

NPN Silicon Planar Transistor

60V_{CEO}, 50mA I_c

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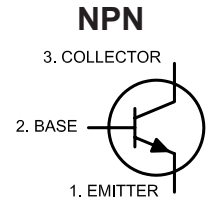
**RoHS
Compliant**



TO-18

Absolute Maximum Ratings

Description	Symbol	Value	Unit
Collector Emitter Voltage	V _{CEO}	60	V
Collector Base Voltage	V _{CB0}	60	V
Emitter Base Voltage	V _{EBO}	6	V
Collector Current Continuous	I _c	50	mA
Power Dissipation at T _A = 25°C Derate above 25°C	P _D	360 2.06	mW mW/°C
Power Dissipation at T _c = 25°C Derate Above 25°C	P _D	1.2 6.85	W mW/°C
Operating and Storage Junction Temperature Range	T _j , T _{stg}	- 65 to +200	°C
Thermal Resistance			
Junction to Case	R _{th(j-c)}	146	°C/W
Junction to Ambient in Free Air	R _{th(j-a)*}	485	°C/W
Lead Temperature	TL	300	°C
1/16" from Case for 10 Seconds			



Electrical Characteristics: (T_A = +25°C Unless otherwise specified)

Description	Symbol	Test Conditions	Min	Max	Unit
Collector -Emitter Voltage	V _{CEO**}	I _c = 10mA, I _B = 0	60	-	V
Collector -Base Voltage	V _{CB0}	I _c = 100μA, I _E = 0	60	-	V
Emitter Base Voltage	V _{EBO}	I _E = 100μA, I _c = 0	6	-	V
Collector Cutoff Current	I _{CB0}	V _{CB} = 45V, I _E = 0 T _A = 150°C	-	10	nA
		V _{CB} = 45V, I _E = 0	-	10	μA
Emitter-Cut off Current	I _{EBO}	V _{EB} = 5V, I _c = 0	-	10	nA
Base-Cut off Current	I _{BL}	V _{CE} = 60V, V _{EB} = 3V	-	20	nA
Collector Emitter Saturation Voltage	V _{CE(sat)}	I _c = 1mA, I _B = 0.1mA	-	0.35	V
Base Emitter on Voltage	V _{BE(on)}	I _c = 0.1mA, V _{CE} = 5V	0.5	0.7	V
DC Current Gain	hFE	I _c = 1μA, V _{CE} = 5V	30	-	
		I _c = 10μA, V _{CE} = 5V T _A = 55°C	100	500	
		I _c = 10uA, V _{CE} = 5V	20	-	
		I _c = 100uA, V _{CE} = 5V	175	-	
		I _c = 500uA, V _{CE} = 5V	200	-	
		I _c = 1mA, V _{CE} = 5V	250	-	
		I _c = 10mA, V _{CE} = 5V**	-	800	

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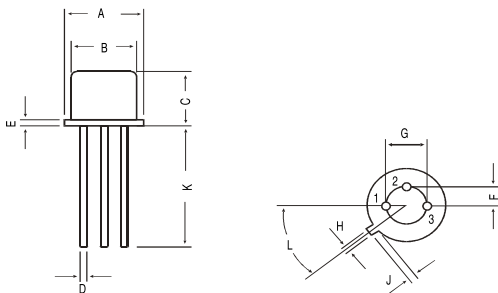
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Description	Symbol	Test Conditions	Min	Max	Unit
Dynamic Characteristics					
Transition Frequency	ft	V _{CE} = 5V, I _c = 0.05mA f = 5MHz	15	-	MHz
		V _{CE} = 5V, I _c = 0.5mA, f = 30MHz	60	-	MHz
Out-put Capacitance	C _{obo}	V _{CB} = 5V, I _E = 0 f = 140kHz	-	6	pF
In-put Capacitance	C _{ibo}	V _{EB} = 0.5V, I _c = 0 f = 140kHz	-	6	pF
Noise Figure	NF	V _{CE} = 5V, I _C = 10μA R _s = 10kΩ f = 100Hz, BW = 20Hz	-	10	dB
		f = 1kHz, BW = 200Hz	-	3	dB
		f = 10kHz, BW = 2kHz	-	2	dB
		f = 10Hz to 15.7kHz, BW = 15.7kHz	-	3	dB
Small Signal Characteristics (@ f = 1kHz unless otherwise specified)					
Input Impedance	h _{ie}	I _c = 1mA, V _{CE} = 5V	3.5	24	kΩ -4
Voltage Feedback Ratio	h _{re}	I _c = 1mA, V _{CE} = 5V	-	800	x10
Small Signal Current Gain	h _{fe}	I _c = 1mA, V _{CE} = 5V	150	900	
Output Admittance	h _{oe}	I _c = 1mA, V _{CE} = 5V	-	40	umhos

*R_{th(j-a)} is measured with the device soldered into a typical printed Circuit board.

**Pulse Test: Pulse Width=300us, Duty Cycle = 2%

TO-18 Metal Can Package



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

Dim.	Min.	Max.
G	-	2.97
H	0.91	1.17
J	0.71	1.21
K	12.7	-
L	45 Deg.	

Dimensions : Millimetres

Part Number Table

Description	Part Number
NPN Silicon Planar Transistor, 60V, 50mA, TO-18	MP001167

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