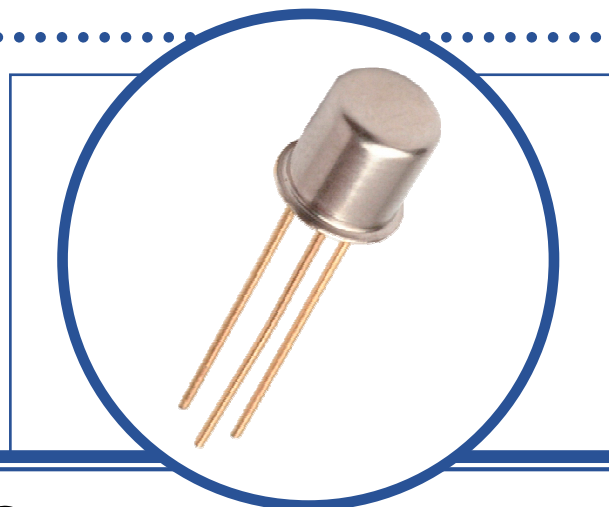


# SILICON PLANAR EPITAXIAL PNP TRANSISTOR

## 2N3799X

- Low Noise
- Hermetic TO-18 Metal package.
- Ideally suited for Low Level Amplifier.  
Instrumentation Amplifiers and General Purpose Applications
- Screening Options Available



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

|           |   |                             |
|-----------|---|-----------------------------|
| $V_{CBO}$ | Collector – Base Voltage                            | -60V                        |
| $V_{CEO}$ | Collector – Emitter Voltage                         | -50V                        |
| $V_{EBO}$ | Emitter – Base Voltage                              | -5V                         |
| $I_C$     | Continuous Collector Current                        | -50mA                       |
| $P_D$     | Total Power Dissipation at $T_A = 25^\circ\text{C}$ | 360mW                       |
|           | Derate Above $25^\circ\text{C}$                     | 2.06mW/ $^\circ\text{C}$    |
| $P_D$     | Total Power Dissipation at $T_C = 25^\circ\text{C}$ | 1.2W                        |
|           | Derate Above $25^\circ\text{C}$                     | 6.86mW/ $^\circ\text{C}$    |
| $T_J$     | Junction Temperature Range                          | -65 to $+200^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                           | -65 to $+200^\circ\text{C}$ |

### THERMAL PROPERTIES

| Symbols         | Parameters                              | Min. | Typ. | Max.   | Units              |
|-----------------|---|------|------|--------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction To Ambient |      |      | 486.11 | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction To Case    |      |      | 145.83 | $^\circ\text{C/W}$ |

Semelab Limited 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.



# SILICON PLANAR EPITAXIAL PNP TRANSISTOR 2N3799X

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

| Symbols             | Parameters                           | Test Conditions                                | Min. | Typ | Max.  | Units         |
|---------------------|--------------------------------------|--|------|-----|-------|---------------|
| $V_{(BR)CEO}^{(1)}$ | Collector-Emitter Breakdown Voltage  | $I_C = -10\text{mA}$ $I_B = 0$                 | -50  |     |       | V             |
| $V_{(BR)CBO}$       | Collector-Base Breakdown Voltage     | $I_C = -10\mu\text{A}$ $I_E = 0$               | -60  |     |       |               |
| $V_{(BR)EBO}$       | Emitter-Base Breakdown Voltage       | $I_E = -10\mu\text{A}$ $I_C = 0$               | -5   |     |       |               |
| $I_{CBO}$           | Collector Cut-Off Current            | $V_{CB} = -50\text{V}$ $I_E = 0$               |      |     | -0.01 | $\mu\text{A}$ |
|                     |                                      | $T_A = 150^\circ\text{C}$                      |      |     | -10   |               |
| $I_{EBO}$           | Emitter Cut-Off Current              | $V_{EB} = -4\text{V}$ $I_C = 0$                |      |     | -20   | nA            |
| $V_{CE(sat)}^{(1)}$ | Collector-Emitter Saturation Voltage | $I_C = -100\mu\text{A}$ $I_B = -10\mu\text{A}$ |      |     | -0.2  | V             |
|                     |                                      | $I_C = -1.0\text{mA}$ $I_B = -100\mu\text{A}$  |      |     | -0.25 |               |
| $V_{BE(sat)}^{(1)}$ | 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  |               |
| $V_{BE(on)}$        | Base-Emitter On Voltage              | $I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$  |      |     | -0.7  |               |
| $h_{FE}^{(1)}$      | Forward-current transfer ratio       | $I_C = -1.0\mu\text{A}$ $V_{CE} = -5\text{V}$  | 75   |     |       |               |
|                     |                                      | $I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$   | 225  |     |       |               |
|                     |                                      | $I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$  | 300  |     |       |               |
|                     |                                      | $T_A = -55^\circ\text{C}$                      | 150  |     |       |               |
|                     |                                      | $I_C = -500\mu\text{A}$ $V_{CE} = -5\text{V}$  | 300  |     |       |               |
|                     |                                      | $I_C = -1.0\text{mA}$ $V_{CE} = -5\text{V}$    | 300  |     |       |               |
|                     |                                      | $I_C = -10\text{mA}$ $V_{CE} = -5\text{V}$     | 250  |     |       |               |

### Notes

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

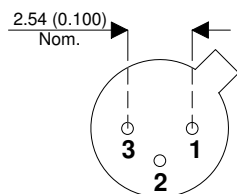
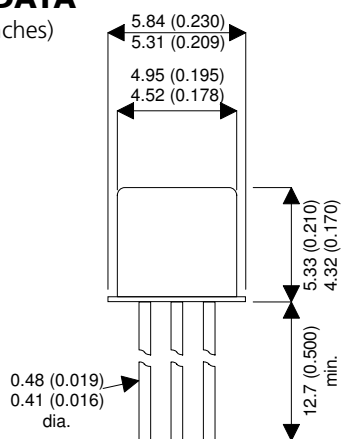
# SILICON PLANAR EPITAXIAL PNP TRANSISTOR 2N3799X

## DYNAMIC CHARACTERISTICS

|           |                           |  |               |                          |     |                  |    |
|-----------|---------------------------|--|---------------|--------------------------|-----|------------------|----|
| $f_T$     | Transition Frequency      | $I_C = -500\mu A$ $V_{CE} = -5V$                         | 30            |                          |     | MHz              |    |
|           |                           | $f = 20MHz$  |               |                          |     |                  |    |
| $C_{obo}$ | Output Capacitance        | $V_{CB} = -5V$ $I_E = 0$                                 |               |                          | 4   | pF               |    |
|           |                           | $f = 1.0MHz$   |               |                          |     |                  |    |
| $C_{ibo}$ | Input Capacitance         | $V_{EB} = -0.5V$ $I_C = 0$                               |               |                          | 8   |                  |    |
|           |                           | $f = 1.0MHz$   |               |                          |     |                  |    |
| $h_{ie}$  | Input Impedance           | $I_C = -1.0mA$ $V_{CE} = -10V$<br>$f = 1.0MHz$           | 10            |                          | 40  | K $\Omega$       |    |
| $h_{oe}$  | Output Admittance         |  | 5             |                          | 60  | $\mu hmos$       |    |
| $h_{re}$  | Voltage Feedback Ratio    |  |               |                          | 25  | $\times 10^{-4}$ |    |
| $h_{fe}$  | Small Signal Current Gain |  | 300           |                          | 900 |                  |    |
| $N_F$     | Noise Figure              | $V_{CE} = -10V$<br>$I_C = -100\mu A$<br>$R_G = 3K\Omega$ |               | $f=100Hz$<br>$BW=20Hz$   | 2.5 | 4                | dB |
|           |                           |  | <b>Spot:</b>  | $f=1.0KHz$<br>$BW=200Hz$ | 0.8 | 1.5              |    |
|           |                           |  | <b>Noise:</b> | $f=10KHz$<br>$BW=2KHz$   | 1.8 | 1.5              |    |
|           |                           |  |               | $f=1.0KHz$               | 1.5 | 2.5              |    |

## MECHANICAL DATA

Dimensions in mm (inches)



### TO-18 (TO-206AA) METAL PACKAGE Underside View

Pin 1 - Emitter

Pin 2 - Base

Pin 3 - Collector