

## SOLID STATE RELAIS FOR DC CURRENT WITH MOSFET

- Designed and approved for railway applications (EN 50155)
- For DIN RAIL mounting
- Latest MOSFET technology generation
- Ultra low voltage drop
- Built-in overvoltage protection
- Control display LED (green)
- Applications :
  - Traffic lights
  - Small motors, electromagnets, lights, heaters
  - Measurement products
  - ...
- Other control and output voltages on request



### XKLD31006



|                                    |                     |
|------------------------------------|---------------------|
| Control voltage range              | 10-30VDC            |
| Max output peak voltage            | 40v<br>(clamp =60V) |
| Nom. Load current without heatsink | 10ADC               |

| Application voltages | Load current range | Control input voltage range          | In & case / Out insulation | Connections     | Dimensions (WxHxD in mm) | Weight |
|----------------------|--------------------|--------------------------------------|----------------------------|-----------------|--------------------------|--------|
| 12-24-36VDC          | 0 to 10A           | 10-30VDC<br>(12,7-30VDC for EN50155) | 2.5kV                      | Screw terminals | 12.2 x 76.4 x 53         | 30g    |

Fig. 1

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

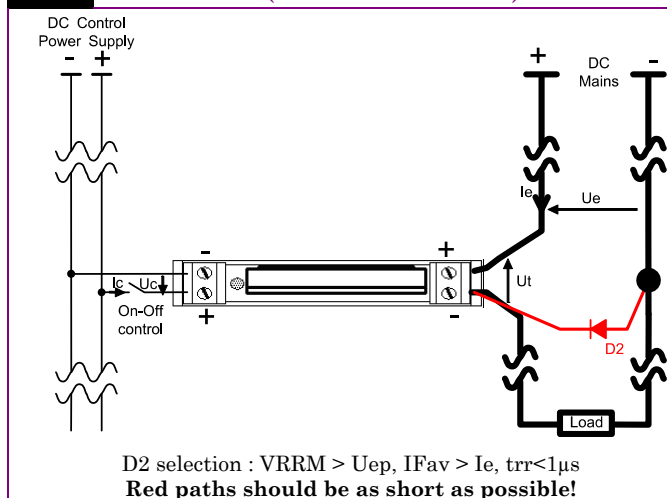


Fig. 2

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

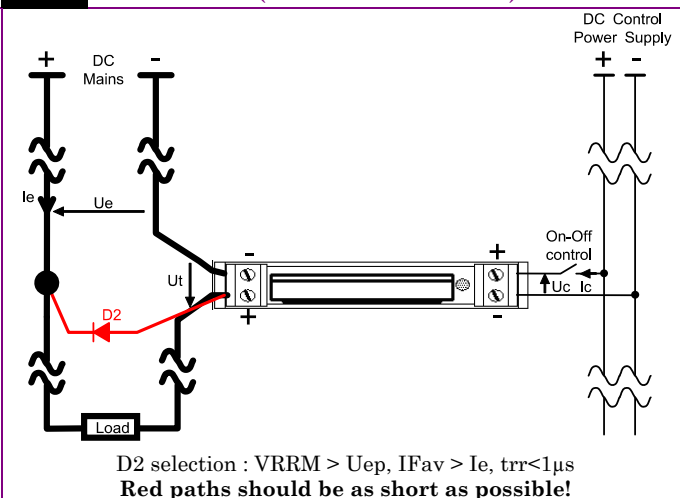
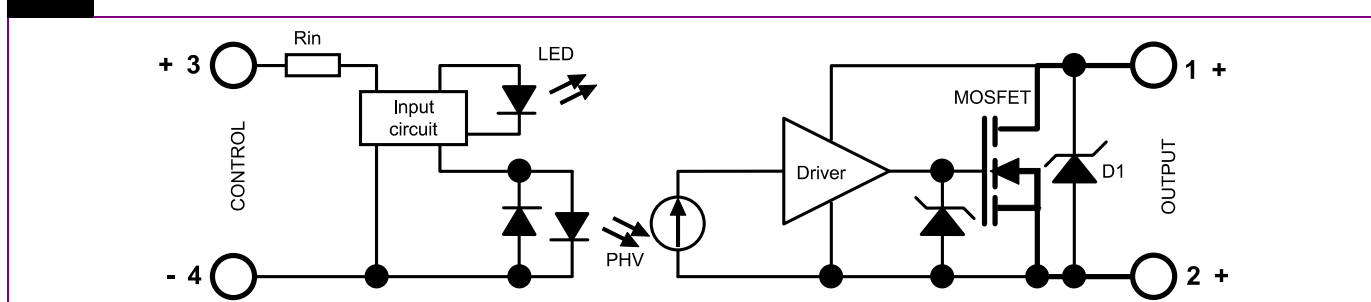


Fig. 3

#### INTERNAL DIAGRAM



Proud to serve you

Data given at Tambient=25°C and subject to modification without previous notice

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**CONTROL INPUT CHARACTERISTICS**

| INPUT CIRCUIT | CHARACTERISTIC          | LABEL    | VALUE        | INFO.       |
|---------------|-------------------------|----------|--------------|-------------|
|               | Nominal control voltage | Ucnom    | 12-24VDC     |             |
|               | Nominal control current | Icnom    | 9-20mADC     |             |
|               | Control voltage range   | Uc       | 10-30VDC     |             |
|               | Control voltage range   | Uc       | 12,7 – 30VDC | For EN50155 |
|               | Current consumption     | Ic       | 7-26mADC     | See fig. 5  |
|               | Releasing voltage       | Ucoffmax | 1VDC         |             |
|               | Max. reverse voltage    | -Ucmax   | 30VDC        |             |
| POWER CIRCUIT | Input impedance         | Rin      | 1000Ω        | See fig. 5  |

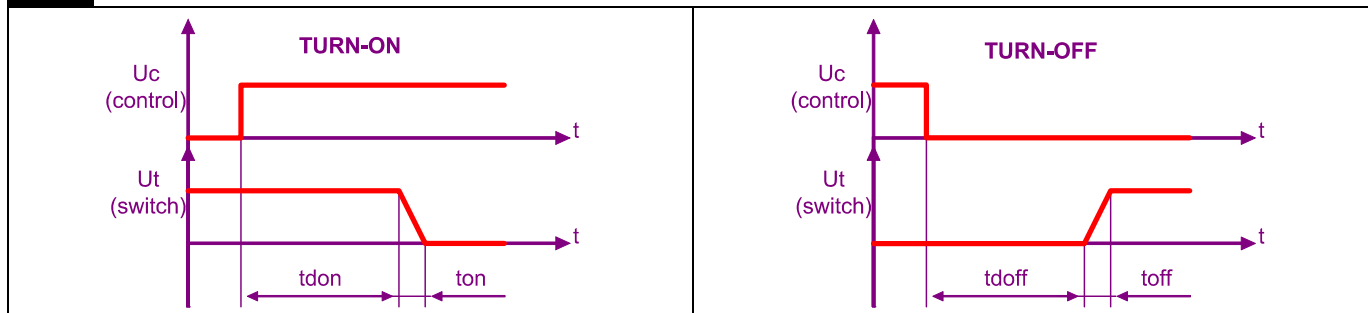
**POWER OUTPUT CHARACTERISTICS**

| POWER CIRCUIT | CHARACTERISTIC                                      | LABEL  | VALUE                                     |                  | INFO.                      |
|---------------|-----------------------------------------------------|--------|-------------------------------------------|------------------|----------------------------|
|               | Mains Nominal voltage                               | Uenom  | 12-24-36VDC                               |                  |                            |
|               | Mains voltage range                                 | Ue     | 10-40VDC                                  |                  |                            |
|               | Non-repetitive peak voltage                         | Uep    | 60V                                       |                  |                            |
|               | Overvoltage protection                              | D1     | Pulse = 600W 1.2/50μs<br>Permanent = 0.5W |                  |                            |
|               | Reverse voltage drop (internal diode)               | -Ue    | 0.82VDC                                   |                  | @Ie=10A<br>@Uc=0           |
|               | Maximum nominal currents                            | Ie     | 10A                                       |                  | See fig. 7 for limits      |
|               | Non-repetitive peak overload current                | Iepeak | 100A @10ms                                |                  | See fig. 8                 |
|               | Min. load current                                   | Iemin  | 0.1mA                                     |                  |                            |
|               | Max. leakage current                                | Ielk   | 0.1mADC                                   |                  | @Uep @Tjmax                |
|               | Max. on-state resistance                            | RDSon  | 14mΩ @Tj=25°C                             | 22.4mΩ @Tj=125°C | @Iemax                     |
|               | Typ. output capacitance                             | Cout   | 360pF                                     |                  | @1MHz<br>@VDS=25V<br>@Uc=0 |
|               | Junction/case thermal resistance per power element  | Rthjc  | 1K/W                                      |                  | Total = 1 power elements   |
|               | Relay/ambient thermal resistance vertically mounted | Rthra  | 22K/W                                     |                  | @ΔTra=60°C                 |
|               | Relay thermal time constant                         | Tthra  | 2min                                      |                  | @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.7                  |
|               | Operating ambient temperature                       | Tamb   | -25->+70°C (OT3)                          |                  | For EN50155 (See fig. 7)   |
|               | Max. case temperature                               | Tc     | 100°C                                     |                  |                            |

## TIME CHARACTERISTICS

Fig. 4

TIME DIAGRAM



| TIME CHARACT. | CHARACTERISTIC        | LABEL                       | VALUE                                                                    | INFO. |
|---------------|-----------------------|-----------------------------|--------------------------------------------------------------------------|-------|
|               | Turn on time          | <b>ton</b>                  | 1μs                                                                      |       |
|               | Turn on delay         | <b>tdon</b>                 | 10μs                                                                     |       |
|               | Turn off time         | <b>toff</b>                 | 10μs                                                                     |       |
|               | Turn off delay        | <b>tdoff</b>                | 150μs                                                                    |       |
|               | Max. On-Off frequency | <b>F<sub>(on-off)</sub></b> | 1 to 700Hz depending on the circuit configuration :<br>please consult us |       |

## GENERAL INFORMATION

|       |                       |  |                  |  |
|-------|-----------------------|--|------------------|--|
| MISC. | Display LED (control) |  | Green            |  |
|       | Housing               |  | UL94V0           |  |
|       | Mounting              |  | DIN RAIL         |  |
|       | Noise level           |  | No audible noise |  |
|       | Weight                |  | 30g              |  |

## STANDARDS

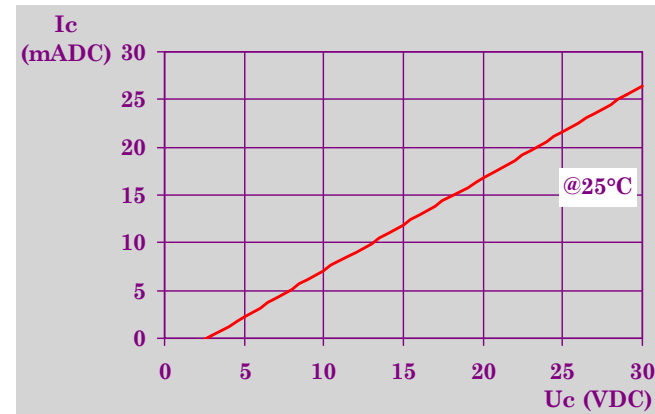
|         |                                 |  |                    |  |
|---------|---------------------------------|--|--------------------|--|
| GENERAL | Standards                       |  | IEC60947-1         |  |
|         | Railway application             |  | EN 50155 – 06/2022 |  |
|         | Protection level                |  | IP00               |  |
|         | Protection against direct touch |  | None               |  |
|         | CE marking                      |  | Yes                |  |
|         | UL, cULUS and VDE approvals     |  | -                  |  |
|         | Shocks and vibration            |  | EN 61373 – 04/2011 |  |

|                   |                                    |             |            |        |
|-------------------|------------------------------------|-------------|------------|--------|
| E.M.C<br>IMMUNITY | TYPE OF TEST                       | STANDARD    | LEVEL      | EFFECT |
|                   | E.S.D. (Electrostatic discharges)  | EN61000-4-2 | Criteria B |        |
|                   | Radiated electromagnetic fields    | EN61000-4-3 | Criteria A |        |
|                   | Fast transients bursts             | EN61000-4-4 | Criteria A |        |
|                   | Electric chocks                    | EN61000-4-5 | Criteria B |        |
|                   | Conducted radio frequency immunity | EN61000-4-6 | Criteria A |        |

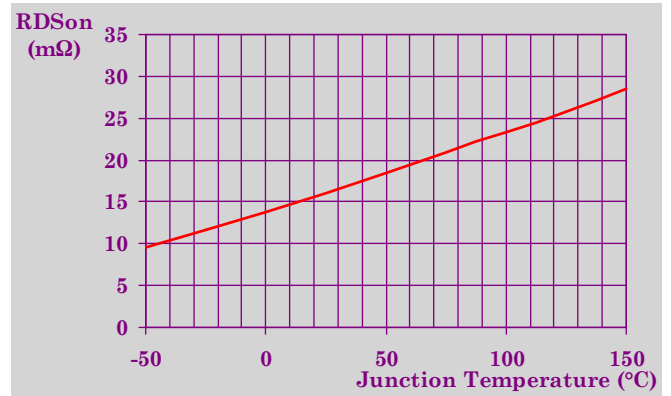
|                    |                    |             |    |  |
|--------------------|--------------------|-------------|----|--|
| E.M.C.<br>EMISSION | Conducted emission | EN55016-2-1 | OK |  |
|                    | Radiated emission  | EN61000-6-4 | OK |  |

## CHARACTERISTIC CURVES

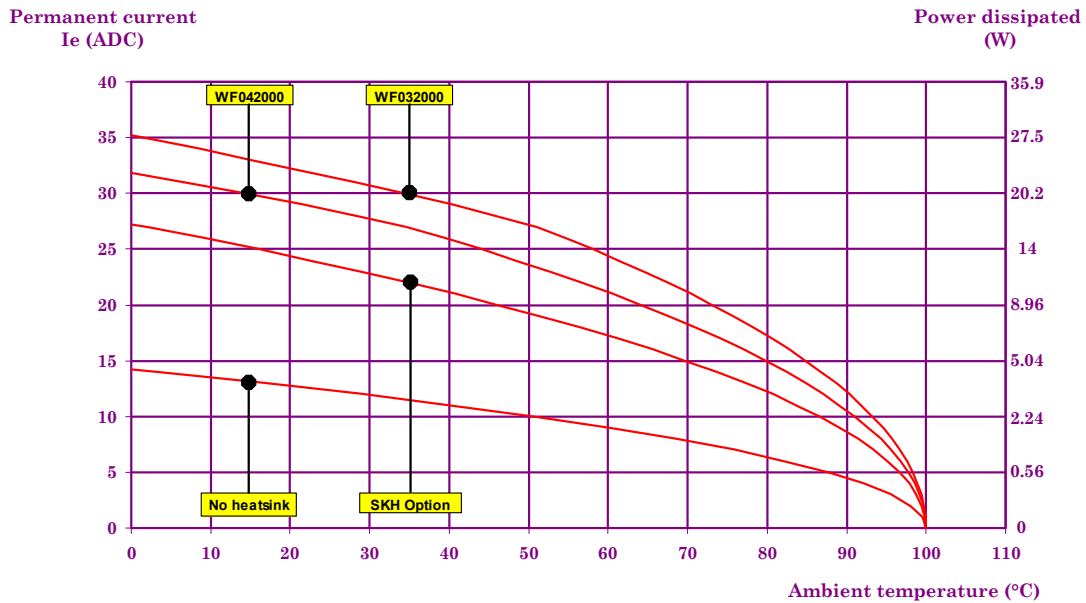
**Fig. 5** INPUT CHARACTERISTIC



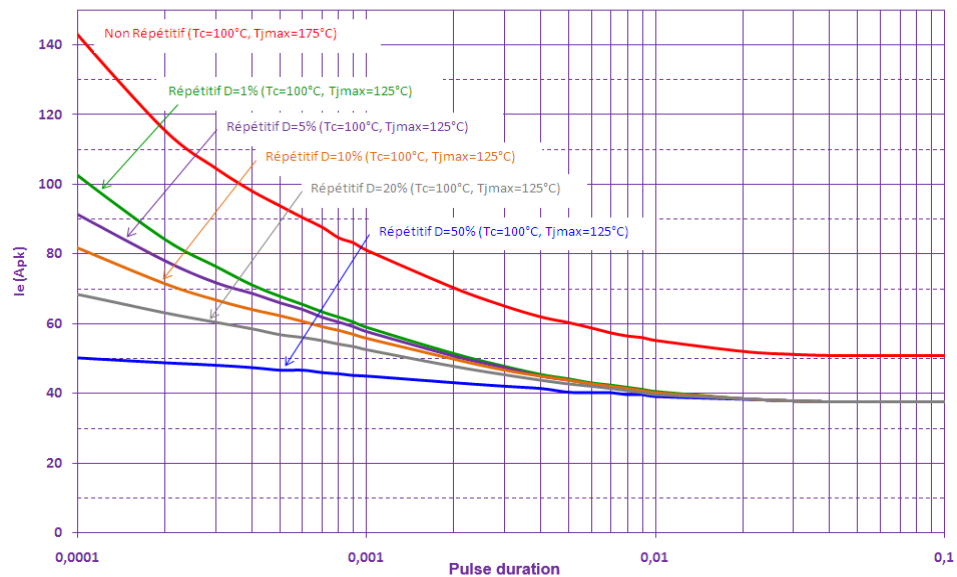
**Fig. 6** ON-STATE VOLTAGE DROP VS TEMPERATURE



**Fig. 7** LOAD CURRENT LIMIT VS TEMPERATURE



**Fig. 8** CURRENT OVERLOAD CHARACTERISTIC (ITSM)



## DIMENSIONS AND ACCESSORIES

Fig. 9

### DIMENSIONS

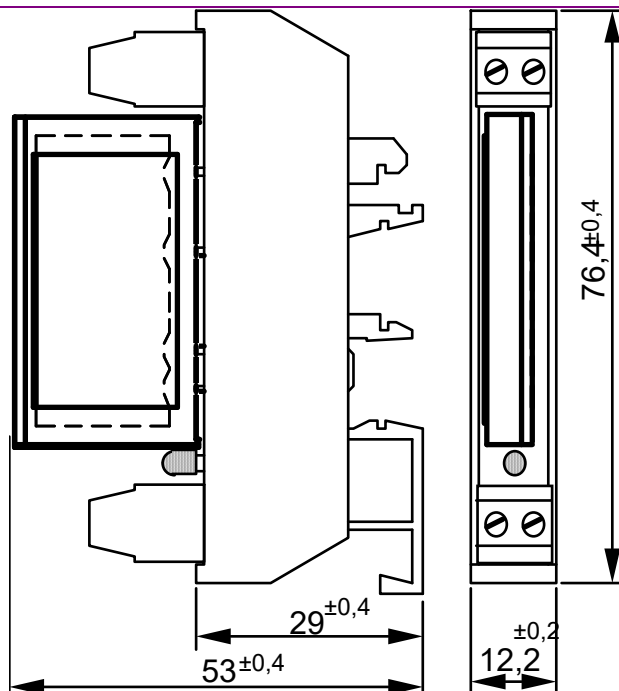


Fig.  
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### ACCESSORIES