INDUSTRIAL MINI I/O Connector

1. INTRODUCTION

1.1 Purpose

Testing was performed on INDUSTRIAL MINI I/O Connector to determine if it meets the requirements of design Objective 108-106087.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance requirements of the INDUSTRILA MINI I/O Connector.

1.3 Product Description

The INDUSTRIAL MINI I/O vertical SMT Connectors are connectors for signal or general circuit for industrial equipment. And, there is board to wire type for connection between equipment.

1.4 Test samples

P/N	Name
1971885-1 1-1971885-1 2271656-1 1-2271656-1	Industrial Vertical Mini I/O Connector SMT type I
1971885-2 1-1971885-2 2271656-2 1-2271656-2	Industrial Vertical Mini I/O Connector SMT type II
1981081-1	Safety I/O cable Assy

Fig. 1

1.5 Test samples

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15℃ to 35℃
Relative Humidity: 25% to 75%

2. Qualification 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	2,4	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																
Fixed strength to PC-Board						3	3									
Vibration (High Frequency)								3								
Physical Shock								4								
Solder ability									2							
Temperature Life (Heat Aging)										3						
Humidity (Steady State)	4										3					
Thermal Shock												3				
Humidity-Temperature Cycling		4											3			
Salt Spray														3		
Hydrogen sulfide Gas (SO_2)															3	
Resistance to Soldering Heat																2

Fig. 2

3. TEST CONTENT

Para	Test Items	Requirements	Judgment
3.1	Examination of Product	Visual inspection No physical damage.	Acceptable
Electrical Requirements			
3.2	Termination Resistance (Low Level)	40 mΩMax. (Initial) 50 mΩMax. (After Test)	Acceptable
3.3	Insulation Resistance	500MΩMin.	Acceptable
3.4	Dielectric withstanding Voltage	DWV test condition (1 minute hold); 1000V DC : Between contact to contact 1500V DC : Between contact to shell No creeping discharge or flashover shall occur. Leak current: 0.5mA Max.	Acceptable
3.5	Temperature Rising	30 °C MAX. Under loading rating current 0.5A.	Accepta ble
Mechanical Requirements			
3.6	Connector Mating Force	30 N Max.	Acceptable
3.7	Connector Un-mating Force	30 N Max.	Acceptable
3.8	Durability (Repeated Mate/Un-mating)	Repeated mating/un-mating for 1500 cycles Operation Speed :200cycles/hour Termination Resistance (Low Level)	Acceptable
3.9	Cable Pull-Out	98N 1 minute No damage on soldering place. No disconnection between shield wire to shell.	Acceptable
3.10	Lock Strength	98N 1 minute No un-mate, No destruction on Lock elements, No destruction on Receptacle connector with PC-Board and no harmful damage on other parts.	Acceptable
3.11	Elasticity	20N,20 cycles(45 degree each total 90 degrees per 1 cycle), No un-mate, No destruction on Lock elements, No destruction on Receptacle connector with PC-Board and no harmful damage on other parts.	Acceptable
3.12	Fixed Strength to PC-Board	40 N. 1 minute for PN: *-2271656-* 15 N. 1 minute for PN:*-1971885-* No destruction on receptacle with PC-Board and no harmful damage on other parts.	Acceptable

Fig.2(CONT.)

Para	Test Items	Requirements	Judgment
3.13	Vibration (Low Frequency)	10-55-10 Hz traversed in 1 minute at 1.52mm amplitude 2 hours each of 3 mutually perpendicular planes No electrical discontinuity greater than 1 μ sec shall occur.	Acceptable
3.14	Physical Shock	30G, Half-sin wave, 11 m sec 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. No electrical discontinuity greater than 1μsec shall occur. Termination Resistance (Low Level).	Acceptable
3.15	Solder ability (SMT Products)	Solder reflow method. Preheating: 150±10°C, 60 ～120sec Soldering: 235±5°C, 10±1 sec Number of reflow : 2 No pin-holes or un-wet or de-wet areas, and so on.	Acceptable
Environmental Requirements			
3.16	Temperature Life (Heat Aging)	Mated connector 85°C, 315 Hours Termination resistance (Low Level)	Acceptable
3.17	Humidity (Steady State)	Mated connector 90-95%R.H. 40°C 240 hours Insulation resistance Dielectric Strength Termination resistance (Low Level)	Acceptable
3.18	Thermal Shock	Mated connector －55°C/ 30 min. +85°C/ 30 min. Making this a cycle, repeat 10 cycles. Termination Resistance (Low Level)	Acceptable
3.19	Humidity-Temperature Cycling	Mated connector, 25～65°C, 80~100%R.H. 7 cycles Cold shock –10°C performed Insulation resistance Dielectric Strength Termination resistance (Low Level)	Acceptable
3.20	Salt Spray	Salt concentration: 5%, 35±2°C, 48 hours Termination resistance (Low Level) After it is left for 1 hour under a steady temperature/humidity, it is measured.	Acceptable
3.21	Hydrogen sulfide Gas (H_2S)	Mated connector H_2S Gas :3±1ppm, 40±2°C, 96 hours Termination resistance (Low Level)	Acceptable

Fig.2(CONT.)

Para	Test Items	Requirements	Judgment
3.22	Resistance to Soldering Heat (SMT Products)	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 No physical damage such as cracks, chips or malting.	Acceptable

Fig. 2 (END)

4. Conclusion

Industrial Mini I/O vertical SMT connector conforms to the electrical, mechanical, and environmental performance requirements of Design Objective 108-106087, Rev C.

5. VALIDATION

Requested by:

Lear Zhang 03/01/2016

Approved by:

Kobby Zhao 03/02/2016