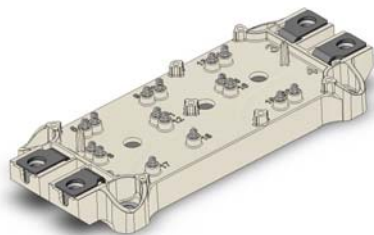


SEMiX353GB126HDs



SEMiX[®] 3s

Trench IGBT Modules

SEMiX353GB126HDs

Features

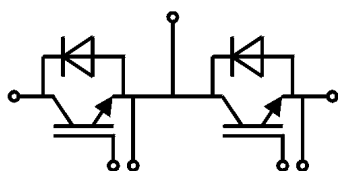
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications*

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^{\circ}\text{C}$ max.
- Not for new design

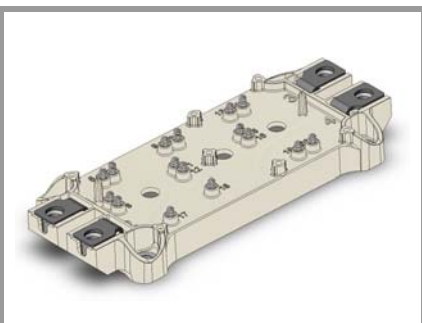


GB

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
IGBT				
V_{CES}		1200	V	
I_C	$T_j = 150^{\circ}\text{C}$	$T_c = 25^{\circ}\text{C}$	364	A
		$T_c = 80^{\circ}\text{C}$	256	A
I_{Cnom}		225	A	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	450	A	
V_{GES}		-20 ... 20	V	
t_{psc}	$V_{CC} = 600\text{ V}$ $V_{GE} \leq 20\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 125^{\circ}\text{C}$	10	μs
T_j		-40 ... 150	$^{\circ}\text{C}$	
Inverse diode				
I_F	$T_j = 150^{\circ}\text{C}$	$T_c = 25^{\circ}\text{C}$	329	A
		$T_c = 80^{\circ}\text{C}$	228	A
I_{Fnom}		225	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	450	A	
I_{FSM}	$t_p = 10\text{ ms, sin } 180^{\circ}, T_j = 25^{\circ}\text{C}$	1700	A	
T_j		-40 ... 150	$^{\circ}\text{C}$	
Module				
$I_{t(RMS)}$		600	A	
T_{stg}		-40 ... 125	$^{\circ}\text{C}$	
V_{isol}	AC sinus 50Hz, $t = 1\text{ min}$	4000	V	

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
IGBT					
$V_{CE(sat)}$	$I_C = 225\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25^{\circ}\text{C}$	1.7	2.1	V
		$T_j = 125^{\circ}\text{C}$	2	2.45	V
V_{CE0}		$T_j = 25^{\circ}\text{C}$	1	1.2	V
		$T_j = 125^{\circ}\text{C}$	0.9	1.1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^{\circ}\text{C}$	3.1	4.0	$\text{m}\Omega$
		$T_j = 125^{\circ}\text{C}$	4.9	6.0	$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C = 9\text{ mA}$	5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25^{\circ}\text{C}$	0.1	0.3	mA
		$T_j = 125^{\circ}\text{C}$			mA
C_{ies}	$V_{CE} = 25\text{ V}$		16.0		nF
C_{oes}	$V_{GE} = 0\text{ V}$		0.84		nF
C_{res}			0.73		nF
Q_G	$V_{GE} = -8\text{ V...} + 15\text{ V}$		1800		nC
R_{Gint}	$T_j = 25^{\circ}\text{C}$		3.33		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 125^{\circ}\text{C}$	265		ns
t_r	$I_C = 225\text{ A}$	$T_j = 125^{\circ}\text{C}$	55		ns
E_{on}	$R_{G on} = 2\ \Omega$	$T_j = 125^{\circ}\text{C}$	26.5		mJ
$t_{d(off)}$	$R_{G off} = 2\ \Omega$	$T_j = 125^{\circ}\text{C}$	585		ns
t_f		$T_j = 125^{\circ}\text{C}$	120		ns
E_{off}		$T_j = 125^{\circ}\text{C}$	32.5		mJ
$R_{th(j-c)}$	per IGBT			0.1	K/W

SEMiX353GB126HDs



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Features

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- High short circuit capability
- UL recognised file no. E63532

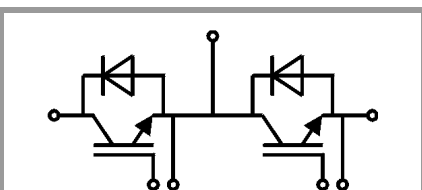
Typical Applications*

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
$V_F = V_{EC}$	$I_F = 225\text{ A}$	$T_j = 25^\circ\text{C}$		1.6	1.80	V
	$V_{GE} = 0\text{ V}$ chip	$T_j = 125^\circ\text{C}$		1.6	1.8	V
V_{F0}		$T_j = 25^\circ\text{C}$	0.9	1	1.1	V
		$T_j = 125^\circ\text{C}$	0.7	0.8	0.9	V
r_F		$T_j = 25^\circ\text{C}$	2.2	2.7	3.1	m Ω
		$T_j = 125^\circ\text{C}$	3.1	3.6	4.0	m Ω
I_{RRM}	$I_F = 225\text{ A}$	$T_j = 125^\circ\text{C}$		330		A
Q_{rr}	$di/dt_{off} = 5600\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		69		μC
E_{rr}	$V_{GE} = -15\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 125^\circ\text{C}$		29		mJ
$R_{th(j-c)}$	per diode				0.17	K/W
Module						
L_{CE}				20		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_C = 25^\circ\text{C}$		0.7		m Ω
		$T_C = 125^\circ\text{C}$		1		m Ω
$R_{th(c-s)}$	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
Temperatur Sensor						
R_{100}	$T_C=100^\circ\text{C}$ ($R_{25}=5\text{ k}\Omega$)			$493 \pm 5\%$		Ω
$B_{100/125}$	$R_{(T)}=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; $T[\text{K}]$;			3550 $\pm 2\%$		K



GB

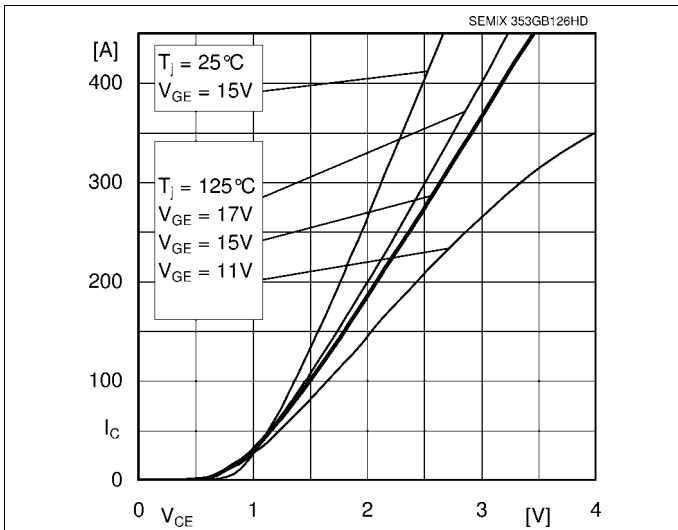


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

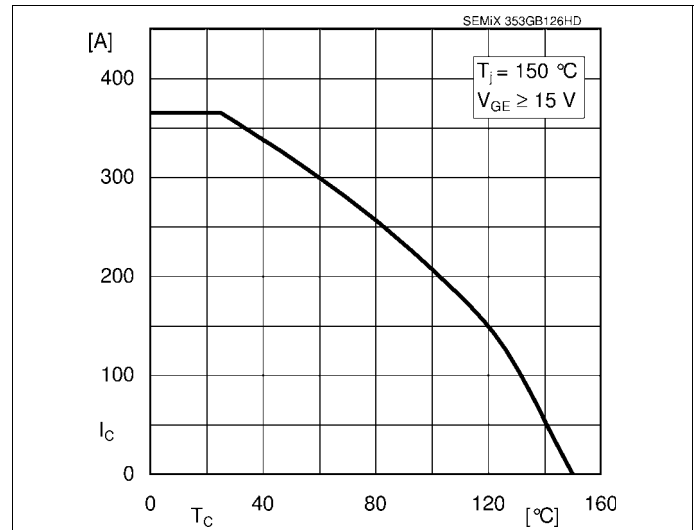


Fig. 2: Rated current vs. temperature $I_C = f(T_C)$

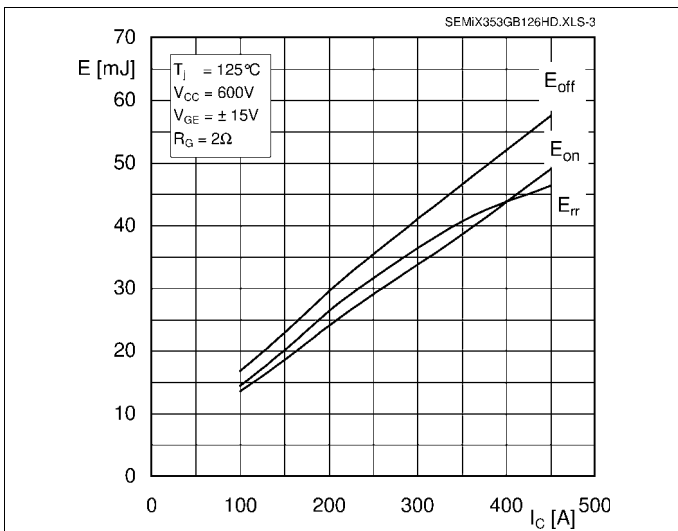


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

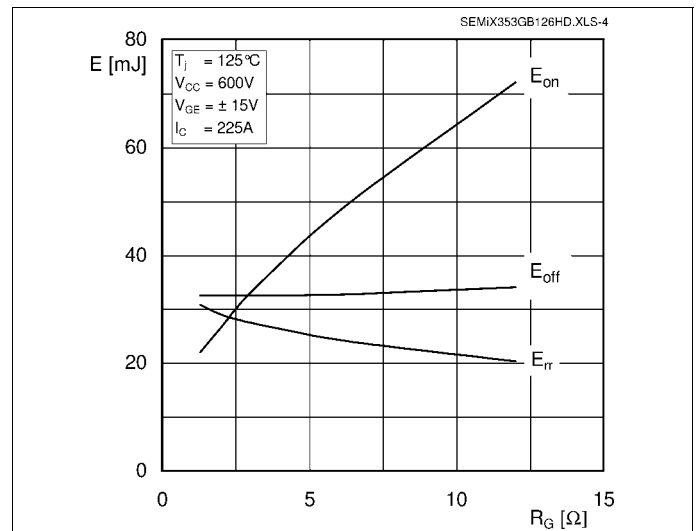


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

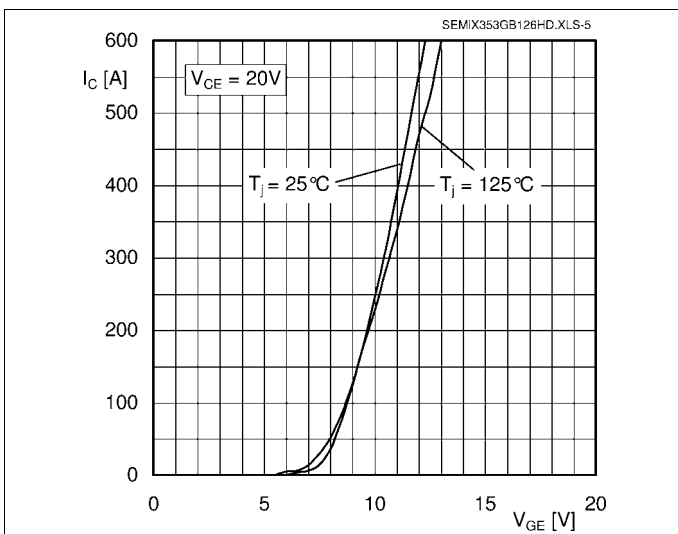


Fig. 5: Typ. transfer characteristic

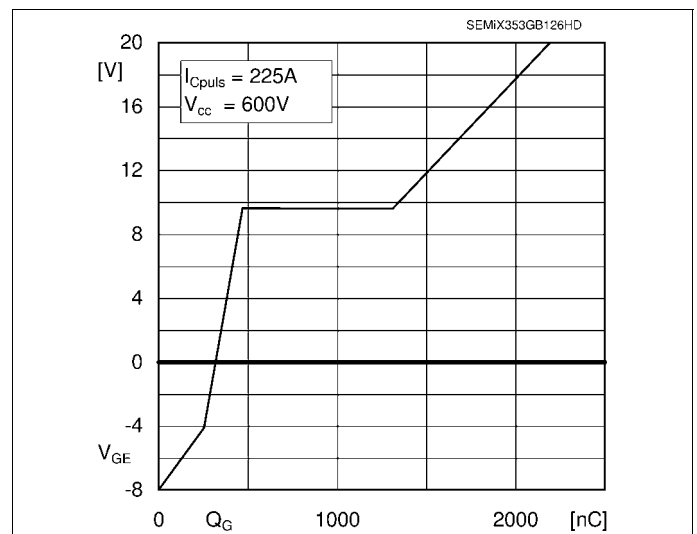
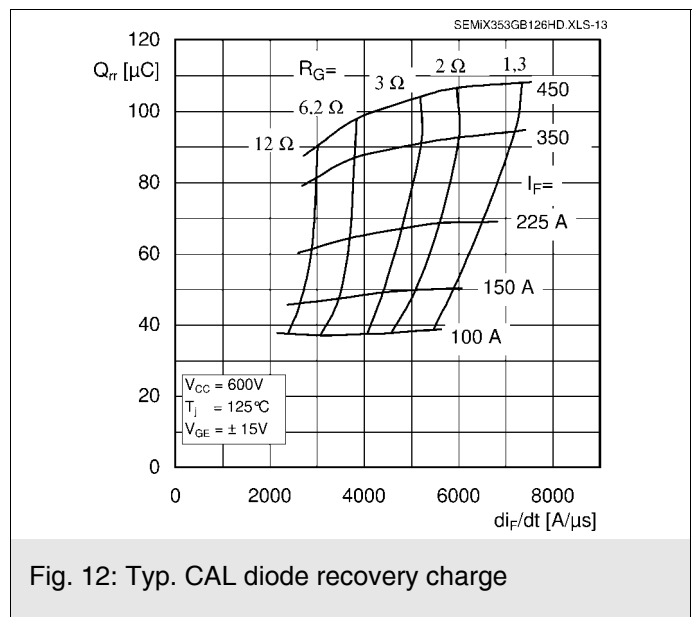
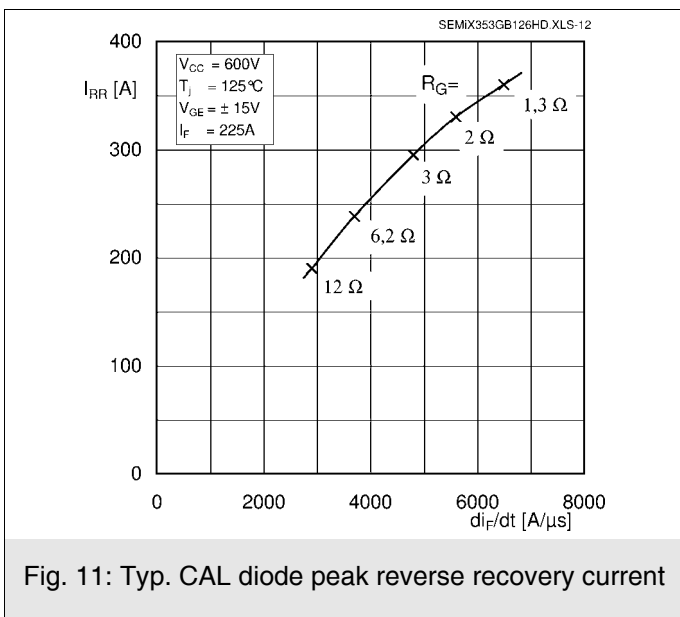
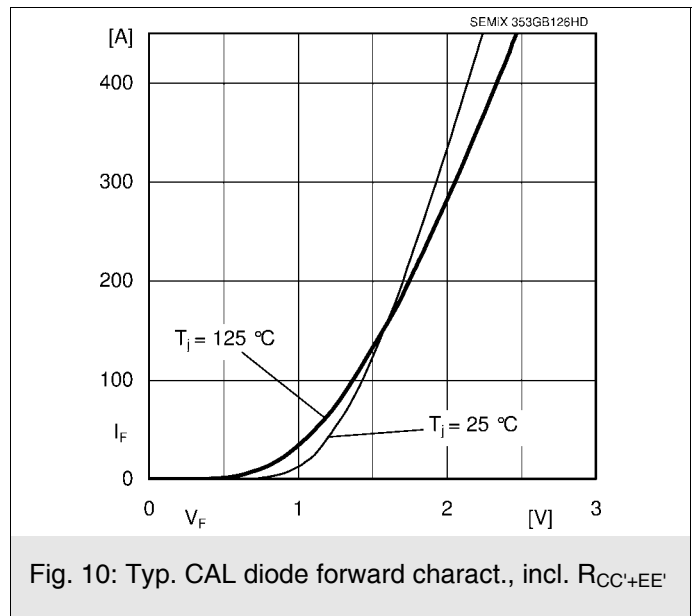
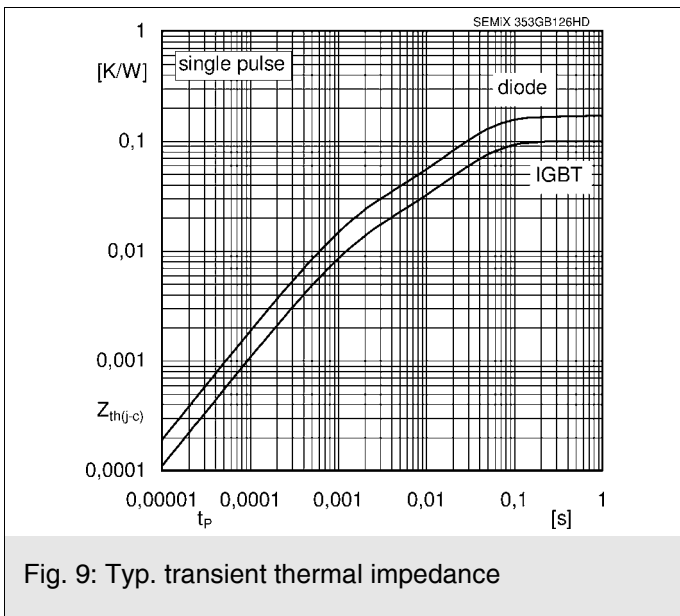
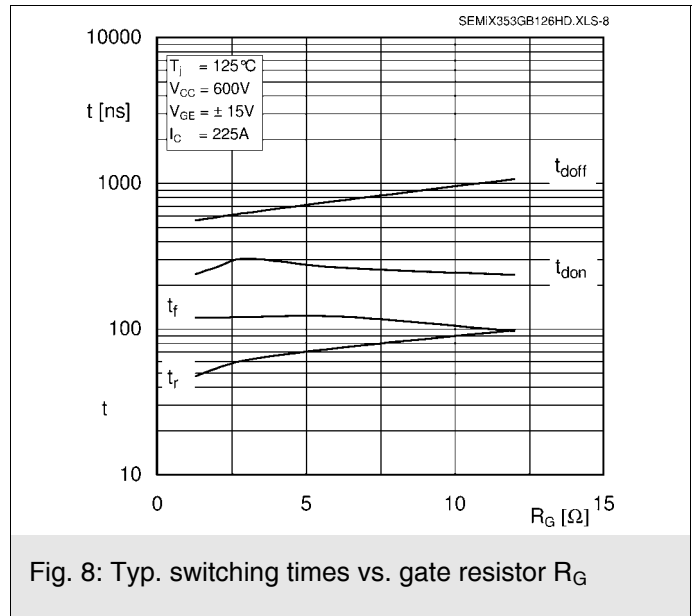
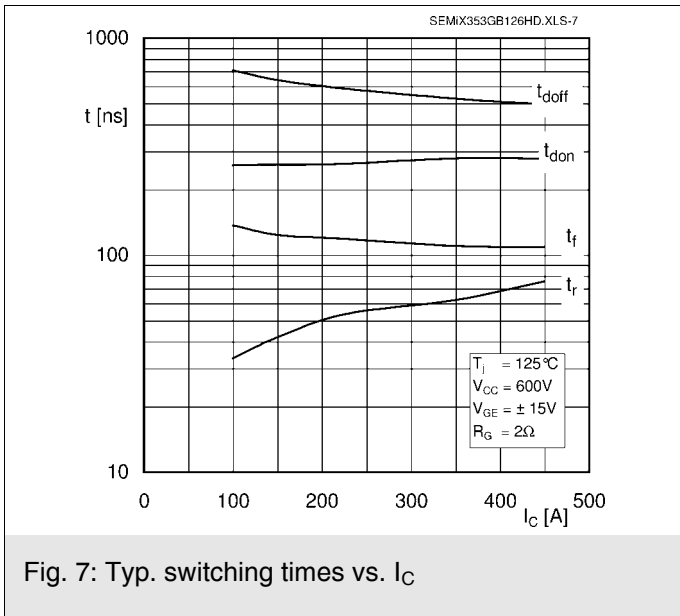


Fig. 6: Typ. gate charge characteristic

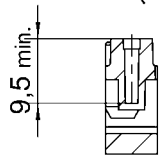


SEMiX353GB126HDs

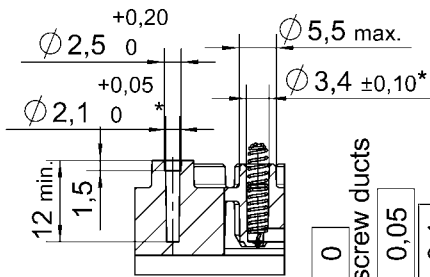
Case: SEMiX 3s

general tolerance ISO 2768-mK

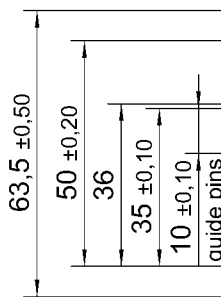
screw duct
(1x centre) :
H-H (1:1)



screw duct (6x)
spring duct (16x) :
A-A (1:1)

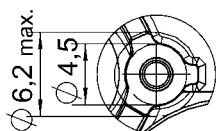


marking of terminals

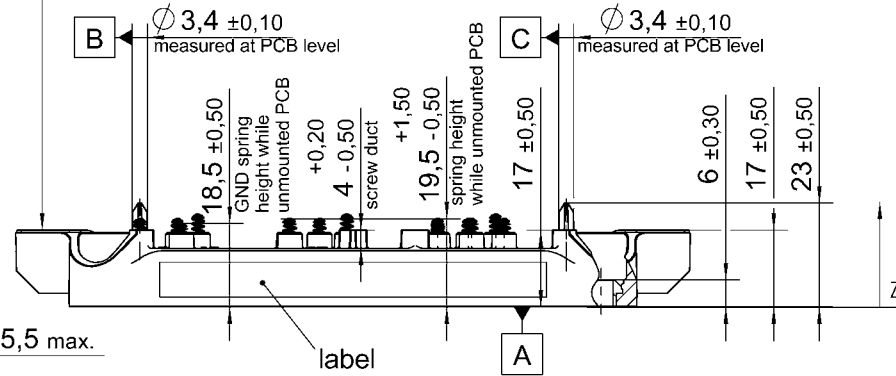


M6 -10 deep

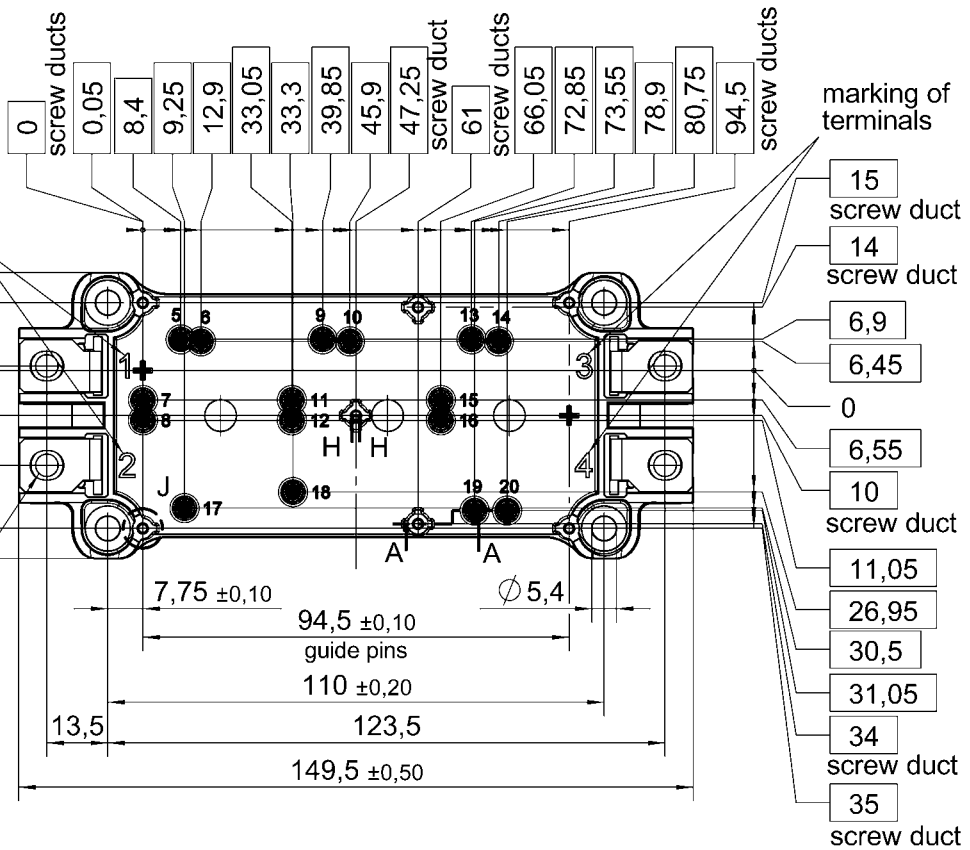
screw duct
top view (7x) :
J (2:1)



	0,3	connector 1-2 / 3-4
	0,2	each connector A



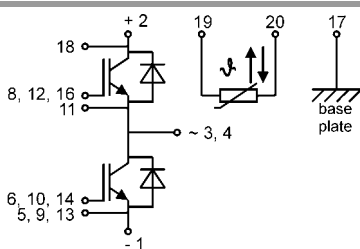
All measures in Z-direction
valid as mounted to heat sink



*screw ducts / spring ducts with $\phi \pm 0,2$ A B C

Rules for the contact PCB:
- holes guidepins = $\phi 4 \pm 0,1$ / position tolerance $\pm 0,1$
- spring landing pad = $\phi 3,5 \pm 0,2$ / position tolerance $\pm 0,2$

SEMiX 3s



spring configuration

SEMiX353GB126HDs

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.