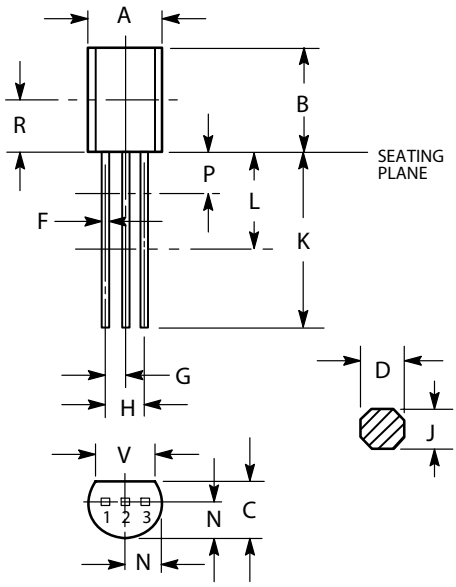
DEC

# POWER TRANSISTOR E13002

## SWITCHING REGULATOR APPLICATION

- High speed switching
- Suitable for switching regulator and motor control
- Case : TO-92 molded plastic body

TO-92




| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.44 | 5.21 |
| B | 0.290 | 0.310 | 7.37 | 7.87 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.018 | 0.022 | 0.46 | 0.56 |
| F | 0.016 | 0.019 | 0.41 | 0.48 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.018 | 0.024 | 0.46 | 0.61 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.135 | --- | 3.43 | --- |
| V | 0.135 | --- | 3.43 | --- |

## NPN SILICON TRANSISTOR

## FEATURES Tc=25°C unless otherwise specified

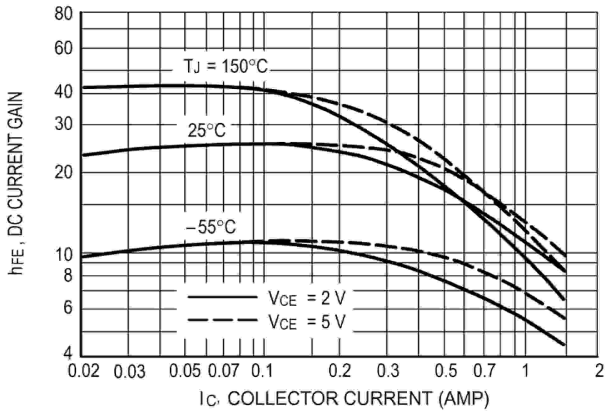
| Parameter | Symbol | Value | UNIT |
|---|---|---|---|
| Power dissipation | $P_{CM}$ | 1.0 | W |
| Collector current | $I_{CM}$ | 1.0 | A |
| Operating and storage junction temperature range | $T_J$, $T_{STG}$ | -55 °C to +150 °C | °C |

## ELECTRICAL CHARACTERISTICS Tc=25°C unless otherwise specified

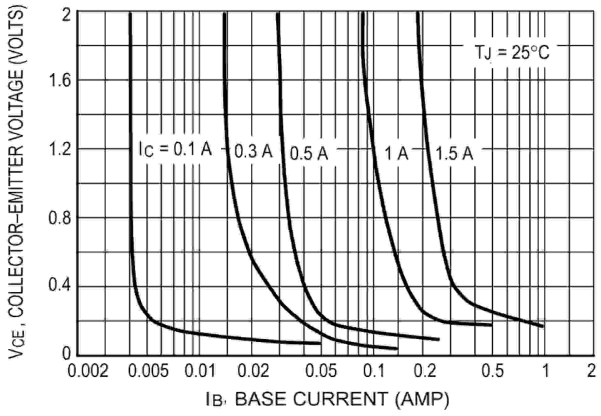
| Parameter | Symbol | Test conditions | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C$=100μA , $I_E$=0 | 600 | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C$=1mA , $I_B$=0 | 400 | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=100μA , $I_C$=0 | 6 | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=600V , $I_E$=0 | | 100 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$=6V , $I_C$=0 | | 100 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}$=10V , $I_C$=100mA | 8 | 60 | |
| | $h_{FE(2)}$ | $V_{CE}$=10V , $I_C$=200mA | 9 | 40 | |
| | $h_{FE(3)}$ | $V_{CE}$=10V , $I_C$=10mA | 6 | | |
| Collector-emitter saturation voltage | $V_{CEsat}$ | $I_C$=200mA , $I_B$=40mA | | 0.8 | V |
| Base-emitter saturation voltage | $V_{BEsat}$ | $I_C$=200mA , $I_B$=40mA | | 1.1 | V |
| Transition frequency | $f_T$ | $V_{CE}$=10V , $I_C$=100mA f=1MHz | 5 | | MHz |
| Fall time | $t_f$ | $I_C$=1A , $I_{B1}$=-$I_{B2}$=0.2A , $V_{CC}$=100V | | 0.5 | μS |
| Storage time | $t_s$ | | | 2.5 | μS |

# DEC

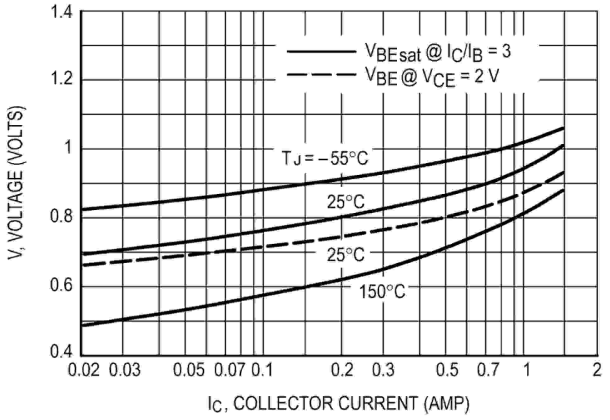
## RATINGS AND CHARACTERISTIC CURVES E13002



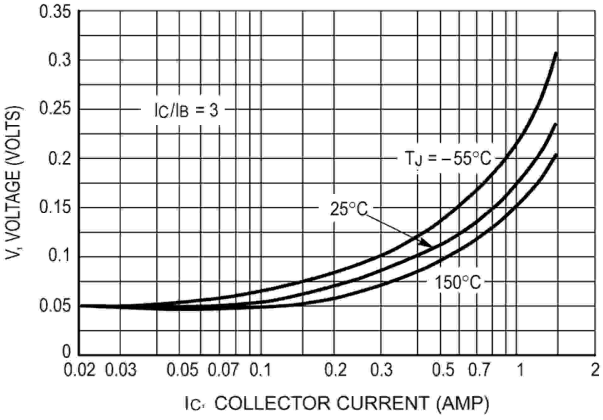

**DC Current Gain**



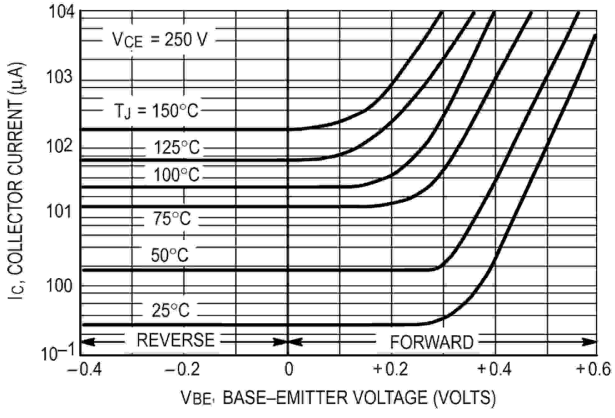

**Collector Saturation Region**



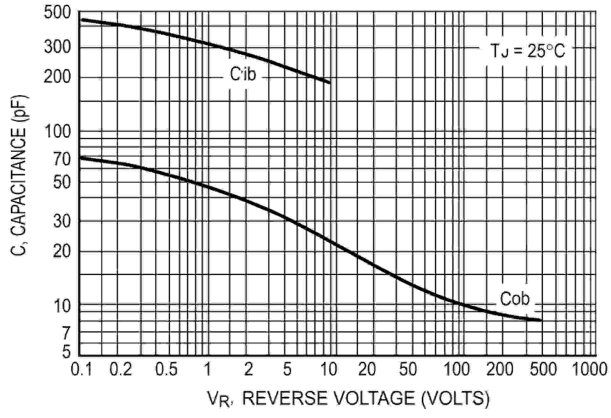

**Base–Emitter Voltage**




**Collector–Emitter Saturation Region**




**Collector Cutoff Region**




**Capacitance**