

JAPAN AVIATION ELECTRONICS IND., LTD. CONNECTOR DIVISION 日本航空電子工業株式会社 コネクタ事業部			<b>MX23A CONNECTOR SPECIFICATION</b>		Connector Specification No. <b>JACS-1728-4</b>
					TK B
Rev. 版数	Date 発行日	DCN No	Drawn by 担当	Checked by 査閲	Approved by 承認
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1.Scope 5

This document prescribes about MX23A connector produced by Japan Aviation Electronics performance. MX23A connector series are as follows. “\* \*” means numbers of connector poles.

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|--|--|
| <ul style="list-style-type: none"> <li><span style="border: 1px solid black; padding: 2px;">2</span> MX23A * * SF1</li> <li>MX23A * * SF2</li> <li>MX23A * * NF1</li> <li>MX23A * * NF2</li> <li>MX23A * * NF3</li> <li>MX23A * * XF1</li> <li>MX23S05K351</li> <li>MX23S05K4F1</li> <li>MX23A36SF1</li> <li>MX23A36SF2</li> <li>MX23A40SF1</li> <li>MX23A36NF1</li> <li>MX23A36NF6</li> <li>MX23A40NF1</li> </ul> | <ul style="list-style-type: none"> <li>Socket housing</li> <li>Socket housing</li> <li>Standard type pin connector(With connector fixing boss)</li> <li>Reverse type pin connector(With connector fixing boss)</li> <li>Standard type pin connector(With self tapping screw holes)</li> <li>Front cap</li> <li>Socket contact for AVSS0.5 ~ 1.25 mm<sup>2</sup> wires</li> <li>Socket contact for AVSS0.3mm<sup>2</sup> wire</li> <li>Socket housing</li> <li>Socket housing(Different mating key of MX23A36SF1)</li> <li>Socket housing</li> <li>Standard type pin connector (With connector fixing boss)</li> <li>Standard type pin connector(Different mating key of MX23A36NF1)</li> <li>Standard type pin connector (With connector fixing boss)</li> </ul> |
|--|--|

No.of contacts:12,18,26,34pos.

Parts name and assembled product name.

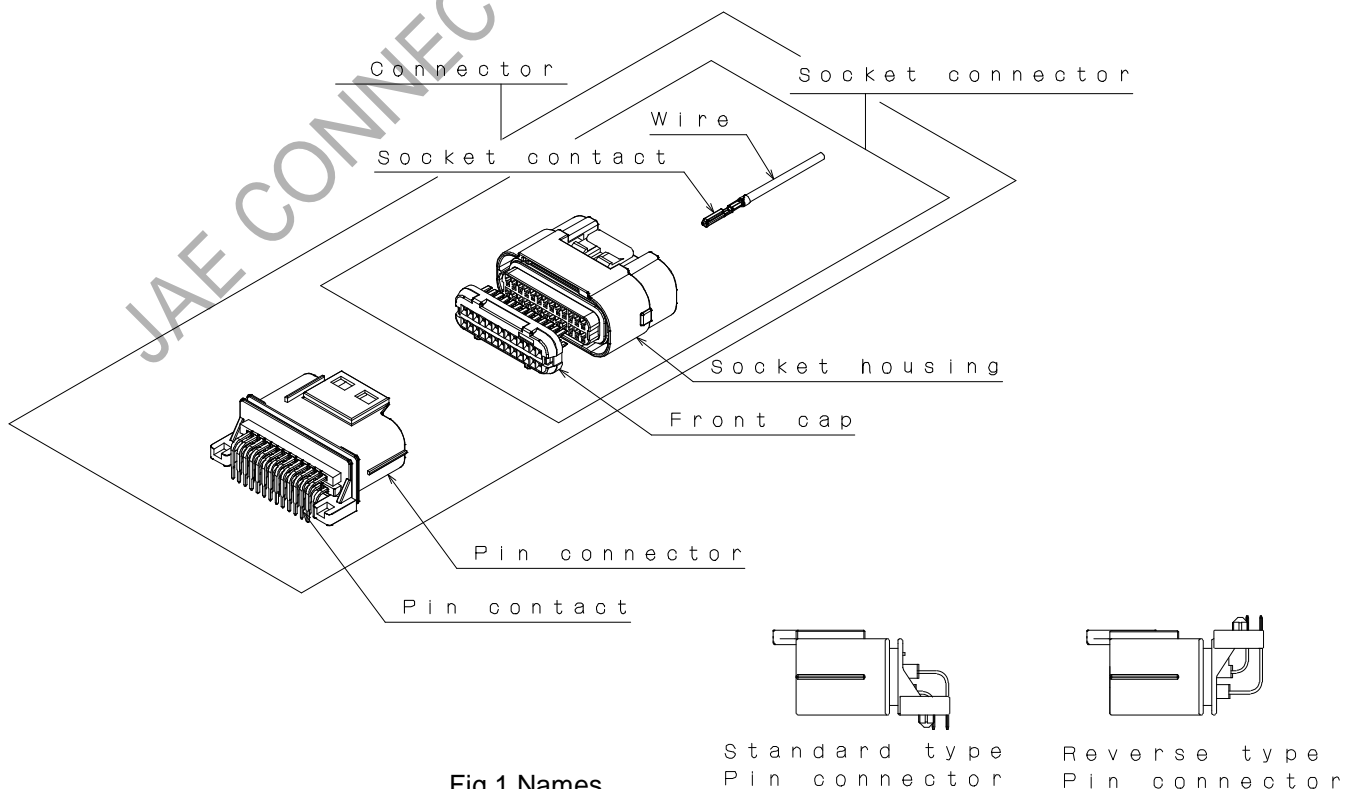


Fig.1 Names

2.Following document is a related specification.

JIS D 0203

Method of moisture, rain and spray test for automobile parts

3.Operating conditions

3-1. Operating temperature range

Minimum temperature: -40 (Ambient temperature)

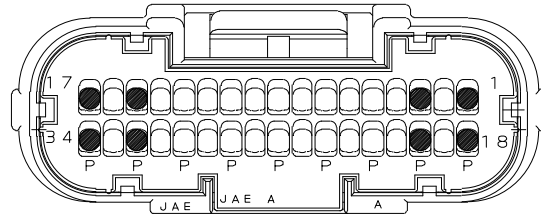
Maximum temperature: 125 (Add rising temperature by electric current and the ambient temperature.)

3-2. Rated current

The rated current is following on the ambient temperature is 85 .

8 AVSS 1.25mm<sup>2</sup> wires inserted every other cavities are MAX DC 7A.

The other AVSS 0.5 mm<sup>2</sup> wires are MAX DC 3A.



“ ” positions: Inserted AVSS 1.25mm<sup>2</sup> wires and pass the electric current DC 7A  
 Other positions: Inserted AVSS 0.5mm<sup>2</sup> wires and pass the electric current DC 3A

Fig.2 Wire positions

Please assemble AVSS 1.25mm<sup>2</sup> wires at both ends of connector.

Please assemble AVSS 1.25mm<sup>2</sup> wires to the minimum. If use many AVSS1.25mm<sup>2</sup> wires insertion force of socket contacts and a socket housing will be increased.

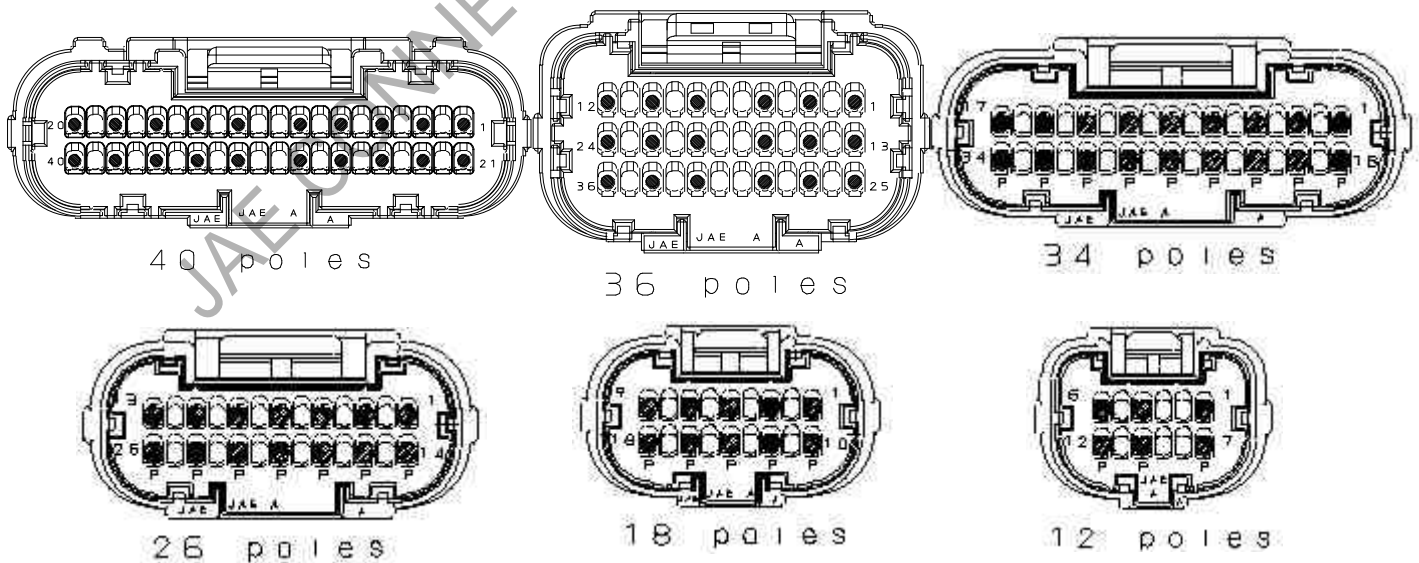
3-3. Applicable wire size

AVSS 0.3mm<sup>2</sup>

AVSS 0.5mm<sup>2</sup>

AVSS 0.85mm<sup>2</sup>

AVSS 1.25mm<sup>2</sup> (Only “ ” positions can be inserted : See Fig. 3)



AVSS 1.25mm<sup>2</sup> can be inserted at “ ” positions.

Fig.3 AVSS 1.25mm<sup>2</sup> wire insertion positions

4. Requirements

4-1.General instructions

Item	Spec	Measurement method
1. Structure and dimensions	No difference with drawings.	
2. Exterior	There is no wrong to be a bat influence on performance. For example: Cracks, Injuries, Stains	Visual check
3. Marking	No difference with drawings.	
4. Material	Be satisfied this specification.	
5.Insertion and separation feeling	No harmful catch is permissible.	Feel
6.Insertion force of socket contact and housing	MAX 20N	See 5.1.1
5 7.Insertion and separation force of connector	12 ~ 36 poles Insertion force: MAX 100N separation force: MAX 100N	See 5.1.2
	40 poles Insertion force: MAX 140N separation force: MAX 140N	
8.Holding force of socket contact	MIN 50N	See 5.1.3
9.Holding force of connector	MIN 100N	See 5.1.4
10.Reverse insertion of socket contact	Can not insert	See 5.1.5
11.Conductor crimping force	AVSS 0.3mm <sup>2</sup> MIN 49.0N AVSS 0.5mm <sup>2</sup> MIN 88.3N AVSS 0.85mm <sup>2</sup> MIN 127.5N AVSS 1.25mm <sup>2</sup> MIN 176.5N	See 5.1.6
12. Unlocking force	MAX 50N	See 5.1.7
13. Sealing performance	Initial MIN 100kPa After test MIN 50kPa	See 5.1.8
14. Insulation resistance	MIN 100M	See 5.1.9
15. Withstand Voltage	No damage on connectors	See 5.1.10
16. Resistance	Initial MAX 5m After test MAX 10m	See 5.1.11
17. Low-level resistance	Initial MAX 5m After test MAX 10m	See 5.1.12
18. Leak current	MAX 1mA	See 5.1.13
4 19. Dip soldering performance	No peel off plating from contacts. Solderability: 95 % or more in soldering area.	See 5.1.14

4.2 Endurance test

4.2.1 Testing items and measurement items

Checking " " items to be measured

Test		Measurement items									
		Resistance	Low-level resistance	Sealing performance	Insulation resistance	Withstand voltage	Holding force of connector	Holding force of socket contact	Leak current	Others	
1	High temperature test	Initial									
		After test									
2	Low temperature test	Initial									
		After test									#1
3	Thermal shock	Initial									
		After test									
4	Water resistance	Initial									
		After test									#2
5	Humidity test	Initial									
		After test									
6	Current cycle	Initial									
		After test									
7	Insertion and separation test	Initial									
		After test									
8	Salt spray	Initial									
		After test									
9	Oil resistance	Initial									
		After test									
10	Sulfur Dioxide resistance	Initial									
		After test									
11	Ozone resistance	Initial									
		After test									
12	Vibration test	Initial									
		After test									#3
13	Complex environment test	Initial									
		After test									#4

Other measurement items are as follows

#1 Drop test #2 Checking no flood inside connector

#3 Measured instantaneous disconnection during the vibration test

#4 Measured temperature rise during the complex environment test

## 4.2.2 Testing items and specifications

Item	Spec	Test method
1.High temperature test	Low-level resistance: MAX 10m Sealing performance: MIN 50kPa Holding force of socket contact: MIN 50N	See 5.2.1
2.Low temperature test	Low-level resistance: MAX 10m Drop test: No damaged	See 5.2.2
3. Thermal shock	Low-level resistance: MAX 10m Sealing performance: MIN 50kPa	See 5.2.3
4. Water resistance	Resistance: MAX 10m No flood inside connector	See 5.2.4
5. Humidity test	Low-level resistance: MAX 10m Sealing performance: MIN 50kPa Leak current: MAX 1mA Insulation resistance: MIN 100M Withstand voltage: No damage on connector	See 5.2.5
6. Current cycle	Resistance: MAX 10m	See 5.2.6
7. Insertion and separation of connector	Resistance: MAX 10m	See 5.2.7
8.Salt spray	Low-level resistance: MAX 10m Insulation resistance: MIN 100M Withstand voltage: No damage on connector Leak current: MAX 1mA	See 5.2.8
9.Oil resistance	Resistance: MAX 10m	See 5.2.9
10.Sulfur Dioxide test	Low-level resistance: MAX 10m	See 5.2.10
11.Ozone resistance	Sealing performance: MIN 50kPa	See 5.2.11
12. Vibration test	Resistance: MAX 10m Instantaneous disconnection: MAX 10 $\mu$ s	See 5.2.12
13. Complex environment test	Low-level resistance: MAX 10m Sealing performance: MIN 50kPa Temperature rise: MAX 20 (Without normal rise by electric current)	See 5.2.13

5.Measurement and Test method

5.1Measurement method

5.1.1 Insertion force of socket contact and housing

Insert a socket contact into a socket housing at a rate of 20mm/min.

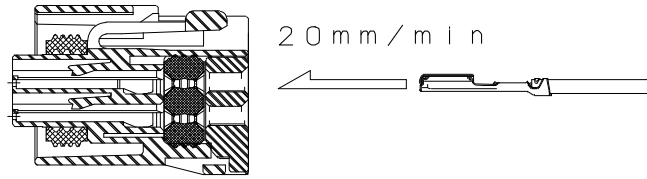


Fig.4

5.1.2 Insertion and separation force of connector

Insert a socket connector into a pin connector at a rate of 20mm/min. Then pull a socket connector at a rate of 20mm/min without activating a locking mechanism

5.1.3 Holding force of socket contact

Assemble a socket contact with crimped wire into a socket housing. Then pull the socket contact at a rate of 20mm/min from socket housing. (When measurement this item do not assemble a front cap.)

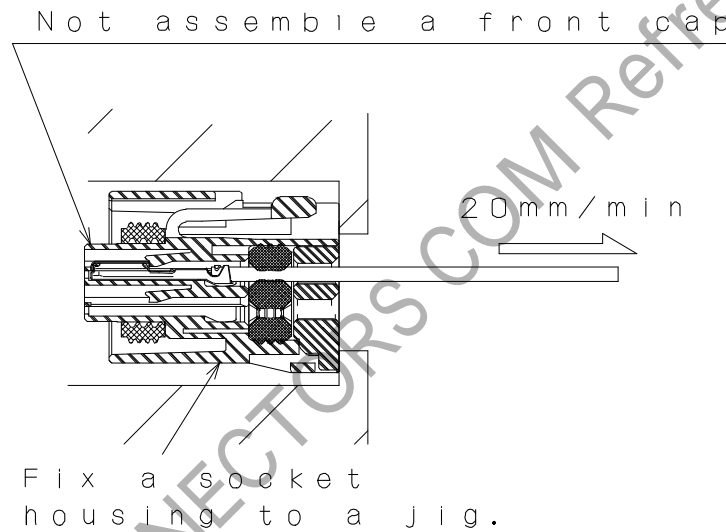


Fig.5

5.1.4 Holding force of connector

Pull a socket connector from a pin connector at a rate of 20mm/min.

5.1.5 Reverse insertion of socket contact

Insert a socket contact into a socket housing at a force of 50N in an abnormal direction.

5.1.6 Conductor crimping force

Crimp a wire into a socket contact and pull the wire in the axial direction at a rate of 100mm/min. When measurement this item do not crimp the socket contact insulation barrel.

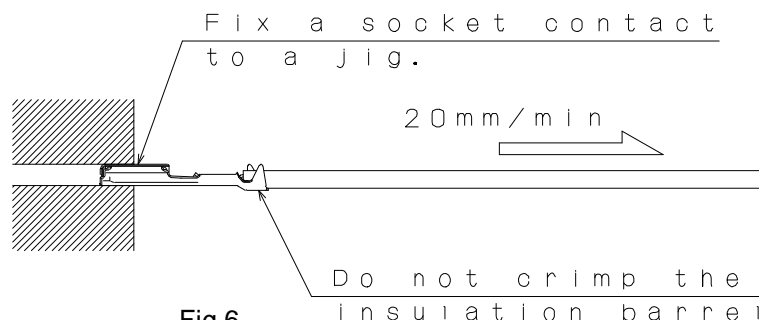


Fig.6

5.1.7 Unlocking force

Connect a socket connector with a pin connector. Then release a lock mechanism at a rate of 20mm/min.

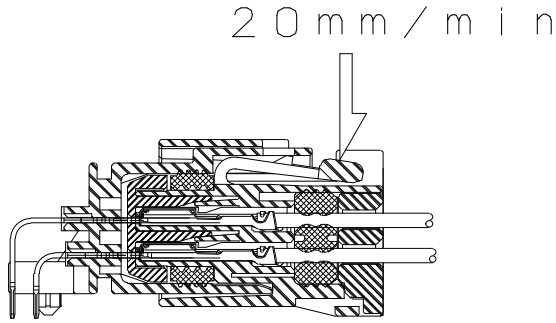


Fig.7

5.1.8 Sealing performance

Sink the connector into the water. Send 10kPa compressed air inside the connector. If during 30 seconds can't see an air leakage bubbles with naked eye then increase an air pressure by 10kPa.

An air pressure is from 10kPa to 100kPa(initial) or from 10kPa to 50kPa(after test).

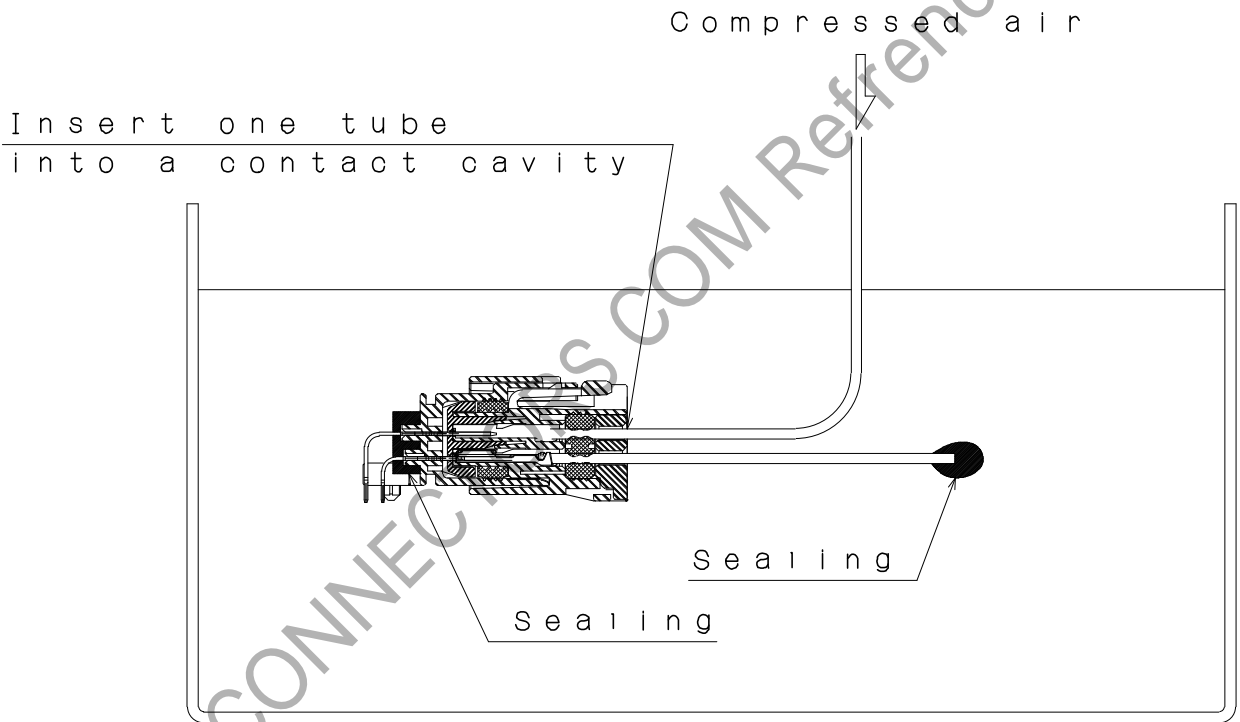


Fig.8

5.1.9 Insulation resistance

Apply 500VDC between contacts and housing and contacts. Measure the insulation resistance within 30 seconds.

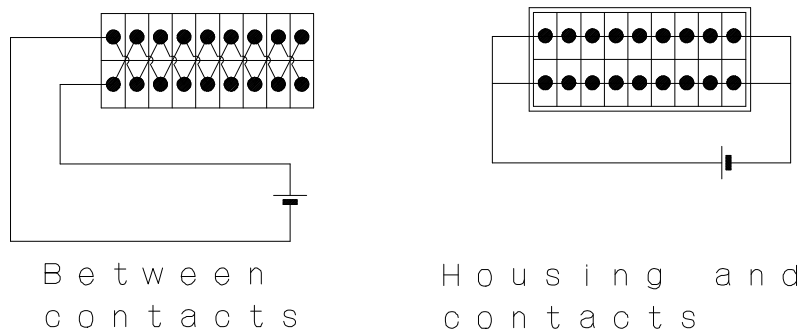


Fig.9

5.1.10 Withstand Voltage

Apply 1000V with frequencies 50Hz or 60Hz, having waveform close to a sinusoidal wave between contacts and between housing and contacts with in 1 minute.

5.1.11 Resistance

Measure the millivolt drop with passing the electric current through a connector. After subtract wire resistance from a measurement value.

DC power supply: 12VDC 1A

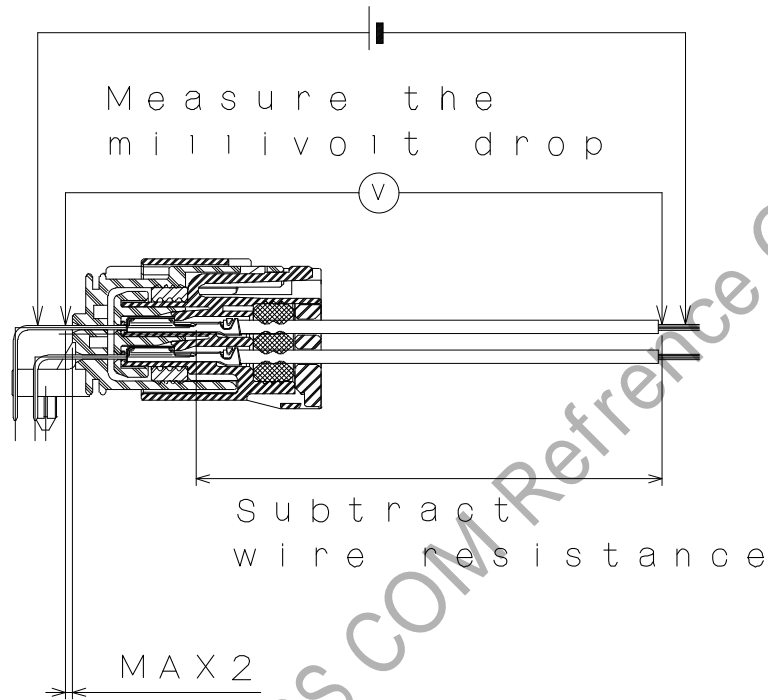


Fig.10

5.1.12 Low-level resistance

Measure the millivolt drop with passing the electric current through a connector. After subtract wire resistance from a measurement value.

DC power supply: 20mVDC 10mA

5.1.13 Leak Current

Measure the leak current with a wired connector.

DC power supply: 13VDC

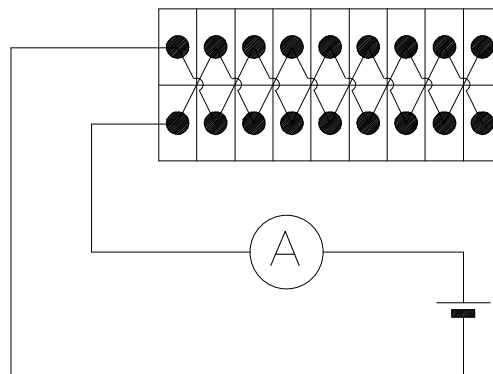


Fig.11



5.1.14 Dip soldering performance

△<sub>4</sub> The soldering part is observed with the magnifying glass.

Table.1 Solder condition

-	Lead-solder	Lead-free solder (3.0%Ag,0.5%Cu,96.5%Sn)
Temperature	230±5	285±5
Dipping time	5±1 s	10±1 s

5.2 Endurance test method

5.2.1 High temperature test

Put the connector to the constant temperature 125 at 500 hours.

5.2.2 Low temperature test

Put the connector to the constant temperature -40 at 500 hours.

△<sub>3</sub> Take some samples out of the thermostatic chamber, and drop them immediately from a height of 1 m onto a steel plate at least 5 mm thick.

5.2.3 Thermal Shock

Put the connector into the chamber to implement cycle test as follows.

- Minimum temperature: -40 at 30min
- Maximum temperature: 120 at 30min
- Temperature transition: less than 5min
- Number of cycles: 500

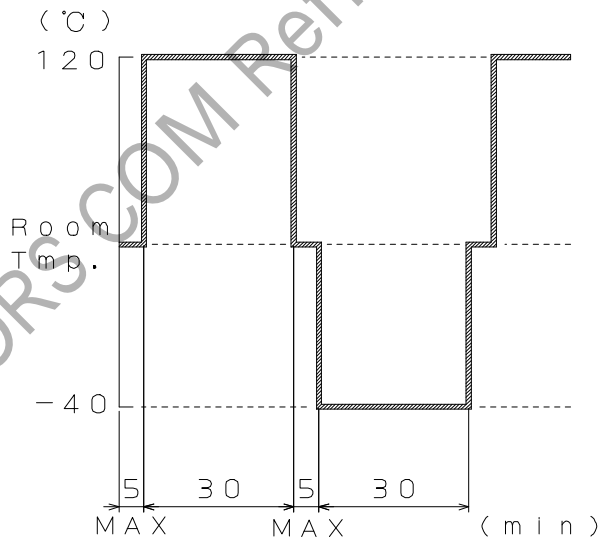


Fig.12

5.2.4 Water resistance

Put the connector into the chamber to implement cycle test as follows.

- Showring ON: 20min, Temperature is room temperature.
- Showring OFF: 40min, Temperature is 100 .
- Number of cycles: 48

Showring condition according to JIS D 0203 S2

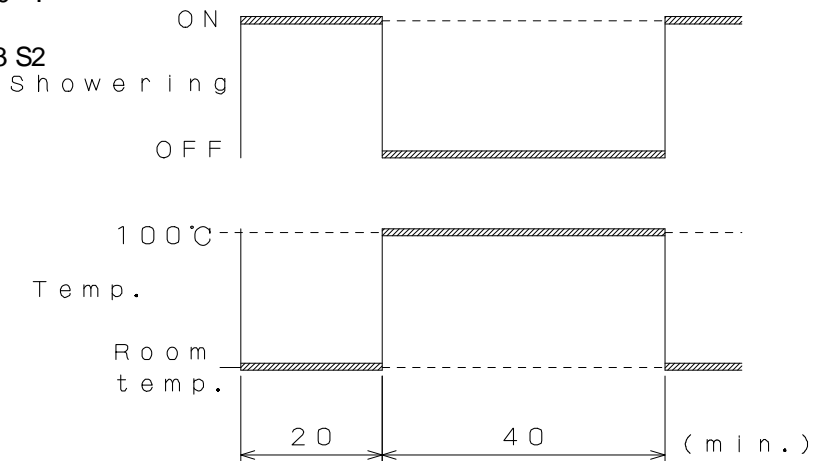


Fig.13

### 5.2.5 Humidity test

Put the connector to the moist air at 500 hours.

Humidity: 90 ~ 95%

Temperature: 85

### 5.2.6 Current cycle

Put the connector into the chamber to implement electric cycle test as follows.

Electric current ON: 45 min.

Electric current OFF: 15 min.

Number of cycles: 1000

Pass the electric current rising connector temperature. 60 .

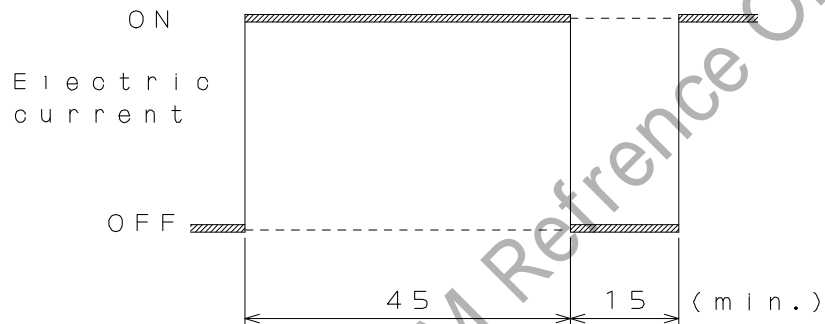


Fig.14

### 5.2.7 Insertion and separation test

Engage and disengage a connector at a rate of 20mm/min 50 cycles.

### 5.2.8 Salt spray

Put the connector into the chamber to implement cycle test as follows.

Salt spray ON: 8h

Salt spray OFF: 16h

Number of cycles: 20

Temperature: 35

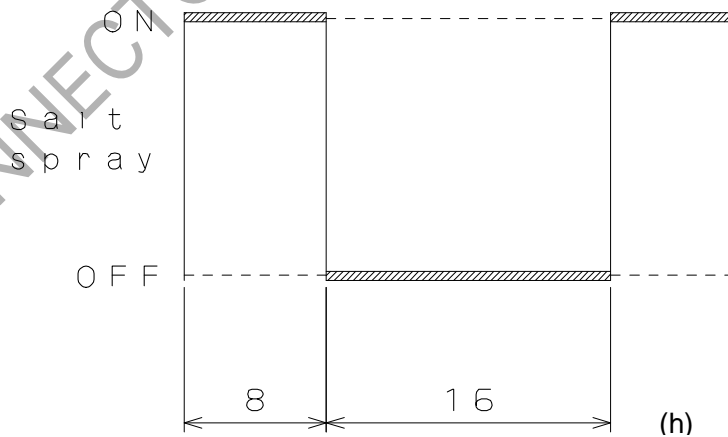


Fig.15

### 5.2.9 Oil resistance

Use separately connectors for each following test.

Test1. 2-cycle engine oil test

Sink the connector in the 2-cycle engine oil at 24 hours.

Test2. 4-cycle engine oil test

Sink the connector in the 4-cycle engine oil at 24 hours.

Test3. Brake oil test

Sink the connector in the brake oil at 24 hours.

Test4. Gasoline test

Pour 0.1l gasoline over the connector.

5.2.10 Sulfur Dioxide test

Exposure the connector to the sulfur dioxide air at 24 hours.  
 Humidity: 90 ~ 95%  
 Temperature: 40  
 Concentration of sulfur dioxide is 10ppm.

5.2.11 Ozone resistance

Put the connector into the ozone weather meter at 100 hours.  
 Temperature: 38  
 Concentration of ozone: 50pphm

5.2.12 Vibration test

Install connectors on the vibration plate to implement vibration test as follows.  
 Frequency range: 50 ~ 1000Hz log sweep test  $196m/s^2$   
 Sweep rate: one frequency cycle is 10 min  
 Test duration: 9 h  
 Pass the electric current during test to examine the instantaneous disconnection.  
 DC power supply: 13VDC 1A  
 Vibrate one connector only one plane. Use separately connectors for each plane.

Connector vibration plane:

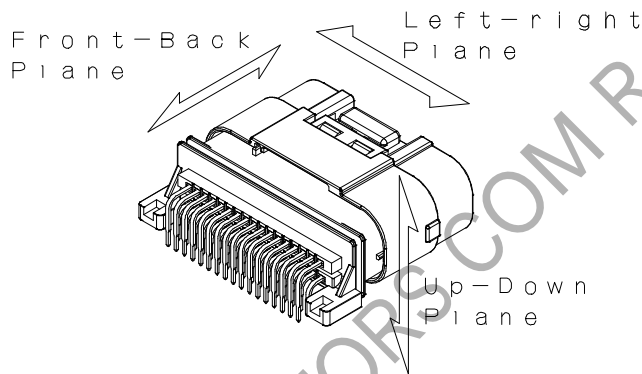


Fig.16

Install connector

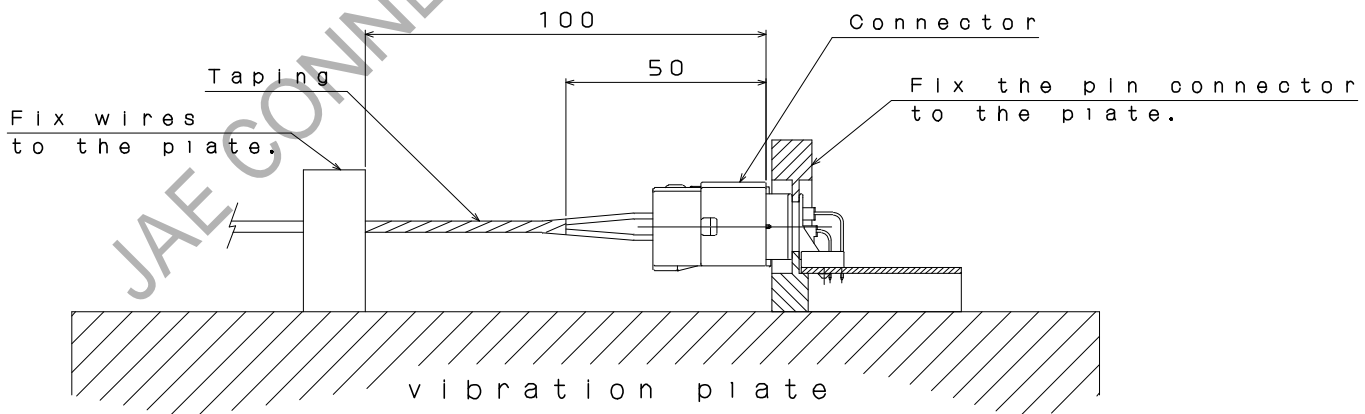


Fig.17

5.2.13 Complex environment test

The test procedure consists as follows.

1. Engage and disengage a connector at a rate of 20mm/min 5 cycles.
  2. Put the connector in electric current, vibration, temperature, and humidity complex environment cycles.
- Number of cycles: 50

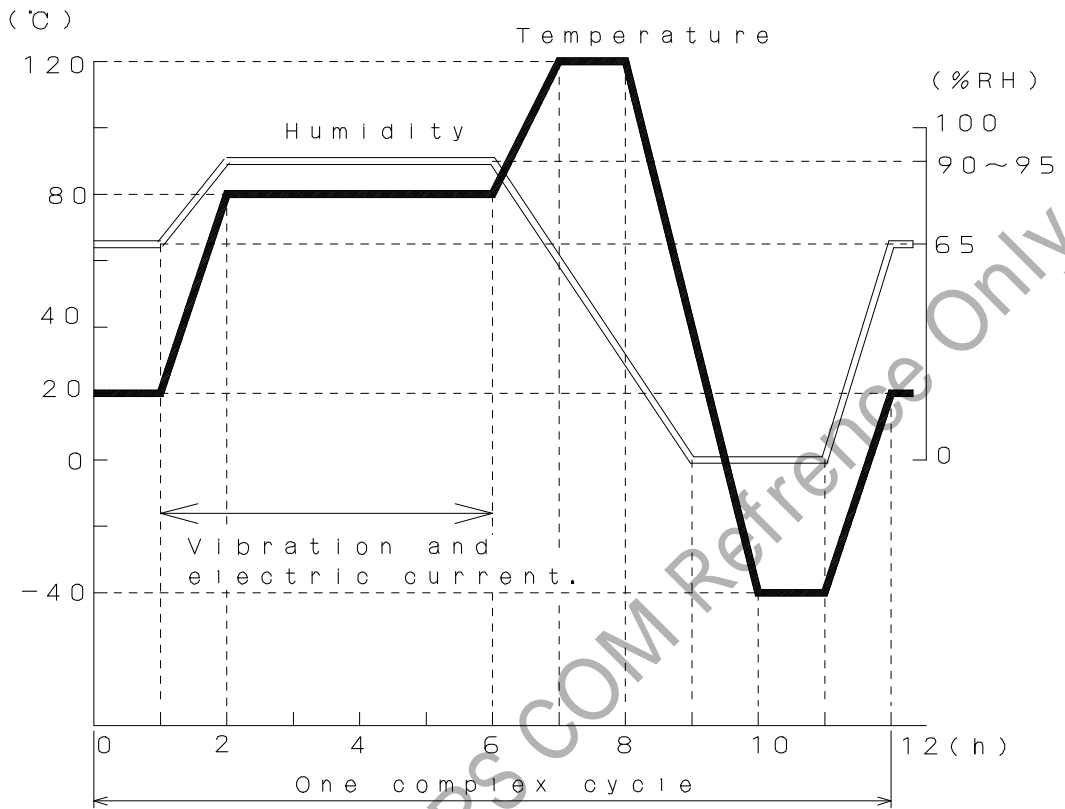


Fig.18

Vibration condition

Frequency range	Acceleration
20 ~ 50Hz	2.9m/s <sup>2</sup>
50 ~ 400Hz	63.7m/s <sup>2</sup>
400 ~ 1000Hz	147.1m/s <sup>2</sup>

log sweep test

Sweep rate: one frequency cycle is 30 min

Vibrate one connector only one plane. Use separately connectors for each plane.

Pass the electric current rising connector temperature 45 .