



SEMITRANS® 2

Trench IGBT Modules

SKM 75GB176D

Features

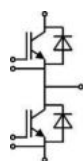
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications*

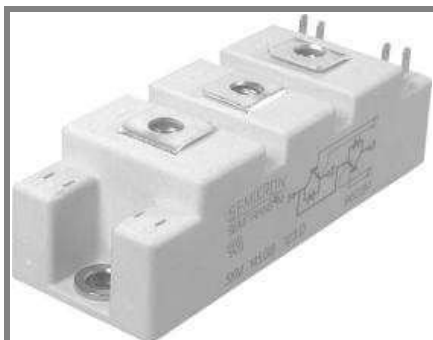
- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)

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	80	A
		T _c = 80 °C	55	A
I _{CRM}	I _{CRM} =2xI _{Cnom}	100		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	80	A
		T _c = 80 °C	55	A
I _{FRM}	I _{FRM} =2xI _{Fnom}	100		A
I _{FSM}	t _p = 10 ms; sin. T _j = 150 °C	550		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		$T_{case} = 25^\circ C$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2 mA$	5,2	5,8	6,4	V
I_{CES}	$V_{GE} = 0 V$, $V_{CE} = V_{CES}$ $T_j = 25^\circ C$			3	mA
V_{CE0}			$T_j = 25^\circ C$	1	V
			$T_j = 125^\circ C$	0,9	V
r_{CE}	$V_{GE} = 15 V$		$T_j = 25^\circ C$	20	m Ω
			$T_j = 125^\circ C$	31	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 50 A$, $V_{GE} = 15 V$		$T_j = 25^\circ C_{chiple v.}$	2	V
			$T_j = 125^\circ C_{chiple v.}$	2,45	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0 V$ $f = 1 MHz$			4,3	nF
C_{oes}				0,18	nF
C_{res}				0,15	nF
Q_G	$V_{GE} = -8V...+15V$			410	nC
R_{Gint}	$T_j = 25^\circ C$			9,5	Ω
$t_{d(on)}$	$R_{Gon} = 6,2 \Omega$ $di/dt = 1680 A/\mu s$			210	ns
t_r				30	ns
E_{on}				25	mJ
$t_{d(off)}$	$R_{Goff} = 6,2 \Omega$ $di/dt = 320 A/\mu s$			590	ns
t_f				135	ns
E_{off}				18	mJ
$R_{th(j-c)}$	per IGBT			0,38	K/W



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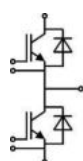
Typical Applications*

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

Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 50\text{ A}; V_{GE} = 0\text{ V}$	$T_j = 25\text{ }^{\circ}\text{C}_{chiplev.}$		1,7	1,9	V
		$T_j = 125\text{ }^{\circ}\text{C}_{chiplev.}$		1,8	2	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		$T_j = 25\text{ }^{\circ}\text{C}$		12	12	mΩ
		$T_j = 125\text{ }^{\circ}\text{C}$		18	18	mΩ
I_{RRM}	$I_F = 50\text{ A}$	$T_j = 125\text{ }^{\circ}\text{C}$		52		A
Q_{rr}	$di/dt = 1320\text{ A}/\mu\text{s}$			20		μC
E_{rr}	$V_{GE} = -15\text{ V}; V_{CC} = 1200\text{ V}$			14,5		mJ
$R_{th(j-c)D}$	per diode				0,55	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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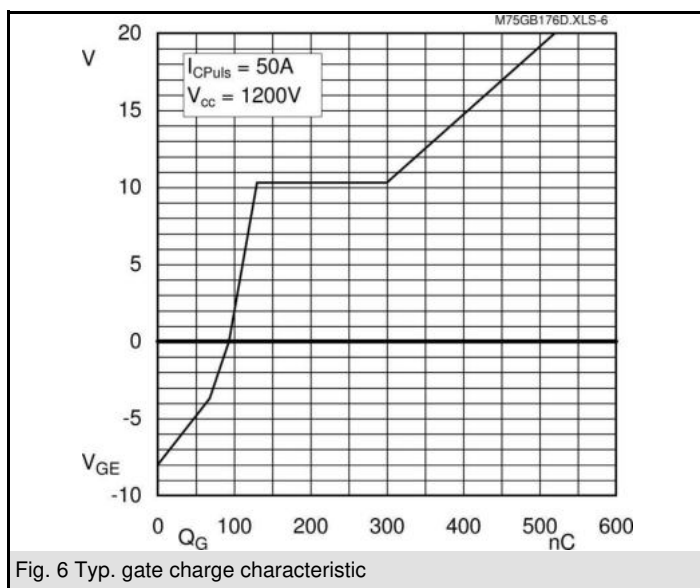
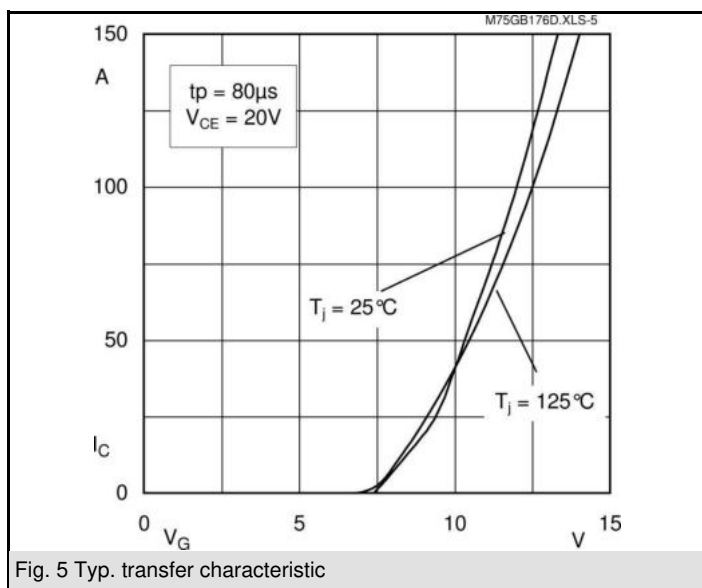
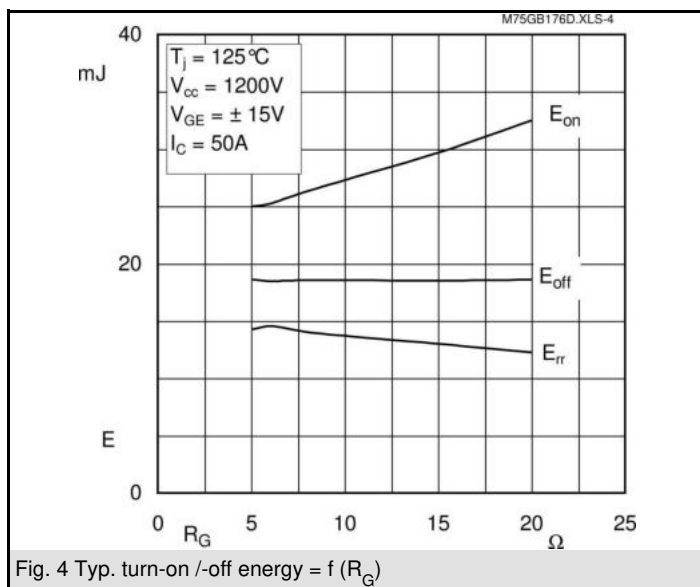
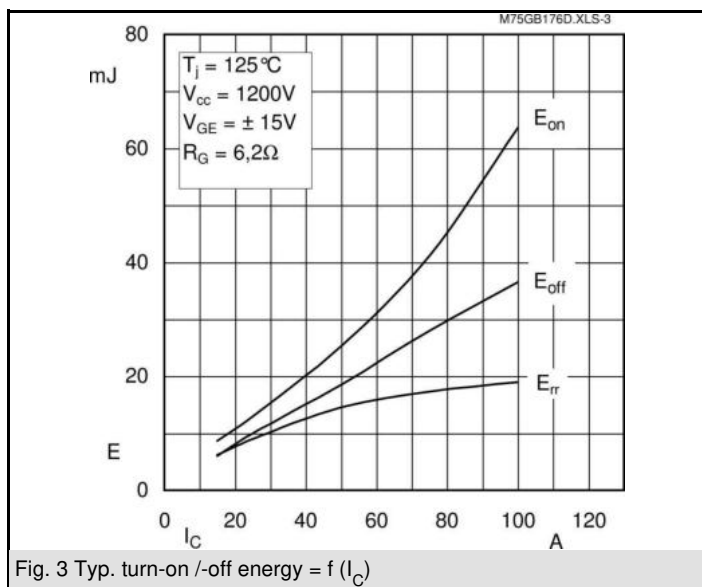
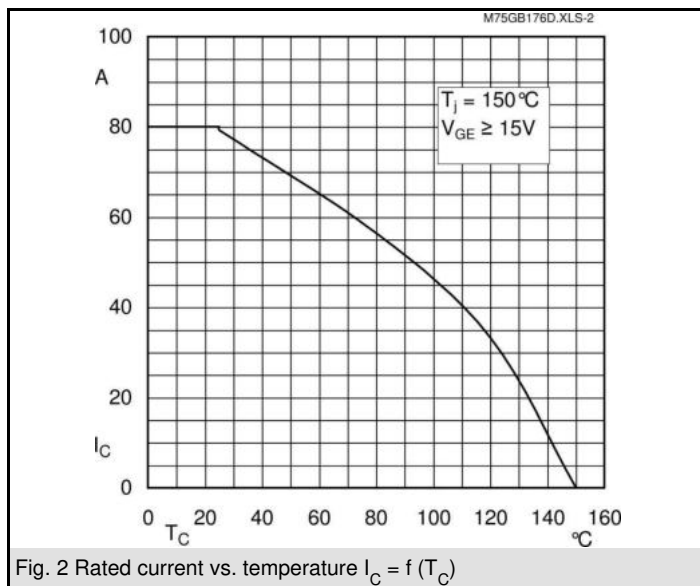
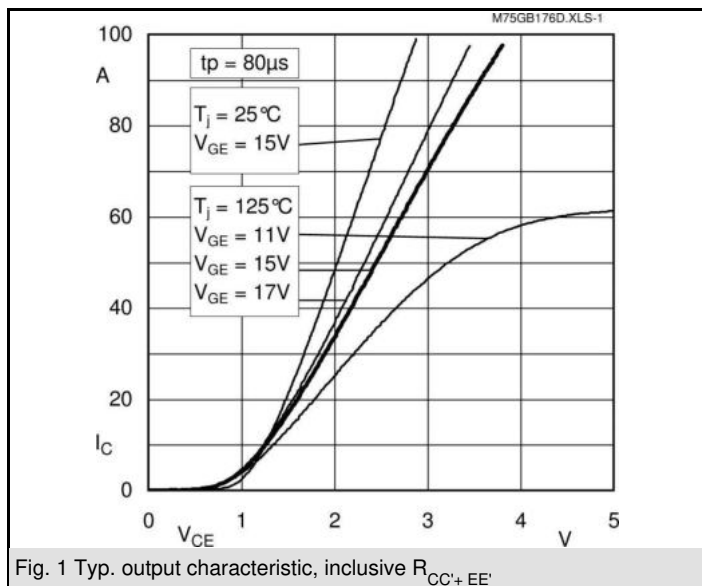
Typical Applications*

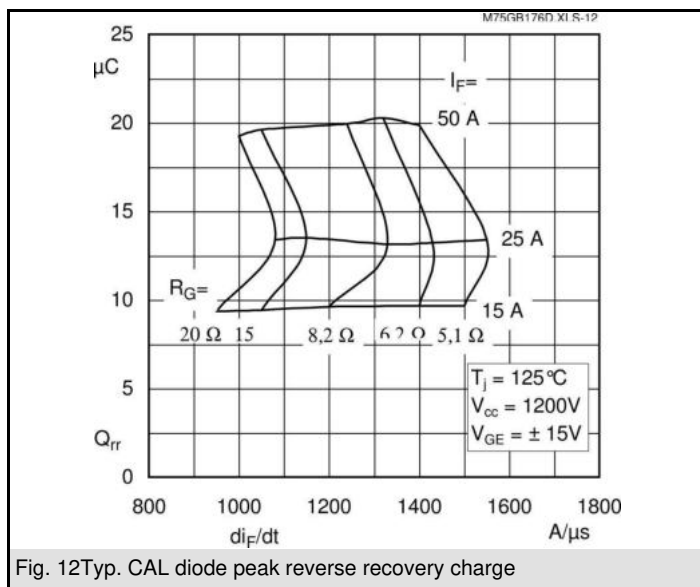
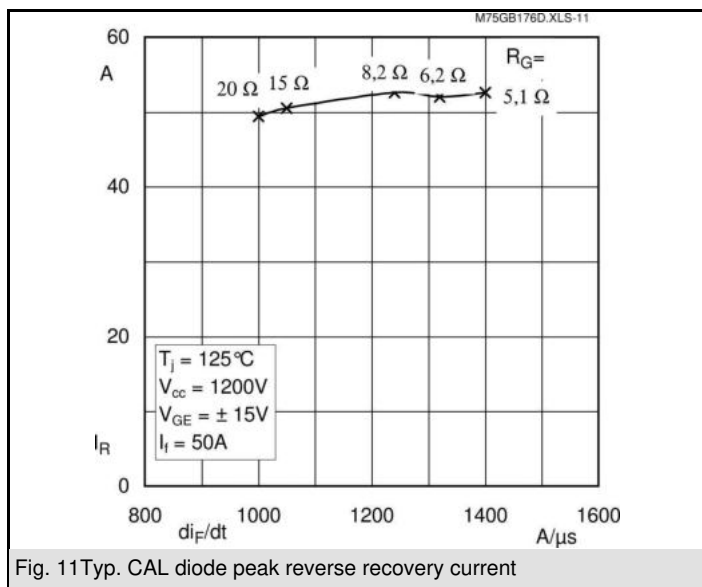
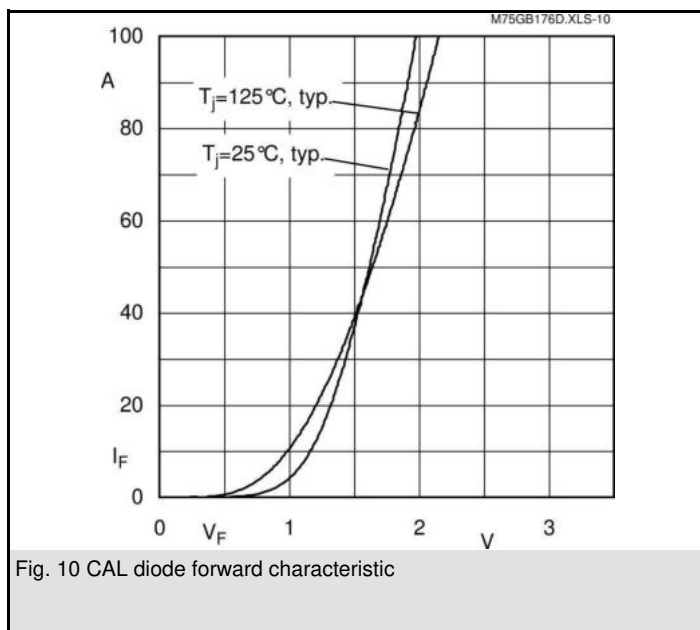
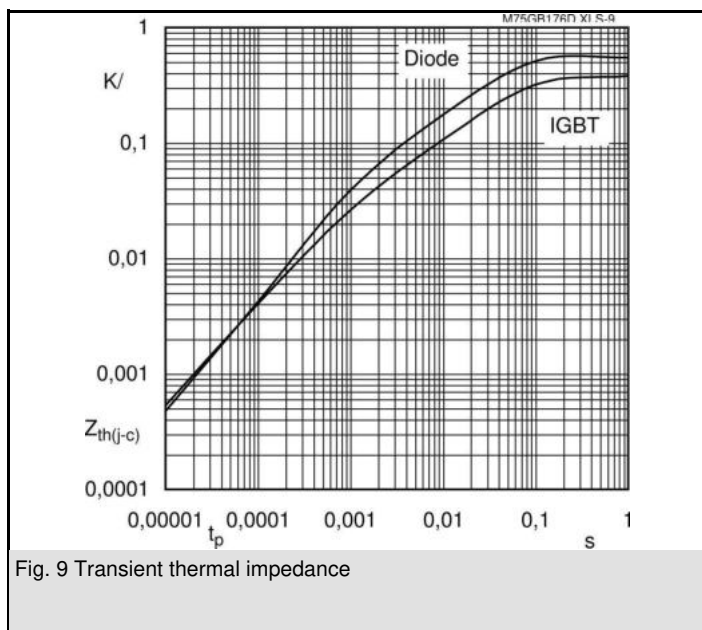
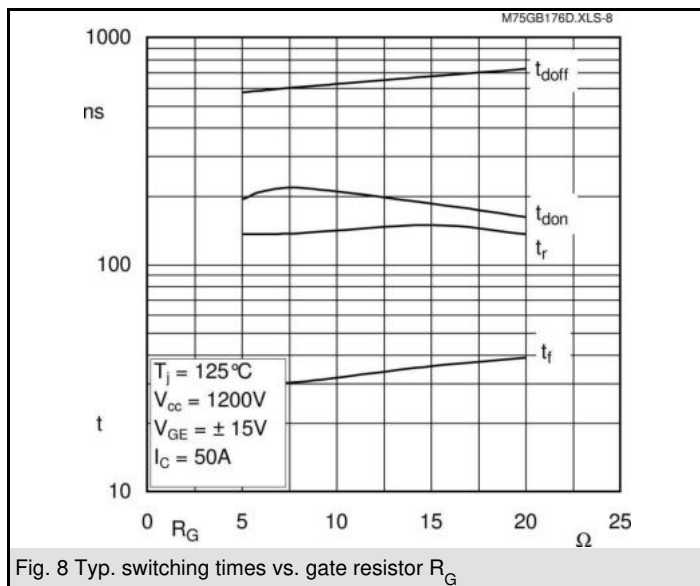
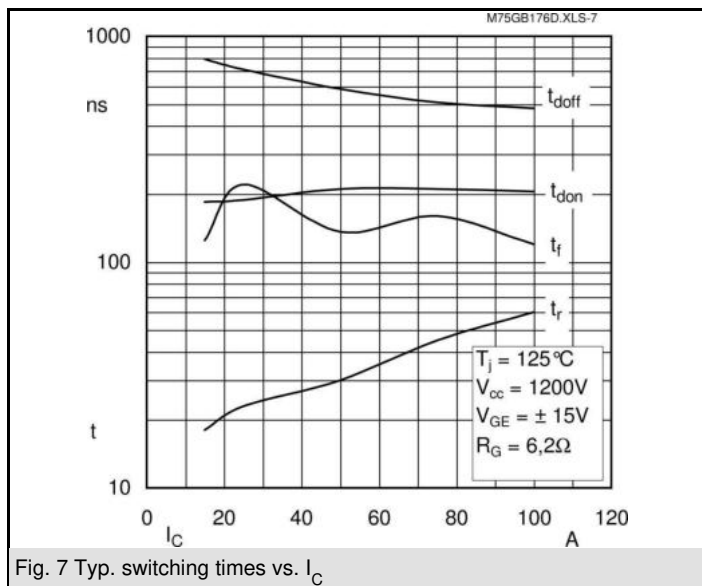
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	270	mk/W
R_i	$i = 2$	85	mk/W
R_i	$i = 3$	21	mk/W
R_i	$i = 4$	4	mk/W
τ_{u_i}	$i = 1$	0,0393	s
τ_{u_i}	$i = 2$	0,0786	s
τ_{u_i}	$i = 3$	0,0014	s
τ_{u_i}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	360	mk/W
R_i	$i = 2$	150	mk/W
R_i	$i = 3$	36	mk/W
R_i	$i = 4$	4	mk/W
τ_{u_i}	$i = 1$	0,0262	s
τ_{u_i}	$i = 2$	0,0417	s
τ_{u_i}	$i = 3$	0,0012	s
τ_{u_i}	$i = 4$	0,001	s

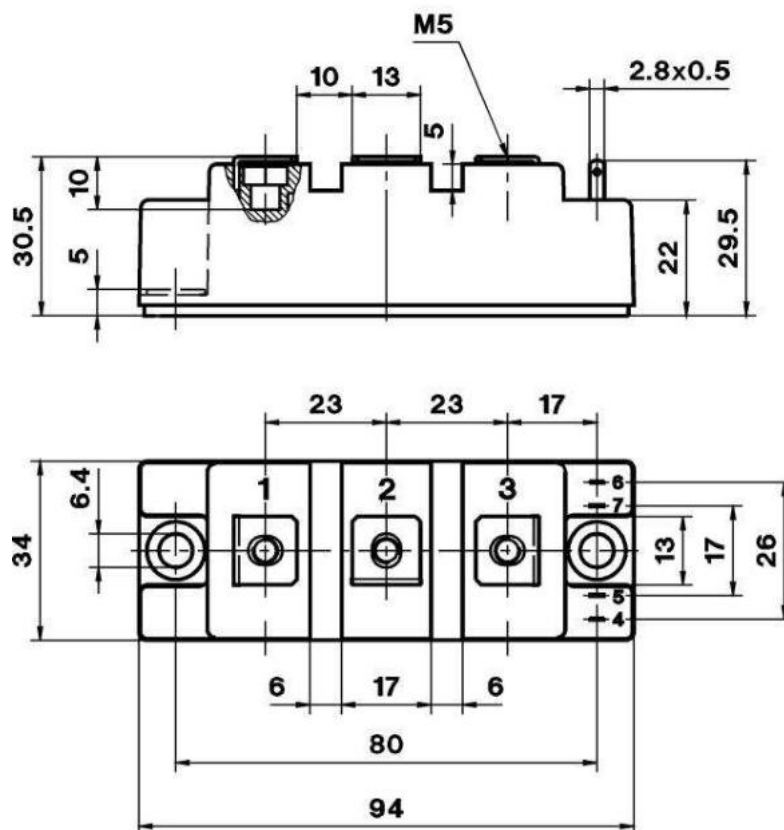


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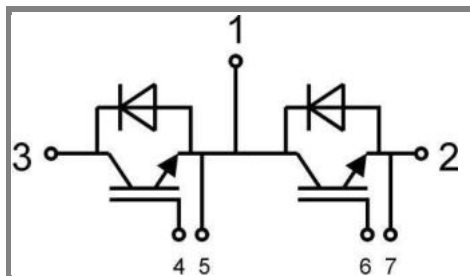




CASED61



Case D 61



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Case D 61