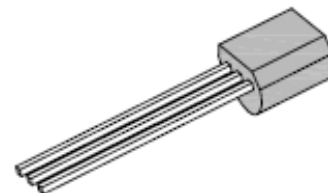


## Small Signal Low Noise Transistors (NPN)

### Features

- NPN silicon epitaxial transistor for switching and amplifier applications
- This device is designed for low noise, high gain, general purpose applications at collector currents from 1µA to 50mA
- RoHS compliance



TO-92



### Mechanical Data

<b>Case:</b>	TO-92, Plastic Package
<b>Terminals:</b>	Solderable per MIL-STD-202G, Method 208
<b>Weight:</b>	0.18 gram

### Absolute Maximum Ratings\* ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

Symbol	Description	2N5088	2N5089	Unit
<b>V<sub>CEO</sub></b>	Collector-Emitter Voltage	30	25	V
<b>V<sub>CB0</sub></b>	Collector-Base Voltage	35	30	V
<b>V<sub>EBO</sub></b>	Emitter-Base Voltage	4.5		V
<b>I<sub>c</sub></b>	Collector Current Continuous	100		mA
<b>T<sub>J</sub>, T<sub>STG</sub></b>	Operation and Storage Junction Temperature Range	-55 to +150		°C

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

### Notes

1. These ratings are based on a maximum junction temperature of 150 degrees C.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

# Small Signal Low Noise Transistors (NPN)

## 2N5088/2N5089

### Thermal Characteristics ( $T_{Ambient}=25^{\circ}\text{C}$ unless noted otherwise)

Symbol	Description	2N5088	2N5089	Unit
<b>P<sub>D</sub></b>	Power Dissipation at $T_A=25^{\circ}\text{C}$	625		mW
	Derate above $25^{\circ}\text{C}$	5.0		mW/ $^{\circ}\text{C}$
<b>P<sub>D</sub></b>	Power Dissipation at $T_C=25^{\circ}\text{C}$	1.5		W
	Derate above $25^{\circ}\text{C}$	12		mW/ $^{\circ}\text{C}$
<b>R<sub>θJA</sub></b>	Thermal Resistance Junction to Ambient Air (Note 1)	357		$^{\circ}\text{C/W}$
<b>R<sub>θJC</sub></b>	Thermal Resistance Junction to Case	125		$^{\circ}\text{C/W}$
<b>T<sub>J</sub>, T<sub>STG</sub></b>	Operation and Storage Junction Temperature Range	-55 to +150		$^{\circ}\text{C}$

**Note:** 1. Measured with the device soldered into a typical printed circuit board.

### Electrical Characteristics ( $T_{Ambient}=25^{\circ}\text{C}$ unless noted otherwise)

#### Off Characteristics

Symbol	Description	2N5088		2N5089		Unit	Conditions
		Min.	Max.	Min.	Max.		
<b>V<sub>(BR)CBO</sub></b>	Collector-Base Breakdown Voltage	35	-	30	-	V	$I_C=100\mu\text{A}$ , $I_E=0$
<b>V<sub>(BR)CEO</sub>*</b>	Collector-Emitter Breakdown Voltage	30	-	25	-	V	$I_C=1\text{mA}$ , $I_B=0$
<b>I<sub>CBO</sub></b>	Collector Cut-Off Current	-	50	-	50	nA	
		$V_{CB}=20\text{V}$ , $I_E=0$		$V_{CB}=15\text{V}$ , $I_E=0$			
<b>I<sub>EBO</sub></b>	Emitter Cut-Off Current	-	50	-	100	nA	
		$V_{EB}=3\text{V}$ , $I_C=0$		$V_{EB}=4.5\text{V}$ , $I_C=0$			

# Small Signal Low Noise Transistors (NPN)

## 2N5088/2N5089

### On Characteristics

Symbol	Description	2N5088		2N5089		Unit	Conditions
		Min.	Max.	Min.	Max.		
<b>hFE</b>	D.C. Current Gain	300	900	400	1200		VCE=5V, IC=0.1mA
		350	-	450	-		VCE=5V, IC=1mA
		300	-	400	-		*VCE=5V, IC=10mA
<b>VCE(sat)</b>	Collector Emitter Saturation Voltage	-	0.5	-	0.5	V	IC=10mA, IB=1mA
<b>VBE(on)*</b>	Base Emitter Saturation Voltage	-	0.8	-	0.8	V	IC=10mA, VCE=5V

### Small signal Characteristics

Symbol	Description	2N5088		2N5089		Unit	Conditions
		Min.	Max.	Min.	Max.		
<b>fT</b>	Current Gain-Bandwidth Product	50	-	50	-	MHz	VCE=5V, IC=0.5mA, f=20MHz
<b>Ccb</b>	Collector-Base Capacitance	-	4.0	-	4.0	pF	VCB=5V, f=100KHz
<b>Ceb</b>	Emitter-Base Capacitance	-	10	-	10	pF	VEB=0.5V, f=100KHz
<b>hfe</b>	Small Signal Current Gain	350	1400	450	1800		VCE=5V, IC=1mA, f=1KHz
<b>NF</b>	Noise Figure	-	3.0	-	2.0	dB	VCE=5V, IC=100μA, Rs=10KΩ, f=10Hz to 15.7 KHz

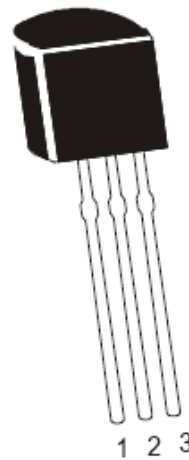
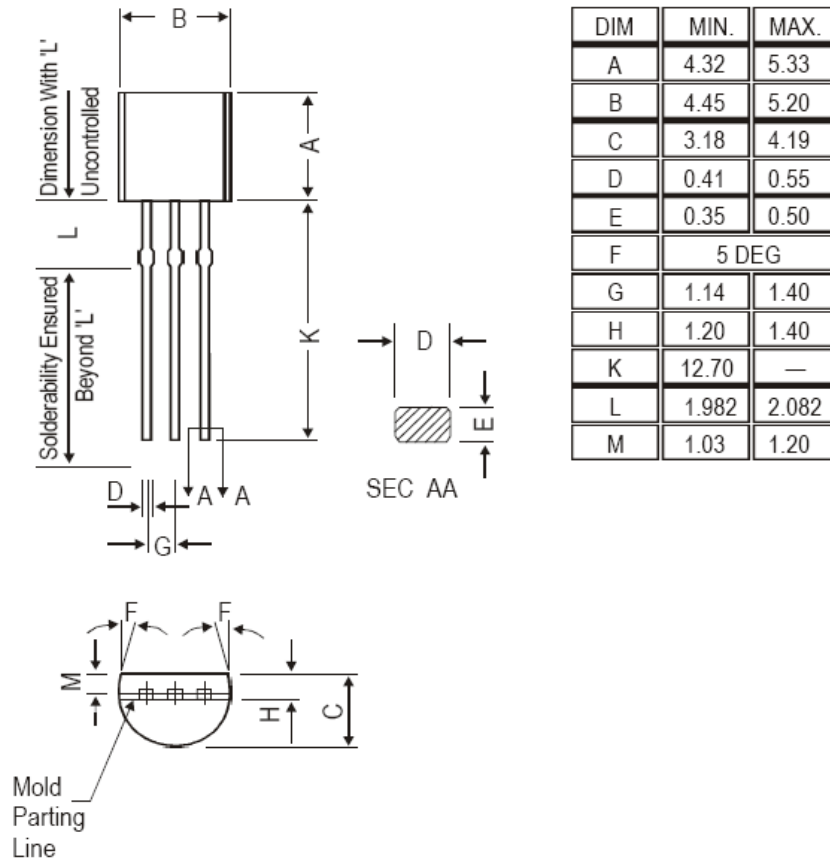
\*Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

# Small Signal Low Noise Transistors (NPN)

## 2N5088/2N5089

Dimensions in mm

TO-92

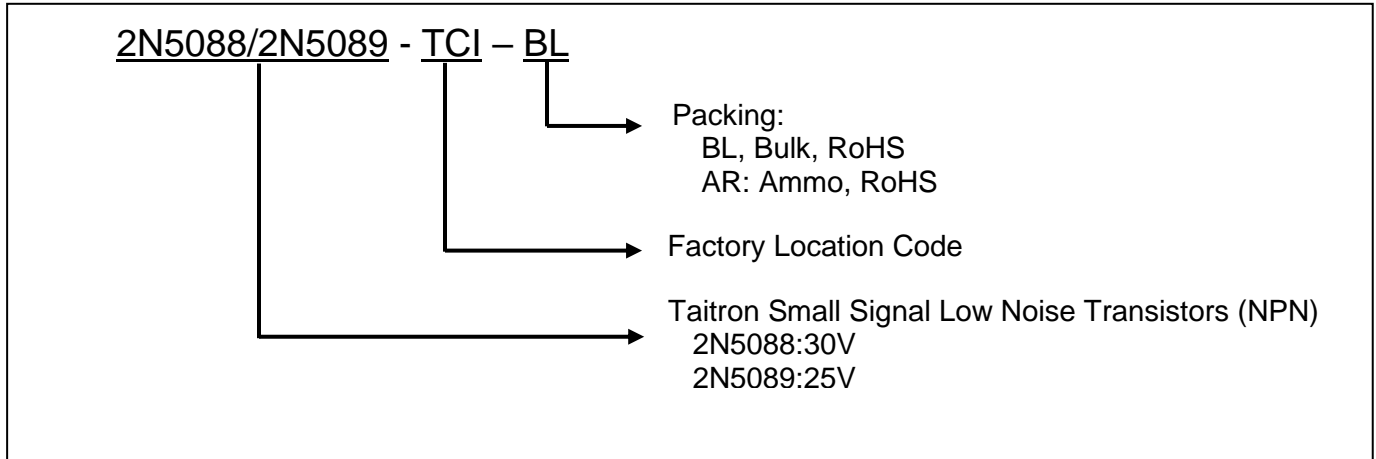


PIN CONFIGURATION  
 1. EMITTER  
 2. BASE  
 3. COLLECTOR

# Small Signal Low Noise Transistors (NPN)

## 2N5088/2N5089

### How to order:



### How to contact us

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