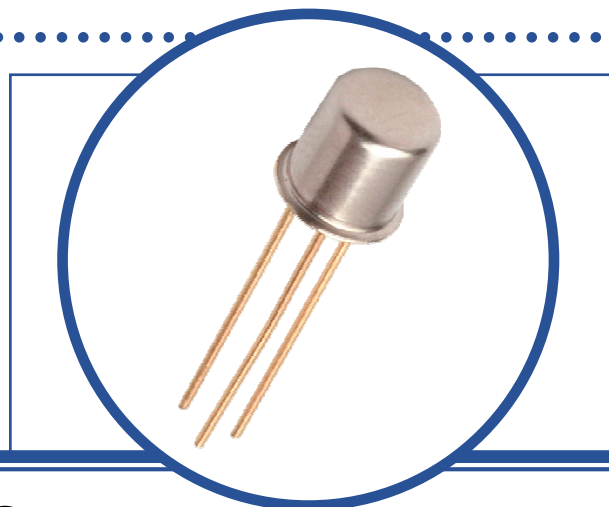


# NPN SWITCHING TRANSISTOR

## 2N2369A

- Silicon Planer Epitaxial NPN Transistor
- Hermetic TO18 Metal Package
- Designed For High Speed Switching Applications
- Screening Options Available



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

|           |                                                      |                             |
|-----------|------------------------------------------------------|-----------------------------|
| $V_{CBO}$ | Collector – Base Voltage                             | 40V                         |
| $V_{CEO}$ | Collector – Emitter Voltage                          | 15V                         |
| $V_{CES}$ | Collector – Emitter Voltage                          | 40V                         |
| $V_{EBO}$ | Emitter – Base Voltage                               | 4.5V                        |
| $I_C$     | Continuous Collector Current                         | 200mA                       |
| $P_D$     | 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 $T_C = 125^\circ\text{C}$ | 360mW                       |
|           | Derate Above $125^\circ\text{C}$                     | 4.80mW/ $^\circ\text{C}$    |
| $T_J$     | 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   | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction To Case    |      |      | 208.3 | $^\circ\text{C/W}$ |

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.

# NPN SWITCHING TRANSISTOR 2N2369A

## 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  | $I_C = 10\text{mA}$ $I_B = 0$                                               | 15   |     |      | V             |
| $I_{CES}$           | Collector-Cut-Off Current            | $V_{CE} = 20\text{V}$ $I_B = 0$                                             |      |     | 0.4  | $\mu\text{A}$ |
| $I_{CBO}$           | Collector-Cut-Off Current            | $V_{CB} = 40\text{V}$ $I_E = 0$                                             |      |     | 10   |               |
|                     |                                      | $V_{CB} = 32\text{V}$ $I_E = 0$                                             |      |     | 0.2  |               |
|                     |                                      | $V_{CB} = 20\text{V}$ $I_E = 0$<br>$T_A = 150^\circ\text{C}^{(2)}$          |      |     | 30   |               |
| $I_{EBO}$           | Emitter-Cut-Off Current              | $V_{EB} = 4.5\text{V}$ $I_C = 0$                                            |      |     | 10   |               |
|                     |                                      | $V_{EB} = 4\text{V}$ $I_C = 0$                                              |      |     | 0.25 |               |
| $I_{CEX}$           | Collector Cut-Off Current            | $V_{CE} = 10\text{V}$ $V_{BE} = -0.25\text{V}$<br>$T_A = 125^\circ\text{C}$ |      |     | 30   |               |
| $h_{FE}^{(1)}$      | Forward-current transfer ratio       | $I_C = 10\text{mA}$ $V_{CE} = 0.35\text{V}$                                 | 40   |     | 120  |               |
|                     |                                      | $I_C = 30\text{mA}$ $V_{CE} = 0.4\text{V}$                                  | 30   |     | 120  |               |
|                     |                                      | $I_C = 10\text{mA}$ $V_{CE} = 1.0\text{V}$                                  | 40   |     | 120  |               |
|                     |                                      | $T_A = -55^\circ\text{C}$                                                   | 20   |     |      |               |
| $V_{CE(sat)}^{(1)}$ | Collector-Emitter Saturation Voltage | $I_C = 10\text{mA}$ $I_B = 1.0\text{mA}$<br>$T_A = 125^\circ\text{C}$       |      |     | 0.2  | V             |
|                     |                                      | $T_A = 125^\circ\text{C}$                                                   |      |     | 0.3  |               |
|                     |                                      | $I_C = 30\text{mA}$ $I_B = 3\text{mA}$                                      |      |     | 0.25 |               |
| $V_{BE(sat)}^{(1)}$ | Base-Emitter Saturation Voltage      | $I_C = 100\text{mA}$ $I_B = 10\text{mA}$                                    |      |     | 0.45 |               |
|                     |                                      | $I_C = 10\text{mA}$ $I_B = 1.0\text{mA}$                                    | 0.7  |     | 0.85 |               |
|                     |                                      | $T_A = 125^\circ\text{C}$                                                   | 0.59 |     |      |               |
|                     |                                      | $T_A = -55^\circ\text{C}$                                                   |      |     | 1.02 |               |
|                     |                                      | $I_C = 30\text{mA}$ $I_B = 3\text{mA}$                                      |      |     | 0.9  |               |
|                     |                                      | $I_C = 100\text{mA}$ $I_B = 10\text{mA}$                                    | 0.8  |     | 1.2  |               |

### Notes

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

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

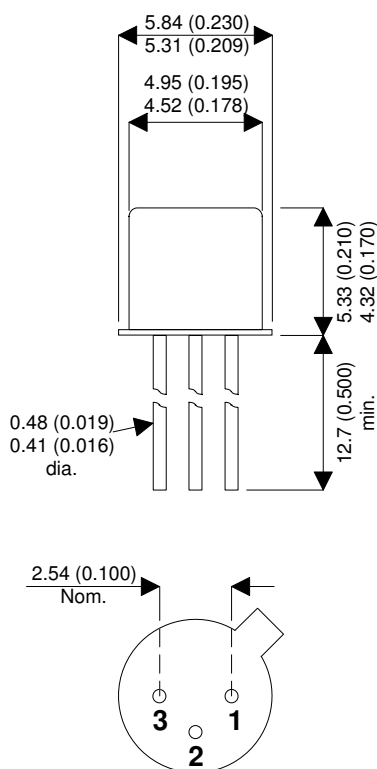
# NPN SWITCHING TRANSISTOR 2N2369A

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

| Symbols    | Parameters                                  | Test Conditions                                                                            | Min. | Typ | Max. | Units |
|------------|---------------------------------------------|--------------------------------------------------------------------------------------------|------|-----|------|-------|
| $ h_{fe} $ | Small signal forward-current transfer ratio | $I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$<br>$f = 100\text{MHz}$                           | 5    |     | 10   |       |
| $C_{obo}$  | Output Capacitance                          | $V_{CB} = 5\text{V}$ $I_E = 0$<br>$f = 1.0\text{MHz}$                                      |      |     | 4    | pF    |
| $C_{ibo}$  | Input Capacitance                           | $V_{EB} = 0.5\text{V}$ $I_C = 0$<br>$f = 1.0\text{MHz}$                                    |      |     | 5    |       |
| $t_s$      | Storage Time                                | $I_C = 10\text{mA}$ $I_{B1} = I_{B2} = 10\text{mA}$                                        |      |     | 13   | ns    |
| $t_{on}$   | Turn-On Time                                | $I_C = 10\text{mA}$ $V_{CC} = 3\text{V}$<br>$I_{B1} = 3\text{mA}$                          |      |     | 12   |       |
| $t_{off}$  | Turn-Off Time                               | $I_C = 10\text{mA}$ $V_{CC} = 3\text{V}$<br>$I_{B1} = 3\text{mA}$ $I_{B2} = -1.5\text{mA}$ |      |     | 18   |       |

## MECHANICAL DATA

Dimensions in mm (inches)



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

Pin 1 - Emitter

Pin 2 - Base

Pin 3 - Collector