
ExpressCard Connector Single slot, Card push type & Button push type

1 Scope :**1.1 Contents**

This specification covers the requirements for product performance, test methods and quality assurance provisions of ExpressCard Connector.

This specification is adapted for all of the Pb free production of ExpressCard connector, card push type and button push type.

2. Applicable Documents:

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 AMP Specifications :

- A. 109-5000 Test Specification, General Requirements for Test Methods
- B. 501-99000 Test Report

2.2 Commercial Standards and Specifications :

- A. MIL-STD-202
- B. ExpressCard Standard Release 1.1
- C. EIA-364

3. Requirements :**3.1 Design and Construction :**

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials :**A. Contact :**

Copper Alloy

Finish:

Contact area : Gold Plating

Solder area : MatteTin or Gold flash plating.

Underplate : Nickel Plating

B. Plastic parts :

Header housing:

Material : High Temperature Thermo plastic

Flammability : UL94V-0

Guide rail housing, Hsg arm, Button:

Material : Thermo plastic

Flammability : UL94V-0

C. Metal parts :

Shield frame, Slider, Lower shell, Upper shell, Arm bar, Push bar, Bracket:

Material : Stainless steel.

Cam rod, Coil Spring:

Material : Steel (SWP)

Nut:

Material : Cutting Steel or Cutting Brass.

Finish: Nickel plating.

3.3 Ratings :

A. Voltage Rating : 50 VAC

B. Current Rating : 0.75 A

C. Temperature Rating —55°C to 85°C

D. Reflow Peak Temperature: 260°C MAX.

3.4 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.

3.5 Test Requirements and Procedures Summary

Para.	Test Items	Requirements	Procedures
3.5.1	Examination of Product	Meets requirements of product drawing	Visual inspection No physical damage
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	40 mΩ Max. (Initial) ΔR=15 mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10 mA Max. at open circuit voltage of 20mV Max. Fig. 3. EIA-364-23
3.5.3	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur. Current leakage : 1 mA Max.	0.5 kVAC for 1 minute. Test between adjacent circuits of unmated connectors. EIA-364-20
3.5.4	Insulation Resistance	500MΩ Min.(Initial) 500MΩ Min.(Final)	Impressed voltage 500 V DC. Test between adjacent circuits of unmated connectors. EIA-364-21
3.5.5	Temperature Rising	30 °C Max. under loaded specified current (0.75 A)	Measure temperature rising by energized current. EIA-364-70 Test method 2
Mechanical Requirements			
Para.	Test Items	Requirements	Procedures
3.5.6	Vibration (Random)	No electrical discontinuity greater than 1 μ sec. shall occur. ΔR=15 mΩ Max. (Final)	Subject mated connectors Vibration Frequency: 10 to 55 Hz Accelerated Velocity: 30.38m/s ² (3.1G), rms. Vibration Direction: In each of 3 mutually perpendicular planes. Duration: 15 minutes each 100 mA applied. Card connector should be fixed on the test jig. EIA-364-28 Method VII condition D

Fig.1 (CONT.)

Para	Test Items	Requirements	Procedures
3.5.7	Physical Shock (Normal test)	No electrical discontinuity greater than 1 μ sec. shall occur. $\Delta R=15 \text{ m}\Omega$ Max. (Final)	Accelerated Velocity: 490 m/s ² (50 G) Waveform: Semi-Sine wave Duration: 11 m sec. Number of Drops: 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. EIA-364-27 Condition A
3.5.8	Card Insertion Force for card push type	Card Insertion Force : 68.7N (7kgf) Max.	Operation Speed: 12.5 mm/min. Measure the force required to mate connector with applicable ExpressCard EIA-364-13
	Card Insertion Force for button push type	Card Insertion Force : 39N (3.98kgf) Max.	
3.5.9	Card Removal Force	Card Removal Force: 3.7N (0.38kgf)Min, 18.5N(1.89kgf)Max.	Operation Speed: 12.5 mm/min. Measure the force required to mate connector with applicable ExpressCard EIA-364-13
3.5.10	Operation Force for button push type	Button Push Force: 29.5N (3kgf) Max.	Operation Speed: 12.5 mm/min. Measure the force required to mate connector with applicable ExpressCard EIA-364-13
3.5.11	Durability (Repeated Mating/Unmating)	$\Delta R=15 \text{ m}\Omega$ Max. (Final)	Repeated mating and unmating of the connector for 5000 cycles. EIA-364-9
3.5.12	Durability (Preconditioning)	No physical damage	No. of cycles : 50 cycles
3.5.13	Reseating	No physical damage	No. of cycles : 3 cycles
3.5.14	Solderability	Wet Solder Coverage: 95 % Min.	Solder Temperature : 245 \pm 5 $^{\circ}\text{C}$ Immersion Duration : 3 \pm 0.5 seconds Flux : Alpha 100

Fig.1 (CONT.)

Para.	Test Items	Requirements	Procedures
3.5.15	Resistance to Reflow Soldering Heat	No physical damage shall occur	Test connector on P.C.Board Temperature is measured on a soldering pad. Fig.3 Pre-Heat 150~200°C: 60~180sec. Heat 217°C Min.: 60~150sec. Heat Peak 260+0/-5°C IPC/JEDEC J-STD-020C
3.5.16	Thermal Shock	$\Delta R=15 \text{ m}\Omega$ Max. (Final)	Mated connector -55 +0/-3°C / 30 min., 85 +3/-0°C / 30 min. Making this a cycle, repeat 10 cycles. EIA-364-32, Condition A
3.5.17	Humidity-Temperature Cycling	Insulation resistance 500 M Ω Min. (final) $\Delta R=15 \text{ m}\Omega$ Max. (Final)	Mated connector, 25±3~65±3°C, 50±3~80±3% R.H. 24 cycles Cold shock -10°C performed EIA-364-31
3.5.18	Thermal Cycling	$\Delta R=15 \text{ m}\Omega$ Max. (Final)	Mated connector, 15±3~85±3°C Ramps: 2°C/min. Dwell time: 5min. Min. 10 Cycle
3.5.19	Temperature Life (Heat Aging)	$\Delta R=15 \text{ m}\Omega$ Max. (Final)	Mated connector 105°C, Duration: 120 hours EIA-364-17, Method A
3.5.20	Temperature Life (Preconditioning)	No physical damage	Mated connector 105°C, Duration: 72 hours EIA-364-17, Method A
3.5.21	Mixed flowing Gas	$\Delta R=15 \text{ m}\Omega$ Max.	Mated connector 30°C, 70% R.H., 7Days Cl ₂ : 10±3ppb No ₂ : 200±50ppb H ₂ S: 10±5ppb EIA-364-65, class II A

Fig. 1 (End)

4. Product Qualification Test Sequence

Test Examination	Test Group												
	1	2	3(b)	4(b)	5(d)	6	7	8	9	10	11	12	13 (c)
	Test Sequence (a)												
Examination of Product	1, 5	1, 3	1, 5, 8	1, 4	1, 4	1, 3	1, 3	1, 5, 8, 11	1, 5, 8	1, 5, 8, 11	1, 5, 8, 11, 14	1, 4, 7, 10, 13	1, 8
Termination Resistance (Low Level)			2, 6, 9	2, 5	2, 5			2, 6, 9, 12	2, 6, 9	2, 6, 9, 12	2, 6, 9, 12, 15	5, 8	2, 9
Dielectric withstanding Voltage	2, 6												
Insulation Resistance	3, 7												
Temperature rising		2											
Vibration (Random)			7										
Physical Shock				3								9	
Card Insertion Force												2, 11	3, 6
Card Removal Force												3, 12	
Operation force for button push type													4, 7
Durability (Repeated Mate/Unmating)					3								5
Durability (Preconditioning)			3					3	3	3	3		
Reseating								10	7	10	13		
Solderability						2							
Resistance to Reflow Soldering Heat							2						
Thermal Shock								4					
Temperature Humidity Cycling	4							7					
Thermal Cycling										7	10		
Temperature Life (Heat Aging)									4			6	
Temperature Life (Preconditioning)			4							4	4		
Mixed flowing Gas											7		

FIG.2

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

(b) No electrical discontinuity shall occur.

(c) Applied for Button Push type.

(d) Applied for Card Push type.

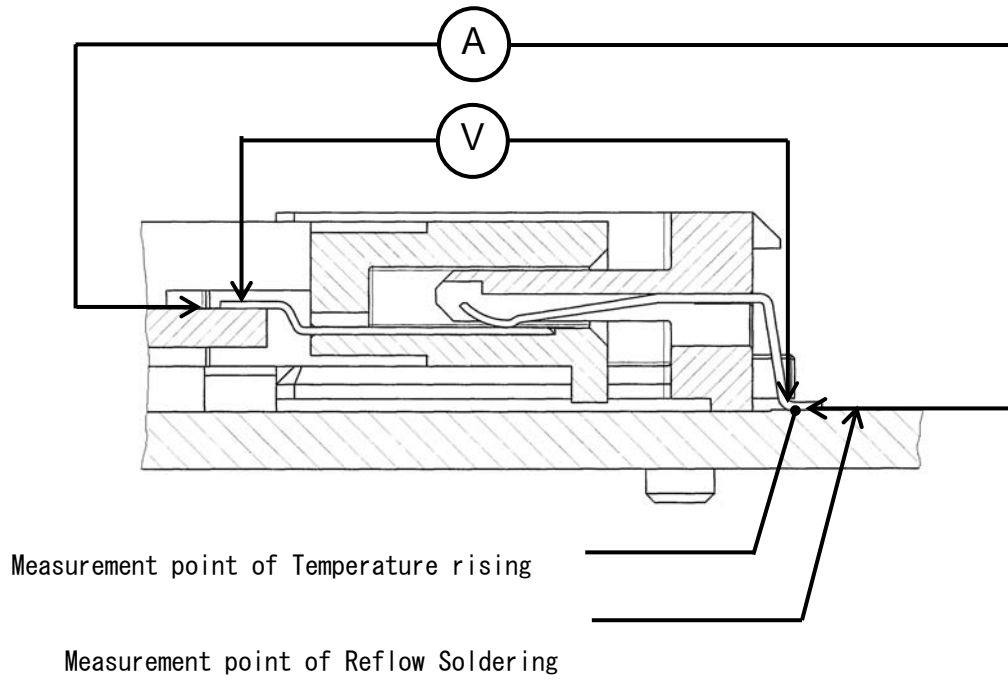


Fig.3 Termination Resistance Measuring points, Temperature Rising Measuring points, and Reflow Temperature Measuring points.

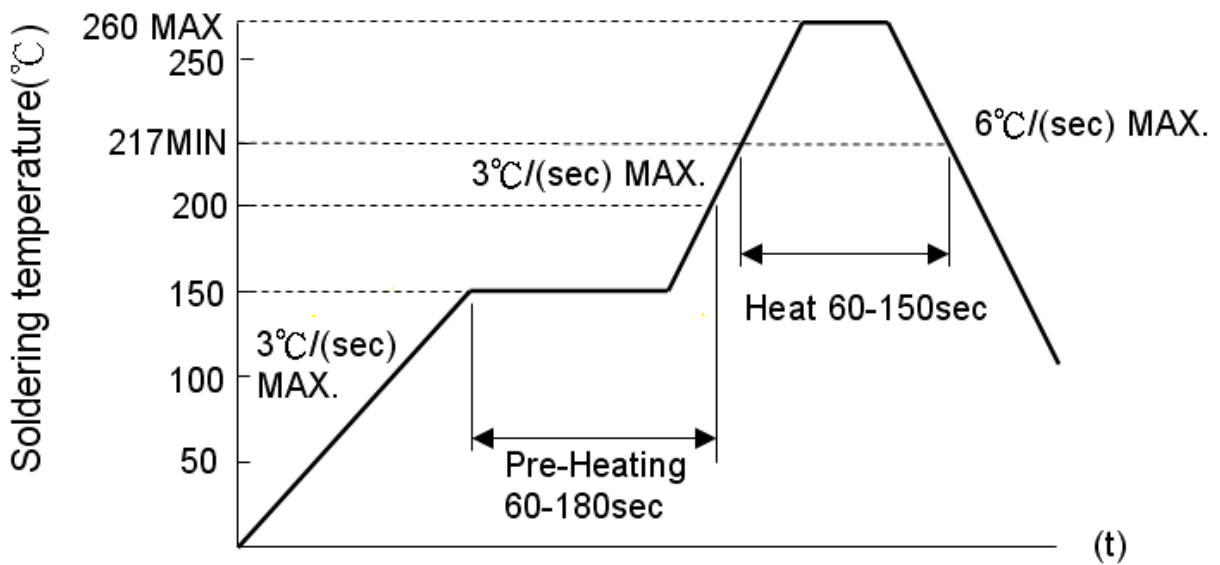


Fig.4 Reference IR flow chart.