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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 μAdc
- 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)

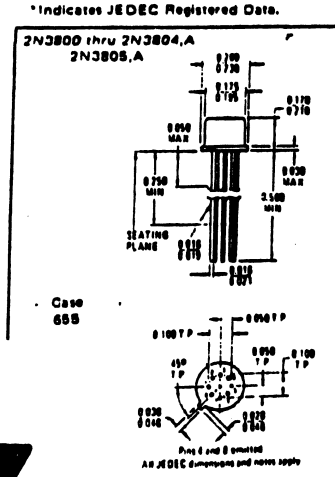
Rating	Symbol	Value		Unit
Collector-Emitter Voltage	V_{CEO}	60		Vdc
Collector-Base Voltage	V_{CB}	60		Vdc
Emitter-Base Voltage	V_{EB}	5.0		Vdc
Collector Current	I_C	50		mAdc
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C
		One Side	Both Sides	
Total Device Dissipation @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

*Indicates JEDEC Registered Data.

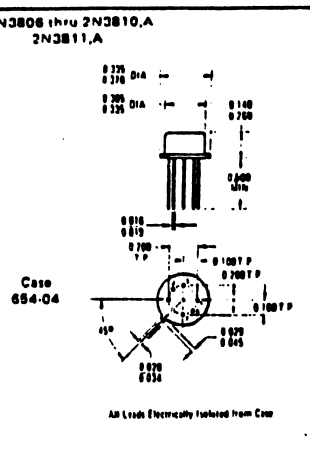
2N3800 thru 2N3804,A
2N3805,A
Case 655

2N3806 thru 2N3810,A
2N3811,A
Case 654-04

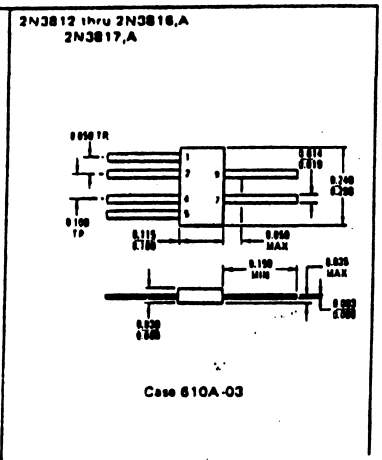
• 2N3812 thru 2N3816,A
2N3817,A
Case 610A-03



2N3800 thru 2N3804,A
2N3805,A
Case 655



2N3806 thru 2N3810,A
2N3811,A
Case 654-04



2N3812 thru 2N3816,A
2N3817,A
Case 610A-03

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
Base-Emitter On Voltage (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	—	0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product		f_T			MHz
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 30 MHz)			30	—	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)			100	500	
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	4.0	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	8.0	pF
Input Impedance		h_{ie}			Ω
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A,12,14,16,A		3.0	30	
	2N3807,9,11,A,13,15,17,A		10	40	
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{re}	—	25	X 10^{-4}
Small-Signal Current Gain		h_{fe}			—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A,12,14,16,A		150	600	
	2N3807,9,11,A,13,15,17,A		300	900	
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{oe}	5.0	60	μmhos
Noise Figure		NF			dB
(I_C = 100 μAdc, V_{CE} = 10 Vdc, R_G = 3.0 kohms					
f = 100 Hz, BW = 20 Hz	2N3806,8,10,A,12,14,16,A		—	7.0	
	2N3807,9,11,A,13,15,17,A		—	4.0	
Spot Noise f = 1.0 kHz, BW = 200 Hz	2N3806,8,10,A,12,14,16,A		—	3.0	
	2N3807,9,11,A,13,15,17,A		—	1.5	
f = 10 kHz, BW = 2.0 kHz)	2N3806,8,10,A,12,14,16,A		—	2.5	
	2N3807,9,11,A,13,15,17,A		—	1.5	
Broadband Noise Bandwidth	2N3806,8,10,A,12,14,16,A		—	3.5	
10 Hz to 15.7 kHz	2N3807,9,11,A,13,15,17,A		—	2.5	
MATCHING CHARACTERISTICS					
DC Current Gain Ratio(2)		h_{FE1}/h_{FE2}			—
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3808,9,14,15		0.8	1.0	
	2N3810,11,16,17		0.9	1.0	
	2N3810A,11A,16A,17A		0.95	1.0	
(I_C = 100 μAdc, V_{CE} = 50 Vdc, T_A = −55 to +125°C)	2N3810A,11A,16A,17A		0.85	1.0	
Base-Emitter Voltage Differential		$\lvert V_{BE1}-V_{BE2}\rvert$			mVdc
(I_C = 10 μAdc to 10 mAdc, V_{CE} = 5.0 Vdc)	2N3808,9,14,15		—	8.0	
	2N3810,A,11,A,16,A,17,A		—	5.0	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3808,9,14,15		—	5.0	
	2N3810,11,16,17		—	3.0	
	2N3810A,11A,16A,17A		—	1.5	
Base-Emitter Voltage Differential Change Due to Temperature		$\Delta(V_{BE1}-V_{BE2})$			mVdc
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55 to +25°C)	2N3808,9,14,15		—	1.6	
	2N3810,11,16,17		—	0.8	
	2N3810A,11A,16A,17A		—	0.4	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = +25 to +125°C)	2N3808,9,14,15		—	2.0	
	2N3810,11,16,17		—	1.0	
	2N3810A,11A,16A,17A		—	0.5	

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) The lowest h_{FE} reading is taken as h_{FE1} for this ratio.