



RADIO TEST REPORT


Test Report No. : 13826578S-A-R2

Applicant : DENSO CORPORATION
Type of EUT : UWB Reader
Model Number of EUT : WAN00
FCC ID : HYQWAN00
Test regulation : FCC Part 15 Subpart F: 2021
Test Result : Complied (Refer to Section 3)

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
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6. This test report covers Radio technical requirements.
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. 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 13826578S-A-R1. 13826578S-A-R1 is replaced with this report.

Date of test: May 19 to June 24, 2021

Representative test engineer: 
Kenichi Adachi
Engineer

Approved by: 
Toyokazu Imamura
Leader



CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 13826578S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13826578S-A	July 29, 2021	-	-
1	13826578S-A-R1	September 3, 2021	p.5	Correction of title: From "Section 15.517 indoor UWB systems" To "Section 15.519 hand held UWB systems"
			p.11	Correction of value: (for carrier's emission) RBW 3 MHz -> 50 MHz VBW 3 MHz -> 80 MHz
			p.11	Correction of Test Distance: From "0.5 m *1) (960 MHz - 10.6 GHz)" To "3.0 m (960 MHz - 1 GHz) 0.5 m *1) (1 GHz - 10.6 GHz)"
			p.11	Additional comment: "*4) For section 10.3.2 of ANSI C63.10: 2013. This measurement was performed at less than 3 m due to the small radiation emission of EUT. In addition, this measurement was performed by the substitution measurement. Since there are frequencies that are the distance of the near field condition with respect to the measurement distance, we have verified the measurement results in the near field condition and the far field condition and confirmed that there was no difference in the test results."
2	13826578S-A-R2	September 22, 2021	p.11	Deleted comment *1), *2), *3) Added comment mark *4)
			p.13, p.14	Changed 10 dBc bandwidth value to 99 % occupied bandwidth value.

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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 : +81-566-87-6722 (Ext.551-45860)
Facsimile Number : +81-566-25-4546
Contact Person : Tatsuya Nakagawa

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 (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : UWB Reader
Model No. : WAN00
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 12 V typical (DC 9 V to 16 V)
Receipt Date of Sample : May 14, 2021
Country of Mass-production : USA, China, Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model: WAN00 (referred to as the EUT in this report) is a UWB Reader.

General Specification

Clock frequency(ies) in the system : 55.2 MHz (RF part), 40 MHz (CAN control part)

Radio Specification

Equipment type : Transceiver
Frequency of operation : 6489.6 MHz (6240.0 - 6739.2 MHz)(ch 5),
7987.2 MHz (7737.6 - 8236.8 MHz)(ch 9)
Type of modulation : BPM-BPSK
Antenna type : Monopole antenna (Printed pattern)
Antenna connector type : None
Antenna gain : +5.0 dBi (for 6489.6 MHz), +4.9 dBi (for 7987.2 MHz)
Operating temperature : -40 deg.C to +105 deg.C

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart F
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021
* The revision does not affect the test result conducted before its effective date.

Title : FCC 47CFR Part15 Radio Frequency Device
Section 15.207 Conducted limits
Subpart F Ultra-Wideband Operation
Section 15.519 Technical requirements for hand held UWB systems.

3.2 Procedures and results

< Requirements for indoor UWB systems >

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	FCC: ANSI C63.10:2013 6 Standard test methods ----- IC: RSS-Gen 8.8	FCC: Section 15.207, Section 15.505(a) Section 15.521(j) ----- IC: RSS-220 5.2.1(b)	-	N/A	*1)
UWB Bandwidth	FCC: Section 15.503(a) ANSI C63.10: 2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices ----- IC: RSS-220 Annex 2	FCC: Section 15.503(d), Section 15.519(b) ----- IC: RSS-220 2, RSS-220 5.1	-	Complied a)	Radiated
Radiated emission	FCC: Section 15.521(d) ANSI C63.10: 2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices ----- IC: RSS-Gen 6.5 RSS-220 Annex 4	FCC: Section 15.209, Section 15.505, Section 15.519(c)(d), Section 521(c) ----- IC: RSS-220 5.3.1(c)(d)(e)	0.03 dB 6536.698 MHz AV, Horizontal (Transmitting CH5)	Complied# b)	Radiated (above 30 MHz) / Conducted (below 30 MHz) *2)
Peak level of the Emission	FCC: Section 15.521(e)(g) ANSI C63.10: 2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices ----- IC: RSS-220 Annex 4	FCC: Section 15.519 (e) ----- IC: RSS-220 5.3.1(g)	14.92 dB 6552.431 MHz PK, Horizontal (Transmitting CH5)	Complied c)	Radiated
Transmitter timeout	FCC: Section 15.519(a)(1) ANSI C63.10: 2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices ----- IC: RSS-220 Annex 4	FCC: Section 15.519 (a)(1) ----- IC: RSS-220 5.3.1(b)	-	Complied d)	Conducted

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

*1) This test not applicable since the EUT does not have AC Mains.

*2) Radiated test was selected over 30 MHz based on section 15.519 (c). a) Refer to APPENDIX 1 (data of UWB Bandwidth)

b) Refer to APPENDIX 1 (data of Radiated emission)

c) Refer to APPENDIX 1 (data of Peak level of the Emission)

d) Refer to APPENDIX 1 (data of Transmitter timeout)

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)

This EUT provides stable voltage constantly to RF Module regardless of input voltage. 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 EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of UWB Bandwidth, 99 % Occupied Bandwidth)					

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 E.U.T. during testing

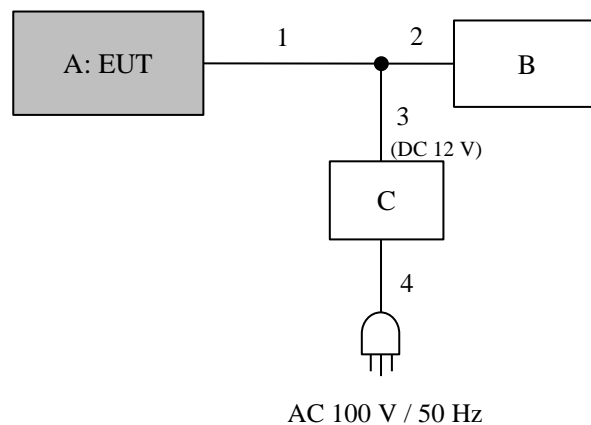
4.1 Operating Mode(s)

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

Test Item	Mode
Other than Transmitter timeout test	Transmitting CH 5 (6489.6 MHz), Transmitting CH 9 (7987.2 MHz)
Transmitter timeout test	Normal transmitting CH 5 (6489.6 MHz), Normal transmitting CH 9 (7987.2 MHz)
-	Software (Firmware): UWB software for certification Ver: 1.2 (Date: 2021.2.13, Storage location: EUT memory) Power setting: Fixed (CH5: +1 dBm, CH 9: 0 dBm) *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.

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration and peripherals



*Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	UWB Reader	WAN00	28 *1) 16 *2) 24 *3)	DENSO	EUT
B	CAN Logger	GL1000	028069-000444	vector	-
C	Power Supply (DC)	PAN35-10A	DE001677	KIKUSUI	-

*1) Used for Radiated emission tests

*2) Used for Antenna terminal conducted tests

*3) Used for Transmitter timeout test

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	DC & Signal	3.3 + 2.5	Unshielded	Unshielded	-
2	DC & Signal	0.5	Unshielded	Unshielded	-
3	DC	0.55	Unshielded	Unshielded	-
4	AC	2.0	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 960 MHz]

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

[For above 960 MHz]

EUT was placed on a platform of nominal size, 0.15 m by 0.05 m, raised 1.5 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.

(UWB emissions and other emissions)

1) The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

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

(UWB emissions only)

2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1.5m as the EUT. The frequency below 1GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1).

The frequency above 1GHz of the Substitution Antenna was used Horn Antenna.

The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 to 4m to obtain maximum receiving level.

Its Output power of Signal Generator was recorded.

3) Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

For the usage of the antenna (horn Antenna) except for the half wave dipole antenna (2.15dBi) for the substitution antenna, the equivalent isotropic radiated power was calculated by compensating not the finite difference in the antenna gain of the half wave dipole antenna, and substitution antenna.

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

Frequency	Below 960 MHz	Above 960 MHz		
Instrument used	Test Receiver	Spectrum Analyzer		
Detector	Quasi-Peak (QP)	Peak (PK)	RMS (AV)	
IF Bandwidth	BW 120 kHz	(for UWB spurious emission): RBW: 1 MHz VBW: 3 MHz (for carrier's emission): RBW: 50 MHz VBW: 80 MHz	(for UWB spurious emission): RBW: 1 MHz VBW: 3 MHz (for Peak level of the emission) RBW: 1 kHz VBW: 3 kHz	
Test Distance	3 m	3.0 m (960 MHz – 1 GHz) 0.5 m *1) (1 GHz – 10.6 GHz), 0.3 m *1) (10.6 GHz – 17 GHz), 0.1 m *1) (above 17 GHz)		

*1) For section 10.3.2 of ANSI C63.10: 2013. This measurement was performed at less than 3 m due to the small radiation emission of EUT. In addition, this measurement was performed by the substitution measurement.

Since there are frequencies that are the distance of the near field condition with respect to the measurement distance, we have verified the measurement results in the near field condition and the far field condition and confirmed that there was no difference in the test results.

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

Polarity	Frequency [GHz]								
	Below 0.030	0.030-0.96	0.96-1	1-4.8	4.8-10.6	10.6-17	17-18	18-26.5	26.5-40
Hor.	X	Y	X	X	X	Y	X	Y	Z
Ver.	X	Y	X	Z	Z	Z	X	X	Y

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

Measurement range : 9 kHz - 40 GHz

Test data : APPENDIX

Test result : Pass

SECTION 7: UWB bandwidth and 99 % occupied bandwidth

Test Procedure

The tests were made with below setting by a radiated electric field in semi-anechoic chamber.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
UWB Bandwidth, 99 % Occupied Bandwidth	1 GHz	1 MHz	3 MHz	Auto	Peak	Max Hold	Spectrum Analyzer

Test data : APPENDIX

Test result : Pass

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SECTION 8: 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
Conducted Spurious Emission *1)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				

*1) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.

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

Test data : APPENDIX
Test result : Pass

SECTION 9: Transmitter timeout

Test Procedure

The test was made with spectrum analyzer.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 19, 2021
Temperature / Humidity : 24 deg. C / 53 % RH
Engineer : Kenichi Adachi
Mode : Transmitting CH 5

(UWB emission, RBW 1 MHz)

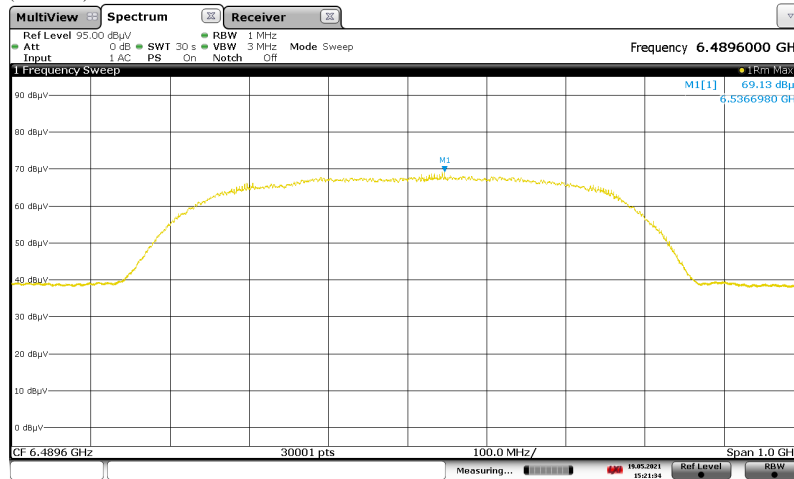
(*SA: Spectrum analyzer, SG: Signal generator, Ant.: substitution antenna)

Band	Pol.	Frequency [MHz]	SA Reading [dBuV/MHz]	SG level [dBm]	Tx Ant.Gain [dBi]	Tx Loss [dB]	-	EIRP Result [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]	Remarks	Height [cm]	Angle [deg.]
3.1 GHz - 10.6 GHz	Hor.	6536.698	69.13	-47.78	10.25	3.80	-	-41.33	-41.30	0.03	carrier	143	109
3.1 GHz - 10.6 GHz	Ver.	6470.801	69.01	-47.90	10.25	3.80	-	-41.45	-41.30	0.15	carrier	148	285

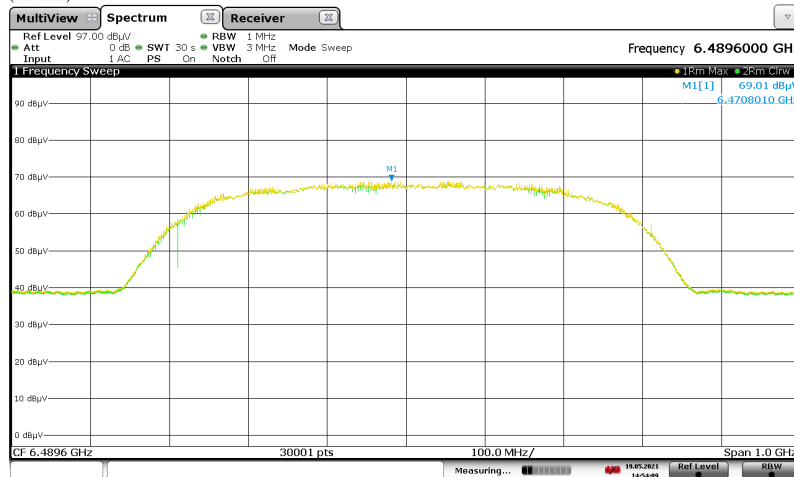
Sample Calculation :

EIRP Result [dBm/MHz] = SG level [dBm] + Tx Ant.Gain [dBi] - Tx Loss [dB]

(Horizontal)



(Vertical)



* For RF Exposure evaluation

Maximum RMS power measured: -41.33 dBm/MHz (refer to upper table value) = $10^{-41.33/10} = 0.000073621$ mW/MHz

The bandwidth of this equipment was 580.378 MHz (99 % occupied bandwidth, refer to the data of bandwidth sheet)

Total RMS output power was 0.042728 mW = 0.000073621 mW/MHz x 580.378 MHz

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Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 20, 2021
Temperature / Humidity : 25 deg. C / 59 % RH
Engineer : Hiromasa Sato
Mode : Transmitting CH 9

(UWB emission, RBW 1 MHz)

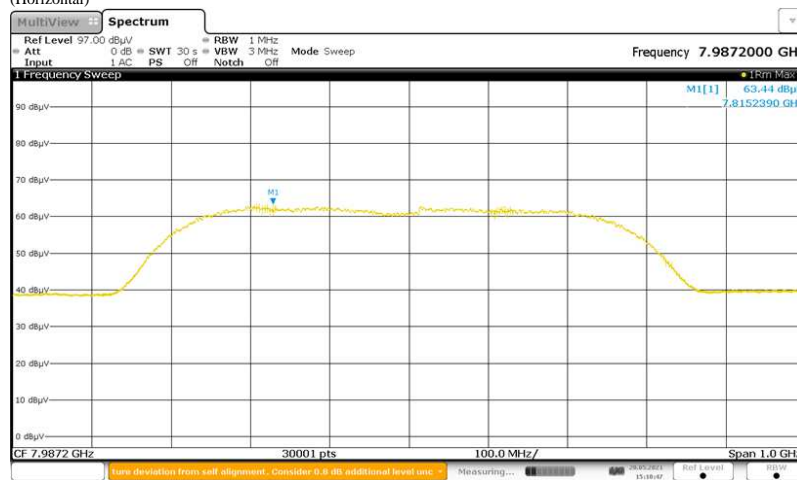
(*SA: Spectrum analyzer, SG: Signal generator, Ant.: substitution antenna)

Band	Pol.	Frequency [MHz]	SA Reading [dBuV/MHz]	SG level [dBm]	Tx Ant.Gain [dBi]	Tx Loss [dB]	-	EIRP Result [dBm/MHz]	EIRP Limit [dBm/MHz]	Margin [dB]	Remarks	Height [cm]	Angle [deg.]
3.1 GHz - 10.6 GHz	Hor.	7815.239	63.44	-42.39	10.81	11.09	-	-42.67	-41.30	1.37	carrier	158	105
3.1 GHz - 10.6 GHz	Ver.	8013.766	64.47	-41.78	10.75	11.11	-	-42.14	-41.30	0.84	carrier	151	295

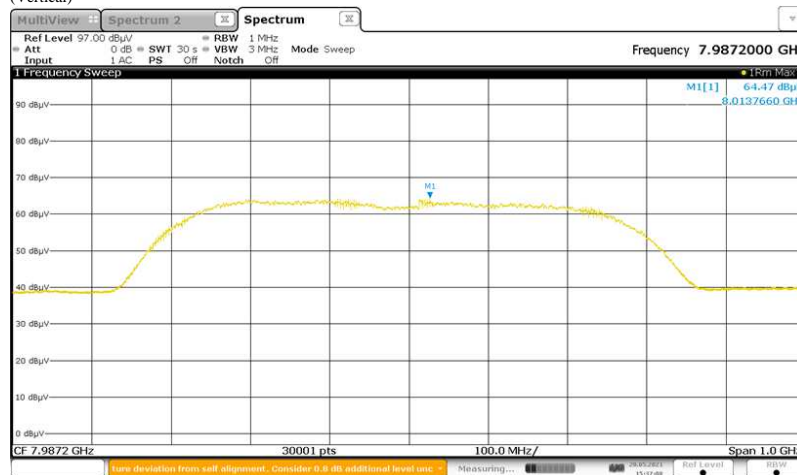
Sample Calculation :

$$\text{EIRP Result [dBm/MHz]} = \text{SG level [dBm]} + \text{Tx Ant.Gain [dBi]} - \text{Tx Loss [dB]}$$

(Horizontal)



(Vertical)



* For RF Exposure evaluation

Maximum RMS power measured: $-42.14 \text{ dBm/MHz} (\text{refer to upper table value}) = 10^{(-42.14 / 10)} = 0.000061094 \text{ mW/MHz}$

The bandwidth of this equipment was 606.892 MHz (99 % occupied bandwidth, refer to the data of bandwidth sheet)

Total RMS output power was $0.037077 \text{ mW} = 0.000061094 \text{ mW/MHz} \times 606.892 \text{ MHz}$

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Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 13826578S-A-R2
Date May 27, 2021 May 19, 2021 May 24, 2021 May 25, 2021
Temperature / Humidity 23 deg. C / 50 % RH 24 deg. C / 53 % RH 23 deg. C / 53 % RH 23 deg. C / 51 % RH
Engineer Toshinori Yamada Kenichi Adachi Yosuke Matsuzawa Yosuke Matsuzawa
(30 MHz - 1000 MHz) (1 GHz - 10.6 GHz) (10.6 GHz - 18 GHz) (18 GHz - 26.5 GHz)
Mode Transmitting CH 5

(UWB emission, For RBW less than 960 MHz was set according to FCC 15.209, Above 960 MHz was set to 1 MHz)

30 MHz - 18 GHz

No.	Freq. [MHz]	Reading (AV) [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	12979.200	41.85	-61.82	12.08	14.57	-64.31	-61.30	3.0	Hori.	149	341	Horn	
2	12979.200	40.62	-63.37	12.08	14.57	-65.86	-61.30	4.5	Vert.	160	259	Horn	

Calculation: Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

18 GHz - 26.5 GHz

No.	Freq. [MHz]	Reading (AV) [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	19468.801	32.15	-82.66	9.41	18.30	-91.55	-61.30	30.2	Hori.	150	0	Horn	RMS, Noise floor
2	25958.400	45.75	-59.83	10.81	21.15	-70.17	-61.30	8.8	Hori.	154	40	Horn	RMS
3	19468.801	32.13	-82.46	9.41	18.30	-91.35	-61.30	30.0	Vert.	150	0	Horn	RMS, Noise floor
4	25958.400	48.65	-57.51	10.81	21.15	-67.85	-61.30	6.5	Vert.	150	301	Horn	RMS

Calculation: Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 27, 2021
Temperature / Humidity : 23 deg. C / 50 % RH
Engineer : Toshinori Yamada
(26.5 GHz – 40 GHz)
Mode : Transmitting CH 5

(UWB emission, RBW 1 MHz)
26.5 GHz - 40 GHz

No.	Freq. [MHz]	Reading <AV> [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	32448.000	50.28	-73.25	11.79	24.42	-85.88	-61.30	24.5	Hori.	157	192	Horn	RMS
2	38937.602	58.57	-61.32	15.07	27.13	-73.38	-61.30	12.0	Hori.	157	221	Horn	RMS
3	32448.000	50.08	-73.86	11.79	24.42	-86.49	-61.30	25.1	Vert.	154	68	Horn	RMS
4	38937.602	57.48	-63.56	15.07	27.13	-75.62	-61.30	14.3	Vert.	153	70	Horn	RMS

Calculation: Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 13826578S-A-R2
Date May 27, 2021 May 20, 2021 May 24, 2021 May 25, 2021
Temperature / Humidity 23 deg. C / 50 % RH 25 deg. C / 59 % RH 23 deg. C / 53 % RH 23 deg. C / 51 % RH
Engineer Toshinori Yamada Hiromasa Sato Yosuke Matsuzawa Yosuke Matsuzawa
Mode (30 MHz - 1000 MHz) (1 GHz – 10.6 GHz) (10.6 GHz – 18 GHz) (18 GHz – 26.5 GHz)
Mode Transmitting CH 9

(UWB emission, For RBW less than 960 MHz was set according to FCC 15.209, Above 960 MHz was set to 1 MHz)

30 MHz – 18 GHz

No.	Freq. [MHz]	Reading (AV) [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	15974.400	39.13	-62.52	13.87	16.19	-64.84	-61.30	3.5	Hori.	153	42	Horn	
2	15974.400	38.68	-63.09	13.87	16.19	-65.41	-61.30	4.1	Vert.	170	66	Horn	

Calculation:Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

18 GHz – 26.5 GHz

No.	Freq. [MHz]	Reading (AV) [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	23961.600	34.82	-79.27	11.58	20.23	-87.92	-61.30	26.6	Hori.	155	357	Horn	RMS
2	23961.600	34.76	-78.37	11.58	20.23	-87.02	-61.30	25.7	Vert.	150	311	Horn	RMS

Calculation:Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

Data of Radiation Test (Regulation: FCC 15.519 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 27, 2021
Temperature / Humidity : 23 deg. C / 50 % RH
Engineer : Toshinori Yamada
(26.5 GHz – 40 GHz)
Mode : Transmitting CH 9

(UWB emission, RBW 1 MHz)
26.5 GHz - 40 GHz

No.	Freq. [MHz]	Reading <AV> [dBuV]	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
						Result [dBm]	Limit [dBm]						
1	31948.801	67.02	-51.58	12.00	23.74	-63.32	-61.30	2.0	Hori.	152	98	Horn	RMS
2	39936.000	52.58	-61.80	13.83	27.15	-75.12	-61.30	13.8	Hori.	157	226	Horn	RMS
3	31948.801	67.95	-50.30	12.00	23.74	-62.04	-61.30	0.7	Vert.	153	71	Horn	RMS
4	39936.000	49.80	-72.03	13.83	27.15	-85.35	-61.30	24.0	Vert.	153	114	Horn	RMS

Calculation: Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable+ATT)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

Data of Radiation Test (Regulation: FCC 15.521 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : April 28, 2021
Temperature / Humidity : 23 deg. C / 52 % RH
Engineer : Shunsaku Yumi
Mode : Transmitting CH 5

(Other emission) (* There were no detect other emissions in the range that below 30 MHz and above 960 MHz)

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

Engineer : Shunsaku Yumi

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	95.989	44.30	9.42	7.43	32.13	29.02	43.50	14.4	Hori.	188	37	BC	
2	319.367	38.60	14.22	8.68	31.96	29.54	46.00	16.4	Hori.	144	152	LP	
3	338.649	39.80	14.97	8.77	31.93	31.61	46.00	14.3	Hori.	140	151	LP	
4	405.082	36.40	16.03	9.08	31.94	29.57	46.00	16.4	Hori.	151	4	LP	
5	441.518	33.10	16.41	9.26	31.93	26.84	46.00	19.1	Hori.	100	357	LP	
6	35.997	30.10	16.38	6.57	32.18	20.87	40.00	19.1	Vert.	100	166	BC	
7	95.989	52.40	9.42	7.43	32.13	37.12	43.50	6.3	Vert.	100	85	BC	
8	155.983	39.30	15.06	7.84	32.09	30.11	43.50	13.3	Vert.	100	125	BC	
9	179.981	36.90	15.98	7.82	32.07	28.63	43.50	14.8	Vert.	100	160	BC	

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+ΔAF)[dB]-Gain(AMP)[dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

Data of Radiation Test (Regulation: FCC 15.521 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : April 28, 2021
Temperature / Humidity : 23 deg. C / 52 % RH
Engineer : Shunsaku Yumi
Mode : Transmitting CH 9

(Other emission) (* There were no detect other emissions in the range that below 30 MHz and above 960 MHz.)
Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK

Engineer : Shunsaku Yumi

<< QP DATA >>

No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margn	Polz.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]					
1	95.989	44.10	9.42	7.43	32.13	28.82	43.50	14.6	Hori.	182	50	BC	
2	332.289	40.70	14.75	8.74	31.94	32.25	46.00	13.7	Hori.	122	148	LP	
3	338.741	39.10	14.97	8.77	31.93	30.91	46.00	15.0	Hori.	146	151	LP	
4	405.223	36.40	16.03	9.09	31.94	29.58	46.00	16.4	Hori.	152	6	LP	
5	441.645	33.10	16.41	9.26	31.93	26.84	46.00	19.1	Hori.	100	354	LP	
6	40.724	31.40	14.66	6.66	32.17	20.55	40.00	19.4	Vert.	100	167	BC	
7	95.987	52.10	9.42	7.43	32.13	36.82	43.50	6.6	Vert.	100	81	BC	
8	155.982	39.30	15.06	7.84	32.09	30.11	43.50	13.3	Vert.	100	123	BC	
9	179.978	36.40	15.98	7.82	32.07	28.13	43.50	15.3	Vert.	100	159	BC	

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+ΔAF)[dB]-Gain(AMP)[dB]
Ant.Type=BC: Biconical Antenna LP: Logperiodic Antenna **SH*: Horn Antenna

Data of Radiation Test (Regulation: FCC 15.519 (d))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 19, 2021
Temperature / Humidity : 24 deg. C / 53 % RH
Engineer : Kenichi Adachi
Mode : Transmitting CH 5

(GPS bands emission)

No.	Freq. [MHz]	Reading (AV)	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		[dBuV]				Result [dBm]	Limit [dBm]						
1	1202.000	15.44	-1 10.00	6.37	4.17	-1 07.80	-85.30	22.5	Hori.	150	0	Horn	(RBW 1 kHz), noise floor level
2	1584.500	15.24	-1 10.00	9.03	4.82	-1 05.79	-85.30	20.4	Hori.	150	0	Horn	(RBW 1 kHz), noise floor level
3	1202.000	15.32	-1 10.00	6.37	4.17	-1 07.80	-85.30	22.5	Vert.	150	0	Horn	(RBW 1 kHz), noise floor level
4	1584.500	15.12	-1 10.00	9.03	4.82	-1 05.79	-85.30	20.4	Vert.	150	0	Horn	(RBW 1 kHz), noise floor level

Calculation: Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable)[dB]
Tx Antenna: Horn(1G-40G) / Rx-Antenna: Horn(1G-40G)

Data of Radiation Test (Regulation: FCC 15.519 (d))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Report No. : 13826578S-A-R2
 Date : May 20, 2021
 Temperature / Humidity : 25 deg. C / 59 % RH
 Engineer : Hiromasa Sato
 Mode : Transmitting CH 9

(GPS bands emission)

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	ERP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	1202.000	15.53	-110.00	6.37	4.17	-107.80	-85.30	22.5	Hori.	150	0	Horn	(RBW 1 kHz),noise floor level
2	1584.500	15.97	-110.00	9.03	4.82	-105.79	-85.30	20.4	Hori.	150	0	Horn	(RBW 1 kHz),noise floor level
3	1202.000	15.84	-110.00	6.37	4.17	-107.80	-85.30	22.5	Vert.	150	0	Horn	(RBW 1 kHz),noise floor level
4	1584.500	15.41	-110.00	9.03	4.82	-105.79	-85.30	20.4	Vert.	150	0	Horn	(RBW 1 kHz),noise floor level

Calculation:Result[dBm]=SG level[dBm]+Tx Ant Gain[dBi]-Tx Loss (Cable)[dB]
 Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna **SH*: Horn Antenna

Data of Radiation Test (Regulation: FCC 15.119 (e))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 19, 2021
Temperature / Humidity : 24 deg. C / 53 % RH
Engineer : Kenichi Adachi
Mode : Transmitting CH 5

(Peak level of the emission)

(*SA: Spectrum analyzer, SG: Signal generator, Ant.: substitution antenna)

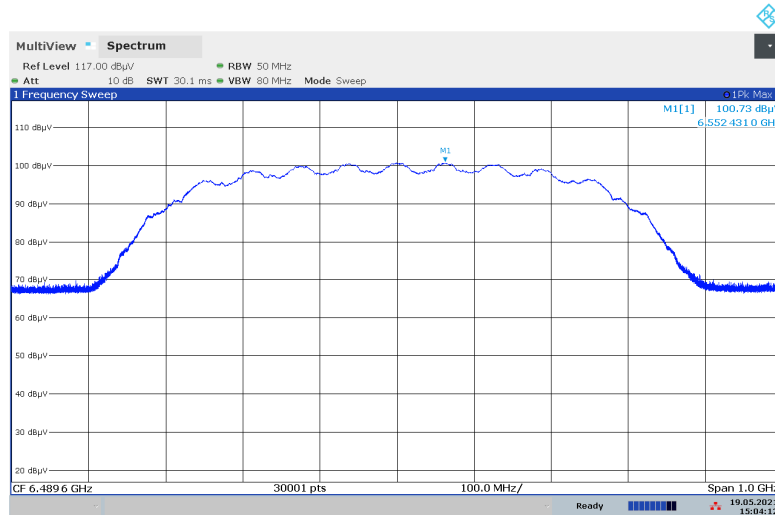
Band	Pol.	Frequency [MHz]	SA Reading [dBuV/50 MHz]	SG level [dBm]	Tx Ant.Gain [dBi]	Tx Loss [dB]	RBW converted factor [dB]	EIRP Result [dBm/50 MHz]	EIRP Limit [dBm/50 MHz]	Margin [dB]	Remarks	Height [cm]	Angle [deg.]
3.1 GHz - 10.6 GHz	Hor.	6552.431	100.73	-16.22	11.10	10.09	0.29	-14.92	0.00	14.92	carrier	143	109
3.1 GHz - 10.6 GHz	Ver.	6551.931	100.59	-16.30	11.10	10.09	0.29	-15.00	0.00	15.00	carrier	148	285

Sample Calculation :

EIRP Result [dBm/MHz] = SG level [dBm] + Tx Ant.Gain [dBi] - Tx Loss [dB] + RBW converted factor [dB]

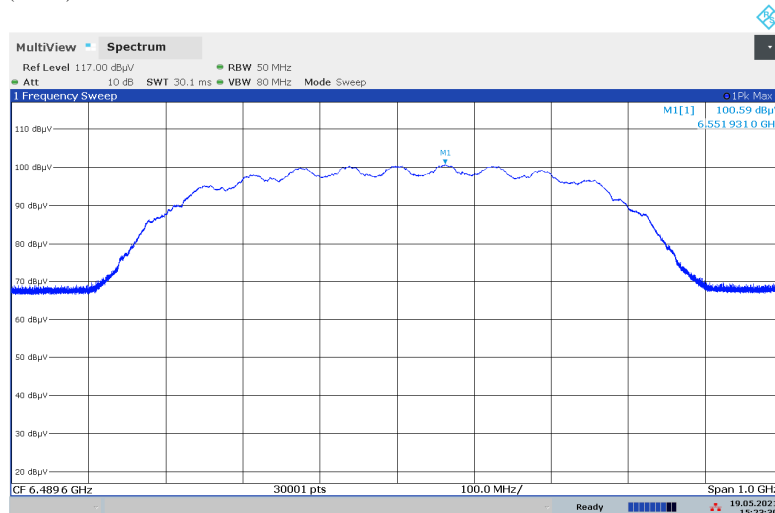
RBW converted factor [dB] = 20 x log (50 / (3 dB measured bandwidth = 48.3384 [MHz]))

(Horizontal)



15:04:12 19.05.2021

(Vertical)



15:23:31 19.05.2021

* For RSP-100 Annex B

Maximum peak power measured: -14.92 dBm/50 MHz (refer to upper table value) = $10^{-14.92/10} = 0.032211$ mW/50 MHz

The bandwidth of this equipment was 548.948 MHz (-10 dBc bandwidth, refer to the data of bandwidth sheet)

Total peak output power was 0.35364 mW = $0.032211 \text{ [mW/50 MHz]} \times 548.948 \text{ [MHz]} / 50 \text{ [MHz]}$

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Data of Radiation Test (Regulation: FCC 15.519 (e))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 20, 2021
Temperature / Humidity : 25 deg. C / 59 % RH
Engineer : Hiromasa Sato
Mode : Transmitting CH 9

(Peak level of the emission)

(*SA: Spectrum analyzer, SG: Signal generator, Ant.: substitution antenna)

Band	Pol.	Frequency [MHz]	SA Reading [dBuV/50 MHz]	SG level [dBm]	Tx Ant.Gain [dBi]	Tx Loss [dB]	RBW converted factor [dB]	EIRP Result [dBm/50 MHz]	EIRP Limit [dBm/50 MHz]	Margin [dB]	Remarks	Height [cm]	Angle [deg.]
3.1 GHz - 10.6 GHz	Hor.	7800.840	95.90	-17.73	10.81	11.09	0.29	-17.72	0.00	17.72	carrier	158	105
3.1 GHz - 10.6 GHz	Ver.	7860.671	97.07	-15.90	10.75	11.11	0.29	-15.97	0.00	15.97	carrier	151	295

Sample Calculation :

EIRP Result [dBm/MHz] = SG level [dBm] + Tx Ant.Gain [dBi] - Tx Loss [dB] + RBW converted factor [dB]

RBW converted factor [dB] = $20 \times \log (50 / (3 \text{ dB measured bandwidth} = 48.3384 \text{ [MHz]}))$

(Horizontal)



15:40:56 20.05.2021

(Vertical)



15:37:51 20.05.2021

* For RSP-100 Annex B

Maximum peak power measured: $-15.97 \text{ dBm/50 MHz (refer to upper table value)} = 10^{(-15.97 / 10)} = 0.025293 \text{ mW/50 MHz}$

The bandwidth of this equipment was 600.559 MHz (-10 dBc bandwidth, refer to the data of bandwidth sheet)

Total peak output power was $0.30380 \text{ mW} = 0.025293 \text{ [mW/50 MHz]} \times 600.559 \text{ [MHz]} / 50 \text{ [MHz]}$

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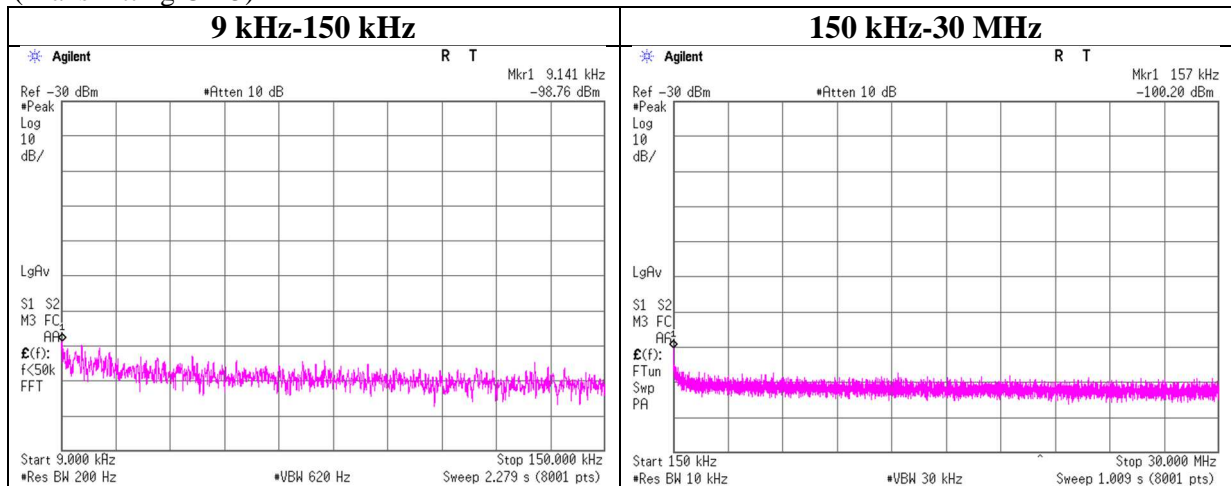
Telephone : +81 463 50 6400

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(Reference) Data of Antenna terminal conducted Test

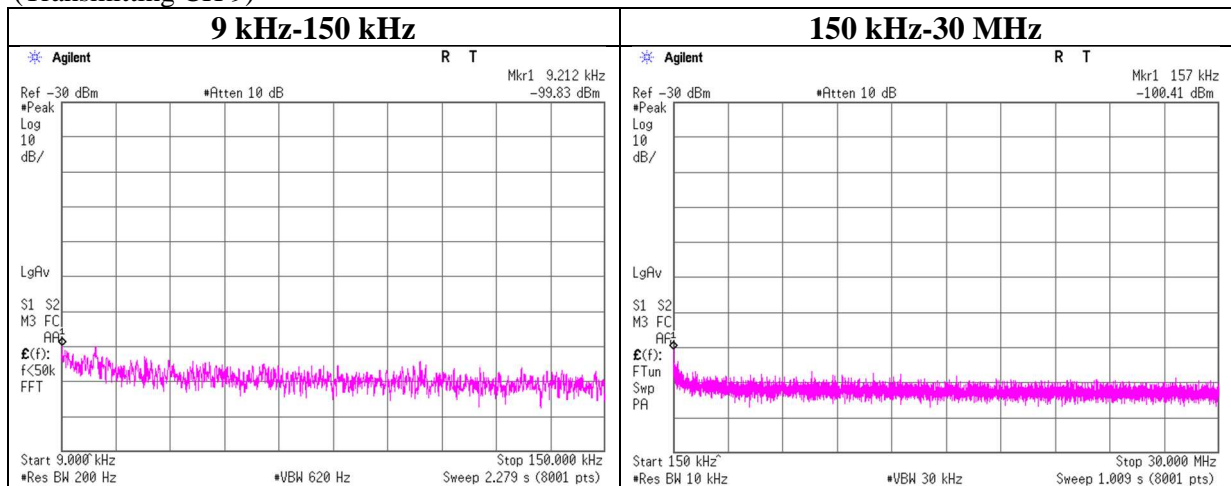
Test place : Shonan EMC Lab. No.5 Shielded Room
 Report No. : 13826578S-A-R2
 Date : June 2, 2021
 Temperature / Humidity : 25 deg. C / 68 % RH
 Engineer : Kenichi Adachi
 Mode : Transmitting

(Transmitting CH 5)



** No detect signal.

(Transmitting CH 9)



** No detect signal.

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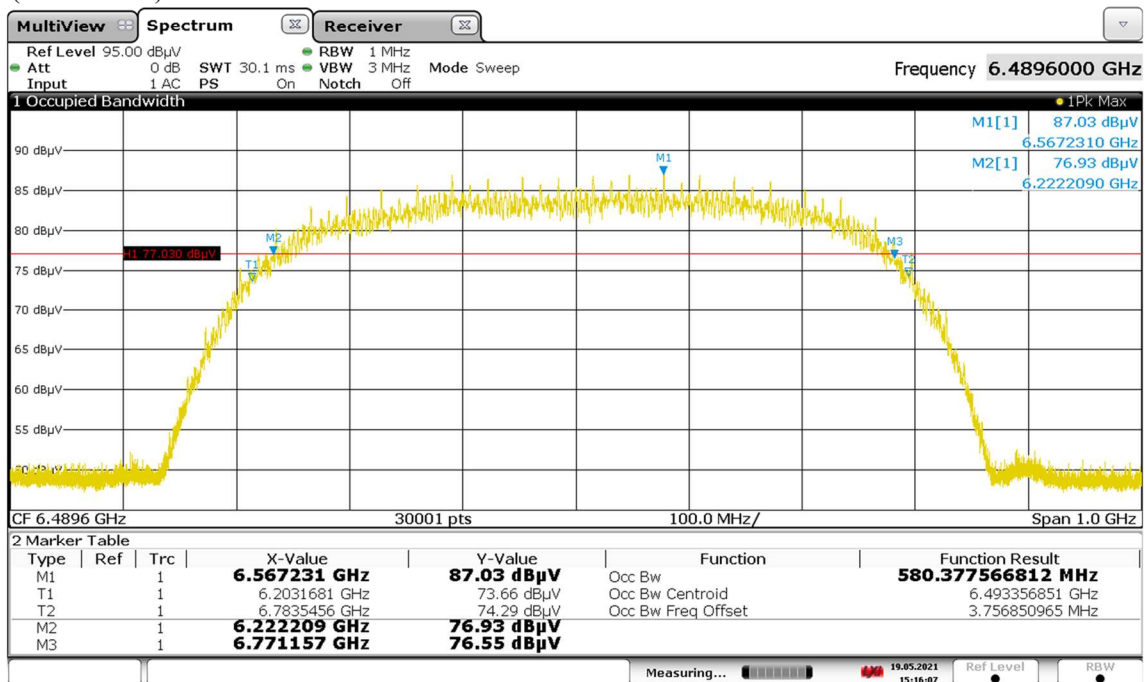
Facsimile : +81 463 50 6401

Bandwidth (Regulation: FCC 15.503(d), FCC 15.519 (b))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 13826578S-A-R2
Date : May 19, 2021
Temperature / Humidity : 24 deg. C / 53 % RH
Engineer : Kenichi Adachi
Mode : Transmitting CH 5

10 dB Bandwidth: 548.948 MHz (Limit: >= 500 MHz)
99 % Occupied Bandwidth: 580.378 MHz
Center Frequency 6496.683 MHz (= (fH + fL) / 2)

(worst: vertical)



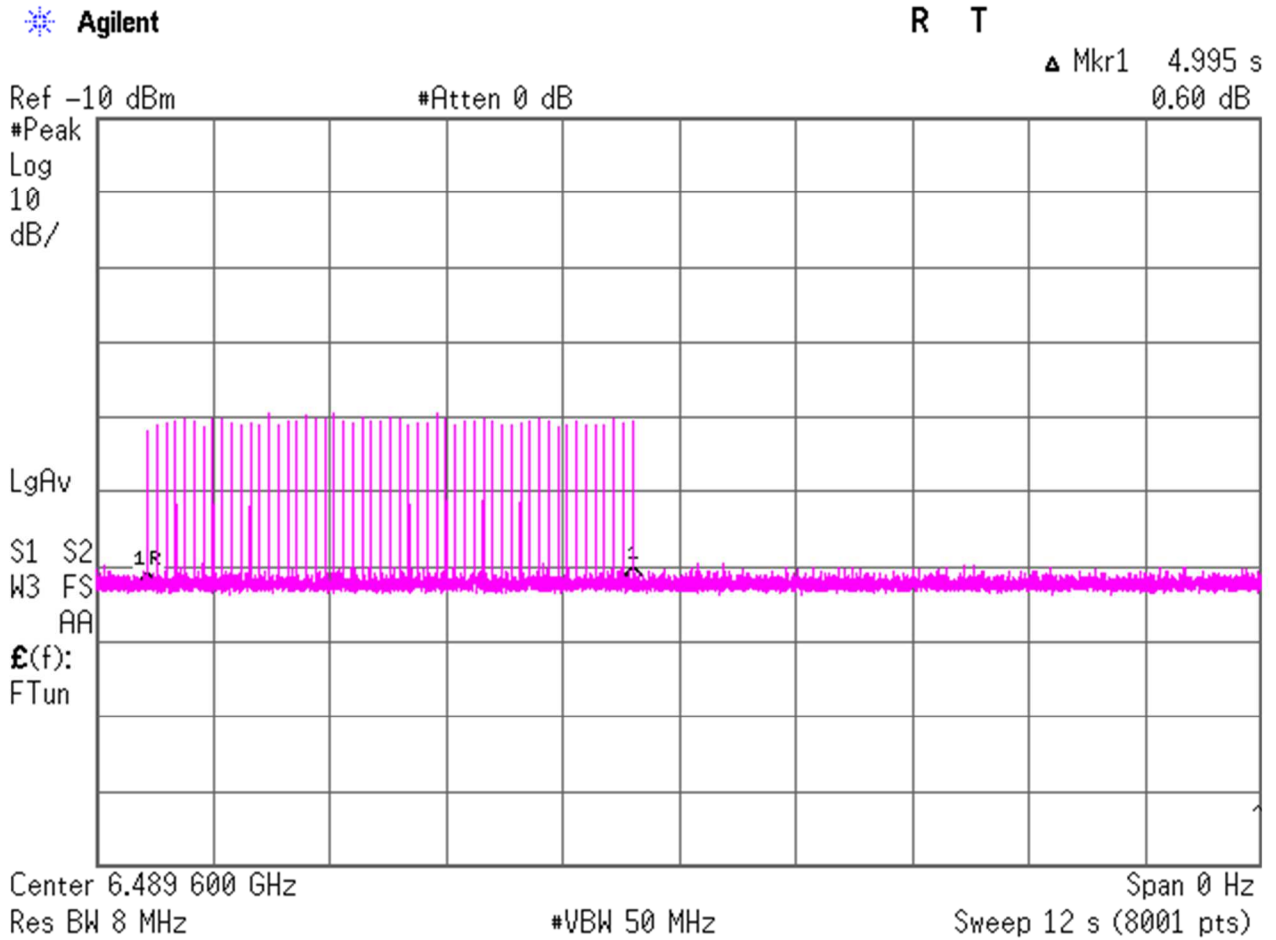
Start Frequency: 5989.600 MHz
Stop Frequency: 6989.600 MHz

fL: 6222.209 MHz
fH: 6771.157 MHz

Data of Transmitter timeout (Regulation: FCC 15.519 (a)(1))

Test place : Shonan EMC Lab. No.5 Shielded Room
 Report No. : 13826578S-A-R2
 Date : June 24, 2021
 Temperature / Humidity : 24 deg. C / 54 % RH
 Engineer : Kenichi Adachi
 Mode : Transmitting CH5

Transmitter Timeout: 4.995 s (Limit: <10 s)



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Data of Transmitter timeout (Regulation: FCC 15.519 (a)(1))

Test place : Shonan EMC Lab. No.5 Shielded Room
 Report No. : 13826578S-A-R2
 Date : June 24, 2021
 Temperature / Humidity : 24 deg. C / 54 % RH
 Engineer : Kenichi Adachi
 Mode : Transmitting CH9

Transmitter Timeout: 4.995 s (Limit: <10 s)



R T

Δ Mkr1 4.995 s
 2.33 dB

Ref -10 dBm

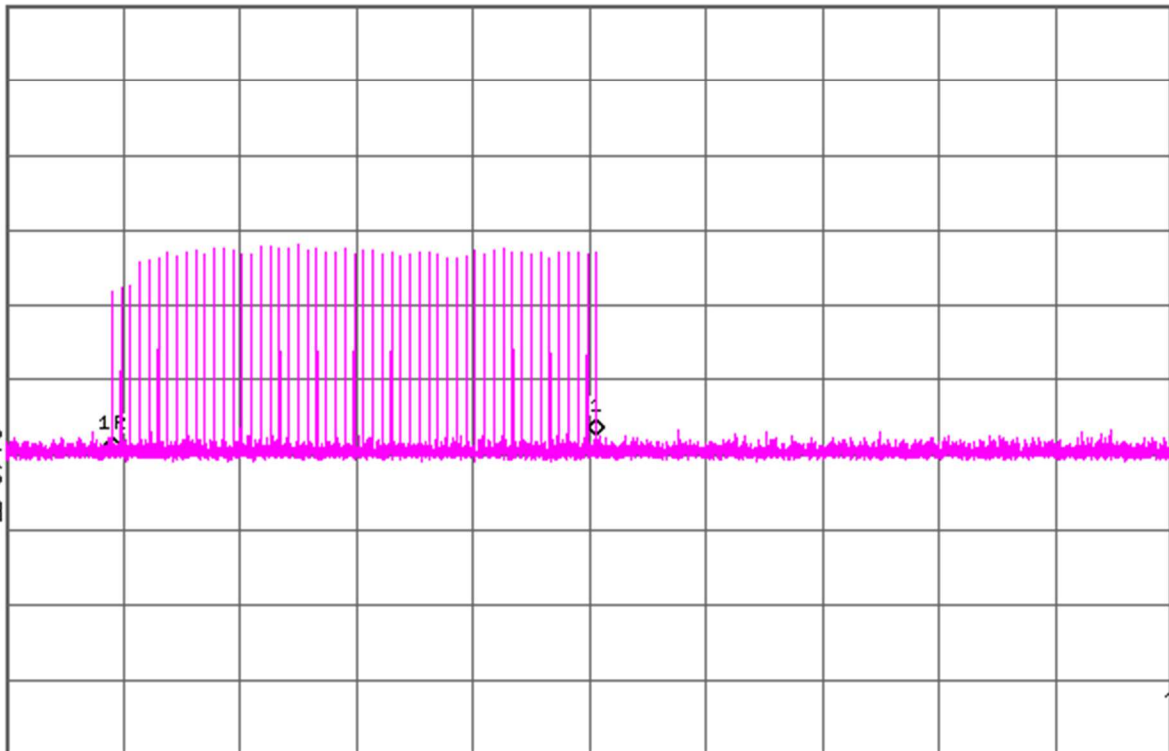
#Atten 0 dB

#Peak
 Log
 10
 dB/

LgAv

S1 S2
 W3 FS
 AA

£(f):
 FTun



Center 7.987 200 GHz

Res BW 8 MHz

#VBW 50 MHz

Span 0 Hz
Sweep 12 s (8001 pts)

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APPENDIX 2: Test instruments

Test Instruments (1/2)

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
RE	COTS-SE MI-5	170932	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(R E,CE,ME,PE)	-	-	-
RE	KAT10-S 2	144892	Attenuator	Keysight Technologies Inc	8490D 010	6036	2020/10/05	12
RE	KHA-02	144941	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	230	2021/05/10	12
RE	KHA-08	144943	DRG Horn Antenna	A.H. Systems, Inc.	SAS-200/571	224	2021/05/10	12
RE	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
RE	KJM-09	145929	Measure	KOMELON	KMC-36	-	-	-
RE	SAEC-01(NSA)	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2021/04/30	12
RE	SAEC-03(NSA)	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2021/04/27	12
RE	SAF-01	145003	Pre Amplifier	SONOMA	310N	290211	2021/02/10	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	SAF-09	145008	Pre Amplifier	Toyo Corporation	HAP18-26W	18	2020/09/02	12
RE	SAF-10	145129	Pre Amplifier	Toyo Corporation	HAP26-40W	10	2021/03/01	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-A2/ A4/A6/A7 /A8/A13/ SRSE-01	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/ T OYO	8D2W/12DSFA /141PE/141PE/1 41PE/141PE/NS 4906	-/0901-269(RF Selector)	2021/04/12	12
RE	SCC-C1/ C2/C3/C4 /C5/C10/S RSE-03	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/ T OYO	8D2W/12DSFA /141PE/141PE/1 41PE/141PE/NS 4906	-/0901-271(RF Selector)	2021/04/12	12
RE	SCC-G15	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2021/03/01	12
RE	SCC-G20	145167	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-003	2021/04/01	12
RE	SCC-G42	151618	Coaxial Cable	Junkosha	J12J103275-00	FEB-28-17-017	2021/03/01	12
RE	SCC-G43	156380	Coaxial Cable	Huber+Suhner	SUCOFLEX_10 4_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-G70	200010	Coaxial Cable	Huber+Suhner	SUCOFLEX 104	575618/4	2020/07/07	12
RE	SCC-M1	194601	Coaxial Cable	Fujikura	5D-2W	-	2020/12/10	12
RE	SFL-26	206229	Bandpass Filter	MICRO-TRONICS	BPC50411	086	2021/03/08	12
RE	SHA-03	145501	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	9120D-739	2021/06/14	12
RE	SHA-05	145513	Horn Antenna	ETS-Lindgren	3160-09	00094867	2021/06/14	12
RE	SHA-06	145514	Horn Antenna	ETS-Lindgren	3160-10	00092383	2021/06/14	12
RE	SHA-07	145515	Horn Antenna	ETS-Lindgren (Cedar Park, Texas)	3116	108256	2021/05/10	12
RE	SHA-10	194685	Horn Antenna	Schwarzbeck Mess-Elektronik OHG	BBHA 9120 C	711	2021/03/03	12

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Test Instruments (2/2)

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
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-20	191837	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/28	12
RE	SOS-23	191840	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/28	12
RE	SRENT-23	206472	Spectrum Analyzer	Rohde & Schwarz	FSW43	104056	2021/04/27	12
RE	SSG-02	146226	Signal Generator	Keysight Technologies Inc	E8257D-540	MY48051404	2021/02/01	12
RE	SSG-11	146256	Signal Generator	Keysight Technologies Inc	E8257D-550	MY53400714	2021/05/27	12
RE	STR-01	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2021/04/27	12
RE	STR-08	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2020/12/02	12
RE	STS-01	145792	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997812	2020/10/19	12
RE	STS-03	146210	Digital Hitester	HIOKI E.E. CORPORATION	3805-50	80997823	2020/10/19	12

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

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