Solid State Relays

General Information

FEATURES
- 5300 \( V_{\text{RMS}} \), 3750 \( V_{\text{RMS}} \) or 1500 \( V_{\text{RMS}} \) I/O Isolation
- Current-limit Protection Built-in
- Linear ac/dc Operation
- High-reliability Monolithic Receptor
- Extremely Low Leakage Current (pA)
- High Contact Off-impedance (GΩ)
- Low Power Consumption (1.0 mW—12 mW)
- Very Low Switch Offset (Typically 0.1 µV)
- Logic Compatible
- Clean, Bounce-free Switching
- Built-in 1 Form C Break-before-make
- High Surge Capability
- Insensitive to dv/dt
- Surface Mountable
- UL Recognized, File No. E52744
- CSA – Certification 093751
- BABT/BSI Certificate of Recognition to BS6301

BENEFITS
- Long Life
- Maintenance Free
- Current-limit SSRs Can Sustain Repeated Faults Without Damage
- Minimizes Drive Circuitry
- Noiseless
- Immune to Shock
- Immune to Environmental Hazards Such as Salt, Dirt, and Humidity
- No Arcing
- No Mounting Restrictions
- Preapproved for DAA Applications
- High Reliability
- Easily Configured in Series or in Parallel for Increased Voltage or Current

DESCRIPTION

Vishay Solid State Relays (SSRs) are miniature, optically-coupled relays with high-voltage MOSFET outputs. The relays are capable of switching ac or dc loads from as little as nanovolts to hundreds of volts. Likewise, the relays can switch currents in the range of nano-amps to hundreds of milliamps. The MOSFET switches are ideal for small signal switching and are primarily suited for dc or audio frequency applications.

Vishay offers integrated current limiting on most of its relays. If load current through the relay exceeds the rated value, the relay clamps the current at a predefined value. If the excessive load current persists, the limiting circuit has a foldback feature to minimize relay power dissipation. The current-limit circuit has a multitude of uses. It can be used in telephony to clamp excessive currents emanating from lightning strikes and/or power-main crosses or in instrumentation and industrial application to squelch transients from reactive loads. The current-limit circuit also provides short-circuit protection in power-feed applications.

The SSRs feature a monolithic output die that minimizes wire bonds and permits easy integration of high-performance circuits such as current limiting in normally-open switches. The output die contains all the necessary circuitry to perform a relay function, including the photodiode receptor array, turn-on and turn-off control circuitry, and the MOSFET switches. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED.

Vishay SSRs are available in a 4-, 6- or 8-pin through-hole DIP or in gull-wing surface-mount packages. Some parts are also offered in 4- or 8-pin small-outline packages (SOPs). The SOPs are size and height compatible with PCMCIA Type 2 cards. Refer to the Parts Coding section for a more in-depth description of these parts.
TYPICAL APPLICATIONS

- ac Switch
- Telephone
- Heater Control
- Light Control
- Switching Systems
- Voltmeters
- Test Equipment
- Service Equipment
- E&M Signaling
- Multiplexers
- Scanners
- Motor Controls
- Output Modules
- Modems
- Programmable Controllers
- FAX
- Data Acquisition Systems
- Security Equipment
- Electric Meters
- Ring Relay
- Thermostats
- Answering Machines
- Battery Switch
- Board Testers
- Gas Pumps
- Test Equipment
- Security Equipment
- Voltmeters
- Electric Meters
- Test Equipment
- Service Equipment
- E&M Signaling
- Multiplexers
- Scanners
- Motor Controls
- Output Modules
- Modems
- Programmable Controllers
- FAX
- Data Acquisition Systems
- Security Equipment
- Electric Meters
- Ring Relay
- Thermostats
- Answering Machines
- Battery Switch
- Board Testers
- Gas Pumps
- Test Equipment
- Security Equipment

<table>
<thead>
<tr>
<th>Application</th>
<th>Flying Capacitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Flying Capacitor Switch</td>
</tr>
<tr>
<td>Equipment</td>
<td>Data Acquisition Systems</td>
</tr>
<tr>
<td></td>
<td>Multiplexers</td>
</tr>
<tr>
<td></td>
<td>Scanners</td>
</tr>
</tbody>
</table>

Application Ring Generators
Function Square Wave Generator
Equipment PBX
Central Office Equipment
Ring Generator

Application Telephone Line Interface/SLIC
Function Ring Relay
Break Switch
Ground Start
Test Access
E&M Signalling
Equipment Subscriber Line Interface Circuits
PBX
Switching Systems
Test/Service Equipment

Application Lamp, Light, Indicator Control
Function ac Switch
Equipment Programmable Controllers
Thermostats
Control Panels
Industrial Controls
Application | Data Access Arrangement (DAA)  
Function | Current-Limited Switchhook Control  
Equipment | Modems  
Security Equipment  
Answering Machines  
Telephones  
FAX

Application | Thermocouple Switching  
Function | Thermocouple Matrix Control  
Equipment | Scanners  
Data Acquisition Systems  
Programmable Controllers

Application | Multiplexer  
Function | Analog Signal Multiplexer  
Analog Input Module  
Instrumentation  
Voltmeters  
Test Equipment  
Board Testers  
Scanners  
Data Acquisition Systems

Application | Alarm Switch  
Function | Glass Break Indicator  
Fire, Smoke Detector  
Security Systems  
Fire/Smoke Alarms
## Wiring Diagrams

### ac/dc OUTPUT CONFIGURATIONS

#### SINGLE LOAD

<table>
<thead>
<tr>
<th>Single Load Configuration</th>
<th>Wiring Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 LOAD</td>
</tr>
<tr>
<td>2</td>
<td>5 NC</td>
</tr>
<tr>
<td>3</td>
<td>4 LOAD</td>
</tr>
</tbody>
</table>

#### TWO LOADS

<table>
<thead>
<tr>
<th>Two Loads Configuration</th>
<th>Wiring Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 LOAD</td>
</tr>
<tr>
<td>2</td>
<td>6, 7 NC</td>
</tr>
<tr>
<td>3</td>
<td>5 LOAD</td>
</tr>
</tbody>
</table>

### dc OUTPUT CONFIGURATIONS

#### SINGLE LOAD

- **Reduced RON**
- **Increased Load Current**
- **Redundancy**

<table>
<thead>
<tr>
<th>Single Load Configuration</th>
<th>Wiring Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 + LOAD</td>
</tr>
<tr>
<td>2</td>
<td>5 - LOAD</td>
</tr>
<tr>
<td>3</td>
<td>4 LOAD</td>
</tr>
</tbody>
</table>

#### TWO LOADS

<table>
<thead>
<tr>
<th>Two Loads Configuration</th>
<th>Wiring Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 LOAD 1</td>
</tr>
<tr>
<td>2</td>
<td>5 - LOAD COMMON</td>
</tr>
<tr>
<td>3</td>
<td>4 + LOAD 2</td>
</tr>
</tbody>
</table>