



SEMITOP® 2

IGBT Module

SK50GARL065

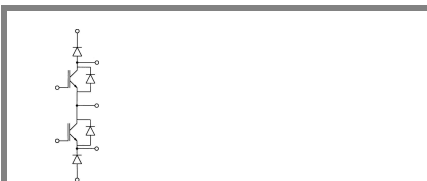
Preliminary Data

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				$T_s = 25\text{ °C}$, unless otherwise specified	
Symbol	Conditions			Values	Units
IGBT					
V_{CES}	$T_j = 25\text{ °C}$			600	V
I_C	$T_j = 125\text{ °C}$	$T_s = 25\text{ °C}$		54	A
		$T_s = 80\text{ °C}$		40	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$			120	A
V_{GES}				± 20	V
t_{psc}	$V_{CC} = 300\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 125\text{ °C}$ $V_{CES} < 600\text{ V}$			10	μs
Inverse Diode					
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$		25	A
		$T_s = 80\text{ °C}$		17	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$				A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ °C}$			100	A
Freewheeling Diode					
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$		64	A
		$T_s = 80\text{ °C}$		48	A
I_{FRM}					A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ °C}$			400	A
Module					
$I_{t(RMS)}$					A
T_{vj}				-40 ... +150	$^{\circ}\text{C}$
T_{stg}				-40 ... +125	$^{\circ}\text{C}$
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 _C = 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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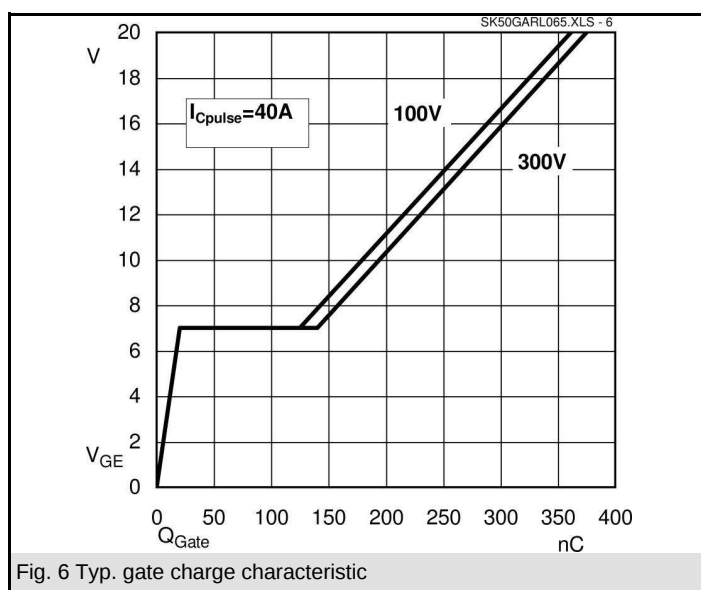
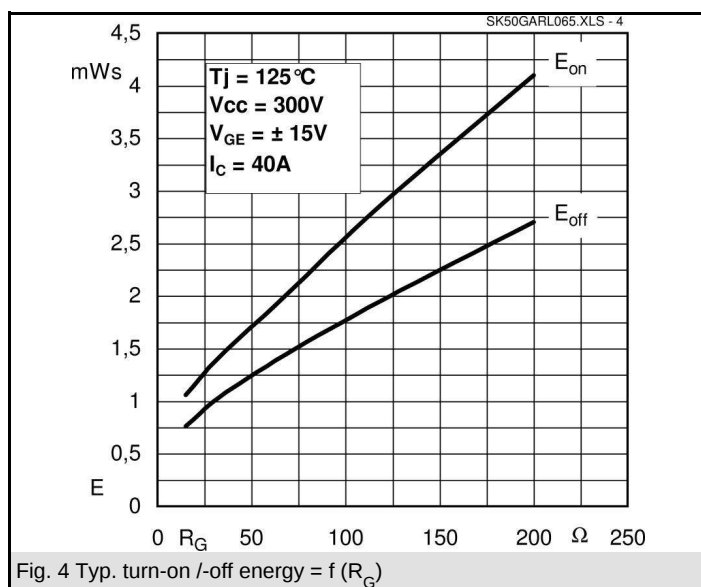
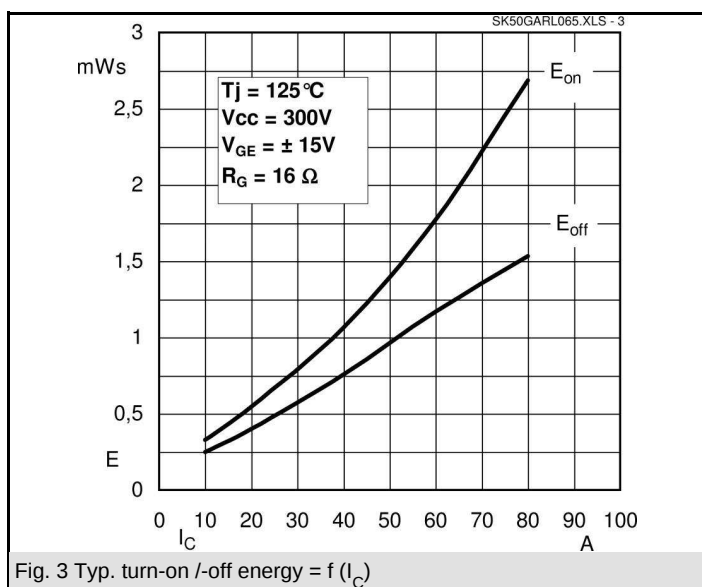
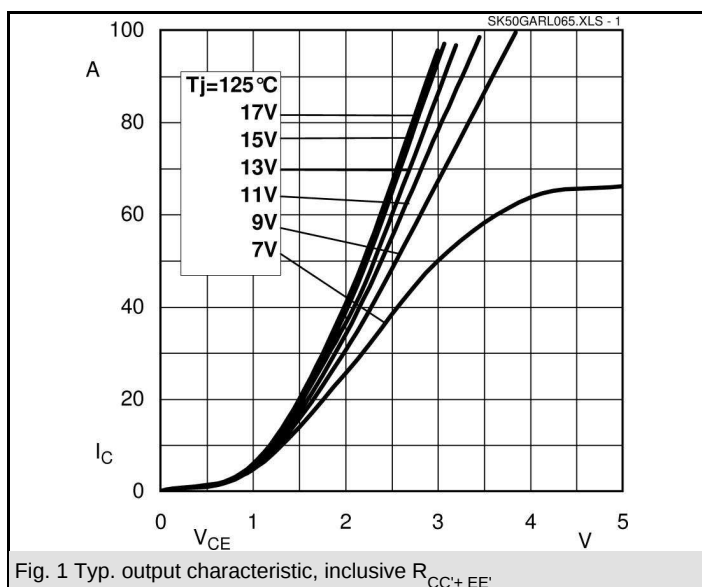
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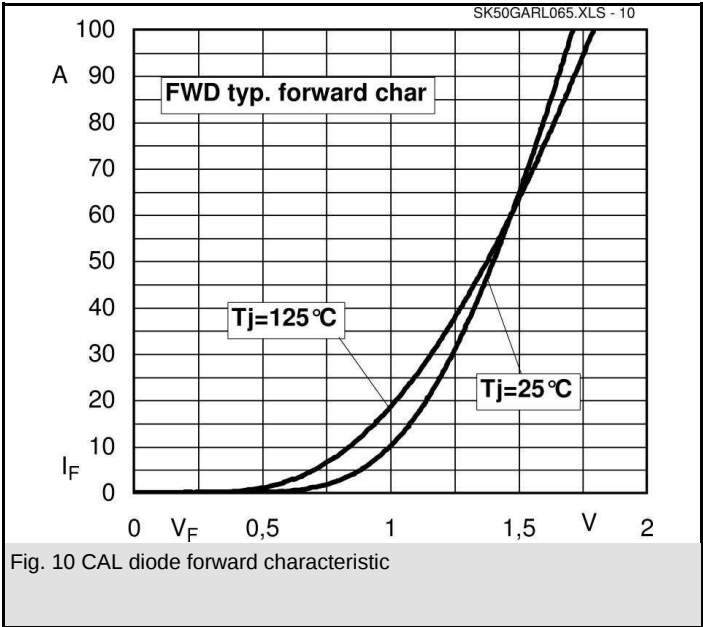
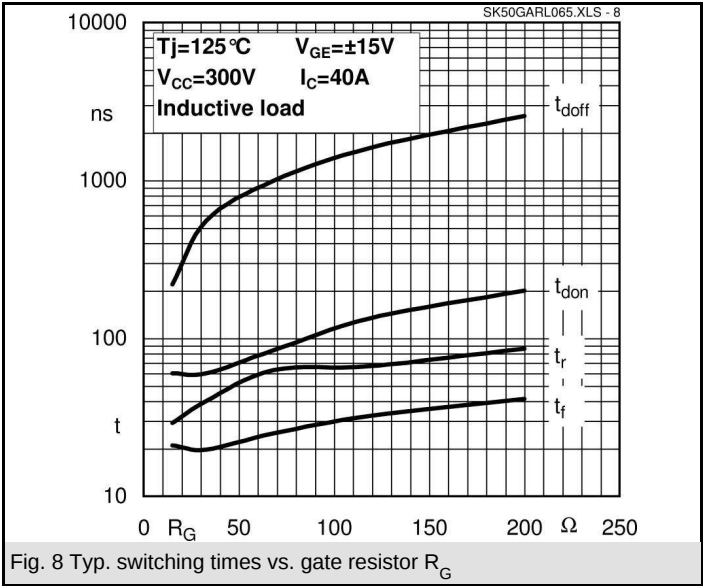
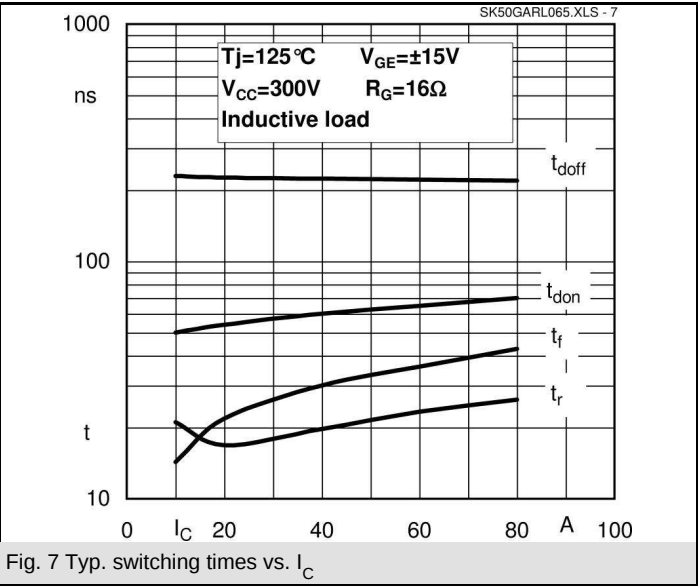


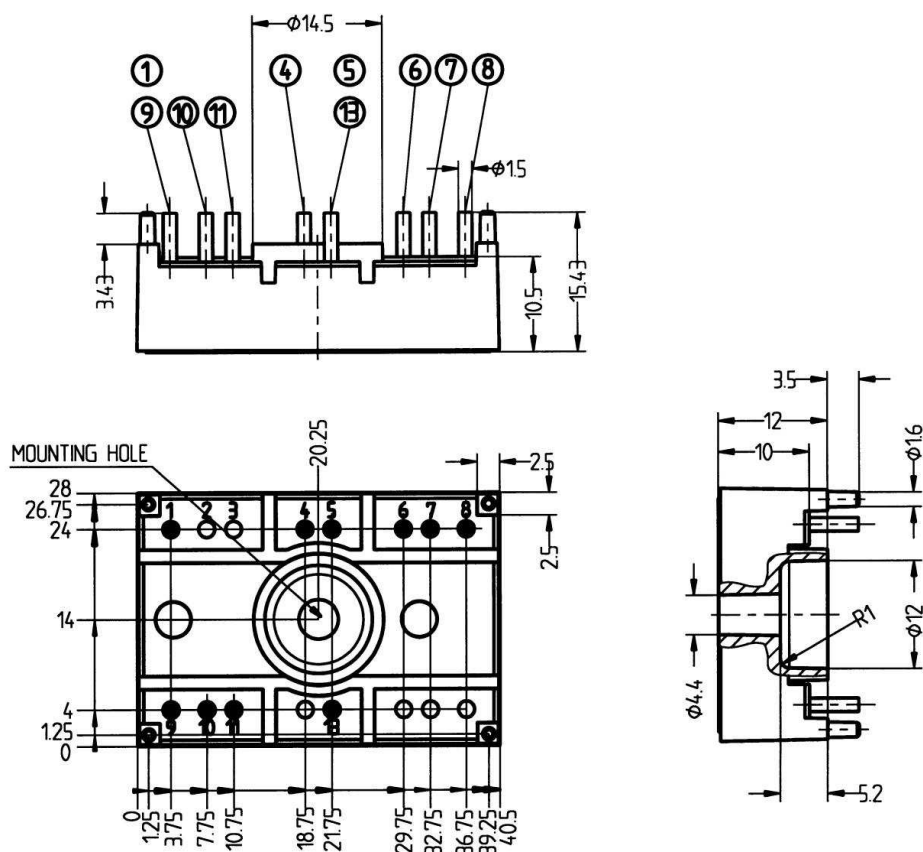
Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 15\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		1,4	1,7	V
		$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,4	1,7	V
V_{F0}		$T_j = 125\text{ }^{\circ}\text{C}$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

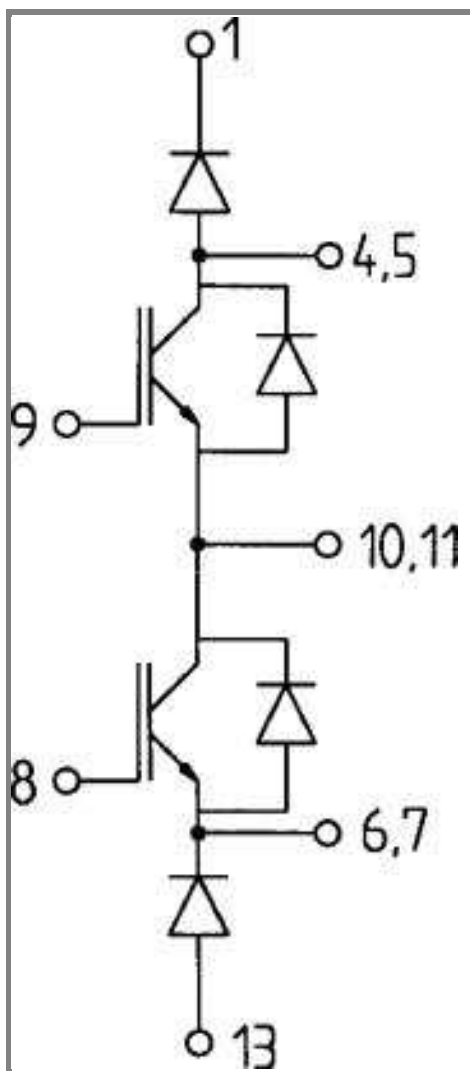
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.







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



Case T31

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