

2N1893

Features

- Meets MIL-S-19500/182
- Collector-Base Voltage 120
- Collector Current: 0.5 mA
- Fast Switching 30 nS

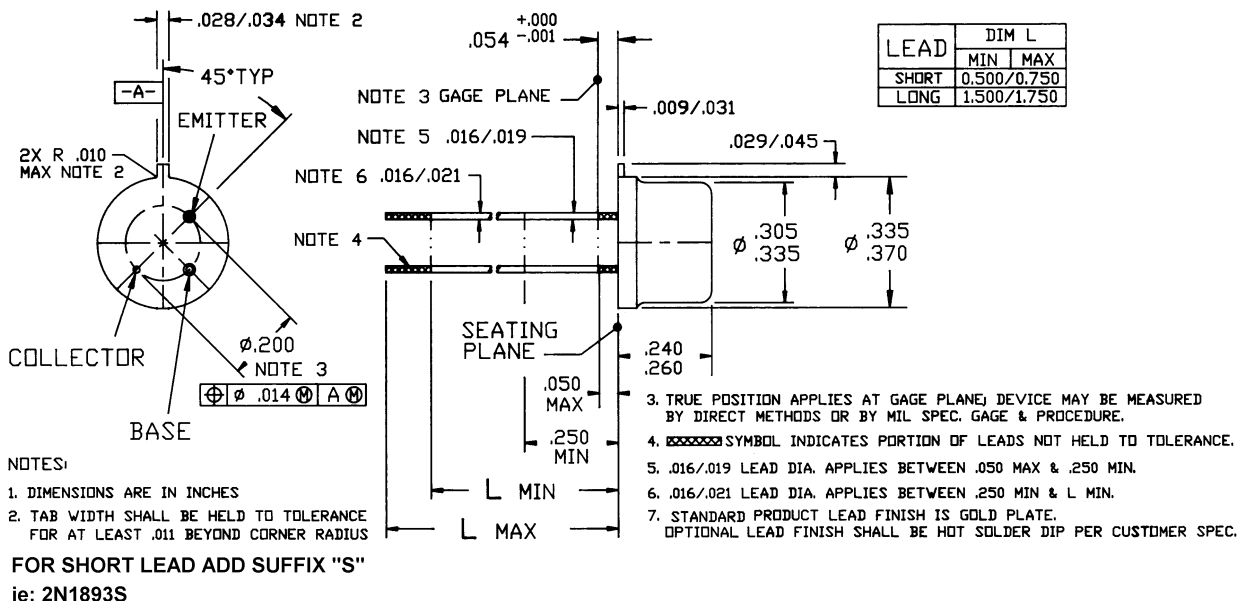
**120 Volts
0.5 Amps**

**NPN
BIPOLAR
TRANSISTOR**

Maximum Ratings

RATING	SYMBOL	MAX.	UNIT
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Emitter Voltage	V_{CER}	100	Vdc
Collector-Base Voltage	V_{CBO}	120	Vdc
Emitter-Base Voltage	V_{EBO}	7.0	Vdc
Collector Current - Continuous	I_C	0.5	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.8 4.57	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	3.0 17.2	Watts mW/ $^\circ\text{C}$
Operating Temperature Range	T_J	-55 to +200	$^\circ\text{C}$
Storage Temperature Range	T_s	-55 to +200	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	219	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JA}$	58	$^\circ\text{C}/\text{W}$

Mechanical Outline



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Electrical Parameters (T_A @ 25°C unless otherwise specified)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Off Characteristics					
Collector-Emitter Breakdown Voltage (I _C = 100 mA _{dc} , R _{BE} = 10 ohms)(1)	BV_{CER}	100		--	V _{dc}
Collector-Emitter Sustaining Voltage(1) (I _C = 30 mA _{dc} , I _B = 0)(1)	BV_{CEO}	80		--	V _{dc}
Collector-Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0)	BV_{(BR)CBO}	120		--	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C = 0)	BV_{(BR)EBO}	7.0		--	V _{dc}
Collector Cutoff Current (V _{CB} = 90 V _{dc} , I _E = 0)	IC_{BO}	--		0.01	μA _{dc}
(V _{CB} = 90 V _{dc} , I _E = 0, T _A = 150°C)		--		15	
Emitter Cutoff Current (V _{EB} = 5.0 V _{dc} , I _C = 0)	IE_{BO}	--		0.01	μA _{dc}
On Characteristics					
D.C. Current Gain (I _C = 0.1 mA _{dc} , V _{CE} = 10 V _{dc})	h_{FE}	20		--	--
(I _C = 10mA _{dc} , V _{CE} = 10 V _{dc})(1)		35		--	
(I _C = 10mA _{dc} , V _{CE} = 10 V _{dc} , T _A = -55°C)(1)		20		--	
(I _C = 150mA _{dc} , V _{CE} = 10 V _{dc})(1)		40		120	
Collector-Emitter Saturation Voltage(1) (I _C = 150 mA _{dc} , I _B = 15 mA _{dc})	V_{CE(Sat)}	--		0.5	V _{dc}
Base-Emitter Saturation Voltage(1) (I _c = 150 mA _{dc} , I _B = 15 mA _{dc})	V_{BE(Sat)}	--		1.3	V _{dc}
Magnitude of small signal short-circuit forward current ratio (I _C = 50 mA _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz)	/h_{fe}/	3		10	
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz)	C_{OBO}	5		15	pF
Input Impedance = (I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0kHz)	h_{ib}	4.0		8.0	Ohms
Voltage Feedback Ratio (I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0 kHz)	h_{rb}	--		1.5	X 10 ⁻⁴
Small-Signal Current Gain (I _c = 1.0 mA _{dc} , V _{cb} = 5.0V _{dc} , f = 1.0 kHz)	h_{fe}	35		100	--
(I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0 kHz)		45		--	
Output Admittance (I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0 kHz)	h_{ob}	--		0.5	μmho
Pulse response (V _{cc} = 20V _{dc} , I _c = 500mA _{dc})	t_{on} + t_{off}	--		30	ns

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.