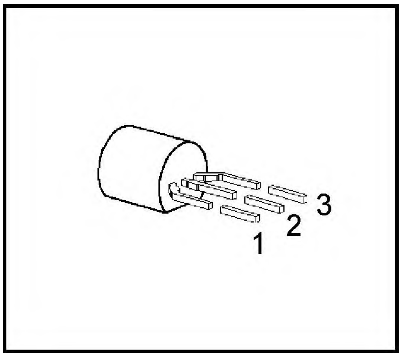
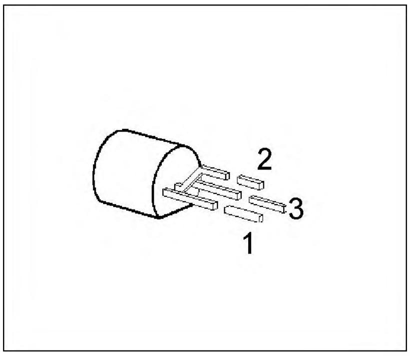
SIEMENS

SIPMOS® Small-Signal Transistor **BSS 129**

- V_{DS} 240 V
- I_D 0.15 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 1	2	3	Marking	Package
BSS 129	Q62702-S510	bulk	G	D	S	BSS 129 marked SS129	TO-92
BSS 129	Q62702-S015	E6288: 1500 pcs/reel; 2 reels/carton; gate first					
BSS 129	Q67000-S116	E6296: 1500 pcs/reel; 2 reels/carton; source first					
BSS 129	Q67000-S313	E7941: 1500 pcs/reel x 2 $V_{GS(th)}$ selected in groups: (**see page 343**)					

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 = 37 °C	I_D	0.15	A
Pulsed drain current, T_A = 25 °C	$I_{D\ puls}$	0.45	
Max. power dissipation, T_A = 25 °C	P_{tot}	1.0	W
Operating and storage temperature range	T_j, T_{stg}	– 55 ... + 150	°C

Thermal resistance, chip-ambient (without heat sink)	R_{thJA}	≤ 125	K/W
DIN humidity category, DIN 40 040	–	E	–
IEC climatic category, DIN IEC 68-1	–	55/150/56	

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	$V_{(BR)DSV}$	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	I_{DSV}				
T_j = 25 ˚C		–	–	100	nA
T_j = 125 ˚C		–	–	200	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)

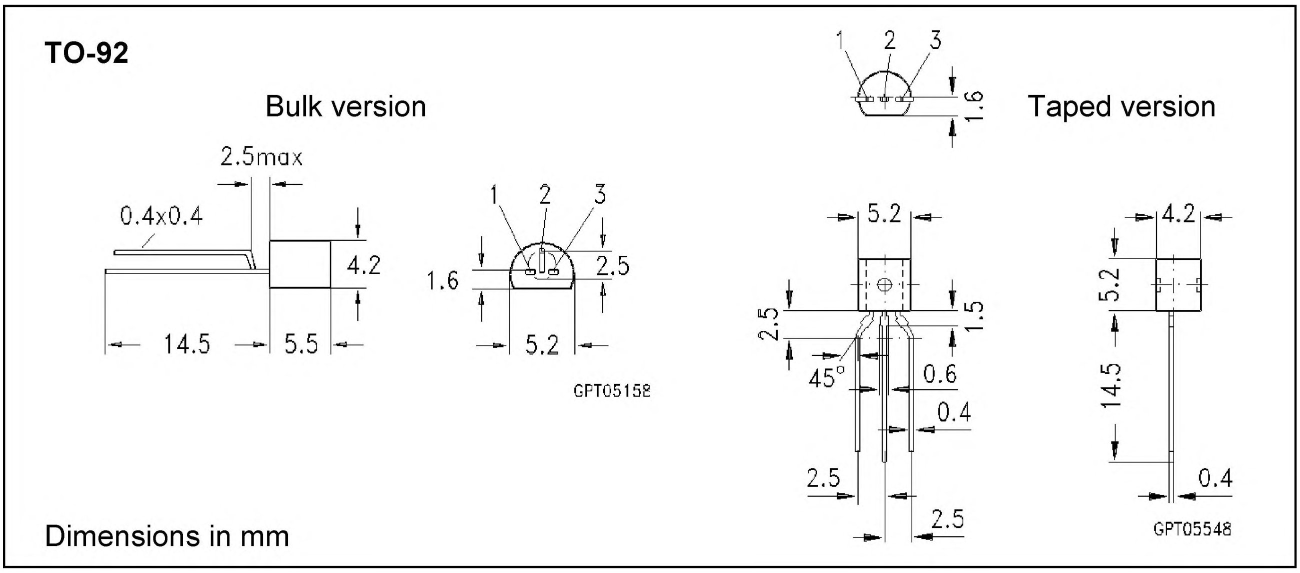
at T_j = 25 ˚C, unless otherwise specified.

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; V_{DS2} = 3 V; I_D = 10 µA
F		– 1.600	– 1.400	V	
G		– 1.700	– 1.500	V	
A		– 1.800	– 1.600	V	
B		– 1.900	– 1.700	V	
C		– 2.000	– 1.800	V	
D		– 2.100	– 1.900	V	

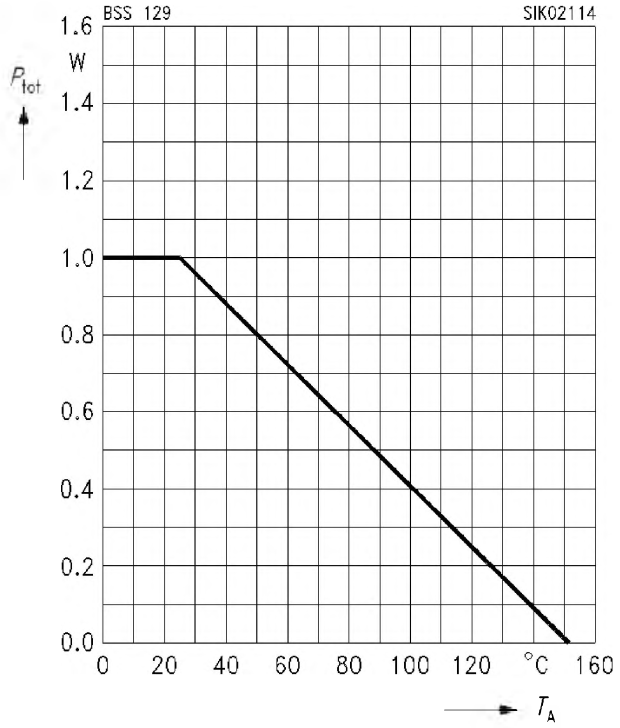
[1] A specific group cannot be ordered seperately.
Each reel only contains transistors from one group.

Package Outline

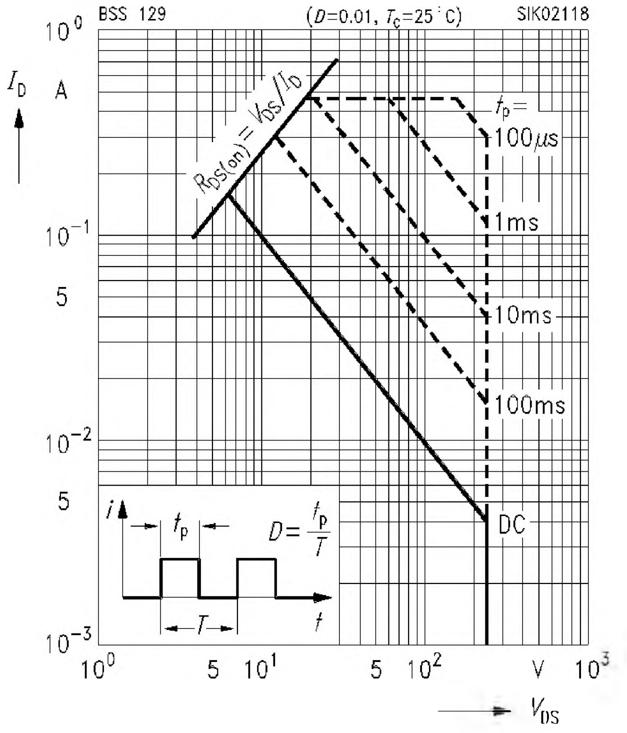


Characteristics
at T_j = 25 °C, unless otherwise specified.

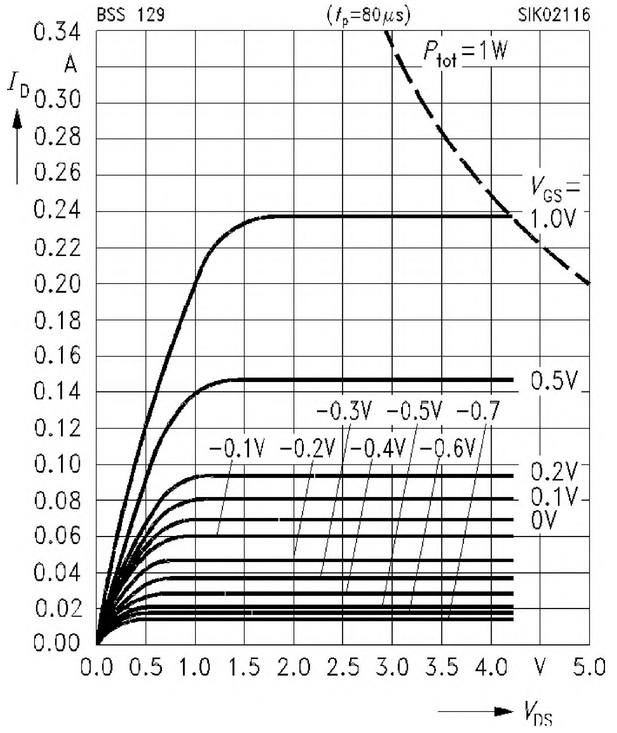
Total power dissipation $P_{tot} = f(T_A)$



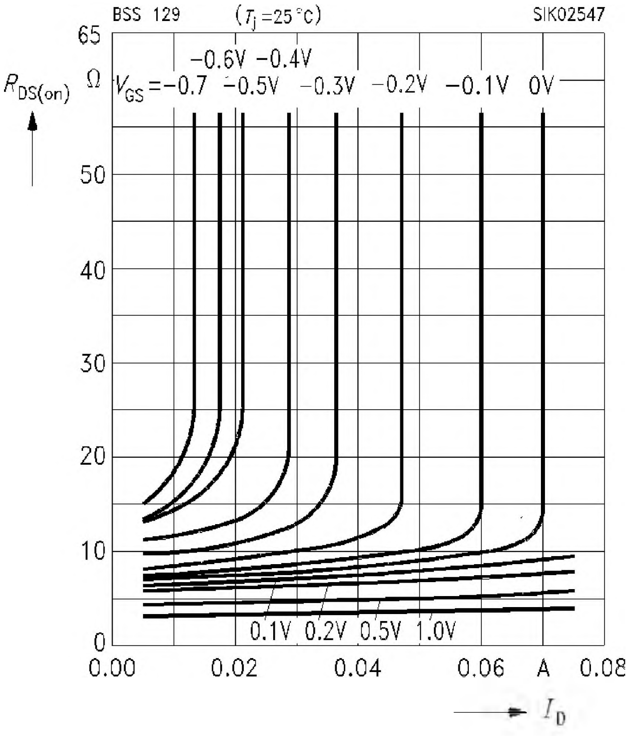
Safe operating area $I_D = f(V_{DS})$
parameter: D = 0.01, T_C = 25 °C



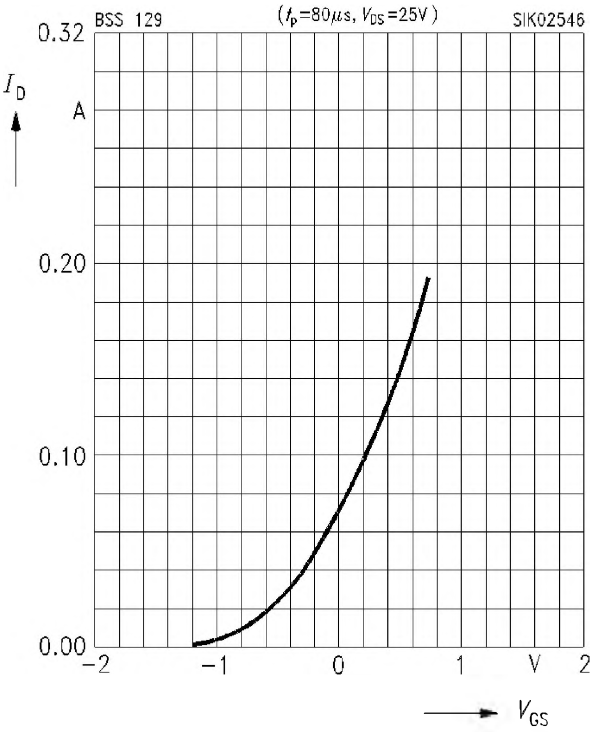
Typ. output characteristics $I_D = f(V_{DS})$
parameter: t_p = 80 µs



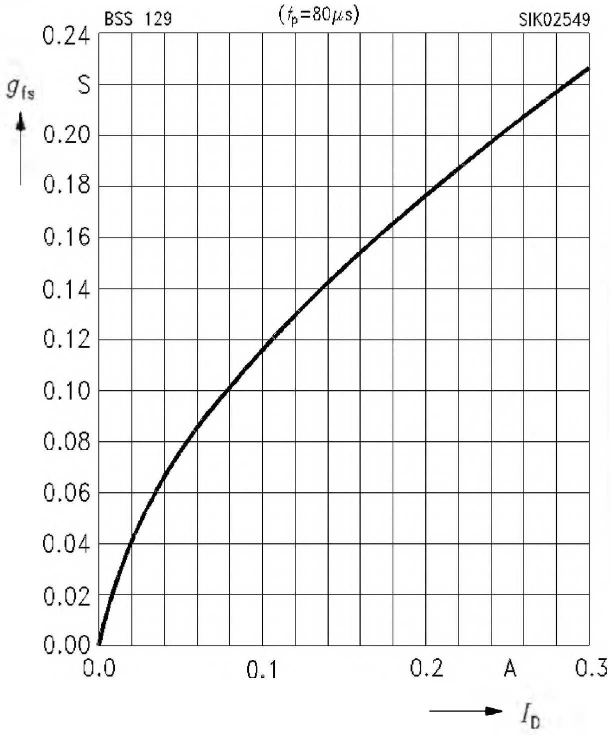
Typ. drain-source on-resistance
$R_{DS(on)} = f(I_D)$
parameter: V_{GS}



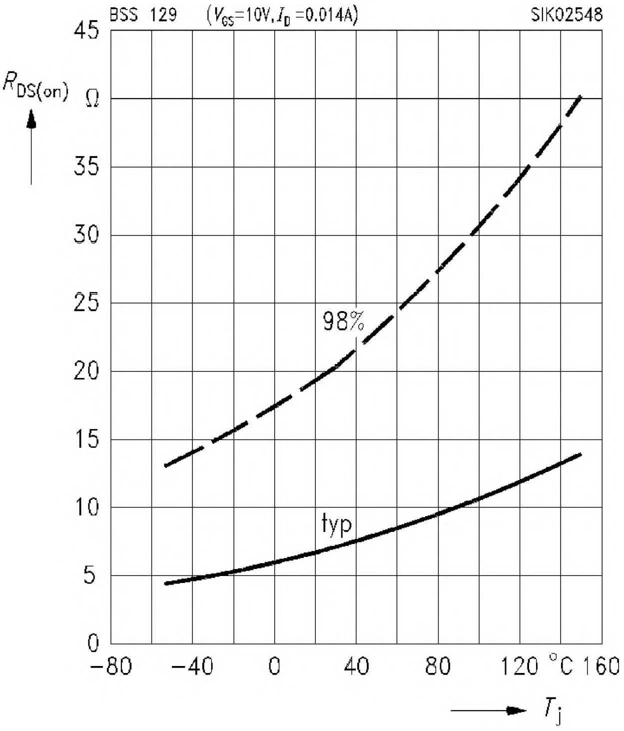
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: t_p = 80 µs, $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$



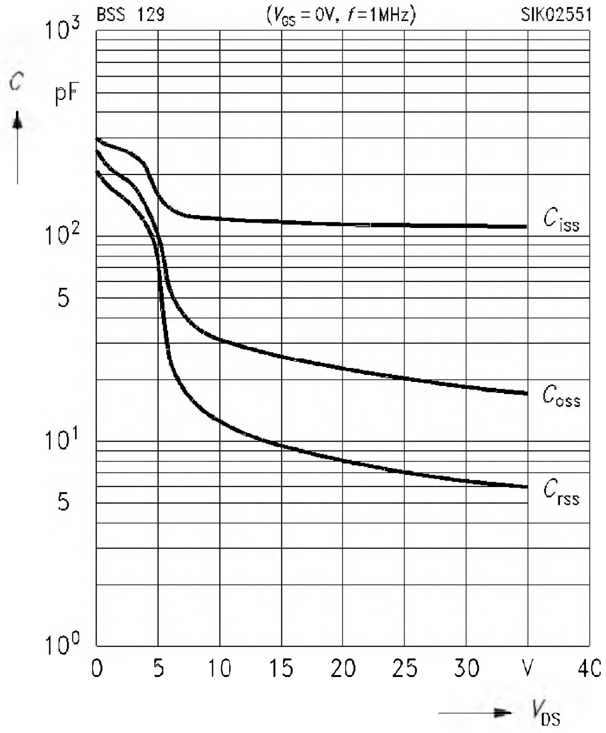
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$, t_p = 80 µs



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

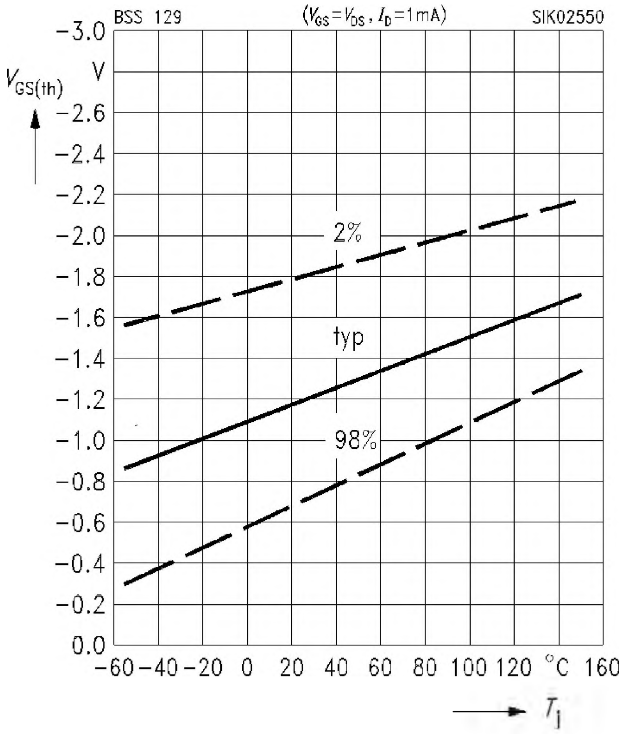


Typ. capacitances $C = f(V_{DS})$
parameter: V_{GS} = 0, f = 1 MHz



Gate threshold voltage $V_{GS(th)} = f(T_j)$

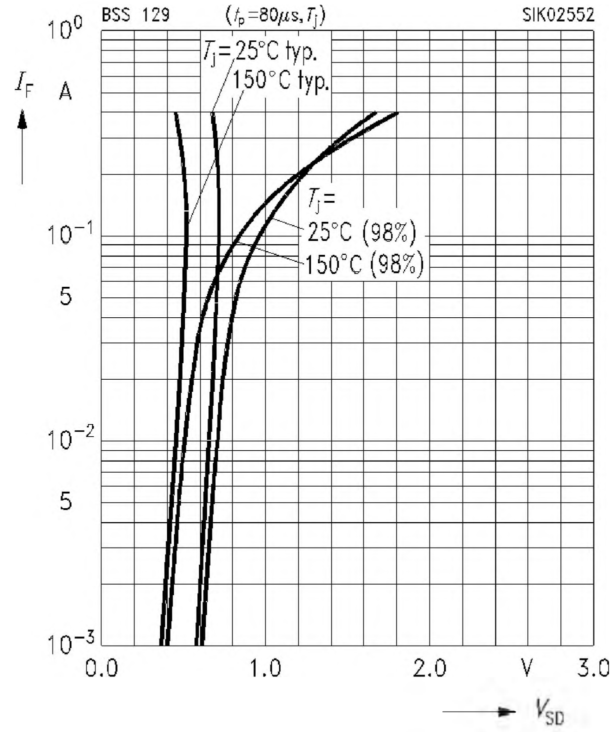
parameter: V_{DS} = 3 V, I_D = 1 mA, (spread)



Forward characteristics of reverse diode

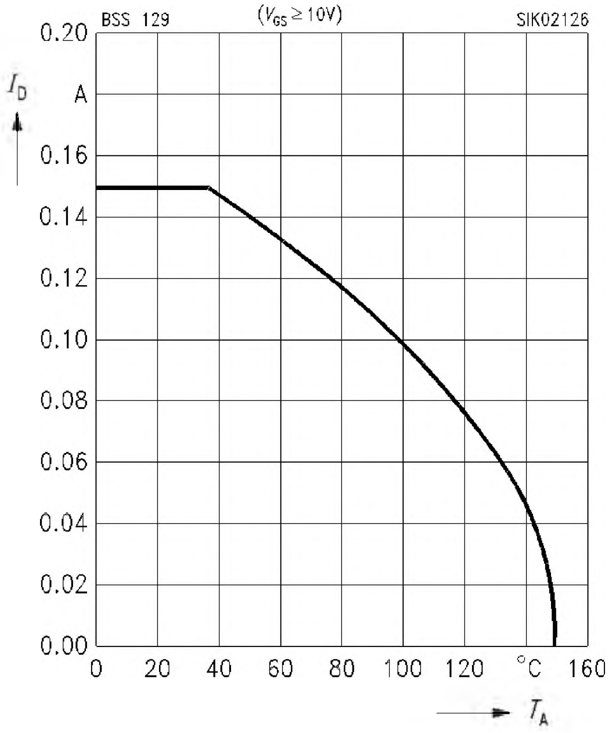
$I_F = f(V_{SD})$

parameter: t_p = 80 µs, T_j, (spread)



Drain current $I_D = f(T_A)$

parameter: $V_{GS} \geq 3$ V



Drain-source breakdown voltage

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