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Form B, SPST-NC, Solid State Relays

Normally Closed, Subminiature Solid State Relays

- Features:** Utilizes only .65 sq. in. of PCB area and only .6" tall
 Sealed Construction for Automatic Soldering and Cleaning
 High sensitivity, only 10 mA required
 Very high surge current tolerance
 Very low on-state resistance
 Standard 0.1" Pin Spacing
 Available for 3.3V, 5V, 12V, 15V and 24V input control voltages

Input Specifications:

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

Typical Output Specifications (D1L30D6/3/C):

Operating DC voltage range	0 to 30 VDC
Maximum continuous current	6 A
Maximum surge current (IDM) - 1mS	120 A
Continues current (ID), 100mS	60 A
Maximum on-state resistance	.020 Ohm
Rising time	100 μ S
Delay-on time	275 μ S
Falling time	2.7 μ S
Delay-off time	17 μ S
Maximum switching frequency	150 Hz

Test performed at the input current equal to 10 mA

General Specifications:

Ambient operating temperature range	-40 ⁰ C to 105 ⁰ C
Ambient storage temperature range	-55 ⁰ C to 125 ⁰ C
Dialectic Strength input-to-output	2,500 V rms (MIN)

Mechanical Specifications:

Weight(oz)	.04
Encapsulation	ResTech 10207/053
Dimensions for D2L package	1.15"H x 1.75"L x 0.4"W
Dimensions for DIP24 package	0.375"H x 0.925"L x 0.53"W
Dimensions for D1L package	0.615"H x 1.485"L x 0.29"W
Terminals/solder for DIP24 package	.030" diameter
Terminals/solder for SIP4m package	control-.040", power-.06"

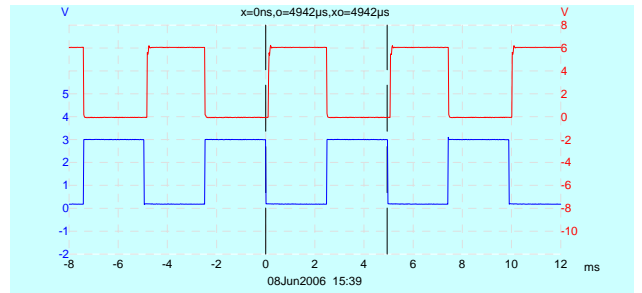
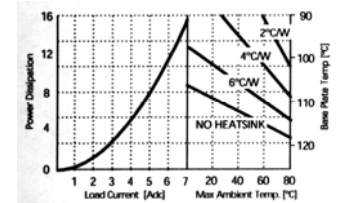
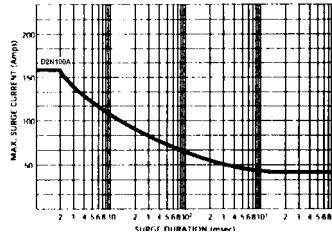
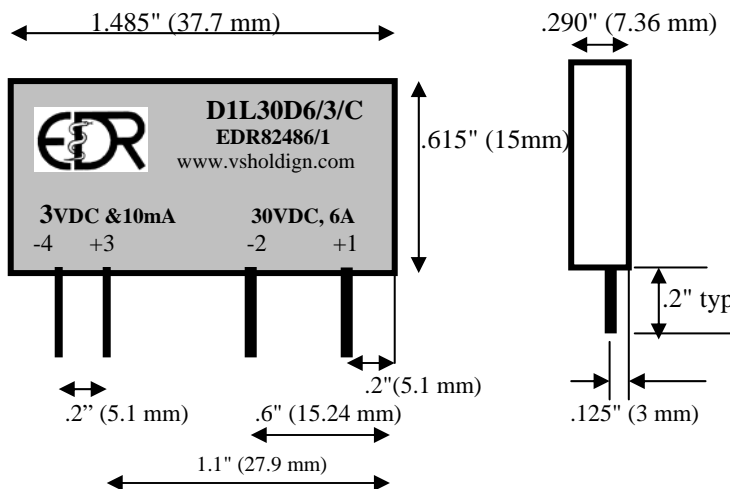


Figure 1

A relay chops a 6 Amp at about 200 Hz.
 A bottom line (blue) is a control signal.
 A top line (red) is an output voltage at a load.

Packaging information and pins-out for a mini SIP4



PIN 1: + LOAD; PIN2: -LOAD (return)
PIN 3: +DC CONTROL; PIN4: -DC (return) CONTROL

All Dimensions are in inches (millimeters).

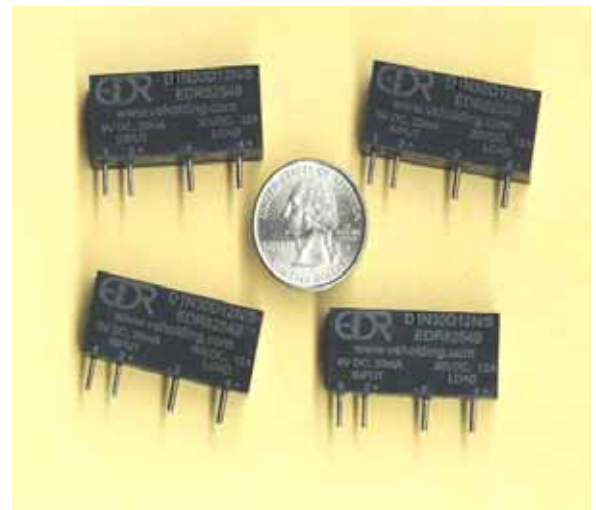


Figure 2

Input Electrical Characteristics (Ta = 25⁰C) for a D1L30D6/3/C model

Characteristic	Test Condition	Min	Typ.	Max.	Unit
Forward Voltage	Input = 10 mA	2.6	3.0	3.3	V
Forward Current		8.3	11	12.54	mA
Reverse Current	Reverse Voltage = 5V			10	μA
Forward Current (max)				50	mA
Reverse voltage (max)				5	V

I. Switching time test – Load - 10VDC & 6.6A, Control Signal – 3.00 VDC & current 10.98 mA

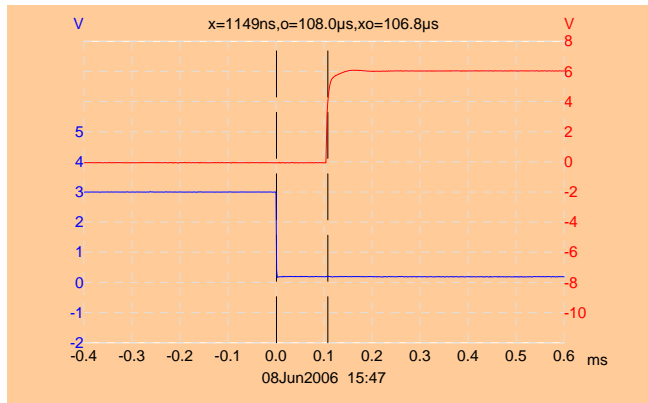


Figure 3. Turn-off delay is 106.8 μs

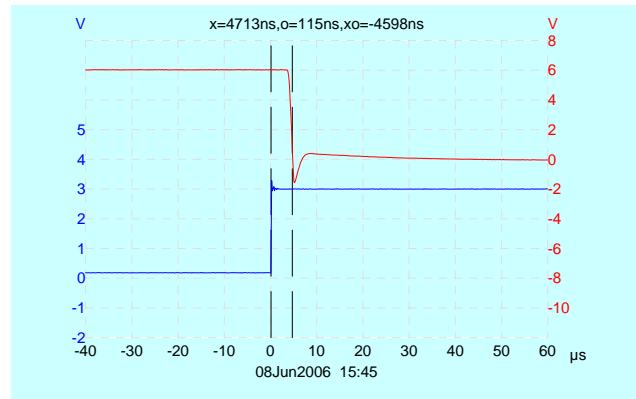


Figure 4. Turn-on delay is 4.598 μs

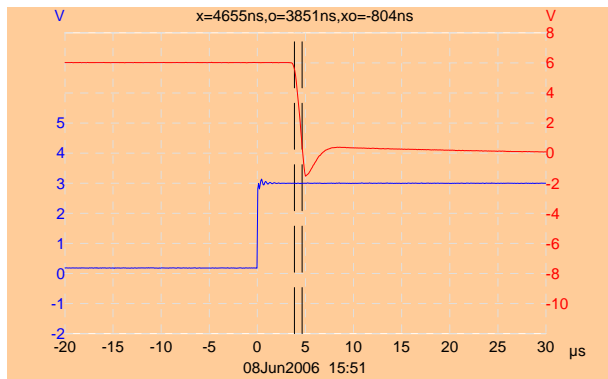


Figure 5. Slope on turn-on is 0.804 μs

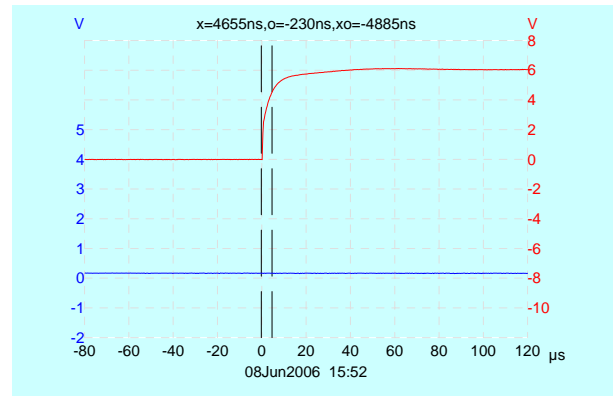


Figure 6. Rise time is 4.885 μs

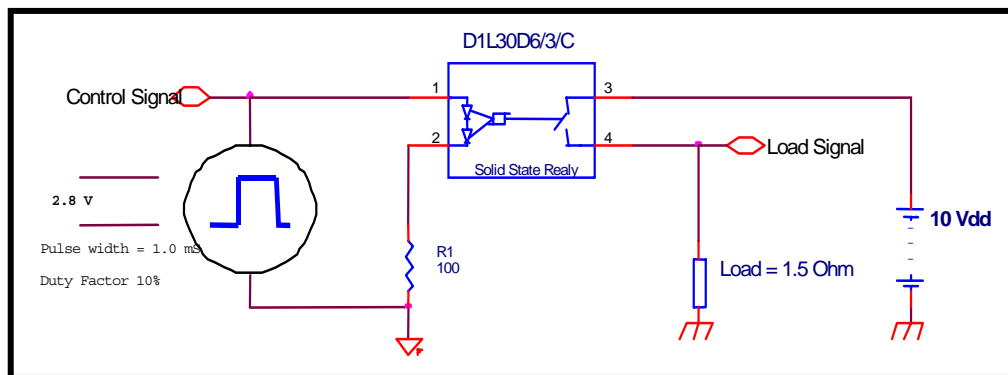


Figure 7. Switching Time Test Circuit

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)

<u>Model Number</u>	<u>Package</u>	<u>Operating Voltage</u>	<u>Id (A) cont.</u>	<u>p/n</u>
D1L30D6/xx/C	SIP4, mini	0 – 30 VDC	6 A rms	EDR82486/x/C
D1L55D2/xx/C	SIP4, mini	0 – 55 VDC	2.3 A rms	EDR82487/x/C
D1L100D06/xxC	SIP4, mini	0 – 100 VDC	0.65 A rms	EDR82488/x/C

We make Solid State Relays with varieties of rated voltages and currents. Please inquire.

All relays can be made in a panel mount box (0.82”H x 2.7”L x 2.0”W), please replace “D1” or “D2” with “D7”

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.

Please specify the input control voltage, as for example D1L30D6/xx/C. Replace xx with a 3, 5, 12, 24, 48, 3-20 and 18-38, they are 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 EDR82486/1 and EDR82486/8. Both relays are almost the same and difference is only an applied to a control voltage, “1” if for 3VDC and “8” is for 18-38VDC;

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

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.

Cost of a Solid State Relay is very much tied to an ordered volume, in most cases a relay costs in low teens in order of 1000 or more.

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.

A part description will be marked according to the description below but p/n EDRxxxxx will stay the same for already items in circulation (already sold).

In the same package we make DPST-NO and SPST-NO relays. Both types made with n AC and DC input

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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Ordering Instruction for EDR's brand of Solid State Relays/Switches

D a b c e f /h /i /k /z /0 /v

“D” is for our standard packages.

(a) Package dimensions

1	0.615”H x 1.48”L x 0.290”W
2	1.15”H x 1.75”L x 0.4”W
3	1.15”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, 0.82”H x 2.7”L x 2.0”W

(b) Speed - A device's ability to turn ON/OFF output terminal(s) per second

L	a low speed relay/switch, rated DC - 2 KHz, direct driving control, SIP4
A	a low speed I/O relay/switch, AC input relays, SIP4
N	a medium speed relay/switch, rated DC - 25 KHz, direct driving control, SIP4
G	a medium speed relay/switch, rated DC - 25 KHz, low current control and power, SIP5
F	a fast relay/switch, rated DC - 150 KHz, low current control and power, SIP5
S	a super-fast relay/switch, rated DC - 1.4 MHz, low current control and power, SIP5
U	a super-fast relay/switch, rated DC - 1.2 MHz, direct driving control, SIP4

(c) Voltage - A maximum allowed voltage between output terminals

It must be replaced with any of offered voltage, 30VDC, 45VDC, 75VDC, 100VDC, 200VDC, 500VDC, 650VDC, 800VDC, 900VDC, 1000VDC and 1100VDC, 1400VDC and 1700VDC.

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.

(e) A relay can be use to control DC or AC/DC power

A	- a relay/switch designed to switch/chop an AC power
C	- a relay/switch with a normal close contacts
D	- a relay/switch designed to switch/chop a DC power

(f) A maximum allowed RMS CURRENT (Ampere) without a heat sink.

(h) We offer several standard control voltages 5VDC, 12VDC, 24VDC, 48VDC, 3-20VDC and 18-38VDC. Please specify the input control voltage, as for example DIL30D12/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;

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

(i) A power supply required for a relay with an internal DC/DC converter. We offer several standard voltages 5VDC, 12VDC, 24VDC and 48VDC.

(k) Output terminals configurations

“1” or nothing	SPST-NO or 1 Form A output terminals
“2”	SPST-NC or 1 Form B output terminals
“5”	SPDT or 1 Form C output terminals
“T”	TOTEM output, break-before-make termination or NO-NO
“7”	DPST-NO or 2 FORM A, normal open terminals
“8”	DPST-NC or 2 FORM A, normal close terminal
“9”	DPST-NC/NO or 2 FORM A, normal close and normal open terminals

(z) A relay/switch built with following standard isolations

“L” type relay is 2500 V

“N” type relay is 3000V, 4000VDC (“H4”) and 5200 (“H5”) VDC.

(0) Screening option, (NONE) for industrial, B for Class B, and S for Class S

(v) a Veri-Slope option.

Examples:

D3F1000D3/4-32/5 - a fast relay/switch designed to work with up to 1000 VDC and capable of 3 Ampere of rms. A control voltage can be any from 4VDC until 32VDC and required 5VDC to operate properly, SIP5 package.

D3N500A10/12/12 - a medium speed relay/switch designed to withstand 500VDC peak-to-peak or 350VAC and 10 Ampere of rms. A control voltage is 12VDC and the power supply is 12VDC, SIP4 package.