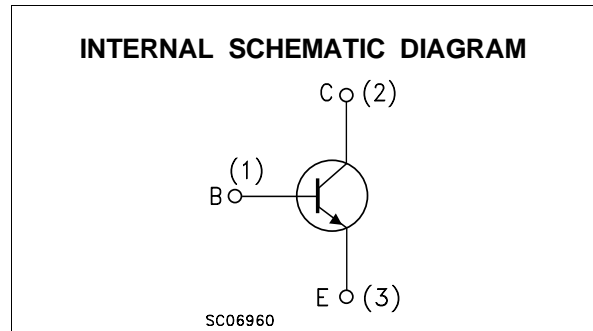
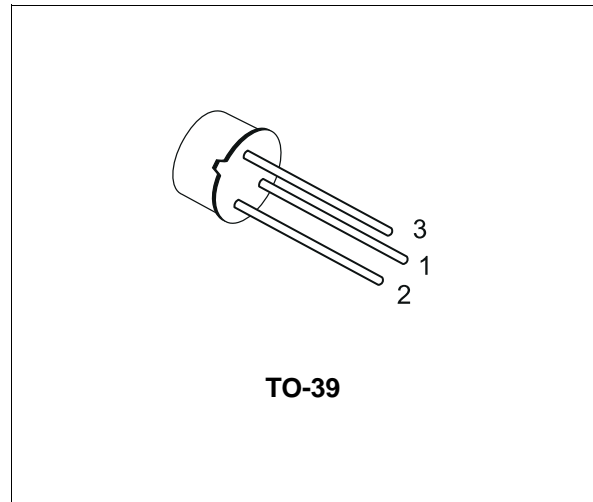


SMALL SIGNAL NPN TRANSISTOR

- 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 $T_{amb} \leq 25\text{ }^\circ\text{C}$	0.8	W
	at $T_C \leq 25\text{ }^\circ\text{C}$	3	W
	at $T_C \leq 100\text{ }^\circ\text{C}$	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

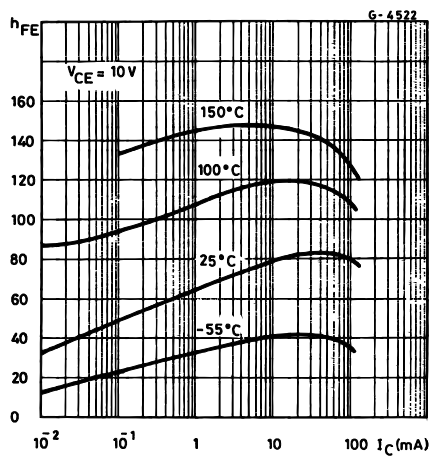
R _{thj-case}	Thermal Resistance Junction-Case	Max	50	°C/W
R _{thj-amb}	Thermal Resistance Junction-Ambient	Max	187.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

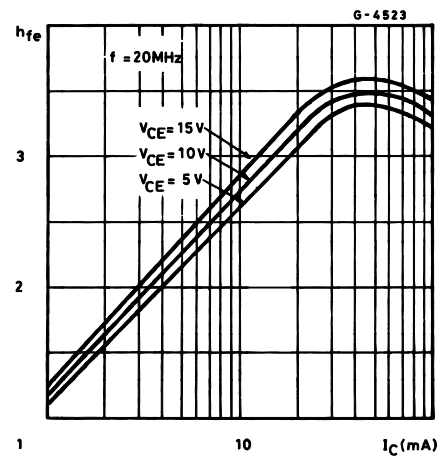
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CBO}	Collector Cut-off Current (I _E = 0)	V _{CB} = 90 V V _{CB} = 90 V T _C = 150 °C			10 15	nA μA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{EB} = 5 V			10	nA
V _{(BR)CBO}	Collector-Base Breakdown Voltage (I _E = 0)	I _C = 100 μA	120			V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

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

DC Current Gain

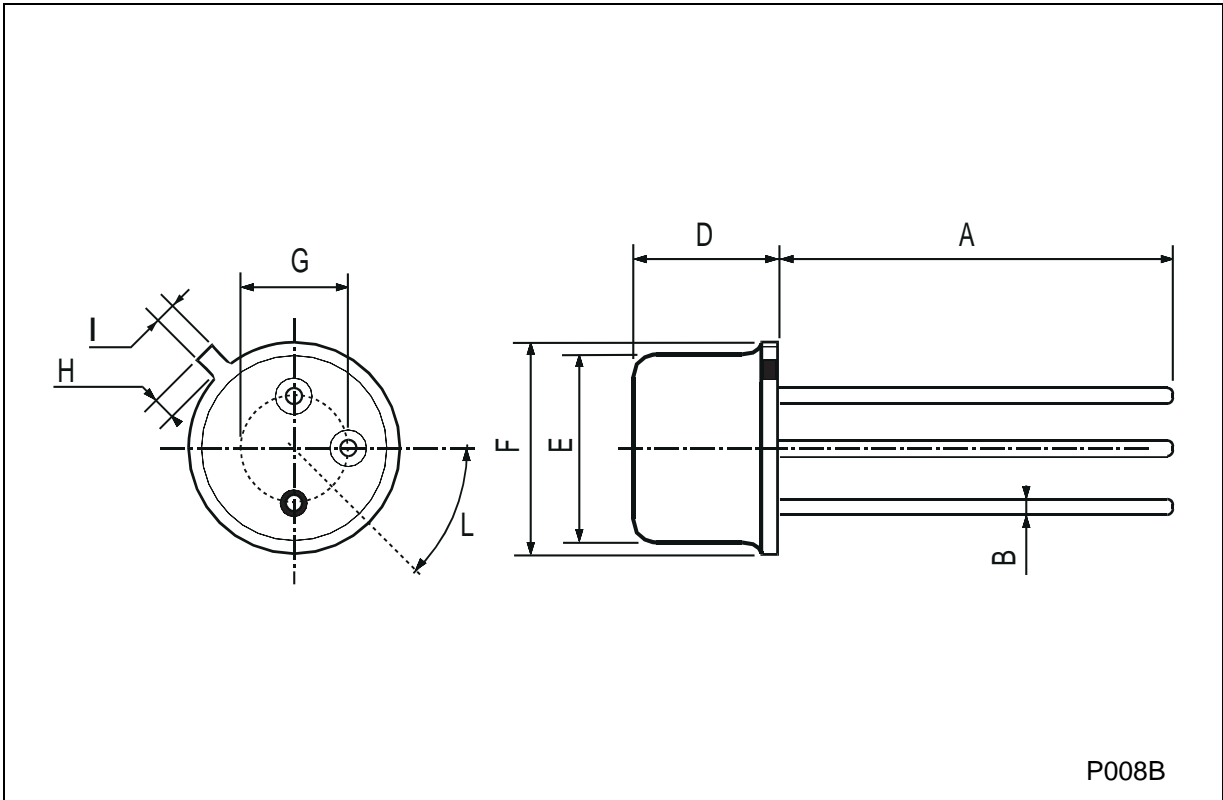


DC Current Gain



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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