

SKM 600GA125D



SEMITRANS® 4

Ultra Fast IGBT Modules

SKM 600GA125D

Features

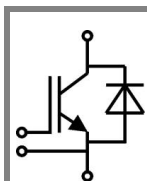
- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit self limiting to $6 \times I_C$
- Corresponds to standards: IEC 60721-3-3 (humidity) class 3K3/IEC 68T.1 climate 40/125/56

Typical Applications*

- Resonant inverters upto 100 kHz
- Inductive heating
- Electronic welders at $f_{SW} > 20$ kHz

Remarks

- $I_{DC} \leq 500A$ limited by terminals
- Take care of over-voltage caused by stray inductances.



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Absolute Maximum Ratings		$T_C = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	580	A
		$T_{case} = 80^\circ\text{C}$	400	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	800		A
V_{GES}		± 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		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	500	A
		$T_{case} = 80^\circ\text{C}$	350	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	800		A
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	3600	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40 ... + 150 (125)		$^\circ\text{C}$
T_{stg}		125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_C = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 16\text{ mA}$	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,15	0,45	mA
		$T_j = 125^\circ\text{C}$	1,5	1,75	V
V_{CE0}			1,7		V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	4,5	5,3	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	6		$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 400\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	3,3	3,85	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	4		V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	36		nF
C_{oes}			3,8		nF
C_{res}			3,5		nF
Q_G	$V_{GE} = -8\text{ V} - +20\text{ V}$	4400		nC	
R_{Gint}	$T_j = ^\circ\text{C}$	1,25		Ω	
$t_{d(on)}$	$R_{Gon} = 2,5\ \Omega$	$V_{CC} = 600\text{ V}$ $I_C = 400\text{ A}$	80		ns
t_r			70		ns
E_{on}			30		mJ
$t_{d(off)}$	$R_{Goff} = 2,5\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	570		ns
t_f			60		ns
E_{off}					mJ
$R_{th(j-c)}$	per IGBT	0,041		K/W	



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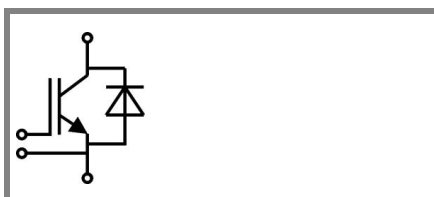
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- Take care of over-voltage caused by stray inductances.

Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400 A; V_{GE} = 0 V$		2	2,5	V
			1,8		V
			1,1	1,2	V
					V
r_F			2,3	3,3	mΩ
					mΩ
I_{RRM}	$I_F = 400 A$		460		A
Q_{rr}			65		μC
E_{rr}	$V_{GE} = 0 V; V_{CC} = 600 V$				mJ
$R_{th(j-c)D}$	per diode			0,09	K/W
Module					
L_{CE}			15	20	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = °C$	0,18		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink		3	5	Nm
M_t	to terminals		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.

* 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.



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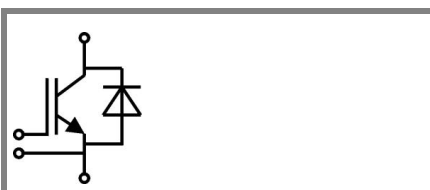
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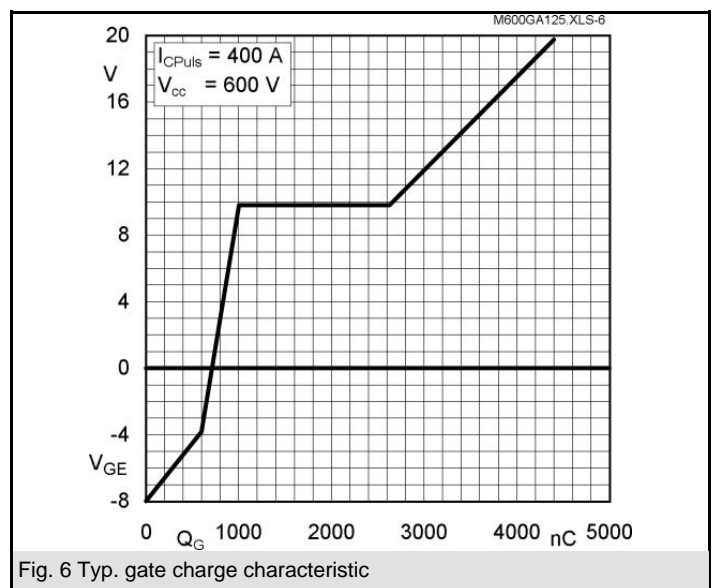
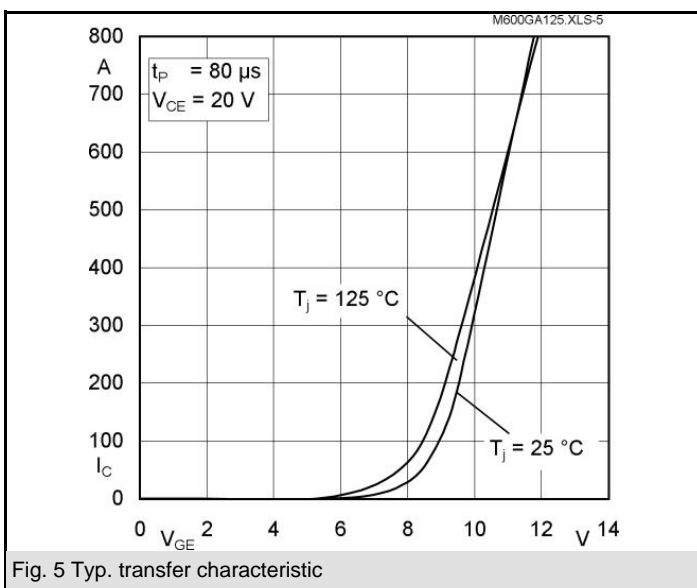
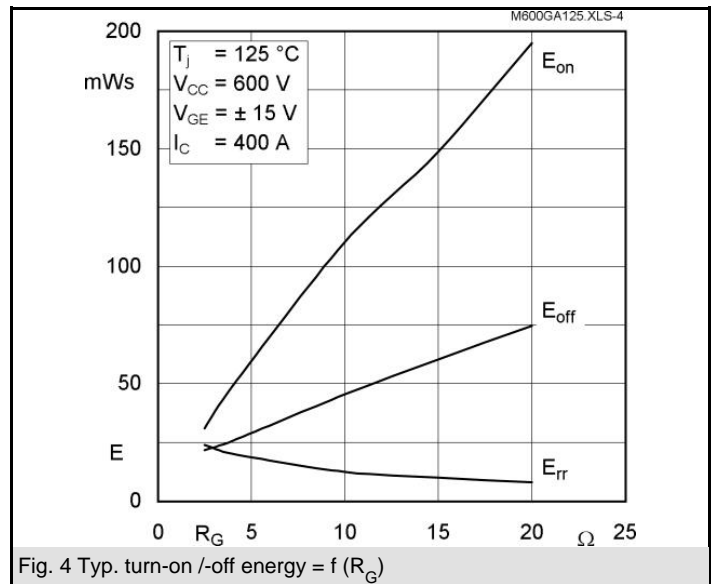
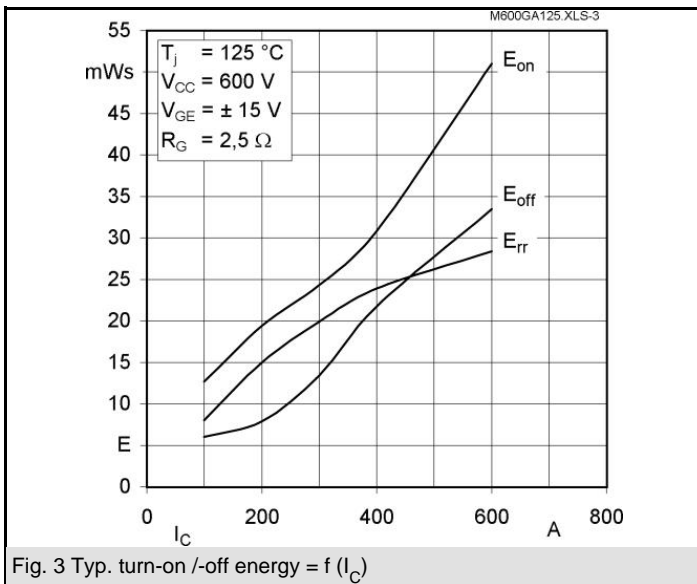
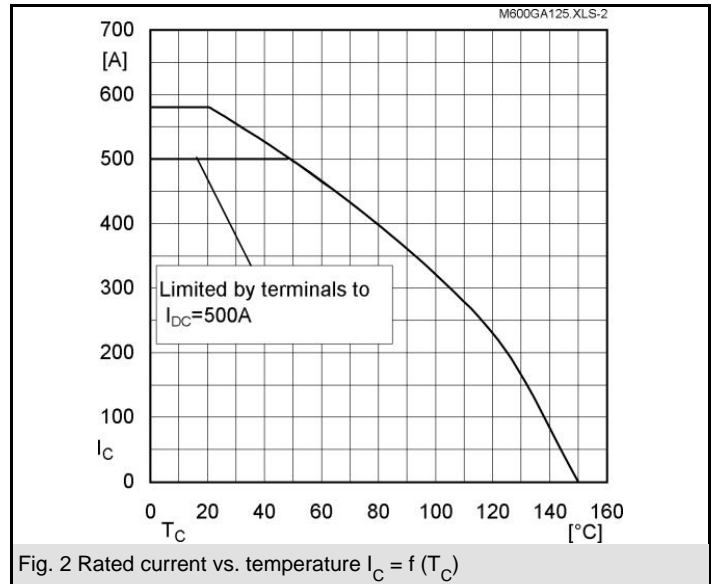
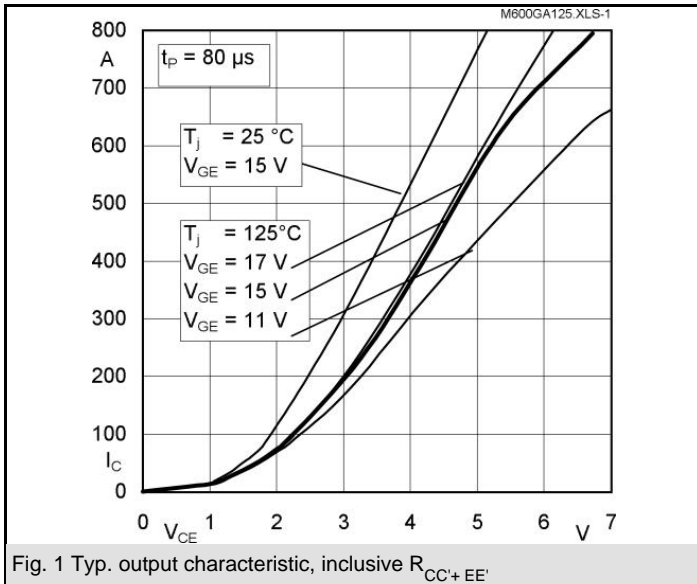
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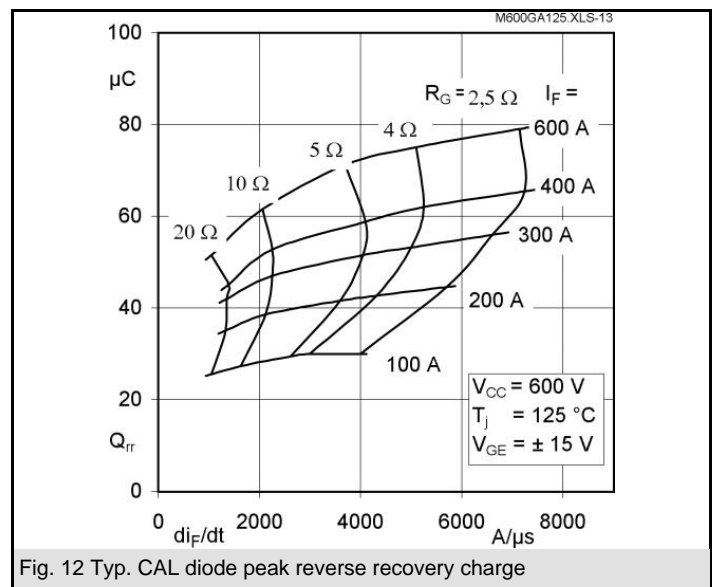
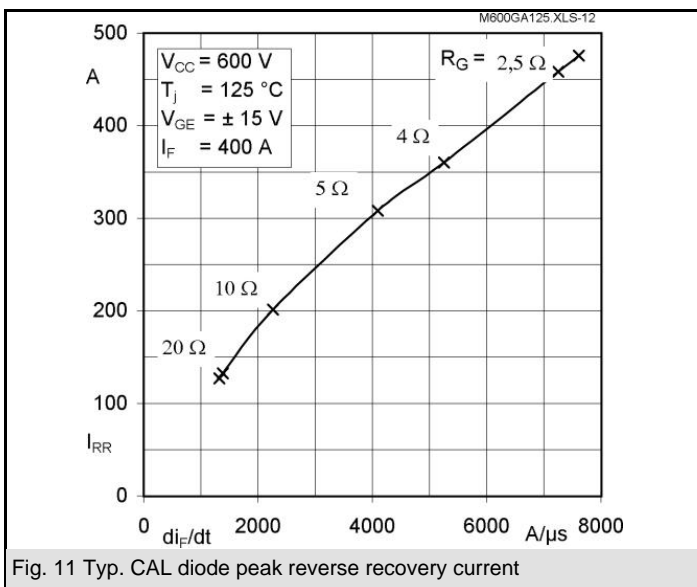
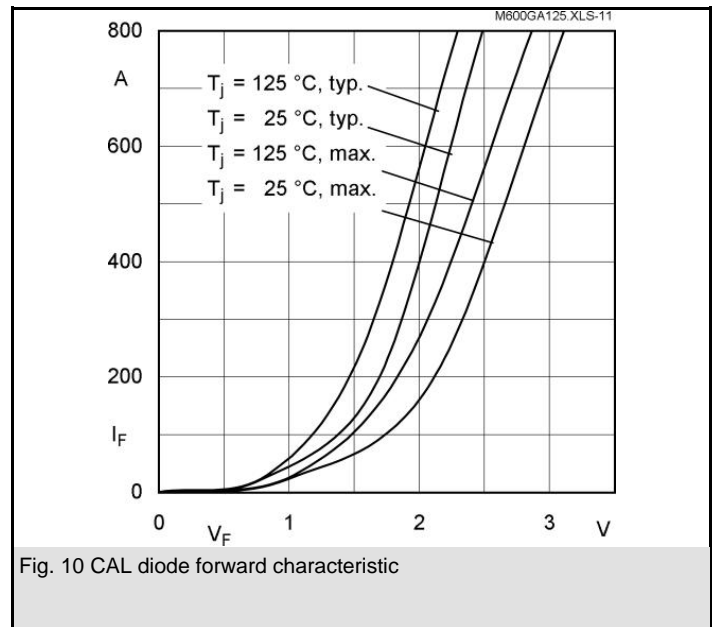
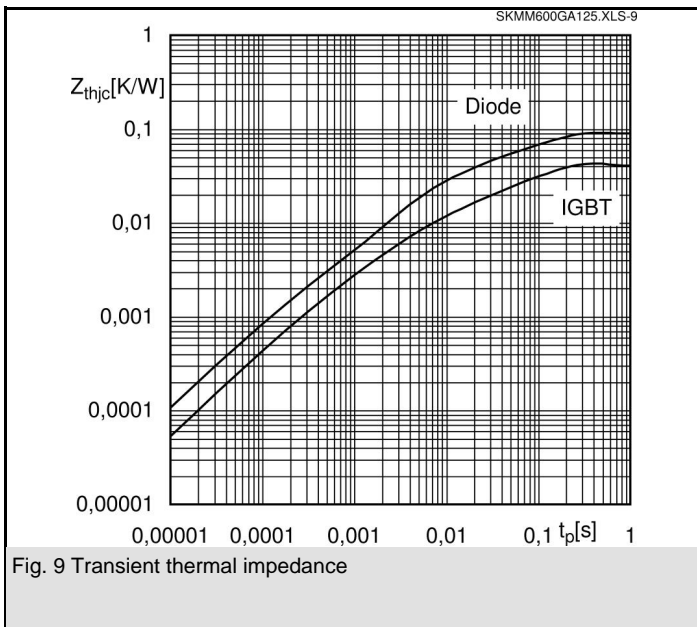
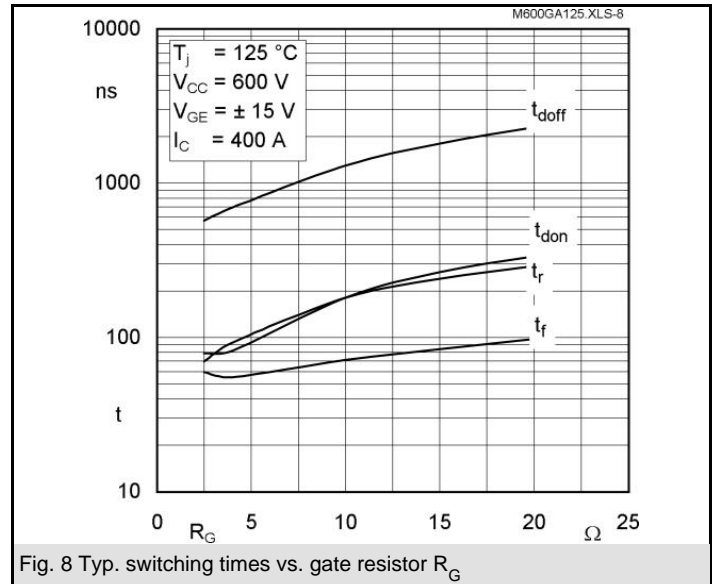
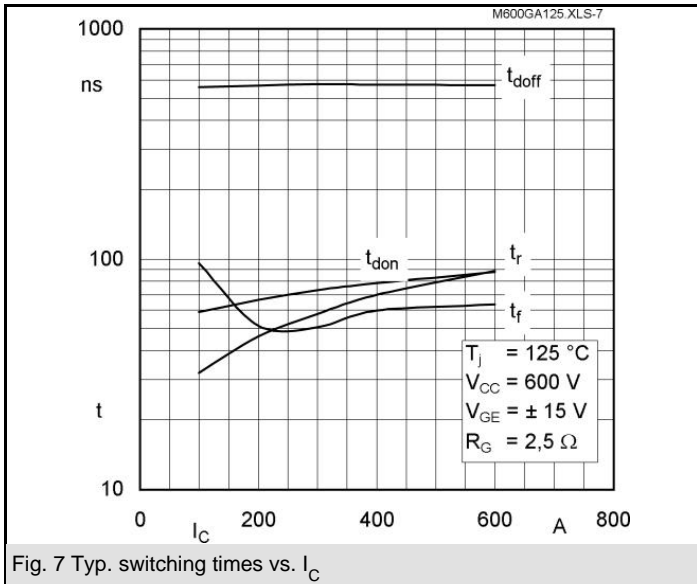
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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_{\theta j-c}$	$i = 1$	29	mk/W
$R_{\theta j-c}$	$i = 2$	9	mk/W
$R_{\theta j-c}$	$i = 3$	2,6	mk/W
$R_{\theta j-c}$	$i = 4$	0,4	mk/W
$\tau_{\theta j-c}$	$i = 1$	0,1043	s
$\tau_{\theta j-c}$	$i = 2$	0,009	s
$\tau_{\theta j-c}$	$i = 3$	0,001	s
$\tau_{\theta j-c}$	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_{\theta j-c}$	$i = 1$	62	mk/W
$R_{\theta j-c}$	$i = 2$	23	mk/W
$R_{\theta j-c}$	$i = 3$	4,2	mk/W
$R_{\theta j-c}$	$i = 4$	0,8	mk/W
$\tau_{\theta j-c}$	$i = 1$	0,0566	s
$\tau_{\theta j-c}$	$i = 2$	0,0166	s
$\tau_{\theta j-c}$	$i = 3$	0,0015	s
$\tau_{\theta j-c}$	$i = 4$	0,0002	s



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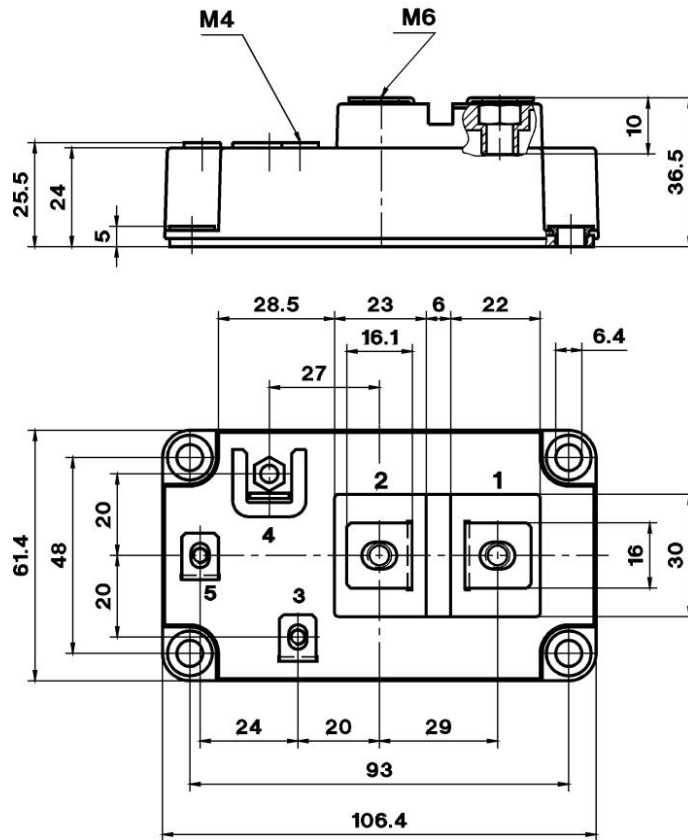


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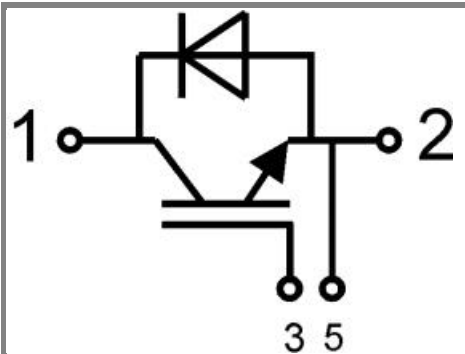
UL Recognized

CASED59

File 63 532



Case D 59



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