SEMIKRON

Absolute Maximum Ratings		Values	
Symbol	Conditions [1]		Units
V_{DS}		800	V
V_{DGR}	R_{GE} = 20 kΩ	800	V
I_D		36	A
I_{DM}		144	A
V_{GS}		± 20	V
P_D		700	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			
$I_F = –I_D$		36	A
$I_{FM} = –I_{DM}$		144	A

Characteristics					
Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)DSS}$	V_{GS} = 0, I_D = 0,25 mA	800	–	–	V
$V_{GS(th)}$	$V_{GS} = V_{DS}$, I_D = 1 mA	2,1	3,0	4,0	V
I_{DSS}	V_{GS} = 0, V_{DS} = 800 V; T_j = 25 °C	–	50	100	µA
	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 = 23 A	–	170	210	mΩ
g_{fs}	V_{DS} = 10 V, I_D = 23 A	16	33	–	S
C_{CHC}		–	–	160	pF
C_{iss}	V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	–	10	14	nF
C_{oss}		–	1,2	1,7	nF
C_{rss}		–	0,6	0,8	nF
L_{DS}		–	–	20	nH
$t_{d(on)}$	V_{DD} = 400 V, I_D = 23 A, V_{GS} = 10 V, R_G = 4,7 Ω (SKM 181A3R: 3,3 Ω)	–	60	–	ns
t_r		–	30	–	ns
$t_{d(off)}$		–	350	–	ns
t_f		–	70	–	ns
Inverse Diode [8]					
V_{SD}	I_F = 72 A, V_{GS} = 0 V	–	0,9	1,2	V
t_{rr}	T_j = 25 °C [2]	–	1200	–	ns
	T_j = 150 °C [2]	–	–	–	ns
Q_{rr}	T_j = 25 °C [2]	–	42	–	µC
	T_j = 150 °C [2]	–		–	µC
Thermal characteristics					
R_{thjc}		–	–	0,18	°C/W
R_{thch}	M_1, surface 10 µm	–	–	0,05	°C/W

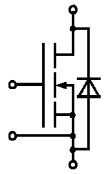
Mechanical Data					
M_1	to heatsink, SI Units	4	–	5	Nm
	to heatsink, US Units	35	–	44	lb.in.
M_2	for terminals, SI Units	2,5	–	3,5	Nm
	for terminals, US Units	22	–	24	lb.in.
a		–	–	5x9,81	m/s^2
w		–	–	130	g
Case	→ B 5 – 25		D15		

[1] T_{case} = 25 °C, unless otherwise specified
[2] $I_F = – I_D$, V_R = 100 V, $–di_F/dt$ = 100 A/µs
[3] SKM 181 A 3 (with standard recovery body drain diode) can replace old SKM 181 F (with fast recovery body drain diode) only in DC-choppers and resonant inverters which do not use the fast recovery feature i. e. f_{sw} > f resonant, but not for $f_{sw} < f_r$ and not for PWM-inverters. In doubt please ask SEMIKRON.

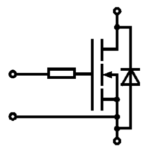
SEMITRANS® M Power MOSFET Modules

SKM 181 A3 [3]
SKM 181 A3R *)

SEMITRANS M1



SKM 181 A3



SKM 181 A3R *)

Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- DCB-ceramic isolated copper baseplate
- All electrical connections on top for easy busbaring
- Large clearance (10 mm) and creepage distances (13 mm)
- UL recognized, file no. E63 532

Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- Resonant and welding inverters
- AC motor drives
- Laser power supplies
- UPS equipment
- Plasma cutting
- Not suitable for linear amplification

*) SKM 181 A3R has built-in gate resistor chips ("R") $R_{ginternal}$ = 1,3Ω, preferred typed for paralleling and for lower switching frequencies

This is an electrostatic discharge sensitive device (ESDS). Please observe the international standard IEC 747-1, Chapter IX.

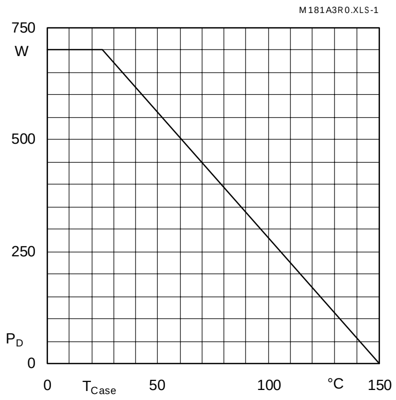


Fig. 1 Rated power dissipation vs. temperature

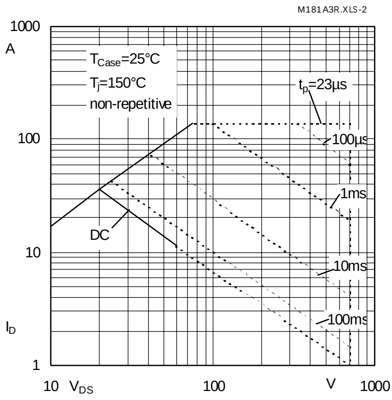


Fig. 2 Maximum safe operating area

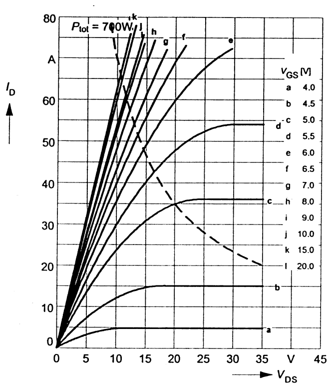


Fig. 3 Output characteristic

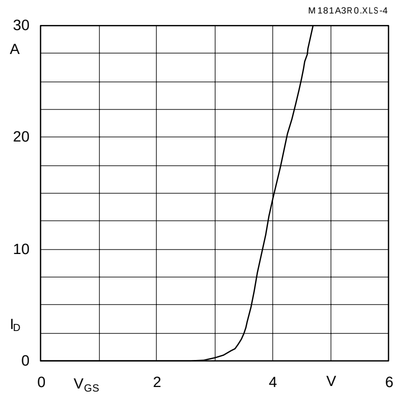


Fig. 4 Transfer characteristic

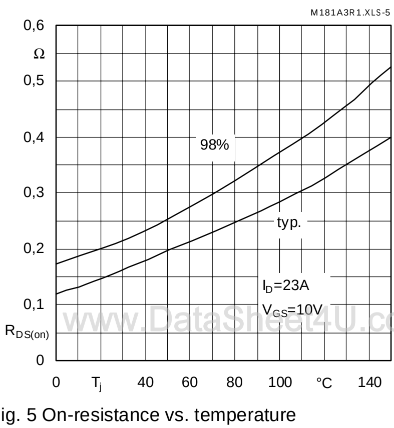


Fig. 5 On-resistance vs. temperature

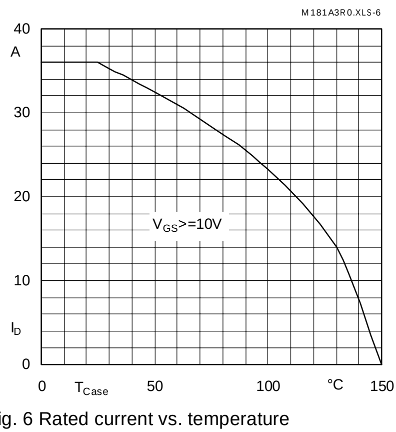


Fig. 6 Rated current vs. temperature

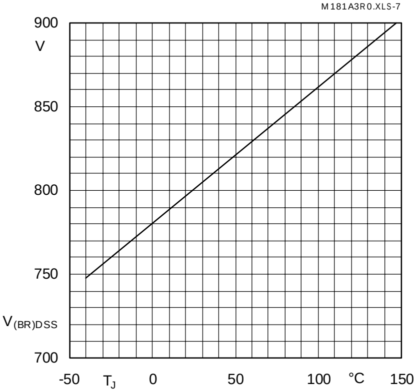


Fig. 7 Breakdown voltage vs. temperature

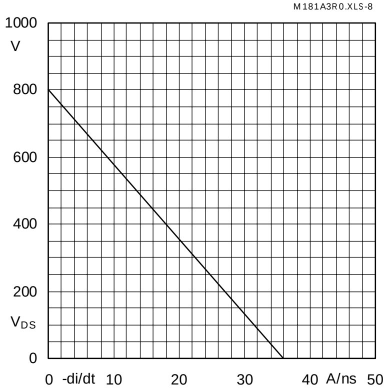


Fig. 8 Drain-source voltage derating

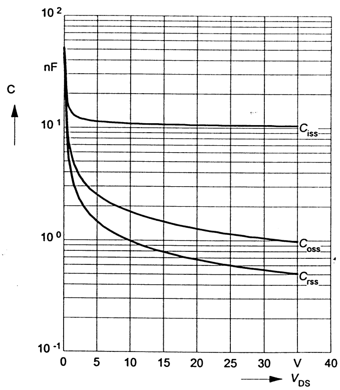


Fig. 9 Typ. capacitances vs. drain-source voltage

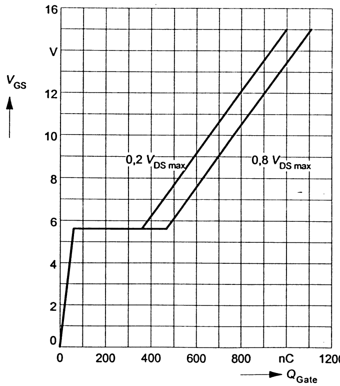


Fig. 10 Gate charge characteristic

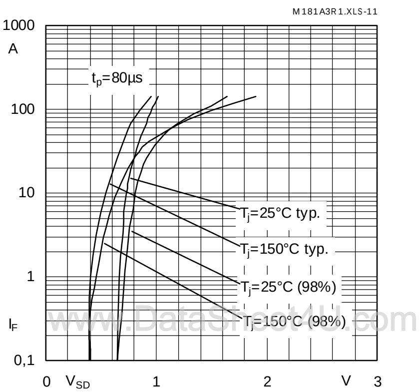


Fig. 11 Diode forward characteristic

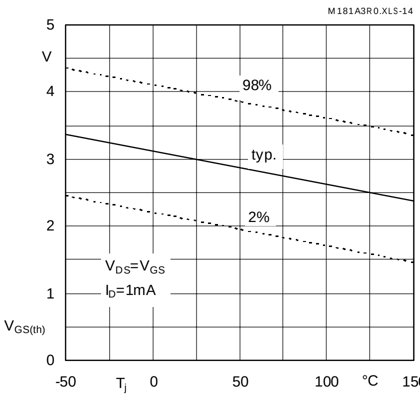


Fig. 14 Gate-source threshold voltage

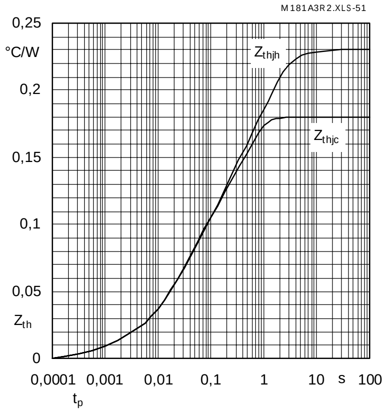


Fig. 51 Transient thermal impedance

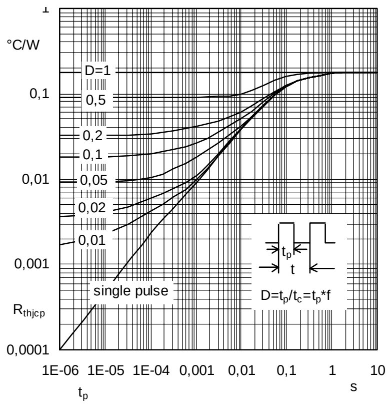


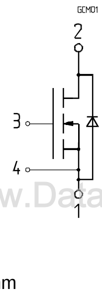
Fig. 52 Thermal impedance under pulse conditions

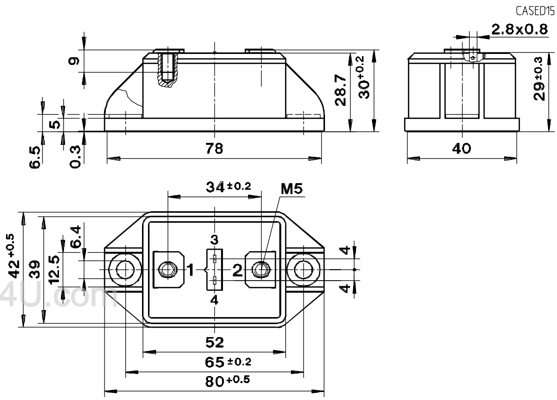
SEMITRANS M 1

Case D 15

SKM 181A3

SKM 181 A3R





Dimensions in mm