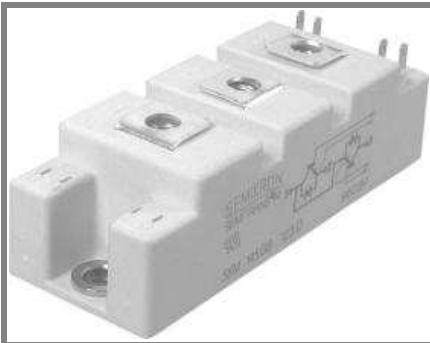


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Superfast NPT-IGBT Modules

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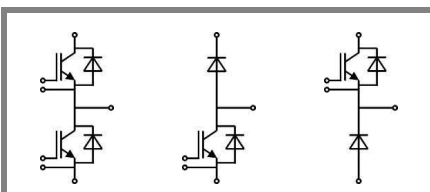
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Features

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- 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}
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- Latch-up free
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- 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 > 10kHz



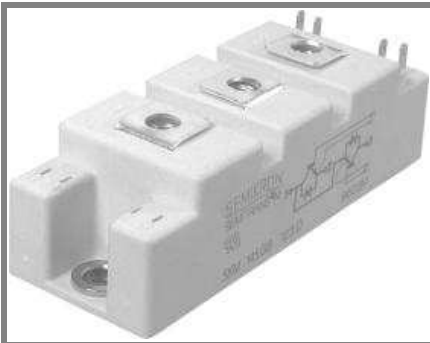
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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	600		V
I_C	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	100	A
		$T_{case} = 75^\circ\text{C}$	75	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 600\text{ V}$	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	75	A
		$T_{case} = 80^\circ\text{C}$	50	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	150		A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	440	
Freewheeling Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	100	A
		$T_c = 80^\circ\text{C}$	75	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200		A
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150^\circ\text{C}$	720	
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		$T_c = 25^\circ\text{C}$, 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}	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		$T_j = 25^\circ\text{C}$ 0,1	0,3	mA
V_{CE0}			$T_j = 25^\circ\text{C}$	1,05	V
			$T_j = 125^\circ\text{C}$	1	V
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25^\circ\text{C}$	14	$\text{m}\Omega$
			$T_j = 125^\circ\text{C}$	18,7	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$		$T_j = 25^\circ\text{C}_{chiplev.}$	2,1	2,5
			$T_j = 125^\circ\text{C}_{chiplev.}$	2,4	2,8
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		4,2	nF
C_{oes}				0,5	nF
C_{res}				0,3	nF
Q_G	$V_{GE} = 0\text{ V} \dots +15\text{ V}$		180		nC
R_{Gint}	$T_j = ^\circ\text{C}$		0		Ω
$t_{d(on)}$	$R_{Gon} = 15\ \Omega$	$V_{CC} = 300\text{ V}$ $I_C = 75\text{ A}$		60	ns
t_r				50	ns
E_{on}				3	mJ
$t_{d(off)}$	$R_{Goff} = 15\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$		350	ns
t_f				35	ns
E_{off}				2,5	mJ
$R_{th(j-c)}$	per IGBT			0,35	K/W



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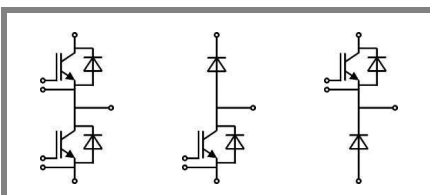
SKM 75GAL063D

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- High short circuit capability, self limiting if term. G is clamped to E
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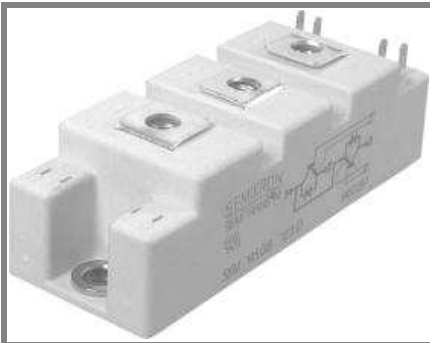
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Characteristics		min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$		1,55	1,9	V
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,55		V
V_{F0}				0,9	V
r_F			10	13,3	mΩ
I_{RRM}	$I_F = 75 \text{ A}$		30		A
Q_{rr}	$di/dt = 800 \text{ A}/\mu\text{s}$		3,7		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,72	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		1,55	1,9	V
	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$				
	$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,55		V
V_{F0}				0,9	V
r_F			8	10	V
I_{RRM}	$I_F = 100 \text{ A}$		44		A
Q_{rr}	$di/dt = 0 \text{ A}/\mu\text{s}$		6		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)FD}$	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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Superfast NPT-IGBT Modules

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SKM 75GAL063D

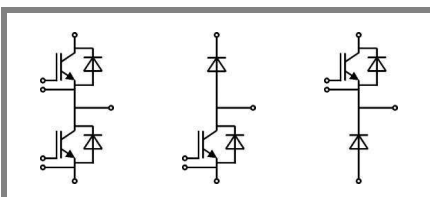
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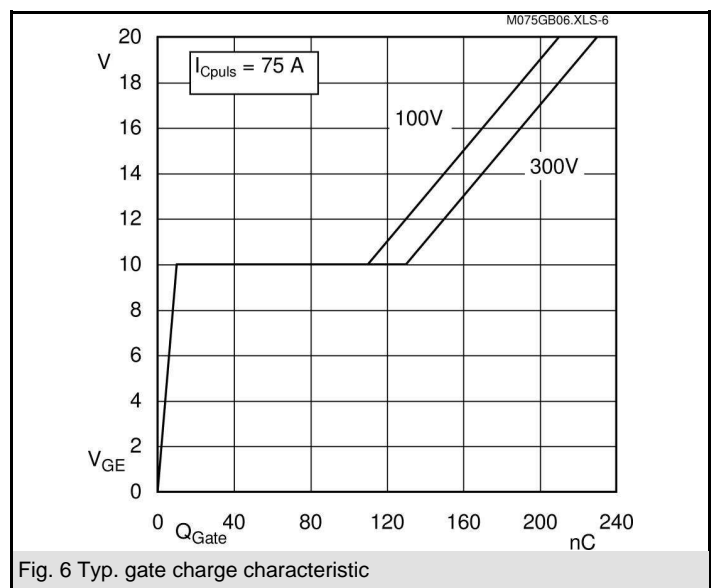
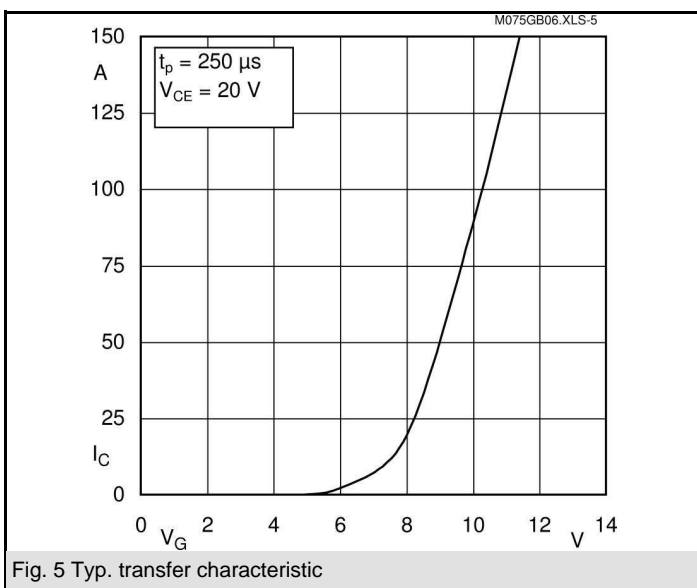
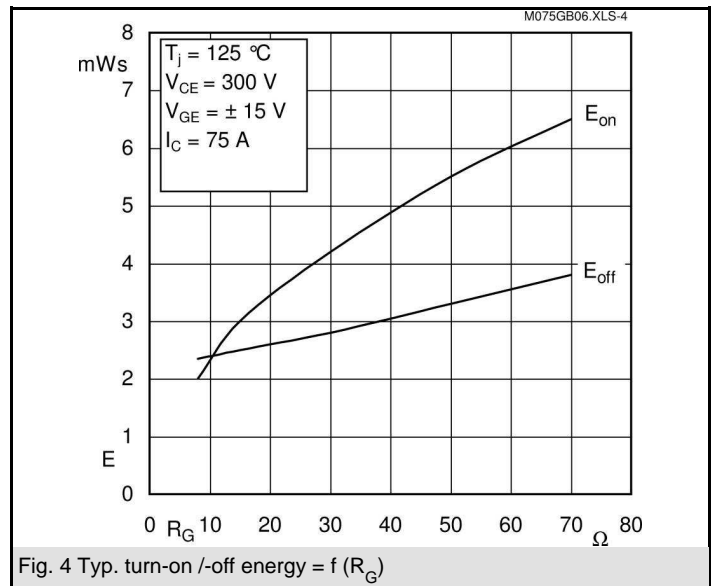
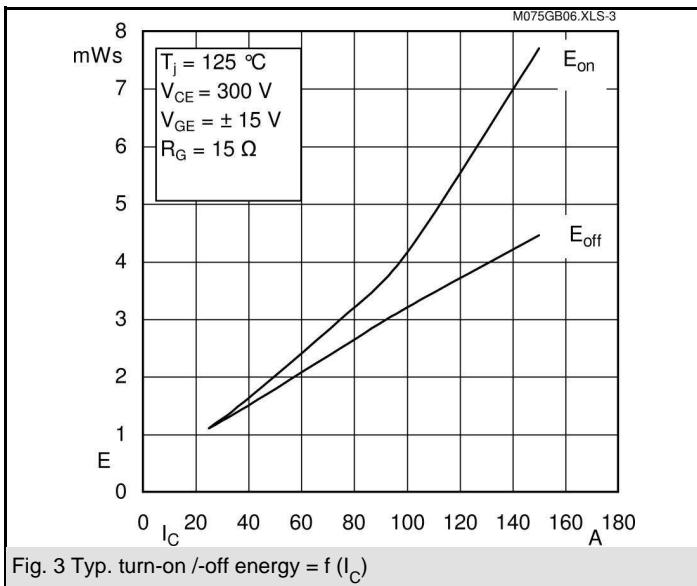
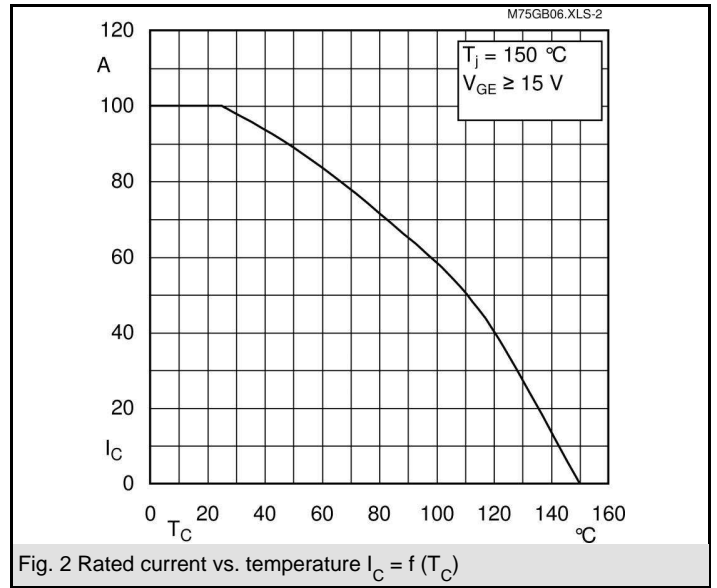
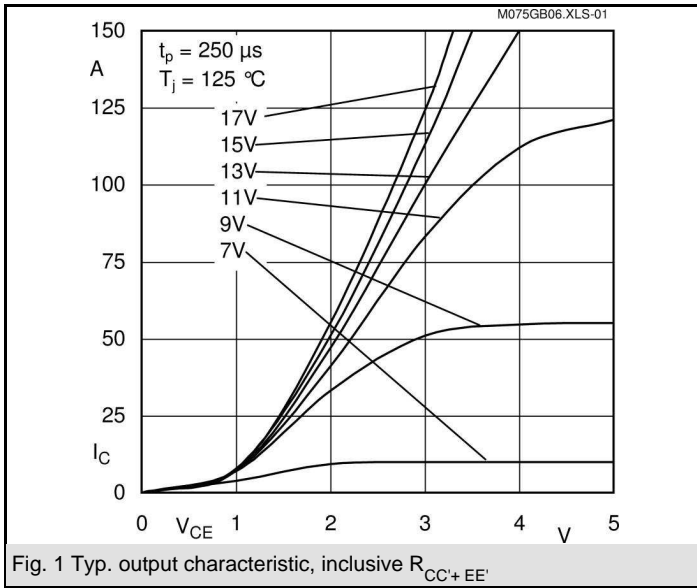
Z_{th}	Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$	R_{θ}	i = 1	250	mk/W
	R_{θ}	i = 2	70	mk/W
	R_{θ}	i = 3	25	mk/W
	R_{θ}	i = 4	5	mk/W
	τ_{θ}	i = 1	0,0874	s
	τ_{θ}	i = 2	0,0078	s
	τ_{θ}	i = 3	0,0017	s
	τ_{θ}	i = 4	0,0001	s
$Z_{th(j-c)D}$	R_{θ}	i = 1	550	mk/W
	R_{θ}	i = 2	340	mk/W
	R_{θ}	i = 3	92	mk/W
	R_{θ}	i = 4	18	mk/W
	τ_{θ}	i = 1	0,0761	s
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	τ_{θ}	i = 3	0,011	s
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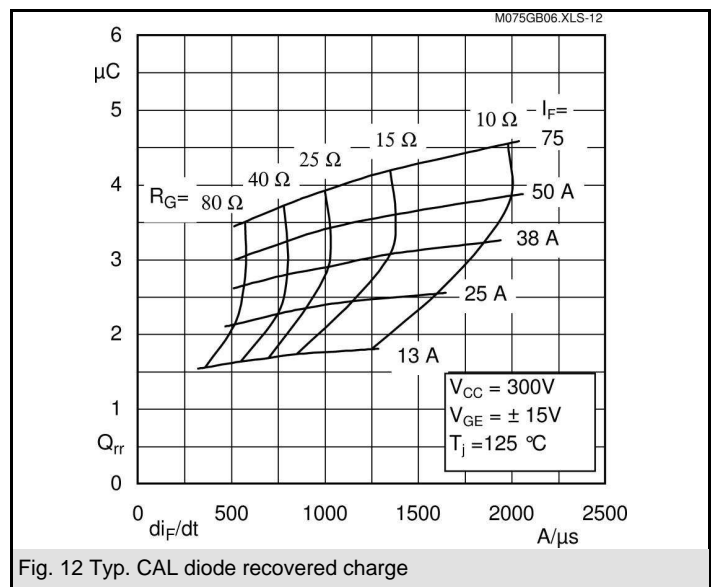
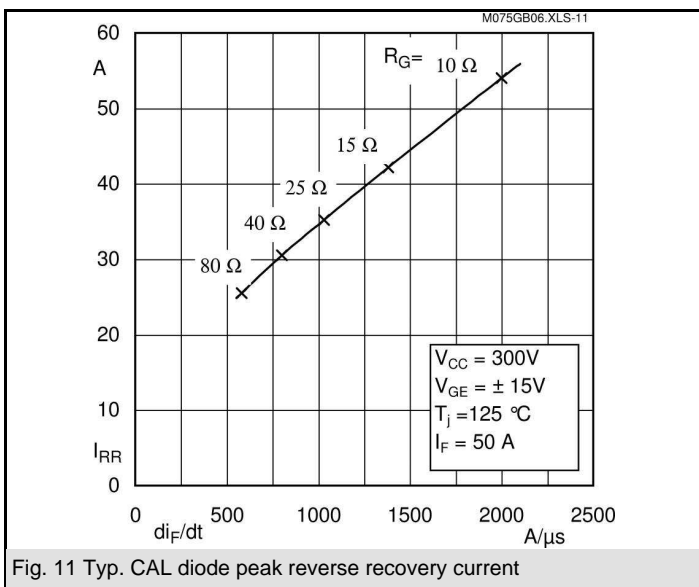
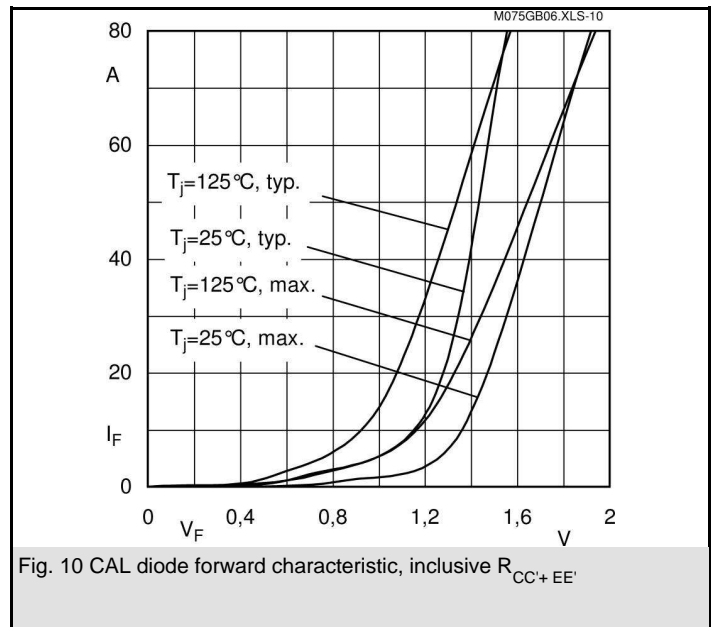
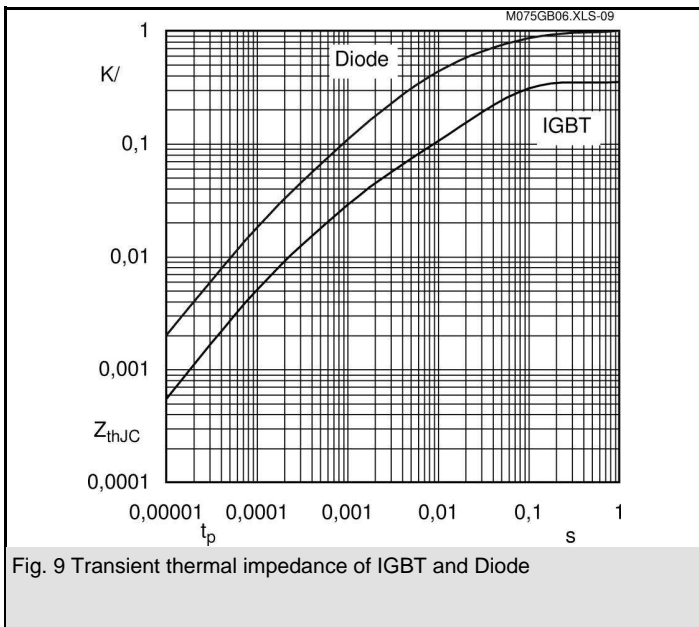
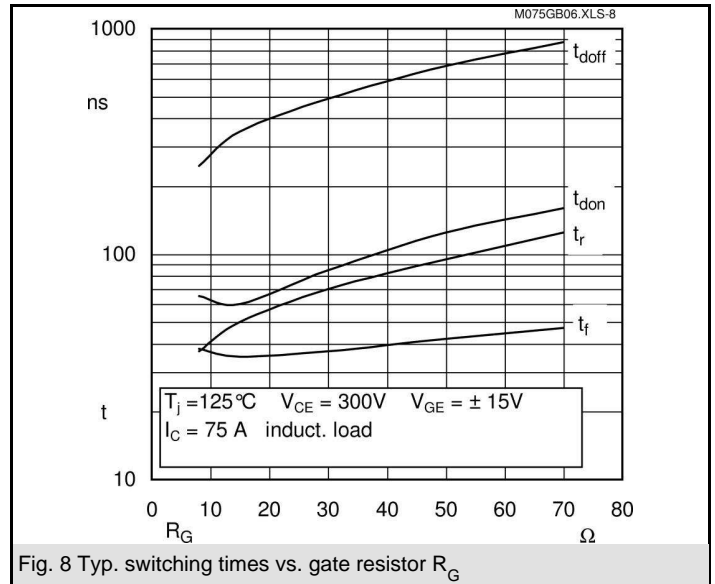
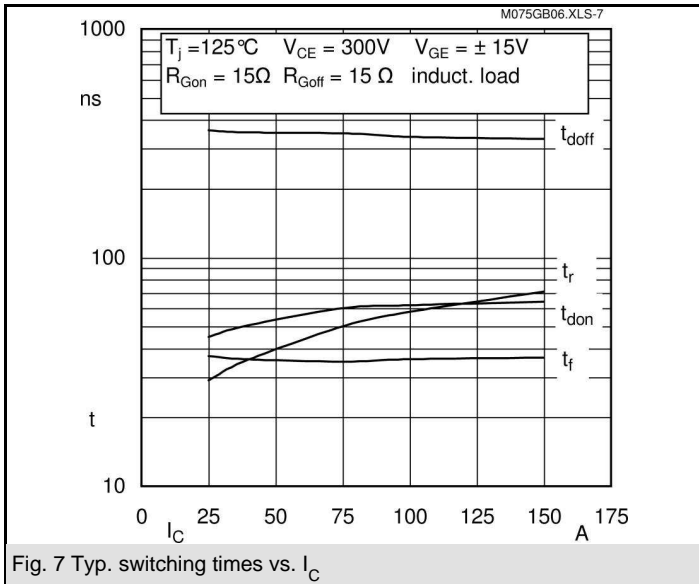


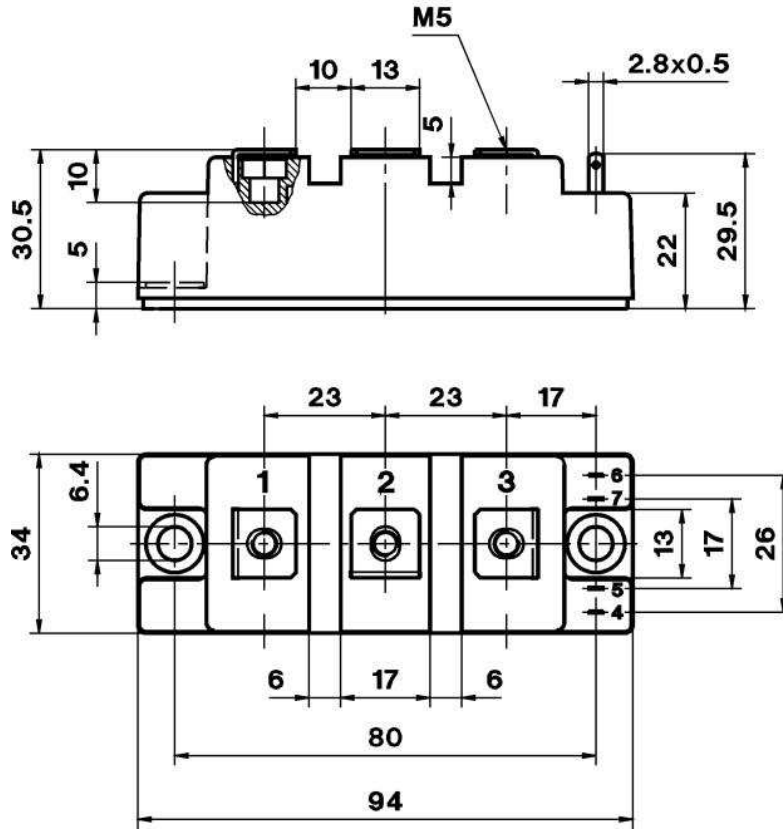
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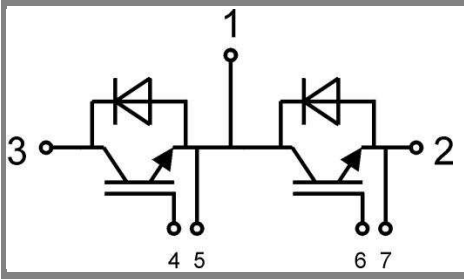
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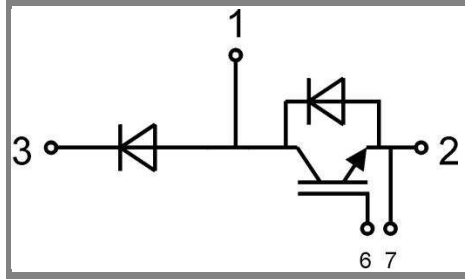




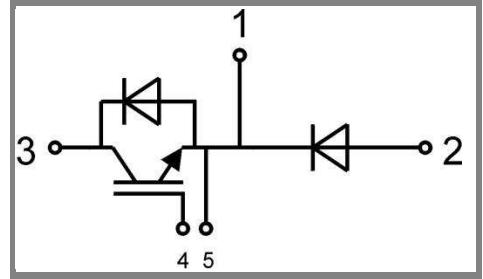
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)