SO(Small Outline) DIMM (Dual-In Memory Module) Sockets, 144 Positions with 0.8mm Centerline Spacing

NOTE

All numerical values are in metric units. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ±0.13 and angles have a tolerance of ±1°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of AMP SO (Small Outline) DIMM (Dual In-Line Memory Module) 144-position sockets with 0.8 centerline spacing onto PC (printed circuit) boards.

These surface mount sockets are available in either SDRAM (Synchronous Dynamic Random Access Memory) or SGRAM (Synchronous Graphics Random Access Memory) configurations designed for 3.3V systems.

The SDRAM sockets are available with 2.1 (low profile), 3.3 (standard), or 3.7 (high profile) card slot height.

The SGRAM sockets are available with 3.7 (high profile) or 8.0 (ultra-high profile) card slot height.

The sockets may be placed on the PC board by hand or by automatic application tooling (typically vacuum pick and place). The sockets are supplied in soft tray form for manual placement, hard tray form for automatic machine placement, and tape-and-reel form for high-speed automatic machine placement.

When corresponding with TE personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of these connectors are provided in Figure 1.

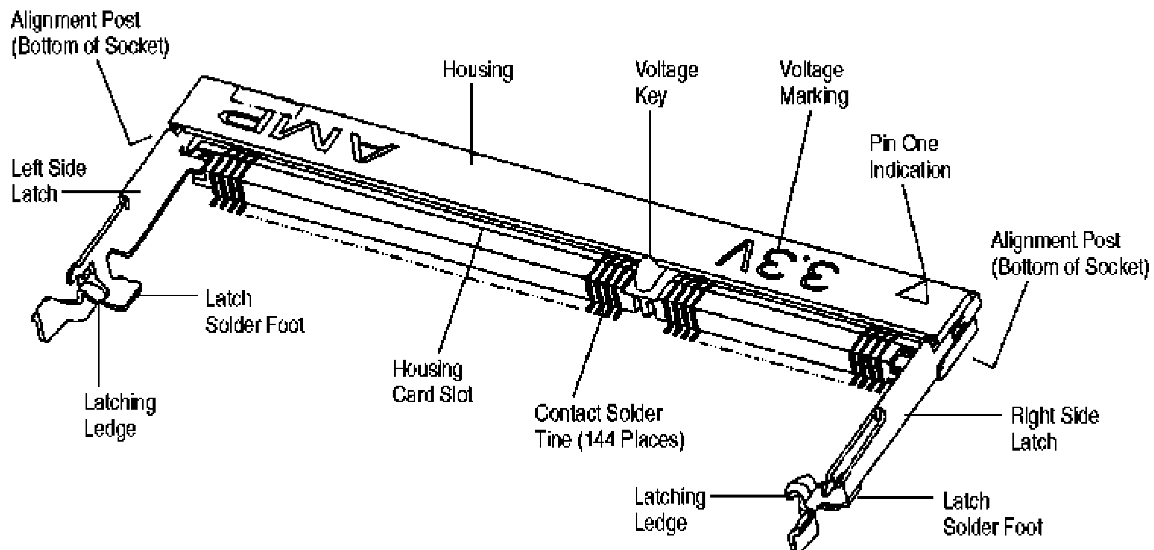

Figure 1

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2. REFERENCE MATERIAL

2.1. Customer Assistance

Product Part Number 390112 and Product Code 4320 are representative of AMP SO DIMM 144-position sockets. Use of these numbers will identify the product line and expedite your inquiries through a TE service network established to help you obtain product and tooling information.

2.2. Drawings

TE Customer Drawings for product part numbers are available from the service network. The information contained in Customer Drawings and this specification takes priority over any other document available through TE.

2.3. Instructional Material

TE instruction sheets (408-series) contain detailed assembly instructions for tooling. Documents available which pertain to this product are:

408-6927 Design Recommendations for PC Board Support Fixture

2.4. Specifications

TE Product Specification 108-1739 provides product performance and test information.

2.5. Bulletins

TE Corporate Bulletin 402-40 is available upon request and can be used as a guide to soldering. This bulletin provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is attached to the bulletin as a guide for information on soldering problems.

3. REQUIREMENTS

3.1. Material

The socket housing is made of high temperature plastic. The contact is made of phosphor bronze plated with gold over nickel, and the solder tine is plated with gold over nickel.

3.2. Storage

The sockets should remain in the shipping containers until ready for use to prevent deformation to the contact solder tines or damage to the housings. The sockets should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

3.3. Chemical Exposure

Do not store sockets near any chemical listed below as they may cause stress corrosion cracking in the contact solder tines.

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

3.4. PC Board

A. Material and Thickness

Board material typically is glass epoxy (FR-4, G-10, or equivalent). Board thickness is recommended to be a minimum of 1.57.

B. Recommended Layout

Recommended solder circuit pad pattern and pad dimensions, as well as tolerances, are shown in Figure 2.

NOTE

The alignment post holes on the pc board require precise drilling dimensions and the location of the circuit pads to these holes is critical. In addition to the circuit pads required for each contact solder tine (144 *places), there must be a circuit pad for each latch solder foot. See Figure* 2.

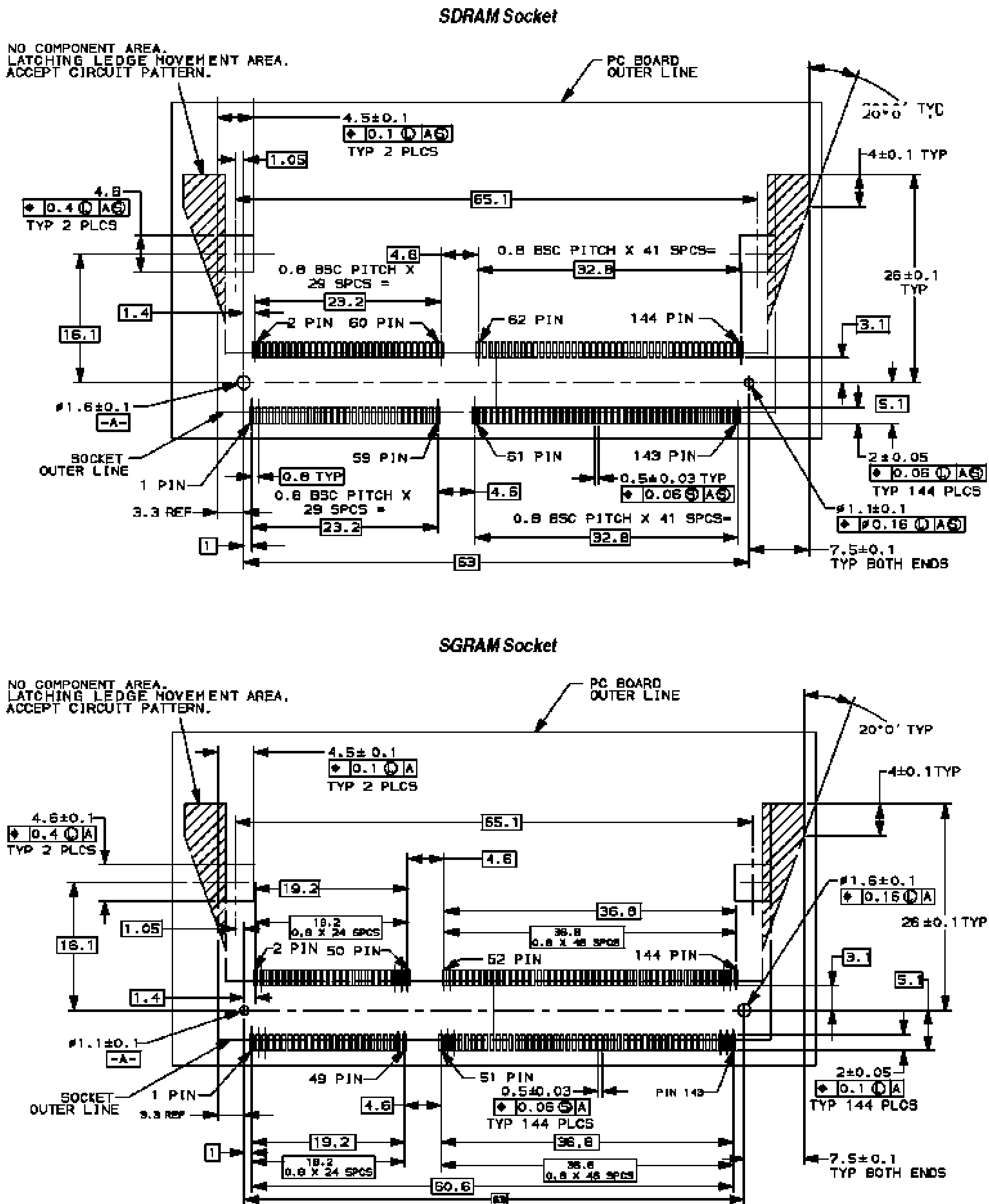

Figure 2

3.5. Solder Paste Characteristics

A1. SnPb alloy composition type shall be 63 Sn/37 Pb, 60 Sn/40 Pb, or 62 Sn/36 Pb/2 Ag.

A2. Pb-free solder alloy composition type shall be Sn95.5Ag3.9Cu0.6, allowing variation of the Ag content between 3.0-4.0 wt% and Cu content between 0.5-1.0 wt% with the balance being Sn.

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

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

3.6. Solder Volume

Minimum solder volume (V) before curing for each circuit pad is calculated by multiplying the pad length (a) by the pad width (b) by the stencil thickness (Tp):

$V= 0.15\ mm^3$

a = aperture dimension corresponding to pad width

b = aperture dimension corresponding to pad length

Tp = stencil thickness

The stencil aperture is determined by the circuit pad size and stencil thickness. It may be any shape as long as it prevents solder bridging from one pad to another. Generally, the thinner stencil will need a larger aperture to maintain the given volume of solder paste.

CAUTION

All traces must be covered by solder mask in the solder deposit area. Exposed traces could cause bridging and create a short, or wick solder away from the solder tines, producing a weak solder joint.

3.7. Solder Mask

Solder mask is recommended between all pads. 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. Additionally, there should be solder mask covering any traces in the area of the latch solder foot deposit. Liquid photo image-able or dry film solder masks are recommended.

3.8. Polarization

The sockets are polarized to the pc board by alignment post diameter differences. The post diameter of the SDRAM and SGRAM sockets are opposite one another, preventing the placement of the wrong socket onto the pc board.

The module is polarized to the socket by a keying feature (notch) and the corresponding voltage key in the socket. This prevents the module from being oriented incorrectly in the socket.

3.9. Socket Placement

A. Registration

The socket alignment posts must be placed over their intended pc board holes, and placed so that the socket is parallel with the pc board, then gently pressed downward on the socket housing and over each latch solder foot simultaneously.

When handling the sockets, pick them up by the housing only.

B. Seating Forces

Because the socket alignment posts are for polarization only (clearance and fit), the force required to seat the socket is minimal. Apply only that force necessary to seat the contact solder tines and each latch solder foot into the top surface of the solder paste.

C. Coplanarity

Optimally, the socket contact solder tines should be centered on the pc board circuit pads, as well as each solder latch foot should be centered on its solder pad. However, slight misalignment is permissible as shown in Figure 3.

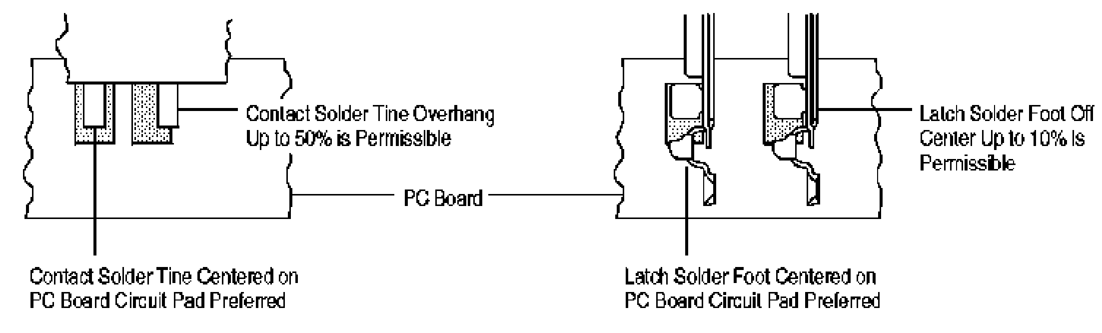

Figure 3

3.10. Soldering

A. Process

The socket is compatible with both infrared reflow and forced convection soldering processes. Information on soldering and soldering variables can be found in Corporate Bulletin 402-40.

NOTE

Due to the many variables involved with reflow processes (component density, location, orientation, etc.), it is recommended that the user conduct trial runs under actual manufacturing conditions to ensure product/process compatibility.

B. Temperature and Time

The reflow temperature to which the socket housing is subjected shall not exceed 260°C for 40 seconds.

CAUTION

As reflow time increases, the housing may become yellow, but the quality of the product will not be affected. Excessive temperatures may cause housing degradation.

C. Cleaning

Fluxes, residues, and activators must be removed. Cleaning procedures depend on the type of flux used on the solder line.

Cleaning compounds and chemicals that may be used on the sockets for up to five minutes without harmful effects are listed in Figure 4.

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 Ambience	
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 4

DANGER

Consideration must be given to toxicity and safety requirements recommended on the Material Safety Data Sheet furnished by the solvent manufacturer.

D. Drying

When drying cleaned assemblies and pc boards, make certain that temperature limitations of -18.1 to 40.6°C are met. Temperature extremes outside this range may cause housing degradation.

3.11. Module Assembly and Removal

A. Mating Module with Socket

Refer to Figure 5, and proceed as follows:

1. Tilt the module approximately 25° above the pc board, and move it in the direction of the housing card slot. Make sure that the key in the module and the key in the housing are aligned.

2. Push the module into the socket until the module bottoms. There should be a slight insertion force to engage the module into the contacts.

3. Rotate the module until it passes through the two metal latching ledges. There will be an audible clicking sound as the latching ledges pass over the edge of the module, indicating that insertion is complete.

4. Make sure that both metal latching ledges are completely engaged. If one latching ledge does not fully engage, push the module down in the area of the ledge until engagement occurs.

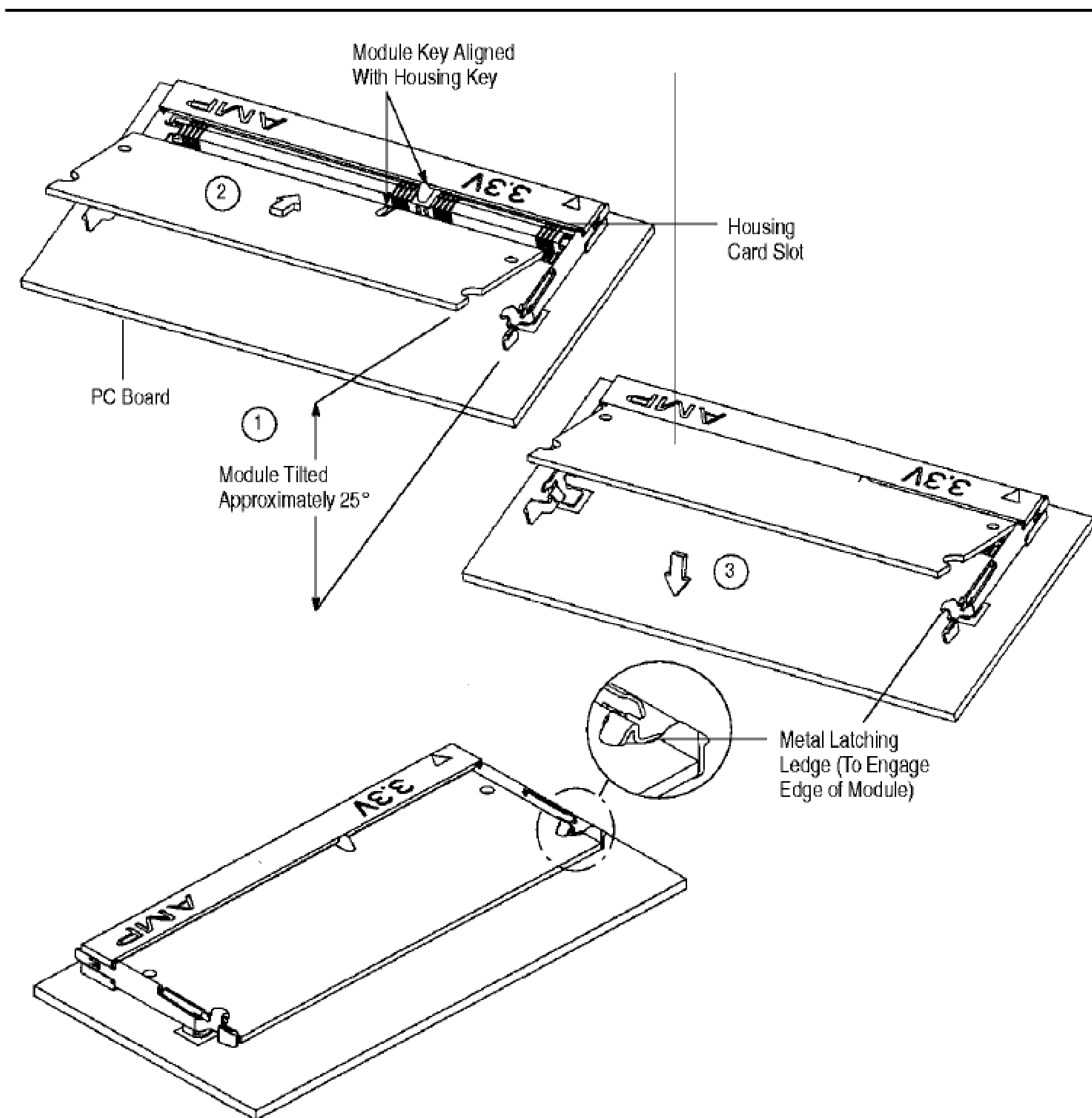

Figure 5

B. Module Removal

Refer to Figure 6, and proceed as follows:

1. Simultaneously move both latching ledges in the direction shown. Once the module is released, it will rotate upward approximately 25° from the pc board.

2. Pull the module straight out of the socket at this angle, trying not to move it side-to-side.

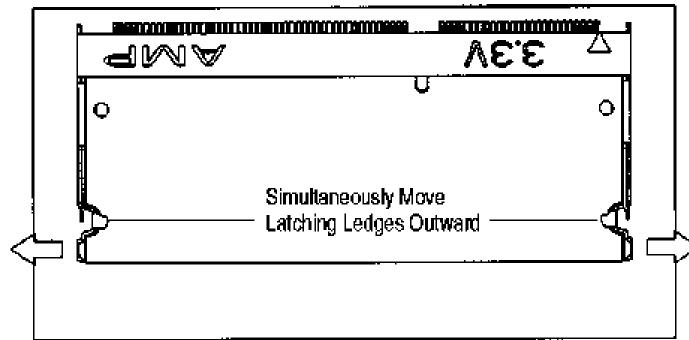

Figure 6

3.12. Repair

The socket may be removed from the pc board by standard de-soldering methods and replaced with a new socket.

4. QUALIFYING SUPPORT

AMP SO DIMM 144-position sockets are listed by Underwriters Laboratories Inc. (UL) under File E28476 and have been UL listed to Canadian safety standards.

5. TOOLING

No tooling is required for manual placement of the sockets. For automatic machine placement, a pc board support must be used to prevent bowing of the pc board during the placement of sockets on the board. It should have flat surfaces with holes or a channel large enough to receive the socket alignment posts. Robotic equipment must have a true position accuracy of 0.25 [.010] to ensure proper location and insertion of the contact solder tines. This includes gripper and fixture tolerances as well as equipment repeatability. It must use the socket datum surfaces detailed on the customer drawing to ensure reliable placement. See Figure 7.

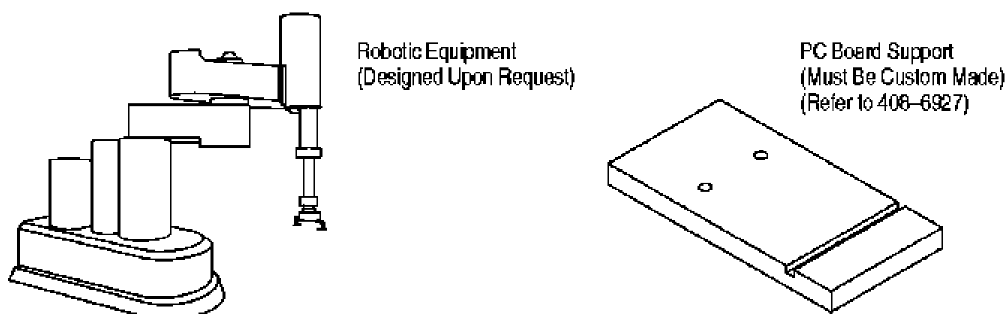

Figure 7

6. VISUAL AID

The illustration below shows a typical application of SO DIMM 144-position sockets. 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.

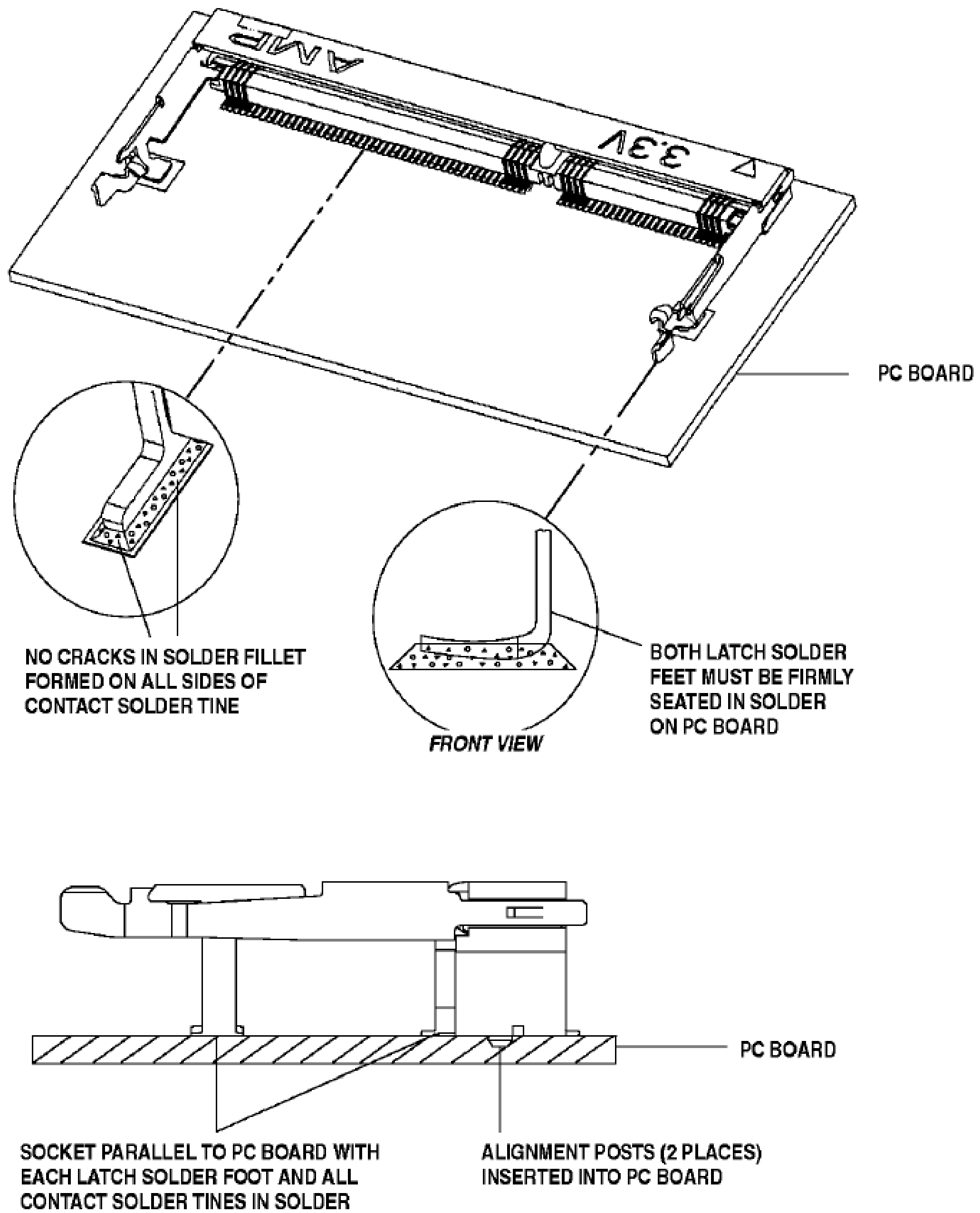

FIGURE 8. VISUAL AID