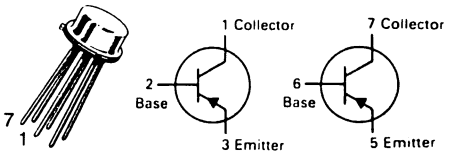
SOLID STATE INC.
46 FARRAND STREET
BLOOMFIELD, NEW JERSEY 07003 www.solidstateinc.com

2N3806 thru 2N3810,A 2N3811,A



2N3810, 2N3811

DUAL AMPLIFIER TRANSISTOR

PNP SILICON

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 Derate above 25°C	P_D	 500 2.86	 600 3.43	mW 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 (V_{CB} = 50 Vdc, I_E = 0) (V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)		I_{CBO}	 — —	 0.01 10	μAdc
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	20	nAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 1.0 μAdc, V_{CE} = 5.0 Vdc)	2N3807,9,11,A	h_{FE}	75	—	—
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A 2N3807,9,11,A		100 225	— —	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A 2N3807,9,11,A		150 300	450 900	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N3806,8,10,A 2N3807,9,11,A		75 150	— —	
(I_C = 500 μAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A 2N3807,9,11,A		150 300	450 900	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A 2N3807,9,11,A		150 300	450 900	
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	2N3806,8,10,A 2N3807,9,11,A		125 250	— —	
Collector-Emitter Saturation Voltage(1) (I_C = 100 μAdc, I_B = 1.0 μA) (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{CE(sat)}$	 — —	 0.2 0.25	Vdc
Base-Emitter Saturation Voltage(1) (I_C = 100 μAdc, I_B = 10 μAdc) (I_C = 1.0 mAdc, I_B = 100 μAdc)		$V_{BE(sat)}$	 — —	 0.7 0.8	Vdc

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}			kΩ
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A		3.0	30	
	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		h_{fe}			—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	2N3806,8,10,A		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		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		—	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	2N3806,8,10,A		—	3.5	
10 Hz to 15.7 kHz	2N3807,9,11,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		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		$\lvert V_{BE1}-V_{BE2}\rvert$			mVdc
(I_C = 10 μAdc to 10 mAdc, V_{CE} = 5.0 Vdc)	2N3808,9		—	8.0	
	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		$\Delta(V_{BE1}-V_{BE2})$			mVdc
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55 to +25°C)					
	2N3808,9		—	1.6	
	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.

FIGURE 1 — DC CURRENT GAIN versus COLLECTOR CURRENT

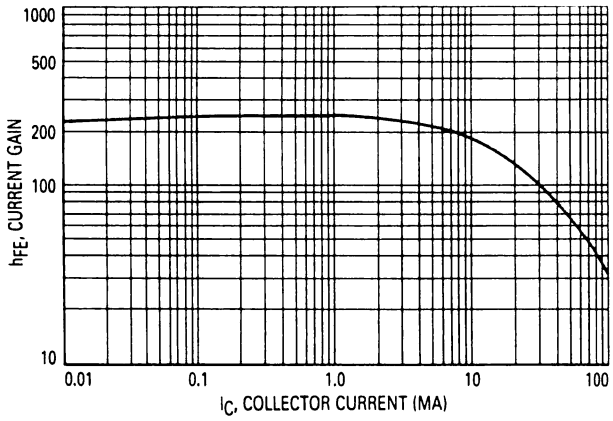


FIGURE 2 — DC CURRENT GAIN versus COLLECTOR CURRENT

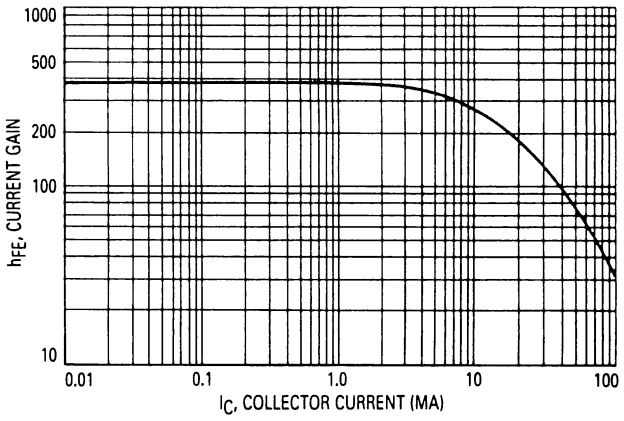


FIGURE 3 — "ON" VOLTAGES

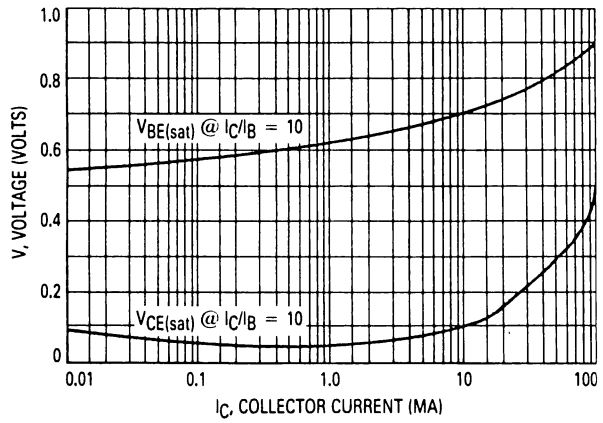
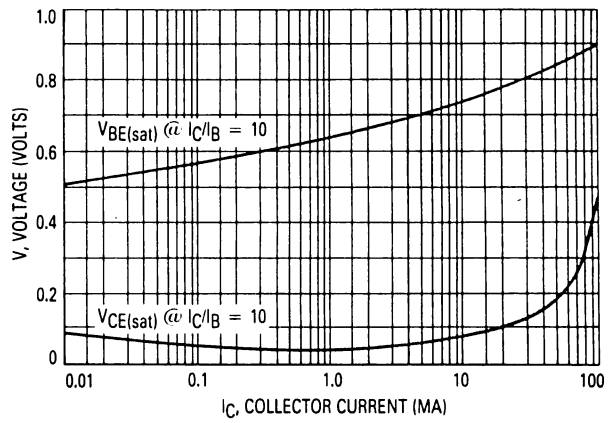
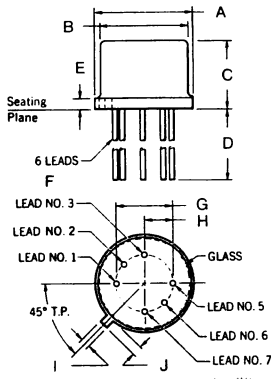


FIGURE 4 — "ON" VOLTAGES



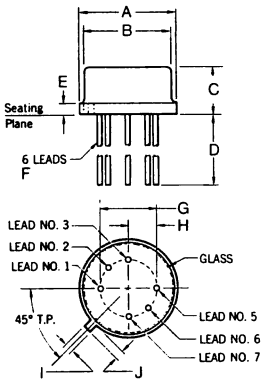
PHYSICAL DIMENSIONS

JEDEC (TO-77) outline



DIM.	INCHES			MILLIMETERS		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	.335		.370	8.51		9.39
B	.305		.335	7.75		8.51
C	.240		.260	6.10		6.60
D	.500			12.70		
E			.040			0.916
F	.016		.019	0.406		0.483
G		.200			5.08	
H		.100			2.54	
I	.028		.034	0.711		0.864
J	.029		.045	0.737		1.14

JEDEC (TO-78) outline



DIM.	INCHES			MILLIMETERS		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	.335		.370	8.51		9.39
B	.305		.335	7.75		8.51
C	.165		.185	4.19		4.69
D	.500			12.70		
E			.040			0.916
F	.016		.019	0.406		0.483
G		.200			5.08	
H		.100			2.54	
I	.028		.034	0.711		0.864
J	.029		.045	0.737		1.14