

SEMITOP® 2

IGBT Module

SK50GARL065F

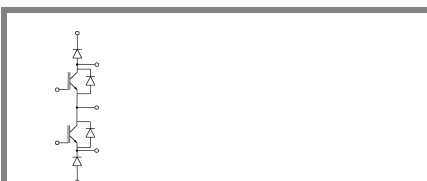
Preliminary Data

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
- Fast Turbo diode

Typical Applications

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



GARL

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	$T_j = 150\text{ °C}$	$T_{case} = 25\text{ °C}$		82	A
		$T_{case} = 80\text{ °C}$		50	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$			120	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				$T_s = 25\text{ °C}$, unless otherwise specified		
Symbol	Conditions			min.	typ.	max. Units
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,7\text{ mA}$			3	4	5 V
I_{CES}	$V_{GE} = 600\text{ V}$, $V_{CE} = V_{CES}$ $T_j = 25\text{ °C}$					0,0022 mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 20\text{ V}$ $T_j = 25\text{ °C}$					120 nA
V_{CE0}		$T_j = 25\text{ °C}$			1,2	1,3 V
		$T_j = 125\text{ °C}$			1,1	1,2 V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$				12 m Ω
		$T_j = 125\text{ °C}$				22 m Ω
$V_{CE(sat)}$	$I_{Cnom} = 60\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$			1,7	2 V
		$T_j = 125\text{ °C}_{chiplev.}$			2,2	2,2 V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$ $f = 1\text{ MHz}$				3,2	nF
C_{oes}					0,3	nF
C_{res}					0,18	nF
Q_G	$V_{GE} = 0 \dots 20\text{ V}$				368	nC
$t_{d(on)}$	$R_{Gon} = 15\text{ }\Omega$	$V_{CC} = 300\text{ V}$ $I_C = 40\text{ A}$			47	ns
t_r					40	ns
E_{on}	$R_{Goff} = 15\text{ }\Omega$	$T_j = 125\text{ °C}$ $V_{GE} = \pm 15\text{ V}$			1,03	mJ
$t_{d(off)}$					203	ns
t_f					33	ns
E_{off}					0,8	mJ
$R_{th(j-s)}$			per IGBT		0,85	K/W



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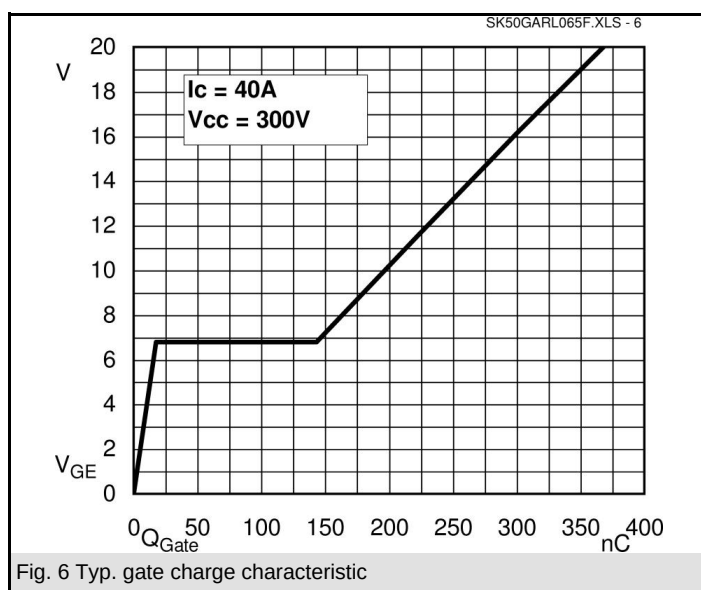
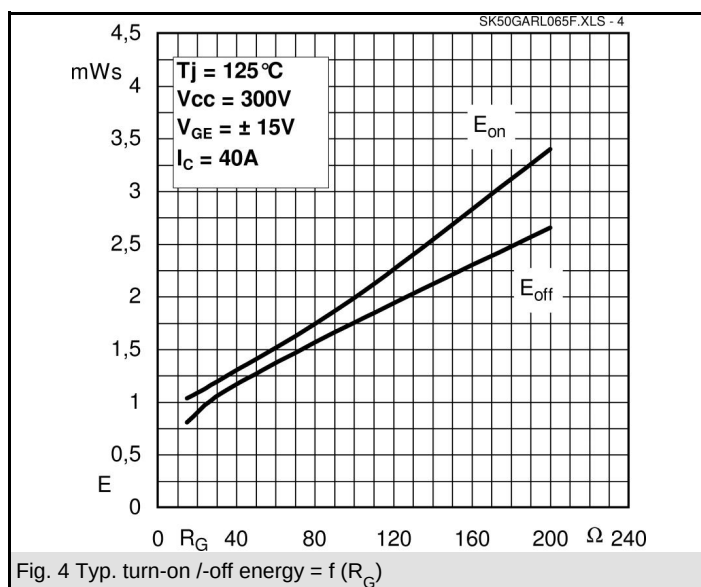
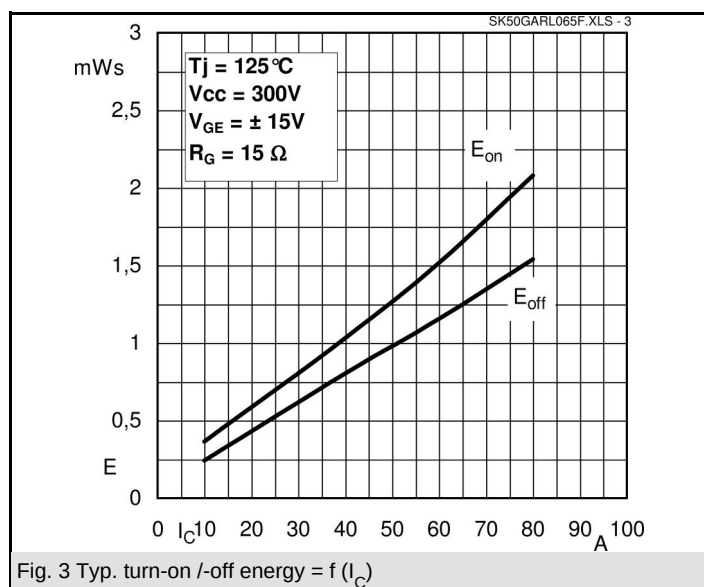
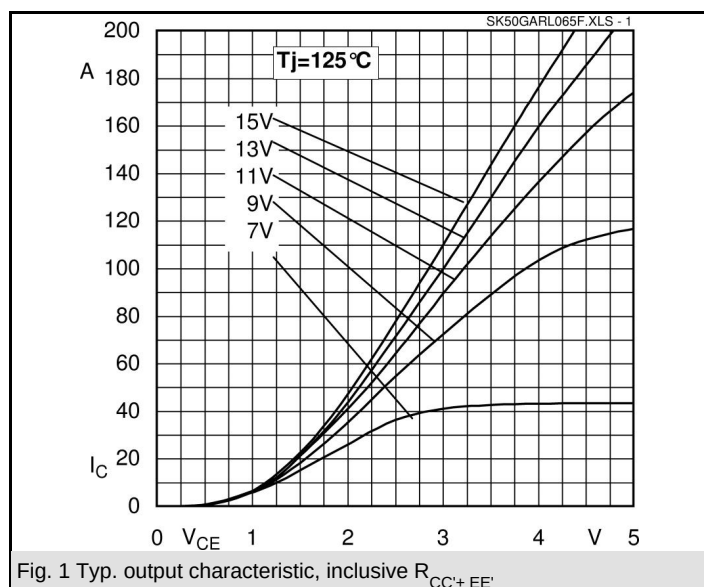
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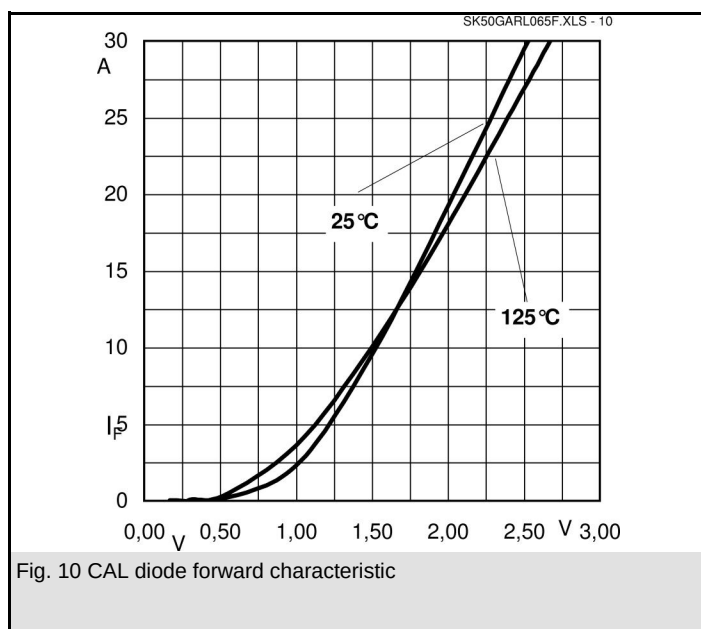
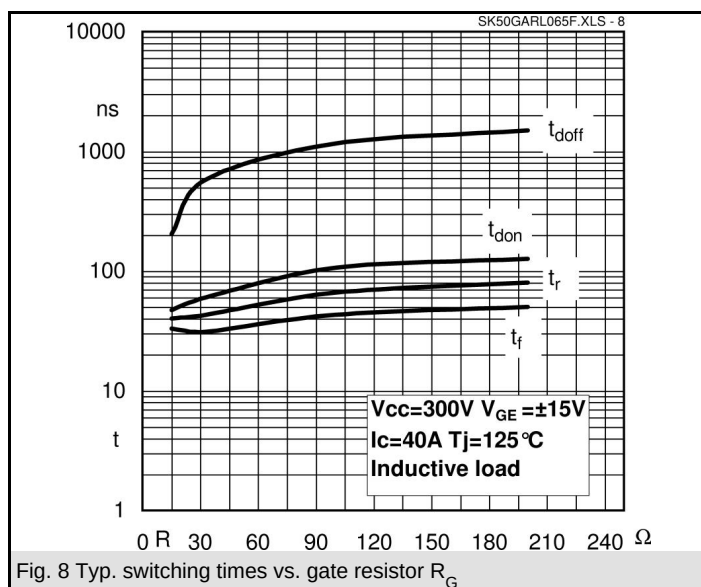
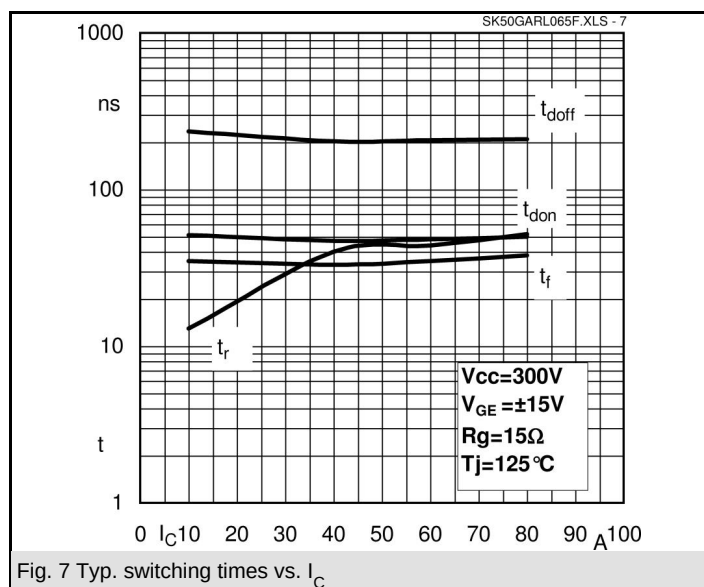


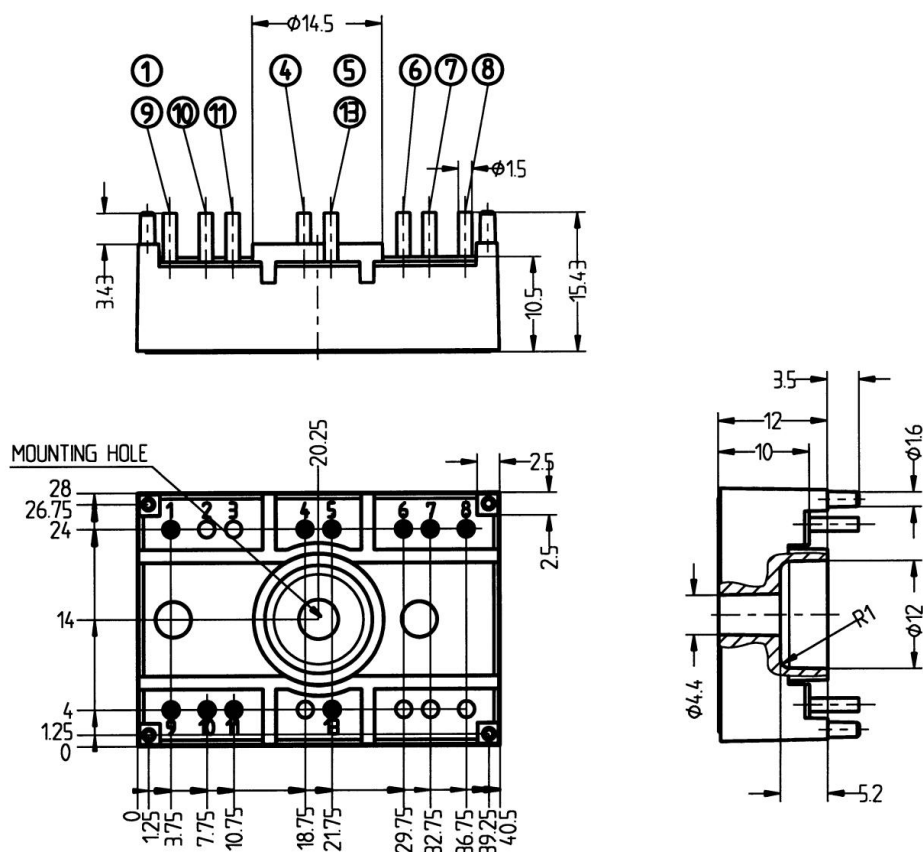
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 15\text{ A}; V_{GE} = 0\text{ V}$		$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$ $T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$	1,4 1,7	V
V_{F0}			$T_j = 125\text{ }^{\circ}\text{C}$	0,9 1	V
r_F			$T_j = 125\text{ }^{\circ}\text{C}$	33 47	mΩ
I_{RRM} Q_{rr} E_{rr}	$I_F = 30\text{ A}$ $di/dt = 500\text{ A}/\mu\text{s}$ $V_{CC} = 300\text{ V}$		$T_j = 125\text{ }^{\circ}\text{C}$		A μC mJ
$R_{th(j-s)D}$	per diode			2,3	K/W
Freewheeling diode					
$V_F = V_{EC}$	$I_{Fnom} = 60\text{ A}; V_{GE} = 0\text{ V}$		$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$ $T_j = 150\text{ }^{\circ}\text{C}_{chiplev.}$	1,1 1,25	V
V_{F0}			$T_j = 150\text{ }^{\circ}\text{C}$	0,85	V
r_F			$T_j = 150\text{ }^{\circ}\text{C}$	7	V
I_{RRM} Q_{rr} E_{rr}	$I_F = 50\text{ A}$ $di/dt = -1000\text{ A}/\mu\text{s}$ $V_R = 300\text{ V}$		$T_j = 125\text{ }^{\circ}\text{C}$	38 2 0,45	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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Case T31 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)

