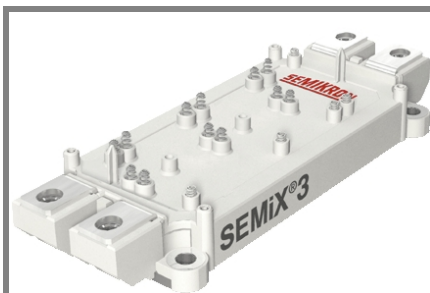


SEMiX 453GB12T4s



SEMiX® 3s

Trench IGBT Modules

SEMiX 453GB12T4s

SEMiX 453GAL12T4s

SEMiX 453GAR12T4s

Target Data

Features

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

Typical Applications

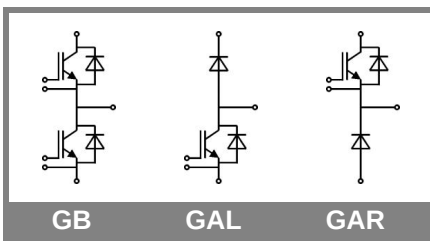
- AC inverter drives
- UPS
- Electronic Welding

Remarks

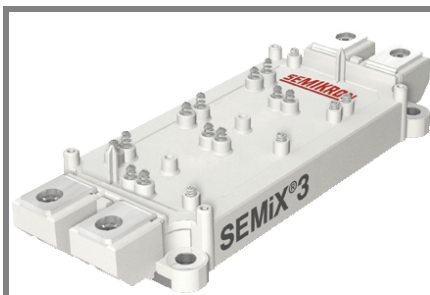
- Case temperature limited to $T_C = 125^\circ\text{C}$ max.
- Product reliability results are valid for $T_J = 150^\circ\text{C}$
- Dynamic values apply to the following combination of resistors:
 $R_{Gon,main} = 1,0\Omega$,
 $R_{Goff,main} = 1,0\Omega$,
 $R_{G,x} = 2,2\Omega$ each,
 $R_{E,x} = 0,5\Omega$ each

Absolute Maximum Ratings			T _{case} = 25°C, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 175 °C	T _c = 25 °C	685	A
		T _c = 80 °C	525	A
I _{CRM}	I _{CRM} =3xI _{Cnom}		1350	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 150 °C V _{CES} < 1200 V		10	µs
Inverse Diode				
I _F	T _j = 175 °C	T _c = 25 °C	545	A
		T _c = 80 °C	405	A
I _{FRM}	I _{FRM} =3xI _{FRom}		1350	A
Module				
I _{t(RMS)}			600	A
T _{vj}			- 40 ... + 175	°C
T _{stg}			- 40 ... + 125	°C
V _{isol}	AC, 1 min.		4000	V

Characteristics			T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 18 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C				0,3	mA
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			2,2	2,4	mΩ
	T _j = 150°C			3,3	3,6	mΩ
V _{CE(sat)}	I _{Cnom} = 450 A, V _{GE} = 15 V T _j = 25°C _{chiplev.}			1,8	2	V
	T _j = 150°C _{chiplev.}			2,2	2,4	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			27,9		nF
C _{oes}				1,7		nF
C _{res}				1,5		nF
Q _G	V _{GE} = -8 ... +15V			2600		nC
R _{Gint}	T _j = 25 °C			1,7		Ω
t _{d(on)}	R _{Gon} = 1,9 Ω di/dt = 4000 A/μs		V _{CC} = 600V I _{Cnom} = 450A T _j = 150 °C	305		ns
t _r				80		ns
E _{on}				45		mJ
t _{d(off)}	R _{Goff} = 1,9 Ω di/dt = 5000 A/μs		T _j = 150 °C	535		ns
t _f				100		ns
E _{off}				50		mJ
R _{th(j-c)}	per IGBT				0,065	K/W



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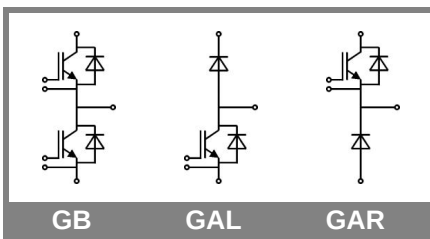
Remarks

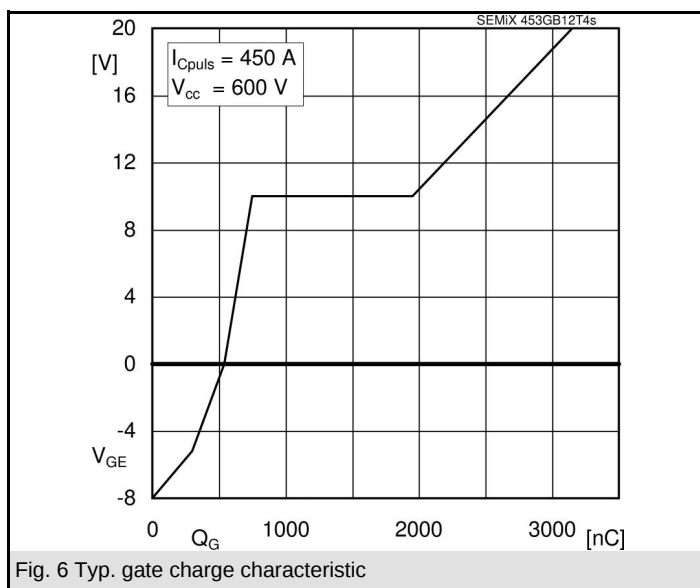
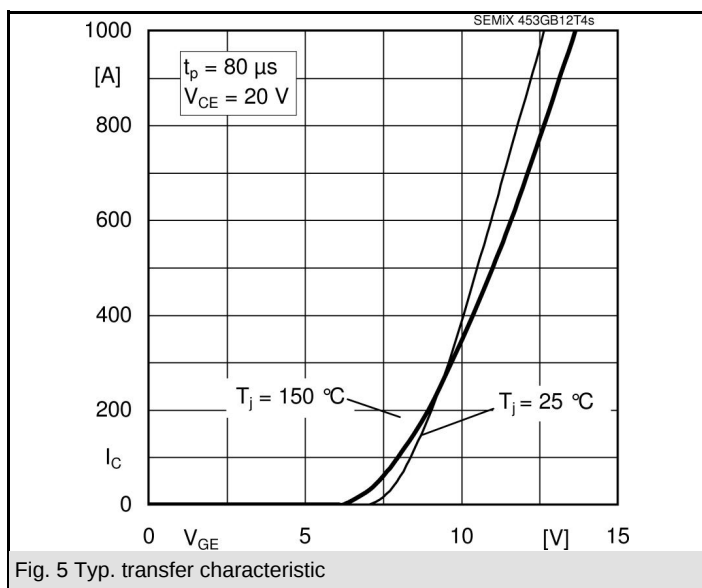
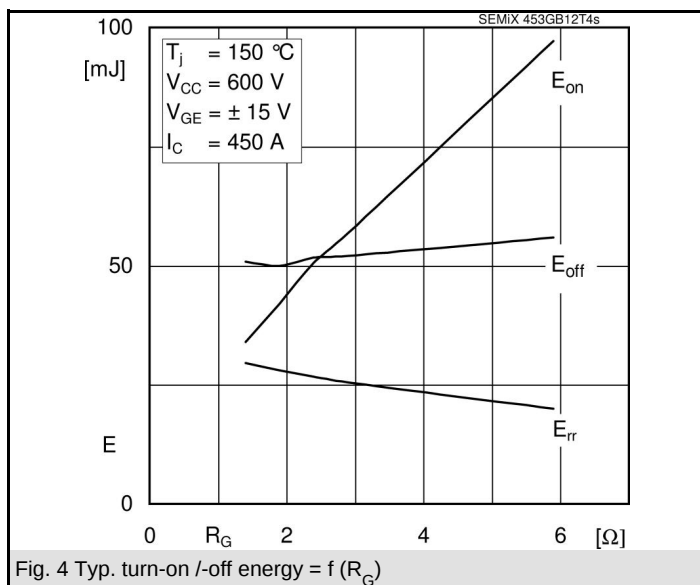
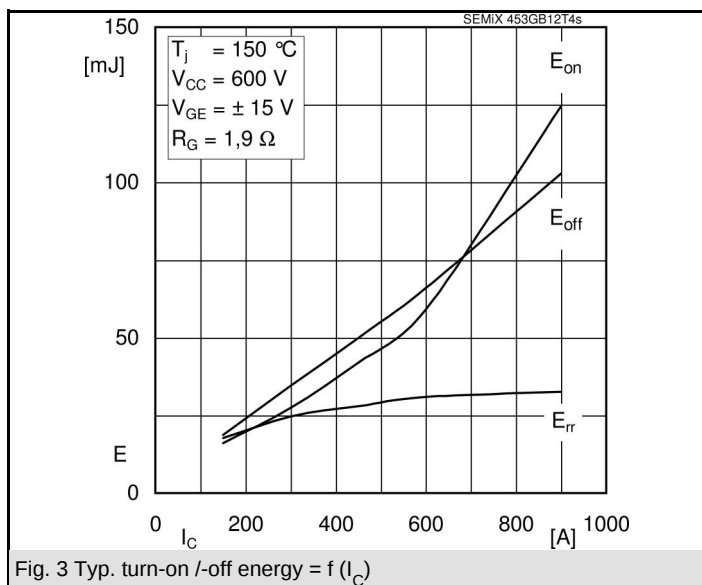
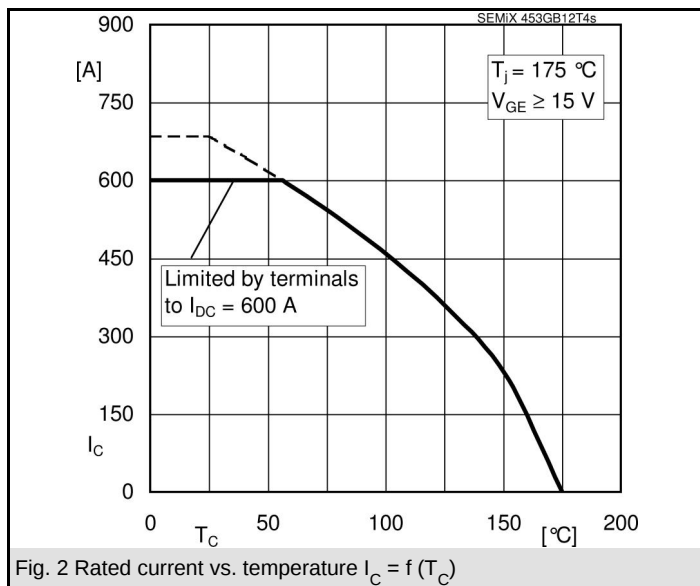
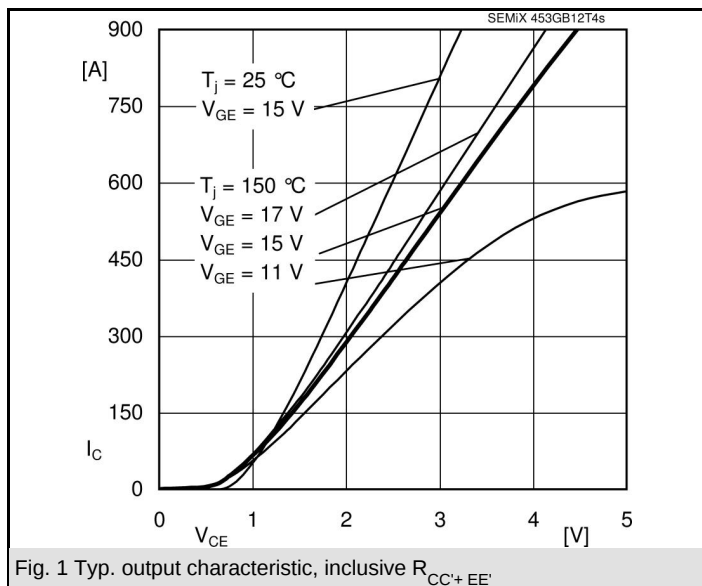
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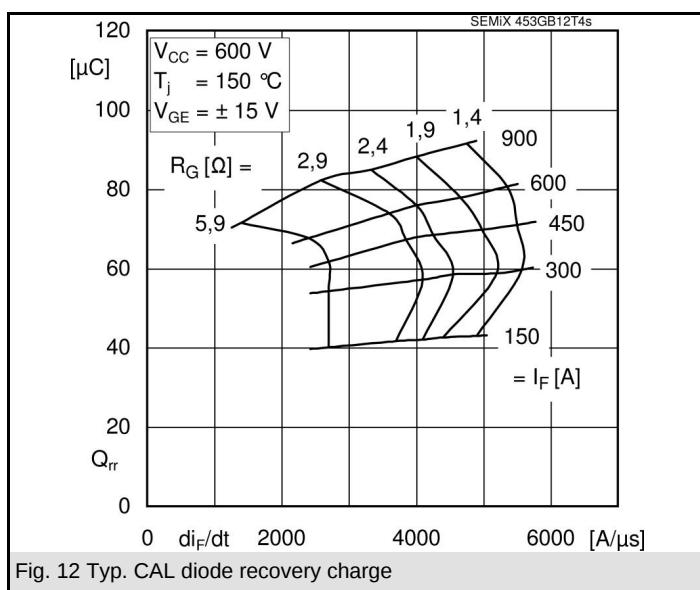
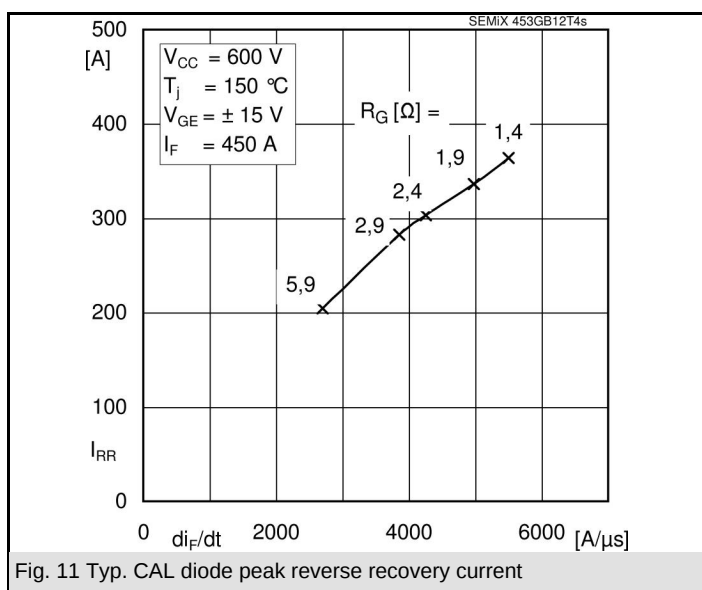
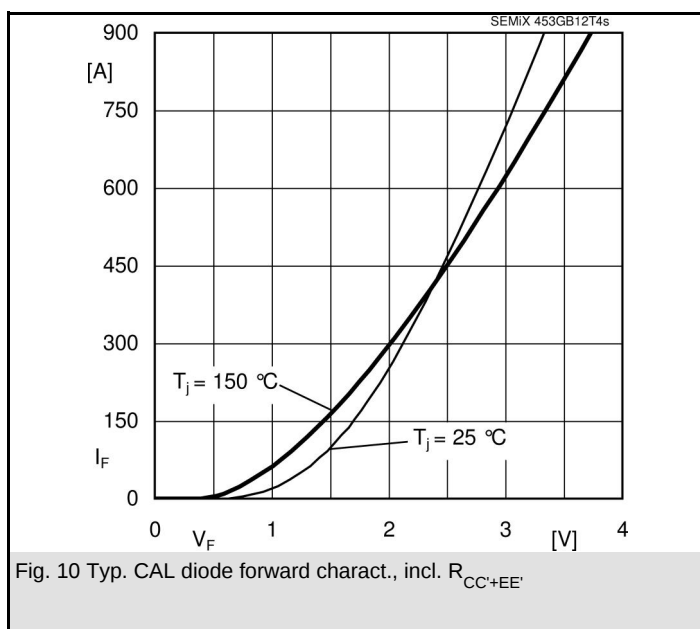
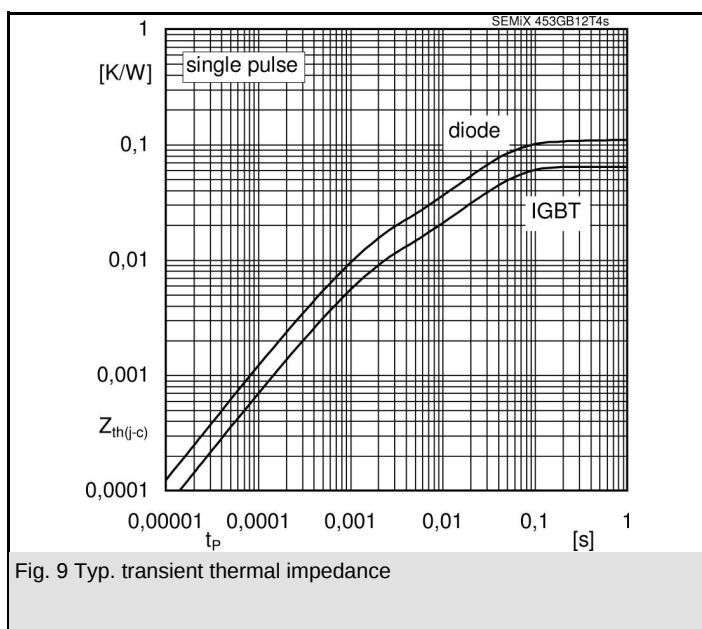
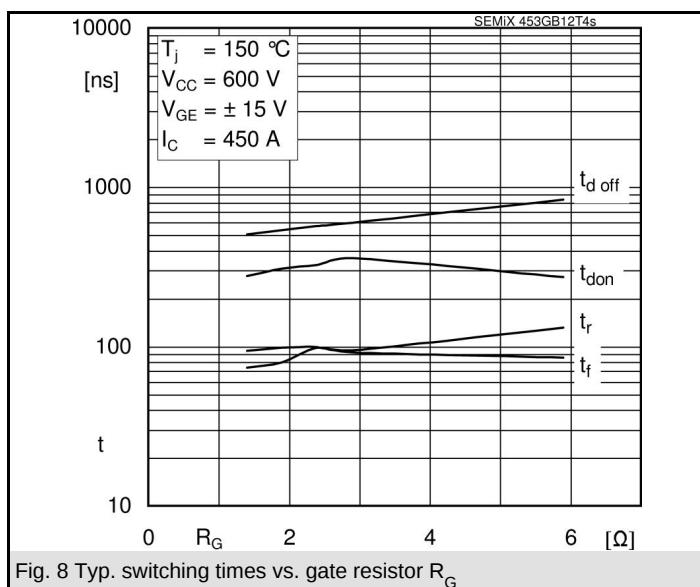
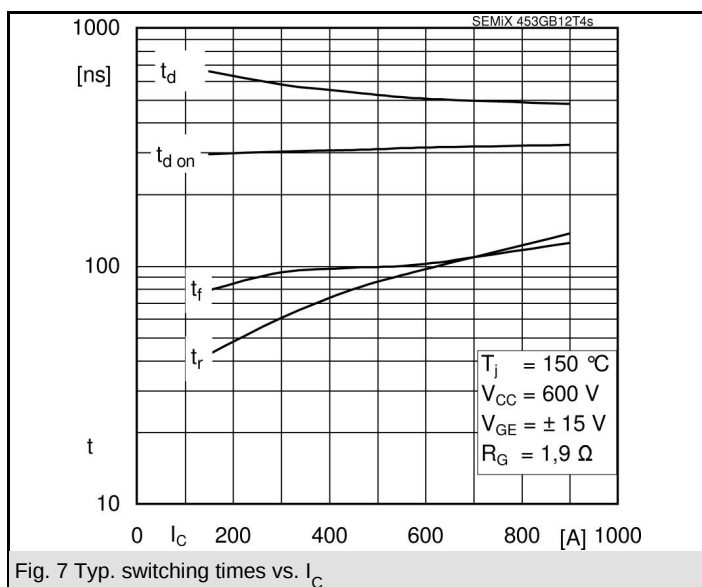
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 450 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_J = 25^\circ\text{C}_{chiplev.}$		2,15	2,45	V
	$T_J = 150^\circ\text{C}_{chiplev.}$		2,05	2,4	V
V_{F0}	$T_J = 25^\circ\text{C}$		1,3	1,5	V
	$T_J = 150^\circ\text{C}$		0,9	1,1	V
r_F	$T_J = 25^\circ\text{C}$		1,9	2,1	mΩ
	$T_J = 150^\circ\text{C}$		2,6	2,9	mΩ
I_{RRM}	$I_{Fnom} = 450 \text{ A}$		350		A
Q_{rr}	$di/dt = 5000 \text{ A}/\mu\text{s}$		70		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		28		mJ
$R_{th(j-c)D}$	per diode			0,11	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				300	g
Temperature sensor					
R_{100}	$T_C=100^\circ\text{C}$ ($R_{25}=5 \text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T)=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; $T[\text{K}]$		3550±2%		K

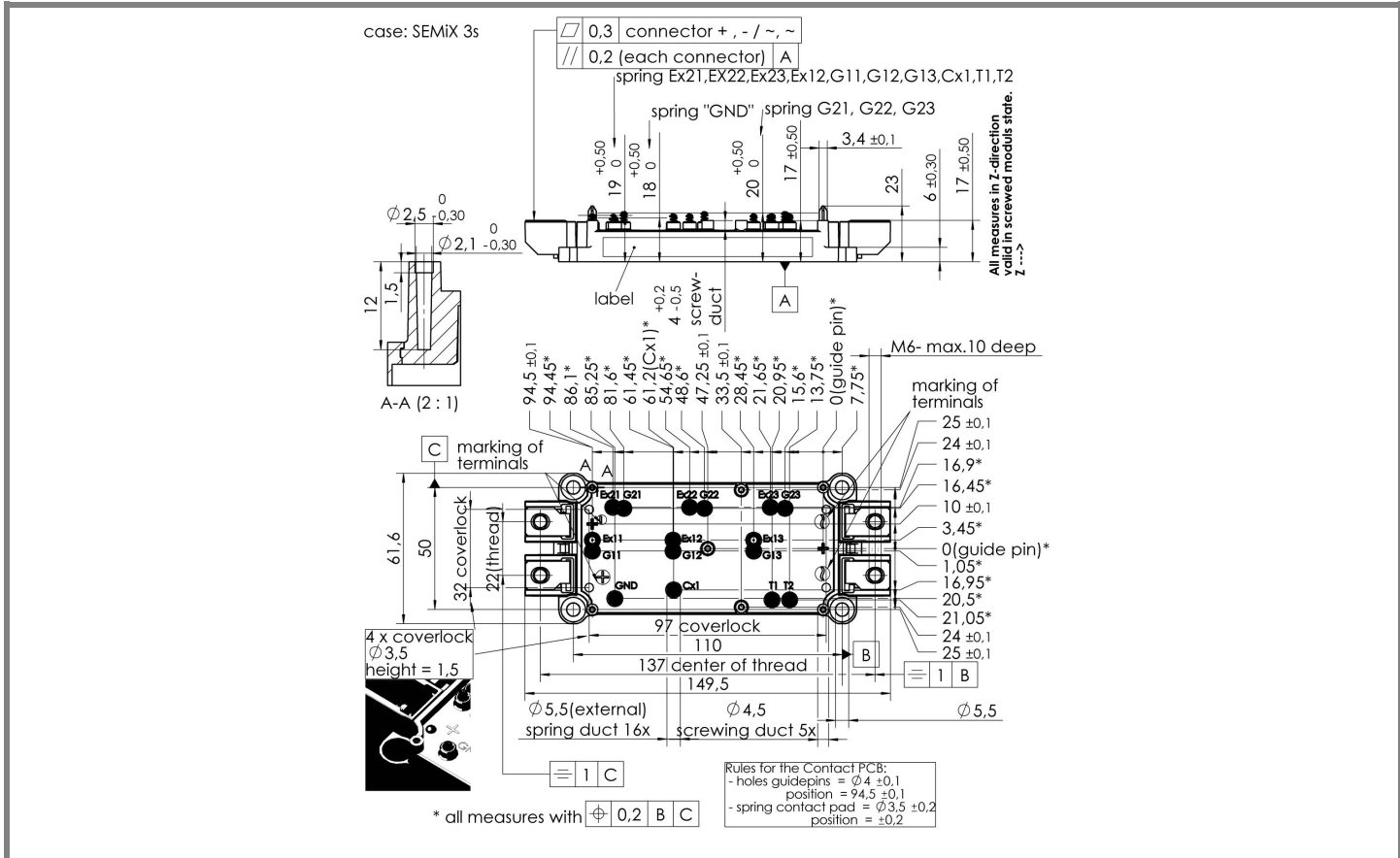
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.









Case SEMiX 3s

