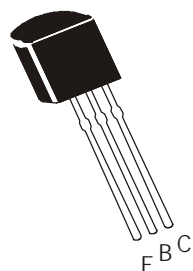


## NPN SILICON EPITAXIAL TRANSISTORS

**2N5088**  
**2N5089**  
**TO-92**  
**CBE**



### Amplifier Transistors

#### ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	2N5088	2N5089	UNITS
Collector -Base Voltage	VCBO	35	30	V
Collector -Emitter Voltage	VCE0	30	25	V
Emitter -Base Voltage	VEBO		4.5	V
Collector Current- Continuous	IC		50	mA
Power Dissipation@ Ta=25 deg C	PD		625	mW
Derate Above 25 deg C			5.0	mW/deg C
Power Dissipation@ Tc=25 deg C	PD		1.5	W
Derate Above 25 deg C			12	mW/deg C
Junction Temperature	Tj		150	deg C
Storage Temperature	Tstg		-55 to +150	deg C
<b>THERMAL RESISTANCE</b>				
Junction to Ambient	Rth(j-a) (1)		357	deg C/W
Junction to Case	Rth(j-c)		125	deg C/W

#### ELECTRICAL CHARACTERISTICS (Ta=25 deg C Unless Otherwise Specified)

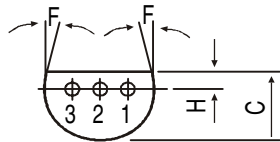
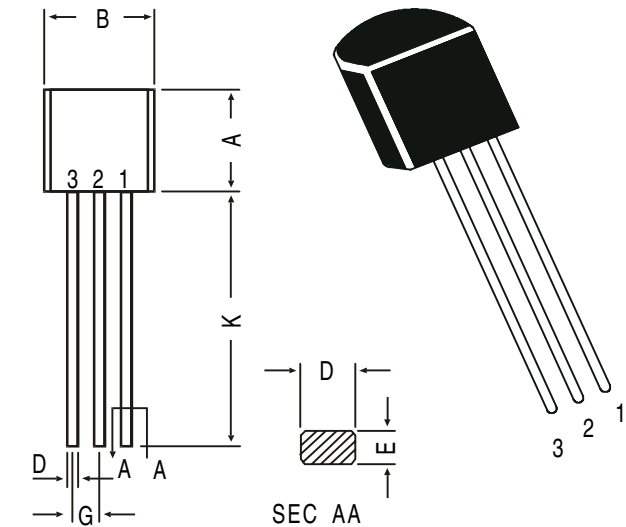
DESCRIPTION	SYMBOL		Min	Max	UNITS
Collector -Emitter Voltage	VCEO* IC=1mA, IB=0	<b>2N5088</b>	30	-	V
		<b>2N5089</b>	25	-	V
Collector -Base Voltage	VCBO IC=100uA, IE=0	<b>2N5088</b>	35	-	V
		<b>2N5089</b>	30	-	V
Collector-Cut off Current	ICBO VCB=20V, IE=0	<b>2N5088</b>	-	50	nA
		<b>2N5089</b>	-	50	nA
Emitter-Cut off Current	IEBO VEB=3.0V, IC=0	<b>2N5088</b>	-	50	nA
		<b>2N5089</b>	-	100	nA

ELECTRICAL CHARACTERISTICS (Ta=25 deg C Unless Otherwise Specified)				2N5088/89		
DESCRIPTION	SYMBOL			Min	Max	UNITS
DC Current Gain	hFE	IC=100uA, VCE=5V	2N5088	300	900	
			2N5089	400	1200	
		IC=1mA, VCE=5V	2N5088	350	-	
			2N5089	450	-	
		IC=10mA, VCE=5V*	2N5088	300	-	
			2N5089	400	-	
Collector Emitter Saturation Voltage	VCE(Sat)	IC=10mA, IB=1.0mA		-	0.5	V
Base Emitter on Voltage	VBE(on) *	IC=10mA, VCE=5V		-	0.8	V
<b><u>DYNAMIC CHARACTERISTICS</u></b>						
Current Gain Bandwidth Product	ft	IC=500uA, VCE=5V f=20MHz		>50	-	MHz
Collector-Base Capacitance	Ccb	VCB=5V, f=100kHz		-	<4.0	pF
Emitter-Base Capacitance	Ceb	VEB=0.5V, f=100kHz		-	<10	pF
Small Signal Current Gain	hfe	IC=1mA, VCE=5V	2N5088	350	1400	
		f=1kHz	2N5089	450	1800	
Noise Figure	NF	IC=100uA, VCE=5V,	2N5088	-	3.0	dB
		Rs=10kohms, f=10Hz to 15.7 kHz	2N5089	-	2.0	dB

\*Pulsed: pulse Duration =300us, Duty Cycle=2%

(1)Rth (j-a) is measured with the device soldered into a typical printed circuit board.

## TO-92 Plastic Package



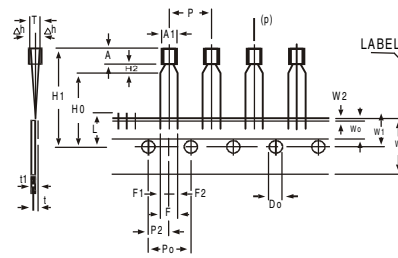
PIN CONFIGURATION  
1. COLLECTOR  
2. BASE  
3. EMITTER

All dimensions in mm.

DIM	MIN.	MAX.
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5 DEG	
G	1.14	1.40
H	1.14	1.53
K	12.70	—

## TO-92 Transistors on Tape and Ammo Pack

### MECHANICAL DATA



All dimensions in mm unless specified otherwise

ITEM	SYMBOL	SPECIFICATION				REMARKS
		MIN.	NOM.	MAX.	TOL.	
BODY WIDTH	A1	4.0		4.8		CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH TO BE MEASURED AT BOTTOM OF CLINCH
BODY HEIGHT	A	4.8		5.2		
BODY THICKNESS	T	3.9		4.2		
PITCH OF COMPONENT	P		12.7		±1	
FEED HOLE PITCH	P0		12.7		±0.3	
FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		±0.4	AT TOP OF BODY
DISTANCE BETWEEN OUTER LEADS	F	5.08			+0.6 -0.2	
COMPONENT ALIGNMENT	Δh	0		1		
TAPE WIDTH	W	18			±0.5	
HOLD-DOWN TAPE WIDTH	W0	6			±0.2	
HOLE POSITION	W1	9			+0.7 -0.5	t1 0.3 - 0.6
HOLD-DOWN TAPE POSITION	W2	0.5			±0.2	
LEAD WIRE CLINCH HEIGHT	H0	16			±0.5	
COMPONENT HEIGHT	H1		23.25			
LENGTH OF SNIPPED LEADS	L		11.0			
FEED HOLE DIAMETER	D0	4			±0.2	t1 0.3 - 0.6
TOTAL TAPE THICKNESS	t		1.2			
LEAD - TO - LEAD DISTANCE F1,	F2	2.54			+0.4 -0.1	
CLINCH HEIGHT	H2		3			
PULL - OUT FORCE	(P)	6N				

### NOTES

1. MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2 mm.
2. MAXIMUM NON-CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1 mm IN 20 PITCHES.
3. HOLDDOWN TAPE NOT TO EXCEED BEYOND THE EDGE(S) OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
4. NO MORE THAN 3 CONSECUTIVE MISSING COMPONENTS ARE PERMITTED.
5. A TAPE TRAILER, HAVING AT LEAST THREE FEED HOLES ARE REQUIRED AFTER THE LAST COMPONENT.
6. SPLICES SHALL NOT INTERFERE WITH THE SPROCKET FEED HOLES.

## Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-92 Bulk	1K/polybag	200 gm/1K pcs	3" x 7.5" x 7.5"	5.0K	17" x 15" x 13.5"	80.0K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2.0K	17" x 15" x 13.5"	32.0K	12.5 kgs

## Notes

### Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/CD is believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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