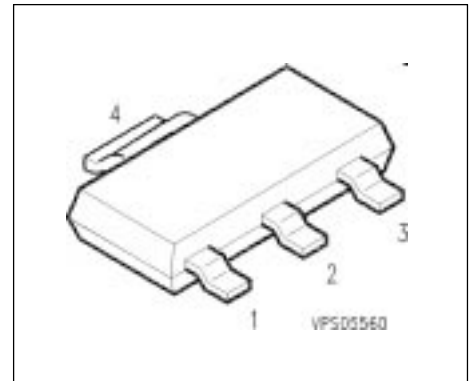


SIPMOS[®] Small-Signal Transistor

- P channel
- Enhancement mode
- Logic Level
- Avalanche rated
- $V_{GS(th)} = -0.8 \dots -2.0 \text{ V}$



Pin 1	Pin 2	Pin 3	Pin 4
G	D	S	D

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSP 171	-60 V	-1.7 A	0.35 Ω	SOT-223	BSP 171

Type	Ordering Code	Tape and Reel Information
BSP 171	Q67000-S224	E6327

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current $T_A = 24 \text{ }^\circ\text{C}$	I_D	-1.7	A
DC drain current, pulsed $T_A = 25 \text{ }^\circ\text{C}$	I_{Dpuls}	-6.8	
Avalanche energy, single pulse $I_D = -1.7 \text{ A}$, $V_{DD} = -25 \text{ V}$, $R_{GS} = 25 \text{ } \Omega$ $L = 3.23 \text{ mH}$, $T_j = 25 \text{ }^\circ\text{C}$	E_{AS}	8	mJ
Gate source voltage	V_{GS}	± 20	V
Power dissipation $T_A = 25 \text{ }^\circ\text{C}$	P_{tot}	1.8	W

Maximum Ratings

Parameter	Symbol	Values	Unit
Chip or operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip to ambient air ¹⁾	R_{thJA}	≤ 70	K/W
Thermal resistance, junction-soldering point ¹⁾	R_{thJS}	≤ 10	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

1) Transistor on epoxy pcb 40 mm x 40 mm x 1,5 mm with 6 cm² copper area for drain connection

Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0 \text{ V}, I_D = -0.25 \text{ mA}, T_j = 25^\circ\text{C}$	$V_{(BR)DSS}$	-60	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}, I_D = -1 \text{ mA}$	$V_{GS(th)}$	-0.8	-1.4	-2	
Zero gate voltage drain current $V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 25^\circ\text{C}$ $V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 125^\circ\text{C}$	I_{DSS}	-	-0.1 -10	-1 -100	μA
Gate-source leakage current $V_{GS} = -20 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	-10	-100	
Drain-Source on-state resistance $V_{GS} = -10 \text{ V}, I_D = -1.7 \text{ A}$	$R_{DS(on)}$	-	0.22	0.35	Ω

Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Dynamic Characteristics

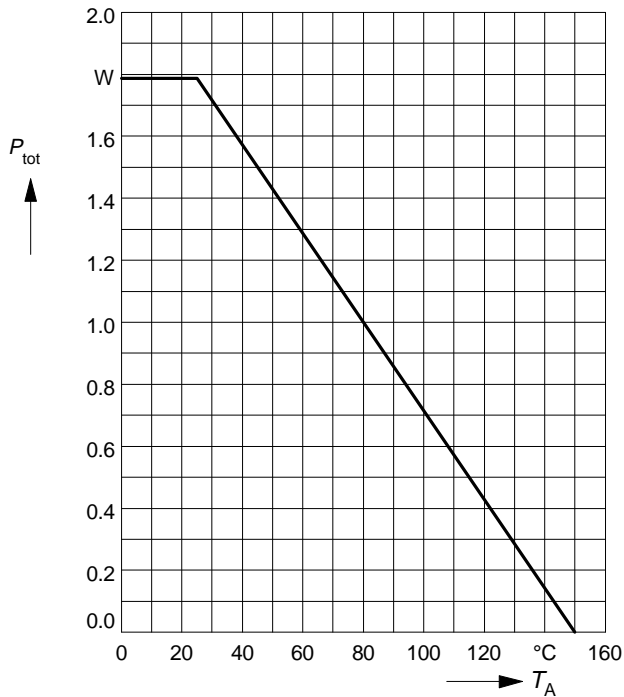
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}, I_D = -1.7 \text{ A}$	g_{fs}	1	1.55	-	S
Input capacitance $V_{GS} = 0 \text{ V}, V_{DS} = -25 \text{ V}, f = 1 \text{ MHz}$	C_{iss}	-	720	960	pF
Output capacitance $V_{GS} = 0 \text{ V}, V_{DS} = -25 \text{ V}, f = 1 \text{ MHz}$	C_{oss}	-	290	435	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}, V_{DS} = -25 \text{ V}, f = 1 \text{ MHz}$	C_{rss}	-	120	180	
Turn-on delay time $V_{DD} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -0.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	16	25	ns
Rise time $V_{DD} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -0.3 \text{ A}$ $R_{GS} = 50 \Omega$	t_r	-	70	105	
Turn-off delay time $V_{DD} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = 0.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	230	310	
Fall time $V_{DD} = -30 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -0.3 \text{ A}$ $R_{GS} = 50 \Omega$	t_f	-	280	375	

Electrical Characteristics, at $T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current $T_A = 25^\circ\text{C}$	I_S	-	-	-1.7	A
Inverse diode direct current, pulsed $T_A = 25^\circ\text{C}$	I_{SM}	-	-	-6.8	
Inverse diode forward voltage $V_{GS} = 0\text{ V}, I_F = -3.4\text{ A}, T_j = 25^\circ\text{C}$	V_{SD}	-	-0.9	-1.2	V
Reverse recovery time $V_R = 30\text{ V}, I_F = I_S = 0, di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	300	-	ns
Reverse recovery charge $V_R = 30\text{ V}, I_F = I_S = 0, di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	0.82	-	μC

Power dissipation

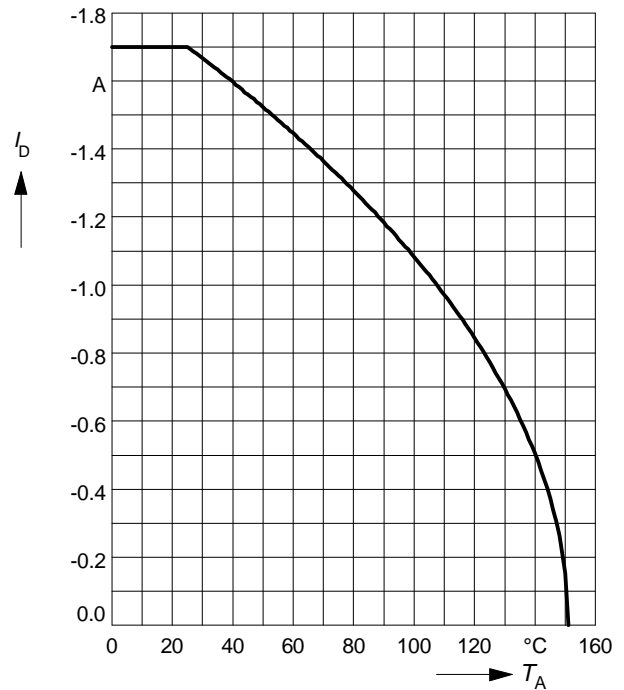
$$P_{\text{tot}} = f(T_A)$$



Drain current

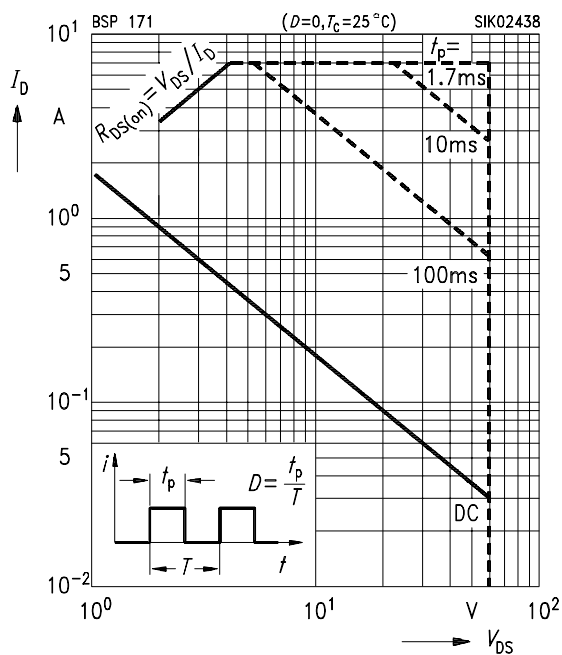
$$I_D = f(T_A)$$

parameter: $V_{GS} \geq -10 \text{ V}$



Safe operating area $I_D = f(V_{DS})$

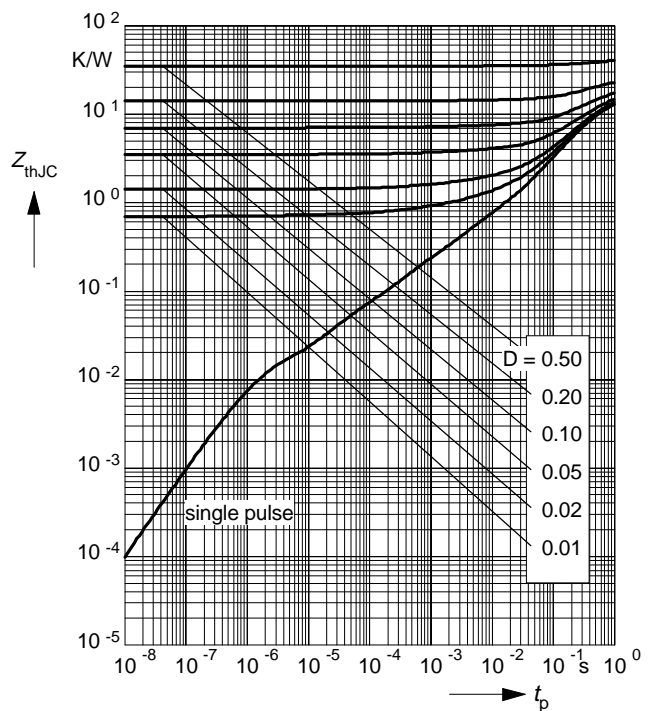
parameter: $D = 0, T_C = 25^\circ\text{C}$



Transient thermal impedance

$$Z_{\text{thJA}} = f(t_p)$$

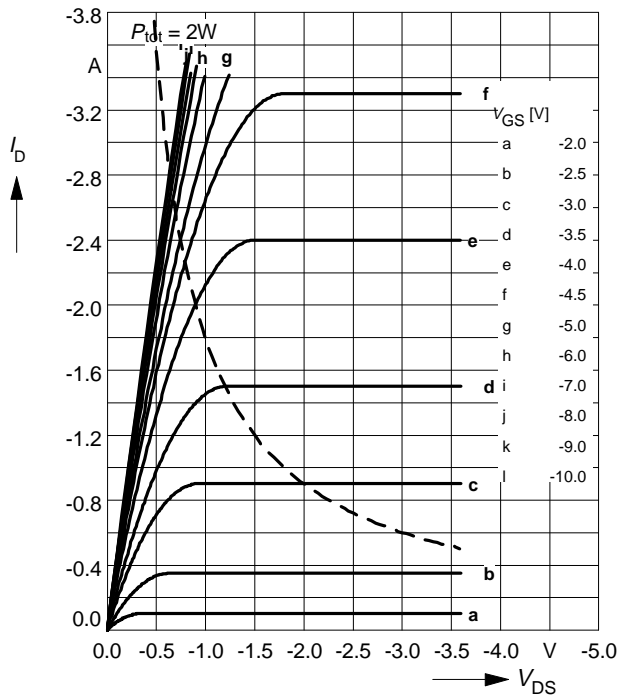
parameter: $D = t_p / T$



Typ. output characteristics

$$I_D = f(V_{DS})$$

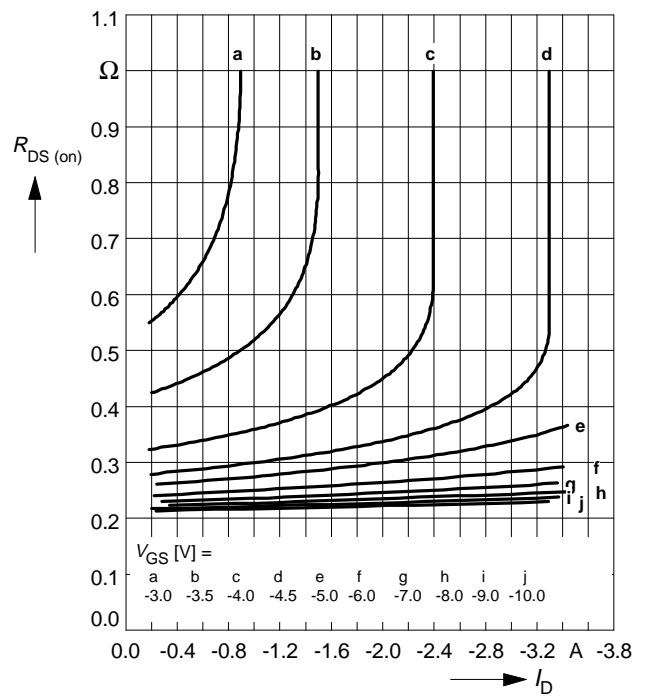
parameter: $t_p = 80 \mu s$



Typ. drain-source on-resistance

$$R_{DS(on)} = f(I_D)$$

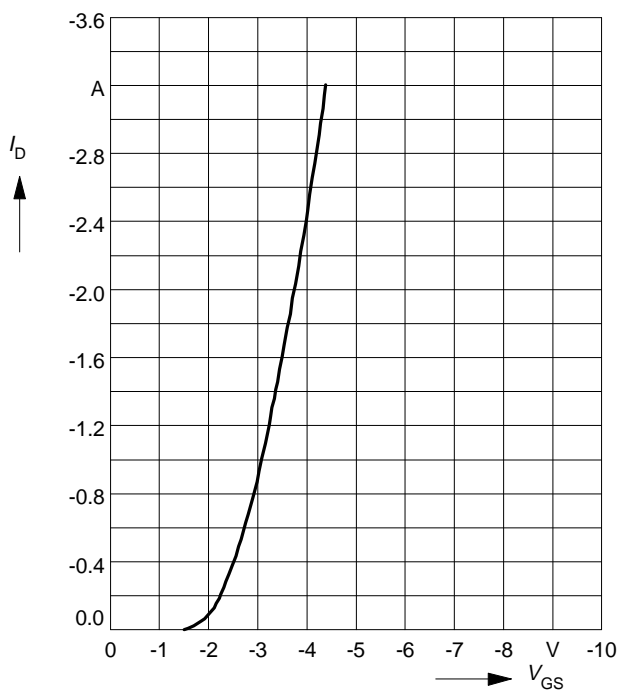
parameter: $t_p = 80 \mu s, T_j = 25^\circ C$



Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: $t_p = 80 \mu s$

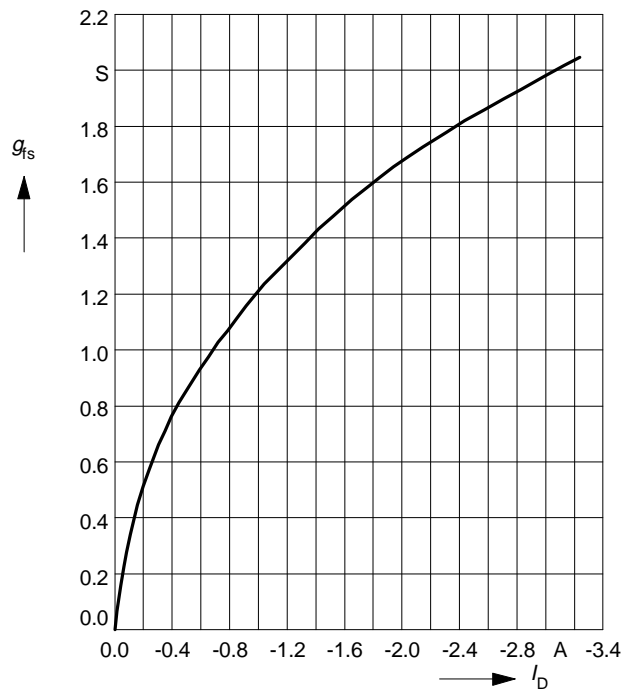
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: $t_p = 80 \mu s,$

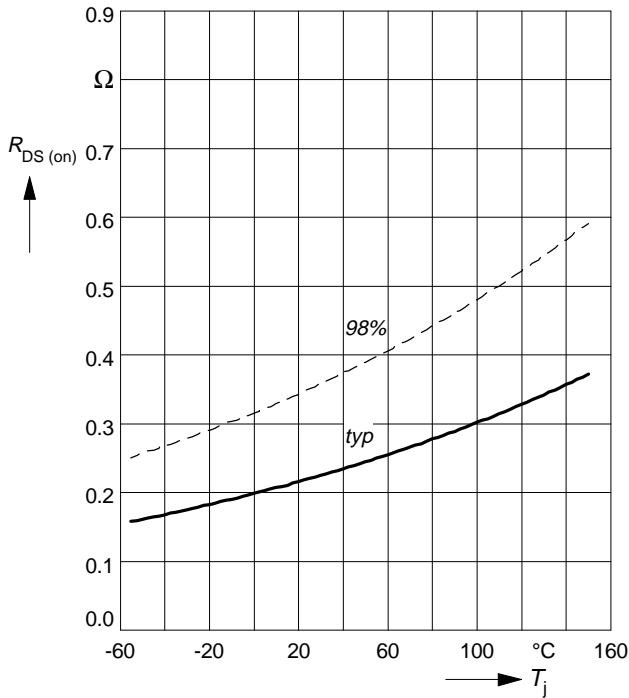
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



Drain-source on-resistance

$$R_{DS(on)} = f(T_j)$$

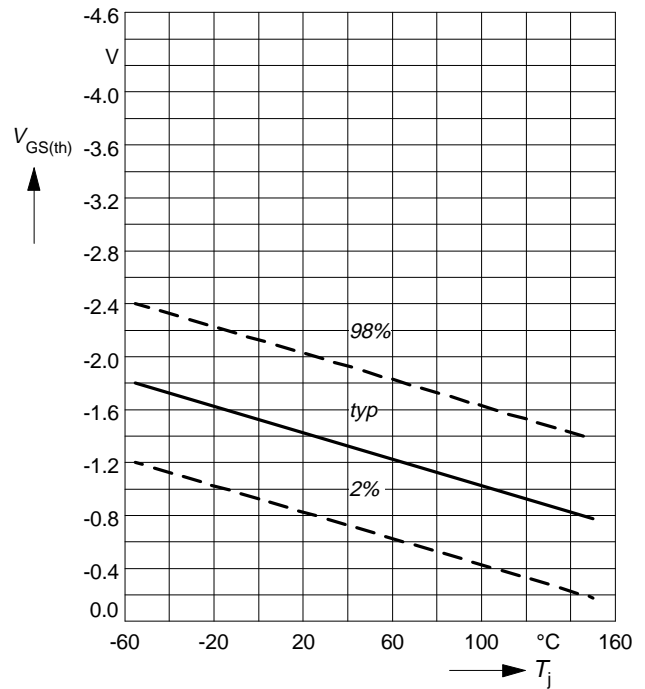
parameter: $I_D = -1.7 \text{ A}$, $V_{GS} = -10 \text{ V}$



Gate threshold voltage

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

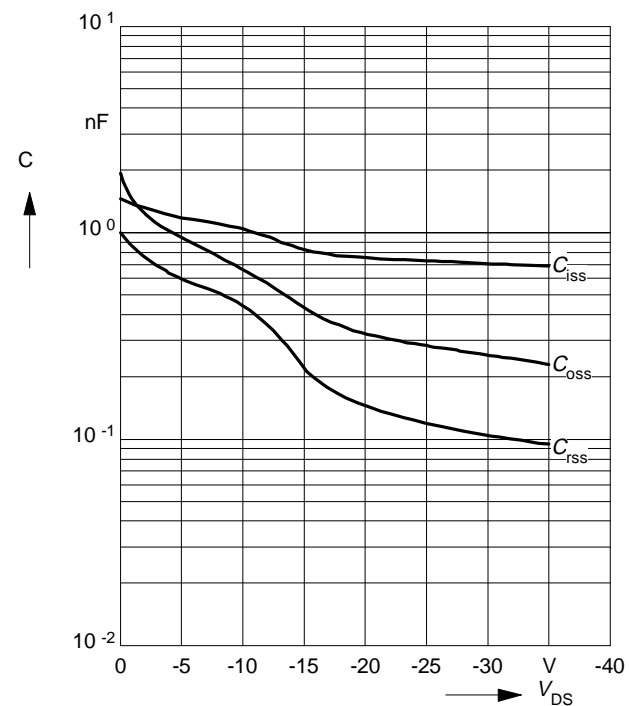
parameter: $V_{GS} = V_{DS}$, $I_D = -1 \text{ mA}$



Typ. capacitances

$$C = f(V_{DS})$$

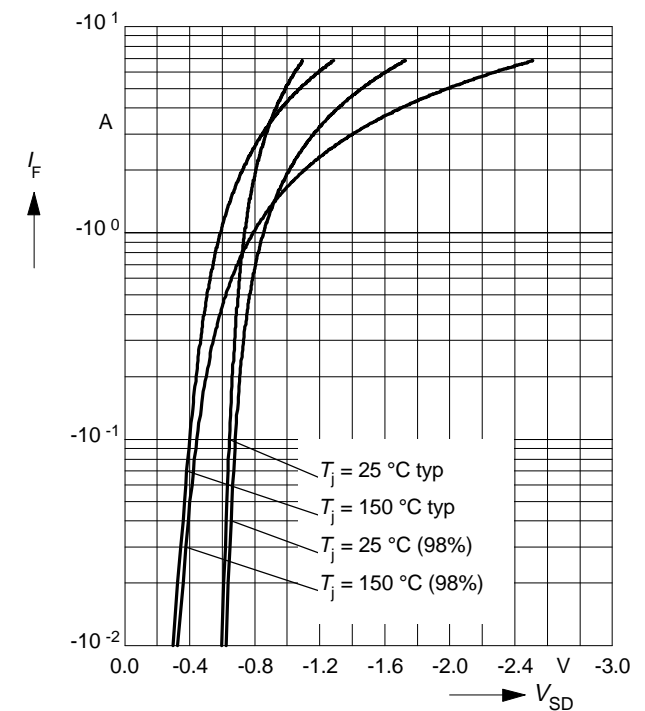
parameter: $V_{GS}=0\text{V}$, $f = 1 \text{ MHz}$



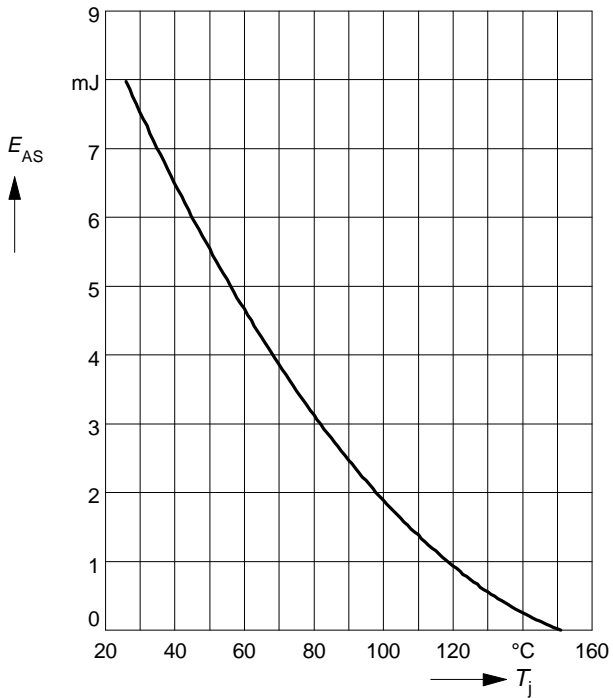
Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

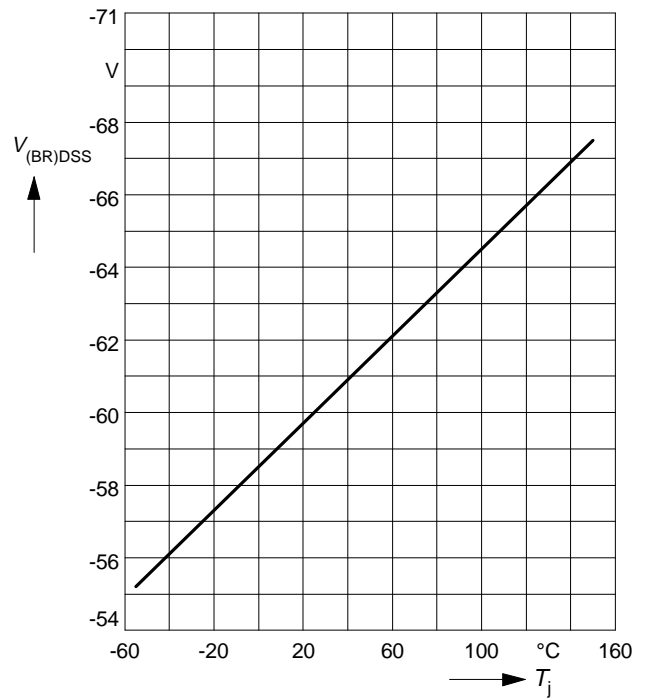
parameter: $T_j, t_p = 80 \mu\text{s}$



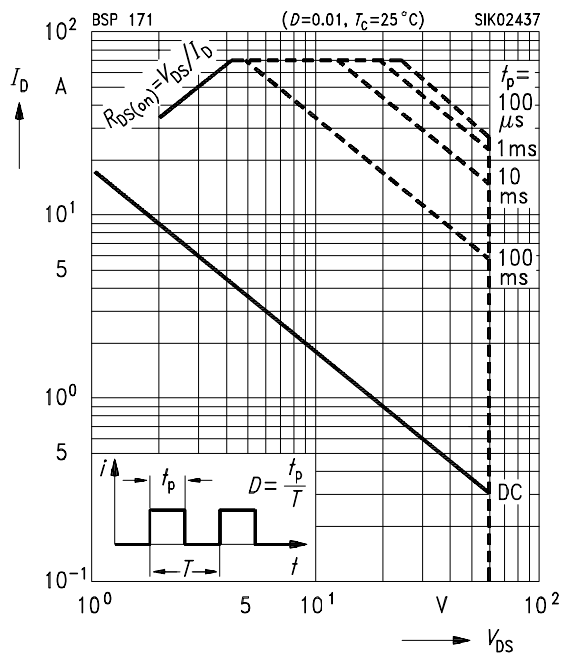
Avalanche energy $E_{AS} = f(T_j)$
 parameter: $I_D = -1.7$ A, $V_{DD} = -25$ V
 $R_{GS} = 25 \Omega$, $L = 3.23$ mH



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



Safe operating area $I_D = f(V_{DS})$
 parameter: $D = 0.01$, $T_C = 25^\circ\text{C}$





LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.