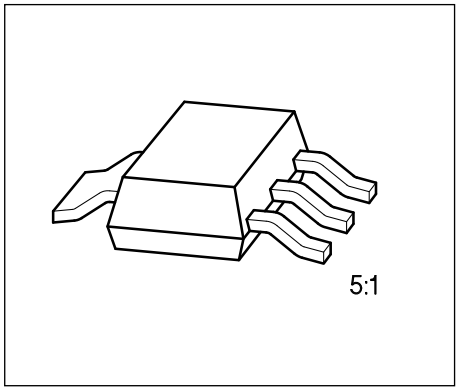
SIEMENS

SIPMOS® Small-Signal Transistor — BSP 129

- V_{DS} 240 V
- I_D 0.2 A
- $R_{DS(on)}$ 20 Ω
- N channel
- Depletion mode
- High dynamic resistance
- Available grouped in $V_{GS(th)}$



Type	Ordering Code	Tape and Reel Information	Pin Configuration				Marking	Package
			1	2	3	4		
BSP 129	Q67000-S073	E6327: 1000 pcs/reel	G	D	S	D	BSP 129	SOT-223
BSP 129	Q67000-S314	E7941: 1000 pcs/reel $V_{GS(th)}$ selected in groups: (**see page 212**)						

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	V_{DS}	240	V
Drain-gate voltage, R_{GS} = 20 kΩ	V_{DGR}	240	
Gate-source voltage	V_{GS}	± 14	
Gate-source peak voltage, aperiodic	V_{gs}	± 20	
Continuous drain current, T_A = 34 ℃	I_D	0.2	A
Pulsed drain current, T_A = 25 ℃	$I_{D\,puls}$	0.6	
Max. power dissipation, T_A = 25 ℃	P_{tot}	1.7	W
Operating and storage temperature range	T_j, T_{stg}	– 55 … + 150	℃

Thermal resistance [1]	chip-ambient chip-soldering point	R_{thJA} R_{thJS}	72 12	K/W
DIN humidity category, DIN 40 040		–	E	–
IEC climatic category, DIN IEC 68-1		–	55/150/56	

[1] Transistor on epoxy pcb 40 mm × 40 mm × 1.5 mm with 6 cm² copper area for drain connection.

Electrical Characteristics

at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS} = – 3 V, I_D = 0.25 mA	$V_{(BR)DSS}$	240	–	–	V
Gate threshold voltage V_{DS} = 3 V, I_D = 1 mA	$V_{GS(th)}$	– 1.8	– 1.2	– 0.7	
Drain-source cutoff current V_{DS} = 240 V, V_{GS} = – 3 V T_j = 25 °C T_j = 125 °C	I_{DSS}	 – –	 – –	 100 200	 nA µA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0	I_{GSS}	–	10	100	nA
Drain-source on-resistance V_{GS} = 0 V, I_D = 0.014 A	$R_{DS(on)}$	–	7.0	20	Ω
Dynamic Characteristics					
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, I_D = 0.25 A	g_{fs}	0.14	0.2	–	S
Input capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	110	150	pF
Output capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	20	30	
Reverse transfer capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	7	10	
Turn-on time t_{on}, (t_{on} = $t_{d(on)}$ + t_r)	$t_{d(on)}$	–	4	6	ns
V_{DD} = 30 V, V_{GS} = – 2 V ... + 5 V, R_{GS} = 50 Ω, I_D = 0.25 A	t_r	–	10	15	
Turn-off time t_{off}, (t_{off} = $t_{d(off)}$ + t_f)	$t_{d(off)}$	–	15	20	
V_{DD} = 30 V, V_{GS} = – 2 V ... + 5 V, R_{GS} = 50 Ω, I_D = 0.25 A	t_f	–	25	35	

Electrical Characteristics (cont'd)
at T_j = 25 ˚C, unless otherwise specified.

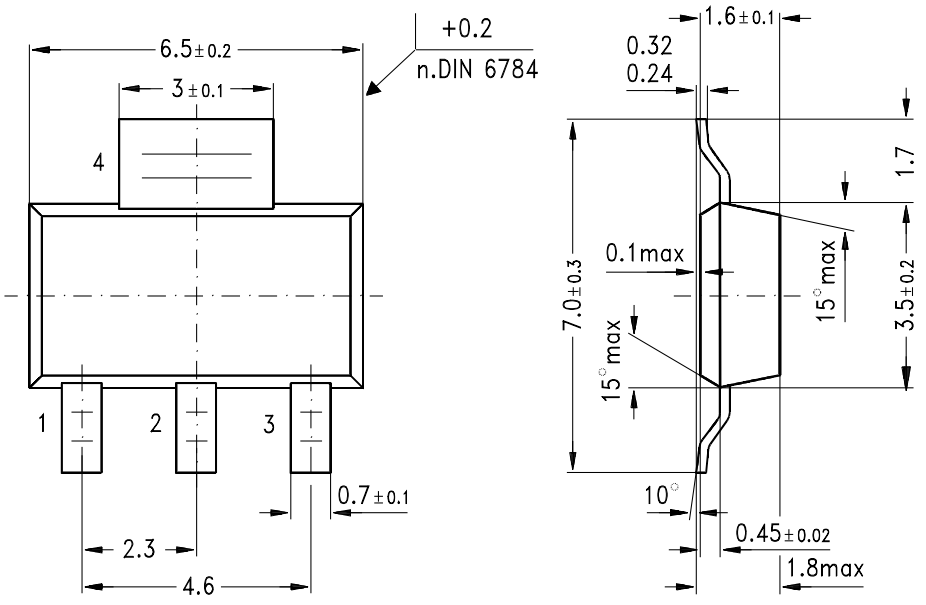
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Continuous reverse drain current T_A = 25 ˚C	I_S	–	–	0.15	A
Pulsed reverse drain current T_A = 25 ˚C	I_{SM}	–	–	0.45	
Diode forward on-voltage I_F = 0.3 A, V_{GS} = 0	V_{SD}	–	0.7	1.4	V

$V_{GS(th)}$ Grouping	Symbol	Limit Values		Unit	Test Condition
		min.	max.		
Range of $V_{GS(th)}$	$\Delta V_{GS(th)}$	–	0.2	V	–
Threshold voltage selected in groups [1]:	$V_{GS(th)}$				V_{DS1} = 0.2 V;
F		– 1.600	– 1.400	V	V_{DS2} = 3 V;
G		– 1.700	– 1.500	V	I_D = 10 µA
A		– 1.800	– 1.600	V	
B		– 1.900	– 1.700	V	
C		– 2.000	– 1.800	V	
D		– 2.100	– 1.900	V	

1) A specific group cannot be ordered separately.
Each reel only contains transistors from one group.

Package Outline

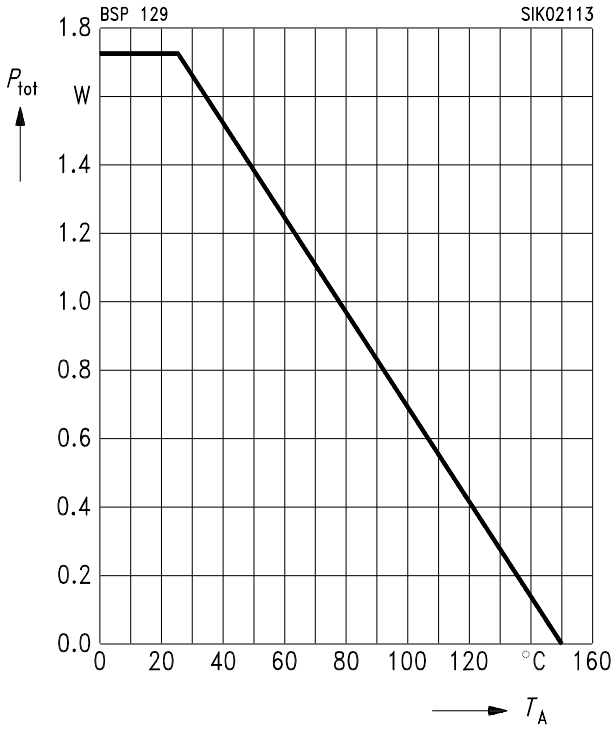
SOT-223



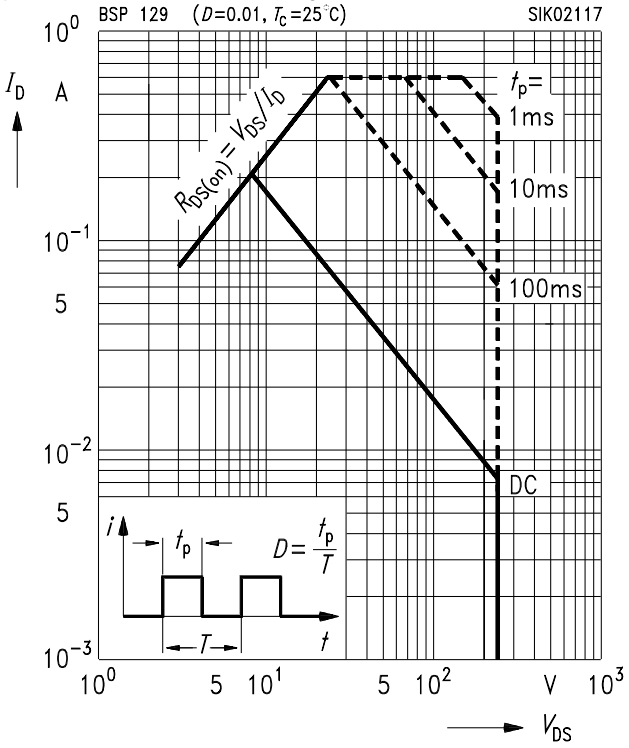
Dimensions in mm

Characteristics
at T_j = 25 ˚C, unless otherwise specified

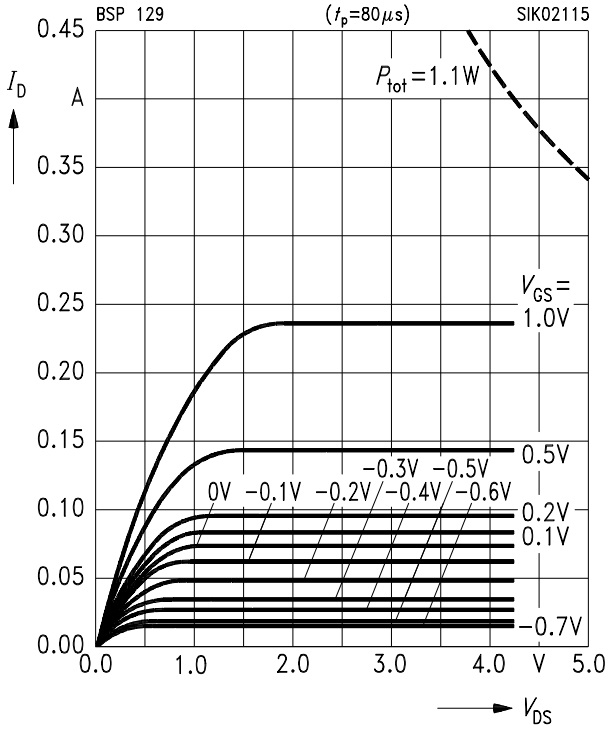
Total power dissipation $P_{tot} = f(T_A)$



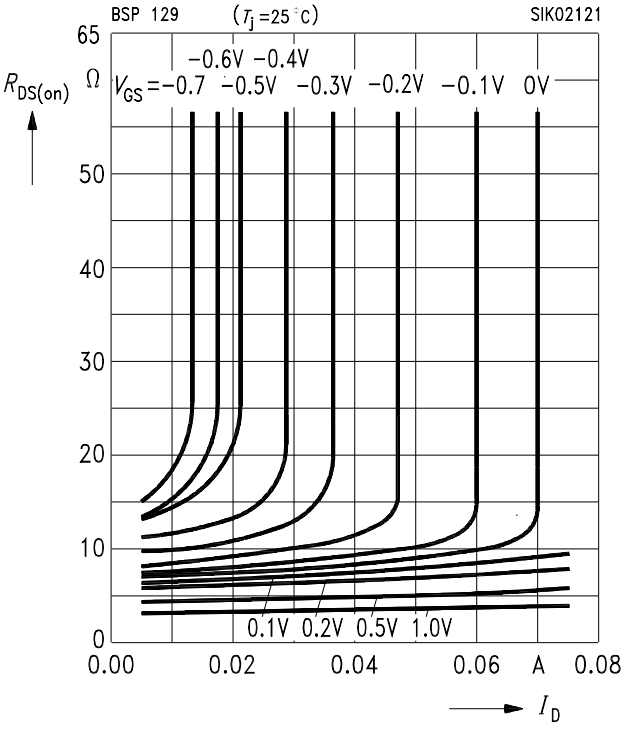
Safe operating area $I_D = f(V_{DS})$
parameter: D = 0.01, T_C = 25 ˚C



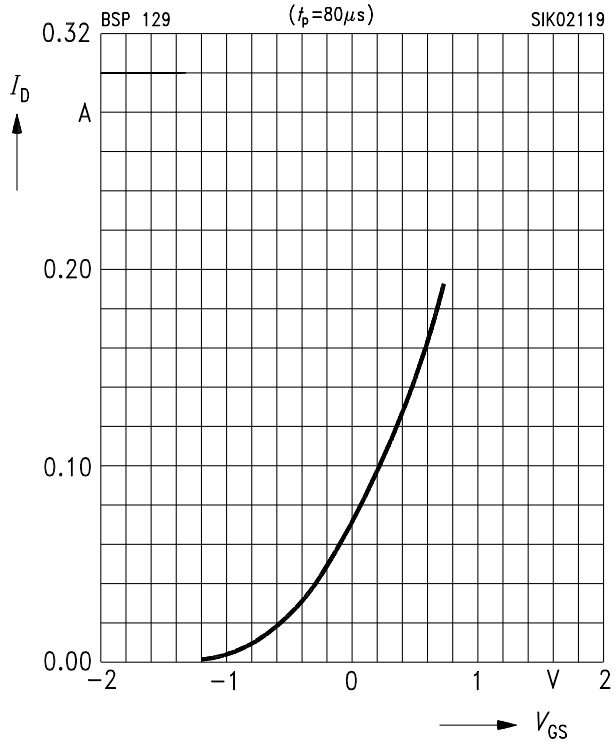
Typ. output characteristics $I_D = f(V_{DS})$
parameter: t_p = 80 µs



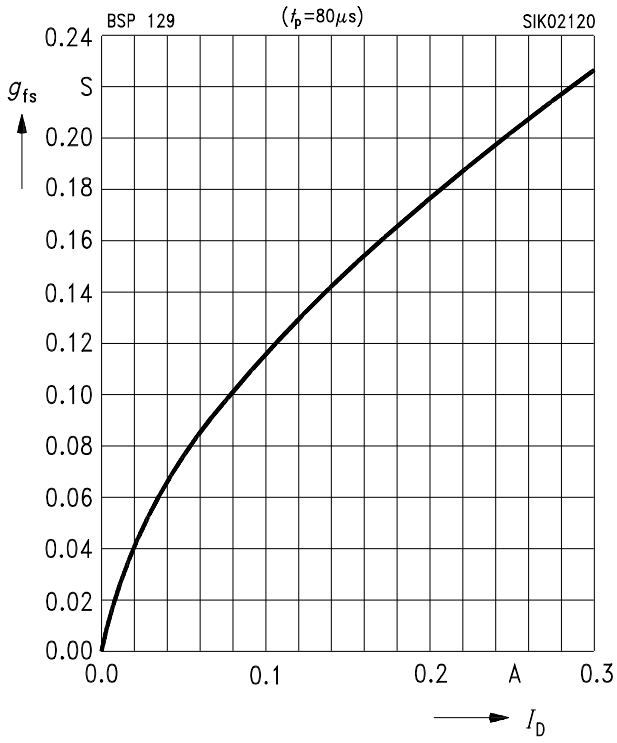
Typ. drain-source on-resistance
$R_{DS(on)} = f(I_D)$
parameter: V_{GS}



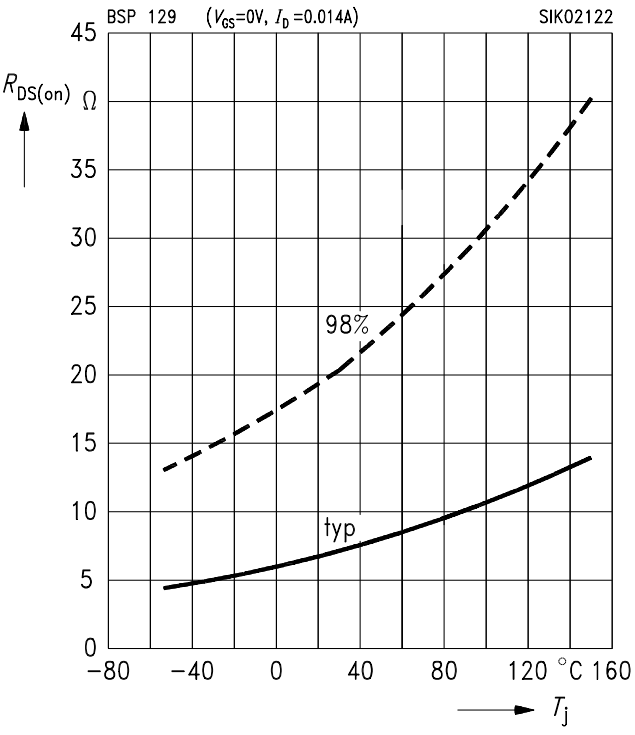
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: t_p = 80 µs, $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$



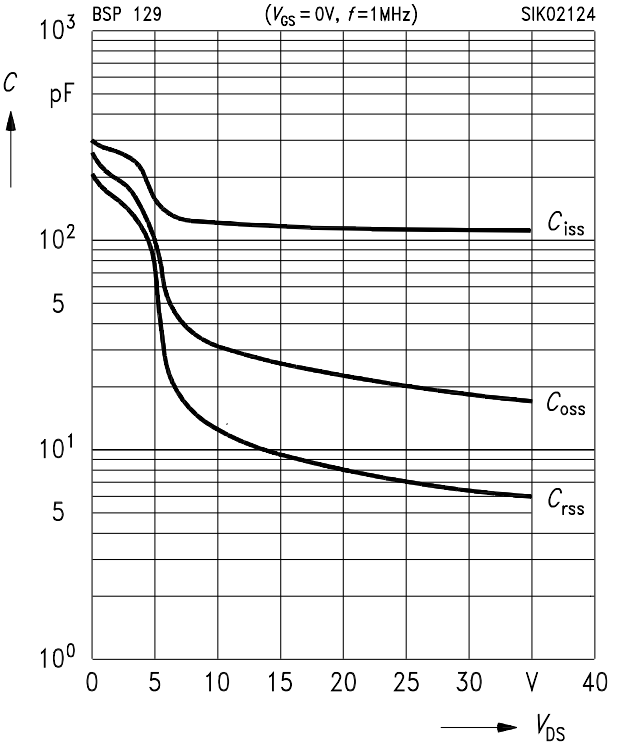
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$, t_p = 80 µs



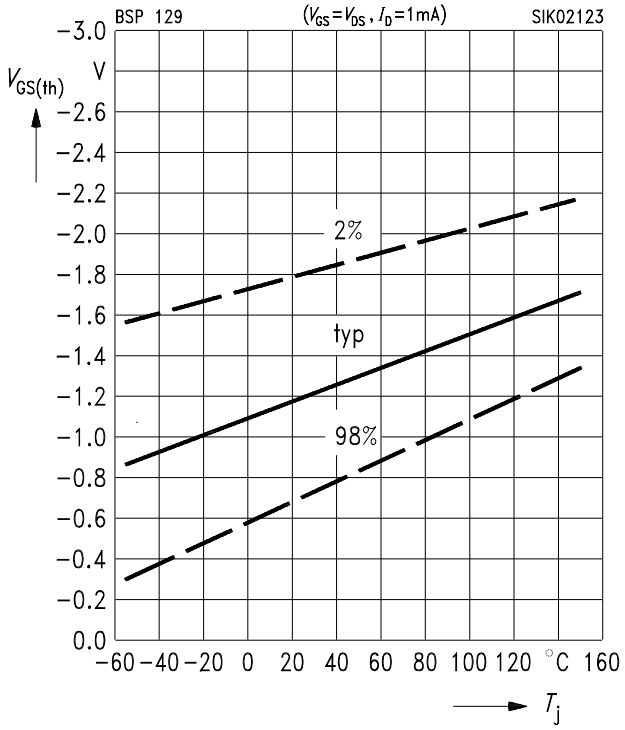
Drain-source on-resistance
$R_{DS(on)} = f(T_j)$
parameter: I_D = 0.014 A, V_{GS} = 0 V, (spread)



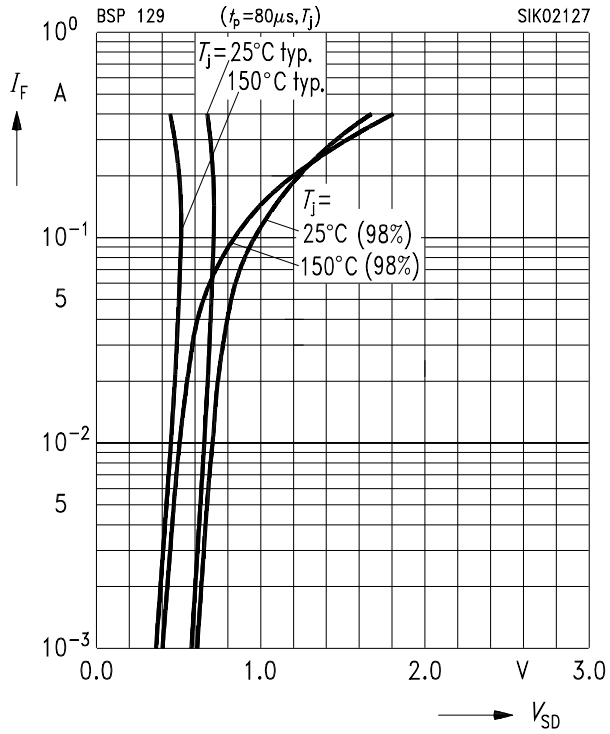
Typ. capacitances $C = f(V_{DS})$
parameter: V_{GS} = 0, f = 1 MHz



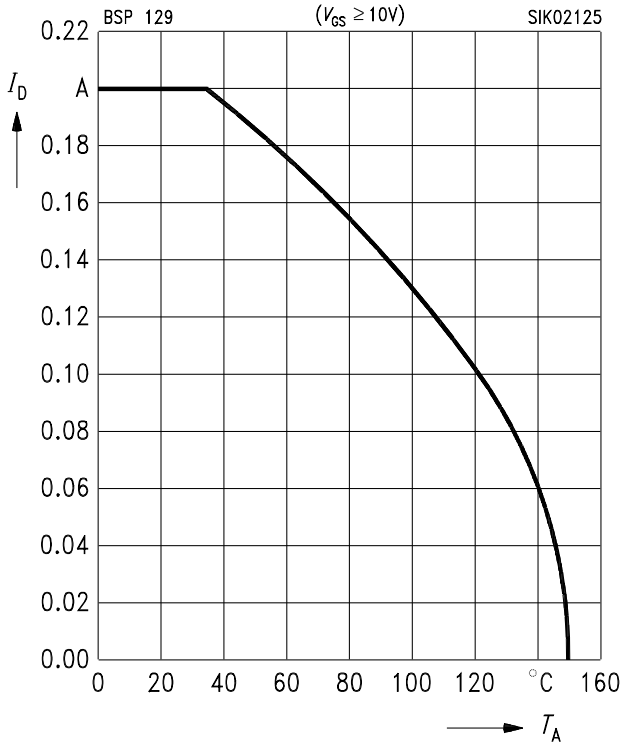
Gate threshold voltage $V_{GS(th)} = f(T_j)$
parameter: V_{DS} = 3 V, I_D = 1 mA, (spread)



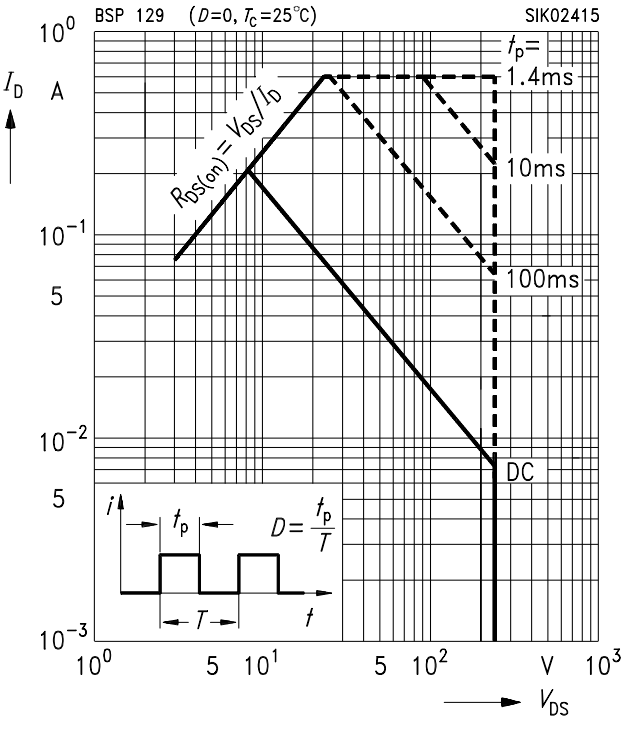
Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: t_p = 80 µs, T_j, (spread)



Drain current $I_D = f(T_A)$
parameter: $V_{GS} \geq 3$ V

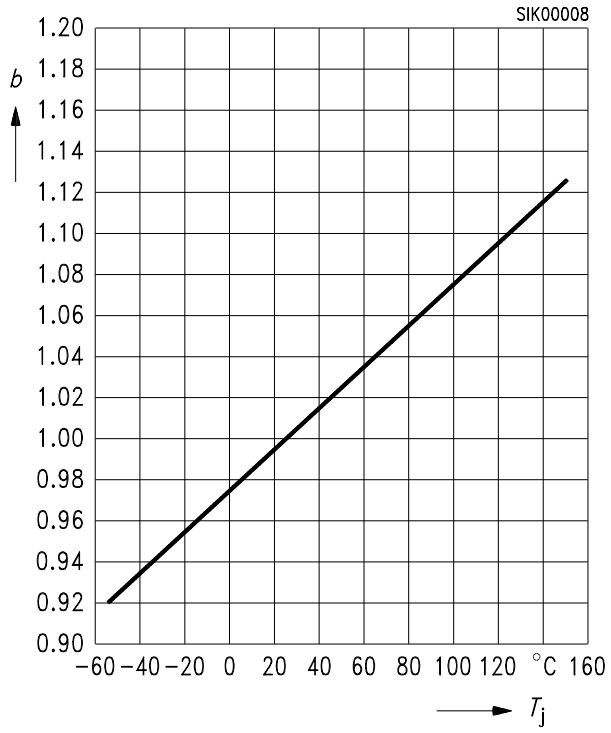


Safe operating area $I_D = f(V_{DS})$
parameter: D = 0, T_C = 25 ℃



Drain-source breakdown voltage

$V_{(BR)\ DSS} = b \times V_{(BR)DSS}$ (25 ˚C)



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