



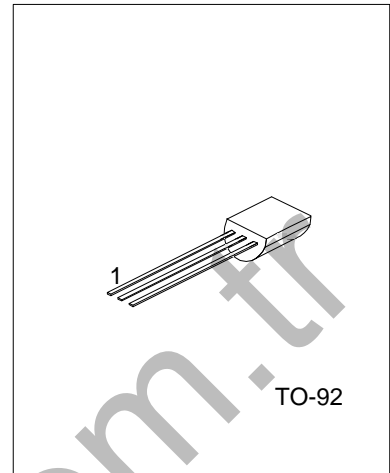
## 2N5088/2N5089

## NPN EPITAXIAL SILICON TRANSISTOR

### NPN GENERAL PURPOSE AMPLIFIER

#### DESCRIPTION

The devices are designed for low noise, high gain, general purpose amplifier applications at collector currents from 1 $\mu$ A ~ 50mA.



#### ORDERING INFORMATION

Order Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N5088L-T92-B	2N5088G-T92-B	TO-92	E	B	C	Tape Box
2N5088L-T92-K	2N5088G-T92-K	TO-92	E	B	C	Bulk
2N5088L-T92-R	2N5088G-T92-R	TO-92	E	B	C	Tape Reel
2N5089L-T92-B	2N5089G-T92-B	TO-92	E	B	C	Tape Box
2N5089L-T92-K	2N5089G-T92-K	TO-92	E	B	C	Bulk
2N5089L-T92-R	2N5089G-T92-R	TO-92	E	B	C	Tape Reel

Note: Pin Assignment: E: Emitter B: Base C: Collector

<p>2N5088L-T92-B</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Lead Free</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel</p> <p>(2) T92: TO-92</p> <p>(3) G: Halogen Free, L: Lead Free</p>
---	--

# 2N5088/2N5089

## NPN EPITAXIAL SILICON TRANSISTOR

■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter voltage	$V_{CEO}$	30	V
		25	
Collector-Base voltage	$V_{CBO}$	35	V
		30	
Emitter-Base Voltage	$V_{EBO}$	4.5	V
Collector Current-Continuous	$I_C$	100	mA
Power Dissipation	$P_D$	625	mW
Derate Above $25^\circ\text{C}$		5	mW/ $^\circ\text{C}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

Note 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.
3. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	200	$^\circ\text{C}/\text{W}$
Junction to Case	$\theta_{JC}$	83.3	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1.0\text{mA}, I_B=0$ (Note)	30			V
			25			
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}, I_E=0$	35			V
			30			
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=20\text{V}, I_E=0$			50	nA
		$V_{CB}=15\text{V}, I_E=0$			50	
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=3.0\text{V}, I_C=0$			50	nA
		$V_{EB}=4.5\text{V}, I_C=0$			100	
DC Current Gain	$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$	2N5088	300	900	
			2N5089	400	1200	
		$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$	2N5088	350		
			2N5089	450		
		$V_{CE}=5.0\text{V}, I_C=10\text{mA}$ (Note)	2N5088	300		
			2N5089	400		
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=1.0\text{mA}$			0.5	V
Base-Emitter On Voltage	$V_{BE(ON)}$	$I_C=10\text{mA}, V_{CE}=5.0\text{V}$			0.8	V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	$V_{CE}=5.0\text{mA}, I_C=500\mu\text{A}, f=20\text{MHz}$	50			MHz
Collector-Base Capacitance	$C_{CB}$	$V_{CB}=5.0\text{V}, I_E=0, f=100\text{kHz}$			4	pF
Emitter-Base Capacitance	$C_{EB}$	$V_{EB}=0.5\text{V}, I_C=0, f=100\text{kHz}$			10	pF
Small-Signal Current Gain	$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, f=1.0\text{kHz}$	2N5088	350	1400	
			2N5089	450	1800	
Noise Figure	NF	$V_{CE}=5.0\text{V}, I_C=100\mu\text{A}, R_S=10\text{k}\Omega,$ $f=10\text{kHz} \sim 15.7\text{kHz}$			3.0	dB
					2.0	

Note Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

[www.signal.com.tr](http://www.signal.com.tr)

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.