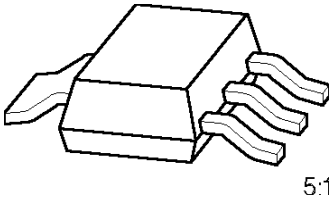
SIEMENS

SIPMOS® Small-Signal Transistor — BSP 315

- V_{DS} – 50 V
- I_D – 1.1 A
- $R_{DS(on)}$ 0.8 Ω
- $V_{GS(th)}$ – 0.8 … – 2.0 V
- P channel
- Enhancement mode
- Logic level



Type	Ordering Code	Tape and Reel Information	Pin Configuration 1	2	3	4	Marking	Package
BSP 315	Q67000-S075	E6327: 1000 pcs/reel	G	D	S	D	BSP 315	SOT-223
BSP 315	Q67000-S249	E6433: 4000 pcs/reel						

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	V_{DS}	– 50	V
Drain-gate voltage, R_{GS} = 20 kΩ	V_{DGR}	– 50	
Gate-source voltage	V_{GS}	± 20	
Continuous drain current, T_A = 39 ℃	I_D	– 1.1	A
Pulsed drain current, T_A = 25 ℃	$I_{D\ puls}$	– 4.4	
Max. power dissipation, T_A = 25 ℃	P_{tot}	1.8	W
Operating and storage temperature range	T_j, T_{stg}	– 55 … + 150	℃

Thermal resistance [1]	chip-ambient chip-soldering point	R_{thJA} R_{thJS}	70 7	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} = 0, I_D = – 0.25 mA	$V_{(BR)DSS}$	– 50	–	–	V
Gate threshold voltage V_{GS} = V_{DS}, I_D = – 1 mA	$V_{GS(th)}$	– 0.8	– 1.1	– 2.0	
Zero gate voltage drain current V_{DS} = – 50 V, V_{GS} = 0 V_{DS} = – 50 V, V_{GS} = 0; T_j = 125 °C V_{DS} = – 30 V, V_{GS} = 0	I_{DSS}	 – – –	 – 0.1 – 10 –	 – 1.0 – 100 – 100	 µA µA nA
Gate-source leakage current V_{GS} = – 20 V, V_{DS} = 0	I_{GSS}	–	– 10	– 100	nA
Drain-source on-resistance V_{GS} = – 10 V, I_D = – 1.1 A	$R_{DS(on)}$	–	0.65	0.8	Ω
Dynamic Characteristics					
Forward transconductance V_{DS} ≥ 2 × I_D × $R_{DS(on)max}$, I_D = – 1.1 A	g_{fs}	0.25	0.7	–	S
Input capacitance V_{GS} = 0, V_{DS} = – 25 V, f = 1 MHz	C_{iss}	–	300	400	pF
Output capacitance V_{GS} = 0, V_{DS} = – 25 V, f = 1 MHz	C_{oss}	–	150	230	
Reverse transfer capacitance V_{GS} = 0, V_{DS} = – 25 V, f = 1 MHz	C_{rss}	–	85	130	
Turn-on time t_{on}, (t_{on} = $t_{d(on)}$ + t_r) V_{DD} = – 30 V, V_{GS} = – 10 V, R_{GS} = 50 Ω, I_D = – 0.29 A	$t_{d(on)}$	–	8	12	ns
	t_r	–	35	55	
Turn-off time t_{off}, (t_{off} = $t_{d(off)}$ + t_f) V_{DD} = – 30 V, V_{GS} = – 10 V, R_{GS} = 50 Ω, I_D = – 0.29 A	$t_{d(off)}$	–	80	110	
	t_f	–	140	190	

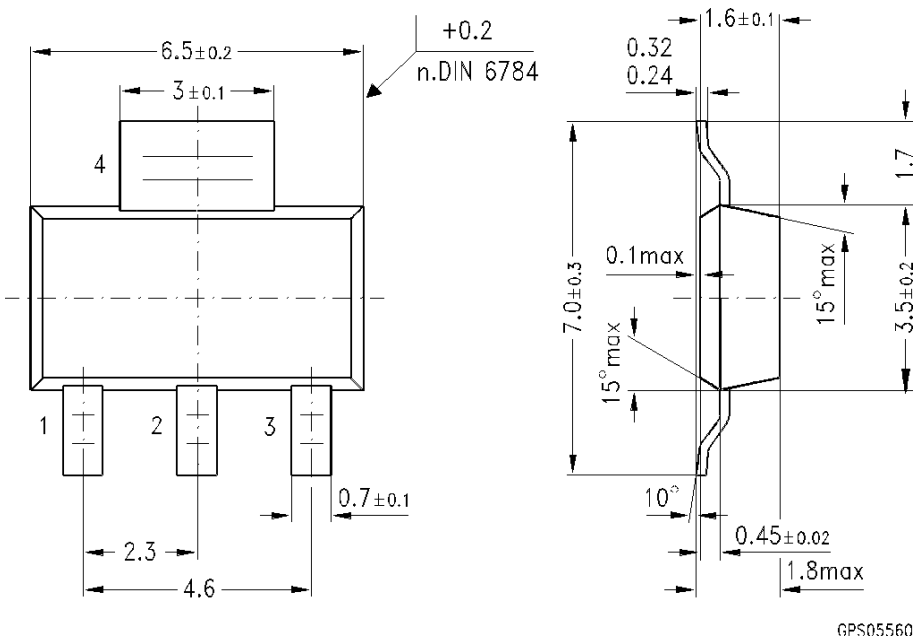
Electrical Characteristics (cont'd)

at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Continuous source current	I_S	–	–	– 1.1	A
Pulsed source current	I_{SM}	–	–	– 4.4	
Diode forward on-voltage I_F = – 2.2 A, V_{GS} = 0	V_{SD}	–	– 1.2	– 1.5	V

Package Outline

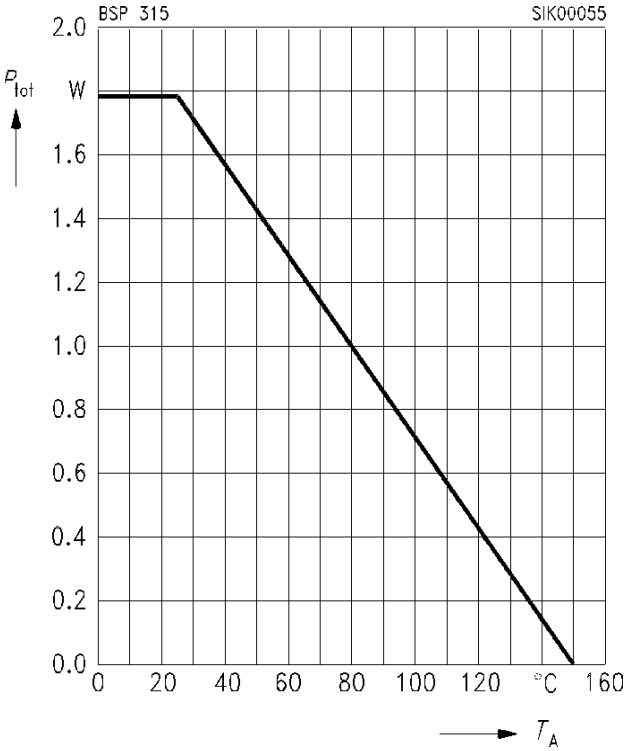
SOT-223



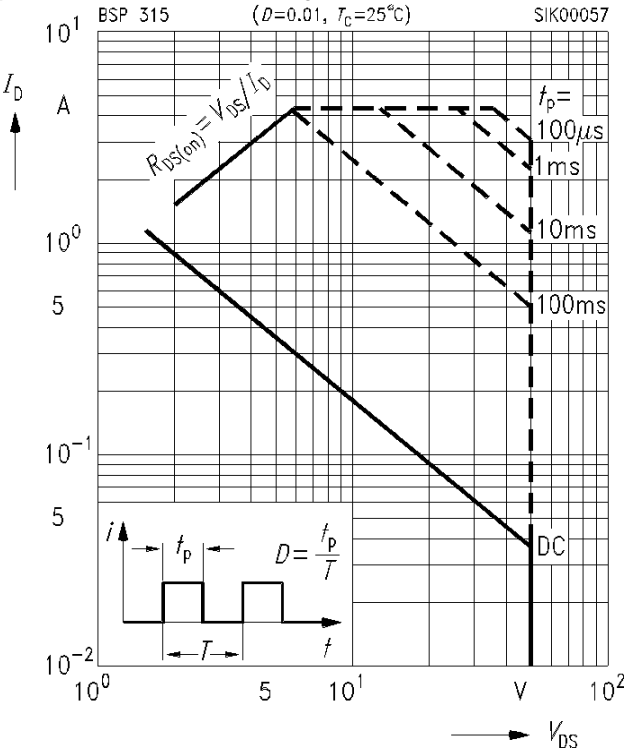
Dimensions in mm

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

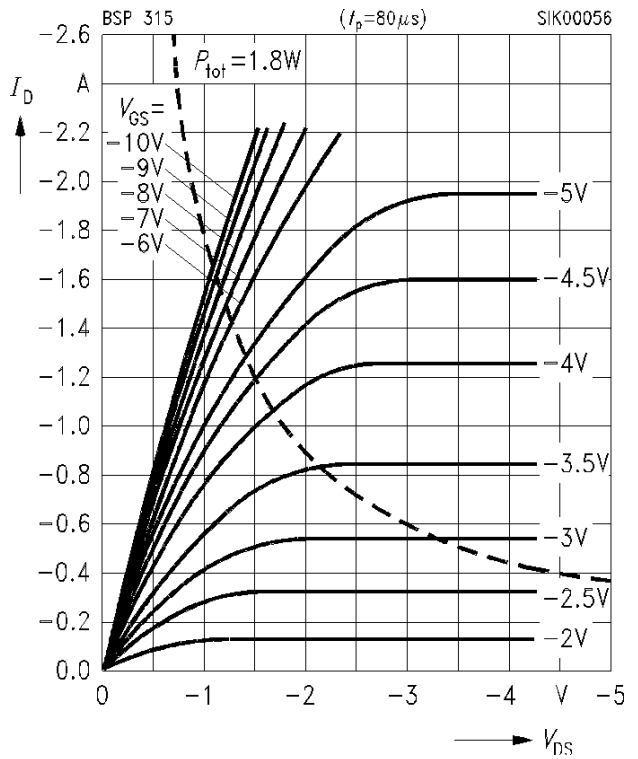
Total power dissipation $P_{tot} = f(T_A)$



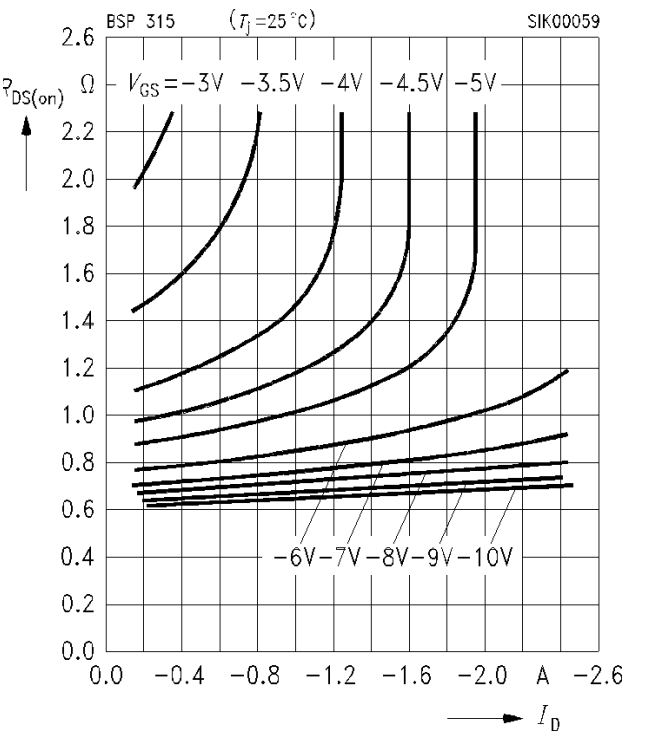
Safe operating area $I_D = f(V_{DS})$
parameter: D = 0.01, T_C = 25 °C



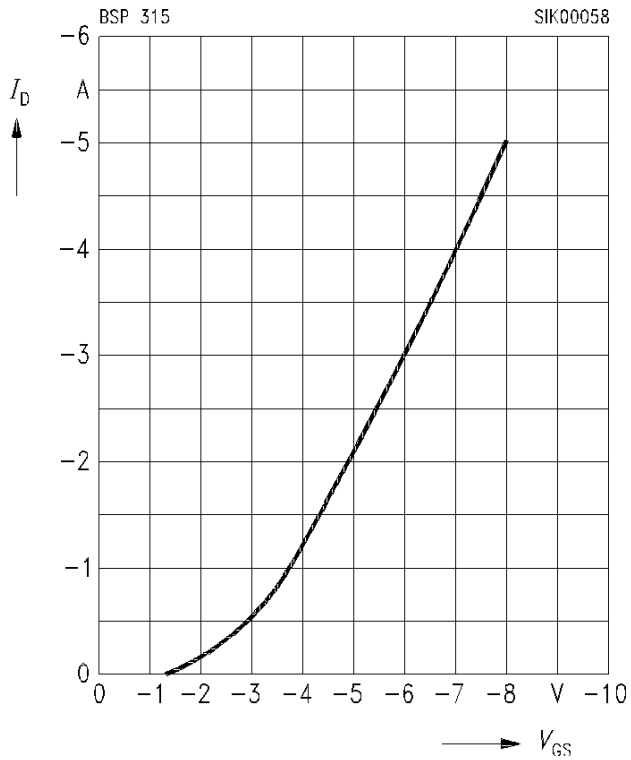
Typ. output characteristics $I_D = f(V_{DS})$
parameter: t_p = 80 µs



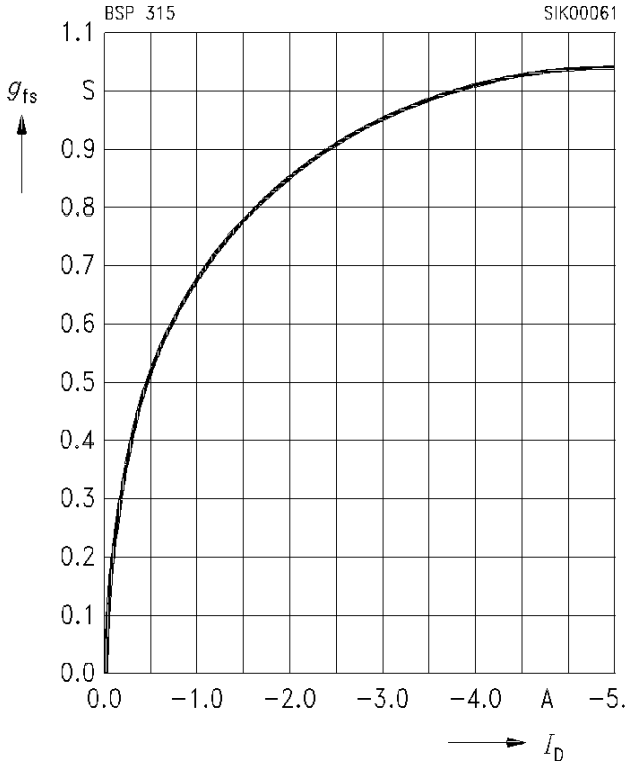
Typ. drain-source on-resistance
$R_{DS(on)} = f(I_D)$
parameter: V_{GS}



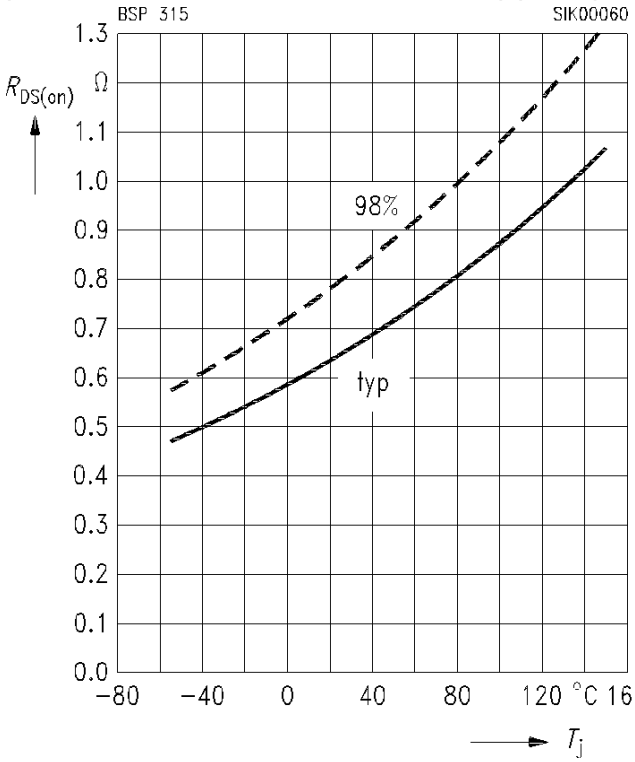
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: t_p = 80 µs, $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$



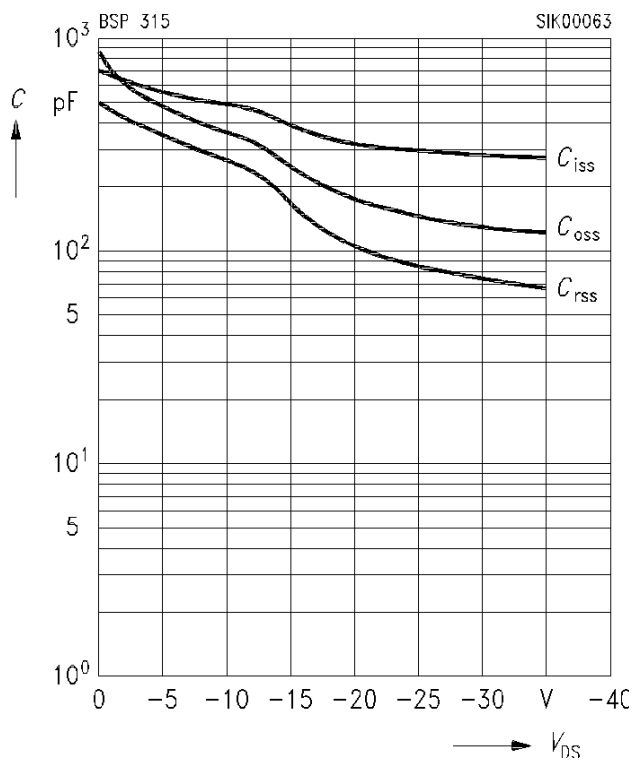
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$, t_p = 80 µs



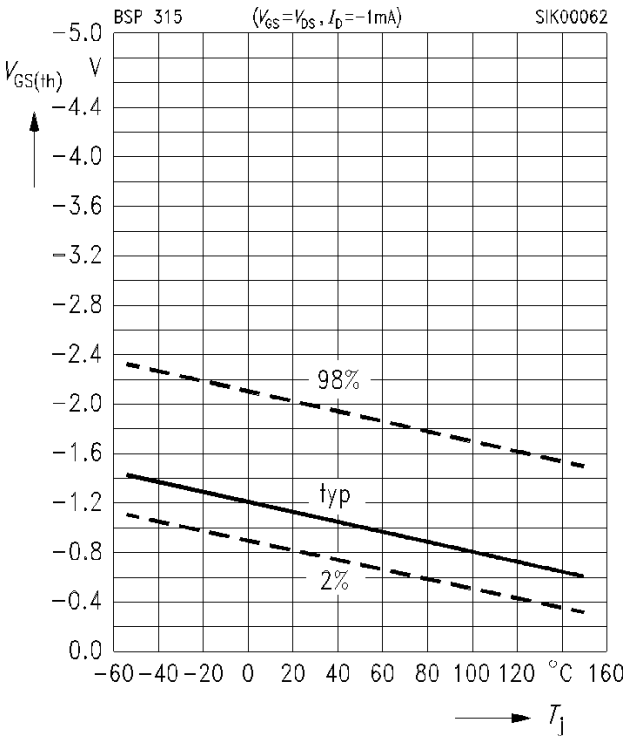
Drain-source on-resistance
$R_{DS(on)} = f(T_j)$
parameter: I_D = – 1.1 A, V_{GS} = – 10 V, (spread)



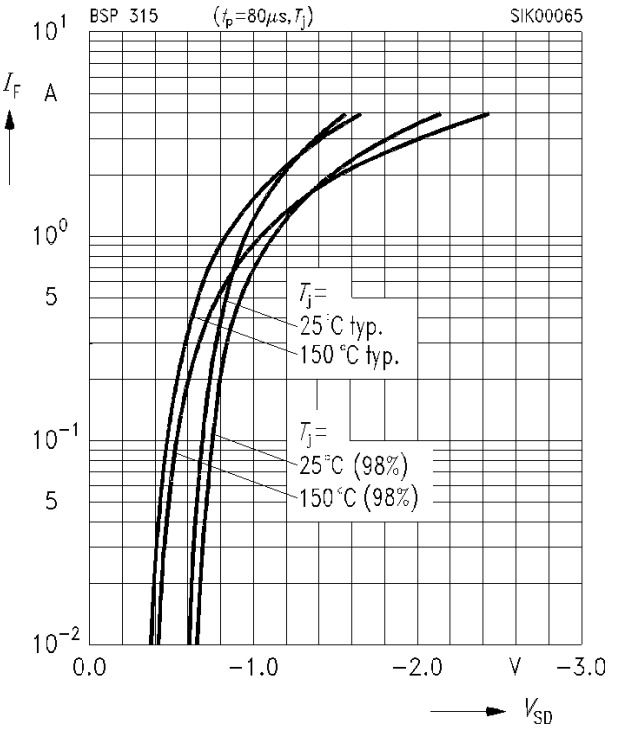
Typ. capacitances $C = f(V_{DS})$
parameter: V_{GS} = 0, f = 1 MHz



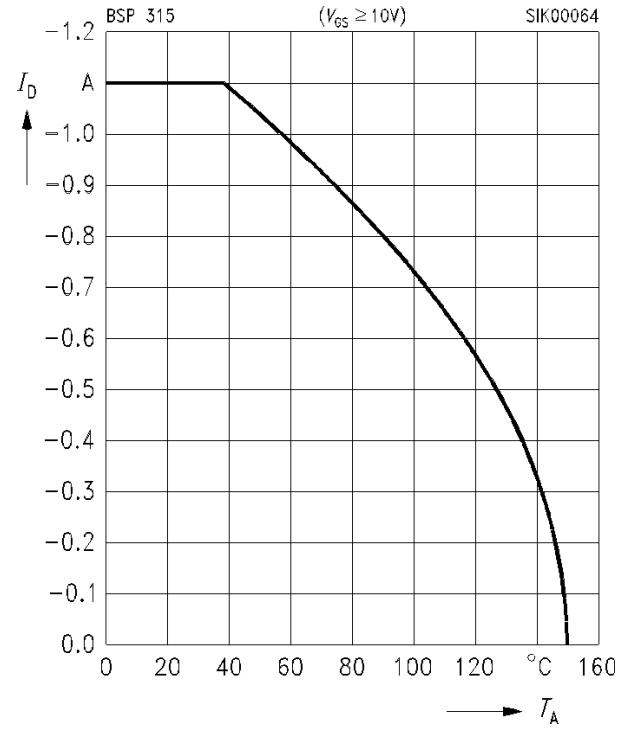
Gate threshold voltage $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, I_D = 1 mA, (spread)



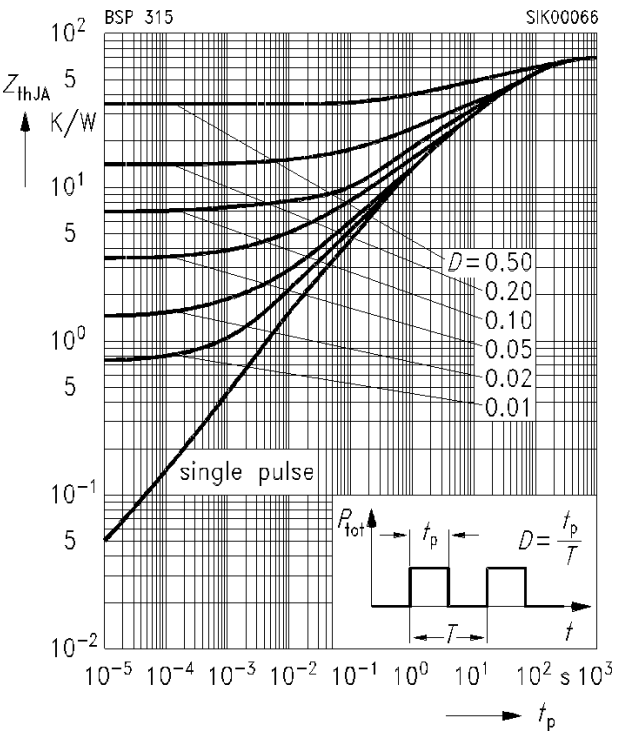
Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: t_p = 80 µs, T_j, (spread)



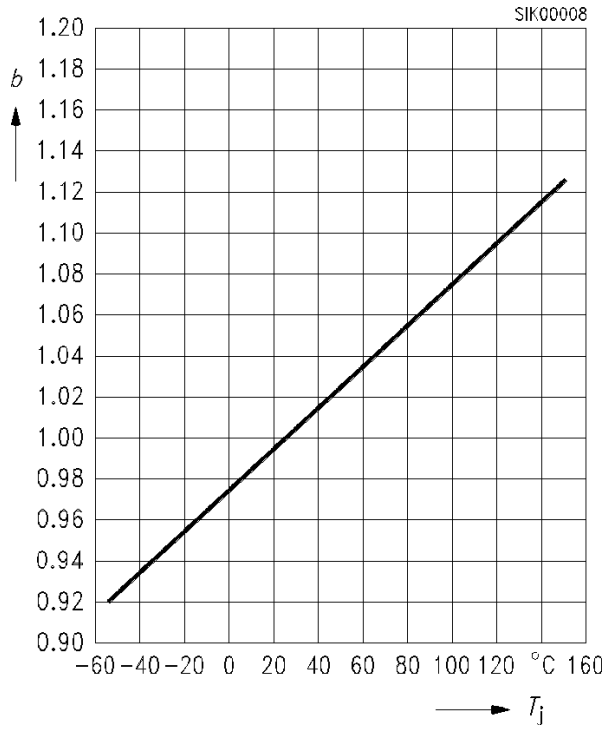
Drain current $I_D = f(T_A)$
parameter: $V_{GS} \geq 10$ V



Transient thermal impedance $Z_{thJA} = f(t_p)$
parameter: $D = t_p / T$



Drain-source breakdown voltage
$V_{(BR)\,DSS} = b \times V_{(BR)DSS}$ (25 ℃)



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