1. INTRODUCTION

This specification covers the requirements for application of 1 position male and female Slim B-B Connectors for use on modular printed circuit board–to–board Surface Mount Technology (SMT) applications. The connector can be mated or unmated horizontally and vertically as figure 2 shows (Refer to 3.5 item D Layout).

When corresponding with Tyco Electronics Personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

1position slim B-B Connector

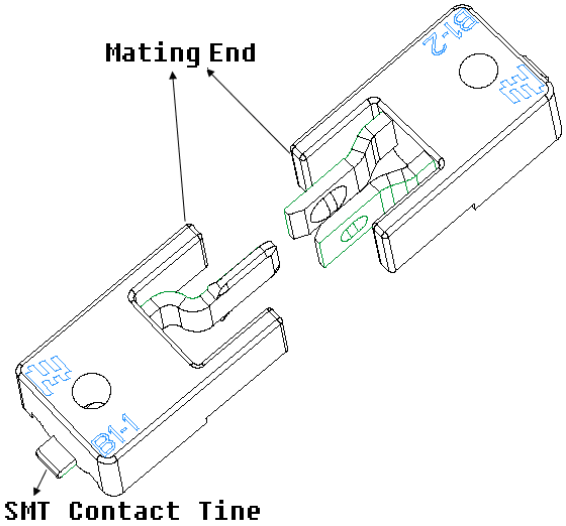


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

1st release revision.

2.2. Customer Assistance

Reference Product Base Part Numbers 1971742/1971743 and Product Code L012 is representative of the SLIM board to board Connector. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product information. Such information can be obtained through a local Tyco Electronics Representative.

2.3. Drawings

Customer Drawings for specific products are available from the responsible Tyco Electronics Engineering department via the service network. The information contained in the Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by Tyco Electronics.

2.4. Manuals

Manual 402–40 is available from the service network. This manual provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is included in the manual as required for information on soldering problems.

3. REQUIREMENTS

3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Limitations

The connectors are designed to operate in a temperature range of –40° C to 105° C

3.3. Material

Contact is made of tin–plated brass for male side and made of Tin-plated copper alloy for female side; Housing is made from UL 94V–0 rated thermal plastic.

3.4. Storage

A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector material.

B. Shelf Life

The contacts and connectors should remain in the shipping containers until ready for use to prevent deformation to components. The components should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

C. Chemical Exposure

Do not store the contacts or connectors near any chemical listed below as they may cause stress corrosion cracking in the components.

Alkalies	Ammonia	Citrates	Phosphates Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites	Tartrates

3.5. PC Board

A. Material and Thickness

Common printed circuit board materials may be used such as glass epoxy (FR–4 or G–10), Aluminum–clad printed circuit board and flexible circuits. The printed circuit board thickness may vary to suit the end user’s thickness.

B. Tolerance

Maximum allowable bow of the printed circuit board shall be 0.10 mm over the length of the connector.

C. Pads

The printed circuit board circuit pads must be solderable in accordance with IPC/EIA J-STD-003.

D. Layout

The printed circuit board layout must be designed using the dimensions provided on the customer drawing for the specific connector. The recommended printed circuit board layout is shown in Figure 2. When dimension A equal 2.00mm, the application for the PCBs should be horizontally mating and unmating and with 0.2mm gap

between two PCBs; When dimension A equal 0.80mm, the application for the PCBs should be vertically and horizontally mating and unmating and with 2.60mm gap between two PCBs.

Recommended PC Board Layout for 1position slim BTB female and male connector

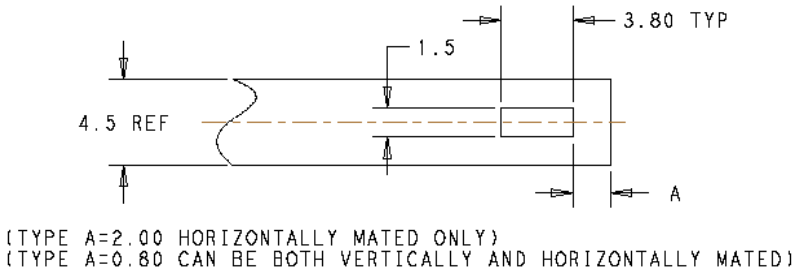
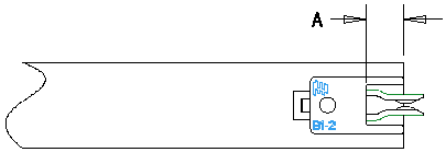


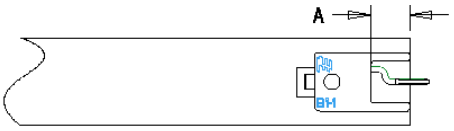
***Figure 2 (*Tolerance of all dimensions: +/- 0.05mm)**

3.6. Component Placement

This product is packaged in tape and reel packaging per ANSI/EIA Std 481–B. Robotic/gripper placement requires total equipment accuracy of 0.10mm to locate the connector for place. This includes gripper and fixture tolerances, as well as equipment repeatability. Place location will be programmed by a simple pantograph/template system or software package. Optimally, the contact solder tines should be centered on the printed circuit board pads. However, slight misalignment is permissible for the performance classifications specified in Association of Connecting Electronics Industries IPC J-STD-001, “General Requirements for Soldering Electronic Interconnection.” See Figure 3.



(TYPE A=2.00 HORIZONTALLY MATED ONLY)
(TYPE A=0.80 CAN BE BOTH VERTICALLY AND HORIZONTALLY MATED)
RECOMMENDED PCB LAYOUT FOR 1971743-1



(TYPE A=2.00 HORIZONTALLY MATED ONLY)
(TYPE A=0.80 CAN BE BOTH VERTICALLY AND HORIZONTALLY MATED)
RECOMMENDED PCB LAYOUT FOR 1971742-1

***Figure 3 (*Tolerance of all dimensions: +/- 0.05mm)**

3.7 Soldering

Observe guidelines and procedures when soldering contacts. Solder, clean, and dry all leads to contacts according to the following. The connectors should be soldered using vapor phase reflow (VPR), double–sided, non–focused infrared (IR), forced air convection, or equivalent soldering techniques. All solder joints should conform to the Workmanship Specification IPC-A-610 and IPC J-STD-001.

1. Solderability

The printed circuit board pads must be solderable in accordance with IPC/EIA J-STD-003 and all other requirements for surface mount contacts specified in this document.

2. Solder Paste Characteristics

a. Alloy type shall be SAC 305; Sn 96.5/Ag 3.0/Cu 0.5

b. Flux incorporated in the paste shall be rosin, mildly active (RMA) type.

c. Paste will be at least 80% solids by volume.

d. Mesh designation –200 to +325 (74 to 44 square micron openings, respectively).

e. Minimum viscosity of screen print shall be 5X10% cp (centipoise).

f. Minimum viscosity of stencil print shall be 7.5X10% cp (centipoise).

3. Solder Mask

Solder mask is recommended between all pads when soldering connectors with surface mount contacts to minimize solder bridging between pads. The mask must not exceed the height of the pad by more than 0.05mm . If a trace is run between adjacent pads on the solder side of the printed circuit board, a solder mask must be applied over the trace to prevent bridging and wicking of solder away from the contact solder tines. Those most suitable are Liquid Photo Imageable and Dry Film.

4. Process

Connectors with surface mount contacts should be soldered using vapor phase (VPR), double–sided, non–focused infrared reflow (IR) or equivalent soldering techniques. Due to many variables involved with the reflow process (i.e., component density, orientation, etc.), it is recommended that trial runs be conducted under actual manufacturing conditions to ensure product and process compatibility. These connectors will withstand the temperature and exposure time specified in Figure 4.

SOLDERING PROCESS	TEMPERATURE (Max)	TIME (At Max Temperature)
IR	260°C [468°F]	10 Seconds

Figure 4

The recommended lead–free reflow profile is shown in Figure 5.

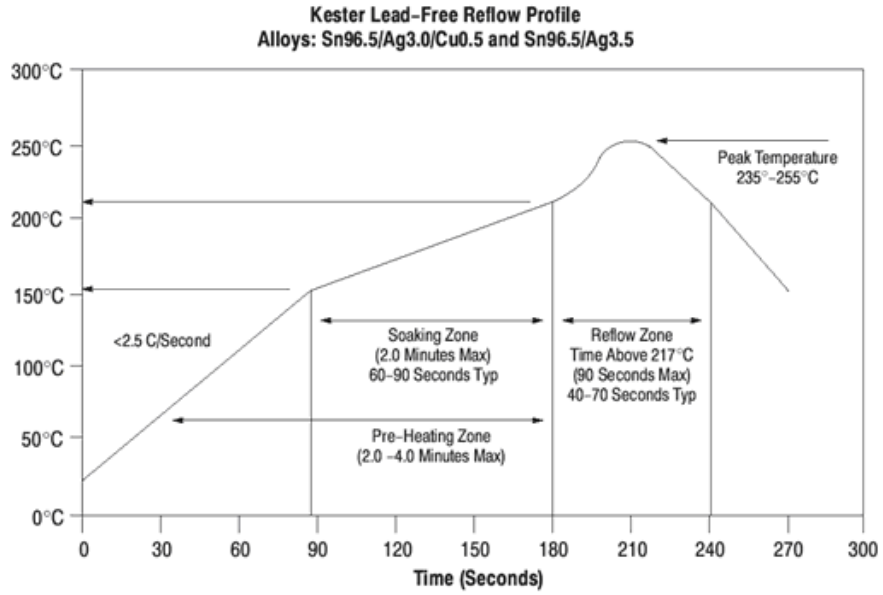


Figure 5

C. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Common cleaning solvents that will not affect the connectors or assemblies for the times and temperatures provided without any adverse effects on the connector assembly are listed in Figure 6.

CLEANER		TIME (Minutes)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110	Aqueous	1	132	270
Bioact EC-7	Solvent	5	100	212
Butyl Carbitol	Solvent	1	Room Ambient	
Isopropyl Alcohol	Solvent	5	100	212
Kester 5778	Aqueous	5	100	212
Kester 5779	Aqueous	5	100	212
Loncoterge 520	Aqueous	5	100	212
Loncoterge 530	Aqueous	5	100	212
Terpene Solvent	Solvent	5	100	212

Figure 6

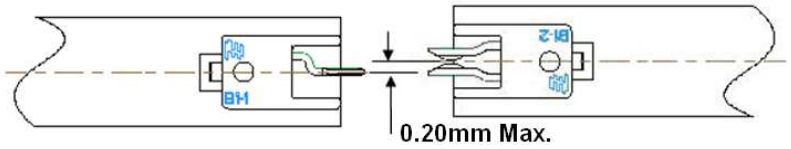
D. Drying

When drying cleaned assemblies and printed circuit boards, temperatures to which the connectors are subject should not exceed 220° C [492° F] for more than 3 minutes.

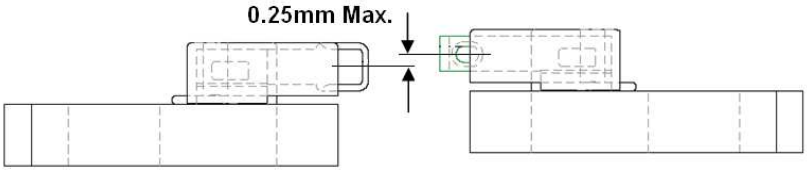
3.8 Alignment

Proper alignment is essential to ensure full engagement of mating connectors and also to ensure the contacts are not bent or otherwise damaged during mating and unmating. For alignment tolerances, see Figure 7.

Horizontal Alignment: 0.20mm Max.



Vertical Alignment: 0.25mm Max.



Angular Alignment: 2° Max.

Figure 7

To avoid the contact issue happen, the mated PCB with connector must be immobilized by mechanically to a rigid substrate (such as heat sink) to avoid the PCB excessive movement case to destroy the contact of the connector.

3.9. Checking Installed Connector

All solder joints should comply with Workmanship Specification IPC J-STD-001. For typical fillets for surface mount tine requirements, refer to Figure 9.

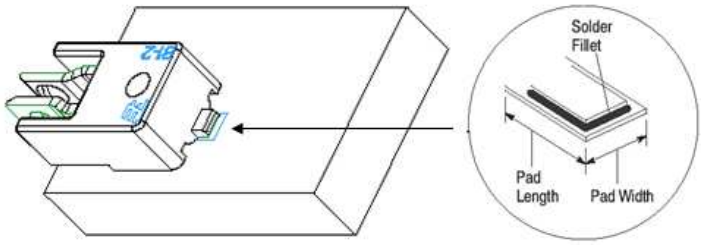


Figure 8

4. TOOLING

4.1. Robotic Equipment

The robotic equipment must have a true position accuracy tolerance of 0.10 mm to properly locate the connectors. This includes gripper and fixture tolerances as well as equipment repeatability.

4.2. Printed Circuit Board Support

For automatic machine placement, a printed circuit board support must be used to prevent bowing of the printed circuit board during the placement of connectors. It should have flat surfaces with holes or a channel large enough and deep enough to receive any protruding components. The printed circuit board support must be customer made.

5. VISUAL AID

Figure 9 (A-horizontally mating and B-vertically mating) show a typical application of this 1 position slim Board to Board connector. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

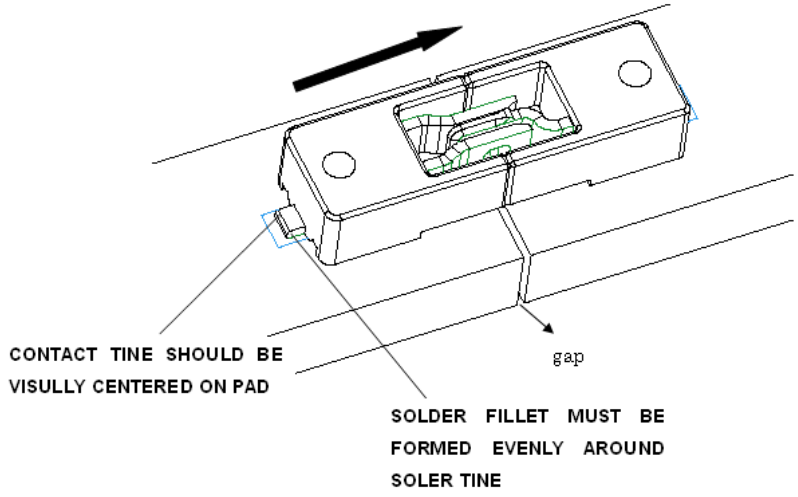


Figure 9-A (Horizontally mating with 0.2mm PCB gap)

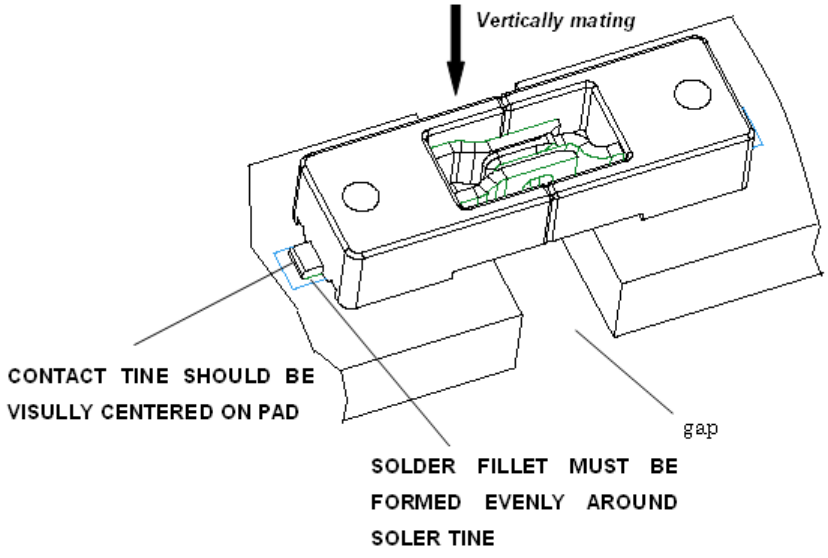


Figure 9-B (Vertically mating with 2.6mm PCB gap)