Absolute Maximum Ratings		Values	Units
Symbol	**Conditions** [1]		
V_{DS}		200	V
V_{DGR}	R_{GE} = 20 kΩ	200	V
I_D	T_{case} = 25 °C	250	A
	T_{case} = 100 °C	150	A
I_{DM}	1 ms	750	A
V_{GS}		± 20	V
P_D		1000	W
T_j, (T_{stg})		–40 ... +150 (125)	°C
V_{isol}	AC, 1 min., 200 µA	2 500	V
humidity	DIN 40 040	Class F	
climate	DIN IEC 68 T.1	40/125/56	
Inverse Diode			
$I_F = -I_D$		250	A
$I_{FM} = -I_{DM}$	10 µs	1000	A

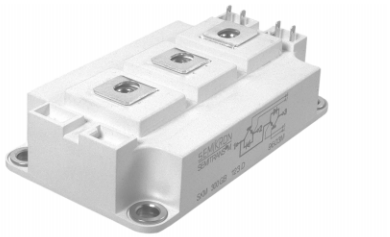
Characteristics					
Symbol	**Conditions** [1]	**min.**	**typ.**	**max.**	**Units**
$V_{(BR)DSS}$	V_{GS} = 0, I_D = 0,5 mA	200	–	–	V
$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 1 mA	2,1	3,0	4,0	V
I_{DSS}	V_{GS} = 0, T_j = 25 °C	–	–	125	µA
	V_{DS} = 200 V, T_j = 125 °C	–	–	1250	µA
I_{GSS} [3]	V_{GS} = 20 V, V_{DS} = 0	–	–	100	nA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 150 A	–	8	8,6	mΩ
g_{fs}	V_{DS} = 25 V, I_D = 150 A	–	200	–	S
C_{CHC}		–	–	700	pF
C_{iss}	V_{GS} = 0	–	34	39	nF
C_{oss}	V_{DS} = 25 V	–	6,5	7,5	nF
C_{rss}	f = 1 MHz	–	2,5	3,5	nF
L_{DS}		–	–	20	nH
$t_{d(on)}$	V_{DD} = 30 V	–	100	–	ns
t_r	I_D = 150 A	–	100	–	ns
$t_{d(off)}$	V_{GS} = ± 10 V	–	700	–	ns
t_f	R_G = 4,7 Ω	–	250	–	ns
Inverse Diode [8]					
V_{SD}	I_F = 250 A, V_{GS} = 0 V	–	–	1,5	V
t_{rr}	T_j = 25 °C [3]	–	160	–	ns
	T_j = 150 °C [3]	–	–	–	ns
Q_{rr}	T_j = 25 °C [3]	–	12	–	µC
I_{RR}	T_j = 150 °C [3]	–	–	–	A
Thermal characteristics					
R_{thjc}	per MOSFET	–	–	0,12	°C/W
R_{thch}	M_1, surface 10 µm, per module	–	–	0,038	°C/W

Mechanical Data						
M_1	to heatsink, SI Units	(M6)	3	–	5	Nm
	to heatsink, US Units		27	–	44	lb.in.
M_2	for terminals, SI Units	(M6)	2,5	–	5	Nm
	for terminals, US Units		22	–	44	lb.in.
a			–	–	5x9,81	m/s^2
w			–	–	325	g
Case	→ B 5 – 42				D 56	

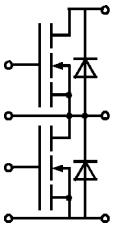
[1] T_{case} = 25 °C, unless otherwise specified
[3] I_F = 250 A, V_R = 100 V, $-di_F/dt$ = 100 A/µs

SEMITRANS® M
Power MOSFET Modules
250 A, 200 V, 8,6 mΩ

SKM 253 B 020



SEMITRANS M3



Features

- N Channel, enhancement mode
- Short internal connections and low inductance case avoid oscillations
- Isolated copper baseplate using Al_2O_3 ceramic Direct Copper Bonding Technology (DCB)
- All electrical connections on top for easy busbaring
- Large clearance (13 mm) and creepage distances (20 mm)
- UL recognized, file no. E63 532

Typical Applications

- 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.

Suitable mounting hardware:
Ident No. 33321100
(for 10 SEMITRANS 3)
Screws → B 6 – 4

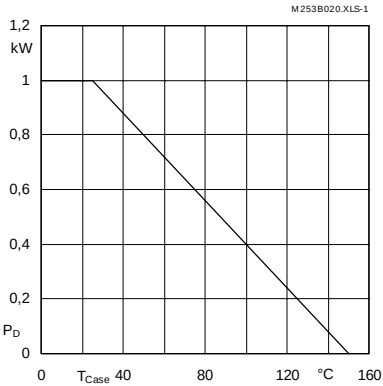


Fig. 1 Rated power dissipation vs. temperature

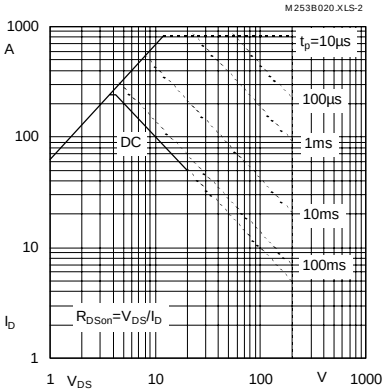


Fig. 2 Maximum safe operating area, single pulse

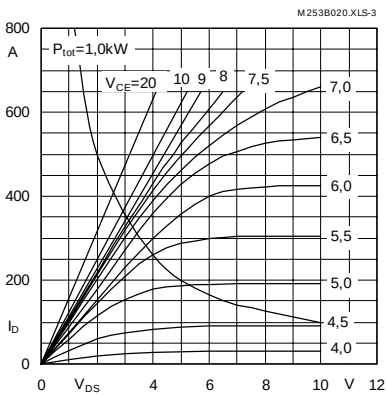


Fig. 3 Output characteristic, t_p = 80 µs, T_j = 25 °C

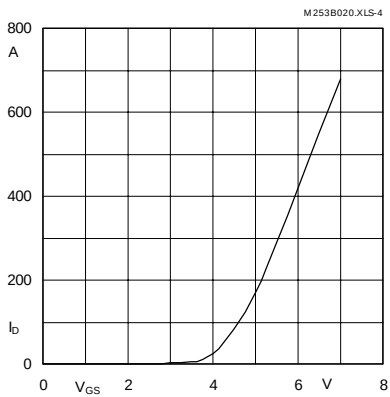


Fig. 4 Transfer characteristic, t_p = 80 µs, V_{DS} = 25 V

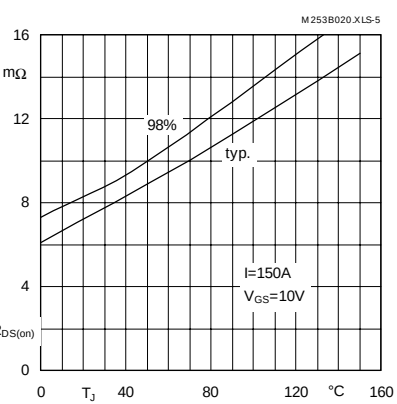


Fig. 5 On-resistance vs. temperature

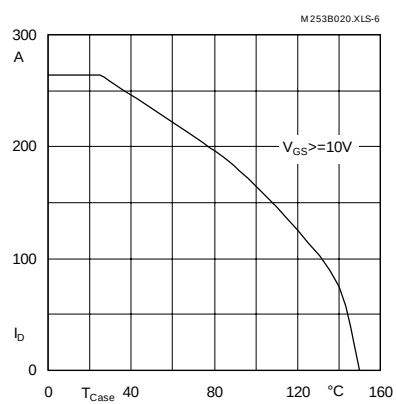


Fig. 6 Rated current vs. temperature

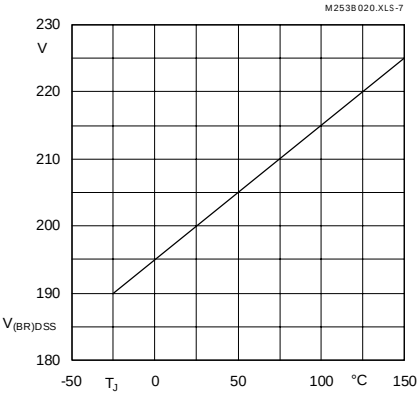


Fig. 7 Breakdown voltage vs. temperature

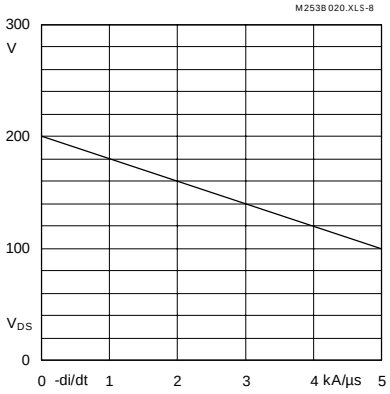


Fig. 8 Drain-source voltage derating (L_{DS})

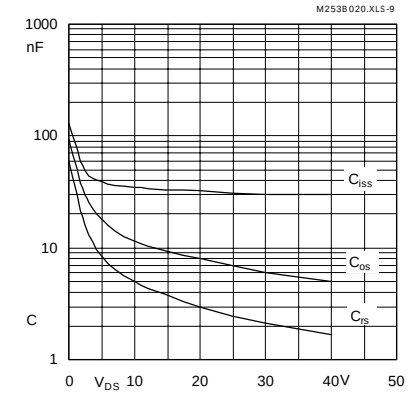


Fig. 9 Typ. capacitances vs. drain-source voltage

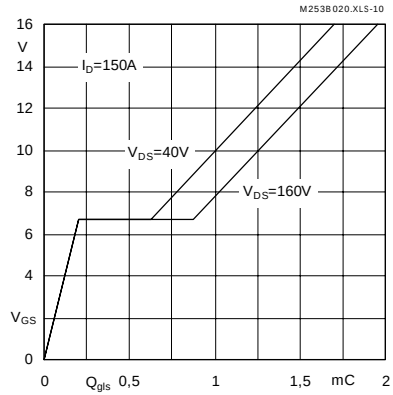


Fig. 10 Gate charge characteristic, I_{Dp} = 250 A

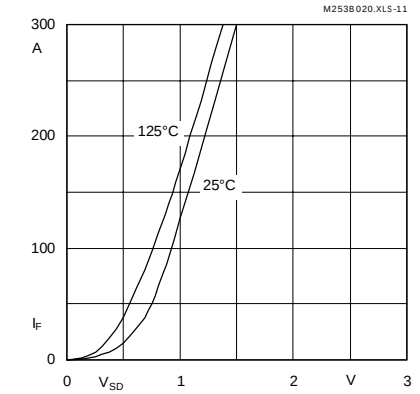


Fig. 11 Diode forward characteristic, t_p = 80 µs

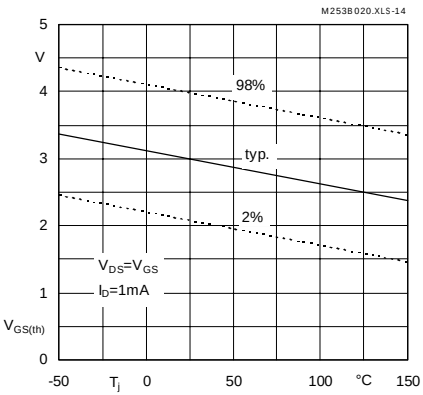


Fig. 14 Gate-source threshold voltage

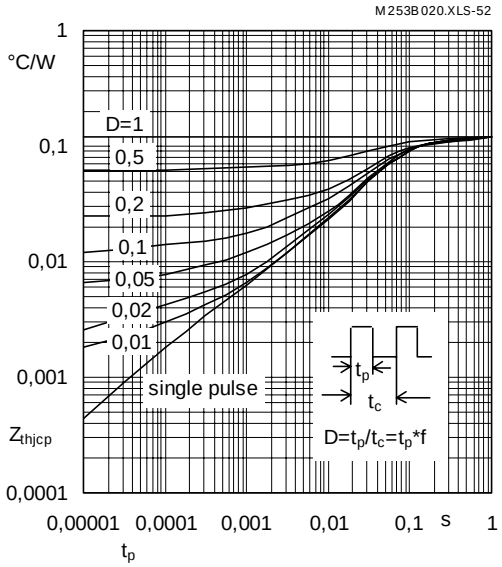


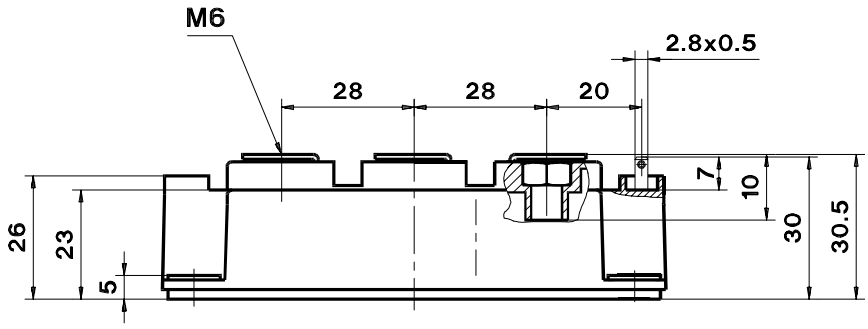
Fig. 52 Thermal impedance under pulse conditions

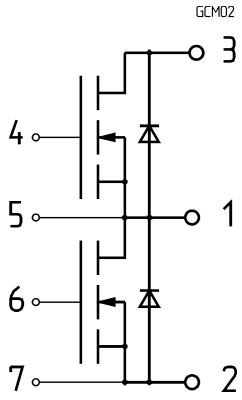
SEMITRANS M 3

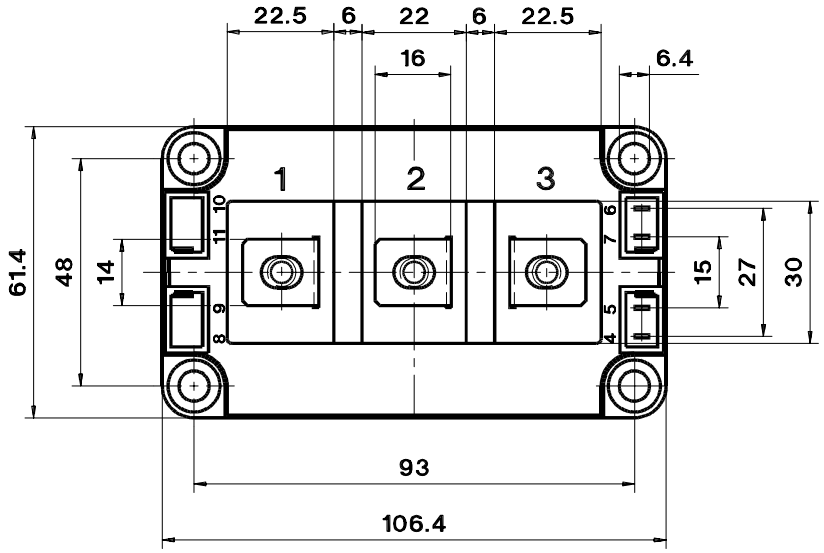
Case D 56

SKM 253 B 020

CASED56







Dimensions in mm

