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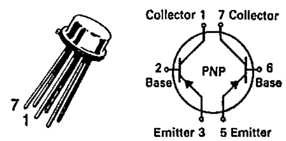
2N3806, A thru 2N3811, A

CASE 654-07, STYLE 1



2N3810, 2N3811 — JAN, JTX, JTXV AVAILABLE

DUAL AMPLIFIER TRANSISTORS

PNP SILICON

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MAXIMUM RATINGS

Rating	Symbol	Value		Unit
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 Device Dissipation @ T_A = 25°C	P_D	500	600	mW
Derate above 25°C		2.86	3.43	mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, I_B = 0)		$V_{(BR)CEO}$	60	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)		$V_{(BR)CBO}$	60	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current		I_{CBO}			μAdc
(V_{CB} = 50 Vdc, I_E = 0)			—	0.01	
(V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)			—	10	
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	20	nAdc
ON CHARACTERISTICS					
DC Current Gain(1)		h_{FE}			—
(I_C = 1.0 μAdc, V_{CE} = 5.0 Vdc)	2N3807,9,11,A		75	—	
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A		100	—	
	2N3807,9,11,A		225	—	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A		150	450	
	2N3807,9,11,A		300	900	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N3806,8,10,A		75	—	
	2N3807,9,11,A		150	—	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A		150	450	
	2N3807,9,11,A		300	900	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A		150	450	
	2N3807,9,11,A		300	900	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A		125	—	
	2N3807,9,11,A		250	—	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$			Vdc
(I_C = 100 μAdc, I_B = 1.0 μA)			—	0.2	
(I_C = 1.0 mAdc, I_B = 100 μAdc)			—	0.25	
Base-Emitter Saturation Voltage(1)		$V_{BE(sat)}$			Vdc
(I_C = 100 μAdc, I_B = 10 μAdc)			—	0.7	
(I_C = 1.0 mAdc, I_B = 100 μAdc)			—	0.8	

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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 (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A	h_{ie}	3.0	30	kΩ
	2N3807,9,11,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 (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A	h_{fe}	150	600	—
	2N3807,9,11,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 (I_C = 100 μAdc, V_{CE} = 10 Vdc, R_G = 3.0 kohms		NF			dB
f = 100 Hz, BW = 20 Hz	2N3806,8,10,A		—	7.0	
	2N3807,9,11,A		—	4.0	
Spot Noise f = 1.0 kHz, BW = 200 Hz	2N3806,8,10,A		—	3.0	
	2N3807,9,11,A		—	1.5	
f = 10 kHz, BW = 2.0 kHz)	2N3806,8,10,A		—	2.5	
	2N3807,9,11,A		—	1.5	
Broadband Noise Bandwidth 10 Hz to 15.7 kHz	2N3806,8,10,A		—	3.5	
	2N3807,9,11,A		—	2.5	
MATCHING CHARACTERISTICS					
DC Current Gain Ratio(2) (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3808,9	h_{FE1}/h_{FE2}	0.8	1.0	—
	2N3810,11		0.9	1.0	
	2N3810A,11A		0.95	1.0	
(I_C = 100 μAdc, V_{CE} = 50 Vdc, T_A = −55 to +125°C)	2N3810A,11A		0.85	1.0	
Base-Emitter Voltage Differential (I_C = 10 μAdc to 10 mAdc, V_{CE} = 5.0 Vdc)	2N3808,9	$\|V_{BE1}-V_{BE2}\|$	—	8.0	mVdc
	2N3810,A,11,A		—	5.0	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3808,9		—	5.0	
	2N3810,11		—	3.0	
	2N3810A,11A		—	1.5	
Base-Emitter Voltage Differential Change Due to Temperature (I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55 to +25°C)	2N3808,9	$\Delta(V_{BE1}-V_{BE2})$	—	1.6	mVdc
	2N3810,11		—	0.8	
	2N3810A,11A		—	0.4	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = +25 to +125°C)	2N3808,9		—	2.0	
	2N3810,11		—	1.0	
	2N3810A,11A		—	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.

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FIGURE 1 — DC CURRENT GAIN versus COLLECTOR CURRENT

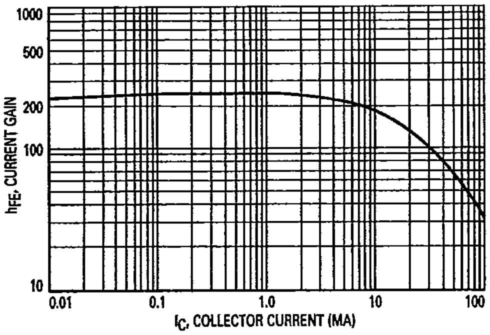


FIGURE 2 — DC CURRENT GAIN versus COLLECTOR CURRENT

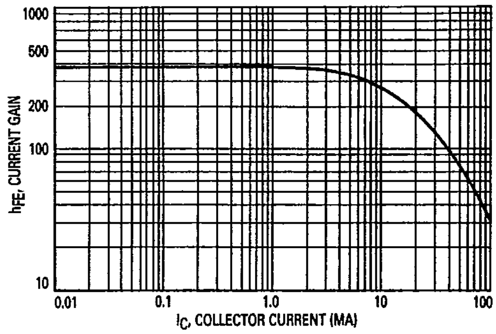


FIGURE 3 — "ON" VOLTAGES

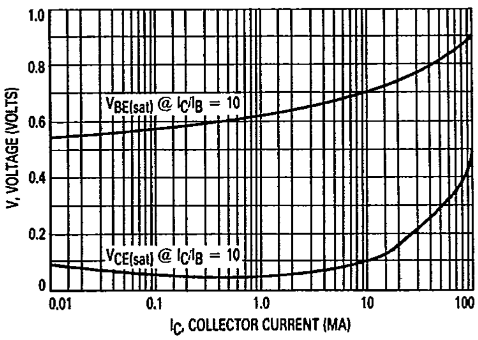
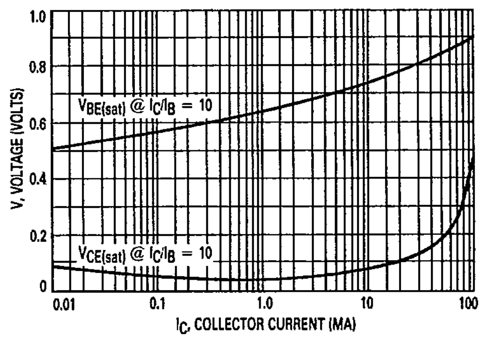


FIGURE 4 — "ON" VOLTAGES



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