

BC807-16/BC807-25/BC807-40**List**

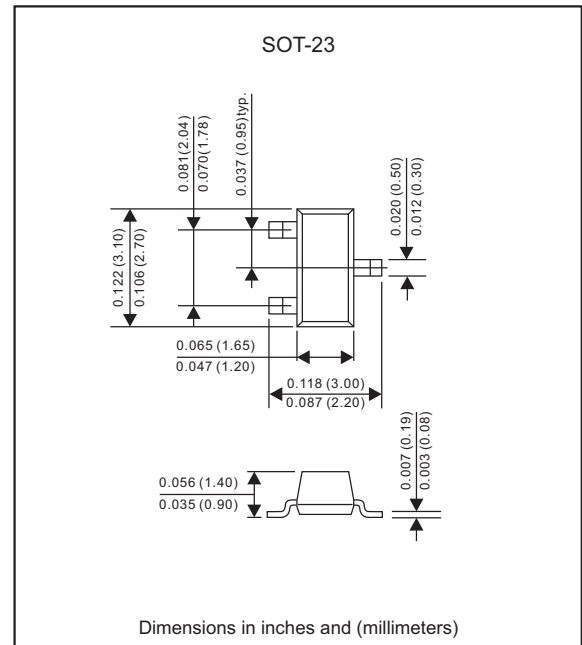
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BC807-16/BC807-25/BC807-40**General Purpose Transistors
PNP Silicon****Features**

- Collector current capability $I_C = -500$ mA
- Collector-emitter voltage $V_{CEO(max)} = -45$ V
- General purpose switching and amplification
- We declare that the material of product compliance with RoHS requirements
- Suffix "-H" indicates Halogen-free part, ex. BC807-16-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline**Maximum ratings** (AT $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-45	V
Emitter-base voltage	V_{EBO}	-5.0	V
Collector current — continuous	I_C	-500	mAdc

Thermal characteristics (AT $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
Total device dissipation FR-5 board(1)	$T_A = 25^\circ\text{C}$	P_D			225	mW
	Derate above 25°C				1.8	mW/ $^\circ\text{C}$
Thermal resistance	Junction to ambient	$R_{\theta JA}$			556	$^\circ\text{C}/\text{W}$
Total device dissipation alumina substrate(2)	$T_A = 25^\circ\text{C}$	P_D			300	mW
	Derate above 25°C				2.4	mW/ $^\circ\text{C}$
Thermal resistance	Junction to ambient	$R_{\theta JA}$			417	$^\circ\text{C}/\text{W}$
Operation junction temperature range		T_J	-55		+150	$^\circ\text{C}$
Storage temperature range		T_{STG}	-55		+150	$^\circ\text{C}$

1. FR-5 = 1.0 X 0.75 X 0.062 in.

2. Alumina = 0.4 X 0.3 X 0.024 in. 99.5% alumina.

BC807-16/BC807-25/BC807-40**Electrical characteristics** (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)**Off characteristics**

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Collector-emitter breakdown voltage	$I_C = -10\text{mA}$	$V_{(BR)CEO}$	-45			V
Collector-emitter breakdown voltage	$I_C = -10\mu\text{A}$, $V_{EB} = 0$	$V_{(BR)CES}$	-50			V
Emitter-base breakdown voltage	$I_E = -1.0\mu\text{A}$	$V_{(BR)EBO}$	-5.0			V
Collector cutoff current	$V_{CB} = -20\text{Vdc}$	I_{CBO}			-100	nA
	$V_{CB} = -20\text{Vdc}$, $T_J = 150^{\circ}\text{C}$	I_{CBO}			-5.0	μA

On characteristics

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
DC current gain	BC807-16 $I_C = -100\text{mA}$, $V_{CE} = -1.0\text{V}$	h_{FE}	100		250	-
	BC807-25 $I_C = -100\text{mA}$, $V_{CE} = -1.0\text{V}$		160		400	
	BC807-40 $I_C = -100\text{mA}$, $V_{CE} = -1.0\text{V}$		250		600	
	$I_C = -500\text{mA}$, $V_{CE} = -1.0\text{V}$		40			
Collector-emitter saturation voltage	$I_C = -500\text{mA}$, $I_B = -50\text{mA}$	$V_{CE(sat)}$			-0.7	V
Base-emitter saturation voltage	$I_C = -500\text{mA}$, $V_{CE} = -1.0\text{V}$	$V_{BE(on)}$			-1.2	V

Small-signal characteristics

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Current-gain-bandwidth product	$I_C = -10\text{mA}$, $V_{CE} = -5\text{V}$, $f = 100\text{MHz}$	f_T	100			MHz
Output capacitance	$V_{CB} = -10\text{V}$, $f = 1.0\text{MHz}$	C_{obo}		10		pF

Rating and characteristic curves (BC807-16)

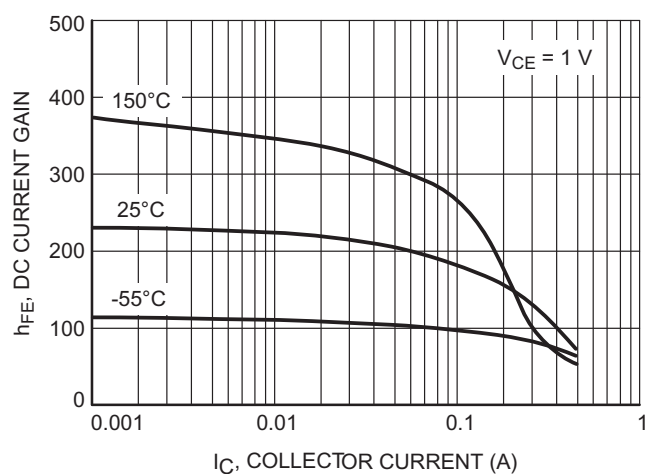


Figure 1. DC Current Gain vs. Collector Current

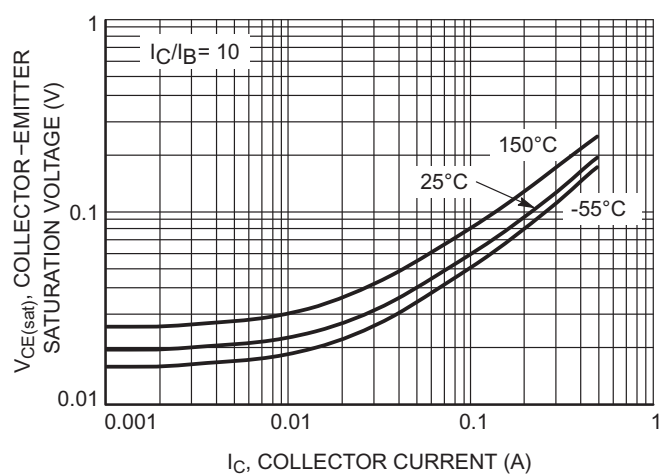


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

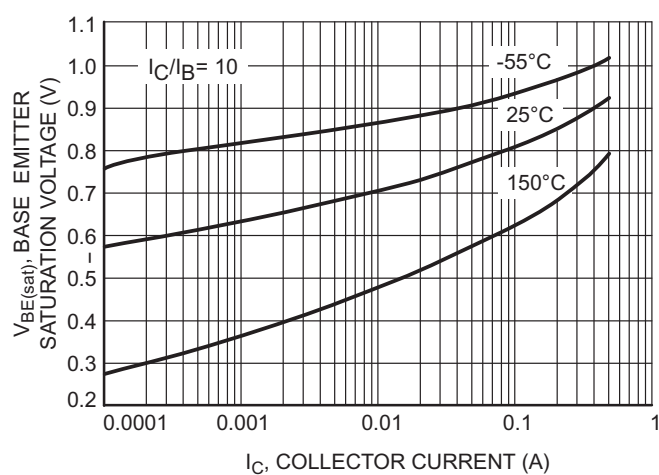


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

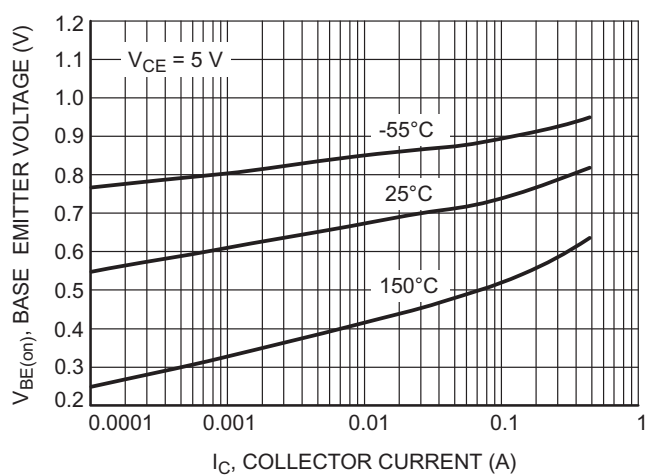


Figure 4. Base Emitter Voltage vs. Collector Current

Rating and characteristic curves (BC807-16)

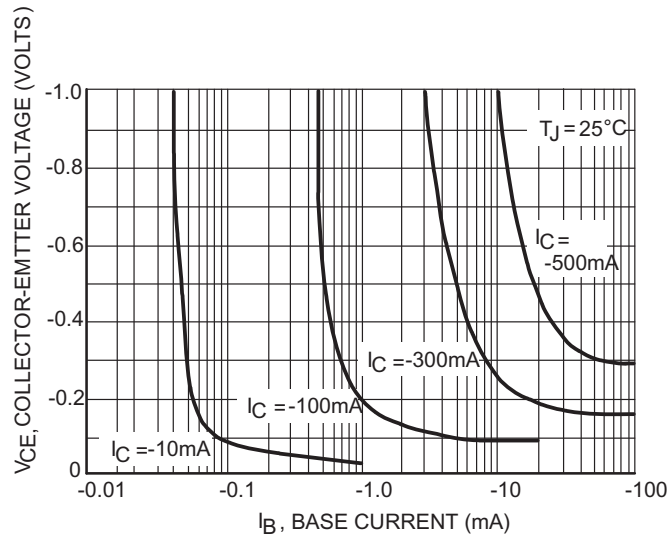


Figure 5. Saturation Region

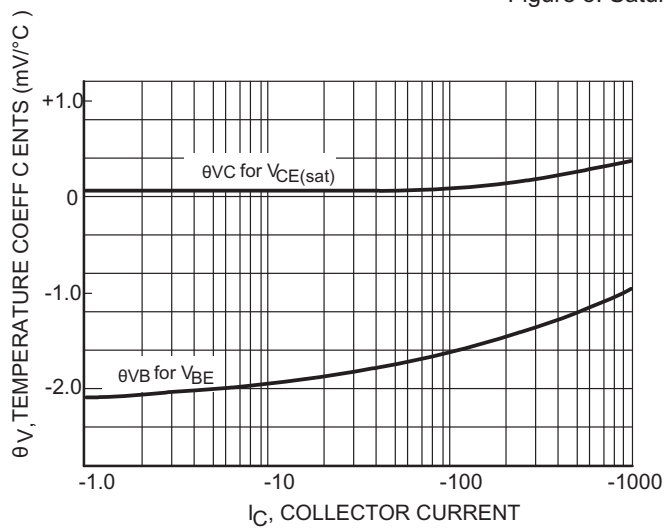


Figure 6. Temperature Coefficients

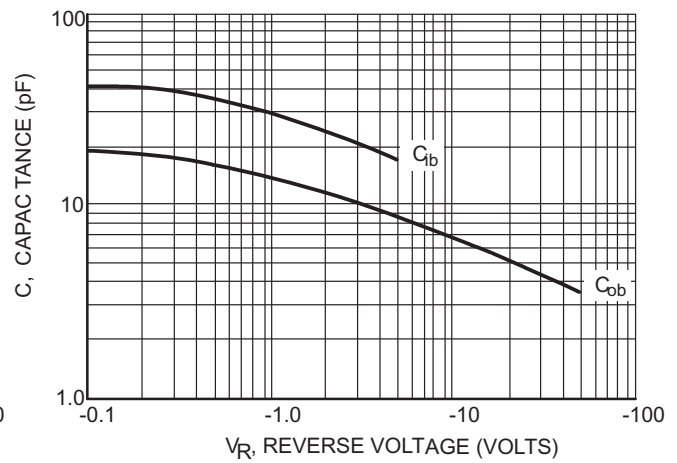


Figure 7. Capacitances

Rating and characteristic curves (BC807-25)

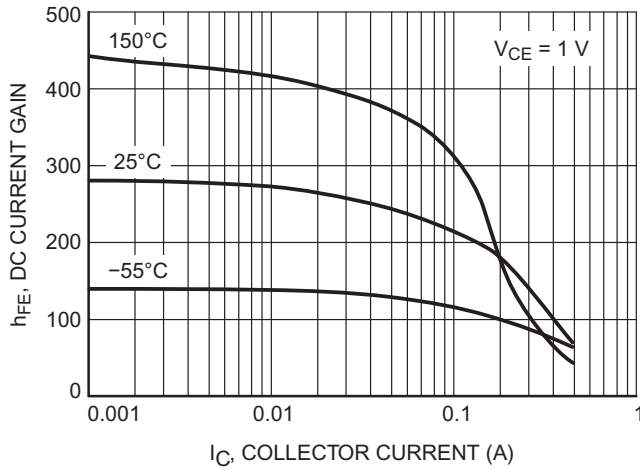


Figure 8. DC Current Gain vs. Collector Current

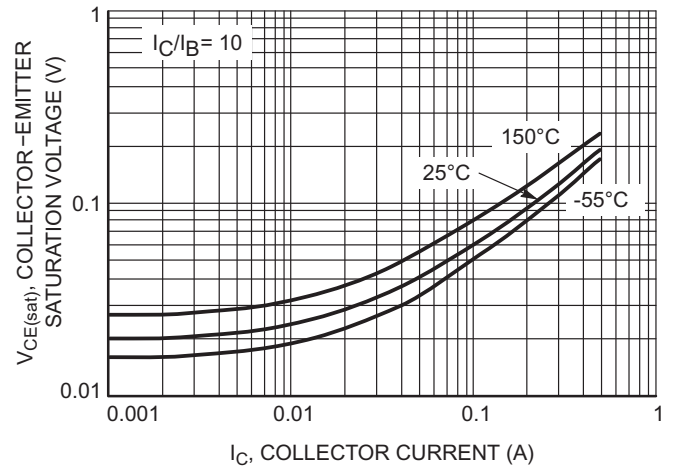


Figure 9. Collector Emitter Saturation Voltage vs. Collector Current

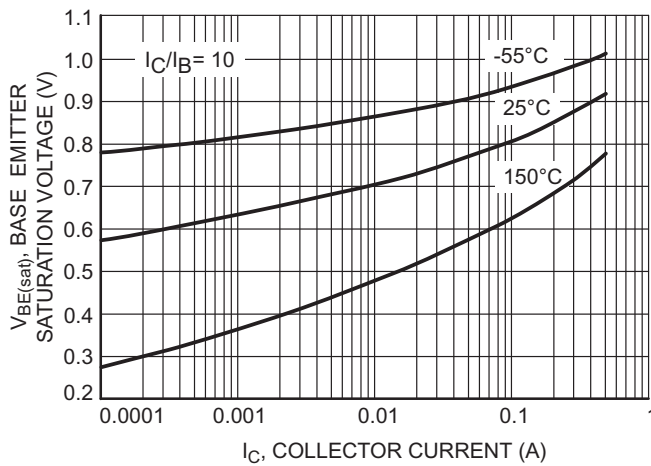


Figure 10. Base Emitter Saturation Voltage vs. Collector Current

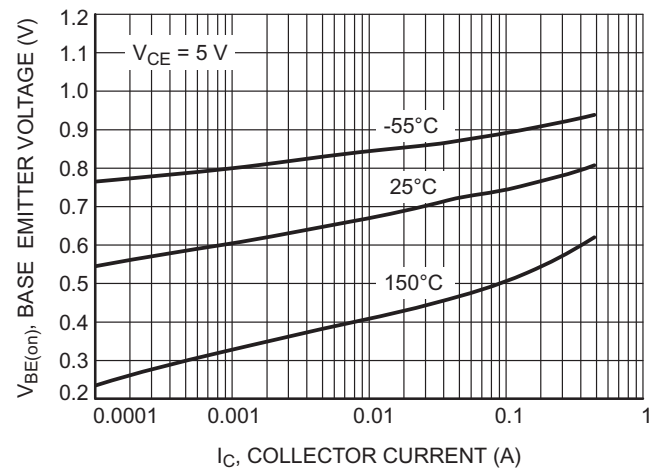


Figure 11. Base Emitter Voltage vs. Collector Current

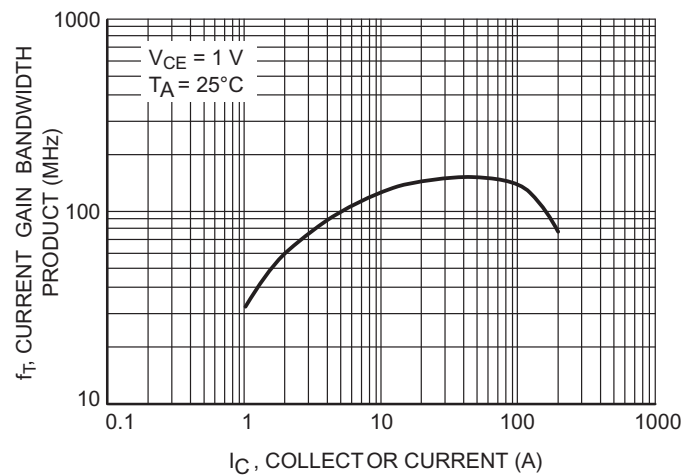


Figure 12. Current Gain Bandwidth Product vs. Collector Current

Rating and characteristic curves (BC807-25)

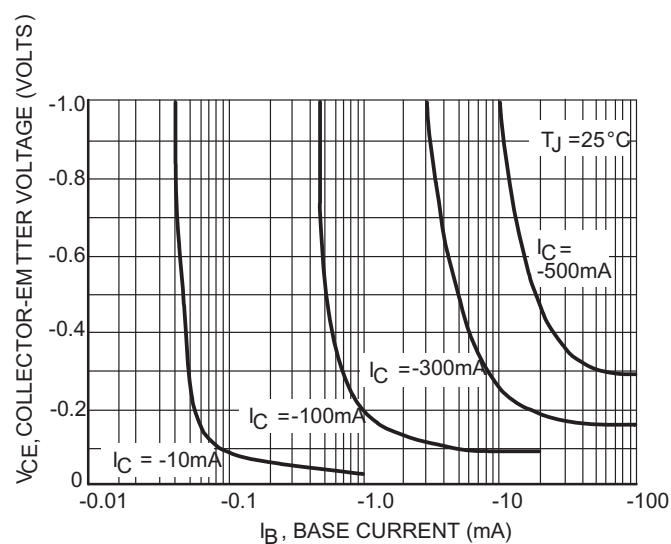


Figure 13. Saturation Region

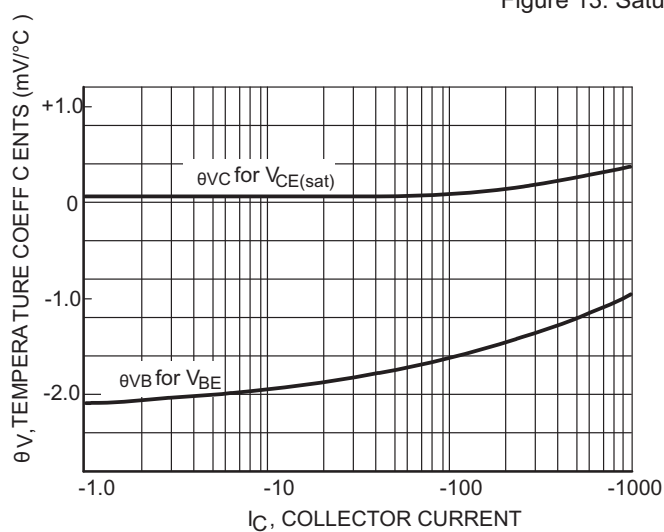


Figure 14. Temperature Coefficients

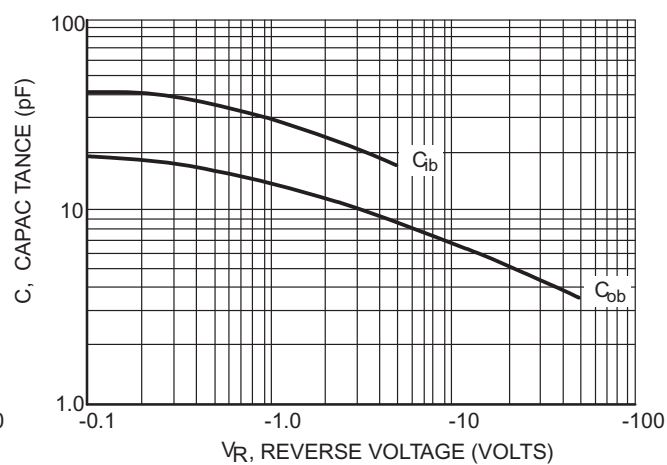


Figure 15. Capacitances

Rating and characteristic curves (BC807-40)

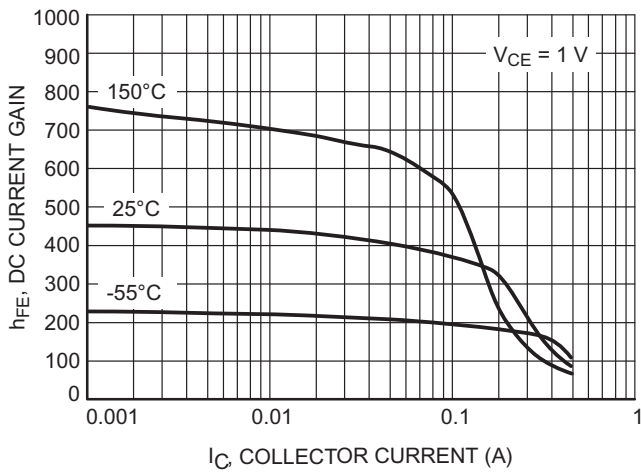


Figure 16. DC Current Gain vs. Collector Current

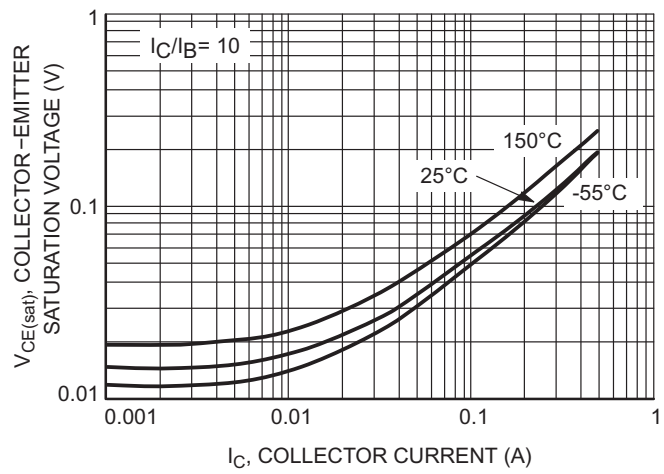


Figure 17. Collector Emitter Saturation Voltage vs. Collector Current

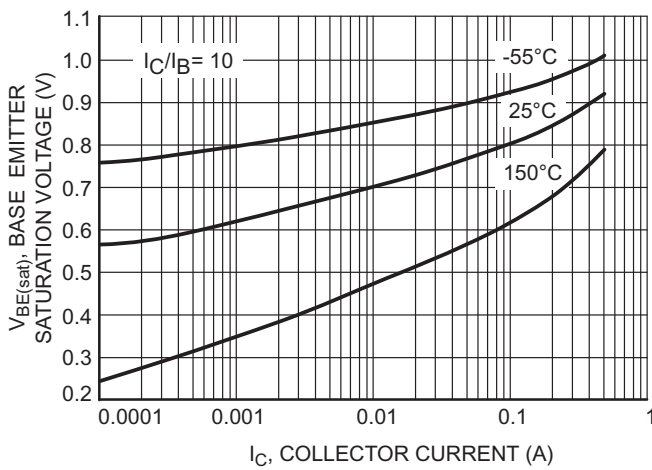


Figure 18. Base Emitter Saturation Voltage vs. Collector Current

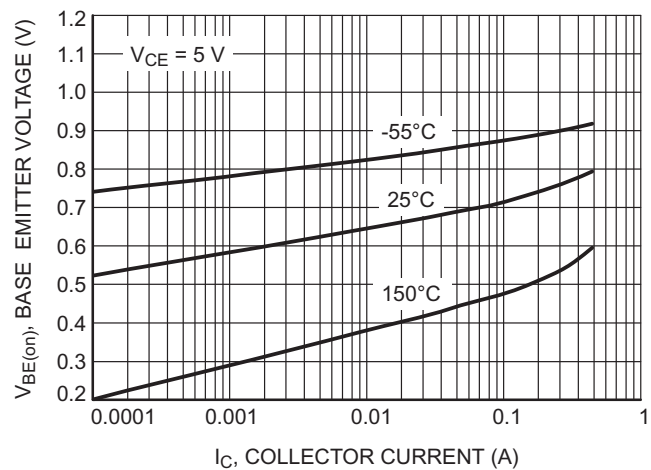


Figure 19. Base Emitter Voltage vs. Collector Current

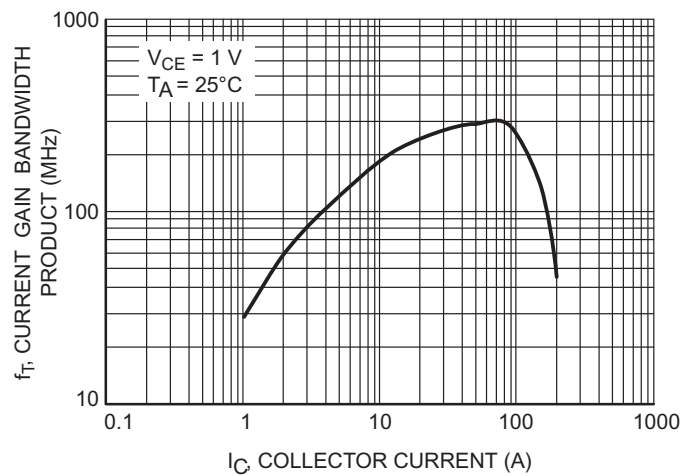


Figure 20. Current Gain Bandwidth Product vs. Collector Current

Rating and characteristic curves (BC807-40)

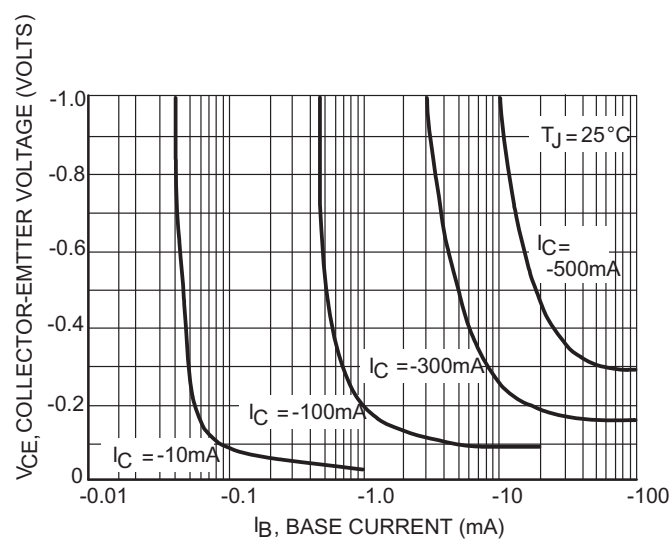


Figure 21. Saturation Region

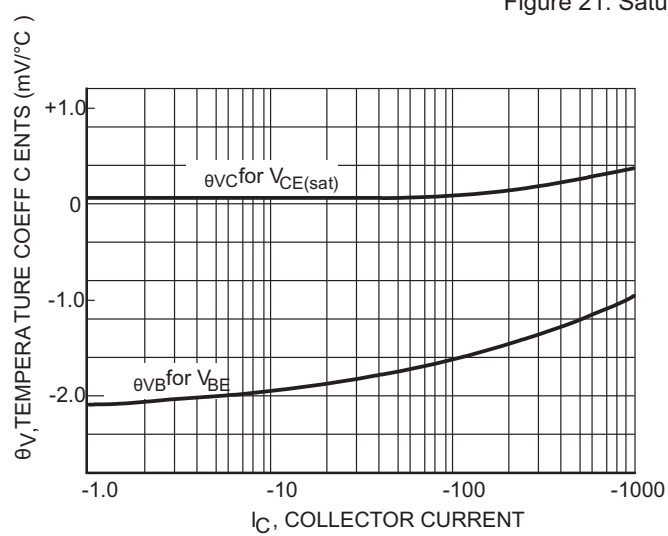


Figure 22. Temperature Coefficients

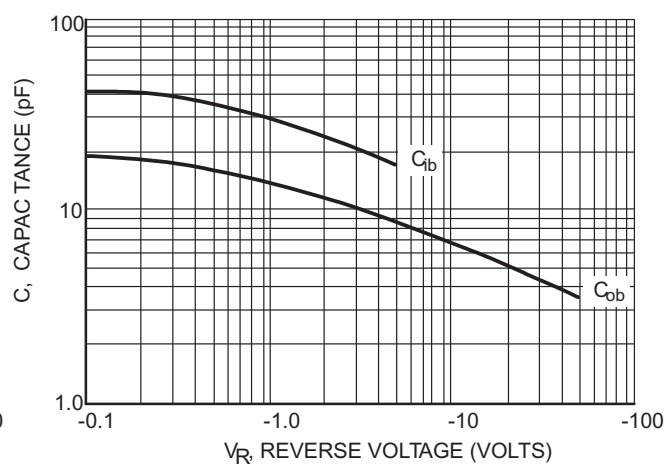


Figure 23. Capacitances

Rating and characteristic curves (BC807-16 / BC807-25 / BC807-40)

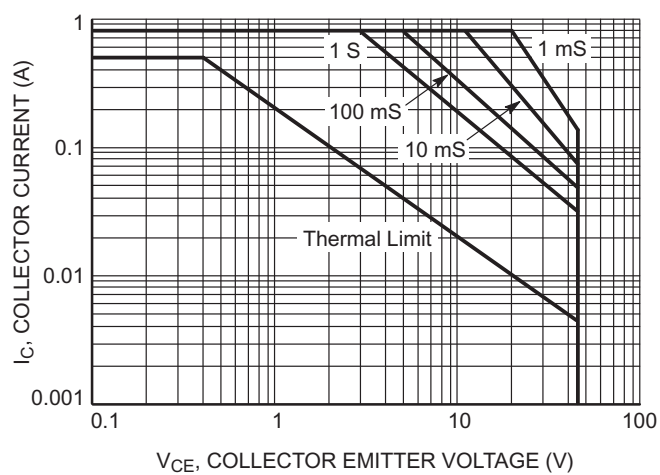
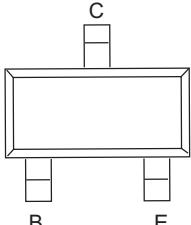
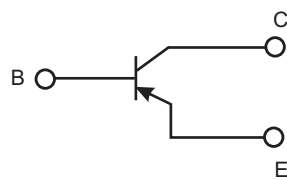


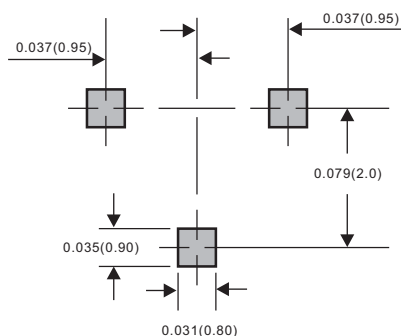
Figure 24. Safe Operating Area

BC807-16/BC807-25/BC807-40**Pinning information**

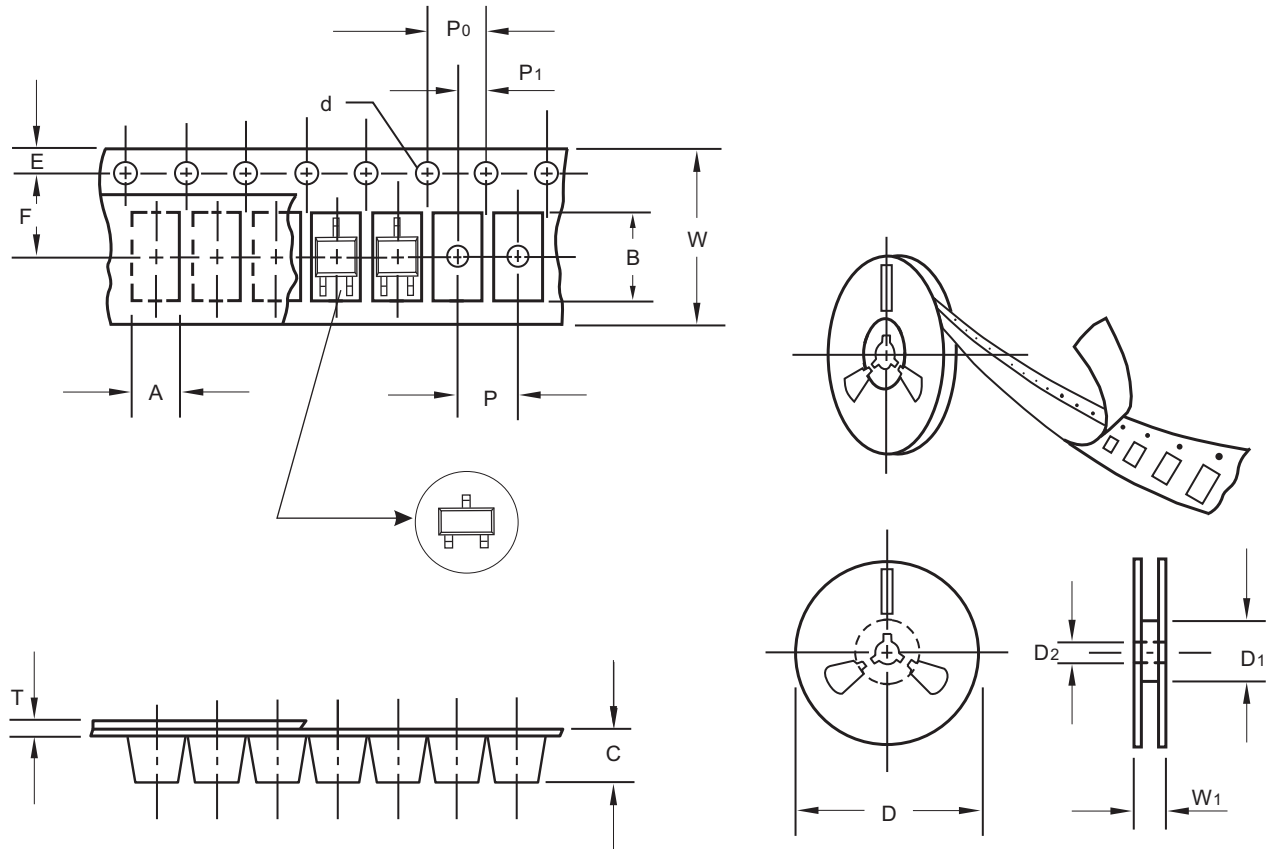
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
BC807-16	5A1,5A
BC807-25	5B1,5B
BC807-40	5C1,5C

Suggested solder pad layout**SOT-23**

Dimensions in inches and (millimeters)

BC807-16/BC807-25/BC807-40**Packing information**

unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.40
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

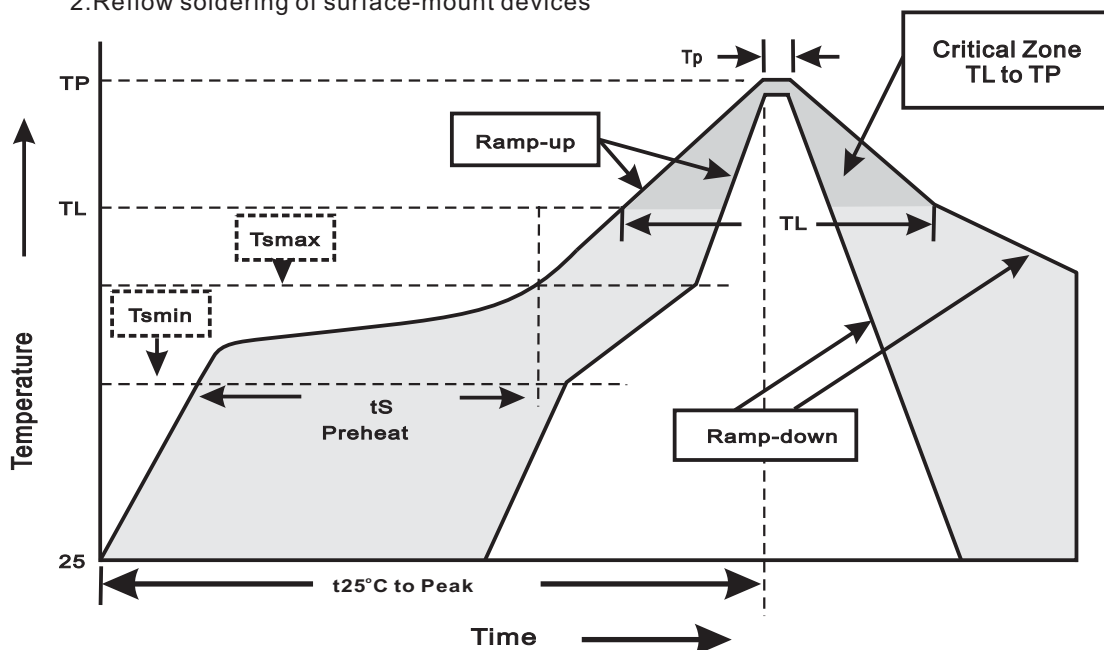
Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

BC807-16/BC807-25/BC807-40**Reel packing**

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices

**3.Reflow soldering**

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _p)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

BC807-16/BC807-25/BC807-40**High reliability test capabilities**

Item Test	Conditions
1. Steady State Operating Life	$P_D=225\text{mW}$ Test Duration:1000hrs
2. High Temperature Reverse Bias	$T_J=150^\circ\text{C}$, $V_{CE}=80\%$ related volage, 1000hrs
3. Temperature Cycle	-55°C (15min) to 150°C (15min) Air to Air Transition Time<20sec Test Cycles: 1000cycle
4. Autoclave	$P=2\text{atm}$ $T_a=121^\circ\text{C}$ $RH=100\%$ Test Duration: 96hrs
5. High Temperature Storage Life	$T_a=150^\circ\text{C}$ Test Duration: 1000hrs
6. Solderability	245°C , 5sec
7. High Temperature High Humidity Reverse Bias	$T_a=85^\circ\text{C}$, 85%RH, $V_{CE}=80\%$ related volage, 1000hrs
8. Resistance to Soldering Heat	260°C , 10sec