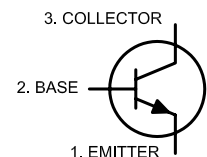
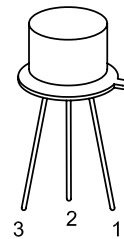


Bipolar Transistor



RoHS
Compliant

NPN



Pin Configuration:

- 1. Emitter
- 2. Base
- 3. Collector

Description:

This is a silicon NPN transistor in a TO-39 type case designed primarily for amplifier and switching applications. This device features high breakdown voltage, low leakage current, low capacity, and beta useful over an extremely wide current range.

Absolute Maximum Ratings:

Collector-Base Voltage, V_{CBO}	: 120V
Collector-Emitter Voltage, V_{CEO}	: 80V
Emitter-Base Voltage, V_{EBO}	: 7V
Continuous Collector Current, I_C	: 0.5A
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	: 800mW
Derate above 25°C	: 4.6mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	: 3W
Derate above 25°C	: 17.2mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	: -65°C to $+200^\circ\text{C}$
Storage Temperature Range, T_{stg}	: -65°C to $+200^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	: 16.5 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	: 219 $^\circ\text{C}/\text{W}$
Lead Temperature (During Soldering, 1/16" from case, 60sec Max.), T_L	: 300 $^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ Unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Max	unit
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OFF Characteristics

Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 30\text{mA}, I_B = 0$	80	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	120	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7	-	V
Collector Cut-Off Current	I_{CBO}	$V_{CB} = 90\text{V}, I_E = 0$	-	0.01	μA
		$V_{CB} = 90\text{V}, I_E = 0, T_A = +150^\circ\text{C}$	-	15	μA
Emitter Cut-Off Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	-	0.01	μA

ON Characteristics (Note 1)

DC Current gain	h_{FE}	$V_{CE} = 10\text{V}, I_C = 0.1\text{mA}$	20	-	-
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	35	-	-
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}$	40	120	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}, I_B = 5\text{mA}$	-	1.2	V
		$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	5	V
		$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	1.3	V

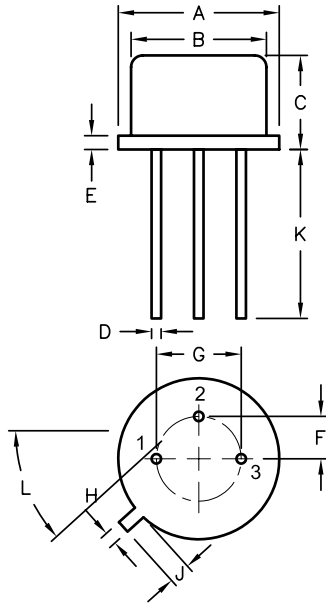
Small-Signal Characteristics

Current gain-Bandwidth product	f_T	$V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 20\text{MHz}$	50	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	-	15	pF
Input Capacitance	C_{ibo}	$V_{BE} = 500\text{mV}, I_C = 0, f = 1\text{MHz}$	-	85	pF
Small-Signal Current gain	h_{fe}	$V_{CE} = 5\text{V}, I_C = 1\text{mA}, f = 1\text{kHz}$	30	-	-

Note:

1. Pulse Test: Pulse Width $<+300\mu\text{s}$, Duty Cycle $\leq 1\%$

Bipolar Transistor



Pin Configuration:

1. Emitter
2. Base
3. Collector

Dimensions	A	B	C	D	E	F	G	H	J	K	L
Min.	8.50	7.74	6.09	0.40	-	2.41	4.82	0.71	0.73	12.70	42°
Max.	9.39	8.50	6.60	0.53	0.88	2.66	5.33	0.86	1.02	-	48°

Dimensions : Millimetres

Part Number Table

Description	Part Number
Bipolar Transistor	2N1893

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