

# SKM 300GA128D



**SEMITRANS® 4**

## SPT IGBT Modules

**SKM 300GA128D**

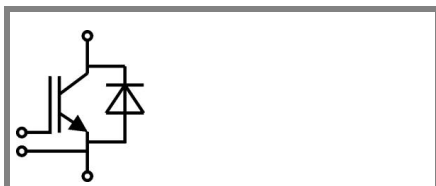
Preliminary Data

### 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		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	Values			Units
<b>IGBT</b>					
$V_{CES}$	$T_j = 25^\circ\text{C}$	1200			V
$I_C$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	370		A
		$T_c = 80^\circ\text{C}$	260		A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	400			A
$V_{GES}$		$\pm 20$			V
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10			$\mu\text{s}$
<b>Inverse Diode</b>					
$I_F$	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	300		A
		$T_c = 125^\circ\text{C}$	210		A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	400			A
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	2200		A
<b>Module</b>					
$I_{t(RMS)}$		500			A
$T_{vj}$		- 40...+ 150			$^\circ\text{C}$
$T_{stg}$		- 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
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 8\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0\text{ V}; V_{CE} = V_{CES}$		$T_j = 25^\circ\text{C}$ 0,2	$T_j = 125^\circ\text{C}$ 0,6	mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1		V
		$T_j = 125^\circ\text{C}$	0,9		V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	4,5		$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	6		$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}; V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,9		V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,1		V
$C_{ies}$	$V_{CE} = 25; V_{GE} = 0\text{ V}$	4,5			nF
$C_{oes}$		0,35			nF
$C_{res}$		0,2			nF
$Q_G$	$V_{GE} -8\text{V} / +20\text{V}$	2400			nC
$R_{Gint}$	$T_j = ^\circ\text{C}$	1,25			$\Omega$
$t_{d(on)}$	$R_{Gon} = 5,1\ \Omega$ $di/dt = 4900\text{ A}/\mu\text{s}$	80			ns
$t_r$		60			ns
$E_{on}$	$R_{Goff} = 5,1\ \Omega$ $di/dt = 2500\text{ A}/\mu\text{s}$	22			mJ
$t_{d(off)}$		520			ns
$t_f$	$V_{GE} = -15\text{V}$ $L_s = 20\text{ nH}$	65			ns
$E_{off}$		21			mJ
$R_{th(j-c)}$	per IGBT	0,085			K/W



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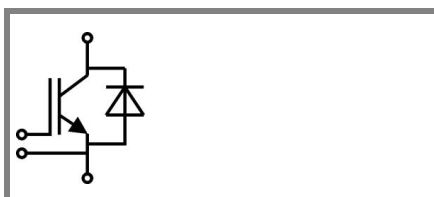
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### Features

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### Typical Applications

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### Characteristics

Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	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
<b>Module</b>					
$L_{CE}$			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

## SPT IGBT Modules

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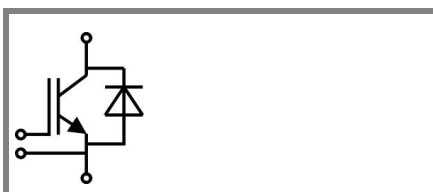
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#### Features

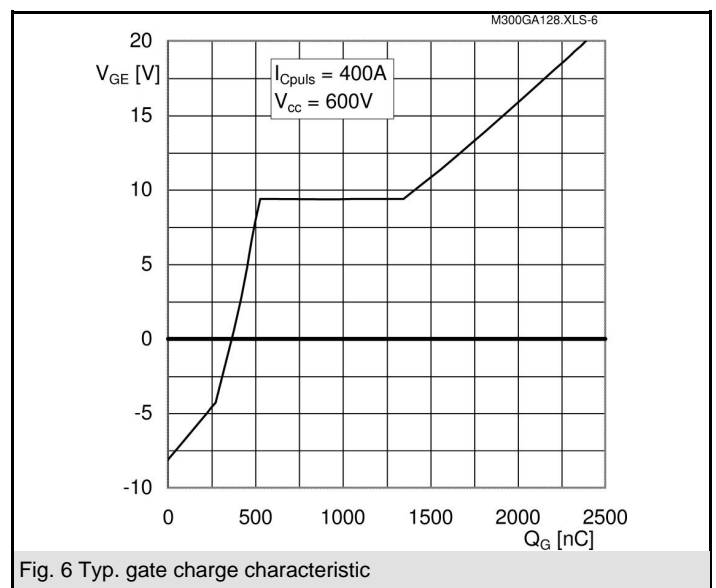
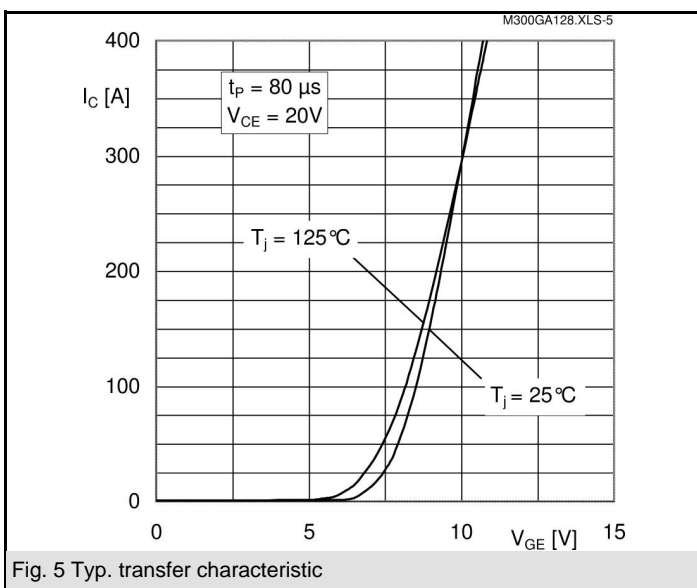
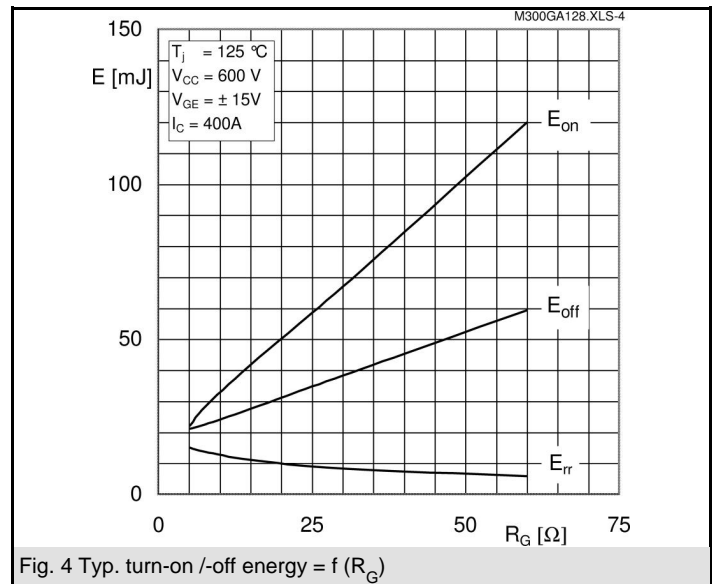
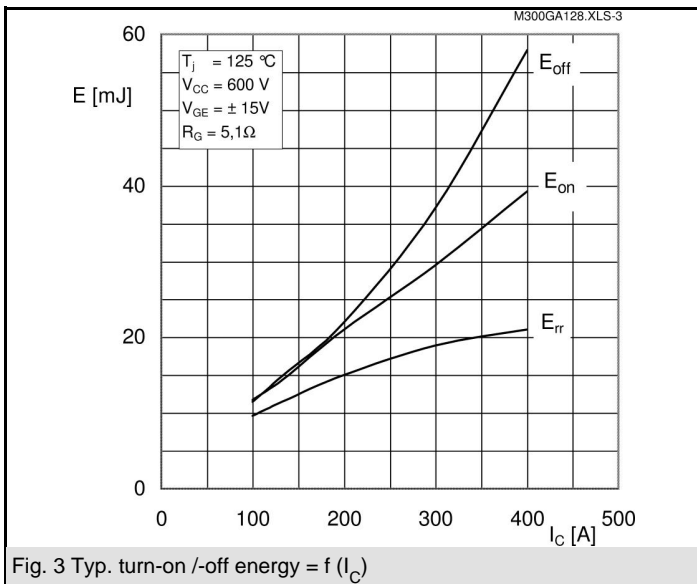
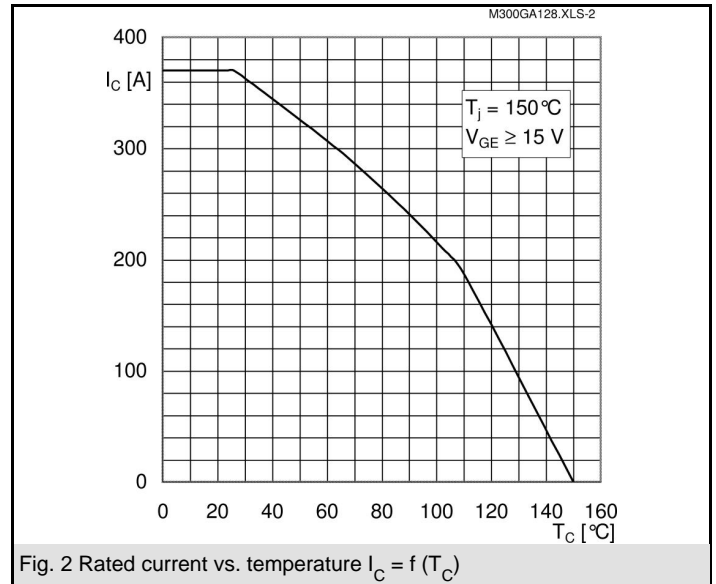
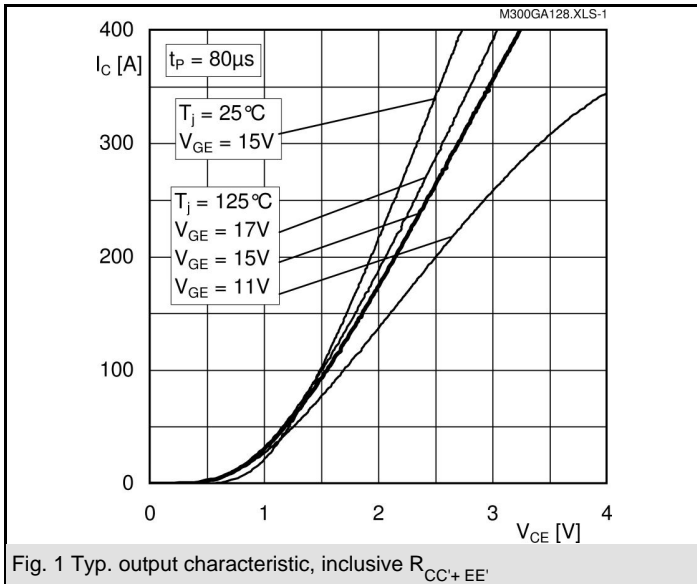
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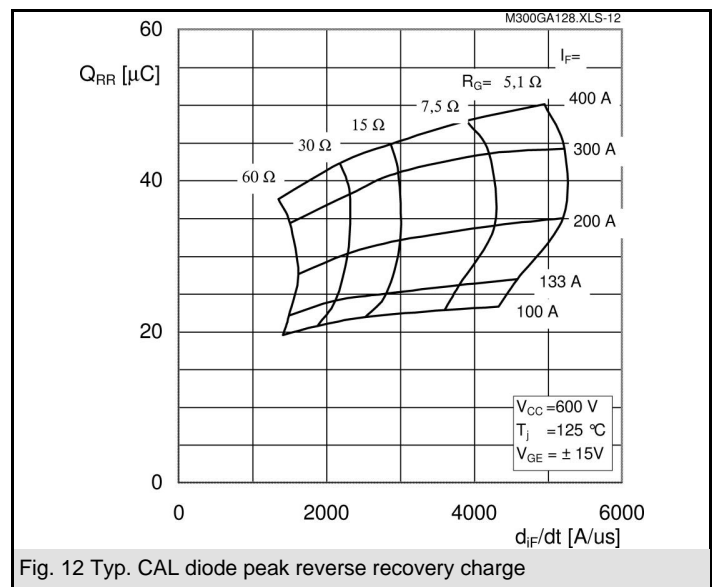
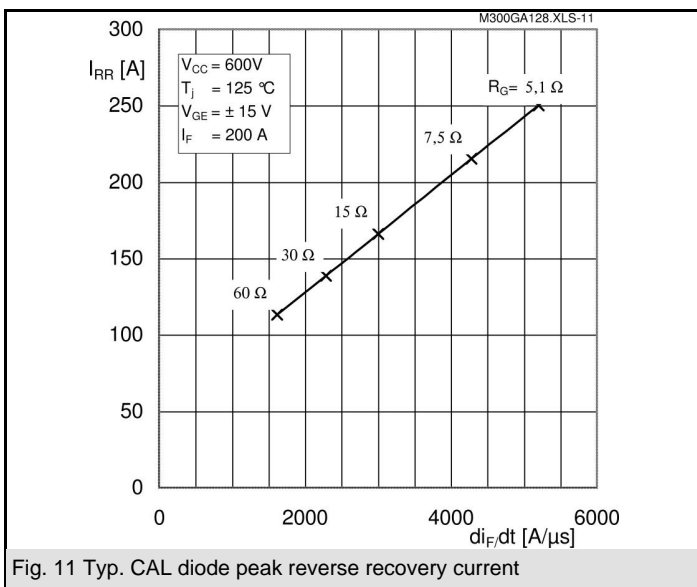
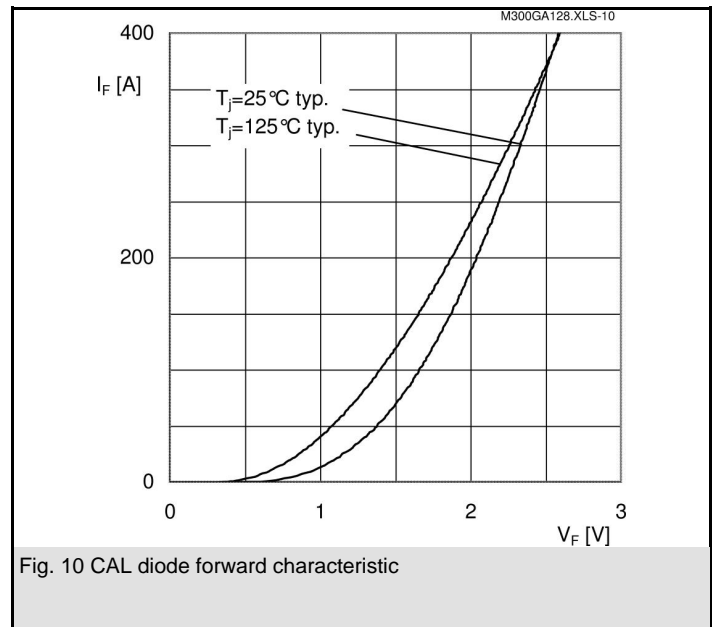
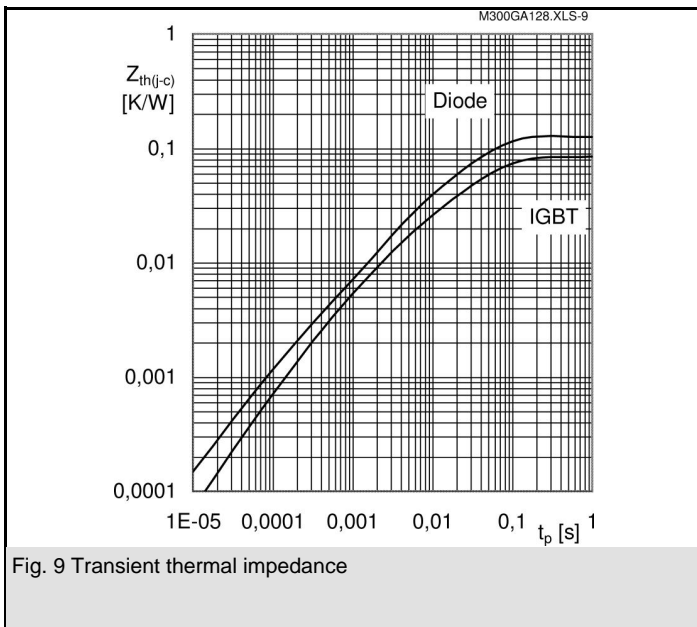
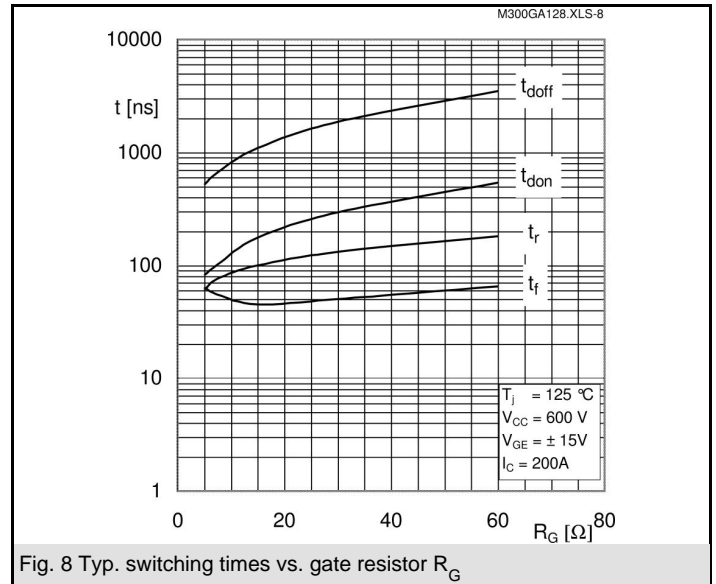
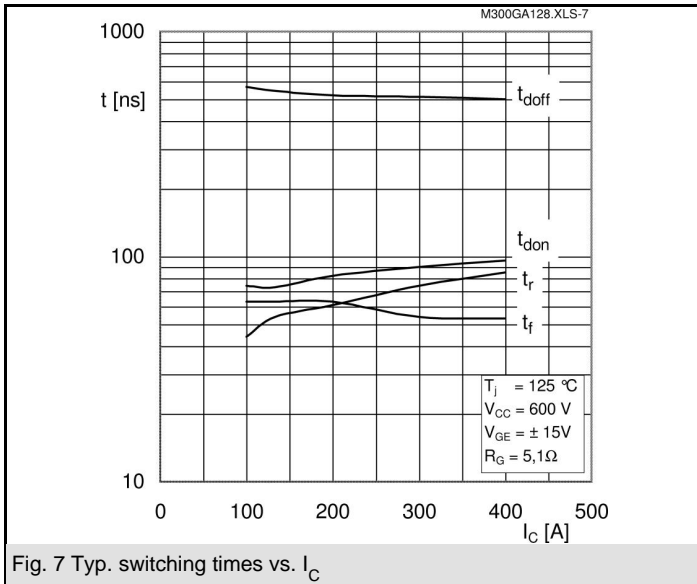
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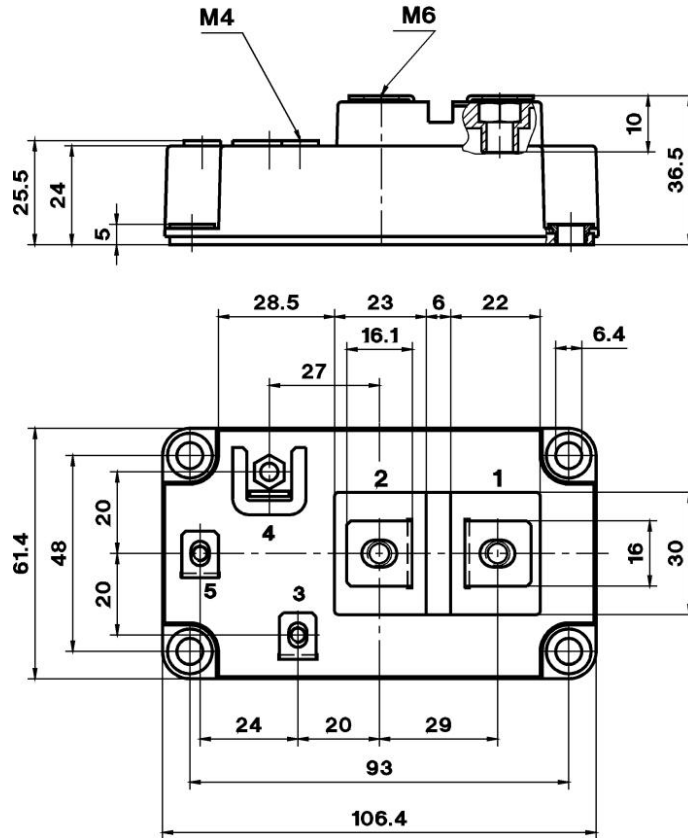


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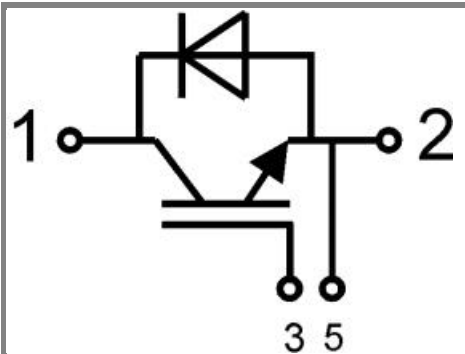
UL Recognized

CASED59

File no. E 63 532



Case D 59



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