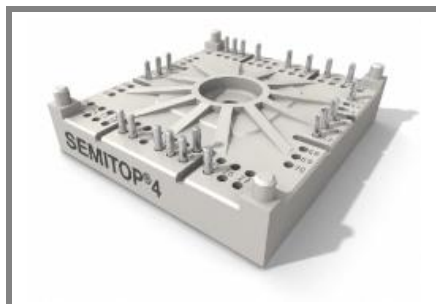




SEMITOP®4

3-phase bridge rectifier +
brake chopper + 3-phase
bridge inverter
SK 50 DGD L 066 T

Target Data

Features

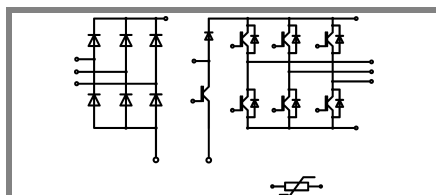
- One screw mounting module
- Fully compatible with SEMITOP®1,2,3
- Improved thermal performances by aluminium oxide substrate
- Trench IGBT technology
- CAL technology free-wheeling diode
- Integrated NTC temperature sensor

Typical Applications

- Inverter up to 12,5 kVA
- Typical motor power 5,5 kW

Remarks

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



DGD L - T

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Inverter, Chopper			
V_{CES}		600	V
I_C	$T_s = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	69 (55)	A
I_C	$T_s = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	62 (47)	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$, $t_p = 1 \text{ ms}$	100	A
V_{GES}		± 20	V
T_j		-40 ... + 175	$^\circ\text{C}$
Diode - Inverter, Chopper			
I_F	$T_s = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	48 (35)	A
I_F	$T_s = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	54 (42)	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$, $t_p = 1 \text{ ms}$		56
Diode - Rectifier			
V_{RRM}		800	V
I_F	$T_s = 70^\circ\text{C}$	46	A
I_{FSM}	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	370	A
i^2t	$t_p = 10 \text{ ms}$, $\sin 180^\circ$, $T_j = 25^\circ\text{C}$	680	A^2s
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
IGBT - Inverter, Chopper					
$V_{CE(sat)}$	$I_{Cnom} = 50 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$	1,05	1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,8 \text{ mA}$	5	5,8	6,5	V
$V_{CE(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,9 (0,8)	1,1 (1)	V
r_{CE}	$T_j = 25 (150)^\circ\text{C}$		11 (17)	15 (21)	m Ω
C_{ies}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		3,1		nF
C_{oes}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		0,2		nF
C_{res}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		0,093		nF
$R_{th(j-s)}$	per IGBT		0,95		K/W
$t_{d(on)}$	under following conditions		21		ns
t_r	$V_{CC} = 300 \text{ V}$, $V_{GE} = -7 / + 15 \text{ V}$		32		ns
$t_{d(off)}$	$I_{Cnom} = 50 \text{ A}$, $T_j = 125^\circ\text{C}$		360		ns
t_f	$R_{Gon} = R_{Goff} = 16 \Omega$		57		ns
$E_{on} (E_{off})$	inductive load		1,87 (1,6)		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	$I_F = 37 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$		1,35 (1,31)		V
$V_{(TO)}$	$T_j = 25 (150)^\circ\text{C}$		(0,85)		V
r_T	$T_j = 25 (150)^\circ\text{C}$		(12,6)		m Ω
$R_{th(j-s)}$	per diode		1,6		K/W
I_{RRM}	under following conditions		40		A
Q_{rr}	$I_{Fnom} = 50 \text{ A}$, $V_R = 300 \text{ V}$		5,6		μC
E_{rr}	$V_{GE} = 0 \text{ V}$, $T_j = 125^\circ\text{C}$ $di_F/dt = 1300 \text{ A}/\mu\text{s}$		0,73		mJ
Diode - Rectifier					
V_F	$I_{Fnom} = 25 \text{ A}$, $T_j = 25^\circ\text{C}$		1,1		V
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8		V
r_T	$T_j = 150^\circ\text{C}$		13		m Ω
$R_{th(j-s)}$	per diode		1,5		K/W
Temperature Sensor					
R_{ts}	5 %, $T_r = 25 (100)^\circ\text{C}$		5000(493)		Ω
Mechanical Data					
w			60		g
M_s	Mounting torque		3,5		Nm

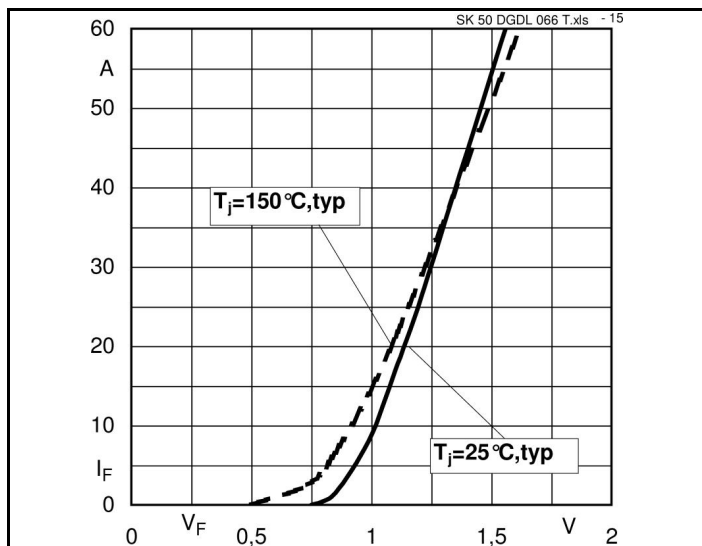


Fig.15 Input Bridge forward characteristic

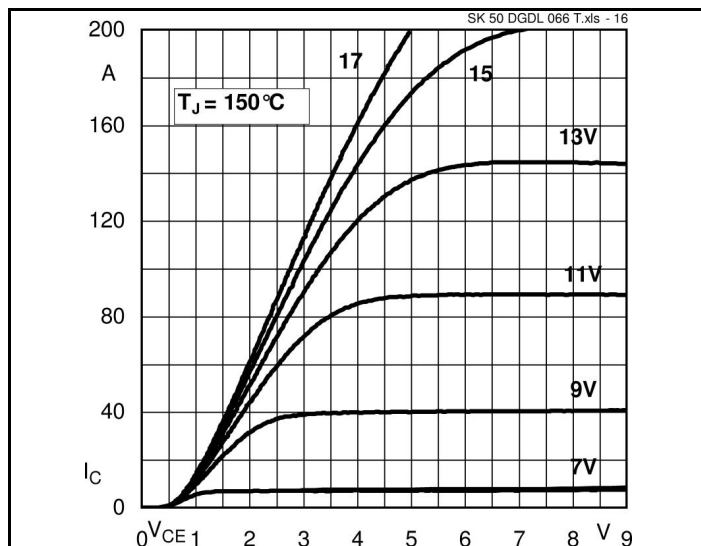


Fig.16 Typical Output characteristic

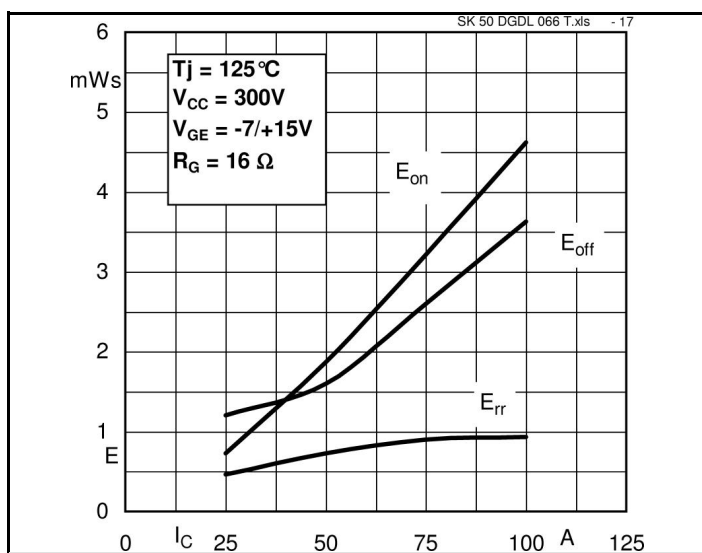


Fig.17 Turn-on/-off energy=f(I_C)

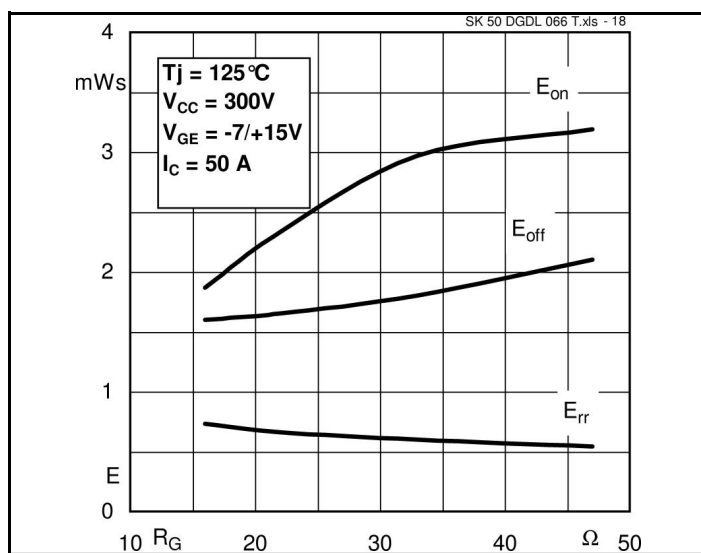


Fig.18 Turn-on/-off energy=f(R_G)

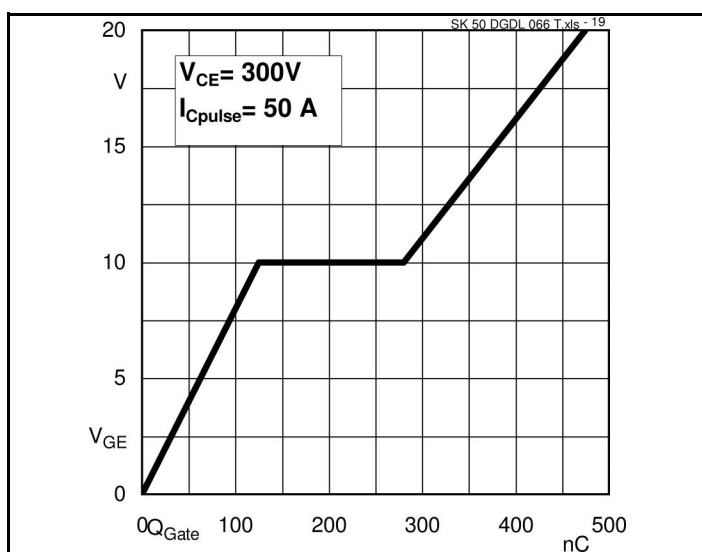
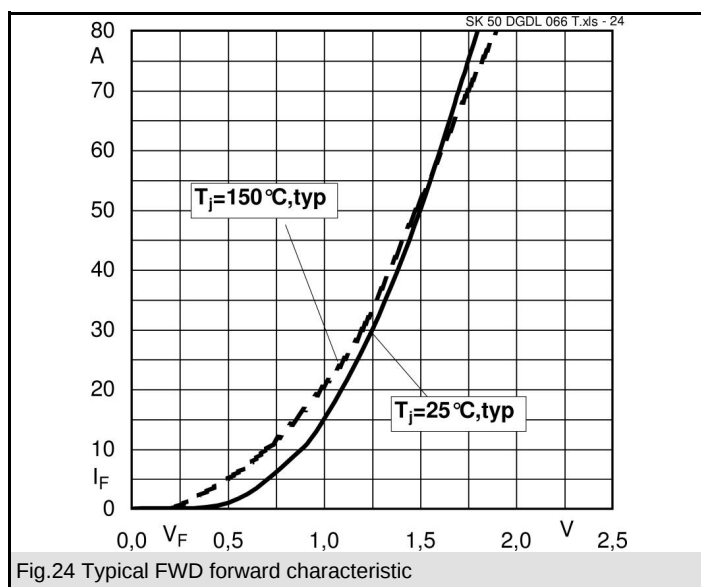
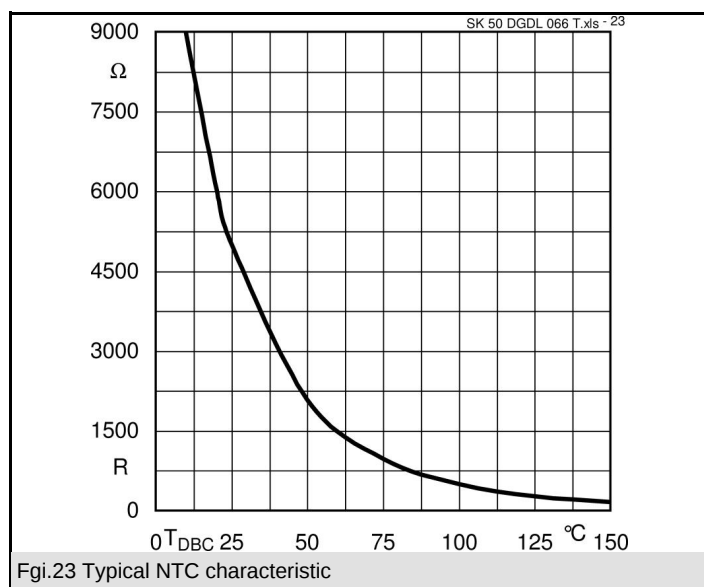
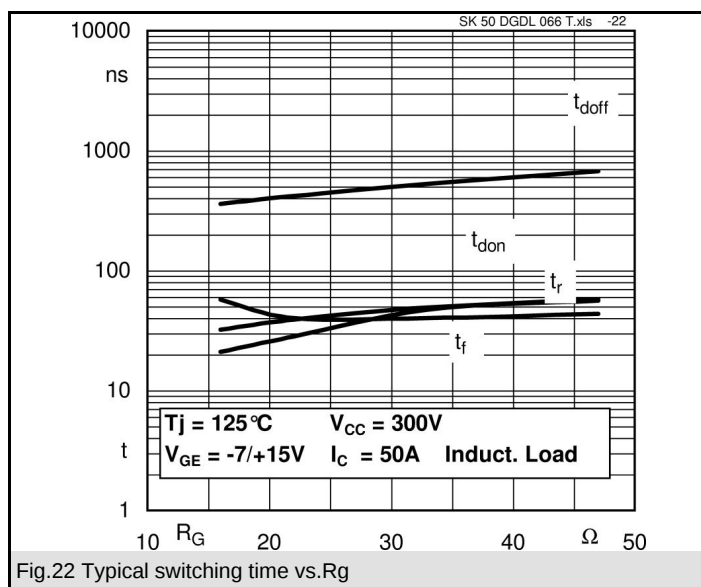
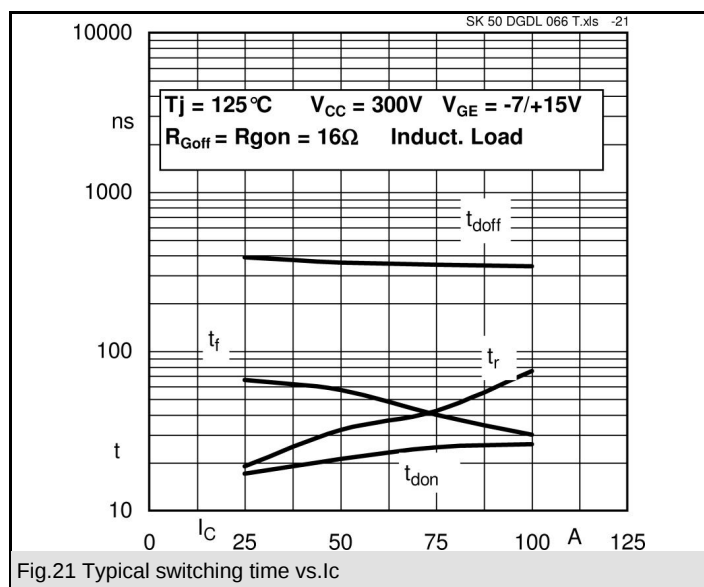
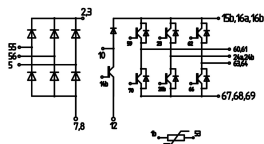
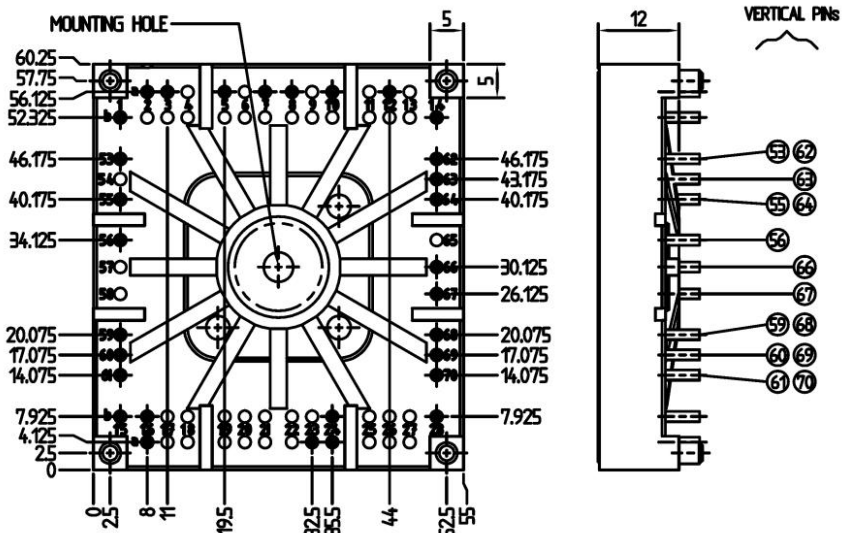
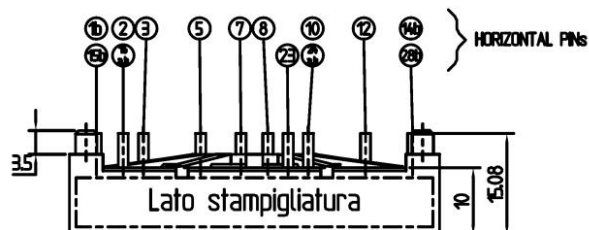


Fig.19 Typical gate charge characteristic





Case T 75
(pin without
letter refers
to row "a",
unless
otherwise
specified)



Case T 75 (Suggested hole diameter for the solder pins in the circuit board: 2mm.
Suggested hole diameter for the mounting pins in the circuit board: 3,6mm)

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

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