

Class 1

RJ45 Modular Jacks

1. INTRODUCTION

This specification covers the requirements for application of RJ45 Jacks, designed to be mounted to a Printed Circuit Board (PCB). The Jacks are available in right-angled, vertical, single-port or multi-port configuration with 8 contacts, shielded designs to accommodate specific application requirements. This specification pertains to all shielded jacks with right-angled (R/A) and vertical orientation, with single or multiple ports.

When corresponding with TE Personnel, use the terminology provided on this specification to help facilitate assistance. Basic terms and features of components are provided in Figure 1.

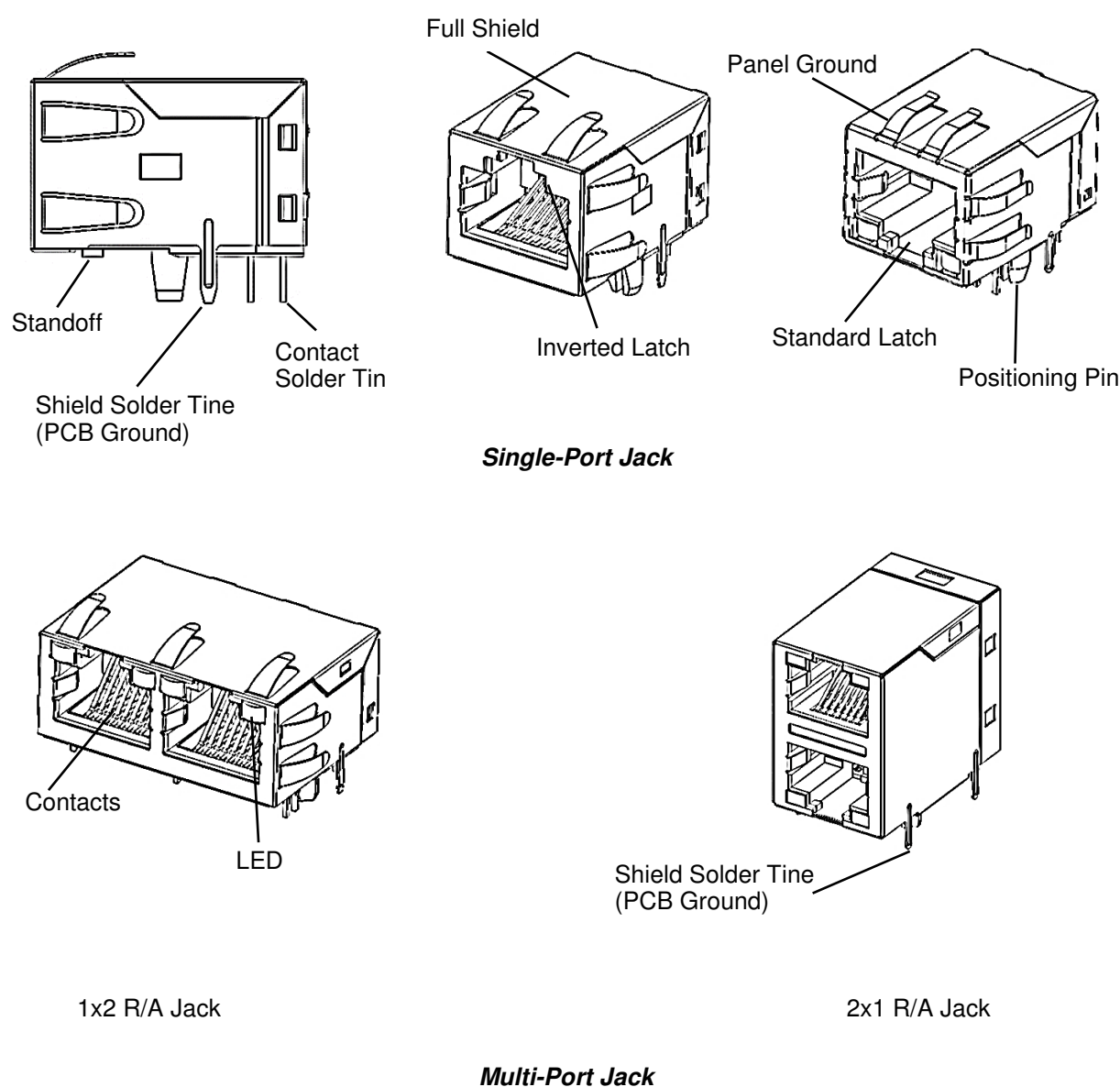


Figure 1: Basic terms and features of components – the schematics above are just for reference and do not necessarily correspond to a connector within this portfolio.

2. REFERENCE MATERIAL

2.1. Customer Assistance

If you need to refer to Base Numbers 2301994, 2301995, 2301996, 2301997, please check Application Spec 114-94447 (RJ45 Jacks with integrated magnetics). If you need to refer to another RJ45 connector with base number xxxxx-E, please check Application Spec 114-94780 (RJ45 Jacks with integrated magnetics), or 114-94805 (RJ45 modular Jacks).

2.2. Drawings

Customer Drawings for product numbers are available from the service network. The information on the customer drawing takes priority over this specification and any other document supplied by TE.

2.3. Product Specifications

Product Specifications 108-94945 covers test and performance requirements.

2.4. Soldering specification

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.

3. REQUIREMENTS

3.1. Safety

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

3.2. Material

The RJ45 Jack housing is made of high temperature thermoplastic, UL94-V-0. The contacts are made of copper alloy under plated with nickel and plated with gold; solder tines are plated with tin over nickel. The shield is made of brass plated with nickel and tin.

3.3. Storage

Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the RJ45 Jack material.

Shelf Life

RJ45 Jacks should remain in the shipping containers until ready for use to prevent damage. The products should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions and degrade shield appearance.

Chemical Exposure

Do not store RJ45 Jacks near any chemicals listed below, as they may cause stress corrosion cracking in the components.

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

Soldering ability over time

To ensure a good solderability of RJ45 Jacks, conditions below should be followed:

Table 1: Storage time and conditions

Packaging type	Condition	Maximal storage time
Tray	Original and unopened package, at temperature $\leq 30^{\circ}\text{C}$	1 year
Tape & Reel		

If storage time exceeds one year, a complete quality check on function & mechanical before parts can be used.

3.4. PCB Layout

The solder tine hole layout for all positions, single- and multi-port jacks is typical for all jacks with comparable positions. The mounting hole location will depend on the number of ports and contact positions.

The mounting holes must be placed in accordance with the customer drawing to ensure proper alignment and optimum continuity for circuits after soldering. The holes must be drilled to specific dimensions to prevent stubbing during placement of the RJ45 Jack on the PCB.

Please refer to each individual drawing for the specific PCB layout dimensions and characteristics.

3.5. PCB Contact Tine Holes

Plated through holes should be used for contact solder tines and, when applicable, shield solder tines. The drilled hole size, plating types, and plating thickness are dependent on your application requirements. The finished hole size must be as stated to provide unrestricted insertion, proper retention in the PCB, and to ensure adequate application of solder to the tines. See Figure 2.

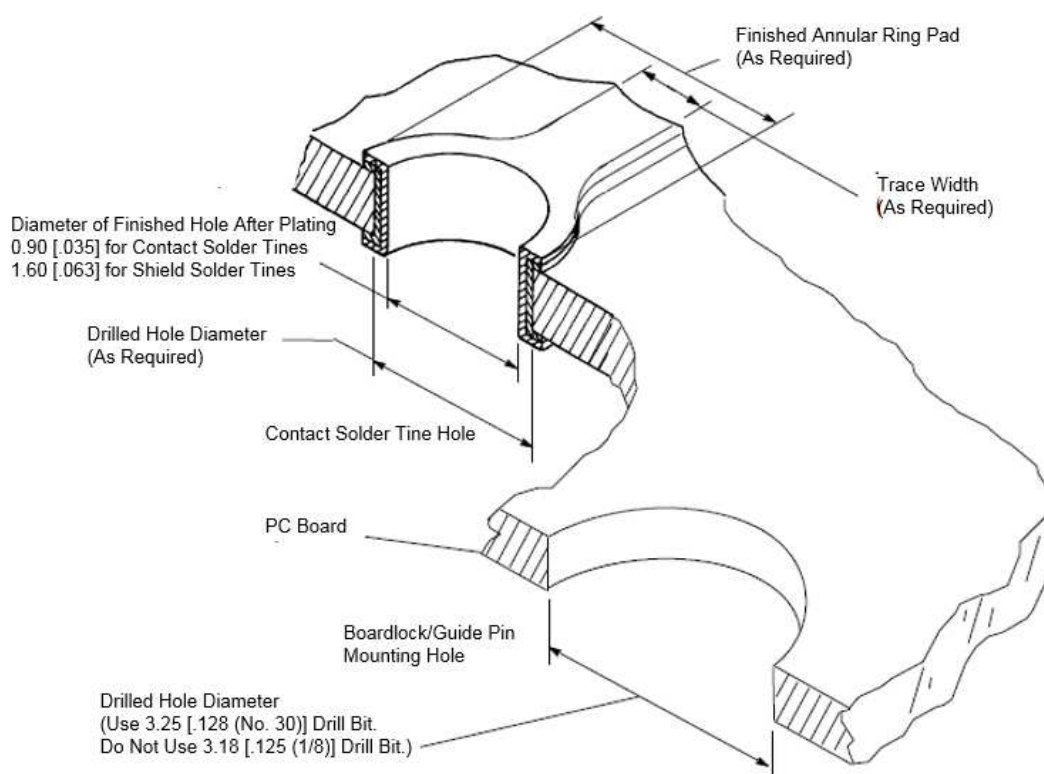


Figure 2: Contact Tine Holes dimensions in PCB

3.6. Jack placement



The connector should be handled only by the housing to avoid deformation, contamination, or other damage to the contact solder tines and, where applicable, shield solder tines

A. Alignment

The RJ45 Jack shall be flush and evenly seated on the PCB. A hold-down may be used to hold the jack in place during the soldering process.

B. Position

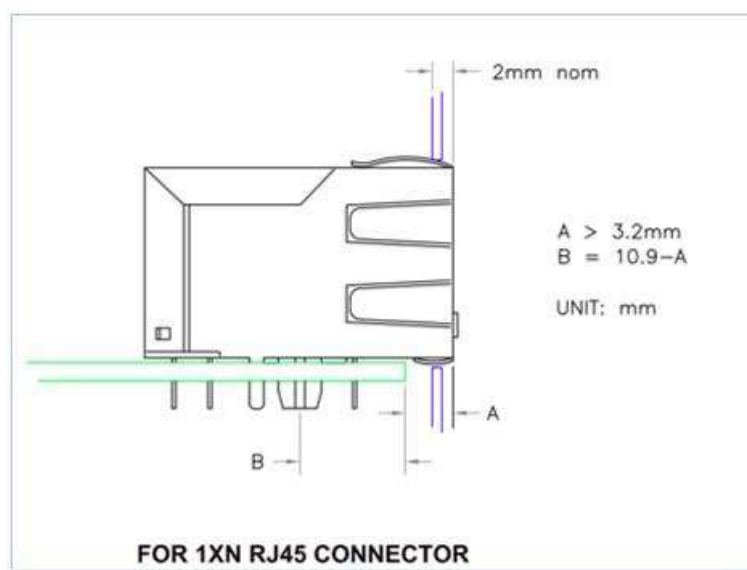
Determine which hole in the PCB is to receive the number one contact tine, then orient the jack so the number one solder tine is aligned with the hole. Insert all solder tines into the board, then press on the top of the jack until it seats on the PCB.

3.7. Shielding

Shielded RJ45 Jacks features brass shells which provide continuity for EMC (Electromagnetic Compatibility) applications. When mated with corresponding shielded RJ45 plugs, shielding and grounding continuity are achieved. When the shield solder tines are soldered to the PCB they provide electrical continuity to any ground path on the PCB and, where applicable, panel ground tabs on the shield provide electrical continuity to any ground path through the equipment panel.

3.8. Panel Cutout

After the modular jack is secured to the PCB, the modular jack can be positioned in a cutout in a panel. If there is no specific requirement, we recommend a protrusion dimension as shown below:



Unit: mm [mil]

Figure3: 8 and 10 position Jack with LEDs

3.9. Soldering Guidelines

RJ45 Modular Jacks can be soldered using reflow or equivalent soldering techniques according to IPC/JEDEC J-STD-020D for PB-free soldering, unless specified differently on the drawing. The temperatures and exposure time shall be within the ranges specified in Table 2.

Table 2: Temperature and exposure time

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temp)
	CELSIUS	FAHRENHEIT	
Reflow Soldering	250	482	10 Seconds



The connector should not be cleaned by immersion in liquid or by an aqueous spray-in-air process. The manual removal of the flux or the use of no-clean flux is recommended.

3.10. Checking Installed Jack

The Jack must be seated on the PCB as shown in figure 8.

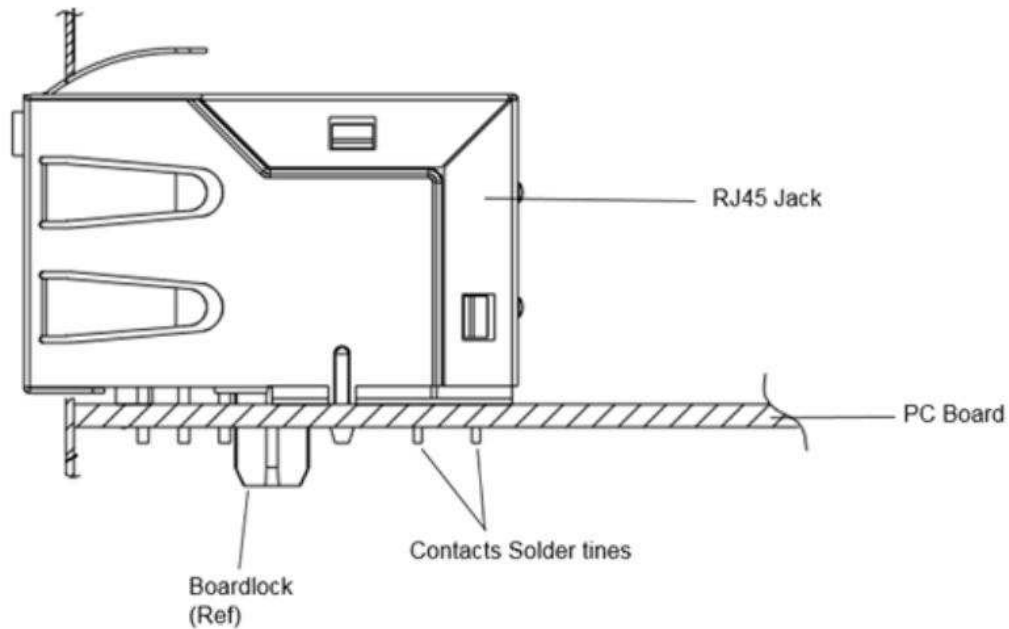


Figure 4: RJ45 Jack installed on PCB

3.11. Repair/Removal

If the jack should become damaged, it must be replaced. It may be removed from the PCB by normal desoldering methods and replaced with a new jack.



When repairing or replacing a RJ45 Jack, be careful not to damage other PCB components during the desoldering process.

4. QUALITY

RJ45 Jacks are recognized by Underwriters Laboratories Incorporated (UL).

5. TOOLING

No special tooling is required for hand placement of RJ45 Jacks onto a PCB. However, a backup support that provides relief for protruding components is needed to prevent deformation of contact solder tines and, when applicable, shield solder tines.

6. VISUAL AID

Figure 9 below, shows typical installation applications of RJ45 Jack and 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.

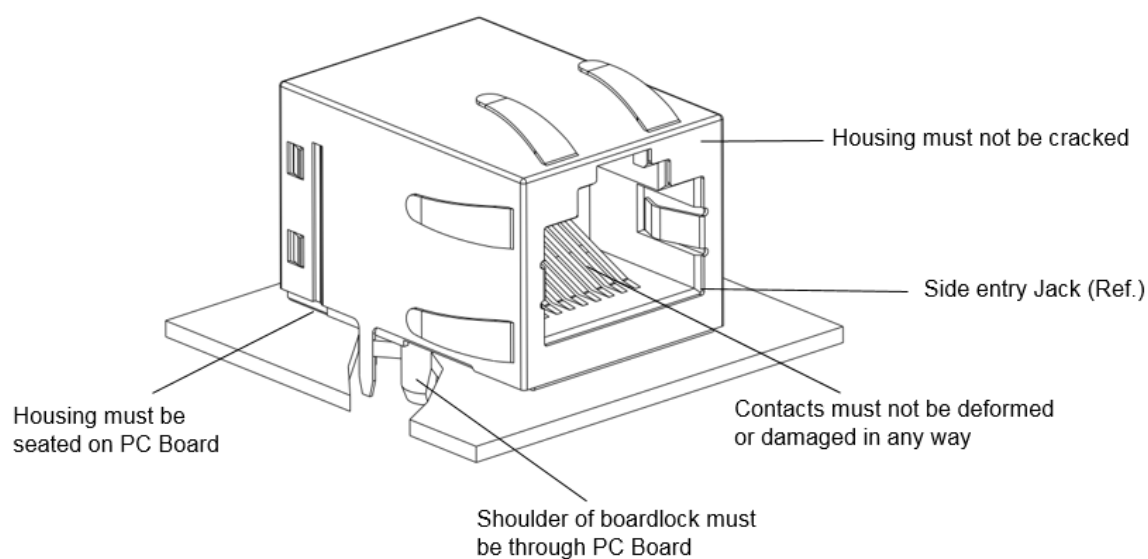


Figure 5: Visual aid

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