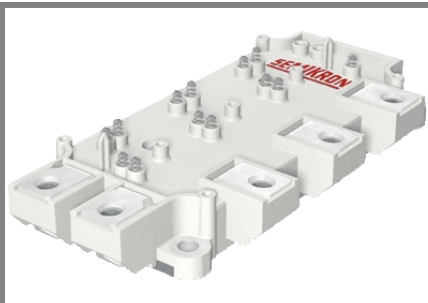


SEMiX 151GD066HDs



SEMiX® 13s

Trench IGBT Modules

SEMiX 151GD066HDs

Preliminary Data

Features

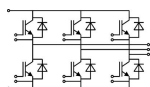
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient

Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

- Case temperature limited to $T_C=125^\circ\text{C}$ max.
- Product reliability results are valid for $T_j=150^\circ\text{C}$
- use of soft RG necessary
- take care of over-voltage caused by stray inductance

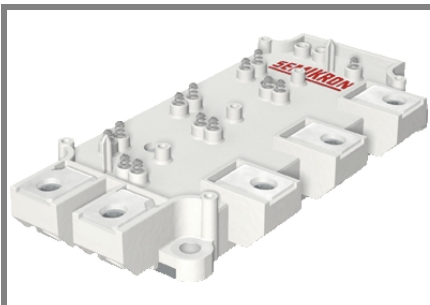


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Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	600		V
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	150	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	300		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 360\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 600\text{ V}$	6		μs
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	220	A
		$T_c = 80^\circ\text{C}$	160	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	300		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 25^\circ\text{C}$	980	A
Module				
$I_{t(RMS)}$		600		A
T_{vj}		- 40 ... + 175 (125)		$^\circ\text{C}$
T_{stg}		- 40 ... + 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2,4\text{ mA}$	5,8			V	
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$			0,45	mA	
V_{CE0}		$T_j = 25^\circ\text{C}$	0,9	1	V	
		$T_j = 150^\circ\text{C}$	0,85	0,9	V	
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	3,7	6	$\text{m}\Omega$	
		$T_j = 150^\circ\text{C}$	5,7	8	$\text{m}\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,45	1,9	V	
		$T_j = 150^\circ\text{C}_{chiplev.}$	1,7	2,1	V	
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$			9,2	nF	
C_{oes}				0,6	nF	
C_{res}				0,28	nF	
Q_G	$V_{GE} = -8 \dots +15\text{V}$			1200	nC	
$t_{d(on)}$	$R_{Gon} = 4,5\ \Omega$	$V_{CC} = 300\text{V}$ $I_{Cnom} = 150\text{A}$			140	ns
t_r					40	ns
E_{on}	$R_{Goff} = 4,5\ \Omega$	$T_j = 150^\circ\text{C}$			3,8	mJ
$t_{d(off)}$					385	ns
t_f					40	ns
E_{off}					6,1	mJ
$R_{th(j-c)}$	per IGBT			0,29	K/W	

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Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

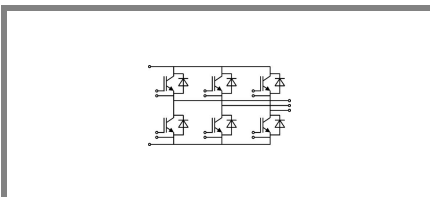
Remarks

- Case temperature limited to $T_C=125^\circ\text{C}$ max.
- Product reliability results are valid for $T_j=150^\circ\text{C}$
- use of soft RG necessary
- take care of over-voltage caused by stray inductance

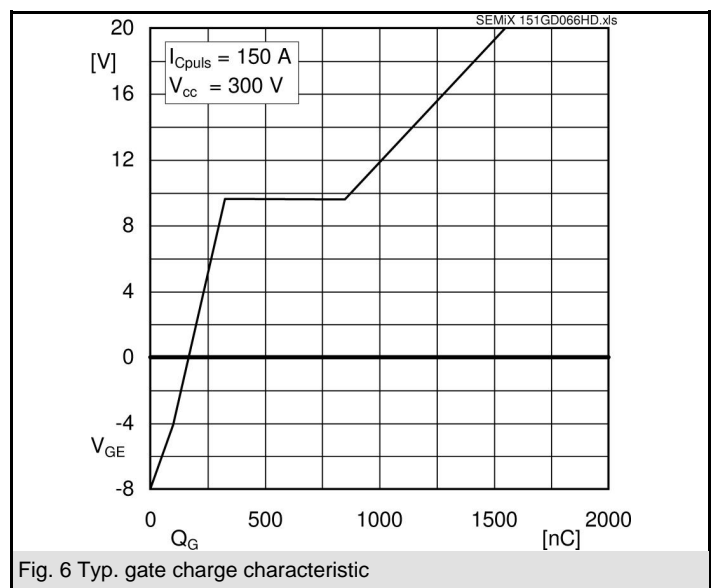
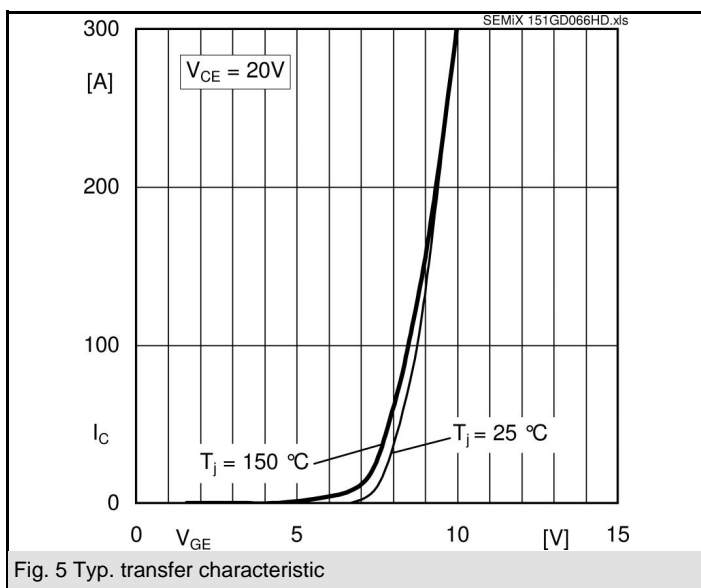
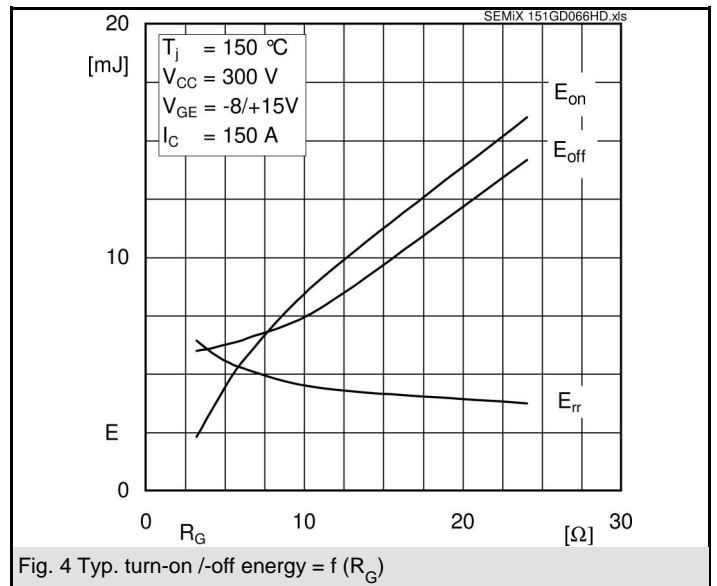
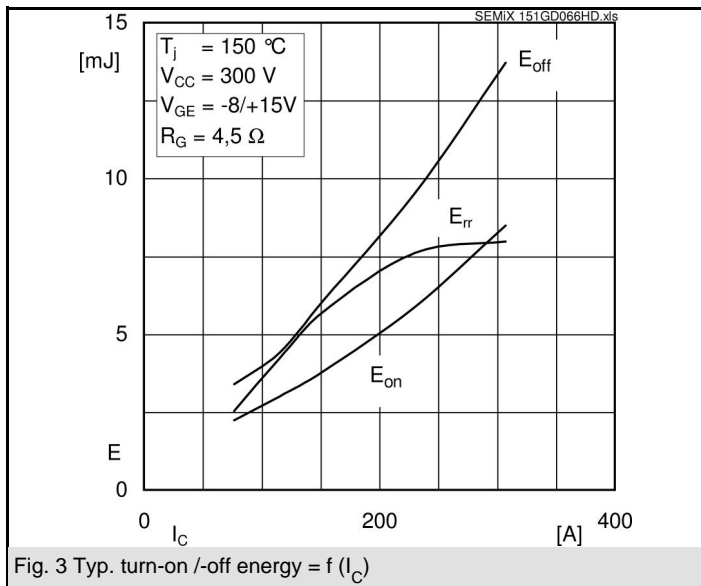
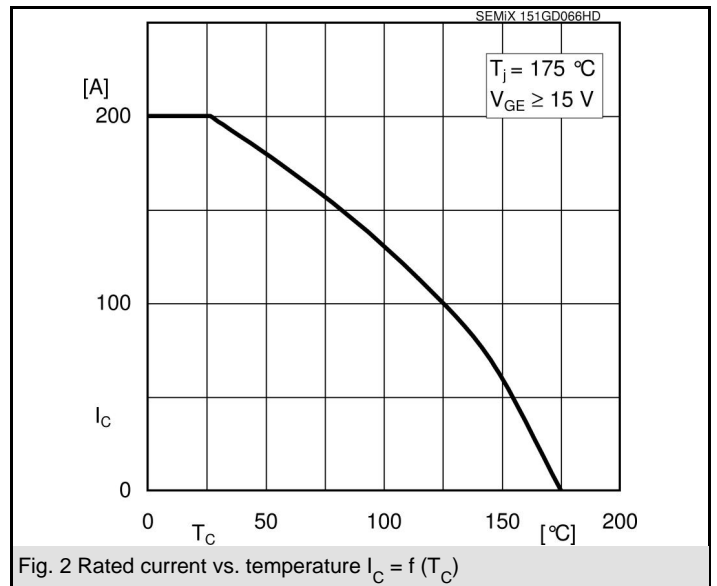
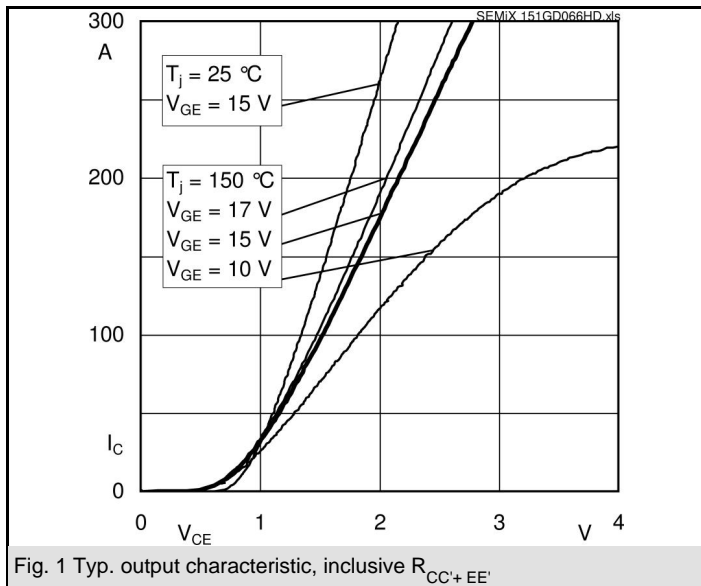
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150\text{ A}; V_{GE} = 0\text{ V}$				
	$T_j = 25^\circ\text{C}_{chiplev.}$		1,4	1,6	V
	$T_j = 150^\circ\text{C}_{chiplev.}$		1,4	1,6	V
V_{F0}					
	$T_j = 25^\circ\text{C}$		1	1,1	V
	$T_j = 150^\circ\text{C}$		0,85	0,95	V
r_F					
	$T_j = 25^\circ\text{C}$		2,7	3,5	mΩ
	$T_j = 150^\circ\text{C}$		3,7	4,5	mΩ
I_{RRM}	$I_{Fnom} = 150\text{ A}$		155		A
Q_{rr}	$di/dt = 3000\text{ A}/\mu\text{s}$		24		μC
E_{rr}	$V_{GE} = -8\text{ V}; V_{CC} = 300\text{ V}$		5,8		mJ
$R_{th(j-c)D}$	per diode			0,36	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				350	g
Temperature sensor					
R_{100}	$T_c = 100^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$ $T[\text{K}]; B$		3550±2%		K

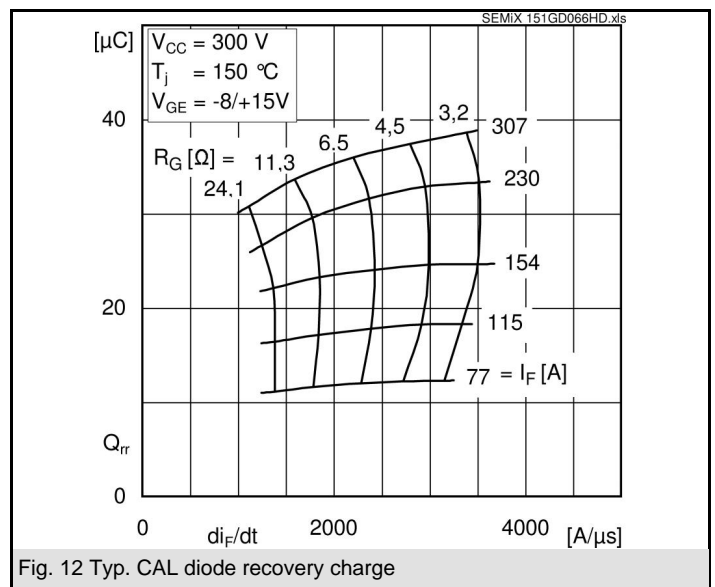
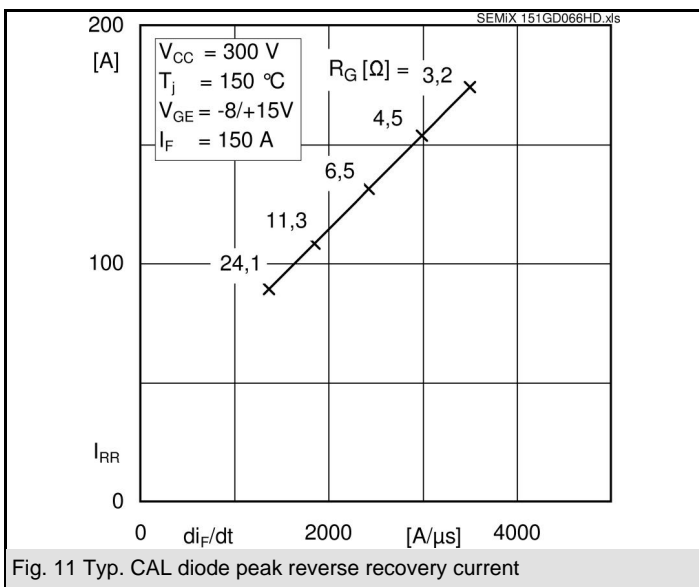
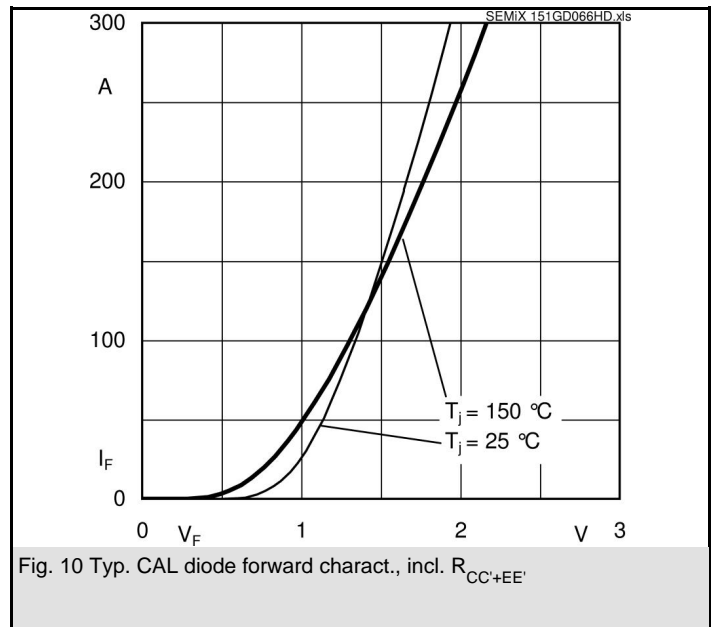
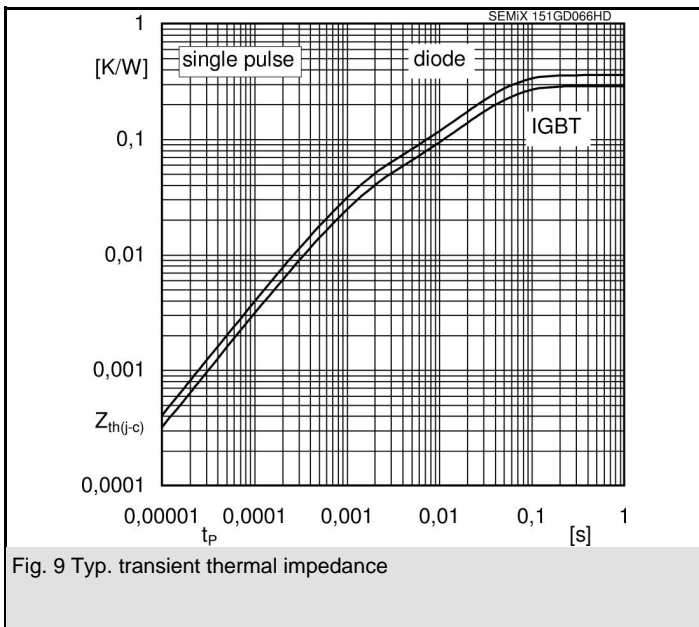
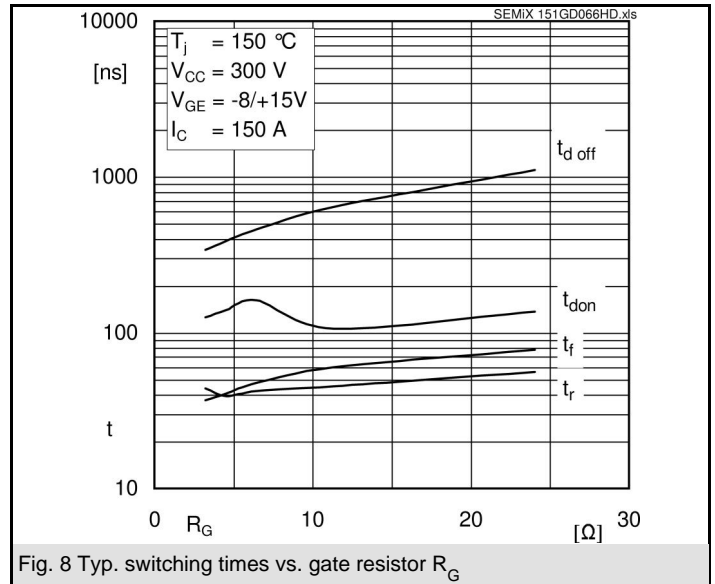
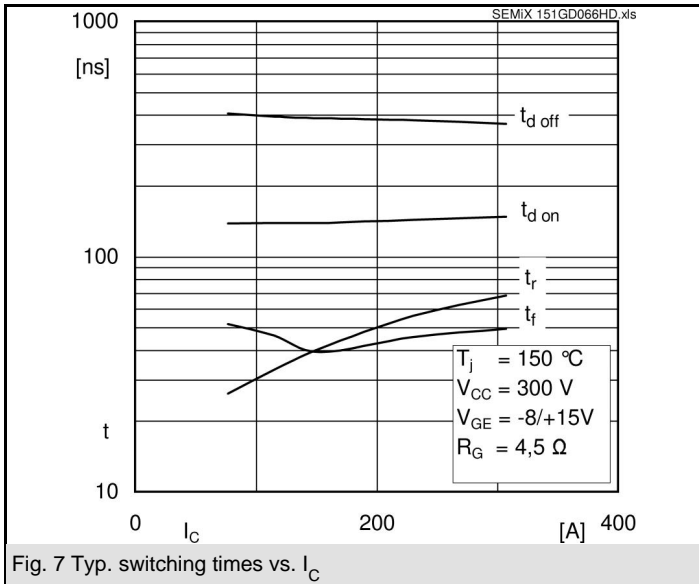
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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



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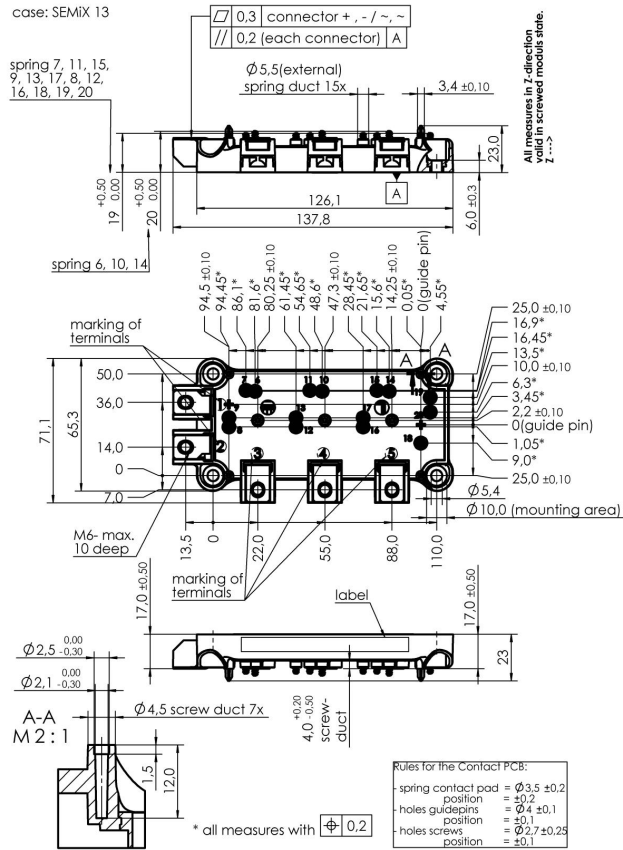




SEMiX 151GD066HDs

UL Recognized
File no. E 63 532

Dimensions in mm



Case SEMiX 13s

