

53209
53210
53211

SPDT SOLID-STATE RELAYS
High Power AC/DC Switching



Features:

- Replacements for M30-1, M30-3, M30-4
- SPDT, Break-Before-Make
- Up to 1500 V RMS optical isolation
- Output voltage up to ± 320 VDC (53211)
- Power FET output low on-state resistance
- Full military temperature operation:
-55°C to +125°C
- Military environmental screening available

Applications:

- High power switching
- Line drivers
- Servo control
- Harsh environment
- Load control
- General purpose switching

DESCRIPTION

The 53209, 53210, and 53211 are military SPDT high power, solid-state relays. These light-weight devices are resistant to damage from shock and vibration, and are immune to contact-related problems (contamination, arcing) associated with mechanical equivalents.

Optical coupling between the input and output stages provides effective isolation up to 1500 volts AC RMS. Power FET outputs eliminate bipolar offset, and minimize output voltage drop for high current capability.

The control logic is CMOS compatible, and will accommodate bias supplies ranging between 4 and 16 VDC. A TTL input driver with pull-up resistor may also be used.

These solid-state relays are ideal for use in military systems, or wherever high reliability, low power actuation, and light weight are design considerations. Applications include general purpose signal switching and electronic load control.

ABSOLUTE MAXIMUM RATINGS

| | |
|--|----------------------|
| Isolation Voltage ¹ | 1500 VAC RMS |
| Continuous Operating Output Voltage: 53209 | ± 80 Peak |
| 53210 | ± 160 Peak |
| 53211 | ± 320 Peak |
| Load Current ² : 53209 | 4.1 A RMS |
| 53210 | 2.6 A RMS |
| 53211 | 1.3 A RMS |
| Bias Supply Voltage, V _{DD} | 16 VDC |
| Control Logic Input Voltage | 16 VDC |
| Operating Temperature | -55°C to +125°C Case |
| Storage Temperature | -55°C to +125°C |

Notes: ¹ 60 Hz sine wave ² at 25°C with 2.0° C/W heat sink max

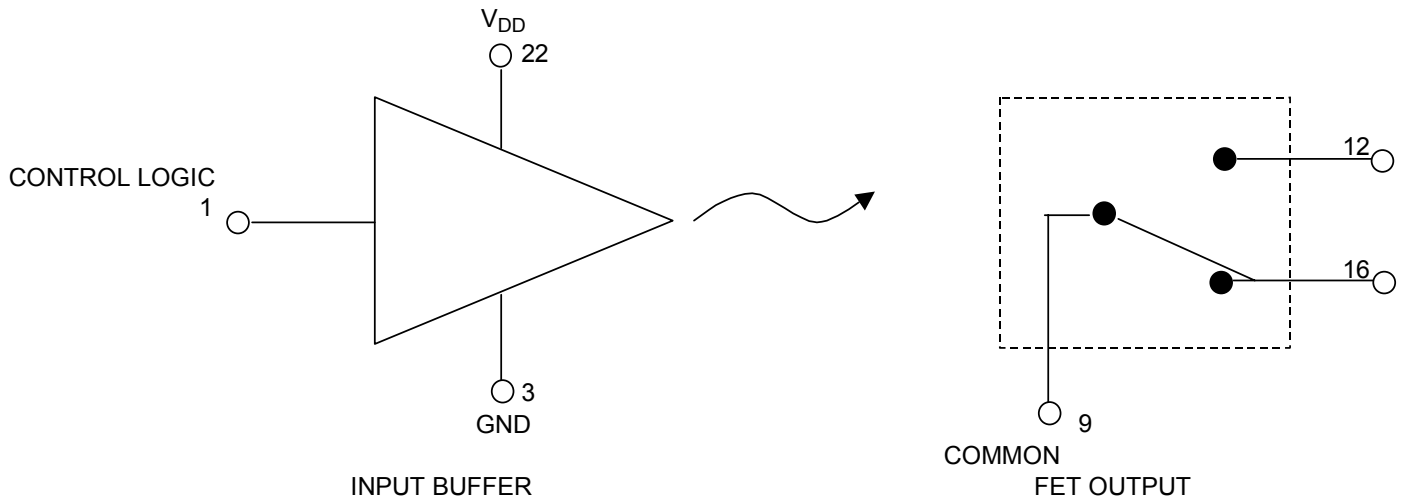
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ELECTRICAL CHARACTERISTICS

$T_A = +25^\circ \text{C}$

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|--|---|------------------|-----------|--------------------------------|--|
| Isolation Voltage, I/O | 60 Hz Sine Wave | 1500 | | | VAC RMS |
| Isolation Resistance | at 500 V | | 10^9 | | Ohms |
| Continuous Operating Output Voltage 53209 53210 53211 | | | | 80 160 320 | VAC Peak VAC Peak VAC Peak |
| Transient Output Voltage 53209 53210 53211 | | | | 80 180 380 | VAC Peak VAC Peak VAC Peak |
| Load Current 53209 53210 53211 | 2.0 °C/W Heat Sink | | | 4.1 2.6 1.3 | Amps RMS |
| On Resistance 53209 53210 53211 | $T_A = 25^\circ\text{C}$ | | | 0.6 1.5 6.0 | Ohms Ohms Ohms |
| Capacitance, I/O | 25 V, 1 MHz | | | 5 | pF |
| Leakage Current | Load Voltage = Maximum | | | 20 | μA |
| Bias Supply Voltage, V_{DD} | | 4 | | 16 | VDC |
| Bias Current | | | 13 | 16 | mA |
| Control Logic Voltage | | | | 16 | VDC |
| Control Logic Current | | | | 2 | μA |
| Control Logic Level – High | | 0.75 V_{DD} | | V_{DD} | VDC |
| Control Logic Level – Low | | 0 | | 0.15 V_{DD} | VDC |
| t_r (Rise Time) t_{on} (Turn-On-Time) t_f (fall Time) t_{off} (Turn-Off Time) t_d (Dwell Time) | Load Voltage = 28 VDC $R_L = 50\Omega$ | | | 3.0 4.0 50 250 1.5 | ms ms μs μs ms |
| Thermal Resistance, θ_{JA} θ_{JC} | | | 20 4.2 | | $^\circ\text{C/W}$ $^\circ\text{C/W}$ |

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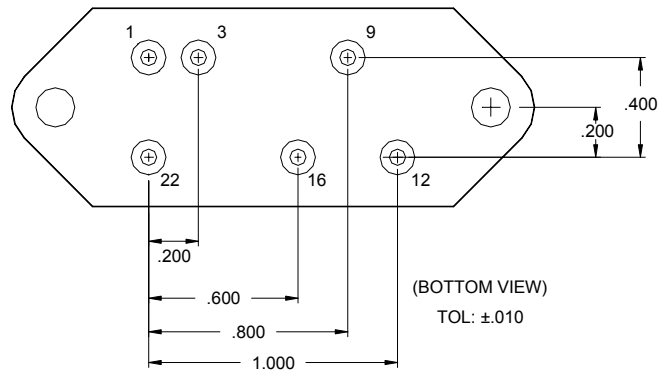
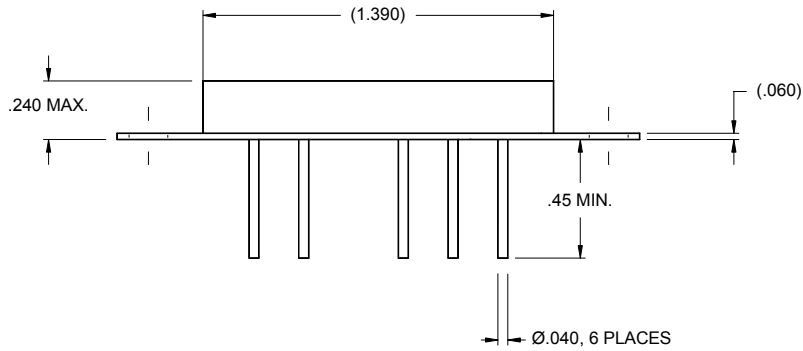
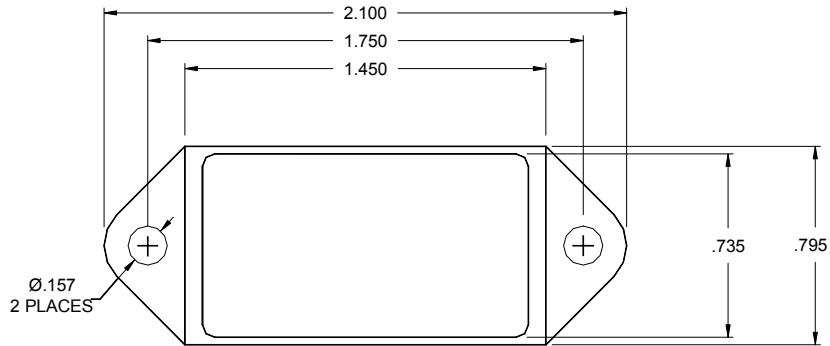


Truth Table

| INPUT (Pin 1) | Pin 12 | Pin 16 |
|---------------|--------|--------|
| High | Closed | Open |
| Low | Open | Closed |

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Package Dimensions



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