



SEMITRANS® 3

IGBT Modules

SKM 200GB173D

SKM 200GB173D1

SKM 200GAL173D

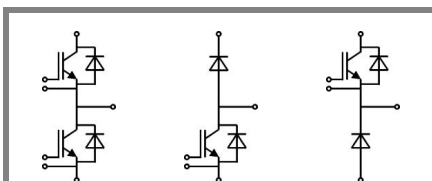
SKM 200GAR173D

Features

- MOS input (voltage controlled)
- N channel , Homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distance (20 mm)

Typical Applications

- AC inverter drives on mains 575 - 750 V_{AC}
- DC bus voltage 750 - 1200 V_{DC}
- Public transport (auxiliary syst.)
- Switching (not for linear use)



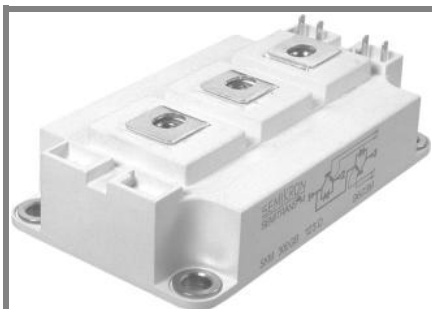
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Absolute Maximum Ratings			T _c = 25 °C, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1700	V
I _C	T _j = 150 °C	T _{case} = 25 °C	220	A
		T _{case} = 80 °C	150	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		300	A
V _{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 _{case} = 25 °C	150	A
		T _{case} = 80 °C	100	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		300	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 150 °C	1450	A
Freewheeling Diode				
I _F	T _j = 150 °C	T _{case} = 25 °C	230	A
		T _{case} = 80 °C	150	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		400	A
I _{FSM}	t _p = 10 ms; sin	T _j = 150 °C	2200	A
Module				
I _{t(RMS)}			500	A
T _{vj}			- 40 ... + 150	°C
T _{stg}			- 40 ... + 125	°C
V _{isol}	AC, 1 min.		4000	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 = 10 mA		4,8	5,5	6,2	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 T _j = 125 °C			1,65	1,9	V	
				1,9	2,15	V	
r _{CE}	V _{GE} = 15 V T _j = 25 °C T _j = 125 °C			11,7	13,3	mΩ	
				17,3	19	mΩ	
V _{CE(sat)}	I _{Cnom} = 150 A, V _{GE} = 15 V T _j = 25 °C _{chiplev.} T _j = 125 °C _{chiplev.}			3,4	3,9	V	
				4,5	5	V	
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			20		nF	
C _{oes}				2		nF	
C _{res}				0,55		nF	
Q _G	V _{GE} =0V/+20V			2000		nC	
t _{d(on)}	R _{Gon} = 4 Ω		V _{CC} = 1200V I _{Cnom} = 150A			580	ns
t _r						100	ns
E _{on}	R _{Goff} = 4 Ω		T _j = 125 °C V _{GE} = ± 15V			95	mJ
t _{d(off)}						750	ns
t _f						40	ns
E _{off}						45	mJ
R _{th(j-c)}	per IGBT				0,1	K/W	



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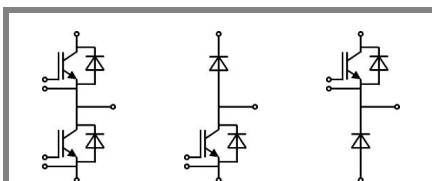
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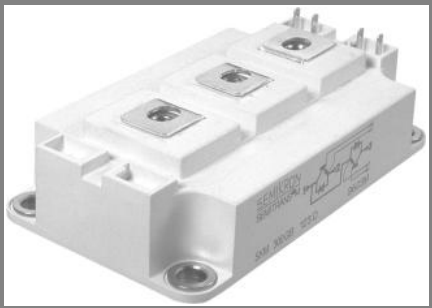
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2,2	2,7	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,9		V
V_{F0}		$T_j = 125 \text{ }^\circ\text{C}$	1,3	1,5	V
r_F		$T_j = 125 \text{ }^\circ\text{C}$	4,5	6,2	mΩ
I_{RRM}	$I_{Fnom} = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	85		A
Q_{rr}	$di/dt = 1000 \text{ A}/\mu\text{s}$		38		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode			0,32	K/W
FWD					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	2	2,4	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,8		V
V_{F0}		$T_j = 125 \text{ }^\circ\text{C}$	1,3	1,5	V
r_F		$T_j = 125 \text{ }^\circ\text{C}$	3,5	4,5	V
I_{RRM}	$I_{Fnom} = 150 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$	110		A
Q_{rr}			50		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 1200 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode			0,21	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ }^\circ\text{C}$	0,35		mΩ
		$T_{case} = 125 \text{ }^\circ\text{C}$	0,5		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6		3	5	Nm
w				325	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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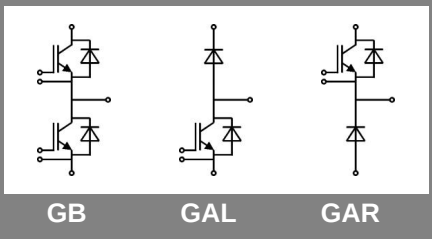
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Features

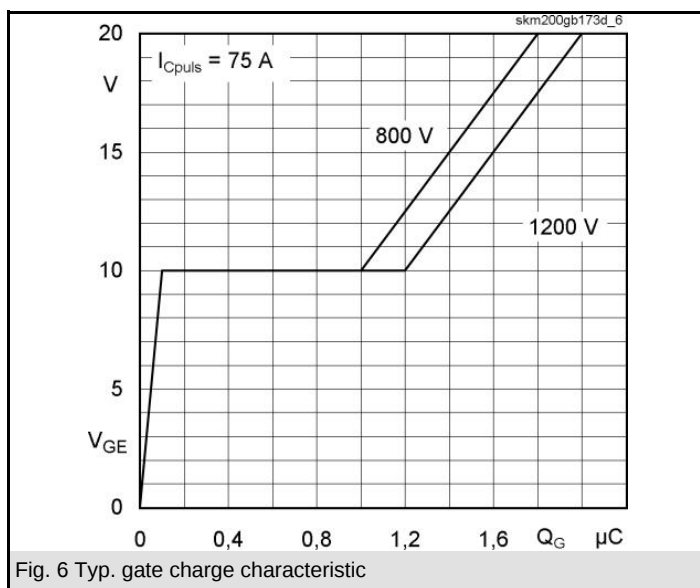
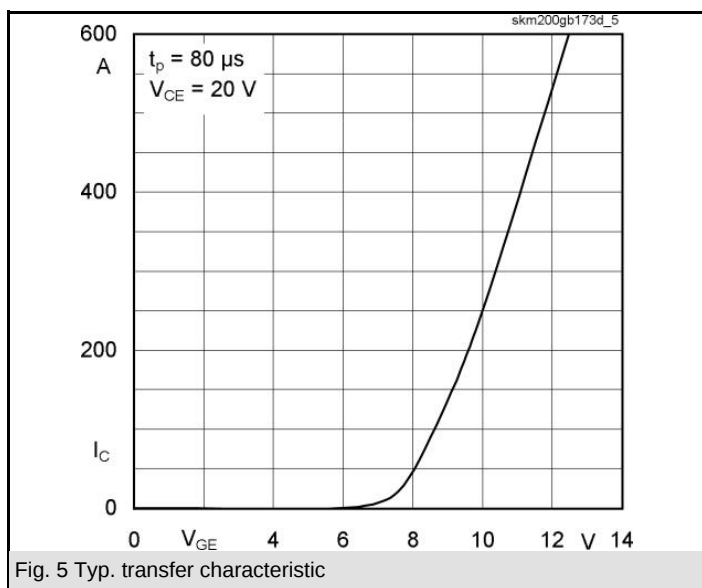
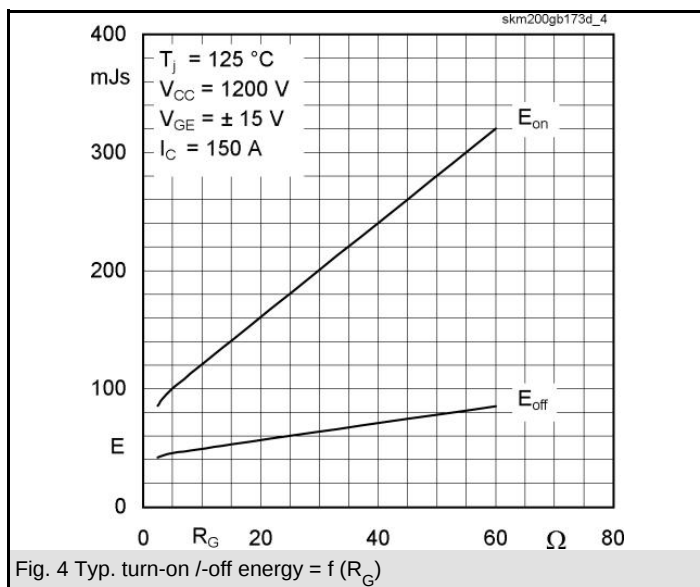
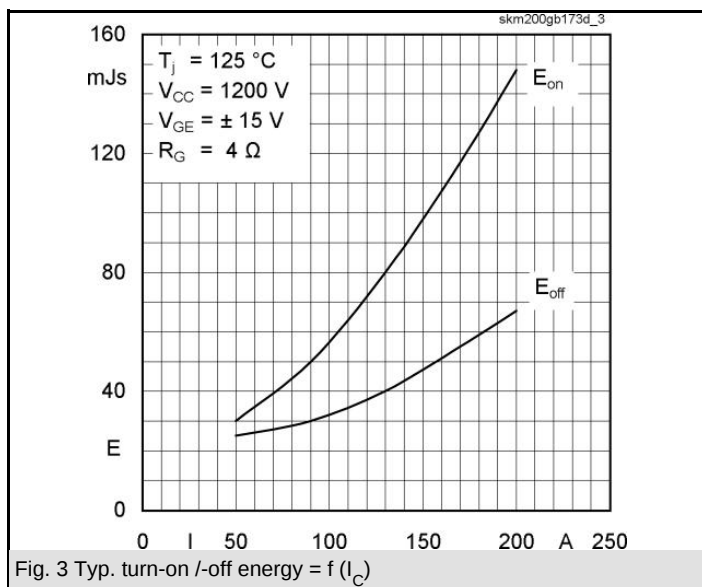
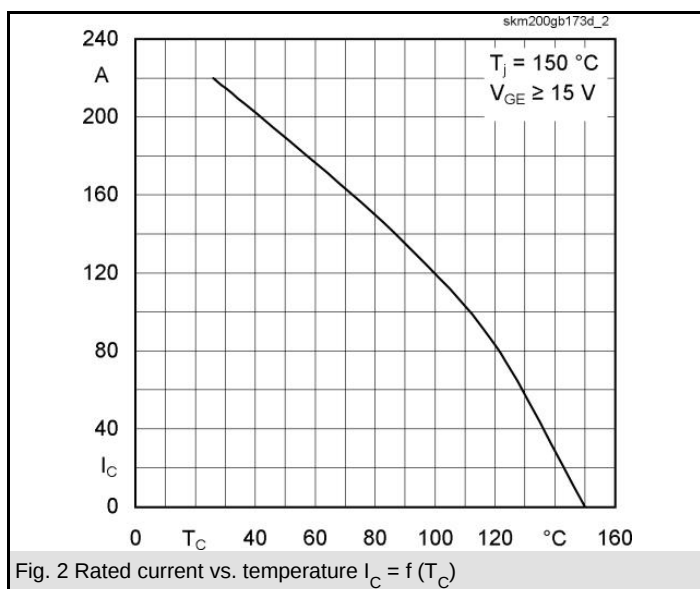
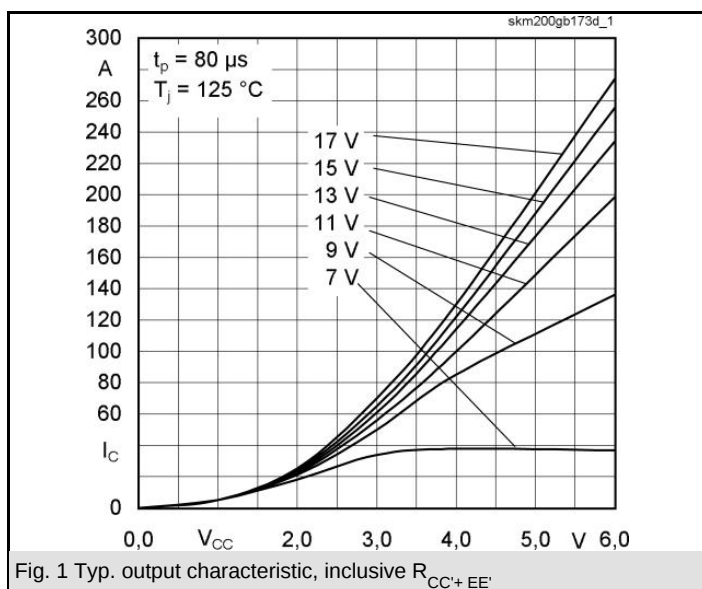
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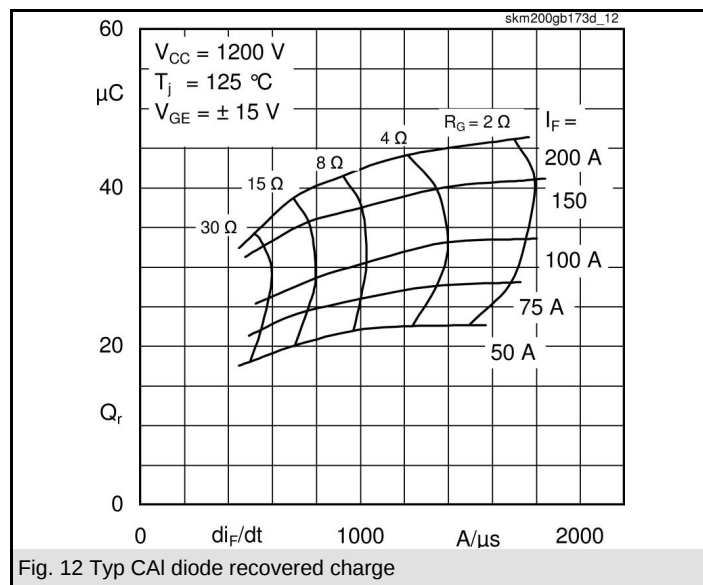
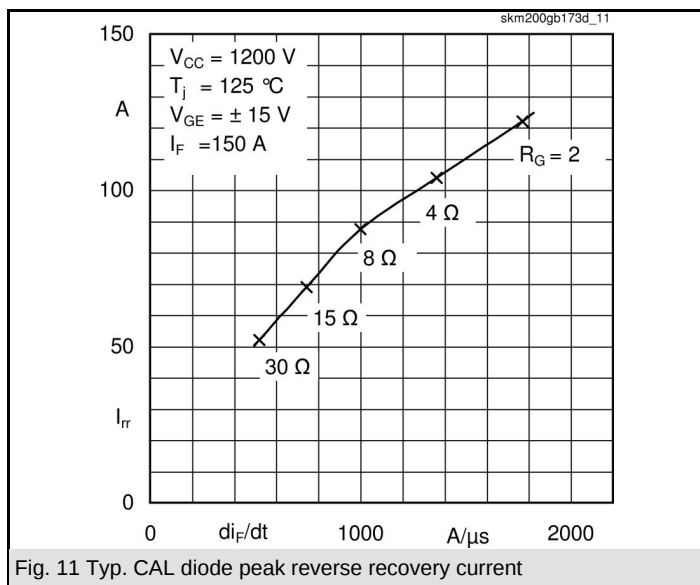
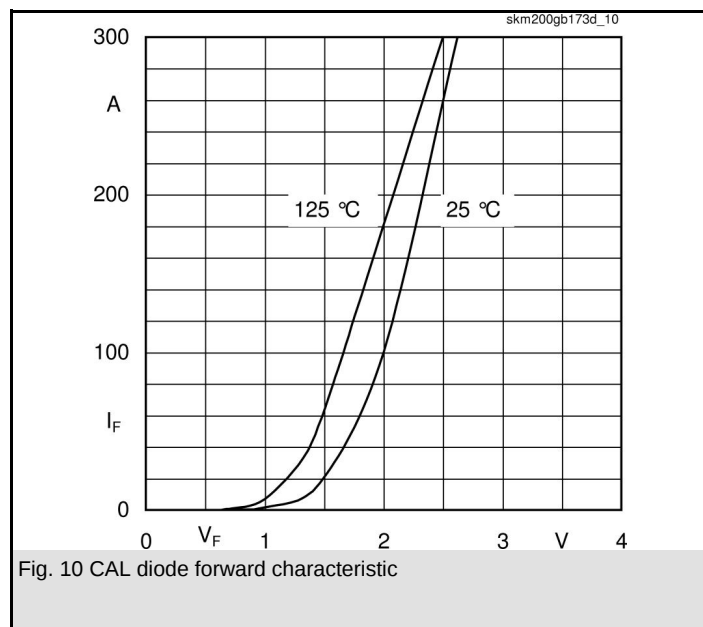
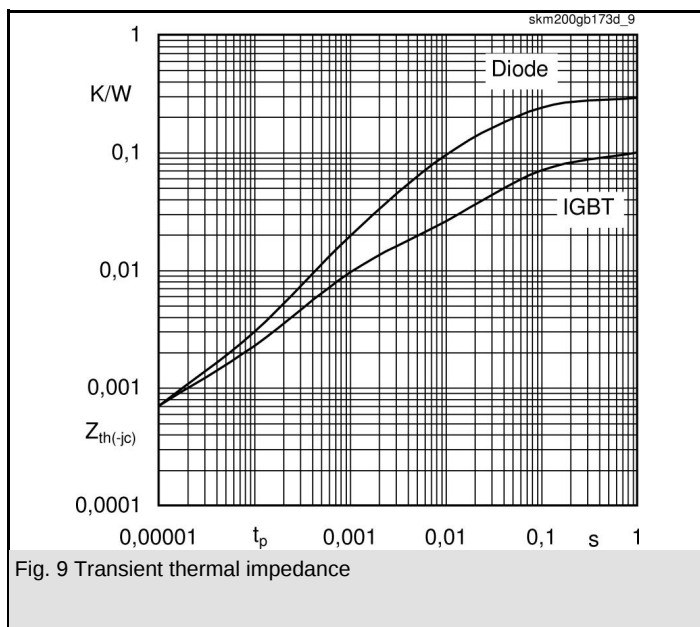
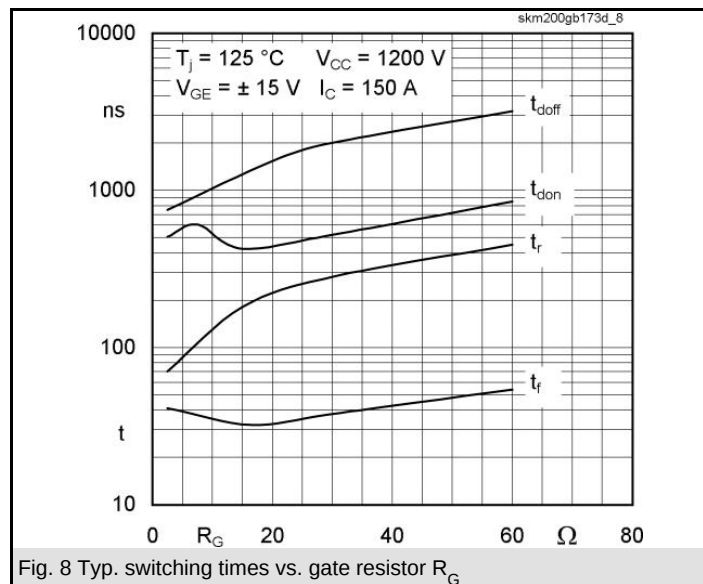
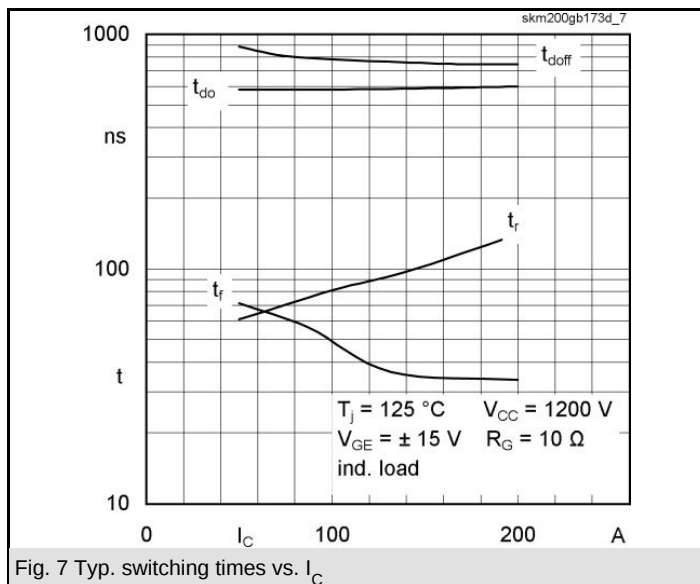
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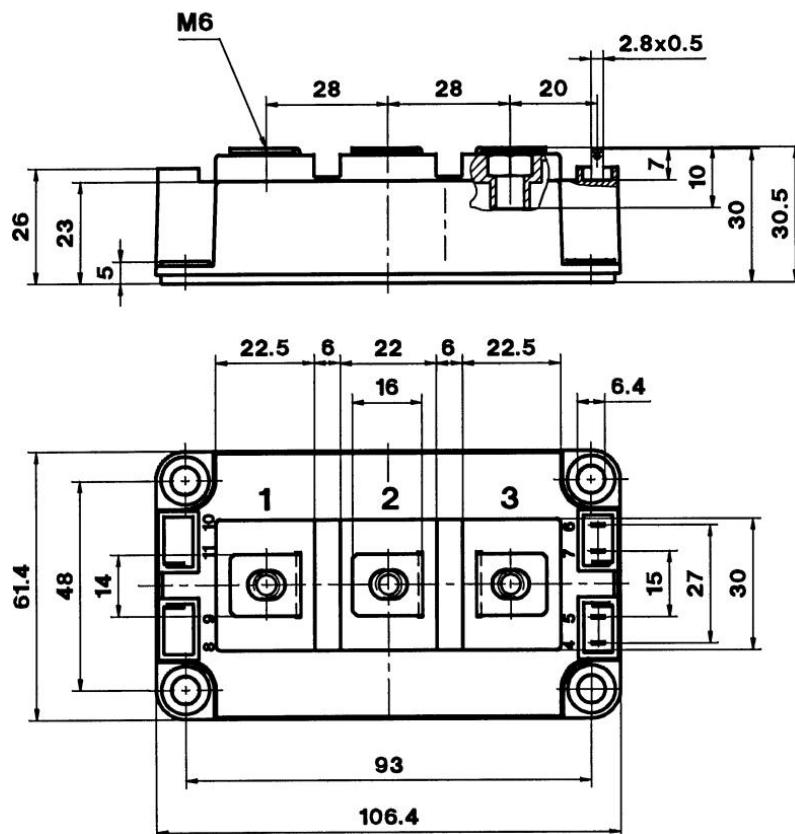


Z _{th}			
Symbol	Conditions	Values	Units
Z _{th(j-c)I}			
R _i	i = 1	72	mk/W
R _i	i = 2	19	mk/W
R _i	i = 3	6,9	mk/W
R _i	i = 4	2,1	mk/W
tau _i	i = 1	0,0946	s
tau _i	i = 2	0,011	s
tau _i	i = 3	0,0011	s
tau _i	i = 4	0	s
Z _{th(j-c)D}			
R _i	i = 1	230	mk/W
R _i	i = 2	70	mk/W
R _i	i = 3	17	mk/W
R _i	i = 4	3	mk/W
tau _i	i = 1	0,0839	s
tau _i	i = 2	0,0069	s
tau _i	i = 3	0,0028	s
tau _i	i = 4	0,0002	s

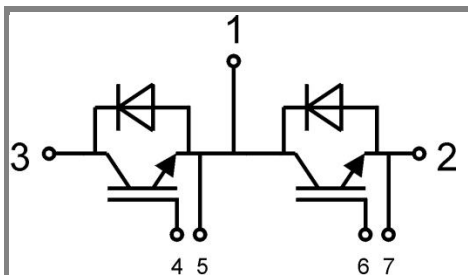




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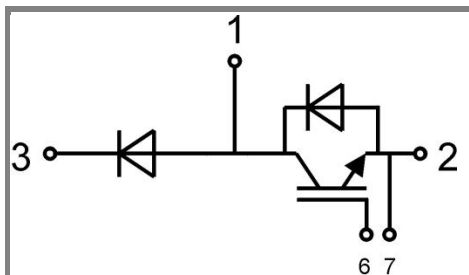


Case D 56



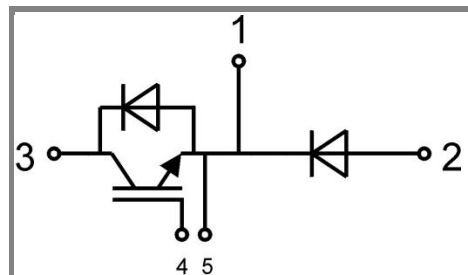
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Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)