# MOSFET BASED DC SOLID STATE RELAY

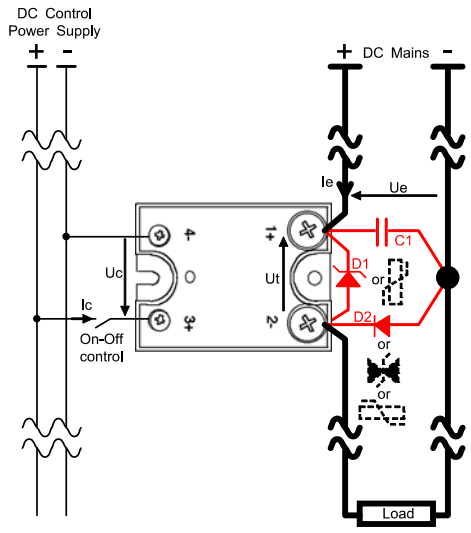
- Latest MOSFET technology generation.
- Ultra low on-state resistance.
- New innovative isolated driver ensuring fast power transistor turn on and off therefore low power transient.
- Ultra low output leakage current
- Low control current consumption
- Triggered control input to avoid linear control risks
- Low conducted and radiated disturbances

## SCM030200

| | |
|---|---|
| Control voltage range | 4.5-32VDC |
| Max. output peak voltage | 200VDC |
| Nom. load current with heatsink | 30ADC |

| Load voltage range | Load current range | Control input voltage range | In & case / Out Insulation | Connections | Dimensions (WxHxD) | Weight |
|---|---|---|---|---|---|---|
| Depends on protection clamping voltage | 0 to 30A (with heatsink) | 4.5-32VDC | 4kV | M3 round tabs M5 round tabs | 44.5 x 58.2 x 27 (mm) | 100g |

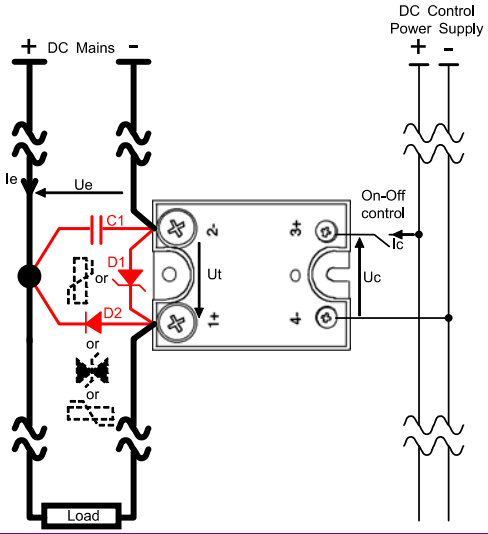
**Fig. 1** HIGH SIDE WIRING DIAGRAM (Load connected to "-")




(*)See Instruction sheet for selective the right protective components

(Red paths as short as possible)

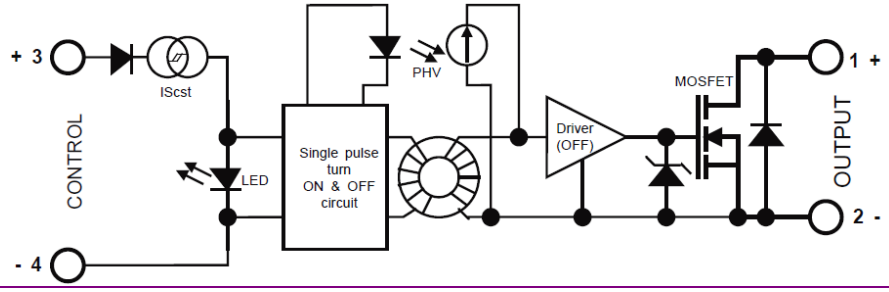
**Fig. 2** LOW SIDE WIRING DIAGRAM (Load connected to "+")




(*)See Instruction sheet for selective the right protective components

(Red paths as short as possible)

**Fig. 3** INTERNAL DIAGRAM




*Proud to serve you*

## CONTROL INPUT CHARACTERISTICS

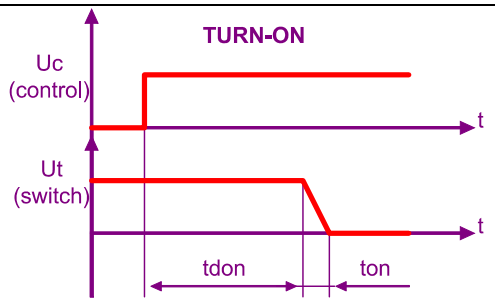
| | CHARACTERISTIC | LABEL | VALUE | INFO. |
|---|---|---|---|---|
| INPUT CIRCUIT | Control voltage range | Uc | 4.5 – 32VDC | |
| | Current consumption | Ic | 25 – 42mADC for control voltage range | See fig. 5 |
| | Typical turn on voltage | Ucontyp | 4.3V | |
| | Min. releasing voltage | Ucoffmin | 1VDC | |
| | Typical releasing voltage | Ucofftyp | 3.5V | |
| | Max. input voltage | Ucmax | 32VDC | |
| | Max. reverse voltage | -Ucmax | 32VDC | |
| | Max. reverse leakage current | -Icmax | 100µA | |
| | Input impedance | Re | Current limitation | See fig. 5 |

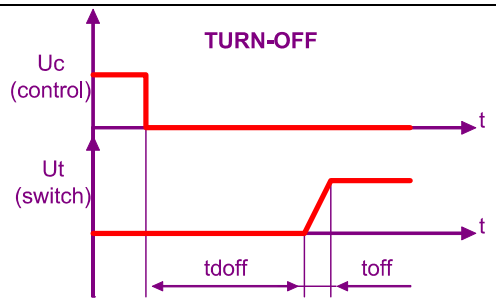
## POWER OUTPUT CHARACTERISTICS

| | CHARACTERISTIC | LABEL | VALUE | | INFO. |
|---|---|---|---|---|---|
| POWER CIRCUIT | Mains voltage range | Ue | Depends on protection clamping voltage | | |
| | Non-repetitive peak voltage | Utp | 200V | | |
| | Overvoltage protection | D1 | Not integrated<br>A voltage clamping mean must be connected across the terminals 1 & 2 (see fig 1 & 2) | | See Instruction sheet for selective the right protective components |
| | Reverse voltage (internal diode) | -Ut | 1,5V | | @Ie=-30A @Uc=0 |
| | Max. repetitive avalanche current | Iep | 18A | | Pulse width limited by Tj max |
| | Max. single pulse avalanche energy | Eep | 315mJ | | @Ut=50V @Ie=Iep |
| | Max. repetitive pulse avalanche energy | Eep | 20mJ | | @Ie=30A |
| | Maximum nominal currents | Ie | Resistive | Motor | See fig. 7 for limits<br>Values with heatsink |
| | | | 30A | Please consult us | |
| | Non-repetitive peak overload current | Iepeak | 120A @Ut=7VDC during 1ms | | See fig. 8 |
| | Min. load current | Iemin | 0mA | | |
| | Max. leakage current | Ielk | 100µADC | | @Utp @Tjmax |
| | Max. on-state resistance | RDSon | 164mΩ | | @Iemax @Tjmax |
| | Typ. output capacitance | Cout | 3nF (Ut=1V 1MHz) | | Uc=0 |
| | Junction/case thermal resistance per power element | Rthjc | 0.75K/W | | Total = 1 power element |
| | Built-in heatsink thermal resistance vertically mounted | Rthra | 8K/W | | @ΔTra=60°C |
| | Heatsink thermal time constant | Tthra | 10min | | @ΔTra=60°C |
| | Control inputs/power outputs insulation voltage | Uimp | 4kV | | |
| | Inputs/case insulation voltage | Uimp | 4kV | | |
| | Outputs/case insulation voltage | Uimp | 4kV | | |
| | 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 | -40->+90°C | | See fig. 7 |
| | Max. case temperature | Tc | 100°C | | |

## TIME CHARACTERISTICS

Fig. 4 — TIME DIAGRAMS




| TIME CHARACT. | CHARACTERISTIC | LABEL | VALUE | INFO. |
|---|---|---|---|---|
| | Turn on time | ton | 10µs (1.2µs typical) | |
| | Turn on delay | tdon | 600µs (500µs typical) | |
| | Turn off time | toff | 10µs (1µs typical) | |
| | Turn off delay | tdoff | 100µs (60µs typical) | |
| | Max. On-Off frequency | F(on-off) | 700Hz | |

## GENERAL INFORMATION

| CONNEC-TIONS | | | | | |
|---|---|---|---|---|---|
| | Connections | | Power | Control | |
| | Screwdriver advised | | Philips™ NR2 | Philips™ NR1 | |
| | Min and max tightening torque | | 1.8 N.m | 0.8 N.m | |
| | Insulated crimp terminals (round tabs, eyelet type) | | M5 | M3 | |

| MISC. | | | | |
|---|---|---|---|---|
| | Display | | Green LED (indicates relay has switched ON) | |
| | Housing | | UL94V0 | |
| | Mounting | | 2 screws (M4x12mm) | See mounting sheet |
| | Noise level | | No audible noise | |
| | Weight | | 100g | |

## STANDARDS

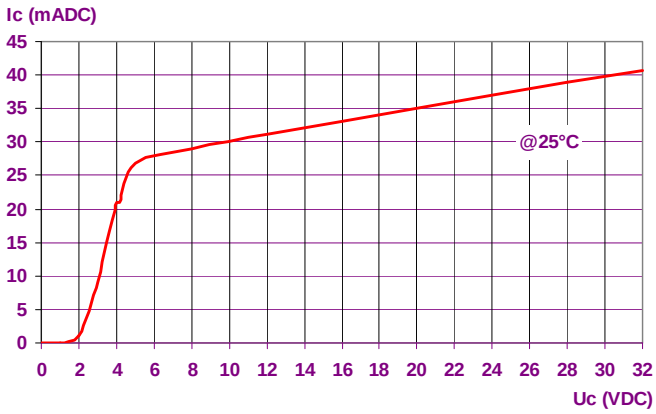
| GENERAL | | | |
|---|---|---|---|
| Standards | | IEC60947-1 | |
| Protection level | | IP00 | |
| Protection against direct touch | | None | |
| CE marking | | Yes | |
| UL, cULUS | | Yes | |

| E.M.C. IMMUNITY | TYPE OF TEST | STANDARD | LEVEL | EFFECT |
|---|---|---|---|---|
| | E.S.D. (Electrostatic discharges) | EN61000-4-2 | Pending | |
| | Radiated electromagnetic fields | EN61000-4-3 | Pending | |
| | Fast transients bursts | EN61000-4-4 | 4kV coupling by clamp on the input side (power side to be tested) | No effect |
| | Electric chocks | EN61000-4-5 | 1kV direct coupling on control side (pending on power side) | No effect |
| | Voltage drop | EN61000-4-11 | - | |

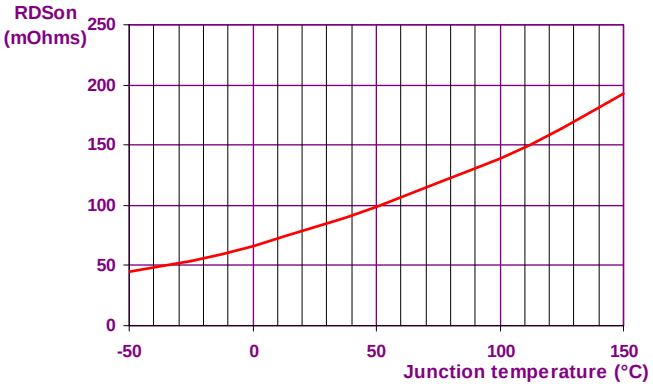
| E.M.C. EMISSION | | | | |
|---|---|---|---|---|
| | Radiated and conducted disturbances | NFEN55011 | Pending | |

## CHARACTERISTIC CURVES

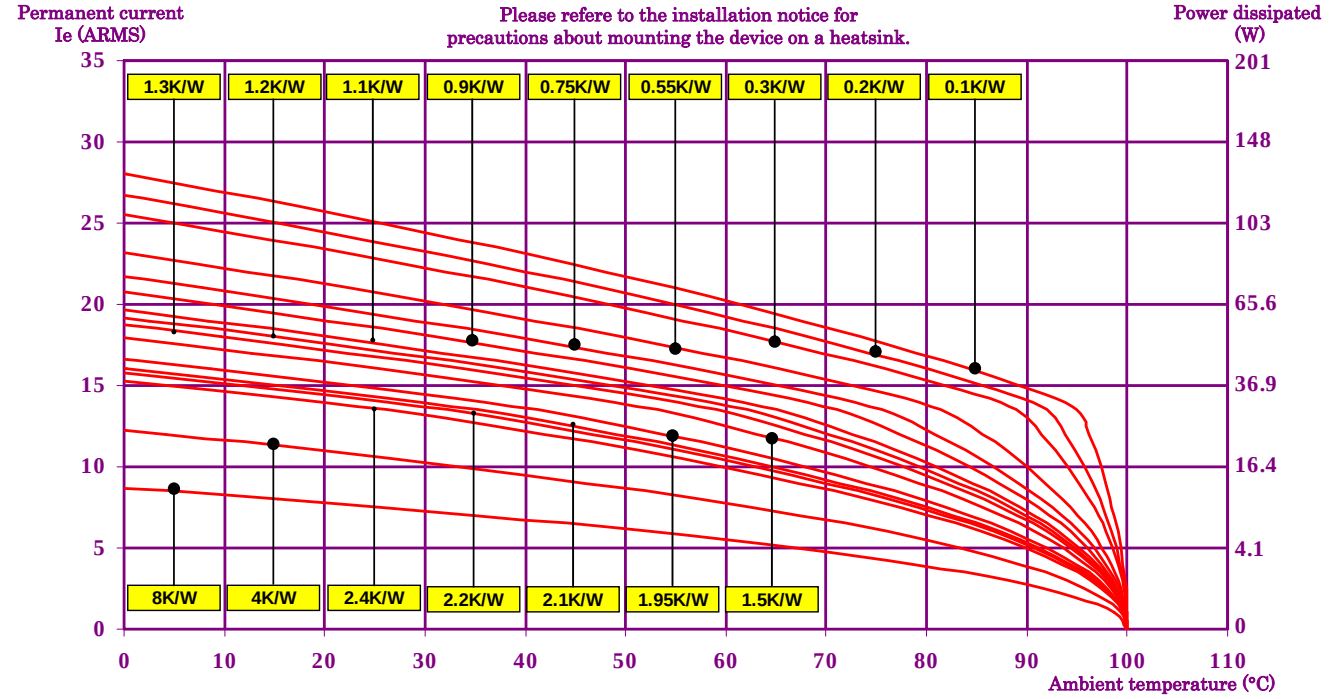
### Fig. 5 INPUT CHARACTERISTIC




### Fig. 6 ON RESISTANCE VS TEMPERATURE

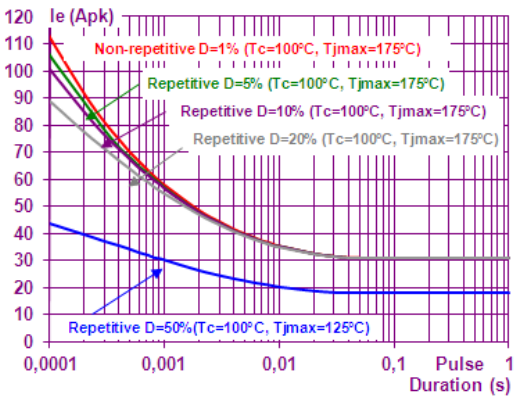



### Fig. 7 POWER DISSIPATED AND LOAD CURRENT LIMIT VS TEMPERATURE



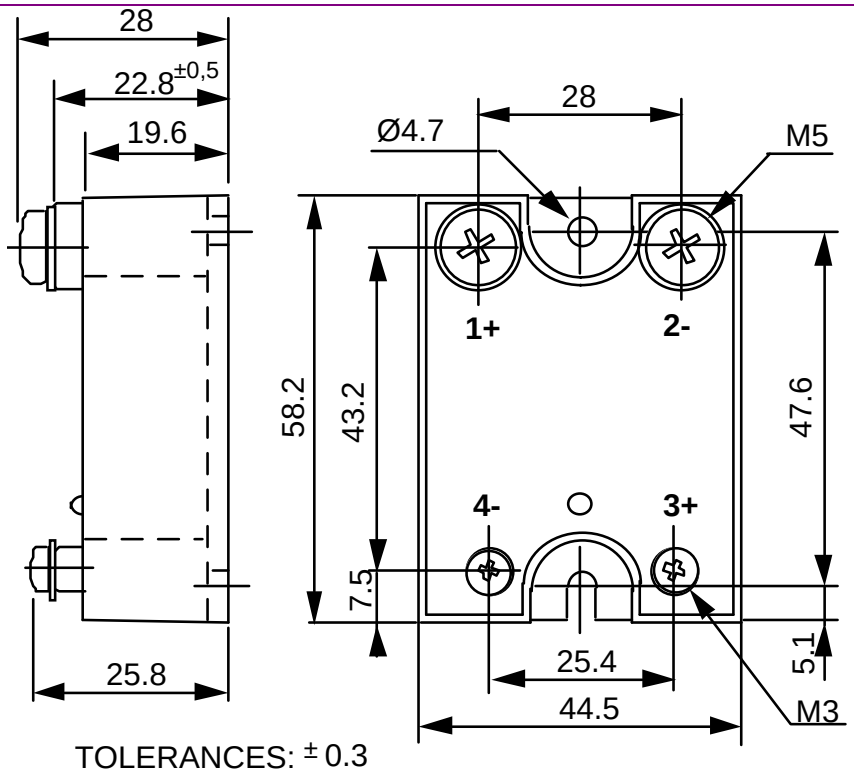

8K/W = No Heatsink 4K/W = No reference 2.4K/W = WF152100 2.2K/W = WF262100 2.2K/W = WF151200
2.1K/W = WF210000 1.95K/W = WF191100 1.5K/W = WF141100 1.3K/W = WF129100 1.2K/W = WF121000
1.1K/W = WF131100 0.9K/W = WF092000 0.9K/W = WF115100 0.7K/W = WF070000 0.55K/W = WF050000
0.3K/W = WF031100

### Fig. 8 CURRENT OVERLOAD CHARACTERISTIC



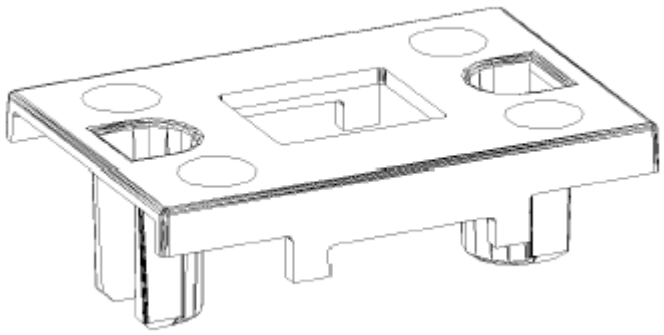
## *DIMENSIONS AND ACCESSORIES*

**Fig. 9** DIMENSIONS




TOLERANCES: ± 0.3

**Fig. 10** ACCESSORIES



PROTECTIVE COVER 1K470000