

**2N3805,A, 2N3806**  
 thru  
**2N3810,A, 2N3811,A**  
**2N3812 thru 2N3816,A, 2N3817,A**

**DUAL PNP SILICON ANNULAR TRANSISTORS**

... specifically designed for differential amplifier applications.

- Tight  $h_{FE}$  Match: 5%
- High  $h_{FE}$ : to 225 (min) @  $I_C = 10 \mu A$ dc
- Low Noise: 1.5 dB (Max) @ 1.0 kHz and 10 kHz
- $h_{FE}$  Match Temperature Tracking: from -55°C to +125°C
- Tight  $V_{BE}$  Match: 1.5 mVdc
- 2N3810 JAN, JTX and 2N3811 JAN, JTX Available

**PNP SILICON  
 DIFFERENTIAL  
 AMPLIFIERS**

\*MAXIMUM RATINGS (each side)

Rating	Symbol	Value	Unit		
Collector-Emitter Voltage	$V_{CEO}$	60	Vdc		
Collector-Base Voltage	$V_{CB}$	60	Vdc		
Emitter-Base Voltage	$V_{EB}$	5.0	Vdc		
Collector Current	$I_C$	50	mAdc		
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	°C		
Total Device Dissipation @ $T_A = 25^\circ C$ Metal Can (2N3800 thru 2N3804,A 2N3805,A Derate above 25°C Metal Can (2N3806 thru 2N3810,A, 2N3811,A Derate above 25°C Flat Package (2N3812 thru 2N3816,A, 2N3817,A Derate above 25°C	$P_D$	One Side	Both Sides	mW	
		250	360		
		1.43	2.06		mW/°C
		500	600		mW
		2.86	3.43	mW/°C	
		250	250	mW	
		1.43	2.06	mW/°C	

\*Indicates JEDEC Registered Data.



2N3800 thru 2N3804,A  
 2N3805,A

Case  
 655

2N3806 thru 2N3810,A  
 2N3811,A

Case  
 654-04

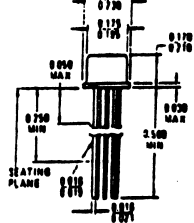


2N3812 thru 2N3816,A  
 2N3817,A

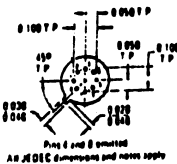
Case 610A-03



2N3800 thru 2N3804,A  
 2N3805,A

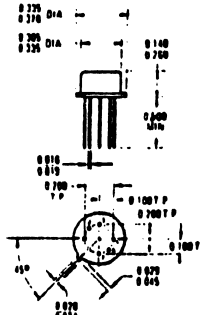


Case  
 655



Pin 6 and 8 omitted  
 All JEDEC dimensions and notes apply

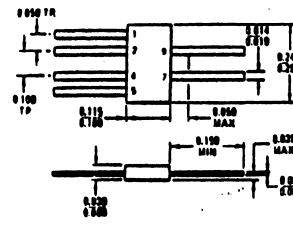
2N3806 thru 2N3810,A  
 2N3811,A



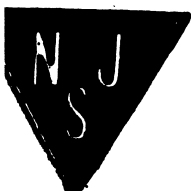
Case  
 654-04

All Leads Electrically Isolated from Case

2N3812 thru 2N3816,A  
 2N3817,A



Case 610A-03



2N3806 thru 2N3810,A, 2N3811,A, 2N3812,A, 2N3816,A, 2N3817,A

ELECTRICAL CHARACTERISTICS (continued) (T<sub>A</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
Base-Emitter On Voltage (I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 5.0 Vdc)	V <sub>BE(on)</sub>	—	0.7	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product (I <sub>C</sub> = 500 μAdc, V <sub>CE</sub> = 5.0 Vdc, f = 30 MHz) (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 5.0 Vdc, f = 100 MHz)	f <sub>T</sub>	30 100	— 500	MHz	
Output Capacitance (V <sub>CB</sub> = 5.0 Vdc, I <sub>E</sub> = 0, f = 100 kHz)	C <sub>obo</sub>	—	4.0	pF	
Input Capacitance (V <sub>BE</sub> = 0.5 Vdc, I <sub>C</sub> = 0, f = 100 kHz)	C <sub>ibo</sub>	—	8.0	pF	
Input Impedance (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	h <sub>ie</sub>	2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	3.0 10	30 40	Ω
Voltage Feedback Ratio (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	h <sub>re</sub>	—	25	X 10 <sup>-4</sup>	
Small-Signal Current Gain (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	h <sub>fe</sub>	2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	150 300	600 900	—
Output Admittance (I <sub>C</sub> = 1.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 1.0 kHz)	h <sub>oe</sub>	—	5.0	60	μmhos
Noise Figure (I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 10 Vdc, R <sub>G</sub> = 3.0 kohms f = 100 Hz, BW = 20 Hz)	NF	2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	— —	7.0 4.0	dB
Spot Noise f = 1.0 kHz, BW = 200 Hz		2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	— —	3.0 1.5	
f = 10 kHz, BW = 2.0 kHz)		2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	— —	2.5 1.5	
Broadband Noise Bandwidth 10 Hz to 15.7 kHz		2N3806,8,10,A,12,14,16,A 2N3807,9,11,A,13,15,17,A	— —	3.5 2.5	

MATCHING CHARACTERISTICS

DC Current Gain Ratio(2) (I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE1</sub> /h <sub>FE2</sub>	2N3808,9,14,15 2N3810,11,16,17 2N3810A,11A,16A,17A	0.8 0.9 0.95	1.0 1.0 1.0	—
(I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 50 Vdc, T <sub>A</sub> = -55 to +125°C)		2N3810A,11A,16A,17A	0.85	1.0	
Base-Emitter Voltage Differential (I <sub>C</sub> = 10 μAdc to 10 mAdc, V <sub>CE</sub> = 5.0 Vdc)	V <sub>BE1</sub> -V <sub>BE2</sub>	2N3808,9,14,15 2N3810,A,11,A,16,A,17,A	— —	8.0 5.0	mVdc
(I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 5.0 Vdc)		2N3808,9,14,15 2N3810,11,16,17 2N3810A,11A,16A,17A	— — —	5.0 3.0 1.5	
Base-Emitter Voltage Differential Change Due to Temperature (I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 5.0 Vdc, T <sub>A</sub> = -55 to +25°C)	Δ(V <sub>BE1</sub> -V <sub>BE2</sub> )	2N3808,9,14,15 2N3810,11,16,17 2N3810A,11A,16A,17A	— — —	1.6 0.8 0.4	mVdc
(I <sub>C</sub> = 100 μAdc, V <sub>CE</sub> = 5.0 Vdc, T <sub>A</sub> = +25 to +125°C)		2N3808,9,14,15 2N3810,11,16,17 2N3810A,11A,16A,17A	— — —	2.0 1.0 0.5	

- (1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.  
 (2) The lowest h<sub>FE</sub> reading is taken as h<sub>FE1</sub> for this ratio.