SEMiX®2s

Trench IGBT Modules

SEMiX202GB12T4s

Features

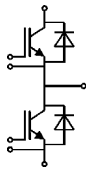
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperature limited to T_C=125°C max.
- Product reliability results are valid for T_j=150°C
- Dynamic values apply to the following combination of resistors:
  $R_{Gon,main}$ = 1,0 Ω
  $R_{Goff,main}$ = 1,0 Ω
  $R_{G,X}$ = 2,2 Ω
  $R_{E,X}$ = 0,5 Ω



GB

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
IGBT				
V_{CES}			1200	V
I_C	T_j = 175 °C	T_c = 25 °C	314	A
		T_c = 80 °C	242	A
I_{Cnom}			200	A
I_{CRM}	I_{CRM} = 3xI_{Cnom}		600	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 800 V V_{GE} ≤ 15 V T_j = 150 °C V_{CES} ≤ 1200 V		10	µs
T_j			-40 ... 175	°C
Inverse diode				
I_F	T_j = 175 °C	T_c = 25 °C	229	A
		T_c = 80 °C	172	A
I_{Fnom}			200	A
I_{FRM}	I_{FRM} = 3xI_{Fnom}		600	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j = 25 °C			A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$			600	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC sinus 50Hz, t = 1 min		4000	V

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
$V_{CE(sat)}$	I_C = 200 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.8	2.05	V
		T_j = 150 °C		2.20	2.4	V
V_{CE0}		T_j = 25 °C		0.8	0.9	V
		T_j = 150 °C		0.7	0.8	V
r_{CE}	V_{GE} = 15 V	T_j = 25 °C		5.0	5.8	mΩ
		T_j = 150 °C		7.5	8.0	mΩ
$V_{GE(th)}$	V_{GE}=V_{CE}, I_C = 7.6 mA		5	5.8	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1200 V	T_j = 25 °C		0.1	0.3	mA
		T_j = 150 °C				mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		12.3		nF
C_{oes}		f = 1 MHz		0.81		nF
C_{res}		f = 1 MHz		0.69		nF
Q_G	V_{GE} = - 8 V...+ 15 V			1130		nC
R_{Gint}	T_j = 25 °C			3.75		Ω
$t_{d(on)}$	V_{CC} = 600 V I_C = 200 A T_j = 150 °C $R_{G\ on}$ = 2.4 Ω $R_{G\ off}$ = 2.4 Ω di/dt_{on} = 3600 A/µs di/dt_{off} = 2100 A/µs			230		ns
t_r				55		ns
E_{on}				22		mJ
$t_{d(off)}$				465		ns
t_f				87		ns
E_{off}				21		mJ
$R_{th(j-c)}$	per IGBT				0.14	K/W
$R_{th(j-s)}$	per IGBT					K/W

SEMiX®2s

Trench IGBT Modules

SEMiX202GB12T4s

Features

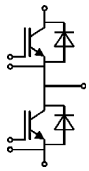
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

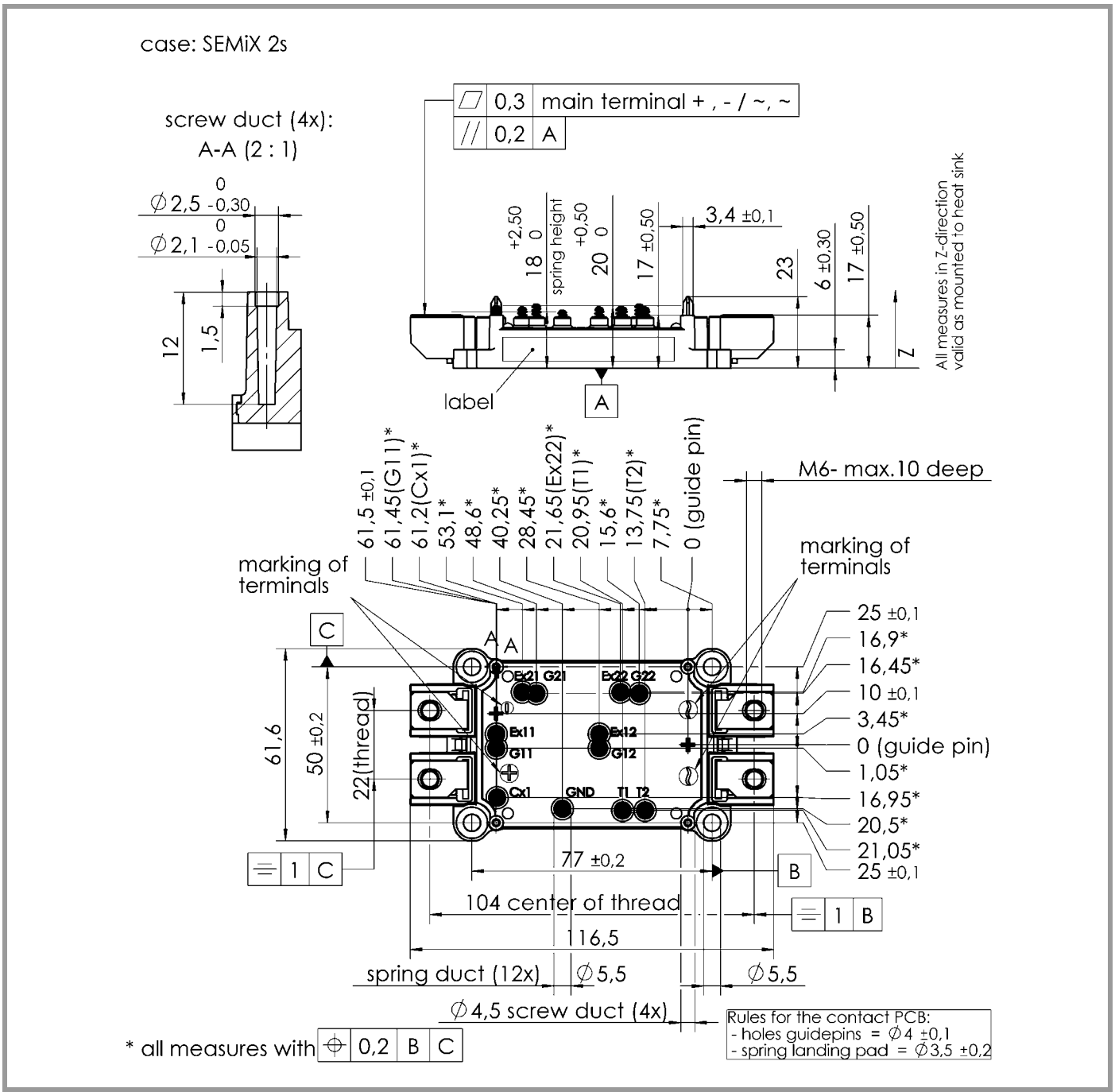
- Case temperature limited to T_C=125°C max.
- Product reliability results are valid for T_j=150°C
- Dynamic values apply to the following combination of resistors:
  $R_{Gon,main}$ = 1,0 Ω
  $R_{Goff,main}$ = 1,0 Ω
  $R_{G,X}$ = 2,2 Ω
  $R_{E,X}$ = 0,5 Ω



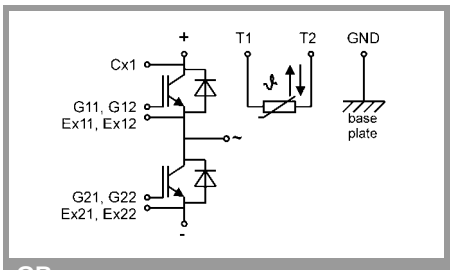
GB

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Inverse diode						
$V_F = V_{EC}$	I_F = 200 A V_{GE} = 0 V chiplevel	T_j = 25 °C		2.2	2.5	V
		T_j = 150 °C		2.1	2.5	V
V_{F0}		T_j = 25 °C	1.1	1.3	1.5	V
		T_j = 150 °C	0.7	0.9	1.1	V
r_F		T_j = 25 °C	4.0	4.5	5.1	mΩ
		T_j = 150 °C	5.3	6.3	6.8	mΩ
I_{RRM}	I_F = 200 A di/dt_{off} = 3400 A/µs V_{GE} = -15 V V_{CC} = 600 V	T_j = 150 °C		160		A
Q_{rr}		T_j = 150 °C		31.5		µC
E_{rr}		T_j = 150 °C		12		mJ
$R_{th(j-c)}$	per diode				0.26	K/W
$R_{th(j-s)}$	per diode					K/W
Module						
L_{CE}				18		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			0.045		K/W
M_s	to heat sink (M5)		3		5	Nm
M_t		to terminals (M6)	2.5		5	Nm
						Nm
w					250	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

© by SEMIKRON



SEMiX 2s



GB

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.