EDR82441 SPDT Analog Switch

1 Form A + 1 From B terminals SSR

Designed to control 4 A, +/-75VDC (52VAC)

Electronic Design & Research
http://www.vsholding.com

Technology for people's ideas

Features:

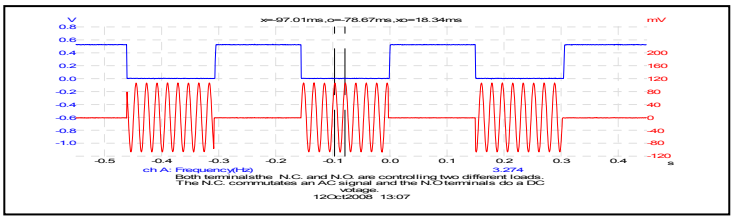
- **Utilizes only 1.84 sq. in. of PCB area and only 1.2" tall**
- **4 Amp continuous or up to 29 Amp-pick in miniature size**
- **100 A surge current and only .06 Ohms low on-state resistance**
- **Wide input range 4-15V input, and only 14 mA**
- **Designed with small internal delays, circuitry virtually eliminates terminals cross conduction and current shoot-through allows the relay to work as a SPDT or DPST output terminals configuration.**
- **Built-in a 7mS de-bouncing protection simplifies an interfacing with electro-mechanical controls.**
- **Break-before-make SPDT switch configurable as a DPST**

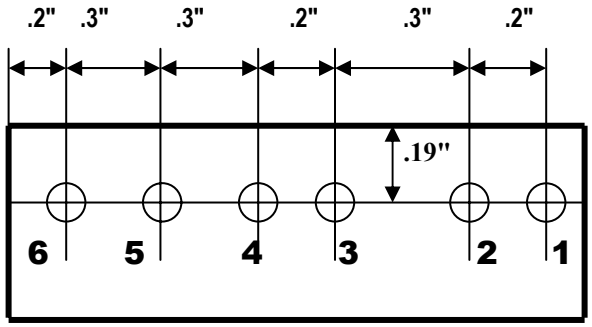
Input Specifications:

Input DC Voltage	3.7VDC 15 VDC
Nominal Current	11 mA 14.6mA
Must Turn On Voltage	3.6 VDC
Must Turn Off Voltage	2.4 VDC

Output Specifications:

Operating DC voltage range	+/-75VDC (52VAC)
Maximum continuous current	4A rms
Maximum surge current (IDM)	100A @ 1.0ms
Continues current (ID)	29A @ 25 °C
Maximum on-state resistance	0.060 Ohm
Rising time	14.9 µS
Delay-on time	22.5µS
Falling time	0.2 µS
Delay-off time	33.25 µS
Maximum switching frequency	70 Hz



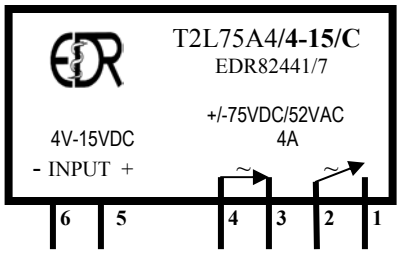


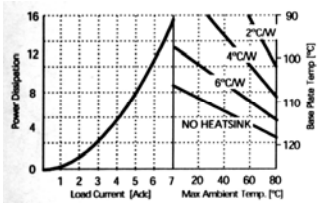
General Specifications:

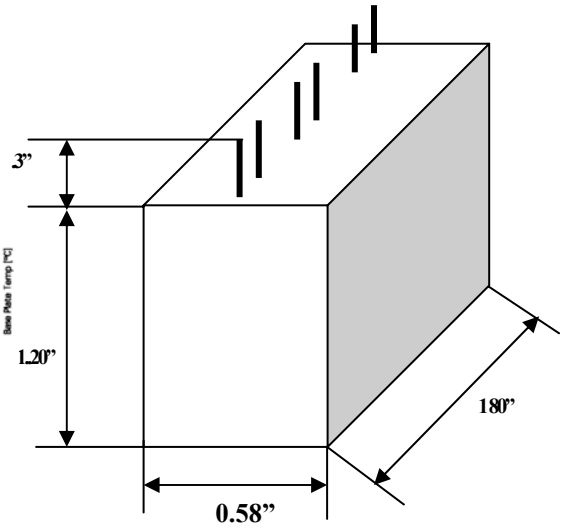
Ambient operating temperature range	-35^0 C to 85^0 C
Ambient storage temperature range	-40^0 C to 90^0 C
Dialectic Strength input-to-output	3000VAC
Dialectic Strength between terminals	3000VAC

Mechanical Specifications:

Weight(oz)	.5
Encapsulation	ResTech 10207/053
Terminals; input/output	.031"/0.051" diameter
Dimensions	1.2"H x 1.8"L x .58"W







Transient Protection: All loads are inductive, even ones that are not so obvious or labeled. An inductive load produces a harmful transient voltage, which is much higher than the applied voltage, when it is turned on and off. A SSR built with a MOSFET output acts as an ideal switch and can produce a seemingly "non-inductive" load, which can cause damage if not suppressed. A transient voltage suppressor, which is bi-directional for an AC applied voltage and unidirectional for a DC applied voltage, should be used to clamp excessive spikes.

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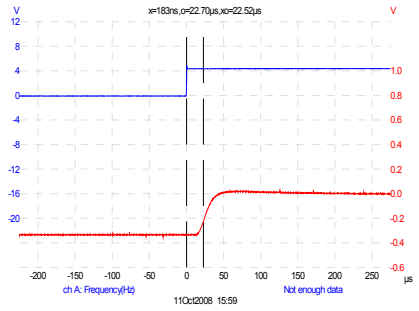
Input Electrical Characteristics (Ta = 25^{0}C) for T2L75A4/4-15, p/n EDR82441/7

	Minimum	Nominal	Maximum	Unit
Control Voltage, pins 5-6	3.5		18	V
Control Current, pins 5-6	11.09		14.8	mA
Current Leakage/75VDC, pins 1-2 and 3-4			20	µA
Capacitance, pins 1-2 and pins 3-4 (turn off)			290	pF

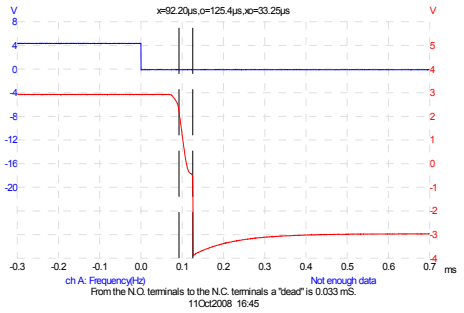
Switching time test: voltage +/-20VDC, load is 10 Ohm & 2A and V1 is 4V



Control

Load

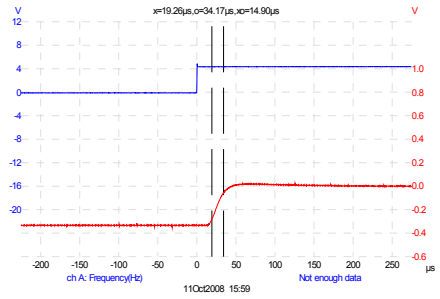
Figure 1 Turn-on delay is 22.5µS



Control

Load

Figure 2 Turn-off "dead" time is 33.25µS



Control

Load

Figure 3 Rising time is 14.9µS

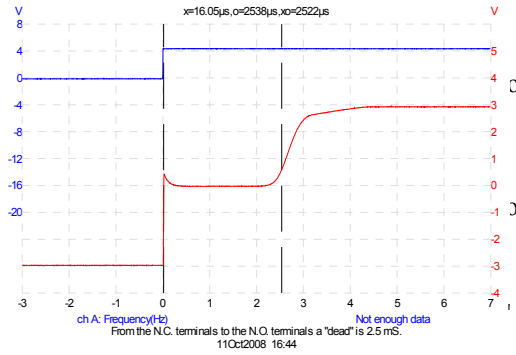


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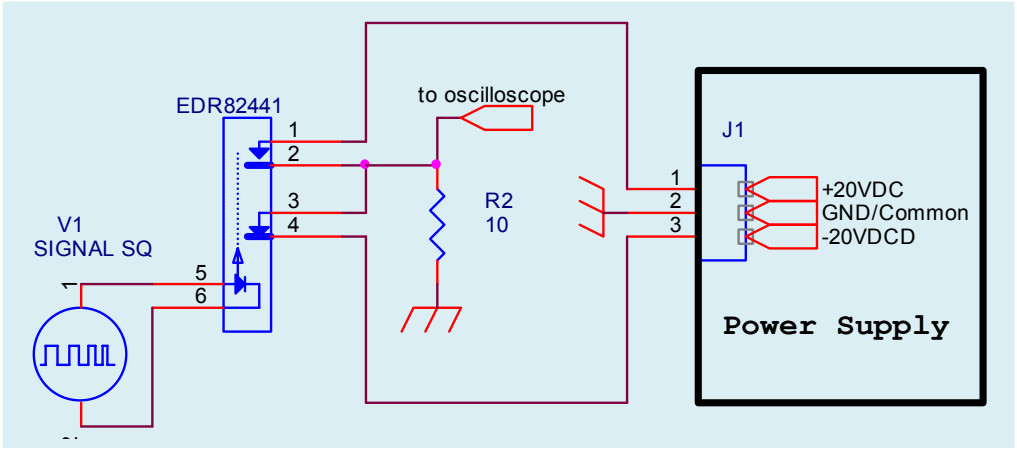
Figure 4 A turn-on "dead" time 2.5 mS

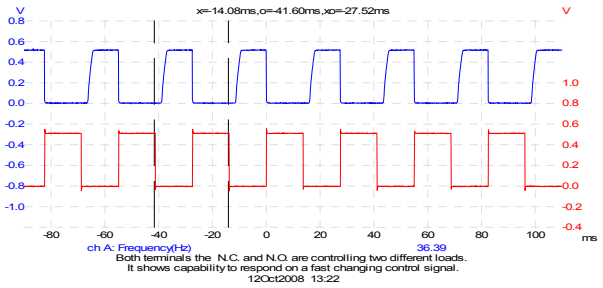


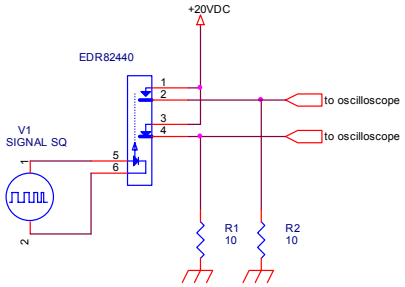
Switching Time Test Circuit

Applications

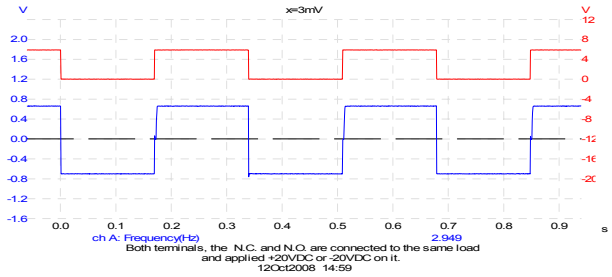
Application for a SPDT/DPST with true N.C. terminal series Solid-State Relay is illustrated by just a few examples below. The EDR82441 from that series is a bi-direction switch taking place over the full analog signal range of +/-75VDC, with break-before- make operation to prevent momentary shorting of output signals. The EDR82441 is an analog switch that switches positive or negative signals while using a single control voltage that can vary from 4V to 15V.

The EDR82441, as 1 Form A + 1 Form B relay switches power alternatively between two loads



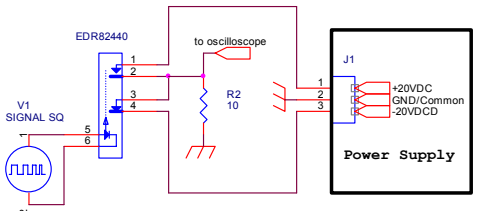


The EDR82441 is configured as a DPST switch (1 Form C)

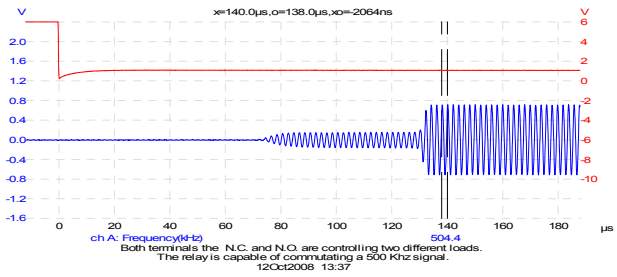


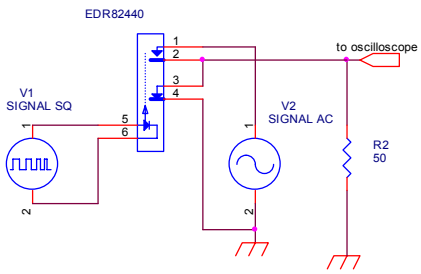
control

output

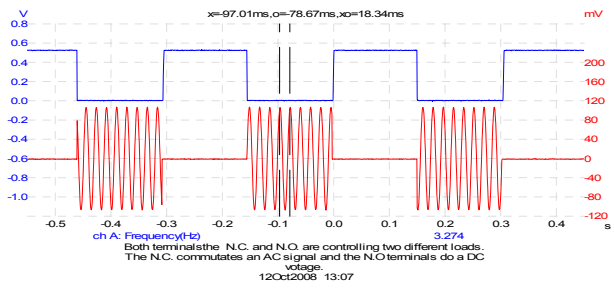


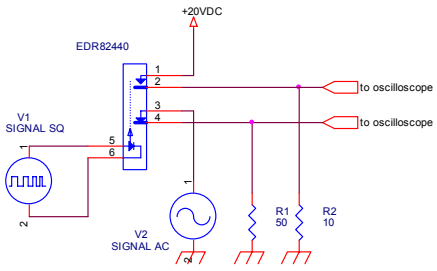
The EDR82441 is capable to commutate a high frequency, as it shown 500 KHz.





Both terminals of EDR82441 are isolated of each other that allow commutating DC and AC powers.

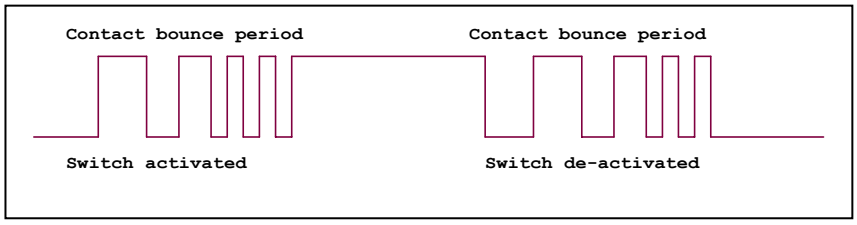




Contact Bounce and EDR82440 is De-Bouncing solution

The situation

Push-button switches, toggle switches, and electro-mechanical relays all have one thing in common: contacts. It's the metal contacts that make and break the circuit and carry the current in switches and relays. Since at least one of the contacts is on a movable strip of metal, it has springiness. Contacts are designed to open and close quickly with a little resistance (damping) to their movement. Contacts have mass and springiness with low damping that make them bouncy as they make and break. When a normally open (N.O.) pair of contacts is closed, the contacts will come together and bounce off each other several times before finally coming to rest in a closed position. The effect is called "contact bounce" or, in a switch, "switch bounce," contacts can bounce on opening as well as on closing.

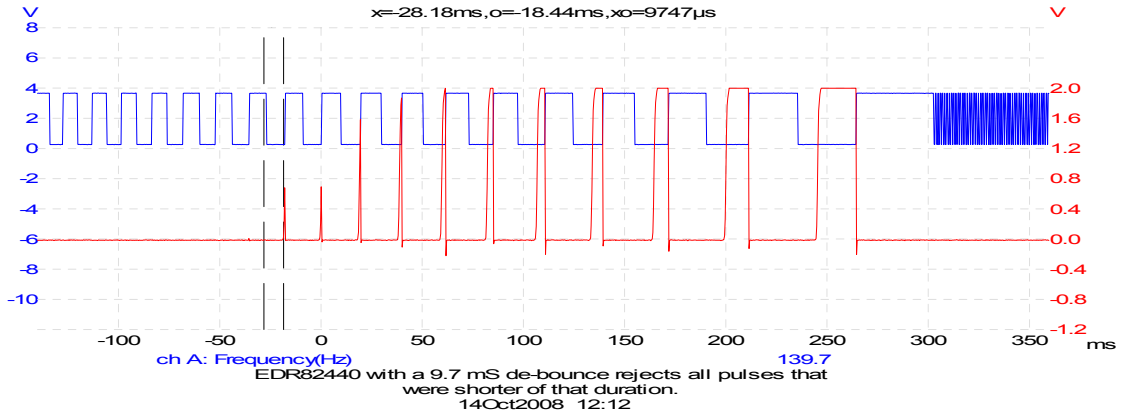


The Problem

In some cases, a contact bouncing is irrelevant when a switch or relay is used to turn on a lamp or start a fan motor. However, it becomes a problem when a switch or electromechanical relay is the input to a digital counter, a personal computer, or a micro-processor based piece of equipment. In such cases, a designer must consider contact bounce. The reason for concern is that the time it takes contacts to stop bouncing is measured in milliseconds, but digital circuits respond in microseconds.

The Solution

There are several ways to solve the problem of contact bounce (that is, to "de-bounce" the input signal). Often the easiest way is to get a piece of equipment that is designed to accept "bouncy" input and EDR's made Solid-State Relays are a solution.



Any relay of the SPDT/DPST with a true N.C. terminals family can be ordered with the de-bouncing. In most cases a 10 mS de-bounce is sufficient to avoid nuisances of mechanical and electromechanical devices but please let us know if any another period would be required.