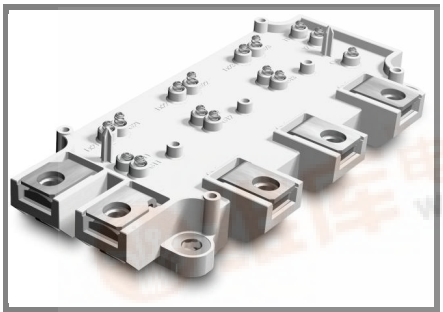
SEMiX 201GD066HDs



SEMiX® 13s

Trench IGBT Modules

SEMiX 201GD066HDs

Target Data

Features

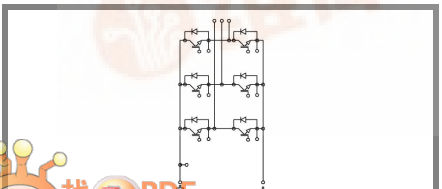
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient

Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

- Case temperatur limited to T_C=125°C max.
- Product reliability results are valid for T_j=150°C
- SC data: $t_p \leq 6$ µs; $V_{GE} \leq 15$ V; T_j = 150°C; V_{CC} = 360 V



SD

Absolute Maximum Ratings T_{case} = 25°C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	T_c = 25 (80) °C, T_j = 150 °C	240 (170)	A
I_C	T_c = 25 (80) °C, T_j = 175 °C	270 (200)	A
I_{CRM}	t_p = 1 ms	400	A
V_{GES}		± 20	V
T_j, (T_{stg})		- 40 ... + 175 (125)	°C
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
I_F	T_c = 25 (80) °C, T_j = 150 °C	190 (130)	A
I_F	T_c = 25 (80) °C, T_j = 175 °C	210 (160)	A
I_{FRM}	t_p = 1 ms	400	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 25 °C	1300	A

Characteristics T_{case} = 25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6,4 mA		5,8		V
I_{CES}	V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25 () °C			0,4	mA
$V_{CE(TO)}$	T_j = 25 (150) °C		0,9 (0,85)	1 (0,9)	V
r_{CE}	V_{GE} = 15 V, T_j = 25 (150) °C		2,8 (4,3)	4,5 (6)	mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 A, V_{GE} = 15 V, T_j = 25 (150) °C, chip level		1,45 (1,7)	1,9 (2,1)	V
C_{ies}	under following conditions		12,3		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25 V, f = 1 MHz		0,77		nF
C_{res}			0,37		nF
L_{CE}			20		nH
$R_{CC'+EE'}$	terminal-chip, T_c= 25 (125) °C		0,7 (1)		mΩ
$t_{d(on)}/t_r$	V_{CC} = 300 V, I_{Cnom} = 200 A		180 / 55		ns
$t_{d(off)}/t_f$	V_{GE} = ±15V		500 / 52		ns
E_{on} (E_{off})	R_{Gon} = R_{Goff} = 3 Ω, T_j = 150 °C		5 (8)		mJ
Inverse diode					
V_F = V_{EC}	I_{Fnom} = 200 A; V_{GE} = 0 V; T_j = 25 (150) °C, chip level		1,4 (1,4)	1,6	V
$V_{(TO)}$	T_j = 25 (150) °C		1 (0,85)	1,1	V
r_T	T_j = 25 (150) °C		2 (2,8)	2,5	mΩ
I_{RRM}	I_{Fnom} = 200 A; T_j = 25 (150) °C		200		A
Q_{rr}	di/dt = 3900 A/µs		32		µC
E_{rr}	V_{GE} = -15 V		7,5		mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,225	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,35	K/W
$R_{th(j-c)FD}$	per FWD				K/W
$R_{th(c-s)}$	per module		0,04		K/W
Temperature sensor					
R_{25}	T_c = 25 °C		5 ±5%		kΩ
$B_{25/85}$	R_2=R_1exp[B(1/T_2-1/T_1)] ; T[K];B		3420		K
Mechanical data					
M_s/M_t	to heatsink (M5) / for terminals (M6)	3/2,5		5 /5	Nm
w			290		g

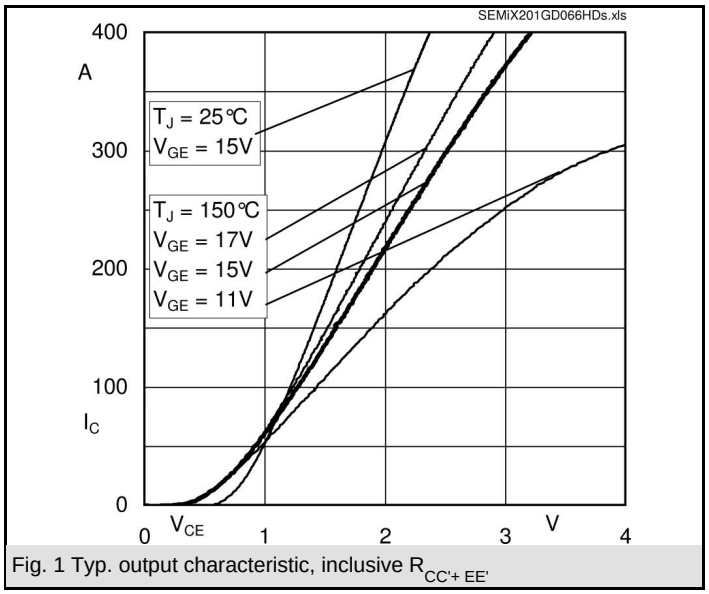


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+ EE'}$

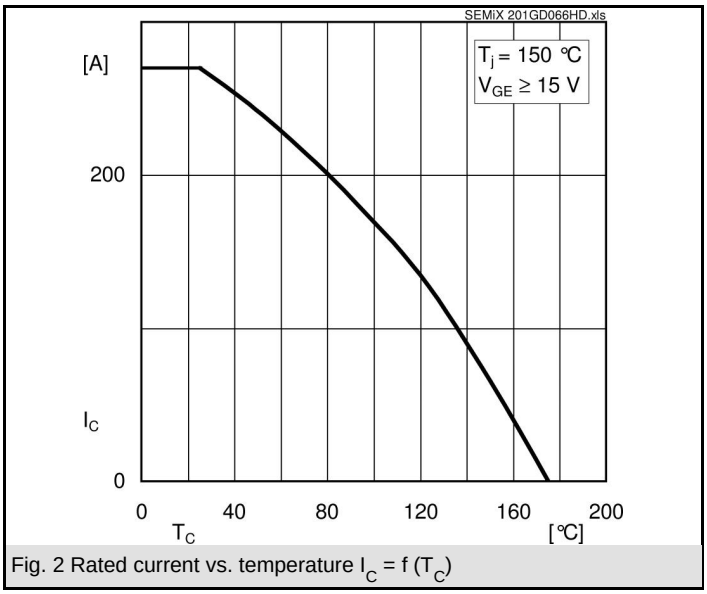


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

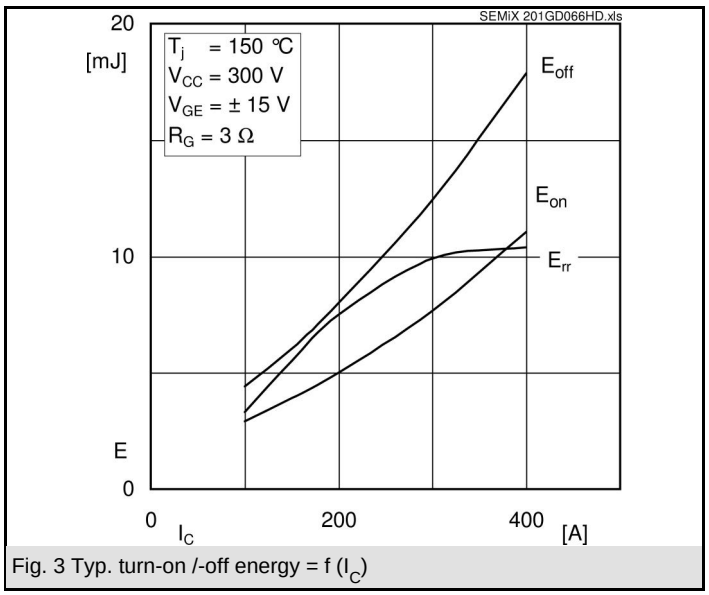


Fig. 3 Typ. turn-on /-off energy = f (I_C)

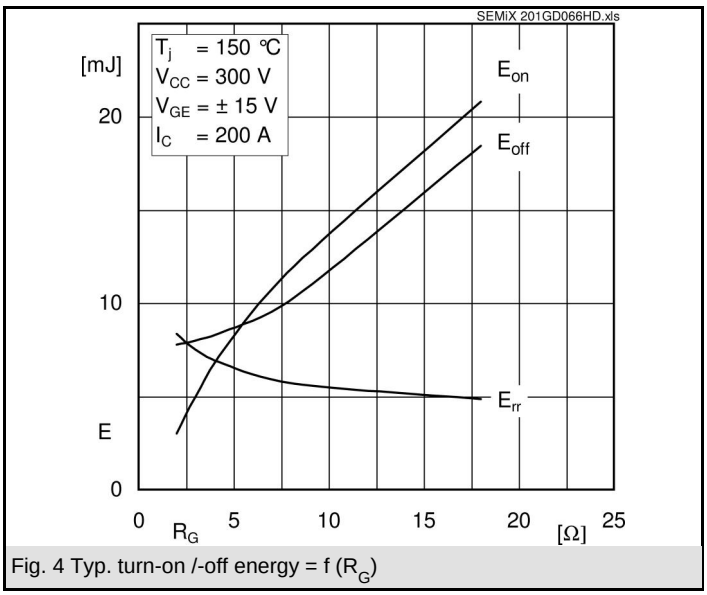


Fig. 4 Typ. turn-on /-off energy = f (R_G)

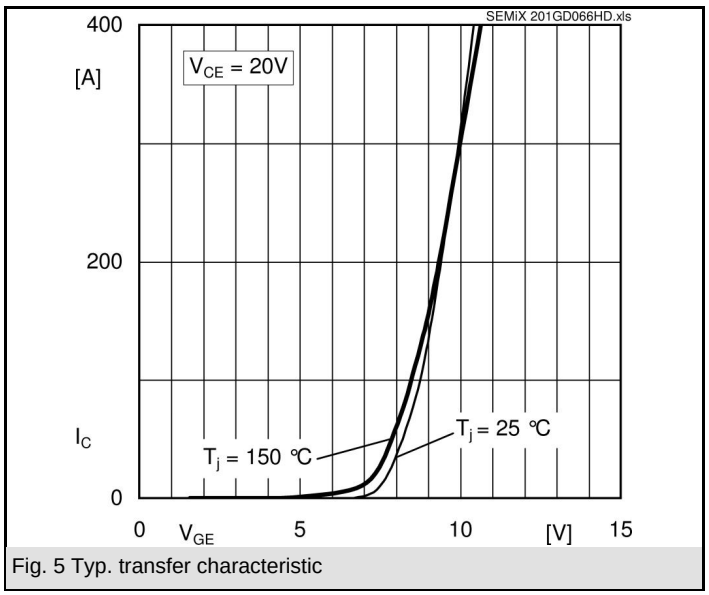


Fig. 5 Typ. transfer characteristic

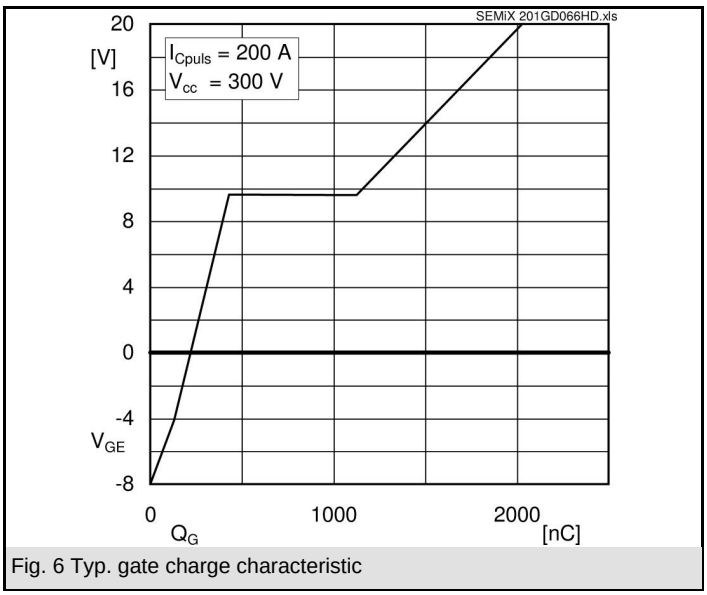


Fig. 6 Typ. gate charge characteristic

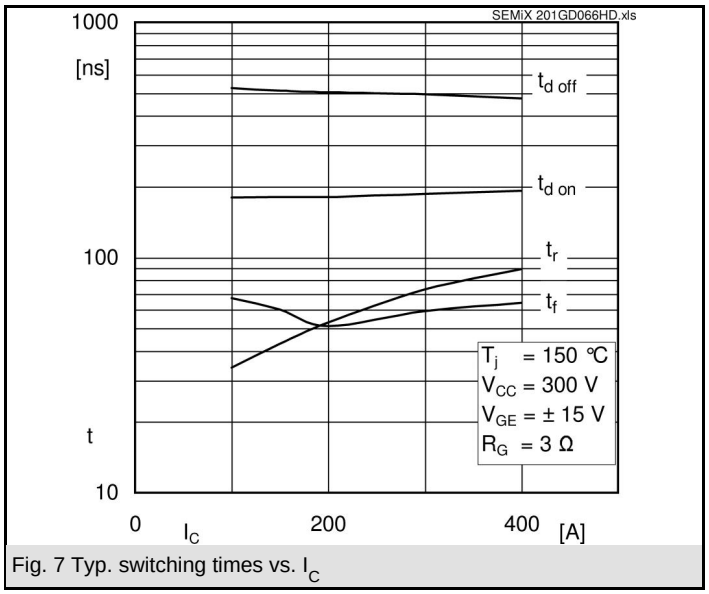


Fig. 7 Typ. switching times vs. I_C

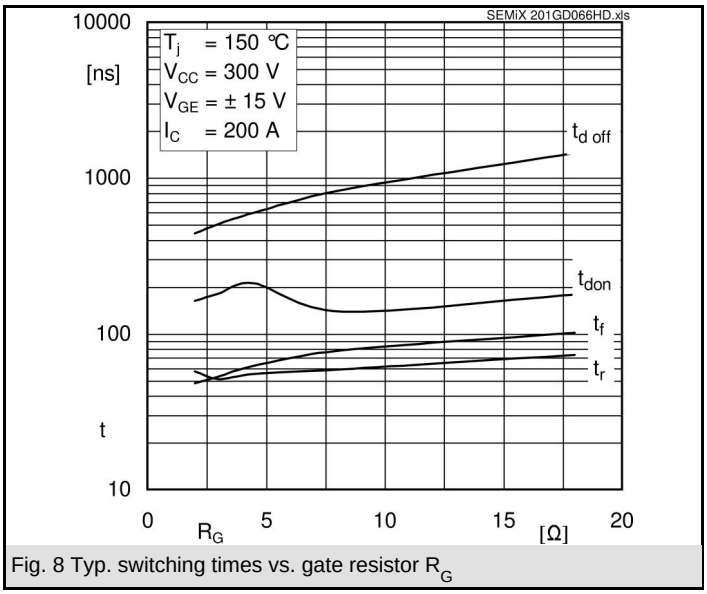


Fig. 8 Typ. switching times vs. gate resistor R_G

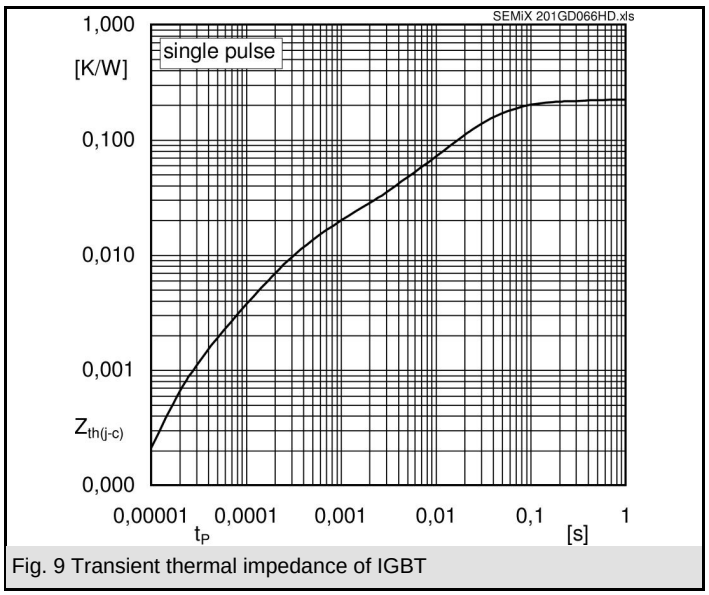


Fig. 9 Transient thermal impedance of IGBT

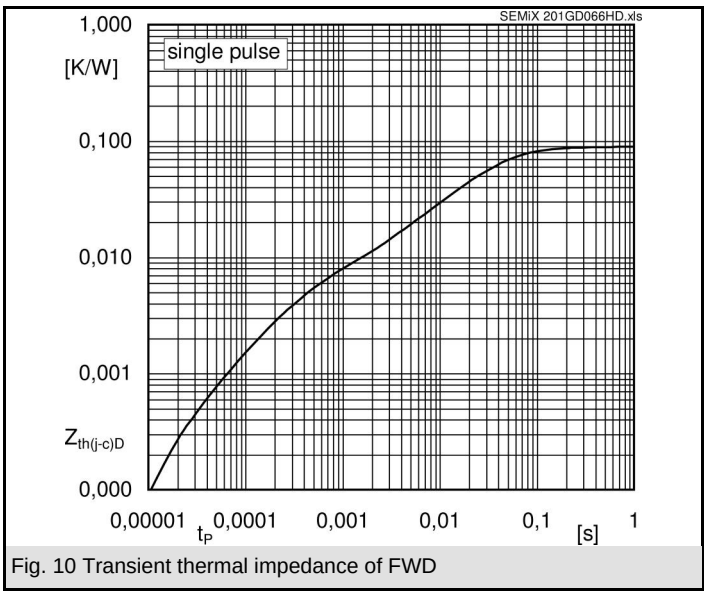


Fig. 10 Transient thermal impedance of FWD

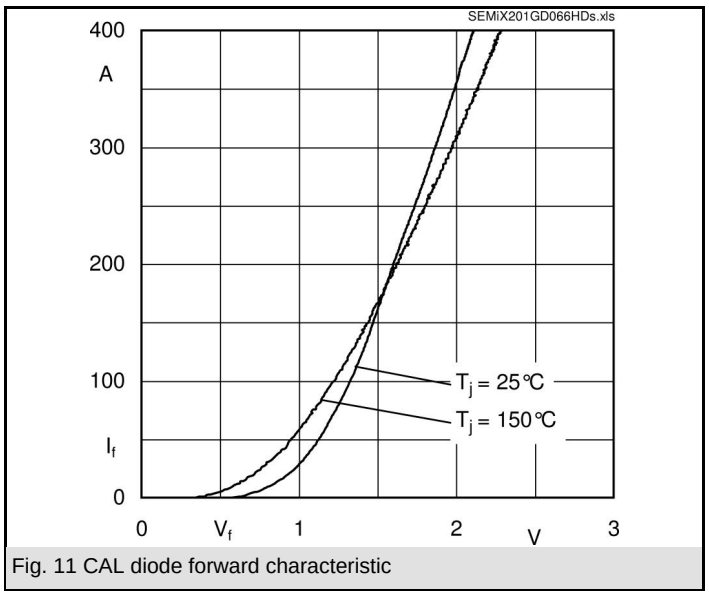


Fig. 11 CAL diode forward characteristic

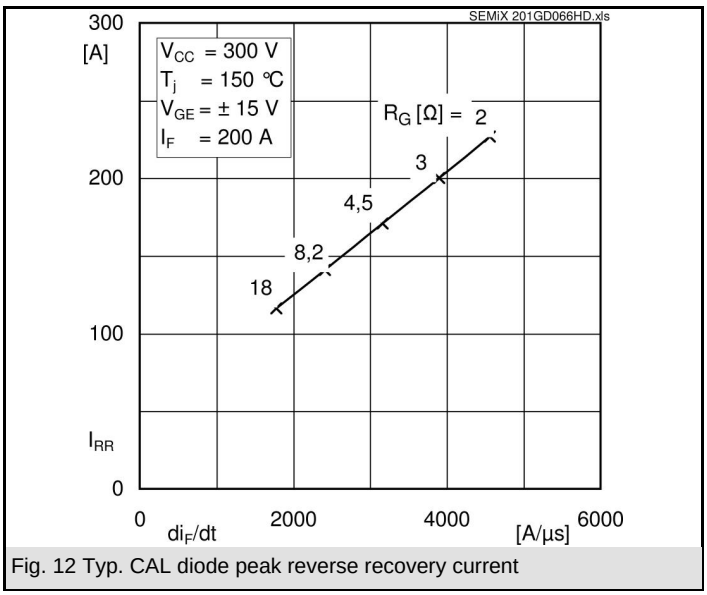


Fig. 12 Typ. CAL diode peak reverse recovery current

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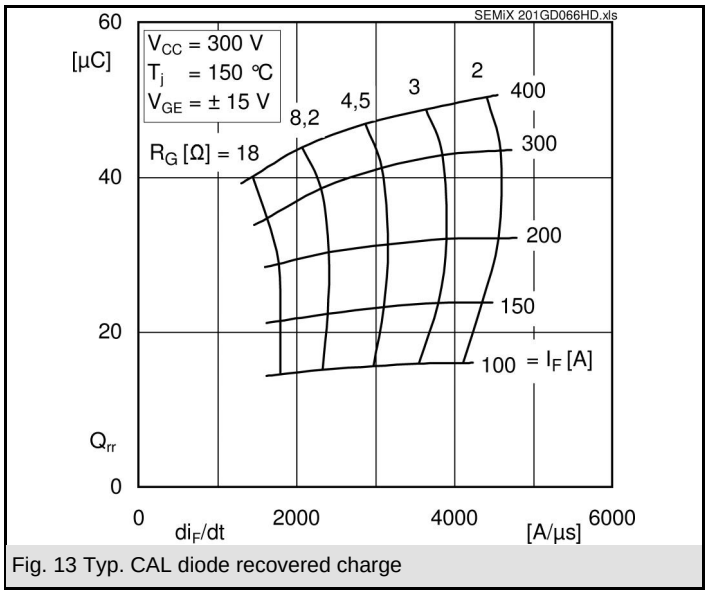
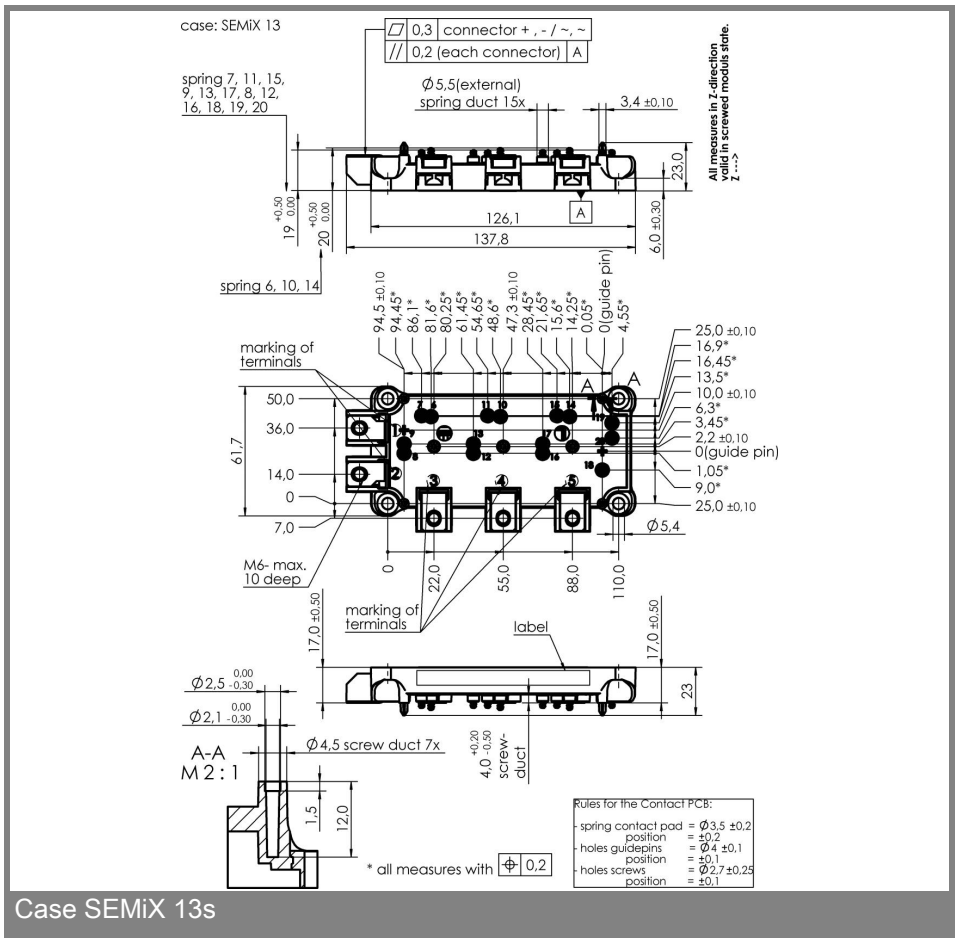
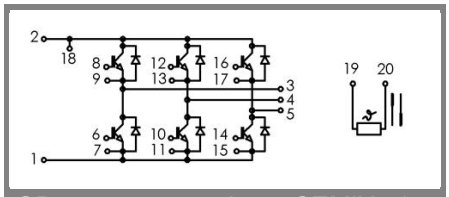


Fig. 13 Typ. CAL diode recovered charge



Case SEMiX 13s



GD pinout SEMiX 13s

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

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