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1.0 Objective

This specification defines the performance, test, quality and reliability requirements of Right Angle (R/A) Power Edge Card connector product that will mate to a separable power edge card at end application.

2.0 General

The specification is composed of the following section.

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3.0 Applicable Documents

The following document of the issue in effect on the date of the latest revision of this specification, shall form a part of this specification to the extent specified herein.

3.1 FCI Specifications

- 10028886 FCI Engineering Drawing.
- 10035388 FCI Engineering Drawing.
- 10055090 FCI Engineering Drawing.
- 10053363 FCI Engineering Drawing.
- BUS-03-601 Current rating /30°C temperature rise.

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- BUS-03-404 Normal Force Measurement.

3.2 Other Standard and Specification

- UL 94, Tests for flammability of plastic materials.
- EIA 364, Electrical connector/socket test procedures include environmental classification.
- EIA-364-1000.01, Environmental test methodology for assessing the performance of electrical connectors and sockets used in business office applications.

4.0 Requirements

4.1 Design and construction

Connectors shall be of the design construction and physical dimensions specified on the applicable product drawing as shown in Para 3.1.

4.2 Material

The material for each part shall be as specified herein or equivalent. The substitute material shall meet the performance requirement of this specification.

4.2.1 Housing & Tail Guide dielectric material

- Plastic raw material: high temperature thermoplastic, glass-filled.
- Flame level: UL 94 V-0 rated.
- Color of housing: black

4.2.2 Power Contact

- Material: High conductivity copper alloy
- Finishing: 30 μ " gold on mating area; 100 μ " tin/lead or tin on soldered tail, all over nickel underplated.

4.2.3 Signal Contact

- Material: Phosphor bronze
- Finishing: 15 μ " gold on mating area; 100 μ " tin/lead or tin on soldered tail, all over nickel underplated.


4.2.4 Latch

- Material: phosphor bronze
- Finishing: Nickel plated.

4.3 Operating temperature range

- -5 °C ~ 105 °C

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4.4 Mechanical Characteristics

4.3.1 Contact retention

- Test Condition: per EIA 364-29; no movement > 0.38 mm.
- Requirement: The individual contact retention shall not be less than 300gf, while applying a downward axial load to the support member of the contact.

4.3.2 Normal force

- Test condition: per FCI Spec BUS-03-404
- Requirement: The contact normal force shall not be less than 150gf per power contact and 35gf per signal contact.

4.3.3 Durability

- Test Condition: per EIA 364-09. Mating/unmating with module-gage rated of 5 inches/minute.
- Requirement: After 200 mating/unmating cycles, there shall be no damage to the housing or contacts. The connector shall meet all electrical and mechanical characteristics.

4.3.4 Durability (preconditioning)

- Test condition: per EIA 364-09, mating/unmating module board at a rate of 5 inches/minute.
- Requirement: There shall be no damage to the housing or contacts after 20 cycles.

4.3.5 Solderability

- Test condition: per EIA 364-52, Class 1, Category 3.
- Requirement: There shall have a solder coverage of 95% minimum.


4.3.6 Mating/unmating force

- Test condition: per EIA 364-13, with speed of 1 inch/minute.
- Requirement: the total force to mate a connector and a module card should not exceed 13.62kgs. The unmating force no less than 0.95kgf.

4.3.7 Reseating

- Test condition: Manual plug/unplug the connector with module board.
- Requirement: Perform 3 such cycles.

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4.5 Electrical Characteristics

4.5.1 Current rating

- Test condition: Series the power contacts each of upper and lower line then measuring the temperature changes at the mating point with test current applied- 7A for power pin, 0.5A for signal pin.
- Requirement: the maximum temperature rise of contacts should no more than 30°C.

4.5.2 Low Level Contact Resistance

- Test condition: per EIA 364-70.
- Requirement: the contact resistance shall not exceed 35mΩ, initial; and less than 20mΩ changes after test.

4.5.3 Dielectric Withstanding Voltage

- Test condition: per EIA 364-20, Apply with test voltage 1000 V/RMS 60hz for power contact and 500V/RMS 60 Hz for signal contact.
- Requirement: there shall no short circuit or insulation break down.

4.5.4 Insulation Resistance

- Test condition: per EIA 364-21. Apply with a test voltage of 500 VDC between the closet adjacent contacts.
- Requirement: the insulation resistance shall be 5,000MΩ minimum for power contact and 500MΩ for signal contact.

4.6 Environmental Conditions

4.6.1 Mechanical Shock

- Test Condition: Per EIA-364-27, Test condition A. Half-Sine pulse, 50G, 11ms, 3 shocks, 6 directions (18 shocks totally).
- Requirement: No physical damages and no electrical discontinuity more than 1μ second.

4.6.2 Random Vibration


- Test Condition: Per EIA-364-28, Test condition III. Sine sweep from 10~2000~10Hz traversed in 20 minutes, 1.52mm, 15G; 12 times for each direction, 12 hours totally.
- Requirement: No physical damages and no electrical discontinuity more than 1μ second.

4.6.3 High Temperature Life

- Test condition: per EIA 364-17, Test method A, 240 hours at temperature 105±2C° to pertaining of 65°C for 10 years.
- Requirement: No physical damages and meets sequenced tests.

4.6.4 High Temperature Life (preconditioning)

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- Test condition: per EIA 364-17, Test method A, 120 hours at temperature $105\pm 2^{\circ}\text{C}$ to pertaining of 65°C for 10 years.
- Requirement: No physical damages and meets sequenced tests.

4.6.5 Thermal Shock

- Test condition: per EIA 364-32, Test Condition 1. Cycle the connector -55 to $+85^{\circ}\text{C}$. Dwell time of 30minutes at extreme temperature. Transfer time 5 minutes max.
- Requirement: No physical damages and meets sequenced tests.

4.6.6 Cyclic Temperature & Humidity

- Test condition: per EIA 364-31,method II. Cycle the connector between $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ at humidity of 90% to 95%.The test condition A will be used and the test duration is 96 hours.
- Requirement: No physical damages and meets sequenced tests.

4.6.7 Mixed Flowing Gas

- Test condition: per EIA 364-65, Class IIA. Perform 10 days.
- Requirement: No physical damages and meets sequenced tests.

4.6.8 Thermal Disturbance

- Test condition: per EIA 364-1000.01 Test Group 4. Cycle the connector between $15^{\circ}\text{C}\pm 3^{\circ}\text{C}$ and $85^{\circ}\text{C}\pm 3^{\circ}\text{C}$, as measured on the part. Ramps should be a minimum of 2°C per minute, and dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes) Humidity is not controlled. Perform 10 such cycles.
- Requirement: No physical damages and meets sequenced tests.

5.0 Product qualification provisions

5.1 Equipment Calibration


All test equipment and inspection facilities used in the performance of any test shall be maintained a calibration system in accordance with TL-9000.

5.2 Inspection Conditions

Unless otherwise specified herein, all inspections shall be performed under the following ambient condition.

- Temperature: $25\pm 5^{\circ}\text{C}$.
- Relative humidity : 30 to 80%
- Barometric pressure: local ambient.

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5.3 Sample Quantity and description

Samples shall be selected at random from current production. The sample size shall be according to test sequence needed.

5.4 Qualification test sequence

Testing Item	Ref. Para.	Testing Group						
		A	B	C	D	E	F	G
Contact Retention	4.4.1				3			
Normal Force	4.4.2				1			
Durability	4.4.3					3		
Durability (Preconditioning)	4.4.4	2	2	2				2
Solderability	4.4.5				4			
Mating / Unmating Force	4.4.6				2			
Reseating	4.4.7	5	8	9				
Current Rating	4.5.1						1	
LLCR	4.5.2	1, 4, 6	1, 4, 7, 9	1, 4, 6, 8, 10		2, 4		1,5,7
Dielectric Withstanding Voltage	4.5.3					1, 5		
Insulation Resistance	4.5.4		6					
Mechanical Shock	4.6.1							6
Random Vibration	4.6.2							4
High Temperature Life	4.6.3	3						
High Temperature Life (Preconditioning)	4.6.4			3				3
Thermal Shock	4.6.5		3					
Cycling Temperature & Humidity	4.6.6		5					
Mixed Flowing Gas	4.6.7			5				
Thermal Disturbance	4.6.8			7				
Sample Size		5	5	5	5	5	5+5	5

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6.0 Packaging and Shipping

- 6.1 Packing the packing and packaging shall be in accordance with industry standard practice in a manner to insure carrier acceptance and safe delivery to destination per FCI packaging specification.
- 6.2 Packaging marking each shipping container shall be clearly marked with the name of the contents, the amount of contained, the FCI part number, and the name of the receiving part, as listed in the procurement.

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7.0 Revision Record

Rev	Page	Description	EC #	Date
A	All	Release	T04-0176	04/21/'04
B	All	Adding Test Group G- Shock & Vibration	T04-0280	06/30/'04
C	All	Update the LLCR from 30m Ω to 35m Ω	DG04-0063	09/06/'04
D	All	Add P/N 10055090 & 10053363 into the item list	DG05-0248	07/26/'05
E	1, 2	Add connectable conductor info in Para 1.0 Add type of terminal info in Para 4.2.2 & 4.2.3 Add Para 4.3	DG06-0220	06/05/'06
F	2	Delete detailed material info in Para 4.2	DG06-0271	07/04/06

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