## NPN Silicon Epitaxial Planar Transistor

## Features

- On special request, these transistors can be manufactured in different pin configurations
- The transistor is subdivided into three groups, O,

Y and G, according to its DC current gain

## Applications

- For switching and AF amplifier applications

Absolute Maximum Ratings ( $\mathrm{T}_{\mathrm{a}}=25^{\circ} \mathrm{C}$ )

| Parameter | Symbol | Value | Unit |
| :--- | :---: | :---: | :---: |
| Collector Base Voltage | $\mathrm{V}_{\text {CBO }}$ | 30 | V |
| Collector Emitter Voltage | $\mathrm{V}_{\text {CEO }}$ | 25 | V |
| Emitter Base Voltage | $\mathrm{V}_{\text {EBO }}$ | 5 | V |
| Collector Current | $\mathrm{I}_{\mathrm{C}}$ | 700 | mA |
| Power Dissipation | $\mathrm{P}_{\text {tot }}$ | 600 | mW |
| Junction Temperature | $\mathrm{T}_{\mathrm{j}}$ | 150 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature Range | $\mathrm{T}_{\text {stg }}$ | -55 to +150 | ${ }^{\circ} \mathrm{C}$ |

Thermal Characteristics

| Parameter | Symbol | Max. | Unit |
| :---: | :---: | :---: | :---: |
| Thermal Resistance - Junction to Ambient | $R_{\text {日JA }}$ | 208 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |

Characteristics at $\mathrm{T}_{\mathrm{a}}=25^{\circ} \mathrm{C}$

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: |
| DC Current Gain <br> at $\mathrm{V}_{\mathrm{CE}}=1 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=100 \mathrm{~mA}$ <br> Current Gain Group <br> at $\mathrm{V}_{\mathrm{CE}}=1 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=700 \mathrm{~mA}$ | $\begin{aligned} & \mathrm{h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FEE}} \end{aligned}$ | $\begin{gathered} 90 \\ 135 \\ 200 \\ 50 \\ \hline \end{gathered}$ |  | $\begin{aligned} & 180 \\ & 270 \\ & 400 \end{aligned}$ | - <br> - |
| Collector Base Cutoff Current at $\mathrm{V}_{\mathrm{CB}}=30 \mathrm{~V}$ | $\mathrm{I}_{\text {cbo }}$ | - | - | 0.1 | $\mu \mathrm{A}$ |
| Emitter Base Cutoff Current at $\mathrm{V}_{E B}=5 \mathrm{~V}$ | $\mathrm{I}_{\text {ebo }}$ | - | - | 0.1 | $\mu \mathrm{A}$ |
| Collector Base Breakdown Voltage at $\mathrm{I}_{\mathrm{C}}=10 \mu \mathrm{~A}$ | $\mathrm{V}_{\text {(BR) } \text { cbo }}$ | 30 | - | - | V |
| Collector Emitter Breakdown Voltage at $\mathrm{I}_{\mathrm{C}}=10 \mathrm{~mA}$ | $\mathrm{V}_{\text {(BR)CEO }}$ | 25 | - | - | V |
| Emitter Base Breakdown Voltage at $\mathrm{I}_{\mathrm{E}}=10 \mu \mathrm{~A}$ | $V_{\text {(BR)EBO }}$ | 5 | - | - | V |
| Collector Emitter Saturation Voltage at $\mathrm{I}_{\mathrm{C}}=700 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=70 \mathrm{~mA}$ | $\mathrm{V}_{\text {CE(sat) }}$ | - | - | 0.6 | V |
| Base Emitter Saturation Voltage at $\mathrm{I}_{\mathrm{C}}=700 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=70 \mathrm{~mA}$ | $\mathrm{V}_{\mathrm{BE} \text { (sat) }}$ | - | - | 1.2 | V |
| $\begin{aligned} & \text { Base Emitter Voltage } \\ & \text { at } I_{C}=10 \mathrm{~mA}, \mathrm{~V}_{\mathrm{CE}}=6 \mathrm{~V} \end{aligned}$ | $\mathrm{V}_{\text {BE }}$ | 0.6 | - | 0.7 | V |
| Gain Bandwidth Product at $\mathrm{V}_{\mathrm{CE}}=6 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=10 \mathrm{~mA}$ | $\mathrm{f}_{\mathrm{T}}$ | 50 | - | - | MHz |
| Output Capacitance at $\mathrm{V}_{\mathrm{CB}}=6 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ | $\mathrm{C}_{\text {ob }}$ | - | - | 25 | pF |

## Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve


Fig. 3 DC Current Gain vs. Collector Current


Fig. 2 Collector Current vs. Base to Emitter Voltage


Fig. $4 \mathrm{~V}_{\text {besat }}$ vs. Collector Current


## Electrical Characteristics Curves

Fig. $5 \mathrm{~V}_{\text {Cesat }}$ vs. Collector Current


Fig. 6 Output Capacitance


Fig. 7 Power Derating Curve


## TO-92 Package Outline (Dimensions in millimeters)



TO-92 Ammo-Pack Outline (Dimensions in millimeters)


Packing information

| Package | Bulk Packing |  | Ammo-Packing |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Per Bag Qty | Per Box Qty | Per Carton Qty | Per Box Qty | Per Carton Qty |
| TO-92 | 1,000 | 5,000 | 50,000 | 4,000 | 20,000 |

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