

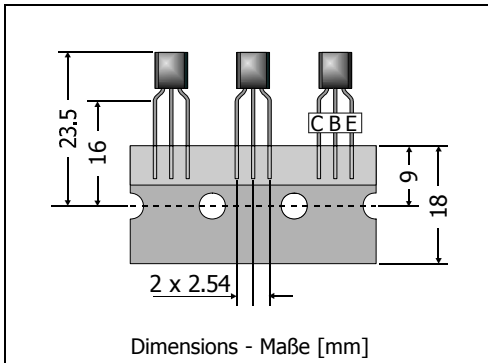
## 2N3906

PNP

**Si-Epitaxial-Planar Switching Transistors**  
**Si-Epitaxial-Planar Schalttransistoren**

PNP

Version 2006-09-12


 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 gegurtet in Ammo-Pack
Maximum ratings ( $T_A = 25^\circ\text{C}$ )Grenzwerte ( $T_A = 25^\circ\text{C}$ )

			2N3906
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	- $V_{EBO}$	5 V
Power dissipation – Verlustleistung		$P_{tot}$	625 mW <sup>1)</sup>
Collector current – Kollektorstrom (dc)		- $I_C$	200 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 <sup>2)</sup>				
- $I_C = 0.1\text{ mA}$ , - $V_{CE} = 1\text{ V}$	$h_{FE}$	60	–	–
- $I_C = 1\text{ mA}$ , - $V_{CE} = 1\text{ V}$	$h_{FE}$	80	–	–
- $I_C = 10\text{ mA}$ , - $V_{CE} = 1\text{ V}$	$h_{FE}$	100	–	300
- $I_C = 50\text{ mA}$ , - $V_{CE} = 1\text{ V}$	$h_{FE}$	60	–	–
- $I_C = 100\text{ mA}$ , - $V_{CE} = 1\text{ V}$	$h_{FE}$	30	–	–
Collector-Emitter saturation voltage – Kollektor-Emitter-Sättigungsspg. <sup>2)</sup>				
- $I_C = 10\text{ mA}$ , - $I_B = 1\text{ mA}$	- $V_{CEsat}$	–	–	0.25 V
- $I_C = 50\text{ mA}$ , - $I_B = 5\text{ mA}$	- $V_{CEsat}$	–	–	0.40 V
Base-Emitter saturation voltage – Basis-Emitter-Sättigungsspannung <sup>2)</sup>				
- $I_C = 10\text{ mA}$ , - $I_B = 1\text{ mA}$	- $V_{BEsat}$	0.65 V	–	0.85 V
- $I_C = 50\text{ mA}$ , - $I_B = 5\text{ mA}$	- $V_{BEsat}$	–	–	0.95 V

1 Mounted on P.C. board with 3 mm<sup>2</sup> copper pad at each terminal  
 Montage auf Leiterplatte mit 3 mm<sup>2</sup> Kupferbelag (Lötpad) an jedem Anschluss

2 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  $\leq 2\%$

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

		Min.	Typ.	Max.
Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom - $V_{CE} = 30\text{ V}$ , - $V_{EB} = 3\text{ V}$	- $I_{CBX}$	–	–	50 nA
Emitter-Base cutoff current – Emitter-Basis-Reststrom - $V_{CE} = 30\text{ V}$ , - $V_{EB} = 3\text{ V}$	- $I_{EBV}$	–	–	50 nA
Gain-Bandwidth Product – Transitfrequenz - $I_C = 10\text{ mA}$ , - $V_{CE} = 20\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	250 MHz	–	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität - $V_{CB} = 5\text{ V}$ , $I_E = i_e = 0$ , $f = 1\text{ MHz}$	$C_{CBO}$	–	–	4.5 pF
Emitter-Base Capacitance – Emitter-Basis-Kapazität - $V_{EB} = 0.5\text{ V}$ , $I_C = i_c = 0$ , $f = 1\text{ MHz}$	$C_{EBO}$	–	–	10 pF
Noise figure – Rauschzahl - $V_{CE} = 5\text{ V}$ , - $I_C = 100\text{ }\mu\text{A}$ , $R_G = 1\text{ k}\Omega$ , $f = 1\text{ kHz}$	F	–	–	4 dB
Switching times – Schaltzeiten (between 10% and 90% levels)				
delay time - $V_{CC} = 3\text{ V}$ , - $V_{BE} = 0.5\text{ V}$	$t_d$	–	–	35 ns
rise time - $I_C = 10\text{ mA}$ , - $I_{B1} = 1\text{ mA}$	$t_r$	–	–	35 ns
storage time - $V_{CC} = 3\text{ V}$ , - $I_C = 10\text{ mA}$ ,	$t_s$	–	–	225 ns
fall time - $I_{B1} = -I_{B2} = 1\text{ mA}$	$t_f$	–	–	75 ns
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft	$R_{thA}$	< 200 K/W <sup>1)</sup>		
Recommended complementary NPN transistors Empfohlene komplementäre NPN-Transistoren		2N3904		

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Montage auf Leiterplatte mit 3 mm<sup>2</sup> Kupferbelag (Löt-pad) an jedem Anschluss