500VDC/20A, 350VAC/13Arms Relay/Switch

Powerful, Fast Solid State Relay

Designed to deliver 100KW of power in microseconds

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

Technology for people's ideas

Features:
- Utilizes only 3 sq. in. of PCB area and only 1.15" tall
- 20A continuously or up to a 200A-pulse in a miniature package
- High sensitivity, even at high switching frequencies
- 800A surge current and only 0.05 Ohms on-state resistance

Please specify input control voltage and power supply

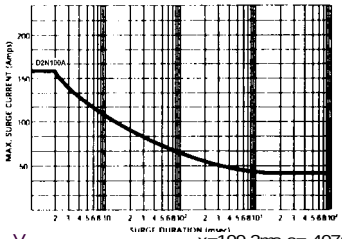
Input Specifications:

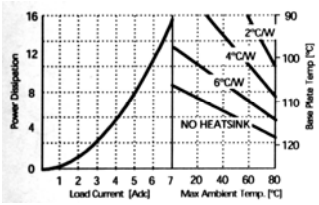
Input Control (pin 4) Current 5mA, see page 3 for information

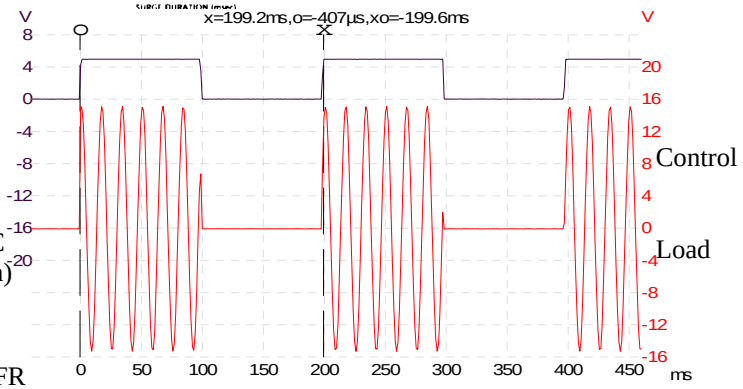
Nominal Current, Vcc, pin 5		50mA/5VDC
Power Supply	Vcc at pin 5	5, or 12, or 15, or 24, or 48VDC

Output Specifications:

Operating DC voltage range	+/-500VDC/350VAC
Maximum continuous current	20 A /13Arms
Maximum surge current (IDM) - .1mS	800 A
Maximum pulsing current, duty 1/50	200 A/10mS
Maximum on-state resistance	0.05 Ohm
Rising time	2.2 µS
Delay-on time	3.0 µS
Falling time	2.6 µS
Delay-off time	8.7 µS
Maximum switching frequency	10.00 KHz







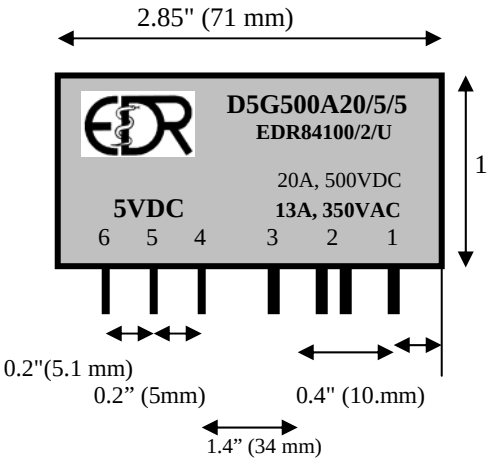
Switching AC power on a 5 Ohm load

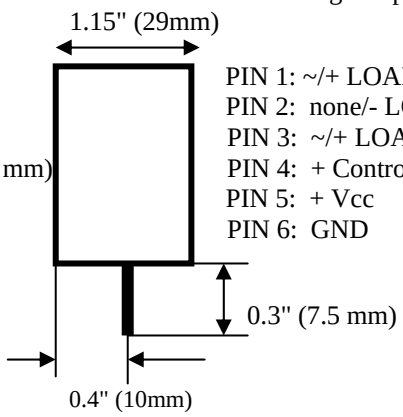
General Specifications:

Ambient operating temperature range	-45^0 C to 85^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dielectric Strength input-to-output	2,500Vrms(min)

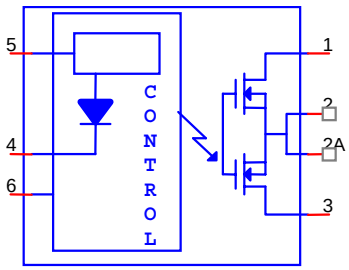
Mechanical Specifications:

Weight (oz)		.2
Encapsulation	Epoxies Etc.	50-2366RFR / 50-2366CFR





PIN 1: ~/+ LOAD
PIN 2: none/- LOAD
PIN 3: ~/+ LOAD
PIN 4: + Control Signal
PIN 5: + Vcc
PIN 6: GND



EDR84100

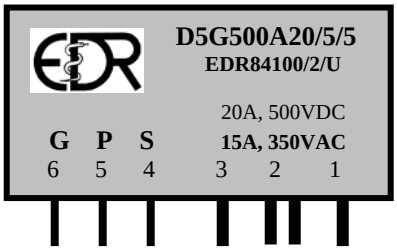
All Dimensions are in inches (millimeters).

Dimensions for SIP4 package	1.15"H x 2.85"L x 1.158"W
Terminals /solder for SIP4 package	control - 0.40", power – 0.64"

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 AC applied voltage and unidirectional for DC applied voltage, should be used to clamp excessive spikes.

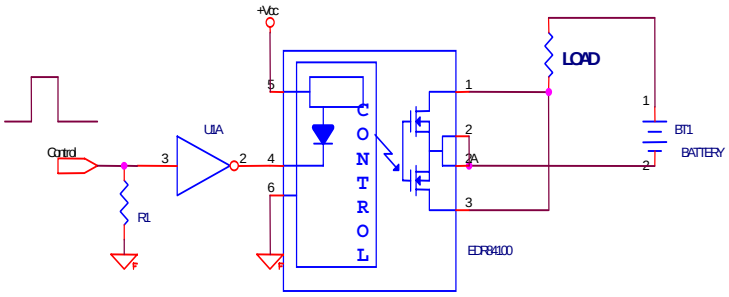
Electronic Design & Research Inc. ** 7331 Intermodal Dr. ** Louisville ** KY 40258
Tel: 502-933-8660; Fax: 502-933-3422; Sales: 800-336-1337; e-mail: vsholding@vsholding.com

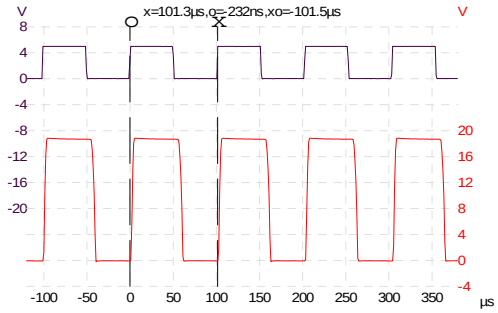
Application of a AC/DC Solid State Relay, p/n EDR84100/2/U in controlling AC or DC power



The relay manufactured for an AC/DC-power control applications made with pins #2 for doubling output current.

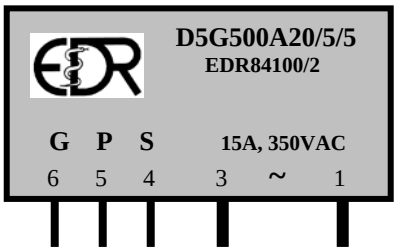
G – ground, P – Power Supply, S – control signal





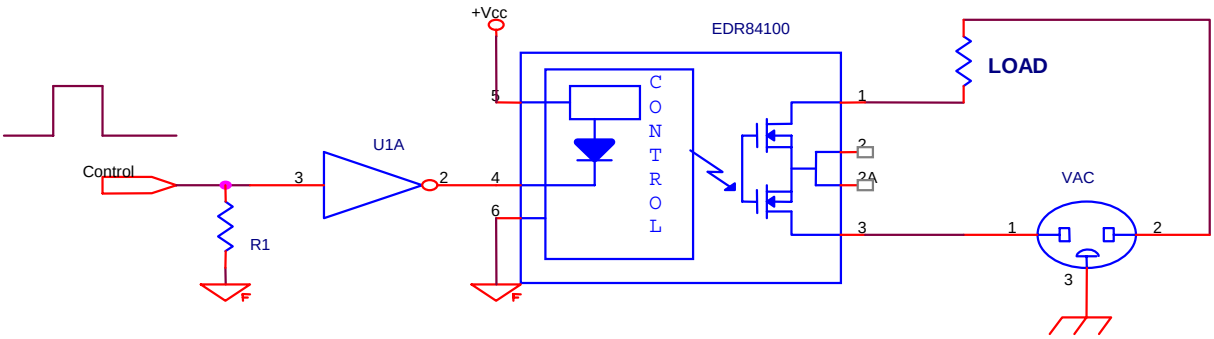
Example of double current for a DC-power application

Application of a AC/DC Solid State Relay, p/n EDR84100/2 in controlling AC power

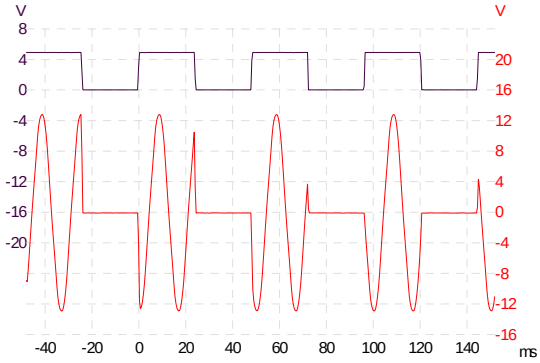


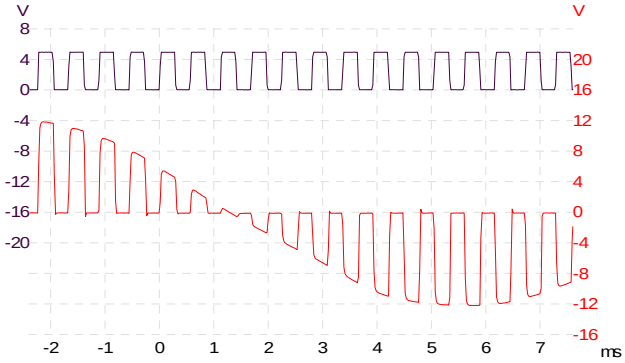
The relay manufactured for an AC-power control applications made without pins #2 for allowing more free space on a PC board.

G – ground, P – Power Supply, S – control signal



Example of an AC-power application





Cycling an AC-power with a random turn on/off

Fast chopping of 60Hz enables precise power control

Input Electrical Characteristics (Ta = 25^{0}C) for D5G500A20/5/5, p/n EDR84100/2

	Minimum	Nominal	Maximum	
Power Supply VDC, Pins 5-6	4.6	5	5.4	V
Power Supply, Current	50	50	100/10Khz	mA
"OFF" state, Control Voltage, normally "HIGH"		5		V
"ON" state, Control Voltage, "LOW"		0.8		V
Maximum Input Current, no external resistor			10	mA
An external resistor can be used to decrease the input current		5		mA

Switching time test – Load – 5 Ohm & 3.6A, a single 50 µS pulse width

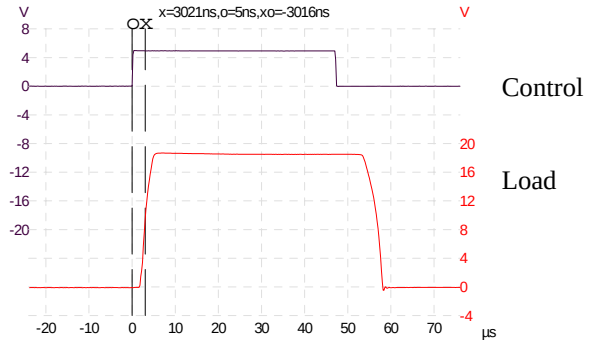


Figure 1 Turn-on delay is 3.0µS

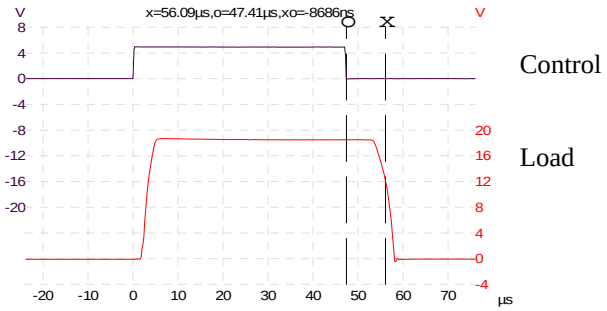


Figure 2 Turn-off delay is 8.6µS

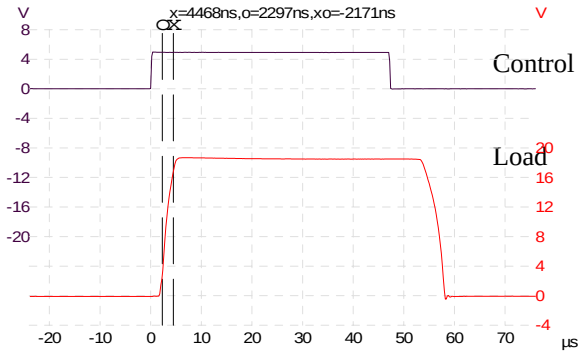


Figure 3 Rising Time is 2.17µS

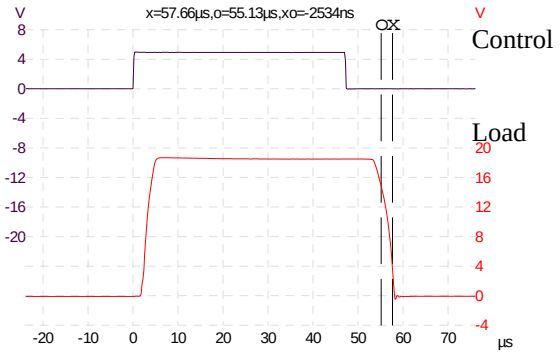
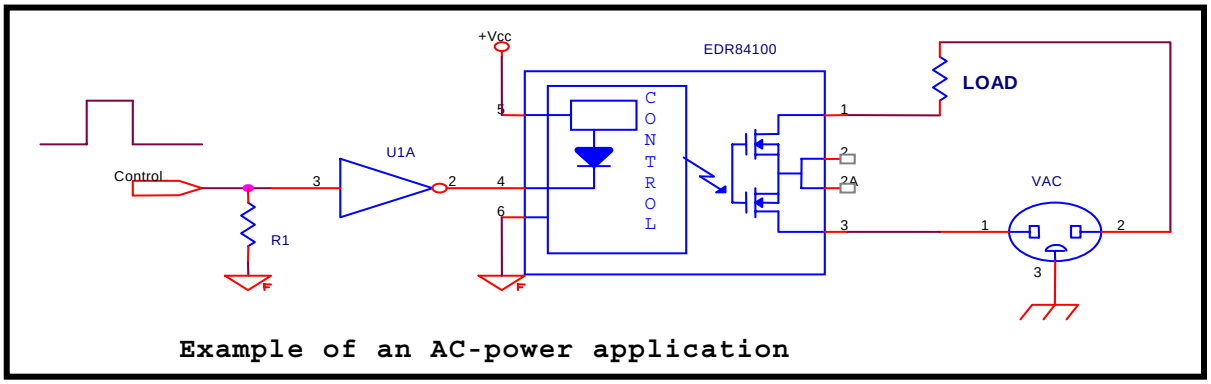


Figure 4 Fall Time is 2.53µS



Switching Time Test Circuit

Ordering Instruction for a EDR's Solid State Realay

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).

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 - 800 Hz, direct driving control
A	a low speed relay/switch, AC input relays
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 DC - 150 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

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

It must be replace 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/DC 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		

(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

"N" or nothing	SPST (1 Form A) output terminals
"NN"	2SPST (2 Form A) output terminals
"NNN"	3SPST (3 Form A) output terminals
"T"	TOTEM or SPDT output, break-before-make termination or NO-NO
"TT"	DPDT (2 Form C) output terminals
"TTT"	3PDT (3 Form C) output 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, assembled as a SIP4 package.