	TYPE	PRODUCT SPECIFICATION		NUMBER	GES-12-067
	TITLE	BERGSTIK™ I HEADERS		PAGE	1 OF 8
				AUTHORIZED BY	Paul Wang
				REV	A
				DATE	06/20/95

## 1.0 GENERAL

### 1.1 Scope

This specification covers the Bergstik Connector, a header designed for use in low-power applications requiring a printed-wiring-board mounted straight or right angle disconnect. The header provides only the male half of the interconnection, using any 0.025 square female connector to complete the connection. The specification is composed of the following sections:


<u>Paragraph</u>	<u>Title</u>
1.0	GENERAL
1.1	Scope
1.2	Type
2.0	APPLICABLE DOCUMENTS
3.0	REQUIREMENTS
3.1	Qualification
3.2	Material
3.3	Finish
3.4	Design and Construction
3.5	Electrical Characteristics
3.6	Mechanical Characteristics
3.7	Environmental Conditions
4.0	QUALITY ASSURANCE PROVISIONS
4.1	Equipment Calibration
4.2	Inspection Conditions
4.3	Qualification Inspection
4.4	Acceptance Inspection
4.5	Qualification Testing
4.6	Requalification Testing

### 1.2 Type

The connector shall be available in one of the following type classifications, as limited by the appropriate product drawing.

<u>Type</u>	<u>Plating</u>
I	Gold flash
II	15 microinches Gold
III	30 microinches Gold
IV	50 microinches Gold
V	Tin-Lead
VI	12 microinches Palladium Alloy
VII	15 microinches Palladium Alloy
VIII	30 microinches Palladium Alloy

E-3005 4/7/93

	TYPE	PRODUCT SPECIFICATION		NUMBER	GES-12-067
	TITLE	BERGSTIK™   HEADERS		PAGE	2 OF 8
				AUTHORIZED BY	REV
				Paul Wang	A
				DATE	06/20/95

## 2.0 APPLICABLE DOCUMENTS

The following documents, 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.

### Military Specifications

MIL-F-14256 Flux, Soldering, Liquid (Rosin Base), Activated  
MIL-G-45204 Gold Plating, Electrodeposited  
MIL-P-45209 Palladium Plating, Electrodeposited  
MIL-P-55110 Printer Wiring Boards  
MIL-P-81728 Plating, Tin-Leaded (Electrodeposited)

### Federal Specifications

QQ-N-290 Nickel Plating (Electrodeposited)  
QQ-W-343 Wire, Electrical and Nonelectrical, Copper (Uninsulated)  
QQ-S-571 Solder: Lead Alloy, Tin-Lead Alloy, and Tin Alloy, Flux Cored Ribbon and Wire, and Solid Form

### Military Standards

MIL-STD-105 Sampling Procedures & Tables for Inspection by Attributes  
MIL-STD-202 Test Methods for Electrical and Electronic Component Parts  
MIL-STD-275 Printed Wiring for Electronic Equipment  
MIL-STD-1344 Test Methods for Electrical Connectors  
ISO-9000 Calibration System Requirements

### Industry Specifications/Standards

UL-94 Tests for Flammability of Plastic Materials  
ASTM B-159 Phosphor Bronze Wire  
ASTM D-2897 Reinforced & Filled Nylon Injection molding & extrusion Materials

## 3.0 REQUIREMENTS


### 3.1 Qualification

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

### 3.2 Material

The material for each part shall be specified herein, or equivalent. Substitute material shall meet the performance requirements of this specification.

E-3005 R.L.V 4/7/93

	TYPE	PRODUCT SPECIFICATION		NUMBER	GES-12-067
	TITLE	BERGSTIK™ I HEADERS		PAGE	3 OF 8
				AUTHORIZED BY	Paul Wang
				REV	A
				DATE	06/20/95

3.2.1 Contact. The contact shall be Phosphor Bronze Alloy UNS C51000 in accordance with ASTM B-159 or other copper alloy as specified on the product drawing.

3.2.2 Insulator. The insulator shall be glass-or mineral-filled nylon in accordance with ASTM D-2897, polyphenylene sulfide (PPS) or PCT. All plastic material shall be rated V-0 in accordance with UL-94.

### 3.3 Finish

The finish of the contact shall be specified herein for the particular type (see Paragraph 1.2) of connector under consideration.

3.3.1 Types I through IV. The contact shall be plated with the specified thickness (see Paragraph 1.2) of gold over 50 microinches of nickel. The gold deposit shall meet the requirements of MIL-G-45204, Type II, Grade C and the nickel deposit shall meet the requirements of QQ-N-290, Class 2. Noncritical areas, such as the sheared pin tip, may have exposed base metal.


3.3.2 Type V. The contact shall be plated with 150 microinches, minimum, of 93/7 tin-lead. The tin-lead deposit shall meet the requirements of MIL-P-81728. Noncritical areas, such as the shared pin tip, may have exposed base metal.

3.3.3 Type VI through VIII. The contact shall be plated with a thin gold flash over the specified thickness (see Paragraph 1.2) of palladium alloy over 50 microinches of nickel. The palladium alloy deposit shall meet the requirements of MIL-P-45209 and the nickel deposit shall meet the requirements of QQ-N-290, Class 2. Noncritical areas, such as the sheared pin tip, may have exposed base metal.

### 3.4 Design and Construction

The connector shall be a multi-piece assembly having one or two rows of contacts with solder tail terminations for installation in .040 inch diameter holes in printed wiring boards of standard thickness. The connector contacts shall be insert molded or in the insulator on rectangular grids of .100, .125, or .150 inches or multiples thereof and shall be available in straight or right-angle configurations. The contacts shall be available in various above-and below-board lengths suitable for use as 0.025 inch square male disconnects or as similarly configured wrapposts for solderless wrapped connections in accordance with MIL-STD-1130.

E-3005 ... 4/7/93

	TYPE	PRODUCT SPECIFICATION		NUMBER	GES-12-067
	TITLE	BERGSTIK™ I HEADERS		PAGE	4 OF 8
				AUTHORIZED BY	REV
				Paul Wang	A
				DATE	06/20/95

3.4.1 Polarization (Optional). Removal or omission of individual contact(s) shall provide polarization/keying to insure correct orientation of the header and an appropriately configured mating part.

3.4.2 Workmanship. Connectors shall be uniform in quality and shall be free from burrs, scratches, cracks, voids, chips, blisters, holes, sharp edges, or other defects that will adversely affect life or serviceability.

### 3.5 Electrical Characteristics

3.5.1 Insulation Resistance. The insulation resistance of the unmated and unterminated connector shall be not less than 5000 megohms when measured in accordance with MIL-STD-1344, Method 3003. The following details shall apply:

- a. Test Condition – 500 volts DC applied for 1 minute.
- b. Points of Measurement – Between individually paired adjacent and opposing contacts.


3.5.2 Dielectric Withstanding Voltage. There shall be no evidence of arc-over, insulation breakdown, or excessive leakage current (>1 milliampere) when the unmated and unterminated connector is tested in accordance with MIL-STD-1344, Method 3001. The following details shall apply:

- a. Test Potential – See Table I.
- b. Test Duration – 50 seconds.
- c. Test Condition – 1(760 Torr – sea level).
- d. Points of Measurement – Between individually paired adjacent and opposing contacts.

TABLE I – DIELECTRIC WITHSTANDING VOLTAGE

Contact Spacing (inch)	Test Voltage VRMS
.100	1500
.125	1500
.150	1500

E-3005 REV 4/7/93

	TYPE PRODUCT SPECIFICATION	NUMBER GES-12-067	
TITEL BERGSTIK™ I HEADERS		PAGE 5 OF 8	REV A
		AUTHORIZED BY Paul Wang	DATE 06/20/95

### 3.6 Mechanical Characteristics

3.6.1 Contact Retention. Individual contacts in an unterminated connector shall withstand a load of 5.0 pounds.

### 3.7 Environmental Conditions

3.7.1 Thermal Shock. After exposure of an unmated and unterminated Connector to alternate periods of extreme high and low temperature, there shall be on evidence of cracking or crazing of the insulator or other physical damage to the connector. The dielectric withstanding voltage shall be not less than 750 volts RMS 60 Hz (see paragraph 3.5.2). The following details shall apply:

- a. Test Conditions – B (1 hour cycles).
- b. Temperature Range – -65° to 105°C.

3.7.2 High Temperature Life. After exposure of an unmated and unterminated connector to a high temperature operating environment, the insulation resistance of the connector shall be not less than 5,000 megohms (see paragraph 3.5.1). The test shall be in accordance with MIL-STD-202, Method 108. The following details shall apply:

- a. Test Chamber Temperature – 105° C (±2°).
- b. Test Condition (Duration) B (250 hours).
- c. Operating Conditions – No Current

### 3.8 Solderability

Tin/Lead plated connectors shall be capable of passing BUS-19-002. Gold and Palladium alloy plated connectors shall be capable of passing BUS-19-098.

## 4.0 QUALITY ASSURANCE PROVISIONS

### 4.1 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 ISO 9000.

E-3005 Rev 4/7/93



TYPE  
PRODUCT SPECIFICATION

NUMBER  
GES-12-067

TITEL  
BERGSTIK™ I HEADERS

PAGE  
6 OF 8

REV  
A

AUTHORIZED BY  
Paul Wang

DATE  
06/20/95

4.2 Inspection Condition

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

- a. Temperature: 25°C ± 5°C.
- b. Relative Humidity: 30 to 60%.
- c. Barometric Pressure: Local Ambient

4.3 Qualification Inspection

Qualification inspection shall be performed on sample units produced with equipment and procedures normally used in production.


4.3.1 Samble. The qualification sample shall consist of 6 of the largest size connectors of the particular design, configuration, and type that are the subject of the test.

4.3.2 Test Sequence. The sample connectors shall be subjected to the inspections specified in Table II in the order shown.

TABLE II – CONNECTOR QUALIFICATION INSPECTION

<u>Examination or Test</u>	<u>Paragraph</u>	<u>Test Sample</u>	
		<u>3</u>	<u>3</u>
Contact Retention	3.6.1	x	-
Insulation Resistance	3.5.1	X	-
Dielectric Withstanding Voltage	3.5.2	X	-
Thermal Shock	3.7.1	X	-
Insulation Resistance	3.5.1	X	-
Dielectric Withstanding Voltage	3.5.2	X	-
High Temperature Life	3.7.2	X	-
Insulation Resistance	3.5.1	X	-
Dielectric Withstanding Voltage	3.5.2	X	-
Solderability	3.8	-	X

E-3005 REV 4/7/93

	TYPE PRODUCT SPECIFICATION	NUMBER GES-12-067	
TITEL BERGSTIK™   HEADERS		PAGE 7 OF 8	REV A
		AUTHORIZED BY Paul Wang	DATE 06/20/95

#### 4.4 Acceptance Inspection

4.4.1 Electrical and mechanical requirements placed on test samples as indicated in paragraphs 3.5 and 3.6 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.

4.4.2 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.

#### 4.5 Qualification testing

Qualification testing shall be performed on sample units produced with equipment and procedures normally used in production. The test sequence shall be as shown in Table II.

#### 4.6 Requalification 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, Table II.

- (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.

E-3005 Rev. 4/7/93



TYPE  
PRODUCT SPECIFICATION

NUMBER  
GES-12-067

TITEL  
BERGSTIK™ | HEADERS

PAGE  
8 OF 8

REV  
A

AUTHORIZED BY  
Paul Wang

DATE  
06/20/95

REVISION RECORD

<u>REV.</u>	<u>PAGE</u>	<u>DESCRIPTION</u>	<u>ECR#</u>	<u>DATE</u>
A	ALL	NEW PRODUCT SPEC RELEASED	T50169	06/20/95

E-300: 4/7/93

NOTE THIS DOCUMENT IS THE PROPERTY OF AND EMBODIES PROPRIETARY INFORMATION OF THE BERG ELECTRONICS COMPANY.  
NO PART OF THE INFORMATION SHOWN ON THIS DOCUMENT MAY BE USED IN ANY WAY WITHOUT THE WRITTEN CONSENT OF BERG ELECTRONICS.