



EMI TEST REPORT

Test Report No. : 13828808H-D-R2

Applicant : DENSO TEN Limited
Type of EUT : Car Navigation
Model Number of EUT : TN0022A
FCC ID : BABTN0022A
Test regulation : FCC Part 15 Subpart B: 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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7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13828808H-D-R1. 13828808H-D-R1 is replaced with this report.

Date of test: June 19 and 21, 2021

Representative test engineer:

Hiroki Numata
Engineer

Approved by:

Tsubasa Takayama
Leader



CERTIFICATE 5107.02

- ☐ 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.: 13828808H-D

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13828808H-D	July 27, 2021	-	-
1	13828808H-D-R1	October 27, 2021	P.10	Replacement of cable No 13 and 15
1	13828808H-D-R1	October 27, 2021	P.11	Correction of Cable name for No. 15 from Signal Cable to USB Cable
2	13828808H-D-R2	October 28, 2021	P.11	Correction of No.15 cable shield from Unshielded to Shielded

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Reference: Abbreviations (Including words undescribed in this report)

AAN	Asymmetric Artificial Network	ILAC	International Laboratory Accreditation Conference
AC	Alternating Current	ISED	Innovation, Science and Economic Development Canada
AM	Amplitude Modulation	ISN	Impedance Stabilization Network
AMN	Artificial Mains Network	ISO	International Organization for Standardization
Amp, AMP	Amplifier	JAB	Japan Accreditation Board
ANSI	American National Standards Institute	LAN	Local Area Network
Ant, ANT	Antenna	LCL	Longitudinal Conversion Loss
AP	Access Point	LIMS	Laboratory Information Management System
ASK	Amplitude Shift Keying	LISN	Line Impedance Stabilization Network
Atten., ATT	Attenuator	MRA	Mutual Recognition Arrangement
AV	Average	N/A	Not Applicable
BPSK	Binary Phase-Shift Keying	NIST	National Institute of Standards and Technology
BR	Bluetooth Basic Rate	NS	No signal detect.
BT	Bluetooth	NSA	Normalized Site Attenuation
BT LE	Bluetooth Low Energy	NVLAP	National Voluntary Laboratory Accreditation Program
BW	BandWidth	OBW	Occupied Band Width
C.F	Correction Factor	OFDM	Orthogonal Frequency Division Multiplexing
Cal Int	Calibration Interval	PK	Peak
CAV	CISPR AV	PLT	long-term flicker severity
CCK	Complementary Code Keying	POHC(A)	Partial Odd Harmonic Current
CDN	Coupling Decoupling Network	Pol., Pola.	Polarization
Ch., CH	Channel	PR-ASK	Phase Reversal ASK
CISPR	Comite International Special des Perturbations Radioelectriques	PST	short-term flicker severity
Corr.	Correction	QAM	Quadrature Amplitude Modulation
CPE	Customer premise equipment	QP	Quasi-Peak
CW	Continuous Wave	QPSK	Quadri-Phase Shift Keying
DBPSK	Differential BPSK	r.m.s., RMS	Root Mean Square
DC	Direct Current	RBW	Resolution Band Width
DET	Detector	RE	Radio Equipment
D-factor	Distance factor	REV	Reverse
Dmax	maximum absolute voltage change during an observation period	RF	Radio Frequency
DQPSK	Differential QPSK	RFID	Radio Frequency Identifier
DSSS	Direct Sequence Spread Spectrum	RSS	Radio Standards Specifications
EDR	Enhanced Data Rate	Rx	Receiving
e.i.r.p., EIRP	Equivalent Isotropically Radiated Power	SINAD	Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)
EM clamp	Electromagnetic clamp	S/N	Signal to Noise ratio
EMC	ElectroMagnetic Compatibility	SA, S/A	Spectrum Analyzer
EMI	ElectroMagnetic Interference	SG	Signal Generator
EMS	ElectroMagnetic Susceptibility	SVSWR	Site-Voltage Standing Wave Ratio
EN	European Norm	THC(A)	Total Harmonic Current
e.r.p., ERP	Effective Radiated Power	THD(%)	Total Harmonic Distortion
EU	European Union	TR	Test Receiver
EUT	Equipment Under Test	Tx	Transmitting
Fac.	Factor	VBW	Video BandWidth
FCC	Federal Communications Commission	Vert.	Vertical
FHSS	Frequency Hopping Spread Spectrum	WLAN	Wireless LAN
FM	Frequency Modulation	xDSL	Generic term for all types of DSL technology (DSL: Digital Subscriber Line)
Freq.	Frequency		
FSK	Frequency Shift Keying		
Fund	Fundamental		
FWD	Forward		
GFSK	Gaussian Frequency-Shift Keying		
GNSS	Global Navigation Satellite System		
GPS	Global Positioning System		
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
I/O	Input/Output		
IEC	International Electrotechnical Commission		
IEEE	Institute of Electrical and Electronics Engineers		
IF	Intermediate Frequency		

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SECTION 1: Customer information

Company Name	:	DENSO TEN Limited
Address	:	2-28, Goshō-dori 1-Chome, Hyogo-ku, Kobe, 652-8510 JAPAN
Telephone Number	:	+81-78-682-2159
Facsimile Number	:	+81-78-682-2169
Contact Person	:	Kaoru Abe

The information provided from the customer is as follows;

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

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Car Navigation
Model Number	:	TN0022A
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 12 V
Receipt Date	:	June 4, 2021
Country of Mass-production	:	Japan
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab

2.2 Product Description

Model: TN0022A (referred to as the EUT in this report) is a Car Navigation.

General Specification

Clock frequency(ies) : 7.3333333 GHz (max.)

Radio Specification

Radio Type : Transceiver

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz - 5240 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5755 MHz - 5795 MHz	5210 MHz 5775 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM (IEEE802.11ac only))		
Channel spacing	5MHz		20MHz	40MHz	80MHz
Antenna type	Inverted F Antenna				
Antenna Connector type	U.FL-R-SMT-1(80)				
Antenna Gain	-1.59 dBi (Peak): 2.4 GHz Band 2.92 dBi (Peak) (ANT 1) / 2.11 dBi (Peak) (ANT 2) : 5 GHz Band				

	Bluetooth Ver.5.0 with EDR function
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK) LE: GFSK
Channel spacing	BT: 1 MHz LE: 2 MHz
Antenna type	Inverted F Antenna
Antenna Connector type	U.FL-R-SMT-1(80)
Antenna Gain	-1.7 dBi (Peak)

	Broadcast Receiver
Radio Type	Receiver
Frequency of Operation	AM, HD_AM: 530 kHz - 1710 kHz FM, RBDS/HD_FM: 87.75 MHz - 107.9 MHz SDARS: 2320 MHz - 2345 MHz
Channel spacing	AM, HD_AM: 10 kHz FM, RBDS/HD_FM: 200 kHz
Antenna connector type	HFC IV

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart B
 FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021
 Title : FCC 47CFR Part15 Radio Frequency Device
 Subpart B Unintentional Radiators

* The revision does not affect the test result conducted before its effective date.

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result	Remarks
Conducted emission	ANSI C63.4: 2014 +C63.4a:2017 7. AC power - line conducted emission measurements IEEE 187:2003	Part 15 Subpart B 15.107(a)	N/A	-	N/A	*1)
Radiated emission	ANSI C63.4: 2014 +C63.4a:2017 8. Radiated emission measurements IEEE 187:2003	Part 15 Subpart B 15.109(a)	N/A	6.68 dB (4999.995 MHz, Vertical, AV, Mode 1 Other / 4999.995 MHz, Vertical, AV, Mode 2 Other)	Complied a)	-
Antenna Terminal	ANSI C63.4: 2014 +C63.4a:2017 12. Measurement of unintentional radiators other than ITE IEEE 187:2003	Part 15 Subpart B 15.111(a)	N/A	11.26 dB 3160.058 MHz	Complied b)	-
*Note: UL Japan, Inc's EMI Work Procedure 13-EM-W0420. *1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line. a) Refer to APPENDIX 1 (data of Radiated Emission) b) Refer to APPENDIX 1 (data of Antenna Terminal Conducted Emission)						
Symbols: Complied The data of this test item has enough margin, more than the measurement uncertainty. Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.						

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

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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 $k = 2$.

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
	(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
	(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
0.5 m	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
Antenna terminal conducted emission / Power density / Burst power	2.6 dB

3.5 Test Location

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*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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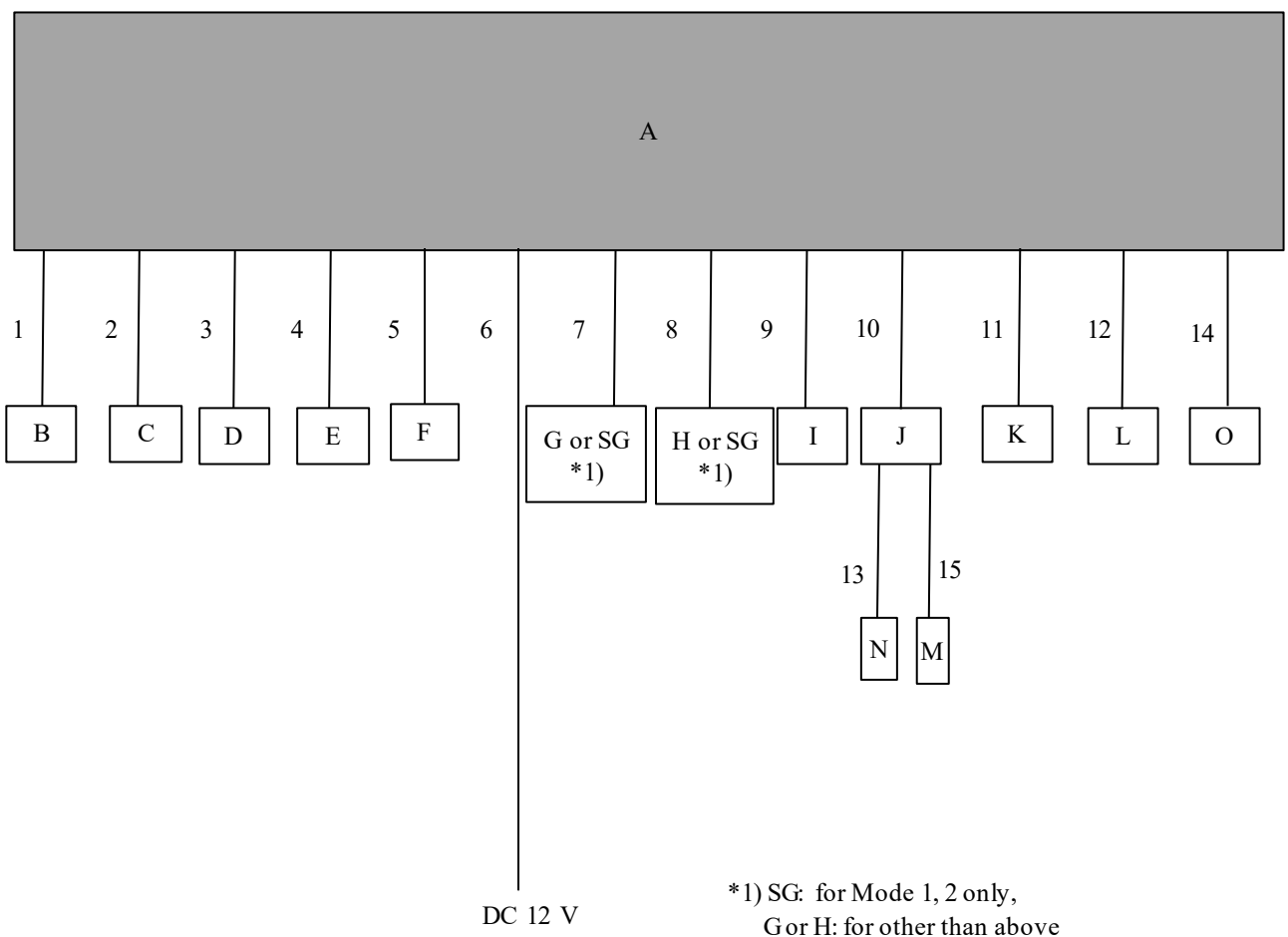
SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Mode 1: FM Main Port Receiving mode (Local / Other) (Radiated Emission test)
Mode 2: FM Sub Port Receiving mode (Local / Other) (Radiated Emission test)
Mode 3: USB Memory Play mode (Radiated Emission test)
Mode 4: FM Main Port Tuning mode (Antenna Terminal test)
Mode 5: FM Sub Port Tuning mode (Antenna Terminal test)

Software : NANE01.035205C

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Navigation	TN0022A	AT20001	DENSO TEN Limited	EUT
B	Switch	-	-	-	-
C	DCM	19MC DCM	E-033720026/008	DENSO Corporation	-
D	Steering Switch	PA6-GF30	39	TOYOTA	-
E	Low noise Amp	ZX60-242GLN-S+	S 2036302044	Mini-Circuits	-
F	GPS Antenna	23D90058	No.48	yokowo co.,ltd.	-
G	FM/AM connector (Main)	86300-30C30	AS500586	DENSO TEN Limited	-
H	FM/AM connector (Sub)	86300-30C70	AS400124	DENSO TEN Limited	-
I	Back Camera	GP-KD7301RC	85C602752	Panasonic	-
J	USB/AUX socket	86190-12040	No.12	Kojima Industries Corporation	-
K	Mic	SDA3510A	0AC067100	Panasonic	-
L	Mic	SDA3510A	0AC067082	Panasonic	-
M	USB Memory	USM4GR B	P90611	SONY	-
N	iPod touch	A1367	CCQ50WDDCPC	Apple	-
O	Speaker Dummy	-	-	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	2.4	Unshielded	Unshielded	-
2	Signal Cable	2.4	Unshielded	Unshielded	-
3	Signal Cable	2.4	Unshielded	Unshielded	-
4	Signal Cable	1.0	Unshielded	Unshielded	-
5	GNSS Antenna Cable	2.6	Shielded	Shielded	-
6	DC Cable	3.4	Unshielded	Unshielded	-
7	Signal Cable	2.6	Unshielded	Unshielded	-
8	Signal Cable	2.6	Unshielded	Unshielded	-
9	Signal Cable	2.4	Unshielded	Unshielded	-
10	USB Cable	3.2	Shielded	Shielded	-
11	Signal Cable	2.7	Unshielded	Unshielded	-
12	Signal Cable	2.7	Unshielded	Unshielded	-
13	Audio Cable	1.5	Shielded	Shielded	-
14	Speaker Cable	3.2	Unshielded	Unshielded	-
15	USB Cable	1.5	Shielded	Shielded	-

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SECTION 5: Radiated Emission

6.1 Operating environment

Test place : No.3 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in APPENDIX 3

6.3 Test conditions

Frequency range : 30 MHz - 200 MHz (Biconical antenna) / 200 MHz - 1000 MHz (Logperiodic antenna)
1000 MHz - 40000 MHz (Horn antenna)
Test distance : 3 m
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

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 intensity.

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

The radiated emission measurements were made with the following detector function of the Test Receiver and the Spectrum Analyzer.

The test of Local oscillator spurious has been measured up to appropriate frequency based on the result of the antenna terminal test.

For above 1 GHz, 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.

Frequency	Below 1 GHz	Above 1 GHz *1)
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120 kHz	PK: RBW: 1 MHz / VBW: 3 MHz AV *2): RBW: 1 MHz / VBW: 10 Hz

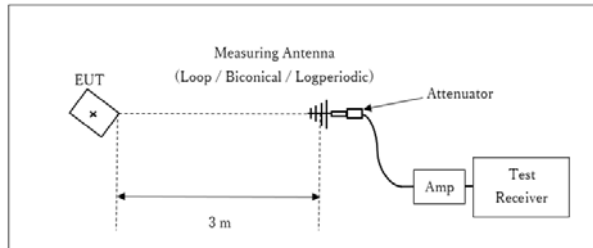
*1) The measurement data was adjusted to a 3 m distance using the following Distance Factor.

Distance Factor: See Figure 1.

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

Figure 1: Test Setup

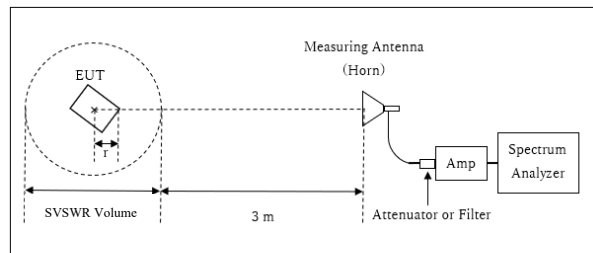
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz – 10GHz



r : Radius of an outer periphery of EUT

× : Center of turn table

Distance Factor: $20 \times \log(3.1 \text{ m}^* / 3.0 \text{ m}) = 0.29 \text{ dB}$

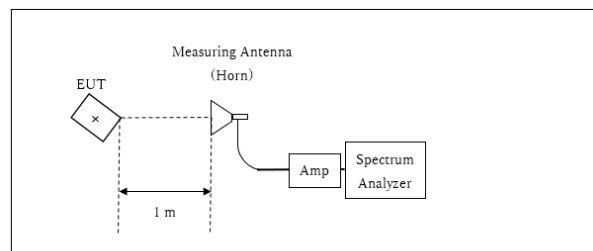
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.1 \text{ m}$

SVSWR Volume: 2 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

$r = 0.9 \text{ m}$

10 GHz - 40 GHz



× : Center of turn table

Distance Factor: $20 \times \log(1.0 \text{ m}^* / 3.0 \text{ m}) = -9.54 \text{ dB}$

*Test Distance: 1 m

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

6.5 Test result

Summary of the test results: Pass

The limit is rounded down to one decimal place.

The test result is rounded off to one or two decimal places, so some differences might be observed.

Date: June 21, 2021

Test engineer: Takafumi Noguchi

UL Japan, Inc.

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SECTION 6: Antenna Terminal

6.1 Operating environment

Test place : No.3 Measurement room
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a wooden table of nominal size, 1.0 m by 1.5 m, raised 0.8 m from the ground.
Photographs of the set up are shown in Appendix 3.

6.3 Test conditions

Frequency range : 30 MHz - 1000 MHz / 1000 MHz - 40000 MHz
Test distance : N / A
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The Antenna Terminal was measured with a spectrum analyzer connected to the antenna port.

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer *1)
IF Bandwidth	PK: RBW: 100 kHz / VBW: 100 kHz	PK: RBW: 1 MHz / VBW: 3 MHz

*1) The Spectrum Analyzer was used in 3 dB resolution bandwidth.

6.5 Test result

Summary of the test results: Pass

Date: June 19, 2021

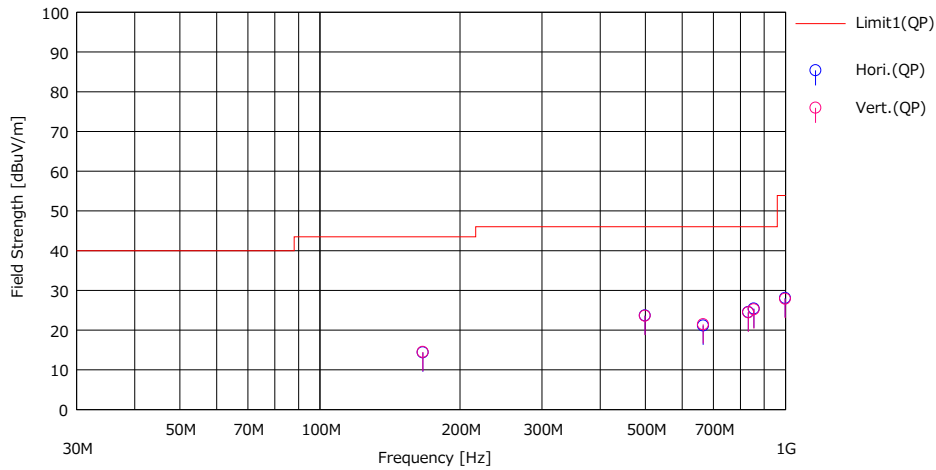
Test engineer: Hiroki Numata

APPENDIX 1: Test data

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Below 1 GHz)
Mode Mode 1 Local

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading [QP] [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [QP] [dBuV/m]	Limit [QP] [dBuV/m]	Margin [QP] [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	166.390	22.00	15.67	8.89	32.19	14.37	43.50	29.13	Hori.	100	0	BA	
2	499.191	26.70	17.66	11.42	32.10	23.68	46.00	22.32	Hori.	100	350	LA20	
3	665.591	21.50	19.34	12.38	32.09	21.13	46.00	24.87	Hori.	100	0	LA20	
4	832.000	21.70	20.96	13.24	31.36	24.54	46.00	21.46	Hori.	100	0	LA20	
5	855.135	21.80	21.48	13.36	31.23	25.41	46.00	20.59	Hori.	100	0	LA20	
6	998.351	22.00	22.43	14.07	30.44	28.06	53.90	25.84	Hori.	100	0	LA20	
7	166.390	22.10	15.67	8.89	32.19	14.47	43.50	29.03	Vert.	100	0	BA	
8	499.191	26.60	17.66	11.42	32.10	23.58	46.00	22.42	Vert.	100	324	LA20	
9	665.591	21.80	19.34	12.38	32.09	21.43	46.00	24.57	Vert.	100	0	LA20	
10	832.000	21.60	20.96	13.24	31.36	24.44	46.00	21.56	Vert.	100	0	LA20	
11	855.135	21.60	21.48	13.36	31.23	25.21	46.00	20.79	Vert.	100	0	LA20	
12	998.351	21.80	22.43	14.07	30.44	27.86	53.90	26.04	Vert.	100	0	LA20	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

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

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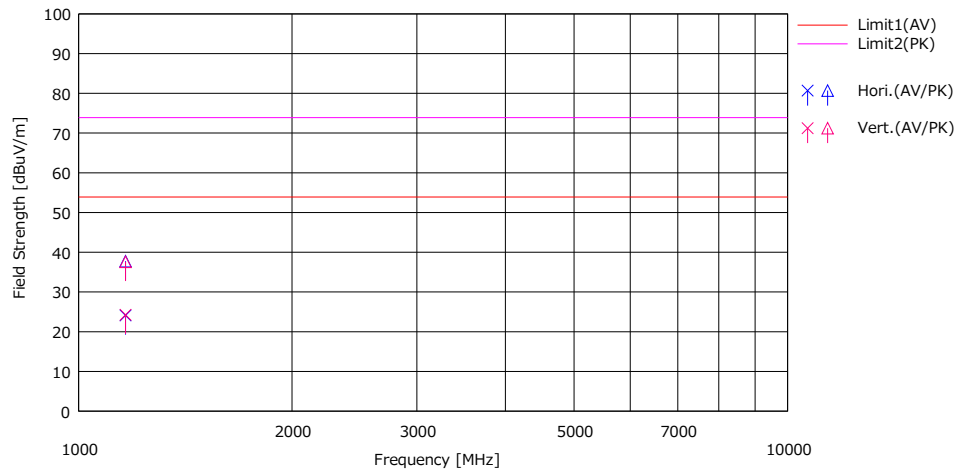
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Above 1 GHz)
Mode Mode 1 Local

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac. [dB]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pda. [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	1165.000	31.70	45.40	25.12	2.01	34.76	24.07	37.77	53.90	73.90	29.83	36.13	Hori.	100	0	H20	
2	1165.000	31.90	45.21	25.12	2.01	34.76	24.27	37.58	53.90	73.90	29.63	36.32	Vert.	100	0	H20	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-200MHz: BICONICAL, 200-1000MHz: LOGPERIODIC, 1000MHz-: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

*** No signal was detected above 10 GHz.**

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

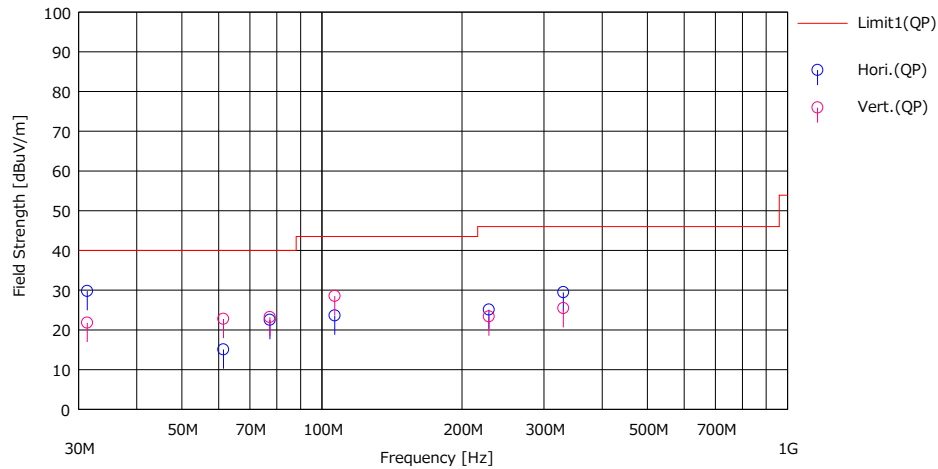
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Below 1 GHz)
Mode Mode 1 Other

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading (QP)	Ant.Fac	Loss	Gain	Result (QP)	Limit (QP)	Margn (QP)	Pol.	Height	Angle	Ant. Type	Comment
		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	31.329	37.00	17.92	7.14	32.27	29.79	40.00	10.21	Hori.	298	212	BA	
2	61.415	32.30	7.38	7.65	32.27	15.06	40.00	24.94	Hori.	389	230	BA	
3	77.317	40.20	6.67	7.89	32.26	22.50	40.00	17.50	Hori.	300	301	BA	
4	106.538	36.60	11.02	8.24	32.24	23.62	43.50	19.88	Hori.	316	349	BA	
5	228.414	36.50	11.27	9.46	32.15	25.08	46.00	20.92	Hori.	216	80	LA22	
6	330.090	36.77	14.51	10.27	32.09	29.46	46.00	16.54	Hori.	190	328	LA22	
7	31.329	29.00	17.92	7.14	32.27	21.79	40.00	18.21	Vert.	100	85	BA	
8	61.415	40.00	7.38	7.65	32.27	22.76	40.00	17.24	Vert.	100	268	BA	
9	77.317	40.90	6.67	7.89	32.26	23.20	40.00	16.80	Vert.	112	310	BA	
10	106.538	41.50	11.02	8.24	32.24	28.52	43.50	14.98	Vert.	103	282	BA	
11	228.414	34.80	11.27	9.46	32.15	23.38	46.00	22.62	Vert.	103	134	LA22	
12	330.090	32.79	14.51	10.27	32.09	25.48	46.00	20.52	Vert.	198	330	LA22	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

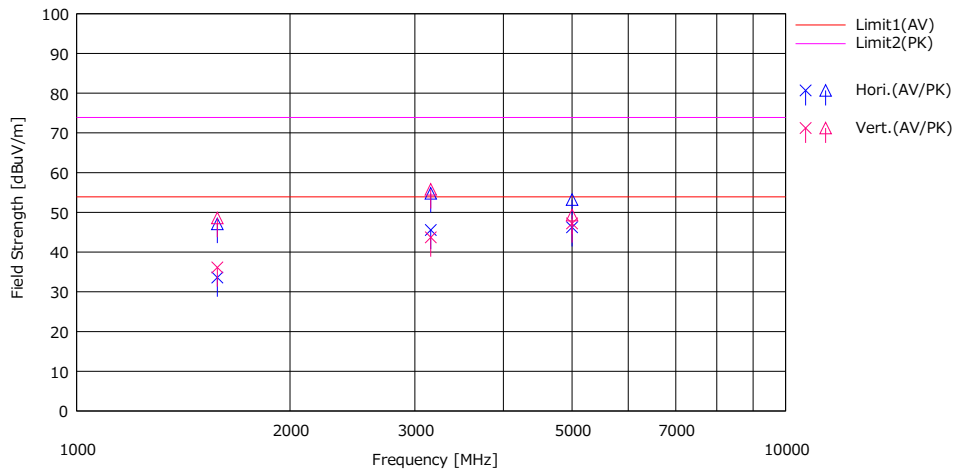
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Above 1 GHz)
Mode Mode 1 Other

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac. [dBuV]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pda. [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	1579.972	40.00	53.48	25.07	2.29	33.76	33.60	47.08	53.90	73.90	20.30	26.82	Hori.	100	0	H20	
2	3159.935	45.89	56.10	28.71	3.21	32.23	45.58	54.79	53.90	73.90	8.32	19.11	Hori.	202	239	H20	
3	4999.995	42.01	49.00	31.76	4.04	31.59	46.22	53.21	53.90	73.90	7.68	20.69	Hori.	223	234	H20	
4	1579.972	42.55	54.98	25.07	2.29	33.76	36.15	48.58	53.90	73.90	17.75	25.32	Vert.	100	182	H20	
5	3159.935	44.00	56.12	28.71	3.21	32.23	43.69	55.81	53.90	73.90	10.21	18.09	Vert.	116	132	H20	
6	4999.995	43.01	45.11	31.76	4.04	31.59	47.22	49.32	53.90	73.90	6.68	24.58	Vert.	100	232	H20	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

* No signal was detected above 10 GHz.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

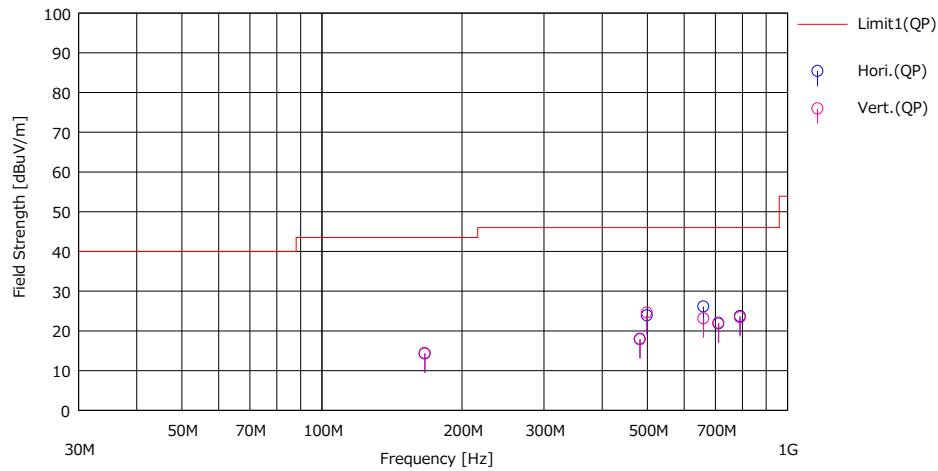
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Below 1 GHz)
Mode Mode 2 Local

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading [QP]	Ant.Fac. [dBuV]	Loss [dB]	Gain [dB]	Result [QP]	Limit [QP]	Margn. [QP]	Pda. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	166.390	21.90	15.67	8.89	32.19	14.27	43.50	29.23	Hori.	100	0	BA	
2	481.976	21.50	17.25	11.31	32.10	17.96	46.00	28.04	Hori.	100	0	LA22	
3	499.191	26.90	17.66	11.42	32.10	23.88	46.00	22.12	Hori.	100	351	LA22	
4	660.068	26.60	19.24	12.35	32.09	26.10	46.00	19.90	Hori.	100	46	LA22	
5	711.145	21.40	19.82	12.64	32.03	21.83	46.00	24.17	Hori.	100	0	LA22	
6	790.930	21.60	20.65	13.03	31.59	23.69	46.00	22.31	Hori.	100	0	LA22	
7	166.390	22.00	15.67	8.89	32.19	14.37	43.50	29.13	Vert.	100	0	BA	
8	481.976	21.40	17.25	11.31	32.10	17.86	46.00	28.14	Vert.	100	0	LA22	
9	499.191	27.60	17.66	11.42	32.10	24.58	46.00	21.42	Vert.	100	324	LA22	
10	660.068	23.60	19.24	12.35	32.09	23.10	46.00	22.90	Vert.	100	327	LA22	
11	711.145	21.60	19.82	12.64	32.03	22.03	46.00	23.97	Vert.	100	0	LA22	
12	790.930	21.30	20.65	13.03	31.59	23.39	46.00	22.61	Vert.	100	0	LA22	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

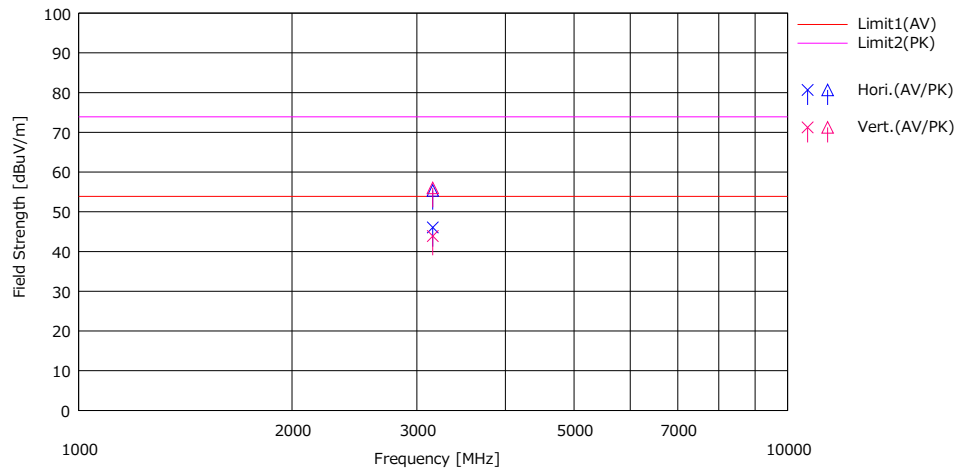
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Above 1 GHz)
Mode Mode 2 Local

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac. [dB]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pda. [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	3160.058	46.36	55.67	28.71	3.21	32.23	46.05	55.36	53.90	73.90	7.85	18.54	Hori.	206	244	H20	
2	3160.058	44.21	56.30	28.71	3.21	32.23	43.90	55.99	53.90	73.90	10.00	17.91	Vert.	115	134	H20	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

* No signal was detected above 10 GHz.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

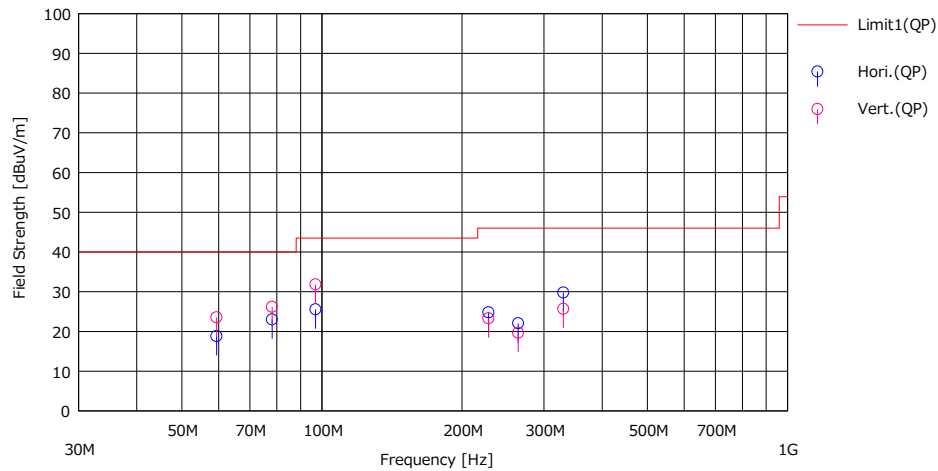
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Below 1 GHz)
Mode Mode 2 Other

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading	Ant Foc	Loss	Gain	Result	Limit	Margn	Pola.	Height	Angle	Ant. Type	Comment
		(QP)				(QP)	(QP)	(QP)					
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	59.397	35.60	7.86	7.62	32.27	18.81	40.00	21.19	Hori.	397	226	BA	
2	78.133	40.60	6.75	7.90	32.26	22.99	40.00	17.01	Hori.	220	215	BA	
3	96.899	40.00	9.62	8.14	32.24	25.52	43.50	17.98	Hori.	319	296	BA	
4	228.007	36.20	11.26	9.46	32.15	24.77	46.00	21.23	Hori.	148	178	LA22	
5	264.030	31.90	12.50	9.76	32.12	22.04	46.00	23.96	Hori.	217	78	LA22	
6	330.022	37.10	14.50	10.27	32.09	29.78	46.00	16.22	Hori.	186	352	LA22	
7	59.397	40.30	7.86	7.62	32.27	23.51	40.00	16.49	Vert.	100	268	BA	
8	78.133	43.80	6.75	7.90	32.26	26.19	40.00	13.81	Vert.	118	303	BA	
9	96.899	46.30	9.62	8.14	32.24	31.82	43.50	11.68	Vert.	100	304	BA	
10	228.007	34.70	11.26	9.46	32.15	23.27	46.00	22.73	Vert.	105	139	LA22	
11	264.030	29.50	12.50	9.76	32.12	19.64	46.00	26.36	Vert.	100	43	LA22	
12	330.022	33.00	14.50	10.27	32.09	25.68	46.00	20.32	Vert.	200	328	LA22	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

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

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Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

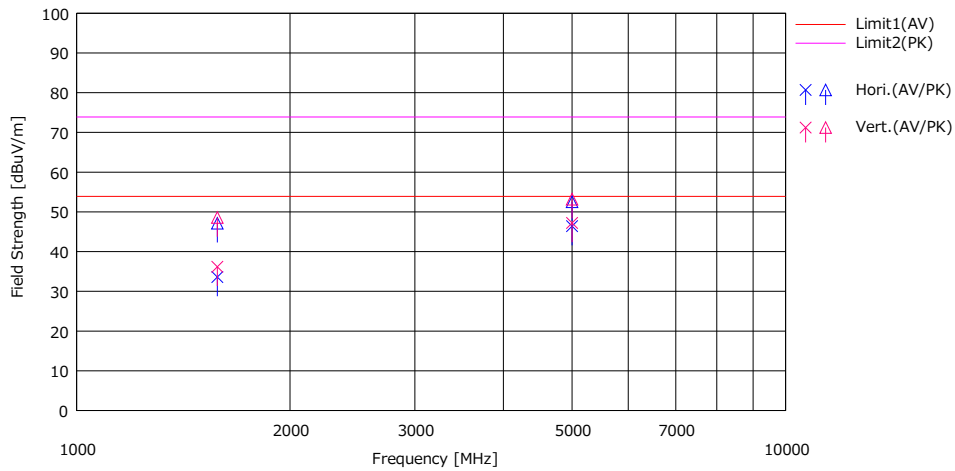
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Above 1 GHz)
Mode Mode 2 Other

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pda. [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	1579.972	40.00	53.55	25.07	2.29	33.76	33.60	47.15	53.90	73.90	20.30	26.75	Hori.	100	0	H20	
2	4999.995	42.18	48.30	31.76	4.04	31.59	46.39	52.51	53.90	73.90	7.51	21.39	Hori.	222	121	H20	
3	1579.972	42.57	55.00	25.07	2.29	33.76	36.17	48.60	53.90	73.90	17.73	25.30	Vert.	100	185	H20	
4	4999.995	43.01	48.99	31.76	4.04	31.59	47.22	53.20	53.90	73.90	6.68	20.70	Vert.	100	230	H20	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

* No signal was detected above 10 GHz.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

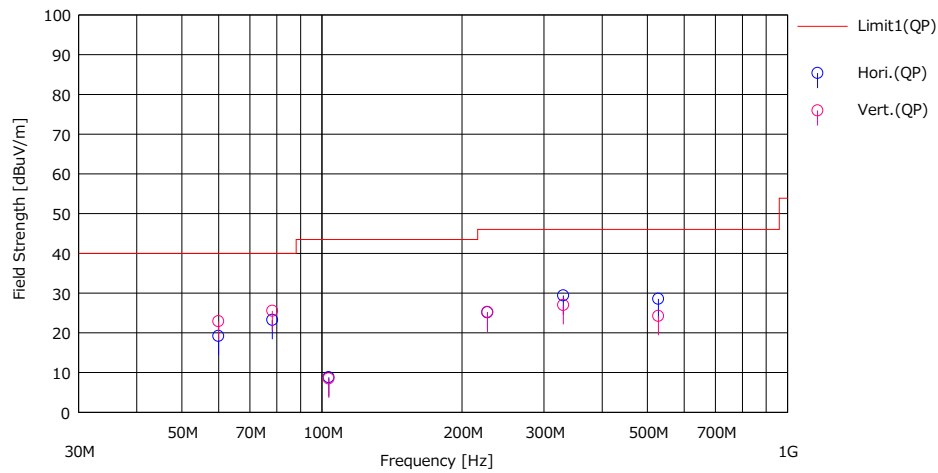
Telephone : +81 596 24 8999

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Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Below 1 GHz)
Mode Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading [QP] [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [QP] [dBuV/m]	Limit [QP] [dBuV/m]	Margn. [QP] [dB]	Pda. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	59.951	36.10	7.73	7.63	32.27	19.19	40.00	20.81	Hori.	398	225	BA	
2	78.258	40.80	6.77	7.91	32.26	23.22	40.00	16.78	Hori.	219	214	BA	
3	103.444	22.30	10.55	8.21	32.24	8.82	43.50	34.68	Hori.	100	0	BA	
4	226.738	36.60	11.23	9.45	32.15	25.13	46.00	20.87	Hori.	150	181	LA22	
5	330.002	36.70	14.50	10.27	32.09	29.38	46.00	16.62	Hori.	190	351	LA22	
6	528.004	31.50	17.53	11.59	32.10	28.52	46.00	17.48	Hori.	100	34	LA22	
7	59.951	39.80	7.73	7.63	32.27	22.89	40.00	17.11	Vert.	100	260	BA	
8	78.258	43.10	6.77	7.91	32.26	25.52	40.00	14.48	Vert.	120	300	BA	
9	103.444	21.99	10.55	8.21	32.24	8.51	43.50	34.99	Vert.	100	0	BA	
10	226.738	36.70	11.23	9.45	32.15	25.23	46.00	20.77	Vert.	102	144	LA22	
11	330.002	34.30	14.50	10.27	32.09	26.98	46.00	19.02	Vert.	201	325	LA22	
12	528.004	27.20	17.53	11.59	32.10	24.22	46.00	21.78	Vert.	100	341	LA22	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)

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

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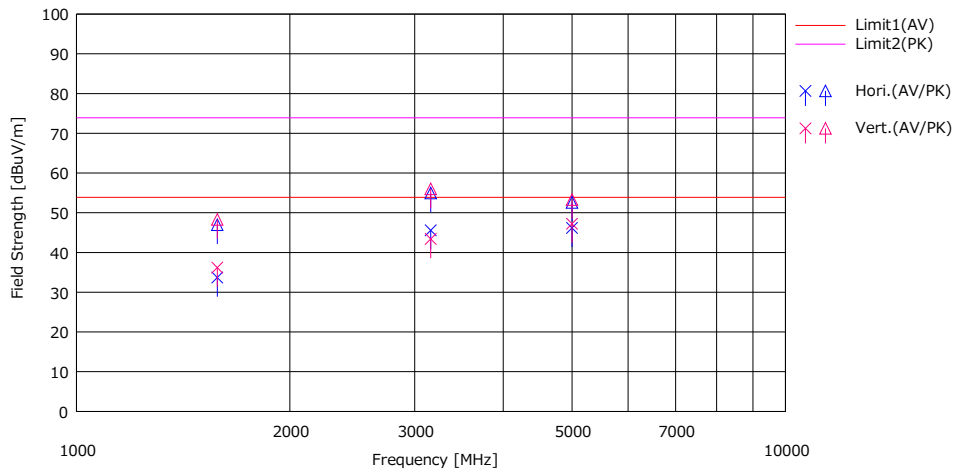
Telephone : +81 596 24 8999

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Radiated Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 21, 2021
Temperature / Humidity 24 deg. C / 50 % RH
Engineer Takafumi Noguchi
(Above 1 GHz)
Mode Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq. [MHz]	Reading		Ant.Fac. [dB]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Pda. [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	1579.972	40.10	53.40	25.07	2.29	33.76	33.70	47.00	53.90	73.90	20.20	26.90	Hori.	100	23	H20	
2	3159.935	45.90	56.30	28.71	3.21	32.23	45.59	54.99	53.90	73.90	8.31	18.91	Hori.	203	239	H20	
3	4999.995	42.00	48.40	31.76	4.04	31.59	46.21	52.61	53.90	73.90	7.69	21.29	Hori.	221	121	H20	
4	1579.972	42.60	54.70	25.07	2.29	33.76	36.20	48.30	53.90	73.90	17.70	25.60	Vert.	100	182	H20	
5	3159.935	43.70	56.30	28.71	3.21	32.23	43.39	55.99	53.90	73.90	10.51	17.91	Vert.	116	132	H20	
6	4999.995	43.00	49.10	31.76	4.04	31.59	47.21	53.31	53.90	73.90	6.69	20.59	Vert.	100	234	H20	

CHART: WITH FACTOR

ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN

CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

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

* No signal was detected above 10 GHz.

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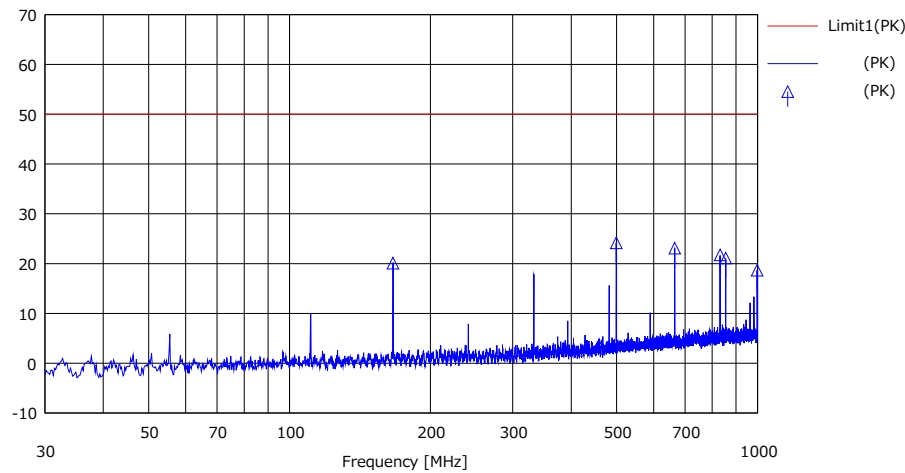
Facsimile : +81 596 24 8124

Antenna Terminal Conducted Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 19, 2021
Temperature / Humidity 24 deg. C / 60 % RH
Engineer Hiroki Numata

Mode Mode 4

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBuV]	Limit +1 (PK) [dBuV]	Margin (PK) [dB]	Polz. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	166.390	47.15	0.00	4.88	31.94	20.09	50.00	29.91					
2	499.191	48.79	0.00	7.38	31.99	24.18	50.00	25.82					
3	665.591	46.90	0.00	8.34	32.13	23.11	50.00	26.89					
4	832.000	44.05	0.00	9.21	31.51	21.75	50.00	28.25					
5	855.135	43.19	0.00	9.32	31.39	21.12	50.00	28.88					
6	998.351	39.33	0.00	10.03	30.69	18.67	50.00	31.33					

*1) 2 nW = -57 dBm = 50 dBuV

CHART: WITH FACTOR

CALCULATION: RESULT = READING + LOSS (CABLE +ATT) - GAIN

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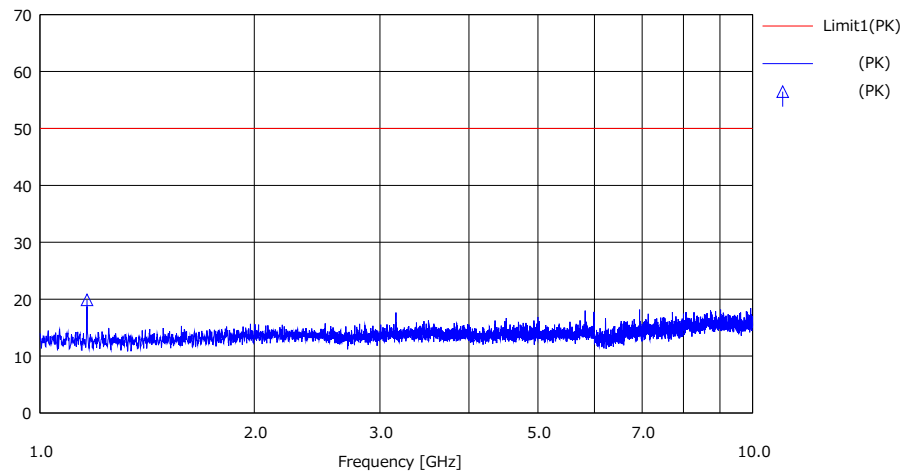
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Antenna Terminal Conducted Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 19, 2021
Temperature / Humidity 24 deg. C / 60 % RH
Engineer Hiroki Numata
(Above 1 GHz)
Mode Mode 4

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBuV]	Limit #1 (PK) [dBuV]	Margn (PK) [dB]	Polz. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	1165.000	51.08	0.00	3.56	34.76	19.88	50.00	30.12					

*1) 2 nW = -57 dBm = 50 dBuV

CHART: WITH FACTOR

CALCULATION: RESULT = READING + LOSS (CABLE + ATT) - GAIN

* No signal was detected above 10 GHz.

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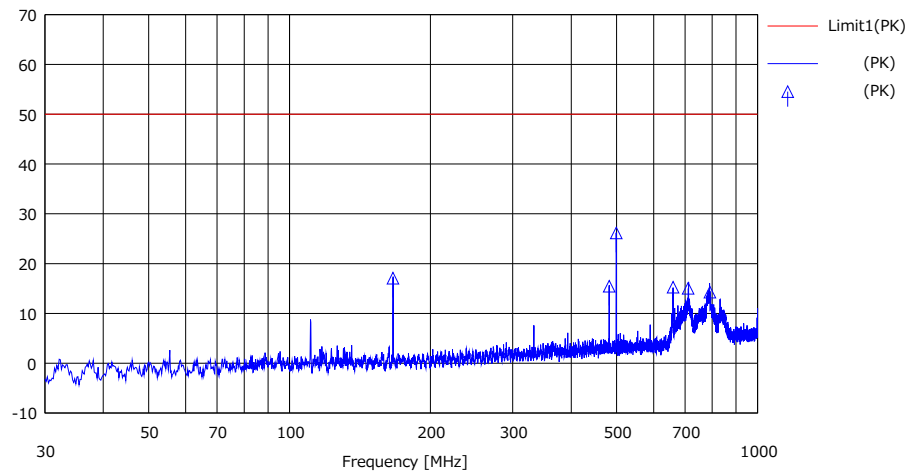
Telephone : +81 596 24 8999

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Antenna Terminal Conducted Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 19, 2021
Temperature / Humidity 24 deg. C / 60 % RH
Engineer Hiroki Numata
(Below 1 GHz)
Mode Mode 5

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK) [dBμV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (PK) [dBμV]	Limit *1) (PK) [dBμV]	Margn (PK) [dB]	Polz. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	166.390	44.13	0.00	4.88	31.94	17.07	50.00	32.93					
2	481.976	40.16	0.00	7.27	31.98	15.45	50.00	34.55					
3	499.191	50.76	0.00	7.38	31.99	26.15	50.00	23.85					
4	660.068	39.08	0.00	8.31	32.13	15.26	50.00	34.74					
5	711.145	38.54	0.00	8.60	32.11	15.03	50.00	34.97					
6	790.930	36.99	0.00	9.00	31.71	14.28	50.00	35.72					

*1) 2 nW = -57 dBm = 50 dBμV

CHART: WITH FACTOR

CALCULATION: RESULT = READING + LOSS (CABLE + ATT) - GAIN

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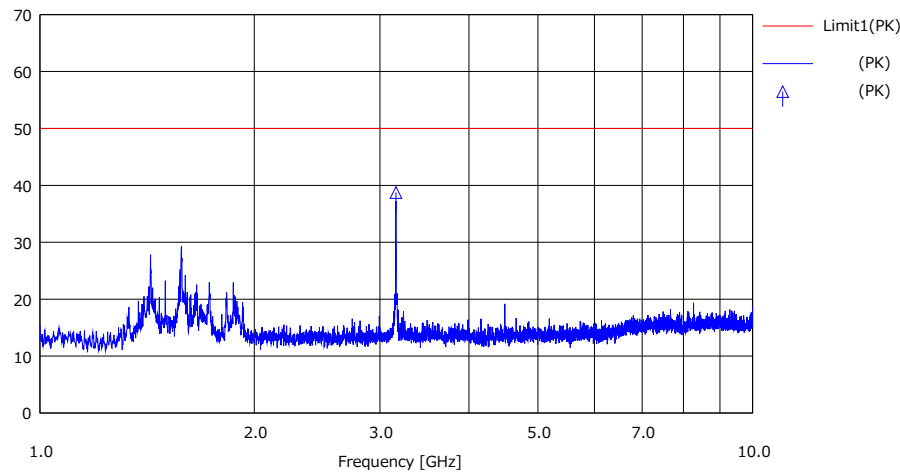
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Antenna Terminal Conducted Emission

Report No. 13828808H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date June 19, 2021
Temperature / Humidity 24 deg. C / 60 % RH
Engineer Hiroki Numata
(Above 1 GHz)
Mode Mode 5

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit *1)	Margin [dB]	Polz. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBμV]				[dBμV]	[dBμV]						
1	3160.058	66.14	0.00	4.83	32.23	38.74	50.00	11.26					

*1) 2 nW = -57 dBm = 50 dBμV

CHART: WITH FACTOR

CALCULATION: RESULT = READING + LOSS (CABLE + ATT) - GAIN

* No signal was detected above 10 GHz.

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APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	2020/05/22	24
AT	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	2021/01/15	12
AT	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	2021/01/07	12
AT	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
AT	COTS-ME MI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
AT	MDCB-04	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	2020/07/13	12
AT	MCC-51	141323	Coaxial cable	UL Japan	-	-	2020/07/06	12
AT	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	2020/12/18	12
AT	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/1902S579(5m)	2021/03/04	12
AT	MPA-14	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	2021/02/18	12
AT	MPA-11	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	2021/03/03	12
AT	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	2021/03/02	12
AT	MPA-03	141577	Microwave System Power Amplifier	Keysight Technologies Inc	83050A	MY39500610	2020/10/19	12
RE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	2020/08/18	12
RE	MCC-51	141323	Coaxial cable	UL Japan	-	-	2020/07/06	12
RE	MAT-95	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	2021/06/09	12
RE	MTR-09	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	2021/06/03	12
RE	MHA-20	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	258	2020/10/01	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/1902S579(5m)	2021/03/04	12
RE	MPA-11	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	2021/03/03	12
RE	MLA-22	141266	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	2020/08/13	12
RE	MBA-03	141424	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	1915	2020/08/13	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	2021/06/07	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 / 1871328	2020/09/07	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	2020/08/03	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	2020/11/17	12
RE	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	2020/08/04	12
RE	MDCB-04	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	2020/07/13	12
RE	MSG-14	141894	Signal Generator	Rohde & Schwarz	SMC100A	1411.4002k02	2020/10/16	12

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***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

AT: Antenna Terminal Conducted test