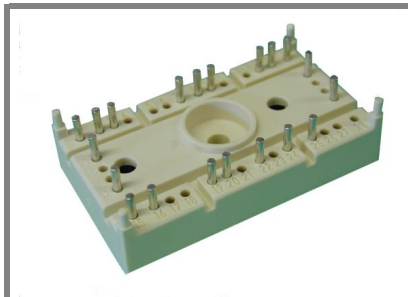


# SK 10 DGDL 126 ET



SEMITOP® 3

3-phase bridge rectifier +  
brake chopper +3-phase  
bridge inverter  
SK 10 DGDL 126 ET

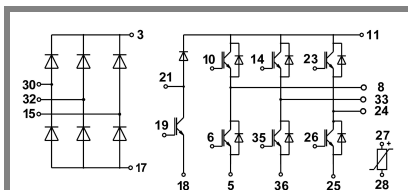
Preliminary Data

## Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium 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
<b>IGBT - Inverter, Chopper</b>			
$V_{CES}$		1200	V
$I_C$	$T_s = 25 (80)^\circ\text{C}$	15 (11)	A
$I_{CM}$	$T_s = 25 (80)^\circ\text{C}$ , $t_p \leq 1 \text{ ms}$	30 (22)	A
$V_{GES}$		$\pm 20$	V
$T_j$		-40 ... +150	$^\circ\text{C}$
<b>Diode - Inverter, Chopper</b>			
$I_F$	$T_s = 25 (80)^\circ\text{C}$	25 (17)	A
$I_{FM} = -I_{CM}$	$T_s = 25 (80)^\circ\text{C}$ , $t_p \leq 1 \text{ ms}$	50 (34)	A
$T_j$		-40 ... +150	$^\circ\text{C}$
<b>Rectifier</b>			
$V_{RRM}$		1600	V
$I_{FAV} / I_{TAV}$	$T_s = 80^\circ\text{C}$	16	A
$I_{FSM} / I_{TSM}$	$t_p = 10 \text{ ms}$ , $\sin 180^\circ$ , $T_j = 25^\circ\text{C}$	220	A
$I_t^2$	$t_p = 10 \text{ ms}$ , $\sin 180^\circ$ , $T_j = 25^\circ\text{C}$	240	$\text{A}^2\text{s}$
$T_j$		-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
<b>IGBT - Inverter, Chopper</b>					
$V_{CEsat}$	$I_C = 8 \text{ A}$ , $T_j = 25 (125)^\circ\text{C}$		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 0,3 \text{ mA}$	5	5,8	6,5	V
$V_{CE(TO)}$	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
$r_T$	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		87 (138)	113 (162)	$\text{m}\Omega$
$C_{ies}$	$V_{CE} = 25 \text{ V}$ , $V_{GE} = 0 \text{ V}$ , $f = 1 \text{ MHz}$		0,7		nF
$C_{oes}$	$V_{CE} = 25 \text{ V}$ , $V_{GE} = 0 \text{ V}$ , $f = 1 \text{ MHz}$		0,2		nF
$C_{res}$	$V_{CE} = 25 \text{ V}$ , $V_{GE} = 0 \text{ V}$ , $f = 1 \text{ MHz}$		0,1		nF
$R_{th(j-s)}$	per IGBT			2	K/W
$t_{d(on)}$	under following conditions		85		ns
$t_r$	$V_{CC} = 600 \text{ V}$ , $V_{GE} = \pm 15 \text{ V}$		30		ns
$t_{d(off)}$	$I_C = 8 \text{ A}$ , $T_j = 125^\circ\text{C}$		430		ns
$t_f$	$R_{Gon} = R_{Goff} = 75 \Omega$		90		ns
$E_{on}$	inductive load		1		mJ
$E_{off}$			1		mJ
<b>Diode - Inverter, Chopper</b>					
$V_F = V_{EC}$	$I_F = 8 \text{ A}$ , $T_j = 25 (125)^\circ\text{C}$		1,9 (2)	2,2	V
$V_{(TO)}$	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		1 (0,8)	1,1 (0,9)	V
$r_T$	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		40 (53)	47	$\text{m}\Omega$
$R_{th(j-s)}$	per diode			2,1	K/W
$I_{RRM}$	under following conditions		21		A
$Q_{rr}$	$I_F = 15 \text{ A}$ , $V_R = 600 \text{ V}$		3,5		$\mu\text{C}$
$E_{rr}$	$V_{GE} = 0 \text{ V}$ , $T_j = 125^\circ\text{C}$		1,4		mJ
	$di_F/dt = 570 \text{ A}/\mu\text{s}$				
<b>Diode rectifier</b>					
$V_F$	$I_F = 15 \text{ A}$ , $T_j = 25^\circ\text{C}$		1,1		V
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8		V
$r_T$	$T_j = 150^\circ\text{C}$		20		$\text{m}\Omega$
$R_{th(j-s)}$	per diode			2,7	K/W
<b>Temperatur sensor</b>					
$R_{ts}$	5 %, $T_r = 25 (100)^\circ\text{C}$		5000(493)		$\Omega$
<b>Mechanical data</b>					
w			30		g
$M_s$	Mounting torque			2,5	Nm

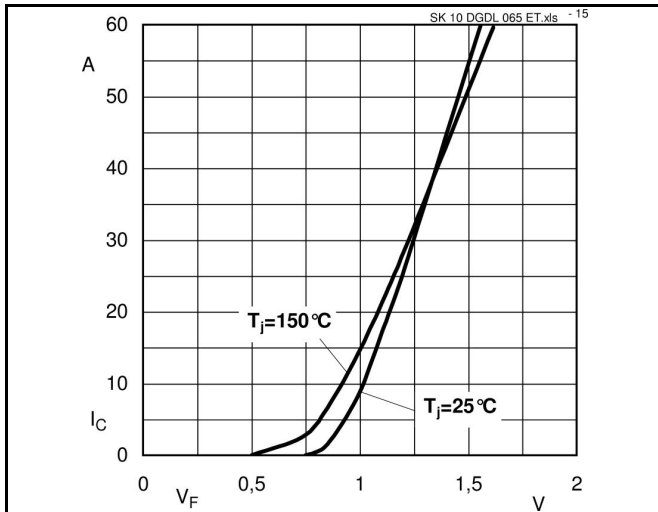


Fig. 15 Input Bridge Diode forward characteristic

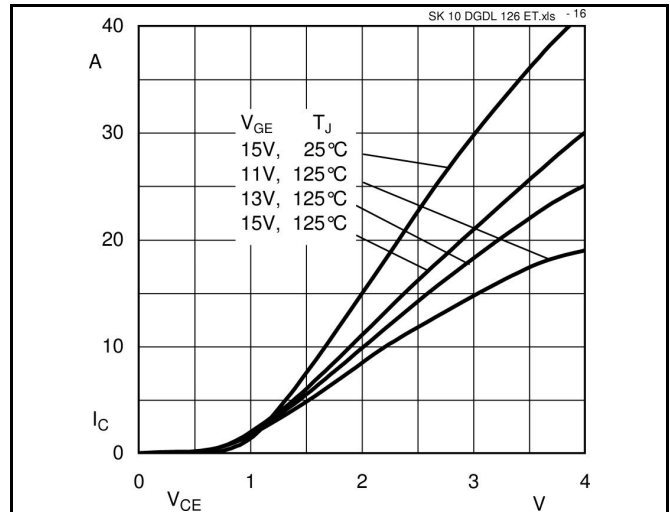


Fig. 16 Typical Output Characteristic

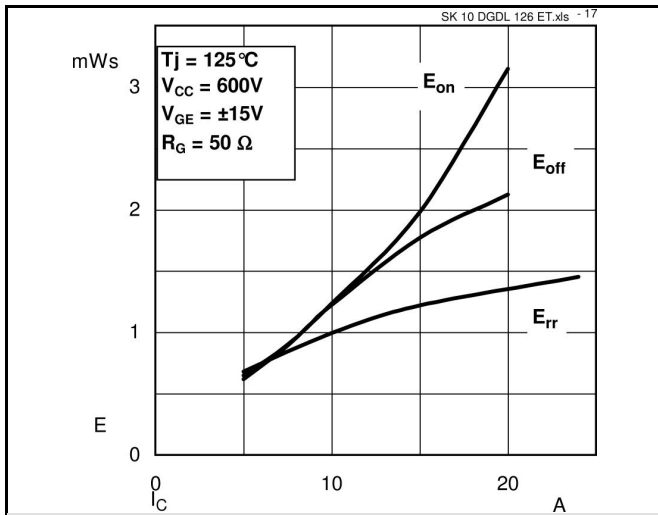


Fig. 17 Turn-on/-off energy =  $f(I_C)$

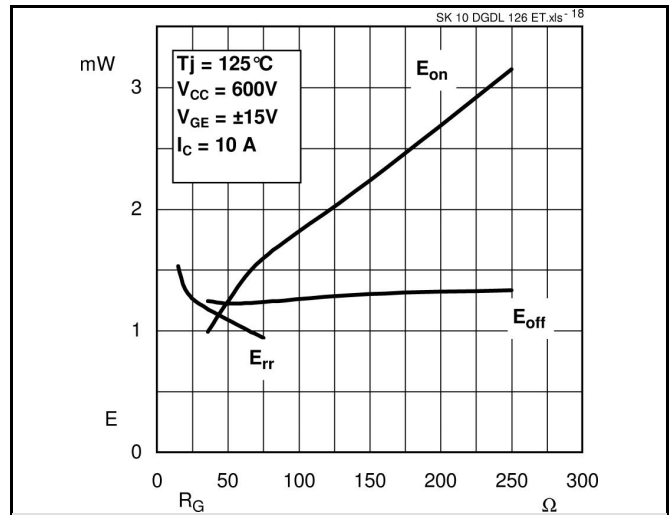


Fig. 18 Turn-on/-off energy =  $f(R_G)$

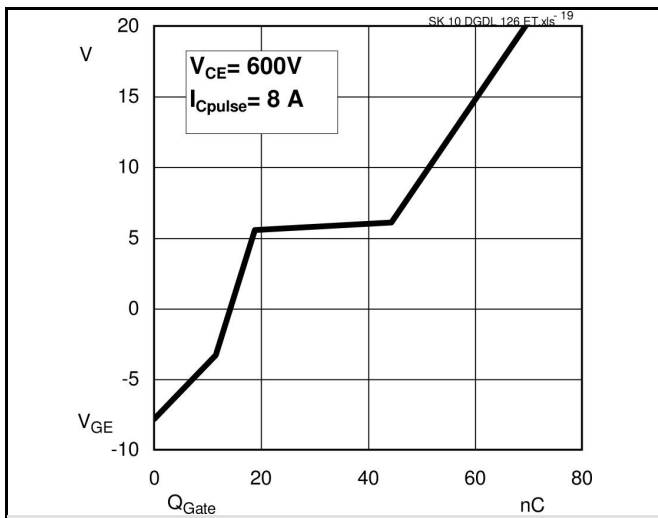
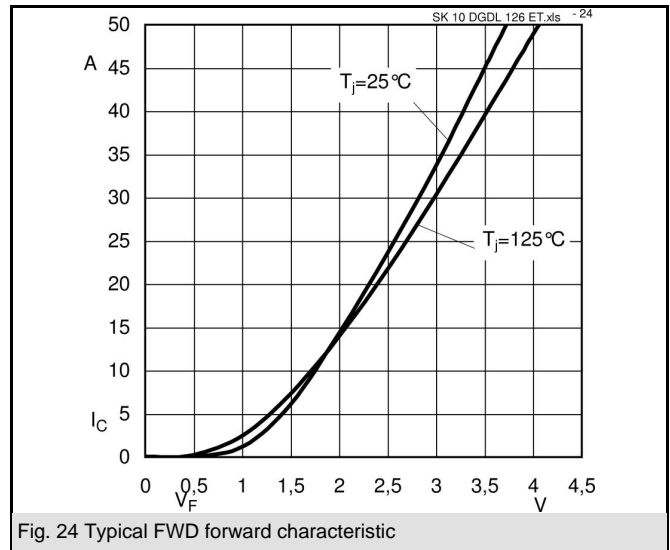
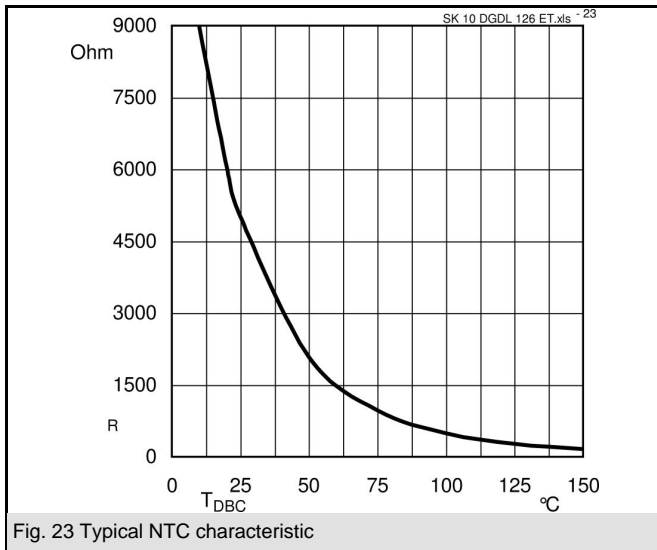
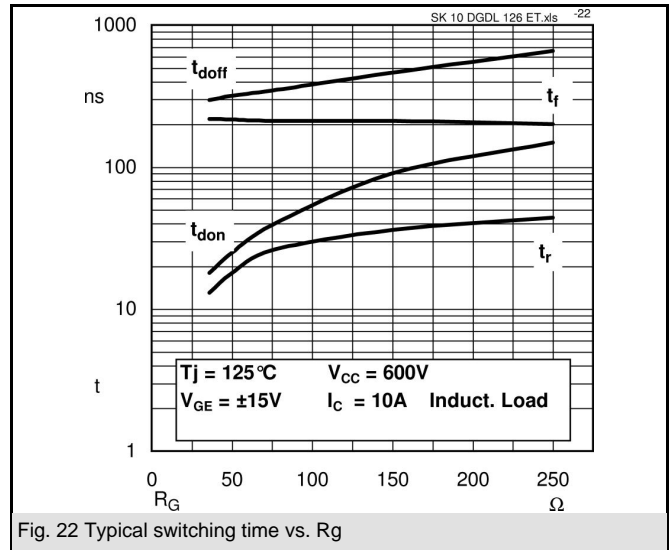
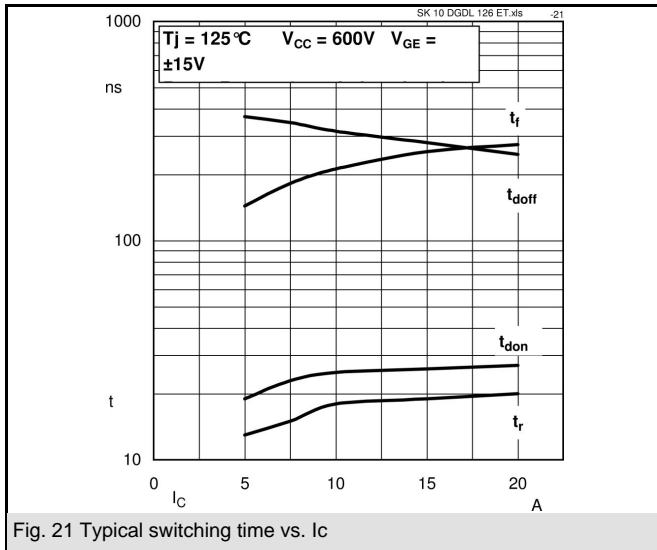


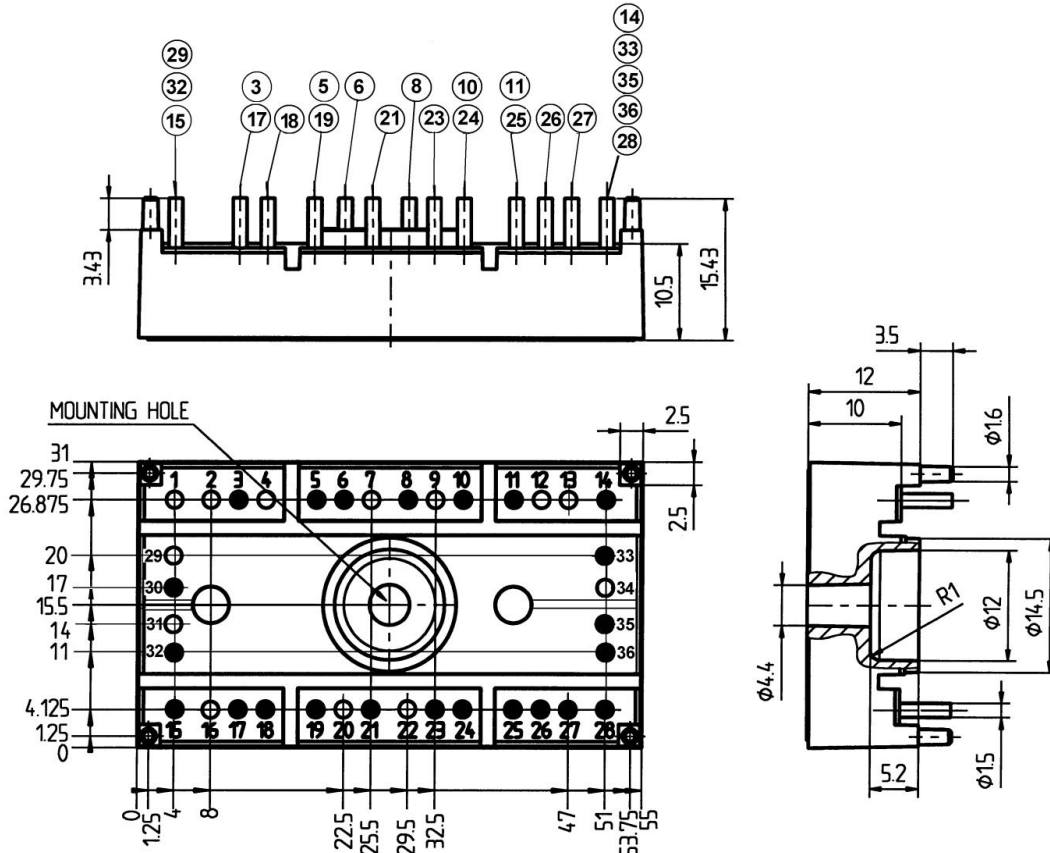
Fig. 19 Typical gate charge characteristic



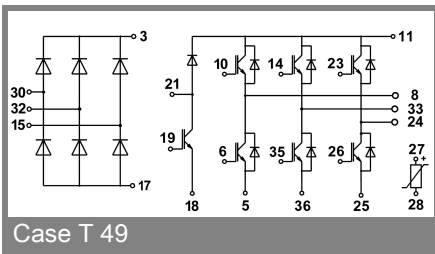
# SK 10 DGDL 126 ET

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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