

SKM 195GB066D



SEMITRANS[®] 2

Trench IGBT Modules

SKM195GB066D

Preliminary Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

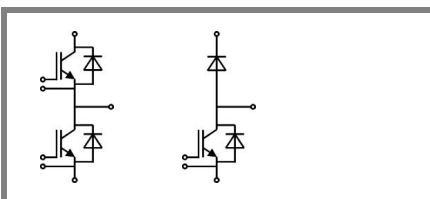
- AC inverter drives
- UPS
- Electronic welders

Remarks

- Case temperature limited to $T_c = 125^\circ\text{C}$ max., product rel. results valid for $T_j \leq 150^\circ\text{C}$
- SC data: Use of soft R_G necessary!
- Take care of over-voltage caused by stray induct.

Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	600	V	
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	265	A
		$T_c = 80^\circ\text{C}$	200	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	400	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 360\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 600\text{ V}$	6	μs	
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	200	A
		$T_c = 80^\circ\text{C}$	130	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	400	A	
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 175^\circ\text{C}$	1400	A
Module				
$I_{t(RMS)}$		200	A	
T_{vj}		- 40 ... + 175	$^\circ\text{C}$	
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
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3,2\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$	0,13	0,38	mA
			$T_j = 150^\circ\text{C}$	0,85	
V_{CE0}		$T_j = 25^\circ\text{C}$	0,9	1	V
		$T_j = 150^\circ\text{C}$	0,85	0,9	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	2,8	4,5	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	4,3	6	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,45	1,9	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	1,7	2,1	V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	12,3		nF
C_{oes}			0,77		nF
C_{res}			0,37		nF
Q_G	$V_{GE} = -8\text{V}...+15\text{V}$		1500		nC
R_{Gint}	$T_j = ^\circ\text{C}$		2		Ω
$t_{d(on)}$	$R_{Gon} = 3\ \Omega$	$V_{CC} = 300\text{V}$ $I_C = 200\text{A}$	160		ns
t_r			68		ns
E_{on}	$R_{Goff} = 3\ \Omega$	$T_j = 150^\circ\text{C}$ $V_{GE} = -8\text{V}/+15\text{V}$	14		mJ
$t_{d(off)}$			520		ns
t_f			49		ns
E_{off}			8		mJ
$R_{th(j-c)}$	per IGBT			0,22	K/W



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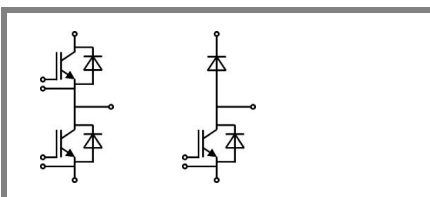
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,4	1,6	V
V_{F0}		$T_j = 25^\circ\text{C}$	0,95	1	V
r_F		$T_j = 25^\circ\text{C}$	2,3	3	mΩ
I_{RRM}	$I_F = 200 \text{ A}$	$T_j = 150^\circ\text{C}$	100		A
Q_{rr}	$di/dt = 2000 \text{ A}/\mu\text{s}$		30		μC
E_{rr}	$V_{GE} = -8 \text{ V}; V_{CC} = 300 \text{ V}$		5,6		mJ
$R_{th(j-c)D}$	per diode			0,4	K/W
Module					
L_{CE}				30	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,75		mΩ
		$T_{case} = 125^\circ\text{C}$	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				150	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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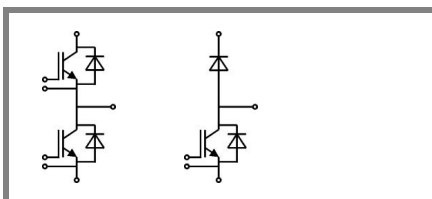
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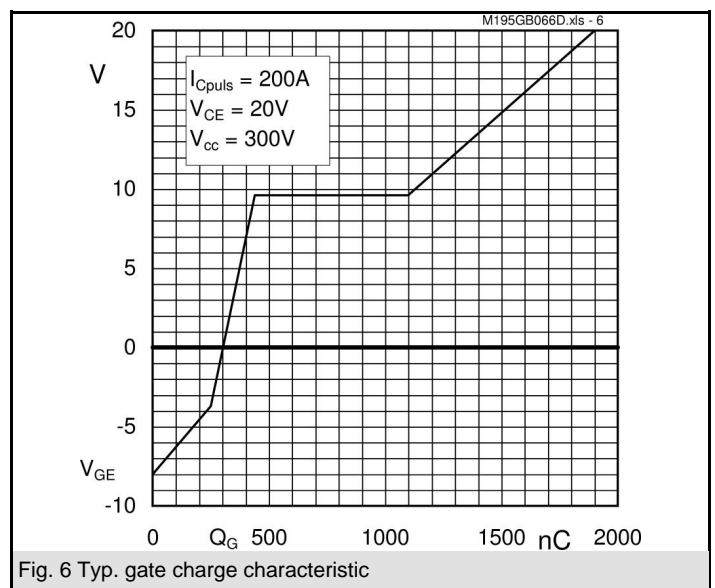
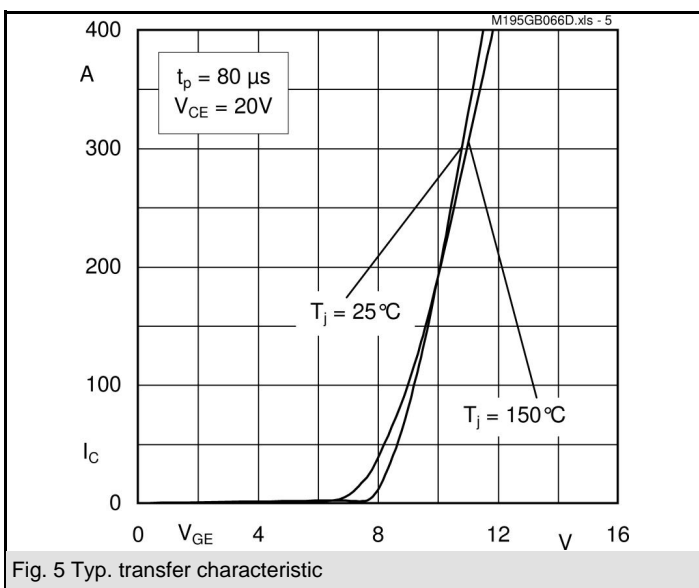
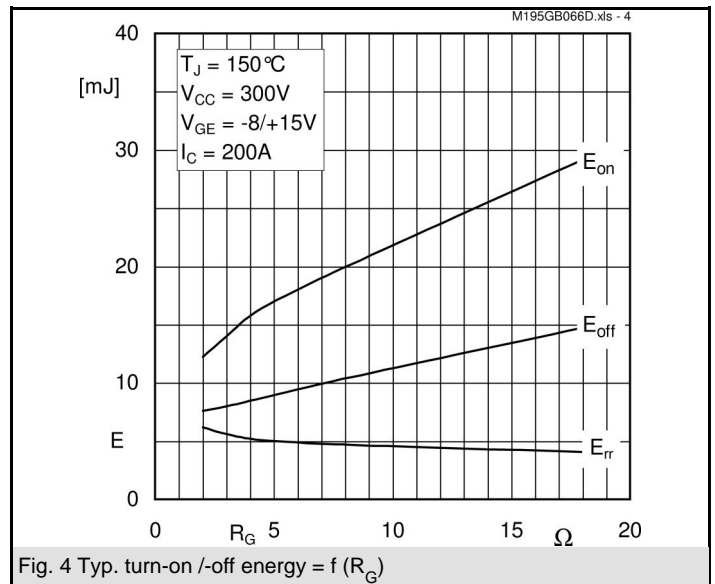
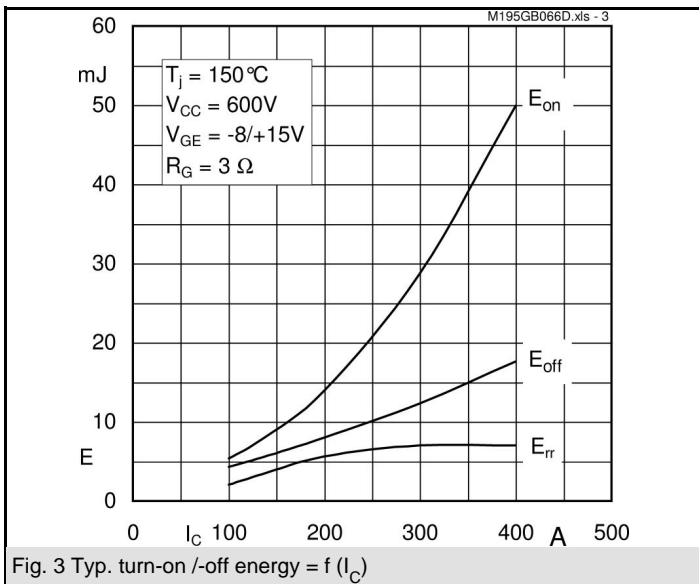
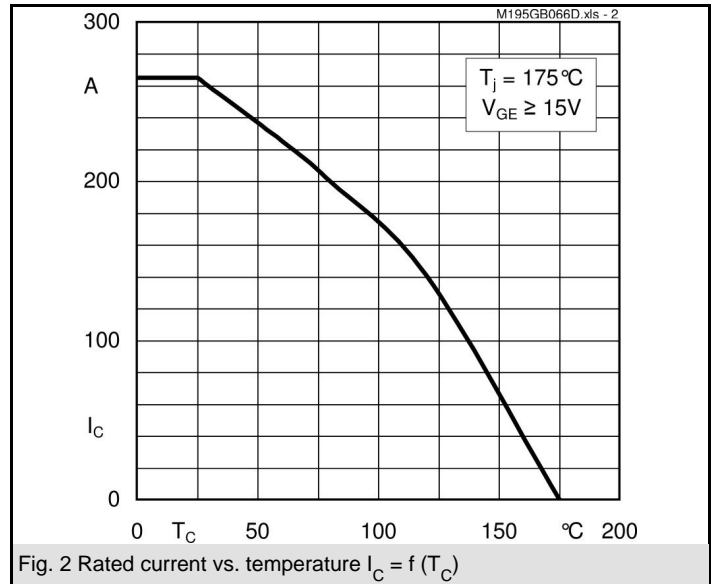
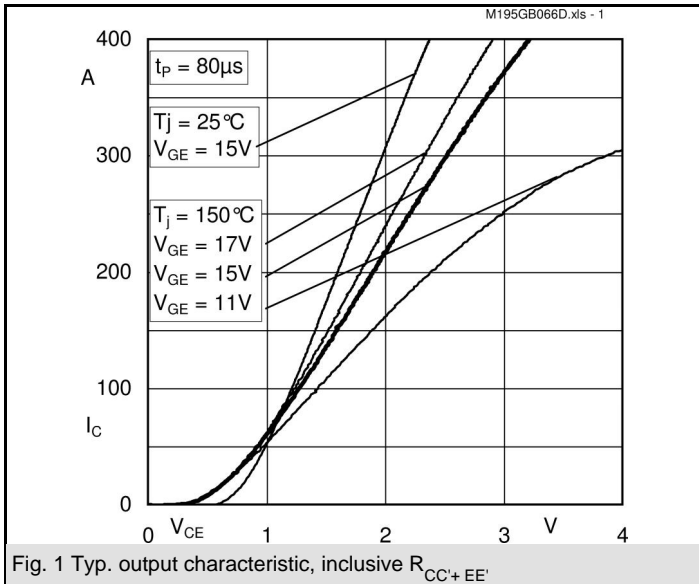
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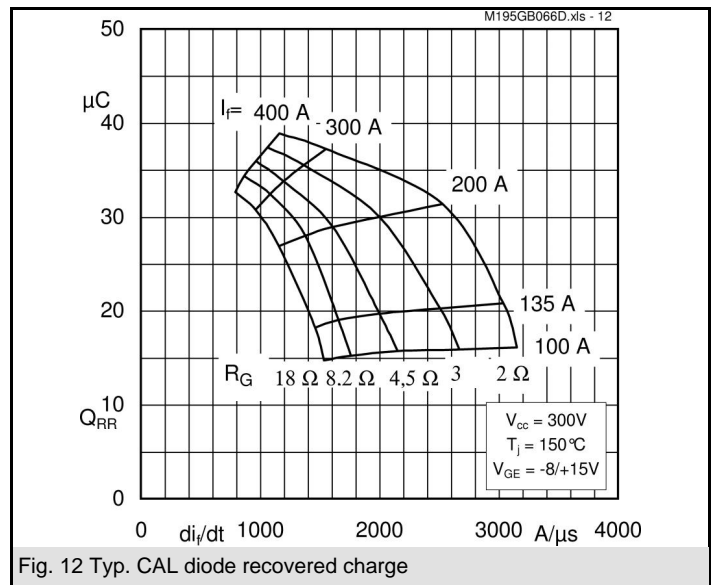
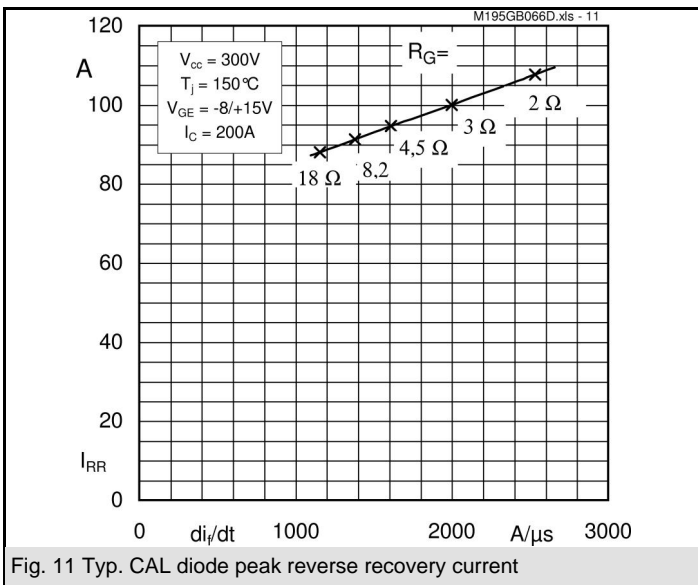
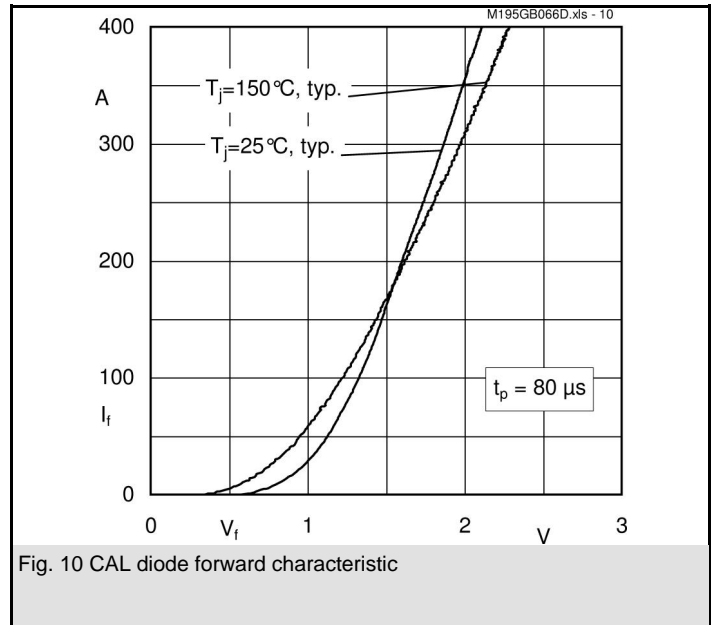
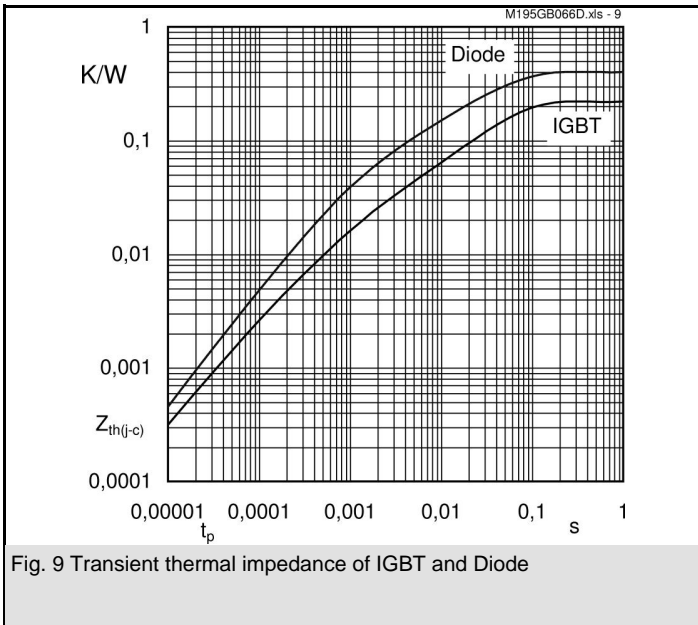
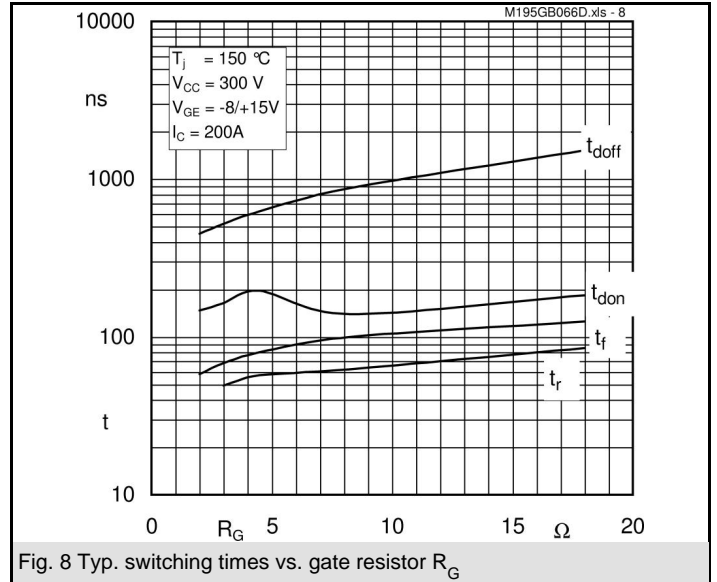
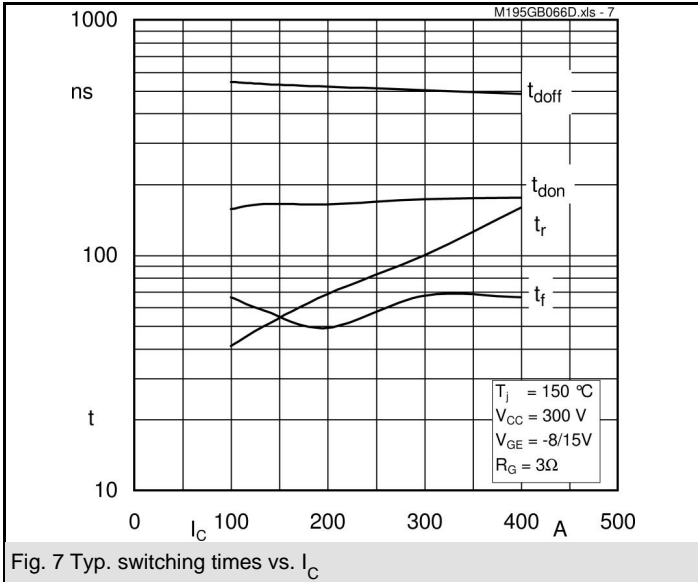
Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c}$		$i = 1$	160	mk/W
$R_{\theta j-c}$		$i = 2$	41	mk/W
$R_{\theta j-c}$		$i = 3$	16	mk/W
$R_{\theta j-c}$		$i = 4$	3	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,0276	s
$\tau_{th(j-c)}$		$i = 2$	0,0406	s
$\tau_{th(j-c)}$		$i = 3$	0,001	s
$\tau_{th(j-c)}$		$i = 4$	0,0011	s
$Z_{th(j-c)D}$				
$R_{\theta j-c}$		$i = 1$	250	mk/W
$R_{\theta j-c}$		$i = 2$	110	mk/W
$R_{\theta j-c}$		$i = 3$	35	mk/W
$R_{\theta j-c}$		$i = 4$	5	mk/W
$\tau_{th(j-c)}$		$i = 1$	0,054	s
$\tau_{th(j-c)}$		$i = 2$	0,012	s
$\tau_{th(j-c)}$		$i = 3$	0,0015	s
$\tau_{th(j-c)}$		$i = 4$	0,0007	s



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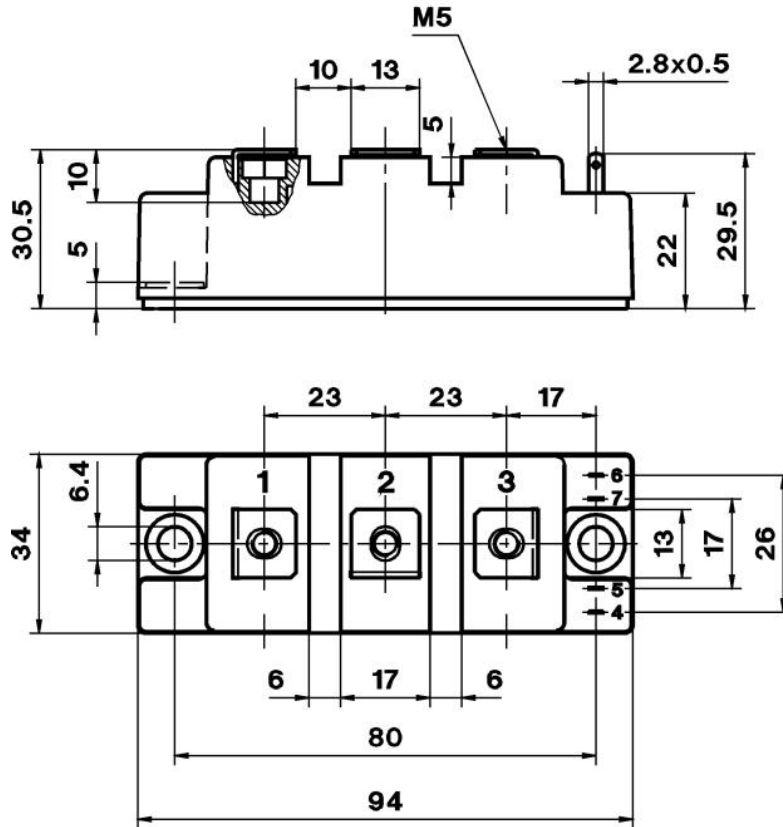




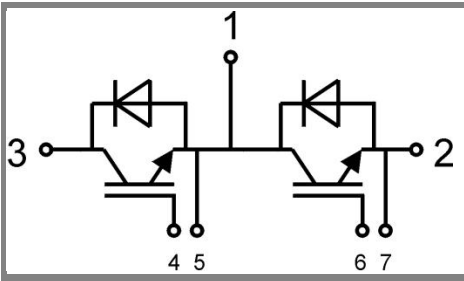
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