

## 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

### SCM0150100



|                                    |                                  |
|------------------------------------|----------------------------------|
| Control voltage range              | 4.5-32VDC                        |
| Max transient peak voltage         | 100v                             |
| Advised max. DC Mains peak voltage | Depend on the voltage protection |
| Max. Load Current (with heatsink)  | 150ADC                           |

| DC Mains voltage range                   | Load current range        | Control input voltage range | In & case / Out Insulation | Connections                    | Dimensions (WxHxD)    | Weight |
|------------------------------------------|---------------------------|-----------------------------|----------------------------|--------------------------------|-----------------------|--------|
| (Depends on protection clamping voltage) | 0 to 150A (with heatsink) | 4.5-32VDC                   | 4kV                        | M3 round tabs<br>M5 round tabs | 44.5 x 58.2 x 27 (mm) | 100g   |

Fig. 1

#### HIGH SIDE WIRING DIAGRAM (Load connected to "-")

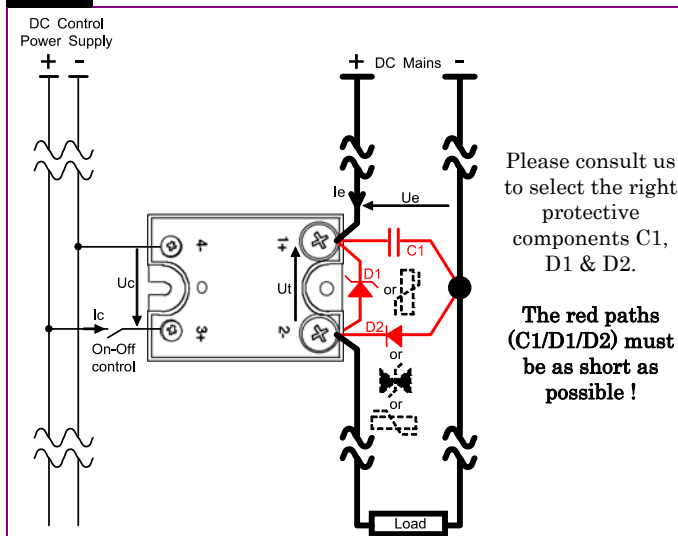


Fig. 2

#### LOW SIDE WIRING DIAGRAM (Load connected to "+")

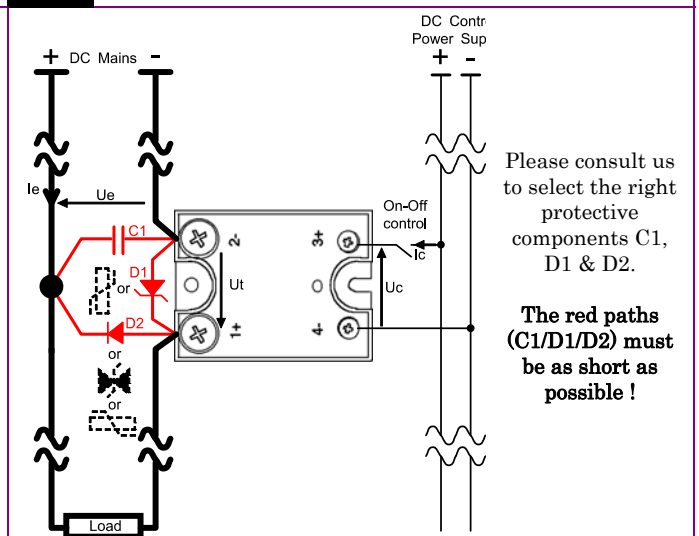
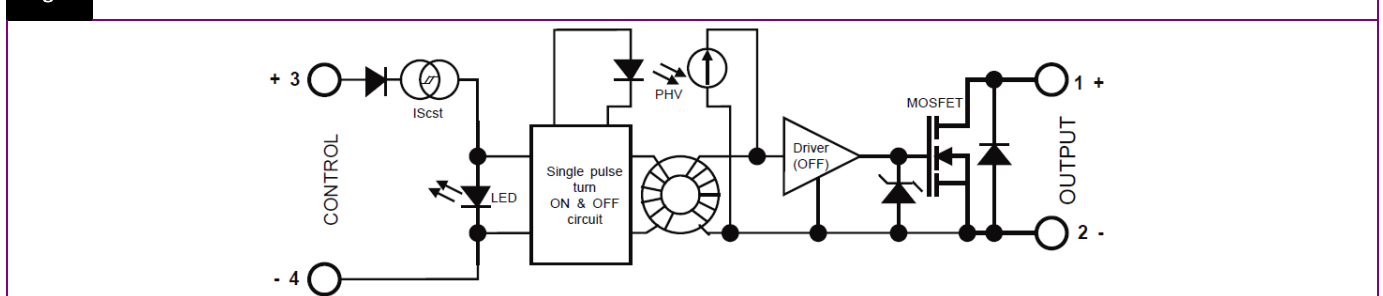


Fig. 3

#### INTERNAL DIAGRAM

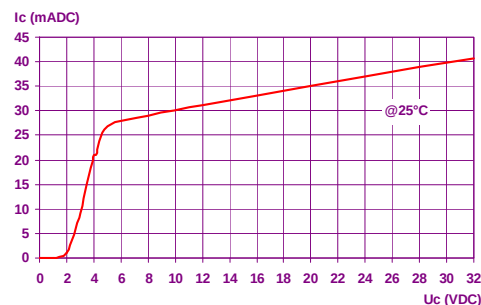


Proud to serve you

**celduc**<sup>®</sup>  
r e l a i s

## CONTROL INPUT CHARACTERISTICS

| INPUT CIRCUIT | CHARACTERISTIC               | LABEL         | VALUE              | INFO.                  | Fig. 4 | CONTROL CURRENT vs. CONTROL VOLTAGE |
|---------------|------------------------------|---------------|--------------------|------------------------|--------|-------------------------------------|
|               | Nom. Control voltage         | $U_{Cnom}$    | 12-24VDC           |                        |        |                                     |
|               | Nom. Control current         | $I_{Cnom}$    | 35mADC             |                        |        |                                     |
|               | Control voltage range        | $U_c$         | 4.5 – 32VDC        | typical=4.3V           |        |                                     |
|               | Control current consumption  | $I_c$         | 25 – 42mADC        | See curve              |        |                                     |
|               | Releasing control voltage    | $U_{Coffmax}$ | 1VDC               | Typical= 3.5V          |        |                                     |
|               | Max. reverse control voltage | $-U_{Cmax}$   | 32VDC              | $-I_{Cmax} < 100\mu A$ |        |                                     |
|               | Input impedance              | $R_{in}$      | Current limitation | See curve              |        |                                     |



## TIME CHARACTERISTICS

| TIME CHARACT. | CHARACTERISTIC        | LABEL          | VALUE       |  |
|---------------|-----------------------|----------------|-------------|--|
|               | Turn on time          | $t_{on}$       | 10 $\mu$ s  |  |
|               | Turn on delay         | $t_{don}$      | 600 $\mu$ s |  |
|               | Turn off time         | $t_{off}$      | 10 $\mu$ s  |  |
|               | Turn off delay        | $t_{doff}$     | 100 $\mu$ s |  |
|               | Max. On-Off frequency | $F_{(on-off)}$ | 700Hz       |  |

## POWER OUTPUT CHARACTERISTICS

| POWER CIRCUIT | CHARACTERISTIC                                          |  | LABEL          | VALUE                                                                                                  |                              | INFO.                                                       |
|---------------|---------------------------------------------------------|--|----------------|--------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------|
|               | Mains voltage range                                     |  | $U_t$   $U_e$  | $Min = R_{DSon} \times I_e$                                                                            |                              | Depends on protection clamping voltage (D1)                 |
|               | Non-repetitive peak voltage                             |  | $U_{tp}$       | 100V                                                                                                   |                              |                                                             |
|               | Overvoltage protection                                  |  | D1             | Not integrated<br>A voltage clamping mean must be connected across the terminals 1 & 2 (see fig 1 & 2) |                              | Please consult us to select the right protective components |
|               | Off-state max reverse voltage drop (internal diode)     |  | $-U_t$         | 0.85V                                                                                                  |                              | @ $I_e=150A$<br>@ $U_c=0$                                   |
|               | Maximum nominal currents                                |  | $I_e \max$     | Resistive                                                                                              | Motor                        | See fig. 9                                                  |
|               |                                                         |  |                | 150A                                                                                                   | Please contact us            |                                                             |
|               | Max. non-repetitive peak current                        |  | $I_{epeak}$    | 1000A                                                                                                  |                              | See fig. 8                                                  |
|               | Min. load current                                       |  | $I_{emin}$     | 0mA                                                                                                    |                              |                                                             |
|               | Max. leakage current                                    |  | $I_{elk \max}$ | 500 $\mu$ A                                                                                            |                              | @ $U_{tp}$ @ $T_{jmax}$                                     |
|               | Max. on-state resistance                                |  | $R_{DSon}$     | 1mOhms @ $T_j=25^\circ C$                                                                              | 1.9mOhms @ $T_j=125^\circ C$ | @ $I_{emax}$                                                |
|               | Typ. output capacitance                                 |  | $C_{out}$      | 2.7nF                                                                                                  |                              | @ $U_{tp}$                                                  |
|               | Junction/case thermal resistance                        |  | $R_{thjc}$     | 0.45K/W                                                                                                |                              |                                                             |
|               | Built-in heatsink thermal resistance vertically mounted |  | $R_{thra}$     | 10K/W                                                                                                  |                              | @ $\Delta T_{ra}=75^\circ C$                                |
|               | Heatsink thermal time constant                          |  | $T_{thra}$     | 10 minutes                                                                                             |                              | @ $\Delta T_{ra}=60^\circ C$                                |
|               | Control inputs/power outputs insulation voltage         |  | $U_{imp}$      | 4kV                                                                                                    |                              |                                                             |
|               | Inputs/case insulation voltage                          |  | $U_{imp}$      | 4kV                                                                                                    |                              |                                                             |
|               | Outputs/case insulation voltage                         |  | $U_{imp}$      | 4kV                                                                                                    |                              |                                                             |
|               | Isolation resistance                                    |  | $R_{io}$       | 1G $\Omega$                                                                                            |                              |                                                             |
|               | Isolation capacitance                                   |  | $C_{io}$       | <8pF                                                                                                   |                              |                                                             |
|               | Maximum junction temperature                            |  | $T_{jmax}$     | 175 $^\circ C$                                                                                         |                              |                                                             |
|               | Storage ambient temperature                             |  | $T_{stg}$      | -40 $^\circ C$ > +100 $^\circ C$                                                                       |                              |                                                             |
|               | Operating ambient temperature                           |  | $T_{amb}$      | -40 $^\circ C$ > +90 $^\circ C$                                                                        |                              | See fig. 9                                                  |
|               | Max. case temperature                                   |  | $T_c$          | 100 $^\circ C$                                                                                         |                              |                                                             |

## OUTPUT SWITCH CHARACTERISTIC CURVES

**Fig. 5** ON RESISTANCE VS JUNCTION TEMPERATURE

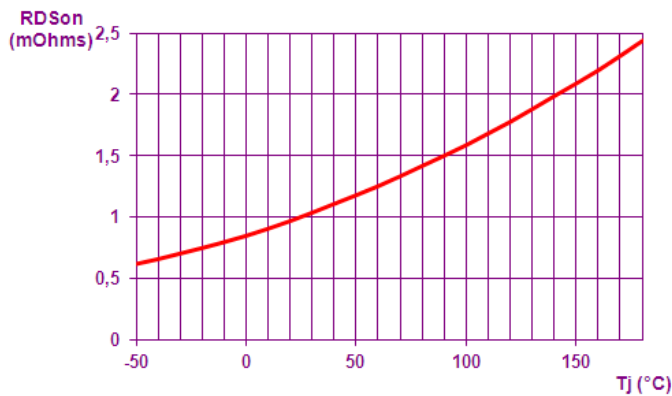


**Fig. 6** REVERSE VOLTAGE DROP VS REVERSE CURRENT

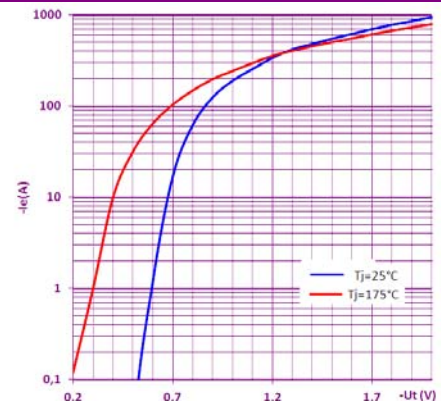


**Fig. 7** POWER ELEMENT TRANSIENT THERMAL IMPEDANCE vs. PULSE DURATION

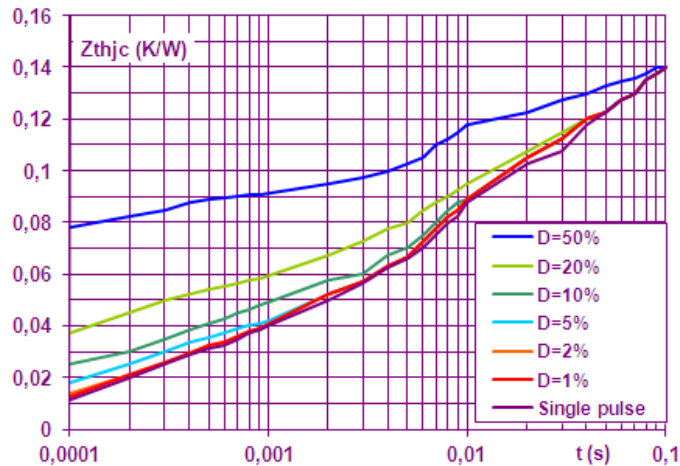


**Fig. 8** ON-STATE PEAK OVERLOAD CURRENT vs. PULSE DURATION

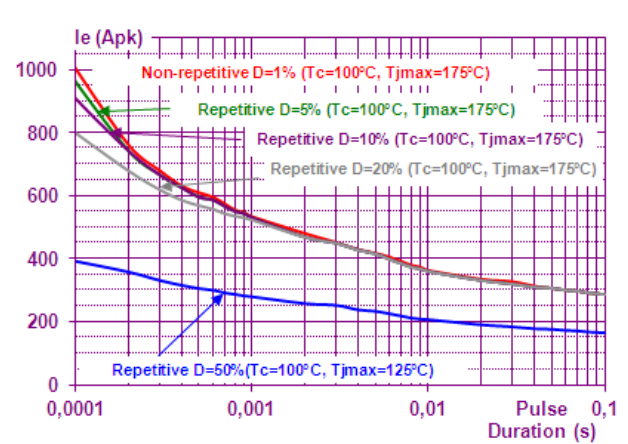
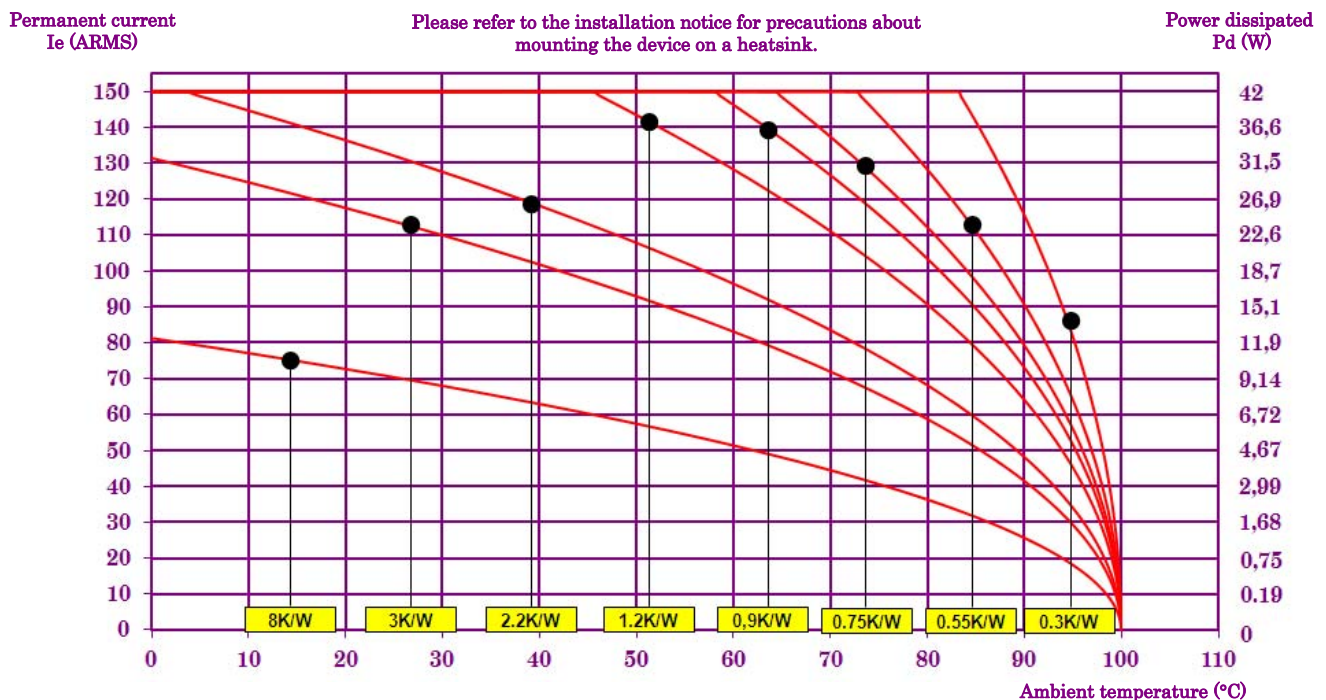


**Fig. 9** POWER DISSIPATED AND LOAD CURRENT LIMIT VS TEMPERATURE



10K/W = No Heatsink / 1LD12020  
2.1K/W = WF210000  
0.9K/W = WF115100

4K/W = 150x150x3mm aluminium sheet  
1.2K/W = WF121000  
0.75K/W = WF070000

2.2K/W = WF262100 / WF151200  
1.1K/W = WF131100  
0.55K/W = WF050000

0.3K/W = WF031100

Please refer to the installation notice for precautions about mounting the device on a heatsink.

**GENERAL INFORMATION**

| CONNECTIONS | 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<br>(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        |  |

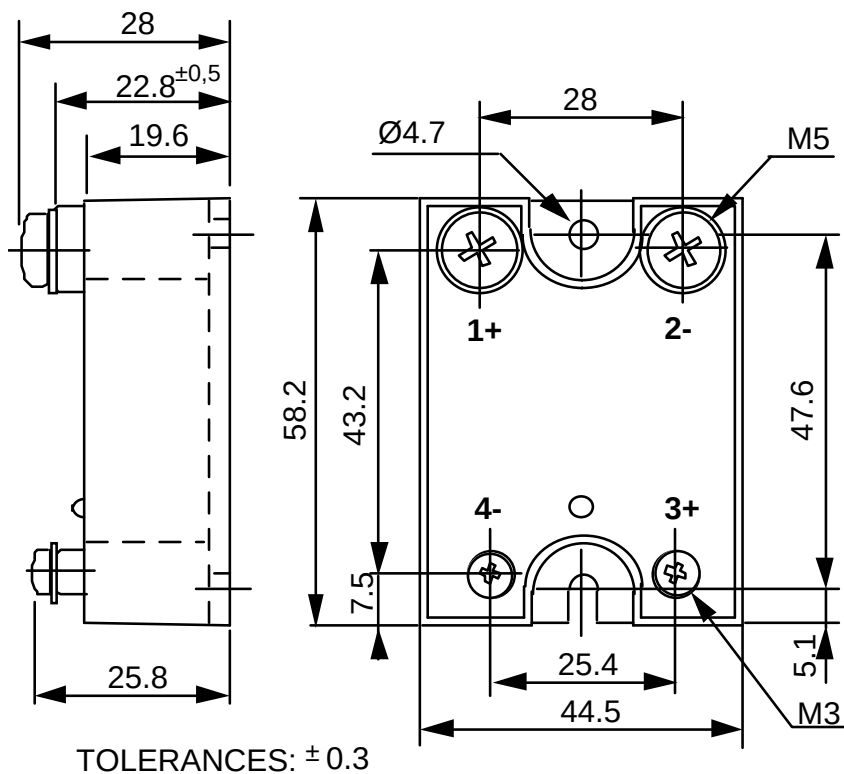
| E.M.C. IMMUNITY | TYPE OF TEST                      | STANDARD     | LEVEL   | EFFECT    |
|-----------------|-----------------------------------|--------------|---------|-----------|
|                 | E.S.D. (Electrostatic discharges) | EN61000-4-2  | Pending | ?         |
|                 | Radiated electromagnetic fields   | EN61000-4-3  | Pending | ?         |
|                 | Fast transients bursts            | EN61000-4-4  | Pending | No effect |
|                 | Electric chocks                   | EN61000-4-5  | Pending | ?         |
|                 | Voltage drop                      | EN61000-4-11 | -       |           |

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

## DIMENSIONS AND ACCESSORIES

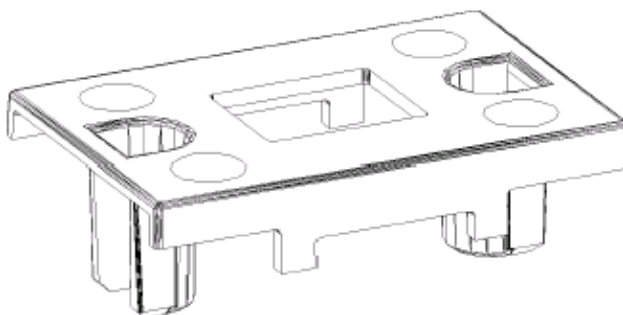
Fig.  
10

DIMENSIONS (mm)



### ACCESSORIES

#### PROTECTIVE COVER 1K470000



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