1.0 OBJECTIVE

This specification defines the performance, test, quality and reliability requirements of 0.8mm pitch BergStak® product.

2.0 SCOPE

This specification is applicable to the termination characteristics of 0.8mm pitch BergStak® family of products (only for receptacle 10144517 and plug 10144518), which provides electrical connections between parallel mounted boards.

3.0 GENERAL

This document is composed of the following sections:

4.0 APPLICABLE DOCUMENTS

4.1 Standards and Specifications

4.1.1 MIL-STD-202: Test methods for electronic and electrical component parts.
4.1.2 MIL-STD-1344: Test methods for electronic connectors.
4.1.3 EIA 364: Electronic connector/socket test procedures including environmental classifications.
4.1.4 QQ-N-290: Nickel plating.
4.1.5 MIL-G-45204: Gold plating electrodeposited
4.1.6 MIL-C-45662: Calibration system requirements

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

5.2.1 Housing: All housing materials shall be high temperature plastic, rated flame retardant 94V-0 in accordance with UL-94.

5.2.2 Receptacle Terminal: copper alloy.

5.2.3 Plug Terminal: copper alloy.

5.2.4 Metal Cap: Stainless steel.

5.3 Finish

The finish for applicable components shall be specified in product drawings with plating area, plating material and plating thickness.

5.4 The thickness of the PCB solder paste

Below data is FCI recommended dimension, For some customer's process are different (such as, PCB thickness, solder temperature, solder paste type, etc.), customer can according to the actual application environment adjust the solder paste thickness.

5.4.1 Recommend using solder paste thickness 0.15mm Min.

5.5 Design and Construction

The connector shall be a multi-piece assembly having two rows of contacts with surface mount solder-tail terminations for installation on printed wiring board.

5.6 Rating

Voltage Rating	100V AC
Current Rating	0.5 A Max.
Temperature Rating	-40°C ~ 125°C

6.0 PERFORMANCE

Unless otherwise specified, the performance of connectors given in the attached list shall satisfy the values specified in Table 6.1. The performance test shall follow the test method and the test sequence given in Table 6.2 & 6.3 under the environmental conditions listed below. All connectors to be tested shall be free of defects such as burr, flaw, void, blister etc. which will affect the life and application of connectors.

- Temperature ---------- 15°C ~ 35°C
- Humidity ---------- 25% ~ 85%
- Pressure ---------- 86 ~ 106KPa

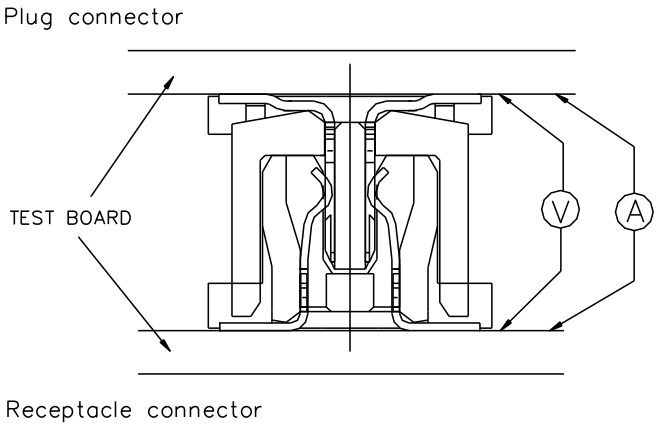
6.1 Performance

TABLE 6.1

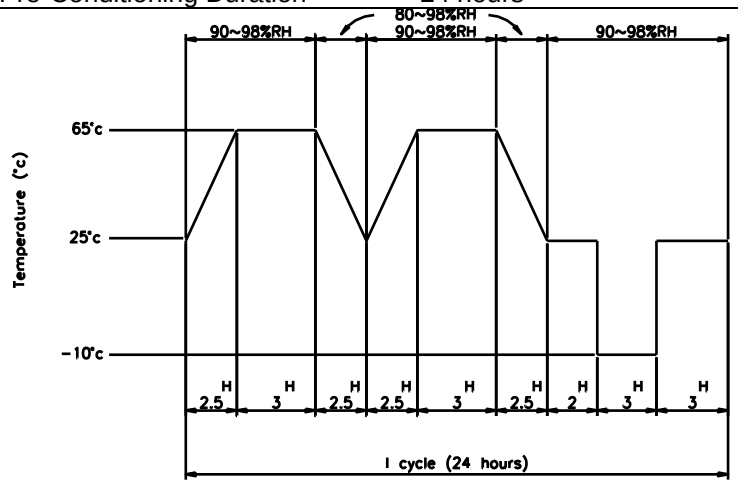
	Test Item	Requirements
6.1.1	Visual Examination	Product shall meet the requirements of product drawings. Visual Examination performed under 10X magnification. Parts should be free from blistering, discoloration, cracks, etc
Electric Requirements		
6.1.2	Low Level Contact Resistance(LLCR)	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.3	Dielectric Withstanding Voltage	No evidence of arc-cover, insulation breakdown or leakage current in excess of 1 mA.
6.1.4	Insulation Resistance	1000 MΩ Minimum
6.1.5	Current Rating	Temperature rise above ambient shall not exceed 30°C with all contacts powered at 0.5A
Mechanical Requirements		
6.1.6	Vibration	No discontinuity greater than 1 microsecond
6.1.7	Shock	No discontinuity greater than 1 microsecond
6.1.8	Mating Force	0.9N (90 gramf) Maximum per contact.
6.1.9	Un-mating Force	0.1N (10 gramf) Minimum per contact.
6.1.10	Durability	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.11	Solderability	Solder coverage ---------- 95% Minimum
6.1.12	Resistance to Solder Heat	No evidence of physical or mechanical damage.
6.1.13	Contact Retention Force	1N Minimum per contact.
6.1.14	Reseating	Manually unplug/replug the mated connector assembly.
Environmental Requirements		
6.1.15	Thermal Shock	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.16	Temperature Life	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.17	Cyclical Humidity & Temperature	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.18	Mixed Flow Gas	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum
6.1.19	Thermal Disturbance	Initial ---------- 40 mΩ Maximum After test ---------- 60 mΩ Maximum

6.2 Test Methods

TABLE 6.2

	Test Item	Test Methods
6.2.1	Visual Examination	Visually and functionally inspected. Under 10X magnification.
6.2.2	Low Level Contact Resistance(LLCR)	 Figure 1 **EIA-364-23** Test method of connection as Figure 1. Test current ---------- 100 mA Maximum Open circuit ---------- 20 mV Maximum Number of readings ------ 100 separable contact interface minimum or 3 connectors whichever is greater
6.2.3	Dielectric Withstanding Voltage	**EIA-364-20 Method B, Test Condition I** Test voltage ---------- 500 Vrms AC Duration ---------- 1 minute Measure between adjacent terminals of mated connectors. Number of readings ------ 30 (10 readings per connector set)
6.2.4	Insulation Resistance	**EIA-364-21** Test voltage ---------- 500 V DC Duration ---------- 1 minute Measure between adjacent terminals of mated connectors. Number of readings ------ 30 (10 readings per connector set)
6.2.5	Current Rating	**EIA-364-70** Ambient still air ---------- 25°C All contact powered ------- 0.5A
6.2.6	Vibration	**EIA-364-28 Test Condition V, Letter D** Frequency ---------- 50 to 2000 Hz Power spectral Density -------- 0.1 g^2/Hz Overall rms g ---------- 11.95 Duration ---------- 1 1/2 hours in each of three mutually perpendicular axes (4 1/2 hours total).

6.2.7	Shock	**EIA-364-27, Test Condition A** Accelerated velocity ----- 490 m/s^2 (50G). Waveform ---------- half-sine shock pulse. Duration ---------- 11 mSec. Velocity change ---------- 11.3 feet per second Number of cycles --------- 18
6.2.8	Mating Force	**EIA-364-13** Operating speed ---------- 25 mm/minute No lubrication and utilize free-floating fixture.
6.2.9	Un-mating Force	**EIA-364-13** Operating speed ---------- 25 mm/minute No lubrication and utilize free-floating fixture.
6.2.10	Durability	**EIA-364-09** Operating speed ---------- 25 mm/minute Number of cycles ---------- 50 Pre-Conditioning cycles ------ 10
6.2.11	Solderability	For leaded: **J-STD-002D Method S** Preheat:150-170°C, Duration: 50~70s Peak Temp:230°C, Duration: 50~70s For Non- leaded: **J-STD-002D Method S1** Preheat:150-180°C, Duration: 60-120s Peak Temp:250°C, Duration: 30~60s
6.2.12	Resistance to Solder Heat	For leaded: **EIA-364-56, test level-5** Peak temperature --------- 240+10/-0°C. Duration ---------- 20 seconds For Non- leaded: **EIA-364-56, test level-6** Peak temperature --------- 260+10/-0°C. Duration ---------- 30 seconds
6.2.13	Contact Retention Force	Operating speed ---------- 25 mm/minute Number of readings ------ 30 (10 readings per connector set)
6.2.14	Reseating	Perform 3 cycles mate/un-mate
6.2.15	Thermal Shock	**EIA-364-32 Method A** Temperature range ------- -40 +0/-5°C to 125 +5/-0°C Time at temperature extremes ----- 30 minutes Test Duration (A-4) --------- 5 cycles Transfer Time ---------- 5 minutes maximum

6.2.16	Temperature Life	**EIA-364-17 Method A, Test Condition 4** Temperature ---------- 125 ±5°C. Duration Condition A ---- 96 hours. Plug & receptacle to remain mated without electrical load. Pre-Conditioning Temperature ----- 125 ±5°C Pre-Conditioning Duration ---------- 24 hours
6.2.17	Cyclical Humidity & Temperature	 **EIA-364-31, Method III (omit step 7b)** Temperature and humidity are listed figure 2. Duration ---------- 10 cycles.
6.2.18	Mixed Flow Gas	**EIA-364-65, Class IIA** Temperature: 30°C Relative Humidity: 70% Concentration: H_2S 10 ppb NO_2 200 ppb CL_2 10 ppb SO_2 100 ppb Test duration: 5days mated
6.2.19	Thermal Disturbance	**EIA-364-1000 Table 4, Test Group 4** Cycle the mated connectors between 15 ± 3°C and 85 ± 3°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 cycles.

7.0 QUALIFICATION TEST MATRIX

Table 7.1

TEST ITEM	TEST GROUP										
	Section	1	2	3	4	5	6	7	8	9	10
Visual Examination	6.2.1	1,10	1,11	1, 9	1	1 3	1 3	1	1	1	1
Low Level Contact Resistance (LLCR)	6.2.2		2 4 6 8 10	2 8				2 4 6 8 10	2 4 6 8	2 4 6 8 10 12	
Dielectric Withstanding Voltage	6.2.3	2,5,8									
Insulation Resistance	6.2.4	3,6,9									
Current Rating	6.2.5										2
Vibration	6.2.6		7								
Shock	6.2.7		9								
Mating Force	6.2.8			3,6							
Un-mating Force	6.2.9			4,7							
Durability Pre-conditioning	6.2.10	4	3					3	3	3	
Durability	6.2.10			5							
Solderability	6.2.11					2					
Resistance To Solder Heat	6.2.12						2				
Contact Retention Force	6.2.13				2						
Reseating	6.2.14							9	7	11	
Thermal Shock	6.2.15							5			
Temperature Life Pre-Conditioning	6.2.16		5							5	
Temperature Life	6.2.16								5		
Cyclical Humidity & Temperature	6.2.17	7						7			
Mixed Flowing Gas 7 days mated	6.2.18									7	
Thermal Disturbance	6.2.18									9	
Number of Samples	6.2.18	3	3	5	3	3	3	3	3	3	3

8.0 RECORD RETENTION

REVISION RECORD

REV	PAGE	DESCRIPTION	ECR #	DATE
A	ALL	INITIAL RELEASE		04 Aug. 17
B	3	CHANGE LLCR REQUIREMENTS	ELX-N-45829	06 Sep. 22
C	3	CHANGE LLCR REQUIREMENTS	ELX-N-48586	06 Mar. 23