Compact Flash® Card Connectors

MI20/21 Series

Features

1. Compact design occupies minimum space
   Connectors are designed with small width and depth for miniaturization and the footprint on the board has been made smaller. (See (a) to the right)

2. Supplied with ground terminals
   The MI21 Series are furnished with ground terminals.

3. Card ejection mechanism
   Two point ejection mechanism to assure even card ejection.

4. Designed and packaged for board placement with automatic equipment
   Headers are designed with a pick up area to accommodate the pick-and-place nozzles of automatic mounting machines. (Patents pending)
   Receptacles are designed to be mounted on top the board, and automatic mounting is possible on the specified board.

5. Card ejection mechanism
   Available in several termination and mounting styles, with and without ejection mechanism, with and without standoffs.

6. Rich variations
   A rich assortment of variations allows selection of a type to suit the specific card and the equipment to which it will be installed.
   (1) Suitable cards: Type I, type I/II.
   (2) Eject button: None, right, left
   (3) Standoff: 0 mm, 2.2 mm
   (4) Board mounting type: Standard, reverse

Applications

PDA, digital still cameras, etc.
### Product Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Insulation resistance</td>
<td>1,000 MΩ min.</td>
<td>500 V DC</td>
</tr>
<tr>
<td>2. Withstanding voltage</td>
<td>No flashover or insulation breakdown.</td>
<td>500 V AC / 1 minute</td>
</tr>
<tr>
<td>3. Contact resistance</td>
<td>40 mΩ max. (initial value)</td>
<td>1 mA</td>
</tr>
<tr>
<td>4. Vibration</td>
<td>No electrical discontinuity of 100ns or more</td>
<td>Frequency: 10 to 2000 Hz, full amplitude of 1.52 mm or acceleration of 147 m/s²(peak), 4 hours in each of the 3 directions.</td>
</tr>
<tr>
<td>5. Humidity (Steady state)</td>
<td>Insulation resistance of 100 MΩ min.</td>
<td>96 hours at temperature of 40±2°C and humidity of 90% to 95%</td>
</tr>
<tr>
<td>6. Temperature cycle</td>
<td>Insulation resistance of 100 MΩ min.</td>
<td>Temperature: -55°C for 30 min. --&gt; +5 to 35°C within 5 min. 85°C for 30 min. --&gt; +5 to 35°C within 5 min. for 5 cycles</td>
</tr>
<tr>
<td>7. Durability (Insertion/withdrawal)</td>
<td>Change of contact resistance from initial value is 20 mΩ max.</td>
<td>10000 cycles at 400 to 600 cycles per hour</td>
</tr>
</tbody>
</table>

Note 1: Includes temperature rise caused by current flow.

Note 2: The term “storage” refers to products stored for long period of time prior to mounting and use. Operating Temperature Range and Humidity range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Note 3: This does not include the resistance of the conductor.

### Materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptacle</td>
<td>Insulator</td>
<td>PPS</td>
<td>Color : Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Contacts</td>
<td>Phosphor bronze</td>
<td>Contact Area : Gold plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mounting Area : Gold plating</td>
<td></td>
</tr>
<tr>
<td>Header</td>
<td>Insulator</td>
<td>PPS</td>
<td>Color : Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Contacts</td>
<td>Brass</td>
<td>Contact Area : Gold plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mounting Area : Solder plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metal fitting</td>
<td>Brass</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eject fitting</td>
<td>Stainless steel</td>
<td></td>
<td>Applied to eject mechanism</td>
</tr>
<tr>
<td></td>
<td>Ground clip</td>
<td>Stainless steel</td>
<td></td>
<td>Applied to MI21 series</td>
</tr>
</tbody>
</table>

### Ordering Information

**MI20 - 50 RD - SF (51)**

1. Series name: MI20
2. Number of contacts: 50
3. Connector type: RD: Receptacle
4. Contact form: SF: SMT
5. (51): RoHS compliant

**MI20 A - 50 PD R - SF - EJR (71)**

1. Series name
   - MI20: for type I cards (★)
   - MI21: for type I and II cards
2. Stand off type
   - Blank : None
   - A : 2.2 mm
3. Number of contacts: 50
4. Connector type
   - PD: Header
5. Board mounting type
   - Blank : Standard
   - R : Reverse
6. Contact type
   - SF: SMT
7. Eject button position
   - EJR : Right button
   - EJL : Left button
   - Blank : None
8. (71): RoHS compliant

(★) Can accommodate type II cards only when standard mounting is used and stand off is 0 mm.
Receptacle

The coplanarity of the conductor is 0.1 mm Max.

<table>
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<tr>
<th>Part Number</th>
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<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI20-50RD-SF(51)</td>
<td>640-7001-0-51</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

PCB mounting pattern

(Recommended board thickness=0.4)
## Headers for Type I or II Cards

- **Eject button**: None
- **Offset**: None
- **Mounting style**: Standard mounting

---

![Diagram of Connectors](image)

### Note 1:
Coplanarity of all surface mount terminals and components is 0.1.

### Note 2:
Dimensions in parentheses ( ) are reference dimensions.

### PCB mounting pattern

![Diagram of PCB mounting pattern](image)

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### Table

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<tbody>
<tr>
<td>MI20-50PD-SF(71)</td>
<td>640-7002-2-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

The product information in this catalog is for reference only. Please request the Engineering Drawing for the most current and accurate design information. All non-RoHS products have been discontinued, or will be discontinued soon. Please check the products status on the Hirose website RoHS search at www.hirose-connectors.com, or contact your Hirose sales representative.
**Headers for Type I Cards**

- **Eject button**: None
- **Offset**: 2.2 mm
- **Mounting style**: Reverse mounting

---

Note 1: Coplanarity of all surface mount terminals and components is 0.1.

Note 2: Dimensions in parentheses ( ) are reference dimensions.

---

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<tr>
<td>MI20A-50PDR-SF(71)</td>
<td>640-7003-5-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

**PCB mounting pattern**

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### Headers for Type I Cards

- **Eject button**: Right button
- **Offset**: 2.2 mm
- **Mounting style**: Standard mounting

#### Notes

1. The amount of card and button protrusion from the connector after mating is 13.6 mm.
2. The dimensions of mating portion of this product comply with CFA standards.
3. This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure. This part is fixed in the initial condition, but released with a single operation of the ejector. (Amount of actual card ejection: 3.5 mm)
4. The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.
5. Dimensions in parentheses ( ) are to be regarded as reference dimensions.

#### PCB mounting pattern

![PCB mounting pattern diagram](image-url)
Headers for Type I Cards

- **Eject button**: Left side
- **Offset**: 2.2 mm
- **Mounting style**: Standard mounting

Note 1: The amount of card and button protrusion from the connector after mating is 13.6 mm.

Note 2: The dimensions of mating portion of this product comply with CFA standards.

Note 3: This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure.

   - This part is fixed in the initial condition, but released with a single operation of the ejector.
   - (Amount of actual card ejection: 3.5 mm)

Note 4: The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.

Note 5: Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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<tbody>
<tr>
<td>MI20A-50PD-SF-EJL(71)</td>
<td>640-7005-0-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

**PCB mounting pattern**
 Headers for Type I or II Cards

- Eject button: Right side
- Offset: 0 mm
- Mounting style: Standard mounting

Note 1: This item is a (standard type) header for use with CompactFlash cards.

Note 2: The dimensions of mating portion of this product comply with CFA standards.

Note 3: This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure.

Note 4: The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.

Note 5: Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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</tr>
</thead>
<tbody>
<tr>
<td>MI21-50PD-SF-EJR(71)</td>
<td>640-7107-0-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

PCB mounting pattern
**Headers for Type I or II Cards**

- **Eject button**: Left side
- **Offset**: None
- **Mounting style**: Standard mounting

---

**Note 1:** This item is a (standard type) header for use with CompactFlash cards.

**Note 2:** The dimensions of mating portion of this product comply with CFA standards.

**Note 3:** This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure.

1. This part is fixed in the initial condition, but released with a single operation of the ejector.
   (Amount of actual card ejection: 3.5 mm)

**Note 4:** The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.

**Note 5:** Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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</tr>
</thead>
<tbody>
<tr>
<td>MI21-50PD-SF-EJL(71)</td>
<td>640-7108-3-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

**PCB mounting pattern**
Headers for Type I or II Cards

- Eject button: None
- Offset: None
- Mounting style: Standard mounting

Note 1: This item is a (standard type) header for use with CompactFlash cards.
Note 2: The dimensions of mating portion of this product comply with CFA standards.
Note 3: The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum
Note 4: Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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</tr>
</thead>
<tbody>
<tr>
<td>MI21-50PD-SF(71)</td>
<td>640-7109-6-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

PCB mounting pattern
### Headers for Type I or II Cards

- **Eject button**: None
- **Offset**: 0 mm
- **Mounting style**: Reverse mounting

Note 1: Coplanarity of all surface mount terminals and components is 0.1.

Note 2: Dimensions in parentheses ( ) are reference dimensions.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MI21A-50PDR-SF(71)</td>
<td>640-7106-8-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
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■Headers for Type I and II Cards

- Eject button : Right side
- Offset : 2.2 mm
- Mounting style : Standard mounting

Note 1: This item is a (standard type) header for use with CompactFlash cards.

Note 2: The dimensions of mating portion of this product comply with CFA standards.

Note 3: This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure.

Note 4: The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.

Note 5: Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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<tbody>
<tr>
<td>MI21A-50PD-SF-EJR(71)</td>
<td>640-7101-4-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

- **PCB mounting pattern**
### Headers for Type I and II Cards

- **Eject button**: Left button
- **Offset**: 2.2 mm
- **Mounting style**: Standard mounting

---

**Note 1**: This item is a (standard type) header for use with CompactFlash cards.

**Note 2**: The dimensions of mating portion of this product comply with CFA standards.

**Note 3**: This product can be automatically mounted. The suction surface for automatic mounting is positioned as illustrated in the figure.

- This part is fixed in the initial condition, but released with a single operation of the ejector.
  - (Amount of actual card ejection: 3.5 mm)

**Note 4**: The coplanarity (degree of flatness) of the SMT lead tip portion and the reinforced fitting mounting end face is to be 0.1 maximum.

**Note 5**: Dimensions in parentheses ( ) are to be regarded as reference dimensions.

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<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI21A-50PD-SF-EJL(71)</td>
<td>640-7102-7-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

#### PCB mounting pattern
Headers for Type I and II Cards

- Eject button: None
- Offset: 2.2 mm
- Mounting style: Standard mounting

Note 1: Coplanarity of all surface mount terminals and components is 0.1.
Note 2: Dimensions in parentheses (    ) are reference dimensions.

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<tr>
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<tr>
<td>MI21A-50PD-SF(71)</td>
<td>640-7103-0-71</td>
<td>50</td>
<td>Tray</td>
<td>YES</td>
</tr>
</tbody>
</table>

PCB mounting pattern
Temperature Profile

Applicable Conditions
Reflow system: IR reflow
Solder: Paste type 96.5% Sn / 3.0% Ag / 0.5% Cu
Test board: Glass epoxy 60mm x 60mm x 1.6 mm
Metal mask thickness: 0.15 mm

Recommended temperature profile.
The temperature may be slightly changed according to the solder paste type and amount.
Precautions for Use

1. Differentiate the side of the card at the time of CF card insertion. This product is furnished with an wrong insertion prevention mechanism which is compliant with CFA standards, but forced wrong insertion of the card may cause damage to the card.

2. Do not move the CF card up and down when it has been partially inserted. It may cause damage to the connector and card.

3. The package used for this product is the soft tray. We recommend a check before mounting, since the adjustment may be required depending on the type of mounter. For more detailed information, please contact nearest Hirose account representative.

Washing Conditions

This product is a no-wash item, but in the case of washing, please observe the following conditions.

1. Organic Solvent Washing

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Room temperature washing</th>
<th>Heated washing</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPA (Isopropyl alcohol)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>HCFC (Hydrochlorofluorocarbon)</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

2. Water Type Washing

When using water type cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers of cleaning agents which describes the effects on metals and resins.

Be careful that parts are not left with moisture remaining on them.

3. Washing Precautions

Residual flux or cleaning agent on the contacts when washing with organic solvents or water type cleaners can give rise to the deterioration of electrical performance. In this regard it is important to check whether a thorough washing has been performed.