# SIEMENS

**SIPMOS ® Small-Signal Transistor**

• N channel

• Depletion mode

• High dynamic resistance
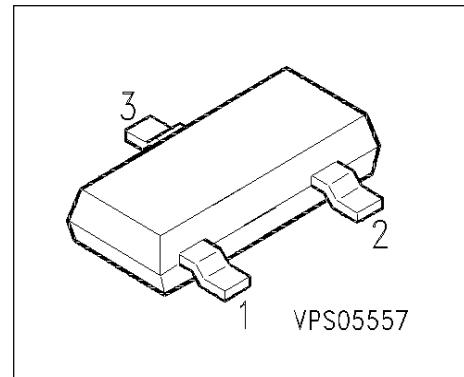
| Pin 1 | Pin 2 | Pin 3 |
|-------|-------|-------|
| G | S | D |

| Type | $V_{DS}$ | $I_D$ | $R_{DS(on)}$ | Package | Ordering Code |
|------|----------|-------|--------------|---------|---------------|
| BSS 159 | 50 V | 0.16 A | 8 Ω | SOT-23 | Q67050-T6 |

**Maximum Ratings**

| Parameter | Symbol | Values | Unit |
|-----------|--------|--------|------|
| Drain source voltage | $V_{DS}$ | 50 | V |
| Drain-gate voltage $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 50 | |
| Gate source voltage | $V_{GS}$ | ± 14 | |
| Gate-source peak voltage, aperiodic | $V_{gs}$ | ± 20 | |
| Continuous drain current $T_A = 25\ °C$ | $I_D$ | 0.16 | A |
| DC drain current, pulsed $T_A = 25\ °C$ | $I_{Dpuls}$ | 0.48 | |
| Power dissipation $T_A = 25\ °C$ | $P_{tot}$ | 0.36 | W |
| Chip or operating temperature | $T_j$ | -55 ... + 150 | °C |
| Storage temperature | $T_{stg}$ | -55 ... + 150 | |
| Thermal resistance, chip to ambient air | $R_{thJA}$ | ≤ 350 | K/W |
| Therminal resistance, chip-substrate - reverse side [1] | $R_{thJSR}$ | ≤ 285 | |
| DIN humidity category, DIN 40 040 | | E | |
| IEC climatic category, DIN IEC 68-1 | | 55 / 150 / 56 | |

1) For package mounted on aluminium 15 mm x 16.7 mm x 0.7 mm.

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

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **Static Characteristics** | | | | | |
| Drain-source breakdown voltage $V_{GS}$ = -10 V, $I_D$ = 250 µA | $V_{(BR)DSV}$ | 50 | - | - | V |
| Gate threshold voltage $V_{DS}$ = 3 V, $I_D$ = 10 µA | $V_{GS(th)}$ | -3 | -2.5 | -1.5 | |
| Drain-source cutoff current $V_{DS}$ = 50 V, $V_{GS}$ = -10 V, $T_j$ = 25 °C $V_{DS}$ = 50 V, $V_{GS}$ = -10 V, $T_j$ = 125 °C | $I_{DSV}$ | - - | - - | 1 - | µA |
| On-state drain current $V_{GS}$ = 0 V, $V_{DS}$ = 10 V | $I_{D(on)}$ | 70 | 200 | - | mA |
| Gate-source leakage current $V_{GS}$ = 20 V, $V_{DS}$ = 0 V | $I_{GSS}$ | - | 10 | 100 | nA |
| Drain-Source on-resistance $V_{GS}$ = 0 V, $I_D$ = 0.07 A | $R_{DS(on)}$ | - | 4 | 8 | Ω |

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

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **Dynamic Characteristics** | | | | | |
| Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}, I_D = 0.16$ A | $g_{fs}$ | 0.1 | 0.16 | - | S |
| Input capacitance $V_{GS} = -4.5$ V, $V_{DS} = 25$ V, $f = 1$ MHz | $C_{iss}$ | - | 70 | 100 | pF |
| Output capacitance $V_{GS} = -4.5$ V, $V_{DS} = 25$ V, $f = 1$ MHz | $C_{oss}$ | - | 15 | 25 | |
| Reverse transfer capacitance $V_{GS} = -4.5$ V, $V_{DS} = 25$ V, $f = 1$ MHz | $C_{rss}$ | - | 6 | 9 | |
| Turn-on delay time $V_{DD} = 30$ V, $V_{GS} = -5... + 5$ V, $I_D = 0.28$ A $R_{GS} = 50 \Omega$ | $t_{d(on)}$ | - | 7 | 11 | ns |
| Rise time $V_{DD} = 30$ V, $V_{GS} = -5... + 5$ V, $I_D = 0.28$ A $R_{GS} = 50 \Omega$ | $t_r$ | - | 11 | 17 | |
| Turn-off delay time $V_{DD} = 30$ V, $V_{GS} = -5... + 5$ V, $I_D = 0.28$ A $R_{GS} = 50 \Omega$ | $t_{d(off)}$ | - | 13 | 17 | |
| Fall time $V_{DD} = 30$ V, $V_{GS} = -5... + 5$ V, $I_D = 0.28$ A $R_{GS} = 50 \Omega$ | $t_f$ | - | 14 | 19 | |

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

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

**Reverse Diode**

| Parameter | Symbol | min. | typ. | max. | Unit |
|---|---|---|---|---|---|
| Inverse diode continuous forward current $T_A$ = 25 °C | $I_S$ | - | - | 0.1 | A |
| Inverse diode direct current,pulsed $T_A$ = 25 °C | $I_{SM}$ | - | - | 0.3 | |
| Inverse diode forward voltage $V_{GS}$ = 0 V, $I_F$ = 0.3 A | $V_{SD}$ | - | 0.8 | 1.3 | V |