



# BC 171 • BC 172 • BC 173

## NPN HIGH GAIN LOW NOISE

### SILICON PLANAR EPITAXIAL TRANSISTOR

BC171  
BC172  
BC173

#### FEATURES

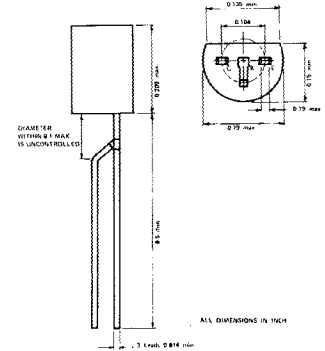
- High Breakdown Voltage  $V_{CE0} \dots 50V$  (BC171)
- Available in Different Current Gain Groupings
- Low Noise N.F.  $\dots 4dB_{max}$  @  $0.2mA$  (BC173)

#### APPLICATIONS

- Audio Amplifier Driver Stage
- Television Receiver Circuits
- Low Power General Purpose
- Low Noise Pre-Amplifier (BC173)

#### MECHANICAL OUTLINE

u - 135  
(Lead Code A)  
(TO-92 Variant)



#### THERMAL CHARACTERISTICS

Thermal Resistance from Junction to Ambient  $\theta(j-amb)$   
Maximum Collector Junction Temperature  
Storage Temperature Range  
Soldering Temperature (10 sec. time limit)

$0.42^{\circ}C/mW$   
 $150^{\circ}C$   
 $-65^{\circ}C$  to  $+150^{\circ}C$   
 $260^{\circ}C$

#### ABSOLUTE MAXIMUM RATINGS

Continuous Power Dissipation @  $25^{\circ}C$  Ambient  
Continuous Collector Current  
Collector - Base Voltage  
Collector - Emitter Voltage  
Base - Emitter Voltage

BC 171	BC 172	BC 173
300 mW	300 mW	300 mW
100 mA	100 mA	100 mA
50 V	25 V	25 V
45 V	25 V	25 V
6 V	5 V	5 V

#### ELECTRICAL CHARACTERISTICS @ $25^{\circ}C$ free air temperature :

PARAMETER	SYMBOL	BC 171		BC 172		BC 173		UNIT	TEST CONDITIONS
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.		
Collector-Base Cutoff Current	$I_{CBO}$		15					nA	$V_{CB} = 45V$
Collector-Base Cutoff Current	$I_{CBO}$				15		15	nA	$V_{CB} = 20V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.25	0.25		0.25		V	$I_C = 10mA$ $I_B = 0.5mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.6	0.6		0.6		V	$I_C = 100mA$ $I_B = 5mA$
Base-Emitter On Voltage	$V_{BE(sat)}$	0.55	0.7	0.55	0.7	0.55	0.7	V	$V_{CE} = 5V$ $I_C = 2mA$
Forward Current Transfer Ratio	$h_{FE}$	110	450	110	800	110	800		$V_{CE} = 5V$ $I_C = 2mA$
Small Signal Current Gain	$h_{fe}$	1.5		1.5		1.5			$f = 100MHz$ $I_C = 10mA$ $V_{CE} = 5V$
Collector Output Capacitance	$C_{ob}$		6		6		6	pF	$V_{CE} = 10V$ $f = 1MHz$ $I_E = 0$
Noise Figure (Narrow Band)	N.F.		10		10		4	dB	$V_{CE} = 5V$ $I_C = 0.2mA$ $R_g = 2K\Omega$ $f = 1KC$ $BW = 200Hz$
Noise Figure (Wide Band)	N.F.						4	dB	$V_{CE} = 5V$ $I_C = 0.2mA$ $R_g = 2K\Omega$ $f = 30Hz$ to $15KHz$

#### \* D. C. CURRENT GAIN GROUPINGS

TYPE	BC 171A		BC 172B BC 173B		BC 172C BC 173C		BC 171A BC 172A BC 173A		BC 171B BC 172B BC 173B		BC 172C BC 173C	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
$V_{CE} = 5V$ $I_C = 0.01mA$			40		40		100					
$V_{CE} = 5V$ $I_C = 2mA$							110	220	200	450	420	800

#### TYPICAL TWO PORT CHARACTERISTICS (h parameters)

TYPE	BC 171A BC 172A BC 173A	BC 171B BC 172B BC 173B	BC 172C BC 173C	UNIT	TEST CONDITIONS
$h_{fe}$	180	300	600		$V_{CE} = 5V$ $I_C = 2mA$ $f = 1KHz$
$h_{ie}$	2.5	4	8	Kohm	
$h_{re}$	$3 \times 10^{-4}$	$6 \times 10^{-4}$	$8 \times 10^{-4}$		
$h_{oe}$	20	26	50	$\mu S$	

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# NPN SILICON PLANAR EPITAXIAL TRANSISTOR

## TYPICAL ELECTRICAL CHARACTERISTICS BC 171 • BC 172 • BC 173

