

## 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.

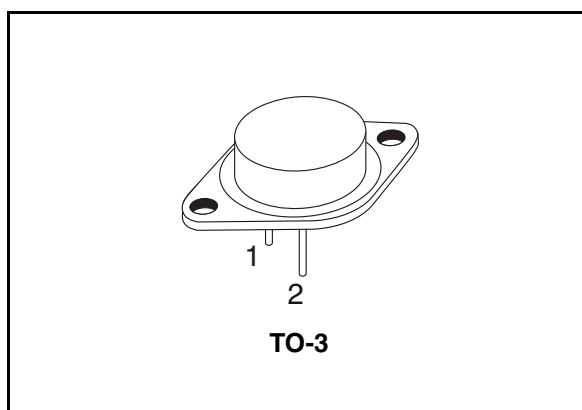


Figure 1. Internal schematic diagram

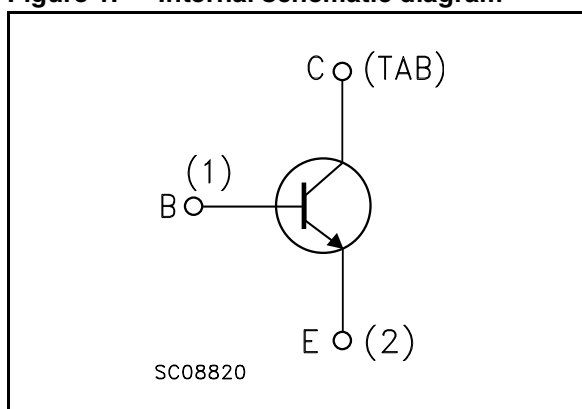


Table 1. Device summary

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
$I_{\text{CEV}}$	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
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 120\text{ V}$			10	mA
$I_{\text{CBO}}$	Collector cut-off current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 140\text{ V}$			2	mA
$I_{\text{EBO}}$	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

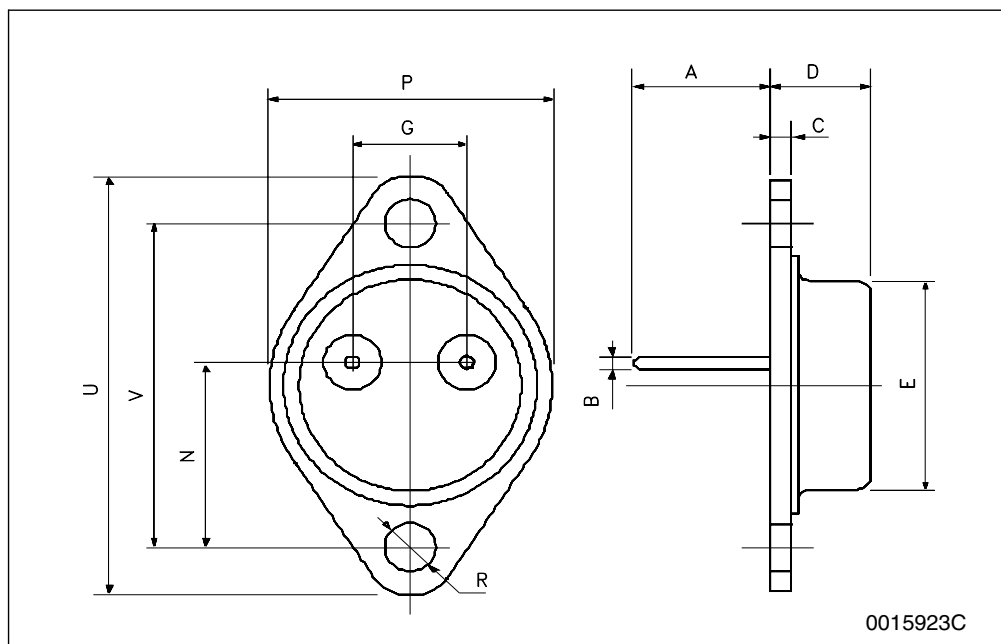
1. Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 2\%$

### 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](http://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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