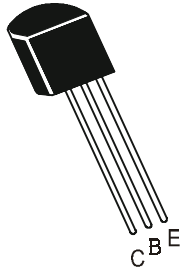


NPN SILICON PLANAR EPITAXIAL TRANSISTORS

BC237 A, B, C
BC238 A, B, C
BC239 B, C



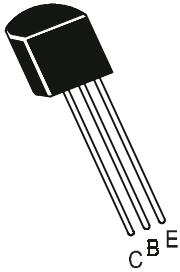
TO-92
Plastic Package

General Purpose Transistor, Best Suited For use In Driver Stages Of Audio Amplifiers, Low Noise Input Stages of Tape Recorders. Hi-Fi Amplifiers , Signal Processing Circuits Of Television Receivers.

DESCRIPTION	SYMBOL	BC237	BC238	BC239	UNITS
Collector -Emitter Voltage	V_{CEO}	45	25	25	V
Collector -Emitter Voltage	V_{CES}	50	30	30	V
Emitter -Base Voltage	V_{EBO}	6	5	5	V
Collector Current Continuous	I_C		100		mA
Power Dissipation@ Ta=25°C	P_D		350		mW
Derate Above 25°C			2.8		mW/°C
Power Dissipation@ Tc=25°C	P_D		1		W
Derate Above 25°C			8		mW/°C
Operating And Storage Junction Temperature Range	T_j, T_{stg}		-55 to +150		°C
THERMAL RESISTANCE					
Junction to ambient	$R_{th(j-a)}$		357		°C/W
Junction to case	$R_{th(j-c)}$		125		°C/W

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

BC237 A, B, C
BC238 A, B, C
BC239 B, C



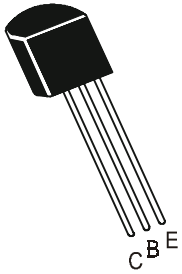
TO-92
Plastic Package

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
Collector Emitter Voltage						
	BC237	V_{CEO}	$I_C=2mA, I_B=0$	45		V
	BC238			25		V
	BC239			25		V
EmitterBase Voltage						
	BC237	V_{EBO}	$I_E=100\mu A, I_C=0$	6		V
	BC238, BC239			5		V
CollectorCut off Current						
	BC238, BC239	I_{CES}	$V_{CE}=30V, V_{BE}=0$		15	nA
	BC237		$V_{CE}=50V, V_{BE}=0$		15	nA
	BC238, BC239		$V_{CE}=30V, V_{BE}=0$ $T_a=125^\circ C$		4	μA
	BC237		$V_{CE}=50V, V_{BE}=0$ $T_a=125^\circ C$		4	μA
DC Current Gain						
	A	h_{FE}	$I_C=10\mu A, V_{CE}=5V$		90	
	B				150	
	C				270	
	BC237, BC238, BC239		$I_C=2mA, V_{CE}=5V$	120		800
	A			120	170	220
	B			200	290	460
	C			380	500	800
	A		$I_C=100mA, V_{CE}=5V^*$		120	
	B				180	
	C				300	
Collector Emitter Saturation Voltage						
	BC237, BC239	$V_{CE(sat)}$	$I_C=10mA, I_B=0.5mA$ $I_C=100mA, I_B=5mA^*$		0.07 0.2	0.2 0.6
	BC238					0.8
Base Emitter Saturation Voltage						
		$V_{BE(sat)}$	$I_C=10mA, I_B=0.5mA$ $I_C=100mA, I_B=0.5mA^*$		0.6	0.83 1.05
Base Emitter On Voltage						
		$V_{BE(on)}$	$I_C=100\mu A, V_{CE}=5V$ $I_C=2mA, V_{CE}=5V$ $I_C=100mA, V_{CE}=5V$		0.5 0.62 0.83	V V V

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

BC237 A, B, C
BC238 A, B, C
BC239 B, C



TO-92
Plastic Package

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
DYNAMIC CHARACTERISTICS						
Transition Frequency						
	BC237	f_T	$I_C=0.5mA, V_{CE}=3V$ $f=100MHz$	100		MHz
	BC238			120		
	BC239			140		
	BC237		$I_C=10mA, V_{CE}=5V$ $f=100MHz$	150	200	MHz
	BC238			150	240	
	BC239			150	280	
Collector Output Capacitance		C_{ob}	$V_{CB}=10V, I_E=0$ $f=1MHz$		4.50	pF
Emitter Input Capacitance		C_{ib}	$V_{EB}=0.5V, I_E=0$ $f=1MHz$	8.0		pF
Noise Figure						
	BC237, BC238	NF	$V_{CE}=5V, I_C=0.2mA$ $R_S=2KW, f=1KHz$ $f=200Hz$	2	10	dB
	BC239			2	4	dB
	BC239		$I_C=0.2mA, V_{CE}=5V$ $R_S=2KW, f=30KHz$ to 15KHz	2	4	dB

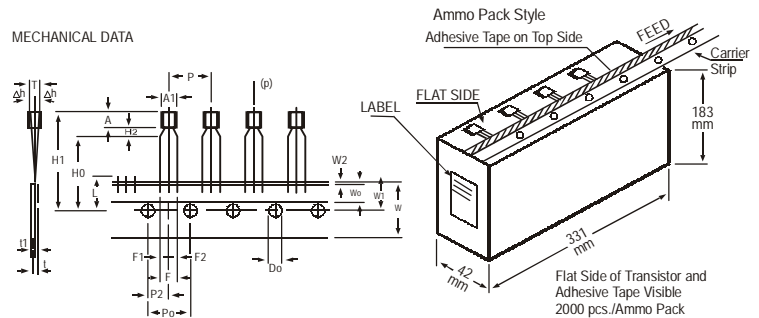
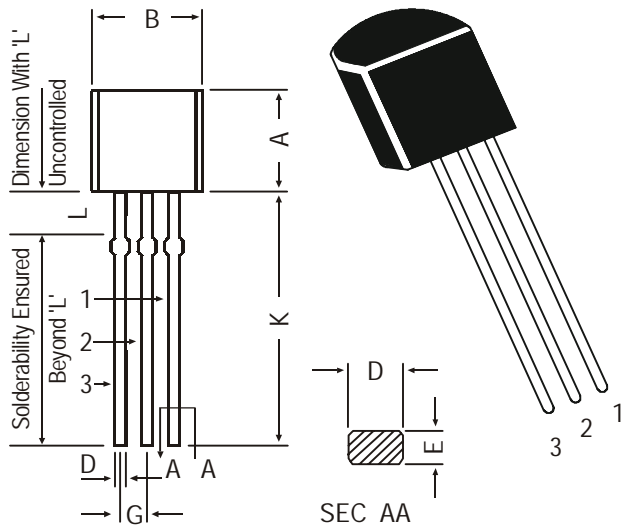
*Pulse Condition: Pulse Width 300us, Duty Cycle 2%.

BC237 A, B, C
BC238 A, B, C
BC239 B, C

TO-92
Plastic Package

TO-92 Plastic Package

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		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	Po		12.7		±0.3	
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	Δh		0		1	AT TOP OF BODY
TAPE WIDTH	W		18		±0.5	
HOLD-DOWN TAPE WIDTH	Wo		6		±0.2	±0.7 -0.5
HOLE POSITION	W1		9			
HOLD-DOWN TAPE POSITION	W2		0.5		±0.2	±0.5
LEAD WIRE CLINCH HEIGHT	Ho		16			
COMPONENT HEIGHT	H1			23.25		±1 0.3 - 0.6
LENGTH OF SNIPPED LEADS	L			11.0		
FEED HOLE DIAMETER	Do		4		±0.2	
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. HOLD-DOWN 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.

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.

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

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