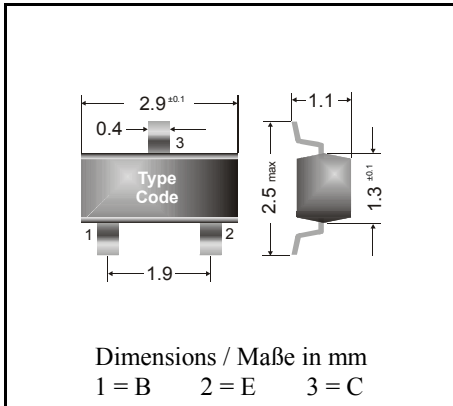


PNP

Surface mount Si-Epitaxial Planar Transistors
Si-Epitaxial Planar Transistoren für die Oberflächenmontage

PNP



Power dissipation – Verlustleistung 250 mW

Plastic case SOT-23
Kunststoffgehäuse (TO-236)

Weight approx. – Gewicht ca. 0.01 g

Plastic material has UL classification 94V-0
Gehäusematerial UL94V-0 klassifiziertStandard packaging taped and reeled
Standard Lieferform gegurtet auf Rolle**Maximum ratings ($T_A = 25^\circ\text{C}$)****Grenzwerte ($T_A = 25^\circ\text{C}$)**

| | | | BSR 15 | BSR 16 |
|---|--------|------------|----------------------|---------------|
| Collector-Emitter-voltage | B open | $-V_{CE0}$ | 40 V | 60 V |
| Collector-Base-voltage | E open | $-V_{CB0}$ | 60 V | |
| Emitter-Base-voltage | C open | $-V_{EB0}$ | 5 V | |
| Power dissipation – Verlustleistung | | P_{tot} | 250 mW ¹⁾ | |
| Collector current – Kollektorstrom (dc) | | $-I_C$ | 600 mA | |
| Peak Collector current – Kollektor-Spitzenstrom | | $-I_{CM}$ | 800 mA | |
| Peak Base current – Basis-Spitzenstrom | | $-I_{BM}$ | 200 mA | |
| Junction temp. – Sperrschichttemperatur | | T_j | 150°C | |
| Storage temperature – Lagerungstemperatur | | T_S | - 65...+ 150°C | |

Characteristics ($T_j = 25^\circ\text{C}$)**Kennwerte ($T_j = 25^\circ\text{C}$)**

| | | | Min. | Typ. | Max. |
|---|--------|------------|-------------|-------------|------------------|
| Collector-Base cutoff current – Kollektorreststrom | | | | | |
| $I_E = 0, -V_{CB} = 50\text{ V}$ | BSR 15 | $-I_{CB0}$ | – | – | 20 nA |
| | | $-I_{CB0}$ | – | – | 20 μA |
| $I_E = 0, -V_{CB} = 50\text{ V}, T_j = 150^\circ\text{C}$ | BSR 15 | $-I_{CB0}$ | – | – | 10 nA |
| | | $-I_{CB0}$ | – | – | 10 μA |
| Emitter-Base cutoff current – Emitterreststrom | | | | | |
| $I_C = 0, -V_{EB} = 5\text{ V}$ | | $-I_{EB0}$ | – | – | 50 nA |

¹⁾ Mounted on P.C. board with 3 mm² copper pad at each terminal
 Montage auf Leiterplatte mit 3 mm² Kupferbelag (Löt-pad) an jedem Anschluß

Characteristics ($T_j = 25^\circ\text{C}$)Kennwerte ($T_j = 25^\circ\text{C}$)

| | | Min. | Typ. | Max. | |
|--|-----------------------------|---------------|----------------|-------|-----------------------|
| DC current gain – Kollektor-Basis-Stromverhältnis ¹⁾ | | | | | |
| - $V_{CE} = 10\text{ V}$, - $I_C = 0.1\text{ mA}$ | BSR 15 | h_{FE} | 35 | – | – |
| | BSR 16 | h_{FE} | 75 | – | – |
| - $V_{CE} = 10\text{ V}$, - $I_C = 1\text{ mA}$ | BSR 15 | h_{FE} | 50 | – | – |
| | BSR 16 | h_{FE} | 100 | – | – |
| - $V_{CE} = 10\text{ V}$, - $I_C = 10\text{ mA}$ | BSR 15 | h_{FE} | 75 | – | – |
| | BSR 16 | h_{FE} | 100 | – | – |
| - $V_{CE} = 10\text{ V}$, - $I_C = 500\text{ mA}$ | BSR 15 | h_{FE} | 30 | – | – |
| | BSR 16 | h_{FE} | 50 | – | – |
| - $V_{CE} = 10\text{ V}$, - $I_C = 150\text{ mA}$ | | h_{FE} | 100 | – | 300 |
| Collector saturation volt. – Kollektor-Sättigungsspg. ¹⁾ | | | | | |
| - $I_C = 150\text{ mA}$, - $I_B = 15\text{ mA}$ | | - V_{CEsat} | – | – | 400 mV |
| - $I_C = 500\text{ mA}$, - $I_B = 50\text{ mA}$ | | - V_{CEsat} | – | – | 1.6 V |
| Base saturation voltage – Basis-Sättigungsspannung ¹⁾ | | | | | |
| - $I_C = 150\text{ mA}$, - $I_B = 15\text{ mA}$ | | - V_{BEsat} | – | – | 1.3 V |
| - $I_C = 500\text{ mA}$, - $I_B = 50\text{ mA}$ | | - V_{BEsat} | – | – | 2.6 V |
| Gain-Bandwidth Product – Transitfrequenz | | | | | |
| - $V_{CE} = 20\text{ V}$, - $I_C = 20\text{ mA}$, $f = 100\text{ MHz}$ | | f_T | 200 MHz | – | – |
| Collector-Base Capacitance – Kollektor-Basis-Kapazität | | | | | |
| - $V_{CB} = 10\text{ V}$, $I_E = i_e = 0$, $f = 1\text{ MHz}$ | | C_{CB0} | – | 8 pF | – |
| Emitter-Base Capacitance – Emitter-Basis-Kapazität | | | | | |
| - $V_{EB} = 2\text{ V}$, $I_C = i_c = 0$, $f = 1\text{ MHz}$ | | C_{EB0} | – | 30 pF | – |
| Switching times – Schaltzeiten | | | | | |
| turn-on time | | t_{on} | – | – | 40 ns |
| delay time | | t_d | – | – | 12 ns |
| rise time | $I_{Con} = 150\text{ mA}$ | t_r | – | – | 30 ns |
| turn-off time | $I_{Bon} = 15\text{ mA}$ | t_{off} | – | – | 365 ns |
| storage time | - $I_{Boff} = 15\text{ mA}$ | t_s | – | – | 300 ns |
| fall time | | t_f | – | – | 65 ns |
| Thermal resistance junction to ambient air | | | | | |
| Wärmewiderstand Sperrschicht – umgebende Luft | | | R_{thA} | | 420 K/W ²⁾ |
| Recommended complementary NPN transistors | | | BSR 13, BSR 14 | | |
| Empfohlene komplementäre NPN-Transistoren | | | | | |
| Marking - Stempelung | | BSR 15 = T7 | BSR 16 = T8 | | |

¹⁾ Tested with pulses $t_p = 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ – Gemessen mit Impulsen $t_p = 300\text{ }\mu\text{s}$, Schaltverhältnis $\leq 2\%$

²⁾ Mounted on P.C. board with 3 mm^2 copper pad at each terminal
Montage auf Leiterplatte mit 3 mm^2 Kupferbelag (Lötpad) an jedem Anschluß