



EMC TEST REPORT

Test Report No.: 14371662Y-R1

Customer	AOR, LTD.
Description of EUT	DIGITAL RECEIVER
Model Number of EUT	AR-DV10
Test Standard	EN 61326-1 :2013 EN IEC 61326-1 :2021 (EMI: Class A, EMS: Immunity test requirements for equipment intended to be used in an industrial electromagnetic environment)
Test Result	Complied (Refer to SECTION 3)
Issue Date	September 13, 2022
Remarks	-

Representative test engineer

Takahiro Tanaka
Engineer

Approved by

Daigo Hamaguchi
Leader



- 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".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 21.0

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- The information provided from the customer for this report is identified in SECTION 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14371662Y

This report is a revised version of 14371662Y. 14371662Y is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14371662Y	September 2, 2022	-
1	14371662Y-R1	September 13, 2022	P.5 Correction of Rating from: DC 7.4 V, 2000 mAh (Lithium-ion battery pack (BP-10)) to: DC 7.4 V, 2200 mAh (Lithium-ion battery pack (BP-10A))

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer information

Company Name	AOR, LTD.
Address	2-6-4 Misuji, Taito-ku, Tokyo 111-0055, Japan
Telephone Number	+81-3-3865-1695
Contact Person	Naoto Nozaki

The information provided from the customer is as follows;

- Customer, Description of EUT, Model Number of EUT 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 and Test Date
- SECTION 3: Test specification, procedures and results, Clause 3.5 Performance criteria
- 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 to 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Description	DIGITAL RECEIVER
Model Number	AR-DV10
Serial Number	Refer to SECTION 4.2
Condition	Production model
Modification	No Modification by the test lab
Receipt Date	July 8, 2022
Test Date	August 1 to 19, 2022

2.2 Product description

General Specification

Rating	<u>Receiver</u> DC 7.4 V, 2200 mAh (Lithium-ion battery pack (BP-10A)) DC 6.5 V to 10.5 V (External Input) <u>AC Adaptor</u> AC 100 V to 240 V, 50/60 Hz
Size	65 x 41 x 137 (Width x Depth x Height (mm))
Clock frequency (ies) in the system	9.8304 MHz (Control board), 11.7 MHz (RF board)
Operating temperature	-10 deg. C to 50 deg. C

SECTION 3: Test specification, procedures and results

3.1 Test specification

EMC	
Title	EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use – EMC requirements - Part 1: General requirements
Title	EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use – EMC requirements - Part 1: General requirements

3.2 Procedures & results

EMI: EN 61326-1:2013, EN IEC 61326-1:2021

Item	Application	Test Procedure*	Specification	Worst margin	Result	Remarks
Conducted emission	AC mains port	EN 55011:2016 /A1:2017/A11:2020 /A2:2021	EN 55011 Group 1 Class A	31.86 dB (19.66500 MHz, QP, N, Mode 2)	Complied a)	-
Radiated emission	Enclosure	EN 55011:2016 /A1:2017/A11:2020 /A2:2021	EN 55011 Group 1 Class A	3.10 dB (626.375 MHz, QP, Hori., Mode 2)	Complied b)	-

Note : UL Japan's EMI Work Procedures: Work Instructions-ULID-003591

* Refer to 3.4.

- a) Refer to APPENDIX 2 (data of Conducted emission)
- b) Refer to APPENDIX 2 (data of Radiated emission)

EMS : EN 61326-1:2013, EN IEC 61326-1:2021 (Industrial electromagnetic environment) (1/2)

Requirement	Test Procedure*	Specification**	Criteria	Deviation	Result	Remarks
Electrostatic discharge	EN 61000-4-2 :2009	±4 kV contact ±8 kV air	B	±4 kV contact ±2 kV, ±4 kV, ±8 kV air	Complied a)	*1)
		±4 kV contact ±8 kV air	B			
Radio-frequency electromagnetic field	EN IEC 61000-4-3:2020	10 V/m (80 MHz to 1 GHz) 3 V/m (1,4 GHz to 2 GHz) 1 V/m (2,0 GHz to 2,7 GHz) (unmodulated, r.m.s.) 80 % AM (1 kHz)	A	10 V/m (80 MHz to 1 GHz) 3 V/m (1,4 GHz to 6 GHz) (unmodulated, r.m.s.) 80 % AM (1 kHz)	Complied b)	*2)
		10 V/m (80 MHz to 1 GHz) 3 V/m (1,4 GHz to 6 GHz) (unmodulated, r.m.s.) 80 % AM (1 kHz)	A			
Electrical fast transient/burst	EN 61000-4-4 :2012	<u>AC power</u> : ±2 kV <u>DC power</u> : ±2 kV <u>I/O signal/control</u> : ±1 kV <u>I/O signal/control connected directly to mains supply</u> : ±2 kV 5/50 ns, 5 kHz	B	-	Complied c)	*3), *4), *5)
		<u>AC power</u> : ±2 kV <u>DC power</u> : ±2 kV <u>I/O signal/control</u> : ±1 kV <u>I/O signal/control connected directly to mains supply</u> : ±2 kV 5 kHz or 100 kHz	B			
Surge	EN 61000-4-5 :2014/A1:2017	<u>AC power / DC power</u> ±2 kV Line to ground ±1 kV Line to line <u>I/O signal/ control</u> ±1 kV Line to ground <u>I/O signal/ control connected directly to mains supply</u> ±2 kV Line to ground ±1 kV Line to line 1.2/50 μs (8/20 μs)	B	<u>AC power</u> ±0.5 kV, ±1.0kV Line to line 1.2/50 μs(8/20 μs)	Complied d)	*3), *4), *5), *6)
		<u>AC power / DC power</u> ±2.0 kV Line to ground ±1.0 kV Line to line <u>I/O signal/ control</u> ±1 kV Line to ground <u>I/O signal/ control connected directly to mains supply</u> ±2 kV Line to ground ±1 kV Line to line 1.2/50 μs (8/20 μs)	B			

Note : UL Japan's EMS Work Procedures: Work Instructions-ULID-003590

* Refer to 3.4.

**Upper row: EN 61326-1:2013

Lower row: EN IEC 61326-1:2021

*1) Air discharge test was performed from lower level.

*2) Test was performed at frequency ranges and test levels that satisfy both standards.

*3) The test on DC power port was not applicable since the EUT does not have DC power port.

*4) The test on I/O signal/control port was not applicable since the EUT does not have I/O signal/control port longer than 3 m.

*5) The test on Line to Earth was not applicable since the EUT was double-insulated products, was not earthed via AE, and does not have earth.

*6) Test was performed from lower level.

a) Refer to APPENDIX 2 (data of Electrostatic discharge)

b) Refer to APPENDIX 2 (data of Radio-frequency electromagnetic field)

c) Refer to APPENDIX 2 (data of Electrical fast transient/burst)

d) Refer to APPENDIX 2 (data of Surge)

EMS : (Industrial electromagnetic environment) (2/2)

Requirement	Test Procedure*	Specification**	Criteria	Deviation	Result	Remarks
Radio-frequency conducted disturbances	EN 61000-4-6 :2014	0.15 MHz - 80 MHz :3 V (unmodulated, r.m.s.) 80 % AM (1 kHz)	A	-	Complied a)	*1), *2), *3)
		0.15 MHz - 80 MHz : 3 V (unmodulated, r.m.s.) 80 % AM (1 kHz)	A			
Power frequency magnetic field	EN 61000-4-8 :2010	50 Hz, 60 Hz 30 A/m(r.m.s.)	A	-	Complied b)	-
		50 Hz, 60 Hz 30 A/m(r.m.s.)	A			
Voltage dips and short interruptions	EN IEC 61000-4-11 :2020	<u>Dips</u> 0 %Ut: 1 cycle 40 %Ut: 10 cycle/12 cycles * 70 %Ut: 25 cycle/30 cycles * <u>Short interruptions</u> 0 %Ut: 250 cycles/ 300 cycles * Ut: Rated voltage of EUT	B C C	-	Complied c)	-
		<u>Dips</u> 0 %Ut: 1 cycle 40 %Ut: 10 cycle/12 cycles * 70 %Ut: 25 cycle/30 cycles * <u>Short interruptions</u> 0 %Ut: 250 cycles/ 300 cycles * Ut: Rated voltage of EUT	B C C C			
* 10 cycles, 25 cycles and 250 cycles at 50 Hz, 12 cycles, 30 cycles and 300 cycles at 60 Hz.						
Note : UL Japan's EMS Work Procedures: Work Instructions-ULID-003590						
* Refer to 3.4.						
**Upper row: EN 61326-1:2013 Lower row: EN IEC 61326-1:2021						
*1) The test on DC power port was not applicable since the EUT does not have DC power port.						
*2) The test on I/O signal/control port was not applicable since the EUT does not have I/O signal/control port longer than 3 m.						
*3) The test on I/O signal/control connected directly to mains supply port was not applicable since the EUT does not have I/O signal/control connected directly to mains supply port.						
a) Refer to APPENDIX 2 (data of Conducted disturbances, induced by radio frequency fields)						
b) Refer to APPENDIX 2 (data of Power frequency magnetic field)						
c) Refer to APPENDIX 2 (data of Voltage dips and voltage interruptions)						

3.3 Uncertainty

EMI

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.

Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

Conducted emission

Mains ports		Calculated Uncertainty (+/-)	Required Uncertainty (+/-)
LISN (AMN)	9 kHz - 150 kHz	3.4 dB	3.8 dB
	150 kHz - 30 MHz	3.0 dB	3.4 dB

Radiated emission

Site No.		Calculated Uncertainty (+/-)			Required Uncertainty (+/-)	
		No.1	No.2	No.3		
3 m	9 kHz - 30 MHz	3.5 dB	3.5 dB	3.5 dB	Not Defined	
	30 MHz - 200 MHz	(Horizontal)	4.6 dB	4.8 dB	4.8 dB	6.3 dB
		(Vertical)	4.7 dB	4.9 dB	4.9 dB	6.3 dB
	200 MHz - 1000 MHz	(Horizontal)	4.9 dB	5.1 dB	5.1 dB	6.3 dB
		(Vertical)	6.0 dB	6.2 dB	6.2 dB	6.3 dB
	1 GHz - 6 GHz		4.7 dB	4.6 dB	4.6 dB	5.2 dB
6 GHz - 18 GHz		4.9 dB	4.8 dB	4.8 dB	5.5 dB	
10 m	9 kHz - 30 MHz	3.4 dB	3.4 dB	3.4 dB	Not Defined	
	30 MHz - 200 MHz	(Horizontal)	4.6 dB	4.8 dB	4.8 dB	6.3 dB
		(Vertical)	4.6 dB	4.8 dB	4.8 dB	6.3 dB
	200 MHz - 1000 MHz	(Horizontal)	4.7 dB	5.0 dB	5.0 dB	6.3 dB
		(Vertical)	4.8 dB	5.0 dB	5.0 dB	6.3 dB

EMS

The laboratory calculates the uncertainty for the EMS test facilities.

These tests are qualitative tests and uncertainties do not apply directly to the results.

3.4 Addition to standard

Test Item	Listed of Standard (*1)	Applied Test Procedure
Conducted emission	EN 55011:2009/A1:2010	EN 55011:2016
Radiated emission		/A1:2017/A11:2020/A2:2021
Radio frequency electromagnetic field	EN 61000-4-3:2006 /A1:2008/A2:2010	EN IEC 61000-4-3:2020
Burst	EN 61000-4-4:2004/A1:2010	EN 61000-4-4:2012
Surge	EN 61000-4-5:2006	EN 61000-4-5:2014/A1:2017
Conducted RF	EN 61000-4-6 2009	EN 61000-4-6:2014
Voltage dip	EN 61000-4-11:2004	EN IEC 61000-4-11:2020

*1. Annex ZA of EN 61326-1:2013.

Test Item	Listed of Standard *1)	Applied Test Procedure
Conducted emission	EN 55011:2009/A1:2010	EN 55011:2016
Radiated emission		/A1:2017/A11:2020/A2:2021
Radio frequency electromagnetic field	EN 61000-4-3:2006 /A1:2008/A2:2010	EN IEC 61000-4-3:2020

*1) Annex ZA of EN IEC 61326-1:2021

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

3.5 Performance criteria

For the EUT, the customer has decided that the performance criteria defined in standards, should be applied as follows:

EN 61326-1:2013

A	<p>The equipment shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.</p>
B	<p>The equipment shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.</p>
C	<p>Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.</p>

EN IEC 61326-1:2021

A	<p>The equipment shall continue to operate as intended during and after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. In the case of applying immunity tests with continuous electromagnetic phenomena, the PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE which shall recover, without user intervention. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. No change in the operating state is allowed nor is loss of data.</p>
B	<p>The equipment shall continue to operate as intended after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. In the case of applying immunity tests with continuous electromagnetic phenomena, the PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE which shall recover, without user intervention. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. No change in the operating state is allowed nor is loss of data.</p>
C	<p>LOSS OF FUNCTION is allowed, provided the function is self-recoverable or can be restored by the operation of the controls. Recovery procedure shall be included in the user documentation. No permanent damage to the equipment is allowed.</p>

3.6 Test Location

UL Japan, Inc. Yokowa EMC Lab.
108 Yokowa-cho, Ise-shi, Mie-ken, 516-1106 Japan
Telephone number : +81-596-24-8750

	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 open area test site	-	40 x 20	-
No.2 open area test site	-	20 x 18	-
No.3 open area test site	-	20 x 18	-
No.1 shielded room	5.5 x 6.4 x 2.7	5.5 x 6.4	-
No.2 shielded room	4.5 x 3.6 x 2.7	4.5 x 3.6	-
No.3 shielded room	3.6 x 7.2 x 2.4	3.6 x 7.2	-
No.4 shielded room	5.5 x 5.0 x 2.4	4.35 x 3.35	-
No.5 shielded room	5.5 x 4.3 x 2.5	5.54 x 3.0	-
No.6 shielded room	5.2 x 3.2 x 2.9	5.2 x 3.2	-
No.7 shielded room	9.3 x 3.4 x 2.7	9.3 x 3.4	-
No.1 EMS lab. (Full-anechoic chamber)	5.0 x 8.0 x 3.5	-	-
No.2 EMS lab. (Full-anechoic chamber)	4.0 x 7.0 x 3.5	-	-

3.7 Test result

Refer to APPENDIX 2.

SECTION 4: Operation of EUT during testing

4.1 Operating modes

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

The mode(s)	1. AC Adapter direct Charging
	2. Charging tower plug
	3. Single AA battery
	4. Exclusive battery unit
	5. Cigarette socket direct charging

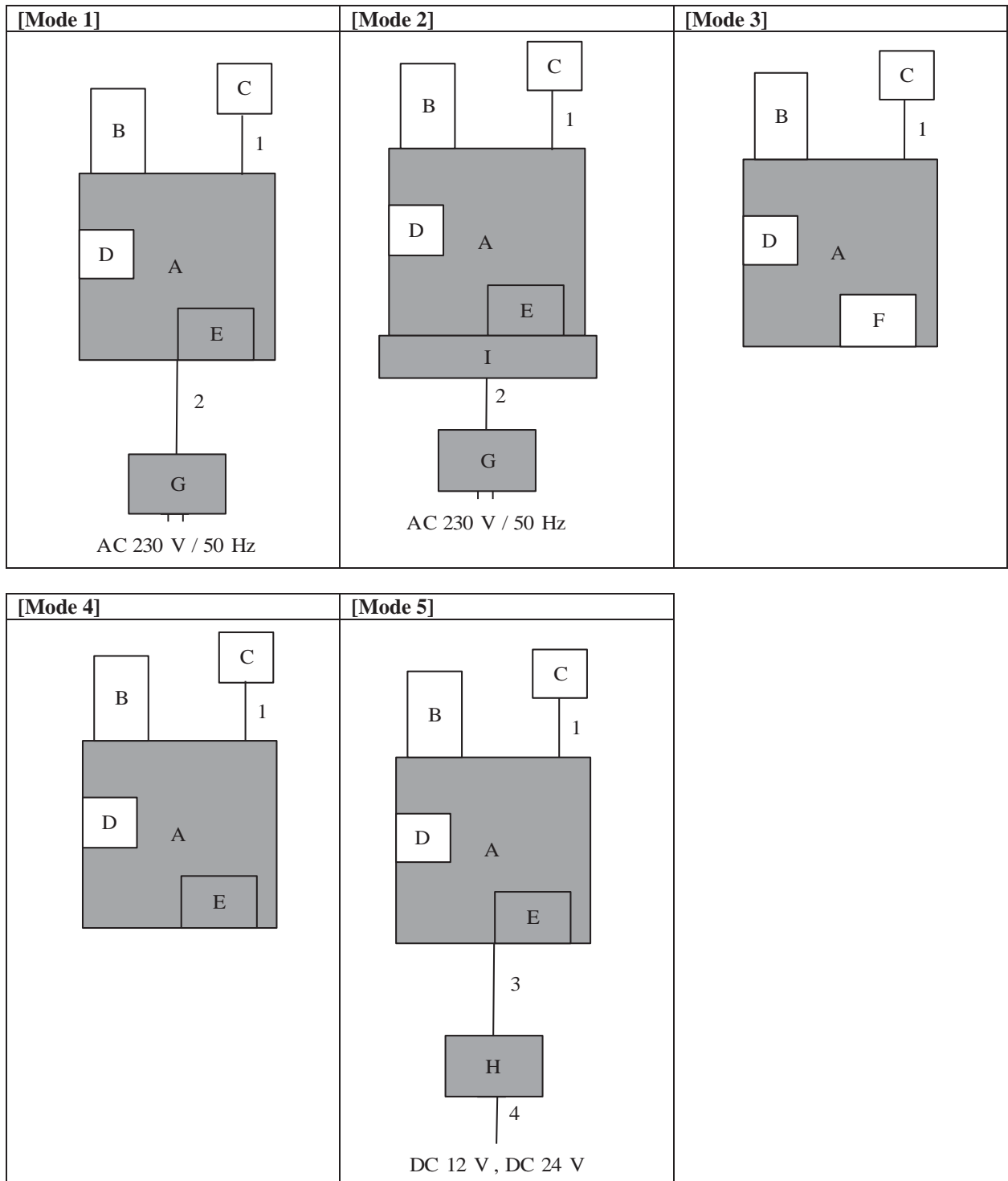
Justification	The system was configured in typical fashion (as a customer would normally use it) for testing.
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Test matrix

Item Mode	Conducted emissions	Radiated emissions	Electrostatic discharges	Continuous RF electromagnetic field disturbances	Electrical fast transient/Burst	Surges	Continuous induced RF disturbances	Power frequency magnetic field	Voltage dips and short interruptions
1	x	x	-	-	-	-	-	-	-
2	x	x	x	x	x	x	x	x	x
3	-	x	-	-	-	-	-	-	-
4	-	x	x	x	-	-	-	x	-
5	-	x	-	-	-	-	-	-	-

x: Tested

4.2 Configuration and peripherals



* Cabling and setup 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	Remark
A	Digital Receiver	AR-DV10	AA633663	AOR, LTD.	EUT
B	Antenna	RA-10	-	AOR, LTD.	-
C	Earphone	-	-	-	-
D	micro SD Card	16GB	-	KIOXIA	-
E	Battery	BP-10A	U52	AOR, LTD.	EUT
F	Alkaline Battery	LR6 / 1.5V	-	Askul	x6
G	AC Power Adapter	AA-10E	AA633663	AOR, LTD.	EUT
H	Vehicle's Cigarette Lighter Socket	DC-10	AA633663	AOR, LTD.	EUT
I	Charger Cradle	CC-10	AA633663	AOR, LTD.	EUT
J	Digital Receiver	AR-DV10	AA633663	AOR, LTD.	EUT

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Earphone Cable	1.1	Unshielded	Unshielded	-
2	DC Cable	1.2	Unshielded	Unshielded	-
3	DC Cable	1.8	Unshielded	Unshielded	-
4	DC Cable	1.0	Unshielded	Unshielded	-

SECTION 5: Conducted emissions

5.1 Test conditions

Frequency range : 0.15 MHz - 30 MHz
EUT position : Table top

5.2 Test configuration

EUT was placed on a platform of nominal size, 1 m by 1.8 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 0.4 m to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 0.8 m from any other grounded conducting surface.

The EUT was located 0.8 m from Artificial Mains Network (AMN).

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through an AMN to the input power source.

Photographs of the set up are shown in APPENDIX 1.

5.3 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in shielded room. The EUT was connected to an AMN.

An overview sweep with peak detection has been performed.

The measurements had been performed with a quasi-peak (QP) detector and if required, with a CISPR Average detector (CAV).

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type	QP	CAV
IF Bandwidth	9 kHz	9 kHz

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

5.4 Results

Summary of the test results : Pass

SECTION 6: Radiated emissions

6.1 Test conditions

Frequency range : 30 MHz - 1000 MHz
Test distance : See Data sheets of APPENDIX 2
EUT position : Table top

6.2 Test configuration

EUT was placed on a table which was consisted by polystyrene foam, polypropylene foam and polycarbonate of nominal size, 1 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of EUT was aligned and flushed with rear of tabletop.

The measurements were performed for vertical or horizontal antenna polarization or both as necessary.

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 1.

6.3 Test procedure

The Radiated Electric Field Strength intensity has been measured on open area test site with a ground plane at a distance of 10 m *. * Measuring distance

The boundary of the EUT is defined by an imaginary circular periphery.

Pre check measurements were performed in a screened room with a search coil at 30 - 1000 MHz to distinguish disturbances of EUT from the ambient noise. Measurements were performed with a quasi-peak detector.

The measuring antenna height was 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 vertical or horizontal antenna polarization or both as necessary.

The radiated emission measurements were made with the following detector function.

Instrument used : Test Receiver
Detector Type : QP
IF Band width : 120 kHz

6.4 Results

Summary of the test results : Pass

SECTION 7: Immunity Test

7.1 Test procedure

Electrostatic discharge

The performance of the EUT was monitored continuously.

Continuous RF electromagnetic field disturbances

The verification of performance was established by monitoring the operation with a video camera during the test.
The test was applied to each surface position to cover all the directions.

Electrical fast transient/Burst

The voltage of test level was applied to each port via CDN.
The performance of the EUT was monitored continuously.

Surges

The voltage of test level was applied to the port via CDN.
The performance of the EUT was monitored continuously.

Continuous induced RF disturbances

The voltage of test level was applied to each port via CDN.
The performance of the EUT was monitored continuously.

Power frequency magnetic field

The power frequency magnetic fields were applied to EUT via induction coil.
The performance of the EUT was monitored continuously.

Voltage dips and short interruptions

The dips and interruptions are generated using a simulator with pre-programmed test sequences for each test level.
The performance of the EUT was monitored continuously.

7.2 Electrostatic discharge test: Photographs of EUT showing the selected test point

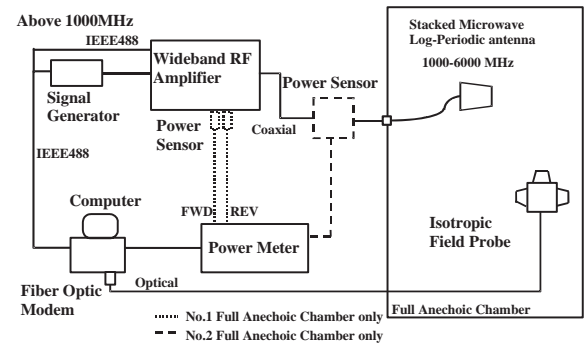
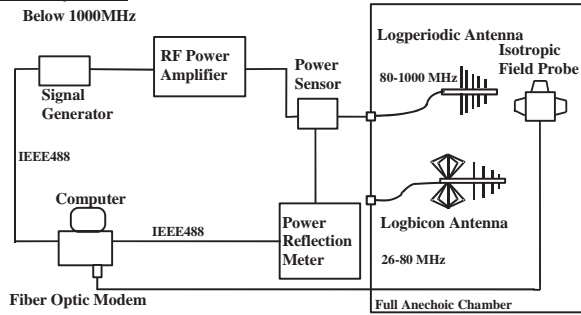
Photograph (1/1)



Yellow: Direct discharge
Green: Air discharge

7.3 Test configuration of radio frequency electromagnetic field

Test System



Tested frequency list

80-1000MHz

80.000	98.581	121.477	149.696	184.472	227.329	280.151	345.243	425.463	524.327	646.165	796.319	981.367
80.800	99.566	122.691	151.192	186.316	229.602	282.952	348.695	429.717	529.570	652.626	804.282	991.180
81.608	100.561	123.917	152.703	188.179	231.898	285.781	352.181	434.014	534.865	659.152	812.324	1000.000
82.424	101.566	125.156	154.230	190.060	234.216	288.638	355.702	438.354	540.213	665.743	820.447	
83.248	102.581	126.407	155.772	191.960	236.558	291.524	359.259	442.737	545.615	672.400	828.651	
84.080	103.606	127.671	157.329	193.879	238.923	294.439	362.851	447.164	551.071	679.124	836.937	
84.920	104.642	128.947	158.902	195.817	241.312	297.383	366.479	451.635	556.581	685.915	845.306	
85.769	105.688	130.236	160.491	197.775	243.725	300.356	370.143	456.151	562.146	692.774	853.759	
86.626	106.744	131.538	162.095	199.752	246.162	303.359	373.844	460.712	567.767	699.701	862.296	
87.492	107.811	132.853	163.715	201.749	248.623	306.392	377.582	465.319	573.444	706.698	870.918	
88.366	108.889	134.181	165.352	203.766	251.109	309.455	381.357	469.972	579.178	713.764	879.627	
89.249	109.977	135.522	167.005	205.803	253.620	312.549	385.170	474.671	584.969	720.901	888.423	
90.141	111.076	136.877	168.675	207.861	256.156	315.674	389.021	479.417	590.818	728.110	897.307	
91.042	112.186	138.245	170.361	209.939	258.717	318.830	392.911	484.211	596.726	735.391	906.280	
91.952	113.307	139.627	172.064	212.038	261.304	322.018	396.840	489.053	602.693	742.744	915.342	
92.871	114.440	141.023	173.784	214.158	263.917	325.238	400.808	493.943	608.719	750.171	924.495	
93.799	115.584	142.433	175.521	216.299	266.556	328.490	404.816	498.882	614.806	757.672	933.739	
94.736	116.739	143.857	177.276	218.461	269.221	331.774	408.864	503.870	620.954	765.248	943.076	
95.683	117.906	145.295	179.048	220.645	271.913	335.091	412.952	508.908	627.163	772.900	952.506	
96.639	119.085	146.747	180.838	222.851	274.632	338.441	417.081	513.997	633.434	780.629	962.031	
97.605	120.275	148.214	182.646	225.079	277.378	341.825	421.251	519.136	639.768	788.435	971.651	

1400-6000 MHz

1400.000	1691.353	2043.338	2468.575	2982.308	3602.953	4352.759	5258.607					
1414.000	1708.266	2063.772	2493.261	3012.131	3638.982	4396.287	5311.193					
1428.140	1725.349	2084.409	2518.193	3042.252	3675.372	4440.250	5364.305					
1442.421	1742.602	2105.253	2543.375	3072.675	3712.126	4484.652	5417.948					
1456.846	1760.028	2126.306	2568.809	3103.401	3749.247	4529.499	5472.128					
1471.414	1777.629	2147.569	2594.497	3134.435	3786.739	4574.794	5526.849					
1486.128	1795.405	2169.045	2620.442	3165.780	3824.607	4620.542	5582.118					
1500.989	1813.359	2190.735	2646.647	3197.437	3862.853	4666.747	5637.939					
1515.999	1831.492	2212.642	2673.113	3229.412	3901.481	4713.415	5694.318					
1531.159	1849.807	2234.769	2699.844	3261.706	3940.496	4760.549	5751.261					
1546.471	1868.305	2257.117	2726.843	3294.323	3979.901	4808.154	5808.774					
1561.936	1886.988	2279.688	2754.111	3327.266	4019.700	4856.236	5866.862					
1577.555	1905.858	2302.485	2781.652	3360.539	4059.897	4904.798	5925.530					
1593.331	1924.917	2325.509	2809.469	3394.144	4100.496	4953.846	5984.786					
1609.264	1944.166	2348.764	2837.563	3428.086	4141.501	5003.385	6000.000					
1625.357	1963.608	2372.252	2865.939	3462.367	4182.916	5053.418						
1641.610	1983.244	2395.975	2894.598	3496.990	4224.745	5103.953						
1658.026	2003.076	2419.934	2923.544	3531.960	4266.993	5154.992						
1674.606	2023.107	2444.134	2952.780	3567.280	4309.663	5206.542						

7.4 Test configuration of radio frequency, common mode

Tested frequency list

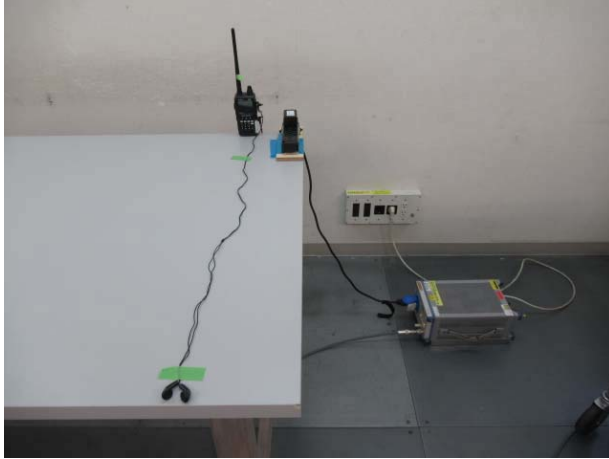
0.15 - 80 MHz

0.150	0.196	0.284	0.418	0.632	0.969	1.502	2.347	3.681	5.789	9.121	14.381	22.697	35.841	56.613
0.151	0.197	0.286	0.422	0.638	0.978	1.517	2.370	3.717	5.846	9.212	14.524	22.923	36.199	57.179
0.152	0.198	0.288	0.426	0.644	0.987	1.532	2.393	3.754	5.904	9.304	14.669	23.152	36.560	57.750
0.153	0.199	0.290	0.430	0.650	0.996	1.547	2.416	3.791	5.963	9.397	14.815	23.383	36.925	58.327
0.154	0.200	0.292	0.434	0.656	1.005	1.562	2.440	3.828	6.022	9.490	14.963	23.616	37.294	58.910
0.155	0.202	0.294	0.438	0.662	1.015	1.577	2.464	3.866	6.082	9.584	15.112	23.852	37.666	59.499
0.156	0.204	0.296	0.442	0.668	1.025	1.592	2.488	3.904	6.142	9.679	15.263	24.090	38.042	60.093
0.157	0.206	0.298	0.446	0.674	1.035	1.607	2.512	3.943	6.203	9.775	15.415	24.330	38.422	60.693
0.158	0.208	0.300	0.450	0.680	1.045	1.623	2.537	3.982	6.265	9.872	15.569	24.573	38.806	61.299
0.159	0.210	0.303	0.454	0.686	1.055	1.639	2.562	4.021	6.327	9.970	15.724	24.818	39.194	61.911
0.160	0.212	0.306	0.458	0.692	1.065	1.655	2.587	4.061	6.390	10.069	15.881	25.066	39.585	62.530
0.161	0.214	0.309	0.462	0.698	1.075	1.671	2.612	4.101	6.453	10.169	16.039	25.316	39.980	63.155
0.162	0.216	0.312	0.466	0.704	1.085	1.687	2.638	4.142	6.517	10.270	16.199	25.569	40.379	63.786
0.163	0.218	0.315	0.470	0.711	1.095	1.703	2.664	4.183	6.582	10.372	16.360	25.824	40.782	64.423
0.164	0.220	0.318	0.474	0.718	1.105	1.720	2.690	4.224	6.647	10.475	16.523	26.082	41.189	65.067
0.165	0.222	0.321	0.478	0.725	1.116	1.737	2.716	4.266	6.713	10.579	16.688	26.342	41.600	65.717
0.166	0.224	0.324	0.482	0.732	1.127	1.754	2.743	4.308	6.780	10.684	16.854	26.605	42.016	66.374
0.167	0.226	0.327	0.486	0.739	1.138	1.771	2.770	4.351	6.847	10.790	17.022	26.871	42.436	67.037
0.168	0.228	0.330	0.490	0.746	1.149	1.788	2.797	4.394	6.915	10.897	17.192	27.139	42.860	67.707
0.169	0.230	0.333	0.494	0.753	1.160	1.805	2.824	4.437	6.984	11.005	17.363	27.410	43.288	68.384
0.170	0.232	0.336	0.498	0.760	1.171	1.823	2.852	4.481	7.053	11.115	17.536	27.684	43.720	69.067
0.171	0.234	0.339	0.502	0.767	1.182	1.841	2.880	4.525	7.123	11.226	17.711	27.960	44.157	69.757
0.172	0.236	0.342	0.507	0.774	1.193	1.859	2.908	4.570	7.194	11.338	17.888	28.239	44.598	70.454
0.173	0.238	0.345	0.512	0.781	1.204	1.877	2.937	4.615	7.265	11.451	18.066	28.521	45.043	71.158
0.174	0.240	0.348	0.517	0.788	1.216	1.895	2.966	4.661	7.337	11.565	18.246	28.806	45.493	71.869
0.175	0.242	0.351	0.522	0.795	1.228	1.913	2.995	4.707	7.410	11.680	18.428	29.094	45.947	72.587
0.176	0.244	0.354	0.527	0.802	1.240	1.932	3.024	4.754	7.484	11.796	18.612	29.384	46.406	73.312
0.177	0.246	0.357	0.532	0.810	1.252	1.951	3.054	4.801	7.558	11.913	18.798	29.677	46.870	74.045
0.178	0.248	0.360	0.537	0.818	1.264	1.970	3.084	4.849	7.633	12.032	18.985	29.973	47.338	74.785
0.179	0.250	0.363	0.542	0.826	1.276	1.989	3.114	4.897	7.709	12.152	19.174	30.272	47.811	75.532
0.180	0.252	0.366	0.547	0.834	1.288	2.008	3.145	4.945	7.786	12.273	19.365	30.574	48.289	76.287
0.181	0.254	0.369	0.552	0.842	1.300	2.028	3.176	4.994	7.863	12.395	19.558	30.879	48.771	77.049
0.182	0.256	0.372	0.557	0.850	1.313	2.048	3.207	5.043	7.941	12.518	19.753	31.187	49.258	77.819
0.183	0.258	0.375	0.562	0.858	1.326	2.068	3.239	5.093	8.020	12.643	19.950	31.498	49.750	78.597
0.184	0.260	0.378	0.567	0.866	1.339	2.088	3.271	5.143	8.100	12.769	20.149	31.812	50.247	79.382
0.185	0.262	0.381	0.572	0.874	1.352	2.108	3.303	5.194	8.181	12.896	20.350	32.130	50.749	80.000
0.186	0.264	0.384	0.577	0.882	1.365	2.129	3.336	5.245	8.262	13.024	20.553	32.451	51.256	
0.187	0.266	0.387	0.582	0.890	1.378	2.150	3.369	5.297	8.344	13.154	20.758	32.775	51.768	
0.188	0.268	0.390	0.587	0.898	1.391	2.171	3.402	5.349	8.427	13.285	20.965	33.102	52.285	
0.189	0.270	0.393	0.592	0.906	1.404	2.192	3.436	5.402	8.511	13.417	21.174	33.433	52.807	
0.190	0.272	0.396	0.597	0.915	1.418	2.213	3.470	5.456	8.596	13.551	21.385	33.767	53.335	
0.191	0.274	0.399	0.602	0.924	1.432	2.235	3.504	5.510	8.681	13.686	21.598	34.104	53.868	
0.192	0.276	0.402	0.608	0.933	1.446	2.257	3.539	5.565	8.767	13.822	21.813	34.445	54.406	
0.193	0.278	0.406	0.614	0.942	1.460	2.279	3.574	5.620	8.854	13.960	22.031	34.789	54.950	
0.194	0.280	0.410	0.620	0.951	1.474	2.301	3.609	5.676	8.942	14.099	22.251	35.136	55.499	
0.195	0.282	0.414	0.626	0.960	1.488	2.324	3.645	5.732	9.031	14.239	22.473	35.487	56.053	

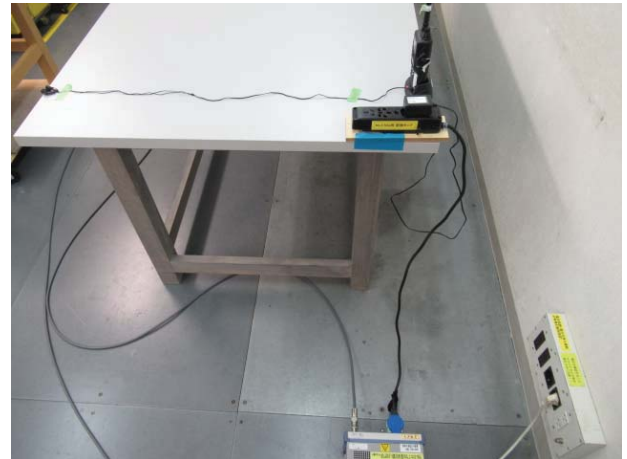
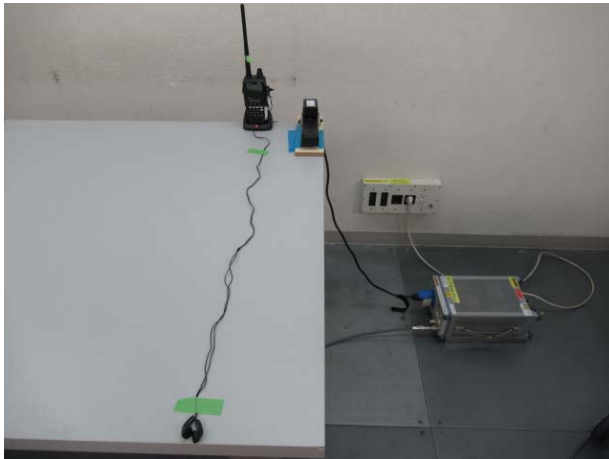
APPENDIX 1: Photographs of test setup

Conducted emissions
(AC power port)

Mode 1

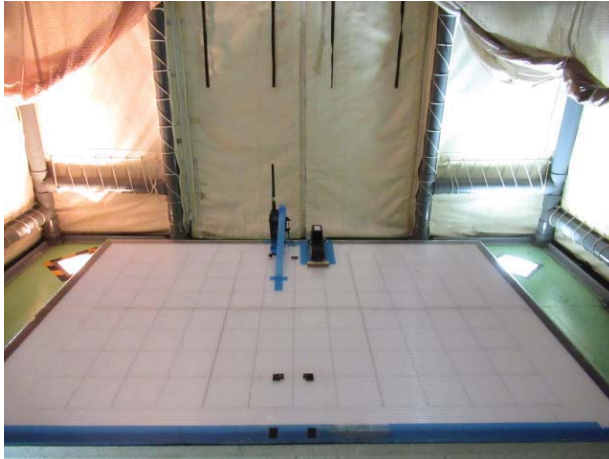


Mode 2

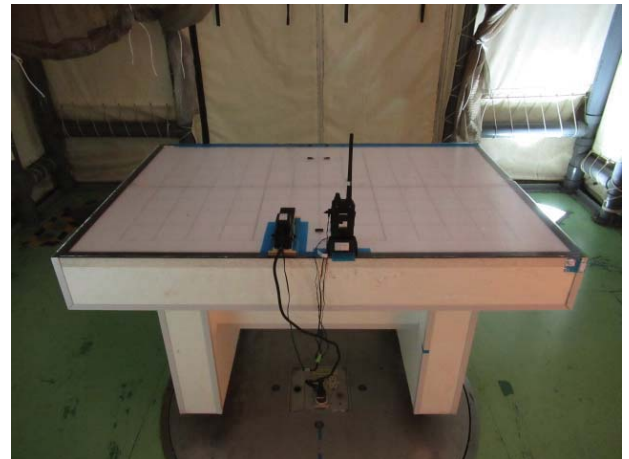
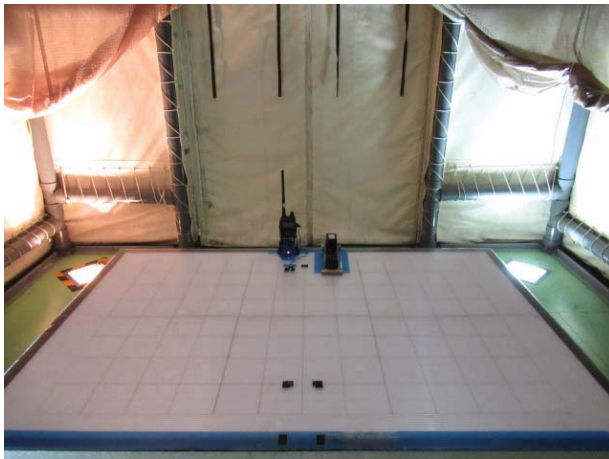


Radiated emissions

Mode 1

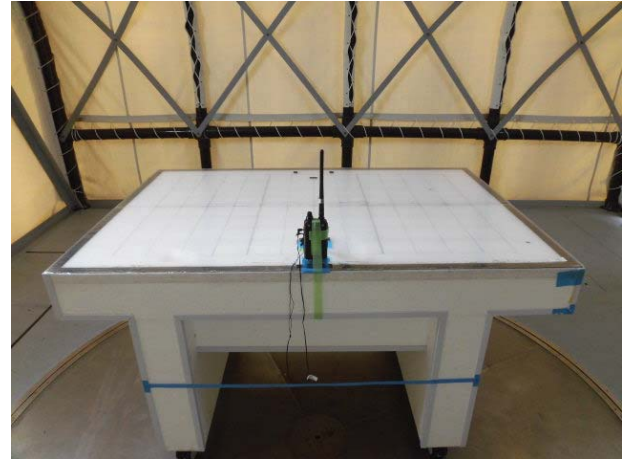


Mode 2

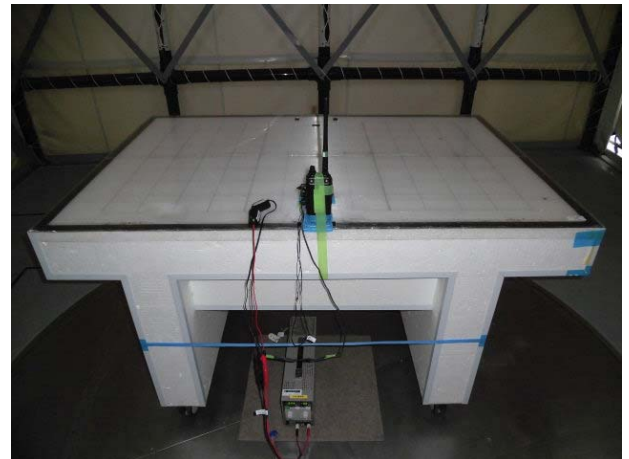


Radiated emissions

Mode 3 and 4

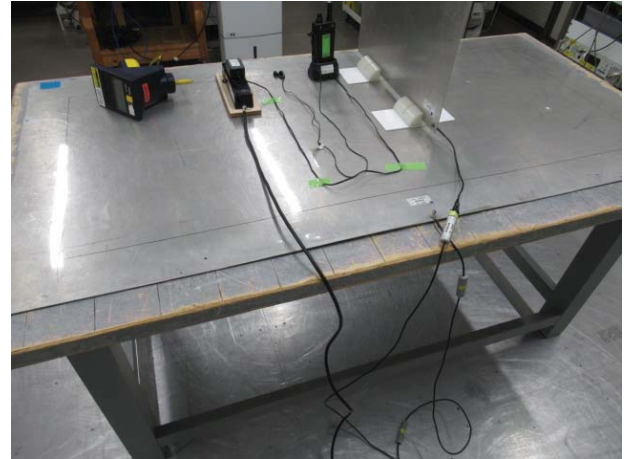
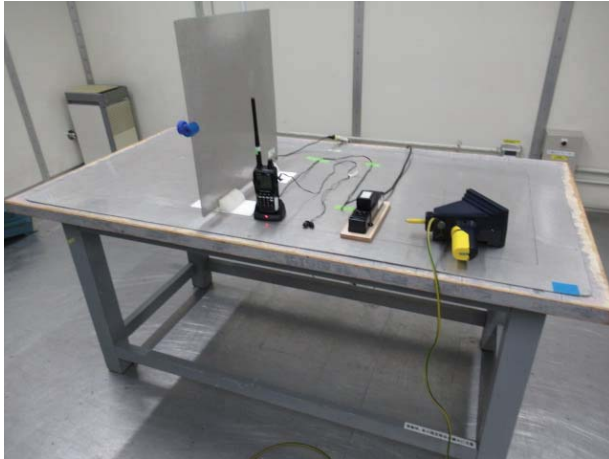


Mode 5



Electrostatic discharges

Mode 2

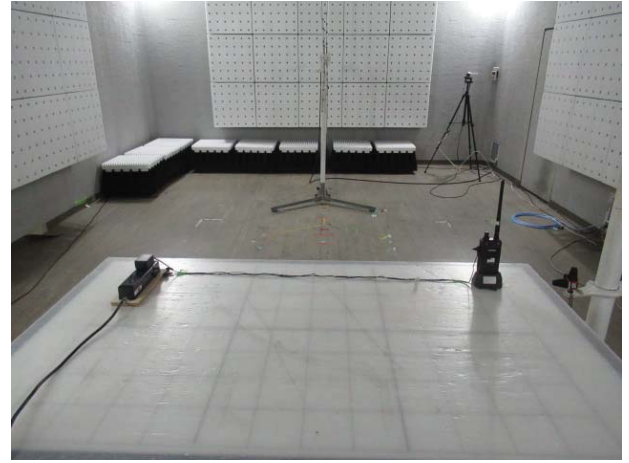


Mode 4



Continuous RF electromagnetic field disturbances
(Below 1 GHz)

Mode 2

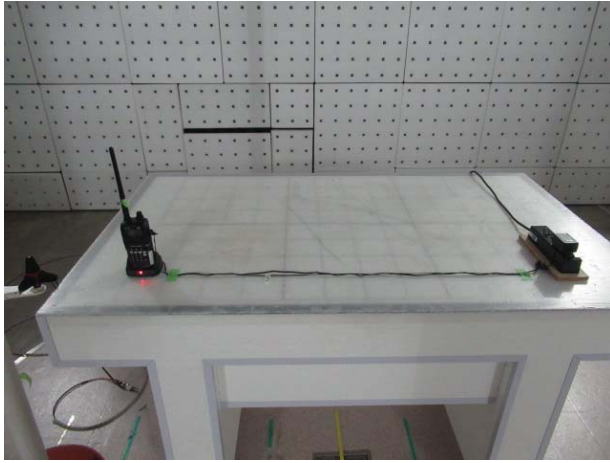


Mode 4



Continuous RF electromagnetic field disturbances
(Above 1 GHz)

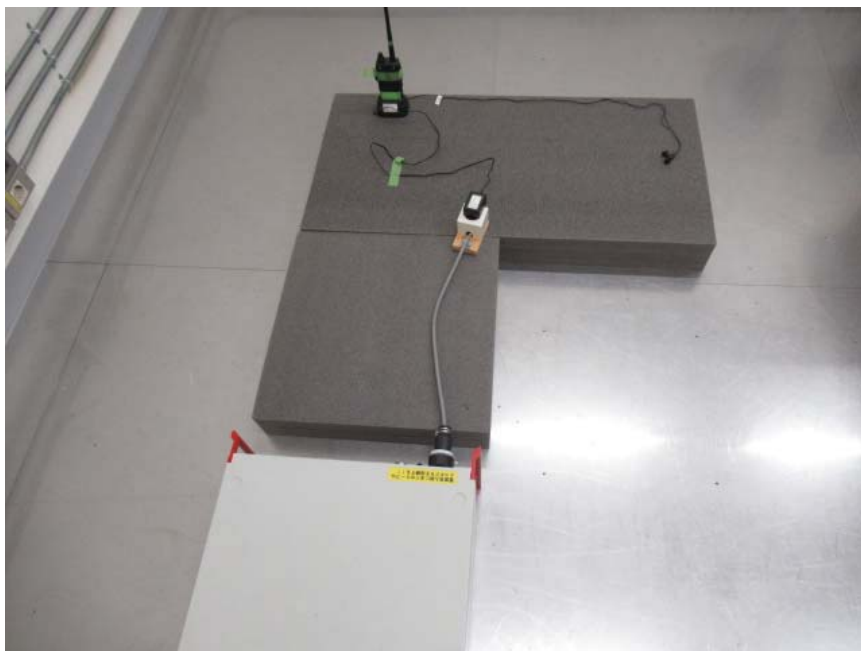
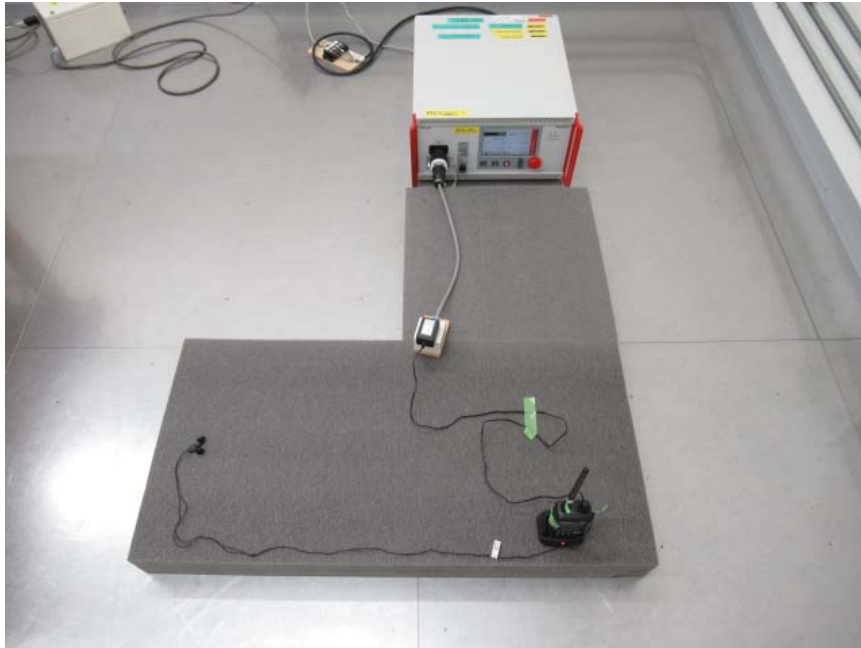
Mode 2



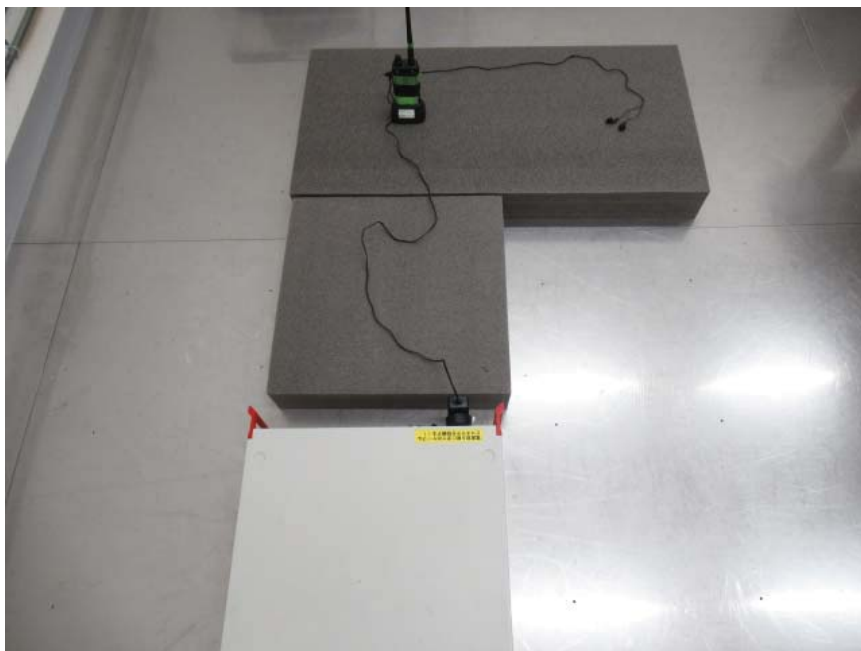
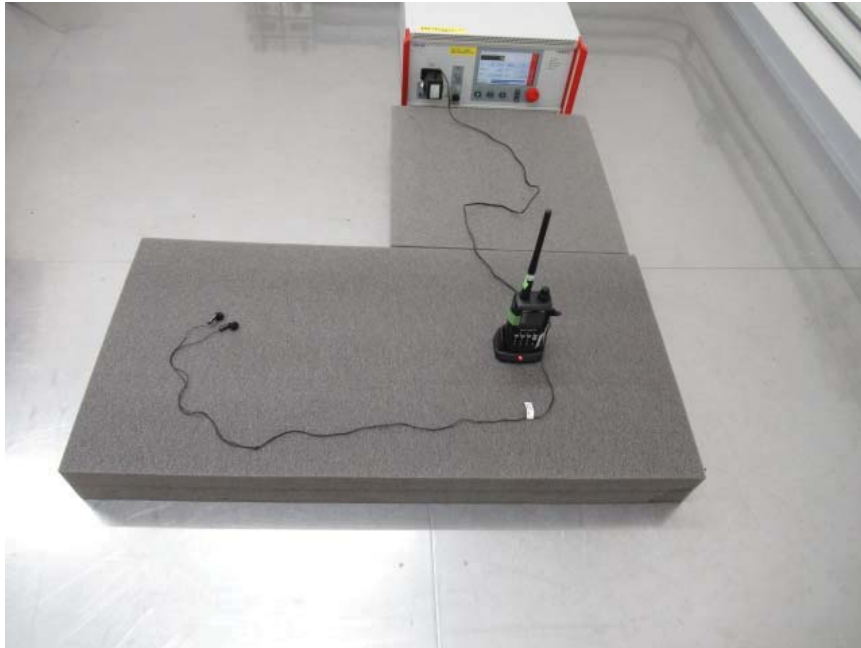
Mode 4



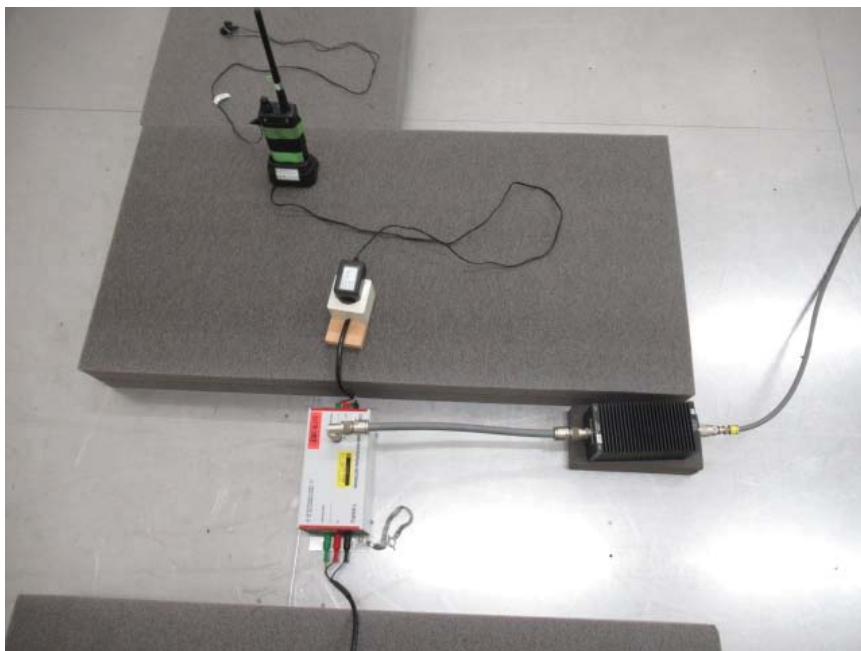
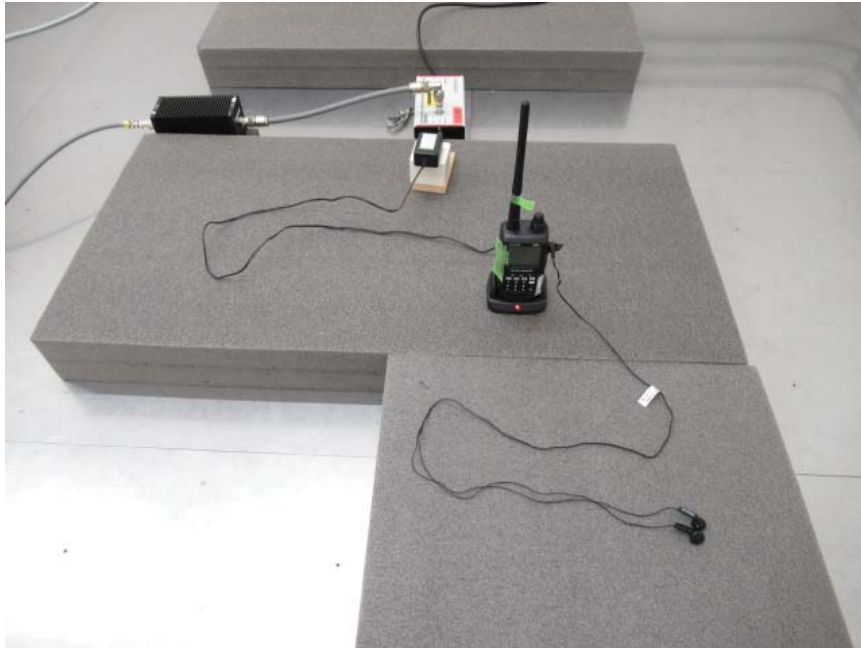
Electrical fast transient/Burst
(Direct injection)



Surges
(AC power port)

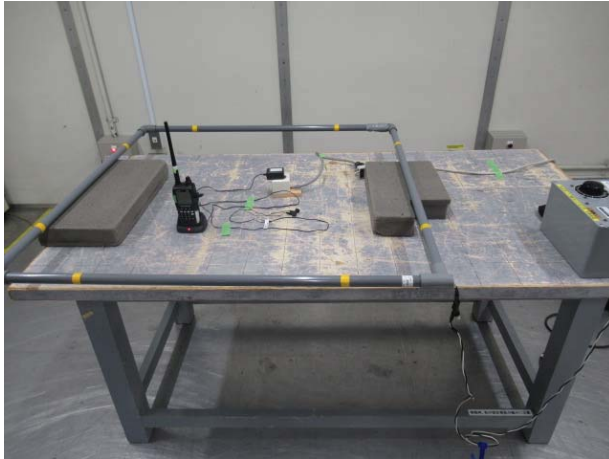


Continuous induced RF disturbances
(Direct injection)

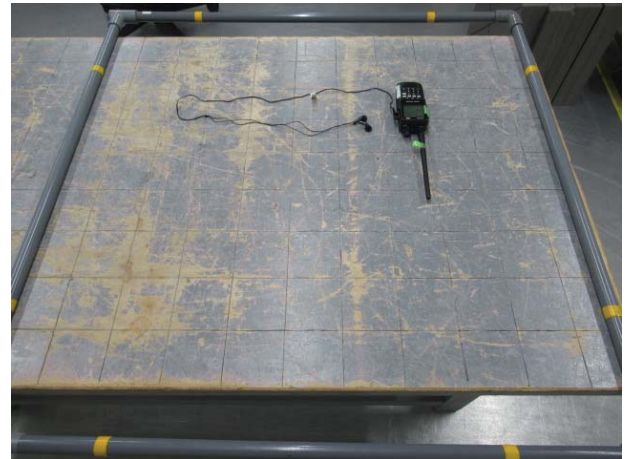


Power frequency magnetic field

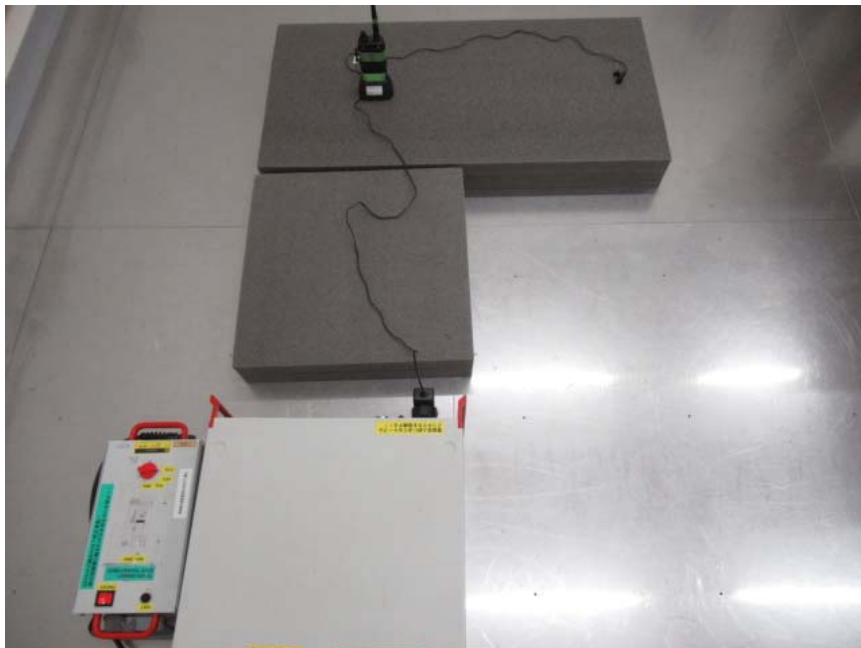
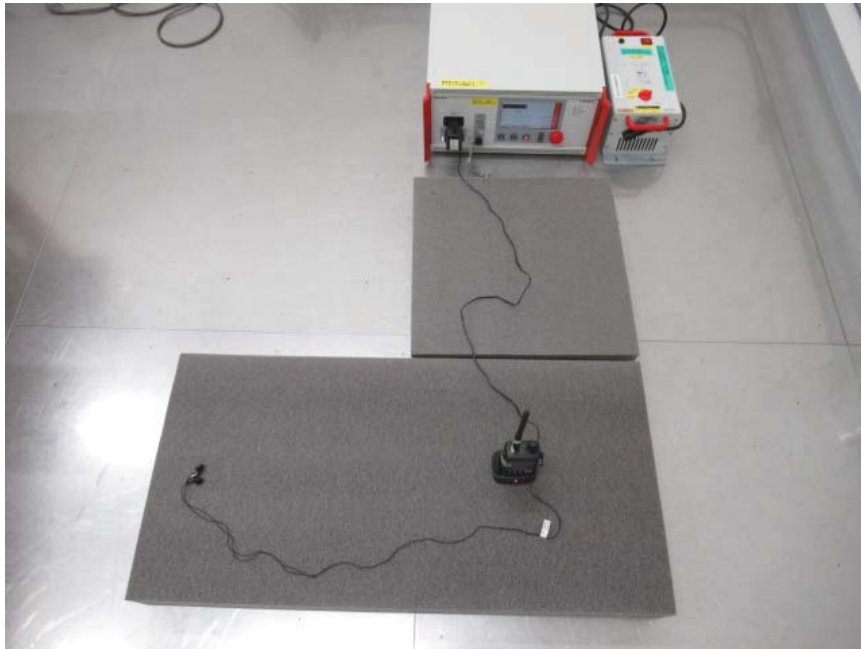
Mode 2



Mode 4



Voltage dips and short interruptions



DATA OF CONDUCTED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Shielded Room
Date : 08/01/2022

Mode : 1.AC Adapter direct Charging
Power : AC 230 V/ 50 Hz
Temp. / Humi. : 23 deg. C / 42 % RH
Atmosphere : 1005 hPa

Remarks : LS-13 LISN with Adaptor HP OFF(2021-9-3)

Limit : EN 55011 Group 1 CLASS A Rated power below 20kVA

Engineer : Yasunori Hashizume

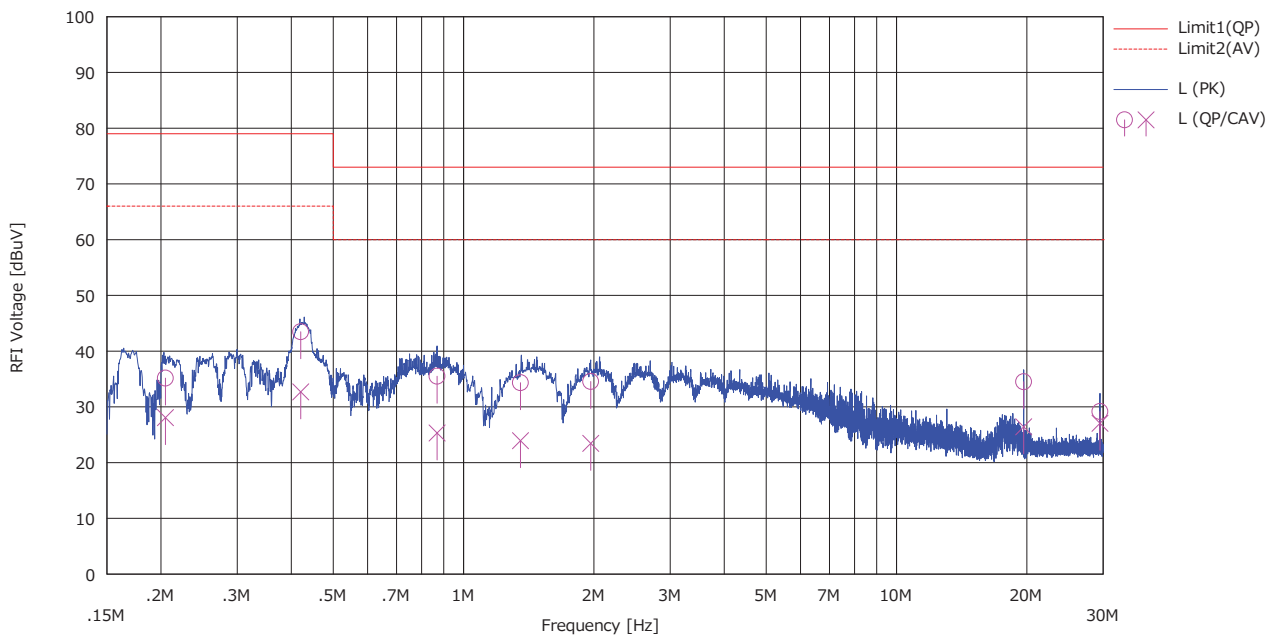
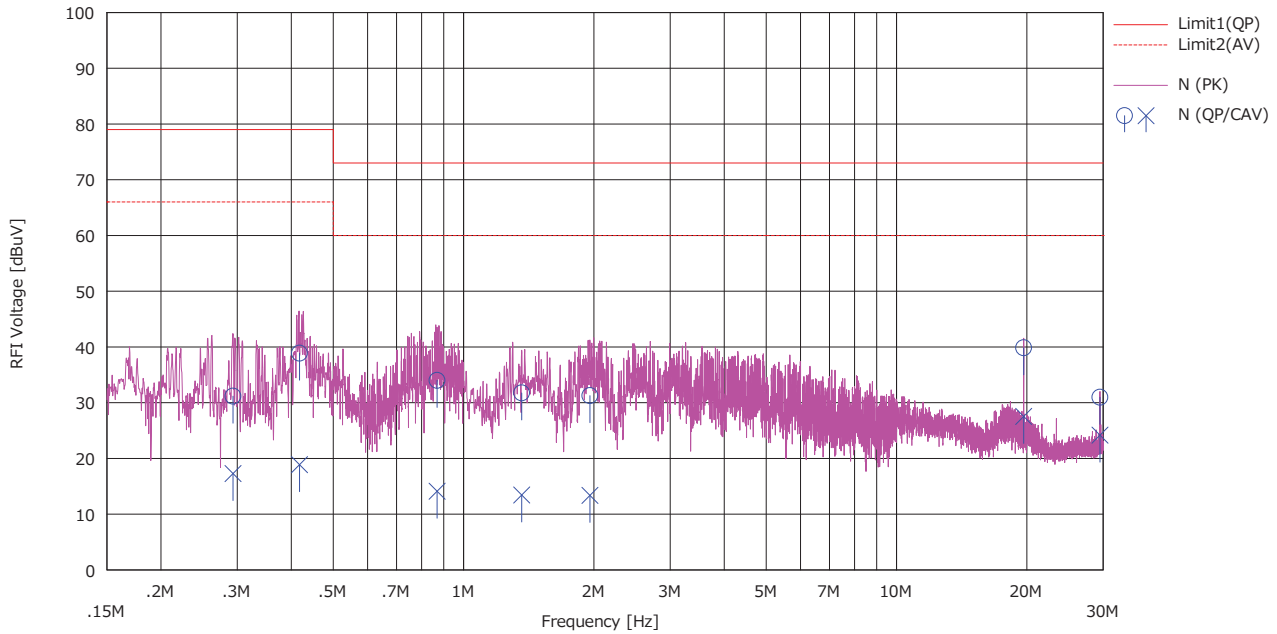


CHART:WITH FACTOR, Peak hold data. Except for the above table: adequate margin data below the limits.
CALCULATION:RESULT[dBuV]=READING[dBuV]+C.F(LOSS)[dB](LISN(or ISN or Probe)+CABLE+ATTEN(Except LS-11,12,13))

DATA OF CONDUCTED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Shielded Room
Date : 08/01/2022

Mode : 1.AC Adapter direct Charging
Power : AC 230 V/ 50 Hz
Temp. / Humi. : 23 deg. C / 42 % RH
Atmosphere : 1005 hPa

Remarks : LS-13 LISN with Adaptor HP OFF(2021-9-3)

Limit : EN 55011 Group 1 CLASS A Rated power below 20kVA

Engineer : Yasunori Hashizume

<< QP/CAV DATA >>

No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.29323	21.40	7.50	9.77	31.17	17.27	79.00	66.00	47.83	48.73	N	
2	0.41778	29.10	9.10	9.78	38.88	18.88	79.00	66.00	40.12	47.12	N	
3	0.86825	24.20	4.30	9.80	34.00	14.10	73.00	60.00	39.00	45.90	N	
4	1.36200	21.90	3.60	9.83	31.73	13.43	73.00	60.00	41.27	46.57	N	
5	1.95800	21.40	3.50	9.86	31.26	13.36	73.00	60.00	41.74	46.64	N	
6	19.66140	29.20	16.90	10.64	39.84	27.54	73.00	60.00	33.16	32.46	N	
7	29.49500	20.10	13.30	10.87	30.97	24.17	73.00	60.00	42.03	35.83	N	
8	0.20483	25.40	18.30	9.76	35.16	28.06	79.00	66.00	43.84	37.94	L	
9	0.42043	33.70	22.90	9.78	43.48	32.68	79.00	66.00	35.52	33.32	L	
10	0.86868	25.70	15.50	9.80	35.50	25.30	73.00	60.00	37.50	34.70	L	
11	1.35310	24.50	14.10	9.82	34.32	23.92	73.00	60.00	38.68	36.08	L	
12	1.96600	24.70	13.60	9.85	34.55	23.45	73.00	60.00	38.45	36.55	L	
13	19.66000	23.80	15.70	10.71	34.51	26.41	73.00	60.00	38.49	33.59	L	
14	29.49500	18.40	16.30	10.76	29.16	27.06	73.00	60.00	43.84	32.94	L	

CHART:WITH FACTOR, Peak hold data. Except for the above table: adequate margin data below the limits.
CALCULATION:RESULT[dBuV]=READING[dBuV]+C.F.(LOSS)[dB](LISN(or ISN or Probe)+CABLE+ATTEN(Except LS-11,12,13))

DATA OF CONDUCTED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Shielded Room
 Date : 08/01/2022

Mode : 2.Charging tower plug
 Power : AC 230 V/ 50 Hz
 Temp. / Humi. : 23 deg. C / 42 % RH
 Atmosphere : 1005 hPa

Remarks : LS-13 LISN with Adaptor HP OFF(2021-9-3)

Limit : EN 55011 Group 1 CLASS A Rated power below 20kVA

Engineer : Yasunori Hashizume

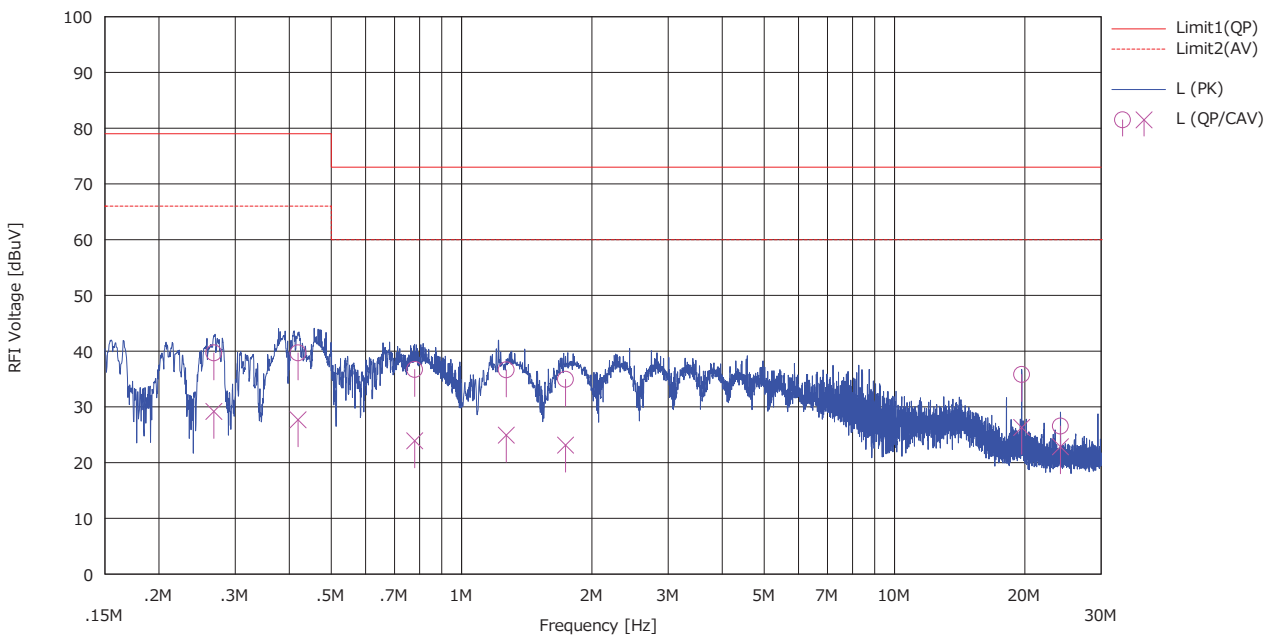
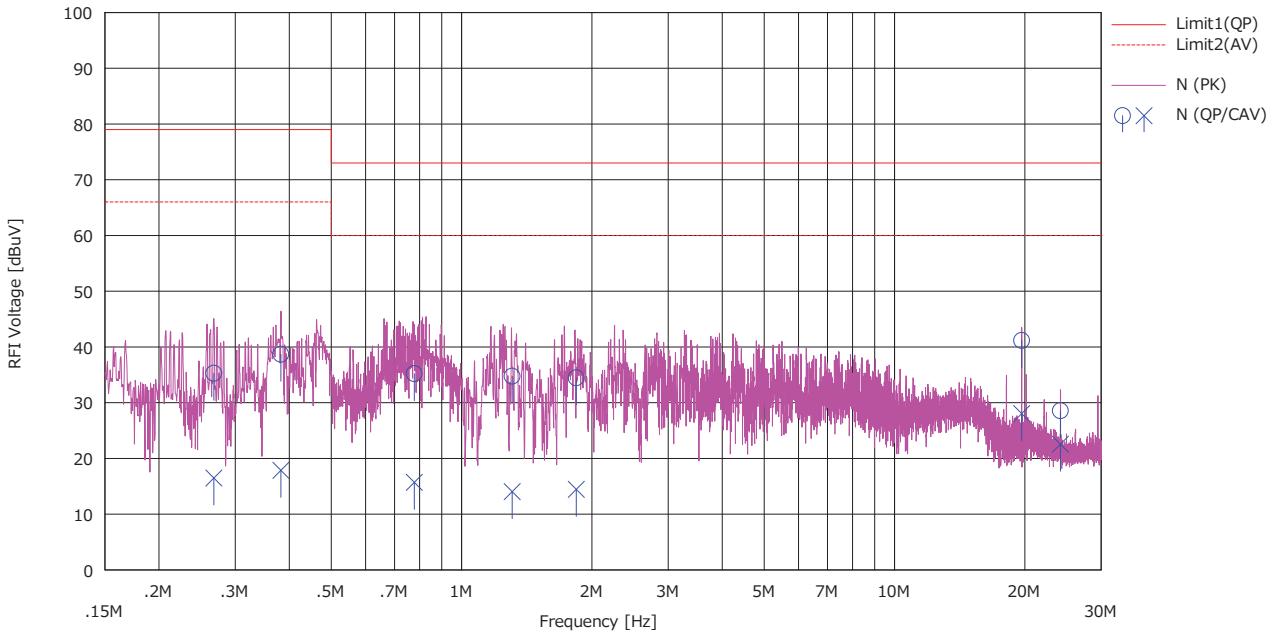


CHART:WITH FACTOR, Peak hold data. Except for the above table: adequate margin data below the limits.
 CALCULATION:RESULT[dBuV]=READING[dBuV]+C.F(LOSS)[dB](LISN(or ISN or Probe)+CABLE+ATTEN(Except LS-11,12,13))

DATA OF CONDUCTED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Shielded Room
Date : 08/01/2022

Mode : 2.Charging tower plug
Power : AC 230 V/ 50 Hz
Temp. / Humi. : 23 deg. C / 42 % RH
Atmosphere : 1005 hPa

Remarks : LS-13 LISN with Adaptor HP OFF(2021-9-3)

Limit : EN 55011 Group 1 CLASS A Rated power below 20kVA

Engineer : Yasunori Hashizume

<< QP/CAV DATA >>

No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<CAV> [dBuV]		<QP> [dBuV]	<CAV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.26773	25.50	6.70	9.77	35.27	16.47	79.00	66.00	43.73	49.53	N	
2	0.38248	28.90	8.10	9.77	38.67	17.87	79.00	66.00	40.33	48.13	N	
3	0.77773	25.40	5.90	9.80	35.20	15.70	73.00	60.00	37.80	44.30	N	
4	1.30840	24.90	4.20	9.83	34.73	14.03	73.00	60.00	38.27	45.97	N	
5	1.84030	24.60	4.60	9.86	34.46	14.46	73.00	60.00	38.54	45.54	N	
6	19.66500	30.50	17.40	10.64	41.14	28.04	73.00	60.00	31.86	31.96	N	
7	24.17000	17.80	11.80	10.75	28.55	22.55	73.00	60.00	44.45	37.45	N	
8	0.26773	29.90	19.40	9.77	39.67	29.17	79.00	66.00	39.33	36.83	L	
9	0.41903	29.90	17.90	9.78	39.68	27.68	79.00	66.00	39.32	38.32	L	
10	0.77943	26.90	14.10	9.80	36.70	23.90	73.00	60.00	36.30	36.10	L	
11	1.26800	26.80	15.10	9.82	36.62	24.92	73.00	60.00	36.38	35.08	L	
12	1.73800	25.10	13.30	9.84	34.94	23.14	73.00	60.00	38.06	36.86	L	
13	19.66500	25.10	15.60	10.71	35.81	26.31	73.00	60.00	37.19	33.69	L	
14	24.17000	15.80	12.10	10.74	26.54	22.84	73.00	60.00	46.46	37.16	L	

DATA OF RADIATED DISTURBANCE TEST

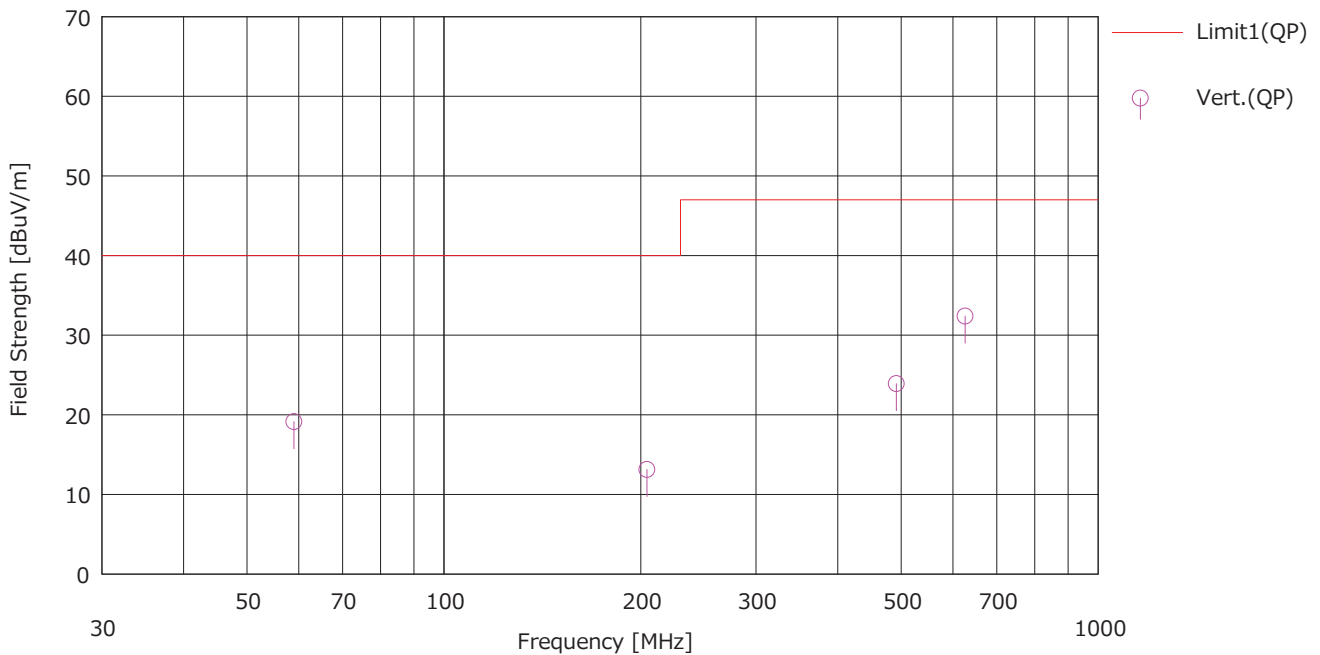
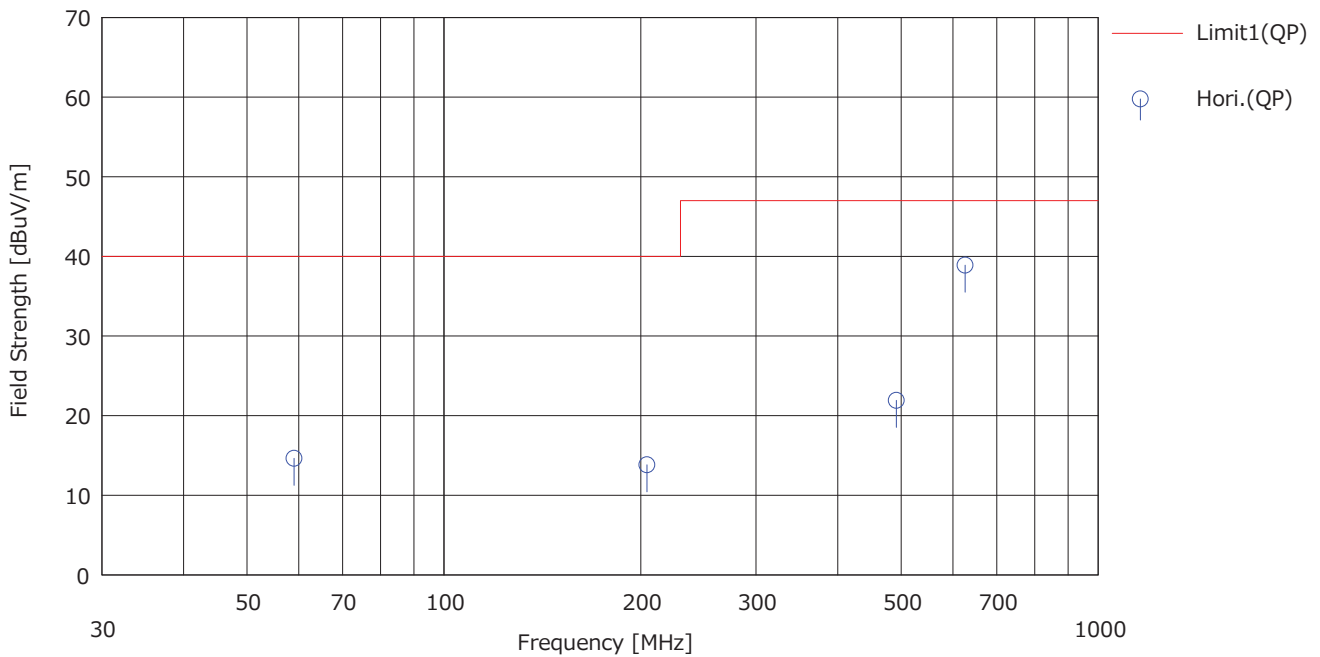
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site
 Date : 08/01/2022

Mode : 1.AC Adapter direct Charging
 Power : AC 230 V / 50 Hz
 Temp. / Humi. : 26 deg. C / 58 % RH
 Atmosphere : 1005 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Jun Ito



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site
 Date : 08/01/2022

Mode : 1.AC Adapter direct Charging
 Power : AC 230 V / 50 Hz
 Temp. / Humi. : 26 deg. C / 58 % RH
 Atmosphere : 1005 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Jun Ito

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]				
1	58.984	31.50	8.60	7.41	28.10	-0.28	19.13	40.00	20.87	Vert.	BA	
2	59.004	27.00	8.60	7.41	28.10	-0.28	14.63	40.00	25.37	Hori.	BA	
3	204.399	23.60	11.70	5.76	27.93	0.00	13.13	40.00	26.87	Vert.	LA	
4	204.404	24.30	11.70	5.76	27.93	0.00	13.83	40.00	26.17	Hori.	LA	
5	491.516	26.30	17.81	7.67	27.86	0.00	23.92	47.00	23.08	Vert.	LA	
6	491.517	24.30	17.81	7.67	27.86	0.00	21.92	47.00	25.08	Hori.	LA	
7	626.377	38.50	19.59	8.33	27.52	0.00	38.90	47.00	8.10	Hori.	LA	
8	626.381	32.00	19.59	8.33	27.52	0.00	32.40	47.00	14.60	Vert.	LA	

DATA OF RADIATED DISTURBANCE TEST

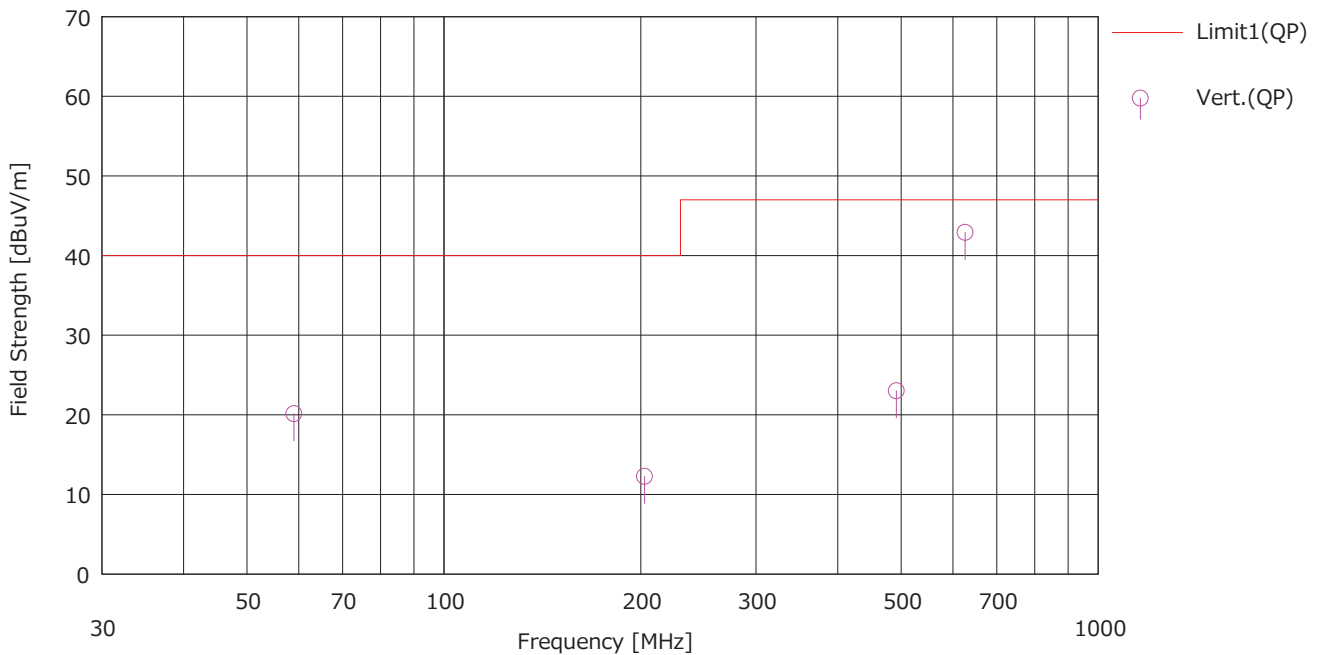
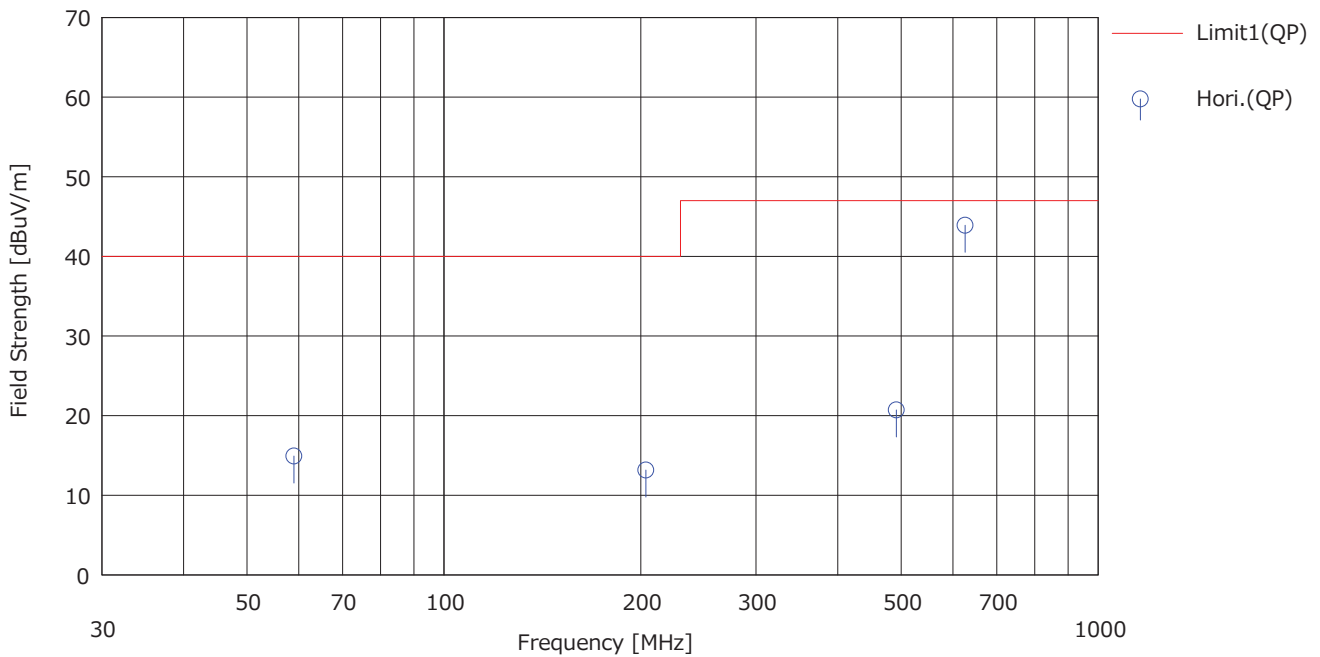
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site
 Date : 08/01/2022

Mode : 2.Charging tower plug
 Power : AC 230 V / 50 Hz
 Temp. / Humi. : 26 deg. C / 58 % RH
 Atmosphere : 1005 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Jun Ito



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site
 Date : 08/01/2022

Mode : 2.Charging tower plug
 Power : AC 230 V / 50 Hz
 Temp. / Humi. : 26 deg. C / 58 % RH
 Atmosphere : 1005 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Jun Ito

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result	Limit	Margin	Pola. [H/V]	Ant. Type	Comment
		<QP> [dBuV]					<QP> [dBuV/m]	<QP> [dB]				
1	58.991	32.50	8.60	7.41	28.10	-0.28	20.13	40.00	19.87	Vert.	BA	
2	58.992	27.30	8.60	7.41	28.10	-0.28	14.93	40.00	25.07	Hori.	BA	
3	202.592	22.70	11.74	5.75	27.93	0.00	12.26	40.00	27.74	Vert.	LA	
4	203.597	23.60	11.73	5.76	27.93	0.00	13.16	40.00	26.84	Hori.	LA	
5	491.516	23.10	17.81	7.67	27.86	0.00	20.72	47.00	26.28	Hori.	LA	
6	491.517	25.40	17.81	7.67	27.86	0.00	23.02	47.00	23.98	Vert.	LA	
7	626.375	43.50	19.59	8.33	27.52	0.00	43.90	47.00	3.10	Hori.	LA	
8	626.381	42.50	19.59	8.33	27.52	0.00	42.90	47.00	4.10	Vert.	LA	

DATA OF RADIATED DISTURBANCE TEST

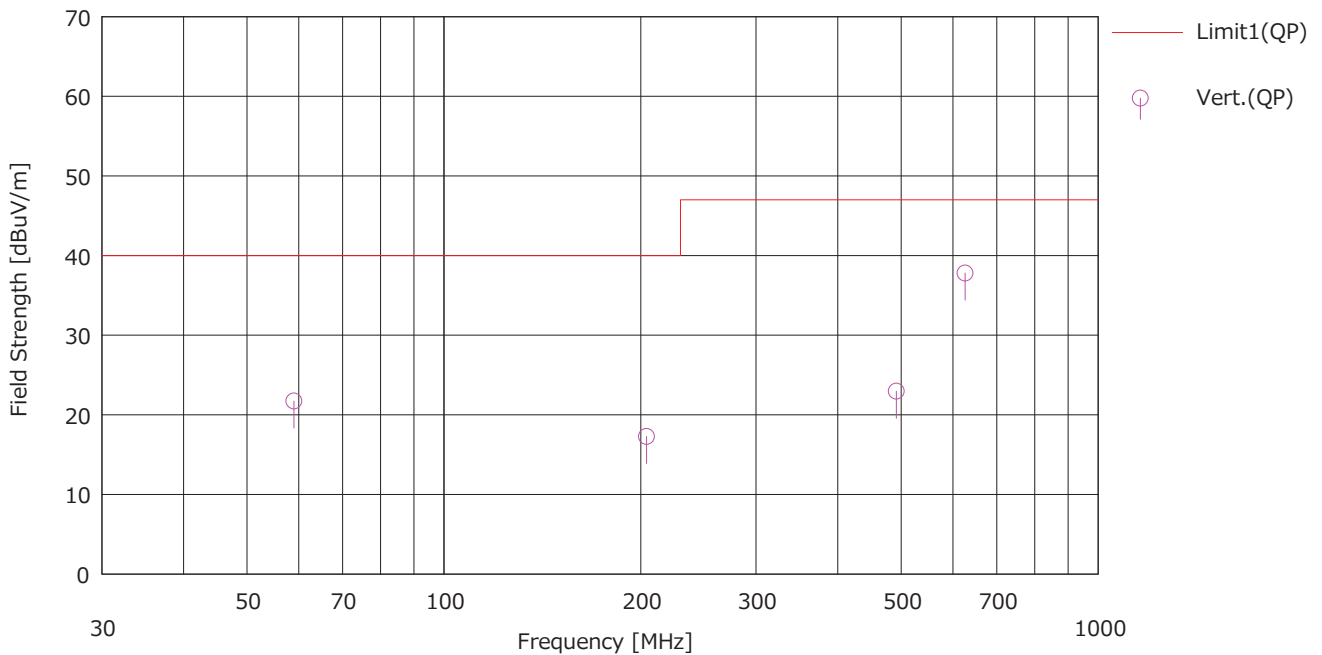
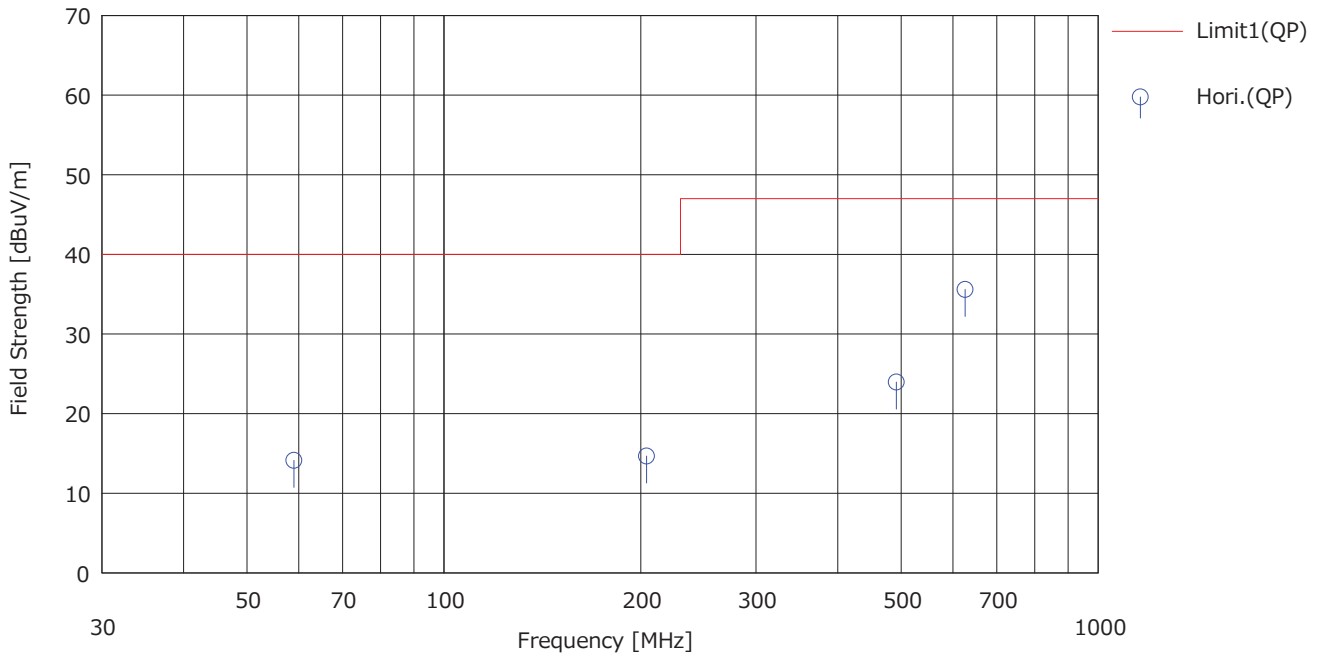
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
 Date : 08/17/2022

Mode : 3.Single AA battery
 Power : DC 9 V
 Temp. / Humi. : 26 deg. C / 47 % RH
 Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
Date : 08/17/2022

Mode : 3.Single AA battery
Power : DC 9 V
Temp. / Humi. : 26 deg. C / 47 % RH
Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Ant. Type	Comment
		[dBuV]					[dBuV/m]	[dBuV/m]	[dB]			
1	58.981	27.00	9.49	7.68	29.76	-0.28	14.13	40.00	25.87	Hori.	BA	
2	58.982	34.60	9.49	7.68	29.76	-0.28	21.73	40.00	18.27	Vert.	BA	
3	204.048	26.10	11.51	6.71	29.65	0.00	14.67	40.00	25.33	Hori.	LA	
4	204.087	28.70	11.51	6.71	29.65	0.00	17.27	40.00	22.73	Vert.	LA	
5	491.519	26.80	17.79	9.28	29.91	0.00	23.96	47.00	23.04	Hori.	LA	
6	491.521	25.80	17.79	9.28	29.91	0.00	22.96	47.00	24.04	Vert.	LA	
7	626.375	35.80	19.60	10.15	29.96	0.00	35.59	47.00	11.41	Hori.	LA	
8	626.376	38.00	19.60	10.15	29.96	0.00	37.79	47.00	9.21	Vert.	LA	

DATA OF RADIATED DISTURBANCE TEST

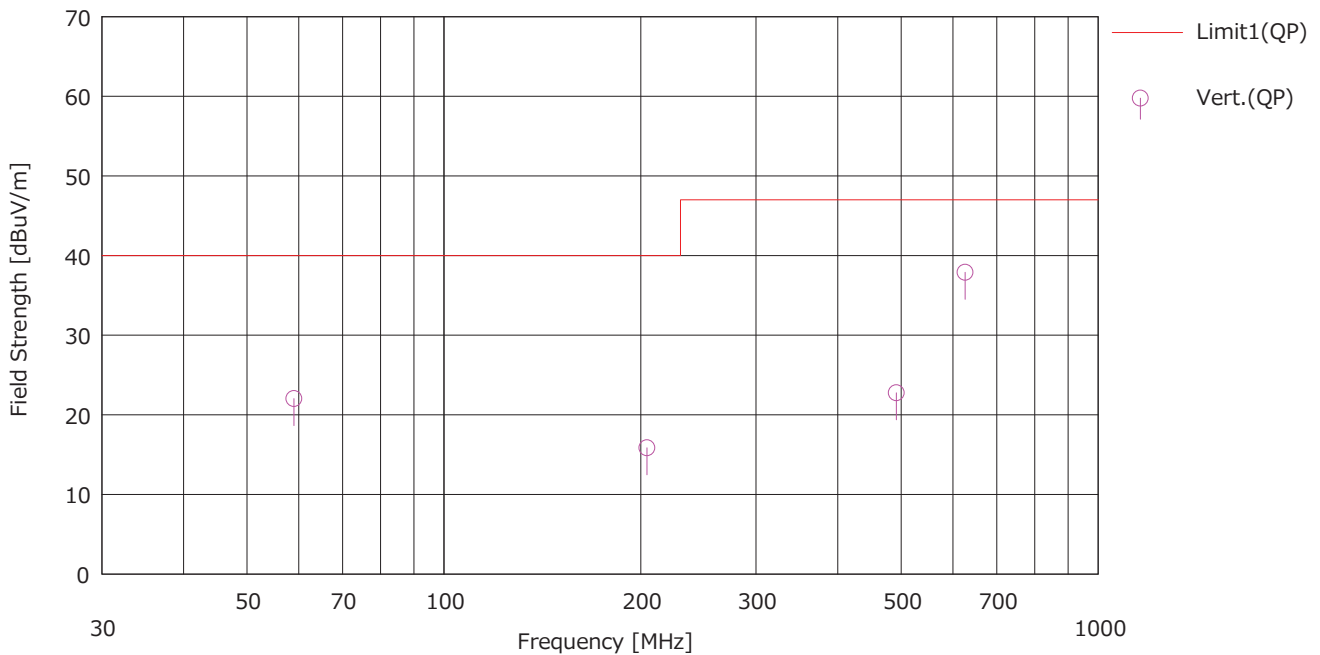
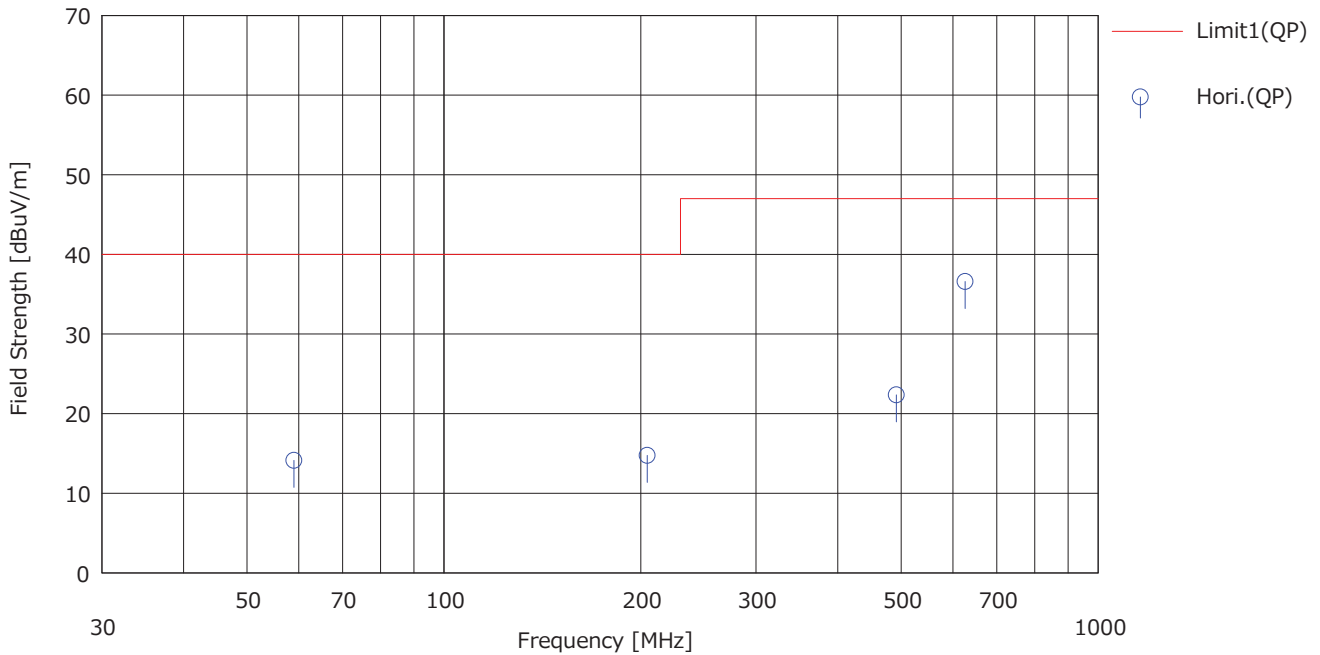
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
 Date : 08/17/2022

Mode : 4.Exclusive battery unit
 Power : DC 7.2 V
 Temp. / Humi. : 26 deg. C / 47 % RH
 Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
Date : 08/17/2022

Mode : 4.Exclusive battery unit
Power : DC 7.2 V
Temp. / Humi. : 26 deg. C / 47 % RH
Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Ant. Type	Comment
		[dBuV]					[dBuV/m]	[dBuV/m]	[dB]			
1	58.982	27.00	9.49	7.68	29.76	-0.28	14.13	40.00	25.87	Hori.	BA	
2	58.983	34.90	9.49	7.68	29.76	-0.28	22.03	40.00	17.97	Vert.	BA	
3	204.352	27.30	11.49	6.71	29.65	0.00	15.85	40.00	24.15	Vert.	LA	
4	204.527	26.20	11.49	6.71	29.65	0.00	14.75	40.00	25.25	Hori.	LA	
5	491.521	25.20	17.79	9.28	29.91	0.00	22.36	47.00	24.64	Hori.	LA	
6	491.523	25.60	17.79	9.28	29.91	0.00	22.76	47.00	24.24	Vert.	LA	
7	626.375	38.10	19.60	10.15	29.96	0.00	37.89	47.00	9.11	Vert.	LA	
8	626.376	36.80	19.60	10.15	29.96	0.00	36.59	47.00	10.41	Hori.	LA	

DATA OF RADIATED DISTURBANCE TEST

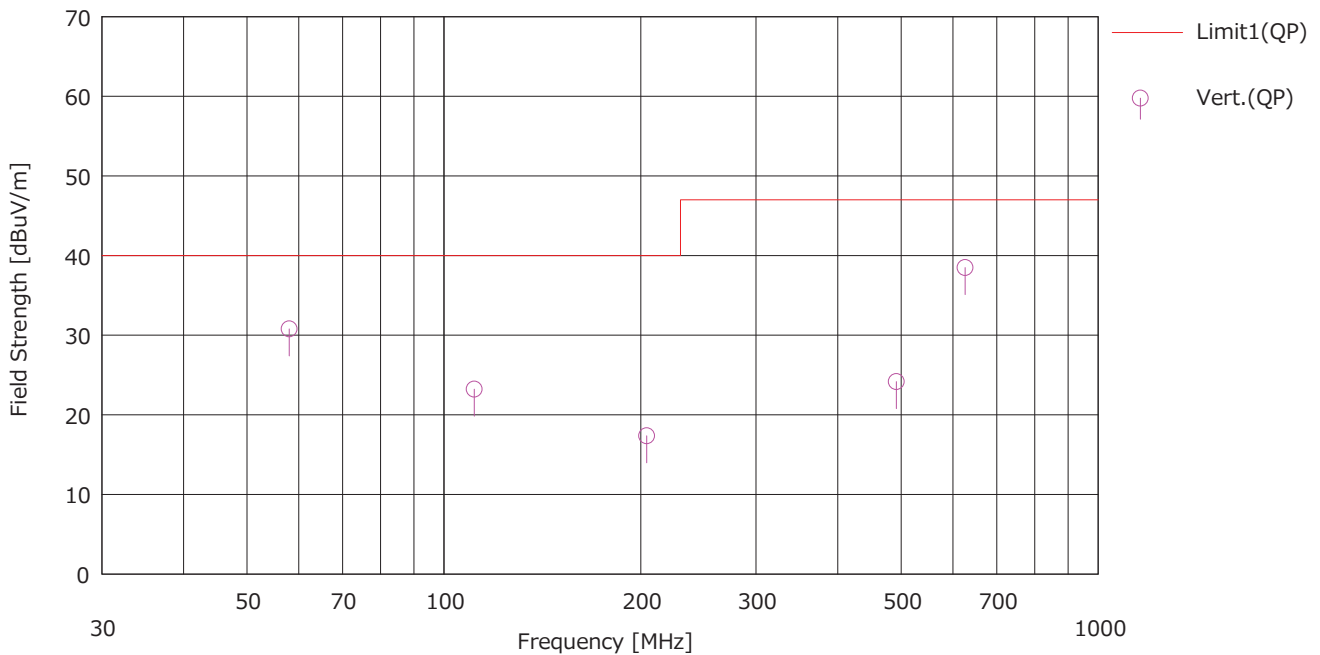
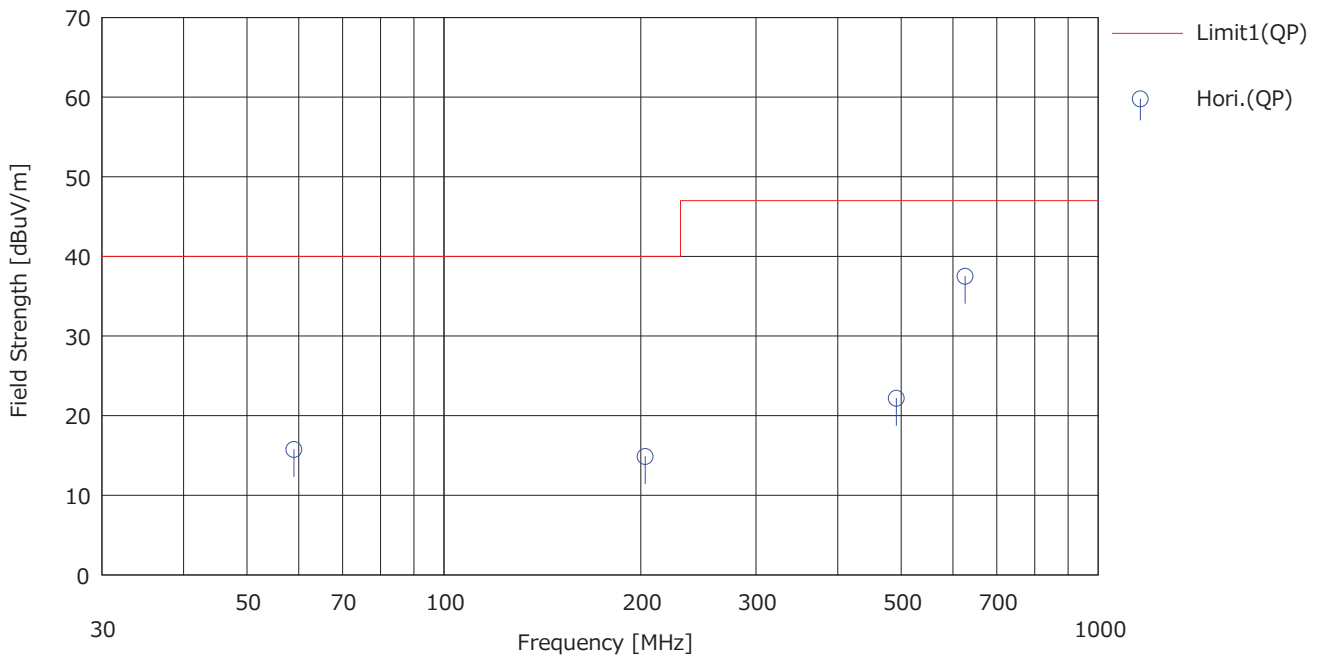
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
 Date : 08/17/2022

Mode : 5.Cigarette socket direct charging
 Power : DC 12 V
 Temp. / Humi. : 26 deg. C / 47 % RH
 Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
Date : 08/17/2022

Mode : 5.Cigarette socket direct charging
Power : DC 12 V
Temp. / Humi. : 26 deg. C / 47 % RH
Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Ant. Type	Comment
		[dBuV]					[dBuV/m]	[dBuV/m]	[dB]			
1	58.019	43.60	9.53	7.66	29.77	-0.23	30.79	40.00	9.21	Vert.	BA	
2	58.982	28.60	9.49	7.68	29.76	-0.28	15.73	40.00	24.27	Hori.	BA	
3	111.298	34.20	10.40	8.45	29.69	-0.14	23.22	40.00	16.78	Vert.	BA	
4	203.112	26.30	11.51	6.70	29.65	0.00	14.86	40.00	25.14	Hori.	LA	
5	204.192	28.80	11.50	6.71	29.65	0.00	17.36	40.00	22.64	Vert.	LA	
6	491.519	25.00	17.79	9.28	29.91	0.00	22.16	47.00	24.84	Hori.	LA	
7	491.519	27.00	17.79	9.28	29.91	0.00	24.16	47.00	22.84	Vert.	LA	
8	626.376	37.70	19.60	10.15	29.96	0.00	37.49	47.00	9.51	Hori.	LA	
9	626.376	38.70	19.60	10.15	29.96	0.00	38.49	47.00	8.51	Vert.	LA	

DATA OF RADIATED DISTURBANCE TEST

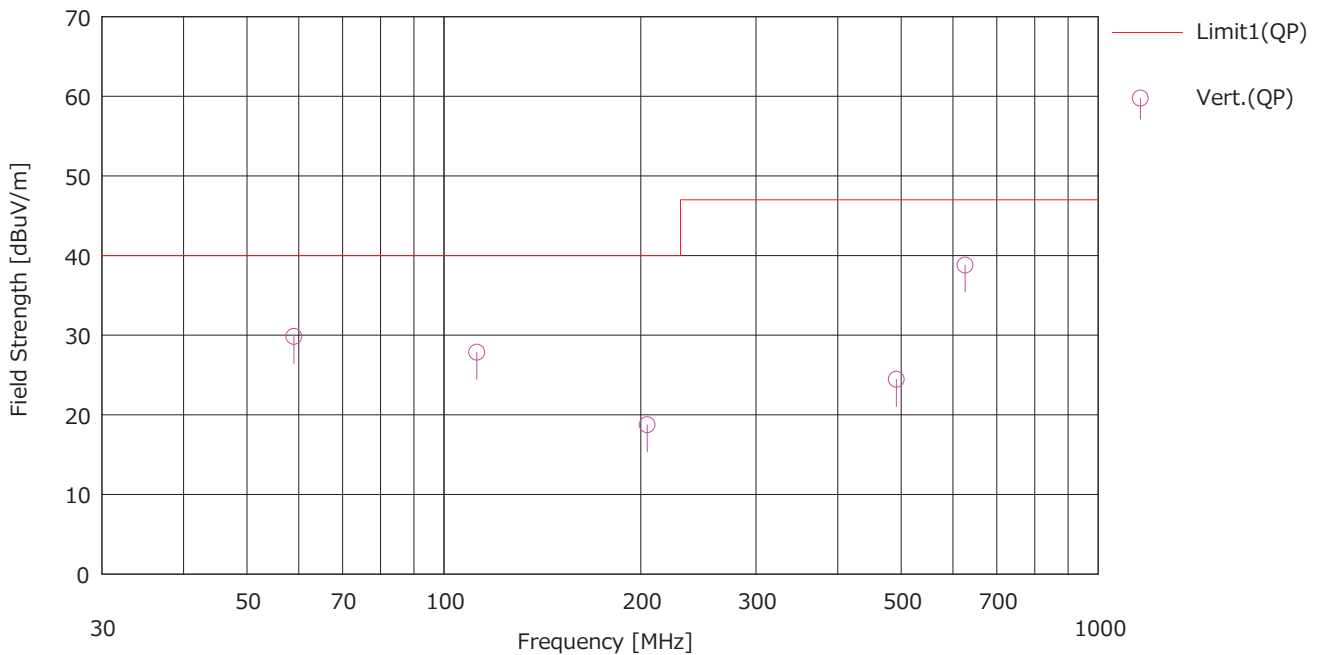
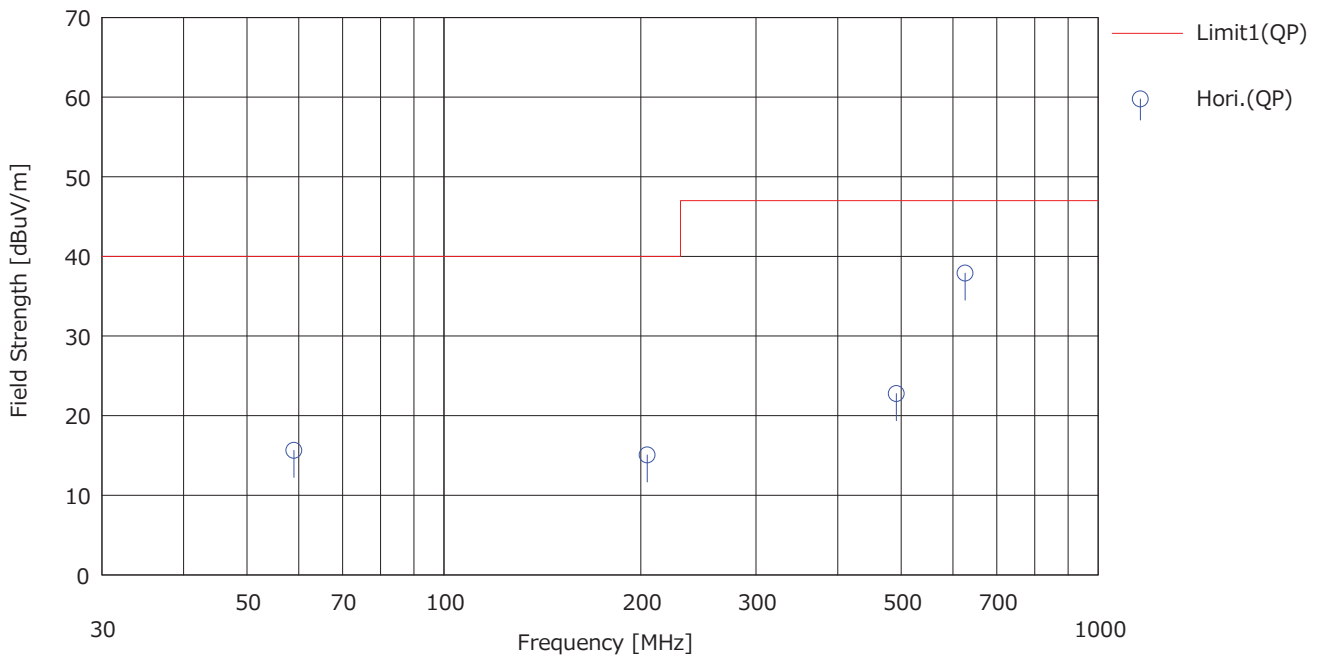
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
 Date : 08/17/2022

Mode : 5.Cigarette socket direct charging
 Power : DC 24 V
 Temp. / Humi. : 26 deg. C / 47 % RH
 Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita



DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site
Date : 08/17/2022

Mode : 5.Cigarette socket direct charging
Power : DC 24 V
Temp. / Humi. : 26 deg. C / 47 % RH
Atmosphere : 1001 hPa

Remarks : -

Limit : EN 55011 Group1 CLASS A (10m)

Engineer : Makoto Kashishita

<< QP DATA >>

No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	S.Fac [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola. [H/V]	Ant. Type	Comment
		[dBuV]					[dBuV/m]	[dBuV/m]	[dB]			
1	58.977	28.50	9.49	7.68	29.76	-0.27	15.64	40.00	24.36	Hori.	BA	
2	58.981	42.70	9.49	7.68	29.76	-0.28	29.83	40.00	10.17	Vert.	BA	
3	112.284	38.80	10.44	8.46	29.69	-0.15	27.86	40.00	12.14	Vert.	BA	
4	204.523	26.50	11.49	6.71	29.65	0.00	15.05	40.00	24.95	Hori.	LA	
5	204.546	30.20	11.49	6.71	29.65	0.00	18.75	40.00	21.25	Vert.	LA	
6	491.518	27.30	17.79	9.28	29.91	0.00	24.46	47.00	22.54	Vert.	LA	
7	491.520	25.60	17.79	9.28	29.91	0.00	22.76	47.00	24.24	Hori.	LA	
8	626.376	39.00	19.60	10.15	29.96	0.00	38.79	47.00	8.21	Vert.	LA	
9	626.376	38.10	19.60	10.15	29.96	0.00	37.89	47.00	9.11	Hori.	LA	



Electrostatic discharge

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.4 Shielded room

Test Mode : 2.Charging tower plug, 4.Exclusive battery unit

Power : AC 230 V / 50 Hz	Date of test. : 8/19/2022
Standard : EN 61326-1	Temp. / Humid. : 22 deg.C / 41 % RH
: EN 61000-4-2	Atmosphere : 1009 hPa
Criterion : B	

Engineer : Hiromichi Nakai

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 Floor Standing (Non-metallic pallet height of 0.1m)

EUT Type : Grounded Ungrounded (*1)

*1 Remained the cable with bleeder resistors(2x470kΩ) on the EUT during the ESD test.
 The enough time interval b/w discharge.
 Touching of the EUT with a grounded brush with bleeder resistors(2x470kΩ) in the grounding cable.
 An air-ionizer.

Contact discharge method(HCP, VCP) : Number of discharges for each polarity at each test point. 10 25

Test Level Polarity		Front		Rear		Right		Left		Top		Bottom		Remarks
		HCP	VCP	HCP	VCP	HCP	VCP	HCP	VCP	HCP	VCP	HCP	VCP	
4.0 kV	+	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
	-	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	
kV	+													
	-													
kV	+													
	-													
kV	+													
	-													

Contact discharge method(Direct) : Number of discharges for each polarity at each test point. 10 25

Test Level Polarity		Test Points						Remarks
4.0 kV	+	Pass						Refer to "Selected test points"
	-	Pass						
kV	+							
	-							
kV	+							
	-							
kV	+							
	-							

Air Discharge method : Number of discharges for each polarity at each test point. 10

Test Level Polarity		Test Points						Remarks
2.0 kV	+	Pass						Refer to "Selected test points"
	-	Pass						
4.0 kV	+	Pass						
	-	Pass						
8.0 kV	+	Pass						
	-	Pass						
kV	+							
	-							

Summary of the test results :

The EUT operated without any recorded disturbance during the test.

Test Result: **Pass** **Fail**



Radio frequency electromagnetic field

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.1 Full-Anechoic chamber

Test Mode : 2.Charging tower plug, 4.Exclusive battery unit
Power : AC 230 V / 50 Hz
Standard : EN 61326-1
 : EN 61000-4-3
Criterion : A

Date of test. : 8/3/2022
Temp. / Humid. : 22 deg.C / 55 % RH
Atmosphere : 1005 hPa

Engineer : Jun Ito

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 : Floor Standing (Non-metallic pallet height of 0.1m)
Frequency step size : 1 %
Dwell time : 3 sec

Freq. Range		80 - 1000 MHz	1400 - 6000 MHz	- MHz	Remarks
Test level		10.0 V/m	3.0 V/m	V/m	
Modulation		<input checked="" type="checkbox"/> AM 80% 1 kHz	<input checked="" type="checkbox"/> AM 80% 1 kHz	<input type="checkbox"/> AM 80% 1 kHz	
		<input type="checkbox"/> Pulse Hz %	<input type="checkbox"/> Pulse Hz %	<input type="checkbox"/> Pulse Hz %	
		<input type="checkbox"/> Unmodulated	<input type="checkbox"/> Unmodulated	<input type="checkbox"/> Unmodulated	
Antenna Height	1.5 m	1.3 m	m		
Distance	2.5 m	3 m	m		
Note					
<input checked="" type="checkbox"/> Front	Hor.	Pass	Pass		
	Ver.	Pass	Pass		
<input checked="" type="checkbox"/> Rear	Hor.	Pass	Pass		
	Ver.	Pass	Pass		
<input checked="" type="checkbox"/> Right	Hor.	Pass	Pass		
	Ver.	Pass	Pass		
<input checked="" type="checkbox"/> Left	Hor.	Pass	Pass		
	Ver.	Pass	Pass		
<input checked="" type="checkbox"/> Top	Hor.	Pass	Pass		Only mode4
	Ver.	Pass	Pass		
<input checked="" type="checkbox"/> Bottom	Hor.	Pass	Pass		Only mode4
	Ver.	Pass	Pass		

Test Result: **Pass** **Fail**



Electrical fast transient/burst

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.6 Shielded room

Test Mode : 2.Charging tower plug
Power : AC 230 V / 50 Hz
Standard : EN 61326-1
 : EN 61000-4-4
Criterion : B

Date of test. : 8/5/2022
Temp. / Humid. : 23 deg.C / 51 % RH
Atmosphere : 999 hPa

Engineer : Takahiro Tanaka

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 Floor Standing (Non-metallic pallet height of 0.1m)
Elevated Ground Plane : Not used Used (*1 Refer to line name)
Duration : 1 min

Line / Injection	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/		<input checked="" type="checkbox"/> CDN	<input type="checkbox"/> Clamp	Remarks
Test level	2 kV				kV	kV	
Repetition rate	5 kHz				kHz	kHz	
Polarity	+ -	+ -	+ -	+ -	+ -	+ -	
N+L	Pass	Pass					
	<input type="checkbox"/> *1						

Line / Injection	<input type="checkbox"/> Signal Line	/		<input type="checkbox"/> Clamp	Remarks
Test level	kV	kV	kV	kV	
Repetition rate	kHz	kHz	kHz	kHz	
Polarity	+ -	+ -	+ -	+ -	
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
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<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					
<input type="checkbox"/> *1					

Summary of the test results :
The EUT operated without any recorded disturbance during the test.

Test Result: Pass Fail



Surge

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.6 Shielded room

Test Mode : 2.Charging tower plug
Power : AC 230 V / 50 Hz
Standard : EN 61326-1
 : EN 61000-4-5
Criterion : B

Date of test. : 8/5/2022
Temp. / Humid. : 23 deg.C / 51 % RH
Atmosphere : 999 hPa

Engineer : Takahiro Tanaka

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 : Floor Standing (Non-metallic pallet height of 0.1m)

Number of surge pulses : 5
Repetition rate : 60 sec

Test level		kV		kV		kV		kV		Remarks
Polarity		+	-	+	-	+	-	+	-	
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	Async									
	Async									
	Async									

Test level		0.5 kV		1.0 kV		kV		kV		Remarks
Polarity		+	-	+	-	+	-	+	-	
L1-N	0 deg.	Pass	Pass	Pass	Pass					
	90 deg.	Pass	Pass	Pass	Pass					
	180 deg.	Pass	Pass	Pass	Pass					
	270 deg.	Pass	Pass	Pass	Pass					
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	Async									
	Async									

Summary of the test results :
The EUT operated without any recorded disturbance during the test.

Test Result: **Pass** **Fail**



Conducted disturbances, induced by radio frequency fields

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.6 Shielded room

Test Mode : 2.Charging tower plug
Power : AC 230 V / 50 Hz
Standard : EN 61326-1
 : EN 61000-4-6
Criterion : A
Date of test. : 8/5/2022
Temp. / Humid. : 23 deg.C / 51 % RH
Atmosphere : 999 hPa
Engineer : Takahiro Tanaka

EUT Setup : Floor Standing (Non-metallic pallet height of 0.1m)
Elevated Ground Plane : Not used Used (*1 Refer to line name)
Frequency step size : 1 %
Dwell time : 3 sec

Freq. Range	0.15 - 80 MHz	- MHz	- MHz	Remarks
Test level	3 V	V	V	
Modulation	<input checked="" type="checkbox"/> AM 80% 1 kHz	<input type="checkbox"/> AM 80% 1 kHz	<input type="checkbox"/> AM 80% 1 kHz	
	<input type="checkbox"/> Pulse Hz %	<input type="checkbox"/> Pulse Hz %	<input type="checkbox"/> Pulse Hz %	
	<input type="checkbox"/> Unmodulated	<input type="checkbox"/> Unmodulated	<input type="checkbox"/> Unmodulated	
Note				
AC Mains <input type="checkbox"/> *1	Pass			<input checked="" type="checkbox"/> CDN M2 <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp
<input type="checkbox"/> *1				<input type="checkbox"/> CDN _____ <input type="checkbox"/> EM Clamp

Test Result: Pass Fail



Power frequency magnetic field

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.4 Shielded room

Test Mode : 2.Charging tower plug, 4.Exclusive battery unit
Power : AC 230 V / 50 Hz
Standard : EN 61326-1
 : EN 61000-4-8
Criterion : A

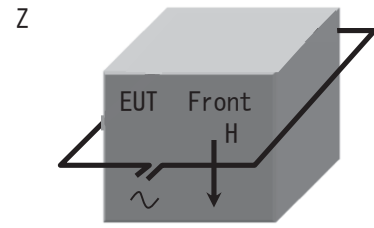
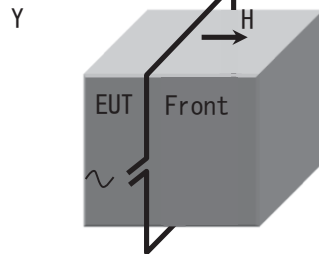
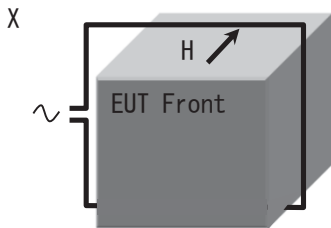
Date of test. : 8/4/2022
Temp. / Humid. : 21 deg.C / 42 % RH
Atmosphere : 998 hPa

Engineer : Takahiro Tanaka

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 Floor Standing (Non-metallic pallet height of 0.1m)
Induction Coil : Single Coil Helm Holtz Coil
Duration : 60 sec

Test level	30 A/m	A/m	A/m	A/m	Remarks
Frequency	<input checked="" type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	<input type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	<input type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	<input type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	
X	Pass				
Y	Pass				
Z	Pass				

Direction of induction coil



Test Result: Pass Fail



Voltage dips & Short interruptions

UL Japan, Inc. Yokowa EMC Lab.
Test Room : No.5 Shielded room

Test Mode : 2.Charging tower plug	Date of test. : 8/5/2022
Power : See Data	Temp. / Humid. : 23 deg.C / 51 % RH
Standard : EN 61326-1	Atmosphere : 999 hPa
: EN 61000-4-11	
Criterion : Refer to following table.	

Engineer : Takahiro Tanaka

EUT Setup : Table Top (Non-metallic table height of 0.8m)
 : Floor Standing (Non-metallic pallet height of 0.1m)

Number of events : 3

Intervals : 10 sec

Test level (Ut)	Voltage dips						Short interruptions		Remarks
	0 %		40 %		70 %		0 %		
Performance Criteria	B		C		C		C		
Duration <input checked="" type="checkbox"/> 50Hz <input type="checkbox"/> 60Hz	1 Periods		10 Periods		25 Periods		250 Periods		
Phase (degree)	0deg. 180deg.		0deg. 180deg.		0deg. 180deg.		0deg. 180deg.		
<input checked="" type="checkbox"/> L1-N	100 V	Pass	Pass	Pass	Pass	Pass	Pass		
	240 V	Pass	Pass	Pass	Pass	Pass	Pass		
<input type="checkbox"/> L2-N	V								
	V								
<input type="checkbox"/> L3-N	V								
	V								
<input type="checkbox"/> L1-L2	V								
	V								
<input type="checkbox"/> L2-L3	V								
	V								
<input type="checkbox"/> L3-L1	V								
	V								
<input type="checkbox"/> All the three phases	V								
	V								

Test level (Ut)	Voltage dips						Short interruptions		Remarks
	0 %		40 %		70 %		0 %		
Performance Criteria	B		C		C		C		
Duration <input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz	1 Periods		12 Periods		30 Periods		300 Periods		
Phase (degree)	0deg. 180deg.		0deg. 180deg.		0deg. 180deg.		0deg. 180deg.		
<input checked="" type="checkbox"/> L1-N	100 V	Pass	Pass	Pass	Pass	Pass	Pass		
	240 V	Pass	Pass	Pass	Pass	Pass	Pass		
<input type="checkbox"/> L2-N	V								
	V								
<input type="checkbox"/> L3-N	V								
	V								
<input type="checkbox"/> L1-L2	V								
	V								
<input type="checkbox"/> L2-L3	V								
	V								
<input type="checkbox"/> L3-L1	V								
	V								
<input type="checkbox"/> All the three phases	V								
	V								

Summary of the test results :
It was returned to normal operation after the test.

Test Result: **Pass** **Fail**

APPENDIX 3

Test Instruments

***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

- CE : Conducted disturbance**
- RE : Radiated disturbance**
- ESD : Electrostatic discharge**
- RS : Radio-frequency electromagnetic field**
- FTB : Electrical fast transient/burst**
- SG : Surge**
- CS : Radio-frequency conducted disturbances**
- MF : Power frequency magnetic field**
- DIP : Voltage dips and short interruptions**

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
ESD	ES25-01	147250	ESD Horizontal Coupling Plate	JSE	N/A	N/A	-	-
ESD	ES25-02	147284	ESD Horizontal Coupling Plate	JSE	N/A	N/A	-	-
ESD	ES25-05	147286	ESD Vertical Coupling Plate With Stand	JSE	N/A	N/A	-	-
ESD	ES25-09	147071	ESD Resistor cable	UL Japan	N/A	N/A	-	-
ESD	ES01-04	154816	ESD Simulator	TESEQ Inc (Ametek)	NSG435	7163	2022/07/11	12
ESD	ES25-15	147290	ESD Removal Brush	STAC & OPTIK / JAPAN FINECHEM	STAC 71/ RH4HVPS	-	-	-
RE	TR-12	146893	EMI Test Receiver	Rohde & Schwarz	ESU 26	100413	2021/09/10	12
RE	DM-02	146648	Tester	SANWA	PC500	7019227	2022/06/14	12
RE	YJM-21	176229	Measure	Shinwa Sokutei	80814	-	-	-
RE	OS-36	197155	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	510Q05R-6	2022/03/09	12
RE	AF-03	146611	Pre Amplifier	Anritsu Corporation	MH648A	M97457	2022/07/20	12
RE	AT-02	146625	Attenuator	Anritsu Corporation	MP721A	6200239014	2022/07/20	12
RE	AT-40	146572	Attenuator	Anritsu Corporation	MP721B	6201150481	2022/07/20	12
RE	CC-2ORC	146806	Yokowa No.2 open coaxial(0.1-1000MHz)	UL Japan	CC-21,CC-22,CC-24,CC-25,CC-27,SW-21,SW-22	YO0201	2021/09/09	12
RE	YOATS-02(NSA)	146944	Open area test site	JSE	3m, 10m	2	2022/06/02	12

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	BA-14	159920	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHBB 9124 + BBA 9106	9124-1022	2022/03/12	12
RE	LA-15	146964	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	185	2022/03/12	12
DIP	YBM-02	212058	Barometer	Sanoh Co., Ltd	SBR121	003673	2021/11/10	36
DIP	YJM-20	169600	Measure	TAJIMA	SFGLM25-55	-	-	-
DIP	OS-28	146985	Thermo-Hygrometer	Baumer	CTH-201	C11Q01	2022/01/10	12
CS	ES22-01	151205	Signal Generator	Rohde & Schwarz	SMB100A	113788	2021/11/25	12
CS	ES03-18	146787	Wide Band RF Amplifier	PRANA	DP70D	1609-1927	2021/10/20	12
CS	ES05-04	146862	Power Meter	Rohde & Schwarz	NRVS	843537/027	2021/11/24	12
CS	ES05-06	146864	Power Meter	Rohde & Schwarz	NRVS	100218	2021/11/24	12
CS	APINU04	146538	Insertion unit	Rohde & Schwarz	URV5-Z4	51450028	2021/11/24	12
CS	ES12-02	146671	Insertion unit	Rohde & Schwarz	URV5-Z4	100151	2021/11/16	12
CS	AT-45	146777	Attenuator	JFW Industries, Inc.	50FH-006-100 N	ATT-JFW-01	2021/10/22	12
CS	COTS-YW-CS2-TSJ	146921	CS Test Software	TSJ (Techno Science Japan)	TEPTO-CS2	-	-	-
FTB	ES15-01-EFTB	146687	EMC Test System	TESEQ Inc (Ametek)	NSG3040	1682	2021/11/02	12
SG	ES15-01-SG	146688	EMC Test System	TESEQ Inc (Ametek)	NSG3040	1682	2021/11/02	12

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CS	YCDN-01	173485	Coupling decoupling network	TESEQ Inc (Ametek)	CDN M016	51061	2021/10/22	12
DIP	ES15-01-DIP	146680	EMC Test System	TESEQ Inc (Ametek)	NSG3040	1682	2022/01/27	12
DIP	ES19-10	146703	Manual Step Transformer	TESEQ Inc (Ametek)	INA6501	179	2022/01/27	12
FTB SG CS	OS-35	197080	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	510Q05R-5	2022/03/09	12
FTB SG CS DIP	DM-06	146650	Tester	SANWA	PC500	7019239	2022/06/14	12
FTB SG CS	YJM-6SR	214298	Measure	Shinwa Sokutei	80814	-	-	-
ESD MF	OS-31	146993	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	510Q05R-3	2022/03/09	12
MF	ES18-01	147233	Magnetic Antenna	UL Japan	-	-	-	-
MF	ES18-02	146908	Magnetic Antenna Power Supply	UL Japan	-	-	2021/12/15	12
MF	ES17-06	146697	Magnetic Field Logger	F.W.BELL	4080	40800101	2021/10/12	12
ESD RS MF	YBM-01	212013	Barometer	Sanoh Co., Ltd	SBR121	003668	2021/11/10	36
ESD RS MF	DM-11	152179	Digital Multimeter	SANWA	PC7000	16115100494	2022/03/09	12
ESD RS MF	YJM-19	169599	Measure	KDS	ESS19-55NKM	-	-	-
RS	OS-30	146735	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	510Q05R-2	2022/03/09	12
RS	RSSG-1A02	156807	Signal Generator	Keysight Technologies Inc	N5171B	MY51350065	2021/10/14	12

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RS	YEMS01-06	159972	Isotropic field Probe	ETS-Lindgren (Cedar Park, Texas)	HI-6006	00214006	2021/09/21	12
RS	YAEC-01	146794	Full-anechoic chamber	JSE	Full 3m	1	2022/06/24	12
RS	COTS-YW-RS-TSJ	168881	EMS measurement program	TSJ (Techno Science Japan)	TEPTO-DV(RS)	-	-	-
RS	ES03-16	146803	Wide Band RF Amplifier	PRANA	AP32 LT235	0807-883	2022/06/17	12
RS	ES05-05	146863	Power Reflection meter	Rohde & Schwarz	NAP	842668/043	2022/07/27	12
RS	ES07-05	147209	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VULP9118-E	710	-	-
RS	ES08-04	146661	Power sensor	Rohde & Schwarz	NAP-Z6	838416/008	2022/07/27	12
RS	YEMS01-01	168883	Stacked Microwave Log.-Per. Antenna	Schwarzbeck Mess-Elektronik OHG	STLP9149	00515	-	-
RS	YEMS01-02	160037	BROADBAND AMPLIFIER D200	Rohde & Schwarz	BBA150	102644	2022/06/17	12
RS	YEMS01-03	160038	BROADBAND AMPLIFIER E100	Rohde & Schwarz	BBA150	102645	2022/06/17	12
RS	YEMS01-05	159177	Dual Directional Coupler	WERLATONE INC.	C10117-10	113202	2021/09/02	12
RS	PM-01	146738	Power Meter	Hewlett Packard	EPM-442A	GB37170361	2021/12/16	12
RS	PS-01	146995	Power sensor	Hewlett Packard	ECP-E18A	US37181065	2021/12/16	12
RS	PS-02	146740	Power sensor	Hewlett Packard	ECP-E18A	US37181073	2021/12/16	12
RE	AT-25	146574	Attenuator	Anritsu Corporation	MP721A	6200543685	2022/07/20	12

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	AT-30	146577	Attenuator	Anritsu Corporation	MP721B	6200749339	2022/07/20	12
RE	BA-12	146831	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	BBA9106	VHA91032273	2022/04/16	12
RE	LA-14	146963	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	184	2022/04/16	12
RE	CTR-02	144194	Test Receiver	Rohde & Schwarz	ESCI	100601	2021/09/22	12
RE	DM-01	146647	Tester	SANWA	PC500	7019221	2022/06/14	12
RE	SC-03	147518	Search Coil	UL Japan	-	-	-	-
RE	OS-07	146989	Digital Humidity Indicator	SATO	PC-5000TRH-II	05A06	2022/01/10	12
RE	AF-01	146610	Pre Amplifier	Hewlett Packard	8447D	2443A04060	2022/03/11	12
RE	CC-3ORC	146807	Yokowa No.3 open coaxial(0.01-1000MHz)	Fujikura,HP,Mini-Circuits,Fujikura	CC-31,CC-32,CC-34,CC-35,CC-36,CC-37,SW-31,SW-32	YO0301	2022/06/17	12
RE	YOATS-03(NSA)	146999	Open area test site	JSE	3m、10m	3	2021/10/04	12
CE	TR-13	151197	EMI Test Receiver	Rohde & Schwarz	ESW26	101287	2021/09/24	12
CE RE	COTS-YW-EMI-TSJ	146923	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
CE	DM-03	146649	Tester	SANWA	PC500	7019229	-	-
CE RE	YJM-3S	214297	Measure	Shinwa Sokutei	80814	-	-	-
CE RE FTB SG CS	BM-1A01	146833	Barometer	Sanoh Co., Ltd	SBR121	002347	2021/09/09	36

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	CC-3S	146876	Yokowa No.3 shield coaxial(0.01-1000MHz)	UL Japan	CC-34,CC-35,CC-37,CC-38,SW-31,SW-32	YS0301	2022/03/11	12
CE	OS-27	146992	Digital Humidity Indicator	SATO	PC-5000TRH-II	04A12	2022/01/10	12
CE	LS-13	146974	LISN (AMN)	Rohde & Schwarz	ENV216	101058	2021/09/03	12

End of Report