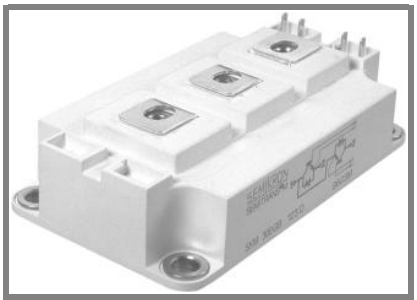
SKM 200GB123D



SEMITRANS® 3

IGBT Modules

SKM 200GB123D

SKM 200GAL123D

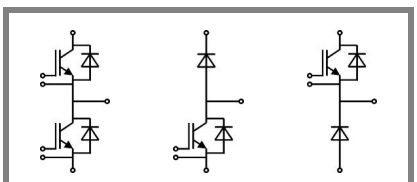
SKM 200GAR123D

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 Technology
- Large clearance (13 mm) and creepage distances (20 mm)

Typical Applications

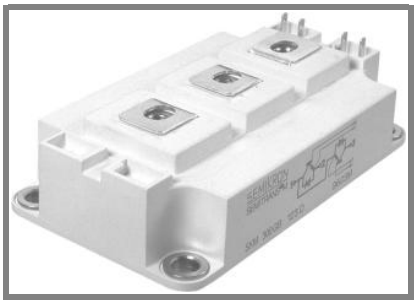
- AC inverter drives
- UPS



GB GAL GAR

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	200	A
		T_{case} = 85 °C	180	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		300	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; V_{GE} ≤ 20 V; V_{CES} < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	200	A
		T_{case} = 80 °C	130	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1440	A
Freewheeling Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	260	A
		T_{case} = 80 °C	180	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1800	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40 ... + 150 (125)	°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 = 6 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		7,33	9,33	mΩ
		T_j = 125°C		10	12,66	mΩ
$V_{CE(sat)}$	I_{Cnom} = 150 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		10	13	nF
C_{oes}				1,5	2	nF
C_{res}				0,8	1,2	nF
Q_G	V_{GE} = -8V - +20V			1500		nC
R_{Gint}	T_j = °C			2,5		Ω
$t_{d(on)}$	R_{Gon} = 5,6 Ω	V_{CC} = 600V		220	400	ns
t_r		I_C= 150A		100	200	ns
E_{on}				24		mJ
$t_{d(off)}$	R_{Goff} = 5,6 Ω	T_j = 125 °C		600	800	ns
t_f		V_{GE} = -15V		70	100	ns
E_{off}				17		mJ
$R_{th(j-c)}$	per IGBT				0,09	K/W



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Typical Applications

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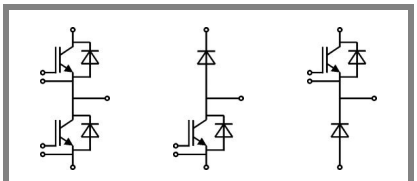
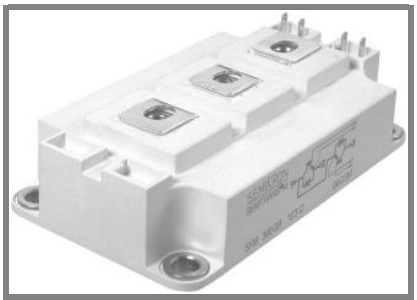


GB GAL GAR

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse 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	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		6	8,7	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_F = 150 A	T_j = 125 °C		90		A
Q_{rr}	di/dt = 1500 A/µs			8		µC
E_{rr}	V_{GE} = -15 V; V_{cc} = 600V			6,6		mJ
$R_{th(j-c)D}$	per diode				0,25	K/W
Freewheeling Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 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	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		4,5	6,5	V
		T_j = 125 °C				V
I_{RRM}	I_F = 200 A	T_j = 125 °C		120		A
Q_{rr}	di/dt = 2000 A/µs			11		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)FD}$	per diode				0,18	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C		0,35		mΩ
		T_{case}= 125 °C		0,5		mΩ
$R_{th(c-s)}$	per module				0,038	K/W
M_s	to heat sink M6		3		5	Nm
M_t	to terminals M6, M4		2,5		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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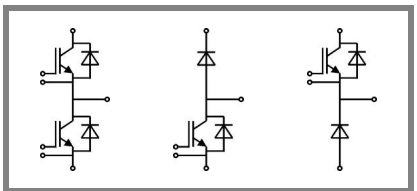
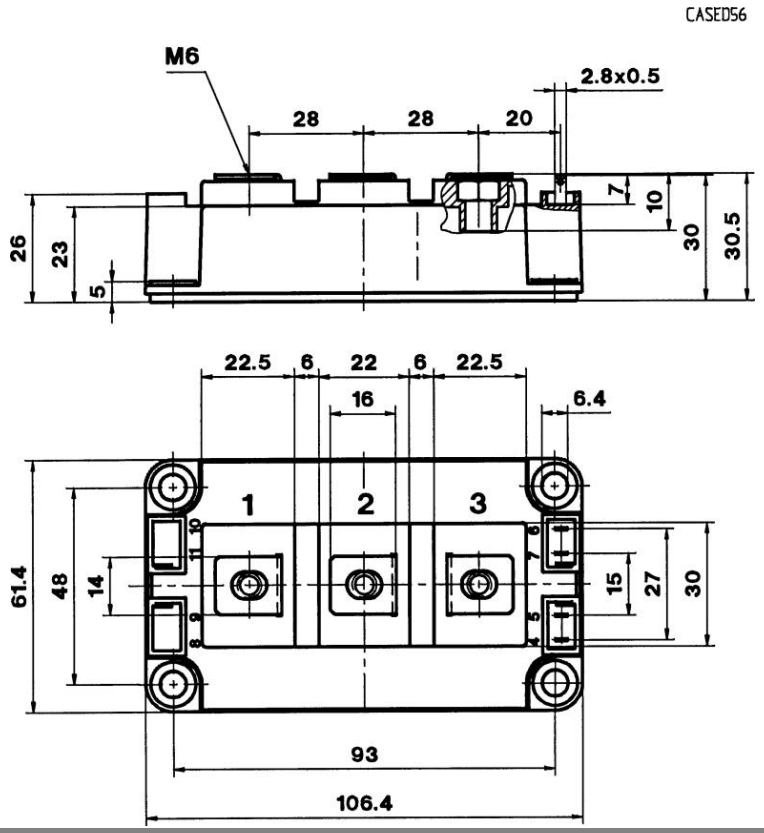


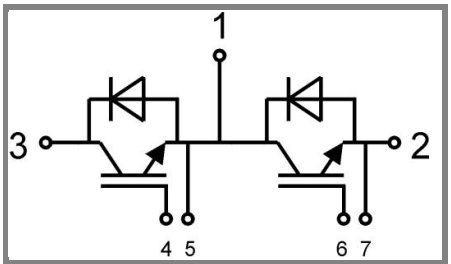
GB GAL GAR

Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	59	mk/W
R_i	i = 2	23	mk/W
R_i	i = 3	6,8	mk/W
R_i	i = 4	1,2	mk/W
tau_i	i = 1	0,03	s
tau_i	i = 2	0,0087	s
tau_i	i = 3	0,002	s
tau_i	i = 4	0,0002	s
$Z_{th(j-c)D}$			
R_i	i = 1	170	mk/W
R_i	i = 2	66	mk/W
R_i	i = 3	12	mk/W
R_i	i = 4	2	mk/W
tau_i	i = 1	0,0348	s
tau_i	i = 2	0,0072	s
tau_i	i = 3	0,077	s
tau_i	i = 4	0,0002	s

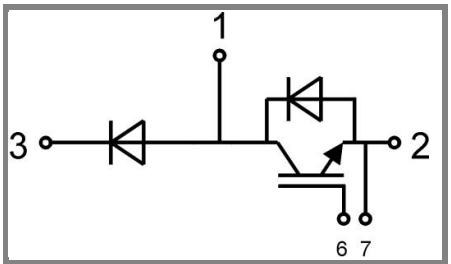
UL Recognized File 63 532



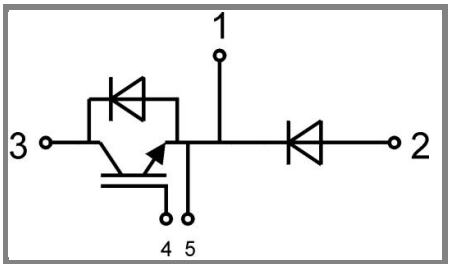
Case D 56



Case D 56 GB



Case D 57 (56) GAL



Case D 58 (56) GAR