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 ±3°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the application requirements for AMP* Low Profile (LP) Screwdriver Actuated ZIF (Zero Insertion Force) PGA (Pin Grid Array) Sockets. The sockets will mate with high pin count PGA devices that have staggered or 1.27 x 2.54 [.050 x .100] contact patterns. The sockets consist of plastic housings and covers, and copper alloy contacts, and are available in a variety of contact patterns. The socket features a cover that keeps the empty socket in the open position. A standard flat–bladed screwdriver is all that is needed to actuate the socket.

Basic terms and features of components are provided in Figure 1.

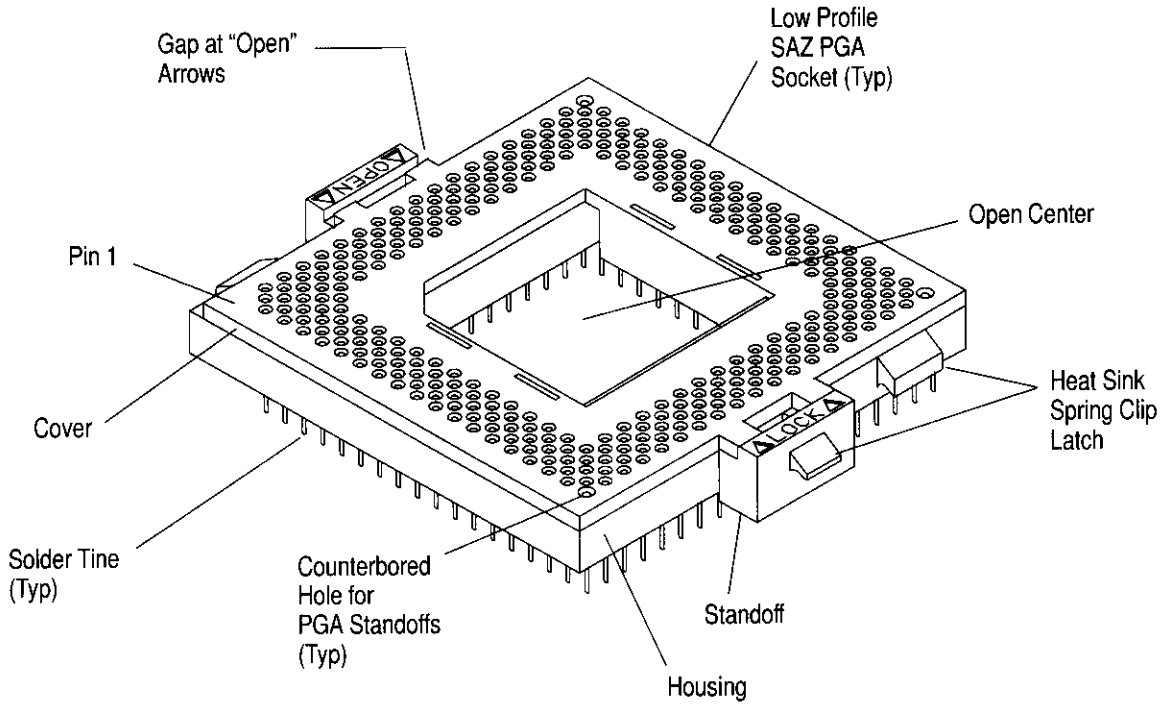


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

This paragraph is reserved for a revision summary of changes and additions made to this specification. No summary is required on this initial release, Revision O (Rev O).

2.2. Customer Assistance

Part Number 916732–1 and Product Code 3954 are representative numbers of the AMP Low Profile SAZ PGA socket products. Use of these numbers will identify the product line and expedite your inquiries through an AMP service network established to help you obtain product and tooling information. Such information can be obtained through a local AMP Representative (Field Sales Engineer, Field Service Engineer, etc.) or, after purchase, by calling the Tooling Assistance Center or the AMP FAX/Product Information number at the bottom of this page.

2.3. Drawings

AMP Customer Drawings for specific part numbers are available from the service network. The information contained in Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by AMP Incorporated.

2.4. Specifications

AMP Product Specification 108–1572–1 covers test and performance requirements.

2.5. Instructional Material

AMP Instruction Sheet 408–3355 provides installation procedures for SAZ PGA sockets.

AMP Corporate Bulletin 401–52 is available from the service network. This bulletin provides information on various flux types and characteristics along 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. Storage

Sockets should remain in the protective packaging until ready for use, to prevent deformation or overstressing of the contact solder tines, and to prevent damage to the plastic components.

3.2. Special Features

The LP SAZ PGA sockets have the following features:

A. Standoffs

The plastic housing is designed with 0.71 [.028]–high standoffs to allow easy printed circuit (pc) board cleaning after the soldering operation.

B. Acceptance of Various PGA Devices

Many different PGA pin patterns can be used by changing the hole pattern in the plastic cover, and by only loading socket contacts in the plastic housing cavities where required. When the PGA pattern is significantly smaller than the maximum allowable in the plastic cover, rows and columns of holes may exist in the cover around the outside edges. These holes balance the cover during the molding process and serve no other function. Contacts will be loaded in the plastic housing under the functional hole pattern only. In all cases where nonfunctional holes exist in the cover, a solid plastic border will separate nonfunctional from functional contact positions on all sides of the PGA pattern. See Customer Drawings for specific PGA pattern applications.

C. Counterbored Cavities

Many PGA devices are manufactured with standoffs on various corner pins. The LP SAZ PGA sockets accommodate these larger diameter standoffs by providing counterbored corresponding cavities in the plastic cover. These counterbores can and do occur at various positions in the many PGA patterns available. See Customer Drawings for specific PGA pattern applications.

D. Keying of PGA Device to Socket

The ability to selectively position cavities and contacts in both the plastic cover and the plastic housing also allows the option of keying the pattern to a specific PGA device, providing positive orientation of the device to the socket. This is done in most cases by eliminating a cavity on the cover in a corner corresponding to a missing contact pin on the PGA device. See Customer Drawings for specific PGA pattern applications.

E. Positive Position of Cover

The cover has an index mark which, when cycled to the open position, will keep the empty socket in the open position.

F. Pin 1 Identifier

The cover is designed with a distinct bevel on one corner, providing visual orientation to the pin 1 position of the PGA device.

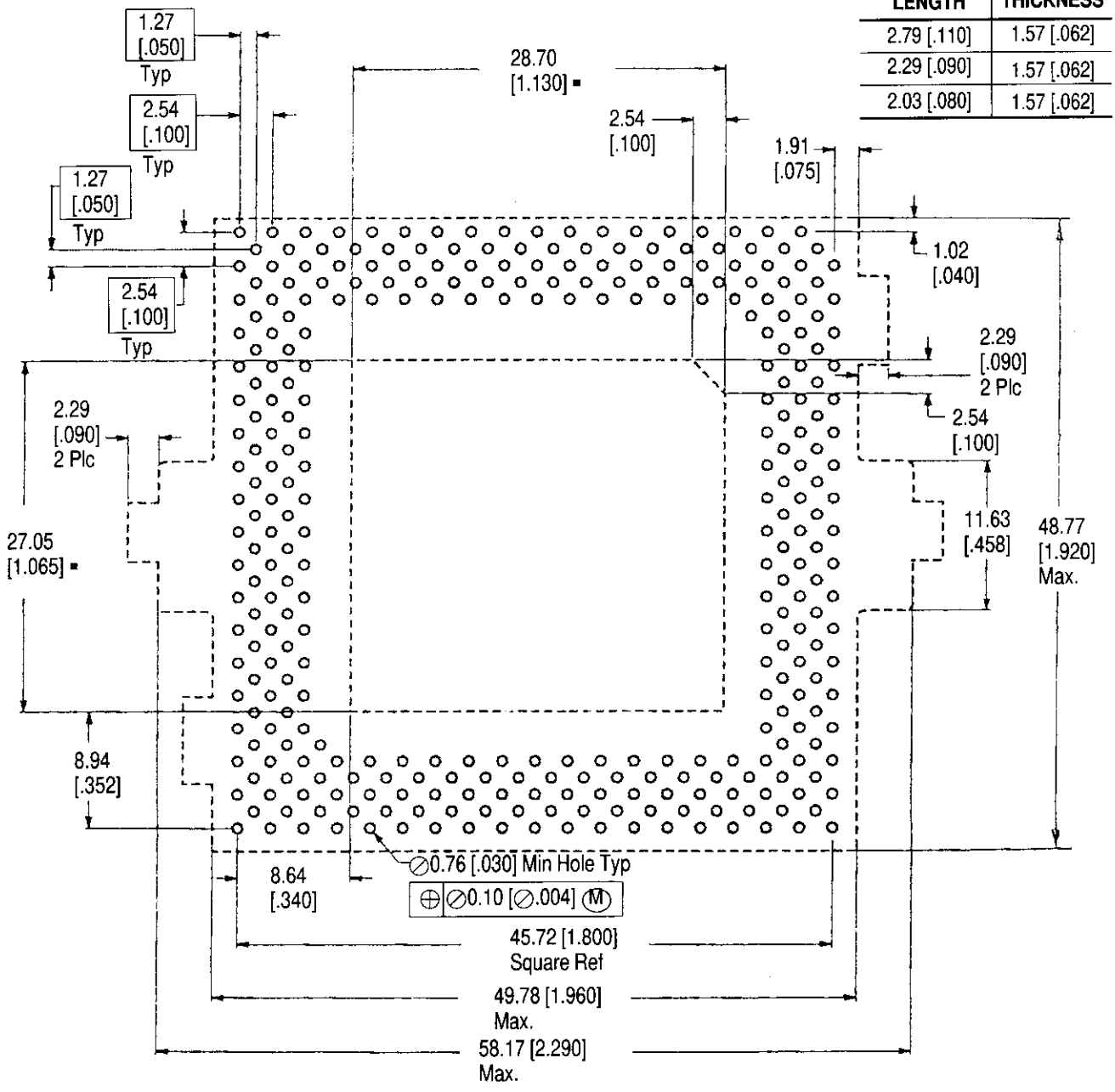
3.3. Printed Circuit Board

The LP SAZ PGA sockets are available with solder tine lengths to fit pc boards having the nominal thicknesses listed in Figure 2. For board thicknesses not listed, the tines must be long enough to receive a 360° solder fillet of integrity, holding each individual tine to the board. The Customer Drawing for a specific socket part number will show the tine length so that you may compare it to your board thickness.

Refer to Figure 2 for the pc board layout dimensions required for placement of a socket. The dimensions given are common to all layouts. Refer to Customer Drawings for specific PGA pattern dimensions, including distances from the plated–through hole pattern to the board edges or to adjacent sockets.

NOTE *Be sure to leave clearance space on the pc board for operation of the actuator tool, for PGA device placement and removal, device mounted heat–sinks, and any other application–specific space requirements.*

SOLDER TINE LENGTH	PC BOARD THICKNESS
2.79 [.110]	1.57 [.062]
2.29 [.090]	1.57 [.062]
2.03 [.080]	1.57 [.062]



▪ Minimum Open Center Through Socket

Figure 2

3.4. Positioning

Sockets should remain in their protective packaging until ready for use. Handle sockets by the housing and cover only, and not by the solder tines. Carefully align all of the socket solder tines with their respective pc board holes before inserting the tines into the holes. One misaligned tine creates little resistance, and could be bent easily. Solder tines can be straightened without damaging contacts.

3.5. Mounting

The dimension between the housing standoffs and pc board after soldering must not exceed that shown in Figure 5. Solder tacking socket contacts to the pc board or some other means can be used to hold the socket in place during the soldering process.

3.6. Soldering

A. Solder Recommendations

These sockets can be soldered to the pc board using standard soldering methods such as machine wave soldering, or hand solder techniques. We recommend using SN60 or SN62 solder.

1. Solder only after making sure that the housing standoffs are securely seated on pc board.

2. Prior to hand soldering, mate a PGA device (preferably a dummy device) to the socket, and make sure that the socket is closed. This stabilizes the socket spring contacts so that they will not be displaced from their normal operating positions. During hand soldering, be careful not to push on the ends of solder tines, thereby dislodging contacts from the socket housing. Rather, lay the soldering iron tip against the sides of the tines to heat them.

3. After soldering, inspect to ensure that no solder balls, bridges, or other visible shorting exists between adjacent solder tines. Each solder fillet must adhere 360° to the tine and pc board through–hole.

NOTE *Due to the tight pattern associated with interstitial contact placement, inspection techniques must provide a much clearer picture of possible areas of shorting than is necessary when using a 2.54 x 2.54 [.100 x .100] pattern.*

B. Soldering Guidelines

Refer to Paragraph 2.5 for instructional material that is available for establishing soldering guidelines.

C. Fluxing

Solder–type contact 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 one of the AMP phone numbers at the bottom of page 1 for consideration of other types of flux. Some fluxes that are compatible with these connectors are provided in Figure 3.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER†	ALPHA‡
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

† Product of Kester Solder Co.
‡ Product of Alphametals Inc

Figure 3

D. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Cleaning methods depend on the type of flux used. Consult the supplier of solder and flux for recommended cleaning solvents. The plastic used in LP SAZ PGA sockets is a 30% glass–filled LCP (Liquid Crystal Polymer). Tests per ASTM D618 indicate no adverse effects to this material when cleaned with the following solvents at boiling point for 5 minutes. See Figure 4.

CLEANER		TIME (Minutes)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110■	Aqueous		132	270
Bioact EC–7◆	Solvent	5	100	212
Carbitol●	Solvent	1	Room Ambience	
Isopropyl Alcohol	Solvent	5	100	212
Kester 5778❋	Aqueous	5	100	212
Kester 5779❋	Aqueous	5	100	212
Lonco 520●	Aqueous	5	100	212
Lonco 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 *Consider 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.*

NOTE *If you have a solvent that is not listed, consult an AMP Representative before using it with these sockets.*

E. Drying

When drying the cleaned, soldered assemblies, do not exceed the temperature limits of –55° to 105°C [–67° to 221°F].

CAUTION *Excessive temperatures may cause housing degradation.*

NOTE *To check insulation resistance or capacitance, we recommend that the part is allowed to stabilize for 24 hours after drying in order to obtain optimum values.*

F. Alignment

In order to function properly, the completed soldered socket and contact solder tines must conform to the dimensions and callouts shown in Figure 5.

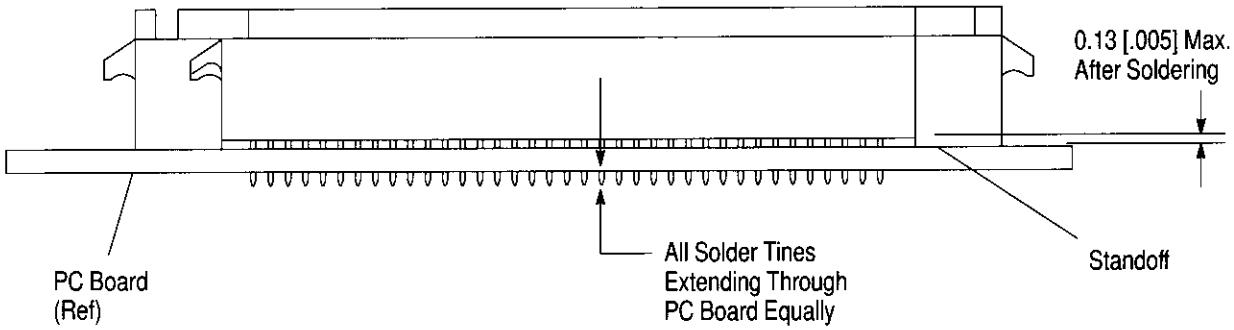


Figure 5

3.7. Intermateability

A. PGA Device Pin Cross–Section

These sockets are designed to mate with PGA devices having pins with a diameter of 0.46 ± 0.05 [.018 ± .002]. No special pin tip lead–ins are required, but some amount of chamfer on the pin tip will aid insertion.

B. PGA Device Pin Length

The PGA sockets accept pins 2.54 – 3.30 [.100 – .130] long.

C. PGA Device Pin True Position

The true position of the PGA package pins should be within 0.20 [.008] MMC (Maximum Material Condition).

D. PGA Device Pin Plating

The socket contacts are plated with gold to mate with gold plated pins. Other platings are available upon request from your AMP Representative.

3.8. Assembly Procedures (to load and lock device in socket) (see Figure 6)

The PGA socket features Zero Insertion Force (ZIF) mating and unmating. A standard flat–bladed screwdriver is all that is needed to actuate the socket.

1. Make sure cover is in open position (gap between cover and "OPEN" arrows denotes cover is open).
2. Align PGA device pin pattern with socket pattern (Pin 1 on socket is at chamfer).

CAUTION *PGA device must drop in freely; if not, remove PGA device, check pins for straightness, verify pattern match, and re–insert.*

3. Place finger on top of PGA device and apply slight downward pressure to ensure device is flush with socket surface and level with socket.
4. While maintaining slight downward pressure on device, place screwdriver into "LOCK" slot at a 30° angle. **Apply firm downward pressure on screwdriver to keep tip at bottom of slot.**
5. While maintaining firm downward pressure on screwdriver, push screwdriver handle forward to vertical position. The PGA device will lock into position.

CAUTION *Stop pushing on screwdriver when screwdriver is in vertical position. Damage to socket will result if screwdriver is forced beyond vertical.*

NOTE *There should be **no gap** between the "open" arrows and the edge of the cover.*

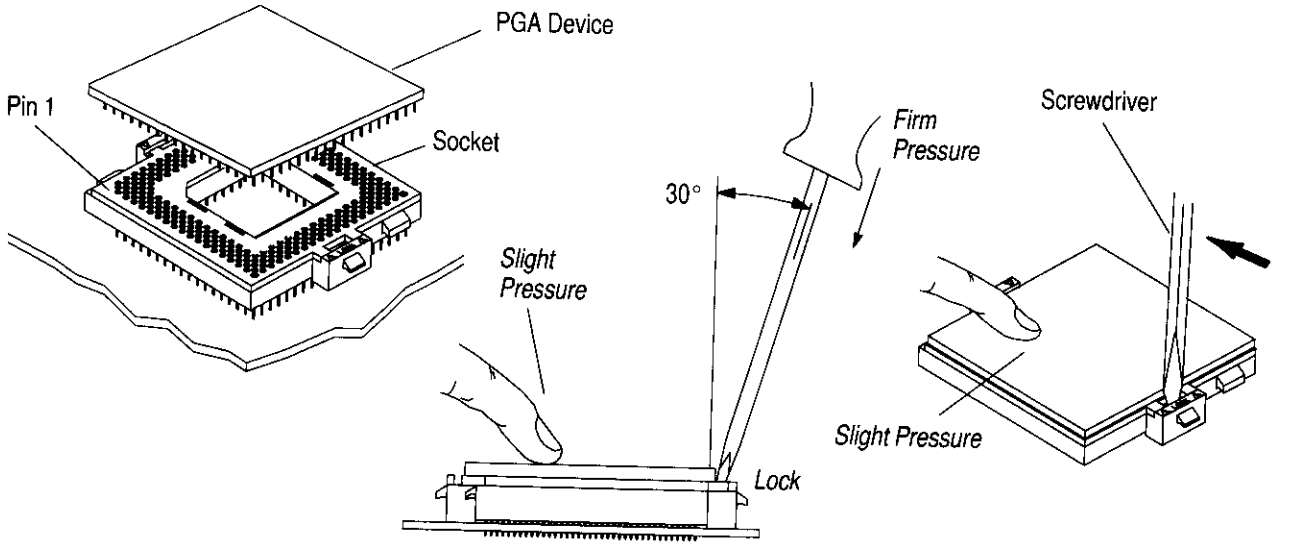


Figure 6

3.9. Heat Sink Installation (to attach a heat sink to socket) (see Figure 7)

NOTE *The SAZ socket has been designed to accommodate two types of heat sink clips ("Z" spring clip and clip–on socket strap).*

1. Lock PGA device in socket according to Paragraph 3.8.
2. Place heat sink on PGA device.
3. Clip heat sink on PGA device.

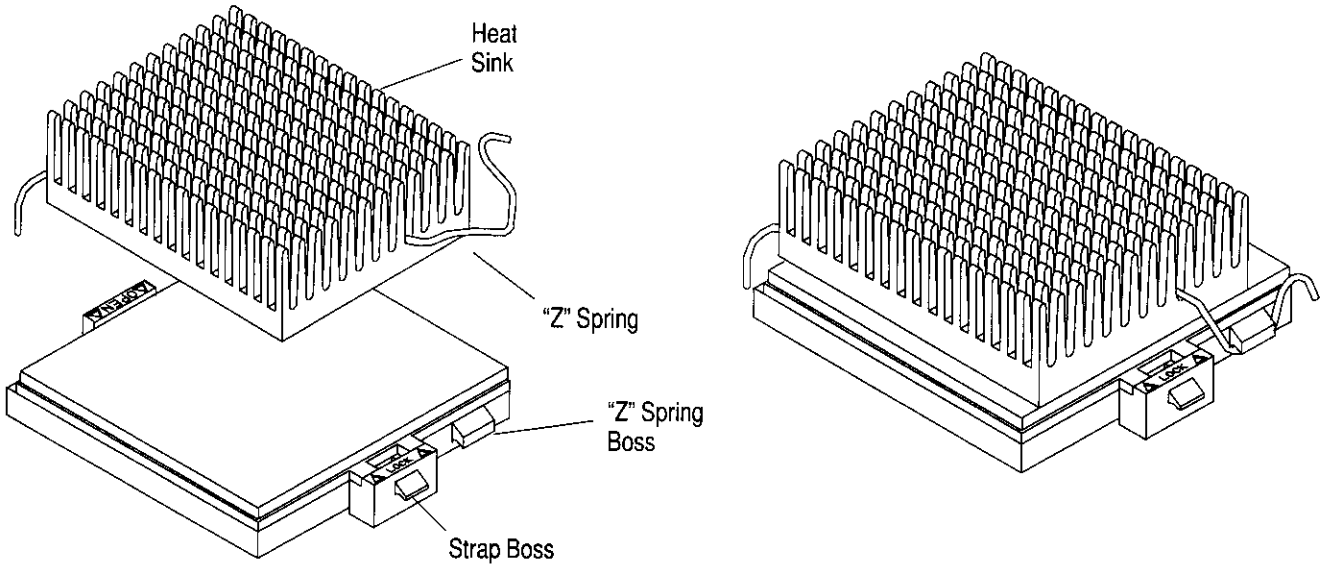


Figure 7

3.10. Disassembly Procedures (to unlock and remove device from socket)

1. Place screwdriver into "OPEN" slot at 30° angle. Apply firm downward pressure on screwdriver to keep tip at bottom of slot.
2. Place finger on top of PGA device and apply slight downward pressure.
3. Push screwdriver handle forward until vertical.

CAUTION *Stop pushing on screwdriver when screwdriver is in vertical position. Damage to socket will result if screwdriver is forced beyond vertical.*

4. QUALIFYING SUPPORT

The LP SAZ PGA sockets are not required to be listed or recognized by Underwriters' Laboratories, Inc. (UL), or the Canadian Standards Association (CSA).

5. TOOLING

The only tooling required for application of this product is a standard flat–bladed screwdriver (see Paragraph 3.8).

6. VISUAL AID

The following illustrations have been included to assist production personnel check for properly applied product. For dimensional inspection, refer to the details in the preceding pages of this specification.

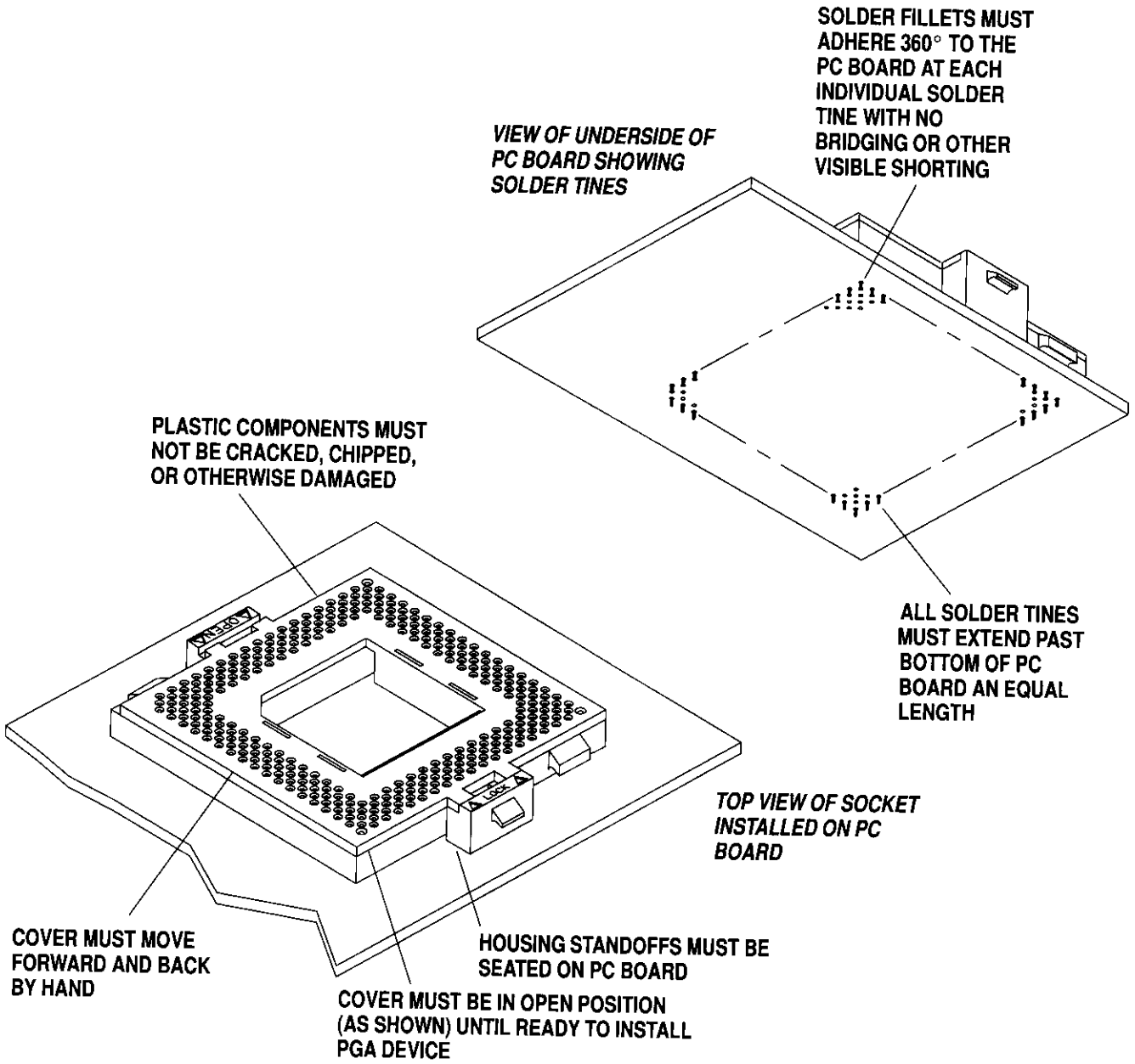


FIGURE 8. VISUAL AID