



Electronic Design & Research Inc.

<http://www.vsholding.com>

True Double Pole, Single Through (DPST or 2 Form A+B) Connectable as a SPDT and SPST-N.C. Solid-State Relays

Technical Information

DPST relays with two isolated pairs, 1 Form A + 1 Form B terminals configuration for DC and AC/DC applications.

Form B terminal is a true normally closed pair

Designed time-delay between terminations allows configuring a DPST relay as a true SPDT relay, or converting

1 Form A + 1 Form B relay into 1 Form C relay

Under management



VS Holding LLC

www.vsholding.com

Electronic Design & Research is a pioneer in developing and manufactures high-speed, high-power relays/switches. Starting since 1998, we have produced vast varieties of Solid-State Modules and Devices. Our products have being used in thousand Defense related and industrial applications.

Piezo Drivers
Video Switches
½ Bridge drivers
Q-type high-pass filters
Precision F-to-V Converters
Soft-Landing Solenoid Drivers
50Hz/60Hz Comb Notch filters
Super-high Power, fast Switches
H-bridge or Full-bridge Drivers
High-power, high-speed Switches
Universal Analog Building Module
Signal Switching Separating Network
Sockets for relays, switches and drivers
Charge-Pump Wide-Band FM detectors
Low-Noise, High-Voltage DC/DC converters
DC-3phase AC resonance mode driver for EV
DC-12phase AC resonance mode driver for EV
Perpetual Pulse-width Discriminator, US Patent
½ and H Fuzzy Logic sockets for various relays
Fuzzy-Logic SPDT Relays, Switches and ½ Drivers
Fully protected, Solid-State DPST Brake, US Patent
Single Pole, Single Trout Relays and Switches, (SPST)
Power-distributing module for Motorcycles, US Patent
Single Pole, Double Trout Relays and Switches, (SPDT)
Double Pole, Single Trout Relays and Switches, (DPST)
1-Form B, SPST-NC (normally closed) Solid State Relays
Charge-and-Add, Up/Down DC/DC Converters, US patent
1-Form B and 1-Form A, DPST-NC/NO Solid State Relays
m-Power Controller for Magnetic Latching Valves, US Patent
High Voltage, Nana-Seconds Rise/Fall time, Push-Pull Drivers
Super-low noise preamplifiers for a low and high impedance sources
m-control, High-Power SPST-NC, normally closed relays, US Patent

We are working hard bringing new devices to the market to meet you requests. Above is a list of family of devices we developed and manufacturing. Most of them covered by propriety technologies and some of them so unique that we filed and receive patents. An inventory of available products exceed of several thousands. We keep a small number of popular devices in stock and ready to ship them at once. Our production capacities exceed 10,000 devices per months when two production robots programmed and working at a full speed.

For your unique application that required a different voltage, current or speed, Ordering Instruction (on the last page) could be rather useful in creating a new part and summarizing what you needed. Do not hesitate to send us an email: info@vsholding.com for any additional information, delivery schedule, and prices.

Thank you,

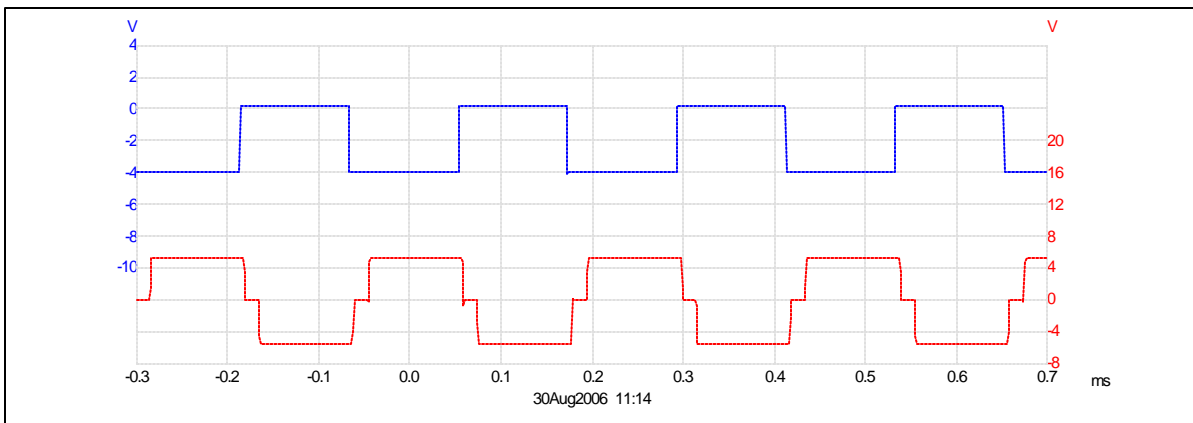
Vladimir A. Shvartsman, Ph.D.
V_Shvartsman@vsholding.com

From the creation time, Electronic Design & Research Inc. is working to satisfy, as it looks like an endless flow of requirements for a new and unique products and technology. We gave life in 1982 to a neural-cell technology and now a new branch of science Neural Networks is flourishing. Based on that invention we introduced in 1984 a Multichannel signal processor, which for the first time detected a faint signal from the heart from the body surface. Since 1998, we put a heavy emphasis on developing varieties of modules, such as solid-state relays, drivers and switches. Our modules are working in many critical applications providing a power inside of super-power, redundant servers installed on submarines, control movements of chairs in iMax Theatres,

One of the most popular relays from that family (p/n EDR82450 with a 2 FORM A wiring diagram) has found application in high-speed printers. Precise turning on/off timing allows connecting both terminals for a large current capacitance and that is exactly what was exploited by one of our customer for controlling powerful, fast-acting machinery.

Devices included in this publication offer speed and power capability with low power dissipation beyond what is available in the industry yester-today. A precise control of turning-on and turning-off timing allows using high-power DPST devices as ½ drivers (or as a true SPDT relay) simplifies designing a high-power controlling and driving equipment. A SIP-packaging is especially attractive for use in the systems where a board space is critical.

Recently, we expended the family with adding more advance switching products. A new relay (p/n EDR82308) with 1A+1B terminal configurations employed that is used can be found only in advanced analog and sophisticated switches. An internal electronic insures and guarantees that there is no shoot-through current when and if a N.C. (normal close) pair and a N.O. (normally open) terminals wired in series. Only expensive ½-bridge drivers and analog switches so far offered such precision switching. It is a fast, powerful relay and more appropriate is a switch rated at 20 amps @ 75VDC. For the first time in the industry, the EDR82308 provides high current, normally close solid-state relays.



The EDR82308 with two pair of terminals (one is N.C. and the other N.O.) can work, as a driver when terminals connected in serious and a load is common.

The internal control circuitry allows the driver, large varieties of powerful MOSFETs and as the result of that; we offer a large variation of relays to switch a DC and DC/AC power. Please send us an inquiry. We do not charge a set-up production fee for an order of 200 relays and up.



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Technology for people's ideas

T4N75D20/24/C

Powerful, N.C./N.O. Solid State Relay

Designed to control 20 A, 75VDC in microseconds

Features: Utilizes only 1.84 sq. in. of PCB area and only 1.2" tall
 20 Amp continuous or up to 160 Amp-pick in miniature size
 High sensitivity, even at a high switching frequency
 300 A surge current, and only 10 mill-Ohms low on-state resistance
 24V input, and only 20 mA

Input Specifications:

Input DC Voltage	24 VDC or 12 VDC
Nominal Current, at 10 Hz	12mA 18mA
Maximum Current, at 1 KHz	13 mA 20mA
Maximum Current, at 25 KHz	16 mA 23mA

Output Specifications:

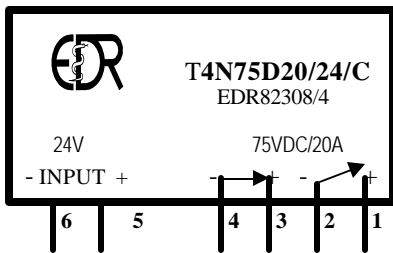
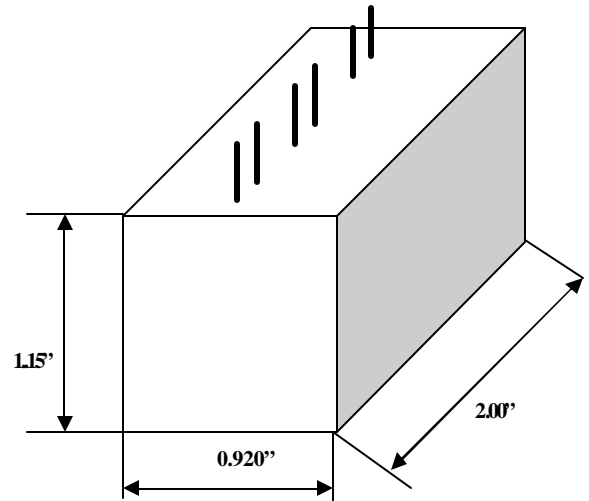
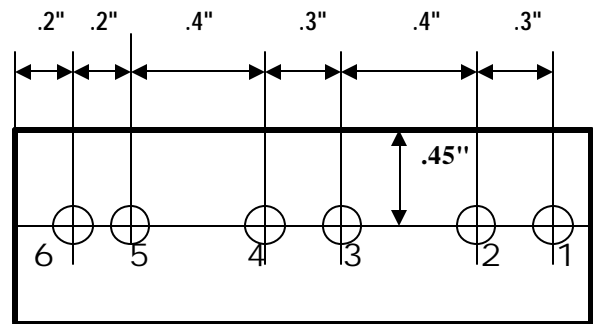
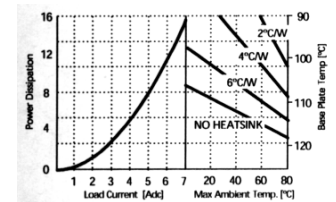
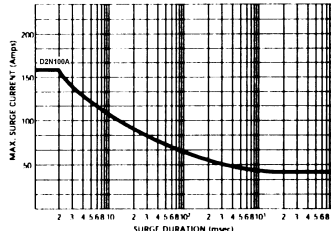
Operating DC voltage range	0 – 75 VDC
Maximum continuous current	20A rms
Maximum surge current (IDM)	300A @ 1.0ms
Continues current (ID)	160A @ 25 °C
Maximum on-state resistance	0.010 Ohm
Rising time	0.5 μS
Delay-on time	7.5 μS
Falling time	0.2 μS
Delay-off time	21.2 μS
Maximum switching frequency	25.0 KHz

General Specifications:

Ambient operating temperature range	-50° C to 55° C
Ambient storage temperature range	-40° C to 150° C
Dialectic Strength input-to-output	3000VAC
Dialectic Strength between terminals	3000VAC

Mechanical Specifications:

Weight(oz)	.5
Encapsulation	ResTech 10207/053
Terminals; input/output	.040"/0.60" diameter
Dimensions	.1.15"Hx2.0"Lx.92"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.

Electronic Design & Research Inc. ** 7331 Intermodal Dr. ** Louisville ** KY 40258

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The SPDT relay (p/n EDR82308) is unique in its class. Below are time-diagrams snap-shorts prepared for better understanding its time-responses and its performance in variety tasks.

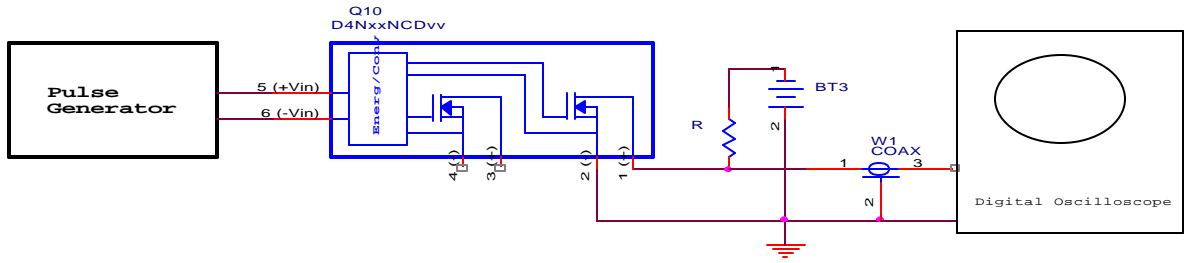


Figure 1 A testing set-up for a normal-open (N.O.) pair

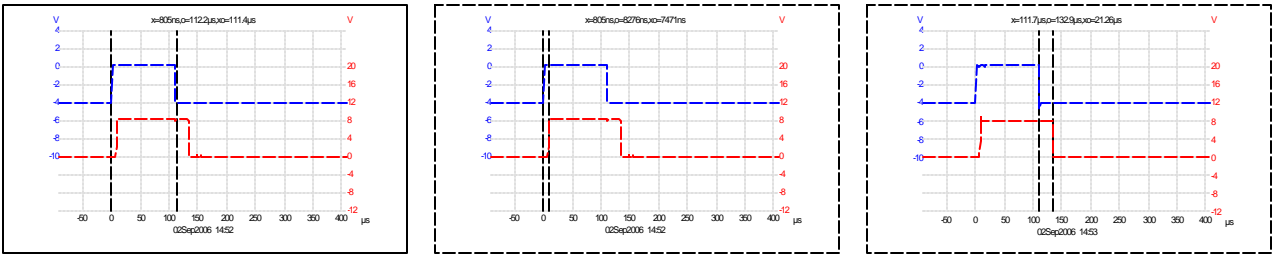


Fig. 2

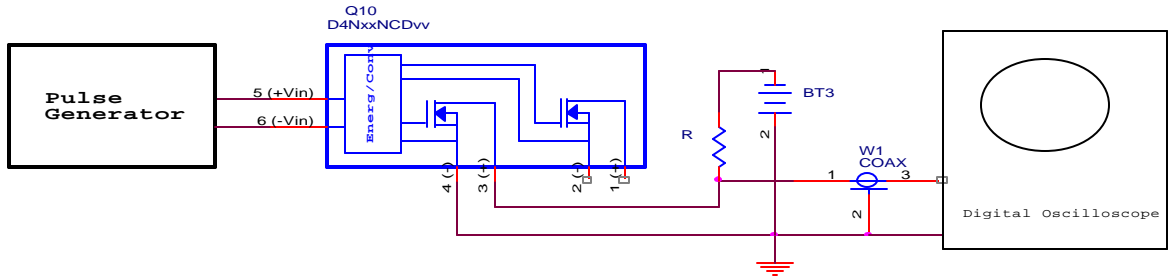
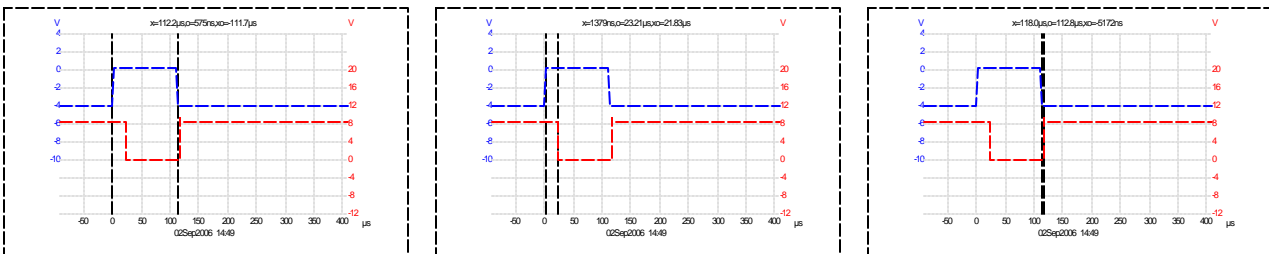


Figure 5 A testing set-up for a normal-close (N.C.) pair



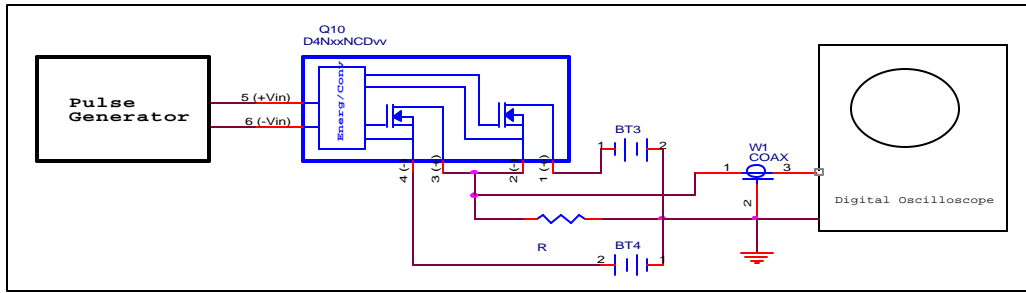
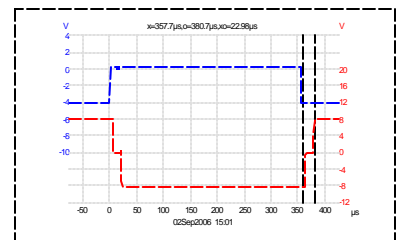
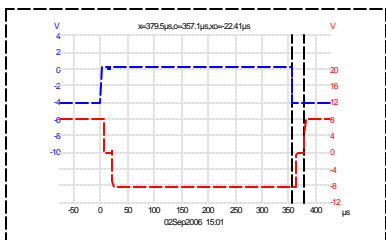
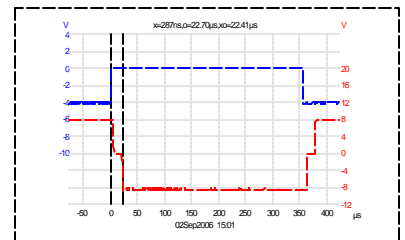
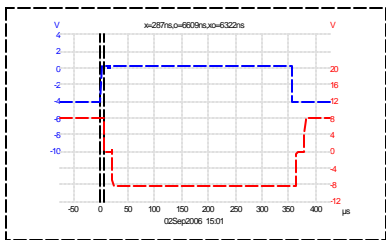
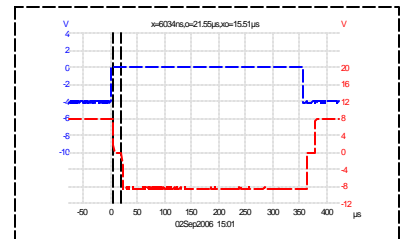
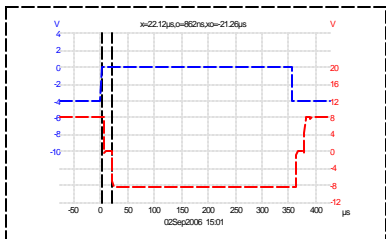
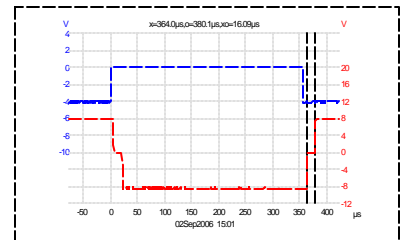
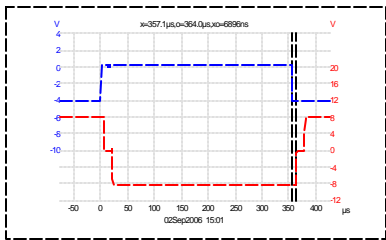
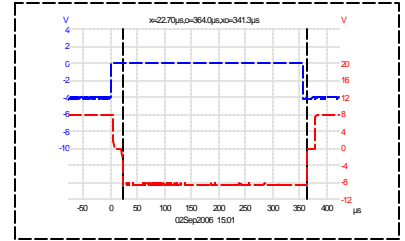
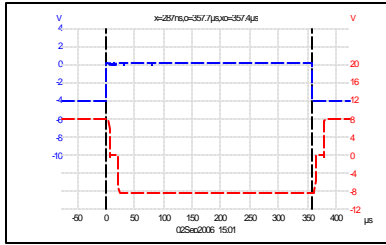


Figure 5 Set-up for test of a SPDT hook-up



Occurred timing relationship between an input signal (pulse) and output signal (pulse) at a load.



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T6N200A2/24/C

Powerful, N.C./N.O. Solid State Relay

Designed to control 2A at +/-200VDC in microseconds

Features: Utilizes only 1.84 sq. in. of PCB area and only 1.2" tall
 2.2 Amp continuous or up to 18 Amp-pick in miniature size
 High sensitivity, even at a high switching frequency
 70 A surge current, and only .30 Ohms low on-state resistance
 At 24V input the relay consumes only 12 mA

Input Specifications:

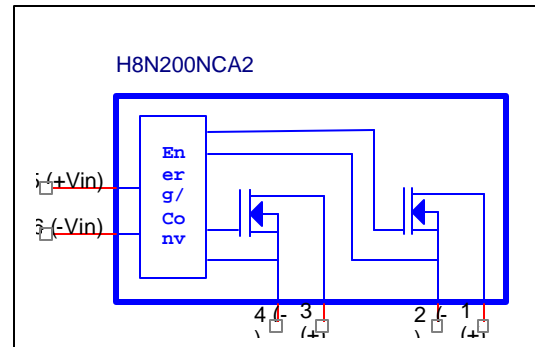
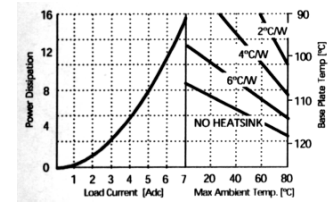
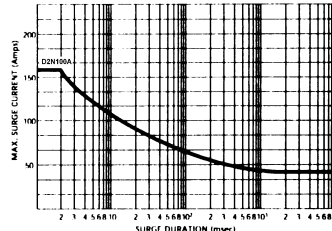
Input DC Voltage	24 VDC or 12 VDC
Nominal Current, at 10 Hz	12mA 18mA
Maximum Current, at 1 KHz	13 mA 20mA
Maximum Current, at 25 KHz	16 mA 23mA

Output Specifications:

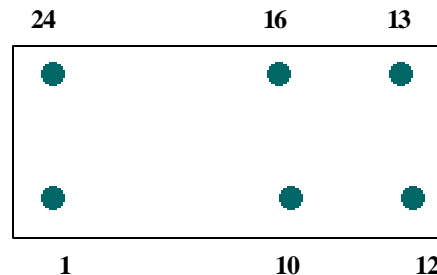
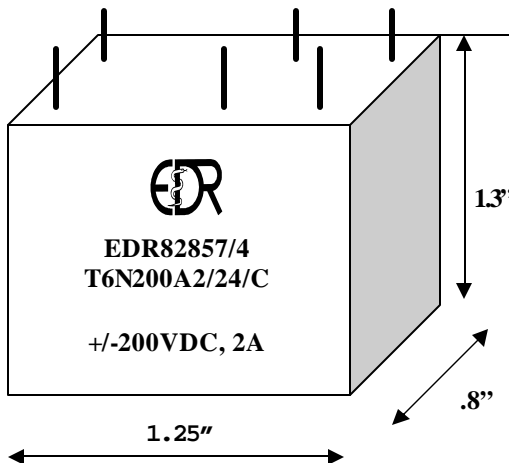
Operating DC voltage range	+/-200 VDC (140VAC)
Maximum continuous current	2.2 A rms
Maximum surge current (IDM)	70 A @ 1.0ms
Continues current (ID)	18A @ 25 °C
Maximum on-state resistance	0.30 Ohm
Rising time	0.5 µS
Delay-on time	7.5 µS
Falling time	0.2 µS
Delay-off time	21.2 µS
Maximum switching frequency	25.0 KHz

General Specifications:

Ambient operating temperature range	-50 ⁰ C to 55 ⁰ C
Ambient storage temperature range	-40 ⁰ C to 150 ⁰ C
Dialectic Strength input-to-output	3000VAC
Dialectic Strength between terminals	3000VA C
Mechanical Specifications:	
Weight(oz)	.5
Encapsulation	ResTech 10207/053
Terminals; input/output	.040"/0.60" diameter
Dimensions	.1.15"Hx2.0"Lx.92"W



Simplified block-diagram of the relay



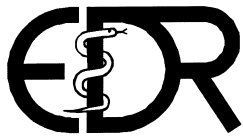
View from the bottom:

- 1 – control signal
- 10 & 12 – N.C. pair
- 13 & 16 – N.O. pair
- 20 – Control Signal

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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D4N200D8/24/NN

Powerful Subminiature Solid State Relay/Switch

Designed to control 8 A, 200 VDC in microseconds

Features: Utilizes only 1.84 sq. in. of PCB area and only 1.2" tall
 8 Amp continues or up to 16 Amp-pick in miniature size
 High sensitivity, even at a high switching frequency
 300 A surge current, and only 40 mill-Ohms low on-state resistance
 24V input, and only 20 mA

Input Specifications:

Input DC Voltage	24 VDC or 12 VDC
Nominal Current, at 10 Hz	12mA 18mA
Maximum Current, at 1 KHz	13 mA 20mA
Maximum Current, at 25 KHz	16 mA 23mA

Output Specifications:

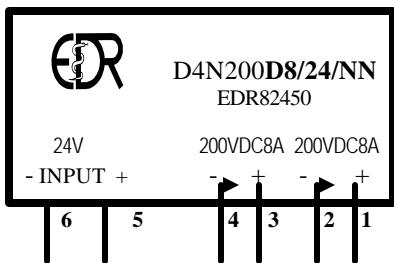
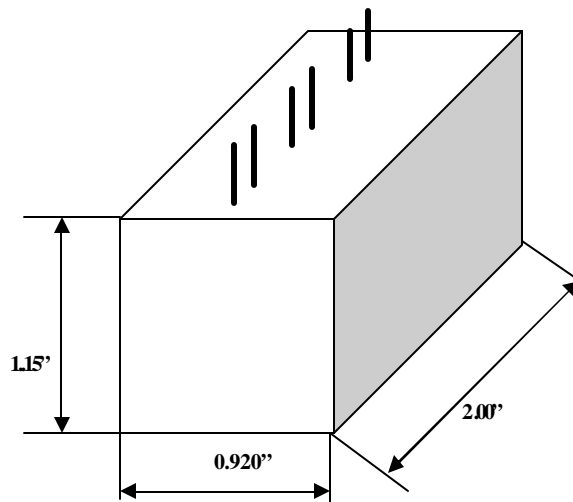
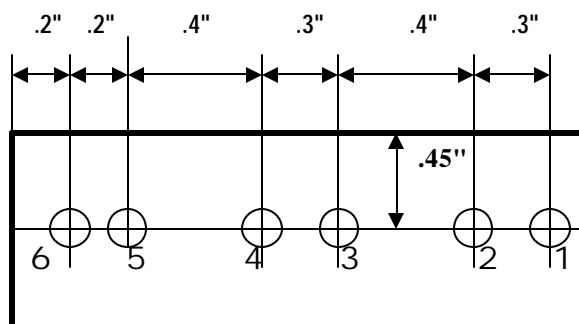
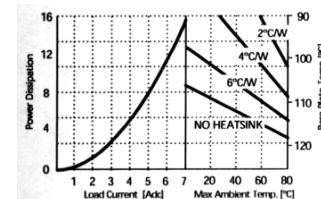
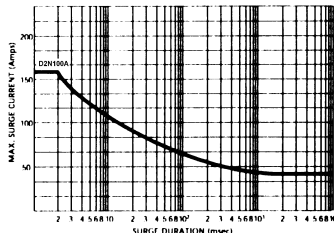
Operating DC voltage range	0 – 200 VDC
Maximum continuous current	8A no heat-sink
Maximum surge current (IDM)	300A @ 0.01mS
Continues current (ID)	120A @ 1.0ms
Maximum on-state resistance	0.080 Ohm
Rising time	0.5 μ S
Delay-on time	1 μ S
Falling time	0.2 μ S
Delay-off time	1 μ S
Maximum switching frequency	25.0 KHz

General Specifications:

Ambient operating temperature range	-50 ^o C to 55 ^o C
Ambient storage temperature range	-40 ^o C to 150 ^o C
Dialectic Strength input-to-output	1000VAC
Dialectic Strength between open contacts	200VAC

Mechanical Specifications:

Weight(oz)	.5
Encapsulation	ResTech 10207/053
Terminals	.040"
Dimensions	.115"Hx2.0"Lx.92"W
Terminals -Solder	.040" diameter



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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EDR82441 SPDT Analog Switch

1 Form A + 1 Form B terminals SSR

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

Features:

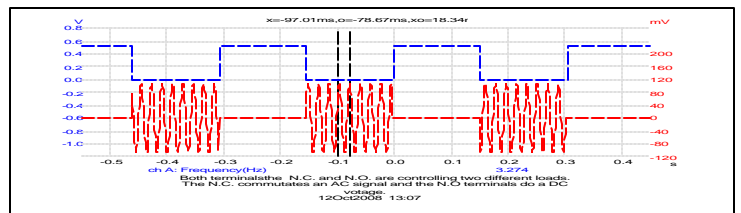
- Utilizes only 1.84 sq. in. of PCB area and only 1.2" tall
- 4 Amp continuous or up to 29 Amp-pick in miniature size
- 100 A surge current and only .06 Ohms low on-state resistance
- Wide input range 4-15V input, and only 14 mA
- Designed with small internal delays, circuitry virtually eliminates terminals 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

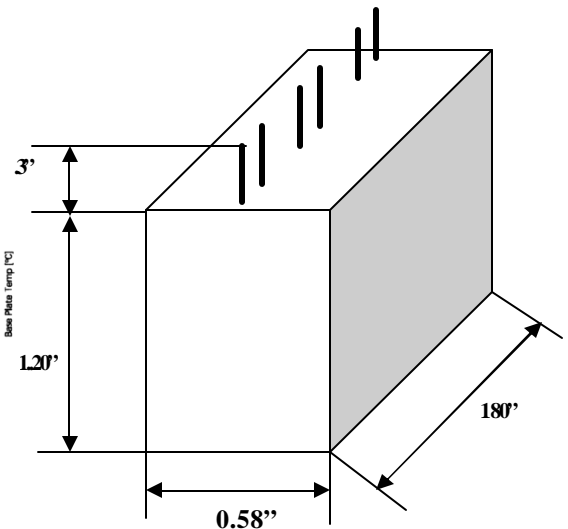
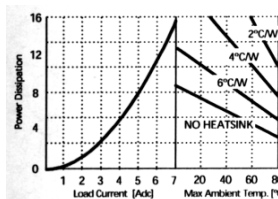
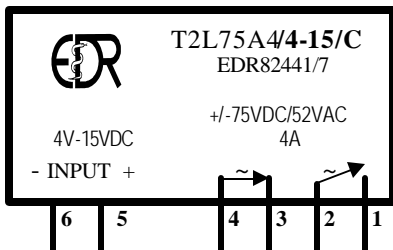
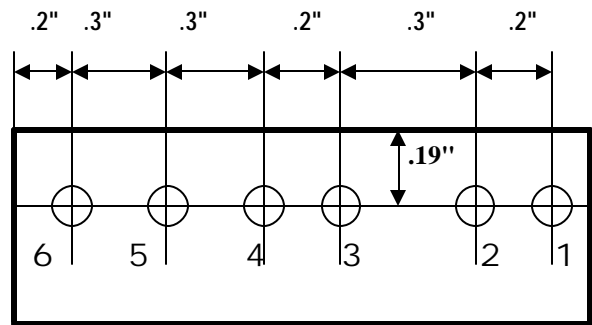


General Specifications:

Ambient operating temperature range	-35° C to 85° C
Ambient storage temperature range	-40° C to 90° 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°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

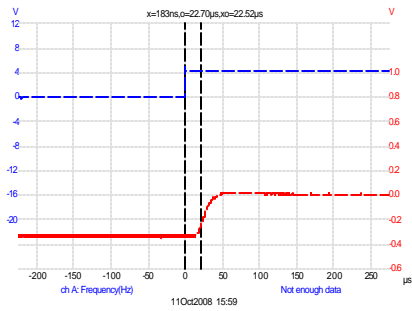


Figure 1 Turn-on delay is 22.5μS

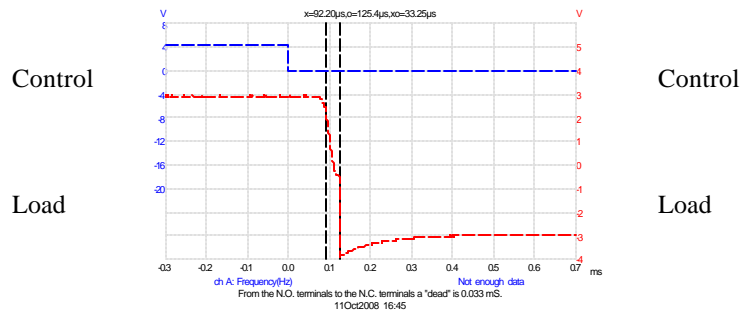


Figure 2 Turn-off "dead" time is 33.25μS

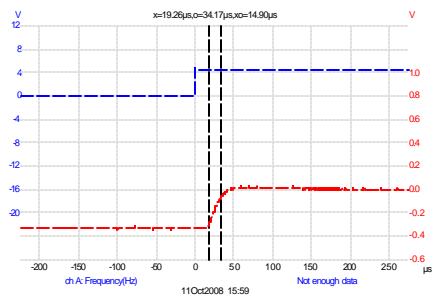


Figure 3 Rising time is 14.9μS

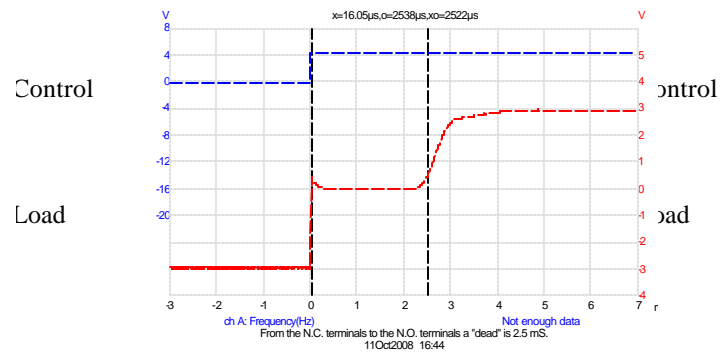
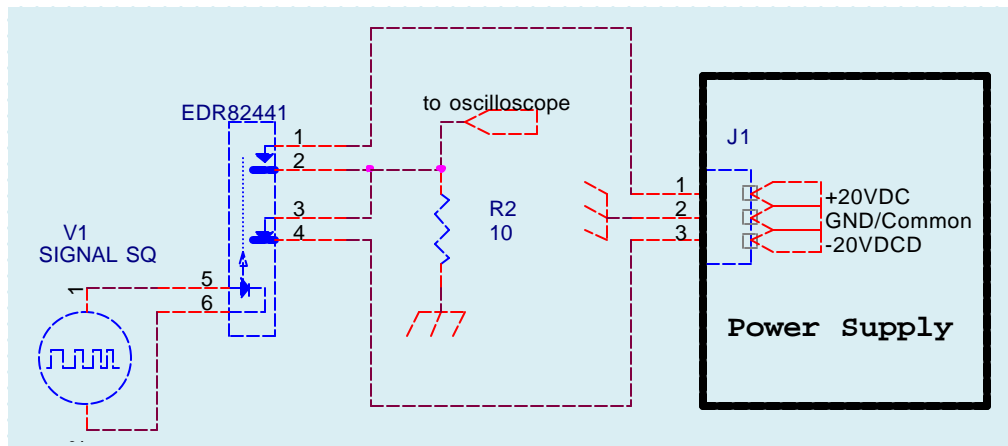


Figure 4 A turn-on "dead" time 2.5 mS

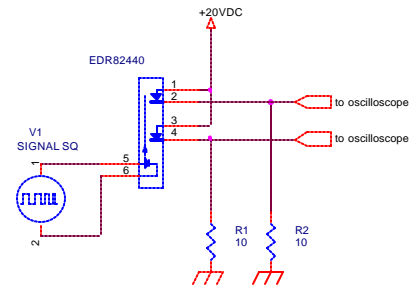
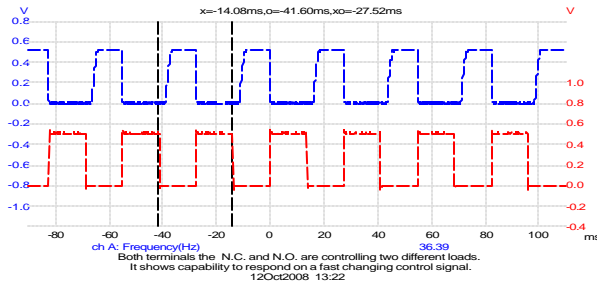


Switching Time Test Circuit

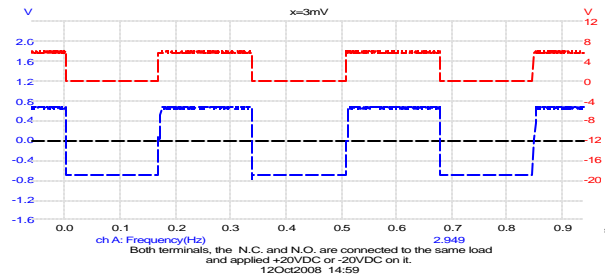
APPLICATIONS

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.

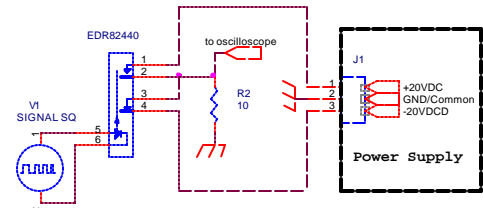
The EDR82441, as 1 Form A + 1 Form B relay switches power alternatively between two loads



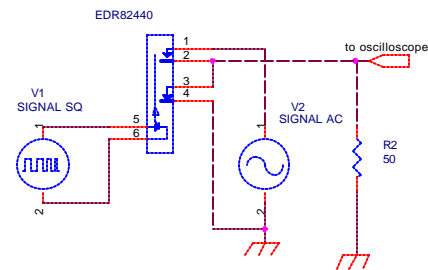
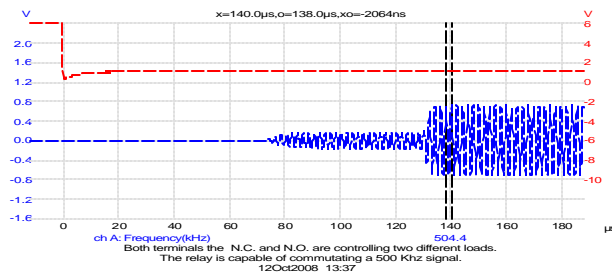
The EDR82441 is configured as a DPST switch (1 Form C)



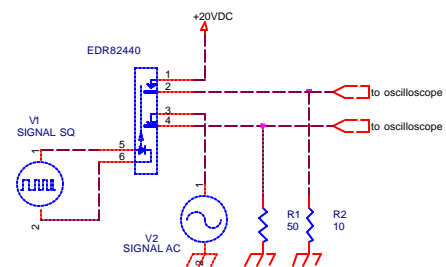
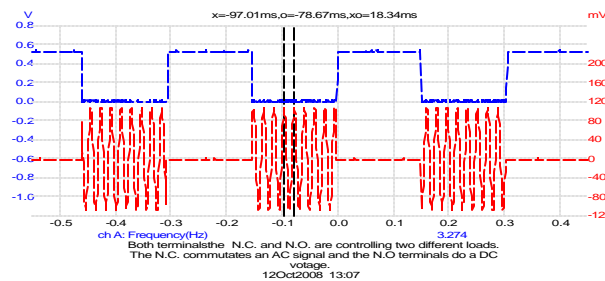
control
output



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



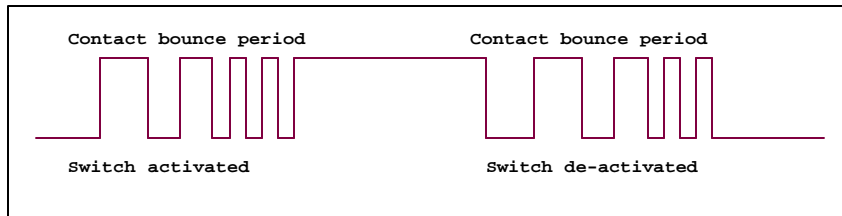
Both terminals of EDR82441 are isolated of each other that allow commutating DC and AC powers.



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.

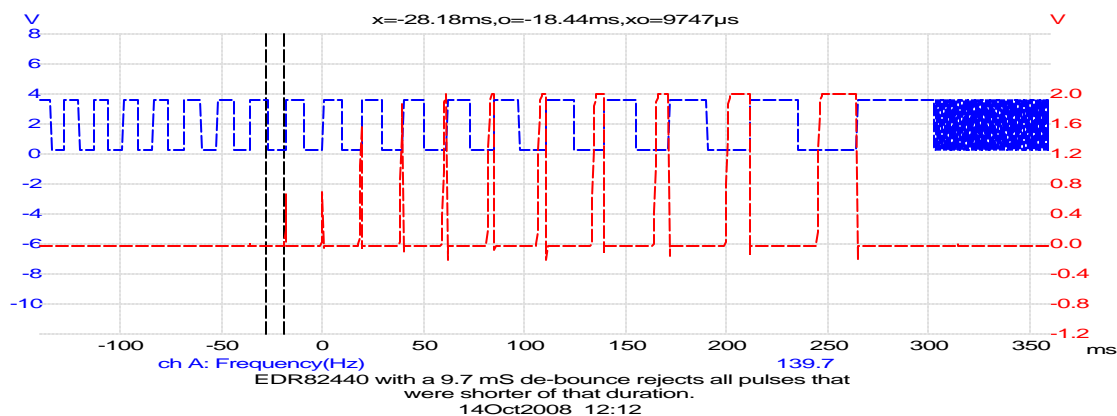


The Problem

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

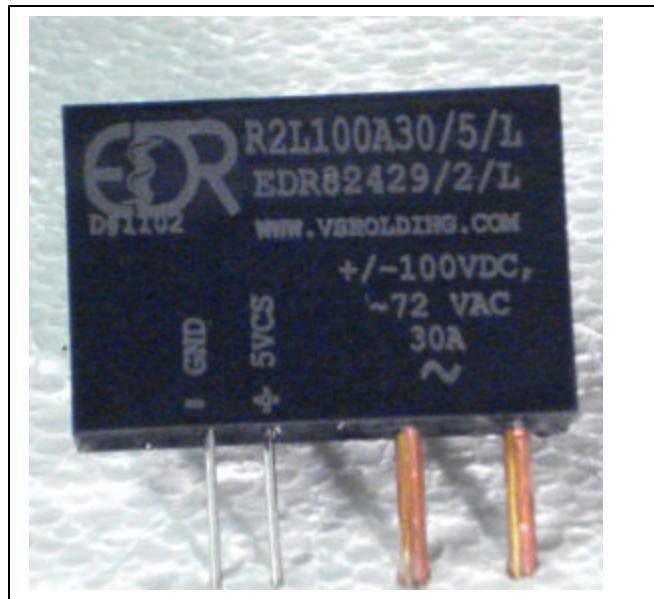
There are several ways to solve the problem of contact bounce (that is, to "de-bounce" the input signal). Often the easiest way is to get a piece of equipment that is designed to accept "bouncy" input and EDR's made Solid-State Relays are a solution.



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.

EDR82425 (500VDC/20A), normally closed relay

The family of high-power SPST-N.C
1-Form B, SPST-N.C. (normally closed) Solid-State Relays



Available from 30V/50A to 600V/20A



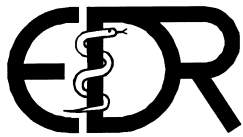
Electronic Design & Research Inc

Under management



VS Holding LLC

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

Technology for people's ideas

1 Form B, SPST-NC, Low Control Power SSR

20A Normally Closed, 30mA controlled Solid State Relay

- Features:** Utilizes only 1.5 sq. in. of PCB area and only 1.15" tall
 Sealed Construction for Automatic Soldering and Cleaning
 High sensitivity, only 1 mA required
 Very high surge current tolerance
 Very low on-state resistance, less than .016 Ohm
 Standard 0.1" Pin Spacing
 Available for 3.3V, 5V, 12V, 3-36V input control voltages

Input Specifications: p/n EDR82425

Input DC Voltage see the Features
 Output Voltage & Current see the available selection

Typical Output Specifications (R4L500D20/x):

Operating DC voltage range	500VDC
Maximum continuous current	20A rms
Maximum surge current (IDM) - 1mS	400 A
Continues current (ID), 100mS	100 A
Maximum on-state resistance	.016 Ohm
Rising time	2.7µS
Delay-on time	60 µS
Falling time	1.2µS
Delay-off time	18 µS
Maximum switching frequency	15 Hz
Leakage at maximum rating, 25°C	4 µA

Test performed at the input current equal to 1 mA

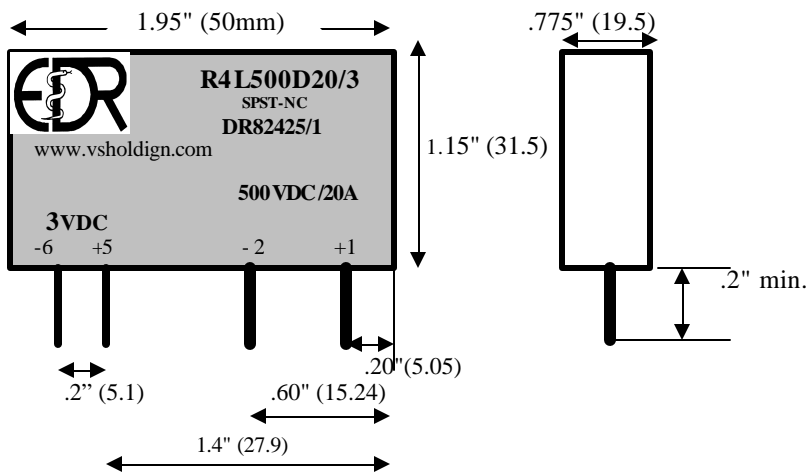
General Specifications :

Ambient operating temperature range	-30 ⁰ C to 100 ⁰ C
Ambient storage temperature range	-40 ⁰ C to 125 ⁰ C
Dialectic Strength input-to-output	3,500 V rms (MIN)

Mechanical Specifications:

Weight(oz)	.08
Encapsulation	ResTech 10207/053
Dimensions for D3L package	1.15"H x 1.95"L x 0.775"W
Terminals/pins for the input	.030" diameter
Terminals/pins for the output	.060" diameter

Information and pins-out for a SIP4 package



All Dimensions are in inches (millimeters).

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.

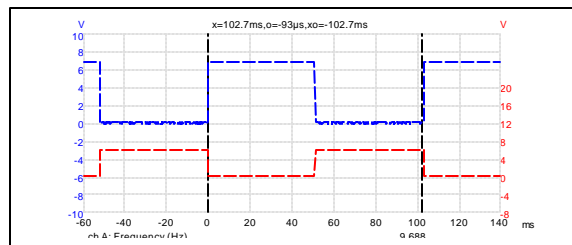
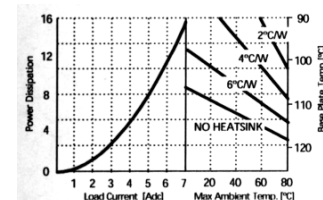
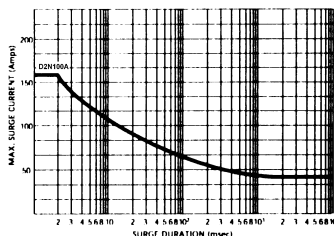
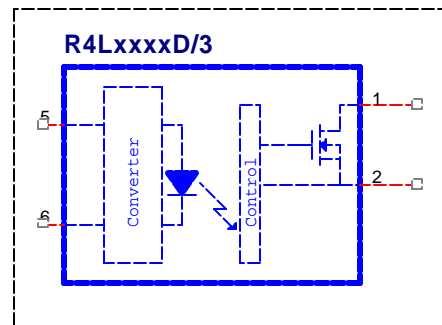
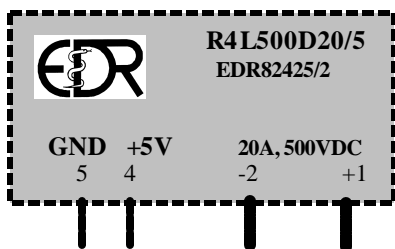


Figure 1
 A relay chops at 20 Amp at about 10 Hz.

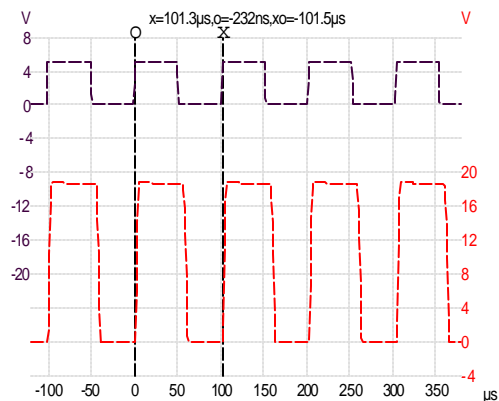
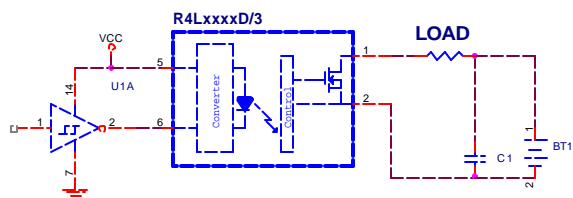
- PIN 1: + LOAD
- PIN 2: - LOAD (return)
- PIN 5: +DC CONTROL
- PIN 6: - DC (return) CONTROL



Application, p/n EDR82425/1



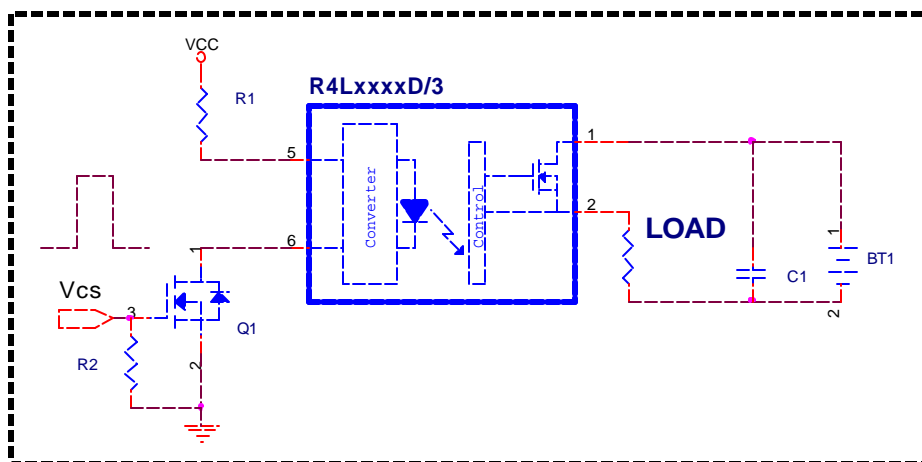
A relay manufactured for a DC-power control



Input Electrical Characteristics (Ta = 25⁰C) for R4L500D20/3, p/n EDR82425/1

	Minimum	Nominal	Maximum	
Control Signal, Pins 4-5	4.6	4.8	5	V
Control Current, Pins 4-5	28	30	40	mA
Turn on		3.9		V
Turn off	3.6			V

An external resistor, connected in series can be use for a different control voltage (current must not exceeded 40mA)



Applying various control voltages on a relay with 3Vcs input

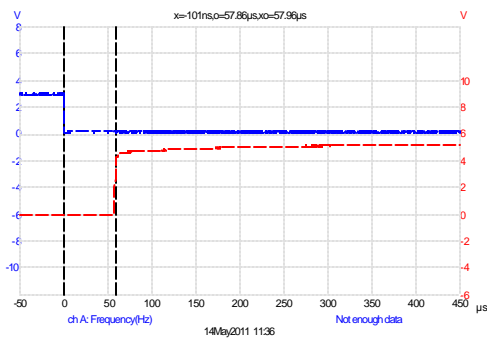
We offer Solid-State Relays with a various control voltages, which can be found on the last page of this data sheet. A relay with 3Vcs is easily adaptable for a various control voltage. A proper valued R1 must be installed to insure the maximum performance. In most cases, similar to an electromechanical relay, a current of 20mA is sufficient to control the relay.

The following equation should be used to calculate the R1 value to insure the required control current:

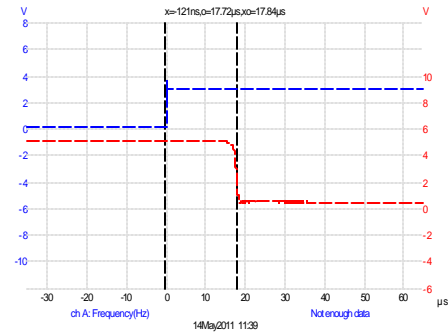
$$R1 = (Vcs - 4.0) / I_{cs}$$

Where is R1 – required resistor; Vcs – Control Voltage; I_{cs} – Control Current

Switching time test – Load – 25 Ohm & 20A, a single 100 mS pulse width



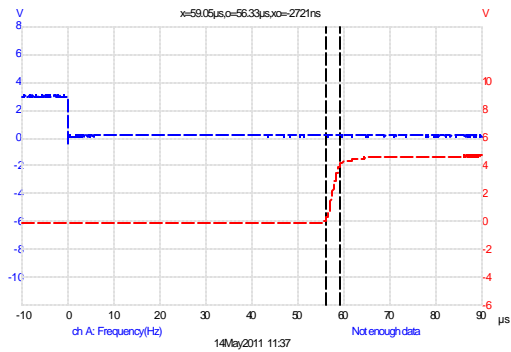
Load
Control



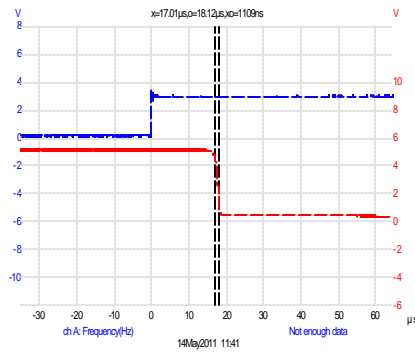
Load
Control

Turn-on delay is 60 μ S

Turn-off delay is 17.84 μ S



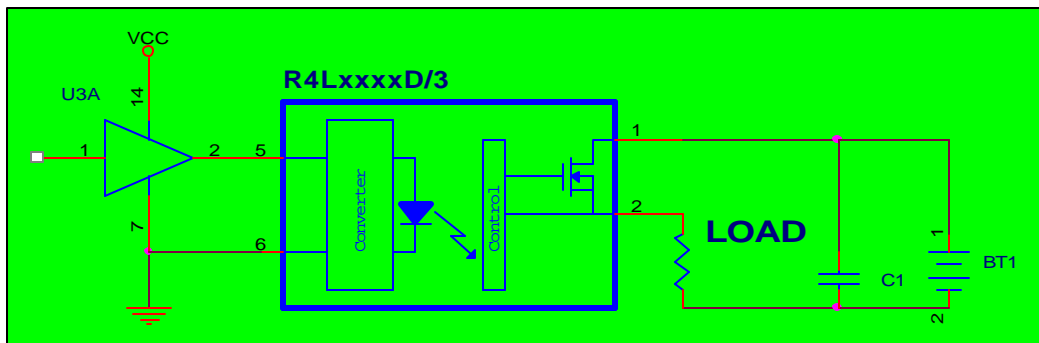
Load
Control



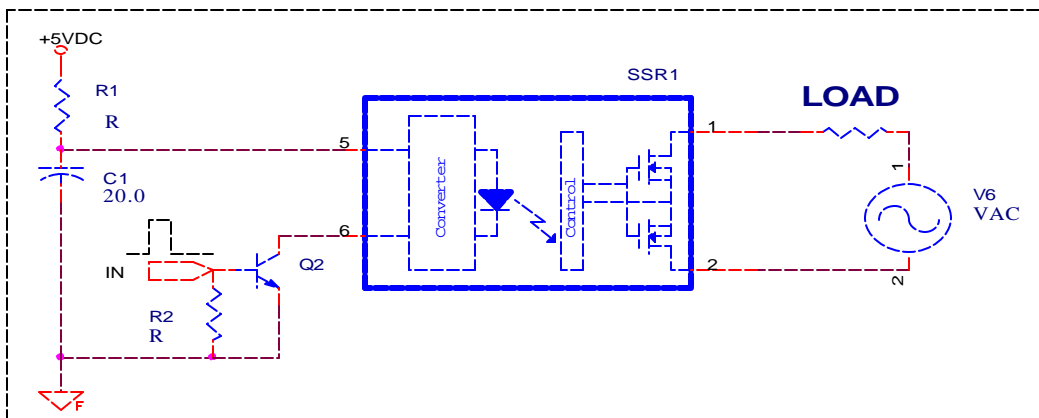
Load
Control

Rising Time is 2.7 μ S

Fall Time is 1.132 μ S



Switching Circuit for VDC (above) and VAC (below) applications



1 Form B, SPST-NC Solid State Relays to replace electromechanical relays

OUTPUT SPECIFICATIONS

(We rated our SSR's for the maximum current without a heat sink)

Model Number	Package	Operating Voltage	Id (A) cont.	p/n	notes
R1L30D6/xx	SIP4, mini	0 to 30 VDC	6 A rms	EDR82486/x	
R2L45D10/xx	SIP4	0 to 45VDC	10A rms	EDR82734/x	
R1L55D2/xx	SIP4, mini	0 to 55 VDC	2.3 A rms	EDR82487/x	
R3L55D05/xx	SIP4	0 to 55 VDC	0.5A	EDR82774/x	
R1L60A1/xx	SIP4	+/-60VDC (42VAC)	1.0 A rms	EDR82792/x/L	low power
R1L60A3/xx	SIP4	+/-60VDC (42VAC)	3.0 A	EDR82644/x	
R3L75D15/xx	SIP4	0 to 75 VDC	15 A rms	EDR82642/x	
R2L75D15/xx	SIP4	0 to 75 VDC	15 Arms	EDR82737/x/L	low power
R3L75D10xx	SIP4/SIP5	+/- 75VDC (50VAC)	10 A rms	EDR82646/x/L	low power
R1L100D06/xx	SIP4, mini	0 to 100 VDC	0.65 A rms	EDR82488/x	
R2L100A18/xx	SIP4/SIP5	+/-100VDC (72VAC)	18A rms	EDR82648/x/L	low power
R2L100D35/xx	SIP4/SIP5	0 to100VDC	35A rms	EDR82428/x/L	low power
R2L100A30/xx	SIP4/SIP5	+/-100VDC (72VAC)	30A rms	EDR82429/x/L	low power
R1L150A02/xx	SIP4 mini	+/- 150 VDC (100VAC)	0.2 A rms	EDR82479/x	
R3L200D6xx	SIP4	0 to 200VDC	6A rms	EDR82730/x	
R3L200A5xx	SIP4/SIP5	+/- 200Vdc (140VAC)	5A rms	EDR82731/x	
R3L200D11xx	SIP4	0 to 200VDC	11A rms	EDR82732/x	
RPL200D35/x/P	Panel Mont.	0 to 200VDC	35A rms	EDR82424/x/P	
RPL200A18x/P	Panel Mont.	+/- 200VDC (140VAC)	18A rms	EDR82425/x/P	
R3L200A10xx	SIP4/SIP5	+/-200VDC (140VAC)	10A rms	EDR82733/x	
R1L250D04/xx	SIP4 mini	0 to 250VDC	0.4 A rms	EDR82480/x	
R1L350A008/xx	SIP4	+/-350 VDC (230VAC)	0.08 A rms	EDR82656/x	
R1L400D03/xx	SIP4	0 to 400VDC	0.3 A rms	EDR82427/x	
R1L400A02/xx	SIP4	+/-400VDC (280VAC)	0.2 A rms	EDR82426/x	
R2L500A1/xx	SIP4	+/-500VDC (350VAC)	1A rms	EDR82424/x	
R4L500D20/xx	SIP4	0 to 500VDC	20A rms	EDR82425/x	
R4L500A10/xx	SIP4	+/-500VDC (350VAC)	10A rms	EDR82398/x	
R4L600D20/xx	SIP4	0 to 600VDC	20A rms	EDR82423/x	
R4L600A9/xx	SIP4	+/-600VDC (480VAC)	9A rms	EDR82399/x	
R2L600A2/xx	SIP4	+/-600VDC (480VAC)	2.0A rms	EDR82468/x	



All relays can be assembled in a panel mount box (0.82”H x 2.7”L x 2.0”W), please replace “R1” or “R2” with “RP”

A suffix “P” should be added to a p/n, for an example EDR82429/x/L/P

Larger varieties of relays possible to assemble in a panel mount package, P/N EDR82425 for an example.

The speed and frequency properties of many DIN-types relays very much resembled the p/n EDR82486. There is some differences for varies relays and all depended on the output power. Please request a specific data sheet if that is important for your application.

In the same packages, we manufacture a family of miniature, low power Solid State Relays, built with MOSFETs. Those relays designed for an extremely small input control current. Only 3.0 mA @ 2.6 VDC required to operate. Please request a data sheet 7090 for p/n EDR82804. Relays were designed as a replacement of a SSR with a TRAIC or SCR output in applications where a low power consumption and low leakage current are must.

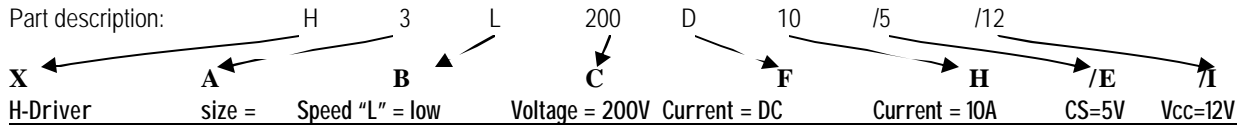
We charge no production set-up fee for an order of 400 and above for any type (input and output specifications) Solid State Relay/Switch and Solid State Breaker.

Electronic Design & Research Inc. ** 7331 Intermodal Dr. ** Louisville ** KY 40258

Tel: 502-933-8660; Fax: 502-933-3422; Sales: 800-336-1337; e-mail: vsholding@vsholding.com

Selection and Ordering Instruction for EDR's made Solid State Modules such as Relays, Switches, Breakers, 1/2 and Full-bridge Drivers, etc.

Notes: During past ten years rapid development of new and additional [products gave us no choice but to expend, modify and unify part descriptions. Below represent the third modification. Our modules description will be marked according to the specifications below but p/n EDRxxxxx will stay the same for already items in circulation (already sold).



“X” module type

- D Solid-State Relay or Switch with SPST -NO (normally open) output terminals
- R Solid-State Relay or Switch with SPST -NC (normally closed) output terminals
- W Solid-State Relay DPST/SPDT output terminals
- T Driver, such as 1/2-bridge or a SPDT relay which can work as a 1/2 driver
- M Driver, such as a switch with built-in PWM controller
- H Full-bridge (H-bridge) Driver
- C Relay with built-in de-bouncing or a turn-on/off delay
- B Solid State Breaker and brakes control modules
- S Solid-State Relay with sensing a load current

“A” package dimensions

- 1 0.615”H x 1.48”L x 0.290”W
- 2 1.75”H x 1.80”L x 0.595”W
- 3 1.125”H x 1.75”L x 0.8”W
- 4 1.15”H x 2.0”L x 0.92”W
- 5 1.15”H x 2.8”L x 1.15”W
- 6 DIP24, 0.375”H x 0.925”L x 0.53”W
- 7 panel mount, .82”H x 3.95”L x 1.96”W
- 8 .575”H x 1.1”L x .2”W
- 9 panel mount 3”H x 10”L x 8”W
- M .625”H x .750”L x .375”
- 0 DIN type enclosure, 2.36”H x 2.36”L x 1.5”W, for 35mm DIN Rail
- P panel mount, .8”H x 2.275”L x 1.75”W
- R panel mount, 1.82”H x 6.0”L x 3.3”W

“B” Speed - A device’s ability to turn ON/OFF output terminal(s) times per second

- L a low speed relay/switch, rated DC - 200 Hz, direct driving control
- A a low speed relay/switch, AC input relays
- M a moderate speed relay, rated DC-2.5 KHz
- N a medium speed relay/switch, rated DC - 25 KHz, direct driving control
- G a medium speed relay/switch, rated DC - 25 KHz, low current control and power
- F a fast relay/switch, rated up to DC - 350 KHz, low current control and power
- S a super-fast relay/switch, rated DC - 1.4 MHz, low current control and power
- U a super-fast relay/switch, rated DC - 1.2 MHz, direct driving control
- V Fast, High Voltage Solid-State Switches with Nanoseconds rise time

“C” Output Voltage - A maximum allowed voltage between output terminals, up to 100kV

It must be replaced with required voltage and we offer the closest and highest value available.

Note: In an “AC” -relay a voltage specified a peak-to-peak maximum voltage and the maximum VAC can be calculated by multiplying a maximum allowed voltage by factor of 0.7

“F” A relay can be use to control either AC, DC or AC/DC power

- A - a relay/switch designed to switch/chop an AC/DC power
- D - a relay/switch designed to switch/chop a DC power
- “none” - relay with a SCR or TRIAC on the output to control only AC power

“H” A maximum allowed RMS CURRENT (Ampere) without a heat sink

We can manufacture a device for any required current.

“I” Some of our products use an internal DC/DC converter no provide a power to the internal electronics.

Varieties voltages are available: 5VDC+/-5%, 12VDC+/-5%, 24VDC+/-5% and 48VDC+/-5%. For a wider input power voltage swing, please add “W” after the voltage. For an example, 24W is for 24V +/-12V.

“E” We offer several standard control voltages 5VDC, 12VDC, 24VDC, 48VDC, 3-20VDC and 18-38VDC. Please specify the input control voltage, as for example D1L30D12/xx. Replace xx with a 3, 5, 12, 24, 48, 3-20 and 18-38 that is for 3VDC, 5VDC, 12VDC, 24VDC, 48VDC, 3-20VDC and 18-38VDC. Respectful control voltage represented at the end of part number in the following way, for an example EDR82653/1 and EDR82653/8. Both relays are almost the same and difference is only an applied control voltage, “1” if for 3VDC and “8” is for 18-38VDC;

Control Voltage	Representation	Control Voltage	Representation	Control Voltage	Representation
3VDC	1	5VDC	2	12VDC	3
24VDC	4	48VDC	5	26VDC	6
3-20VDC	7	18-38VDC	8	90-120VAC	9
74VDC	10				

“Z” A relay/switch built with following standard isolations

- “L” or “none” type relay is 2500 V
- “N” type relay is 3000V, 4000VDC (“H4”) and 5200 (“H5”) VDC.

“T” Turn-on delays; “S” for seconds, “M” for milliseconds, “U” for microseconds, M102 – 100 mS turn-off delay, 102M mS – turn-on delay