

PRELIMINARY



VOLTAGE PROTECTION FOR DC SOLID-STATE RELAYS

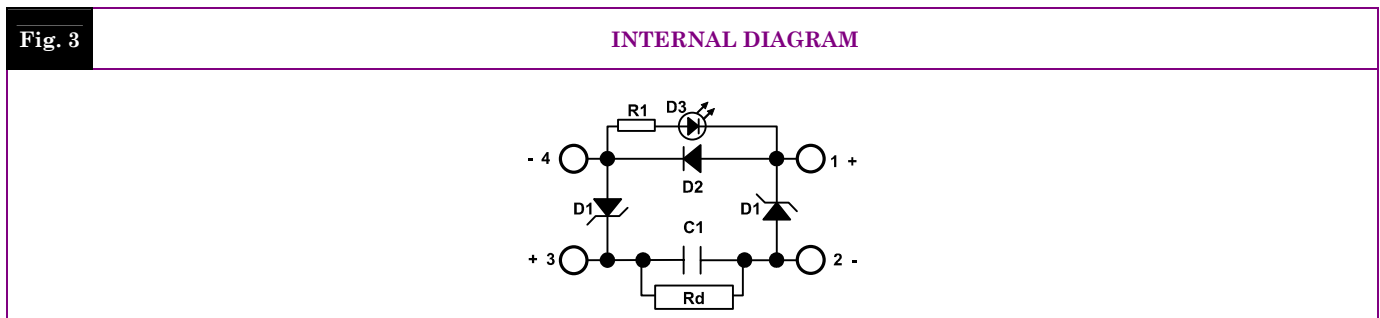
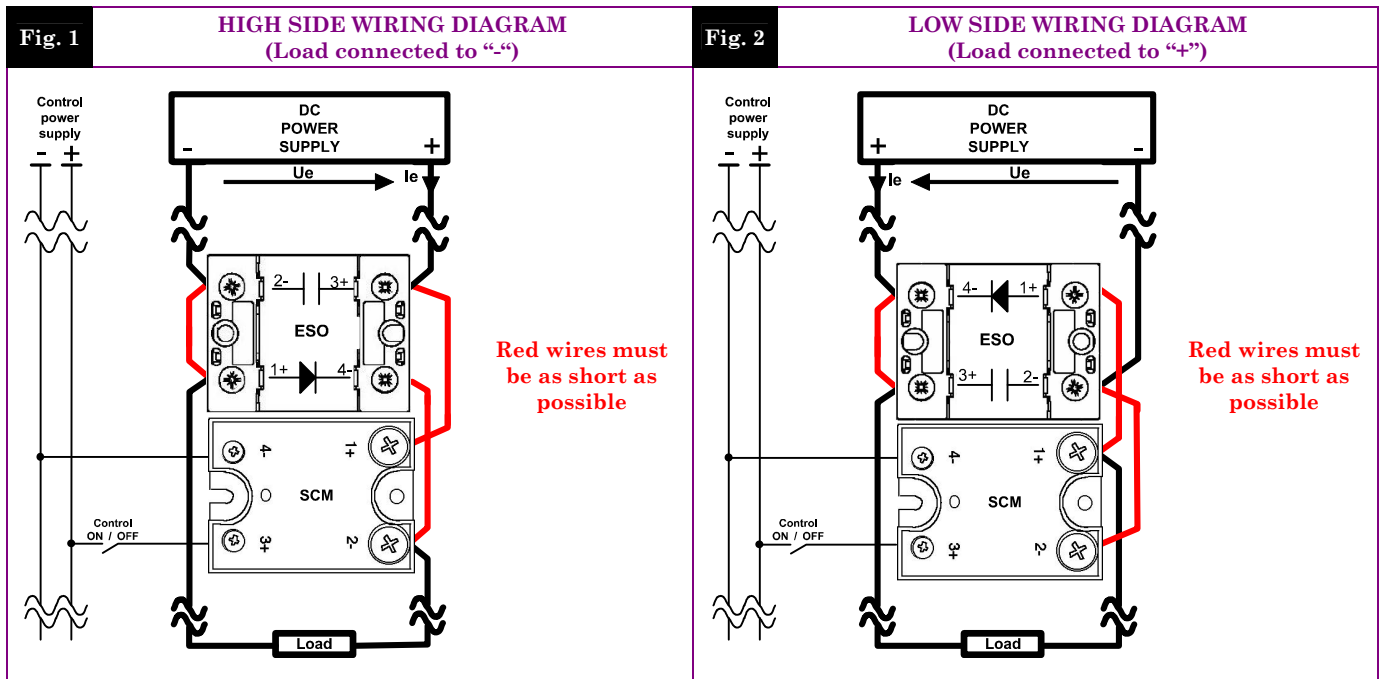
- ▶ Helps protecting solid-state relays against voltage transient due to the inductive effect of lines and loads.
- ▶ Clamping function (D1) to limit voltage transients across the power element of the DC solid state relay without built-in voltage clamp (SCM)
- ▶ Fly wheel diode (D2), with fast response, low on-state voltage drop and connection polarity free, mounted on the metal base plate to be cooled by a heatsink for high switching frequency applications (PWM)
- ▶ Decoupling capacitor (C1), connection polarity free and non polarized (polyester) equipped with a discharging resistor
- ▶ Led indicating voltage presence across the load

ESO02000



Non-repetitive peak voltage	75VDC
Max operating permanent current	80A
Clamping voltage function for DC relays (D1)	Yes

Operating voltage range	Current range	DC SSR clamping voltage function	Isolations	Connections	Dimensions (LxHxD)	Weight
0-130VDC	0-80A	Yes	4kV	Screw terminals	45 x 58.5 x 30	80g



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GENERAL CHARACTERISTICS

POWER CIRCUIT	CHARACTERISTIC	LABEL	VALUE	INFO.
	DC mains max voltage	U _{emax}	40VDC	
	Non repetitive peak voltage	U _{ep}	75V	
	Max voltage rise	dU _e /dt	125V/μs	U _e =U _{ep}
	Max nominal current	I _{e max}	80A	
	Power output/case insulation	U _{imp}	4kV	
	Isolation resistance	R _{io}	1GΩ	
	Isolation capacitance	C _{io}	<8pF	
	Storage ambient temperature	T _{stg}	-40°C -> +100°C	
	Operating ambient temperature	T _{amb}	-40°C -> +90°C	
Max. case temperature	T _c	100°C		

LINE CIRCUIT CHARACTERISTICS (C1 & Rd)

LINE CIRCUIT	CHARACTERISTIC	LABEL	VALUE	INFO.
	Decoupling capacitor	C1	4.4μF ±20%	
	Technology		Polyester	
	Discharging resistor	Rd	1MΩ / 0.5 W	
Discharging time constant	τ	1s		

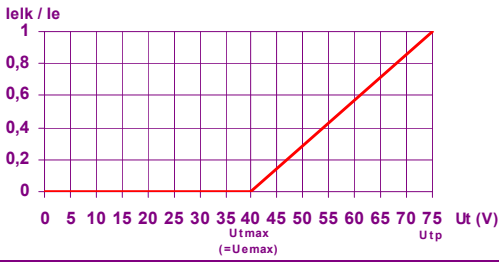
LOAD CIRCUIT CHARACTERISTICS (D2)

LOAD CIRCUIT	CHARACTERISTIC	LABEL	VALUE	INFO.
	Voltage drop during fly wheel	U _{D2} (VF)	1.2V	@I _e =80A see fig. 6
	Instantaneous power dissipation	P _{D2}	0.96 + 0.003 x I _e	
	Max nominal average current	I _{D2av} (I _{Fav})	80A	
	Max repetitive peak overload current	I _{D2peak} (IFRM)	500A	T _{pulse} =25μs
	Max non repetitive peak overload current	I _{D2peak} (IFSM)	1000A	T _{pulse} =25μs
	Max leakage current	-I _{D2} (IR)	= current in the ouput LED	See fig. 7
	Recovering time	trr	190ns	I _{D2} =1A, di/dt=50A/μs, T _c =25°C
	Junction/case thermal resistance	R _{thjc}	0.35K/W	
	Housing thermal resistance vertically mounted	R _{thra}	10K/W	@ΔT _{ra} =75°C
Housing thermal time constant	T _{thra}	10 minutes	@ΔT _{ra} =60°C	
Maximum junction temperature	T _{jmax}	125°C		



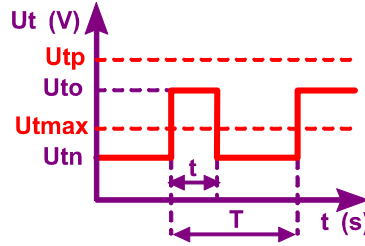
CHARACTERISTICS OF THE BUILT-IN VOLTAGE PROTECTION (D1)

Fig. 4 LEAKAGE CURRENT (I_{elk}) VS DC OUTPUT SSR SWITCH VOLTAGE (U_t)



I_{elk} : Leakage current of the relay
I_e : User load nominal current
U_{tp} : Relay max. non repetitive peak voltage

Fig. 5 OVERVOLTAGE DURATION AND FREQUENCY ABSOLUTE LIMITS



U_{max} : Max. nominal voltage of the relay
U_{to} : Possible overvoltage above U_{max}
U_{tn} = U_e : User DC power supply voltage

U_{to} < U_{tp}

$$t_{max} = \frac{2.5}{(U_{to} - U_{tmax}) \times I_e}$$

$$P_{(protection)} = 2W_{max}$$

$$\Rightarrow \frac{(U_{to} - U_{tmax}) \times I_e \times t}{T} \leq 2$$

t : Overvoltage duration
T : Time between 2 overvoltage

OUTPUT CHARACTERISTIC CURVES

Fig. 6 VOLTAGE DROP VS CURRENT (DIODE D2 DURING FLY WHEEL)

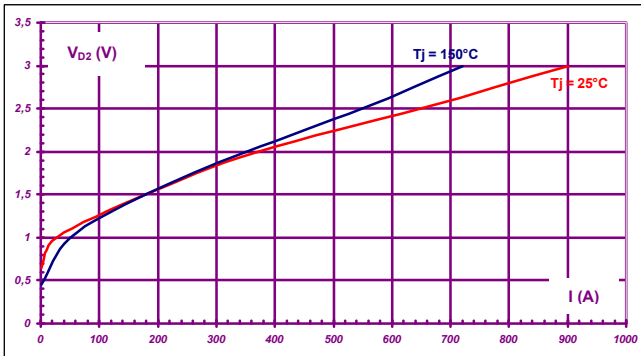


Fig. 8 THERMAL IMPEDANCE (DIODE D2)

Not available

Fig. 7 OUTPUT LED (D3) CURRENT VS LOAD VOLTAGE

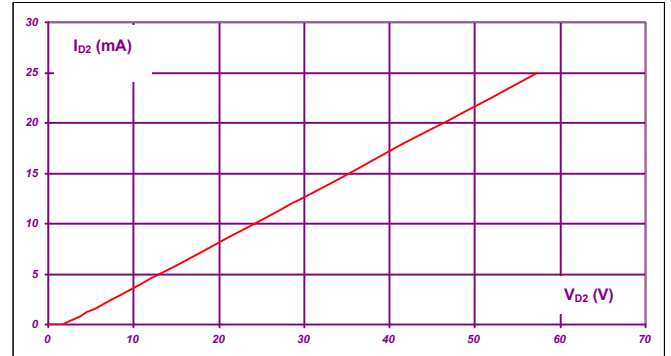


Fig. 9 OVERLOAD PERMITTED DURING ON-STATE (DIODE D2 DURING FLY WHEEL)

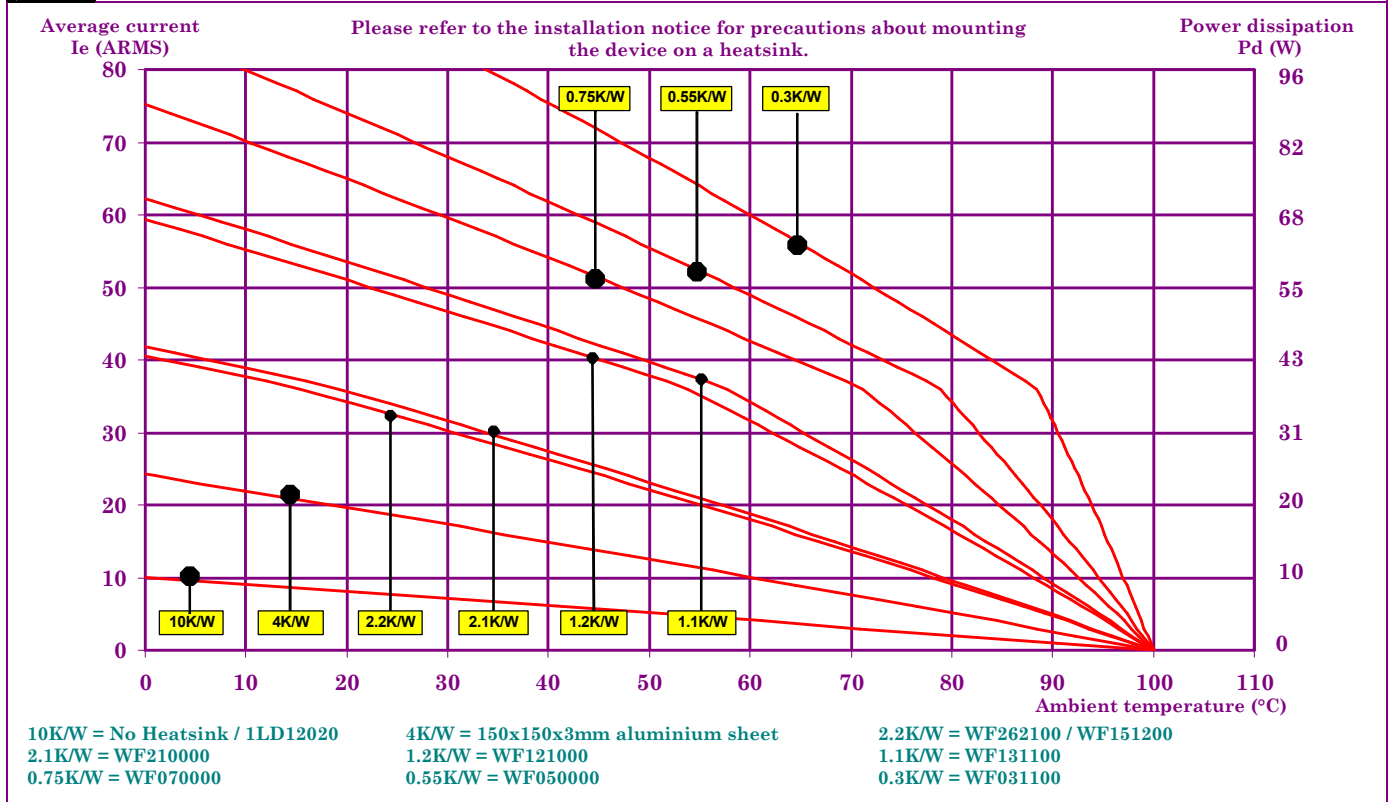
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OUTPUT CHARACTERISTIC CURVES (cont.)

Fig. 10

POWER DISSIPATION AND AVERAGE CURRENT VS AMBIENT TEMPERATURE



GENERAL INFORMATION

GENERAL INFORMATION	Mounting	2 screws (M4x12mm ; tightening = 1.2N.m)	See mounting sheet
	Screwdriver for connections	POZIDRIV2	
	tightening torque for	2 N.m	
	Insulated crimp terminals (round tabs, eyelet type)	M5	
	Display	Green LED (load supplied)	
	Housing	UL94V0	
Weight	80g		

STANDARDS

STANDARDS	Standards	IEC60947-1	
	Protection level	IP20	
	Protection against direct touch	Yes	
	CE marking	Yes	
	UL, cULUS and VDE approvals	Pending	

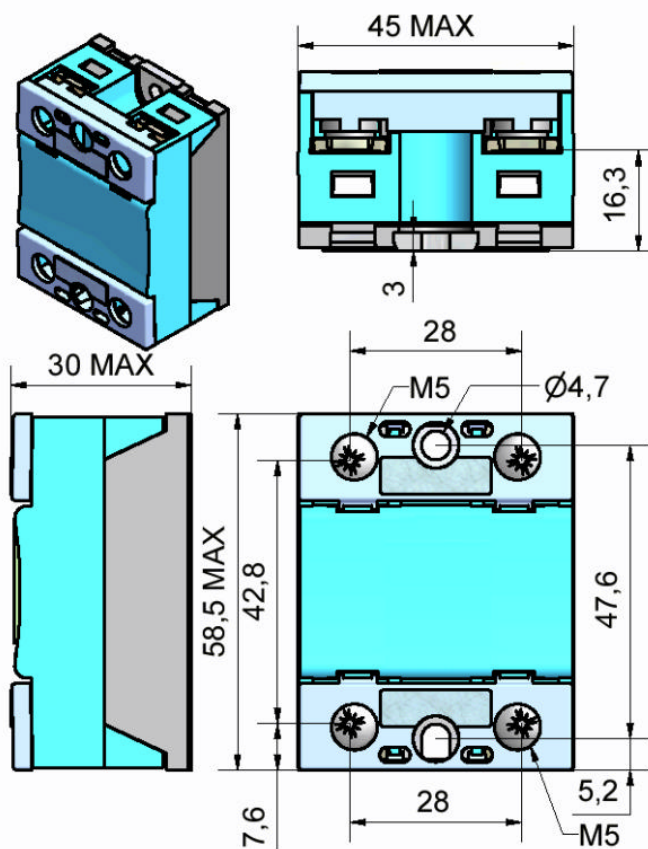


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DIMENSIONS ET ACCESSORIES

Fig.
11

DIMENSIONS (mm)



ACCESSORIES

FLAT TAB CONNECTION ADAPTORS
1L587000



Please consult our website for other accessory references
(Heatsinks, mounting adaptors, thermal grease...)



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