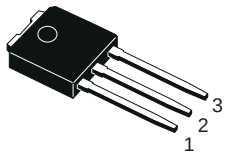
# BUXD87

## HIGH VOLTAGE NPN POWER TRANSISTOR

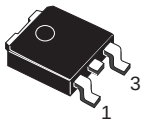
- REVERSE PINS OUT Vs STANDARD IPAK/DPAK PACKAGE
- HIGH VOLTAGE CAPABILITY
- HIGH DC CURRENT GAIN
- THROUGH-HOLE IPAK (TO-251) POWER PACKAGE IN TUBE (SUFFIX "-1")
- SURFACE-MOUNTING DPAK (TO-252) POWER PACKAGE IN TAPE & REEL (SUFFIX "T4")

**APPLICATIONS:**
- SWITCH MODE POWER SUPPLIES
- GENERAL PURPOSE SWITCHING

**DESCRIPTION**
The BUXD87 is manufactured using High Voltage Multi Epitaxial Planar technology for high switching speeds and high voltage withstand capability.

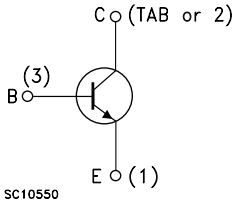



**IPAK**
**TO-251**
(Suffix "-1")




**DPAK**
**TO-252**
(Suffix "T4")

**INTERNAL SCHEMATIC DIAGRAM**




**ABSOLUTE MAXIMUM RATINGS**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CEV}$ | Collector-Emitter Voltage ($V_{BE}$ = -1.5V) | 1000 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | 450 | V |
| $V_{EBO}$ | Emitter-Base Voltage ($I_C$ = 0) | 5 | V |
| $I_C$ | Collector Current | 0.5 | A |
| $I_{CM}$ | Collector Peak Current ($t_p$ < 5 ms) | 1 | A |
| $I_B$ | Base Current | 0.3 | A |
| $I_{BM}$ | Base Peak Current ($t_p$ < 5 ms) | 0.6 | A |
| $P_{tot}$ | Total Dissipation at $T_c$ = 25 $^oC$ | 20 | W |
| $T_{stg}$ | Storage Temperature | -65 to 150 | $^oC$ |
| $T_j$ | Max. Operating Junction Temperature | 150 | $^oC$ |

## THERMAL DATA

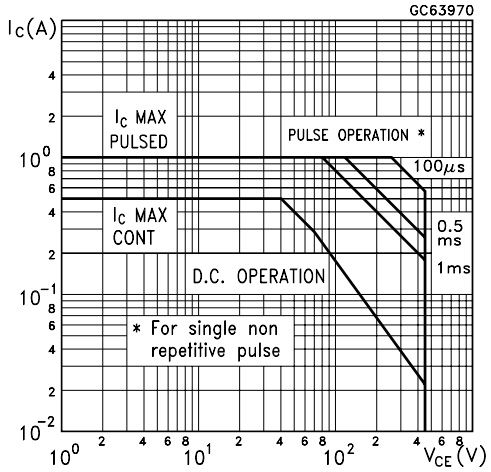
| | | | | |
|---|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case | Max | 6.25 | °C/W |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-ambient | Max | 100 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25 °C unless otherwise specified)

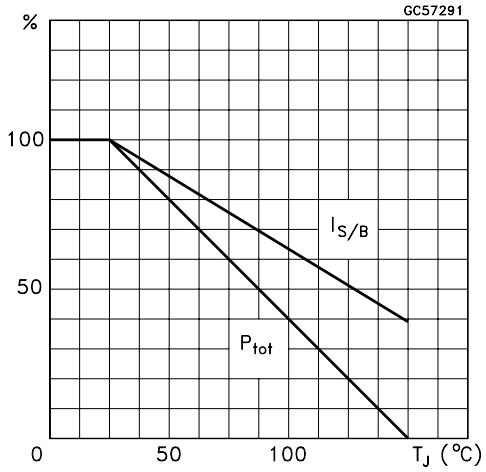
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CEV}$ | Collector Cut-off Current ($V_{BE}$ = -1.5V) | $V_{CE}$ = 1000 V<br>$V_{CE}$ = 1000 V $T_j$ = 125 °C | | | 100<br>1 | µA<br>mA |
| $I_{EBO}$ | Emitter Cut-off Current ($I_C$ = 0) | $V_{EB}$ = 5 V | | | 1 | mA |
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C$ = 100 mA | 450 | | | V |
| $V_{BEO}$ | Collector-Base Sustaining Voltage | $I_C$ = 10 mA | 5 | | | V |
| $V_{CE(sat)}$* | Collector-Emitter Saturation Voltage | $I_C$ = 0.1 A $I_B$ = 0.01 A<br>$I_C$ = 0.2 A $I_B$ = 0.02 A | | | 0.8<br>1 | V<br>V |
| $V_{BE(sat)}$* | Base-Emitter Saturation Voltage | $I_C$ = 0.2 A $I_B$ = 0.02 A | | | 1 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 50 mA $V_{CE}$ = 5 V<br>$I_C$ = 40 mA $V_{CE}$ = 5 V | <br>12 | 50 | | |
| $f_T$ | Transition Frequency | $I_C$ = 50 mA $V_{CE}$ = 10 V f=1MHz | | 20 | | MHz |
| <br>$t_s$<br>$t_f$ | RESISTIVE LOAD<br>Storage Time<br>Fall Time | $V_{CC}$ = 250 V $I_C$ = 200 mA<br>$I_{B1}$ = 40 mA $I_{B2}$= -80 mA<br>$t_p$ = 20 µs | | <br>4.5<br>0.5 | | <br>µs<br>µs |

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %

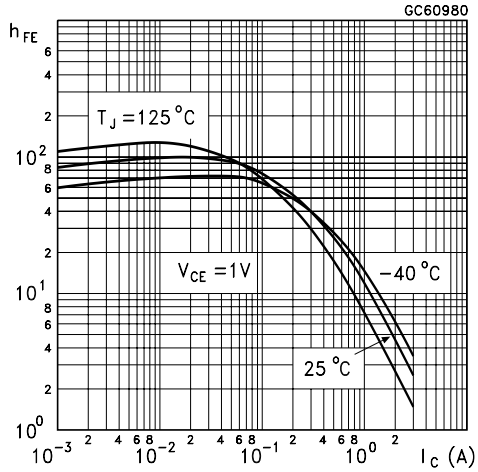
Safe Operating Area



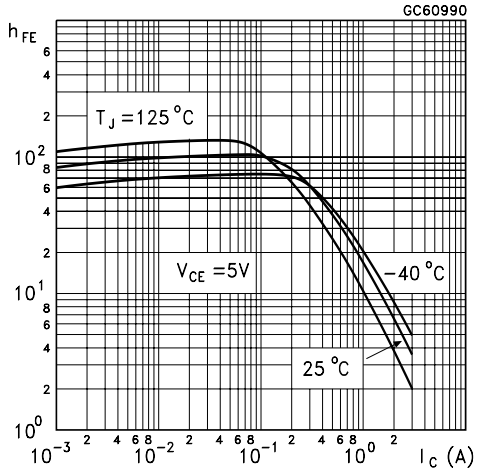

Derating Curves



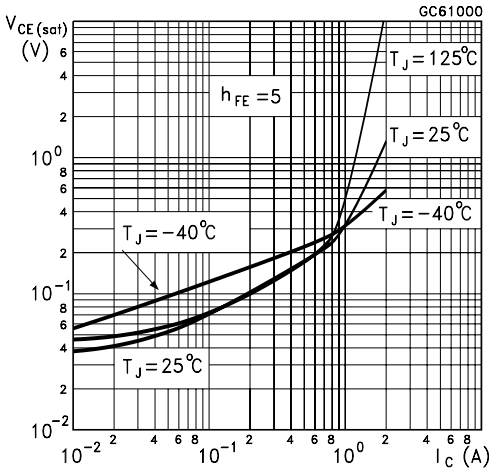
DC Current Gain



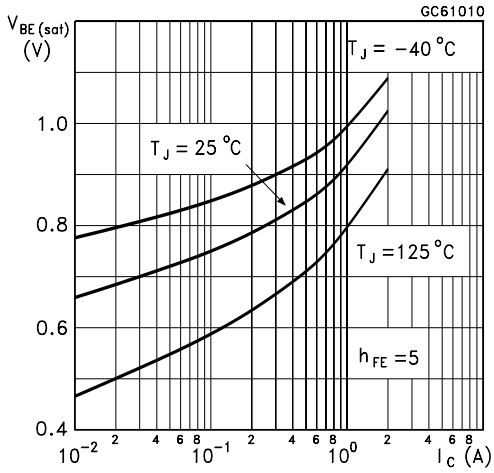

DC Current Gain



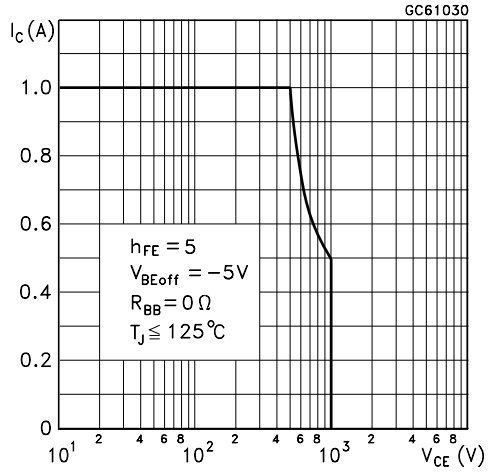

Collector Emitter Saturation Voltage




Base Emitter Saturation Voltage

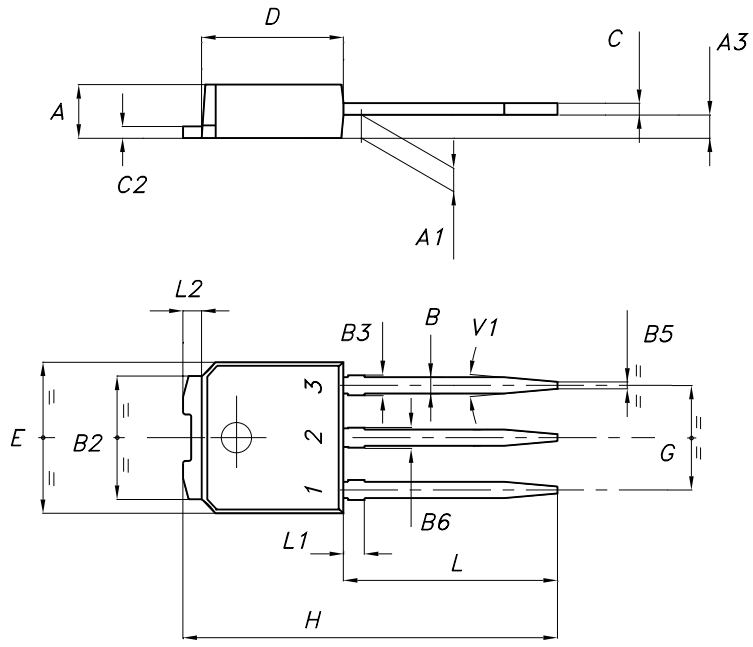



Reverse Biased SOA



## TO-251 (IPAK) MECHANICAL DATA

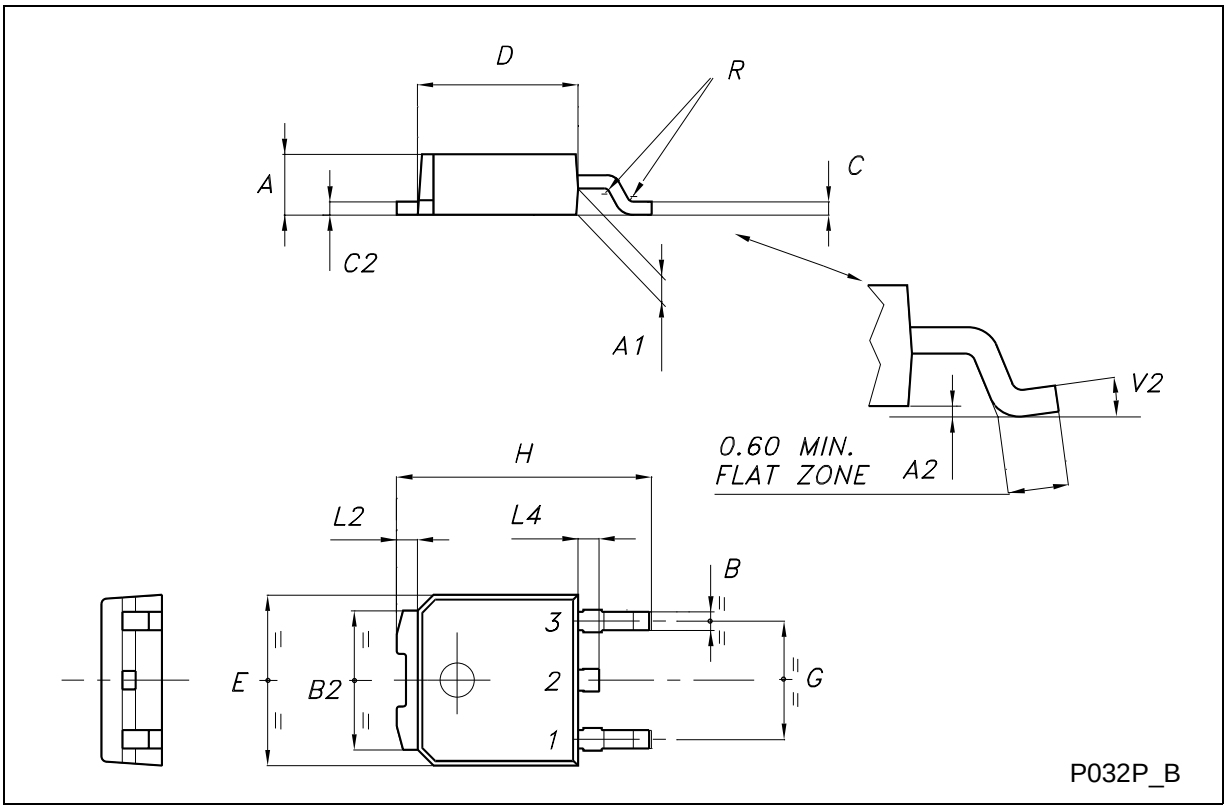
| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 | | 2.40 | 0.087 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A3 | 0.70 | | 1.30 | 0.028 | | 0.051 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.213 |
| B3 | | | 0.85 | | | 0.033 |
| B5 | | 0.30 | | | 0.012 | |
| B6 | | | 0.95 | | | 0.037 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.60 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.237 | | 0.244 |
| E | 6.40 | | 6.60 | 0.252 | | 0.260 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 15.90 | | 16.30 | 0.626 | | 0.642 |
| L | 9.00 | | 9.40 | 0.354 | | 0.370 |
| L1 | 0.80 | | 1.20 | 0.031 | | 0.047 |
| L2 | | 0.80 | 1.00 | | 0.031 | 0.039 |
| V1 | | $10^o$ | | | $10^o$ | |




P032N_E

# TO-252 (DPAK) MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 | | 2.40 | 0.087 | | 0.094 |
| A1 | 0.90 | | 1.10 | 0.035 | | 0.043 |
| A2 | 0.03 | | 0.23 | 0.001 | | 0.009 |
| B | 0.64 | | 0.90 | 0.025 | | 0.035 |
| B2 | 5.20 | | 5.40 | 0.204 | | 0.213 |
| C | 0.45 | | 0.60 | 0.018 | | 0.024 |
| C2 | 0.48 | | 0.60 | 0.019 | | 0.024 |
| D | 6.00 | | 6.20 | 0.236 | | 0.244 |
| E | 6.40 | | 6.60 | 0.252 | | 0.260 |
| G | 4.40 | | 4.60 | 0.173 | | 0.181 |
| H | 9.35 | | 10.10 | 0.368 | | 0.398 |
| L2 | | 0.8 | | | 0.031 | |
| L4 | 0.60 | | 1.00 | 0.024 | | 0.039 |
| V2 | $0^o$ | | $8^o$ | $0^o$ | | $0^o$ |



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