ZIF- Line (Zero Insertion Force) Flexible Film to PC Board Connectors

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 ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification specification covers the requirements for terminating ZIF-Line Connectors that are designed for flexible film to printed circuit (pc) board applications. They are available with contact centerlines on 1.27 [.050] with positions of 5 through 55, and with contact centerlines on 2.54 [.100] with positions of 8 through 22. They feature contacts with solder tines and circuit tips, and a housing with polarizing ribs, locking tab, and standoffs, and a stuffer with locking latches that secure the film in the connector. The connectors are designed to be placed on the pc board manually.

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

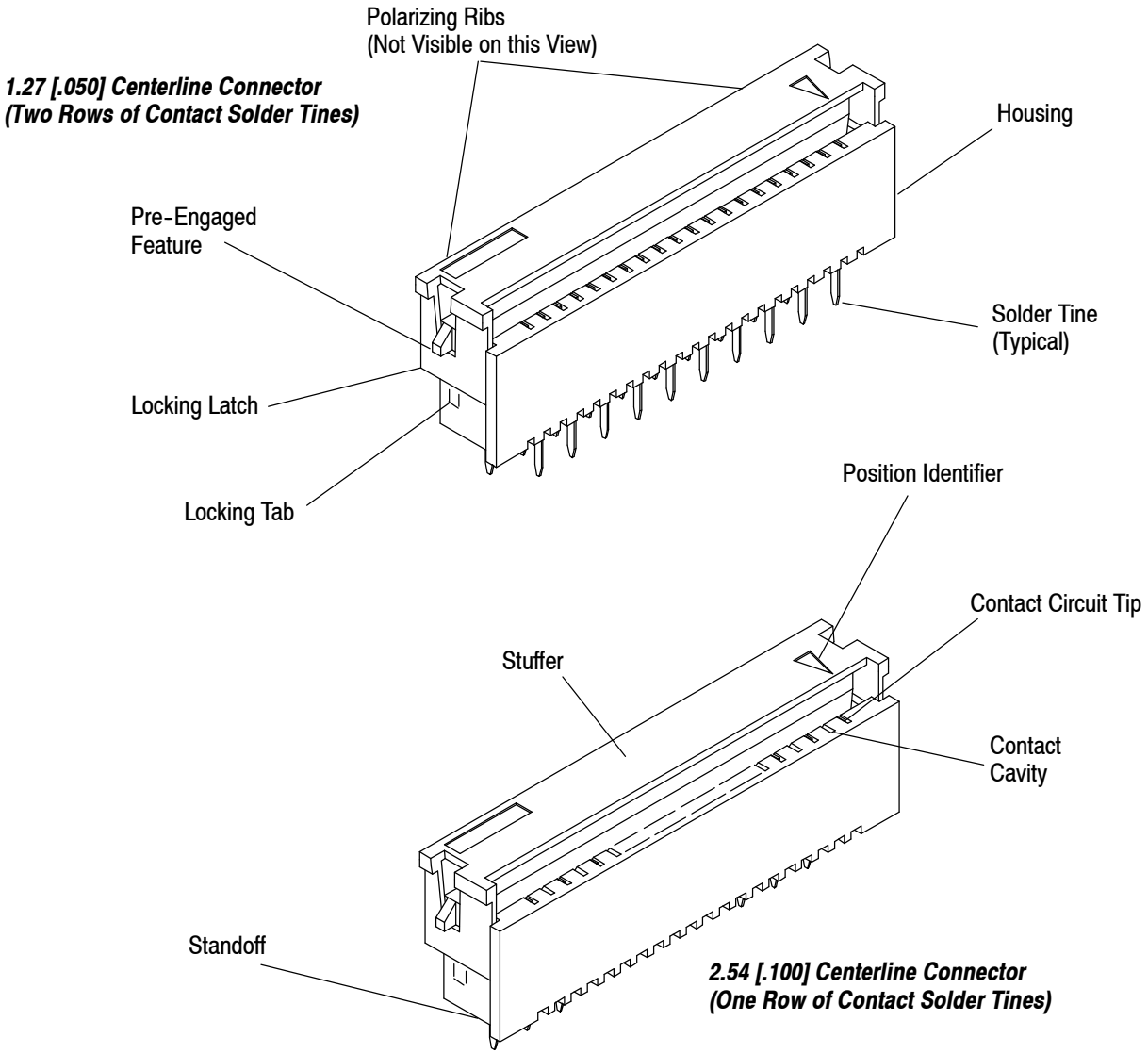


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Updated document to corporate requirements.

2.2. Customer Assistance

Reference Part Number 487576 and Product Code 5626 are representative numbers of ZIF-Line Flexible Film to Printed Circuit (pc) Board Connectors. 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 TE Representative (Field Service Engineer, Field Applications Engineer, etc.) or, after purchase, by calling the Technical Assistance Center number at the bottom of page 1.

2.3. Drawings

Customer Drawings for specific products 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 TE.

2.4. Specifications

Product Specification 108-16025 is available for test and performance requirements.

2.5. Instruction Material

Corporate Bulletin No. 52 is available upon request and can be used as a guide in soldering. 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. Material

A. Housing and stuffer

The connector housings and stuffers are black thermoplastic that is flame retardant 94V-0 rated.

B. Contact

The contacts are phosphor bronze that are fully plated with bright tin-lead over nickel.

3.2. Storage

Each connector is packaged and shipped in an individual anti-static tube and reel container. To prevent damage to the solder tines, the connector should remain in the container until ready for installation. Also to prevent possible storage contamination and preserve maximum solderability, the connectors should be used on a first-in, first-out basis.

3.3. Chemical Exposure

Do not store connectors near any chemicals listed below as they may cause discoloration stress, corrosion, or cracking of the housing, stuffer, or contacts.

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

NOTE

Where the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass if available.

3.4. Connector Characteristics

The connector stuffer features two polarizing bars and a position identifier (conductor No. 1) to assist in proper orientation of the circuits. It has locking latches that hold the stuffer open in the pre-engaged position for film insertion and, when the stuffer is closed, they engage the locking tabs on the housing to secure the flexible film in the connector. Connectors with contacts on 1.27 [.050] centerline spacing have two rows of solder tines. Those with contacts on 2.54 [.100] centerline spacing have a single row of solder tines. See Figure 1.

3.5. Flexible Film

The connectors accept flexible film circuits that are designed in accordance with the Institute of Interconnecting & Packaging for electronic circuitry commercial specification IPC-FC-220. The following requirements are applicable to film construction.

A. Insulation Material

The insulation material (film base) may be polyimide or other material that has similar wear, chemical resistance, flexibility, and circuit manufacturing characteristics.

B. Conductors

- The conductor centerline spacing must match the contact spacing in the connector and the quantity of conductors must match the quantity of contacts in the connector.
- The conductors may be tin plated copper or conductive ink. Their width shall be in accordance with the dimensions provided in Figure 2.
- Only the conductor surface that will engage the contact circuit tips shall be exposed.
- Conductor exposure must include the full insertion depth into the connector. Exposed conductors must be free of contaminants and film particles.

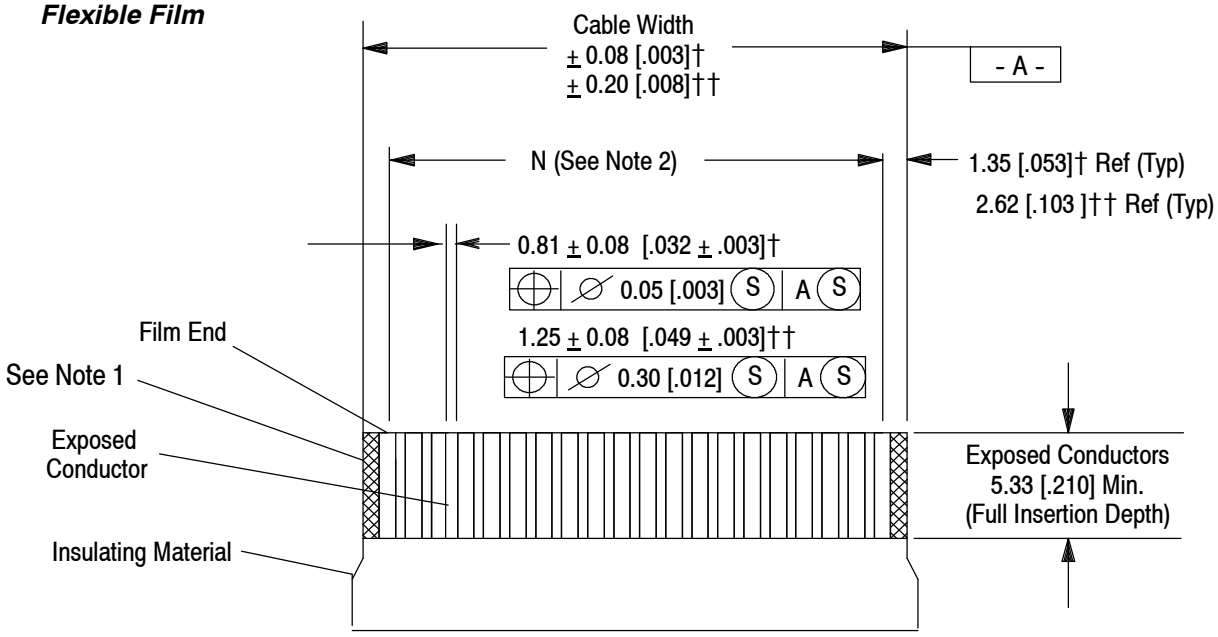
C. Thickness

The total thickness, including film insulating material and conductors, may be 0.10 to 0.31 [.004 to .012].

D. Film End

The film end must be perpendicular to conductors and have a straight section equal to the full insertion depth into the connector. See Figure 2.

Flexible Film



Notes: 1. Added strength and stiffness can be designed into the film end by making the two outer conductors over size. Also, when using 2.54 [.100] connectors, tape can be applied (3M 8412 or equivalent) to the insulated side of the two end conductors. See darken area on layout.
2. N is equal to the number of spaces between conductors. N + 1 is equal to the number of contact positions.

† 1.27 [.050] Centerline spacing.
†† 2.54 [.100] Centerline spacing.

Figure 2

3.6. PC Board

The holes for the solder tines must be precisely located, drilled and plated-through to assure proper placement and optimum performance of the connector. See Figure 3.

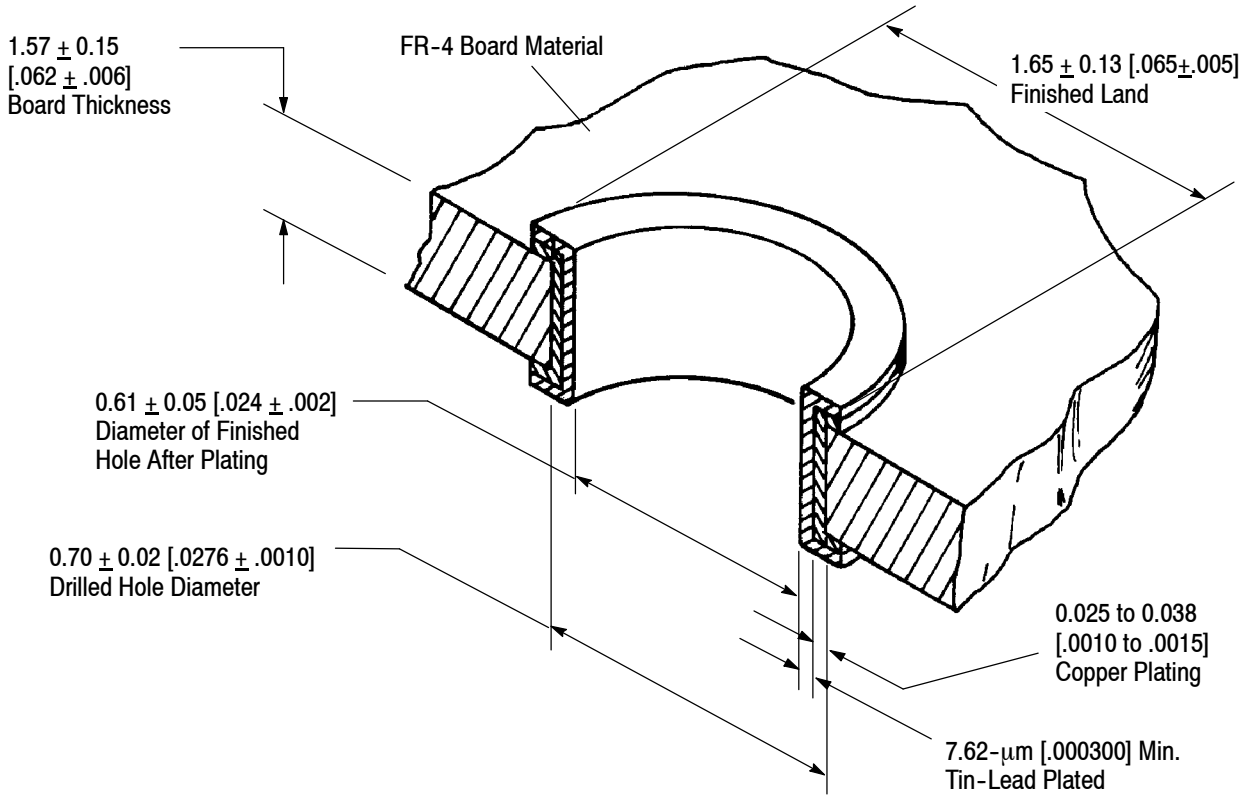


Figure 3

A. Material

The pc board material shall be FR-4 glass epoxy or equivalent.

B. Thickness

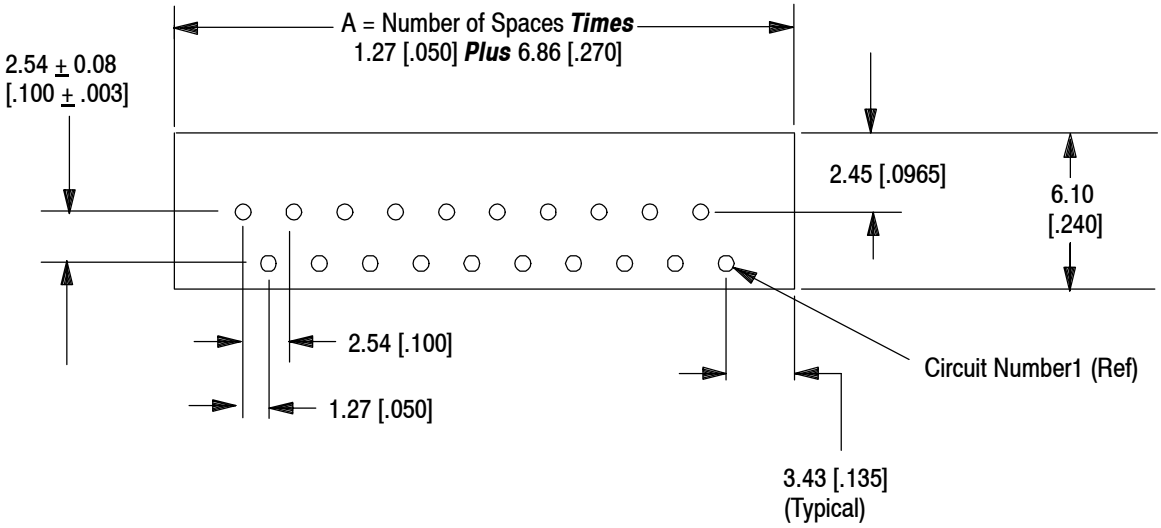
The connectors are designed for the pc board thickness indicated in Figure 3. For suitability of other board thicknesses, contact TE Engineering by calling one of the phone numbers at the bottom of page 1.

C. Tolerance

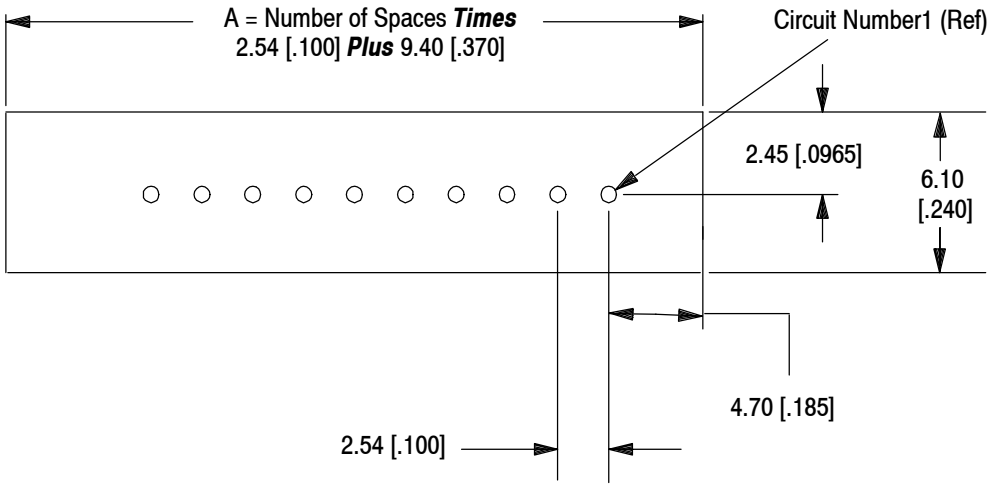
The maximum allowable bow of the pc board is 0.03 [.001] over the entire length of the connector.

D. Layout

The pc board layouts for each connector type is provided in Figure 4.



Layout for Connectors with Centerlines on 1.27 [.050]



Layout for Connectors with Centerlines on 2.54 [.100]

Figure 4

3.7. Placement of Connector on PC Board

Use the position identifier on the housing stuffer to orient the contact tines with the appropriate circuit (No. 1) on the pc board. See Figure 5.

Grip the connector at the housing ends and, holding the connector at an angle, align a full row of contact tines with the appropriate holes in the pc board. Rotate the connector until the housing is parallel with the pc board then, using only light pressure, seat the housing standoffs on the pc board.

CAUTION

The connectors must be handled by the housing only to prevent deformation, contamination, or any other damage to the contact solder tines.

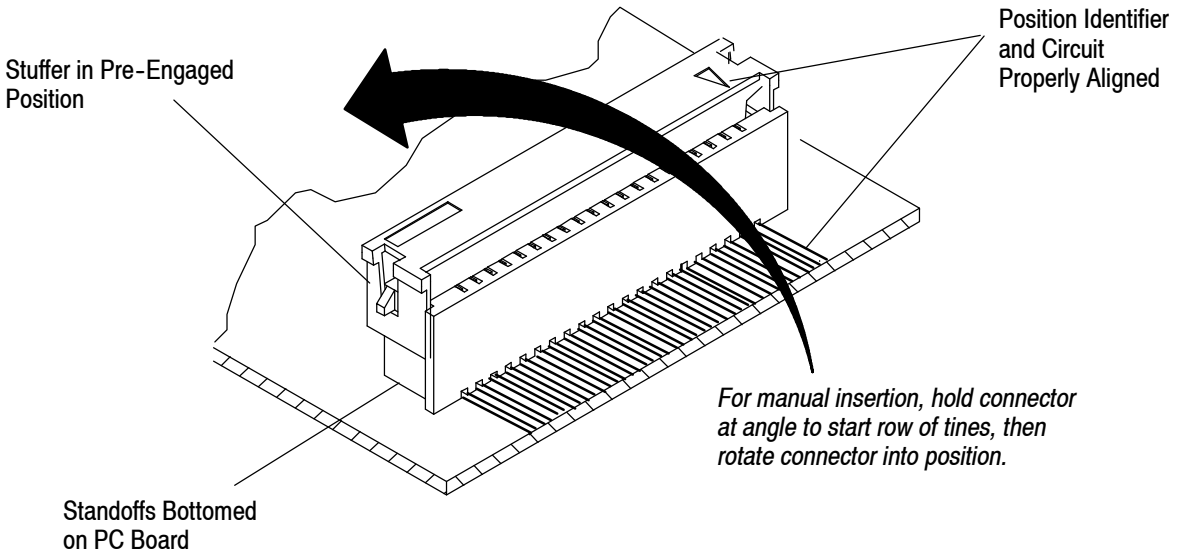


Figure 5

3.8. Soldering

A. Solder Recommendations

These connector assemblies 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.

B. Soldering Guidelines

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

C. Fluxing

Contact solder 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 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 6.

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 6

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 following are common cleaning solvents that can be used on these connectors for 10 minutes at room temperature without any adverse effects on contacts or housing. See Figure 7.

CLEANER		TIME (Minutes)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110■	Aqueous	1	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 7

DANGER

Consider toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacture's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners.

NOTE

If you have a solvent that is not listed, consult a TE Representative before using it with these connectors.

E. Drying

When drying the soldered and cleaned connector 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.

3.9. Inspecting Soldered Connector

Each of the tines must have an even solder fillet and the housing standoffs must be seated on the pc board to within the dimension provided. See Figure 8.

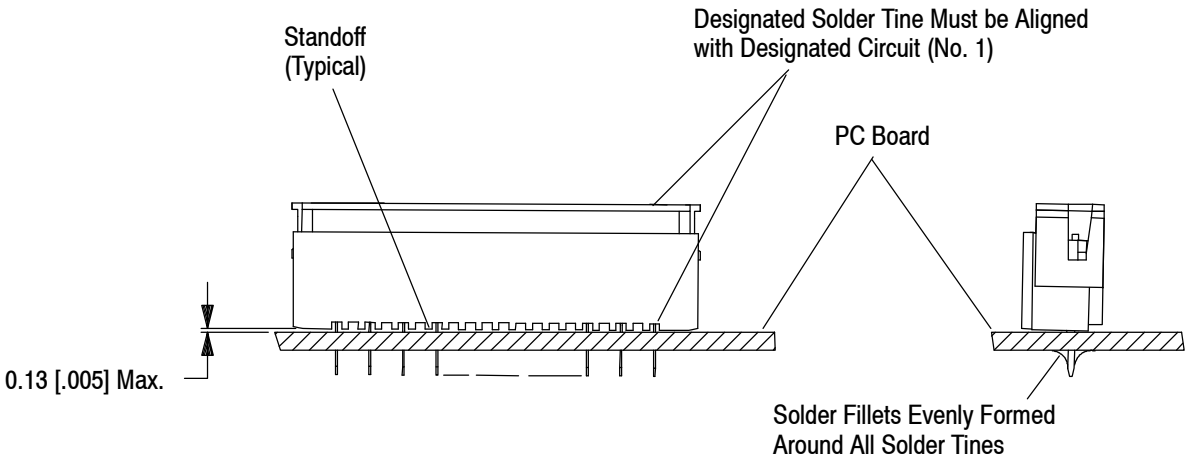
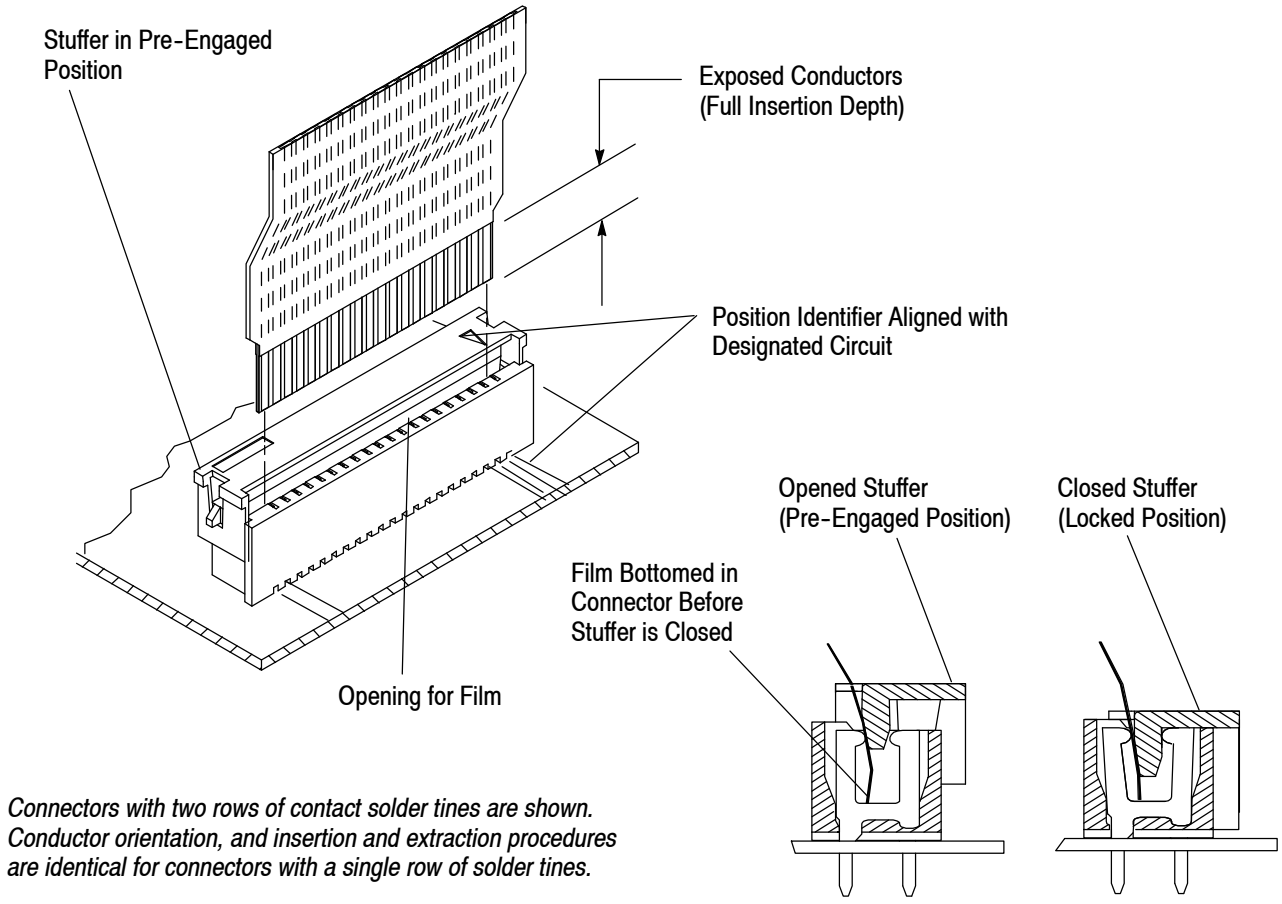


Figure 8

3.10. Inserting and Extracting Film

A. Insertion

The stuffer must be fully opened in the pre-engaged position. The film must be oriented so that the designated conductor is aligned with the position indentifier on the housing. The film must be inserted straight into the connector until bottomed and held in position while the stuffer is pressed into the housing until the locking latches engage the locking tabs. See Figure 9.



Connectors with two rows of contact solder tines are shown. Conductor orientation, and insertion and extraction procedures are identical for connectors with a single row of solder tines.

Figure 9

B. Extraction

Both ends of the stuffer must be held firmly and pulled away from the housing until it releases and enters the pre-engaged position. In this position, no force will be required to remove the film from the connector. See Figure 9.

3.11. Repair

The stuffer is the only component that can be replaced. If the housing or contacts become damaged , the connector must be removed by desoldering the contact tines and replacing the entire connector with a new one.

4. QUALIFICATIONS

The ZIF Line Connectors are designed to commercial specification IPC-FC-220. No approvals by any qualification agency are required.

5. TOOLING (Figure 10)

The connector should be removed from the shipping container only when ready for installation. A pc board support is recommended when installing connectors to prevent deformation of the solder tines. It may have a channel or holes to match the solder tine pattern of the connector. The connector should not be removed from the shipping container until the pc board and support are ready for installation. See Figure 10.

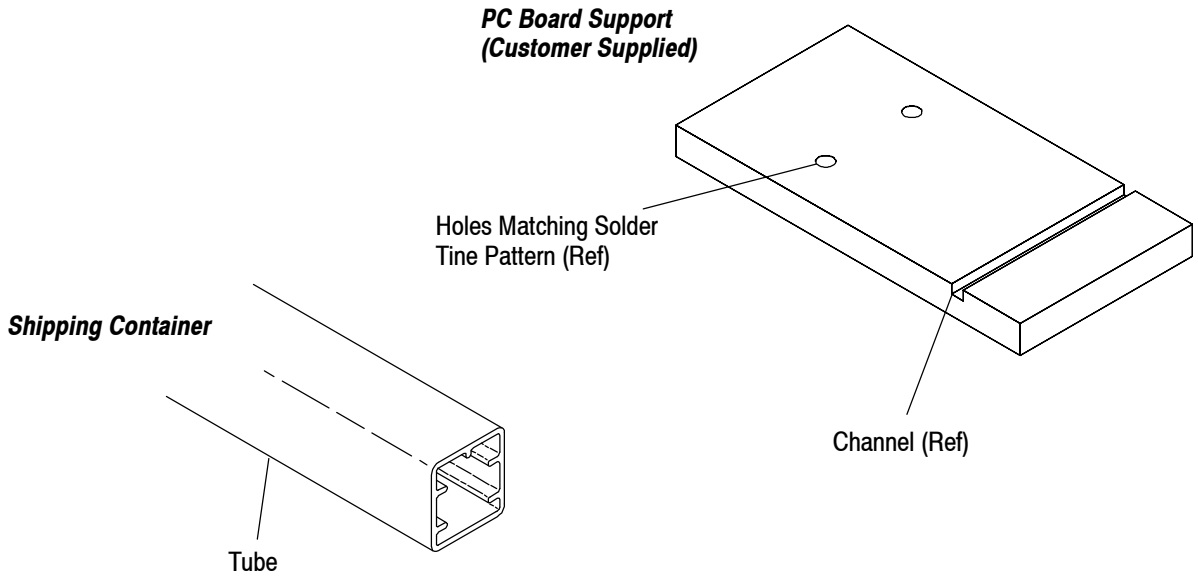


Figure 10

6. VISUAL AID

The following illustrations show typical installations and are intended for use by production personnel to visually ensure suitable applications. Installations that may appear visually incorrect should be dimensionally inspected using the information given in the preceding pages of this application specification.

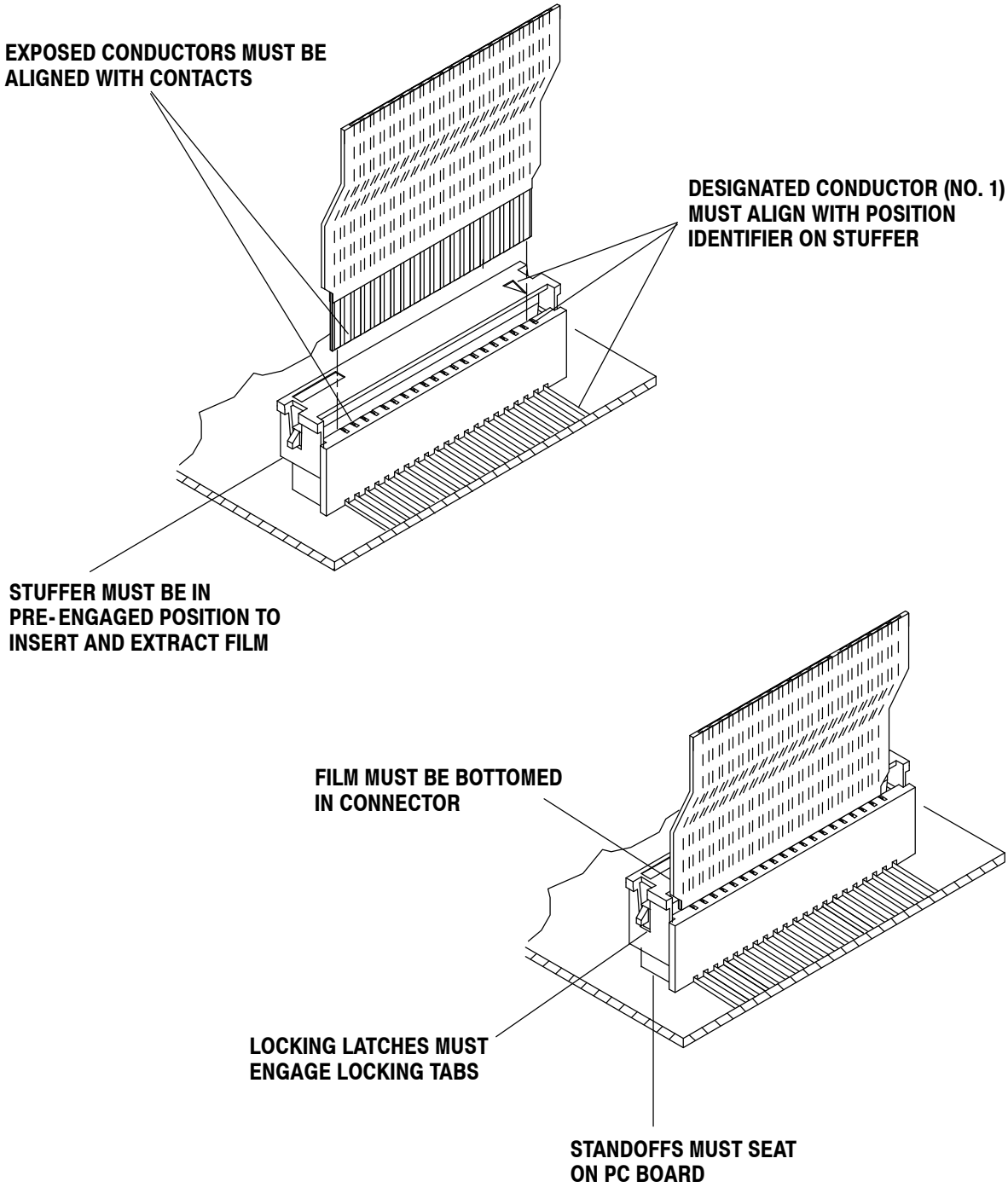


FIGURE 11. VISUAL AID