

## Universal MATE-N-LOK Connectors (Continued)

#### **PC Board Vertical Pin Headers**

# 2, 3, 4, 5, 6 and 8 Circuit, In-Line

Centerline Spacing --- 6.35 [.250] Solder Tall Diameter -- 1.57 [.062]

#### Material

Housing — UL 94V-2 Nylon, natural color UL 94V-0 Nylon

Contacts — Phosphor bronze

#### **Mating Connectors** Universal MATE-N-LOK

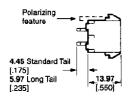
Plug Housings — Page 393

Note: For Recommended PC Board Hole Layout for Vertical Pin Headers, see page 393.

| Polariz ng feature  4.45 Standard Tai [.175] | 7.62   |
|--|--------|
| 5.97 Long Tail 13.97<br>[.235] [.550]        | [.300] |

| N                            |                       | Pin Header Part Numbers |                     | Mates with Plug  |   |                        |   |  |                |  |  |  |  |  |         |          |  |          |  |
|------------------------------|-----------------------|-------------------------|---------------------|------------------|---|------------------------|---|--|----------------|--|--|--|--|--|---------|----------|--|----------|--|
| Number of A<br>Circuits Dim. |                       | Flammability<br>Rating  | Pin<br>Finish       | Standard<br>Tail | Standard Tail<br>Polarized <sup>2</sup> | Long Tail <sup>3</sup> | Housing Part Number (Using Socket Contacts) |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | UL 94V-2                | Pre-tin             | 350428-1         | ···                                     | 350582-1               | 1 120000 0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | OL 94V-2                | Duplex1             | 350428-2         |   | 350582-2               | 1-480698-0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
| 2                            | 1 <b>3.97</b><br>.550 | UL 94V-0                | Pre-tin             | 350786-1         | 641964-1<br>1-641964-1                  | 350787-1               | 350777-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       |                         | Duplex1             | 350786-2         | _                                       | 350787-2               |   |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       |                         | Pre-tin             | 350429-1         | 641965-1                                | 350583-1               |   |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | UL 94V-2                | Duplex <sup>1</sup> | 350429-2         | -                                       | 350583-2               | 1-480700-0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
| 3                            | .800                  | UL 94V-0                | Pre-tin             | 350789-1         | 641966-1<br>1-641966-1                  | 350790-1               | 350766-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       |                         | Duplex1             | 350789-2         | _                                       | 350790-2               |   |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | Pre-tin                 | 350430-1            | 641967-1         | 350584-1                                |                        |   |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | UL 94V-2                | Pre-tin             | _                | _                                       |                        | 1-480702 0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
| 4                            |                       |                         |                     | 26.67            |   |                        |   |  | 26.67<br>1.050 |  |  |  |  |  | Duplex1 | 350430-2 |  | 350584-2 |  |
|                              | 1.000                 | UL 94V-0                | Pre-tin             | 350792-1         | 641968-1                                | <b>350793-</b> 1       | 350779-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | OL 94V-0                | Duplex <sup>1</sup> | 350792-2         | _                                       | 350793-2               | 330779-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | UL 94V-2                | Pre-tin             | 640466-1         | 643405-1                                |                        | 1 400700 0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
| 5                            | 33.02                 | OL 94V-2                | Duplex1             | _                | _                                       | _                      | 1-480763-0                                  |  |                |  |  |  |  |  |         |          |  |          |  |
| 3                            | 1.300                 | UL 94V-0                | Pre-tin             | 640900-1         | 643406-1                                | _                      | 350809-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              |                       | OL 94 V-0               | Duplex <sup>1</sup> | 640900-2         | _                                       |                        | 350809-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
| 6                            | 39.37                 | UL 94V-2                | Pre-tin             | 641832-1         | 643407-1                                |                        | 640585-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
|                              | 1.550                 | UL 94V-0                | Pre-tin             | 641831-1         | 643408-1                                |                        | 640581-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
| 8                            | 52.07                 | UL 94V-2                | Pre-tin             | 641825-1         |   | 770143-1               | 640586-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |
| 6                            | 2.050                 | UL 94V-0                | Pre-tin             | 641828-1         | 643410-1                                | 770272-1               | 640582-1                                    |  |                |  |  |  |  |  |         |          |  |          |  |

#### 6, 9, 12 and 15 Circuit, Matrix





| Number of     | Α.             | Flammability | Pin                           | Pin H                                   | eader Part Nu | mbers                                       | Mates with Plug |
|---------------|----------------|--------------|-------------------------------|---|---------------|---|-----------------|
| Circuits Dim. | Rating         | Finish       | Standard<br>Tall <sup>2</sup> | Standard Tail<br>Polarized <sup>2</sup> | Long Tall     | Housing Part Number (Using Socket Contacts) |                 |
|               |                |              | D 12                          |   | 641969-1      | 350585-1                                    |                 |
|               |                | UL 94V-2     | Pre-tin                       | 350431-1                                |               |   | 1-480704-0      |
| 6             | 13.97          |              | Duplex'                       | 350431-2                                | _             | 350585-2                                    |                 |
| •             | .550           |              | Pre-tin                       | 350711-1                                | 641970-1      | 350732-1                                    |                 |
|               |                | UL 94V-0     | Pre-un                        | 330711-1                                |               | 350/32-1                                    | 350715-1        |
|               |                |              | Duplex'                       | 350711-2                                | 641970-2      | 350732-2                                    |                 |
|               |                | UL 94V-2     | Pre-tin                       | 350432-1                                | 641971-1      | 350586-1                                    | 4 400700 0      |
|               |                | OL 94 V-2    | Duplex1                       | 350432-2                                | _             | 350586-2                                    | 1-480706-0      |
| 9 20.32       |                | Pre-tin      | 350712-1                      | 641972-1                                | 350742-1      |   |                 |
|               | .000           | UL 94V-0     | F16-011                       | F18-III 330712-1                        | 1-641972-f    | 330742-1                                    | 350720-1        |
|               |                |              | Duplex1                       | 350712-2                                | _             | 350742-2                                    |                 |
|               |                | UL 94V-2     | Pre-tin                       | 350433-1                                | 641973-1      | 350587-1                                    | 1-480708-0      |
|               |                | OL 94V-2     | Duplex'                       | 350433-2                                |               |   | 1-460700-0      |
| 12            | 26.67<br>1.050 | Pre-tin      | 350713-1                      | 641974-1                                | 350737-1      |   |                 |
|               |                | UL 94V-0     |                               |   |               |   | 350735-1        |
|               |                |              | Duplex1                       | 350713-2                                |               | 350737-2                                    |                 |
|               |                | UL 94V-2     | Pre-tin                       | 350434-1                                | 641975-1      | 350588-1                                    | 1-480710-0      |
| 15            | 33.02          | OL 34 V-2    | Duplex1                       | 350434-2                                |               | 350588-2                                    | 1 450710 0      |
| 13            | 1.300          | UL 94V-0     | Pre-tin                       | 350714-1                                | 641976-1      | 350738-1                                    | 250726 1        |
|               |                | UL 94V-0     | Duplex1                       | 350714-2                                | _             | 350738-2                                    | 350736-1        |

Duplex Finish — Plated with .000762 [.000030] min. gold in mating area, matte tin-lead on solder tail end over .00127 [.000050] min. nickel underplate on entire contact.

\*Use Standard Tail for 1.57 [.062] thick PC Board.

\*Use Long Tail for 3.18 [.125] thick PC Board.

\*Black in color.

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Dimensions are in millimeters over (inches)

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Specifications subject to change.







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## **General Information**

View Details

# .250" Centerline, 600 V, 19 A max. (Universal MATE-N-LOK) -Current Rating Verification

# **Performance Characteristics**

**Maximum Current:** Maximum current rating of Universal MATE-N-LOK connectors is limited by the maximum operating temperature of the housings which is 105°C including the temperature rise of the contacts which is a maximum of 30°C. There are several variables which have a direct effect on this maximum current-carrying capability for a given connector and must be considered for each application. These variables are:

Wire Size: Larger diameter wire will carry more current since it has less internal resistance to current flow and thus generates less heat. Longer wire lengths also enhance current carrying capabilities since the wire conducts heat away from the connector.

**Connector Size:** In general, the more circuits in a connector, the less current can be carried.

**Ambient Temperature:** The higher the ambient temperature, the less current can be carried in any given connector.

**Printed Wiring Board Conductor Size:** The finished trace conductor width and thickness should be maximized to allow for the greatest current carrying capacity and heat dissipation.

Universal MATE-N-LOK connectors also will withstand the following tests:

#### Vibration:

10-55-10 cycles per minute at .06 inch total excursion

#### **Physical Shock:**

18 drops, 50 g sawtooth at 10 milliseconds

#### **Housing Panel Retention:**

75 lb. min.

**Housing Lock Strength:** 

30 lb. min.

**Thermal Shock:** 

-55°C to +85°C

**Temperature-Humidity Cycling:** 

25°C to 65°C at 95 RH

**Corrosion:** 

48 hr. at 5% salt concentration

# **Current Rating Verification for 30°C Maximum Temperature Rise 100% Energized**

# Wire-to-Wire

#### **UMNL Calculated Current Table**

| Number         |       | Wire Gauge |       |       |       |       |      |      |      |      |
|----------------|-------|------------|-------|-------|-------|-------|------|------|------|------|
| of<br>Circuits | 10    | 12         | 14    | 16    | 18    | 20    | 22   | 24   | 26   | 30   |
| 2              | 19.00 | 18.00      | 17.00 | 14.50 | 13.00 | 10.00 | 8.00 | 6.50 | 5.50 | 3.50 |
| 3              | 17.50 | 16.50      | 15.50 | 13.00 | 12.00 | 9.00  | 7.50 | 6.00 | 5.00 | 3.00 |
| 4              | 16.50 | 15.50      | 15.00 | 12.50 | 11.00 | 8.50  | 7.00 | 5.50 | 4.50 | 3.00 |
| 5              | 16.00 | 15.00      | 14.00 | 12.00 | 10.50 | 8.00  | 6.50 | 5.50 | 4.50 | 3.00 |
| 6 Inline       | 15.50 | 14.50      | 13.50 | 11.50 | 10.00 | 8.00  | 6.50 | 5.00 | 4.00 | 2.50 |
| 6 Matrix       | 15.00 | 14.00      | 13.00 | 11.00 | 9.50  | 7.50  | 6.00 | 5.00 | 4.00 | 2.50 |
| 8              | 14.50 | 14.00      | 13.00 | 10.50 | 9.50  | 7.50  | 6.00 | 5.00 | 4.00 | 2.50 |
| 9              | 13.50 | 12.50      | 11.50 | 9.50  | 8.50  | 6.50  | 5.50 | 4.50 | 3.50 | 2.00 |
| 10             | 14.00 | 13.00      | 12.50 | 10.00 | 9.00  | 7.00  | 5.50 | 4.50 | 3.50 | 2.50 |
| 12             | 12.50 | 12.00      | 11.00 | 9.00  | 8.00  | 6.00  | 5.00 | 4.00 | 3.00 | 2.00 |
| 15             | 12.00 | 11.50      | 10.00 | 8.50  | 7.50  | 6.00  | 4.50 | 4.00 | 3.00 | 2.00 |

Values are based on initial Temperature Rise versus Current Testing and are intended to be a guide in the selection of a connector family. All applications should be tested by the end user. The values listed are per circuit for fully loaded housings being 100% energized. **Note:** All combinations were not tested, and this chart contains interpolated and extrapolated values.

### Minimum Wire Lengths for T-Rise vs. Current Testing

| AWG | Min. Length (in.)   | AWG | Min. Length (in.)   |
|-----|---------------------|-----|---------------------|
|     | Will. Length (III.) | AWG | Will. Length (III.) |
| 30  | 2.6                 | 18  | 9.4                 |
| 28  | 3.2                 | 16  | 11.3                |
| 26  | 4.1                 | 14  | 13.7                |
| 24  | 5.1                 | 12  | 16.4                |
| 20  | 7.0                 | 10  | 10.2                |

| 20              | 7.8                               | 10               | 19.3                              |
|-----------------|-----------------------------------|------------------|-----------------------------------|
| Note: If wire l | engths used are less than those l | isted above, the | e current carrying ability of the |
| system will be  | reduced due to less heat being of | conducted away   | from the connector. The           |

system will be reduced due to less heat being conducted away from the connector. The customer should fully test all applications.

#### Wire-to-Board

Due to the vast differences in trace geometry and printed circuit board configurations, we are unable to provide a separate current carrying chart for our printed circuit board header products. However, the above Wire-to-Wire charts may be used as a guideline for headers if the trace width and thickness is equal to the listed wire gauge. For vertical headers, only 75% of the Wire-to-Wire value should be used. The chart values are only a tool for connector selection and will require the customer to fully test their application.

**Termination Resistance/Contact Crimp Tensile Force** 

| Wire       | Size       |                  | mination<br>sistance      | itact<br>imp<br>e Force |             |
|------------|------------|------------------|---------------------------|-------------------------|-------------|
| AWG        | 2          | Test             |                           |                         | (Min.)      |
| AWG        | mm²        | Current (Amps)   | Milliohms<br>(Max. Init.) | lbs.                    | N           |
| 30         | .05        | -                | -                         | 2                       | 9           |
| 28         | .08        | -                | -                         | 3                       | 13          |
| 26         | .12        | -                | -                         | 6                       | 27          |
| 24         | .2         | 1.5              | 3.50                      | 8                       | 36          |
| 22         | .3         | 3                | 3.50                      | 14                      | 62          |
| 20         | .5         | 4.5              | 3.00                      | 14                      | 62          |
| 18         | .8         | 6                | 3.00                      | 30                      | 133         |
| 16         | 1.2        | 8                | 2.75                      | 45                      | 200         |
| 14         | 2.0        | 10               | 2.75                      | 50                      | 222         |
| 12         | 3.0        | -                | -                         | 60                      | 267         |
| 10         | 5.0        | -                | -                         | 70                      | 311         |
| Note: This | is the tot | al resistance be | tween wire crimps of      | a mated pin             | and socket. |

# **Technical Documents**

#### **Product Specifications**

108-1031 -- Universal MATE-N-LOK Connectors

108-1053 -- Universal MATE-N-LOK Headers

(You can search for the above documents using the Document Search option

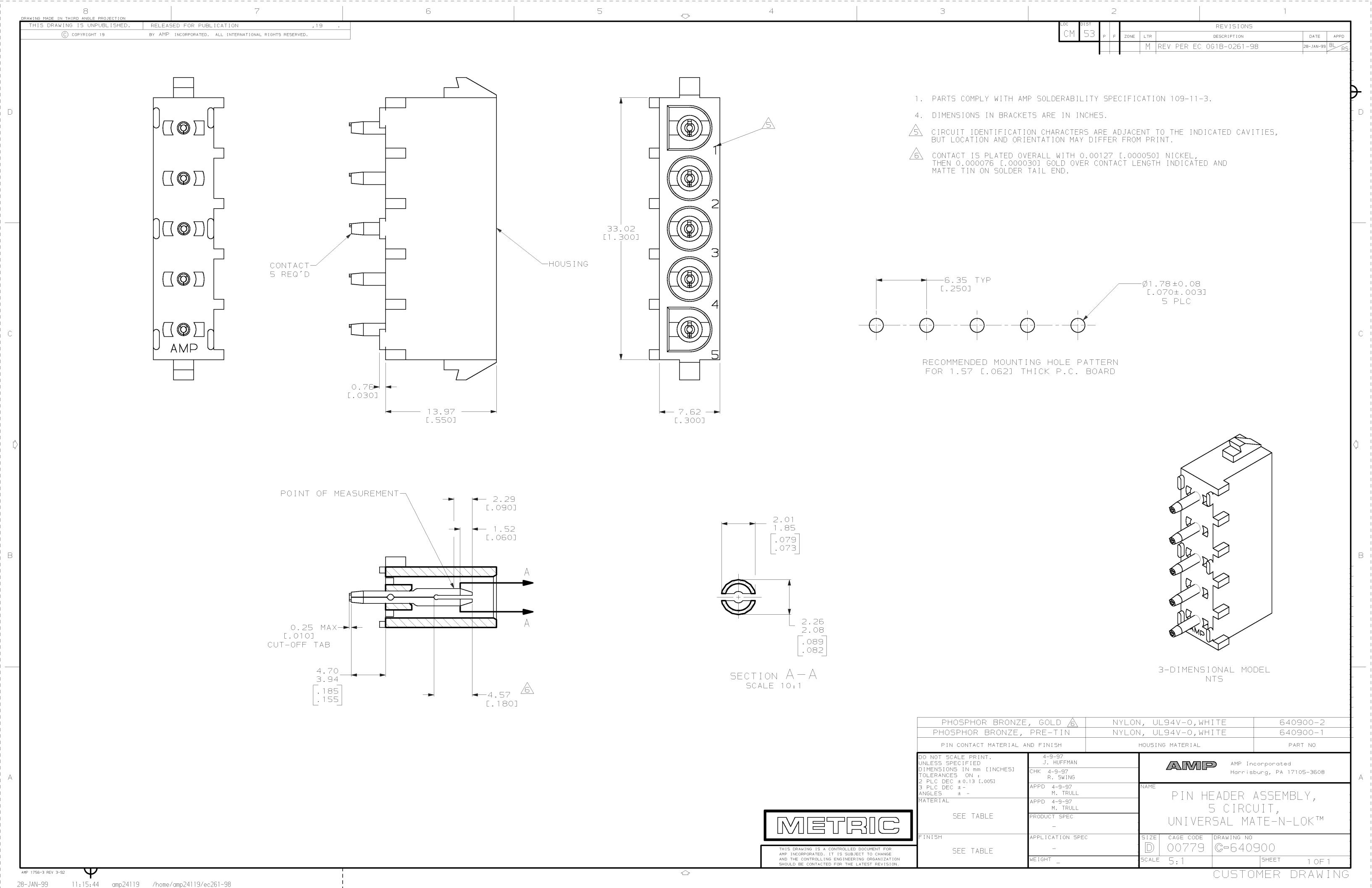
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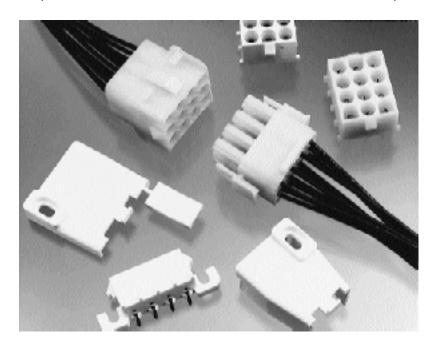
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## **General Information**

View Details

# .250" Centerline, 600 V, 19 A max. (Universal MATE-N-LOK)



# **Product Facts**

- Pins and sockets can be intermixed in the same housing
- Positive polarization
- Rear cavity identification
- Contacts completely enclosed in housings
- Positive locking housings
- Insulation capability to .200 [5.08] diameter
- Removable, crimp snap-in contacts
- Low contact mating force
- Contacts accept 30-10 AWG [.05-5.0 mm<sup>2</sup>] wire sizes
- Contacts available with pre-tin or gold plating
- Dual locking lances provide optimum contact stability
- Panel mount or free hanging
- Mate with Universal MATE-N-LOK II Housings
- Available in UL 94V-0 flame retardant material; meets the material

requirements of Table 25.1 of U.L. Standard 1410 (television receivers and video products)

- Not for interrupting current
- Harness to PC Board capability using pin or socket headers
- Pin and socket headers are available in both vertical and right angle style
- Solderability -- headers meet MIL-STD 202 Method 208
- Contacts are on .250 [6.35] centerline spacing
- Recognized under the Component Program of Underwriters

Laboratories, Inc. File No. E28476



- Certified by Canadian Standards Association File No. LR 7189
- Passed test by VDE under their Registration Number 5618/Continuous Surveillance

#### **Performance Characteristics**

The Universal MATE-N-LOK Connector performance characteristics are based on free hanging and panel mount connectors, loaded with contacts crimped on stranded wire.

#### **Dielectric Withstanding Voltage:**

5.0 KVAC or 10.0 KVDC between adjacent circuits

#### **Insulation Resistance:**

1000 megohms minimum initial between adjacent circuits

#### **Voltage Rating:**

600V AC or DC

#### **Connector Mating:**

Solid Pin -- 3.0 lb. max. per circuit

Split Pin -- 1.5 lb. max. per circuit

#### **Connector Unmating:**

Solid Pin -- .7 lb. min. per circuit

Split Pin -- .5 lb. min. per circuit

#### **Contact Insertion Force:**

5.0 lb. max. per contact

#### **Contact Retention:**

15 lb. min. per contact

#### **Durability:**

50 cycles, mating and unmating

# **Technical Documents**

#### **Product Specifications**

108-1031 -- Universal MATE-N-LOK Connectors

108-1053 -- Universal MATE-N-LOK PC Board Headers

#### **Application Specification**

114-1010 -- Universal MATE-N-LOK Contacts

Instruction Sheet

408-7714 -- Plug, Cap, Headers, Pin, Socket and Accessories

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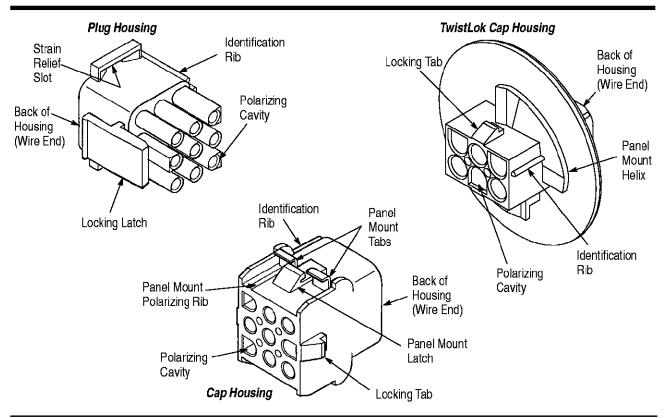
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#### Universal MATE-N-LOK\* Connectors

13 SEP 00 Rev E



| HOUSINGS  |                      |                    |                      |                    |                      |                    |
|-----------|----------------------|--------------------|----------------------|--------------------|----------------------|--------------------|
| NUMBER OF | PLUG PAR             | TNUMBER            | CAP PART             | Γ NUMBER           | TWISTLOK CAP         | PART NUMBER        |
| CIRCUITS  | NATURAL <sup>1</sup> | WHITE <sup>2</sup> | NATURAL <sup>1</sup> | WHITE <sup>2</sup> | NATURAL <sup>1</sup> | WHITE <sup>2</sup> |
| 1         | 350867               | 350865             | 770421               | 350866             |                      |                    |
| 2●        | 480698               | 350777             | 480699               | 350778             |                      |                    |
| 3●        | 480700               | 350766             | 480701               | 350767             |                      |                    |
| 4●        | 480702               | 350779             | 480703               | 350780             |                      |                    |
| 5●        | 480763               | 350809             | 480764               | 350810             |                      |                    |
| 6●        | 640585               | 640581             | 926307               | 926307             |                      |                    |
| 6         | 480704               | 350715             | 480705               | 350781             | 794714               | 794760             |
| 8●        | 640586               | 640582             | 926308               | 926308             |                      |                    |
| 9         | 480706               | 350720             | 480707               | 350782             | 794715               | 794761             |
| 10●       | 926302               | 926302             | 926309               | 926309             |                      |                    |
| 12        | 480708               | 350735             | 480709               | 350783             | 794716               | 794762             |
| 15        | 480710               | 350736             | 480711               | 350784             |                      |                    |

<sup>1</sup> Natural colored housings are 94V-2 nylon material.

Figure 1

#### 1. INTRODUCTION

This instruction sheet provides assembly procedures for the AMP\* Universal MATE-N-LOK housings and printed circuit (pc) board headers listed in Figures 1, 2, and 3.



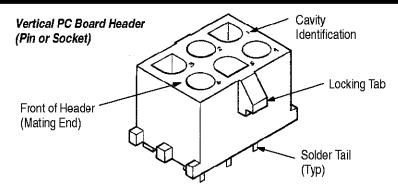
Dimensions on this sheet are in metric units [with U.S. customary units in brackets].

Reasons for reissue are provided in Section 8, REVISION SUMMARY.

<sup>2</sup> White colored housings are flame-retardant 94V-0 nylon material.

In-line version





|                       | VERTICAL PC BOARD HEADERS    |                                   |                                     |                           |                          |  |                           |  |
|-----------------------|------------------------------|-----------------------------------|-------------------------------------|---------------------------|--------------------------|--|---------------------------|--|
|                       |                              | PIN H                             | PIN HEADER PART NUMBER <sup>2</sup> |                           |                          | SOCKET HEADER PART NUMBER <sup>2</sup> |                           |  |
| NUMBER OF<br>CIRCUITS | HEADER<br>COLOR <sup>1</sup> | STD<br>T <b>a</b> il <sup>3</sup> | STD TAIL<br>PLZD <sup>3</sup>       | LONG<br>TAIL <sup>4</sup> | STD<br>Tail <sup>3</sup> | STD TAIL<br>PLZD <sup>3</sup>          | LONG<br>TAIL <sup>4</sup> |  |
| 2●                    | NATURAL                      | 350428                            | 641963                              | 350582                    | 350759                   | 643411                                 | 350986                    |  |
| 2●                    | WHITE                        | 350786                            | 641964                              | 350787                    | 350824                   | 643412                                 | 350831                    |  |
| 3●                    | NATURAL                      | 350429                            | 641965                              | 350583                    | 350760                   | 643413                                 | 350987                    |  |
| 3●                    | WHITE                        | 350789                            | 641966                              | 350790                    | 350825                   | 643414                                 | 350832                    |  |
| 4●                    | NATURAL                      | 350430                            | 641967                              | 350584                    | 350761                   | 643415                                 | 350988                    |  |
| 4●                    | WHITE                        | 350792                            | 641968                              | 350793                    | 350826                   | 643416                                 | 350833                    |  |
| 5●                    | NATURAL                      | 640466                            | 643405                              | _                         | 640467                   | _                                      | _                         |  |
| 5●                    | WHITE                        | 640900                            | 643406                              | _                         | 640901                   | _                                      | _                         |  |
| 6●                    | NATURAL                      | 641832                            | 643407                              | _                         | _                        | _                                      | _                         |  |
| 6●                    | WHITE                        | 641831                            | 643408                              | _                         | 770262                   | _                                      | _                         |  |
| 6                     | NATURAL                      | 350431                            | _                                   | 350585                    | 350762                   | 643423                                 | 350989                    |  |
| 6                     | WHITE                        | 350711                            | 641970                              | 350732                    | 350827                   | 643424                                 | 350834                    |  |
| 8•                    | NATURAL                      | 641825                            | _                                   | 770143                    | _                        | _                                      | _                         |  |
| 8•                    | WHITE                        | 641828                            | 643410                              | _                         | _                        | _                                      | _                         |  |
| 9                     | NATURAL                      | 350432                            | 641971                              | 350586                    | 350763                   | 643425                                 | 350990                    |  |
| 9                     | WHITE                        | 350712                            | 641972                              | 350742                    | 350828                   | 643426                                 | 350835                    |  |
| 12                    | NATURAL                      | 350433                            | 641973                              | 350587                    | 350764                   | _                                      | 350991                    |  |
| 12                    | WHITE                        | 350713                            | 641974                              | 350737                    | 350829                   | 643428                                 | 350836                    |  |
| 15                    | NATURAL                      | 350434                            | 641975                              | 350588                    | 350765                   | 643429                                 | 350992                    |  |
| 15                    | WHITE                        | 350714                            | 641976                              | 350738                    | 350830                   | 643430                                 | 350837                    |  |

<sup>1</sup> Natural colored housings are 94V-2 nylon material. White colored housings are flame-retardant 94V-0 nylon material.

#### Figure 2

#### 2. DESCRIPTION

A connector consists of either (1) a housing (plug or cap) with a specified number of crimp contacts (pin or socket); or (2) a pc board header preloaded with solder tail contacts (pin or socket).

Mating connectors may be a plug and a cap, or a plug and a pc board header, so long as both connectors have an identical number of circuits with a pin contact mating with a socket contact. Mating connectors are fully polarized for proper engagement and employ a positive locking feature to prevent accidental disengagement.

The plug and cap housings are available with 1 through 15 circuits and accept pin and socket crimp contacts and programmable socket contacts (see Figure 5). Both the plug and the cap housings have individually numbered cavity identification on the BACK (wire end), plus an identification rib on the SIDE indicating the Number 1 cavity.

2 of 4 Rev E

<sup>2</sup> Base numbers shown. Dash numbers indicate contacts with a pre-tin finish or a duplex finish.

<sup>3</sup> Use standard tail (and standard tail polarized) for 1.57 [.062] thick pc board.

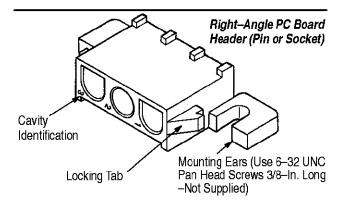
<sup>4</sup> Use long tail for 3.18 [.125] thick pc board.

In-line version.



The housings feature polarizing cavities on the mating end. The plug housing has two locking latches and the cap housing has two locking tabs. The housings are designed for free hanging or panel mounting applications (refer to Section 5, PANEL CUTOUT).

The pc board headers are supplied preloaded with solder tail pin contacts or solder tail socket contacts. Vertical pin and socket headers are available in 2 through 15 circuits. Vertical headers are designed for either 1.57 mm [.062 in.] thick pc boards (standard solder tail length), or 3.18 mm [.125 in.] thick pc boards (long solder tail length). Right—angle pin and socket headers are available in 2 through 8 circuits. All headers feature individually numbered cavity identification on the FRONT (mating end), polarizing cavities, and locking tabs. Refer to Section 6, PRINTED CIRCUIT BOARD LAYOUT.



| RIGHT-ANGLE PC BOARD HEADERS <sup>1</sup> |  |            |
|---|--|------------|
|   |  | D DEVDEDO: |

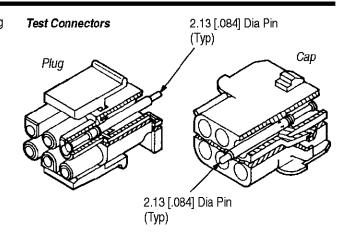
| NUMBER OF<br>CIRCUITS | PIN HEADER<br>PART NUMBER <sup>2</sup> | SOCKET HEADER<br>PART NUMBER <sup>2</sup> |
|-----------------------|--|---|
| 2                     | 350942                                 | 643226                                    |
| 3                     | 350943                                 | 643228                                    |
| 4                     | 350944                                 | 643230                                    |
| 5                     | 350945                                 | 643232                                    |
| 6                     | 640583                                 | 643234                                    |
| 8                     | 640584                                 | 643236                                    |

<sup>1</sup> All housings are white colored, flame-retardant, 94V-0, nylon material.
2 Base numbers shown. Dash numbers indicate contacts with a pre-tin finish or a duplex finish.

Figure 3

#### 3. TEST CONNECTORS (Figure 4)

Plug and cap test connectors are designed to mate with respective assembled plug and cap connectors and headers to test the electrical circuit. The test connectors are preloaded with spring—loaded contacts that will mate with pin or socket contacts in the connector. The 2.13 mm [.084 in.] diameter pin that extends out the BACK of the test connector will accept Universal MATE—N—LOK socket contacts.



| TEST CONNECTORS●   |                     |                    |  |  |  |  |  |
|--------------------|---------------------|--------------------|--|--|--|--|--|
| NUMBER OF CIRCUITS | PLUG<br>Part Number | CAP<br>PART NUMBER |  |  |  |  |  |
| 2                  | 350848–2            | 350849–2           |  |  |  |  |  |
| 3                  | 350848–3            | 350849–3           |  |  |  |  |  |
| 4                  | 350848–4            | 350849–4           |  |  |  |  |  |
| 5                  | 350848–5            | 350849–5           |  |  |  |  |  |
| 6                  | 350848–6            | 350849–6           |  |  |  |  |  |
| 9                  | 350848–9            | 350849–9           |  |  |  |  |  |
| 12                 | 1-350848-2          | 1-350849-2         |  |  |  |  |  |
| 15                 | 1–350848–5          | 1-350849-5         |  |  |  |  |  |

All housings are white colored, flame—retardant, 94V—0, nylon material. The test connectors have a 5 amp maximum current rating per circuit.

Figure 4

#### 4. ACCESSORIES

Keying Plugs – Keying plugs provide additional polarization for the connectors. Refer to Instruction Sheet 408–3320 for insertion procedures.

Strain Relief Assembly – The strain relief assembly is designed to relieve the stress of the wires on the contacts. There are two strain relief versions (open and enclosed). Refer to Instruction Sheet 408–3320 for assembly procedures.

#### 5. PANEL CUTOUT

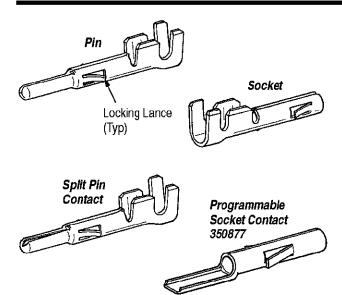
The cap housing features flexible mounting latches and is designed for panel mounting. The TwistLok cap housing has a panel mount helix and is designed to insert into a panel by twisting clockwise until seated. Refer to the customer drawing or Application Specification 114–1010 for cutout dimensions.

#### 6. PRINTED CIRCUIT BOARD LAYOUT

Headers are designed to be mounted and soldered onto pc boards. Refer to the customer drawing or Application Specification 114–1010 for layout dimensions.

Rev E 3 of 4





| WIRE<br>SIZE<br>(AWG) | CONTACT |                               |                         |
|-----------------------|---------|-------------------------------|-------------------------|
|                       | ТҮРЕ    | LOOSE PIECE<br>PART<br>NUMBER | STRIP<br>PART<br>Number |
| 30 to 26              | Pin     | 770672                        | 350924                  |
|                       | Skt     | 770673                        | 350925                  |
| 24 to 18              | Pin     | 350690                        | 350561                  |
|                       | Skt     | 640347                        | 350851                  |
|                       | Skt     | 350689                        | 350570                  |
|                       | Pin●    | 350706                        | 350699                  |
|                       | Pin●●   | _                             | 770210                  |
| 20 to 14              | Pin     | 350547                        | 350218                  |
|                       | Skt     | 350550                        | 350536                  |
|                       | Pin●    | 350705                        | 350687                  |
|                       | Pin●●   | 350669                        | 350654                  |
|                       | Pin     | 350552                        | 350538                  |
|                       | Skt     | 350551                        | 350537                  |
|                       | Pin●    | 350707                        | 350700                  |
| 18 to 14              | Pin     | 350918                        | 350873                  |
|                       | Skt     | 350919                        | 350874                  |
| 12 to 10              | Pin     | 640309                        | 350922                  |
|                       | Skt     | 640310                        | 350923                  |
|                       | Pin●●   | _                             | 770234                  |

Split pin
 ● Grounding pin – 2.54 [.100] longer than standard pin.

Figure 5

#### 7. CONTACTS (Figure 5)

#### 7.1. Selection

Refer to Figure 5 for wire size and pin and socket compatibility.

Pin and socket crimp contacts are available in strip form for machine crimping, and in loose piece form for hand tool crimping. Split pin contacts are recommended for use in housings having 6, 9, 12, and 15 circuits to reduce mating force. Grounding pin contacts (2.54 mm [.100 in.] longer than standard pin contacts) are designed for a mate first, break last grounding application. Programmable socket contacts are designed to accept 110 Series FASTON\* receptacle terminals.

#### 7.2. Crimping

Follow termination procedures shown in Application Specification 114–1010.

Strip form contacts are designed to be crimped with a heavy duty miniature applicator in an AMP semi-automatic or automatic machine. Consult your local AMP representative for assistance in selecting the machine that will best suit your needs.

Loose piece contacts are designed to be crimped with an AMP hand crimping tool. Read the instruction sheet packaged with the tool for the proper crimping procedure.

#### 7.3. Insertion

An insertion tool is generally NOT required for inserting contacts into the housings. Pin and socket contacts may be inserted in either the plug or the cap housing, or they may be intermixed in each housing to provide additional keying combinations.

AMP Insertion Tool 455830–1 is available for inserting contacts crimped to small wire sizes. Refer to Instruction Sheet 408–7984 for insertion procedures.

#### 7.4. Extraction

AMP Extraction Tool 318851–1 is designed for removing pin and socket contacts from plug and cap housings. Refer to Instruction Sheet 408–4371 for extraction procedures.

#### 8. REVISION SUMMARY

Since the previous release of this instruction sheet, the following changes have been made:

Per EC 0990-1143-00

- Updated document to corporate requirements
- Added TwistLok Cap drawing and part numbers to table in Figure 1

**4** of 4 Rev **E**