



SEMITOR® 1

IGBT Module

SK25GB063

SK25GAL063

SK25GAR063

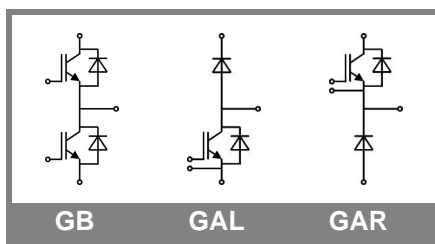
Preliminary Data

Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonding aluminium oxide ceramic (DBC)
- N-channel homogeneous silicon structure (NPT-Non punch-through IGBT)
- High short circuit capability
- Low tail current with low temperature dependence
- UL recognized, file no. E 63 532

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	$T_j = 125\text{ °C}$	$T_s = 25\text{ °C}$	30 A
		$T_s = 80\text{ °C}$	21 A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$, $t_p = 1\text{ ms}$	60	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	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	36 A
		$T_s = 80\text{ °C}$	24 A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$, $t_p = 1\text{ ms}$	50	A
Freewheeling Diode			
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	36 A
		$T_s = 80\text{ °C}$	24 A
I_{FRM}		50	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					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 0,7\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$	$T_j = 25\text{ °C}$		0,1	mA
		$T_j = 125\text{ °C}$			mA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = 30\text{ V}$	$T_j = 25\text{ °C}$		120	nA
		$T_j = 125\text{ °C}$			nA
V_{CE0}		$T_j = 25\text{ °C}$	1		V
		$T_j = 125\text{ °C}$	0,8		V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	40		m Ω
		$T_j = 125\text{ °C}$	55		m Ω
$V_{CE(sat)}$	$I_{Cnom} = 30\text{ A}$, $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	2	2,5	V
		$T_j = 125\text{ °C}_{chiplev.}$	1,9	2,4	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	1,3		nF
C_{oes}					nF
C_{res}			0,1		nF
Q_G	$V_{GE} = 0 \dots 20\text{ V}$		125		nC
$t_{d(on)}$	$R_{Gon} = 33\ \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 25\text{ A}$	30		ns
t_r			35		ns
E_{on}			1,25		mJ
$t_{d(off)}$	$R_{Goff} = 33\ \Omega$	$T_j = 125\text{ °C}$ $V_{GE} = \pm 15\text{ V}$	200		ns
t_f			25		ns
E_{off}			0,9		mJ
$R_{th(j-s)}$	per IGBT			1,4	K/W



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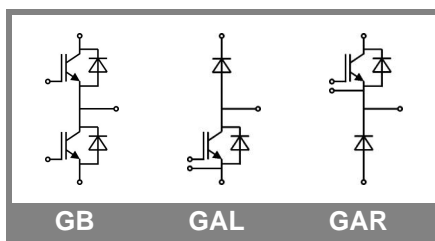
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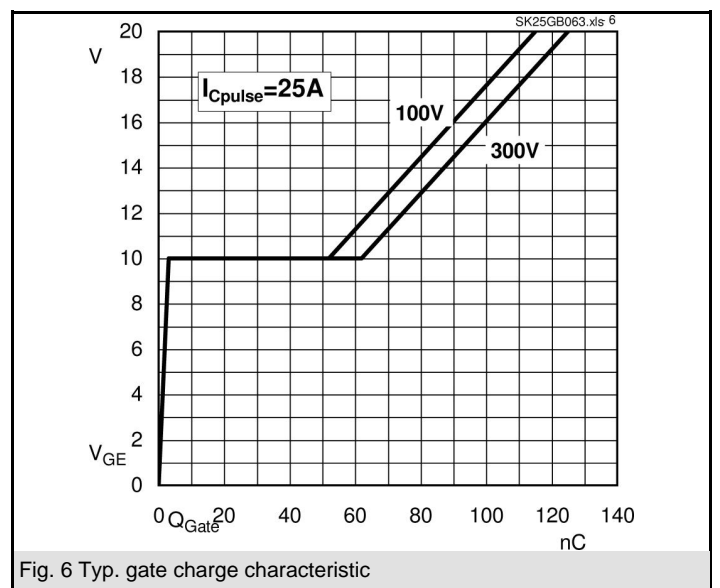
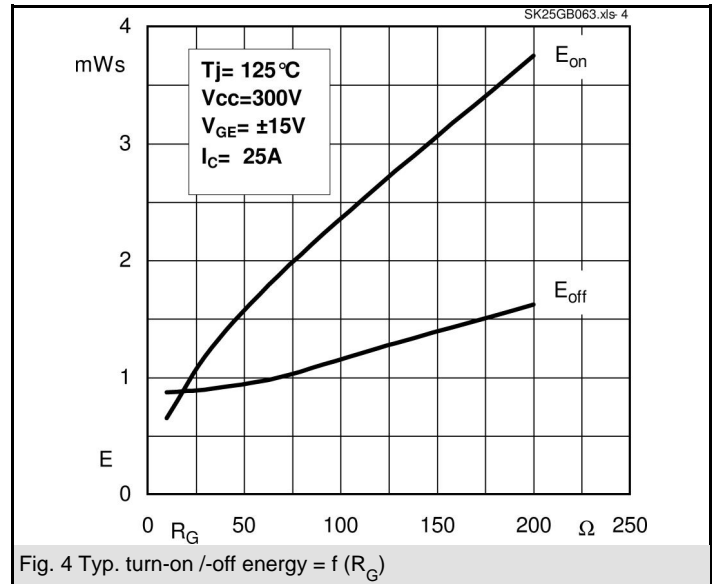
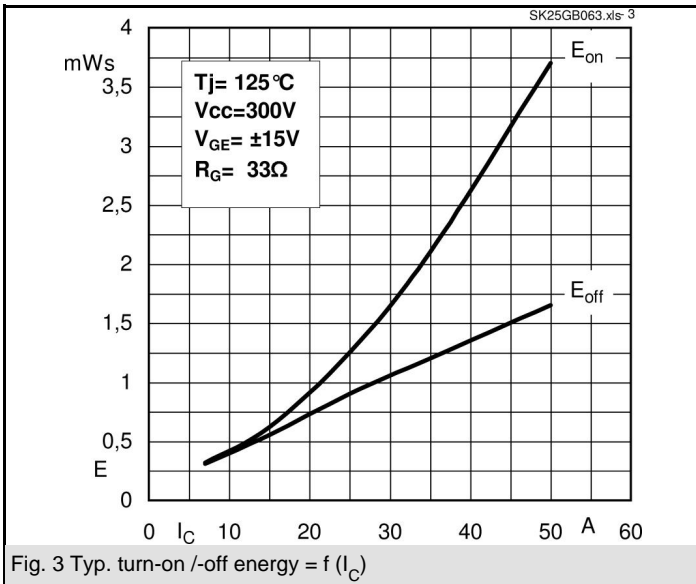
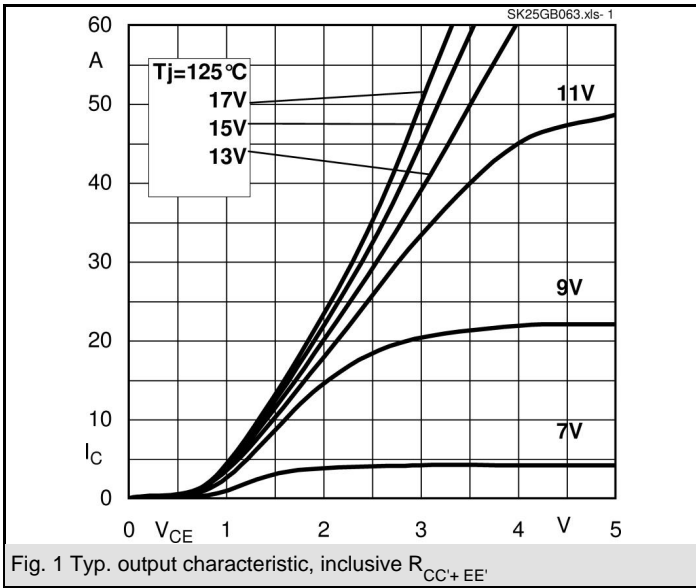
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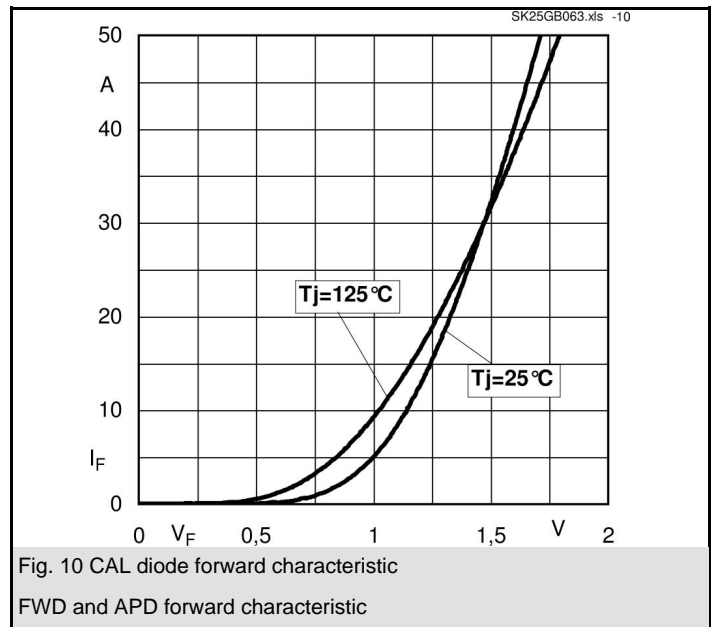
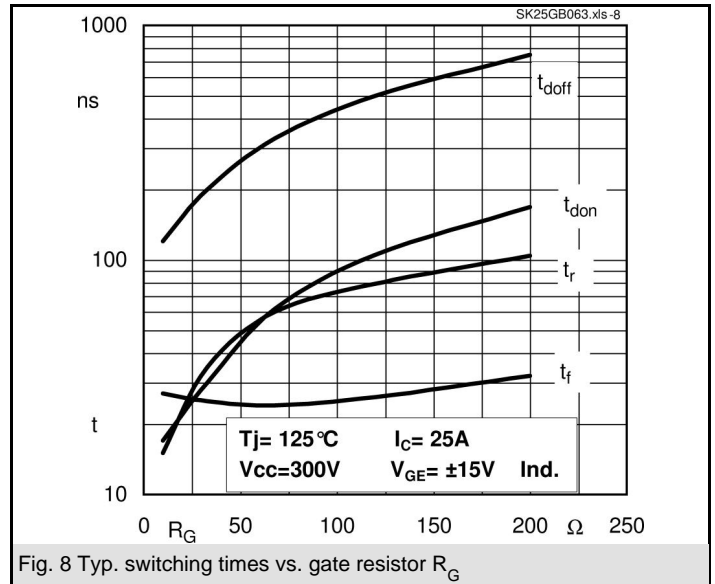
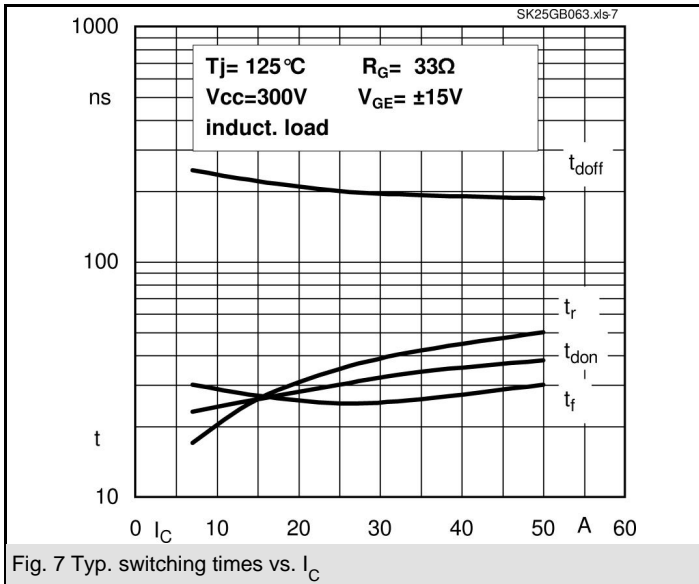
Characteristics

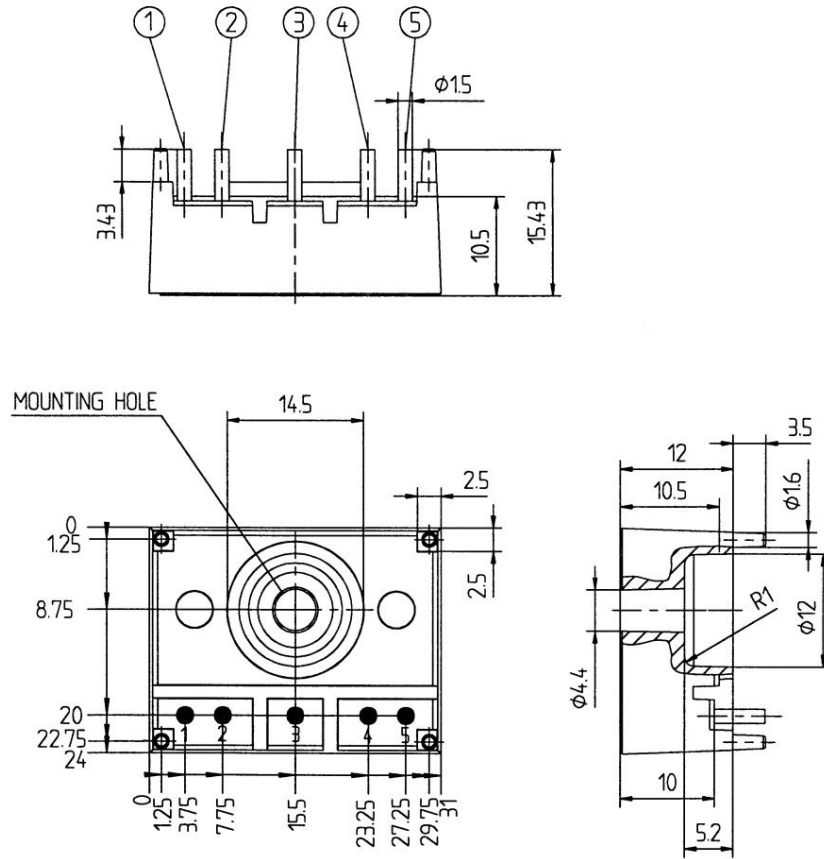
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 25 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,45	1,7	V
		$T_j = 125 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,4	1,75	V
V_{F0}		$T_j = 125 \text{ }^\circ\text{C}$	0,85	0,9	V
r_F		$T_j = 125 \text{ }^\circ\text{C}$	22	32	mΩ
I_{RRM}	$I_{Fnom} = 25 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	16		A
Q_{rr}	$di/dt = -500 \text{ A}/\mu\text{s}$		2		μC
E_{rr}	$V_{CC} = 300 \text{ V}$		0,25		mJ
$R_{th(j-s)D}$	per diode			1,7	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 25 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,45	1,7	V
		$T_j = 125 \text{ }^\circ\text{C}_{\text{chiplev.}}$	1,4	1,75	V
V_{F0}		$T_j = 125 \text{ }^\circ\text{C}$	0,85	0,9	V
r_F		$T_j = 125 \text{ }^\circ\text{C}$	22	32	V
I_{RRM}	$I_{Fnom} = 25 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	16		A
Q_{rr}	$di/dt = -500 \text{ A}/\mu\text{s}$		2		μC
E_{rr}	$V_R = 300 \text{ V}$		0,25		mJ
$R_{th(j-s)FD}$	per diode			1,7	K/W
M_s	to heat sink M1			1,5	Nm
w			13		g

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

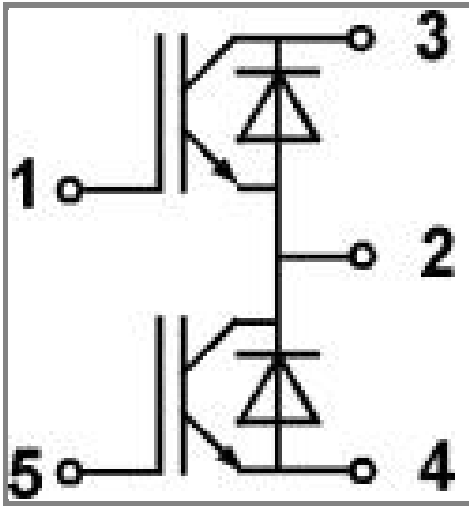
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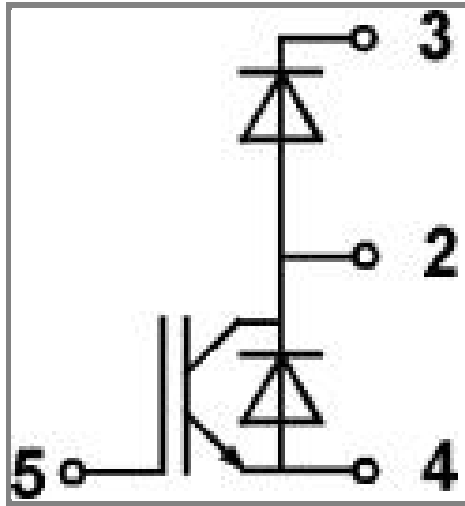


Case T3 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



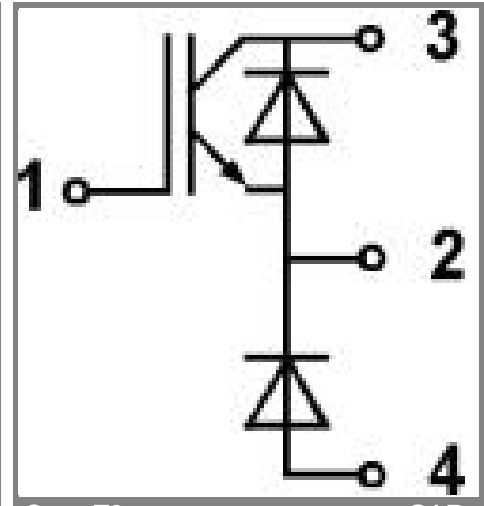
Case T3

GB



Case T3

GAL



Case T3

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