

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
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

SEMITRANS® M Power MOSFET Modules

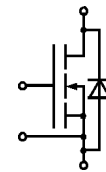
SKM 151 A4R

Preliminary Data



Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
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 V _{DS} = 500 V } T _j = 125 °C	–	1	250	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 } V _{DS} = 25 V } f = 1 MHz	–	15	20	nF
C _{oss}		–	1,9	2,9	nF
C _{rSS}		–	0,72	1,1	nF
L _{DS}		–	–	30	nH
t _{d(on)}	} V _{DD} = 250 V } I _D = 30 A } V _{GS} = 10 V } R _G = 4,7Ω	–	60	–	ns
t _r		–	100	–	ns
t _{d(off)}		–	500	–	ns
t _f		–	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⁾	–	–	–	μC
Thermal characteristics					
R _{thjc}		–	–	0,16	°C/W
R _{thch}	M ₁ , surface 10 μm	–	–	0,05	°C/W

SEMITRANS M1



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.

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

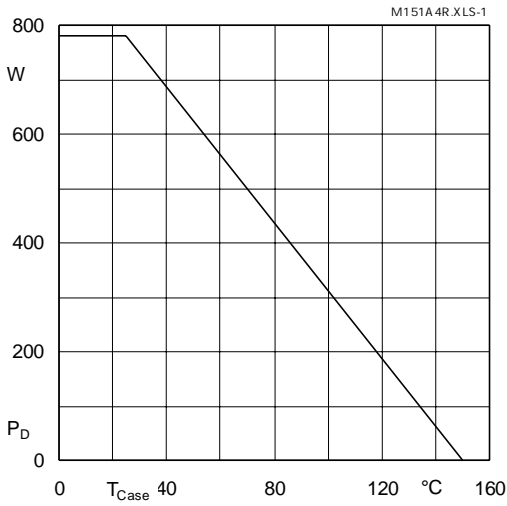


Fig. 1 Rated power dissipation vs. temperature

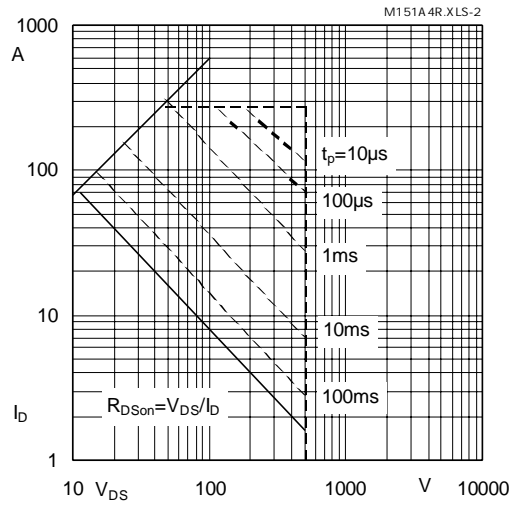


Fig. 2 Maximum safe operating area

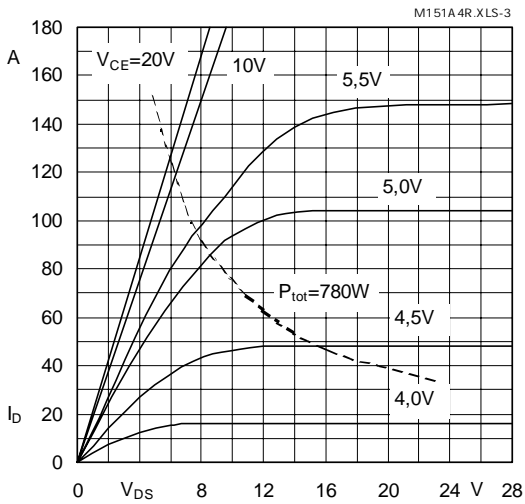


Fig. 3 Output characteristic

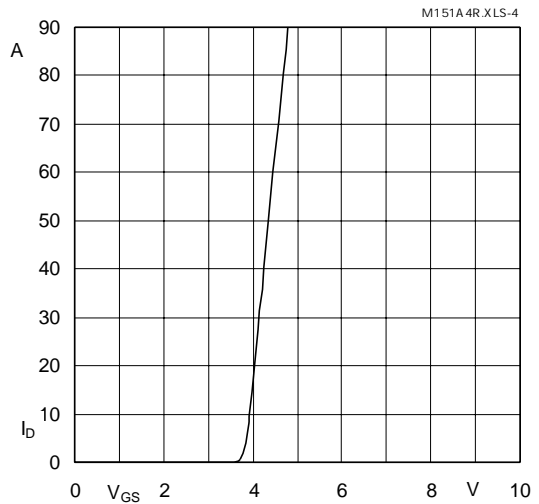


Fig. 4 Transfer characteristic

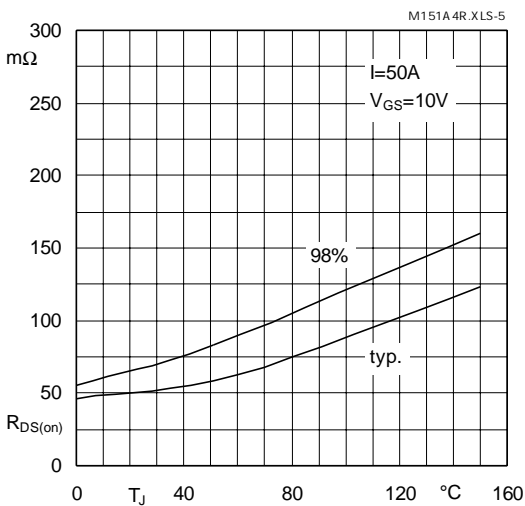


Fig. 5 On-resistance vs. temperature

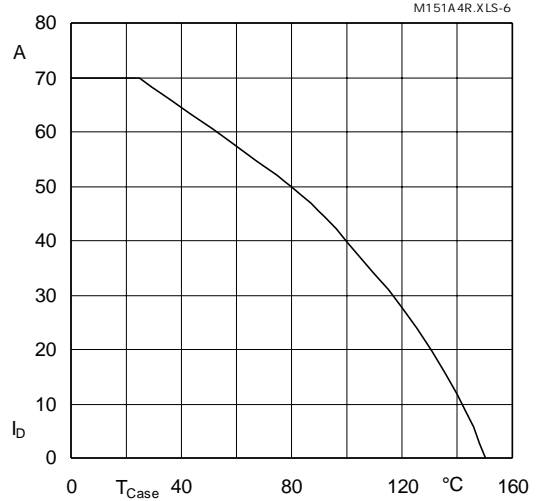


Fig. 6 Rated current vs. temperature

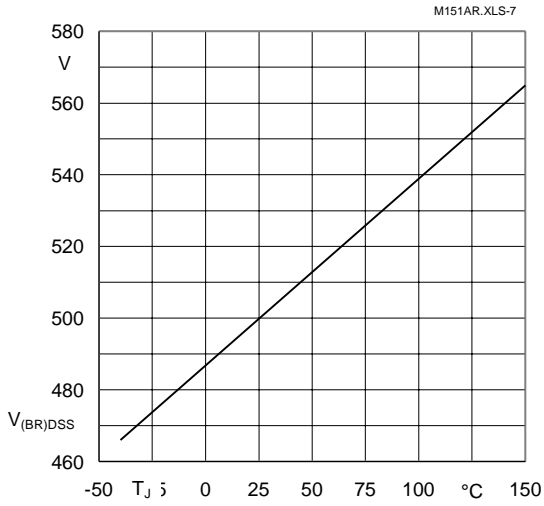


Fig. 7 Breakdown voltage vs. temperature

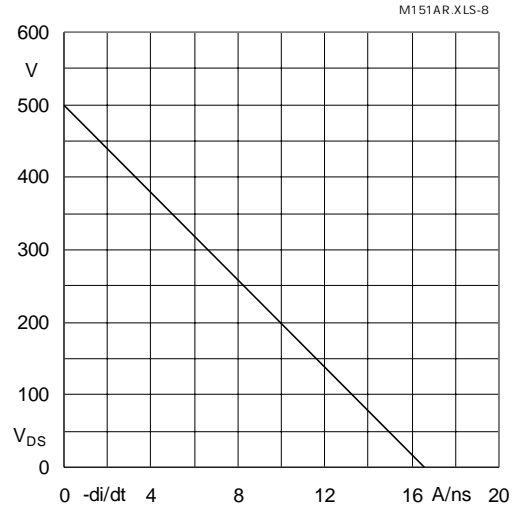


Fig. 8 Drain-source voltage derating

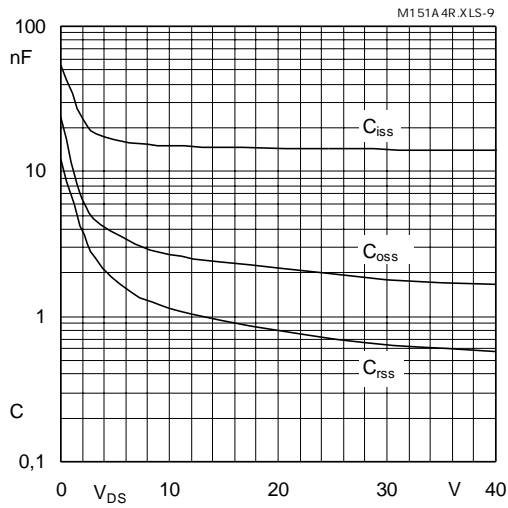


Fig. 9 Capacitances vs. drain-source voltage

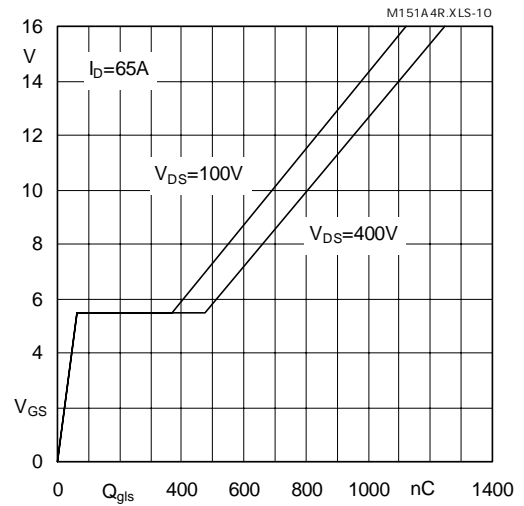


Fig. 10 Gate charge characteristic

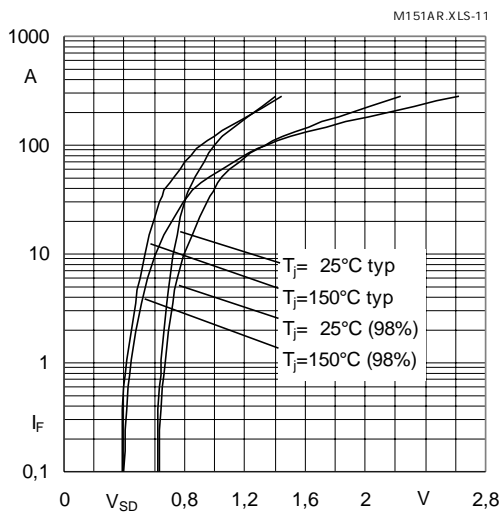


Fig. 11 Diode forward characteristic

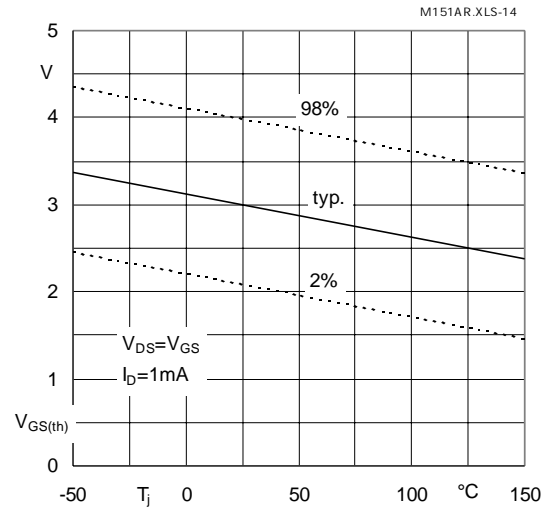


Fig. 14 Gate-source threshold voltage

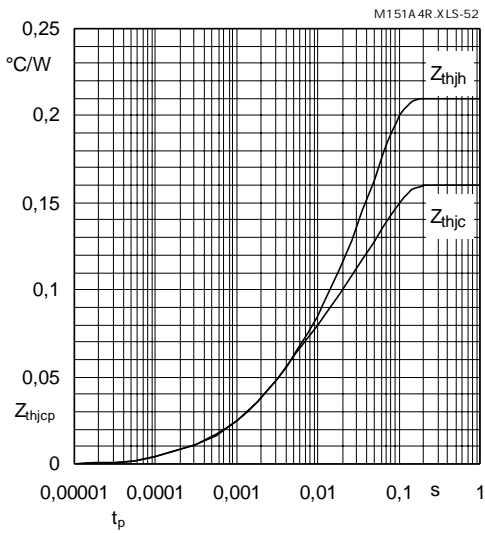


Fig. 51 Transient thermal impedance

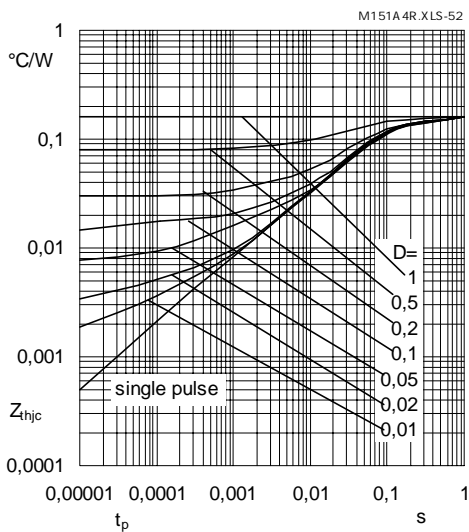


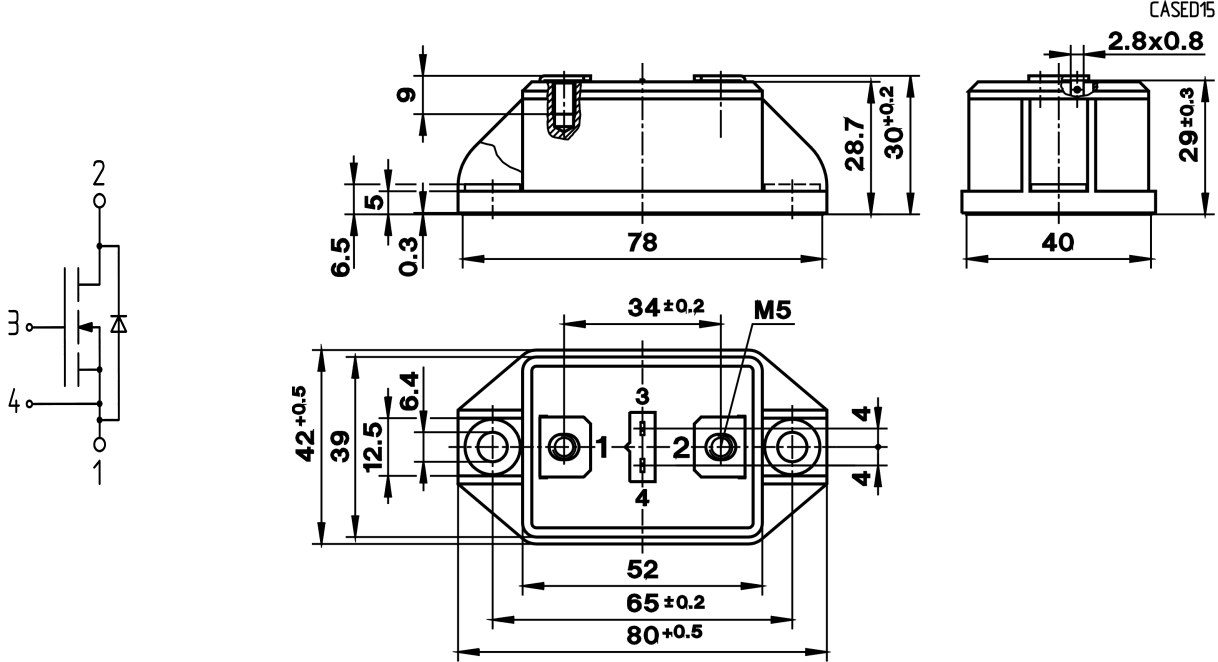
Fig. 52 Thermal impedance under pulse conditions

SEMITRANS M 1

Case D 15

UL recognized, file No. E63 5632

SKM 151 A4R



Outline and circuit diagram