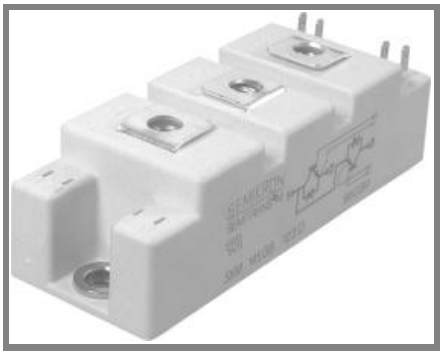
SKM 145GB123D



SEMITRANS® 2

IGBT Modules

SKM 145GB123D

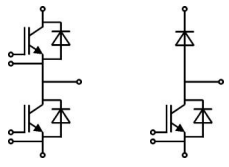
SKM 145GAL123D

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 x I_{cnom}
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)
- AC inverter drives

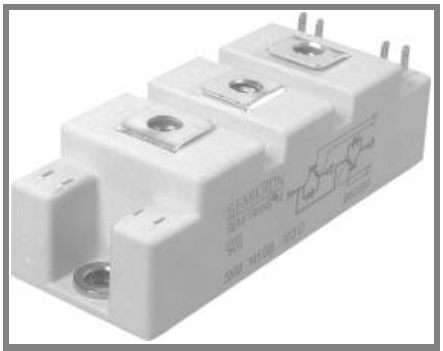


GB **GAL**

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	145	A
		T_{case} = 80 °C	110	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		200	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; $V_{GE} \leq$ 20 V; V_{CES} < 1200 V	T_j = 125 °C	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	170	A
		T_{case} = 80 °C	115	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1440	A
Module				
$I_{t(RMS)}$			200	A
T_{vj}			- 40 ...+ 150	°C
T_{stg}			- 40 ...+ 125	°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 = 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		1,4	1,6	V
		T_j = 125 °C		1,6	1,8	V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		11	14	mΩ
		T_j = 125°C		15	19	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 A, V_{GE} = 15 V	T_j = °$C_{chiplev.}$		2,5	3	V
C_{ies}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		6,5	8,5	nF
C_{oes}				1	1,5	nF
C_{res}				0,5	0,6	nF
Q_G	V_{GE} = -8V - +20V			1000		nC
R_{Gint}	T_j = °C			5		Ω
$t_{d(on)}$	R_{Gon} = 6,8 Ω	V_{CC} = 600V		160	320	ns
t_r		I_C= 100A		80	160	ns
E_{on}		T_j = 125 °C		16		mJ
$t_{d(off)}$	R_{Goff} = 6,8 Ω	V_{GE} = -15V		400	520	ns
t_f				70	100	ns
E_{off}				12		mJ
$R_{th(j-c)}$	per IGBT				0,15	K/W

SKM 145GB123D



SEMITRANS® 2

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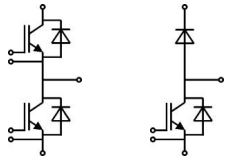


GB **GAL**

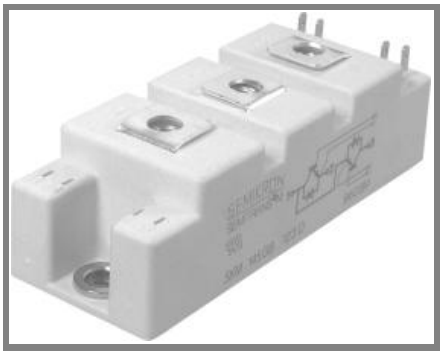
Characteristics

Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 100 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,4	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		9	11	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_F = 100 A	T_j = 25 °C		35		A
Q_{rr}	di/dt = 1000 A/µs			5		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)D}$	per diode				0,36	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 150 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,4	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		9	11	V
		T_j = 125 °C				V
I_{RRM}	I_F = 150 A	T_j = 25 °C		55		A
Q_{rr}				8		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)FD}$	per diode				0,3	K/W
Module						
L_{CE}					30	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C		0,75		mΩ
		T_{case}= 125 °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.

SKM 145GB123D



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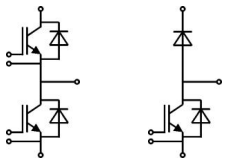

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Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	100	mk/W
R_i	i = 2	38	mk/W
R_i	i = 3	10	mk/W
R_i	i = 4	2	mk/W
tau_i	i = 1	0,03	s
tau_i	i = 2	0,0287	s
tau_i	i = 3	0,0012	s
tau_i	i = 4	0,0002	s
$Z_{th(j-c)D}$			
R_i	i = 1	240	mk/W
R_i	i = 2	95	mk/W
R_i	i = 3	22	mk/W
R_i	i = 4	3	mk/W
tau_i	i = 1	0,054	s
tau_i	i = 2	0,0113	s
tau_i	i = 3	0,0012	s
tau_i	i = 4	0,005	s

SKM 145GB123D

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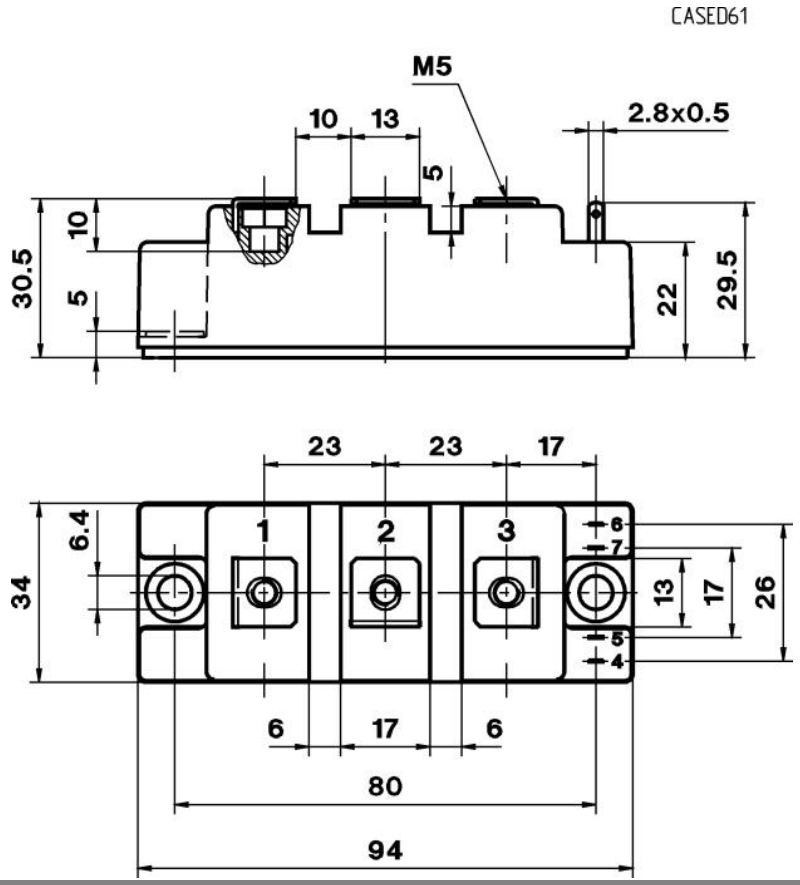
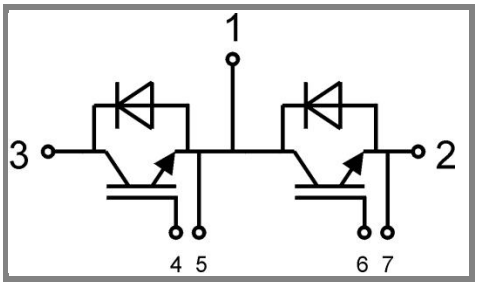
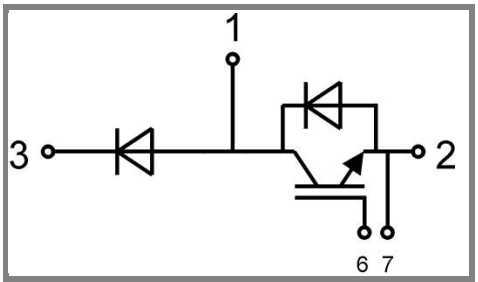


Case D 61



GB Case D 61



GAL Case D 62 (➞ D 61)

