

DATA SHEET

BC846A/B, BC847A/B/C, BC848A/B/C

NPN GENERAL PURPOSE TRANSISTORS

VOLTAGE 30 ~ 65 V **CURRENT** 100 mA

FEATURES

- IDEALLY SUITED FOR AUTOMATIC INSERTION
- FOR SWITCHING AND AF AMPLIFIER APPLICATIONS
- NPN SILICON EPITAXIAL PLANAR TRANSISTOR FOR SWITCHING AND AMPLIFIER APPLICATIONS
- COLLECTOR CURRENT $I_C = 100\text{mA}$
- LEAD FREE AND HALOGEN-FREE

MECHANICAL DATA

- CASE: SOT-23
- TERMINALS: SOLDERABLE PER MIL-STD-202G, METHOD 208
- APPROX. WEIGHT: 0.008 GRAMS



CASE: SOT-23

ABSOLUTE MAXIMUM RATINGS

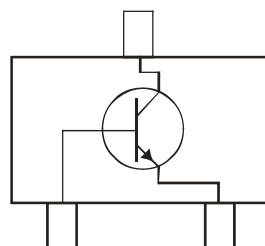
AT $T_A = 25^\circ\text{C}$, UNLESS OTHERWISE NOTED

PARAMETER	SYMBOL	BC846	BC847	BC848	UNITS
COLLECTOR-EMITTER VOLTAGE	V_{CEO}	65	45	30	V
COLLECTOR-BASE VOLTAGE	V_{CBO}	80	50	30	V
EMITTER-BASE VOLTAGE	V_{EBO}	6.0			V
DC COLLECTOR CURRENT	I_C	100			mA
COLLECTOR POWER DISSIPATION	P_C	200			mW
THERMAL RESISTANCE, JUNCTION TO AMBIENT	$R_{\theta JA}$	555			$^\circ\text{C}/\text{W}$
JUNCTION TEMPERATURE	T_J	150			$^\circ\text{C}$
STORAGE TEMPERATURE RANGE	T_{STG}	-55 ~ +150			$^\circ\text{C}$

NOTE:

1. $R_{\theta JA}$ IS THE SUM OF THE JUNCTION-TO-CASE AND CASE-TO-AMBIENT THERMAL RESISTANCE WHERE THE CASE THERMAL REFERENCE IS DEFINED AS THE SOLDER MOUNTING SURFACE OF THE DRAIN PINS. THE VALUE OF $R_{\theta JA}$ IS MEASURED WITH DEVICE MOUNTED ON 1 IN² FR-4 BOARD WITH 2 OZ COPPER.

NPN



ELECTRICAL CHARACTERISTICS

AT $T_A = 25^\circ\text{C}$, UNLESS OTHERWISE SPECIFIED

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNITS	
OFF CHARACTERISTICS						
COLLECTOR-BASE BREAKDOWN VOLTAGE	BC846	$I_C = 10\mu\text{A}, I_E = 0$	80	-	V	
	BC847		50	-		
	BC848		30	-		
COLLECTOR-EMITTER BREAKDOWN VOLTAGE	BC846	$I_C = 10\text{mA}, I_B = 0$	65	-	V	
	BC847		45	-		
	BC848		30	-		
EMITTER-BASE BREAKDOWN VOLTAGE	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	6.0	-	V	
COLLECTOR CUT-OFF CURRENT	BC846	I_{CBO}	$V_{CB} = 70\text{V}, I_E = 0$	-	0.1	μA
	BC847		$V_{CB} = 50\text{V}, I_E = 0$			
	BC848		$V_{CB} = 30\text{V}, I_E = 0$			
COLLECTOR CUT-OFF CURRENT	BC846	I_{CEO}	$V_{CE} = 60\text{V}, I_B = 0$	-	0.1	μA
	BC847		$V_{CE} = 45\text{V}, I_B = 0$			
	BC848		$V_{CE} = 30\text{V}, I_B = 0$			
EMITTER CUT-OFF CURRENT	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	0.1	μA	
ON CHARACTERISTICS (NOTE.1)						
DC CURRENT GAIN	BC846A,847A,848A	h_{FE}	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	110	220	-
	BC846B,847B,848B			200	450	
	BC847C,848C			420	800	
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 5\text{mA}$	-	0.5	V	
BASE-EMITTER SATURATION VOLTAGE	$V_{BE(sat)}$	$I_C = 100\text{mA}, I_B = 5\text{mA}$	-	1.1	V	
SMALL-SIGNAL CHARACTERISTICS						
TRANSITION FREQUENCY	f_T	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$ $f = 100\text{MHz}$	100	-	MHz	
COLLECTOR OUTPUT CAPACITANCE	C_{ob}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$	-	4.5	pF	

NOTE:

1. PULSE TEST: PULSE WIDTH $\leq 300 \mu\text{s}$; DUTY CYCLE $\leq 2\%$.

ORDERING AND MARKING INFORMATION

PART NUMBER	PACKAGE	SHIPPING	MARKING CODE
BC846A-T3R	SOT-23	TAPE REEL	SEE CLASSIFICATION OF h_{FE}
BC846B-T3R	SOT-23	TAPE REEL	
BC847A-T3R	SOT-23	TAPE REEL	
BC847B-T3R	SOT-23	TAPE REEL	
BC847C-T3R	SOT-23	TAPE REEL	
BC848A-T3R	SOT-23	TAPE REEL	
BC848B-T3R	SOT-23	TAPE REEL	
BC848C-T3R	SOT-23	TAPE REEL	

CLASSIFICATION OF h_{FE}

PART NUMBER	BC846A	BC847A	BC848A	BC846B	BC847B	BC848B	BC847C	BC848C
RANGE OF h_{FE}	110 ~ 220			200 ~ 450			420 ~ 800	
MARKING	1A	1E	1J	1B	1F	1K	1G	1L

TYPICAL PERFORMANCE CHARACTERISTICS

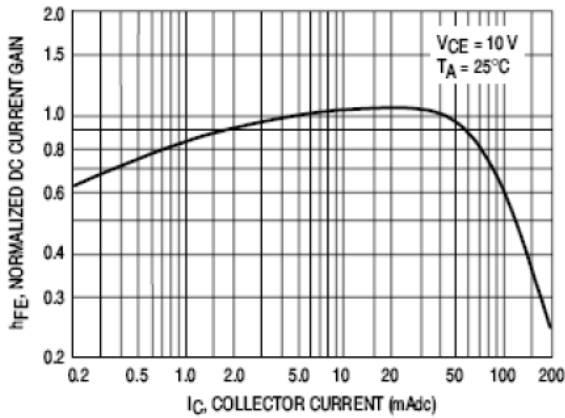


Figure 1. Normalized DC Current Gain

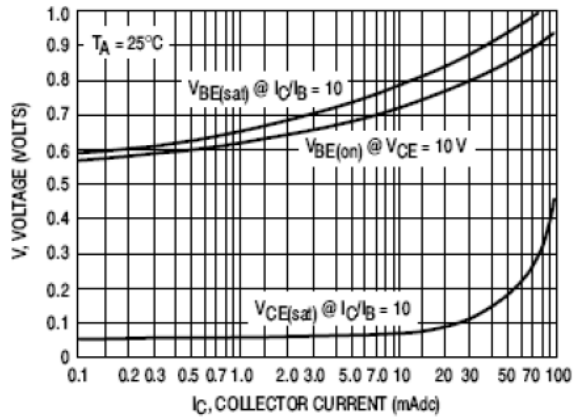


Figure 2. "Saturation" and "On" Voltages

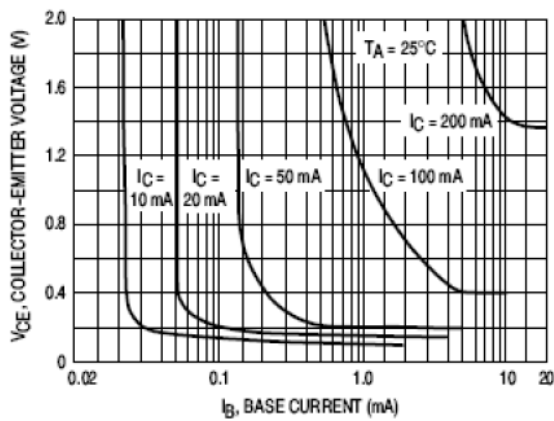


Figure 3. Collector Saturation Region

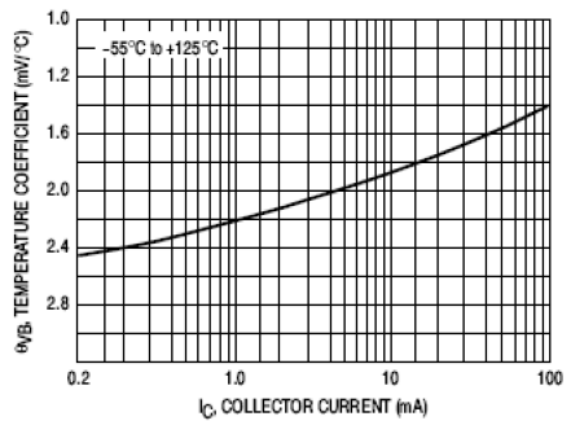


Figure 4. Base-Emitter Temperature Coefficient

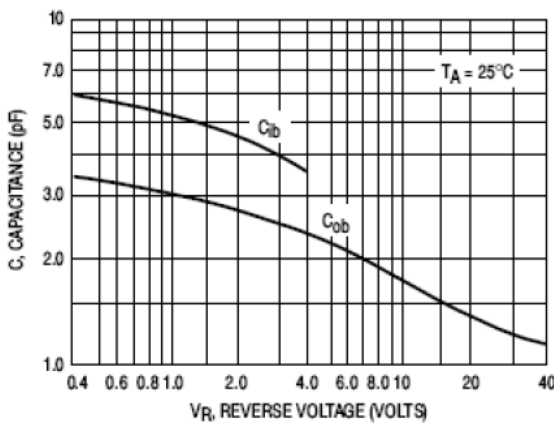


Figure 5. Capacitances

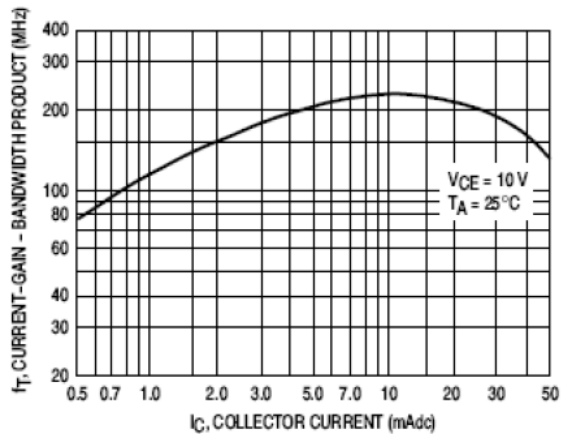
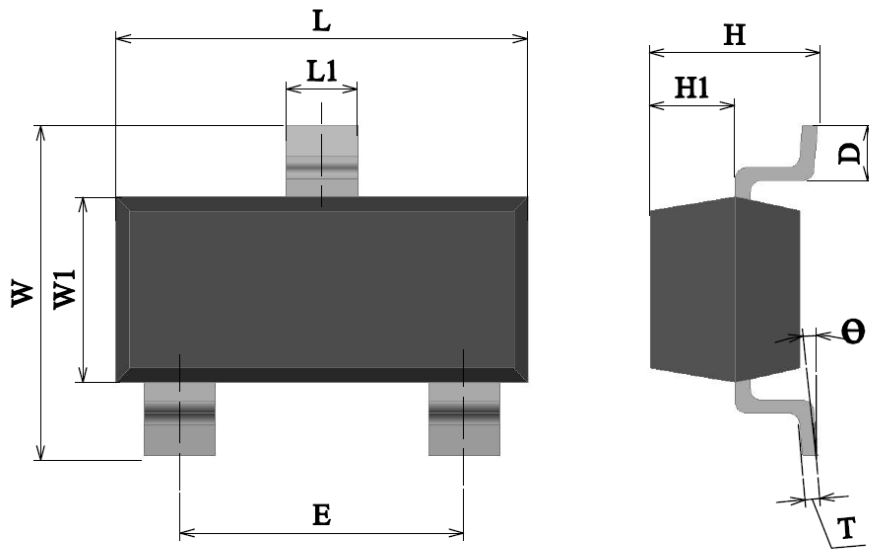


Figure 6. Current-Gain - Bandwidth Product

SOT-23 DIMENSION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
L	2.80	3.10	0.110	0.122
L1	0.30	0.50	0.012	0.020
W	2.25	2.54	0.089	0.100
W1	1.20	1.40	0.047	0.055
E	1.80	2.00	0.071	0.079
H	0.90	1.15	0.035	0.045
H1	0.40	0.80	0.016	0.031
D	0.30	0.50	0.012	0.020
T	0.08	0.15	0.003	0.006
θ	0°	8°	0°	8°