SGS-THOMSON MICROELECTRONICS

2N1893

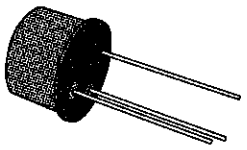
GENERAL PURPOSE HIGH-VOLTAGE TYPE

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.

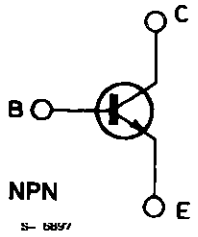
It provides greater voltage swings in oscillator and amplifier circuits and more protection in inductive switching circuits due to its 120 V collector-to-base voltage rating.

Products approved to CECC 50002-104 available on request.



TO-39

INTERNAL SCHEMATIC DIAGRAM



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 Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C at $T_{case} \leq 100$ °C	0.8 3 1.7	W W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

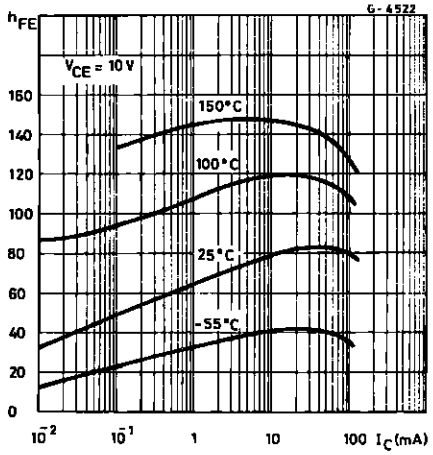
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	58	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	219	°C/W

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

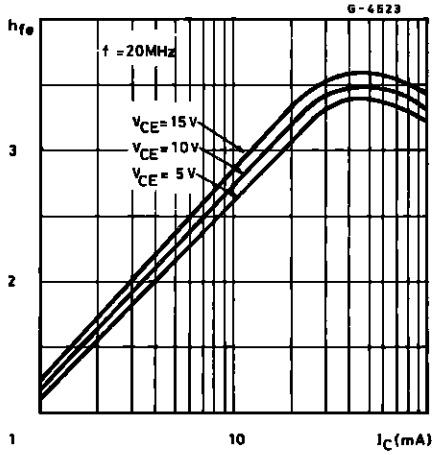
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 90 V V_{CB} = 90 V T_{amb} = 150 °C			10 15	nA µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			10	nA
$V_{(BR)\ CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 100 µA	120			V
$V_{(BR)CER}$*	Collector-emitter Breakdown Voltage ($R_{BE} \leq 10\ \Omega$)	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_{amb} = – 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 = 1 kHz I_C = 5 mA V_{CE} = 10 V f = 1 kHz	 30 45	 70 85	 150	
f_T	Transition Frequency	I_C = 50 mA V_{CE} = 10 V f = 20 MHz	50	70		MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 MHz		55	85	pF
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz		13	15	pF

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

DC Current Gain.

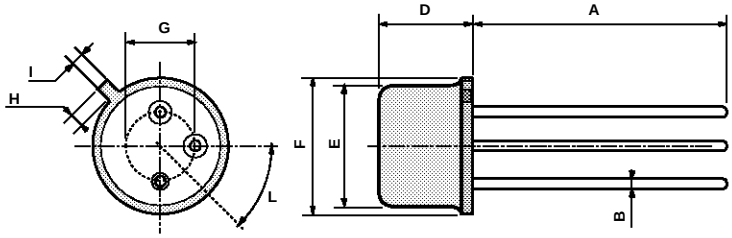


High-frequency Current Gain.



TO39 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^{o} (typ.)					



P008B