

General Purpose Transistors

PNP Silicon

- Moisture Sensitivity Level: 1
- ESD Rating – Human Body Model: >4000 V
– Machine Model: >400 V
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

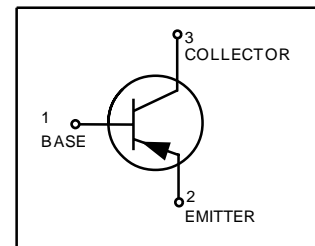
Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC856 BC857 BC858, BC859	V _{CEO}	-65 -45 -30	V
Collector-Base Voltage BC856 BC857 BC858, BC859	V _{CBO}	-80 -50 -30	V
Emitter-Base Voltage	V _{EBO}	-5.0	V
Collector Current – Continuous	I _C	-100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1.) T _A = 25°C Derate above 25°C	P _D	250 2	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 1.)	R _{θJA}	500	°C/W
Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C

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

BC856AN Series S-BC856AN Series



DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Package	Shipping
BC856AN,S-BC856AN	3A	DFN1006-3L	10000/Tape&Reel
BC856BN,S-BC856BN	3B	DFN1006-3L	10000/Tape&Reel
BC857AN,S-BC857AN	3E	DFN1006-3L	10000/Tape&Reel
BC857BN,S-BC857BN	3F	DFN1006-3L	10000/Tape&Reel
BC857CN,S-BC857CN	3G	DFN1006-3L	10000/Tape&Reel
BC858AN,S-BC858AN	3J	DFN1006-3L	10000/Tape&Reel
BC858BN,S-BC858BN	3K	DFN1006-3L	10000/Tape&Reel
BC858CN,S-BC858CN	3L	DFN1006-3L	10000/Tape&Reel
BC859BN,S-BC859BN	4B	DFN1006-3L	10000/Tape&Reel
BC859CN,S-BC859CN	4C	DFN1006-3L	10000/Tape&Reel



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I _C = –10 mA)	BC856 Series BC857 Series BC858, BC859 Series	V _{(BR)CEO}	–65 –45 –30	– – –	– – –	V
Collector–Emitter Breakdown Voltage (I _C = –10 μA, V _{EB} = 0)	BC856 Series BC857 Series BC858, BC859 Series	V _{(BR)CES}	–80 –50 –30	– – –	– – –	V
Collector–Base Breakdown Voltage (I _C = –10 μA)	BC856 Series BC857 Series BC858, BC859 Series	V _{(BR)CBO}	–80 –50 –30	– – –	– – –	V
Emitter–Base Breakdown Voltage (I _E = –1.0 μA)	BC856 Series BC857 Series BC858, BC859 Series	V _{(BR)EBO}	–5.0 –5.0 –5.0	– – –	– – –	V
Collector Cutoff Current (V _{CB} = –30 V) (V _{CB} = –30 V, T _A = 150°C)		I _{CBO}	– –	– –	–15 –4.0	nA μA
ON CHARACTERISTICS						
DC Current Gain (I _C = –2.0 mA, V _{CE} = –5.0 V)	BC856A, BC857A, BC858A BC856B, BC857B, BC858B, BC859B BC857C, BC858C, BC859C	h _{FE}	125 220 420	180 290 520	250 475 800	–
Collector–Emitter Saturation Voltage (I _C = –10 mA, I _B = –0.5 mA) (I _C = –100 mA, I _B = –5.0 mA)		V _{CE(sat)}	– –	– –	–0.3 –0.4	V
Base–Emitter Saturation Voltage (I _C = –10 mA, I _B = –0.5 mA) (I _C = –100 mA, I _B = –5.0 mA)		V _{BE(sat)}	– –	–0.7 –0.9	– –	V
Base–Emitter On Voltage (I _C = –2.0 mA, V _{CE} = –5.0 V) (I _C = –10 mA, V _{CE} = –5.0 V)		V _{BE(on)}	–0.6 –	– –	–0.75 –0.82	V
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain – Bandwidth Product (I _C = –10 mA, V _{CE} = –5.0 Vdc, f = 100 MHz)		f _T	100	–	–	MHz
Output Capacitance (V _{CB} = –10 V, f = 1.0 MHz)		C _{ob}	–	–	4.5	pF
Noise Figure (I _C = –0.2 mA, V _{CE} = –5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	BC856, BC857, BC858 Series BC859 Series	NF	– –	– –	10 4.0	dB



BC857/ BC858

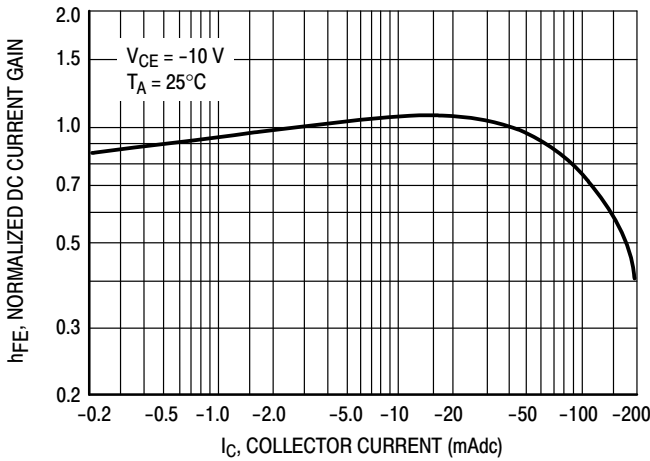


Figure 1. Normalized DC Current Gain

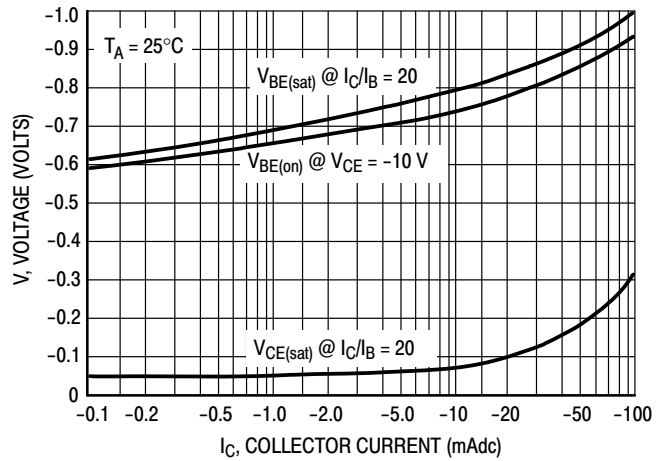


Figure 2. "Saturation" and "On" Voltages

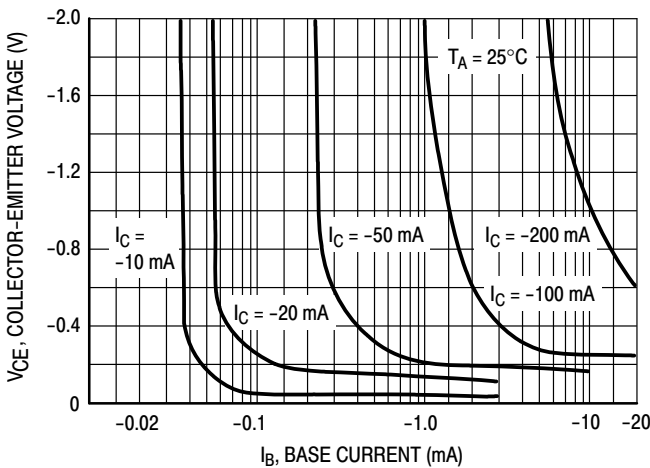


Figure 3. Collector Saturation Region

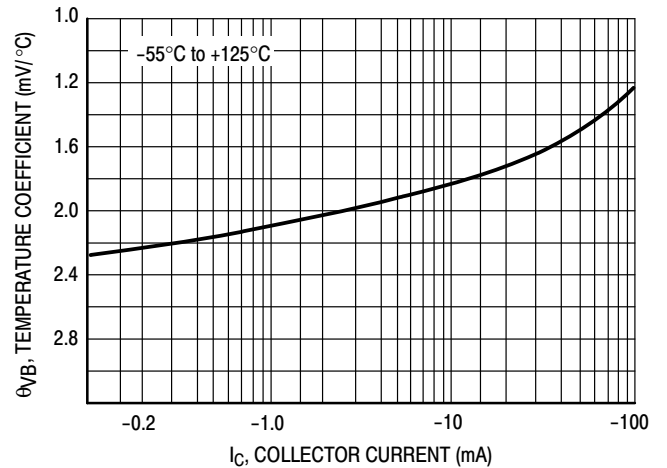


Figure 4. Base-Emitter Temperature Coefficient

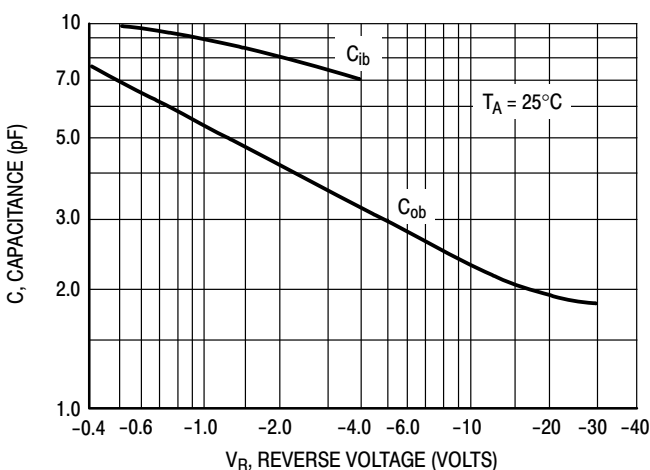


Figure 5. Capacitances

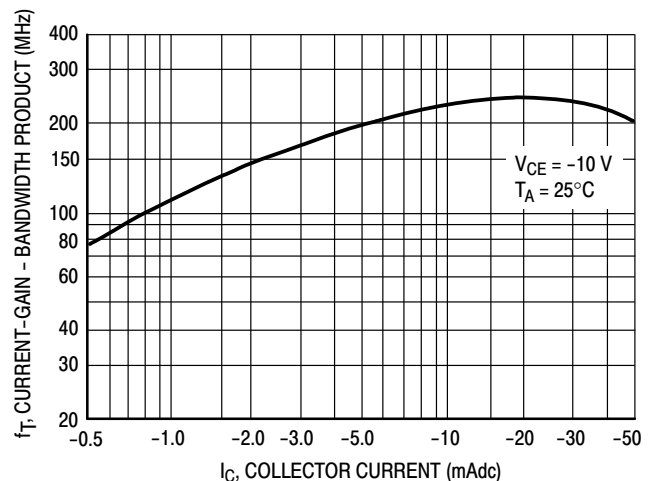


Figure 6. Current-Gain - Bandwidth Product



BC856

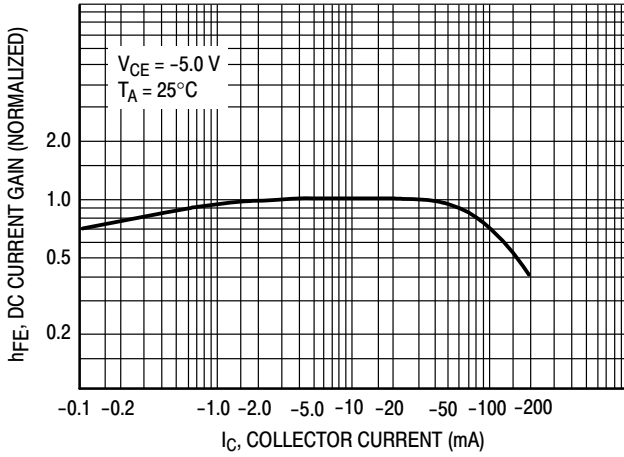


Figure 7. DC Current Gain

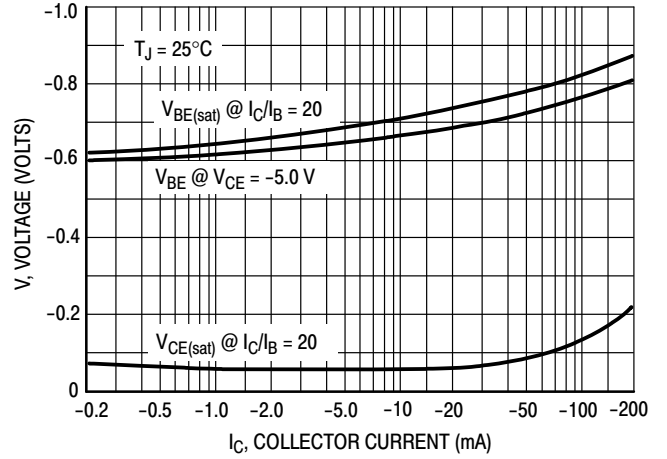


Figure 8. "On" Voltage

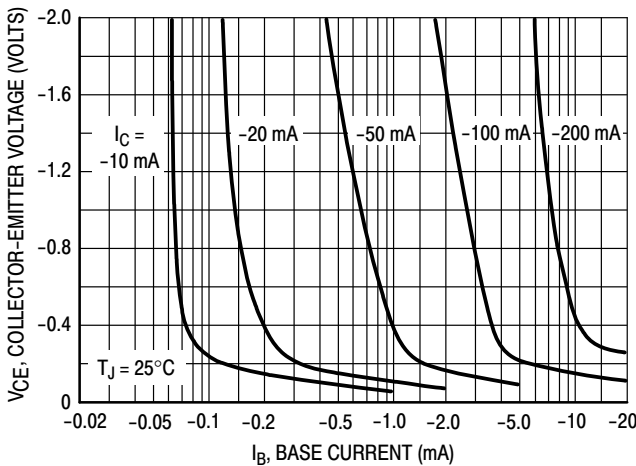


Figure 9. Collector Saturation Region

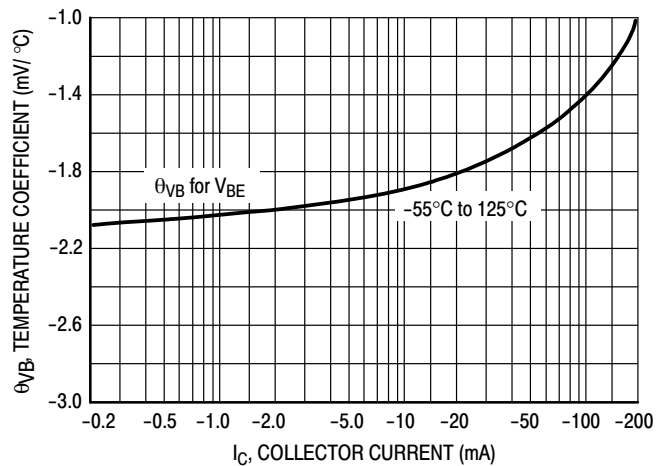


Figure 10. Base-Emitter Temperature Coefficient

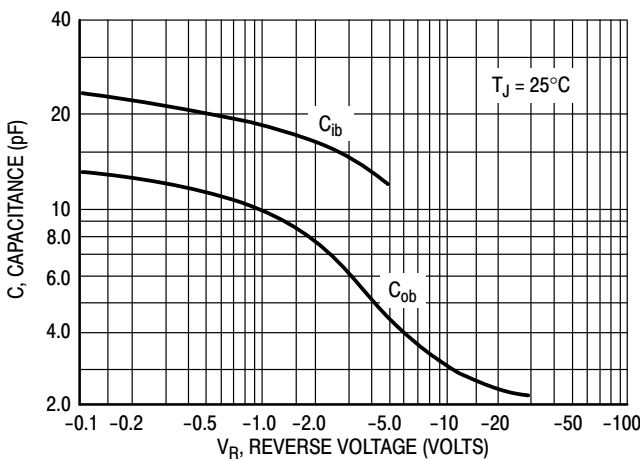


Figure 11. Capacitance

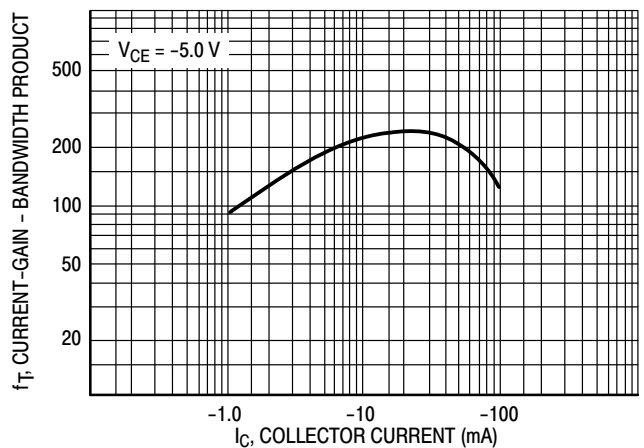


Figure 12. Current-Gain - Bandwidth Product



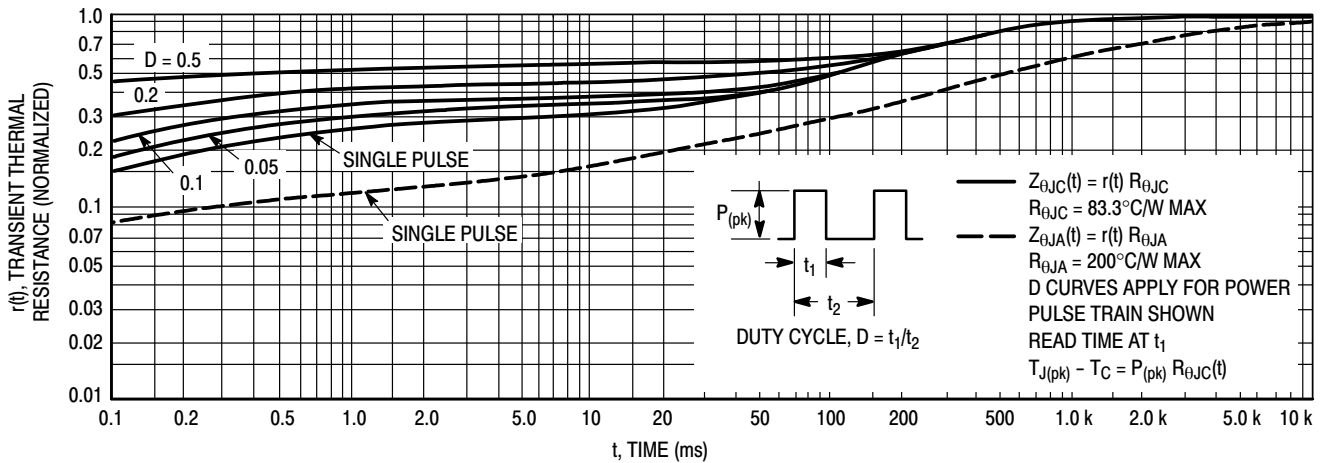


Figure 13. Thermal Response

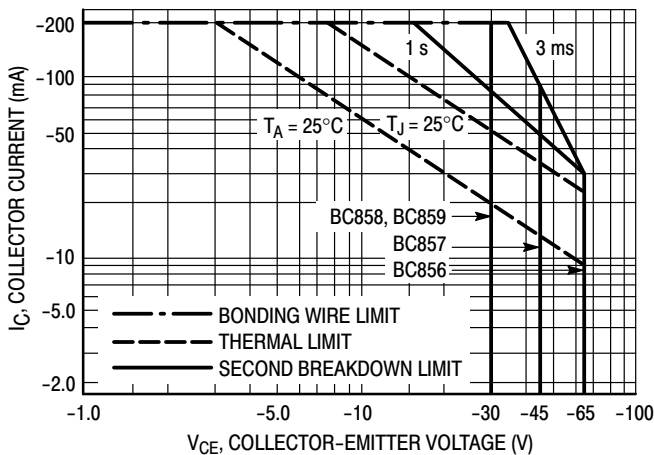


Figure 14. Active Region Safe Operating Area

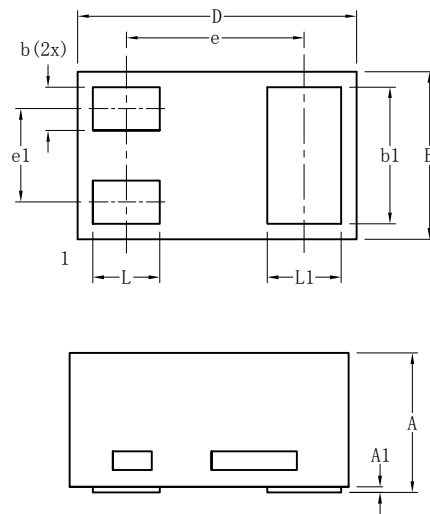
The safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.



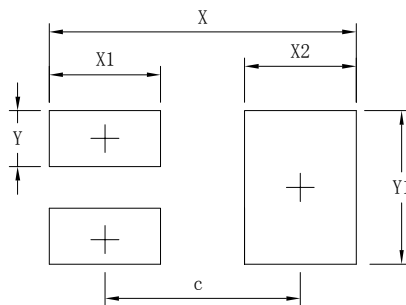
DFN1006-3L

Package Outline Dimensions



DFN1006-3L			
Dim	Min	Typ	Max
D	0.95	1.00	1.05
E	0.50	0.60	0.65
e	-	0.64	-
e1	-	0.34	-
L	0.19	0.24	0.29
L1	0.22	0.27	0.32
b	0.10	0.15	0.20
b1	0.44	0.49	0.54
A	0.43	0.48	0.53
A1	0	-	0.05
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
c	0.70
X	1.10
X1	0.40
X2	0.40
Y	0.20
Y1	0.55

