

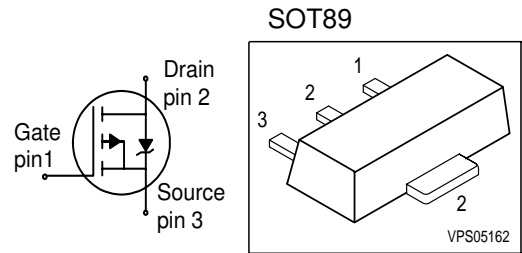
SIPMOS® Small-Signal-Transistor

Feature

- P-Channel
- Enhancement mode
- Logic Level
- dv/dt rated

Product Summary

| | | |
|--------------|-------|----------|
| V_{DS} | -250 | V |
| $R_{DS(on)}$ | 12 | Ω |
| I_D | -0.19 | A |



| Type | Package | Ordering Code | Tape and Reel Information | Marking |
|-----------|---------|---------------|---------------------------|---------|
| BSS 192 P | SOT89 | Q67042-S4168 | - | KC |

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

| Parameter | Symbol | Value | Unit |
|---|-----------------------|---------------|-------------------------|
| Continuous drain current $T_A=25\text{ }^\circ\text{C}$ $T_A=70\text{ }^\circ\text{C}$ | I_D | -0.19 -0.1 | A |
| Pulsed drain current $T_A=25\text{ }^\circ\text{C}$ | $I_{D\text{ puls}}$ | -0.76 | |
| Reverse diode dv/dt $I_S=-0.19\text{ A}$, $V_{DS}=-200\text{ V}$, $di/dt=-200\text{ A}/\mu\text{s}$, $T_{j\text{ max}}=150\text{ }^\circ\text{C}$ | dv/dt | 6 | $\text{kV}/\mu\text{s}$ |
| Gate source voltage | V_{GS} | ± 20 | V |
| Power dissipation $T_A=25\text{ }^\circ\text{C}$ | P_{tot} | 1 | W |
| Operating and storage temperature | T_j, T_{stg} | -55... +150 | $^\circ\text{C}$ |
| IEC climatic category; DIN IEC 68-1 | | 55/150/56 | |

Thermal Characteristics

| Parameter | Symbol | Values | | | Unit |
|---|------------|--------|------|------|------|
| | | min. | typ. | max. | |
| Characteristics | | | | | |
| Thermal resistance, junction - soldering point (Pin 2) | R_{thJS} | - | - | 10 | K/W |
| Thermal resistance, junction - ambient, leaded | R_{thJA} | - | - | 125 | |

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

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

Static Characteristics

| | | | | | |
|--|---------------|------|------|------|---------------|
| Drain-source breakdown voltage $V_{GS}=0, I_D=-250\mu\text{A}$ | $V_{(BR)DSS}$ | -250 | - | - | V |
| Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D=-130\mu\text{A}$ | $V_{GS(th)}$ | -1 | -1.5 | -2 | |
| Zero gate voltage drain current $V_{DS}=-250\text{V}, V_{GS}=0, T_j=25^\circ\text{C}$ $V_{DS}=-250\text{V}, V_{GS}=0, T_j=150^\circ\text{C}$ | I_{DSS} | - | -0.1 | -0.2 | μA |
| Gate-source leakage current $V_{GS}=-20\text{V}, V_{DS}=0$ | I_{GSS} | - | -10 | -100 | nA |
| Drain-source on-state resistance $V_{GS}=-2.8\text{V}, I_D=-0.025\text{A}$ | $R_{DS(on)}$ | - | 10 | 20 | Ω |
| Drain-source on-state resistance $V_{GS}=-4.5\text{V}, I_D=-0.1\text{A}$ | $R_{DS(on)}$ | - | 8.3 | 15 | |
| Drain-source on-state resistance $V_{GS}=-10\text{V}, I_D=-0.19\text{A}$ | $R_{DS(on)}$ | - | 7.7 | 12 | |

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

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

Dynamic Characteristics

| | | | | | | |
|------------------------------|--------------|---|------|------|-----|----|
| Transconductance | g_{fs} | $ V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = -0.1\text{A}$ | 0.19 | 0.38 | - | S |
| Input capacitance | C_{iss} | $V_{GS} = 0, V_{DS} = -25\text{V}$, $f = 1\text{MHz}$ | - | 83 | 104 | pF |
| Output capacitance | C_{oss} | | - | 13 | 16 | |
| Reverse transfer capacitance | C_{rss} | | - | 6 | 8 | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = -125\text{V}, V_{GS} = -10\text{V}$, $I_D = -0.19\text{A}, R_G = 2\Omega$ | - | 4.7 | 7 | ns |
| Rise time | t_r | | - | 5.2 | 8 | |
| Turn-off delay time | $t_{d(off)}$ | | - | 72 | 108 | |
| Fall time | t_f | | - | 50 | 75 | |

Gate Charge Characteristics

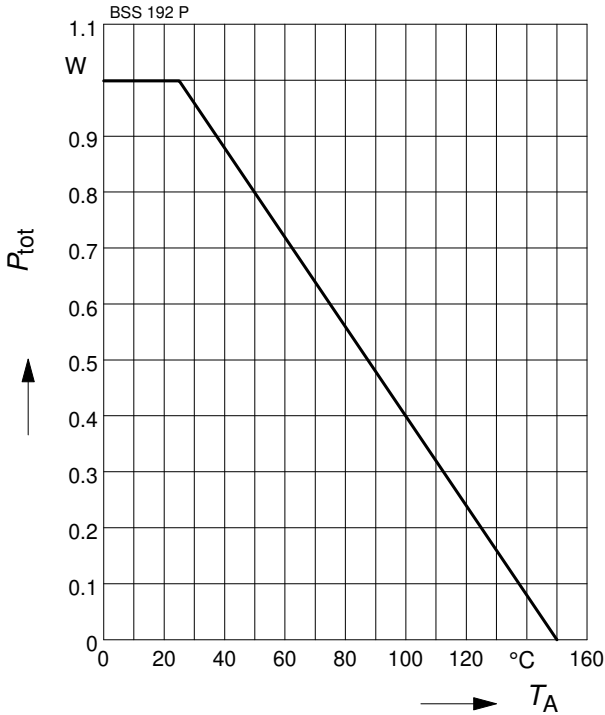
| | | | | | | |
|-----------------------|-----------------|--|---|-------|-------|----|
| Gate to source charge | Q_{gs} | $V_{DD} = -200\text{V}, I_D = -0.19\text{A}$ | - | -0.2 | -0.25 | nC |
| Gate to drain charge | Q_{gd} | | - | -1.9 | -2.4 | |
| Gate charge total | Q_g | $V_{DD} = -200\text{V}, I_D = -0.19\text{A}$, $V_{GS} = 0 \text{ to } -10\text{V}$ | - | -4.9 | -6.1 | |
| Gate plateau voltage | $V_{(plateau)}$ | $V_{DD} = -200\text{V}, I_D = -0.19\text{A}$ | - | -2.63 | - | V |

Reverse Diode

| | | | | | | |
|--|----------|--|---|-------|-------|----|
| Inverse diode continuous forward current | I_S | $T_A = 25\text{ }^\circ\text{C}$ | - | - | -0.19 | A |
| Inv. diode direct current, pulsed | I_{SM} | | - | - | -0.76 | |
| Inverse diode forward voltage | V_{SD} | $V_{GS} = 0, I_F = -0.19\text{A}$ | - | -0.78 | -1.1 | V |
| Reverse recovery time | t_{rr} | $V_R = -125\text{V}, I_F = I_S$, $di_F/dt = 100\text{A}/\mu\text{s}$ | - | 46 | 57 | ns |
| Reverse recovery charge | Q_{rr} | | - | 72 | 90 | |

1 Power dissipation

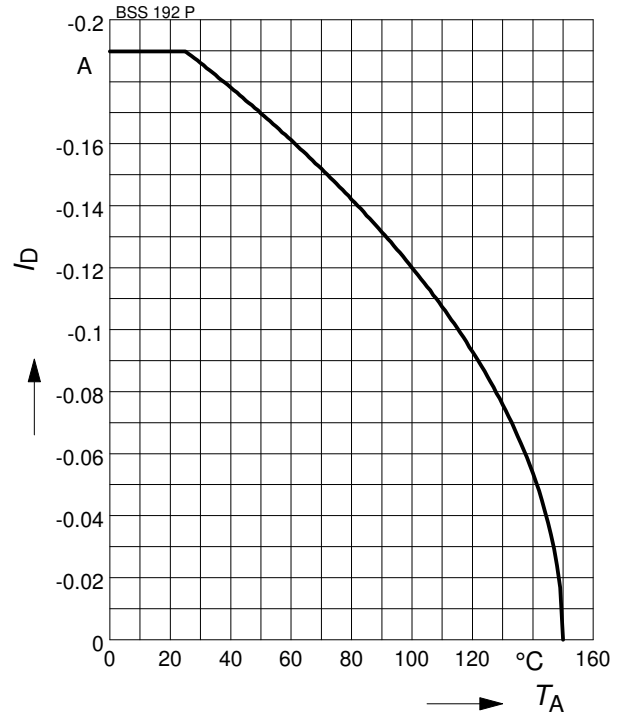
$$P_{tot} = f(T_A)$$



2 Drain current

$$I_D = f(T_A)$$

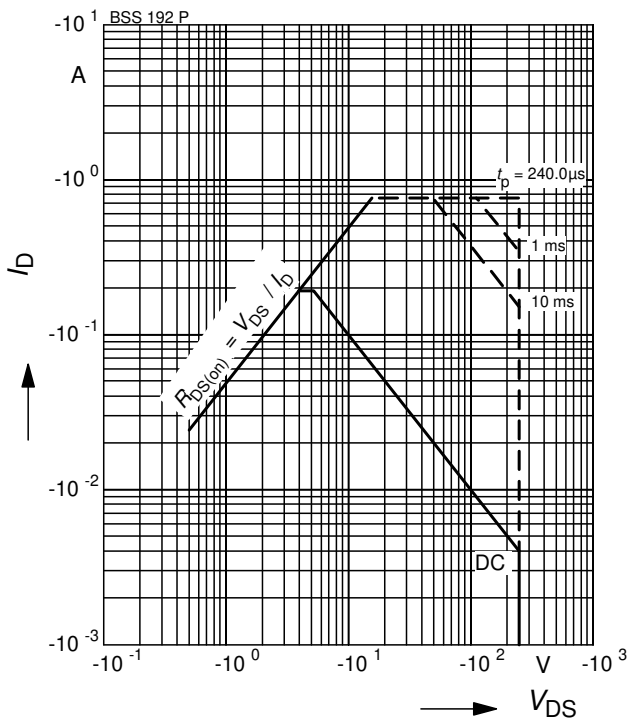
parameter: $|V_{GS}| \geq 10V$



3 Safe operating area

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

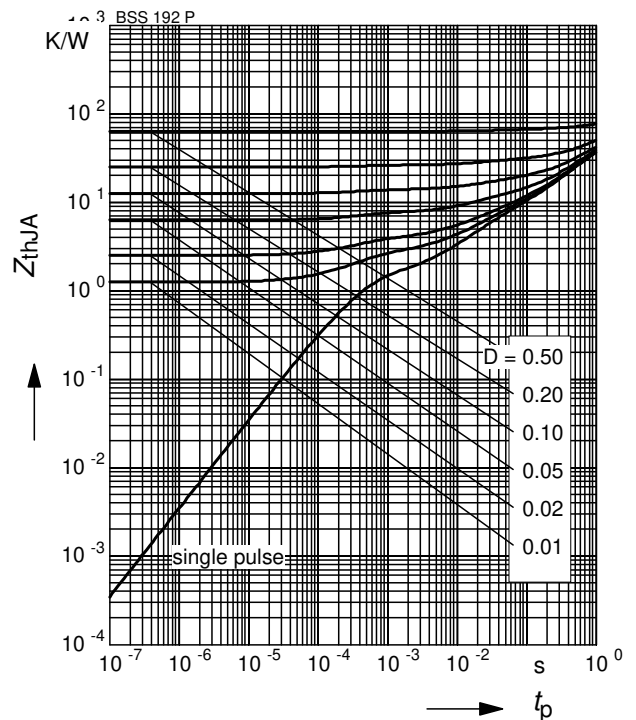
parameter: $D = 0$, $T_A = 25^\circ C$



4 Transient thermal impedance

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

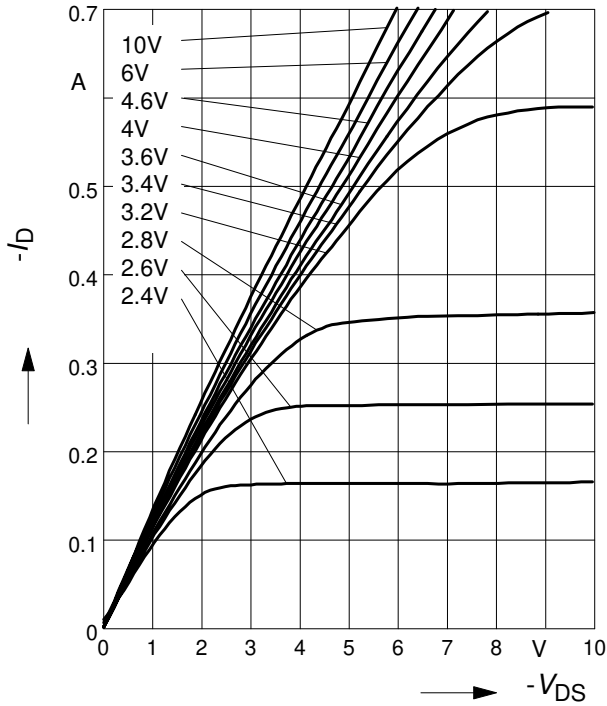
parameter: $D = t_p/T$



5 Typ. output characteristic

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

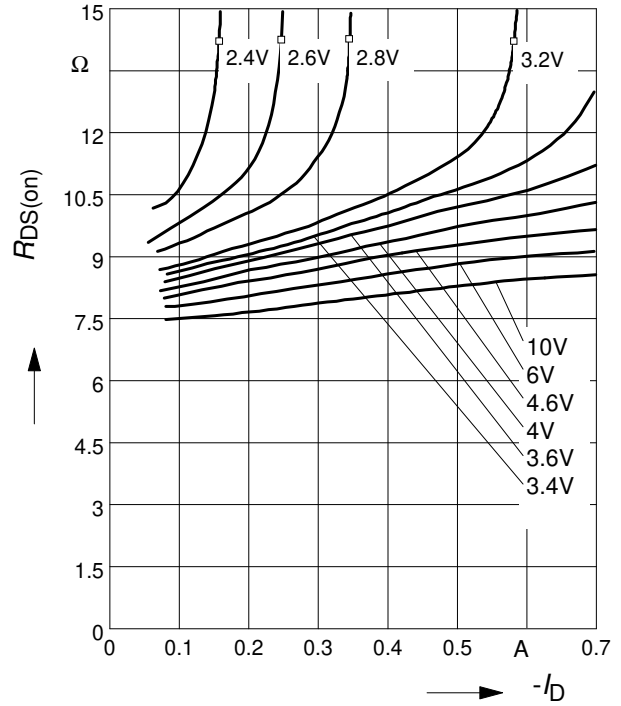
parameter: $T_j = 25^\circ\text{C}$, $-V_{GS}$



6 Typ. drain-source on resistance

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

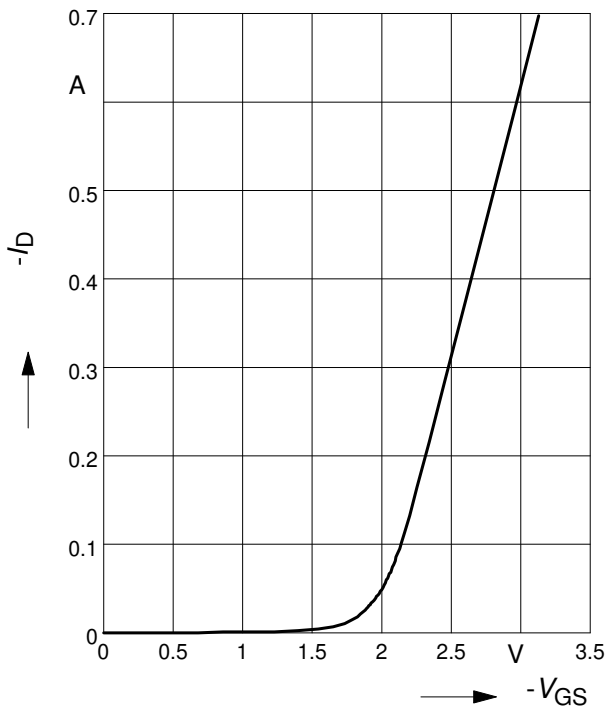
parameter: V_{GS} ; $T_j = 25^\circ\text{C}$, $-V_{GS}$



7 Typ. transfer characteristics

$$I_D = f(V_{GS}); |V_{DS}| \geq 2 \times |I_D| \times R_{DS(on)max}$$

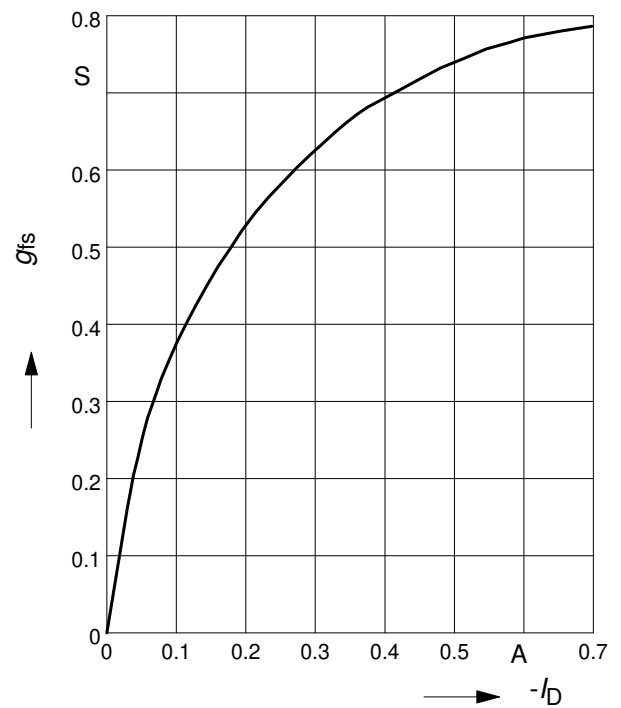
parameter: $T_j = 25^\circ\text{C}$



8 Typ. forward transconductance

$$g_{fs} = f(I_D)$$

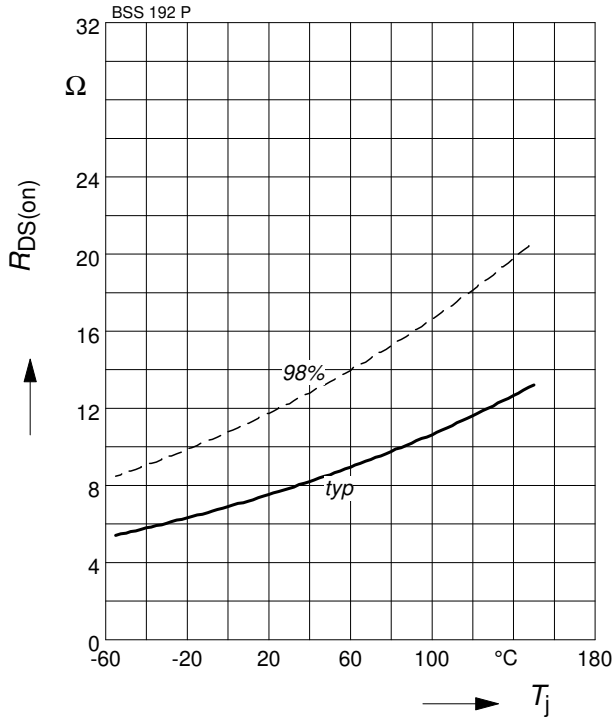
parameter: $T_j = 25^\circ\text{C}$



9 Drain-source on-state resistance

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

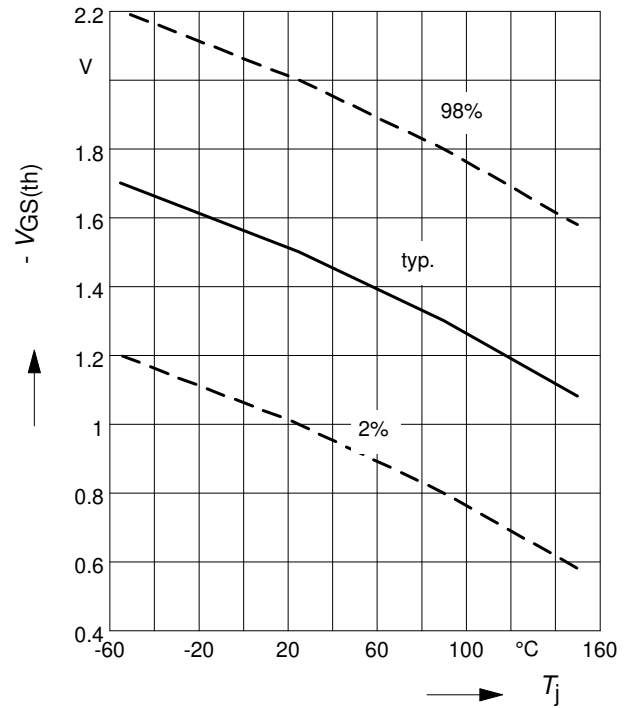
parameter : $I_D = -0.19 \text{ A}$, $V_{GS} = -10 \text{ V}$



10 Typ. gate threshold voltage

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

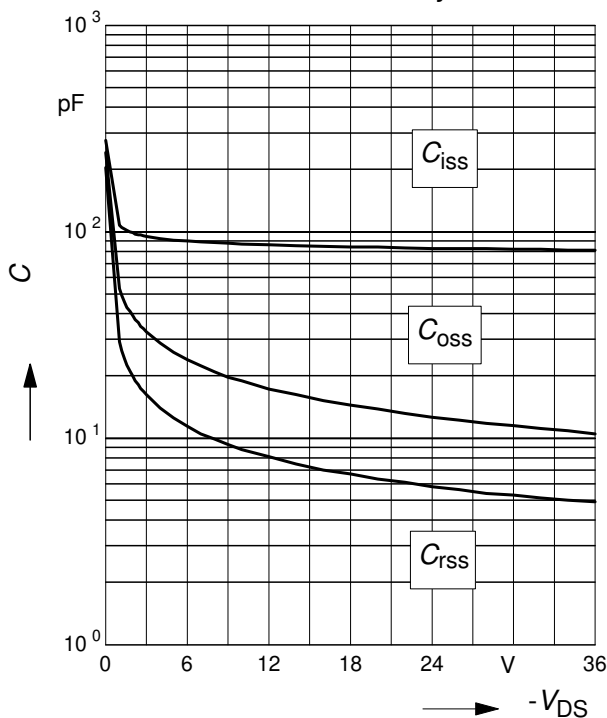
parameter: $V_{GS} = V_{DS}$



11 Typ. capacitances

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

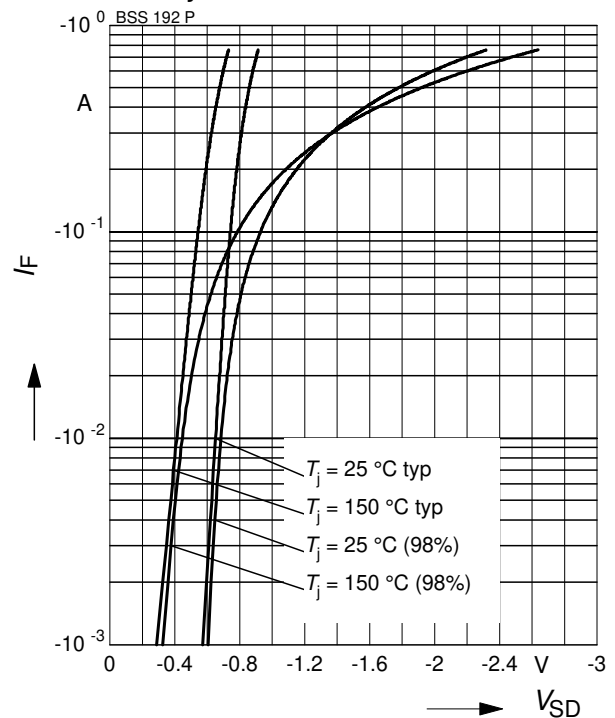
parameter: $V_{GS}=0$, $f=1 \text{ MHz}$, $T_j = 25 \text{ }^\circ\text{C}$



12 Forward character. of reverse diode

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

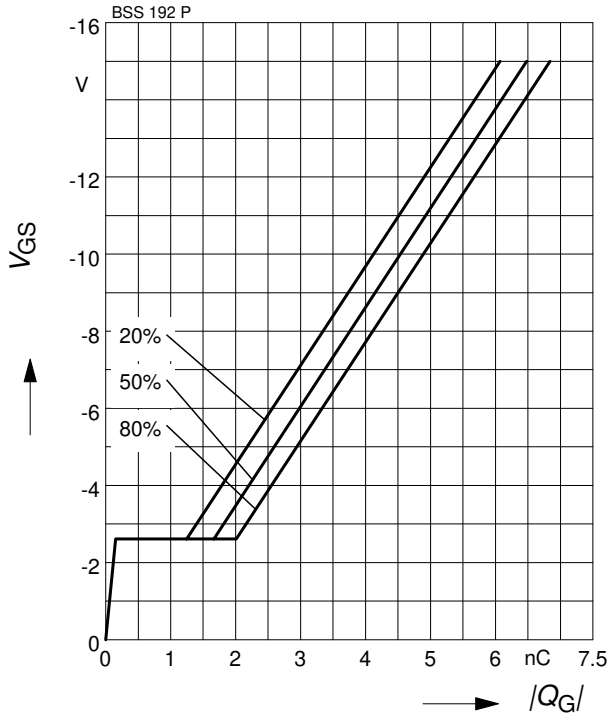
parameter: T_j



13 Typ. gate charge

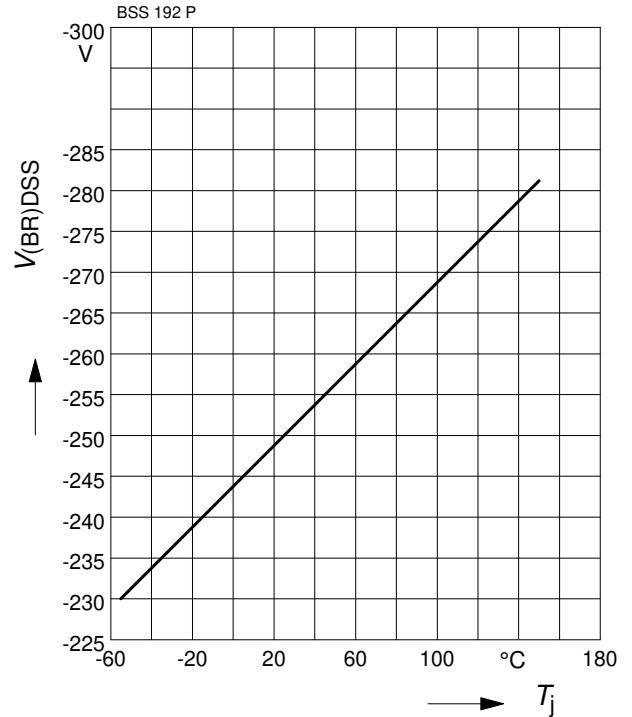
$$V_{GS} = f(Q_{Gate})$$

parameter: $I_D = -0.19$ A pulsed, $T_j = 25$ °C



14 Drain-source breakdown voltage

$$V_{(BR)DSS} = f(T_j)$$



Published by
Infineon Technologies AG,
Bereichs Kommunikation
St.-Martin-Strasse 53,
D-81541 München
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