



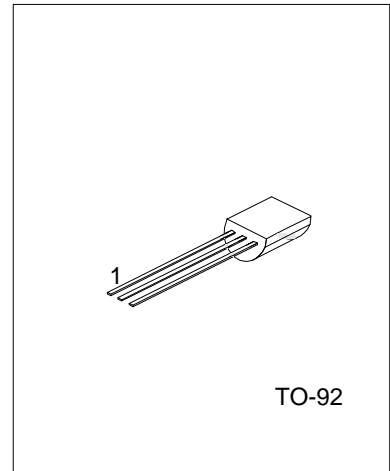
2N5088/2N5089

NPN EPITAXIAL SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER

DESCRIPTION

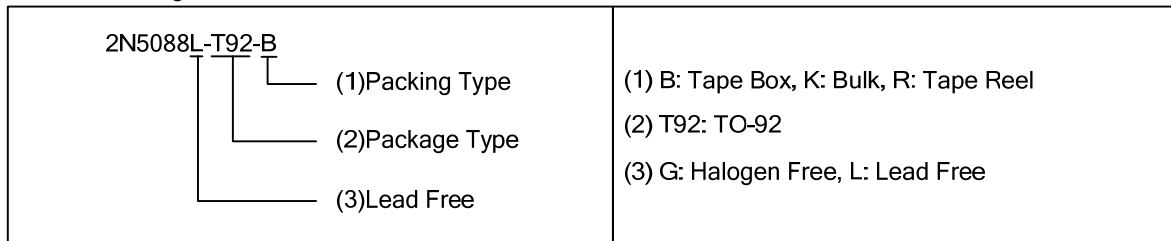
The devices are designed for low noise, high gain, general purpose amplifier applications at collector currents from 1μA ~ 50mA.



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



■ **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°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	θ_{JA}	200	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{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
OFF CHARACTERISTICS						
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
SMALL SIGNAL CHARACTERISTICS						
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 $\leq 2.0\%$

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