

Features

- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings @ 25°C Unless Otherwise Specified

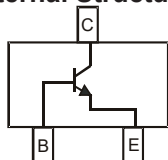
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 625°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}		V
BC846A-BC846C		80	
BC847A-BC847C		50	
BC848A-BC848C, BC849B-BC849C		30	
Collector-Emitter Voltage	V_{CEO}		V
BC846A-BC846C		65	
BC847A-BC847C		45	
BC848A-BC848C, BC849B-BC849C		30	
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	100	mA
Collector Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 2)	P_C	200	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

2. Transistor mounted on an FR4 printed-circuit board

Internal Structure

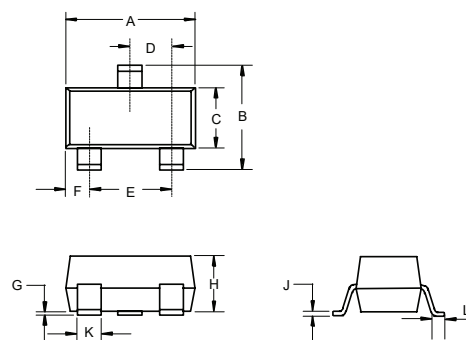


Marking:

BC846A:1A; BC846B:1B; BC846C:1C;
BC847A:1E; BC847B:1F; BC847C:1G;
BC848A:1J; BC848B:1K; BC848C:1L;
BC849B:49B; BC849C:49C;

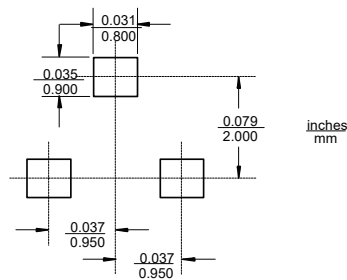
NPN Plastic-Encapsulate Transistors

SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.014	0.020	0.35	0.51	
L	0.007	0.020	0.20	0.50	

Suggested Solder Pad Layout



Electrical Characteristics @ $T_A=25^\circ\text{C}$ Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$					
BC846A-BC846C		80			V	$I_C=10\mu\text{A}$, $I_E=0$
BC847A-BC847C		50				
BC848A-BC848C, BC849B-BC849C		30				
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$					
BC846A-BC846C		65			V	$I_C=10\text{mA}$, $I_B=0$
BC847A-BC847C		45				
BC848A-BC848C, BC849B-BC849C		30				
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E=10\mu\text{A}$, $I_C=0$
Collector Cut-off Current	I_{CBO}					
BC846A-BC846C				0.1	μA	$V_{CB}=70\text{V}$, $I_E=0$
BC847A-BC847C						$V_{CB}=50\text{V}$, $I_E=0$
BC848A-BC848C, BC849B-BC849C						$V_{CB}=30\text{V}$, $I_E=0$
Emitter Cutoff Current	I_{CEO}					
BC846A-BC846C				0.1	μA	$V_{CE}=60\text{V}$, $I_B=0$
BC847A-BC847C						$V_{CE}=45\text{V}$, $I_B=0$
BC848A-BC848C, BC849B-BC849C						$V_{CE}=30\text{V}$, $I_B=0$
Emitter Cutoff Current	I_{EBO}			0.1	μA	$V_{EB}=5\text{V}$, $I_C=0$
DC Current Gain	$h_{FE(1)}$		180			$V_{CE}=5\text{V}$, $I_C=10\mu\text{A}$
BC846A/BC847A/BC848A			280			
BC846B/BC847B/BC848B/BC849B			400			
DC Current Gain	$h_{FE(2)}$					$V_{CE}=5\text{V}$, $I_C=2\text{mA}$
BC846A/BC847A/BC848A		110		220		
BC846B/BC847B/BC848B/BC849B		200		450		
BC846C/BC847C/BC848C/BC849C		420		800		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.25	V	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$
				0.5	V	$I_C=100\text{mA}$, $I_B=5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.7		V	$I_C=10\text{mA}$, $I_B=0.5\text{mA}$
			0.9	1.1	V	$I_C=100\text{mA}$, $I_B=5\text{mA}$
Base-Emitter On Voltage	$V_{BE(on)}$	0.58	0.66	0.7	V	$V_{CE}=5\text{V}$, $I_C=2\text{mA}$
				0.77	V	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$
Transition Frequency	f_T	100			MHz	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$, $f=100\text{MHz}$
Collector Output Capacitance	C_{ob}			4.5	pF	$V_{CB}=10\text{V}$, $I_E=0$, $f=0.1\text{MHz}$
Noise Figure	NF			10	dB	$I_C=0.2\text{mA}$, $V_{CE}=5.0\text{V}$, $R_S=2.0\text{k}\Omega$, $f=1.0\text{kHz}$, $BW=200\text{Hz}$

Curve Characteristics

Fig. 1 - Static Characteristics

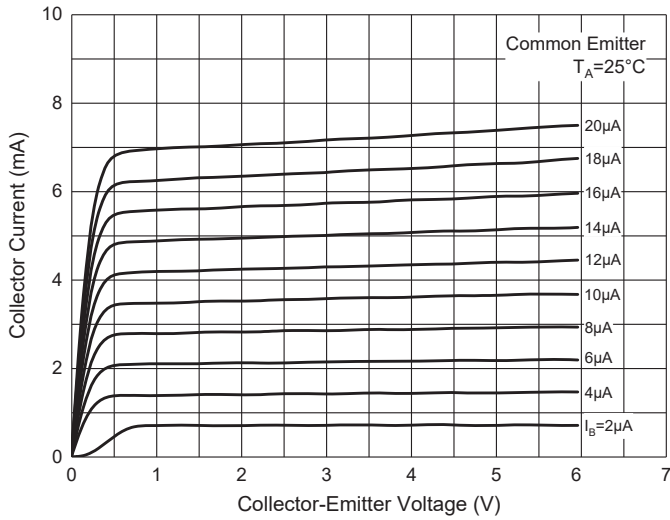


Fig. 2 - DC Current Gain Characteristics

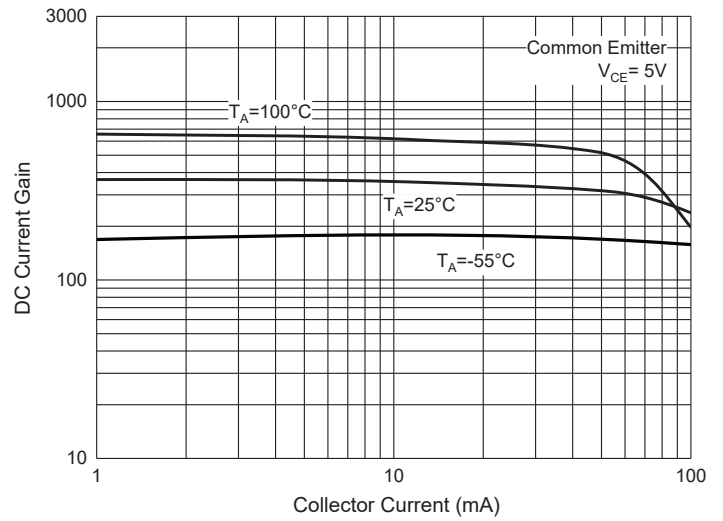


Fig. 3 - Base-Emitter Saturation Voltage Characteristics

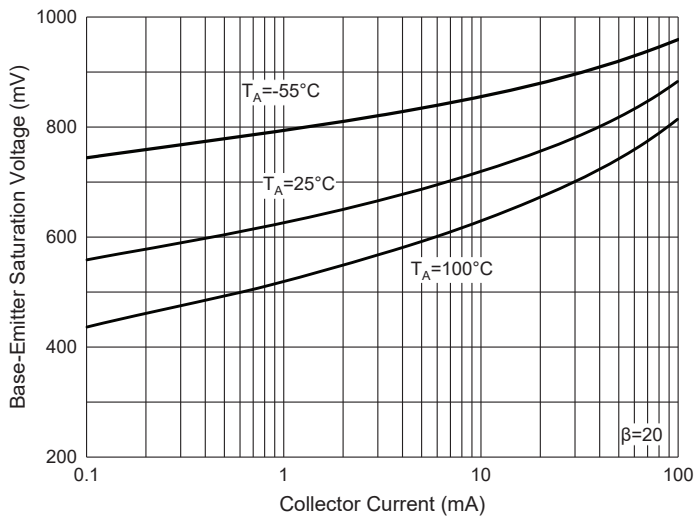


Fig. 4 - Collector-Emitter Saturation Voltage Characteristics

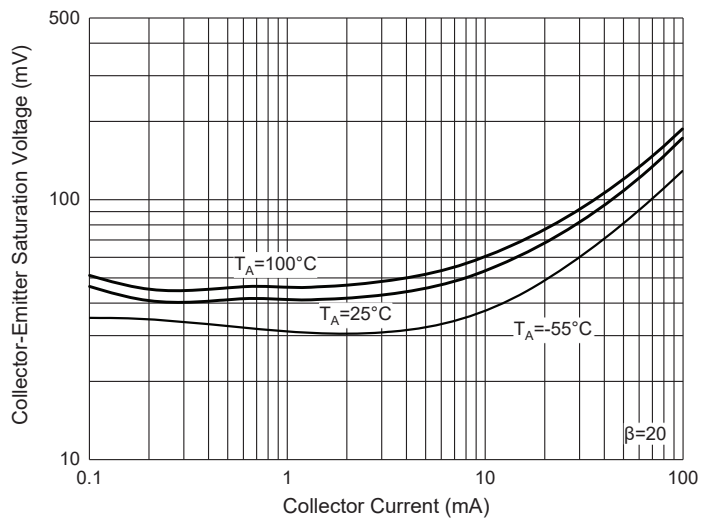


Fig. 5 - Base-Emitter Voltage Characteristics

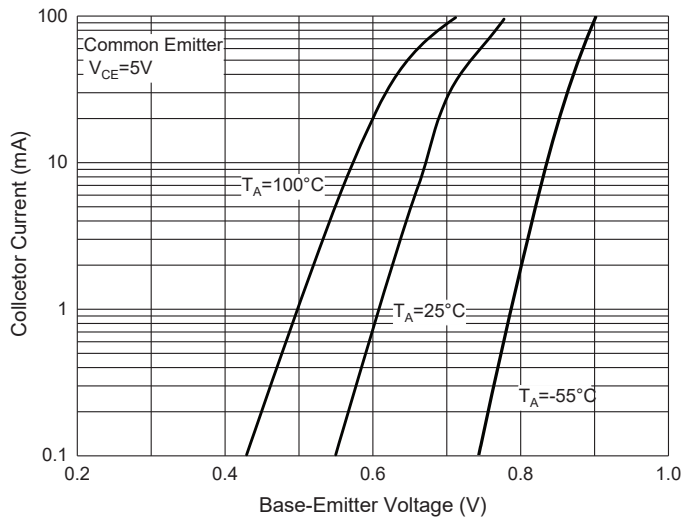
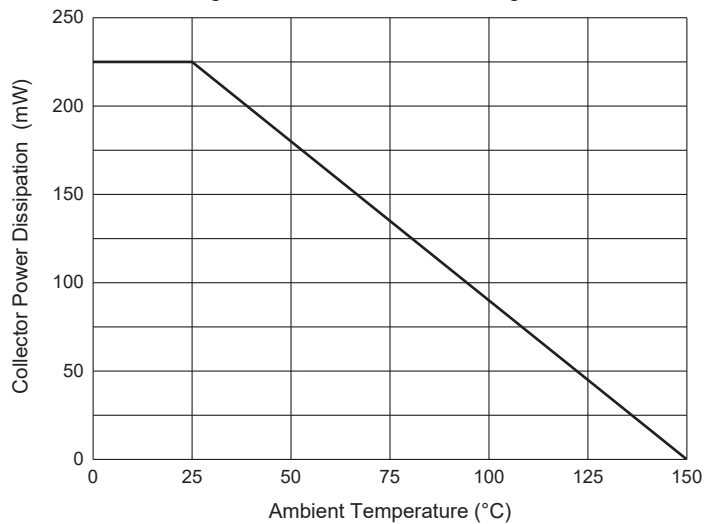
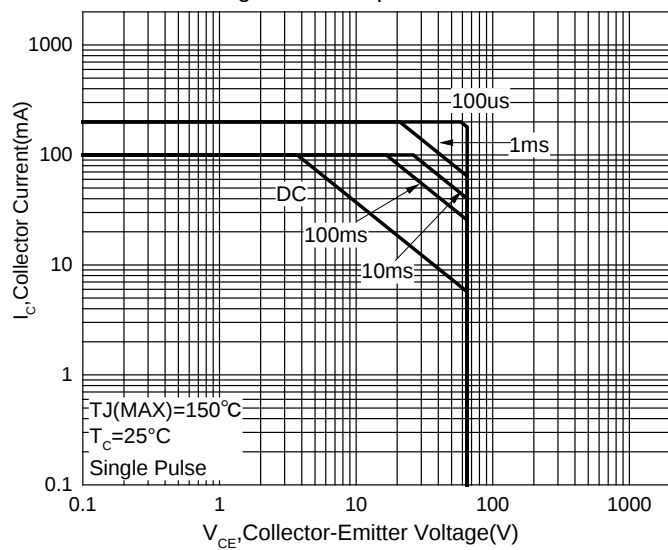


Fig. 6 - Collector Power Derating Curve



Curve Characteristics

Fig. 7 - Safe Operation Area



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel
Part Number-13P	Tape&Reel:10Kpcs/Reel

For packaging details, go to our website at https://www.mccsemi.com/pdf/productpackaging/SOT-23_Package_Rev.I_.pdf

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