

Power transistor

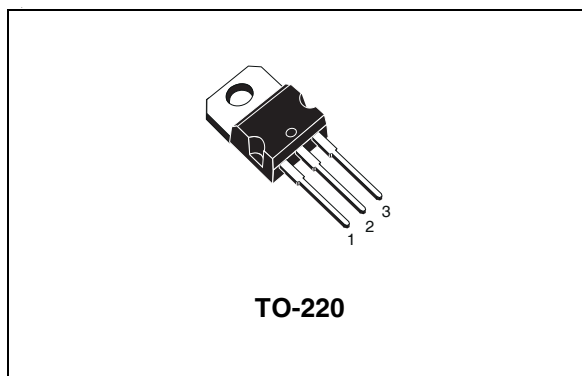
Applications

- Linear and switching industrial equipment

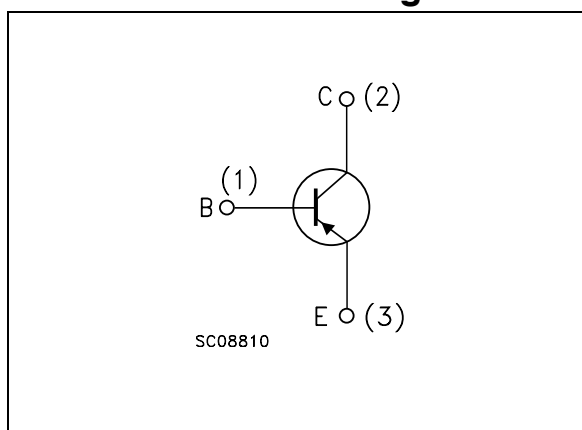
Description

The TIP32C is a silicon Epitaxial-base PNP power transistor in Jedec TO-220 plastic package. It is intended for use in medium power linear and switching applications.

The complementary NPN type is TIP31C.



Internal schematic diagram



Order codes

| Part number | Marking | Package | Packing |
|-------------|---------|---------|---------|
| TIP32C | TIP32C | TO-220 | Tube |

1 Absolute maximum ratings

Table 1. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------------------|
| V_{CBO} | Collector-base voltage ($I_E = 0$) | -100 | V |
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | -100 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | -5 | V |
| I_C | Collector current | -3 | A |
| I_{CM} | Collector peak current ($t_P < 5\text{ms}$) | -5 | A |
| I_B | Base current | -1 | A |
| P_{TOT} | Total dissipation at $T_{case} = 25^\circ\text{C}$ $T_{amb} = 25^\circ\text{C}$ | 40 | W |
| | | 2 | W |
| T_{stg} | Storage temperature | -65 to 150 | $^\circ\text{C}$ |
| T_J | Max. operating junction temperature | 150 | $^\circ\text{C}$ |

2 Electrical characteristics

($T_{\text{case}} = 25^{\circ}\text{C}$; unless otherwise specified)

Table 2. Electrical characteristics

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|---|--|----------|------|------|------|
| I_{CEO} | Collector cut-off current ($I_{\text{B}} = 0$) | $V_{\text{CB}} = -60\text{V}$ | | | -0.3 | mA |
| I_{CES} | Collector cut-off current ($V_{\text{BE}} = 0$) | $V_{\text{CB}} = -100\text{V}$ | | | -0.2 | mA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = -5\text{V}$ | | | -1 | mA |
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = -30\text{mA}$ | -100 | | | V |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = -3\text{A}$ $I_{\text{B}} = 375\text{mA}$ | | | -1.2 | V |
| $V_{\text{BE(on)}}^{(1)}$ | Base-emitter voltage | $I_{\text{C}} = -3\text{A}$ $V_{\text{CE}} = -4\text{V}$ | | | -1.8 | V |
| $h_{\text{FE}}^{(1)}$ | DC current gain | $I_{\text{C}} = -1\text{A}$ $V_{\text{CE}} = -4\text{V}$ $I_{\text{C}} = -3\text{A}$ $V_{\text{CE}} = -4\text{V}$ | 25 10 | | 50 | |

1. Pulsed duration = 300 ms, duty cycle $\geq 1.5\%$.

2.1 Typical characteristic

Figure 1. Safe operating area

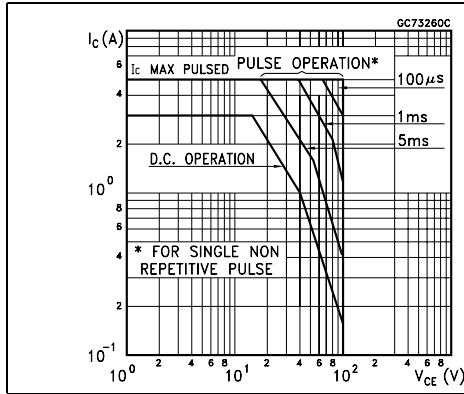


Figure 2. Derating Curves

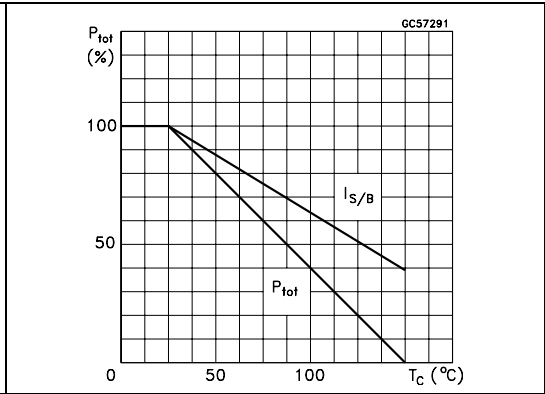


Figure 3. DC current gain

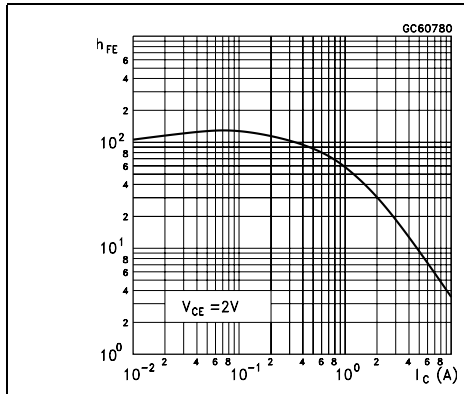


Figure 4. Collector-emitter saturation voltage

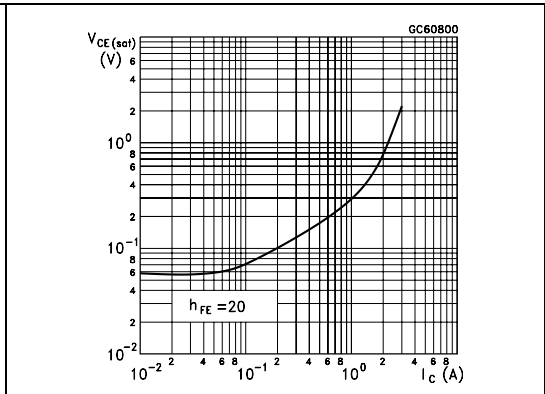
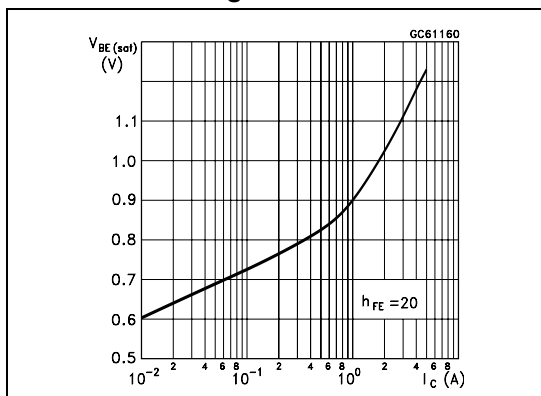


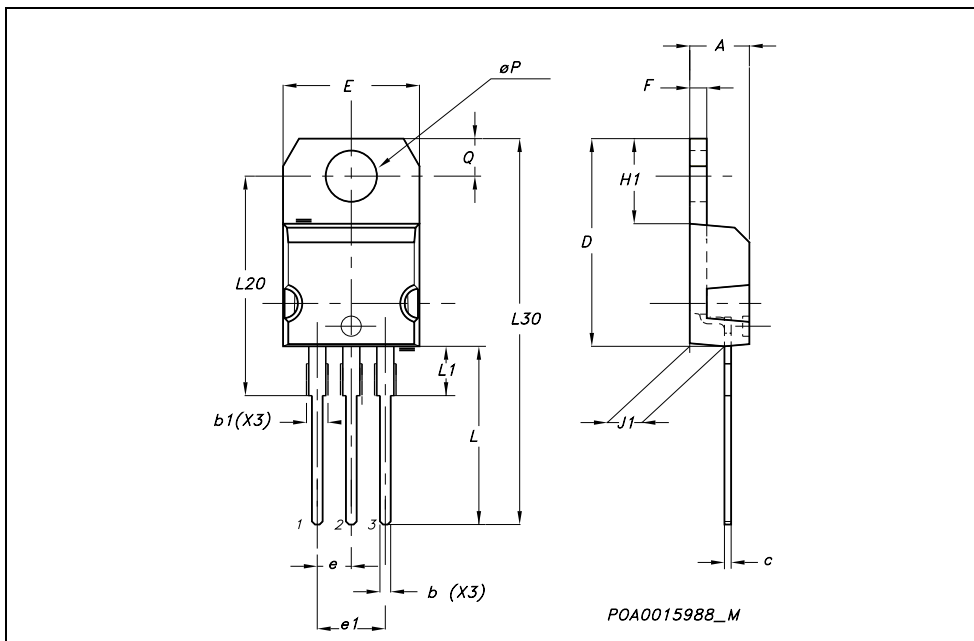
Figure 5. Base-emitter saturation voltage



3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

| TO-220 MECHANICAL DATA | | | | | | |
|------------------------|-------|-------|-------|-------|-------|-------|
| DIM. | mm. | | | inch | | |
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| b | 0.61 | | 0.88 | 0.024 | | 0.034 |
| b1 | 1.15 | | 1.70 | 0.045 | | 0.066 |
| c | 0.49 | | 0.70 | 0.019 | | 0.027 |
| D | 15.25 | | 15.75 | 0.60 | | 0.620 |
| E | 10 | | 10.40 | 0.393 | | 0.409 |
| e | 2.40 | | 2.70 | 0.094 | | 0.106 |
| e1 | 4.95 | | 5.15 | 0.194 | | 0.202 |
| F | 1.23 | | 1.32 | 0.048 | | 0.052 |
| H1 | 6.20 | | 6.60 | 0.244 | | 0.256 |
| J1 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| L | 13 | | 14 | 0.511 | | 0.551 |
| L1 | 3.50 | | 3.93 | 0.137 | | 0.154 |
| L20 | | 16.40 | | | 0.645 | |
| L30 | | 28.90 | | | 1.137 | |
| øP | 3.75 | | 3.85 | 0.147 | | 0.151 |
| Q | 2.65 | | 2.95 | 0.104 | | 0.116 |



4 Revision History

Table 3. Revision history

| Date | Revision | Changes |
|-------------|----------|-----------------------------------|
| 10-Oct-1999 | 1 | Initial Release |
| 15-Nov-2006 | 2 | The document has been reformatted |

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