Teledyne Relays has been providing industrial power solid-state relays for over 50 years. The company offers a broad range of products, from standard off-the-shelf single-, dual-, three- and quad-output relays to custom products with diagnostics and phase monitoring. These relays are used in numerous applications, including food equipment, heating, lighting, medical equipment, motor control, refrigeration, temp control and mil-aero applications. Teledyne’s selection of high-quality components results in reduced EMI and lower start-up surges. The rugged design, including the direct-bond copper (DBC) and wirebond assembly, offers the most reliable and thermally efficient product on the market. Teledyne is also the world’s innovative leader in manufacturing hermetically sealed solid-state and electromechanical relays. Teledyne Relays’ industrial SSRs, mil-aero SSRs, electromechanical relays and coaxial switches offer switching solutions across a wide range of markets and applications.

Markets
- Industrial Power & Motion Control
- Temperature Control
- Lighting
- Motor Control
- Power Supplies
- Medical Equipment
- Commercial & Military Aviation
- Defense & Aerospace
- Telecom/Communications (Wireless)
- Instrumentation & Test

Product Assurance
Under an aggressive Total Quality Management (TQM) program, Teledyne Relays has embraced a “continuous improvement” culture. With recognized certifications such as Boeing D6-82479, MIL-STD-790, AS/EN/JISQ9100:2009 (Rev C) and ISO 9001:2008, Teledyne Relays has become a primary supplier of switching solutions with the highest quality and reliability to industry leaders around the world.

Technical Service & Customer Support
Teledyne Relays provides easy access to technical service and customer support. An innovative, integrated website makes it easy to find technical information, buy relays and even get e-mail responses within 24 hours.
Series SH High Industrial Performance (HIPpak) AC Solid-State Relays with Covers
Series SH relays offer high performance in a flexible and innovative package. Designed for all types of loads, they provide output to 125A, 690Vac. They incorporate removable touch-proof terminal covers for versatile, easy, and quick connections. SH relays feature a metal baseplate and built-in LED. They are up to 30% lighter than standard relays.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>(I_t)</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH24D25</td>
<td>25A</td>
<td>12–275 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>600 A's</td>
<td>2.3 x 1.77 x 1.18 in.</td>
</tr>
<tr>
<td>SH24A25</td>
<td>25A</td>
<td>12–275 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>20–265 Vac/Vdc</td>
<td>600 A's</td>
<td></td>
</tr>
<tr>
<td>SH24D50</td>
<td>50A</td>
<td>12–275 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>2800 A's</td>
<td></td>
</tr>
<tr>
<td>SH24R50</td>
<td>50A</td>
<td>12–275 Vac</td>
<td>600 Vpeak</td>
<td>Random</td>
<td>3–32 Vdc</td>
<td>2500 A's</td>
<td></td>
</tr>
<tr>
<td>SH48D35</td>
<td>35A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>1250 A's</td>
<td></td>
</tr>
<tr>
<td>SH48D50</td>
<td>50A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>2500 A's</td>
<td></td>
</tr>
<tr>
<td>SH48A50</td>
<td>50A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>20–265 Vac/Vdc</td>
<td>2500 A's</td>
<td></td>
</tr>
<tr>
<td>SH48D95</td>
<td>95A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>14400 A's</td>
<td></td>
</tr>
<tr>
<td>SH48A95</td>
<td>95A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>20–265 Vac/Vdc</td>
<td>14400 A's</td>
<td></td>
</tr>
<tr>
<td>SH48R125</td>
<td>125A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Random</td>
<td>3.5–32 Vdc</td>
<td>24000 A's</td>
<td></td>
</tr>
<tr>
<td>SH48D125</td>
<td>125A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>24000 A's</td>
<td></td>
</tr>
<tr>
<td>SH48A125</td>
<td>125A</td>
<td>24–510 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>20–265 Vac/Vdc</td>
<td>24000 A's</td>
<td></td>
</tr>
<tr>
<td>SH60D50</td>
<td>50A</td>
<td>24–690 Vac</td>
<td>1600 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>2500 A's</td>
<td></td>
</tr>
<tr>
<td>SH60D125</td>
<td>125A</td>
<td>24–690 Vac</td>
<td>1600 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–32 Vdc</td>
<td>24000 A's</td>
<td></td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options.
RoHS Compliant.
For SH48D75, contact factory for availability.

Series STH High Industrial Performance (HIPpak) AC Solid-State Relays
Series STH relays offer high performance in a flexible and innovative package. Designed for all types of loads, they deliver output to 75A, 600Vac for resistive loads. They have removable touch-proof terminal covers for versatile, easy, and quick connections. STH relays feature a metal baseplate and are up to 30% lighter than standard relays.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>(I_t)</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>STH24D12</td>
<td>12A</td>
<td>12–280 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>128 A's</td>
<td></td>
</tr>
<tr>
<td>STH24D25</td>
<td>25A</td>
<td>12–280 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>600 A's</td>
<td></td>
</tr>
<tr>
<td>STH24D35</td>
<td>35A</td>
<td>12–280 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>1250 A's</td>
<td></td>
</tr>
<tr>
<td>STH48D50</td>
<td>50A</td>
<td>24–600 Vac</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>2500 A's</td>
<td></td>
</tr>
<tr>
<td>STH24D50</td>
<td>50A</td>
<td>12–280 Vac</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>2800 A's</td>
<td></td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options.
IP20 touch-proof covers option: -17
RoHS Compliant.
For STH48D35, contact factory for availability.

TELEDYNE'S INNOVATIVE CONSTRUCTION
New construction method offers low profile, less weight, touch-proof terminal covers and higher reliability. Teledyne's new HIPpak housing offers a new metallic base for screw terminals versus plastic to improve the ruggedness. The housing also offers hinged, removable terminal covers for opening and closing. Internal components are now surface mount, allowing for a lower profile. The power device continues to utilize a DBC (Direct Bond Copper) process between the copper and alumina substrate. The DBC process offers the most efficient means of transferring thermal energy out of the device. The construction also incorporates wirebonds versus clips and jumpers. This feature reduces the thermal stress improving the reliability of the relay (see chart, page 20).
SINGLE-PHASE AC SOLID-STATE RELAYS

Series S AC Hockey Puck Solid-State Relays

The Series S single-phase relays are designed for all types of loads. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. All contain an internal snubber for output protection. High-current models are excellent for motor and UPS control.

- Low zero-cross turn-on voltage for low EMI
- AC or DC control available
- Excellent thermal performance
- High immunity to surges
- Internal snubber (except S60 models)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I²t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>S24A12</td>
<td>12A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>90–240 Vac</td>
<td>72 A²s</td>
<td></td>
</tr>
<tr>
<td>S24D25</td>
<td>25A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>288 A²s</td>
<td></td>
</tr>
<tr>
<td>S24R40</td>
<td>40A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Random</td>
<td>3–30 Vdc</td>
<td>612 A²s</td>
<td></td>
</tr>
<tr>
<td>S24D40</td>
<td>40A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>612 A²s</td>
<td></td>
</tr>
<tr>
<td>S24A40</td>
<td>40A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>90–240 Vac/Vdc</td>
<td>612 A²s</td>
<td></td>
</tr>
<tr>
<td>S48R50</td>
<td>50A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Random</td>
<td>4–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>S48D50</td>
<td>50A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>5–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>S48A50</td>
<td>50A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>90–240 Vac/Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>S48A50-22/R**</td>
<td>50A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>17–80 Vac/Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>S48R125</td>
<td>125A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Random</td>
<td>90–240 Vac/Vdc</td>
<td>20000 A²s</td>
<td></td>
</tr>
<tr>
<td>S48A125</td>
<td>125A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>90–240 Vac/Vdc</td>
<td>20000 A²s</td>
<td></td>
</tr>
<tr>
<td>S60D50</td>
<td>50A</td>
<td>24–690 Vrms</td>
<td>1600 Vpeak</td>
<td>Zero Cross</td>
<td>7–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>S60D125</td>
<td>125A</td>
<td>24–660 Vrms</td>
<td>1600 Vpeak</td>
<td>Zero Cross</td>
<td>7–30 Vdc</td>
<td>20000 A²s</td>
<td></td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options. RoHS Compliant **. S48A50-22 available with /R option

Series ST AC Hockey Puck Solid-State Relays

Series ST relays are designed for high-power applications. The design incorporates an SCR or triac output. The relays utilize optical isolation to protect the control from load transients. A control LED is available on certain models. All Series ST relays are zero crossing. Internal MOV is also available on ST24D 25A and 50A models.

- Tight zero-cross window for low EMI
- AC or DC control available
- Excellent thermal performance
- Internal MOV (certain models)
- Control LED (certain models)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I²t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST24D12</td>
<td>12A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>72 A²s</td>
<td></td>
</tr>
<tr>
<td>ST24D12-02</td>
<td>12A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>72 A²s</td>
<td></td>
</tr>
<tr>
<td>ST24D25</td>
<td>25A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>288 A²s</td>
<td></td>
</tr>
<tr>
<td>ST24D50-16</td>
<td>50A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>ST48D50</td>
<td>50A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>5–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
<tr>
<td>ST48D50-02</td>
<td>50A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>5–30 Vdc</td>
<td>1500 A²s</td>
<td></td>
</tr>
</tbody>
</table>

-02 = Control LED; -16 = Internal MOV; -22 = 24 Vac control

See Appendix for heat-sink information and other options. RoHS Compliant
**Series FS Miniature AC Solid-State Relays**

Series FS relays are designed for medium-power loads. The relays incorporate a triac output and utilize optical isolation to protect the control from load transients. The package is available with faston or PCB terminals. The compact size of the FS makes it ideal for designs where space is limited. The FS has excellent thermal performance.

- Miniature package
- Faston or PCB terminals available
- Tight zero-cross window for low EMI
- Excellent thermal performance
- High immunity to surges

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>(I_t)</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS24D10-06</td>
<td>10A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>72 A(^2)s</td>
<td>1.18 x .83 x .59 in. 30 x 21 x 15 mm</td>
</tr>
<tr>
<td>FS24D10</td>
<td>10A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>72 A(^2)s</td>
<td></td>
</tr>
<tr>
<td>FS24D20-06</td>
<td>20A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>200 A(^2)s</td>
<td></td>
</tr>
</tbody>
</table>

-06 = Faston

RoHS Compliant available with option: /R

**Series G AC Solid-State Relays**

Series G relays are designed for medium-power loads. The design incorporates a thyristor output. Series G relays utilize optical isolation to protect the control from load transients. An internal MOV is also provided to protect against load transient voltages. The compact size makes it ideal for designs where space is limited.

- Miniature size package
- Power and control connections by Faston terminals
- Internal MOV protection
- Excellent thermal performance
- High immunity to surges

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>(I_t)</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>G24R12-06</td>
<td>12 Arms</td>
<td>12–320 Vrms</td>
<td>520 Vpeak</td>
<td>Random</td>
<td>3–32 Vdc</td>
<td>340 A(^2)s</td>
<td>2.63 x 1.50 x .87 in. 56.9 x 38 x 22 mm</td>
</tr>
<tr>
<td>G24D12-06</td>
<td>12 Arms</td>
<td>12–320 Vrms</td>
<td>520 Vpeak</td>
<td>Zero Cross</td>
<td>4–32 Vdc</td>
<td>340 A(^2)s</td>
<td></td>
</tr>
</tbody>
</table>

-06 = Faston

RoHS Compliant

**Series XV No Heat Sink AC Hybrid Relays**

Series XV relays combine the best of solid-state and electromechanical technology. The relay is designed in a touch-proof hockey-puck package. The XV relay switches current up to 30A without a heat sink. Visual control status is provided as a standard. Elimination of the heat sink conserves space and makes the XV ideal for many applications.

- Industry-standard package
- Requires no heat sink
- Low zero-cross turn-on voltage for low EMI
- Control LED
- High immunity to surges

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>(I_t)</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>XV46D30K</td>
<td>30A</td>
<td>12–420 Vrms</td>
<td>800 Vpeak</td>
<td>Zero Cross</td>
<td>20–30 Vdc</td>
<td>288 A(^2)s</td>
<td>2.41 x 1.75 x 1.77 in. 61.3 x 44.5 x 45 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant
SINGLE-PHASE AC SOLID-STATE RELAYS

Series SHP Phase-Control AC Solid-State Relays
The Series SHP phase-angle controller provides analog switching. It features an internal microcontroller and overvoltage protection. Choose relays with either removable input spring connectors or IP20 touchproof flaps. The relays are designed in conformity with EN60947-4-3 (IEC947-4-3) and EN60950/VDE0805 (Reinforced Insulation).

- Microcontroller inside
- Analog switching
- Overvoltage protection by varistor
- Green LED for input visualization
- Short-circuit protection

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Range</th>
<th>( I_t )</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHP24N50R</td>
<td>50A</td>
<td>90–280 Vac</td>
<td>600 Vpeak</td>
<td>Phase Angle</td>
<td>4–20 mA</td>
<td>2500 A()s</td>
<td>1.77 x 2.30 x 1.18 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45 x 58.5 x 30 mm</td>
</tr>
<tr>
<td>SHP24N50A</td>
<td>50A</td>
<td>100–280 Vac</td>
<td>600 Vpeak</td>
<td>Phase Angle</td>
<td>8–30 Vdc</td>
<td>2500 A()s</td>
<td>1.77 x 2.30 x 1.18 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45 x 58.5 x 30 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant

Series LS Ultraminiature AC Solid-State Relays
Series L relays are designed to control medium-power AC loads, while occupying minimal board space. The Series L is an excellent choice for a PCB-mount power-switching relay. A thermal pad is available to eliminate thermal grease when mounting it on to a heat sink. The relay's optical isolation protects the control from load transients.

- Ultraminiature package
- Zero-cross turn-on voltage
- Designed for PC board mounting
- Optional thermal pad available
- High immunity to transients

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>( I_t )</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS24D40G</td>
<td>40 Arms</td>
<td>24–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>12.5–32 Vdc</td>
<td>612 A()s</td>
<td>35 x 28.3 x 9.4 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant
For LS24D25G, contact factory for availability.

Series LS AC Solid-State Relays with Optional Heat Sinks
Series LS single-inline package (SIP) relays are designed for mounting on printed circuit boards. LS relays facilitate heat sinking by providing an metallic interface surface. The relays use a direct-bonded copper substrate for thermal efficiency, thermal stress performance and long-life expectancy. Optional heat sinks are available.

- Compact SIP package
- Designed for external heat-sink attachment
- Over-sized thyristor ratings (up to 50A)
- Direct-copper bonding technology
- Optional heat sinks available

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>( I_t )</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS24D16C</td>
<td>16A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>128 A()s</td>
<td>LS: 1.72 x .96 x .25 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.6 x 24.5 x 6.3 mm</td>
</tr>
<tr>
<td>LS24D16C-HS1</td>
<td>16A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>128 A()s</td>
<td>LS with H1 Heat Sink: 1.72 x 1.4 x .87 in.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.6 x 35.7 x 22 mm</td>
</tr>
<tr>
<td>LS60D22C</td>
<td>22A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>450 A()s</td>
<td>LS: 1.72 x .96 x .25 in.</td>
</tr>
<tr>
<td>LS60D22C-HS1</td>
<td>22A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>450 A()s</td>
<td>43.6 x 24.5 x 6.3 mm</td>
</tr>
<tr>
<td>LS24D27C</td>
<td>27A</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>1800 A()s</td>
<td>LS: 1.72 x .96 x .25 in.</td>
</tr>
<tr>
<td>LS60D30C</td>
<td>30A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>4–14 Vdc</td>
<td>5000 A()s</td>
<td>43.6 x 24.5 x 6.3 mm</td>
</tr>
</tbody>
</table>

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-HS1 = With heat sink

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Series AS4 Single-Inline Package AC Solid-State Relays

Series AS4 solid-state single inline (SIP) four-pin relays are designed for mounting on a printed circuit board. The relays offer built-in voltage protection and can withstand very high current overloads. The relays have a low zero-cross window. The compact size and triac output make the AS relay the perfect retrofit for electromechanical relays.

- Industry-standard package
- Tight zero-cross window for low EMI
- Low input current draw
- Integral transient voltage protection
- DIN rail available

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I^2t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS24D4E/R</td>
<td>4 Arms</td>
<td>12–275 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>50 A's</td>
<td>1.70 x 1.0 x .39 in.</td>
</tr>
<tr>
<td>AS46D4E</td>
<td>4 Arms</td>
<td>12–460 Vrms</td>
<td>900 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>50 A's</td>
<td>43.2 x 25.4 x 10.2 mm</td>
</tr>
<tr>
<td>AS60D4E</td>
<td>5 Arms</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>5–30 Vdc</td>
<td>72 A's</td>
<td></td>
</tr>
<tr>
<td>AS24D4E-X1</td>
<td>4 Arms</td>
<td>12–275 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>6–30 Vdc</td>
<td>50 A's</td>
<td></td>
</tr>
<tr>
<td>AS46D4E/X1</td>
<td>5 Arms</td>
<td>12–460 Vrms</td>
<td>800 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>72 A's</td>
<td></td>
</tr>
</tbody>
</table>

-02 = LED; X1 = DIN rail clip with LED; X2 = DIN rail clip without LED

RoHS Compliant

Series BS Single-Inline Package AC Solid-State Relays

Series BS 4-amp solid-state single inline (SIP) four-pin relays are designed for mounting on a printed circuit board. BS relays can withstand very high current overloads. The compact size and triac output make the BS relay an excellent choice for switching medium-power resistive loads.

- Industry-standard package
- High in-rush capabilities
- Low input current draw
- Low zero-cross turn-on voltage for low EMI
- Up to 600Vrms load voltage

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I^2t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS24D4A</td>
<td>4 Arms</td>
<td>15–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–10 Vdc</td>
<td>50 A's</td>
<td>1.70 x 1.0 x .39 in.</td>
</tr>
<tr>
<td>BS24D4F</td>
<td>4 Arms</td>
<td>15–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>8–30 Vdc</td>
<td>50 A's</td>
<td>43.2 x 25.4 x 10.2 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant

Series DH (slimpac) AC Solid State Relays

Series DH relays are designed for all types of loads. These relays feature our new high efficiency back-to-back thyristors for long lifetime expectancy. The relays utilize optical isolation to protect the control from load transients. All relays offer a green control LED.

- New High Efficiency Back-to-Back Thyristors
- Zero-cross models designed for resistive loads
- Input protection and control LED standard
- IP20 protective cover
- Up to 600Vrms load voltage

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I^2t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH24D25</td>
<td>25 Arms</td>
<td>12-280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3-32 Vdc</td>
<td>340 A's</td>
<td>3.58 x .89 x 1.65 in.</td>
</tr>
<tr>
<td>DH48D35</td>
<td>35 Arms</td>
<td>24-600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>3.5-32 Vdc</td>
<td>882 A's</td>
<td>91 x 22.5 x 42 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant
**SINGLE-PHASE AC SOLID-STATE RELAYS**

**Series TS and PS AC Solid-State Relays**

Series TS and Series PS relays provide AC/DC switching in a compact size. They also provide AC/DC control. These relays can withstand high surge currents. TS and PS relays are pin-to-pin compatible with electromechanical relays and may be used as replacements. Applications include: vending machines, lighting and fans.

- Compact size
- Pin-to-pin compatible with electromechanical relays
- AC and DC control; AC and DC output
- Random and zero-cross turn-on voltage
- High inrush capabilities

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I²t</th>
<th>Dimensions L x W x H</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS24D2G</td>
<td>2 Arms</td>
<td>12–275 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>12–30 Vac/Vdc</td>
<td>50 A’s</td>
<td>1.14 x .51 x 0.6 in</td>
</tr>
<tr>
<td>PS24D4G</td>
<td>4 Arms</td>
<td>12–275 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>12–30 Vac/Vdc</td>
<td>50 A’s</td>
<td>1.14 x .50 x 1 in</td>
</tr>
</tbody>
</table>

RoHS Compliant

**DUAL-OUTPUT AC SOLID-STATE RELAYS**

**Series SD Dual-Output AC Solid-State Relays**

Series SD dual-phase relays are designed for all types of loads. The design incorporates two relays in a single package. The relays utilize optical isolation to protect the control from load transients. High-current models are excellent for motor and phase angle control. SD Series are available with faston or screw terminals.

- Designed for all types of loads
- Dual output (two relays in one package)
- Faston or screw terminals
- Tight zero-cross window for low EMI
- High immunity to surges

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I²t</th>
<th>Dimensions L x W x H</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD24D40-06</td>
<td>40 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>612 A’s</td>
<td>2.28 x 1.75 x 1.26 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>58 x 44.5 x 32 mm</td>
</tr>
<tr>
<td>SD24R50</td>
<td>50 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Random</td>
<td>4–30 Vdc</td>
<td>1500 A’s</td>
<td>2.28 x 1.75 x 1.06 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>58 x 44.5 x 27 mm</td>
</tr>
<tr>
<td>SD24D50-06</td>
<td>50 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>1500 A’s</td>
<td>2.28 x 1.75 x 1.26 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58 x 44.5 x 32 mm</td>
</tr>
<tr>
<td>SD24R50-06</td>
<td>50 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>4–30 Vdc</td>
<td>1500 A’s</td>
<td>2.28 x 1.75 x 1.26 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58 x 44.5 x 32 mm</td>
</tr>
<tr>
<td>SD48D50A</td>
<td>50 Arms</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>10–30 Vdc</td>
<td>1500 A’s</td>
<td>2.28 x 1.75 x 1.06 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>58 x 44.5 x 27 mm</td>
</tr>
<tr>
<td>SD48D50A2</td>
<td>50 Arms</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>10–30 Vdc</td>
<td>1500 A’s</td>
<td>2.28 x 1.75 x 1.40 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58 x 44.5 x 35.6 mm</td>
</tr>
<tr>
<td>SD48D40-06</td>
<td>40 Arms</td>
<td>24–510 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>5–30 Vdc</td>
<td>612 A’s</td>
<td>2.28 x 1.75 x 1.26 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58 x 44.5 x 32 mm</td>
</tr>
</tbody>
</table>

-06 = Faston terminals

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See Appendix for heat-sink information and other options.

View data sheet for package detail.
THREE-PHASE AC SOLID-STATE RELAYS

Series E3P Three-Phase AC Solid-State Relays
Series E3P three-phase relays are designed for all types of loads. The design incorporates an oversized thyristor output. Control status LED is standard on all models. Output protection is provided internally on certain models. The E3P is available in random and zero-cross turn-on. High-current models are ideal for motor control.

- Three-phase output
- AC or DC control
- Internal output protection
- Tight zero-cross window for low EMI
- High immunity to surges

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I’t</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3P48A50</td>
<td>50A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>90-240 Vac</td>
<td>1500 A’s</td>
<td>3.94 x 2.89 x 1.56 in.</td>
</tr>
<tr>
<td>E3P48A75</td>
<td>75A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>10-30 Vac</td>
<td>5000 A’s</td>
<td>100 x 73.5 x 39.5 mm</td>
</tr>
<tr>
<td>E3P48A75-22</td>
<td>75A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>10-30 Vac</td>
<td>5000 A’s</td>
<td></td>
</tr>
<tr>
<td>E3PT48D25</td>
<td>25A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>8.5–30 Vdc</td>
<td>265 A’s</td>
<td></td>
</tr>
<tr>
<td>E3PT48D50</td>
<td>50A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>8.5–30 Vdc</td>
<td>1500 A’s</td>
<td></td>
</tr>
<tr>
<td>E3PT48D75</td>
<td>75A</td>
<td>24–600 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>8.5–30 Vdc</td>
<td>5000 A’s</td>
<td></td>
</tr>
<tr>
<td>E3PT48D75-16</td>
<td>75A</td>
<td>24–520 Vrms</td>
<td>1200 Vpeak</td>
<td>Zero Cross</td>
<td>8.5–30 Vdc</td>
<td>5000 A’s</td>
<td></td>
</tr>
</tbody>
</table>

-16 = Internal protection
RoHS Compliant.
For E3P48A50-16, contact factory for availability.

Series E3PT Three-Phase Touch-Proof AC Solid-State Relays
Series E3PT three-phase solid-state relays are designed for all types of loads. The E3PT relays include as a standard a control LED for visual status. The E3PT is touch-proof for user safety. An internal MOV and snubber circuit protect the output thyristor. The E3PT relays are highly immune to large current surges.

- Designed for all types of loads
- Tight zero-cross window for low EMI
- Control LED on all models
- Internal output transient protection
- IP20 touch-proof

H = High surge capability
RoHS Compliant.
For E3PT48D50H and E3PT48A50H, contact factory for availability.

Series DR3P Three-Phase AC Solid-State Relays with Heat Sink and DIN Rail
Series DR3P solid-state relays provide three-phase output, offering both AC and DC control with a zero-cross turn-ON thyristor output. The DR3P provides an integrated heat sink, output transient suppression (MOV and snubber circuit) and LEDs that serve as status indicators for diagnostics. The relays are designed for DIN-rail or panel mounting.

- Three-phase solid-state relay with heat sink
- DIN rail or panel mounting
- AC/DC control voltage with input status LED
- Internal protection by integrated snubber MOV
- IP20 touch-proof

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Series C3P Three-Phase AC Solid-State Relays
Series C3P relays control medium amounts of power in three-phase applications. Optical isolation ensures complete protection of the C3P’s control circuit from load transients. The compact plastic housing provides a low-cost alternative to large metallic three-phase contactors. The ceramic baseplate provides excellent thermal performance.

- Industry-standard hockey-puck package
- Spring connectors
- Three relays in a single package
- Zero-cross and random turn-on options
- RoHS Compliant available with option -/R

Series S3P Three-Phase AC Solid-State Relays
Series S3P relays are made up of three separate relays controlled by a common DC voltage control. They are designed to control 10A AC loads such as resistors and small motors on a mains from 12 to 440 Vac, either single- or three-phase. They are well suited for applications requiring compact size and low cost.

- Three-phase relay in a compact single-inline package
- High-temperature plastic housing
- Tight zero-cross window for low EMI
- Exposed ceramic baseplate for reduced thermal resistance

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I2t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3P24D25</td>
<td>25 Arms</td>
<td>24–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>10–30 Vdc</td>
<td>260 A's</td>
<td>3.2 x 1.09 x 0.32 in</td>
</tr>
<tr>
<td>C3P24D25C</td>
<td>25 Arms</td>
<td>24–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3.5–10 Vdc</td>
<td>260 A's</td>
<td>3.2 x 1.09 x 0.32 in</td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options. RoHS Compliant

Series SQ Quad-Output AC Solid-State Relays
Series SQ relay provides four independent 25A relays in a standard hockey-puck package. The SQ package conserves space while providing high-power switching. The tight zero-cross window reduces the EMI level. Optical isolation ensures complete protection of the control circuit from load transients.

- Four solid-state relays in a hockey puck package
- Tight zero-cross window for low EMI
- Constant current input for low current draw
- High Immunity to surges
- RoHS Compliant available with option -/R

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Switch Type</th>
<th>Control Voltage</th>
<th>I2t</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ24D25</td>
<td>25 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>288 A's</td>
<td>2.28 x 1.75 x 1.29 in</td>
</tr>
<tr>
<td>SQ24R25</td>
<td>25 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Random</td>
<td>4–30 Vdc</td>
<td>288 A's</td>
<td>2.28 x 1.75 x 1.29 in</td>
</tr>
<tr>
<td>SQ24D25-02</td>
<td>25 Arms</td>
<td>12–280 Vrms</td>
<td>600 Vpeak</td>
<td>Zero Cross</td>
<td>3–32 Vdc</td>
<td>288 A's</td>
<td>2.28 x 1.75 x 1.29 in</td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options. RoHS Compliant
Series S20, S60 and S75 DC Solid-State Relays

Series S20 and S60 relays switch medium- to high-power DC loads. These devices feature the latest-generation MOSFET technology as well as an innovative isolated driver to ensure fast power turn on and off. The relays feature triggered control input to avoid linear control risks and fast switching times. The relays also offer an LED for status.

- Low on-state resistance
- Low output leakage current
- Low control current consumption
- Triggered control input to avoid linear control risks
- Low conducted and radiated disturbances

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions</th>
<th>LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>S20DC100</td>
<td>100A</td>
<td>0–130 Vdc</td>
<td>200 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>22 mΩ</td>
<td>2.29 x 1.75 x 1.1 in.</td>
<td>58.2 x 44.5 x 28 mm</td>
</tr>
<tr>
<td>S60DC40</td>
<td>40A</td>
<td>0–350 Vdc*</td>
<td>600 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>70 mΩ</td>
<td>2.92 x 1.75 x 1.1 in.</td>
<td>74.2 x 44.5 x 28 mm</td>
</tr>
<tr>
<td>S20DC30</td>
<td>30A</td>
<td>0–130 Vdc</td>
<td>200 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>164 mΩ</td>
<td>2.29 x 1.75 x 1.1 in.</td>
<td>58.2 x 44.5 x 28 mm</td>
</tr>
<tr>
<td>S75DC150</td>
<td>150A</td>
<td>0–42 Vdc</td>
<td>75 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>2.25 mΩ</td>
<td>2.29 x 1.75 x 1.1 in.</td>
<td>58.2 x 44.5 x 28 mm</td>
</tr>
</tbody>
</table>

*275 Vrms size 20 varistor as protection across the output

See Appendix for heat-sink information and other options.

RoHS Compliant

Series SI DC Solid-State Relays

Series SI relays are designed to switch high voltage (high power) DC loads. These devices feature the latest generation of High Voltage IGBT Technology as well as an innovative isolated driver to ensure fast power turn on and OFF. The relays feature triggered control input to avoid linear control risks and fast switching times. The relays also offer an LED for status.

- Latest generation of High Voltage IGBT Technology
- Ultra low output leakage current
- Low control current consumption
- Triggered control input to avoid linear control risks
- Low conducted and radiated disturbances

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON-State Voltage Drop</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI60DC100</td>
<td>100A</td>
<td>0–500 Vdc</td>
<td>600 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>1.35 V</td>
<td>2.29 x 1.75 x 1.1 in.</td>
</tr>
<tr>
<td>SI120DC50</td>
<td>50A</td>
<td>0–1000 Vdc</td>
<td>1200 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>1.5 V</td>
<td>2.92 x 1.75 x 1.1 in.</td>
</tr>
<tr>
<td>SI170DC25</td>
<td>25A</td>
<td>0–1400 Vdc</td>
<td>1700 Vpeak</td>
<td>10 μs</td>
<td>4.5–32 Vdc</td>
<td>3.3 V</td>
<td>2.29 x 1.75 x 1.1 in.</td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options.

RoHS Compliant

Series SH DC Solid-State Relays

Series SH relays offer high performance in a flexible, innovative package. They feature the latest-generation MOSFET technology as well as triggered control input to avoid linear control risks. The relays offer diagnostics, removable touch-proof terminal covers and a metal baseplate. They are up to 30% lighter than standard relays.

- Built-in diagnostics with status LED
- Ultra low on-state resistance
- Low output leakage current
- Low control current consumption
- Triggered control input to avoid linear control risks
- No radiated or conducted disturbances

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH10DC40</td>
<td>40A</td>
<td>5–100 Vdc</td>
<td>100 Vpeak</td>
<td>20 μs</td>
<td>3.5–32 Vdc</td>
<td>30 mΩ</td>
<td>2.3 x 1.77 x 1.18 in.</td>
</tr>
<tr>
<td>SH10DC40-16</td>
<td>40A</td>
<td>5–60 Vdc</td>
<td>100 Vpeak</td>
<td>20 μs</td>
<td>3.5–32 Vdc</td>
<td>30 mΩ</td>
<td>2.3 x 1.77 x 1.18 in.</td>
</tr>
<tr>
<td>SH20DC20-16</td>
<td>20A</td>
<td>5–110 Vdc</td>
<td>200 Vpeak</td>
<td>20 μs</td>
<td>3.5–32 Vdc</td>
<td>90 mΩ</td>
<td>2.3 x 1.77 x 1.18 in.</td>
</tr>
</tbody>
</table>

-16 = Internal protection

See Appendix for heat-sink information and other options.

RoHS Compliant
Series LS10 DC Solid-State Relays

Series LS10 DC solid-state relays are designed for mounting on printed circuit boards. They facilitate heatsinking by providing an interface surface. They can switch loads with high starting currents. The nominal switched currents depend on the size of the heat sink. The relays use a direct-bonded copper substrate for thermal efficiency and long life.

- Slim compact design
- Heatsinking capabilities
- Integrated voltage protection
- High surge handling capability
- MOSFET output

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS60DC10C-21</td>
<td>10A</td>
<td>7–36 Vdc</td>
<td>60 Vpeak</td>
<td>10 μs</td>
<td>3–10 Vdc</td>
<td>20 mΩ</td>
<td>1.71 x 0.96 x 0.25 in.</td>
</tr>
<tr>
<td>LS60DC10F-21</td>
<td>10A</td>
<td>7–36 Vdc</td>
<td>60 Vpeak</td>
<td>10 μs</td>
<td>7–30 Vdc</td>
<td>20 mΩ</td>
<td>43.6 x 24.5 x 6.3 mm</td>
</tr>
</tbody>
</table>

-21 = Self turn-on suppression
RoHS Compliant

Series SDS Slim Single-Inline Package DC Solid-State Relays

The Series SDS slim single-inline package (SIP) relays save space on printed circuit boards. Designed for DC applications, they offer a 28Vdc 4A output and a 60Vdc 2.5A output. Several control ranges are available from 3 to 32Vdc. The low-cost plastic relays feature an integrated voltage clamp and high surge handling capability.

- Slim compact DC design
- Range for printed circuit board
- Integrated voltage clamp
- High surge handling capabilities
- Wide control range offerings

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS32R4K</td>
<td>4A</td>
<td>0–32 V</td>
<td>60 Vpeak</td>
<td>20 μs</td>
<td>18–32 Vdc</td>
<td>120 mΩ</td>
<td>1.10 x 0.59 x 0.2 in.</td>
</tr>
<tr>
<td>SDS32R4A</td>
<td>4A</td>
<td>0–32 V</td>
<td>60 Vpeak</td>
<td>50 μs</td>
<td>3–10 Vdc</td>
<td>120 mΩ</td>
<td>28 x 15 x 5 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant

Series DX DIN-Rail DC Solid-State Relays

Series DX relays are designed for DIN-rail mounting. These solid-state relays include a control LED that provides visual control status. Its compact size and user-friendly package make the Series DX relay an excellent choice for designers. The DX series relays offer long life versus mechanical relays.

- Solid-state relays for DIN-rail mounting
- Control visualization by LED
- AC/DC control
- High immunity to surges
- Compact design

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX6R3E-02</td>
<td>3A</td>
<td>2–60 V</td>
<td>60 Vpeak</td>
<td>20 μs</td>
<td>3–30 Vdc</td>
<td>600 Ω</td>
<td>3.01 x 2.09 x 0.48 in.</td>
</tr>
<tr>
<td>DX6R3U-02</td>
<td>3A</td>
<td>2–60 V</td>
<td>60 Vpeak</td>
<td>20 μs</td>
<td>90–240 Vac/Vdc</td>
<td>41 kΩ</td>
<td>76.4 x 53 x 12.2 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant
Series TS and Series PS DC Solid-State Relays
Series TS and Series PS relays provide AC/DC switching in a compact size. They also provide AC/DC control. These relays can withstand high surge currents. TS and PS relays are pin-to-pin compatible with electromechanical relays and may be used as replacements. Applications include vending machines, lighting and fans.

- Compact size
- Pin-to-pin compatible with electromechanical relays
- AC and DC control; AC and DC output
- Random and zero-cross turn-on voltage
- High inrush capabilities

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS3R5G</td>
<td>5A</td>
<td>0–30 V</td>
<td>60 Vpeak</td>
<td>50 μs</td>
<td>10–30 Vdc</td>
<td>2100 Ω</td>
<td>1.14 x .50 x 1 in</td>
</tr>
<tr>
<td>TS3R2G</td>
<td>2.5A</td>
<td>0–30 V</td>
<td>60 Vpeak</td>
<td>50 μs</td>
<td>10–30 Vdc</td>
<td>2100 Ω</td>
<td>29 x 12.7 x 25.4 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant

NEW Series SHI DC Solid-State Relays
Series SHI relays are designed to switch high voltage (high power) DC loads. These devices feature the latest generation of High Voltage IGBT Technology. This SSR comes with built-in Diagnostic features. The SHI Series is built with many protection features including protection for transient voltage bursts, overload and short circuits of the load.

- Latest generation of IGBT Technology
- Ultra low drop out voltage
- Built-in protection against overvoltage and fast transient burst
- Built-in over-temperature protection
- Pluggable control connector with spring terminals

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Turn-On Time</th>
<th>Control Voltage</th>
<th>ON Resistance</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHI75DC50-6</td>
<td>50A</td>
<td>12–940 Vdc</td>
<td>1270 Vpeak</td>
<td>50 μs</td>
<td>24-48 Vdc</td>
<td>35 Ω</td>
<td>5.67 x 2.67 x 3.27 in</td>
</tr>
<tr>
<td>SHI75DC50-9</td>
<td>50A</td>
<td>12–940 Vdc</td>
<td>1270 Vpeak</td>
<td>50 μs</td>
<td>72-110 Vdc</td>
<td>35 Ω</td>
<td>144 x 68 x 83 mm</td>
</tr>
</tbody>
</table>

RoHS Compliant
Series PR Protection Module

Series PR is a protection module that helps protect DC solid-state relays against voltage transients due to inductive effects of lines and loads. The PR Series offer 2 types, one with additional output protection for DC relays that already have built-in MOV and one with a full protection scheme for relays that have no built-in protection. The PR Series also features IP20 touch-proof covers.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Load Current</th>
<th>Load Voltage</th>
<th>Peak Voltage</th>
<th>Recover Time</th>
<th>Vdrop During Fly Wheel</th>
<th>Discharge Time Constant</th>
<th>Dimensions LxWxH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR20DC80</td>
<td>0-80A</td>
<td>0-130 Vdc</td>
<td>200 Vpeak</td>
<td>190 ns</td>
<td>1.2 V</td>
<td>2s</td>
<td>2.3 x 1.77 x 1.18 in</td>
</tr>
<tr>
<td>PR75DC80</td>
<td>0-80A</td>
<td>0-40 Vdc</td>
<td>75 Vpeak</td>
<td>190 ns</td>
<td>1.2 V</td>
<td>1s</td>
<td>58.5 x 45 x 30 mm</td>
</tr>
</tbody>
</table>

See Appendix for heat-sink information and other options.

RoHS Compliant
APPENDIX

Hockey Puck Relay Options

Mounting
Most SSRs must be mounted on heat sinks. A large range of heat sinks are available.
For heat-sink mounting, use thermal grease or a thermal pad with high conductivity specified by Teledyne. See our website for additional heat sinks.

Typical Loads (Random)
HiPpak relays with random turn-on are designed for high inductive loads or phase angle control applications.
Our data sheet lists nominal current of power thyristors corresponding to a resistive load (AC-51).
Depending on the loads, check the inrush current at turn ON and possible overvoltages at turn OFF.
Main applications:
• AC-55b — Incandescent or infrared lamps. Inrush current is generally 10 times In during few 10ms.
  Random relays often use in-phase angle controllers or soft-starters with the right control.
• AC-53 — Three-phase motors. 2 or 3 random turn-on relays can drive such motors.
• AC-56a — Transformer loads. Very high inrush current up to 100 times In. Use a random turn-on SSR like the SH.
The table below lists recommended current values for proper lifetime expectancy.

Typical Loads (Zero-Cross)
HiPpak relays with zero-cross turn-on are designed for most types of loads.
Our data sheet lists the AC-51 current value corresponding to resistive loads.
For other loads, check the inrush current at turn ON and possible overvoltages at turn OFF:
• AC-55b — Incandescent lamps. Inrush current is generally 10 times In during few 10ms.
• AC-55a — Electric discharge lamp. These loads often have overcurrent at turn ON and overvoltage at turn OFF.
  so use 400VAC SSR on 230VAC mains.
• AC-58 — One-pole motors. These loads often have overcurrent at turn ON and overvoltage at turn OFF, so use
  400VAC SSR on 230VAC mains and adapt the SSR current to the starting current of the motor.
• AC-53 — Three-phase motors. 2 or 3 SH zero-cross relays can drive these motors, but generally use
  E3P/E3PT or other three-phase relays or SH random range.
• AC-56b — Transformer loads. Very high inrush current up to 100 times In. Use SH random relay or peak control SSR.
• AC-56b — Capacitor loads with very high current at turn ON and overvoltage at turn OFF. Our high-voltage
  relays are well adapted for high inrush current.

<table>
<thead>
<tr>
<th>SSR Model</th>
<th>AC-53 Current (motor)</th>
<th>AC-55b Current (lamp)</th>
<th>AC-55b Current (transformer)</th>
<th>AC-55b Current (capacitor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12A</td>
<td>2.5A</td>
<td>2.5A</td>
<td>0.4A</td>
<td>XXX</td>
</tr>
<tr>
<td>25A</td>
<td>5A</td>
<td>5A</td>
<td>1A</td>
<td>XXX</td>
</tr>
<tr>
<td>35A</td>
<td>9A</td>
<td>9A</td>
<td>2A</td>
<td>XXX</td>
</tr>
<tr>
<td>50A</td>
<td>12A</td>
<td>12A</td>
<td>3A</td>
<td>13A</td>
</tr>
<tr>
<td>75A</td>
<td>16A</td>
<td>16A</td>
<td>6A</td>
<td>24A</td>
</tr>
<tr>
<td>95A</td>
<td>24A</td>
<td>24A</td>
<td>9A</td>
<td>36A</td>
</tr>
<tr>
<td>125A</td>
<td>32A</td>
<td>32A</td>
<td>12A</td>
<td>48A</td>
</tr>
</tbody>
</table>
Power Solid-State Relays
Proven · Rugged · Reliable

With more than 50 years of proven experience, Teledyne Relays delivers solutions second to none with features like built-in touch-proof covers, built-in heat sinks, miniature solutions, large I^2t values for higher reliability, tight zero-cross window for less noise and lower in-rush currents. Our rugged design offers up to 2000A surge capability and excellent thermal characteristics.

Can’t Find What You Need?
Check out our full line of relays and switches. Order literature online at http://www.teledyne-relays.com/lit-request.asp
Did you know...

Teledyne Relays offers electromechanical relays for various markets?

RF RELAYS

- Signal Integrity up to 40Gbps
- DC - 16GHz
- Surface-Mount
- DPDT, SPDT, 4PST and Loopback Relays

MILITARY GRADE RELAYS

- Built and tested to meet MIL-PRF-39016
- Built and tested to meet MIL-PRF-28776
- Built-in Diodes, Transistor Driver and CMOS
- Low Power coils

TELEDYNE ESTABLISHED RELIABILITY RELAYS

- Fully defined product requirements and screening levels
- Spacer/Spreader pad options not allowed by military specifications
- Reduced lead time and cost vs Military Grade

HIGH PERFORMANCE RELAYS

- -65 °C to +200 °C
- Shock up to 4,000 g’s
- Vibration up to 380 g’s
- Non-Latching & Magnetic-Latching

COMMERCIAL RELAYS

- Standard electrical tests at 25 °C
- “Low cost” switching solutions
- Surface-Mount
- Short lead times
Did you know...

Teledyne Coax Switches offers coaxial switches for ATE, Radar, Amplifier Switching, Etc.?

**SPDT SWITCHES**
- DC - 40GHz, Internal 50 Ω Termination
- SMA, mini-SMB, TNC & N Connectors
- 5 Million Cycles
- High Power & Low PIM
- Failsafe & Latching

**TRANSFER SWITCHES**
- DC - 18GHz
- SMA, TNC & N Connectors
- 5 Million Cycles
- High Power
- Failsafe & Latching

**MULTI-THROW SWITCHES**
- DC - 40 GHz, Internal 50 Ω Termination
- SMA, mini-SMB, TNC & N Connectors
- SP3T - SP10T
- 5 Million Cycles
- Normally Open & Latching

**LOW PIM SWITCHES**
- DC - 3 GHz
- SMA, N and 7/16 D Connectors
- SPDT, Transfer and Multi-Throw
- Failsafe & Latching

**SPECIALTY SWITCHES**
- DC - 40GHz
- 3-State Attenuated Switch
- Radiation Shielding
- Switch Blocks
- Redundant Diode Configuration
Did you know...

Teledyne Relays offers Commercial/Industrial Solid State Relays?

SINGLE PHASE AC SOLID STATE RELAYS

- Up to 690Vac, 125A
- Input & Output Protection
- Chassis, DIN Rail and PCB Mount
- Zero-Cross & Random Switching
- Touch-Proof Covers

DUAL-PHASE AC SOLID STATE RELAYS

- Up to 600Vac, 50A
- Output Protection
- Chassis and DIN Rail
- Zero-Cross & Random Switching
- Touch-Proof Covers

3 & 4 PHASE SOLID STATE RELAYS

- Up to 600Vac, 75A
- Output Protection
- Chassis and DIN Rail
- Zero-Cross & Random Switching
- DC & AC Control

DC SOLID STATE RELAYS

- Up to 1400Vdc, 100A
- Output Protection
- Chassis, DIN Rail and PCB Mount
- IGBT and MOSFET
- Touch-Proof Covers

SOFT START MOTOR CONTROLLERS AND MOTOR REVERSERS

- Up to 26kW, 480Vac
- Star & Delta Configurations
- DIN Rail
- Output Protection
- Built-in Diagnostics and Self Test
Did you know...

Teledyne Relays offers Military Solid State Relays?

**DC SOLID STATE RELAYS**
- Meet MIL-PRF-28750
- Tested Per MIL-STD-704
- Silicon Carbide MOSFET
- Up to 250Vdc, 1A
- Chassis and PCB Mount
- Short-Circuit Protection
- Plastic and Hermetically Sealed

**BI-DIRECTIONAL/AC SOLID STATE RELAYS**
- Meet MIL-PRF-28750
- Tested Per MIL-STD-704
- Up to 250Vac, 25A
- Chassis and PCB Mount
- Short-Circuit Protection
- Plastic and Hermetically Sealed

**COMMERCIAL, LOW POWER, I/O MODULES**
- Up to 250Vac, 10A
- Short-Circuit Protection
- Chassis and PCB Mount
- Zero-Cross & Random Switching
- Low Off-State Leakage Current

**SILICON CARBIDE TECHNOLOGY**
- Up to 270Vdc, 20 A
- Meet MIL-PRF-28750
- Tested Per MIL-STD-704
- Low ON resistance
- Low Profile Hermetic Package
Did you know...

Teledyne Coax Switches offers coaxial switch matrices for ATE, Radar, Filter Switching, Airborne Surveillance Systems, Etc.?

MINI MATRICES

- Remote Control via USB and/or Ethernet
- GUI controllable
- Accepts ASCII code
- Available in 18, 26.5 and 40 GHz
- SPDT, Transfer and Multi-throw configurations

MULTIPLEXOR/FANOUT SWITCH MATRICES

- Up to 1x1024 Switch Matrix
- SMA, mini-SMB, TNC & N Connectors
- Failsafe, Latching or Normally Open Configurations
- Switching Systems for 50 Ω & 75 Ω applications

MIMO/BLOCKING AND MIMO SINGLE CONNECTION SWITCH MATRICES

- Up to 1x1024 Switch Matrix
- SMA, mini-SMB, TNC & N Connectors
- RS-232, TTL, USB, GPIB, TTL, Ethernet Control
- 1 Million Cycles
- Failsafe & Latching

CUSTOMIZED SWITCH MATRICES

- EMI/RFI
- Transient Suppression
- Ballistic Shock Fatigue
- Crash Load
- Altitude
Did you know...

Teledyne Relays offers Space Qualified Switches?

SPACE MARKET SEGMENTS SERVED

- Deep-Space Probes
- Manned Programs
- Communications Satellites
- Launch Vehicles
- Earth Observatory / Weather Satellites
- Commercial / Military Satellites

CAPABILITIES

- Logistic Infrastructure
- Chemical Analysis Lab
- Scanning Electro Microscope
- In-house Plating Shop
- Environment Test Lab
- Field Technical Support

ELECTROMECHANICAL RELAY SPECIFICATIONS

- MIL-PRF-39016
- MIL-PRF-28776
- NASA/GSFC S-311-P-754
- NASA EEE-INST-002
- ESA/SCC 3601 & 3602