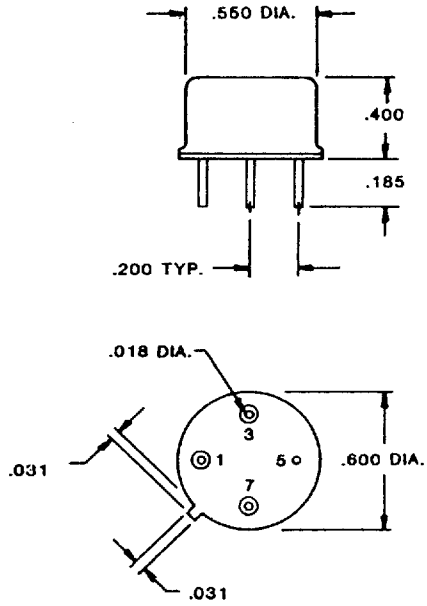
53104, 53105, 53106
SPST SOLID-STATE RELAYS

MILITARY, DC SOLID STATE RELAYS

FEATURES

- SPST, Normally Open
- Up to 500V RMS Optical Isolation
- Power FET Output - Low On-state Resistance
- Full Military Temperature Operation: -55°C to +125°C
  - Military Environmental Screening Available
- Improved Thermal Characteristics

PACKAGE DIMENSIONS



Bottom View

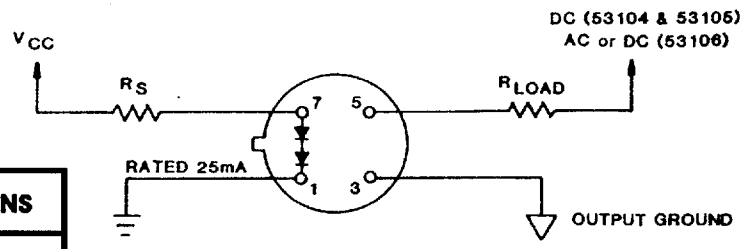
GENERAL DESCRIPTION

The MII 53104, 53105 & 53106 are military SPST 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 500 volts AC RMS. Power FET outputs eliminate bipolar offset, and minimize output voltage drop.

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

APPLICATION INFORMATION[1]



Top View

TTL CONFIGURATION

†Limiting resistor (R_S) may be required. See Table 1.

1 Both circuits shown are logically inverting

PART NUMBERING AND GENERAL SPECIFICATIONS

Part No.	Maximum Operating Output Voltage	Maximum Output Current (25°C)
53104	80 volts DC	1.0 Amps DC
53104-1	150 volts DC	0.56 Amps DC
53104-2	350 volts DC	0.375 Amps DC
53105	80 volts DC	1.3 Amps DC
53105-1	150 volts DC	.8 Amps DC
53105-2	350 volts DC	0.5 Amps DC
53106	±80 volts PEAK	0.64 Amps (RMS)
53106-1	±150 volts PEAK	0.40 Amps (RMS)
53106-2	±350 volts PEAK	0.25 Amps (RMS)

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LIMITING RESISTANCE (R_s) VALUES (Without Heat Sink)

$$R_s = \frac{V_{CC} - 2.3\ V}{I\ operating}$$

ABSOLUTE MAXIMUM RATINGS

Isolation Voltage ..... 500 VAC RMS
Operating Temperature ..... -55°C to +125°C Case
Storage Temperature ..... -55°C to +125°C

ELECTRICAL CHARACTERISTICS* T_A = +25°C

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Characteristics					
Input Current			25	50	mA
Voltage Range	Bias Resistance	4.5		32	VDC
Input Differential		2.3			VDC

ELECTRICAL CHARACTERISTICS* T_A = +25°C DC RELAY

PARAMETER	CONDITIONS	53104	53104-1	53104-2	UNITS
Maximum Continuous Operating Output Voltage		80	150	350	Volts
Maximum Load Current	25 °C	1.0	.56	.375	Amps DC
On Resistance -Typical		.25	0.5	1.5	Ohms
Maximum		.30	0.8	1.8	Ohms
Maximum Output Capacitance	25 V, 1 MHz	300	250	150	pF
Maximum Input-Output Capacitance	25 V, 1 MHz	5	5	5	pF
Typical Thermal Resistance, θJA		100	100	100	°C/W
θJC		25	25	25	°C/W
Typical Rise Time, t_r	10% - 90% Load Voltage (I_{LED} = 25 mA)	400	400	400	µs
Typical Fall Time, t_f	90% - 10% Load Voltage	500	500	500	µs
Typical On Delay, t_{dON}	Minimum Turn On Volts to 10% Load	200	200	200	µs
Typical Off Delay, t_{dOFF}	Maximum Turn Off Volts to 90% Load	100	100	100	µs
Maximum Surge Voltage	2 Second Maximum (Note 1)	100	200	400	VDC or Peak
Typical Leakage Current	at Max Operating	10	10	10	µA
Minimum Dielectric Strength		500	500	500	V RMS
Typical Isolation Resistance	Input to Case, 500 V	10^9	10^9	10^9	Ohms

NOTES: $t_{ON} = t_r - t_{dON}$
$t_{OFF} = t_f - t_{dOFF}$

1. Voltage transients due to reactive loads must be externally limited to maximum surge voltage.

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