







RADIO TEST REPORT

Test Report No.: 14142390S-R1

Customer	Fukuda Denshi CO., Ltd.
Description of EUT	ECG, Respiration and SpO2 Transmitter
Model Number of EUT	LX-8300N
FCC ID	DV8LX8300N
Test Regulation	FCC Part 95 Subpart H: 2020 FCC Part 2 Subpart J: 2021
Test Result	Complied (Refer to SECTION 3)
Issue Date	May 23, 2022
Remarks	-

Representative Test Engineer	Approved By
	
Yusuke Tanikawara Engineer	Toyokazu Imamura Leader
	
	
CERTIFICATE 1266.03	
<input type="checkbox"/> The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.	
<input checked="" type="checkbox"/> There is no testing item of "Non-accreditation".	

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- The information provided from the applicant for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14142390S

This report is a revised version of 14142390S. 14142390S is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14142390S	February 28, 2022	-
1	14142390S-R1	May 23, 2022	4.2 Configuration and Peripherals Correction of List of cables used (Remarks) CMT-02CTH-0.8A →CMT-02CTH-0.8DA APPENDIX 1: Test data (p.13 to 15) Addition of calculation data Result 2 (e.i.r.p) to RF output power

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	Fukuda Denshi CO., Ltd.
Address	35-8, Hongo 2-Chome, Bunkyo-ku, Tokyo 113-8420, Japan
Telephone Number	+81-3-5684-1300
Contact Person	Yasuhiro Yonekawa

The information provided from the customer is as follows;

- Customer, Description 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 and Test 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**

Description	ECG, Respiration and SpO2 Transmitter
Model Number	LX-8300N
Serial Number	Refer to SECTION 4.2
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	February 2, 2022
Test Date	February 2 to 4, 2022

2.2 Product Description**General Specification**

Rating	DC 3 V (Battery)
Operating temperature	+10 deg. C to +40 deg. C

Radio Specification

Equipment Type	Transceiver
Frequency of Operation	608.0125 MHz to 613.9875 MHz
Type of Modulation	FSK
RF Output Power	1 mW \pm 2 dB *1)
RF Output Power Limit	200 mV/m at 3 m (= 106.02 dBuV/m at 3 m) (for 608 Mhz to 614 MHz)
Antenna Type	Monopole Antenna (Cable Antenna)
Antenna Gain	-1.5 dBi

*1) RF Output Power is fixed as shown in the document "Theory of Operation" and this product is shipped. (Maximum measurement value was 0.875 mW. Refer to APPENDIX 1.)

SECTION 3: Test Specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 95 Subpart H, FCC Part 95 final revised on June 26, 2020
Title	FCC 47 CFR Part 95 Personal Radio Services Subpart H Wireless Medical Telemetry Service

Test Specification	FCC Part 2 Subpart J, FCC Part 2 final revised on September 20, 2021
Title	FCC 47 CFR Part 2 Frequency Allocations and Radio Treaty Matters; General Rules and Regulations Subpart J Equipment Authorization Procedures

The EUT is used for the purpose of being related with medical treatment. Therefore this device applies to §15.103(e), exempted from FCC Part 15 Subpart B.

3.2 Procedures and Results

Item	Test Procedure *1)	Specification	Test method	Worst margin	Results	Remarks
Conducted emissions	ANSI C63.4: 2014	FCC 15.207	-	-	N/A	N/A *2)
WMTS field strength limits	FCC 2.1046, ANSI/TIA-603-E	FCC 95.2369 (a)	Radiated	12.8 dB (Horizontal, QP Mode: Tx 611.0000 MHz)	Complied a)	N/A
WMTS unwanted emissions limits	FCC 2.1053, ANSI/TIA-603-E	FCC 95.2379	Radiated	1.1 dB (3648.075 MHz, Vertical, AV Mode: Tx 608.0125 MHz)	Complied# a)	N/A
WMTS frequency accuracy	FCC 2.1055, ANSI/TIA-603-E	FCC 95.2365	Radiated	-	Complied b)	N/A
Bandwidth	FCC 2.1049, ANSI/TIA-603-E	Applicant specification	Radiated	-	Complied c)	N/A
Spurious emission at antenna terminals	FCC 2.1051, ANSI/TIA-603-E	-	Conducted	-	N/A	N/A *3)
<p>Note: UL Japan, Inc.'s EMI Work Test Procedure 13-EM-W0420.</p> <p>*1) These tests were also referred to "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards" (TIA-603-E: 2016).</p> <p>*2) The test is not applicable since the EUT has no AC mains.</p> <p>*3) The test is not applicable since the EUT has no antenna terminals.</p> <p>a) Refer to APPENDIX 1 (data of Field Strength (Fundamental Emission & Out of band emissions))</p> <p>b) Refer to APPENDIX 1 (data of Bandwidth & Occupied bandwidth (99 %))</p> <p>c) Refer to APPENDIX 1 (data of Frequency Stability)</p> <p>Symbols:</p> <p>Complied The data of this test item has enough margin, more than the measurement uncertainty.</p> <p>Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.</p>						

Supplied voltage

The EUT is a battery-operated device and test was performed with the new battery. Therefore, the EUT complies with power supply regulation.

3.3 Addition to Standard

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 SAC / SR	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.9 dB	2.8 dB	2.9 dB	2.9 dB	2.9 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	3.0 dB	3.1 dB	-	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.7 dB	-	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.1 dB	-	-
	1 GHz-6 GHz	4.8 dB	4.8 dB	4.8 dB	-	-
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB	-	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 dB	-	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Other test	Uncertainty (+/-)
Bandwidth Measurement	0.012 %
Temperature_SCH-01	0.93 deg.C.
Humidity_SCH-01	4.1 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.97 %
Frequency Measurement (Spectrum Analyzer)	1.2×10^{-8}

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)

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

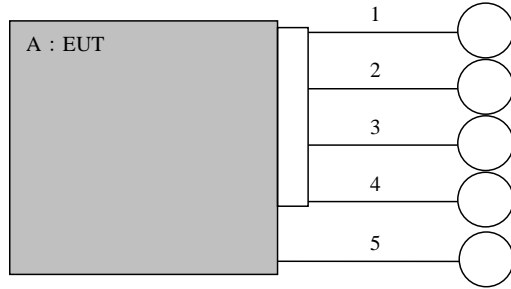
Test item	Operating mode	Tested frequency
All items	Transmitting (Modulated)	608.0125 MHz 611.0000 MHz 613.9875 MHz

*EUT has the power settings by the software as follows;

Power Setting	Fixed
Software	V06-01 (Date: 2022.1.6, Storage location: EUT memory)

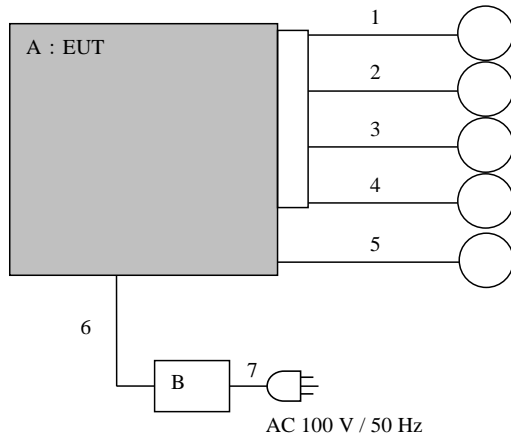
4.2 Configuration and Peripherals

<Radiated Emission>



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

<Other >



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	ECG, Respiration and SpO2 Transmitter	LX-8300N	00000006	Fukuda Denshi CO., Ltd.	EUT
B	DC power supply	PW18-2ATP	19050351	TEXIO	-

List of cables used

No.	Name	Length (m)	Shield (Cable)	Shield (Connector)	Remarks
1	Signal	0.8	Shielded	Unshielded	CMT-02CTH-0.8DA
2	Signal	0.8	Shielded	Unshielded	CMT-02CTH-0.8DA
3	Signal	0.8	Shielded	Unshielded	CMT-02CTH-0.8DA
4	Signal	0.8	Shielded	Unshielded	CMT-02CTH-0.8DA
5	Signal	0.9	Shielded	Unshielded	DS-100A
6	DC	1.5	Unshielded	Unshielded	-
7	AC	1.5	Unshielded	Unshielded	-

SECTION 5: Field Strength (Fundamental Emission & Out of band emissions)

Test Procedure

EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane, and at a distance of 3 m.

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.

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Test Receiver	Spectrum Analyzer *1)
Detector IF Bandwidth	QP: RBW 200 Hz (9 kHz -150 kHz), QP: RBW 9 kHz (150 kHz -30 MHz), QP: BW 120 kHz (30 MHz – 1000 MHz),	AV: RBW: 1 MHz VBW: 10 Hz (No pulse emission detected)
Measuring antenna	Loop (9 kHz – 30 MHz), Biconical (30 MHz - 200 MHz) Logperiodic (200 MHz - 1 GHz)	Horn

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

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

Antenna polarization	Spurious (Below 1 GHz)		Spurious (Above 1 GHz)	
	EUT	Antenna	EUT	Antenna
Horizontal	Y	Y	X	Y
Vertical	Y	Y	X	Y

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

Band edge

To determine the level of band-edge spurious, we use the following procedure:

Set the resolution bandwidth to 1 kHz in the peak detector mode.

Because we don't want to include in-band emission at BandEdge measurement if center frequencies are "608.0125 MHz" or "613.9875 MHz" and BandEdges are "608 MHz" or "614 MHz".

(The supplementation: There are some granted test report that were measured by 3 kHz RBW for the equipment that has 350 kHz for 26 dB bandwidth in similar case.)

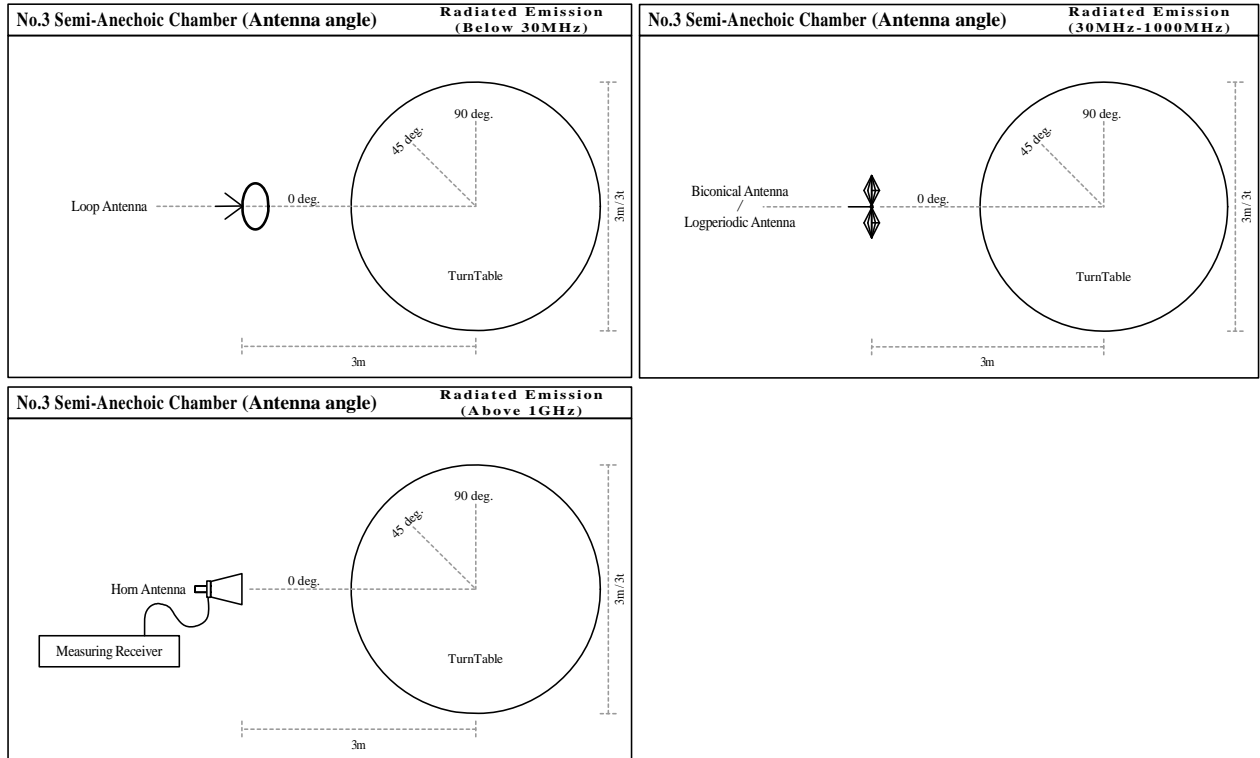
We used RBW = 1 kHz (greater than 1 % bandwidth) to prevent to detect in-band emission. Refer to KDB 971168 D01 (971168 D01 Power Meas License Digital Systems v03r01).

Measure the maximum level of the in-band channel closest to the band edge and the maximum level of the out-of-band emissions close to the same band edge.

Determine the ratio of the in-band signal to the out-of-band emissions. Then, measure the level of the in-band channel in CISPR quasi-peak mode with 120 kHz bandwidth. Using the ratio obtained, we calculate the equivalent level of the out-of-band emissions to determine compliance with the limits.

The emission tests, except for the band edge, were performed with the quasi-peak mode of the spectrum analyzer. (Bandwidth: 1 MHz)

Figure 1. Antenna angle



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

Measurement Range : 9 kHz to 7 GHz
Test Data : APPENDIX
Test Result : Pass

SECTION 6: Bandwidth & Occupied bandwidth (99 %)

Test procedure

The bandwidth was measured with a spectrum analyzer using test fixture.

Test data : APPENDIX
Test result : Pass

SECTION 7: Frequency Stability

Test procedure

The frequency stability was measured with a spectrum analyzer using test fixture.
 The temperature test was started after the temperature stabilization time of 30 minutes.

Tested temperature was -30 deg.C. to +50 deg.C

* The test result on 50 deg.C., 0 deg.C., -10 deg.C., -20 deg.C, and -30 deg.C were reference data, since the specification of operating temperature of EUT was 10 deg.C to 40 deg.C. (It used the manufacturer's specified conditions (refer to FCC 95.2365))

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Field Strength (Electric Field Strength of Fundamental Emission, Spurious Emission and Band Edge Compliance)

Report No. 14142390S-R1
 Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 2, 2022 February 3, 2022
 Temperature / Humidity 20 deg. C / 30 % RH 23 deg. C / 31 % RH
 Engineer Yosuke Murakami Yusuke Tanikawara
 (9 kHz – 1000 MHz) (1 GHz – 7 GHz)
 Mode Transmitting 608.0125 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	179.999	QP	35.00	15.98	7.82	32.07	26.73	46.0	19.2	180	69	-
Hori.	239.999	QP	41.40	11.99	8.24	31.99	29.64	46.0	16.3	137	312	-
Hori.	608.000	QP	41.96	19.67	9.92	31.90	39.65	46.0	6.3	173	324	Refer to Marker Delta Method
Hori.	608.013	QP	95.30	19.67	9.92	31.90	92.99	106.0	13.0	173	324	Carrier
Hori.	1216.025	AV	53.07	25.41	3.01	41.08	40.41	53.9	13.4	100	21	VBW 10 Hz
Hori.	1824.037	AV	49.35	25.73	3.73	41.35	37.46	53.9	16.4	114	347	VBW 10 Hz
Hori.	2432.050	AV	53.12	28.27	4.34	41.64	44.09	53.9	9.8	100	94	VBW 10 Hz
Hori.	3040.063	AV	53.03	29.10	4.88	41.82	45.19	53.9	8.7	107	92	VBW 10 Hz
Hori.	3648.075	AV	59.04	29.64	5.35	42.19	51.84	53.9	2.0	100	358	VBW 10 Hz
Hori.	4256.0870	AV	48.37	30.48	5.80	42.58	42.07	53.9	11.8	174	242	VBW 10 Hz
Hori.	4864.100	AV	42.24	31.85	6.22	42.89	37.42	53.9	16.4	195	62	VBW 10 Hz
Hori.	5472.112	AV	43.17	32.46	6.61	43.39	38.85	53.9	15.0	228	230	VBW 10 Hz
Hori.	6080.125	AV	40.56	33.73	6.96	43.46	37.79	53.9	16.1	100	202	VBW 10 Hz
Hori.	6688.138	AV	37.10	35.32	7.32	43.45	36.29	53.9	17.6	100	169	VBW 10 Hz
Vert.	239.999	QP	36.30	11.99	8.24	31.99	24.54	46.0	21.4	203	0	-
Vert.	279.999	QP	30.20	13.42	8.47	31.98	20.11	46.0	25.8	163	0	-
Vert.	608.000	QP	38.78	19.67	9.92	31.90	36.47	46.0	9.5	175	357	Refer to Marker Delta Method
Vert.	608.013	QP	92.30	19.67	9.92	31.90	89.99	106.0	16.0	175	357	Carrier
Vert.	1216.025	AV	54.72	25.41	3.01	41.08	42.06	53.9	11.8	295	358	VBW 10 Hz
Vert.	1824.037	AV	47.27	25.73	3.73	41.35	35.38	53.9	18.5	100	187	VBW 10 Hz
Vert.	2432.050	AV	54.03	28.27	4.34	41.64	45.00	53.9	8.9	130	173	VBW 10 Hz
Vert.	3040.063	AV	54.90	29.10	4.88	41.82	47.06	53.9	6.8	149	178	VBW 10 Hz
Vert.	3648.075	AV	59.95	29.64	5.35	42.19	52.75	53.9	1.1	103	202	VBW 10 Hz
Vert.	4256.0870	AV	54.38	30.48	5.80	42.58	48.08	53.9	5.8	103	194	VBW 10 Hz
Vert.	4864.100	AV	44.85	31.85	6.22	42.89	40.03	53.9	13.8	104	161	VBW 10 Hz
Vert.	5472.112	AV	54.02	32.46	6.61	43.39	49.70	53.9	4.2	102	181	VBW 10 Hz
Vert.	6080.125	AV	40.88	33.73	6.96	43.46	38.11	53.9	15.7	137	131	VBW 10 Hz
Vert.	6688.138	AV	37.33	35.32	7.32	43.45	36.52	53.9	17.3	100	117	VBW 10 Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

*The 10th harmonic was not seen so the result was its base noise level.

Marker Delta Method(Test distance 3 m)

Step	Fundamental(608.0125 MHz)	Polarity	AV			
			Hor.		Ver.	
			[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]
			Reading	Result	Reading	Result
Step1	Fundamental(608.0125 MHz)	QP	95.30	92.99	92.30	89.99
Step2	Fundamental(608.0125 MHz)	1 kHz/3 kHz	95.15	92.84	92.32	90.01
	Band-edge(608 MHz)	1 kHz/3 kHz	41.81	39.50	38.80	36.49
	Amplitude delta	-	53.34	53.34	53.52	53.52
Step3	Field strength of band-edge	-	-	39.65	-	36.47
	Limit	-	-	46.0	-	46.0
	Margin	-	-	6.3	-	9.5

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:1 kHz,VBW:3 kHz) - Band-edge(RBW:1 kHz,VBW:3 kHz)

*2 Field strength of band-edge = Fundamental(AV) - Amplitude delta

*As we stated at section 7 ("Bandedge" section), we used RBW = 1 kHz (greater than 1 % bandwidth) to prevent to detect in-band emission. Refer to KDB 971168 D01 (KDB 971168 D01 Power Meas Licence Digital System D03r01).

(for RF Exposure sheet)

[RF output power]

	Result 0 [dBuV/m]	Result 1 [mW]	Result 2 [mW]
carrier	92.99	0.844	0.597
Level			

Calculation: (*Result 0 is the maximum value (Result in the table above))

Result 1 [mW] = (((10^(Result [dBuV/m] / 20)) x 10^(-6)))

x (distance=) 3 [m]) ^2) / (30 x (gain=) 10^(-1.5 dB / 10)) x 10^3

* antenna gain value is average value. (refer to Antenna Specifications.)

(for frequency range 608-614 MHz)

Result 2 [mW] = (((10^(Result [dBuV/m] / 20)) x 10^(-6)))

x (distance=) 3 [m]) ^2) / (30 x 1) x 10^3

(*Result 1: Antenna power value, Result 2: EIRP value)

**Field Strength (Electric Field Strength of Fundamental Emission,
Spurious Emission and Band Edge Compliance)**

Report No. 14142390S-R1
 Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 2, 2022 February 3, 2022
 Temperature / Humidity 20 deg. C / 30 % RH 23 deg. C / 31 % RH
 Engineer Yosuke Murakami Yosuke Tanikawara
 (9 kHz – 1000 MHz) (1 GHz – 7 GHz)
 Mode Transmitting 611.0000 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	179.999	QP	35.1	16.0	7.8	32.1	26.8	46.0	19.1	179	68	-
Hori.	239.999	QP	42.3	12.0	8.2	32.0	30.5	46.0	15.4	138	313	-
Hori.	611.000	QP	95.4	19.7	9.9	31.9	93.2	106.0	12.8	243	0	Carrier
Hori.	1222.000	AV	53.5	25.4	3.0	41.1	40.9	53.9	13.0	100	20	VBW 10Hz
Hori.	1833.000	AV	48.4	25.8	3.7	41.4	36.6	53.9	17.3	111	346	VBW 10Hz
Hori.	2444.000	AV	53.8	28.3	4.4	41.6	44.7	53.9	9.1	167	87	VBW 10Hz
Hori.	3055.000	AV	54.4	29.1	4.9	41.8	46.6	53.9	7.2	107	80	VBW 10Hz
Hori.	3666.000	AV	59.1	29.7	5.4	42.2	52.0	53.9	1.9	100	356	VBW 10Hz
Hori.	4277.000	AV	46.0	30.5	5.8	42.6	39.7	53.9	14.2	100	41	VBW 10Hz
Hori.	4888.000	AV	42.1	31.9	6.3	42.9	37.3	53.9	16.5	102	45	VBW 10Hz
Hori.	5499.000	AV	45.9	32.5	6.6	43.4	41.6	53.9	12.2	136	151	VBW 10Hz.
Hori.	6110.000	AV	40.6	33.8	7.0	43.5	37.9	53.9	16.0	111	211	VBW 10Hz
Hori.	6721.000	AV	39.3	35.4	7.3	43.4	38.6	53.9	15.2	128	188	VBW 10Hz.
Vert.	239.999	QP	37.0	12.0	8.2	32.0	25.2	46.0	20.7	180	358	-
Vert.	279.999	QP	30.4	13.4	8.5	32.0	20.3	46.0	25.6	180	2	-
Vert.	611.000	QP	92.6	19.7	9.9	31.9	90.4	106.0	15.6	178	350	Carrier
Vert.	1222.000	AV	54.7	25.4	3.0	41.1	42.1	53.9	11.8	295	359	VBW 10Hz
Vert.	1833.000	AV	47.3	25.8	3.7	41.4	35.5	53.9	18.4	143	180	VBW 10Hz
Vert.	2444.000	AV	53.3	28.3	4.4	41.6	44.3	53.9	9.6	100	174	VBW 10Hz
Vert.	3055.000	AV	54.3	29.1	4.9	41.8	46.5	53.9	7.3	146	170	VBW 10Hz
Vert.	3666.000	AV	59.6	29.7	5.4	42.2	52.4	53.9	1.4	100	197	VBW 10Hz
Vert.	4277.000	AV	53.5	30.5	5.8	42.6	47.2	53.9	6.7	103	194	VBW 10Hz
Vert.	4888.000	AV	45.3	31.9	6.3	42.9	40.6	53.9	13.3	101	156	VBW 10Hz
Vert.	5499.000	AV	56.0	32.5	6.6	43.4	51.7	53.9	2.2	115	179	VBW 10Hz
Vert.	6110.000	AV	40.9	33.8	7.0	43.5	38.2	53.9	15.7	183	189	VBW 10Hz
Vert.	6721.000	AV	42.2	35.4	7.3	43.4	41.5	53.9	12.3	101	173	VBW 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

*The 10th harmonic was not seen so the result was its base noise level.

(for RF Exposure sheet)

[RF output power]

	Result 0 [dBuV/m]	Result 1 [mW]	Result 2 [mW]
carrier	93.15	0.875	0.62
Level			

Calculation: (*Result 0 is the maximum value (Result) in the table above)

$$\text{Result 1 [mW]} = (((10^{\text{Result [dBuV/m]} / 20}) \times 10^{(-6)}) \times (\text{distance} = 3 \text{ [m]})^2) / (30 \times (\text{gain} = 10^{(-1.5 \text{ dBi} / 10)}) \times 10^3)$$

* antenna gain value is average value. (refer to Antenna Specifications)

(for frequency range 608-614 MHz)

$$\text{Result 2 [mW]} = (((10^{\text{Result [dBuV/m]} / 20}) \times 10^{(-6)}) \times (\text{distance} = 3 \text{ [m]})^2) / (30 \times 1) \times 10^3$$

(*Result 1: Antenna power value, Result 2: EIRP value)

**Field Strength (Electric Field Strength of Fundamental Emission,
Spurious Emission and Band Edge Compliance)**

Report No. 14142390S-R1
 Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 2, 2022 February 3, 2022
 Temperature / Humidity 20 deg. C / 30 % RH 23 deg. C / 31 % RH
 Engineer Yosuke Murakami Yosuke Tanikawara
 (9 kHz – 1000 MHz) (1 GHz – 7 GHz)
 Mode Transmitting 613.9875 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	179.999	QP	34.9	16.0	7.8	32.1	26.6	46.0	19.3	179	67	-
Hori.	239.999	QP	42.0	12.0	8.2	32.0	30.2	46.0	15.7	138	312	-
Hori.	613.988	QP	95.3	19.7	9.9	31.9	93.1	106.0	12.9	172	321	Carrier
Hori.	614.000	QP	45.3	19.7	9.9	31.9	43.0	46.0	3.0	172	321	Refer to Maker Delta Method
Hori.	1227.975	AV	54.5	25.5	3.0	41.1	41.9	53.9	11.9	100	23	VBW 10Hz
Hori.	1841.963	AV	46.8	25.8	3.7	41.4	35.0	53.9	18.9	109	347	VBW 10Hz
Hori.	2455.950	AV	52.7	28.3	4.4	41.7	43.7	53.9	10.2	163	86	VBW 10Hz
Hori.	3069.938	AV	51.0	29.2	4.9	41.8	43.2	53.9	10.7	315	85	VBW 10Hz
Hori.	3683.9250	AV	56.9	29.7	5.4	42.2	49.8	53.9	4.1	100	358	VBW 10Hz
Hori.	4297.913	AV	46.6	30.6	5.8	42.6	40.3	53.9	13.5	295	52	VBW 10Hz
Hori.	4911.900	AV	47.7	32.0	6.3	42.9	43.1	53.9	10.8	400	48	VBW 10Hz.
Hori.	5525.888	AV	49.4	32.5	6.6	43.4	45.2	53.9	8.7	109	149	VBW 10Hz
Hori.	6139.875	AV	41.2	33.9	7.0	43.5	38.6	53.9	15.3	100	12	VBW 10Hz
Hori.	6753.862	AV	44.7	35.5	7.4	43.4	44.1	53.9	9.8	255	242	VBW 10Hz
Vert.	239.999	QP	36.8	12.0	8.2	32.0	25.0	46.0	20.9	171	340	-
Vert.	279.999	QP	30.2	13.4	8.5	32.0	20.1	46.0	25.8	166	358	-
Vert.	613.988	QP	92.9	19.7	9.9	31.9	90.7	106.0	15.3	175	350	Carrier
Vert.	614.000	QP	46.1	19.7	9.9	31.9	43.8	46.0	2.2	175	350	Refer to Maker Delta Method
Vert.	1227.975	AV	55.7	25.5	3.0	41.1	43.1	53.9	10.8	281	1	VBW 10Hz
Vert.	1841.9630	AV	46.5	25.8	3.7	41.4	34.7	53.9	19.2	185	187	VBW 10Hz
Vert.	2455.950	AV	53.7	28.3	4.4	41.7	44.6	53.9	9.2	161	186	VBW 10Hz
Vert.	3069.938	AV	51.0	29.2	4.9	41.8	43.2	53.9	10.6	100	203	VBW 10Hz
Vert.	3683.925	AV	59.5	29.7	5.4	42.2	52.4	53.9	1.4	101	194	VBW 10Hz
Vert.	4297.913	AV	53.6	30.6	5.8	42.6	47.4	53.9	6.5	103	202	VBW 10Hz
Vert.	4911.900	AV	51.4	32.0	6.3	42.9	46.7	53.9	7.1	100	165	VBW 10Hz
Vert.	5525.888	AV	56.3	32.5	6.6	43.4	52.0	53.9	1.8	102	182	VBW 10Hz
Vert.	6139.875	AV	44.3	33.9	7.0	43.5	41.7	53.9	12.2	154	251	VBW 10Hz
Vert.	6753.862	AV	52.1	35.5	7.4	43.4	51.5	53.9	2.4	102	175	VBW 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

*The 10th harmonic was not seen so the result was its base noise level.

Marker Delta Method(Test distance 3 m)

Step	Fundamental(613.9875 MHz)	Polarity	AV			
			Hor.		Ver.	
			Reading [dBuV]	Result [dBuV/m]	Reading [dBuV]	Result [dBuV/m]
Step1	Fundamental(613.9875 MHz)	QP	95.30	93.05	92.90	90.65
Step2	Fundamental(613.9875 MHz)	1 kHz/3 kHz	95.40	93.15	92.91	90.66
	Band-edge(614 MHz)	1 kHz/3 kHz	45.35	43.10	46.10	43.85
Step3	Amplitude delta	-	50.05	50.05	46.81	46.81
	Field strength of band-edge	-	-	43.00	-	43.84
	Limit	-	-	46.0	-	46.0
	Margin	-	-	3.0	-	2.2

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:1 kHz,VBW:3 kHz) - Band-edge(RBW:1 kHz,VBW:3 kHz)

*2 Field strength of band-edge = Fundamental(AV) - Amplitude delta

*As we stated at section 7 ("Bandedge" section), we used RBW = 1 kHz (greater than 1 % bandwidth) to prevent to detect in-band emission. Refer to KDB 971168 D01 (KDB 971168 D01 Power Meas Licence Digital System D03r01).

(for RF Exposure sheet)

[RF output power]	Result 0	Result 1	Result 2
	[dBuV/m]	[mW]	[mW]
carrier	93.05	0.855	0.606
Level			

Calculation: (*Result 0 is the maximum value (Result) in the table above)

$$\text{Result 1 [mW]} = (((10^{\text{Result [dBuV/m]}} / 20) \times 10^{(-6)}) \times (\text{distance} = 3 \text{ [m]})^2) / (30 \times (\text{gain} = 10^{(-1.5 \text{ dB} / 10)}) \times 10^3$$

* antenna gain value is average value. (refer to Antenna Specifications.)

(for frequency range 608-614 MHz)

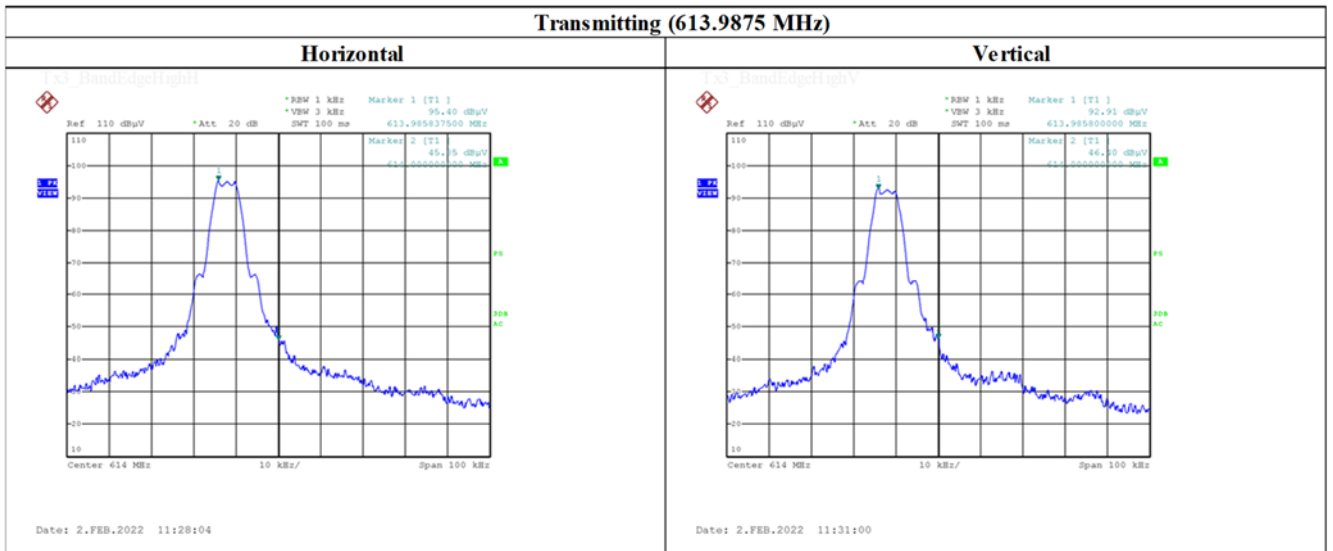
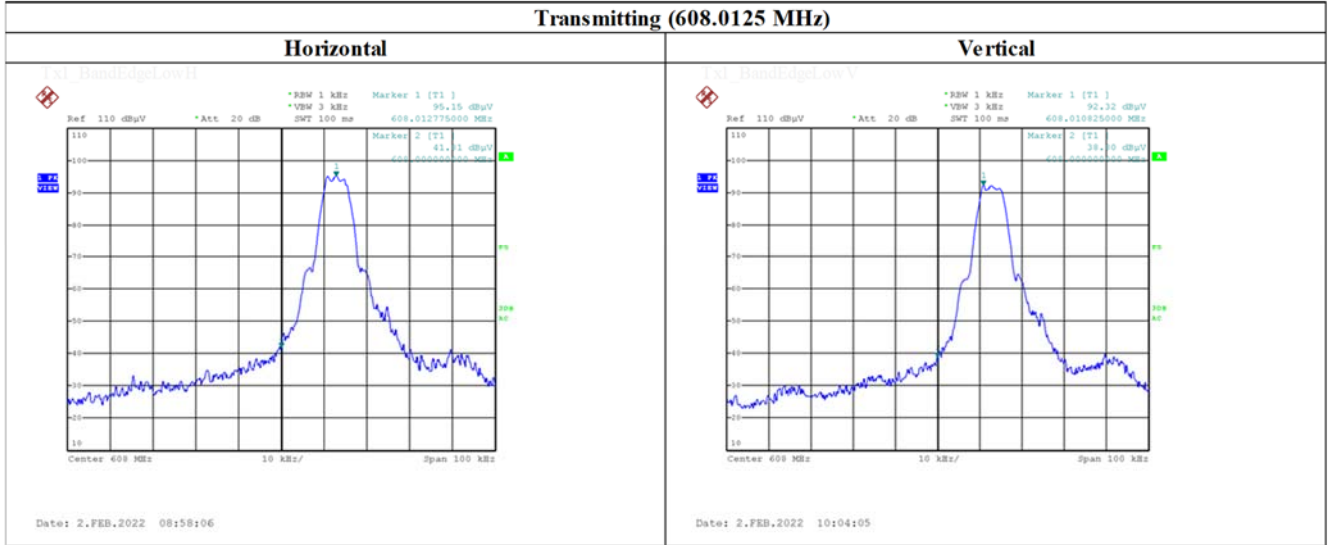
$$\text{Result 2 [mW]} = (((10^{\text{Result [dBuV/m]}} / 20) \times 10^{(-6)}) \times (\text{distance} = 3 \text{ [m]})^2) / (30 \times 1) \times 10^3$$

(*Result 1: Antenna power value, Result 2: EIRP value)

**Field Strength (Electric Field Strength of Fundamental Emission,
 Spurious Emission and Band Edge Compliance)**

Report No. 14142390S-R1
 Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 2, 2022
 Temperature / Humidity 20 deg. C / 30 % RH
 Engineer Yosuke Murakami
 Mode Transmitting

Band Edge compliance(for Marker Delta Method)

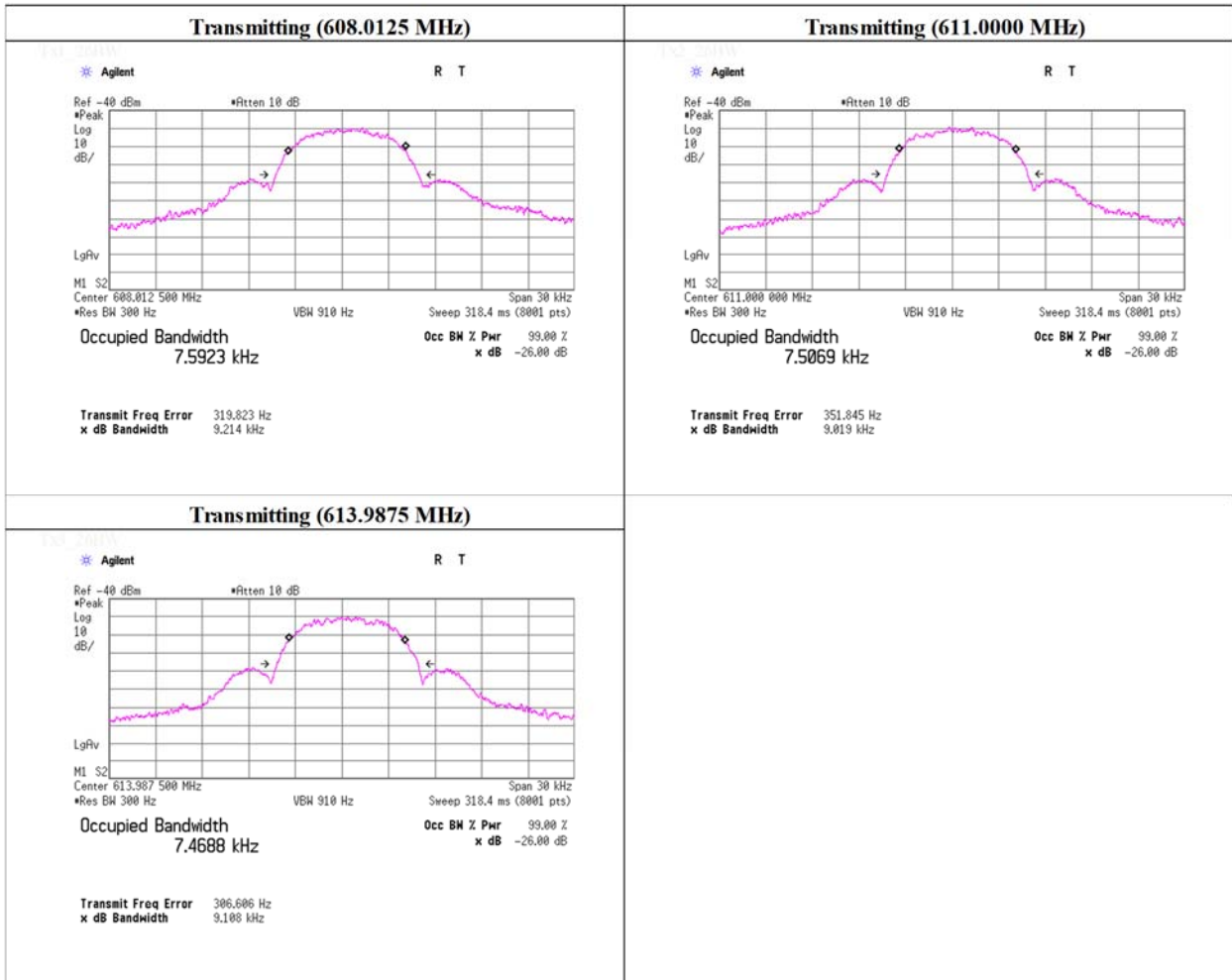


Bandwidth and Occupied Bandwidth (99 %)

Report No.	14142390S-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	February 3, 2022
Temperature / Humidity	25 deg. C / 35 % RH
Engineer	Yosuke Murakami
Mode	Transmitting

Freq. [MHz]	-26 dB Bandwidth [kHz]	99 % Occupied Bandwidth [kHz]
608.0125	9.214	7.5923
611.0000	9.019	7.5069
613.9875	9.108	7.4688

No limit applies to -26 dB Bandwidth and 99 % Occupied Bandwidth.



Frequency Stability

Report No.	14142390S-R1	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	February 3, 2022	February 4, 2022
Temperature / Humidity	25 deg. C / 35 % RH	23 deg. C / 38 % RH
Engineer	Yosuke Murakami	
Mode	Transmitting 608.0125 MHz	

Test Condition deg.C Voltage		Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	Limit [+/- ppm]	Margin [ppm]
20 deg.C	DC 1.8 V (Vmin)	Power on	608.012688	0.000188	0.31	2.50	2.19
		on 2 min.	608.012788	0.000288	0.47	2.50	2.03
		on 5 min.	608.012816	0.000316	0.52	2.50	1.98
		on 10 min.	608.012657	0.000157	0.26	2.50	2.24
	DC 3 V (Vnom)	Power on	608.012757	0.000257	0.42	2.50	2.08
		on 2 min.	608.012923	0.000423	0.69	2.50	1.81
		on 5 min.	608.012829	0.000328	0.54	2.50	1.96
		on 10 min.	608.013079	0.000578	0.95	2.50	1.55
50 deg.C.	DC 3 V	Power on	608.012357	-0.000143	-0.24	-	-
		on 2 min.	608.012322	-0.000178	-0.29	-	-
		on 5 min.	608.012413	-0.000088	-0.14	-	-
		on 10 min.	608.012276	-0.000225	-0.37	-	-
40 deg.C.	DC 3 V	Power on	608.012104	-0.000397	-0.65	2.50	1.85
		on 2 min.	608.011997	-0.000503	-0.83	2.50	1.67
		on 5 min.	608.012313	-0.000187	-0.31	2.50	2.19
		on 10 min.	608.012235	-0.000265	-0.44	2.50	2.06
30 deg.C.	DC 3 V	Power on	608.012272	-0.000228	-0.37	2.50	2.13
		on 2 min.	608.012472	-0.000028	-0.05	2.50	2.45
		on 5 min.	608.012541	0.000041	0.07	2.50	2.43
		on 10 min.	608.012504	0.000004	0.01	2.50	2.49
20 deg.C.	DC 3 V	Power on	608.012757	0.000257	0.42	2.50	2.08
		on 2 min.	608.012923	0.000423	0.69	2.50	1.81
		on 5 min.	608.012829	0.000328	0.54	2.50	1.96
		on 10 min.	608.013079	0.000578	0.95	2.50	1.55
10 deg.C.	DC 3 V	Power on	608.012951	0.000451	0.74	2.50	1.76
		on 2 min.	608.013120	0.000619	1.02	2.50	1.48
		on 5 min.	608.013036	0.000535	0.88	2.50	1.62
		on 10 min.	608.013057	0.000557	0.92	2.50	1.58
0 deg.C.	DC 3 V	Power on	608.012707	0.000206	0.34	-	-
		on 2 min.	608.012501	0.000000	0.00	-	-
		on 5 min.	608.012542	0.000041	0.07	-	-
		on 10 min.	608.012576	0.000075	0.12	-	-
-10deg.C.	DC 3 V	Power on	608.011419	-0.001082	-1.78	-	-
		on 2 min.	608.011441	-0.001060	-1.74	-	-
		on 5 min.	608.011453	-0.001047	-1.72	-	-
		on 10 min.	608.011428	-0.001072	-1.76	-	-
-20 deg.C	DC 3 V	Power on	608.007533	-0.004968	-8.17	-	-
		on 2 min.	608.008204	-0.004296	-7.07	-	-
		on 5 min.	608.008345	-0.004155	-6.83	-	-
		on 10 min.	608.008524	-0.003977	-6.54	-	-
-30 deg.C	DC 3 V	Power on	608.006194	-0.006306	-10.37	-	-
		on 2 min.	608.006466	-0.006034	-9.92	-	-
		on 5 min.	608.006745	-0.005756	-9.47	-	-
		on 10 min.	608.006370	-0.006131	-10.08	-	-

Limit : 608.0125 MHz +/-0.00025 % (+/-2.5 ppm) = +/- 0.001520 MHz

*The test on 50 deg.C., 0 deg.C., -10 deg.C., -20 deg.C. and -30 deg.C. were reference data, since the specification of operating temperature of EUT was 10 deg.C to 40 deg.C. (It used the manufacturer's specified conditions (refer to FCC 95.2365))

Frequency Stability

Report No.	14142390S-R1	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	February 3, 2022	February 3, 2022
Temperature / Humidity	25 deg. C / 35 % RH	25 deg. C / 35 % RH
Engineer	Yosuke Murakami	
Mode	Transmitting 611.0000 MHz	

Test Condition		Test Timing	Measured frequency	Frequency error	Result	Limit	Margin
deg.C	Voltage		[MHz]	[MHz]	[ppm]	[+/- ppm]	[ppm]
20 deg.C	DC 1.8 V (Vmin)	Power on	611.000198	0.000198	0.32	2.50	2.18
		on 2 min.	611.000276	0.000276	0.45	2.50	2.05
		on 5 min.	611.000313	0.000313	0.51	2.50	1.99
		on 10 min.	611.000276	0.000276	0.45	2.50	2.05
	DC 3 V (Vnom)	Power on	611.000470	0.000470	0.77	2.50	1.73
		on 2 min.	611.000507	0.000507	0.83	2.50	1.67
		on 5 min.	611.000438	0.000438	0.72	2.50	1.78
		on 10 min.	611.000276	0.000276	0.45	2.50	2.05
50 deg.C.	DC 3 V	Power on	610.999797	-0.000203	-0.33	-	-
		on 2 min.	610.999685	-0.000315	-0.52	-	-
		on 5 min.	611.000060	0.000060	0.10	-	-
		on 10 min.	610.999754	-0.000247	-0.40	-	-
40 deg.C.	DC 3 V	Power on	610.999610	-0.000390	-0.64	2.50	1.86
		on 2 min.	610.999685	-0.000315	-0.52	2.50	1.98
		on 5 min.	610.999566	-0.000434	-0.71	2.50	1.79
		on 10 min.	610.999591	-0.000409	-0.67	2.50	1.83
30 deg.C.	DC 3 V	Power on	610.999738	-0.000262	-0.43	2.50	2.07
		on 2 min.	611.000104	0.000104	0.17	2.50	2.33
		on 5 min.	610.999979	-0.000022	-0.04	2.50	2.46
		on 10 min.	611.000035	0.000035	0.06	2.50	2.44
20 deg.C.	DC 3 V	Power on	611.000470	0.000470	0.77	2.50	1.73
		on 2 min.	611.000507	0.000507	0.83	2.50	1.67
		on 5 min.	611.000438	0.000438	0.72	2.50	1.78
		on 10 min.	611.000276	0.000276	0.45	2.50	2.05
10 deg.C.	DC 3 V	Power on	611.000607	0.000607	0.99	2.50	1.51
		on 2 min.	611.000520	0.000519	0.85	2.50	1.65
		on 5 min.	611.000610	0.000610	1.00	2.50	1.50
		on 10 min.	611.000385	0.000385	0.63	2.50	1.87
0 deg.C.	DC 3 V	Power on	611.000085	0.000084	0.14	-	-
		on 2 min.	611.000335	0.000335	0.55	-	-
		on 5 min.	611.000185	0.000185	0.30	-	-
		on 10 min.	611.000048	0.000047	0.08	-	-
-10deg.C.	DC 3 V	Power on	610.998741	-0.001260	-2.06	-	-
		on 2 min.	610.998828	-0.001172	-1.92	-	-
		on 5 min.	610.999053	-0.000947	-1.55	-	-
		on 10 min.	610.999000	-0.001000	-1.64	-	-
-20 deg.C	DC 3 V	Power on	610.996117	-0.003883	-6.36	-	-
		on 2 min.	610.996415	-0.003585	-5.87	-	-
		on 5 min.	610.996867	-0.003133	-5.13	-	-
		on 10 min.	610.996605	-0.003395	-5.56	-	-
-30 deg.C	DC 3 V	Power on	610.993645	-0.006355	-10.40	-	-
		on 2 min.	610.993601	-0.006400	-10.47	-	-
		on 5 min.	610.993776	-0.006224	-10.19	-	-
		on 10 min.	610.993785	-0.006215	-10.17	-	-

Limit : 611 MHz +/-0.00025 % (+/-2.5 ppm) = +/- 0.001528 MHz

*The test on 50 deg.C., 0 deg.C., -10 deg.C., -20 deg.C. and -30 deg.C. were reference data, since the specification of operating temperature of EUT was 10 deg.C to 40 deg.C. (It used the manufacturer's specified conditions (refer to FCC 95.2365))

Frequency Stability

Report No.	14142390S-R1	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	February 3, 2022	February 3, 2022
Temperature / Humidity	25 deg. C / 35 % RH	25 deg. C / 35 % RH
Engineer	Yosuke Murakami	
Mode	Transmitting 613.9875 MHz	

Test Condition deg.C Voltage		Test Timing	Measured frequency [MHz]	Frequency error [MHz]	Result [ppm]	Limit [+/- ppm]	Margin [ppm]
20 deg.C	DC 1.8 V (Vmin)	Power on	613.987573	0.000072	0.12	2.50	2.38
		on 2 min.	613.987723	0.000223	0.36	2.50	2.14
		on 5 min.	613.987560	0.000060	0.10	2.50	2.40
		on 10 min.	613.987719	0.000219	0.36	2.50	2.14
	DC 3 V (Vnom)	Power on	613.987835	0.000335	0.54	2.50	1.96
		on 2 min.	613.987601	0.000101	0.16	2.50	2.34
		on 5 min.	613.987832	0.000332	0.54	2.50	1.96
		on 10 min.	613.987826	0.000326	0.53	2.50	1.97
50 deg.C.	DC 3 V	Power on	613.987470	-0.000030	-0.05	-	-
		on 2 min.	613.987310	-0.000190	-0.31	-	-
		on 5 min.	613.987369	-0.000131	-0.21	-	-
		on 10 min.	613.987235	-0.000265	-0.43	-	-
40 deg.C.	DC 3 V	Power on	613.987294	-0.000206	-0.34	2.50	2.16
		on 2 min.	613.986916	-0.000584	-0.95	2.50	1.55
		on 5 min.	613.987191	-0.000309	-0.50	2.50	2.00
		on 10 min.	613.987163	-0.000337	-0.55	2.50	1.95
30 deg.C.	DC 3 V	Power on	613.987382	-0.000118	-0.19	2.50	2.31
		on 2 min.	613.987426	-0.000074	-0.12	2.50	2.38
		on 5 min.	613.987410	-0.000090	-0.15	2.50	2.35
		on 10 min.	613.987272	-0.000228	-0.37	2.50	2.13
20 deg.C.	DC 3 V	Power on	613.987835	0.000335	0.54	2.50	1.96
		on 2 min.	613.987601	0.000101	0.16	2.50	2.34
		on 5 min.	613.987832	0.000332	0.54	2.50	1.96
		on 10 min.	613.987826	0.000326	0.53	2.50	1.97
10 deg.C.	DC 3 V	Power on	613.987926	0.000426	0.69	2.50	1.81
		on 2 min.	613.988032	0.000532	0.87	2.50	1.63
		on 5 min.	613.988119	0.000619	1.01	2.50	1.49
		on 10 min.	613.987916	0.000416	0.68	2.50	1.82
0 deg.C.	DC 3 V	Power on	613.987547	0.000047	0.08	-	-
		on 2 min.	613.987835	0.000335	0.54	-	-
		on 5 min.	613.987713	0.000213	0.35	-	-
		on 10 min.	613.987635	0.000135	0.22	-	-
-10deg.C.	DC 3 V	Power on	613.985671	-0.001829	-2.98	-	-
		on 2 min.	613.985922	-0.001578	-2.57	-	-
		on 5 min.	613.986084	-0.001416	-2.31	-	-
		on 10 min.	613.986143	-0.001357	-2.21	-	-
-20 deg.C	DC 3 V	Power on	613.984093	-0.003407	-5.55	-	-
		on 2 min.	613.984211	-0.003289	-5.36	-	-
		on 5 min.	613.984042	-0.003458	-5.63	-	-
		on 10 min.	613.984315	-0.003185	-5.19	-	-
-30 deg.C	DC 3 V	Power on	613.980898	-0.006602	-10.75	-	-
		on 2 min.	613.980988	-0.006512	-10.61	-	-
		on 5 min.	613.981420	-0.006080	-9.90	-	-
		on 10 min.	613.981057	-0.006443	-10.49	-	-

Limit : 613.9875 MHz +/-0.00025 % (+/-2.5 ppm) = +/- 0.001535 MHz

*The test on 50 deg.C., 0 deg.C., -10 deg.C., -20 deg.C. and -30 deg.C. were reference data, since the specification of operating temperature of EUT was 10 deg.C to 40 deg.C. (It used the manufacturer's specified conditions (refer to FCC 95.2365))

APPENDIX 2: Test Instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	COTS-SEMI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3 (RE,CE,ME,PE)	-	-	-
RE	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
RE	SAEC-03 (NSA)	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2021/04/27	12
RE	SAF-03	145126	Pre Amplifier	SONOMA	310N	290213	2021/02/10	12
RE	SAF-06	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2021/02/08	12
RE	SAT6-13	167094	Attenuator	JFW	50HF-006N	-	2021/02/10	12
RE	SAT6-15	167096	Attenuator	JFW	50HF-006N	-	2021/02/10	12
RE	SBA-03	145023	Biconical Antenna	Schwarzbeck Mess- Elektronik OHG	BBA9106	91032666	2021/05/15	12
RE	SCC- C1/C2/C3/C4/C5 /C10/SRSE-03	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271 (RF Selector)	2021/04/12	12
RE	SCC-G40	166491	Coaxial Cable	Junkosha	MWX221- 01000NFSNMS/B	1612S005	2022/01/06	12
RE	SCC-G43	156380	Coaxial Cable	Huber+Suhner	SUCOFLEX_104_E	SN MY 13406/4E	2021/05/17	12
RE	SCC-G58	183047	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	800287/4A	2021/05/17	12
RE	SCC-M1	194601	Coaxial Cable	Fjikura	5D-2W	-	2021/12/10	12
RE	SHA-03	145501	Horn Antenna	Schwarzbeck Mess- Elektronik OHG	BBHA9120D	9120D-739	2021/06/14	12
RE	SLA-07	145529	Logperiodic Antenna	Schwarzbeck Mess- Elektronik OHG	VUSLP9111B	196	2021/05/15	12
RE	SLP-02	145536	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	2021/04/06	12
RE	SOS-23	191840	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/08/02	12
RE	SSA-02	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2021/04/13	12
RE	STR-02	145791	Test Receiver	Rohde & Schwarz	ESCI	100575	2021/06/02	12
RE	STR-09	213530	Test Receiver	Rohde & Schwarz	ESW44	103068	2022/01/17	12
RE	STS-03	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2021/09/14	12
TF	KTS-07	145111	Digital Tester	SANWA	PC500	7019232	2021/09/14	12
TF	SCH-01	145200	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	2021/04/02	12
TF	SOS-19	175823	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2021/10/14	12
TF	SRENT-22	202830	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250036	2021/12/01	12
TF	SSCA-01	146178	Search coil	Langer	RF-R 400-1	02-0634	-	-

*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

TF: Test Fixture Test