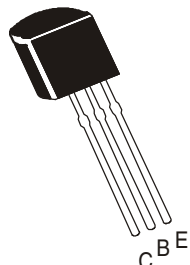


PNP SILICON PLANAR EPITAXIAL TRANSISTORS



BC212, A, B
BC213, A, B, C
BC214, B, C

TO-92
Plastic Package

Silicon Small Signal General Purpose Amplifier

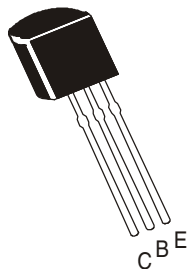
ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless specified otherwise)

DESCRIPTION	SYMBOL	BC212	BC213	BC214	UNITS
Collector Emitter Voltage	V_{CEO}	50	30	30	V
Collector Base Voltage	V_{CBO}	60	45	45	V
Emitter Base Voltage	V_{EBO}		5		V
Collector Current Continuous	I_C		100		mA
Power Dissipation @ $T_a=25^\circ\text{C}$	P_D		350		mW
Derate Above 25°C			2.8		mW/ $^\circ\text{C}$
Power Dissipation @ $T_c=25^\circ\text{C}$	P_D		1		W
Derate Above 25°C			8		mW/ $^\circ\text{C}$
Operating And Storage Junction Temperature Range	T_j, T_{stg}	-55 to +150			$^\circ\text{C}$

THERMAL RESISTANCE

Junction to Ambient in free air	$R_{th(j-a)}$	357	$^\circ\text{C/W}$
Junction to case	$R_{th(j-c)}$	125	$^\circ\text{C/W}$

PNP SILICON PLANAR EPITAXIAL TRANSISTORS



BC212, A, B
BC213, A, B, C
BC214, B, C

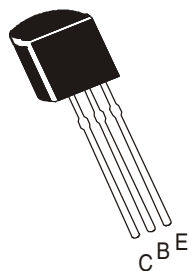
TO-92
Plastic Package

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
Collector Emitter Voltage	V_{CEO}	$I_C=2\text{mA}, I_B=0$				
BC212			50			V
BC213, BC214			30			V
Collector Base Voltage	V_{CBO}	$I_C=10\mu\text{A}, I_E=0$				
BC212			60			V
BC213, BC214			45			V
Emitter Base Voltage	V_{EBO}	$I_E=10\mu\text{A}, I_C=0$	5			V
Collector Cut off Current	I_{CBO}	$V_{CB}=30\text{V}, I_E=0$			15	nA
Emitter Cut off Current	I_{EBO}	$V_{EB}=4\text{V}, I_C=0$			15	nA
DC Current Gain						
BC212, BC213	h_{FE}	$I_C=10\mu\text{A}, V_{CE}=5\text{V}$	40			
BC214			100			
BC212	h_{FE}	$I_C=2\text{mA}, V_{CE}=5\text{V}$	60			
BC213			80			
BC214			140		600	
BC212, BC214	h_{FE}	$I_C=100\text{mA}, V_{CE}=5\text{V}^*$		120		
BC213				140		
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$		0.10		V
		$I_C=100\text{mA}, I_B=5\text{mA}^*$		0.25	0.6	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=100\text{mA}, I_B=5\text{mA}^*$		1.00	1.4	V
Base Emitter On Voltage	$V_{BE(on)}$	$I_C=2\text{mA}, V_{CE}=5\text{V}$	0.6	0.62	0.72	V

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

PNP SILICON PLANAR EPITAXIAL TRANSISTORS



BC212, A, B
BC213, A, B, C
BC214, B, C

TO-92
Plastic Package

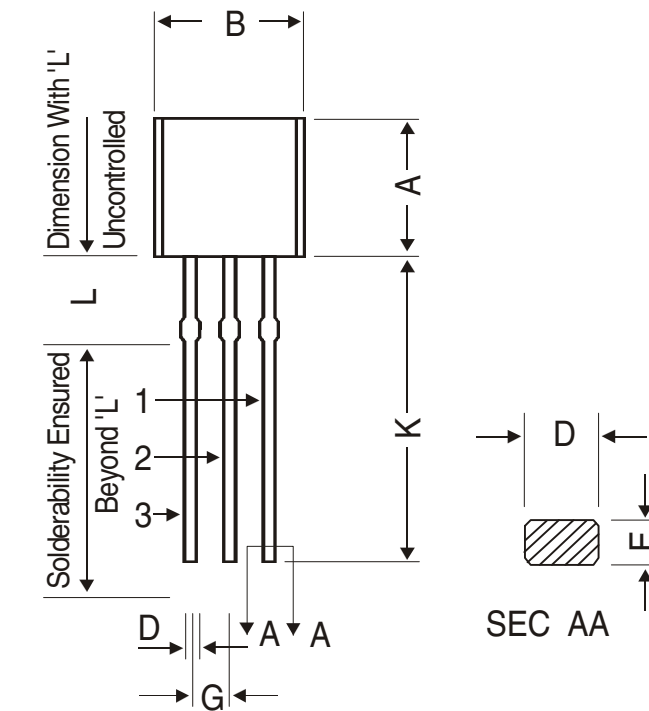
ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless specified otherwise)

DYNAMICS CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
Transition Frequency						
BC212	f_T	$I_C=10\text{mA}$, $V_{CE}=5\text{V}$		280		MHz
BC213		$f=50\text{MHz}$		360		MHz
BC214				320		MHz
Output Capacitance						
	C_{ob}	$V_{CB}=10\text{V}$, $I_E=0$			6	pF
Noise Figure						
BC212, BC213	NF	$I_C=200\mu\text{A}$, $V_{CE}=5\text{V}$			10	dB
		$R_S=2\text{K}\Omega$ $f=1\text{KHz}$				
		$f=200\text{Hz}$				
BC214	NF	$I_C=200\mu\text{A}$, $V_{CE}=5\text{V}$			2	dB
		$R_S=2\text{K}\Omega$ $f=30\text{Hz}$				
		to 15KHz				
Small Signal Current Gain						
BC212	h_{fe}	$I_C=2\text{mA}$, $V_{CE}=5\text{V}$	60			
BC213		$f=1\text{KHz}$	80			
BC214			140			
BC212A, BC213A	h_{fe}	$I_C=2\text{mA}$, $V_{CE}=5\text{V}$	100		300	
BC212B, BC213B, BC214B		$f=1\text{KHz}$	200		400	
BC213C, BC214C			350		600	

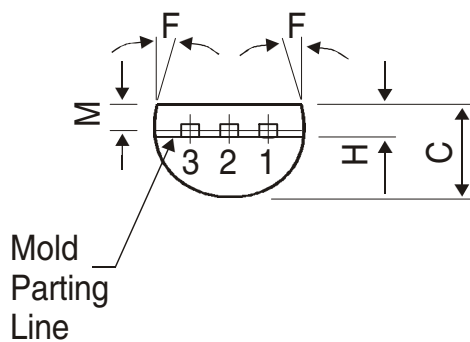
*Pulse Condition: Pulse Width = 300 μs , Duty Cycle = 2%.

TO-92 Plastic Package



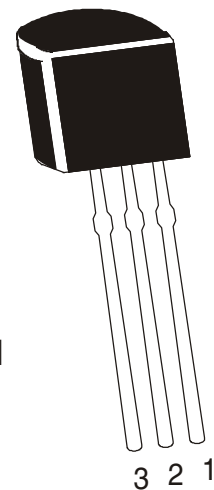
DIM	MIN.	MAX.
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5 DEG	
G	1.14	1.40
H	1.20	1.40
K	12.70	—
L	1.982	2.082
M	1.03	1.20

All dimensions are in mm



PIN CONFIGURATION

1. EMITTER
2. BASE
3. COLLECTOR



The TO-92 Package , Tape and Ammo Pack drawings are correct as on the date of issue/revision of this Data Sheet.

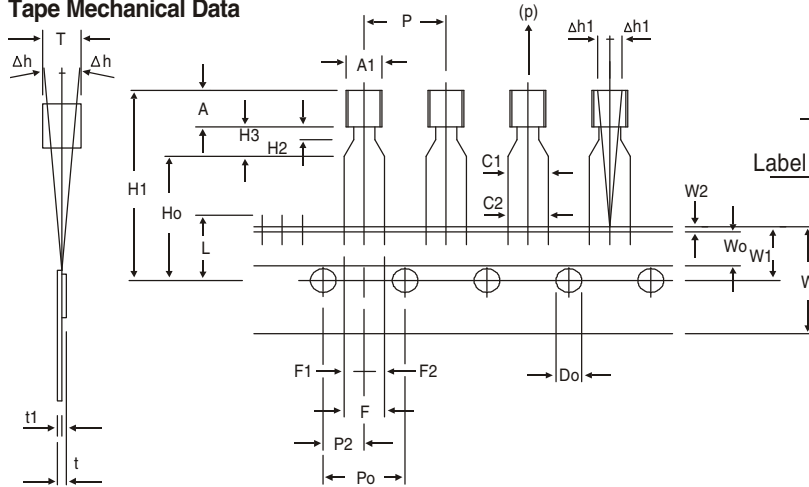
The currently valid dimensions and information, may please be confirmed from the TO-92 Drawing in the Packages and Packing Section of the Product Catalogue.

Packing Details

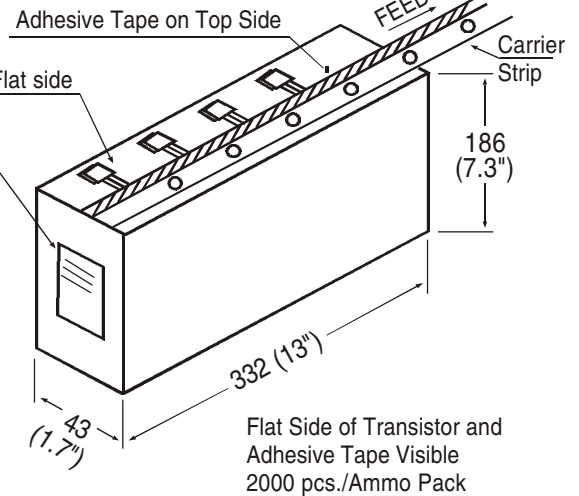
PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-92 Bulk	1K/polybag	200 gm/1K pcs	3" x 7.5" x 7.5"	5K	17" x 15" x 13.5"	80K	23 kgs
TO-92 T&A	2K/ammo box	645 gm/2K pcs	12.5" x 8" x 1.8"	2K	17" x 15" x 13.5"	32K	12.5 kgs

TO-92 Tape and Ammo Pack

Tape Mechanical Data



Ammo Pack Style



All dimensions are in mm

ITEM	SYMBOL	SPECIFICATION			
		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		± 1.0
*1 FEED HOLE PITCH	Po		12.7		± 0.3
*2 FEED HOLE CENTRE TO COMPONENT CENTRE	P2		6.35		± 0.4
DISTANCE BETWEEN OUTER LEADS	F		5.08		+ 0.6 - 0.2
*3 COMPONENT ALIGNMENT SIDE VIEW	Δh		0	1.0	
*4 COMPONENT ALIGNMENT FRONT VIEW	Δh1		0	1.3	
TAPE WIDTH	W		18		± 0.5
HOLD-DOWN TAPE WIDTH	W0		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
*5 TOTAL TAPE THICKNESS	t			1.2	
LEAD - TO - LEAD DISTANCE	F1, F2		2.54		+ 0.4 - 0.1
STAND OFF	H2	0.45		1.45	
CLINCH HEIGHT	H3			3.0	
LEAD PARALLELISM	C1 - C2			0.22	
PULL - OUT FORCE	(p)	6N			

NOTES

- Maximum alignment deviation between leads will not to be greater than 0.2mm.
- Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
- Holddown tape will not exceed beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
- There will be no more than three (3) consecutive missing components in a tape.
- A tape trailer, having at least three feed holes are provided after the last component in a tape.
- Splices should not interfere with the sprocket feed holes.

REMARKS

- *1 Cumulative pitch error 1.0 mm/20 pitch
*2 To be measured at bottom of clinch
*3 At top of body
*4 At top of body
*5 t1 0.3 – 0.6 mm

Disclaimer

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