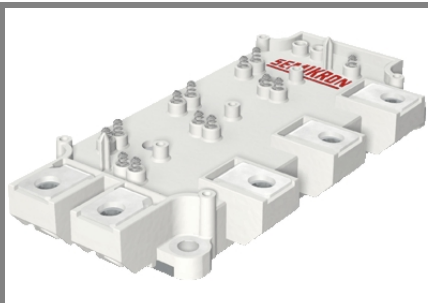


SEMiX 101GD066HDs



SEMiX® 13s

Trench IGBT Modules

SEMiX 101GD066HDs

Preliminary Data

Features

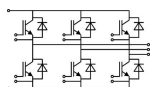
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient

Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

- Case temperature limited to $T_C=125^\circ\text{C}$ max.
- Product reliability results are valid for $T_j=150^\circ\text{C}$
- use of soft RG necessary
- take care of over-voltage caused by stray inductance

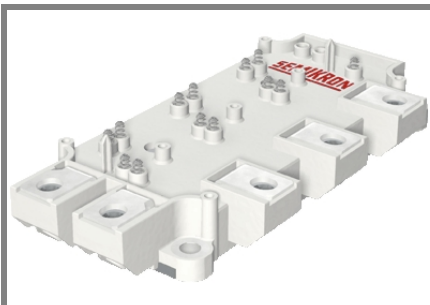


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Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	600	V	
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	140	A
		$T_c = 80^\circ\text{C}$	105	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	200	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 360\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 600\text{ V}$	6	μs	
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	150	A
		$T_c = 80^\circ\text{C}$	110	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200	A	
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 25^\circ\text{C}$	500	A
Module				
$I_{t(RMS)}$		600	A	
T_{vj}		- 40 ... + 175	$^\circ\text{C}$	
T_{stg}		- 40 ... + 125	$^\circ\text{C}$	
V_{isol}	AC, 1 min.	4000	V	

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 1,6\text{ mA}$		5,8		V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$			0,45	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	0,9	1	V
		$T_j = 150^\circ\text{C}$	0,85	0,9	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	5,5	9	m Ω
		$T_j = 150^\circ\text{C}$	8,5	12	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,45	1,9	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	1,7	2,1	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	6,2		nF
C_{oes}			0,39		nF
C_{res}			0,18		nF
Q_G	$V_{GE} = -8 \dots +15\text{ V}$		800		nC
$t_{d(on)}$	$R_{Gon} = 6,2\ \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 100\text{ A}$	140		ns
t_r			35		ns
E_{on}	$R_{Goff} = 6,2\ \Omega$	$T_j = 150^\circ\text{C}$	3		mJ
$t_{d(off)}$			440		ns
t_f			55		ns
E_{off}			4		mJ
$R_{th(j-c)}$	per IGBT			0,41	K/W

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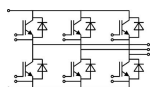
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- use of soft RG necessary
- take care of over-voltage caused by stray inductance

Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100\text{ A}; V_{GE} = 0\text{ V}$		1,4	1,6	V
	$T_j = 25^\circ\text{C}_{chiplev.}$				
	$T_j = 150^\circ\text{C}_{chiplev.}$		1,4	1,6	V
V_{F0}			1	1,1	V
	$T_j = 25^\circ\text{C}$				
	$T_j = 150^\circ\text{C}$		0,85	0,95	V
r_F			4	5	mΩ
	$T_j = 25^\circ\text{C}$				
	$T_j = 150^\circ\text{C}$		5,5	6,5	mΩ
I_{RRM}	$I_{Fnom} = 100\text{ A}$		130		A
Q_{rr}	$di/dt = 3200\text{ A}/\mu\text{s}$		18		μC
E_{rr}	$V_{GE} = -8\text{ V}; V_{CC} = 300\text{ V}$		4,5		mJ
$R_{th(j-c)D}$	per diode			0,51	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,04		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				350	g
Temperature sensor					
R_{100}	$T_c = 100^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$; $T[\text{K}]; B$		3550±2%		K

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

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