SK 40GB123



SEMITOP[®] 2

IGBT Module

SK 40GB123

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

Typical Applications

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

Remarks

V_F = chip level value

Absolute	Maximum Ratings	T _s =	25 °C, ur	less oth	erwise s	pecified
Symbol	Conditions	Values			Units	
IGBT						
V _{CES}	T _i = 25 °C		1200			V
I _C	$T_{j} = 25 \text{ °C}$ $T_{j} = 125 \text{ °C}$	T _s = 25 °C		40		Α
		T _s = 80 °C		27		А
I _{CRM}	I _{CRM} = 2 x I _{Cnom}		60			Α
V _{GES}			± 20			V
t _{psc}	$V_{CC} = 600 \text{ V}; \text{ V}_{GE} \le 20 \text{ V}; \\ \text{V}_{CES} < 1200 \text{ V}$	T _j = 125 °C	10			μs
Inverse D	Diode					
I _F	T _j = 150 °C	T _s = 25 °C		48		А
		T _s = 80 °C		34		А
I _{FRM}	I _{FRM} = 2 x I _{Fnom}			60		Α
Module						•
I _{t(RMS)}						А
T _{vj}			-	40 +150		°C
T _{stg}			-40 +125			°C
V _{isol}	AC, 1 min.			2500		V
Characte	ristics	T _s =	25 °C, ur	less oth	erwise s	pecified
Symbol	Conditions		min.	41/00		
-	oonanions			typ.	max.	Unite
IGBT	Conditions			typ.	max.	Units
-			4,5	тур. 5,5	max. 6,5	Units
IGBI V _{GE(th)} I _{CES}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$	T _j = 25 °C				
V _{GE(th)}	$V_{GE} = V_{CE}, I_C = 1.2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$				6,5	V
V _{GE(th)} I _{CES}		$T_j = 125 \text{ °C}$ $T_j = 25 \text{ °C}$			6,5	V mA
V _{GE(th)} I _{CES} I _{GES}	$V_{GE} = V_{CE}, I_C = 1.2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$	$T_j = 125 \text{ °C}$ $T_j = 25 \text{ °C}$		5,5	6,5 0,2	V mA mA nA nA
V _{GE(th)} I _{CES} I _{GES}	$V_{GE} = V_{CE}, I_C = 1.2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$	$T_j = 125 °C$ $T_j = 25 °C$ $T_j = 125 °C$ $T_j = 25 °C$			6,5 0,2	V mA mA nA
V _{GE(th)} I _{CES} I _{GES}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$	$T_j = 125 °C$ $T_j = 25 °C$ $T_j = 125 °C$ $T_j = 25 °C$ $T_j = 125 °C$ $T_j = 125 °C$		5,5	6,5 0,2	V mA mA nA nA
V _{GE(th)} I _{CES} I _{GES}	$V_{GE} = V_{CE}, I_C = 1.2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$	$T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$		5,5 1,2 1,2 43	6,5 0,2	V mA mA nA nA V
V _{GE(th)} I _{CES} I _{GES} V _{CE0} r _{CE}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$	$T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$	4,5	5,5 1,2 1,2 43 63	6,5 0,2 560	V mA mA nA nA v V V mΩ
V _{GE(th)} I _{CES} I _{GES} V _{CE0}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$	$\begin{array}{c} T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$		5,5 1,2 1,2 43 63 2,5	6,5 0,2 560 3	V mA mA nA nA v V V V V V V V V V V V V V
V _{GE(th)} I _{CES} I _{GES} V _{CE0} V _{CE(sat)}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$	$T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$	4,5	5,5 1,2 1,2 43 63 2,5 3,1	6,5 0,2 560	V mA mA nA nA nA mΩ W V V V V V V V V V V V
V _{GE(th)} I _{CES} I _{GES} V _{CE0} I _{CE} V _{CE(sat)} C _{ies}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$ $I_{Cnom} = 30 \text{ A}, V_{GE} = 15 \text{ V}$	$\begin{array}{l} T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$	4,5	5,5 1,2 1,2 43 63 2,5 3,1 2	6,5 0,2 560 3	V mA mA nA nA nA nA v V V V V V V NQ V V V N V V N V V N N
V _{GE(th)} I _{CES} I _{GES} V _{CE0} r _{CE} V _{CE(sat)} C _{ies} C _{oes}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$	$\begin{array}{c} T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$	4,5	5,5 1,2 1,2 43 63 2,5 3,1 2 0,3	6,5 0,2 560 3	V mA mA nA nA v V V V V V V NΩ NF nF
V _{GE(th)} I _{CES} I _{GES} V _{CE0} r _{CE} V _{CE(sat)} C _{ies} C _{oes} C _{res}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$ $I_{Cnom} = 30 \text{ A}, V_{GE} = 15 \text{ V}$	$\begin{array}{l} T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$	4,5	5,5 1,2 1,2 43 63 2,5 3,1 2 0,3 0,14	6,5 0,2 560 3	V mA mA nA nA nA v V WΩ V V NΩ NF nF nF nF
V _{GE(th)} I _{GES} I _{GES} V _{CE0} V _{CE0} V _{CE(sat)} C _{ies} C _{oes} C _{res} t _{d(on)}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$ $I_{Cnom} = 30 \text{ A}, V_{GE} = 15 \text{ V}$ $V_{CE} = 25, V_{GE} = 0 \text{ V}$	$T_{j} = 125 °C$ $T_{j} = 25 °C$ $T_{j} = 125 °C$ $chiplev.$ $T_{j} = 125 °C$	4,5	5,5 1,2 1,2 43 63 2,5 3,1 2 0,3 0,14 35	6,5 0,2 560 3	V mA mA nA nA nA v V V V V V V N Γ Γ nF nF nF
V _{GE(th)} I _{CES} I _{GES} V _{CE0} r _{CE} V _{CE(sat)} C _{ies} C _{oes}	$V_{GE} = V_{CE}, I_{C} = 1,2 \text{ mA}$ $V_{GE} = 30 \text{ V}, V_{CE} = V_{CES}$ $V_{CE} = 0 \text{ V}, V_{GE} = 30 \text{ V}$ $V_{GE} = 15 \text{ V}$ $I_{Cnom} = 30 \text{ A}, V_{GE} = 15 \text{ V}$	$\begin{array}{l} T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 25 \ ^{\circ}\text{C} \\ T_{j} = 125 \ ^{\circ}\text{C} \\ \end{array}$	4,5	5,5 1,2 1,2 43 63 2,5 3,1 2 0,3 0,14	6,5 0,2 560 3	mA mA nA nA nA mΩ mΩ mΩ V V V NG NF nF nF nF

T_i = 125 °C

V_{GE}=±15V



 R_{Goff} = 20 Ω

per IGBT

 $t_{d(off)}$

t_f

 $\mathsf{E}_{\mathsf{off}}$

R_{th(j-s)}

0,85

ns

ns

mJ

K/W

45

3,6

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- Inverter
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Remarks

• V_F = chip level value

Characteristics									
Symbol	Conditions		min.	typ.	max.	Units			
Inverse D	Diode								
$V_F = V_{EC}$	I _{Fnom} = 30 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		2		V			
		T _j = 125 °C _{chiplev.}		1,8		V			
V _{F0}		T _j = 125 °C		1	1,2	V			
r _F		T _j = 125 °C		53	73	mΩ			
I _{RRM}	I _{Fnom} = 30 A	T _i = 125 °C		32		А			
Q _{rr}	di/dt = 400 A/µs			5,4		μC			
E _{rr}	V _{CC} = 600V			1,2		mJ			
R _{th(j-s)D}	per diode				1	K/W			
M _s	to heat sink M1				2	Nm			
w				21		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.



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