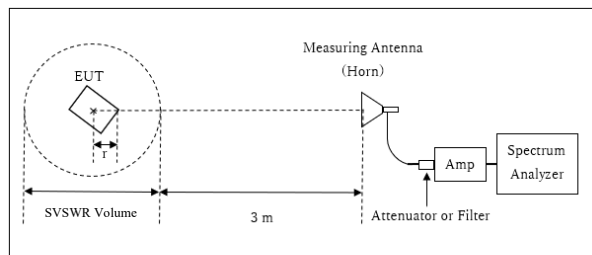
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

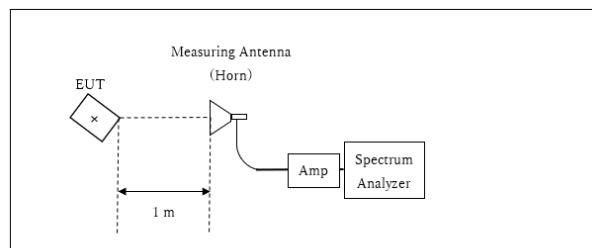


r : Radius of an outer periphery of EUT  
× : Center of turn table

Distance Factor:  $20 \times \log(3.8 \text{ m} / 3.0 \text{ m}) = 2.06 \text{ dB}$   
\* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.8 \text{ m}$

SVSWR Volume : 2.0 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
r = 0.2 m

10 GHz - 26.5 GHz



× : Center of turn table

Distance Factor:  $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$   
\*Test Distance: 1 m

The test was made on EUT at the normal use position.

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

Measurement range : 9 kHz - 26.5 GHz  
Test data : APPENDIX  
Test result : Pass

## **SECTION 6: Antenna Terminal Conducted Tests**

### **Test Procedure**

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20 dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *3) *4)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

\*1) The measurement was performed with Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.

\*2) Reference data

\*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately and the noise was detected as shown in the chart, and therefore, Radiated Emission below 30 MHz was performed. \*4) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to  $45.5 - 51.5 = -6.0$  dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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**

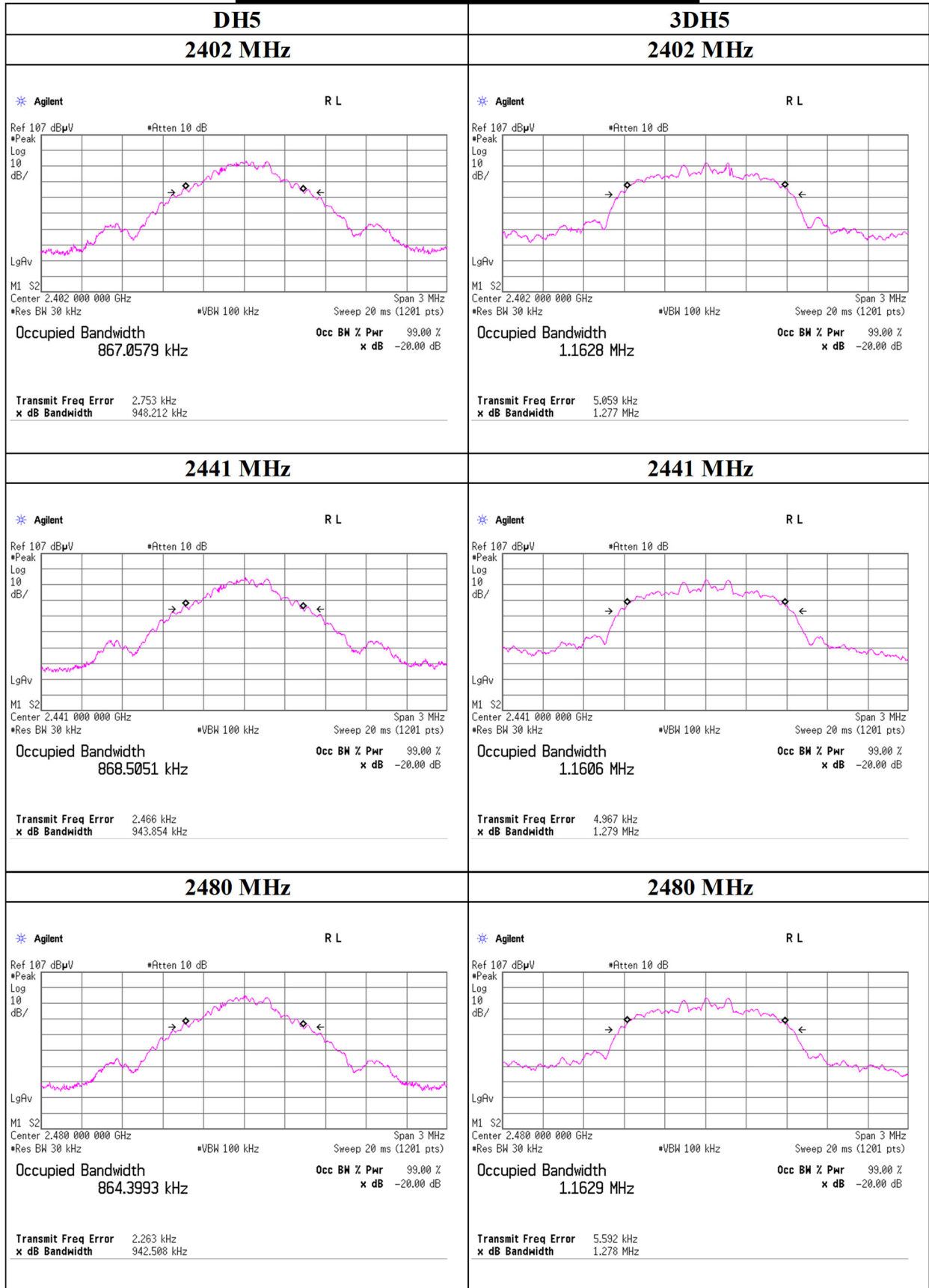
Report No. 13682531S-A-R2  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 20, 2021  
Temperature / Humidity 25 deg. C / 30 % RH  
Engineer Kenichi Adachi  
Mode Tx, Hopping Off, Tx, Hopping On

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.948	867.1	1.000	$\geq 0.632$
DH5	2441.0	0.944	868.5	1.000	$\geq 0.629$
DH5	2480.0	0.943	864.4	1.000	$\geq 0.629$
DH5	Hopping On	-	78619.9	-	-
3DH5	2402.0	1.277	1162.8	1.000	$\geq 0.851$
3DH5	2441.0	1.279	1160.6	1.000	$\geq 0.853$
3DH5	2480.0	1.278	1162.9	1.000	$\geq 0.852$
3DH5	Hopping On	-	78723.0	-	-

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

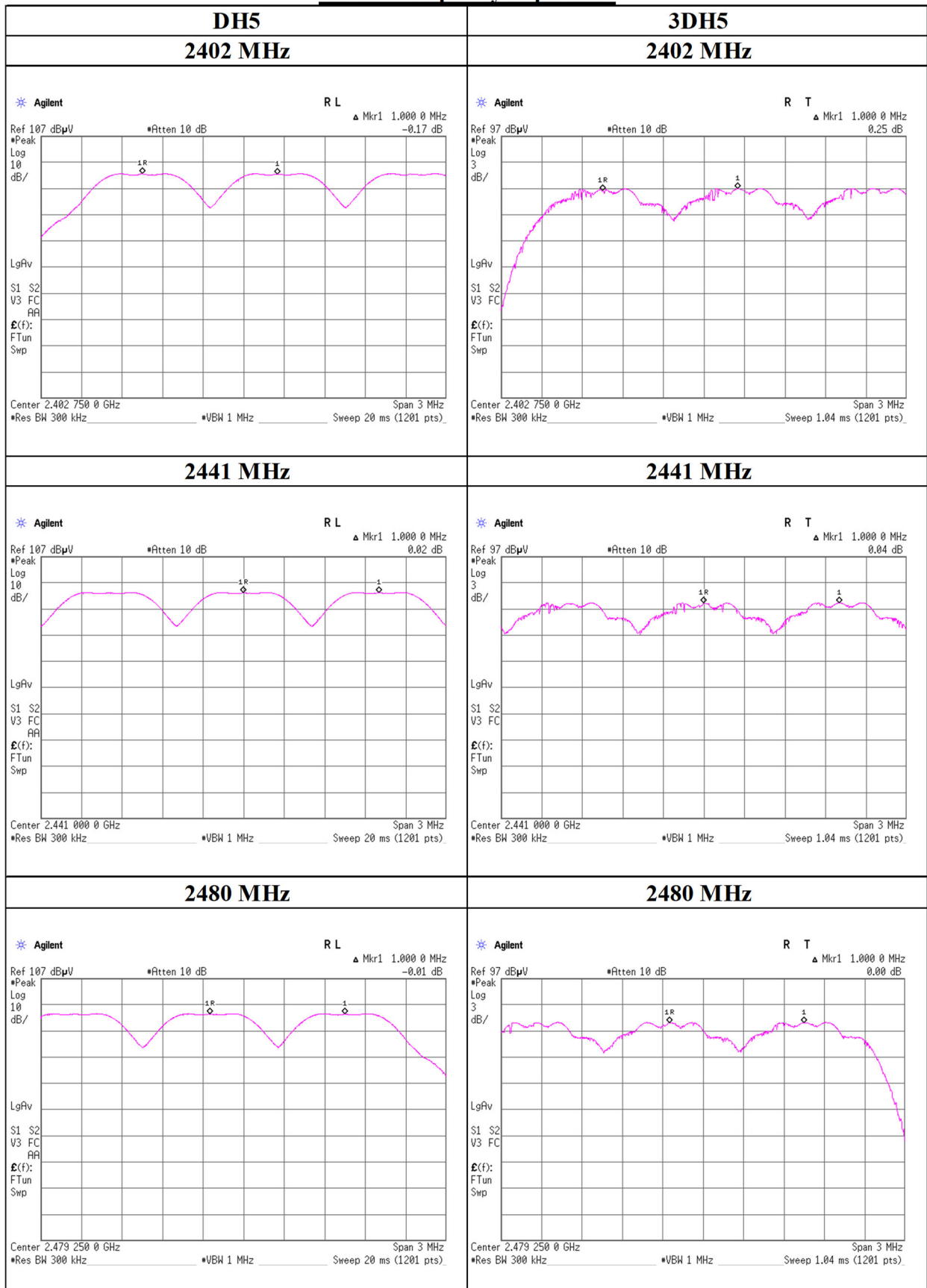
No limit applies to 20 dB Bandwidth.

**20 dB Bandwidth & 99 % Occupied Bandwidth**





### Carrier Frequency Separation



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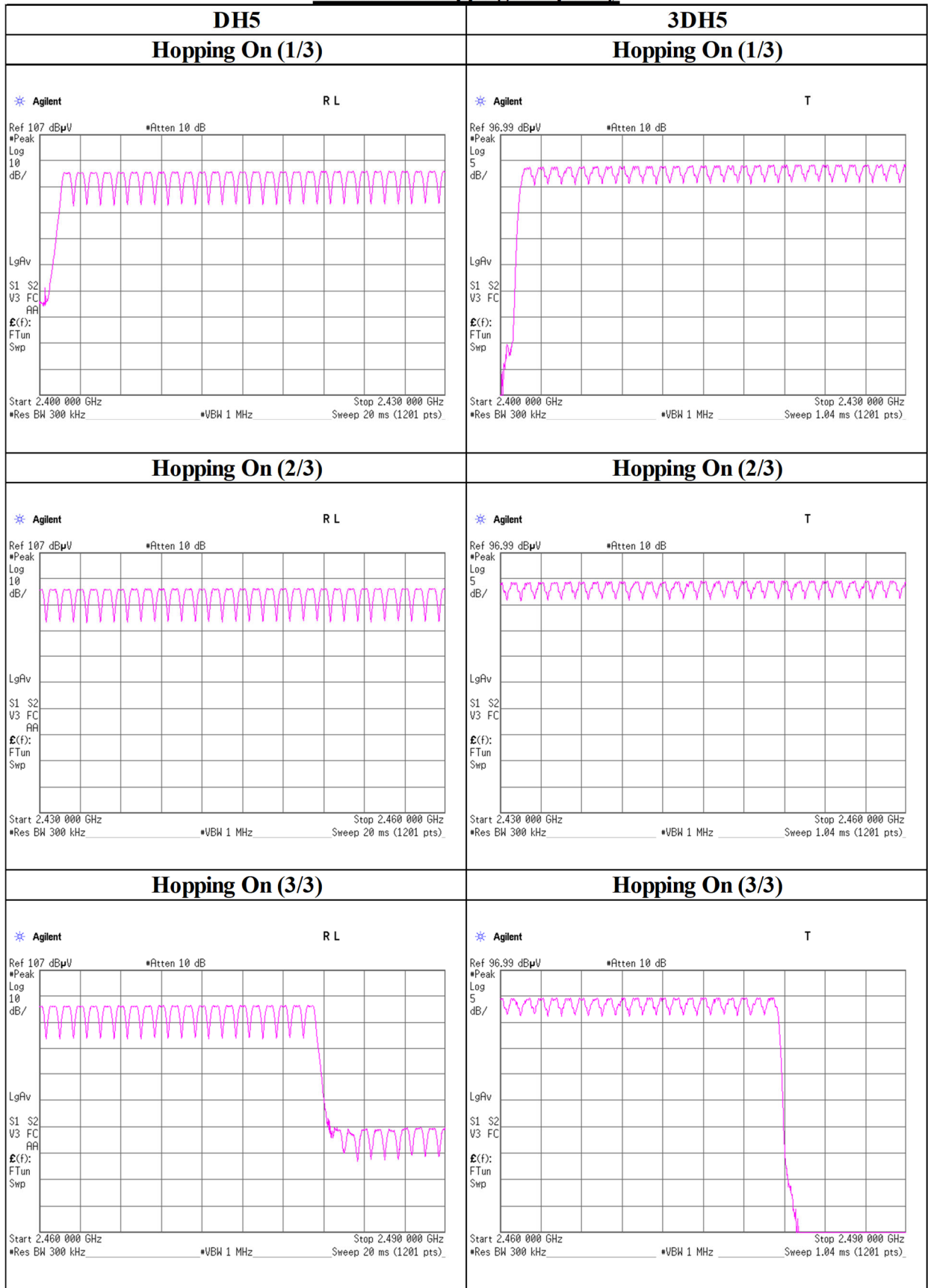
### Number of Hopping Frequency

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 20, 2021  
Temperature / Humidity 25 deg. C / 30 % RH  
Engineer Kenichi Adachi  
Mode Tx, Hopping On

Mode	Number of channel [channels]	Limit [channels]
DH5	79	$\geq 15$
3DH5	79	$\geq 15$

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

**Number of Hopping Frequency**



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### Dwell time

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Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 20, 2021  
Temperature / Humidity 25 deg. C / 30 % RH  
Engineer Kenichi Adachi  
Mode Tx, Hopping On

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4)			Length of transmission [ms]	Result [ms]	Limit [ms]	
DH1	50.8 times /	5 s x	31.6 s =	322 times	0.409	132	400
DH3	25.8 times /	5 s x	31.6 s =	164 times	1.670	274	400
DH5	17.0 times /	5 s x	31.6 s =	108 times	2.914	315	400
3DH1	50.8 times /	5 s x	31.6 s =	322 times	0.420	135	400
3DH3	26.0 times /	5 s x	31.6 s =	165 times	1.671	276	400
3DH5	17.0 times /	5 s x	31.6 s =	108 times	2.922	316	400

Sample Calculation

Result = Number of transmission x Length of transmission

\*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	51	50	51	51	50.8
DH3	26	26	25	26	26	25.8
DH5	17	17	17	17	17	17
3DH1	51	51	50	51	51	50.8
3DH3	26	26	26	26	26	26
3DH5	17	17	17	17	17	17

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

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

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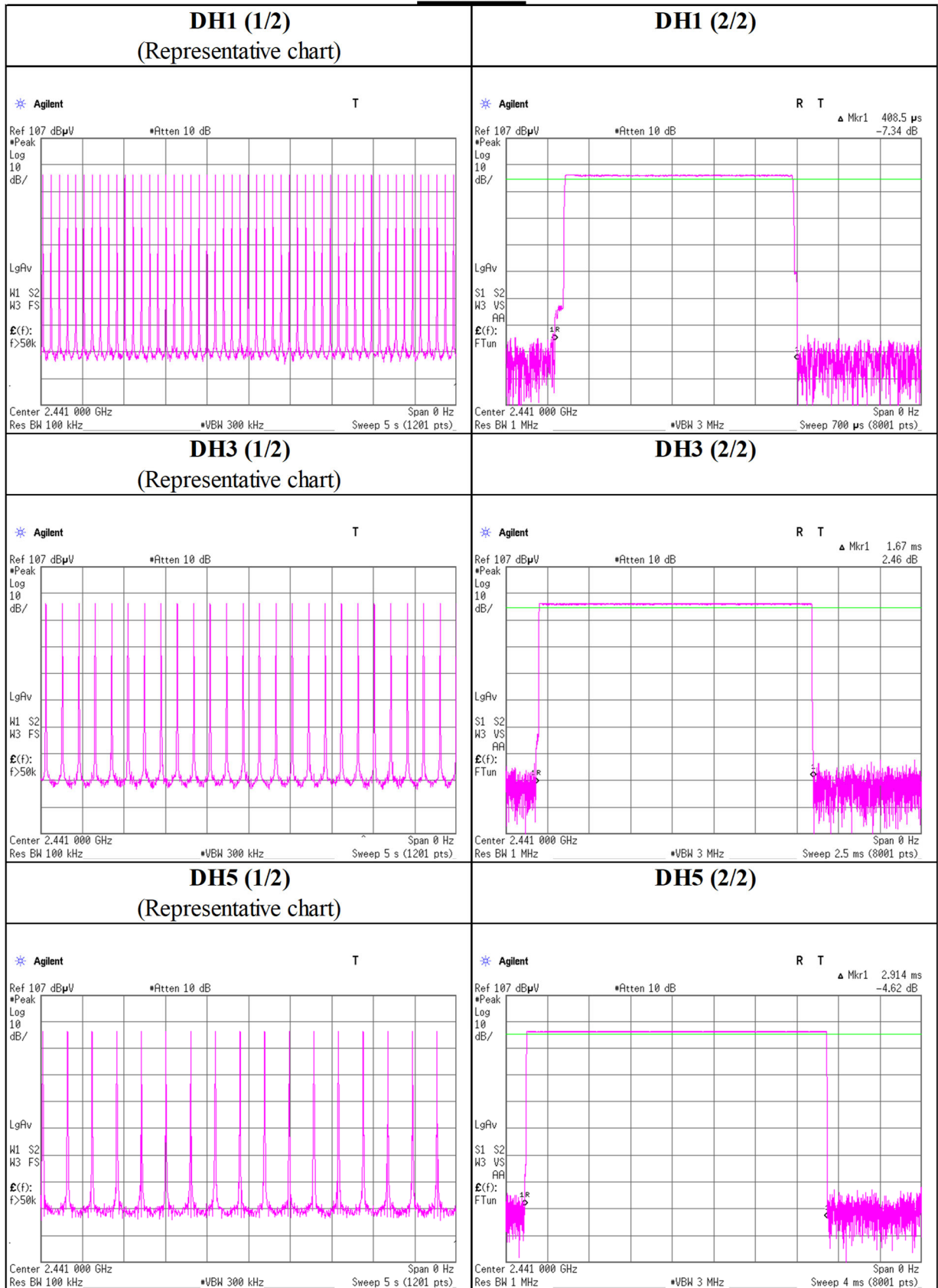
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**Dwell time**



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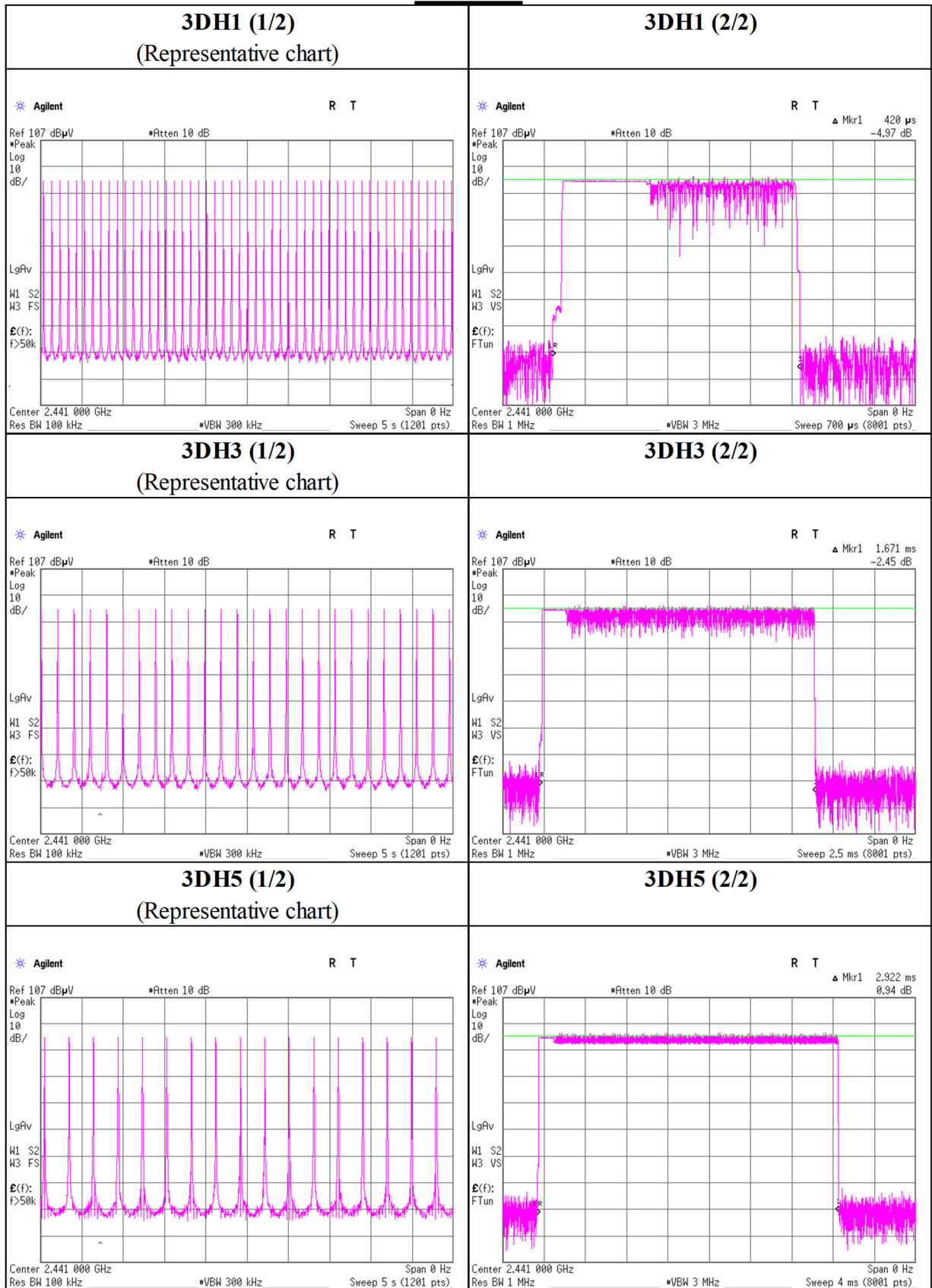
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**Dwell time**



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## Maximum Peak Output Power and Average Output Power

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 20, 2021  
Temperature / Humidity 25 deg. C / 30 % RH  
Engineer Kenichi Adachi  
Mode Tx, Hopping Off

### Maximum peak output power

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
					Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
DH5	2402	-13.58	1.52	9.88	-2.18	0.61	30.00	1000	32.18	-0.88	-3.06	0.49	36.02	4000	39.08
DH5	2441	-13.03	1.52	9.88	-1.63	0.69	30.00	1000	31.63	-0.88	-2.51	0.56	36.02	4000	38.53
DH5	2480	-12.75	1.53	9.88	-1.34	0.73	30.00	1000	31.34	-0.88	-2.22	0.60	36.02	4000	38.24
2DH5	2402	-13.94	1.52	9.88	-2.54	0.56	30.00	1000	32.54	-0.88	-3.42	0.45	36.02	4000	39.44
2DH5	2441	-13.38	1.52	9.88	-1.98	0.63	30.00	1000	31.98	-0.88	-2.86	0.52	36.02	4000	38.88
2DH5	2480	-13.07	1.53	9.88	-1.66	0.68	30.00	1000	31.66	-0.88	-2.54	0.56	36.02	4000	38.56
3DH5	2402	-13.33	1.52	9.88	-1.93	0.64	30.00	1000	31.93	-0.88	-2.81	0.52	36.02	4000	38.83
3DH5	2441	-12.72	1.52	9.88	-1.32	0.74	30.00	1000	31.32	-0.88	-2.20	0.60	36.02	4000	38.22
3DH5	2480	-12.69	1.53	9.88	-1.28	0.74	30.00	1000	31.28	-0.88	-2.16	0.61	36.02	4000	38.18

Sample Calculation:

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

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

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

All comparison were carried out on same frequency and measurement factors.

Test was not performed at AFH mode, because the decrease of number of channel (min: 20 ch) at AFH mode does not influence on the output power and bandwidth of the EUT.  
As this device had AFH mode and frequency separation could not meet the requirement of over 20 dB BW without 2/3 relaxation, 125 mW power limit was applied to it.

### Average power (Reference data for RF Exposure)

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
					DH5	2402	-15.22	1.52	9.88
DH5	2441	-14.62	1.52	9.88	-3.22	0.48	1.10	-2.12	0.61
DH5	2480	-14.33	1.53	9.88	-2.92	0.51	1.10	-1.82	0.66
2DH5	2402	-17.91	1.52	9.88	-6.51	0.22	1.08	-5.43	0.29
2DH5	2441	-17.31	1.52	9.88	-5.91	0.26	1.08	-4.83	0.33
2DH5	2480	-16.98	1.53	9.88	-5.57	0.28	1.08	-4.49	0.36
3DH5	2402	-17.90	1.52	9.88	-6.50	0.22	1.08	-5.42	0.29
3DH5	2441	-17.26	1.52	9.88	-5.86	0.26	1.08	-4.78	0.33
3DH5	2480	-17.15	1.53	9.88	-5.74	0.27	1.08	-4.66	0.34

Sample Calculation:

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

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

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

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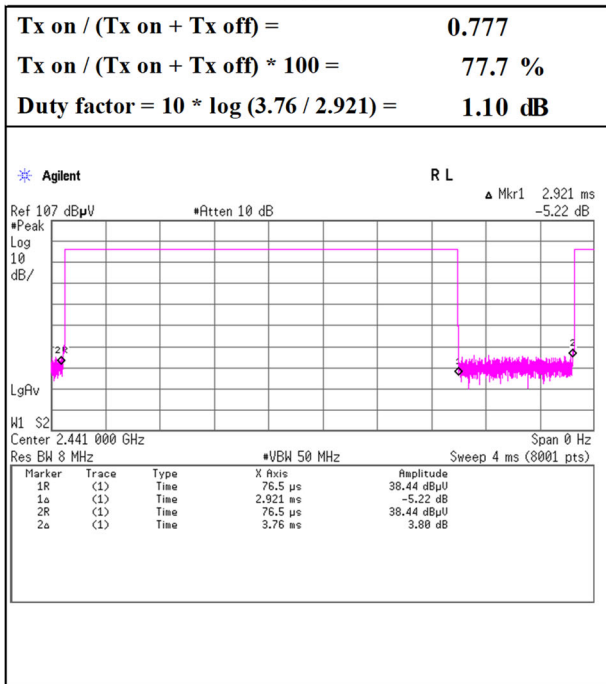
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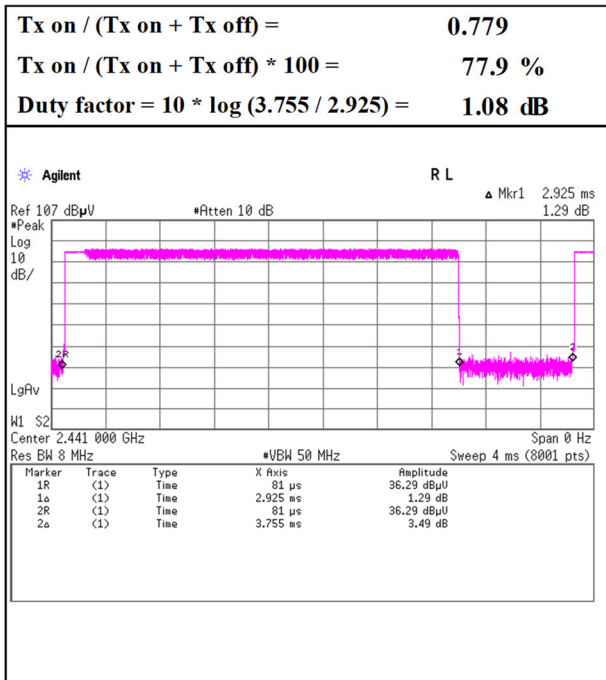
## Burst Rate Confirmation

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 20, 2021  
Temperature / Humidity 25 deg. C / 30 % RH  
Engineer Kenichi Adachi  
Mode Tx, Hopping Off

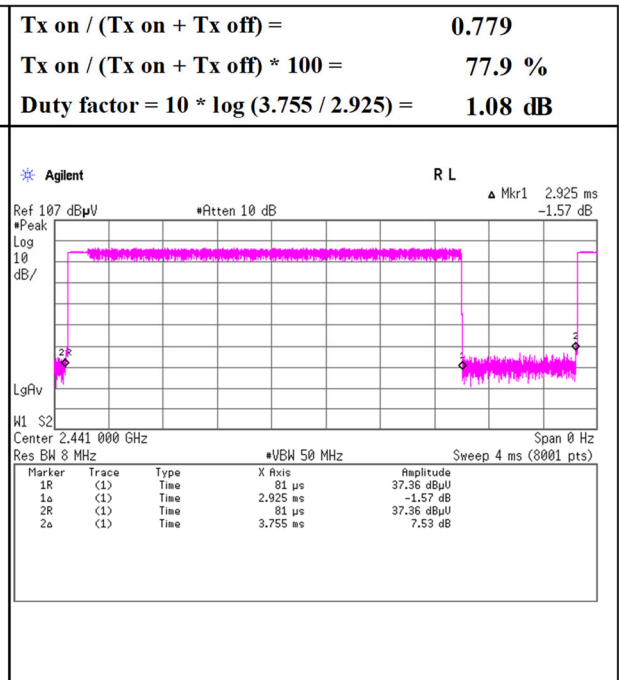
### DH5



### 2DH5



### 3DH5



**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Spurious Emission

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2 2  
Date January 26, 2021 January 22, 2021 January 20, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Toshinori Yamada Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -10 GHz ) ( 10 GHz -26.5 GHz )  
Mode Tx, Hopping Off, DH5 2402 MHz

(\* PK: Peak, AV: Average, OP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	164.248	QP	37.40	15.37	8.94	31.78	0.00	29.93	43.5	13.5	192	119	-
Hori.	200.001	QP	51.70	11.43	5.81	31.78	0.00	37.16	43.5	6.3	239	299	-
Hori.	224.003	QP	55.50	11.22	6.00	31.77	0.00	40.95	46.0	5.0	141	69	-
Hori.	240.001	QP	53.90	11.55	6.12	31.77	0.00	39.80	46.0	6.2	178	252	-
Hori.	288.002	QP	48.00	13.49	6.47	31.78	0.00	36.18	46.0	9.8	153	141	-
Hori.	327.999	QP	48.40	14.43	6.74	31.80	0.00	37.77	46.0	8.2	145	176	-
Hori.	336.001	QP	48.70	14.68	6.79	31.80	0.00	38.37	46.0	7.6	129	189	-
Hori.	2322.000	PK	46.26	28.71	13.98	38.72	2.06	52.29	73.9	21.6	109	354	-
Hori.	2362.000	PK	45.71	28.63	14.01	38.70	2.06	51.71	73.9	22.1	109	354	-
Hori.	2390.000	PK	45.18	28.56	14.04	38.68	2.06	51.16	73.9	22.7	109	354	-
Hori.	2880.115	PK	52.75	28.89	6.15	38.47	2.06	51.38	73.9	22.5	143	178	-
Hori.	3459.263	PK	52.46	29.00	5.94	38.19	2.06	51.27	73.9	22.6	100	231	-
Hori.	3650.000	PK	52.13	29.80	5.98	38.16	2.06	51.81	73.9	22.0	151	228	-
Hori.	4804.000	PK	45.37	31.62	6.43	38.54	2.06	46.94	73.9	26.9	155	207	-
Hori.	7206.000	PK	52.04	37.62	7.91	39.13	2.06	60.50	73.9	13.4	217	167	-
Hori.	9608.000	PK	46.54	38.74	9.11	39.70	2.06	56.75	73.9	17.1	100	0	-
Hori.	2880.115	AV	49.34	28.89	6.15	38.47	2.06	47.97	53.9	5.9	143	178	VBW:10 Hz
Hori.	3459.263	AV	48.04	29.00	5.94	38.19	2.06	46.85	53.9	7.0	100	231	VBW:10 Hz
Hori.	3650.000	AV	48.93	29.80	5.98	38.16	2.06	48.61	53.9	5.2	151	228	VBW:10 Hz
Vert.	52.184	QP	41.10	10.44	7.46	31.83	0.00	27.17	40.0	12.8	100	223	-
Vert.	64.820	QP	43.70	7.26	7.21	31.83	0.00	26.34	40.0	13.6	100	295	-
Vert.	192.001	QP	36.60	16.38	8.97	31.78	0.00	30.17	43.5	13.3	100	139	-
Vert.	200.001	QP	54.80	11.43	5.81	31.78	0.00	40.26	43.5	3.2	100	189	-
Vert.	208.001	QP	52.20	11.26	5.87	31.78	0.00	37.55	43.5	5.9	100	328	-
Vert.	215.999	QP	51.60	11.15	5.93	31.77	0.00	36.91	43.5	6.5	100	136	-
Vert.	224.001	QP	55.80	11.22	6.00	31.77	0.00	41.25	46.0	4.7	100	74	-
Vert.	232.003	QP	53.20	11.38	6.06	31.77	0.00	38.87	46.0	7.1	100	136	-
Vert.	240.001	QP	52.20	11.55	6.12	31.77	0.00	38.10	46.0	7.9	100	168	-
Vert.	2322.000	PK	46.11	28.71	13.98	38.72	2.06	52.14	73.9	21.7	100	304	-
Vert.	2362.000	PK	45.14	28.63	14.01	38.70	2.06	51.14	73.9	22.7	100	304	-
Vert.	2390.000	PK	45.35	28.56	14.04	38.68	2.06	51.33	73.9	22.5	100	304	-
Vert.	2880.115	PK	51.84	28.89	6.15	38.47	2.06	50.47	73.9	23.4	152	214	-
Vert.	3369.310	PK	53.19	28.75	5.87	38.24	2.06	51.63	73.9	22.2	150	165	-
Vert.	3650.000	PK	52.64	29.80	5.98	38.16	2.06	52.32	73.9	21.5	150	165	-
Vert.	4804.000	PK	45.11	31.62	6.43	38.54	2.06	46.68	73.9	27.2	135	160	-
Vert.	7206.000	PK	53.22	37.62	7.91	39.13	2.06	61.68	73.9	12.2	100	176	-
Vert.	9608.000	PK	46.50	38.74	9.11	39.70	2.06	56.71	73.9	17.1	100	0	-
Vert.	2880.115	AV	48.40	28.89	6.15	38.47	2.06	47.03	53.9	6.8	152	214	VBW:10 Hz
Vert.	3369.310	AV	50.11	28.75	5.87	38.24	2.06	48.55	53.9	5.3	150	165	VBW:10 Hz
Vert.	3650.000	AV	49.27	29.80	5.98	38.16	2.06	48.95	53.9	4.9	150	165	VBW:10 Hz

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

Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB

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

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2322.000	PK	46.26	28.71	13.98	38.72	-24.67	2.06	27.62	53.9	26.2	*1)
Hori.	2362.000	PK	45.71	28.63	14.01	38.70	-24.67	2.06	27.04	53.9	26.8	*1)
Hori.	2390.000	PK	45.18	28.56	14.04	38.68	-24.67	2.06	26.49	53.9	27.4	*1)
Hori.	4804.000	PK	45.37	31.62	6.43	38.54	-24.67	2.06	22.27	53.9	31.6	-
Hori.	7206.000	PK	52.04	37.62	7.91	39.13	-24.67	2.06	35.83	53.9	18.0	-
Hori.	9608.000	PK	46.54	38.74	9.11	39.70	-24.67	2.06	32.08	53.9	21.8	-
Vert.	2322.000	PK	46.11	28.71	13.98	38.72	-24.67	2.06	27.47	53.9	26.4	*1)
Vert.	2362.000	PK	45.14	28.63	14.01	38.70	-24.67	2.06	26.47	53.9	27.4	*1)
Vert.	2390.000	PK	45.35	28.56	14.04	38.68	-24.67	2.06	26.66	53.9	27.2	*1)
Vert.	4804.000	PK	45.11	31.62	6.43	38.54	-24.67	2.06	22.01	53.9	31.8	-
Vert.	7206.000	PK	53.22	37.62	7.91	39.13	-24.67	2.06	37.01	53.9	16.8	-
Vert.	9608.000	PK	46.50	38.74	9.11	39.70	-24.67	2.06	32.04	53.9	21.8	-

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

Distance factor : 1 GHz - 10 GHz : 20 log(3.80 m / 3.0 m) = 2.06 dB

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

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

\*1) Not out of band emission (Leakage Power)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	85.34	28.54	14.05	38.67	2.06	91.32	-	-	Carrier
Hori.	2400.000	PK	36.78	28.54	14.05	38.67	2.06	42.76	71.3	28.5	-
Vert.	2402.000	PK	85.92	28.54	14.05	38.67	2.06	91.90	-	-	Carrier
Vert.	2400.000	PK	37.74	28.54	14.05	38.67	2.06	43.72	71.9	28.1	-

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

Distance factor : 1 GHz - 10 GHz : 20 log(3.80 m / 3.0 m) = 2.06 dB

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

\*These results have sufficient margin without taking account Duty cycle correction factor.

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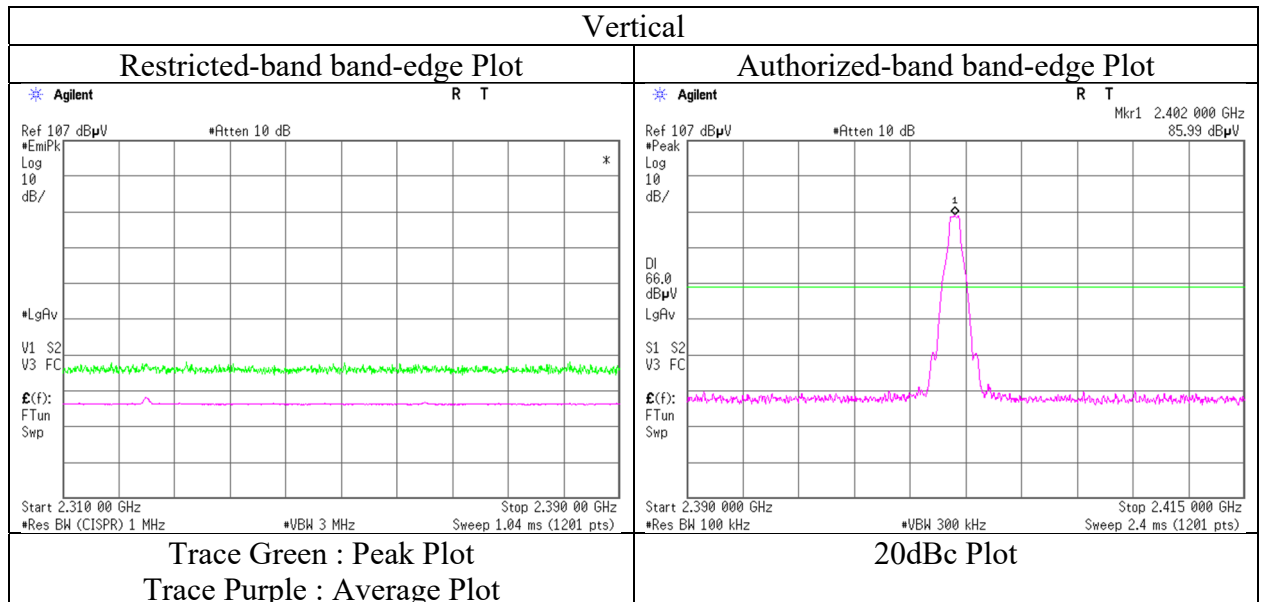
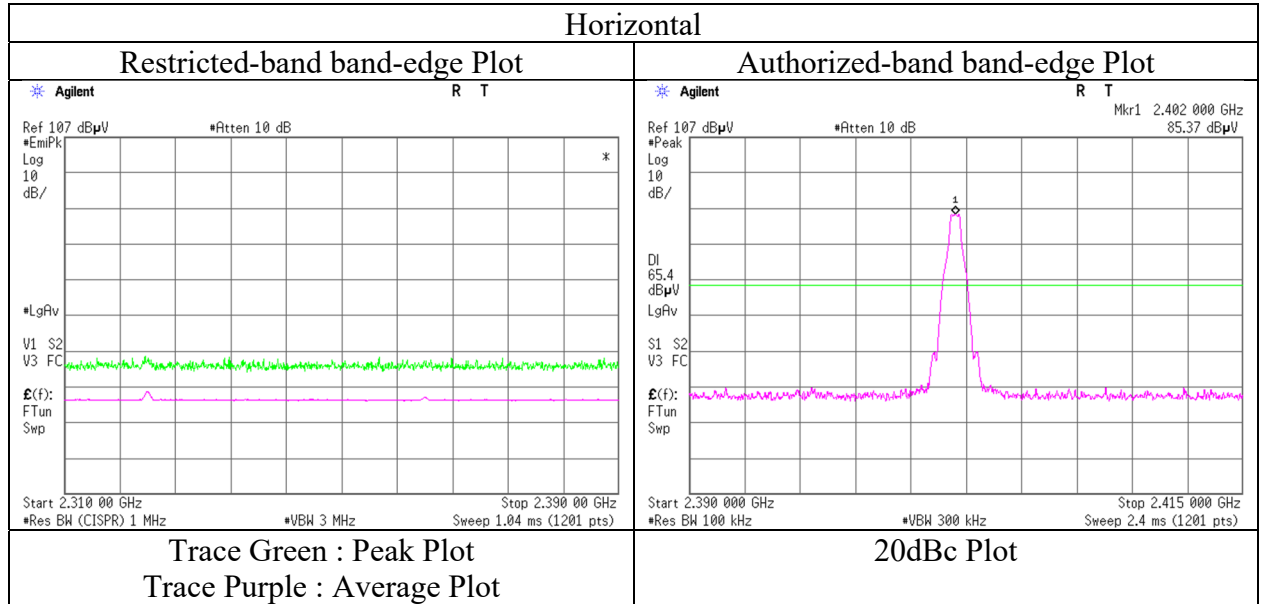
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**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

Report No.	13682531S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	2
Date	January 20, 2021
Temperature / Humidity	22 deg.C, 38 %RH
Engineer	Toshinori Yamada
Mode	Tx, Hopping Off, DH5 2402 MHz



\* 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. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2  
Date January 26, 2021 January 22, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -26.5 GHz )  
Mode Tx, Hopping Off, DH5 2441 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant. Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	192.003	QP	38.80	16.38	8.97	31.78	0.00	32.37	43.5	11.1	164	283	-
Hori.	200.002	QP	51.70	11.43	5.81	31.78	0.00	37.16	43.5	6.3	221	103	-
Hori.	208.001	QP	49.90	11.26	5.87	31.78	0.00	35.25	43.5	8.2	173	114	-
Hori.	224.003	QP	54.10	11.22	6.00	31.77	0.00	39.55	46.0	6.4	141	64	-
Hori.	232.001	QP	50.50	11.38	6.06	31.77	0.00	36.17	46.0	9.8	143	128	-
Hori.	240.002	QP	51.70	11.55	6.12	31.77	0.00	37.60	46.0	8.4	158	259	-
Hori.	320.003	QP	50.20	14.17	6.69	31.79	0.00	39.27	46.0	6.7	139	280	-
Hori.	336.003	QP	50.80	14.68	6.79	31.80	0.00	40.47	46.0	5.5	132	280	-
Hori.	2361.000	PK	46.12	28.63	14.01	38.70	2.06	52.12	73.9	21.7	115	354	-
Hori.	2521.000	PK	47.12	28.35	14.15	38.60	2.06	53.08	73.9	20.8	115	354	-
Hori.	2880.100	PK	52.01	28.89	6.15	38.47	2.06	50.64	73.9	23.2	153	263	-
Hori.	3459.263	PK	52.44	29.00	5.94	38.19	2.06	51.25	73.9	22.6	126	255	-
Hori.	3650.000	PK	52.61	29.80	5.98	38.16	2.06	52.29	73.9	21.6	119	246	-
Hori.	4882.000	PK	44.18	31.58	6.48	38.54	2.06	45.76	73.9	28.1	150	62	-
Hori.	7323.000	PK	49.83	37.74	7.98	39.28	2.06	58.33	73.9	15.5	143	170	-
Hori.	9764.000	PK	46.48	39.13	9.19	39.61	2.06	57.25	73.9	16.6	150	0	-
Hori.	2880.100	AV	49.28	28.89	6.15	38.47	2.06	47.91	53.9	5.9	153	263	VBW:10Hz
Hori.	3459.263	AV	47.98	29.00	5.94	38.19	2.06	46.79	53.9	7.1	126	255	VBW:10Hz
Hori.	3650.000	AV	49.74	29.80	5.98	38.16	2.06	49.42	53.9	4.4	119	246	VBW:10Hz
Vert.	52.186	QP	40.20	10.44	7.46	31.83	0.00	26.27	40.0	13.7	100	201	-
Vert.	64.635	QP	44.20	7.29	7.22	31.83	0.00	26.88	40.0	13.1	100	301	-
Vert.	192.007	QP	39.50	16.38	8.97	31.78	0.00	33.07	43.5	10.4	100	143	-
Vert.	200.001	QP	54.90	11.43	5.81	31.78	0.00	40.36	43.5	3.1	100	322	-
Vert.	208.001	QP	51.80	11.26	5.87	31.78	0.00	37.15	43.5	6.3	100	354	-
Vert.	216.000	QP	53.70	11.15	5.93	31.77	0.00	39.01	43.5	4.4	100	134	-
Vert.	224.003	QP	56.10	11.22	6.00	31.77	0.00	41.55	46.0	4.4	100	76	-
Vert.	232.000	QP	52.30	11.38	6.06	31.77	0.00	37.97	46.0	8.0	100	135	-
Vert.	2361.000	PK	45.78	28.63	14.01	38.70	2.06	51.78	73.9	22.1	115	311	-
Vert.	2521.000	PK	47.15	28.35	14.15	38.60	2.06	53.11	73.9	20.7	115	311	-
Vert.	2880.100	PK	53.20	28.89	6.15	38.47	2.06	51.83	73.9	22.0	145	162	-
Vert.	3369.310	PK	53.55	28.75	5.87	38.24	2.06	51.99	73.9	21.9	120	202	-
Vert.	3650.000	PK	52.33	29.80	5.98	38.16	2.06	52.01	73.9	21.8	144	162	-
Vert.	4882.000	PK	44.20	31.58	6.48	38.54	2.06	45.78	73.9	28.1	148	168	-
Vert.	7323.000	PK	50.84	37.74	7.98	39.28	2.06	59.34	73.9	14.5	175	207	-
Vert.	9764.000	PK	46.23	39.13	9.19	39.61	2.06	57.00	73.9	16.9	150	0	-
Vert.	2880.100	AV	50.71	28.89	6.15	38.47	2.06	49.34	53.9	4.5	145	162	VBW:10Hz
Vert.	3369.310	AV	49.55	28.75	5.87	38.24	2.06	47.99	53.9	5.9	120	202	VBW:10Hz
Vert.	3650.000	AV	49.31	29.80	5.98	38.16	2.06	48.99	53.9	4.9	144	162	VBW:10Hz

Result = Reading + Ant. Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

### Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant. Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2361.000	PK	46.12	28.63	14.01	38.70	-24.67	2.06	27.45	53.9	26.4	-
Hori.	2521.000	PK	47.12	28.35	14.15	38.60	-24.67	2.06	28.41	53.9	25.4	-
Hori.	4882.000	PK	44.18	31.58	6.48	38.54	-24.67	2.06	21.09	53.9	32.8	-
Hori.	7323.000	PK	49.83	37.74	7.98	39.28	-24.67	2.06	33.66	53.9	20.2	-
Hori.	9764.000	PK	46.48	39.13	9.19	39.61	-24.67	2.06	32.58	53.9	21.3	-
Vert.	2361.000	PK	45.78	28.63	14.01	38.70	-24.67	2.06	27.11	53.9	26.7	-
Vert.	2521.000	PK	47.15	28.35	14.15	38.60	-24.67	2.06	28.44	53.9	25.4	-
Vert.	4882.000	PK	44.20	31.58	6.48	38.54	-24.67	2.06	21.11	53.9	32.7	-
Vert.	7323.000	PK	50.84	37.74	7.98	39.28	-24.67	2.06	34.67	53.9	19.2	-
Vert.	9764.000	PK	46.23	39.13	9.19	39.61	-24.67	2.06	32.33	53.9	21.5	-

Result = Reading + Ant. Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB  
Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

\*These results have sufficient margin without taking account Duty cycle correction factor.

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## Radiated Spurious Emission

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2  
Date January 26, 2021 January 22, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -26.5 GHz )  
Mode Tx, Hopping Off, DH5 2480 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	191.998	QP	39.30	16.38	8.97	31.78	0.00	32.87	43.5	10.6	170	281	-
Hori.	200.000	QP	51.90	11.43	5.81	31.78	0.00	37.36	43.5	6.1	220	107	-
Hori.	207.999	QP	50.60	11.26	5.87	31.78	0.00	35.95	43.5	7.5	159	111	-
Hori.	216.000	QP	50.70	11.15	5.93	31.77	0.00	36.01	43.5	7.4	149	158	-
Hori.	224.002	QP	54.00	11.22	6.00	31.77	0.00	39.45	46.0	6.5	153	68	-
Hori.	320.001	QP	50.30	14.17	6.69	31.79	0.00	39.37	46.0	6.6	145	283	-
Hori.	335.998	QP	49.90	14.68	6.79	31.80	0.00	39.57	46.0	6.4	136	278	-
Hori.	2483.500	PK	44.22	28.40	14.13	38.62	2.06	50.19	73.9	23.7	108	355	-
Hori.	2560.000	PK	45.37	28.30	14.19	38.59	2.06	51.33	73.9	22.5	108	355	-
Hori.	2880.100	PK	51.63	28.89	6.15	38.47	2.06	50.26	73.9	23.6	153	263	-
Hori.	3459.261	PK	51.62	29.00	5.94	38.19	2.06	50.43	73.9	23.4	127	255	-
Hori.	3650.000	PK	52.55	29.80	5.98	38.16	2.06	52.23	73.9	21.6	120	248	-
Hori.	4960.000	PK	44.29	31.74	6.53	38.54	2.06	46.08	73.9	27.8	149	63	-
Hori.	7440.000	PK	48.48	37.84	8.04	39.43	2.06	56.99	73.9	16.9	152	186	-
Hori.	9920.000	PK	41.65	39.25	9.27	39.52	2.06	52.71	73.9	21.1	150	0	-
Hori.	2880.100	AV	48.35	28.89	6.15	38.47	2.06	46.98	53.9	6.9	153	263	VBW:10Hz
Hori.	3459.261	AV	47.65	29.00	5.94	38.19	2.06	46.46	53.9	7.4	127	255	VBW:10Hz
Hori.	3650.000	AV	49.03	29.80	5.98	38.16	2.06	48.71	53.9	5.1	120	248	VBW:10Hz
Vert.	52.184	QP	41.60	10.44	7.46	31.83	0.00	27.67	40.0	12.3	100	197	-
Vert.	64.660	QP	44.20	7.29	7.22	31.83	0.00	26.88	40.0	13.1	100	298	-
Vert.	192.004	QP	39.30	16.38	8.97	31.78	0.00	32.87	43.5	10.6	100	136	-
Vert.	200.002	QP	54.70	11.43	5.81	31.78	0.00	40.16	43.5	3.3	100	335	-
Vert.	208.002	QP	51.60	11.26	5.87	31.78	0.00	36.95	43.5	6.5	100	354	-
Vert.	216.000	QP	54.20	11.15	5.93	31.77	0.00	39.51	43.5	3.9	100	130	-
Vert.	224.001	QP	56.10	11.22	6.00	31.77	0.00	41.55	46.0	4.4	100	70	-
Vert.	231.998	QP	51.40	11.38	6.06	31.77	0.00	37.07	46.0	8.9	100	135	-
Vert.	2483.500	PK	44.51	28.40	14.13	38.62	2.06	50.48	73.9	23.4	103	318	-
Vert.	2560.000	PK	45.50	28.30	14.19	38.59	2.06	51.46	73.9	22.4	103	318	-
Vert.	2880.100	PK	53.33	28.89	6.15	38.47	2.06	51.96	73.9	21.9	146	163	-
Vert.	3369.301	PK	53.25	28.75	5.87	38.24	2.06	51.69	73.9	22.2	120	202	-
Vert.	3650.000	PK	52.18	29.80	5.98	38.16	2.06	51.86	73.9	22.0	144	163	-
Vert.	4960.000	PK	44.84	31.74	6.53	38.54	2.06	46.63	73.9	27.2	153	161	-
Vert.	7440.000	PK	49.20	37.84	8.04	39.43	2.06	57.71	73.9	16.1	168	206	-
Vert.	9920.000	PK	44.88	39.25	9.27	39.52	2.06	55.94	73.9	17.9	150	0	-
Vert.	2880.100	AV	50.47	28.89	6.15	38.47	2.06	49.10	53.9	4.8	146	163	VBW:10Hz
Vert.	3369.301	AV	49.58	28.75	5.87	38.24	2.06	48.02	53.9	5.8	120	202	VBW:10Hz
Vert.	3650.000	AV	48.70	29.80	5.98	38.16	2.06	48.38	53.9	5.5	144	163	VBW:10Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

### Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	44.22	28.40	14.13	38.62	-24.67	2.06	25.52	53.9	28.3	*1)
Hori.	2560.000	PK	45.37	28.30	14.19	38.59	-24.67	2.06	26.66	53.9	27.2	-
Hori.	4960.000	PK	44.29	31.74	6.53	38.54	-24.67	2.06	21.41	53.9	32.4	-
Hori.	7440.000	PK	48.48	37.84	8.04	39.43	-24.67	2.06	32.32	53.9	21.5	-
Hori.	9920.000	PK	41.65	39.25	9.27	39.52	-24.67	2.06	28.04	53.9	25.8	-
Vert.	2483.500	PK	44.51	28.40	14.13	38.62	-24.67	2.06	25.81	53.9	28.0	*1)
Vert.	2560.000	PK	45.50	28.30	14.19	38.59	-24.67	2.06	26.79	53.9	27.1	-
Vert.	4960.000	PK	44.84	31.74	6.53	38.54	-24.67	2.06	21.96	53.9	31.9	-
Vert.	7440.000	PK	49.20	37.84	8.04	39.43	-24.67	2.06	33.04	53.9	20.8	-
Vert.	9920.000	PK	44.88	39.25	9.27	39.52	-24.67	2.06	31.27	53.9	22.6	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB  
Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.  
\*1) Not out of band emission (Leakage Power)

### 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.	2480.000	PK	86.71	28.41	14.13	38.62	2.06	92.69	-	-	-Carrier
Hori.	2400.000	PK	38.77	28.54	14.05	38.67	2.06	44.75	72.6	27.8	-
Vert.	2480.000	PK	86.87	28.41	14.13	38.62	2.06	92.85	-	-	-Carrier
Vert.	2400.000	PK	38.81	28.54	14.05	38.67	2.06	44.79	72.8	28.0	-

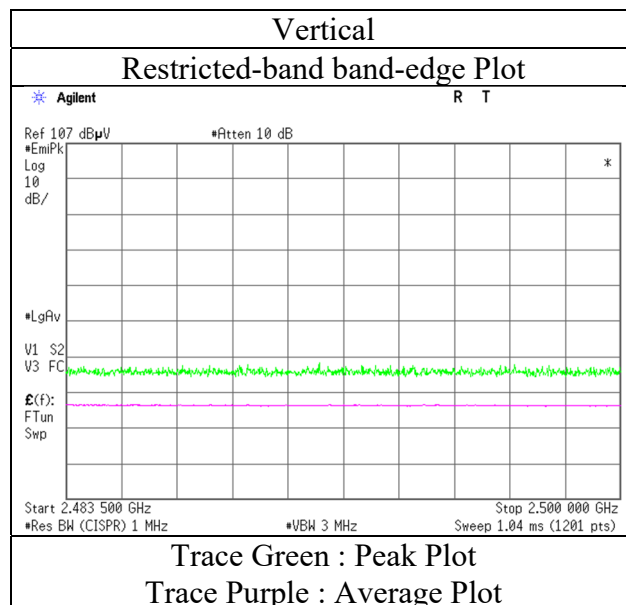
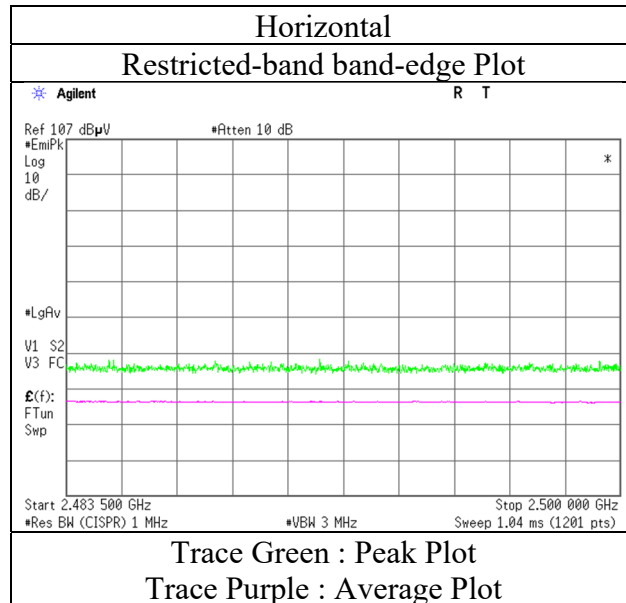
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20 log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20 log(1.0 m / 3.0 m) = -9.54 dB

\*These results have sufficient margin without taking account Duty cycle correction factor.



**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 2  
Date January 20, 2021  
Temperature / Humidity 22 deg.C, 38 %RH  
Engineer Yohsuke Matsuzawa  
Mode Tx, Hopping Off, DH5 2480 MHz



\* 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. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2  
Date January 26, 2021 January 22, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -26.5 GHz )  
Mode Tx, Hopping Off, 3DH5 2402 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	192.000	QP	39.30	16.38	8.97	31.78	0.00	32.87	43.5	10.6	169	279	-
Hori.	200.001	QP	51.50	11.43	5.81	31.78	0.00	36.96	43.5	6.5	205	104	-
Hori.	208.001	QP	51.40	11.26	5.87	31.78	0.00	36.75	43.5	6.7	175	176	-
Hori.	216.000	QP	50.60	11.15	5.93	31.77	0.00	35.91	43.5	7.5	157	157	-
Hori.	224.001	QP	53.70	11.22	6.00	31.77	0.00	39.15	46.0	6.8	144	61	-
Hori.	320.000	QP	50.30	14.17	6.69	31.79	0.00	39.37	46.0	6.6	144	288	-
Hori.	335.998	QP	49.40	14.68	6.79	31.80	0.00	39.07	46.0	6.9	131	279	-
Hori.	2322.000	PK	45.85	28.71	13.98	38.72	2.06	51.88	73.9	22.0	122	354	-
Hori.	2390.000	PK	45.97	28.56	14.04	38.68	2.06	51.95	73.9	21.9	122	354	-
Hori.	2880.100	PK	52.18	28.89	6.15	38.47	2.06	50.81	73.9	23.0	154	263	-
Hori.	3459.274	PK	52.22	29.00	5.94	38.19	2.06	51.03	73.9	22.8	126	256	-
Hori.	3650.000	PK	52.43	29.80	5.98	38.16	2.06	52.11	73.9	21.7	119	248	-
Hori.	4804.000	PK	44.58	31.62	6.43	38.54	2.06	46.15	73.9	27.7	148	154	-
Hori.	7206.000	PK	49.58	37.62	7.91	39.13	2.06	58.04	73.9	15.8	154	310	-
Hori.	9608.000	PK	46.04	38.74	9.11	39.70	2.06	56.25	73.9	17.6	150	0	-
Hori.	2880.100	AV	48.65	28.89	6.15	38.47	2.06	47.28	53.9	6.6	154	263	VBW:10Hz
Hori.	3459.274	AV	47.78	29.00	5.94	38.19	2.06	46.59	53.9	7.3	126	256	VBW:10Hz
Hori.	3650.000	AV	48.87	29.80	5.98	38.16	2.06	48.55	53.9	5.3	119	248	VBW:10Hz
Vert.	52.176	QP	42.10	10.44	7.46	31.83	0.00	28.17	40.0	11.8	100	186	-
Vert.	64.588	QP	43.90	7.30	7.22	31.83	0.00	26.59	40.0	13.4	100	316	-
Vert.	192.002	QP	39.20	16.38	8.97	31.78	0.00	32.77	43.5	10.7	100	142	-
Vert.	200.001	QP	54.50	11.43	5.81	31.78	0.00	39.96	43.5	3.5	100	335	-
Vert.	208.002	QP	52.40	11.26	5.87	31.78	0.00	37.75	43.5	5.7	100	354	-
Vert.	216.000	QP	54.40	11.15	5.93	31.77	0.00	39.71	43.5	3.7	100	136	-
Vert.	224.003	QP	56.00	11.22	6.00	31.77	0.00	41.45	46.0	4.5	100	70	-
Vert.	232.001	QP	51.20	11.38	6.06	31.77	0.00	36.87	46.0	9.1	100	140	-
Vert.	2322.000	PK	44.75	28.71	13.98	38.72	2.06	50.78	73.9	23.1	101	308	-
Vert.	2390.000	PK	44.24	28.56	14.04	38.68	2.06	50.22	73.9	23.6	101	308	-
Vert.	2880.100	PK	53.43	28.89	6.15	38.47	2.06	52.06	73.9	21.8	145	161	-
Vert.	3369.285	PK	52.39	28.75	5.87	38.24	2.06	50.83	73.9	23.0	122	203	-
Vert.	3650.000	PK	52.00	29.80	5.98	38.16	2.06	51.68	73.9	22.2	143	163	-
Vert.	4804.000	PK	44.38	31.62	6.43	38.54	2.06	45.95	73.9	27.9	151	173	-
Vert.	7206.000	PK	51.27	37.62	7.91	39.13	2.06	59.73	73.9	14.1	162	162	-
Vert.	9608.000	PK	46.16	38.74	9.11	39.70	2.06	56.37	73.9	17.5	150	0	-
Vert.	2880.100	AV	50.59	28.89	6.15	38.47	2.06	49.22	53.9	4.6	145	161	VBW:10Hz
Vert.	3369.285	AV	49.27	28.75	5.87	38.24	2.06	47.71	53.9	6.1	122	203	VBW:10Hz
Vert.	3650.000	AV	48.38	29.80	5.98	38.16	2.06	48.06	53.9	5.8	143	163	VBW:10Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log (3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2322.000	PK	45.85	28.71	13.98	38.72	-24.66	2.06	27.22	53.9	26.6	*1)
Hori.	2390.000	PK	45.97	28.56	14.04	38.68	-24.66	2.06	27.29	53.9	26.6	*1)
Hori.	4804.000	PK	44.58	31.62	6.43	38.54	-24.66	2.06	21.49	53.9	32.4	-
Hori.	7206.000	PK	49.58	37.62	7.91	39.13	-24.66	2.06	33.38	53.9	20.5	-
Hori.	9608.000	PK	46.04	38.74	9.11	39.70	-24.66	2.06	31.59	53.9	22.3	-
Vert.	2322.000	PK	44.75	28.71	13.98	38.72	-24.66	2.06	26.12	53.9	27.7	*1)
Vert.	2390.000	PK	44.24	28.56	14.04	38.68	-24.66	2.06	25.56	53.9	28.3	*1)
Vert.	4804.000	PK	44.38	31.62	6.43	38.54	-24.66	2.06	21.29	53.9	32.6	-
Vert.	7206.000	PK	51.27	37.62	7.91	39.13	-24.66	2.06	35.07	53.9	18.8	-
Vert.	9608.000	PK	46.16	38.74	9.11	39.70	-24.66	2.06	31.71	53.9	22.1	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log (3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.  
\*1) Not out of band emission (Leakage Power)

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

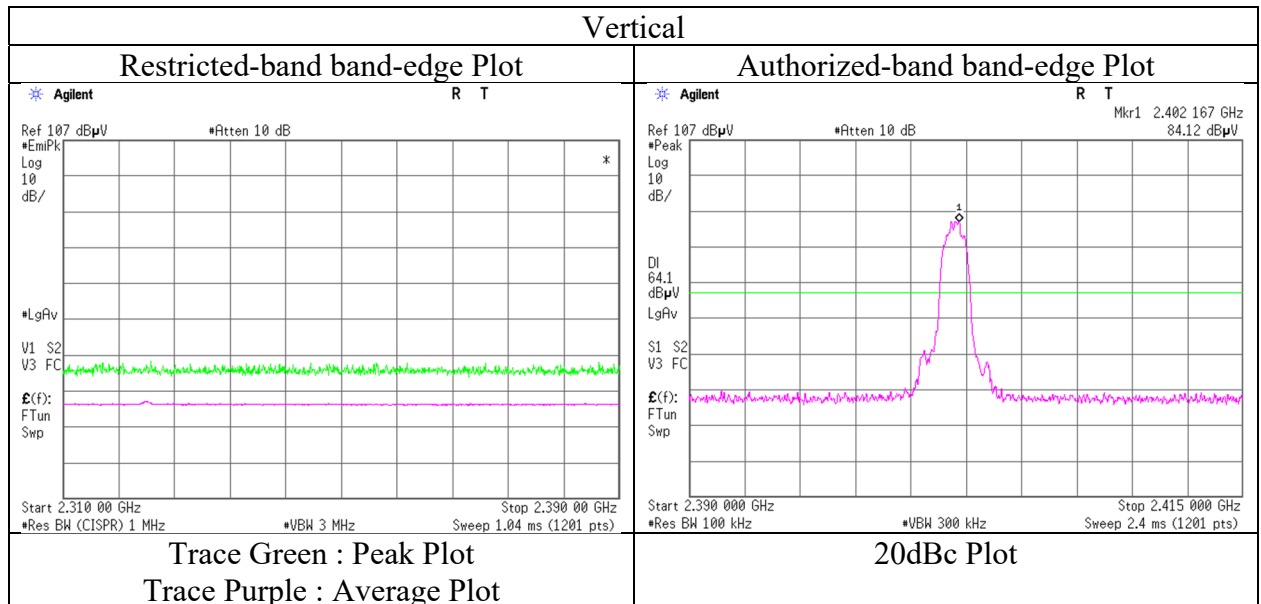
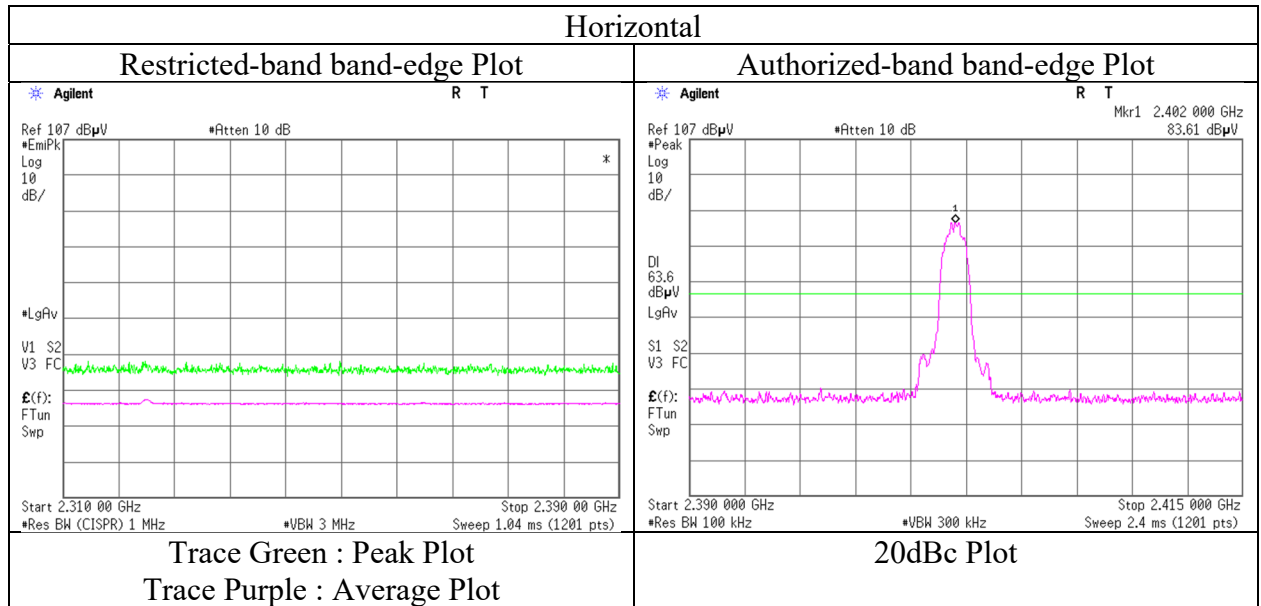
Polarity	Frequency	Detector	Reading	Ant.Fac.	Loss	Gain	Distance	Result	Limit	Margin	Remark
Hori.	2402.000	PK	83.58	28.54	14.05	38.67	2.06	89.56	-	-	Carrier
Hori.	2400.000	PK	36.58	28.54	14.05	38.67	2.06	42.56	69.5	26.9	-
Vert.	2402.000	PK	84.06	28.54	14.05	38.67	2.06	90.04	-	-	Carrier
Vert.	2400.000	PK	36.29	28.54	14.05	38.67	2.06	42.27	70.0	27.7	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20 log (3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20 log (1.0 m / 3.0 m) = -9.54 dB

**\*These results have sufficient margin without taking account Duty cycle correction factor.**

**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 2  
Date January 20, 2021  
Temperature / Humidity 22 deg.C, 38 %RH  
Engineer Yohsuke Matsuzawa  
Mode Tx, Hopping Off, 3DH5 2402 MHz



\* 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. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2  
Date January 26, 2021 January 22, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -26.5 GHz )  
Mode Tx, Hopping Off, 3DH5 2441 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	192.001	QP	38.90	16.38	8.97	31.78	0.00	32.47	43.5	11.0	167	285	-
Hori.	200.001	QP	52.10	11.43	5.81	31.78	0.00	37.56	43.5	5.9	216	103	-
Hori.	208.000	QP	51.00	11.26	5.87	31.78	0.00	36.35	43.5	7.1	165	113	-
Hori.	215.999	QP	51.00	11.15	5.93	31.77	0.00	36.31	43.5	7.1	156	159	-
Hori.	224.001	QP	53.40	11.22	6.00	31.77	0.00	38.85	46.0	7.1	152	59	-
Hori.	320.000	QP	50.20	14.17	6.69	31.79	0.00	39.27	46.0	6.7	142	286	-
Hori.	336.000	QP	50.00	14.68	6.79	31.80	0.00	39.67	46.0	6.3	126	177	-
Hori.	2361.000	PK	46.90	28.63	14.01	38.70	2.06	52.90	73.9	21.0	119	354	-
Hori.	2521.000	PK	45.83	28.35	14.15	38.60	2.06	51.79	73.9	22.1	119	354	-
Hori.	2880.100	PK	50.47	28.89	6.15	38.47	2.06	49.10	73.9	24.8	155	262	-
Hori.	3459.261	PK	52.51	29.00	5.94	38.19	2.06	51.32	73.9	22.5	127	256	-
Hori.	3650.000	PK	52.27	29.80	5.98	38.16	2.06	51.95	73.9	21.9	119	246	-
Hori.	4882.000	PK	44.84	31.58	6.48	38.54	2.06	46.42	73.9	27.4	149	323	-
Hori.	7323.000	PK	48.52	37.74	7.98	39.28	2.06	57.02	73.9	16.8	149	168	-
Hori.	9764.000	PK	46.50	39.13	9.19	39.61	2.06	57.27	73.9	16.6	150	0	-
Hori.	2880.100	AV	46.39	28.89	6.15	38.47	2.06	45.02	53.9	8.8	155	262	VBW:10Hz
Hori.	3459.261	AV	47.51	29.00	5.94	38.19	2.06	46.32	53.9	7.5	127	256	VBW:10Hz
Hori.	3650.000	AV	48.62	29.80	5.98	38.16	2.06	48.30	53.9	5.6	119	246	VBW:10Hz
Vert.	52.203	QP	41.60	10.43	7.46	31.83	0.00	27.66	40.0	12.3	100	210	-
Vert.	64.583	QP	43.90	7.30	7.22	31.83	0.00	26.59	40.0	13.4	100	304	-
Vert.	192.002	QP	39.10	16.38	8.97	31.78	0.00	32.67	43.5	10.8	100	140	-
Vert.	200.001	QP	54.60	11.43	5.81	31.78	0.00	40.06	43.5	3.4	100	325	-
Vert.	208.000	QP	52.50	11.26	5.87	31.78	0.00	37.85	43.5	5.6	100	356	-
Vert.	216.000	QP	54.80	11.15	5.93	31.77	0.00	40.11	43.5	3.3	100	130	-
Vert.	224.001	QP	55.70	11.22	6.00	31.77	0.00	41.15	46.0	4.8	100	74	-
Vert.	232.000	QP	51.20	11.38	6.06	31.77	0.00	36.87	46.0	9.1	100	137	-
Vert.	2361.000	PK	45.86	28.63	14.01	38.70	2.06	51.86	73.9	22.0	101	310	-
Vert.	2521.000	PK	46.61	28.35	14.15	38.60	2.06	52.57	73.9	21.3	101	310	-
Vert.	2880.100	PK	53.58	28.89	6.15	38.47	2.06	52.21	73.9	21.6	146	161	-
Vert.	3369.291	PK	53.61	28.75	5.87	38.24	2.06	52.05	73.9	21.8	122	203	-
Vert.	3650.000	PK	52.17	29.80	5.98	38.16	2.06	51.85	73.9	22.0	143	162	-
Vert.	4882.000	PK	44.10	31.58	6.48	38.54	2.06	45.68	73.9	28.2	150	170	-
Vert.	7323.000	PK	49.86	37.74	7.98	39.28	2.06	58.36	73.9	15.5	187	206	-
Vert.	9764.000	PK	46.58	39.13	9.19	39.61	2.06	57.35	73.9	16.5	150	0	-
Vert.	2880.100	AV	50.78	28.89	6.15	38.47	2.06	49.41	53.9	4.4	146	161	VBW:10Hz
Vert.	3369.291	AV	50.00	28.75	5.87	38.24	2.06	48.44	53.9	5.4	122	203	VBW:10Hz
Vert.	3650.000	AV	48.65	29.80	5.98	38.16	2.06	48.33	53.9	5.5	143	162	VBW:10Hz

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

### Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2361.000	PK	46.90	28.63	14.01	38.70	-24.66	2.06	28.24	53.9	25.6	-
Hori.	2521.000	PK	45.83	28.35	14.15	38.60	-24.66	2.06	27.13	53.9	26.7	-
Hori.	4882.000	PK	44.84	31.58	6.48	38.54	-24.66	2.06	21.76	53.9	32.1	-
Hori.	7323.000	PK	48.52	37.74	7.98	39.28	-24.66	2.06	32.36	53.9	21.5	-
Hori.	9764.000	PK	46.50	39.13	9.19	39.61	-24.66	2.06	32.61	53.9	21.2	-
Vert.	2361.000	PK	45.86	28.63	14.01	38.70	-24.66	2.06	27.20	53.9	26.7	-
Vert.	2521.000	PK	46.61	28.35	14.15	38.60	-24.66	2.06	27.91	53.9	26.0	-
Vert.	4882.000	PK	44.10	31.58	6.48	38.54	-24.66	2.06	21.02	53.9	32.9	-
Vert.	7323.000	PK	49.86	37.74	7.98	39.28	-24.66	2.06	33.70	53.9	20.2	-
Vert.	9764.000	PK	46.58	39.13	9.19	39.61	-24.66	2.06	32.69	53.9	21.2	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor  
Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

**\*These results have sufficient margin without taking account Duty cycle correction factor.**

## Radiated Spurious Emission

Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 3 1 2  
Date January 26, 2021 January 22, 2021 January 20, 2021  
Temperature / Humidity 23 deg.C, 37 %RH 20 deg.C, 33 %RH 22 deg.C, 38 %RH  
Engineer Yohsuke Murakami Yohsuke Matsuzawa Yohsuke Matsuzawa  
( 9 kHz -30 MHz ) ( 30 MHz -1 GHz ) ( 1 GHz -26.5 GHz )  
Mode Tx, Hopping Off, 3DH5 2480 MHz

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	192.001	QP	39.10	16.38	8.97	31.78	0.00	32.67	43.5	10.8	168	183	-
Hori.	200.001	QP	51.90	11.43	5.81	31.78	0.00	37.36	43.5	6.1	222	106	-
Hori.	208.000	QP	50.90	11.26	5.87	31.78	0.00	36.25	43.5	7.2	169	111	-
Hori.	215.999	QP	51.40	11.15	5.93	31.77	0.00	36.71	43.5	6.7	156	162	-
Hori.	224.000	QP	53.80	11.22	6.00	31.77	0.00	39.25	46.0	6.7	153	63	-
Hori.	240.000	QP	50.20	11.55	6.12	31.77	0.00	36.10	46.0	9.9	161	253	-
Hori.	320.001	QP	50.10	14.17	6.69	31.79	0.00	39.17	46.0	6.8	144	286	-
Hori.	335.997	QP	50.20	14.68	6.79	31.80	0.00	39.87	46.0	6.1	131	279	-
Hori.	2483.500	PK	44.75	28.40	14.13	38.62	2.06	50.72	73.9	23.1	108	354	-
Hori.	2560.000	PK	45.60	28.30	14.19	38.59	2.06	51.56	73.9	22.3	108	354	-
Hori.	2880.100	PK	52.10	28.89	6.15	38.47	2.06	50.73	73.9	23.1	155	261	-
Hori.	3459.261	PK	53.07	29.00	5.94	38.19	2.06	51.88	73.9	22.0	127	256	-
Hori.	3650.000	PK	52.07	29.80	5.98	38.16	2.06	51.75	73.9	22.1	118	245	-
Hori.	4960.000	PK	44.91	31.74	6.53	38.54	2.06	46.70	73.9	27.2	152	329	-
Hori.	7440.000	PK	47.31	37.84	8.04	39.43	2.06	55.82	73.9	18.0	149	142	-
Hori.	9920.000	PK	44.90	39.25	9.27	39.52	2.06	55.96	73.9	17.9	150	0	-
Hori.	2880.100	AV	47.86	28.89	6.15	38.47	2.06	46.49	53.9	7.4	155	261	VBW:10Hz
Hori.	3459.261	AV	48.59	29.00	5.94	38.19	2.06	47.40	53.9	6.5	127	256	VBW:10Hz
Hori.	3650.000	AV	48.97	29.80	5.98	38.16	2.06	48.65	53.9	5.2	118	245	VBW:10Hz
Vert.	52.190	QP	41.20	10.44	7.46	31.83	0.00	27.27	40.0	12.7	100	204	-
Vert.	64.537	QP	43.60	7.31	7.22	31.83	0.00	26.30	40.0	13.7	100	311	-
Vert.	192.000	QP	39.00	16.38	8.97	31.78	0.00	32.57	43.5	10.9	100	132	-
Vert.	200.000	QP	54.50	11.43	5.81	31.78	0.00	39.96	43.5	3.5	100	324	-
Vert.	207.998	QP	52.10	11.26	5.87	31.78	0.00	37.45	43.5	6.0	100	352	-
Vert.	216.000	QP	54.80	11.15	5.93	31.77	0.00	40.11	43.5	3.3	100	132	-
Vert.	223.999	QP	55.40	11.22	6.00	31.77	0.00	40.85	46.0	5.1	100	60	-
Vert.	231.999	QP	50.90	11.38	6.06	31.77	0.00	36.57	46.0	9.4	100	133	-
Vert.	2483.500	PK	44.94	28.40	14.13	38.62	2.06	50.91	73.9	22.9	118	318	-
Vert.	2560.000	PK	46.27	28.30	14.19	38.59	2.06	52.23	73.9	21.6	118	318	-
Vert.	2880.100	PK	53.64	28.89	6.15	38.47	2.06	52.27	73.9	21.6	146	162	-
Vert.	3369.285	PK	52.99	28.75	5.87	38.24	2.06	51.43	73.9	22.4	122	203	-
Vert.	3650.000	PK	51.90	29.80	5.98	38.16	2.06	51.58	73.9	22.3	145	161	-
Vert.	4960.000	PK	43.96	31.74	6.53	38.54	2.06	45.75	73.9	28.1	150	168	-
Vert.	7440.000	PK	48.25	37.84	8.04	39.43	2.06	56.76	73.9	17.1	145	137	-
Vert.	9920.000	PK	44.81	39.25	9.27	39.52	2.06	55.87	73.9	18.0	150	0	-
Vert.	2880.100	AV	50.76	28.89	6.15	38.47	2.06	49.39	53.9	4.5	146	162	VBW:10Hz
Vert.	3369.285	AV	48.70	28.75	5.87	38.24	2.06	47.14	53.9	6.7	122	203	VBW:10Hz
Vert.	3650.000	AV	48.67	29.80	5.98	38.16	2.06	48.35	53.9	5.5	145	161	VBW:10Hz

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

Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

### Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	44.75	28.40	14.13	38.62	-24.66	2.06	26.06	53.9	27.8	*1)
Hori.	2560.000	PK	45.60	28.30	14.19	38.59	-24.66	2.06	26.90	53.9	27.0	-
Hori.	4960.000	PK	44.91	31.74	6.53	38.54	-24.66	2.06	22.04	53.9	31.8	-
Hori.	7440.000	PK	47.31	37.84	8.04	39.43	-24.66	2.06	31.16	53.9	22.7	-
Hori.	9920.000	PK	44.90	39.25	9.27	39.52	-24.66	2.06	31.30	53.9	22.6	-
Vert.	2483.500	PK	44.94	28.40	14.13	38.62	-24.66	2.06	26.25	53.9	27.6	*1)
Vert.	2560.000	PK	46.27	28.30	14.19	38.59	-24.66	2.06	27.57	53.9	26.3	-
Vert.	4960.000	PK	43.96	31.74	6.53	38.54	-24.66	2.06	21.09	53.9	32.8	-
Vert.	7440.000	PK	48.25	37.84	8.04	39.43	-24.66	2.06	32.10	53.9	21.8	-
Vert.	9920.000	PK	44.81	39.25	9.27	39.52	-24.66	2.06	31.21	53.9	22.6	-

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

Distance factor : 1 GHz - 10 GHz : 20log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.  
\*1) Not out of band emission (Leakage Power)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Distance	Result	Limit	Margin	Remark
Hori.	2480.000	PK	85.08	28.41	14.13	38.62	2.06	91.06	-	-	Carrier
Hori.	2400.000	PK	38.03	28.54	14.05	38.67	2.06	44.01	71.0	26.9	-
Vert.	2480.000	PK	84.79	28.41	14.13	38.62	2.06	90.77	-	-	Carrier
Vert.	2400.000	PK	35.93	28.54	14.05	38.67	2.06	41.91	70.7	28.7	-

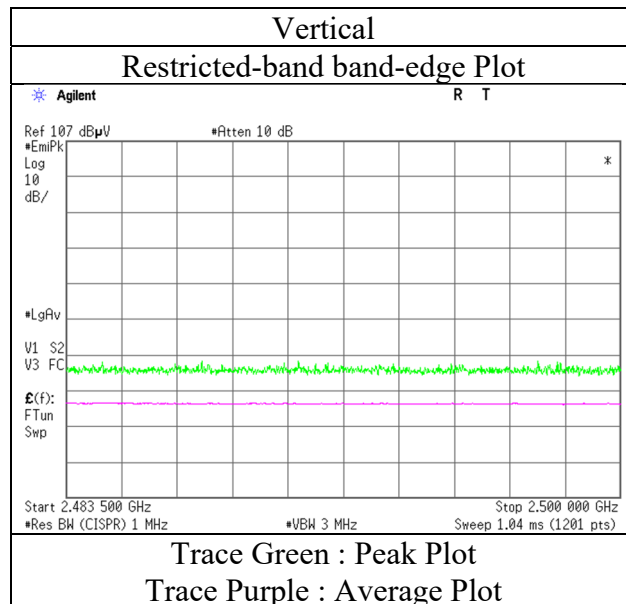
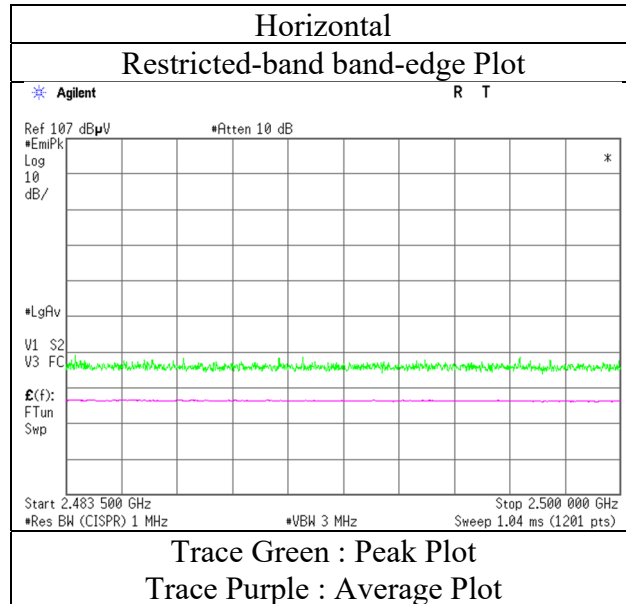
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20 log(3.80 m / 3.0 m) = 2.06 dB  
10 GHz - 40 GHz : 20 log(1.0 m / 3.0 m) = -9.54 dB

\*These results have sufficient margin without taking account Duty cycle correction factor.

**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

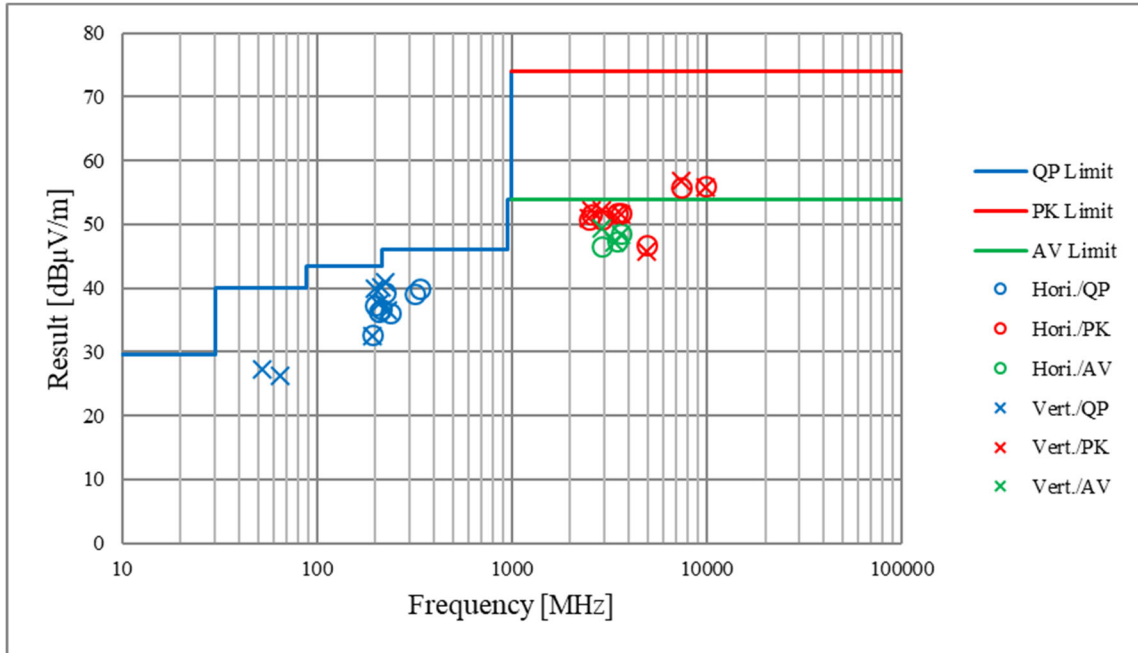
Report No. 13682531S-A-R2  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 2  
Date January 20, 2021  
Temperature / Humidity 22 deg.C, 38 %RH  
Engineer Yohsuke Matsuzawa  
Mode Tx, Hopping Off, 3DH5 2480 MHz



\* 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.	13682531S-A-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	1	2
Date	January 26, 2021	January 22, 2021	January 20, 2021
Temperature / Humidity	23 deg.C, 37 %RH	20 deg.C, 33 %RH	22 deg.C, 38 %RH
Engineer	Yohsuke Murakami ( 9 kHz -30 MHz )	Yohsuke Matsuzawa ( 30 MHz -1 GHz )	Yohsuke Matsuzawa ( 1 GHz -26.5 GHz )
Mode	Tx, Hopping Off, 3DH5 2480 MHz		



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