

# SKM 120B020



**SEMITRANS™ 2**

## Power MOSFET Modules

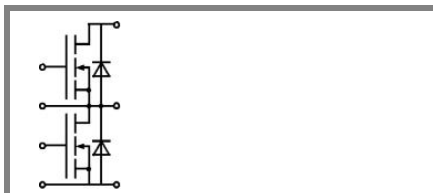
### SKM 120B020

#### Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- Isolated copper baseplate using Al<sub>2</sub>O<sub>3</sub> ceramic Direct copper bonding Technology (DCB)
- All electrical connections on top for easy busbaring
- Large clearance (10 mm) and creepage distances (13 mm)
- UL recognized, file no. E 63 532

#### Typical Applications

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



**MB**

Absolute Maximum Ratings		T <sub>c</sub> = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
V <sub>DS</sub>		200	V
I <sub>D</sub>	T <sub>s</sub> = 25 (85) °C	120 (87)	A
I <sub>DM</sub>	1 ms	360	A
V <sub>GS</sub>		± 20	V
T <sub>vj</sub> (T <sub>stg</sub> )		- 40 ... + 150 (125)	°C
V <sub>isol</sub>	AC, 1 min.	2500	V
Inverse diode			
I <sub>F</sub> = - I <sub>S</sub>		120	A
I <sub>FM</sub> = - I <sub>SM</sub>		360	A

Characteristics		T <sub>c</sub> = 25 °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 0,25 mA	200			V
V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 1 mA	2,1	3	4	V
I <sub>DSS</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 200 V, T <sub>j</sub> = 25 (125) °C		50 (300)	250 (1000)	µA
I <sub>GSS</sub>	V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V		10	100	nA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 200 A		15	17	mΩ
g <sub>fs</sub>	V <sub>DS</sub> = 25 V, I <sub>D</sub> = 200 A	60	90		S
C <sub>CHC</sub>	V <sub>GS</sub> = 0, V <sub>DS</sub> = 25 V, f = 1 MHz			100	pF
C <sub>iss</sub>			10,4	16	nF
C <sub>oss</sub>			2	4,5	nF
C <sub>rss</sub>			1	1,4	nF
L <sub>DS</sub>				30	nH
t <sub>d(on)</sub>	V <sub>DD</sub> = 100 V, I <sub>D</sub> = 75 A,		120		ns
t <sub>r</sub>	V <sub>GS</sub> = 10 V, R <sub>G</sub> = 3,3 Ω		60		ns
t <sub>d(off)</sub>			240		ns
t <sub>f</sub>			40		ns
Inverse diode					
V <sub>SD</sub>	I <sub>F</sub> = 240 A; V <sub>GS</sub> = 0 V		1,2	1,5	V
t <sub>rr</sub>	T <sub>j</sub> = 25 (150) °C		400 (700)		ns
Q <sub>rr</sub>	T <sub>j</sub> = 25 °C		5		µC
I <sub>rr</sub>	T <sub>j</sub> = 150 °C		8		A
Thermal characteristics					
R <sub>th(j-c)</sub>	per MOSFET			0,25	K/W
R <sub>th(c-s)</sub>	M <sub>s</sub> , surface µm, per module			0,05	K/W
Mechanical data					
M <sub>s</sub>	to heatsink (M6)	4		5	Nm
M <sub>t</sub>	for terminals (M5)	2,5		3,5	Nm
w				160	g

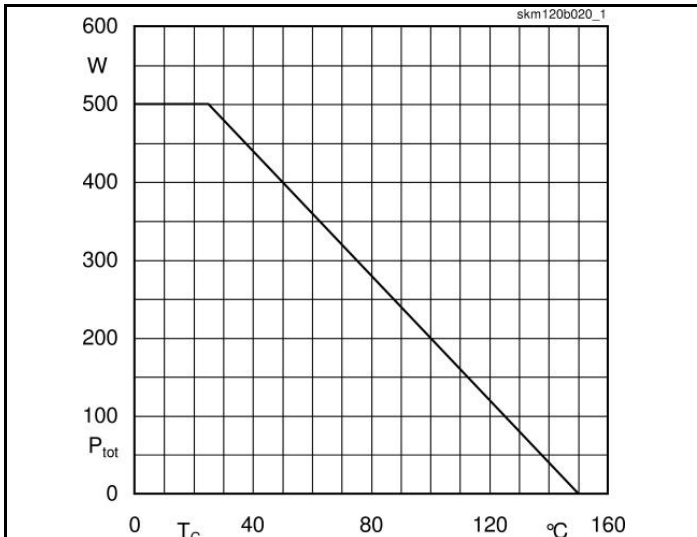


Fig. 1 Rated power dissipation vs. temperature

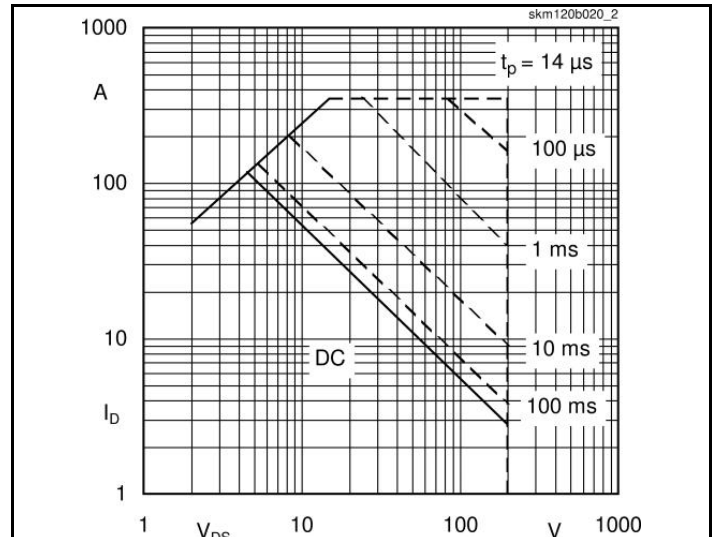


Fig. 2 Maximum safe operating area

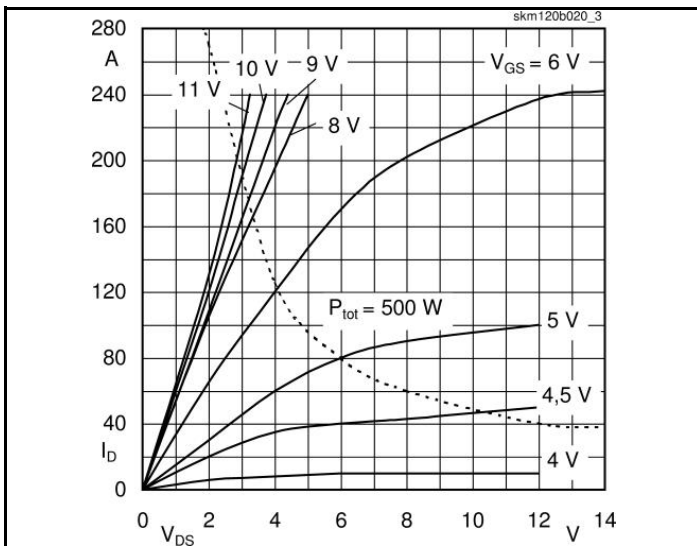


Fig. 3 Output characteristic

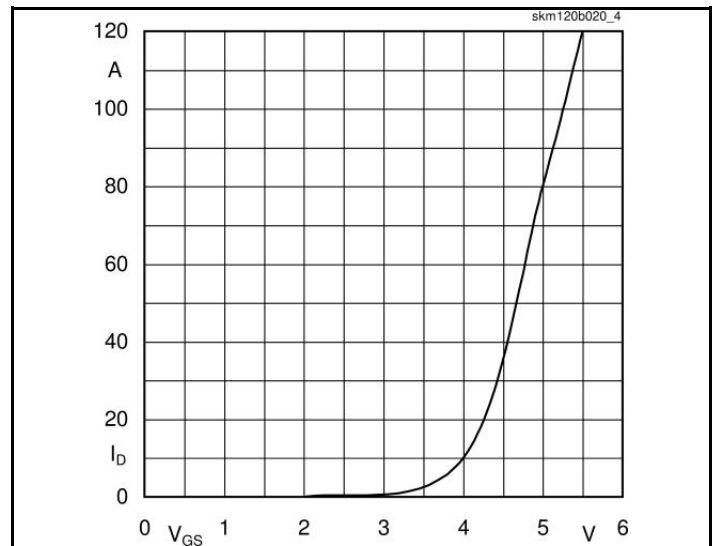


Fig. 4 Transfer characteristic

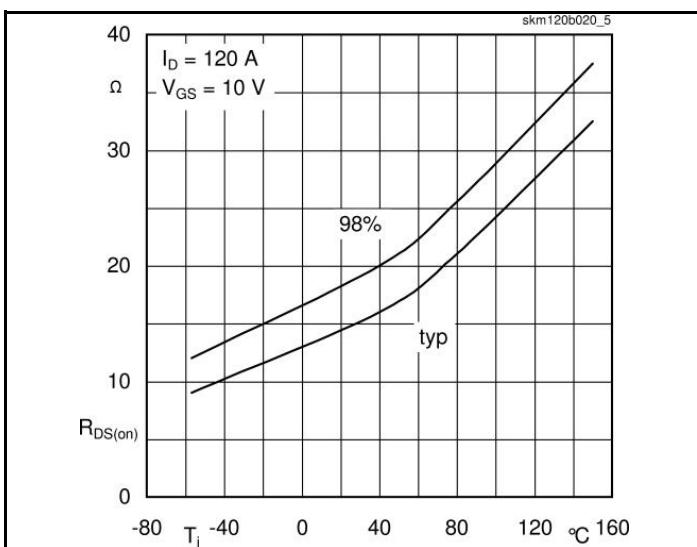


Fig. 5 On-resistance vs. temperature

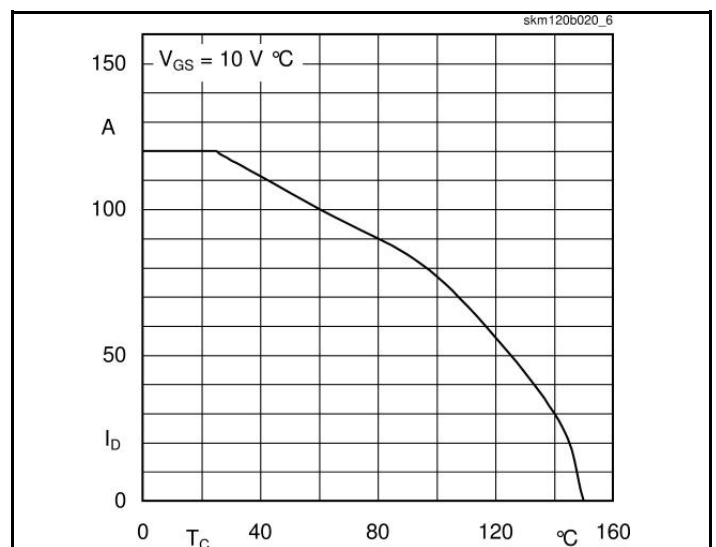


Fig. 6 Rated current vs. temperature

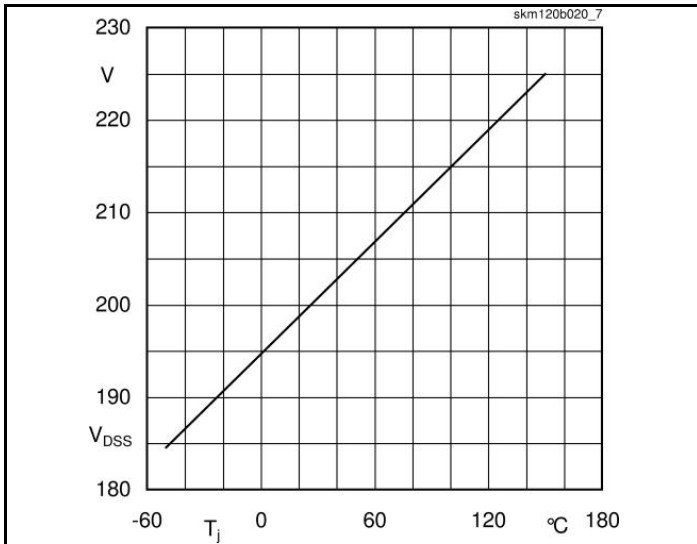


Fig. 7 Breakdown voltage vs. temperature

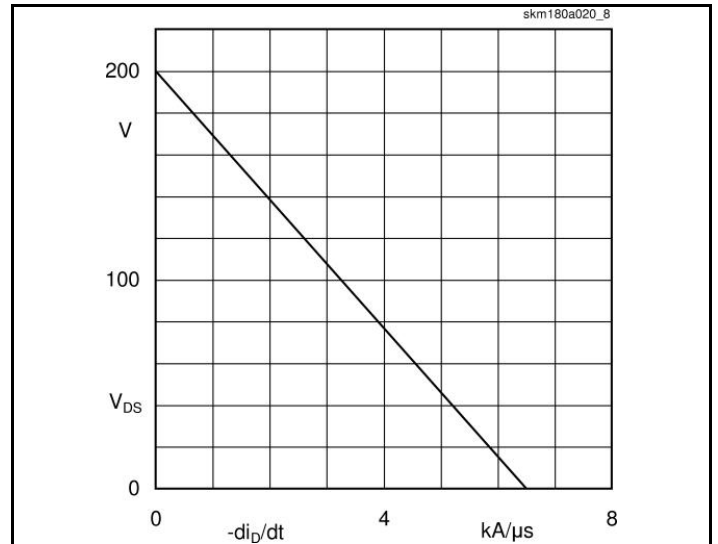


Fig. 8 Drain-source voltage derating

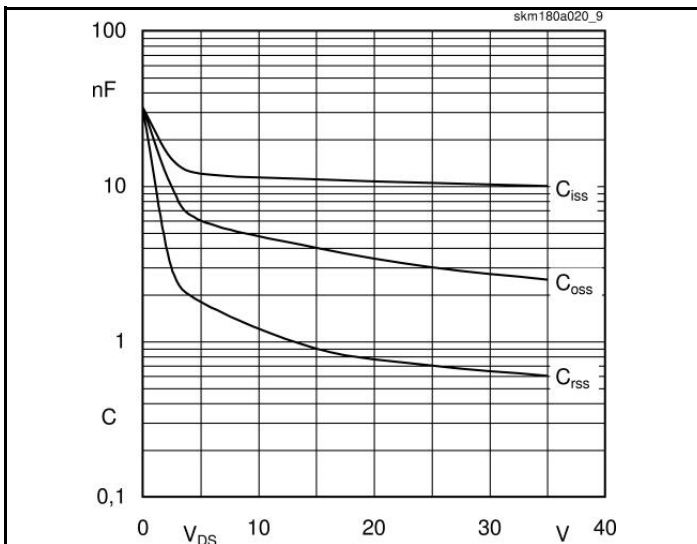


Fig. 9 Capacitances vs. drain-source voltage

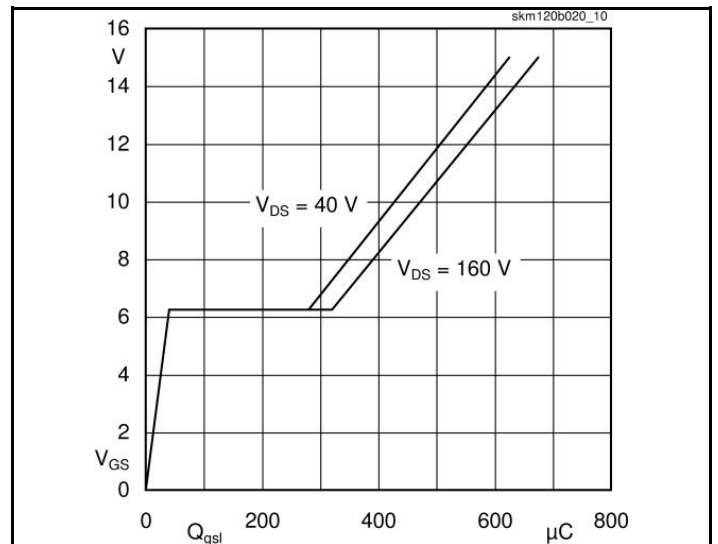


Fig. 10 Gate charge characteristic

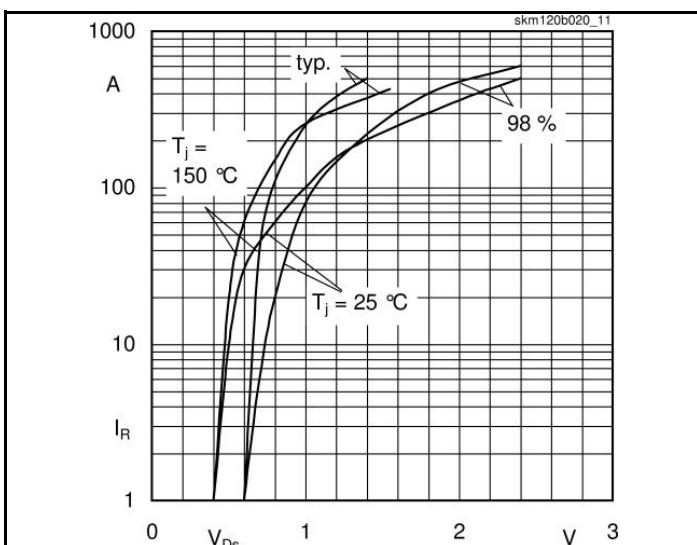


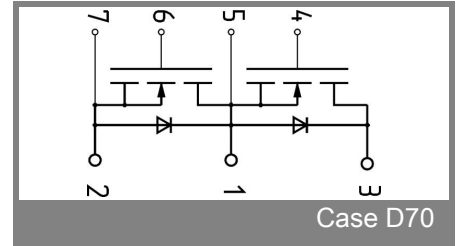
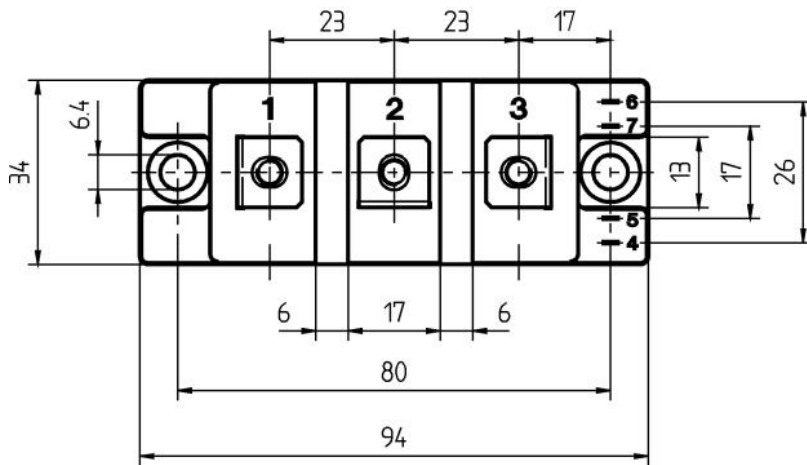
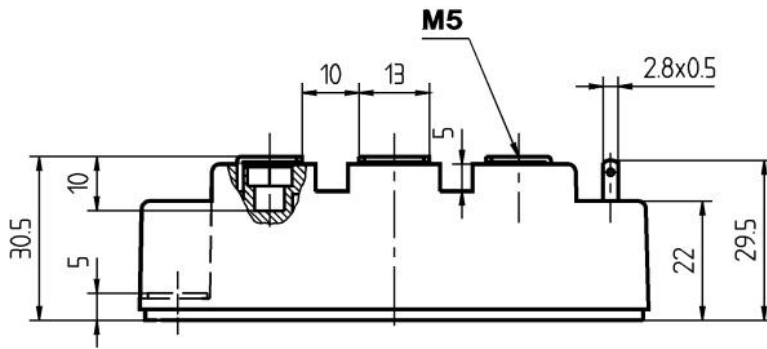
Fig. 11 Diode forward characteristic

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UL Recognized  
File no. E 63 532

Dimensions in mm

CASED70



Case D70

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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