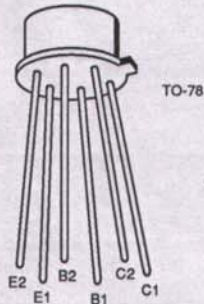


2N3810A / 2N3811A

PIN CONFIGURATION



5010

ABSOLUTE MAXIMUM RATINGS

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

Emitter-Base Voltage (Note 1)	-5V
Collector-Base or Collector-Emitter Voltage (Note 1)	-60V
Collector Current (Note 1)	50mA
Storage Temperature Range	-65°C to $+175^\circ\text{C}$
Operating Temperature Range	-55°C to $+175^\circ\text{C}$
Lead Temperature (Soldering, 10sec)	$+300^\circ\text{C}$

	One Side	Both Sides
Power Dissipation	500mW	600mW
Derate above 25°C	$3.3\text{W}/^\circ\text{C}$	$4.0\text{mW}/^\circ\text{C}$

NOTE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ORDERING INFORMATION

Part	Package	Temperature Range
2N3810	Hermetic TO-78	-55°C to $+175^\circ\text{C}$
X2N3810	Sorted Chips in Carriers	-55°C to $+175^\circ\text{C}$
2N3810A	Hermetic TO-78	-55°C to $+175^\circ\text{C}$
X2N3810A	Sorted Chips in Carriers	-55°C to $+175^\circ\text{C}$
2N3811	Hermetic TO-78	-55°C to $+175^\circ\text{C}$
X2N3811	Sorted Chips in Carriers	-55°C to $+175^\circ\text{C}$
2N3811A	Hermetic TO-78	-55°C to $+175^\circ\text{C}$
X2N3811A	Sorted Chips in Carriers	-55°C to $+175^\circ\text{C}$

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

SYMBOL	PARAMETER	2N3810 / A		2N3811 / A		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
BV_{CBO}	Collector-Base Breakdown Voltage	-60		-60		V	$I_C = -10\mu\text{A}, I_E = 0$
BV_{CEO}	Collector-Emitter Breakdown Voltage (Note 2)	-60		-60			$I_C = -10\text{mA}, I_B = 0$
BV_{EBO}	Emitter-Base Breakdown Voltage	-5		-5			$I_E = -10\mu\text{A}, I_C = 0$
$I_{C(off)}$	Collector Cutoff Current		-10		-10	nA	$V_{CB} = -50\text{V}, I_E = 0$
			-10		-10		$T_A = +150^\circ\text{C}$
$I_{E(off)}$	Emitter Cutoff Current		-20		-20	nA	$V_{BE} = 4\text{V}, I_C = 0$
h_{FE}	Static Forward Current Transfer Ratio	100		225		V _{CE} = -5V	$I_C = -10\mu\text{A}$
		150	450	300	900		$I_C = -100\mu\text{A}$ to -1mA
		125		250			$I_C = 10\text{mA}$ (Note 2)
		75		150			$I_C = 100\mu\text{A}, T_A = -55^\circ\text{C}$

Small Signal
Discretes

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

SYMBOL	PARAMETER	2N3810 / A		2N3811 / A		UNITS	TEST CONDITIONS	
		MIN	MAX	MIN	MAX			
$V_{BE(sat)}$	Base-Emitter Saturation Voltage		-0.7		-0.7	V	$I_C = -100\mu\text{A}, I_B = -10\mu\text{A}$	
			-0.8		-0.8		$I_C = -1.0\mu\text{A}, I_B = -100\mu\text{A}$	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (Note 2)		-0.2		-0.2	V	$I_B = -10\mu\text{A}, I_C = -100\mu\text{A}$	
			-0.25		-0.25		$I_B = -100\mu\text{A}, I_C = -1\text{mA}$	
h_{ie}	Input Impedance (Note 4)	3	30	10	40	$k\Omega$		
h_{fe}	Forward Current Transfer Ratio (Note 4)	150	600	300	900		$V_{CE} = -10\text{V}$ $I_C = -1\text{mA}$ $f = 1\text{kHz}$	
h_{re}	Reverse Voltage Transfer Ratio (Note 4)		0.25		0.25			
h_{oe}	Output Admittance (Note 4)	5	60	5	60			μs
$ h_{fe} $	Magnitude of small signal current gain (Note 4)		1	5	1	5	$V_{CE} = -5\text{V}$	$I_C = -1\text{mA}, f = 100\text{MHz}$
		A devices	1		1			$I_C = -500\mu\text{A}, f = 30\text{MHz}$
C_{obo}	Output Capacitance (Note 4)		4		4	pF	$V_{CB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	
C_{ibo}	Input Capacitance (Note 4)		8		8		$V_{CB} = -0.5\text{V}, I_C = 0, f = 1\text{MHz}$	
h_{FE1}/h_{FE2}	DC Current Gain Ratio		0.9	1.0	0.9	1.0	$V_{CE} = -5\text{V}, I_C = 100\mu\text{A}$	
		A devices	0.95	1.0	0.95	1.0		
$ V_{BE1} - V_{BE2} $	Base-Emitter Voltage Differential			-5	-5	mV	$V_{CE} = -5\text{V}$	$I_C = 10\mu\text{A}$ to 10mA
		A devices		-2.5	-2.5			$I_C = 100\mu\text{A}$
				-3	-3			
A devices		-1.5	-1.5					
$\frac{\Delta V_{BE1} - V_{BE2}}{\Delta T}$	Base-Emitter Voltage Differential Gradient			10	10	$\mu\text{V}/^\circ\text{C}$	$V_{CE} = -5\text{V}, I_C = 100\mu\text{A}$	
		A devices		5	5			
NF	Spot Noise Figure (Note 4)		7		4	dB	$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3k\Omega, f = 100\text{Hz}, \text{Noise Bandwidth} = 20\text{Hz}$	
			3		1.5		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3k\Omega, f = 1\text{kHz}, \text{Noise Bandwidth} = 200\text{kHz}$	
			2.5		1.5		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3k\Omega, f = 10\text{kHz}, \text{Noise Bandwidth} = 2\text{kHz}$	
			3.5		2.5		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3k\Omega, \text{Noise Bandwidth} = 15.7\text{kHz}$ (Note 3)	

- NOTES: 1. Per transistor.
 2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.
 3. 3dB down at 10Hz and 10kHz.
 4. For design reference only, not 100% rested.