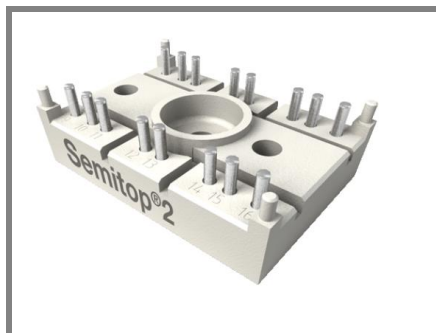




SEMITOP® 2

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

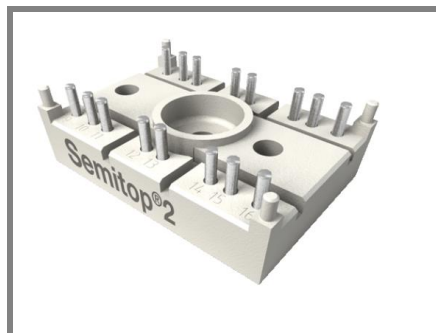
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



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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} ≤ 20 V; T _j = 125 °C V _{CES} < 600 V		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}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			3,2		nF
C _{oes}				0,3		nF
C _{res}				0,18		nF
Q _G	V _{GE} =0 ... 20 V			375		nC
t _{d(on)}	R _{Gon} = 15 Ω	V _{CC} = 300V I _{Cnom} = 40A T _j = 125 °C V _{GE} = ±15V		47		ns
t _r				60	80	ns
E _{on}			1,07	1,4	mJ	
t _{d(off)}	R _{Goff} = 16 Ω			220	280	ns
t _f				20	26	ns
E _{off}				0,76	1	mJ
R _{th(j-s)}	per IGBT				0,85	K/W



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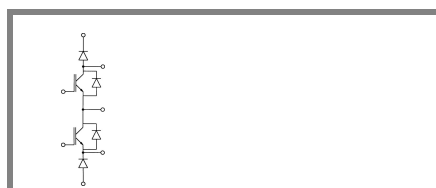
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- Switched mode power supplies
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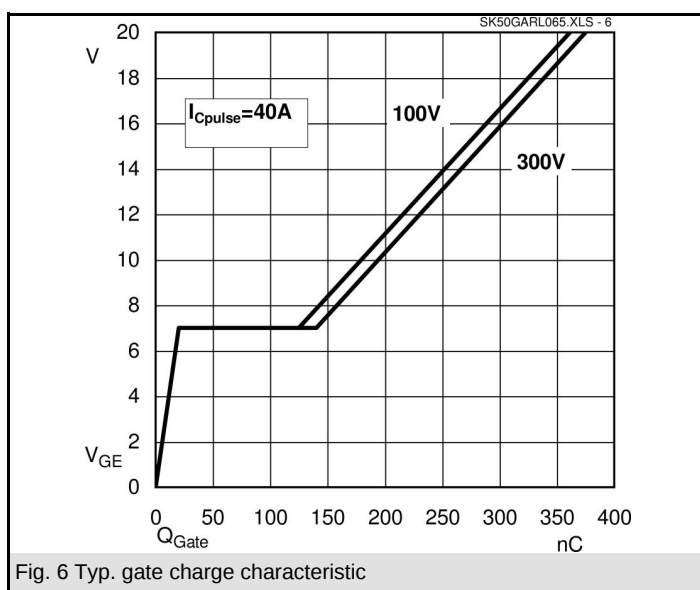
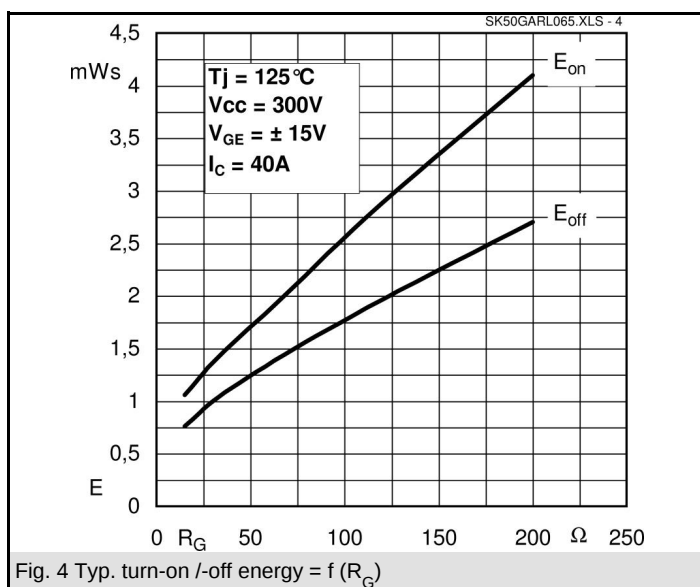
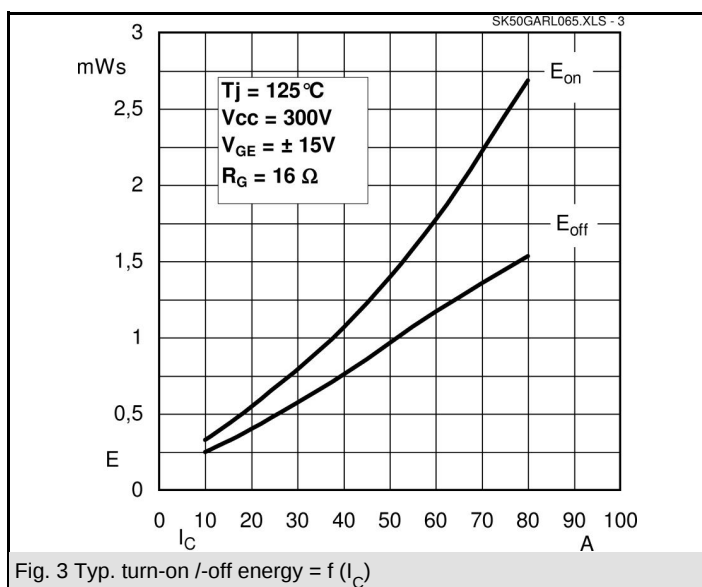
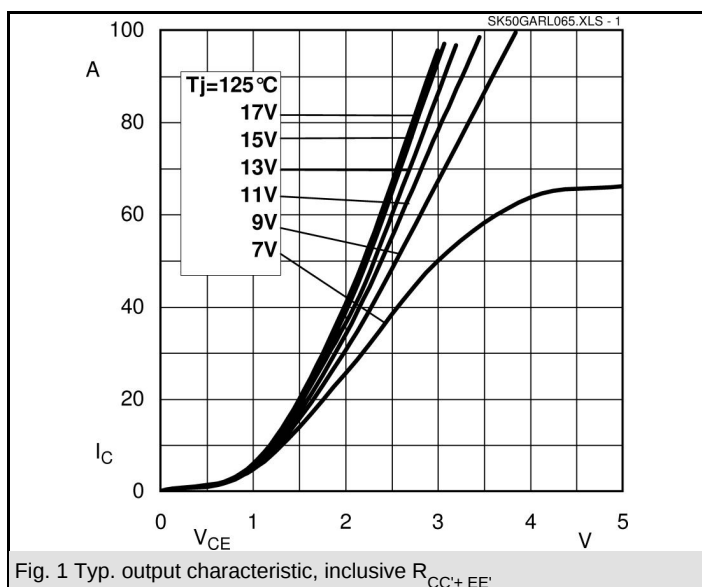
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 15 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$ $T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,4 1,7	V
V_{F0}			$T_j = 125 \text{ }^\circ\text{C}$	0,9	V
r_F			$T_j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

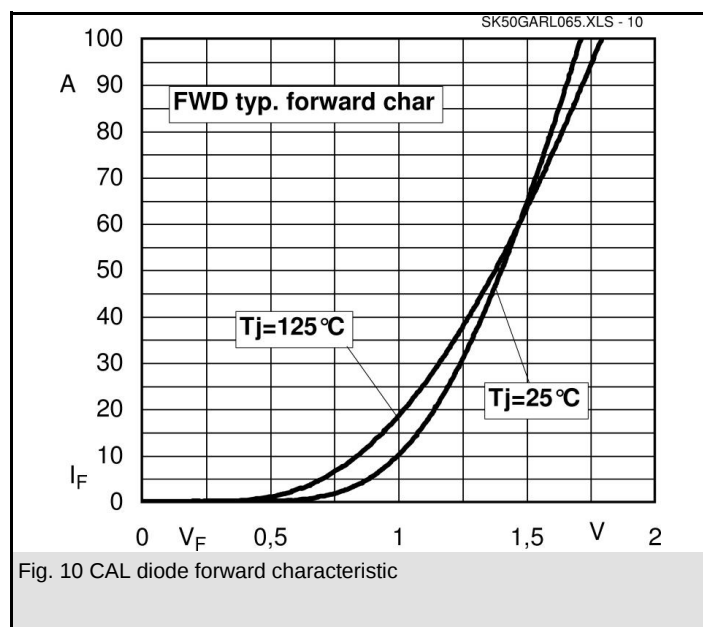
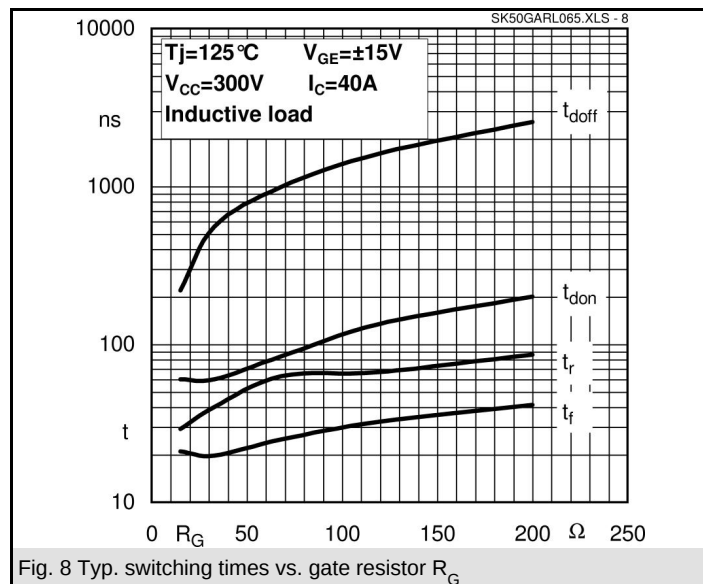
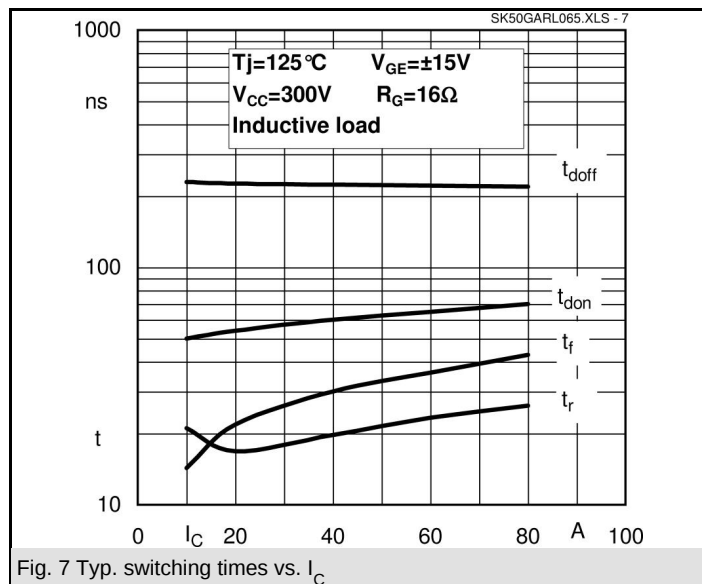
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

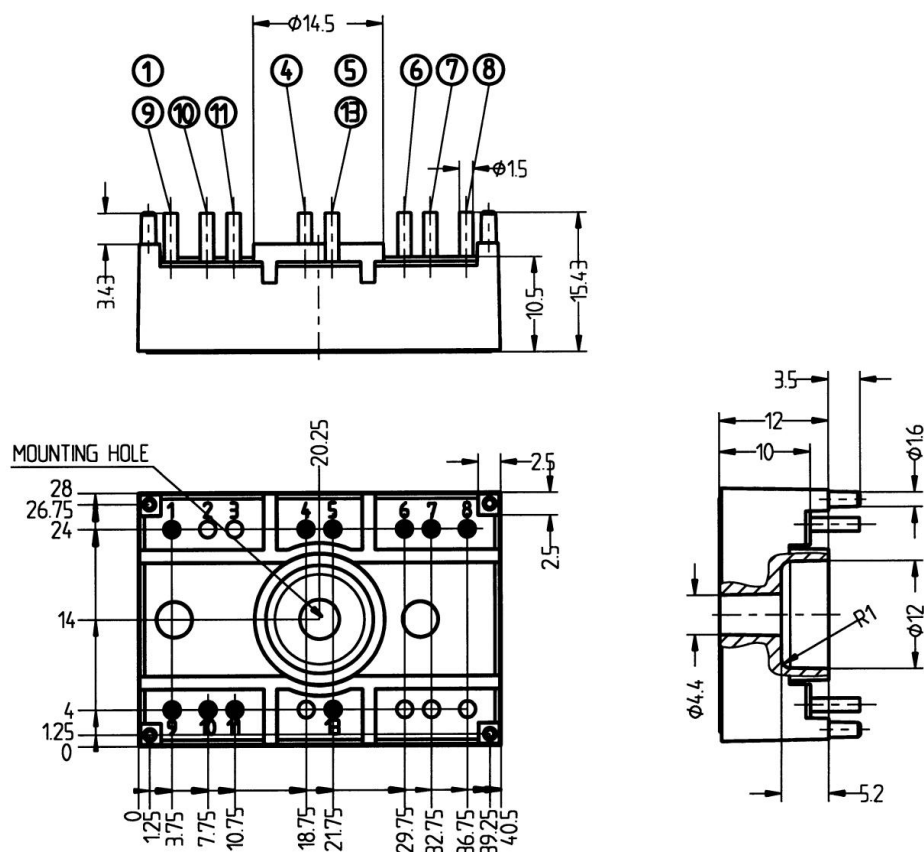
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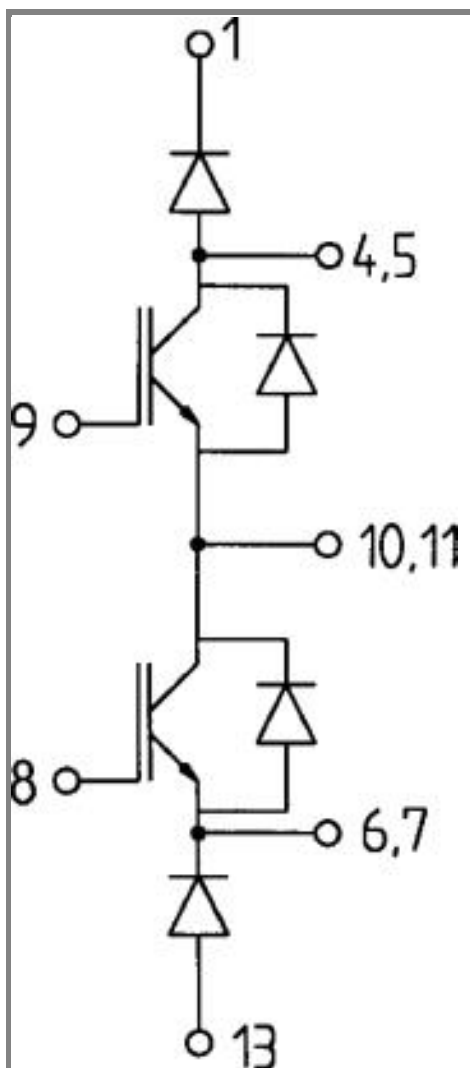
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Case T31 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T31

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