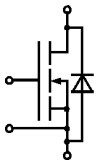
SEMIKRON

SEMITRANS® M
Power MOSFET Modules

SKM 151 A4R

Preliminary Data

SEMITRANS M1



Absolute Maximum Ratings		Values	
Symbol	**Conditions** [1]		**Units**
V_{DS}		500	V
V_{DGR}	R_{GE} = 20 kΩ	500	V
I_D	T_c = 25 / 80 °C	70 / 50	A
I_{DM}	T_c = 25 / 80 °C	280 / 200	A
V_{GS}		± 20	V
P_D		780	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			
$I_F = -I_D$	T_c = 25 / 80°C	70 / 50	A
$I_{FM} = -I_{DM}$	T_c = 25 / 80°C	280 / 200	A

Characteristics					
Symbol	**Conditions** [1]	**min.**	**typ.**	**max.**	**Units**
$V_{(BR)DSS}$	V_{GS} = 0, I_D = 0,25 mA	500	–	–	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	–	1	250	µA
	V_{DS} = 500 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 = 50 A	–	50	70	mΩ
g_{fs}	V_{DS} = 25 V, I_D = 50 A	48	90	–	S
C_{CHC}		–	–	160	pF
C_{iss}	V_{GS} = 0	–	15	20	nF
C_{oss}	V_{DS} = 25 V	–	1,9	2,9	nF
C_{rss}	f = 1 MHz	–	0,72	1,1	nF
L_{DS}		–	–	30	nH
$t_{d(on)}$	V_{DD} = 250 V	–	60	–	ns
t_r	I_D = 30 A	–	100	–	ns
$t_{d(off)}$	V_{GS} = 10 V	–	500	–	ns
t_f	R_G = 4,7Ω	–	120	–	ns
Inverse Diode					
V_{SD}	I_F = 120 A, V_{GS} = 0 V	–	1,0	1,4	V
t_{rr}	T_j = 25 °C [2]	–	450	–	ns
	T_j = 150 °C [2]	–	–	–	ns
Q_{rr}	T_j = 25 °C [2]	–	36	–	µC
	T_j = 150 °C [2]	–		–	
Thermal characteristics					
R_{thjc}		–	–	0,16	°C/W
R_{thch}	M_1, surface 10 µm	–	–	0,05	°C/W

Mechanical Data					
M_1	to heatsink, SI Units	4	–	6	Nm
	to heatsink, US Units	35	–	53	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		–	–	150	g
Case	page 5		D15		

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

Do not parallel with former SKM 151 or SKM 151F
(which are discontinued)
SKM 151 A4R can replace SKM 151, former SKM 151 R and SKM 151 AR

Features

- N Channel, enhancement mode
- Short internal connections avoid oscillations
- With built-in gate resistor chips (“R”) R_{gtotal} = 1,3 Ω
- Without hard mould (environmental aspects)
- Isolated copper baseplate using DCB Direct Copper Bonding Ceramic
- 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
- Not suitable for linear amplification

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

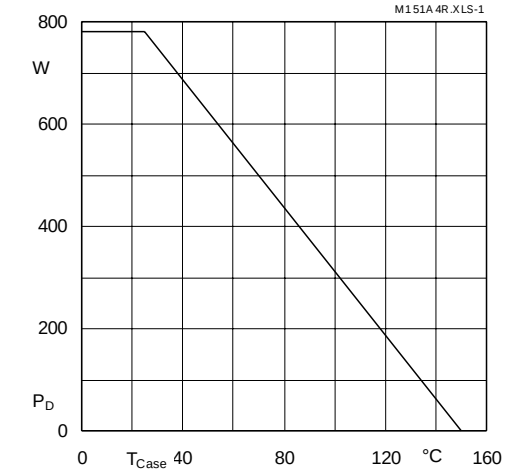


Fig. 1 Rated power dissipation vs. temperature

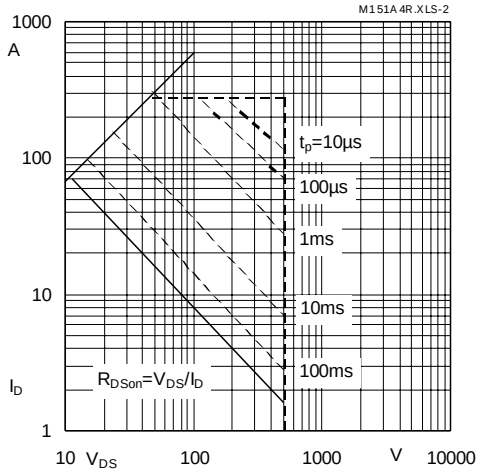


Fig. 2 Maximum safe operating area

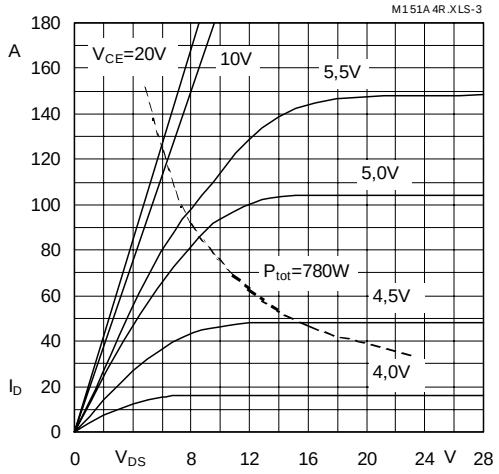


Fig. 3 Output characteristic

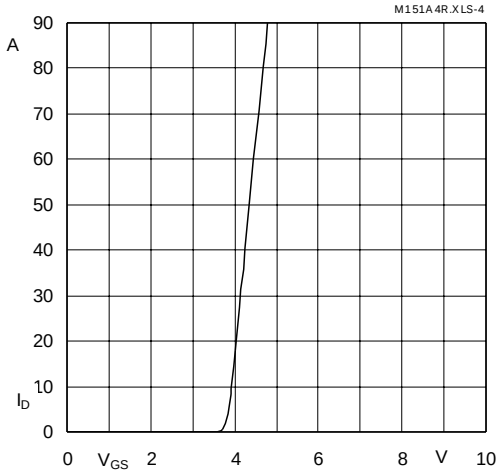


Fig. 4 Transfer characteristic

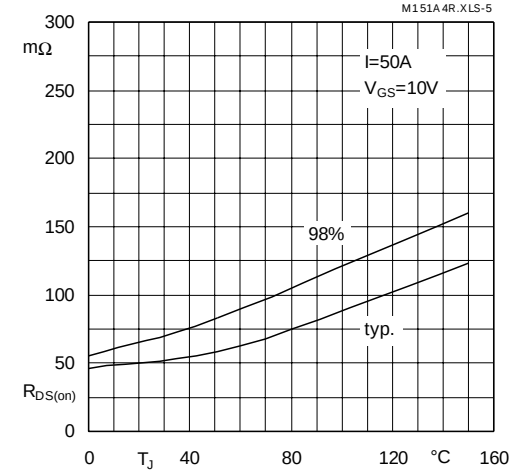


Fig. 5 On-resistance vs. temperature

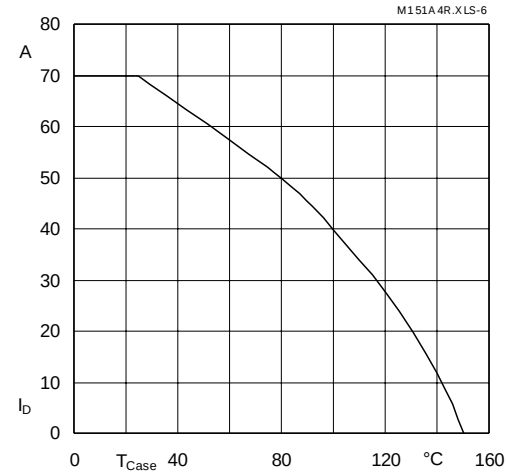


Fig. 6 Rated current vs. temperature

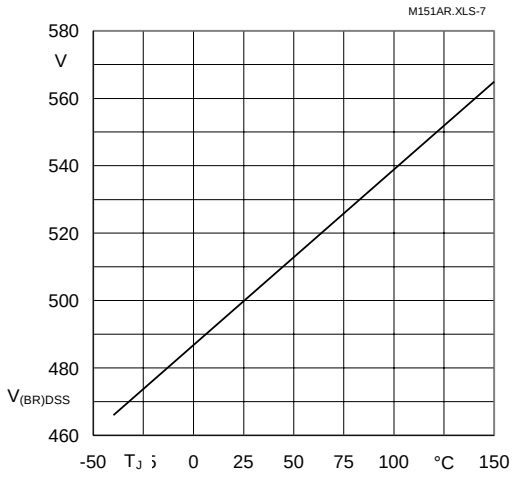


Fig. 7 Breakdown voltage vs. temperature

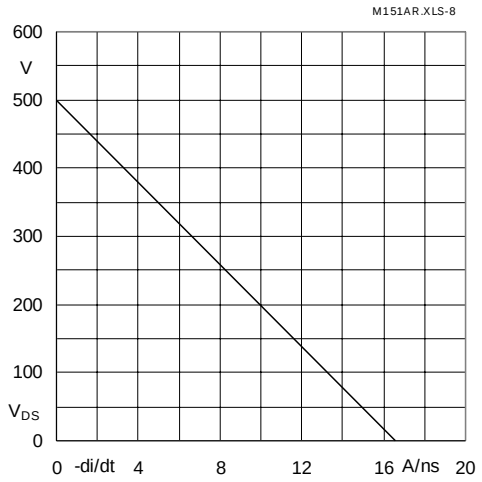


Fig. 8 Drain-source voltage derating

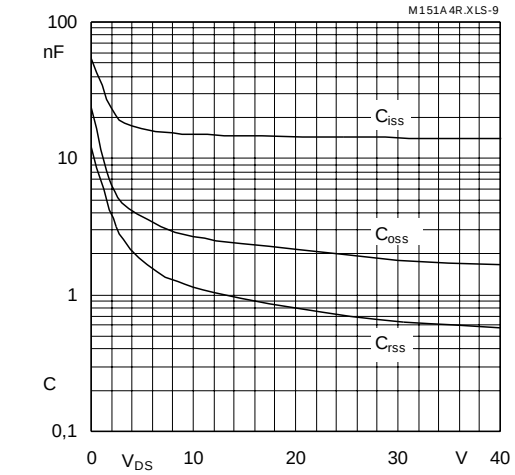


Fig. 9 Capacitances vs. drain-source voltage

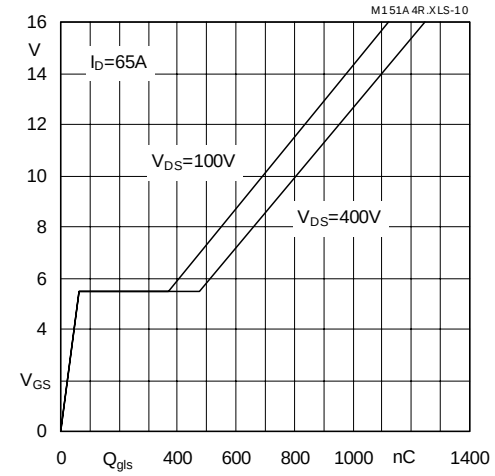


Fig. 10 Gate charge characteristic

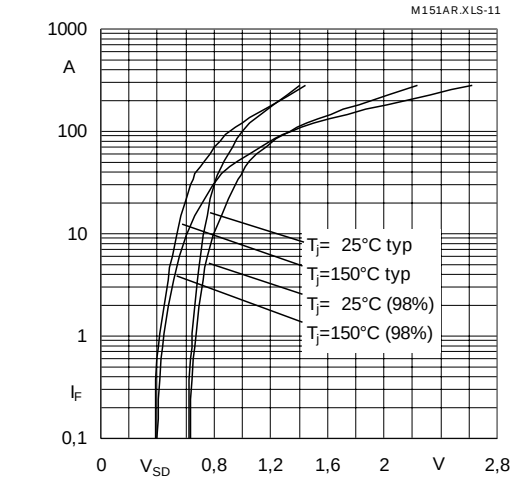


Fig. 11 Diode forward characteristic

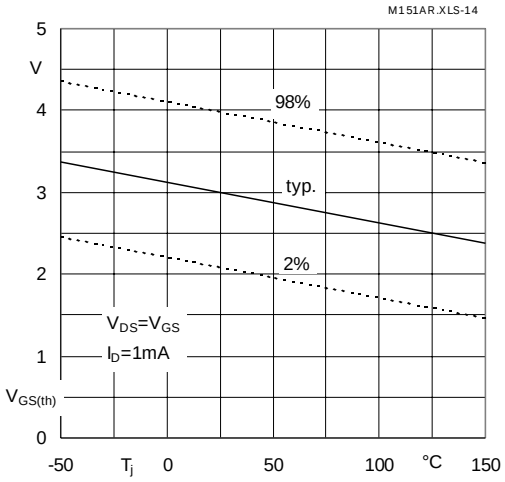


Fig. 14 Gate-source threshold voltage

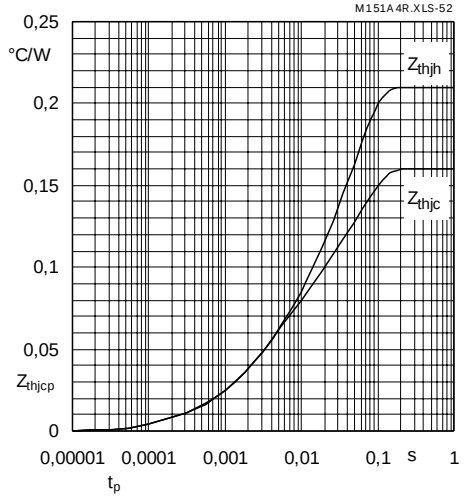


Fig. 51 Transient thermal impedance

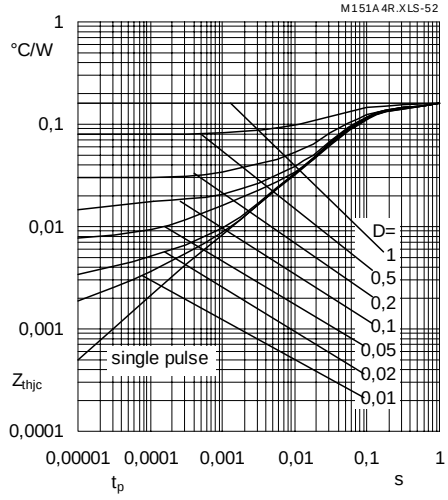


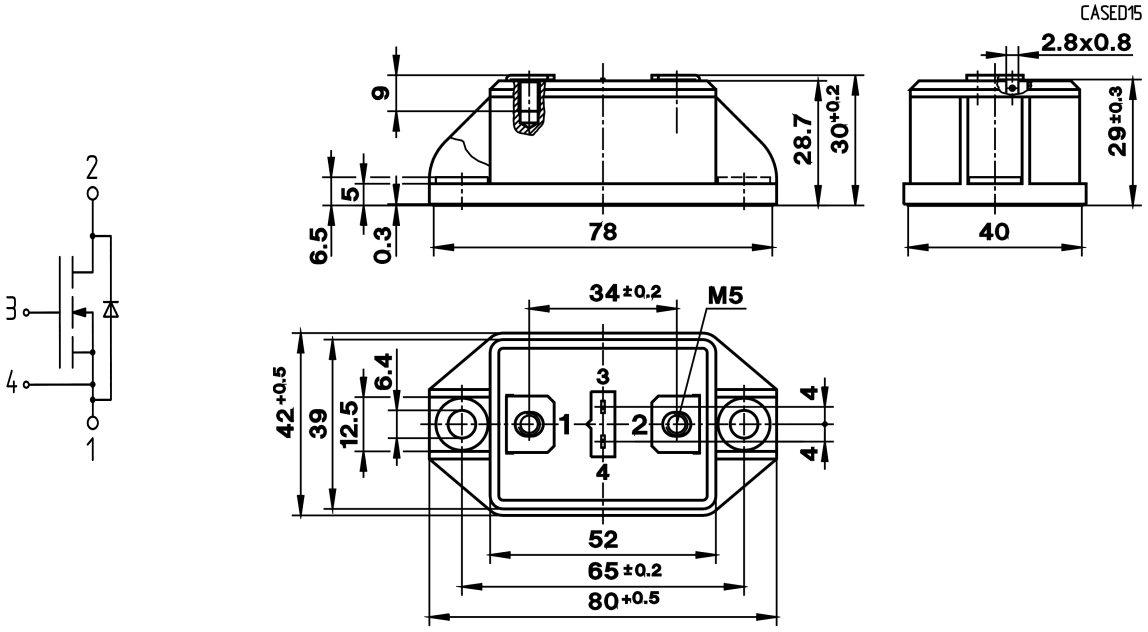
Fig. 52 Thermal impedance under pulse conditions

SEMITRANS M 1

Case D 15

UL recognized, file No. E63 5632

SKM 151 A4R



Outline and circuit diagram