

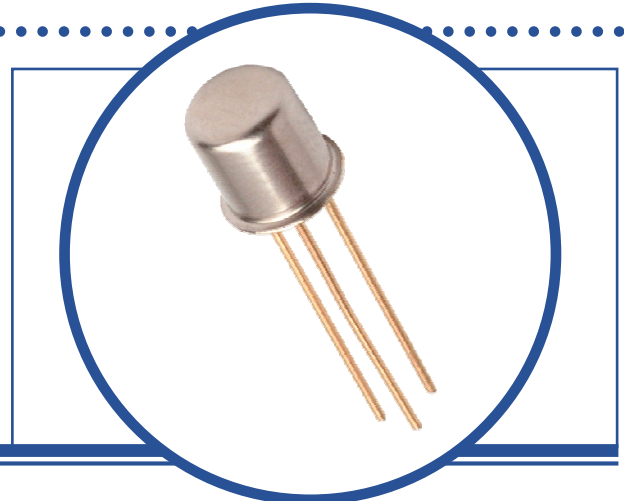
# SILICON NPN TRANSISTOR



Semelab Limited

## 2N3700

- High Voltage, Medium Power Silicon Planar NPN Transistor
- Hermetic TO18 Metal Package
- High Reliability Screening Options Available
- CECC and Space Quality Level Options



### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage	140V
$V_{CEO}$	Collector – Emitter Voltage	80V
$V_{EBO}$	Emitter – Base Voltage	7.0V
$I_C$	Continuous Collector Current	1.0A
$P_D$	Total Power Dissipation at $T_A = 25^\circ\text{C}$	0.5W
	Derate Above $T_A = 25^\circ\text{C}$	2.9mW/°C
	$T_C = 25^\circ\text{C}$	1.0W
	Derate Above $T_C = 25^\circ\text{C}$	5.7mW/°C
$T_J$	Junction Temperature Range	-65 to +200°C
$T_{stg}$	Storage Temperature Range	-65 to +200°C

### THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient			350	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction To Case			175	°C/W

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### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = 30\text{mA}$ $I_B = 0$	80			V
$I_{EBO}$	Emitter-Base Cut-Off Current	$V_{EB} = 7.0\text{V}$ $I_C = 0$			10	$\mu\text{A}$
		$V_{EB} = 5.0\text{V}$ $I_C = 0$			10	nA
$I_{CES}$	Collector-Emitter Cut-Off Current	$V_{CE} = 90\text{V}$			10	nA
		$T_A = 150^\circ\text{C}$			5	$\mu\text{A}$
$I_{CBO}$	Collector-Base Cut-Off Current	$V_{CB} = 140\text{V}$ $I_E = 0$			10	nA
$h_{FE}^{(1)}$	DC Current Gain	$I_C = 0.10\text{mA}$ $V_{CE} = 10\text{V}$	50			
		$I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$	90			
		$I_C = 150\text{mA}$ $V_{CE} = 10\text{V}$	100		300	
		$T_A = -55^\circ\text{C}$	40			
		$I_C = 500\text{mA}$ $V_{CE} = 10\text{V}$	50			
		$I_C = 1.0\text{A}$ $V_{CE} = 10\text{V}$	15			
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$			0.2	V
		$I_C = 500\text{mA}$ $I_B = 50\text{mA}$			0.5	
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$			1.1	V

### DYNAMIC CHARACTERISTICS

$ h_{fel} $	Magnitude of Small-Signal Short-Circuit Current Gain	$I_C = 50\text{mA}$ $V_{CE} = 10\text{V}$ $f = 20\text{MHz}$	4	5	20	
$h_{fe}$	Small-Signal Short-Circuit Current Gain	$I_C = 1.0\text{mA}$ $V_{CE} = 5.0\text{V}$ $f = 1.0\text{KHz}$	80		400	
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			12	pF
$C_{ibo}$	Input Capacitance	$V_{EB} = 0.5\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$			60	pF

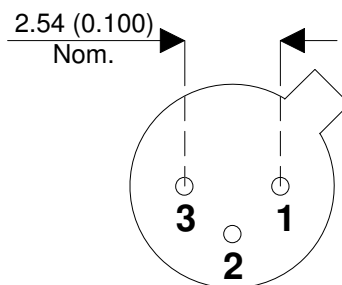
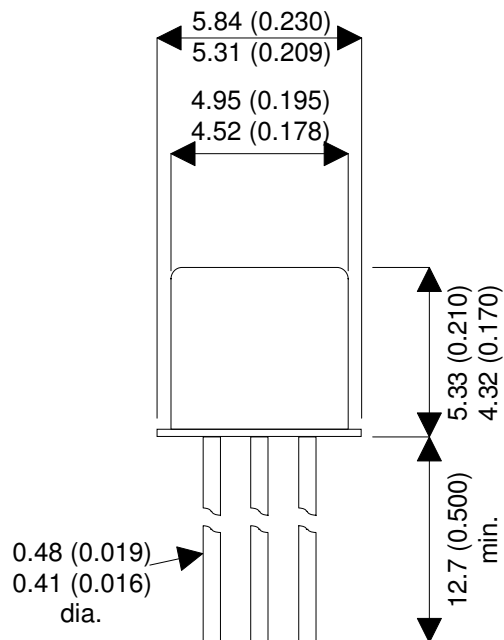
#### Notes

(1) Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$

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## MECHANICAL DATA

Dimensions in mm (inches)



## TO18 (TO-206AA) METAL PACKAGE

Underside View

PIN 1 - Emitter

PIN 2 - Base

PIN 3 - Collector