



SLIVER 4C Vertical Card Edge Connector with High Power

1. SCOPE

1.1. Content

This specification defines performance, test and quality requirements for the Sliver 4C Vertical Card Edge Connector with High Power (4C-HP).

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on October 1, 2019. The qualification test report number is 501-134099. This documentation is on file and available from Engineering Practices and Standards.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-130014: Application Specification
- 501-134099: Qualification Test Report
- 108-130028: Product Specification – Sliver 2.0 Card Edge Power Mini Module
- 108-130021: Product Specification – Sliver 2.0 Signal Contacts

2.2. Industry Documents

- EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications
- EIA-638 Surface Mount Solderability
- IPC/ECA J-STD-002 Solderability

2.3. Reference Document

- [109-197](#) Test Specification (TE Test Specification vs EIA and IEC Test Methods)
- 102-950 Qualification of Separable Interface Connectors

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Signal Contact Ratings

Voltage	Current	Temperature
30 VDC	Signal application only	-55 to 105°C

3.3. High Power Contact Ratings

Voltage (AC)	Estimated CSA Current Rating (amperes at 30°C temperature rise)	Temperature
48V	50A (25A per contact)	-55 to 105°C

3.4. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure
Initial examination of product	Meets requirements of product drawing.	EIA-364-18 Visual examination and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18 Visual examination.
ELECTRICAL		
Low Level Contact Resistance (LLCR), Signal	ΔR 10 m Ω maximum	EIA-364-23 Max. open voltage 20mV. Max current 100 mA DC. Measure a minimum of 40 contacts, half from each connector side.
Low Level Contact Resistance (LLCR) Power	2 m Ω maximum, initial (Including bulk resistance of test board) ΔR 1 m Ω maximum	EIA-364-23 Max. open voltage 20mV. Max current 100 mA DC.
Insulation Resistance	1 G Ω minimum	EIA-364-21 Test Voltage 500V DC. Duration 5 seconds minimum. Measure between Power and Signal Contacts.
Withstanding Voltage	Maximum leakage current of 2.0 mA. No breakdown or flashover.	EIA-364-20, Condition I Test Voltage 1100VAC Measure between Power and Signal Contacts.
MECHANICAL		
Random vibration	No discontinuity \geq 1 microsecond. See Note.	EIA-364-28, Test Condition VII, Test Condition Letter D. Subject mated specimens to 3.10 G RMS between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock	No discontinuity \geq 1 microsecond. maximum. See Note.	EIA-364-27, Test Condition A. Subject mated specimens to 50 Gs half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Mating Force	74 N maximum per connector	EIA-364-13 Axial Tension/ Compression machine such as an Instron Tensile Tester. Rate 12.7mm/minute.
Un-mating Force	16 N minimum per connector	EIA-364-13 Axial Tension/ Compression machine such as an Instron Tensile Tester. Rate 12.7mm/minute.
Durability	See Note.	EIA-364-09. Mate and unmate specimens. Swap paddle card every 50 cycles. Maximum rate: 500 cycles per hour. Operation cycles: 200.

ENVIRONMENTAL		
Solderability	95% minimum wetting	IPC/ECA J-STD-002, Test S1 Preheat: 150° to 180°C / 60-120 seconds Reflow: 230° to 260°C / 30-60 seconds for surface mount signal contacts. IPC/ECA J-STD-002, Test A1 for through hole power contacts.
Resistance to reflow soldering heat	See Note.	TEC-109-201 Method-B, Condition-B. Subject connector to 3x reflow curve 260°C peak.
Thermal shock.	See Note.	EIA-364-32, Method A, Test Condition VII. Subject mated specimens to 5 cycles between -55° and 105°C with 30 minute dwells at temperature extremes and maximum 1 minute transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 98% RH.
Minute disturbance	See Note.	Manually unmate and mate the specimen 5 times.

Figure 1 End



NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Design Verification Test Sequence shown in Figure 2.

3.5. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Low Level Contact Resistance	4,6,10			
Insulation resistance (c)		2,6		
Withstanding voltage (c)		3,7		
Random vibration	7			
Mechanical shock	8			
Durability	5			
Connector Mating Force	3			
Connector Un-Mating Force	11			
Connector solderability			2	
Resistance to reflow soldering heat				2
Thermal shock		4 (d)		
Humidity/temperature cycling		5		
Minute disturbance	2,9			
Final examination of product	12	8	3	3

Figure 2



NOTE

- (a) Samples shall be prepared in accordance with applicable instructions. Unless otherwise stated, all test groups shall consist of a minimum of 5 connectors of which all contacts shall be tested.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Measure between adjacent Power and Signal Contacts
- (d) Connectors for these tests shall be preconditioned by 10 mating and un-mating cycles.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification testing

A. Sample selection

Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production. Unless otherwise specified, all test groups shall consist of a minimum of 5 connectors of which 40 contacts minimum shall be tested.

B. Test sequence

Qualification inspection shall be verified by testing samples as specified in Paragraph 3.4

4.2. Acceptance

Acceptance is based upon verification that product meets requirements of Paragraph 3.4. Failures attributed to equipment, test set-up, applied customer components or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken, and samples resubmitted for requalification. Testing to confirm corrective action is required before resubmittal.