



SEMITOP® 3

3-phase bridge rectifier +
brake chopper

SK 55 DGL 126

Preliminary Data

Features

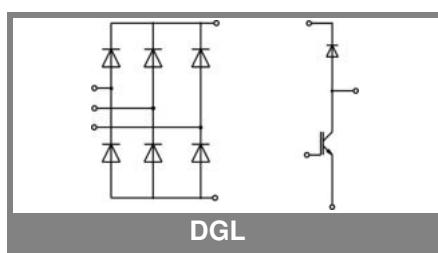
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminum oxide ceramic (DCB)
- Trench IGBT technology
- CAL Technology FWD

Typical Applications*

- Rectifier

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT - Chopper				
V_{CES}		1200		V
I_C	$T_s = 25 (80)^\circ\text{C}$	40 (32)		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$, $t_p = 1 \text{ ms}$	70		A
V_{GES}		± 20		V
T_j		-40 ... +150		$^\circ\text{C}$
Diode - Chopper				
I_F	$T_s = 25 (80)^\circ\text{C}$	45 (35)		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$, $t_p = 1 \text{ ms}$	100		A
T_j		-40 ... +150		$^\circ\text{C}$
Rectifier				
V_{RRM}		1600		V
I_D	$T_s = 80^\circ\text{C}$	55		A
I_{FSM} / I_{TSM}	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	370		A
I_{t^2}	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	685		A ² 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.
IGBT - Chopper				
V_{CEsat}	$I_C = 35 \text{ A}$, $T_j = ()^\circ\text{C}$		1,7 (2)	2,1
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 1,5 \text{ mA}$	5	5,8	6,5
$V_{CE(TO)}$	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		1 (0,9)	1,2
r_T	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		20 (31)	26
C_{ies}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		2,4	nF
C_{oes}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		0,5	nF
C_{res}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		0,4	nF
$R_{th(j-s)}$	per IGBT		1,05	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
$t_{d(off)}$	$I_C = 30 \text{ A}$, $T_j = ()^\circ\text{C}$		430	ns
t_f	$R_{Gon} = R_{Goff} = 22 \Omega$		90	ns
E_{on}	inductive load		4,6	mJ
E_{off}			4,3	mJ
Diode - Chopper				
$V_F = V_{EC}$	$I_F = 45 \text{ A}$, $T_j = ()^\circ\text{C}$		1,5 (1,5)	1,77 (1,77)
$V_{(TO)}$	$T_j = ()^\circ\text{C}$ (125) $^\circ\text{C}$		(0,92)	V
r_T	$T_j = 25^\circ\text{C}$ (125) $^\circ\text{C}$		(13,4)	mΩ
$R_{th(j-s)}$	per diode		1,2	K/W
I_{RRM}	under following conditions		30	A
Q_{rr}	$I_F = 50 \text{ A}$, $V_R = 600 \text{ V}$		10	μC
E_{rr}	$V_{GE} = 0 \text{ V}$, $T_j = ()^\circ\text{C}$			mJ
di_F/dt	$= 500 \text{ A}/\mu\text{s}$			
Diode rectifier				
V_F	$I_F = 25 \text{ A}$, $T_j = ()^\circ\text{C}$		-	1,25
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8	V
r_T	$T_j = 150^\circ\text{C}$		13	mΩ
$R_{th(j-s)}$	per diode		2	K/W
Temperatur sensor				
R_{ts}	$\%, T_r = ()^\circ\text{C}$		()	Ω
Mechanical data				
w			30	g
M_s	Mounting torque		2,5	Nm



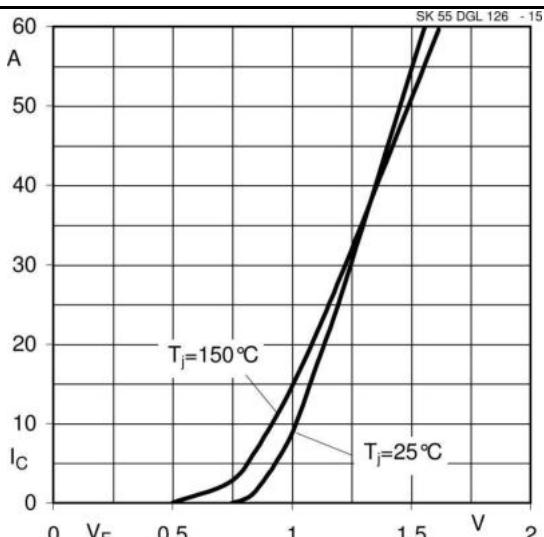


Fig.15 Typical input diode bridge forward characteristic

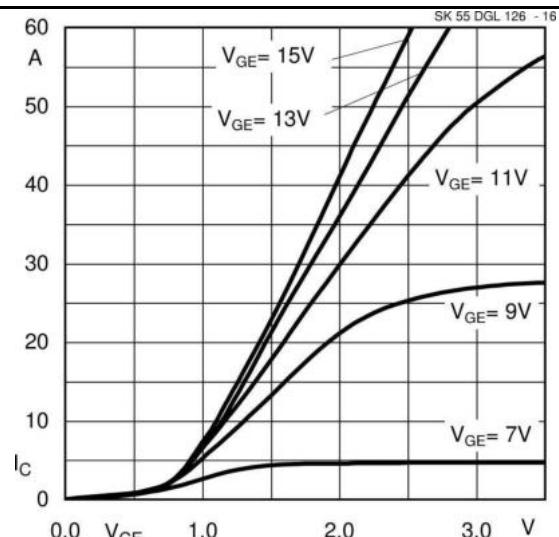


Fig.16 Typical IGBT output characteristic

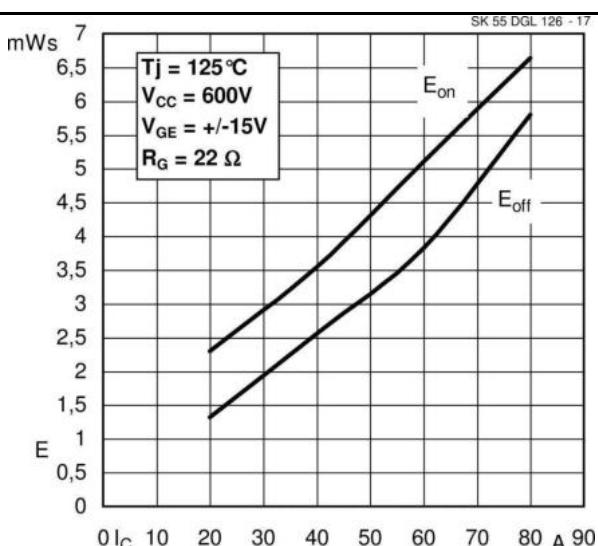


Fig.17 Turn-on/off energy=f(I_c)

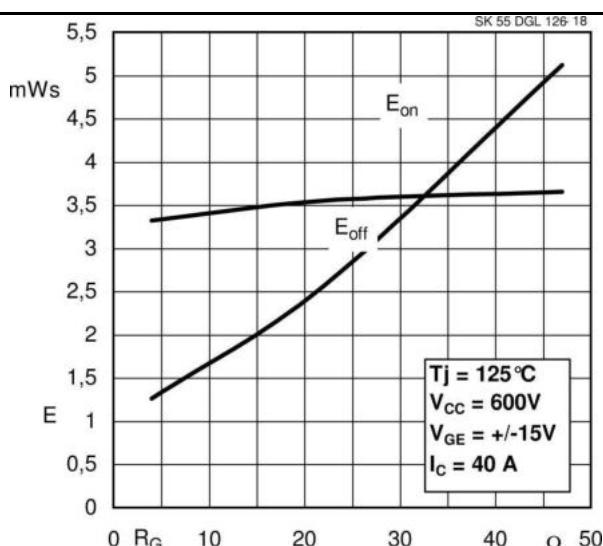


Fig. 18 Turn-on/off energy=f(R_g)

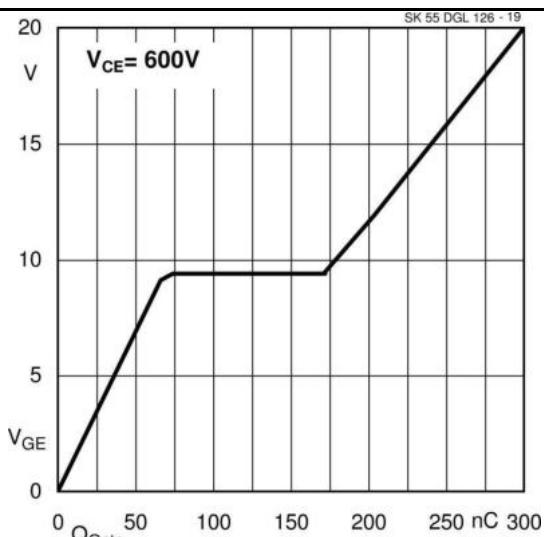


Fig.19 Typical gate charge characteristic

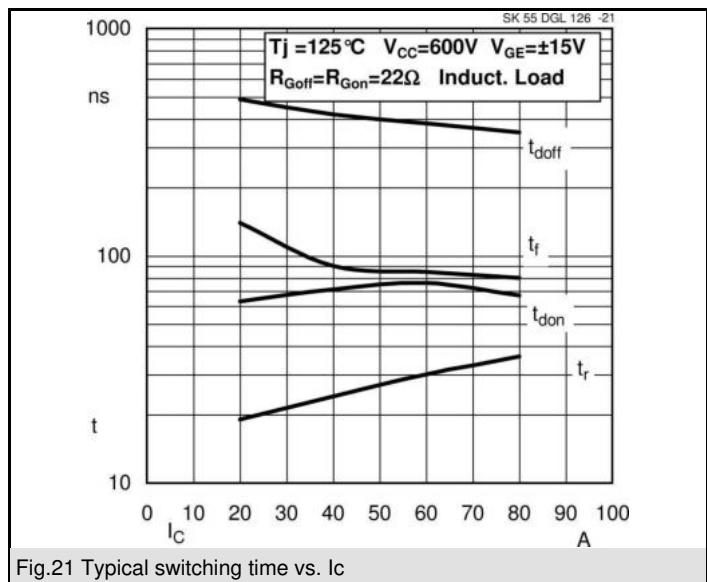


Fig.21 Typical switching time vs. Ic

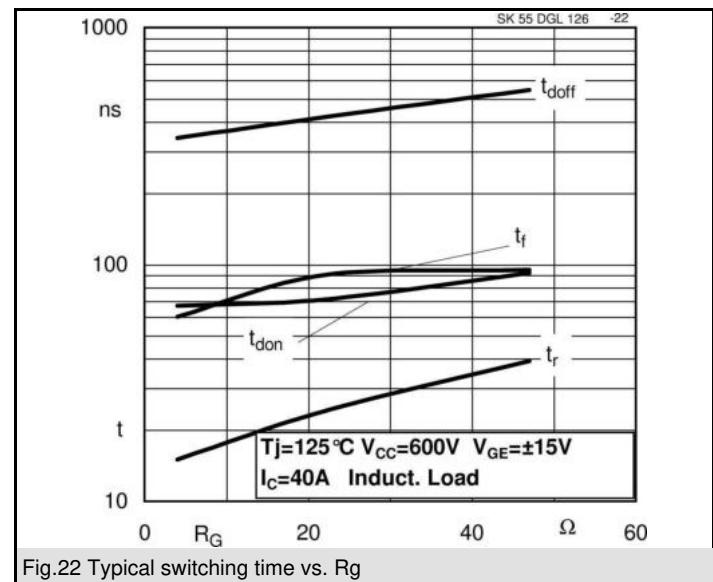
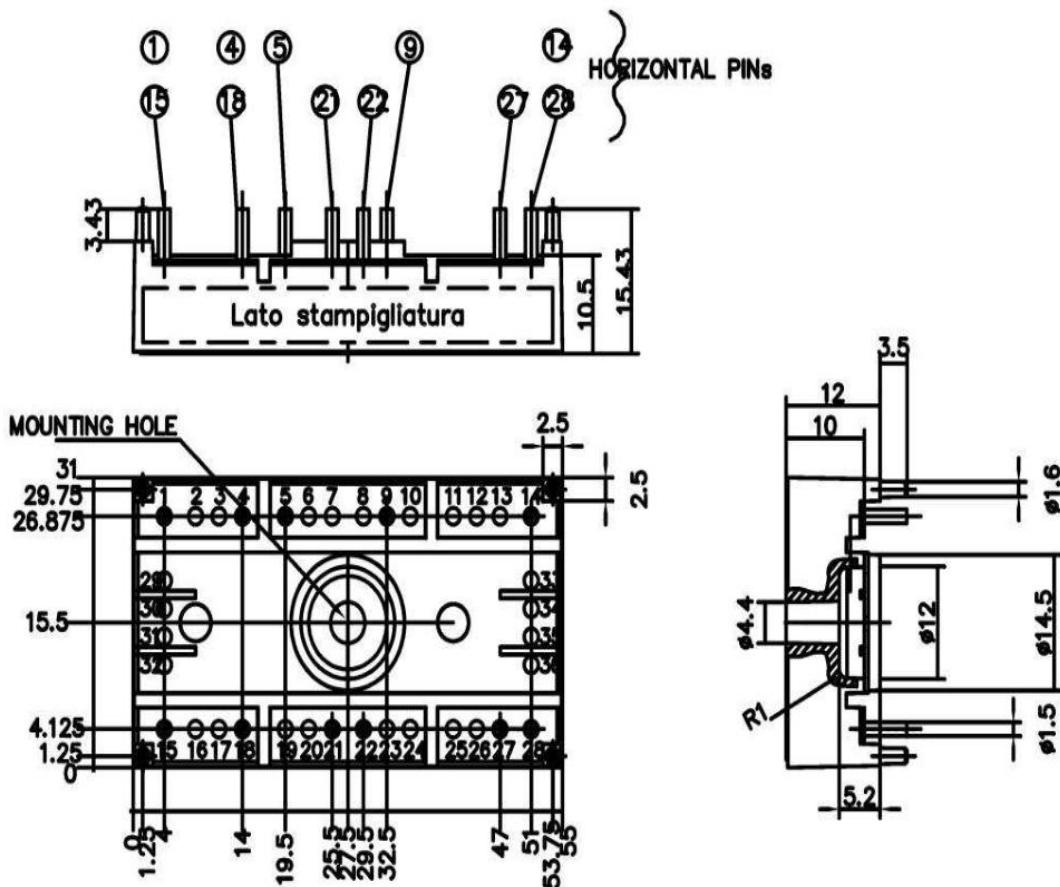
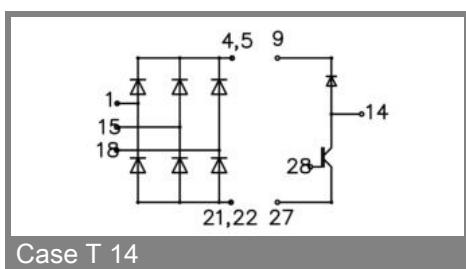


Fig.22 Typical switching time vs. Rg



Case T 14 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 14

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

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our staff.