



### 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  $\pm 0.13$  [ $\pm 0.005$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification only and are not drawn to scale.

## 1. INTRODUCTION

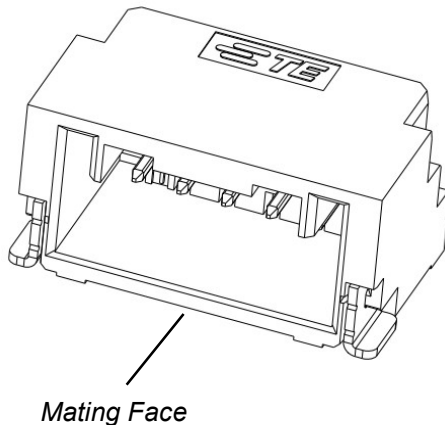
This specification covers the requirements for application of Signal Grace Inertial (SGI) 1.25 & 1.50 connector system includes SMT header assembly and plug assembly used in the wire-to-board interconnections, cap assembly and plug assembly used in the wire-to-wire interconnections.

The SGI 1.25 connector system is available in 2 through 18 positions for single row, 20/22/30/40 positions for dual row, and SGI 1.50 connector system is available in 2 through 12 positions for single row, 4 through 18 positions for dual row. Wire size ranges from 26 to 30 AWG for 1.25mm pitch connector, and 24 to 28 AWG for 1.50mm pitch connector.

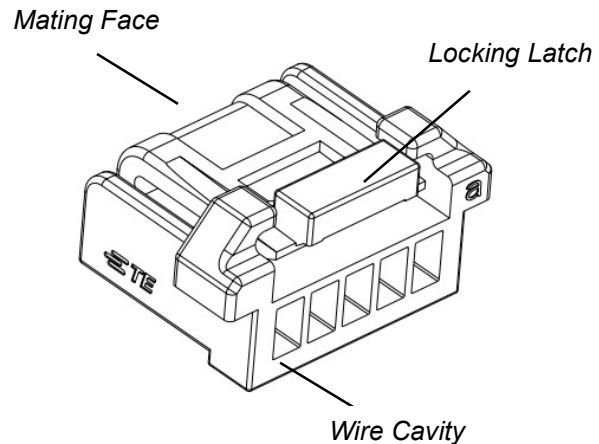
When corresponding with TE Connectivity Personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

- SGI 1.25 Single Row

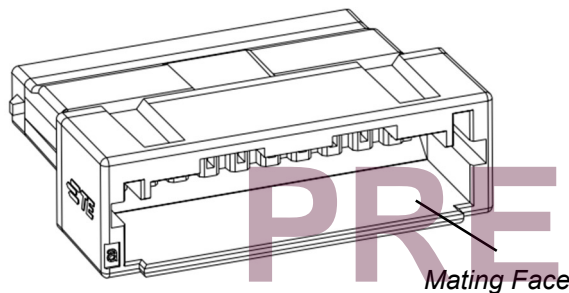
**Header Assembly**  
**SGI 1.25 Single Row (5pos shown)**



**Plug Housing**  
**SGI 1.25 Single Row (5pos shown)**

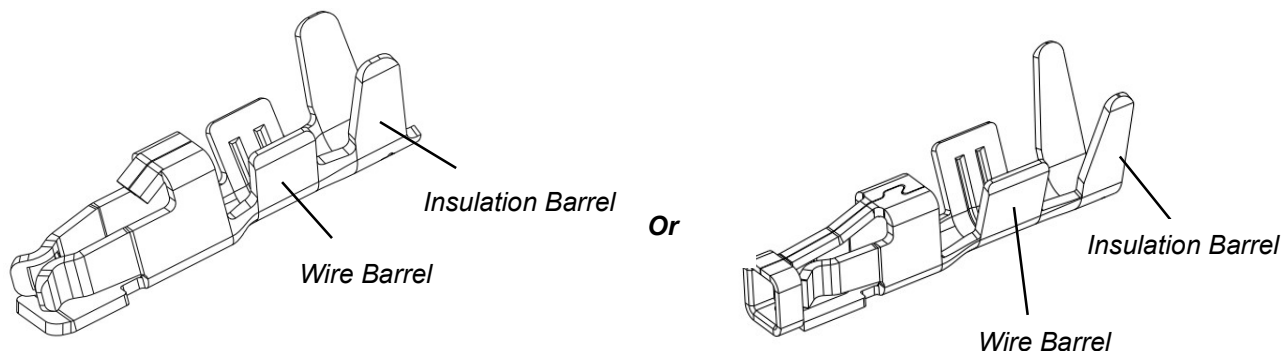


**Cap Housing**  
**SGI 1.25 Single Row (10pos shown)**

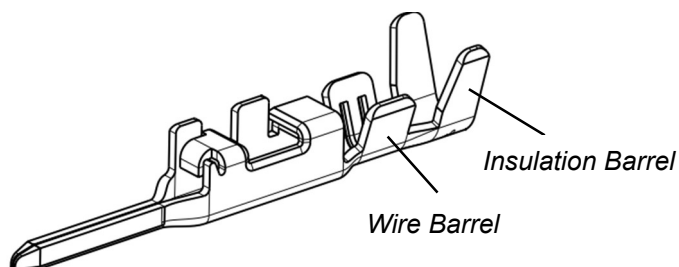


PRELIMINARY

**Receptacle Terminal**  
SGI 1.25 and 1.5 Single Row and Dual Row

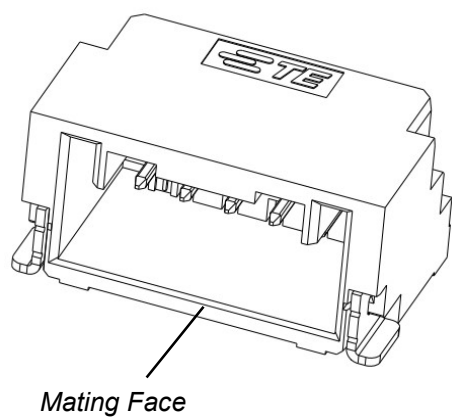


**Tab Terminal**  
SGI 1.25 Single Row and Dual Row

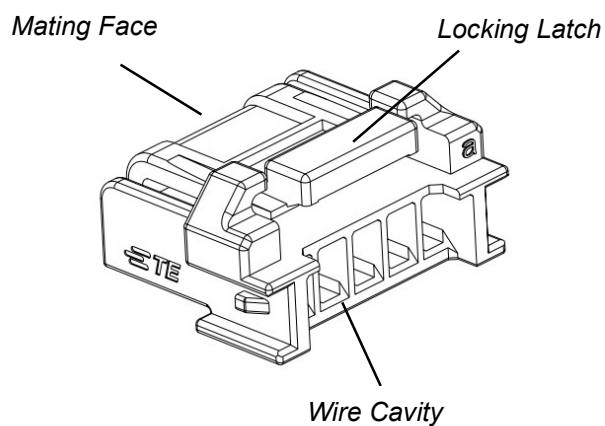


- SGI 1.50 Single Row

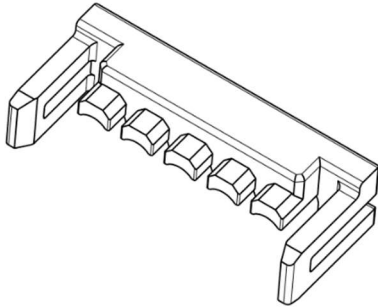
**Header Assembly**  
SGI 1.5 Single Row (5pos shown)



**Plug Housing**  
SGI 1.5 Single Row (5pos shown)

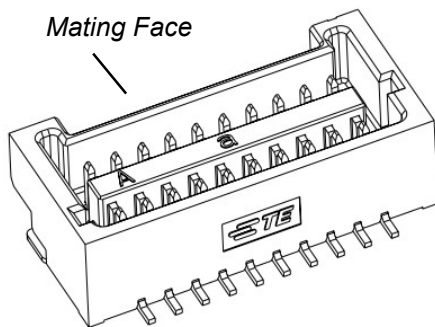


**TPA (5pos shown)**  
**For SGI 1.50 Single Row only**

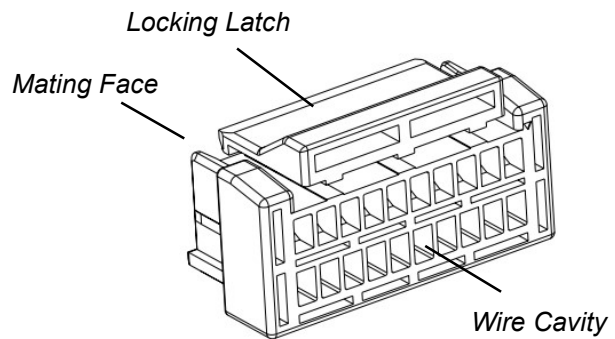


- SGI 1.25 Dual Row

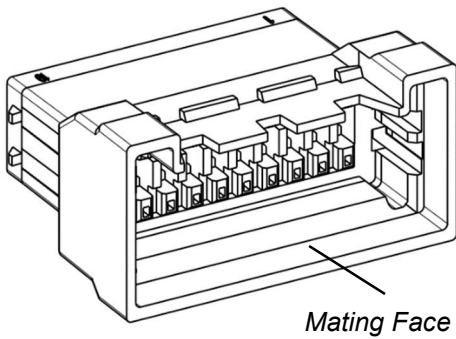
**Header Assembly**  
**SGI 1.25 Dual Row (20pos shown)**



**Plug Housing**  
**SGI 1.25 Dual Row (20pos shown)**



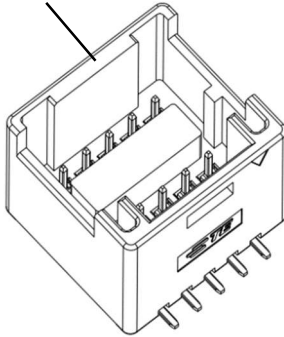
**Cap Housing**  
**SGI 1.25 Dual Row (20pos shown)**



- SGI 1.50 Dual Row

**Header Assembly**  
**SGI 1.5 Dual Row (10pos shown)**

Mating Face

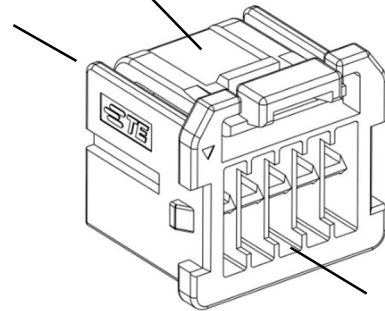


**Plug Housing**  
**SGI 1.5 Dual Row (10pos shown)**

Locking Latch

Mating Face

Wire Cavity



**TPA**  
**SGI 1.50 Dual Row (10pos shown)**

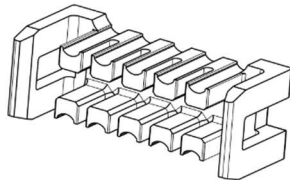


Figure 1 (Schematic Diagram Only)

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revision to this application specification include:

- Update crimp parameter for 2371403-3 and 2454997-3.
- Add total length requirement and insulation visual requirement after crimp.

### 2.2. Customer Assistance

Reference Product Base Part numbers are stated in Figure 2. Use of these numbers will identify the product line and help you to obtain product and tooling information when visiting [www.te.com](http://www.te.com) or calling the number at the bottom of page 1.

SGI 1.25 connector (Single Row or Dual Row)			SGI 1.50 connector (Single Row or Dual Row)		
Product Type	Base PN		Product Type	Base PN	
	Single Row	Dual Row		Single Row	Dual Row
Header Assembly, SMT, Right Angle	2360538	NA	Header Assembly, SMT, Right Angle	2360545	-
Header Assembly, SMT, Vertical	2360540	2376974 2456589	Header Assembly, SMT, Vertical	2360547	2427710
Plug Housing	2371404	2376950 2456588	Plug Housing	2382946	2426397
Receptacle Terminal	2371403 2454997	2371403 2454997	Crimp Terminal	2371403 2454997	2371403 2454997
Cap Housing	2428107	2428108	-	-	-
Tab Terminal	2428106		-	-	-
			TPA	2383410	2426398

Figure 2

### 2.3. Drawings

Customer drawings for product part numbers are available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority.

### 2.4. Manuals

Manual 402-40 can be used as a guide to solder. This manual provides information on various flux types and characteristics with the commercial designation, flux removal procedures, and a checklist for information on soldering problems.

### 2.5. Specifications

Product Specification 108-106451, 108-160851 and Qualification Report 501-106475, 501-160511 provide product performance and test results.

## 2.6. Instructional Material

Instruction sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and customer manuals (409-series) provide machine setup and operating procedures. Instructional material that pertain to this product are:

- 408-8040 Heavy Duty Miniature Quick-Change Applicators with Mechanical Feed System
- 408-9640 Crimp Quality Monitor (CQM) Applicators for Side-Feed and End-Feed Applications
- 408-10389 Ocean Side-Feed Applicators

## 3. REQUIREMENTS

### 3.1. Safety

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

### 3.2. Storage

#### A. Ultraviolet Light

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

#### B. Shelf Life

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

#### C. Reels

When using reeled contacts, store coil wound reels horizontally. When storing partial reeled contacts, the end of the strip should be secured to the flange using a wire tie or similar method.

#### D. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

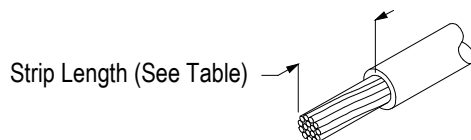
Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates

### 3.3. Wire Selection and Preparation

The contacts accept stranded wire sizes 24-30 AWG [0.205 – 0.0507 mm<sup>2</sup>] with an insulation diameter range given in Figure 3. The wire must be stripped to the dimension given in Figure 3.


**CAUTION**

Care shall be taken during the stripping operation to ensure the conductor is not nicked, scraped, or cut.



CONTACT			WIRE	
TYPE	PART NUMBER	WIRE SIZE (AWG) [mm <sup>2</sup> ]	INSULATION DIAMETER	STRIP LENGTH (±0.2)
SGI Receptacle Terminal	2371403-1 2454997-1	26-30 [0.128 – 0.0507]	0.76 - 1.0	1.50
	2371403-2 2454997-2	24-28 [0.205 – 0.0804]	0.85 - 1.10	1.70
	2371403-3 2454997-3	24-28 [0.205 – 0.0804]	0.76 - 1.30	1.70
SGI Tab Terminal	2428106-1	26-30 [0.128 – 0.0507]	0.76 - 1.0	1.50

**Figure 3**

### 3.4. Crimp Requirements

Contacts must be terminated according to the instructions packaged with the tooling.

#### A. Bellmouth

The rear bellmouth shall be evident and be within the dimensions given in Figure 4.

#### B. Cutoff Tab and Burr

The cutoff tab is the remaining portion of the carrier strip after the contact is cut from the strip. The cutoff tab and burr shall not exceed the dimension given in Figure 4.

#### C. Wire Barrel Flash

Wire barrel flash is the formation that may appear on both sides of the wire barrel as the result of the crimping process. The wire barrel flash shall not exceed the dimension given in Figure 4.

#### D. Wire Barrel Crimp

The crimp applied to the wire barrel portion of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contact. The crimp must be centered on the closed wire barrel. The crimp must result in an “F” crimp where the wire barrel forms a closed seam with no evidence of loose wire strands or wire strands visible in the seam. The crimp height and width must be within the dimensions given in Figure 4.

#### E. Insulation Barrel Crimp

The crimp applied to the insulation barrel of the contact must result in an “F” crimp. The crimp height and width must be within the dimensions provided in Figure 4. Slight scratch is acceptable on insulation crimp.

#### F. Effective Crimp Length

Effective crimp length shall be defined as that portion of the wire barrel, excluding the rear bellmouth, fully formed by the crimping tool. Refer to Figure 4.

## G. Wire Location

All conductors must be held firmly inside the wire barrel. No strands can be folded back over the wire insulation. The wire insulation must be inside the insulation barrel but must not enter the wire barrel. The wire insulation and conductors must be visible in the transition area between the wire barrel and insulation barrel. See Figure 4.

## H. Wire Brush

The conductors may extend beyond the wire barrel within the dimensions given in Figure 4.

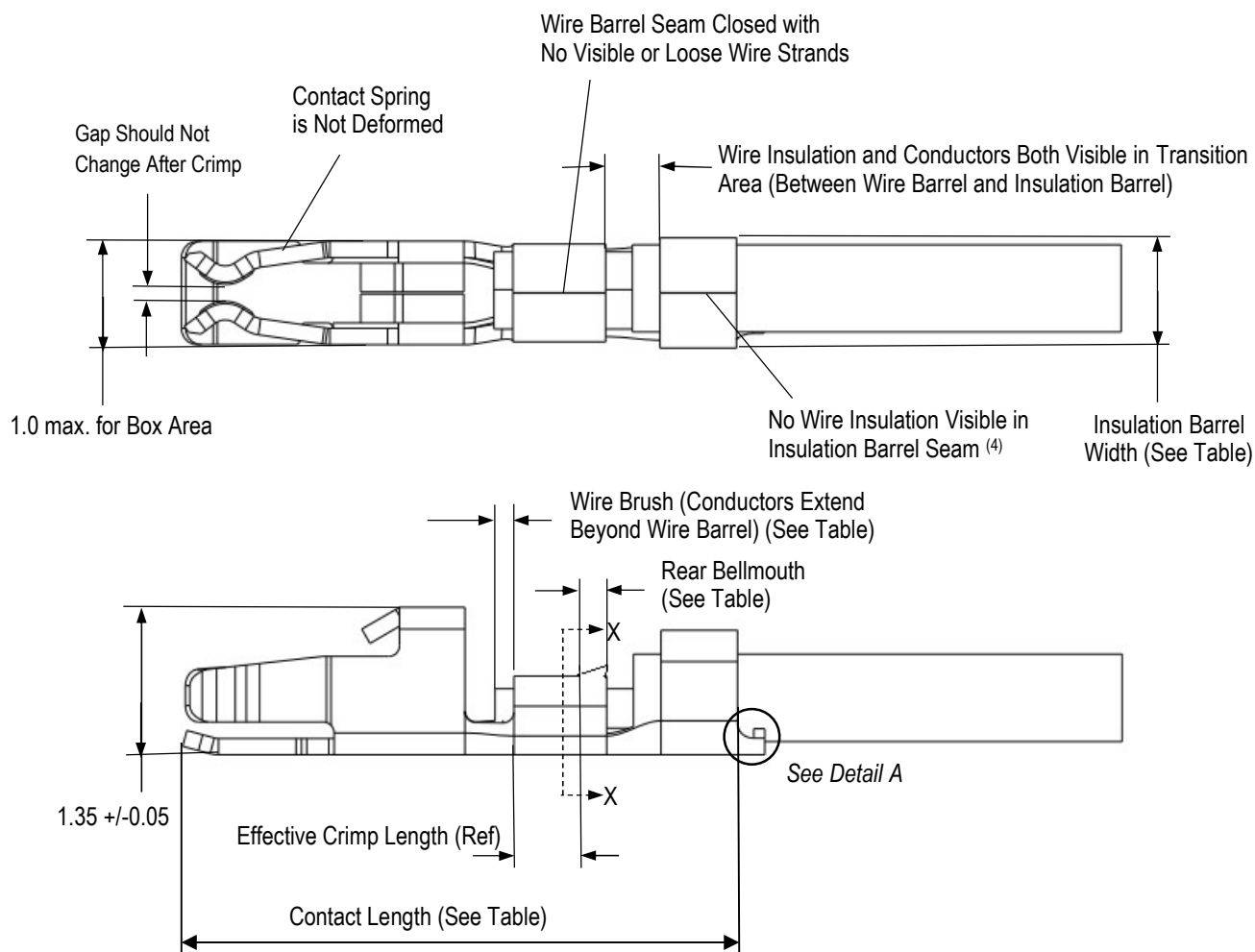
## I. Wire Barrel Seam

The wire barrel seam must be closed with no evidence of loose wire strands visible in the seam.

## K. Twist and Roll

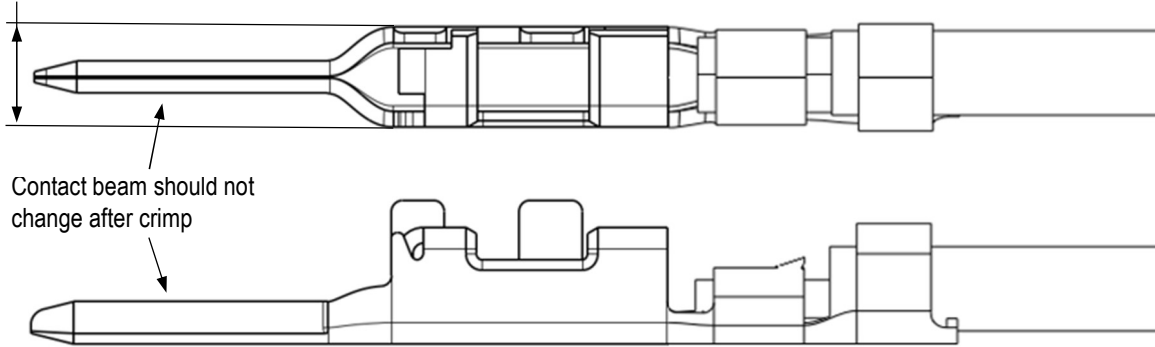
There should be no twist or roll of the wire barrel or mating portion of the crimped contact that would cause overstress or impair usage. See Figure 4 for allowable limits.

**i** **NOTE**  
The effective crimp length depends on the crimping dies used and should not be measured for inspection purposes.

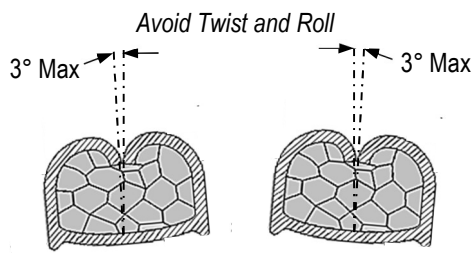
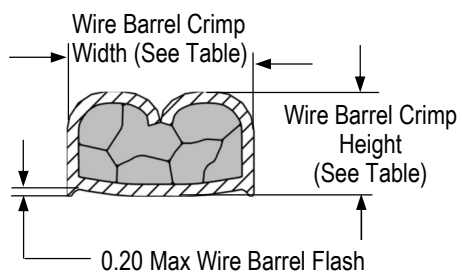




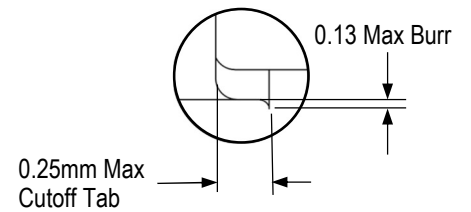
1.0 max. for Box Area



**Section X-X**



**Detail A**



WIRE SIZE		CONTACT 2371403-1, 2454997-1						
mm <sup>2</sup>	AWG	WIRE BARREL CRIMP		INSULATION BARREL CRIMP WIDTH	INSULATION BARREL CRIMP HEIGHT	WIRE BRUSH	REAR BELLMOUTH	Contact Length
		HEIGHT ±0.03	WIDTH			APPLICATOR	APPLICATOR	
0.128	26	0.51	1.0 max (0.84 Crimper Width) F shape	1.0 max. (0.84 Crimper Width) F shape	(1) As required	0.0 - 0.45	0.15-0.35	-
0.0804	28	0.46						
0.0507	(2) 30	0.41						
WIRE SIZE		CONTACT 2371403-2, 2454997-2						
mm <sup>2</sup>	AWG	WIRE BARREL CRIMP		INSULATION BARREL CRIMP WIDTH	INSULATION BARREL CRIMP HEIGHT	WIRE BRUSH	REAR BELLMOUTH	Contact Length
		HEIGHT ±0.03	WIDTH			APPLICATOR	APPLICATOR	
0.205	24	0.68	1.2 max (0.95 Crimper Width) F shape	1.2 max. (1.05 Crimper Width) F shape	1.60 +/-0.05	0.0 - 0.45	0.15-0.35	6.05 max.
0.128	26	0.60						
0.0804	(2) 28	0.56						
WIRE SIZE		CONTACT 2371403-3, 2454997-3						
mm <sup>2</sup>	AWG	WIRE BARREL CRIMP		INSULATION BARREL CRIMP WIDTH	INSULATION BARREL CRIMP HEIGHT	WIRE BRUSH	REAR BELLMOUTH	Contact Length
		HEIGHT ±0.03	WIDTH			APPLICATOR	APPLICATOR	
0.205	24	0.68	1.2 max (0.95 Crimper Width) F shape	1.2 max. (1.05 Crimper Width) F shape	(3) 1.4 ~ 1.8	0.0 - 0.45	0.15-0.35	6.15 max.
0.128	26	0.60						
0.0804	(2) 28	0.56						
WIRE SIZE		CONTACT 2428106-1						
mm <sup>2</sup>	AWG	WIRE BARREL CRIMP		INSULATION BARREL CRIMP WIDTH	INSULATION BARREL CRIMP HEIGHT	WIRE BRUSH	REAR BELLMOUTH	Contact Length
		HEIGHT ±0.03	WIDTH			APPLICATOR	APPLICATOR	
0.128	26	0.51	1.0 max (0.84 Crimper Width) F shape	1.0 max. (0.84 Crimper Width) F shape	(1) As required	0.0 - 0.45	0.15-0.35	-
0.0804	28	0.46						
0.0507	(2) 30	0.41						

\* Note:

(1) Insulation crimp height will be variable depending on insulation diameter.

(2) Slight touch bottom is acceptable for 2371403-1 / 2454997-1 / 2428106-1 with 30AWG wire and 2371403-2 / 2454997-2 / 2371403-3 / 2454997-3 with 28AWG wire.

(3) Insulation crimp height for 2371403-3 / 2454997-3 will be variable in 1.4~1.8mm depending on insulation diameter.

(4) Insulation material is pierced slightly without touch the conductor is acceptable for insulation diameter greater than 1.1mm.

Figure 4

## L. Straightness

The force applied during crimping may cause some bending between the crimped wire barrel and the mating portion of the contact. Such deformation is acceptable within the following limits:

The side-to-side bending of the contact may not exceed the limits provided in Figure 5.

The crimped contact, including cutoff tab and burr, shall not be bent above or below the datum line more than the amount given in Figure 5.

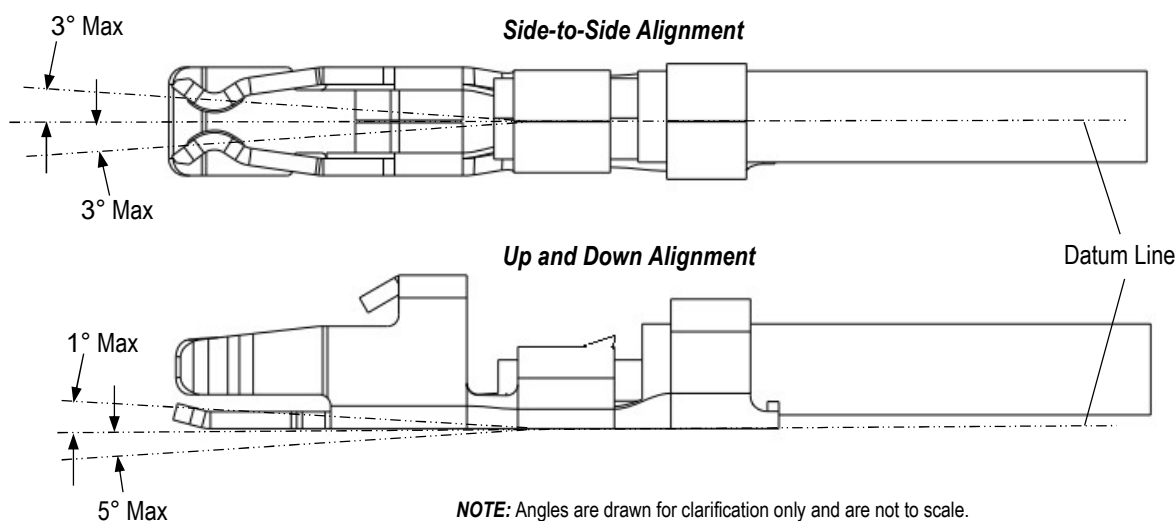
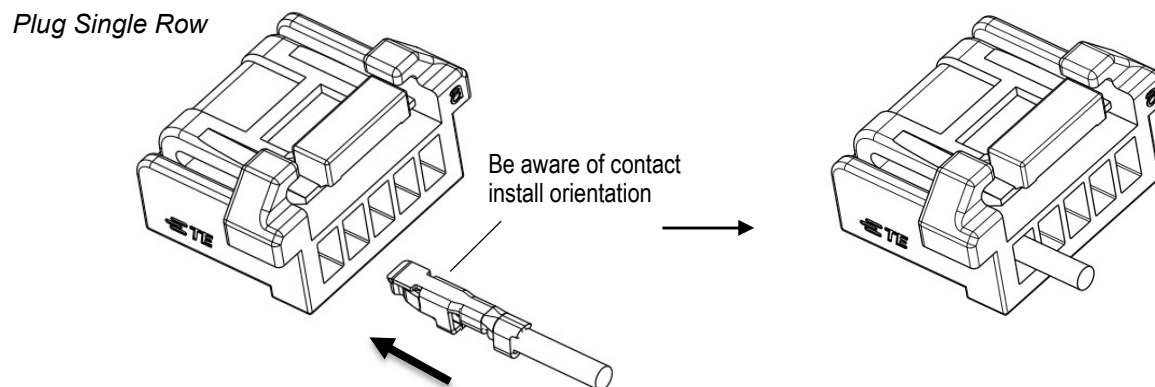


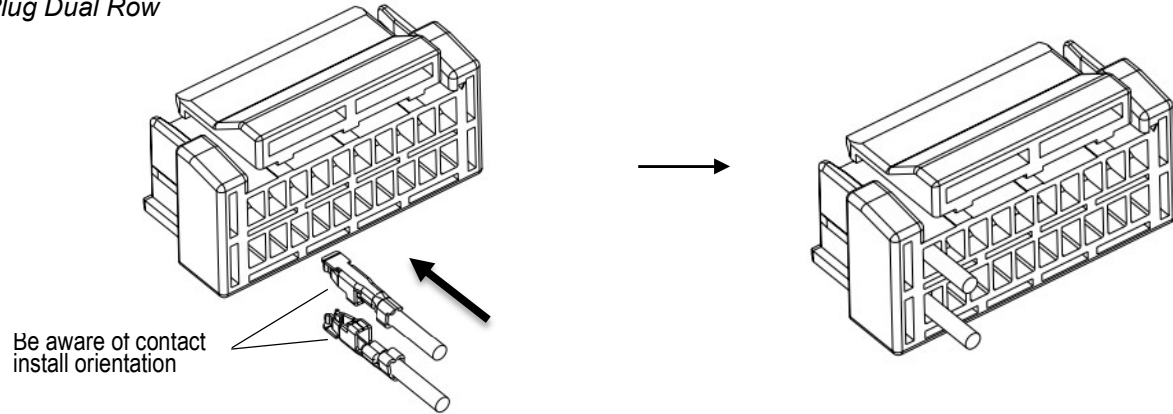
Figure 5

## 3.5. Inserting Contact into Housing

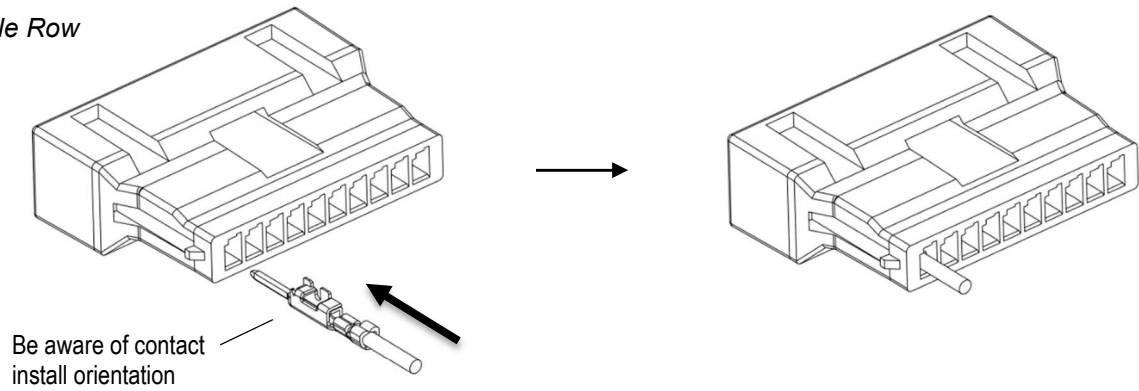
Grasp the wire directly behind the contact insulation barre and push the contact straight into the cavity until it bottoms (there should be an audible click). Be aware that the contact must be installed in correct orientation as specified below. Pull back lightly on the wire to be sure the contact is locked in place. Refer to Figure 6



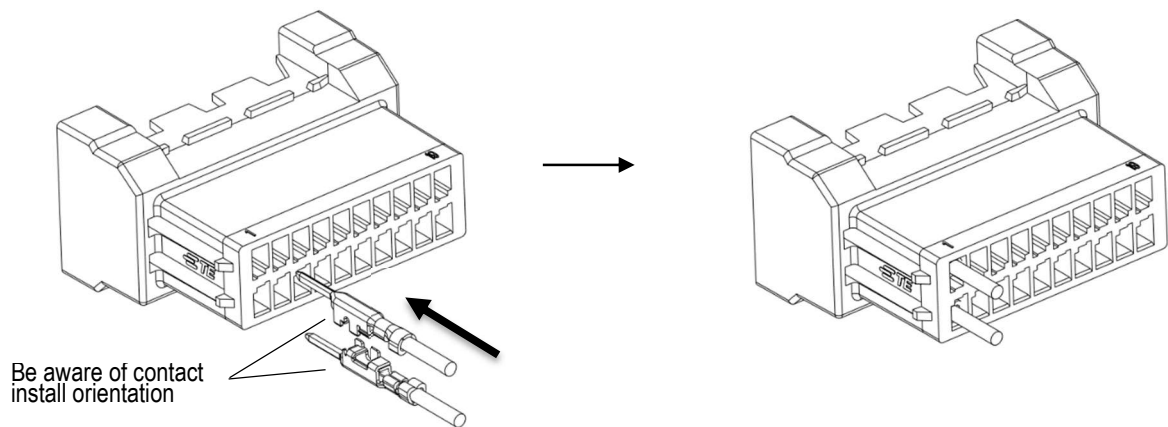
*Plug Dual Row*



*Cap Single Row*



*Cap Dual Row*

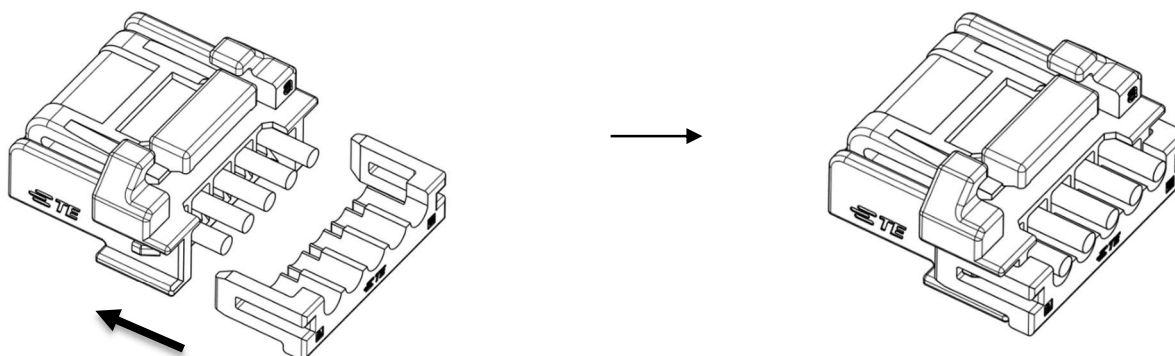


**Figure 6**

### 3.6. Installing TPA (If Applicable)

Grasp the TPA and push it straight into the housing until it bottoms (there should be an audible click). Pull back lightly to be sure the TPA is locked in place. See Figure 7.

#### Single Row



#### Dual Row

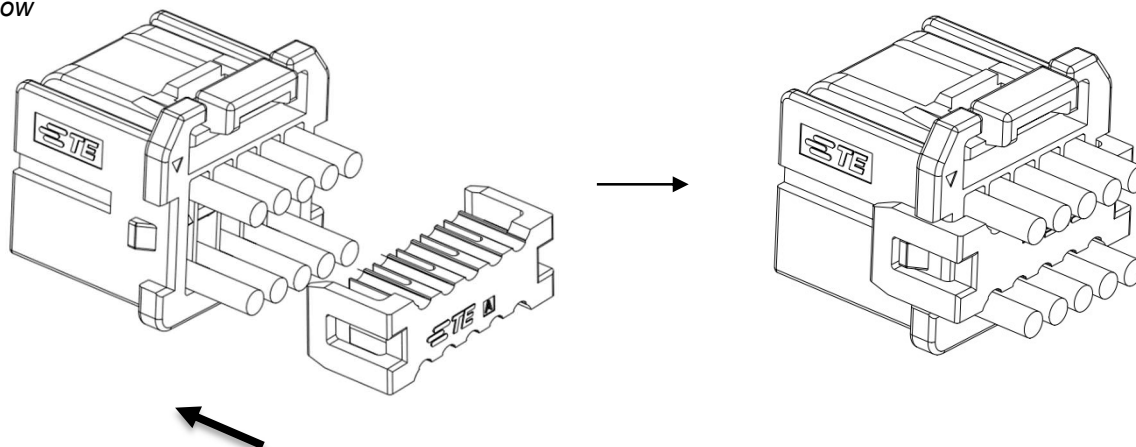
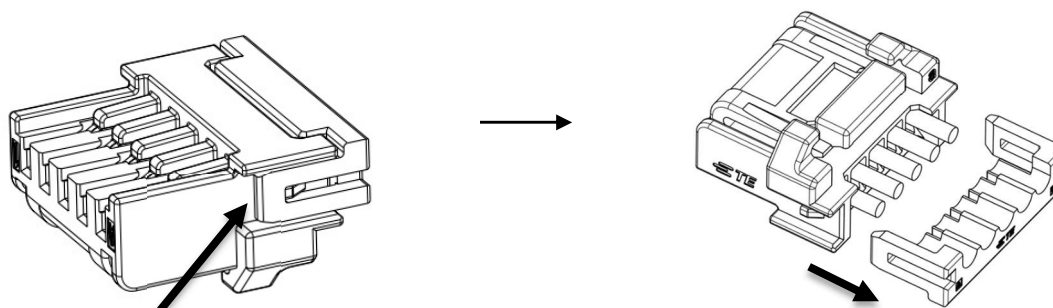


Figure 7

### 3.7. Un-installing TPA (For SGI 1.50 only)

Use special tool (like sharp object) to lift the tip of TPA latch at both sides carefully and then remove the TPA from plug housing. Be careful not to damage TPA during the operation. See Figure 8.

#### Single Row



### Dual Row

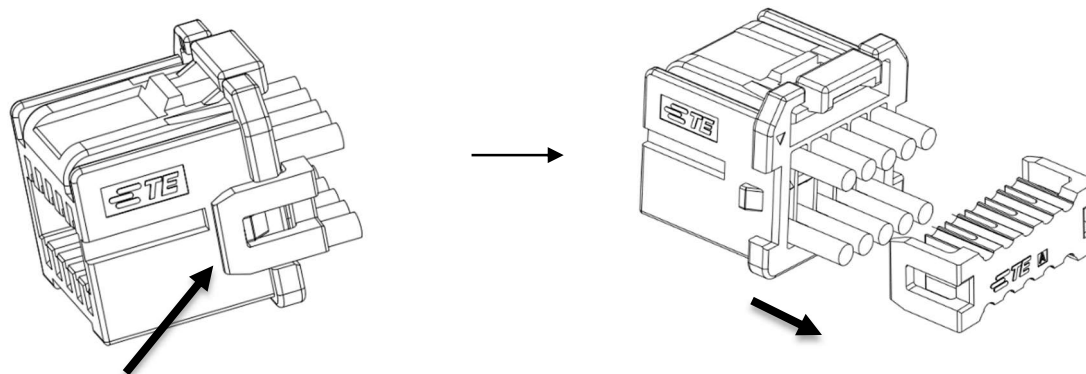


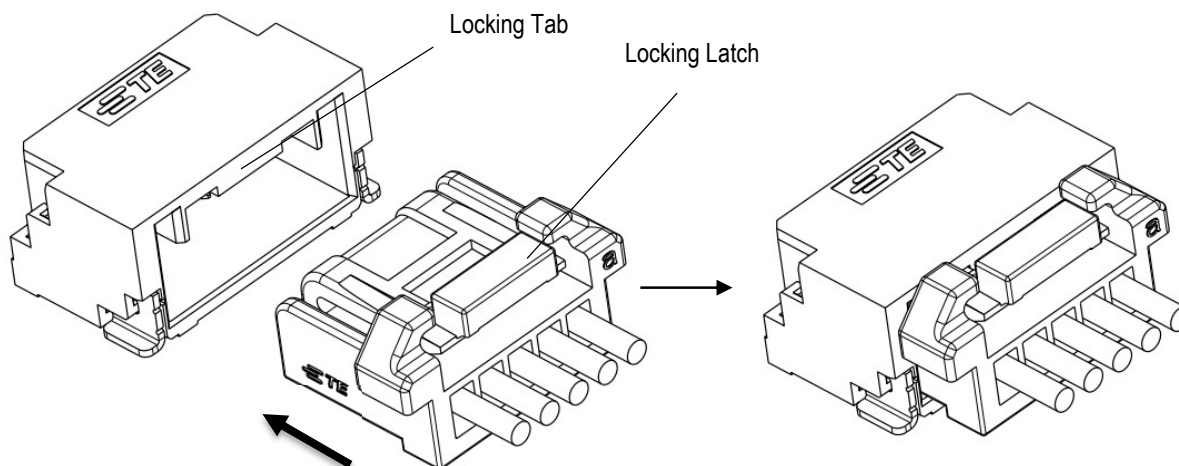
Figure 8

### 3.8. Mating Connectors

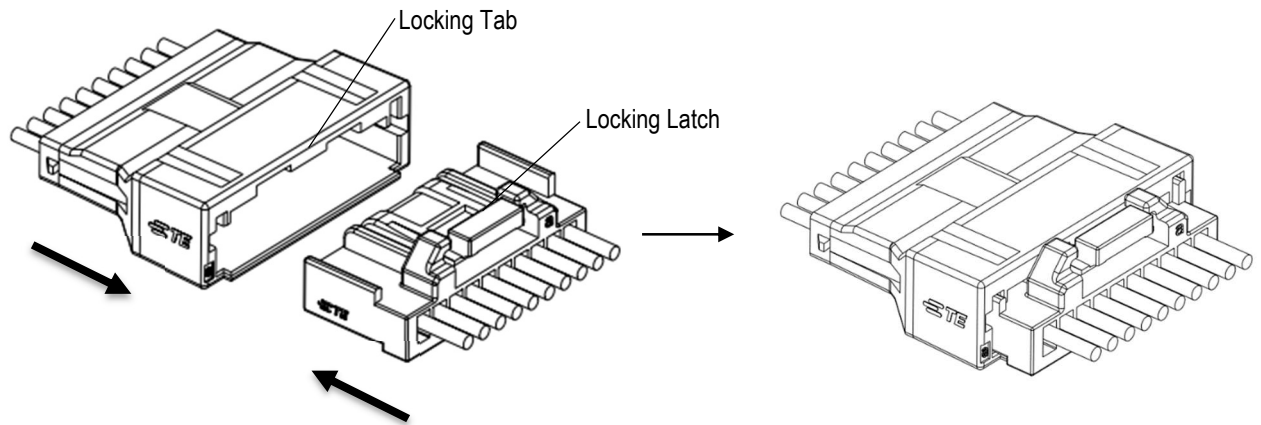
Ensure that the mating connectors have identical number of circuits and a pin contact mating with a socket contact. Align the mating faces of the connectors and push them together until the locking latch fully engages the locking tab. Pull back to ensure proper engagement and to prevent any deformation of the locking mechanism. See Figure 9.

During mating connector, please don't stack up the wire to the middle in case damage the connector, the correct operation should be gripping the wire in up and down direction, as Figure 11 show.

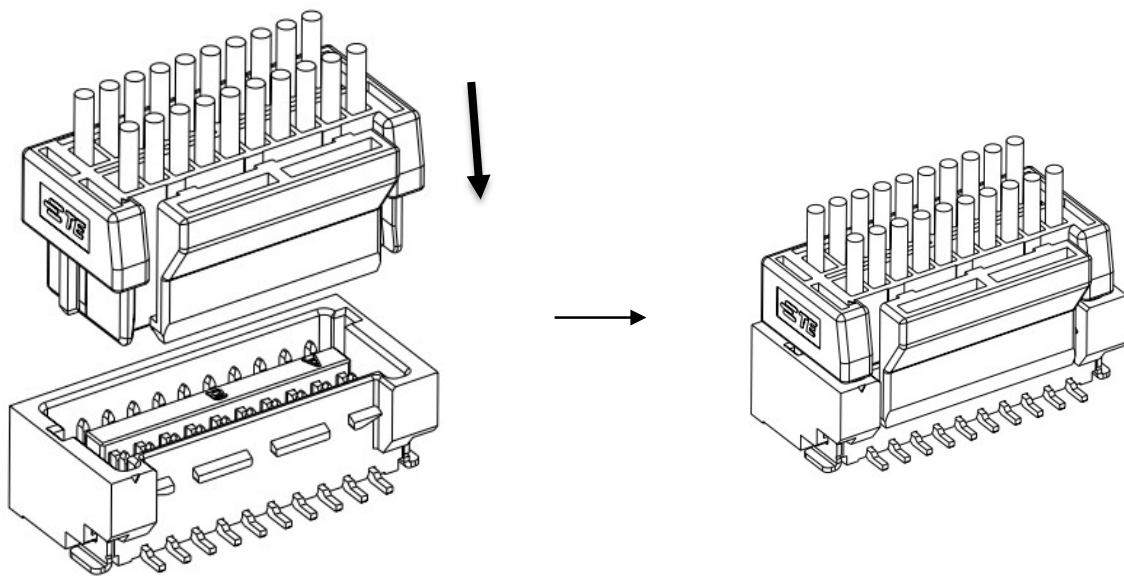
### Single Row

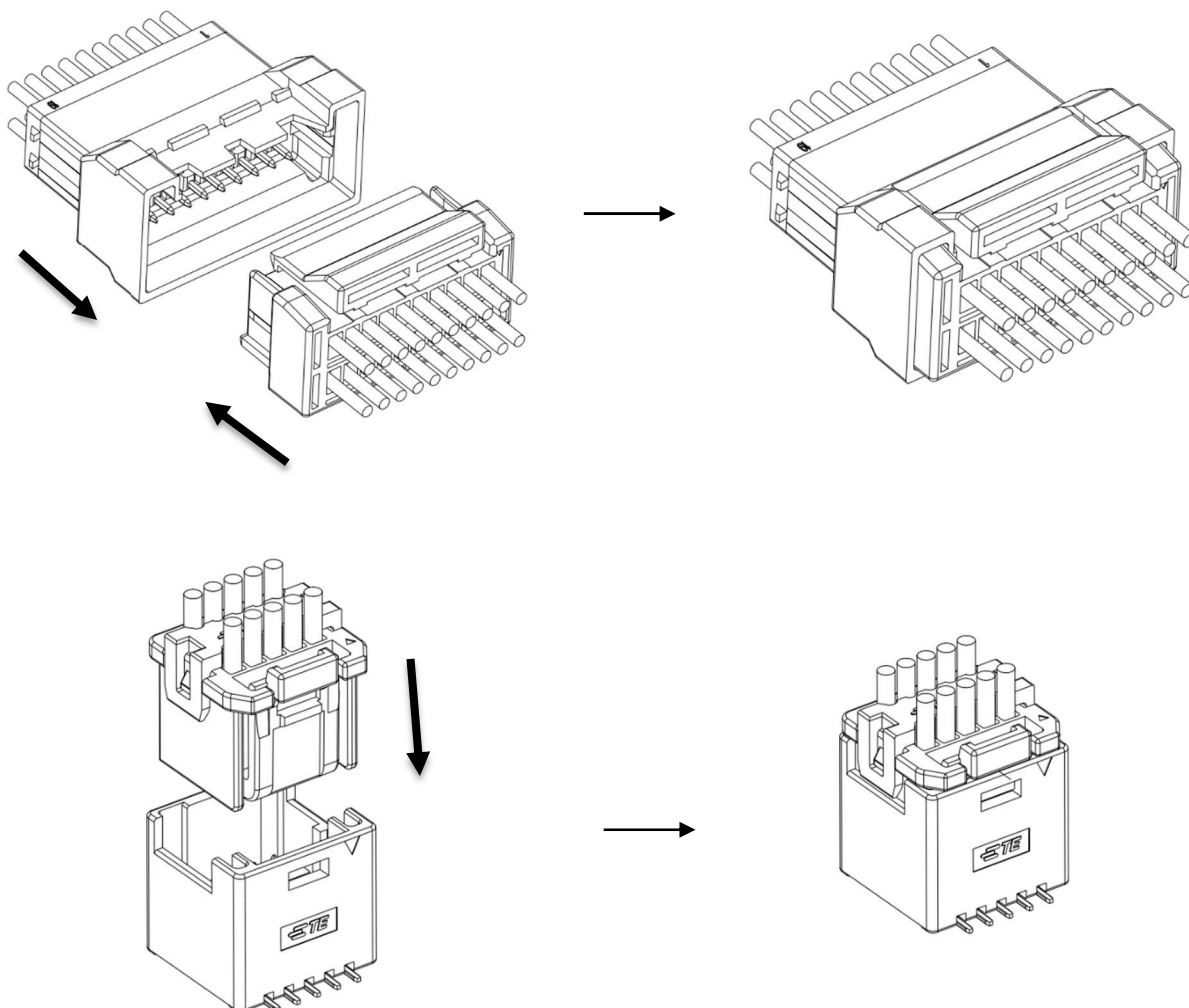






### *Dual Row*




**NOTE**

Align the plug housing with header assembly or cap housing and then mate them without giving “KOJIRI” motions. Be sure that they are locked in position.

Figure 9

### 3.9. Unmating Connectors

To disengage mating connectors, depress latch of plug housing with thumbnail, and pull the connectors apart. Refer to Figure 10.

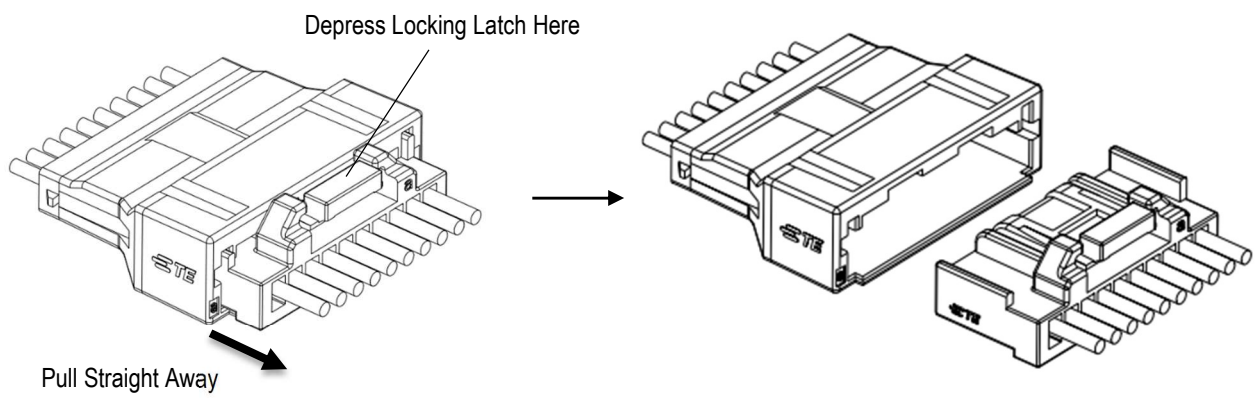
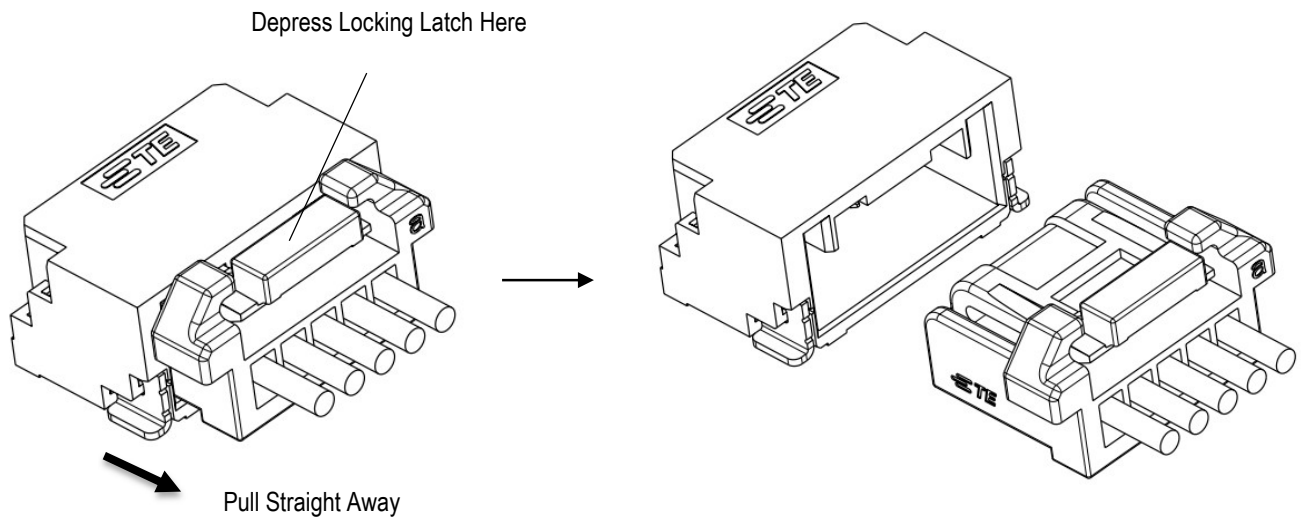
During unmating connector, please don't stack up the wire to the middle in case damage the connector, the correct operation should be gripping the wire in up and down direction, as Figure 11 show.


**NOTE**

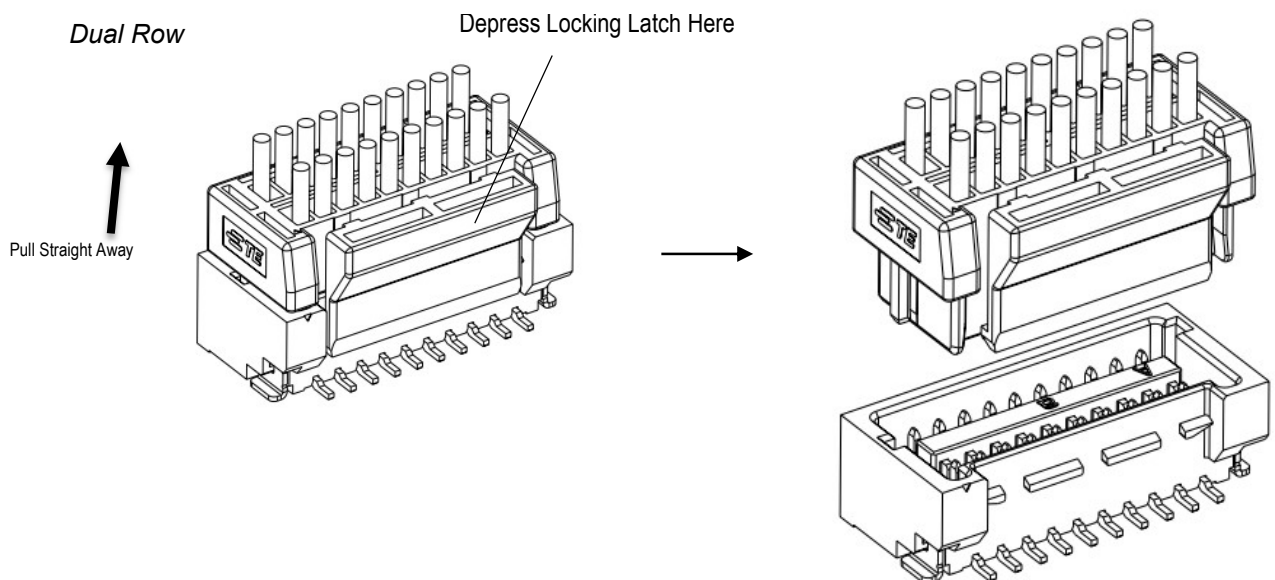
DO NOT pull the connectors by the wires.



### Single Row



### Dual Row



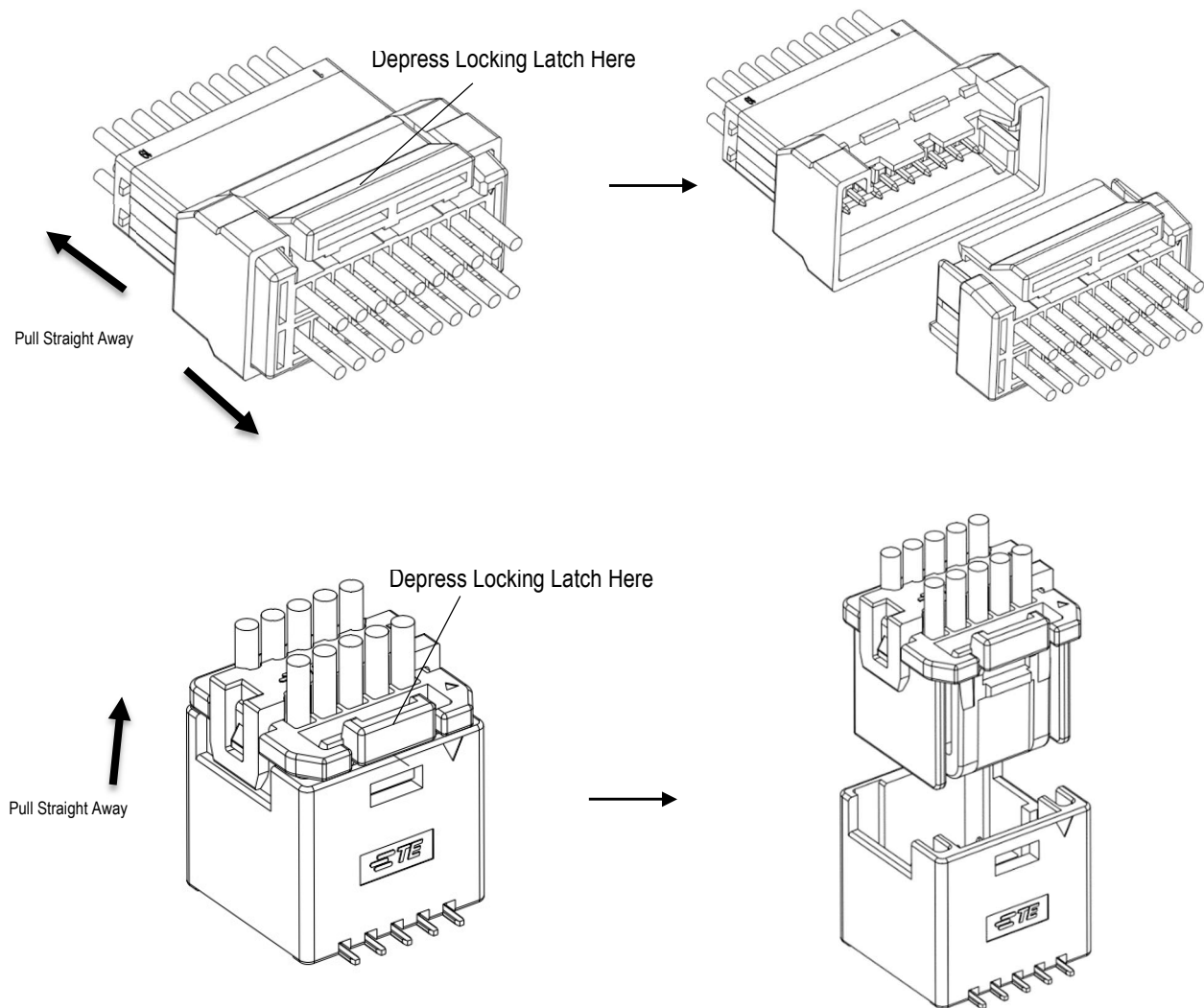


Figure 10

Grip in broadside direction **X**

Grip in up and down direction **O**

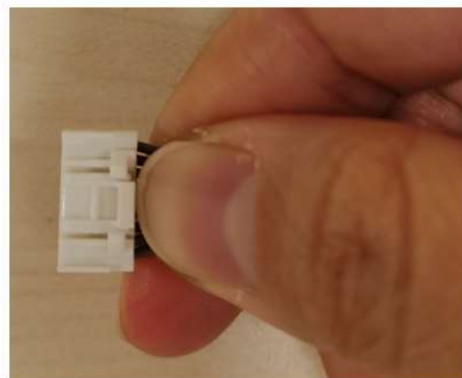
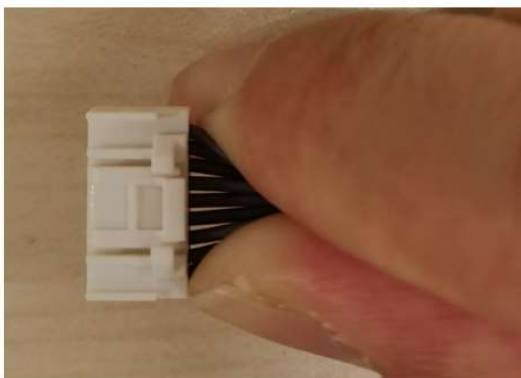


Figure 11

### 3.10. PC Board

The PC board pads must be solderable in accordance with EIA-638(Electronic Industries Alliance). Recommended PC board pad pattern, dimensions and tolerances are shown in customer drawing.

### 3.11. PC Board Header Assembly Placement



#### CAUTION

*If connectors are placed on the board manually, the connector should be handled only by housing to avoid deformation, contamination, or damage to the contact solder tines and metal pegs.*

#### A. Manual Placement

When placing the Surface Mount Connectors, the contact solder tines should be centered on the PC board circuit pads. However, slight misalignment is permissible as shown in Figure 12.

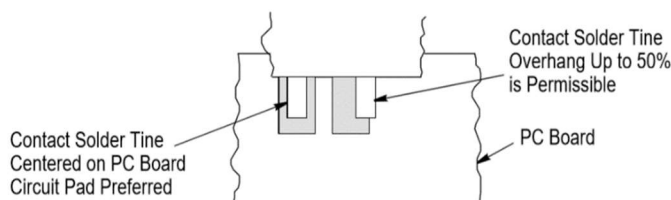


Figure 12

#### B. Robotic Placement

The robotic equipment must be adjusted to feed, pick up, and place the headers on the PC board with an accuracy as required. The header assembly datum surfaces detailed on the customer drawing will ensure correct placement of the header.

### 3.12. Replacement and Repair

Do not use defective or damaged product. These products cannot be repaired. For replacement information, call the number at the bottom of page 1.

### 3.13. Strain Relief and Wire Dress

Wires can be bundled together and supported using cable ties or electrical tap. The wires must remain perpendicular to the housing and avoid an excessively sharp bend radius. The wire bundle must be at least 76mm [3.0 inch] from the back of the housing before bending in any direction. Do not bend unsupported wires as this may cause strain on the contacts.

### 3.14. Soldering

#### A. Process

The contacts can be soldered using reflow soldering or equivalent soldering techniques. Temperature and exposure time shall be as specified in 108-106451.

#### B. Flux Selection

The contact Stabilizer Barrel must be fluxed prior to soldering with a 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 the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these connectors are provided in Figure 13.

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

Figure 13

### C. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Cleaners must be free of dissolved flux and other contaminants. It is recommended that cleaning takes place with the PC board on its edge. If using an aqueous cleaner, it is recommended using standard equipment, such as a soak tank or automatic in-line machine. Common cleaning solvents with times and temperatures that will not affect these contacts is specified in Figure 14.



#### NOTE

For solvents not listed, call the number on the bottom of page 1 for recommendations.

CLEANER		TIME (Minutes)	TEMPERATURE (Max)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

Figure 14

### D. Drying

When drying cleaned contacts and PC boards, temperature limitations must not be exceeded: -55° to 105°C [-67° to 221°F]. Excessive temperatures may cause contact degradation.

## 4. TOOLING

Applicators contain the tooling for feeding and crimping strip-form terminals. Automatic machines provide the power to operate the applicator. See Figure 15 for representative images.

Tooling information for product part numbers is available from [www.te.com](http://www.te.com) or by calling the Product Information Center at the number at the bottom of page 1.

Applicators for product part numbers are available from the [Applicator Search Portal](http://www.te.com) on [www.te.com](http://www.te.com) or by calling the Product Information Center at the bottom of page 1.



Ocean Applicator



Semi Automatic Machine

Figure 15

## 5. 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.

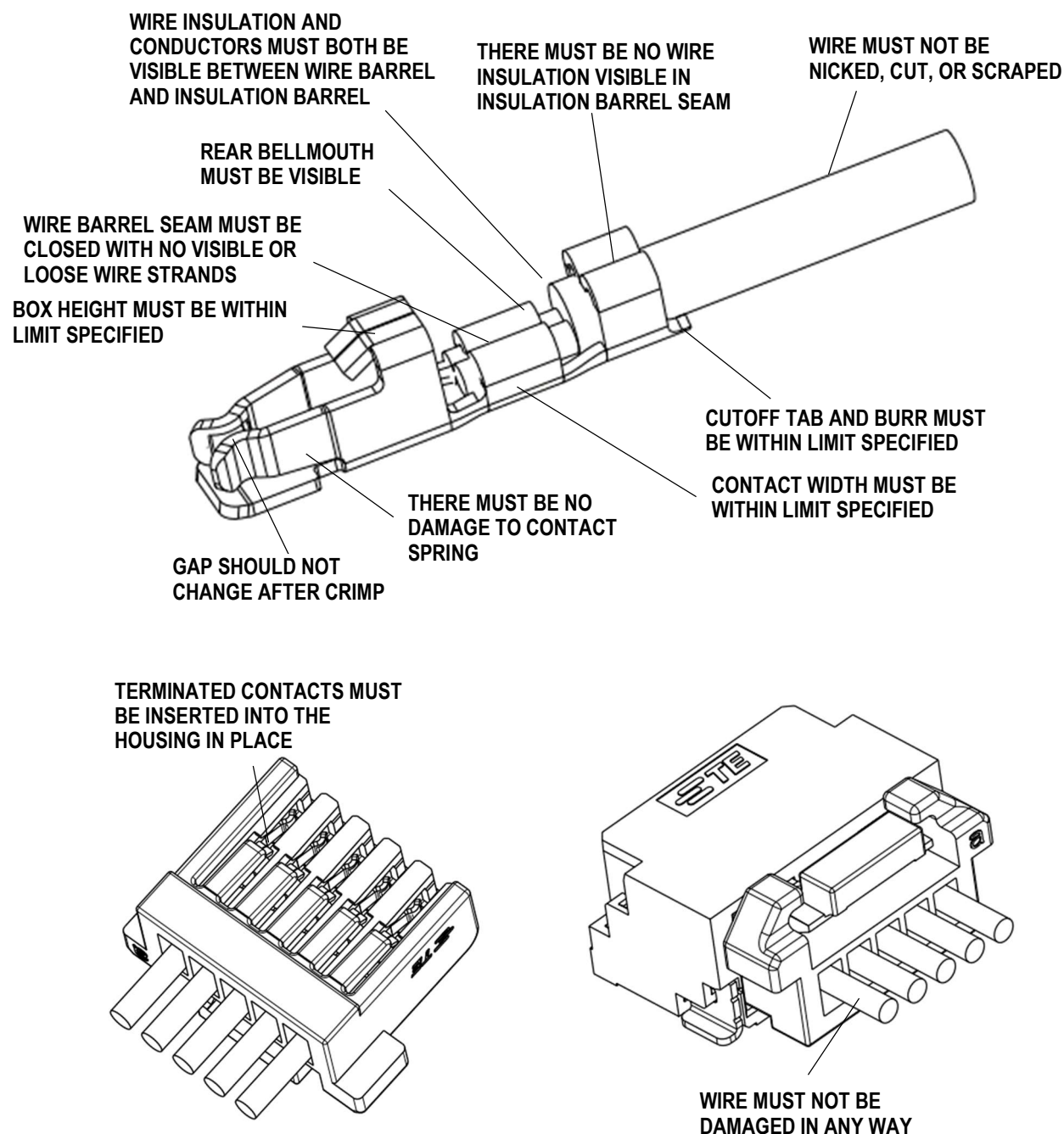
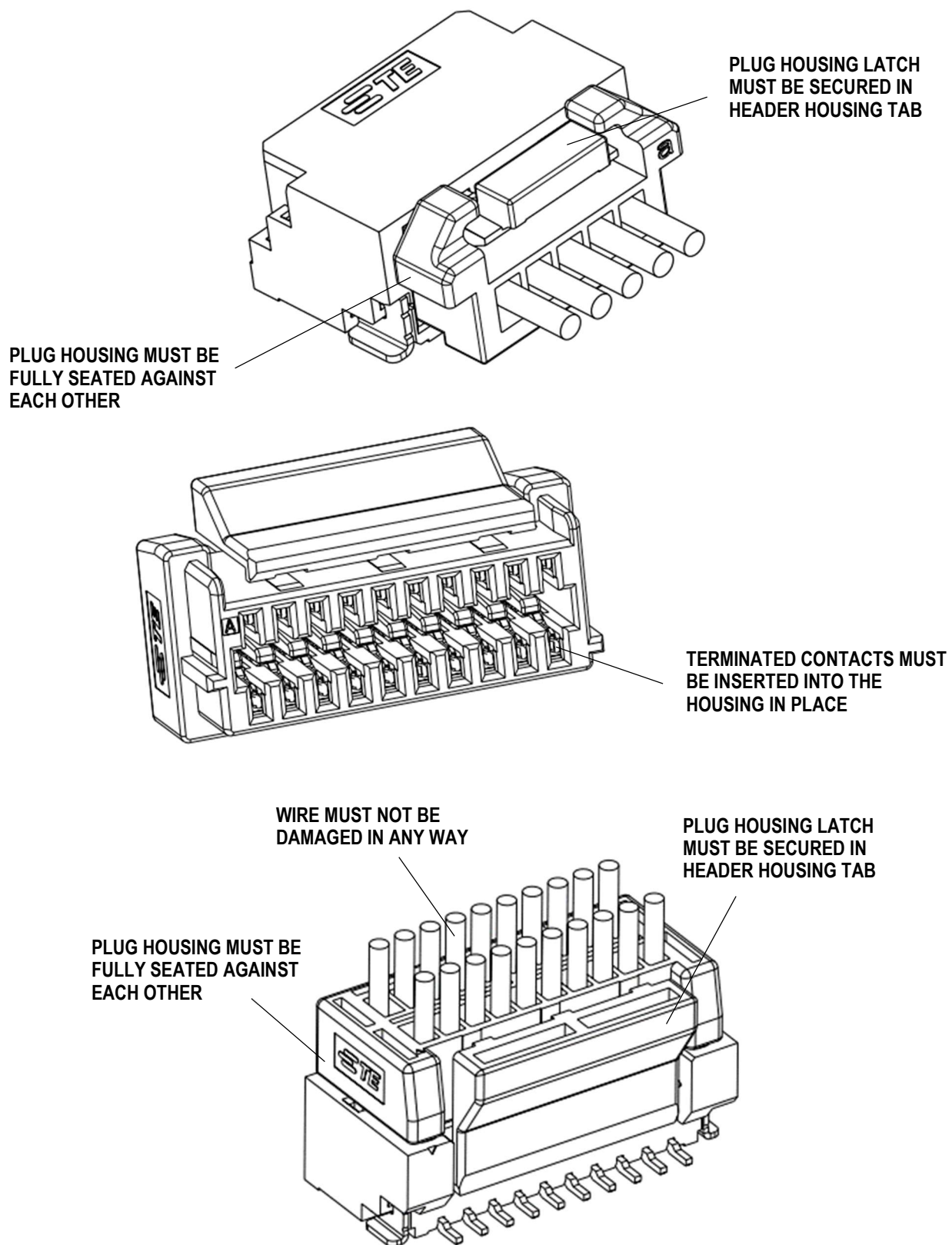


Figure 16 (continued): Visual Aid





**Figure 16 (end): Visual Aid**