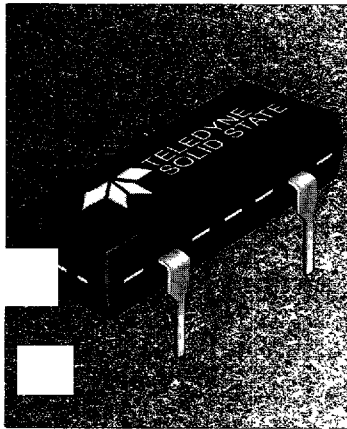




TELEDYNE SOLID STATE

**SERENDIP®
SOLID STATE DC RELAY
TRANSFORMER ISOLATED
100 to 600 mA**

FEATURES

- Solid State pin compatible replacement for DIP reed relays
- TTL compatible input
- Exceed current and voltage ratings of opto-isolators
- High switching speed
- Standard TO-116 DIP

DESCRIPTION

The 643 Series DC SSRs employ transformer coupling for high input/output isolation, high switching speed, and low off-state leakage. The output current and voltage ratings greatly exceed the capabilities of opto-isolators, with an equivalent current transfer ratio as high as 2500%. Thus, they serve as ideal solid state alternatives for opto-isolators and reed relays in applications such as isolated line drivers, lamp drivers, current loop switches, and general purpose DC switching where "relay" isolation is required. Internal construction employs thick film hybrid circuitry with a unique patented lead frame design for low cost. Molded in a standard TO-116 DIP.

PART NUMBERING

PART NUMBER	OUTPUT CURRENT RATING (mA _{dc})	OUTPUT VOLTAGE RATING (V _{dc})
643-1	400	60
643-2	100	250
643-3	600	130

ELECTRICAL SPECIFICATIONS (25°C UNLESS OTHERWISE SPECIFIED)

INPUT (CONTROL) SPECIFICATIONS		MIN.	TYP.	MAX.	UNITS	NOTES
Control Voltage Range		3.8		10	V _{dc}	See Fig. 2 & Note 1
Input Current at 5VDC Control Voltage			9	15	mA	See Fig. 1
Turn Off Voltage				0.4	V _{dc}	
Dielectric Strength (Input to Output)		1500			V _{rms}	60 Hz Sine Wave
Isolation (Input to Output)		10 ⁹			Ohms	
Capacitance (Input to Output)				5	pF	
Reverse Voltage Protection				3	V _{dc}	
OUTPUT (LOAD) SPECIFICATIONS		MIN.	TYP.	MAX.	UNITS	NOTES
Max. Allowable Output Current (10 Volt Input)	643-1	0		400	mA	See Fig. 2 And Note 1
	643-2	0		100		
	643-3	0		600		
Max. Allowable Output Current (5 Volt Input)	643-1	0		200	mA	See Fig. 2 And Note 1
	643-2	0		50		
	643-3	0		250		
Output Voltage	643-1	0		60	V _{dc}	
	643-2	0		250		
	643-3	0		130		
On-State Voltage Drop			0.8	1.5	V _{dc}	See Fig. 4
Offstate Leakage Current	643-1	V _O = 30 V _{dc}		15	μA	See Fig. 3
		V _O = 60 V _{dc}		60		
	643-2	V _O = 125 V _{dc}		0.6		
		V _O = 250 V _{dc}		6.0		
	643-3	V _O = 65 V _{dc}		15		
		V _O = 130 V _{dc}		75		
Turn On Time (T _{DELAY} + T _{RISE}) (See Fig. 5)	643-1		0.5	1.0	μs	Note 4
	643-2		1.0	5.0		
	643-3			10		
Turn Off Time (T _{DELAY} + T _{FALL})	643-1		3	5	μs	
	643-2		30	75		
	643-3			75		
Capacitance Across Output	643-1		10	15	pF	
	643-2		30	40		
	643-3			150		
Surge Current Rating				200	% Of Rating	See Fig. 6

PATENT #3,791,025

CHARACTERISTIC CURVES

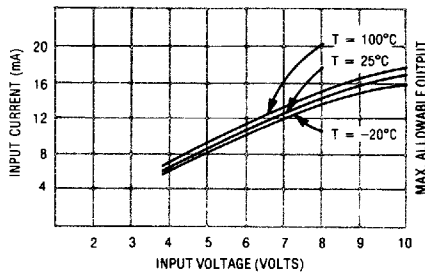


FIGURE 1 - INPUT CURRENT VS. INPUT VOLTAGE (TYPICAL)

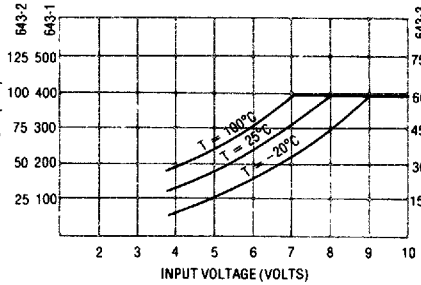


FIGURE 2 - MAXIMUM ALLOWABLE OUTPUT CURRENT VS. INPUT CONTROL VOLTAGE

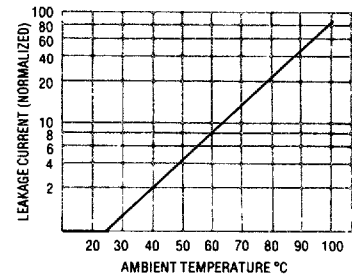


FIGURE 3 - TYPICAL LEAKAGE CURRENT VS. AMBIENT TEMPERATURE (NORMALIZED TO 25°C)

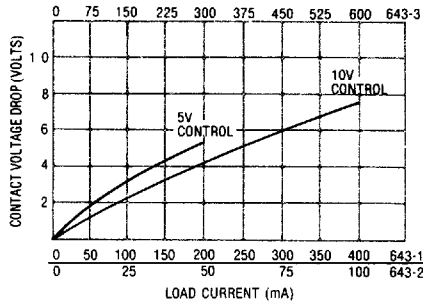


FIGURE 4 - CONTACT VOLTAGE DROP VS. LOAD CURRENT (TYPICAL)

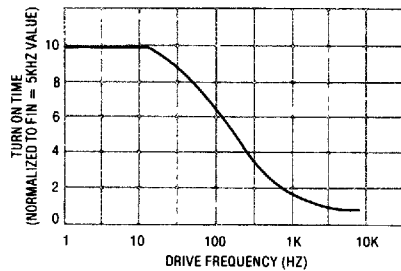


FIGURE 5 - NORMALIZED TURN-ON TIME VS. DRIVE FREQUENCY (TYPICAL)

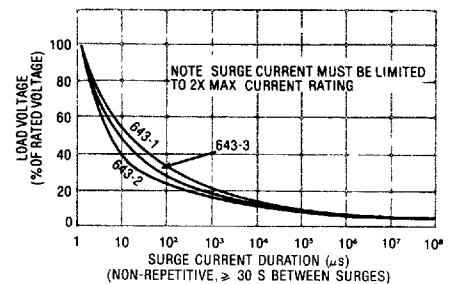
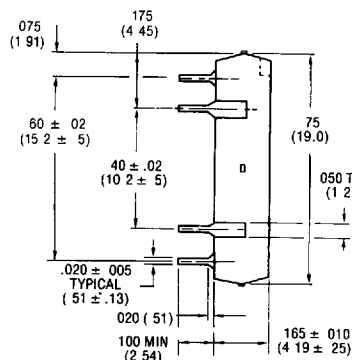
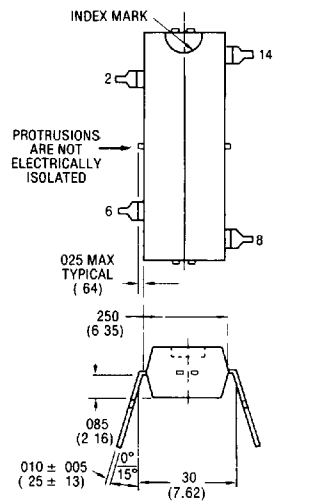


FIGURE 6 - SUPPLY VOLTAGE VS. SURGE CURRENT DURATION

MECHANICAL SPECIFICATIONS



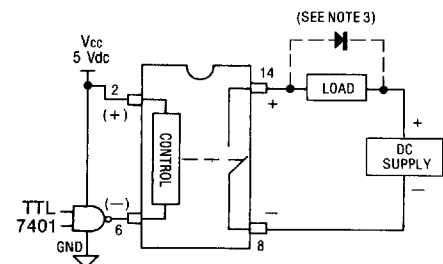
- Ambient Temperature Range: -20°C to 100°C Operating & Storage
- Vibration: 30g level, 10 to 2,000 Hz
- Shock: Meets or exceeds MIL-STD-202
- Weight: 2.0 grams max.
- Enclosure: 14 pin dual in line T0-116
- Case Material: Filled epoxy, self extinguishing



DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)

- Tolerances (unless otherwise specified) $\pm .015$ (.38)

WIRING DIAGRAM



NOTES:

- For any control voltage, the maximum load current value shown in Figure 2 must not be exceeded. (Attempting to draw currents in excess of these curves can cause permanent damage.)
- Pin 14 must be positive with respect to Pin 8 or damage may result.
- Inductive loads must be diode suppressed.
- Test Conditions: $V_{IN} = 5V$, $f_{IN} = 5kHz$, $V_L = 20V$, $R_L = 100\Omega$ (643-1, 643-3), $R_L = 1000\Omega$ (643-2).