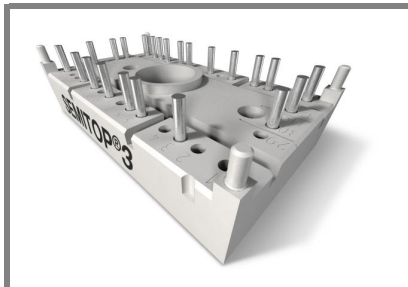


# SK 20 DGDL 066 ET



**SEMITOP®3**

**3-phase bridge rectifier +  
brake chopper + 3-phase  
bridge inverter**  
**SK 20 DGDL 066 ET**

Target Data

## Features

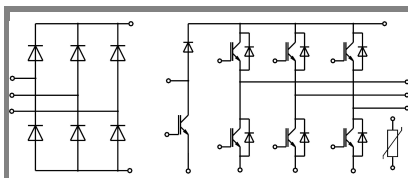
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD
- Integrated NTC temperature sensor

## 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		$T_s = 25^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT - Inverter, chopper</b>			
$V_{CES}$		600	V
$I_C$	$T_s = 25 (70)^\circ\text{C}$ , $T_j = 175^\circ\text{C}$	29 (23)	A
$I_C$	$T_s = 25 (70)^\circ\text{C}$ , $T_j = 150^\circ\text{C}$	25 (20)	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$ , $t_p = 1 \text{ ms}$	40	A
$V_{GES}$		$\pm 20$	V
$T_j$		-40 ... + 175	$^\circ\text{C}$
<b>Diode - Inverter, chopper</b>			
$I_F$	$T_s = 25 (70)^\circ\text{C}$ , $T_j = 150^\circ\text{C}$	27 (20)	A
$I_F$	$T_s = 25 (70)^\circ\text{C}$ , $T_j = 175^\circ\text{C}$	31 (24)	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$ , $t_p = 1 \text{ ms}$	40	A
<b>Diode - Rectifier</b>			
$V_{RRM}$		800	V
$I_F$	$T_s = 70^\circ\text{C}$	26	A
$I_{FSM}$	$t_p = 10 \text{ ms}$ , $\sin 180^\circ$ , $T_j = 25^\circ\text{C}$	220	A
$i^2t$	$t_p = 10 \text{ ms}$ , $\sin 180^\circ$ , $T_j = 25^\circ\text{C}$	240	$\text{A}^2\text{s}$
$T_j$		-40 ... + 175	$^\circ\text{C}$
$T_{sol}$	Terminals, 10 s	260	$^\circ\text{C}$
$T_{stg}$		-40 ... + 125	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500	V

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

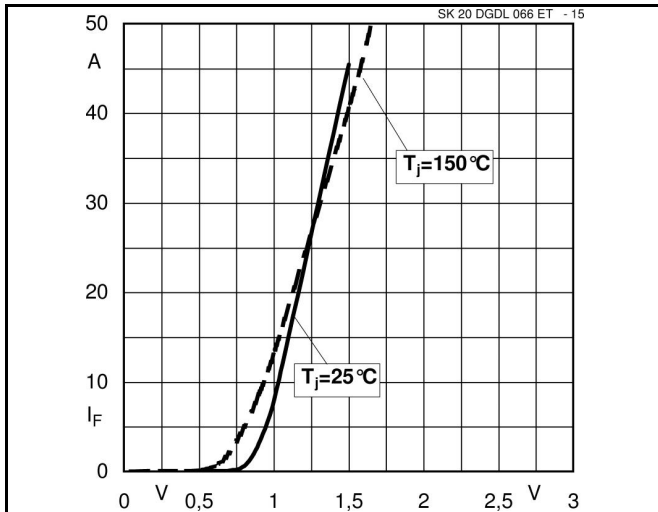


Fig.15 Input Bridge Diode forward characteristic

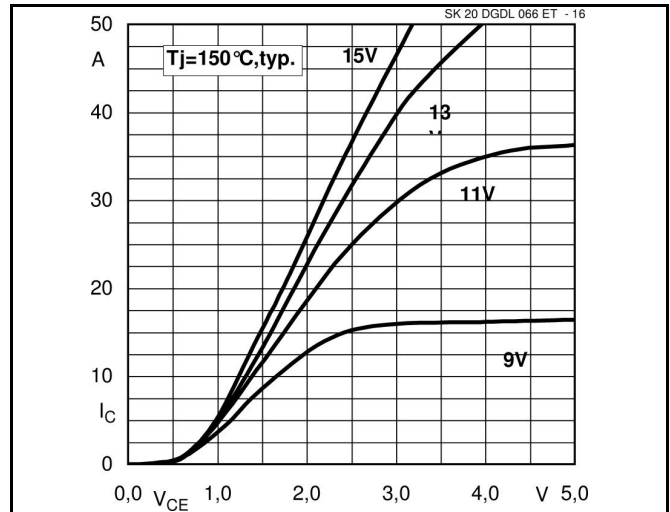


Fig.16 Typical Output Characteristic

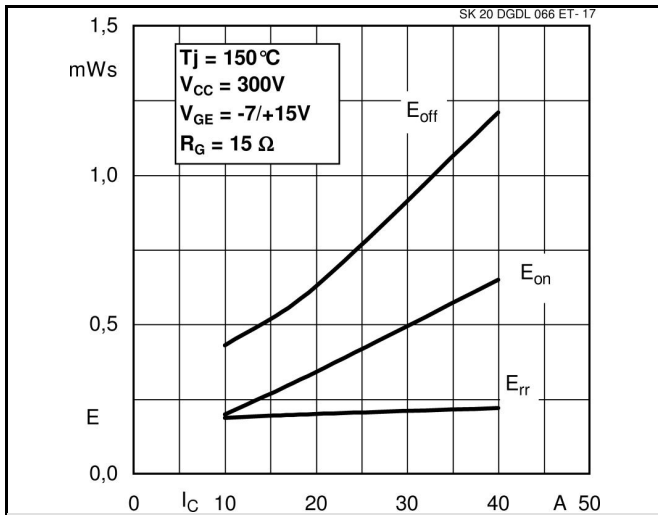


Fig. 17 Turn -on/-off energy=f(I<sub>c</sub>)

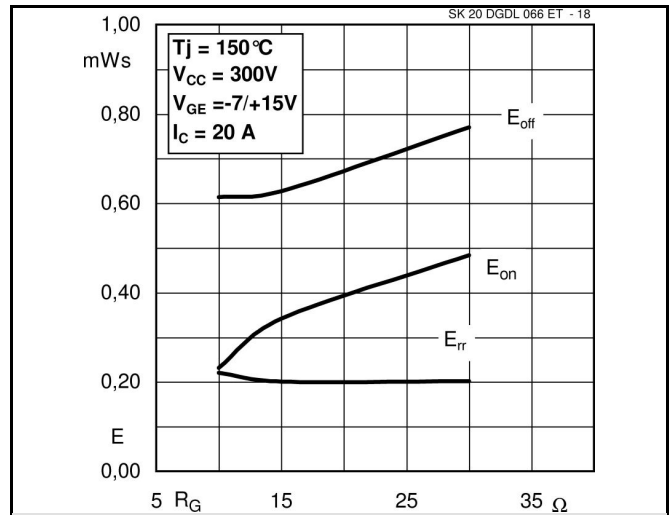


Fig. 18 Turn -on/-off energy=f(R<sub>g</sub>)

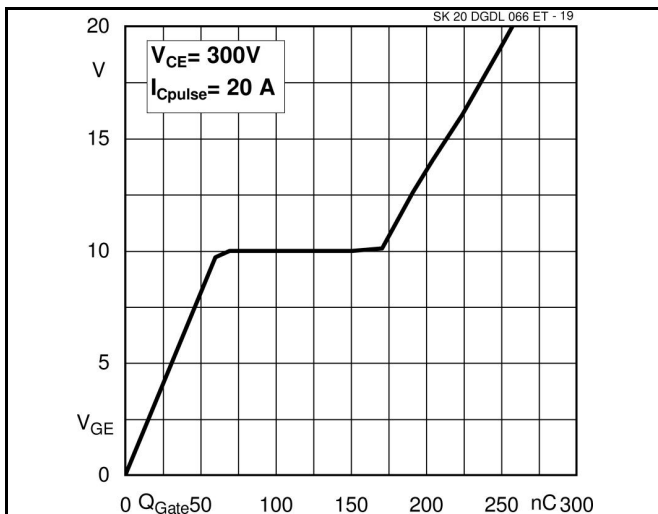
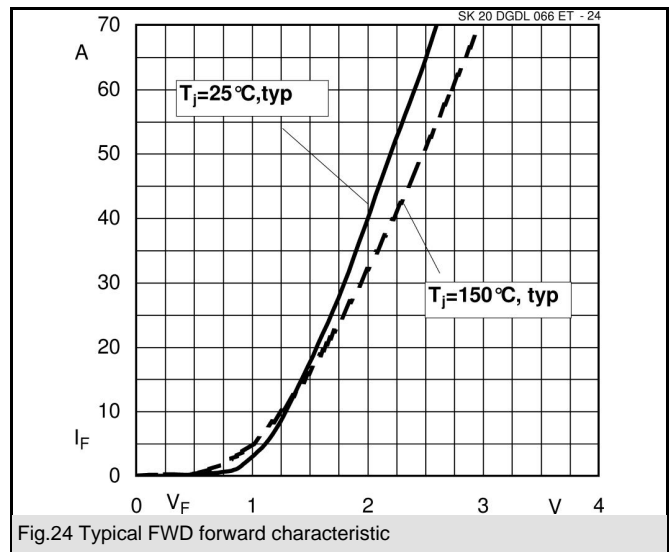
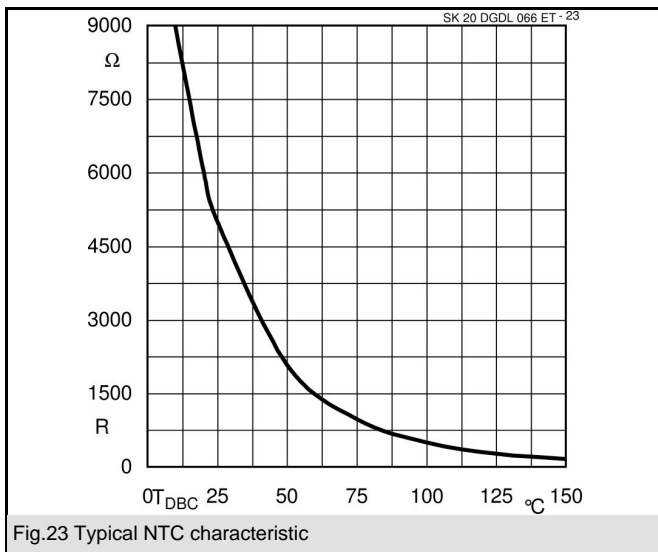
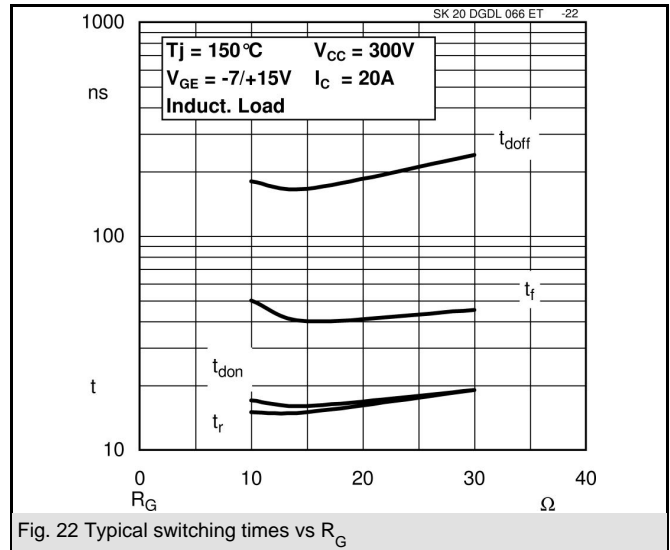
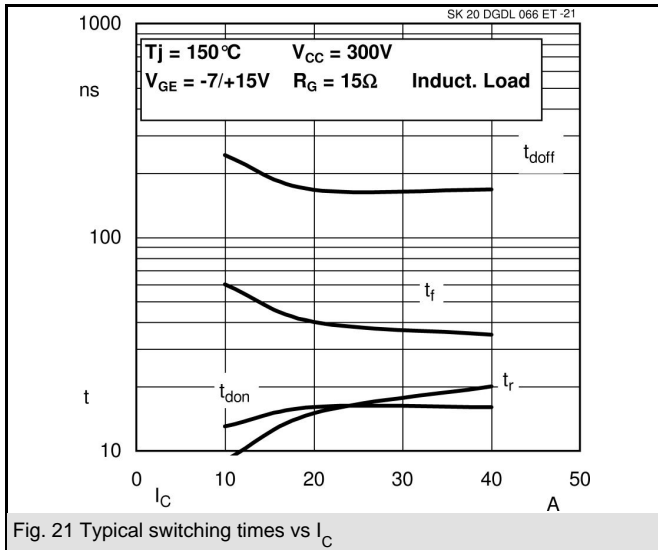
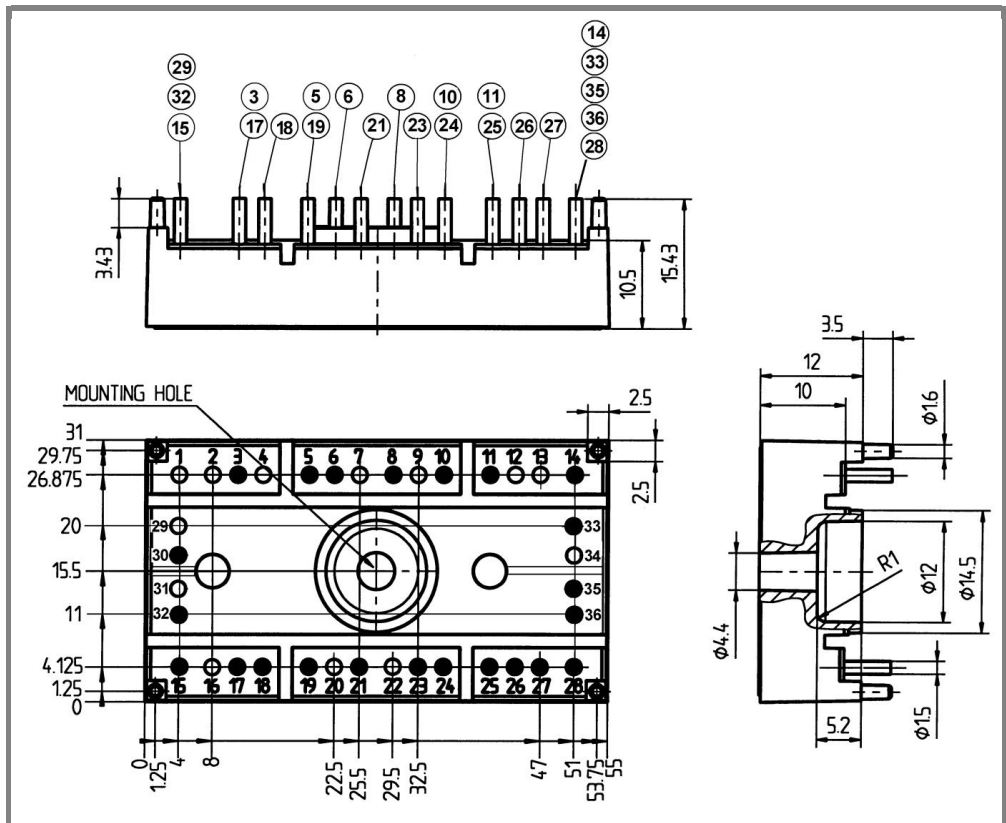
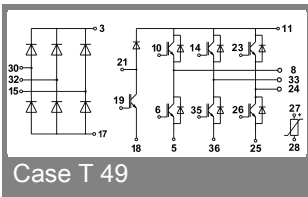


Fig. 19 Typical gate charge characteristic



# SK 20 DGDL 066 ET



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.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.