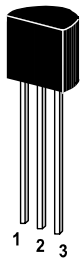


NPN

Si-Epitaxial Planar Transistors

NPN

Version 2004-01-20



Standard Pinning
1 = C 2 = B 3 = E

Power dissipation – Verlustleistung 625 mW

Plastic case TO-92
Kunststoffgehäuse (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 gegurtet in Ammo-Pack

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

			2N3903, 2N3904
Collector-Emitter-voltage	B open	V_{CE0}	40 V
Collector-Base-voltage	E open	V_{CE0}	60 V
Emitter-Base-voltage	C open	V_{EB0}	6 V
Power dissipation – Verlustleistung		P_{tot}	625 mW ¹⁾
Collector current – Kollektorstrom (dc)		I_C	600 mA
Junction temp. – Sperrschichttemperatur		T_j	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.
Collector saturation volt. – Kollektor-Sättigungsspannung				
$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$	$V_{CE\text{sat}}$	–	–	200 mV
$I_C = 50 \text{ mA}, I_B = 5 \text{ mA}$	$V_{CE\text{sat}}$	–	–	300 mV
Base saturation voltage – Basis-Sättigungsspannung				
$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$	$V_{BE\text{sat}}$	–	–	850 mV
$I_C = 50 \text{ mA}, I_B = 5 \text{ mA}$	$V_{BE\text{sat}}$	–	–	950 mV
Collector cutoff current – Kollektorreststrom				
$V_{CE} = 30 \text{ V}, V_{EB} = 3 \text{ V}$	I_{CEV}	–	–	50 nA
Emitter cutoff current – Emitterreststrom				
$V_{CE} = 30 \text{ V}, V_{EB} = 3 \text{ V}$	I_{EBV}	–	–	50 nA

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 von Gehäuse auf Umgebungstemperatur gehalten werden

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

			Min.	Typ.	Max.
DC current gain – Kollektor-Basis-Stromverhältnis					
$V_{CE} = 1\text{ V}, I_C = 0.1\text{ mA}$	2N3903	h_{FE}	20	–	–
	2N3904	h_{FE}	40	–	–
$V_{CE} = 1\text{ V}, I_C = 1\text{ mA}$	2N3903	h_{FE}	35	–	–
	2N3904	h_{FE}	70	–	–
$V_{CE} = 1\text{ V}, I_C = 10\text{ mA}$	2N3903	h_{FE}	50	–	150
	2N3904	h_{FE}	100	–	300
$V_{CE} = 1\text{ V}, I_C = 50\text{ mA}$	2N3903	h_{FE}	30	–	–
	2N3904	h_{FE}	60	–	–
$V_{CE} = 1\text{ V}, I_C = 510\text{ mA}$	2N3903	h_{FE}	15	–	–
	2N3904	h_{FE}	30	–	–
Gain-Bandwidth Product – Transitfrequenz					
$V_{CE} = 20\text{ V}, I_C = 10\text{ mA},$ $f = 100\text{ MHz}$	2N3903	f_T	250 MHz	–	–
	2N3904	f_T	300 MHz	–	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität					
$V_{CB} = 5\text{ V}, I_E = i_e = 0, f = 100\text{ kHz}$		C_{CB0}	–	–	4 pF
Emitter-Base Capacitance – Emitter-Basis-Kapazität					
$V_{EB} = 0.5\text{ V}, I_C = i_c = 0, f = 100\text{ kHz}$		C_{EB0}	–	–	8 pF
Noise figure – Rauschzahl					
$V_{CE} = 5\text{ V}, I_C = 100\text{ }\mu\text{A}$ $R_G = 1\text{ k}\Omega, f = 10\text{ Hz} \dots 15.7\text{ kHz}$	2N3903	F	–	–	6 dB
	2N3904	F	–	–	5 dB
Switching times – Schaltzeiten					
turn-on time	$I_{Con} = 10\text{ mA},$	t_{on}	–	–	70
turn-off time	$I_{Bon} = -I_{Boff} = 1\text{ mA}$	t_{off}	–	–	250
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft			R_{thA} 200 K/W ¹⁾		
Recommended complementary PNP transistors Empfohlene komplementäre PNP-Transistoren			2N3905, 2N3906		

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 von Gehäuse auf Umgebungstemperatur gehalten werden