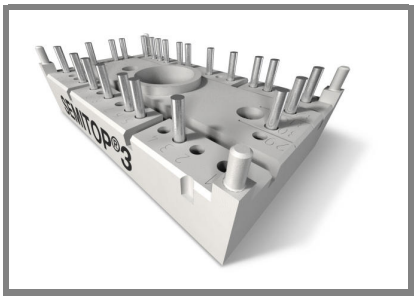


SEMITOP®3

3-phase bridge rectifier + brake chopper + 3-phase bridge inverter

SK 20 DGDL 066 ET

Target Data

Features

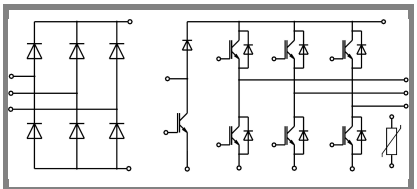
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications*

- Inverter up to 6,3 kVA
- Typ. motor power 4 kW

Remarks

- $V_{CE,sat}$, V_F = chip level value
- SC data: $t_p \leq 6\mu s; V_{GE} \leq 15V; T_j = 150°C; V_{cc} = 360V$
- V_{isol} = 3000V AC,50Hz,1s



DGDL - ET

Absolute Maximum Ratings	T_s = 25°C , unless otherwise specified		
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter, chopper			
V_{CES}		600	V
I_C	T_s = 25 (70) °C, T_j = 175 °C	30 (24)	A
I_C	T_s = 25 (70) °C, T_j = 150 °C	27 (21)	A
I_{CRM}	I_{CRM} = 2 x I_{Cnom}, t_p = 1 ms	40	A
V_{GES}		± 20	V
T_j		-40 ... + 175	°C
Diode - Inverter, chopper			
I_F	T_s = 25 (70) °C, T_j = 150 °C	27 (20)	A
I_F	T_s = 25 (70) °C, T_j = 175 °C	31 (24)	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}, t_p = 1 ms	40	A
Diode - Rectifier			
V_{RRM}		800	V
I_F	T_s = 70 °C	26	A
I_{FSM}	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	A^2s
T_j		-40 ... + 175	°C
T_{sol}	Terminals, 10 s	260	°C
T_{stg}		-40 ... + 125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics	T_s = 25°C , unless otherwise specified				
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Inverter, chopper					
$V_{CE(sat)}$	I_{Cnom} = 20 A, T_j = 25 (150) °C		1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0,29 mA	5	5,8	6,5	V
$V_{CE(TO)}$	T_j = 25 (150) °C		0,9 (0,85)	1 (0,9)	V
r_{CE}	T_j = 25 (150) °C		27,5 (40)	37,5 (52,5)	mΩ
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1,1		nF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,071		nF
C_{res}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,32		nF
$R_{th(j-s)}$	per IGBT		1,95		K/W
$t_{d(on)}$	under following conditions		16		ns
t_r	V_{CC} = 300 V, V_{GE} = -7/+15		15		ns
$t_{d(off)}$	I_{Cnom} = 20 A, T_j = 150 °C		166		ns
t_f	R_{Gon} = R_{Goff} = 15 Ω		40		ns
E_{on} (E_{off})	inductive load		0,3 (0,6)		mJ
Diode - Inverter, chopper					
V_F = V_{EC}	I_F = 20 A, T_j = 25 (150) °C		1,4 (1,4)	1,7 (1,7)	V
$V_{(TO)}$	T_j = 25 (150) °C		1 (0,9)	1,1 (1)	V
r_T	T_j = 150 () °C		20 (25)	30 (35)	mΩ
$R_{th(j-s)}$	per diode		2,46		K/W
I_{RRM}	under following conditions		32		A
Q_{rr}	I_{Fnom} = 20 A, V_R = 300 V		2		µC
E_{rr}	V_{GE} = 0 V, T_j = 150°C		0,2		mJ
	di_F/dt = -3300 A/µs				
Diode rectifier					
V_F	I_{Fnom} = 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		2,15		K/W
Temperature Sensor					
R_{ts}	5 %, T_r = 25 (100) °C		5000(493)		Ω
Mechanical Data					
w			30		g
M_s	Mounting torque	2,25		2,5	Nm

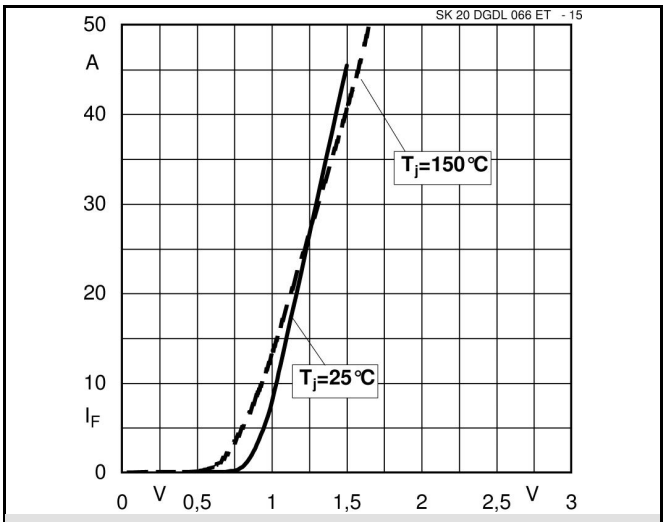


Fig.15 Input Bridge Diode forward characteristic

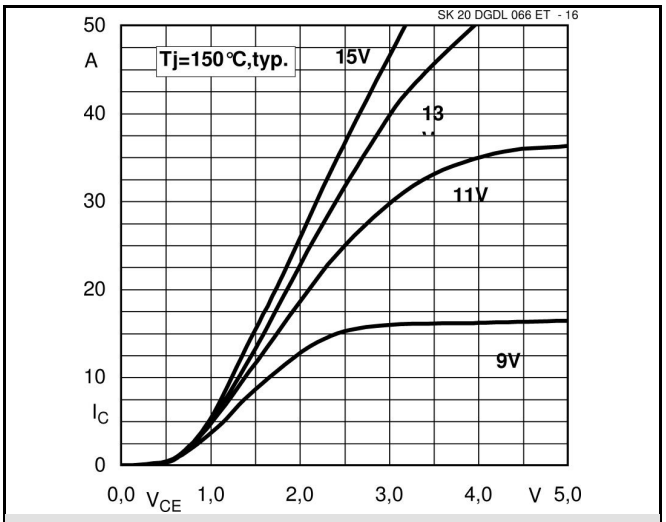


Fig.16 Typical Output Characteristic

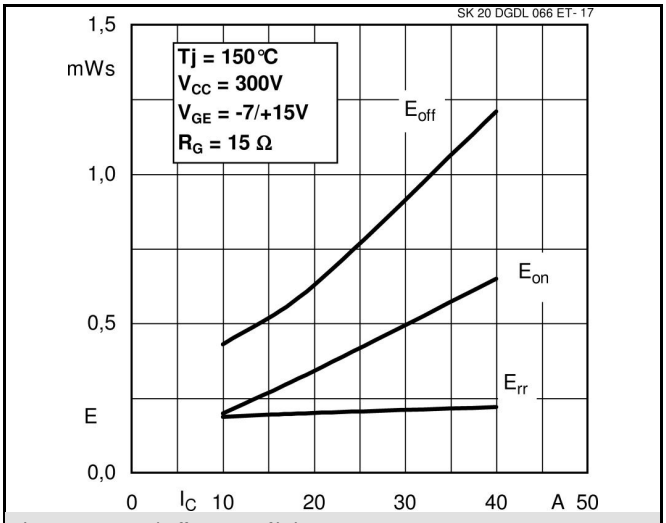


Fig. 17 Turn -on/-off energy=f(Ic)

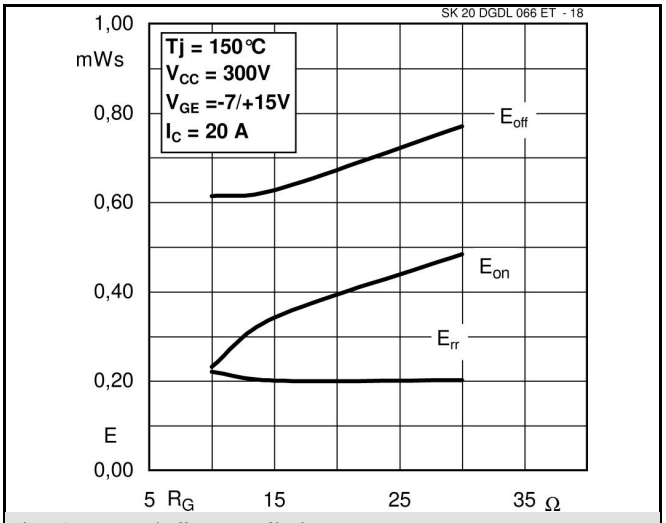


Fig. 18 Turn -on/-off energy=f(R_g)

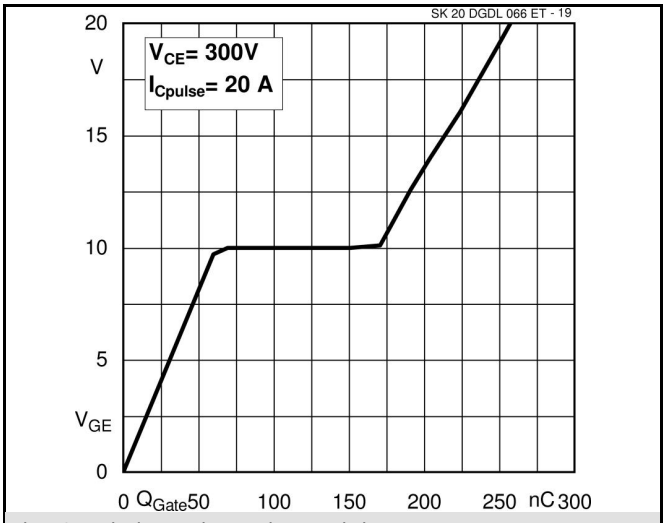


Fig. 19 Typical gate charge characteristic

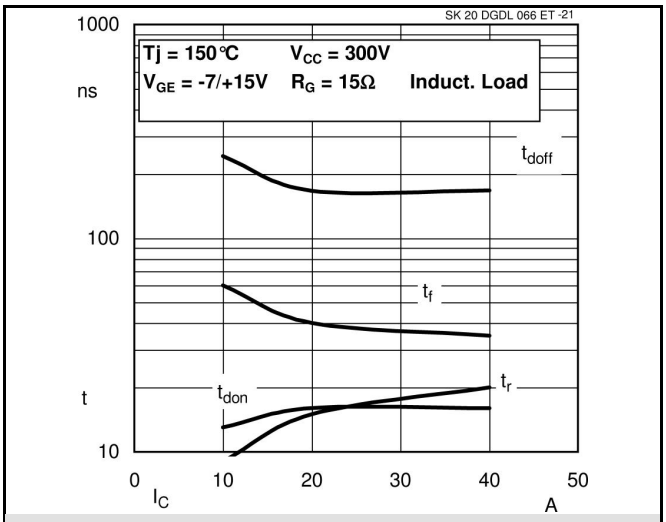


Fig. 21 Typical switching times vs I_C

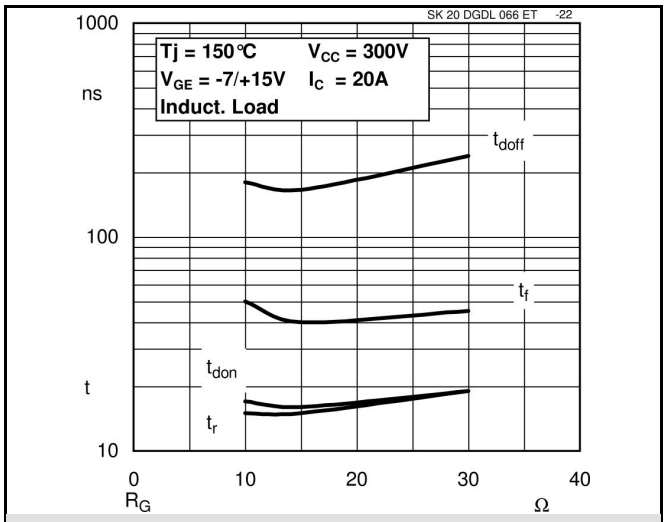


Fig. 22 Typical switching times vs R_G

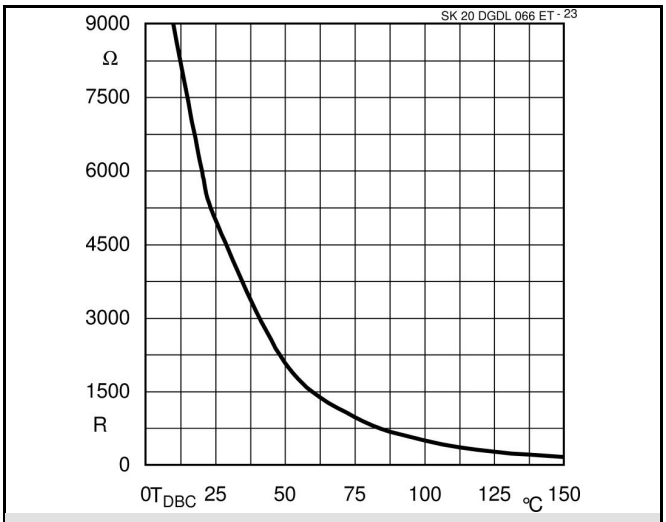


Fig.23 Typical NTC characteristic

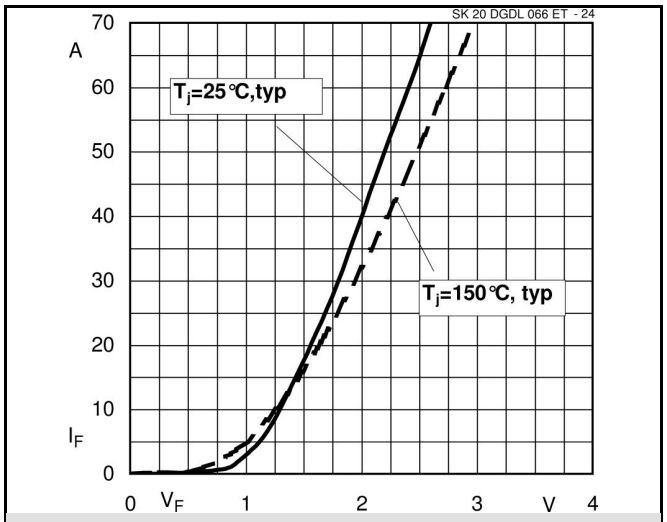
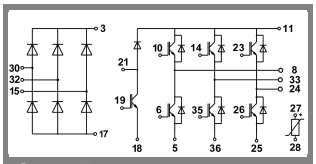
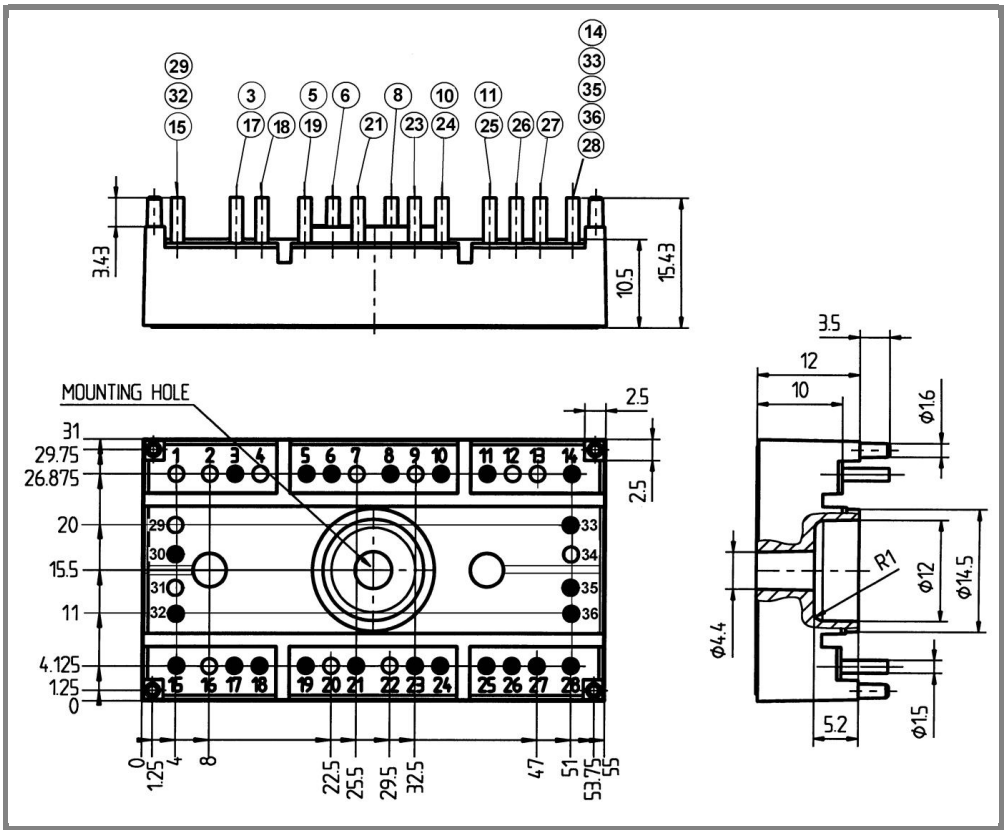


Fig.24 Typical FWD forward characteristic



Case T 49



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

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 personal.