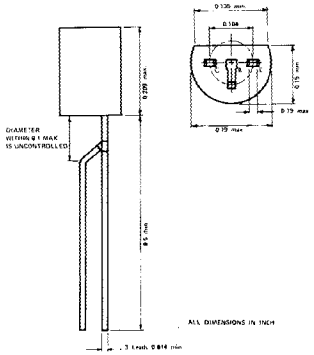
BC 171 • BC 172 • BC 173
NPN HIGH GAIN LOW NOISE
SILICON PLANAR EPITAXIAL TRANSISTOR

BC 171
BC 172
BC 173

FEATURES
- High Breakdown Voltage LV_{CEO} 50V (BC171)
- Available in Different Current Gain Groupings
- Low Noise N.F. .... 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 θ (j-amb)	0.42°C/mW
Maximum Collector Junction Temperature	150°C
Storage Temperature Range	-65°C to +150°C
Soldering Temperature (10 sec. time limit)	260°C

ABSOLUTE MAXIMUM RATINGS

	BC 171	BC 172	BC 173
Continuous Power Dissipation @ 25°C Ambient	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 CHARACTESISTICS @ 25°C free air temperature:

PARAMETER	SYMBOL	BC 171 MIN.	BC 171 MAX.	BC 172 MIN.	BC 172 MAX.	BC 173 MIN.	BC 173 MAX.	UNIT	TEST CONDITIONS
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 = 2KΩ f = 1KC BW = 200Hz
Noise Figure (Wide Band)	N.F.						4	dB	V_{CE} = 5V I_C = 0.2mA R_g = 2KΩ f=30Hz to 15KHz

*D. C. CURRENT GAIN GROUPINGS

TYPE / TEST CONDITIONS	BC171A MIN.	BC171A MAX.	BC172B BC173B MIN.	BC172B BC173B MAX.	BC172C BC173C MIN.	BC172C BC173C MAX.	BC171A BC172A BC173A MIN.	BC171A BC172A BC173A MAX.	BC171B BC172B BC173B MIN.	BC171B BC172B BC173B MAX.	BC172C BC173C MIN.	BC172C BC173C 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)

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}	3×10^{-4}	6×10^{-4}	8×10^{-4}		
h_{oe}	20	26	50	μS	

43510

69477
3430181-5

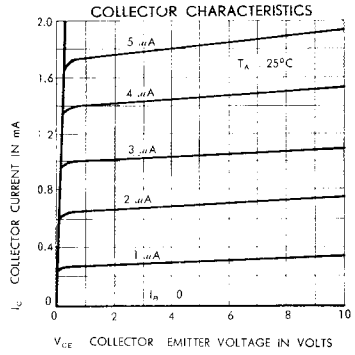
12:74 REV 0

NPN SILICON PLANAR EPITAXIAL TRANSISTOR

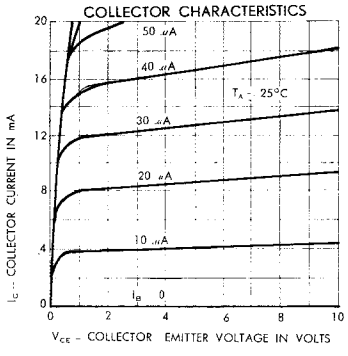
TYPICAL ELECTRICAL CHARACTERISTICS

BC 171 • BC 172 • BC 173

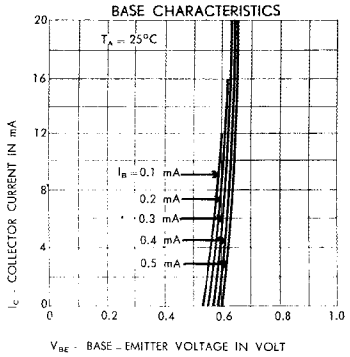
COLLECTOR CHARACTERISTICS



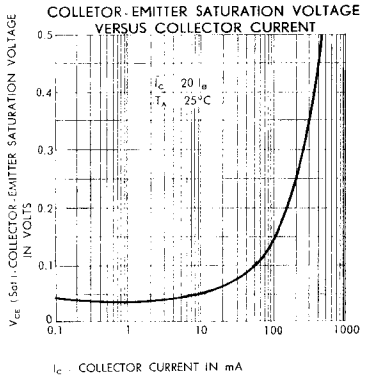
COLLECTOR CHARACTERISTICS



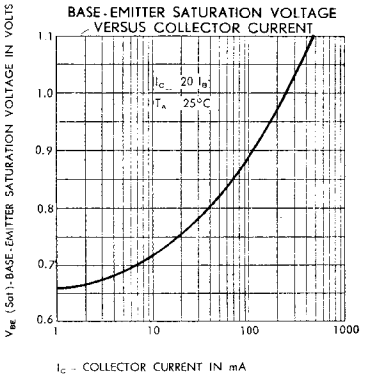
BASE CHARACTERISTICS



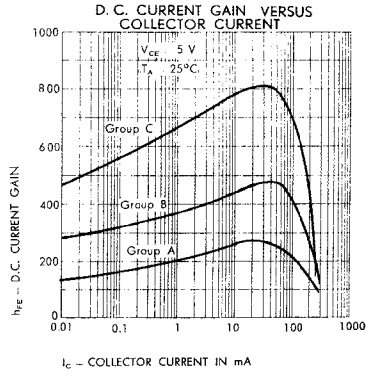
COLLETOR-EMITTER SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



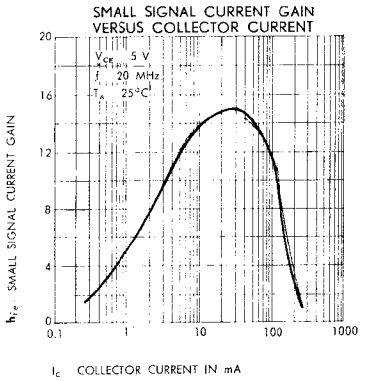
BASE-EMITTER SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



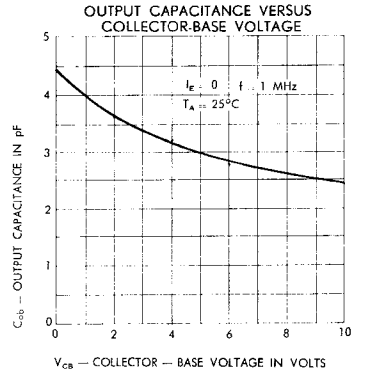
D. C. CURRENT GAIN VERSUS COLLECTOR CURRENT



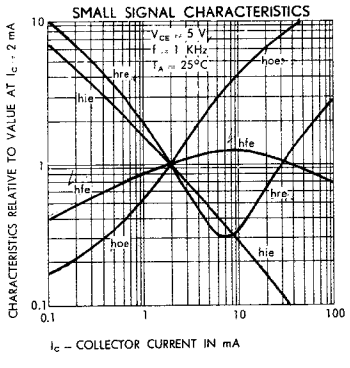
SMALL SIGNAL CURRENT GAIN VERSUS COLLECTOR CURRENT



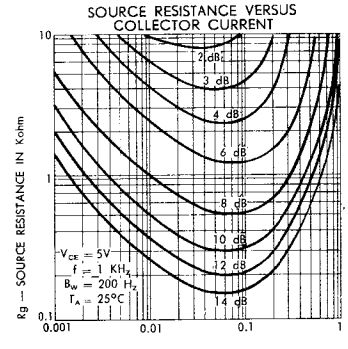
OUTPUT CAPACITANCE VERSUS COLLECTOR-BASE VOLTAGE



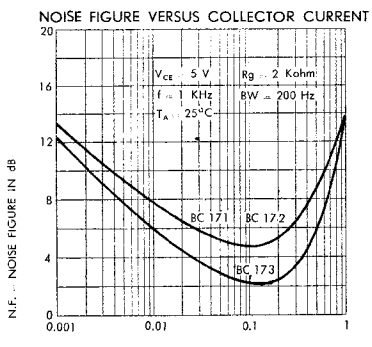
SMALL SIGNAL CHARACTERISTICS



SOURCE RESISTANCE VERSUS COLLECTOR CURRENT



NOISE FIGURE VERSUS COLLECTOR CURRENT



NOISE FIGURE VERSUS FREQUENCY

