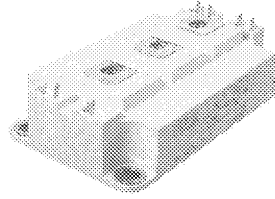


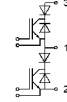
Absolute Maximum Ratings		Values		Units
Symbol	Conditions ¹⁾			
V _{CES}		1200		V
V _{CGR}	R _{GE} = 20 kΩ	1200		V
I _C	T _{case} = 25/80 °C	200 / 150		A
I _{CM}	T _{case} = 25/80 °C; t _p = 1 ms	400 / 300		A
V _{GES}		± 20		V
P _{tot}	per IGBT, T _{case} = 25 °C	1250		W
T _J , (T _{stg})		- 40 ... +150 (125)		°C
V _{isol}	AC, 1 min.	2 500 ⁷⁾		V
humidity	DIN 40 040	Class F		
climate	DIN IEC 68 T.1	55/150/56		
Diodes		Inverse D.	Series ⁶⁾	
I _F = - I _C	T _{case} = 25/80 °C	25 / 15	260 / 180	A
I _{FM} = - I _{CM}	T _{case} = 25/80 °C; t _p = 1 ms	50 / 30	600 / 400	A
I _{FSM}	t _p = 10 ms; sin.; T _J = 150 °C	200	2 200	A
t _{st}	t _p = 10 ms; T _J = 150 °C	200	24 200	A ² s

SEMITRANS® M IGBT Modules SKM 200 GBD 123 D

Preliminary Data



SEMITRANS 3



GBD

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 * I_{Cnom}
- Latch-up free
- Fast & soft inverse CAL diodes ³⁾
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distances (20 mm).

Typical Applications:

- Switching (not for linear use)
- Resonant inverters

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
V _{(BR)CES}	V _{GE} = 0, I _C = 4 mA	≥ V _{CES}	--	--	V
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 6 mA	4,5	5,5	6,5	V
I _{CES}	V _{GE} = 0 } T _J = 25 °C	--	0,2	3	mA
	V _{CE} = V _{CES} } T _J = 125 °C	--	12	--	mA
I _{GES}	V _{GE} = 20 V, V _{CE} = 0	--	--	1	μA
V _{CEsat}	I _C = 150 A { V _{GE} = 15 V; } I _C = 200 A { T _J = 25 (125) °C }	--	2,5(3,1)	3(3,7)	V
V _{CEsat}	I _C = 200 A { T _J = 25 (125) °C }	--	2,8(3,6)	--	V
g _{fs}	V _{CE} = 20 V, I _C = 150 A	95	--	--	S
C _{CHC}	per IGBT	--	--	700	pF
C _{ies}	V _{GE} = 0	--	10	13	nF
C _{oes}	V _{CE} = 25 V	--	1,5	2	nF
C _{res}	f = 1 MHz	--	0,8	1,2	nF
L _{CE}		--	--	40	nH
t _{d(on)}	V _{CC} = 600 V	--	220	400	ns
t _r	V _{GE} = -15 V / +15 V ³⁾	--	100	200	ns
t _{d(off)}	I _C = 150 A, ind. load	--	600	800	ns
t _f	R _{Gon} = R _{Goff} = 5,6 Ω	--	70	100	ns
E _{on} ⁵⁾	T _J = 125 °C	--	24	--	mWs
E _{off} ⁵⁾		--	17	--	mWs
Inverse Diode ⁸⁾ D1, D2 ⁹⁾					
V _F = V _{EC}	I _F = 15 A { V _{GE} = 0 V; } I _F = 25 A { T _J = 25 (125) °C }	--	2,0(1,8)	2,5	V
V _F = V _{EC}	I _F = 25 A { T _J = 25 (125) °C }	--	2,3(2,1)	--	V
V _{TO}	T _J = 125 °C	--	--	1,2	V
r _T	T _J = 125 °C	--	45	70	mΩ
I _{RRM}	I _F = 150 A; T _J = 25 (125) °C ²⁾	--	12(16)	--	A
Q _{rr}	I _F = 150 A; T _J = 25 (125) °C ²⁾	--	1(2,7)	--	μC
Series Diodes D3, D4 ⁸⁾ ⁶⁾					
V _F = V _{EC}	I _F = 200 A { V _{GE} = 0 V; } I _F = 300 A { T _J = 25 (125) °C }	--	2,0(1,8)	2,5	V
V _F = V _{EC}	I _F = 300 A { T _J = 25 (125) °C }	--	2,25(2,1)	--	V
V _{TO}	T _J = 125 °C	--	--	1,2	V
r _T	T _J = 125 °C	--	3	5,5	mΩ
I _{RRM}	I _F = 200 A; T _J = 25 (125) °C ²⁾	--	70(105)	--	A
Q _{rr}	I _F = 200 A; T _J = 25 (125) °C ²⁾	--	10(26)	--	μC
Thermal Characteristics					
R _{thjc}	per IGBT	--	--	0,1	°C/W
R _{thjc}	per inverse/series diode	--	--	1,5/0,15	°C/W
R _{thch}	per module	--	--	0,038	°C/W

¹⁾ T_{case} = 25 °C, unless otherwise specified

²⁾ I_F = - I_C, V_R = 600 V, - di_F/dt = 1500 A/μs, V_{GE} = 0 V

³⁾ Use V_{GEoff} = -5 ... -15 V

⁵⁾ See fig. 2 + 3; R_{Goff} = 5,6 Ω

⁶⁾ Series diodes have the data of the inverse diodes of SKM 300 GB 123 D

⁸⁾ CAL = Controlled Axial Lifetime Technology.

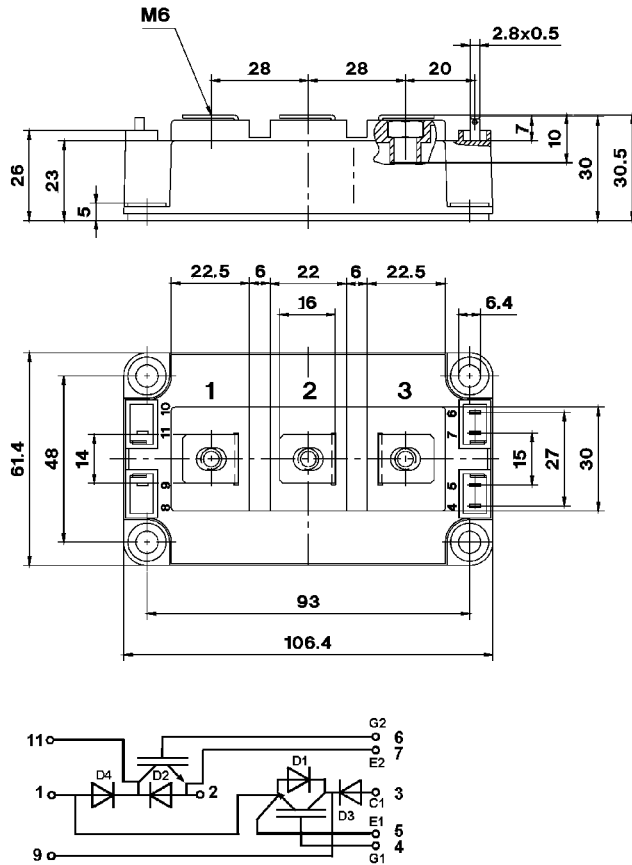
⁹⁾ see page 2

Cases and mech. data → page 2

Diagramms see SEMIKRON Book '97/98 page B6-71 etc.

SEMISTRANS 3

Case D 56a
 UL Recognized
 File no. E 63 532



Dimensions in mm

Case outline and circuit diagrams

⁹⁾ The inverse diodes D1 and D2 have the function of protective devices only. Data see type SKM 22GD123D (Fig. 17, 18, 22-24)

Symbol	Conditions		Values			Units
			min.	typ.	max.	
M ₁	to heatsink, SI Units	(M6)	3	--	5	Nm
	to heatsink, US Units		27	--	44	lb.in.
M ₂	for terminals, SI Units	(M6)	2,5	--	5	Nm
	for terminals US Units		22	--	44	lb.in.
a			--	--	5x9,81	m/s ²
w			--	--	420	g

This is an electrostatic discharge sensitive device (ESDS). Please observe the international standard IEC 747-1, Chapter IX.

Three devices are supplied in one SEMIBOX A without mounting hardware, which can be ordered separately under Ident No. 33321100 (for 10 SEMISTRANS 3). Larger packing units of 12 and 20 pieces are used if suitable.

See SEMIKRON Book '97/'98

Accessories → page B 6 - 4.

SEMIBOX → page C - 1.