Electronic Design & Research Inc

www.vsholding.com

Panel Mount SSR
Micro-power "µDPL" SPST-NO SSRs
From 1A to 240A & from 24V to 1,700 V
1 Form A, SPST-NO Solid-State Relays

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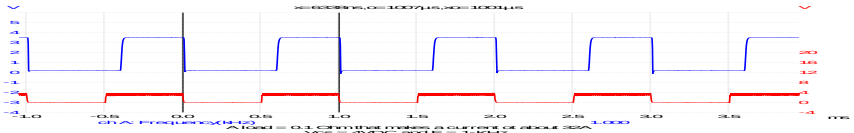
DC control (ask for an AC control)
MOSFETs output
Voltage ratings from 24 VDC (17VAC) to 1,700VDC (1,200VAC)
Current ratings from 1.0 A to 240 A
Requires no heat sink at rated currents
Relays are easily paralleled for higher-current applications
Low control power of only 1.4mW at 2.8VDC
Low control voltage 2.8 – 5 VDC. Let us know if you might need a different voltage.
Maximum switching frequency 3 KHz



Rating Currents	**100VDC/140A**	**~72VAC/40A**	**1,700VDC/2.8A**	**~1,200VAC/1.2A**
Device description	µPDL100D140/3	µPDL100A40/3	µPDL172D3/3	µPDL172A1/3
Part Number	EDR83114/1	EDR83142/1	EDR83138/1	EDR83147/1
Cost (USD) each per 100	**$145.91 ea/100**	**$159.68 ea/100**	**$134.91 ea/100**	**$153.60 ea/100**

Description	**OUTPUT SPECIFICATIONS**			
Operating Voltage [VDC and VDDC/AVC]	**0 to +100VDC**	**+/-100VDC (72VAC)**	**0 to +1,700VDC**	**+/-1,700VDC (1,200VAC)**
Max. OFF-State Leakage [µA] at V max	**30**	**20**	**15**	**15**
Max. ON-State Resistance [Ohms] at rated current	**0.0004**	**0.008**	**0.250**	**0.500**
Max. Load Current [Amps]	**140**	**40**	**2.8**	**1.2**
Minimum Load Current [µA]	**50**	**30**	**20**	**20**
Max. Surge Current [A DC] (1µs)	**500**	**750**	**1000**	**1300**
Max. ON-State Voltage Drop [V] at rated current	**0.45**	**0.525**	**0.75**	**0.75**

Description		**INPUT SPECIFICATIONS**			
Control Voltage			**from 2.8 to 5.2 VDC**		
Maximum Turn-ON Voltage			**2.4 VDC**		
Minimum Turn-OFF Voltage			**2.0 VDC**		
Maximum Input Current			**0.6 mA (2.8VDC), 10 mA (5.2 VDC)**		
Max. Turn-ON delay time	**[µsec]**	**115**	**110**	**100**	**100**
Max. Switching Frequency	**[Hz]**	**100**	**400**	**500**	**500**
Max. Turn-OFF delay time	**[µsec]**	**11**	**11**	**11**	**11**

Description	**GENERAL SPECIFICATIONS**			
Dielectric Strength, Input /Output/Base (50/60Hz)		**2500 Vrms**		
Min. Insulation Resistance at 500 VDC		**10^9 Ohm**		
Max. Capacitance, Input /Output		**50 pF**		
Ambient Operating Temperature Range		**-45 to 85 ºC**		
Ambient Storage Temperature Range		**-50 to 125 ºC**		
Wight (average)	**3.5 oz**	**3.0 oz**	**3.0 oz**	**3.0 oz**
Encapsulation		**Thermally conductive Epoxy**		
Terminals	**6-32 Screws – 10 in lbs. (control) 8-32 Screws and 10-32 – 20 in lbs. (power)**			

GENERAL NOTES

All parameters at 25 ºC and per section unless otherwise specified
Dielectric strength and isolation resistance are measured between input and output
Rated at other voltages/currents µPDL SPST-NO (normally opened) series relays are presented on the next page
In the same package, µPDL SPST-NC (normally closed) relays are available

1 Form A, SPST-NO Solid-State Relays to replace electromechanical relays

OUTPUT SPECIFICATIONS (We rate our devices at the maximum voltage/current; a heat sink is not required)

(Here is a small list of available devices. Let us know if you need a device rated at a different voltage or current).

Model	V range (VDC)	I rms	Idm	Rds [ON]	I surge	p/n
µDPL24D240	0 TO +24	240	800	.0002	1500	EDR83122
µDPL24A48	+/-24(15VAC)	48	220	.0004	400	EDR83139
µDPL40D50	0 TO +40	50	250	.0017	800	EDR83128
µDPL40D120	0 TO +40	120	440	.0008	1100	EDR83129
µDPL40A100	+/-40(28VAC)	100	360	.0008	1100	EDR83140
µDPL40D150	0 TO +40	150	600	.00035	1400	EDR83130
µDPL55D50	0 TO +55	50	200	.0017	800	EDR83131
µDPL55D100	0 TO +55	100	400	.0008	1100	EDR83132
µDPL55A90	+/-55(37VAC)	90	340	.0008	1100	EDR83141
µDPL55D150	0 TO +55	150	600	.00036	1400	EDR83133
µDPL75D50	0 TO +75	50	250	.0023	800	EDR83134
µDPL75D100	0 TO +75	100	400	.0013	1000	EDR83135
µDPL75D150	0 TO +75	150	600	.0007	1200	EDR83136
µDPL100D50	0 TO +100	50	250	.004	500	EDR83116
µDPL100D85	0 TO +100	85	250	.003	750	EDR83115
µDPL100D110	0 TO +100	110	450	.0012	1000	EDR83113
µDPL100A40	+/- 100(72VAC)	40	150	.004	500	EDR83142
µDPL100D140	0 TO +100	140	420	.0008	1300	EDR83114
µDPL150D80	0 TO +150	80	350	.002	800	EDR83117
µDPL150D55	0 TO +150	55	250	.0028	600	EDR83118
µDPL150A20	+/- 55(48VAC)	20	90	.0008	80	EDR83143
µDPL200D50	0 TO +200	50	200	.0037	600	EDR83119
µDPL300D35	0 TO +300	35	120	.009	140	EDR83120
µDPL500D30	0 TO +500	30	110	.019	420	EDR83121
µDPL900D14	0 TO +900	14	68	.075	260	EDR83126
µDPL900D20	0 TO +900	20	80	.060	280	EDR83127
µDPL900A3	+/-900(630VAC)	3	15	.564	75	EDR83144
µDPL900A5	+/-900(72VAC)	5	25	.280	114	EDR83145
µDPL900A7	+/-900(72VAC)	7	35	.150	130	EDR83146
µDPL122D2	0 TO +1,200	2	8	.500	30	EDR83124
µDPL122D10	0 TO +1,200	10	40	.110	200	EDR83123
µDPL122D20	0 TO +1,200	20	90	.110	380	EDR83137
µDPL122A3	+/-1200(840VAC)	3	9	.500	36	EDR83147
µDPL122A7	+/-1200(840VAC)	7	20	.500	80	EDR83148
µDPL172D3	0 TO +1,700	2.8	8	1000	40	EDR83138
µDPL172A1	+/-1700(1240VAC)	1	3	.500	12	EDR83149

NOTE:

1 We recommend applying 20% less voltage and current down from the rating to maintain safety margins and extend life expectancy beyond ten years.
2 V ranges a range of voltages that can be applied to the output terminals
3 I rms a maximum allowed average current (amperes) through the output terminals
4 I DM is the maximum permitted pulsing current (amperes), maintaining a 1.0% duty cycle or less.
5 Rds (ON) is the maximum resistance between output terminals while the control signal is applied.
6 I surge a maximum allowed surge current for pulses shorter than 25□s 1000% duty cycle.

Some differences between devices such as a maximum switching frequency, turn-on delay, slope, consumption control current, etc., somewhat depend on the output rating. Please request a specific data sheet if that is important for your application.

We manufacture large varieties of Solid-State Modules including but limited to relays [SPST, SPDT, and DPST], switches, ½ drivers, H-drivers, High-voltage relays and switches, Super-High current switching systems, etc.

There is no production set-up fee for an order of 400 and above for any previously developed Solid State Relay/Switch and Solid State Breaker.

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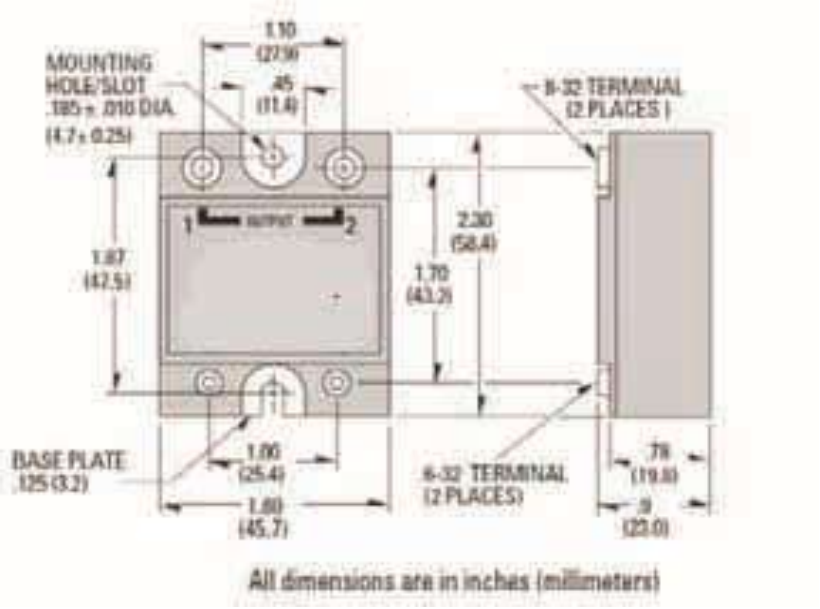
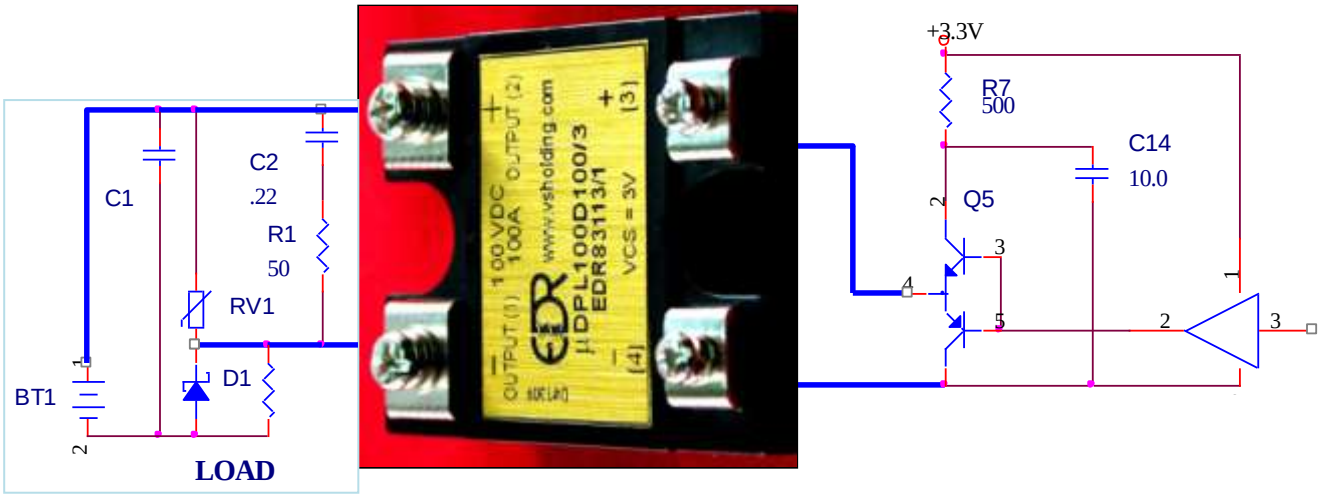
MECHANICAL DIMENSIONS



Application Note



1. The hook-up diagram presented above is applicable to both the µDPL and µRPM families of devices because the input schematics are somewhat similar functionally. The stability and accuracy of the turn-on and turn-off relays depend on the sharpness of the control signal rising and falling slopes. For that reason, integrating a push-pull driver (Q5) in your design for driving the relay is paramount. Many commercially available IC chips are built with a push-pull output.
2. A relay requires less than 1mA rms to maintain the ON state, but the control current could be ten times higher during the turn-on phase. The R-C integrated network consisting of R7 and C14 helps average consumption input current, thus making it possible to apply micropower to control kilowatts.
3. Semiconductors can provide a trouble-free, unlimited lifespan of operation, taking voltage currents that would not exceed the rating. Of course, an ambient temperature and environment are serviceable. A simple protection installed on the output would ensure its survivability. Power devices built with MOSFETs, in general, are much easier to withstand 500% output current surges during a short time than 20% of excessive applied voltage. Three simple and effective protections must be integrated to prevent a disaster. One of them is a high-frequency, high-current Schottky diode (D1) installed in parallel to a load. It is also called a flyback/clamp diode. A connective cable must be considered as a part of the load; hence, it is wise to connect the diode's cathode to the output terminal. Other protection is a combination of a snubbing network, including a capacitor and a resistor (C2 + R1) connected in series with a Transient Voltage Surge [TVS] diode (RV1) connected in parallel to it. Some designers use only the snubbing network, others use only TVS, and others use only the flyback diode. We recommend installing all three protections. The snubbing network alone wouldn't provide sufficient protection against a high-power transient voltage surge.