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Printed Circuit Board Overview

Deutsch Industrial printed circuit board or PCB connectors are heavy duty environmentally sealed connectors designed for wire-to-circuit board connections. Deutsch PCB connectors are built to maintain the integrity and continuity of data and power signals in harsh environments. Developed and designed for heavy duty electronically equipped vehicles, Deutsch Industrial printed circuit board connections use standard Deutsch connector bodies and will withstand dust, dirt, moisture, and vibration.

Available in a variety of styles from several different connector families, Deutsch printed circuit board connectors cover a range of pin counts from 2 to 80 and wire gauges from 10 to 22. Many of the connectors are available in straight, 90°, or solder pot options.

Deutsch PCB connectors mate with standard Deutsch plugs. With integral silicone wire seals and molded-in contacts that do not require potting or epoxy sealant, Deutsch PCB connectors are sealed, reliable, and easy to install.

Printed Circuit Board Connector Options

DRC Series
- 24, 40, 50, 60, 64, 70, 76, and 80 cavity arrangements
- Mating connectors accept 14-22 AWG

DT Family
- DT Series 2, 3, 4, 6, 8, and 12 cavity arrangements
- DT Series mating connectors accept 14-20 AWG
- DT Series flangeless options available
- DTM Series 8, 12, and 48 cavity arrangements
- DTM Series mating connectors accept 16-22 AWG
- DTM Series flangeless 48 way option
- DTP Series 4 cavity arrangement
- DTP Series mating connectors accept 10-14 AWG
- Some arrangements of the DT and DTM Series are available with A, B, C, and D keying options

HD10 Series
- 6 and 9 cavity arrangements
- Mating connectors accept 14-20 AWG

STRIKE Series
- 32 cavity arrangement
- Mating connectors accept 14-22 AWG

EEC Enclosure and Flange Receptacle
- DT Series header 12, 24, 36, and 48 cavity arrangements
- DT Series mating connectors accept 14-20 AWG
- DTM Series header 12 and 24 cavity arrangements
- DTM Series mating connectors accept 16-22 AWG
- Some arrangements of the DT and DTM Series are available with A, B, C, and D keying options

By fixing the connectors to the board prior to soldering, pressure can be greatly reduced at the solder joint.
**DRC10 Series Straight**

**Materials**
- **Housing**: Thermoplastic
- **Grommet**: Silicone elastomer
- **Receptacle Threaded Insert**: Steel
- **Contacts**: Molded-in copper alloy, tin plated solder pot standard (gold optional - see modifications)

**Mating Plugs**
- 24 Pin: DRC16-24S*
- 40 Pin: DRC16-40S

**Modifications**
- A004: Tin plated PCB pins
- AG02: Some terminals are gold plated

![DRC10 Series Straight](image)

**DRC10-24P***
- 24 Pin: DRC16-24S*

**DRC10-40P***
- 40 Pin: DRC16-40S

**DRC13 Series 90°**

**Materials**
- **Housing**: Thermoplastic
- **Receptacle Threaded Insert**: Steel/Brass
- **Contacts**: Molded-in copper alloy, tin plated PCB pins standard (gold optional - see modifications)
- **Mounting Seal**: Silicone

**Mating Plugs**
- 24 Pin: DRC16-24S*
- 40 Pin: DRC18-40S*
- 70 Pin: DRC16-70S*

**Modifications**
- C023: 5mm² threaded insert mounting holes
- G002: Only outside terminal rows are gold plated
- N012: One piece connector design

![DRC13 Series 90°](image)

**DRC13-24P***
- 24 Pin: DRC16-24S*

**DRC13-40P***
- 40 Pin: DRC18-40S*

**DRC13-70P***
- 70 Pin: DRC16-70S*
## DRC20/22 Series Straight

### Materials
- **Housing**: Thermoplastic
- **Grommet**: Silicone elastomer
- **Receptacle Threaded Insert**: Steel
- **Contacts**: Molded-in copper alloy, gold plated mating side, tin plated PCB side (size 12 contacts are tin plated on mating and PCB sides)
- **Mounting Seal**: Silicone rubber

### Mating Plugs
- **50 Pin**: DRC26-50S**
- **60 Pin**: DRC26-60S**
- **76 Pin**: (2) DRC26-38S**

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## DRC23 Series 90° Miniature

### Materials
- **Housing**: Thermoplastic
- **Grommet**: Silicone elastomer
- **Receptacle Threaded Insert**: Steel
- **Contacts**: Molded-in copper alloy, gold plated PCB pins standard (tin optional)
- **Mounting Seal**: Silicone rubber

### Mating Plugs
- **24 Pin**: DRC26-24S*
- **40 Pin**: DRC26-40S*
- **64 Pin**: DRC26-24S*, DRC26-40S*
- **80 Pin**: (2) DRC26-40S*

---

![DRC20/22 Series Straight](image)

![DRC23 Series 90° Miniature](image)
### Printed Circuit Board Connectors

#### DT13/15 Series 90° or Straight

**Materials**
- Housing: Thermoplastic
- Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)
- Mounting Seal: Silicone rubber

**Mating Plugs**
- 2 Pin: DT06-2S
- 4 Pin: DT06-4S
- 6 Pin: DT06-6S
- 8 Pin: DT06-8S*
- 12 Pin: DT06-12S*

** Modifications**
- B016: Extended shell and additional keys
- G003: Gold plated pins

#### DTM13/15 Series 90° or Straight

**Materials**
- Housing: Thermoplastic
- Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)
- Mounting Seal: Silicone rubber

**Mating Plugs**
- 12 Pin: DTM06-12S*

** Modifications**
- B016: Extended shell and additional keys
- G003: Gold plated pins

#### DTP10 Series Straight

**Materials**
- Housing: Thermoplastic
- Contacts: Molded-in copper alloy, tin plated
- Mounting Seal: Silicone rubber

**Mating Plugs**
- 4 Pin: DTP06-4S

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**Notice**
Camcar thread forming screws are recommended. See drawing.
Printed Circuit Board Connectors

Flangeless Part Numbering System

![Flangeless Part Numbering System Diagram]

DT* 13 - 6 P * - XXXX

Series
F = DTF Series
MF = DTMF Series

Style
13 = 90° pins
15 = Straight pins

Configuration

Special Modifications
Key
A, B, C, or D (if applicable)

Contacts
P = Pin
S = Socket

DTF13 Series Flangeless 90°

Materials
Housing: Thermoplastic
Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)

Mating Plugs
2 Pin: DT06-2S
3 Pin: DT06-3S
4 Pin: DT06-4S
6 Pin: DT06-6S
12 Pin: DT06-12S*

DTF13-2P  2 size 16
DTF13-3P  3 size 16
DTF13-4P  4 size 16
DTF13-6P  6 size 16
DTF13-12P* 12 size 16
A, B, C, D

Modifications
G003: Gold plated pins

DTF15 Series Flangeless Straight

Materials
Housing: Thermoplastic
Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)

Mating Plugs
12 Pin: DT06-125*

DTF15-12P* 12 size 16
A, B, C, D

Modifications
G003: Gold plated pins
**Printed Circuit Board Connectors**

- **DTMF15 Series Miniature Straight**
  
  **Materials**
  Housing: Thermoplastic  
  Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)

  **Mating Plugs**
  12 Pin: (4) DTM06-12S*

  **Modifications**
  B026: Alternate keying position

  ![DTMF15-48P](image)

- **HD10 Series Straight**
  
  **Materials**
  Housing: Thermoplastic  
  Contacts: Molded-in copper alloy, nickel plated  
  Mounting Seal: Standard O-rings may be used

  **Mating Plugs**
  6 Pin: HD16-6-96S  
  9 Pin: HD16-9-96S

  **Modifications**
  N005: Straight reduced diameter pins supplied as standard

  ![HD10 Series](image)

- **STRIKE13/15 Series 90° or Straight**
  
  **Materials**
  Housing: Thermoplastic  
  Contacts: Molded-in copper alloy, tin plated (gold optional - consult factory)  
  Mounting Seal: Silicone rubber

  **Mating Plugs**
  32 Pin: SRK06-MD*-32A-***

  ![STRIKE13/15 Series](image)
Printed Circuit Board Connectors

Printed Circuit Board Enclosures and Headers

Deutsch Industrial offers compact circuit board enclosures that accept snap-in headers. The enclosure features a through hole mounting flange on each side, as well as optional venting. Designed with space to accommodate one or more DT or DTM Series interfaces, the headers feature 90° pins. A radial flange seal provides environmental sealing to the enclosure. The headers mate with the DT and DTM standard plugs.

DTM Series Enclosure and Header Dimensions

<table>
<thead>
<tr>
<th>DTM Series Enclosure with Header</th>
<th>Overall Length A</th>
<th>Overall Height B</th>
<th>Overall Width C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.24 (133.03)</td>
<td>1.42 (36.00)</td>
<td>4.68 (118.80)</td>
</tr>
</tbody>
</table>

Dimensions are for reference only.

DTM Header Connector

Materials
Contacts: Molded-in nickel mating side, tin plated PCB side

Mating Plugs
12 Pin: DTM06-12S*
24 Pin: (2) DTM06-12S*

Modifications
GR01: DTM Series snap-in header with gold plated pins
R008: DTM Series snap-in header

DTM PCB Enclosure

Material
Housing: Thermoplastic

Board Size
3.25” X 4”

Venting*
A: With vent hole
B: Without vent hole

Modifications
E016: Molded in clear Ultem® material

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### DT Series Enclosure and Header Dimensions

- **DT Series Enclosure with Header**

<table>
<thead>
<tr>
<th>Overall Length A</th>
<th>Overall Height B</th>
<th>Overall Width C</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.93 (201.30)</td>
<td>2.15 (54.63)</td>
<td>6.30 (160.00)</td>
</tr>
</tbody>
</table>

Dimensions are for reference only.

### DT Header Connector

- **Materials**
  - Contacts: Molded-in tin (gold optional - consult factory)

- **Mating Plugs**
  - 12 Pin: DT06-12S*
  - 24 Pin: (2) DT06-12S*
  - 36 Pin: (3) DT06-12S*
  - 48 Pin: (4) DT06-12S*

- **Modifications**
  - GR02: DT Series snap-in header with gold plated pins
  - R015: DT Series snap-in header

### DT PCB Enclosure

- **Material**
  - Housing: Thermoplastic

- **Board Size**
  - 5” X 6.50”

- **Venting**
  - A: With vent hole
  - B: Without vent hole

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**Notice**

Keying position of receptacle must match keying position of mating plug(s).
Electronic Module Design Recommendations

Deutsch connectors are designed to handle all environmental conditions typically seen on heavy duty equipment. Design considerations have been given for temperature, vibration, and high current levels to exist simultaneously in a connector with no performance degradation.

- **Low Voltage Circuits**

Applications with data input/output signals of 0 to 5 volts require special consideration in the terminal selection. The primary concern is ensuring the low voltage signal is carried through the circuit. To minimize signal degradation, select a gold plated terminal. Gold is a better plating choice for 0 to 5 volt applications because it does not oxidize and easily conducts lower voltage signals. Nickel and tin platings are not designed for voltage levels less than 5 volts. Terminals plated with nickel and tin will over time form a layer of oxidation on the surface of the plating that only higher voltage signals are able to break through. The small additional cost for the gold terminal can dramatically improve the reliability of the electronic system.

- **Air Tight Connections**

In some applications, it is important to prevent air from penetrating electronic enclosures. Air can bring in water vapor and create condensation on the printed circuit board. To prevent this from happening, potting or a light conformal coating can be applied to the board.

Another method for protecting against air penetration is to seal the enclosure after it is assembled and tested. One drawback to consider is accommodating the connector interface. The flange seal prevents air penetration at the flange, but there is still a possibility for air to enter through the pin terminal area. Deutsch has several designs that offer a seal around the terminal. This can prevent any air penetration through the connector up to a 5 p.s.i. pressure differential. Consult a Deutsch representative for additional assistance.
Eliminating Long Term Vibration Problems

A critical concern when applying connectors to printed circuit boards is the long term durability as it relates to temperature cycling and vibration. All of the components including the design of the box, the pc board, the connector, and the seal must work together to account for temperature cycling and vibration. The main concern is to not have the pc board flex in service.

A typical heavy duty application uses either a straight extended pin connector or a connector with pins that are bent 90° to the axis of the connector. At the point the connector mates with the board, there is a mechanical attachment for the connector to the pc board which is independent of the solder. The engaging end of the connector normally goes through an opening in the box that houses the pc board. The connector is then attached to the box during which time a seal is used to prevent moisture intrusion into the box.

Another design pitfall is stress on the soldered terminal on the connector. To avoid these concerns, an allowance must be made to assure that stress between the pc board and connector does not interfere with the seal performance. There are a variety of methods that can be used to create a successful design. These methods include having the pc board loose in the box and then pot the box with a flexible sealant after the sealing flange is attached to the box. Another possibility would be to reflow the solder after the board and connector are mounted in the box. There are several good approaches to solving these problems and providing a trouble free installation. Consult a Deutsch representative for assistance specific to your application.