



SEMITRANS® 2

SPT IGBT Module

SKM 145GB128D

SKM 145GAL128D

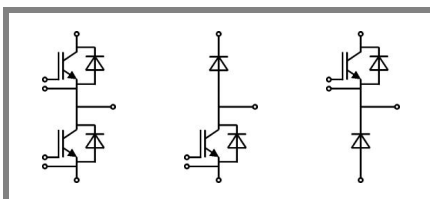
SKM 145GAR128D

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



GB

GAL

GAR

Absolute Maximum Ratings			$T_c = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		1200	V
I_C	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	190	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	135	A
I_{CRM}	$I_{CRM}=2 \times I_{Cnom}$		200	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125\text{ }^{\circ}\text{C}$ $V_{CES} < 1200\text{ V}$		10	μs
Inverse Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	130	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	90	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		200	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	900	A
Freewheeling Diode				
I_F	$T_j = 150\text{ }^{\circ}\text{C}$	$T_{case} = 25\text{ }^{\circ}\text{C}$	130	A
		$T_{case} = 80\text{ }^{\circ}\text{C}$	90	A
I_{FRM}	$I_{FRM}=2 \times I_{Fnom}$		200	A
I_{FSM}	$t_p = 10\text{ ms}; \sin.$	$T_j = 150\text{ }^{\circ}\text{C}$	900	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.		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}				1	1,15	V	
				0,9	1,05	V	
r _{CE}	V _{GE} = 15 V			9	12	mΩ	
				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 _C = 100A		210		ns
t _r					40		ns
E _{on}					12		mJ
t _{d(off)}	R _{Goff} = 3 Ω		T _j = 125 °C V _{GE} = ±15V		430		ns
t _f					65		ns
E _{off}					10		mJ
R _{th(j-c)}	per IGBT				0,165		K/W



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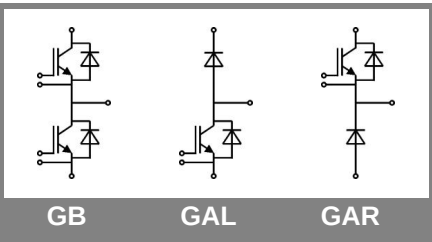
Typical Applications

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

Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 100 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.} T _j = 125 °C _{chiplev.}		2 1,8	2,5	V V
V _{F0}		T _j = 25 °C T _j = 125 °C		1,1	1,2	V V
r _F		T _j = 25 °C T _j = 125 °C		9	13	mΩ mΩ
I _{RRM} Q _{rr} E _{rr}	I _F = 100 A di/dt = 3500 A/μs V _{GE} = -15 V; V _{CC} = 600 V	T _j = 125 °C		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 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.} T _j = 125 °C _{chiplev.}		2 1,8	2,5	V V
V _{F0}		T _j = 25 °C		1,1	1,2	V
r _F		T _j = 25 °C		9	13	V
I _{RRM} Q _{rr} E _{rr}	I _F = 100 A di/dt = 0 A/μs V _{GE} = -15 V; V _{CC} = 600 V	T _j = 125 °C		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 °C T _{case} = 125 °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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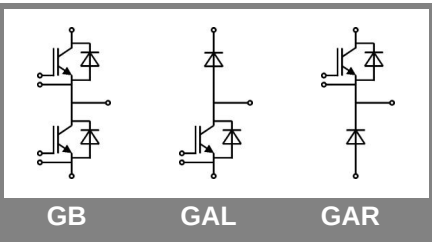
Features

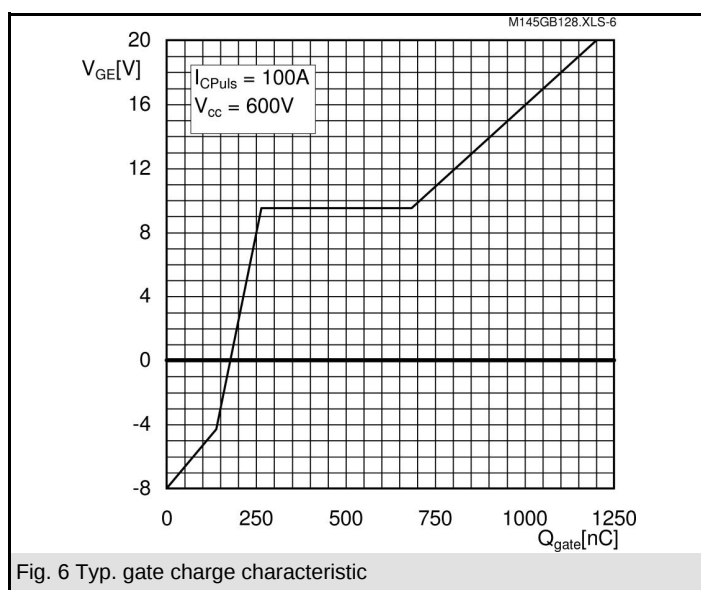
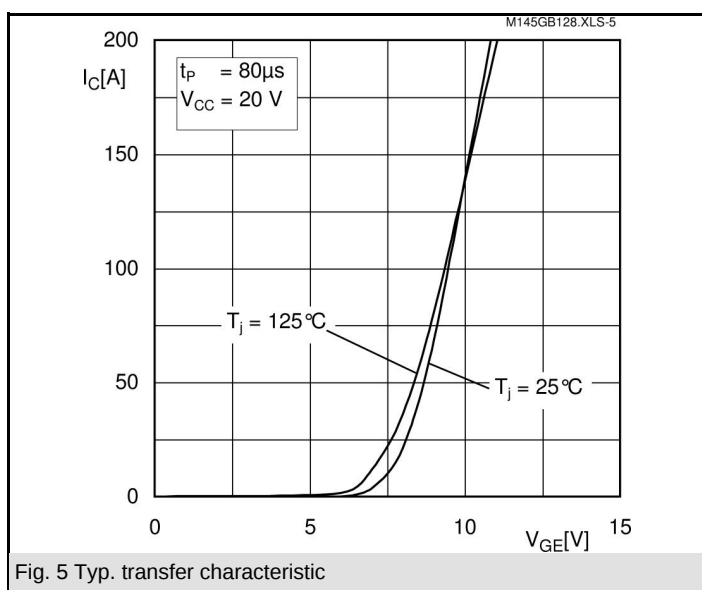
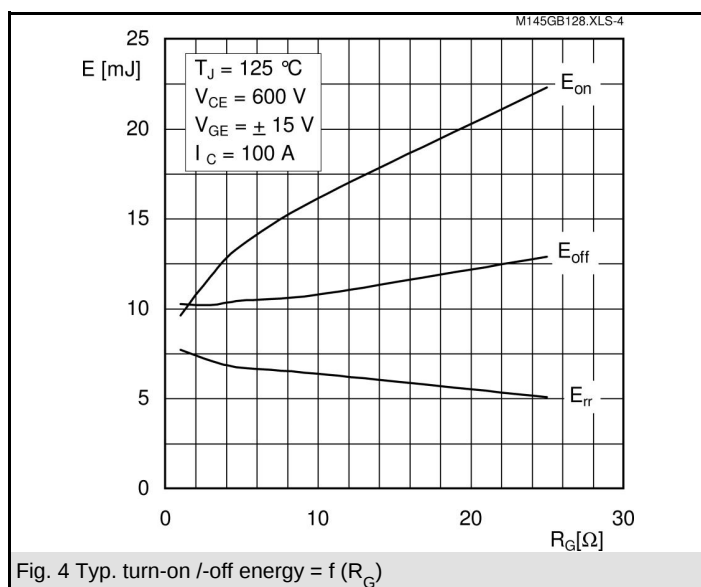
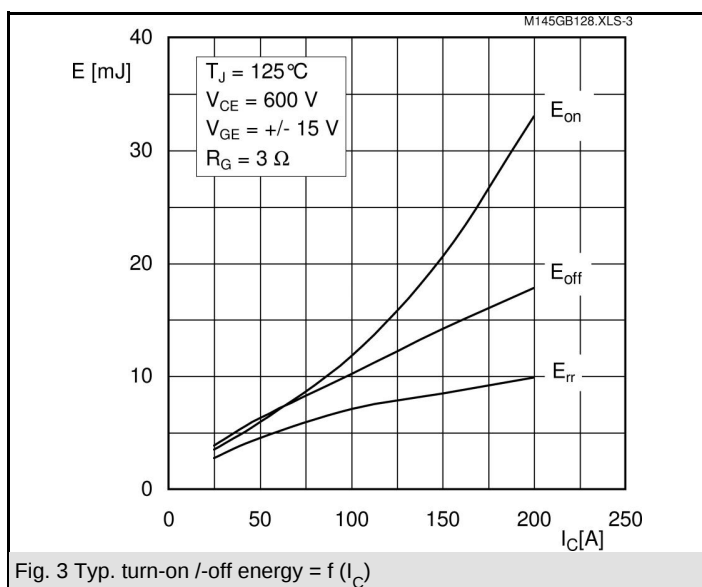
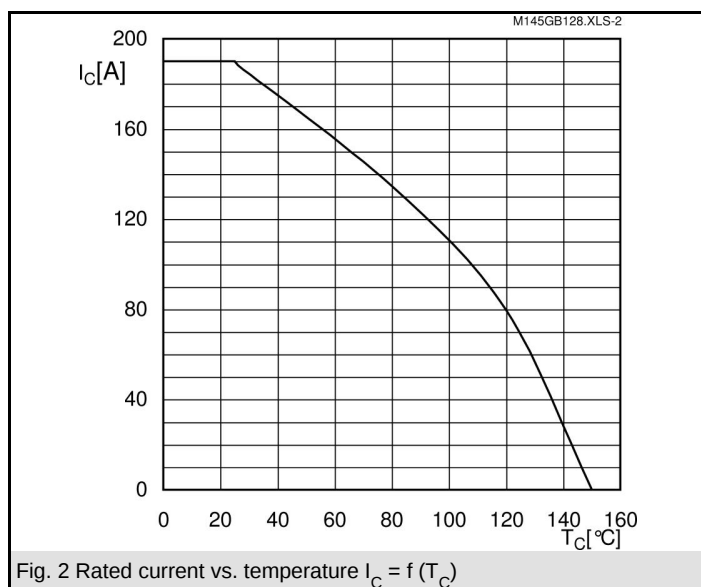
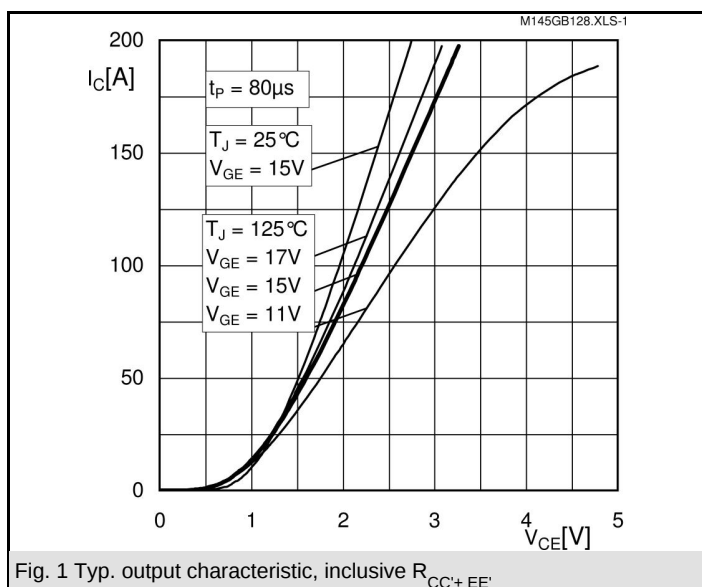
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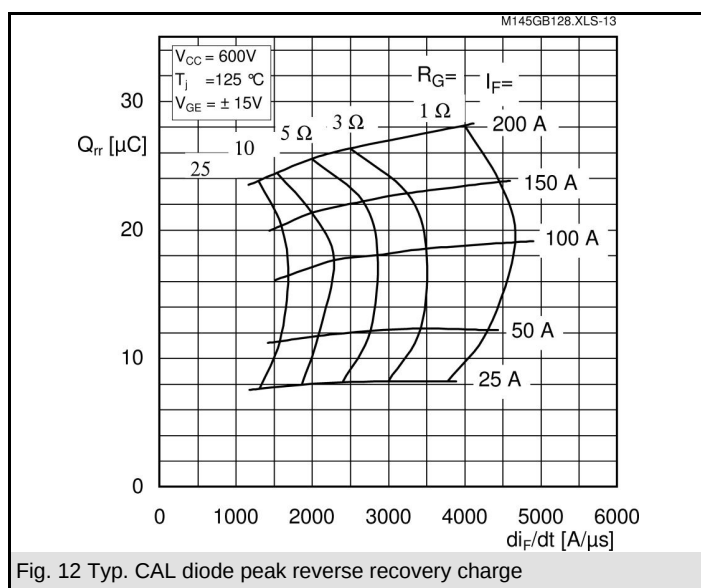
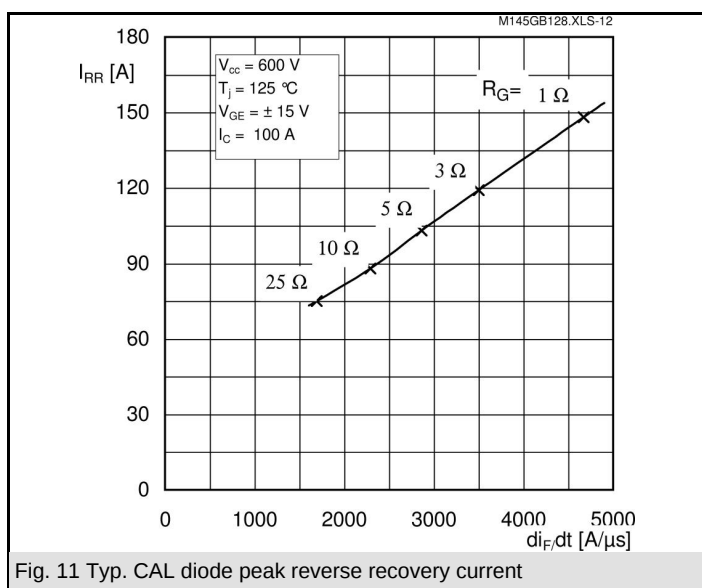
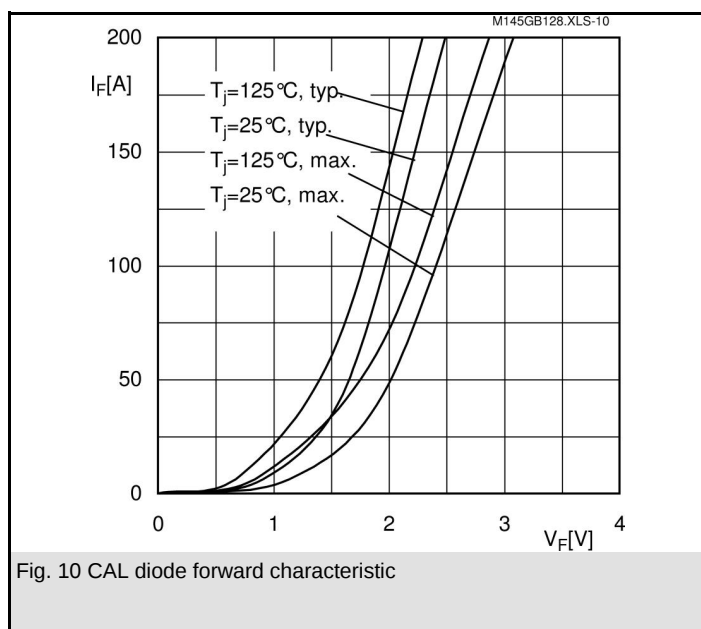
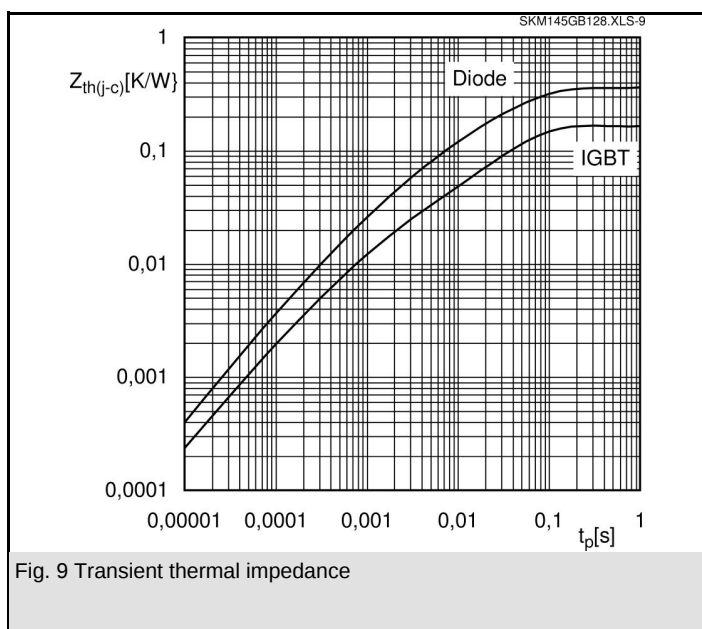
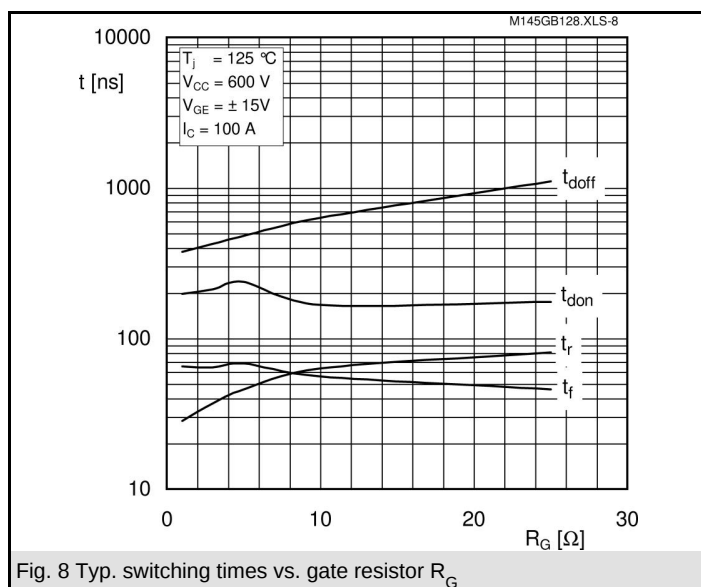
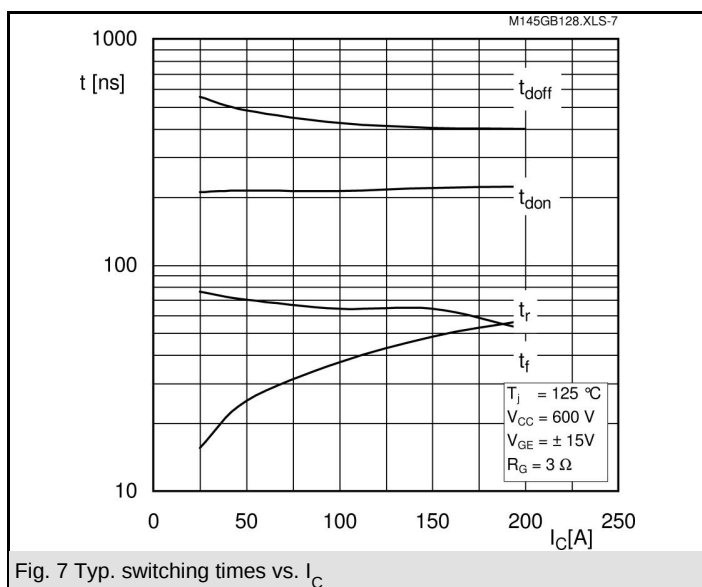
Typical Applications

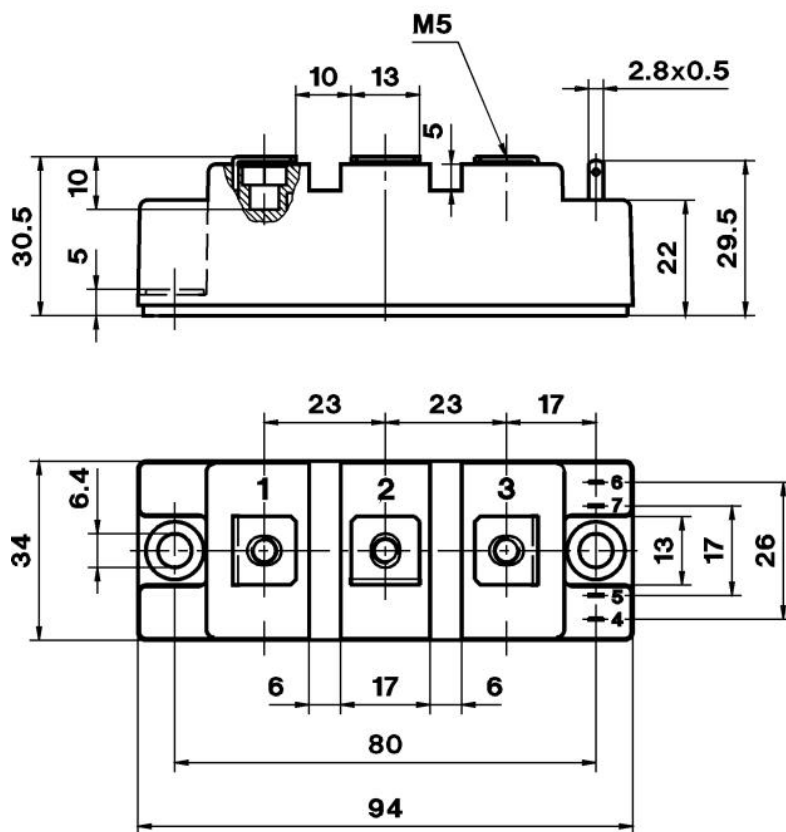
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Z_{th}			
Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	$i = 1$	120	mk/W
R_i	$i = 2$	34	mk/W
R_i	$i = 3$	9	mk/W
R_i	$i = 4$	2	mk/W
τ_{u_i}	$i = 1$	0,03	s
τ_{u_i}	$i = 2$	0,1123	s
τ_{u_i}	$i = 3$	0,0012	s
τ_{u_i}	$i = 4$	0,0002	s
$Z_{th(j-c)D}$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

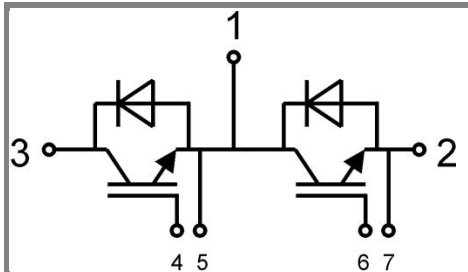






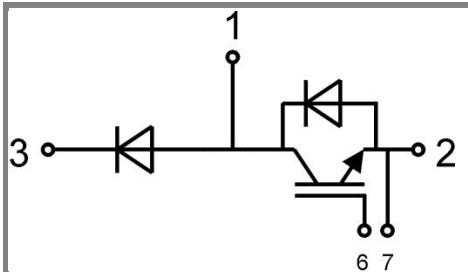


Case D 61, Case D 62, Case D 63



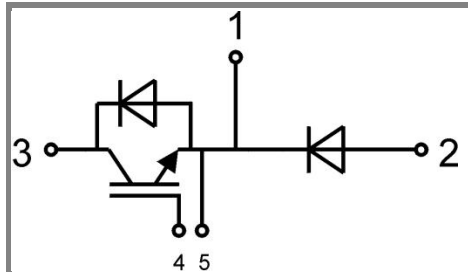
GB

Case D 61



GAL

Case D 62



GAR

Case D 63