

53206, 53207, and 53208
SPST SOLID-STATE POWER CONTROLLERS



FEATURES

- Replacements for M33, M33S, M33S-1
- SPST, Normally Open
- Up to 1500 V RMS Optical Isolation
- Output Current up to 10 Amps DC (53208)
- Power FET Output - Low On-state Resistance
- Full Military Temperature Operation:
 -55°C to +125°C
 - Military Environmental Screening Available

MILITARY HIGH-CURRENT DC POWER CONTROLLERS WITH INTEGRAL SHORT CIRCUIT PROTECTION (53207, 53208)



GENERAL DESCRIPTION

The MII 53206, 53207, and 53208 are military SPST 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 input logic may be driven by either CMOS or TTL, and will accommodate bias supplies ranging between 3.8 and 32 VDC.

Integral short-circuit and thermal shutdown protection are provided in the 53207 and 53208. These units sense excessive current flow while under load or while switching, and respond by opening the output. The output will remain blocked indefinitely until the short is removed and the unit reset. This feature prevents damage to the controller and also averts further system failures that may be caused by the short circuit. Resetting the unit can be accomplished by cycling the input control, or reducing the load voltage to zero.

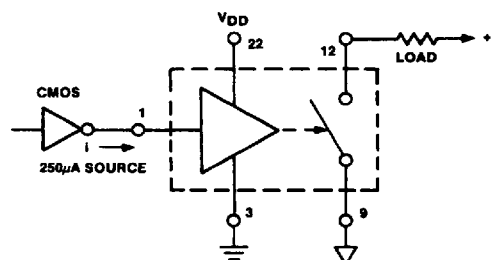


Figure 1. CMOS Input Configuration

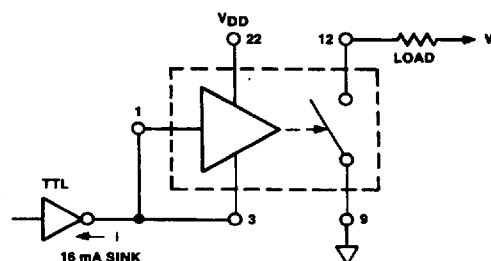


Figure 2. TTL Input Configuration

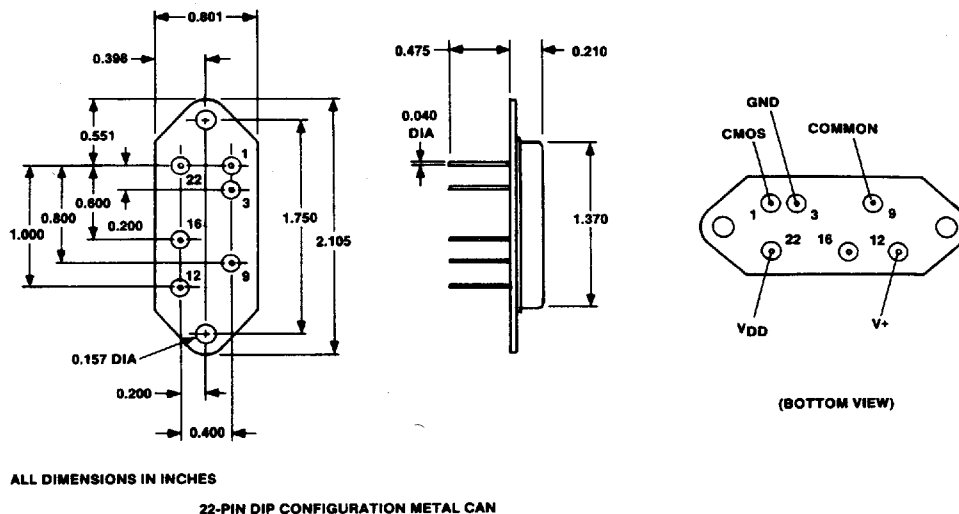
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53206, 53207, 53208 SPDT SOLID-STATE RELAYS

PACKAGE DIMENSIONS



ABSOLUTE MAXIMUM RATINGS

Isolation Voltage ¹	1500 VAC RMS
Continuous Operating Output Voltage ³ : 53206	60 VDC
53207	60 VDC
53208	40 VDC
Load Current ² : 53206	5.0 Amps DC
53207	5.0 Amps DC
53208	10.0 Amps DC
Bias Supply Voltage, V _{DD}	3.8 to 32 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*

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Characteristics CMOS Configuration (Figure 1)					
Bias Supply Range, V_{DD}		3.8		32	VDC
Bias Current			13	15	mA
Input Current	5 VDC Input			250	μA
Control Voltage Range		2.5		18	VDC
Turn-Off Voltage				2.8	VDC
Turn-On Voltage		0.5			VDC
Total Hysteresis			1.8		VDC
Dielectric Strength	60 Hz	1500			VAC RMS
Input Characteristics TTL Configuration (Figure 2)					
Input Current			13	16	mA
Control Voltage Range		3.8		32	VDC
Turn-Off Voltage				1.5	VDC
Turn-On Voltage		3.8			VDC
Output Characteristics					
Output Current: 53206 and 53207 53208	With 2°C/W Heat Sink			5.0	Amps DC
				1.0	Amps DC
Continuous Output Voltage: 53206 and 53207 53208				60	VDC
				40	VDC
Continuous Blocking Voltage				80	VDC
On-State Resistance, R_{ds} : 53206 and 53207 53208	25 $^{\circ}\text{C}$ Case		0.15	0.30	Ohms
			0.05	0.075	Ohms
Turn-On Time at 25 $^{\circ}\text{C}$ Case	See Application Note 1		2.0	3.5	mSec
Turn-Off Time at 25 $^{\circ}\text{C}$ Case			0.5	2.0	mSec
Off-State Leakage	60 VDC			10	μA
	80 VDC			1.0	mA
Capacitance Across Output: 53206 and 53207 53208				1600	pF
				600	pF
Junction Temperature				125	$^{\circ}\text{C}$
Thermal Resistance, θ_{JA}				30	$^{\circ}\text{C/W}$
θ_{JC}				7	$^{\circ}\text{C/W}$

APPLICATION NOTES

- Maximum input switching frequency not to exceed 20 Hz under normal conditions, or 1 Hz if output is shorted.
- Input transitions should be <1 mS in duration and input source should be "bounceless contact" type.
- Inductive loads must be diode suppressed.

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