



SEMITRANS® 2

Superfast NPT-IGBT Module

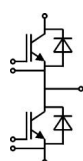
SKM 100GB063D

Features

- N channel, homogeneous Silicon structure (NPT- Non punch through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of V_{CEsat}
- Very low C_{ies} , C_{oes} , C_{res}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper Bonding Technology without hard mould
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also above 10 kHz



GB

Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		600	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	130	A
		$T_{case} = 70\text{ }^{\circ}\text{C}$	100	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		200	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 600\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	100	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	75	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		200	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	720	A
Module				
$I_{t(RMS)}$			200	A
T_{vj}			- 40 ... + 150	$^{\circ}\text{C}$
T_{stg}			- 40 ... + 125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.		2500	V

Characteristics			T _c = 25 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 2 mA		4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C			0,1	0,3	mA
V _{CE0}				1,05		V
				1		V
r _{CE}	V _{GE} = 15 V			10,5		mΩ
				14		mΩ
V _{CE(sat)}	I _{Cnom} = 100 A, V _{GE} = 15 V			2,1	2,5	V
				2,4	2,8	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			5,6		nF
C _{oes}				0,6		nF
C _{res}				0,4		nF
Q _G	V _{GE} = 0V - +15V			240		nC
R _{Gint}	T _j = °C			0		Ω
t _{d(on)}	R _{Gon} = 10 Ω			50		ns
t _r				40		ns
E _{on}				4		mJ
t _{d(off)}	R _{Goff} = 10 Ω			300		ns
t _f				35		ns
E _{off}				3		mJ
R _{th(j-c)}	per IGBT				0,27	K/W

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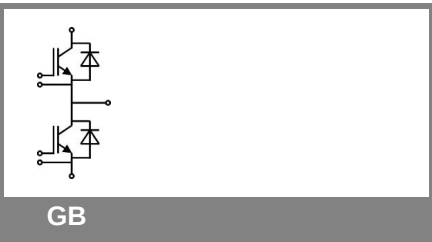
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Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 100 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		1,55	1,9	V
		T _j = 125 °C _{chiplev.}		1,55		V
V _{F0}		T _j = 125 °C			0,9	V
r _F		T _j = 125 °C		8	10	mΩ
I _{RRM}	I _F = 100 A	T _j = 125 °C		44		A
Q _{rr}				6		μC
E _{rr}						
	V _{GE} = -15 V; V _{CC} = 300 V					
R _{th(j-c)D}	per diode				0,6	K/W
Module						
L _{CE}					30	nH
R _{CC'+EE'}	res., terminal-chip	T _{case} = 25 °C		0,75		mΩ
		T _{case} = 125 °C		1		mΩ
R _{th(c-s)}	per module				0,05	K/W
M _s	to heat sink M6		3		5	Nm
M _t	to terminals M5		2,5		5	Nm
w					160	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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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	160	mk/W
R_i	$i = 2$	88	mk/W
R_i	$i = 3$	18	mk/W
R_i	$i = 4$	4	mk/W
τ_{ui}	$i = 1$	0,0447	s
τ_{ui}	$i = 2$	0,0087	s
τ_{ui}	$i = 3$	0,0015	s
τ_{ui}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	400	mk/W
R_i	$i = 2$	165	mk/W
R_i	$i = 3$	30,5	mk/W
R_i	$i = 4$	4,5	mk/W
τ_{ui}	$i = 1$	0,0613	s
τ_{ui}	$i = 2$	0,0085	s
τ_{ui}	$i = 3$	0,0045	s
τ_{ui}	$i = 4$	0,0003	s

