

## PNP SILICON DUAL TRANSISTOR

Qualified per MIL-PRF-19500 /336

### DEVICES

2N3810      2N3811  
 2N3810L    2N3811L  
 2N3810U    2N3811U

### LEVELS

JAN  
 JANTX  
 JANTV  
 JANS

### ABSOLUTE MAXIMUM RATINGS ( $T_C = +25^\circ\text{C}$ unless otherwise noted)

Parameters / Test Conditions	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	$I_C$	50		mAdc
		One Section <sup>1</sup>	Both Sections <sup>2</sup>	
Total Power Dissipation @ $T_A = +25^\circ\text{C}$	$P_T$	200	350	mW
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$



TO-78

### Note:

1. Derate linearly 1.143mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$  (one section)
2. Derate linearly 2.00mW/ $^\circ\text{C}$  for  $T_A > +25^\circ\text{C}$  (both sections)

### ELECTRICAL CHARACTERISTICS ( $T_A = +25^\circ\text{C}$ , unless otherwise noted)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage $I_C = 100\mu\text{Adc}$	$V_{(BR)CEO}$	60		Vdc
Collector-Base Cutoff Current $V_{CB} = 50\text{Vdc}$ $V_{CB} = 60\text{Vdc}$	$I_{CBO}$		10 10	$\eta\text{Adc}$ $\mu\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 4.0\text{Vdc}$ $V_{EB} = 5.0\text{Vdc}$	$I_{EBO}$		10 10	$\eta\text{Adc}$ $\mu\text{Adc}$

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### ELECTRICAL CHARACTERISTICS (con't)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>ON CHARACTERISTICS</b>				
Forward-Current Transfer Ratio $I_C = 10\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 100\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 1.0\text{mAdc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 10\text{mAdc}, V_{CE} = 5.0\text{Vdc}$  $I_C = 1.0\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 10\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 100\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 1.0\text{mAdc}, V_{CE} = 5.0\text{Vdc}$ $I_C = 10\text{mAdc}, V_{CE} = 5.0\text{Vdc}$	2N3810, 2N3810L, 2N3810U     2N3811, 2N3811L, 2N3811U	$h_{FE}$     $h_{FE}$	100 150 150 125  75 225 300 300 250	450 450
Collector-Emitter Saturation Voltage $I_C = 100\mu\text{Adc}, I_B = 10\mu\text{Adc}$ $I_C = 1.0\text{mAdc}, I_B = 100\mu\text{Adc}$	$V_{CE(sat)}$		0.2 0.25	Vdc
Base-Emitter Saturation Voltage $I_C = 100\mu\text{Adc}, I_B = 10\mu\text{Adc}$ $I_C = 1.0\text{mAdc}, I_B = 100\mu\text{Adc}$	$V_{BE(sat)}$		0.7 0.8	Vdc
Base-Emitter Non-Saturation Voltage $V_{CE} = 5.0\text{Vdc}, I_C = 100\mu\text{Adc}$	$V_{BE}$		0.7	Vdc

### DYNAMIC CHARACTERISTICS

Forward Current Transfer Ratio, Magnitude $I_C = 500\mu\text{Adc}, V_{CE} = 5.0\text{Vdc}, f = 30\text{MHz}$ $I_C = 1.0\text{mAdc}, V_{CE} = 5.0\text{Vdc}, f = 100\text{MHz}$	$ h_{fe} $	1.0 1.0	5.0	
Small-Signal Short Circuit Forward Current Transfer Ratio $I_C = 1.0\text{mAdc}, V_{CE} = 10\text{Vdc}, f = 1.0\text{kHz}$	$h_{fe}$	2N3810, 2N3810L, 2N3810U 2N3811, 2N3811L, 2N3811U	150 300	600 900
Small-Signal Short Circuit Input Impedance $I_C = 1.0\text{mAdc}, V_{CE} = 10\text{Vdc}, f = 1.0\text{kHz}$	$h_{je}$	2N3810, 2N3810L, 2N3810U 2N3811, 2N3811L, 2N3811U	3.0 3.0	30 40
Small-Signal Short Circuit Output Admittance $I_C = 1.0\text{mAdc}, V_{CE} = 10\text{Vdc}, f = 1.0\text{kHz}$	$h_{oe}$	2N3810, 2N3810L, 2N3810U 2N3811, 2N3811L, 2N3811U	5.0	60
Output Capacitance $V_{CB} = 5.0\text{Vdc}, I_E = 0, 100\text{kHz} \leq f \leq 1.0\text{MHz}$	$C_{obo}$			5.0
Input Capacitance $V_{EB} = 5.0\text{Vdc}, I_C = 0, 100\text{kHz} \leq f \leq 1.0\text{MHz}$	$C_{lbo}$			8.0



# TECHNICAL DATA SHEET

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### DYNAMIC CHARACTERISTICS (cont.)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Noise Figure				
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 100\text{Hz}$ , $R_G = 3.0\text{k}\Omega$ 2N3810, L, U	F <sub>1</sub>		7.0	dB
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 1.0\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3810, L, U	F <sub>2</sub>		3.0	
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 10\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3810, L, U	F <sub>3</sub>		2.5	
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 10\text{Hz to } 15.7\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3810, L, U	F <sub>4</sub>		3.5	
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 100\text{Hz}$ , $R_G = 3.0\text{k}\Omega$ 2N3811, L, U	F <sub>1</sub>		4.0	dB
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 1.0\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3811, L, U	F <sub>2</sub>		1.5	
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 10\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3811, L, U	F <sub>3</sub>		2.0	
$I_C = 100\mu\text{A}$ dc, $V_{CE} = 10\text{V}$ dc, $f = 10\text{Hz to } 15.7\text{kHz}$ , $R_G = 3.0\text{k}\Omega$ 2N3811, L, U	F <sub>4</sub>		2.5	

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