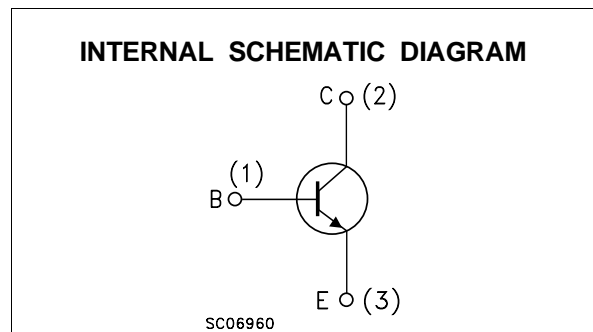
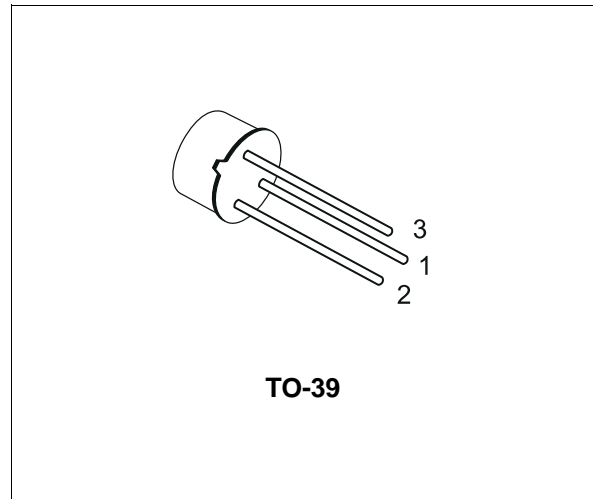


## SMALL SIGNAL NPN TRANSISTOR

- GENERAL PURPOSE HIGH VOLTAGE DEVICE

### DESCRIPTION

The 2N1893 is a Silicon Planar Epitaxial NPN transistor in Jedec TO-39 metal case, designed for use in high-performance amplifier, oscillator and switching circuits. It provides greater voltage swings in oscillator and amplifier circuits and more protection in inductive switching circuits due to its 120 V collector-to-base voltage rating.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	120	V
$V_{CER}$	Collector-Emitter Voltage ( $R_{BE} \leq 10\Omega$ )	100	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	0.5	A
$P_{tot}$	Total Dissipation at $T_{amb} \leq 25^\circ\text{C}$	0.8	W
	at $T_C \leq 25^\circ\text{C}$	3	W
	at $T_C \leq 100^\circ\text{C}$	1.7	W
$T_{stg}$	Storage Temperature	-65 to 175	$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	175	$^\circ\text{C}$

## THERMAL DATA

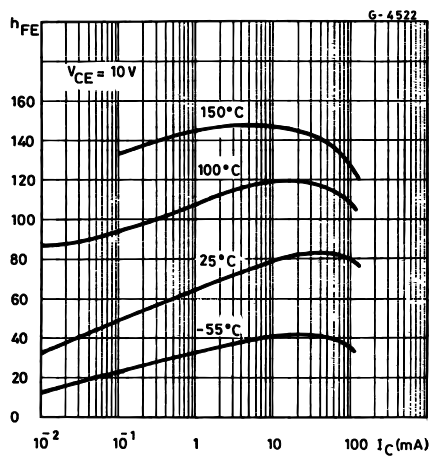
R <sub>thj-case</sub>	Thermal Resistance Junction-Case	Max	50	°C/W
R <sub>thj-amb</sub>	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

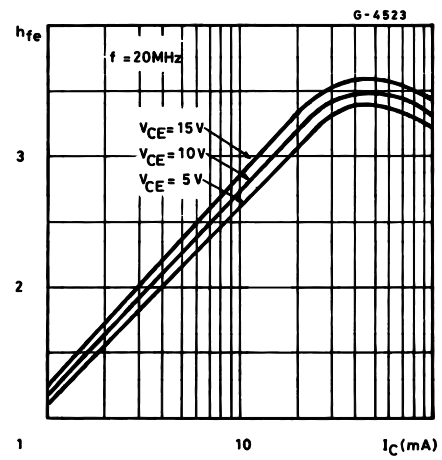
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = 90 V V <sub>CB</sub> = 90 V    T <sub>C</sub> = 150 °C			10 15	nA μA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			10	nA
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = 100 μA	120			V
V <sub>(BR)CER*</sub>	Collector-Emitter Breakdown Voltage (R <sub>BE</sub> ≤ 10 Ω)	I <sub>C</sub> = 10 mA	100			V
V <sub>(BR)CEO*</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = 10 mA	80			V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 100 μA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 50 mA    I <sub>B</sub> = 5 mA I <sub>C</sub> = 150 mA    I <sub>B</sub> = 15 mA			1.2 5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 50 mA    I <sub>B</sub> = 5 mA I <sub>C</sub> = 150 mA    I <sub>B</sub> = 15 mA		0.82 0.96	0.9 1.3	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 0.1 mA    V <sub>CE</sub> = 10 V I <sub>C</sub> = 10 mA    V <sub>CE</sub> = 10 V I <sub>C</sub> = 150 mA    V <sub>CE</sub> = 10 V I <sub>C</sub> = 10 mA    V <sub>CE</sub> = 10 V T <sub>C</sub> = -55 °C	20 35 40 20	50 80 80 40	120	
h <sub>fe*</sub>	Small Signal Current Gain	I <sub>C</sub> = 1 mA    V <sub>CE</sub> = 5 V    f = 1KHz I <sub>C</sub> = 5 mA    V <sub>CE</sub> = 10 V    f = 1KHz	30 45	70 85	150	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = 50 mA    V <sub>CE</sub> = 10 V    f = 20MHz	50	70		MHz
C <sub>CBO</sub>	Collector-Base Capacitance	I <sub>E</sub> = 0    V <sub>CB</sub> = 10 V    f = 1MHz		13	15	pF
C <sub>EBO</sub>	Emitter-Base Capacitance	I <sub>C</sub> = 0    V <sub>EB</sub> = 0.5 V    f = 1MHz		55	85	pF

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1 %

DC Current Gain

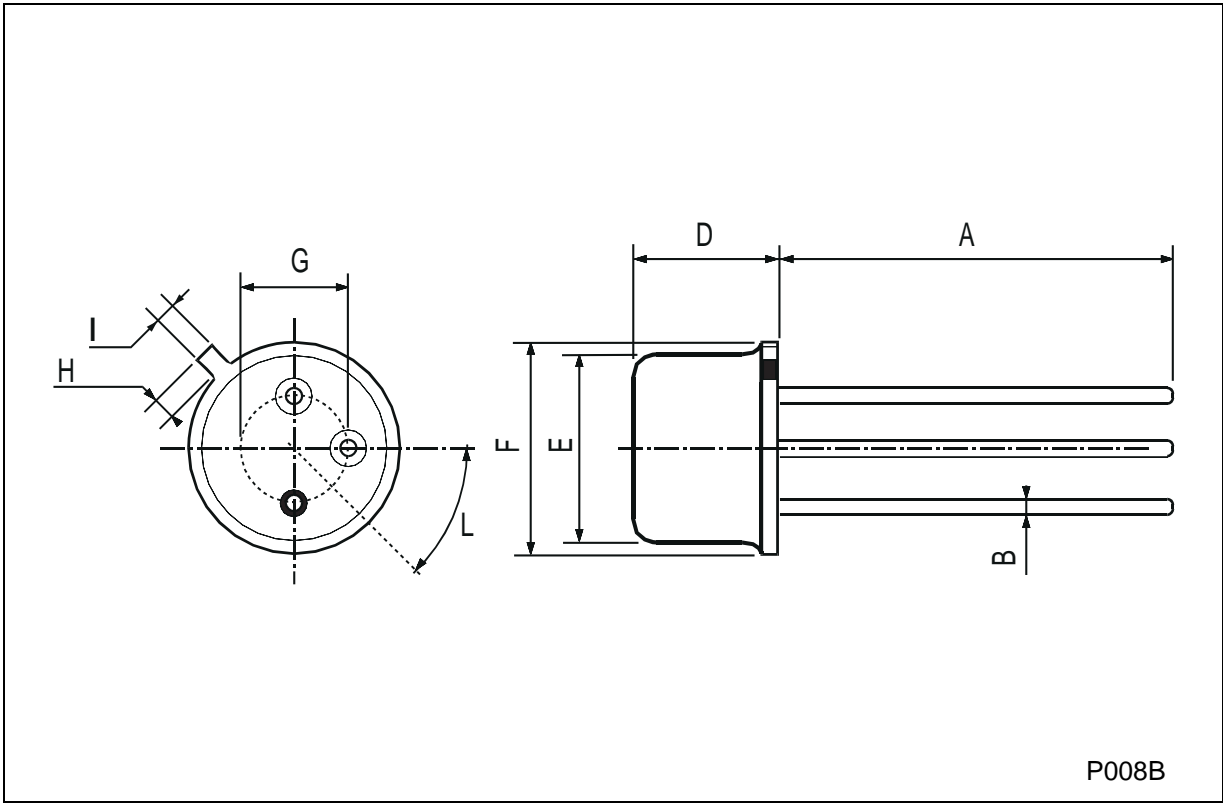


DC Current Gain



**TO-39 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45° (typ.)					



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