2mm PITCH METRIC CONNECTORS
FOR PCB CONNECTION
FCN-086 /087 SERIES

OVERVIEW

Fujitsu’s 2mm hard metric connector F-PACK-3 (FCN-086/087 series) are connectors for connecting boards
developed to support high-speed transmission/high density packaging of communication equipment,
conforms to IEC 917 (DIN 43355) and IEC 61076-4-101, and supports compact PCI. Product meets Bellcor
1217. To support high-speed transmission, these connectors implement low inductance, low cross-talk, and
matching characteristic impedance (50 ohms), exhibiting superb transmission characteristics.

Connection with the PCB is solderless (press fit) for both the plug/socket side, making mounting cost effective.
Insertion connections are completely unnecessary since a polarity key is supported.

Plug contact has a four level sequence structure that makes connection/disconnection in an active state
possible. Terminals have a five level pin length to support various applications. New customized connectors
can be supported by freely combining the pin lengths of contacts and terminals.

For shield plate products, which support high-speed transmission based on standard products, 5 row 55,
95, 110, 110 (with key) and 125 contact, plugs support 77, 133, 154 and 175 contacts. The shield plate
corresponds to the respective number of contacts, and the standard is post attachment. Sockets can also
be shipped with shields pre-attached.

8 row products are also in the series. Consult factory for your requirements.

Fujitsu has developed a new high density power connector (25% denser) to improve operability.

A double press fit, which can connect two printed boards with one connector, greatly contributes to
improved mounting and decreasing cost. Consult factory for details.
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Standard connector</th>
<th>Power connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature range</td>
<td>-55˚ C to +125˚ C</td>
<td>-40˚ C to +85˚ C</td>
<td></td>
</tr>
<tr>
<td>Current rating</td>
<td>1A DC max. (75˚ C)</td>
<td>7A DC/contact max. (75˚ C)</td>
<td></td>
</tr>
<tr>
<td>Voltage rating</td>
<td>500V AC r.m.s</td>
<td>56V DC</td>
<td></td>
</tr>
<tr>
<td>Contact resistance</td>
<td>20mohms max. (DC 20mV, 10mA)</td>
<td>20mohms max. (DC 20mV, 10mA)</td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>10,000 Mohms min. (100V DC)</td>
<td>10,000 Mohms min. (100V DC)</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>750V AC for 1 minute</td>
<td>600V AC for 1 minute</td>
<td></td>
</tr>
<tr>
<td>Insertion/Withdrawal life</td>
<td>125 times</td>
<td>250 times</td>
<td></td>
</tr>
<tr>
<td>Insertion force</td>
<td>0.75N/pin min.</td>
<td>20N/connector max.</td>
<td></td>
</tr>
<tr>
<td>Withdrawal force</td>
<td>0.15N/pin min.</td>
<td>1N/connector min.</td>
<td></td>
</tr>
</tbody>
</table>

**CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic impedance</td>
<td>50 ohms</td>
</tr>
<tr>
<td>Transmission speed</td>
<td>300 MHz</td>
</tr>
<tr>
<td>Near end cross talk</td>
<td>4.3 % max.</td>
</tr>
</tbody>
</table>

**MATERIALS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Polyester resin (UL94V-0)</td>
</tr>
<tr>
<td>Conductor</td>
<td>Copper alloy</td>
</tr>
<tr>
<td>Plating</td>
<td>Press fit: Solder</td>
</tr>
<tr>
<td></td>
<td>Press fit other: PAGOS</td>
</tr>
<tr>
<td></td>
<td>Contact area: Gold (PAGOS)</td>
</tr>
<tr>
<td></td>
<td>Lead / press fit area: Solder</td>
</tr>
</tbody>
</table>

**CONFIGURATION OF F&T 2 MM H.M. CONNECTOR**

1. Basic configuration of socket/plug

There are five types of sockets: three basic types: type A (110 contacts), type B (125 contacts), and type C (55 contacts), and a 110 contact and 95 contact types. Many coding keys are in the series to prevent insertion errors.
TERMINAL CONFIGURATION OF PLUG

The contact pins have a three-level sequence structure and can be connected/disconnected in an active state. The terminal side can support various applications with four types of length. These combinations allow 20 types of terminals.

Relationship between housing and terminals
Terminal types in the series

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PC Board Face
Contact Types

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Specifications subject to change
Dimensions are in millimeters (inches) www.fcai.fujitsu.com
Request Form for Customer Specific Pin Arrangement for 2mm Connectors

Part of the benefit of using the FCN-086 2mm Backplane connector is the flexibility of creating unique contact loads in the connector body. To define your needs, make a photocopy of the following page(s), select your connector needs, and fill in the blanks with the specific contact designation (see page 5 for available contacts). Forward to Fujitsu for quotation and part number assignment. (Please note that the pin arrangement drawings are "View from the Mating Side").

1. TYPE A (110 pos. with polarization key) (5+2)

2. TYPE B (125 pos.) (5+2)

3. TYPE C (55 pos.) (5+2)

4. 95 pos. (5+2)
TRANSMISSION CHARACTERISTICS

The transmission characteristics were designed to an optimum level by repeating various transmission characteristics simulations when the structure was designed, so as to improve the transmission characteristics of this connector. The characteristic impedance and the measurement device of the connector are shown below.

<table>
<thead>
<tr>
<th>Measurement Point</th>
<th>Measurement Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At Start</strong></td>
<td>100 ps 300 ps 500 ps 1 ns</td>
</tr>
<tr>
<td><strong>Frequency: Hz</strong></td>
<td>1.75 GHz 580 MHz 350 MHz 175 MHz</td>
</tr>
<tr>
<td><strong>Characteristic Impedance (Ω)</strong></td>
<td>45.3 to 64.0 48.2 to 56.8 49.2 to 54.6 49.3 to 52.8</td>
</tr>
<tr>
<td><strong>Near/Far end cross talk:</strong></td>
<td>1.96/1.14 1.49/0.78 1.06/0.51 0.71/0.27</td>
</tr>
</tbody>
</table>

Measurements were performed using a TDR measurement device CSA803 and SD24 (Tektronix).

- **Measurement point:**
  - PC board part
  - PC board part
  - PC board part

**Specs:**
- Measurement voltage: Vin = 5.0V
- Rise time: Tr = 100ps, 300ps, 500ps, 1ns
- Measurement device: TDR measurement device CSA803 and SD24 (Tektronix)
- Measurement system: Coaxialable measurement

**Diagram:**
- CSA 803 SD 24
- 50Ω termination connector
- Measurement board
FCN-086/087 Series  Compact PCI / VME

**STANDARD AND HOT SWAP PART NUMBERS**

**Coding Keys for Daughter Card**
- FCN-086B1278 - 3.3V
- FCN-086B2348 - 5.0V

**Coding Keys for Midplane/Backplane**
- FCN-086A3456 - 3.3V
- FCN-086A2348 - 5.0V

**COMPUTER TELEPHONY PART NUMBERS**

**Coding Keys for Daughter Card**
- FCN-086B1278 - 3.3V
- FCN-086B2348 - 5.0V
- FCN-086B3567 - J4

**Coding Keys for Midplane/Backplane**
- FCN-086A3456 - 3.3V
- FCN-086A2348 - 5.0V

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Specifications subject to change
Dimensions are in millimeters (inches)
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- Standard and Hot Swap part numbers
- Coding Keys for Daughter Card
- Coding Keys for Midplane/Backplane
- Computer Telephony Part Numbers
P3 TYPE 3
STRAIGHT PLUG (133 POSITIONS)

- **DIMENSIONS**

  - Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
  - Drill hole Diameter: $\phi 0.7 \pm 0.025$ mm (.028 in.)
  - Through hole diameter (after plating): $\phi 0.6 \pm 0.05$ mm (.024)

  - Ordering part number: FCN-086P133-G/111A-BCR

- **MOUNTING HOLE LAYOUT**

P3 TYPE B MALE FEED THROUGH
STRAIGHT PLUG (133 POSITIONS)

- **DIMENSIONS**

  - Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
  - Drill hole Diameter: $\phi 0.7 \pm 0.025$ mm (.028 in.)

  - Ordering part number: FCN-086P133-G/502A-BCR

- **MOUNTING HOLE LAYOUT**
**P1/P4 TYPE A**
STRAIGHT PLUG (154 POSITIONS)

■ **DIMENSIONS**

![Diagram of P1/P4 Type A Straight Plug (154 Positions)]

- **Ordering Part Number:** FCN-086P154-G/104-BCR

**P2/P5 TYPE B**
STRAIGHT PLUG (154 POSITIONS)

■ **DIMENSIONS**

![Diagram of P2/P5 Type B Straight Plug (154 Positions)]

- **Ordering Part Number:** FCN-086P154-G/111A-BCR

**MOUNTING HOLE LAYOUT**

- **Thickness:** 1.4 to 5.6 mm (.055 to .220 in.)
- **Drill hole Diameter:** Ø0.7±0.025 mm (.028 in.)
- **Through hole diameter (after plating):** Ø0.6±0.05 mm (.024 in.)

![Diagram of Mounting Hole Layout (P1/P4 Type A)]

![Diagram of Mounting Hole Layout (P2/P5 Type B)]
P1 TYPE A HOT SWAP 110 SIGNAL CONNECTOR
STRAIGHT PLUG (154 POSITIONS)

- DIMENSIONS

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>1.4 to 5.6 mm (.055 to .220 in.)</td>
</tr>
<tr>
<td>Drill hole Diameter</td>
<td>Ø0.7±0.025 mm (.028 in.)</td>
</tr>
<tr>
<td>Through hole diameter (after plating)</td>
<td>Ø0.6±0.05 mm (.024)</td>
</tr>
</tbody>
</table>

- ORDERING PART NUMBER: FCN-086P154-G/114-BCR

P4 TYPE A MALE FEED THROUGH STRAIGHT PLUG (154 POSITIONS)

- DIMENSIONS

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>1.4 to 5.6 mm (.055 to .220 in.)</td>
</tr>
<tr>
<td>Drill hole Diameter</td>
<td>Ø0.7±0.025 mm (.028 in.)</td>
</tr>
<tr>
<td>Through hole diameter (after plating)</td>
<td>Ø0.6±0.05 mm (.024)</td>
</tr>
</tbody>
</table>

- ORDERING PART NUMBER: FCN-086P154G/401-BCR
TYPE 2 FEED THROUGH
STRAIGHT PLUG (154 POSITIONS)

■ DIMENSIONS

ORDERING PART NUMBER: FCN-086P154-G/401A-BCR

MOUNTING HOLE LAYOUT

Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
Through hole diameter (after plating): Ø0.6±0.05 mm (.024)

ORDERING PART NUMBER: FCN-086P154-G/502A-BCR

MOUNTING HOLE LAYOUT

Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
Through hole diameter (after plating): Ø0.6±0.05 mm (.024)
P5 TYPE B FEED THRU COMPUTER TELEPHONY CONNECTOR
STRAIGHT PLUG (154 POSITIONS)

**DIMENSIONS**

- Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
- Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
- Through hole diameter (after plating): Ø0.6±0.05 mm (.024)

**ORDERING PART NUMBER:** FCN-086P154-G/503A-BCR

P4 TYPE A COMPUTER TELEPHONY CONNECTOR
STRAIGHT PLUG (154 POSITIONS)

**DIMENSIONS**

- Thickness: 1.4 to 5.6 mm (.055 to .220 in.)
- Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
- Through hole diameter (after plating): Ø0.6±0.05 mm (.024)

**ORDERING PART NUMBER:** FCN-086P154-G/516-BCR

Specifications subject to change
Dimensions are in millimeters (inches)
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FCN-086 / 087 Series

**SOCKET: 55 CONTACTS**

**DIMENSIONS**

- 2 x (11-1) = 20 (.787)  
- 2 (0.079)

**MOUNTING HOLE LAYOUT**

Thickness: 1.4 to 2.0 mm (.055 to .220 in.)  
Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)  
Through hole diameter (after plating): Ø0.6±0.05 mm (.024)

**ORDERING PART NUMBER:** FCN-086J055-G/101-BCR  
FCN-086J055-G/111-BCR (with pre-attached upper shield)

**SHIELD PLATE**

**DIMENSIONS**

- 4 x (6-1)=20 (.787)  
- (0.157±0.008)

**ORDERING PART NUMBER:**  
FCN-086J055-G/USD-BCR (top shield plate)

**DIMENSIONS**

- 4 x (5-1)=16 (.630)  
- (0.063)

**ORDERING PART NUMBER:**  
FCN-086J055-G/LSD-BCR (bottom shield plate)

Specifications subject to change  
Dimensions are in millimeters (inches)  
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**FCN-086 / 087 Series**

** SOCKET: 95 CONTACTS **

** DIMENSIONS **

![Diagram of dimensions](image)

** MOUNTING HOLE LAYOUT **

Thickness: 1.4 to 2.0 mm (0.55 to .220 in.)
Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
Through hole diameter (after plating): Ø0.6±0.05 mm (.024 in.)

** ORDERING PART NUMBER: FCN-086J095-G/101A-BCR **

** SHIELD PLATE **

** DIMENSIONS **

![Diagram of shield plate dimensions](image)

** ORDERING PART NUMBER: FCN-086J095-G/VSD-BCR **

** ORDERING PART NUMBER: FCN-086J095-G/MSD-BCR (bottom shield plate) **

Specifications subject to change
Dimensions are in millimeters (inches)
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FCN-086 / 087 Series

Specifications subject to change
Dimensions are in millimeters (inches)

Dimensions are in millimeters (inches) www.fcai.fujitsu.com

Thickness: 1.4 to 2.0 mm (.055 to .220 in.)
Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
Through hole diameter (after plating): Ø0.6±0.05 mm (.024 in.)

ORDERING PART NUMBER:
FCN-086J110-G/USD-BCR (with key, top shield plate)
FCN-086J110-G/LSD-BCR (with key, bottom, shield plate)

Specifications subject to change www.fcai.fujitsu.com

Dimensions are in millimeters (inches)
**FCN-086 / 087 Series**

**Socket: 10 Contacts Without Key**

**Dimensions**

- **Thickness**: 1.4 to 2.0 mm (.055 to .220 in.)
- **Drill hole Diameter**: ∅0.7±0.025 mm (.028 in.)
- **Through hole diameter (after plating)**: ∅0.6±0.05 mm (.024 in.)

**Mounting hole layout**

- **Thickness**: 1.4 to 2.0 mm (.055 to .220 in.)
- **Drill hole Diameter**: ∅0.7±0.025 mm (.028 in.)
- **Through hole diameter (after plating)**: ∅0.6±0.05 mm (.024 in.)

**Ordering part number:**

- FCN-086J110-G/VSD-BCR (without key, top shield plate)
- FCN-086J110-G/MSD-BCR (without key, bottom shield plate)

**Shield plate**

**Dimensions**

**Ordering part number:**

- FCN-086J110-G/111A-BCR (with pre-attached upper shield)

Specifications subject to change
Dimensions are in millimeters (inches)
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Part Numbers DISCONTINUED
Alternate Parts Available
FCN-086 / 087 Series

 SOCKET: 125 CONTACTS

 ■ DIMENSIONS

 MOUNTING HOLE LAYOUT

 Thickness: 1.4 to 2.0 mm (.055 to .220 in.)
 Drill hole Diameter: Ø0.7±0.025 mm (.028 in.)
 Through hole diameter (after plating):
 Ø0.6±0.05 mm (.024)

 ORDERING PART NUMBER:
 FCN-086J125-G/101-BCR
 FCN-086J125-G/111-BCR (with pre-attached upper shield)

 SHIELD PLATE
 ■ DIMENSIONS

 ORDERING PART NUMBER:
 FCN-086J125-G/USD-BCR (top shield plate)

 ORDERING PART NUMBER:
 FCN-086J125-G/LSD-BCR (bottom shield plate)

 Specifications subject to change
 Units are in millimeters (inches) www.fcai.fujitsu.com
**FCN-086 / 087 Series**

**CODING KEY**

- **DIMENSIONS**

- **ORDERING PART NUMBER:**
  - FCN-086A3568
  - Quantities: 50 pieces/package; minimum order quantity: 500 pieces

- **ORDERING PART NUMBER:**
  - FCN-086B1247

- **COMBINATION OF CODING KEYS**

<table>
<thead>
<tr>
<th>Plug</th>
<th>Jack</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1236</td>
<td>4578</td>
<td>Nut brown</td>
</tr>
<tr>
<td>1238</td>
<td>4567</td>
<td>Ultramarine blue</td>
</tr>
<tr>
<td>1248</td>
<td>3567</td>
<td>Strawberry red</td>
</tr>
<tr>
<td>1268</td>
<td>3457</td>
<td>Olive yellow</td>
</tr>
<tr>
<td>1567</td>
<td>2348</td>
<td>Brilliant blue</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plug</th>
<th>Jack</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>2578</td>
<td>1346</td>
<td>Reseda green</td>
</tr>
<tr>
<td>3467</td>
<td>1258</td>
<td>Slate gray</td>
</tr>
<tr>
<td>3567</td>
<td>1248</td>
<td>Antique pink</td>
</tr>
<tr>
<td>3568</td>
<td>1247</td>
<td>Pastel orange</td>
</tr>
</tbody>
</table>

**ORDERING PART NUMBERs:**
- Plug Coding Key: FCN-086A****
- Jack Coding Key: FCN-086B****

****: Add Coding Key number: eg: FCN-086A1268