

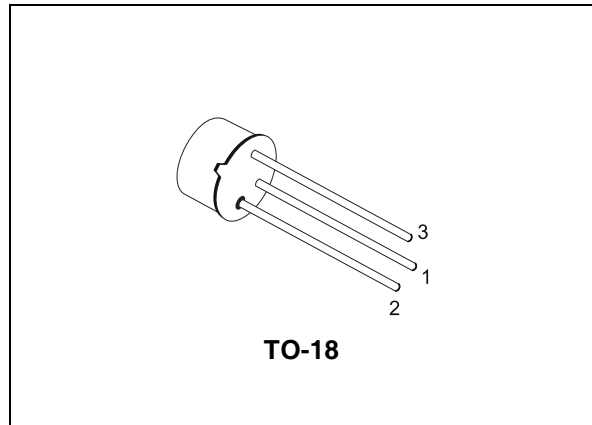


## 2N3700

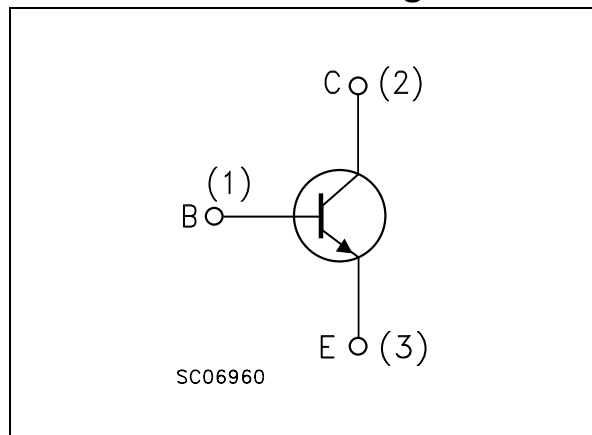
### General purpose amplifiers

#### Description

The 2N3700 is silicon planar epitaxial NPN transistor in Jedec TO-18 metal case. It is intended for small signal, low noise industrial applications.



#### Internal schematic diagram



#### Order codes

Part Number	Marking	Package	Packing
2N3700	2N3700	TO-18	Bag

# 1 Electrical ratings

**Table 1. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-emitter voltage ( $I_E = 0$ )	140	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	80	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	7	V
$I_C$	Collector current	1	A
$P_{tot}$	Total dissipation at $T_{amb} \leq 25^\circ\text{C}$	0.5	W
	at $T_{case} \leq 25^\circ\text{C}$	1.8	W
	at $T_{case} \leq 100^\circ\text{C}$	1	W
$T_{stg}$	Storage temperature	-65 to 200	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	200	$^\circ\text{C}$

**Table 2. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	97	$^\circ\text{C/W}$
$R_{thj-amb}$	Thermal resistance junction-ambient max	350	$^\circ\text{C/W}$

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector cut-off current ( $I_E = 0$ )	$V_{CB} = 90\text{V}$ $V_{CB} = 90\text{V}$ $T_{amb} = 150^{\circ}\text{C}$			10 10	nA $\mu\text{A}$
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5\text{V}$			10	nA
$V_{(BR)CBO}$	Collector-base breakdown voltage ( $I_E = 0$ )	$I_C = 100\mu\text{A}$	140			V
$V_{(BR)CEO}^{(1)}$	Collector-emitter breakdown voltage ( $I_B = 0$ )	$I_C = 30\text{mA}$	80			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage ( $I_C = 0$ )	$I_E = 100\mu\text{A}$	7			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$ $I_C = 0.5\text{A}$ $I_B = 50\text{mA}$			0.2 0.5	V V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$			1.1	V
$h_{FE}$	DC current gain	$I_C = 0.1\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 150\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 500\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 1\text{A}$ $V_{CE} = 10\text{V}$ $I_C = 150\text{mA}$ $V_{CE} = 10\text{V}$ $T_{amb} = -55^{\circ}\text{C}$	50 90 100 50 15 40		300	
$h_{fe}$	Small signal current gain	$I_C = 1\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1\text{kHz}$	80		400	
$f_T$	Transition frequency	$I_C = 50\text{mA}$ $V_{CE} = 10\text{V}$ $f = 20\text{MHz}$		100		MHz
$C_{EBO}$	Emitter-base capacitance	$I_C = 0$ $V_{EB} = 0.5\text{V}$ $f = 1\text{MHz}$		60		pF
$C_{CBO}$	Collector-base capacitance	$I_E = 0$ $V_{CB} = 10\text{V}$ $f = 1\text{MHz}$		12		pF
$r_{bb'} C_{b'c}$	Feedback time constant	$I_C = 10\text{mA}$ $V_{CB} = 10\text{V}$ $f = 4\text{MHz}$	25		400	ps

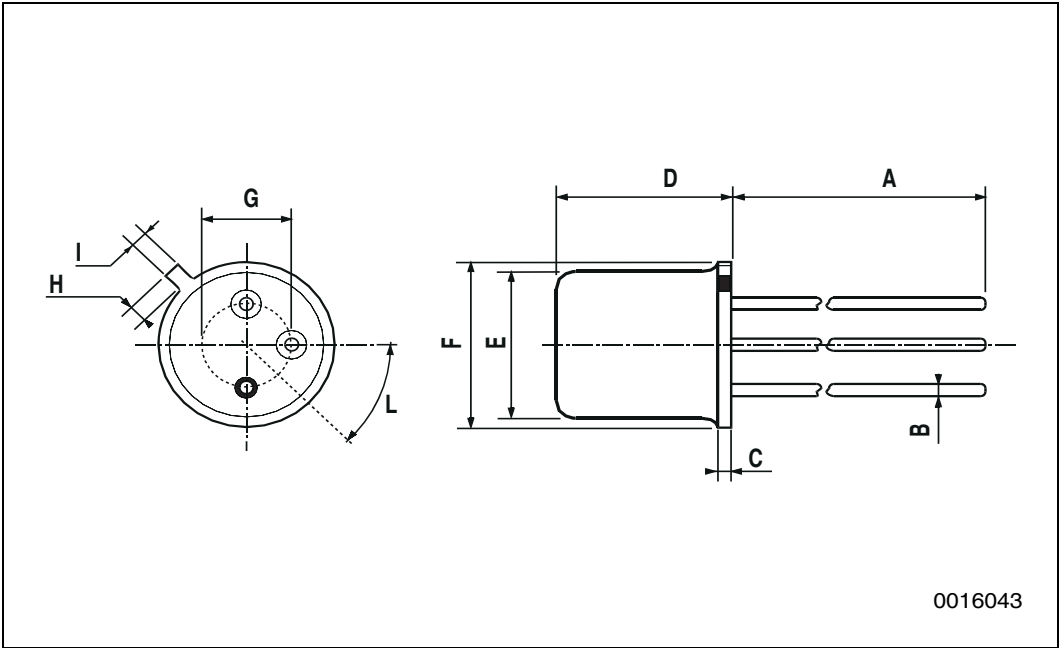
**Note:** (1) Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1\%$

### 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-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45°			45°		



## 4 Revision history

**Table 4. Revision history**

Date	Revision	Changes
31-Jan-1989	1	First release
06-Nov-2006	2	The document has been reformatted

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