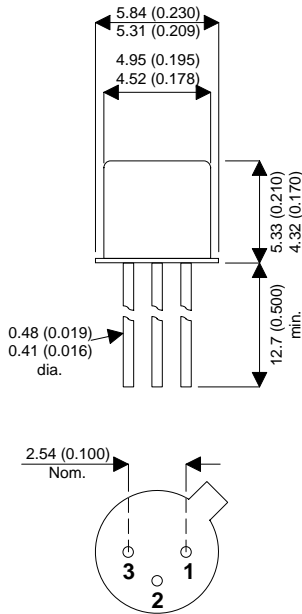


MECHANICAL DATA

Dimensions in mm (inches)



TO18 (TO-206AA) PACKAGE

Underside View

Pin 1 = Emitter Pin 2 = Base Pin 3 = Collector

**BIPOLAR NPN SILICON
AMPLIFIER TRANSISTORS**

FEATURES

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HERMETICALLY SEALED METAL PACKAGE
- CECC SCREENING OPTIONS AVAILABLE
- SPACE QUALITY LEVELS AVAILABLE

APPLICATIONS:

The 2N930 is designed for small general purpose and amplifier applications

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

V_{CBO}	Collector – Base Voltage	45V
V_{CEO}	Collector – Emitter Voltage	45V
V_{EBO}	Emitter – Base Voltage	5V
I_C	Collector Current	30mA
P_D	Total Device Dissipation @ $T_A = 25^\circ\text{C}$	0.5W
	Derate above 25°C	$350^\circ\text{C} / \text{W}$
P_D	Total Device Dissipation @ $T_C = 25^\circ\text{C}$	1.2W
	Derate above 25°C	$146^\circ\text{C} / \text{W}$
T_{STG}, T_J	Operating and Storage Temperature Range	-65 to $+200^\circ\text{C}$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
OFF CHARACTERISTICS						
$V_{(BR)CEO}^*$	Collector – Emitter Breakdown Voltage	$I_C = 10\text{mA}$	$I_B = 0$	45		V
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage	$I_C = 10\mu\text{A}$	$I_E = 0$	45		
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage	$I_E = 10\mu\text{A}$	$I_C = 0$	5		
I_{CEO}	Collector Cut-off Current	$V_{CE} = 5\text{V}$	$I_B = 0$		2	nA
I_{CBO}	Collector – Cut-off Current	$V_{CB} = 45\text{V}$	$I_E = 0$		10	
I_{CES}	Collector – Cut-off Current	$V_{CE} = 45\text{V}$	$V_{BE} = 0$		10	nA
			$T_A = 170^\circ\text{C}$		10	μA
I_{EBO}	Emitter – Cut-off Current	$V_{BE} = 5\text{V}$	$I_C = 0$		10	nA
ON CHARACTERISTICS						
$V_{CE(sat)}^*$	Collector – Emitter Saturation Voltage	$I_C = 10\text{mA}$	$I_B = 0.5\text{mA}$		1	V
$V_{BE(sat)}^*$	Base – Emitter Saturation Voltage	$I_C = 10\text{mA}$	$I_B = 0.5\text{mA}$	0.7	0.9	
h_{FE}^*	DC Current Gain	$I_C = 10\mu\text{A}$	$V_{CE} = 5\text{V}$	100	300	—
			$T_A = -55^\circ\text{C}$	20		
		$I_C = 500\mu\text{A}$	$V_{CE} = 5\text{V}$	150		
		$I_C = 10\text{mA}$	$V_{CE} = 5\text{V}$	600		
SMALL SIGNAL CHARACTERISTICS						
f_T	Current Gain Bandwidth Product	$I_C = 500\mu\text{A}$	$V_{CE} = 5\text{V}$	30		MHz
C_{ob}	Output Capacitance	$I_E = 1\text{mA}$	$V_{CB} = 5\text{V}$		8	pF
h_{ib}	Input Impedance			25	32	Ω
h_{rb}	Voltage Feedback Ratio	$I_E = 1\text{mA}$	$V_{CB} = 5\text{V}$		600	$\times 10^{-6}$
h_{ob}	Output Admittance	$f = 1\text{KHz}$			1	μmho
h_{fe}	Small Signal Current Gain			150	600	—
NF	Noise Figure	$V_{CE} = 5\text{V}$	$I_C = 10\mu\text{A}$		3	dB
		$R_S = 10\text{k}\Omega$				
		$f = 10\text{Hz to } 15.7\text{kHz}$				

* Pulse Test: $t_p \leq 300\mu\text{s}$, $\delta \leq 2\%$