## HIGH VOLTAGE NPN MULTIEPITAXIAL FAST-SWITCHING TRANSISTOR

- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- LOW BASE-DRIVE REQUIREMENTS


## APPLICATIONS

- ELECTRONIC BALLASTS FOR FLUORESCENT LIGHTING
- SWITCH MODE POWER SUPPLIES


## DESCRIPTION

The BU505 is a high voltage NPN fastswitching transistor designed to be used in lighting application, like electronic ballas for fluorescent lamps.
Its characteristics make it also ideal for power supplies.


INTERNAL SCHEMATIC DIAGRAM


## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
| :---: | :--- | :---: | :---: |
| $\mathrm{V}_{\mathrm{CES}}$ | Collector-Emitter Voltage $\left(\mathrm{V}_{\mathrm{BE}}=0\right)$ | 1500 | V |
| $\mathrm{~V}_{\text {CEO }}$ | Collector-Emitter Voltage $\left(\mathrm{I}_{\mathrm{B}}=0\right)$ | 700 | V |
| $\mathrm{I}_{\mathrm{C}}$ | Collector Current | 2.5 | A |
| $\mathrm{I}_{\mathrm{CM}}$ | Collector Peak Current $\left(\mathrm{t}_{\mathrm{p}}<5 \mathrm{~ms}\right)$ | 4 | A |
| $\mathrm{I}_{\mathrm{B}}$ | Base Current | 1 | A |
| $\mathrm{I}_{\mathrm{BM}}$ | Base Peak Current $\left(\mathrm{t}_{\mathrm{p}}<5 \mathrm{~ms}\right)$ | 2 | A |
| $\mathrm{P}_{\text {tot }}$ | Total Dissipation at $\mathrm{T}_{\mathrm{C}} \leq 25^{\circ} \mathrm{C}$ | 75 | W |
| $\mathrm{~T}_{\text {stg }}$ | Storage Temperature | -65 to 150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{j}}$ | Max. Operating Junction Temperature | 150 | ${ }^{\circ} \mathrm{C}$ |

## BU505

## THERMAL DATA

| R $_{\text {thj-case }}$ | Thermal Resistance Junction-case | Max | 1.67 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| :--- | :--- | :--- | :--- | :--- |

ELECTRICAL CHARACTERISTICS $\left(\mathrm{T}_{\text {case }}=25^{\circ} \mathrm{C}\right.$ unless otherwise specified)

| Symbol | Parameter | Test Conditions |  | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ices | Collector Cut-off Current ( V be $=0$ ) | $\begin{aligned} & \mathrm{V}_{\mathrm{CE}}=\mathrm{V}_{\mathrm{CES}} \\ & \mathrm{~V}_{C E}=\mathrm{V}_{C E S} \end{aligned}$ | $\mathrm{T}_{\text {case }}=125^{\circ} \mathrm{C}$ |  |  | $\begin{gathered} 0.15 \\ 1 \end{gathered}$ | $\begin{aligned} & \mathrm{mA} \\ & \mathrm{~mA} \end{aligned}$ |
| Iebo | Emitter Cut-off Current ( I = $=0$ ) | $\mathrm{V}_{\mathrm{EB}}=5 \mathrm{~V}$ |  |  |  | 1 | mA |
| $\mathrm{V}_{\text {CEO }}$ (sus) | Collector-emitter Sustaining Voltage | $\mathrm{IC}=100 \mathrm{~mA}$ | $\mathrm{L}=25 \mathrm{mH}$ | 700 |  |  | V |
| $\mathrm{V}_{\text {CE(sat)* }}$ | Collector-emitter Saturation Voltage | $\mathrm{IC}=2 \mathrm{~A}$ | $\mathrm{I}_{\mathrm{B}}=0.9 \mathrm{~A}$ |  |  | 5 | V |
| $\mathrm{V}_{\mathrm{BE} \text { (sat) }}{ }^{*}$ | Base-emitter Saturation Voltage | $\mathrm{IC}=2 \mathrm{~A}$ | $\mathrm{I}_{\mathrm{B}}=0.9 \mathrm{~A}$ |  |  | 1.3 | V |
| $\mathrm{I}_{\mathrm{s} / \mathrm{b}}$ | Second Breakdown Current | $\mathrm{V}_{\mathrm{CE}}=120 \mathrm{~V}$ | $\mathrm{t}=200 \mu \mathrm{~s}$ | 2 |  |  | A |
| $\mathrm{t}_{\text {s }}$ | Storage Time | $\begin{aligned} & \mathrm{V}_{\text {Clamp }}=250 \mathrm{~V} \\ & \mathrm{I}_{\mathrm{B} 1}=0.7 \mathrm{~A} \\ & \mathrm{R}_{\mathrm{bb}}=0 \end{aligned}$ | $\begin{aligned} & \mathrm{IC}=2 \mathrm{~A} \\ & V_{\text {be (off) }}=-5 \mathrm{~V} \\ & \mathrm{~L}=200 \mu \mathrm{H} \end{aligned}$ |  | $\begin{gathered} 2 \\ 350 \end{gathered}$ |  | $\begin{aligned} & \mu \mathrm{s} \\ & \mathrm{~ns} \end{aligned}$ |

* Pulsed: Pulse duration = $300 \mu \mathrm{~s}$, duty cycle $1.5 \%$.


## TO-220 MECHANICAL DATA

| DIM. | mm |  |  | inch |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 |  | 4.60 | 0.173 |  | 0.181 |
| C | 1.23 |  | 1.32 | 0.048 |  | 0.051 |
| D | 2.40 |  | 2.72 | 0.094 |  | 0.107 |
| D1 |  | 1.27 |  |  | 0.050 |  |
| E | 0.49 |  | 0.70 | 0.019 |  | 0.027 |
| F | 0.61 |  | 0.88 | 0.024 |  | 0.034 |
| F1 | 1.14 |  | 1.70 | 0.044 |  | 0.067 |
| F2 | 1.14 |  | 1.70 | 0.044 |  | 0.067 |
| G | 4.95 |  | 5.15 | 0.194 |  | 0.203 |
| G1 | 2.4 |  | 2.7 | 0.094 |  | 0.106 |
| H2 | 10.0 |  | 10.40 | 0.393 |  | 0.409 |
| L2 |  | 16.4 |  |  | 0.645 |  |
| L4 | 13.0 |  | 14.0 | 0.511 |  | 0.551 |
| L5 | 2.65 |  | 2.95 | 0.104 |  | 0.116 |
| L6 | 15.25 |  | 15.75 | 0.600 |  | 0.620 |
| L7 | 6.2 |  | 6.6 | 0.244 |  | 0.260 |
| L9 | 3.5 |  | 3.93 | 0.137 |  | 0.154 |
| DIA. | 3.75 |  | 3.85 | 0.147 |  | 0.151 |



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