

Scalable Light Emitting Diode (LED) Socket

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 ± 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 the scalable LED socket. The scalable LED socket is designed to interface with various chip-on-board (COB) LEDs. This socket allows direct attachment of a COB LED to a cooling device using two customer-supplied standard No. 4 or M3 screws and provides poke-in termination to electrically connect to the LED. This socket is available in a 1-piece or 2-piece configuration to support various LED lighting applications.

NOTE


Refer to the socket Customer Drawing for LED applicability and fitment.

The socket consists of a housing and an integrated electrical contact. The maximum acceptable LED substrate thickness is 2.0. The socket is available with a thermal spring for applications where the LED substrate is less than 1.50 thick to ensure adequate thermal performance. The housing features an alignment post to aid in positioning the socket on the cooling device, screw hole that accepts a customer-supplied screw for mounting, a pocket (L-shaped cutout area) that aligns with the outer perimeter of the COB LED to aid in properly aligning the socket with the COB LED, and a wire entrance hole. An embossed arrow at the wire entrance hole indicates the direction for wire insertion. The 1-piece socket includes integral joiners that hold 2 sockets together.

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.

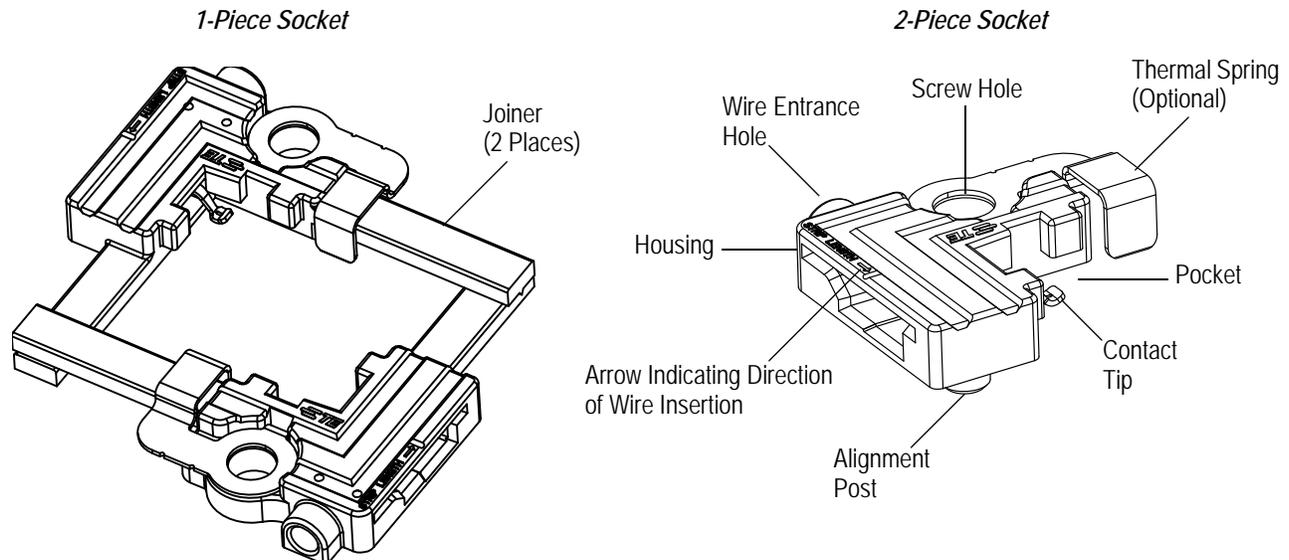


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Removed manufacturers from Section 1

- Added maximum acceptable LED substrate thickness to Section 1
- Changed Section 3.9

2.2. Customer Assistance

Reference Product Base Part Numbers 2154857 and 2154874 and Product Code L836 are representative of the scalable LED socket. Use of these numbers will identify the product line and help you to obtain product and tooling information. Such information can be obtained through a local Representative, by visiting our website at www.te.com, or by calling PRODUCT INFORMATION or the TOOLING ASSISTANCE CENTER at the numbers 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, call PRODUCT INFORMATION at the number at the bottom of page 1.

2.4. Specifications

Design Objective 108-133005 provides expected product performance and test information.

3. REQUIREMENTS

3.1. Safety

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

3.2. Storage

A. Shelf Life

The sockets should remain in the shipping containers until ready for use to prevent deformation. 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.

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

3.3. Wire Selection and Preparation

A. Selection

The sockets will accept solid, pre-bond, and stranded copper wire sizes 22 to 18 AWG with an insulation diameter equal to or less than 2.10. For pre-bond wire, there must be 16 strands or less, and for stranded wire, there must be 16 strands. Refer to Figure 2.

| WIRE | | WIRE MUST CONFORM TO UNDERWRITERS LABORATORIES INC. (UL) SPECIFICATION |
|------------|----------|--|
| SIZE (AWG) | TYPE | |
| 22 | Solid | UL 1007-22 |
| | Pre-Bond | UL 1007-20 (7 Strands) |
| 18 | Solid | UL 1007-18 |
| | Pre-Bond | UL 1007-18 (16 Strands) |
| | Stranded | UL 1007-18 (16 Strands) |

Figure 2

B. Preparation

The wire must be stripped within the dimensions provided in Figure 3.

For stranded wire, it is recommended to NOT twist the strands after stripping the insulation. Stranded wire should be straight (or slightly twisted), as when the wire was manufactured, for ease in inserting the wire into the socket wire entrance hole.



Wire conductors must not be nicked, cut, or scrapped during or after the stripping operation.

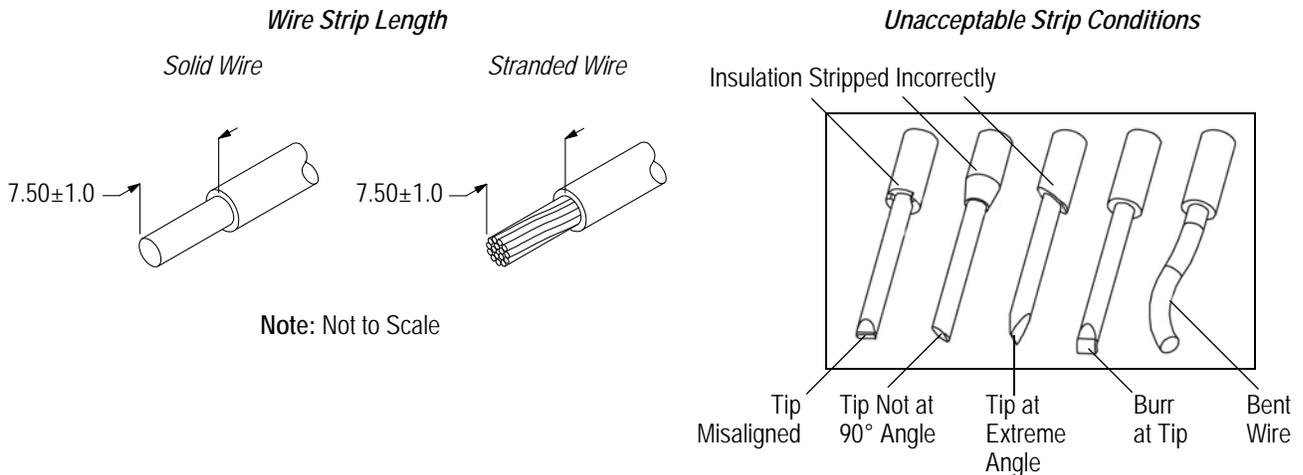


Figure 3

3.4. Cooling Device

The cooling device must be clean and flat with no crowns or peaks in the mounting area. The hole pattern must be drilled and tapped in the cooling device and designed using the dimensions provided on the customer drawing for the specific socket. A reference sample of the hole pattern is shown in Figure 4.

Reference Sample of Cooling Device Hole Pattern

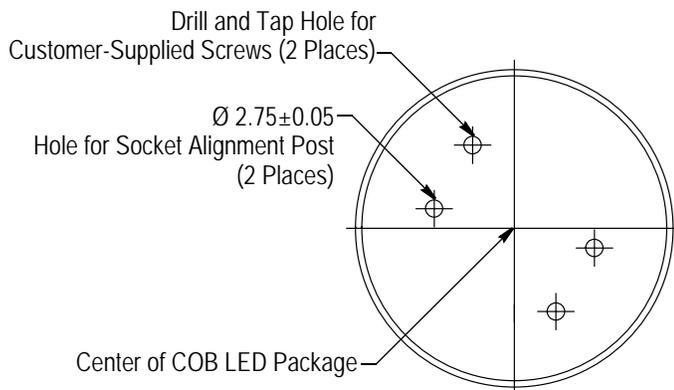


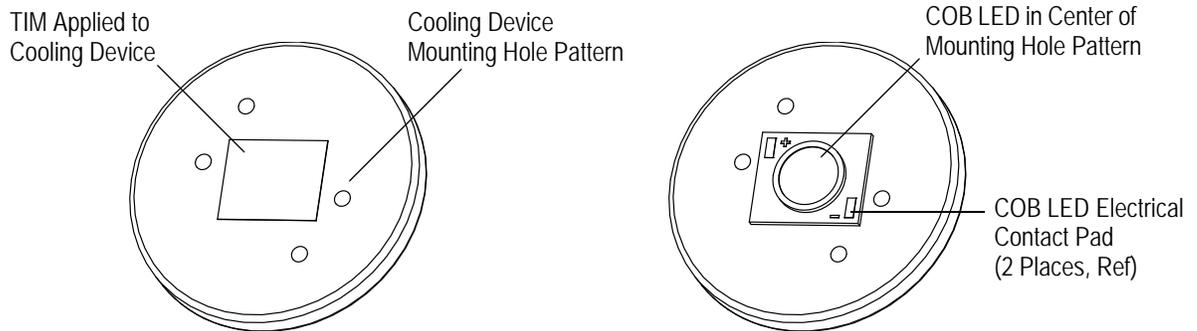
Figure 4

3.5. Mounting

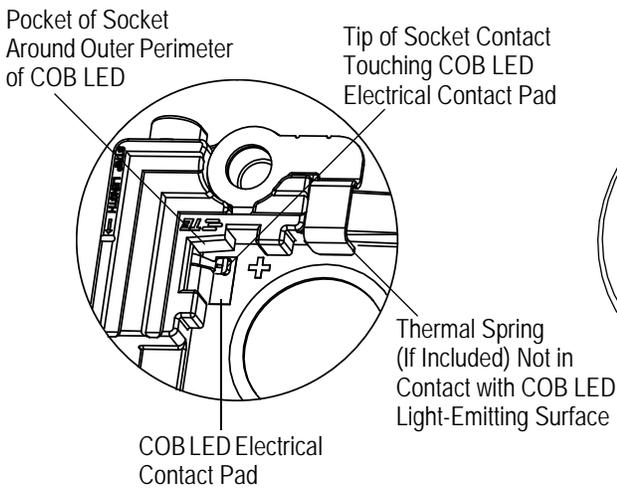
1. The cooling device must be prepared:

- a. A thermal interface material (TIM) must be applied to the cooling device according to the COB LED manufacturer's instructions. The socket will accommodate a TIM having a maximum thickness of 0.35. Refer to the COB LED manufacturer's instructions for recommended TIMs. Refer to Figure 5, Detail A.
- b. The COB LED must be placed in the center of the mounting hole pattern of the cooling device. Refer to Figure 5, Detail A.

Detail A

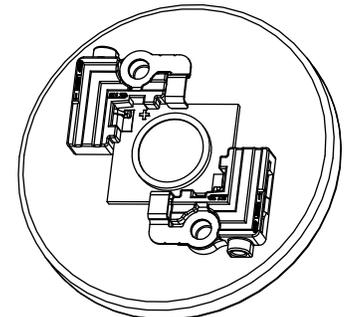
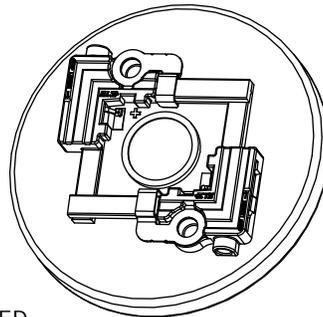


Detail B

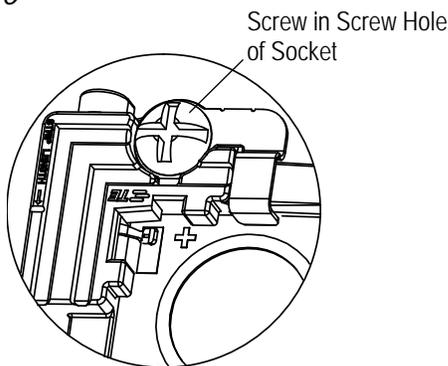


1-Piece Socket

2-Piece Socket



Detail C



1-Piece Socket

2-Piece Socket

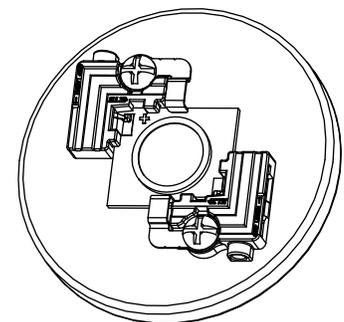
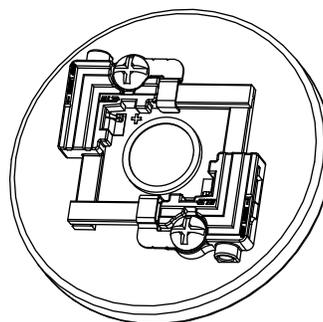


Figure 5

2. The socket must be placed on the cooling device:

The socket must be placed over the COB LED so that the pocket aligns with the outer perimeter of the COB LED. The tip of the socket contact must touch the electrical contact pad of the COB LED. The thermal spring (if included) of the socket must NOT be in contact with the COB LED light-emitting surface. Refer to Figure 5, Detail B.



Care must be taken when placing the socket over the top of the COB LED; otherwise damage to the COB LED could occur.

3. The socket must be secured to the cooling device:

A customer-supplied No. 4 or M3x6-mm (minimum) screw must be threaded through the screw hole of the socket and into the tapped hole in the cooling device. Each screw must be tightened to a torque between 0.28 and 0.45 N [2.5 and 4 in.-lb]. See Figure 5, Detail C.



To protect against corrosion, screws from ferrous metals (metals other than stainless steel) should be zinc plated or have an equivalent protective coating. It is recommended using button head screws; use of flat head screws is not recommended.

3.6. Wire Insertion

The stripped end of each wire must be inserted into a wire entrance hole of the socket until the wire stops. Each wire must be inserted in the direction of the embossed arrow. See Figure 6.

The wire conductor(s) must be fully bottomed in the socket wire entrance hole and must not be visible. The end of the wire insulation must be inside the wire entrance hole and surrounded by the socket housing.

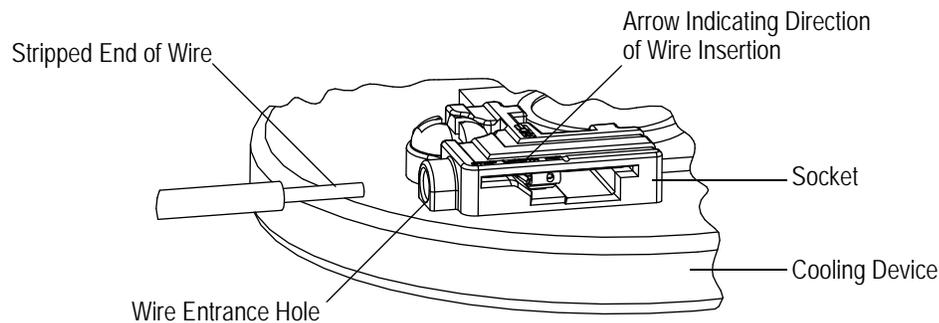


Figure 6

3.7. Removal

The socket can be removed from the cooling device by removing the screws. For re-use, the wire or any part of the wire must not be damaged or dislodged. The contact tip and beams of the socket must not be damaged.

3.8. Replacement and Repair

Deformed or damaged sockets must not be used. The socket is not repairable. For re-use, the wire must not be removed from the socket. The socket must not be re-terminated.

The LED of the socket can be replaced. Refer to the instructions given by the COB LED manufacturer.

3.9. QUALIFICATION

The scalable LED socket is Recognized by Underwriters Laboratories Inc. (UL)/CSA International in File E28476.

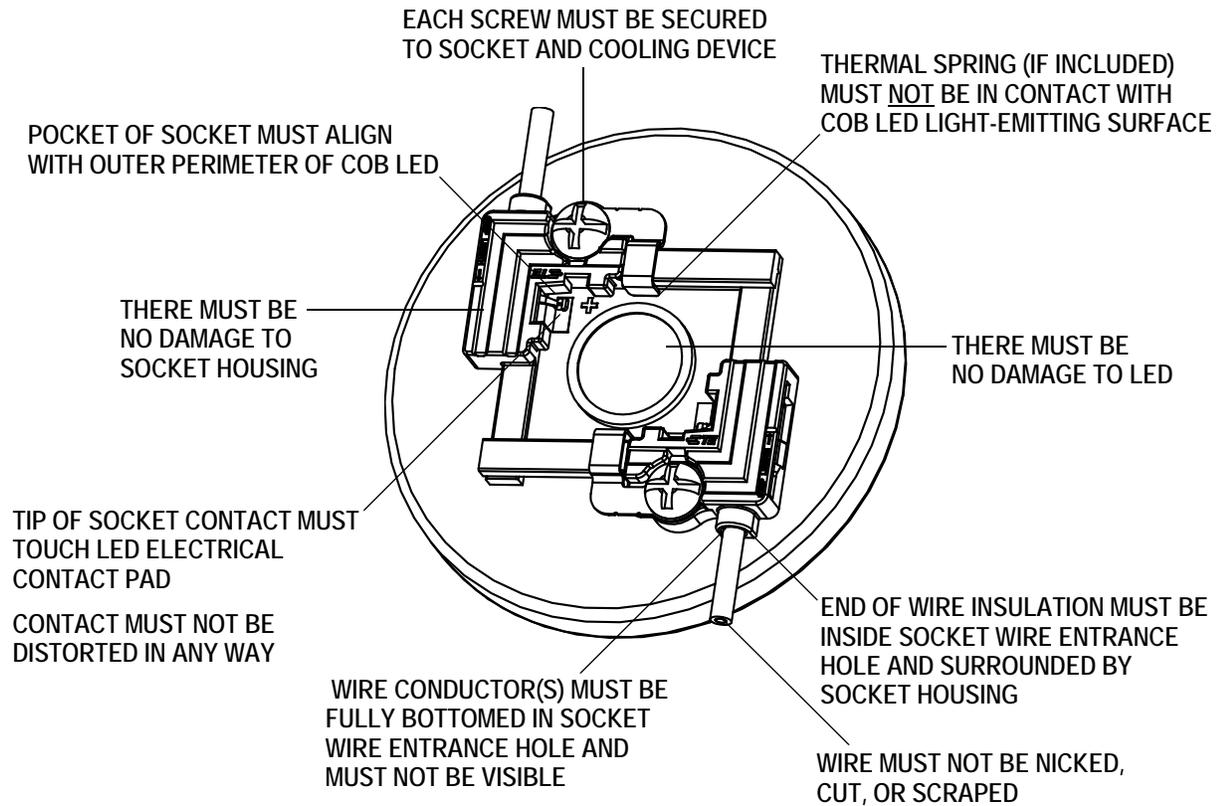
3.10. TOOLING

A torque driver is required to tighten the screws when mounting the socket to the cooling device.

4. 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.

1-PIECE SOCKET



2-PIECE SOCKET

SAME REQUIREMENTS APPLY

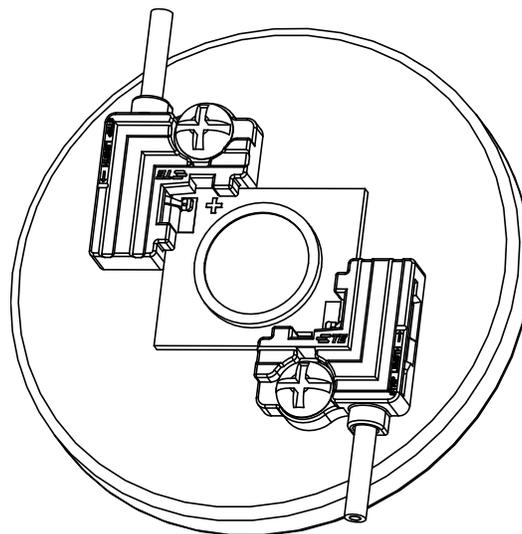


FIGURE 7. VISUAL AID