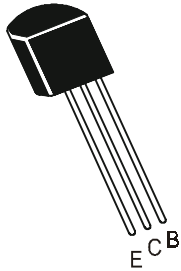


**NPN SILICON PLANAR EPITAXIAL TRANSISTORS**



**BC167A, BC167B  
BC168A, BC168B, BC168C  
BC169B, BC169C**

**TO-92  
Plastic Package**

**AF Pre and Driver Stages as well as for Universal Application.**

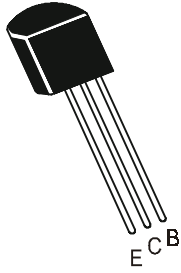
**ABSOLUTE MAXIMUM RATINGS(Ta=25°C unless specified otherwise)**

DESCRIPTION	SYMBOL	BC167	BC168	BC169	UNITS
Collector -Emitter Voltage	$V_{CEO}$	45	20	20	V
Collector -Emitter Voltage	$V_{CES}$	50	30	30	V
Emitter -Base Voltage	$V_{EBO}$	6.0	5	5	V
Collector Current Continuous	$I_C$	100	100	50	mA
Collector Peak Current	$I_{CM}$	200	200		mA
Base Current	$I_B$	50	50	5	mA
Power Dissipation @ Ta=25°C	$P_{tot}$		300		mW
Storage Junction	$T_{stg}$		-55 to +150		°C
Junction Temperature	$T_j$		150		°C
<b>THERMAL RESISTANCE</b>					
Junction to Ambient	$R_{th(j-a)}$		420		K/W

**ELECTRICAL CHARACTERISTICS (Ta=25°C Unless Specified Otherwise)**

DESCRIPTION		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
Collector -Emitter Voltage	BC167	$BV_{CEO}$	$I_C=2mA, I_B=0$	45			V
	BC168, 169			20			V
Emitter-Base Voltage	BC167	$BV_{EBO}$	$I_E=1\mu A, I_C=0$	6			V
	BC168, 169			5			V
Collector-Cut off Current	BC167	$I_{CES}$	$V_{CE}=50V, V_{BE}=0$			15	nA
	BC168, 169					15	nA
	BC167	$I_{CES}$	$V_{CE}=50V, V_{BE}=0$			4	$\mu A$
	BC168, 169					4	$\mu A$

**NPN SILICON PLANAR EPITAXIAL TRANSISTORS**



**BC167A, BC167B  
BC168A, BC168B, BC168C  
BC169B, BC169C**

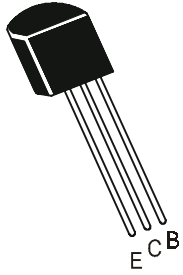
**TO-92  
Plastic Package**

**ELECTRICAL CHARACTERISTICS (Ta=25°C Unless Specified Otherwise)**

DESCRIPTION		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
DC Current Gain	A	$h_{FE}$	$I_C=0.01mA, V_{CE}=5V$		90		
	B				150		
	C				270		
	A		$I_C=2mA, V_{CE}=5V$	120		220	
	B			180		460	
	C			380		800	
			$I_C=100mA, V_{CE}=5V$		120		
					200		
					400		
Collector Emitter Saturation Voltage		$V_{CE(Sat)}$ *	$I_C=10mA, I_B=0.5mA$			0.2	V
		$V_{CE(Sat)}$ *	$I_C=100mA, I_B=5mA^{**}$			0.6	V
Base Emitter Saturation Voltage		$V_{BE(Sat)}$ *	$I_C=10mA, I_B=0.5mA$			0.83	V
		$V_{BE(Sat)}$ *	$I_C=100mA, I_B=5mA^{**}$			1.05	V
Base Emitter On Voltage		$V_{BE(On)}$	$I_C=2mA, V_{CE}=5V$	0.55		0.7	V
			$I_C=0.1mA, V_{CE}=5V$		0.55		V
			$I_C=100mA, V_{CE}=5V^{**}$		0.83		V

DESCRIPTION		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
<b>DYNAMIC CHARACTERISTICS</b>							
Transistors Frequency		$f_T$	$I_C=0.5mA, V_{CE}=3V$		85		MHz
			$I_C=10mA, V_{CE}=5V$	150			MHz
Collector Capacitance		$C_{cbo}$	$V_{CB}=10V, I_E=0$ $f=1MHz$			4.5	pF
Emitter Capaitance		$C_{ebo}$	$V_{EB}=0.5V, f=1MHz$		8.0		pF

**NPN SILICON PLANAR EPITAXIAL TRANSISTORS**



**BC167A, BC167B  
BC168A, BC168B, BC168C  
BC169B, BC169C**

**TO-92  
Plastic Package**

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
<b>DYNAMIC CHARACTERISTICS</b>						
<b>Noise Figure</b>						
<b>Small Signall Current Gain</b>	<b>BC169</b>	NF	$I_C=0.2mA, V_{CE}=5V$		4.0	dB
	<b>A</b>		$R_g=2W, f=30HZ$ to 15kHz			
<b>Small Signall Current Gain</b>	<b>BC167, 168</b>	NF	$I_C=0.2mA, V_{CE}=5V$		10	
	<b>BC169</b>		$R_g=2W, f=1kHz,$ $f=200Hz$		4	dB
<b>Small Signall Current Gain</b>	<b>A</b>	$h_{11e}$	$I_C=2mA, V_{CE}=5V,$ $f=1kHz$	1.6	4.5	kW
	<b>B</b>			3.2	8.5	kW
	<b>C</b>			6.0	16	kW
<b>Small Signall Current Gain</b>	<b>A</b>	$h_{12e}$		1.5		$10^{-4}$
	<b>B</b>			2.0		
	<b>C</b>			3.0		
<b>Small Signall Current Gain</b>	<b>A</b>	$h_{21e}$		125	260	
	<b>B</b>			240	500	
	<b>C</b>			450	900	
<b>Small Signall Current Gain</b>	<b>A</b>	$h_{22e}$			30	$\mu$ MHO
	<b>B</b>				60	$\mu$ MHO
	<b>C</b>				110	$\mu$ MHO

**\*\* Measuring Values not for BC169**

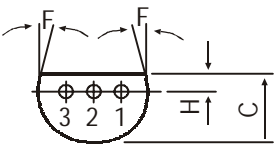
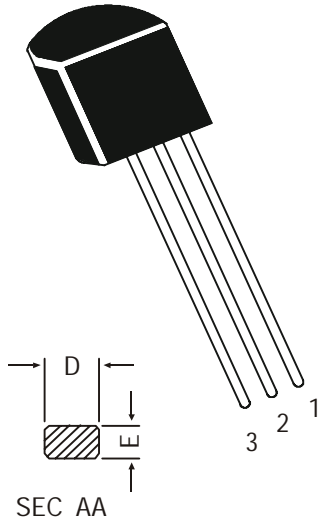
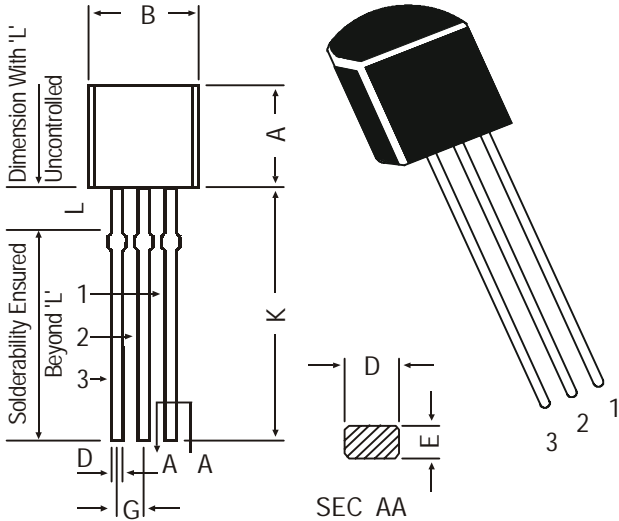
**\* The transistor is overdriven to such an extent that the static forward current transfer ratio has decreased to  $h_{FE} = 20$**

**BC167A, BC167B  
BC168A, BC168B, BC168C  
BC169B, BC169C**

**TO-92  
Plastic Package**

**TO-92 Plastic Package**

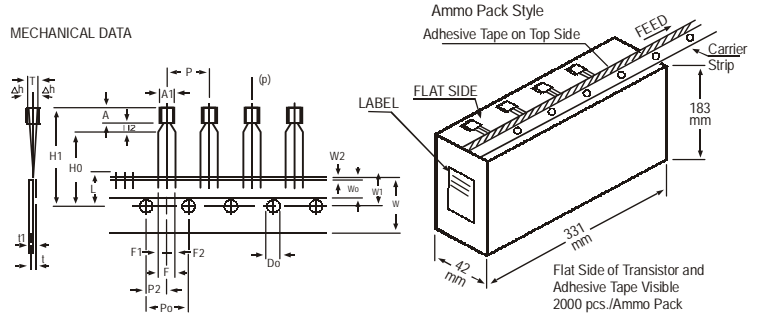
**TO-92 Transistors on Tape and Ammo Pack**



**PIN CONFIGURATION**  
1. BASE  
2. COLLECTOR  
3. EMITTER

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	—
L	1.982	2.082

All dimensions in mm.



All dimensions in mm unless specified otherwise

ITEM	SYMBOL	SPECIFICATION				REMARKS
		MIN.	NOM.	MAX.	TOL.	
BODY WIDTH	A1	4.0		4.8		
BODY HEIGHT	A	4.8		5.2		
BODY THICKNESS	T	3.9		4.2		
PITCH OF COMPONENT	P		12.7		±1	
FEED HOLE PITCH	Po		12.7		±0.3	
FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		±0.4	CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH TO BE MEASURED AT BOTTOM OF CLINCH
DISTANCE BETWEEN OUTER LEADS	F		5.08		+0.6	
COMPONENT ALIGNMENT	Δh		0	1	-0.2	AT TOP OF BODY
TAPE WIDTH	W		18		±0.5	
HOLD-DOWN TAPE WIDTH	Wo		6		±0.2	
HOLE POSITION	W1		9		+0.7 -0.5	
HOLD-DOWN TAPE POSITION	W2		0.5		±0.2	
LEAD WIRE CLINCH HEIGHT	Ho		16		±0.5	
COMPONENT HEIGHT	H1			23.25		
LENGTH OF SNIPPED LEADS	L			11.0		
FEED HOLE DIAMETER	Do		4		±0.2	
TOTAL TAPE THICKNESS	t			1.2		t1 0.3 - 0.6
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"	5K	17" x 15" x 13.5"	80K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2K	17" x 15" x 13.5"	32K	12.5 kgs

### **Disclaimer**

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