

SKM 75GB063D



SEMITRANS[®] 2

Superfast NPT-IGBT Modules

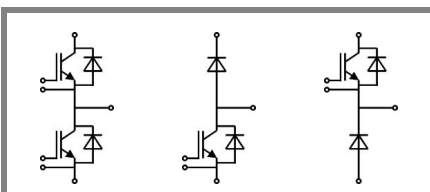
SKM 75GB063D
SKM 75GAR063D
SKM 75GAL063D

Features

- N channel, homogeneous Si-structure (NPT-Non punch-through IGBT)
- 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}
- Very low C_{ies} , C_{oes} , C_{res}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DBC Direct Copper Bonding Technology without hard mould
- 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



GB GAL GAR

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	$T_j = 150\text{ }^\circ\text{C}$	$T_{case} = 25\text{ }^\circ\text{C}$	100	A	
		$T_{case} = 75\text{ }^\circ\text{C}$	75	A	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	150		A	
V_{GES}		± 20		V	
t_{psc}	$V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^\circ\text{C}$ $V_{CES} < 600\text{ V}$	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}	$I_{FRM} = 2 \times I_{Fnom}$	150		A	
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^\circ\text{C}$	440		A
Freewheeling Diode					
I_F	$T_j = 150\text{ }^\circ\text{C}$	$T_c = 25\text{ }^\circ\text{C}$	100	A	
		$T_c = 80\text{ }^\circ\text{C}$	75	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	200		A	
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150\text{ }^\circ\text{C}$	720		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	
V_{CE0}			$T_j = 25\text{ }^\circ\text{C}$	1,05	V	
			$T_j = 125\text{ }^\circ\text{C}$	1	V	
r_{CE}	$V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}$	14	$\text{m}\Omega$	
			$T_j = 125\text{ }^\circ\text{C}$	18,7	$\text{m}\Omega$	
$V_{CE(sat)}$	$I_{Cnom} = 75\text{ A}, V_{GE} = 15\text{ V}$		$T_j = 25\text{ }^\circ\text{C}_{chiplev.}$	2,1	2,5	V
			$T_j = 125\text{ }^\circ\text{C}_{chiplev.}$	2,4	2,8	V
C_{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}	$T_j = \text{ }^\circ\text{C}$		0		Ω	
$t_{d(on)}$	$R_{Gon} = 15\text{ } \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 75\text{ A}$		60	ns	
t_r				50	ns	
E_{on}				3	mJ	
$t_{d(off)}$	$R_{Goff} = 15\text{ } \Omega$	$T_j = 125\text{ }^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$		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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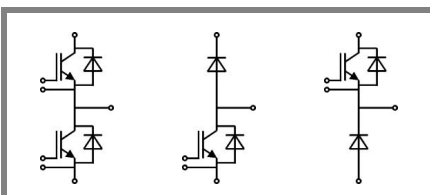
SKM 75GAL063D

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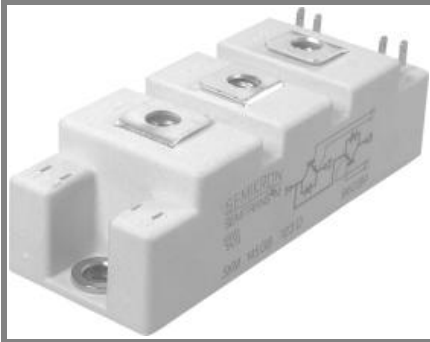
GAR

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}	$T_j = 125 \text{ }^\circ\text{C}$			0,9	V
r_F	$T_j = 125 \text{ }^\circ\text{C}$		10	13,3	m Ω
I_{RRM}	$I_{Fnom} = 75 \text{ A}$		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}	$T_j = 125 \text{ }^\circ\text{C}$			0,9	V
r_F	$T_j = 125 \text{ }^\circ\text{C}$		8	10	V
I_{RRM}	$I_{Fnom} = 100 \text{ A}$		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		m Ω
		$T_{case} = 125 \text{ }^\circ\text{C}$	1		m Ω
$R_{th(c-s)}$	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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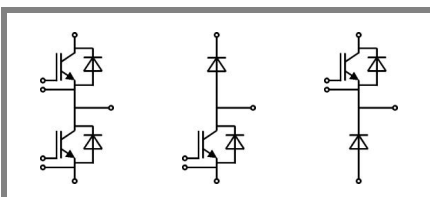
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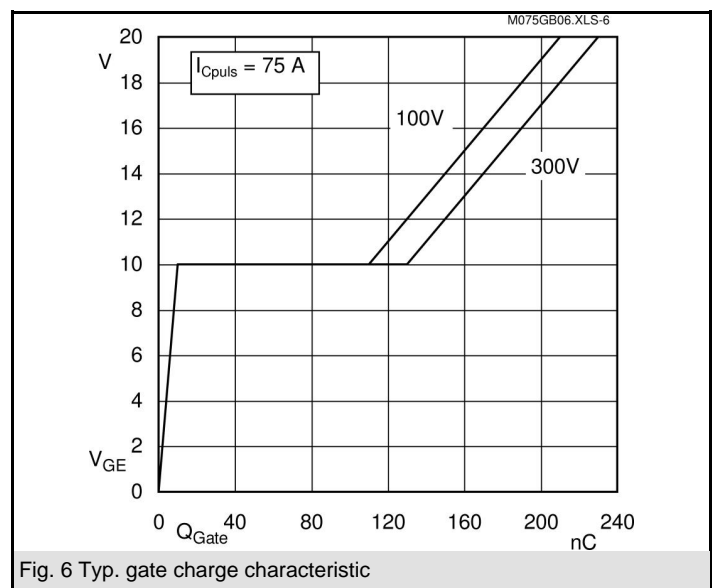
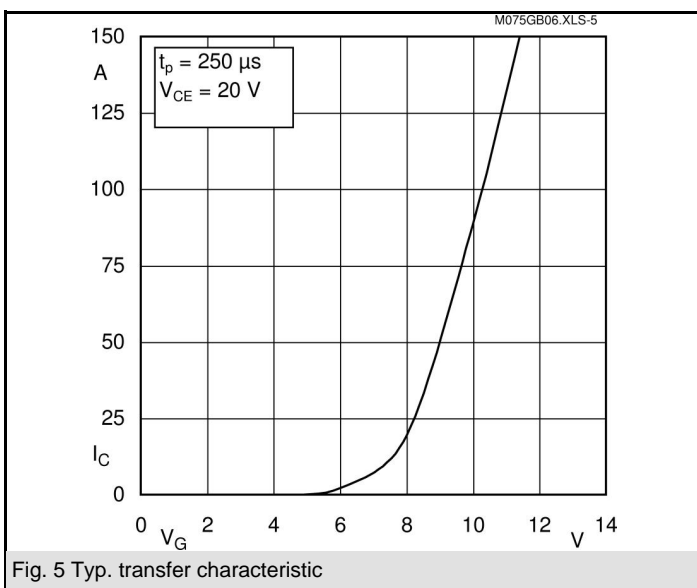
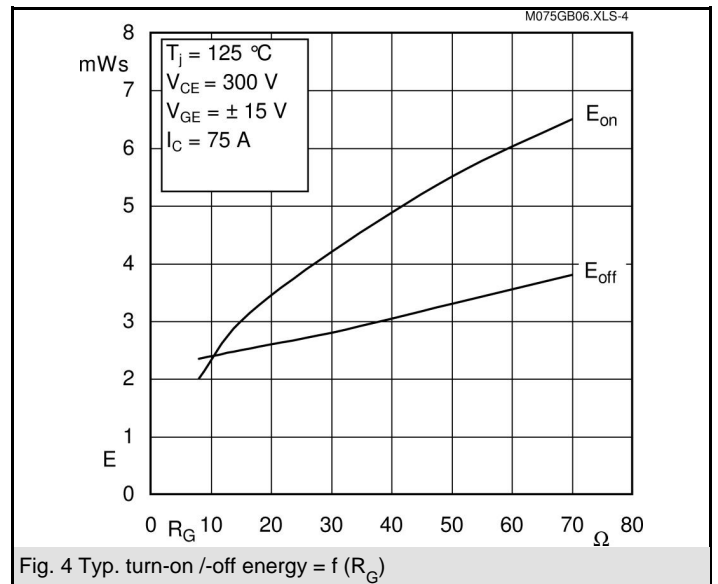
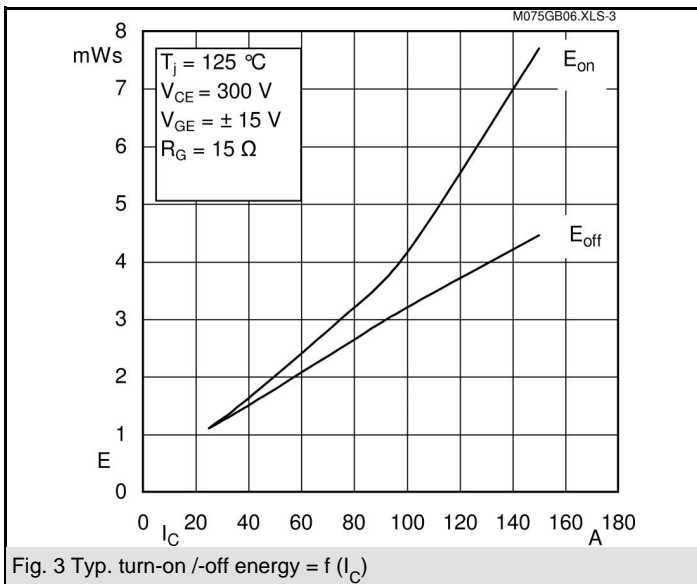
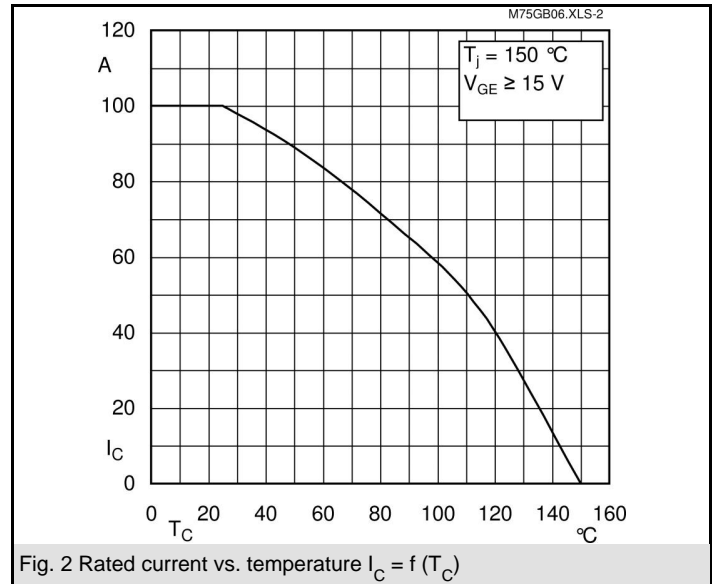
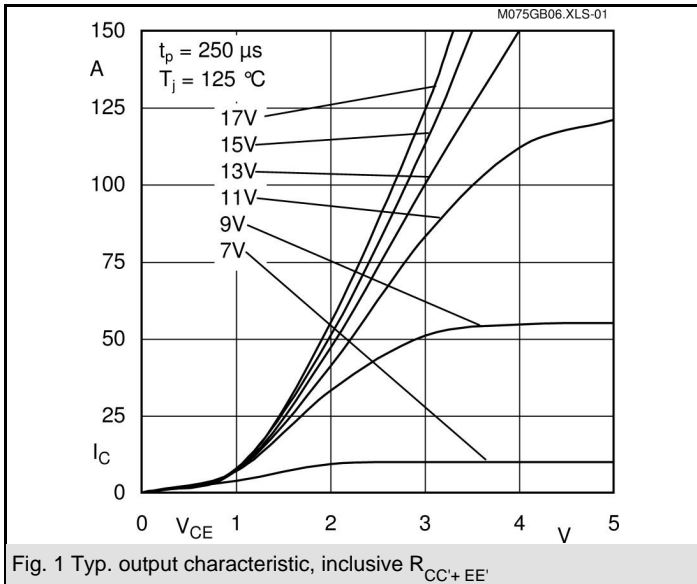
Z_{th}	Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$	R_{θ}	i = 1	250	mk/W
	R_{θ}	i = 2	70	mk/W
	R_{θ}	i = 3	25	mk/W
	R_{θ}	i = 4	5	mk/W
	τ_{θ}	i = 1	0,0874	s
	τ_{θ}	i = 2	0,0078	s
	τ_{θ}	i = 3	0,0017	s
	τ_{θ}	i = 4	0,0001	s
$Z_{th(j-c)D}$	R_{θ}	i = 1	550	mk/W
	R_{θ}	i = 2	340	mk/W
	R_{θ}	i = 3	92	mk/W
	R_{θ}	i = 4	18	mk/W
	τ_{θ}	i = 1	0,0761	s
	τ_{θ}	i = 2	0,0045	s
	τ_{θ}	i = 3	0,011	s
	τ_{θ}	i = 4	0,0002	s

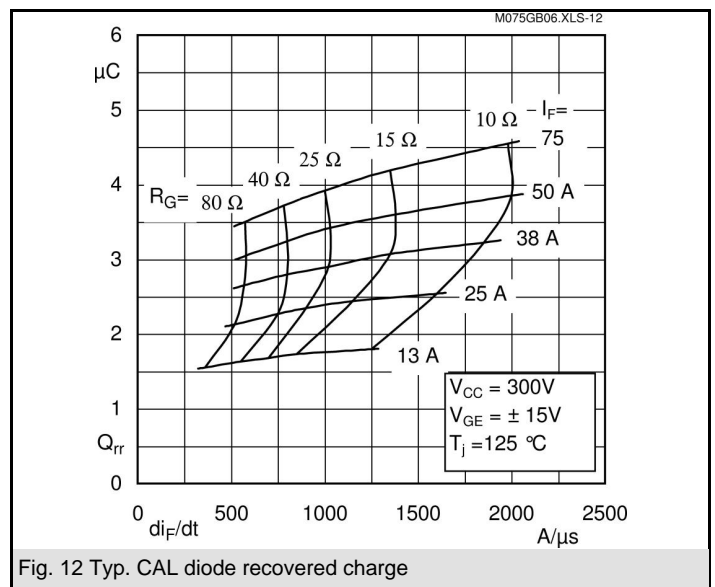
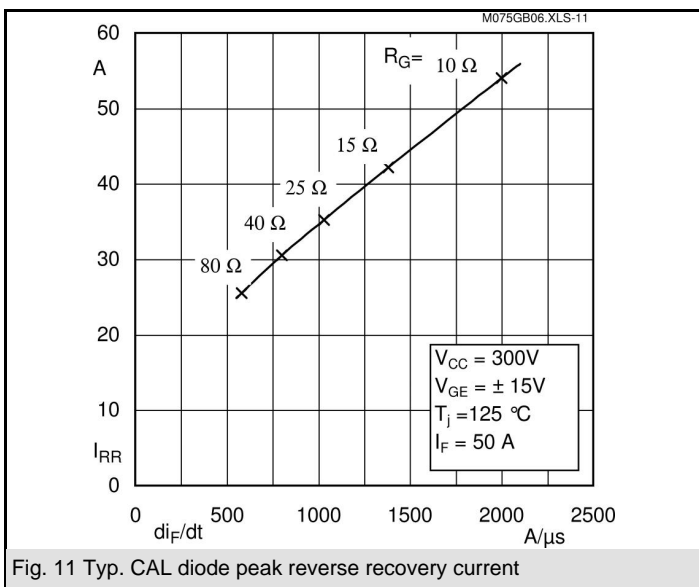
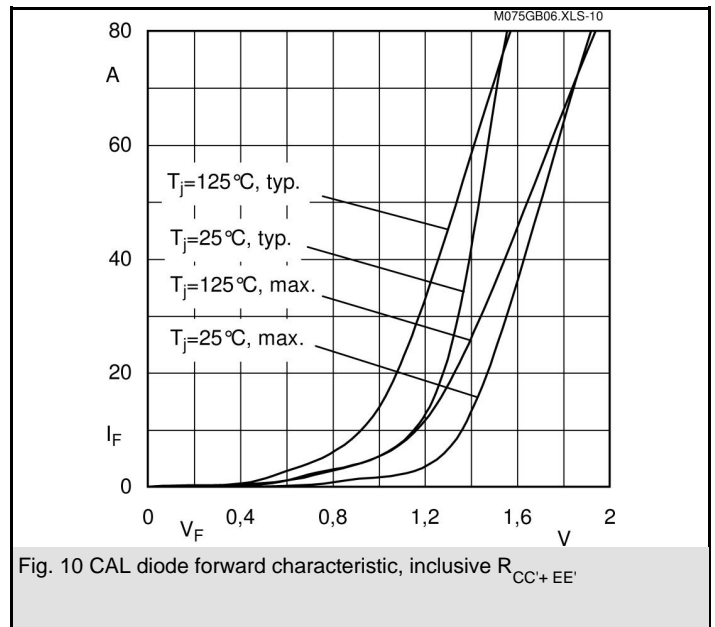
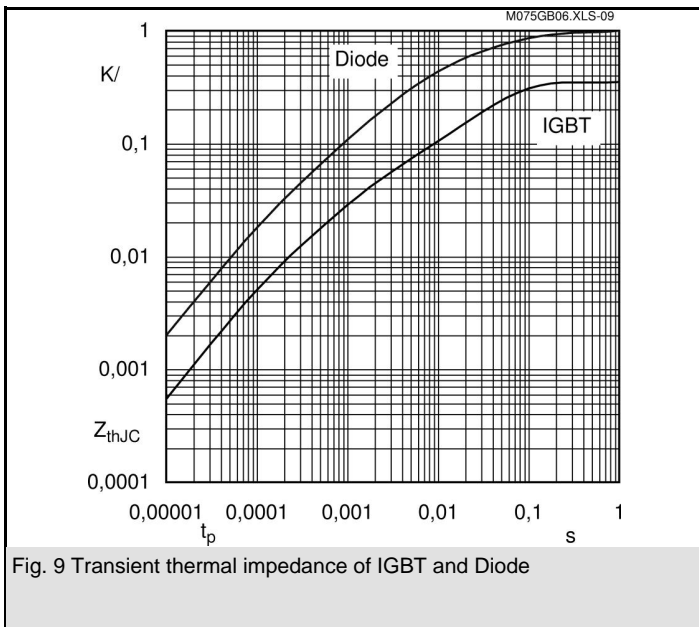
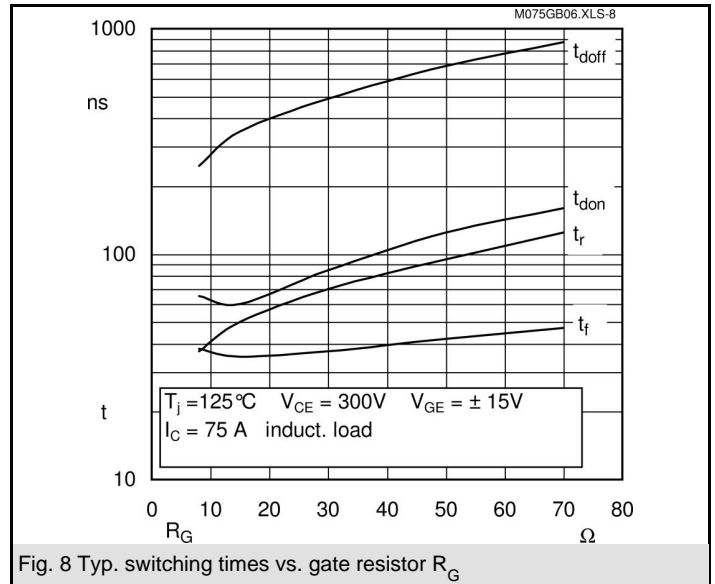
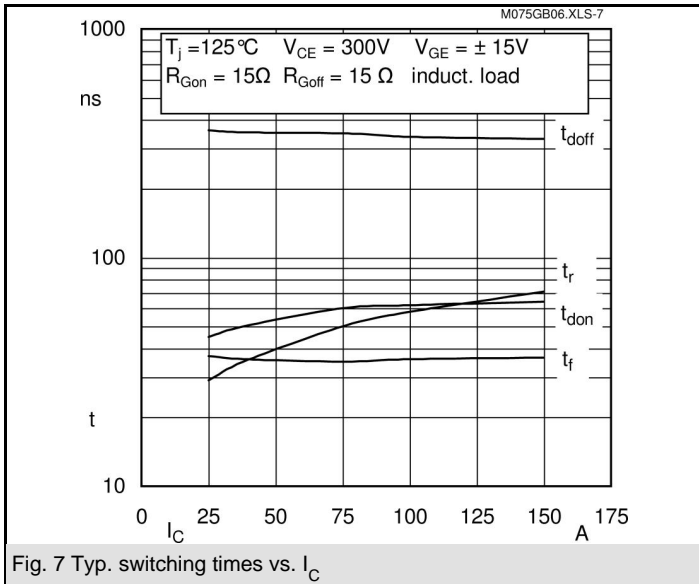


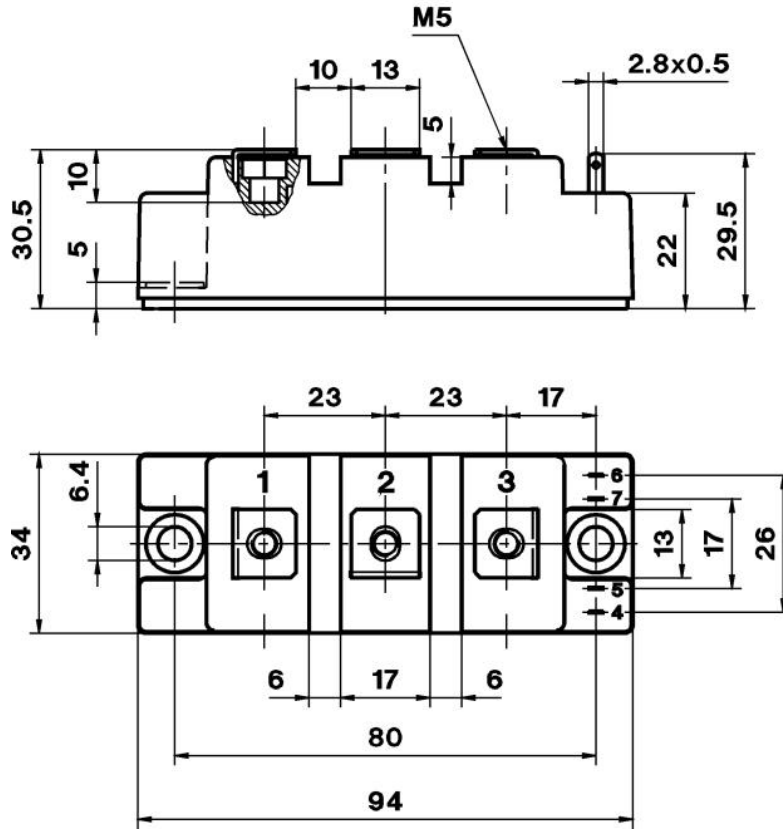
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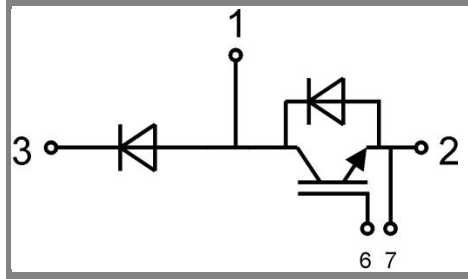




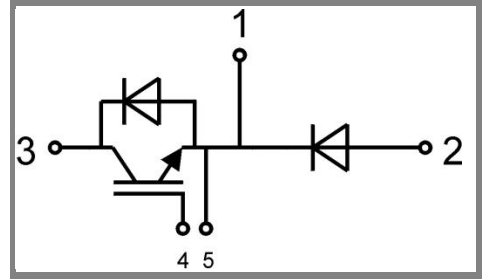
Case D 61



GB Case D 61



GAL Case D 62 (→ D 61)



GAR Case D 63 (→ D 61)