

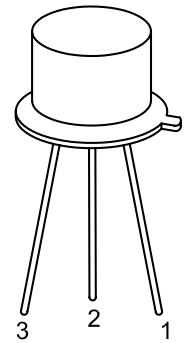
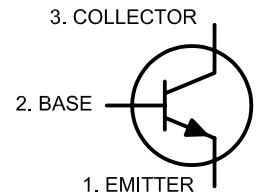


Description:

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.

**RoHS
Compliant**

NPN



Absolute Maximum Ratings:

Characteristic	Symbol	Rating
Collector-Base Voltage	V_{CB0}	120V
Collector-Emitter Voltage	V_{CEO}	65V
Emitter - Base Voltage	V_{EBO}	7V
Continuous Collector Current	I_C	1A
Total Device Dissipation ($T_c = +25^\circ\text{C}$) Derate above 25°C	P_D	800mW 4.6mW/ $^\circ\text{C}$
Total Device Dissipation ($T_c = +25^\circ\text{C}$) Derate above 25°C	P_D	5W 28.6mW/ $^\circ\text{C}$
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}	35°C/W
Thermal Resistance, Junction-to-Ambient	R_{thJC}	175°C/W
Lead Temperature (During Soldering, 1/16" from case, 60sec max.)	T_L	300°C

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

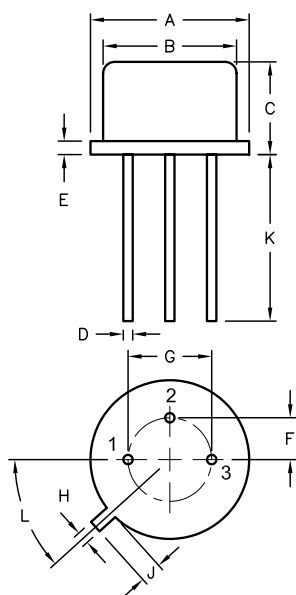
Parameter	Symbol	Test Conditions	Min.	Max.	Unit.
OFF Characteristics					
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\text{mA}, I_B = 0$	65	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	120	-	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7	-	
Collector-Cut-Off Current	I_{CBO}	$V_{CB} = 60\text{V}, I_E = 0$	-	0.002	μA
		$V_{CB} = 60\text{V}, I_E = 0, T_A = +150^\circ\text{C}$	-	2	
Emitter Cut-Off Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	-	0.002	
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	-

Parameter	Symbol	Test Conditions	Min.	Max.	Unit.
DC Current Gain	h _{FE}	V _{CE} = 10V, I _C = 10mA, T _A = -55°C	20	-	-
		V _{CE} = 10V, I _C = 500mA	25	-	-
		V _{CE} = 10V, I _C = 1A	10	-	-
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C = 150mA, I _B = 15mA	-	0.5	V
Base-Emitter Saturation Voltage	V _{BE(sat)}	I _C = 150mA, I _B = 15mA	-	1.1	V

Small-Signal Characteristics

Current Gain-Bandwidth Product	f _T	V _{CE} = 10V, I _C = 50mA, f = 20MHz	60	-	MHz
Output Capacitance	C _{obo}	V _{CB} = 10V, I _E = 0, f = 1MHz	-	15	pF
Input Capacitance	C _{ibo}	V _{BE} = 500mV, I _C = 0, f = 1MHz	-	80	pF
Small-Signal Current Gain	h _{fe}	V _{CE} = 5V, I _C = 1mA, f = 1kHz	30	100	-
Noise Figure	NF	V _{CE} = 10V, I _C = 100 μA, f = kHz, R _s = 1kΩ	-	6	dB

Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1%



1. EMITTER
2. BASE
3. COLLECTOR

Dimensions	A	B	C	D	E	F	G	H	J	K	L
Min.	8.5	7.74	6.09	0.4	-	2.41	4.82	0.71	0.73	12.7	42°
Max.	9.39	8.50	6.6	0.53	0.88	2.66	5.33	0.86	1.02	-	48°

Dimensions : Millimetres

Part Number Table

Description	Part Number
Bipolar Transistor, NPN, 1A, 65V, TO-39	2N2102

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