Absolute Maximum Ratings Symbol	Conditions [1]	Values		Units
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	755/150/56		
Diodes		Inverse D.	Series [6]	
I_F= – I_C	T_{case} = 25/80 °C	25 / 15	200 / 130	A
I_{FM}= – I_{CM}	T_{case} = 25/80 °C; t_p = 1 ms	50 / 30	400 / 300	A

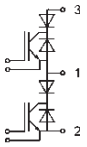
Characteristics Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)CES}$	V_{GE} = 0, I_C = 4 mA	≥ V_{CES}	–	–	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA	4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0, T_j = 25 °C	–	0,2	3	mA
	V_{CE} = V_{CES}, T_j = 125 °C	–	12	–	mA
I_{GES}	V_{GE} = 20 V, V_{CE} = 0	–	–	1	µA
V_{CEsat}	I_C = 150 A; V_{GE} = 15 V;	–	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;	–	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 = 150 A; V_{GE} = 0 V;	–	2,0(1,8)	2,5	V
V_F = V_{EC}	I_F = 200 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	–	5	7	mΩ
I_{RRM}	I_F = 150 A; T_j = 25 (125) °C [2]	–	55(80)	–	A
Q_{rr}	I_F = 150 A; T_j = 25 (125) °C [2]	–	8(23)	–	µC
Thermal Characteristics					
R_{thjc}	per IGBT	–	–	0,1	°C/W
R_{thjc}	per inverse/series diode	–	–	1,5/0,25	°C/W
R_{thch}	per module	–	–	0,038	°C/W

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 [8]
- 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

[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 200 GB 123 D
[8] CAL = Controlled Axial Lifetime Technology.
[9] see page 2 for protection only

Cases and mech. data → page 2

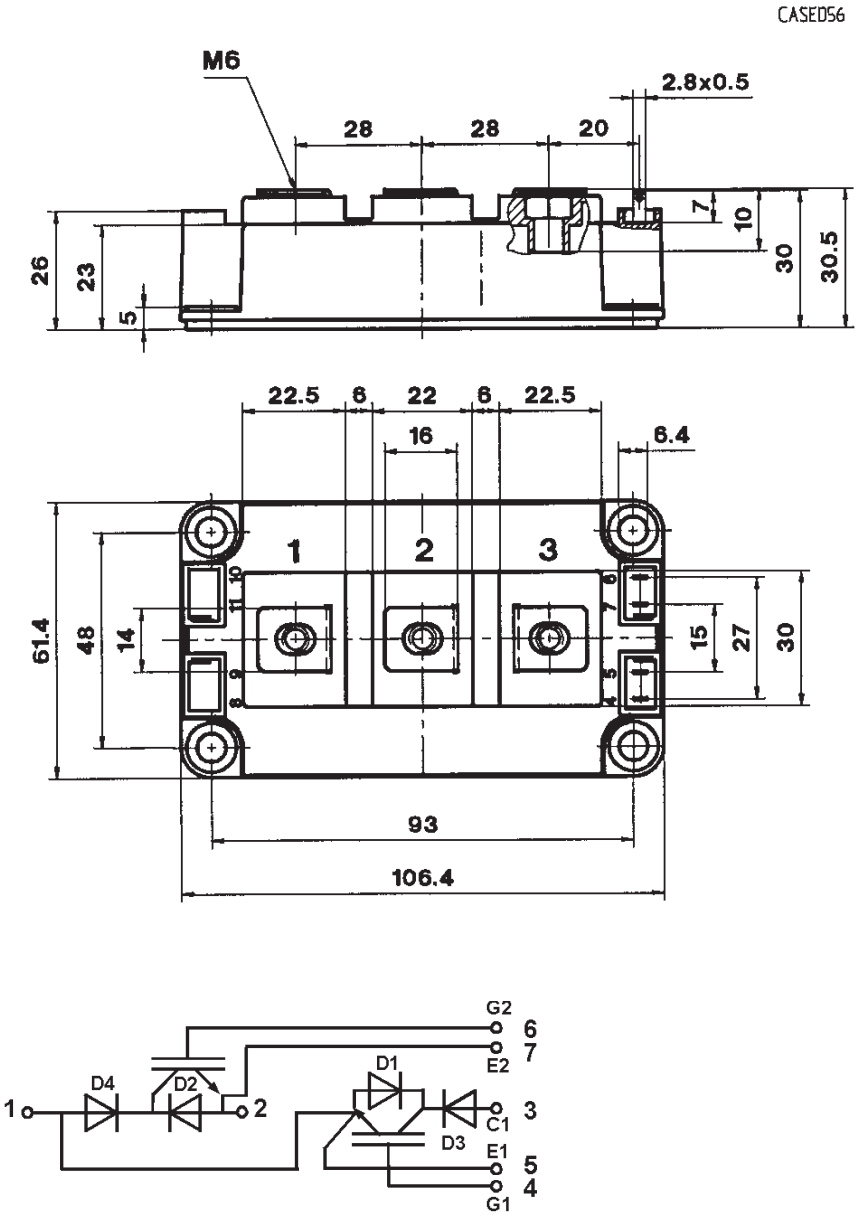
Diagramms see SEMIKRON Book ’97/98 page B6-71 etc.

SEMITRANS 3

Case D 56

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)

Mechanical Data						
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 SEMITRANS 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.

