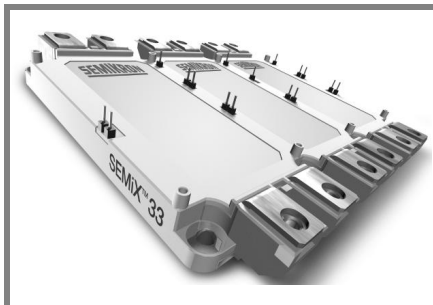


SEMiX 403GD128Dc



SEMiX® 33c

SPT IGBT Modules

SEMiX 403GD128Dc

Preliminary Data

Features

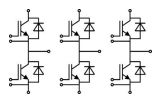
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

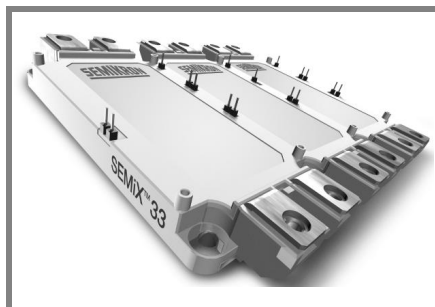
Absolute Maximum Ratings		$T_{case} = 25^{\circ}C$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^{\circ}C$	1200		V
I_C	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	420	
		$T_{case} = 80^{\circ}C$	300	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	450		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600 V$; $V_{GE} \leq 20 V$; $T_j = 125^{\circ}C$ $V_{CES} < 1200 V$	10		μs
Inverse Diode				
I_F	$T_j = 150^{\circ}C$	$T_{case} = 25^{\circ}C$	340	
		$T_{case} = 80^{\circ}C$	235	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	450		A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 25^{\circ}C$	2000	
Module				
$I_{t(RMS)}$		600		A
T_{vj}		-40 ... +150		$^{\circ}C$
T_{stg}		-40 ... +125		$^{\circ}C$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_{case} = 25^{\circ}C$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 9 mA$	4,5	5	6,5	V
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$	$T_j = 25^{\circ}C$	0,3		mA
		$T_j = 125^{\circ}C$			
V_{CE0}		$T_j = 25^{\circ}C$	1		V
		$T_j = 125^{\circ}C$	0,9		
r_{CE}	$V_{GE} = 15 V$	$T_j = 25^{\circ}C$	4		$m\Omega$
		$T_j = 125^{\circ}C$	5,3		
$V_{CE(sat)}$	$I_{Cnom} = 225 A$, $V_{GE} = 15 V$	$T_j = 25^{\circ}C_{chiplev.}$	1,9		V
		$T_j = 125^{\circ}C_{chiplev.}$	2,1		
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0 V$	20,8		nF	
C_{oes}		1,4		nF	
C_{res}		0,9		nF	
Q_G	$V_{GE} = -8 V \dots +15 V$	2150		nC	
$t_{d(on)}$	$R_{Gon} = 4 \Omega$	$V_{CC} = 600V$ $I_{Cnom} = 225A$	145		ns
t_r			60		
E_{on}	$R_{Goff} = 4 \Omega$	$T_j = 125^{\circ}C$	20		mJ
$t_{d(off)}$			575		
t_f			70		
E_{off}			23		mJ
$R_{th(j-c)}$	per IGBT	0,075		K/W	



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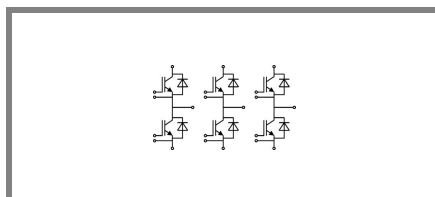
Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 225\text{ A}; V_{GE} = 0\text{ V}$		2	2,5	V
	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$		1,8	2,3	V
V_{F0}			1,1	1,45	V
	$T_j = 25\text{ }^\circ\text{C}$				
	$T_j = 125\text{ }^\circ\text{C}$		0,85	1,2	V
r_F			4	4,7	mΩ
	$T_j = 25\text{ }^\circ\text{C}$				
	$T_j = 125\text{ }^\circ\text{C}$		4,2	4,9	mΩ
I_{RRM}	$I_{Fnom} = 225\text{ A}$		260		A
Q_{rr}	$di/dt = 4950\text{ A}/\mu\text{s}$		29		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$		10		mJ
$R_{th(j-c)D}$	per diode			0,13	K/W
Module					
L_{CE}			20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25\text{ }^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125\text{ }^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,014		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				900	g
Temperature sensor					
R_{100}	$T_c = 100\text{ }^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		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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