



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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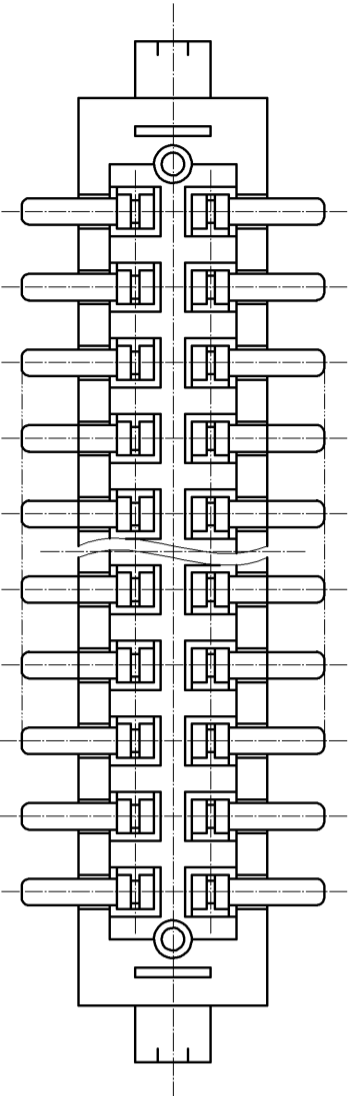
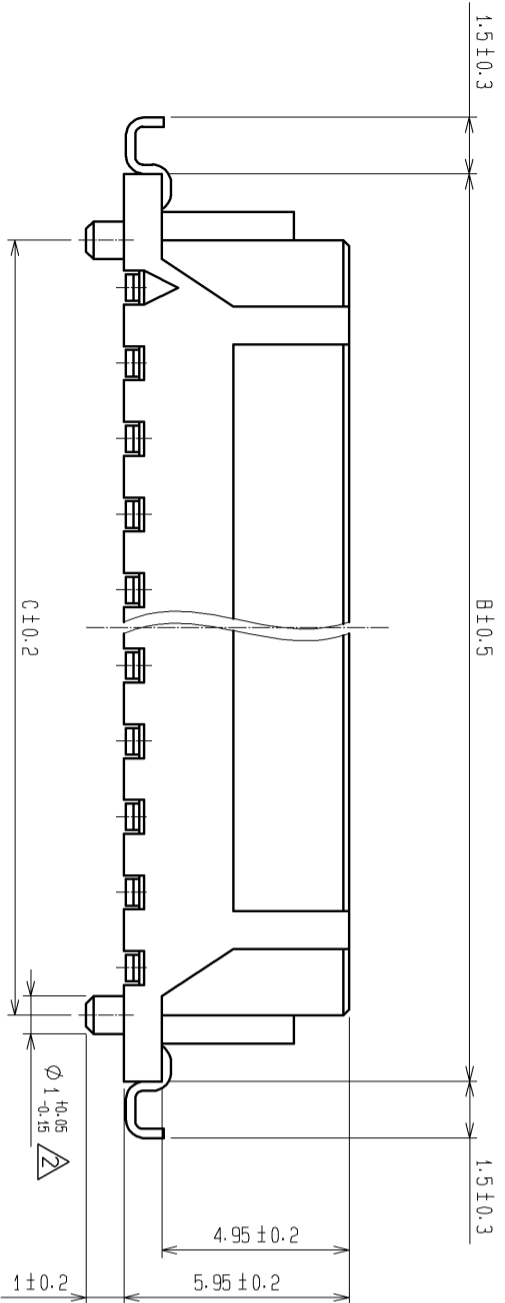
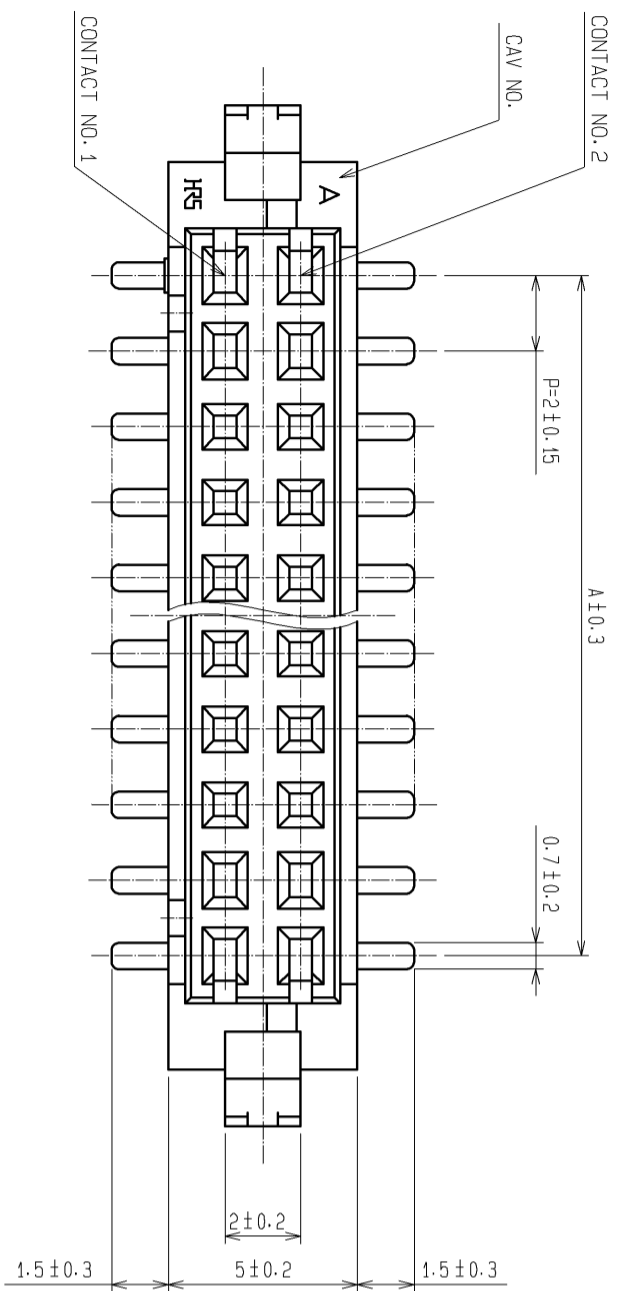


DRAWING FOR REFERENCE: This is subject to change without notice

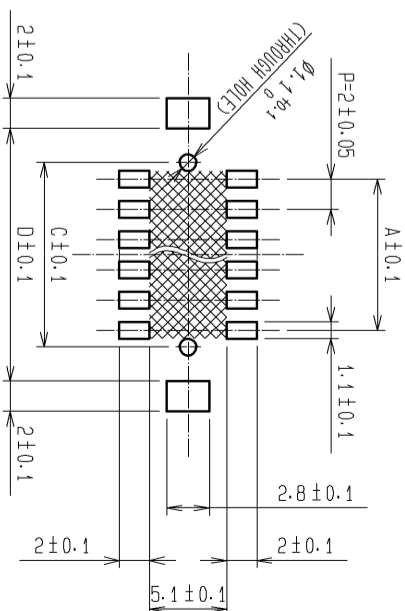
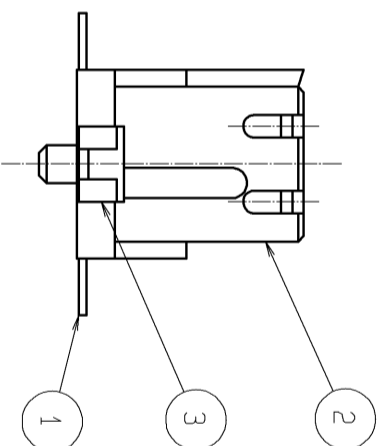
TO			
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COUNT	DESCRIPTION OF REVISIONS	BY	CHKD	DATE	COUNT	DESCRIPTION OF REVISIONS	BY	CHKD	DATE				
△					△								
△					△								
△					△								
<b>APPLICABLE STANDARD</b>													
<b>RATING</b>		250 V AC		<b>OPERATING TEMPERATURE RANGE</b>		-30 °C TO +85 °C (NOTE1)							
<b>CURRENT</b>		2 A		<b>STORAGE TEMPERATURE RANGE</b>		-10 °C TO +60 °C (NOTE2)							
<b>SPECIFICATIONS</b>													
<b>ITEM</b>		<b>TEST METHOD</b>		<b>REQUIREMENTS</b>		<b>Q1</b>		<b>Q1 AT</b>					
<b>CONSTRUCTION</b>				VISUALLY AND BY MEASURING INSTRUMENT.				ACCORDING TO DRAWING.					
<b>GENERAL EXAMINATION</b>				CONFIRMED VISUALLY.				X X					
<b>MARKING</b>								X X					
<b>ELECTRIC CHARACTERISTICS</b>													
<b>CONTACT RESISTANCE</b>		100 mA (DC OR 1000 Hz).		30 mΩ MAX.		X		-					
<b>INSULATION RESISTANCE</b>		500 V DC.		1000 MΩ MIN.		X		-					
<b>VOLTAGE PROOF</b>		650 V AC FOR 1 min.		NO FLASHOVER OR BREAKDOWN.		X		-					
<b>MECHANICAL CHARACTERISTICS</b>													
<b>MECHANICAL OPERATION</b>				30 TIMES INSERTIONS AND EXTRACTIONS.				① CONTACT RESISTANCE: 30 mΩ MAX. ② NO DAMAGE, CRACK OR LOOSENESS OF PARTS.					
<b>VIBRATION</b>		FREQUENCY 10 TO 55 Hz, SINGLE AMPLITUDE 0.75 mm, AT 2 h, FOR 3 DIRECTIONS.		① NO ELECTRICAL DISCONTINUITY OF 1 μs.		X		-					
<b>SHOCK</b>		490 m/s <sup>2</sup> DURATION OF PULSE 11 ms AT 3 TIMES FOR 3 DIRECTIONS.		② NO DAMAGE, CRACK OR LOOSENESS OF PARTS.		X		-					
<b>ENVIRONMENTAL CHARACTERISTICS</b>													
<b>RAPID CHANGE OF TEMPERATURE</b>		TEMPERATURE -55 → 5 TO 35 → +85 → 5 TO 35°C TIME 30 → 5 TO 15 → 30 → 5 TO 15min UNDER 5 CYCLES.		① CONTACT RESISTANCE: 30 mΩ MAX. ② INSULATION RESISTANCE: 1000 MΩ MIN. ③ NO DAMAGE, CRACK OR LOOSENESS OF PARTS.		X		-					
<b>DAMP HEAT (STEADY STATE)</b>		EXPOSED AT 40±2 °C, 90 TO 95 %, 96 h.		① CONTACT RESISTANCE: 30 mΩ MAX. ② INSULATION RESISTANCE: 500 MΩ MIN. ③ NO DAMAGE, CRACK OR LOOSENESS OF PARTS.		X		-					
<b>RESISTANCE TO SOLDERING HEAT</b>		1) AUTOMATIC SOLDERING (REFLOW) 《REFLOW AREA》 WITHIN 10 sec. MAX 240°C 10 sec to 30 sec. MIN 220°C 《PREHEATING AREA》 150°C 100 TO 120 s PUT THROUGH IN REFLOW FURNACE TWICE. LEAVE IN AMBIENT TEMPERATURE AND HUMIDITY FOR 1 HOUR. CONNECTOR TEMPERATURE TO BE AMBIENT FOR SECOND REFLOW. 2) MANUAL SOLDERING SOLDERING IRON TEMPERATURE : 290±10°C, SOLDERING TIME : 3 s NO STRENGTH ON CONTACT.		NO DEFORMATION OF CASE OF EXCESSIVE LOOSENESS OF THE TERMINALS.		X		-					
<b>SOLDERABILITY</b>		SOLDERED AT SOLDER TEMPERATURE, 230±5°C FOR IN IMMERSION, DURATION, 3 s.		A NEW UNIFORM COATING OF SOLDER SHALL COVER MINIMUM OF 95 % OF THE SURFACE BEING IMMERSED.		X		-					
<b>REMARKS</b>				<b>DRAWN</b>		<b>DESIGNED</b>		<b>CHECKED</b>		<b>APPROVED</b>		<b>RELEASED</b>	
NOTE1: INCLUDING THE TEMPERATURE RISE BY CURRENT. NOTE2: APPLY TO THE CONDITION OF LONG TERM STORAGE FOR UNUSED PRODUCTS BEFORE PCB ON BOARD, AFTER PCB BOARD OPERATING TEMPERATURE AND HUMIDITY RANGE IS APPLIED FOR INTERIM STORAGE DURING TRANSPORTATION.				F. Matsuki 04.03.30		<i>S. Sato</i> 04.04.01		<i>H. Tanaka</i> 04.04.01		<i>T. Owa</i> 04.04.02			
Unless otherwise specified, refer to JIS C 5402. Note Q1: Qualification Test AT Assurance Test X: Applicable Test													
<b>HRS HIROSE ELECTRIC CO., LTD.</b>				<b>SPECIFICATION SHEET</b>				<b>PART NO.</b>				<b>PART NO.</b>	
CODE NO.(OLD)				DRAWING NO.				PART NO.				PART NO.	
CL				ELC4-306129-01				CL543				DF11Z-*DS-2V(20)	
											1	1	





CODE NO.	PART NO.	NUMBER OF CONTACT	A	B	C	D
CL543-2001-3-20	DF11Z-4DS-2V(20)	4	2.0	8.5	4.5	8.7
CL543-2002-6-20	DF11Z-6DS-2V(20)	6	4.0	10.5	6.5	10.7
CL543-2003-9-20	DF11Z-8DS-2V(20)	8	6.0	12.5	8.5	12.7
CL543-2004-1-20	DF11Z-10DS-2V(20)	10	8.0	14.5	10.5	14.7
CL543-2005-4-20	DF11Z-12DS-2V(20)	12	10.0	16.5	12.5	16.7
CL543-2006-7-20	DF11Z-14DS-2V(20)	14	12.0	18.5	14.5	18.7
CL543-2007-0-20	DF11Z-16DS-2V(20)	16	14.0	20.5	16.5	20.7
CL543-2008-2-20	DF11Z-18DS-2V(20)	18	16.0	22.5	18.5	22.7
CL543-2009-5-20	DF11Z-20DS-2V(20)	20	18.0	24.5	20.5	24.7
CL543-2010-4-20	DF11Z-22DS-2V(20)	22	20.0	26.5	22.5	26.7
CL543-2011-7-20	DF11Z-24DS-2V(20)	24	22.0	28.5	24.5	28.7
CL543-2012-0-20	DF11Z-26DS-2V(20)	26	24.0	30.5	26.5	30.7
CL543-2013-2-20	DF11Z-28DS-2V(20)	28	26.0	32.5	28.5	32.7
CL543-2014-5-20	DF11Z-30DS-2V(20)	30	28.0	34.5	30.5	34.7
CL543-2015-8-20	DF11Z-32DS-2V(20)	32	30.0	36.5	32.5	36.7
CL543-2016-0-20	DF11Z-40DS-2V(20)	40	38.0	44.5	40.5	44.7



RECOMMENDED PATTERN(2:1)  
PCB THICKNESS: 1.6mm

NOTES 1: IF THERE IS PATTERN ON PART, THERE IS A POSSIBILITY THAT IT WILL MAKE CONTACT WITH THE LEADS.  
2: LEAD CO-PLANARITY INCLUDE REINFORCED METAL FITTINGS SHALL BE 0.1mm MAX.  
3: METAL MASK THICKNESS: 0.15~0.2mm  
OPENING RATIO: 100%

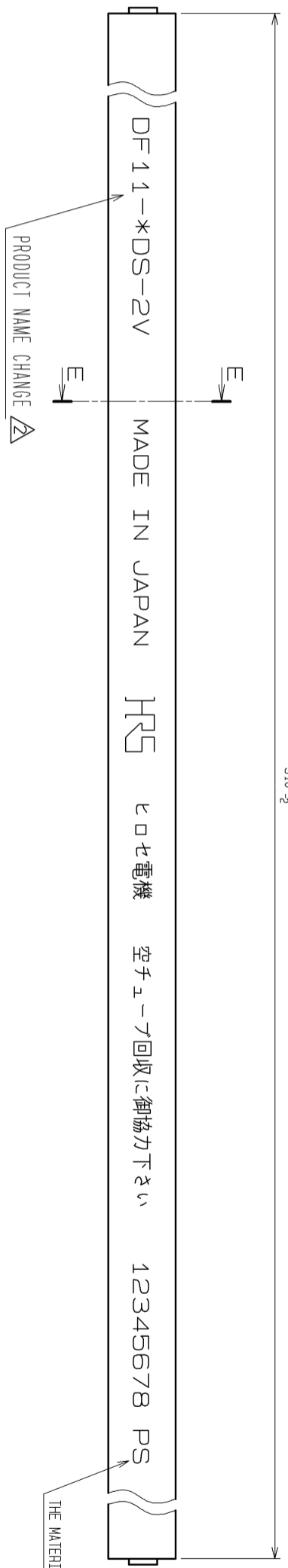
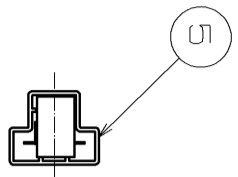
NO.	MATERIAL	FINISH	REMARKS	NO.	MATERIAL	FINISH	REMARKS
2	POLYAMIDE	UL94V-0: NATURAL (BEIGE)		5	ELASTOMER	STOPPER: GRAY	
1	PHOSPHOR BRONZE	TIN PLATED 2μm min		4	PS	ELECTROSTATIC PROTECTION CLEAR	
				3	BRASS	TIN PLATED 14μm min	

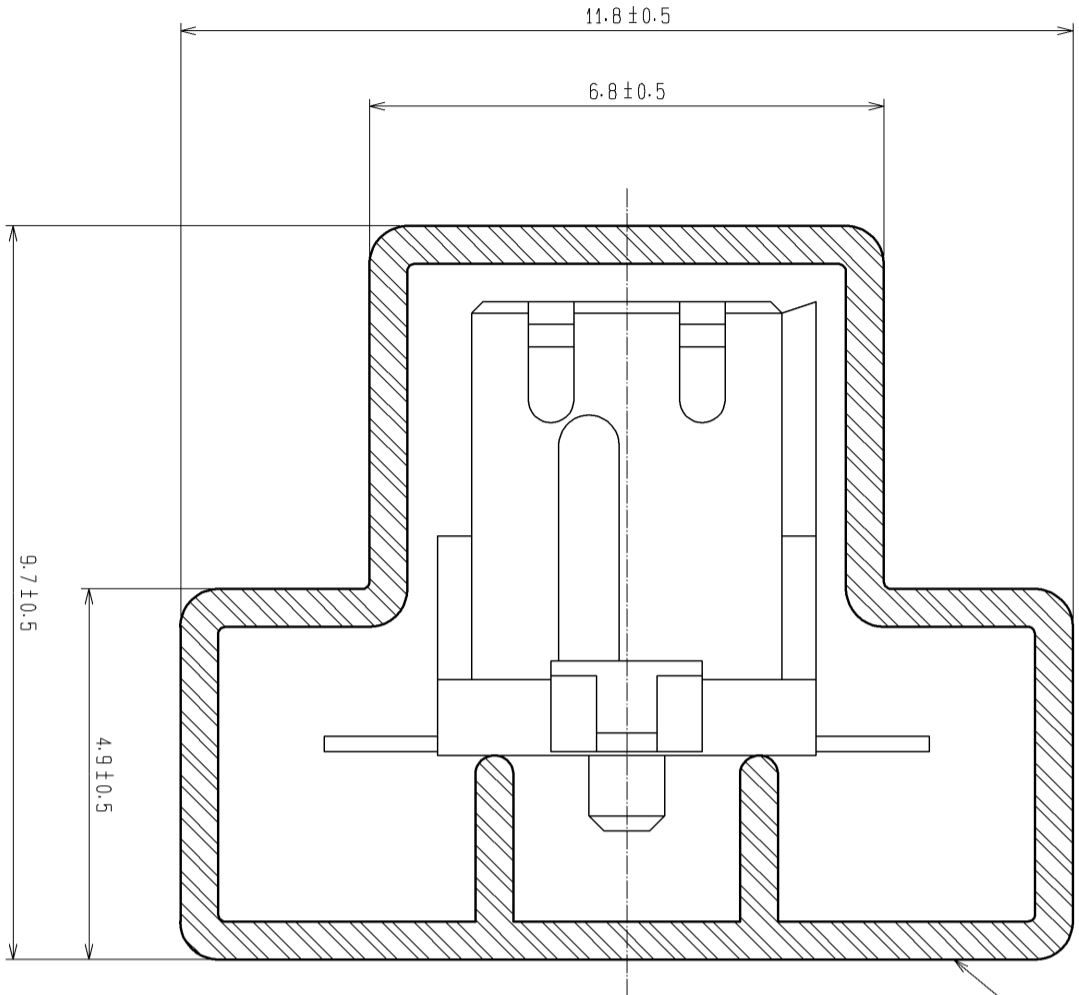
UNITS	SCALE	COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
mm	5:1	4	DIS-H-003627	KT. ISHII	TS. KUMAZAWA	09.01.23

APPROVED	CHECKED	DESIGNED	DRAWING NO.	PART NO.	CODE
KJ. KATAYOSE	TY. OMA	IO. DENPOUYA	EDC3-306129-01	DF11Z-*DS-2V(20)	CL543



E-E (10:1)



NOTES 4 : NUMBER OF CONNECTORS PER A MAGAZINE CASE SHALL BE IN ACCORDANCE WITH THE LIST BELOW.  
 5 : THESE CONNECTORS SHALL BE ON SALED IN ACCORDANCE WITH THE MULTIPLE QUANTITY ON THE LIST.

CODE NO.	PART NO.	QUANTITY OF CONNECTOR
CL543-2001-3-20	DF11Z-4DS-2V(20)	41
CL543-2002-6-20	DF11Z-6DS-2V(20)	35
CL543-2003-9-20	DF11Z-8DS-2V(20)	30
CL543-2004-1-20	DF11Z-10DS-2V(20)	27
CL543-2005-4-20	DF11Z-12DS-2V(20)	24
CL543-2006-7-20	DF11Z-14DS-2V(20)	22
CL543-2007-0-20	DF11Z-16DS-2V(20)	20
CL543-2008-2-20	DF11Z-18DS-2V(20)	18
CL543-2009-5-20	DF11Z-20DS-2V(20)	17
CL543-2010-4-20	DF11Z-22DS-2V(20)	16
CL543-2011-7-20	DF11Z-24DS-2V(20)	15
CL543-2012-0-20	DF11Z-26DS-2V(20)	14
CL543-2013-2-20	DF11Z-28DS-2V(20)	13
CL543-2014-5-20	DF11Z-30DS-2V(20)	12
CL543-2015-8-20	DF11Z-32DS-2V(20)	12
CL543-2016-0-20	DF11Z-40DS-2V(20)	10

FORM HC0011-5-8

<b>HR5</b>	DRAWING NO.	EDC3-306129-01
	PART NO.	DF11Z-*DS-2V(20)
	CODE	CL543

(1/23)

TR543E-10319

QUALITY EVALUATION TEST REPORT ON DF11 SERIES  
(LEAD-FREE PRODUCT)

APPROVED	S.I.TOMIOKA
CHECKED	S.I.TOMIOKA
CHARGED	HT.SAKATA

**HR5**  
HIROSE ELECTRIC CO.,LTD.

[1] Objective:  
To evaluate the performance and quality of DF11 Series (lead-free product).

[2] Specimens:  
DF11Z-32DP-2V(27)  
DF11Z-32DS-2V(22)

[Above test specimens were tested in the condition as it is received from the client.]

[3] Test period:  
From: 2004-06-09  
To: 2004-06-24

[4] Test temperature:  
18 °C to 28 °C

[5] Test humidity:  
25 %RH to 75 %RH



## [6] Test item, Number of specimens, Page No.

Test item No.	Test item/ (Applicable standard)	Group					Number of Specimens	Page No.
		A	B	C	D	E		
1	Appearance, Construction (JIS C 5402 4.1 4.3)	○	○	○	○	○	20 sets	9
2	Contact resistance (JIS C 5402 5.4)		○	○	○	○	16 sets	10
3	Insulation resistance (JIS C 5402 5.2)			○	○		8 sets	11
4	Voltage proof (JIS C 5402 5.1)			○	○		8 sets	12
5	Contact's gauge insertion and extraction forces (JIS C 5402 6.4)		○				4 pcs	13
6	Vibration (JIS C 5402 6.1)	○					4 sets	14
7	Shock (JIS C 5402 6.2)	○					4 sets	15
8	Mechanical operation, 30 times (JIS C 5402 6.3)		○				4 sets	16
9	Change of temperature (JIS C 5402 7.2)			○			4 sets	17
10	Dry heat (JIS C 5402 7.8)			○			4 sets	18
11	Cold (JIS C 5402 7.9)			○			4 sets	19
12	Damp heat (JIS C 5402 7.3)				○		4 sets	20
13	Corrosion, salt mist				○		4 sets	21
14	Mechanical operation, 30 times (JIS C 5402 6.3)					○	4 sets	22
15	Corrosion, H <sub>2</sub> S gas (JIS C 0092)					○	4 sets	23

Note 1) Different specimens (in a condition that the specimens are not mounted on a board) are used for [Insulation resistance] and [Voltage proof] from those for [Contact resistance].

Note 2) All tests except Test item Nos. 1, 3, 4, 5, 8, and 14 and measurements are conducted in a condition that boards on the header side and the socket side are fixed (with screws and spacers).

\* Refer to the figure of measuring points in [Contact resistance] in page 10.

Table for each test item to be measured

Test item No.	Test item	(1)	(2)	(3)	(4)	(5)	(6)
6	Vibration	○					○
7	Shock	○					○
8	Mechanical operation, 30 times	○	○			○	
9	Change of temperature	○	○	○	○		
10	Dry heat	○	○	○	○		
11	Cold	○	○	○	○		
12	Damp heat	○	○	○	○		
13	Corrosion, salt mist	○	○				
14	Mechanical operation, 30 times	○	○				
15	Corrosion, H <sub>2</sub> S gas	○	○				

- Remarks:
- (1) Appearance, Construction
  - (2) Contact resistance
  - (3) Insulation resistance
  - (4) Voltage proof
  - (5) Contact's gauge insertion and extraction forces
  - (6) Electrical discontinuity

[7] Test results

See the page which describes each test item.

See the pages shown below for variation graphs and result data.

Contact resistance, variation graphs and result data

See page 5 for Groups B and C.

See page 6 for Groups D and E.

Insulation resistance, result data

See page 7 for Groups C and D.

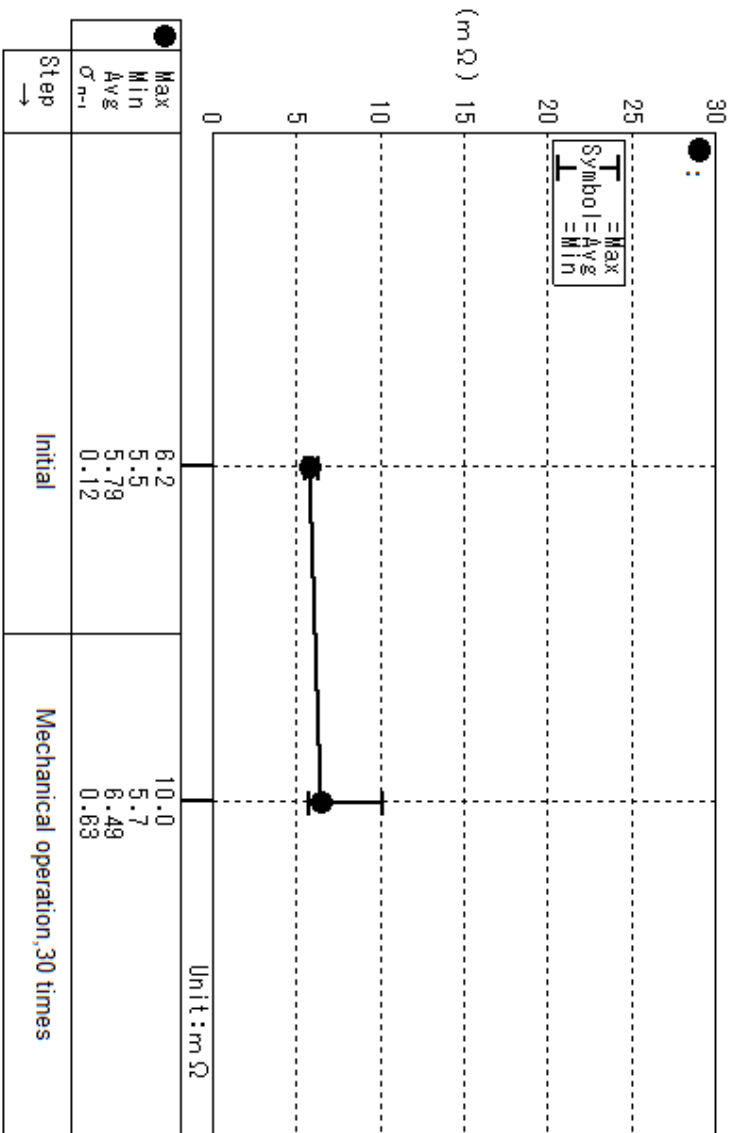
Contact's gauge insertion and extraction forces, variation graph and result data

See page 8 for Group B.



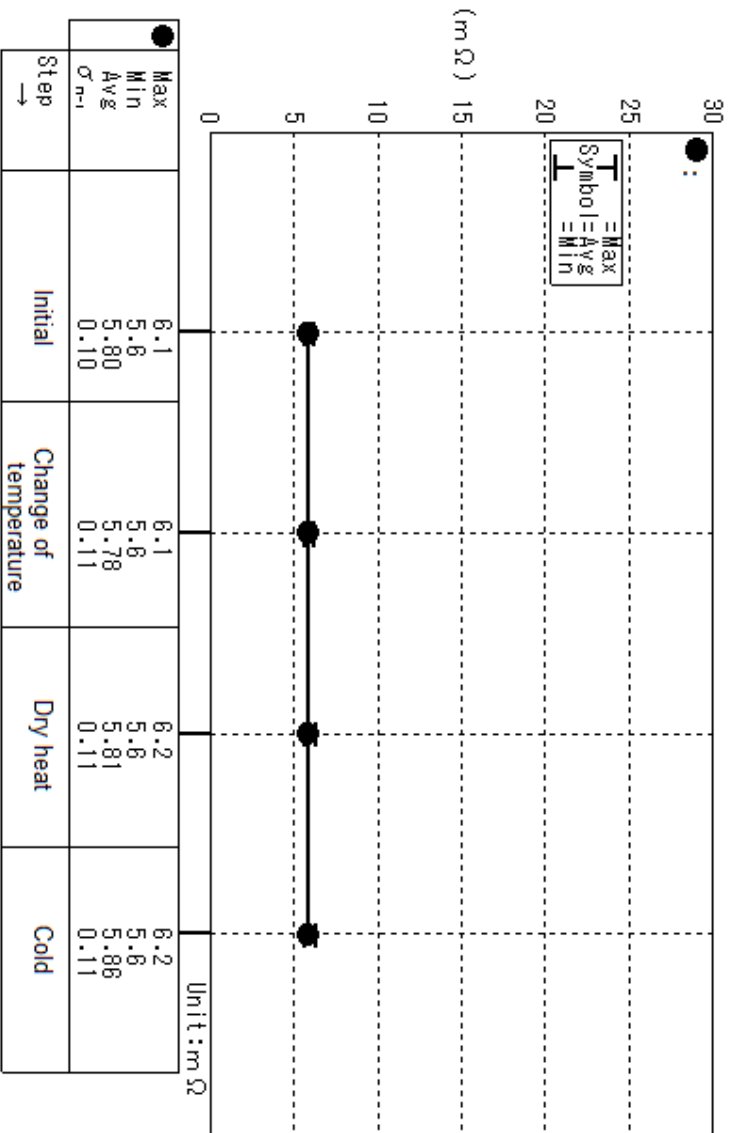
Group B  
Contact resistance

<< Requirement >>  
30 mΩ or less

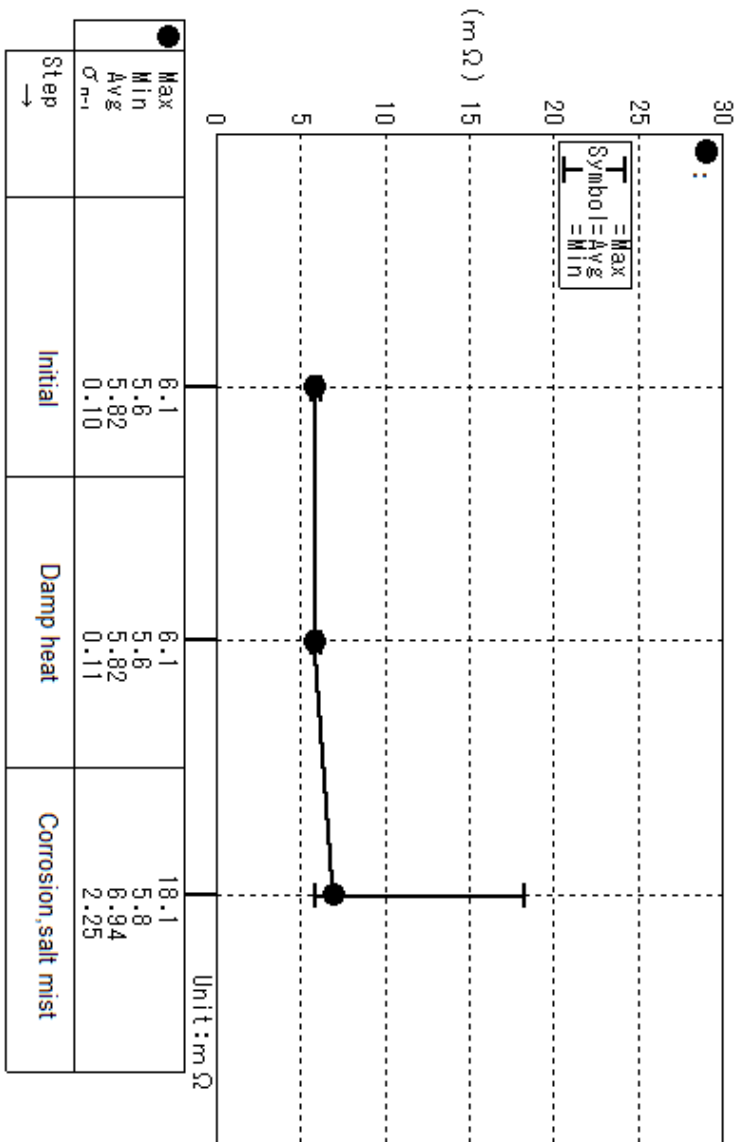


Group C  
Contact resistance

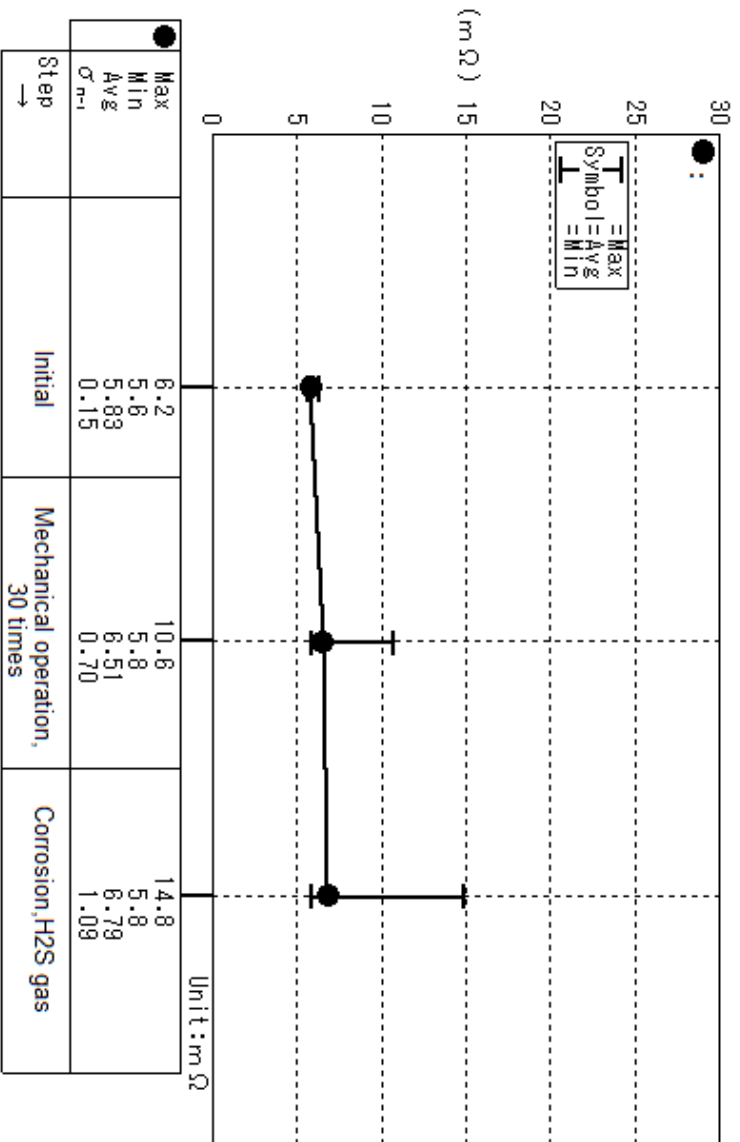
<< Requirement >>  
30 mΩ or less



Group D  
Contact resistance  
 << Requirement >>  
 30 mΩ or less



Group E  
Contact resistance  
 << Requirement >>  
 30 mΩ or less



**Insulation resistance**

Requirements:  
1000 MΩ or more

Group C

Between adjacent contacts

Unit: [ $\times 10^4$  MΩ]

	Initial	Change of temperature	Dry heat	Cold
Max	100	100	100	100
Min	100	100	100	100

Requirements:  
Initial: 1000 MΩ or more  
Damp heat: 500 MΩ or more

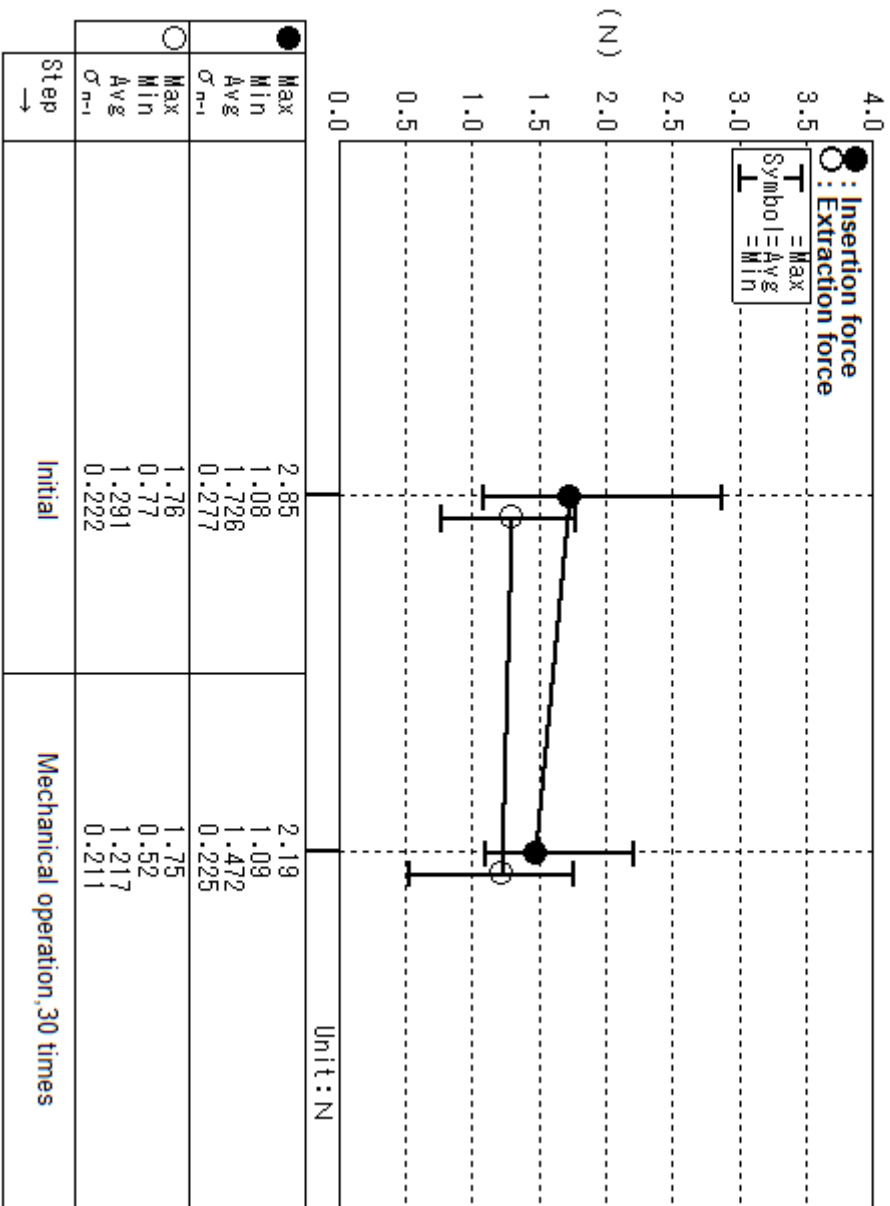
Group D

Between adjacent contacts

Unit: [ $\times 10^4$  MΩ]

	Initial	Damp heat
Max	100	0.3
Min	100	0.2

Group B  
Contact's gauge insertion and extraction forces  
  
<< Requirement >>  
0.5 N to 4.4 N



## 1. Appearance, Construction

### 1.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.

Intermateability: No defect in mating.

### 1.2 Test method

Appearance, Construction: Check visually with a magnifying glass for existence of breakage, crack or looseness on the component.

Intermateability: Check for existence of any defect when specimens are mated with the applicable connector.

### 1.3 Test results

Appearance, Construction:

No breakage, crack or looseness on the component was found.

Intermateability:

No defect in mating was found.

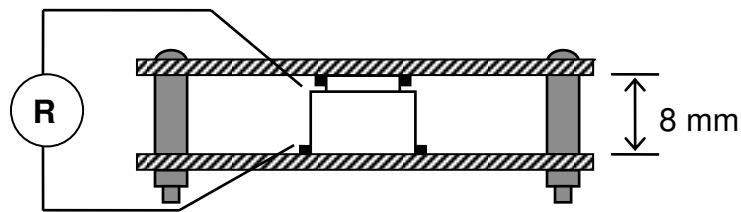
## 2. Contact resistance

2.1 Requirements  
30 mΩ or less.

2.2 Test method  
Contact resistance is measured according to the conditions specified in the table below:

Open circuit voltage	20 mV a.c. or less, 1 kHz
Test current	1 mA a.c.

Measuring method: Measured by milliohm-meter at the points shown in the following figure.



**Figure: Measuring points**

2.3 Test equipment

Test equipment	Model	Manufacturer
Milliohm-meter	2420	NF Corporation

2.4 Test results

(Groups B to E) Unit: [mΩ]

Max	6.2
Min	5.5
Avg	5.81
$\sigma_{n-1}$	0.12

### 3. Insulation resistance

#### 3.1 Requirements

1000 MΩ or more.

#### 3.2 Test method

Insulation resistance is measured according to the conditions specified in the table below:

Test voltage	500 V d.c.
Duration	For 1 min ± 5 s. However, if the results are verified as the required value or more during the testing, the measurement can be terminated.

Measuring point: Between adjacent contacts. (Measured for each 1 pin.)

Mated/Unmated: Mated.

#### 3.3 Test equipment

Test equipment	Model	Manufacturer
Super Megohm-meter	SM-8210	Toa Electronics

#### 3.4 Test results

(Groups C and D) Unit: [ $\times 10^4$  MΩ]

	Between adjacent contacts
Max	100
Min	100



## 4. Voltage proof

### 4.1 Requirements

No flashover or dielectric breakdown.

### 4.2 Test method

Voltage proof is checked according to the conditions specified in the table below:

Test voltage	650 V a.c.
Duration	For 1 min $\pm$ 5 s

Imposing method: Test voltage is raised in a rate of 500 V/s or less until it reaches to the value listed above.

Leak current: Judged flashover or dielectric breakdown at 2 mA.

Measuring point: Between adjacent contacts.

Mated/Unmated: Mated.

### 4.3 Test equipment

Test equipment	Model	Manufacturer
Voltage proof tester	TOS8750	Kikusui Electronics

### 4.4 Test results

(Groups C and D)

No flashover or dielectric breakdown was found.

## 5. Contact's gauge insertion and extraction forces

5.1 Requirements  
0.5 N to 4.4 N.

5.2 Test method  
Measured by means of that the following sized steel gauge is inserted/extracted to/from the female contact at normally applied depth.

Contact gauge dimension	□ 0.5 mm ± 0.002 mm
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5.3 Test equipment

Test equipment	Model	Manufacturer
Insertion and extraction tester	1840	Aikoh Engineering

5.4 Test results  
See page 8 for variation graph and result data.

## 6. Vibration

### 6.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.

Electrical discontinuity: No electrical discontinuity of 1  $\mu$ s or more.

### 6.2 Test method

The test is conducted according to the conditions specified in the table below:

Frequency range	10 Hz to 55 Hz
Single amplitude	0.75 mm
Time for one cycle	10 Hz to 55 Hz to 10 Hz, for approx. 5 min
Number of cycles	3 axial directions, 10 cycles each, 30 cycles in total

Connection method: Series connection for all contacts

Test voltage: 5 V d.c.

Test current: 100 mA d.c.

Note) [Electrical discontinuity] is checked continuously during the test.

### 6.3 Test equipment

Test equipment	Model	Manufacturer
Vibration machine	F-300BM/A-E78	Emic
Digital oscilloscope	9362	Lecroy
Variable constant dc volt and ampere generator	PAC35-3	Kikusui Electronics

### 6.4 Test results

Appearance, Construction:

No breakage, crack or looseness on the component was found.

Electrical discontinuity:

No electrical discontinuity of 1  $\mu$ s or more was found.

## 7. Shock

### 7.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.

Electrical discontinuity: No electrical discontinuity of 1  $\mu$ s or more.

### 7.2 Test method

The test is conducted according to the conditions specified in the table below:

Acceleration	490 m/s <sup>2</sup>
Duration	11 ms
Wave form	Half-sine wave
Number of shocks	3 both axial directions, 3 times each, 18 times in total

Connection method: Series connection for all contacts

Test voltage: 5 V d.c.

Test current: 100 mA d.c.

Note) [Electrical discontinuity] is checked during the test.

### 7.3 Test equipment

Test equipment	Model	Manufacturer
Shock testing machine	PEP-250MR	Itoh Seiki
Digital oscilloscope	9362	Lecroy
Variable constant dc volt and ampere generator	PAC35-3	Kikusui Electronics

### 7.4 Test results

Appearance, Construction:

No breakage, crack or looseness on the component was found.

Electrical discontinuity:

No electrical discontinuity of 1  $\mu$ s or more was found.

## 8. Mechanical operation, 30 times

### 8.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.

Contact resistance: 30 mΩ or less.

Contact's gauge insertion and extraction forces: 0.5 N to 4.4 N

### 8.2 Test method

30 times of insertions and withdrawals are conducted at a rate of 600 times/h or less.

### 8.3 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.

Contact resistance: See page 5 for variation graph and result data.

Contact's gauge insertion and extraction forces:  
See page 8 for variation graph and result data.

## 9. Change of temperature

### 9.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.  
 Contact resistance: 30 mΩ or less.  
 Insulation resistance: 1000 MΩ or more.  
 Voltage proof: No flashover or dielectric breakdown.

### 9.2 Test method

The test is conducted according to the conditions specified in the table below:

Step	1	2
Temperature (°C)	-55 ± 3	85 ± 2
Duration (min)	30	30

Note) Chamber transfer time is 2 min to 3 min.

Number of cycles: 5 cycles are conducted with the above condition as 1 cycle.  
 Mated/Unmated: Mated.  
 Recovery: After completion of the test, let the specimens rest in ambient temperature for 1 h to 2 h.

### 9.3 Test equipment

Test equipment	Model	Manufacturer
Constant low temperature chamber	TSV-40S	Espec

### 9.4 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.  
 Contact resistance: See page 5 for variation graph and result data.  
 Insulation resistance: See page 7 for result data.  
 Voltage proof: No flashover or dielectric breakdown was found.

## 10. Dry heat

### 10.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.  
 Contact resistance: 30 mΩ or less.  
 Insulation resistance: 1000 MΩ or more.  
 Voltage proof: No flashover or dielectric breakdown.

### 10.2 Test method

The test is conducted according to the conditions specified in the table below:

Temperature	85 °C ± 2 °C
Duration	96 h

Mated/Unmated: Mated.

Recovery: After completion of the test, let the specimens rest in ambient temperature for 1 h to 2 h.

### 10.3 Test equipment

Test equipment	Model	Manufacturer
Constant high temperature chamber	PVH-220	Espec

### 10.4 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.  
 Contact resistance: See page 5 for variation graph and result data.  
 Insulation resistance: See page 7 for result data.  
 Voltage proof: No flashover or dielectric breakdown was found.



## 11. Cold

### 11.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.  
 Contact resistance: 30 mΩ or less.  
 Insulation resistance: 1000 MΩ or more.  
 Voltage proof: No flashover or dielectric breakdown.

### 11.2 Test method

The test is conducted according to the conditions specified in the table below:

Temperature	-55 °C ± 3 °C
Duration	96 h

Mated/Unmated: Mated.

Recovery: After completion of the test, let the specimens rest in ambient temperature for 1 h to 2 h.

### 11.3 Test equipment

Test equipment	Model	Manufacturer
Constant low temperature chamber	MC-810	Espec

### 11.4 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.  
 Contact resistance: See page 5 for variation graph and result data.  
 Insulation resistance: See page 7 for result data.  
 Voltage proof: No flashover or dielectric breakdown was found.

## 12. Damp heat

### 12.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.  
 Contact resistance: 30 mΩ or less.  
 Insulation resistance: 500 MΩ or more.  
 Voltage proof: No flashover or dielectric breakdown.

### 12.2 Test method

The test is conducted according to the conditions specified in the table below:

Temperature	40 °C ± 2 °C
Humidity	90 %RH to 95 %RH
Duration	96 h

Mated/Unmated: Mated.

Recovery: After completion of the test, let the specimens rest in ambient temperature for 1 h to 2 h.

### 12.3 Test equipment

Test equipment	Model	Manufacturer
Constant temperature and humidity chamber	LHL-111	Espec

### 12.4 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.  
 Contact resistance: See page 6 for variation graph and result data.  
 Insulation resistance: See page 7 for result data.  
 Voltage proof: No flashover or dielectric breakdown was found.

### 13. Corrosion, salt mist

#### 13.1 Requirements

Appearance, Construction: No excessive corrosion.

Contact resistance: 30 mΩ or less.

#### 13.2 Test method

The test is conducted according to the conditions specified in the table below:

Concentration	5 wt% ± 1 wt%
Temperature	35 °C ± 2 °C
pH value	6.5 to 7.2
Duration	48 h

Mated/Unmated: Mated.

Recovery: After completion of the test, let the specimens rest in ambient temperature for 24 h.

#### 13.3 Test equipment

Test equipment	Model	Manufacturer
CASS tester	CASSER-ISO-3	Suga Test Instrument

#### 13.4 Test results

Appearance, Construction: No excessive corrosion was found.

Contact resistance: See page 6 for variation graph and result data.

## 14. Mechanical operation, 30 times

### 14.1 Requirements

Appearance, Construction: No breakage, crack or looseness on the component.

Contact resistance: 30 mΩ or less.

### 14.2 Test method

30 times of insertions and withdrawals are conducted at a rate of 600 times/h or less.

### 14.3 Test results

Appearance, Construction: No breakage, crack or looseness on the component was found.

Contact resistance: See page 6 for variation graph and result data.