Absolute Maximum Ratings

Symbol	Conditions [1]	Values	Units
V_{DS}		200	V
V_{DGR}	R_{GS} = 20 kΩ	200	V
I_D	T_{case} = 25 °C	120	A
	T_{case} = 85 °C	87	A
I_{DM}		360	A
V_{GS}		± 20	V
P_D		500	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		120	A
I_{FM}= – I_{DM}		360	A

Characteristics

Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)DSS}$	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

M_1	to heatsink	SI Units (M6)	4	–	5	Nm
		US Units	35	–	44	lb.in.
M_2	for terminals	SI Units (M5)	2,5	–	3,5	Nm
		US Units	22	–	24	lb.in.
a			–	–	5x9,81	m/s^2
w			–	–	160	g
Case	→ page B 5 – 38			D 70		

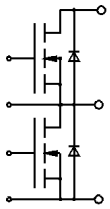
[1] T_{case} = 25 °C, unless otherwise specified.
[2] I_F = – I_D, V_R = 100 V, – di_F/dt = 100 A/µs

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
- Isolated copper baseplate using Al_2O_3 ceramic Direct Copper Bonding Technology (DCB)
- All electrical connections on top for easy busbaring
- Large clearances (10 mm) and creepage distances (20 mm)
- UL recognized, file E63 532

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.

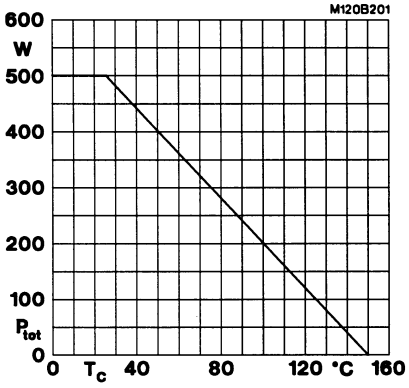


Fig. 1 Rated power dissipation vs. temperature

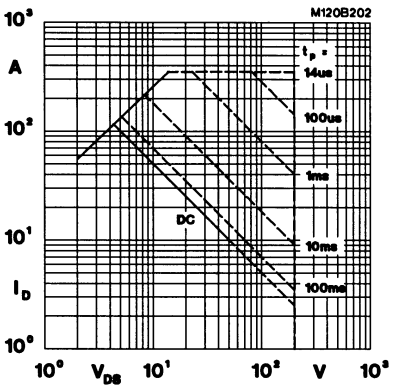


Fig. 2 Maximum safe operating area

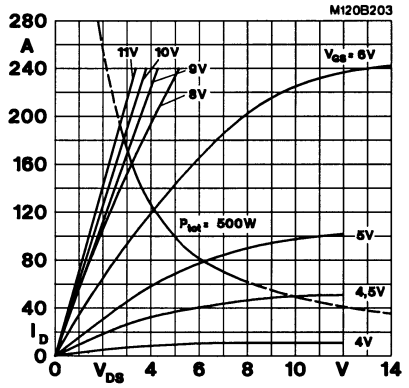


Fig. 3 Output characteristic

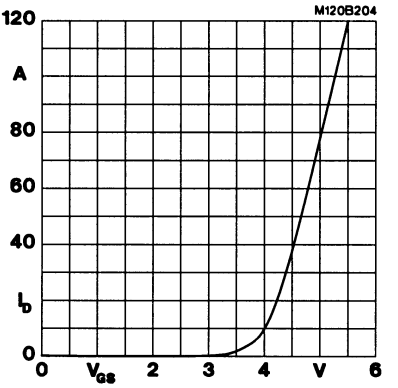


Fig. 4 Transfer characteristic

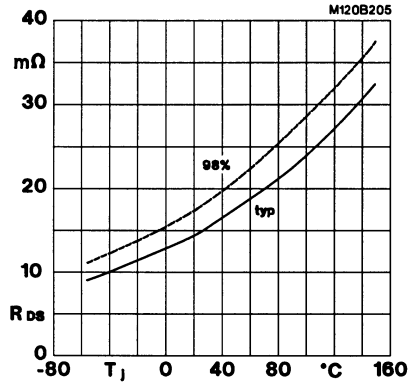


Fig. 5 On-resistance vs. temperature; I_D = 120 A; V_{GS} = 10 V

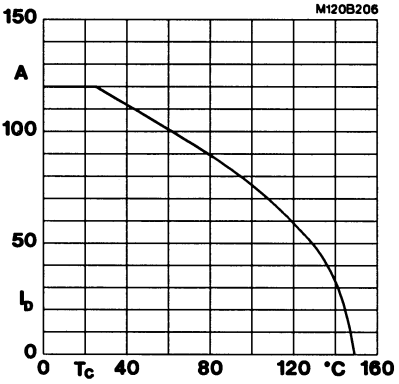


Fig. 6 Rated current vs. temperature; V_{GS} = 10 V

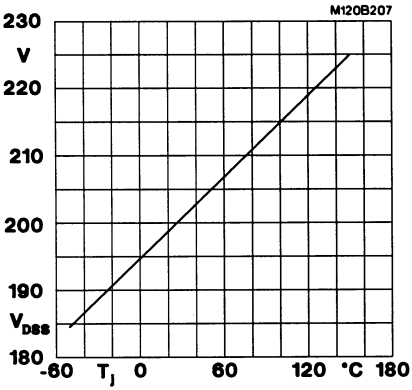


Fig. 7 Breakdown voltage vs. temperature

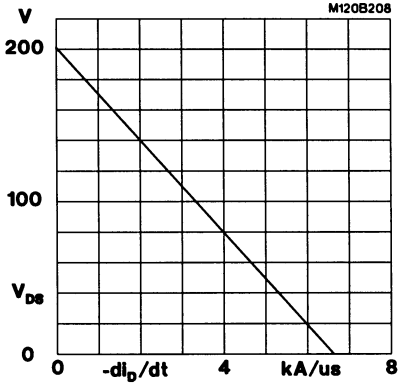


Fig. 8 Drain-source voltage derating

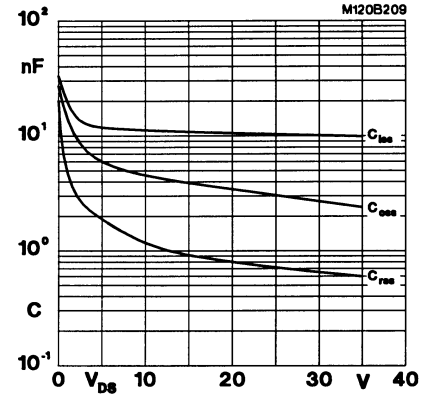


Fig. 9 Capacitances vs. drain-source voltage

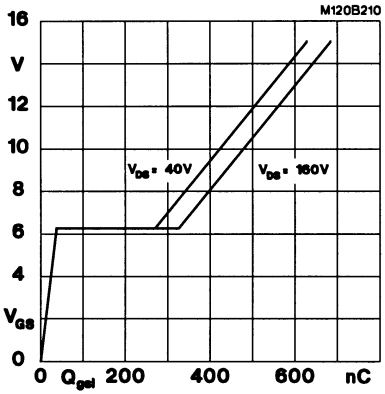


Fig. 10 Gate charge characteristic

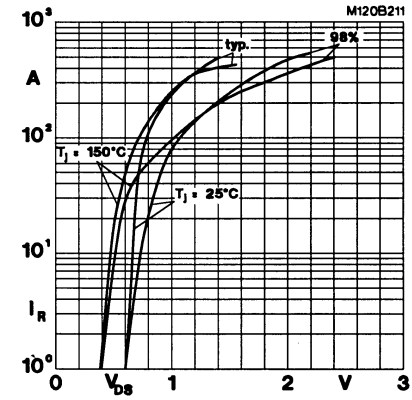


Fig. 11 Diode forward characteristic

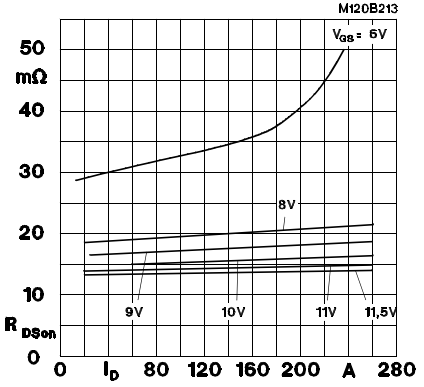


Fig. 13 On-resistance vs. drain current

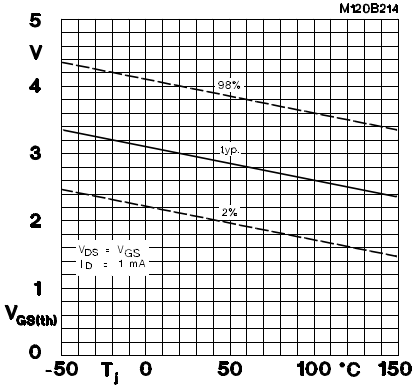


Fig. 14 Gate-source threshold voltage

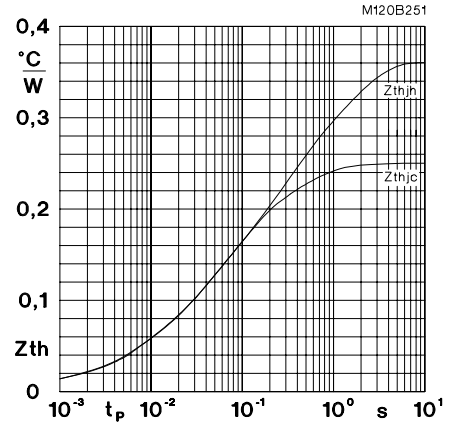


Fig. 51 Transient thermal impedance

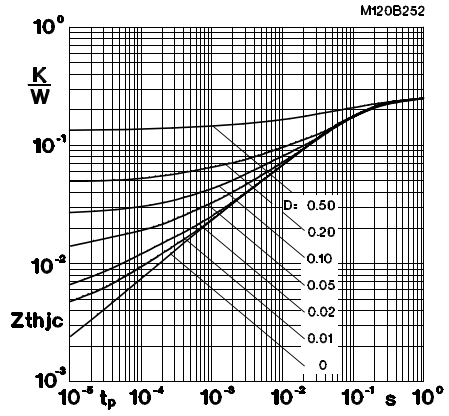


Fig. 52 Thermal impedance under pulse conditions

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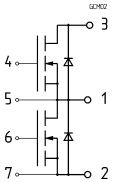
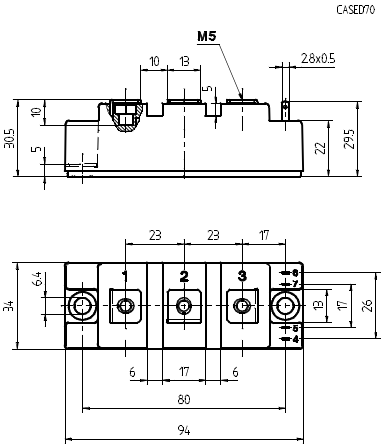
Case D 70





Dimensions in mm

