# SIEMENS
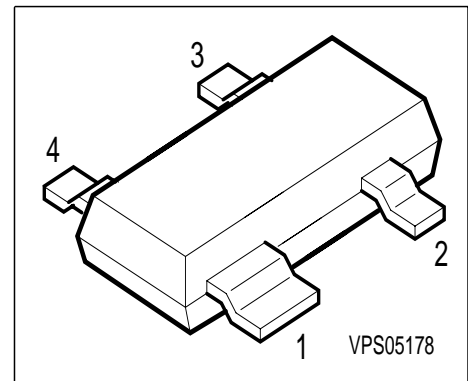
## Silicon N Channel MOSFET Tetrode

### Target data sheet

- Short-channel transistor with high S/C quality factor

- For low-noise, gain-controlled input stages up to 1 GHz


VPS05178

| Type | Marking | Ordering Code | Pin Configuration | | | | Package |
|------|---------|---------------|--------|--------|---------|---------|---------|
| BF 2000 | NDs | Q62702-F1771 | 1 = S | 2 = D | 3 = G2 | 4 = G1 | SOT-143 |

### Maximum Ratings

| Parameter | Symbol | Value | Unit |
|-----------|--------|-------|------|
| Drain-source voltage | $V_{DS}$ | 12 | V |
| Continuos drain current | $I_D$ | 30 | mA |
| Gate 1/gate 2 peak source current | $\pm I_{G1/2SM}$ | 10 | |
| Total power dissipation, $T_S = 76\,°C$ | $P_{tot}$ | 200 | mW |
| Storage temperature | $T_{stg}$ | - 55 ...+150 | °C |
| Channel temperature | $T_{ch}$ | 150 | |

### Thermal Resistance

| | | | |
|-----------|--------|-------|------|
| Channel - soldering point | $R_{thchs}$ | $\leq 370$ | K/W |

**Electrical Characteristics** at $T_A$ = 25 °C; unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **DC characteristics** | | | | | |
| Drain-source breakdown voltage $I_D$ = 10 µA, - $V_{G1S}$ = 4 V, - $V_{G2S}$ = 4 V | $V_{(BR)DS}$ | 12 | - | - | V |
| Gate 1 source breakdown voltage ± $I_{G1S}$ = 10 mA, $V_{G2S}$ = $V_{DS}$ = 0 | ± $V_{(BR)G1SS}$ | 8 | - | 12 | V |
| Gate 2 source breakdown voltage ± $I_{G2S}$ = 10 mA, $V_{G1S}$ = 0 V, $V_{DS}$ = 0 V | ± $V_{(BR)G2SS}$ | 8 | - | 12 | |
| Gate 1 source leakage current ± $V_{G1S}$ = 5 V, $V_{G2S}$ = $V_{DS}$ = 0 | ± $I_{G1SS}$ | - | - | 50 | nA |
| Gate 2 source leakage current ± $V_{G2S}$ = 5 V, $V_{G1S}$ = 0 V, $V_{DS}$ = 0 V | ± $I_{G2SS}$ | - | - | 50 | |
| Drain current $V_{DS}$ = 5 V, $V_{G1S}$ = 0 , $V_{G2S}$ = 4 V | $I_{DSS}$ | - | - | 1 | µA |
| Gate 1-source pinch-off voltage $V_{DS}$ = 5 V, $V_{G2S}$ = 4 V, $I_D$ = 200 µA | $V_{G1S(p)}$ | - | 0.3 | - | V |
| Gate 2-source pinch-off voltage $V_{DS}$ = 5 V, $I_D$ = 100 µA | $V_{G2S(p)}$ | - | 0.2 | - | V |

**Electrical Characteristics** at $T_A$ = 25 °C, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **AC characteristics** | | | | | |
| Forward transconductance $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 1 kHz | $g_{fs}$ | - | 24 | - | mS |
| Gate 1 input capacitance $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 1 MHz | $C_{g1ss}$ | - | 1.2 | - | pF |
| Gate 2 input capacitance $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 1 MHz | $C_{g2ss}$ | - | - | - | |
| Feedback capacitance $V_{DS}$ = 8 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 1 MHz | $C_{dg1}$ | - | 25 | - | fF |
| Output capacitance $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 1 MHz | $C_{dss}$ | - | 0.8 | - | pF |
| Power gain $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 45 MHz | $G_{ps}$ | 28 | 29 | - | dB |
| Power gain $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 800 MHz | $G_{ps}$ | - | 22 | - | |
| Noise figure $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 45 MHz | $F$ | - | 1.1 | - | |
| Noise figure $V_{DS}$ = 5 V, $I_D$ = 10 mA, $V_{G2S}$ = 4 V, $f$ = 800 MHz | $F$ | - | 1 | - | |
| Gain control range $V_{DS}$ = 8 V, VG2S = 4 ... -2V, $f$ = 800 MHz | $\Delta G_{ps}$ | 40 | - | - | |