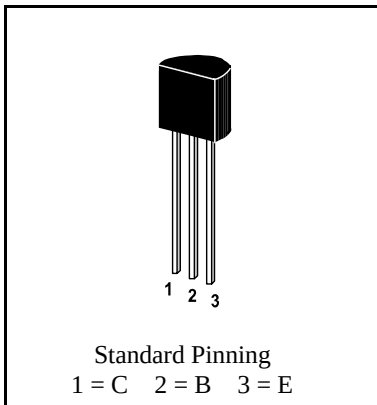


NPN

Si-Epitaxial Planar Transistors

NPN

Version 2004-01-20



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 klassifiziertStandard packaging taped in ammo pack
Standard Lieferform gegurtet in Ammo-PackMaximum ratings ($T_A = 25^\circ\text{C}$)Grenzwerte ($T_A = 25^\circ\text{C}$)

			2N4400, 2N4401
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				
$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$	$V_{CE\text{sat}}$	–	–	400 mV
$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$	$V_{CE\text{sat}}$	–	–	750 mV
Base saturation voltage – Basis-Sättigungsspannung				
$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$	$V_{BE\text{sat}}$	750 mV	–	950 mV
$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$	$V_{BE\text{sat}}$	–	–	1.2 V
Collector cutoff current – Kollektorreststrom				
$V_{CE} = 35 \text{ V}, V_{EB} = 0.4 \text{ V}$	I_{CBV}	–	–	100 nA
Emitter cut-off current – Emitterreststrom				
$V_{CE} = 35 \text{ V}, V_{EB} = 0.4 \text{ V}$	I_{EBV}	–	–	100 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 V, I _C = 0.1 mA	2N4401	h _{FE}	20	–	–
V _{CE} = 1 V, I _C = 1 mA	2N4400	h _{FE}	20	–	–
	2N4401	h _{FE}	40	–	–
V _{CE} = 1 V, I _C = 10 mA	2N4400	h _{FE}	40	–	–
	2N4401	h _{FE}	80	–	–
V _{CE} = 1 V, I _C = 150 mA	2N4400	h _{FE}	50	–	150
	2N4401	h _{FE}	100	–	300
V _{CE} = 1 V, I _C = 500 mA	2N4400	h _{FE}	20	–	–
	2N4401	h _{FE}	40	–	–
h-Parameters at V _{CE} = 10 V, I _C = 1 mA, f = 1 kHz					
Small signal current gain Kleinsignal-Stromverstärkung		h _{fe}	40	–	500
Input impedance – Eingangs-Impedanz		h _{ie}	1 k S	–	15 k S
Output admittance – Ausgangs-Leitwert		h _{oe}	1 μS	–	30 μS
Reverse voltage ratio – Spannungsrückwirkg.		h _{re}	0.1 *10 ⁻⁴	–	8 *10 ⁻⁴
Gain-Bandwidth Product – Transitfrequenz					
V _{CE} = 10 V, I _C = 20 mA,	2N4400	f _T	200 MHz	–	–
f = 100 MHz	2N4401	f _T	250 MHz	–	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität					
V _{CB} = 10 V, I _E = i _e = 0, f = 1 MHz		C _{CB0}	–	–	6.5 pF
Emitter-Base Capacitance – Emitter-Basis-Kapazität					
V _{EB} = 2 V, I _C = i _c = 0, f = 1 MHz		C _{EB0}	–	–	30 pF
Switching times – Schaltzeiten					
turn-on time		t _{on}	–	–	35 ns
delay time		t _d	–	–	15 ns
rise time	I _{Con} = 150 mA	t _r	–	–	20 ns
turn-off time	I _{Bon} = 15 mA	t _{off}	–	–	255 ns
	- I _{Boff} = 15 mA				
storage time		t _s	–	–	225 ns
fall time		t _f	–	–	30 ns
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft			R _{thA}	200 K/W ¹⁾	
Recommended complementary PNP transistors Empfohlene komplementäre PNP-Transistoren			2N4402, 2N4403		

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