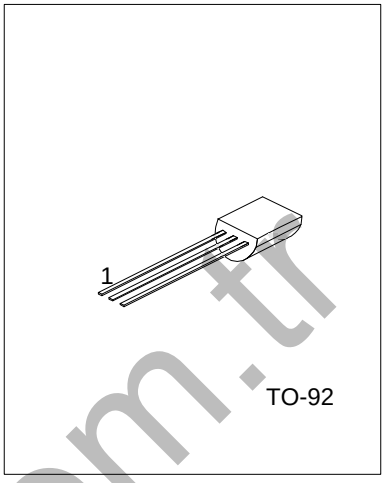
2N5088/2N5089

NPN EPITAXIAL SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER



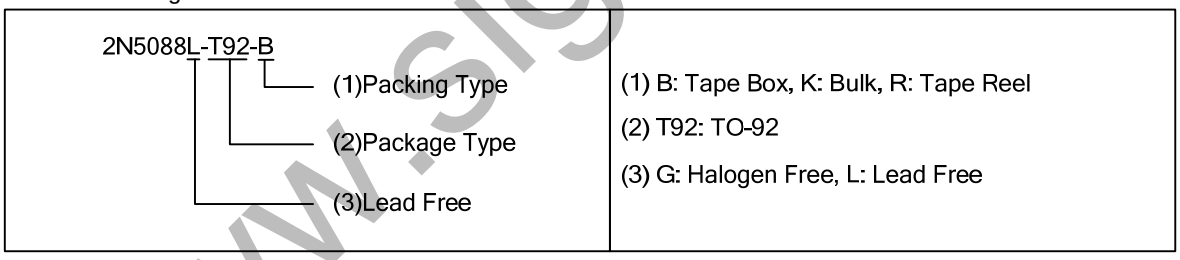
■ DESCRIPTION

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℃, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter voltage	2N5088	V_{CEO}	30	V
	2N5089		25	
Collector-Base voltage	2N5088	V_{CBO}	35	V
	2N5089		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℃			5	mW/℃
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55 ~ +150	℃

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℃, unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	200	℃/W
Junction to Case	θ_{JC}	83.3	℃/W

■ ELECTRICAL CHARACTERISTICS (T_A=25℃, unless otherwise noted)

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

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