

# NPN Silicon Planar Transistor

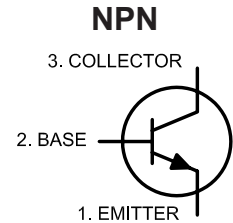
## 50V<sub>CEO</sub>

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**RoHS  
Compliant**



TO-39



### Absolute Maximum Ratings

Description	Symbol	Value	Unit
Collector Emitter Voltage, $R_{BE} \leq 10\Omega$	$V_{CER}$	50	V
Collector Base Voltage	$V_{CBO}$	75	V
Emitter Base Voltage	$V_{EBO}$	7	V
Power Dissipation at $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	800 4.57	mW mW/°C
Power Dissipation at $T_c = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	3 17.15	W mW/°C
Operating and Storage Junction Temperature Range	$T_j, T_{stg}$	- 65 to +200	°C

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

Description	Symbol	Test Conditions	Min	Max	Unit
Collector Emitter Voltage	$V_{CER}$	$I_C = 1\text{mA}, R_{BE} \leq 10\Omega$	50		V
Collector Base Voltage	$V_{CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	75		V
Emitter Base Voltage	$V_{EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7		V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 60\text{V}, I_E = 0$ $V_{CB} = 60\text{V}, I_E = 0, T_A = 150^\circ\text{C}$		10 10	nA $\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$		5	nA
DC Current Gain	$h_{FE}$	$I_C = 0.01\text{mA}, V_{CE} = 10\text{V}$ $I_C = 0.1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}, T_A = -55^\circ\text{C}$ $I_C = 150\text{mA}, V_{CE} = 10\text{V}$ $I_C = 150\text{mA}, V_{CE} = 10\text{V}$	20 35 75 35 100 40	300	
Collector Emitter Saturation Voltage	$*V_{CE(Sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$		0.5	V
Base Emitter Saturation Voltage	$*V_{BE(Sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$		1.3	V

### Small Signal Characteristics

Description	Symbol	Test Conditions	Min	Max	Unit
Transition Frequency	$f_T$	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 20\text{MHz}$	70		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$		25	pF
Input Capacitance	$C_{ib}$	$V_{EB} = 0.5\text{V}, I_C = 0, f = 100\text{kHz}$		80	pF

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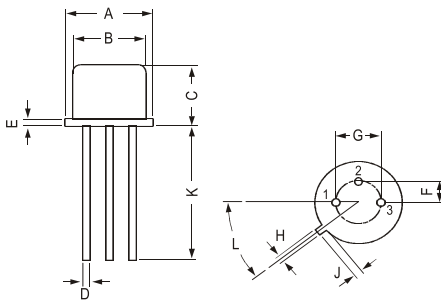
## 50V<sub>CEO</sub>

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Description	Symbol	Test Conditions	Min	Max	Unit
Input Impedance	$h_{ib}$	$I_C = 1\text{mA}, V_{CB} = 5\text{V}, f = 1\text{kHz}$	24	34	$\Omega$
		$I_C = 5\text{mA}, V_{CB} = 10\text{V}, f = 1\text{kHz}$	4	8	$\Omega$
Voltage Feedback Ratio	$h_{rb}$	$I_C = 1\text{mA}, V_{CB} = 5\text{V}, f = 1\text{kHz}$		5	$\times 10^{-4}$
		$I_C = 5\text{mA}, V_{CB} = 10\text{V}, f = 1\text{kHz}$		5	$\times 10^{-4}$
Small Signal Current Gain	$h_{fe}$	$I_C = 1\text{mA}, V_{CB} = 5\text{V}, f = 1\text{kHz}$	50	200	
		$I_C = 5\text{mA}, V_{CB} = 10\text{V}, f = 1\text{kHz}$	70	300	
Output Admittance	$h_{ob}$	$I_C = 1\text{mA}, V_{CB} = 5\text{V}, f = 1\text{kHz}$	0.05	0.05	$\mu\text{mhos}$
		$I_C = 5\text{mA}, V_{CB} = 10\text{V}, f = 1\text{kHz}$	0.05	0.05	$\mu\text{mhos}$
Noise Figure	NF	$I_C = 300\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$		8	dB

\*Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $< 2\%$

### TO-39 Metal Can Package



Dim.	Min.	Max.
A	8.5	9.39
B	7.74	8.50
C	6.09	6.60
D	0.4	0.53
E	-	0.88
F	2.41	2.66

Dim.	Min.	Max.
G	4.82	5.33
H	0.71	0.86
J	0.73	1.02
K	12.7	-
L	42 Deg.	48 Deg.

Dimensions : Millimetres

### Part Number Table

Description	Part Number
NPN Silicon Planar Transistor, 50V, TO-39	MP001165

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