



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  [ $\pm 0.005$ ] 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 Printed Circuit (PC) Board Contacts. This product family includes pin receptacles, compression pin receptacles, and gage clips. They are designed to be placed into a variety of pc board thicknesses by automatic machines.

When corresponding with TE Connectivity 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.

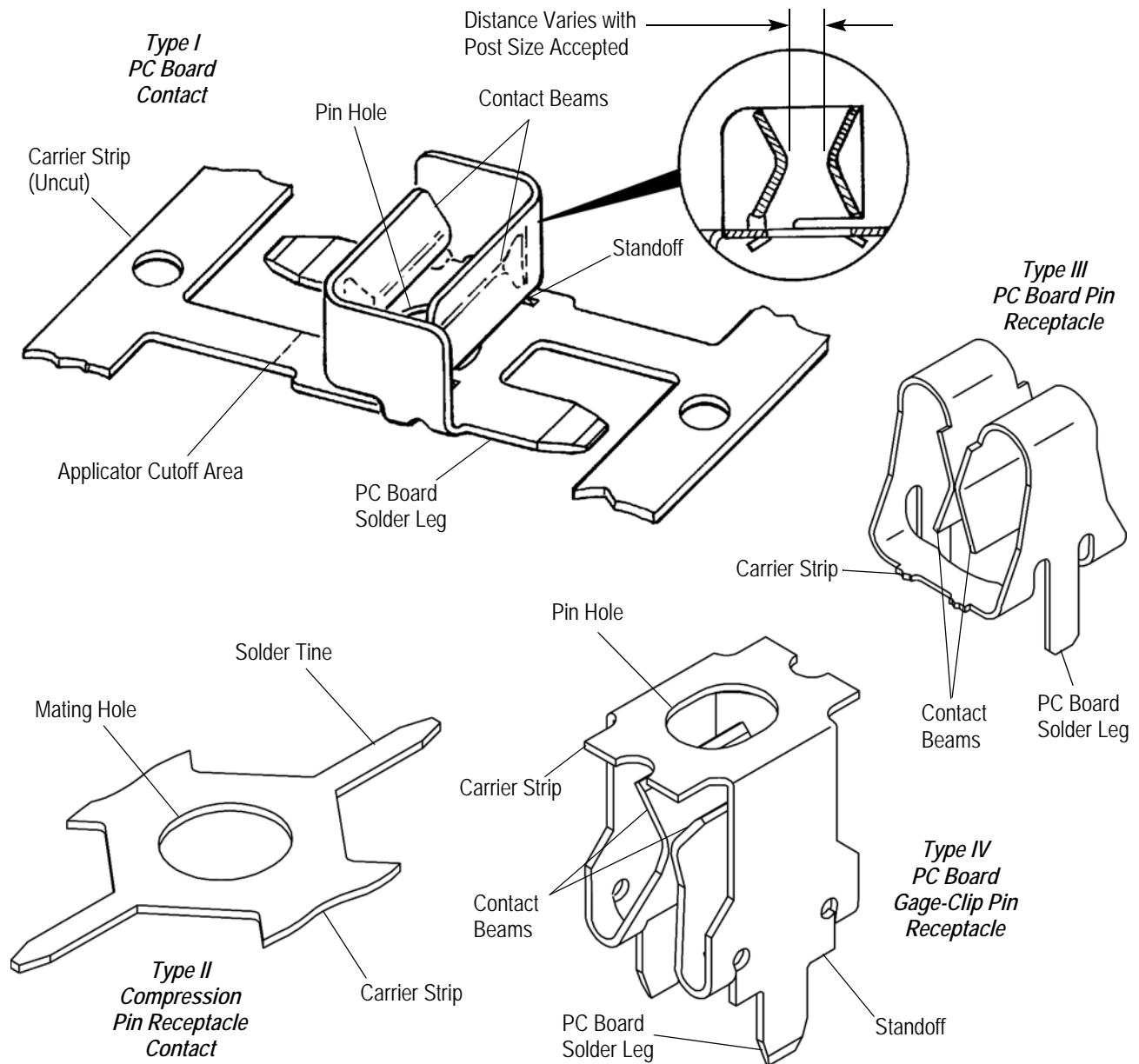


Figure 1

---

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Updated document to corporate requirements.

### 2.2. Customer Assistance

Reference Part Number 63566 and Product Code 0780 are representative numbers that identify the PC Board Contacts. These numbers are used in the customer service network to access tooling and product application information. This service is provided by your local TE representative (Field Sales Engineer, Field Application Engineer, etc.) or, after purchase, by calling the Tooling Assistance Center number at the bottom page 1.

### 2.3. Drawings

Customer Drawings for specific products are available from the responsible 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 TE.

### 2.4. Specifications

Product Specification 108-1411 and 108-1411-1 provides test and performance requirements. These products when soldered will meet TE Solderability Specification 109-11-5 when plated and 109-11-1 after two years of shelf life.

### 2.5. Manuals

Manual 402-40 is available upon request and can be used as a guide in soldering. 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 a guide for information on soldering problems.

### 2.6. Instructional Material

The following list includes available instruction sheets (408-series) that provide assembly procedures for product, operation, maintenance and repair of tooling, as well as setup and operation procedures of applicators; and customer manuals (409-series) that provide setup, operation, and maintenance of machines.

<u>Document Number</u>	<u>Document Title</u>
408-3295. . . . .	Preparing Reel Of Contacts for Application Tooling
408-6927. . . . .	Design Recommendations for PC Board Support Fixtures
408-9816. . . . .	Handling Of Reeled Products
408-9866. . . . .	Terminal Reel Flange Removal Tool 354030-1
409-5799. . . . .	Gage Clip Applicator Insertion Head 853439-[ ]
409-5863. . . . .	COMP-U-SERTOR* II Machine 122300-[ ]
409-5872. . . . .	Modular Insertion System (MIS) Bench Machine 217600-[ ]

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Shelf Life

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

#### B. Ultraviolet Light

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

#### C. Reeled Contacts

When using tape-mounted reeled contacts, care must be taken to prevent stretching, sagging, or other distortion that would prevent smooth feeding of the tape through automatic machine feed mechanisms. Store coil wound reels horizontally and traverse wound reels vertically.

### D. Chemical Exposure

Do not store the contacts 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



Where the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass if available.

### 3.2. Material

The pc board contacts are made of phosphor bronze, except for the compression pin receptacle, which is made of brass.

### 3.3. PC Boards

#### A. Material and Thickness

- 1.Board material will be glass epoxy (FR-4, G-10).
- 2.Board thickness shall be 1.6-2.0 [.063-.079] for pin receptacle contacts that mate with 2.25 [.088], 2.36 [.093], and 2.49 [.098] posts; 1.6 [.063] for compression pin receptacle contacts; and 1.57 [.062] for gage-clip pin receptacle contacts.

Contact the Tooling Assistance Center number listed at the bottom of page 1 for suitability of other board materials or thicknesses.

#### B. PC Board Layout

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the contact. The contacts are placed on the pc board by machine. The dimensions provided in Figure 2 must be observed when preparing a pc board for the contacts.

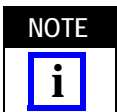


Figure 2 represents typical pc board layouts for this product. For dimensions and hole pattern layout for specific product, obtain the appropriate customer drawing through your Tyco representative or refer to the telephone numbers at the bottom of page 1.

Typical PC Board Layout  
for Type I PC Board Pin  
Receptacle Contacts that Mate  
with 2.25 [.088], 2.36 [.093],  
or 2.49 [.098] Posts

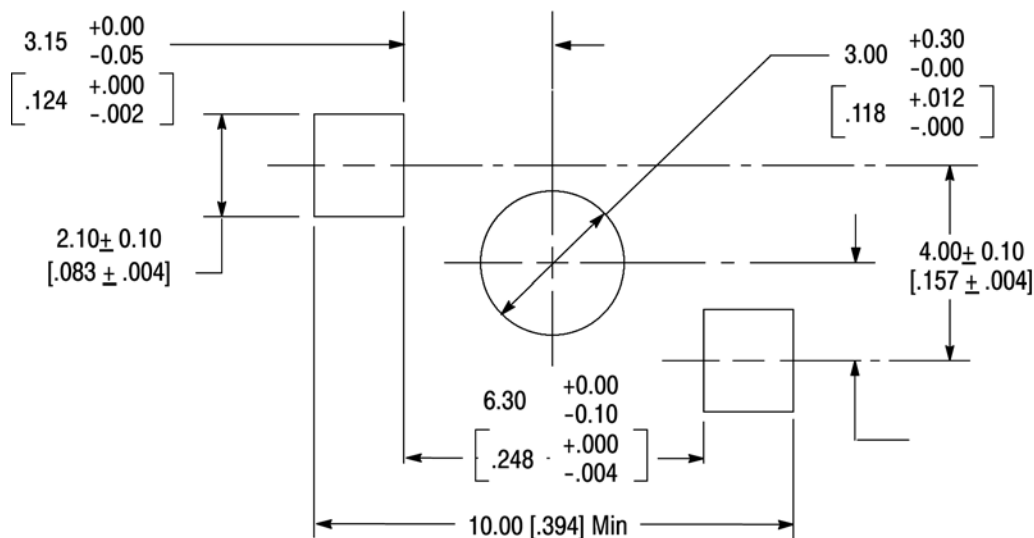
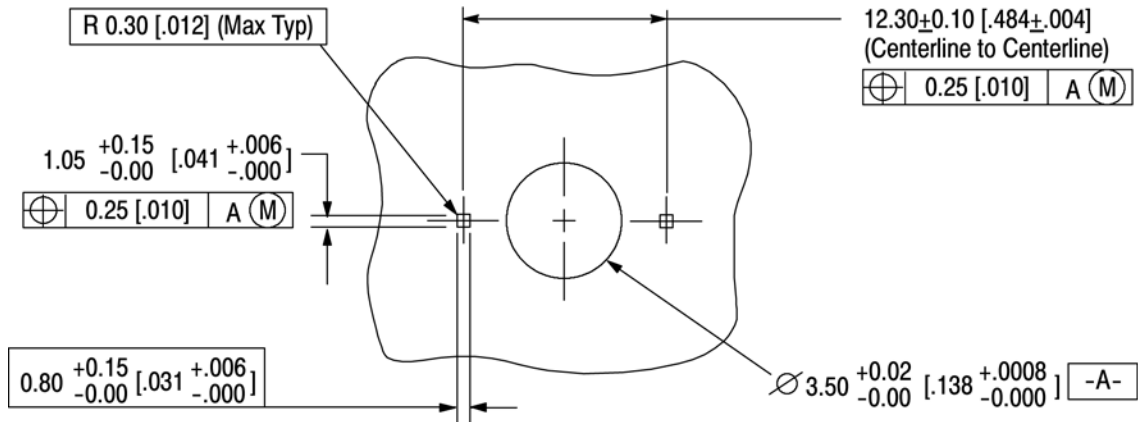
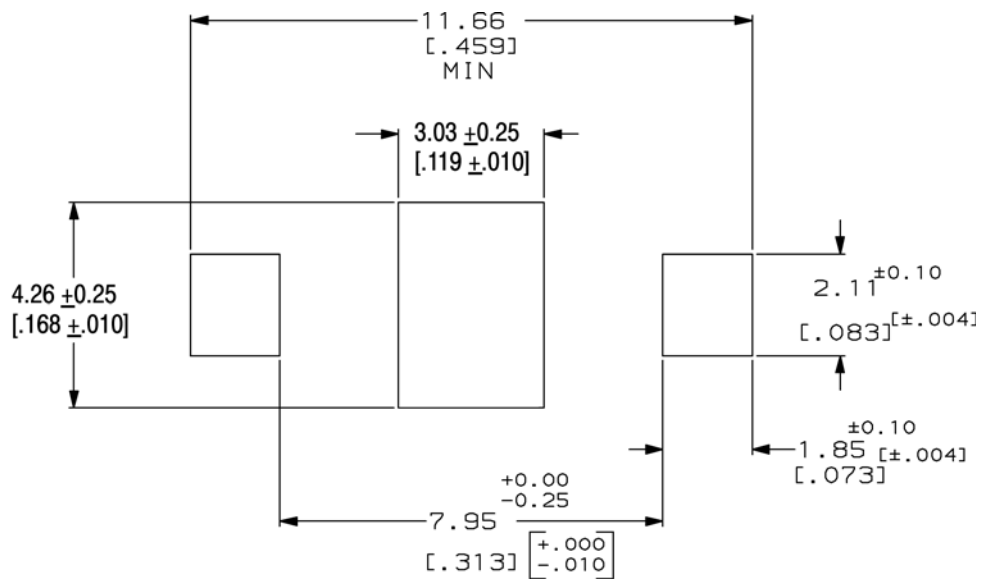


Figure 2 (Cont'd)

Typical PC Board Layout  
for Type II Compression  
Pin Receptacle Contacts



Typical PC Board Layout  
for Type III Pin Receptacle Contacts



Typical PC Board Layout  
for Type IV Gage-Clip  
Pin Receptacle Contacts

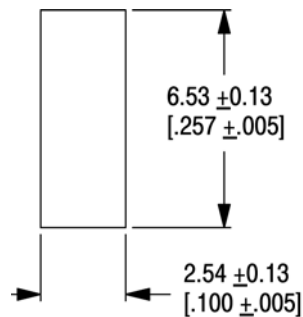


Figure 2 (End)

### 3.4. Sheared Cutoff

Individual contacts are removed from the carrier strip by shearing the material between adjacent contacts. In order to provide proper application of the contacts, the dimensional requirements for the sheared cutoff is provided in Figure 3.

1. The allowable length of shear must not exceed the dimension shown in Figure 3.
2. The individual contact must meet the dimensions shown in Figure 3.
3. The height of shear burr must not exceed the dimension shown in Figure 3.
4. Burr allowance on cutoff should not exceed the dimension shown in Figure 3.

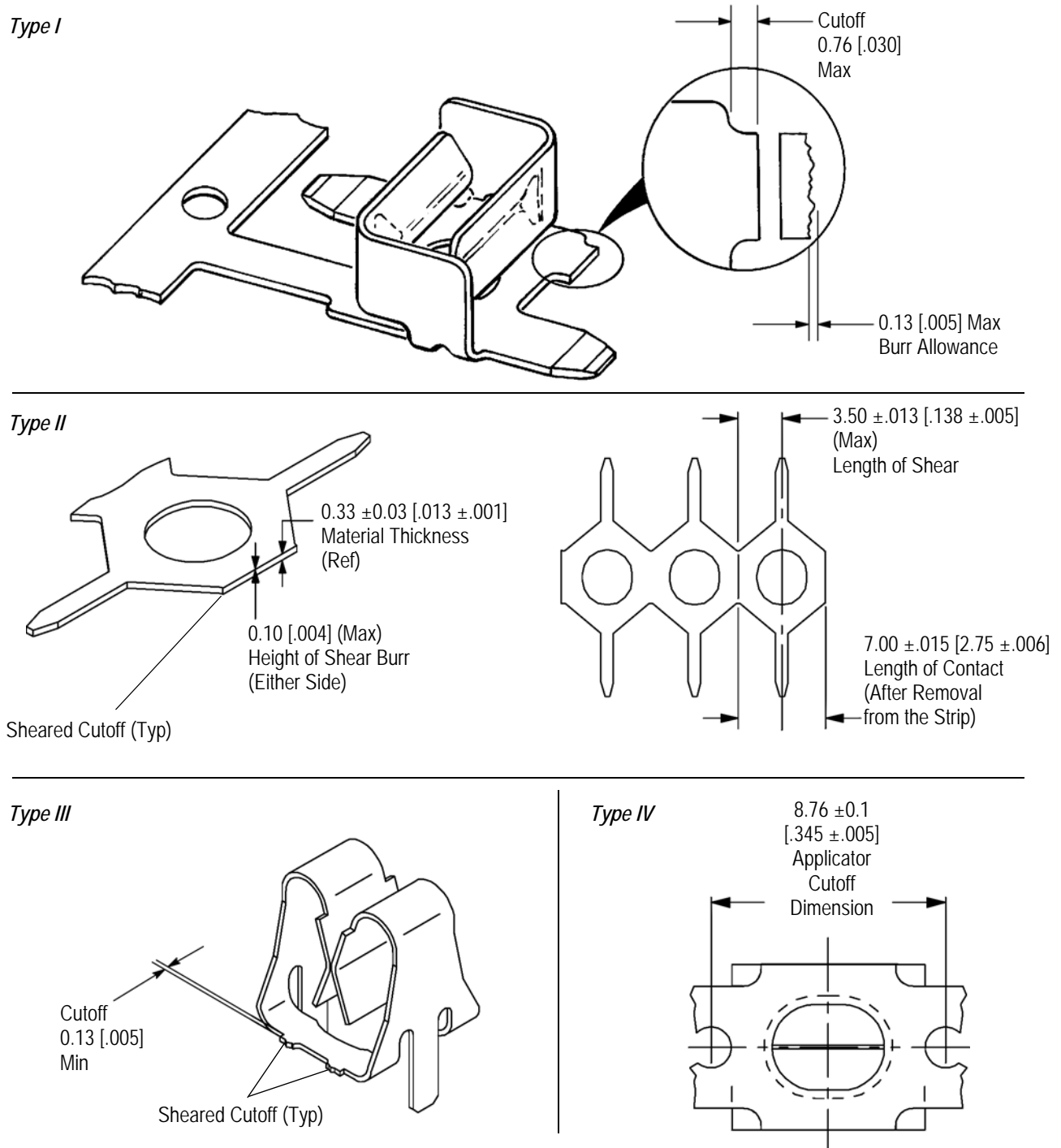


Figure 3

### 3.5. Mounting Contacts to PC Board

#### A. Standoff Tolerance

The contact must be seated to within the dimensions shown in Figure 4.

#### B. Clinching

The pc board mounting legs must be clinched to within the dimension shown in Figure 4. The clinching operation must not deform the contact in any way.

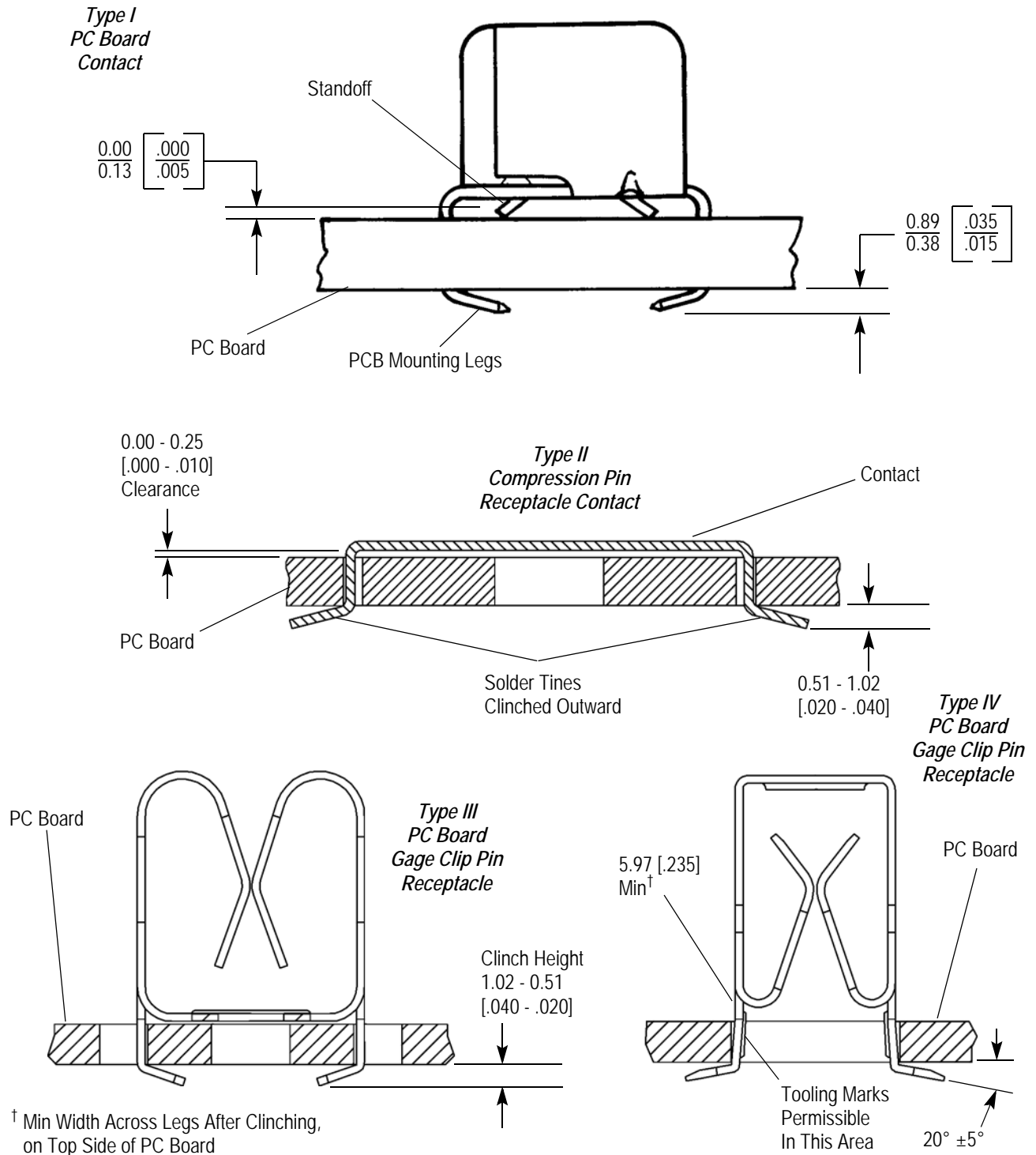


Figure 4

### 3.6. Soldering

#### A. Flux Selection

Contact solder tines 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. Call the Product Information phone number at the bottom of page 1 for consideration of other types of flux. Some fluxes that are compatible with these contacts are provided in Figure 5.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER <sup>‡</sup>	ALPHA <sup>●</sup>
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

<sup>‡</sup>Product of Kester Solder Co.

<sup>●</sup>Product of Alphasmetals Inc.

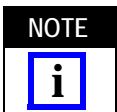
Figure 5

#### B. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. The following is a listing of common cleaning solvents that will not affect the contacts for the time and temperature specified. See Figure 6.



*Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride can be used with no harmful affect to the contacts; however, TE does not recommend them because of the harmful occupational and environmental effects. Both are carcinogenic (cancer-causing) and Trichloroethylene is harmful to the earth's ozone layer.*



*If you have a particular solvent that is not listed, contact the Tooling Assistance Center or Product Information number at the bottom of page 1.*

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

ALPHA, BIOACT, CARBITOL, LONCOTERGE, and KESTER are trademarks of their respective owners.

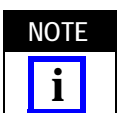
Figure 6

#### C. Drying

When drying cleaned contacts, make certain that temperature limitations are not exceeded: -40° to 85°C [-40° to 185°F] for standard temperature products. Excessive temperatures may cause degradation.

#### D. Soldering Guidelines

PC Board Contacts can be soldered using wave, vapor phase (VPR), double sided non-focused infrared reflow processes (IR) or equivalent soldering techniques. The temperatures and exposure time shall be within the ranges specified in Figure 7. We recommend using SN60 or SN62 solder for these contacts.



*Manual 402-40 provides some guidelines for establishing soldering practices. Refer to Paragraph 2.5, Manuals.*

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temperature)
	CELSIUS	FAHRENHEIT	
Wave Soldering	260†	500†	5 Seconds
Vapor Phase Soldering	215	419	5 Minutes
Infrared Reflow Soldering	230	446	5 Minutes

† Wave Temperature

Figure 7

### 3.7. Repair/Replacement

A damaged contact must be removed and replaced with a new one. Solder must be removed from soldered tines and clinched tines must be straightened before removal. Care must be used to prevent damage to the mounting surface and surrounding components.

### 4. QUALIFICATIONS

This product complies with Solderability Specification 109-11-5 and 109-11-1. No other qualification requirements have been stipulated.

### 5. TOOLING

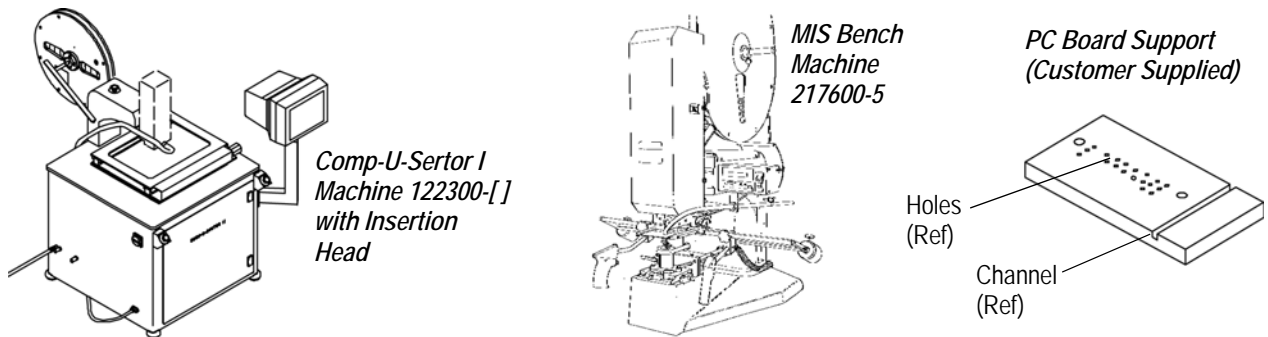
This section provides a selection of tools for various application requirements. They include semi-automatic and automatic machines for power assist application of strip form contacts. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact one of the service groups at the bottom of page 1. A listing of tooling recommendations is provided in Figure 8.

- Insertion Head

Insertion heads are designed to insert the contacts to a pre-determined depth and can be used in a variety of power sources.

- Power Units

A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an insertion head.



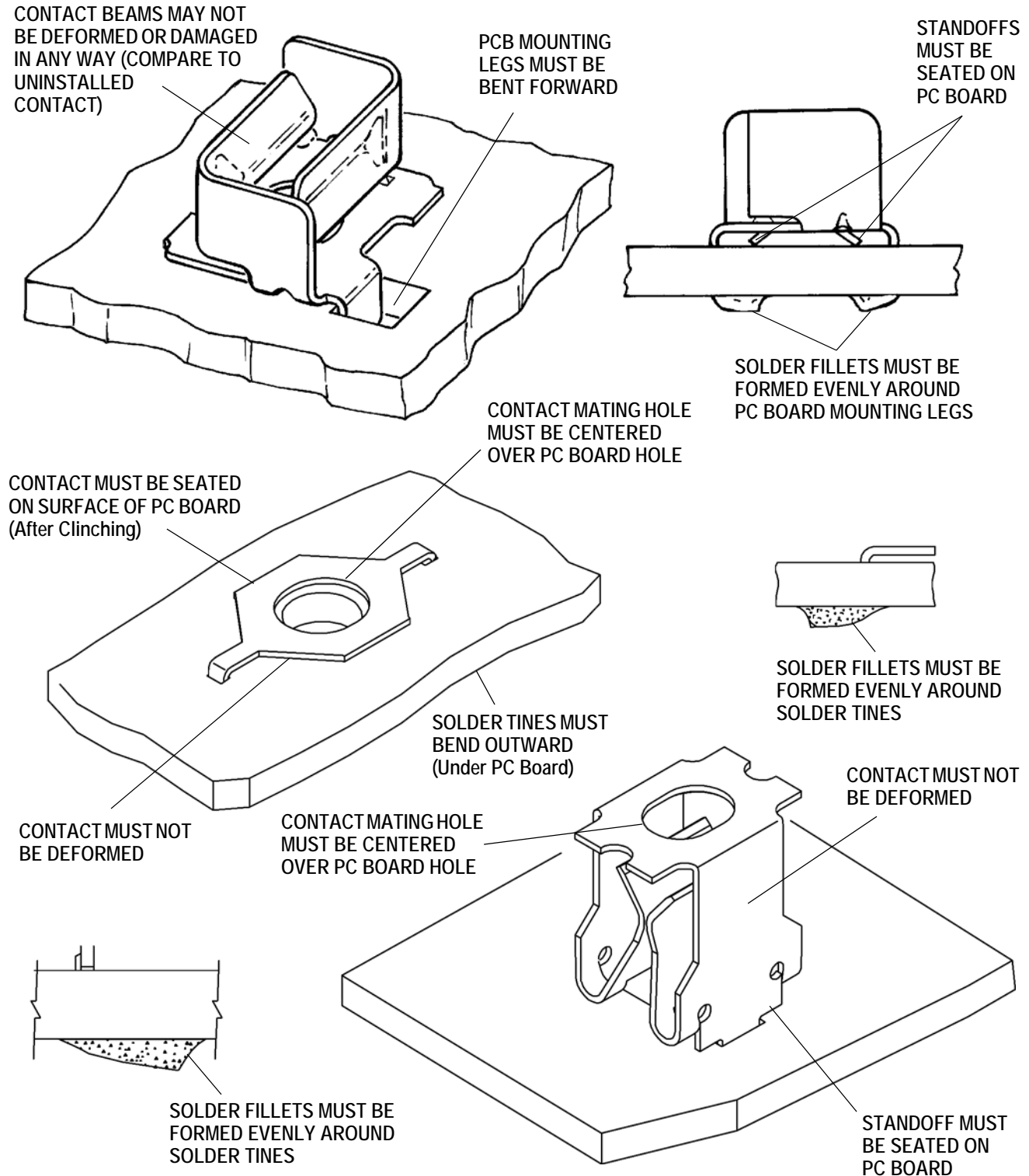
TYPE OF CONTACT	INSERTION HEAD	POWER UNIT (DOCUMENT)
Pin Receptacle	904601-1	122300-1 (409-5863)
		122300-2 (409-5863)
	904008-1	217600-5 (409-5872)
		122300-1 (409-5863)
Compression Pin Receptacle	679441-1	217600-5 (409-5872)
Gage-Clip Pin Receptacle (Type III)	679943-1	122300-1 (409-5863)
		904605-1
Gage-Clip Pin Receptacle (Type IV)	904607-1	122300-1 (409-5863)

Figure 8



## 6. VISUAL AID

The illustration below shows a typical application of this product. 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. VISUAL AID**