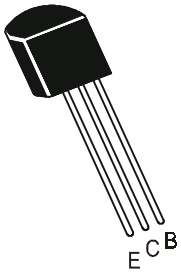
NPN SILICON PLANAR EPITAXIAL TRANSISTORS

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=25ºC unless specified otherwise)

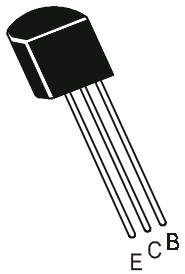
DESCRIPTION	SYMBOL	BC167	BC168	BC169	UNITS
Collector -Emitter Voltage	V_{CEO}	45	20	20	V
Collector -Emitter Voltage	V_{CES}	50	30	30	V
Emitter -Base Voltage	V_{EBO}	6.0	5	5	V
Collector Current Continuous	I_C	100	100	50	mA
Collector Peak Current	I_{CM}	200	200		mA
Base Current	I_B	50	50	5	mA
Power Dissipation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

ELECTRICAL CHARACTERISTICS (Ta=25ºC 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=1µA, 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		V_{CE}=30V,V_{BE}=0			15	nA
			Ta =125ºC				
	BC167		V_{CE}=50V,V_{BE}=0			4	µA
	BC168, 169		V_{CE}=30V,V_{BE}=0			4	µA

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

BC167A, BC167B
BC168A, BC168B, BC168C
BC169B, BC169C



TO-92
Plastic Package

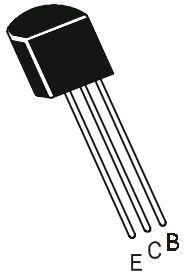
ELECTRICAL CHARACTERISTICS (Ta=25ºC Unless Specified Otherwise)

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	
	BC167A, 168A		I_C=100mA,V_{CE}=5V		120		
	BC167B, 168B				200		
	BC168C				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
DYNAMIC CHARACTERISTICS						
Transistors Frequency	f_T	I_C=0.5mA, V_{CE}=3V f=100MHz		85		MHz
		I_C=10mA, V_{CE}=5V f=100MHz	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

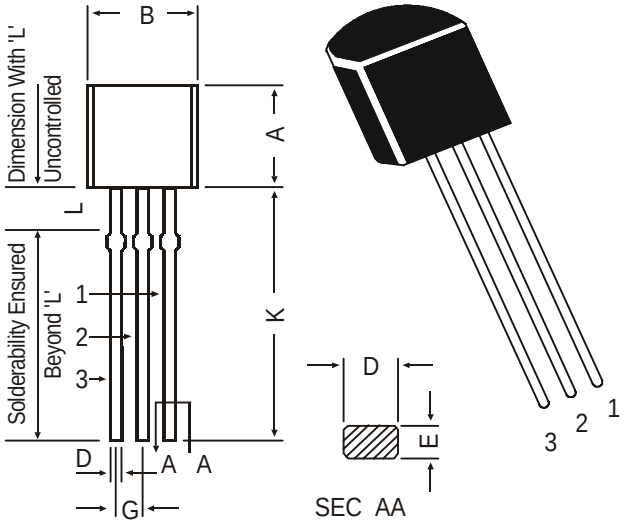


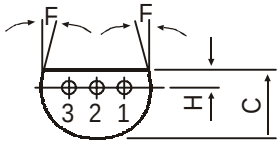
TO-92
Plastic Package

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

TO-92 Plastic Package



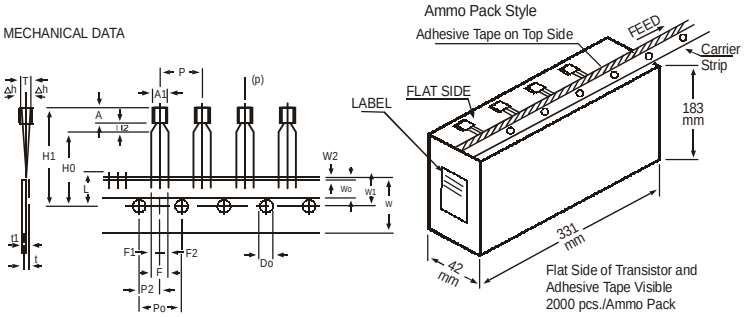


PIN CONFIGURATION
1. BASE
2. COLLECTOR
3. EMITTER

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 diminsions in mm.

TO-92 Transistors on Tape and Ammo Pack



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	CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH
FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		±0.4	TO BE MEASURED AT BOTTOM OF CLINCH
DISTANCE BETWEEN OUTER LEADS	F		5.08		+0.6 -0.2	
COMPONENT ALIGNMENT	△h		0	1		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 DISTANCEF1,	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

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 in the Data Sheet and 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).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.