

**SEMITOP<sup>®</sup> 3**

## IGBT Module

**SK25GD063**

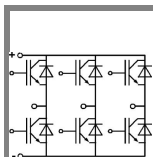
Preliminary Data

### 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 punchthrough IGBT)
- High short circuit capability
- Low tail current with low temperature dependence
- UL recognized, file no. E63532

### Typical Applications

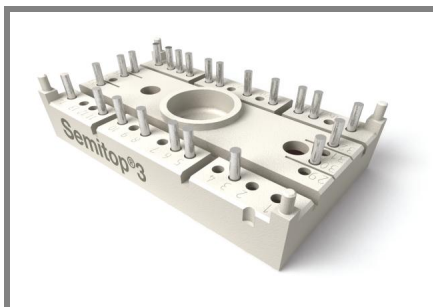
- Switching (not for linear use)
- Inverter
- Switched mode power supplies
- UPS



**GD**

Absolute Maximum Ratings		$T_s = 25\text{ °C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$	$T_j = 25\text{ °C}$	600	V
$I_C$	$T_j = 125\text{ °C}$	$T_s = 25\text{ °C}$	30 A
		$T_s = 80\text{ °C}$	21 A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	60	A
$V_{GES}$		$\pm 20$	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	$\mu\text{s}$
<b>Inverse Diode</b>			
$I_F$	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	36 A
		$T_s = 80\text{ °C}$	24 A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$		A
$I_{FSM}$	$t_p = 10\text{ ms}$ ; half sine wave $T_j = 150\text{ °C}$	200	A
<b>Module</b>			
$I_{t(RMS)}$			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
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 0,7\text{ mA}$	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
		$T_j = 125\text{ °C}$	1,1		V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$	37		$\text{m}\Omega$
		$T_j = 125\text{ °C}$	30		$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 30\text{ A}$ , $V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}_{chiplev.}$	2,1	2,5	V
		$T_j = 125\text{ °C}_{chiplev.}$	2	2,3	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
$t_{d(on)}$	$R_{Gon} = 33\ \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 25\text{ A}$	40		ns
$t_r$			50		ns
$E_{on}$	$R_{Goff} = 33\ \Omega$	$T_j = 125\text{ °C}$ $V_{GE} = \pm 15\text{ V}$	1,3		mJ
$t_{d(off)}$			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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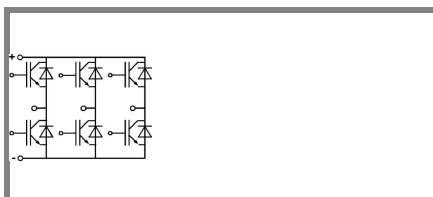
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### Characteristics

Symbol	Conditions	min.	typ.	max.	Units	
<b>Inverse Diode</b>						
$V_F = V_{EC}$	$I_{Fnom} = 25 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{\text{chiplev.}}$	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
$M_s$	to heat sink M1	2,25		2,5		Nm
w			30			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.

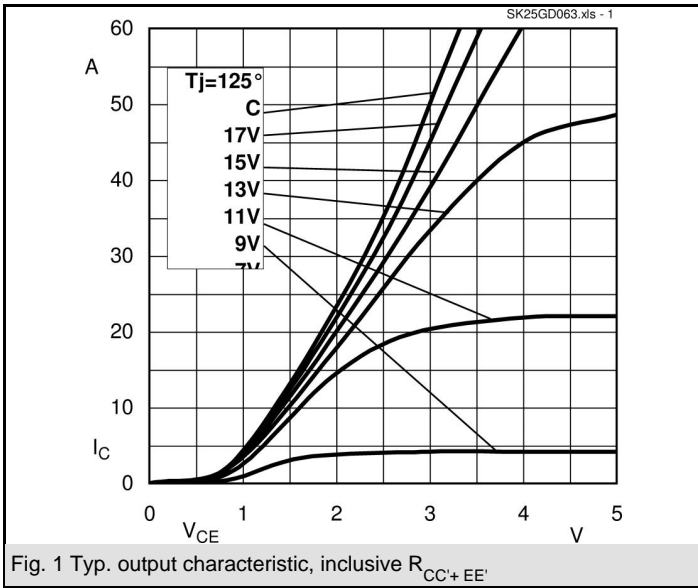


Fig. 1 Typ. output characteristic, inclusive  $R_{CC+EE'}$

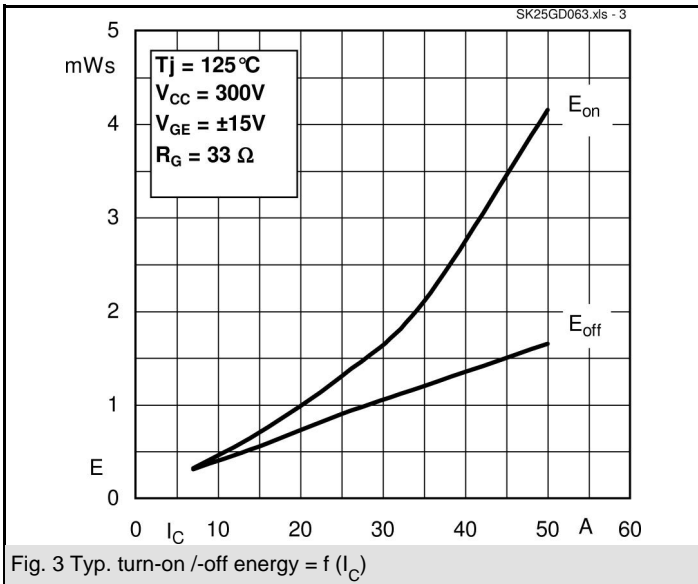


Fig. 3 Typ. turn-on /-off energy =  $f(I_C)$

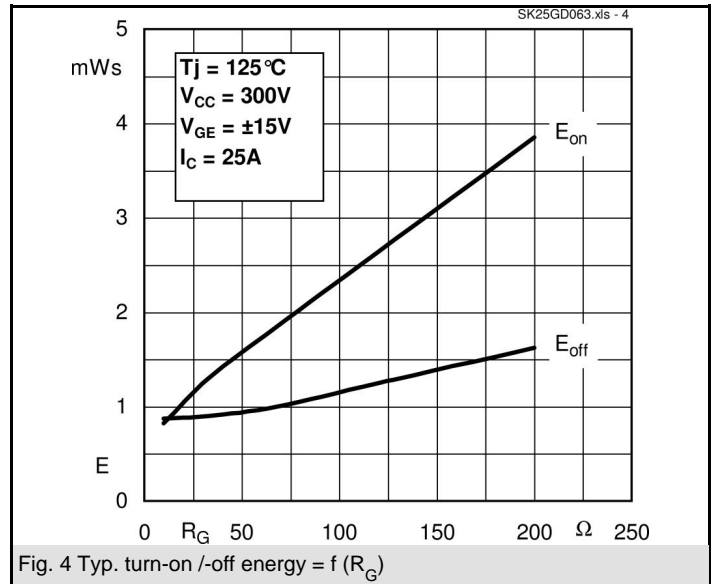


Fig. 4 Typ. turn-on /-off energy =  $f(R_G)$

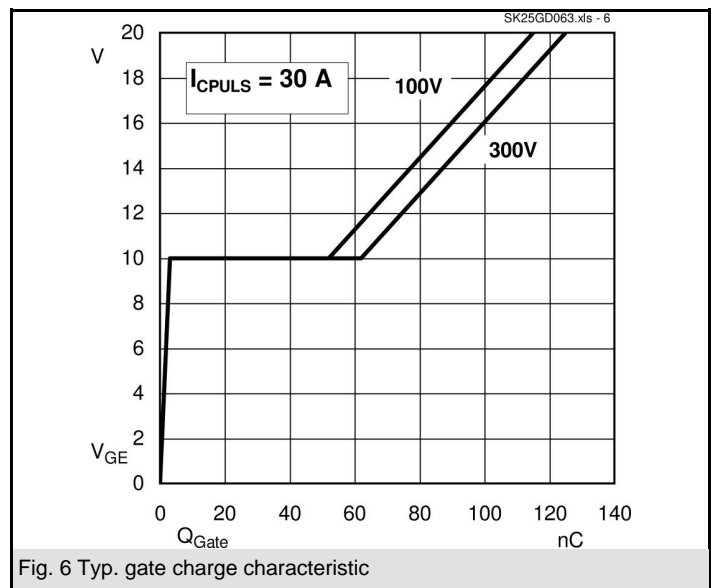
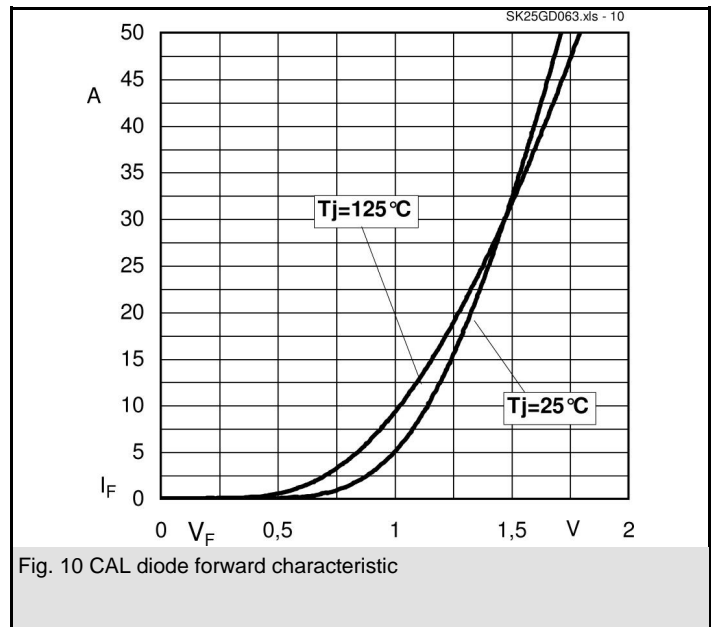
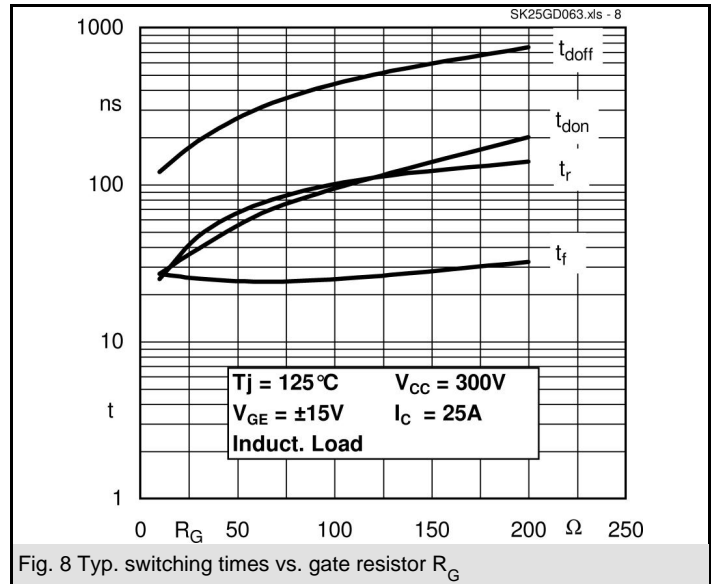
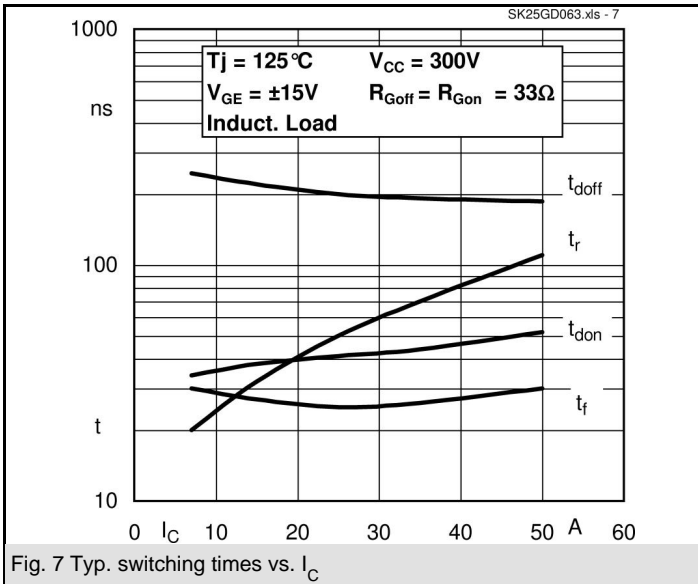
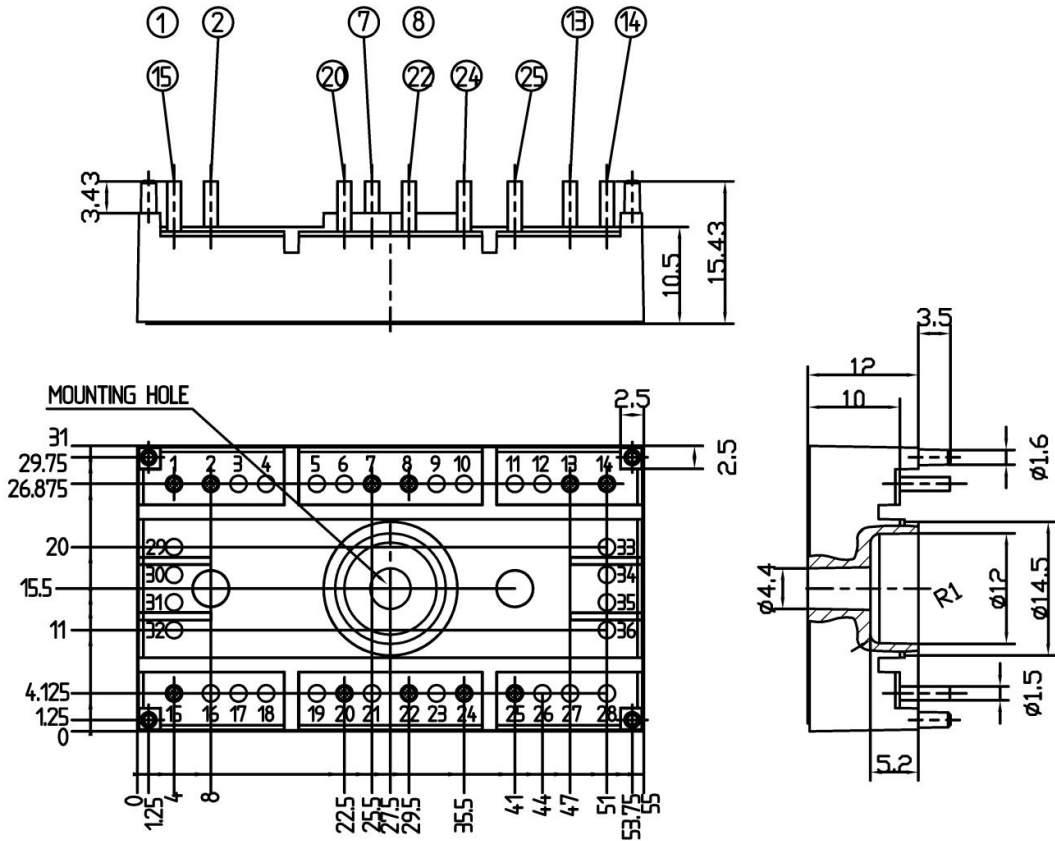


Fig. 6 Typ. gate charge characteristic





Case T12 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)

