



# BC 171 • BC 172 • BC 173

## NPN HIGH GAIN LOW NOISE

### SILICON PLANAR EPITAXIAL TRANSISTOR

#### 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)

#### THERMAL CHARACTERISTICS

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

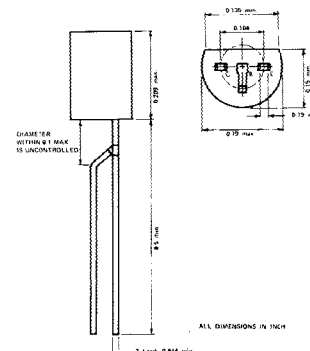
$0.42^{\circ}C/mW$   
 $150^{\circ}C$   
 $-65^{\circ}C$  to  $+150^{\circ}C$   
 $260^{\circ}C$

#### 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)**



#### 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
Continuous Power Dissipation	300 mW	300 mW	300 mW
Continuous Collector Current	100 mA	100 mA	100 mA
Collector - Base Voltage	50 V	25 V	25 V
Collector - Emitter Voltage	45 V	25 V	25 V
Base - Emitter Voltage	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	BC171A		BC172B BC173B		BC172C BC173C		BC171A BC172A BC173A		BC171B BC172B BC173B		BC172C BC173C	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
$V_{CE} = 5V$ $I_C = 0.01mA$						100						
$V_{CE} = 5V$ $I_C = 2mA$	40		40				110	220	200	450	420	800

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

TYPE	BC171A BC172A BC173A	BC171B BC172B BC173B	BC172C BC173C	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

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