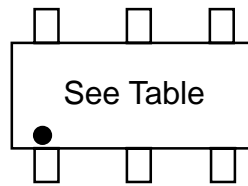
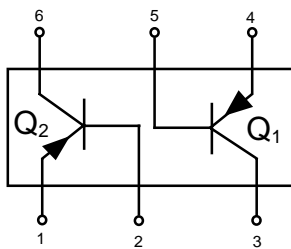


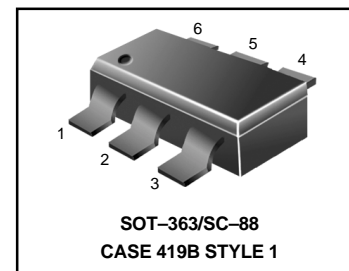
Dual General Purpose Transistors

PNP Duals

These transistors are designed for general purpose amplifier applications. They are housed in the SOT-363/SC-88 which is designed for low power surface mount applications.



BC856BDW1T1
BC857BDW1T1
BC857CDW1T1
BC858BDW1T1
BC858CDW1T1



MAXIMUM RATINGS

| Rating | Symbol | BC856 | BC857 | BC858 | Unit |
|-------------------------------|-----------|-------|-------|-------|------|
| Collector-Emitter Voltage | V_{CE0} | -65 | -45 | -30 | V |
| Collector-Base Voltage | V_{CBO} | -80 | -50 | -30 | V |
| Emitter-Base Voltage | V_{EBO} | -5.0 | -5.0 | -5.0 | V |
| Collector Current -Continuous | I_C | -100 | -100 | -100 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|-------------|---------------------------|
| Total Device Dissipation | P_D | 380 | mW |
| Per Device | | 250 | mW |
| FR-5 Board, (1) $T_A = 25^\circ\text{C}$ | | | |
| Derate above 25°C | | 3.0 | mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 328 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

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

ORDERING INFORMATION

| Device | Package | Shipping |
|-------------|---------|-----------------|
| BC856BDW1T1 | SOT-363 | 3000 Units/Reel |
| BC857BDW1T1 | SOT-363 | 3000 Units/Reel |
| BC857CDW1T1 | SOT-363 | 3000 Units/Reel |
| BC858BDW1T1 | SOT-363 | 3000 Units/Reel |
| BC858CDW1T1 | SOT-363 | 3000 Units/Reel |

BC856BDW1T1, BC857BDW1T1, BC857CDW1T1, BC858BDW1T1, BC858CDW1T1
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|------|-----|------|---------------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ mA}$) | $V_{(BR)CEO}$ | | | | V |
| BC856 Series | | -65 | — | — | |
| BC857 Series | | -45 | — | — | |
| BC858 Series | | -30 | — | — | |
| Collector–Emitter Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$, $V_{EB} = 0$) | $V_{(BR)CES}$ | | | | V |
| BC856 Series | | -80 | — | — | |
| BC857 Series | | -50 | — | — | |
| BC858 Series | | -30 | — | — | |
| Collector–Base Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$) | $V_{(BR)CBO}$ | | | | V |
| BC856 Series | | -80 | — | — | |
| BC857 Series | | -50 | — | — | |
| BC858 Series | | -30 | — | — | |
| Emitter–Base Breakdown Voltage ($I_E = -1.0\text{ }\mu\text{A}$) | $V_{(BR)EBO}$ | | | | V |
| BC856 Series | | -5.0 | — | — | |
| BC857 Series | | -5.0 | — | — | |
| BC858 Series | | -5.0 | — | — | |
| Collector Cutoff Current ($V_{CB} = -30\text{ V}$) | I_{CBO} | — | — | -15 | nA |
| ($V_{CB} = -30\text{ V}$, $T_A = 150^\circ\text{C}$) | | — | — | -4.0 | μA |

ON CHARACTERISTICS

| | | | | | |
|---|---------------|------|------|-------|---|
| DC Current Gain ($I_C = -10\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ V}$) | h_{FE} | | | | — |
| BC856B, BC857B, BC858B | | — | 150 | — | |
| BC857C, BC858C | | — | 270 | — | |
| ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | | | | | |
| BC856B, BC857B, BC858B | | 220 | 290 | 475 | |
| BC857C, BC858C | | 420 | 520 | 800 | |
| Collector–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) | $V_{CE(sat)}$ | — | — | -0.3 | V |
| ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | | — | — | -0.65 | |
| Base–Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) | $V_{BE(sat)}$ | — | -0.7 | — | V |
| ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | | — | -0.9 | — | |
| Base–Emitter Voltage ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | $V_{BE(on)}$ | -0.6 | — | -0.75 | V |
| ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | | — | — | -0.82 | |

SMALL–SIGNAL CHARACTERISTICS

| | | | | | |
|--|-----------|-----|---|-----|-----|
| Current–Gain — Bandwidth Product ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 100\text{ MHz}$) | f_T | 100 | — | — | MHz |
| Output Capacitance ($V_{CB} = -10\text{ V}$, $f = 1.0\text{ MHz}$) | C_{obo} | — | — | 4.5 | pF |
| Noise Figure ($I_C = -0.2\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 2.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$, $BW = 200\text{ Hz}$) | NF | — | — | 10 | dB |

BC856BDW1T1, BC857BDW1T1, BC857CDW1T1
BC858BDW1T1, BC858CDW1T1

TYPICAL PNP CHARACTERISTICS — BC856

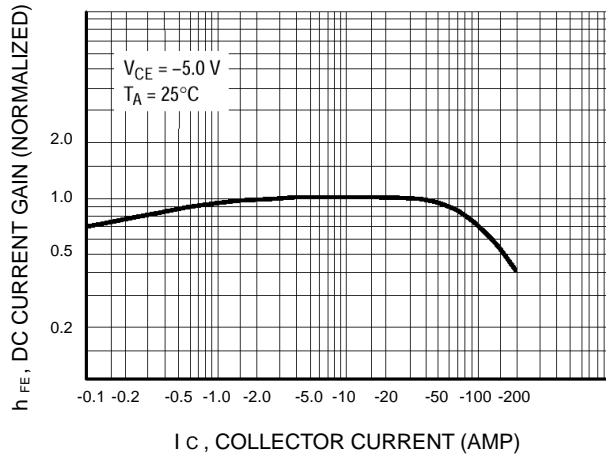


Figure 1. DC Current Gain

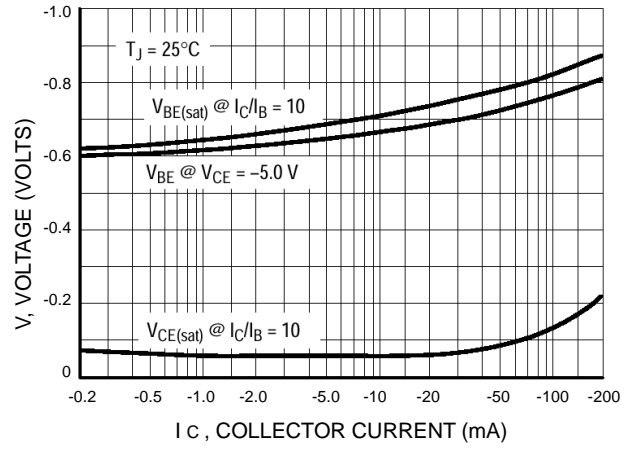


Figure 2. "On" Voltage

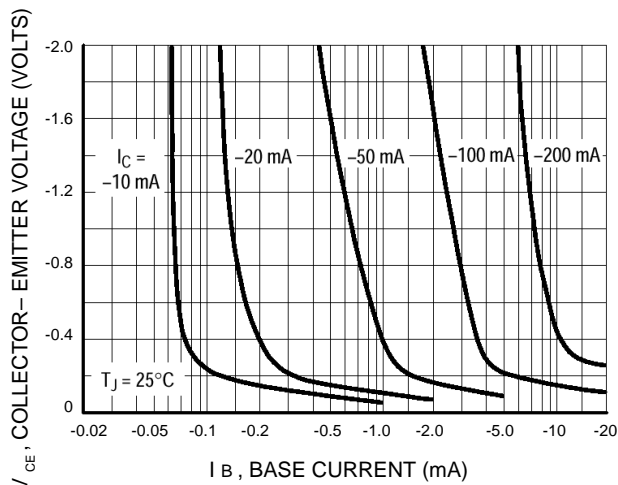


Figure 3. Collector Saturation Region

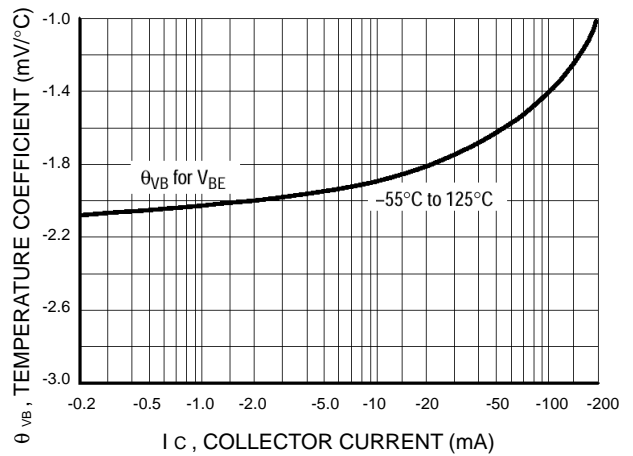


Figure 4. Base-Emitter Temperature Coefficient

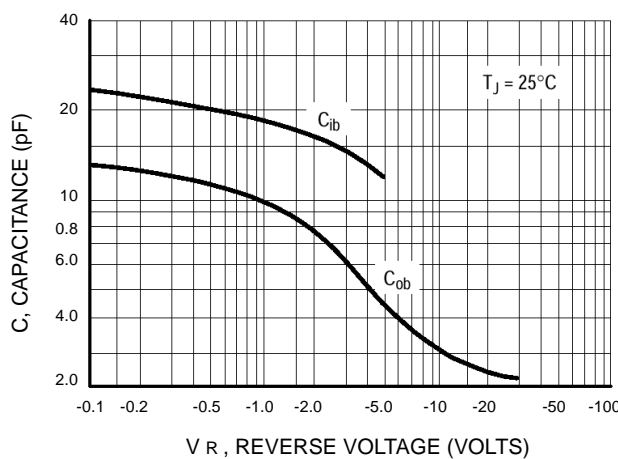


Figure 5. Capacitance

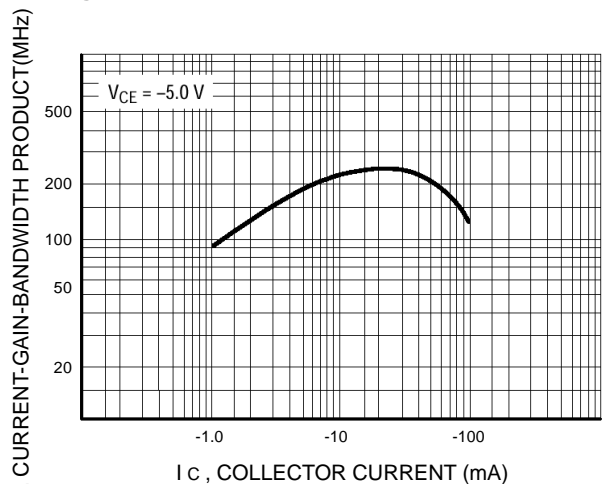


Figure 6. Current-Gain - Bandwidth Product

**BC856BDW1T1, BC857BDW1T1, BC857CDW1T1
BC858BDW1T1, BC858CDW1T1**

TYPICAL PNP CHARACTERISTICS — BC857/BC858

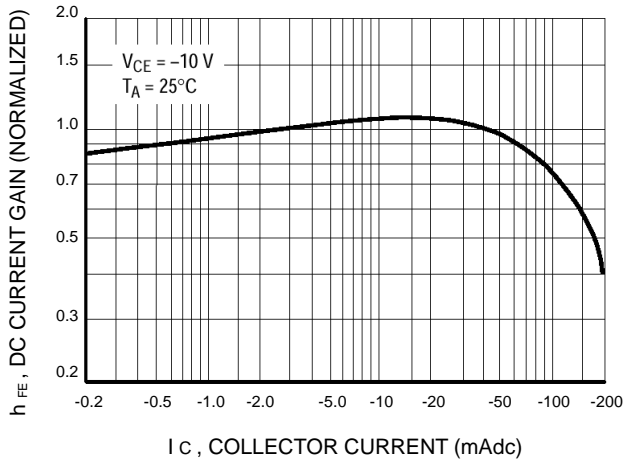


Figure 7. Normalized DC Current Gain

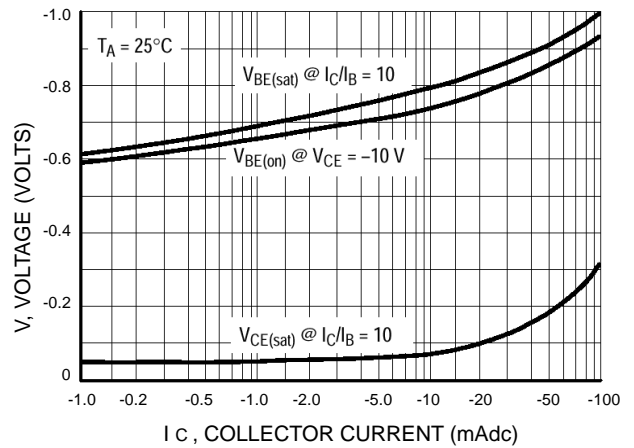


Figure 8. "Saturation" and "On" Voltages

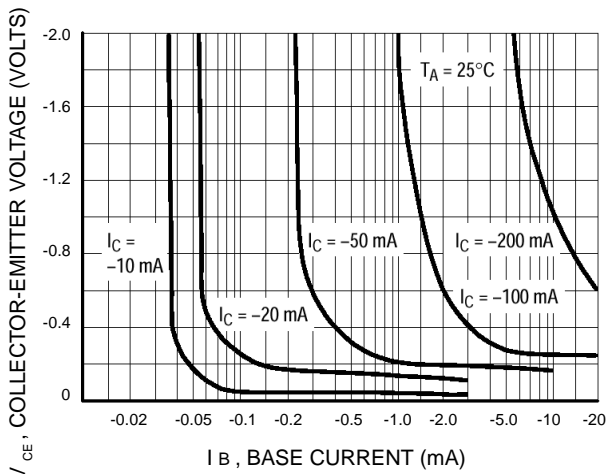


Figure 9. Collector Saturation Region

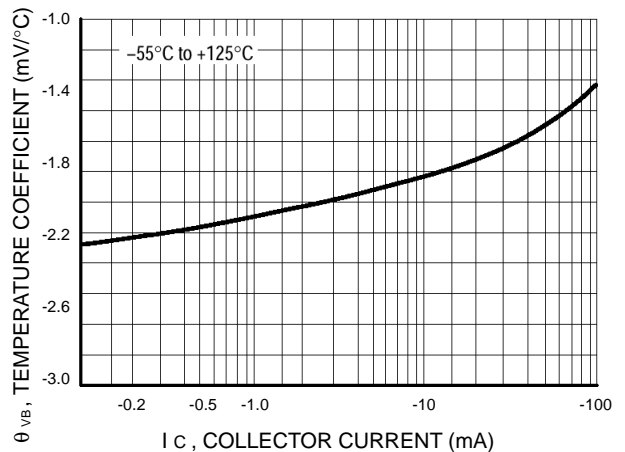


Figure 10. Base-Emitter Temperature Coefficient

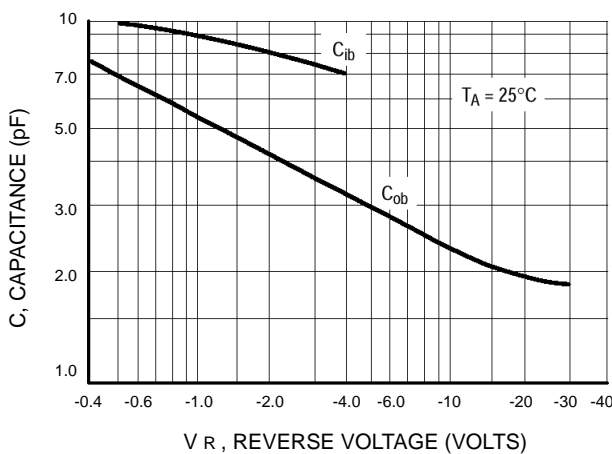


Figure 11. Capacitance

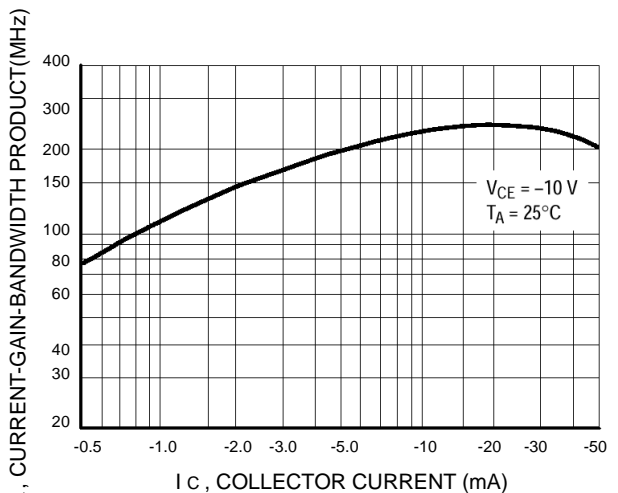


Figure 12. Current-Gain-Bandwidth Product

BC846BDW1T1, BC847BDW1T1, BC847CDW1T1, BC848BDW1T1, BC848CDW1T1

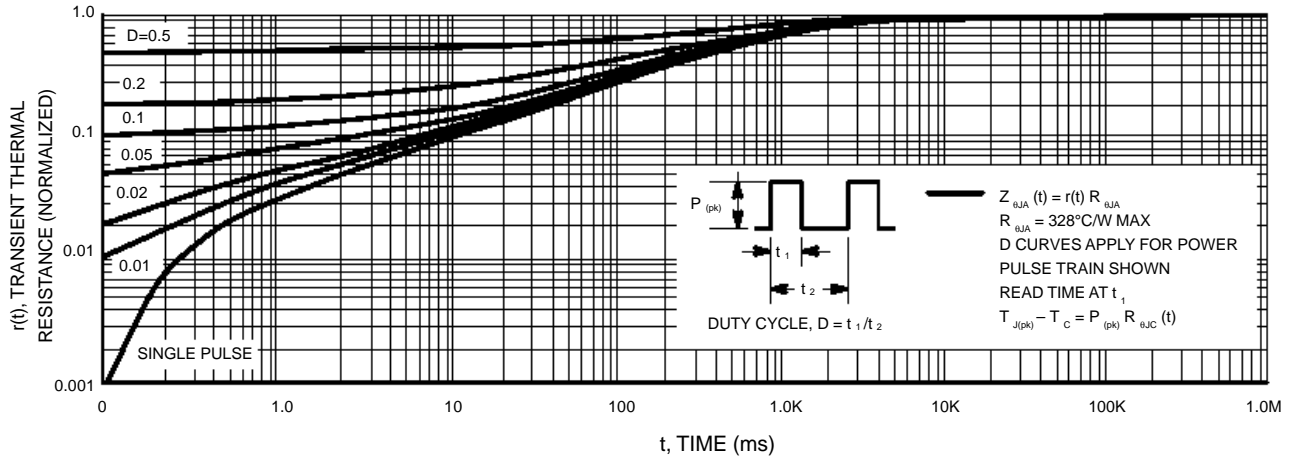


Figure 13. Thermal Response

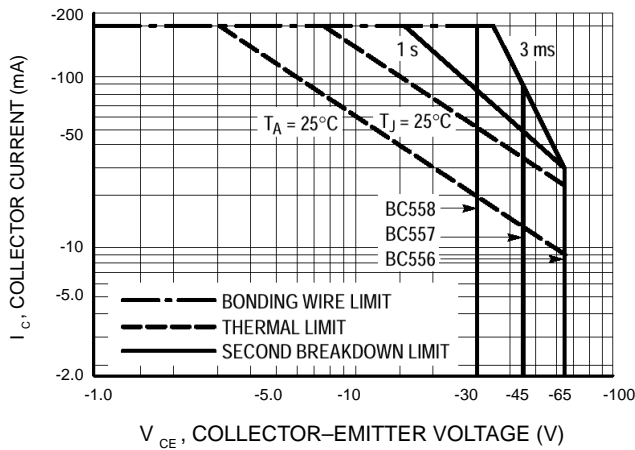


Figure 14. Active Region Safe Operating Area

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.