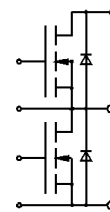


SEMITRANS® M Power MOSFET Modules SKM 204 A



SEMITRANS 2



Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- Fast inverse diodes
- Isolated copper baseplate
- All electrical connections on top for easy busbaring
- Large clearances (10 mm) and creepage distances (20 mm)
- UL recognized, file no. E 63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- Resonant and welding inverters
- Induction heaters
- UPS equipment
- Plasma cutting
- Not suitable for linear amplification

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

Screws → page B 6 – 4

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
V _{DS}		50	V
V _{DGR}	R _{GS} = 20 kΩ	50	V
I _D	T _{case} = 55 °C	200	A
I _{DM}		600	A
V _{GS}		± 20	V
P _D		400	W
T _j , (T _{stg})		- 40 . . . +150 (125)	°C
V _{isol}	AC, 1 min	2 500	V
humidity	DIN 40 040	Class F	
climate	DIN IEC 68 T.1	40/125/56	
Inverse Diode			
I _F = - I _D		200	A
I _{FM} = - I _{DM}		600	A

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
V _{(BR)DSS}	V _{GS} = 0, I _D = 0,25 mA	50	-	-	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	-	50	250	μA
	V _{DS} = 50 V } T _j = 125 °C	-	300	1000	μA
I _{GSS}	V _{GS} = 20 V, V _{DS} = 0	-	10	100	nA
R _{DS(on)}	V _{GS} = 10 V, I _D = 130 A	-	3,8	4,5	mΩ
g _{fs}	V _{DS} = 25 V, I _D = 130 A	90	130	-	S
C _{CHC}	per MOSFET	-	-	100	pF
C _{iss}	} V _{GS} = 0 } V _{DS} = 25 V } f = 1 MHz	-	12	16	nF
C _{oss}		-	6	8	nF
C _{rss}		-	1,6	2,4	nF
L _{DS}		-	-	20	nH
t _{d(on)}	} V _{DD} = 30 V } I _D = 130 A } V _{GS} = 10 V } R _{GS} = 3,3 Ω	-	80	-	ns
t _r		-	300	-	ns
t _{d(off)}		-	400	-	ns
t _f		-	280	-	ns
Inverse Diode					
V _{SD}	I _F = 400 A, V _{GS} = 0	-	1,25	1,6	V
t _{rr}	T _j = 25 °C ²⁾	-	350	-	ns
	T _j = 150 °C ²⁾	-	600	900	ns
Q _{rr}	T _j = 25/150 °C ²⁾	-	4/18	-	μC
I _{RRM}	T _j = 25/150 °C ²⁾	-	30/70	-	A
Thermal Characteristics					
R _{thjc}	per MOSFET	-	-	0,31	°C/W
R _{thch}	per module	-	-	0,07	°C/W

Mechanical Data		min.	typ.	max.	Units
M ₁	to heatsink, SI Units				
	to heatsink, US Units	35	-	44	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		-	-	160	g
Case	→ page B 5 – 2	D 70			

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

²⁾ I_F = - I_D, V_R = 100 V, - di_F/dt = 100 A/μs

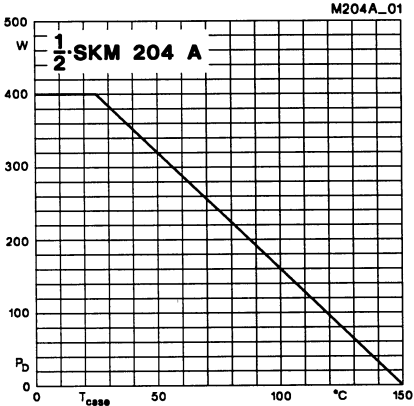


Fig. 1 Rated power dissipation vs. temperature

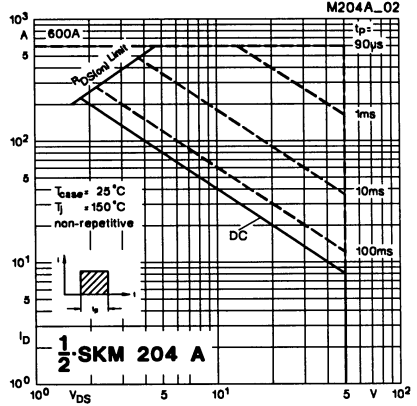


Fig. 2 Maximum safe operating area

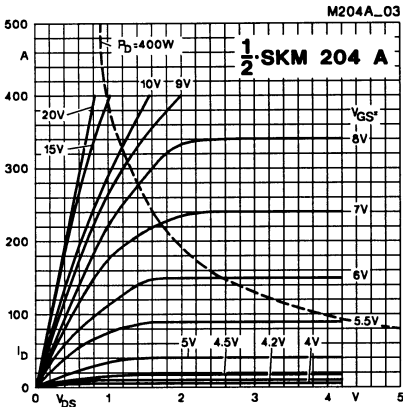


Fig. 3 Output characteristic

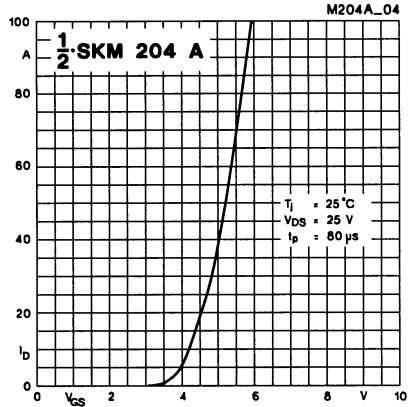


Fig. 4 Transfer characteristic

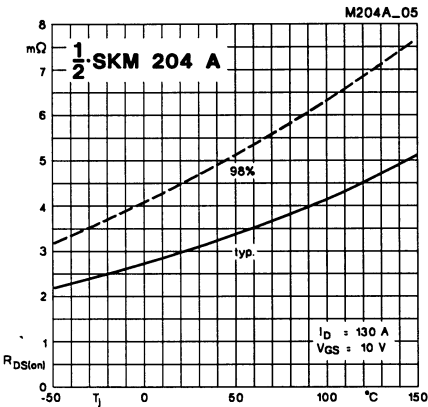


Fig. 5 On-resistance vs. temperature

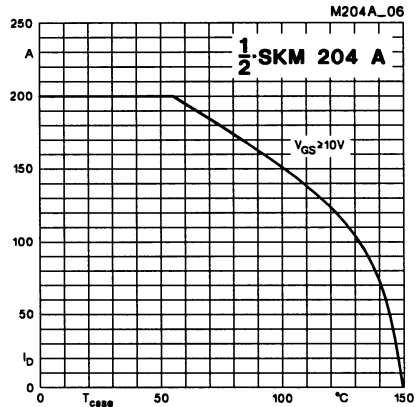


Fig. 6 Rated current vs. temperature

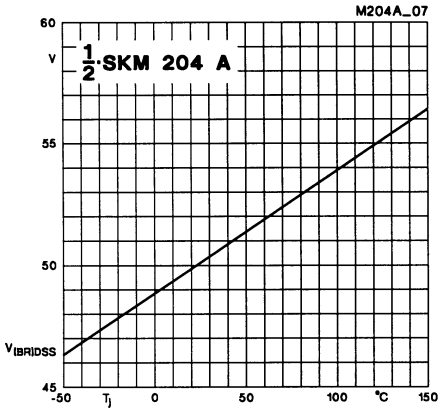


Fig. 7 Breakdown voltage vs. temperature

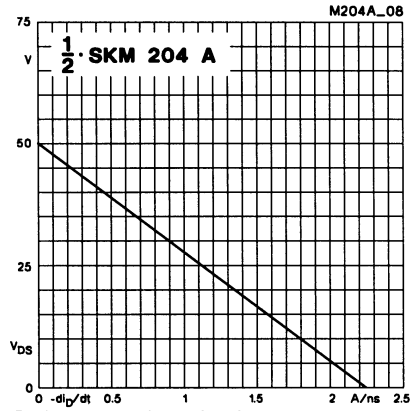


Fig. 8 Drain-source voltage derating

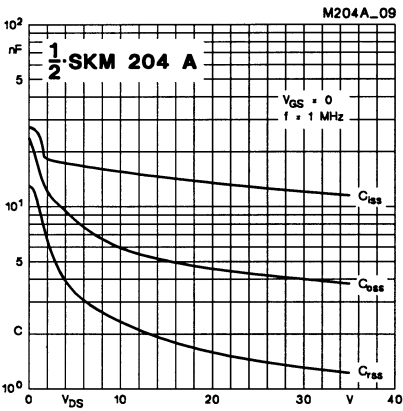


Fig. 9 Capacitances vs. drain-source voltage

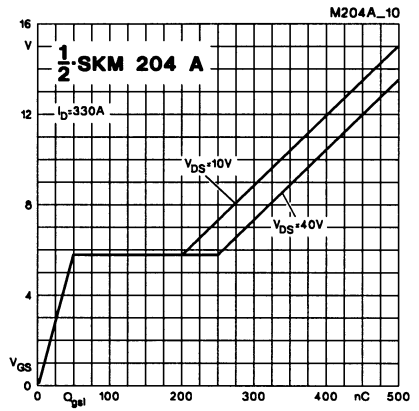


Fig. 10 Gate charge characteristic

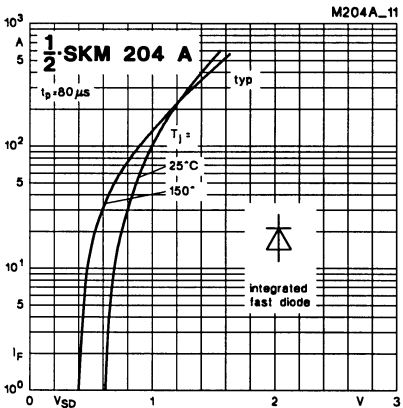


Fig. 11 Diode forward characteristic

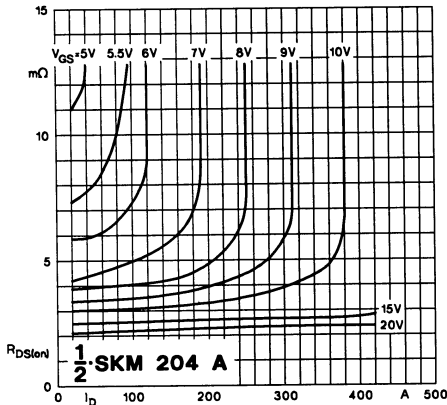


Fig. 13 On-resistance vs. drain current

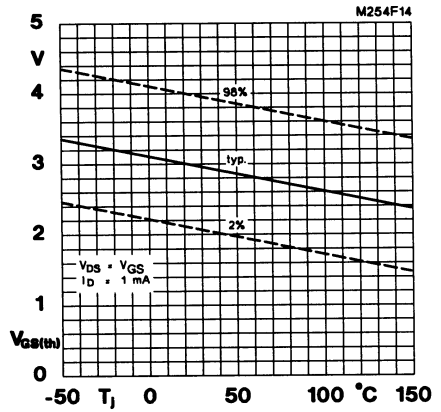


Fig. 14 Gate-source threshold voltage

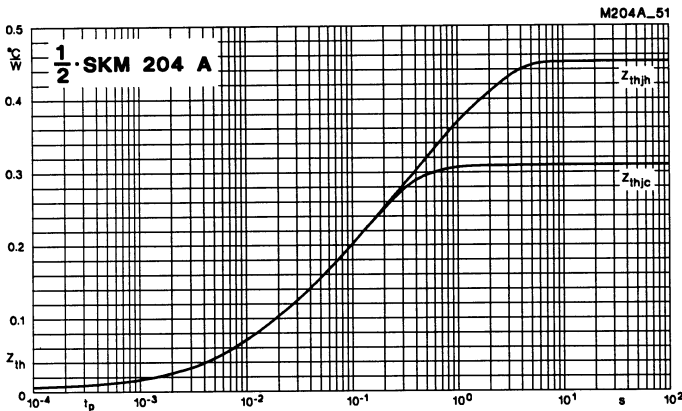


Fig. 51 Transient thermal impedance

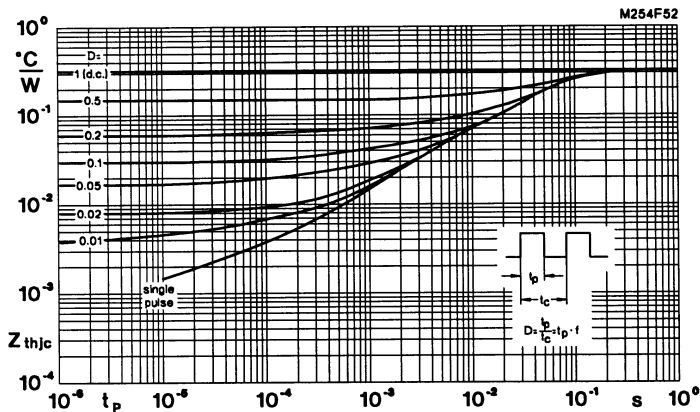
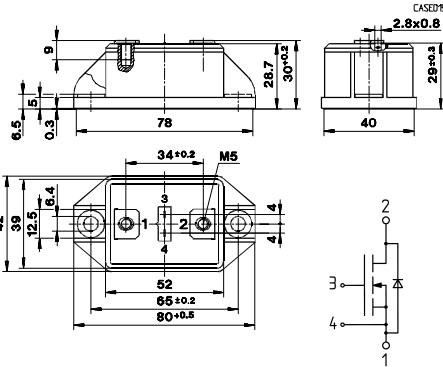


Fig. 52 Thermal impedance under pulse conditions

SEMISTRANS® 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

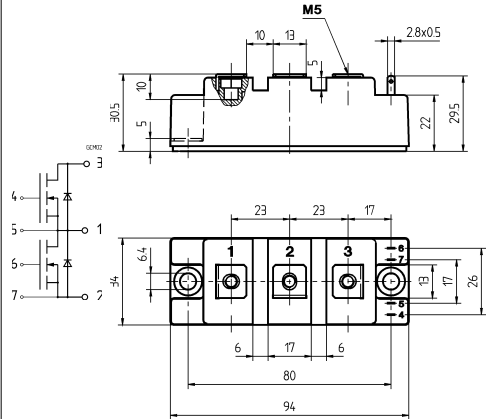
w = 130 g

SEMISTRANS® M2

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

UL recognized
 File No. E 63 532

CASED70



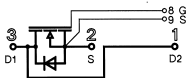
Dimensions in mm

w = 160 g

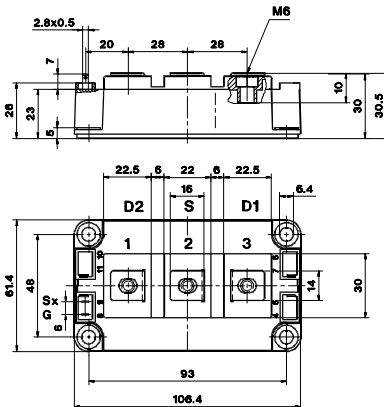
SEMISTRANS® M3

(SINGLE)
 Case D 71
 SKM 453 A 020

UL recognized
 File No. E 63 532



CASED71



→ B 5 – 18

Dimensions in mm

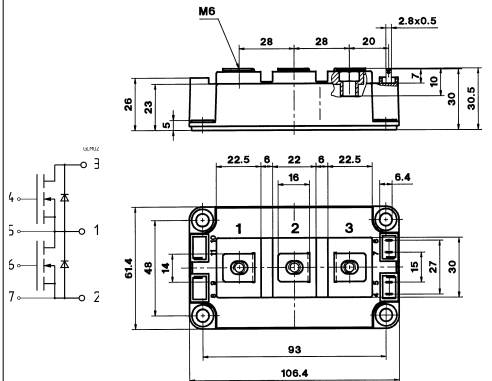
w = 325 g

SEMISTRANS® 3

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

UL recognized
 File No. E 63 532

CASED56



Dimensions in mm

w = 325 g