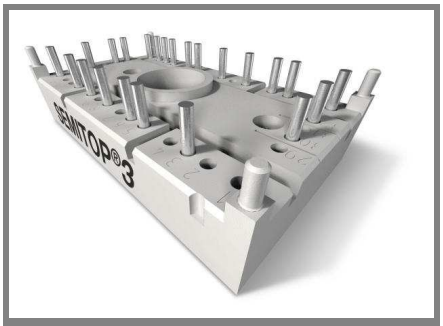


SEMITOP® 3

3-phase bridge rectifier + 3-phase bridge inverter

SK 9 DGD 065 ET

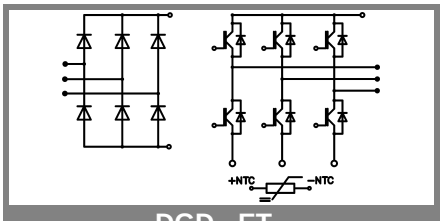
Preliminary Data

Features

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

Typical Applications*

- Inverter



DGD - ET

Absolute Maximum Ratings		T_s= 25°C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter			
V_{CES}		600	V
I_C	T_s = 25 (80) °C	12 (8)	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}, t_p = 1 ms	12	A
V_{GES}		±20	V
T_j		-40 ... +150	°C
Diode - Inverter			
I_F	T_s = 25 (80) °C	20 (13)	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}, t_p = 1 ms	16	A
T_j		-40 ... +150	°C
Rectifier			
V_{RRM}		800	V
I_F	T_s = 80 °C	25	A
I_{FSM} / I_{TSM}	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	A²s
T_j		-40 ... +150	°C
T_{sol}	Terminals, 10s	260	°C
T_{stg}		-40 ... +125	°C
V_{isol}	AC, 1 min. / 1s	2500 / 3000	V

Characteristics		T_s= 25°C, unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Inverter					
V_{CEsat}	I_C = 6 A, T_j = 25 (125) °C		2 (2,2)		V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0,5 mA	3	4	5	V
$V_{CE(TO)}$	T_j = 25 °C (125) °C		1,2 (1,1)		V
r_T	T_j = 25 °C (125) °C		133 (183)		mΩ
C_{ies}	V_{CE} = V_{GE} = 0 V, f = 1 MHz		0,35		nF
C_{oes}	V_{CE} = V_{GE} = 0 V, f = 1 MHz		0,4		nF
C_{res}	V_{CE} = V_{GE} = 0 V, f = 1 MHz		0,25		nF
$R_{th(j-s)}$	per IGBT			2,6	K/W
$t_{d(on)}$	under following conditions		20		ns
t_r	V_{CC} = 300 V, V_{GE} = ± 15 V		25		ns
$t_{d(off)}$	I_C = 6 A, T_j = 125 °C		145		ns
t_f	R_{Gon} = R_{Goff} = 120 Ω		25		ns
E_{on}	inductive load		0,22		mJ
E_{off}			0,12		mJ
Diode - Inverter					
V_F = V_{EC}	I_F = 8 A, T_j = 25(125) °C		1,35		V
$V_{(TO)}$	T_j = 25 °C (125) °C		(0,8)		V
r_T	T_j = 25 °C (125) °C		(44)		mΩ
$R_{th(j-s)}$	per diode			2,7	K/W
I_{RRM}	under following conditions		4,2		A
Q_{rr}	I_F = 8 A, V_R = 300 V		0,65		µC
E_{rr}	V_{GE} = 0 V, T_j = 125 °C				mJ
	$di_{F/dt}$ = -120 A/µs				
Diode rectifier					
V_F	I_F = 20 A, T_j = 25() °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,85		V
r_T	T_j = 150 °C		15		mΩ
$R_{th(j-s)}$	per diode			2,15	K/W
Temperatur sensor					
R_{ts}	5 %, T_r = 25 (100) °C		5000(493)		Ω
Mechanical data					
w			31		g
M_s	Mounting torque	2,3		2,5	Nm

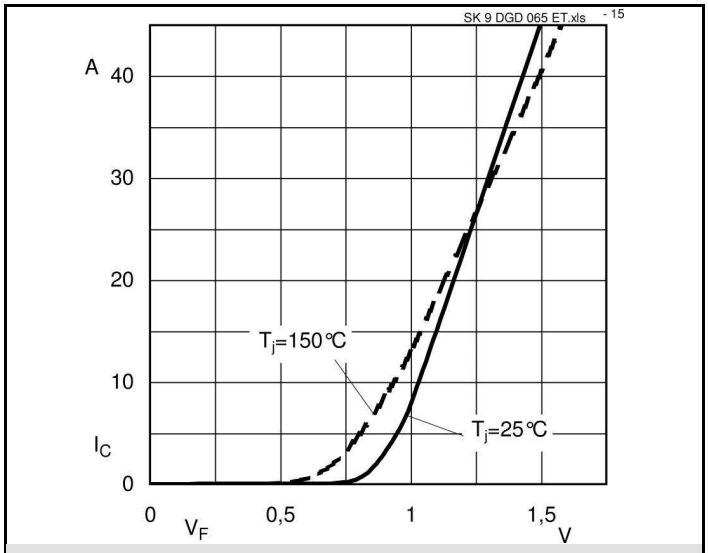


Fig. 15 Typ. Input Bridge Diode forward characteristic

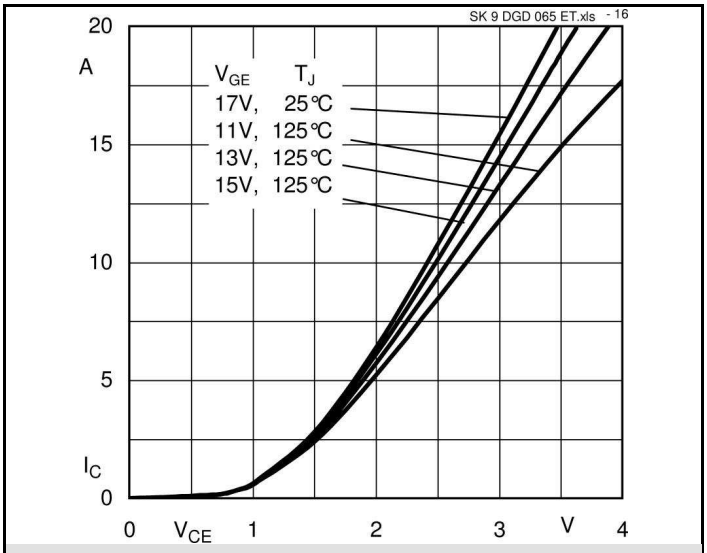


Fig. 16 Typical Output Characteristic

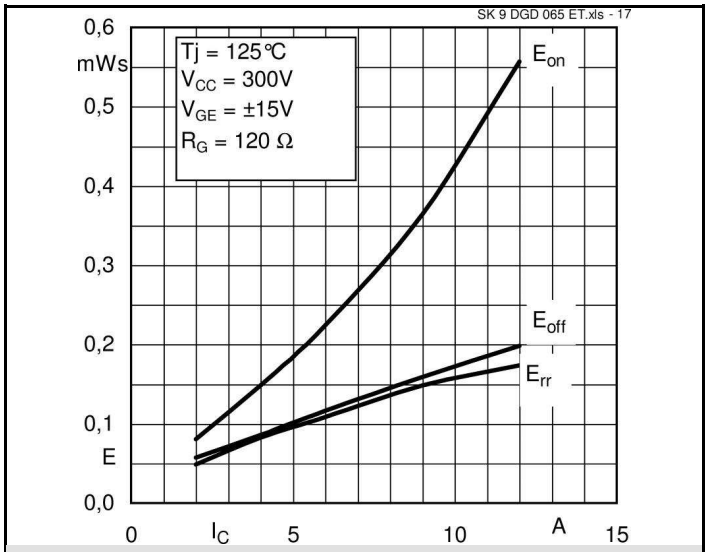


Fig. 17 Turn-On/Off Energy = f (Ic)

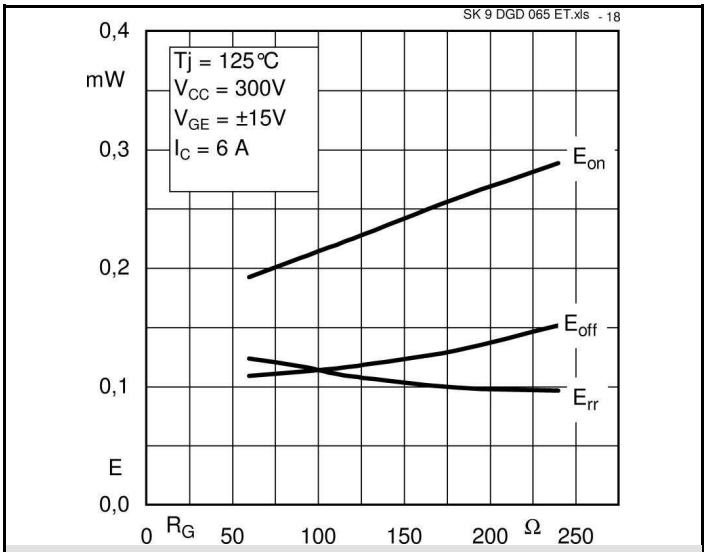


Fig. 18 Turn-On/Off Energy = f (Rg)

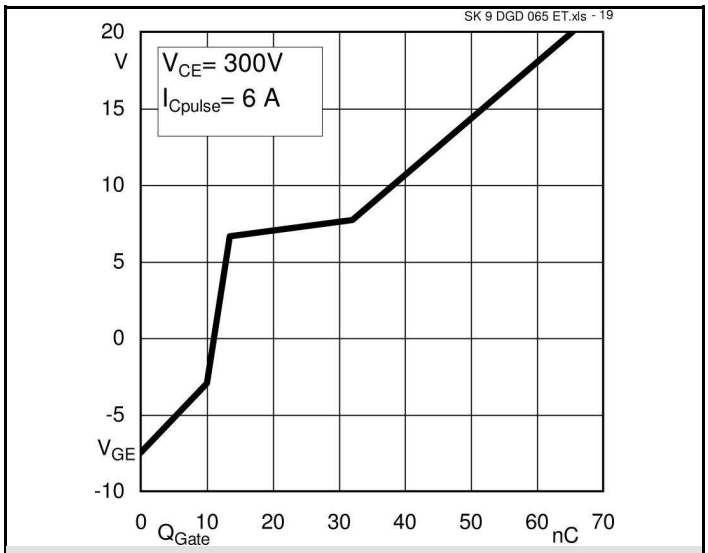


Fig. 19 Typical Gate Charge Characteristic

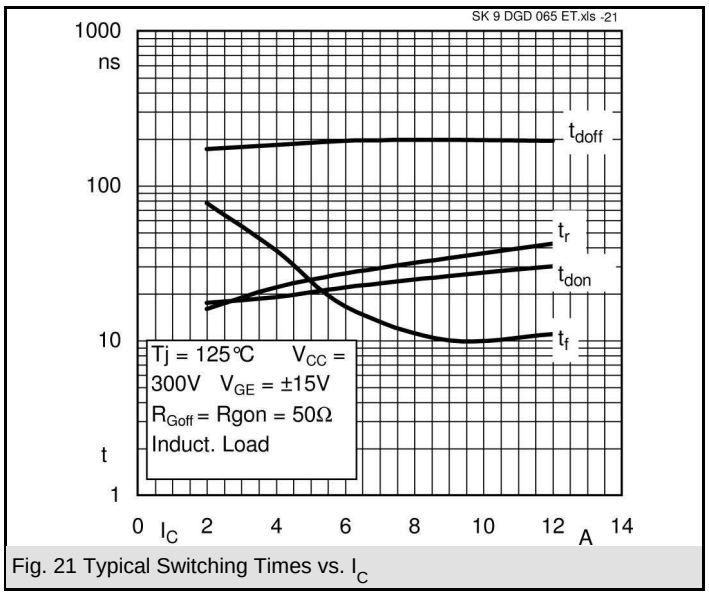


Fig. 21 Typical Switching Times vs. I_C

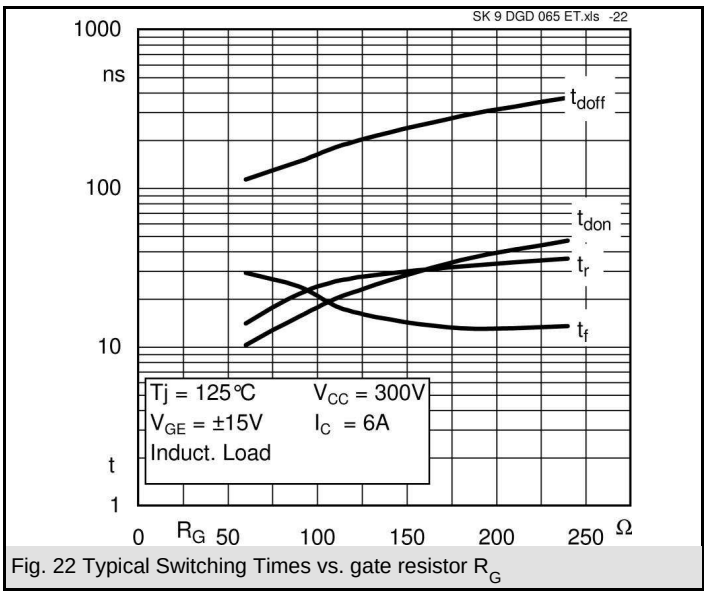


Fig. 22 Typical Switching Times vs. gate resistor R_G

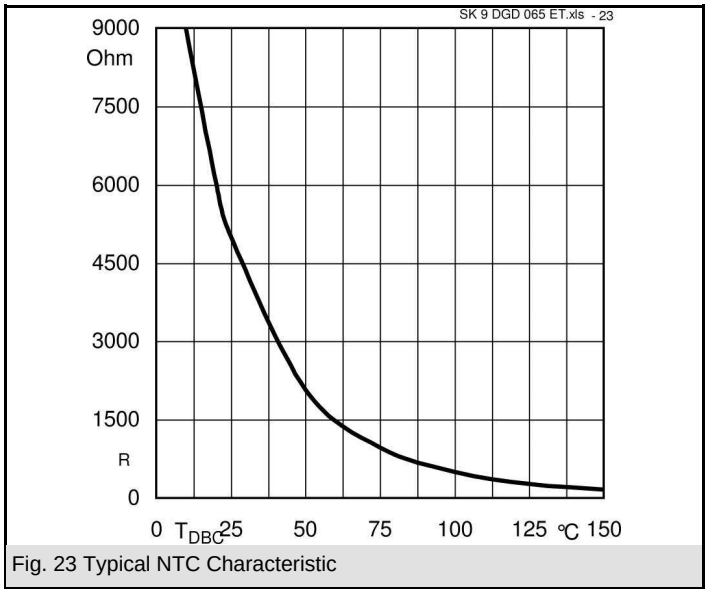


Fig. 23 Typical NTC Characteristic

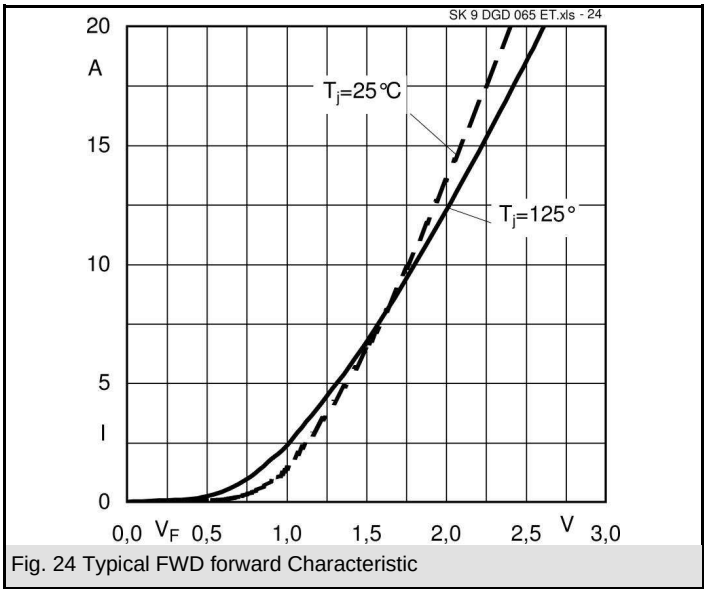
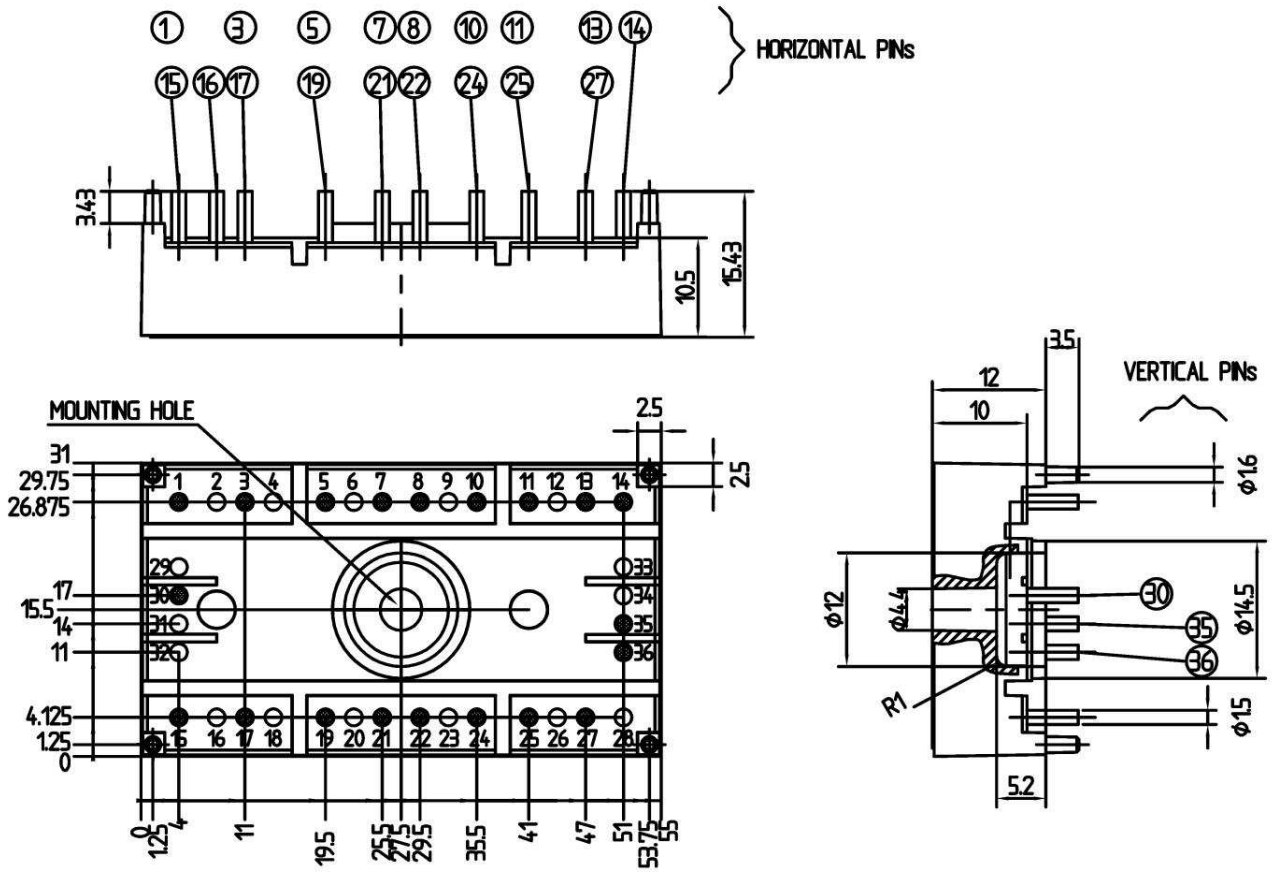
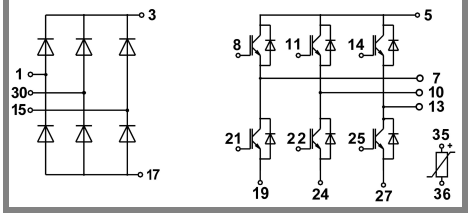


Fig. 24 Typical FWD forward Characteristic

Dimensions in mm



Case T60 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T60 DGD - ET

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.

