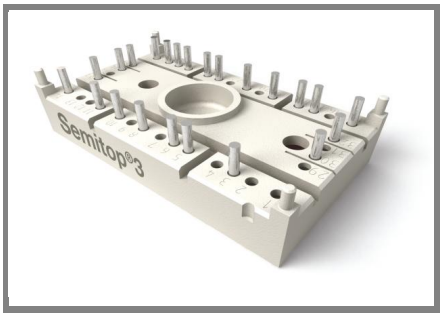
# SK 15 GD 126 ET






**SEMITOP® 3**

3-phase bridge inverter

**SK 15 GD 126 ET**

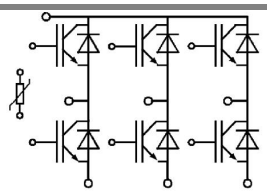
Preliminary Data

## Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded alumium oxide ceramic (DCB)
- Trench technology IGBT
- CAL High Density FWD
- Integrated NTC temperature sensor

## Typical Applications

- Inverter



**GD - ET**

| **Absolute Maximum Ratings** | | $T_s$= 25°C, unless otherwise specified | |
|---|---|---|---|
| **Symbol** | **Conditions** | **Values** | **Units** |
| **IGBT - Inverter, Chopper** | | | |
| $V_{CES}$ | | 1200 | V |
| $I_C$ | $T_s$ = 25 (80) °C | 22 (15) | A |
| $I_{CRM}$ | , $t_p$ = 1 ms | 44 | A |
| $V_{GES}$ | | ±20 | V |
| $T_j$ | | -40 ... +150 | °C |
| **Diode - Inverter, Chopper** | | | |
| $I_F$ | $T_s$ = 25 (80) °C | 25 (17) | A |
| $I_{FRM}$ | $I_{FRM}$ = 2x$I_{Fnom}$, $t_p$ = 1 ms | 50 | A |
| $T_j$ | | -40 ... +150 | °C |
| **Rectifier** | | | |
| $V_{RRM}$ | | | V |
| $I_F$ | $T_s$ = °C | | A |
| $I_{FSM}$ / $I_{TSM}$ | $t_p$ = ms , sin ° ,$T_j$ = °C | | A |
| $I^2t$ | $t_p$ = ms , sin ° ,$T_j$ = °C | | $A^2s$ |
| $T_j$ | | | °C |
| $T_{sol}$ | Terminals, 10s | 260 | °C |
| $T_{stg}$ | | -40, ... +125 | °C |
| $V_{isol}$ | AC, 1 min. / 1s | 2500 / 3000 | V |

| **Characteristics** | | $T_s$= 25°C, unless otherwise specified | | | |
|---|---|---|---|---|---|
| **Symbol** | **Conditions** | **min.** | **typ.** | **max.** | **Units** |
| **IGBT - Inverter, Chopper** | | | | | |
| $V_{CEsat}$ | $I_C$ = 15 A, $T_j$ = 25 (125) °C | | 1,7 (2,2) | 2,1 | V |
| $V_{GE(th)}$ | $V_{GE}$ = $V_{CE}$, $I_C$ = 0,6 mA | 5 | 5,8 | 6,5 | V |
| $V_{CE(TO)}$ | $T_j$ = 25 °C (125) °C | | 1 (0,9) | 1,2 | V |
| $r_T$ | $T_j$ = 25 °C (125) °C | | 47 (73) | 60 | mΩ |
| $C_{ies}$ | $V_{CE}$ = 25 $V_{GE}$ = 0 V, f = 1 MHz | | 1,2 | | nF |
| $C_{oes}$ | $V_{CE}$ = 25 $V_{GE}$ = 0 V, f = 1 MHz | | 0,3 | | nF |
| $C_{res}$ | $V_{CE}$ = 25 $V_{GE}$ = 0 V, f = 1 MHz | | 0,2 | | nF |
| $R_{th(j-s)}$ | per IGBT | | | 1,6 | K/W |
| $t_{d(on)}$ | under following conditions | | 35 | | ns |
| $t_r$ | $V_{CC}$ = 600 V, $V_{GE}$ = ± 15 V | | 20 | | ns |
| $t_{d(off)}$ | $I_C$ = 15 A, $T_j$ = 125 °C | | 403 | | ns |
| $t_f$ | $R_{Gon}$ = $R_{Goff}$ = 50 Ω | | 192 | | ns |
| $E_{on}$ | inductive load | | 1,63 | | mJ |
| $E_{off}$ | | | 1,93 | | mJ |
| **Diode - Inverter, Chopper** | | | | | |
| $V_F$ = $V_{EC}$ | $I_F$ = 15 A, $T_j$ = 25 (125) °C | | 1,6 (1,6) | 1,8 | V |
| $V_{(TO)}$ | $T_j$ = 25 °C (125) °C | | 1 (0,8) | 1,1 | V |
| $r_T$ | $T_j$ = 25 °C (125) °C | | 40 (53) | 47 | mΩ |
| $R_{th(j-s)}$ | per diode | | | 2,1 | K/W |
| $I_{RRM}$ | under following conditions | | 21 | | A |
| $Q_{rr}$ | $I_F$ = 15 A, $V_R$ = 600 V | | 3,5 | | µC |
| $E_{rr}$ | $V_{GE}$ = 0 V, $T_j$ = 125 °C | | 1,4 | | mJ |
| | $di_{F/dt}$ = 570 A/µs | | | | |
| **Diode rectifier** | | | | | |
| $V_F$ | $I_F$ = A, $T_j$ = 25 °C | | | | V |
| $V_{(TO)}$ | $T_j$ = °C | | | | V |
| $r_T$ | $T_j$ = °C | | | | mΩ |
| $R_{th(j-s)}$ | per diode | | | | K/W |
| **Temperatur sensor** | | | | | |
| $R_{ts}$ | 5 %, $T_r$ = 25 (100 ) °C | | 5000(493) | | Ω |
| **Mechanical data** | | | | | |
| w | | | 30 | | g |
| $M_s$ | Mounting torque | | | 2,5 | Nm |

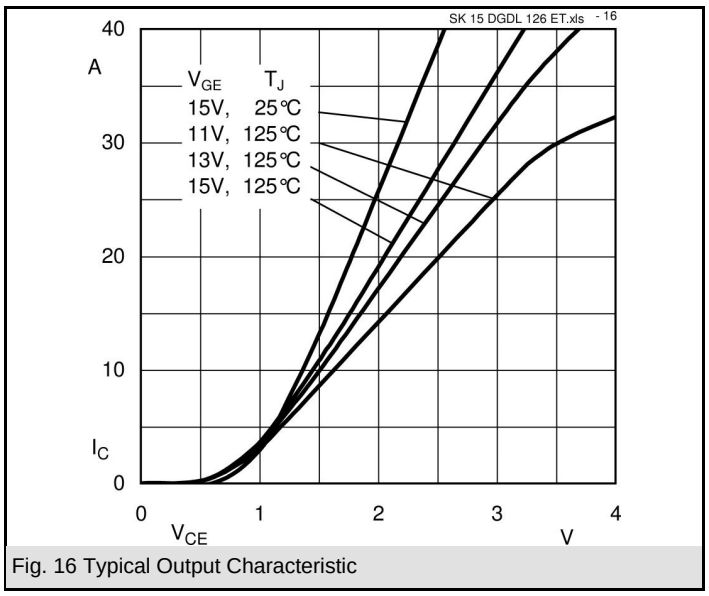


Fig. 16 Typical Output Characteristic

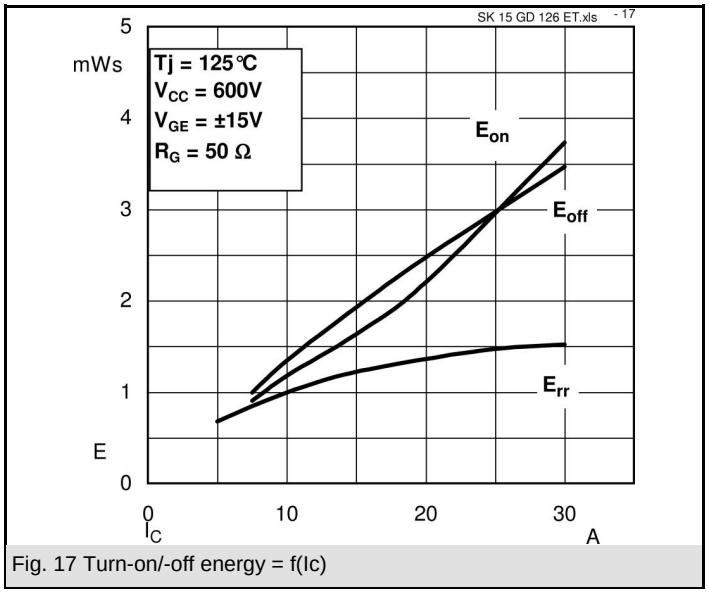


Fig. 17 Turn-on/-off energy = f(Ic)

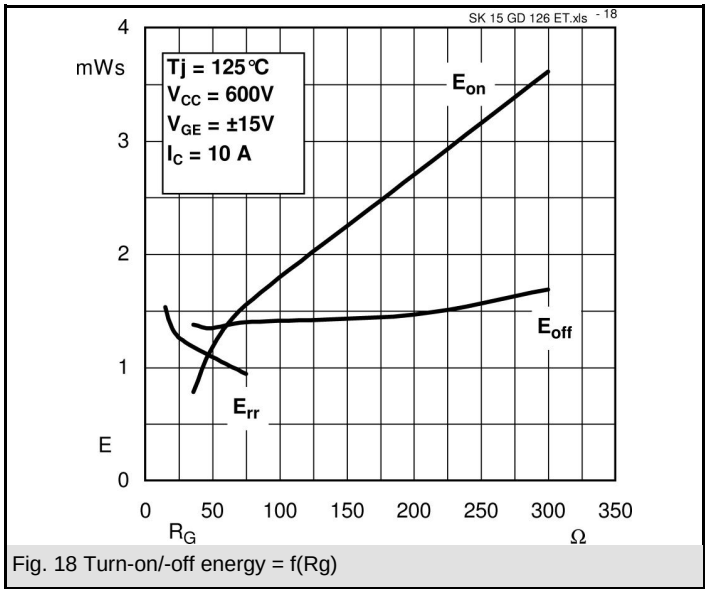


Fig. 18 Turn-on/-off energy = f(Rg)

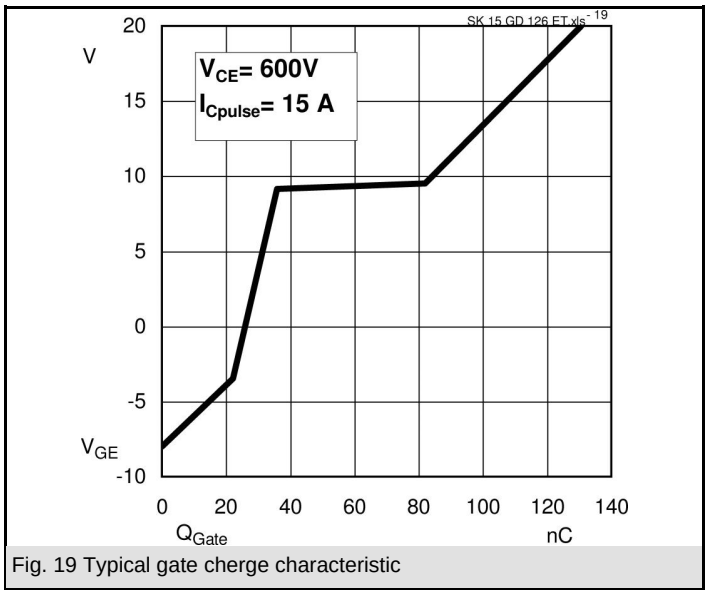


Fig. 19 Typical gate cherge characteristic

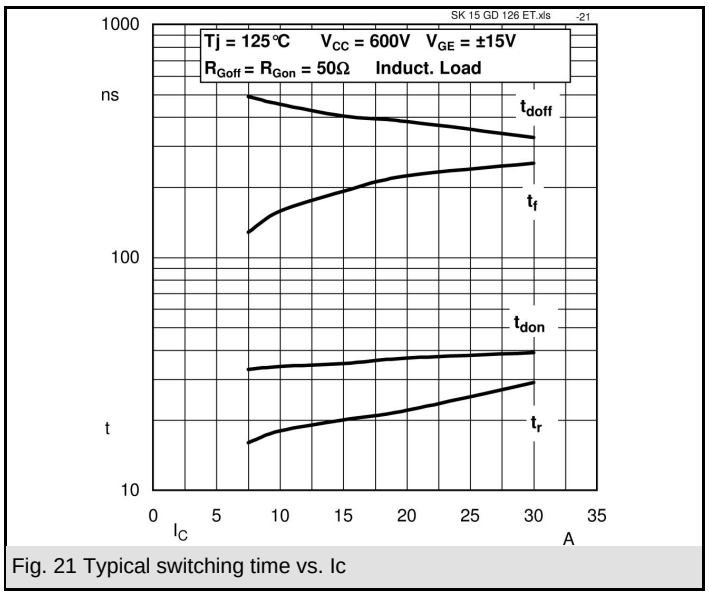



Fig. 21 Typical switching time vs. Ic

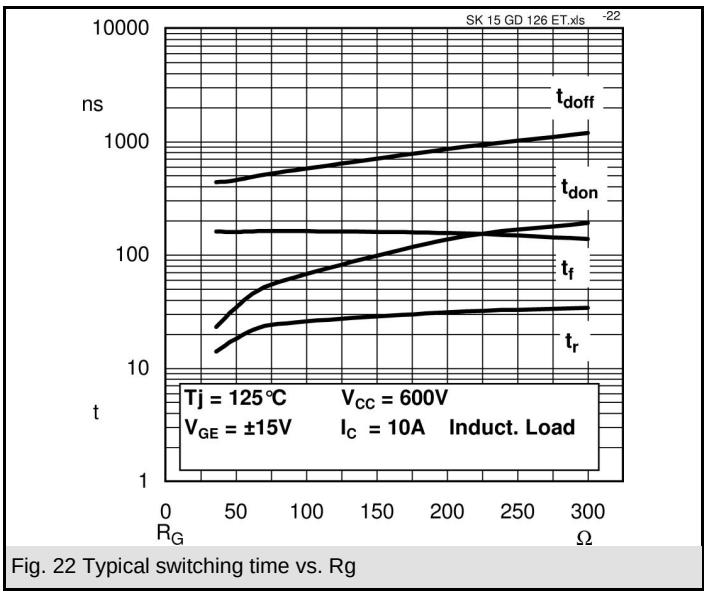



Fig. 22 Typical switching time vs. Rg

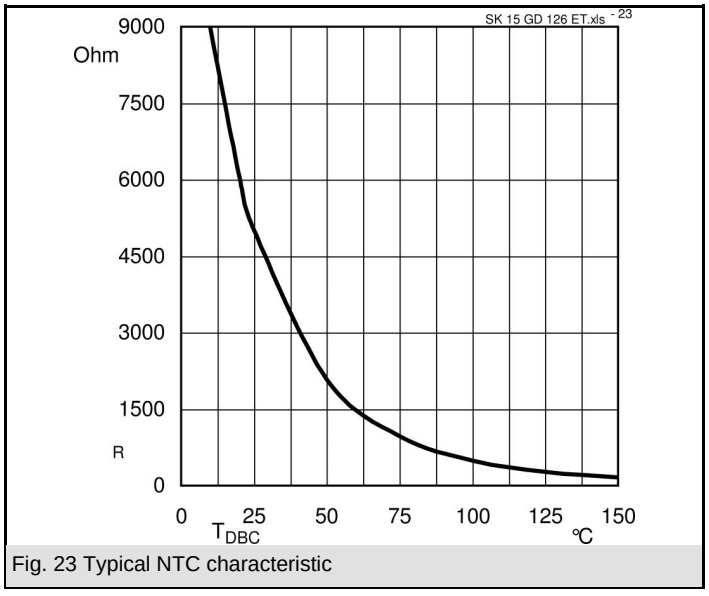



Fig. 23 Typical NTC characteristic

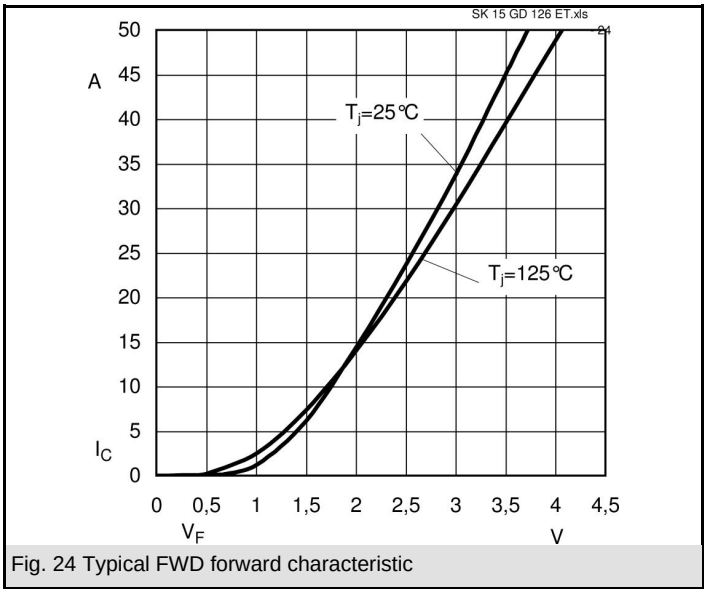
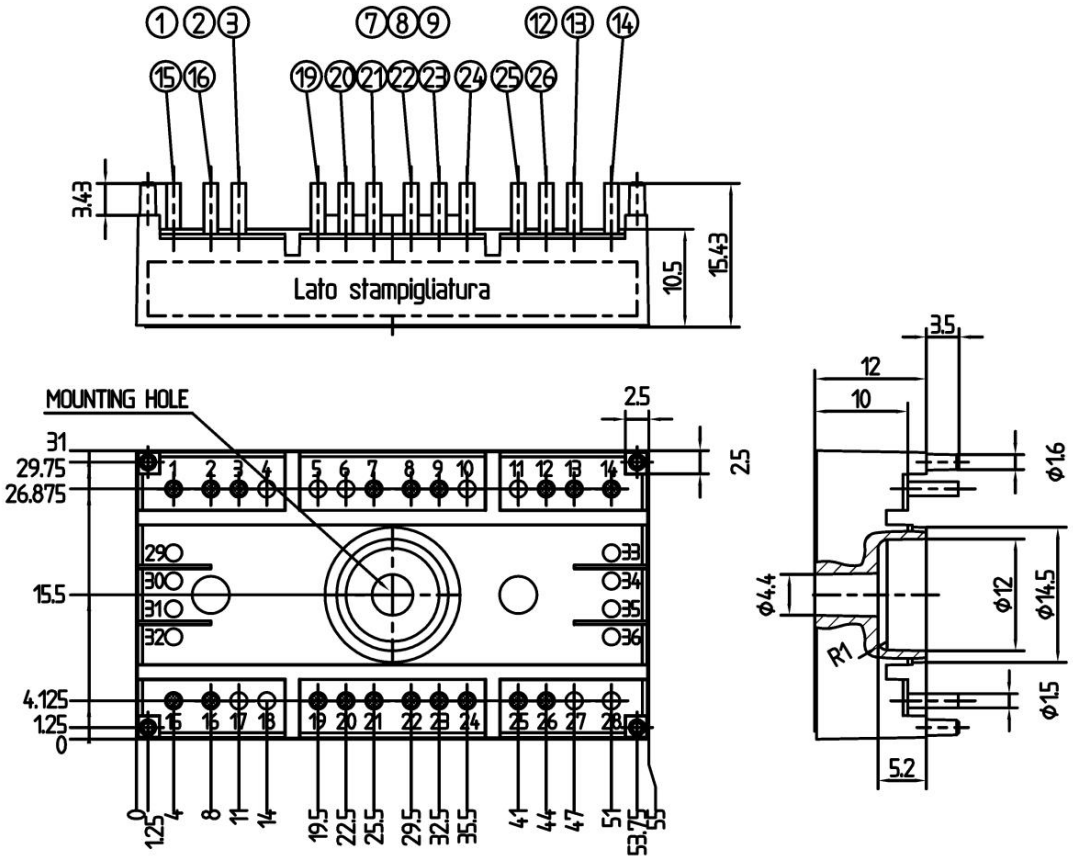



Fig. 24 Typical FWD forward characteristic

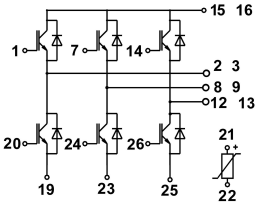
 

UL Recognized
File no. E63 532

Dimensions in mm




Case T 52 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 52

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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