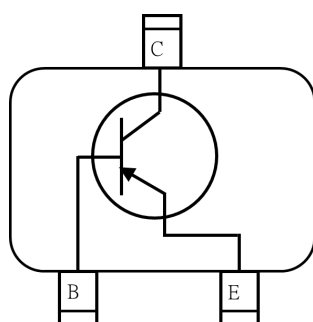
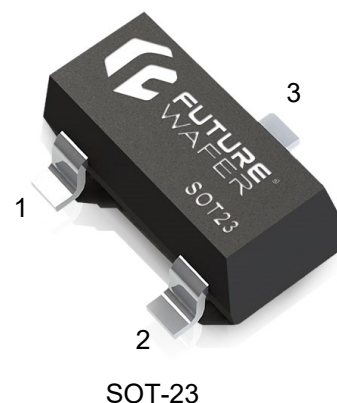


1. Features List

- Complementary PNP types available
- For switching and AF Amplifier applications
- Totally Lead-Free

2. Mechanical Characteristics

- Molded JEDEC SOT-23 Package
- Packaging: Tape and Reel
- Flammability rating UL 94V-0
- Halogen Free



Pin 1 : Base
Pin 2 : Emitter
Pin 3 : Collector



3. Device Characteristics

Maximum Ratings@25°C Unless Otherwise Specified

Parameter		Symbol	Value	Units
Collector Base Voltage	BC856	V_{CBO}	-80	V dc
	BC857		-50	
	BC858		-30	
Collector Emitter Voltage	BC856	V_{CEO}	-65	
	BC857		-45	
	BC858		-30	
Emitter Base Voltage	BC856	V_{EBO}	-6.0	
	BC857		-6.0	
	BC858		-5.0	
Collector Current		I_C	-100	mAdc
Total Device Dissipation FR-5 Board		P_D	-200	mW
Junction Temperature		T_J	-55 to 150	°C
Storage Temperature		T_{STG}		

4. Electrical Characteristics (TA=25 °C unless otherwise noted)

Parameter		Symbol	Min.	Typ.	Max.	Units
Collector-Emitter Breakdown Voltage $I_C = -10\text{mA}$	BC856	V_{BR-CEO}	-65	-	-	V
	BC857		-45	-	-	
	BC858		-30	-	-	
Emitter-Base Breakdown Voltage $I_E = -1.0\mu\text{A}$	BC856	V_{BR-EBO}	-6	-	-	
	BC857		-6	-	-	
	BC858		-5	-	-	
Collector-Base Breakdown Voltage $I_C = -10\mu\text{A}$	BC856	V_{BR-CBO}	-80	-	-	
	BC857		-50	-	-	
	BC858		-30	-	-	
Collector-Base Cutoff Current $V_{CB} = 30\text{V}, T_A = 25^\circ\text{C}$		I_{CBO}	-	-	-15	nA
Emitter-Base Cutoff Current $V_{CB} = 30\text{V}, T_A = 25^\circ\text{C}$		I_{EBO}	-	-	-100	

5. On Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units
DC Current Gain $I_C = -2.0\text{mA}, V_{CE} = -5.0\text{V}$	BC856A	h_{FE}	125	-	250	
	BC857A					
	BC858A					
	BC856B	h_{FE}	200	-	450	
	BC857B					
	BC858B					
	BC856C	h_{FE}	420	-	800	
	BC857C					
	BC858C					
Collector-Emitter Saturation Voltage, $I_C = -10\text{mA}, I_B = -0.5\text{mA}$		$V_{CE(sat)}$	-	-	-0.30	V
Collector-Emitter Saturation Voltage, $I_C = -100\text{mA}, I_B = -5.0\text{mA}$			-	-	-0.65	
Base-Emitter Voltage, $I_C = 2\text{mA}, V_{CE} = 5\text{V}$		$V_{BE(ON)}$	0.6	-	0.75	
Base-Emitter Voltage, $I_C = 10\text{mA}, V_{CE} = 5\text{V}$			-	-	0.82	

6. Small Signal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Current Gain Bandwidth Product $I_C = -10\text{mA}, V_{CE} = -5.0\text{V}, f = 100\text{MHz}$	f_T	100	-	-	Mhz
Output Capacitance $V_{CB} = -10\text{V}, f = 1.0\text{Mhz}$	C_{ob}	-	-	6	pF

7. Rating and Characteristic Curve

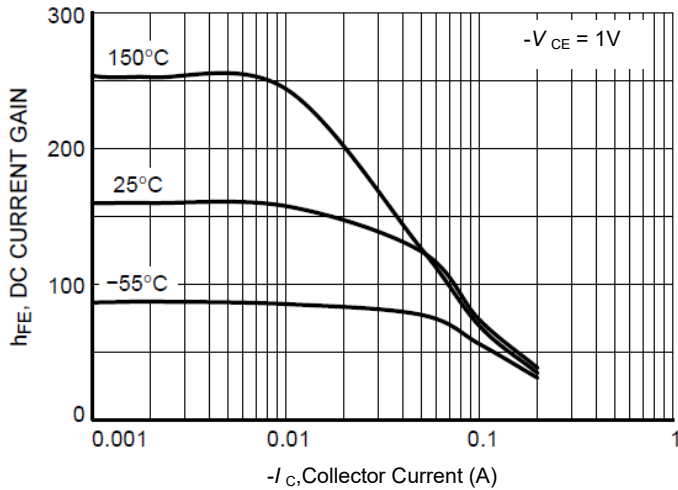


Figure 1. DC Current Gain vs. Collector Current

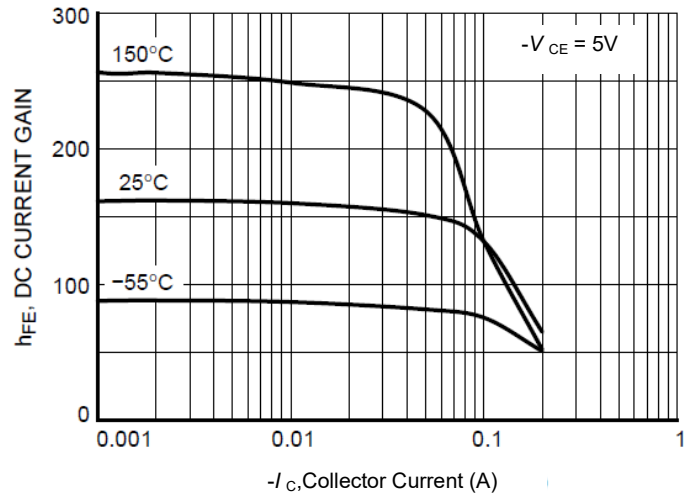


Figure 2. DC Current Gain vs. Collector Current

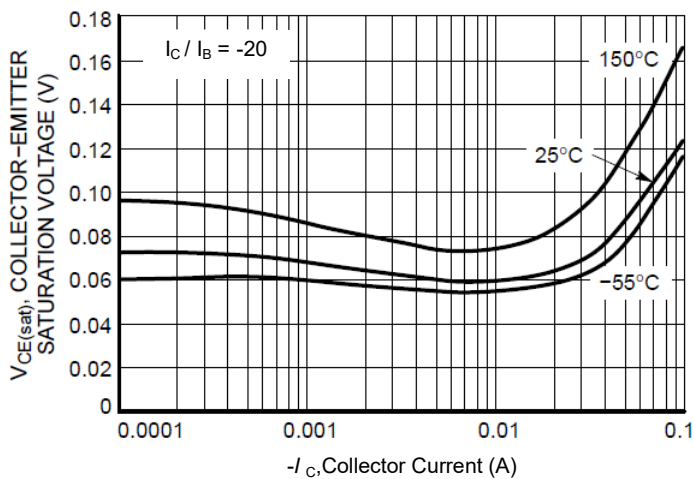


Figure 3. Collector Emitter Saturation Voltage vs. Collector Current

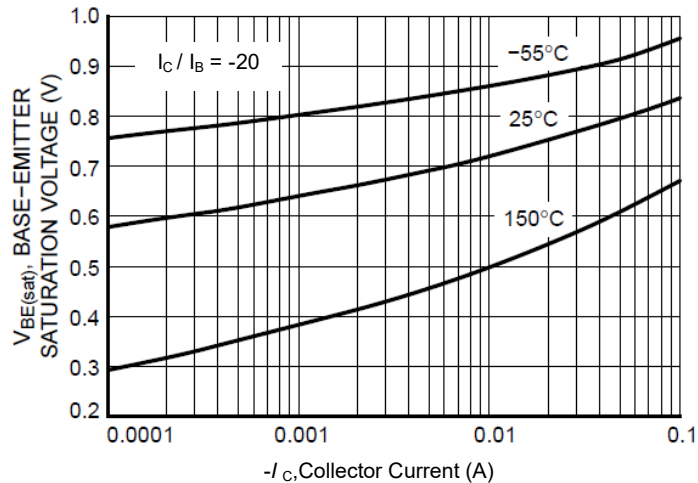


Figure 4. Base Emitter Saturation Voltage vs. Collector Current

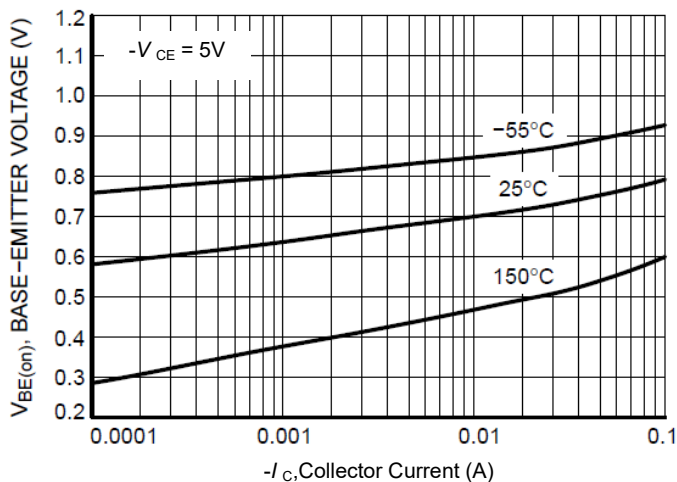


Figure 5. Base Emitter Voltage vs. Collector Current

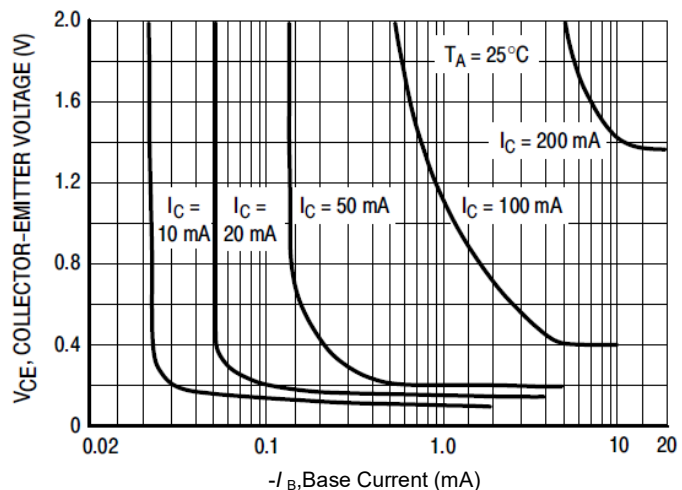


Figure 6. Collector Saturation Region

7. Rating and characteristic curve

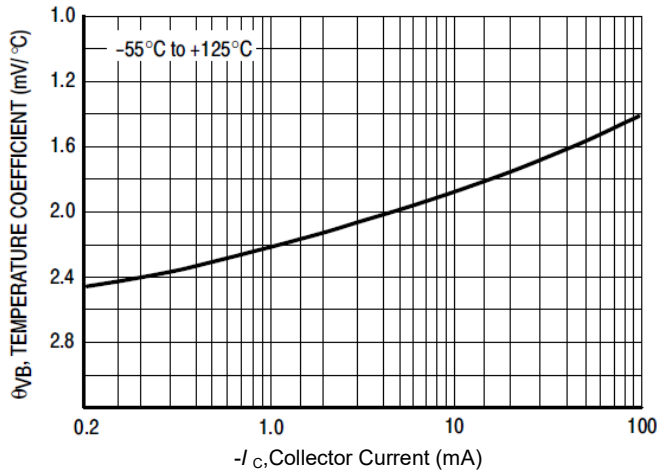


Figure 7. Base-Emitter Temperature Coefficient

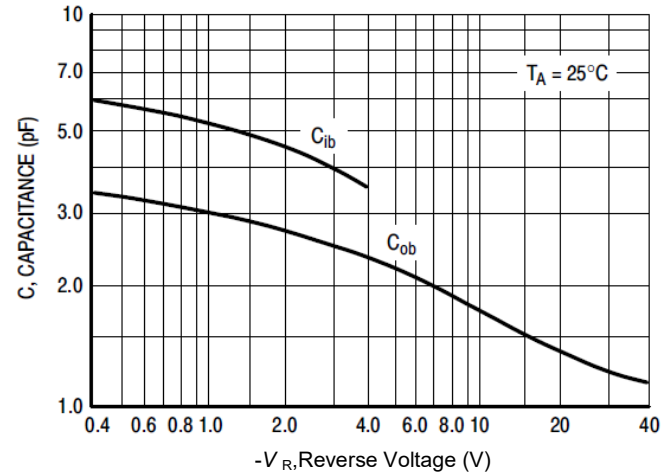


Figure 8. Capacitances

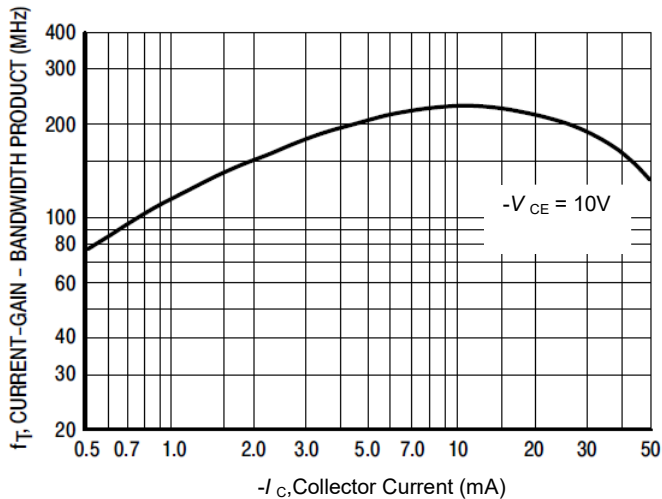


Figure 9. Current-Gain - Bandwidth Product

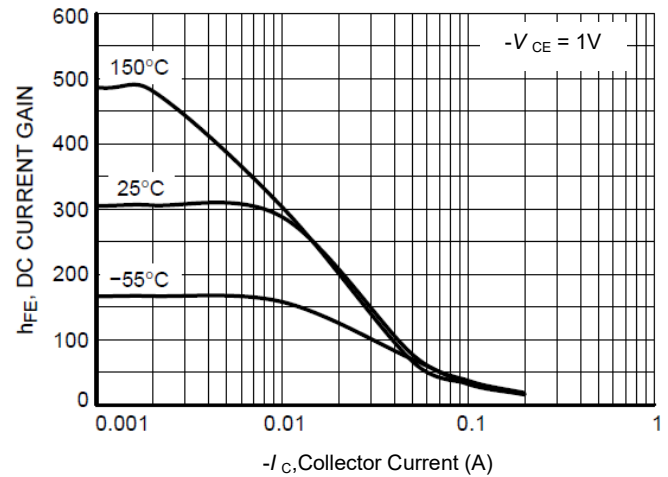


Figure 10. DC Current Gain vs. Collector Current

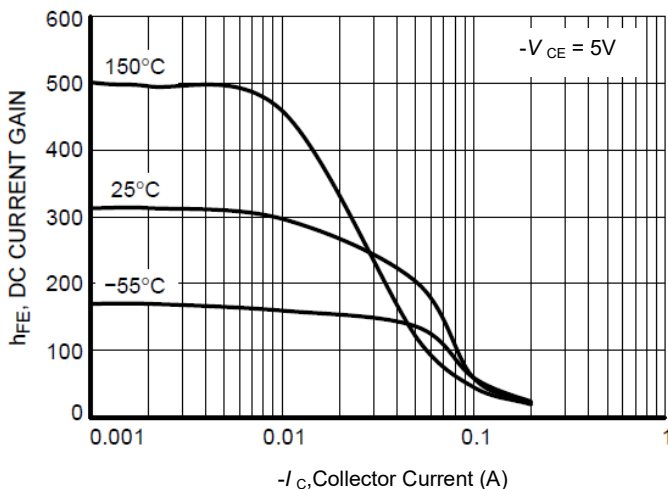


Figure 11. DC Current Gain vs. Collector Current

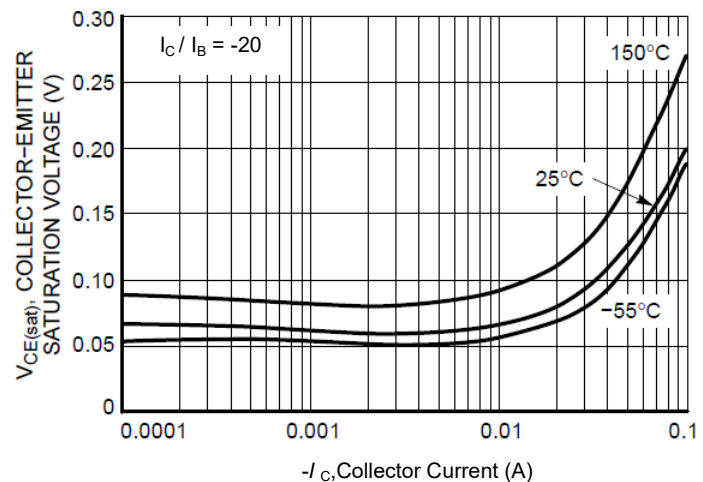


Figure 12. Collector Emitter Saturation Voltage vs. Collector Current

7. Rating and Characteristic Curve

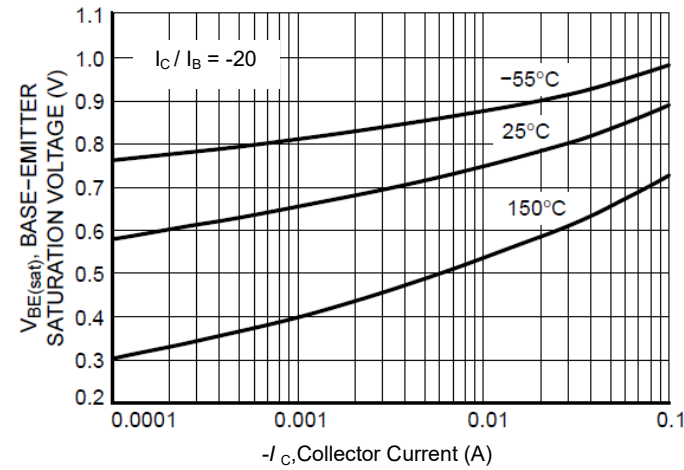


Figure 13. Base-Emitter Saturation Voltage vs. Collector Current

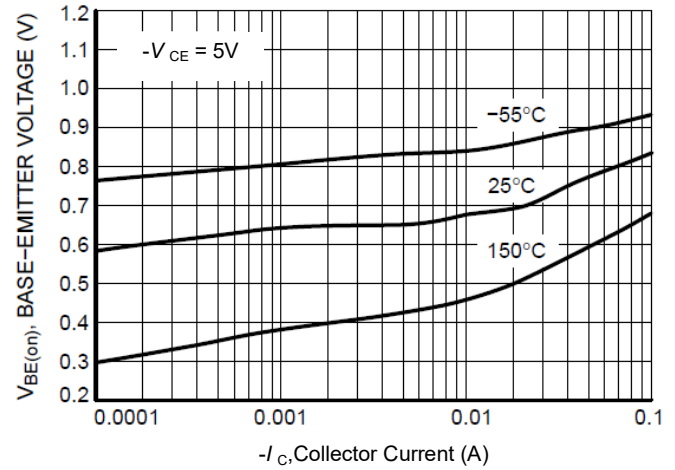


Figure 14. Base-Emitter Voltage vs. Collector Current

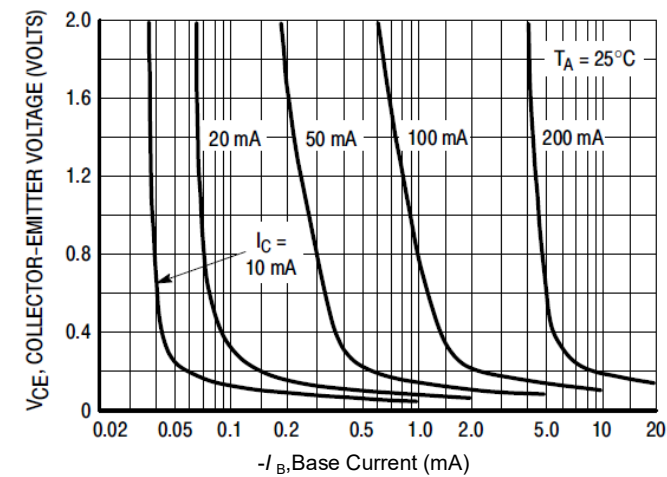


Figure 15. Collector Saturation Region

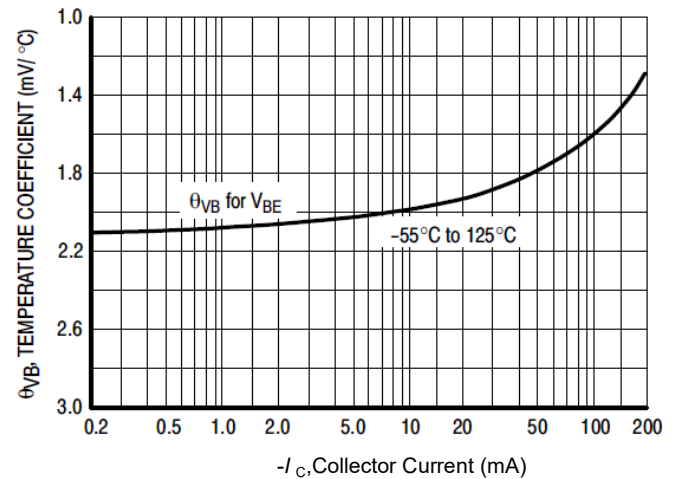


Figure 16. Base-Emitter Temperature Coefficient

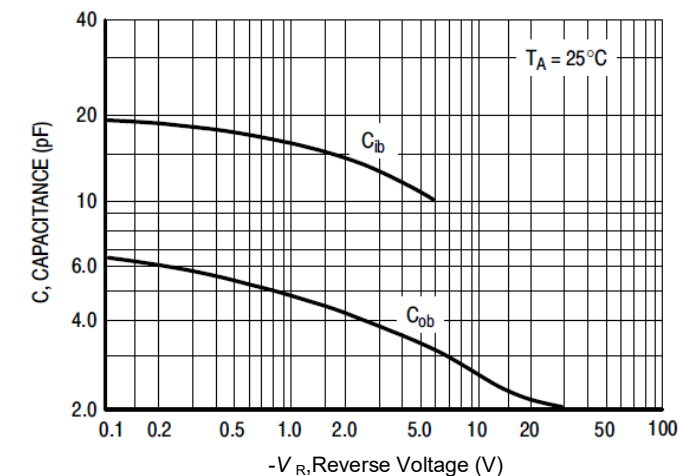


Figure 17. Capacitance

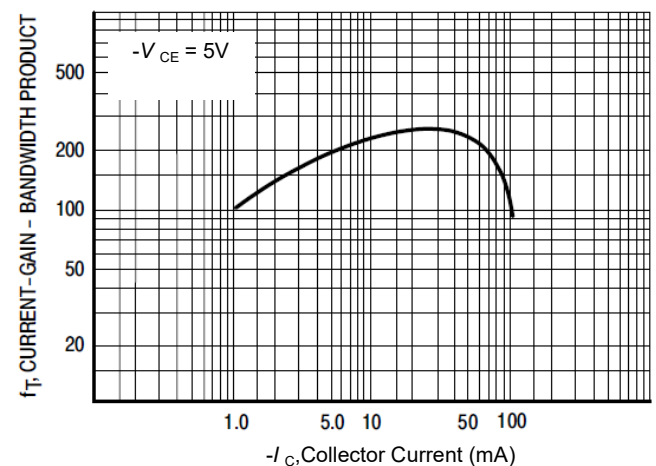


Figure 18. Current-Gain - Bandwidth Product

7. Rating and Characteristic Curve

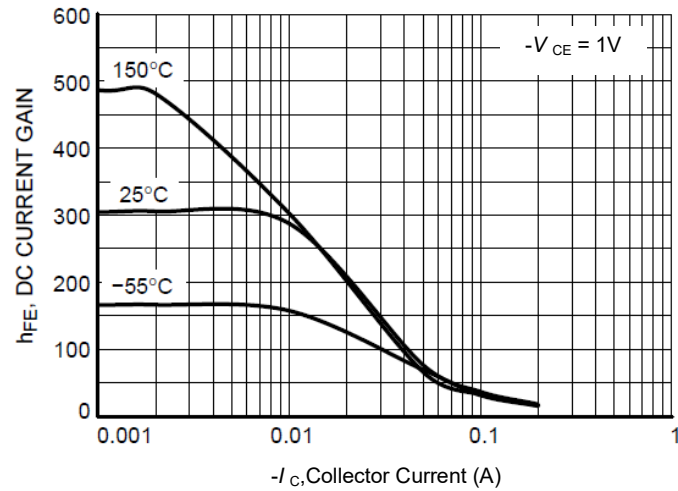


Figure 19. DC Current Gain vs. Collector Current

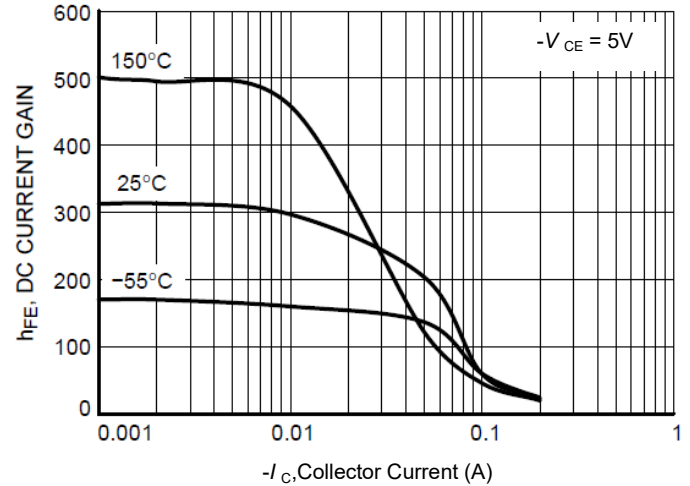


Figure 20. DC Current Gain vs. Collector Current

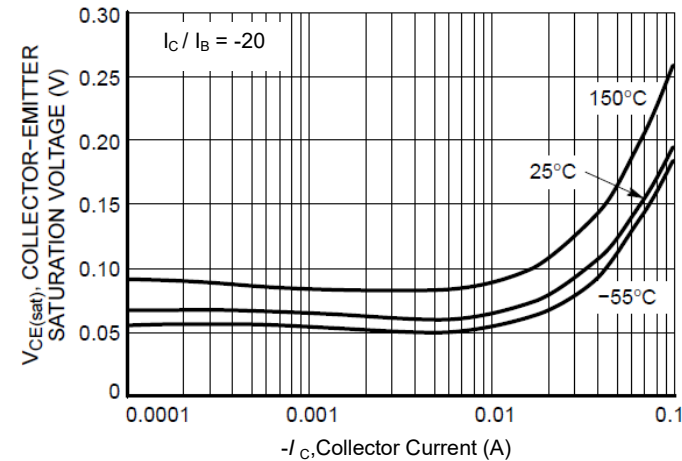


Figure 21. Collector Emitter Saturation Voltage vs. Collector Current

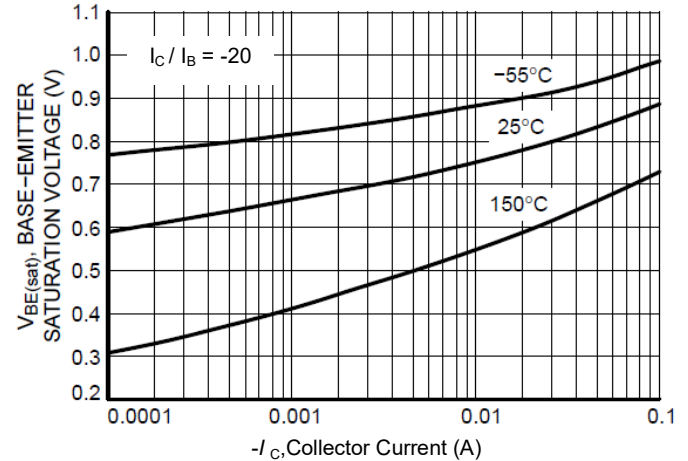


Figure 22. Base Emitter Saturation Voltage vs. Collector Current

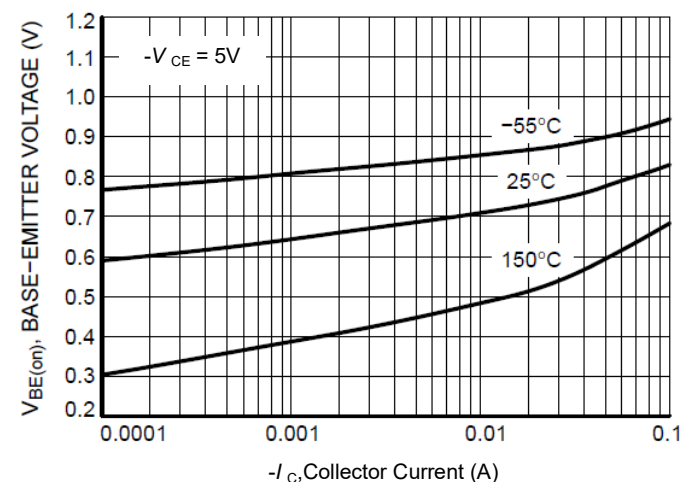


Figure 23. Base Emitter Voltage vs. Collector Current

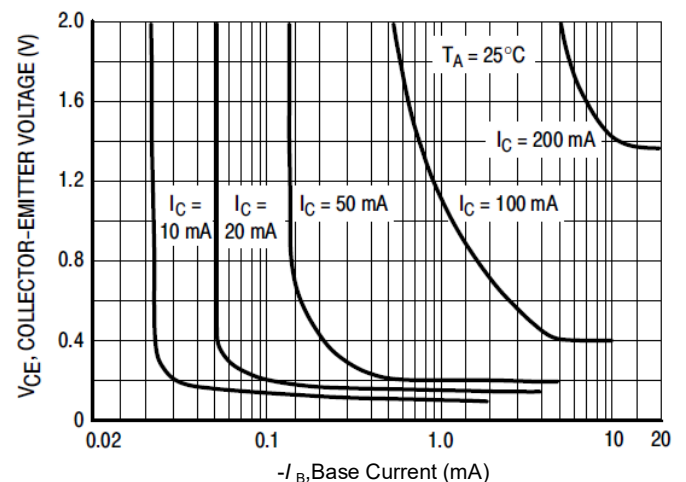


Figure 24. Collector Saturation Region

7. Rating and Characteristic Curve

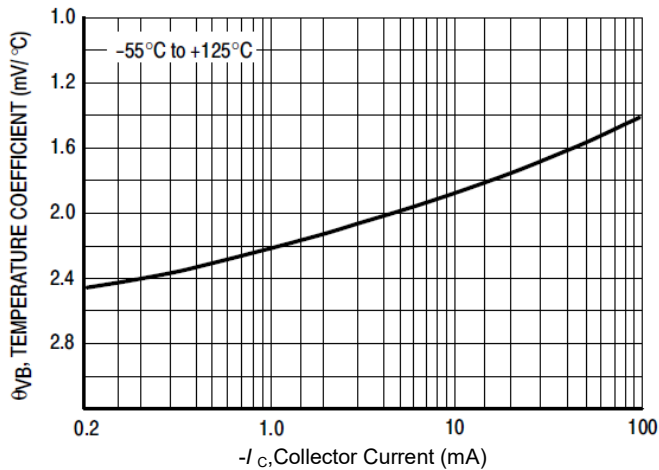


Figure 25. Base-Emitter Temperature Coefficient

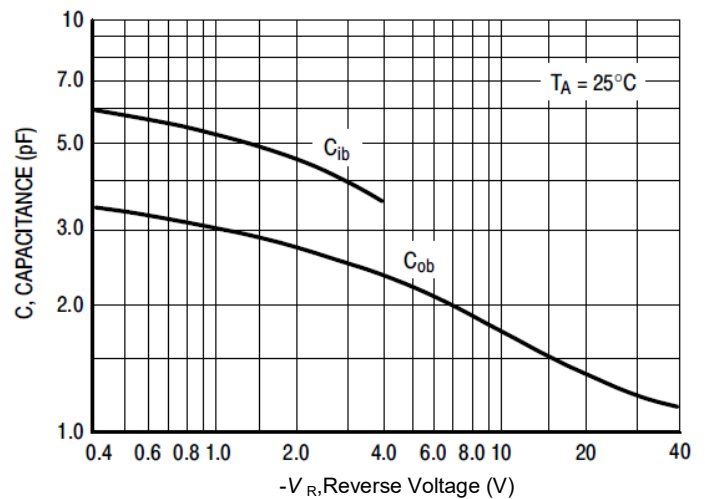


Figure 26. Capacitances

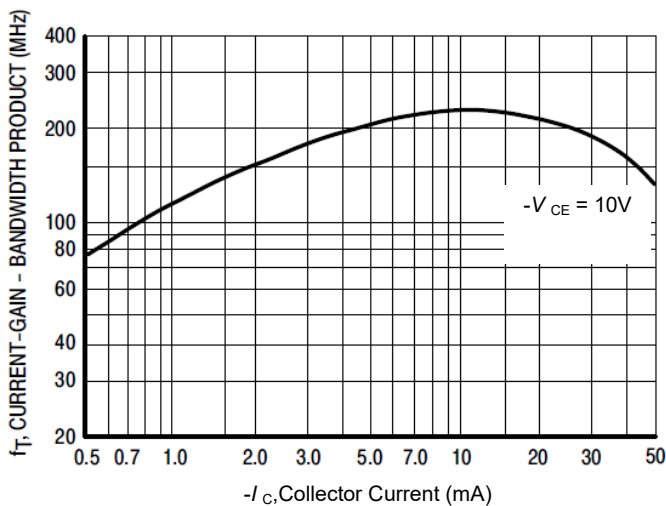


Figure 27. Current-Gain - Bandwidth Product

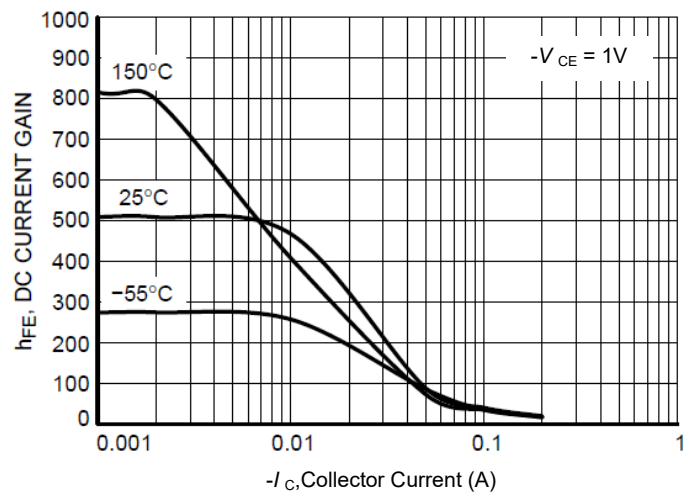


Figure 28. DC Current Gain vs. Collector Current

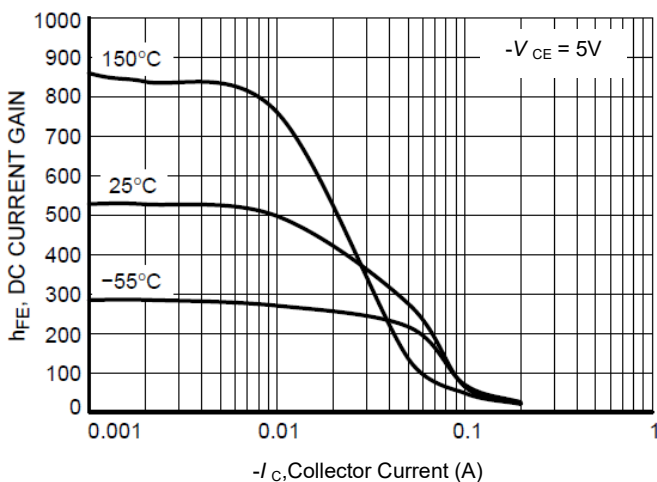


Figure 29. DC Current Gain vs. Collector Current

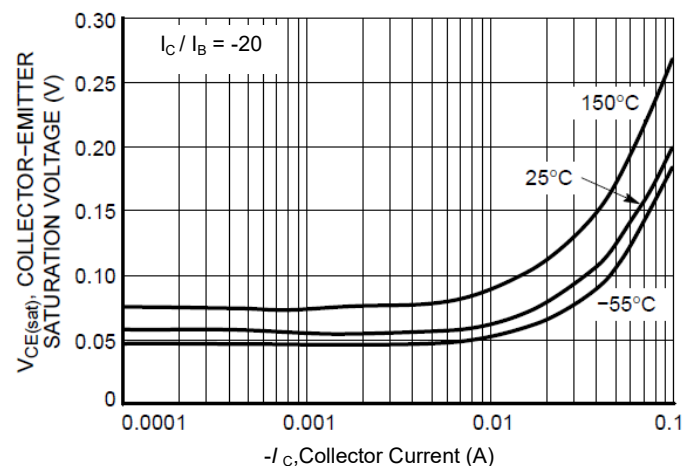


Figure 30. Collector Emitter Saturation Voltage vs. Collector Current

7. Rating and Characteristic Curve

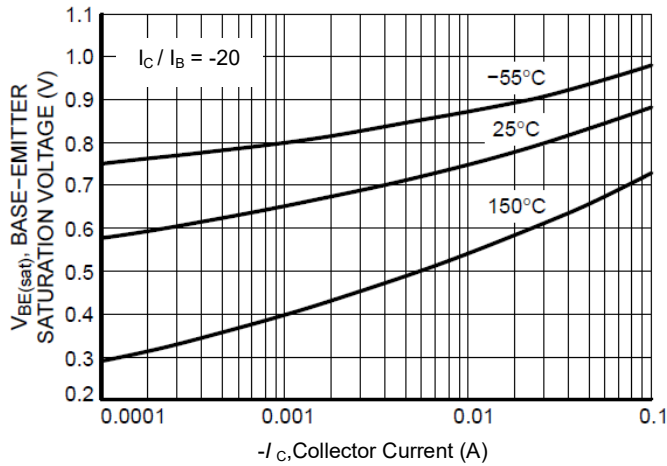


Figure 31. Base Emitter Saturation Voltage vs. Collector Current

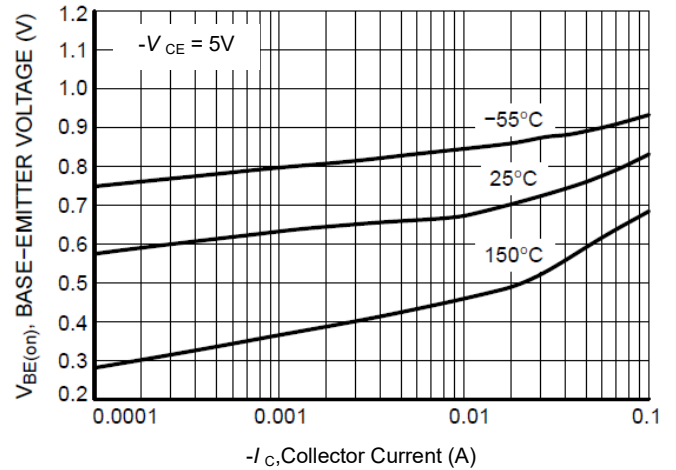


Figure 32. Base Emitter Voltage vs. Collector Current

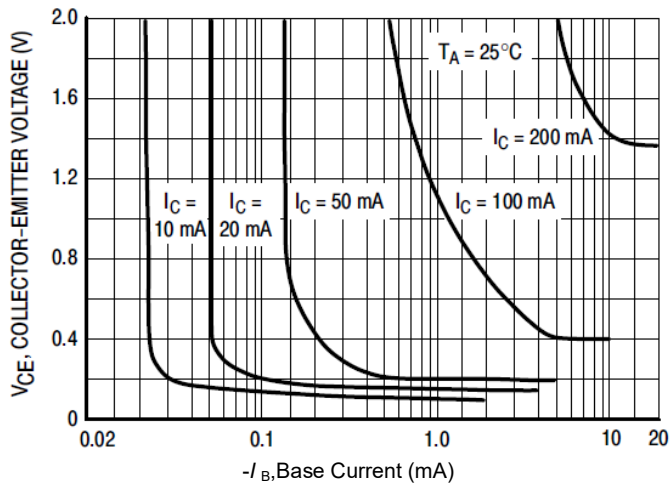


Figure 33. Collector Saturation Region

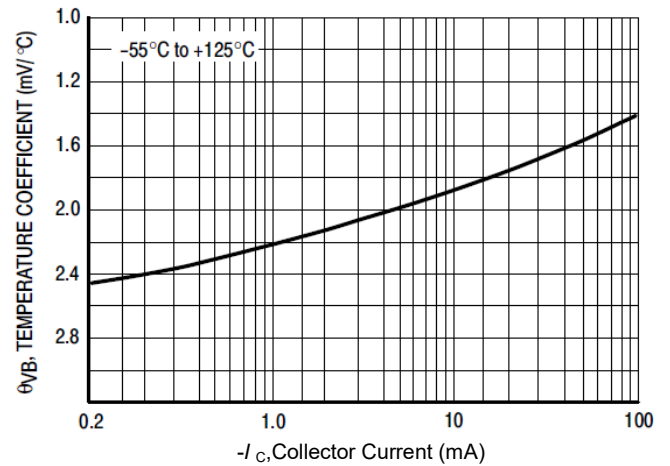


Figure 34. Base-Emitter Temperature Coefficient

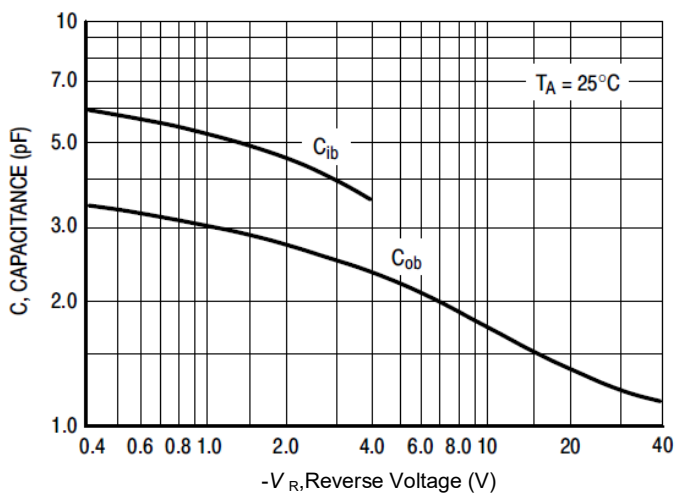


Figure 35. Capacitances

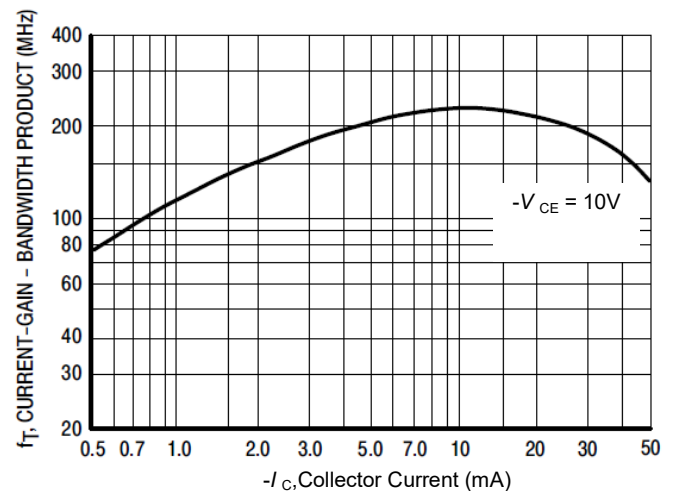


Figure 36. Current-Gain - Bandwidth Product

7. Rating and Characteristic Curve

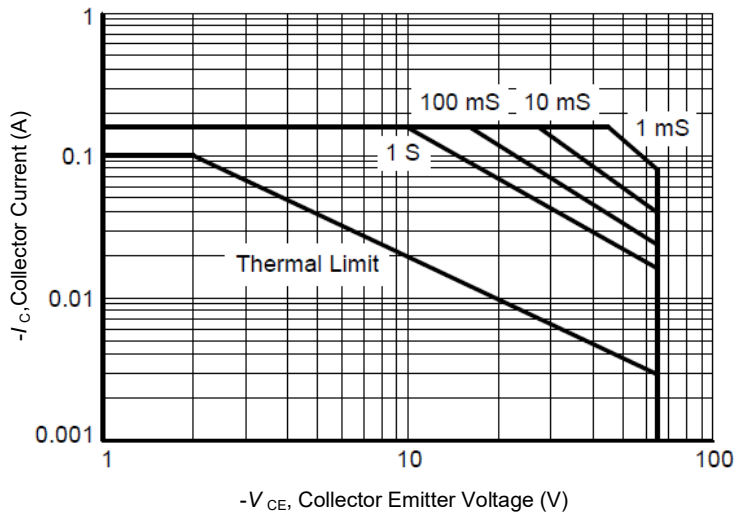


Figure 37. Safe Operating Area for BC856A/B/C

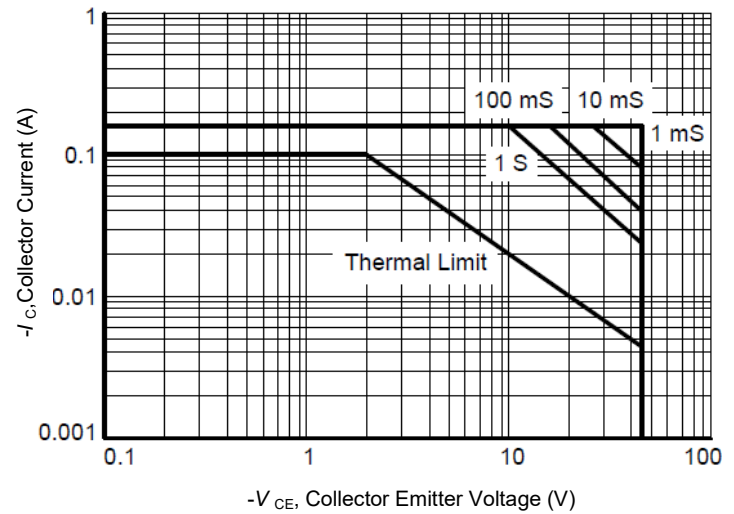


Figure 38. Safe Operating Area for BC857A/B/C

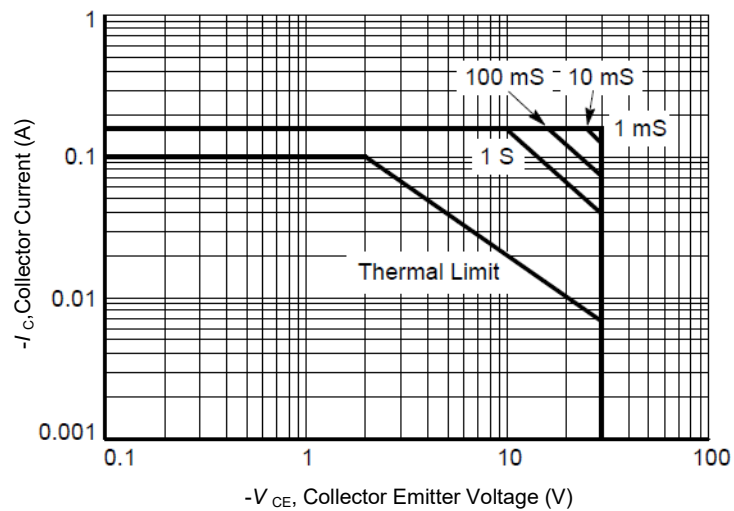
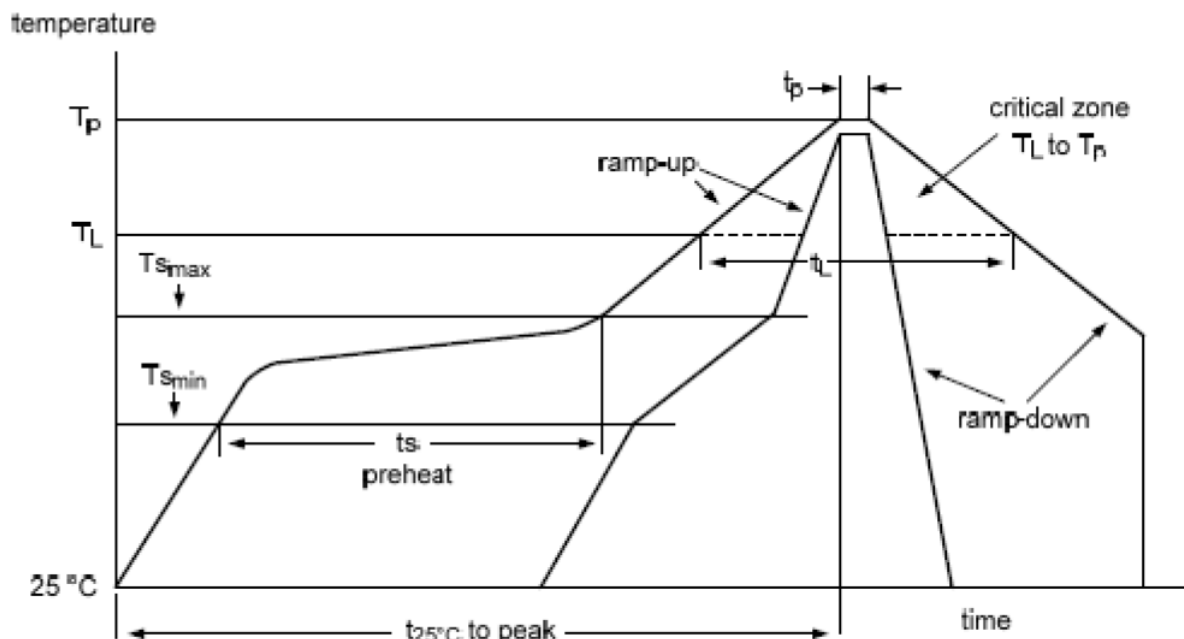


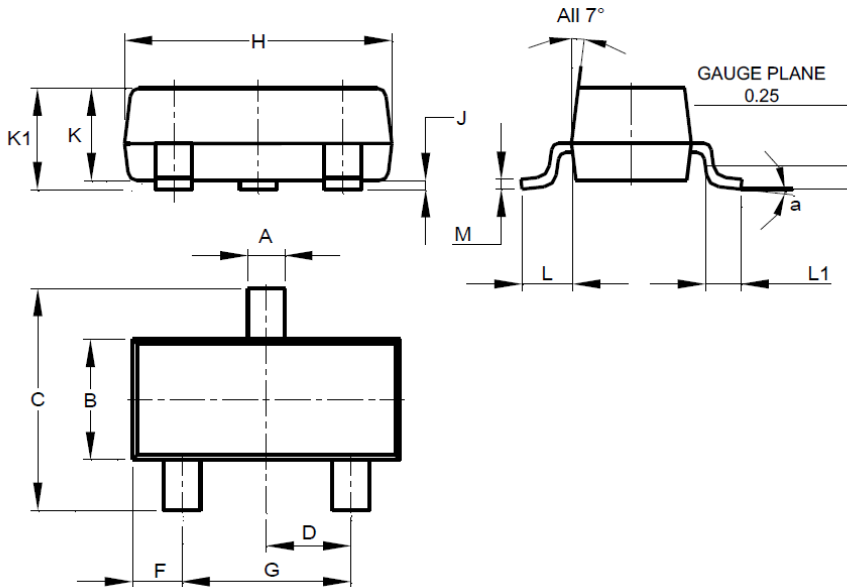
Figure 39. Safe Operating Area for BC858A/B/C

8. Soldering Parameters

Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T _{smax} to T _p)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (T _{smin})	100 °C	150 °C
Temperature maximum (T _{smax})	150 °C	200 °C
Time (t _{smin} to t _{smax})	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T _L)	183 °C	217 °C
Time (t _L)	60 s to 150 s	60 s to 150 s
Peak/classification temperature (T)	235 °C	260 °C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (t _p)	10 s to 30 s	20 s to 40 s
Ramp-down rate	6 °C/s maximum	6 °C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum



9. Package Information-SOT-23

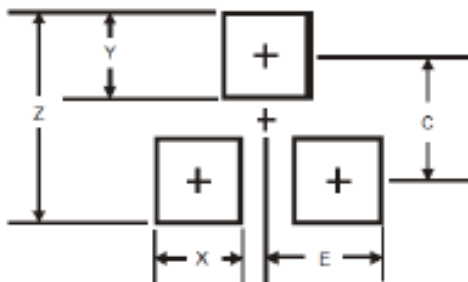


SOT-23

Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°C		

Dimension in mm

10. Suggest Pad Layout-SOT-23



Dimension	Millimeter
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

11. Ordering Information

Part No.	Marking	Package Type	Shipping
BC856A	3A	SOT-23	3,000PCS/Tape @Reel
BC856B	3B		
BC856C	3C		
BC857A	3E		
BC857B	3F		
BC857C	3G		
BC858A	3E		
BC858B	3F		
BC858C	3G		

12. History

Version	Date	File No.	Recording	Basis
A	10-Jul-2018	F51841P	New Create	Market
B	03-Apr-2019		Update Company Information	System
2.0	21-May-2021		Update Version	System