

SKM 145GB128D ...



SEMITRANS® 2

SPT IGBT Module

SKM 145GB128D

SKM 145GAL128D

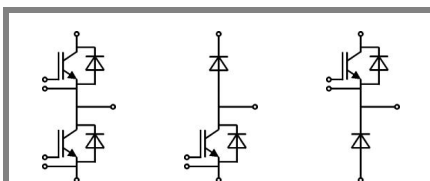
SKM 145GAR128D

Features

- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_c$

Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20kHz



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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		1200	V
I _C	T _j = 150 °C	T _{case} = 25 °C	190	A
		T _{case} = 80 °C	135	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		200	A
V _{GES}			±20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	µs
Inverse Diode				
I _F	T _j = 150 °C	T _{case} = 25 °C	130	A
		T _{case} = 80 °C	90	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		200	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 150 °C	900	A
Freewheeling Diode				
I _F	T _j = 150 °C	T _{case} = 25 °C	130	A
		T _{case} = 80 °C	90	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		200	A
I _{FSM}	t _p = 10 ms; sin.	T _j = 150 °C	900	A
Module				
I _{t(RMS)}			200	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 = 4 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	1,15	V
	T _j = 125 °C			0,9	1,05	V
r _{CE}	V _{GE} = 15 V T _j = 25°C			9	12	mΩ
	T _j = 125°C			12	15	mΩ
V _{CE(sat)}	I _{Cnom} = 100 A, V _{GE} = 15 V T _j = 25°C _{chiplev.}			1,9	2,35	V
	T _j = 125°C _{chiplev.}			2,1	2,55	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz			9		nF
C _{oes}				1		nF
C _{res}				1		nF
Q _G	V _{GE} = -8V - +20V			1200		nC
R _{Gint}	T _j = °C			4		Ω
t _{d(on)}	R _{Gon} = 3 Ω	V _{CC} = 600V I _{Cnom} = 100A T _j = 125 °C V _{GE} =±15V		210		ns
t _r				40		ns
E _{on}			12		mJ	
t _{d(off)}	R _{Goff} = 3 Ω			430		ns
t _f				65		ns
E _{off}				10		mJ
R _{th(j-c)}	per IGBT				0,165	K/W



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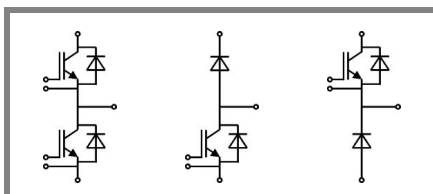
Typical Applications

- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20kHz

Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25^\circ\text{C}_{chiplev.}$ $T_j = 125^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		1,1	1,2	V V
r_F	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		9	13	mΩ mΩ
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 100 \text{ A}$ $di/dt = 3500 \text{ A}/\mu\text{s}$ $V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		120 18,5 7		A μC mJ
$R_{th(j-c)D}$	per diode			0,36	K/W
Freewheeling Diode					
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$ $T_j = 25^\circ\text{C}_{chiplev.}$ $T_j = 125^\circ\text{C}_{chiplev.}$		2 1,8	2,5	V V
V_{F0}	$T_j = 25^\circ\text{C}$		1,1	1,2	V
r_F	$T_j = 25^\circ\text{C}$		9	13	V
I_{RRM} Q_{rr} E_{rr}	$I_{Fnom} = 100 \text{ A}$ $di/dt = 0 \text{ A}/\mu\text{s}$ $V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		120 18,5 7		A μC mJ
$R_{th(j-c)FD}$	per diode			0,36	K/W
Module					
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_{case} = 25^\circ\text{C}$ $T_{case} = 125^\circ\text{C}$		0,75 1		mΩ 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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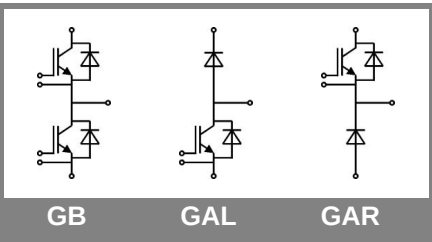
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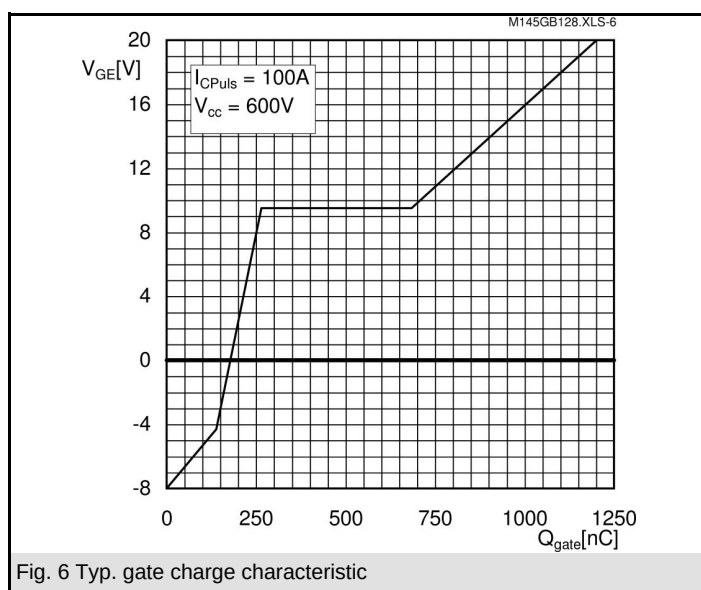
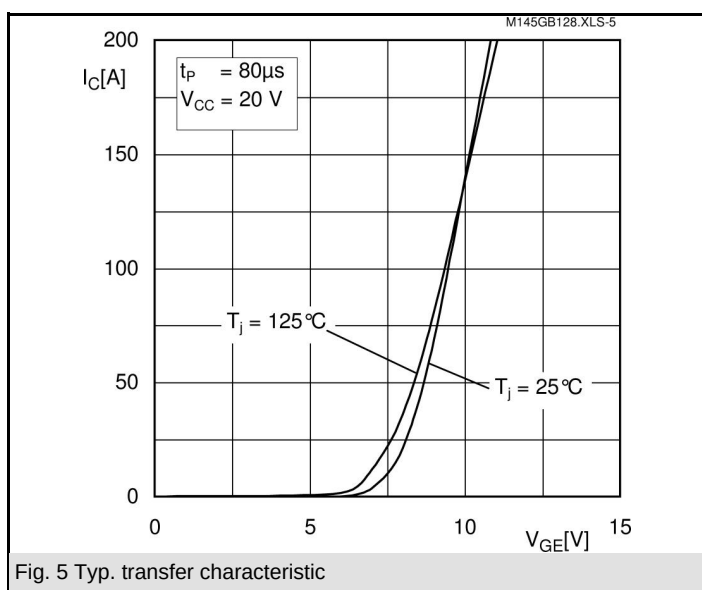
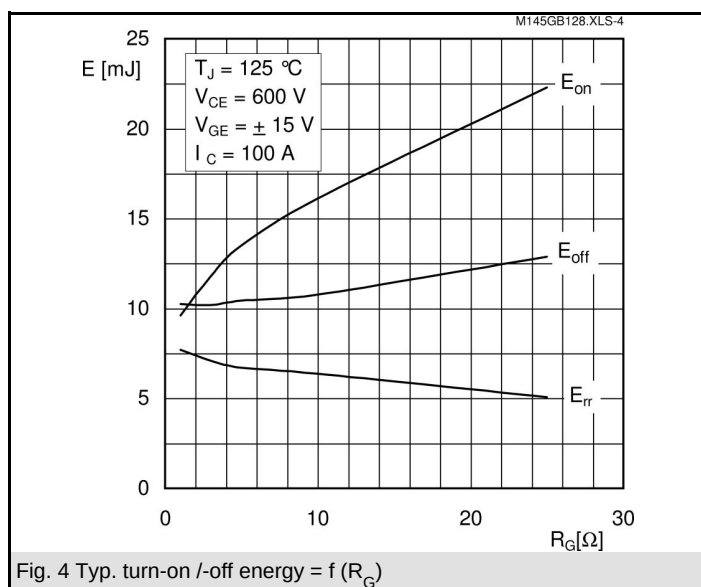
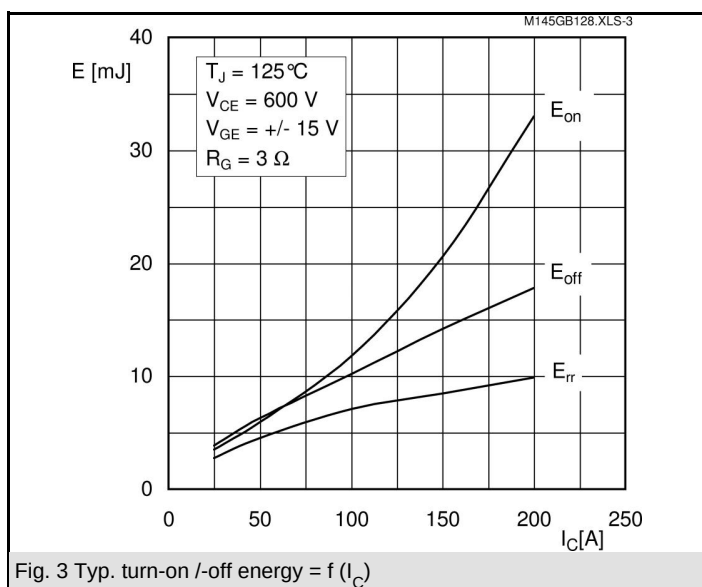
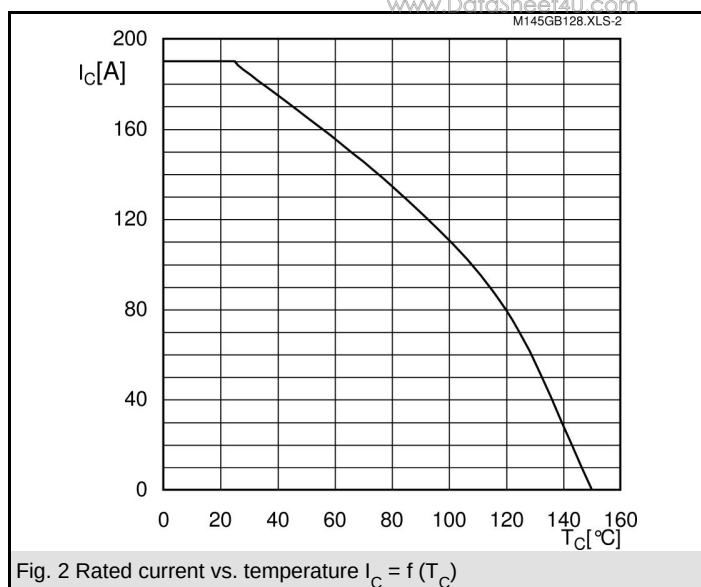
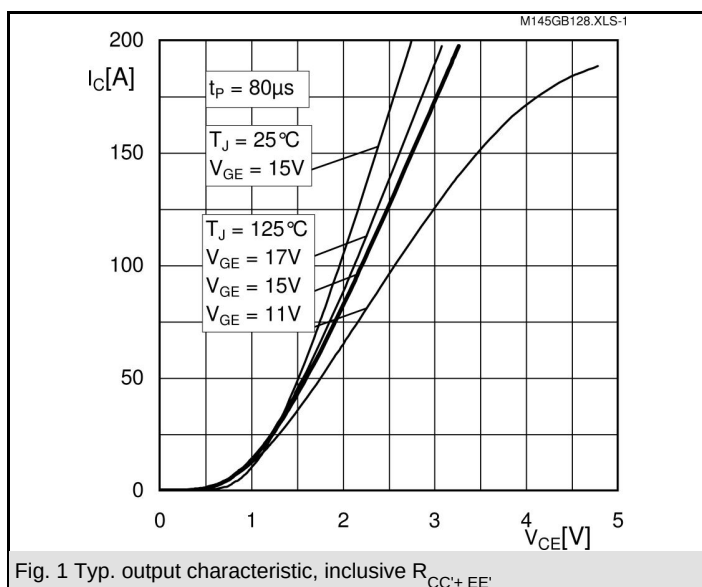
Typical Applications

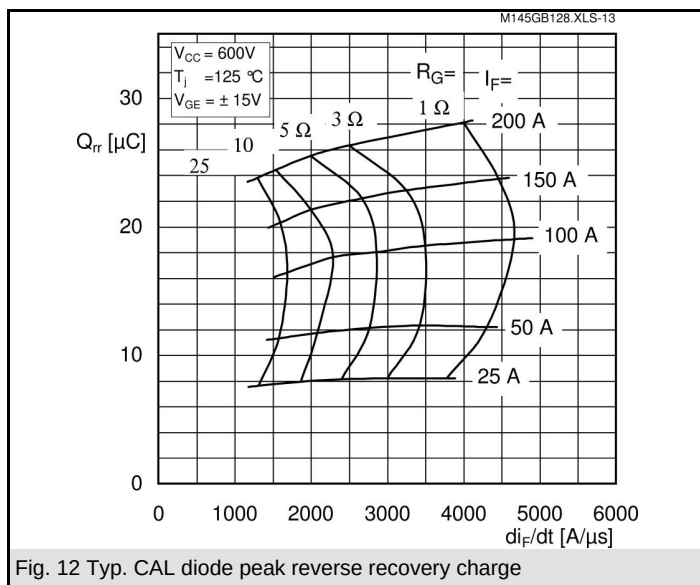
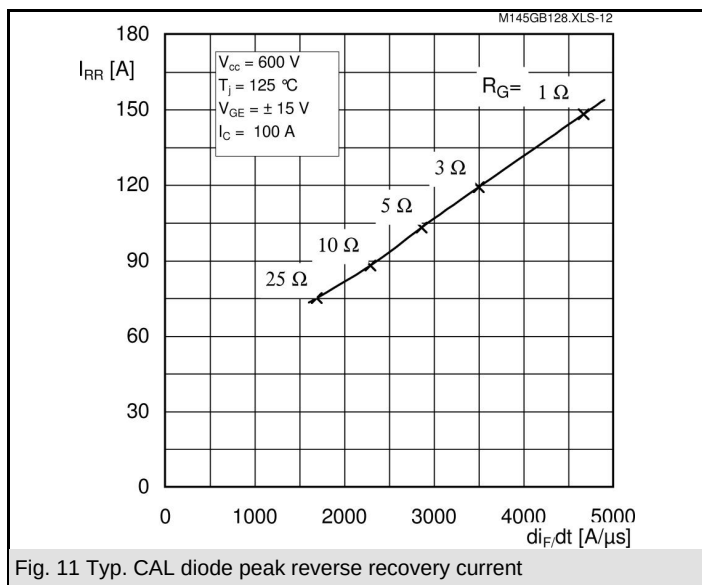
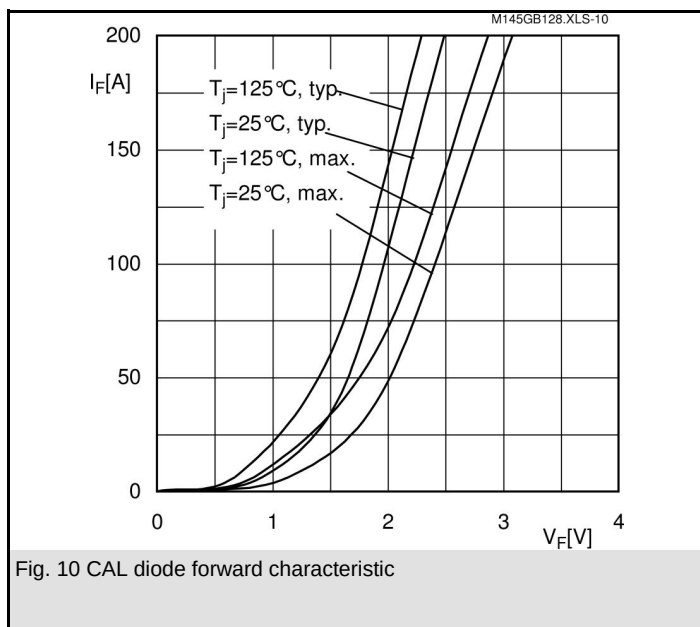
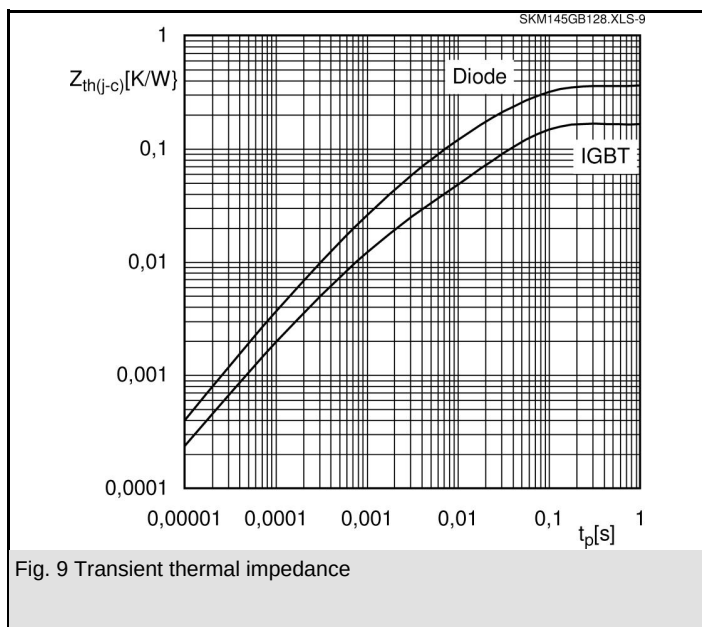
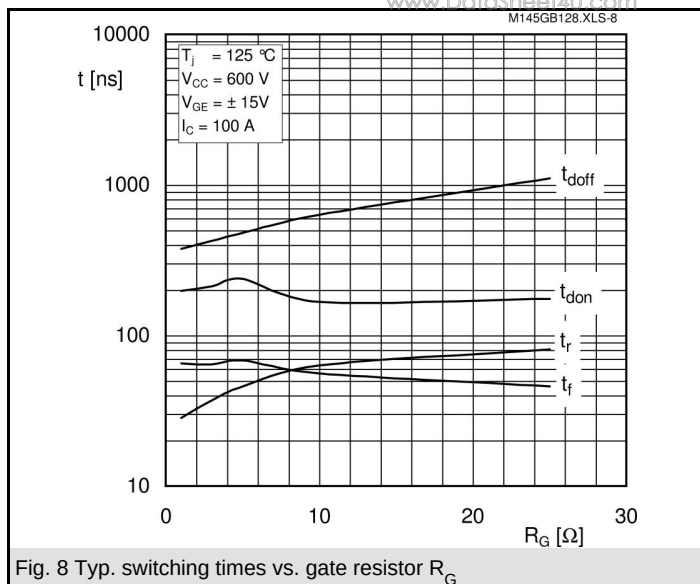
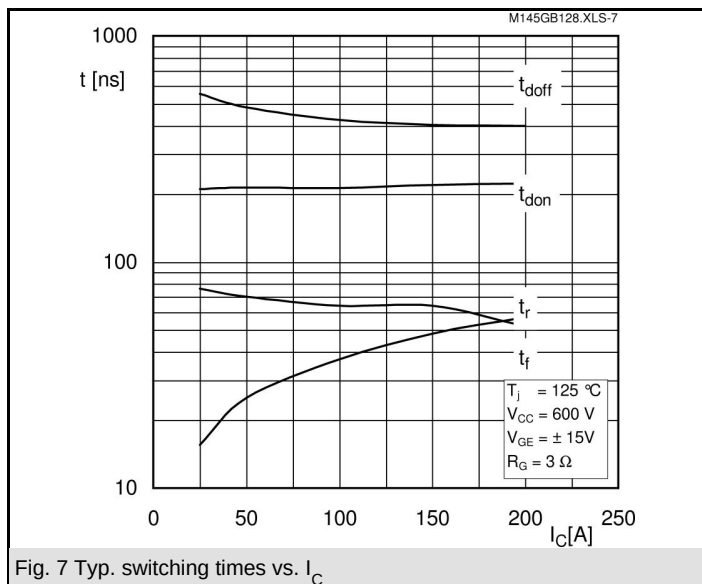
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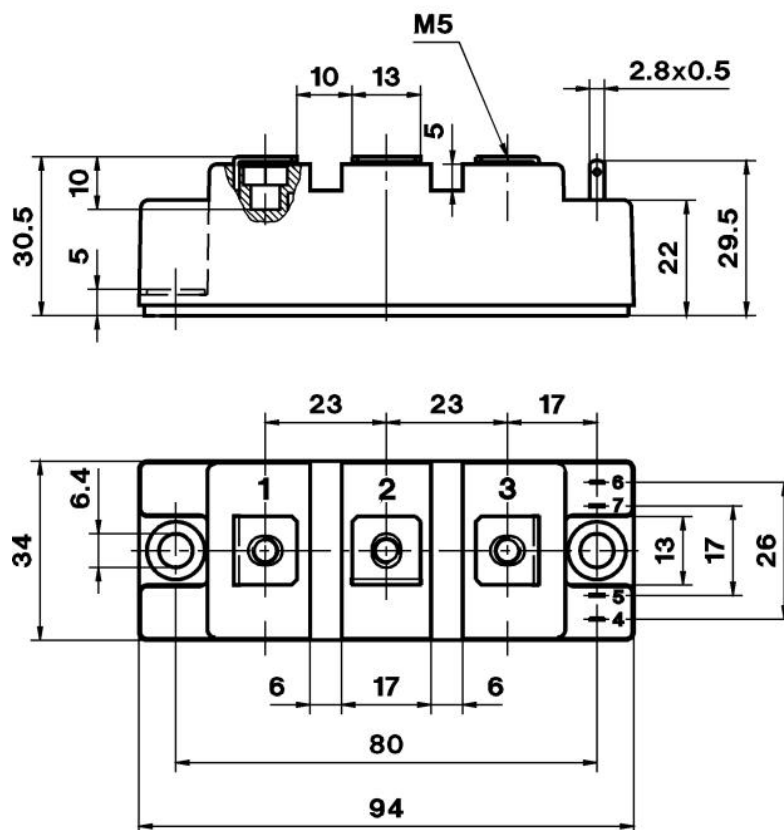
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Z_{th}	Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$	R_i	$i = 1$	120	mk/W
	R_i	$i = 2$	34	mk/W
	R_i	$i = 3$	9	mk/W
	R_i	$i = 4$	2	mk/W
	τ_{ui}	$i = 1$	0,03	s
	τ_{ui}	$i = 2$	0,1123	s
	τ_{ui}	$i = 3$	0,0012	s
	τ_{ui}	$i = 4$	0,0002	s
	$Z_{th(j-c)D}$	R_i	$i = 1$	240
R_i		$i = 2$	95	mk/W
R_i		$i = 3$	21,5	mk/W
R_i		$i = 4$	3,5	mk/W
τ_{ui}		$i = 1$	0,054	s
τ_{ui}		$i = 2$	0,0113	s
τ_{ui}		$i = 3$	0,0012	s
τ_{ui}		$i = 4$	0,005	s

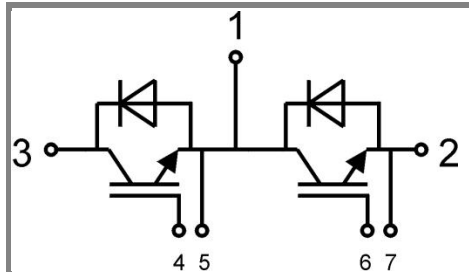




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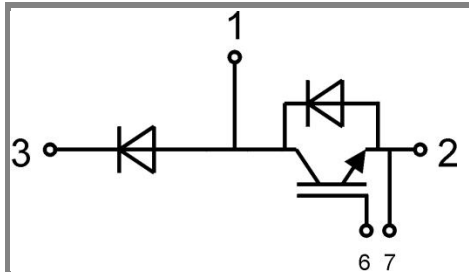


Case D 61, Case D 62, Case D 63



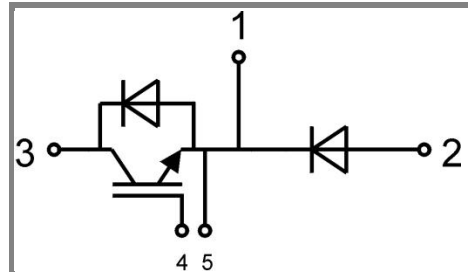
GB

Case D 61



GAL

Case D 62



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Case D 63