Overview
Developed as external input/output connectors for the portable and mobile devices used in consumer markets. As such, the connectors incorporate features required to assure reliable electrical and mechanical performance under extreme and unpredictable conditions.

Features
1. Strong locking mechanism
   To assure continuous reliability of the connection in an unpredictable consumer environment, mated connectors will withstand pull force of 49N max. applied in any direction.
2. Prevention against reversed or angle insertion
   Multiple polarization keys will not allow incorrect insertion of the mating plug. In addition, contacts will not be damaged when the user attempts to insert only the corner of the mating plug.
3. Small size and low profile
   Contact pitch of 0.5 mm and utilization of state-of-the-art manufacturing technologies has produced receptacle height of 3 mm above the board and maximum thickness of the plug of only 7 mm.
4. EMI protection
   Built-in ground continuity features and EMI shielding assure interference free performance.
5. Wide variety of contact positions and mounting styles
   Standard, reverse, vertical and cradle mountings, as well as utilization of variety of cables and conductors assure application of this connector in diversified applications.

Applications
Digital Still Cameras, Personal Digital Assistance, Notebook computers, Cellular phones, Portable readers, Mobile recorders and any mobile or portable device requiring high reliability small size input/output connection.
Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contact resistance</td>
<td>60m Ω max.</td>
<td>100mA DC</td>
</tr>
<tr>
<td>2. Insulation resistance</td>
<td>100M Ω min.</td>
<td>250V DC</td>
</tr>
<tr>
<td>3. Dielectric withstanding voltage</td>
<td>No flashover or insulation breakdown.</td>
<td>350V AC/ one minute</td>
</tr>
<tr>
<td>5. Durability (mating/un-mating)</td>
<td>Contact resistance: 50 m Ω max.</td>
<td>10000 cycles</td>
</tr>
<tr>
<td>6. Shock</td>
<td>No electrical discontinuity of 10 μ sec. max.</td>
<td>Acceleration of 490 m/s², 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis.</td>
</tr>
<tr>
<td>7. Temperature cycle</td>
<td>Contact resistance: 100m Ω max. Insulation resistance: 1000M Ω min.</td>
<td>Temperature: -55°C to +35°C to +35°C to +5°C to +35°C Time (Minutes): 30 → 5 → 30 → 5 → 5 cycles</td>
</tr>
<tr>
<td>8. Salt spray</td>
<td>No corrosions</td>
<td>5±1% salt water solution at 35±3°C for 48 hours, after washing without salt, leave for 24 hours at room temperature</td>
</tr>
<tr>
<td>9. Lock strength</td>
<td>Fully inserted and locked corresponding connector. No physical damage or electrical failure.</td>
<td>Pull force: 49N max. applied in each of the 3 axis.</td>
</tr>
<tr>
<td>10. Shock</td>
<td>No electrical discontinuity of 10 μ sec. max. Contact resistance: 100m Ω max.</td>
<td>Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis.</td>
</tr>
</tbody>
</table>

Note: Includes temperature rise caused by current flow.

Materials

- **Receptacles and cradles**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Thermoplastic compound, glass reinforced</td>
<td>Color: Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td>Contacts</td>
<td>Copper alloy</td>
<td>Contact area: Gold plated</td>
<td></td>
</tr>
<tr>
<td>Shield</td>
<td>Stainless steel</td>
<td>Tin alloy plating</td>
<td></td>
</tr>
</tbody>
</table>

- **Plugs**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
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<td>Contact area: Gold plated</td>
<td></td>
</tr>
<tr>
<td>Shield</td>
<td>Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cover</td>
<td>Thermoplastic compound, glass reinforced</td>
<td></td>
<td>UL94-HB</td>
</tr>
</tbody>
</table>

Ordering information

- **Receptacles**

  **ST 60 - 18 P /4**

  - 1
  - 2
  - 4
  - 5
  - 6

- **Plugs**

  **ST 40 X - 18 S - CVR**

  - 1
  - 2
  - 3
  - 4
  - 5
  - 7

- **Plug - Cradle type**

  **ST 80 X - 18 S**

  - 1
  - 2
  - 3
  - 4
  - 5

Note:

- **Rating**
  - Current rating: 0.5A (1 A max. can be carried via 4 random contacts)
  - Operating temperature range: -30°C to +80°C
  - Voltage rating: 100V AC
  - Storage temperature range: -40°C to +85°C (Note)

- **Characteristics**
  - Contact resistance: 50 m Ω max.
  - Insulation resistance: 1000M Ω min.
  - No flashover or insulation breakdown.
  - Mating: 29.4N max.
  - With corresponding connector.
  - No electrical discontinuity of 10 μ sec. max.
  - Contact resistance: 100m Ω max.
  - 10000 cycles
  - Acceleration of 490 m/s², 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis.
  - Contact resistance: 100m Ω max. Insulation resistance: 1000M Ω min.
  - Temperature: -55°C to +35°C to +35°C to +5°C to +35°C Time (Minutes): 30 → 5 → 30 → 5 → 5 cycles
  - No electrical discontinuity of 10 μ sec. max.
  - Contact resistance: 100m Ω max.
  - No electrical discontinuity of 10 μ sec. max. Contact resistance: 100m Ω max.
  - Pull force: 49N max. applied in each of the 3 axis.
  - Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis.

- **Contact area**
  - Black
  - Gold plated
  - Tin alloy plating

- **Material**
  - Thermoplastic compound, glass reinforced
  - Copper alloy
  - Stainless steel

- **Finish**
  - Color: Black
  - Contact area: Gold plated
  - Tin alloy plating

- **Remarks**
  - UL94V-0
  - UL94-HB

- **Termination type**
  - 60: Right angle SMT
  - 40: Solder type
  - 80: Cradle, vertical, SMT

- **Shield**
  - X: With shield
  - Blank: Without shield

- **Number of positions**

- **Contact type**
  - P: Male contact (Receptacle)
  - S: Female contact (Plug)

- **Contact arrangement**
  - /4: Combination, with 4 power contacts

- **Plug type**
  - CV: Standard type, for top PCB mount
  - CVR: Reverse type, for bottom PCB mount
  - CV1: For larger diameter cables
## Packaging Specification

### Embossed Carrier Tape Dimensions

![Diagram of embossed carrier tape dimensions]

### Reel Dimensions

- **Unreeling direction**
  - **Pocket**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>pcs. / reel</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST60-10P</td>
<td>24</td>
<td>—</td>
<td>11.5</td>
<td>12</td>
<td>5</td>
<td>1500</td>
</tr>
<tr>
<td>ST60-18P</td>
<td>24</td>
<td>—</td>
<td>11.5</td>
<td>12</td>
<td>5</td>
<td>1500</td>
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<tr>
<td>ST60-24P</td>
<td>32</td>
<td>28.4</td>
<td>14.2</td>
<td>12</td>
<td>5</td>
<td>1500</td>
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<tr>
<td>ST60-36P</td>
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<td>40.4</td>
<td>20.2</td>
<td>12</td>
<td>5</td>
<td>1500</td>
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<tr>
<td>ST60-18P/4</td>
<td>44</td>
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<td>20.2</td>
<td>12</td>
<td>6.2</td>
<td>1000</td>
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<tr>
<td>ST60-36PR</td>
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<td>20.2</td>
<td>12</td>
<td>5</td>
<td>1500</td>
</tr>
<tr>
<td>ST80X-10S</td>
<td>24</td>
<td>—</td>
<td>11.5</td>
<td>16</td>
<td>12.2</td>
<td>400</td>
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<tr>
<td>ST80X-18S</td>
<td>44</td>
<td>40.4</td>
<td>20.2</td>
<td>16</td>
<td>12.7</td>
<td>400</td>
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<td>ST80X-24S</td>
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<td>40.4</td>
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<td>16</td>
<td>12.7</td>
<td>400</td>
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<td>20</td>
<td>4.85</td>
<td>900</td>
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</tbody>
</table>
Recommended Temperature Profile (Lead-free soldering compound)

HRS test conditions
Solder composition: Paste, 96.5%Sn/3.0%Ag/0.5%Cu
Test board: Glass epoxy 35mm×35mm×0.8mm thick

The temperature profiles are based on the above conditions. In individual applications the actual temperature may vary, depending on solder paste type, volume/thickness and board size/thickness. Consult your solder paste and equipment manufacturer for specific recommendations.