FASTON* .250/.205 Series Printed Circuit (PC) Board Receptacles

NOTE *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 ±0.13 [±.005] and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.*

1. INTRODUCTION

This specification covers the requirements for application of FASTON .250/.205 Series receptacles for pc board application. The receptacles accept a mating tab with a width of 6.35 [.250] or 5.21 [.205] (the series designator) and thicknesses of 0.81 [.032] or 0.64 [.025]. These receptacles are available in loose piece form for manual placement on the pc board and reeled form for automatic and semi–automatic machine application.

The receptacles are designed with a cantilevered floor or triangular cutouts in the mating rolls to provide low insertion forces. The mating rolls allow maximum compliance toward the mating tab. When the receptacle is mounted onto the pc board, the stabilizer supports the receptacle. When mated, the mating tab detent engages the mating tab to provide the required retention force.

When corresponding with 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.

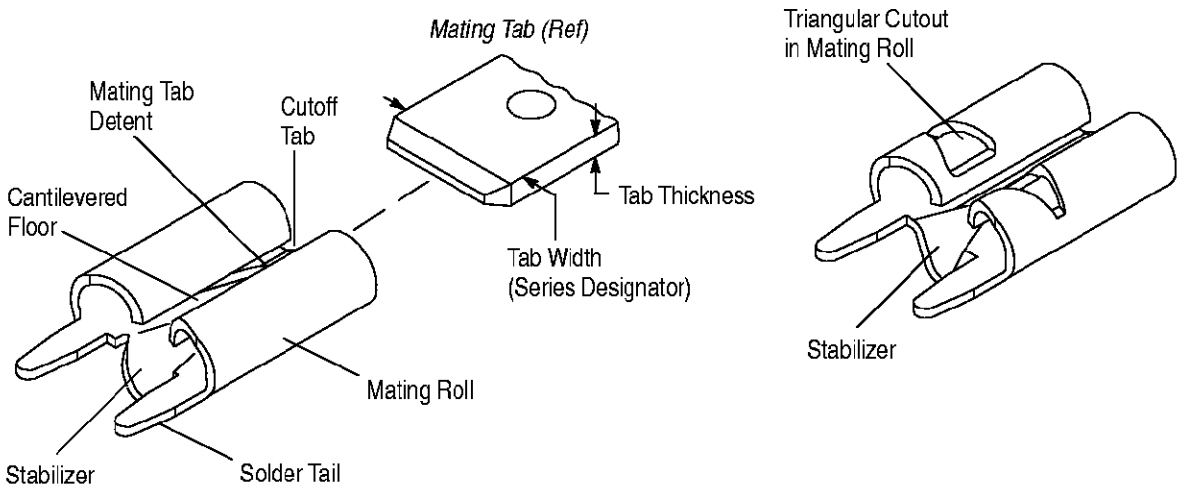


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Per EC 0990–0610–02:

- Initial release of application specification

2.2. Customer Assistance

Reference Product Part Number 63969 and Product Code A456 are representative of FASTON .250/.205 Series pc board receptacles. 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 Representative (Field Service Engineer, Field Applications Engineer, etc.) or, after purchase, by calling PRODUCT INFO 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 INFO at the number at the bottom of this page.

2.4. Instructional Material

Instruction Sheets (408–series) provide assembly instructions and Customer Manuals (409–series) provide machine setup and operation procedures. Documents available which pertain to this product are:

408–4416	Installation of Modular Insertion System (MIS) Applicator Insertion Heads
408–4441	MIS .250 FASTON* Receptacle Applicator Subassembly 904825–1
409–5863	Comp–U–Sertor* II Machine 122300–[ ]
409–5872	MIS Bench Machine 217600–[ ]
409–5893	MIS Bench Machine 662820–[ ]

2.5. 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.

2.6. Specifications

Product Specification 108–1706 provides product performance and test information.

Qualification Test Report 501–486 is a test report confirming successful qualification of the information in 108–1706.

Workmanship Specification 101–21 provides solder fillet requirements.

Test Specification 109–11 provides solderability requirements and quality inspection methods.

3. REQUIREMENTS

3.1. Material

These receptacles are made of brass with tin over copper plating.

3.2. Limitations

These receptacles are designed to operate in a temperature range of –40° to 105°F [–40° to 221°C].

3.3. Storage

A. Ultraviolet Light

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

B. Shelf Life

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

C. Reels

Store coil wound reels horizontally and traverse wound reels vertically.

D. Chemical Exposure

Do not store receptacles near any chemical listed below as they may cause stress corrosion cracking.

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

3.4. Receptacle Cutoff Tab

Individual receptacles must be removed from the carrier strip by shearing the material between carrier strip and receptacle. In order to provide proper application of the receptacle, the allowable length and width of the cutoff cutoff tab and maximum length of the burr must not exceed the dimensions shown in Figure 2.

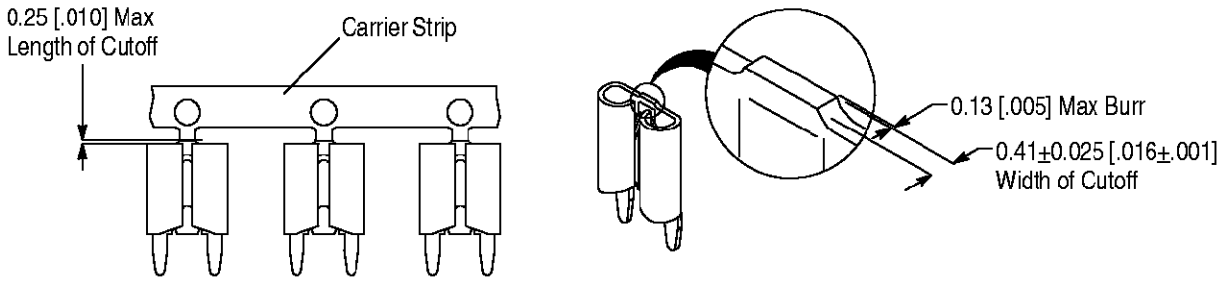


Figure 2

3.5. PC Board

A. Material and Thickness

The pc board material shall be glass epoxy (FR–4 or G–10). The pc board thickness shall be 1.57 [.062].

B. Pads

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

C. Hole Dimensions

The receptacles may be used with or without plated through holes. If plated, the drilled hole size, plating types, and plating thickness are dependent on the application requirements. The finished hole size must be as stated to provide unrestricted insertion and ensure adequate application of solder to the solder tails. Refer to Figure 3.

D. Layout

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the receptacle. The pc board layout must be designed using the dimensions provided on the customer drawing for the specific receptacle. A reference *sample* of the recommended pc board layout is shown in Figure 3.

Sample Recommended PC Board Layout

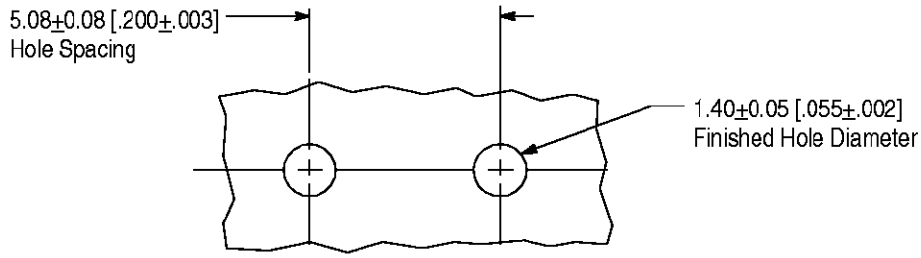


Figure 3

3.6. Seating

When placing receptacles on the pc board, the solder tails must be aligned and started into the matching holes before seating the receptacle. The solder tails must be clinched outward to the degree stated in Figure 4.

The clinching operation must not deform the receptacle in any way. After clinching, the receptacle mating rolls and stabilizer must be seated on the pc board not exceeding the dimension shown in Figure 4.

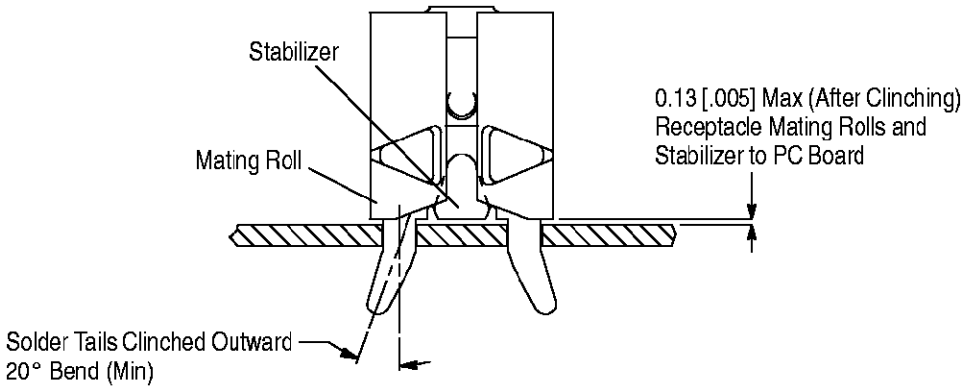


Figure 4

3.7. Soldering

A. Flux Selection

The solder tails 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 these receptacles are provided in Figure 5.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER▩	ALPHA■
RMA	Mild	Noncorrosive	186	611

▩ Product of Kester Solder Co. ■ Product of Alphametals Inc.

Figure 5

B. Process

These receptacles can be soldered using wave soldering or equivalent soldering techniques. The temperature and exposure time shall be as specified in Figure 6.

SOLDERING PROCESS	WAVE TEMPERATURE	TIME (At Max Temperature)
Wave	260°C [500°F]	5 Seconds

Figure 6

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. Cleaners must be free of dissolved flux and other contaminants. Common cleaning solvents that will not affect the receptacles for the time and temperature specified are listed in Figure 7.

DANGER *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 is not recommended because of harmful occupational and environmental effects. Both are carcinogenic (cancer–causing).*

NOTE *If you have a particular solvent that is not listed, call PRODUCT INFO at the number at the bottom of page 1.*

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110■	Aqueous	1	132	270
Bioact EC–7◆	Solvent	5	100	212
Butyl Carbitol●	Solvent	1	Ambient Room	
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

■ Product of Fry's Metals, Inc. ◆ Product of Petroferm, Inc. ● Product of Union Carbide Corp. ❖ Product of Litton Systems, Inc.

Figure 7

D. Drying

When drying cleaned assemblies, make certain that temperature limitations are not exceeded: –40° to 105°F [–40° to 221°C]. Excessive temperatures may cause receptacle degradation.

3.8. Checking Installed Receptacle

The receptacle must have solder fillets evenly formed around each solder tail. All solder joints should conform to those specified in Workmanship Specification 101–21.

3.9. Mating and Unmating

Mating and unmating forces must be measured using a testing device capable of holding the reading. It must also provide accurate alignment with slow and steady mating and unmating of the receptacle and mating tab. The forces required to mate and unmate the receptacle and mating tab are specified in Figure 8.

MATING (Max) N (Newtons) [lbs]	UNMATING (MIN) N (Newtons) [lbs]
26 [6]	13 [3]
44 [10]	18 [4]

Figure 8

3.10. Repair

These receptacles must NOT be re–used. Damaged receptacles must be de–soldered then removed, discarded, and replaced.

4. QUALIFICATION

No qualifying support for FASTON .250/.205 Series pc board receptacles was defined at the time of publication of this document.

5. TOOLING

No tooling is available for manual placement of the receptacles on the pc board. For information on tooling concepts, contact PRODUCT INFO at the number at the bottom of page 1. Automatic and semi–automatic machines are available for power assisted application of reeled terminals. Tooling part numbers and instructional material packaged with the tooling is provided in Figure 9.

5.1. Power Units

The power units provide the force required to drive the tooling for applying the receptacles to the pc board. These machines provide for high volume production requirements.

A. MIS Bench Machines

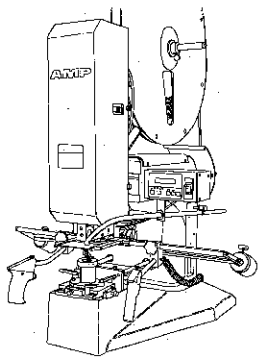
These machines are designed to be bench mounted. The applicator must be installed onto the machine. The lower tooling is included with these machines. Machine 217600–3 is CE marked.

B. Comp–U–Sertor II Machine

This machine is designed to be floor standing. The applicator and lower tooling must be installed onto the machine.

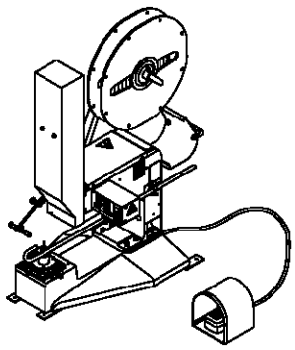
5.2. Applicator and Lower Tooling

The applicator and applicator subassembly (included with the applicator) seats the receptacles onto the pc board. The lower tooling provides the clinching operation.



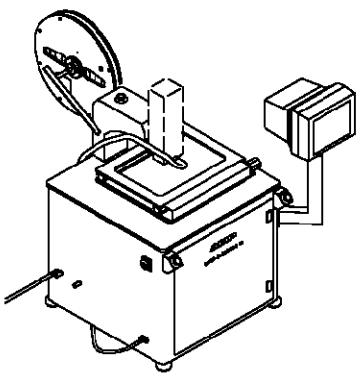
MIS Bench Machine 217600–3
(409–5872)

Includes (Clinch) Lower
Tooling Assembly



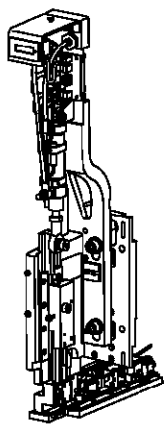
MIS Bench Machine 662820–3
(409–5893)

Includes (Clinch) Lower
Tooling Assembly



Comp–U–Sertor II Machine
122300–1 [ ](409–5863)

Requires Double–Acting (Clinch)
Lower Tooling 1214223–1



MIS FASTON Receptacle Applicator
904602–1 (408–4416)

Includes MIS .250 FASTON
Receptacle Applicator Subassembly
904825–1 (408–4441)

Figure 9

6. VISUAL AID

The illustration below shows a typical application of FASTON .250/.205 Series pc board receptacles. 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.

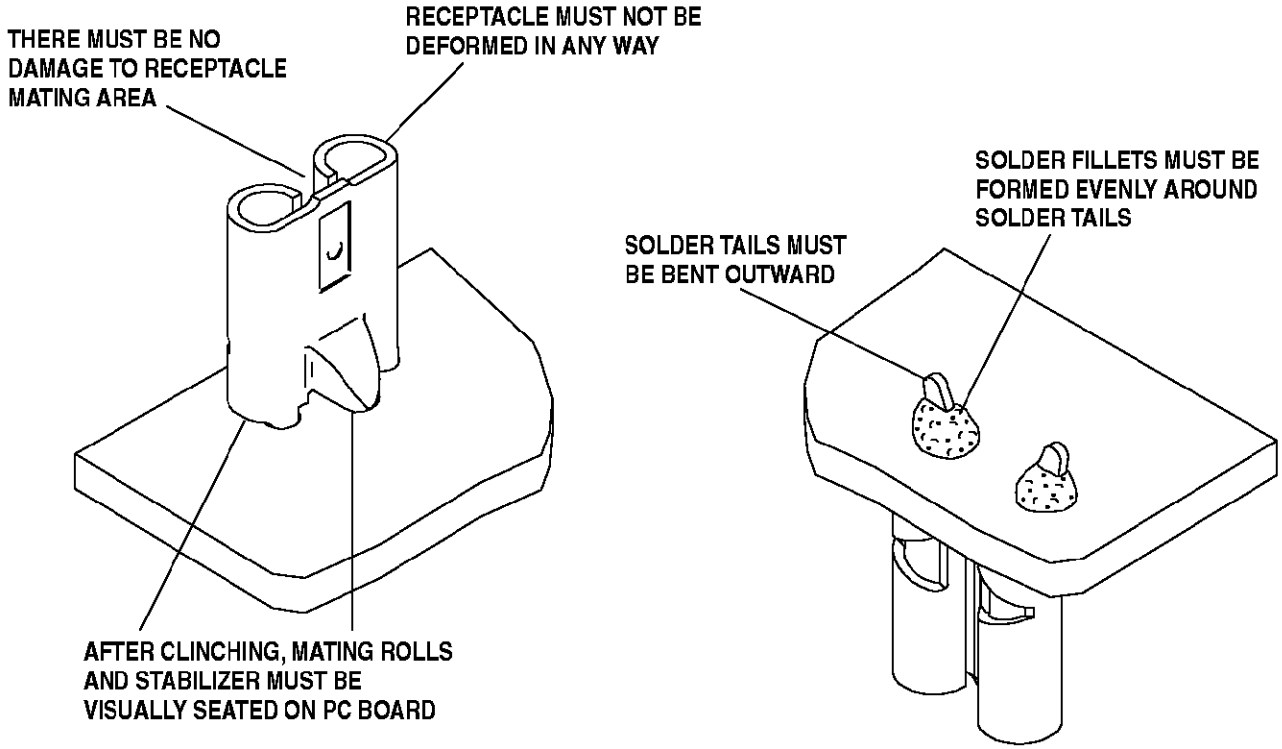


FIGURE 10. VISUAL AID