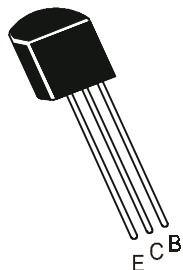


NPN SILICON PLANAR EPITAXIAL TRANSISTORS



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

**TO-92
Plastic Package**

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

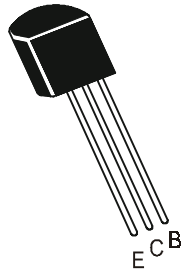
ABSOLUTE MAXIMUM RATINGS(Ta=25°C unless specified otherwise)

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
THERMAL RESISTANCE					
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		$V_{CE}=30V, V_{BE}=0$			15	nA
			Ta =125°C				
	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**

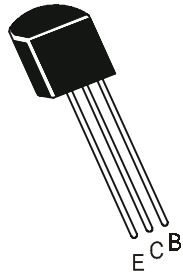
**TO-92
Plastic Package**

ELECTRICAL CHARACTERISTICS (Ta=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	
BC167A, 168A BC167B, 168B BC168C			$I_C=100mA, V_{CE}=5V$		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
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

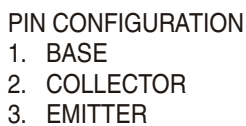
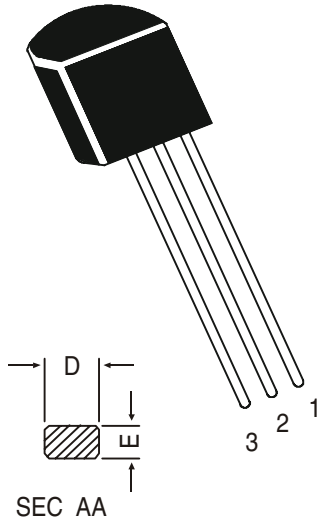
DESCRIPTION		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
DYNAMIC CHARACTERISTICS							
Noise Figure							
Small Signall Current Gain	BC169	NF	$I_C=0.2mA, V_{CE}=5V$			4.0	dB
	A		$R_g=2W, f=30HZ \text{ to } 15kHz$				
Small Signall Current Gain	BC167, 168	NF	$I_C=0.2mA, V_{CE}=5V$			10	
	BC169		$R_g=2W, f=1kHz, f=200Hz$			4	dB
	A	h_{11e}	$I_C=2mA, V_{CE}=5V, f=1kHz$	1.6		4.5	kW
	B			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	μMHO
	B					60	μMHO
	C					110	μMHO

** 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

TO-92 Transistors on Tape and Ammo Pack



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

MECHANICAL DATA

Ammo Pack Style

Adhesive Tape on Top Side

FEED

Carrier Strip

183 mm

331 mm

42 mm

Flat Side of Transistor and Adhesive Tape Visible
2000 pcs./Ammo Pack

FLAT SIDE

LABEL

Dimensions shown in the side view include: 2b, 2h, A, H1, H0, L, F1, F2, P2, Po, Do, W2, W0, W1, and W.

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
DISTANCE BETWEEN OUTER LEADS	F		5.08		+0.6	
COMPONENT ALIGNMENT	△ F		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 DISTANCEF1,	F2		2.54		+0.4 -0.1	
CLINCH HEIGHT	H2			3		
PULL - OUT FORCE	(P)	6N				

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. HALDDOWN 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.

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).

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