EMI TEST REPORT

Test Report No. : 13828809H-D-R1

Applicant	:	**DENSO TEN Limited**
Type of EUT	:	**Car Audio**
Model Number of EUT	:	**TN0023A**
FCC ID	:	**BABTN0023A**
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.
4. The test results in this test report are traceable to the national or international standards.
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6. This test report covers EMC technical requirements. It does not cover administrative issues such as Manual or non-EMC test related Requirements. (if applicable)
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, 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 13828809H-D. 13828809H-D is replaced with this report.

Date of test: June 24, 2021

Representative test engineer:
Junya Okuno
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".

REVISION HISTORY

Original Test Report No.: 13828809H-D

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13828809H-D	July 27, 2021	-	-
1	13828809H-D-R1	October 26, 2021	P.11	Exchange model name for Item M and N
1	13828809H-D-R1	October 26, 2021	P.15	Add test data of 998.388 MHz (Horizontal)

Reference: Abbreviations (Including words undescribed in this report)

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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	DENSO TEN Limited
Address	:	2-28, Gosho-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 Audio
Model Number	:	TN0023A
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: TN0023A (referred to as the EUT in this report) is a Car Audio.

General Specification

Feature of EUT:

Clock frequency(ies) in the system : 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	-1.41 dBi (Peak): 2.4 GHz Band 3.28 dBi (Peak) (ANT 1) / 1.79 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, π/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	0.70 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

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	7.73 dB (5000.000 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	9.6 dB 1580.000 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.

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

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

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	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

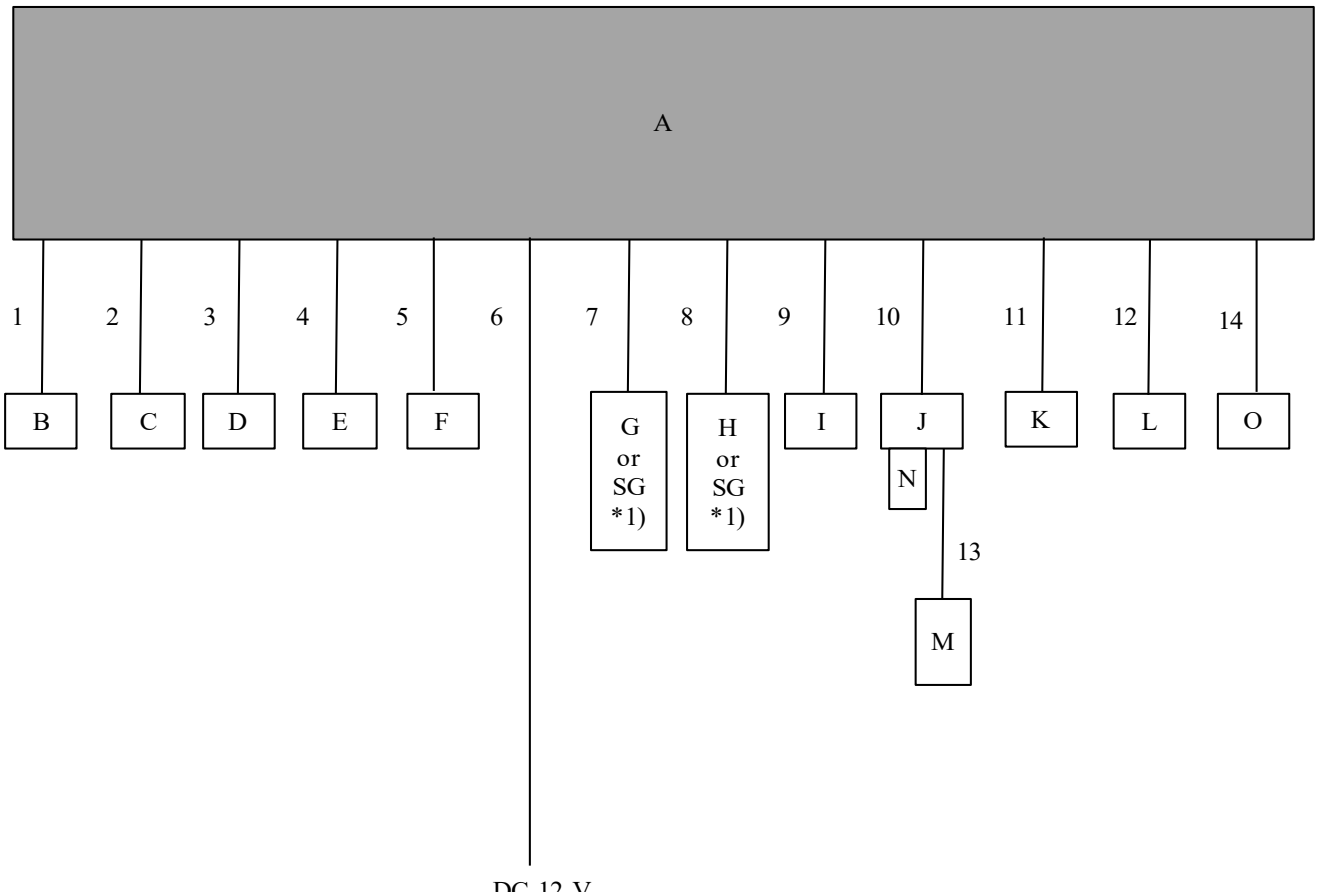
SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

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



*1) SG (Signal Generator) is used other than Mode 3.

* 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 Audio	TN0023A	AT300025	DENSO TEN Limited	EUT
B	Switch	-	-	-	-
C	DCM	19MC_DCM	E-033720026/006	DENSO TEN Limited	-
D	Steering Switch	PA6-GF30	48	TOYOTA	-
E	Low noise Amp	ZX60-242GLN-S+	S 2036302044	Mini-Circuits	-
F	GPS Antenna	23D90058	No.17	yokowo co.,ltd.	-
G	FM/AM connector (Main)	86300-30C30	PS600112	DENSO TEN Limited	-
H	FM/AM connector (Sub)	86300-30C70	PS6020494	DENSO TEN Limited	-
I	Back Camera	GP-KD7301RC	64F000037	Panasonic	-
J	USB/AUX socket	86190-12040	No.17	Kojima Industries Corporation	-
K	Mic	SDA3510A	0DC040830	Panasonic	-
L	Mic	SDA3510A	0DC040817	Panasonic	-
M	iPod touch	A1367	CCQ50WDDCPC	Apple	-
N	USB Memory	USM4GR B	17116 DGGNN	SONY	-
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	-

SECTION 5: Radiated Emission

5.1 Operating environment

Test place : No.1 semi anechoic chamber
Temperature : See data
Humidity : See data

5.2 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.

5.3 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

5.4 Test procedure

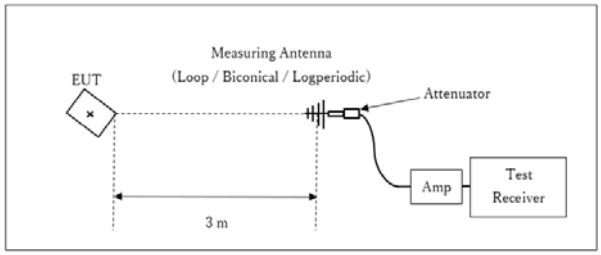
The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
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 1GHz	1 GHz to 26.5 GHz *1)	Above 26.5 GHz *1)
Instrument used	Test Receiver	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120 kHz	PK: BW 1 MHz, CISPR AV: BW 1 MHz	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

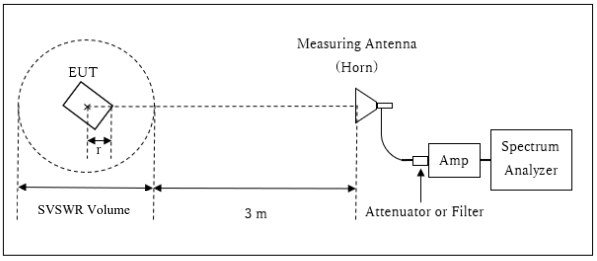
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz

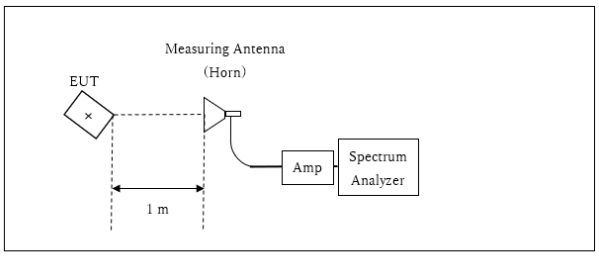


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.0 m*/3.0 m) = 0.0 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.0 m

SVSWR Volume: 1.5 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.75 m

13 GHz - 40 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m* / 3.0 m) = -9.54 dB
*Test Distance: 1 m

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

5.5 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 24, 2021 Test engineer: Junya Okuno and Takafumi Noguchi

SECTION 6: Antenna Terminal

6.1 Operating environment

Test place : No.2 semi anechoic chamber
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

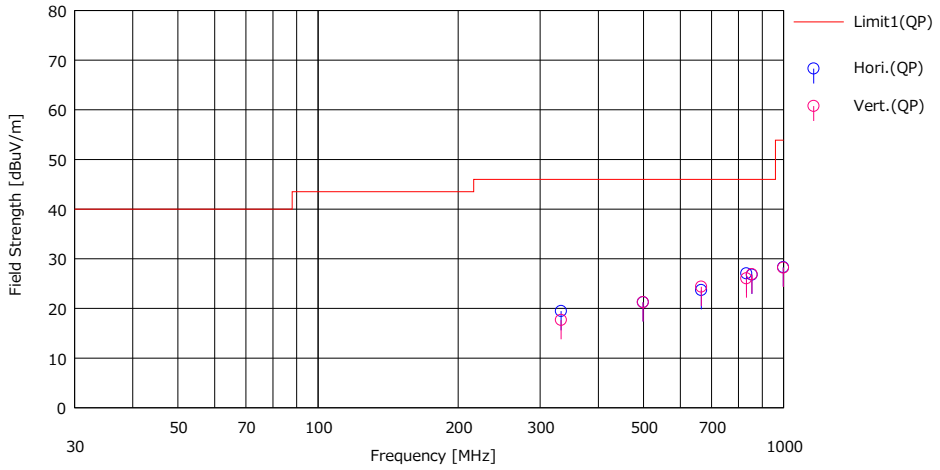
Date: June 24, 2021 Test engineer: Junya Okuno

APPENDIX 1: Test data

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 1 (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



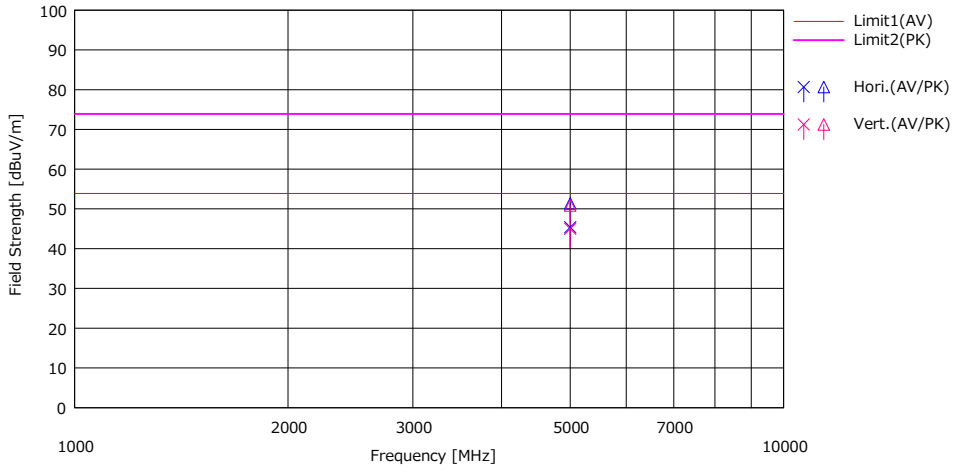
No.	Freq.	Reading (QP)	Ant.Fac	Loss	Gain	Result (QP)	Limit (QP)	Margin (QP)	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	332.796	23.60	14.59	9.10	27.83	19.46	46.00	26.54	Hori.	100	264	LA21	
2	499.191	22.60	17.85	9.82	29.04	21.23	46.00	24.77	Hori.	100	359	LA21	
3	665.590	22.90	19.53	10.45	29.21	23.67	46.00	22.33	Hori.	100	0	LA21	
4	831.992	23.80	21.10	11.08	28.95	27.03	46.00	18.97	Hori.	100	112	LA21	
5	855.141	22.90	21.59	11.17	28.90	26.76	46.00	19.24	Hori.	100	81	LA21	
6	998.388	22.60	22.57	11.65	28.55	28.27	53.90	25.63	Hori.	130	272	LA21	
7	332.796	21.80	14.59	9.10	27.83	17.66	46.00	28.34	Vert.	100	0	LA21	
8	499.191	22.60	17.85	9.82	29.04	21.23	46.00	24.77	Vert.	100	0	LA21	
9	665.590	23.60	19.53	10.45	29.21	24.37	46.00	21.63	Vert.	100	0	LA21	
10	831.992	22.80	21.10	11.08	28.95	26.03	46.00	19.97	Vert.	100	359	LA21	
11	855.141	23.00	21.59	11.17	28.90	26.86	46.00	19.14	Vert.	100	215	LA21	
12	998.388	22.50	22.57	11.65	28.55	28.17	53.90	25.73	Vert.	100	142	LA21	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(Above 1 GHz)
Mode	Mode 1 (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	5000.000	44.00	50.00	31.56	3.61	33.80	45.37	51.37	53.90	73.90	8.53	22.53	Hori.	170	55	HA6	
2	5000.000	43.60	49.50	31.56	3.61	33.80	44.97	50.87	53.90	73.90	8.93	23.03	Vert.	100	197	HA6	

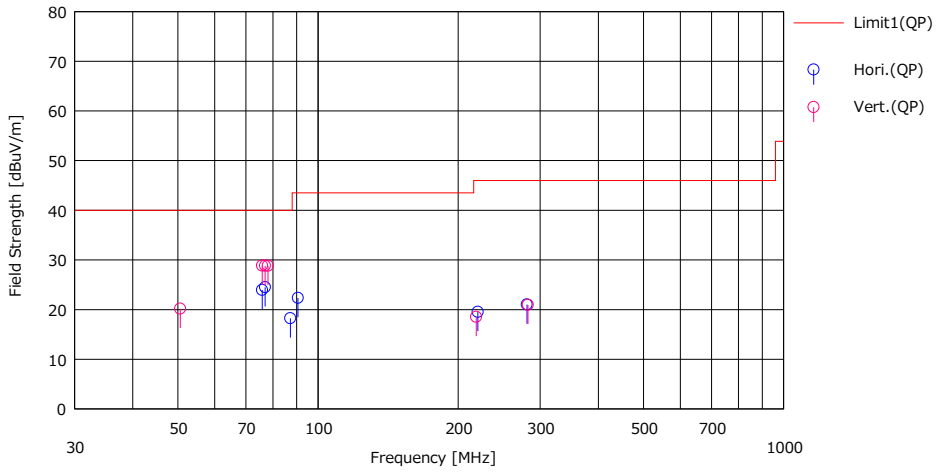
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 1 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



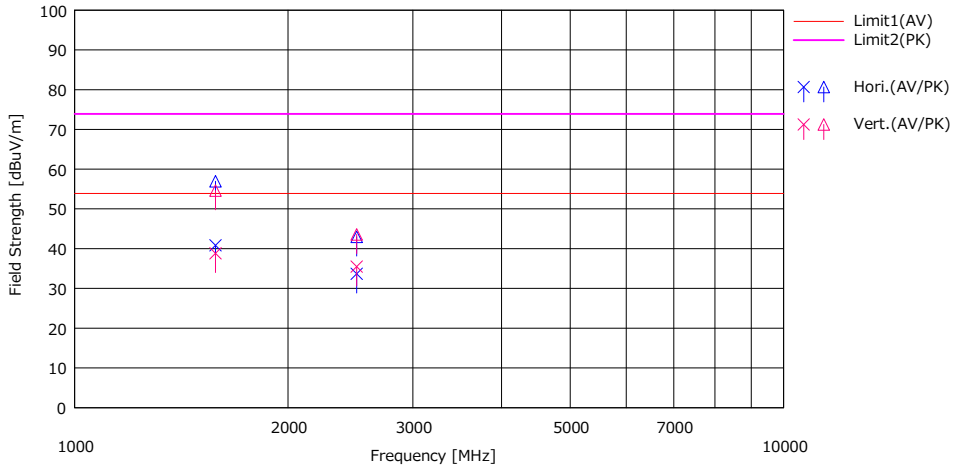
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	75.888	38.80	6.27	7.25	28.37	23.95	40.00	16.05	Hori.	217	318	BA	
2	77.002	39.30	6.32	7.26	28.37	24.51	40.00	15.49	Hori.	215	316	BA	
3	87.244	31.60	7.64	7.36	28.35	18.25	40.00	21.75	Hori.	400	28	BA	
4	90.585	35.00	8.29	7.39	28.34	22.34	43.50	21.16	Hori.	400	18	BA	
5	220.466	27.80	11.20	8.34	27.80	19.54	46.00	26.46	Hori.	121	60	LA21	
6	281.075	26.50	13.44	8.73	27.65	21.02	46.00	24.98	Hori.	155	359	LA21	
7	50.604	30.70	10.91	6.99	28.43	20.17	40.00	19.83	Vert.	100	162	BA	
8	75.898	43.70	6.27	7.25	28.37	28.85	40.00	11.15	Vert.	146	358	BA	
9	76.998	43.60	6.32	7.26	28.37	28.81	40.00	11.19	Vert.	148	0	BA	
10	78.094	43.50	6.42	7.27	28.37	28.82	40.00	11.18	Vert.	147	359	BA	
11	218.762	26.80	11.20	8.33	27.80	18.53	46.00	27.47	Vert.	100	100	LA21	
12	282.557	26.40	13.48	8.74	27.65	20.97	46.00	25.03	Vert.	101	338	LA21	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(1 GHz - 10 GHz)
Mode	Mode 1 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



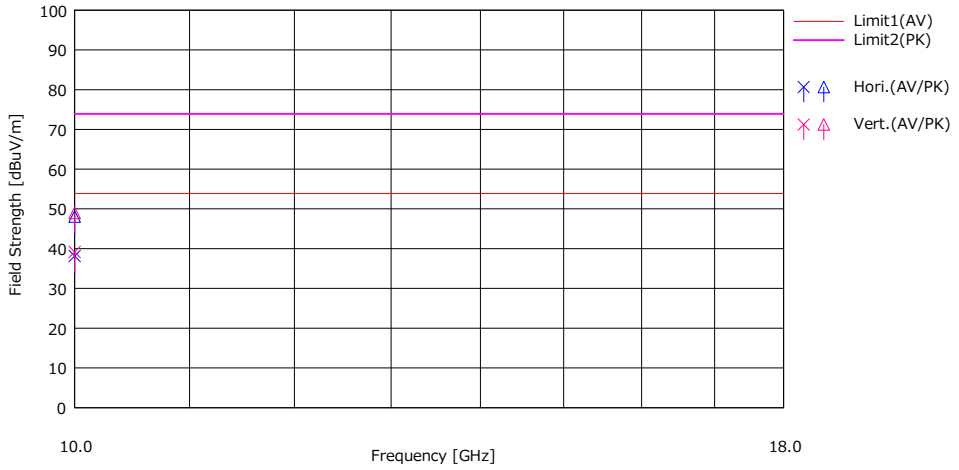
No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1580.000	48.70	64.80	25.29	1.98	35.14	40.83	56.93	53.90	73.90	13.07	16.97	Hori.	100	36	HA6	
2	2500.000	38.30	47.60	27.40	2.53	34.56	33.67	42.97	53.90	73.90	20.23	30.93	Hori.	100	132	HA6	
3	1580.000	46.70	62.50	25.29	1.98	35.14	38.83	54.63	53.90	73.90	15.07	19.27	Vert.	100	175	HA6	
4	2500.000	40.10	48.20	27.40	2.53	34.56	35.47	43.57	53.90	73.90	18.43	30.33	Vert.	100	152	HA6	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(Above 10 GHz)
Mode	Mode 1 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	10000.000	37.50	47.40	39.28	-4.33	34.29	38.16	48.06	53.90	73.90	15.74	25.84	Hori.	100	141	HA6	
2	10000.000	38.50	48.30	39.28	-4.33	34.29	39.16	48.96	53.90	73.90	14.74	24.94	Vert.	111	171	HA6	

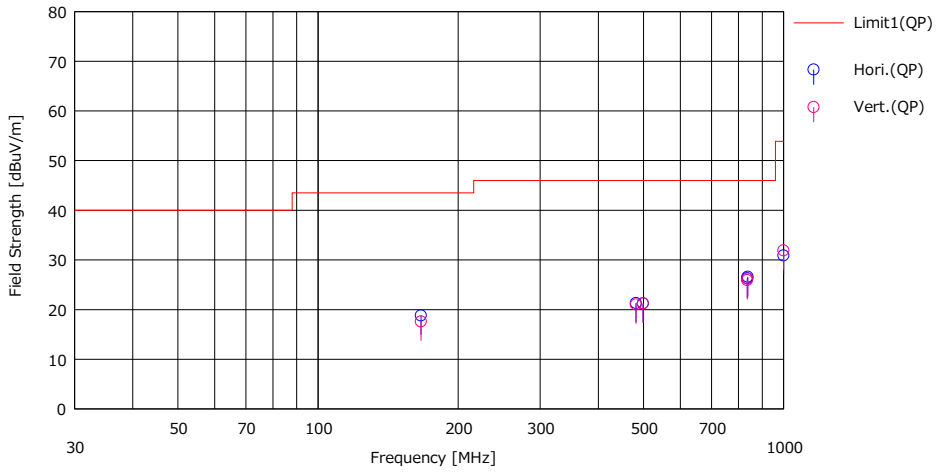
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 18 GHz.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 2 (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



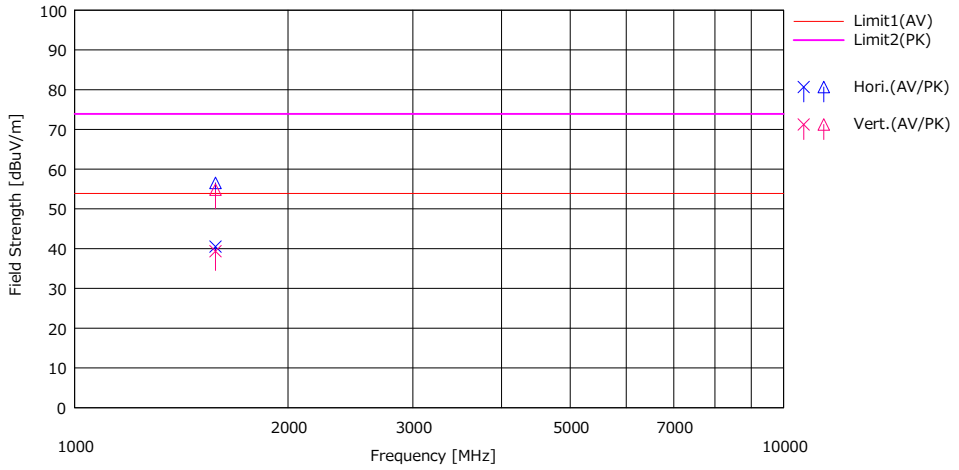
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	166.400	23.60	15.30	7.97	28.07	18.80	43.50	24.70	Hori.	193	123	BA	
2	481.978	23.10	17.38	9.76	28.94	21.30	46.00	24.70	Hori.	100	201	LA21	
3	499.191	22.60	17.85	9.82	29.04	21.23	46.00	24.77	Hori.	100	359	LA21	
4	835.250	23.00	21.16	11.09	28.94	26.31	46.00	19.69	Hori.	100	180	LA21	
5	837.711	23.20	21.23	11.10	28.93	26.60	46.00	19.40	Hori.	100	181	LA21	
6	999.962	25.20	22.58	11.66	28.55	30.89	53.90	23.01	Hori.	118	315	LA21	
7	166.400	22.40	15.30	7.97	28.07	17.60	43.50	25.90	Vert.	100	34	BA	
8	481.978	22.80	17.38	9.76	28.94	21.00	46.00	25.00	Vert.	100	0	LA21	
9	499.191	22.60	17.85	9.82	29.04	21.23	46.00	24.77	Vert.	100	0	LA21	
10	835.250	22.60	21.16	11.09	28.94	25.91	46.00	20.09	Vert.	100	359	LA21	
11	837.711	22.80	21.23	11.10	28.93	26.20	46.00	19.80	Vert.	100	183	LA21	
12	999.962	26.20	22.58	11.66	28.55	31.89	53.90	22.01	Vert.	100	165	LA21	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(Above 1 GHz)
Mode	Mode 2 (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1580.000	48.40	64.40	25.29	1.98	35.14	40.53	56.53	53.90	73.90	13.37	17.37	Hori.	100	36	HA6	
2	1580.000	47.20	62.70	25.29	1.98	35.14	39.33	54.83	53.90	73.90	14.57	19.07	Vert.	100	175	HA6	

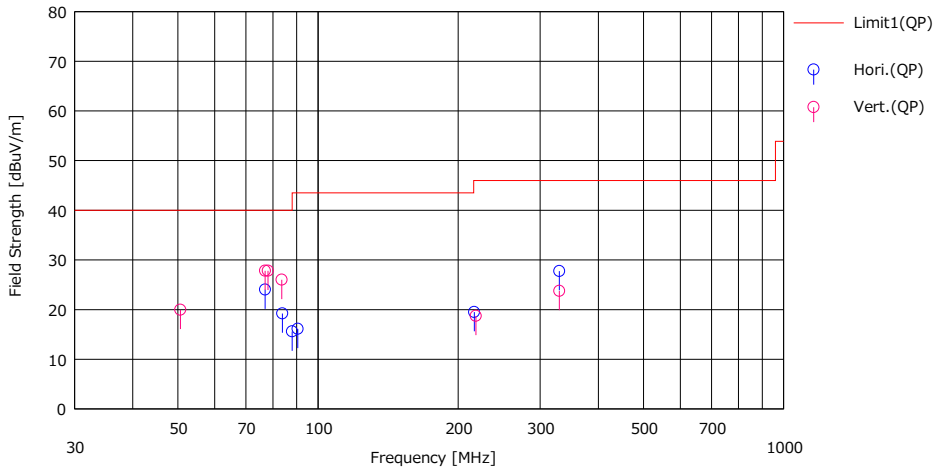
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 2 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



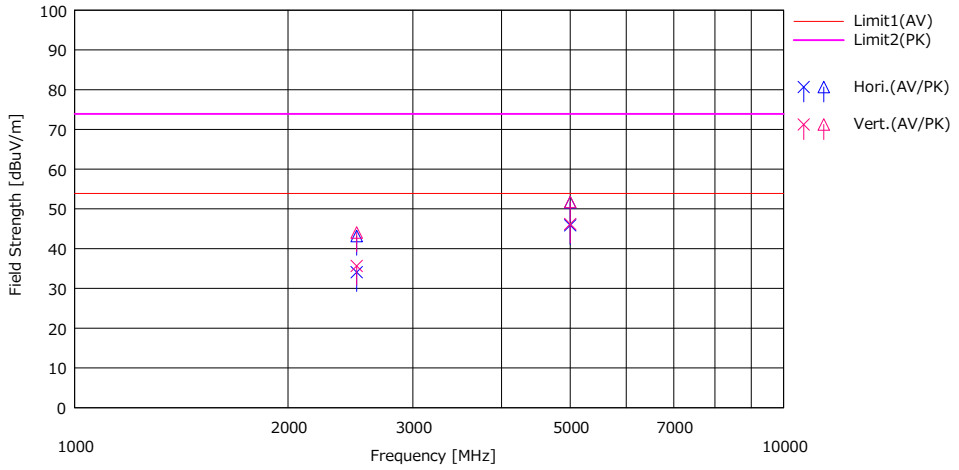
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	77.000	38.80	6.32	7.26	28.37	24.01	40.00	15.99	Hori.	213	317	BA	
2	83.864	33.20	7.05	7.33	28.36	19.22	40.00	20.78	Hori.	233	20	BA	
3	88.000	28.80	7.78	7.36	28.35	15.59	40.00	24.41	Hori.	240	283	BA	
4	90.503	28.80	8.27	7.38	28.34	16.11	43.50	27.39	Hori.	176	322	BA	
5	216.555	27.80	11.19	8.31	27.81	19.49	46.00	26.51	Hori.	148	267	LA21	
6	330.000	32.00	14.47	9.08	27.81	27.74	46.00	18.26	Hori.	130	31	LA21	
7	50.651	30.50	10.90	6.99	28.43	19.96	40.00	20.04	Vert.	100	112	BA	
8	77.002	42.60	6.32	7.26	28.37	27.81	40.00	12.19	Vert.	120	0	BA	
9	78.094	42.50	6.42	7.27	28.37	27.82	40.00	12.18	Vert.	156	359	BA	
10	83.594	40.00	7.02	7.33	28.36	25.99	40.00	14.01	Vert.	100	80	BA	
11	218.335	27.00	11.20	8.32	27.81	18.71	46.00	27.29	Vert.	100	89	LA21	
12	330.000	28.00	14.47	9.08	27.81	23.74	46.00	22.26	Vert.	100	298	LA21	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(1 GHz - 10 GHz)
Mode	Mode 2 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



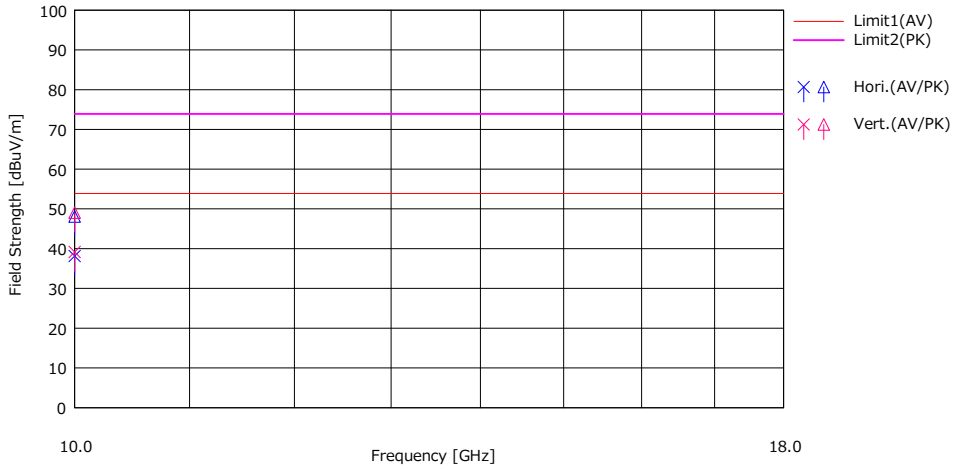
No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	2500.000	38.70	47.80	27.40	2.53	34.56	34.07	43.17	53.90	73.90	19.83	30.73	Hori.	100	132	HA6	
2	5000.000	44.50	50.30	31.56	3.61	33.80	45.87	51.67	53.90	73.90	8.03	22.23	Hori.	170	54	HA6	
3	2500.000	40.30	48.70	27.40	2.53	34.56	35.67	44.07	53.90	73.90	18.23	29.83	Vert.	100	152	HA6	
4	5000.000	44.80	50.40	31.56	3.61	33.80	46.17	51.77	53.90	73.90	7.73	22.13	Vert.	100	197	HA6	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(Above 10 GHz)
Mode	Mode 2 (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	10000.000	37.50	47.40	39.28	-4.33	34.29	38.16	48.06	53.90	73.90	15.74	25.84	Hori.	100	136	HA6	
2	10000.000	38.50	48.40	39.28	-4.33	34.29	39.16	49.06	53.90	73.90	14.74	24.84	Vert.	111	170	HA6	

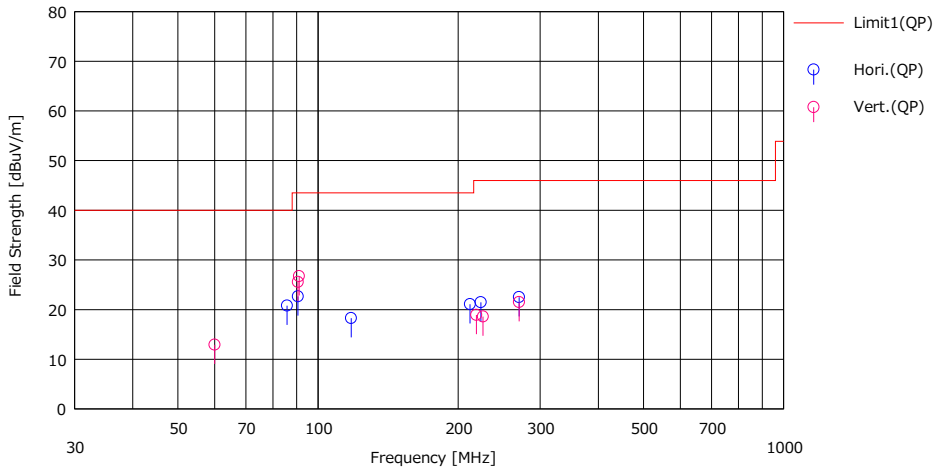
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 18 GHz.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



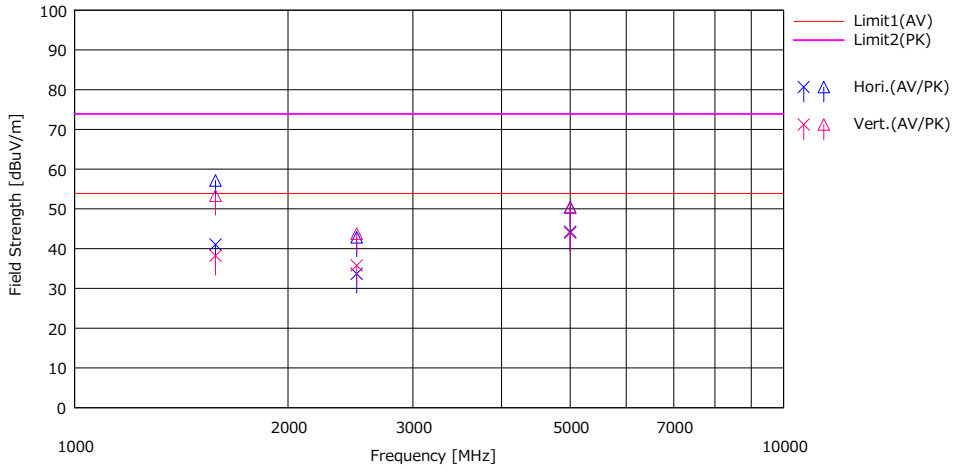
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	85.842	34.40	7.38	7.35	28.35	20.78	40.00	19.22	Hori.	400	211	BA	
2	90.590	35.30	8.29	7.39	28.34	22.64	43.50	20.86	Hori.	400	22	BA	
3	117.824	26.30	12.63	7.61	28.26	18.28	43.50	25.22	Hori.	400	359	BA	
4	212.121	29.50	11.12	8.29	27.83	21.08	43.50	22.42	Hori.	160	295	LA21	
5	223.713	29.70	11.19	8.36	27.78	21.47	46.00	24.53	Hori.	114	54	LA21	
6	270.362	28.50	13.00	8.66	27.65	22.51	46.00	23.49	Hori.	152	0	LA21	
7	60.000	26.40	7.83	7.09	28.41	12.91	40.00	27.09	Vert.	100	359	BA	
8	90.600	38.20	8.29	7.39	28.34	25.54	43.50	17.96	Vert.	100	351	BA	
9	91.092	39.30	8.38	7.39	28.34	26.73	43.50	16.77	Vert.	100	350	BA	
10	218.874	27.20	11.20	8.33	27.80	18.93	46.00	27.07	Vert.	100	90	LA21	
11	226.189	26.80	11.19	8.37	27.77	18.59	46.00	27.41	Vert.	100	118	LA21	
12	270.355	27.50	13.00	8.66	27.65	21.51	46.00	24.49	Vert.	103	309	LA21	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(1 GHz - 10 GHz)
Mode	Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



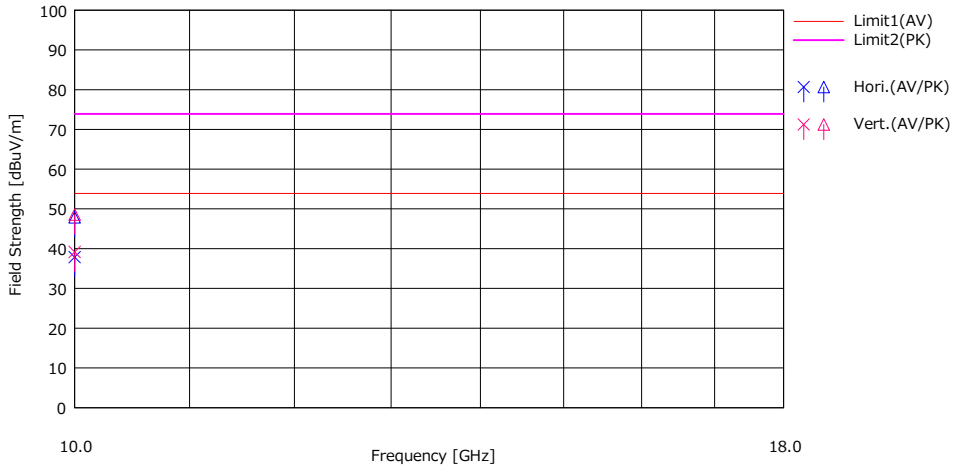
No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1580.000	48.90	65.00	25.29	1.98	35.14	41.03	57.13	53.90	73.90	12.87	16.77	Hori.	100	36	HA6	
2	2500.000	38.30	47.50	27.40	2.53	34.56	33.67	42.87	53.90	73.90	20.23	31.03	Hori.	100	130	HA6	
3	5000.000	42.90	49.10	31.56	3.61	33.80	44.27	50.47	53.90	73.90	9.63	23.43	Hori.	171	55	HA6	
4	1580.000	46.10	61.20	25.29	1.98	35.14	38.23	53.33	53.90	73.90	15.67	20.57	Vert.	100	176	HA6	
5	2500.000	40.40	48.40	27.40	2.53	34.56	35.77	43.77	53.90	73.90	18.13	30.13	Vert.	100	152	HA6	
6	5000.000	42.60	48.90	31.56	3.61	33.80	43.97	50.27	53.90	73.90	9.93	23.63	Vert.	100	198	HA6	

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.

Radiated Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Takafumi Noguchi
	(Above 10 GHz)
Mode	Mode 3

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading		Ant.Fac	Loss	Gain	Result		Limit		Margin		Pola.	Height	Angle	Ant. Type	Comment
		〈AV〉	〈PK〉				〈AV〉	〈PK〉	〈AV〉	〈PK〉	〈AV〉	〈PK〉					
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	10000.000	37.20	47.20	39.28	-4.33	34.29	37.86	47.86	53.90	73.90	16.04	26.04	Hori.	100	141	HA6	
2	10000.000	38.50	47.90	39.28	-4.33	34.29	39.16	48.56	53.90	73.90	14.74	25.34	Vert.	111	171	HA6	

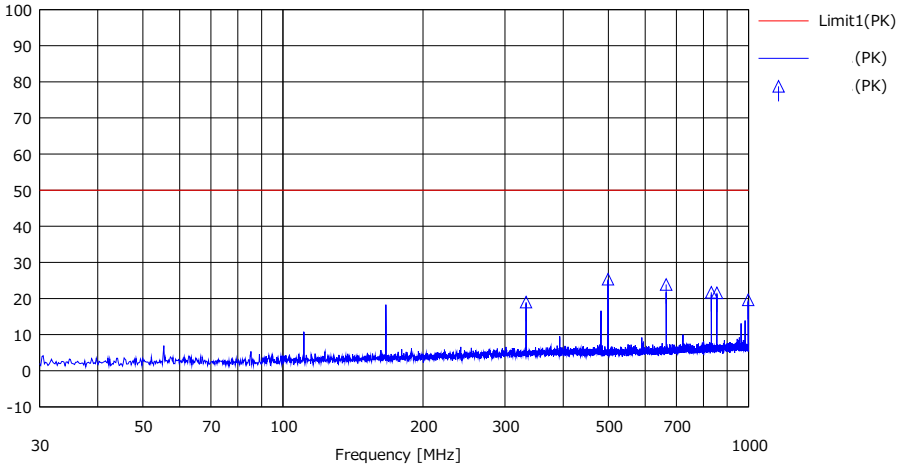
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)
Except for the above table: adequate margin data below the limits.

* No signal was detected above 18 GHz.

Antenna Terminal Conducted Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 4

Limit : FCC15.111 Antenna terminal measurement



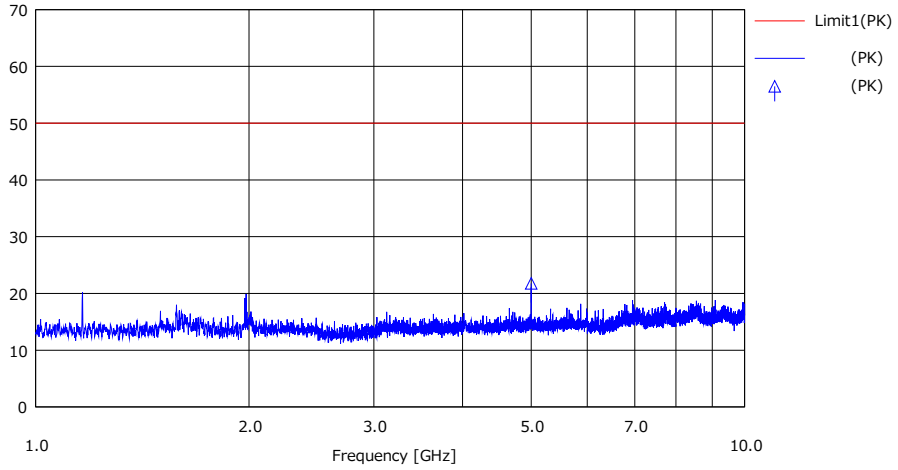
No.	Freq. [MHz]	Reading <PK> [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result <PK> [dBuV]	Limit *1) <PK> [dBuV]	Margin <PK> [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	332.796	41.87	0.00	4.96	27.83	19.00	50.00	31.00					
2	499.191	48.74	0.00	5.67	29.04	25.37	50.00	24.63					
3	665.590	46.80	0.00	6.30	29.21	23.89	50.00	26.11					
4	831.992	43.74	0.00	6.93	28.95	21.72	50.00	28.28					
5	855.141	43.48	0.00	7.01	28.90	21.59	50.00	28.41					
6	998.388	40.72	0.00	7.48	28.55	19.65	50.00	30.35					

*1) 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = Reading + Loss (Cable + DC Block + 75ohm-50ohm Conversion Factor) - Gain
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(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]	Margin 〈PK〉 [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	5000.000	49.97	0.00	5.60	33.80	21.77	50.00	28.23					

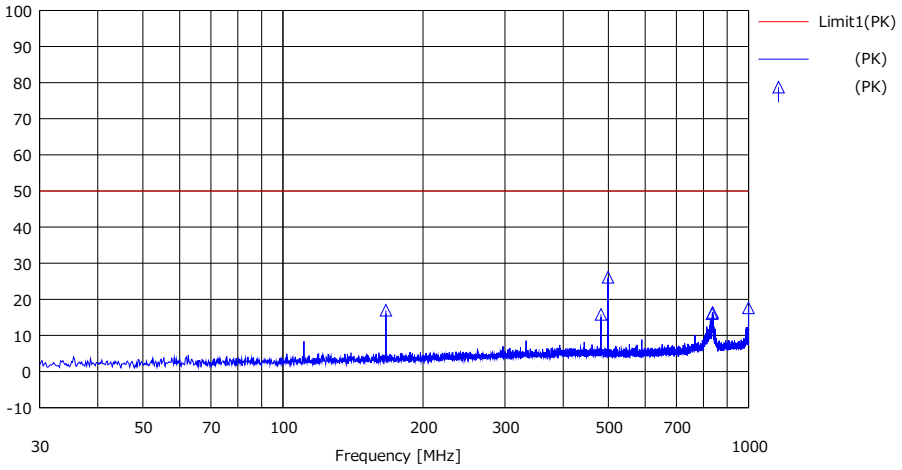
*1) 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = Reading + Loss (Cable + DC Block + 75ohm-50ohm Conversion Factor) - Gain
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

Antenna Terminal Conducted Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Below 1 GHz)
Mode	Mode 5

Limit : FCC15.111 Antenna terminal measurement



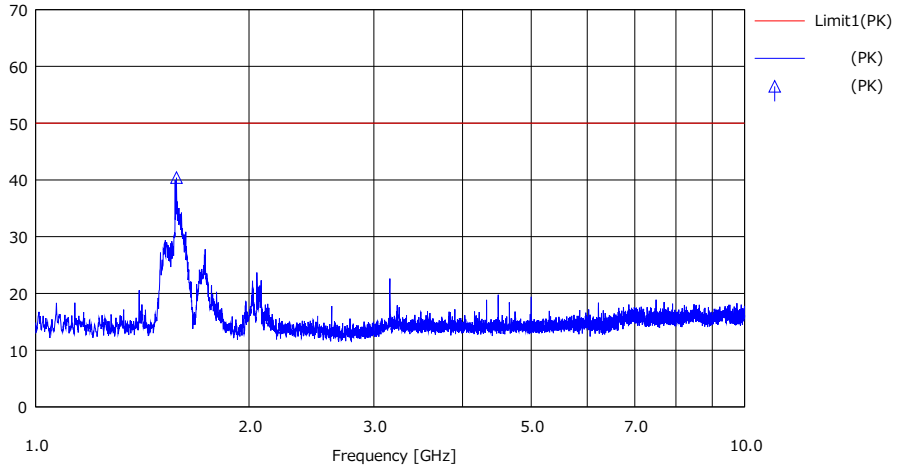
No.	Freq.	Reading (PK)	Ant.Fac	Loss	Gain	Result (PK)	Limit *1) (PK)	Margin (PK)	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV]	[dBuV]	[dB]	[H/V]	[cm]	[deg]		
1	166.400	41.19	0.00	3.85	28.07	16.97	50.00	33.03	Hori.				
2	481.978	39.16	0.00	5.61	28.94	15.83	50.00	34.17	Hori.				
3	499.191	49.47	0.00	5.67	29.04	26.10	50.00	23.90	Hori.				
4	835.250	38.05	0.00	6.94	28.94	16.05	50.00	33.95	Hori.				
5	837.711	38.32	0.00	6.95	28.93	16.34	50.00	33.66	Hori.				
6	999.962	38.70	0.00	7.49	28.55	17.64	50.00	32.36	Hori.				

*1) 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = Reading + Loss (Cable + DC Block + 75ohm-50ohm Conversion Factor) - Gain
Except for the above table: adequate margin data below the limits.

Antenna Terminal Conducted Emission

Report No.	13828809H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 24, 2021
Temperature / Humidity	25 deg. C / 68 % RH
Engineer	Junya Okuno
	(Above 1 GHz)
Mode	Mode 5

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]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	1580.000	71.71	0.00	3.83	35.14	40.40	50.00	9.60					

*1) 2 nW = -57 dBm = 50 dBuV
CHART: WITH FACTOR
CALCULATION: RESULT = Reading + Loss (Cable + DC Block + 75ohm-50ohm Conversion Factor) - Gain
Except for the above table: adequate margin data below the limits.

* No signal was detected above 10 GHz.

APPENDIX 2: Test instruments

Test equipment

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/26/2020	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/18/2020	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-M EMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/13/2020	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	8031	07/29/2020	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/25/2020	12
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/29/2020	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/18/2021	12
RE	MTR-09	141950	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	06/03/2021	12
RE	MDCB-04	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	07/13/2020	12
RE	MSG-14	141894	Signal Generator	Rohde & Schwarz	SMC100A	1411.4002k02	10/16/2020	12
AT	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
AT	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/18/2020	12
AT	COTS-M EMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
AT	MDCB-04	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	07/13/2020	12
AT	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/25/2020	12
AT	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/18/2021	12
AT	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	08/04/2020	12
AT	MCC-218	141394	Microwave Cable	Junkosha	MWX221	1607S141(1 m) / 1608S264(5 m)	09/23/2020	12
AT	MPA-10	141579	Pre Amplifier	Keysight Technologies Inc	8449B	3008A02142	02/18/2021	12
AT	MPA-03	141577	Microwave System Power Amplifier	Keysight Technologies Inc	83050A	MY39500610	10/19/2020	12
AT	MCC-54	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/02/2021	12
RE	MAEC-02 -SVSWR	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/09/2021	24
RE	MHA-06	141512	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	254	09/14/2020	12
RE	MCC-218	141394	Microwave Cable	Junkosha	MWX221	1607S141(1 m) / 1608S264(5 m)	09/23/2020	12
RE	MPA-10	141579	Pre Amplifier	Keysight Technologies Inc	8449B	3008A02142	02/18/2021	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	06/07/2021	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	08/03/2020	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/17/2020	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	09/07/2020	12
RE	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	08/04/2020	12

***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