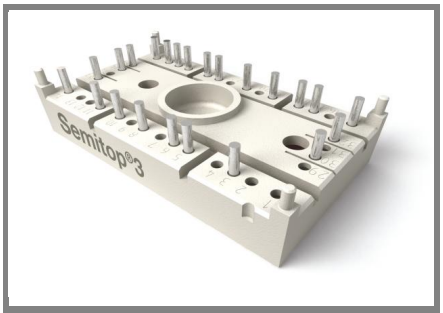

SEMITOP® 3

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 alumium 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°C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter, Chopper			
V_{CES}		1200	V
I_C	T_s = 25 (80) °C	15 (11)	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}, t_p = 1 ms	16	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} = 2xI_{Fnom}, t_p = 1 ms	50	A
T_j		-40 ... +150	°C
Rectifier			
V_{RRM}		1600	V
I_F	T_s = 80 °C	21	A
I_{FSM} / I_{TSM}	t_p = 10 ms , sin 180 ° ,T_j = 25 °C	220	A
I^2t	t_p = 10 ms , sin 180 ° ,T_j = 25 °C	240	A²s
T_j		-40 ... +150	°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 = 8 A, T_j = 25 (125) °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 °C (125) °C		1 (0,9)	1,2 (1,1)	V
r_T	T_j = 25 °C (125) °C		87 (138)	113 (162)	mΩ
C_{ies}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,7		nF
C_{oes}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,2		nF
C_{res}	V_{CE} = 25 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} = ± 15 V		30		ns
$t_{d(off)}$	I_C = 8 A, T_j = 125 °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) °C		1,9 (2)	2,2	V
$V_{(TO)}$	T_j = 25 °C (125) °C		1 (0,8)	1,1 (0,9)	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 = 15 A, T_j = 25 °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,8		V
r_T	T_j = 150 °C		20		mΩ
$R_{th(j-s)}$	per diode			2,7	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

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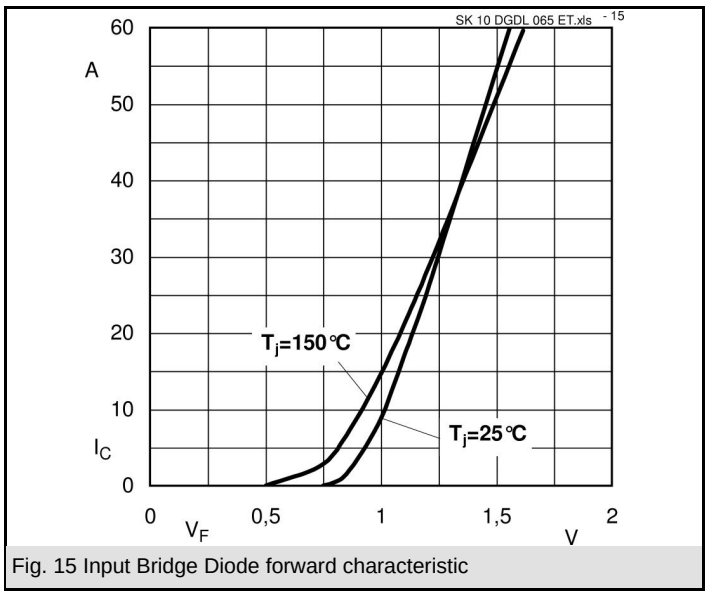

Fig. 15 Input Bridge Diode forward characteristic

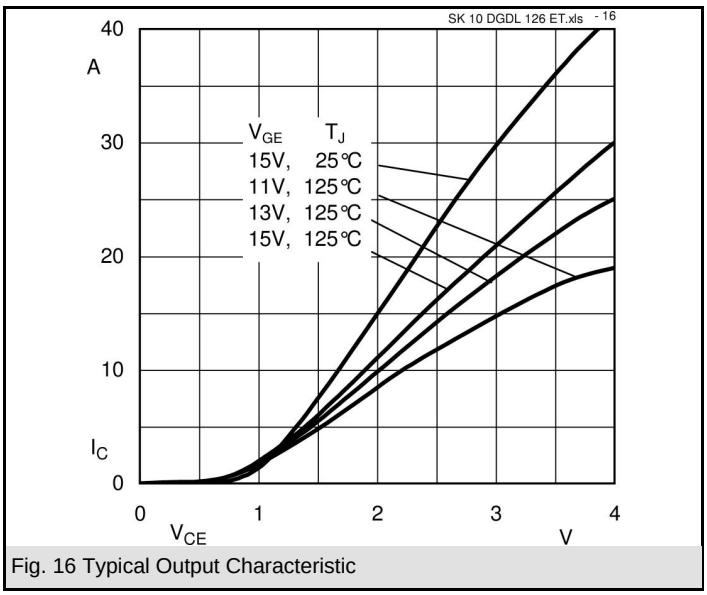

Fig. 16 Typical Output Characteristic

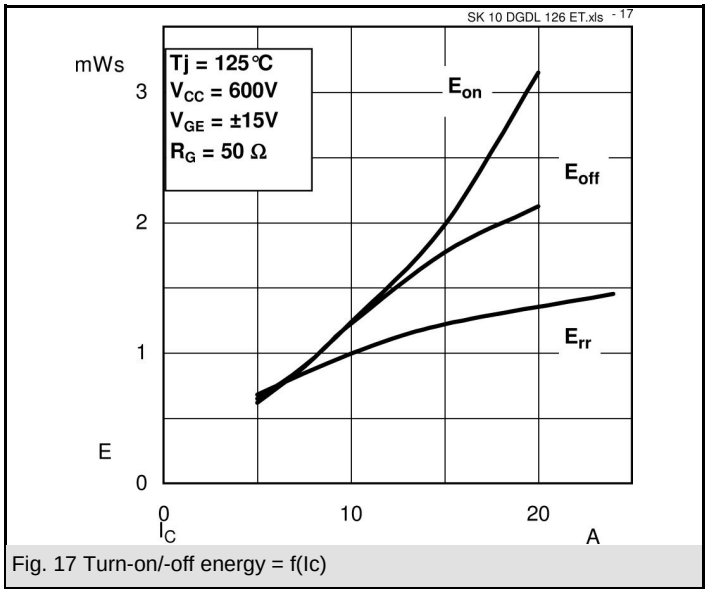

Fig. 17 Turn-on/-off energy = f(Ic)

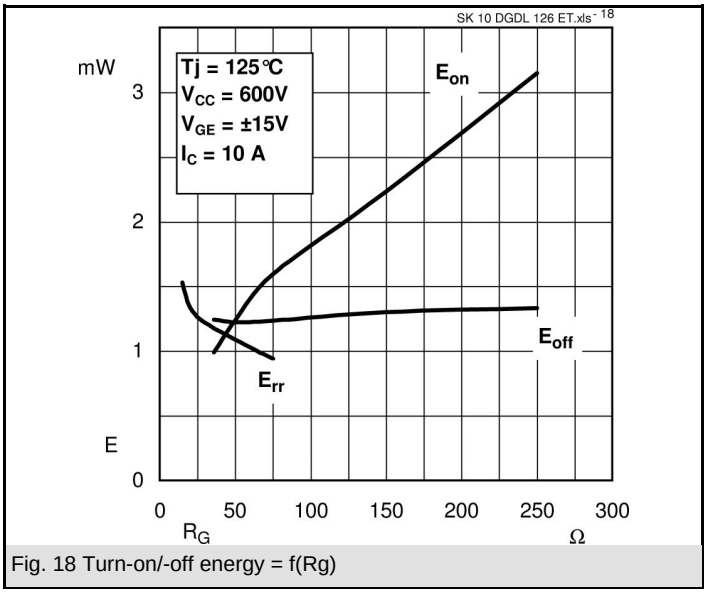

Fig. 18 Turn-on/-off energy = f(Rg)

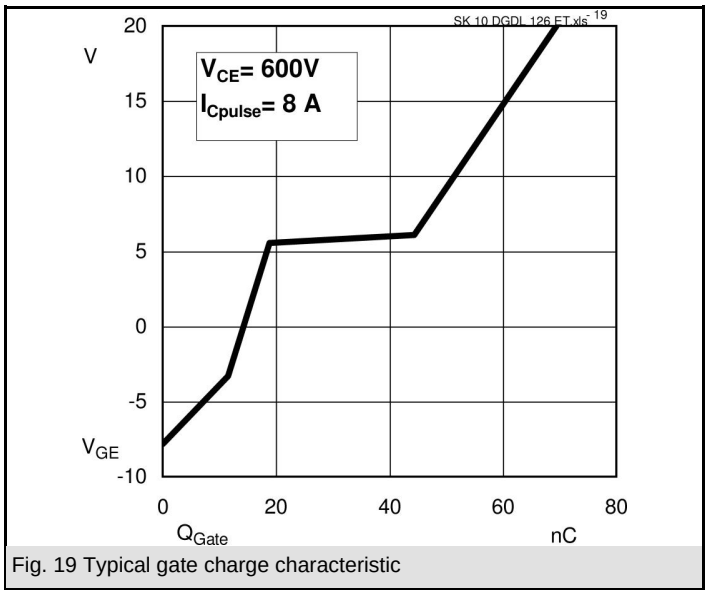

Fig. 19 Typical gate charge characteristic

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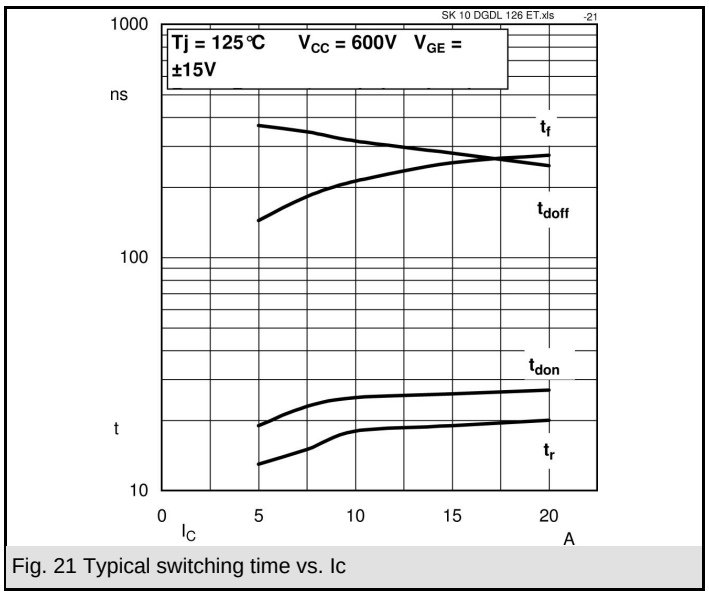

Fig. 21 Typical switching time vs. Ic

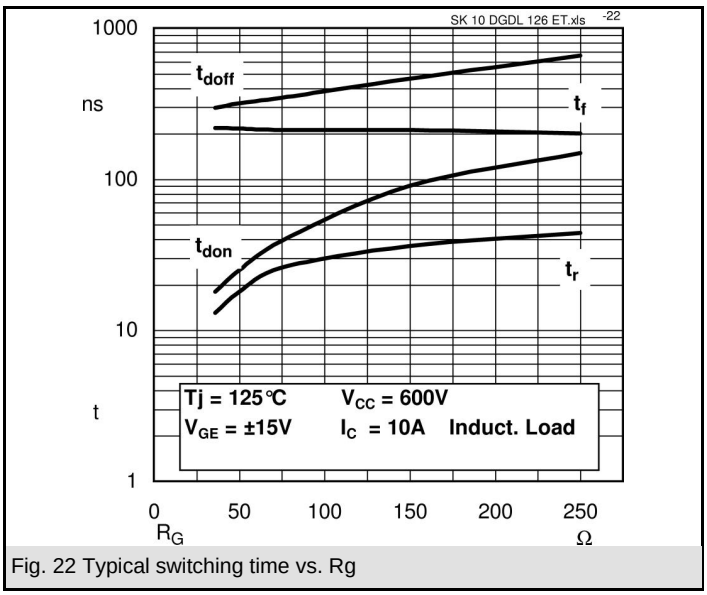

Fig. 22 Typical switching time vs. Rg

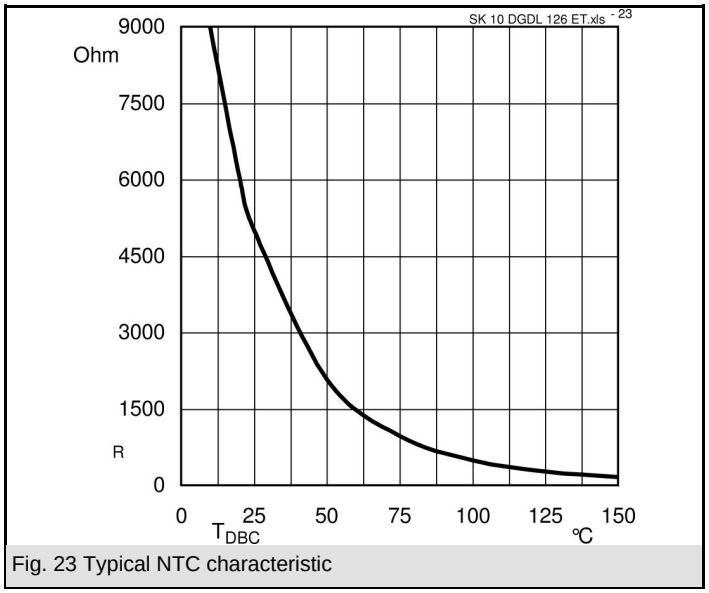

Fig. 23 Typical NTC characteristic

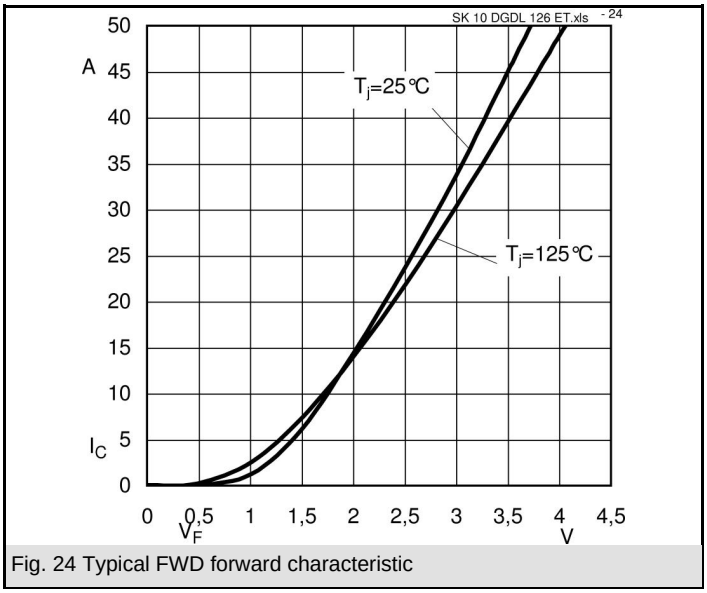

Fig. 24 Typical FWD forward characteristic

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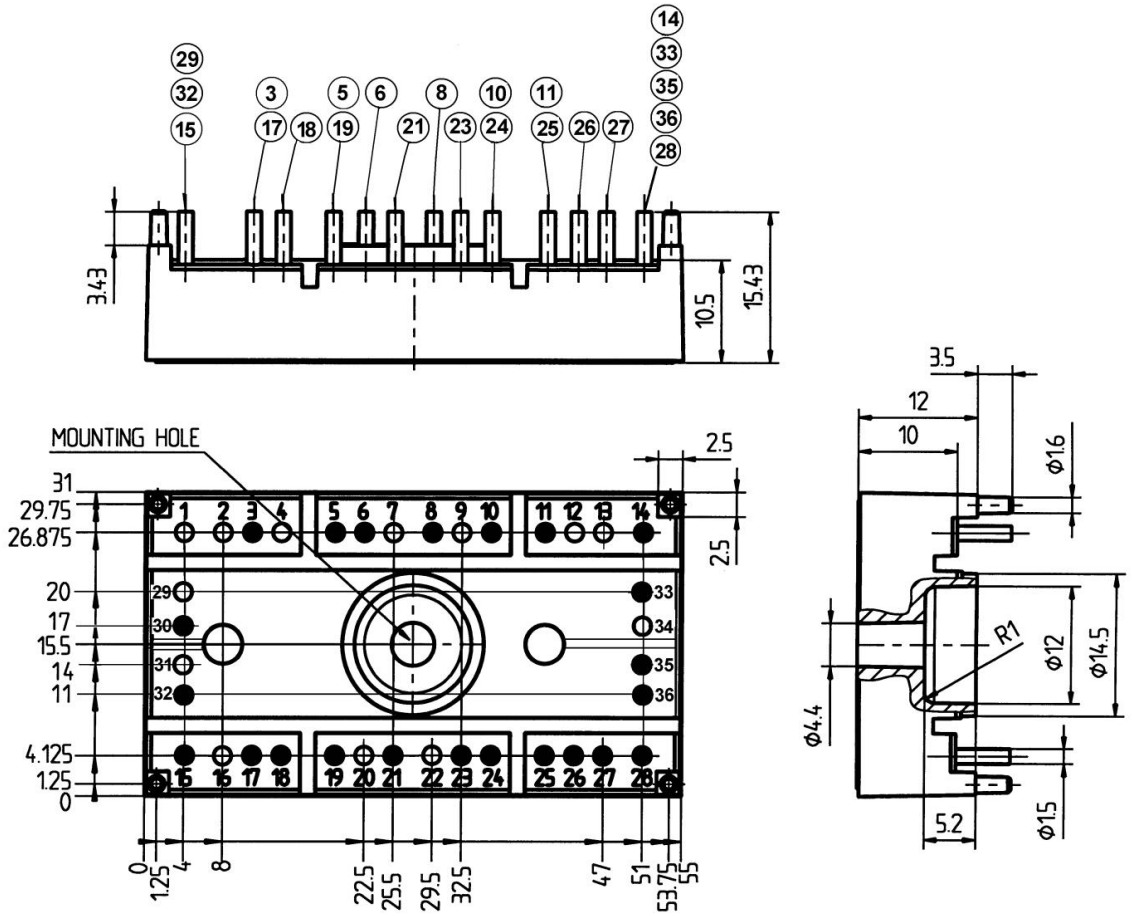
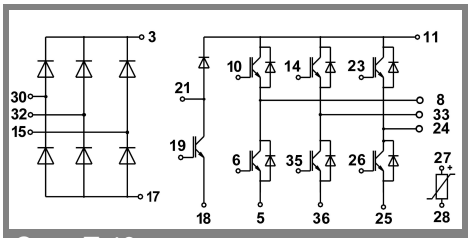
UL Recognized
File no. E63 532

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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