

NOTE



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ± 0.13 and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of Inverted Through Board SMT Connector Assembly used for routing of discreet wire.

The connector features a housing, SMT contacts with complimentary post contacts, and two board locks. The connector is available in 2 through 6 position sizes, and has in-row contact centerline spacings of 1.50 mm. The board locks stabilize the connector when placed on the pc board.

The connector interfaces with mini CT connectors from the bottom of the pc board. The connector is supplied in tape-and-reel form for hand or robotic equipment placement.

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.

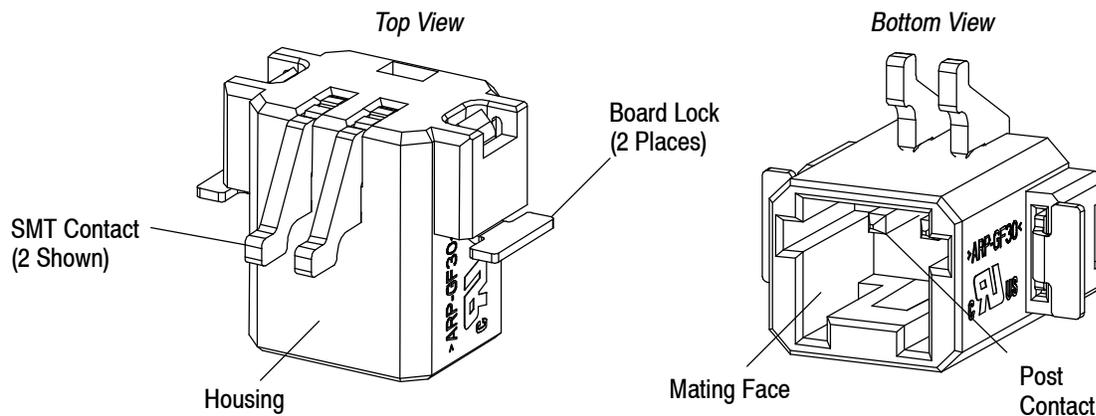


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

- Updated document to corporate requirements
- Added new information in Paragraph 3.6 and renumbered
- Added new Figures 3, 4, and 5 and renumbered

2.2. Customer Assistance

Reference Product Base Part Number 2106091 and Product Code L012 are representative of Inverted Through Board SMT Connector Assemblies. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Tyco Electronics Representative or, after purchase, by calling Product Information at the number at the bottom of this page.

2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call Product Information at the number at the bottom of this page.

2.4. Manuals

Manual 402-40 can be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

3. REQUIREMENTS

3.1. Material

The connector housing is made of LCP (liquid crystal polymer) thermoplastic. The contacts are made of copper alloy plated with tin over nickel. The board locks are made of brass plated with tin over nickel.

3.2. Safety

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

3.3. Limitations

These connectors are designed to operate in a temperature range of -30° to 105°C [-22° to 221°F].

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 connectors should remain in the shipping containers until ready for use to prevent deformation to the contacts. The connectors 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 connectors near any chemical listed below as they may cause stress corrosion cracking in the contacts.

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

D. Reeled Products

Care must be taken to prevent stretching, sagging, or other distortion that would prevent smooth feeding of the tape and reel through automatic machine feed mechanisms. Store coil wound reels horizontally and traverse wound reels vertically.

3.5. PC Board

A. Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10). There is no required thickness for the pc board.

B. Tolerance

Maximum allowable bow of the pc board shall be 0.03 mm over the length of the connector.

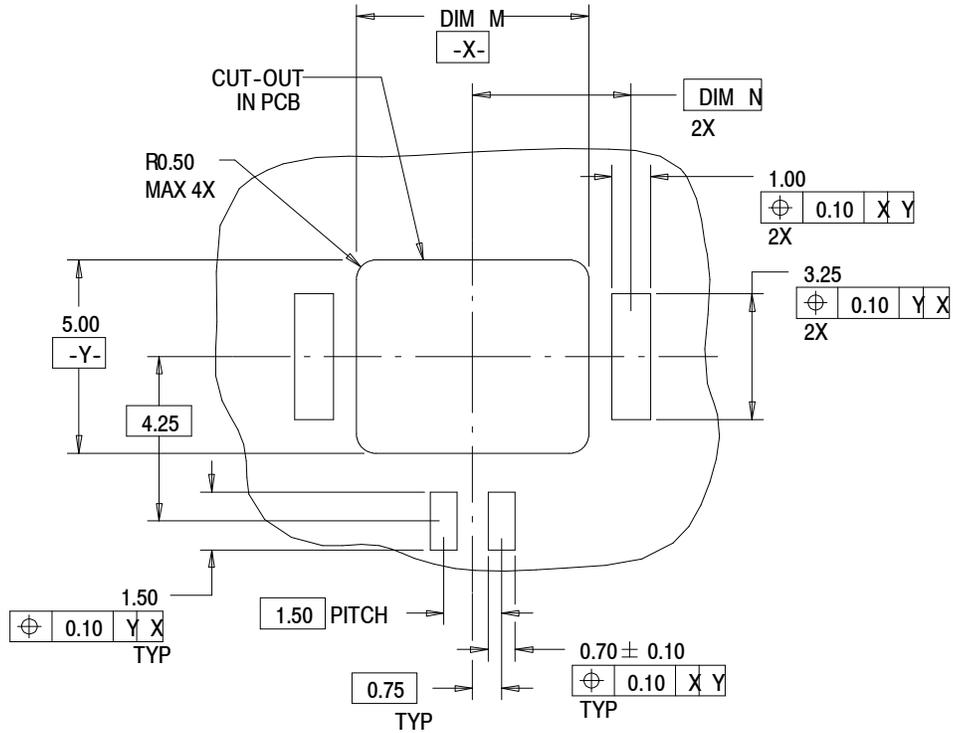
C. Pads

The pc board circuit pads must be solderable in accordance with Test Specification 109-11.

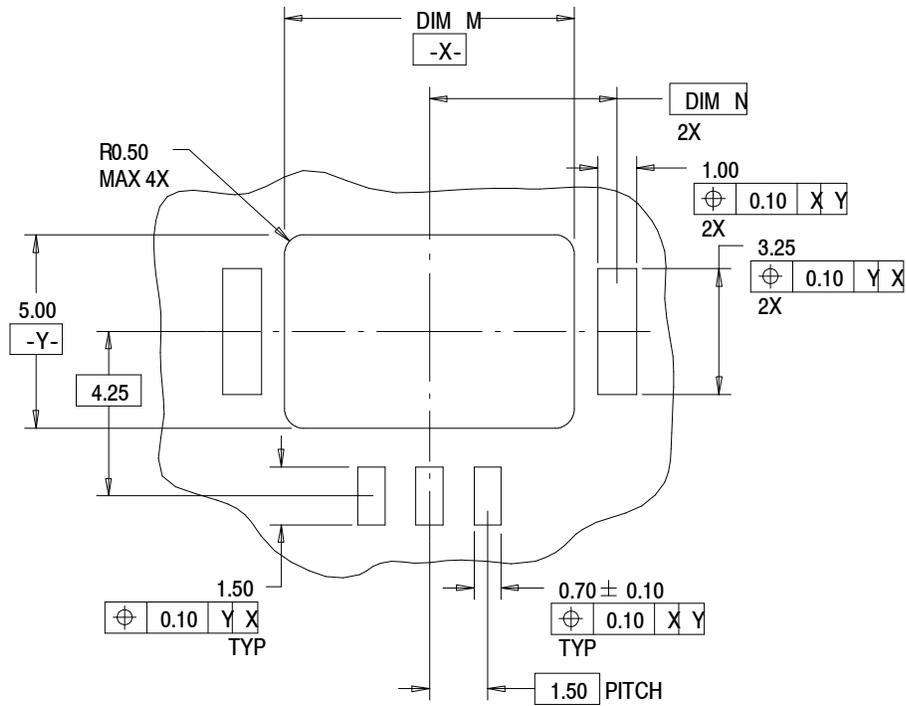
D. Layout

The pc board layout must be designed using the dimensions provided on the customer drawing for the specific connector. Reference *sample* of the recommended pc board layout is shown in Figure 2.

Recommended Sample PC Board Layout



RECOMMENDED PCB LAYOUT
EVEN NUMBER POSITIONS SHOWN



RECOMMENDED PCB LAYOUT
ODD NUMBER POSITIONS SHOWN

Figure 2

3.6. 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 101-21 and IPC-S-815.

A. Flux Selection

Contacts must be fluxed prior to soldering with a mildly active, rosin base flux. Selection of the flux will depend on the type of pc board and other components mounted on the board. Additionally, the flux must be compatible with the wave solder line, manufacturing, health, and safety requirements. Flux that is compatible with the connectors is provided in Figure 3.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER	ALPHA
Type RMA (Mildly Activated)	Mild	Noncorrosive	185/197	611

Figure 3

B. Connectors with SMT Contacts

1. Solderability

The pc board pads must be solderable in accordance with Test Specification 109-11 (Test Method A, non-activated rosin flux) and all other requirements for surface mount contacts specified in this document.

2. Solder Paste Characteristics

1. Alloy type shall be SAC 305; Sn 96.5/Ag 3.0/Cu 0.5.
2. Flux incorporated in the paste shall be rosin, mildly active (RMA) type.
3. Paste will be at least 80% solids by volume.
4. Mesh designation -200 to +325 (74 to 44 square micron openings, respectively).
5. Minimum viscosity of screen print shall be 5×10% cp (centipoise).
6. Minimum viscosity of stencil print shall be 7.5×10% cp (centipoise).

3. Solder Volume

NOTE *Solder volume may vary depending on solder paste composition.*



Solder volume is required to be 0.33 mm³ per contact solder tine and 0.75 mm³ per board lock (calculated per 50% solid content).

4. Screen (or Stencil)

The stencil aperture shall be determined by the circuit pad size and thickness. It may be any shape as long as it prevents solder bridging and maintains the given volume of solder paste.

C. 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	220°C [428°F]	3 Minutes

Figure 4

The lead-free reflow profile is shown in Figure 5.

Kester Lead-Free Reflow Profile
Alloys: Sn96.5/Ag3.0/Cu0.5 and Sn96.5/Ag3.5

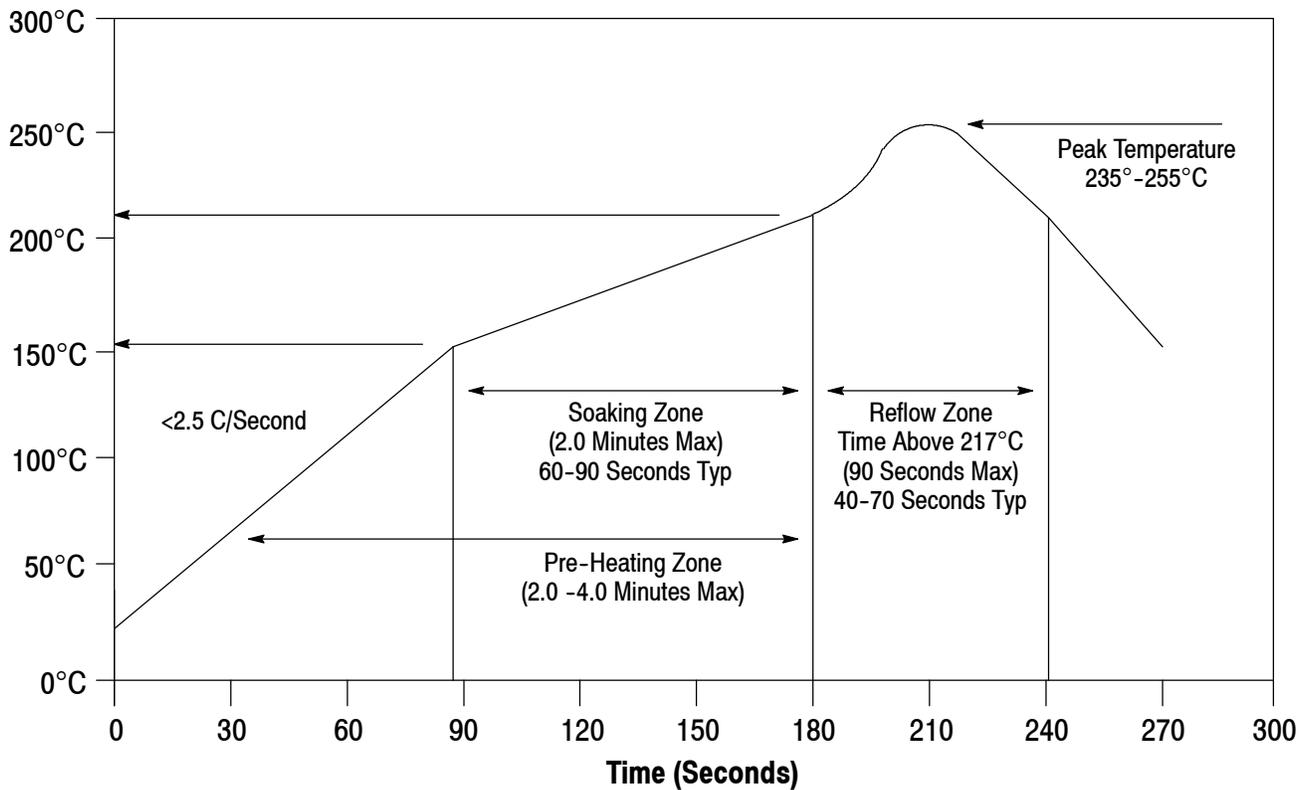


Figure 5

3.7. Connector Placement

A. Position

Optimally, the solder tines should be centered on the pads; however, slight misalignment is permissible as long as the entire length of the solder tine is on the pad. Refer to Figure 6.

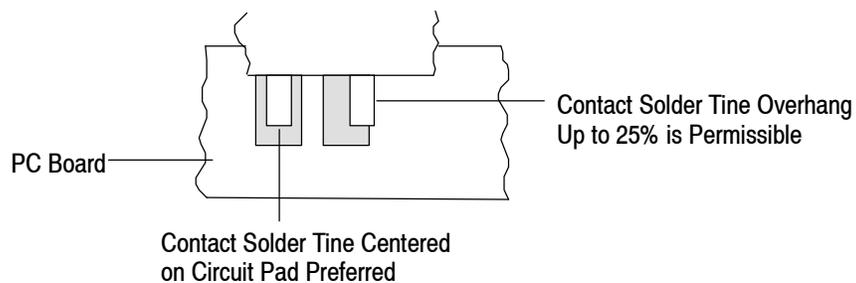


Figure 6

B. Seating Force

It is imperative that the contact solder tines and board locks are sufficiently pressed into the solder paste.

3.8. Checking Installed Connector

All solder joints should conform to those specified in Workmanship Specification 101-21 and all other requirements specified in this document.

The board lock must be seated on the pc board not exceeding the dimension shown in Figure 7.

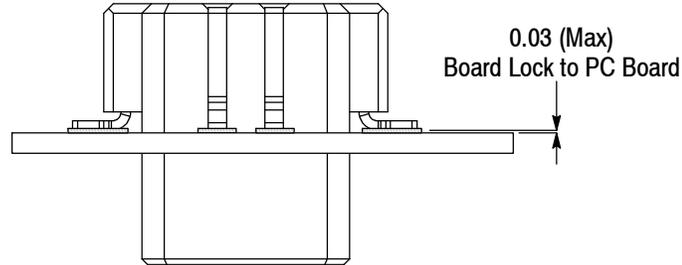


Figure 7

3.9. Retention Force

Retention force is 1.0 kgf per contact solder tine.

3.10. Repair



Damaged or defective connectors MUST NOT be used. Connectors will require desoldering of all contact solder tines.

4. QUALIFICATION

The Inverted Through Board SMT Connector assemblies are Recognized Compliant to Underwriters Laboratories Inc. (UL) and CSA International requirements as Listed in UL File No. E28476.

5. TOOLING

No tooling is required for manual placement of the connectors.

For automatic machine placement, a pc board support must be used to prevent bowing of the pc board during the placement of connectors on the board. It should have flat surfaces with a cutout large enough and deep enough to receive the connector housing. The robotic equipment must have a true position accuracy tolerance to properly locate the connector. This includes gripper and fixture tolerances as well as equipment repeatability. It must use the datum surfaces detailed on the customer drawing to ensure reliable placement.

6. VISUAL AID

Figure 8 shows a typical application of an Inverted Through Board SMT Connector Assembly. 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.

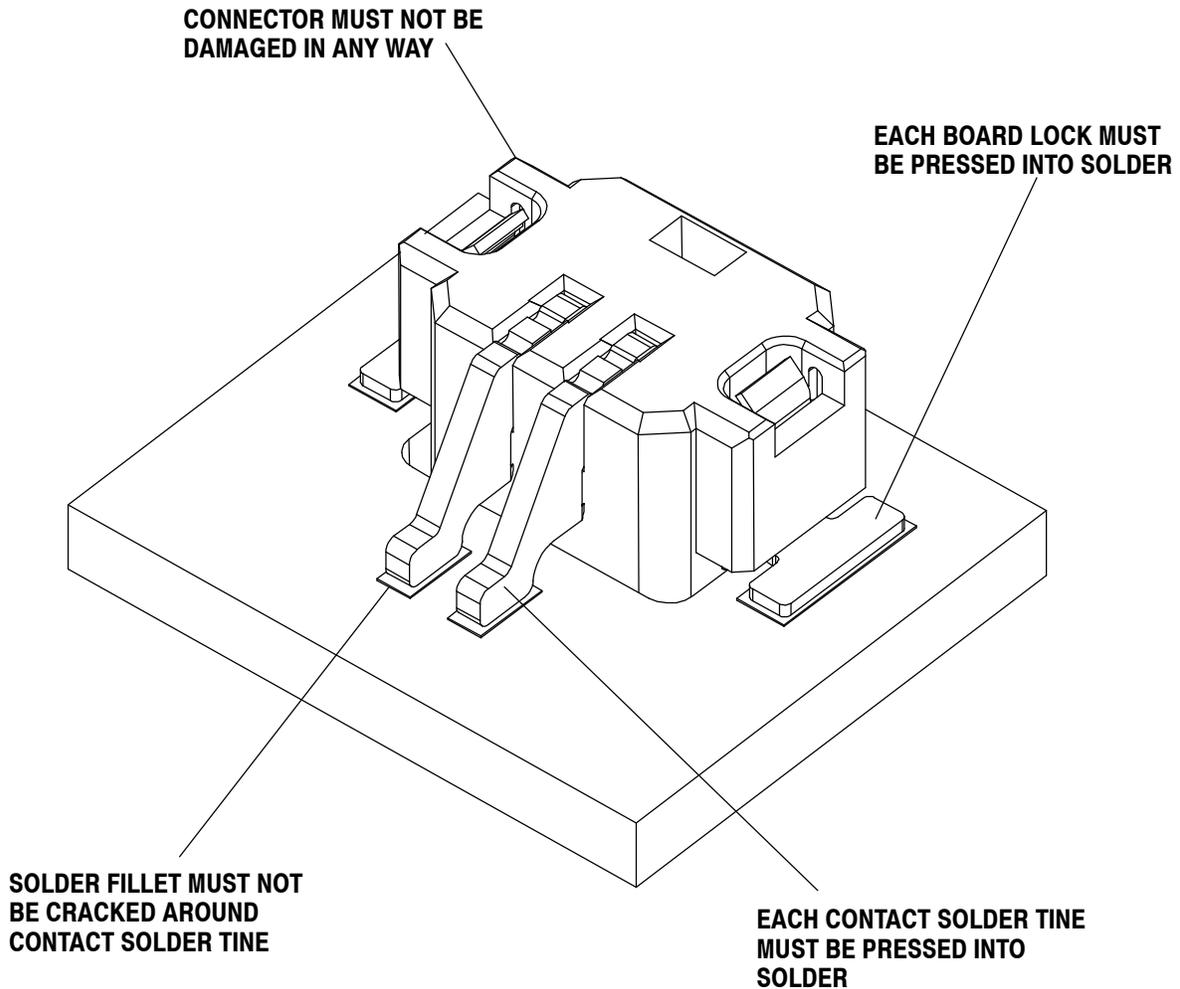


FIGURE 8. VISUAL AID