PRELIMINARY DATA

MOSFET BASED DC SOLID-STATE RELAY

(With built-in transient voltage suppressor)

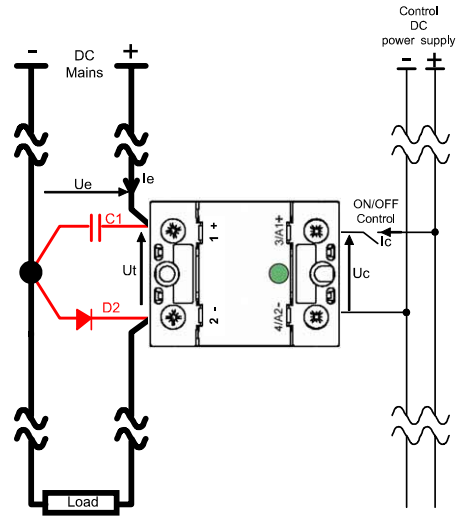
SOM06075

- Latest MOSFET technology generation.
- Ultra low on-state resistance.
- Low output leakage current.
- Low control current consumption.
- Built-in overvoltage protection (TVS)
- Reverse protected triggered control input to avoid linear control risks
- No radiated or conducted disturbances
- Touch protected housing IP20

Control voltage range	3.5-32VDC
Max transient peak voltage	75V
Max. DC Mains peak voltage	40VDC
Max. Load Current (with heatsink)	60ADC

DC Mains voltage range	Load current range	Control input voltage range	In & case / Out Insulation	Connections	Dimensions (WxHxD)	Weight
5-40VDC (75Vpeak)	Up to 60A (with heatsink)	3.5-32VDC	2.5kV	Screw terminals	45 x 58.5 x 30	80g

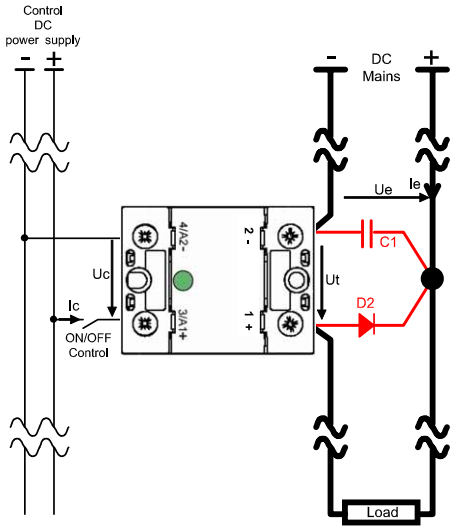
Fig. 1 HIGH SIDE WIRING DIAGRAM (Load connected to "-")



Please consult us to select the right protective components C1 & D2.
(see also accessory list page 5)

The red paths (C1/D2) must be as short as possible !

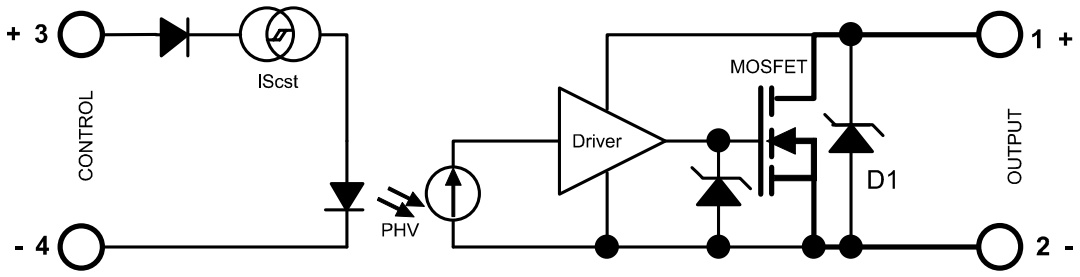
Fig. 2 LOW SIDE WIRING DIAGRAM (Load connected to "+")



Please consult us to select the right protective components C1 & D2.
(see also accessory list page 5)

The red paths (C1/D2) must be as short as possible !

Fig. 3 INTERNAL DIAGRAM



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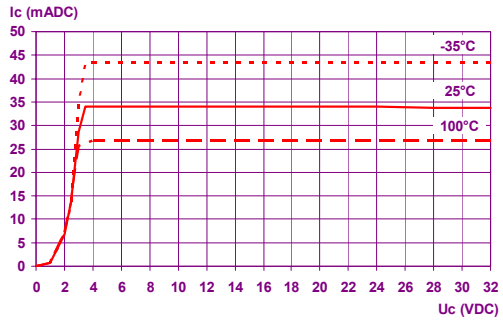
CONTROL INPUT CHARACTERISTICS

INPUT CIRCUIT

CHARACTERISTIC	LABEL	VALUE	INFO.
Nom. Control voltage	U_{cnom}	12-24VDC	
Nom. Control current	I_{cnom}	35mADC	-100µA/°C
Control voltage range	Uc	3.5 – 32VDC	typical=3.3V
Control current consumption	Ic	32 – 35mADC	See curve
Releasing control voltage	$U_{coffmax}$	1VDC	Typical= 2.6V
Max. reverse control voltage	$-U_{cmax}$	32VDC	-Icmax <100µA
Input impedance	Rin	Current limitation	See curve

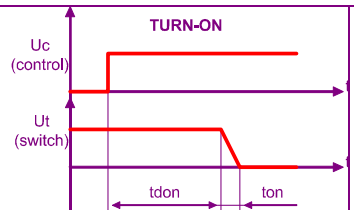
Fig. 4 CONTROL CURRENT vs. CONTROL VOLTAGE

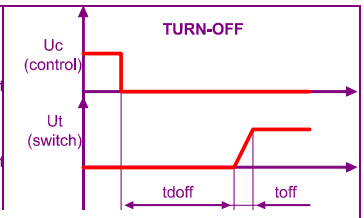


TIME CHARACTERISTICS

TIME CHARACT.

CHARACTERISTIC	LABEL	VALUE
Turn on time	ton	20µs
Turn on delay	tdon	20µs
Turn off time	toff	20µs
Turn off delay	tdoff	20µs
Max. On-Off frequency	$F_{(on-off)}$	>1000Hz





For high frequency, take 2 x Ie to calculate the heatsink; the protections must be chosen carefully. Please consult us if any.

POWER OUTPUT CHARACTERISTICS

POWER CIRCUIT

CHARACTERISTIC	LABEL	VALUE	INFO.
Nominal voltage	Uenom	**24VDC**	
Voltage range	Ut Ue	**5-40VDC**	Utmax=40VDC
Non-repetitive peak voltage	Utp	75V	
Overvoltage protection	D1	39V (Transient voltage suppressor)	1500W / 1ms See fig.10 & 11
Off-state max reverse voltage drop (internal diode)	-Ut	0.92V	@Ie=75A & @Uc=0 See fig. 6
Maximum nominal currents	Ie max	Resistive: 60A; Motor: Please contact us	**See fig. 9**
Max. non-repetitive peak current	Iepeak	Switch OFF D<1%: 294A; Switch OFF Fmax: 60A; ON-state: 750A	@Tc=100°C @Tj=175°C @Utp **(See fig. 8)**
Min. load current	Iemin	5mA	
Max. leakage current	Ielk max	3mA	@Utmax @Tjmax
Max. on-state resistance	RDSon	4.5mOhms @Tj=25°C / 8.2mOhms @Tj=125°C	@Iemax
Typ. output capacitance	Cout	1.5nF	@Utp
Junction/case thermal resistance per power element	Rthjc	1.2K/W	
Built-in heatsink thermal resistance vertically mounted	Rthra	10K/W	@ΔTra=75°C
Heatsink thermal time constant	Tthra	10 minutes	@ΔTra=60°C
Control inputs/power outputs insulation voltage	Uimp	2.5kV	
Inputs/case insulation voltage	Uimp	2.5kV	
Outputs/case insulation voltage	Uimp	2.5kV	
Isolation resistance	Rio	1GΩ	
Isolation capacitance	Cio	<8pF	
Maximum junction temperature	Tjmax	175°C	
Storage ambient temperature	Tstg	-40->+100°C	
Operating ambient temperature	Tamb	**-25->+90°C**	**See fig. 9**
Max. case temperature	Tc	**100°C**	

OUTPUT SWITCH CHARACTERISTIC CURVES

Fig. 5 ON RESISTANCE VS JUNCTION TEMPERATURE

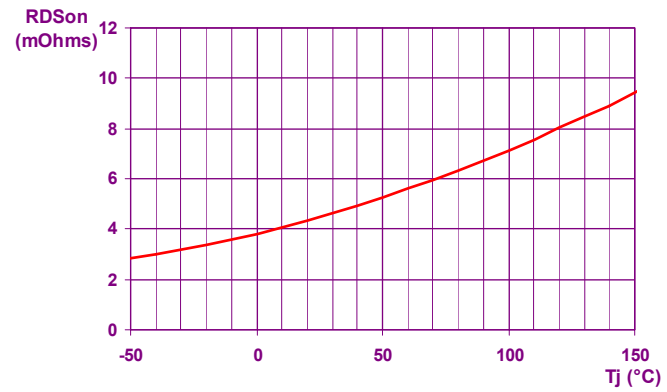


Fig. 6 REVERSE VOLTAGE DROP VS REVERSE CURRENT

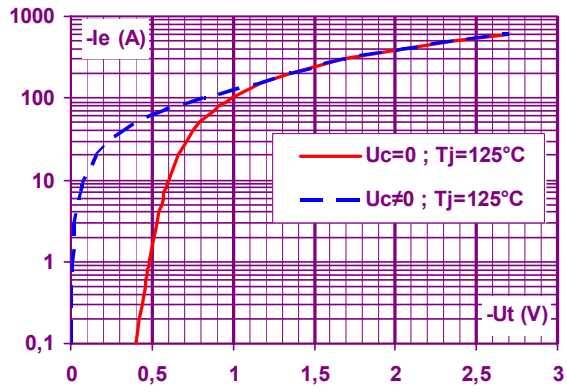


Fig. 7 POWER ELEMENT TRANSIENT THERMAL IMPEDANCE vs. PULSE DURATION

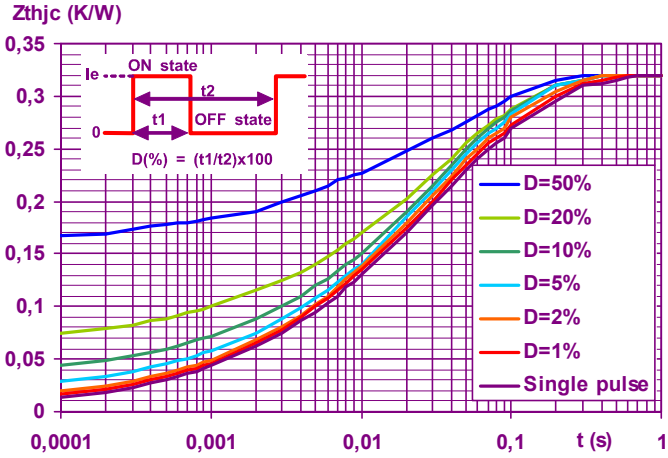


Fig. 8 ON-STATE PEAK OVERLOAD CURRENT vs. PULSE DURATION

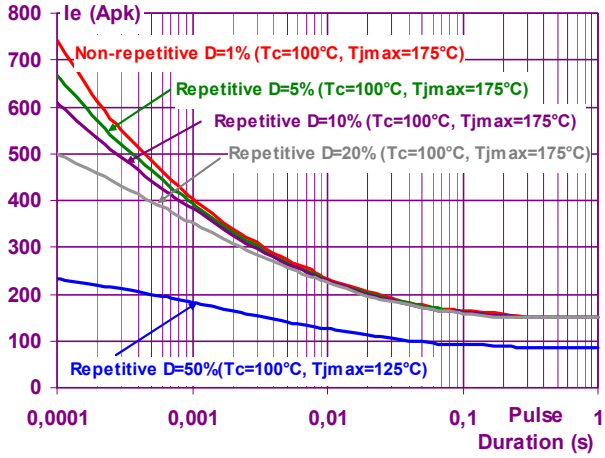
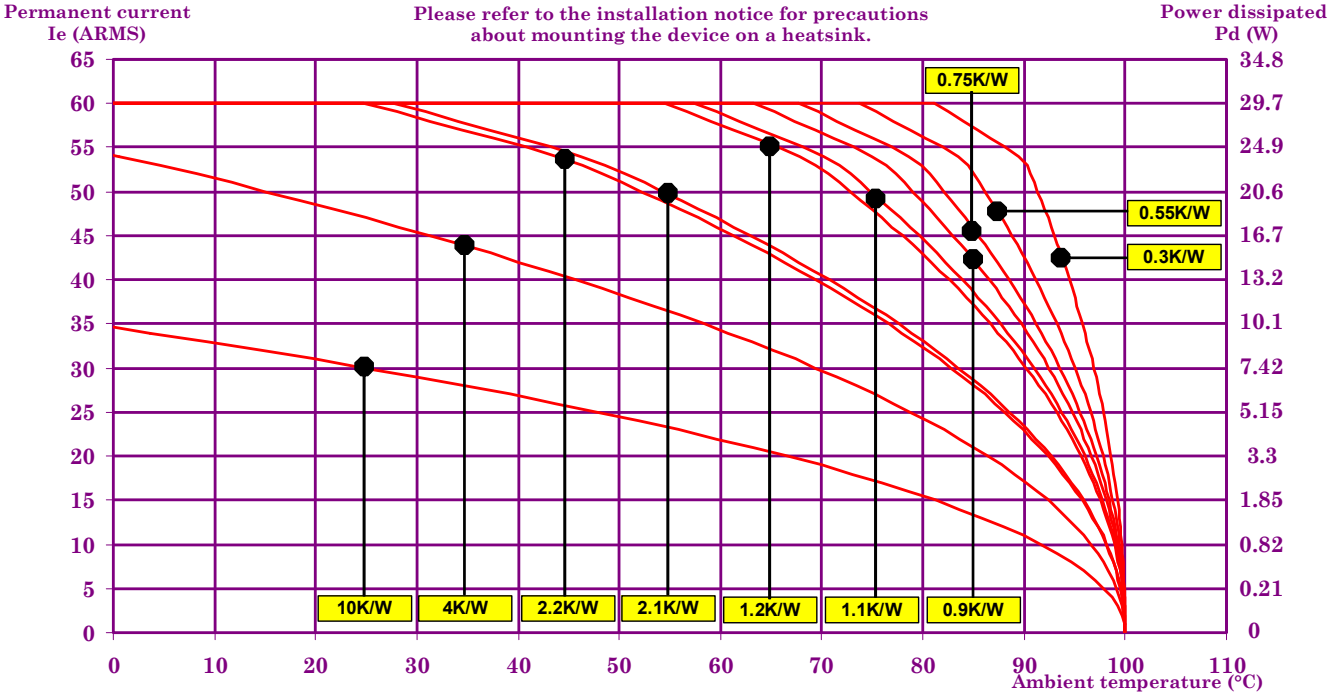


Fig. 9 POWER DISSIPATED AND LOAD CURRENT LIMIT VS TEMPERATURE



10K/W = No Heatsink / 1LD12020
4K/W = 150x150x3mm aluminium sheet
2.2K/W = WF262100 / WF151200
2.1K/W = WF210000
1.2K/W = WF121000
1.1K/W = WF131100
0.9K/W = WF115100
0.75K/W = WF070000
0.55K/W = WF050000
0.3K/W = WF031100

BUILT-IN OVERVOLTAGE PROTECTION CHARACTERISTICS

Fig. 10 — LEAKAGE CURRENT (Ielk) VS DC OUTPUT SWITCH VOLTAGE (Ut)

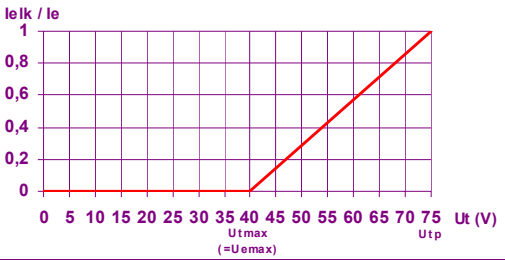
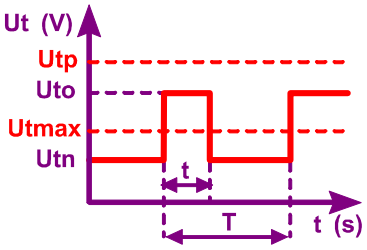


Fig. 11 — OVERVOLTAGE DURATION AND FREQUENCY ABSOLUTE LIMITS



$$Uto < Utp$$

$$t\,max = \frac{0.75}{(Uto - Ut\,max) \times Ie}$$

$$P_{(protection)} = 1W_{max}$$

$$\Rightarrow \frac{(Uto - Ut\,max) \times Ie \times t}{T} \leq 1$$

Ielk : Leakage current of the relay
Ie : User load nominal current
Utp : Relay max. non repetitive peak voltage

Utmax : Max. nominal voltage of the relay
Uto : Possible overvoltage above Utmax
Utn = Ue : User DC power supply voltage

t : Overvoltage duration
T: Time between 2 overvoltage

GENERAL INFORMATION

CONNECTIONS	Connections		Power	Control	
	Screwdriver advised		POZIDRIV2		
	Min and max tightening torque		2 N.m	1.2 N.m	
	Insulated crimp terminals (round tabs, eyelet type)		M5	M4	
MISC.	Display		Green LED (indicates relay has switched ON)		
	Housing		UL94V0		
	Mounting		2 screws (M4x12mm ; tightening = 1.2N.m)		See mounting sheet
	Noise level		None		
	Weight		80g		

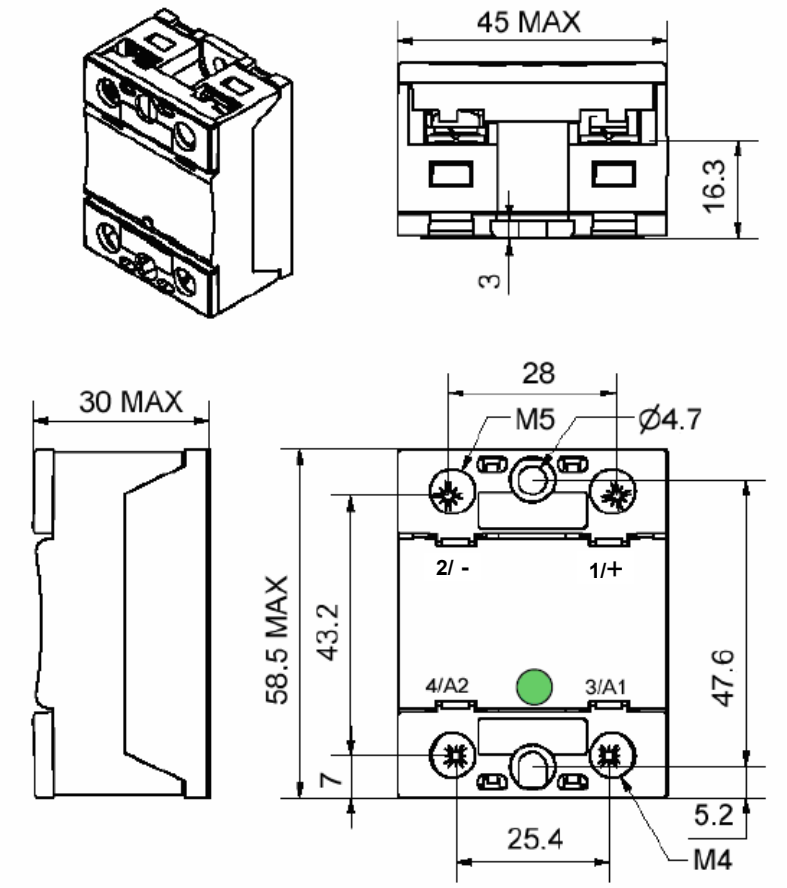
STANDARDS

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

	TYPE OF TEST	STANDARD	LEVEL	EFFECT
E.M.C. IMMUNITY	E.S.D. (Electrostatic discharges)	EN61000-4-2	Pending	?
	Radiated electromagnetic fields	EN61000-4-3	Pending	?
	Fast transients bursts	EN61000-4-4	Pending	?
	Electric chocks	EN61000-4-5	Pending	?
	Voltage drop	EN61000-4-11	-	
E.M.C. EMISSION	Radiated and conducted disturbances	NFEN55011	Pending	

DIMENSIONS AND ACCESSORIES

Fig. 12 — DIMENSIONS (mm)



ACCESSORIES

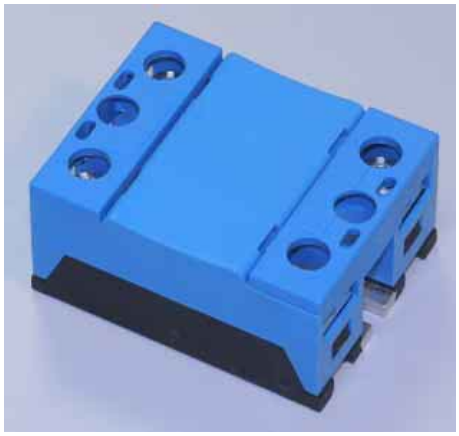
FLAT TAB CONNECTION ADAPTORS
1L587000

READY TO USE OVERVOLTAGE PROTECTION
ESO01000

(Please check our website for availability)

This device includes a diode (D2) and a capacitor (C1) suitable for most of the DC application.

To be mounted close to the SOM.



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

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