

**NOTE**



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  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 DDR4 Dual In-Line Memory Module (DIMM) Sockets–Solder Tail for main memory applications in networking equipment. The sockets are available in a 288–position with contact spacing on 0.80 mm centerlines (0.80mm pitch). The sockets are designed to connect processor modules (daughterboard) to printed circuit (pc) boards (motherboard).

The socket consists of a polarized housing containing pre–installed through hole contacts. Each contact is a solid one–piece construction with a tapered lead–in solder tine. The socket features module support towers and extractors designed to support and hold the module in the mated position, and a card slot which contains a molded–in voltage key and function key to ensure polarization with the mating daughterboard (which must be slotted to accept the keys). The socket features boardlocks to provide retention for the socket during soldering or alignment posts to aid in pc board alignment during mating. The socket also features standoffs and molded–in circuit identification on the mating face. The sockets are designed for manual placement on the pc board.

When corresponding with Tyco Electronics 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.

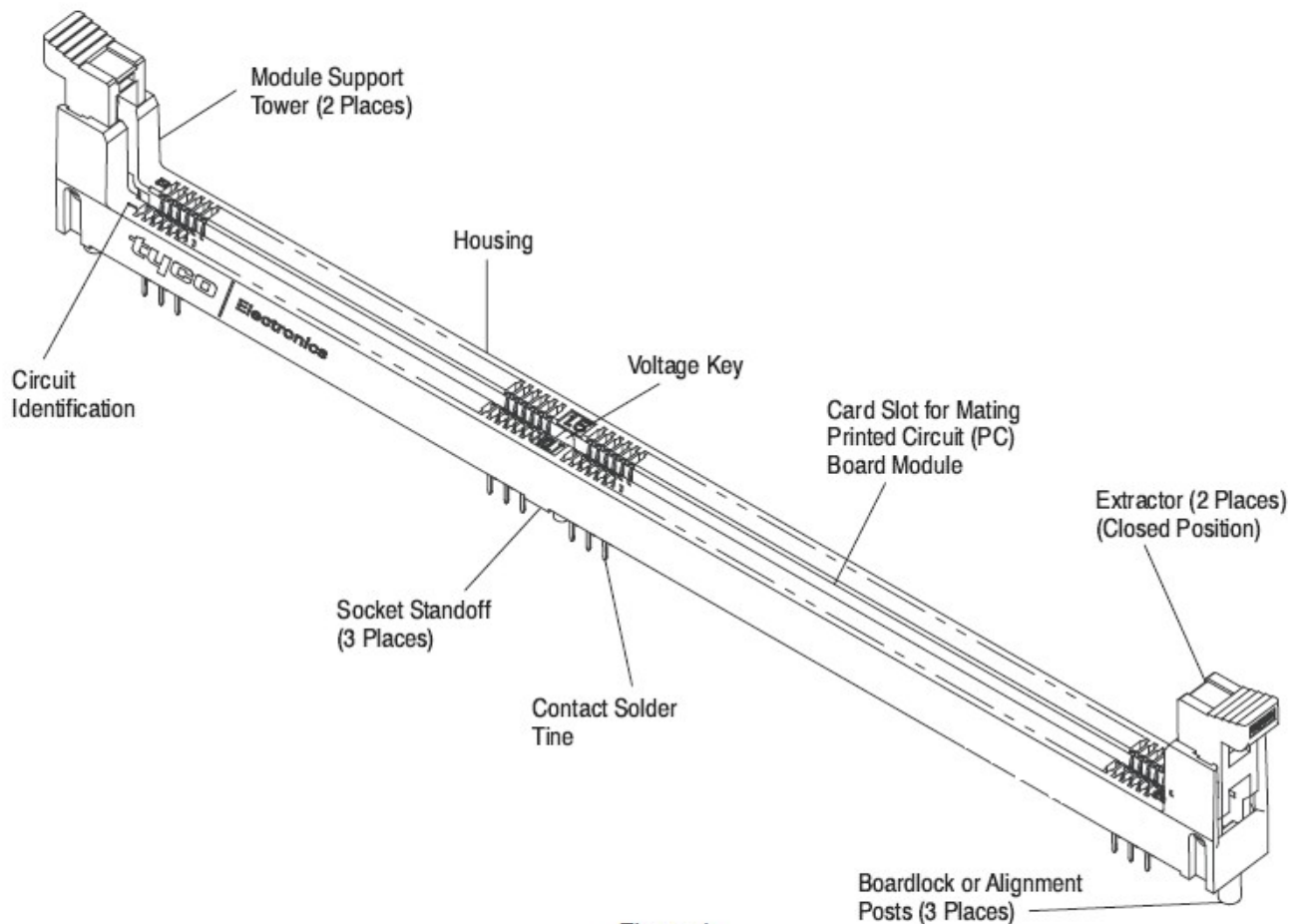


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Updated document to corporate requirements
- New format

### 2.2. Customer Assistance

Reference Base Product Part Number 2308107 and Product Code E449 are representative numbers of DDR4 DIMM Sockets–Solder Tail. 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 Tyco Electronics Representative or, after purchase, by calling the Product Information Center at the number at the bottom of page 1.

### 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, the Customer Drawing takes preference.

### 2.4. Manuals

Manual 402–40 is available upon request and 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.

### 2.5. Specifications

Product Specification 108–115124 and Test Report 501–115135 provide product performance requirements and test information. Test Specification 109–11 provides solderability requirements and evaluation methods. Workmanship Specification 101–21 provides solder fillet requirements.

## 3. REQUIREMENTS

### 3.1. Safety

Do not stack socket packages so high that the shipping containers buckle or deform.

### 3.2. Special Feature

The socket supports memory capacity to 128 GB.

### 3.3. Limitations

Socket assemblies are designed to operate in a temperature range of  $-55^{\circ}$  to  $105^{\circ}\text{C}$  [ $-67^{\circ}$  to  $221^{\circ}\text{F}$ ].

### 3.4. Material

The housing and extractors are made of high temperature nylon. The contacts are made of copper alloy and the solder tines are plated with tin matte over nickel. The boardlocks are made of stainless steel.

### 3.5. Storage

#### A. Shelf Life

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

#### B. Chemical Exposure

Do not store sockets 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

### 3.6. PC Board

#### A. Material and Thickness

The pc board material must be glass epoxy (FR–4 or G–10). Refer to the customer drawing for various tail lengths and corresponding pc board thicknesses.



Contact the Product Information Center at the number listed at the bottom of page 1 for suitability of other board materials and thicknesses.

**B. Tolerance**

Maximum allowable bow of the pc board must be 0.08 mm over each 25.4 mm of length of the socket.

**C. Hole Dimensions**

The pc board holes for the socket contact solder tines must be plated through. The drilled hole size, plating types, and plating thickness will depend on application requirements. The finished hole size must be as stated to provide unrestricted insertion and ensure adequate application of solder to the solder tines. See Figure 2.

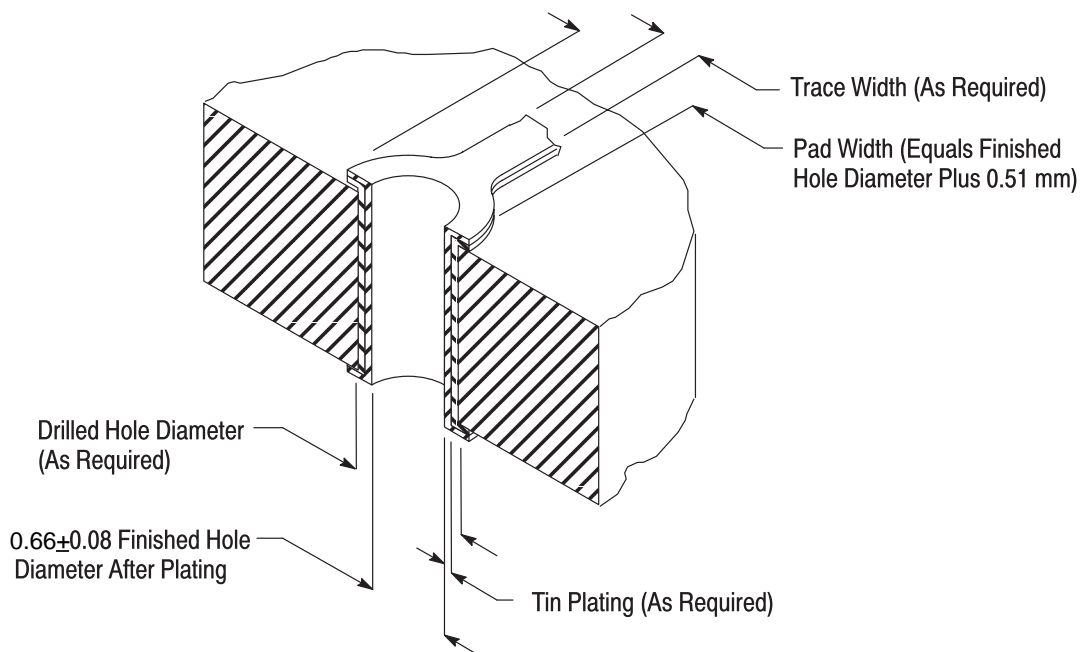


Figure 2

**D. Layout (Motherboard)**

The contact holes and boardlock/alignment post holes in the pc board must be precisely located to ensure proper placement and optimum performance of the socket. The pc board layout dimensions and tolerances shown in Figure 3 must be observed when preparing pc boards for the socket styles. The layout shows the top (component) side of the board.



- 1 Keep out zone.
- 2 Finished hole size. 0.15 mm maximum angular ring.
- 3 Datum -G- is connector side surface of pc board.

288-Position Solder Tail DDR4

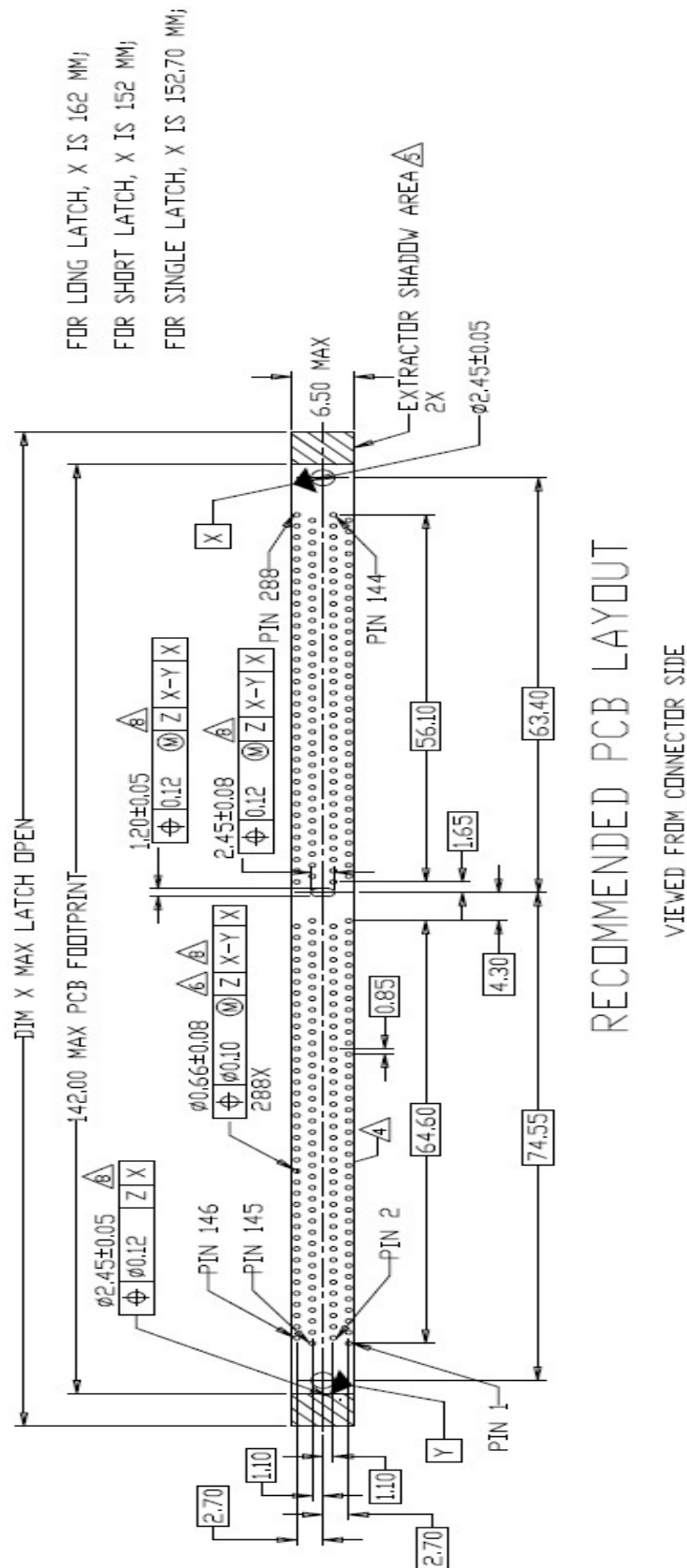


Figure 3

### 3.7. Socket Spacing

Care must be used to avoid interference between adjacent sockets and other components. The minimum allowable distance between sockets, measured from housing end to housing end, to ensure proper assembly is provided in Figure 4.

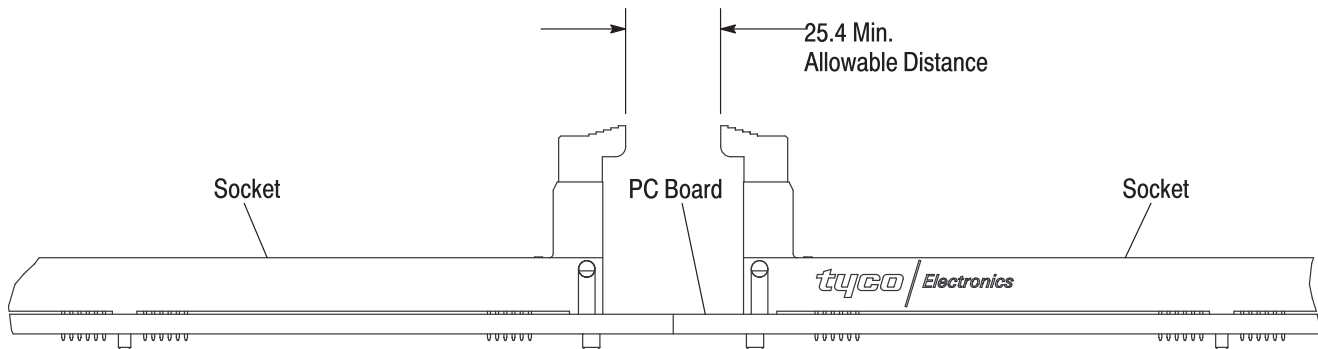


Figure 4

### 3.8. Socket Placement

When placing sockets on the pc board, make sure that the socket number one position is aligned with the number one position board hole. Boardlocks or alignment posts must be aligned and started into the matching holes before inserting the contact solder tines into respective holes. Avoid applying in-line force which could cause irreparable damage to the boardlocks/alignment posts and contact solder tines. The socket must be kept parallel to the full length of the pc board.



*Sockets should be handled only by the housing to avoid deformation, contamination, or damage to the contact solder tines.*

### 3.9. Soldering



*The boardlocks/alignment posts should be the only means of retaining the socket to the board during soldering. Clinching is not recommended as a method of retention.*

The pc board pads must be solderable in accordance with Test Specification 109–11. Observe guidelines and procedures when soldering contacts. Solder, clean, and dry contacts according to the following:

#### A. Flux Selection

Contact solder tines must be fluxed prior to soldering with a no-clean, 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 Product Information at the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these sockets are provided in Figure 5.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION
			ALPHA
NO-CLEAN	High	Noncorrosive	RF800
	Mild	Noncorrosive	EF-9301

Figure 5

**B. Process**

The sockets should be soldered using wave, non-focused infrared (IR) reflow, or equivalent soldering technique. Refer to Manual 402-40 for soldering guidelines. The reflow temperature and time to which the housing can be subjected is specified in Figure 6.

SOLDERING PROCESS	TEMPERATURE (Max)	TIME EXPOSED (Max)
Wave	260°C [500°F]	10 Seconds
IR	Oven Peak 225°C [437°F]	40 Seconds
	Ramp 1-3°C [33.8-37.4°F]	1 Second

Figure 6

**3.10. Checking Installed Socket**

All solder joints should conform to those specified in Workmanship Specification 101-21 and all other requirements specified in this document. The housing standoffs must be seated on the pc board not exceeding the dimension shown in Figure 7.



*Due to the 28-ohm system impedance requirement for the Rambus channel, it is important to minimize tilt of the socket and adhere to the seating requirement.*

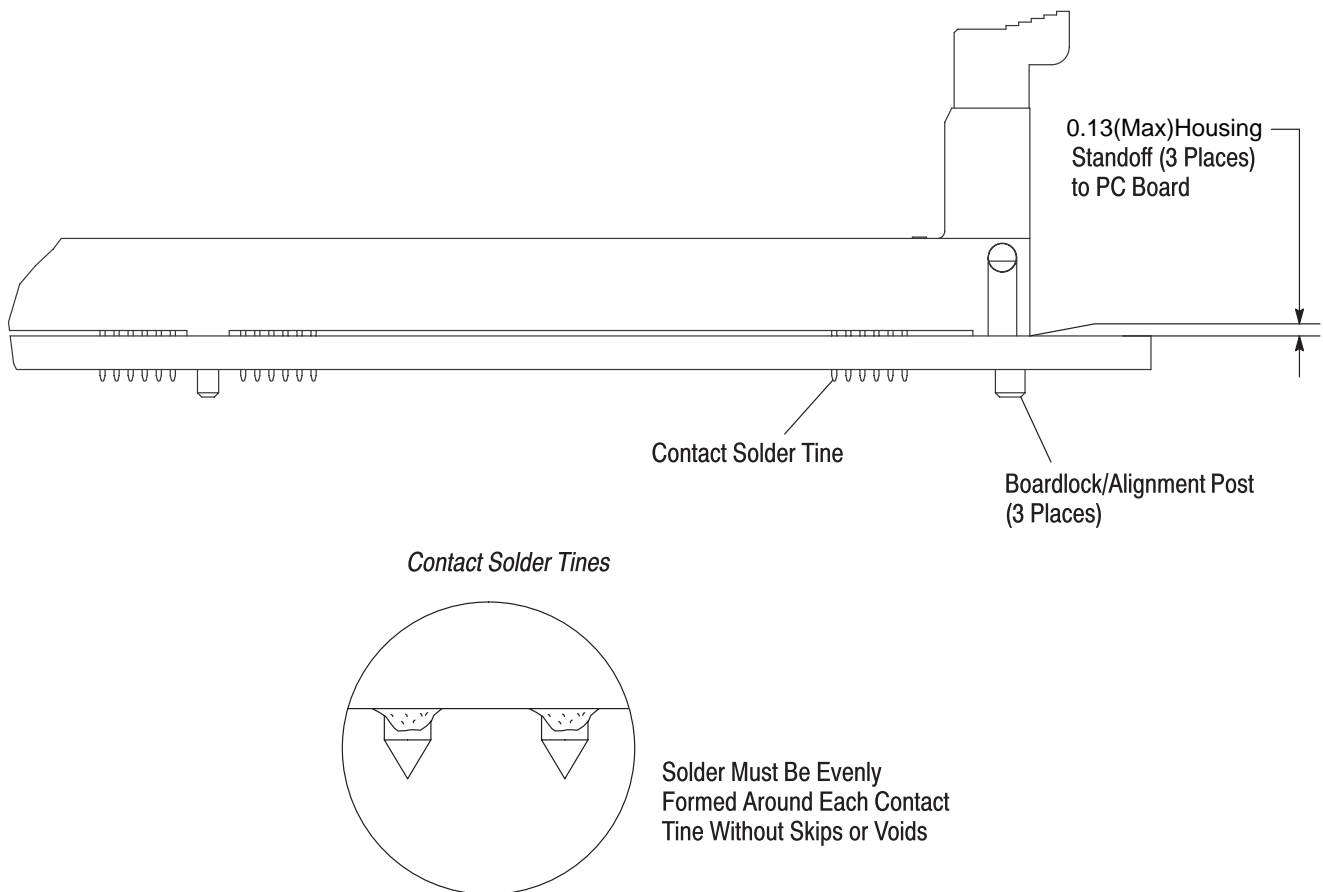


Figure 7

**3.11. Daughterboard Configuration**

Daughterboard configuration must be in accordance with the dimensions and tolerances provided in Figure 8.

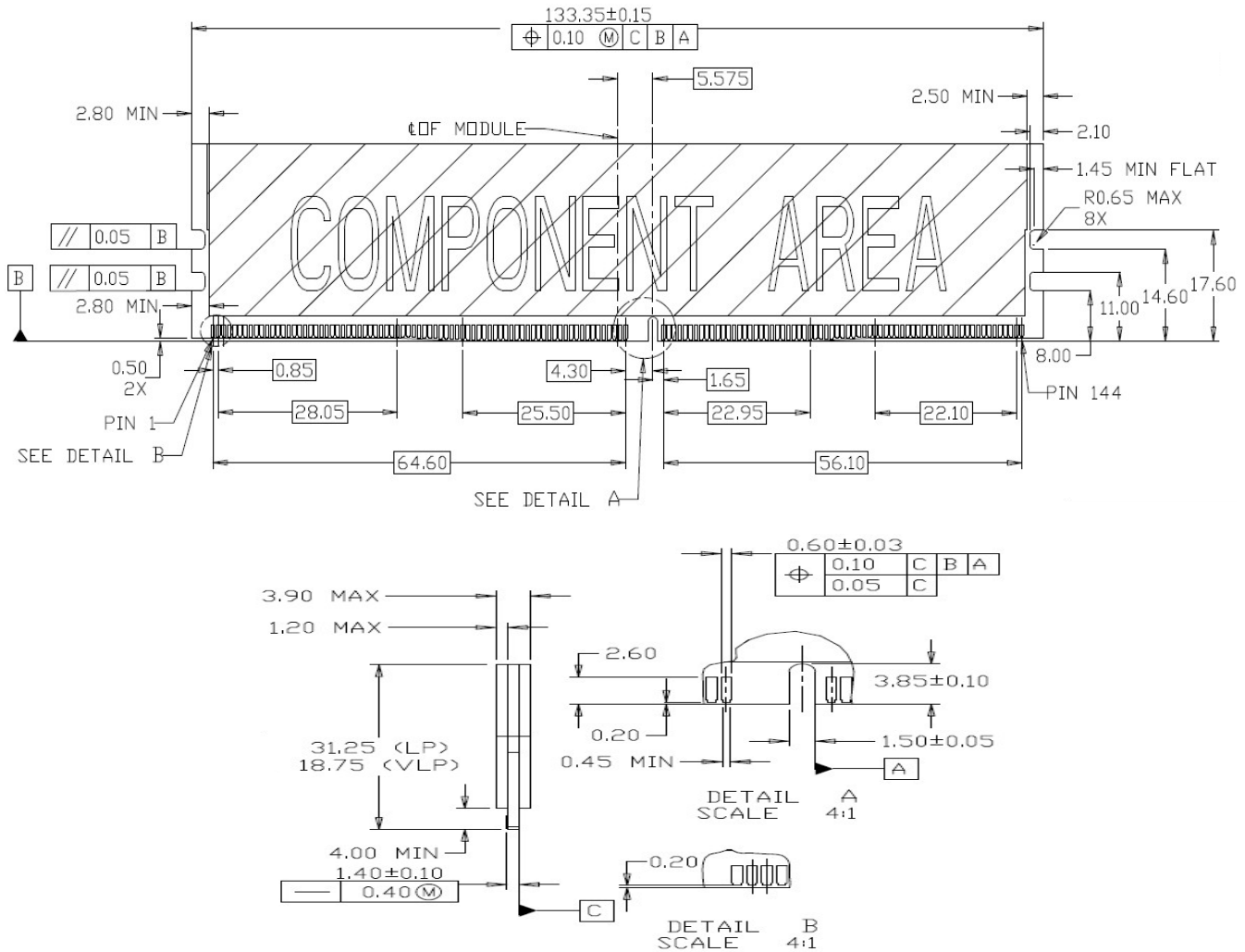


Figure 8

### 3.12. Processor Module Mating and Unmating



When mating or unmating module, care should be taken to prevent longitudinal rocking of the module with respect to the socket. Angles greater than 3° could cause damage to the housing or misregistration of the contacts and module circuit pads. Refer to Figure 9.

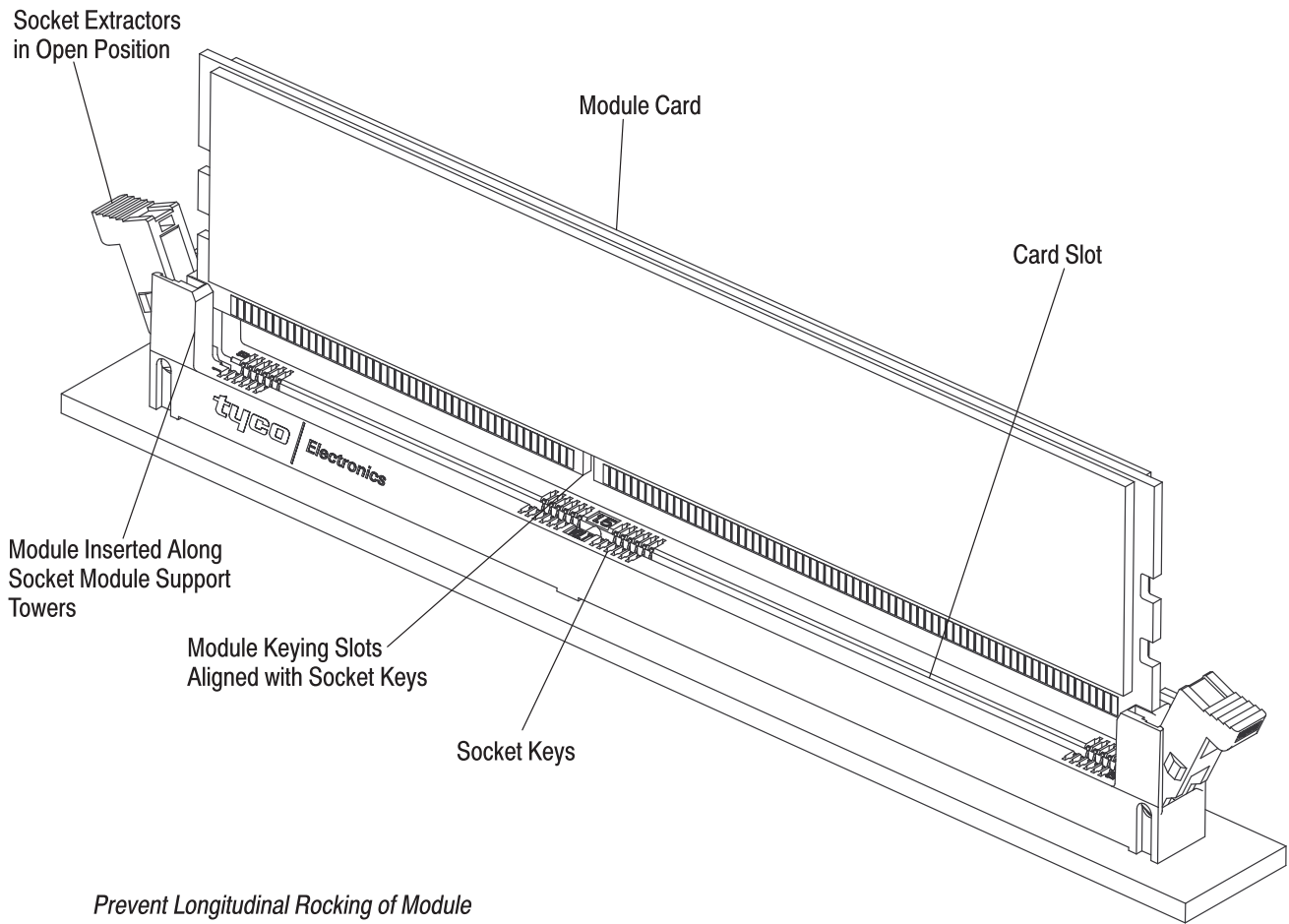
The module must be mated to the socket according to the following requirements:

1. The socket extractors must be moved to the open position. See Figure 9.
2. The keying slots of the module must align with the keys of the socket.
3. The module must be slid along the interior walls of the module support towers of the socket and into the card slot. The extractors must rotate inward until there is an audible click. The module must be fully seated, and the extractors must be in the closed position.

The module must be removed from the socket according to the following requirements:

1. The extractors must be simultaneously rotated away from the module. As the extractors rotate outward, the module must move out of the socket. When the extractors are fully rotated open (25° away from end of housing), the module must be completely disengaged from the socket.
2. The module must be carefully slid straight out of the module support towers.





*Prevent Longitudinal Rocking of Module*

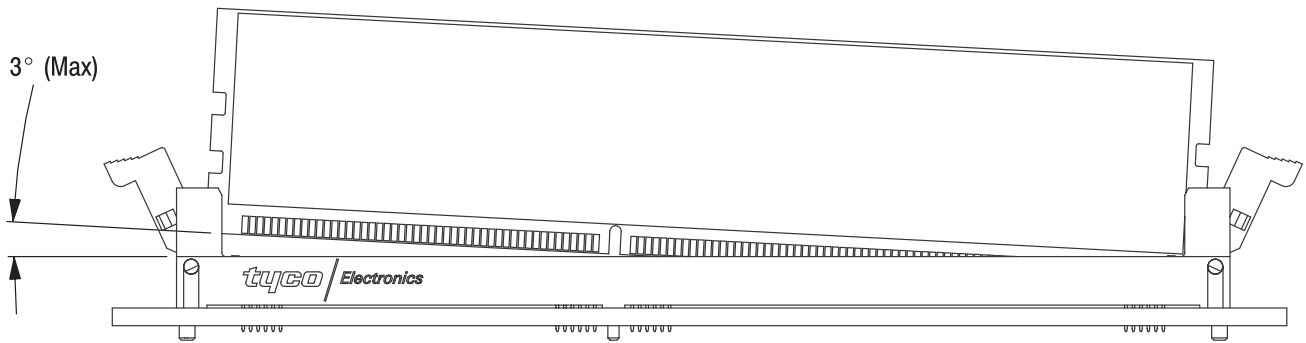


Figure 9

**3.13. Repair**

Damaged sockets must be removed, discarded, and replaced. The contact solder tines and boardlocks will require desoldering.

**4. QUALIFICATION**

DDR4 DIMM Sockets are Qualified to INTEL 288 Pin DDR4 Memory Connector Specification.

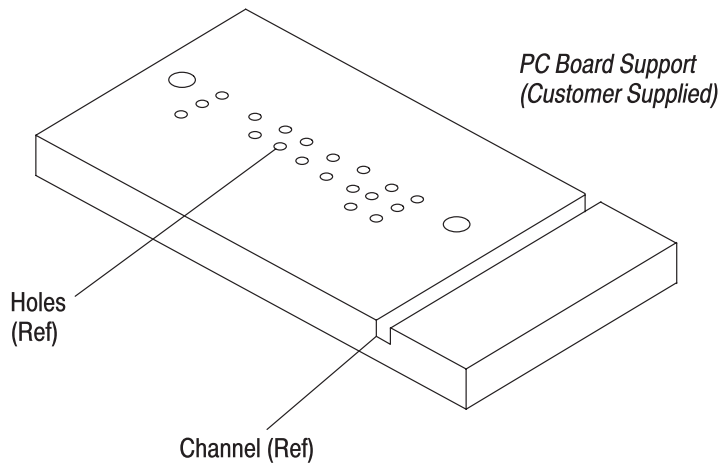


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## 5. TOOLING

No tooling is required for placement of the sockets onto the pc board. A pc board support must be used to prevent damage to the socket components during the placement of socket on the board. It should have flat surfaces with holes or a channel large enough and deep enough to receive the socket contact solder tines and boardlocks. See Figure 10.

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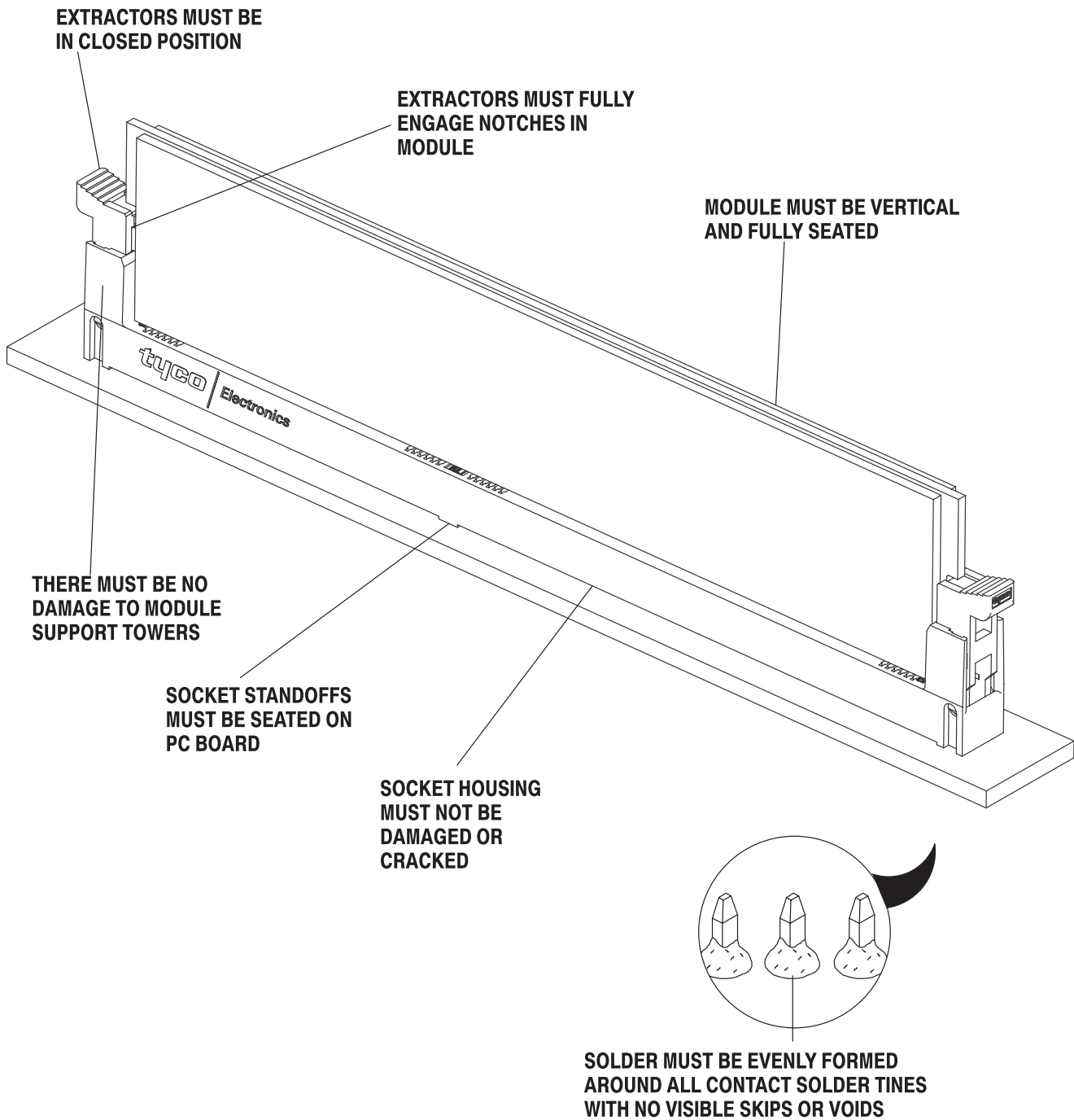


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Figure 10

**6. VISUAL AID**

Figure 11 shows a typical application of a DDR4 DIMM Socket–Solder Tail. 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 11. VISUAL AID**