

General Purpose Transistors NPN Silicon

FEATURE

- Collector current capability $I_C = 500$ mA.
- Collector-emitter voltage $V_{CEO(max)} = 45$ V.
- General purpose switching and amplification.
- PNP complement: BC807 Series.
- We declare that the material of product compliance with RoHS requirements.
- AEC-Q101 qualified (Automotive grade with suffix "Q".)

ORDERING INFORMATION

Device	Marking	Shipping
BC817-16	6A/6CQ	3000/Tape&Reel
BC817-25	6B/6CX/6CS	3000/Tape&Reel
BC817-40	6C/6CT	3000/Tape&Reel

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	45	V
Collector–Base Voltage	V_{CBO}	50	V
Emitter–Base Voltage	V_{EBO}	5.0	V
Collector Current — Continuous	I_C	500	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	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	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

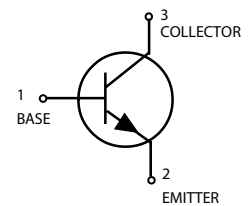
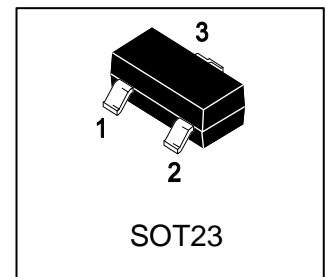
Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = 10$ mA)	$V_{(BR)CEO}$	45	—	—	V
Collector–Emitter Breakdown Voltage ($V_{EB} = 0, I_C = 10$ μA)	$V_{(BR)CES}$	50	—	—	V
Emitter–Base Breakdown Voltage ($I_E = 1.0$ μA)	$V_{(BR)EBO}$	5.0	—	—	V
Collector Cutoff Current ($V_{CB} = 20$ V)	I_{CBO}	—	—	100	nA
($V_{CB} = 20$ V, $T_A = 150^\circ\text{C}$)		—	—	5.0	μA

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.



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C = 100\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	h_{FE}	100	—	250	
	BC817-16	160	—	400	
	BC817-25	250	—	600	
($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	BC817-40	40	—	—	
Collector-Emitter Saturation Voltage ($I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$)	$V_{CE(sat)}$	—	—	0.7	V
Base-Emitter On Voltage ($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$)	$V_{BE(on)}$	—	—	1.2	V

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}_{dc}$, $f = 100\text{ MHz}$)	f_T	100	—	—	MHz
Output Capacitance ($V_{CB} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	C_{obo}	—	10	—	pF

TYPICAL CHARACTERISTICS – BC817-16

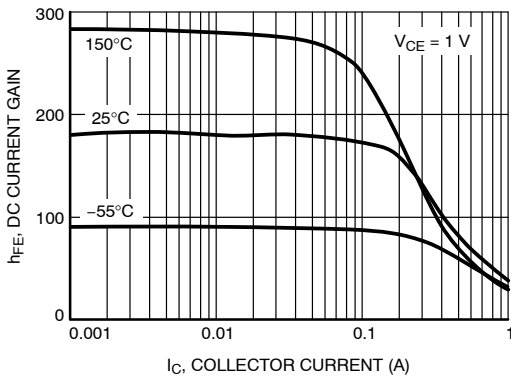


Figure 1. DC Current Gain vs. Collector Current

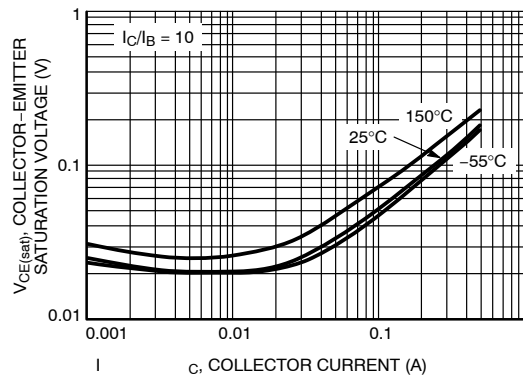


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

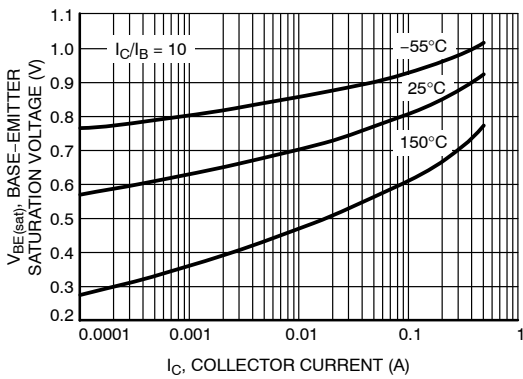


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

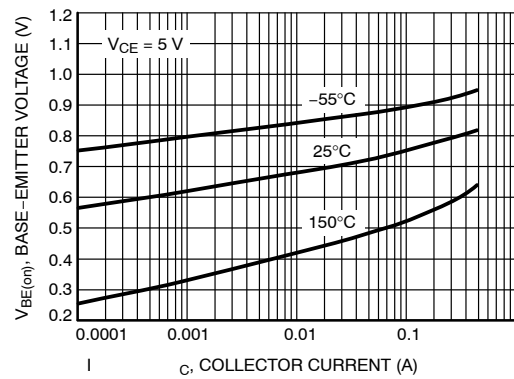


Figure 4. Base Emitter Voltage vs. Collector Current

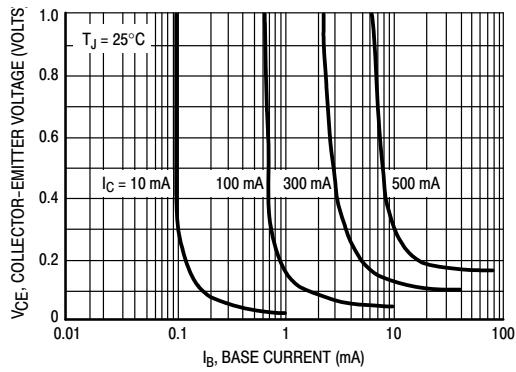


Figure 5. Saturation Region

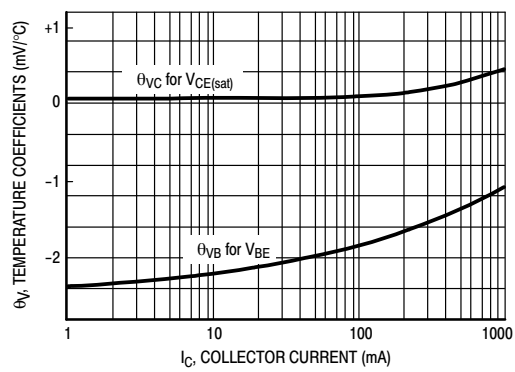


Figure 6. Temperature Coefficients

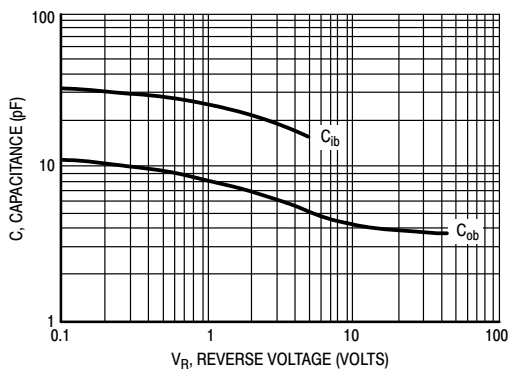


Figure 7. Capacitances

TYPICAL CHARACTERISTICS – BC817-25

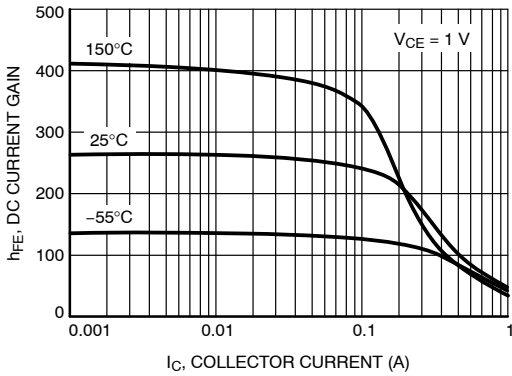


Figure 8. DC Current Gain vs. Collector Current

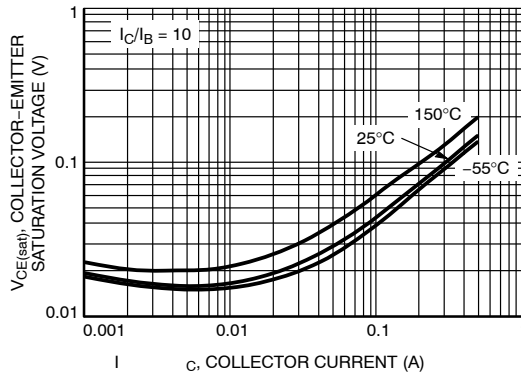


Figure 9. Collector Emitter Saturation Voltage vs. Collector Current

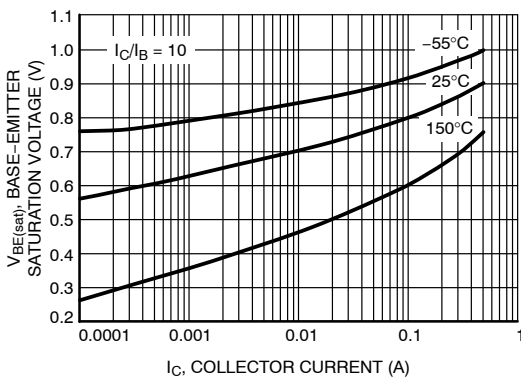


Figure 10. Base Emitter Saturation Voltage vs. Collector Current

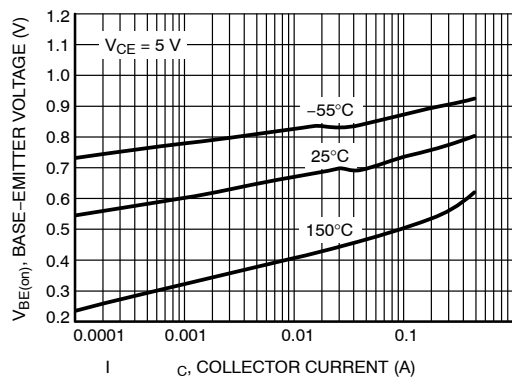


Figure 11. Base Emitter Voltage vs. Collector Current

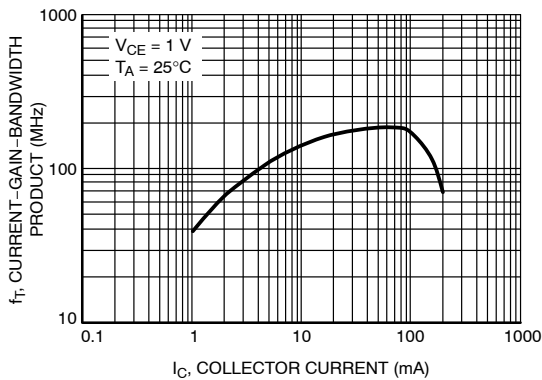


Figure 12. Current Gain Bandwidth Product vs. Collector Current

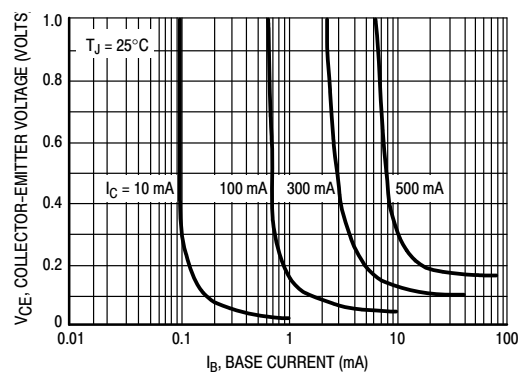


Figure 13. Saturation Region

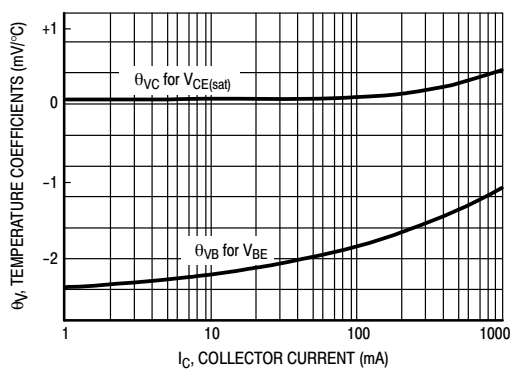


Figure 14. Temperature Coefficients

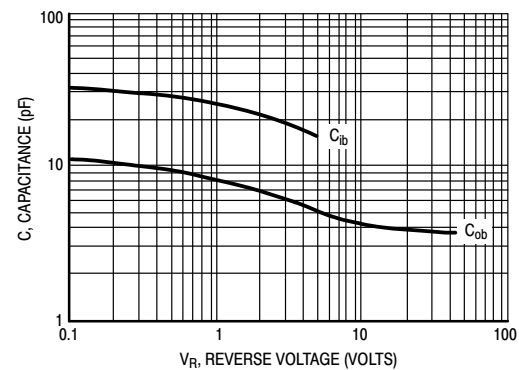


Figure 15. Capacitances

TYPICAL CHARACTERISTICS – BC817-40

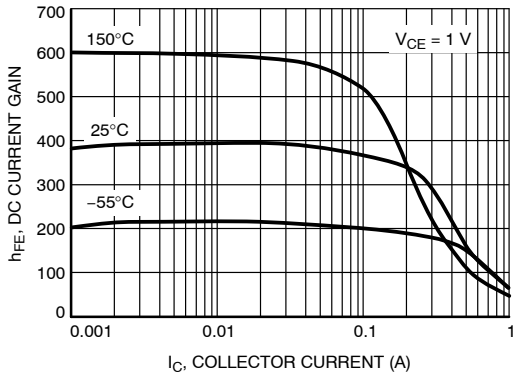


Figure 16. DC Current Gain vs. Collector Current

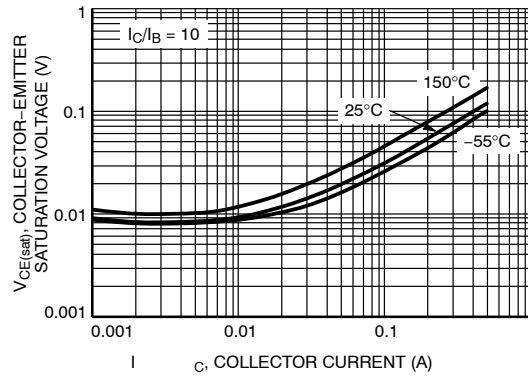


Figure 17. Collector Emitter Saturation Voltage vs. Collector Current

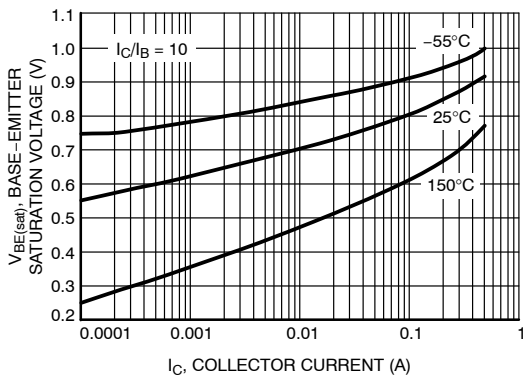


Figure 18. Base Emitter Saturation Voltage vs. Collector Current

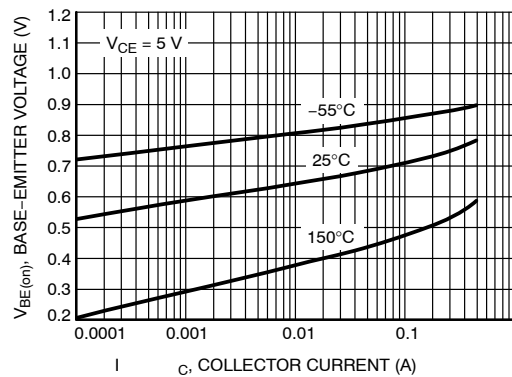


Figure 19. Base Emitter Voltage vs. Collector Current

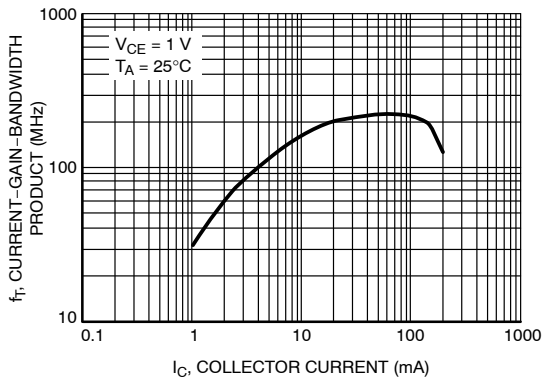


Figure 20. Current Gain Bandwidth Product vs. Collector Current

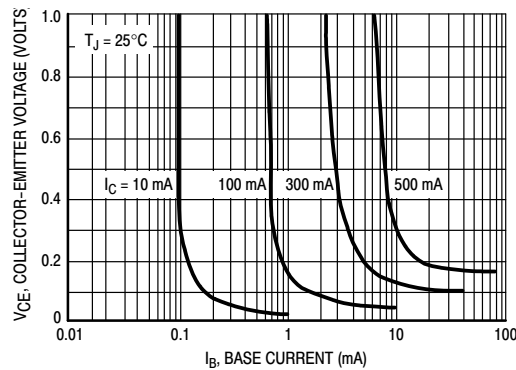


Figure 21. Saturation Region

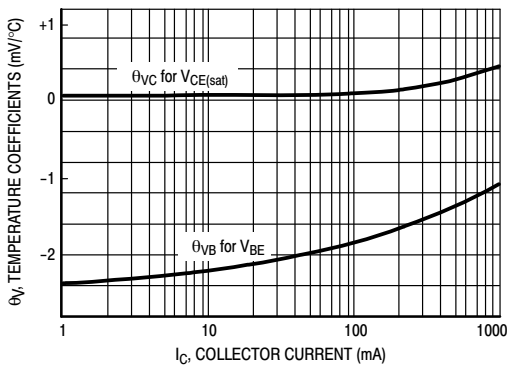


Figure 22. Temperature Coefficients

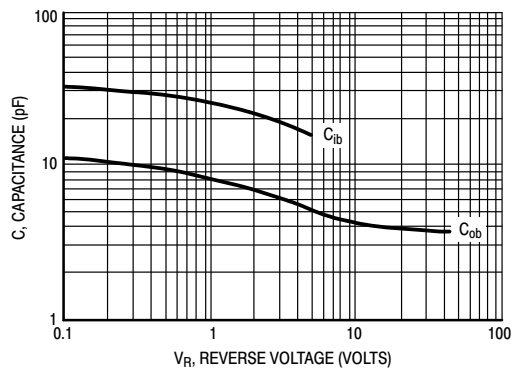
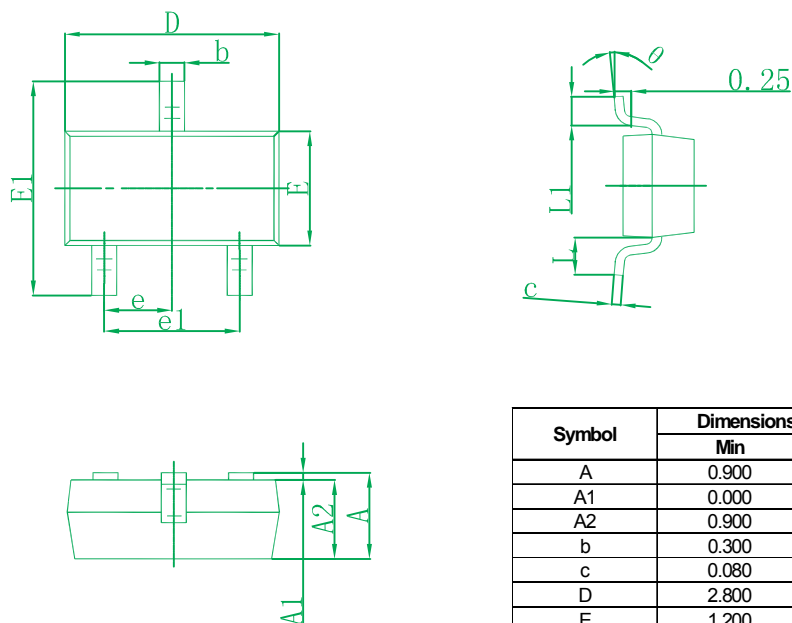


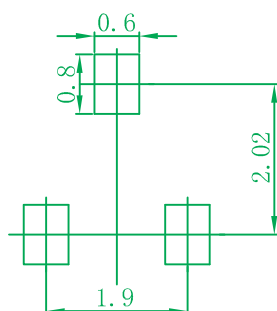
Figure 23. Capacitances

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.150	0.035	0.045
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.050	0.110	0.120
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05 mm.
 3. The pad layout is for reference purposes only.

Ordering information

Device	Package	Shipping
BC817-16/25/40	SOT-23	3000/Tape&Reel