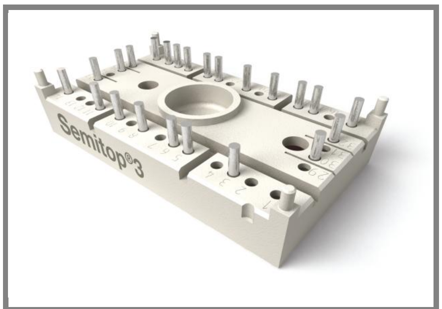


SEMITOP® 3

1-phase bridge rectifier +3-phase bridge inverter

SK 9 BGD 065 ET

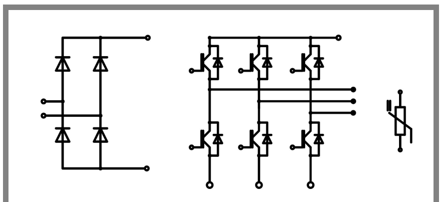
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded alumium oxide ceramic (DCB)
- N-channel homogeneous silicon structure (NPT-Non punch-through IGBT)
- High short circuit capability
- Low tail current with low temperature dependance

Typical Applications

- Inverter
- Servo drives



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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	(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 = 125 °C	220	A
I^2_t	t_p = 10 ms , sin 180 ° ,T_j = 125 °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		-		nF
C_{oes}	V_{CE} = V_{GE} = 0 V, f = 1 MHz		-		nF
C_{res}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,03		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 = °C (125) °C		(0,8)	(0,9)	V
r_T	T_j = °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}	%, T_r = ( ) °C		()		Ω
Mechanical data					
w			31		g
M_s	Mounting torque	2,3		2,5	Nm

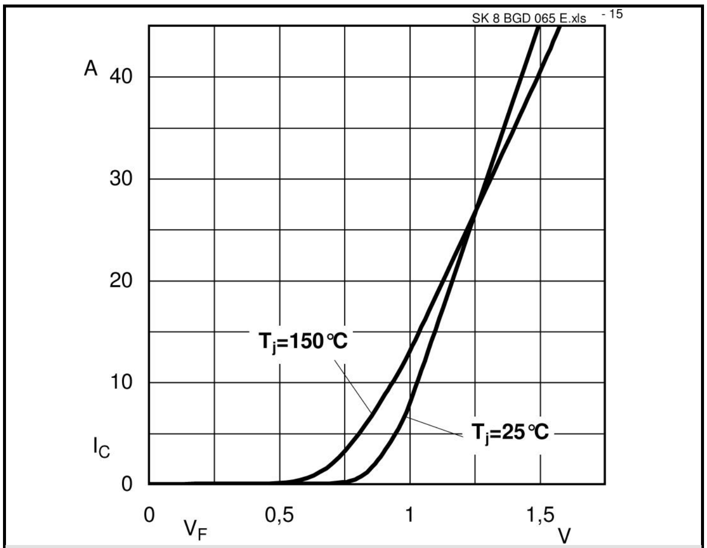


Fig. 15 Input Bridge Diode forward characteristic

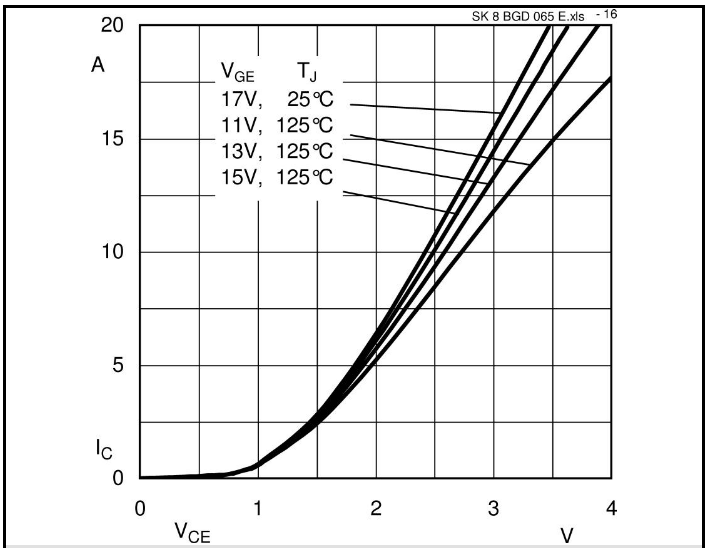


Fig. 16 Typical Output Characteristic

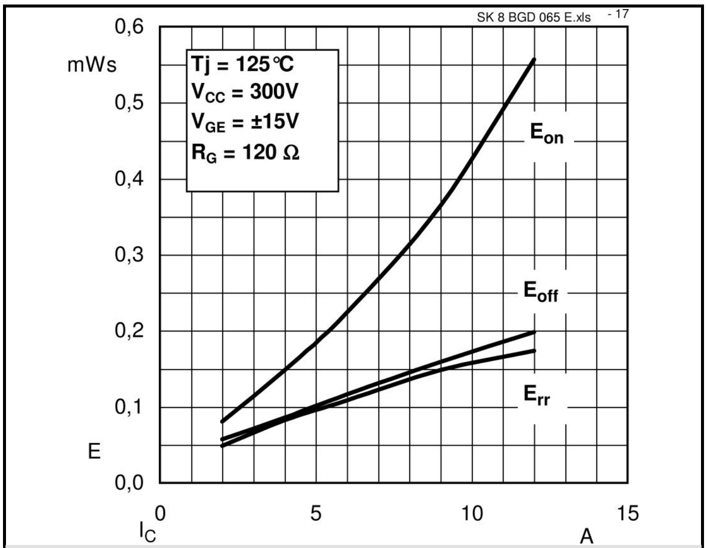


Fig. 17 Turm-on/-off energy = f(Ic)

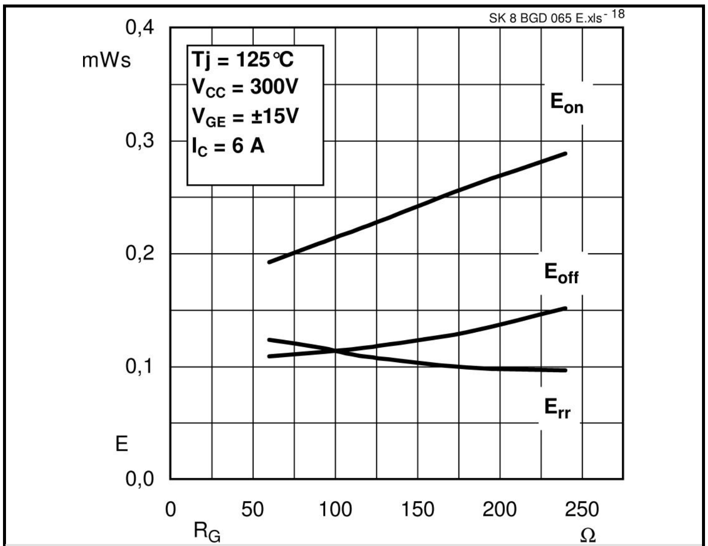


Fig. 18 Turm-on/-off energy = f(Rg)

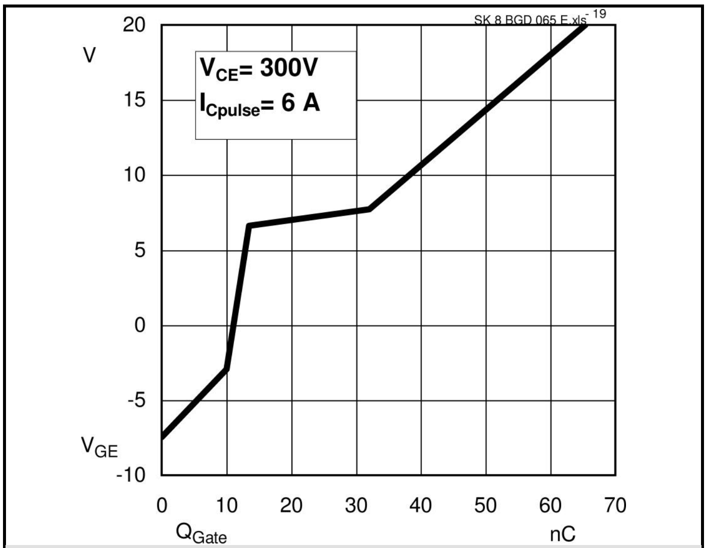


Fig. 19 Typical gate charge characteristic

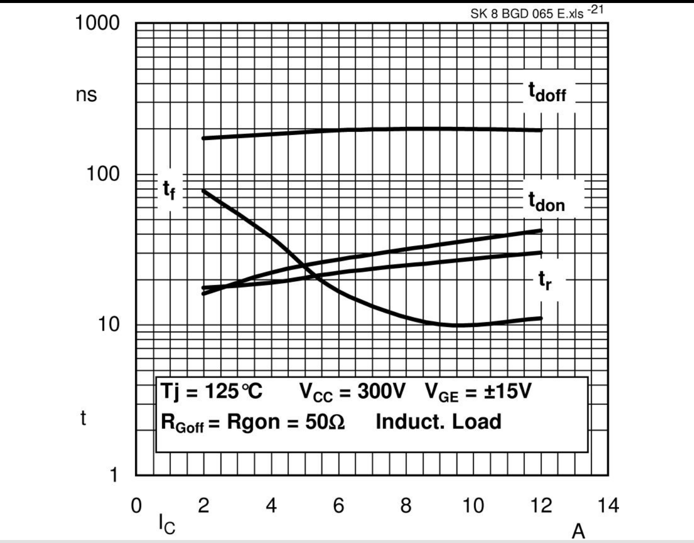


Fig. 21 Typical switching time vs. Ic

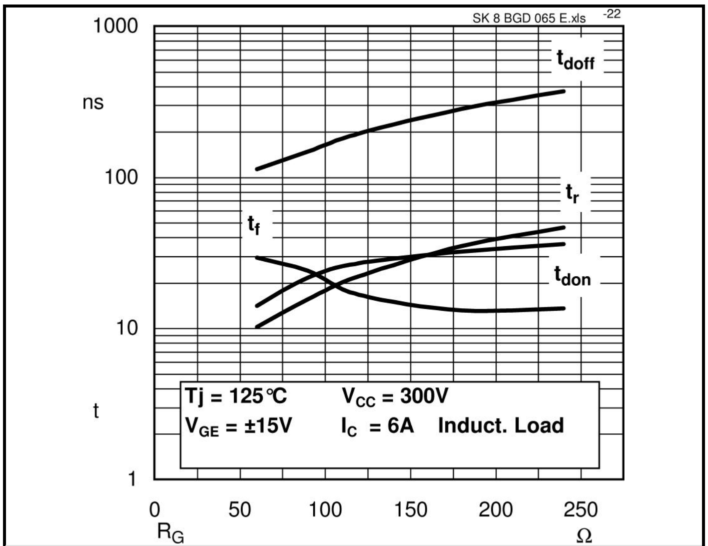


Fig. 22 Typical switching time vs. Rg

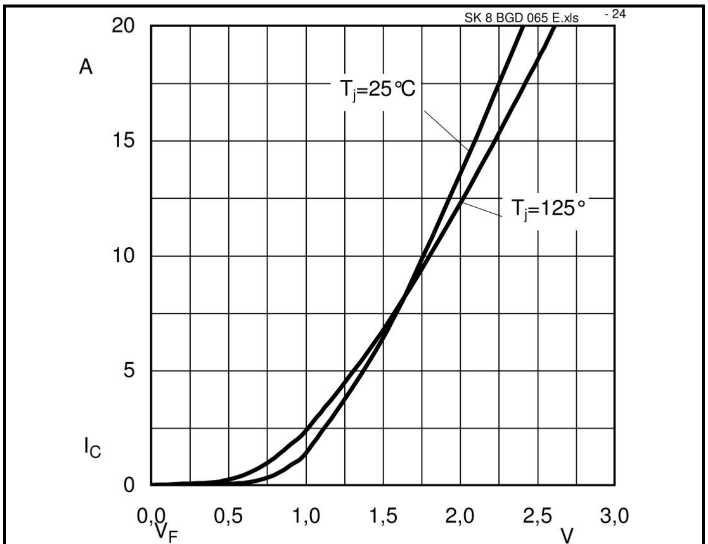
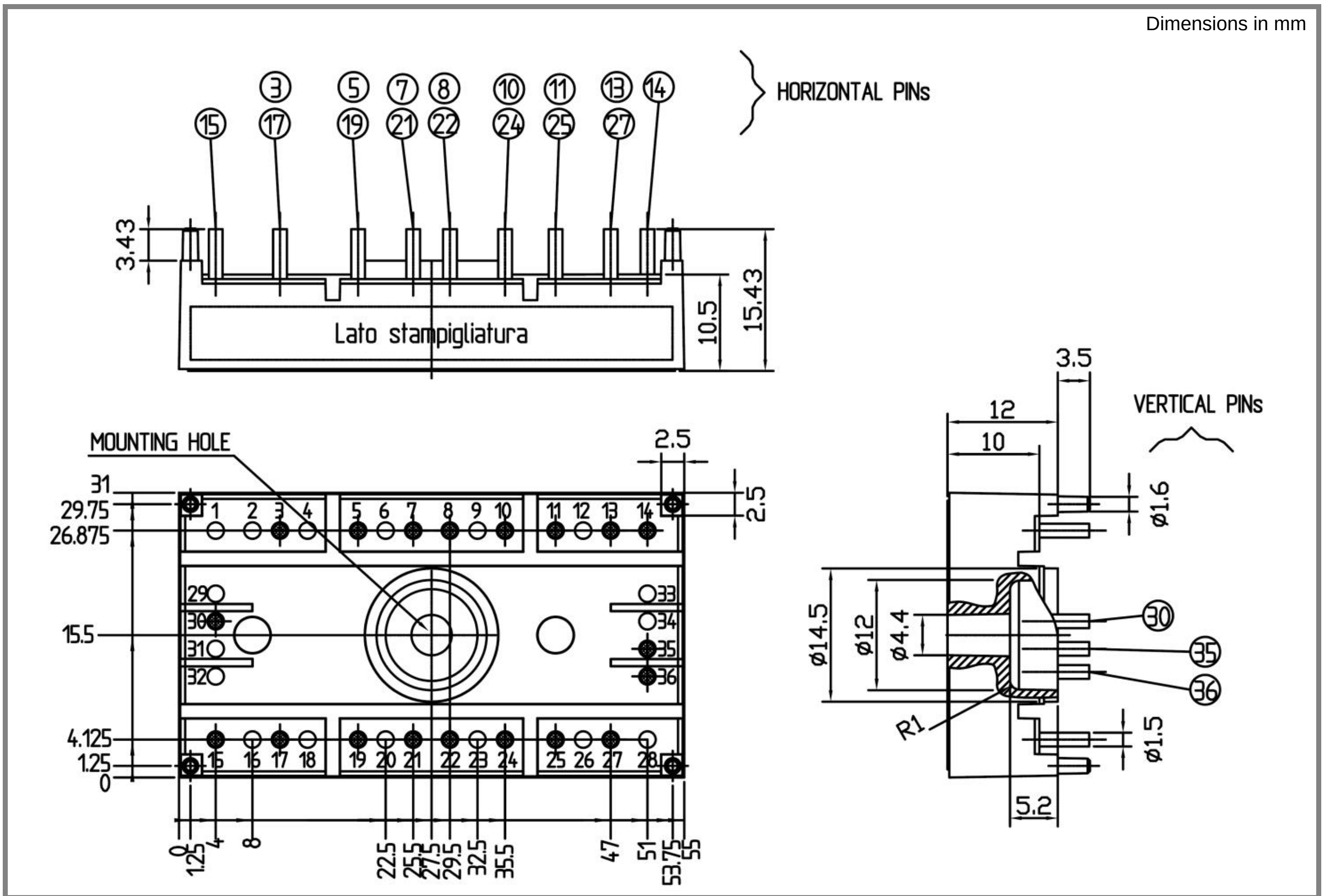
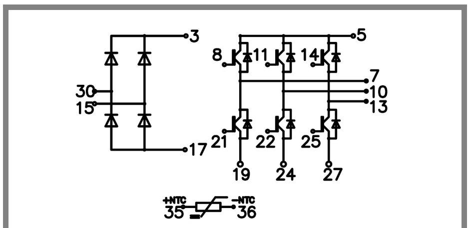


Fig. 24 Typical FWD forward characteristic



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



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

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