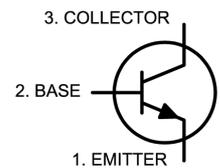
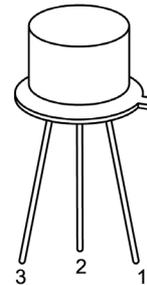


RoHS
Compliant



Description:

A Widely used "Industry Standard" silicon NPN transistor in a TO-18 type case designed for applications such as medium-speed switching and amplifiers from audio to VHF frequencies.

Absolute Maximum Ratings:

Collector-Base Voltage, V_{CBO}	: 60V
Collector-Emitter Voltage, V_{CEO}	: 60V
Emitter-Base Voltage, V_{EBO}	: 6V
Continuous Collector Current, I_C	: 30mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	: 500mW
Derate above 25°C	: >3.33mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	: 1.8W
Derate above 25°C	: 12mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	: -65°C to $+200^\circ\text{C}$
Storage Temperature Range, T_{stg}	: -65°C to $+200^\circ\text{C}$

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	$V_{(BR)CEO}$	$I_C = 10\text{mA}$, $I_B = 0$, Note 1	45	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_E = 0$	80	-	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	6	-	
Collector Cut-off Current	I_{CBO}	$V_{CB} = 45\text{V}$, $I_E = 0$	-	2	nA
Emitter Cut-Off Current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$	-	2	

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

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

ON Characteristics

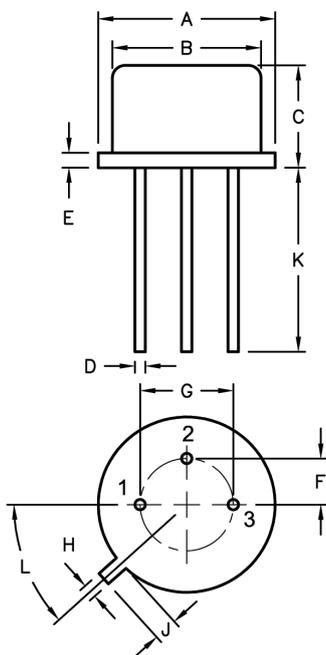
Parameter	Symbol	Test Conditions	Min.	Max.	Unit
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 0.001\text{mA}$, Note 1	60	-	-
		$V_{CE} = 5\text{V}, I_C = 0.01\text{mA}$	100	300	-
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$, Note 1	-	600	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$, Note 1	-	0.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$, Note 1	0.7	0.9	

Small-Signal Characteristics

Current Gain-Bandwidth Product	f_T	$V_{CE} = 5\text{V}, I_C = 0.5\text{mA}, f = 30\text{MHz}$, Note 2	45	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$	-	6	pF
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 10\mu\text{A}, f = 1\text{kHz}$, $R_s = 10\text{k}\Omega$	-	3	dB

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.



1. EMITTER
2. BASE
3. COLLECTOR

Dim.	Min.	Max.
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.4	0.53
E	-	0.76
F	-	1.27
G	-	2.97
H	0.91	1.17
J	0.71	1.21
K	12.7	-
L	45°	45°

Dimensions : Millimetres

Part Number Table

Description	Part Number
Bipolar Transistor, NPN, 60V, TO-18	2N930A

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