



RADIO TEST REPORT

Test Report No. : 11920654S-A-R2

Applicant : Ueda Japan Radio Co., Ltd.
Type of Equipment : UWB Transceiver
Model No. : DTG-108
FCC ID : 2ADKK-DTG108
Test regulation : FCC Part 15 Subpart F: 2018
Test Result : Complied

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4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11920654S-A-R1. 11920654S-A-R1 is replaced with this report.

Date of test: January 23 to 30, 2018

Representative test engineer:

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- 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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13-EM-F0429

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SECTION 1: Customer information

Company Name : Ueda Japan Radio Co., Ltd.
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Contact Person : Mitsugu Suzuki

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

2.1 Identification of E.U.T.

Type of Equipment : UWB Transceiver
Model No. : DTG-108
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 5 V typical (DC 4.85 V to 5.25 V)
Receipt Date of Sample : December 5, 2017
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model: DTG-108 (referred to as the EUT in this report) is a UWB Transceiver.

General Specification

Clock frequency(ies) in the system : 44 MHz (RF part), 20 MHz (baseband), 24 MHz (USB)

Radio Specification

Equipment type : Transceiver
Frequency of operation : 7392 MHz - 8976 MHz
Type of modulation : OFDM
Antenna type : Chip
Antenna connector type : None
Antenna gain : +2.6 dBi max
Operating temperature : +5 deg.C to +35 deg.C
Subclass of UWB : Indoor communications device

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart F
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

* The revisions made after testing date do not affect the test specification applied to the EUT.

Title : FCC 47CFR Part15 Radio Frequency Device
Section 15.207 Conducted limits
Subpart F Ultra-Wideband Operation
Section 15.517 Technical requirements for indoor UWB systems.

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

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	FCC: Section 15.207 Section 15.505(a)	5.7 dB 0.15000 MHz	Complied	-
	IC: RSS-Gen 8.8	IC: RSS-220 5.2.1(b)	L1, QP		
UWB Bandwidth	FCC: Section 15.503(a) ANSI C63.10:2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices	FCC: Section 15.503(d) Section 15.517(b)	-	Complied	Radiated
	IC: RSS-220 Annex 2	IC: RSS-220 2 RSS-220 5.1			
Radiated emission	FCC: Section 15.521(d) ANSI C63.10:2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices	FCC: Section 15.209 Section 15.517 (c), (d)	4.2 dB 1231.389 MHz AV, Vertical	Complied	Radiated (above 30 MHz) / Conducted (below 30 MHz) *1)
	IC: RSS-Gen 6.5 RSS-220 Annex 4	IC: RSS-220 5.2.1(c),(d),(e)			
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	FCC: Section 15.517 (e)	8.7 dB 8532.893 MHz PK, Vertical	Complied	Radiated
	IC: RSS-220 Annex 4	IC: RSS-220 5.2.1(g)			

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

*1) In the frequency range of less than 30 MHz, only measurement of antenna terminal conduction measurement was carried out and the radiated emission measurement was omitted, since it nothing was detected at the antenna terminal.

* 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 (DC 1.2 V, DC 2.4 V) constantly to RF part (except base band part) 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.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	IC: RSS-Gen 6.6	IC: -	N/A	-	Conducted

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

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	2.5 dB	2.5 dB	2.6 dB	2.6 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.2 dB	3.2 dB	3.3 dB	-	-
	30 MHz-200 MHz	4.3 dB	4.3 dB	4.3 dB	-	-
	200 MHz-1 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
	1 GHz-6 GHz	4.7 dB	4.7 dB	4.7 dB	-	-
	6 GHz-18 GHz	5.3 dB	5.3 dB	5.3 dB	-	-
Radiated emission (Measurement distance: 1 m)	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	1 GHz-18 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
Radiated emission (Substitution measurement;3m) (EUT height 1.5m)	30 MHz-200 MHz	4.8 dB	4.8 dB	4.8 dB	-	-
	200 MHz-1 GHz	3.6 dB	3.6 dB	3.6 dB	-	-
Radiated emission (Substitution measurement;1m) (EUT height 1.5m)	1 GHz-13 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	13 GHz-18 GHz	5.0 dB	5.0 dB	5.0 dB	-	-
	18 GHz-26.5 GHz	5.7 dB	5.7 dB	5.7 dB	-	-
Radiated emission (Substitution measurement;0.5m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.3 dB	4.3 dB	4.3 dB	-	-
	1 GHz-13 GHz	4.5 dB	4.5 dB	4.5 dB	-	-
	13 GHz-18 GHz	5.0 dB	5.0 dB	5.0 dB	-	-
	18 GHz-26.5 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
Radiated emission (Substitution measurement;0.3m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.2 dB	4.2 dB	4.2 dB	-	-
	1 GHz-13 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	13 GHz-18 GHz	5.1 dB	5.1 dB	5.1 dB	-	-
	18 GHz-26.5 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
Radiated emission (Substitution measurement;0.1m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.2 dB	4.2 dB	4.2 dB	-	-
	1 GHz-13 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	13 GHz-18 GHz	5.8 dB	5.8 dB	5.8 dB	-	-
	18 GHz-26.5 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
	26.5 GHz-40 GHz	4.6 dB	4.6 dB	4.6 dB	-	-
		4.8 dB	4.8 dB	4.8 dB	-	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.48 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.66 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.47 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.64 dB
Spurious emission (Conducted) below 1GHz	1.8 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.5 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.7 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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JAB Accreditation No. RTL02610
FCC Test Firm Registration Number: 839876

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

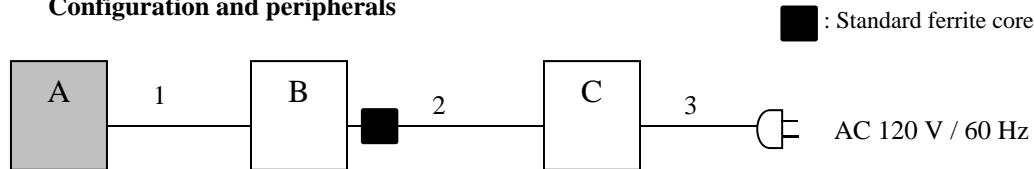
4.1 Operating Mode(s)

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
All items	Transmitting
	Software: RET Tool, ver.8.14.8 Power setting: Fixed *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. *1) We tested with the operation mode in three channel simultaneous transmission and with the worst case of the modulation operation mode used in actual radio operation. Pre-check was by customer in test of this job while being seen by customers. (This EUT is In a normal communication operation, a transmission operation is always performed in which three channels are transmitted.)

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

4.2 Configuration and peripherals



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

* The ferrite core attached to DC cable is not used to reduce the noise from the EUT. Therefore, that does not affect the emission level of the EUT.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	UWB Transceiver	DTG-108	9990016	Ueda Japan Radio Co., Ltd.	EUT
B	Personal Computer	Latitude E5500	33406843389	Dell	-
C	AC adapter	HA90PE0-00	0W529	Dell	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	3.0	Shielded	Shielded	-
2	DC	1.8	Unshielded	Unshielded	-
3	AC	0.8	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 1.5 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.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via AC adapter in a Shielded room.

The EUT via AC adapter was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

[For below 960 MHz]

EUT was placed on a platform of nominal size, 0.15 m by 0.05 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	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	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: 3 MHz VBW: 3 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	0.5 m *1) (960 MHz – 10.6 GHz), 0.3 m *2) (10.6 GHz – 17 GHz), 0.1 m *3) (above 17 GHz)	

- *1) Distance Factor: $20 \times \log(0.5 \text{ m} / 3.0 \text{ m}) = -15.56 \text{ dB}$
*2) Distance Factor: $20 \times \log(0.3 \text{ m} / 3.0 \text{ m}) = -20.00 \text{ dB}$
*3) Distance Factor: $20 \times \log(0.1 \text{ m} / 3.0 \text{ m}) = -29.54 \text{ dB}$

- 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]							
	0.03-0.96	0.96-1	1-4.8	4.8-10.6	10.6-17	17-18	18-26.5	26.5-40
Hor.	X	X	Y	X	Z	Z	Z	Y
Ver.	Z	Z	Z	Y	Y	Y	Z	Z

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

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

SECTION 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	2 GHz	1 MHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer

Test data : APPENDIX
Test result : Pass

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.
(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

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

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Test data

**Conducted Emission
DATA OF CONDUCTED EMISSION TEST**

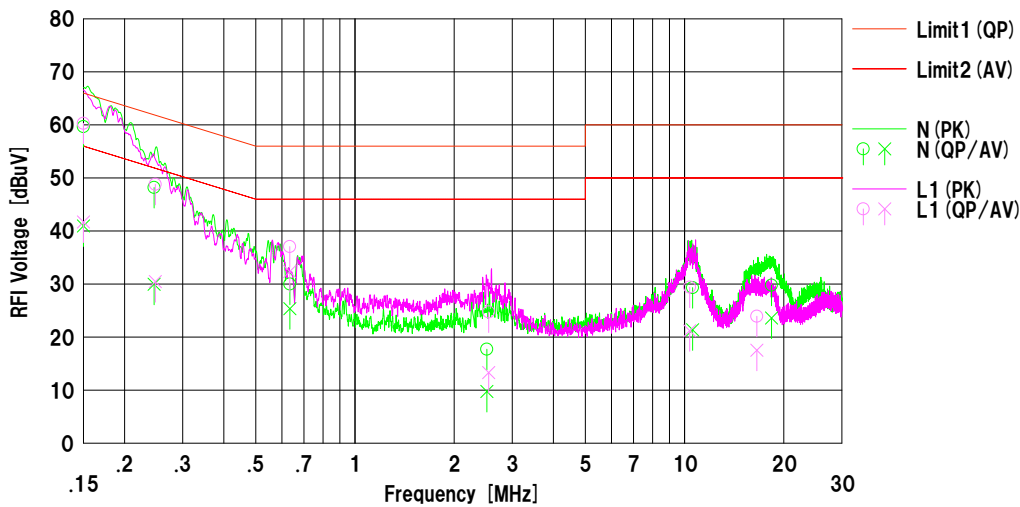
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2018/01/30

Mode : Transmittig UWB
Power : AC 120 V / 60 Hz (PC's AC adapter in)
Temp./Humi. : 23 deg.C / 23 %RH

Remarks : with AC adapter of personal computer

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]	<QP> [dB]	<AV> [dB]		
1	0.15000	47.16	28.43	12.52	59.68	40.95	66.00	56.00	6.3	15.0	N	
2	0.24578	35.69	17.44	12.52	48.21	29.96	61.90	51.90	13.6	21.9	N	
3	0.63453	17.43	12.78	12.57	30.00	25.35	56.00	46.00	26.0	20.6	N	
4	2.51291	4.95	-3.02	12.77	17.72	9.75	56.00	46.00	38.2	36.2	N	
5	10.57687	15.44	7.48	13.88	29.32	21.36	60.00	50.00	30.6	28.6	N	
6	18.36416	15.08	8.89	14.71	29.79	23.60	60.00	50.00	30.2	26.4	N	
7	0.15000	47.78	29.18	12.52	60.30	41.70	66.00	56.00	5.7	14.3	L1	
8	0.24787	36.28	17.94	12.52	48.80	30.46	61.83	51.83	13.0	21.3	L1	
9	0.63418	24.49	19.78	12.57	37.06	32.35	56.00	46.00	18.9	13.6	L1	
10	2.54501	11.96	0.54	12.77	24.73	13.31	56.00	46.00	31.2	32.6	L1	
11	10.36437	15.56	7.34	13.86	29.42	21.20	60.00	50.00	30.5	28.8	L1	
12	16.56846	9.34	2.93	14.58	23.92	17.51	60.00	50.00	36.0	32.4	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN (AMN) +Cable+ATT) [dB]
LISN: SLS-02

Except for the above table: adequate margin data below the limits.

Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(UWB emission, RBW 1 MHz)

Limit : FCC15.517 (c), Substitution limit

Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	5280.044	52.76	-70.38	12.74	9.63	-67.27	-41.30	25.9	Hori.	138	63	Horn	AvRMS
2	6336.058	51.42	-61.57	12.98	10.64	-59.23	-41.30	17.9	Hori.	153	270	Horn	AvRMS
3	7637.872	56.07	-53.59	11.60	11.51	-53.50	-41.30	12.2	Hori.	149	0	Horn	AvRMS
4	8206.764	56.24	-55.39	11.59	12.39	-56.19	-41.30	14.8	Hori.	149	0	Horn	AvRMS
5	8532.893	58.26	-51.25	12.00	12.63	-51.88	-41.30	10.5	Hori.	149	0	Horn	AvRMS
6	5280.044	52.49	-66.57	12.74	9.63	-63.46	-41.30	22.1	Vert.	138	63	Horn	AvRMS
7	6336.058	53.88	-56.36	12.98	10.64	-54.02	-41.30	12.7	Vert.	158	269	Horn	AvRMS
8	7637.872	59.34	-49.24	11.60	11.51	-49.15	-41.30	7.8	Vert.	151	38	Horn	AvRMS
9	8206.764	59.96	-49.99	11.59	12.39	-50.79	-41.30	9.4	Vert.	151	38	Horn	AvRMS
10	8532.893	60.08	-48.97	12.00	12.63	-49.60	-41.30	8.3	Vert.	151	38	Horn	AvRMS

* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

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

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Telephone : +81 463 50 6400

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Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 25, 2018
Temperature / Humidity : 23 deg. C / 25 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(UWB emission, RBW 1 MHz)

Limit : FCC15.517 (c), Substitution limit

Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	17424.082	47.95	-60.46	11.42	18.08	-67.12	-51.30	15.8	Hori.	155	189	Horn	AvRMS
2	17424.082	50.67	-54.49	11.42	18.08	-61.15	-51.30	9.8	Vert.	154	34	Horn	AvRMS

* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

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

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Data of Radiation Test (Regulation: FCC 15.517 (c))

(Reference data)

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(UWB emission, RBW 1 MHz, 3 m distance result)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dBu/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	5280.044	52.76	57.86	32.06	6.07	44.73	-15.56	30.60	35.70	53.90	73.90	23.3	38.2	Hori.	138	63	SHA03	AvRMS
2	6336.058	51.42	54.98	34.27	6.63	44.71	-15.56	32.05	35.61	53.90	73.90	21.8	38.2	Hori.	153	270	SHA03	AvRMS
3	7637.872	56.07	70.98	37.25	7.35	44.04	-15.56	41.07	55.98	53.90	73.90	12.8	17.9	Hori.	149	0	SHA03	AvRMS
4	8206.764	56.24	71.28	37.79	7.48	44.11	-15.56	41.84	56.88	53.90	73.90	12.0	17.0	Hori.	149	0	SHA03	AvRMS
5	8532.893	58.26	72.33	37.91	7.60	44.36	-15.56	43.85	57.92	53.90	73.90	10.0	15.9	Hori.	149	0	SHA03	AvRMS
6	5280.044	52.49	55.68	32.06	6.07	44.73	-15.56	30.33	33.52	53.90	73.90	23.5	40.3	Vert.	138	63	SHA03	AvRMS
7	6336.058	53.88	55.96	34.27	6.63	44.71	-15.56	34.51	36.59	53.90	73.90	19.3	37.3	Vert.	158	269	SHA03	AvRMS
8	7637.872	59.34	73.21	37.25	7.35	44.04	-15.56	44.34	58.21	53.90	73.90	9.5	15.6	Vert.	151	38	SHA03	AvRMS
9	8206.764	59.96	73.56	37.79	7.48	44.11	-15.56	45.56	59.16	53.90	73.90	8.3	14.7	Vert.	151	38	SHA03	AvRMS
10	8532.893	60.08	75.06	37.91	7.60	44.36	-15.56	45.67	60.65	53.90	73.90	8.2	13.2	Vert.	151	38	SHA03	AvRMS

* PK was measured setting was RBW 3 MHz, VBW 50 MHz, peak value, in the frequency range from 7000 MHz to 9000 MHz.

* AV was measured setting was RBW1 MHz, VBW 3 MHz, RMS value, in the frequency range from 7000 MHz to 9000 MHz.

* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

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

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Facsimile : +81 463 50 6401

Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 29, 2018
Temperature / Humidity : 20 deg. C / 25 % RH
Engineer : Yosuke Ishikawa
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Yosuke Ishikawa

<< 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	609.638	35.30	19.01	10.05	31.82	32.54	46.00	13.4	Hori.	100	145	LP	
2	711.246	34.60	19.69	10.42	31.72	32.99	46.00	13.0	Hori.	191	126	LP	
3	959.992	37.60	22.12	11.23	30.40	40.55	46.00	5.4	Hori.	118	359	LP	
4	59.999	40.00	7.78	7.08	32.11	22.75	40.00	17.2	Vert.	100	359	BC	
5	71.998	43.50	6.21	7.20	32.10	24.81	40.00	15.1	Vert.	100	173	BC	
6	86.054	39.90	7.39	7.33	32.09	22.53	40.00	17.4	Vert.	100	196	BC	
7	140.002	35.70	14.32	7.75	32.04	25.73	43.50	17.7	Vert.	100	208	BC	
8	220.032	41.10	11.51	8.27	31.97	28.91	46.00	17.0	Vert.	293	189	LP	
9	959.990	33.30	22.12	11.23	30.40	36.25	46.00	9.7	Vert.	116	72	LP	

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

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Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018 January 25, 2018
Temperature / Humidity : 23 deg. C / 28 % RH 23 deg. C / 25 % RH
Engineer : Kenichi Adachi Kenichi Adachi
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	1439.985	65.84	68.17	24.94	3.21	43.79	-15.56	34.64	36.97	53.90	73.90	19.2	36.9	Hori.	158	271	SHA03	Av:RMS (other)
2	1584.006	48.43	55.52	25.17	3.35	43.83	-15.56	17.56	24.65	53.90	73.90	36.3	49.2	Hori.	153	274	SHA03	Av:RMS (other)
3	1919.982	54.76	59.87	25.87	3.69	44.00	-15.56	24.76	29.87	53.90	73.90	29.1	44.0	Hori.	155	279	SHA03	Av:RMS (other)
4	2112.006	61.43	63.21	26.39	3.87	44.07	-15.56	32.06	33.84	53.90	73.90	21.8	40.0	Hori.	148	215	SHA03	Av:RMS (other)
5	3168.011	50.97	53.88	28.76	4.79	44.28	-15.56	24.68	27.59	53.90	73.90	29.2	46.3	Hori.	152	269	SHA03	Av:RMS (other)
6	4224.018	56.24	59.07	30.11	5.39	44.24	-15.56	31.94	34.77	53.90	73.90	21.9	39.1	Hori.	154	205	SHA03	Av:RMS (other)
7	1439.985	66.62	68.54	24.94	3.21	43.79	-15.56	35.42	37.34	53.90	73.90	18.4	36.5	Vert.	146	177	SHA03	Av:RMS (other)
8	1584.006	47.94	54.65	25.17	3.35	43.83	-15.56	17.07	23.78	53.90	73.90	36.8	50.1	Vert.	149	167	SHA03	Av:RMS (other)
9	1919.982	53.90	52.68	25.87	3.69	44.00	-15.56	23.90	22.68	53.90	73.90	30.0	51.2	Vert.	150	63	SHA03	Av:RMS (other)
10	2112.006	60.76	62.63	26.39	3.87	44.07	-15.56	31.39	33.26	53.90	73.90	22.5	40.6	Vert.	151	174	SHA03	Av:RMS (other)
11	3168.011	51.58	54.69	28.76	4.79	44.28	-15.56	25.29	28.40	53.90	73.90	28.6	45.5	Vert.	147	179	SHA03	Av:RMS (other)
12	4224.018	56.36	59.34	30.11	5.39	44.24	-15.56	32.06	35.04	53.90	73.90	21.8	38.8	Vert.	138	218	SHA03	Av:RMS (other)

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

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Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 25, 2018
Temperature / Humidity : 23 deg. C / 25 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
		1	16896.061					54.18	55.47	39.96	11.35	41.70	-20.00					
2	16896.061	52.69	54.61	39.96	11.35	41.70	-20.00	42.30	44.22	53.90	73.90	11.6	29.6	Vert.	149	143	SHA03	Av:RMS(Other)

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

Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 25, 2018
Temperature / Humidity : 23 deg. C / 25 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]	<AV> [dB]	<PK> [dB]					
1	21120.121	41.45	42.85	39.79	14.17	47.16	-29.54	18.71	20.11	53.90	73.90	35.1	53.7	Hori.	155	332	SHA04	AvRMS (other)
2	25344.148	39.78	40.97	39.99	16.29	47.28	-29.54	19.24	20.43	53.90	73.90	34.6	53.4	Hori.	154	113	SHA04	AvRMS (other)
3	21120.121	37.30	39.28	39.79	14.17	47.16	-29.54	14.56	16.54	53.90	73.90	39.3	57.3	Vert.	156	32	SHA04	AvRMS (other)
4	25344.148	39.11	40.34	39.99	16.29	47.28	-29.54	18.57	19.80	53.90	73.90	35.3	54.1	Vert.	155	33	SHA04	AvRMS (other)

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

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Data of Radiation Test (Regulation: FCC 15.517 (c))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 25, 2018
Temperature / Humidity : 23 deg. C / 25 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	33792.145	71.34	73.37	43.37	18.05	66.50	-29.54	36.72	38.75	53.90	73.90	17.1	35.1	Hori.	155	265	SHA06	AvRMS (other)
2	33792.145	73.92	75.24	43.37	18.05	66.50	-29.54	39.30	40.62	53.90	73.90	14.6	33.2	Vert.	154	35	SHA06	AvRMS (other)

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

Data of Radiation Test (Regulation: FCC 15.517 (d))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

Limit : FCC15.517 (d) , Substitution limit (1164-1240 MHz, 1559-1610 MHz)
Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	1231.389	36.09	-95.67	6.23	4.55	-93.99	-85.30	8.6	Hori.	139	92	Horn	AvRMS, RBW 1 kHz
2	1231.389	38.01	-91.26	6.23	4.55	-89.58	-85.30	4.2	Vert.	153	0	Horn	AvRMS, RBW 1 kHz

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

Data of Radiation Test (Regulation: FCC 15.517 (d))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

Limit : FCC15.517 (d) , Substitution limit (1164-1240 MHz, 1559-1610 MHz)
Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	1607.983	30.95	-96.78	8.33	5.23	-93.68	-85.30	8.3	Hori.	148	271	Horn	AvRMSRBW 1 kHz
2	1607.983	32.45	-97.67	8.33	5.23	-94.57	-85.30	9.2	Vert.	147	182	Horn	AvRMSRBW 1 kHz

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

Data of Radiation Test (Regulation: FCC 15.517 (e))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

Limit : FCC15.517 (e) , (RBW 50 MHz value) Substitution limit
Engineer : Kenichi Adachi

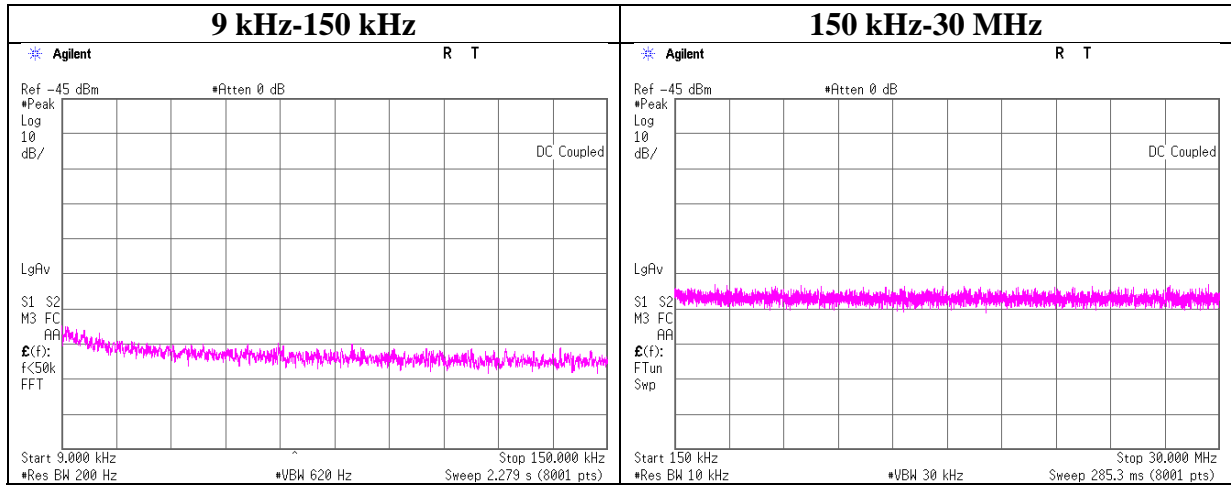
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No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<PK> [dBuV]				Result [dBm]	Limit [dBm]						
1	7637.872	70.98	-34.98	11.60	-12.89	-10.49	0.00	10.4	Hori.	149	0	Horn	Peak RBW 3 MHz
2	8206.764	71.28	-38.13	11.59	-12.01	-14.53	0.00	14.5	Hori.	149	0	Horn	Peak RBW 3 MHz
3	8532.893	72.33	-35.24	12.00	-11.77	-11.47	0.00	11.4	Hori.	149	0	Horn	Peak RBW 3 MHz
4	7637.872	73.21	-33.55	11.60	-12.89	-9.06	0.00	9.0	Vert.	151	38	Horn	Peak RBW 3 MHz
5	8206.764	73.56	-35.59	11.59	-12.01	-11.99	0.00	11.9	Vert.	151	38	Horn	Peak RBW 3 MHz
6	8532.893	75.06	-32.54	12.00	-11.77	-8.77	0.00	8.7	Vert.	151	38	Horn	Peak RBW 3 MHz

Calculation: Result [dBm] = SG level [dB] + Tx Ant Gain [dBi] - Tx Loss (Cable [dB] + RBW converted factor (-24.44 = 20 x log (3 / 50)) [dB])
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)

Data of Antenna terminal conducted Test (Regulation: FCC 15.517 (c))

Test place Shonan EMC Lab. No.1 Measurement Room
 Report No. 11920654S-A-R2
 Date January 23, 2018
 Temperature / Humidity 22 deg. C / 42 % RH
 Engineer Kenichi Adachi
 Mode Transmitting

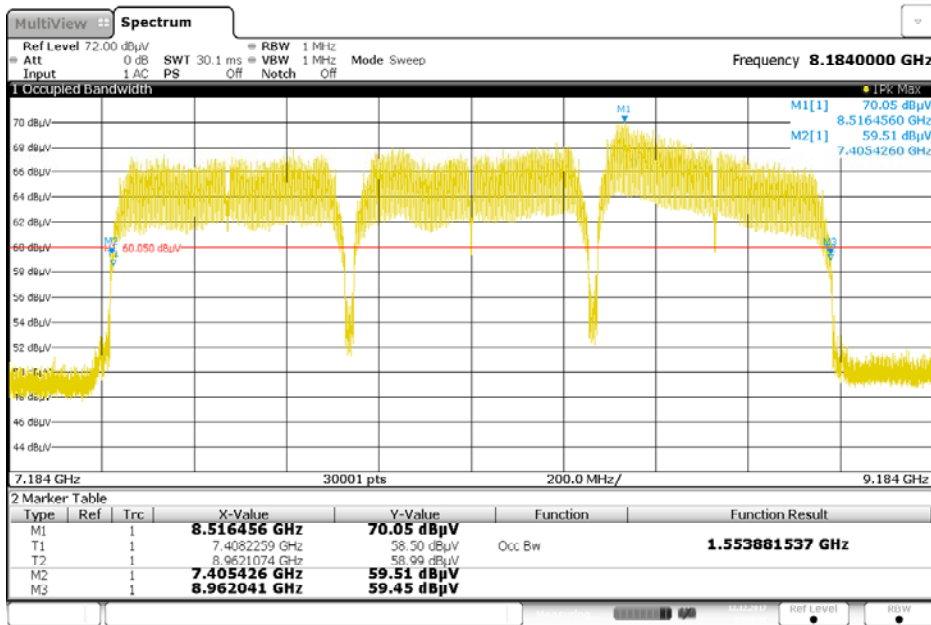


* No detect signal

Bandwidth (Regulation: FCC 15.503(d), FCC 15.517 (b))

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11920654S-A-R2
Date : January 24, 2018
Temperature / Humidity : 23 deg. C / 28 % RH
Engineer : Kenichi Adachi
Mode : Transmitting

10 dB Bandwidth: 1556.615 MHz (= fH - fL) (Limit: >= 500 MHz)
99 % Occupied Bandwidth: 1553.882 MHz fL = 7405.426 MHz
Center Frequency: 8183.734 MHz (= (fH + fL) / 2) fH = 8962.041 MHz



Date: 12 DEC 2017 04:39:46

APPENDIX 2: Test instruments

Test Instruments (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2017/07/17 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2017/08/23 * 12
SAJ-01	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S001	RE	Pre Check
SCC-G41	Coaxial Cable	Junkosha	MWX221-01000NFS NMS/B	1612S006	RE	2017/01/08 * 12
SCC-G07	Coaxial Cable	Junkosha	J12J103316-00-R	OCT-12-17-054	RE	2017/10/23 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	2046104	RE	2017/09/22 * 12
SCC-G43	Coaxial Cable	HUBER+SUHNER	SUCOFLEX_104_E	SN MY 13406/4E	RE	2017/07/10 * 12
STR-08	Test Receiver	Rohde & Schwarz	ESW44	101581	RE, CE	2017/11/24 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,R FI,MF)	-	RE, CE	
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2017/10/30 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE, CE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE, CE	2017/10/16 * 12
SSG-02	Signal Generator	Agilent	E8257D-540	MY48051404	RE	2017/03/09 * 12
SCC-G16	Coaxial Cable	Suhner	SUCOFLEX 102	32704/2	RE	2017/03/23 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	230	RE	2017/06/29 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM9861	RE	2017/07/11 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2017/03/17 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KMS KMS	-	RE	2017/04/20 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2017/03/23 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2017/03/15 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2017/03/17 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2017/03/23 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2017/06/11 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2017/10/02 * 12
SLA-07	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	RE	2017/01/26 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2017/08/24 * 12
SCC-C1/C2/C3/C4/ C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/ TOYO	8D2W/12DSFA/141P E/141PE/141PE/141P E/NS4906	-/0901-271(RF Selector)	RE	2017/04/07 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2017/02/09 * 12

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: CE: Conducted Emission test
RE: Radiated Emission test
AT: Antenna Terminal Conducted test

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Test Instruments (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-C9/C10/SRSE -03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS49 06	-/0901-271(RF Selector)	CE	2017/04/07 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE	2017/02/10 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2017/09/08 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2017/12/21 * 12
SRENT-09	Spectrum Analyzer	Agilent	E4440A	MY46186392	AT	2017/11/08 * 12
SCC-G31	Coaxial Cable	Junkosha	MWX241-01000KMS KMS	OCT-08-13-046	AT	2017/04/20 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2017/12/21 * 12
KTS-08	Digital Tester	SANWA	PC500	7019224	AT	2017/03/08 * 12

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