## NPN Silicon Epitaxial Planar Transistor

for switching and AF amplifier applications.
The transistor is subdivided into four groups $\mathrm{Q}, \mathrm{R}, \mathrm{S}$ and E. according to its DC current gain.

On special request, these transistors can be manufactured in different pin configurations.


1. Emitter 2. Collector 3. Base

TO-92 Plastic Package
Weight approx. 0.19g

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

|  | Symbol | Value | Unit |
| :--- | :---: | :---: | :---: |
| Collector Base Voltage | $\mathrm{V}_{\text {CBO }}$ | 60 | V |
| Collector Emitter Voltage | $\mathrm{V}_{\text {CEO }}$ | 50 | V |
| Emitter Base Voltage | $\mathrm{V}_{\text {EBO }}$ | 5 | V |
| Collector Current | $\mathrm{I}_{\mathrm{C}}$ | 150 | mA |
| Power Dissipation | $\mathrm{P}_{\text {tot }}$ | 300 | mW |
| Junction Temperature | $\mathrm{T}_{\mathrm{j}}$ | 150 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature Range | $\mathrm{T}_{\mathrm{S}}$ | -55 to +150 | ${ }^{\circ} \mathrm{C}$ |

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

|  |  | Symbol | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DC Current Gain at $\mathrm{V}_{\mathrm{CE}}=6 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=1 \mathrm{~mA}$ | $\begin{gathered} \mathrm{Q} \\ \mathrm{R} \\ \mathrm{~S} \\ \mathrm{E} \end{gathered}$ | $\begin{aligned} & \mathrm{h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FE}} \\ & \mathrm{~h}_{\mathrm{FE}} \end{aligned}$ | $\begin{aligned} & 120 \\ & 180 \\ & 270 \\ & 390 \end{aligned}$ |  | $\begin{aligned} & 270 \\ & 390 \\ & 560 \\ & 820 \end{aligned}$ |  |
| Collector Base Breakdown Voltage at $\mathrm{I}_{\mathrm{C}}=50 \mu \mathrm{~A}$ |  | $\mathrm{V}_{\text {(BR) }}$ cbo | 60 | - | - | V |
| Collector Emitter Breakdown Voltage at $\mathrm{I}_{\mathrm{C}}=1 \mathrm{~mA}$ |  | $\mathrm{V}_{\text {(BR)CEO }}$ | 50 | - | - | V |
| Emitter Base Breakdown Voltage at $\mathrm{I}_{\mathrm{E}}=50 \mu \mathrm{~A}$ |  | $\mathrm{V}_{\text {(BR)Ebo }}$ | 5 | - | - | V |
| Collector Cutoff Current at $\mathrm{V}_{\mathrm{CB}}=60 \mathrm{~V}$ |  | $\mathrm{I}_{\text {cbo }}$ | - | - | 0.1 | $\mu \mathrm{A}$ |
| Emitter Cutoff Current at $\mathrm{V}_{\mathrm{EB}}=5 \mathrm{~V}$ |  | $\mathrm{I}_{\text {Ebo }}$ | - | - | 0.1 | $\mu \mathrm{A}$ |
| Collector Saturation Voltage at $\mathrm{I}_{\mathrm{C}}=50 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=5 \mathrm{~mA}$ |  | $\mathrm{V}_{\text {CE(sat) }}$ | - | - | 0.4 | V |
| Gain Bandwidth Product at $\mathrm{V}_{\mathrm{CE}}=12 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=2 \mathrm{~mA}$ |  | $\mathrm{f}_{T}$ | - | 180 | - | MHz |
| Output Capacitance at $\mathrm{V}_{\mathrm{CB}}=12 \mathrm{~V}, \mathrm{f}=1 \mathrm{MHz}$ |  | $\mathrm{C}_{\text {ов }}$ | - | 2 | 3.5 | pF |

