



SEMITRANS® 2

Superfast NPT-IGBT Modules

SKM 75GB063D

SKM 75GAR063D

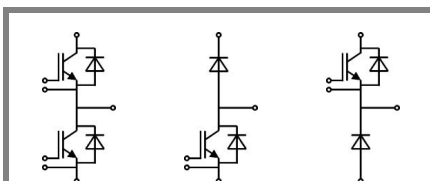
SKM 75GAL063D

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



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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	A
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	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 °C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 1 mA		4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES}	T _j = 25 °C		0,1	0,3	mA
V _{CE0}		T _j = 25 °C		1,05		V
		T _j = 125 °C		1		V
r _{CE}	V _{GE} = 15 V	T _j = 25°C		14		mΩ
		T _j = 125°C		18,7		mΩ
V _{CE(sat)}	I _{Cnom} = 75 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}		2,1	2,5	V
		T _j = 125°C _{chiplev.}		2,4	2,8	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		4,2		nF
C _{oes}				0,5		nF
C _{res}				0,3		nF
Q _G	V _{GE} = 0V...+15V			180		nC
R _{Gint}	T _j = °C			0		Ω
t _{d(on)}	R _{Gon} = 15 Ω	V _{CC} = 300V I _C = 75A T _j = 125 °C V _{GE} = ±15V		60		ns
t _r				50		ns
E _{on}				3		mJ
t _{d(off)}	R _{Goff} = 15 Ω			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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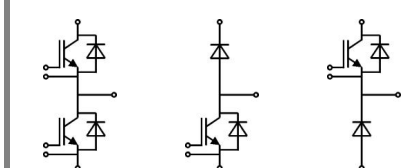
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- Latch-up free
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 75 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	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	mΩ
I_{RRM}	$I_F = 75 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	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					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	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}	$I_F = 100 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	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.

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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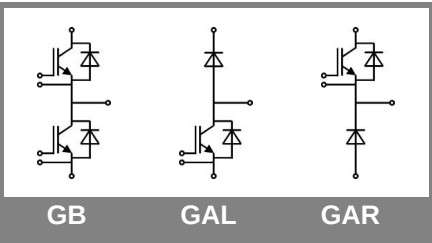
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Features

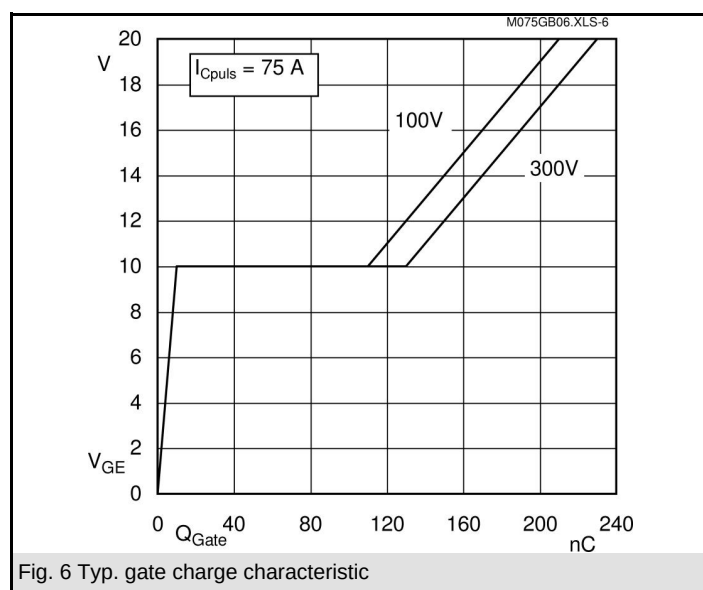
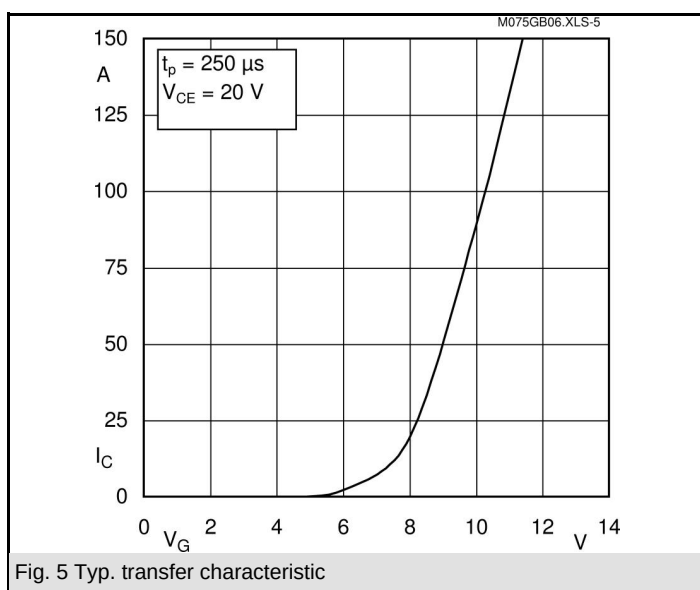
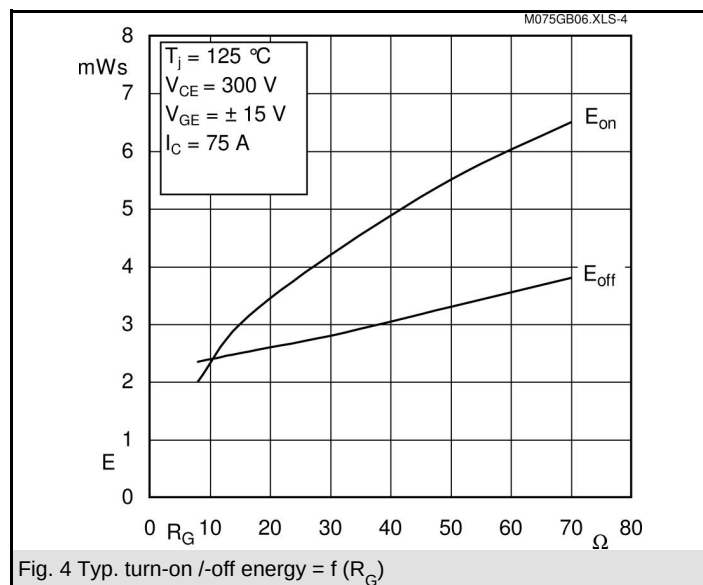
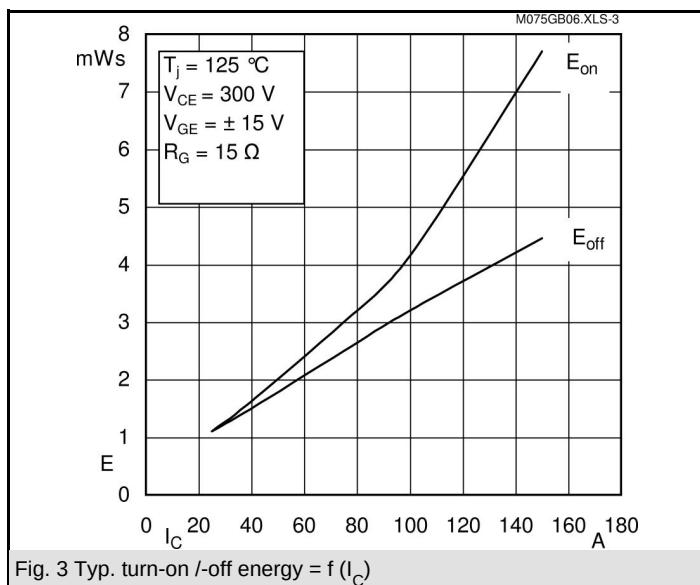
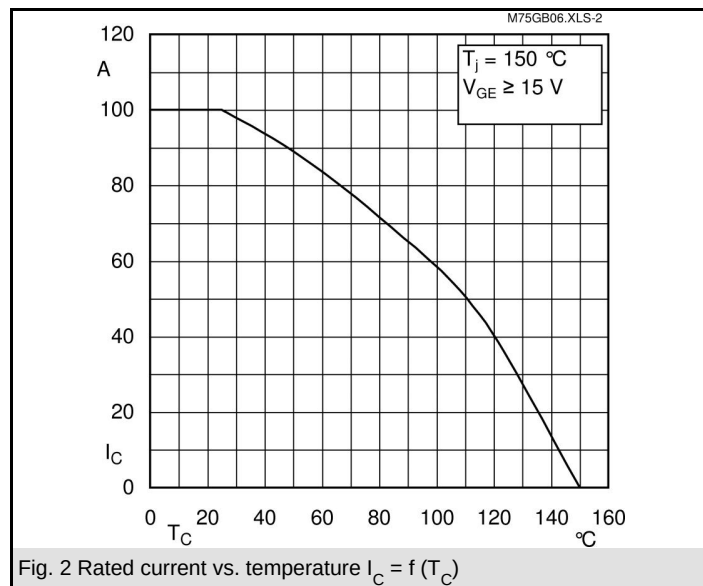
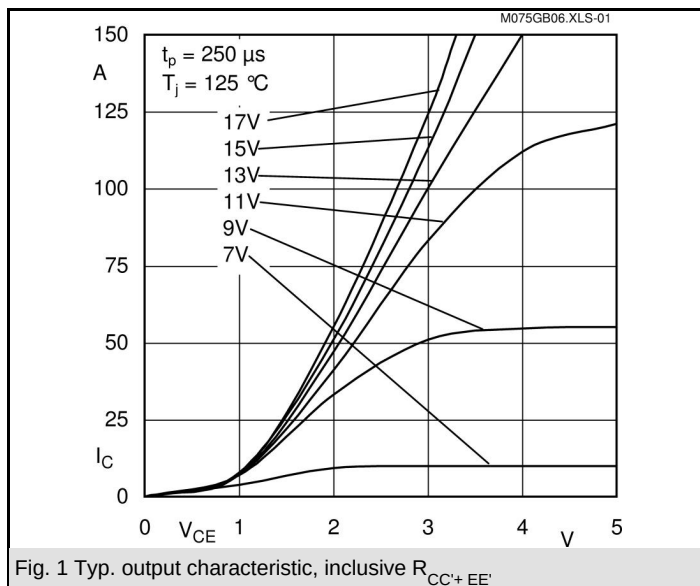
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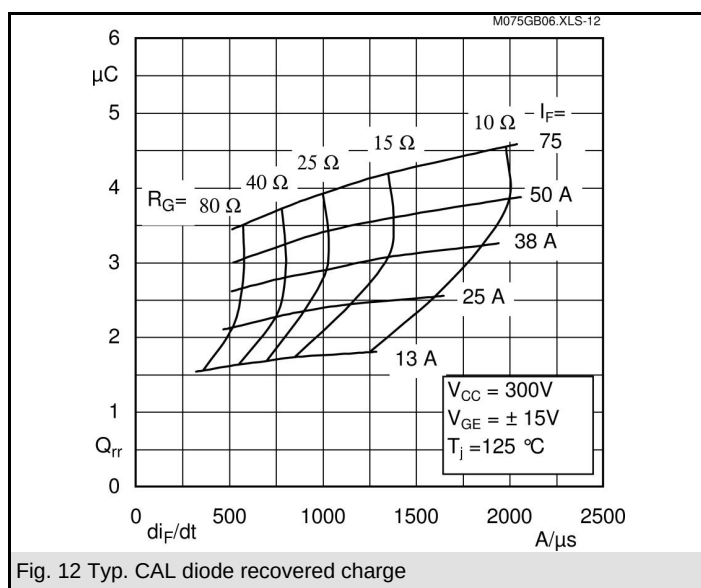
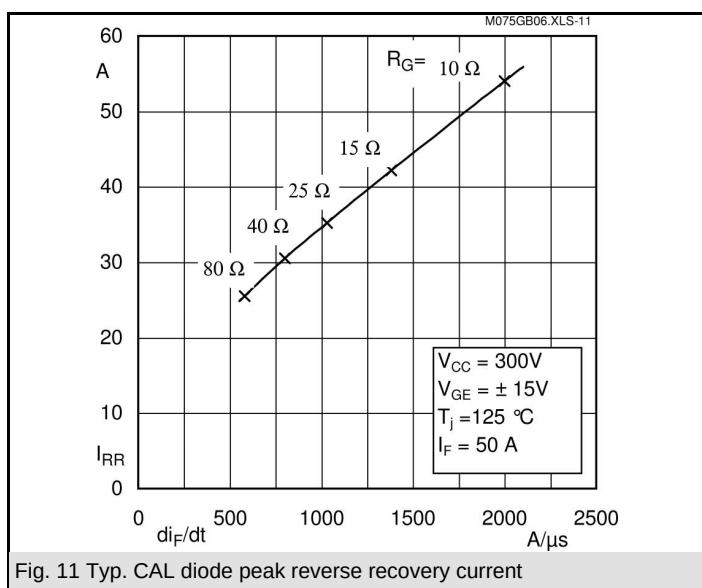
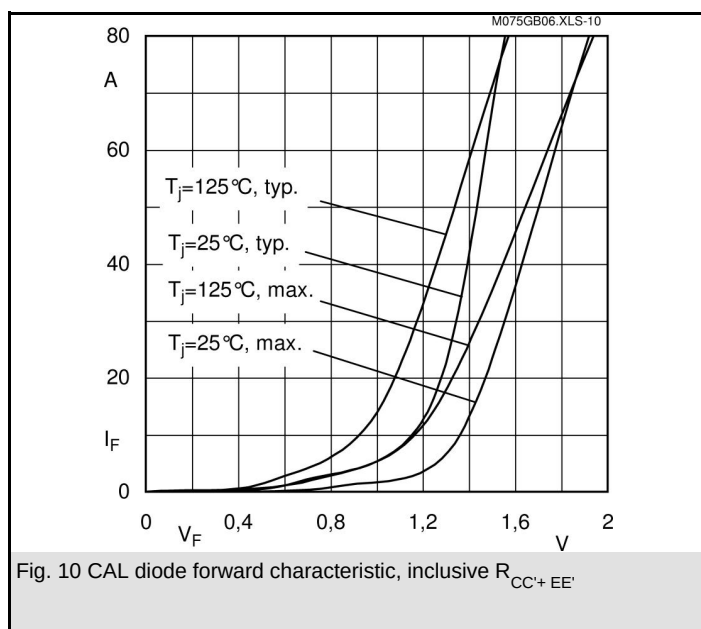
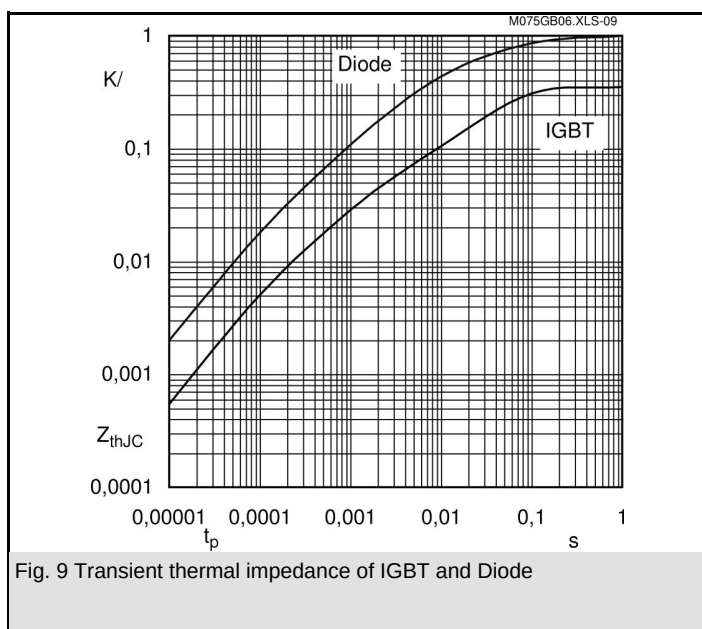
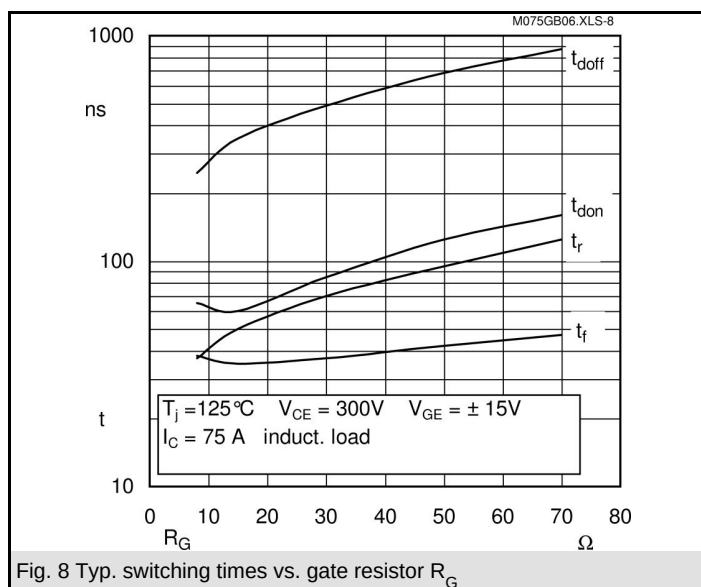
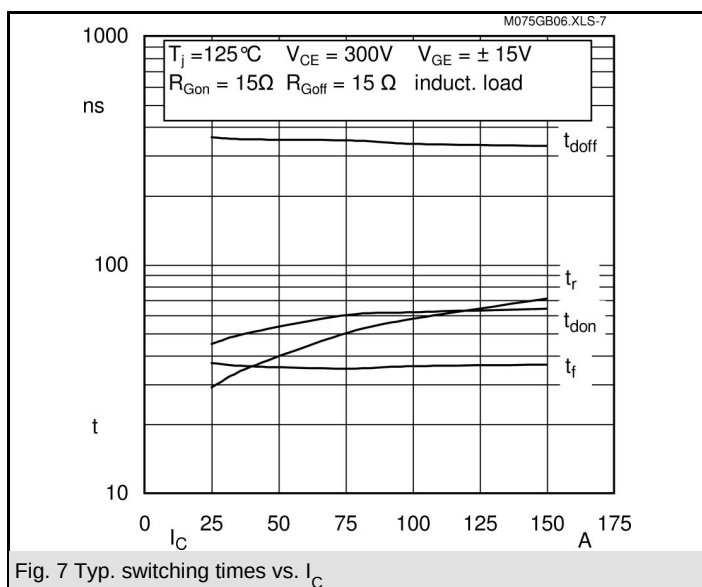
Typical Applications

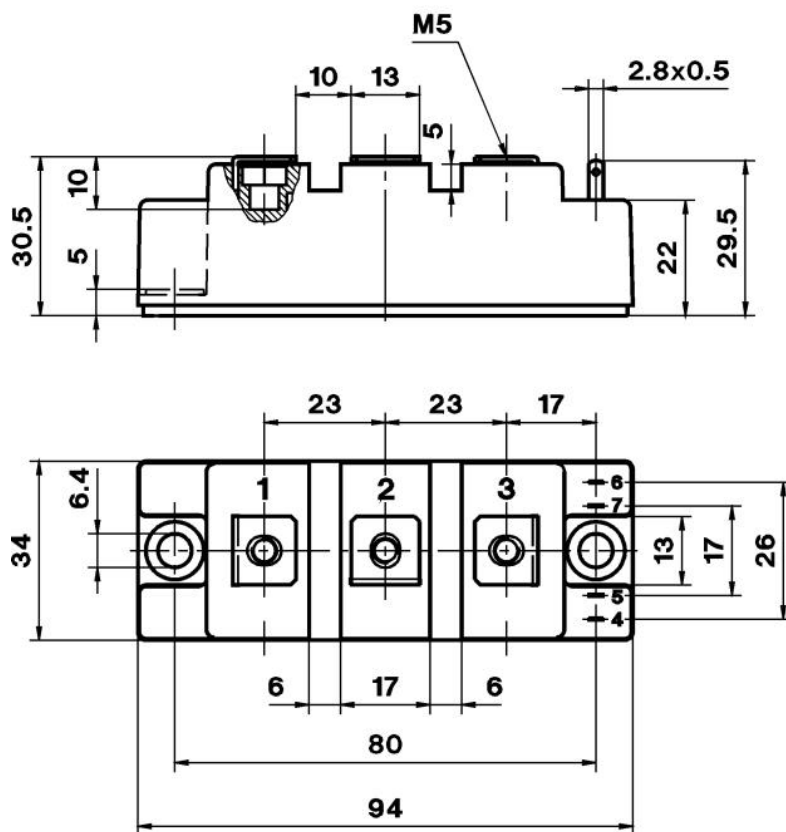
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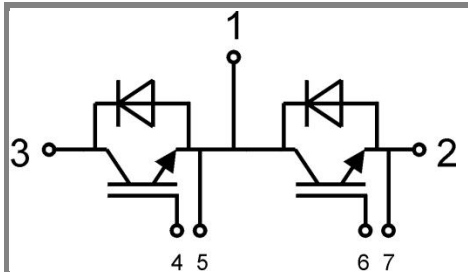
Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	250	mk/W
R_i	$i = 2$	70	mk/W
R_i	$i = 3$	25	mk/W
R_i	$i = 4$	5	mk/W
τ_{ui}	$i = 1$	0,0874	s
τ_{ui}	$i = 2$	0,0078	s
τ_{ui}	$i = 3$	0,0017	s
τ_{ui}	$i = 4$	0,0001	s
$Z_{th(j-c)D}$			
R_i	$i = 1$	550	mk/W
R_i	$i = 2$	340	mk/W
R_i	$i = 3$	92	mk/W
R_i	$i = 4$	18	mk/W
τ_{ui}	$i = 1$	0,0761	s
τ_{ui}	$i = 2$	0,0045	s
τ_{ui}	$i = 3$	0,011	s
τ_{ui}	$i = 4$	0,0002	s





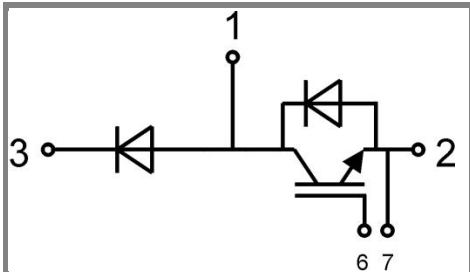


Case D 61



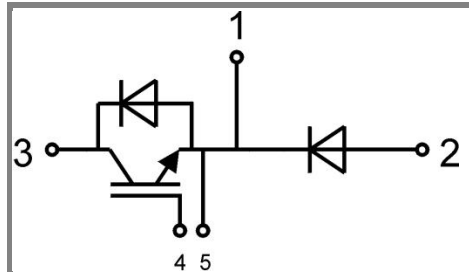
GB

Case D 61



GAL

Case D 62 (→ D 61)



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Case D 63 (→ D 61)