



R-SERIES

High Reliability, DC Solid State Relay

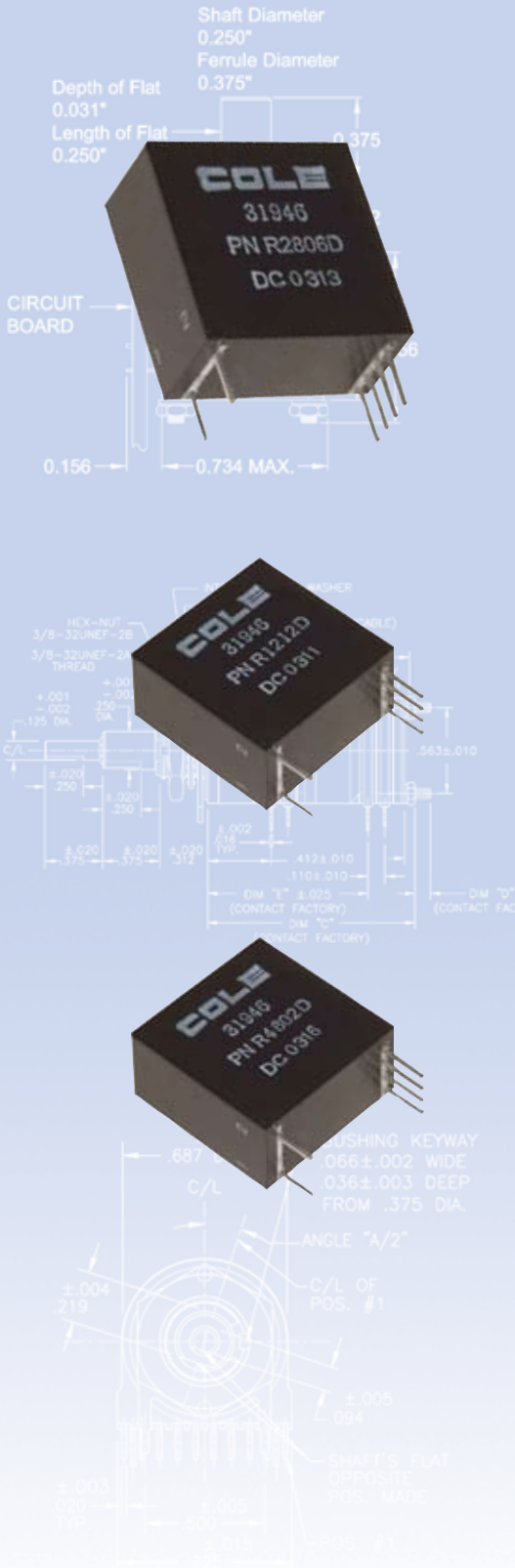
Designed for the highest levels of reliability, the Cole R-series Solid State Relay has no moving parts, making it immune to all contact related problems such as contamination, arcing erosion, and bouncing associated with electromechanical relays.

The R-series operates as an SPST, normally open (1 Form A) switch. Its circuitry is encapsulated in a non-hermetic plastic package and is suitable for PC mount applications. It is configured for switching DC current and can be operated as a unidirectional high-side or low-side switch.

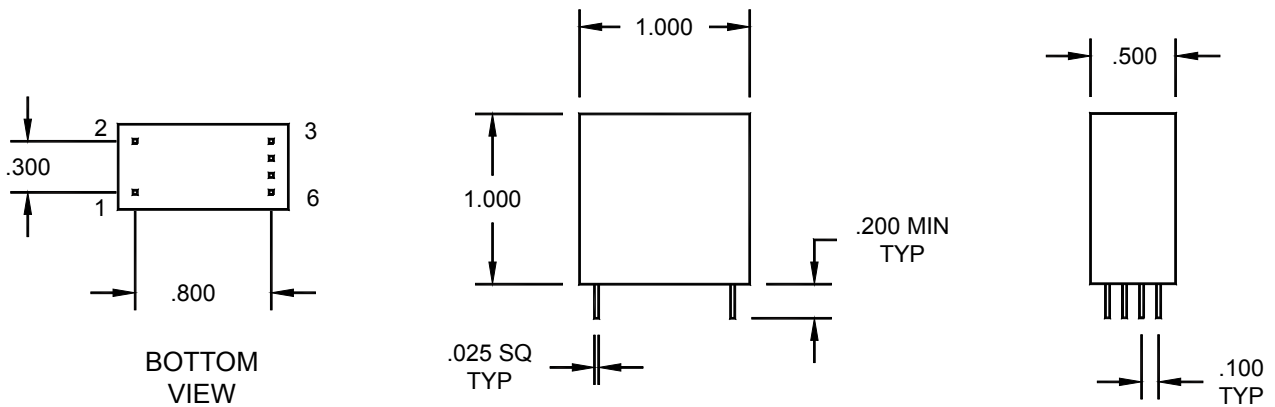
Cole's R-Series employs an optocoupler as an optical isolation barrier between its control input and output (load) that eliminates the system ground loop noise. The control input that actuates the switch contains a light emitting diode (LED) with low forward voltage and current. This low power LED is compatible with most TTL and CMOS devices.

The output circuitry contains at least one MOSFET with low on-state resistance to minimize its internal power dissipation over the operating temperature range of -40° C to 85° C. Therefore no heat sink is required for applications where the R-Series is operated within its specified ratings.

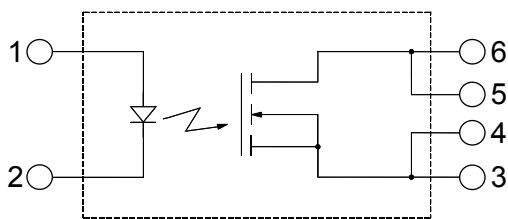
The Cole R-Series Solid State Relay is ideal for COTS military applications, avionics, industrial automation, programmable logic controllers, office and test equipment, and motor, solenoid, display, and lamp drivers. Quality construction and exceedingly stringent manufacturing processes, inspection and testing, ensure the R-Series will meet the demands of your most challenging applications.



MECHANICAL SPECIFICATION



BLOCK DIAGRAM & PIN ASSIGNMENT



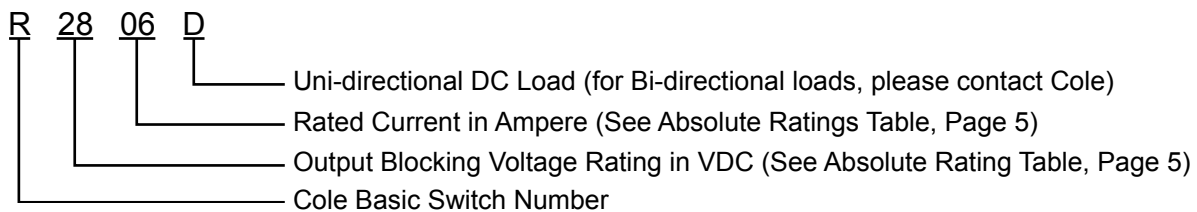
Pin Number	Function
1	+ Control Input
2	- Control Input
3	- Output
4	- Output
5	+ Output
6	+ Output

NOTE:

All output pins must be connected to the appropriate circuit nodes for maximum operating current rating.

ORDERING INFORMATION

Sample code

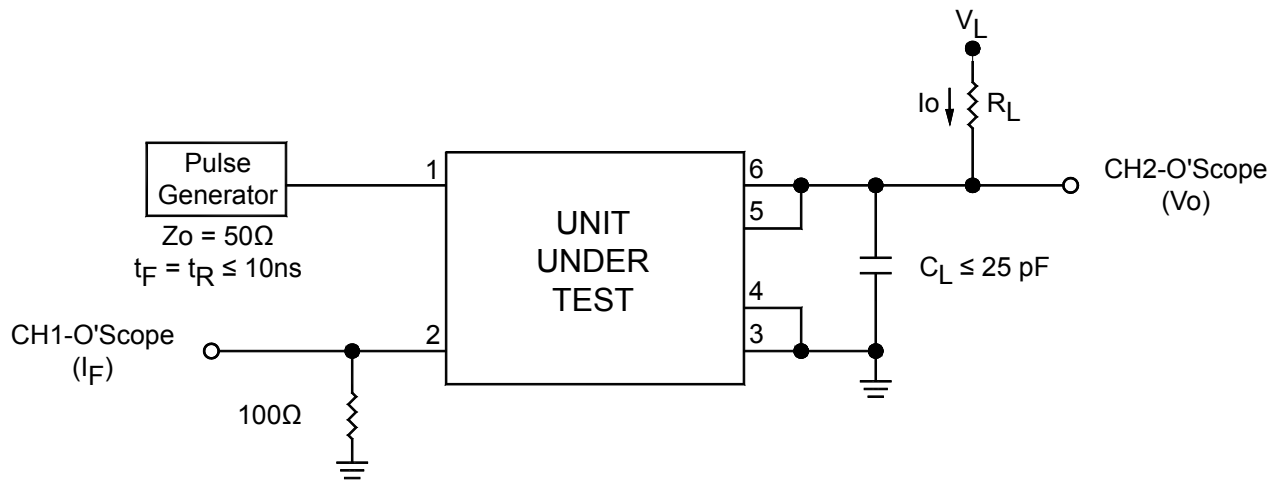


Switch shown in the sample code is a uni-directional DC solid state relay having its contact rating of 28VDC and 6 amperes.

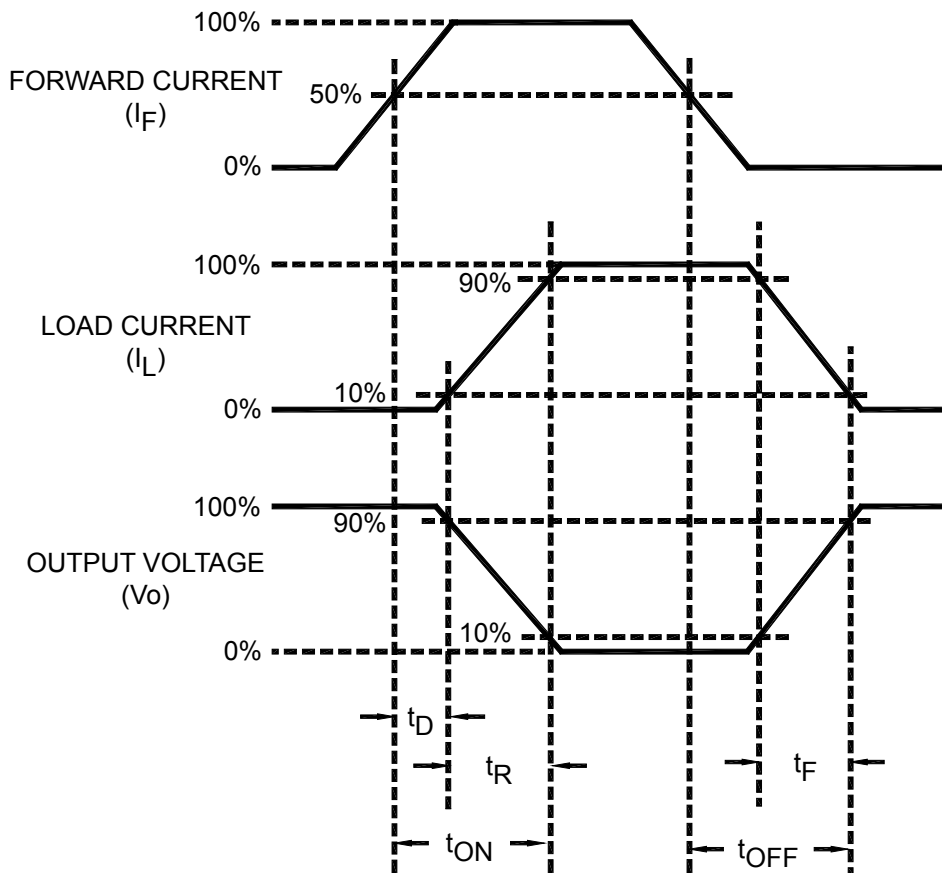
For customization, please contact factory.



TEST CIRCUIT



TYPICAL SWITCHING WAVE FORMS



R-SERIES TECHNICAL DATA

ELECTRICAL SPECIFICATION

(T_C = -40° C to +85° C, unless otherwise specified)

CONTROL INPUT

Characteristic	Symbol	Min	Max	Unit	Test Conditions	Note
Forward Voltage	V _F	1	2	VDC	I _F =10 mA	
Reverse Breakdown Voltage	V _R	3		VDC	I _R =10 μA	1

OUTPUT (LOAD)

Characteristic	Symbol	Min	Max	Unit	Test Conditions	Note
On-State Resistance (by part number)	R _{ON}			mΩ	I _F =10 mA, I _O =rated I _{O(ON)} , pulse width=10 ms, duty cycle ≤ 10%, resistive load	2
R4803D			80			
R1206D			70			
R1212D			40			
R2806D			20			
R2812D			10			
Turn-On Time	t _{ON}		8	ms		3
Turn-Off Time	t _{OFF}		2	ms		3
Rise Time	t _R		6	ms		1, 3
Fall Time	t _F		1	ms		1, 3
Off-State Leakage Current	I _O (OFF)		250	μA	I _F =0 mA, V _O =28 VDC	

OTHERS

Characteristic	Symbol	Min	Max	Unit	Test Conditions	Note
Input/Output Isolation Voltage	BV _{I-O}	2500		VRMS	T _C =25°C, RH≤45%, t=5 s, I _{LK} ≤1 mA	4
Thermal Resistance, Junction-to-Air	Θ _{JA}		45	°C/W		1

NOTES:

- Guaranteed, but not tested.
- Applying appropriate transient suppression technique between output terminals would be necessary for inductive loads.
- Times are measured as follows:
Rise time: from 10% to 90% of load current (or 90% to 10% of output voltage).
Fall time: from 90% to 10% of load current (or 10% to 90% of output voltage).
Turn-on time: from 50% of the rising edge of the input forward current to 90% of load current (or 10% of output voltage).
Turn-off time: from 50% of the falling edge of the input forward current to 10% of load current (or 90% of the output Voltage).
- Test voltage should be applied momentarily, not a steady state operating condition.



R-SERIES TECHNICAL DATA, CONT.**ABSOLUTE RATINGS**

Part Number	Output Blocking Voltage, $V_{O(OFF)}$	Continuous Output Current, $I_{O(ON)}$
R4803D	48 VDC	3A
R2812D	28 VDC	12A
R2806D	28 VDC	6A
R1212D	12 VDC	12A
R1206D	12VDC	6A

Input Forward Current	$I_F (ON)$	50	mA
Case Operating Temperature	T_C	-40 to +85	°C
Non-Operating Storage Temperature	T_{STG}	-65 to +125	°C
Junction Temperature	T_J	150	°C
Lead Solder Temperature, for 10 Seconds		260	°C

