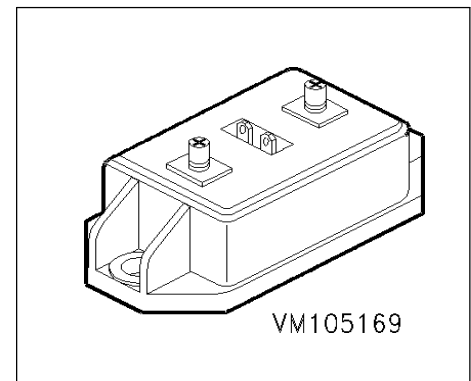# BSM 181 A / BSM 181 AR

eupec

SIMOPAC® MODULE

- Single switch power MOSFET module
- N channel, enhancement mode
- Avalanche rated
- Package with insulated metal base plate
- Built in gate series resistor

VM105169

Type	V_{DS}	I_D	$R_{DS(on)}$**max**	Package	Ordering Code
BSM 181 AR	800 V	36 A	0.24 Ω	SSW MOS 1	C67076-A1017-A20

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	800	V
Drain-gate voltage R_{GS} = 20 kΩ	V_{DGR}	800	
Gate source voltage	V_{GS}	± 20	
Continuous drain current T_C = 25 °C	I_D	36	A
DC drain current, pulsed T_C = 25 °C	I_{Dpuls}	144	
Power dissipation T_C = 25 °C	P_{tot}	700	W
Chip temperature	T_{jmax}	150	°C
Storage temperature	T_{stg}	-40 ... + 125	

Thermal resistance chip - case	R_{thJC}	≤ 0.18	K/W
Thermal resistance case - heat sink	R_{thCA}	≤ 0.05	
Insulation test voltage, t = 1min	V_{is}	2.5	kV ac
Creepage distance, drain-source		16	mm
Clearance, drain-source		11	
DIN humidity category, DIN 40 040		F	
DIN humidity category, DIN IEC 68-1		40 / 125 / 56	

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Electrical Characteristics, at $T_j = 25°C$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Gate threshold voltage $V_{GS} = V_{DS}, I_D = 1$ mA	$V_{GS(th)}$	2.1	3	4	V
Drain-Source on-resistance $V_{GS} = 10$ V, $I_D = 23$ A	$R_{DS(on)}$	-	0.18	0.24	Ω
Zero gate voltage drain current $V_{DS} = 800$ V, $V_{GS} = 0$ V, $T_j = 25$ °C $V_{DS} = 800$ V, $V_{GS} = 0$ V, $T_j = 125$ °C	I_{DSS}	- -	50 300	100 1000	µA
Gate-source leakage current $V_{GS} = 20$ V, $V_{DS} = 0$ V	I_{GSS}	-	10	100	nA

Reverse Diode

|					
Inverse diode continuous forward current $T_C = 25$ °C	I_S	-	-	36	A
Inverse diode direct current,pulsed $T_C = 25$ °C	I_{SM}	-	-	144	
Inverse diode forward voltage $V_{GS} = 0$ V, $I_F = 72$ A	V_{SD}	0.65	0.9	1.2	V
Reverse recovery time $V_R = 100$ V, $I_F = I_S$, $di_F/dt = 100$ A/µs	t_{rr}	-	1200	-	ns
Reverse recovery charge $V_R = 100$ V, $I_F = I_S$, $di_F/dt = 100$ A/µs	Q_{rr}	-	42	-	µC

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Electrical Characteristics, at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 23 A	g_{fs}	16	33	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	10	14	nF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	1.2	1.7	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	0.6	0.8	
Turn-on delay time V_{DD} = 400 V, V_{GS} = 10 V, I_D = 23 A R_{GS} = 3.3 Ω	$t_{d(on)}$	-	60	-	ns
Rise time V_{DD} = 400 V, V_{GS} = 10 V, I_D = 23 A R_{GS} = 3.3 Ω	t_r	-	30	-	
Turn-off delay time V_{DD} = 400 V, V_{GS} = 10 V, I_D = 23 A R_{GS} = 3.3 Ω	$t_{d(off)}$	-	710	-	
Fall time V_{DD} = 400 V, V_{GS} = 10 V, I_D = 23 A R_{GS} = 3.3 Ω	t_f	-	100	-	

Power dissipation

$P_{tot} = f(T_C)$

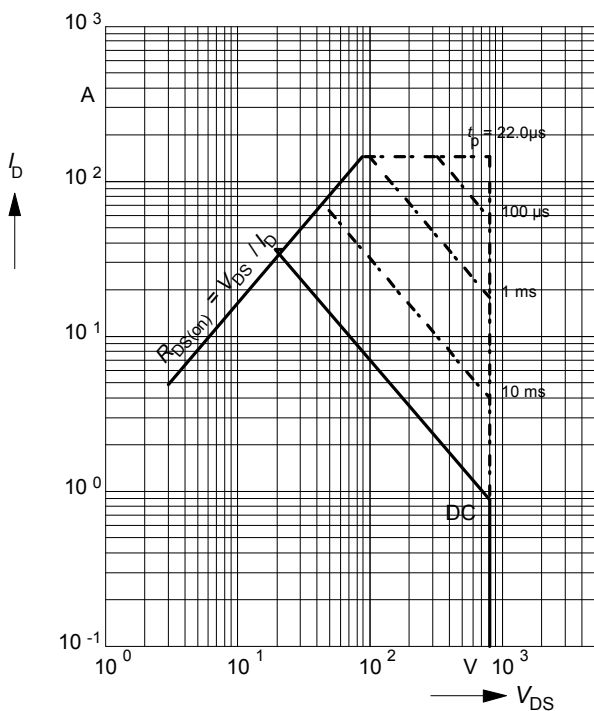parameter: $T_j \leq 150\,°C$
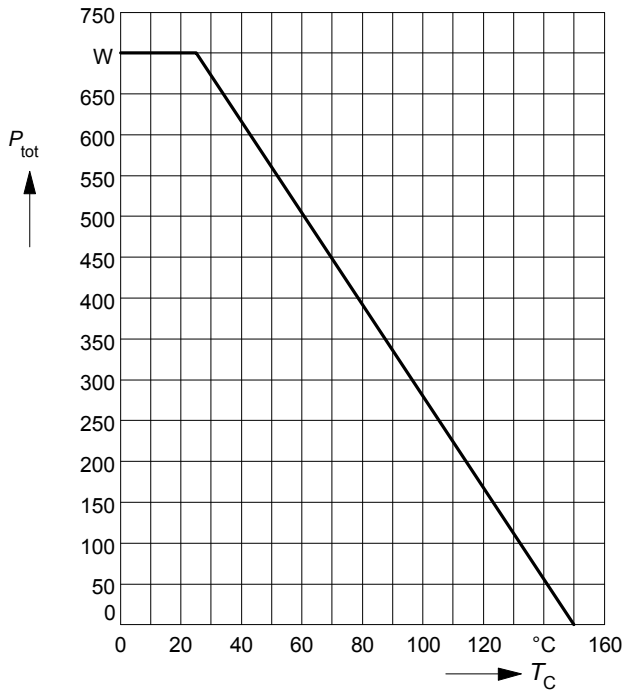
Drain current

$I_D = f(T_C)$

parameter: $V_{GS} \geq 10\,V$, $T_j \leq 150\,°C$
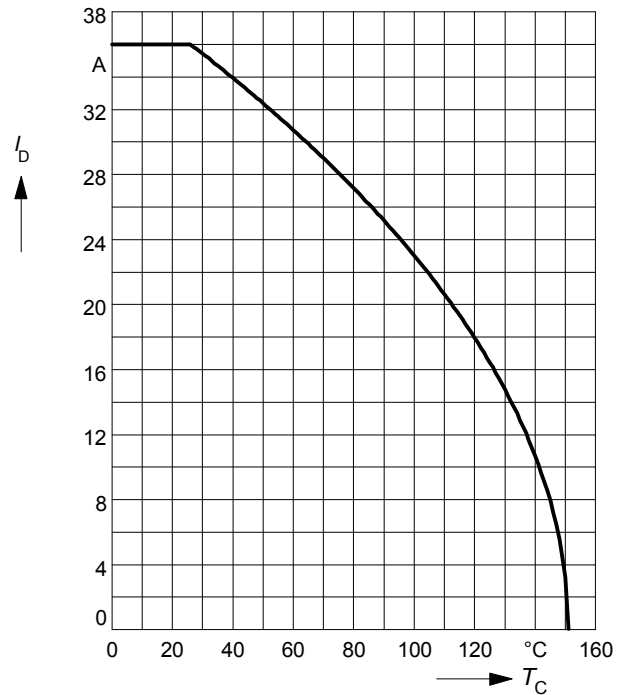
Safe operating area

$I_D = f(V_{DS})$
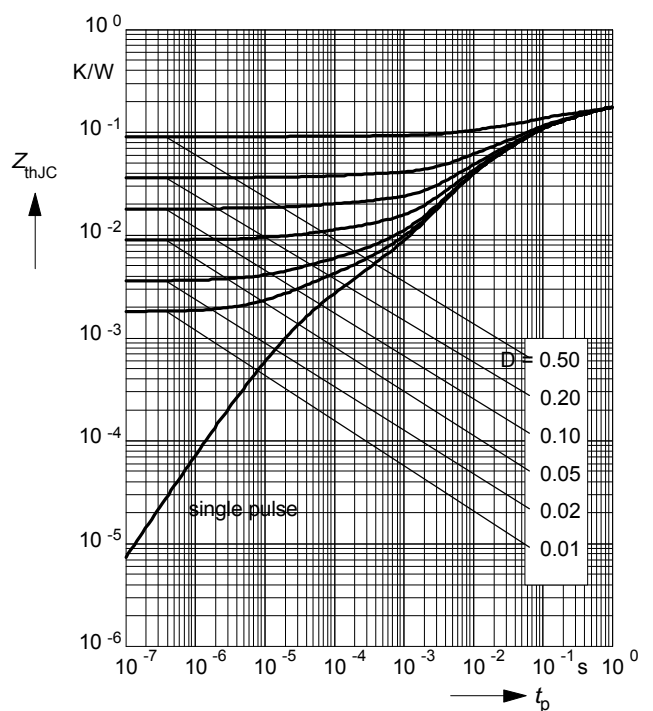
parameter: *single puls*, $T_C = 25°C$, $T_j \leq 150\,°C$
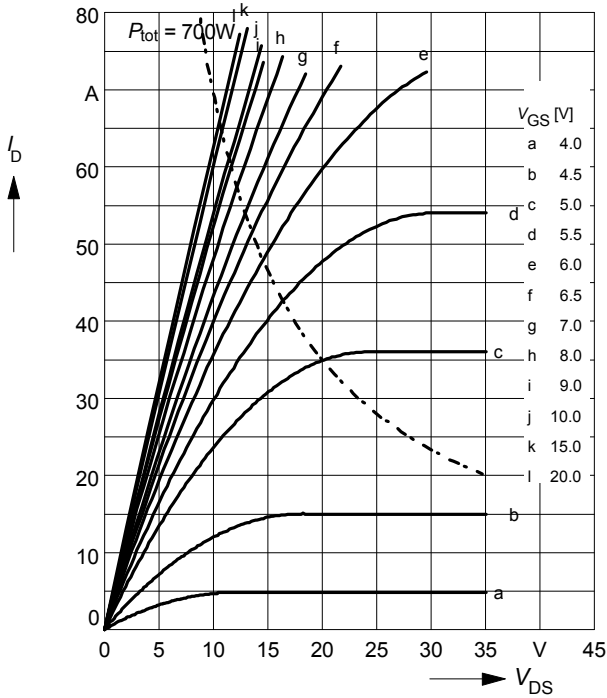

Transient thermal impedance

$Z_{th\,JC} = f(t_p)$

parameter: $D = t_p / T$
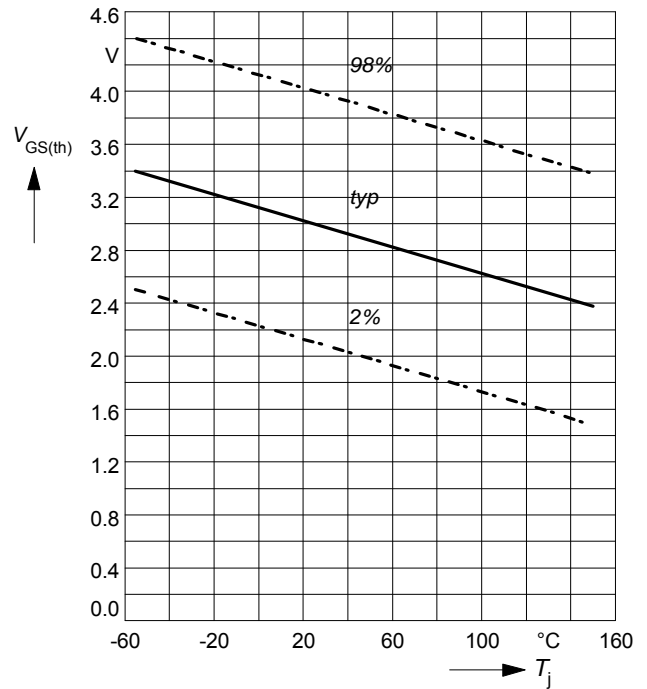

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Typ. output characteristics

$I_D = f(V_{DS})$

parameter: t_p = 80 µs , T_j = 25 °C
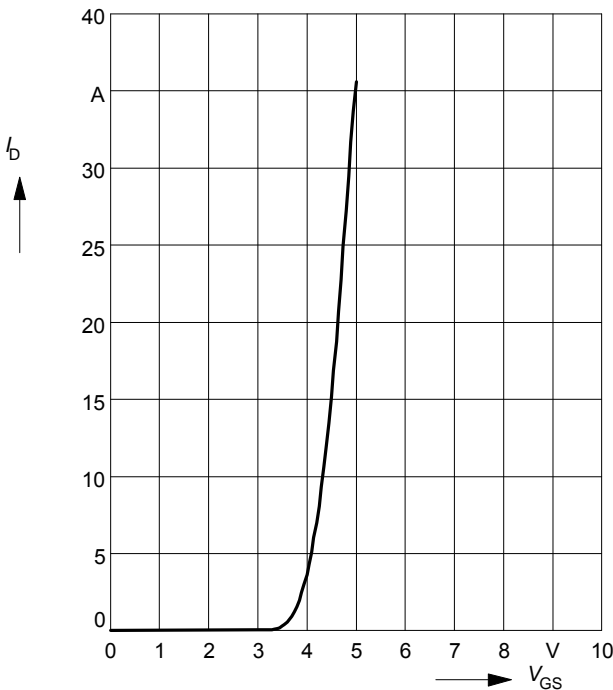
Gate threshold voltage

$V_{GS\,(th)} = f(T_j)$

parameter: $V_{GS} = V_{DS}$, I_D = 1 mA

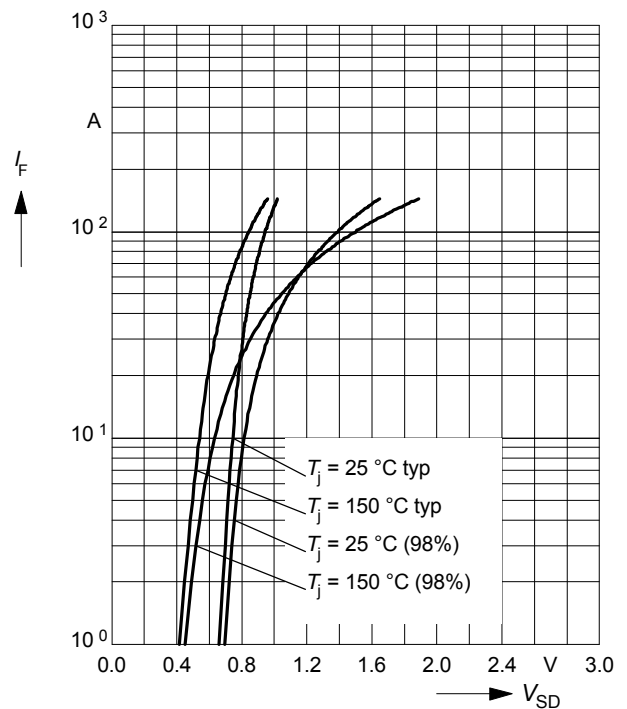|	V_{GS} [V]
a	4.0
b	4.5
c	5.0
d	5.5
e	6.0
f	6.5
g	7.0
h	8.0
i	9.0
j	10.0
k	15.0
l	20.0

P_{tot} = 700W

Typ. transfer characteristic

$I_D = f(V_{GS})$

parameter:t_p = 80 µs. V_{DS} = 25 V

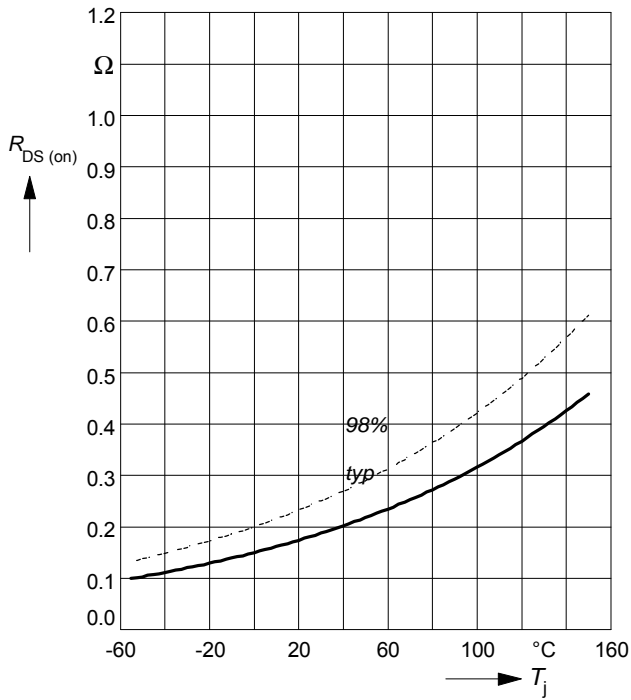Forward characteristics of reverse diode

$I_F = f(V_{SD})$

parameter: T_j, t_p = 80 µs

T_j = 25 °C typ

T_j = 150 °C typ

T_j = 25 °C (98%)
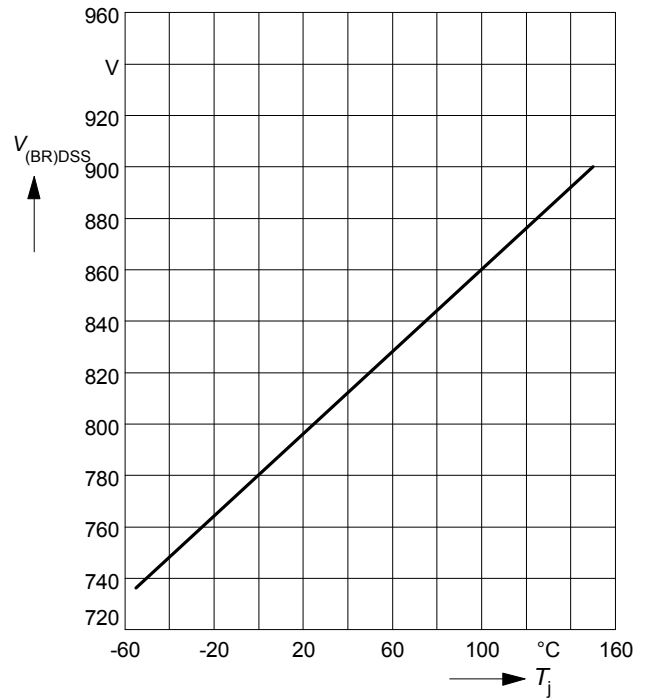
T_j = 150 °C (98%)

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Drain-source on-resistance
$R_{DS(on)} = f(T_j)$
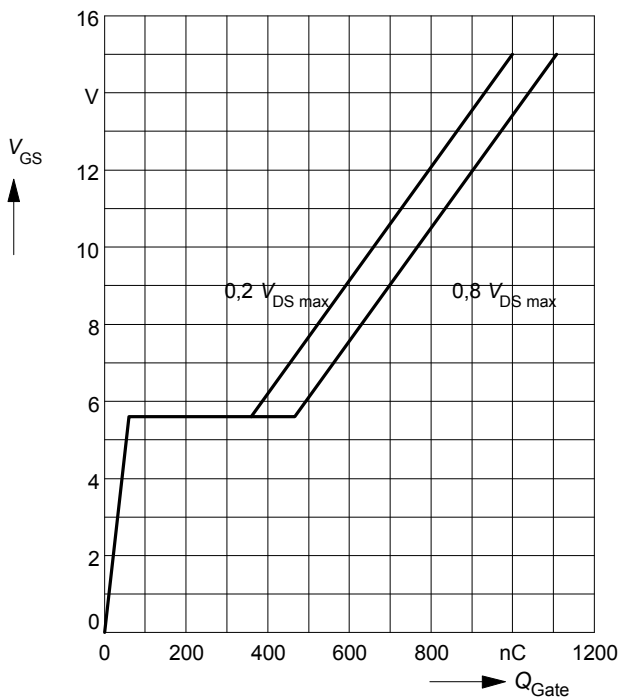parameter: I_D = 23 A, V_{GS} = 10 V

Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$

Typ. gate charge
$V_{GS} = f(Q_{Gate})$
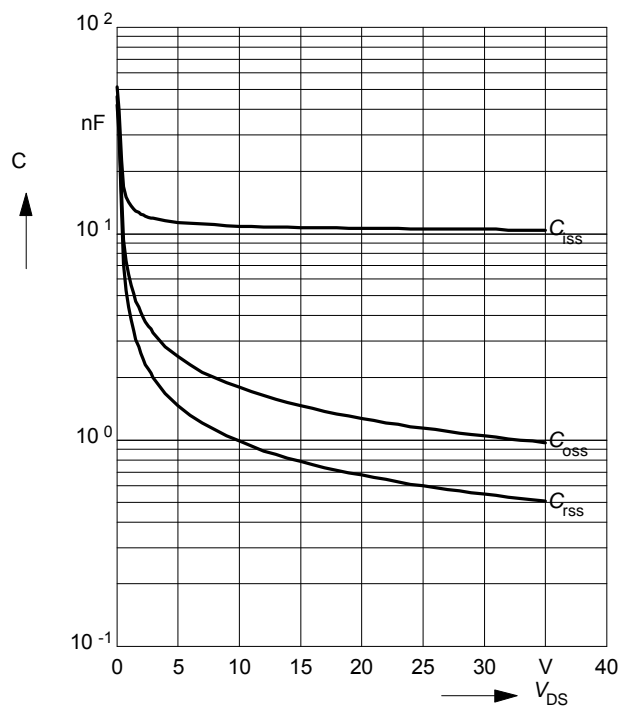parameter: $I_{D\ puls}$ = 53 A

Typ. capacitances
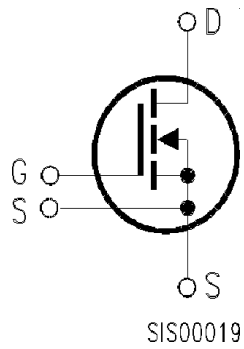$C = f(V_{DS})$
parameter: V_{GS} = 0 V, f = 1 MHz

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Circuit Diagramm

SIS00019

Package Outlines
Dimension in mm
Weight: 130 g

GM105169

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