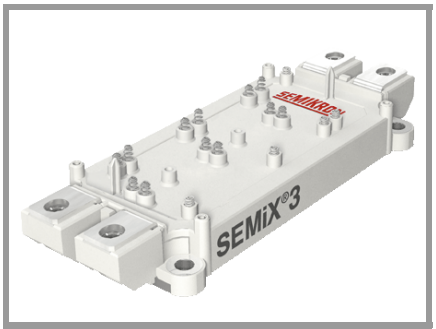
SEMiX603GB066HDs



SEMiX®3s

Trench IGBT Modules

SEMiX603GB066HDs

Preliminary Data

Features

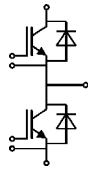
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- UL recognised file no. E63532

Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

- Case temperature limited to T_C=125°C max.
- Product reliability results are valid for T_j=150°C
- For short circuit: Soft R_{Goff} recommended
- Take care of over-voltage caused by stray inductance



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Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
IGBT				
V_{CES}			600	V
I_C	T_j = 175°C	T_c = 25°C	720	A
		T_c = 80°C	541	A
I_{CRM}	I_{CRM} = 2xI_{Cnom}		1200	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 360V $V_{GE} \leq$ 15V T_j = 150°C $V_{CES} \leq$ 600V		6	µs
T_j			-40 ... 175	°C
Inverse diode				
I_F	T_j = 175°C	T_c = 25°C	771	A
		T_c = 80°C	562	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}		1200	A
I_{FSM}	t_p = 10ms, half sine wave, T_j = 25°C		1800	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$			600	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC sinus 50Hz, t = 60s		4000	V

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
IGBT						
$V_{CE(sat)}$	I_{Cnom} = 600A V_{GE} = 15V chiplevel	T_j = 25°C		1.45	1.9	V
		T_j = 150°C		1.70	2.1	V
V_{CE0}		T_j = 25°C		0.9	1	V
		T_j = 150°C		0.85	0.9	V
r_{CE}	V_{GE} = 15V	T_j = 25°C		0.9	1.5	mΩ
		T_j = 150°C		1.4	2.0	mΩ
$V_{GE(th)}$	V_{GE}=V_{CE}, I_C = 9.6mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0V V_{CE} = 600V	T_j = 25°C		0.15	0.45	mA
		T_j = 150°C				mA
C_{ies}	V_{CE} = 25V V_{GE} = 0V	f = 1MHz		37.0		nF
C_{oes}		f = 1MHz		2.31		nF
C_{res}		f = 1MHz		1.10		nF
Q_G	V_{GE} = - 8 V...+ 15 V			4800		nC
R_{Gint}	T_j = 25°C			0.67		Ω
$t_{d(on)}$	V_{CC} = 300V I_{Cnom} = 600A T_j = 150°C $R_{G\ on}$ = 3Ω $R_{G\ off}$ = 3Ω			150		ns
t_r				145		ns
E_{on}				12		mJ
$t_{d(off)}$				1050		ns
t_f				105		ns
E_{off}				43		mJ
$R_{th(j-c)}$	per IGBT				0.087	K/W

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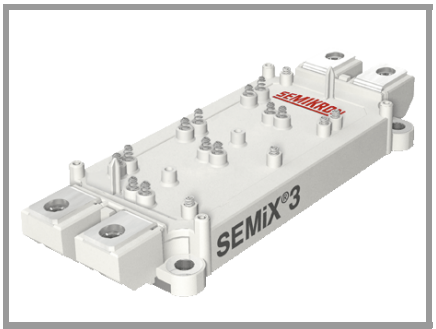

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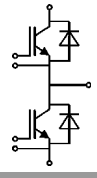

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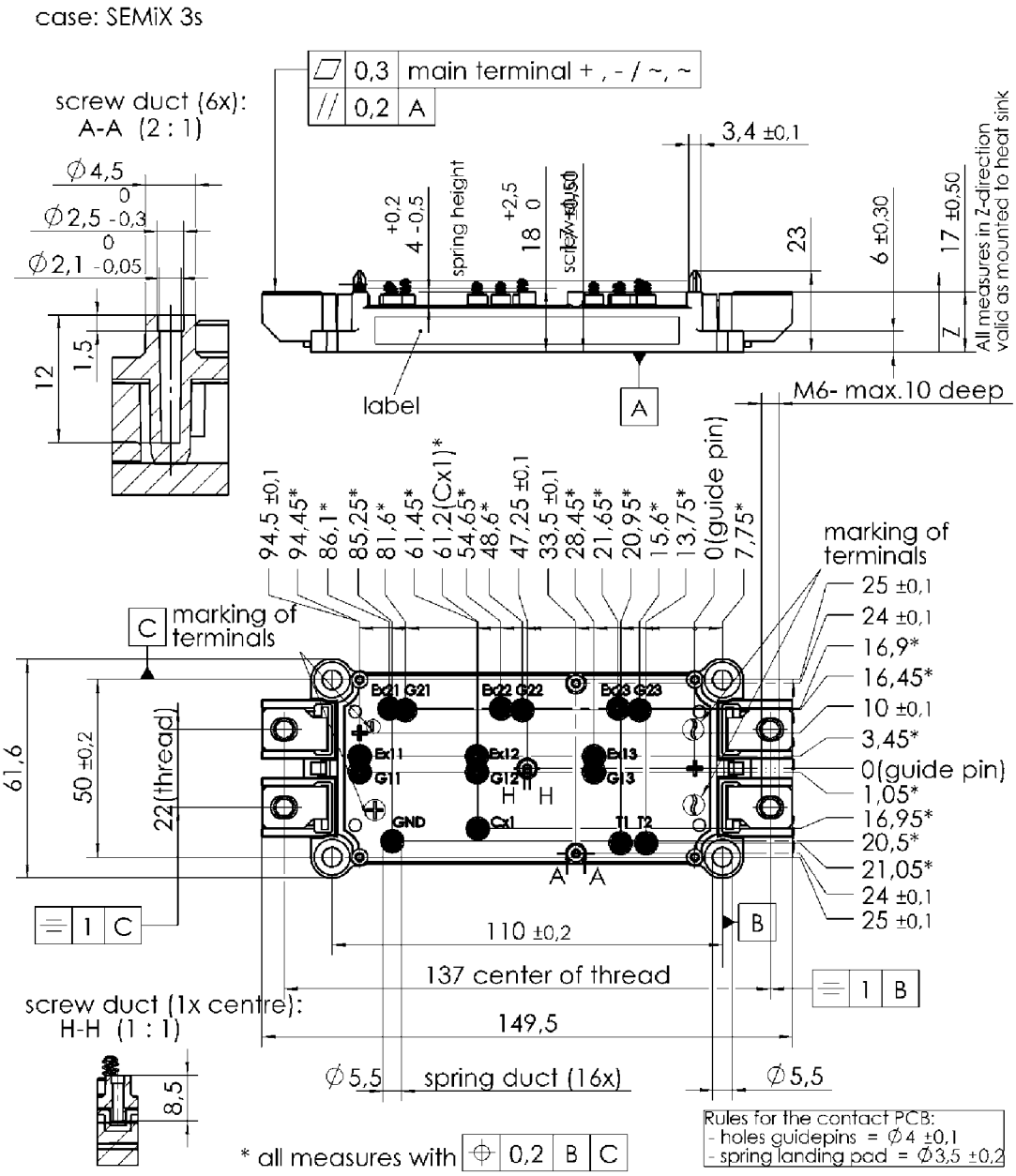
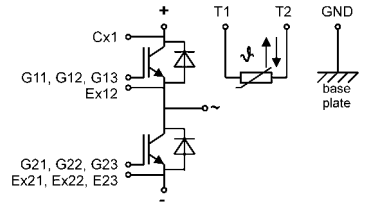
Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
$V_F = V_{EC}$	I_{Fnom} = 600A V_{GE} = 0V chiplevel	T_j = 25°C		1.4	1.6	V
		T_j = 150°C		1.4	1.6	V
V_{F0}		T_j = 25°C	0.9	1	1.1	V
		T_j = 150°C	0.75	0.85	0.95	V
r_F		T_j = 25°C	0.5	0.7	0.8	mΩ
		T_j = 150°C	0.8	0.9	1.1	mΩ
I_{RRM}	I_{Fnom} = 600A di/dt_{off} = 3800A/µs V_{GE} = -8V V_{CC} = 300V	T_j = 150°C		350		A
Q_{rr}		T_j = 150°C		63		µC
E_{rr}		T_j = 150°C		13		mJ
$R_{th(j-c)D}$	per diode				0.11	K/W
Module						
L_{CE}				20		nH
$R_{CC'+EE'}$	res., terminal-chip	T_C = 25°C		0.7		mΩ
		T_C = 125°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					300	g
Temperature sensor						
R_{100}	T_c=100°C (R_{25}=5 kΩ)			0,493 ±5%		kΩ
$B_{100/125}$	$R_{(T)}=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; T[K];			3550 ±2%		K



SEMiX 3s



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

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