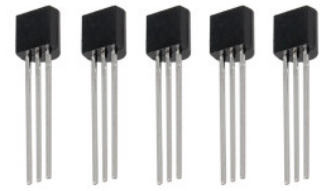




**PRODUCT NAME** : 2N5089 NPN General Purpose Transistor (Pack of 5)

**PRICE** : Rs 20.00

**SKU** : RM2075



WITH THE PRODUCT MAY BE COVERED FROM MAJOR ONLINE STORES Copyrights by Robomart.com

## DESCRIPTION

## Features

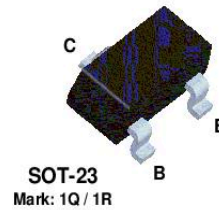
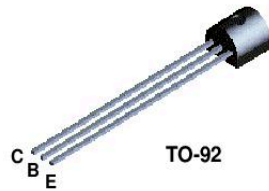
- Collector-Emitter Volt ( $V_{ce0}$ ): 25V
- Collector-Base Volt ( $V_{cb0}$ ): 30V
- Collector Current ( $I_c$ ): 0.1A
- $h_{fe}$ : 450 @ 1mA
- Power Dissipation ( $P_{tot}$ ): 625mW
- Current-Gain-Bandwidth ( $f_{total}$ ): 50MHz
- Type: PNP



*Discrete POWER & Signal  
Technologies*

**2N5088  
2N5089**

**MMBT5088  
MMBT5089**



### NPN General Purpose Amplifier

This device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1µA to 50 mA. Sourced from Process 07.

#### Absolute Maximum Ratings\* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	2N5088	30 V
		2N5089	25 V
V <sub>CBO</sub>	Collector-Base Voltage	2N5088	35 V
		2N5089	30 V
V <sub>EBO</sub>	Emitter-Base Voltage	4.5	V
I <sub>C</sub>	Collector Current - Continuous	100	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating 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.

#### Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		2N5088 2N5089	*MMBT5088 *MMBT5089	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	350	mW
		5.0	2.8	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3		°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	357	°C/W

\*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

2N5088 / MMBT5088 / 2N5089 / MMBT5089

**NPN General Purpose Amplifier**

(continued)

**Electrical Characteristics**

TA = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
<b>OFF CHARACTERISTICS</b>					
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage*	I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0	<b>2N5088</b>	30	V
			<b>2N5089</b>	25	V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0	<b>2N5088</b>	35	V
			<b>2N5089</b>	30	V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0	<b>2N5088</b>	50	nA
		V <sub>CB</sub> = 15 V, I <sub>E</sub> = 0	<b>2N5089</b>	50	nA
I <sub>EBO</sub>	Emitter Cutoff Current	V <sub>EB</sub> = 3.0 V, I <sub>C</sub> = 0		50	nA
		V <sub>EB</sub> = 4.5 V, I <sub>C</sub> = 0		100	nA
<b>ON CHARACTERISTICS</b>					
h <sub>FE</sub>	DC Current Gain	I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V	<b>2N5088</b>	300	900 1200
			<b>2N5089</b>	400	
		I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 V	<b>2N5088</b>	350	
			<b>2N5089</b>	450	
		I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V*	<b>2N5088</b>	300	
	<b>2N5089</b>	400			
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 1.0 mA		0.5	V
V <sub>BE(on)</sub>	Base-Emitter On Voltage	I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V		0.8	V
<b>SMALL SIGNAL CHARACTERISTICS</b>					
f <sub>r</sub>	Current Gain - Bandwidth Product	I <sub>C</sub> = 500 μA, V <sub>CE</sub> = 5.0 mA, f = 20 MHz		50	MHz
C <sub>cb</sub>	Collector-Base Capacitance	V <sub>CB</sub> = 5.0 V, I <sub>E</sub> = 0, f = 100 kHz		4.0	pF
C <sub>eb</sub>	Emitter-Base Capacitance	V <sub>BE</sub> = 0.5 V, I <sub>C</sub> = 0, f = 100 kHz		10	pF
h <sub>ie</sub>	Small-Signal Current Gain	I <sub>C</sub> = 1.0 mA, V <sub>CE</sub> = 5.0 V, f = 1.0 kHz	<b>2N5088</b>	350	1400
			<b>2N5089</b>	450	1800
NF	Noise Figure	I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V, R <sub>S</sub> = 10 kΩ, f = 10 Hz to 15.7 kHz	<b>2N5088</b>	3.0	dB
			<b>2N5089</b>	2.0	dB

\*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

**Spice Model**

NPN (Is=5.911f Xti=3 Eg=1.11 Vaf=62.37 Bf=1.122K Ne=1.394 Ise=5.911f Ikf=14.92m Xtb=1.5 Br=1.271 Nc=2 Isc=0 Ikr=0 Rc=1.61 Cjc=4.017p Mjc=.3174 Vjc=.75 Fc=.5 Cje=4.973p Mje=.4146 Vje=.75 Tr=4.673n Tf=821.7p Itf=.35 Vtf=4 Xtf=7 Rb=10)

