EMC TEST REPORT

Test report No.: 12777555S-A

Applicant	:	**LEA Professional**
Type of Equipment	:	**Pro audio amplifier**
Model No.	:	**704D**
Test standard	:	**EN 301 489-1 V2.1.1** **EN 301 489-17 V3.1.1**
Test item	:	**Electrostatic discharge, Radio-frequency electromagnetic field, Electrical fast transient/burst, Surge, Radio-frequency conducted disturbances, Voltage dips and voltage interruptions**
Test result	:	**Complied (Refer to Section 3.2)**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above standard.
4. The test results in this test report are traceable to the national or international standards.
5. This test report covers EMC technical requirements.
   It does not cover administrative issues such as Manual or non-EMC test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
7. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
8. The information provided from the customer for this report is identified in Section 1.

Date of test:

February 4 to July 15, 2020

Representative test engineer:

M. Ozaki

Masahide Ozaki
Engineer
Consumer Technology Division

Approved by:

H. Shirasawa

Hikaru Shirasawa
Engineer
Consumer Technology Division

Testing LAB
RTL02610

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

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REVISION HISTORY

Original Test Report No.: 12777555S-A

Revision	Test report No.	Date	Page revised	Contents
-(Original)	12777555S-A	August 26, 2020	-	-

Reference: Abbreviations (Including words undescribed in this report)

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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	LEA Professional
Address	:	635 S Lafayette Blvd Building 113 Suite 109, South Bend IN 46601, USA
Telephone Number	:	+1-574-286-1519
Contact Person	:	Jeremy Bules

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No. 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	:	Pro audio amplifier
Model No.	:	704D
Serial No.	:	Refer to SECTION 4, SECTION 4.2
Rating	:	AC 100 V – 240 V, 50/60 Hz
Receipt Date of Sample	:	January 31, 2020 (S/N: 296190140)
(Information from test lab.)		April 23, 2020 (S/N: 326190012)
Country of Mass-production	:	Costa Rica
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: 704D (referred to as the EUT in this report) are Pro audio amplifier.

Similar models to the EUT: 702, 702D, 704, 352, 352D, 354, 354D
* D = DANTE ports added
* The third digit references either 2 = two channel, 4 = four channel

General Specification

Clock frequency(ies) in the system : 400 MHz

Radio Specification

WLAN

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2472 MHz
Modulation	:	DSSS, OFDM
Antenna type	:	External
Antenna Gain	:	2 dBi
Operating Temperature	:	0 deg. C to +60 deg. C

SECTION 3: Test specification, procedures and results

3.1 Test specification

EMI & EMS

Test specification	:	EN 301 489-1 V 2.1.1
Title	:	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
Test specification	:	EN 301 489-17 V3.1.1
Title	:	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
Purpose of Test	:	Compliance with the RE directive 2014/53/EU

3.2 Procedures and results

EMS

Item	Test Procedure	Specification	Criteria	Actual Performance	Result
Electrostatic discharge	EN 61000-4-2:2009	Enclosure port: Contact: ±4 kV Air: ±8 kV	B, TT&TR	Enclosure port: Contact: ±4 kV Air: ±2 kV, ±4 kV, ±8 kV	Complied a)
Radio-frequency electromagnetic field	EN 61000-4-3:2006 +A1:2008+A2:2010	Enclosure port: 80 MHz - 6000 MHz: 3 V/m (unmodulated, r.m.s.) 80 % AM, 1 kHz	A, CT&CR	Enclosure port: 80 MHz - 6000 MHz: 3 V/m (unmodulated, r.m.s.) 80 % AM, 1 kHz *1)	Complied b)
Electrical fast transient/burst	EN 61000-4-4:2012	AC mains port: ±1 kV Signal/ Wired network lines: ±0.5 kV (5/50 ns, 5 kHz)	B, TT&TR	AC mains port: ±1 kV Signal/ Wired network lines: ±0.5 kV (5/50 ns, 5 kHz)	Complied c)
Surge	EN 61000-4-5:2014	AC Mains ±2 kV (line to ground) ±1 kV (line to line) 1.2/50 us (8/20 us)	B, TT&TR	AC Mains ±0.5 kV, ±1 kV, ±2 kV (line to ground) ±0.5 kV, ±1 kV (line to line) 1.2/50 us (8/20 us)	Complied d)
		Wired network port (outdoor cables, symmetrically operated): ±1 kV (line to ground) 10/700 us Wired network port (outdoor cables, unsymmetrically operated): ±1 kV (line to ground) ±0.5 kV (line to line) 1.2/50 us Wired network port (indoor cables): ±0.5 kV (line to ground) 1.2/50 us	B, TT&TR	Wired network port (indoor cables): ±0.5 kV (line to ground) 1.2/50 us	Complied d)
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, CT&CR	0.15 MHz - 80 MHz 3 V (unmodulated, r.m.s.) 80 % AM, 1 kHz	Complied e)
Voltage dips and voltage interruptions	EN 61000-4-11:2004	Residual / Cycle			Complied f)
		0 % / 0.5, 1.0 cycles (dips)	B, TT&TR	0 % / 0.5, 1.0 cycles (dips)	
		70 % / 25 cycles (dips)	B, TT&TR	70 % / 25 cycles (dips) *2)	
		0 % / 250 cycles (interruptions)	C, TT&TR	0 % / 250 cycles (interruptions)	

Note: UL Japan's EMS Work Procedures No. 13-EM-W0417
*1) 2280 MHz to 2603.5 MHz: The exclusion band for equipment operating in the 2.4 GHz band (clause 4.3 of EN 301 489-17)
*2) The test has been declared as pass by the customer.
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)
e) Refer to Appendix 2 (data of Radio-frequency conducted disturbances)
f) Refer to Appendix 2 (data of Voltage dips and voltage interruptions)

3.3 Deviation from standards

Test Item	Normative references	Actually applied
Surge	EN 61000-4-5: 2006	EN 61000-4-5:2014
Radio-frequency conducted disturbances	EN 61000-4-6: 2009	EN 61000-4-6:2014

Other than above, no addition, deviation nor exclusion has been made from standards

3.4 Performance criteria

The performance criteria are:

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature;
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Performance table (clause 6.2, in EN 301 489-17)

Criteria	During test	After test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more) May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more)	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).

NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.
If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria for Continuous phenomena applied to Transmitters (CT) (clause 6.3, in EN 301 489-17)
The performance criteria A shall apply.
Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Transmitters (TT) (clause 6.4, in EN 301 489-17)
The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration, for which performance criteria C shall apply.
Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied to Receivers (CR) (clause 6.5, in EN 301 489-17)
The performance criteria A shall apply.
Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied to Receivers (TR) (clause 6.6, in EN 301 489-17)
The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000 ms duration for which performance criteria C shall apply.
Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

3.5 Confirmation

UL Japan, Inc. hereby confirms that E.U.T., in the configuration tested, complies with the specifications EN 301 489-17 V3.1.1 and EN 301 489-1 V2.1.1 for tested item.

3.6 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

EMS
These tests are qualitative tests and uncertainties do not apply directly to the results.
The uncertainty of the EMS testing of the laboratory is within the tolerance specified by the each standard.

3.7 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3 Megumigaoka Hiratsuka-shi Kanagawa-ken 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10 m
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10 m
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5 m
No.4 Semi-anechoic chamber	8.1 x 5.1 x 3.55

Test room	Width x Depth x Height (m)
No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 shielded room	6.3 x 4.7 x 2.7
No.4 Shielded room	4.4 x 4.7 x 2.7
No.5 Shielded room	7.8 x 6.4 x 2.7
No.6 Shielded room	7.8 x 6.4 x 2.7
No.7 Shielded room	2.76 x 3.76 x 2.4
No.8 Shielded room	3.45 x 5.5 x 2.4
No.1 Measurement room	2.55 x 4.1 x 2.5

3.8 Test setup, data of EMI / EMS test and test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

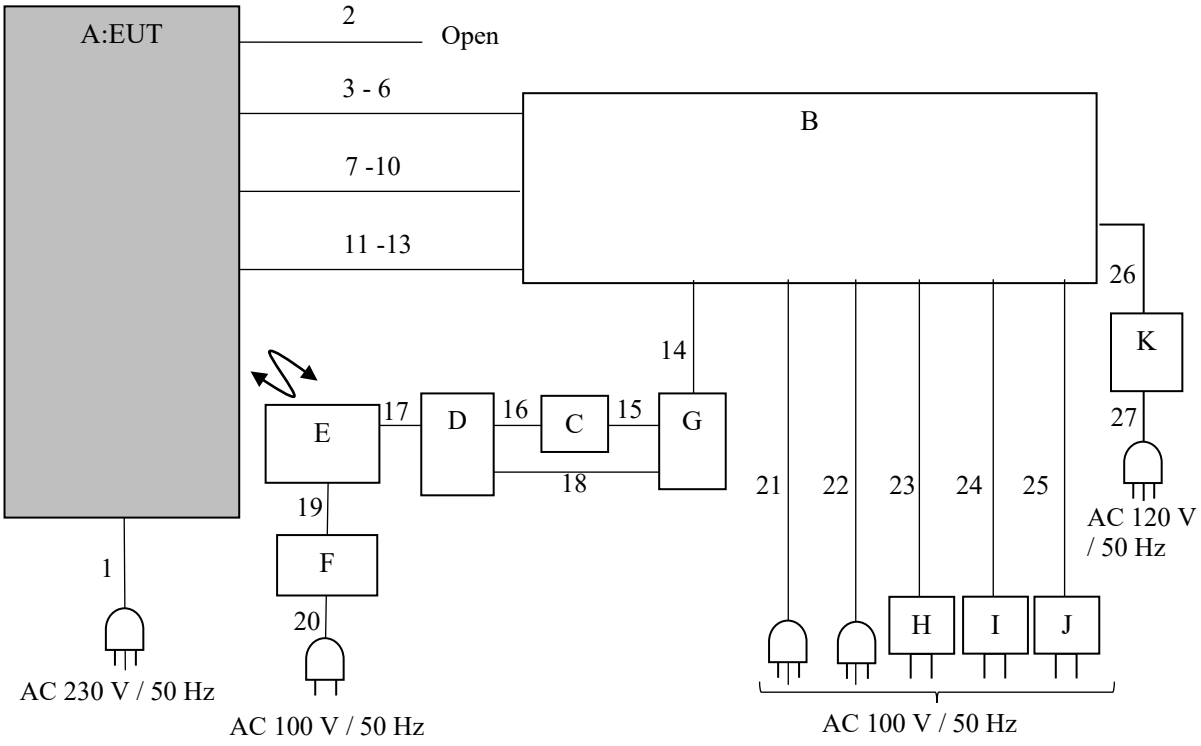
The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test sequence is used: WLAN Communication mode
Standby mode

Software: Firmware Version 1.0.0.4
Firmware Version 1.1.1.1 *1) Used for Surge test.

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Pro audio amplifier	704D	296190140 326190012 *1)	LEA Professional	EUT
B	AE Box	-	-	-	-
C	USB LAN Adaptor	USB31000S	190614013037	StartTechcom	-
D	USB Hub	-	-	SABRENT	-
E	Laptop Computer	P82G	8LGT6Y2	Dell	-
F	AC Adaptor	HA45NM180	CN-01J12J-CH200-96S-06W6-A01	Dell	-
G	Mini Smart Router	GL-MT300N-V2	89fd8deec9c16999	GL.iNet	-
H	AC Adaptor	ZDA240100US	-	Radio Design Labs	-
I	AC Adaptor	SMI36-12	-	CUI INC	-
J	AC Adaptor	SMI36-12	-	CUI INC	-
K	Function / Arbitrary Waveform Generator	33120A	MY40003557	Agilent Technologies	-

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	AC	1.7	Unshielded	Unshielded	-
2	I/O	12.7	Shielded	Shielded	-
3	CH1	15.2 1.6 *1)	Unshielded	Unshielded	-
4	CH2	15.2 1.6 *1)	Unshielded	Unshielded	-
5	CH3	15.2 1.6 *1)	Unshielded	Unshielded	-
6	CH4	15.2 1.6 *1)	Unshielded	Unshielded	-
7	IN1	15.2 1.5 *1)	Shielded	Shielded	-
8	IN2	15.2 1.5 *1)	Shielded	Shielded	-
9	IN3	15.2 1.5 *1)	Shielded	Shielded	-
10	IN4	15.2 1.5 *1)	Shielded	Shielded	-
11	LAN	15.2 1.5 *1)	Unshielded	Unshielded	-
12	LAN(Primary)	15.2 1.5 *1)	Unshielded	Unshielded	-
13	LAN(Secondary)	15.2 1.5 *1)	Unshielded	Unshielded	-
14	LAN	15.2	Unshielded	Unshielded	-
15	LAN	0.3	Shielded	Shielded	-
16	USB	0.1	Shielded	Shielded	-
17	USB	0.4	Shielded	Shielded	-
18	USB	0.7	Shielded	Shielded	-
19	DC	1.7	Unshielded	Unshielded	-
20	AC	0.8	Unshielded	Unshielded	-
21	AC	1.1	Unshielded	Unshielded	-
22	AC	1.1	Unshielded	Unshielded	-
23	DC	1.1	Unshielded	Unshielded	-
24	DC	1.2	Unshielded	Unshielded	-
25	DC	1.2	Unshielded	Unshielded	-
26	BNC	0.7	Shielded	Shielded	-
27	AC	1.8	Unshielded	Unshielded	-

*1) Used for Surge test.

SECTION 5: Electrostatic discharge

5.1 Operating environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

5.2 Test configuration

The EUT was placed on the 0.5 mm thick insulating support above the horizontal coupling plane (HCP) in size of 1.6 m × 0.8 m that was set on a wooden table height of 0.8 m on the reference ground plane.
Photographs of the set up are shown in APPENDIX 1.

5.3 Test conditions

Test levels	:	±4 kV for indirect discharge ±2 kV, ±4 kV and ±8 kV for air discharge
Performance criterion	:	B, TT&TR
Number of discharges	:	Total 20 times (10 times for each polarity and on each test point for indirect and direct discharge.) Total 20 times (10 times for each polarity and on each test point for air discharge, when discharged.)
EUT position	:	Table top

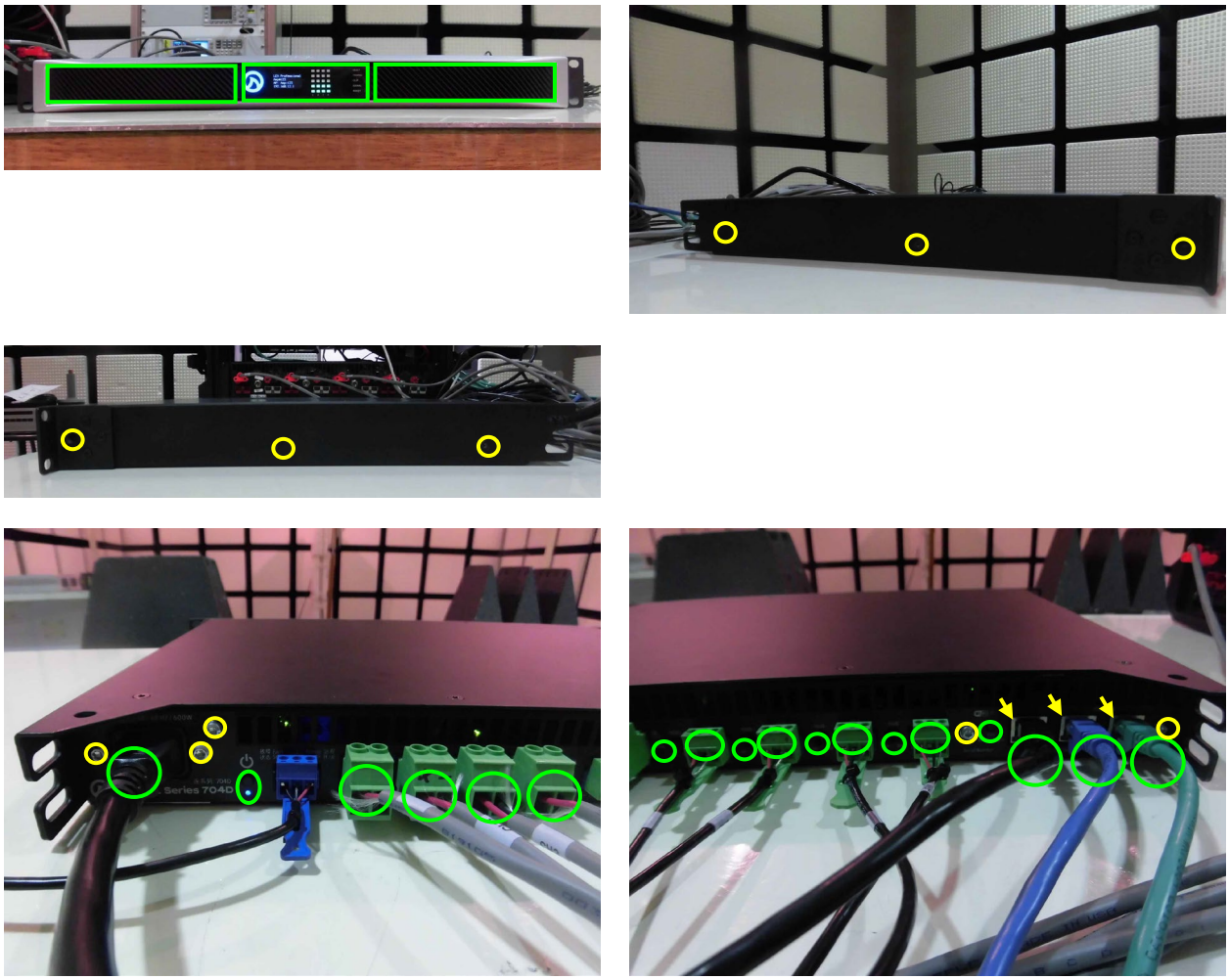
5.4 Test procedure

The performance of the EUT was monitored continuously.
The selected test points are found in Figure 1.

5.5 Results

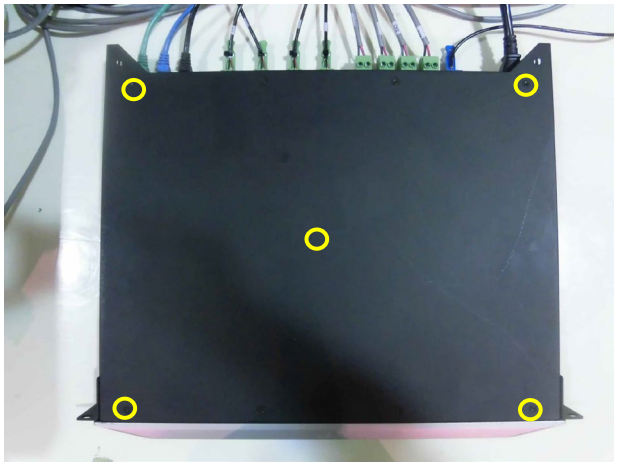
Summary of the test results : Pass
Refer to APPENDIX 2.

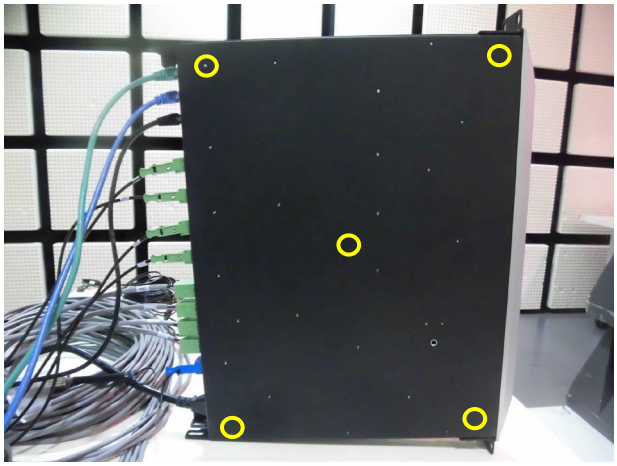
Figure 1. Selected test points for Electrostatic discharge (1/2)



Yellow: Direct discharge
Green: Air discharge

Selected test points for Electrostatic discharge (2/2)





Yellow: Direct discharge
Green: Air discharge

SECTION 6: Radio-frequency electromagnetic field

6.1 Operating environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

6.2 Test configuration

The EUT was placed on a non-metallic table height of 0.8 m with the mains cable placed horizontally.
Photographs of the set up are shown in APPENDIX 1.

6.3 Test condition

Frequency range	:	80 MHz - 1000 MHz, 1000 MHz - 6000 MHz
Test level	:	3 V/m
Modulation	:	80 % AM (1 kHz)
Performance criterion	:	A, CT&CR
Frequency step size	:	1 %
Dwell time	:	2 sec.
Field orientation	:	Horizontal and Vertical
Antenna	:	Logperiodic antenna (80 MHz - 1000 MHz) Horn antenna (1000 MHz - 6000 MHz)
Antenna distance	:	2.5 m (80 MHz - 1000 MHz), 3 m (1000 MHz - 2700 MHz), 2 m (2700 MHz - 6000 MHz)
Antenna height	:	1.55 m (80 MHz - 1000 MHz), 1.55 m (1000 MHz - 6000 MHz)
EUT position	:	Table top

6.4 Generation of the electromagnetic field

The electromagnetic field is generated from a signal generator controlled by a computer.
The output power is amplified and then radiated from logperiodic antenna and Horn Antenna.
At every test frequency the field strength is checked prior to the actual test by placing the field sensor at the same distance from and in the same relative location to, the field generating antenna, as will be used by the EUT.

6.5 Test procedure

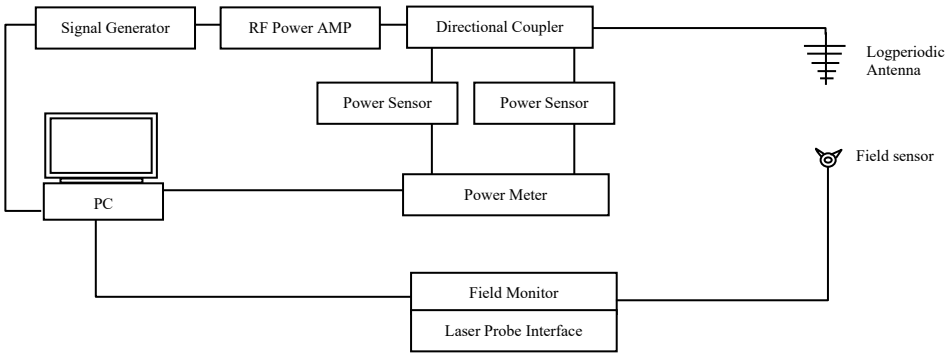
During test, the verification of performance was established by monitoring the EUT with a video camera.
The test was covered the complete frequency span; two polarization and specified sides of the EUT facing the antenna.

6.6 Results

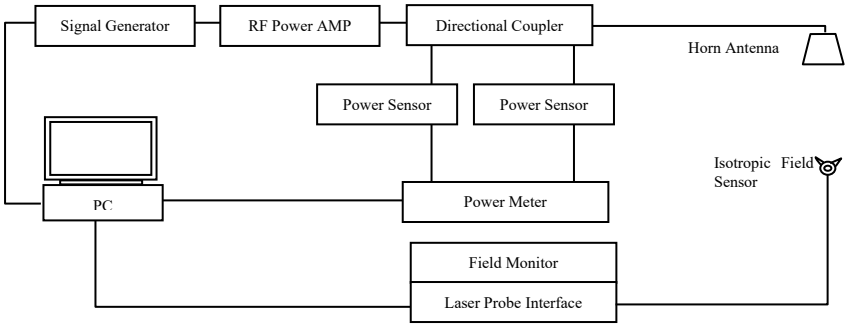
Summary of the test results : Pass
Refer to APPENDIX 2.

Figure 2. Test System

Frequency range: below 1 GHz



Frequency range: above 1 GHz



Tested Frequency List: 80 MHz -1000 MHz (1% Step)

80.000	102.582	131.539	168.681	216.305	277.386	355.714	456.163	584.982	750.187	962.052
80.800	103.607	132.854	170.367	218.468	280.159	359.271	460.724	590.831	757.688	971.672
81.608	104.643	134.182	172.070	220.652	282.960	362.863	465.331	596.739	765.264	981.388
82.424	105.689	135.523	173.790	222.858	285.789	366.491	469.984	602.706	772.916	991.201
83.248	106.745	136.878	175.527	225.086	288.646	370.155	474.683	608.733	780.645	1000.000
84.080	107.812	138.246	177.282	227.336	291.532	373.856	479.429	614.820	788.451	
84.920	108.890	139.628	179.054	229.609	294.447	377.594	484.223	620.968	796.335	
85.769	109.978	141.024	180.844	231.905	297.391	381.369	489.065	627.177	804.298	
86.626	111.077	142.434	182.652	234.224	300.364	385.182	493.955	633.448	812.341	
87.492	112.187	143.858	184.478	236.566	303.367	389.033	498.894	639.782	820.464	
88.366	113.308	145.296	186.322	238.931	306.40	392.923	503.882	646.179	828.668	
89.249	114.441	146.749	188.185	241.320	309.464	396.852	508.920	652.640	836.954	
90.141	115.585	148.216	190.066	243.733	312.558	400.820	514.009	659.166	845.323	
91.042	116.740	149.698	191.966	246.170	315.683	404.828	519.149	665.757	853.776	
91.952	117.907	151.195	193.885	248.631	318.839	408.876	524.340	672.414	862.313	
92.871	119.086	152.707	195.823	251.117	322.027	412.964	529.583	679.138	870.936	
93.799	120.276	154.234	197.781	253.628	325.247	417.093	534.878	685.929	879.645	
94.737	121.478	155.776	199.758	256.164	328.499	421.263	540.226	692.788	888.441	
95.684	122.692	157.333	201.755	258.725	331.784	425.475	545.628	699.715	897.325	
96.640	123.918	158.906	203.772	261.312	335.101	429.729	551.084	706.712	906.298	
97.606	125.157	160.495	205.809	263.925	338.452	434.026	556.594	713.779	915.361	
98.582	126.408	162.100	207.867	266.564	341.836	438.366	562.159	720.916	924.514	
99.567	127.672	163.721	209.945	269.229	345.254	442.749	567.780	728.125	933.759	
100.562	128.948	165.358	212.044	271.921	348.706	447.176	573.457	735.406	943.096	
101.567	130.237	167.011	214.164	274.640	352.193	451.647	579.191	742.760	952.527	

Tested Frequency List: 1000 MHz -6000 MHz(1 % Step)

1000.000	1184.298	1402.562	1661.053	1967.184	2329.735	2754.270	3261.894	3863.076	4575.058	5418.261
1010.000	1196.141	1416.587	1677.663	1986.855	2353.032	2781.813	3294.513	3901.706	4620.808	5472.444
1020.100	1208.102	1430.752	1694.439	2006.723	2376.562	2809.631	3327.458	3940.724	4667.016	5527.168
1030.301	1220.183	1445.059	1711.383	2026.790	2400.327	2837.727	3360.733	3980.131	4713.687	5582.440
1040.604	1232.384	1459.509	1728.496	2047.057	2424.33	2866.104	3394.340	4019.932	4760.823	5638.264
1051.010	1244.707	1474.104	1745.781	2067.527	2448.573	2894.765	3428.284	4060.131	4808.432	5694.647
1061.520	1257.154	1488.845	1763.238	2088.202	2473.058	2923.713	3462.566	4100.733	4856.516	5751.593
1072.135	1269.725	1503.733	1780.870	2109.084	2497.788	2952.950	3497.192	4141.740	4905.081	5809.109
1082.856	1282.422	1518.770	1798.678	2130.174	2522.765	2982.480	3532.164	4183.157	4954.132	5867.200
1093.684	1295.246	1533.957	1816.664	2151.475	2547.992	3012.305	3567.486	4224.989	5003.673	5925.872
1104.620	1308.198	1549.296	1834.830	2172.989	2573.471	3042.428	3603.160	4267.239	5053.710	5985.131
1115.666	1321.28	1564.789	1853.178	2194.718	2599.205	3072.852	3639.192	4309.911	5104.247	6000.000
1126.822	1334.492	1580.436	1871.709	2216.665	2625.197	3103.580	3675.584	4353.010	5155.290	
1138.090	1347.836	1596.240	1890.426	2238.831	2651.449	3134.616	3712.340	4396.541	5206.842	
1149.470	1361.314	1612.202	1909.330	2261.219	2677.963	3165.962	3749.463	4440.506	5258.911	
1160.964	1374.927	1628.324	1928.423	2283.831	2700.000	3197.622	3786.958	4484.911	5311.500	
1172.573	1388.676	1644.607	1947.707	2306.669	2727.000	3229.598	3824.827	4529.760	5364.615	

* 2280 MHz to 2603.5 MHz: The exclusion band for equipment operating in the 2.4 GHz band (clause 4.3 of EN 301 489-17)

SECTION 7: Electrical fast transient/burst

7.1 Operating Environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

7.2 Test configuration

The EUT was placed on an urethane pallet height of 0.1 m above the reference ground plane.
Photographs of the set up are shown in APPENDIX 1.

7.3 Test conditions

Test level	:	±1.0 kV / AC mains ±0.5 kV / Signal lines, Wired network line
Performance criterion	:	B, TT&TR
Repetition rate	:	5 kHz
Application method	:	CDN injection / AC mains Clamp injection / Signal lines, Wired network line
Duration of each test	:	60 sec.
Lines for test	:	AC mains, Signal lines
EUT position	:	Floor standing

7.4 Test procedure

The test voltage was applied to the each line for 60 sec.
The performance of the EUT was monitored continuously.

7.5 Results

Summary of the test results : Pass
Refer to APPENDIX 2.

SECTION 8: Surge

8.1 Operating environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

8.2 Test configuration

The EUT was placed on a non-metallic table height of 0.8 m on the reference ground plane.
Photographs of the set up are shown in APPENDIX 1.

8.3 Test condition

AC mains

Test level	:	±0.5 kV, ±1.0 kV, ±2.0 kV (line to ground)
		±0.5 kV, ±1.0 kV (line to line)
Polarity	:	Positive / Negative
Phase shifting	:	0, 90, 180 and 270 phase angle (degree)

Telecommunication lines [Indoor cable]

Test level	:	±0.5 kV (line to ground)
Polarity	:	Positive / Negative
Phase shifting	:	Asynchronization

Performance criterion	:	B, TT&TR
Repetition rate	:	60 sec.
Number	:	5 points
EUT position	:	Table top

8.4 Test procedure

The performance of the EUT was monitored continuously.
The test voltage was applied to specified cable via CDN.

8.5 Results

Summary of the test results : Pass
Refer to APPENDIX 2.

SECTION 9: Radio-frequency conducted disturbances

9.1 Operating environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

9.2 Test configuration

The EUT was placed on a non-metallic pallet of 0.1 m above a reference ground plane.
Photographs of the set up are shown in APPENDIX 1.

9.3 Test condition

Frequency range	:	0.15 MHz – 80 MHz
Test level	:	3 V
Modulation	:	80 % AM (1 kHz)
Performance criterion	:	A, CT&CR
Frequency step size	:	1 %
Dwell time	:	2 sec.
EUT position	:	Floor standing

9.4 Test procedure

The test electromagnetic fields were applied to AC mains and signal cable via CDN and Clamp injection.
The performance of the EUT was monitored continuously.

9.5 Results

Summary of the test results : Pass
Refer to APPENDIX 2.

Tested Frequency List: 0.15 MHz - 80 MHz (1 % Step)

0.1500	0.2461	0.4057	0.6704	1.1103	1.8415	3.0556	5.0722	8.4220	13.9861	23.2284	38.5809	64.0826
0.1515	0.2485	0.4097	0.6771	1.1214	1.8599	3.0861	5.1229	8.5062	14.1259	23.4606	38.9667	64.7234
0.1530	0.2509	0.4137	0.6838	1.1326	1.8784	3.1169	5.1741	8.5912	14.2671	23.6952	39.3563	65.3706
0.1545	0.2534	0.4178	0.6906	1.1439	1.8971	3.1480	5.2258	8.6771	14.4097	23.9321	39.7498	66.0243
0.1560	0.2559	0.4219	0.6975	1.1553	1.9160	3.1794	5.2780	8.7638	14.5537	24.1714	40.1472	66.6845
0.1575	0.2584	0.4261	0.7044	1.1668	1.9351	3.2111	5.3307	8.8514	14.6992	24.4131	40.5486	67.3513
0.1590	0.2609	0.4303	0.7114	1.1784	1.9544	3.2432	5.3840	8.9399	14.8461	24.6572	40.9540	68.0248
0.1605	0.2635	0.4346	0.7185	1.1901	1.9739	3.2756	5.4378	9.0292	14.9945	24.9037	41.3635	68.7050
0.1621	0.2661	0.4389	0.7256	1.2020	1.9936	3.3083	5.4921	9.1194	15.1444	25.1527	41.7771	69.3920
0.1637	0.2687	0.4432	0.7328	1.2140	2.0135	3.3413	5.5470	9.2105	15.2958	25.4042	42.1948	70.0859
0.1653	0.2713	0.4476	0.7401	1.2261	2.0336	3.3747	5.6024	9.3026	15.4487	25.6582	42.6167	70.7867
0.1669	0.2740	0.4520	0.7475	1.2383	2.0539	3.4084	5.6584	9.3956	15.6031	25.9147	43.0428	71.4945
0.1685	0.2767	0.4565	0.7549	1.2506	2.0744	3.4424	5.7149	9.4895	15.7591	26.1738	43.4732	72.2094
0.1701	0.2794	0.4610	0.7624	1.2631	2.0951	3.4768	5.7720	9.5843	15.9166	26.4355	43.9079	72.9314
0.1718	0.2821	0.4656	0.7700	1.2757	2.1160	3.5115	5.8297	9.6801	16.0757	26.6998	44.3469	73.6607
0.1735	0.2849	0.4702	0.7777	1.2884	2.1371	3.5466	5.8879	9.7769	16.2364	26.9667	44.7903	74.3973
0.1752	0.2877	0.4749	0.7854	1.3012	2.1584	3.5820	5.9467	9.8746	16.3987	27.2363	45.2382	75.1412
0.1769	0.2905	0.4796	0.7932	1.3142	2.1799	3.6178	6.0061	9.9733	16.5626	27.5086	45.6905	75.8926
0.1786	0.2934	0.4843	0.8011	1.3273	2.2016	3.6539	6.0661	10.0730	16.7282	27.7836	46.1474	76.6515
0.1803	0.2963	0.4891	0.8091	1.3405	2.2236	3.6904	6.1267	10.1737	16.8954	28.0614	46.6088	77.4180
0.1821	0.2992	0.4939	0.8171	1.3539	2.2458	3.7273	6.1879	10.2754	17.0643	28.3420	47.0748	78.1921
0.1839	0.3021	0.4988	0.8252	1.3674	2.2682	3.7645	6.2497	10.3781	17.2349	28.6254	47.5455	78.9740
0.1857	0.3051	0.5037	0.8334	1.3810	2.2908	3.8021	6.3121	10.4818	17.4072	28.9116	48.0209	79.7637
0.1875	0.3081	0.5087	0.8417	1.3948	2.3137	3.8401	6.3752	10.5866	17.5812	29.2007	48.5011	80.0000
0.1893	0.3111	0.5137	0.8501	1.4087	2.3368	3.8785	6.4389	10.6924	17.7570	29.4927	48.9861	
0.1911	0.3142	0.5188	0.8586	1.4227	2.3601	3.9172	6.5032	10.7993	17.9345	29.7876	49.4759	
0.1930	0.3173	0.5239	0.8671	1.4369	2.3837	3.9563	6.5682	10.9072	18.1138	30.0854	49.9706	
0.1949	0.3204	0.5291	0.8757	1.4512	2.4075	3.9958	6.6338	11.0162	18.2949	30.3862	50.4703	
0.1968	0.3236	0.5343	0.8844	1.4657	2.4315	4.0357	6.7001	11.1263	18.4778	30.6900	50.9750	
0.1987	0.3268	0.5396	0.8932	1.4803	2.4558	4.0760	6.7671	11.2375	18.6625	30.9969	51.4847	
0.2006	0.3300	0.5449	0.9021	1.4951	2.4803	4.1167	6.8347	11.3498	18.8491	31.3068	51.9995	
0.2026	0.3333	0.5503	0.9111	1.5100	2.5051	4.1578	6.9030	11.4632	19.0375	31.6198	52.5194	
0.2046	0.3366	0.5558	0.9202	1.5251	2.5301	4.1993	6.9720	11.5778	19.2278	31.9359	53.0445	
0.2066	0.3399	0.5613	0.9294	1.5403	2.5554	4.2412	7.0417	11.6935	19.4200	32.2552	53.5749	
0.2086	0.3432	0.5669	0.9386	1.5557	2.5809	4.2836	7.1121	11.8104	19.6142	32.5777	54.1106	
0.2106	0.3466	0.5725	0.9479	1.5712	2.6067	4.3264	7.1832	11.9285	19.8103	32.9034	54.6517	
0.2127	0.3500	0.5782	0.9573	1.5869	2.6327	4.3696	7.2550	12.0477	20.0084	33.2324	55.1982	
0.2148	0.3535	0.5839	0.9668	1.6027	2.6590	4.4132	7.3275	12.1681	20.2084	33.5647	55.7501	
0.2169	0.3570	0.5897	0.9764	1.6187	2.6855	4.4573	7.4007	12.2897	20.4104	33.9003	56.3076	
0.2190	0.3605	0.5955	0.9861	1.6348	2.7123	4.5018	7.4747	12.4125	20.6145	34.2393	56.8706	
0.2211	0.3641	0.6014	0.9959	1.6511	2.7394	4.5468	7.5494	12.5366	20.8206	34.5816	57.4393	
0.2233	0.3677	0.6074	1.0058	1.6676	2.7667	4.5922	7.6248	12.6619	21.0288	34.9274	58.0136	
0.2255	0.3713	0.6134	1.0158	1.6842	2.7943	4.6381	7.7010	12.7885	21.2390	35.2766	58.5937	
0.2277	0.3750	0.6195	1.0259	1.7010	2.8222	4.6844	7.7780	12.9163	21.4513	35.6293	59.1796	
0.2299	0.3787	0.6256	1.0361	1.7180	2.8504	4.7312	7.8557	13.0454	21.6658	35.9855	59.7713	
0.2321	0.3824	0.6318	1.0464	1.7351	2.8789	4.7785	7.9342	13.1758	21.8824	36.3453	60.3690	
0.2344	0.3862	0.6381	1.0568	1.7524	2.9076	4.8262	8.0135	13.3075	22.1012	36.7087	60.9726	
0.2367	0.3900	0.6444	1.0673	1.7699	2.9366	4.8744	8.0936	13.4405	22.3222	37.0757	61.5823	
0.2390	0.3939	0.6508	1.0779	1.7875	2.9659	4.9231	8.1745	13.5749	22.5454	37.4464	62.1981	
0.2413	0.3978	0.6573	1.0886	1.8053	2.9955	4.9723	8.2562	13.7106	22.7708	37.8208	62.8200	
0.2437	0.4017	0.6638	1.0994	1.8233	3.0254	5.0220	8.3387	13.8477	22.9985	38.1990	63.4482	

SECTION 10: Voltage dips and voltage interruptions

10.1 Operating environment

Test place : Refer to the APPENDIX 2
Temperature : Refer to the APPENDIX 2
Humidity : Refer to the APPENDIX 2

10.2 Test configuration

The EUT was placed on a non-metallic table height of 0.8 m on the reference ground plane.
Photographs of the set up are shown in APPENDIX 1.

10.3 Test condition

(1) Voltage dips	:	0 % Ut, 0.5 cycles (Voltage shift at 0 and 180 degree.)
		0 % Ut, 1.0 cycle (Voltage shift at 0 degree.)
		70 % Ut, 25 cycles (Voltage shift at 0 degree.)
Performance criterion	:	0 % Ut, 0.5cycles => B, TT&TR
		0 % Ut, 1.0 cycle => B, TT&TR
		70 % Ut, 25 cycles => C, TT&TR
Number of events	:	3 at each level
Recovery time	:	10 sec.
EUT position	:	Table top
(2) Short interruptions	:	0 % Ut, 250 cycles (Voltage shift at 0 degree.)
Performance criterion	:	C, TT&TR
Number of events	:	3 at each level
Recovery time	:	10 sec.
EUT position	:	Table top

10.4 Test procedure

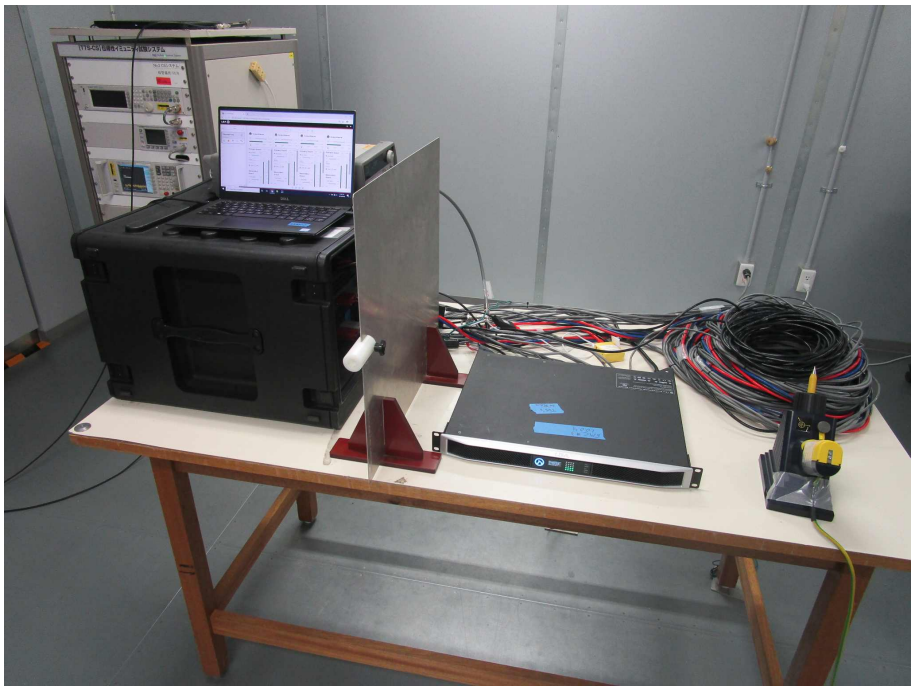
The dips and interruptions are generated using a simulator with pre-programmed test sequences for each test level.
The performance of the EUT was monitored continuously.
The test was performed at AC 100 V for lower voltage and at AC 240 V for upper voltage, since the voltage range of EUT was AC 100 V – AC 240 V.

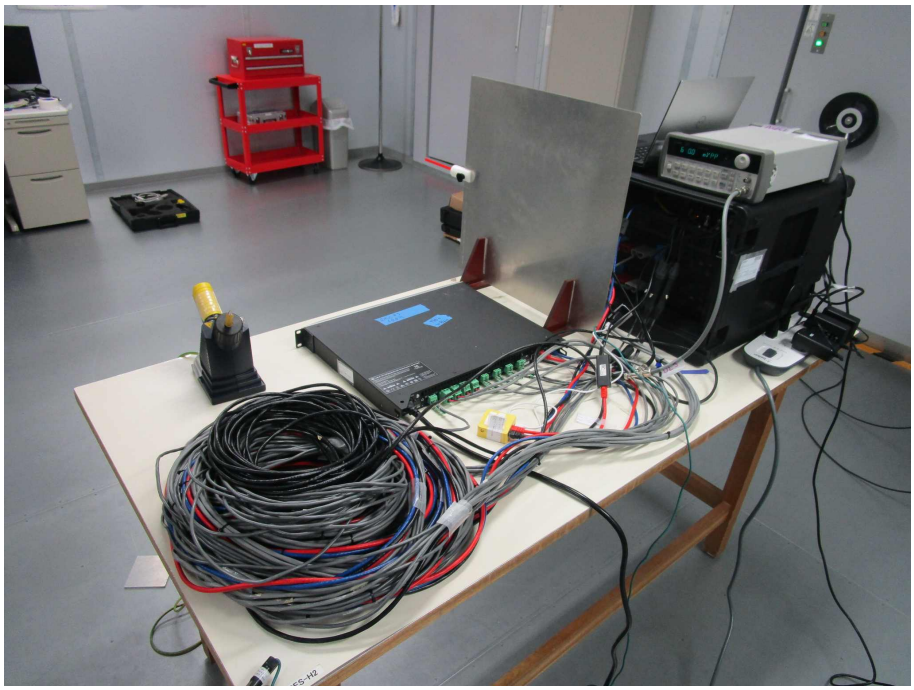
10.5 Results

Summary of the test results : Pass
Refer to APPENDIX 2.

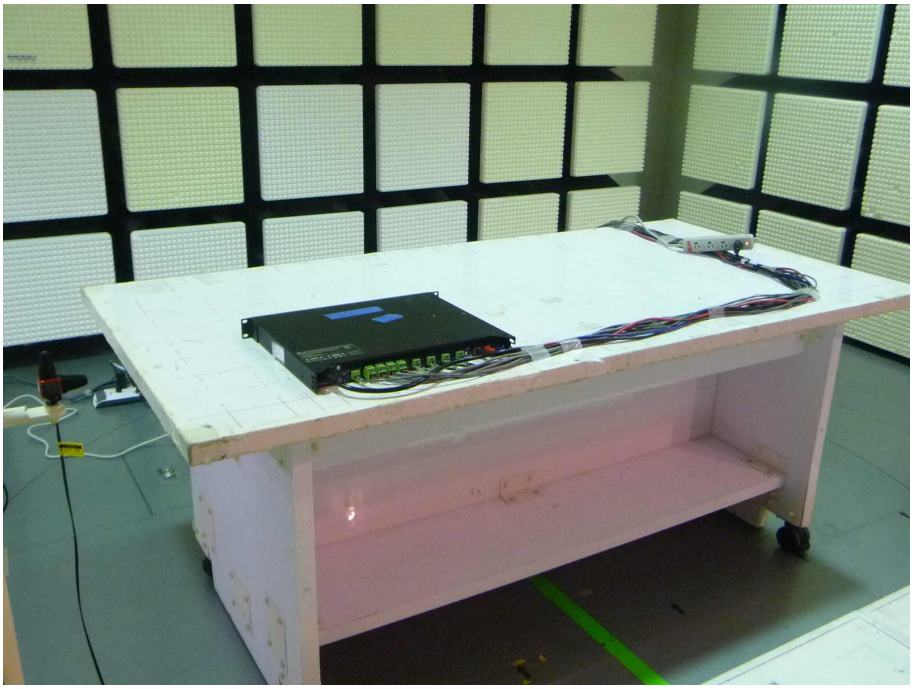
APPENDIX 1: Photographs of test setup

Electrostatic discharge





Radio-frequency electromagnetic field

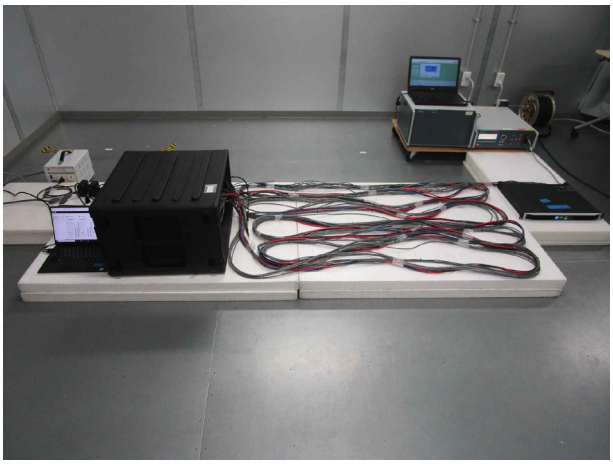


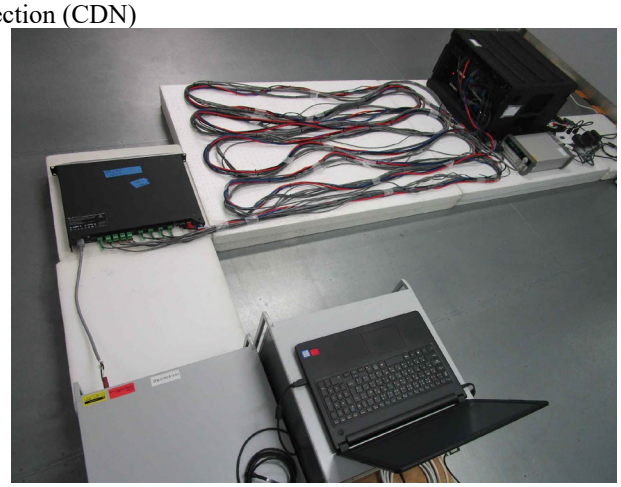
80 MHz - 1000 MHz

1000 MHz - 6000 MHz

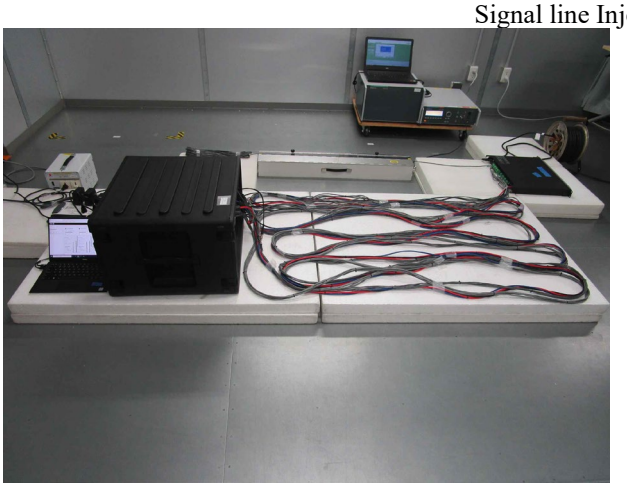
Electrical fast transient/burst

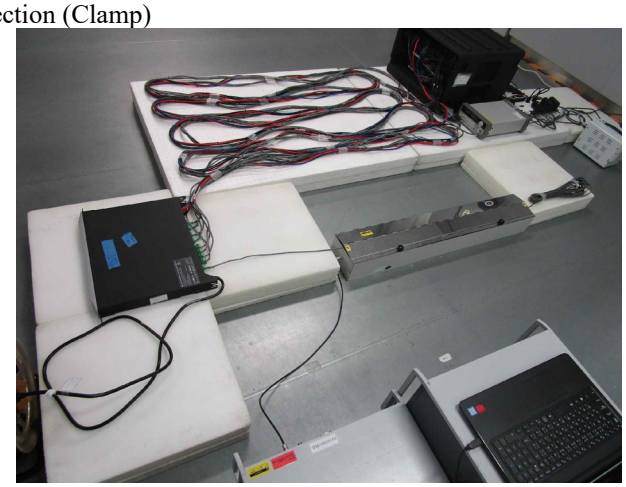
AC Mains Injection (CDN)





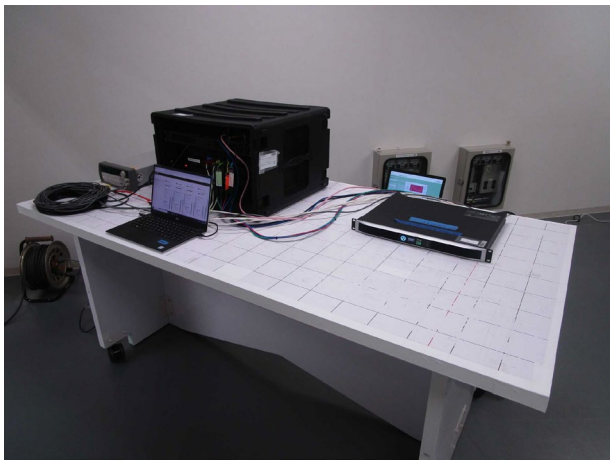
Signal line Injection (Clamp)

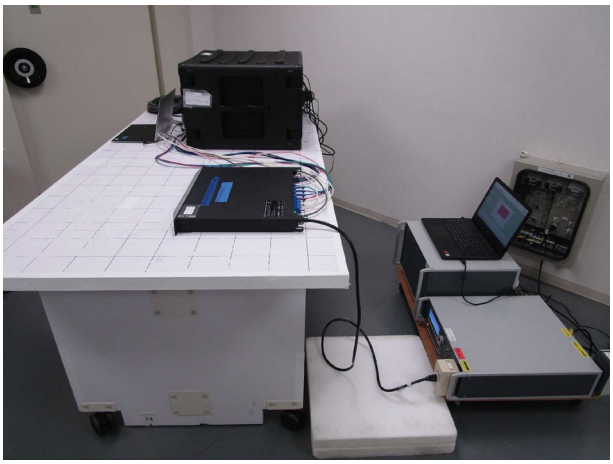




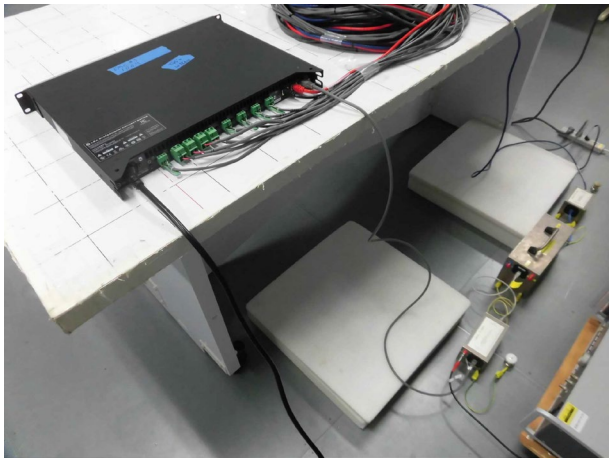
Surge and Voltage dips and voltage interruptions

AC mains



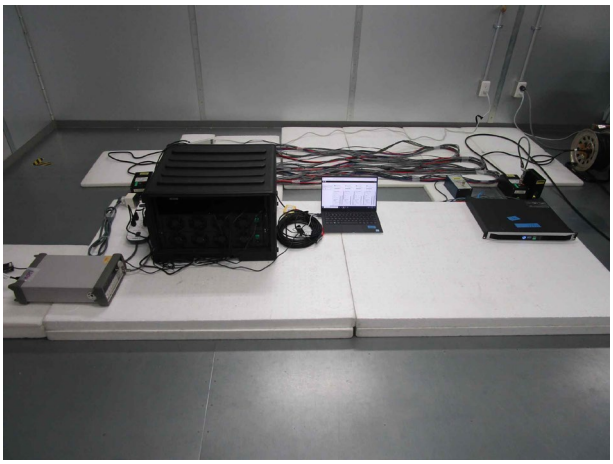


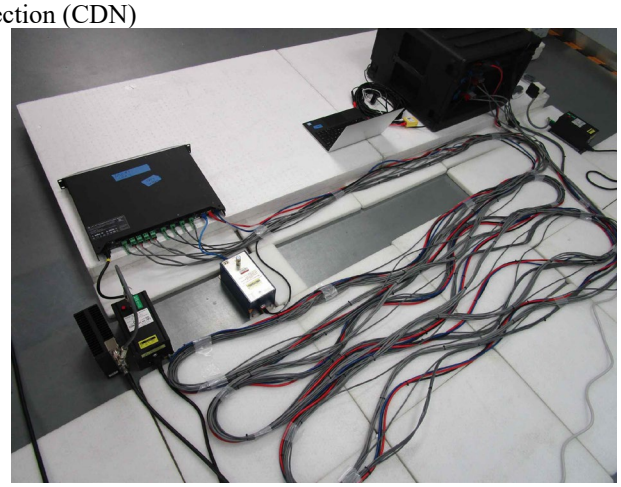
Signal line



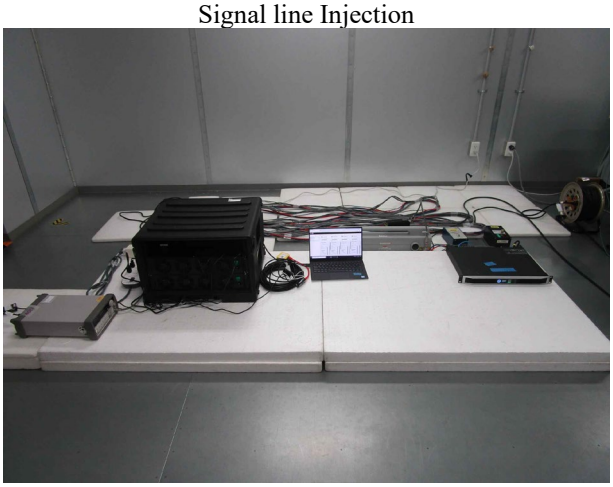
Radio frequency conducted disturbances

AC Mains Injection (CDN)

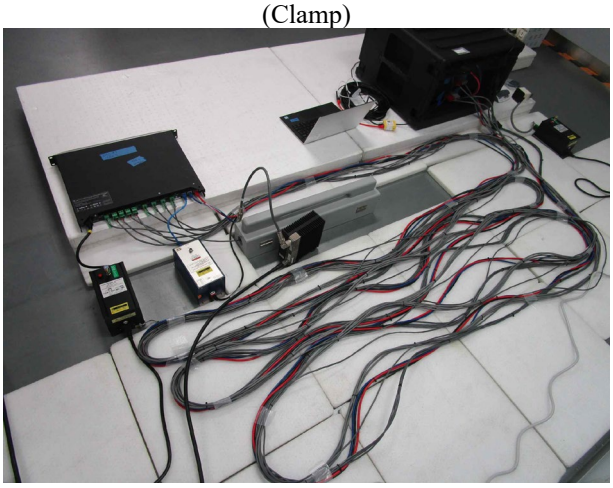




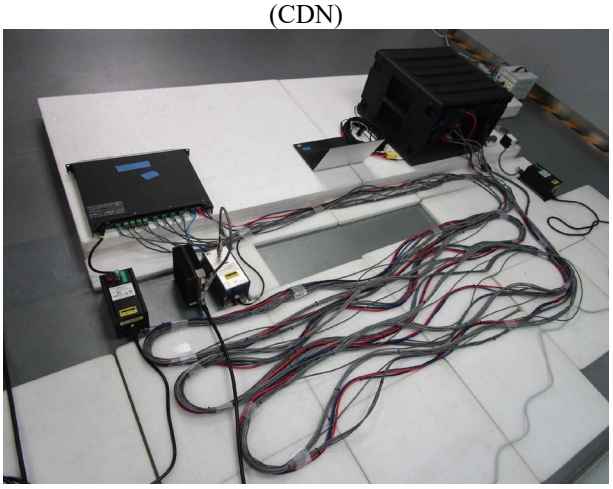
Signal line Injection



(Clamp)



(CDN)



Electrostatic discharge

UL Japan, Inc. Shonan EMC Lab.
Test Room : No.5 Shielded room
Order No. : 12777555S

Company : LEA Professional
Equipment : Pro audio amplifier
Model No. : 704D
Serial No. : 296190140
Test Mode : WLAN Communication mode, Standby mode
Power : AC 230 V / 50 Hz
Standard : EN 301489
: EN 61000-4-2
Criterion : TT&TR, B

Date of test. : February 13, 2020
Temp. / Humid. : 23 deg.C / 47 %RH
Atmosphere : 1010 hPa

Engineer : Takahiro Suzuki

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)
EUT Type : ☑ Grounded ☐ Ungrounded (*1)
*1 ☐ Remained the cable with bleeder resistors(2x470 kΩ) 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(2x470 kΩ) 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	+							
	-							

Radio frequency electromagnetic field

UL Japan, Inc. Shonan EMC Lab.
Test Room : No.4 Semi-anechoic chamber
Order No. : 12777555S

Company : LEA Professional
Equipment : Pro audio amplifier
Model No. : 704D
Serial No. : 296190140
Test Mode : WLAN Communication mode, Standby mode
Power : AC 230 V / 50 Hz
Standard : EN 301489
: EN 61000-4-3
Criterion : CT&CR, A

Date of test. : February 11 and 13, 2020
Temp. / Humid. : 21 deg.C / 44 %RH (2/11)
Atmosphere : 25 deg.C / 41 %RH (2/13)
1023 hPa(2/11) / 1010 hPa((2/13)
Engineer : Takahiro Suzuki, Masahide Ozaki

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)
Freqency step size : 1 %
Dwell time : 2 sec

Freq. Range		80 - 1000 MHz	1000 - 2700 MHz	2700 - 6000 MHz	Remarks
Test level		3 V/m	3 V/m	3 V/m	
Modulation		☑ AM 80 % 1 kHz ☐ Pulse Hz % ☐ Unmodulated	☑ AM 80 % 1 kHz ☐ Pulse Hz % ☐ Unmodulated	☑ AM 80 % 1 kHz ☐ Pulse Hz % ☐ Unmodulated	
Antenna	Height	1.55 m	1.55 m	1.55 m	
	Distance	2.5 m	3.0 m	2.0 m	
Note					
☑ Front	Hor.	Pass	Pass	Pass	
	Ver.	Pass	Pass	Pass	
☑ Rear	Hor.	Pass	Pass	Pass	
	Ver.	Pass	Pass	Pass	
☑ Right	Hor.	Pass	Pass	Pass	
	Ver.	Pass	Pass	Pass	
☑ Left	Hor.	Pass	Pass	Pass	
	Ver.	Pass	Pass	Pass	
☐ Top	Hor.				
	Ver.				
☐ Bottom	Hor.				
	Ver.				

Test Result: ☑ **Pass** ☐ **Fail**

Electrical fast transient/burst

UL Japan, Inc.		Shonan EMC Lab.
Test Room	:	No.5 Shielded room
Order No.	:	12777555S

Company	:	LEA Professional
Equipment	:	Pro audio amplifier
Model No.	:	704D
Serial No.	:	296190140
Test Mode	:	WLAN Communication mode, Standby mode
Power	:	AC 230 V / 50 Hz
Standard	:	EN 301489
	:	EN 61000-4-4
Criterion	:	TT&TR, B

Date of test.	:	February 07, 2020
Temp. / Humid.	:	21 deg.C / 33 %RH
Atmosphere	:	1021 hPa
Engineer	:	Masahide Ozaki

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

Line / Injection	☑ AC		☐ DC		/ ☑ CDN		☐ Clamp		Remarks
Test level	1.0	kV		kV		kV		kV	
Repetation rate	5	kHz		kHz		kHz		kHz	
Polarity	+	-	+	-	+	-	+	-	
N+L+PE	Pass	Pass							
☐ *1									

Line / Injection	☑ Signal Line		/ ☑ Clamp						Remarks
Test level	0.5	kV		kV		kV		kV	
Repetation rate	5	kHz		kHz		kHz		kHz	
Polarity	+	-	+	-	+	-	+	-	
I/O ☐ *1	Pass	Pass							
CH1 ☐ *1	Pass	Pass							
CH2 ☐ *1	Pass	Pass							
CH3 ☐ *1	Pass	Pass							
CH4 ☐ *1	Pass	Pass							
IN1 ☐ *1	Pass	Pass							
IN2 ☐ *1	Pass	Pass							
IN3 ☐ *1	Pass	Pass							
IN4 ☐ *1	Pass	Pass							
LAN ☐ *1	Pass	Pass							
LAN(Primary) ☐ *1	Pass	Pass							
LAN(Secondary) ☐ *1	Pass	Pass							
☐ *1									
☐ *1									
☐ *1									
☐ *1									
☐ *1									

Surge

UL Japan, Inc.		Shonan EMC Lab.
Test Room	:	No.1, No.3 and No.6 Shielded room
Order No.	:	12777555S

Company	:	LEA Professional
Equipment	:	Pro audio amplifier
Model No.	:	704D
Serial No.	:	296190140, 326190012
Test Mode	:	WLAN Communication mode, Standby mode
Power	:	AC 230 V / 50 Hz
Standard	:	EN 301489
	:	EN 61000-4-5
Criterion	:	TT&TR, B

Date of test.	:	February 14, June 30, July 14, and July 15, 2020
Temp. / Humid.	:	22 deg.C / 44 %RH (February 14)
Temp. / Humid.	:	21 deg.C / 57 %RH (June 30)
Temp. / Humid.	:	22 deg.C / 59 %RH (July 14)
Temp. / Humid.	:	26 deg.C / 59 %RH (July 15)
Atmosphere	:	1012 hPa (February 14)
Atmosphere	:	997 hPa (June 30)
Atmosphere	:	1005 hPa (July 14)
Atmosphere	:	995 hPa (July 15)
Engineer	:	Takahiro Suzuki, Masahide Ozaki

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

Number of surge pulses : 5

Repetition rate : 60 sec

Test level		0.5 kV		1.0 kV		2.0 kV		kV		Remarks
Polarity		+	-	+	-	+	-	+	-	
N-PE	0 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	90 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	180 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	270 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
L1-PE	0 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	90 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	180 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	270 deg.	Pass	Pass	Pass	Pass	Pass	Pass			
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
LAN(Network)	Async	Pass	Pass							
LAN(Primary)	Async	Pass	Pass							
LAN(Secondary)	Async	Pass	Pass							

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.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	0 deg.									
	90 deg.									
	180 deg.									
	270 deg.									
	Async									
	Async									

Test Result: ☑ **Pass** ☐ **Fail**

Conducted disturbances, induced by radio frequency fields

UL Japan, Inc. Shonan EMC Lab.
Test Room : No.5 Shielded room
Order No. : 12777555S

Company : LEA Professional
Equipment : Pro audio amplifier
Model No. : 704D
Serial No. : 296190140
Test Mode : WLAN Communication mode, Standby mode
Power : AC 230 V / 50 Hz
Standard : EN 301489
: EN 61000-4-6
Criterion : CT&CR, A

Date of test. : February 04, 05 and 07, 2020
Temp. / Humid. : 26 deg.C / 47 %RH (February 04)
Temp. / Humid. : 23 deg.C / 48 %RH (February 05)
Temp. / Humid. : 21 deg.C / 33 %RH (February 07)
Atmosphere : 1015 hPa (February 04)
Atmosphere : 1006 hPa (February 05)
Atmosphere : 1021 hPa (February 07)
Engineer : Masahide Ozaki

EUT Setup : ☑ Floor Standing (Non-metallic pallet height of 0.1 m)
Elevated Ground Plane : ☑ Not used ☐ Used (*1 Refer to line name)
Frequency step size : 1 %
Dwell time : 2 sec

Freq. Range	0.15 - 80 MHz	- MHz	- MHz	Remarks
Test level	3 V	V	V	
Modulation	☑ AM 80 % 1 kHz ☐ Pulse Hz % ☐ Unmodulated	☐ AM 80 % kHz ☐ Pulse Hz % ☐ Unmodulated	☐ AM 80 % kHz ☐ Pulse Hz % ☐ Unmodulated	
Note				
AC Mains ☐ *1	Pass			☑ CDN M3 ☐ EM Clamp
I/O ☐ *1	Pass			☐ CDN ☑ EM Clamp
CH1 ☐ *1	Pass			☐ CDN ☑ EM Clamp
CH2 ☐ *1	Pass			☐ CDN ☑ EM Clamp
CH3 ☐ *1	Pass			☐ CDN ☑ EM Clamp
CH4 ☐ *1	Pass			☐ CDN ☑ EM Clamp
IN1 ☐ *1	Pass			☐ CDN ☑ EM Clamp
IN2 ☐ *1	Pass			☐ CDN ☑ EM Clamp
IN3 ☐ *1	Pass			☐ CDN ☑ EM Clamp
IN4 ☐ *1	Pass			☐ CDN ☑ EM Clamp
LAN ☐ *1	Pass			☑ CDN T8 ☐ EM Clamp
LAN(Primary) ☐ *1	Pass			☑ CDN T8 ☐ EM Clamp
LAN(Secondary) ☐ *1	Pass			☑ CDN T8 ☐ EM Clamp
☐ *1				☐ CDN ☐ EM Clamp

Test Result: ☑ **Pass** ☐ **Fail**

Voltage dips & Short interruptions

UL Japan, Inc. Shonan EMC Lab.
Test Room : No.6 Shielded room
Order No. : 12777555S

Company : LEA Professional
Equipment : Pro audio amplifier
Model No. : 704D
Serial No. : 326190012
Test Mode : WLAN Communication mode, Standby mode
Power : AC 100V to 240V / 50 Hz
Standard : EN 301489
: EN 61000-4-11
Criterion : Refer to following table.

Date of test. : June 30, 2020
Temp. / Humid. : 21 deg.C / 57 %RH
Atmosphere : 997 hPa

Engineer : Masahide Ozaki

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)
Number of events : 3
Intervals : 10 sec

Test level (Ut)			Voltage dips						Short interruptions		Remarks
			0 %		0 %		70 %		0 %		
Performance Criteria			TT&TR, B		TT&TR, B		TT&TR, B		TT&TR, C		
Duration ☑ 50 Hz ☐ 60 Hz			0.5 Periods		1 Periods		25 Periods		250 Periods		
Phase (degree)			0 deg.	180 deg.	0 deg.	180 deg.	0 deg.	180 deg.	0 deg.	180 deg.	
☑	L1-N	100 V	Pass	Pass	Pass		Pass		Pass		
		240 V	Pass	Pass	Pass		Pass		Pass		
☐	L2-N	V									
		V									
☐	L3-N	V									
		V									
☐	L1-L2	V									
		V									
☐	L2-L3	V									
		V									
☐	L3-L1	V									
		V									
☐	All the three phases	V									
		V									

Test level (Ut)			Voltage dips						Short interruptions		Remarks
			%		%		%		%		
Performance Criteria											
Duration ☐ 50 Hz ☐ 60 Hz			Periods		Periods		Periods		Periods		
Phase (degree)			0 deg.	180 deg.	0 deg.	180 deg.	0 deg.	180 deg.	0 deg.	180 deg.	
☐	L1-N	V									
		V									
☐	L2-N	V									
		V									
☐	L3-N	V									
		V									
☐	L1-L2	V									
		V									
☐	L2-L3	V									
		V									
☐	L3-L1	V									
		V									
☐	All the three phases	V									
		V									

Test Result: ☑ **Pass** ☐ **Fail**

APPENDIX 3
Test Instruments

EMS test equipment

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
CS	COTS-SCS	144911	Radio-frequency conducted disturbances soft	TSJ (Techno Science Japan)	TEPT-CS2	-	-	-
CS	SAT6-CS02	145159	Attenuator	Bird Electronic	100-SA-FFN-06	1002479	2020/04/06	12
CS	SCN-07	145210	Coupling Decoupling Network	LUTHI	CDN L801-M2/M3	2505	2019/11/08	12
CS	SCN-08	145014	Coupling Decoupling Network	LUTHI	CDN L801-M2/M3	2506	2019/11/08	12
CS	SCN-24	145452	Coupling Decoupling Network	FCC	TSCDN-T8-RJ45	9224	2019/11/08	12
CS	SDCPL-07	145466	Directional Coupler	WERLATONE	C5086-10	81074	2020/04/06	12
CS	SPA-07	145609	RF Power Amplifier	AMPLIFIER RESEARCH	75A250	330791	2020/04/08	12
CS	SPM-04	146265	Power Meter	Keysight Technologies Inc	E4418B	MY45109229	2019/12/04	12
CS	SPSO-06	146278	Power Sensor	Keysight Technologies Inc	E9304A	MY41498833	2019/12/04	12
CS	SSG-06	145805	Signal Generator	Keysight Technologies Inc	N5181A	MY48181112	2019/12/04	12
CS	STM-18	146197	Terminator	TME	CT-01 BP	-	2020/01/30	12
CS	STM-21	145767	Terminator	TME	CT-01 BP	-	2020/01/30	12
CS,EFT/B, ESD	SBM-09	144962	Barometer	Sunoh	SBR121	1074	2017/12/13	36
CS,EFT/B, ESD	SJM-17	145339	Measure	ASKUL	-	-	-	-
CS,EFT/B, ESD	SOS-27	191845	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2019/12/12	12
CS,EFT/B, ESD	STS-05	146212	Digital Hitester	Hioki	3805-50	80997828	2019/10/01	12
Dip	SMV-02	145747	Motor Variac	EM Test (Ametek)	MV2616	V084710448	-	-
Dip,EFT/B, SG	COTS-SEMS	144869	EFT/B, Surge,MF,Dip test program	EM Test (Ametek)	-	-	-	-
Dip,SG	KTS-06	145110	Digital Tester	SANWA	PC500	7019240	2020/04/09	12
Dip,SG	SBM-11	144964	Barometer	Sunoh	SBR121	1077	2017/11/10	36
Dip,SG	SOS-18	175822	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2019/12/19	12
Dip,SG	SPG-03	146262	Pulse Generator	EM Test (Ametek)	UCS500N4	V0847104442	2019/11/13	12
EFT/B	SCL-01	145201	Capacitive Clamp	EM Test (Ametek)	HFK	1208-75	2020/04/02	12
EFT/B	SCL-01C	145284	Capacitive Clamp Cable	EM Test (Ametek)	-	-	-	-
EFT/B	SIC-01	145819	Induction Coil	EM Test (Ametek)	MS100	0908-10	-	-
EFT/B,SG	SPG-01	146240	Pulse Generator	EM Test (Ametek)	UCS500N4	V0847104443	2020/04/01	12
ESD	SES-02	154825	ESD Simulator	Teseq	NSG435	6195	2020/05/07	12
ESD	SES-H2	145225	Horizontal Coupling Plane	NAKANO EMC	-	-	-	-
ESD	SES-V2	145368	Vertical Coupling Plane	NAKANO EMC	-	-	-	-
RS	COTS-SRS	159176	Radiated RF electromagnetic field soft	TSJ (Techno Science Japan)	TEPTO-DV(RS)	-	-	-
RS	SAEC-04(UFA)	145567	Semi-Anechoic Chamber	TDK	SAEC-04(UFA)	4	2020/03/19	12
RS	SBM-07	145027	Barometer	Sunoh	SBR121	1075	2017/12/13	36
RS	SDCPL-04	145390	Directional Coupler	WERLATONE	C3908-10	80906	2019/09/01	12

EMS test equipment

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Interval (Month)
RS	SDCPL-05	145391	Directional Coupler	RLC	CHP-1040-D-50-50-MF	909002	2019/09/01	12
RS	SDCPL-13	191631	Directional Coupler	RLC	CHP-2080-D-40-40-FF	1940	2019/12/02	12
RS	SFS-04	146657	Isotropic field Probe	ETS LINDGREN	HI-6005/HI-4413P	00033981	2019/07/25	12
RS	SHA-RS01	145516	Horn Antenna	Schwarzbeck Mess - Elektronik	BBHA9120D	770	-	-
RS	SHA-RS02	145823	Horn Antenna	Schwarzbeck Mess - Elektronik	BBHA9120B	488	-	-
RS	SJM-15	145338	Measure	ASKUL	-	-	-	-
RS	SLA-RS02	145829	Logperiodic Antenna	Schwarzbeck Mess - Elektronik	VULP9118E	VULP9118 E-846	-	-
RS	SOS-25	191843	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2019/12/12	12
RS	SPA-04	145607	RF Power Amplifier	PRANA	AP32MT235	0302-929	2019/12/02	12
RS	SPA-05	145608	RF Power Amplifier	PRANA	AP32SW210	0902-330	2020/07/14	12
RS	SPA-14	191630	RF Power Amplifier	PRANA	UX55DC	1910-2589	2019/12/02	12
RS	SPM-02	146245	Power Meter	Keysight Technologies Inc	E4419B	MY45104213	2020/01/27	12
RS	SPSO-03	146305	Power Sensor	Keysight Technologies Inc	E9304A	MY41498835	2020/01/27	12
RS	SPSO-04	146306	Power Sensor	Keysight Technologies Inc	E9304A	MY41498831	2020/01/27	12
RS	SSG-04	146228	Signal Generator	Keysight Technologies Inc	N5181A	MY48181114	2020/05/26	12
RS	SSW-02	145736	RF Switch	TSJ (Techno Science Japan)	RFM-3SA3CIL	4333	-	-
RS	STS-04	146211	Digital Hitester	Hioki	3805-50	80997827	2020/04/09	12
SG	KJM-02	146432	Measure	TAJIMA	GL19-55	-	-	-
SG	KJM-09	145929	Measure	KOMELON	KMC-36	-	-	-
SG	SBM-02	145051	Barometer	Sunoh	SBR121	1004	2017/11/10	36
SG	SBM-06	144961	Barometer	Sunoh	SBR121	1071	2017/10/27	36
SG	SCDN-04	144980	Coupling decoupling network	EM Test (Ametek)	CNI 508N1	V1213112471	2020/03/04	12
SG	SCDN-04C	145411	Coupling decoupling network cable	EM Test (Ametek)	-	-	-	-
SG	SJM-18	147480	Measure	ASKUL	-	-	-	-
SG	SOS-16	167990	Humidity Indicator	CUSTOM. Inc	CTH-202	708Q08R	2019/12/19	12
SG	SOS-24	191841	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2019/12/12	12
SG	SPG-02	146241	Pulse Generator	EM Test (Ametek)	UCS500N4	V0847104441	2020/01/06	12
SG	STS-01	145792	Digital Hitester	Hioki	3805-50	80997812	2019/10/01	12
SG	STS-03	146210	Digital Hitester	Hioki	3805-50	80997823	2019/10/01	12

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

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards
Test Item:
ESD: Electrostatic discharge,
RS: Radiated RF electromagnetic field,
EFT/B: Electrical fast transient burst,
SG: Surge,
CS: Radio-frequency conducted disturbances,
Dip: Voltage dips and short interruptions

End of Report