1. Scope

This specification covers the requirements for product performance, test methods and quality assurance provisions of INDUSTRIAL MINI I/O Connector.

Our Industrial Mini I/O connectors (IEC 61076-3-122) portfolio consists of various board and cable connectors

2. Features

● **Rated current 0.5A Max**
The maximum current of the signal pin is 0.5A.

● **High reliability of contact design**
A metal latch prevents accidental unplugging of a network connection due to shock, vibration or pulling on cords

• **High reliability of contact design**
"Fighting snake" contact structure with two contact points provides high resistance to shock and vibration

● **Good electromagnetic resistance**
EMI and Signal Integrity are optimized by the signal path design and the 360 degrees shielding brings in next generations to CAT5E performance.

3. Ordering information

Refer to the drawing.

4. Connector dimensions

Refer to the drawing.

5. Material

Housing: Thermo plastic，Flammability: UL94 V-0,Color: Black
Contact: Copper alloy
Finish: Nickel plating all over
Contact area: Au plating
Soldering area: Tin plating
Shell:Material: Phosphor Bronze
Finish: Tin plating over Ni under-plating

6. Accommodated P.C.B layout

Refer to the drawing.

7. Rating

position /pitch	8 position/1.27mm
Operating voltage(Max.)	50V AC/ 60VDC
Current rating(Max.)	Power pin: 0.5A
Temperature Rating :	－40° C to 85° C(Unless limited by cable)
Storage temperature	-10°C -- +60°C (Note 3)
Data rate	10Mbit/s, 100Mbit/s, 1Gbit/s,
Operating humidity	20% to 80%
Storage humidity	40% to 70%

Performance Requirements and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.1. All tests shall be performed in the room temperature, unless otherwise specified.

8. Test Requirements and Procedures Summary

Test Items	Requirements	Procedures
Examination of Product	Meets requirements of product drawing.	Visual inspection
	Structure shall be meet the design and dimensional requirements of drawing	No physical damage.
Electrical Performance		
Termination Resistance (Low Level)	40 mΩMax. (Initial) 50 mΩMax. (After Test)	Subject mated contacts assembled in housing to 20mV Max open circuit at 100mA. Fig.3. EIA364-23
Insulation Resistance	500 MΩ Min.	100V DC. 1minute hold. Test between adjacent circuits of mated connectors.EIA364-21
Dielectric withstanding Voltage	No creeping discharge or flashover shall occur. Leak current: 0.5mA Max.	DWV test condition (1 minute hold); 1000V DC : Between contact to contact 1500V DC : Between contact to shell Test between adjacent circuits of mated connectors. EIA364-20
Temperature Rising	30° C MAX under loaded rating current.	Measure temperature rising by energized current.
Fig.1		
Mechanical Performance		
Connector Mating Force	30 N Max	Operation speed: 10mm/min. Measure force necessary to mate samples. EIA364-13
Connector Un-mating Force	30 N Max	Set lock operation part of plug connector to open. Operation speed: 10mm/min. Measure force necessary to unmate samples. EIA364-13
Test item	Requirement	Procedure
Durability (Repeated Mate/Unmating)	Termination Resistance (Low Level).	Operation Speed :200cycles/hour No. of Cycles: 1500cycles.(SMT HDR) No. of Cycles: 1500cycles.(DIP HDR) EIA364-09
Cable Pull-Out	No damage on soldering place. No disconnection between shield wire to shell.	Apply axial load to cable on plug connector. Fig.4 EIA364-38 Retention force for KIT products shall be determined by cable. Retention force for CABLE ASSY products shall be specified on CABLE ASSY drawing.
Lock Strength	Connector must not unmate. No destruction on Lock elements, no destruction on Receptacle connector with PC-Board and no harmful damage on other parts.	Mate connector and make lock mechanism effective. Apply axial load to cable on plug connector. 98 N. 1 minute. Fig.4
Elasticity	Connector must not unmate. No destruction on Lock elements, no destruction on Receptacle connector with PC-Board and no harmful damage on other parts.	Mate connector and make lock mechanism effective. Apply axial load to cable on plug connector 20N and bend cable to direction 45 degrees each on both side up to 20 cycles. Fig.5
Fixed Strength to PC-Board	No destruction on Receptacle connector with PC-Board and no harmful damage on other parts.	Mate connector. Apply load to edge of plug connector. Load one direction on one sample. Fig 6 40 N. 1 minute for PN:*-227165-* 15N. 1 minute for PN:*-1971885-* Recommend panel protection for bigger strength application (Fig.7)
Vibration (Low Frequency)	No electrical discontinuity greater than 1μ sec shall occur. Termination Resistance (Low Level).	Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52mm amplitude 2 hours each of 3 mutually perpendicular planes. EIA364-28

Physical Shock	No electrical discontinuity greater than 1μ sec shall occur. Termination Resistance (Low Level).	Accelerated Velocity : 30G Waveform : Half-sin wave Duration:11 millisecond Number of drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops.EIA364-27
Solder ability (DIP Products)	Appearance of the specimen shall be inspected after the test with the assistance of a magnifier capable of giving a magnifier of 10X. The soldered surface shall be covered with a smooth solder coating with no more than small amounts of scattering imperfections such as pin-holes or un-wet or de-wet areas.	Eutectic solder Solder Temperature : 235±5° C Immersion Duration: 3±0.5 sec. Lead-Free solder (Sn-Ag-Cu) Solder Temperature : 245±5° C Immersion Duration: 3±0.5 sec. MIL-STD-202 Method 208

Test item	Requirement	Procedure
Solder ability (SMT Products)	Appearance of the specimen shall be inspected after the test with the assistance of a magnifier capable of giving a magnifier of 10X. The soldered surface shall be covered with a smooth solder coating with no more than small amounts of scattering imperfections such as pin-holes or un-wet or de-wet areas.	Conform to IEC60068-2-58 7.Solder reflow method. Preheating: 150±10° C, 60～120sec Soldering: 235±5° C, 10±1 sec Number of reflow : 2

Environmental Performance and others

Temperature Life (Heat Aging)	Termination resistance (Low Level)	Mated connector 85° C, 315 Hours EIA364-17
Humidity (Steady State)	Insulation resistance Dielectric Strength Termination resistance (Low Level)	Mated connector 90-95%R.H. 40° C 240 hours EIA364-31
Thermal Shock	Termination Resistance (Low Level)	Mated connector －55° C/ 30 min. +85° C/ 30 min. Making this a cycle, repeat 10 cycles. EIA364-32
Humidity-Temperatu re Cycling	Insulation resistance Dielectric Strength Termination resistance (Low Level)	Mated connector, 25～65° C, 80~100%R.H. 7 cycles Cold shock –10° C performed EIA364-31
Salt Spray	Termination resistance(Low Level) After it is left for 1 hour under a steady temperature/humidity, it is measured.	Mated connector Salt concentration: 5%, 35±2° C,48 hours EIA364-26 (MIL-STD-202F Method 101 Condition B)
Hydrogen sulfide Gas (H2S)	Termination resistance (Low Level)	Mated connector H2S Gas :3±1ppm, 40±2° C, 96 hours
Resistance to Soldering Heat (DIP Products)	No physical damage shall occur.	Test connector on PCB. Solder Temperature : 260±5° C Immersion Duration : 10±0.5 sec. AMP Spec. 109-5204, Condition B MIL-STD-202, Condition 210 In case of manual soldering iron, apply it as 360±10° C for 3±0.5° C seconds without forcing pressure to affect the tine of contact
Resistance to Soldering Heat (SMT Products)	Appearance of the specimen shall be inspected after the test with the assistance of a magnifier capable of giving a magnification of 10X, No physical damage such as cracks, chips or malting.	Test connector on PC-Board. Reflow Average ramp rate: 3° C/ sec max Preheat temperature:150～200° C Preheat time: 60～180sec Ramp to peak: 3° C/ sec max Time over liquid's (217° C):60～150 seconds Peak temperature: 260 +0/-5 ° C Time within 5° C of peak:20～40 sec Ramp - cool down: 6° C/ sec max Time 25° C to peak: 8 min max After reflow, then DIP (Legs of shell) Solder temperature 260° C±5° C Immersion duration 10±1sec. Number of reflow : 2 EIA-364-56

Fig.1 end

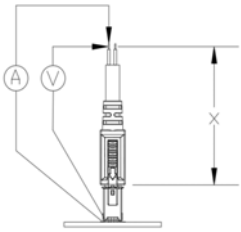
Note
Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Re qualification Test Sequence shown in Figure 3.

9. Product qualification and reliability test sequence

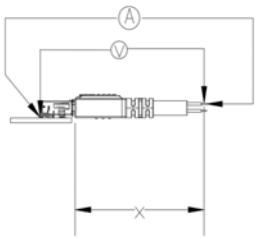
Test Examination	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Examination Of Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Termination Resistance (Low Level)				2,6			2,4	2,5		2,4	2,4	2,4	2,4	2,4	2,4	
Insulation Resistance	2,5	2,5														
Dielectric Withstanding Voltage	3,6	3,6														
Temperature Rising			2													
Conn. Mating Force				3												
Conn. Unmating Force				4												
Durability Repeated mate/Unmating				5												
Cable Pull-Out					2											
Lock Strength																
Elasticity						2										
Fixed strength to PC-Board							3									
Vibration (High Frequency)								3								
Physical Shock								4								
Solder ability									2							
Temperature Life (Heat Aging)										3						
Humidity (Steady State)											3					
Thermal Shock												3				
Humidity-Temperature Cycling													3			
Salt Spray														3		
Hydrogen sulfide Gas (SO2)															3	
Resistance to Soldering Heat																2

(a) Numbers indicate sequence in which tests are performed.

Fig.2(end)



SMT TYPE



SMT TYPE

Fig.3

(Cable balk resistance of length X is deducted from measurement value.) Termination Resistance Measurement

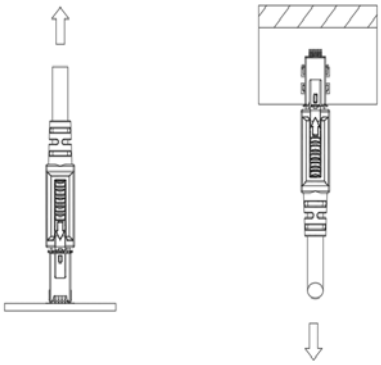


Fig.4

Cable Pull-Out、 Lock Strength Measurement Method

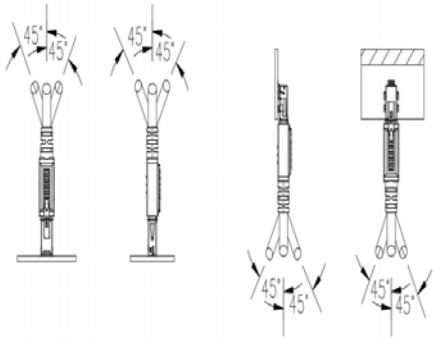


Fig.5

Elasticity Measurement Method

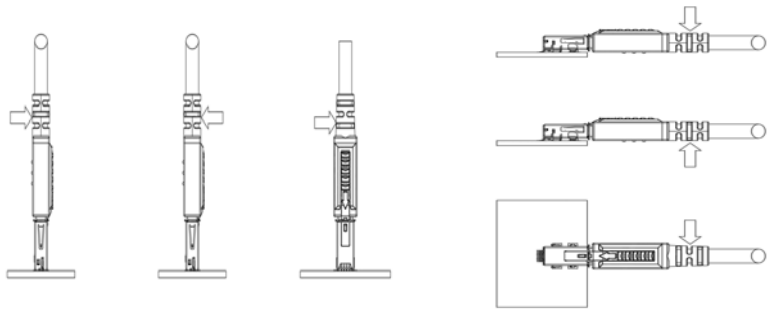


Fig.6

(Fix P.C.Board. Load as shown figure、 1 direction per 1 sample.) Fixed strength to PC-Board Measurement Points

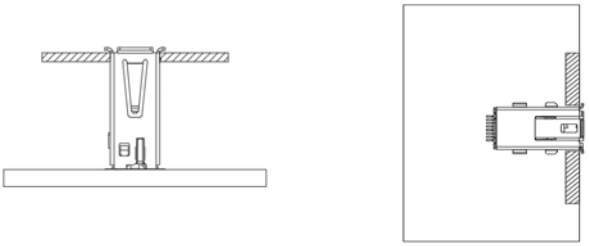


Fig.7

(Recommend panel protection for bigger strength application)