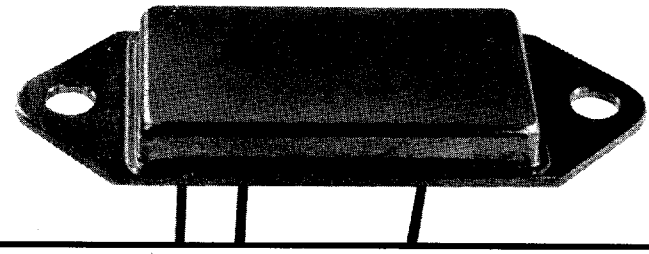
53201, 53202, and 53205
SPDT SOLID-STATE RELAYS

FEATURES

- Replacements for M31-2, M31-4, M31-4A
- SPDT, Break-Before-Make
- Up to 1500 V RMS Optical Isolation
- Output Voltage up to 320 VDC (53202, 53205)
- Power FET Output - Low On-state Resistance
- Full Military Temperature Operation:
  -55°C to +125°C
  - Military Environmental Screening Available

MILITARY HIGH POWER SPDT SOLID STATE RELAYS



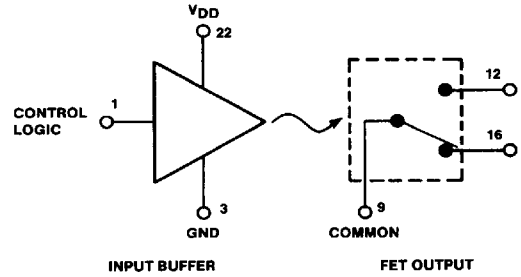
GENERAL DESCRIPTION

The MII 53201, 53202, and 53205 are military SPDT high power, solid-state relays. These lightweight 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.



TRUTH TABLE

INPUT (PIN 1)	PIN 12	Pin 16
High	Closed	Open
Low	Open	Closed

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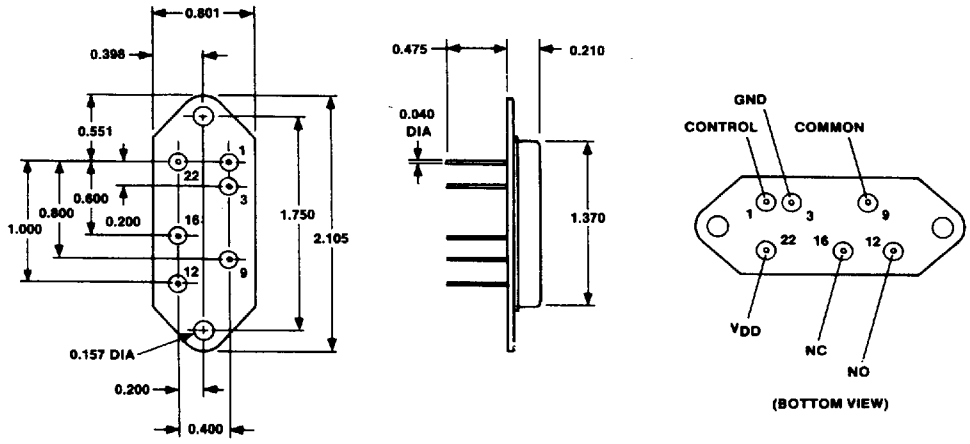
53201, 53202, 53205
SPDT SOLID-STATE RELAYS

PACKAGE DIMENSIONS



ALL DIMENSIONS IN INCHES

22-PIN DIP CONFIGURATION METAL CAN

ABSOLUTE MAXIMUM RATINGS

Isolation Voltage[1] ..... 1500 VAC RMS
Continuous Operating Output Voltage[3]: 53201 ..... 160 VDC
53202 ..... 320 VDC
53205 ..... 320 VDC
Load Current[2]: 53201 ..... 3.0 Amps DC
53202 ..... 1.5 Amps DC
53205 ..... 2.6 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	UNITS
Isolation Voltage, I/O	60 Hz Sine Wave	1500			VAC RMS
Isolation Resistance	Input to Case, at 500 V		10^9		Ohms
Continous Operating Output Voltage					
53201 and 53202				160	VDC
53205				320	VDC
Transient Output Voltage					
53201 and 53202				180	VDC
53205				380	VDC
Load Current: 53201	2.0 °C/W Heat Sink			3.0	Amps DC
53202				1.5	Amps DC
53205				2.6	Amps DC
On Resistance: 53201				0.75	Ohms
53202				3.0	Ohms
53205				1.5	Ohms
Capacitance, I/O	25 V, 1 MHz			5	pF
Leakage Current: 53201	Load Voltage = Maximum			20	µA
53202 and 53205				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}		V_{DD}	VDC
Control Logic Level - Low		0		0.15 V_{DD}	VDC
t_r (Rise Time): 53201	Load Voltage = 25 VDC			2.0	ms
53202 and 53205	R_L = 50 Ω			3.0	ms
t_{on} (Turn-On-Time): 53201				3.0	ms
53202 and 53205				4.0	ms
t_f (Fall Time)				50	µs
t_{off} (Turn-Off Time): 53201				200	µs
53202 and 53205				250	µs
t_d (Dwell Time)		0.5		1.5	ms
Thermal Resistance, θJA: 53201			23		°C/W
53202 and 53205			20		°C/W
Thermal Resistance, θJC: 53201			7.0		°C/W
53202 and 53205			4.2		°C/W

APPLICATION NOTES

1. Maximum input switching frequency not to exceed 20 Hz under normal conditions, or 1 Hz if output is shorted.
2. Input transistions should be <1 mS in duration and input source should be "bounceless contact" type.

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