

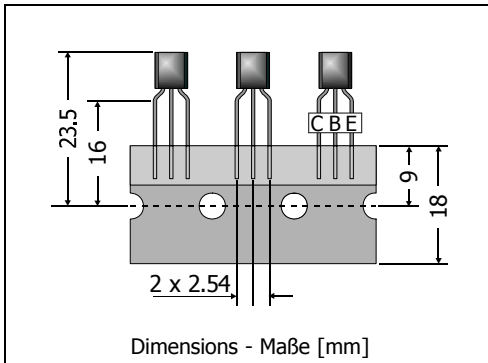
2N4403

PNP

General Purpose Si-Epitaxial Planar Transistors
Si-Epitaxial Planar-Transistoren für universellen Einsatz

PNP

Version 2006-10-17



Power dissipation
Verlustleistung

625 mW

Plastic case
Kunststoffgehäuse

TO-92
(10D3)

Weight approx. – Gewicht ca.

0.18 g

Plastic material has UL classification 94V-0
Gehäusematerial UL94V-0 klassifiziert

Standard packaging taped in ammo pack
Standard Lieferform getupet in Ammo-Pack

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

| | | | 2N4403 |
|------------------------------------------------------|--------|-------------|----------------------|
| Collector-Emitter-volt. – Kollektor-Emitter-Spannung | B open | - V_{CEO} | 40 V |
| Collector-Base-voltage – Kollektor-Basis-Spannung | E open | - V_{CBO} | 40 V |
| Emitter-Base-voltage – Emitter-Basis-Spannung | C open | - V_{EB0} | 5 V |
| Power dissipation – Verlustleistung | | P_{tot} | 625 mW ¹⁾ |
| Collector current – Kollektorstrom (dc) | | - I_C | 600 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⁾ | | | | |
| - $I_C = 0.1 \text{ mA}$, - $V_{CE} = 1 \text{ V}$ | h_{FE} | 30 | – | – |
| - $I_C = 1 \text{ mA}$, - $V_{CE} = 1 \text{ V}$ | h_{FE} | 60 | – | – |
| - $I_C = 10 \text{ mA}$, - $V_{CE} = 1 \text{ V}$ | h_{FE} | 100 | – | – |
| - $I_C = 150 \text{ mA}$, - $V_{CE} = 2 \text{ V}$ | h_{FE} | 100 | – | 300 |
| - $I_C = 500 \text{ mA}$, - $V_{CE} = 2 \text{ V}$ | h_{FE} | 20 | – | – |
| h-Parameters at/bei - $V_{CE} = 10 \text{ V}$, - $I_C = 1 \text{ mA}$, $f = 1 \text{ kHz}$ | | | | |
| Small signal current gain – Kleinsignal-Stromverstärkung | h_{fe} | 60 | – | 500 |
| Input impedance – Eingangs-Impedanz | h_{ie} | 1.5 k Ω | – | 15 k Ω |
| Output admittance – Ausgangs-Leitwert | h_{oe} | 1 μS | – | 30 μS |
| Reverse voltage transfer ratio – Spannungsrückwirkung | h_{re} | 0.1*10 ⁻⁴ | – | 8*10 ⁻⁴ |

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

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 voltage – Kollektor-Emitter-Sättigungsspg. ²⁾ - $I_C = 150\text{ mA}$, - $I_B = 15\text{ mA}$ - $I_C = 500\text{ mA}$, - $I_B = 50\text{ mA}$ | - V_{CEsat} - V_{CEsat} | – – | 0.40 V 0.75 V |
| Base-Emitter saturation voltage – Basis-Emitter-Sättigungsspannung ²⁾ - $I_C = 150\text{ mA}$, - $I_B = 15\text{ mA}$ - $I_C = 500\text{ mA}$, - $I_B = 50\text{ mA}$ | - V_{BEsat} - V_{BEsat} | 0.75 V – | 0.95 V 1.3 V |
| Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom - $V_{CE} = 35\text{ V}$, - $V_{EB} = 0,4\text{ V}$ | - I_{CEX} | – | 100 nA |
| Emitter-Base cutoff current – Emitter-Basis-Reststrom - $V_{CE} = 35\text{ V}$, - $V_{EB} = 0,4\text{ V}$ | - I_{EBV} | – | 100 nA |
| Gain-Bandwidth Product – Transitfrequenz - $I_C = 20\text{ mA}$, - $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$ | f_T | 200 MHz | – |
| Collector-Base Capacitance – Kollektor-Basis-Kapazität - $V_{CB} = 5\text{ V}$, $I_E = i_e = 0$, $f = 1\text{ MHz}$ | C_{CBO} | – | 8.5 pF |
| Emitter-Base Capacitance – Emitter-Basis-Kapazität - $V_{EB} = 0.5\text{ V}$, $I_C = i_c = 0$, $f = 1\text{ MHz}$ | C_{EBO} | – | 30 pF |
| Switching times – Schaltzeiten (between 10% and 90% levels) | | | |
| delay time | t_d | – | 15 ns |
| rise time | t_r | – | 20 ns |
| storage time | t_s | – | 225 ns |
| fall time | t_f | – | 30 ns |
| Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft | R_{thA} | < 420 K/W ¹⁾ | |
| Recommended complementary NPN transistors Empfohlene komplementäre NPN-Transistoren | 2N4401 | | |

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