

High power NPN transistor

Features

- High power dissipation
- Low collector-emitter saturation voltage

Description

The device is a planar NPN transistor mounted in TO-3 metal case. It is intended for linear amplifiers and inductive switching applications.

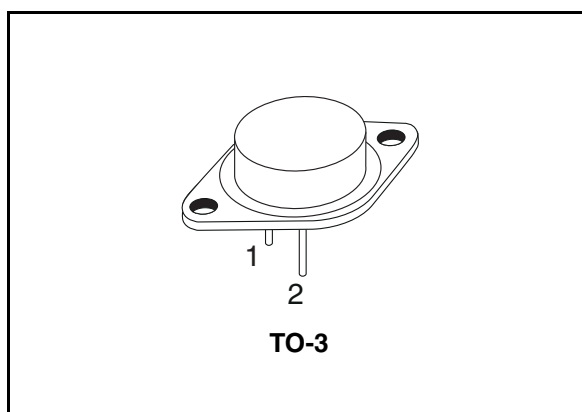


Figure 1. Internal schematic diagram

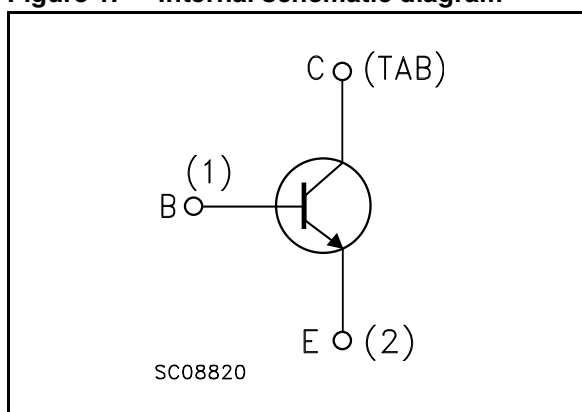


Table 1. Device summary

| Order code | Marking | Package | Packaging |
|------------|---------|---------|-----------|
| 2N3773 | 2N3773 | TO-3 | Tray |

1 Electrical ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_{CEO} | Collector-emitter voltage ($I_B = 0$) | 140 | V |
| V_{CEV} | Collector-emitter voltage ($V_{BE} = -1.5$ V) | 160 | V |
| V_{CBO} | Collector-base voltage ($I_E = 0$) | 160 | V |
| V_{EBO} | Emitter-base voltage ($I_C = 0$) | 7 | V |
| I_C | Collector current | 16 | A |
| I_{CM} | Collector peak current ($t_P < 5$ ms) | 30 | A |
| I_B | Base current | 4 | A |
| I_{BM} | Base peak current ($t_P < 1$ ms) | 15 | A |
| P_{tot} | Total dissipation at $T_C \leq 25$ °C | 150 | W |
| T_{stg} | Storage temperature | -65 to 200 | °C |
| T_j | Max. operating junction temperature | 200 | °C |

Table 3. Thermal data

| Symbol | Parameter | Value | Unit |
|----------------|---|-------|------|
| $R_{thj-case}$ | Thermal resistance junction-case Max | 1.17 | °C/W |

2 Electrical characteristics

($T_{\text{case}} = 25\text{ °C}$ unless otherwise specified)

Table 4. Electrical characteristics

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|-----------------------------|--|---|---------|------|----------|----------|
| I_{CEV} | Collector cut-off current ($V_{\text{BE}} = -1.5\text{ V}$) | $V_{\text{CE}} = 140\text{ V}$ $V_{\text{CE}} = 140\text{ V}$ $T_{\text{C}} = 150\text{ °C}$ | | | 2 10 | mA mA |
| I_{CEO} | Collector cut-off current ($I_{\text{B}} = 0$) | $V_{\text{CE}} = 120\text{ V}$ | | | 10 | mA |
| I_{CBO} | Collector cut-off current ($I_{\text{E}} = 0$) | $V_{\text{CB}} = 140\text{ V}$ | | | 2 | mA |
| I_{EBO} | Emitter cut-off current ($I_{\text{C}} = 0$) | $V_{\text{EB}} = 7\text{ V}$ | | | 5 | mA |
| $V_{\text{CEO(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($I_{\text{B}} = 0$) | $I_{\text{C}} = 0.2\text{ A}$ | 140 | | | V |
| $V_{\text{CEV(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($V_{\text{BE}} = -1.5\text{ V}$) | $I_{\text{C}} = 0.1\text{ A}$ | 160 | | | V |
| $V_{\text{CER(sus)}}^{(1)}$ | Collector-emitter sustaining voltage ($R_{\text{BE}} = 100\ \Omega$) | $I_{\text{C}} = 0.2\text{ A}$ | 150 | | | V |
| $V_{\text{CE(sat)}}^{(1)}$ | Collector-emitter saturation voltage | $I_{\text{C}} = 8\text{ A}$ $I_{\text{B}} = 0.8\text{ A}$ $I_{\text{C}} = 16\text{ A}$ $I_{\text{B}} = 3.2\text{ A}$ | | | 1.4 4 | V V |
| $V_{\text{BE}}^{(1)}$ | Base-emitter voltage | $I_{\text{C}} = 8\text{ A}$ $V_{\text{CE}} = 4\text{ V}$ | | | 2.2 | V |
| $h_{\text{FE}}^{(1)}$ | DC current gain | $I_{\text{C}} = 8\text{ A}$ $V_{\text{CE}} = 4\text{ V}$ $I_{\text{C}} = 16\text{ A}$ $V_{\text{CE}} = 4\text{ V}$ | 15 5 | | 60 | |
| $I_{\text{s/b}}$ | Second Breakdown Collector Current | $V_{\text{CE}} = 30\text{ V}$ $t = 1\text{ s}$ (non repetitive) | 5 | | | A |

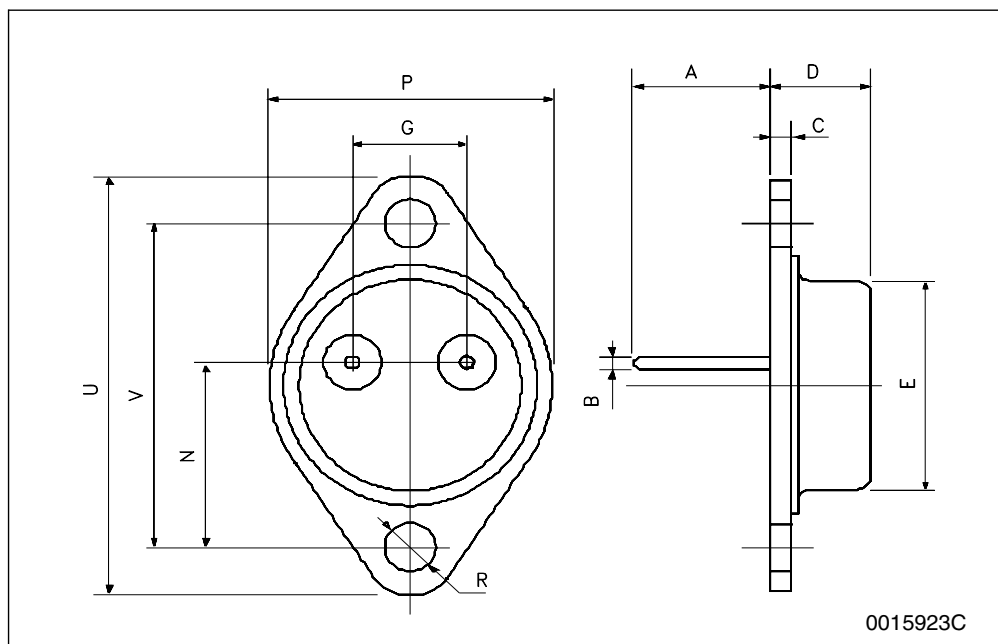
1. Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2\%$

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-3 mechanical data

| DIM. | mm. | | |
|------|-------|-----|-------|
| | min. | typ | max. |
| A | 11.00 | | 13.10 |
| B | 0.97 | | 1.15 |
| C | 1.50 | | 1.65 |
| D | 8.32 | | 8.92 |
| E | 19.00 | | 20.00 |
| G | 10.70 | | 11.10 |
| N | 16.50 | | 17.20 |
| P | 25.00 | | 26.00 |
| R | 4.00 | | 4.09 |
| U | 38.50 | | 39.30 |
| V | 30.00 | | 30.30 |



4 Revision history

Table 5. Document revision history

| Date | Revision | Changes |
|-------------|-----------------|--|
| 03-Apr-2006 | 1 | Initial release. |
| 10-Oct-2008 | 2 | Content reworked to improve readability, no technical changes. |

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