NPN Transistor Bare Die - BC107B

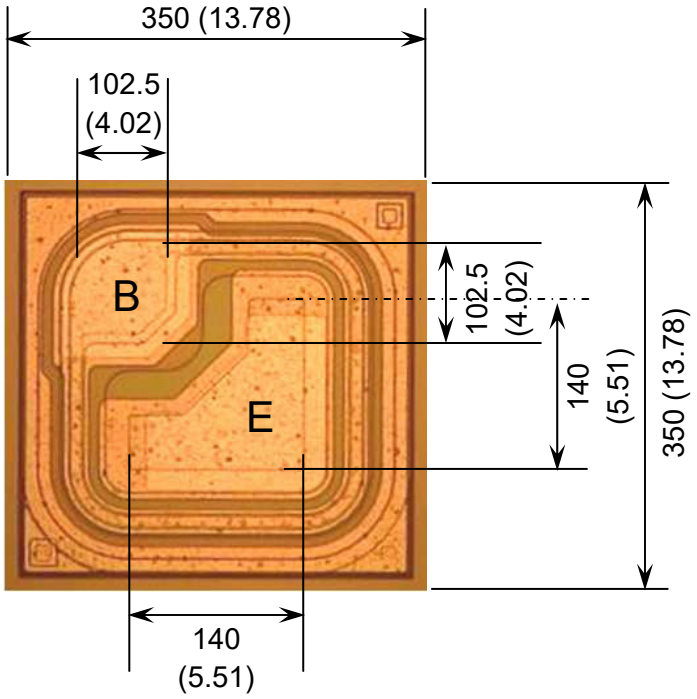
Rev 1.0
08/01/19

General purpose medium power amplifier or switch in bare die form
Complement to PNP BC307B

Features:

- Low saturation voltage
- Well suited for amplifier applications
- High reliability gold back metal
- High reliability tested grades for Military + Space

Die Dimensions in µm (mils)



Ordering Information:

The following part suffixes apply:

- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

www.siliconsupplies.com\quality\bare-die-lot-qualification

E = EMITTER **B** = BASE

DIE BACK = COLLECTOR

Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – Specific request
- Unsawn Wafer – Specific request
- With additional electrical selection – Specific request
- Sawn as pairs or adjacent pair pick – Specific request

Mechanical Specification

Die Size (Excluding Saw Street)	350 x 350 13.78 x 13.78	µm mils
Base Pad Size	102.5 x 102.5 4.02 x 4.02	µm mils
Emitter Pad Size	96 x 96 5.51 x 5.51	
Die Thickness	230 (±15) 9.06 (±0.59)	µm mils
Top Metal Composition	Al - 1.3µm	
Back Metal Composition	AuAs - 0.9µm	

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Absolute Maximum Ratings T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	100	mA
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55 to 150	°C

Electrical Characteristics T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	50	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	45	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	6	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 40V, I_E = 0	-	-	15	nA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio[1]	h_{FE}	V_{CE} = 5V, I_C = 2mA	200	230	450	-
		V_{CE} = 5V, I_C = 10μA	40	150	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 0.5mA	-	70	250	mV
		I_C = 100mA, I_B = 5mA	-	200	600	mV
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 0.5mA	-	700	830	mV
		I_C = 100mA, I_B = 5mA	-	950	1050	mV
Base-Emitter On Voltage	$V_{BE(on)}$	I_C = 2mA, V_{CE} = 5V	550	650	700	mV
		I_C = 10mA, V_{CE} = 5V	-	-	770	mV
SMALL SIGNAL CHARACTERISTICS[2]						
Transition Frequency[3]	f_T	V_{CE} = 5V, I_C = 10mA, f = 100MHz	150	300	-	MHz
Small-Signal Current Gain	h_{fe}	V_{CE}= 5V, I_C = 2mA, f = 1 kHz	240	330	500	
Output Capacitance	C_{obo}	V_{CB} = 10V, I_E = 0, f = 1MHz	-	2.5	4.5	pF
Input Capacitance	C_{ibo}	V_{BE} = 10V, I_C = 0, f = 1MHz	-	9	-	pF
Noise Figure	NF	V_{CE} = 5V, I_C = 200μA, f = 1KHz, R_G=2KΩ	-	2	10	dB

Note 1: Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%
Note 2: Not production testing in die form. Characterized by chip design and tested in package
Note 3: f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

Typical Characteristics T_A = 25°C unless otherwise stated

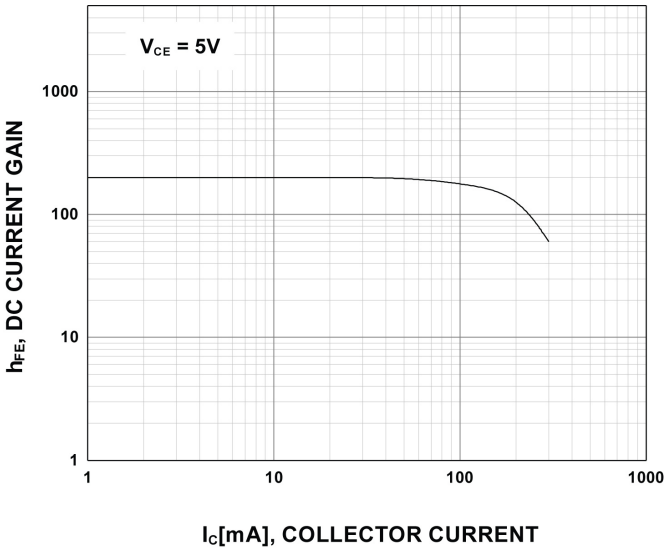

Figure 1 – DC Current Gain

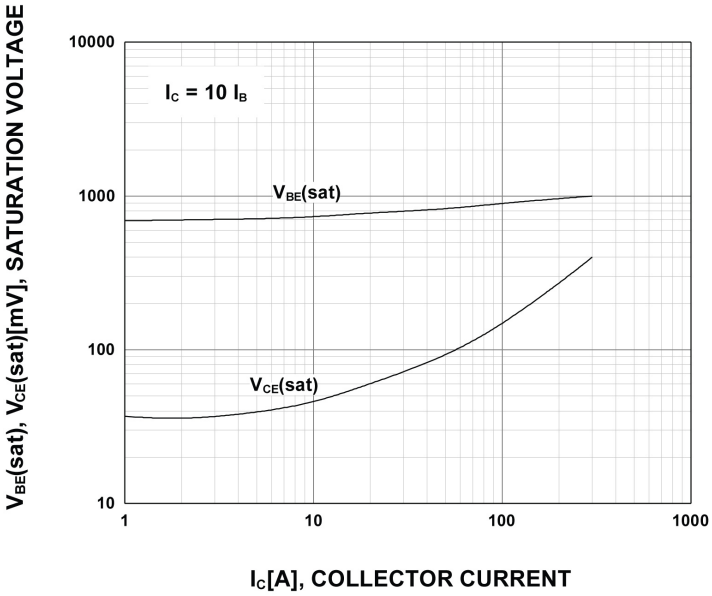

Figure 3 – Base-Emitter Saturation Voltage versus Collector-Emitter Saturation Voltage

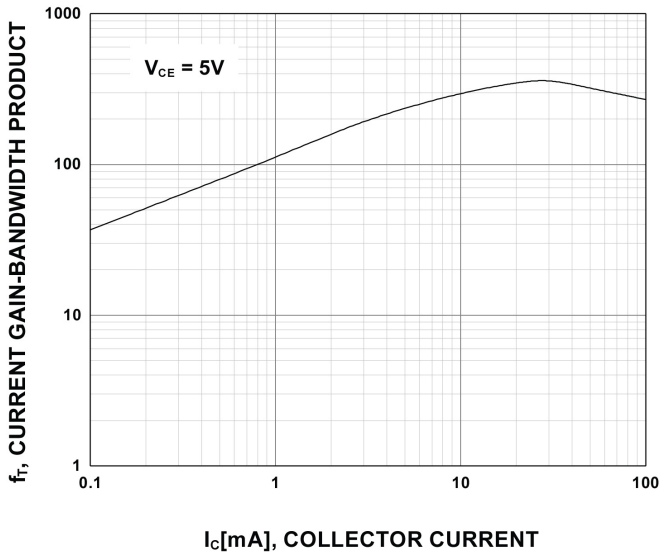

Figure 3 – Current Gain Bandwidth Product

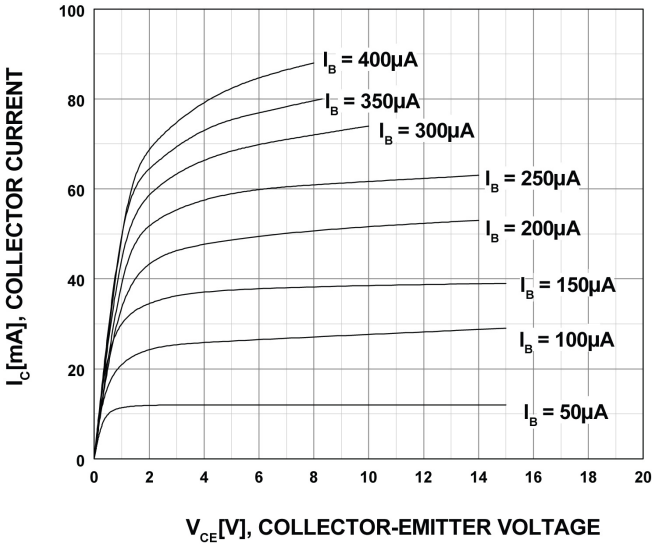

Figure 4 – Static Characteristics

Typical Characteristics T_A = 25°C unless otherwise stated

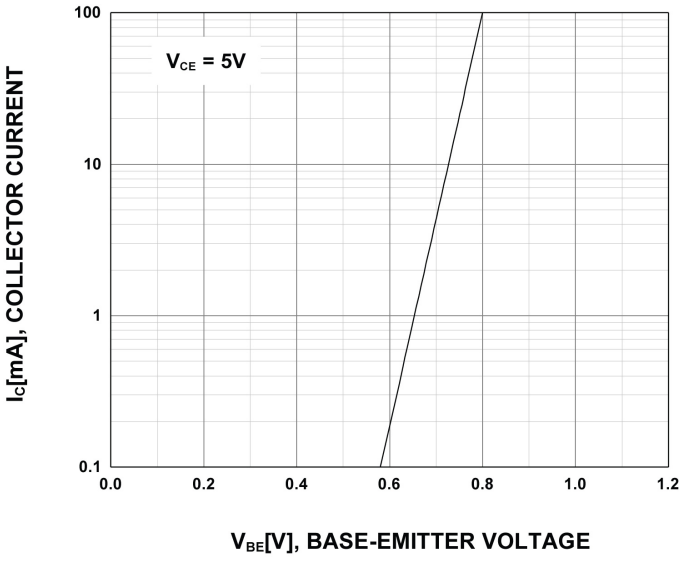

Figure 5 – Transfer Characteristic

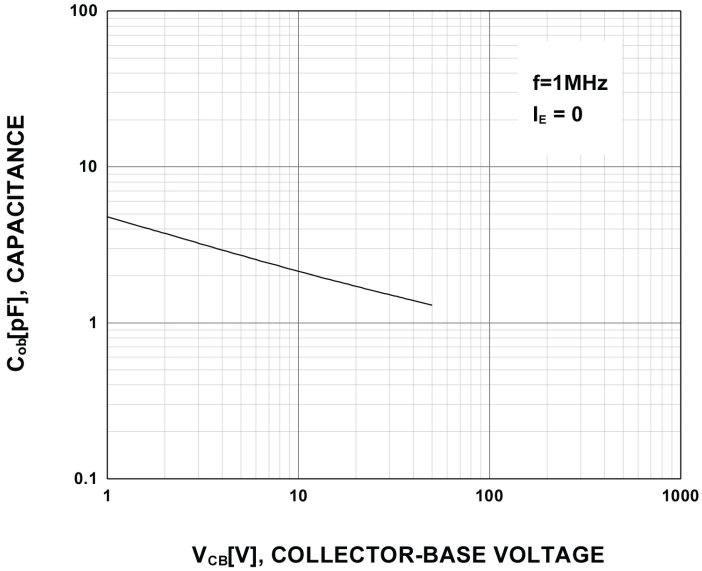

Figure 6 – Output Capacitance