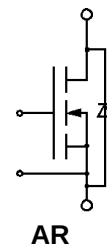


SEMITRANS® M Power MOSFET Modules SKM 111 AR



SEMITRANS M1



Features

- N Channel, enhancement mode
- Avalanche characteristic
- Short connections and built-in gate resistors to suppress internal oscillations even in critical applications
- Isolated copper baseplate
- All electrical connections on top for easy busbaring
- Large clearances (10 mm) and creepagedistances (13 mm)
- UL recognized, file no. E 63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- 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					
Symbol	Conditions ¹⁾	Values			Units
V _{DS}	R _{GS} = 20 kΩ	100			V
V _{DGR}		100			V
I _D		200			A
I _{DM}		600			A
V _{GS}		± 20			V
P _D		700			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		200			A
I _{FM} = – I _{DM}		600			A
Characteristics					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
V _{(BR)DSS}	V _{GS} = 0, I _D = 0,25 mA	100	–	–	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} = 100 V } T _j = 125 °C	–	50	250	μA
		–	300	1000	μA
I _{GSS} ³⁾	V _{GS} = 20 V, V _{DS} = 0	–	10	100	nA
R _{DS(on)}	V _{GS} = 10 V, I _D = 130 A	–	7	8,5	mΩ
g _{fs}	V _{DS} = 25 V, I _D = 130 A	60	75	–	S
C _{CHC}	V _{GS} = 0 V _{DS} = 25 V f = 1 MHz	–	–	160	pF
C _{iss}		–	10	13	nF
C _{oss}		–	5	7,5	nF
C _{rss}		–	1,8	2,7	nF
L _{DS}		–	–	20	nH
t _{d(on)}	V _{DD} = 50 V I _D = 130 A V _{GS} = 10 V R _{GS} = 3,3 Ω	–	60	–	ns
t _r		–	220	–	ns
t _{d(off)}		–	270	–	ns
t _f		–	200	–	ns
Inverse Diode					
V _{SD}	I _F = 400 A, V _{GS} = 0	–	1,25	1,6	V
t _{rr}	T _j = 25 °C ²⁾	–	400	–	ns
	T _j = 150 °C ²⁾	–	–	–	ns
Q _{rr}	T _j = 25 °C ²⁾	–	3,5	–	μC
	T _j = 150 °C ²⁾	–	–	–	
Thermal Characteristics					
R _{thjc}	M ₁ , surface 10 μm	–	–	0,18	°C/W
R _{thch}		–	–	0,05	°C/W
Mechanical Data					
M ₁	to heatsink, SI Units	4	–	5	Nm
	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		–	–	130	g
Case	→ page B 5 – 2	D 15			

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

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

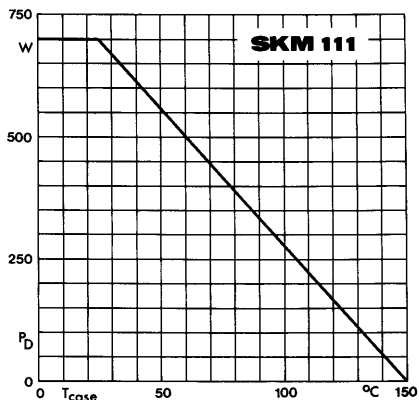


Fig. 1 Rated power dissipation vs. temperature

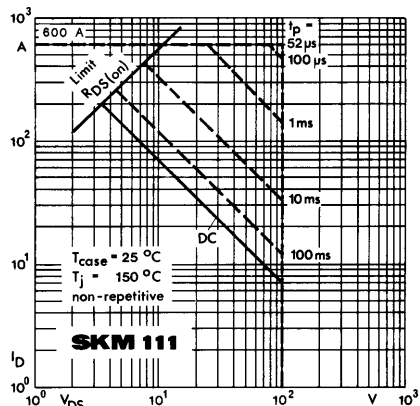


Fig. 2 Maximum safe operating area

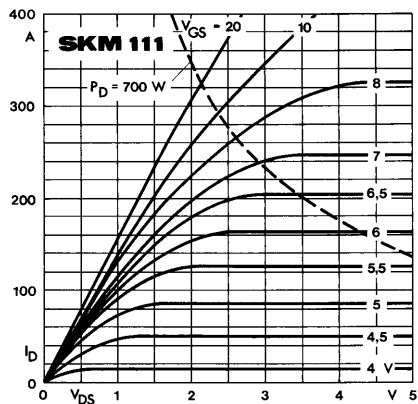


Fig. 3 Output characteristic

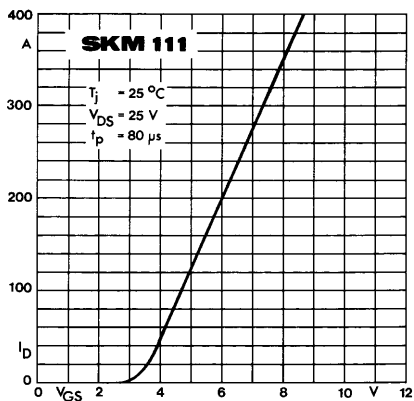


Fig. 4 Transfer characteristic

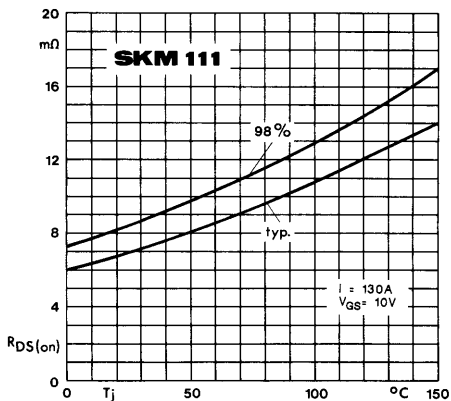


Fig. 5 On-resistance vs. temperature

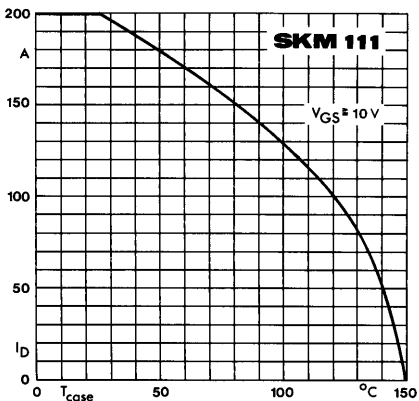


Fig. 6 Rated current vs. temperature

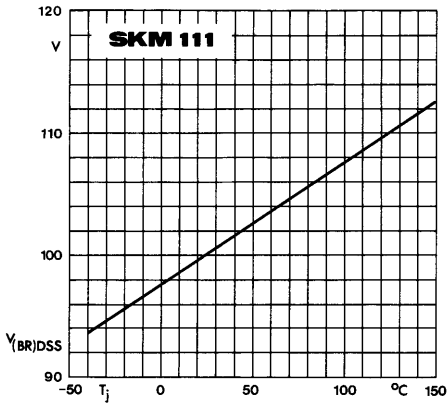


Fig. 7 Breakdown voltage vs. temperature

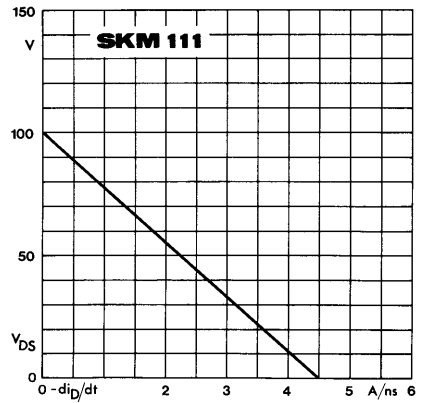


Fig. 8 Drain-source voltage derating

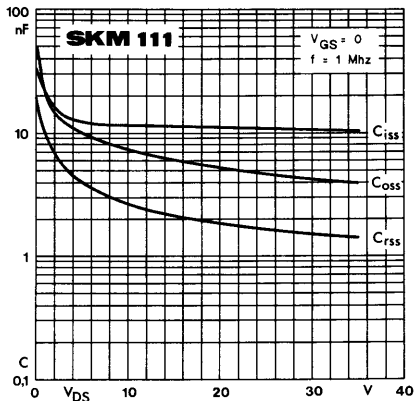


Fig. 9 Capacitances vs. drain-source voltage

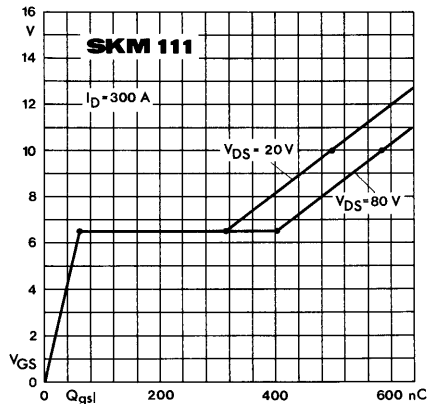


Fig. 10 Gate charge characteristic

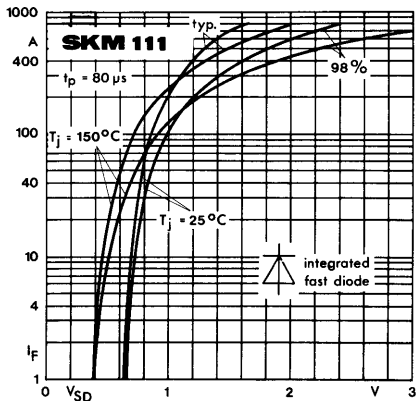


Fig. 11 Diode forward characteristic

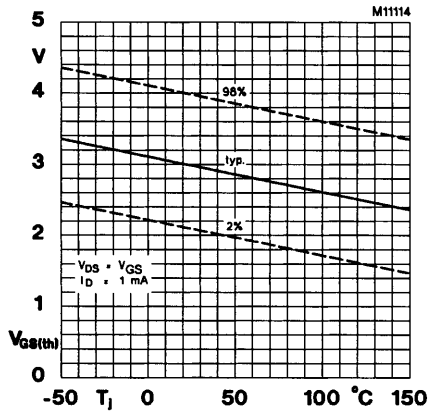


Fig. 14 Gate-source threshold voltage

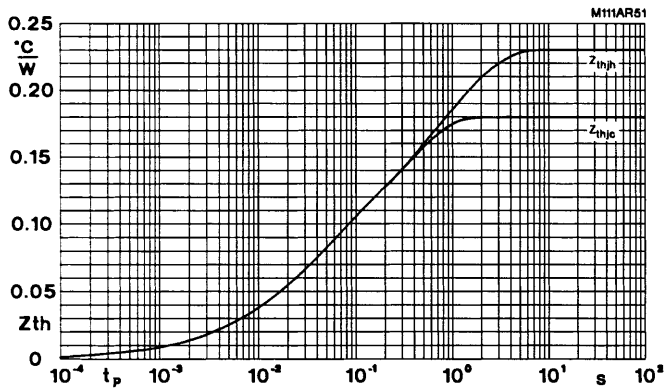


Fig. 51 Transient thermal impedance

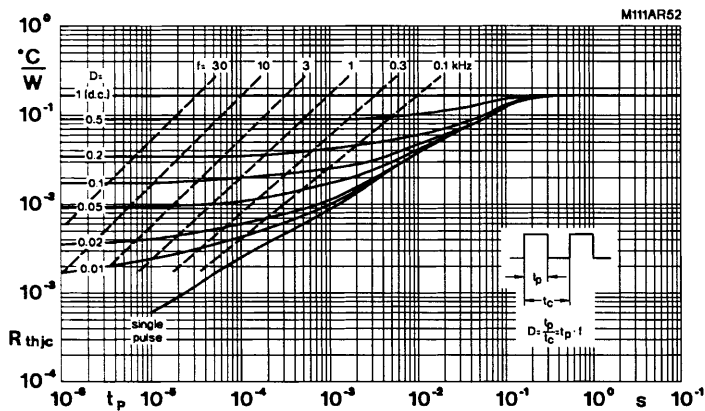
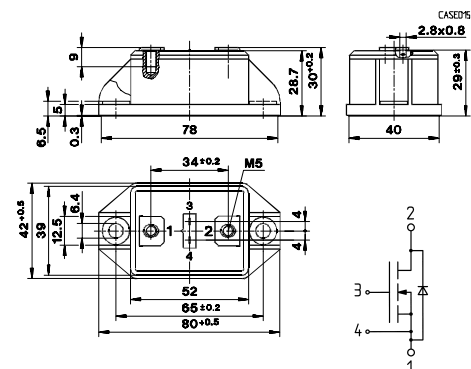


Fig. 52 Thermal impedance under pulse conditions

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

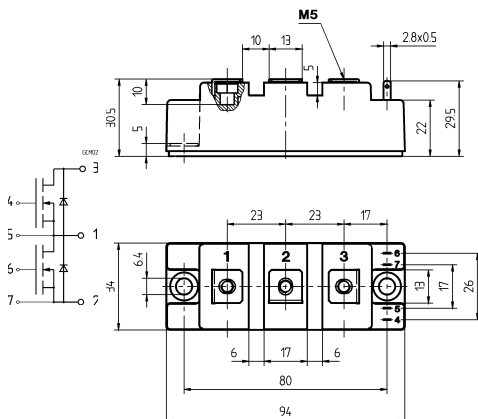
w = 130 g

SEMITRANS® M2

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

UL recognized
File No. E 63 532

CASED70



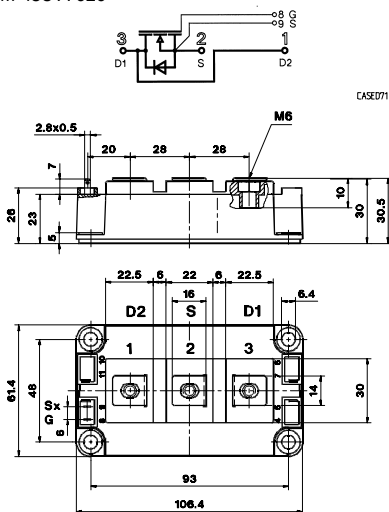
Dimensions in mm

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

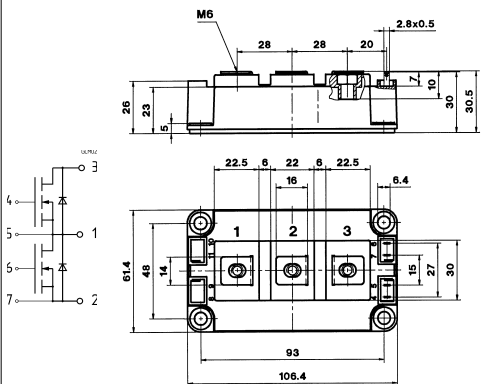
w = 325 g

SEMITRANS® 3

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

UL recognized
File No. E 63 532

CASED56



Dimensions in mm

w = 325 g