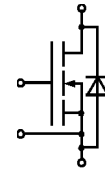


SEMITRANS® M Power MOSFET Modules

SKM 151 AR ³⁾



SEMITRANS M1



Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- With built-in gate resistor chips ("R") $R_{gtotal} = 1,3 \Omega$ for better simultaneous switching, lower frequencies and many in parallel
- Isolated copper baseplate using DCB Direct Copper Bonding Ceramic
- All electrical connections on top for easy busbaring
- Large clearance (10 mm) and creepage distances (13 mm)
- UL recognized, file no. E63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- Resonant and welding inverters
- AC motor drives
- Laser power supplies
- UPS equipment
- Not suitable for linear amplification

This is an electrostatic discharge sensitive device (ESDS).

Please observe the international standard IEC 747-1, Chapter IX.

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
V _{DS}	R _{GE} = 20 kΩ	500	V
V _{DGR}		500	V
I _D		48	A
I _{DM}		192	A
V _{GS}		± 20	V
P _D		625	W
T _J , (T _{stg})	AC, 1 min. DIN 40 040 DIN IEC 68 T.1	−40 ... +150 (125)	°C
V _{isol}		2 500	V
humidity		Class F	
climate		40/125/56	
Inverse Diode			
I _F = −I _D		48	A
I _{FM} = −I _{DM}		192	A

Characteristics					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
V _{(BR)DSS}	V _{GS} = 0, I _D = 0,25 mA	500	—	—	V
V _{GS(th)}	V _{GS} = V _{DS} , I _D = 1 mA	2,1	3,0	4,0	V
I _{DSS}	V _{GS} = 0 } T _j = 25 °C V _{DS} = 500 V } T _j = 125 °C	—	50	250	μA
		—	300	1000	μA
I _{GSS}	V _{GS} = 20 V, V _{DS} = 0	—	10	100	nA
R _{DS(on)}	V _{GS} = 10 V, I _D = - 45 A	—	100	120	mΩ
g _{fs}	V _{DS} = 25 V, I _D = - 45 A	30	45	—	S
C _{CHC}	V _{GS} = 0 V _{DS} = 25 V f = 1 MHz	—	—	160	pF
C _{iss}		—	8	10,5	nF
C _{oss}		—	1,1	1,6	nF
C _{rss}		—	0,5	0,7	nF
L _{DS}		—	—	30	nH
t _{d(on)}	V _{DD} = 250 V I _D = 30 A V _{GS} = 10 V R _G = 3,3 Ω	—	60	—	ns
t _r		—	25	—	ns
t _{d(off)}		—	260	—	ns
t _f		—	50	—	ns
Inverse Diode					
V _{SD}	I _F = 120 A, V _{GS} = 0 V	—	1,1	1,4	V
t _{rr}	T _j = 25 °C ²⁾	—	600	—	ns
Q _{rr}	T _j = 150 °C ²⁾	—	—	—	ns
	T _j = 25 °C ²⁾	—	16	—	μC
	T _j = 150 °C ²⁾	—	—	—	
Thermal characteristics					
R _{thjc}	M ₁ , surface 10 μm	—	—	0,20	°C/W
R _{thch}		—	—	0,05	°C/W

Mechanical Data					
M_1	to heatsink, SI Units	4	—	6	Nm
	to heatsink, US Units	35	—	53	lb.in.
M_2	for terminals, SI Units	2,5	—	3,5	Nm
	for terminals, US Units	22	—	24	lb.in.
a		—	—	5x9,81	m/s ²
w		—	—	130	g
Case	→ B 5 – 2	D15			

¹⁾ $T_{case} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified

²⁾ $I_F = -I_D, V_R = 100 \text{ V}, -di_F/dt = 100 \text{ A}/\mu\text{s}$

³⁾ SKM 151 AR replaces older SKM 151 (discontinued) and older option SKM 151 R

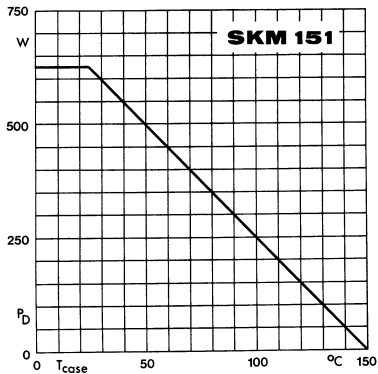


Fig. 1 Rated power dissipation vs. temperature

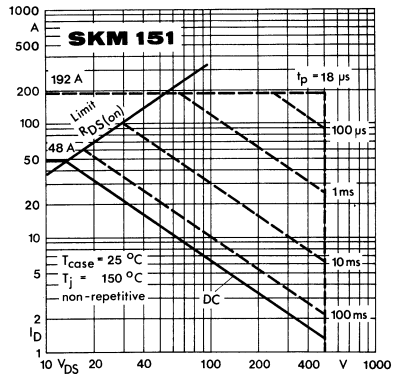


Fig. 2 Maximum safe operating area

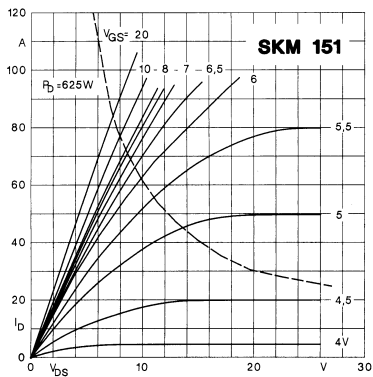


Fig. 3 Output characteristic

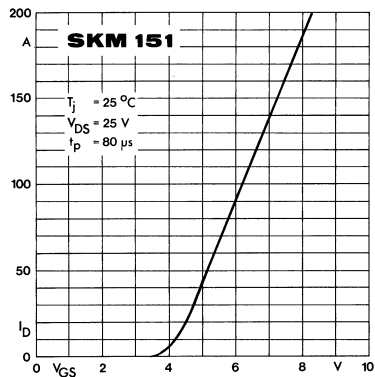


Fig. 4 Transfer characteristic

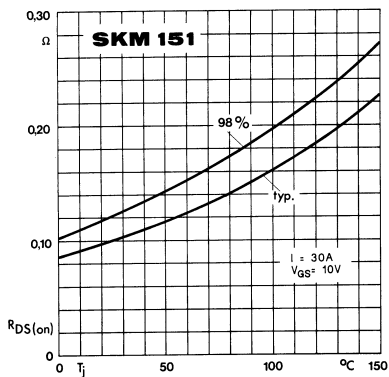


Fig. 5 On-resistance vs. temperature

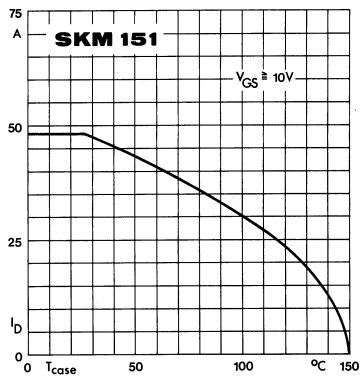
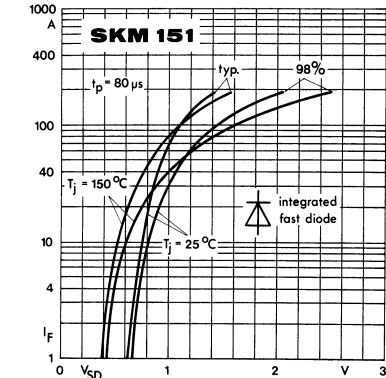
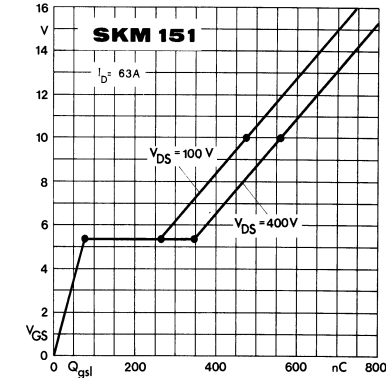
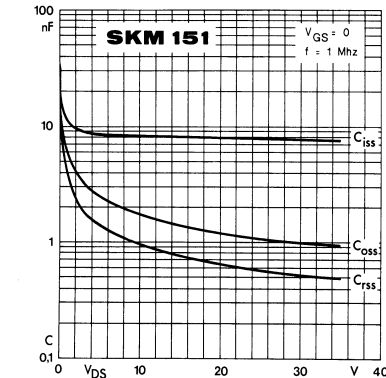
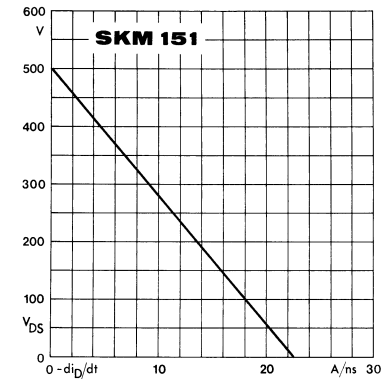
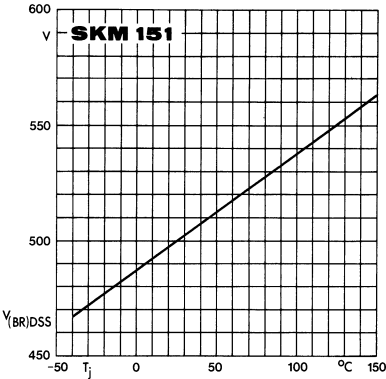


Fig. 6 Rated current vs. temperature



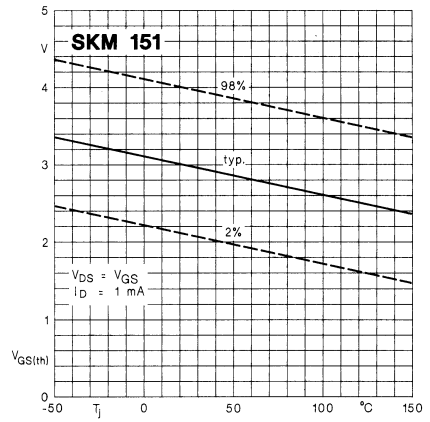


Fig. 14 Gate-source threshold voltage

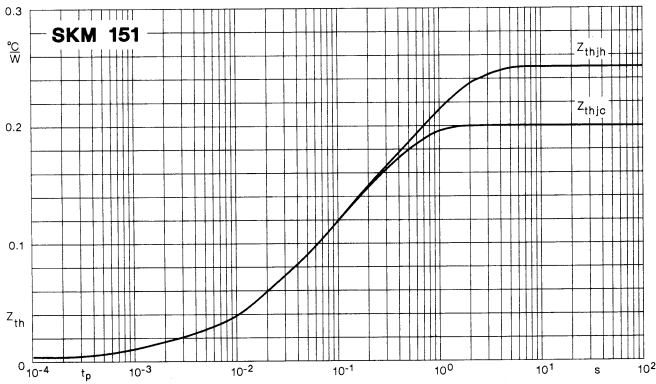


Fig. 51 Transient thermal impedance

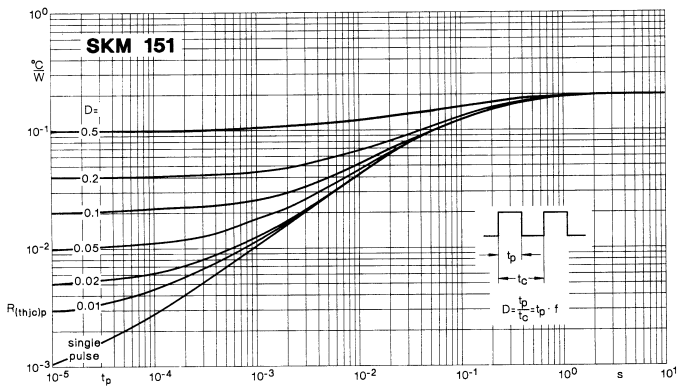
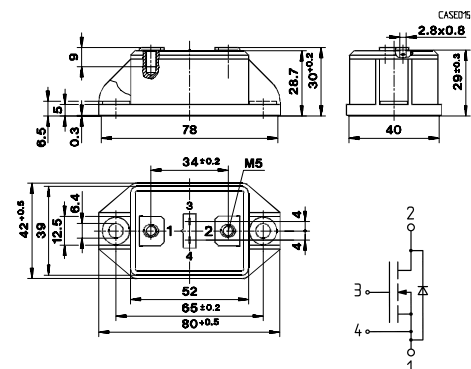


Fig. 52 Thermal impedance under pulse conditions

SEMITRANS® M1

Case D 15
SKM 111 AR
SKM 121 AR
SKM 151 AR
SKM 180 A 020
SKM 181 A3 (R)

UL recognized
File No. E 63 532



Dimensions in mm

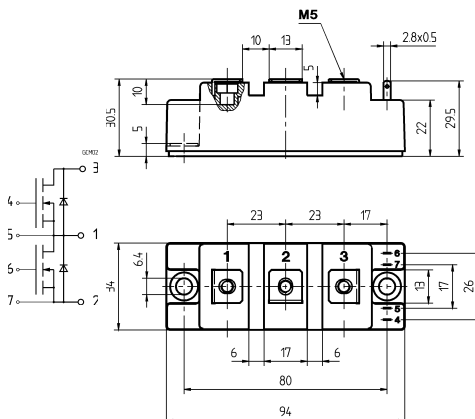
w = 130 g

SEMITRANS® M2

Case D 70
SKM 120 B 020
SKM 204 A
SKM 214 A

UL recognized
File No. E 63 532

CASE D70



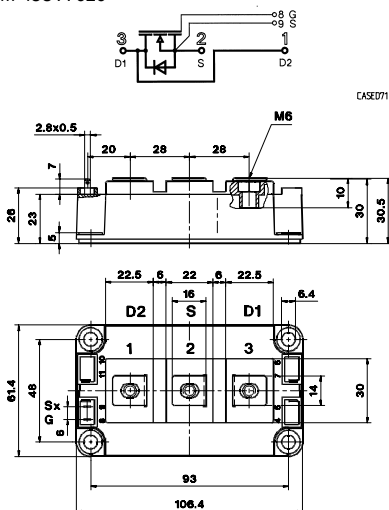
Dimensions in mm

w = 160 g

SEMITRANS® M3

(SINGLE)
Case D 71
SKM 453 A 020

UL recognized
File No. E 63 532



→ B 5 – 18

Dimensions in mm

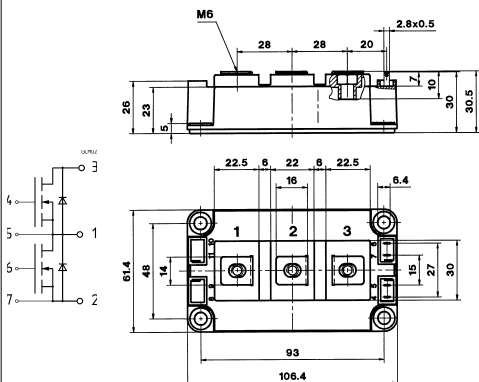
w = 325 g

SEMITRANS® 3

(DUAL)
Case D 56
SKM 253 B 020
SKM 313 B 010

UL recognized
File No. E 63 532

CASE D56



Dimensions in mm

w = 325 g