

# SEMITOP<sup>®</sup> 3

### **IGBT** Module

#### SK60GB125

Preliminary Data

### Features

- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- High short circuit capability
- Ultra Fast NPT IGBT technology

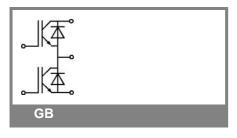
## V<sub>ce,sat</sub> with positive coefficient

## Typical Applications\*

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

Absolute Maximum Ratings $T_s = 25 \text{ °C}$ , unless otherwise specified					
Symbol	-		Values	Units	
IGBT					
V <sub>CES</sub>	T <sub>j</sub> = 25 °C		1200	V	
I <sub>C</sub>	T <sub>j</sub> = 125 °C	T <sub>s</sub> = 25 °C	51	A	
		T <sub>s</sub> = 80 °C	35	А	
I <sub>CRM</sub>	I <sub>CRM</sub> = 2 x I <sub>Cnom</sub>		100	А	
V <sub>GES</sub>			± 20	V	
t <sub>psc</sub>	$V_{CC}$ = 300 V; $V_{GE} \leq$ 20 V; $V_{CES} < 600$ V	T <sub>j</sub> = 125 °C	10	μs	
Inverse D	liode				
I <sub>F</sub>	T <sub>j</sub> = 150 °C	T <sub>s</sub> = 25 °C	57	A	
		T <sub>s</sub> = 80 °C	38	А	
I <sub>FRM</sub>	I <sub>FRM</sub> = 2 x I <sub>Fnom</sub>			А	
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; half sine wave	T <sub>j</sub> = 150 °C	550	А	
Module	·				
I <sub>t(RMS)</sub>				А	
T <sub>vj</sub>			-40 +150	°C	
T <sub>stg</sub>			-40 +125	°C	
V <sub>isol</sub>	AC, 1 min.		2500	V	

Characteristics T <sub>s</sub> =			25 °C, unless otherwise specified				
Symbol	Conditions		min.	typ.	max.	Units	
IGBT	_						
V <sub>GE(th)</sub>	$V_{GE} = V_{CE}, I_C = 2 \text{ mA}$		4,5	5,5	6,5	V	
I <sub>CES</sub>	$V_{GE}$ = 0 V, $V_{CE}$ = $V_{CES}$	T <sub>j</sub> = 25 °C			0,006	mA	
I <sub>GES</sub>	V <sub>CE</sub> = 0 V, V <sub>GE</sub> = 20 V	T <sub>j</sub> = 25 °C			300	nA	
V <sub>CE0</sub>		T <sub>j</sub> = 25 °C		1,4	1,9	V	
		T <sub>j</sub> = 125 °C		1,7	2,2	V	
r <sub>CE</sub>	V <sub>GE</sub> = 15 V	T <sub>j</sub> = 25°C		36		mΩ	
		T <sub>j</sub> = 125°C		43		mΩ	
V <sub>CE(sat)</sub>	I <sub>Cnom</sub> = 50 A, V <sub>GE</sub> = 15 V	T <sub>j</sub> = 25°C <sub>chiplev.</sub>		3,2	3,7	V	
		T <sub>j</sub> = 125°C <sub>chiplev.</sub>		3,85		V	
Cies				3,3		nF	
C <sub>oes</sub>	$V_{CE}$ = 25, $V_{GE}$ = 0 V	f = 1 MHz		0,5		nF	
C <sub>res</sub>				0,22		nF	
t <sub>d(on)</sub>				80		ns	
t <sub>r</sub>	$R_{Gon}$ = 33 $\Omega$	V <sub>CC</sub> = 600V		65		ns	
Eon		I <sub>C</sub> = 45A		8,36		mJ	
t <sub>d(off)</sub>	R <sub>Goff</sub> = 33 Ω	T <sub>j</sub> = 125 °C		539		ns	
t <sub>f</sub>		V <sub>GE</sub> =±15V		22		ns	
E <sub>off</sub>				3,32		mJ	
R <sub>th(j-s)</sub>	per IGBT				0,6	K/W	





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### IGBT Module

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Characteristics								
Symbol	Conditions		min.	typ.	max.	Units		
Inverse Diode								
$V_F = V_{EC}$	$I_{Fnom}$ = 50 A; $V_{GE}$ = 0 V	T <sub>j</sub> = 25 °C <sub>chiplev.</sub>		2		V		
		T <sub>j</sub> = 125 °C <sub>chiplev.</sub>		1,8		V		
V <sub>F0</sub>		T <sub>j</sub> = 25 °C				V		
		T <sub>j</sub> = 125 °C		1	1,2	V		
r <sub>F</sub>		T <sub>j</sub> = 25 °C				mΩ		
		T <sub>j</sub> = 125 °C		16	22	mΩ		
I <sub>RRM</sub>	I <sub>F</sub> = 50 A	T <sub>i</sub> = 125 °C		40		А		
Q <sub>rr</sub>	di/dt = -800 A/µs			8		μC		
E <sub>rr</sub>	V <sub>CC</sub> = 600V			2		mJ		
R <sub>th(j-s)D</sub>	per diode				0,9	K/W		
M <sub>s</sub>	to heat sink		2,25		2,5	Nm		
w				30		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.

