

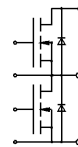
SEMITRANS® M Power MOSFET Modules 120 A, 200 V, 17 mΩ

SKM 120 B 020

Replaces discontinued SKM 224 A



SEMITRANS 2



Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- Switching kW in less than 1 μs
- Isolated copper baseplate using Al₂O₃ ceramic Direct Copper Bonding Technology (DCB)
- All electrical connections on top for easy busbaring
- Large clearances and creepage distances
- Material, clearances and creepage distances meet UL-specifications

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- 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.

Absolute Maximum Ratings		Values			Units
Symbol	Conditions ¹⁾				
V _{DS}	R _{GS} = 20 kΩ T _{case} = 25 °C T _{case} = 85 °C	200			V
V _{DGR}		200			V
I _D		120			A
I _{DM}		87			A
V _{GS}		360			A
P _D	AC, 1 min DIN 40 040 DIN IEC 68 T.1	± 20			V
T _J , T _{stg}		500			W
V _{isol}		– 55 ... +150			°C
humidity		2 500			V
climate		Class F			
		55/150/56			
Inverse Diode					
I _F = – I _D		120			A
I _{FM} = – I _{DM}		360			A
Characteristics					Units
Symbol	Conditions ¹⁾	min.	typ.	max.	
V _{(BR)DSS}	V _{GS} = 0, I _D = 0,25 mA	200	–	–	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 _{GS} = 200 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 = 120 A	–	15	17	mΩ
g _{fs}	V _{DS} = 5 V, I _D = 75 A	60	90	–	S
C _{CHC}	per MOSFET	–	–	100	pF
C _{iss}	V _{GS} = 0	–	10,4	16	nF
C _{oss}	V _{DS} = 25 V	–	2	4,5	nF
C _{rss}	f = 1 MHz	–	1	1,4	nF
L _{DS}		–	–	30	nH
t _{d(on)}	V _{DD} = 100 V	–	120	–	ns
t _r	I _D = 75 A	–	60	–	ns
t _{d(off)}	V _{GS} = 10 V	–	240	–	ns
t _f	R _{GS} = 3,3 Ω	–	40	–	ns
Inverse Diode					
V _{SD}	I _F = 240 A, V _{GS} = 0	–	1,2	1,5	V
t _{rr}	T _J = 25 °C ²⁾	–	400	–	ns
	T _J = 150 °C ²⁾	–	700	–	ns
Q _{rr}	T _J = 25 °C ²⁾	–	5,0	–	μC
	T _J = 150 °C ²⁾	–	8	–	
Thermal Characteristics					
R _{thjc}	per MOSFET	–	–	0,25	°C/W
R _{thch}	per module	–	–	0,05	°C/W
Mechanical Data					Units
M ₁	to heatsink	SI Units (M6)	4	–	5
		US Units	35	–	44
M ₂	for terminals	SI Units (M5)	2,5	–	3,5
		US Units	22	–	24
a			–	–	5x9,81
w			–	–	250
Case	→ page B 5 – 42	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

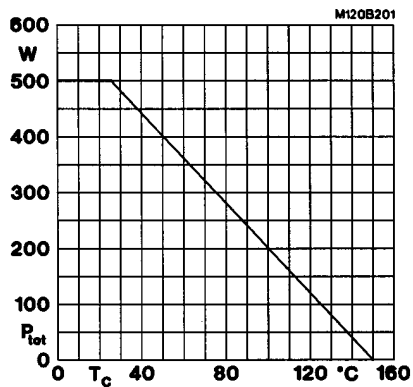


Fig. 1 Rated power dissipation vs. temperature

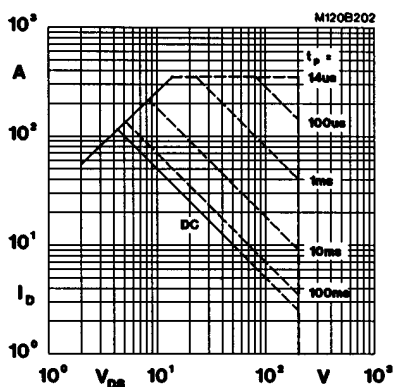


Fig. 2 Maximum safe operating area

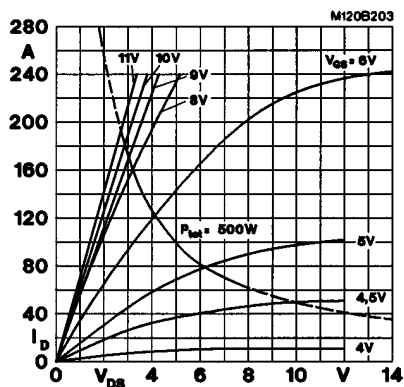


Fig. 3 Output characteristic

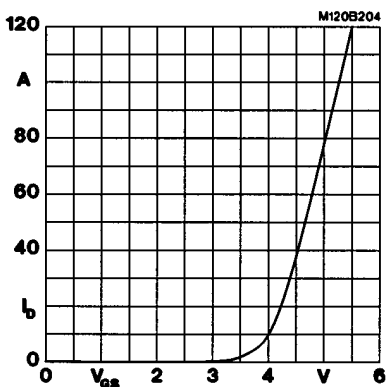


Fig. 4 Transfer characteristic

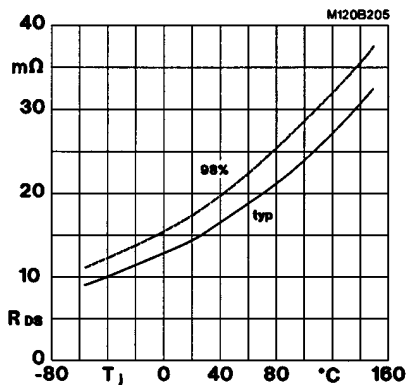


Fig. 5 On-resistance vs. temperature; $I_D = 120$ A; $V_{GS} = 10$ V

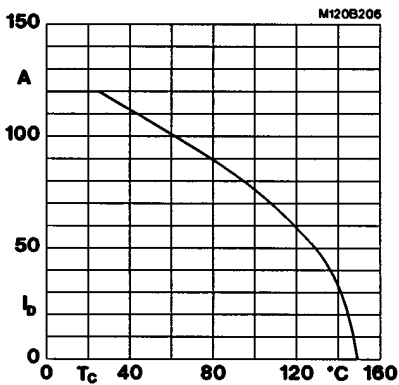


Fig. 6 Rated current vs. temperature; $V_{GS} = 10$ V

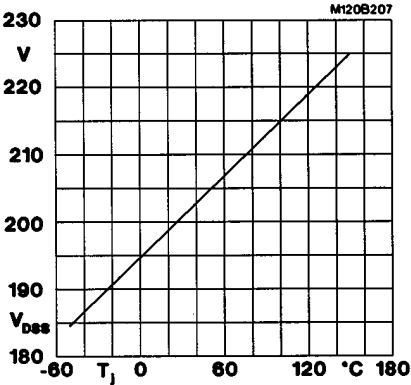


Fig. 7 Breakdown voltage vs. temperature

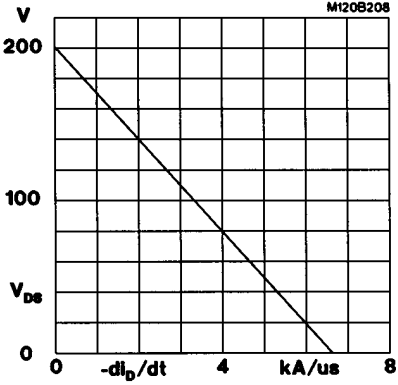


Fig. 8 Drain-source voltage derating

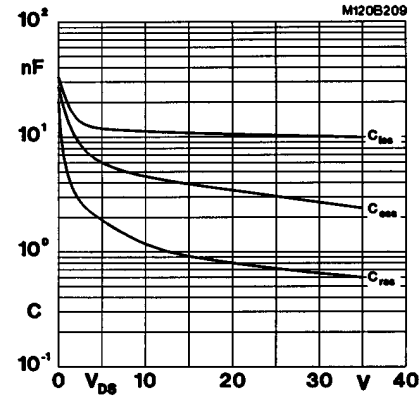


Fig. 9 Capacitances vs. drain-source voltage

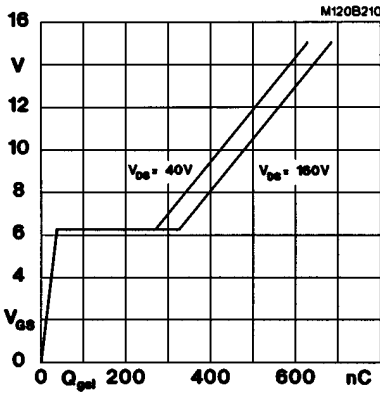


Fig. 10 Gate charge characteristic

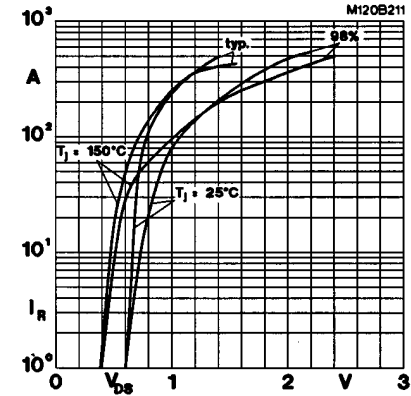


Fig. 11 Diode forward characteristic

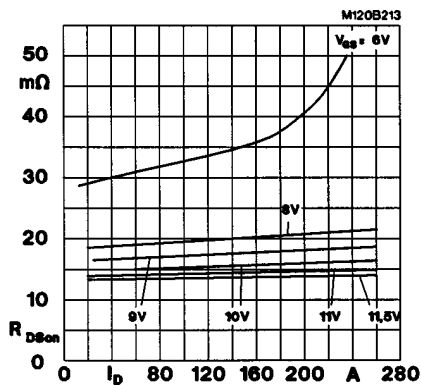


Fig. 13 On-resistance vs. drain current

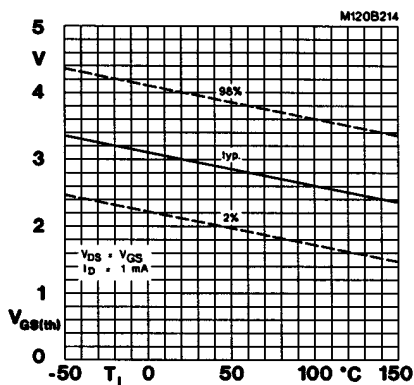


Fig. 14 Gate-source threshold voltage

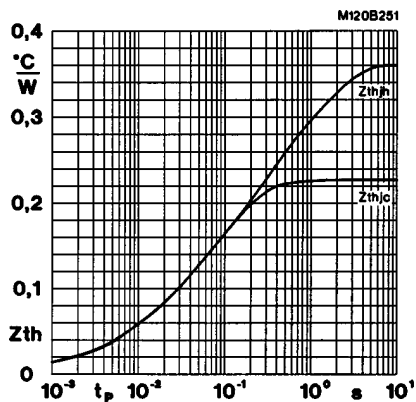


Fig. 51 Transient thermal impedance

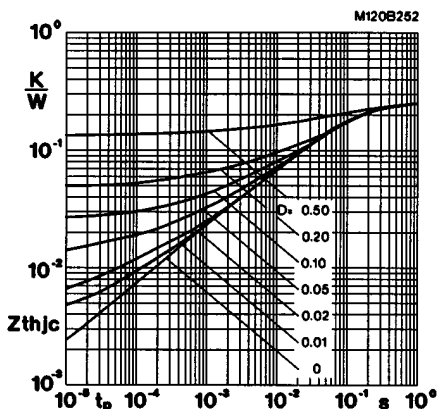
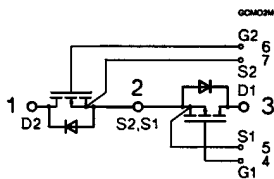


Fig. 52 Thermal impedance under pulse conditions

SEMTRANS 2

Case D 70



Dimensions in mm

