

SKM 300GA128D



SEMITRANS® 4

SPT IGBT Modules

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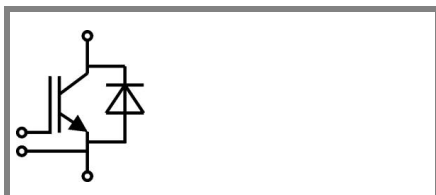
Preliminary Data

Features

- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders for f_{sw} up to 20 kHz



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Absolute Maximum Ratings		$T_{case} = 25^\circ C$, unless otherwise specified			
Symbol	Conditions	Values			Units
IGBT					
V_{CES}	$T_j = 25^\circ C$	1200			V
I_C	$T_j = 150^\circ C$	$T_c = 25^\circ C$	370		A
		$T_c = 80^\circ C$	260		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	400			A
V_{GES}		± 20			V
t_{psc}	$V_{CC} = 600 V$; $V_{GE} \leq 20 V$; $T_j = 125^\circ C$ $V_{CES} < 1200 V$	10			μs
Inverse Diode					
I_F	$T_j = 150^\circ C$	$T_c = 25^\circ C$	300		A
		$T_c = 125^\circ C$	210		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	400			A
I_{FSM}	$t_p = 10 ms$; sin.	$T_j = 150^\circ C$	2200		A
Module					
$I_{t(RMS)}$		500			A
T_{vj}		- 40...+ 150			$^\circ C$
T_{stg}		- 40...+ 125			$^\circ C$
V_{isol}	AC, 1 min.	4000			V

Characteristics		$T_{case} = 25^\circ C$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CES}$, $I_C = 8 mA$	4,5	5,5	6,5	V	
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$	$T_j = 25^\circ C$		0,2	0,6	mA
V_{CE0}		$T_j = 25^\circ C$		1	1,15	V
		$T_j = 125^\circ C$		0,9	1,05	V
r_{CE}	$V_{GE} = 15 V$	$T_j = 25^\circ C$		4,5	6	m Ω
		$T_j = 125^\circ C$		6	7,5	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 200 A$, $V_{GE} = 15 V$	$T_j = 25^\circ C_{chiplev.}$		1,9	2,35	V
		$T_j = 125^\circ C_{chiplev.}$		2,1	2,55	V
C_{res}	$V_{CE} = 25$, $V_{GE} = 0 V$			4,5		nF
C_{oes}				0,35		nF
C_{res}				0,2		nF
Q_G	$V_{GE} -8V / +20V$	2400			nC	
R_{Gint}	$T_j = ^\circ C$	1,25			Ω	
$t_{d(on)}$	$R_{Gon} = 5,1 \Omega$ $di/dt = 4900 A/\mu s$			80	ns	
t_r				60	ns	
E_{on}				22	mJ	
$t_{d(off)}$	$R_{Goff} = 5,1 \Omega$ $di/dt = 2500 A/\mu s$	$T_j = 125^\circ C$		520	ns	
		$V_{GE} = -15V$		65	ns	
t_f		$L_s = 20 nH$		21	mJ	
E_{off}						
$R_{th(j-c)}$	per IGBT	0,085			K/W	

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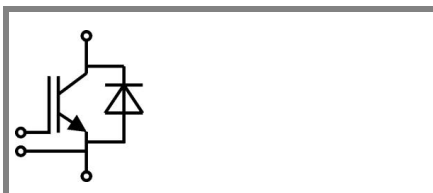
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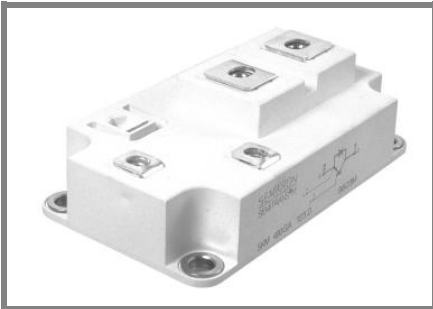
Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 25 \text{ }^\circ\text{C}$	1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$			V
r_F		$T_j = 25 \text{ }^\circ\text{C}$	4,5	6,5	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$			mΩ
I_{RRM}	$I_{Fnom} = 200 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	250		A
Q_{rr}	$di/dt = 5200 \text{ A}/\mu\text{s}$	$L_S = 20 \text{ nH}$	35		μC
E_{rr}	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$		16,5		mJ
$R_{th(j-c)D}$	per diode			0,15	K/W
Module					
L_{CE}			15	20	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = \text{ }^\circ\text{C}$	0,18		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M6 (M4)		2,5 (1,1)	5 (2)	Nm
w				330	g

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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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)}$			
$R_{\theta j-c}$	$i = 1$	1,25	mk/W
$R_{\theta j-c}$	$i = 2$		mk/W
$R_{\theta j-c}$	$i = 3$		mk/W
$R_{\theta j-c}$	$i = 4$		mk/W
$\tau_{\theta j-c}$	$i = 1$		s
$\tau_{\theta j-c}$	$i = 2$		s
$\tau_{\theta j-c}$	$i = 3$		s
$\tau_{\theta j-c}$	$i = 4$		s

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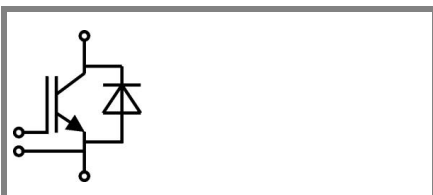
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Features

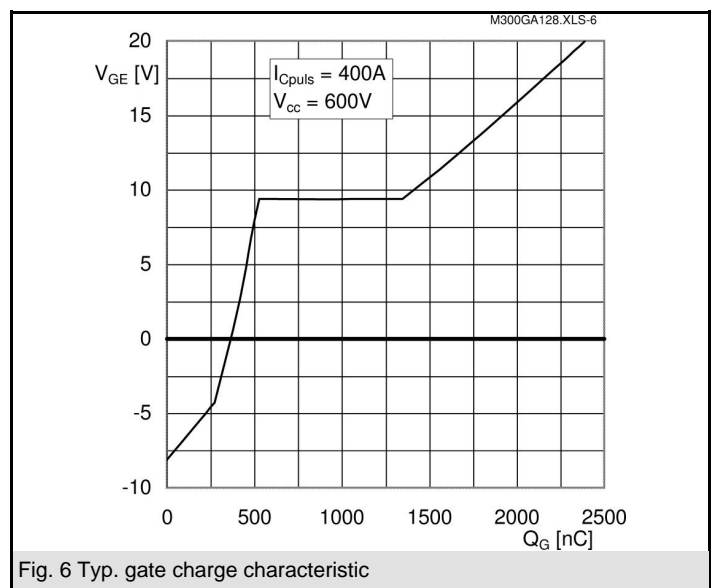
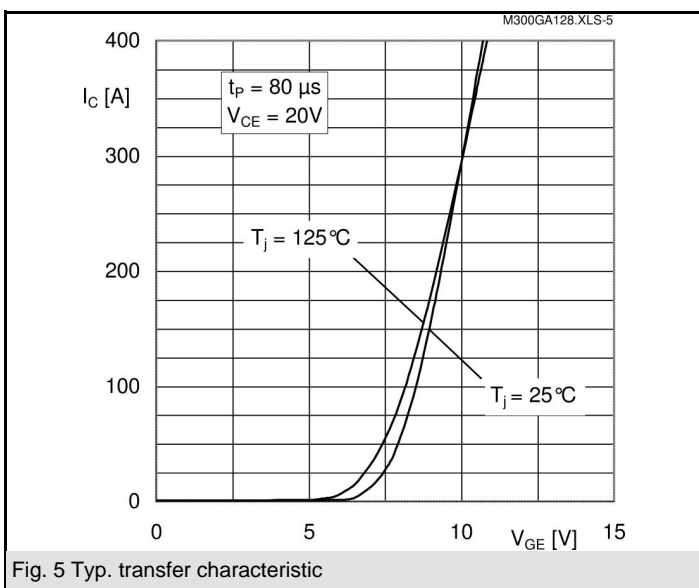
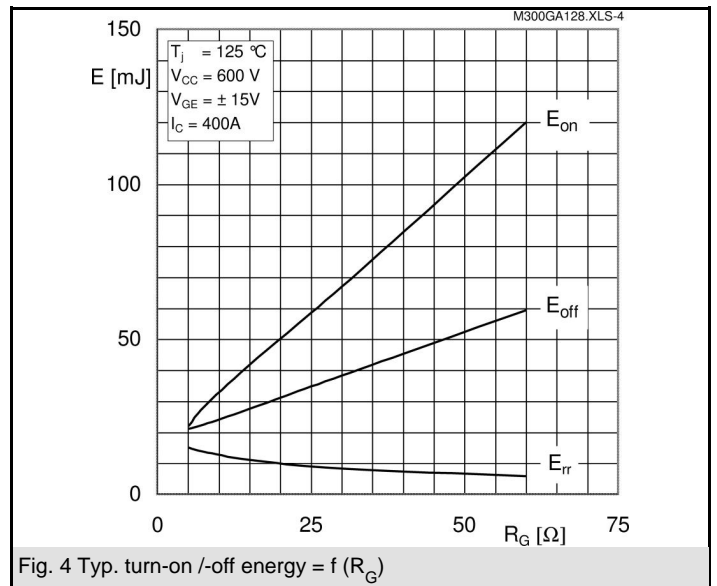
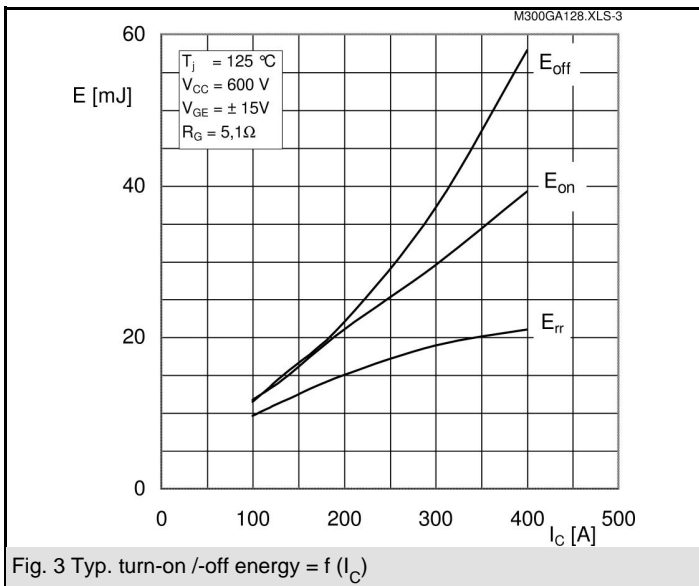
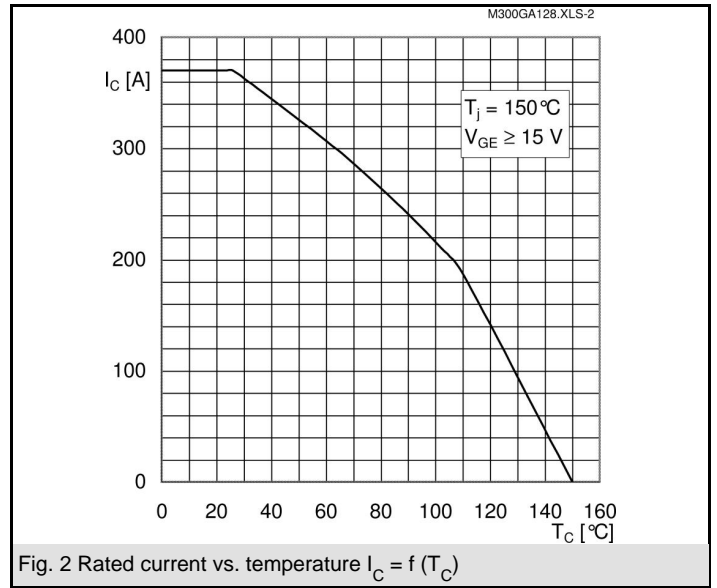
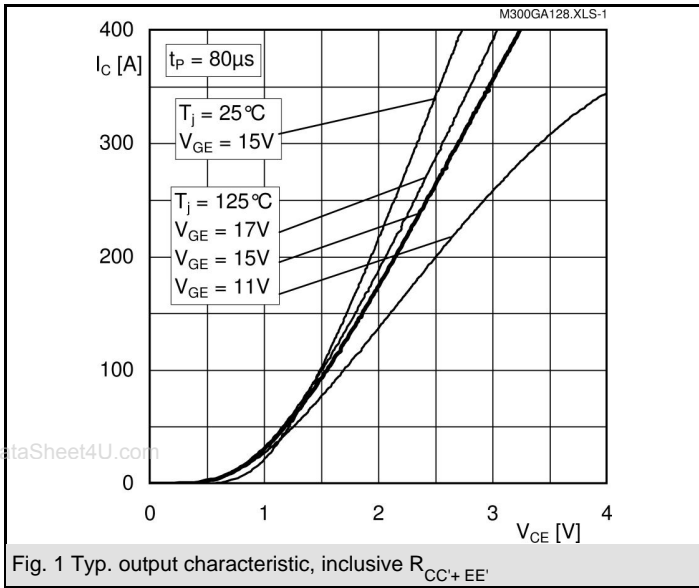
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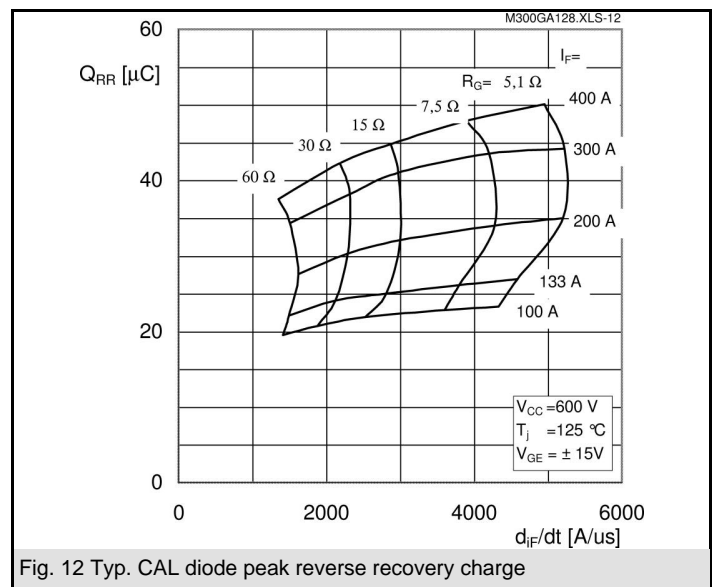
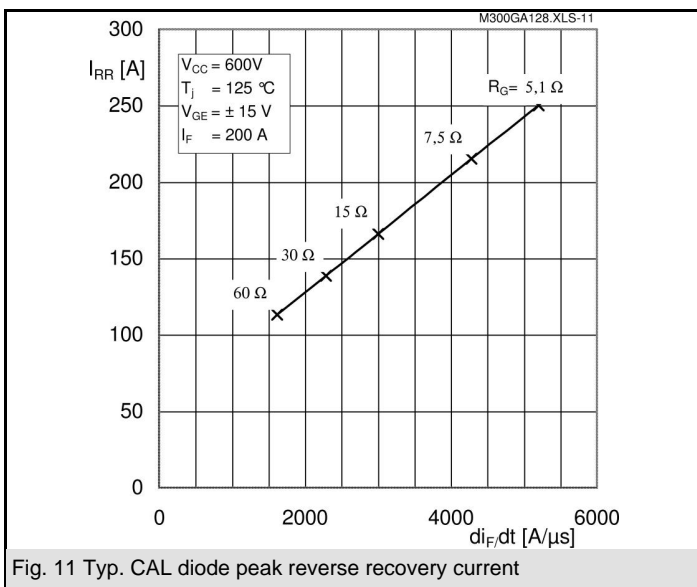
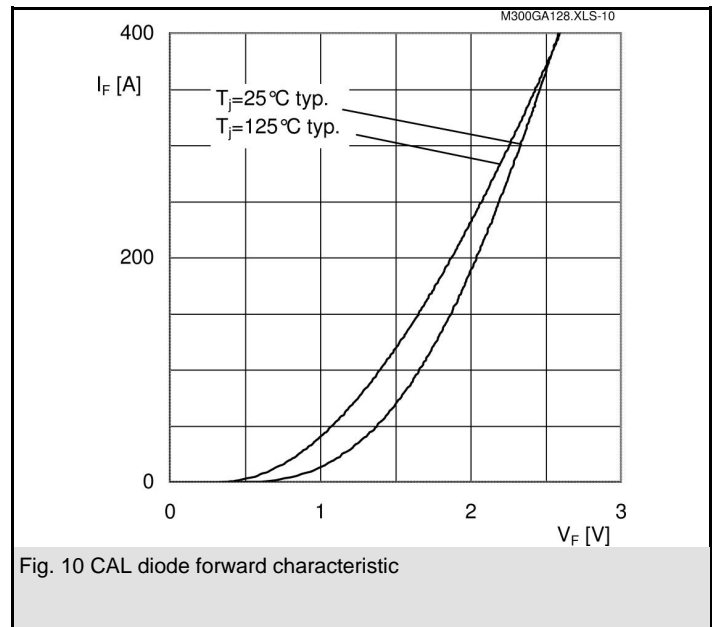
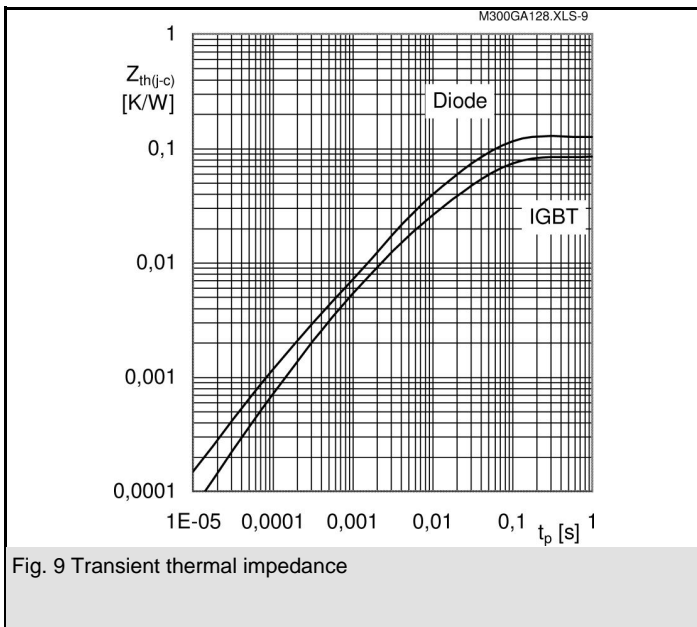
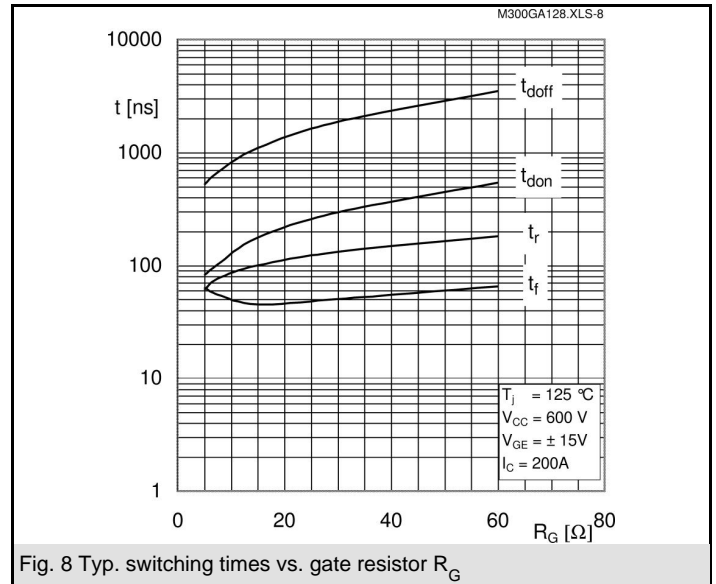
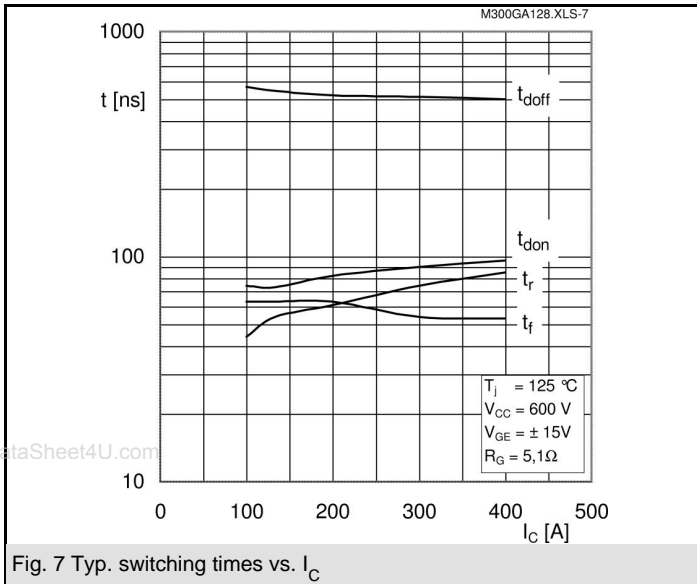
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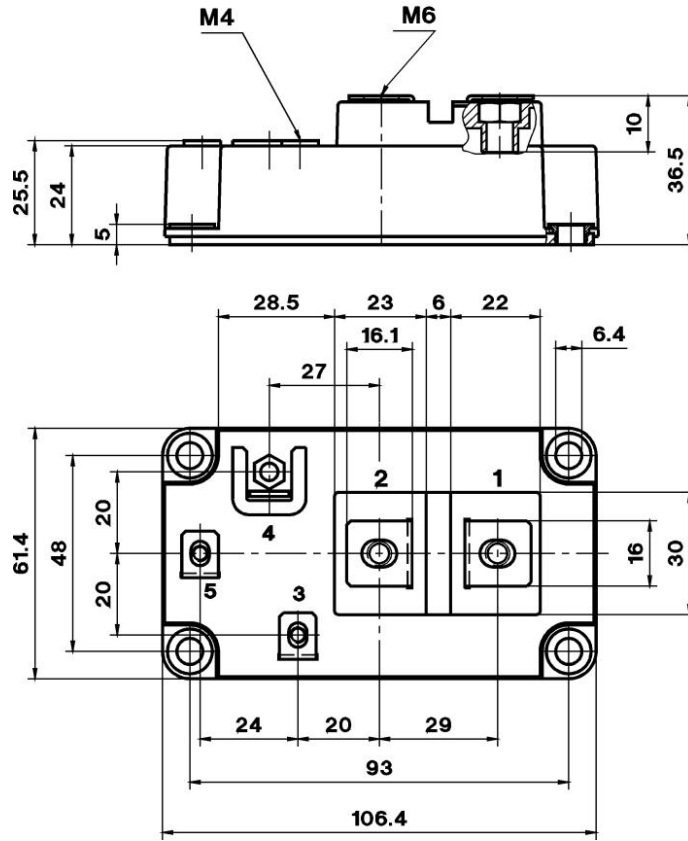


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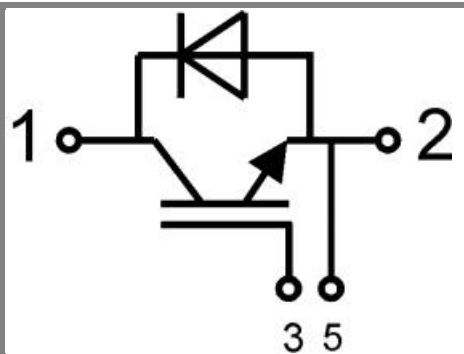
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