SK50GARL065

SEMITOP® 2

IGBT Module

SK50GARL065

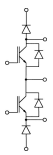
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- N-channel homogeneous silicon structure (NPT-Non punch-through IGBT)
- Low tail current with low temperature dependence
- Low threshold voltage

Typical Applications

- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



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Absolute Maximum Ratings			T_s = 25 °C, unless otherwise specified	
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		600	V
I_C	T_j = 125 °C	T_s = 25 °C	54	A
		T_s = 80 °C	40	A
I_{CRM}	I_{CRM}= 2 x I_{Cnom}		120	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 300 V; $V_{GE} \leq$ 20 V; V_{CES} < 600 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_s = 25 °C	25	A
		T_s = 80 °C	17	A
I_{FRM}	I_{FRM}= 2 x I_{Fnom}			A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	100	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_s = 25 °C	64	A
		T_s = 80 °C	48	A
I_{FRM}				A
I_{FSM}	t_p = 10 ms; half sine wave	T_j = 150 °C	400	A
Module				
$I_{t(RMS)}$				A
T_{vj}			-40 ... +150	°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						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0,7 mA		3	4	5	V
I_{CES}	V_{GE} = 600 V, V_{CE} = V_{CES}	T_j = 25 °C			0,0022	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = 20 V	T_j = 25 °C			120	nA
V_{CE0}		T_j = 25 °C		1,2	1,3	V
		T_j = 125 °C		1,1	1,2	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C			12	mΩ
		T_j = 125°C			22	mΩ
$V_{CE(sat)}$	I_{Cnom} = 60 A, V_{GE} = 15 V	T_j = 25°$C_{chiplev.}$		1,7	2	V
		T_j = 125°$C_{chiplev.}$		2,2	2,2	V
C_{ies}				3,2		nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		0,3		nF
C_{res}				0,18		nF
Q_G	V_{GE}=0 ... 20 V			375		nC
$t_{d(on)}$				47		ns
t_r	R_{Gon} = 15 Ω	V_{CC} = 300V		60	80	ns
E_{on}		I_C= 40A		1,07	1,4	mJ
$t_{d(off)}$	R_{Goff} = 16 Ω	T_j = 125 °C		220	280	ns
t_f		V_{GE}= ±15V		20	26	ns
E_{off}				0,76	1	mJ
$R_{th(j-s)}$	per IGBT				0,85	K/W

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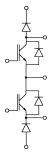

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Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 15 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		1,4	1,7	V
		T_j = 125 °C$_{chiplev.}$		1,4	1,7	V
V_{F0}		T_j = 125 °C		0,9	1	V
r_F		T_j = 125 °C		33	47	mΩ
I_{RRM}	I_F = 30 A	T_j = 125 °C				A
Q_{rr}	di/dt = 500 A/µs					µC
E_{rr}	V_{CC}=300V					mJ
$R_{th(j-s)D}$	per diode				2,3	K/W
Freewheeling diode						
$V_F = V_{EC}$	I_{Fnom} = 60 A; V_{GE} = 0 V	T_j = 25 °C$_{chiplev.}$		1,45	1,7	V
		T_j = 150 °C$_{chiplev.}$		1,4	1,75	V
V_{F0}		T_j = 125 °C		0,85	0,9	V
r_F		T_j = 125 °C		11	16	V
I_{RRM}	I_F = 50 A	T_j = 125 °C		40		A
Q_{rr}	di/dt = -1000 A/µs			3,6		µC
E_{rr}	V_R=300V			0,55		mJ
$R_{th(j-s)D}$	per diode				1,1	K/W
M_s	to heat sink		1,8		2	Nm
w				19		g

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.

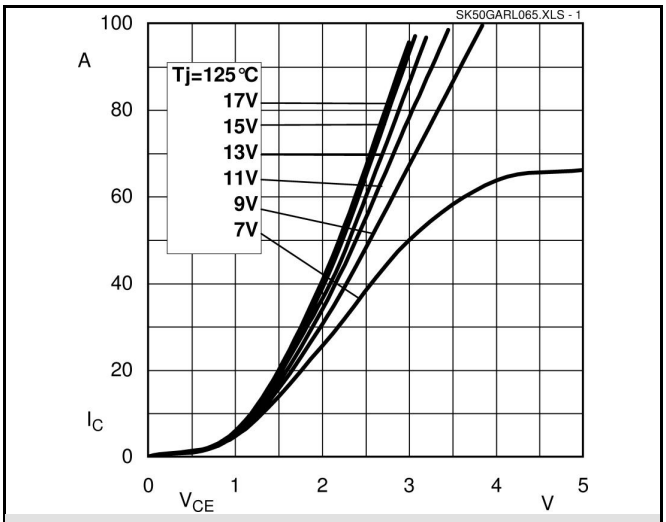


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

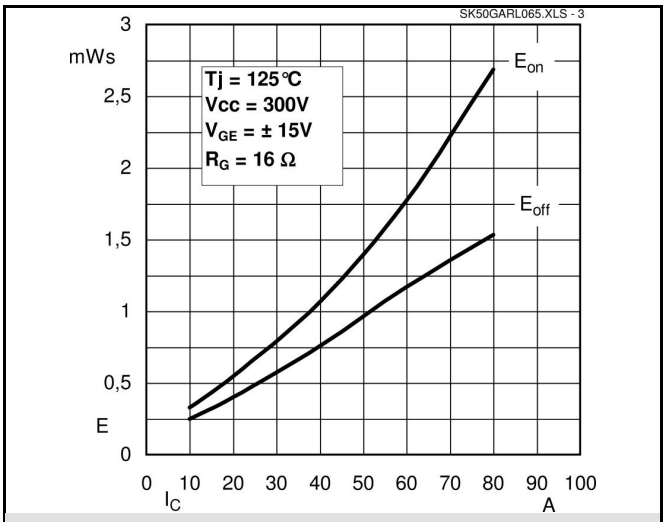


Fig. 3 Typ. turn-on /-off energy = f (I_C)

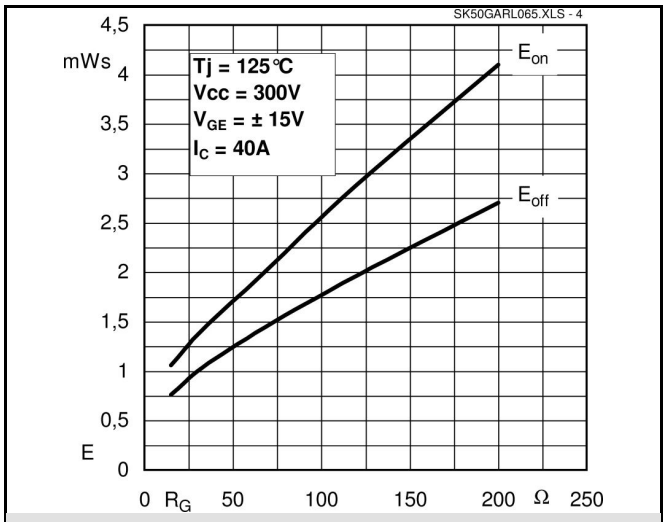


Fig. 4 Typ. turn-on /-off energy = f (R_G)

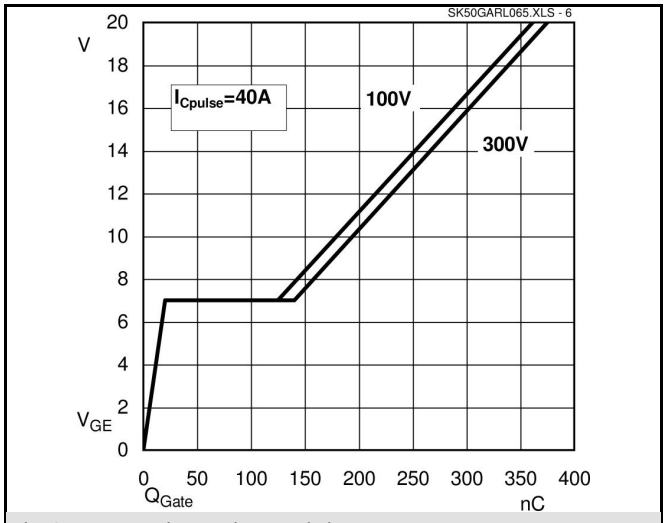


Fig. 6 Typ. gate charge characteristic

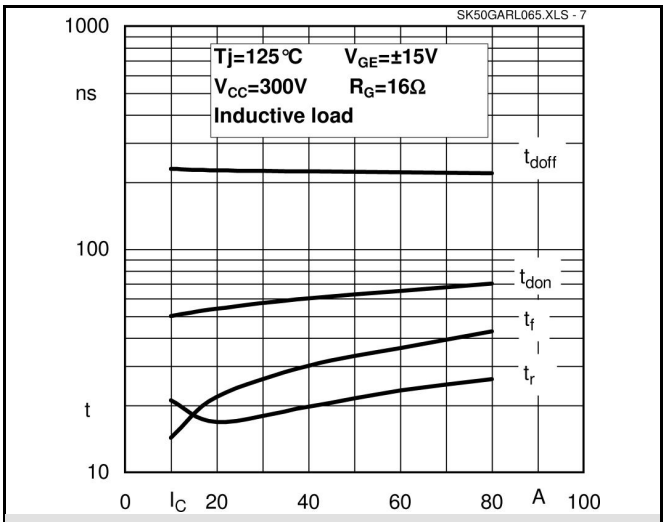


Fig. 7 Typ. switching times vs. I_C

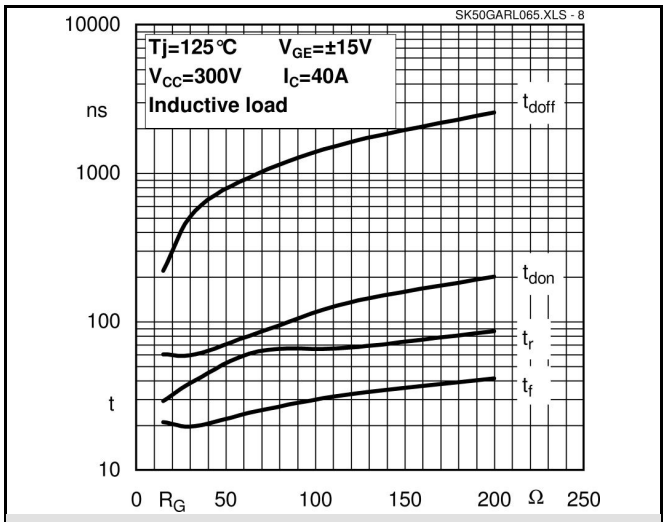


Fig. 8 Typ. switching times vs. gate resistor R_G

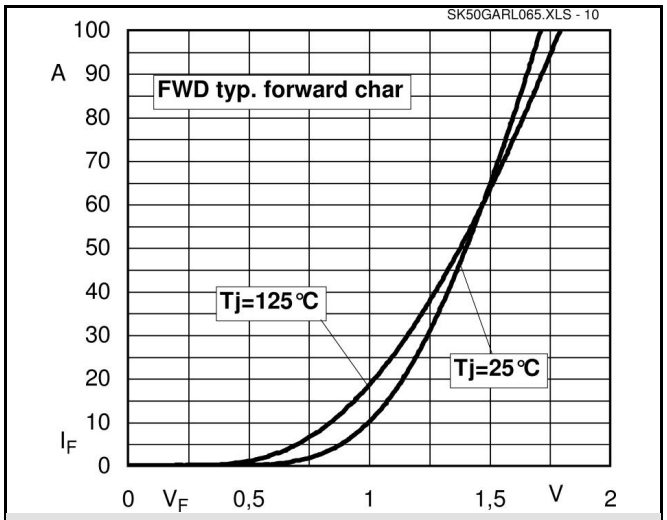
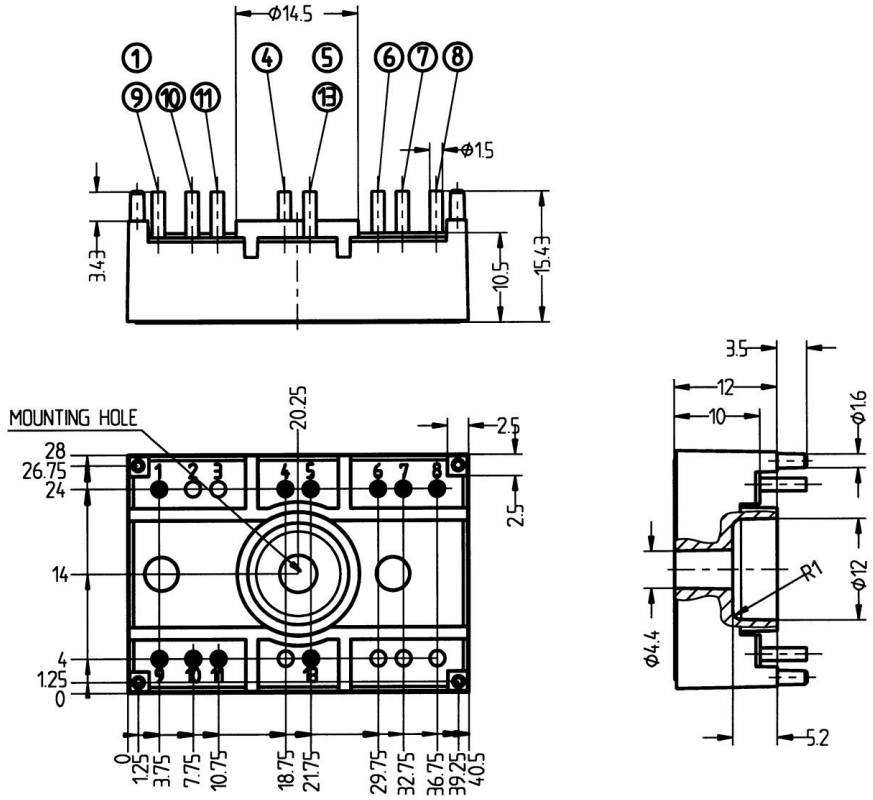
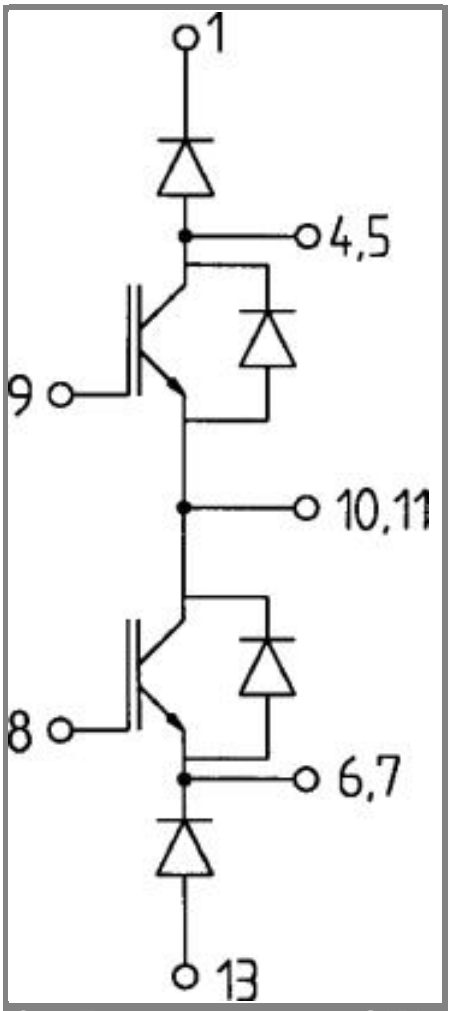


Fig. 10 CAL diode forward characteristic

UL recognized file no. E 63 532



Case T31 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T31 GARL

