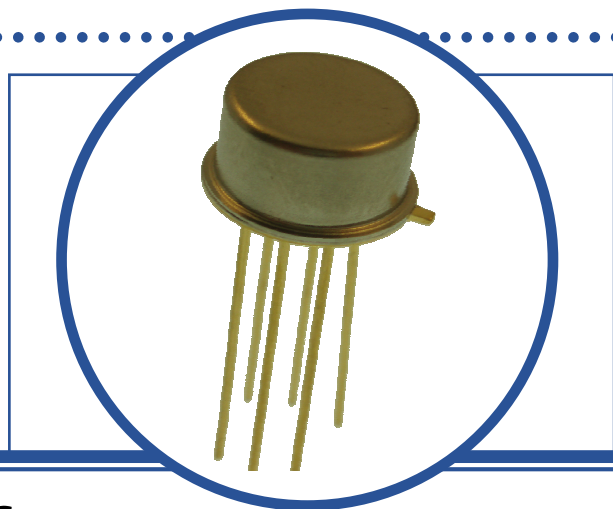


SILICON DUAL MATCHED PNP TRANSISTORS

2N3810

- Matched Dual Transistor.
- Hermetic Metal TO78 Package.
- Suitable For High Gain, Low Noise, Differential Amplifier, Applications.
- Screening Options Available



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise stated)

		Each Side	Total Device
V _{CB0}	Collector – Base Voltage	-60V	
V _{CEO}	Collector – Emitter Voltage	-60V	
V _{EBO}	Emitter – Base Voltage	-5V	
I _C	Continuous Collector Current	-50mA	
P _D	Total Power Dissipation at T _A = 25°C Derate Above 25°C	500mW 2.86mW/°C	600mW ⁽¹⁾ 3.43mW/°C
T _J	Junction Temperature Range	-65 to +200°C	
T _{stg}	Storage Temperature Range	-65 to +200°C	

THERMAL PROPERTIES (Each Side)

Symbols	Parameters	Min.	1Typ.	Max.	Units
R _{θJA}	Thermal Resistance, Junction To Ambient			350	°C/W

Notes

(1) Total device power dissipation limited by package.

SILICON DUAL MATCHED PNP TRANSISTORS 2N3810

ELECTRICAL CHARACTERISTICS (Each Side, $T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\mu\text{A}$ $I_E = 0$	-60			V
$V_{(BR)CEO}^{(2)}$	Collector-Emitter Breakdown Voltage	$I_C = -10\text{mA}$ $I_B = 0$	-60			
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\mu\text{A}$ $I_C = 0$	-5			
I_{CBO}	Collector-Cut-Off Current	$V_{CB} = -50\text{V}$ $I_E = 0$			-10	nA
		$T_A = 150^\circ\text{C}$			-10	μA
I_{EBO}	Emitter-Cut-Off Current	$V_{EB} = -4\text{V}$ $I_C = 0$			-20	nA
$h_{FE}^{(2)}$	Forward-current transfer ratio	$I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$	100			
		$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	150		450	
		$T_A = -55^\circ\text{C}$	60			
		$I_C = -500\mu\text{A}$ $V_{CE} = -5\text{V}$	150		450	
		$I_C = -1.0\text{mA}$ $V_{CE} = -5\text{V}$	150		450	
$I_C = -10\text{mA}$ $V_{CE} = -5\text{V}$	125					
$V_{BE}^{(2)}$	Base-Emitter Voltage	$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$			-0.7	V
$V_{BE(sat)}^{(2)}$	Base-Emitter Saturation Voltage	$I_C = -100\mu\text{A}$ $I_B = -10\mu\text{A}$			-0.7	
		$I_C = -1.0\text{mA}$ $I_B = -100\mu\text{A}$			-0.8	
$V_{CE(sat)}^{(2)}$	Collector-Emitter Saturation Voltage	$I_C = -100\mu\text{A}$ $I_B = -10\mu\text{A}$			-0.2	
		$I_C = -1.0\text{mA}$ $I_B = -100\mu\text{A}$			-0.25	

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

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$\frac{h_{FE1}^{(3)}}{h_{FE2}}$	Forward-current transfer ratio (gain ratio)	$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	0.9		1.0	
$ V_{BE1} - V_{BE2} $	Base-Emitter Voltage Differential	$V_{CE} = -5\text{V}$ $I_C = -10\mu\text{A}$ to -10mA			5	mV
		$V_{CE} = -5\text{V}$ $I_C = -100\mu\text{A}$			3	
$ \Delta(V_{BE1} - V_{BE2})\Delta T_A $	Base-Emitter Voltage Differential Change Due To Temperature	$V_{CE} = -5\text{V}$ $I_C = -100\mu\text{A}$ $T_{A1} = 25^\circ\text{C}$ $T_{A2} = -55^\circ\text{C}$			0.8	mV
		$V_{CE} = -5\text{V}$ $I_C = -100\mu\text{A}$ $T_{A1} = 25^\circ\text{C}$ $T_{A2} = 125^\circ\text{C}$			1.0	

Notes

(2) Pulse Width $\leq 300\mu\text{s}$, $\delta \leq 2\%$

(3) The lower of the two readings is taken as h_{FE1}

SILICON DUAL MATCHED PNP TRANSISTORS 2N3810

DYNAMIC CHARACTERISTICS

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units	
$ h_{fe} $	Small signal forward-current transfer ratio	$I_C = -500\mu A$ $V_{CE} = -5V$ $f = 30MHz$	1.0				
		$I_C = -1.0mA$ $V_{CE} = -5V$ $f = 100MHz$	1.0		5		
C_{obo}	Output Capacitance	$I_E = 0$ $V_{CB} = -5V$ $f = 1.0MHz$			4	pF	
C_{ibo}	Input Capacitance	$I_C = 0$ $V_{EB} = -0.5V$ $f = 1.0MHz$			15		
$h_{ie}^{(4)}$	Input Impedance	$I_C = -1.0mA$ $V_{CE} = -10V$ $f = 1.0KHz$ $R_G = 3K\Omega$	3		30	K Ω	
$h_{oe}^{(4)}$	Output Admittance		5		60	$\mu hmos$	
$h_{re}^{(4)}$	Voltage Feedback Ratio				25	$\times 10^{-4}$	
h_{fe}	Small Signal Current Gain		150		600		
$N_F^{(4)}$	Noise Figure	$V_{CE} = -10V$ $I_C = -100\mu A$ $R_G = 3K\Omega$	$f=100Hz$ $BW=20Hz$			7	dB
			$f=1.0KHz$ $BW=200Hz$			3	
			$f=10KHz$ $BW=2KHz$			2.5	
	Noise Figure (Broadband)		$f=10Hz$ to $15.7KHz$			3.5	

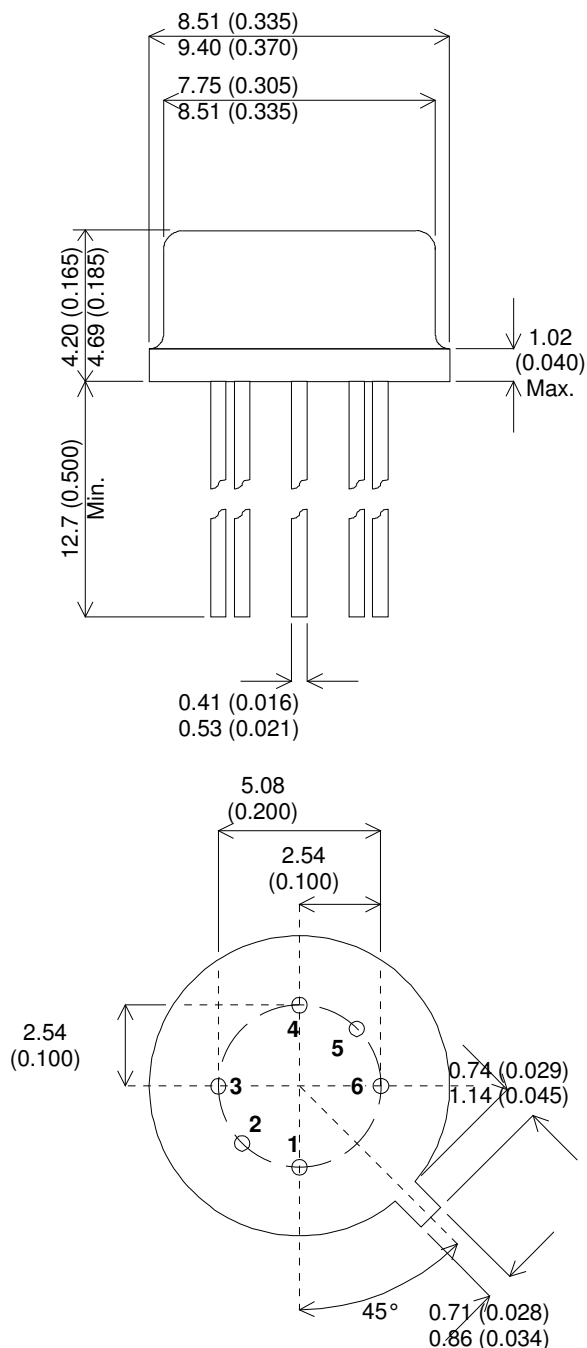
Notes

(4) By design only, not a production test.

SILICON DUAL MATCHED PNP TRANSISTORS 2N3810

MECHANICAL DATA

Dimensions in mm (inches)



TO-78 (MO-002AG)

Underside View

- | | |
|---------------------|---------------------|
| Pin 1 – Collector 1 | Pin 4 – Emitter 2 |
| Pin 2 – Base 1 | Pin 5 – Base 2 |
| Pin 3 – Emitter 1 | Pin 6 – Collector 2 |