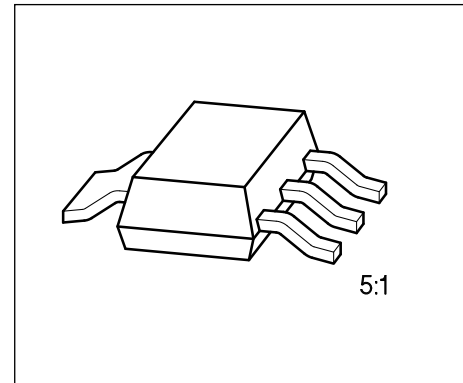


- V_{DS} 240 V
- I_D 0.2 A
- $R_{DS(on)}$ 20 Ω
- N channel
- Depletion mode
- High dynamic resistance
- Available grouped in $V_{GS(th)}$



| 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, $R_{GS} = 20 \text{ k}\Omega$ | V_{DGR} | 240 | |
| Gate-source voltage | V_{GS} | ± 14 | |
| Gate-source peak voltage, aperiodic | V_{gs} | ± 20 | |
| Continuous drain current, $T_A = 34 \text{ }^\circ\text{C}$ | I_D | 0.2 | A |
| Pulsed drain current, $T_A = 25 \text{ }^\circ\text{C}$ | $I_{D \text{ puls}}$ | 0.6 | |
| Max. power dissipation, $T_A = 25 \text{ }^\circ\text{C}$ | P_{tot} | 1.7 | W |
| Operating and storage temperature range | T_j, T_{stg} | $-55 \dots +150$ | $^\circ\text{C}$ |

| | | | | |
|-------------------------------------|----------------------|------------|-----------|-----|
| Thermal resistance ¹⁾ | chip-ambient | R_{thJA} | 72 | K/W |
| | chip-soldering point | R_{thJS} | 12 | |
| 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 $T_j = 25\text{ °C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|-----------|--------|--------|------|------|------|
| | | min. | typ. | max. | |

Static Characteristics

| | | | | | |
|--|---------------|-------|-------|------------|----------|
| Drain-source breakdown voltage $V_{GS} = -3\text{ V}$, $I_D = 0.25\text{ mA}$ | $V_{(BR)DSS}$ | 240 | – | – | V |
| Gate threshold voltage $V_{DS} = 3\text{ V}$, $I_D = 1\text{ mA}$ | $V_{GS(th)}$ | – 1.8 | – 1.2 | – 0.7 | |
| Drain-source cutoff current $V_{DS} = 240\text{ V}$, $V_{GS} = -3\text{ V}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$ | I_{DSS} | – | – | 100 200 | nA μA |
| Gate-source leakage current $V_{GS} = 20\text{ V}$, $V_{DS} = 0$ | I_{GSS} | – | 10 | 100 | nA |
| Drain-source on-resistance $V_{GS} = 0\text{ V}$, $I_D = 0.014\text{ A}$ | $R_{DS(on)}$ | – | 7.0 | 20 | Ω |

Dynamic Characteristics

| | | | | | |
|--|--------------|------|-----|-----|----|
| Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $I_D = 0.25\text{ A}$ | g_{fs} | 0.14 | 0.2 | – | S |
| Input capacitance $V_{GS} = 0$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{iss} | – | 110 | 150 | pF |
| Output capacitance $V_{GS} = 0$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{oss} | – | 20 | 30 | |
| Reverse transfer capacitance $V_{GS} = 0$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$ | C_{rss} | – | 7 | 10 | |
| Turn-on time t_{on} , ($t_{on} = t_{d(on)} + t_r$) $V_{DD} = 30\text{ V}$, $V_{GS} = -2\text{ V} \dots + 5\text{ V}$, $R_{GS} = 50\text{ Ω}$, $I_D = 0.25\text{ A}$ | $t_{d(on)}$ | – | 4 | 6 | ns |
| | t_r | – | 10 | 15 | |
| Turn-off time t_{off} , ($t_{off} = t_{d(off)} + t_f$) $V_{DD} = 30\text{ V}$, $V_{GS} = -2\text{ V} \dots + 5\text{ V}$, $R_{GS} = 50\text{ Ω}$, $I_D = 0.25\text{ A}$ | $t_{d(off)}$ | – | 15 | 20 | |
| | t_f | – | 25 | 35 | |

Electrical Characteristics (cont'd)

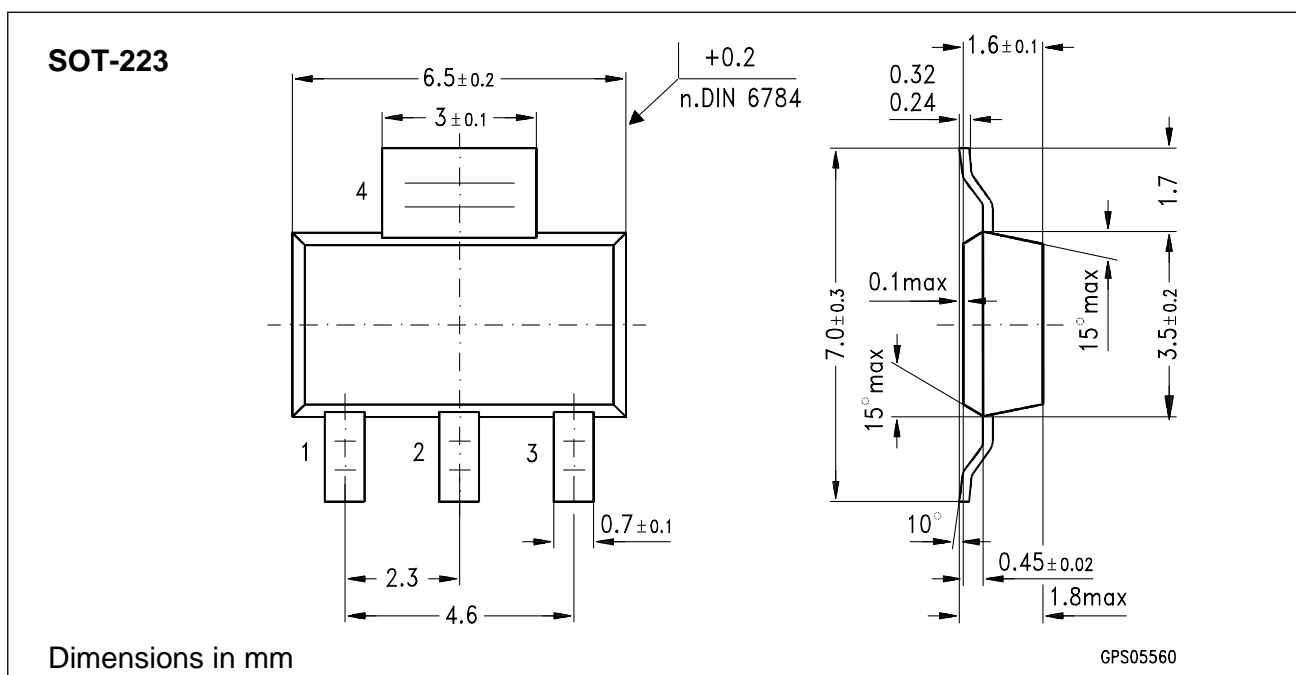
at $T_j = 25\text{ °C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|----------|--------|------|------|------|
| | | min. | typ. | max. | |
| Reverse Diode | | | | | |
| Continuous reverse drain current $T_A = 25\text{ °C}$ | I_S | – | – | 0.15 | A |
| Pulsed reverse drain current $T_A = 25\text{ °C}$ | I_{SM} | – | – | 0.45 | |
| Diode forward on-voltage $I_F = 0.3\text{ A}$, $V_{GS} = 0$ | 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⁾ : | $V_{GS(th)}$ | | | | $V_{DS1} = 0.2\text{ V};$ $V_{DS2} = 3\text{ V};$ $I_D = 10\text{ }\mu\text{A}$ |
| 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 separately.
Each reel only contains transistors from one group.

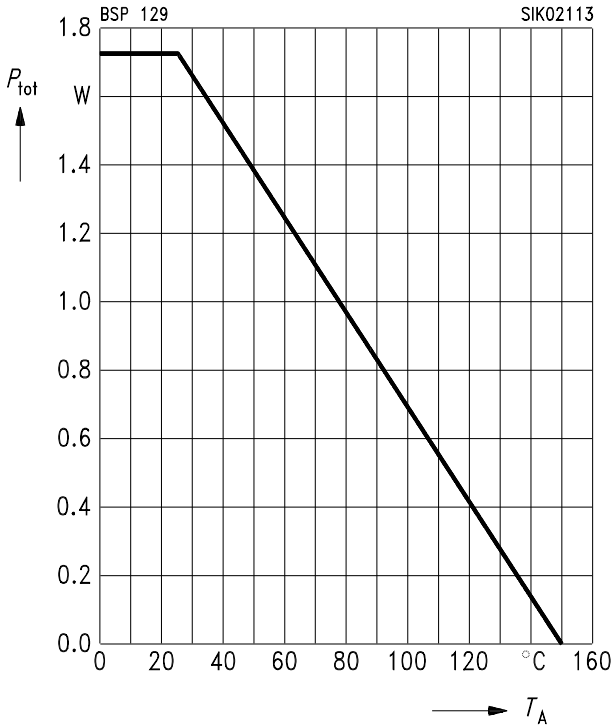
Package Outline



Characteristics

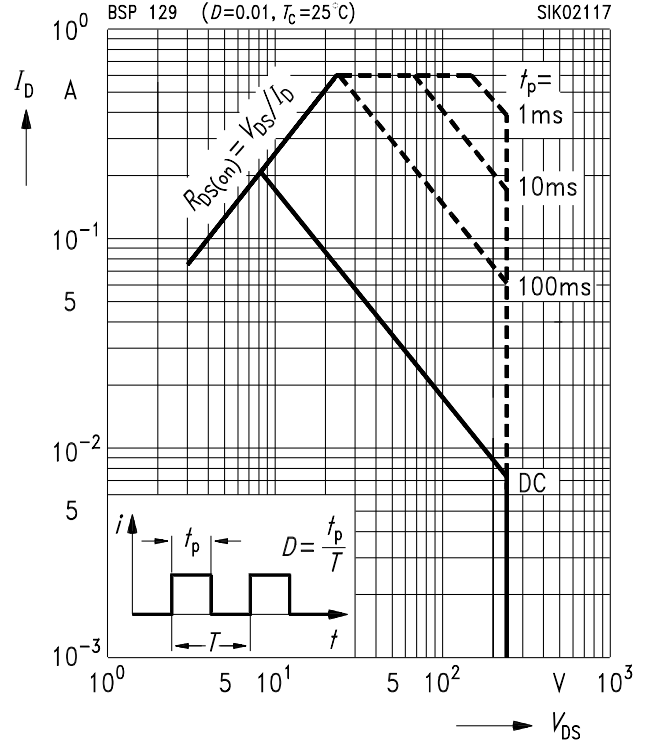
at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

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



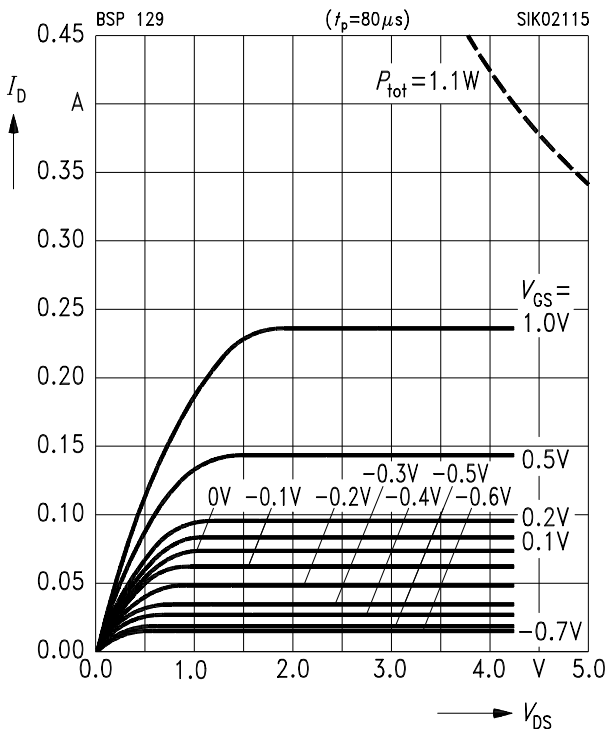
Safe operating area $I_D = f(V_{\text{DS}})$

parameter: $D = 0.01, T_C = 25\text{ }^\circ\text{C}$



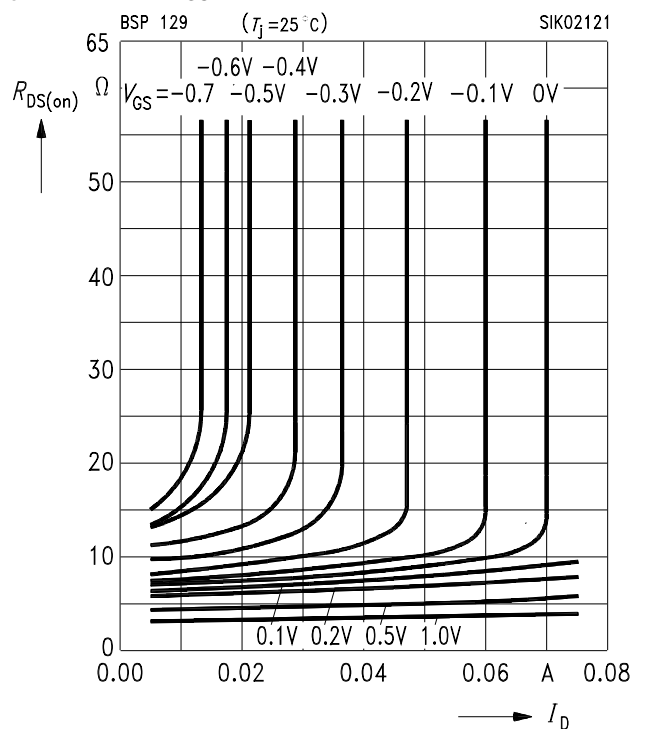
Typ. output characteristics $I_D = f(V_{\text{DS}})$

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

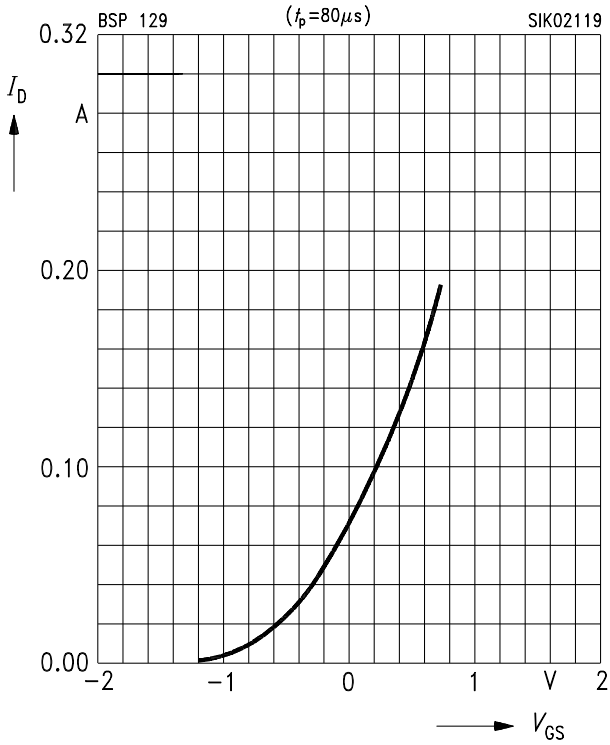


Typ. drain-source on-resistance $R_{\text{DS(on)}} = f(I_D)$

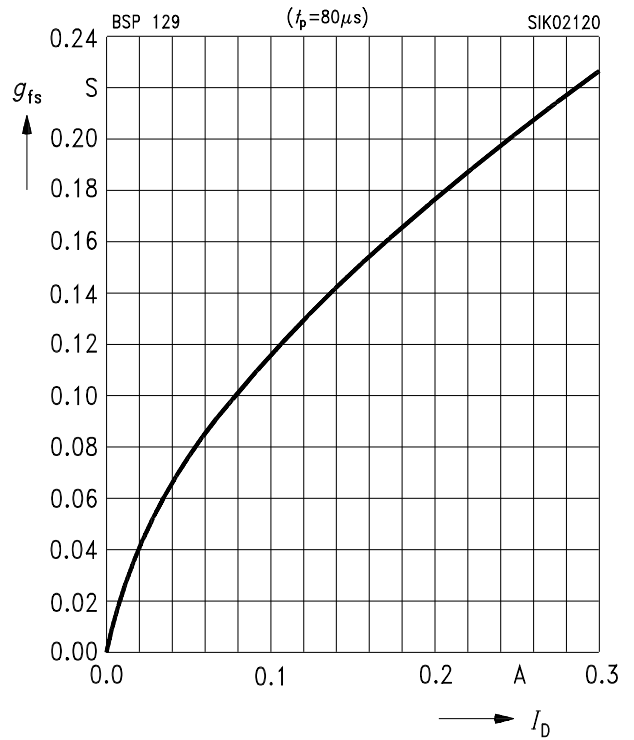
parameter: V_{GS}



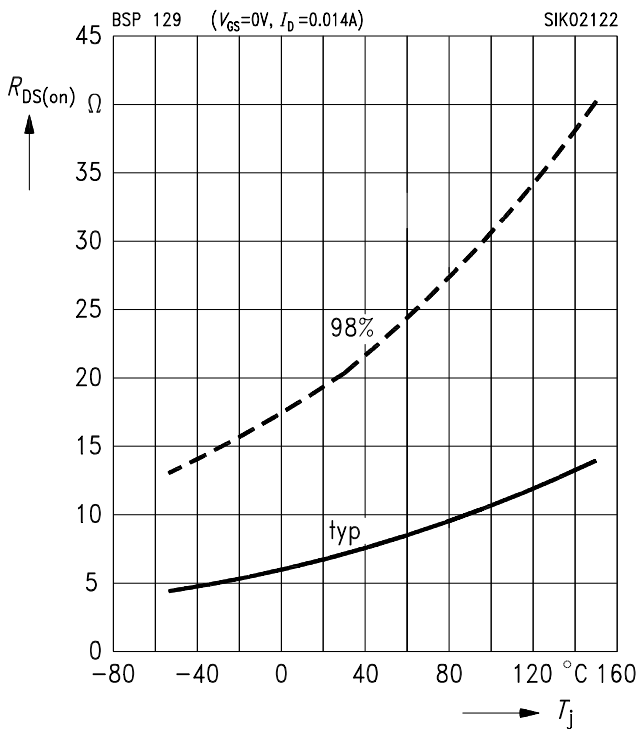
Typ. transfer characteristics $I_D = f(V_{GS})$
 parameter: $t_p = 80 \mu s$, $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$



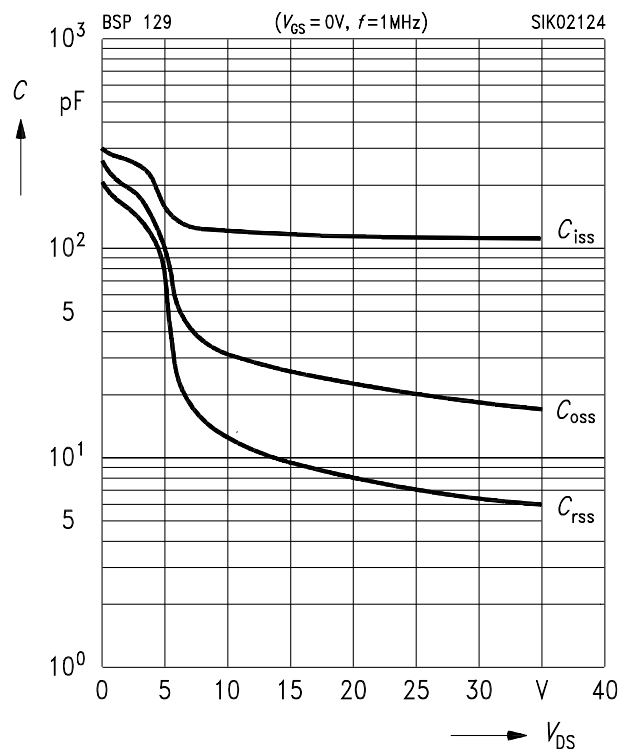
Typ. forward transconductance $g_{fs} = f(I_D)$
 parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$, $t_p = 80 \mu s$



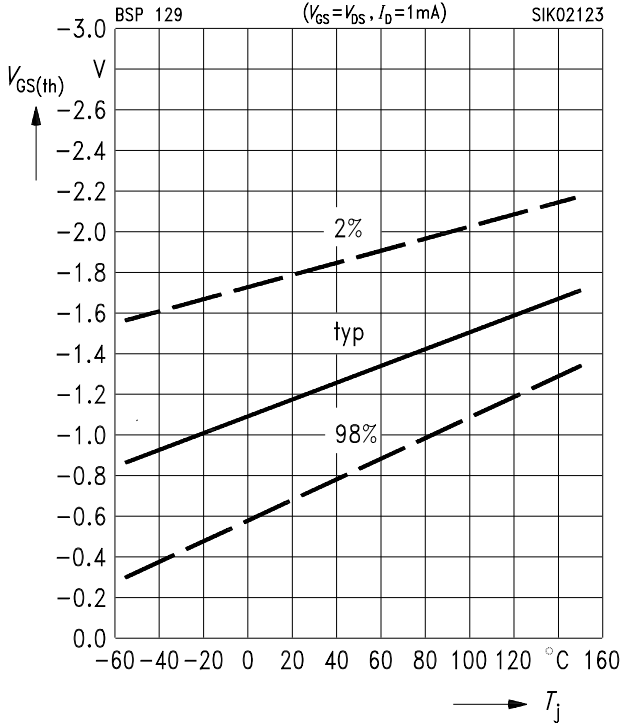
Drain-source on-resistance
 $R_{DS(on)} = f(T_j)$
 parameter: $I_D = 0.014 A$, $V_{GS} = 0 V$, (spread)



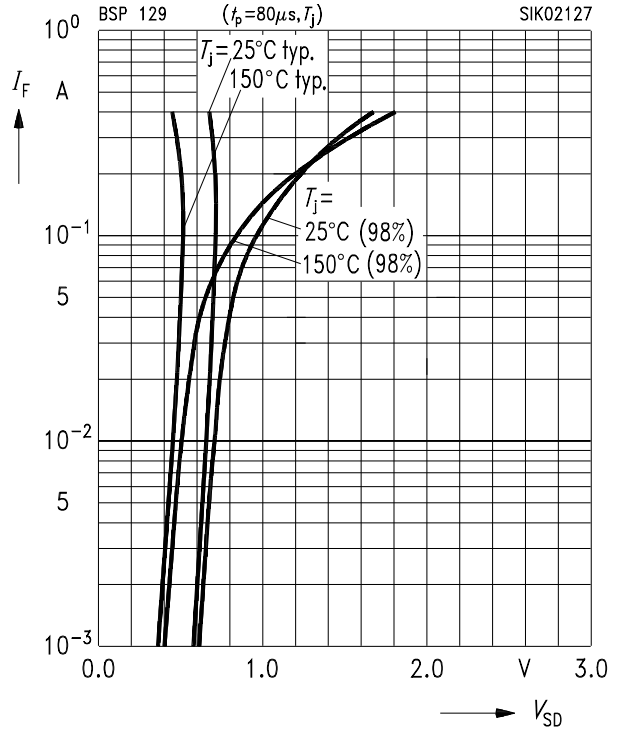
Typ. capacitances $C = f(V_{DS})$
 parameter: $V_{GS} = 0V$, $f = 1 MHz$



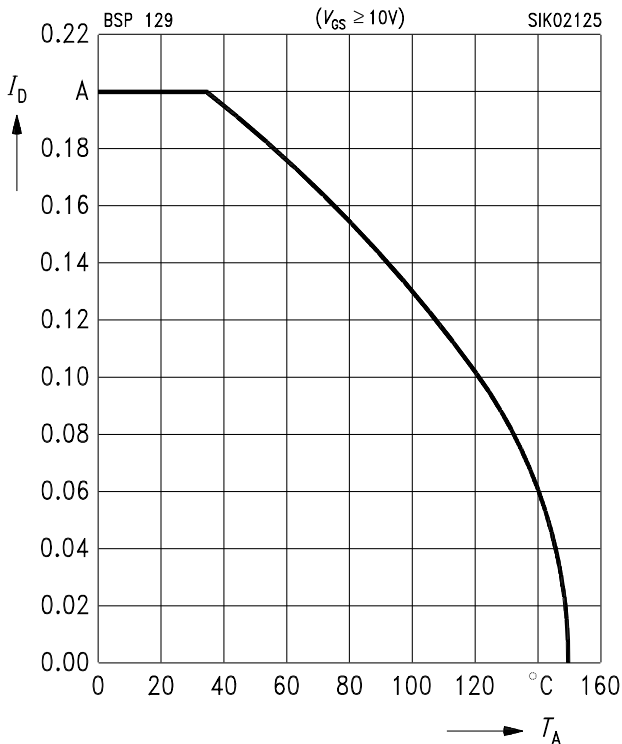
Gate threshold voltage $V_{GS(th)} = f(T_j)$
 parameter: $V_{DS} = 3\text{ V}$, $I_D = 1\text{ mA}$, (spread)



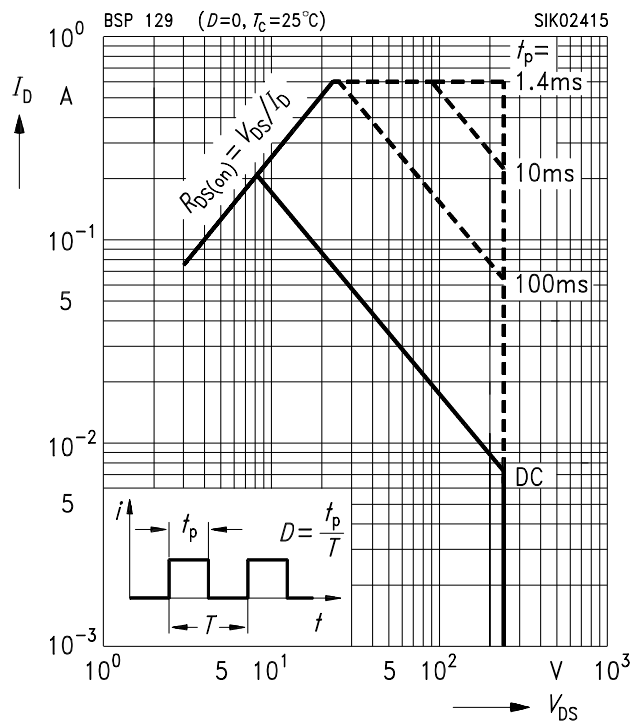
Forward characteristics of reverse diode
 $I_F = f(V_{SD})$
 parameter: $t_p = 80\ \mu\text{s}$, T_j , (spread)



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



Safe operating area $I_D = f(V_{DS})$
 parameter: $D = 0$, $T_c = 25\text{ °C}$



Drain-source breakdown voltage

$$V_{(BR)DSS} = b \times V_{(BR)DSS} (25\text{ }^\circ\text{C})$$

