2,500VDC, 3A, 150 KHz Realy/Switch

IGBT type, Powerful Fast Solid State Relay

Designed to deliver 68 KW of power in a microsecond

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

Technology for people's ideas

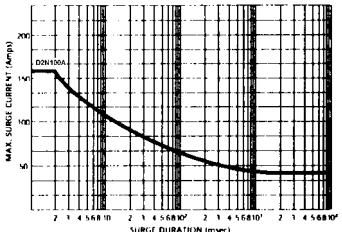
Features:
- Utilizes only 1.4 sq. in. of PCB area and only 1.15" tall
- 3A continuously or up to a 30A pulse in a miniature package
- High sensitivity, even at high switching frequencies
- 50A surge current and only 3.2 Vce saturated
- Please specify control voltage

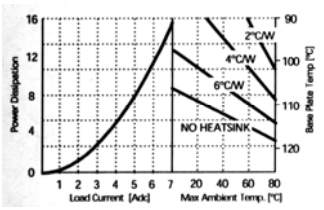
Input Specifications:

Input Control Voltage (pin 4)	see the order page
Nominal Current	7.5 mA
Power Supply +Vcc (pin 3)	see the order page for selection

Output Specifications:

Operating DC voltage range	0 – 2500 VDC	
Maximum continuous current	3 A rms	
Maximum surge current (IDM) - .3mS	50 A	
Continuous current (ID)	30A	
Maximum Vce (sat)	3.2 V @ 50A	
Rising time	30 nS	
Delay-on time	280 nS	
Falling time	35 nS	@ 5 Ohm
Delay-off time	60 nS	
Maximum switching frequency	150 KHz	



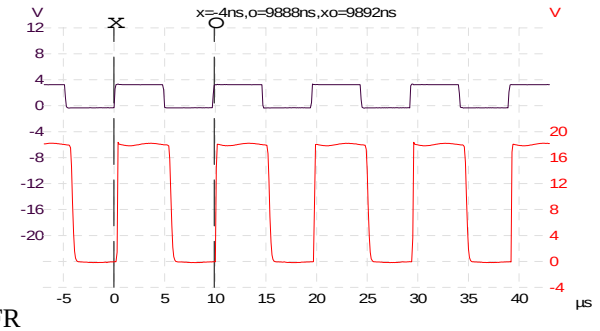


General Specifications:

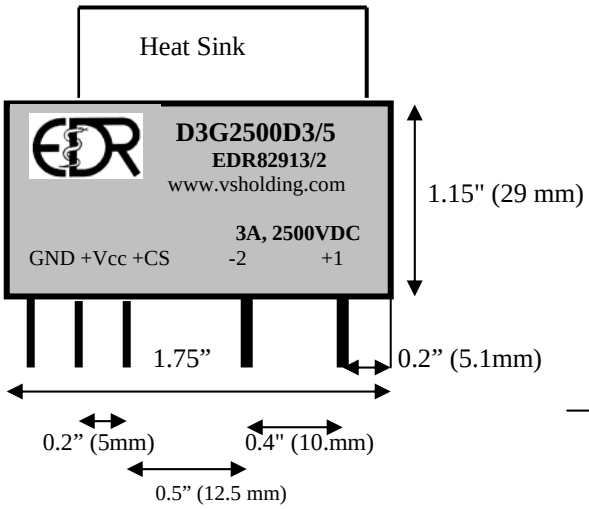
Ambient operating temperature range	-40^0 C to 100^0 C
Ambient storage temperature range	-55^0 C to 125^0 C
Dielectric Strength input-to-output	5,000VAC

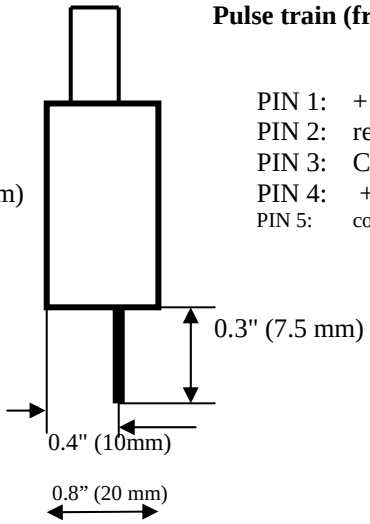
Mechanical Specifications:

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



Pulse train (frequency) about 100 KHz





PIN 1: + LOAD
PIN 2: return LOAD
PIN 3: Control Signal
PIN 4: + Vcc
PIN 5: common/GND return

All Dimensions are in inches (millimeters).

Dimensions for SIP4 package	1.15"H x 1.75"L x 0.8"W
Terminals/solder for SIP4 package	control - 0.40", power – 0.6"

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.

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Input Electrical Characteristics (Ta = 25^{0}C) for D3G2500D3/5, p/n EDR82913/2

Characteristic	Test Condition	Min	Typ.	Max.	Unit
Control voltage range		3.5	5	7	V
Maximum Turn-On Voltage				2	V
Maximum Turn-Off Voltage				1.6	V
Input Current, C/S		6	7.5	20	mA

Input Electrical Characteristics (Ta = 25^{0}C) for D3G2500D3/5, p/n EDR82913/2

Power Supply		5	V
Maximum Input Current at 1 KHz		20	mA
Maximum Input Current at 25 KHz		100	mA

I. Switching time test, 2 µS pulse, Load – 65 Ohm, 2A, Control Signal +5VDC, Vcc +5VDC

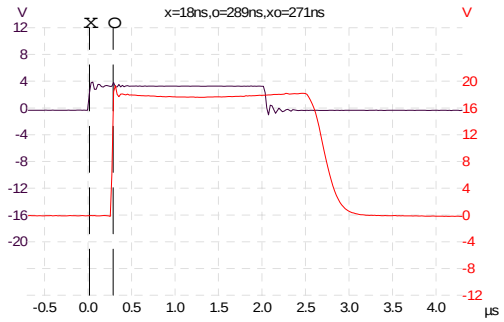

Figure 1 Turn-on delay is 0.271µS

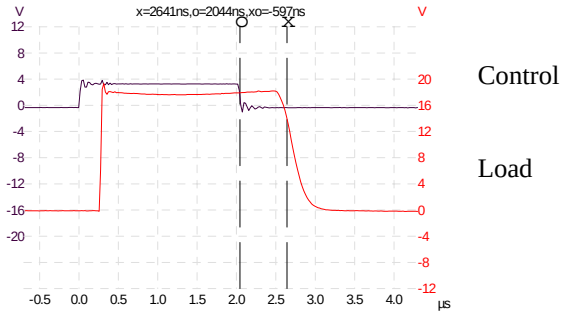

Figure 2 Turn-off delay is 0.597µS

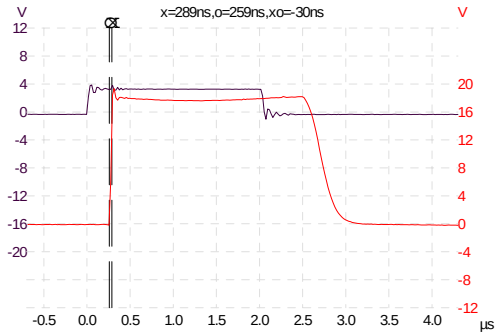

Figure 3 Rising Time is 30 ηS

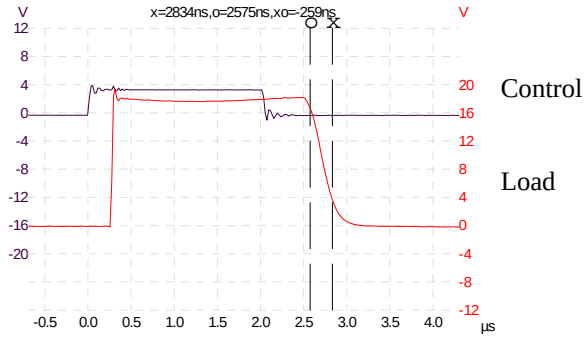

Figure 4 Fall Time is 30ηS at 65 Ω (at 5Ω = 38 ηS)
Please request a SPDT SSR for controlled falling time

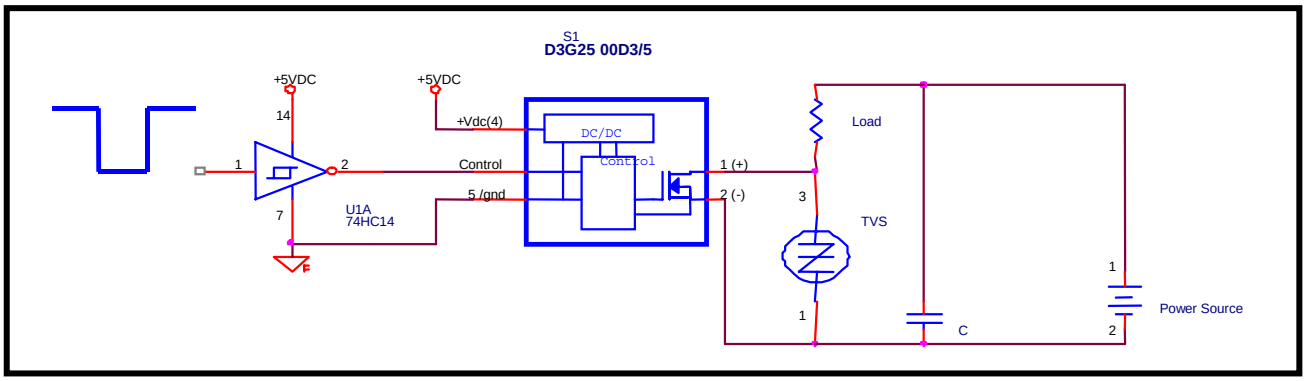

Figure 5 Switching Time Test Circuit

2,500VDC, 3A, 25 KHz Realy/Switch

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Features:
Utilizes only 1.4 sq. in. of PCB area and only 1.15" tall
3A continuously or up to a 30A pulse in a miniature package
Only two input terminals, even at high switching frequencies
50A surge current and only 3.2 Vce saturated
Please specify control voltage: 12VDC or 24VDC

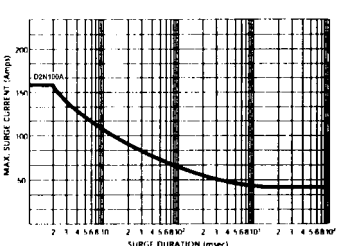
Input Specifications:

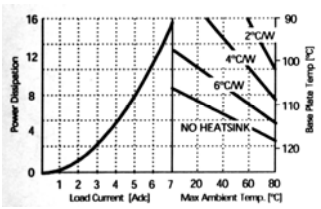
Input Control Voltage (pin 3&4)	12VDC	24VDC
Nominal Current	13 mA	12mA

Output Specifications:

Operating DC voltage range	0 – 2500 VDC
Maximum continuous current	3 A rms
Maximum surge current (IDM) - .3mS	50 A
Continuous current (ID)	30A
Maximum Vce (sat)	3.2 V @ 50A
Rising time	600 nS
Delay-on time (chopping)	5 µS
Delay-on time (single event)	110 µS
Falling time	310 nS @ 5 Ohm
Delay-off time	3.4 µS
Maximum switching frequency	25 KHz

Measurements performed at 100 KHz, CS = 5VDC





General Specifications:

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Ambient storage temperature range	-55^0 C to 125^0 C
Dielectric Strength input-to-output	3,000VAC

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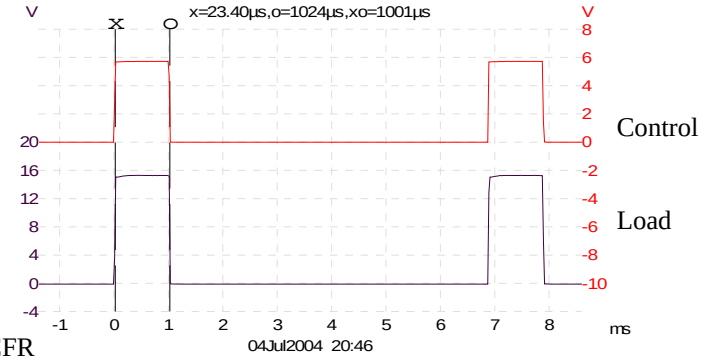
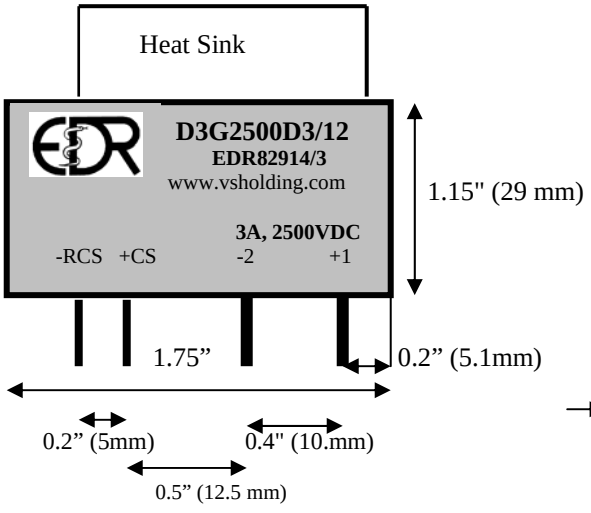
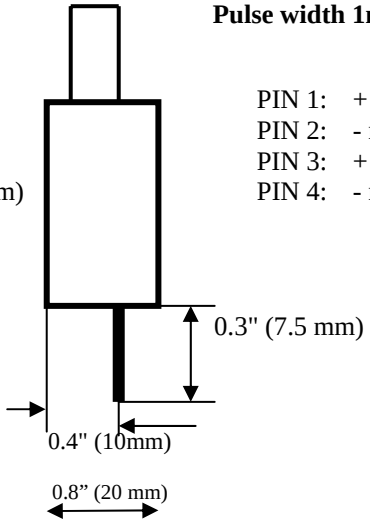
Weight (oz)		.2
Encapsulation	Epoxies Etc.	50-2366RFR / 50-2366CFR



Pulse width 1mS, 1500VDC, 3A





PIN 1: + LOAD
PIN 2: - return LOAD
PIN 3: + Control Signal (CS)
PIN 4: - return Control Signal (RCS)

All Dimensions are in inches (millimeters).

Dimensions for SIP4 package	1.15"H x 1.75"L x 0.8"W
Terminals/solder for SIP4 package	control - 0.40", power – 0.6"

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.

Input Electrical Characteristics (Ta = 25^{0}C) for D3N2500D3/12, p/n EDR82914/3

Characteristic	Test Condition	Min	Typ.	Max.	Unit
Control voltage range		10	12	15	V
Maximum Turn-On Voltage			10*		V
Maximum Turn-Off Voltage			8*		V
Maximum Input Current at 1 KHz			13		mA
Maximum Input Current at 25 KHz			140		mA

*At low frequency (single event) the turn-on delay is depend on the control voltage. Keep the voltage at typical level.

I. Switching time test, 10 KHz, Load – 500 Ω, 3A, Control Signal +12VDC

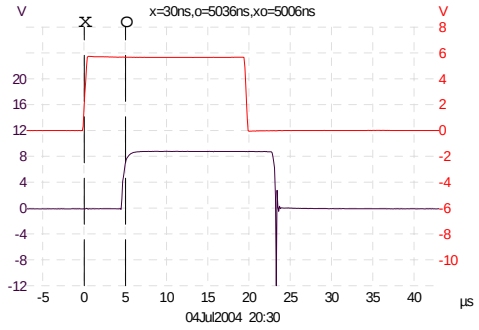


Figure 1 Turn-on delay is 5.0µS

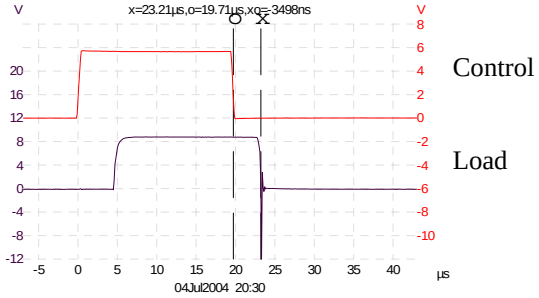


Figure 2 Turn-off delay is 3.5µS

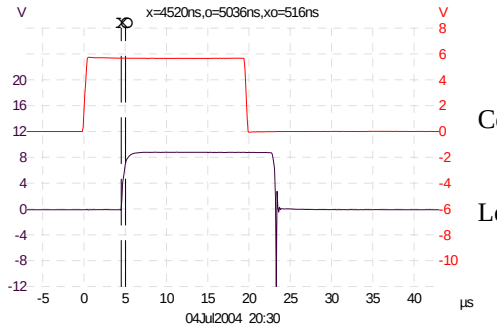


Figure 3 Rising Time is 516 ηS

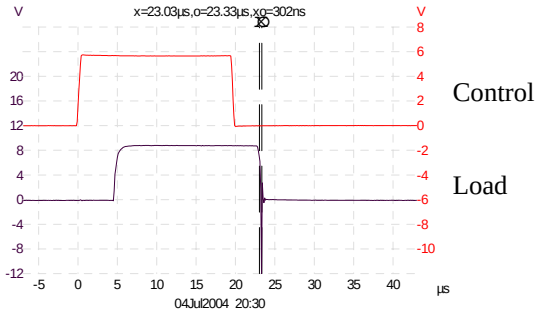


Figure 4 Fall Time is 302ηS at 500 Ω
Please request a SPDT SSR for controlled falling time

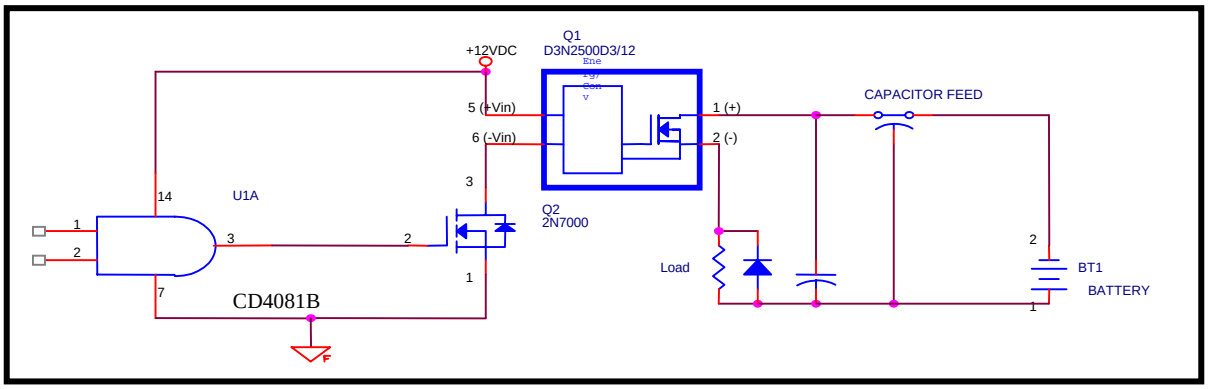
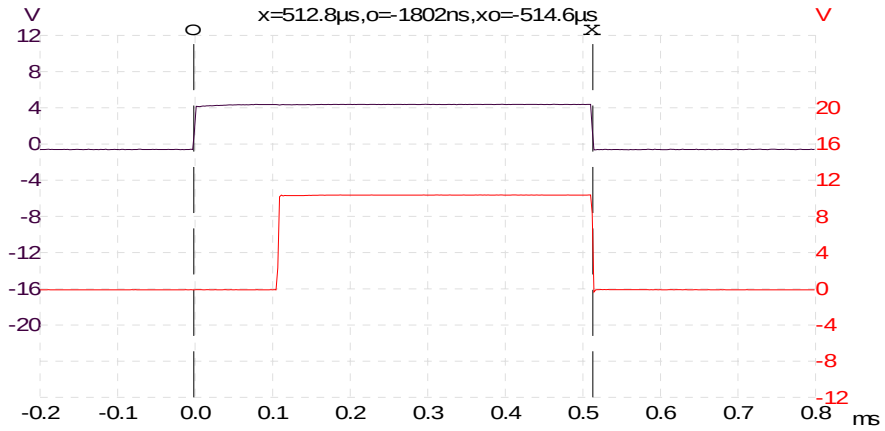
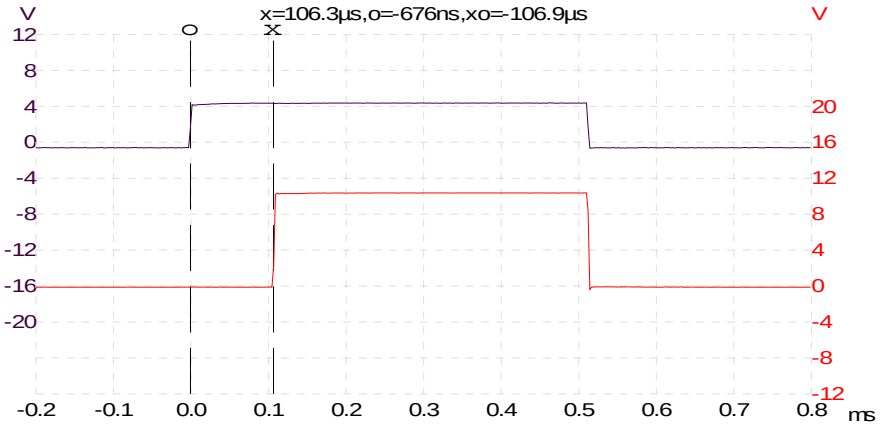


Figure 5 Switching Time Test Circuit

II. Switching time test

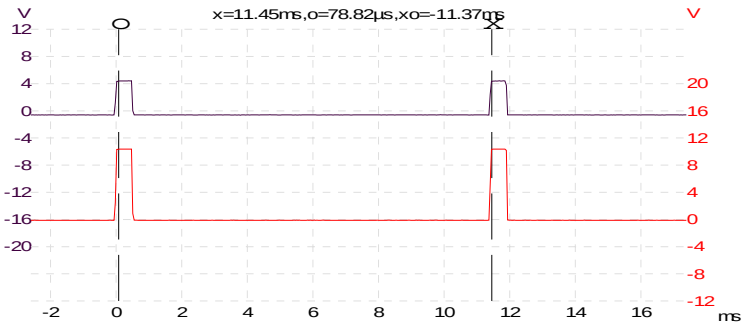


A single 515 µS pulse or a single event, a load is 500 Ω, 3A and control is +12VDC.



Turn-on delay is 106.9 µS and turn-off is 0.6 µS

The EDR82914 relay employs a unique design that allows building a low cost, powerful and high-speed relay. Insignificant trade-off is a slight variation in a turn-on delay, which very from 107 µS at a single event (pulse) to about 0.28 µS at repeatable rate of 100 Hz and above. An internally generated power did not dissipated and being used during the next consecutive pulse. In general, the turn-on delay at a low chopping rate depends on a level of a control signal and a duty cycle. Otherwise it is stable and reliable device capable to chop a high voltage, high power at very high frequency.



At rate of 100 Hz and above the turn-on delay is 0.28 µS

Ordering Instruction

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, SIP4
A	a low speed 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 up to DC - 350 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 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 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

"N" or nothing	SPST or 1 Form A output terminals,
"NN"	2SPST, or 2 Form A output terminals, or DPST
"NNN"	3SPST, or 3 Form A output terminals
"T"	TOTEM output, break-before-make termination, or NO-NO, or SPDT, or analog switch
"CN"	SPDT, or 1 Form C output terminals
"V"	VIDEO switch

(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

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.