

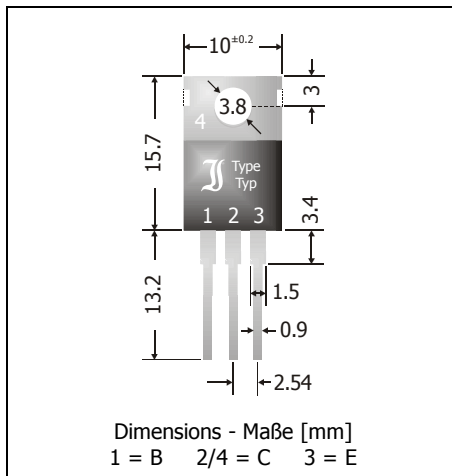
TIP120 ... TIP122

NPN

Si-Epitaxial Planar Darlington Power Transistors
Si-Epitaxial Planar Darlington-Leistungs-Transistoren

NPN

Version 2006-10-17



Max. power dissipation with cooling

65 W

Max. Verlustleistung mit Kühlung

Collector current

5 A

Kollektorstrom

Plastic case

TO-220AB

Kunststoffgehäuse

Weight approx.

2.2 g

Gewicht ca.

Plastic material has UL classification 94V-0

Gehäusematerial UL94V-0 klassifiziert

Standard packaging in tubes

Standard Lieferform in Stangen

Maximum ratings ($T_A = 25^\circ\text{C}$)Grenzwerte ($T_A = 25^\circ\text{C}$)

| | | | TIP120 | TIP121 | TIP122 |
|--|--------------------------|-----------|-------------------|--------|--------|
| Collector-Emitter-volt. – Kollektor-Emitter-Spg. | B open | V_{CEO} | 60 V | 80 V | 100 V |
| Collector-Base-voltage – Kollektor-Basis-Spg. | E open | V_{CBO} | 60 V | 80 V | 100 V |
| Emitter-Base-voltage – Emitter-Basis-Spannung | C open | V_{EBO} | 5 V | | |
| Power dissipation – Verlustleistung | | | | | |
| without cooling – ohne Kühlung | $T_A = 25^\circ\text{C}$ | P_{tot} | 2 W ¹⁾ | | |
| with cooling – mit Kühlung | $T_C = 25^\circ\text{C}$ | P_{tot} | 65 W | | |
| Collector current – Kollektorstrom (dc) | | I_C | 5 A | | |
| Peak Collector current – Kollektor-Spitzenstrom | | I_{CM} | 8 A | | |
| Base current – Basisstrom (dc) | | I_B | 120 mA | | |
| Junction temperature – Sperrschichttemperatur | | T_j | -55...+150°C | | |
| Storage temperature – Lagerungstemperatur | | T_S | -55...+150°C | | |

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

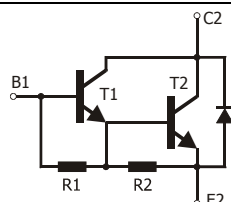
| | | Min. | Typ. | Max. |
|---|----------|------|------|------|
| DC current gain – Kollektor-Basis-Stromverhältnis ²⁾ | | | | |
| $I_C = 0.5\text{ A}, V_{CE} = 3\text{ V}$ | h_{FE} | 1000 | – | – |
| $I_C = 3\text{ A}, V_{CE} = 3\text{ V}$ | h_{FE} | 1000 | – | – |
| Small signal current gain – Kleinsignal-Stromverstärkung | | | | |
| $I_C = 3\text{ A}, V_{CE} = 4\text{ V}, f = 1\text{ MHz}$ | h_{fe} | 4 | | |

1 Valid, if leads are kept at ambient temperature at a distance of 5 mm from case

Gültig wenn die Anschlussdrähte in 5 mm Abstand vom Gehäuse auf Umgebungstemperatur gehalten werden

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

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

| | Min. | Typ. | Max. |
|---|---|------------------------------|--------|
| Collector-Emitter saturation volt. – Kollektor-Emitter-Sättigungsspg. ²⁾ | | | |
| $I_C = 3\text{ A}, I_B = 12\text{ mA}$ | V_{CEsat} | – | – |
| $I_C = 5\text{ A}, I_B = 20\text{ mA}$ | V_{CEsat} | – | 2 V |
| Base-Emitter voltage – Basis-Emitter-Spannung ²⁾ | | | |
| $I_C = 3\text{ A}, V_{CE} = 3\text{ V}$ | V_{BE} | – | – |
| | | | 2.5 V |
| Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom | | | |
| $V_{CE} = 30\text{ V}, (B\text{ open})$ | TIP120 | I_{CEO} | – |
| $V_{CE} = 40\text{ V}, (B\text{ open})$ | TIP121 | I_{CEO} | – |
| $V_{CE} = 50\text{ V}, (B\text{ open})$ | TIP122 | I_{CEO} | – |
| | | | 500 nA |
| | | | 500 nA |
| | | | 500 nA |
| Collector-Base cutoff current – Kollektor-Basis-Reststrom | | | |
| $V_{CB} = 60\text{ V}, (E\text{ open})$ | TIP120 | I_{CBO} | – |
| $V_{CB} = 80\text{ V}, (E\text{ open})$ | TIP121 | I_{CBO} | – |
| $V_{CB} = 100\text{ V}, (E\text{ open})$ | TIP122 | I_{CBO} | – |
| | | | 200 nA |
| | | | 200 nA |
| | | | 200 nA |
| Collector-Base Capacitance – Kollektor-Basis-Kapazität | | | |
| $V_{CB} = 10\text{ V}, I_E = i_e = 0, f = 100\text{ kHz}$ | C_{CB0} | – | – |
| | | | 200 pF |
| Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft | R_{thA} | < 63 K/W ¹⁾ | |
| Thermal resistance junction to case Wärmewiderstand Sperrschicht – Gehäuse | R_{thC} | < 3 K/W | |
| Admissible torque for mounting Zulässiges Anzugsdrehmoment | M4 | 9 ± 10% lb.in. 1 ± 10% Nm | |
| Recommended complementary PNP transistors Empfohlene komplementäre PNP-Transistoren | TIP125 ... TIP127 | | |
| Equivalent Circuit – Ersatzschaltbild |  | | |

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

¹⁾ Valid, if leads are kept at ambient temperature at a distance of 2 mm from case

Gültig wenn die Anschlussdrähte in 2 mm Abstand vom Gehäuse auf Umgebungstemperatur gehalten werden