

SKM 100GB176D



SEMITRANS® 2

Trench IGBT Modules

SKM 100GB176D

Features

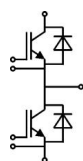
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)

Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V _{CES}	T _j = 25 °C	1700		V
I _C	T _j = 150 °C	T _c = 25 °C	125	A
		T _c = 80 °C	90	A
I _{CRM}	I _{CRM} =2xI _{Cnom}	150		A
V _{GES}		± 20		V
t _{psc}	V _{CC} = 1200 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1700 V	10		µs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	100	A
		T _c = 80 °C	70	A
I _{FRM}	I _{FRM} =2xI _{Fnom}	150		A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C	720		A
Module				
I _{t(RMS)}		200		A
T _{vj}		- 40 ... +150		°C
T _{stg}		- 40 ... +125		°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					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3\text{ mA}$	5,2	5,8	6,4	V
I_{CES}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1	1,2	V
		$T_j = 125^\circ\text{C}$	0,9	1,1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	13	16,7	m Ω
		$T_j = 125^\circ\text{C}$	20	24	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2	2,45	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,4	2,9	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	5,7		nF
C_{oes}			0,28		nF
C_{res}			0,22		nF
Q_G	$V_{GE} = -8\text{V}/+15\text{V}$		620		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		8,5		Ω
$t_{d(on)}$	$R_{Gon} = 4,2\ \Omega$ $di/dt = 1680\text{ A}/\mu\text{s}$	$V_{CC} = 1200\text{V}$ $I_C = 75\text{A}$	280		ns
t_r			40		ns
E_{on}			44		mJ
$t_{d(off)}$	$R_{Goff} = 4,2\ \Omega$ $di/dt = 490\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$ $V_{GE} = -15\text{V}$ $L_s = 20\text{ nH}$	680		ns
t_f			140		ns
E_{off}			28,5		mJ
$R_{th(j-c)}$	per IGBT			0,24	K/W



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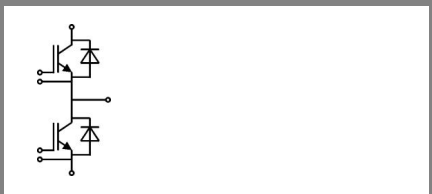
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Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75\text{ A}; V_{GE} = 0\text{ V}$				
	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,9	V
	$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,6	1,9	V
V_{F0}					
	$T_j = 25\text{ }^{\circ}\text{C}$		1,1	1,3	V
	$T_j = 125\text{ }^{\circ}\text{C}$		0,9	1,1	V
r_F					
	$T_j = 25\text{ }^{\circ}\text{C}$		6,7	8	mΩ
	$T_j = 125\text{ }^{\circ}\text{C}$		9,3	11	mΩ
I_{RRM}	$I_F = 75\text{ A}$		78,5		A
Q_{rr}	$di/dt = 1650\text{ A}/\mu\text{s}$		29,6		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 1200\text{ V}$		21,4		mJ
$R_{th(j-c)D}$	per diode			0,45	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.

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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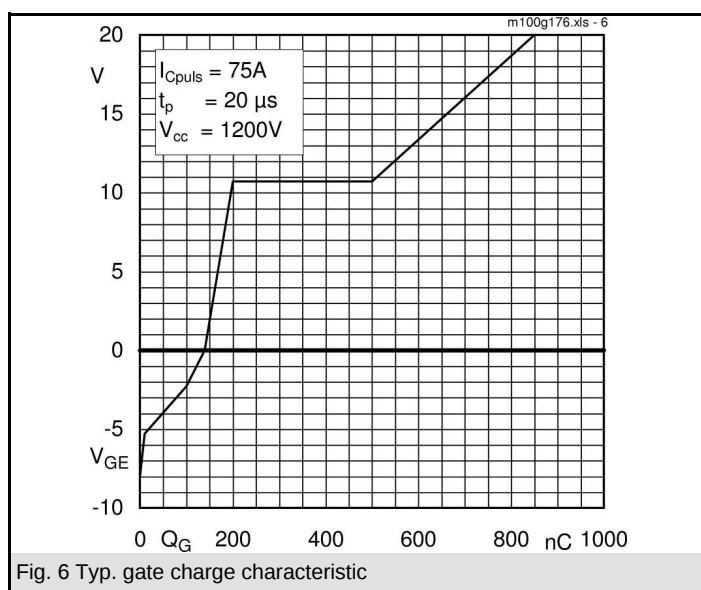
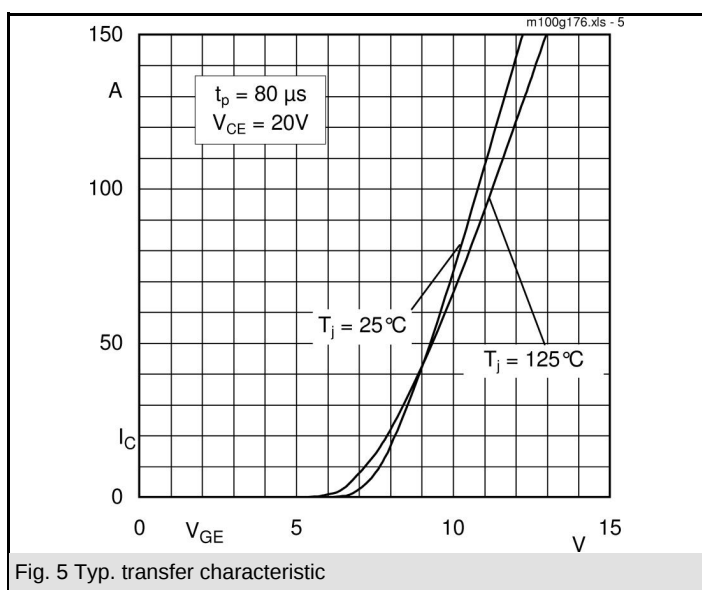
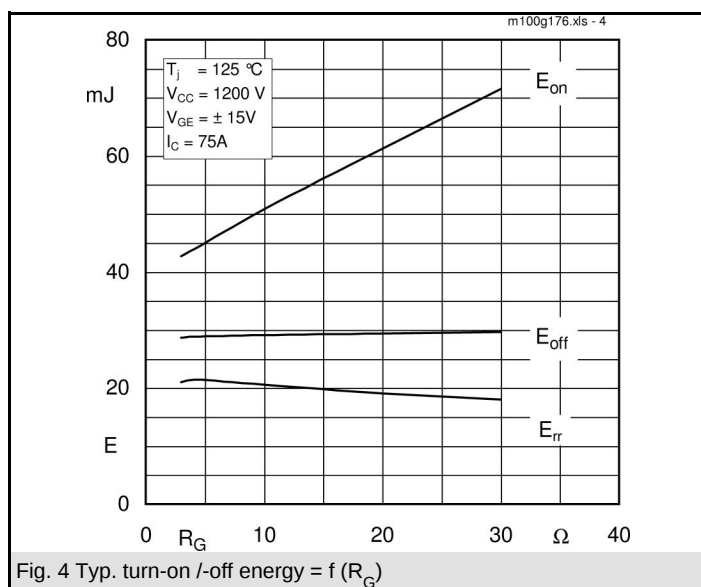
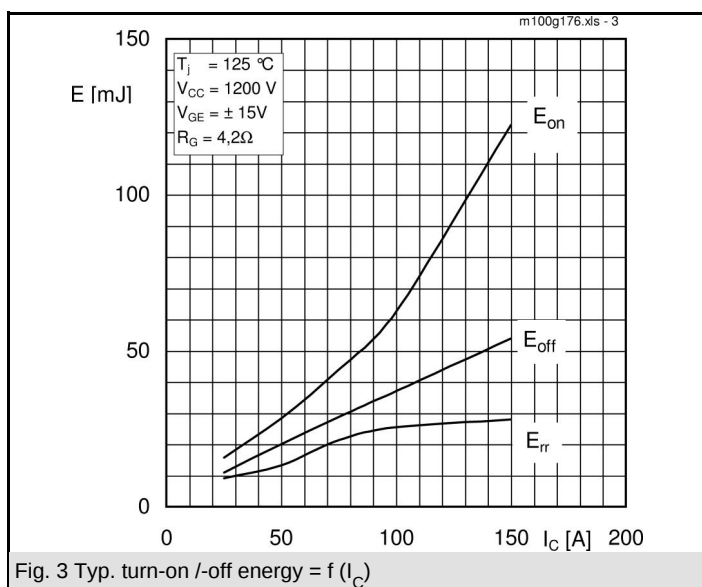
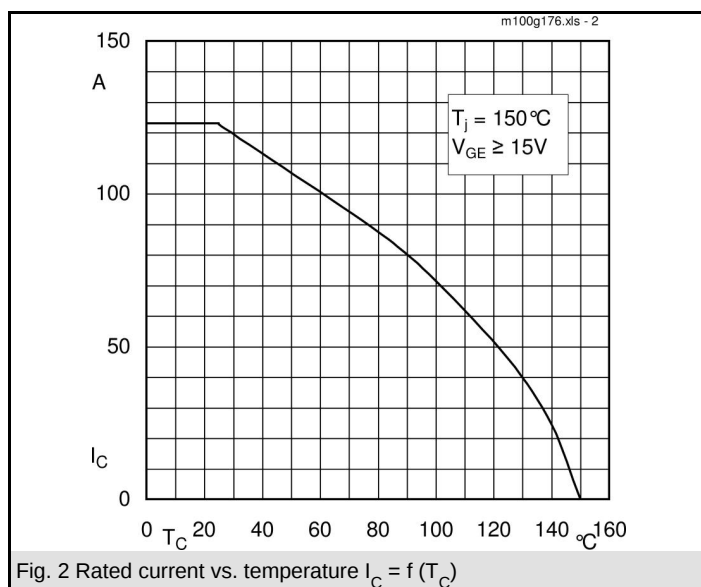
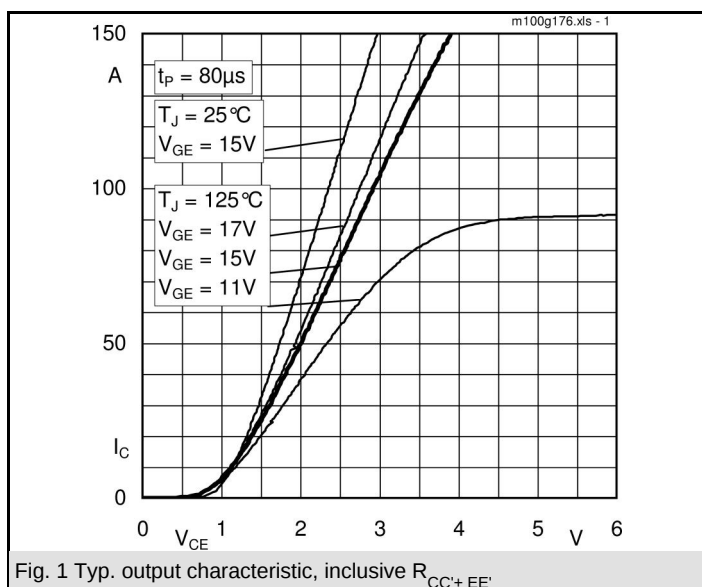
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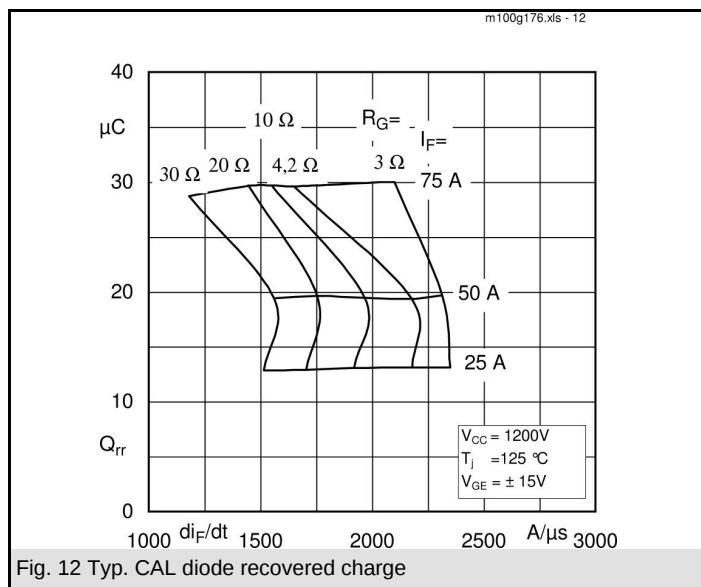
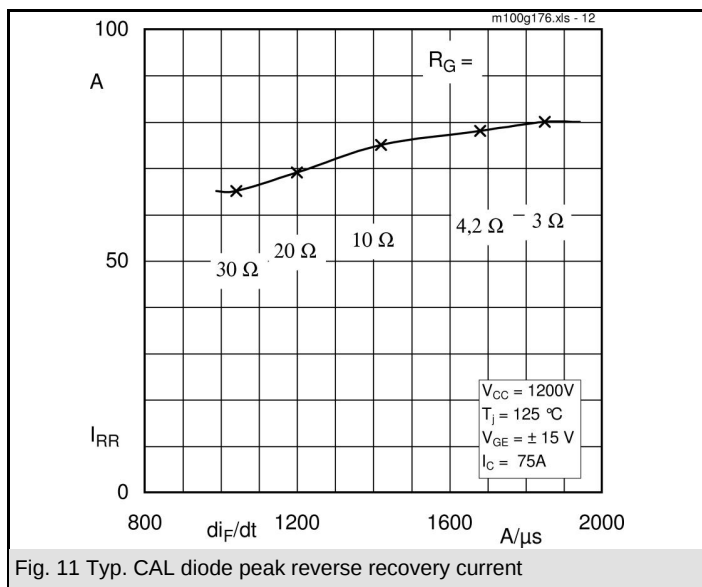
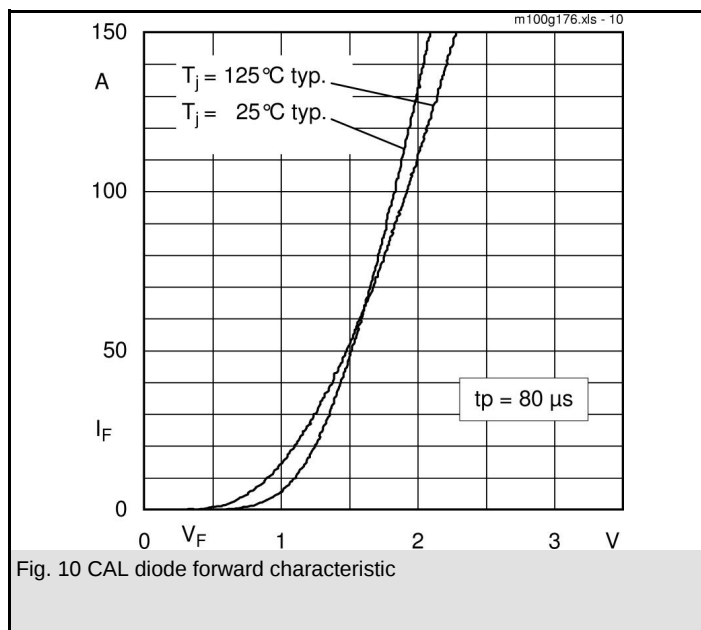
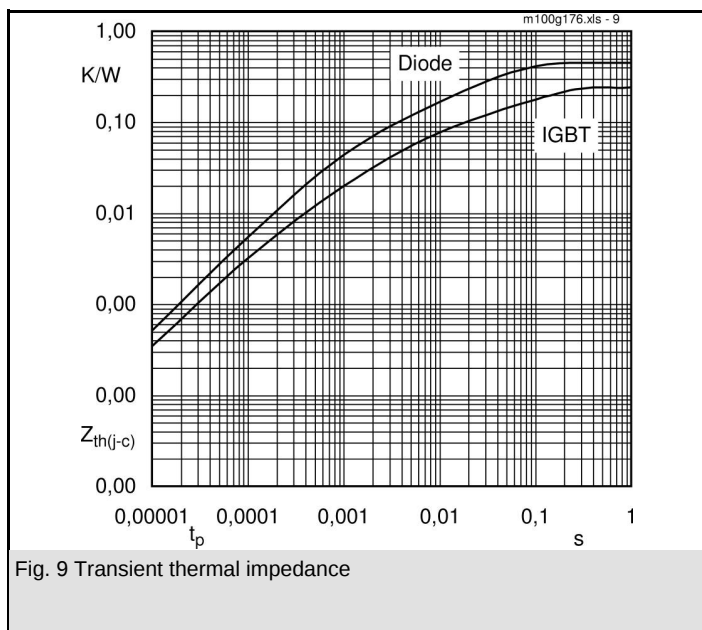
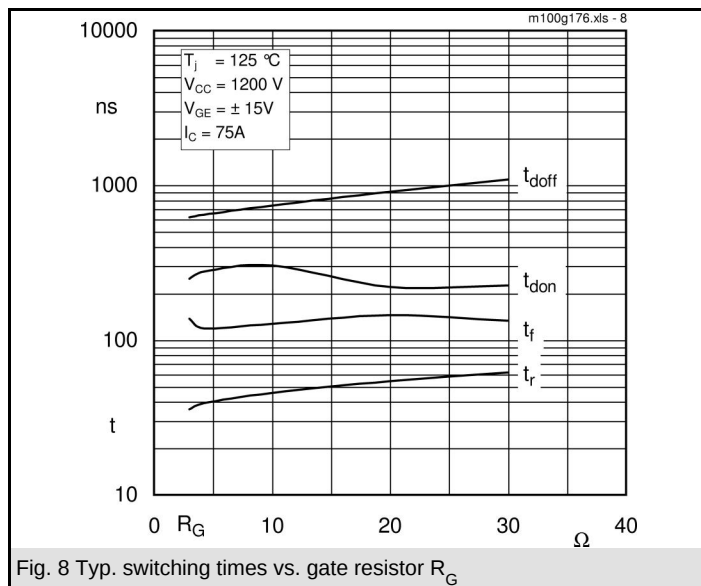
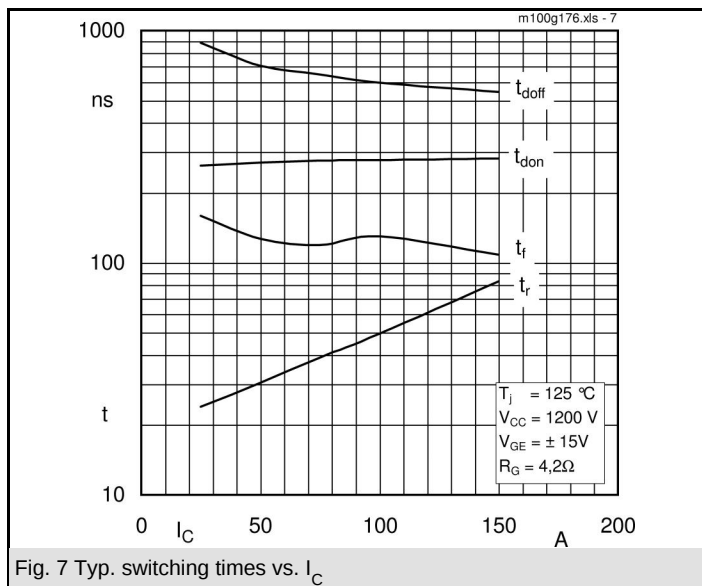
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	160	mk/W
R_i	$i = 2$	60	mk/W
R_i	$i = 3$	16,5	mk/W
R_i	$i = 4$	3,5	mk/W
τ_{u_i}	$i = 1$	0,1056	s
τ_{u_i}	$i = 2$	0,009	s
τ_{u_i}	$i = 3$	0,0011	s
τ_{u_i}	$i = 4$	0,0005	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	270	mk/W
R_i	$i = 2$	139	mk/W
R_i	$i = 3$	37	mk/W
R_i	$i = 4$	4	mk/W
τ_{u_i}	$i = 1$	0,0475	s
τ_{u_i}	$i = 2$	0,0104	s
τ_{u_i}	$i = 3$	0,0011	s
τ_{u_i}	$i = 4$	0,0003	s



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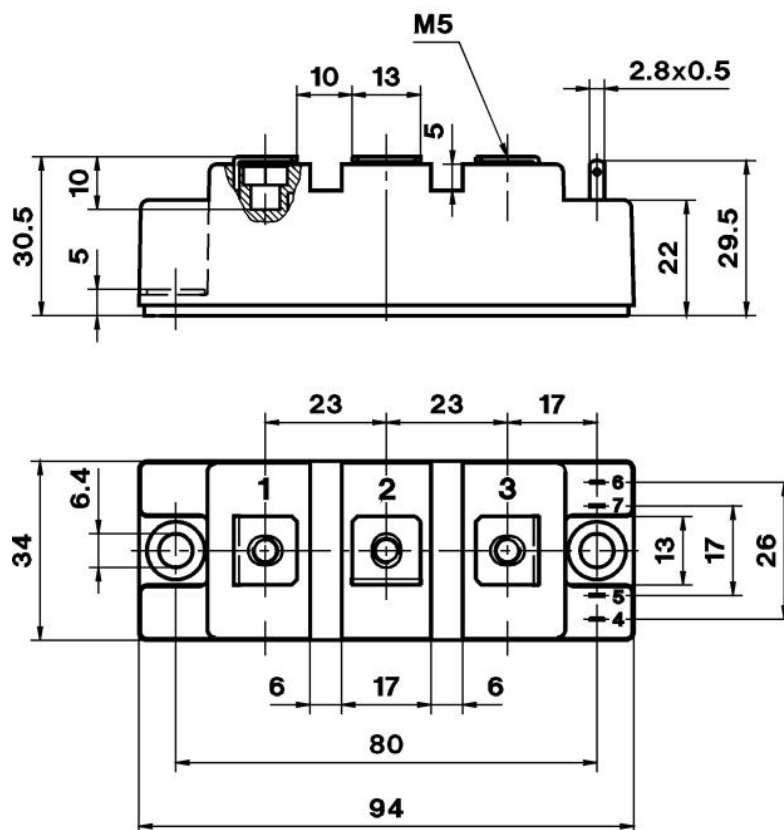


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