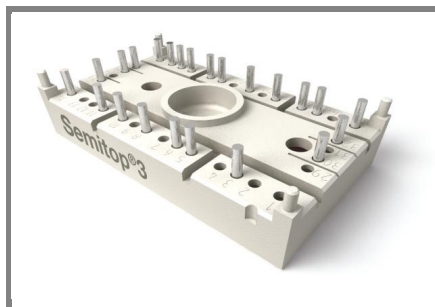


SK 15 DGDL 126 ET



SEMITOP® 3

**3-phase bridge rectifier +
brake chopper +3-phase
bridge inverter**
SK 15 DGDL 126 ET

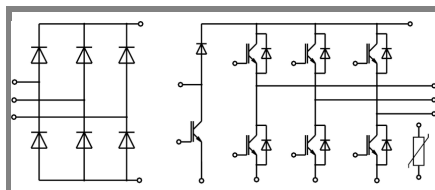
Preliminary Data

Features

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

Typical Applications

- Inverter



DGDL - ET

| Absolute Maximum Ratings | | $T_s = 25^\circ\text{C}$, unless otherwise specified | |
|----------------------------------|--|---|----------------------|
| Symbol | Conditions | Values | Units |
| IGBT - Inverter, Chopper | | | |
| V_{CES} | | 1200 | V |
| I_C | $T_s = 25$ (80) $^\circ\text{C}$ | 22 (15) | A |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$, $t_p = 1$ ms | 30 | A |
| V_{GES} | | ± 20 | V |
| T_j | | -40 ... +150 | $^\circ\text{C}$ |
| Diode - Inverter, Chopper | | | |
| I_F | $T_s = 25$ (80) $^\circ\text{C}$ | 25 (17) | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$, $t_p = 1$ ms | 30 | A |
| T_j | | -40 ... +150 | $^\circ\text{C}$ |
| Rectifier | | | |
| V_{RRM} | | 1600 | V |
| I_F | $T_s = 80$ $^\circ\text{C}$ | 21 | A |
| I_{FSM} / I_{TSM} | $t_p = 10$ ms, sin 180° , $T_j = 25$ $^\circ\text{C}$ | 220 | A |
| I_t^2 | $t_p = 10$ ms, sin 180° , $T_j = 25$ $^\circ\text{C}$ | 240 | A^2s |
| T_j | | -40 ... +150 | $^\circ\text{C}$ |
| T_{sol} | Terminals, 10s | 260 | $^\circ\text{C}$ |
| T_{stg} | | -40 ... +125 | $^\circ\text{C}$ |
| V_{isol} | AC, 1 min. / 1s | 2500 / 3000 | V |

| Characteristics | | $T_s = 25^\circ\text{C}$, unless otherwise specified | | | |
|----------------------------------|--|---|-----------|------|---------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT - Inverter, Chopper | | | | | |
| V_{CEsat} | $I_C = 15$ A, $T_j = 25$ (125) $^\circ\text{C}$ | | 1,7 (2) | 2,1 | V |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C = 0,6$ mA | 5 | 5,8 | 6,5 | V |
| $V_{CE(TO)}$ | $T_j = 25$ $^\circ\text{C}$ (125) $^\circ\text{C}$ | | 1 (0,9) | | V |
| r_T | $T_j = 25$ $^\circ\text{C}$ (125) $^\circ\text{C}$ | | 45 (70) | | m Ω |
| C_{ies} | $V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz | | 1,2 | | nF |
| C_{oes} | $V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz | | 0,1 | | nF |
| C_{res} | $V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz | | 9,1 | | nF |
| $R_{th(j-s)}$ | per IGBT | | | 1,6 | K/W |
| $t_{d(on)}$ | under following conditions | | 25 | | ns |
| t_r | $V_{CC} = 600$ V, $V_{GE} = \pm 15$ V | | 25 | | ns |
| $t_{d(off)}$ | $I_C = 15$ A, $T_j = 125$ $^\circ\text{C}$ | | 385 | | ns |
| t_f | $R_{Gon} = R_{Goff} = 30$ Ω | | 90 | | ns |
| E_{on} | inductive load | | 2 | | mJ |
| E_{off} | | | 1,8 | | mJ |
| Diode - Inverter, Chopper | | | | | |
| $V_F = V_{EC}$ | $I_F = 15$ A, $T_j = 25$ (125) $^\circ\text{C}$ | | 1,6 (1,6) | | V |
| $V_{(TO)}$ | $T_j = 25$ $^\circ\text{C}$ (125) $^\circ\text{C}$ | | 1 (0,8) | | V |
| r_T | $T_j = 25$ $^\circ\text{C}$ (125) $^\circ\text{C}$ | | 40 (53) | | m Ω |
| $R_{th(j-s)}$ | per diode | | | 2,1 | K/W |
| I_{RRM} | under following conditions | | 25 | | A |
| Q_{rr} | $I_F = 15$ A, $V_R = 600$ V | | 3 | | μC |
| E_{rr} | $V_{GE} = 0$ V, $T_j = 125$ $^\circ\text{C}$ | | 1,1 | | mJ |
| | $di_F/dt = 900$ A/ μs | | | | |
| Diode rectifier | | | | | |
| V_F | $I_F = 15$ A, $T_j = 25$ $^\circ\text{C}$ | | 1,1 | | V |
| $V_{(TO)}$ | $T_j = 150$ $^\circ\text{C}$ | | 0,9 | | V |
| r_T | $T_j = 150$ $^\circ\text{C}$ | | 20 | | m Ω |
| $R_{th(j-s)}$ | per diode | | | 2 | K/W |
| Temperatur sensor | | | | | |
| R_{ts} | 5 %, $T_r = 25$ (100) $^\circ\text{C}$ | | 5000(493) | | Ω |
| Mechanical data | | | | | |
| w | | | 30 | | g |
| M_s | Mounting torque | | | 2,5 | Nm |

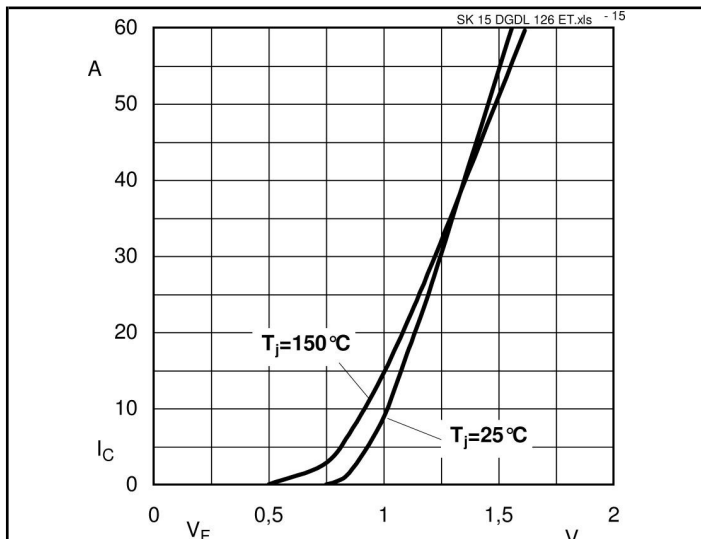


Fig. 15 Input Bridge Diode forward characteristic

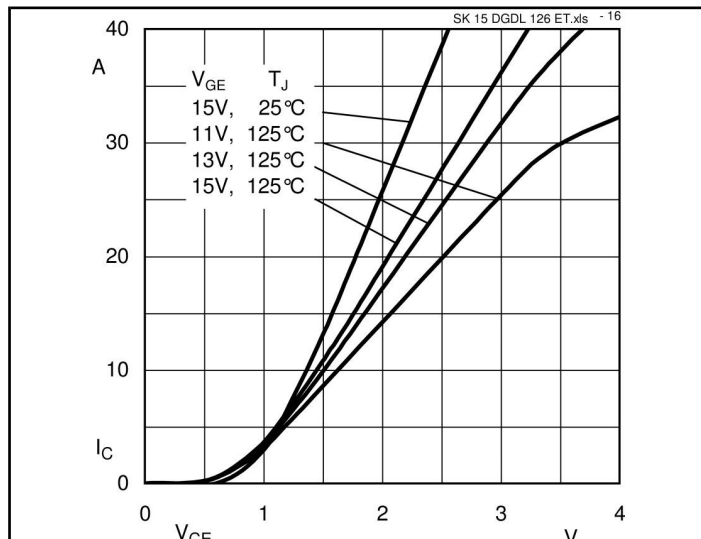


Fig. 16 Typical Output Characteristic

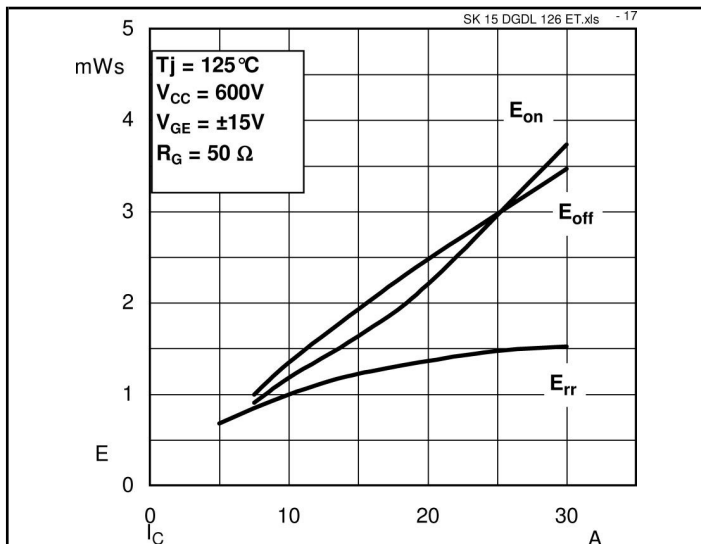


Fig. 17 Turn-on/-off energy = f (Ic)

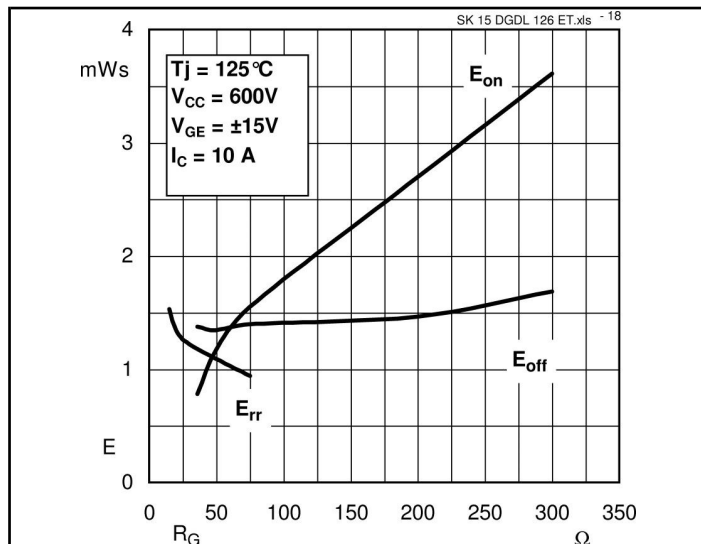


Fig. 18 Turn-on/-off energy = f (RG)

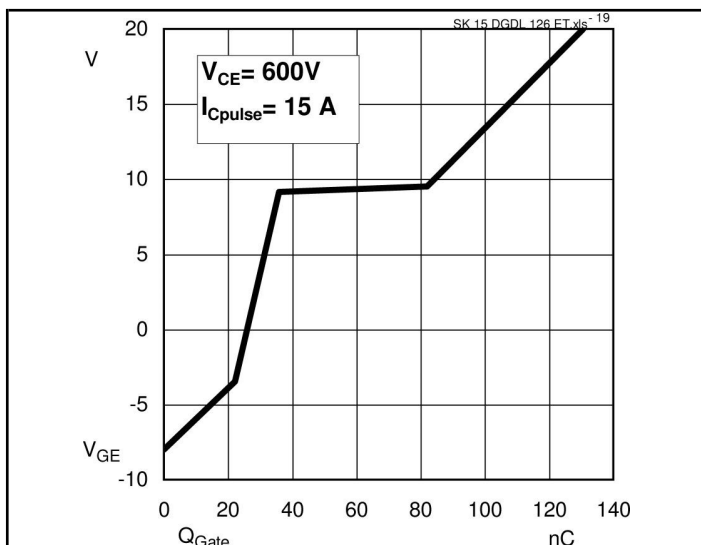
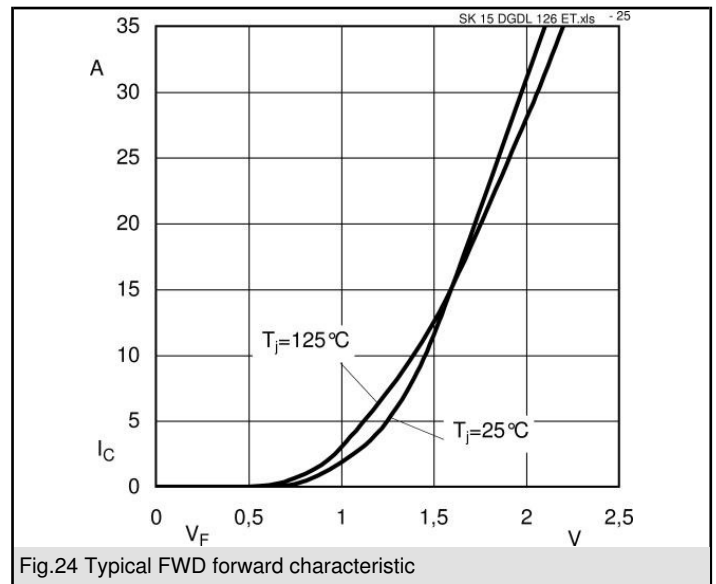
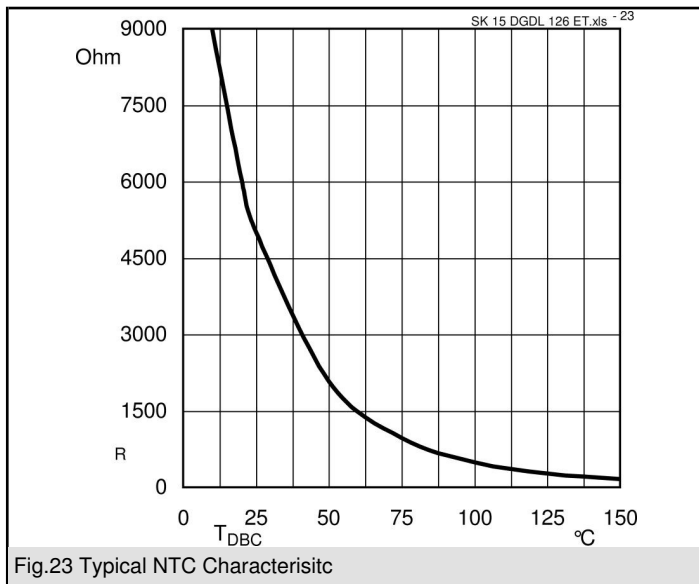
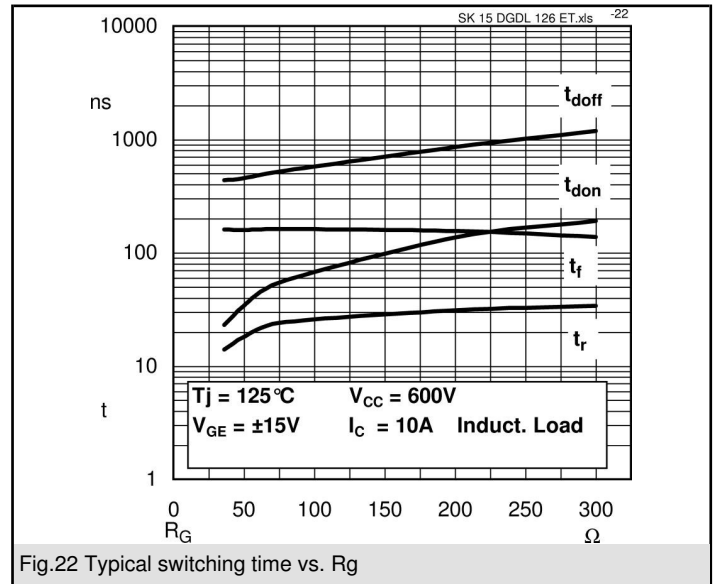
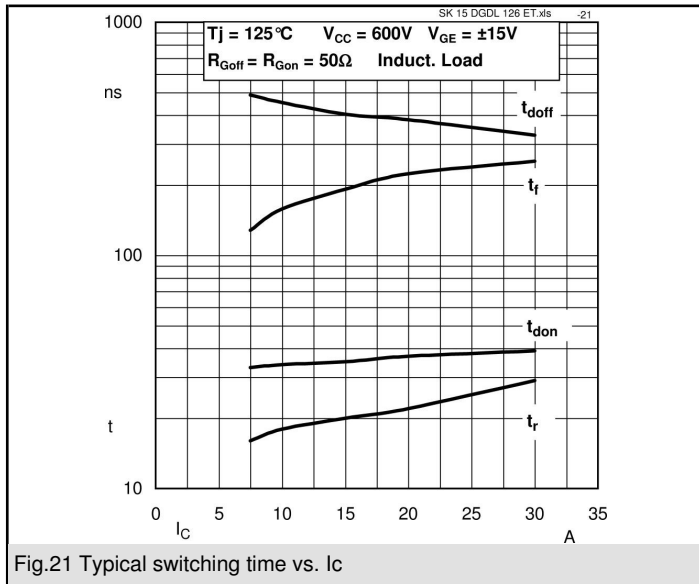


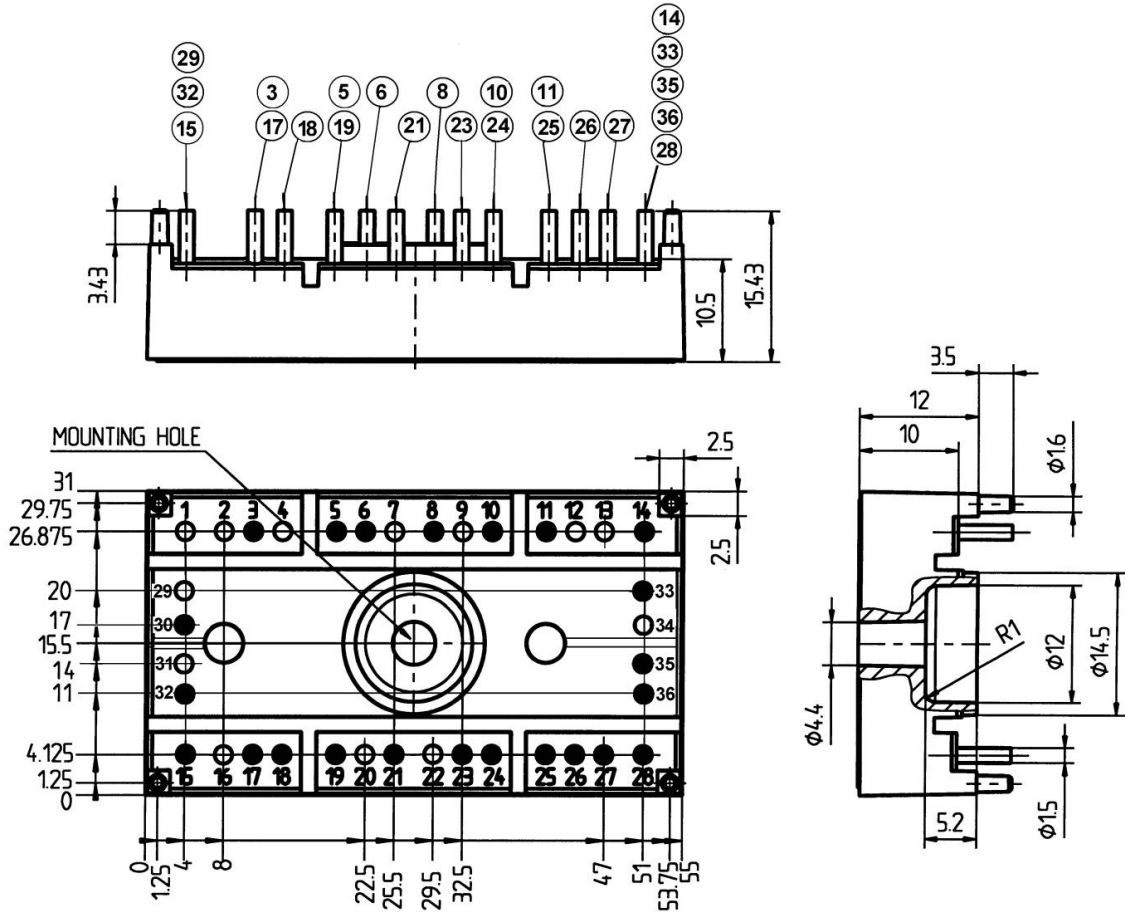
Fig. 19 Typical gate charge characteristic



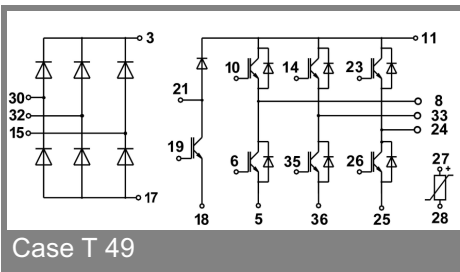
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UL Recognized
File no. E63 532

Dimensions in mm



Case T 49 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 49

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

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