

SEMITORP® 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 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) $^\circ\text{C}$	15 (11)	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$, $t_p = 1$ ms	16	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	50	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, $\sin 180^\circ$, $T_j = 25$ $^\circ\text{C}$	220	A
I_t^2	$t_p = 10$ ms, $\sin 180^\circ$, $T_j = 25$ $^\circ\text{C}$	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}	$I_C = 8$ A, $T_j = 25$ (125) $^\circ\text{C}$		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,3$ 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)	m Ω
C_{ies}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		0,7		nF
C_{oes}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		0,2		nF
C_{res}	$V_{CE} = 25$ V, $V_{GE} = 0$ V, $f = 1$ MHz		0,1		nF
$R_{th(j-s)}$	per IGBT			2	K/W
$t_{d(on)}$	under following conditions		85		ns
t_r	$V_{CC} = 600$ V, $V_{GE} = \pm 15$ V		30		ns
$t_{d(off)}$	$I_C = 8$ A, $T_j = 125$ $^\circ\text{C}$		430		ns
t_f	$R_{Gon} = R_{Goff} = 75$ Ω		90		ns
E_{on}	inductive load		1		mJ
E_{off}			1		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	$I_F = 8$ 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	m Ω
$R_{th(j-s)}$	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, $T_j = 125$ $^\circ\text{C}$		1,4		mJ
	$di_F/dt = 570$ A/ μs				
Diode rectifier					
V_F	$I_F = 15$ A, $T_j = 25$ $^\circ\text{C}$		1,1		V
$V_{(TO)}$	$T_j = 150$ $^\circ\text{C}$		0,8		V
r_T	$T_j = 150$ $^\circ\text{C}$		20		m Ω
$R_{th(j-s)}$	per diode			2,7	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

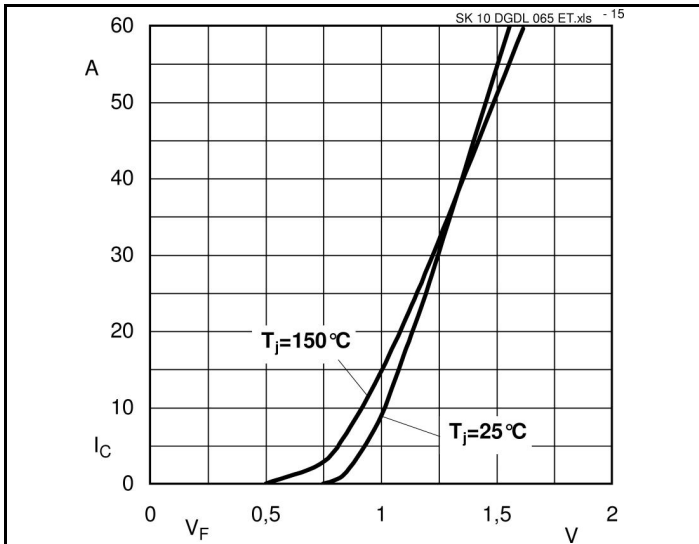


Fig. 15 Input Bridge Diode forward characteristic

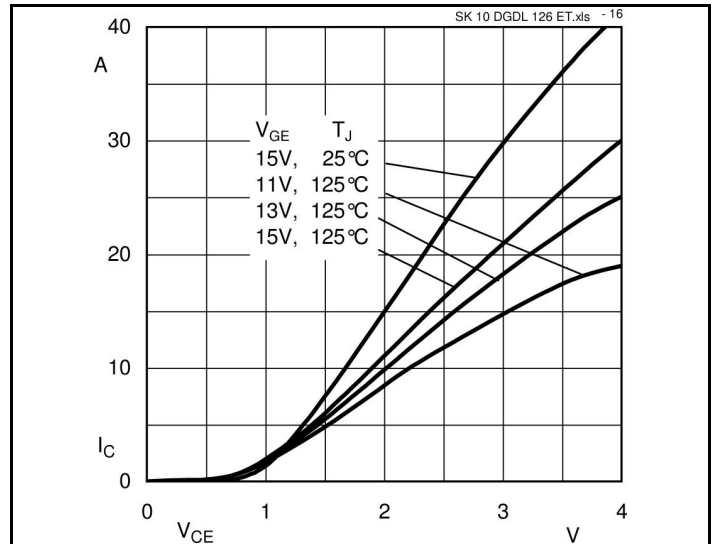


Fig. 16 Typical Output Characteristic

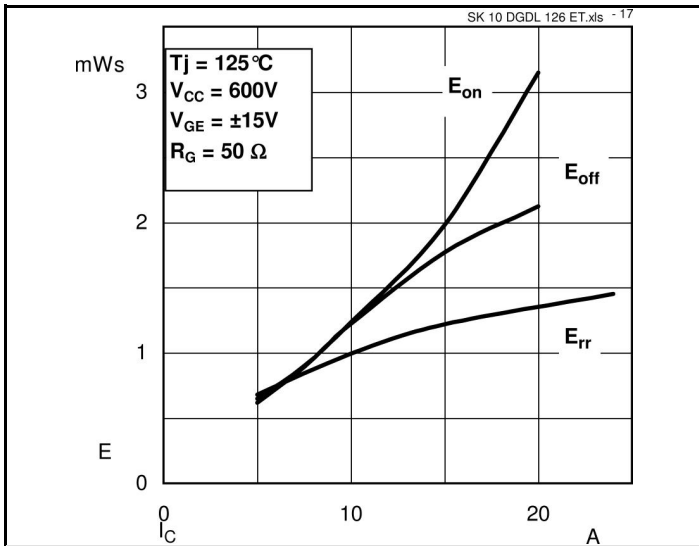


Fig. 17 Turn-on/-off energy = $f(I_C)$

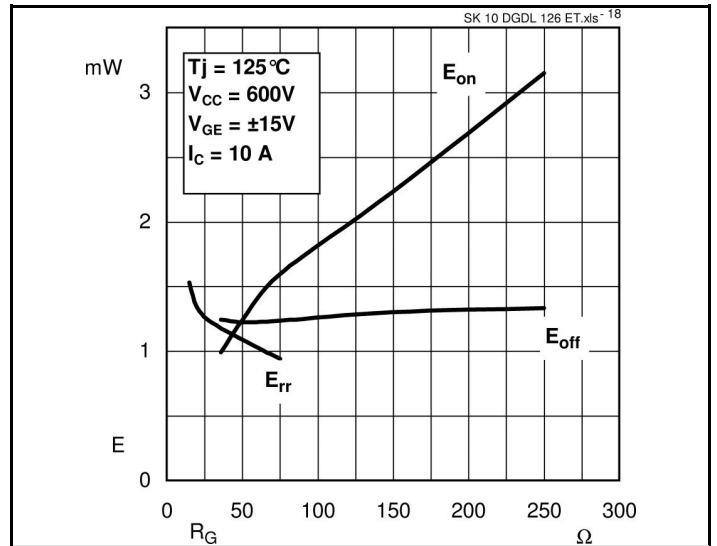


Fig. 18 Turn-on/-off energy = $f(R_G)$

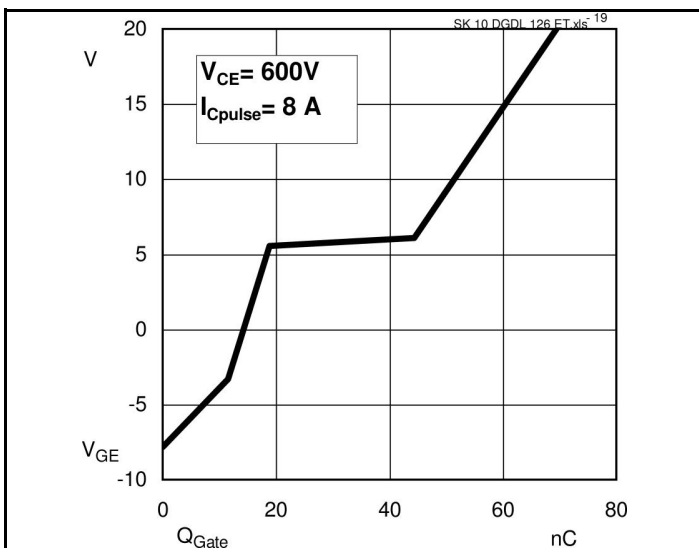
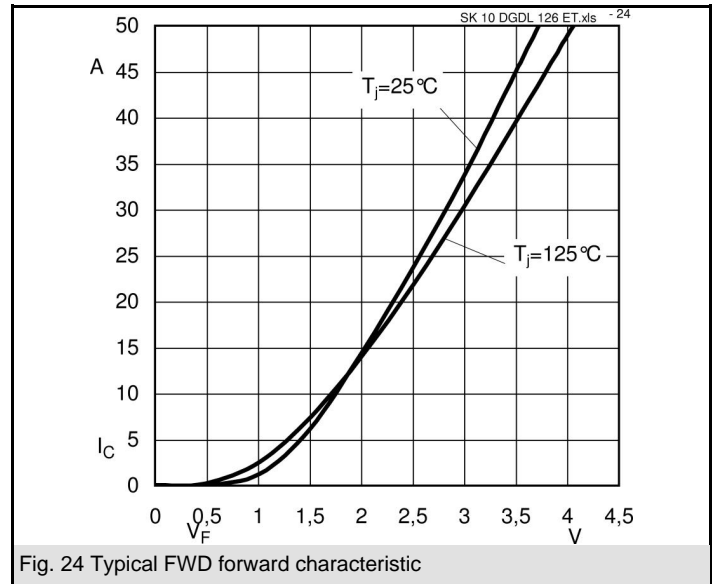
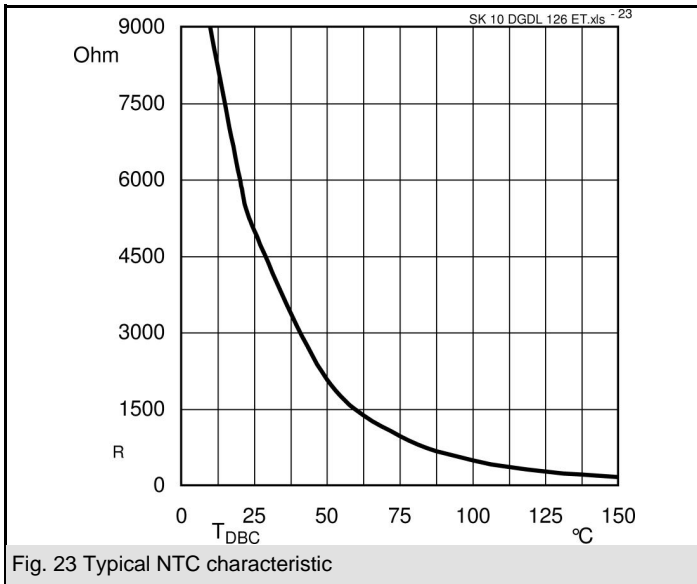
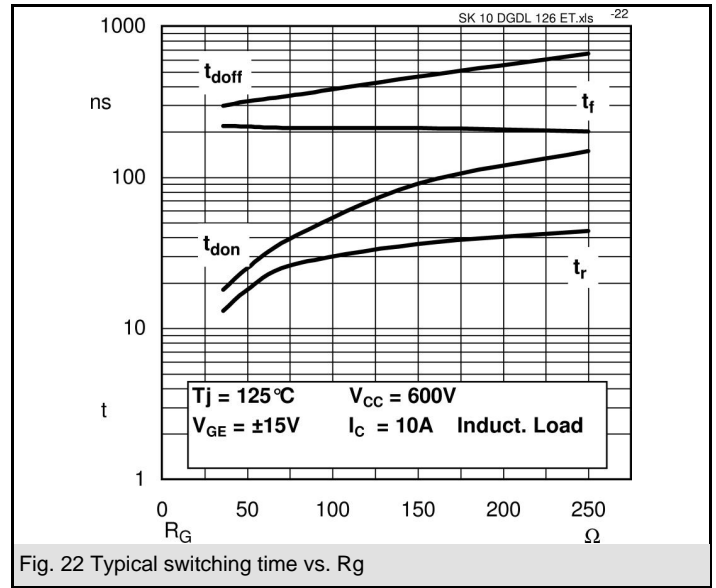
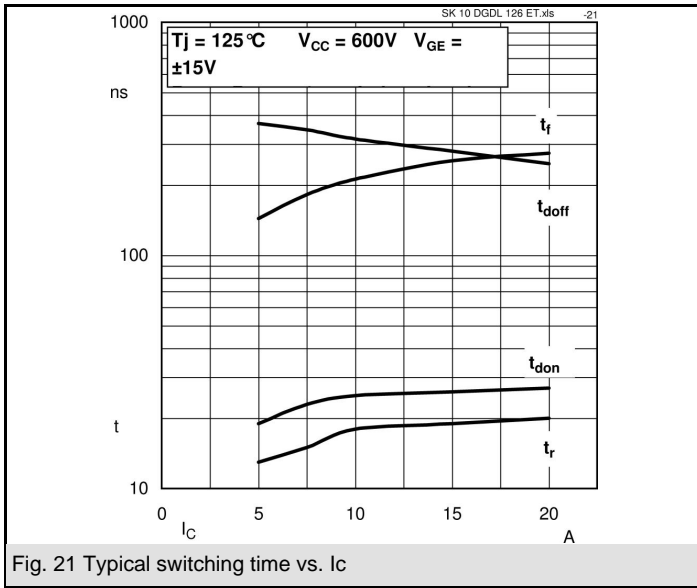


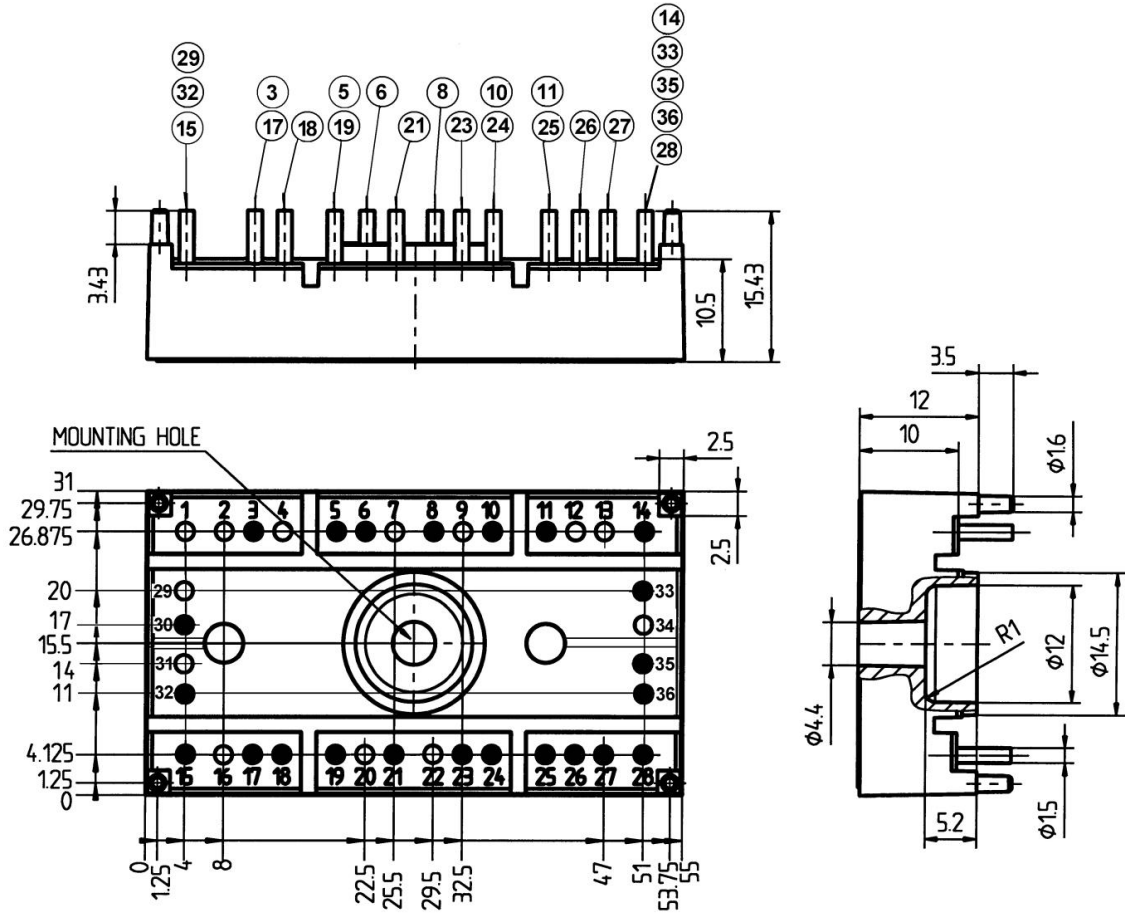
Fig. 19 Typical gate charge characteristic



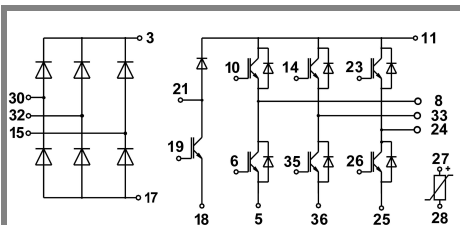
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UL Recognized
File no. E63 532

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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