2

BC174
BC171
BC172

CASE 29-02, STYLE 17
TO-92 (TO-226AA)

AMPLIFIER TRANSISTORS

NPN SILICON

Refer to BC546 for graphs.

MAXIMUM RATINGS

Rating	Symbol	BC 174	BC 171	BC 172	Unit
Collector-Emitter Voltage	V_{CEO}	65	45	25	Vdc
Collector-Base Voltage	V_{CBO}	80	50	30	Vdc
Emitter-Base Voltage	V_{EBO}		6.0		Vdc
Collector Current – Continuous	I_C		100		mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D		350 2.B		mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D		1.0 B.0		Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}		−55 to +150		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JC}$	357	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 1 mA, I_B = 0)	 BC174 BC171 BC172	$V_{(BR)CEO}$	 65 45 25			V
Emitter-Base Breakdown Voltage (I_E = 10 μA, I_C = 0)	 BC171 BC172 BC174	$V_{(BR)EBO}$	 6 6 6			V
Collector Cutoff Current (V_{CE} = 70 V, V_{BE} = 0) (V_{CE} = 50 V, V_{BE} = 0) (V_{CE} = 35 V, V_{BE} = 0) (V_{CE} = 30 V, T_A = 125 °C)	 BC174 BC171 BC172 BC174 BC171 BC172	I_{CES}		 0.20 0.20 0.20	 15 15 15 4 4 4	nA μA
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 μA, V_{CE} = 5 V) (I_C = 2 mA, V_{CE} = 5 V) (I_C = 100 mA, V_{CE} = 5 V)	 BC171A/2A/4A BC171B/2B/4B BC172C BC174 BC171 BC172 BC171A/2A/4A BC171B/2B/4B BC172C BC171A/2A/4A BC171B/2B/4B BC172C	h_{FE}	 120 120 120 120 180 3B0	 90 150 270 180 290 520 120 1B0 300	 450 800 800 220 460 B00	
Collector-Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5 mA) (I_C = 10 mA, I_B = See Note 1)		$V_{CE(sat)}$		 0.09 0.2 0.3	 0.25 0.60 0.6	V
Base-Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA)		$V_{BE(sat)}$		 0.7		V
Base-Emitter On Voltage (I_C = 2 mA, V_{CE} = 5 V) (I_C = 10 mA, V_{CE} = 5 V)		$V_{BE(on)}$	 0.55		 0.70 0.77	V

NOTE 1: I_B is value for which I_C = 11 mA at V_{CE} = 1 V.

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted)

Characteristic	Type	Symbol	Min.	Typ.	Max.	Unit
DYNAMIC CHARACTERISTICS, SMALL SIGNAL CHARACTERISTICS						
Current-Gain Bandwidth Product (I_C = 10 mA, V_{CE} = 5 V, f = 100 MHz)	BC171 BC172 BC174	f_T	 150 150 150	 300 300 300		MHz
Output Capacitance (V_{CB} = 10 V, I_C = 0, f = 1 MHz)		C_{obo}		1.7	4.5	pF
Input Capacitance (V_{BE} = 0.5 V, I_C = 0, f = 1 MHz)		C_{ibo}		10		pF
Input Impedance (I_C = 2 mA, V_{CE} = 5 V, f = 1 KHz)	BC171A/2A/4A BC171B/2B/4B BC172C	h_{ie}	1.6 3.2 6.0	2.7 4.5 8.7	4.5 8.5 15.0	Kohm
Voltage Feedback Ratio (I_C = 2 mA, V_{CE} = 5 V, f = 1 KHz)	BC171A/2A/4A BC171B/2B/4B BC172C	h_{re}		1.5 2.0 3.0		$X10^{-4}$
Small-Signal Current Gain (I_C = 2 mA, V_{CE} = 5 V, f = 1 KHz)	BC171A/2A/4A BC171B/2B/4B BC172C	h_{fe}	125 240 450	220 330 600	260 500 900	
Output Admittance (I_C = 2 mA, V_{CE} = 5 V, f = 1 KHz)	BC171A/2A/4A BC171B/2B/4B BC172C	h_{oe}		8 10 12	25 35 50	µmhos
Noise Figure (I_C = 0.2 mA, V_{CE} = 5 V, R_S = 2 KOhms, f = 1 KHz, Δf = 200 Hz)	BC171 BC172 BC174	NF		2 2 2	10 10 10	dB