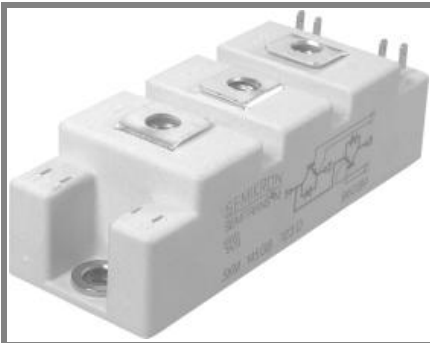


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SEMITRANS[®] 2

Superfast NPT-IGBT Modules

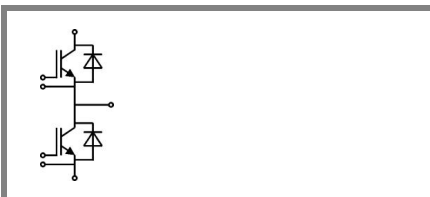
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Features

- NPT = non punch-through IGBT technology
- High short circuit capability, self limiting to $6 \times I_C$
- Pos. temp.-coeff. of V_{CEsat}
- Isolated copper baseplate

Typical Applications

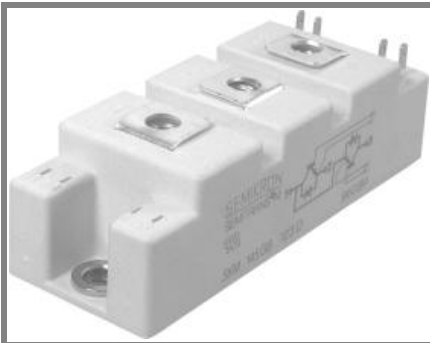
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control



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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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	70		A
		$T_{case} = 75\text{ }^\circ\text{C}$	50		A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	100		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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	75		A
		$T_{case} = 80\text{ }^\circ\text{C}$	50		A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	100		A	
I_{FSM}	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150\text{ }^\circ\text{C}$	440		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						
$V_{GE(th)}$	$V_{GE} = V_{CE}; I_C = 1\text{ mA}$	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
		$T_j = 125\text{ }^\circ\text{C}$	1,05			V
V_{CE0}			1		V	
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}$	25		m Ω	
		$T_j = 125\text{ }^\circ\text{C}$	33		m Ω	
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,1		2,5	V
		$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,4		2,8	V
C_{res}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	2,8		nF	
C_{oes}			0,3		nF	
C_{res}			0,2		nF	
Q_G	$V_{GE} = 0\text{ V} \dots +15\text{ V}$	120			nC	
R_{Gint}	$T_j = \text{ }^\circ\text{C}$	0			Ω	
$t_{d(on)}$	$R_{Gon} = 22\text{ } \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 50\text{ A}$	50		ns	
t_r			40		ns	
E_{on}	$R_{Goff} = 22\text{ } \Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	2,5		mJ	
$t_{d(off)}$			300		ns	
t_f			30		ns	
E_{off}			1,8		mJ	
$R_{th(j-c)}$	per IGBT			0,5	K/W	



SEMITRANS® 2

Superfast NPT-IGBT Modules

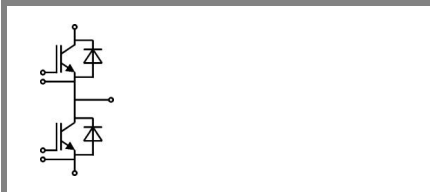
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Features

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- Pos. temp.-coeff. of V_{CEsat}
- Isolated copper baseplate

Typical Applications

- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control



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Characteristics

Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$		1,45	1,7	V
			1,35		V
V_{F0}				0,9	V
r_F			10	15	mΩ
I_{RRM}	$I_{Fnom} = 50 \text{ A}$		31		A
Q_{rr}	$di/dt = 50 \text{ A}/\mu\text{s}$		3,2		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			1	K/W
Module					
L_{CE}				30	nH
R_{CC+EE}	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,75		mΩ
		$T_{case} = 125 \text{ °C}$	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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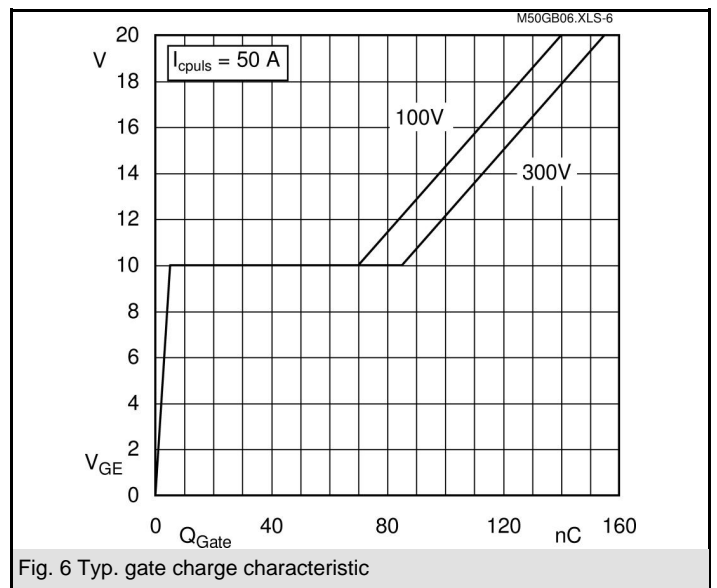
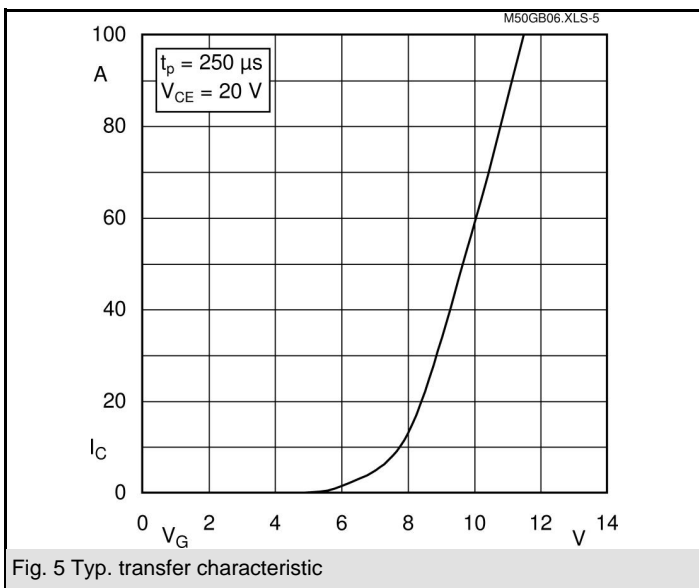
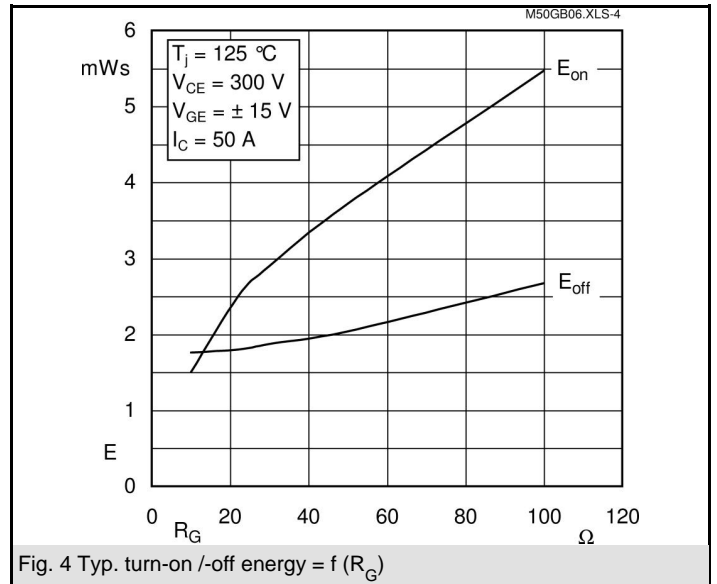
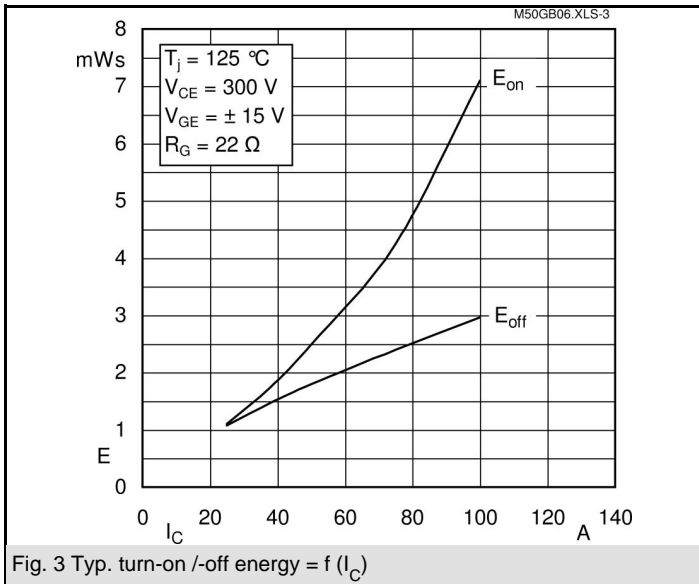
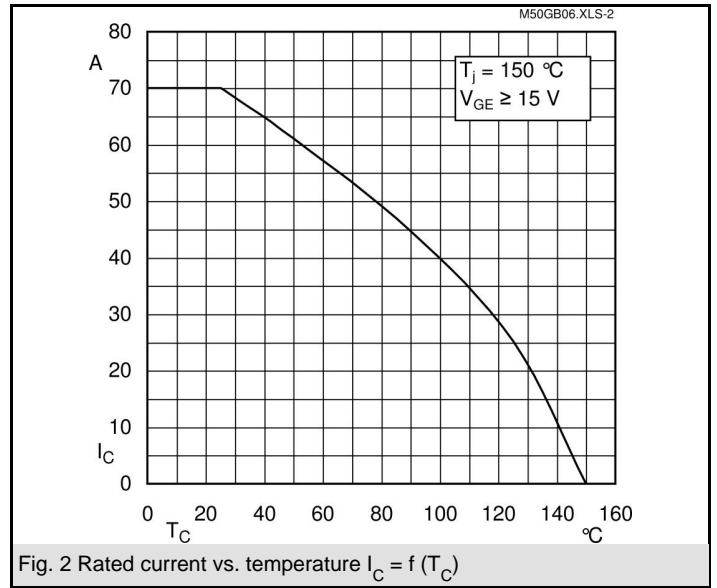
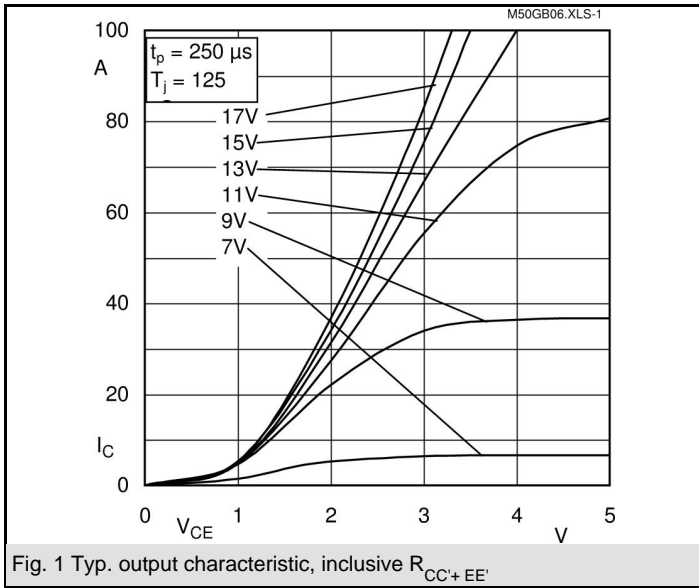
Typical Applications

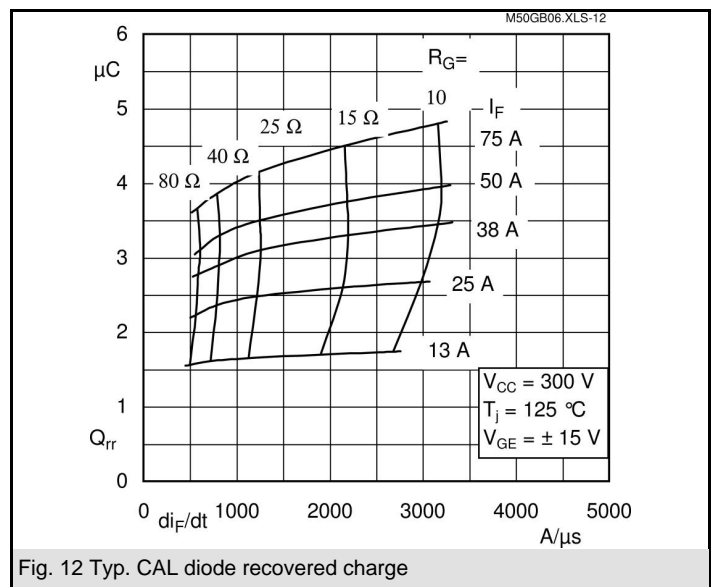
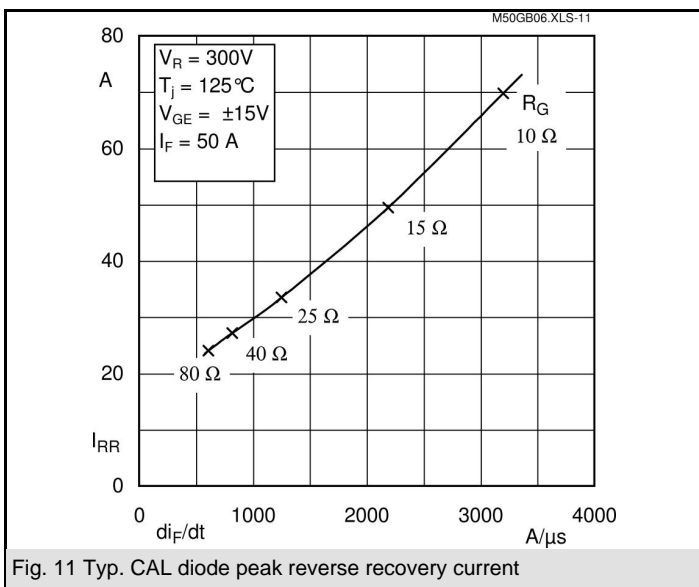
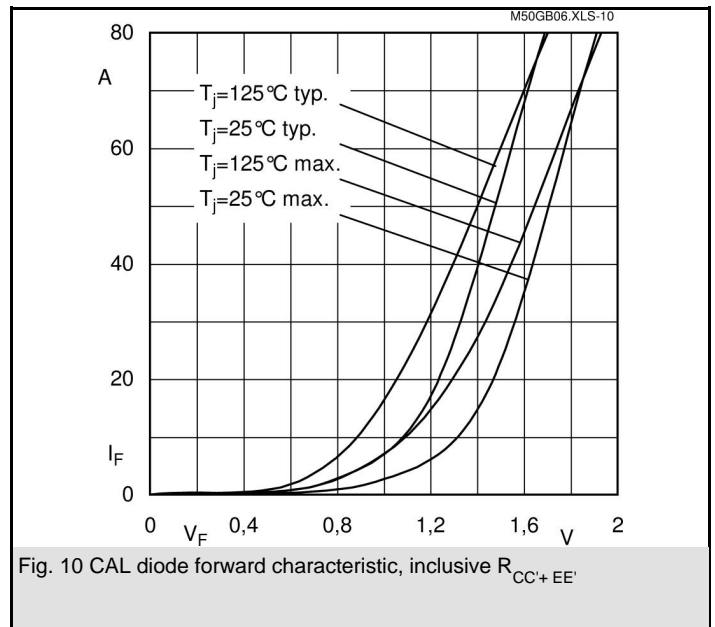
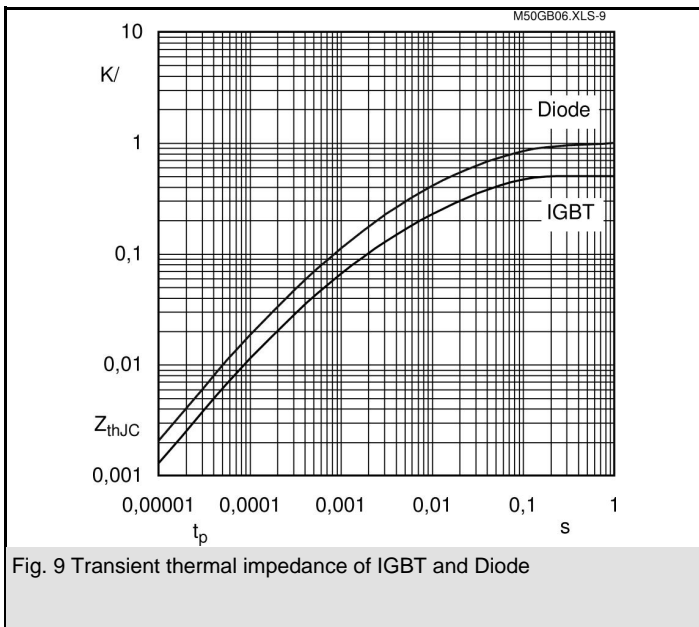
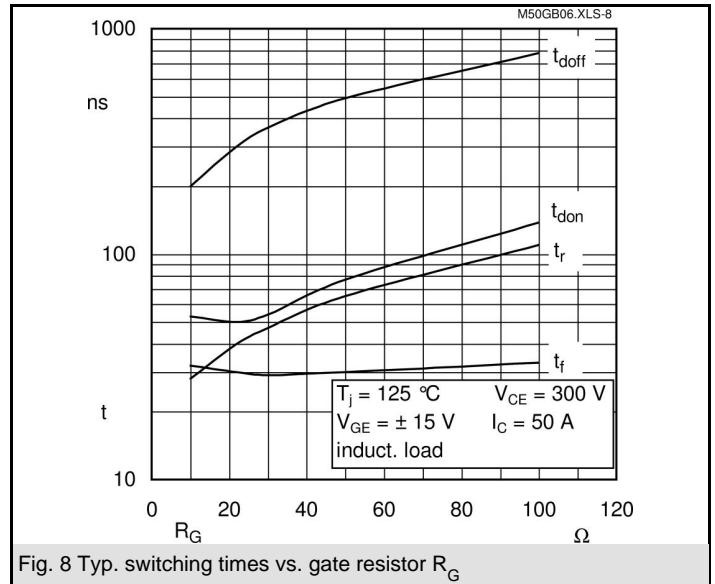
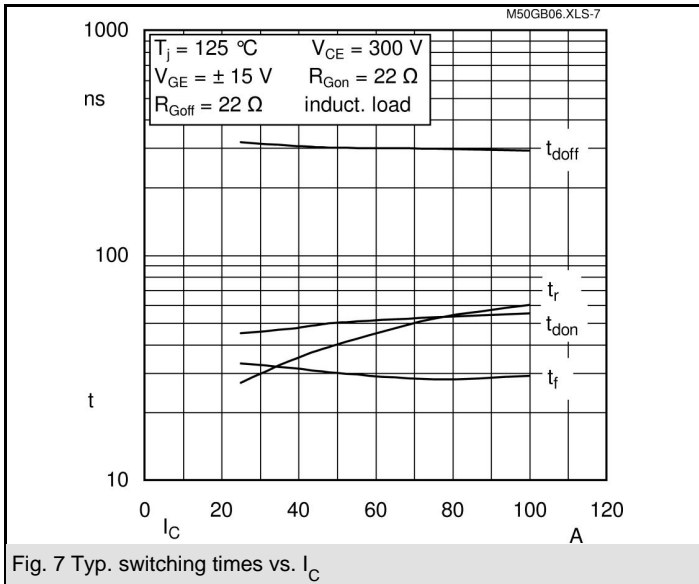
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Z_{th}		Conditions	Values	Units
$Z_{th(j-c)I}$				
$R_{\theta j-c1}$	$i = 1$		290	mk/W
$R_{\theta j-c2}$	$i = 2$		145	mk/W
$R_{\theta j-c3}$	$i = 3$		54	mk/W
$R_{\theta j-c4}$	$i = 4$		11	mk/W
τ_{th1}	$i = 1$		0,0382	s
τ_{th2}	$i = 2$		0,0078	s
τ_{th3}	$i = 3$		0,0017	s
τ_{th4}	$i = 4$		0,0001	s
$Z_{th(j-c)D}$				
$R_{\theta j-cD1}$	$i = 1$		550	mk/W
$R_{\theta j-cD2}$	$i = 2$		340	mk/W
$R_{\theta j-cD3}$	$i = 3$		92	mk/W
$R_{\theta j-cD4}$	$i = 4$		18	mk/W
τ_{thD1}	$i = 1$		0,0761	s
τ_{thD2}	$i = 2$		0,045	s
τ_{thD3}	$i = 3$		0,011	s
τ_{thD4}	$i = 4$		0,0002	s
$Z_{th(r-s)}$				
$R_{\theta r-s1}$	$i = 1$			mk/W
$R_{\theta r-s2}$	$i = 2$			mk/W
$R_{\theta r-s3}$	$i = 3$			mk/W
$R_{\theta r-s4}$	$i = 4$			mk/W
τ_{thr-s1}	$i = 1$			s
τ_{thr-s2}	$i = 2$			s
τ_{thr-s3}	$i = 3$			s
τ_{thr-s4}	$i = 4$			s



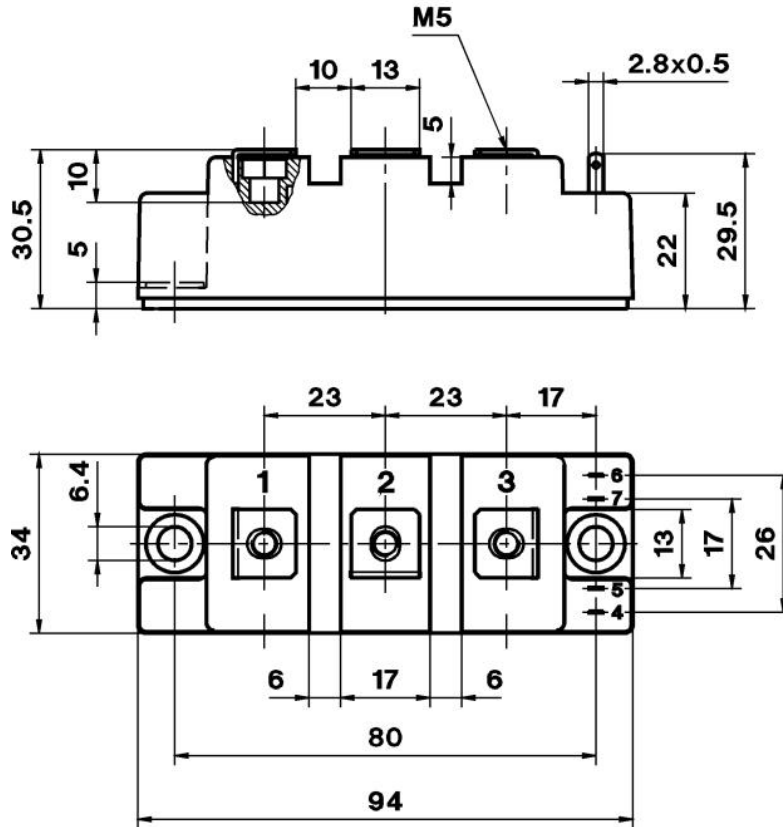


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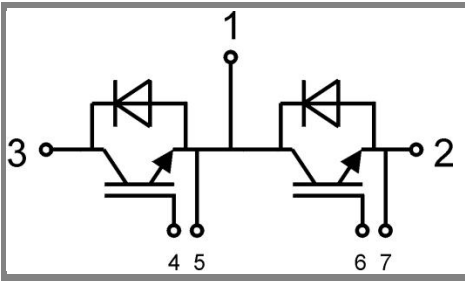
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Case D 61



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