発行
21.3.26
BOSS

EMS TEST REPORT

Roland Report No.	:	RJA01318-1
Issue Date	:	March 9, 2021
Applicant	:	Roland Corporation 1-5-3, Shinmiyakoda, Kita-ku, Hamamatsu, Shizuoka, 431-2103, JAPAN PHONE (053) 428-5095, FAX (053) 428-6500
Manufacturer	:	Same as above
Description of Device	:	Guitar Effects
a) Category	:	Multimedia Equipment
b) Trade Name	:	BOSS
c) Model No.	:	DC-2W
d) Serial No.	:	Z2J0001
e) Date of Manufacture	:	July 31, 2018
f) Power Supply	:	230V AC 50 Hz DC 9 V: Alkaline 9V (6LR61 or 6LF22) type battery
g) EUT Size	:	73 mm wide, 129 mm deep and 59 mm high
h) EUT Grounding	:	None
Measurement Results	:	The results obtained from the measuring of the above-mentioned device are as shown in the attached sheets.
Test Standard	:	EN55035:2017/A11:2020
Test Date	:	May 7, 2018 to October 19, 2020
Test Result	:	Complied (Refer to Section 1)

Approved by:

Kyosuke Hata
Product Leader
BOSS Company New Category Product Design Dept.
Roland Corporation

Issued by:

Masayuki Takagi
Leader
Quality Assurance Dept.
Roland Corporation

1. TEST RESULTS

Applied standards	EN55035:2017/A11:2020

Item	Test Procedure	Criterion	Date	Results	Remarks
Electrostatic discharges	IEC61000-4-2	B	May 7, 2018	Complied	(*2)
Continuous RF Electromagnetic field disturbances, swept test	IEC61000-4-3	A	October 19, 2020	Complied	-
Continuous RF Electromagnetic field disturbances, spot test	IEC61000-4-3	A	October 19, 2020	Complied	-
Electrical fast transients / burst	IEC61000-4-4	B	May 14, 2018	Complied	(*2)
Surges	IEC61000-4-5	B	May 7, 2018	Complied	(*2)
Continuous inducted RF disturbances	IEC61000-4-6	A	October 8, 2020	Complied	-
Power frequency magnetic field	IEC61000-4-8	A	N/A	N/A	(*1)
Voltage dips voltage dip (<5%) voltage dip (70%) short interruption (<5%)	IEC61000-4-11	 B C C	May 7, 2018	Complied	(*2)

(*1) The test was not applicable since the test is applicable only to equipment containing devices intrinsically susceptible to magnetic fields.

(*2) Refer to the following report for the test results.(No.RJA01318: DC-2W)

2. GENERAL INFORMATION

2.1.1 Test mode(s) and Primary Function(s):

Test Mode	Primary Function
Normal Mode / Test Mode	General: Data Processing function ~~Annex D: Display and output functions~~ ~~Annex E: Musical tone generationg function [A2]~~ ~~Annex G: Audio output function~~

2.1.2 Performance Criteria

General and Data Processing function (EN55035 Clause 8)

Performance Criterion	Detail(s)
A	The apparatus shall continue to operate as intended without operator intervention while performance testing. No degradation of performance or loss of function is allowed.
B	The apparatus might have influence from electrical interference without operator intervention while testing, however it should be able to return in the state of normal operation after turn off electrical interference. Moreover, data in the memory must be maintained.
C	The apparatus lost or temporary lost the function while performs the testing, it shall operate normally after reset the apparatus main power. For this EUT, the applicant has decided that the performance criteria chould be applied as mentioned above.

Display and output functions (EN55035 Annex D)

Performance Criterion	Detail(s)
A	For continuous radiated and conducted dusturbances tests Apply criterion A as defined in Clause 2.1.2. Additionally, an increase in any degradation greater than just perceptible by observation of the image shall not occur as a consequence of the application of the test. Examples of such degradations are: ・Superimposed patterning; ・Positional disturbances due to synchronization errors; ・Geometric distortion; ・Change of contrast or brightness; ・Picture artefacts; ・Freezing or disturbance of motion; ・Image loss; ・Video data or decoding errors;

Performance Criterion	Detail(s)
A	For power frequency magnetic field test Alternative 1: A continuous magnetic field of 1 A/m: The jitter (in mm) shall not exceed the value (character height in mm + 0.3) x 2.5 33.3
B	Apply criterion B as defined in Clause 2.1.2
C	Apply criterion C as defined in Clause 2.1.2

Musical tone generationg function (EN55035 Annex E)

<table>
<tr><th>Performance Criterion</th><th>Detail(s)</th></tr>
<tr><td>A</td><td>
Perfprmance criterion A is subdivided according to the type of equipment and its use. Three subgroups corresponding to fifferent equipment types are defined in EN55035 Table E.1 and have corresponding performance criteria A1, A2 and A3. The relevant subgroup shall be selected by the manufacturrer in accordance with the product specification. The description of criteria A1, A2 and A3 are presented in EN55035 Table E.2.

EN55035 Table E.1 - Subgroups and performance criteria A for the musical tone generating function
<table>
<tr><th>Equipment type and use</th><th>Subgroup</th><th>Performance criteria</th></tr>
<tr><td>High-end quality suitable for professional use or studiorecording</td><td>1</td><td>A1</td></tr>
<tr><td>Middle grade quality suitable for amateur use or home use</td><td>2</td><td>A2</td></tr>
<tr><td>Entry grade quality for practice or exercise use</td><td>3</td><td>A3</td></tr>
</table>

EN55035 Table E.2 - Preformance criteria for different subgroups given in Table E.1
<table>
<tr><th rowspan="2">Description of degradation in performance</th><th colspan="3">Performance Criteria</th></tr>
<tr><th>A1</th><th>A2</th><th>A3</th></tr>
<tr><td>Specific unintended change in the characteristic of the tone generated
1. interruption
2. stopping (or ceasing)
3. holding
4. sudden change in amplification</td><td>Not acceptable</td><td>Not acceptable</td><td>Not acceptable</td></tr>
<tr><td>Specific unintended change in the characteristic of the tone generated
1. frequency
2. harmonic distortion</td><td>Not acceptable</td><td>Not acceptable if the degradation is beyond the level specified by the manufacturer</td><td>Not acceptable if the manufacturer judges such degradations interfere with the continuation of playing music</td></tr>
<tr><td>Other change in the type of the tone generated</td><td>Not acceptable</td><td>Not acceptable</td><td>Not acceptable if the manufacturer judges such degradations interfere with the continuation of playing music</td></tr>
<tr><td colspan="4">The specified degradations shall be perceptible to a listener.

During the test no performance degradation other than that permitted by this table is allowed. After the test the EUT shall operate without performance degradation.</td></tr>
</table>
</td></tr>
<tr><td>B</td><td>During the test, degradation of performance beyohd that defined in criterion A1 of Table E.2 is allowed. However, sudden amplification of tone to a level that exceeds the expected level by more than 6dB is not allowed.

After the test, normal operation of the EUT shall be self-recovered.</td></tr>
<tr><td>C</td><td>Degradation of the performance beyond that defined in criterion A1 of Table E.2 is permitted provided that the normal operation of the EUT can be restored after the test by operator intervention. However, sudden amplification of tone to a level that exceeds the expected level by more than 6dB is not allowed.</td></tr>
</table>

Audio output function (EN55035 Annex G)

Performance Criterion	Detail(s)
A	The measured acoustic interference radio and/or the measured electrical interference ratio during the shall be -20dB or better.
B	Apply criterion B as defined in Clause 2.1.2
C	Apply criterion C as defined in Clause 2.1.2

2.1.3 Test Location:

■ Roland EMC Testing Laboratory (Miyakoda No.1)
1-5-3, Shinmiyakoda, Kita-ku, Hamamatsu, Shizuoka, 431-2103, JAPAN
PHONE (053) 428-5095, FAX (053) 428-6500

3. MEASURING INSTRUMENTS

3.1 Electrostatic discharges

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
ESD Simulator(No.1)	Noise Laboratory	ESS-S3011A	ESS1817532	Jun.08,2020	Jun.07,2021
Discharge Gun(No.1)	Noise Laboratory	GT-30RA	ESS1817552	Jun.08,2020	Jun.07,2021
ESD Simulator(No.2)	Noise Laboratory	ESS-S3011	ESS1213018	Apr.14,2020	Apr.13,2021
Discharge Gun(No.2)	Noise Laboratory	GT-30R	ESS1213038	Apr.14,2020	Apr.13,2021

3.2 Continuous RF Electromagnetic field disturbances

□ Anechoic Chamber 1

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Signal Generator	Rohde&Schwarz	SMB100B	101278	Jun.02,2020	Jun.01,2021
Bi-Log Antenna	TESEQ	CBL6111	1273	N/A	N/A
Power Meter	Keysight Technologies	N1914A	MY59050002	Jun.04,2020	Jun.03,2021
Power Sensor	Keysight Technologies	E4412A	MY59060002	Jun.05,2020	Jun.04,2021
Power Sensor	Keysight Technologies	E4412A	MY59060003	Jun.05,2020	Jun.04,2021
RF Power Amplifier	Amplifier Research	150W1000M3	313566	N/A	N/A
Audio Analyzer	Rohde & Schwarz	UPP400	141136	Jun.02,2020	Jun.01,2021
Dual Directional Coupler	WERLATONE	C5982-714	118316	Jun.04,2020	Jun.03,2021
Ethernet Audio Communication	Roland	S-1608	Z0J3391	N/A	N/A
Ethernet Audio Communication	Roland	S-0816	Z0J0373	N/A	N/A
Uniformity	-	-	-	Jun.18,2020	Jun.17,2021

■ Anechoic Chamber2

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Signal Generator	Keysight Technologies	N5171B	MY59100734	Mar.19,2020	Mar.18,2021
Stacked Log-Peri. Antenna	SCHWARZBECK	STLP9129	9129 143	N/A	N/A
Power Meter	Keysight Technologies	N1914A	MY59500013	Mar.25,2020	Mar.24,2021
Power Sensor	Keysight Technologies	E9304A	MY59490017	Mar.25,2020	Mar.24,2021
Power Sensor	Keysight Technologies	E9304A	MY59490024	Mar.25,2020	Mar.24,2021
RF Power Amplifier (MHz)	TESEQ	CBA1G-300D-10	1088926	N/A	N/A
Audio Analyzer	Rohde & Schwarz	UPP400	141144	Apr.30,2020	Apr.29,2021
RF Power Amplifier (GHz)	MILMEGA	AS0860-100-10	1088928	N/A	N/A
Dual Directional Coupler	WERLATONE	C5982-10	121005	Mar.23,2020	Mar.22,2021
Dual Directional Coupler	WERLATONE	C10117-10	120931	Mar.23,2020	Mar.22,2021
Ethernet Audio Communication	Roland	S-1608	Z0J3390	N/A	N/A
Ethernet Audio Communication	Roland	S-0816	Z0J0372	N/A	N/A
Uniformity	-	-	-	Jun.03,2020	Jun.02,2021

3.3 Electrical fast transients / burst

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Fast Transient Noise Simulator	Noise Laboratory	FNS-AX3-A16B	FNS11Z1025	Jun.06,2020	Jun.05,2021
Capacitive Coupling Clamp	Noise Laboratory	15-00001A	-	N/A	N/A

3.4 Surges

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Surge Transients Tester	Schaffner	MODULA6150	34543	Jan.29,2020	Jan.28,2021

3.5 Continuous inducted RF distrbances

□ Shielded Room 1

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
RF Generator	TESEQ	NSG 4070B-35	41139	Jun.05,2020	Jun.04,2021
Audio Analyzer	Rohde & Schwarz	UPP400	141135	Jun.02,2020	Jun.01,2021
Power Attenuator	TESEQ	ATN 6050	39978	N/A	N/A
CDN-M1	TESEQ	CDN M1-10	34546	Jun.05,2019	Jun.04,2021
CDN-M3	Schaffner	CDN M3-16A	09D001	Jun.05,2019	Jun.04,2021
CDN-M3	Schaffner	CDN M316	19943	Jun.03,2019	Jun.02,2021
CDN-M3	Schaffner	CDN M316	20648	Jun.03,2019	Jun.02,2021
CDN-M2	Schaffner	CDN M216	19295	Jun.03,2020	Jun.02,2021
CDN-S4	Schaffner	CDN S400	16692	Jun.03,2020	Jun.02,2021
CDN-S4	Schaffner	CDN S400	16691	Jun.03,2020	Jun.02,2021
CDN-S25	Schaffner	CDN S25	06D004	Jun.05,2019	Jun.04,2021
CDN-S25	Schaffner	CDN S250	16960	Jun.03,2020	Jun.02,2021
CDN-AF2	Schaffner	CDN 801 AF 2	06D006	Jun.05,2019	Jun.04,2021
CDN-AF3	Schaffner	CDN A301	16471	Jun.03,2020	Jun.02,2021
CDN-S75	Schaffner	CDN S751	19255	Jun.04,2019	Jun.03,2021
CDN-S75	Schaffner	CDN S751	16150	Jun.04,2019	Jun.03,2021
EM Clamp	TESEQ	KEMZ 801A	38683	Jun.05,2020	Jun.04,2021
Monitoring Probe	TESEQ	MD 4070	39627	N/A	N/A
Decoupling Clamp	Schaffner	INA 726	64	N/A	N/A
Decoupling Clamp	Kyoritsu	KT-20	8-1588-2	N/A	N/A

■ Shielded Room 2

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
RF Generator	TESEQ	NSG 4070C-35	54444	Dec.19,2019	Dec.18,2020
Audio Analyzer	Rohde & Schwarz	UPP400	141139	Apr.09,2020	Apr.08,2021
Power Attenuator	Weinschel	40-6-33	TZ988	N/A	N/A
CDN-M3	TESEQ	CDN M316	56047	Jan.24,2020	Jan.23,2021
CDN-M2	TESEQ	CDN M216	56139	Jan.24,2020	Jan.23,2021
CDN-S4	TESEQ	CDN S400	56143	Jan.24,2020	Jan.23,2021
CDN-S25	TESEQ	CDN S250	56144	Jan.24,2020	Jan.23,2021
CDN-S75	TESEQ	CDN S751A	56104	Jan.24,2020	Jan.23,2021
EM Clamp	TESEQ	KEMZ 801A	78026	Jan.28,2020	Jan.27,2021
Decoupling Clamp	TESEQ	KEMA801B	56051	N/A	N/A
Decoupling Clamp	TESEQ	KEMA801B	56052	N/A	N/A
Decoupling Clamp	TESEQ	KEMA801B	56053	N/A	N/A

3.6 Power frequency magnetic field

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Surge Transients Tester	Schaffner	MODULA6150	34543	Jan.29,2020	Jan.28,2021
Magnetic Field Coil &	TESEQ	INA702 &MFO6502	159&104	Jan.29,2019	Jan.28,2021

3.7 Voltage dips

Description	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Surge Transients Tester	Schaffner	MODULA6150	34543	Jan.29,2020	Jan.28,2021

4. CONFIGURATION OF EUT

4.1 The Equipment Under Test (EUT) consists of:

Description	Trade Name	Model No.	Serial No.
Guitar Effects	BOSS	DC-2W	Z2J0001

4.2 The measurement was carried out with the following equipment connected:

Description	Trade Name	Model No.	Serial No.
Digital Recorder	BOSS	BR-80	F8K3131
Digital Recorder	BOSS	BR-80	F7K2900
Monitor Speaker	Roland	CM-30	E8K6761
AC Adaptor	BOSS	PSA-230S	1711004686

4.3 Operating Conditions of the EUT:

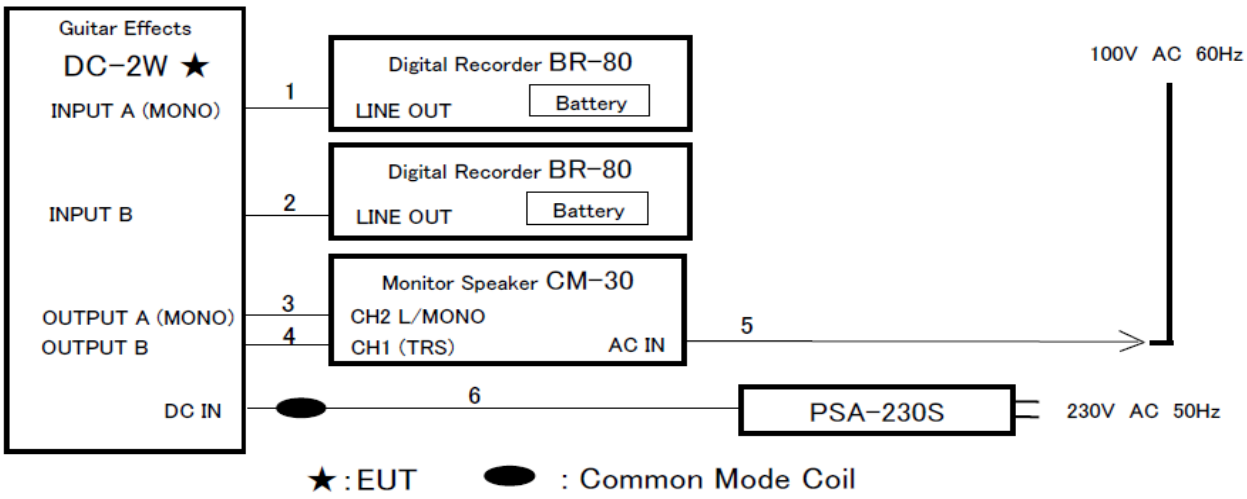
None.

5. TYPE OF INTERFACE CABLE(S)

Cable No.	Description	Shielded	Ferrite Core	Connector	Length (m)
1	TRS - TRS	Yes	No	Metal	2.0
2	RCA- TS	Yes	No	Metal	2.0
3	TRS - TRS	Yes	No	Metal	2.0
4	TS - TS	Yes	No	Metal	2.0
5	AC Power	No	No	Non-Metal	2.4
6	DC PLUG - EUT	Yes	No(*1)	Non-Metal	2.1

(*1) But with common mode coil.

6. ARRANGEMENT OF THE INTERFACE CABLE(S)



TEST DATA

◆Continuous RF Electromagnetic field disturbances

Model No. : DC-2W
Test Result : Complied

Tested by: Hirohisa Oishi

1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
October 19, 2020	20.4 ℃	56.5%

2. Test Results:

Test Side	Polarization	Audio quality evaluation		Performance evaluation
		Measurement port	Margin >20dB	Criteria A
Left	Horizontal	N/A	N/A	Complied
	Vertical	N/A	N/A	Complied
Right	Horizontal	N/A	N/A	Complied
	Vertical	N/A	N/A	Complied
Front	Horizontal	N/A	N/A	Complied
	Vertical	N/A	N/A	Complied
Rear	Horizontal	N/A	N/A	Complied
	Vertical	N/A	N/A	Complied

The minimum margin(s) to the limit(s) are as follows:					
Test Side	Polarization	Measurement port	Frequency	Measurement Value	Margin
N/A	N/A	N/A	N/A	N/A	N/A

3. Test Conditions:

Frequency Range	:	[Sweep] 80 MHz - 1000MHz / [Spot] 1800, 2600, 3500, 5000 MHz
Frequency Steps	:	1%
Dwell Time		0.5s
Modulation	:	80% AM (1kHz)
Test Level	:	3 V/m
Test Room	:	Anechoic Chamber 2

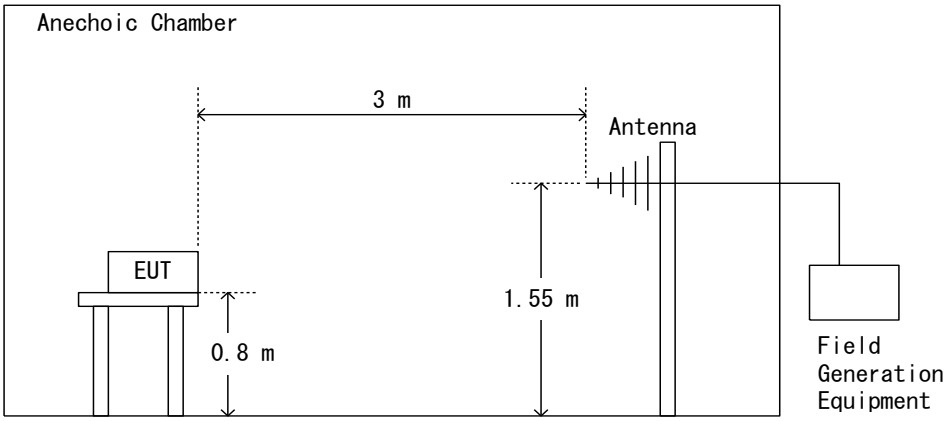
4. Operating Conditions of the EUT:

Refer to the test procedure document "BG741_試験セッティング_20180510.xlsx".

5. Notes:

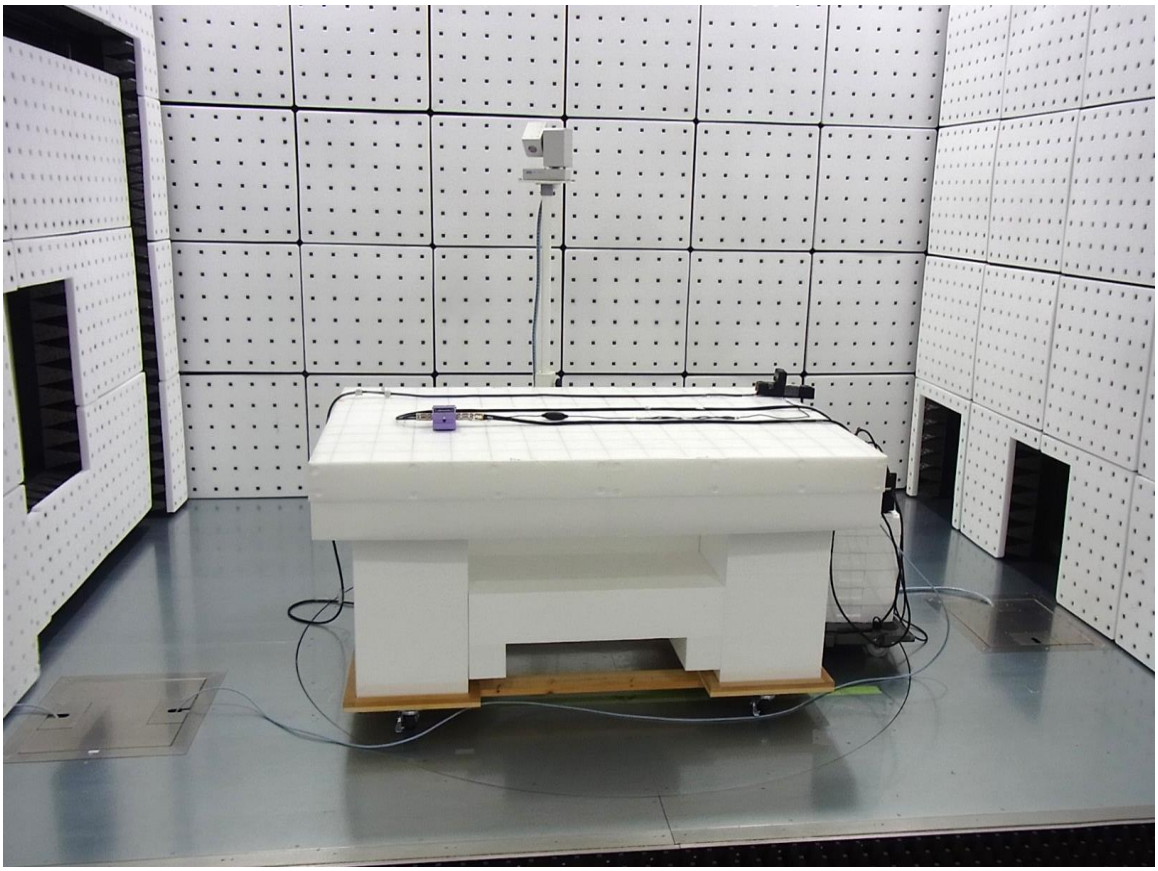
The test was used “Ethernet Audio Communication system”.
The audio signal of EUT was sent to the audio analyzer in the measurement room.

6. Test Set-up Sketch:

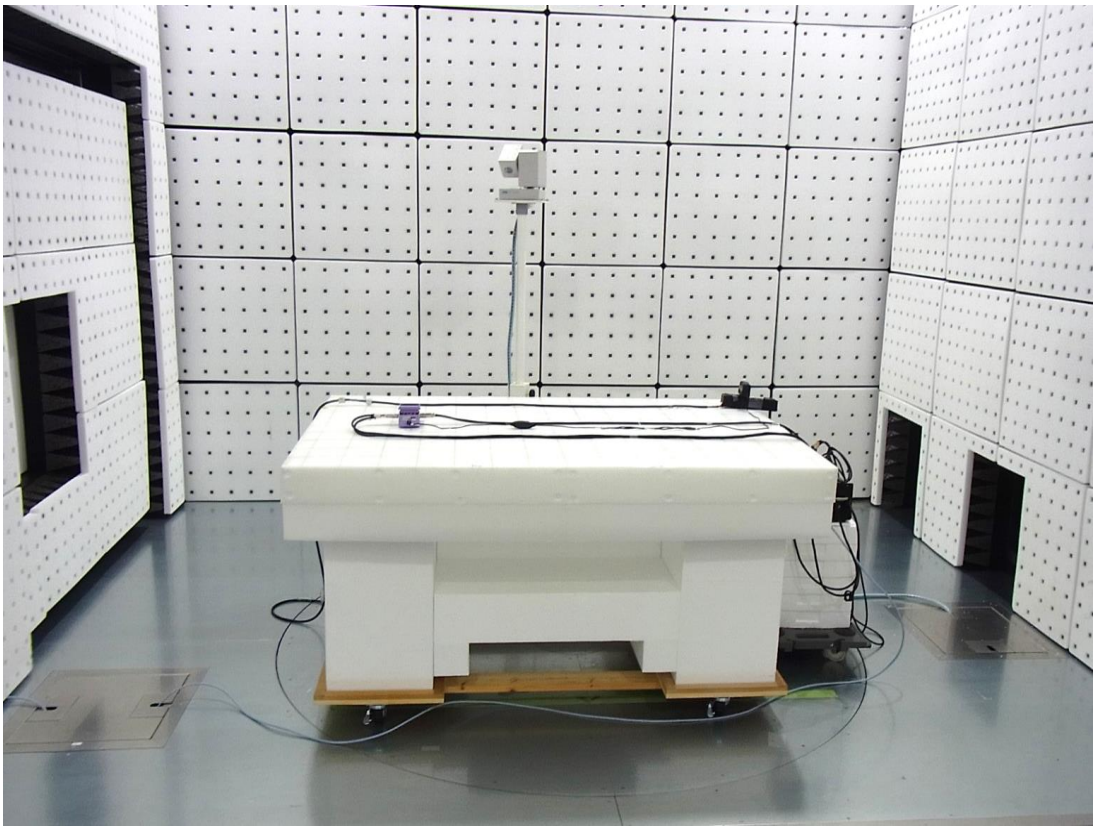


7. Photograph(s) of Test Set-up:

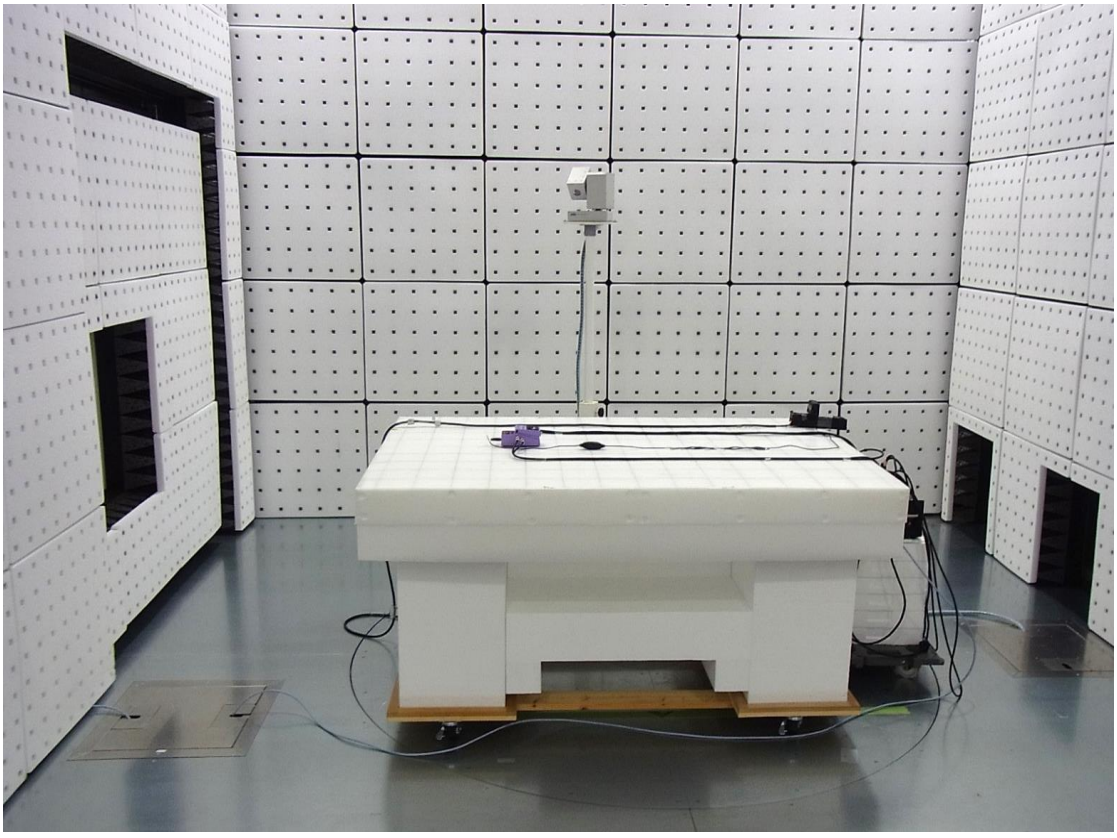
Test Side: Front



Test Side: Rear



Test Side: Left



Test Side: Right



TEST DATA

◆Continuous inducted RF disturbances

Model No. : DC-2W
Test Result : Complied

Tested by: Kaito Sui

1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
October 8, 2020	25.0℃	51%

2. Test Results:

Injection Port	Audio quality evaluation (G.2.9)		Performance evaluation	Comments
	Measurement port	Margin >20dB	Criteria A	
INPUT A (MONO)	N/A	N/A	Complied	EM Clamp
INPUT B		N/A	Complied	EM Clamp
OUTPUT A (MONO)		N/A	Complied	EM Clamp
OUTPUT B		N/A	Complied	EM Clamp
MAINS		N/A	Complied	CDN M2

The minimum margin(s) to the limit(s) are as follows:				
Injection Port	Measurement port	Frequency	Measurement Value	Margin
N/A	N/A	N/A	N/A	N/A

3. Test Conditions:

Frequency Range / Voltage: 150 kHz - 10 MHz / 6 Vrms
10 MHz - 30 MHz / 6-2 Vrms
30 MHz - 80 MHz / 2 Vrms
Frequency Steps / Dwell Time: 4.0 % / 0.5 s
＊EN55035 Clause 4.2.2.1

Modulation: 80% AM (1kHz)
Test Room: Shielded Room 2

4. Operating Conditions of the EUT:

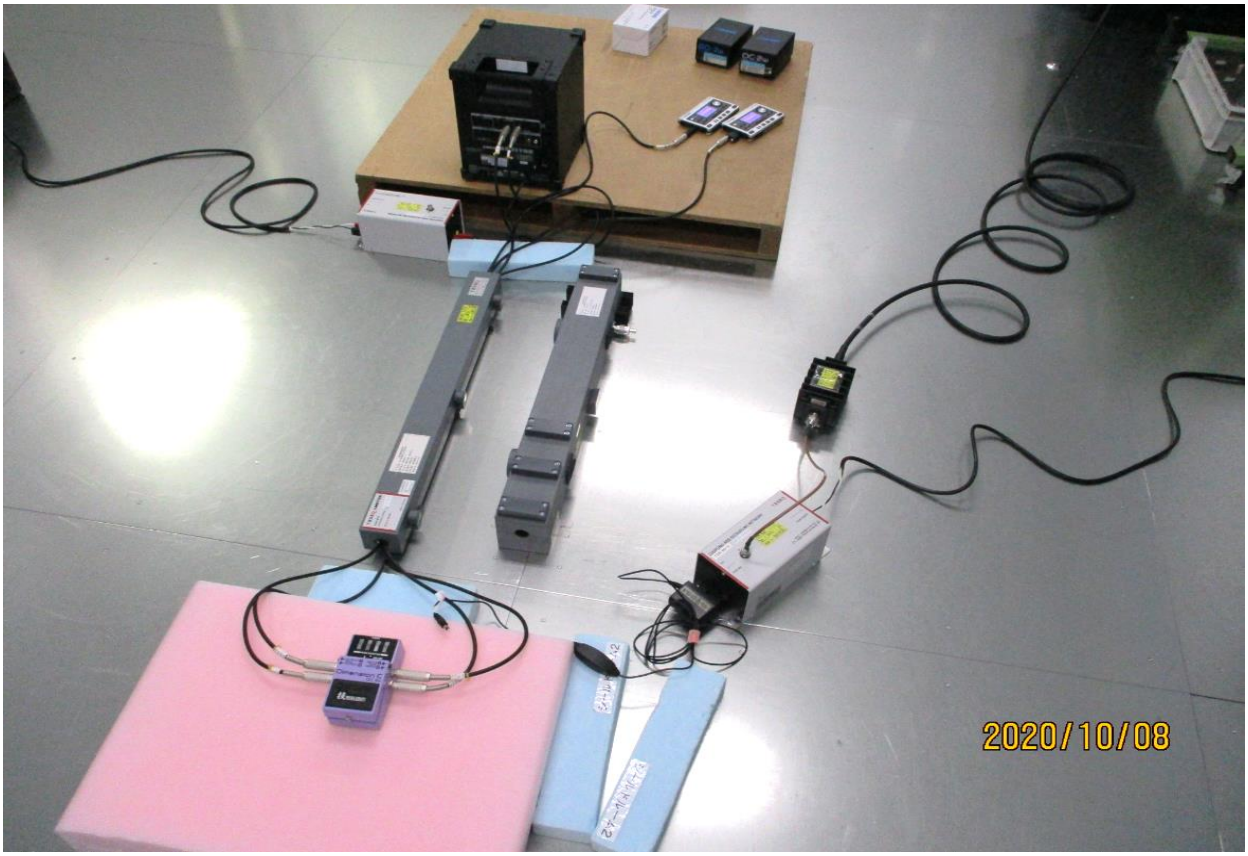
None.

5. Notes:

None.

6.Photograph(s) of Test Set-up:

・Overview



TEST DATA

◆Electrostatic discharge immunity test

Model No.	:	DC-2W
Test Result	:	Passed

Tested by:

Naoto Iguchi

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1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
May 7, 2018	25.0 ℃	37.8 %

2. Test Results:

2.1 Indirect discharge

Test Level	Test Side	Polarization	Operating Condition #1	Operating Condition #2
1	Front, Rear, Left, Right	Horizontal	N/A	N/A
		Vertical	N/A	N/A
2	Front, Rear, Left, Right	Horizontal	N/A	N/A
		Vertical	Pass	Pass

2.2 Direct discharge

Test Level	Operating Condition #1	Operating Condition #2
1	N/A	N/A
2	Pass	Pass

2.3 Air discharge

Test Level	Operating Condition #1	Operating Condition #2
1	Pass	Pass
2	Pass	Pass
3	Pass	Pass

3. Test Conditions:

Type of Test	:	Type test
Number of Discharge	:	10 times per each test point
Performance Criterion	:	B

4. Operating Conditions of the EUT:

Operating Condition #1 : The EUT has following 2 power supply modes;
1. AC Adaptor mode (without Battery mounted)
2. Battery mode

1600Hz/400Hz sine wave was input to the "INPUT A/B " port of the EUT from the Digital Recorder "MICRO BR".

Operating Condition #2 : No operation

5. Notes:

The air discharge test was performed by level 3 specified in CISPR 20 / CISPR 24, and the test by level 1 and 2 were was skipped, because no degradation or loss of function was observed on the test by level 3 and the same result could be reasonably expected when the EUT was tested by level 1 or 2.

6. The measurement was carried out with the following equipment(s) connected:

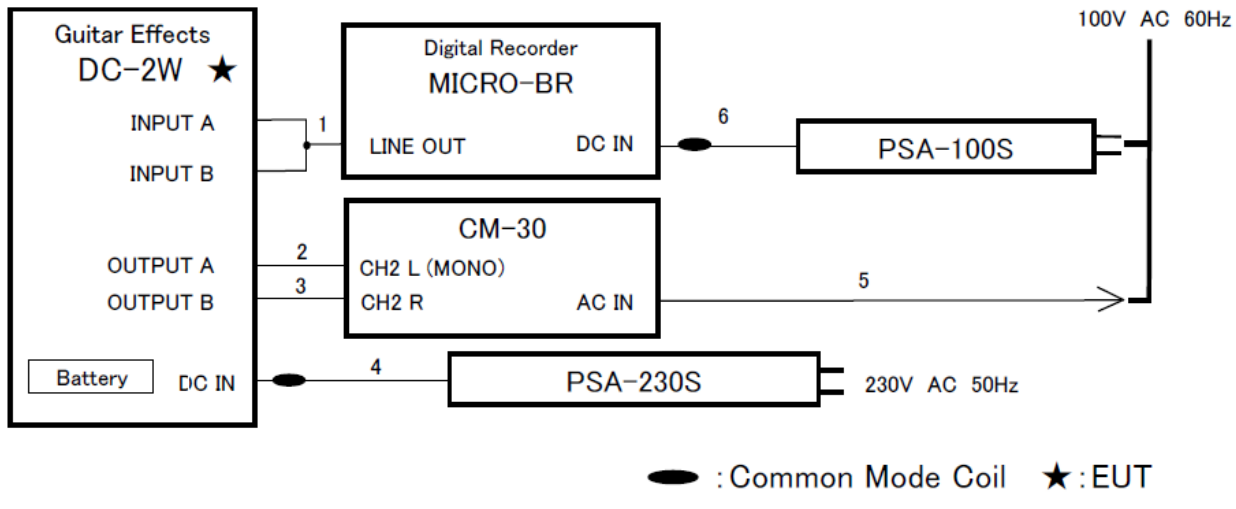
Description	Trade Name	Model No.	Serial No.
Digital Recorder	BOSS	MICRO BR	ZU80101
AC Adaptor	BOSS	PSA-100S	N/A
Monitor Speaker	Roland	CM-30	GZ27245
AC Adaptor	BOSS	PSA-230S	1512002983

7. Type of the interface cable(s):

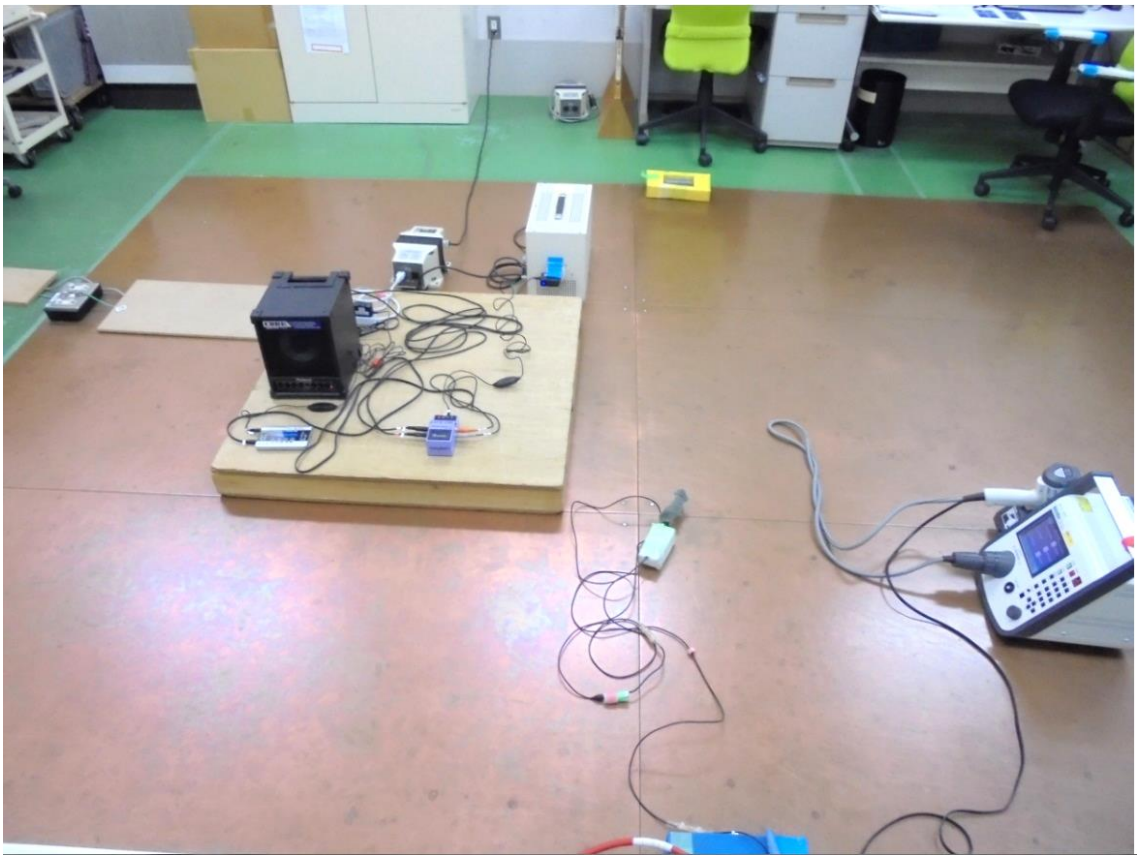
Cable No.	Description	Shielded	Ferrite Core	Connector	Length
1	Audio Cable (Y Cable)	Yes	No	Non-Metal	2.9 m
2	Audio Cable	Yes	No	Non-Metal	3.0 m
3	Audio Cable	Yes	No	Non-Metal	3.0 m
4	DC Power Cable (PSA-230S)	No	No (*1)	Non-Metal	3.1 m
5	AC Power Cable (CM-30)	No	No	Non-Metal	2.4 m
6	DC Power Cable (PSA-100S)	No	No (*1)	Non-Metal	3.1 m

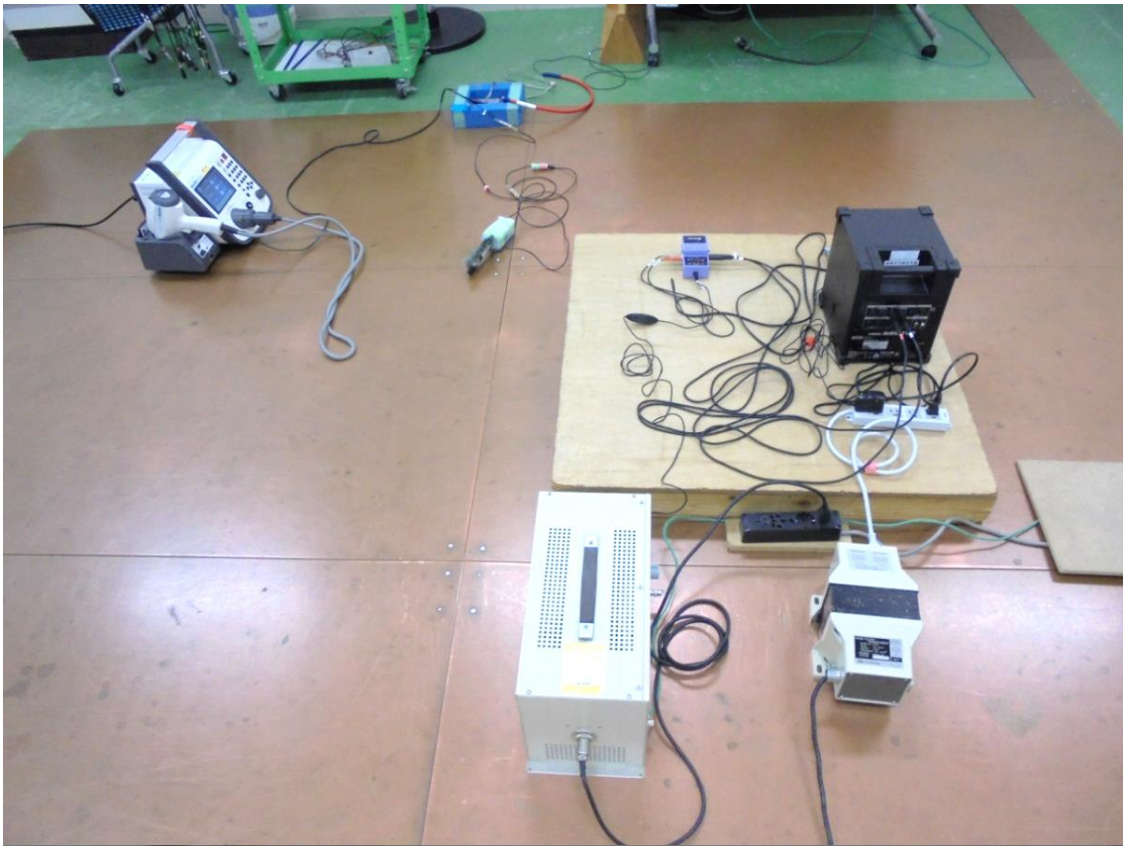
(*1) But with Common mode coil.

8.Arrangement of the interface cable(s):



9.Photograph(s) of Test Set-up:





10. Photograph(s) of EUT test points :

△ : Direct discharge ▲ : Direct discharge (Signal line) ● : Air discharge



TOP



BOTTOM

△ : Direct discharge ▲ : Direct discharge (Signal line) ● : Air discharge

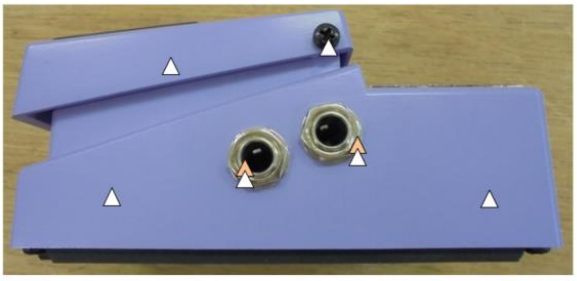
REAR

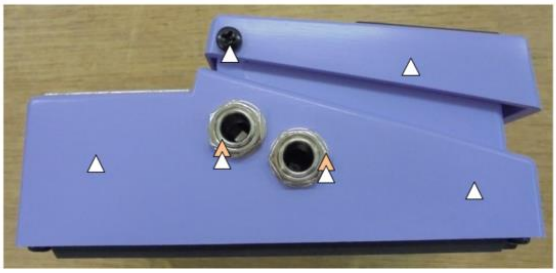




FRONT

RIGHT





LEFT



Battery terminal

TEST DATA

◆Electrical fast transient/burst immunity test

Model No.	:	DC-2W
Test Result	:	Passed

Tested by:

Hirofumi Iwanaga

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1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
May 14, 2018	25.0 ℃	47%

2. Test Results:

Test on power supply ports and on protective earth terminals

	Results – Level 1 (0.5 kV)		Results – Level 2 (1.0 kV)	
Test Point	Positive (+)	Negative (-)	Positive (+)	Negative (-)
L	N/A	N/A	N/A	N/A
N	N/A	N/A	N/A	N/A
L, N	N/A	N/A	Pass	Pass
PE	N/A	N/A	N/A	N/A
L, PE	N/A	N/A	N/A	N/A
N, PE	N/A	N/A	N/A	N/A
L, N, PE	N/A	N/A	N/A	N/A

Test on I/O and communication ports

	Results – Level 1 (0.25 kV)		Results – Level 2 (0.5 kV)	
Test Point	Positive (+)	Negative (-)	Positive (+)	Negative (-)
INPUT A	N/A	N/A	Pass	Pass
INPUT B	N/A	N/A	Pass	Pass
OUTPUT A	N/A	N/A	Pass	Pass
OUTPUT B	N/A	N/A	Pass	Pass

3. Test Conditions:

Type of Test	:	Type test
Duration of Test	:	120 sec
Number of Application of the Test Voltage	:	1 time
Performance Criterion	:	B

4. Operating Conditions of the EUT:

The EUT has following 2 power supply modes;
1. AC Adaptor mode (with Battery mounted/ without Battery mounted)
2. Battery mode

1kHz sine wave was input into front "INPUT" port of the EUT from the Digital Recorder "MICRO BR".

The application software named "WAVE SPECTRA" was running on the Computer "CF-S10CWHDS" for monitoring 1kHz audio signal from monitor speaker "CM-30".

5. Notes:

The test was performed by level 2 only, and the test by level 1 was skipped, because no degradation or loss of function was observed on the test by level 2 and the same result could be reasonably expected when the EUT was tested by level 1.

6. The measurement was carried out with the following equipment(s) connected:

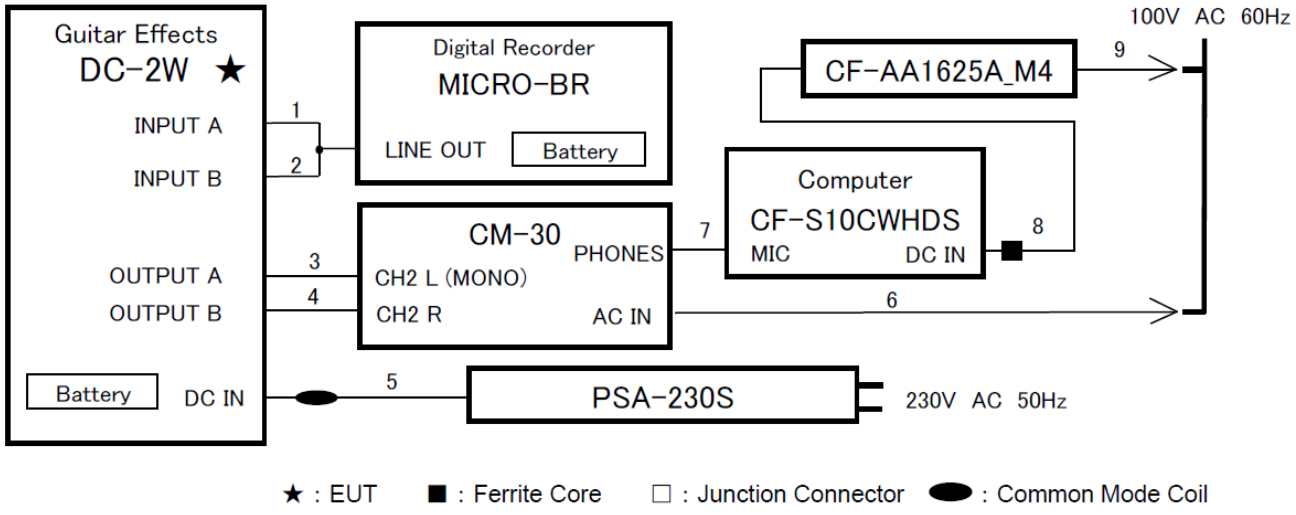
Description	Trade Name	Model No.	Serial No.
Digital Recorder	BOSS	MICRO BR	ZU80106
Monitor Speaker	Roland	CM-30	I5A2026
AC Adaptor	BOSS	PSA-230S	1512002983
Computer	Panasonic	CF-S10CWHDS	1FKSA70345
AC Adaptor	Panasonic	CF-AA1625A_M4	1625AM4058 21996D

7. Type of the interface cable(s):

Cable No.	Description	Shielded	Ferrite Core	Connector	Length
1	Audio Cable	Yes	No	Metal	3.0 m
2	Audio Cable	Yes	No	Metal	3.0 m
3	Audio Cable	Yes	No	Metal	3.0 m
4	Audio Cable	Yes	No	Metal	3.0 m
5	DC Power Cable (PSA-230S)	No	No (*1)	Non-Metal	3.1 m
6	AC Power Cable (CM-30)	No	No	Non-Metal	2.5 m
7	Audio Cable	Yes	No	Non-Metal	1.5 m
8	DC Power Cable (CF-AA1625A M4)	No	Yes	Non-Metal	1.2 m
9	AC Power Cable (CF-AA1625A M4)	No	No	Non-Metal	0.9 m

(*1) But with common mode coil.

8. Arrangement of the interface cable(s):

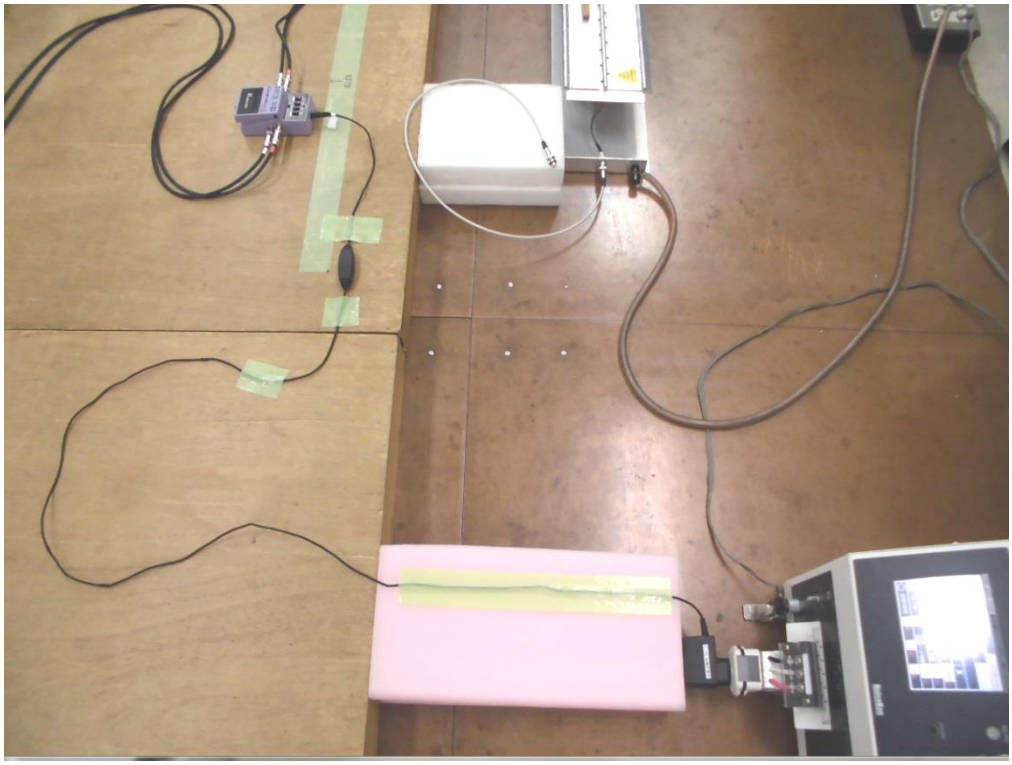


9. Photograph(s) of Test Set-up:

・Overview (Mains Port)



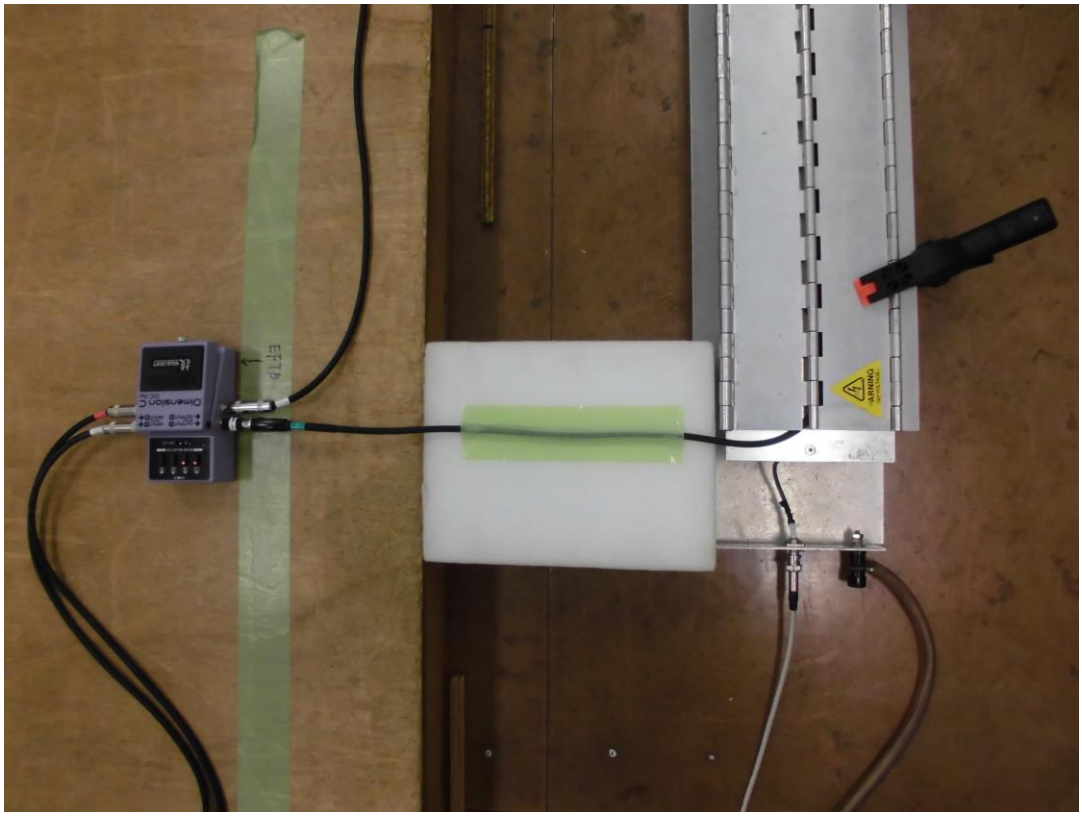
・Power supply port.



・Overview (Signal Port)



・Oprerating using Signal port.



TEST DATA

◆Surge immunity test

Model No. : DC-2W
Test Result : Passed

Tested by:

Naoto Iguchi

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1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
May 7, 2018	25.1 ℃	37.2 %

2. Test Results:

Test on input AC power ports

Test Points	Phase Angle	Level 1 (0.5 kV)		Level 2 (1.0 kV)		Level 3 (2.0 kV)	
		Positive	Negative	Positive	Negative	Positive	Negative
L to N	0 °	N/A	N/A	Pass	Pass	N/A	N/A
	90 °	N/A	N/A	Pass	Pass	N/A	N/A
	180 °	N/A	N/A	Pass	Pass	N/A	N/A
	270 °	N/A	N/A	Pass	Pass	N/A	N/A
L to PE	0 °	N/A	N/A	N/A	N/A	N/A	N/A
	90 °	N/A	N/A	N/A	N/A	N/A	N/A
	180 °	N/A	N/A	N/A	N/A	N/A	N/A
	270 °	N/A	N/A	N/A	N/A	N/A	N/A
N to PE	0 °	N/A	N/A	N/A	N/A	N/A	N/A
	90 °	N/A	N/A	N/A	N/A	N/A	N/A
	180 °	N/A	N/A	N/A	N/A	N/A	N/A
	270 °	N/A	N/A	N/A	N/A	N/A	N/A

3. Test Conditions:

Generator Source Impedance : 2 ohms (Live to Neutral)
12 ohms (Live to Protective Earth, Neutral to Protective Earth)
Number of Tests : 5 times
Repetition Rate : 1/minute
Performance Criterion : B

4. Operating Conditions of the EUT:

The EUT has following power supply mode;
AC Adaptor mode (with Battery mounted)

1600Hz/400Hz sine wave was input to the "INPUT A/B " port of the EUT from the Digital Recorder "MICRO BR".

5. Notes:

None;

6. The measurement was carried out with the following equipment(s) connected:

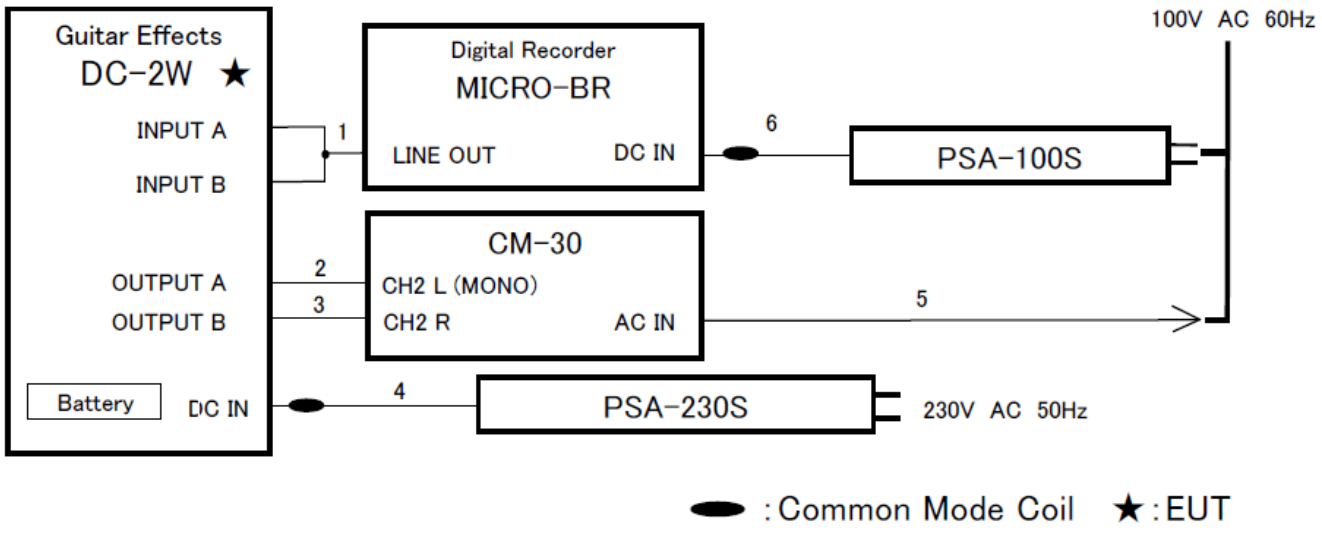
Description	Trade Name	Model No.	Serial No.
Digital Recorder	BOSS	MICRO BR	ZU80101
AC Adaptor	BOSS	PSA-100S	N/A
Monitor Speaker	Roland	CM-30	GZ27245
AC Adaptor	BOSS	PSA-230S	1512002983

7. Type of the interface cable(s):

Cable No.	Description	Shielded	Ferrite Core	Connector	Length
1	Audio Cable (Y Cable)	Yes	No	Non-Metal	2.9 m
2	Audio Cable	Yes	No	Non-Metal	3.0 m
3	Audio Cable	Yes	No	Non-Metal	3.0 m
4	DC Power Cable (PSA-230S)	No	No (*1)	Non-Metal	3.1 m
5	AC Power Cable (CM-30)	No	No	Non-Metal	2.4 m
6	DC Power Cable (PSA-100S)	No	No (*1)	Non-Metal	3.1 m

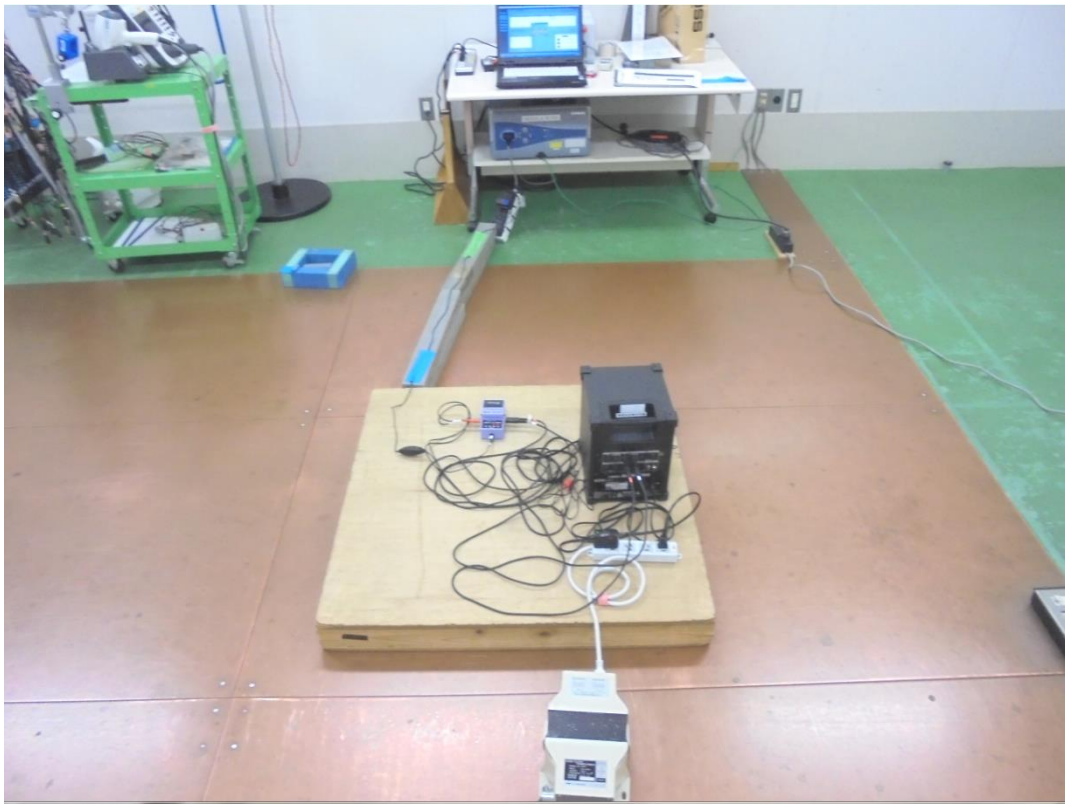
(*1) But with Common mode coil.

8.Arrangement of the interface cable(s):



9. Photograph(s) of Test Set-up:





TEST DATA

◆Voltage dips, short interruptions and voltage variations immunity tests

Model No.	:	DC-2W
Test Result	:	Passed

Tested by:

Naoto Iguchi

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1. Date of Measurement: / Environmental Conditions:

Date of Measurement:	Temperature:	Humidity:
May 7, 2018	24.9 ℃	38.3 %

2. Test Results:

Voltage Dips

Reduction	Duration	Phase Angle	Performance Criterion	Standard	Result
> 95 %	0.5 period (10 ms)	0 °	B	EN 55024:2010	Pass
> 95 %	0.5 period (10 ms)	180 °	B	EN 55024:2010	Pass
30 %	25 periods (500 ms)	0 °	C	EN 55024:2010	Pass
30 %	25 periods (500 ms)	180 °	C	EN 55024:2010	Pass
30 %	10 ms	0 °	B	EN 55103-2:2009	N/A
30 %	10 ms	180 °	B	EN 55103-2:2009	N/A
60 %	100 ms	0 °	C	EN 55103-2:2009	N/A
60 %	100 ms	180 °	C	EN 55103-2:2009	N/A

Voltage Interruptions

Reduction	Duration	Phase Angle	Performance Criterion	Standard	Result
> 95 %	250 periods (5000 ms)	0 °	C	EN 55024:2010	Pass
> 95 %	250 periods (5000 ms)	180 °	C	EN 55024:2010	Pass
> 95 %	5000 ms	0 °	C	EN 55103-2:2009	N/A
> 95 %	5000 ms	180 °	C	EN 55103-2:2009	N/A

3. Test Conditions:

Number of Tests : 10 times

4. Operating Conditions of the EUT:

The EUT has following power supply mode;
AC Adaptor mode (with Battery mounted)

1600Hz/400Hz sine wave was input to the "INPUT A/B " port of the EUT from the Digital Recorder "MICRO BR".

5. Notes:

None;

6. The measurement was carried out with the following equipment(s) connected:

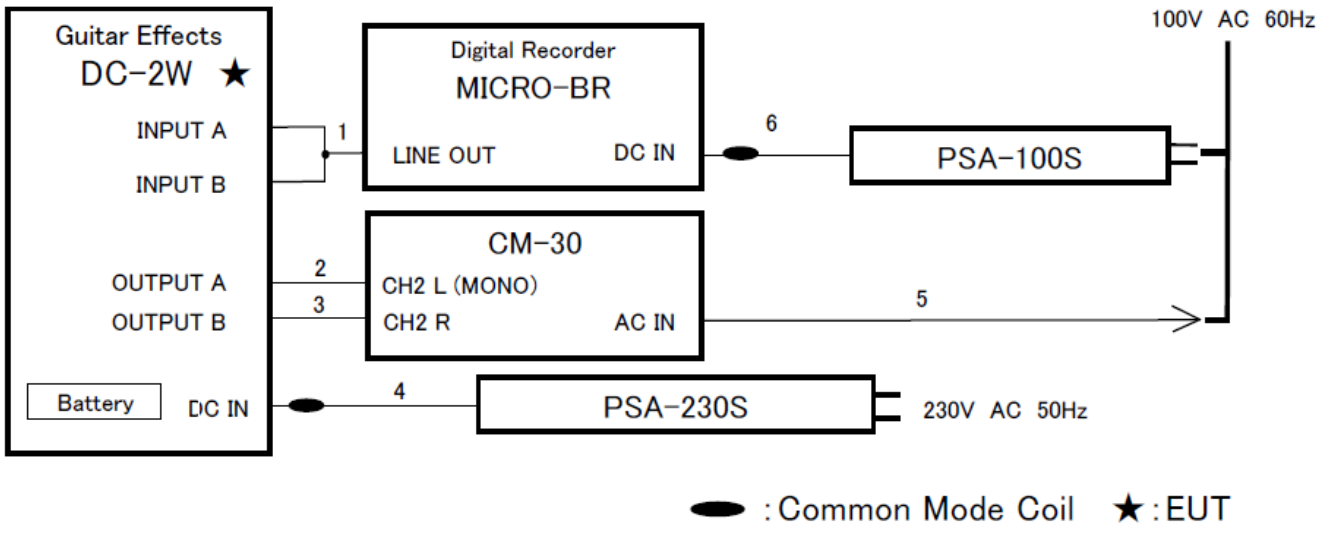
Description	Trade Name	Model No.	Serial No.
Digital Recorder	BOSS	MICRO BR	ZU80101
AC Adaptor	BOSS	PSA-100S	N/A
Monitor Speaker	Roland	CM-30	GZ27245
AC Adaptor	BOSS	PSA-230S	1512002983

7. Type of the interface cable(s):

Cable No.	Description	Shielded	Ferrite Core	Connector	Length
1	Audio Cable (Y Cable)	Yes	No	Non-Metal	2.9 m
2	Audio Cable	Yes	No	Non-Metal	3.0 m
3	Audio Cable	Yes	No	Non-Metal	3.0 m
4	DC Power Cable (PSA-230S)	No	No (*1)	Non-Metal	3.1 m
5	AC Power Cable (CM-30)	No	No	Non-Metal	2.4 m
6	DC Power Cable (PSA-100S)	No	No (*1)	Non-Metal	3.1 m

(*1) But with Common mode coil.

8.Arrangement of the interface cable(s):



9. Photograph(s) of Test Set-up:

