1.0 Objective

This specification defines the performance, test, quality and reliability requirements of the Pluggable Power Connector of BarKlip BK300 product.

2.0 Scope

This specification is applicable to the termination characteristics of the BarKlip connector family of products which provides a separable interface when mated to Bus Bar with 3.0 mm thickness.

3.0 Ratings

3.1 Operating Voltage Rating = 54 V_{DC}

3.2 Operating Current Rating = 300 Amperes

3.3 Operating Temperature Range = -55 °C to +105 °C[1]

Note 1: includes the terminal temperature rise when powered

4.0 Applicable Documents

4.1 Specifications

4.1.1 Engineering drawings: 10161933

4.1.2 Application specification: GS-20-0710

4.1.3 Package specification: GS-14-2376

4.2 National or International Standards

4.2.1 Flammability: UL94V-0.

4.2.2 EIA 364: Electrical Connector/Socket Test Procedures Including Environmental Classifications.

4.2.3 EIA 364-1000: Environmental test methodology for assessing performance of electrical connectors and sockets used in business office application.

4.2.4 EIA 364-1004: Environmental test methodology for verifying the current rating of freestanding power contacts or electrical connectors and sockets.

4.3 Laboratory Reports - Supporting Data

DL-2021-05-022B-CR

4.4 Safety Agency Approvals

UL/CSA File #: E522216 Vol. 1 Sec. 3

5.0 Requirements

5.1 Qualification

Connectors furnished under this specification shall be capable of meeting the qualification test requirements specified herein.

5.2 Material

Power Contacts – High Performance Copper Alloy
Guide Shell – Stainless Steel
Nut, Screw, Washer – Stainless Steel

5.3 Finish

Contacts area: Silver plated over Nickel.

Mounted area: Tin plated over Nickel.

5.4 Design and Construction

Connectors shall be of the design, construction, and physical dimensions specified on the applicable product drawing. There shall be no cracks, burrs, or other physical defects that may impair performance.

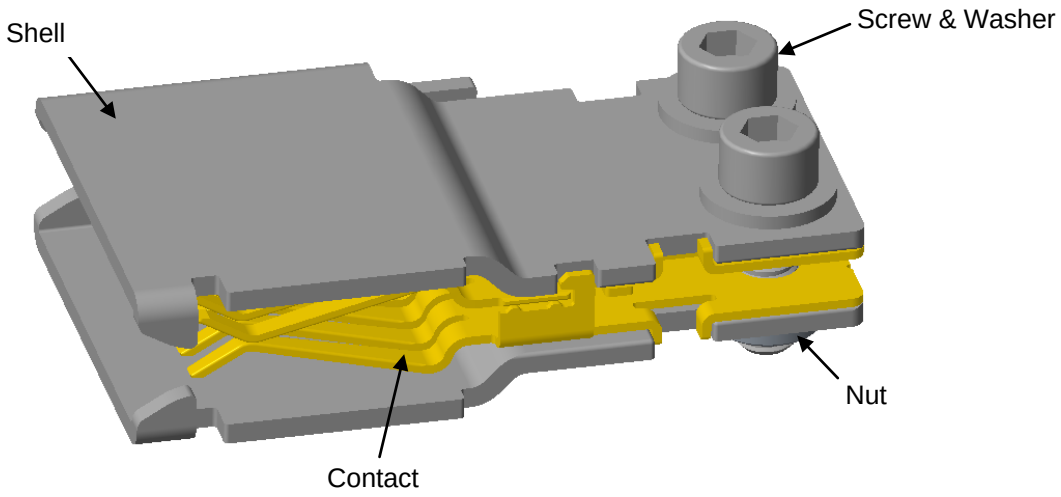

Figure 1 BK300 connector

6.0 Electrical characteristics

6.1 Contact Resistance, Low Level (LLCR)

The low level contact resistance shall not exceed 0.1mΩ initially and final after any treatment and/or environmental exposure.

Measurements shall be in accordance with EIA 364-23.

The following details shall apply:

a. Test Voltage - 20 milli-volts DC max open circuit.

b. Test Current - Not to exceed 100 milli-amperes.

6.2 Contact Resistance at rated current

The contact resistance at rated current shall not exceed 0.1mΩ initially and final after any treatment and/or environmental exposure.

Measurements shall be in accordance with EIA 364-23.

The following details shall apply:

Test Current - 300 Amps.

6.3 Current Rating

The temperature rise above ambient shall not exceed 30 deg C at any point in the system when all contacts are powered at 300 Amps.

The following details shall apply:

a. Ambient Conditions – still air at lab room ambient

b. Reference - EIA 364-70

7.0 Mechanical Characteristics

7.1 Mating/Un-mating Force

a. Cross Head Speed – 12.7 mm per minute.

b. Lubrication - No additional lubricant shall be added to production test samples.

c. Utilize free floating fixtures.

d. Reference – EIA 364-13, Method A.

Configuration	Mating force	Unmating force
BarKlip BK300 connector	45 N Max.	4 N Min.

7.2 Durability

The connector pairs shall be capable of withstanding 50 mating/un-mating cycles.

a. Cycling Rate: 300 cycles per hour Max.

b. Reference – EIA 364-09

8.0 Environmental Conditions

After exposure to the following environmental conditions in accordance with the specified test procedure and/or details, the product shall show no physical damage and shall meet the electrical and mechanical requirements per paragraphs 6.0 and 7.0 as specified in the Table 1 test sequences. Unless specified otherwise, assemblies shall be mated during exposure.

8.1 High Temperature Life –EIA 364-17, Method A.

a. Test Temperature – 105 deg C

b. Test Duration - 1000 hours

8.2 Mixed Flowing Gas corrosion (MFG) – EIA 364-65

a. Class - IIA

b. Duration - 20 days

c. Samples mated for 480 hours.

8.3 Random Vibration – EIA 364-28

a. Test Condition - condition V, letter C

b. Vibration Amplitude – 9.26 rms G

c. Duration – 120 minutes along each of three orthogonal axes (6 hours total)

d. Mounting - Rigidly mount assemblies.

e. No discontinuities greater than 1.0 microsecond

9.0 QUALITY ASSURANCE PROVISIONS

9.1 Equipment Calibration

All test equipment and inspection facilities used in the performance of any test shall be maintained in a calibration system in accordance with ANSI Z-540 and ISO 9000.

9.2 Inspection Conditions

Unless otherwise specified herein, all inspections shall be performed under the following ambient conditions:

a. Temperature: 25 +/- 5 deg C

b. Relative Humidity: 30% to 60%

c. Barometric Pressure: Local ambient

9.3 Sample Quantity and Description

The sample size and description for each test are listed in table 1.

9.4 Acceptance

9.4.1 Electrical and mechanical requirements placed on test samples as indicated in paragraphs 6.0

and 7.0 shall be established from test data using appropriate statistical techniques or shall otherwise be customer specified, and all samples tested in accordance with this product specification shall meet the stated requirements.

9.4.2 Failures attributed to equipment, test setup, or operator error shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

9.5 Qualification Testing

Qualification testing shall be performed on sample units produced with equipment and procedures normally used in production. The test sequences shall be as shown in the qualification test table. Data shall be provided with the samples noting production history: production lot codes for components and assemblies, components and assemblies produced to print revision, verification of plating composition and thickness, etc.

9.6 Re-Qualification Testing

If any of the following conditions occur, the responsible product engineer shall initiate requalification testing consisting of all applicable parts of the qualification test matrix.

a. A significant design change is made to the existing product which impacts the product form, fit or function. Examples of significant changes shall include, but not be limited to, changes in the plating material composition or thickness, contact force, contact surface geometry, insulator design, contact base material, or contact lubrication requirements.

b. A significant change is made to the manufacturing process which impacts the product form, fit or function.

c. A significant event occurs during production or end use requiring corrective action to be taken relative to the product design or manufacturing process.

9.7 Qualification Test Table

Table 1

Test or Examination	Test sequence
Initial examination of product	1
Low level contact resistance	3,7,9,11
Contact resistance @Current rated	13
Temperature rise	4,12
Vibration	10
Durability	5
Mating force	2
Un-mating force	14
Temperature life	8
Mixed flowing gas	6
Final examination of product	15
Sample size	5 pcs

REVISION RECORD

Rev	Page	Description	EC#	Date
A	All	Initial release	N/A	2021/Dec/17