Series D1L- Solid State Relay

DC & AC/DC Subminiature Solid State Relays

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

Technology for people's ideas

Features:
Utilizes only .65 sq. in. of PCB area and only .6" tall
12 Amp continues or up to 100 Amp-pick in miniature size
High sensitivity, even at a high switching frequency
300 A surge current and only 20 mill-Ohms low on-state resistance
Available in DIP24 and a miniature SIP4 packages
Please specify input control voltage: control voltage

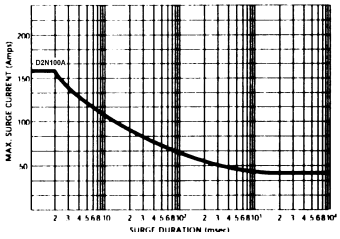
Input Specifications:

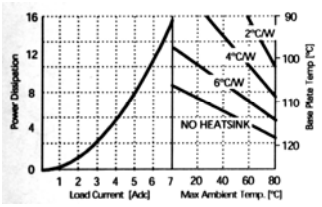
Input DC Voltage	see the Features
Nominal Current	varies

Typical Output Specifications (D1L30D12):

Operating DC voltage range	30 VDC
Maximum continuous current	12 A
Maximum surge current (IDM) - 2mS	200 A
Continues current (ID)	100 A
Maximum on-state resistance	.020 Ohm
Rising time	100 µS
Delay-on time	275 µS
Falling time	2.7 µS
Delay-off time	17 µS
Maximum switching frequency	800 Hz

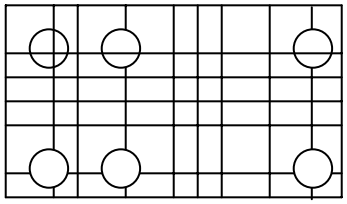
*** Test performed at the input current equal to 20 mA**





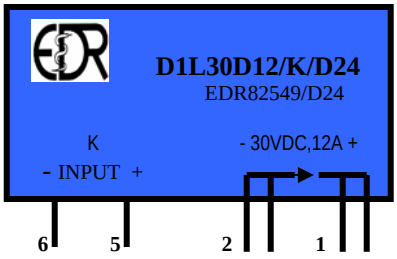
General Specifications:

Ambient operating temperature range	-25^0 C to 85^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dialectic Strength input-to-output	2,500 VAC

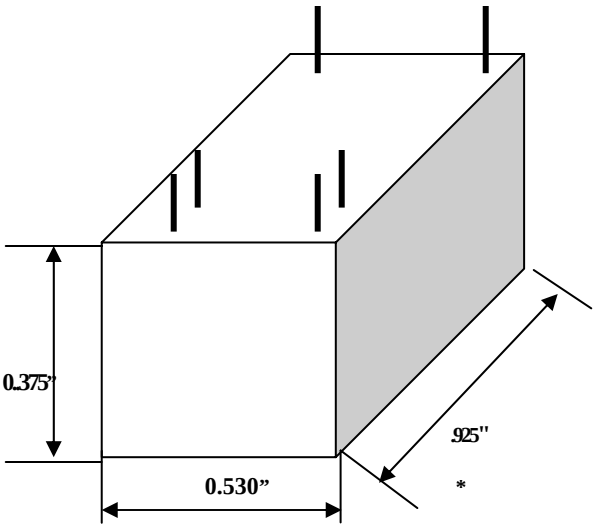


Mechanical Specifications:

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 - 0.40", power – 0.6"



*** replace "K" with a desired and offered control voltage**



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

Input Electrical Characteristics (Ta = 25^{0}C) for xxx\2.8 model, DIP24 & SIP4

Characteristic	Test Condition	Min	Typ.	Max.	Unit
Forward Voltage	Input = 10 mA	2.4	2.8	3.4	V
Forward Current		10	20	25	mA
Reverse Current	Reverse Voltage = 3V			10	μA
Forward Current (max)				50	mA
Reverse voltage (max)				5	V

Input Electrical Characteristics (Ta = 25^{0}C) for xxx\5 model, SIP4

Forward Voltage		3.8	4.3	7.5	V
Forward Current		10	15	30	mA
Reverse Current	Reverse Voltage = 3V			10	μA
Reverse voltage (max)				7	V

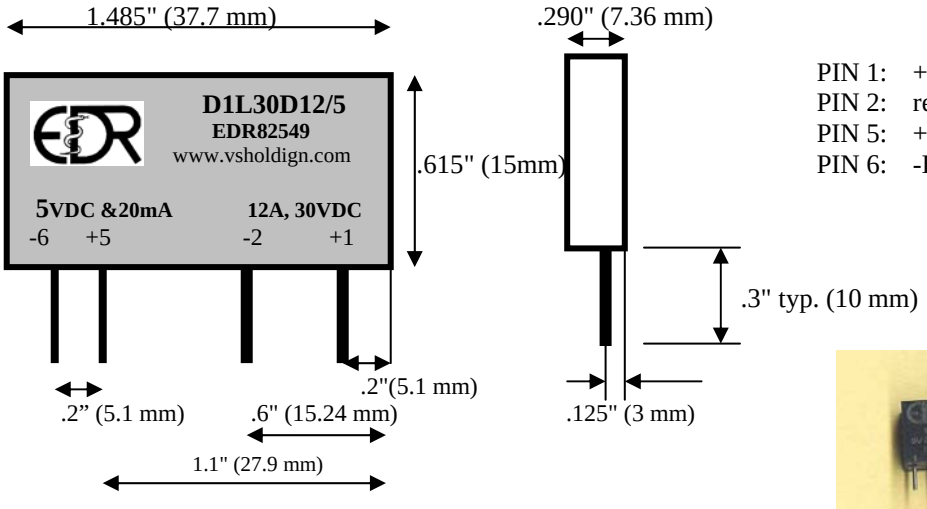
Input Electrical Characteristics (Ta = 25^{0}C) for xxx\3.4-15 model, SIP4

Forward Voltage		3.4	9	15	V
Forward Current		10	20	23	mA
Reverse Current (max)	Reverse Voltage = 7V			10	μA
Reverse voltage (max)				20	V

Isolation and Temperature Characteristics for all models, DIP24 & SIP4

Capacitance input to output			0.8		pF
Isolation resistance	tested at 500V, R.H. [60%	5x10^{10}	10^{14}		ς
Isolation voltage	AC, 1 minute	2500			Vrms
Storage Temperature			-55 ~ 125		^{0}C
Operating temperature		-25		85	^{0}C

Packaging information and pins-out for a mini SIP4m.



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

All Dimensions are in inches (millimeters).

Input terminals (pins) are	.040" (1 mm) diameter.
Output terminals (pins)	.060"
Weight: (typical)	.35 oz. (9.9 g)
Encapsulation:	Thermally Conductive Epoxy

Figure 3

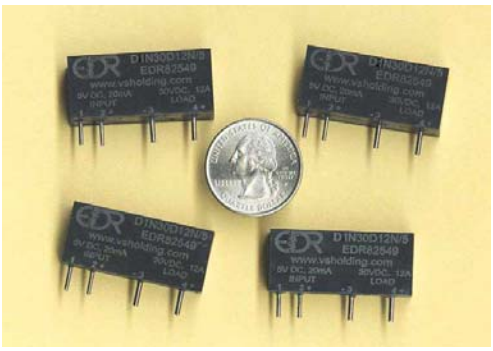


Figure 4

I. Switching time test – Load - 10VDC & 10A, Control Signal – 4.8 VDC & current 20 mA

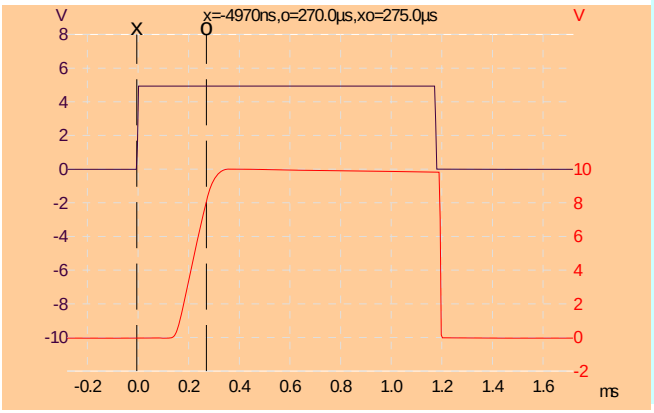


Figure 5. Turn-on delay is 275 µS

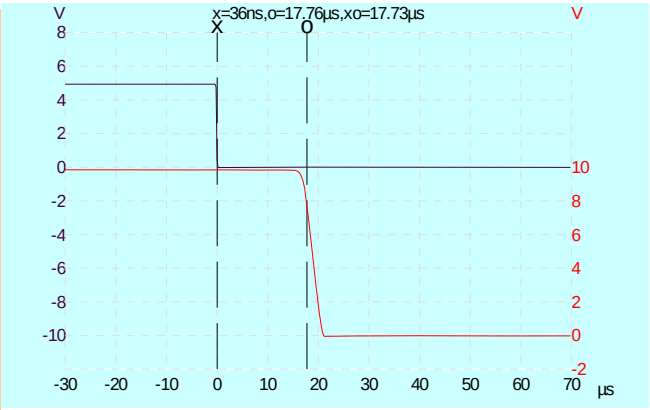


Figure 6. Turn-off delay is 17.73 µS

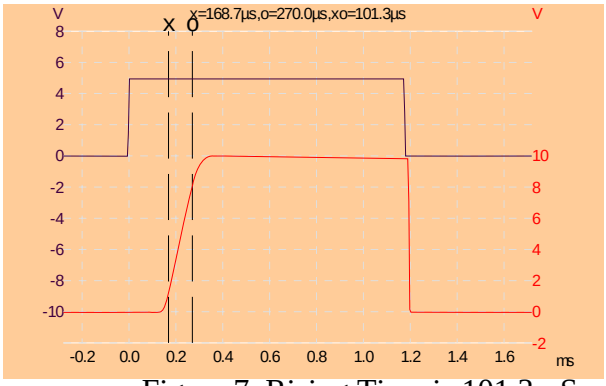


Figure 7. Rising Time is 101.3 µS

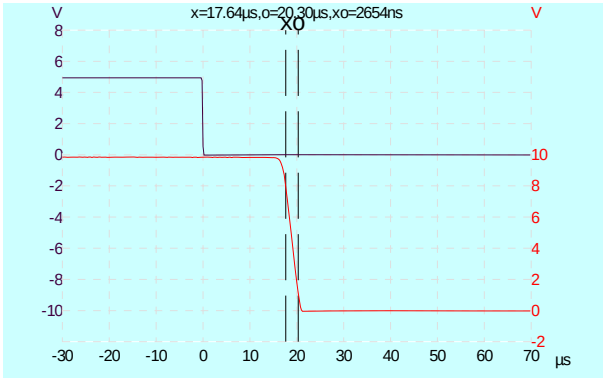


Figure 8. Fall Time is 2.654 µS

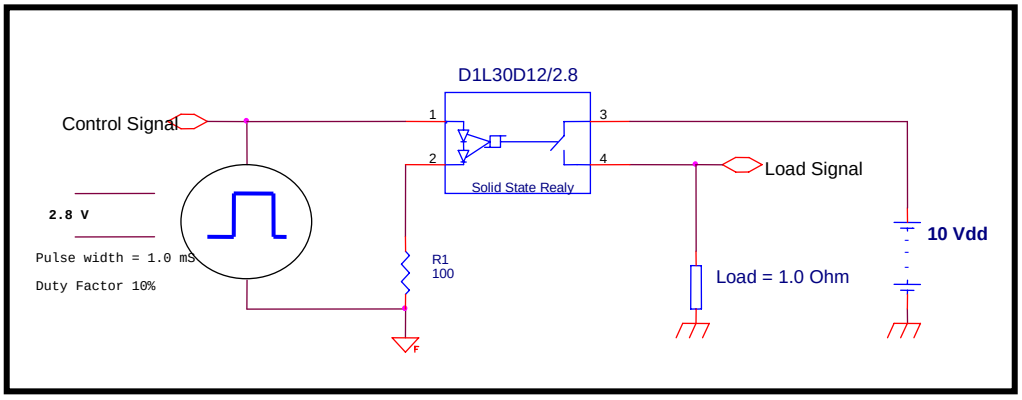


Figure 9. Switching Time Test Circuit

II. Choosing R1 and control current for repay with 5 VDC input.

It is easy to select a proper value for R1 to insure the maximum performance. In most cases, similar to an electromechanical relay, the switching cycle occurs no more than 10Hz and a current of 10mA is sufficient to control the relay. The current must be increased if the delay or rising slope must be improved. Section III shows the switching performance vs. the control current. The following equation should be used to calculate the required control current:

$$\mathbf{R1 = (Vcc - 2.8)/I_{cs}}$$

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

III. Switching time test vs. the control current – Load is 10VDC, 10A and the pulse duration is 1.0 mS

Control current is 10 mA or about 3.3 VDC

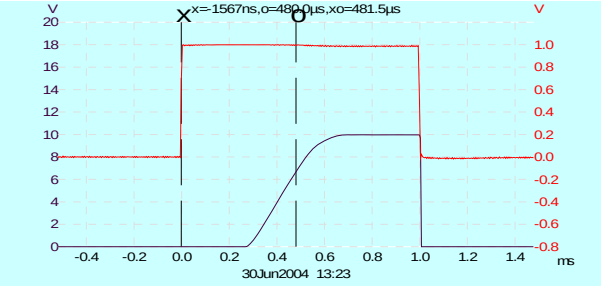


Figure 10. Turn-on delay is 481.5 µS

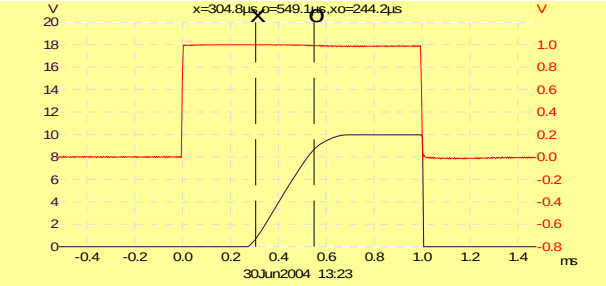


Figure 11. Rising time is 244.5 µS

Control current is 20 mA or about 5.5 VDC

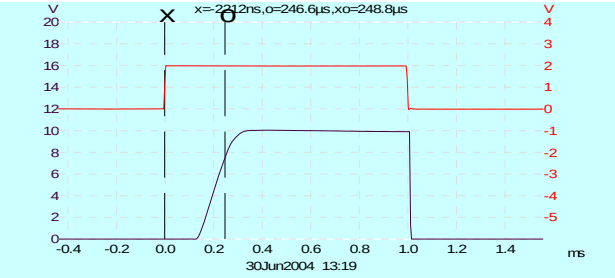


Figure 12. Turn-on delay is 248.8 µS

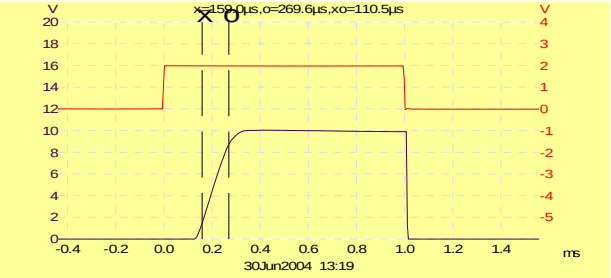


Figure 13. Rising time is 110.5 µS

Control current is 30 mA or about 7.5 VDC

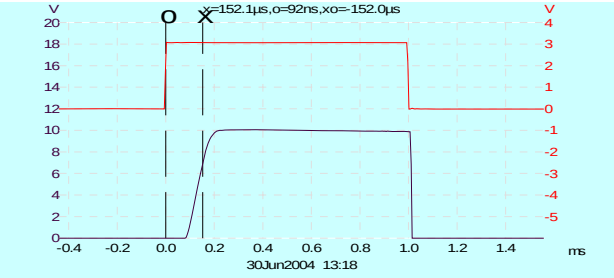


Figure 14. Turn-on delay is 152.0 µS

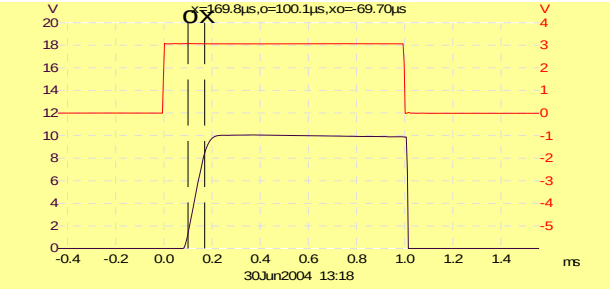


Figure 15. Rising time is 69.7 µS

IV. A switching time test – Load – 10 VDC, 10A, control signal 20 mA, frequency 500 Hz

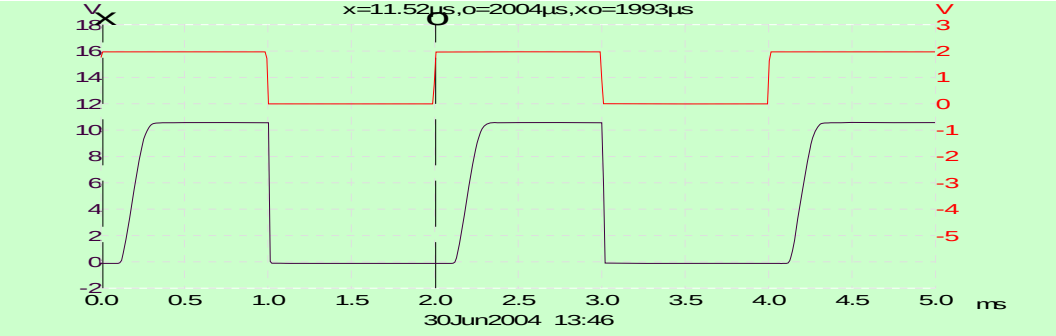


Figure 16. Top line is a control signal and bottom line is a load signal

Low Control Power, 650 Voltage – D1L series

Only 10 mA required and driving by a low power IC Chip
High sensitive, only 70 x 10^{-6} S delay and made in a DP24 or mini SIP4 package
Various output ratings are available, call with your requirements.

Specifications for p/n EDR82991/2 – D1L650D09/5

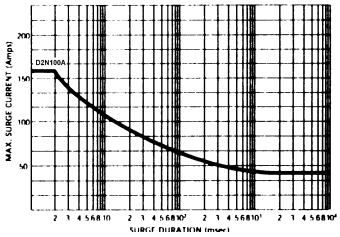
Input Specifications:

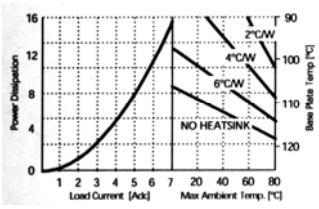
Input DC Voltage	see the Features
Nominal Current	10.0 mA

Typical Output Specifications

Operating DC voltage range	650 VDC
Maximum continuous current	0.9 A
Maximum surge current (IDM) - 2mS	6.8 A
Maximum on-state resistance	.60 Ohm
Rising time	54 µS
Delay-on time	68 µS
Falling time	2 µS
Delay-off time	102 µS
Maximum switching frequency	300 Hz

*** Test performed at the input current equal to 10 mA**



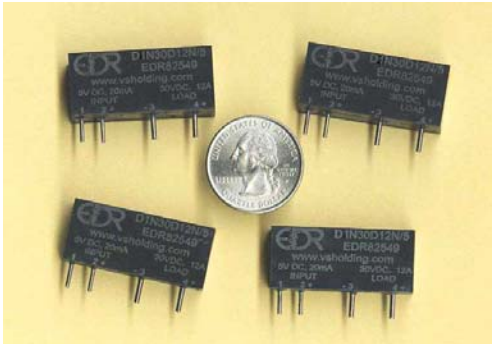


General Specifications:

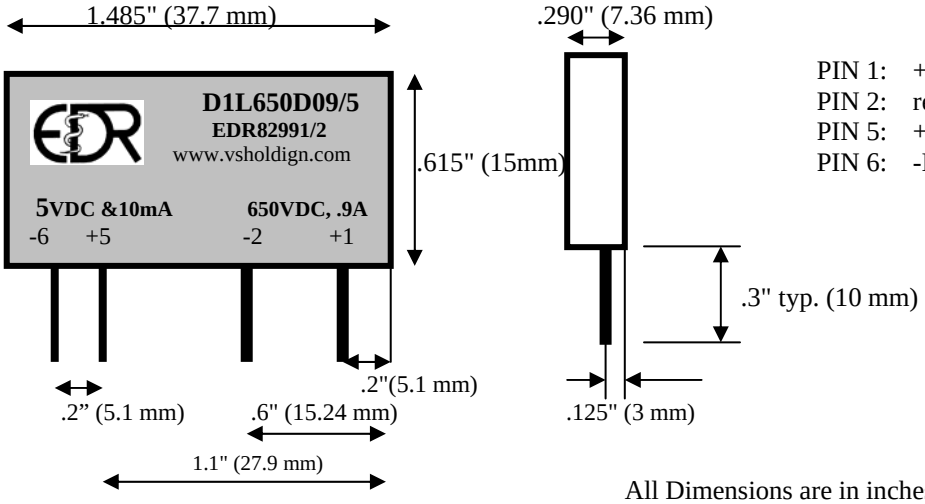
Ambient operating temperature range	-40^0 C to 85^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dialectic Strength input-to-output	2,500 V rms

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 - 0.40", power – 0.6"



Packaging information and pins-out for a mini SIP4m.



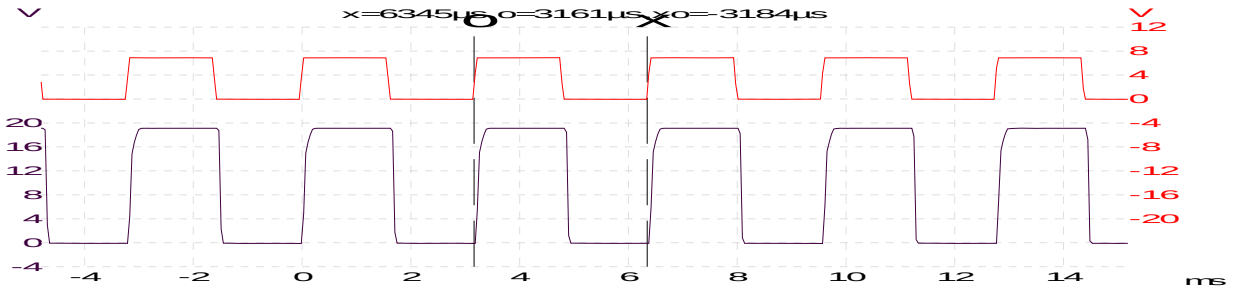
PIN 1: + LOAD
PIN 2: return LOAD
PIN 5: +DC CONTROL
PIN 6: -DC CONTROL

All Dimensions are in inches (millimeters).
Input terminals (pins) are .040" (1 mm) diameter.
Output terminals (pins) .060"
Weight: (typical) .35 oz. (9.9 g)
Encapsulation: Thermally Conductive Epoxy

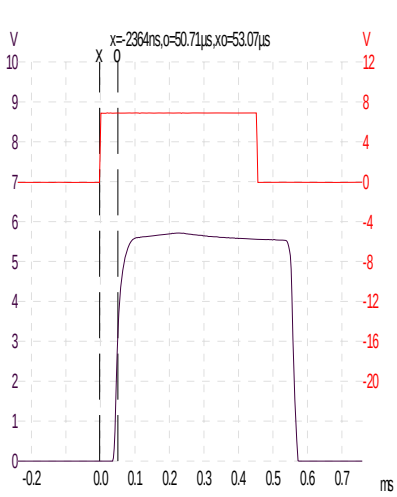
Input Electrical Characteristics (Ta = 25^{0}C) for xxx\2.8 model, DIP24 & SIP4

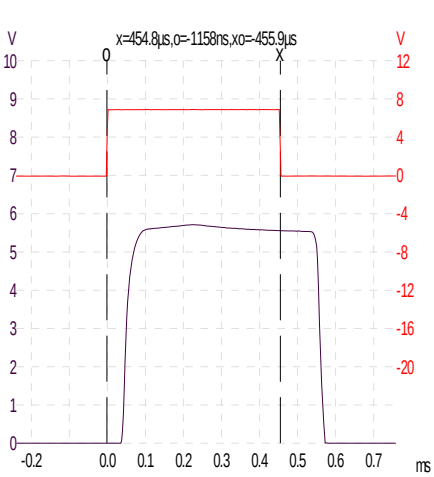
Characteristic	Test Condition	Min	Typ.	Max.	Unit
Forward Voltage	Input = 10 mA	2.4	2.8	3.4	V
Forward Current		9	10	20	mA
Reverse Current	Reverse Voltage = 3V			10	µA
Recommended Operating temperature		-25 ^{o}C		+ 85 ^{o}C	
Reverse voltage (max)				3	V

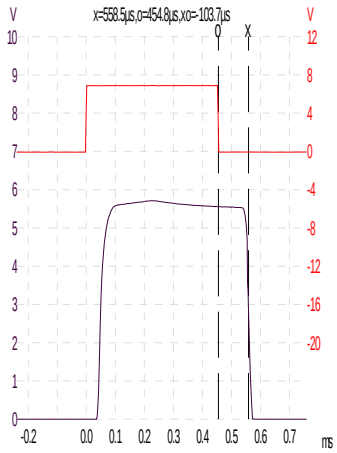
Switching time test – Load 250 Ohm at 200VDC/800mA, control 3.3VDC, 10mA



The EDR82991 chopping capability at about 300 Hz







Turn-on delay is 53 µS **Pulse width is 0.5 mS** **Turn-off delay is 109 µS**

The input circuitry of a miniature, low frequency EDR's family (D1Lxxx) Solid State Relay built with a specially designed photovoltaic device with an LED type input. We make relays with all industrial standard input voltages (3.3V, 5V, 9V. 12V, 15V, 24V, 48V, 4-15V, 9-28V and anything in between). The above specifications were giving without components that insure a proper input current through the device. The typical input current is strongly recommended in a critical applications when a relay attend to be use for the maximum specify current or at highest chapping frequency. The input current is also effect on the turn-on delay.

Please specify your driving voltage and for order of 100 or above there is no additional charge to meet your requirements.

Equation on the Page 3 should be used if you decided to install a resistor in serious by yourself.

Low Power, Isolated Solenoid Driver – D1L series

Only 5 mA, 5VDC and driving by a low power RS-232 IC Chip
High sensitive, only 70 x 10^{-6} S delay and made in a DP24 or mini SIP4 package
Various output ratings are available, call with your requirements.

Specifications for p/n EDR82582/2 – D1L30D05/5

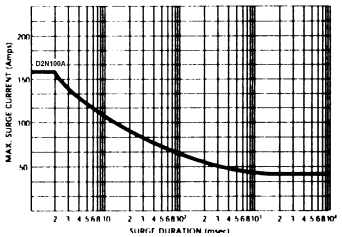
Input Specifications:

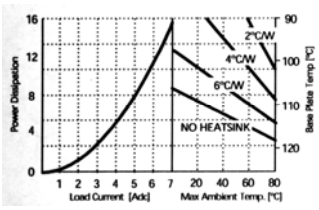
Input DC Voltage	see the Features
Nominal Current	5.0 mA

Typical Output Specifications (D1L30D05):

Operating DC voltage range	30 VDC
Maximum continuous current	0.5 A
Maximum surge current (IDM) - 2mS	6.8 A
Maximum on-state resistance	.30 Ohm
Rising time	54 µS
Delay-on time	68 µS
Falling time	2 µS
Delay-off time	102 µS
Maximum switching frequency	2000 Hz

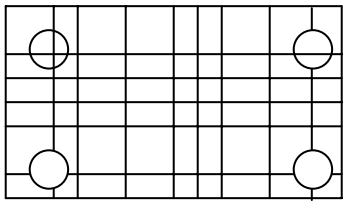
*** Test performed at the input current equal to 5.0 mA**





General Specifications:

Ambient operating temperature range	-10^0 C to 85^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dialectic Strength input-to-output	2,500 VAC



Mechanical Specifications:

Weight(oz)	.04
Encapsulation	ResTech 10207/053
Dimensions for D2L package	1.15"H x 1.75"L x 0.4"W
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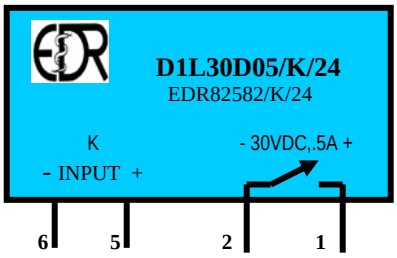
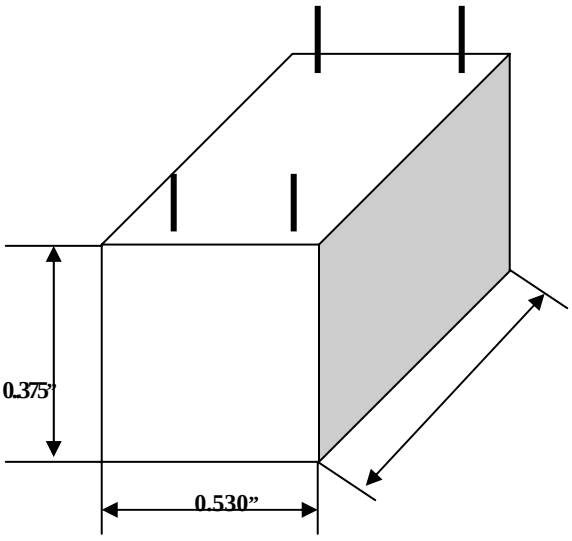
Dimensions for D1L package	0.615"H x 1.485"L x 0.29"W
Terminals/solder for DIP24 package	.030" diameter
Terminals /solder for SIP4m package	control - 0.40", power – 0.6"





*** replace "K" with a desired and offered control voltage**

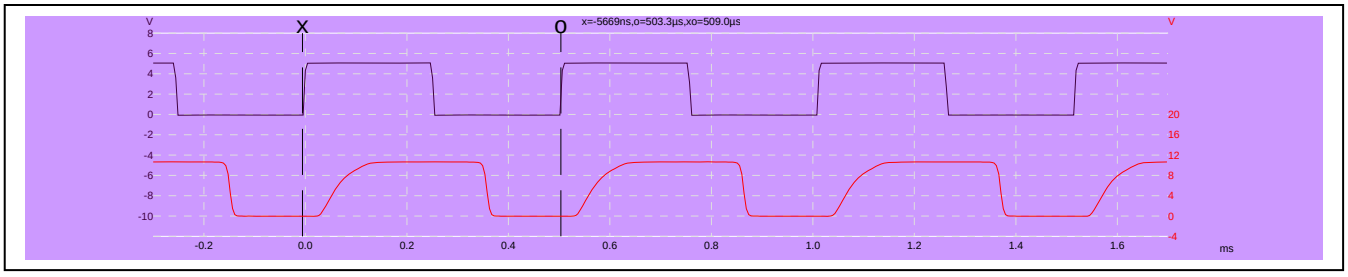
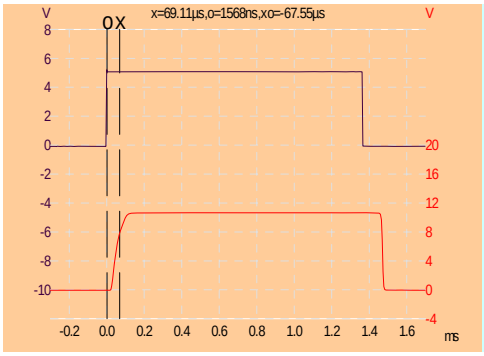
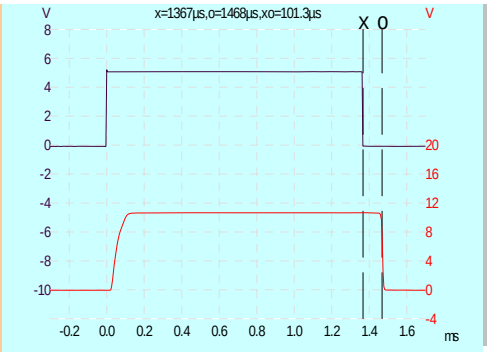


Figure 19. D1L30D05 is a low power, fast relay/switch and useful for various power-management applications and capable to chop at 2 KHz rate

I. Switching time test – Load - 11VDC & 0.5A, Control Signal – 4.9 VDC & current 4.9 mA





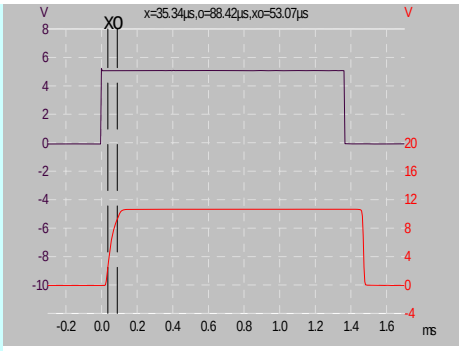


Fig. 20.Turn-on delay is 67.5µS **Fig. 21. Delay-off time is 101.3µS** **Fig. 22. Rising time is 53.1µS**

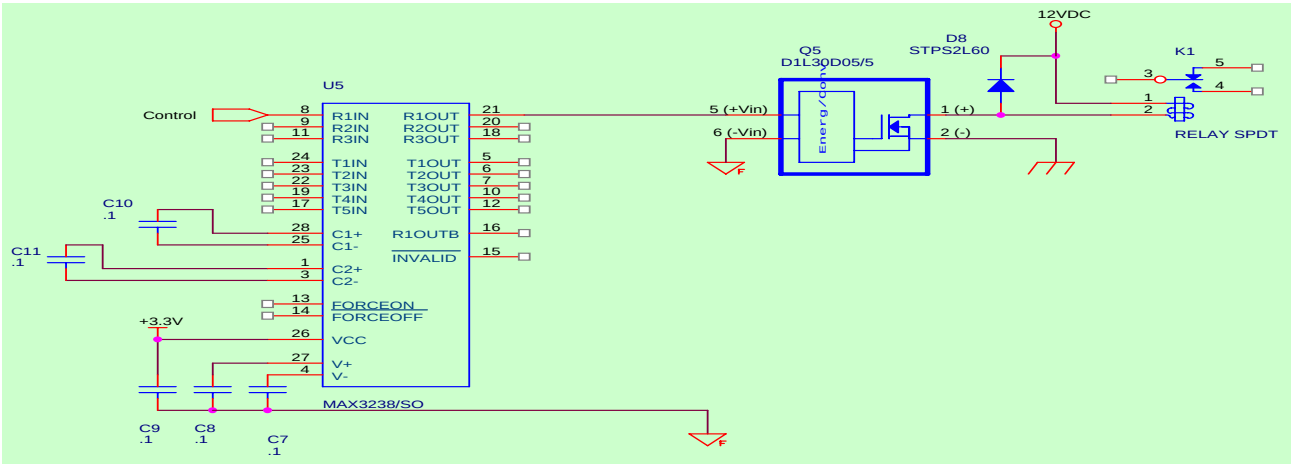
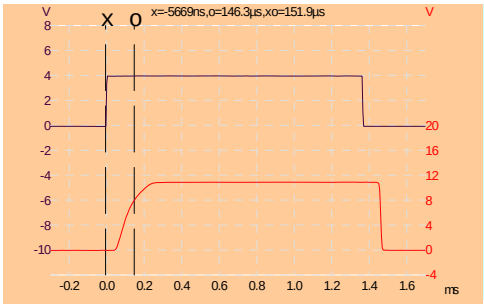
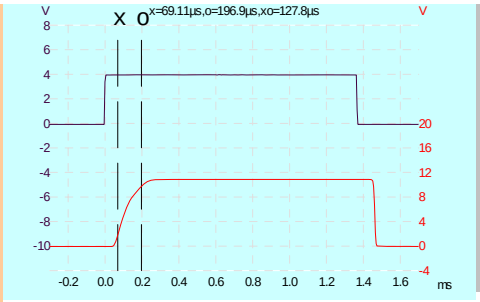


Figure 23. Interfacing a high-power electromechanical relay via EDR82582 with a low-power, fast RS-232 transceiver (MAX3238)

I. Switching time test – Load - 11VDC & 0.5A, Control Signal – 4 VDC & current 3.8 mA





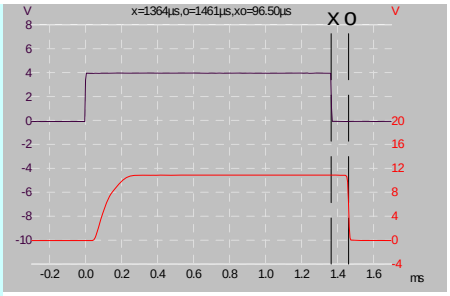


Fig. 24. Turn-on delay is 151.9µS **Fig. 25. Rising time is 127.8µS** **Fig. 26. Delay-off time is 96.5µS**

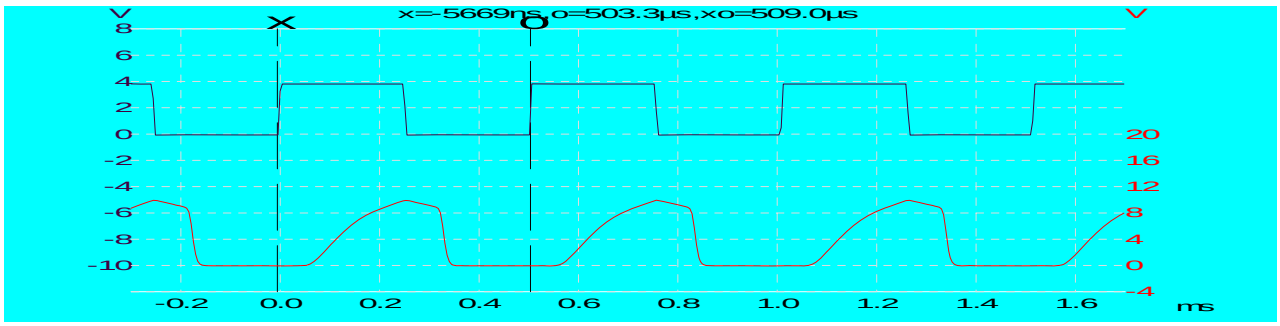


Fig. 27. D1L30D05/5 chops power at 2 KHz and requires only 3.8 mA

Low cost DPST (2 Form A) Relays

Up to 600VDC & +/-600 Solid State Relays

Electronic Design & Research
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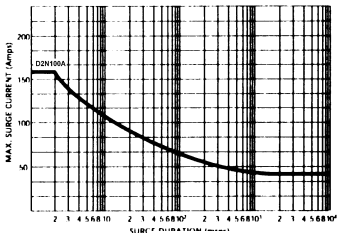
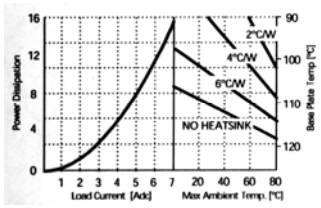
Technology for people's ideas

Features: Utilizes only 1.65 sq. in. of PCB area and only 1.1" tall
A family of low cost Solid State Relays – designed for varieties of Industrial applications to control an average power.
Relays offered with range of control (input) voltages and required only 25 mA to operate properly. There are several output voltages available: 30, 40, 55, 100, 200 and 600 VDC with a maximum current of up to 40A rms per terminal.

Input Specifications:

Input DC Voltage	see the Features
Nominal Current	25mA

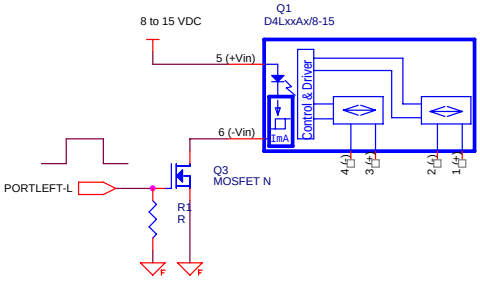




Typical Output Specifications (D4L30D22):

Operating DC voltage range	30 VDC
Maximum continuous current	22 A
Maximum surge current (IDM) - 2mS	700 A
Continues current (ID)	200 A
Maximum on-state resistance	.003 Ohm
Rising time	100 µS
Delay-on time	275 µS
Falling time	3 µS
Delay-off time	17 µS
Maximum switching frequency	250 Hz

*** Test performed at the input current equal to 25 mA**



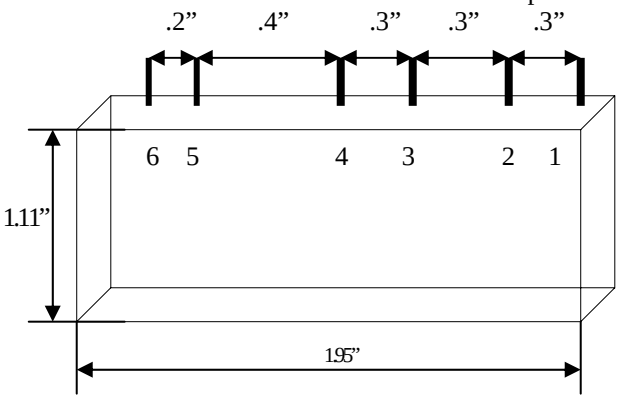
A SSR with the constant current input

General Specifications:

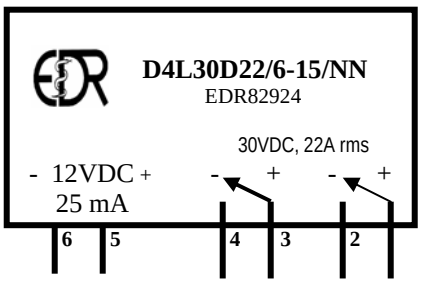
Ambient operating temperature range	-25^0 C to 85^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dialectic Strength input-to-output	2,500 VAC

Mechanical Specifications:

Weight(oz)	.2
Encapsulation	ResTech 10207/053
Dimensions for D4L package	1.11"H x 1.95"L x 0.775"W

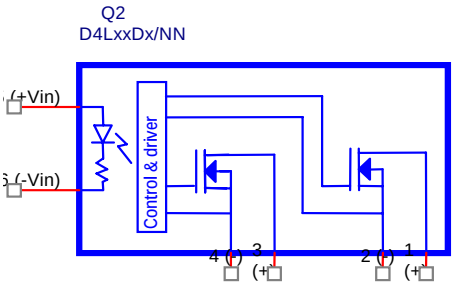


Terminals /solder for SIP4m package control - 0.40", power – 0.6"



PIN1	+V for a DC type and ~ for a AC/DC type relay, 1st terminal
PIN2	-V for a DC type relay and ~ for AC/DC type relay, 1st terminal
PIN3	+V for a DC type relay and ~ for a AC/DC type relay, 2nd terminal
PIN4	-V fro a DC type relay and ~ for a AC/DC type relay, 2nd terminal
PIN5	+V control signal
PIN6	-V (return) 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



A SSR with a LED input

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

Input Electrical Characteristics (Ta = 25^{0}C) for D4Lxxx\8 VDC model,

Characteristic	Test Condition	Min	Typ.	Max.	Unit
Forward Voltage	Input = 10 mA	6.8	8	12	V
Forward Current		23	25	30	mA
Reverse Current	Reverse Voltage = 4V			10	µA
Forward Current (max)				50	mA
Reverse voltage (max)				7	V

Input Electrical Characteristics (Ta = 25^{0}C) for D4Lxxx\6-15VDC model

Forward Voltage		6	12	15	V
Forward Current		24	25	26	mA
Reverse Current	Reverse Voltage = 3V			10	µA
Reverse voltage (max)				7	V

I. Switching time test – Load - 10VDC & 10A, Control Signal – 8 VDC & current 25 mA

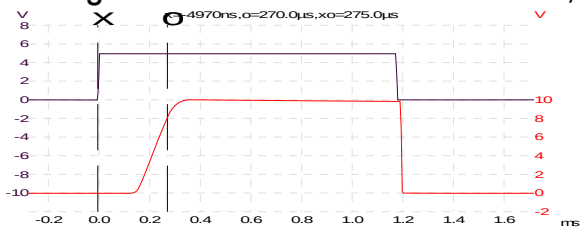


Figure 1. Turn-on delay is 275 µS

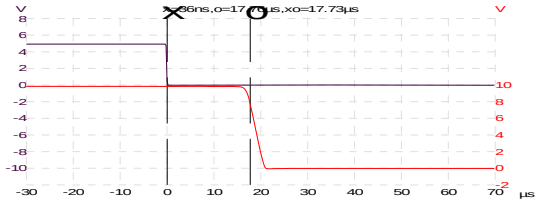


Figure 2. Turn-off delay is 17.73 µS

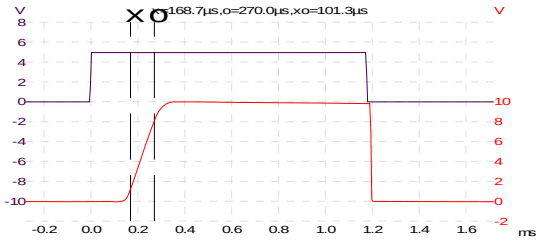


Figure 3. Rising Time is 101.3 µS

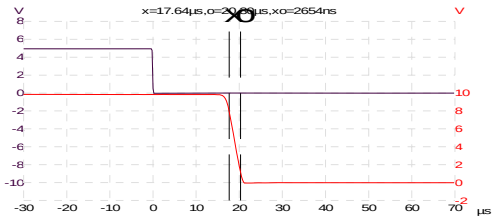
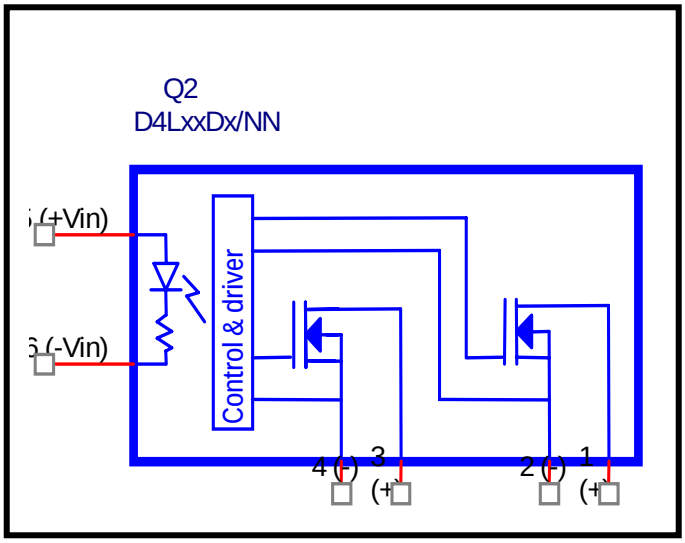


Figure 4. Fall Time is 2.654 µS



Choosing an external resistor with a D4Lxxx\8 VDC type SSRs.

It is easy to select a proper value of an external resistor if only voltage above the recommended range is available. In most cases, similar to an electromechanical relay, the switching cycle occurs no more than 100 Hz and a current of 23 mA is sufficient to control the relay. The current must be increased if the delay or rising slope must be improved. The following equation should be used to calculate the required control current:

R1 = (Vcc – 10)/0.025

Where is a R1 (required resistor); Vcc – an available control voltage. For example, 24 VDC is available hence an external resistor is (24 – 10)/. 025 = 480 Ohm.

Figure 5. Simplified diagram of D4L-type

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Technology for people's ideas

1-Form B, SPST-NC, Solid State Realys

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

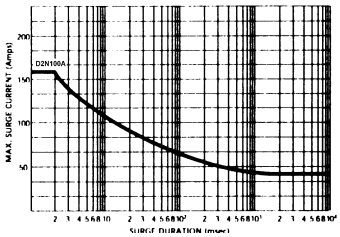
Input Specifications:

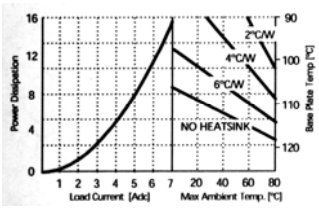
Input DC Voltage	see the Features
Output Voltage & Current	see the available selection

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 µS
Delay-on time	275 µS
Falling time	2.7 µS
Delay-off time	17 µS
Maximum switching frequency	150 Hz

Test performed at the input current equal to 10 mA





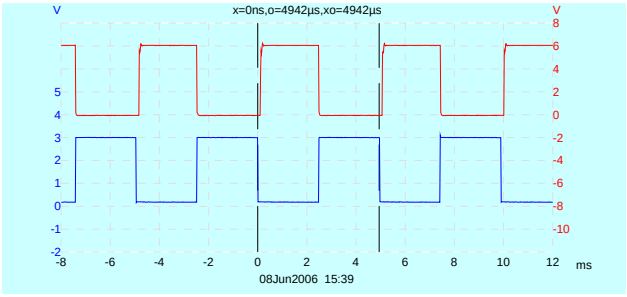


Figure 1

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.

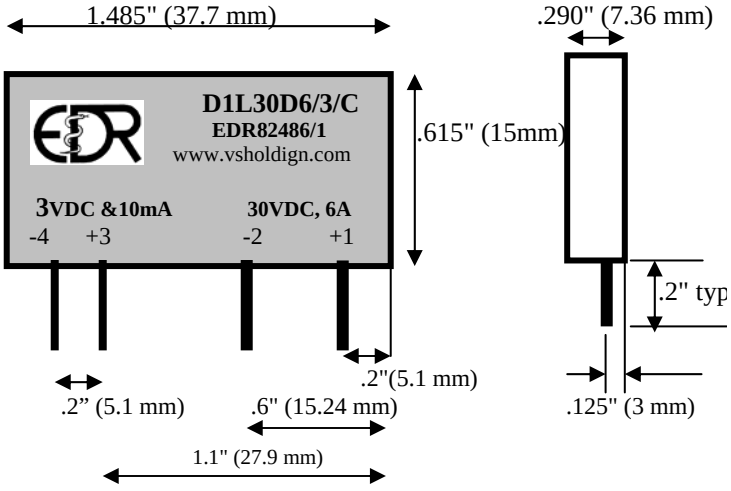
General Specifications:

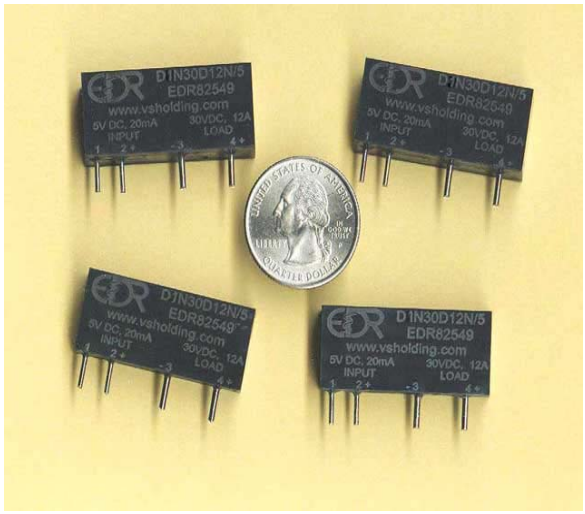
Ambient operating temperature range	-40^0 C to 105^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dialectic Strength input-to-output	2,500 V rms (MIN)

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 - 0.40", power – 0.6"

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 = 25^{0}C) 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

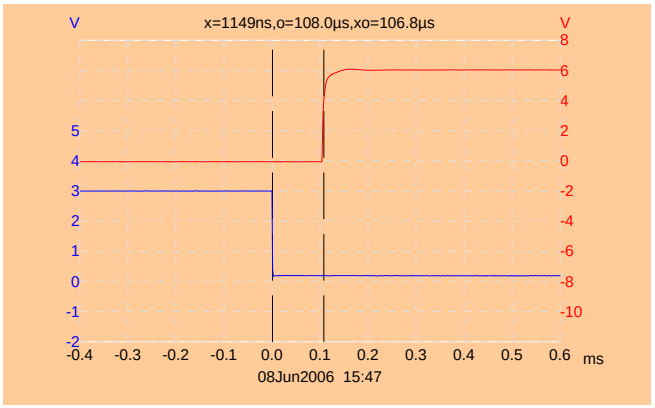


Figure 3. Turn-off delay is 106.8 µS

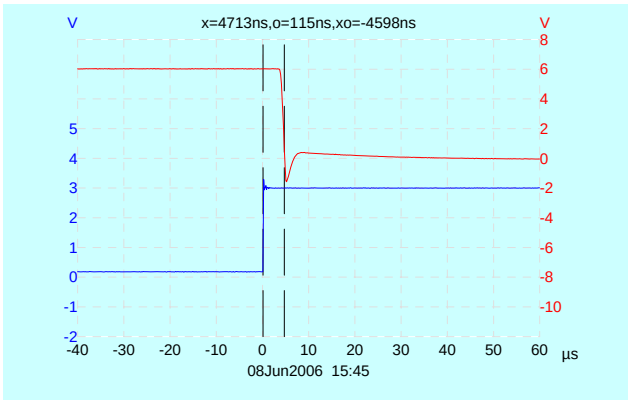


Figure 4. Turn-on delay is 4.598 µS

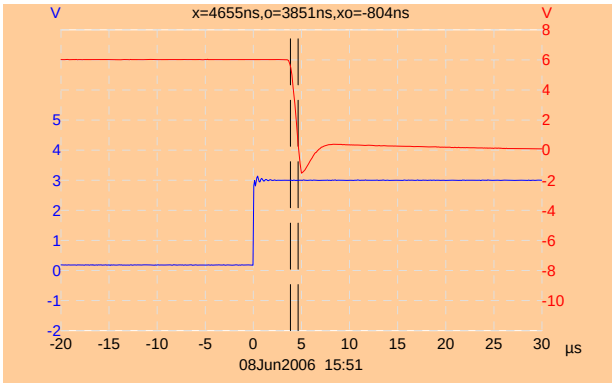


Figure 5. Slope on turn-on is 0.804 µS

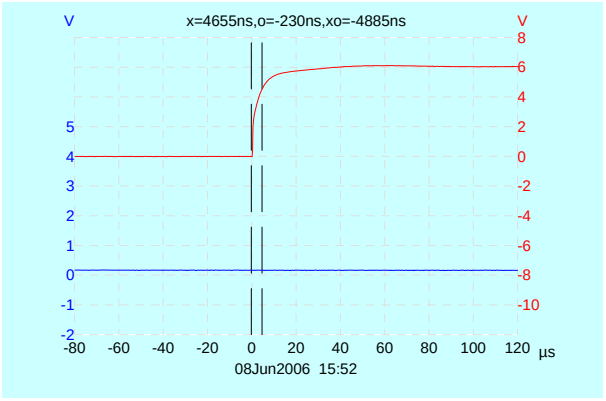


Figure 6. Rise time is 4.885 µS

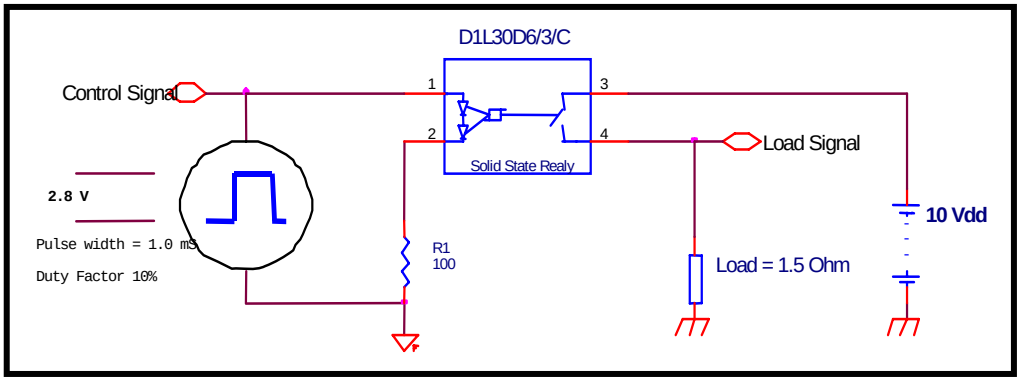


Figure 7. Switching Time Test Circuit

Solid State Relay to replace an electromechanical relay

1-Form A, SPST-NO (normally open) Solid State Relays

Model Number	Package	Operating Voltage	Id (A) cont.	Idm (A)	Ic (mA)	p/n
D1L30D12/xx	SIP4, mini	0 – 30 VDC	12 A rms	300	85	EDR82549/x
D1L30D6/xx	SIP4, mini	0 – 30 VDC	6 A rms	100	50	EDR82588/x
D1L30D05/x	SIP4, mini	0 – 30 VDC	1 A rms	6.8	4	EDR82582/x
D2L55D10/xx	SIP4	0 – 55 VDC	10 A rms	200	80	EDR82586/x
D1L60D5/xx	SIP4, mini	0 – 60 VDC	5 A rms	120	40	EDR82635/x
D1L60D3/xx	SIP4, mini	0 – 60 VDC	3 A rms	60	10	EDR82653/x
D2L75D10/xx	SIP4	0 – 75 VDC	10 A rms	200	80	EDR82996/x
D1L100D2/xx	SIP4, mini	0 – 100 VDC	2 A rms	100	30	EDR82637/x
D2L100D10/xx	SIP4	0 – 100 VDC	10 A rms	180	60	EDR82992/x
D1L200D2/xx	SIP4, mini	0 – 200 VDC	2 A rms	96	28	EDR82639/x
D2L500D1/xx	SIP4	0 – 500VDC	1.3 A rms	30	20	EDR82630/x
D1L30A11/xx	SIP4, mini	+/- 30VDC (21 VAC)	11 A rms	120	50	EDR82634/x
D2L55A8/xx	SIP4	+/- 55VDC (38 VAC)	8 A rms	160	60	EDR82587/x
D1L60A3/xx	SIP4, mini	+/- 60 VDC (42 VAC)	3 A rms	70	25	EDR82636/x
D1L100A2/xx	SIP4, mini	+/- 100 VDC (70 VAC)	2 A rms	50	20	EDR82638/x
D2L100A5/xx	SIP4	+/- 100 VDC (70 VAC)	5 A rms	80	30	EDR82992/x
D1L200A2/xx	SIP4, mini	+/- 200 VDC (140 VAC)	2 A rms	48	20	EDR82640/x
D1L350A08/xx	SIP4	+/- 350VDC (225 AVC)	0.8Arms	4	1.7	EDR82655/x
D2L500A1/xx	SIP4	+/- 500 VDC (350 VAC)	1.1 A rms	25	21	EDR82631/x
D3L500A6/xx	SIP4	+/- 500 VDC (350 VAC)	6 A rms	100	40	EDR82499/x
D1L650D06/xx	SIP4 mini	0 – 650 VDC	0.6A	3	.9	EDR82990/x
D1L650D09/xx	SIP4 mini	0 – 650 VDC	0.9 A rms	6.8	2	EDR82991/x

2-Form A, DPST-NO (normally open) Solid State Relays

D1A60A2/xx/N	SIP6 mini	60VDC/42AVC	2A rms			EDR82485/x
D2L75D10/xx/N	SIP6	75VDC	10 Arms			EDR82589/x
D4L30D12/xx	SIP6	0 – 30 VDC	12 A rms	120		EDR82923x
D4L30D22/xx	SIP6	0 – 30 VDC	22 A rms	200		EDR82924/x
D4L30D40/xx	SIP6	0 – 30 VDC	40 A rms	400		EDR82921/x
D4L30A11/xx	SIP6	+/- 30 VDC (21 VAC)	11 A rms	110		EDR82922/x
D4L30A20/xx	SIP6	+/- 30 VDC (21 VAC)	20 A rms	180		EDR82925/x
D4L40D14/xx	SIP6	0 – 40 VDC	14 A rms	130		EDR82926/x
D4L40D23/xx	SIP6	0 – 40 VDC	23 A rms	220		EDR82927/x
D4L40D40/xx	SIP6	0 - 40 VDC	40 A rms	460		EDR82928/x
D4L40A13/xx	SIP6	+/- 40 VDC (28 VAC)	13 A rms	120		EDR82949/x
D4L40A18/xx	SIP6	+/- 40 VDC (28 VAC)	18 A rms	200		EDR82950/x
D4L55D10/xx	SIP6	0 – 55 VDC	10 A rms	80		EDR82929/x
D4L55D18/xx	SIP6	0 – 55 VDC	18 A rms	150		EDR82930/x
D4L55D32/xx	SIP6	0 – 55 VDC	32 A rms	300		EDR82931/x
D4L55A9/xx	SIP6	+/- 55 VDC (38 VAC)	9 A rms	70		EDR82932/x
D4L55A16/xx	SIP6	+/- 55 VDC (38 VAC)	16 A rms	120		EDR82933/x
D4L100D5/xx	SIP6	0 – 100 VDC	5 A rms	40		EDR82934/x
D4L100D9/xx	SIP6	0 – 100 VDC	9 A rms	70		EDR82935/x
D4L100D19/xx	SIP6	0 – 100 VDC	19 A rms	50		EDR82936/x
D4L100A4/xx	SIP6	+/- 100 VDC (70 VAC)	4 A rms	35		EDR82937/x
D4L100A8/xx	SIP6	+/- 100 VDC (70 VAC)	8 A rms	60		EDR82938/x
D4L200D2/xx	SIP6	0 – 200 VDC	2 A rms	15		EDR82939/x
D4L200D4/xx	SIP6	0 – 200 VDC	4 A rms	28		EDR82940/x
D4L200D7/xx	SIP6	0 – 200 VDC	7 A rms	60		EDR82941/x
D4L200A2/xx	SIP6	+/- 200 VDC (140 VAC)	2 A rms	12		EDR82942/x
D4L200A6/xx	SIP6	+/- 200 VDC (140 VAC)	6 A rms	26		EDR82943/x
D4L600D1/xx	SIP6	0 – 600 VDC	1.2 A rms	9		EDR82944/x

D4L600D3/xx	SIP6	0 – 600 VDC	2.8 A rms	17	EDR82945/x
D4L600D4/xx	SIP6	0 – 600 VDC	4.1 A rms	32	EDR82946/x
D4L600A1/xx	SIP6	+/- 600 VDC (420 VAC)	1 A rms	8	EDR82947/x
D4L600A3/xx	SIP6	+/- 600 VDC (420 VAC)	2.7 A rms	16	EDR82948/x

1-Form B, SPST-NC (normally closed) Solid State Relays

Model Number	Package	Operating Voltage	Id (A) cont.	p/n	
D1L30D6/xx/C	SIP4, mini	0 – 30 VDC	6 A rms	EDR82486/x	
D1L55D2/xx/C	SIP4, mini	0 – 55 VDC	2.3 A rms	EDR82487/x	
D1L100D06/xxC	SIP4, mini	0 – 100 VDC	0.65 A rms	EDR82488/x	
D1L250D04/xx/C	SIP4 mini	0 - 250VDC	0.4 A rms	EDR82480/x	
D1L150A02/xx/C	SIP4 mini	+/-150VDC (110 AVC)	0.2 A rms	EDR82479/x	
D3L75D15/xx/C	SIP4	0 – 75VDC	15A rms	EDR82642/x	low power
D3L75A19/xx/C	SIP4	+/-75VDC (52AVC)	10 Arms	EDR82646/x	low power

1-Form B and 1-Form A, DPST-NC/NO Solid State Relays

Model Number	Package	Operating Voltage	Id (A) cont.	p/n

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 D1L-types relays very much resembled the p/n EDR82549. 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.

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 200 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).

Ordering Instruction for EDR's brand of Fast 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
8	DIP16

(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 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

(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.