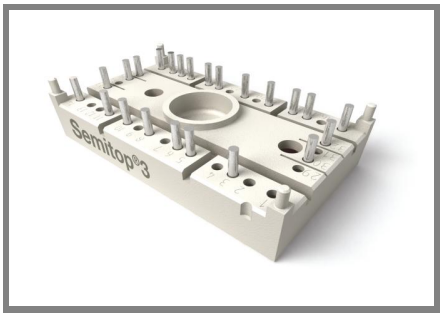
SK 20 DGDL 066 ET CONVERTER, INVERTER, BRAKE



SEMITOP®3

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

SK 20 DGDL 066 ET

Target Data

Features

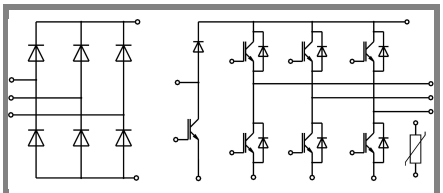
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

Typical Applications

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

Remarks

- $V_{CE,sat}$, V_F = chip level value



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	29 (23)	A
I_C	T_s = 25 (70) °C, T_j = 150 °C	25 (20)	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
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		2,1		K/W
$t_{d(on)}$	under following conditions		-		ns
t_r	V_{CC} = 300 V, V_{GE} = ±15V		-		ns
$t_{d(off)}$	I_{Cnom} = 20 A, T_j = 150 °C		-		ns
t_f	R_{Gon} = R_{Goff} = 15 Ω		-		ns
E_{on} (E_{off})	inductive load		0,75 (0,65)		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		-		A
Q_{rr}	I_{Fnom} = 20 A, V_R = 300 V		-		µC
E_{rr}	V_{GE} = 0 V, T_j = 150°C		0,2		mJ
	di_F/dt = -1240 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

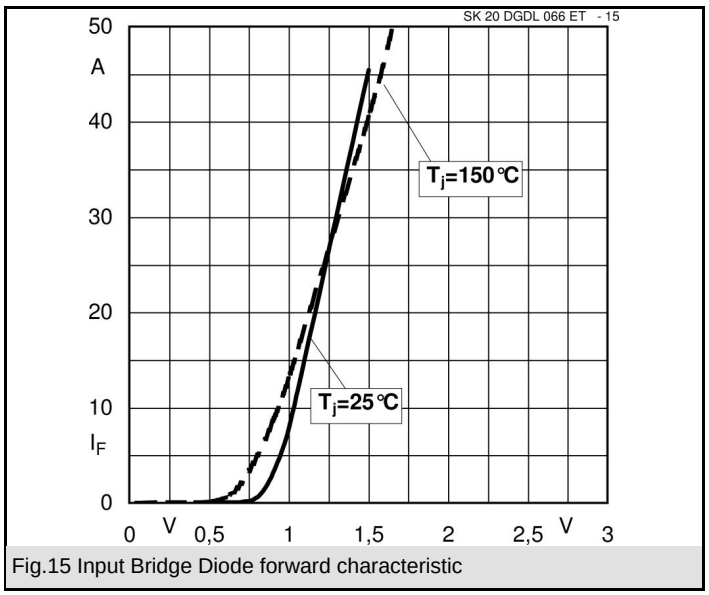


Fig.15 Input Bridge Diode forward characteristic

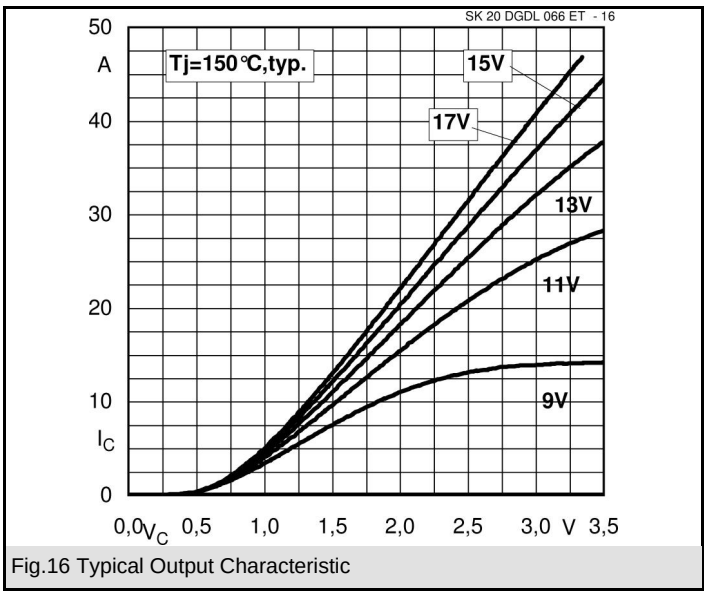


Fig.16 Typical Output Characteristic

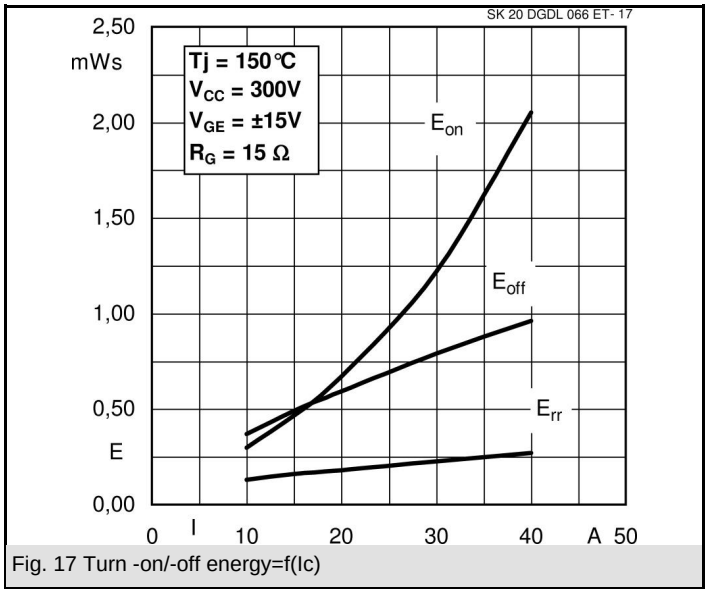


Fig. 17 Turn -on/-off energy=f(Ic)

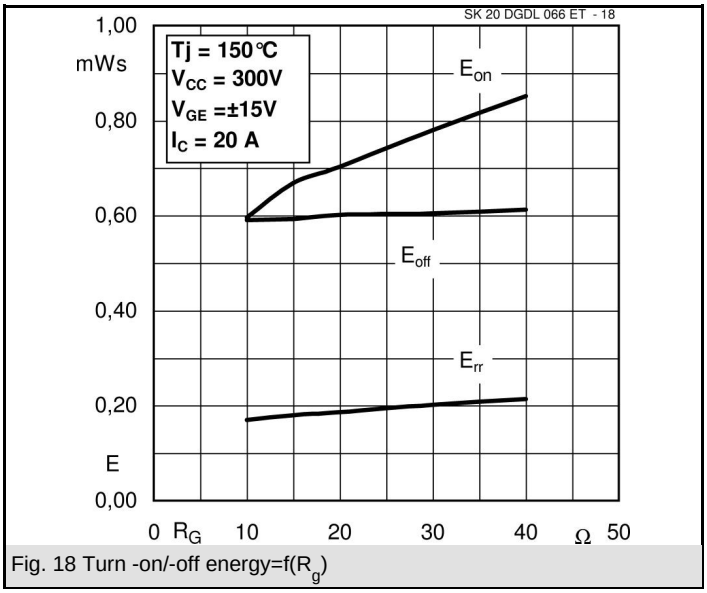


Fig. 18 Turn -on/-off energy=f(R_g)

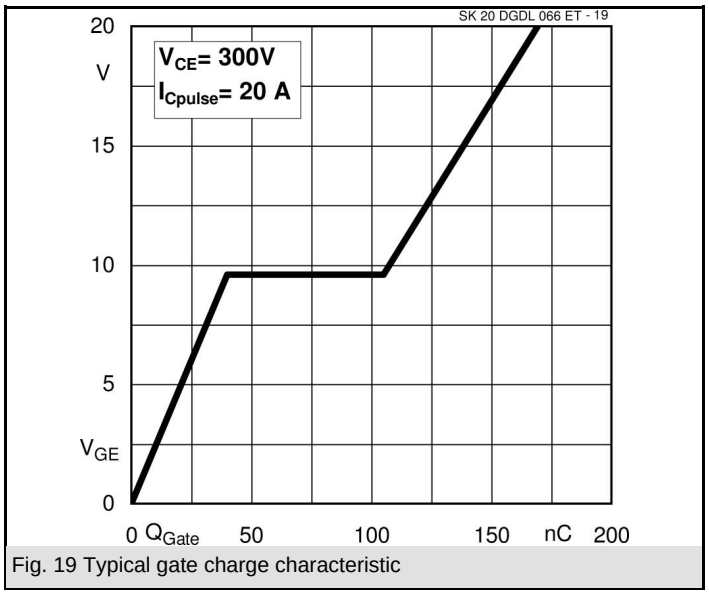


Fig. 19 Typical gate charge characteristic

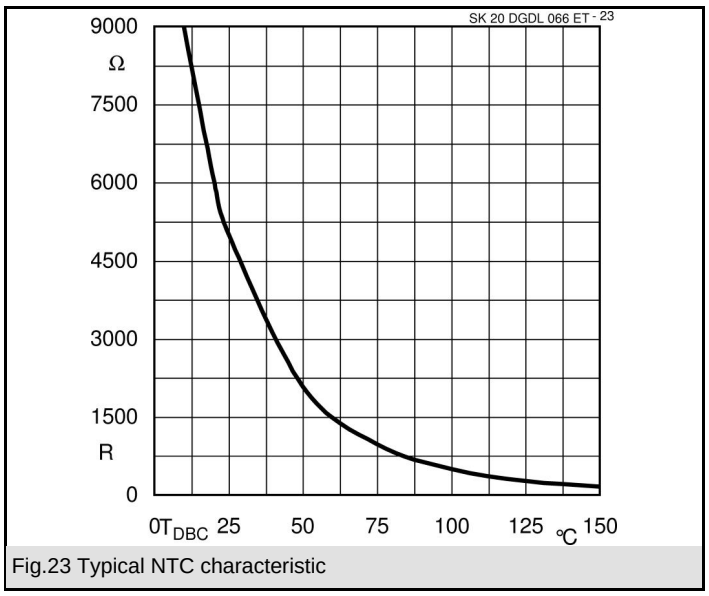


Fig.23 Typical NTC characteristic

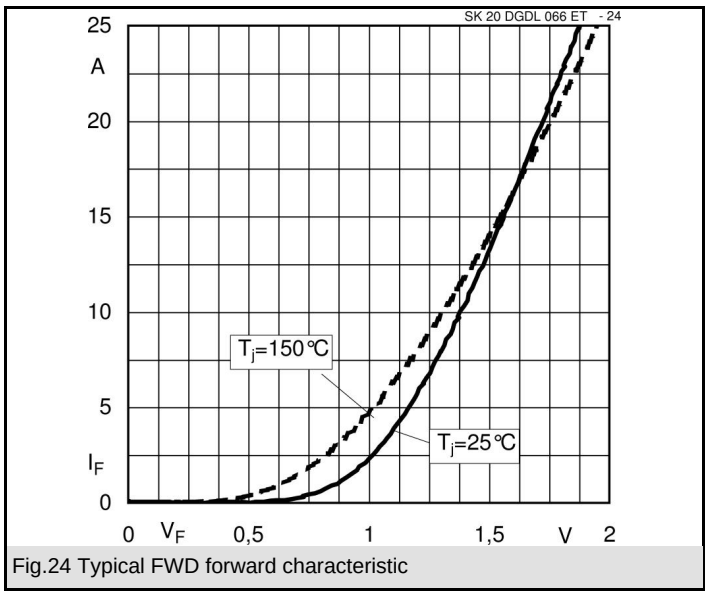
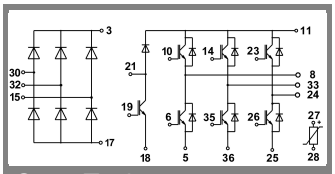
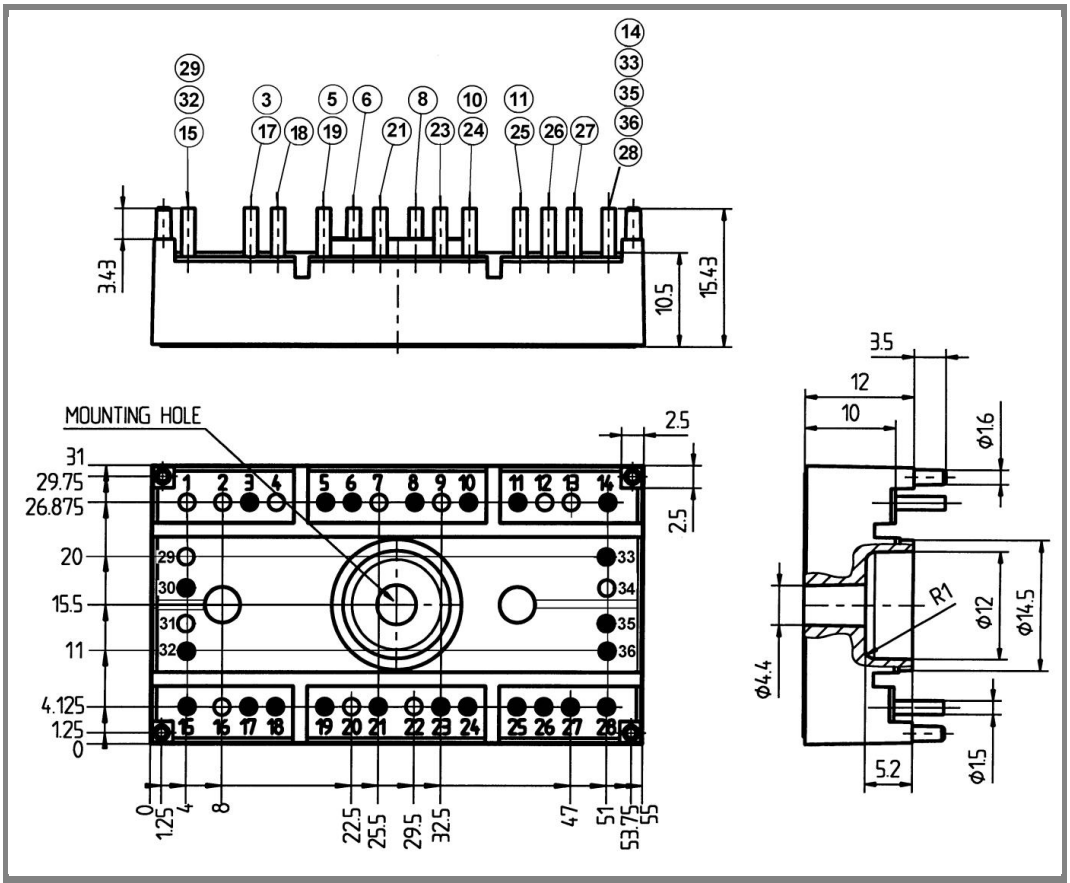


Fig.24 Typical FWD forward characteristic



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.

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