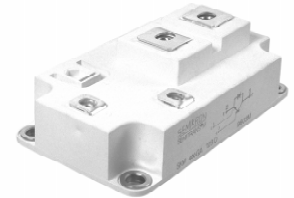


Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
V _{CES}		1700	V
V _{CGR}	R _{GE} = 20 kΩ	1700	V
I _C ; I _{CN}	T _{case} = 25/70 °C	600 / 500	A
I _{CM}	T _{case} = 25/70 °C; t _p = 1 ms	1200 / 1000	A
V _{GES}		± 20	V
P _{tot}	per IGBT, T _{case} = 25 °C	3000	W
T _j , (T _{stg})		-40 ... +150 (125)	°C
V _{isol}	AC, 1 min. ⁴⁾	3400	V
humidity	DIN 40 040	Class F	
climate	DIN IEC 68 T.1	40/125/56	
Inverse Diode ⁸⁾			
I _F = -I _C	T _{case} = 25/70 °C	550 / 420	A
I _{FM} = -I _{CM}	T _{case} = 25/70 °C; t _p = 1 ms	1200/ 1000	A
I _{FSM}	t _p = 10 ms; sin.; T _j = 150 °C	4400	A
I ² t	t _p = 10 ms; T _j = 150 °C	96800	A ² s

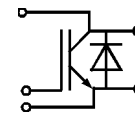
SEMITRANS® M Low Loss IGBT Modules

SKM 500 GA 174 D

Preliminary Data



SEMITRANS 4



GA

Features

- MOS input (voltage controlled)
- N channel, homogeneous Silicon structure (NPT- Non punch-through IGBT)
- Low inductance case
- Low tail current with low temperature dependence
- High short circuit capability, self limiting to 4 * I_{Cnom}
- Latch-up free
- Fast & soft inverse CAL diodes ⁸⁾
- Isolated copper baseplate using DCB Direct Copper Bonding
- Large clearance (13 mm) and creepage distances (20 mm)

Typical Applications

- AC inverter drives on mains 575 - 750 V_{AC}
- DC bus voltage 750 - 1200 V_{DC}
- Public transport (auxiliary syst.)
- Switching (not for linear use)

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
V _{(BR)CES}	V _{GE} = 0, I _C = 8 mA	≥ V _{CES}	-	-	V
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 24 mA	4,8	5,5	6,2	V
I _{CES}	V _{GE} = 0 } T _j = 25 °C	-	0,1	0,8	mA
	V _{CE} = V _{CES} } T _j = 125 °C	-	16	-	mA
I _{GES}	V _{GE} = 20 V, V _{CE} = 0	-	-	100	nA
V _{CESat}	I _C = 400 A } V _{GE} = 15 V;	-	2,8(3,25)	3,3	V
	I _C = 500 A } T _j = 25 (125) °C }	-	3,0(3,6)	-	V
g _{fs}	V _{CE} = 20 V, I _C = 400 A	-	220	-	S
C _{CHC}	per IGBT	-	-	1,4	nF
C _{ies}	V _{GE} = 0	-	20	-	nF
C _{oes}	V _{CE} = 25 V	-	3,8	-	nF
C _{res}	f = 1 MHz	-	1,3	-	nF
L _{CE}		-	-	20	nH
t _{d(on)}	V _{CC} = 1200 V	-	150	-	ns
t _r	V _{GE} = -15 V / +15 V ³⁾	-	120	-	ns
t _{d(off)}	I _C = 400 A, ind. load	-	1000	-	ns
t _f	R _{Gon} = R _{Goff} = 4,7 Ω	-	150	-	ns
E _{on}	T _j = 125 °C	-	280	-	mWs
E _{off}	L _S = 60 nH	-	160	-	mWs
Inverse Diode ⁸⁾					
V _F = V _{EC}	I _F = 400 A } V _{GE} = 0 V;	-	2,2(1,9)	2,7(2,4)	V
V _F = V _{EC}	I _F = 500 A } T _j = 25 (125) °C }	-	2,4(2,3)	-	V
V _{TO}	T _j = 125 °C	-	1,3	1,5	V
r _t	T _j = 125 °C	-	2	2,5	mΩ
I _{RRM}	I _F = 400 A; T _j = 25 (125) °C ²⁾	-	200(300)	-	A
Q _{rr}	I _F = 400 A; T _j = 25 (125) °C ²⁾	-	48(116)	-	μC
Thermal characteristics					
R _{thjc}	per IGBT	-	-	0,041	°C/W
R _{thjc}	per diode D	-	-	0,075	°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 = 1200 V, -di_F/dt = 1500 A/μs, V_{GE} = 0 V

³⁾ Use V_{GEoff} = -5 ... -15 V

⁴⁾ Option V_{isol} = 4000V/1 min add suffix „H4“ - on request

⁸⁾ CAL = Controlled Axial Lifetime Technology

Cases and mech. data → B6-280

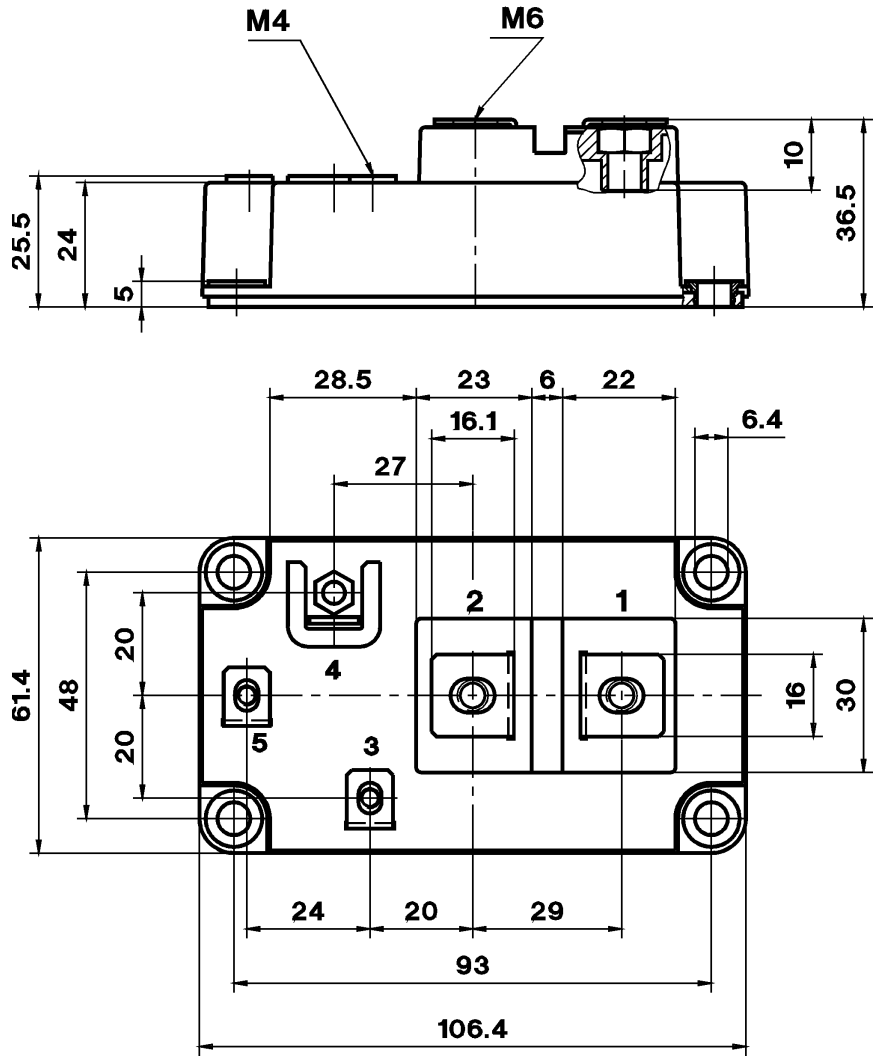
SEMITRANS 4

Case D 59

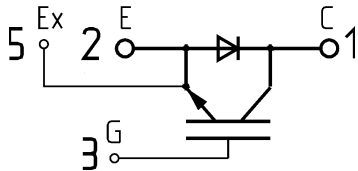
UL Recognition
File no. E 63 532
applied for

CASED59

SKM 500 GA 174 D



GCIGGA4



Dimensions in mm

Option SKM 500 GA 174 DS on request:
Terminal 4 = collector sense V_{CE} , add suffix „S“. → B 6 – 212

Case outline and circuit diagram

Mechanical Data		Values			Units
Symbol	Conditions	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/M4)	2,5/1,1	–	5/2	Nm
	for terminals, US Units	22/10	–	44/18	lb.in.
a		–	–	5x9,81	m/s ²
w		–	–	330	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 B without mounting hardware, which can be ordered separately under Ident No. 33321100 (for 10 SEMITRANS 4)

Larger packing units of 12 or 20 pieces are used if suitable
Accessories → B 6 – 4
SEMIBOX → C – 1.