Absolute Maximum Ratings		Values	
Symbol	Conditions [1]		Units
V_{DS}		100	V
V_{DGR}	R_{GE} = 20 kΩ	100	V
I_D	T_{case} = 25 °C / 80 °C	400 / 300	A
	T_{case} = 100 °C	250	A
I_{DM}	1 ms	1140	A
V_{GS}		± 20	V
P_D		1040	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			
$I_F = –I_D$		380	A
$I_{FM} = –I_{DM}$	10 µs	1140	A

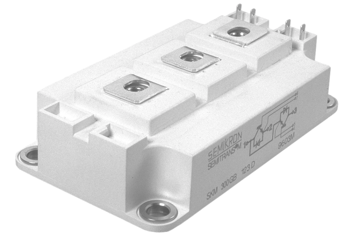
Characteristics					
Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)DSS}$	V_{GS} = 0, I_D = 0,5 mA	100	–	–	V
$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 5 mA	2,1	3,0	4,0	V
I_{DSS}	V_{GS} = 0, V_{DS} = 100 V; T_j = 25 °C	–	–	100	µA
	V_{GS} = 0, V_{DS} = 100 V; T_j = 125 °C	–	–	1000	µA
I_{GSS}[3]	V_{GS} = 20 V, V_{DS} = 0	–	–	100	nA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 300 A	–	3	3,5	mΩ
g_{fs}	V_{DS} = 25 V, I_D = 300 A	150	200	–	S
C_{CHC}		–	–	700	pF
C_{iss}	V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	–	24	32	nF
C_{oss}		–	7,3	11	nF
C_{rss}		–	4,3	6,5	nF
L_{DS}		–	–	20	nH
$t_{d(on)}$	V_{DD} = 30 V, I_D = 250 A, V_{GS} = ± 10 V, R_G = 4,7 Ω	–	100	–	ns
t_r		–	100	–	ns
$t_{d(off)}$		–	700	–	ns
t_f		–	250	–	ns
Inverse Diode					
V_{SD}	I_F = 300 A, V_{GS} = 0 V	–	1,2	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]	–	10	–	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 – 46			D 56	

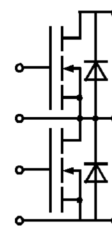
[1] T_{case} = 25 °C, unless otherwise specified
[3] I_F = 300 A, V_R = 100 V, $–di_F/dt$ = 100 A/µs

SEMITRANS® M Power MOSFET Modules 300 A, 100 V, 3,5 mΩ

SKM 313 B 010



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
- Battery vehicles
- 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

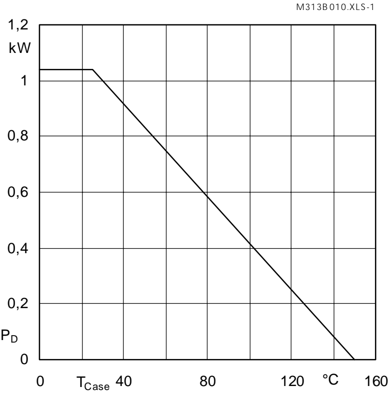


Fig. 1 Rated power dissipation vs. temperature

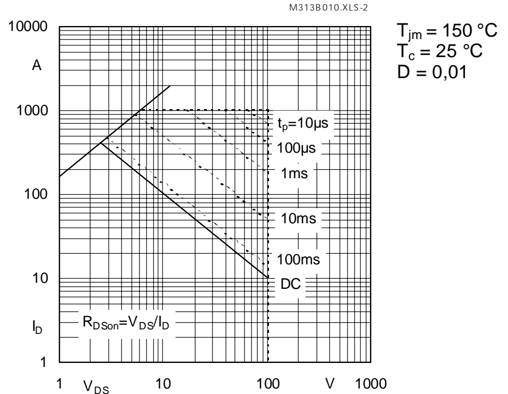


Fig. 2 Maximum safe operating area, single pulse

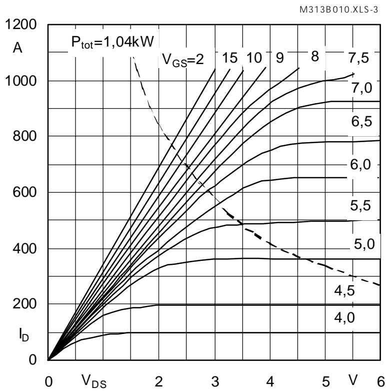


Fig. 3 Output characteristic, t_p = 80 µs, T_j = 25 °C

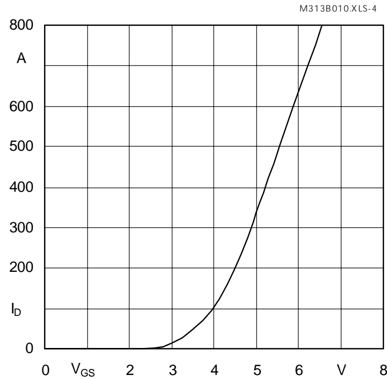


Fig. 4 Transfer characteristic, t_p = 80 µs, V_{DS} = 25 V

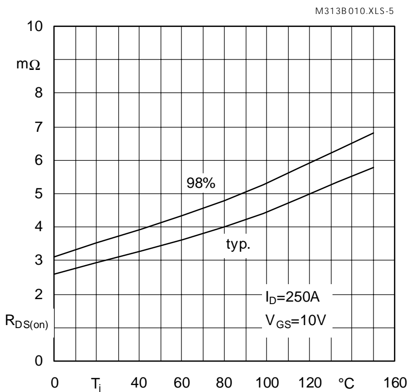


Fig. 5 On-resistance vs. temperature

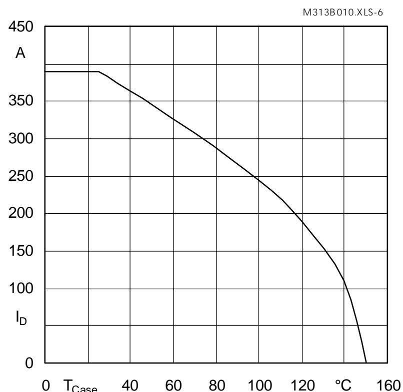


Fig. 6 Rated current vs. temperature

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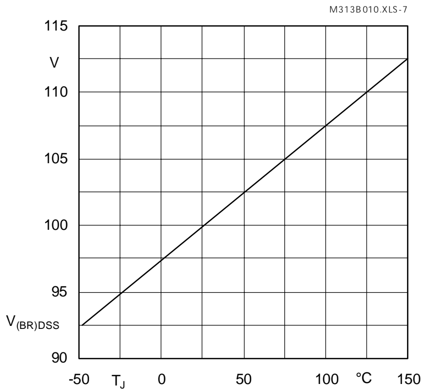

Fig. 7 Breakdown voltage vs. temperature

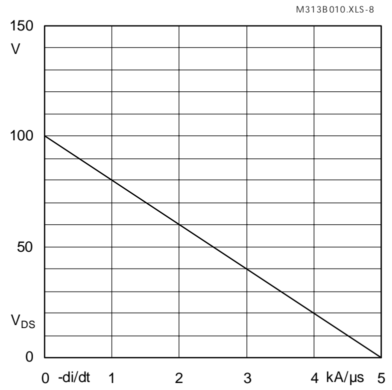

Fig. 8 Drain-source voltage derating (L_{DS})

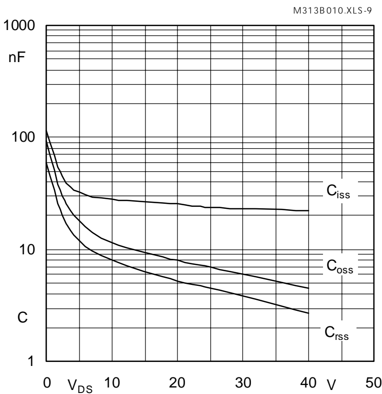

Fig. 9 Typ. capacitances vs. drain-source voltage

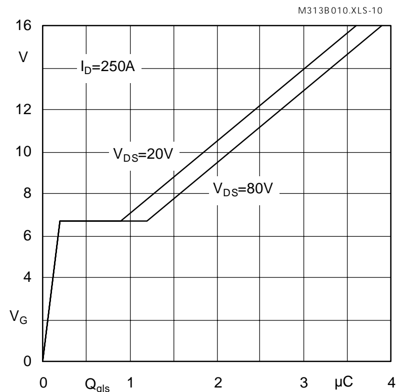

Fig. 10 Gate charge characteristic, I_{Dp} = 250 A

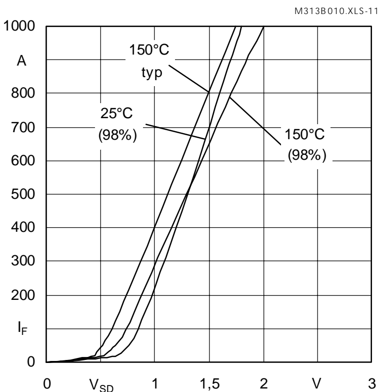

Fig. 11 Typ. Diode forward characteristic, t_p = 80 µs

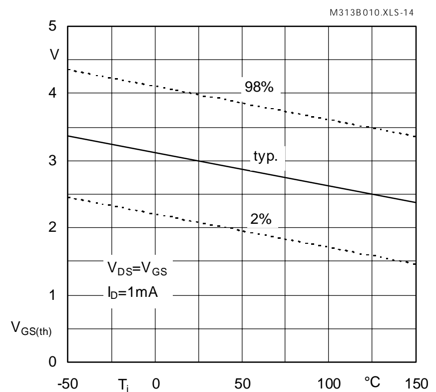

Fig. 14 Gate-source threshold voltage

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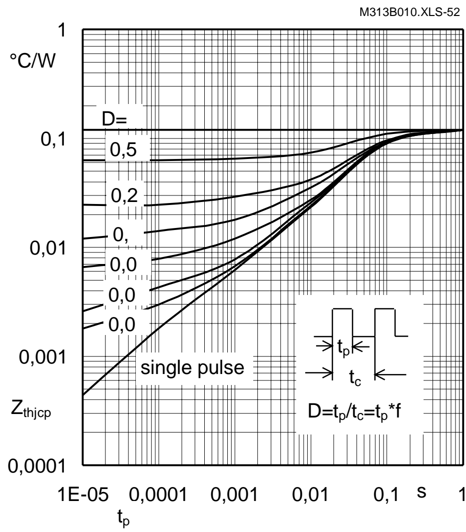


Fig. 52 Thermal impedance under pulse conditions

SEMITRANS M 3

Case D 56

SKM 313 B 010

GCM02

3

4

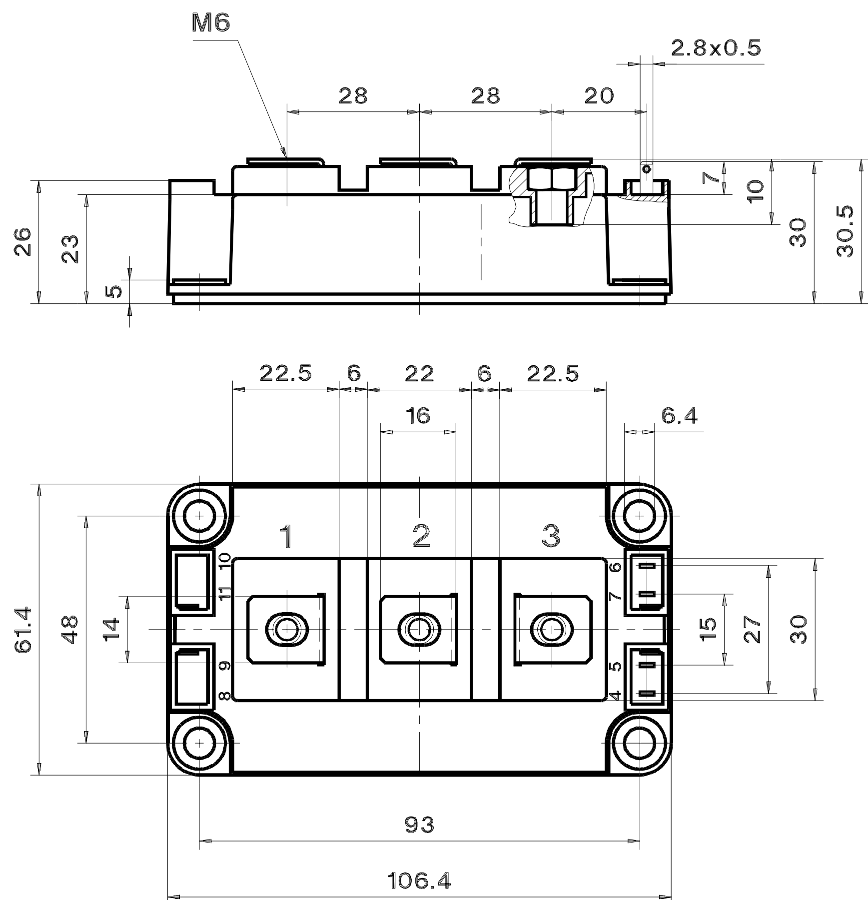
5

1

6

7

2



Dimensions in mm

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