



SEMITRANS[®] 2

Superfast NPT-IGBT Module

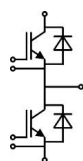
SKM 100GB063D

Features

- N channel, homogeneous Silicon structure (NPT- Non punch through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of V_{CEsat}
- Very low C_{ies} , C_{oes} , C_{res}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper Bonding Technology without hard mould
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications*

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also above 10 kHz



GB

Absolute Maximum Ratings		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25\text{ }^\circ\text{C}$	600	V	
I_C	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	130	A
		$T_{case} = 70\text{ }^\circ\text{C}$	100	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	200	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 300\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 600\text{ V}$	10	μs	
Inverse Diode				
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	100	A
		$T_{case} = 80\text{ }^\circ\text{C}$	75	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200	A	
I_{FSM}	$t_p = 10\text{ ms}$; sin. $T_j = 150\text{ }^\circ\text{C}$	720	A	
Module				
$I_{t(RMS)}$		200	A	
T_{vj}		- 40 ... + 150	$^\circ\text{C}$	
T_{stg}		- 40 ... + 125	$^\circ\text{C}$	
V_{isol}	AC, 1 min.	2500	V	

Characteristics		$T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2\text{ mA}$	4,5	5,5	6,5	V	
I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = V_{CES}$ $T_j = 25\text{ }^\circ\text{C}$		0,1	0,3	mA	
V_{CE0}			$T_j = 25\text{ }^\circ\text{C}$	1,05	V	
			$T_j = 125\text{ }^\circ\text{C}$	1	V	
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}$	10,5	$\text{m}\Omega$	
			$T_j = 125\text{ }^\circ\text{C}$	14	$\text{m}\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}$, $V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,5	V
			$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,4	2,8	V
C_{res}	$V_{CE} = 25$, $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		5,6	nF	
C_{oes}				0,6	nF	
C_{res}				0,4	nF	
Q_G	$V_{GE} = 0\text{ V} - +15\text{ V}$		240		nC	
R_{Gint}	$T_j = \text{ }^\circ\text{C}$		0		Ω	
$t_{d(on)}$	$R_{Gon} = 10\text{ }\Omega$	$V_{CC} = 300\text{ V}$ $I_C = 100\text{ A}$		50	ns	
t_r				40	ns	
E_{on}				4	mJ	
$t_{d(off)}$	$R_{Goff} = 10\text{ }\Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$		300	ns	
t_f				35	ns	
E_{off}				3	mJ	
$R_{th(j-c)}$	per IGBT			0,27	K/W	



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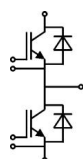
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Characteristics

Symbol	Conditions	min.	typ.	max.	Units	
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
			$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,55		V
V_{F0}				0,9	V	
r_F			8	10	mΩ	
I_{RRM}	$I_F = 100 \text{ A}$		44		A	
Q_{rr}			6		μC	
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ	
$R_{th(j-c)D}$	per diode			0,6	K/W	
Module						
L_{CE}				30	nH	
R_{CC+EE}	res., terminal-chip		$T_{case} = 25 \text{ }^\circ\text{C}$	0,75	mΩ	
			$T_{case} = 125 \text{ }^\circ\text{C}$	1	mΩ	
$R_{th(c-s)}$	per module			0,05	K/W	
M_s	to heat sink M6		3	5	Nm	
M_t	to terminals M5		2,5	5	Nm	
w				160	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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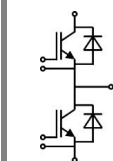
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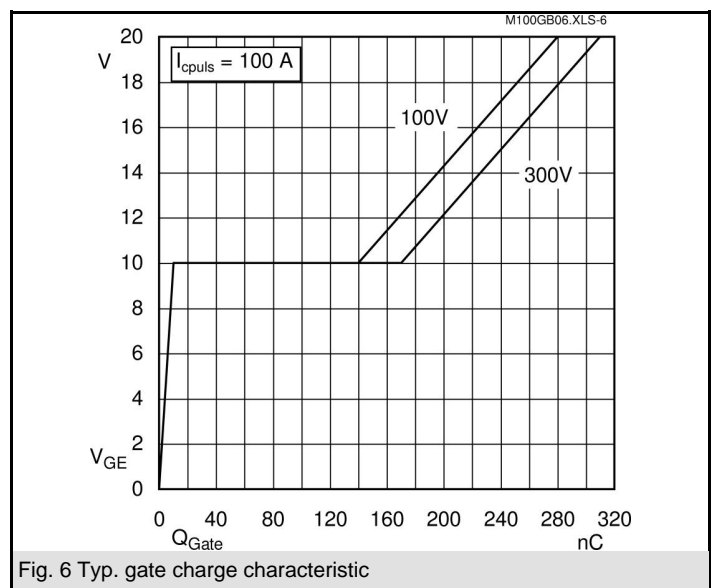
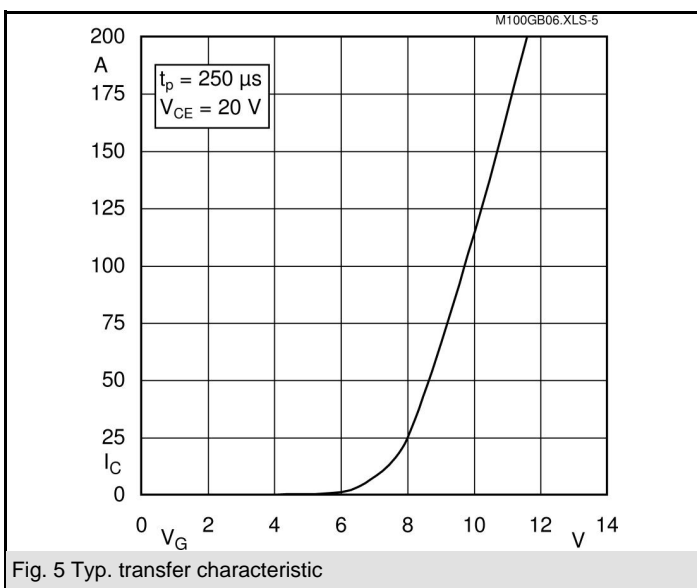
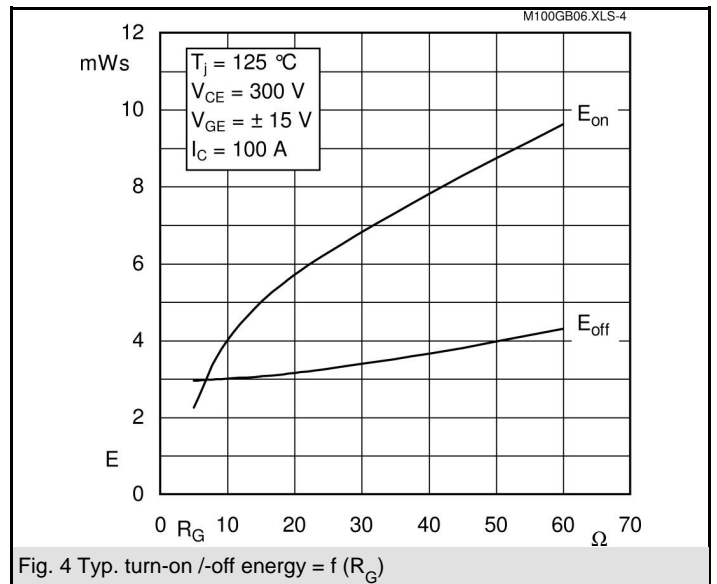
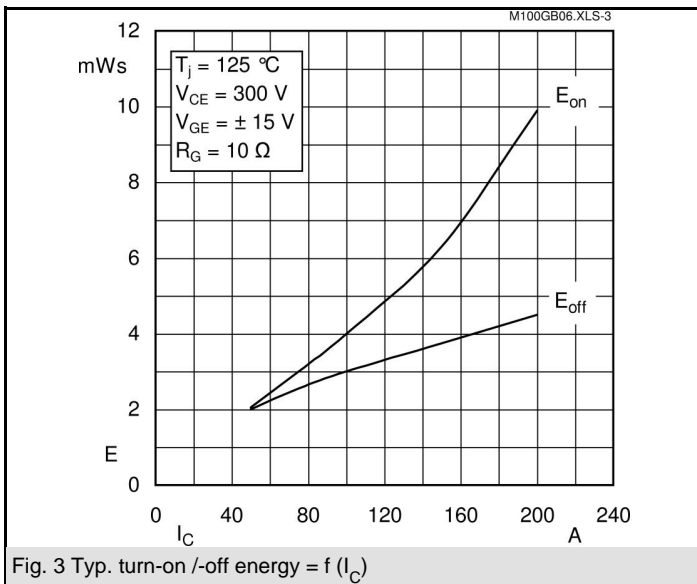
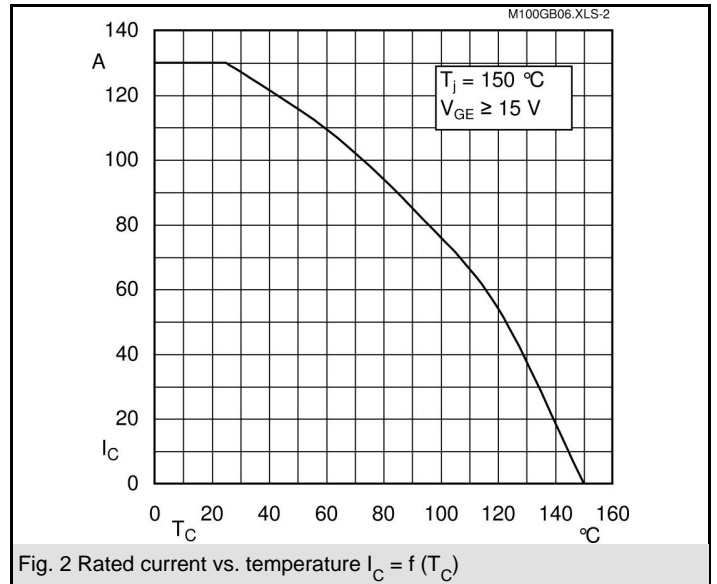
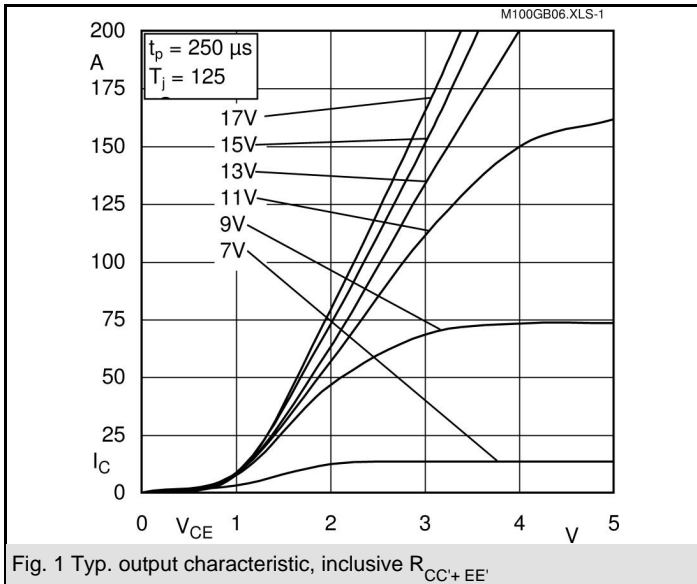
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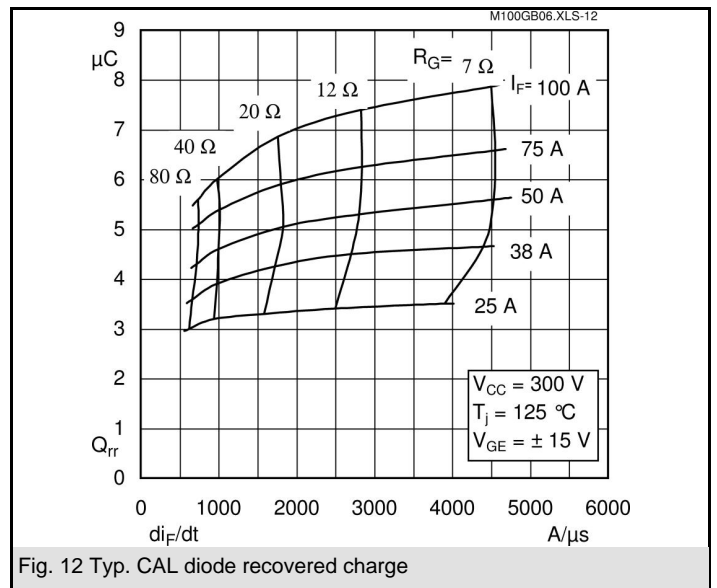
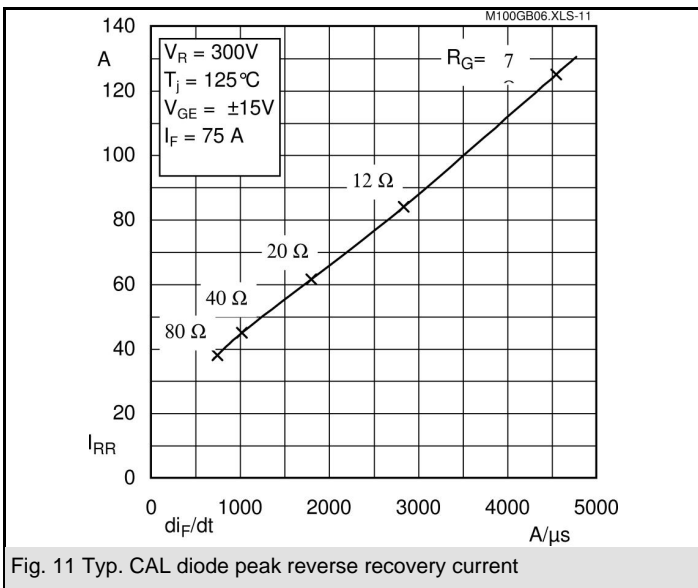
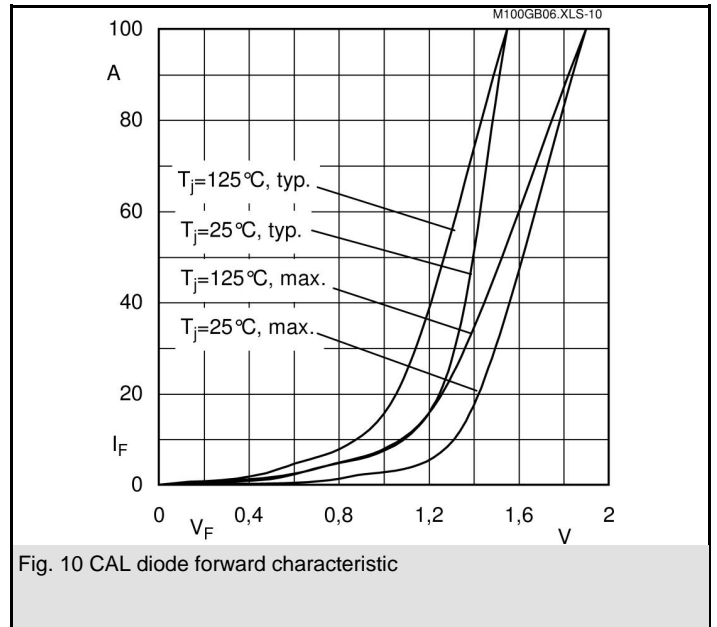
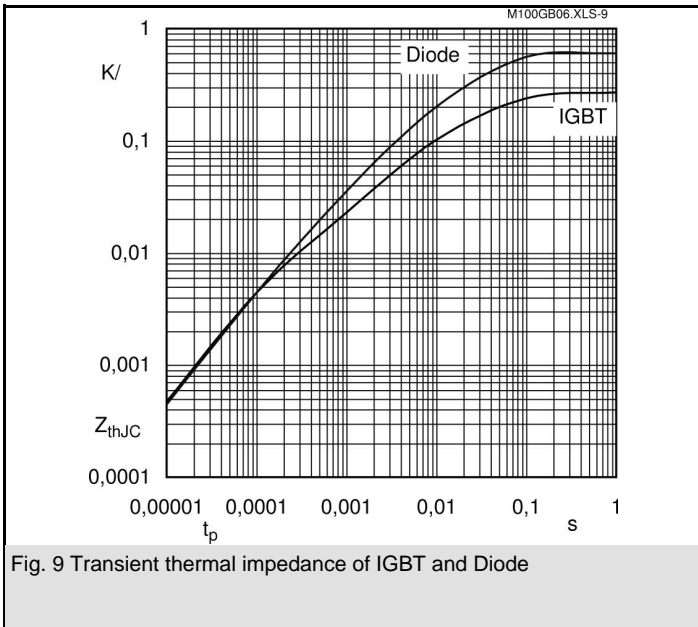
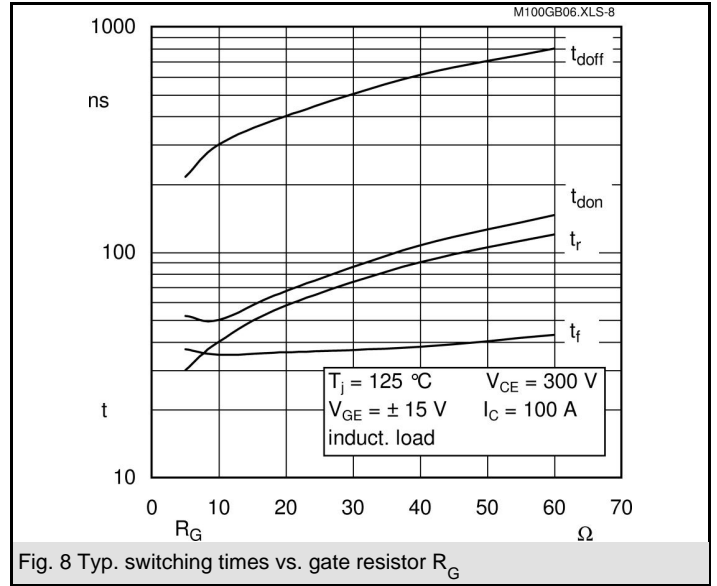
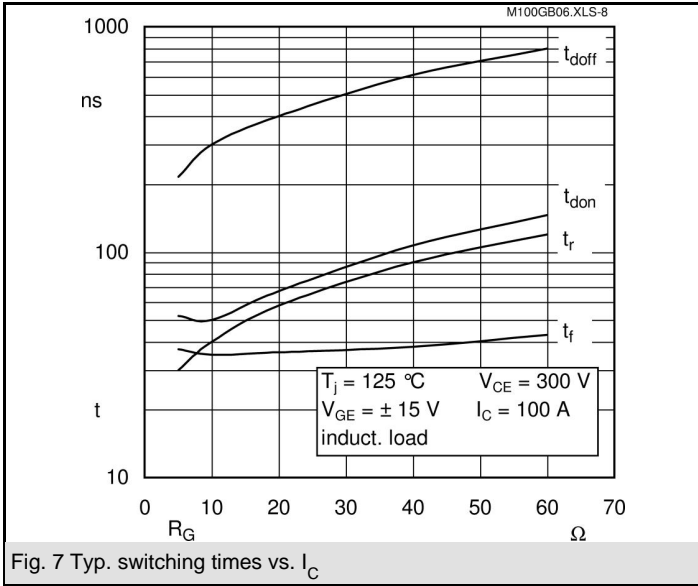
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
$R_{\theta i}$	$i = 1$	160	mk/W
$R_{\theta i}$	$i = 2$	88	mk/W
$R_{\theta i}$	$i = 3$	18	mk/W
$R_{\theta i}$	$i = 4$	4	mk/W
$\tau_{\theta i}$	$i = 1$	0,0447	s
$\tau_{\theta i}$	$i = 2$	0,0087	s
$\tau_{\theta i}$	$i = 3$	0,0015	s
$\tau_{\theta i}$	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_{\theta i}$	$i = 1$	400	mk/W
$R_{\theta i}$	$i = 2$	165	mk/W
$R_{\theta i}$	$i = 3$	30,5	mk/W
$R_{\theta i}$	$i = 4$	4,5	mk/W
$\tau_{\theta i}$	$i = 1$	0,0613	s
$\tau_{\theta i}$	$i = 2$	0,0085	s
$\tau_{\theta i}$	$i = 3$	0,0045	s
$\tau_{\theta i}$	$i = 4$	0,0003	s



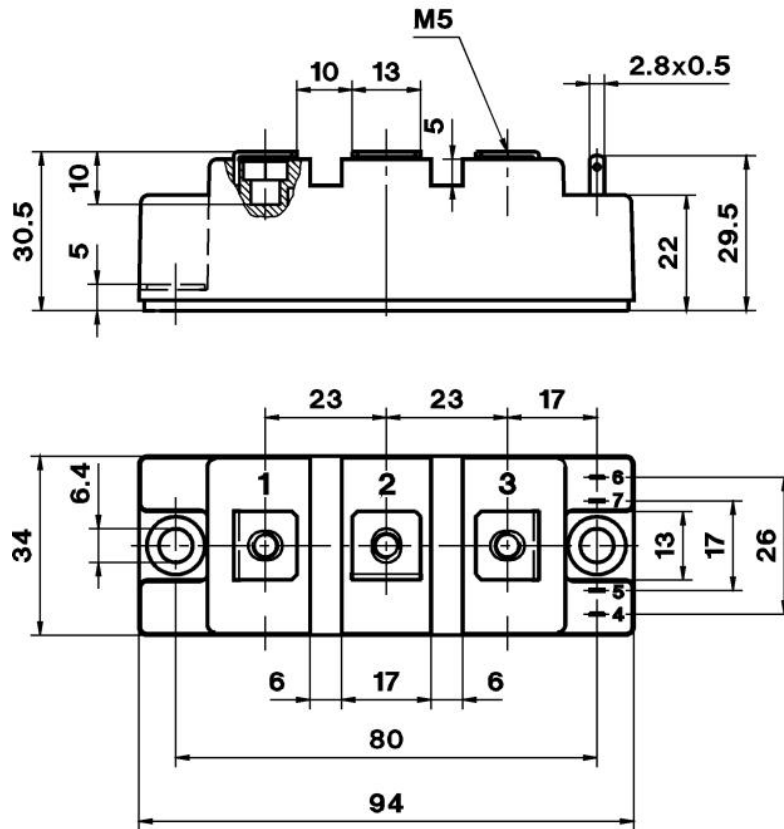


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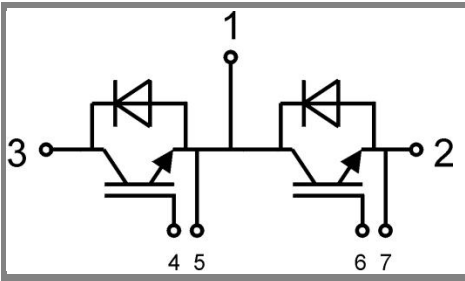
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