

**53200
53203
53204**

SPDT SOLID-STATE RELAYS



Features:

- Replacements for M31-1, M31-1A, M31-2 A
- SPDT, Break-Before-Make
- Up to 1500 V RMS Optical Isolation
- Output current up to 8.2 Amps (53203)
- Power FET Output Low On-state Resistance
- Full Military Temperature Operation:
-55°C to +125°C
- Military Environmental Screening Available

Applications:

- Heater Load Switching
- Sensor Activation
- Remote Signal Activation
- Servo and synchro control
- High power switching

DESCRIPTION

The MII 53200, 53203, and 53204 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 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 | 1000 VAC RMS |
| Continuous Operating Output Voltage ³ : 53200 | 80 VDC |
| 53203 | 80 VDC |
| 53204 | 160 VDC |
| Load Current ² : 53200 | 4.8 Amps DC |
| 53203 | 8.2 Amps DC |
| 53204 | 5.2 Amps DC |
| 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 ³ Reversing polarity on the output may cause permanent damage.

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ELECTRICAL CHARACTERISTICS

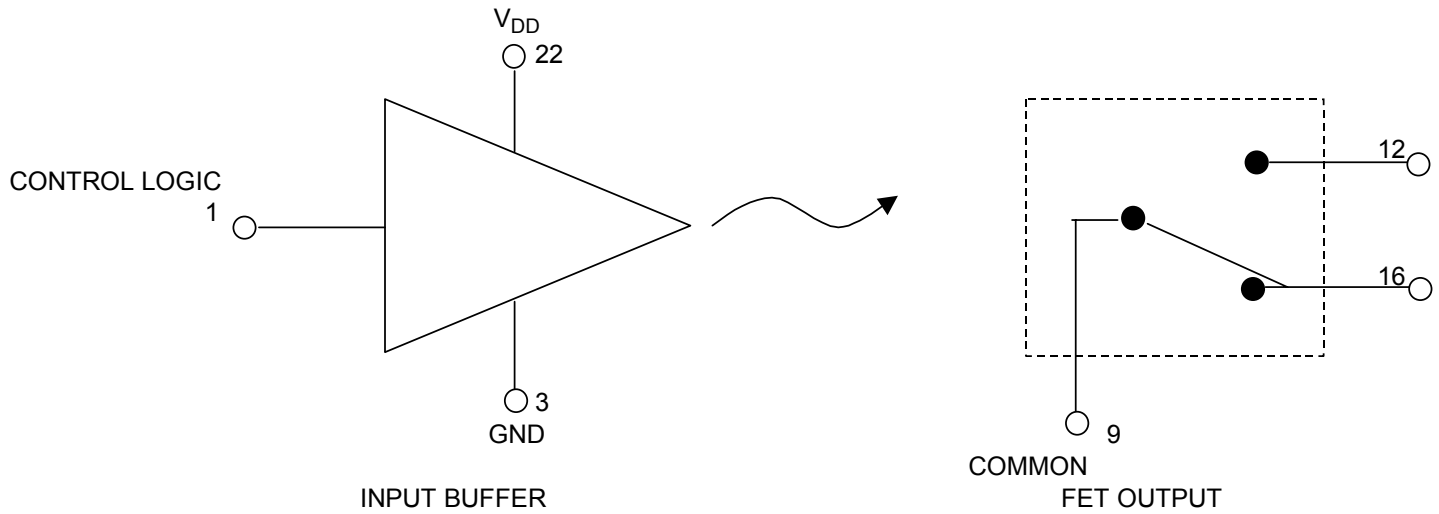
T_A = +25° C

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNIT |
|---------------------------------------|---|----------------------|-----------------|----------------------|---------|
| Isolation Voltage, I/O | 60 Hz Sine Wave | 1500 | | | VAC RMS |
| Isolation Resistance | Input to Case, at 50V | | 10 ⁹ | | Ohms |
| Continuos Operating Output Voltage | | | | | |
| 53200 | | | | 80 | VDC |
| 53203 | | | | 80 | VDC |
| 53204 | | | | 160 | VDC |
| Transient Output Voltage | | | | | |
| 53200 | | | | 80 | VDC |
| 53203 | | | | 80 | VDC |
| 53204 | | | | 180 | VDC |
| Load Current: | 2.0 °C/W Heat Sink | | | | |
| 53200 | | | | 4.8 | Amps DC |
| 53203 | | | | 8.2 | Amps DC |
| 53204 | | | | 5.2 | Amps DC |
| On Resistance: | | | | | |
| 53200 | | | | 0.3 | Ohms |
| 53203 | | | | 0.15 | Ohms |
| 53204 | | | | 0.38 | Ohms |
| Capacitance, I/O | 25 V, 1 MHz | | | 5 | PF |
| Leakage Current: | Load Voltage = Maximum | | | | |
| 53200 | | | | 20 | μA |
| 53203 | | | | 40 | μA |
| 53204 | | | | 40 | 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} | | | VDC |
| Control Logic Level – Low | | 0 | | 0.15 V _{DD} | VDC |
| t _r (Rise Time): | Load Voltage = 25 VDC R _L = 50Ω | | | | |
| 53200 | | | | 2.0 | ms |
| 53203 | | | | 3.0 | ms |
| 53204 | | | | 3.0 | ms |
| t _{on} (Turn-On-Time): | | | | | |
| 53200 | | | | 3.0 | ms |
| 53203 | | | | 4.0 | ms |
| 53204 | | | | 4.0 | ms |
| t _f (Fall Time) | | | | 50 | μs |
| t _{off} (Turn-Off-Time): | | | | | |
| 53200 | | | | 200 | μs |
| 53203 | | | | 250 | μs |
| 53204 | | | | 250 | μs |
| t _d (Dwell Time) | | 0.5 | | 1.5 | ms |
| Thermal Resistance, θ _{JA} : | | | | | |
| 53200 | | | 23 | | °C/W |
| 53203 | | | 20 | | °C/W |
| 53204 | | | 20 | | °C/W |
| Thermal Resistance, θ _{JC} : | | | | | |
| 53200 | | | 7.0 | | °C/W |
| 53203 | | | 4.2 | | °C/W |
| 53204 | | | 4.2 | | °C/W |

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Truth Table

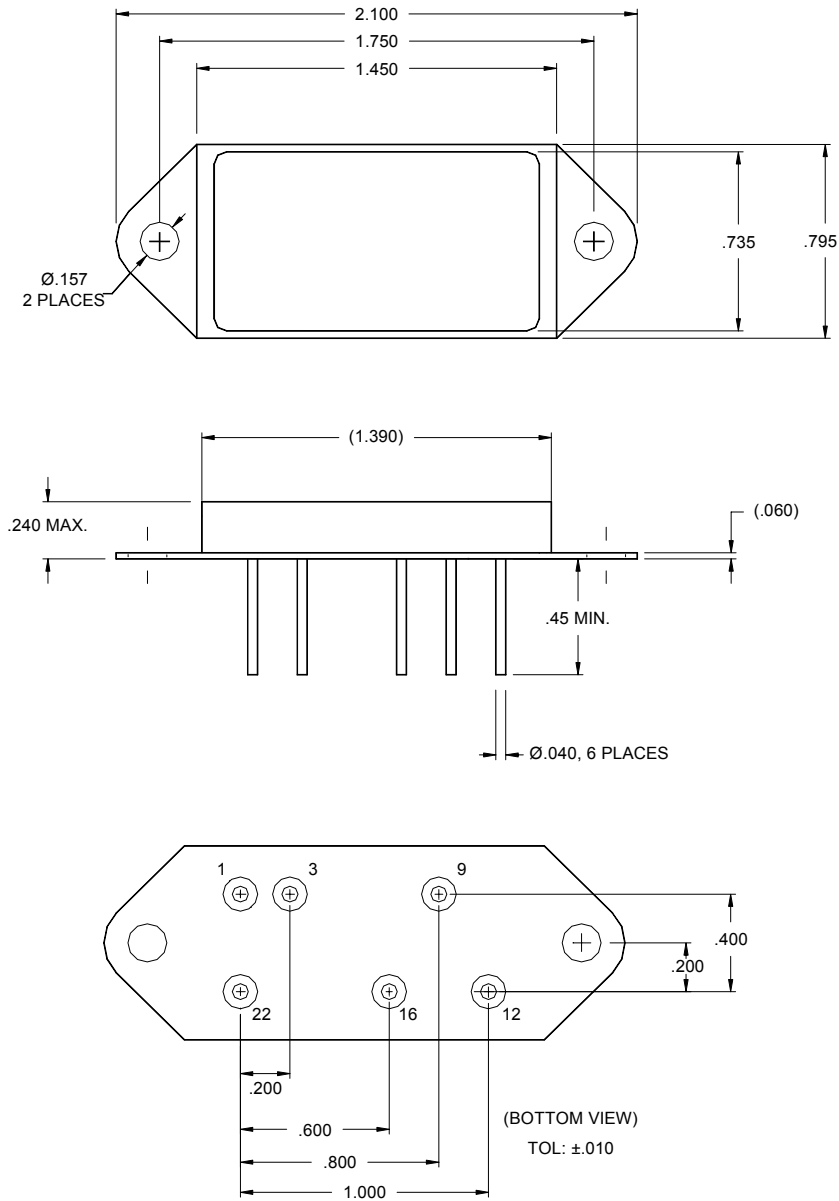
| INPUT (PIN 1) | PIN 12 | PIN 16 |
|---------------|--------|--------|
| High | Closed | Open |
| Low | Open | Closed |

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Package Dimensions



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