

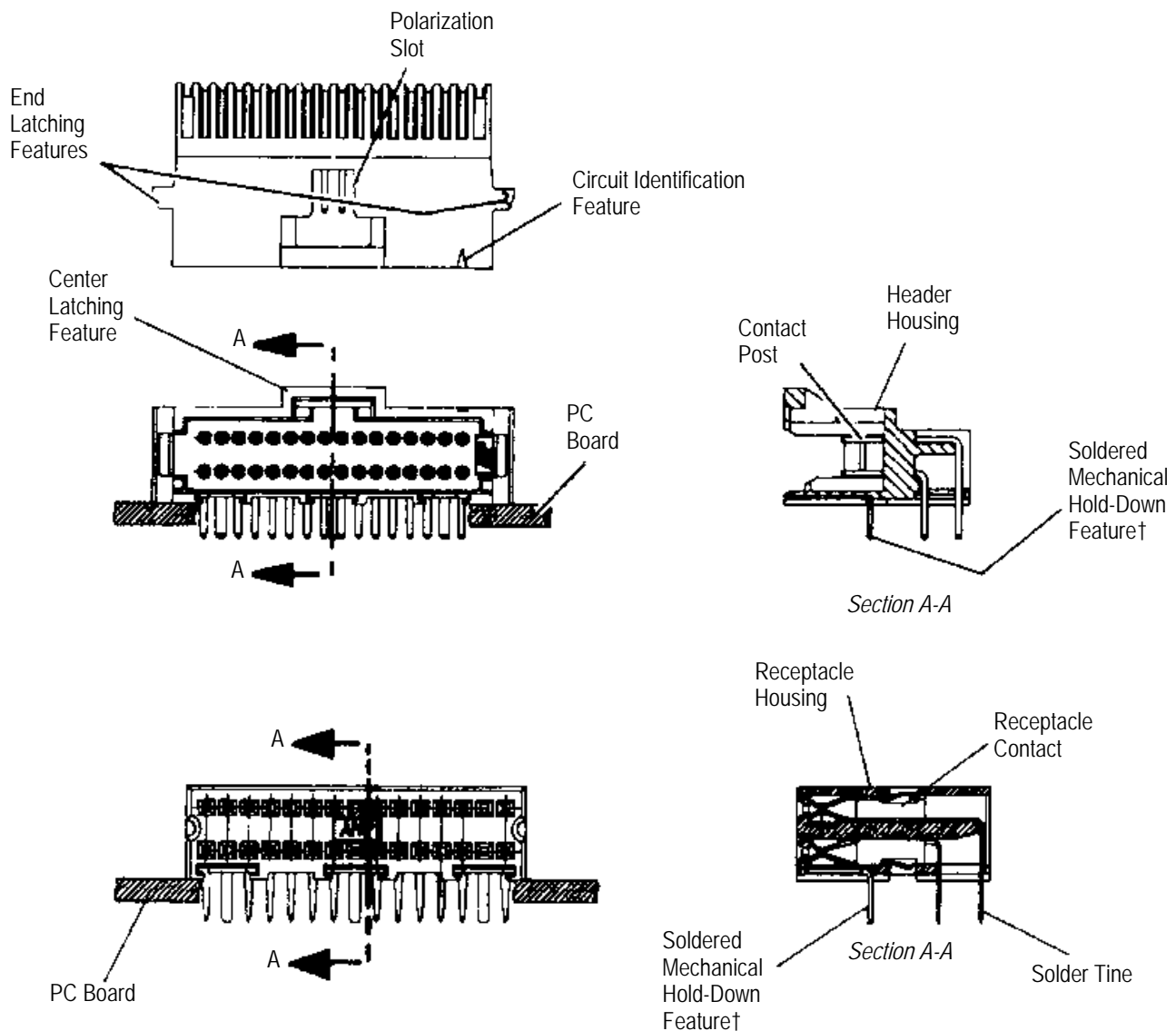


All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  [ $\pm 0.005$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification only and are not drawn to scale.

## 1. INTRODUCTION

This specification covers the requirements for application of AMPMODU System 50 Thru-Hole Connectors for printed circuit (pc) boards. These connectors are available in four types: receptacles, unshrouded headers, universal shrouded headers, and a vertical shrouded header with card slots. Single row connectors are spaced on 1.27 mm [.050 in.] centerlines and double row connectors are on 1.27 x 2.54 mm [.050 x .100 in.] centerlines.

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.



†Applies to right-angle connectors only.

Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Updated document to corporate requirements
- New logo

### 2.2. Customer Assistance

Reference Product Base Part Number 104069 and Product Code 0387 are representative of AMPMODU System 50 Thru-Hole 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 Representative or, after purchase, by calling PRODUCT INFORMATION 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, call PRODUCT INFORMATION at the number at the bottom of page 1.

### 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 for information on soldering problems.

### 2.5. Specifications

Application Specifications 114-16008 and 114-25029 provide product description and application requirements of AMPMODU System 50 receptacles which are applied to 1.27 mm [.050 in.] centerline flat flexible cable and to 0.64 mm [.025 in.] centerline ribbon cable respectively.

Product Specification 108-1093 provides product performance and test information.

### 2.6. Instructional Material

Instruction Sheets (408-series) providing procedural information is packaged with the product.

## 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 connector material.

#### B. Shelf Life

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

### 3.3. Material

AMPMODU System 50 connector housings are molded from high-temperature thermoplastic resins which are chemically resistant to most standard cleaning fluids used throughout the electronics industry. The following is a partial list of solvents that are compatible with the connector when applied for the times and temperatures presented.



*Consult the solvent manufacturer concerning health and safety hazards related to the solvent used.*

| CLEANER           |         | TIME<br>(Minutes) | TEMPERATURE<br>(Maximum) |
|-------------------|---------|-------------------|--------------------------|
| 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 |                   |                          |

ALPHA, BIOACT, CARBITOL, LONCOTERGE, and KESTER are trademarks of their respective owners.

Figure 2

### 3.4. Chemical Exposure

Do not store connectors 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        |

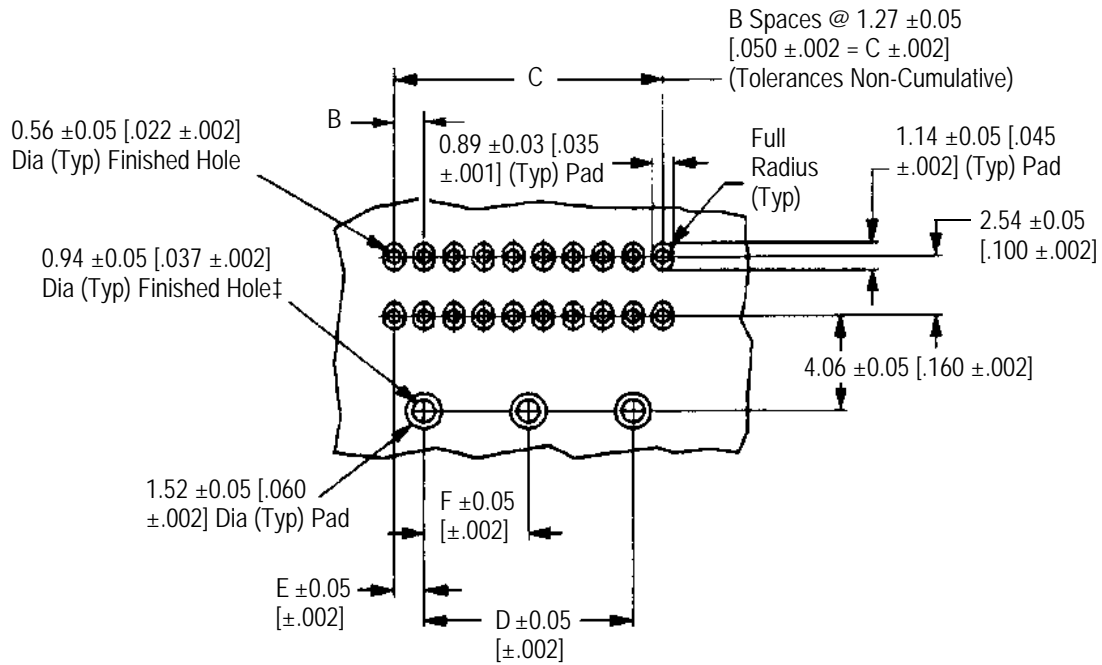
### 3.5. PC Board Thickness and Layout

#### A. Thickness

PC board thickness shall be 1.57 mm [.062 in.] nominal.

#### B. Layout

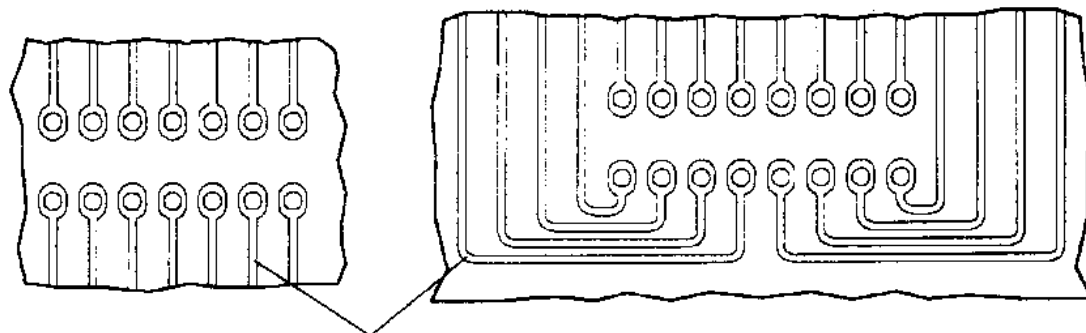
PC board layout and hold sizes shall be as indicated on the appropriate product drawing (contact TE Engineering). Typical layout and wiring arrangements are shown in Figure 3.



‡ When needed for soldered mechanical hold-down only.

**NOTE:** Refer to the appropriate product drawing for the correct B, C, D, E, and F dimensions.

*Typical PC Board Layout*



Trace on Internal Layer of Multi-Layer PC Board  
or Opposite Side of Double-Layer PC Board



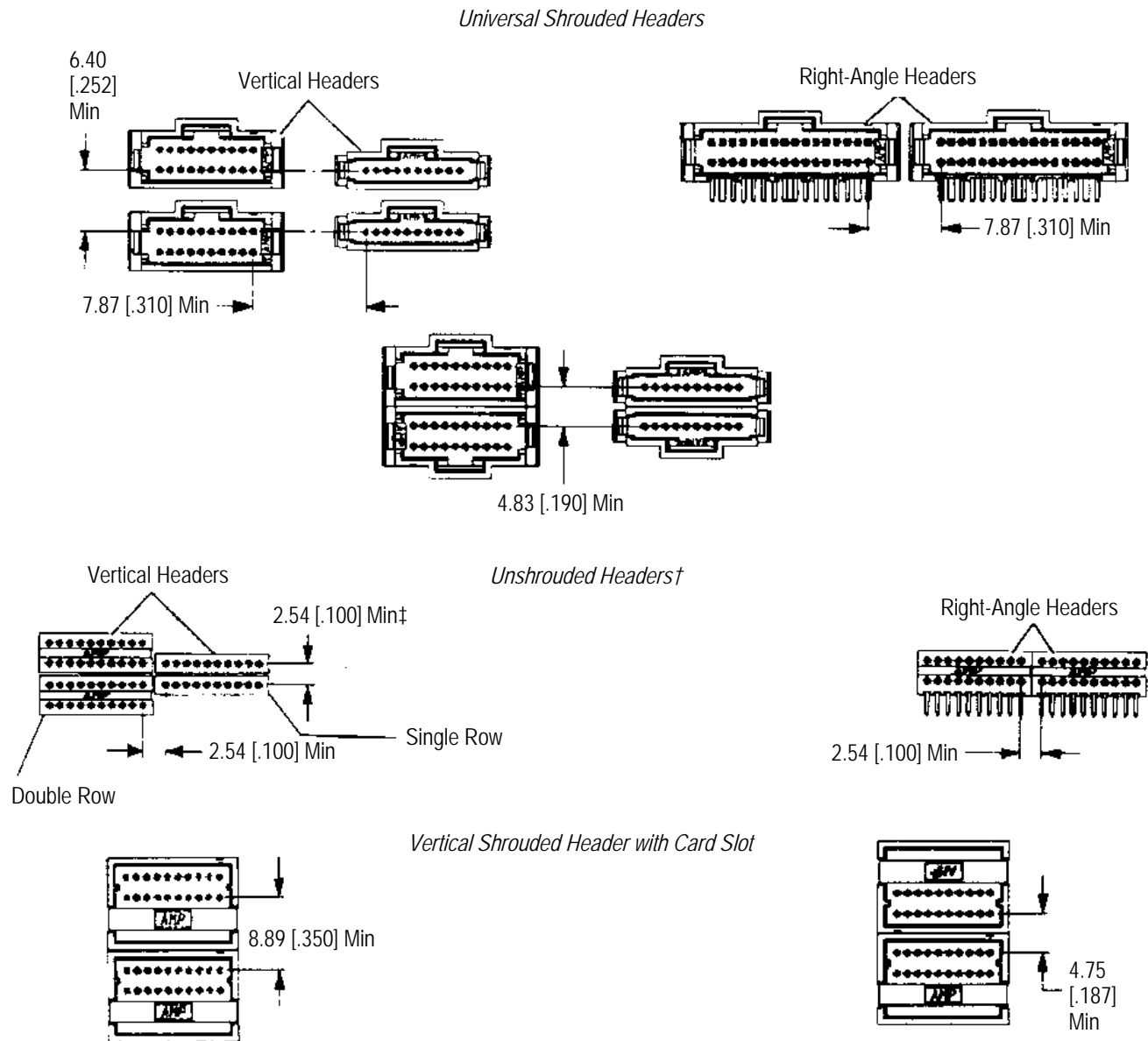
*Typical Wiring Arrangements*

Figure 3

### 3.6. Clearance Requirements

Clearance requirements are as follows:

1. The use of more than one connector pair to interconnect two pc boards is not recommended; if such a configuration is necessary to meet design requirements, consult TE Engineering.
2. Figure 4 shows minimum spacing dimensions for System 50 headers.

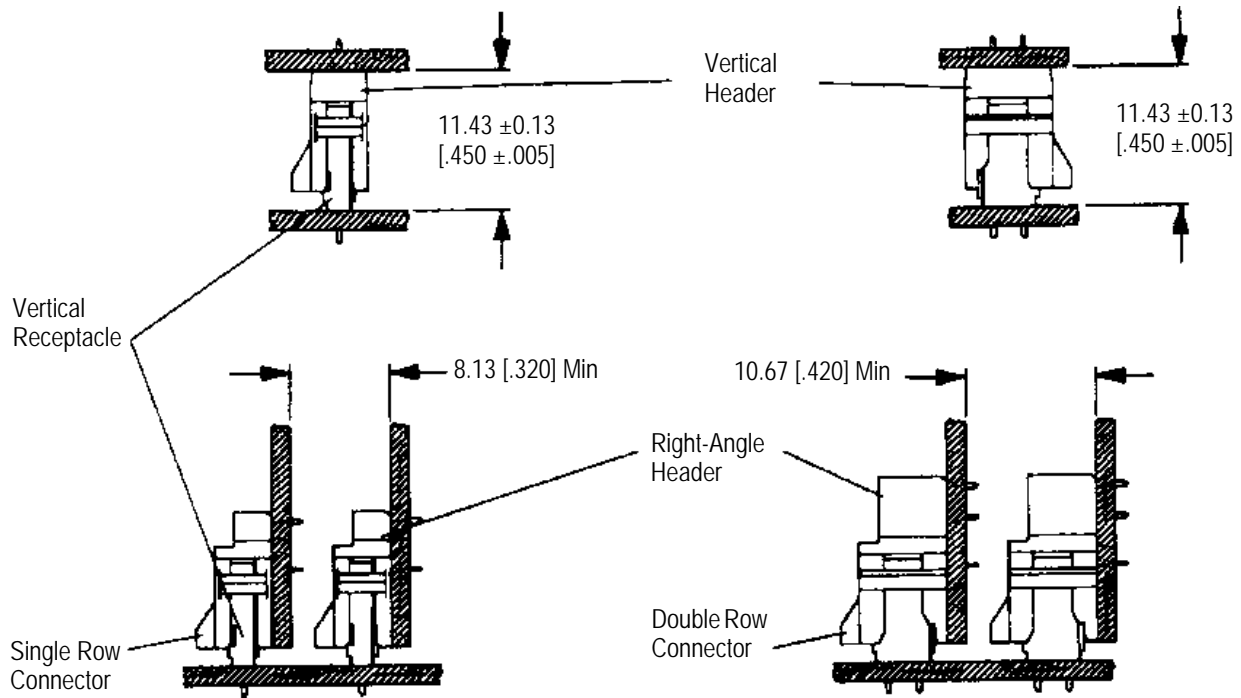


†Spacing dimensions for these headers do not include space needed for operation the latches on mating wire-to-board receptacles. The space allowed is to be determined by the customer.

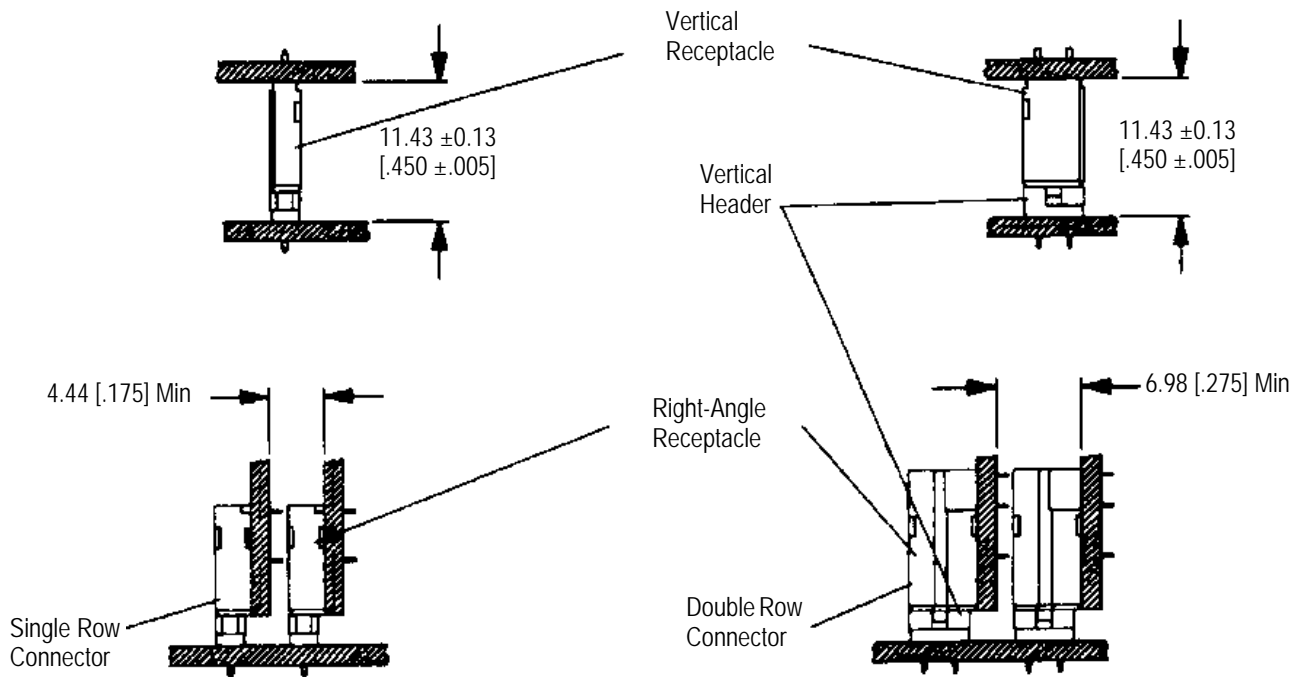
‡Minimum spacing dimensions for the mating receptacle must be considered in applying this dimension.

Figure 4

3. Dimensions for stacking applications are given in Figure 5.

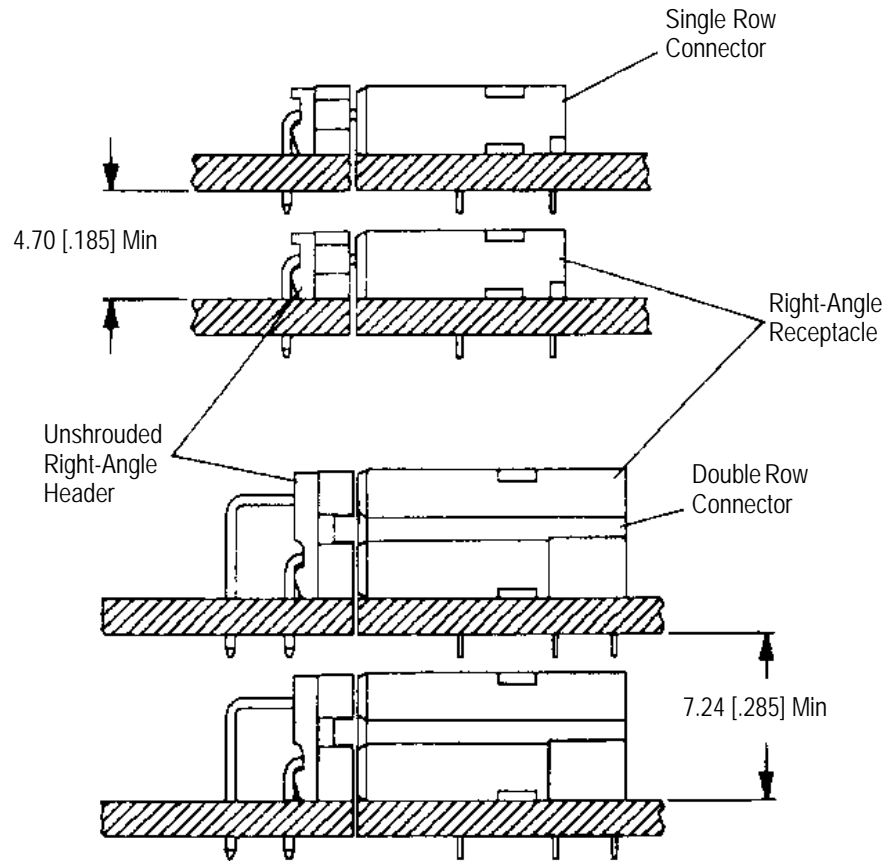


*Universal Shrouded Headers and Vertical Receptacles*

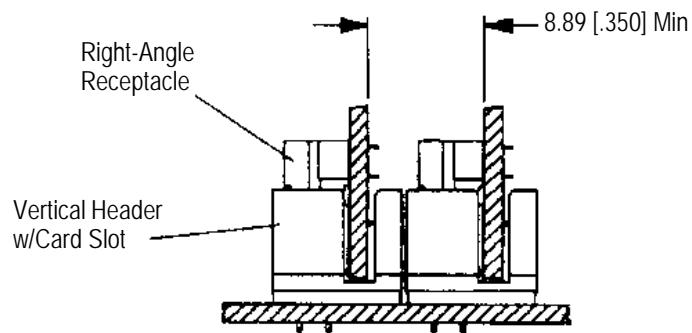


*Unshrouded Vertical Headers, Vertical and Right-Angle Receptacles*

*Figure 5 (Cont'd)*



*Unshrouded Right-Angle Headers and Right-Angle Receptacles*



*Vertical Header with Card Slot and Right-Angle Receptacle*

Figure 5 (End)

### 3.7. Polarization

Polarization of connectors is achieved by a slotted feature on the header housing and a matching key on the mating wire-to-board receptacle housing.

### 3.8. Circuit Identification

A v-shaped recess in the connector housing provides a means of circuit identification. Typically this recess is used to locate the number one circuit, but another method may be used if desired. (See Figure 1.)

### 3.9. Mating

AMPMODU System 50 headers mate to receptacles as shown in Figure 6. Consult TE Engineering for specific part numbers and for any application of these products not covered in this specification.

|                       |               | UNIVERSAL SHROUDED HEADERS                                 |                     |                        |                        | VERTICAL SHROUDED HEADER W/CARD SLOTS | UNSHROUDED HEADERS  |                     |                        |                        |  |
|-----------------------|---------------|------------------------------------------------------------|---------------------|------------------------|------------------------|---------------------------------------|---------------------|---------------------|------------------------|------------------------|--|
|                       |               | SINGLE ROW VERTICAL                                        | DOUBLE ROW VERTICAL | SINGLE ROW RIGHT-ANGLE | DOUBLE ROW RIGHT-ANGLE |                                       | SINGLE ROW VERTICAL | DOUBLE ROW VERTICAL | SINGLE ROW RIGHT-ANGLE | DOUBLE ROW RIGHT-ANGLE |  |
| RECEPTACLE ASSEMBLIES | BOARD MOUNTED | Single Row Vertical                                        |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       |               | Double Row Vertical                                        |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       |               | Single Row Right-Angle                                     |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       |               | Double Row Right-Angle                                     |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       | WIRE APPLIED  | 0.64 mm [.025 in.] CL Ribbon Cable Connector               |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       |               | 1.27 mm [.050 in.] CL Flat Flex Cable Connector Single Row |                     |                        |                        |                                       |                     |                     |                        |                        |  |
|                       |               | 1.27 mm [.050 in.] CL Flat Flex Cable Connector Double Row |                     |                        |                        |                                       |                     |                     |                        |                        |  |

†Refer to Paragraph 2.5 for information regarding these connectors.

Figure 6

### 3.10. Seated Connector Requirements

Seated connector requirements are as follows:

1. Solder tines may be clinched to the pc board in order to hold the connector assembly in place during handling and soldering, and to ensure the integrity of the solder joints. The pc board and the connector assembly shall both be supported during the clinching operation.



*The methods used to provide support and to clinch the tines is left to the customer's discretion, but the chosen method shall not apply pressure against the tines in a direction perpendicular to the pc board. Failure to comply may result in contacts being dislodged from their proper position in the housing.*

2. Seated, clinched connectors shall be completely flush to the pc board and shall appear as illustrated in Figure 7.



*Connectors are not to be used as the sole mechanical support between the pc boards. The use of commercially available standoffs or card guides is recommended to ensure the mechanical integrity of the system.*



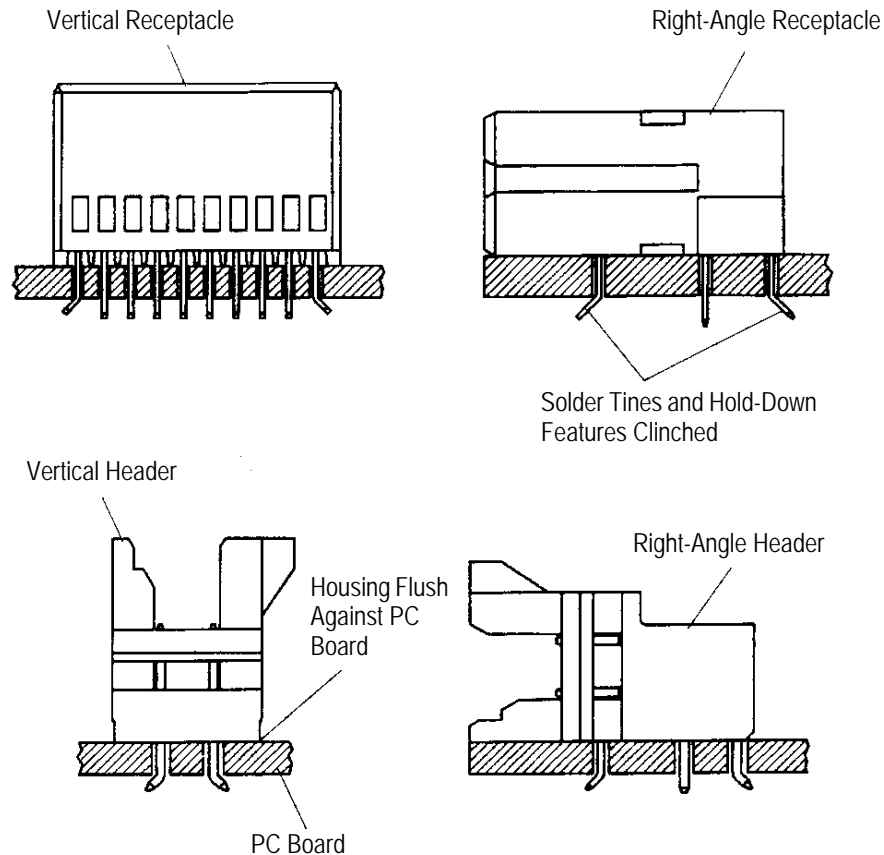


Figure 7

### 3.11. Cleaning and Soldering

Cleaning and soldering shall be according to the following guidelines:

1. Solder tines shall be fluxed prior to soldering using a non-activated to mildly activated rosin. Proper flux selection depends on the type of pc board and any components already mounted. Flux must also be compatible with the customer's flow solder line and with manufacturing and safety requirements.
2. Removal of fluxes, residues, and activators is mandatory. Cleaning procedures are chosen by the customer and depend on the type of flux used on the solder line.
3. Extra consideration must be given to wave soldering parameters and pc board design to minimize solder bridging between adjacent leads due to the 1.27 mm [.050 in.] centerline spacing on the connectors. When a trace must be run on the solder side of the pc board between adjacent pads as shown in Figure 3, mask must be applied over the trace. Recommended masks are:

- Photo-imageable liquid mask
- Dry film solder mask

Orient the pc boards so that the length of the connector is perpendicular to the solder wave. Solderability of the pc board is also critical in the successful soldering of the connector.

**NOTE**



*The wave soldering process will vary among customers and equipment. It is recommended that each customer perform experimental runs to determine an optimum process providing maximum yields. Typical parameters are:*

Conveyor speed ----- 1.83 m [6 ft] per minute  
 Pre-heat temp ----- 104.4°C [220°F] top surface of pc board  
 Solder ----- 63/37 257.2°C [495°F] pot temperature

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### 3.12. Workmanship Standards

The following workmanship standards shall apply to the completed pc board assembly:

1. The solder tines and hold-down features shall protrude through the pc board and be correctly soldered.
2. The plastic connector housing and pc board shall not sustain damage during the clinching or soldering processes to the extent that performance is affected.
3. The assembly shall conform to all the requirements of the appropriate product drawing.

### 4. QUALIFICATIONS

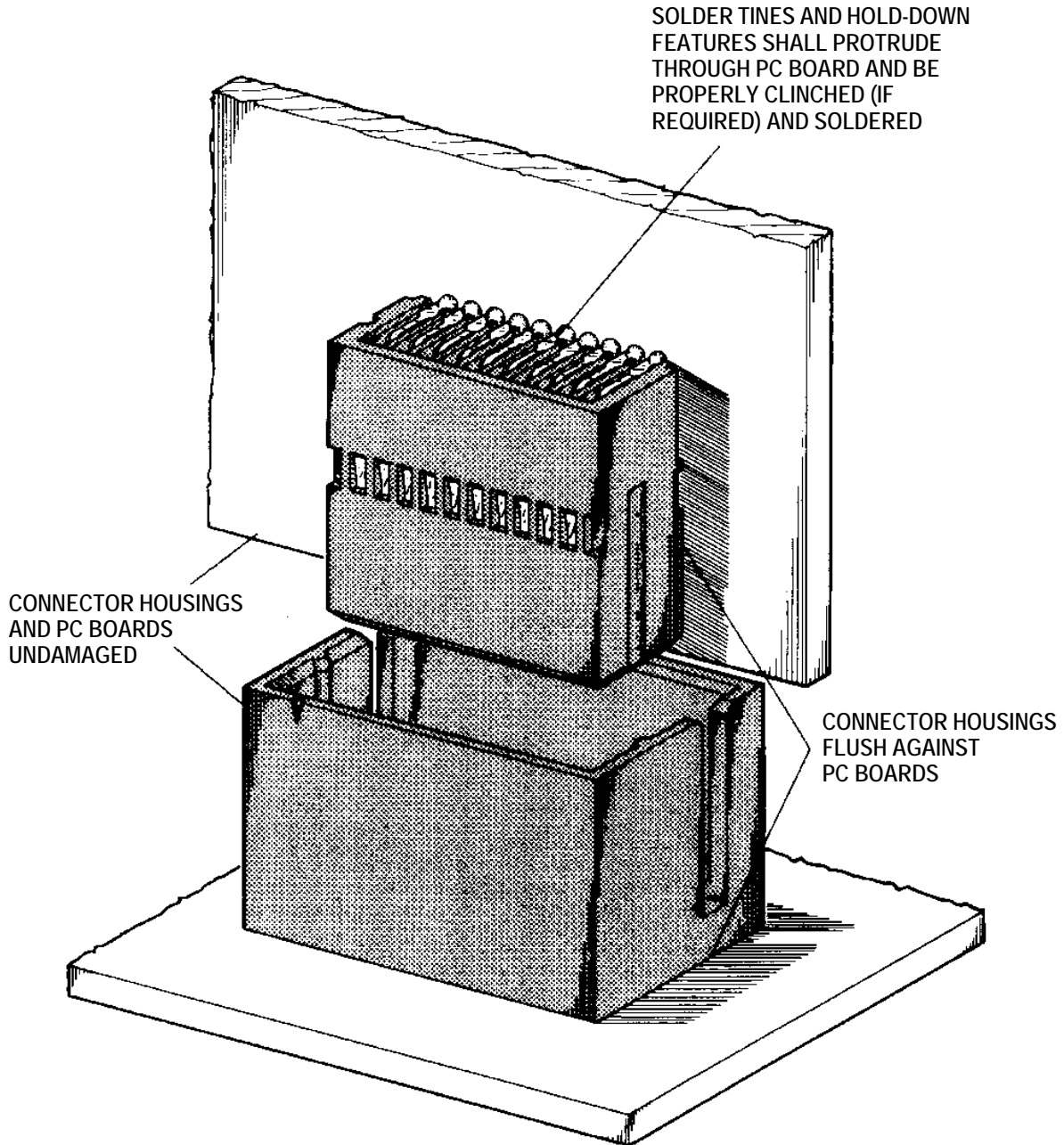
No qualification support was provided at the time of release of this specification.

### 5. TOOLING

The connector assemblies are to be hand-applied and are not considered repairable. Therefore, no application or repair tooling is required. Clinching and soldering equipment and tooling is customer supplied to meet their specific needs.

## 6. 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 8. VISUAL AID**