EMI TEST REPORT

Test Report No. : 12902060H-C-R1

Applicant	:	**DENSO TEN Limited**
Type of Equipment	:	**Car Audio**
Model No.	:	**FT0106B**
FCC ID	:	**BABFT0106B**
Test regulation	:	**FCC Part 15 Subpart B: 2019 Class B** **ICES-003 Issue 6: 2016 (updated April 2019) Class B**
Test Result	:	**Complied (Refer to SECTION 3.2)**

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3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
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8. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 12902060H-C. 12902060H-C is replaced with this report.

Date of test: June 11 to July 14, 2019

Representative test engineer:

Akihiko Maeda
Engineer
Consumer Technology Division

Approved by:

Tsubasa Takayama
Leader
Consumer Technology Division

NVLAP TESTING NVLAP LAB CODE 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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☐ This report contains data that are not covered by the NVLAP accreditation.
☒ There is no testing item of "Non-accreditation".

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REVISION HISTORY

Original Test Report No.: 12902060H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12902060H-C	July 25, 2019	-	-
1	12902060H-C-R1	February 3, 2020	P1	Correction of note: 7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the **Federal** Government. ↓ 7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the **US** Government.
1	12902060H-C-R1	February 3, 2020	P1	Correction of note under the NVLAP logo: The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan. ↓ This report contains data that are not covered by the NVLAP accreditation.
1	12902060H-C-R1	February 3, 2020	P1, P7 (Original page 6)	Correction of Test regulation: ICES-003 Issue 6: 2016 **+ Amendment 1: 2017** ↓ ICES-003 Issue 6: 2016 **(updated April 2019)**
1	12902060H-C-R1	February 3, 2020	P3	Addition of Abbreviations list

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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)

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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	:	+81-78-671-7160
Contact Person	:	DAISUKE FUKII

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No. 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 (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing

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

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio
Model No.	:	FT0106B
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample (Information from test lab.)	:	June 3, 2019
Country of Mass-production	:	Mexico
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: FT0106B (referred to as the EUT in this report) is a Car Audio.

General Specification

Clock frequency(ies) in the system	:	48 MHz (Crystal), 1495.780 MHz (Main), 48.75 MHz (WLAN), 2.955 MHz (BT)
Operating Temperature	:	-20 deg. C- +65 deg. C

Radio Specification

WLAN (IEEE802.11b/g/n-20)

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS/OFDM
Antenna type	:	Inverted F Antenna
Antenna Gain	:	0.98 dBi

Bluetooth (Ver.4.2 + EDR)

Equipment Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Type of Modulation	:	FHSS, GFSK, π/4 DQPSK, 8 DPSK
Antenna Type	:	Inverted F Antenna
Antenna Gain	:	0.98 dBi

GPS Receiver

Type of Receiver	:	GPS Receiver
Frequency of Operation	:	1575.42 MHz ±1.023 MHz
Modulation	:	DSSS
Antenna type	:	GPS Antenna
Antenna Gain	:	29 dBi

AM / FM

Type of Receiver	:	Receiver
Frequency of Operation	:	AM: 530 kHz to 1710 kHz FM: 87.75 MHz to 107.9 MHz
Channel spacing	:	AM: 10 kHz FM: 200 kHz
Antenna connector type	:	AM / FM: HFC II

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart B FCC Part 15 final revised on July 19, 2019 and effective August 19, 2019 except 15.258
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators
Test specification	:	ICES-003 Issue 6: 2016 (updated April 2019)
Title	:	Spectrum Management and Telecommunications Interference-Causing Equipment Standard Information Technology Equipment (Including Digital Apparatus) – Limits and Methods of Measurement

* The revision on July 19, 2019, does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result	Remarks
Conducted emission	**FCC:** ANSI C63.4: 2014 7. AC power - line conducted emission measurements IEEE 187: 2003 **IC:** ICES-003 Issue 6: 2016 (updated April 2019)	Class B	N/A	N/A	N/A	*1)
Radiated emission	**FCC:** ANSI C63.4: 2014 8. Radiated emission measurements IEEE 187: 2003 **IC:** ICES-003 Issue 6: 2016 (updated April 2019)	Class B	N/A	13.51 dB 516.095 MHz, Horizontal	Complied a)	-
Antenna Terminal	**FCC:** ANSI C63.4: 2014 12. Measurement of unintentional radiators other than ITE IEEE 187: 2003 **IC:** -	Class B	N/A	4.22 dB 2151.820 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)	4.9 dB
	200 MHz to 1000 MHz	(Horizontal)	5.0 dB
		(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz		5.0 dB
	6 GHz to 18 GHz		5.3 dB
1 m	10 GHz to 26.5 GHz		5.8 dB
	26.5 GHz to 40 GHz		5.8 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	2.7 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967 / ISED Lab Company Number: 2973C
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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.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* 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

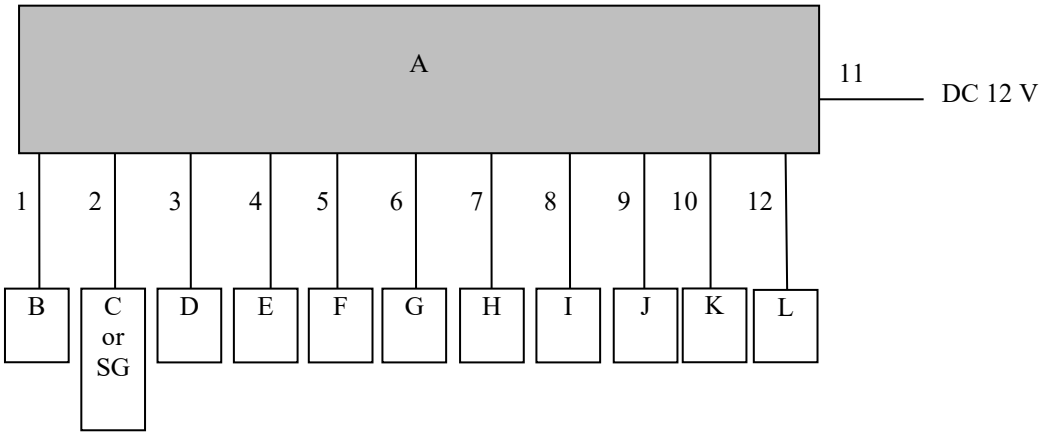
Refer to APPENDIX.

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

4.1 Operating Mode(s)

The mode(s) : 1. FM Receiving mode Main port / Sub port (Local, Other) : Radiated Emission test only
2. USB Play mode: Radiated Emission test only
3. FM Tuning mode (Antenna port A / B): Antenna Terminal Conducted Emission test only

4.2 Configuration and peripherals



SG : Signal Generator

* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* Signal Generator was used on Mode: 1.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio	FT0106B	MR20020	DENSO TEN Limited	EUT
B	USB Memory	USM4GR B	17116 DGGNN	SONY	-
C	FM Dummy	828-00064-D5	Z312515070049	-	-
D	XM Radio Antenna	1149	No.2	-	-
E	GPS Antenna	2354031090A15000	No.7	-	-
F	Speaker Dummy	-	-	-	-
G	Microphone	-	46	-	-
H	Smart Camera	867B0-76010	No.3	Panasonic	-
I	Back Camera	317616008-012	No.12	Panasonic	-
J	Switch	-	-	-	-
K	Steering switch	84250-53201	No.2	-	-
L	iPod Touch	A1367	CCQ50WDDCPC	Apple	

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	2.0	Shielded	Shielded	-
2	FM Antenna Cable	1.5 for Mode: 1 0.2 for other Mode	Shielded	Shielded	-
3	Signal Cable	7.2	Shielded	Shielded	-
4	Signal Cable	4.4	Shielded	Shielded	-
5	Signal Cable	3.5	Unshielded	Unshielded	-
6	Signal Cable	3.6	Unshielded	Unshielded	-
7	Signal Cable	3.75	Unshielded	Unshielded	-
8	Signal Cable	3.75	Unshielded	Unshielded	-
9	Signal Cable	3.75	Unshielded	Unshielded	-
10	Signal Cable	3.5	Unshielded	Unshielded	-
11	DC Cable	4.5	Unshielded	Unshielded	
12	Signal Cable	1.5	Unshielded	Unshielded	

SECTION 5: Radiated Emission

5.1 Operating environment

Test place : No.4 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

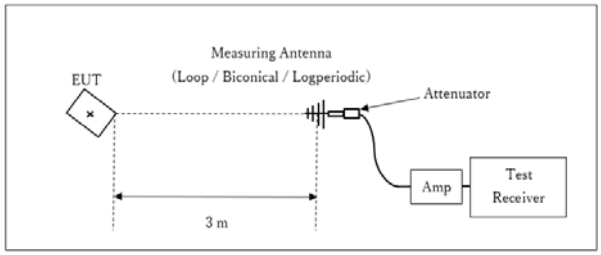
The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the Test Receiver and the Spectrum Analyzer.
For Mode 1, test was performed under the condition that signal of FM 94.1 MHz from Signal Generator was input to the EUT.
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 Distance Factor.
Refer to Figure 1.
*2) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Figure 1: Test Setup

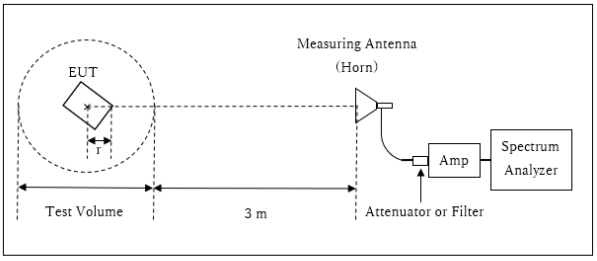
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

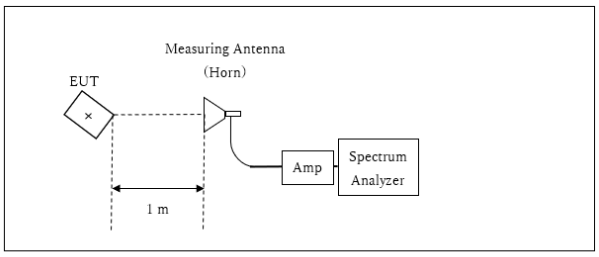


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.1 m*/3.0 m) = 0.29 dB
* Test Distance: (3 + Test Volume /2) - r = 3.1 m

Test Volume: 2 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.9m

10 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 13, 2019 Test engineer: Masaya Minami
July 14, 2019 Akihiko Maeda

SECTION 6: Antenna Terminal Conducted Emission

6.1 Operating environment

Test place : No.5 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.

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
IF Bandwidth	PK: RBW: 100 kHz / VBW: 100 kHz	PK: RBW: 1 MHz / VBW: 3 MHz

6.5 Test result

Summary of the test results: Pass

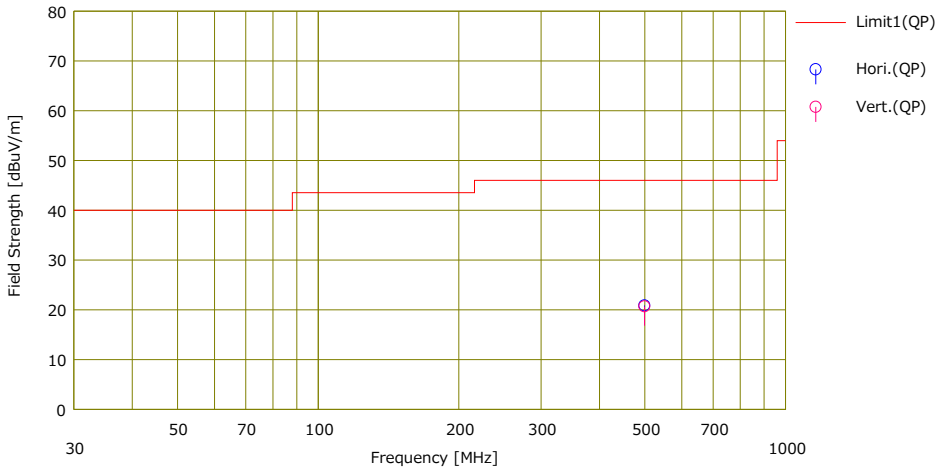
Date: June 11, 2019 Test engineer: Akihiko Maeda

APPENDIX 1: Test data

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 13, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Masaya Minami (Below 1 GHz)
Mode	Mode 1 Main Port (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



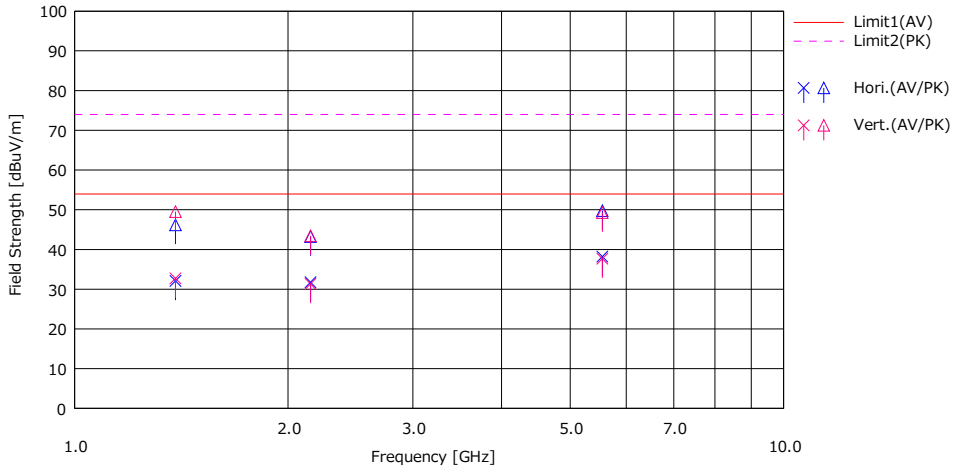
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	499.197	23.40	17.69	9.77	29.99	20.87	46.00	25.13	Hori.	100	0	LA21	
2	499.197	23.20	17.69	9.77	29.99	20.67	46.00	25.33	Vert.	100	0	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)

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	July 14, 2019
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Akihiko Maeda
	(Above 1 GHz)
Mode	Mode 1 Main Port (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	1387.747	37.26	51.37	25.04	2.85	33.08	32.07	46.18	54.00	74.00	21.93	27.82	Hori.	100	239	H21	
2	2151.820	32.05	43.54	27.75	3.40	31.45	31.75	43.24	54.00	74.00	22.25	30.76	Hori.	100	0	H21	Floor Noise
3	5551.023	31.86	43.43	32.22	4.95	30.82	38.21	49.78	54.00	74.00	15.79	24.22	Hori.	100	0	H21	Floor Noise
4	1387.747	37.92	54.73	25.04	2.85	33.08	32.73	49.54	54.00	74.00	21.27	24.46	Vert.	122	184	H21	
5	2151.820	31.62	43.72	27.75	3.40	31.45	31.32	43.42	54.00	74.00	22.68	30.58	Vert.	100	0	H21	Floor Noise
6	5551.023	31.31	42.96	32.22	4.95	30.82	37.66	49.31	54.00	74.00	16.34	24.69	Vert.	100	0	H21	Floor Noise

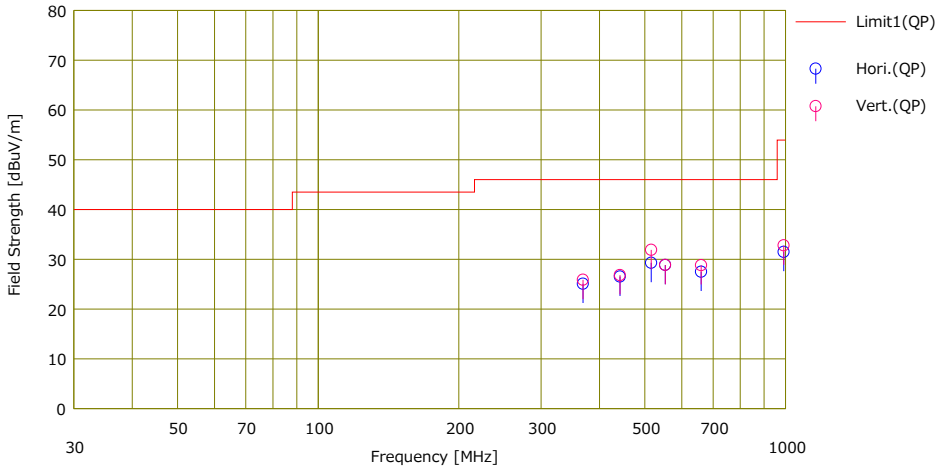
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

* No signal was detected above 10 GHz

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 13, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Masaya Minami
	(Below 1 GHz)
Mode	Mode 1 Main Port (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



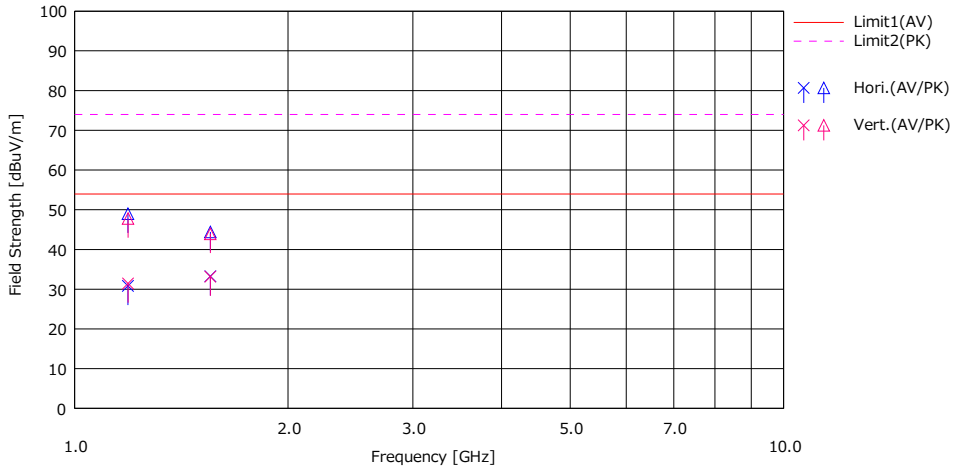
No.	Freq.	Reading (QP)	Ant.Fac	Loss	Gain	Result (QP)	Limit (QP)	Margin (QP)	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	368.635	30.20	15.06	9.38	29.56	25.08	46.00	20.92	Hori.	100	15	LA21	
2	442.365	30.50	16.26	9.60	29.84	26.52	46.00	19.48	Hori.	100	347	LA21	
3	516.093	31.80	17.60	9.83	29.94	29.29	46.00	16.71	Hori.	100	0	LA21	
4	552.964	30.80	17.92	9.97	29.84	28.85	46.00	17.15	Hori.	179	347	LA21	
5	663.001	27.20	19.32	10.40	29.41	27.51	46.00	18.49	Hori.	115	139	LA21	
6	994.269	25.00	22.39	11.60	27.50	31.49	54.00	22.51	Hori.	100	190	LA21	
7	368.635	31.00	15.06	9.38	29.56	25.88	46.00	20.12	Vert.	126	350	LA21	
8	442.365	30.80	16.26	9.60	29.84	26.82	46.00	19.18	Vert.	124	341	LA21	
9	516.093	34.40	17.60	9.83	29.94	31.89	46.00	14.11	Vert.	105	341	LA21	
10	552.964	30.80	17.92	9.97	29.84	28.85	46.00	17.15	Vert.	100	345	LA21	
11	663.001	28.50	19.32	10.40	29.41	28.81	46.00	17.19	Vert.	100	200	LA21	
12	994.269	26.30	22.39	11.60	27.50	32.79	54.00	21.21	Vert.	100	191	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)

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	July 14, 2019
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Akihiko Maeda
	(Above 1 GHz)
Mode	Mode 1 Main Port (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



No.	Freq.	Reading ⟨AV⟩	Reading ⟨PK⟩	Ant.Fac	Loss	Gain	Result ⟨AV⟩	Result ⟨PK⟩	Limit ⟨AV⟩	Limit ⟨PK⟩	Margin ⟨AV⟩	Margin ⟨PK⟩	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[H/V]	[cm]	[deg]		
1	1189.512	37.10	55.27	24.62	2.70	33.59	30.83	49.00	54.00	74.00	23.17	25.00	Hori.	145	124	H21	
2	1554.284	36.84	48.03	26.07	2.98	32.66	33.23	44.42	54.00	74.00	20.77	29.58	Hori.	100	306	H21	
3	1189.558	37.70	54.05	24.62	2.70	33.59	31.43	47.78	54.00	74.00	22.57	26.22	Vert.	119	219	H21	
4	1554.220	36.77	47.51	26.07	2.98	32.66	33.16	43.90	54.00	74.00	20.84	30.10	Vert.	106	18	H21	

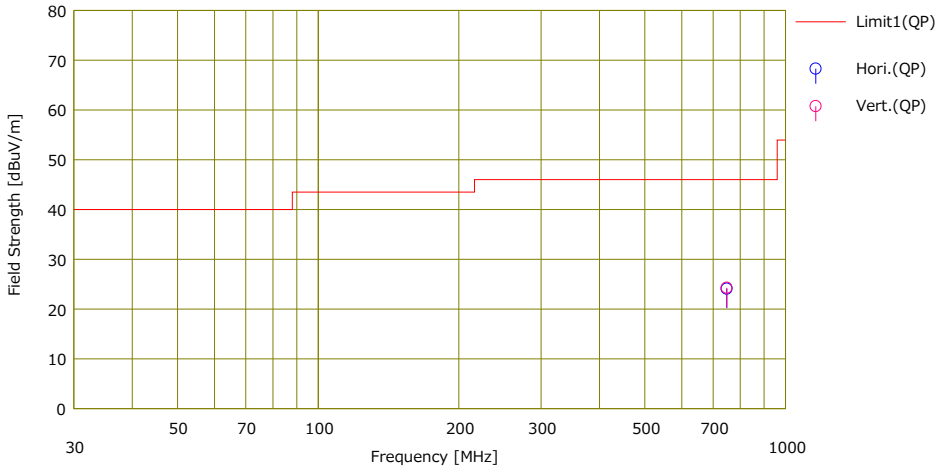
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

* No signal was detected above 10 GHz

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 13, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Masaya Minami
	(Below 1 GHz)
Mode	Mode 1 Sub Port (Local)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



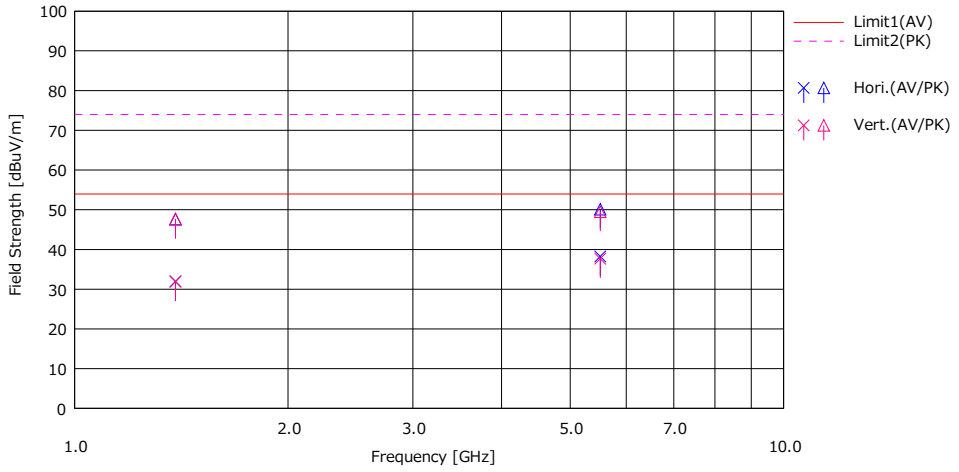
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	748.779	22.00	20.29	10.73	28.94	24.08	46.00	21.92	Hori.	100	0	LA21	
2	748.779	22.20	20.29	10.73	28.94	24.28	46.00	21.72	Vert.	100	0	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)

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	July 14, 2019
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Akihiko Maeda
	(Above 1 GHz)
Mode	Mode 1 Sub Port (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	1387.747	37.67	53.34	25.04	2.31	33.08	31.94	47.61	54.00	74.00	22.06	26.39	Hori.	105	247	H21	
2	5513.581	32.43	44.33	32.21	4.40	30.80	38.24	50.14	54.00	74.00	15.76	23.86	Hori.	100	0	H21	Floor Noise
3	1387.747	37.67	53.45	25.04	2.31	33.08	31.94	47.72	54.00	74.00	22.06	26.28	Vert.	100	169	H21	
4	5513.581	31.86	43.65	32.21	4.40	30.80	37.67	49.46	54.00	74.00	16.33	24.54	Vert.	100	0	H21	Floor Noise

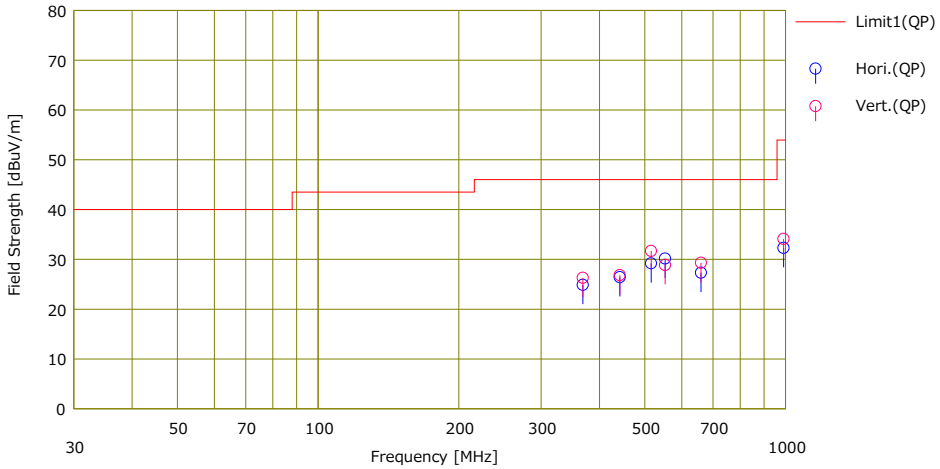
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

* No signal was detected above 10 GHz

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 13, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Masaya Minami
	(Below 1 GHz)
Mode	Mode 1 Sub Port (Other)

Limit : FCC_Part 15 Subpart B(15.109)_Class B



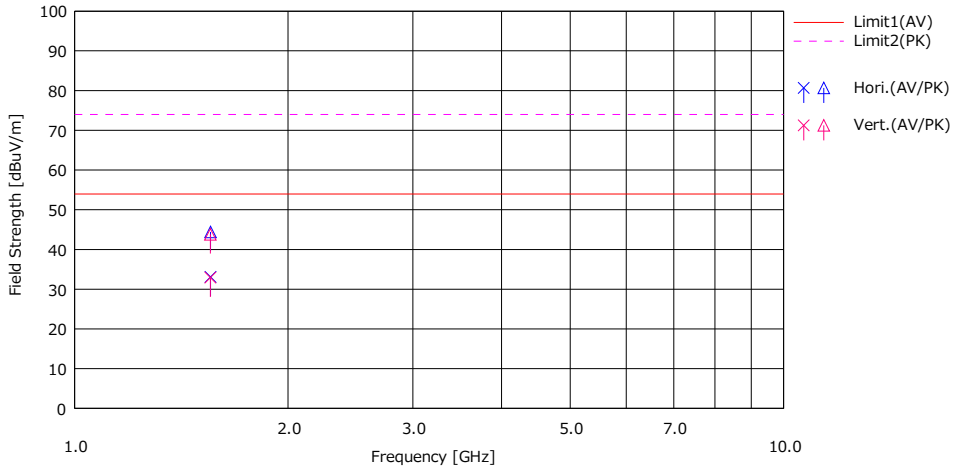
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	368.650	30.00	15.06	9.38	29.56	24.88	46.00	21.12	Hori.	100	24	LA21	
2	442.369	30.40	16.26	9.60	29.84	26.42	46.00	19.58	Hori.	100	347	LA21	
3	516.095	31.70	17.60	9.83	29.94	29.19	46.00	16.81	Hori.	100	0	LA21	
4	552.960	32.10	17.92	9.97	29.84	30.15	46.00	15.85	Hori.	153	340	LA21	
5	660.001	27.00	19.32	10.40	29.41	27.31	46.00	18.69	Hori.	245	271	LA21	
6	991.271	25.80	22.39	11.60	27.50	32.29	54.00	21.71	Hori.	100	181	LA21	
7	368.650	31.40	15.06	9.38	29.56	26.28	46.00	19.72	Vert.	139	9	LA21	
8	442.369	30.80	16.26	9.60	29.84	26.82	46.00	19.18	Vert.	100	190	LA21	
9	516.095	34.20	17.60	9.83	29.94	31.69	46.00	14.31	Vert.	100	328	LA21	
10	552.960	30.80	17.92	9.97	29.84	28.85	46.00	17.15	Vert.	100	345	LA21	
11	660.001	29.00	19.32	10.40	29.41	29.31	46.00	16.69	Vert.	100	187	LA21	
12	991.271	27.60	22.39	11.60	27.50	34.09	54.00	19.91	Vert.	100	181	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)

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	July 14, 2019
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Akihiko Maeda
	(Above 1 GHz)
Mode	Mode 1 Sub Port (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	1555.047	36.70	48.00	26.05	2.98	32.65	33.08	44.38	54.00	74.00	20.92	29.62	Hori.	100	308	H21	
2	1554.275	36.50	47.40	26.07	2.98	32.66	32.89	43.79	54.00	74.00	21.11	30.21	Vert.	123	17	H21	

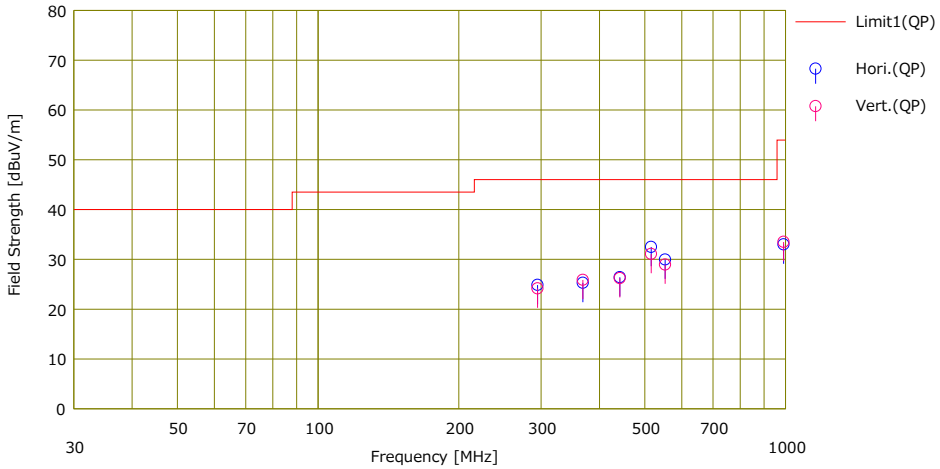
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

* No signal was detected above 10 GHz

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	June 13, 2019
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Masaya Minami
	(Below 1 GHz)
Mode	Mode 2

Limit : FCC_Part 15 Subpart B(15.109)_Class B



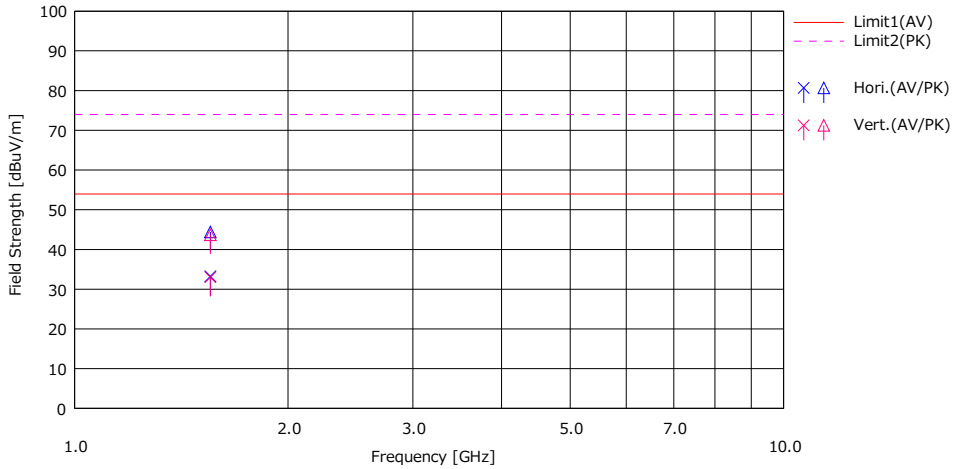
No.	Freq. [MHz]	Reading (QP) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP) [dBuV/m]	Limit (QP) [dBuV/m]	Margin (QP) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	294.903	31.80	13.46	8.80	29.20	24.86	46.00	21.14	Hori.	100	288	LA21	
2	368.638	30.40	15.06	9.38	29.56	25.28	46.00	20.72	Hori.	100	23	LA21	
3	442.365	30.40	16.26	9.60	29.84	26.42	46.00	19.58	Hori.	100	341	LA21	
4	516.095	35.00	17.60	9.83	29.94	32.49	46.00	13.51	Hori.	173	342	LA21	
5	552.955	31.90	17.92	9.97	29.84	29.95	46.00	16.05	Hori.	154	344	LA21	
6	991.250	26.50	22.39	11.60	27.50	32.99	54.00	21.01	Hori.	100	123	LA21	
7	294.903	31.10	13.46	8.80	29.20	24.16	46.00	21.84	Vert.	138	186	LA21	
8	368.638	31.00	15.06	9.38	29.56	25.88	46.00	20.12	Vert.	124	0	LA21	
9	442.365	30.20	16.26	9.60	29.84	26.22	46.00	19.78	Vert.	100	191	LA21	
10	516.095	33.60	17.60	9.83	29.94	31.09	46.00	14.91	Vert.	100	8	LA21	
11	552.955	30.90	17.92	9.97	29.84	28.95	46.00	17.05	Vert.	100	345	LA21	
12	991.250	27.00	22.39	11.60	27.50	33.49	54.00	20.51	Vert.	100	181	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)

Radiated Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	July 14, 2019
Temperature / Humidity	20 deg. C / 60 % RH
Engineer	Akihiko Maeda
	(Above 1 GHz)
Mode	Mode 2

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	1554.296	36.86	48.02	26.07	2.98	32.66	33.25	44.41	54.00	74.00	20.75	29.59	Hori.	100	307	H21	
2	1554.293	36.62	47.29	26.07	2.98	32.66	33.01	43.68	54.00	74.00	20.99	30.32	Vert.	126	17	H21	

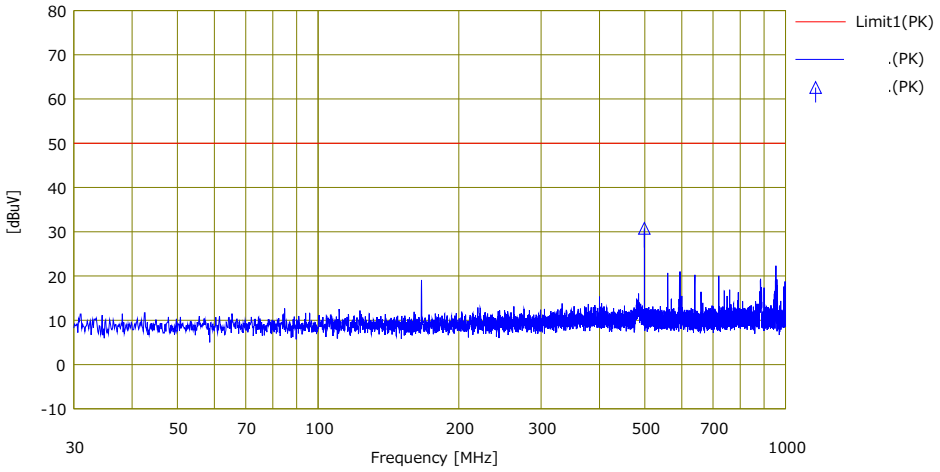
CHART: WITH FACTOR
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)

* No signal was detected above 10 GHz

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(Below 1 GHz)
Mode	Mode 3, Antenna Port A

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	499.197	44.38	0.00	27.05	40.66	30.77	50.00	19.23	---	0	0	---	

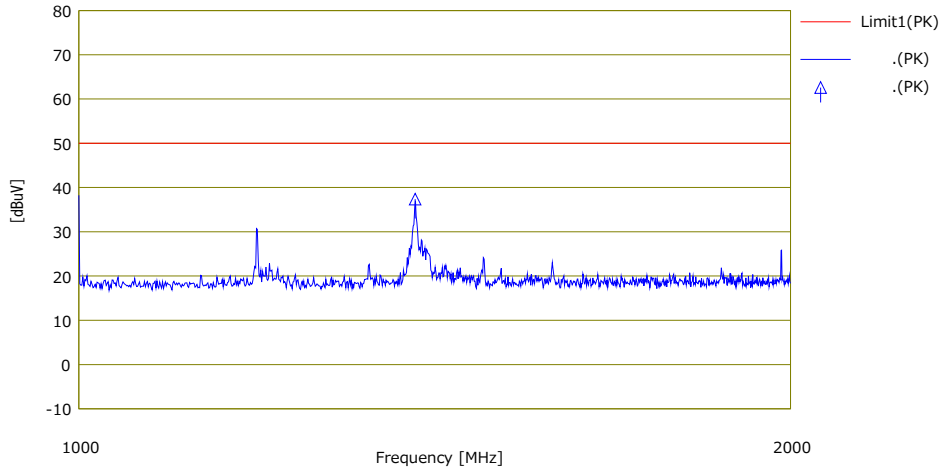
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(1 GHz - 2 GHz)
Mode	Mode 3, Antenna Port A

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	1387.747	69.41	0.00	7.41	39.44	37.38	50.00	12.62	---	0	0	---	

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

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

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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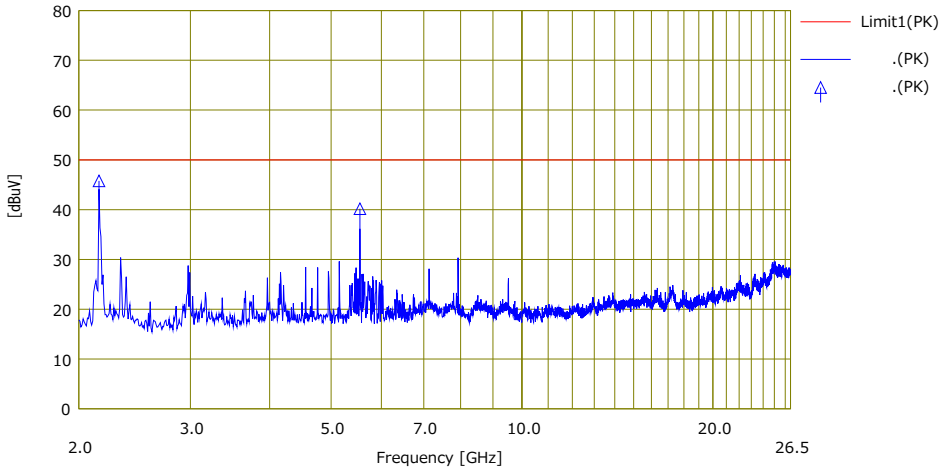
Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(2 GHz - 26.5 GHz)
Mode	Mode 3, Antenna Port A

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	2151.820	68.85	0.00	3.09	26.16	45.78	50.00	4.22	---	0	0	---	
2	5551.023	61.12	0.00	3.95	24.89	40.18	50.00	9.82	---	0	0	---	

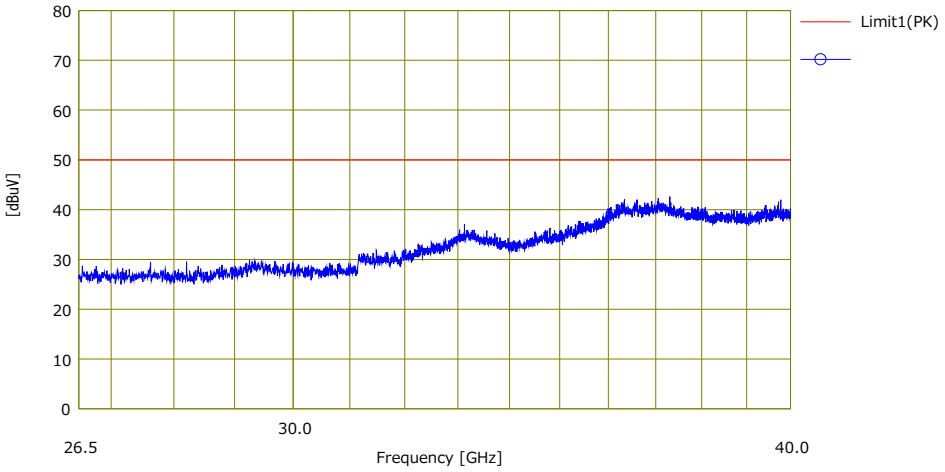
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(26.5 GHz - 40 GHz)
Mode	Mode 3, Antenna Port A

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV]	Limit*1) <PK> [dBuV]	Margin <PK> [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
													No signal detected

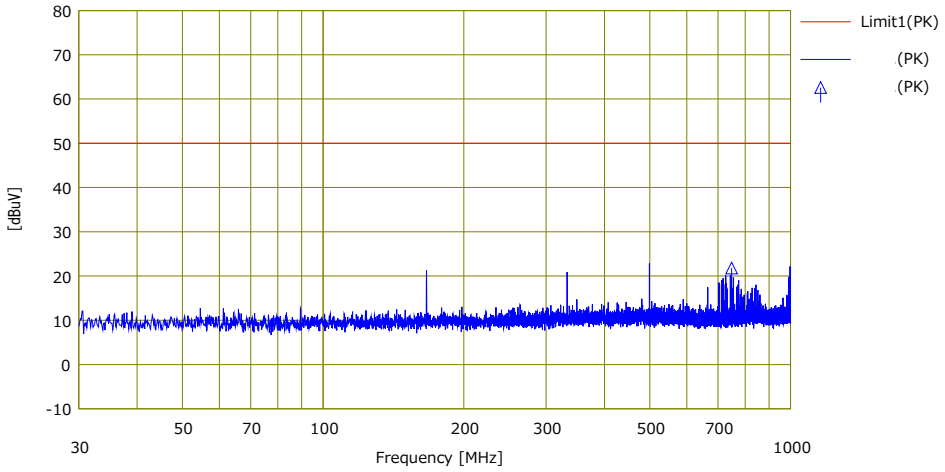
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(Below 1 GHz)
Mode	Mode 3, Antenna Port B

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	748.779	35.29	0.00	27.13	40.62	21.80	50.00	28.20	----	0	0	---	94.1MHz

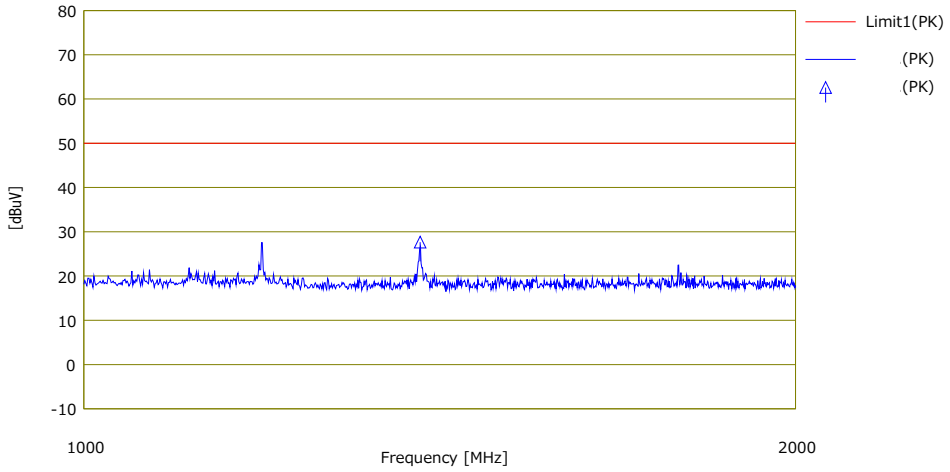
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(1 GHz - 2 GHz)
Mode	Mode 3, Antenna Port B

Limit : FCC15.111 Antenna terminal measurement



No.	Freq. [MHz]	Reading (PK) [dBuV]	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV] [dBuV/m]	Limit*1) [dBuV] [dBuV/m]	Margin (PK) [dB]	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
1	1387.747	59.93	0.00	7.18	39.44	27.67	50.00	22.33	---	0	0	---	

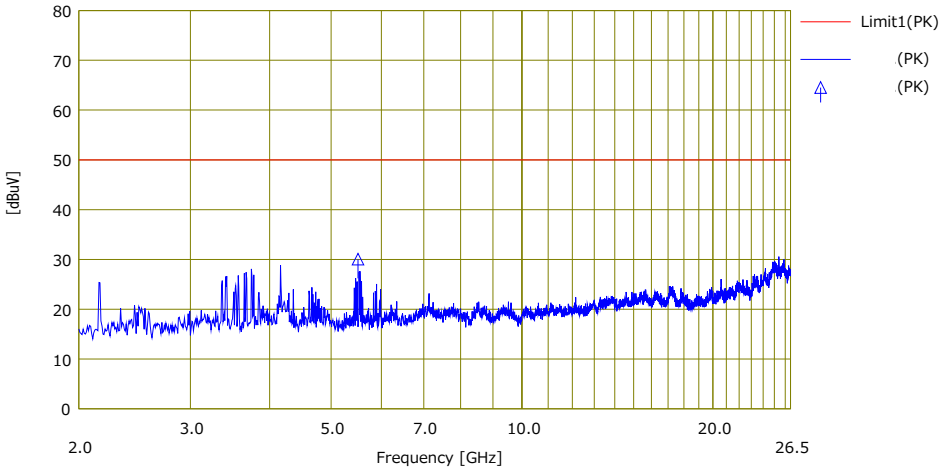
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(2 GHz - 26.5 GHz)
Mode	Mode 3, Antenna Port B

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	5513.581	51.02	0.00	3.94	24.90	30.06	50.00	19.94	---	0	0	---	98.9MHz

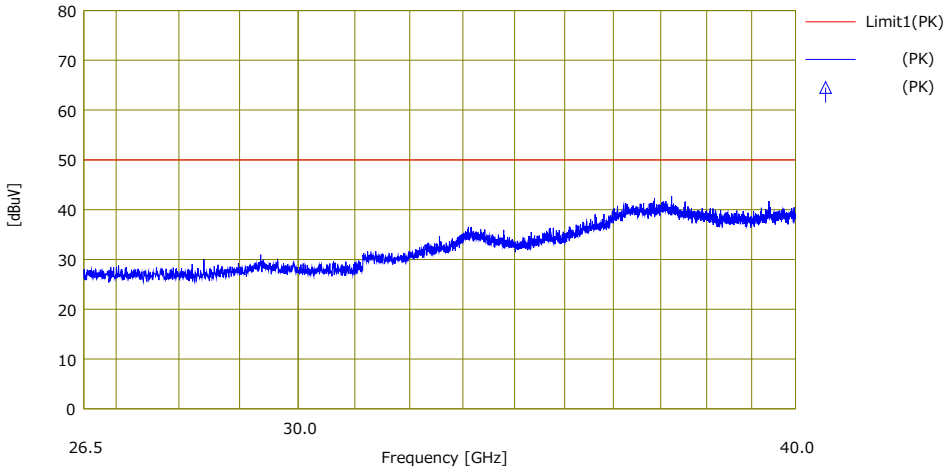
*1) 2 nW = -57 dBm = 50 dBuV

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

Antenna Terminal Conducted Emission

Report No.	12902060H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.5
Date	June 11, 2019
Temperature / Humidity	22 deg. C / 53 % RH
Engineer	Akihiko Maeda
	(26.5 GHz - 40 GHz)
Mode	Mode 3, Antenna Port B

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
													No signal detected

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

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

APPENDIX 2: Test instruments

Test Instruments

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/21/2018	08/31/2019	12
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
RE	142228	Measure	KOMELON	KMC-36	-	-	-	-
AT	141227	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S305	03/05/2019	03/31/2020	12
AT	141325	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	03/04/2019	03/31/2020	12
AT	141321	Microwave Cable	Junkosha	MWX221	1409S493	03/26/2019	03/31/2020	12
AT	141577	Microwave System Power Amplifier	AGILENT	83050A	MY39500610	10/04/2018	10/31/2019	12
AT	156190	DC Block	EMC Instruments Corporation	N9398C	MY46457635	07/01/2019	07/31/2020	12
AT	141550	Matching Pad Anritsu	ANRITSU	MB-009	40063	07/03/2019	07/31/2020	12
AT	141171	Attenuator(20dB)_DC-1GHz_N	Weinschel Corp	MODEL 1	BG0143	12/17/2018	12/31/2019	12
AT	141395	Coaxial Cable	UL Japan	-	-	11/13/2018	11/30/2019	12
AT	141327	Coaxial Cable	UL Japan	-	-	02/07/2019	02/29/2020	12
AT	141586	Pre Amplifier	Elena	EPA-4020YA	30801	02/06/2019	02/29/2020	12
AT	141884	Spectrum Analyzer	AGILENT	E4448A	MY44020357	03/13/2019	03/31/2020	12
AT	141546	Digital HiTESTER	HIOKI	3805	60100600	05/21/2019	05/31/2020	12
AT	141563	Thermo-Hygrometer	CUSTOM	CTH-180	1701	01/11/2019	01/31/2020	12
RE	141317	Coaxial Cable	Fujikura/Agilent	-	-	02/25/2019	02/29/2020	12
RE	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/05/2018	11/30/2019	12
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	06/29/2018	06/30/2020	24
RE	141265	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	03/25/2019	03/31/2020	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	04/12/2019	04/30/2020	12
RE	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/08/2018	08/31/2019	12
RE	141412	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	06/17/2019	06/30/2020	12
RE	141581	MicroWave System Amplifier	AGILENT	83017A	650	10/04/2018	10/31/2019	12
RE	142227	Measure	KOMELON	KMC-36	-	-	-	-
RE	141506	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	05/10/2019	05/31/2020	12
RE	141508	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	05/16/2019	05/31/2020	12
RE	142011	AC4_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	06/28/2018	06/30/2020	24
RE	141562	Thermo-Hygrometer	CUSTOM	CTH-201	0010	01/11/2019	01/31/2020	12
RE	141297	High Pass Filter (1.1-10GHz)	TOKYO KEIKI	TF219CD1	1001	01/10/2019	01/31/2020	12
RE	141885	Spectrum Analyzer	AGILENT	E4448A	US44300523	11/07/2018	11/30/2019	12
RE	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/08/2018	11/30/2019	12
RE	141545	DIGITAL HiTESTER	HIOKI	3805	51201148	01/29/2019	01/31/2020	12
RE	142017	AC4_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/04/2019	04/30/2021	24
RE	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600	1871355 /1871328	09/21/2018	09/30/2019	12
RE	141517	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	152399	05/16/2019	05/31/2020	12

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

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

Test item:

RE: Radiated emission
AT: Antenna Terminal Conducted Emission