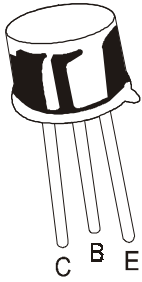


**NPN SILICON PLANAR TRANSISTORS**

**2N 1893**



**TO-39  
Metal Can Package**

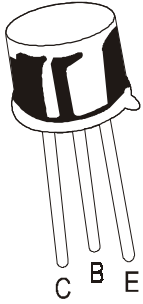
**General Purpose Transistors.**

**ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless specified otherwise)**

DESCRIPTION	SYMBOL	VALUE	UNITS
Collector Emitter Voltage	$V_{CEO}$	80	V
Collector Emitter Voltage	$V_{CER}$	100	V
Collector Base Voltage	$V_{CBO}$	120	V
Emitter Base Voltage	$V_{EBO}$	7.0	V
Collector Current Continuous	$I_C$	0.5	A
Total Device Dissipation @ Ta=25°C	$P_D$	0.8	W
Derate Above 25°C		4.57	mW/°C
Total Device Dissipation @ Tc=25°C	$P_D$	3.0	W
Derate Above 25°C		17.2	mW/°C
Operating And Storage Junction Temperature Range	$T_j, T_{stg}$	-65 to +200	°C
<b>THERMAL RESISTANCE</b>			
Junction to Ambient	$R_{th(j-a)}$	219	°C/W
Junction to Case	$R_{th(j-c)}$	58.3	°C/W

**ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise)**

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	MAX	UNITS
Collector Emitter Breakdown Voltage	$BV_{CER(sus)}$	$I_C=100mA, R_{BE}=10\Omega$	100		V
Collector Emitter Sustaining Voltage	$BV_{CEO(sus)}^*$	$I_C=10mA, I_B=0$	80		V
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C=100\mu A, I_E=0$	120		V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E=100\mu A, I_C=0$	7.0		V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=90V, I_E=0$		10	nA
		$V_{CB}=90V, I_E=0, T_A=150^\circ C$		15	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5V, I_C=0$		10	nA
DC Current Gain	$h_{FE}^*$	$I_C=1mA, V_{CE}=10V$	20		
		$I_C=10mA, V_{CE}=10V$	35		
		$I_C=10mA, V_{CE}=10V$	20		
		$T_C=-55^\circ C$			
Collector Emitter (Sat) Voltage	$V_{CE(Sat)}$	$I_C=150mA, V_{CE}=10V$	40	120	
		$I_C=50mA, I_B=5.0mA$		1.2	V
Base Emitter (Sat) Voltage	$V_{BE(Sat)}$	$I_C=150mA, I_B=15mA$		5.0	V
		$I_C=50mA, I_B=5.0mA$		0.9	V
		$I_C=150mA, I_B=15mA$		1.3	

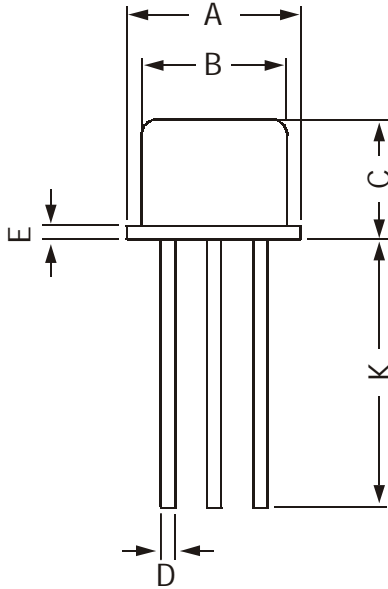


## ELECTRICAL CHARACTERISTICS (Ta=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	MAX	UNITS
<b><u>SMALL SIGNAL CHARACTERISTICS</u></b>					
Current Gain Bandwidth Product	$f_T$	$I_C=50\text{mA}$ , $V_{CE}=10\text{V}$ $f=20\text{MHz}$	50		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}$ , $I_E=0$ , $f=1\text{MHz}$		15	pF
Input Capacitance	$C_{ib}$	$V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=1\text{MHz}$		85	pF
Input Impedance	$h_{ib}$	$I_C=1.0\text{mA}$ , $V_{CB}=5.0\text{V}$ , $f=1.0\text{kHz}$	20	30	$\Omega$
Voltage Feedback Ratio	$h_{rb}$	$I_C=5.0\text{mA}$ , $V_{CB}=10\text{V}$ , $f=1.0\text{kHz}$	4.0	8.0	
		$I_C=1.0\text{mA}$ , $V_{CB}=5.0\text{V}$ , $f=1.0\text{kHz}$		1.25	$\times 10^{-4}$
Small Signal Current Gain	$ h_{fe} $	$I_C=5.0\text{mA}$ , $V_{CB}=10\text{V}$ , $f=1.0\text{kHz}$		1.5	
		$I_C=1.0\text{mA}$ , $V_{CB}=5.0\text{V}$ , $f=1.0\text{kHz}$	30	100	
Output Admittance	$h_{ob}$	$I_C=1.0\text{mA}$ , $V_{CB}=5.0\text{V}$ , $f=1.0\text{kHz}$		0.5	$\mu\text{mho}$
		$I_C=5.0\text{mA}$ , $V_{CB}=10\text{V}$ , $f=1.0\text{kHz}$		0.5	

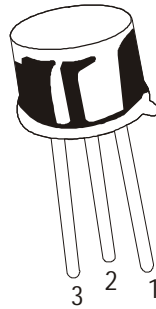
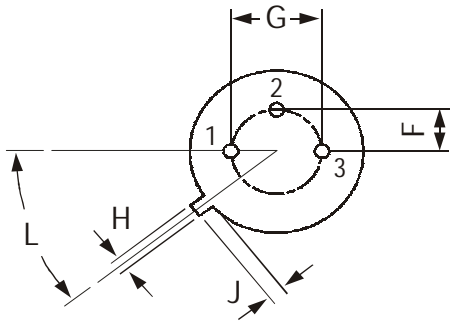
\*Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

TO-39 Metal Can Package



All dimensions are in mm

DIM	MIN	MAX
A	8.50	9.39
B	7.74	8.50
C	6.09	6.60
D	0.40	0.53
E	—	0.88
F	2.41	2.66
G	4.82	5.33
H	0.71	0.86
J	0.73	1.02
K	12.70	—
L	42 DEG	48 DEG



PIN CONFIGURATION  
1. EMITTER  
2. BASE  
3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-39	500 pcs/polybag	540 gm/500 pcs	3" x 7.5" x 7.5"	20K	17" x 15" x 13.5"	32K	40 kgs

### **Disclaimer**

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