

MINIATURE NPN AF LOW NOISE SILICON PLANAR EPITAXIAL TRANSISTOR

GENERAL DESCRIPTION

The BC 146 is a NPN silicon planar epitaxial transistor in miniature plastic package designed for hearing aids, watches, paging systems and other equipment where small size is of paramount importance. The BC 146 is complementary to PNP BC 200.

ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage
 Collector-Emitter Voltage
 Emitter-Base Voltage
 Collector Current
 Total Power Dissipation at $T_A \leq 45^\circ\text{C}$
 Junction Temperature
 Storage Temperature Range

V_{CBO} 20V
 V_{CEO} 20V
 V_{EBO} 4V
 I_C 50mA
 P_{tot} 50mW
 T_j 125°C
 T_{stg} -65°C to +125°C

THERMAL RESISTANCE

Junction to Ambient

θ_{ja} 1.6°C/mW

ELECTRICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	BC 146R			BC 146Y			BC 146G			UNIT	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
Collector-Base Cutoff Current	I_{CBO}			100			100			100	nA	$V_{CB}=20V$ $I_E=0$
Collector-Emitter Knee Voltage	V_{CEK}		200			200			200		mV	$I_C=2mA$ $I_B=$ value for which $I_C=2.2mA$ and $V_{CE}=1V$
Base-Emitter Voltage	V_{BE}		570			570			570		mV	$V_{CE}=0.5V$ $I_C=0.2mA$
Base-Emitter Voltage	V_{BE}		630			630			630		mV	$V_{CE}=1V$ $I_C=2mA$
DC Current Gain	H_{FE}	80	120	200	140	220	350	280	380	550		$V_{CE}=0.5V$ $I_C=0.2mA$
DC Current Gain	H_{FE}	100			140			280				$V_{CE}=1V$ $I_C=2mA$
Noise Figure	NF		1.5			1.5	4		1.5		dB	$V_{CE}=5V$ $I_C=0.2mA$ $R_g=2K\Omega$ $f=30Hz-15KHz$
Transition Frequency	f_T		80			110			150		MHz	$V_{CE}=5V$ $I_C=2mA$
Collector Capacitance	C_{cb}		2.5			2.5			2.5		pF	$V_{CB}=5V$ $I_E=0$ $f=1MHz$

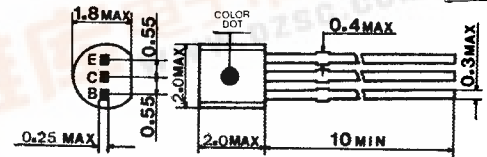
TYPICAL h-PARAMETERS AT $V_{CE}=0.5V$, $I_C=0.2mA$, $f=1KHz$

PARAMETER	SYMBOL	BC 146R	BC 146Y	BC146G	UNIT
Input Impedance	h_{ie}	20	30	45	$K\Omega$
Reverse Voltage Transfer Ratio	h_{re}	15	25	40	$\times 10^{-4}$
Small Signal Current Gain	h_{fe}	130	240	400	
Output Admittance	h_{oe}	15	20	35	μS

COLOR DOT
 R - RED
 Y - YELLOW
 G - GREEN

MECHANICAL OUTLINE

MT-42



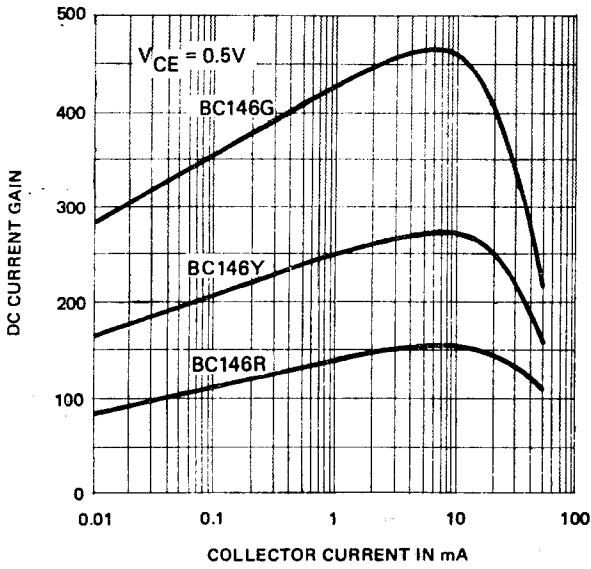
ALL DIMENSIONS IN mm



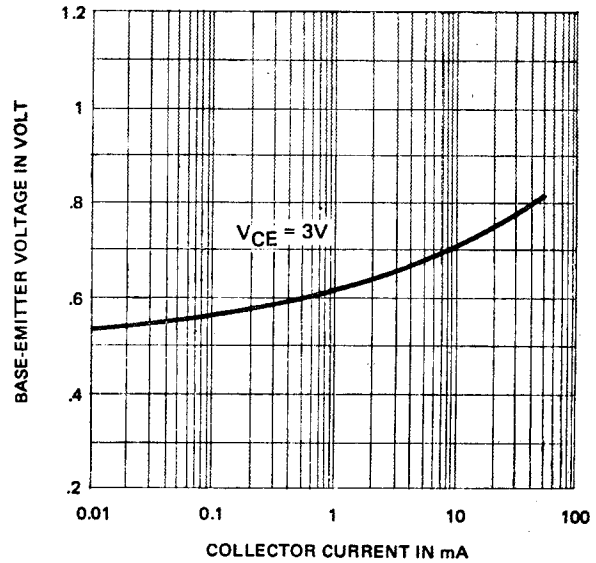
TYPICAL ELECTRICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$

BC 146

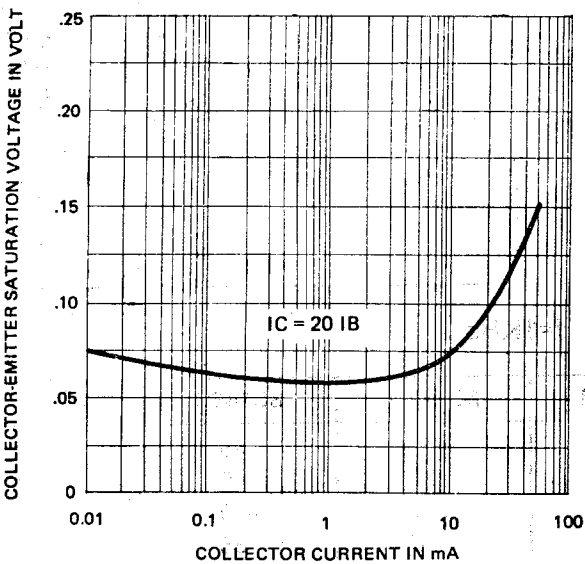
DC CURRENT GAIN VERSUS COLLECTOR CURRENT



BASE-EMITTER VOLTAGE VERSUS COLLECTOR CURRENT



COLLECTOR-EMITTER SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



WIDE BAND NOISE FIGURE

