

# BC846...BC850-AH

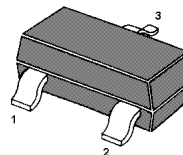
## NPN Silicon Epitaxial Planar Transistor

### Feature

- AEC-Q101 Qualified
- Halogen and Antimony Free(HAF), RoHS compliant

### Applications

- For switching and amplifier



1. Base 2. Emitter 3. Collector  
SOT-23 Plastic Package

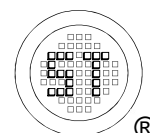
### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Value	Unit	
Collector Base Voltage	BC846	$V_{CBO}$	80	V
	BC847, BC850	$V_{CBO}$	50	V
	BC848, BC849	$V_{CBO}$	30	V
Collector Emitter Voltage	BC846	$V_{CEO}$	65	V
	BC847, BC850	$V_{CEO}$	45	V
	BC848, BC849	$V_{CEO}$	30	V
Emitter Base Voltage	BC846, BC847	$V_{EBO}$	6	V
	BC848, BC849, BC850	$V_{EBO}$	5	V
Collector Current	$I_C$	100	mA	
Peak Collector Current	$I_{CM}$	200	mA	
Power Dissipation	$P_{tot}$	300	mW	
Junction Temperature	$T_j$	150	$^\circ\text{C}$	
Storage Temperature Range	$T_{stg}$	- 65 to + 150	$^\circ\text{C}$	

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient <sup>1)</sup>	$R_{\theta JA}$	417	$^\circ\text{C/W}$

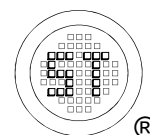
<sup>1)</sup> Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.



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## Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$	Current Gain Group A	$h_{FE}$	110	-	220	-
	B	$h_{FE}$	200	-	450	-
	C	$h_{FE}$	420	-	800	-
Collector Base Cutoff Current at $V_{CB} = 30\text{ V}$	$I_{CBO}$	-	-	15	nA	
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	BC846	$V_{(BR)CBO}$	80	-	-	V
	BC847, BC850	$V_{(BR)CBO}$	50	-	-	V
	BC848, BC849	$V_{(BR)CBO}$	30	-	-	V
Collector Emitter Breakdown Voltage at $I_C = 2\text{ mA}$	BC846	$V_{(BR)CEO}$	65	-	-	V
	BC847, BC850	$V_{(BR)CEO}$	45	-	-	V
	BC848, BC849	$V_{(BR)CEO}$	30	-	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	BC846, BC847	$V_{(BR)EBO}$	6	-	-	V
	BC848, BC849, BC850	$V_{(BR)EBO}$	5	-	-	V
Collector Emitter Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ at $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{CE(sat)}$	-	-	0.25	V	
	$V_{CE(sat)}$	-	-	0.6	V	
Base Emitter Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ at $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{BE(sat)}$	-	0.7	-	V	
	$V_{BE(sat)}$	-	-	1	V	
Base Emitter On Voltage at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$ at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	$V_{BE(on)}$	0.58	-	0.7	V	
	$V_{BE(on)}$	-	-	0.72	V	
Transition Frequency at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	-	300	-	MHz	
Collector Output Capacitance at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{ob}$	-	-	6	pF	
Input Capacitance at $V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$	$C_{ib}$	-	9	-	pF	



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## Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

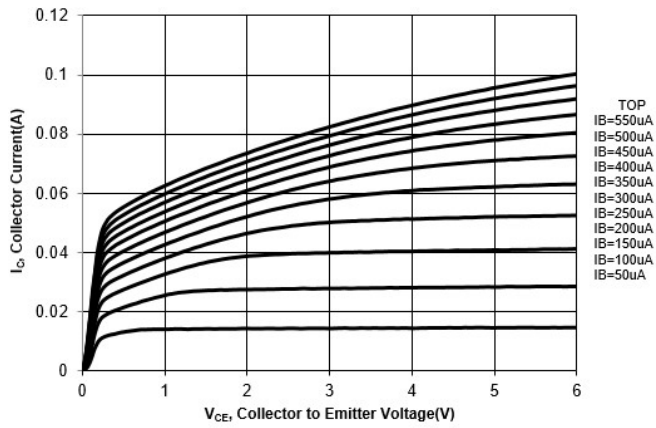


Fig. 2 Collector Current vs. Base to Emitter Voltage

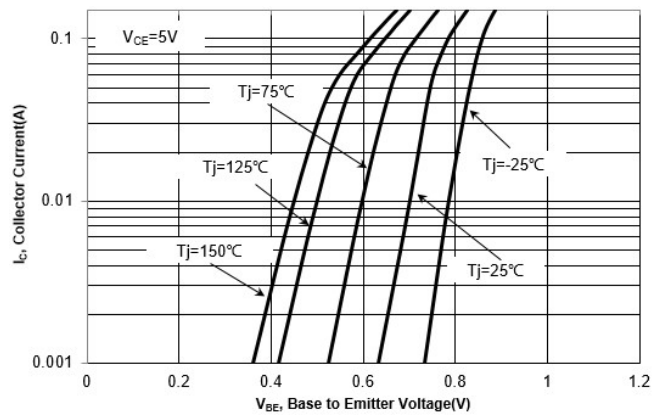


Fig. 3 DC Current Gain vs. Collector Current

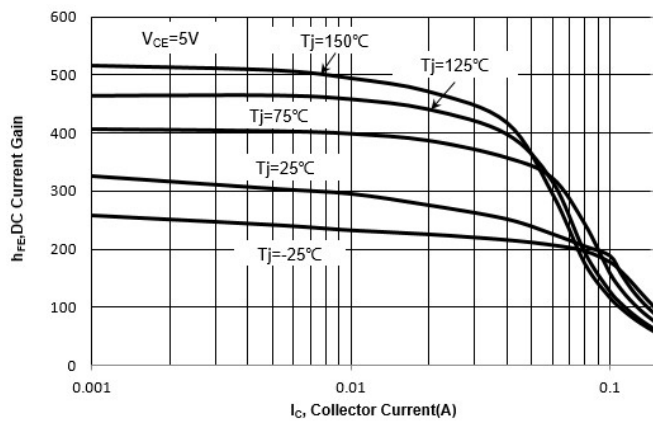
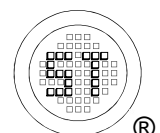
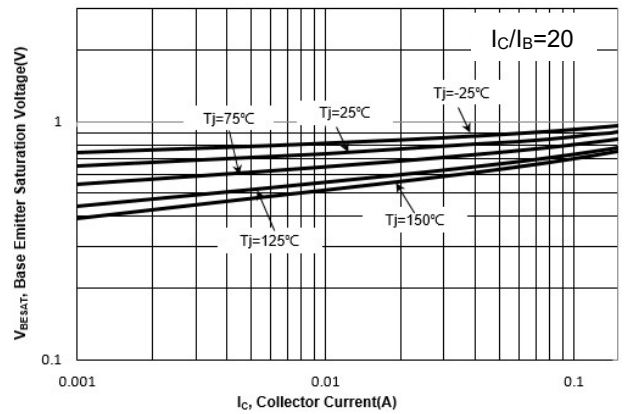


Fig. 4  $V_{BE(sat)}$  vs. Collector Current



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## Electrical Characteristics Curves

Fig. 5  $V_{CESAT}$  vs. Collector Current

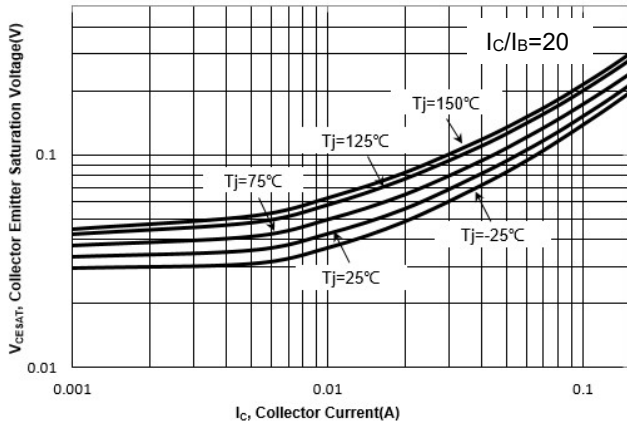


Fig. 6 Output Capacitance

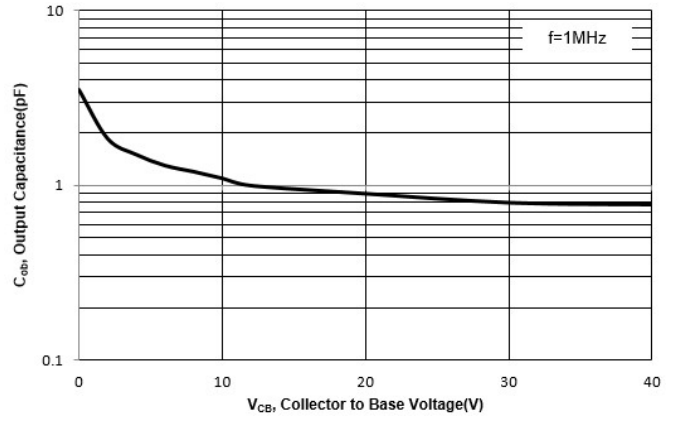
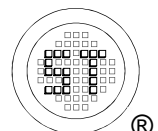
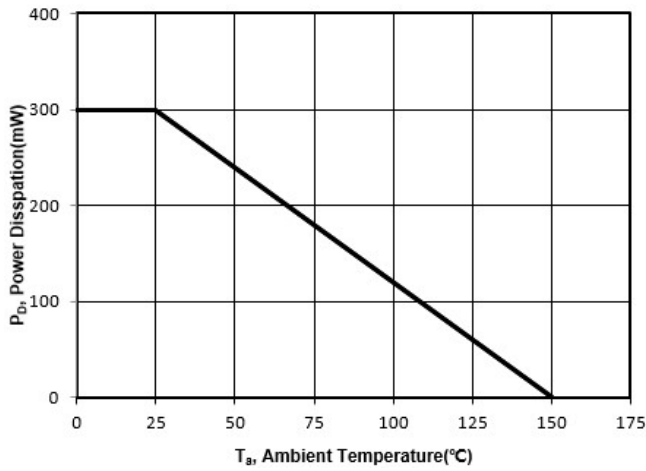


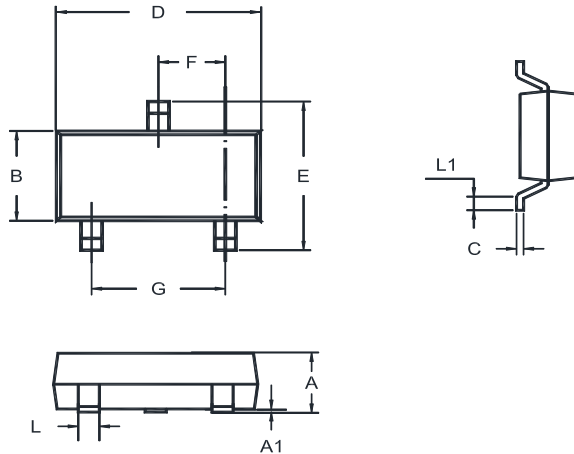
Fig. 7 Power Derating Curve



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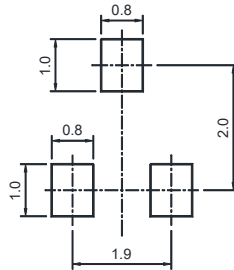
## Package Outline (Dimensions in mm)

SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20	0.100	1.40	0.19	3.04	2.6	1.02	2.04	0.51	0.2
	0.89	0.013	1.20	0.08	2.80	2.2	0.89	1.78	0.37	MIN

## Recommended Soldering Footprint



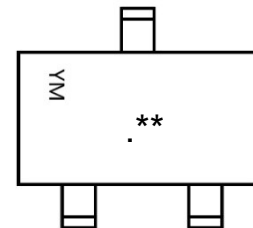
## Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

## Marking information

"\*\*" = Part No.

Type	Marking	Type	Marking
BC846A	1A	BC847A~ BC850A	1E
BC846B	1B	BC847B~ BC850B	1F
BC846C	1C	BC847C~ BC850C	1G



"•" = HAF (Halogen and Antimony Free)

"YM" = Date Code Marking

"Y" = Year

"M" = Month

Font type: Arial

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