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| NUMBER<br>GS-20-0379                  | TYPE<br><b>Application Specification</b> |  |                      |
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|                                       |  | AUTHORIZED BY<br>Mathew Jacob   | DATE<br>24 July 2013 |
| CLASSIFICATION<br><b>UNRESTRICTED</b> |  |   |                      |

## 1.0 OBJECTIVE

This specification provides information and requirements regarding customer application of Rotatable Board to Board connector (RotaConnect™). This specification are intended to provide general guidance for application process development. It is recognized that no single application process will work under all customer scenarios and that customers will develop their own application processes to meet their needs. However, if these application processes differ greatly from the one recommended, FCI cannot guarantee results

## 2.0 SCOPE

This specification provides information and requirements regarding customer application of RotaConnect™ for use on modular printed circuit board-to-board Surface Mount Technology applications.

## 3.0 GENERAL

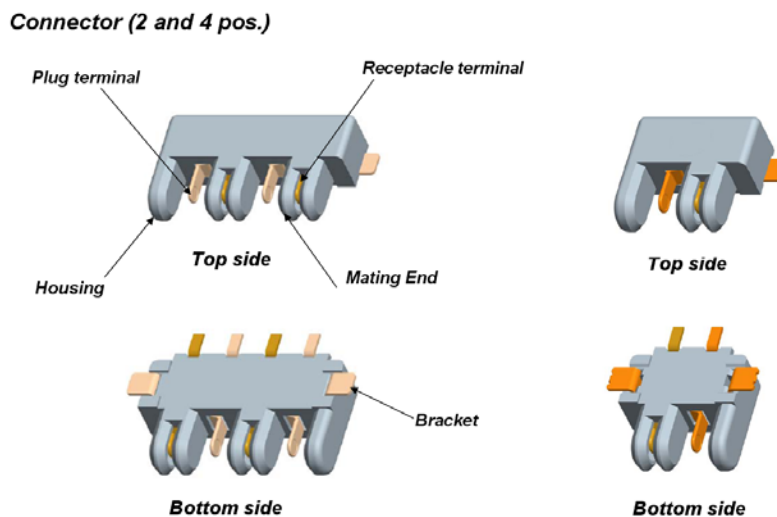
This document is meant to be an application guide. If there is a conflict between the product drawings and specifications, the drawings take precedence.


A Rotatable board to board SMT connector can be used to support perpendicular, coplanar and angled connections, in multiple mating/un-mating directions.

The hermaphroditic 'mates to itself' design enables mating at any angle between +90° and -60° which enables connector to be placed anywhere on the PCB.

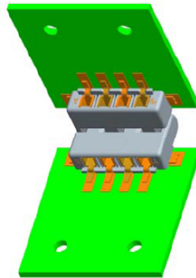
Featuring a 3mm pitch, these board to board connectors are available in positions ranging from 2 up to 14 (in increments of two).

This design allows the uses of a single part number which will compromise both male and female contacts. The high temperature grade housing material is reflow soldering compatible. The tape and reel packaging permits automatic pick and place application.

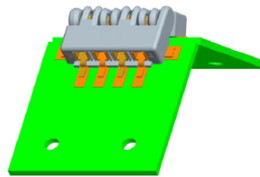


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***Rotated View (4 pos.)***



***Rotate angle +90 degrees***



***Rotate angle -60 degrees***

#### 4.0 DRAWINGS AND APPLICABLE DOCUMENTS

Product drawings and FCI's GS-12-1079 Product Specification are available at [www.fci.com](http://www.fci.com). In the event of a conflict between this application specification and the drawing, the drawing will take precedence. Customers are advised to refer to the latest revision level of FCI product drawings for appropriate details.


#### 5.0 APPLICATION REQUIREMENTS

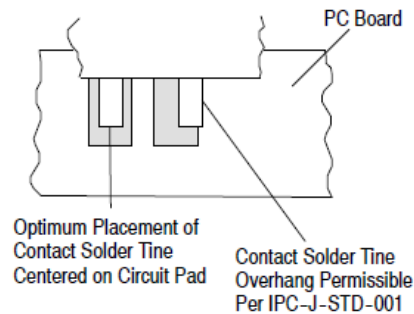
For specifics of pc board layout, refer to the customer drawings for the particular Part Number being applied.

Common pc board materials may be used such as glass epoxy, Aluminum-clad pc boards etc. The PC board thickness may vary to suit the end use thickness. Maximum allowable bow of the pc board shall be 0.10 mm over the length of the connector.

##### Connector Placement

The connector is packed in Tape and Reel packing as per EIA-481 STD for automatic pick and place application. Insertion location will be programmed by a simple pantograph/template system or software package. Optimally, the contact solder tines should be centered on the PC board pads. However slight misalignment is permissible for the performance classifications specified in Association of Connecting Electronics Industries IPC-J-STD-001 (Requirements for Soldering Electrical and Electronic Assemblies).

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The robotic equipment accuracy, repeatability etc is also an important factor to properly locate the connectors on the PCB.

### Soldering

The connectors should be soldered using Reflow soldering techniques. All solder joints should conform to the Workmanship Specification IPC-A-610.

### Stencil

The stencil aperture shall be determined by the circuit pad size and stencil thickness. For recommended pad size refer applicable FCI Customer drawing. The stencil aperture size of at least 90% of pad size should be used. The recommended stencil thickness is 0.13 mm minimum.

### 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 0.05 mm. If a trace is run between adjacent pads on the solder side of the pc board, a solder mask must be applied over the trace to prevent bridging and wicking of solder away from the contact solder tines.

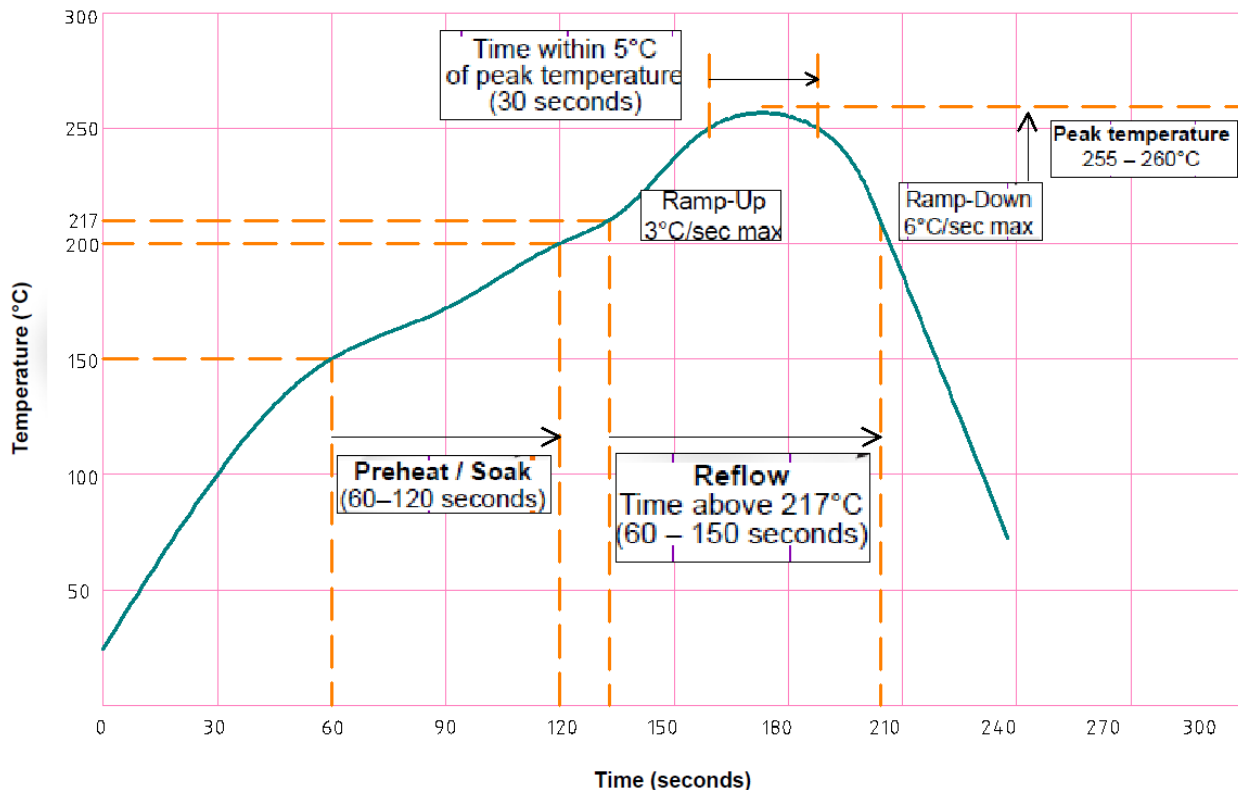
Since the connector may rest on the top of the solder mask, an excessively high mask will allow too much space between the lead and pad for a good solder joint. A solder joint under these conditions would be weak and would not provide long term performance of the connector.

### Process

The connectors should be soldered using reflow soldering techniques. Due to many variables involved with the reflow process, it is recommended that trial runs be conducted under actual manufacturing conditions to ensure product and process compatibility. These connectors will withstand the temperature of 260° C for 10 seconds.

The lead-free reflow profile shown below is based on IPC/JEDEC J-STD-020. It is provided only as a guide / reference purpose.

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**(Sample profile only – be sure to follow solder profile guidelines of solder paste being used)**

### Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents.

### Drying

When drying cleaned assemblies and pc boards, temperatures to which the connectors are subject should not exceed 220° C for more than 3 minutes. Excessive temperatures may cause housing and plating degradation.

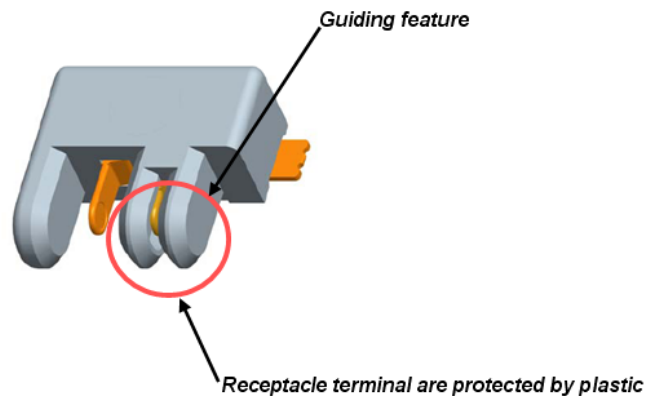
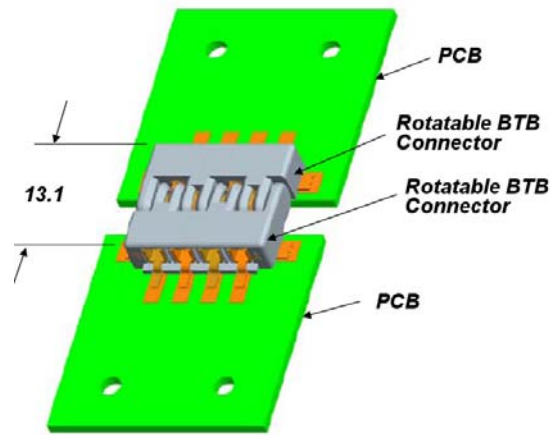
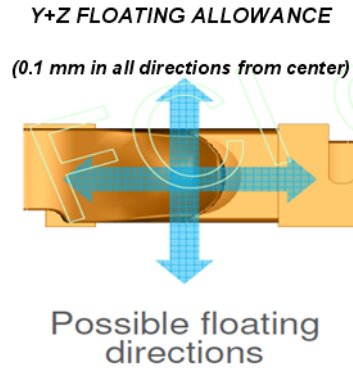
### Alignment

Proper alignment is essential to ensure full engagement of mating connectors. Guiding feature is provided as shown below and also the pins are protected during mating (preventing damage during mating/unmating).

The center of the coined hole in header contact is the intended rotation point and receptacle contact will guide itself to the center of the hole.

Floating allowance of 0.1mm maximum possible from center as shown below.


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## 6.0 POST-APPLICATION INSPECTION PROCEDURES

Visually inspect the connector after reflow for damage and cleanliness. Solder joints should be inspected visually, if possible, or by alternate methods such as X-ray to assure that the solder joints are acceptable.

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## 7.0 REPAIR / REMOVAL PROCEDURE

Damaged product should not be used. If a damaged product is evident, it should be removed from the pc board and replaced with a new one. Removal of the Rotatable Board to Board connector from the pc board may be done by standard SMT Rework methods.

## 8.0 PC BOARD SUPPORT

For automatic machine placement, a pc board support must be used to prevent bowing of the pc 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 pc board support must be customer made.

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**9.0 RECORD RETENTION**

| <b>REV</b> | <b>PAGE</b> | <b>DESCRIPTION</b> | <b>EC #</b> | <b>DATE</b> |
|------------|-------------|--------------------|-------------|-------------|
| A          | ALL         | NEW DOCUMENT       | N/A         | 24/07/2013  |

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