## SIEMENS

## Silicon N Channel MOSFET Triode

BF 999

- For high-frequency stages up to 300 MHz , preferably in FM applications


| Type | Marking | Ordering Code |  |  | Pin Configuration |  |  | Package ${ }^{\text {1 }}$ |
| :--- | :--- | :--- | :---: | :---: | :---: | :--- | :---: | :---: |
|  |  | (tape and reel) | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ |  |  |  |
| BF 999 | LB | Q62702-F1132 | G | D | S | SOT-23 |  |  |

## Maximum Ratings

| Parameter | Symbol | Values | Unit |
| :--- | :--- | :--- | :--- |
| Drain-source voltage | $V_{\mathrm{DS}}$ | 20 | V |
| Drain current | ID | 30 | mA |
| Gate-source peak current | $\pm$ IGsM | 10 |  |
| Total power dissipation, $T_{\mathrm{A}} \leq 60^{\circ} \mathrm{C}$ | $P_{\text {tot }}$ | 200 | mW |
| Storage temperature range | $T_{\text {stg }}$ | $-55 \ldots+150$ | ${ }^{\circ} \mathrm{C}$ |
| Channel temperature | $T_{\mathrm{ch}}$ | 150 |  |

## Thermal Resistance

| Junction - ambient ${ }^{2)}$ | $R_{\text {th JA }}$ | $\leq 450$ | K/W |
| :--- | :--- | :--- | :--- |

[^0]
## Electrical Characteristics

at $T_{\mathrm{A}}=25^{\circ} \mathrm{C}$, unless otherwise specified.

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

## DC Characteristics

| Drain-source breakdown voltage <br> $I \mathrm{D}=10 \mu \mathrm{~A},-V \mathrm{GS}=4 \mathrm{~V}$ | $V_{(\mathrm{BR}) \mathrm{DS}}$ | 20 | - | - | V |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Gate-source breakdown voltage <br> $\pm I \mathrm{GS}=10 \mathrm{~mA}, V \mathrm{DS}=0$ | $\pm V_{(\mathrm{BR}) \mathrm{GSS}}$ | 6.5 | - | 12 |  |
| Gate-source leakage current <br> $\pm V \mathrm{GS}=5 \mathrm{~V}, V \mathrm{DS}=0$ | $\pm I \mathrm{ISS}$ | - | - | 50 | nA |
| Drain current <br> $V_{\mathrm{DS}}=10 \mathrm{~V}, V \mathrm{GS}=0$ | IDSs | 5 | - | 18 | mA |
| Gate-source pinch-off voltage <br> $V \mathrm{DS}=10 \mathrm{~V}, I \mathrm{D}=20 \mu \mathrm{~A}$ | $-V_{\mathrm{GS}}(\mathrm{p})$ | - | - | 2.5 | V |

## AC Characteristics

| Forward transconductance <br> $V_{\mathrm{DS}}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=1 \mathrm{kHz}$ | $g_{\mathrm{fs}}$ | 14 | 16 | - | mS |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Gate input capacitance <br> $V \mathrm{DS}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=1 \mathrm{MHz}$ | $C_{\mathrm{gss}}$ | - | 2.5 | - | pF |
| Reverse transfer capacitance <br> $V \mathrm{DS}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=1 \mathrm{MHz}$ | $C_{\mathrm{dg}}$ | - | 25 | - | fF |
| Output capacitance <br> $V_{\mathrm{Ds}}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=1 \mathrm{MHz}$ | $C_{\mathrm{dss}}$ | - | 1 | - | pF |
| Power gain <br> (test circuit) |  |  |  |  |  |
| $V \mathrm{Ds}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=200 \mathrm{MHz}$, <br> $G \mathrm{G}=2 \mathrm{mS}, G \mathrm{~L}=0.5 \mathrm{mS}$ | $G_{\mathrm{p}}$ | - | 25 | - | dB |
| Noise figure (test circuit) <br> $V \mathrm{DS}=10 \mathrm{~V}, I \mathrm{D}=10 \mathrm{~mA}, f=200 \mathrm{MHz}$, <br> $G \mathrm{G}=2 \mathrm{mS}, G \mathrm{~L}=0.5 \mathrm{mS}$ | $F$ | - | 1 | - |  |

Total power dissipation $P_{\text {tot }}=f\left(T_{\mathrm{A}}\right)$


Gate transconductance $g_{\text {fs }}=f(V \mathrm{GG})$
$V_{\mathrm{Ds}}=10 \mathrm{~V}, I \mathrm{dss}=10 \mathrm{~mA}, f=1 \mathrm{kHz}$


Output characteristics $I_{\mathrm{D}}=f\left(V_{\mathrm{DS}}\right)$


Drain current $I_{\mathrm{D}}=f\left(V_{\mathrm{GS}}\right)$
$V \mathrm{DS}=10 \mathrm{~V}$


Gate input capacitance $C_{\text {gss }}=f(V \mathrm{Gs})$ $V \mathrm{Ds}=10 \mathrm{~V}, I \mathrm{css}=10 \mathrm{~mA}, f=1 \mathrm{MHz}$


Reverse transfer capacitance
$C_{\text {dg }}=f\left(V_{\mathrm{DS}}\right)$
$I \mathrm{dss}=10 \mathrm{~mA}, f=1 \mathrm{MHz}, V \mathrm{Gs}=0$


Output capacitance $C_{\text {dss }}=f\left(V_{\mathrm{Ds}}\right)$ $V \mathrm{GS}=0$, Idss $=10 \mathrm{~mA}, f=1 \mathrm{MHz}$


## Gate input admittance $y_{11 \mathrm{~s}}$

$V_{\mathrm{Ds}}=10 \mathrm{~V}, V_{\mathrm{Gs}}=0$,
Idss $=10 \mathrm{~mA}$, (common-source)


Gate forward transfer admittance $y_{21 s}$
$V_{\mathrm{DS}}=10 \mathrm{~V}, V_{\mathrm{GS}}=0$,
$I \mathrm{dss}=10 \mathrm{~mA}$, (common-source)


## Output admittance $y^{22 \mathrm{~s}}$

$V_{\mathrm{DS}}=10 \mathrm{~V}, V_{\mathrm{GS}}=0$,
$I_{\mathrm{sss}}=10 \mathrm{~mA}$, (common-source)


Test circuit for power gain and noise figure
$f=200 \mathrm{MHz}$



[^0]:    1) For detailed information see chapter Package Outlines.
    2) Package mounted on alumina $15 \mathrm{~mm} \times 16.7 \mathrm{~mm} \times 0.7 \mathrm{~mm}$.
