

**2N3700**

**140 Volts  
 1 Amp**

**NPN  
 BIPOLAR  
 TRANSISTOR**

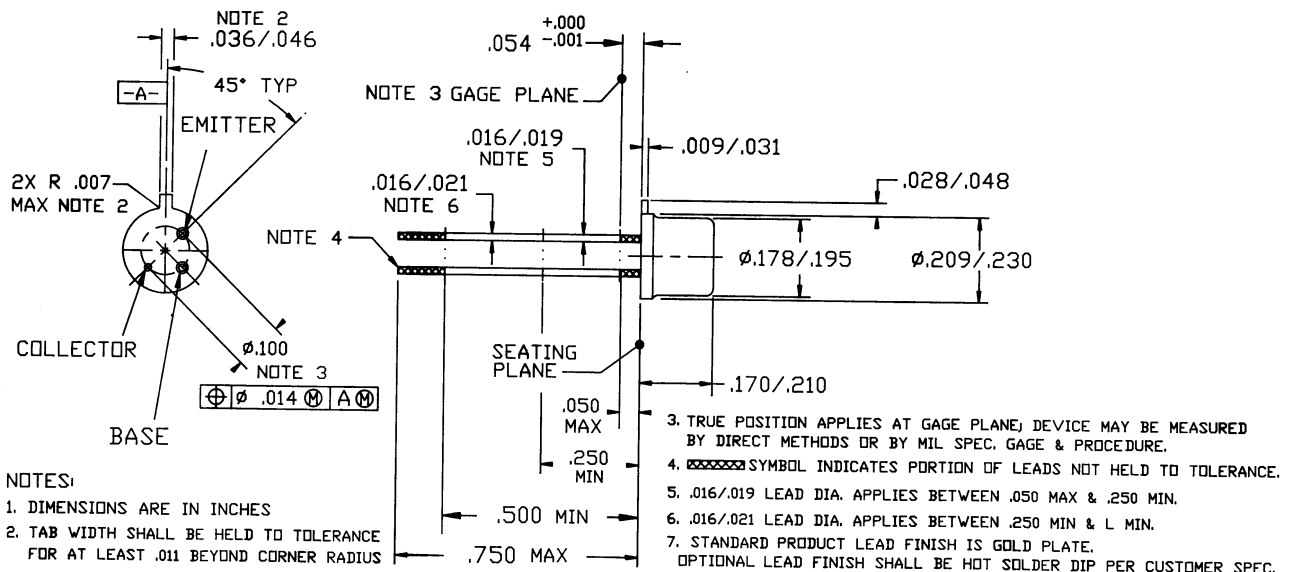
**Features**

- Meets MIL-S-19500/391
- Collector-Base Voltage 140V
- Fast Switching 30 nS

**Maximum Ratings**

RATING	SYMBOL	MAX.	UNIT
Collector-Emitter Voltage	$V_{CEO}$	80	Vdc
Collector-Base Voltage	$V_{CBO}$	140	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0	Vdc
Total Device Dissipation @ TA = 25°C Derate above 25°C	$P_D$	0.5 2.85	Watts mW/°C
Total Device Dissipation @ TA = 25°C Derate above 25°C	$P_D$	1.8 10.3	Watts mW/°C
Operating Temperature Range	$T_J$	-55 to +175	°C
Storage Temperature Range	$T_S$	-55 to +175	°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	300	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83	°C/W

**Mechanical Outline**



**2N3700**

### Electrical Parameters (T<sub>A</sub> @ 25°C unless otherwise specified)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>Off Characteristics</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 30 mA, I <sub>B</sub> = 0)	<b>BV<sub>CEO</sub></b>	80		--	Vdc
Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0)	<b>BV<sub>CBO</sub></b>	140		--	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0)	<b>BV<sub>EBO</sub></b>	7.0		--	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 90 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 90 Vdc, I <sub>E</sub> = 0, T <sub>A</sub> = + 150°C)	<b>I<sub>CES</sub></b>	--		0.01 10	μAdc
Emitter Cutoff Current (V <sub>EB</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	<b>I<sub>EBO</sub></b>	--		10	nAdc
D.C. Current Gain (I <sub>C</sub> = 0.1 mA, V <sub>CE</sub> = 10 Vdc) (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 10 Vdc)(1) (I <sub>C</sub> = 150 mA, V <sub>CE</sub> = 10 Vdc)(1) (I <sub>C</sub> = 150 mA, V <sub>CE</sub> = 10 Vdc, T <sub>C</sub> = -55°C)(1) (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 10 Vdc)(1) (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 10 Vdc)	<b>h<sub>FE</sub></b>				--
		50		200	
		90		--	
		100		300	
		40		--	
		50		200	
		15		--	
Collector-Emitter Saturation Voltage(1) (I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA) (I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA)	<b>V<sub>CE(Sat)</sub></b>	--		0.2 0.5	Vdc
Base-Emitter Saturation Voltage(1) (I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA)	<b>V<sub>BE(Sat)</sub></b>	--		1.1	Vdc
Small-signal short circuit forward current transfer ratio (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 10 Vdc, f = 20 MHz)	<b>h<sub>fe</sub></b>	5		20	
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100kHz ≤ f ≤ 1MHz)	<b>C<sub>OBO</sub></b>	--		12	pf
Input Capacitance (V <sub>EB</sub> = 0.5 Vdc, I <sub>C</sub> = 0, 100kHz ≤ f ≤ 1MHz)	<b>C<sub>IBO</sub></b>	--		60	pf
Small—Signal Current Gain (I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 MHz)	<b>h<sub>fe</sub></b>	80		400	--
Collector Base Time Constant (I <sub>E</sub> = 10 mA, V <sub>CB</sub> = 10 Vdc, f = 79.8 MHz)	<b>rb'C<sub>C</sub></b>			400	ps
Noise Figure (I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 10 Vdc, R <sub>g</sub> = 1.0 k ohms, f = 200Hz)	<b>NF</b>	--		4	dB

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 1.0%.