



NES

NEW ENGLAND SEMICONDUCTOR

**2N3806,A
thru
2N3809,A
2N3810*,A
2N3811*,A**

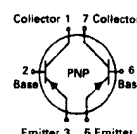
*also available as
JAN, JANTX,
JANTXV

PNP SILICON DUAL AMPLIFIER TRANSISTOR

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

RATINGS	SYMBOL	VALUE	UNITS
Collector-Emitter Voltage	V_{CEO}	60	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current -- Continuous	I_C	50	mAdc
		One Die	Both Die
Total Power Dissipation Derate above 25°C	P_D	500 2.86	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

TO-99



DUAL TRANSISTORS
PNP SILICON

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ⁽¹⁾ $I_C = 10 \text{ mAdc}, I_B = 0$	$V_{(BR)CEO}$	60		Vdc
Collector-Base Breakdown Voltage $I_C = 10 \mu\text{Adc}, I_E = 0$	$V_{(BR)CBO}$	60		Vdc
Emitter-Base Breakdown Voltage $I_E = 10 \mu\text{Adc}, I_C = 0$	$V_{(BR)EBO}$	5.0		Vdc
Collector Cutoff Current $V_{CB} = 50 \text{ Vdc}, I_E = 0$ $V_{CB} = 50 \text{ Vdc}, I_E = 0, T_A = 150^\circ\text{C}$	I_{CBO}		0.01 10	μAdc
Emitter Cutoff Current $V_{BE} = 4.0 \text{ Vdc}, I_C = 0$	I_{EBO}		20	ηAdc

ON CHARACTERISTICS (I)

DC Current Gain $I_C = 1.0 \mu\text{Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 10 \mu\text{Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 100 \mu\text{Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 100 \mu\text{Adc}, V_{CE} = 5.0 \text{ Vdc}, T_A = -55^\circ\text{C}$ $I_C = 500 \mu\text{Adc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$	2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A	h_{FE}	75 100 225 150 300 75 150 150 300 150 300 125 250	450 900	--
Collector-Emitter Saturation Voltage $I_C = 100 \mu\text{Adc}, I_B = 1.0 \mu\text{Adc}$ $I_C = 1.0 \text{ mAdc}, I_B = 100 \mu\text{Adc}$		$V_{CE(sat)}$		0.2 0.25	Vdc
Base-Emitter Saturation Voltage $I_C = 100 \mu\text{Adc}, I_B = 10 \mu\text{Adc}$ $I_C = 1.0 \text{ mAdc}, I_B = 100 \mu\text{Adc}$		$V_{BE(sat)}$		0.7 0.8	Vdc

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T4-4.8-860-356 REV: --



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ELECTRICAL CHARACTERISTICS..con't.. ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristics		Symbol	Min	Max	Unit
ON CHARACTERISTICS (1) con't					
Base-Emitter On Voltage I _C = 100 μA _{dc} , V _{CE} = 10 μA _{dc}		V _{BE(on)}		0.7	V _{dc}
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain -- Bandwidth Product I _C = 500 μA _{dc} , V _{CE} = 5.0 V _{dc} , f = 30 Mhz I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc} , f = 100 Mhz		f _T	30 100	- 500	MHz
Output Capacitance V _{CB} = 5.0 V _{dc} , I _E = 0, f = 100 kHz		C _{obo}		4.0	p ^f
Input Capacitance V _{BE} = 0.5 V _{dc} , I _C = 0, f = 100 kHz		C _{ibo}		8.0	p ^f
Input Impedance I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz 2N3806,8,10,A 2N3807,9,11,A		h _{je}	3.0 10	30 40	kΩ
Voltage Feedback Ratio I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz		h _{re}		25	x10 ⁻⁴
Small-Signal Current Gain I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz 2N3806,8,10,A 2N3807,9,11,A		h _{fe}	150 300	600 900	--
Output Admittance I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz		h _{oe}	5.0	60	μmhos
Noise Figure I _C = 100 μA _{dc} , V _{CE} = 10 V _{dc} , R _G = 3.0 kohms f = 100 Hz, BW = 20 Hz Spot Noise f = 1.0 kHz, BW = 200 Hz f = 10 kHz, BW = 2.0 kHz Broadband Noise Bandwidth 10 Hz to 15.7 kHz		2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A 2N3806,8,10,A 2N3807,9,11,A	NF	7.0 4.0 3.0 1.5 2.5 1.5 3.5 2.5	dB
MATCHING CHARACTERISTICS					
DC Current Gain Ratio (2) I _C = 100 μA _{dc} , V _{CE} = 5.0 V _{dc} T _A = -55 to +125 ⁰ C		2N3808,9 2N3810,11 2N3810A,11A 2N3810A,11A	h _{FE1} /h _{FE2}	0.8 0.9 0.95 0.85	1.0 1.0 1.0 1.0 --
Base-Emitter Voltage Differential I _C = 10 μA _{dc} to 10 mA _{dc} , V _{CE} = 5.0 V _{dc} I _C = 100 μA _{dc} , V _{CE} = 5.0 V _{dc}		2N3808,9 2N3810,A,11,A 2N3808,9 2N3810,11 2N3810A,11A	V _{BE1} -V _{BE2}	8.0 5.0 5.0 3.0 1.5	mV _{dc}
Base-Emitter Voltage Differential Change Due to Temperature I _C = 100 μA _{dc} , V _{CE} = 5.0 V _{dc} T _A = -55 to +125 ⁰ C I _C = 100 μA _{dc} , V _{CE} = 5.0 V _{dc} T _A = +25 to +125 ⁰ C		2N3808,9 2N3810,11 2N3810A,11A 2N3808,9 2N3810,11 2N3810A,11A	ΔV _{BE1} -V _{BE2}	1.6 0.8 0.4 2.0 1.0 0.5	mV _{dc}

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

(2) The lowest h_{FE} reading is taken as h_{FE1} for this ratio.

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