

2N3905 2N3906

PNP SILICON PLANAR EPITAXIAL TRANSISTORS

THE 2N3905 AND 2N3906 ARE PNP SILICON PLANAR EPITAXIAL TRANSISTORS. THEY ARE INTENDED FOR GENERAL PURPOSE, SATURATED-SWITCHING AND AMPLIFIER APPLICATIONS. THEY ARE COMPLEMENTARY TO 2N3903 AND 2N3904 RESPECTIVELY.

CASE T0-92A



EBC

ABSOLUTE MAXIMUM RATINGS

For p-n-p devices, voltage and current values are negative.

Collector-Base Voltage	V_{CB0}	40V
Collector-Emitter Voltage	V_{CE0}	40V
Emitter-Base Voltage	V_{EB0}	5V
Collector Current	I_C	200mA
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_{tot}	350mW
@ $T_C=25^\circ\text{C}$		1W
Operating Junction & Storage Temperature	T_j, T_{stg}	-55 to +150°C

ELECTRICAL CHARACTERISTICS AT $T_A=25^\circ\text{C}$

PARAMETER	SYMBOL	2N3905 MIN MAX	2N3906 MIN MAX	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	BV_{CB0}	40	40	V	$-I_C=10\mu\text{A}$ $I_E=0$
Collector-Emitter Breakdown Voltage	LV_{CE0}^*	40	40	V	$-I_C=1\text{mA}$ $I_B=0$
Emitter-Base Breakdown Voltage	BV_{EB0}	5	5	V	$-I_E=10\mu\text{A}$ $I_C=0$
Collector Cutoff Current	$-I_{CEV}$		50	nA	$V_{CE}=30\text{V}$ $V_{EB}=3\text{V}$
Base Cutoff Current	I_{BEV}		50	nA	$V_{CE}=30\text{V}$ $V_{EB}=3\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}^*$	0.25	0.25	V	$I_C=10\text{mA}$ $I_B=1\text{mA}$
		0.4	0.4	V	$I_C=50\text{mA}$ $I_B=5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}^*$	0.65	0.65	V	$I_C=10\text{mA}$ $I_B=1\text{mA}$
		0.85	0.85	V	$I_C=50\text{mA}$ $I_B=5\text{mA}$
		0.95	0.95	V	$I_C=50\text{mA}$ $I_B=5\text{mA}$
D.C. Current Gain	H_{FE}^*	30	60		$I_C=0.1\text{mA}$ $V_{CE}=1\text{V}$
		40	80		$I_C=1\text{mA}$ $V_{CE}=1\text{V}$
		50 150	100 300		$I_C=10\text{mA}$ $V_{CE}=1\text{V}$
		30	60		$I_C=50\text{mA}$ $V_{CE}=1\text{V}$
		15	30		$I_C=100\text{mA}$ $V_{CE}=1\text{V}$

* Pulse Test : Pulse Width=0.3mS, Duty Cycle=1%.

P.T.O.

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PARAMETER	SYMBOL	2N3905		2N3906		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Current Gain-Bandwidth Product	f_T	200		250		MHz	$I_C=10\text{mA}$ $V_{CE}=20\text{V}$ $f=100\text{MHz}$
Output Capacitance	C_{ob}		4.5		4.5	pF	$V_{CB}=5\text{V}$ $I_E=0$ $f=100\text{kHz}$
Input Capacitance	C_{ib}		10		10	pF	$V_{EB}=0.5\text{V}$ $I_C=0$ $f=100\text{kHz}$
Input Impedance	h_{ie}	0.5	8	2	12	k Ω	$I_C=1\text{mA}$ $V_{CE}=10\text{V}$ $f=1\text{kHz}$
Voltage Feedback Ratio	h_{re}	0.1	5	1	10	$\times 10^{-4}$	$I_C=1\text{mA}$ $V_{CE}=10\text{V}$ $f=1\text{kHz}$
Small Signal Current Gain	h_{fe}	50	200	100	400		$I_C=1\text{mA}$ $V_{CE}=10\text{V}$ $f=1\text{kHz}$
Output Admittance	h_{oe}	1	40	3	60	μS	$I_C=1\text{mA}$ $V_{CE}=10\text{V}$ $f=1\text{kHz}$
Noise Figure	NF		5		4	dB	$I_C=100\mu\text{A}$ $V_{CE}=5\text{V}$ $R_S=1\text{k}\Omega$ $f=10\text{Hz}$ to 15.7kHz
Delay Time	t_d		35		35	nS	$V_{CC}=3\text{V}$ $V_{EB}=0.5\text{V}$ $I_C=10\text{mA}$ $I_{B1}=1\text{mA}$
Rise Time	t_r		35		35	nS	$V_{CC}=3\text{V}$ $V_{EB}=0.5\text{V}$ $I_C=10\text{mA}$ $I_{B1}=1\text{mA}$
Storage Time	t_s		200		225	nS	$V_{CC}=3\text{V}$ $I_C=10\text{mA}$ $I_{B1}=I_{B2}=1\text{mA}$
Fall Time	t_f		60		75	nS	$V_{CC}=3\text{V}$ $I_C=10\text{mA}$ $I_{B1}=I_{B2}=1\text{mA}$