

TELEDYNE SOLID STATE MILITARY SOLID STATE RELAY

OPTICALLY ISOLATED
1 A, 250 Vrms
(2 A with Heat Sink)

MODEL

682-1

(M28750/9)

SPST/NO

FEATURES

- JAN Relay, qualified to MIL-R-28750
- Optical isolation
- Low minimum output current
- Extremely low EMI
- Zero voltage turn-on
- Zero current turn-off
- Logic compatible input
- Low profile metal DIP package

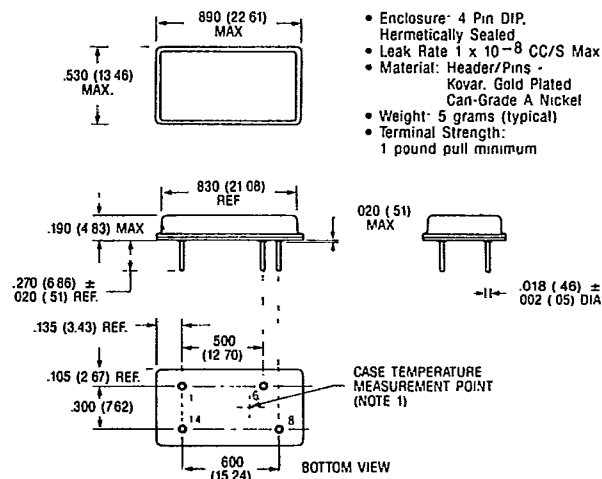
DESCRIPTION

This state-of-the-art solid state relay is designed for use in ac power switching applications. The output is rated for 1 A (2 A with heat sink) at 250 Vrms and can operate from 40 to 440 Hz for resistive and reactive loads with power factors as low as 0.2. Back-to-back SCRs are configured for zero voltage turn-on and can handle current surges up to 8 A. The patented circuit design assures the lowest possible EMI by virtually eliminating commutation spikes while maintaining excellent noise immunity. Optical isolation allows safe control of ac loads from low level logic circuits. The low profile metal DIP package is hermetically sealed to withstand severe environmental conditions encountered in military and aerospace applications. This relay is qualified to MIL-R-28750/9-001 and is available in W and Y screening levels.

PART NUMBER*	MILITARY NUMBER*	RELAY TYPE
682-1W	M28750/9-001W	AC SOLID STATE RELAY
682-1Y	M28250/9-001Y	

* The W or Y suffix denotes the screening level of MIL-R-28750.

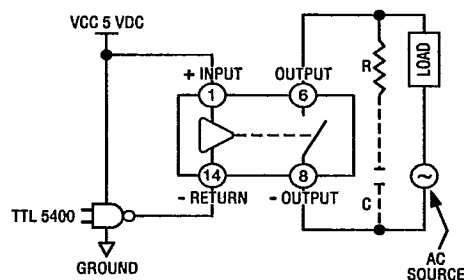
OUTLINE DIMENSIONS



DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)

WIRING DIAGRAM

TYPICAL INTERFACE TO 5 VOLT LOGIC (WITH SUGGESTED dv/dt SUPPRESSION - SEE NOTE 2)



RELAY BOTTOM VIEW

ELECTRICAL SPECIFICATIONS
(-55°C TO +110°C UNLESS OTHERWISE SPECIFIED)

INPUT (CONTROL) CHARACTERISTICS		MIN	TYP	MAX	MAX
Input Current (See Figure 1)	$V_{IN} = 5 \text{ Vdc}$		13	15	mA dc
	$V_{IN} = 32 \text{ Vdc}$		13	18	
Turn-Off Voltage (Guaranteed Off)				1.5	Vdc
Turn-On Voltage (Guaranteed On)		3.8			Vdc
Reverse Voltage Protection				-32	Vdc
Input Voltage Range		3.8		32	Vdc
OUTPUT (LOAD) SPECIFICATIONS		MIN	TYP	MAX	UNITS
Output Current Rating (See Fig. 4 & 5)		0.020		2.0	Arms
Output Voltage Rating		20		250	Vrms
Frequency Range		40		440	Hz
Output Voltage Drop @ 1 Ampere (See Figure 2)				1.5	Vrms
Off-State Leakage Current (250 Vac, 400 Hz)				1.0	mArms
Turn-On Time				1/2	Cycle
Turn-Off Time				1	Cycle
Transient Voltage ($T < 5 \text{ s}$)				± 500	Vpk
Surge Current @ 25°C (16 ms) (See Figure 3)				8	Apk
Overload (Repetitive, 10% Duty Cycle)				1.5	Arms
DC Offset Voltage				± 100	mV
Waveform Distortion				4	Vrms
Zero Voltage Turn-On Point at 25°C				± 15	Vpk
Off-State dv/dt (With Snubber — See Note 2)		200			V/ μs
Commutating dv/dt		5			V/ μs
Load Power Factor (With Snubber — See Note 3)		0.2			
Fusing I ² T (10 ms)				1	A ² s
Insulation Resistance @ 500 Vdc		10 ⁹			Ohms
Isolation (Input to Output)				10	pF
Dielectric Withstanding Voltage		1500			50 Hz SINE WAVE
Power Dissipation				2	Watts
Output Switch Junction Temperature (T_J Max.)				130	°C
Thermal Resistance Junction to Ambient (θ_{JA})				65	°C/W
Thermal Resistance Junction to Case (θ_{JC})				15	°C/W

ENVIRONMENTAL SPECIFICATIONS*

Ambient Temperature	-55°C to 110°C Operating -55°C to 125°C Storage
Shock	1500 g, 0.5 ms
Vibration	30 g, 10-3000 Hz
Acceleration Y1 Axis Only	5000 g

*Contact factory for higher level environmental requirements

NOTES:

- Case temperature is measured at point specified.
- Recommended snubber across output terminals $R = 100\Omega$ 0.5V, $C = 0.01 \text{ MFD}$ 600V. The dv/dt rating is based on a source impedance of 50 ohms.
- Output may lose blocking capability during and after surge until T_J falls below maximum.
- Contact factory for additional specifications.

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CHARACTERISTIC CURVES

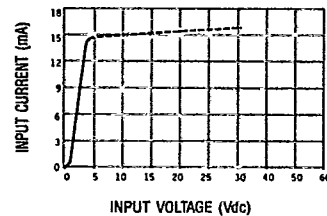


FIGURE 1 — TYPICAL INPUT CURRENT VS. INPUT VOLTAGE

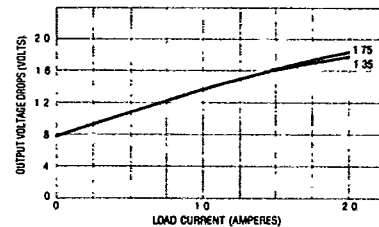


FIGURE 2 — LOAD CURRENT VS. TYPICAL OUTPUT VOLTAGE DROP

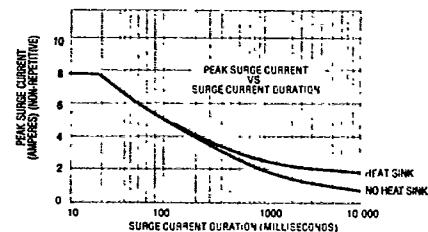


FIGURE 3 — PEAK SURGE CURRENT VS. SURGE CURRENT DURATION (SEE NOTE 5)

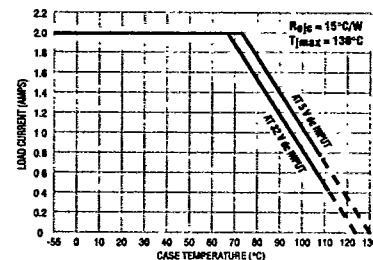


FIGURE 4 — MAX. LOAD CURRENT VS. CASE TEMPERATURE (SEE NOTE 2)

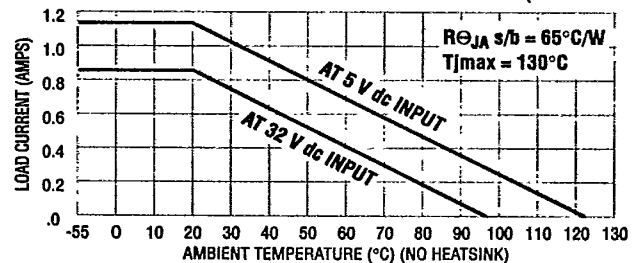


FIGURE 5 — MAXIMUM LOAD CURRENT VS. AMBIENT TEMPERATURE

PATENT #4,339,670