WEITRON

PNP Dual General Purpose Transistors

Pb **Lead(Pb)-Free**
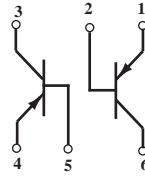
PNP+PNP
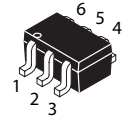
SOT-363(SC-88)

Maximum Ratings

Rating	Symbol	BC856	BC857	BC858	Unit
Collector-Emitter Voltage	V_{CEO}	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	mA

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation Per Device FR-5 Board(1)$T_A = 25°C$ Derate Above 25°C	P_D	380 250 3.0	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	°C/W
Junction Temperature Range	T_j	+150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Note : FR-5=1.0 x 0.75 x 0.062 inch

Device Marking

BC856BDW=3B , BC857BDW=3F , BC857CDW=3G , BC858BDW=3K , BC858CDW=3L

Electrical Characteristics (T$_A$=25°C Unless Otherwise noted)

Characteristics		Symbol	Min	Typ	Max	Unit

Off Characteristics

Characteristics		Symbol	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage I$_C$=10mA	BC856 BC857 BC858	V$_{(BR)CEO}$	-65 -45 -30	- - -	- - -	V
Collector-Emitter Breakdown Voltage V$_{EB}$=0V, I$_C$=-10μA	BC856 BC857 BC858	V$_{(BR)CES}$	-80 -50 -30	- - -	- - -	V
Emitter-Base Breakdown Voltage I$_C$=-10μA	BC856 BC857 BC858	V$_{(BR)CBO}$	-80 -50 -30	- - -	- - -	V
Emitter-Base Breakdown Voltage I$_E$=-1.0μA	BC856 BC857 BC858	V$_{(BR)EBO}$	-5.0 -5.0 -5.0	- - -	- - -	V
Collector Cutoff Current V$_{CB}$=-30V V$_{CB}$=-30V, T$_A$=150°C		I$_{CBO}$	- -	- -	-15 -4.0	nA μA

On Characteristics

Characteristics		Symbol	Min	Typ	Max	Unit
DC Current Gain V$_{CE}$ = −5.0V, I$_C$ = −10μA V$_{CE}$ = −5.0V, I$_C$ = −2.0mA	BC856B, BC857B, BC858C BC857C, BC858C BC856B, BC857B, BC858C BC857C, BC858C	h$_{FE}$	- - 220 420	150 270 290 520	- - 450 800	-
Collector-Emitter Saturation Voltage I$_C$ = −10mA, I$_B$ = −0.5mA I$_C$ = −100mA, I$_B$ = −5.0mA		V$_{CE(sat)}$	- -	- -	-0.3 -0.65	V
Base-Emitter Saturation Voltage I$_C$ = −10mA, I$_B$ = −0.5mA I$_C$ = −100mA, I$_B$ = −5.0mA		V$_{BE(sat)}$	- -	-0.7 -0.9	- -	V
Base-Emitter Voltage V$_{CE}$ = −5.0V, I$_C$ = −2.0mA V$_{CE}$ = −5.0V, I$_C$ = −10mA		V$_{BE(on)}$	-600 -	- -	-750 -820	mV

Small-Signal Characteristics

Characteristics	Symbol	Min	Typ	Max	Unit
Current-Gain-Bandwidth Product V$_{CE}$ = −5.0V, I$_C$ = −10mA, f = 100MHz	f$_T$	100	-	-	MHz
Output Capacitance V$_{CB}$ = −10V, f = 1.0kHz	C$_{ob}$	-	-	4.5	pF
Noise Figure V$_{CE}$ = −5.0V, I$_C$ = −0.2mA, R$_S$ = 2.0kΩ, f = 1.0kHz, B$_W$ = 200Hz	NF	-	-	10	dB

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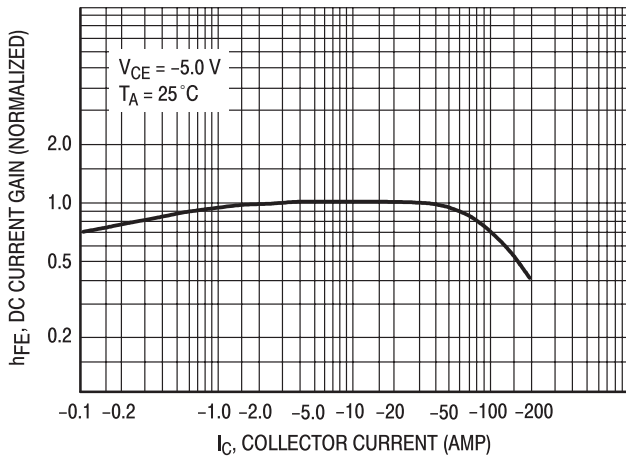## Electrical Characteristics

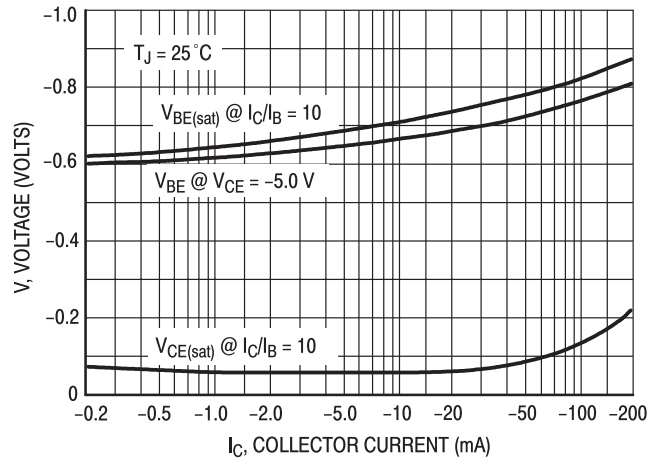

Figure 1. DC Current Gain
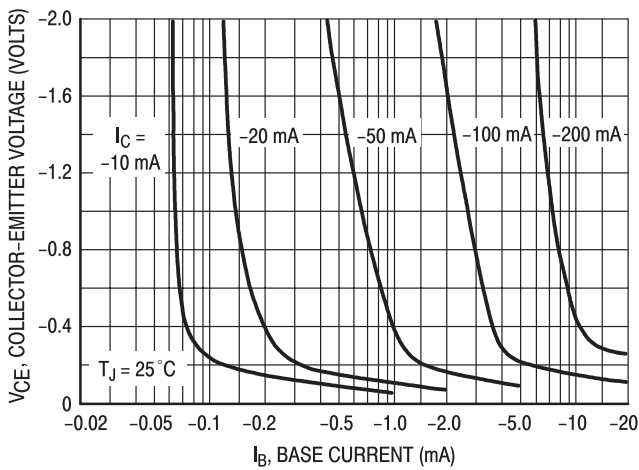

Figure 2. "On" Voltage
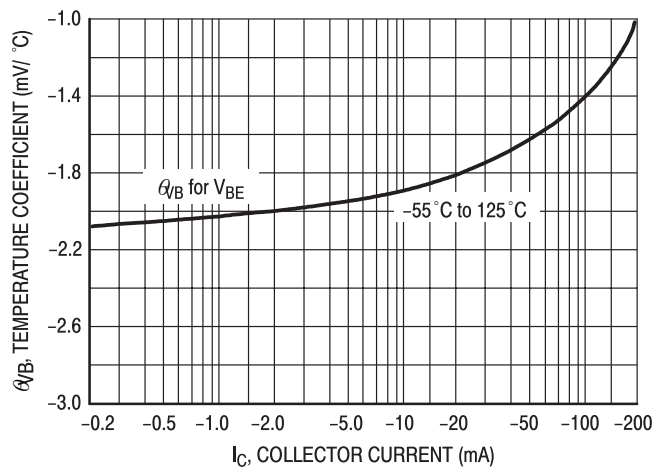

Figure 3. Collector Saturation Region

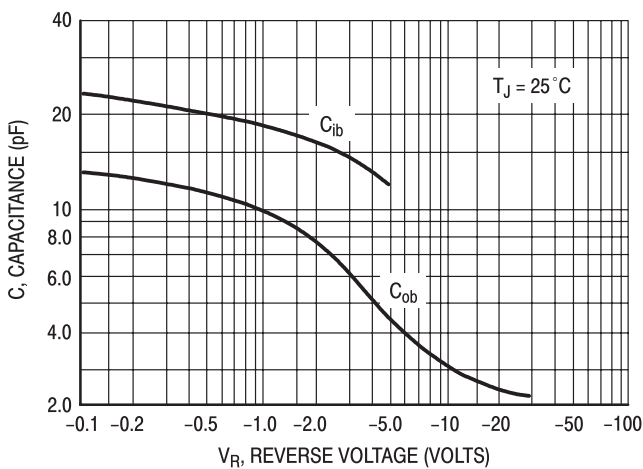**Figure 4. Base–Emitter Temperature Coefficient**
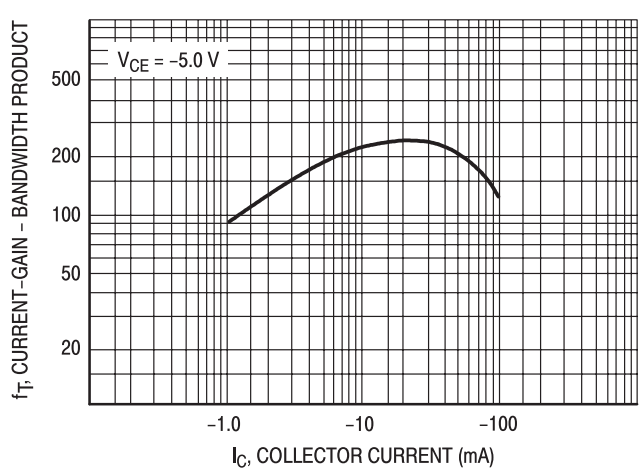

Figure 5. Capacitance

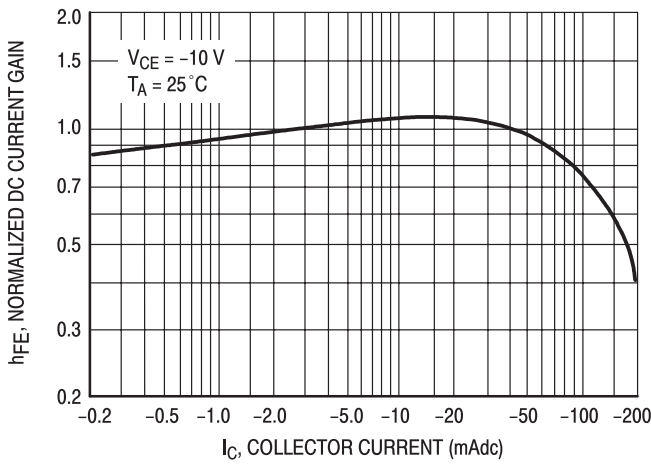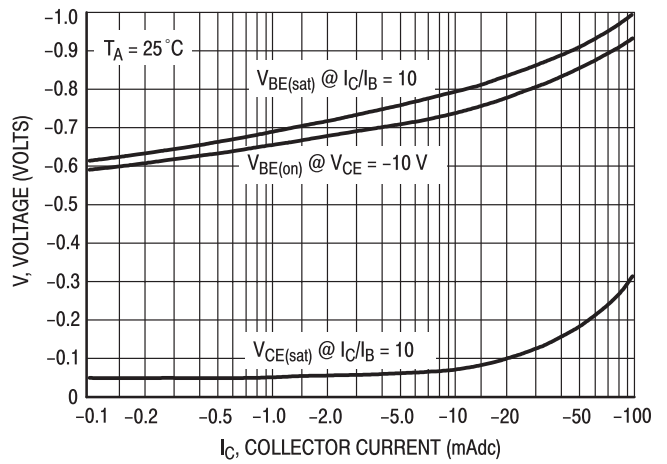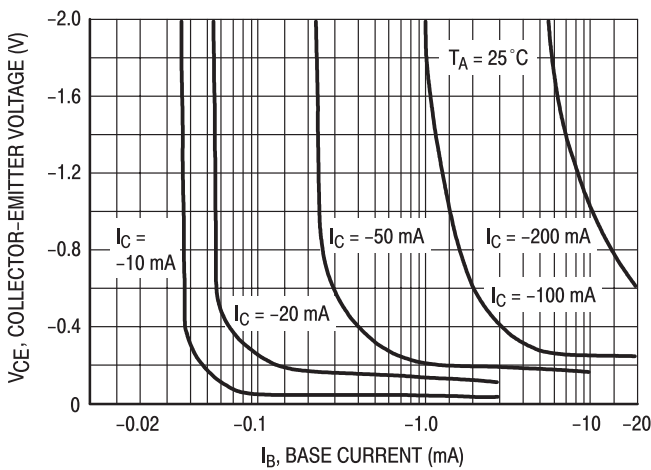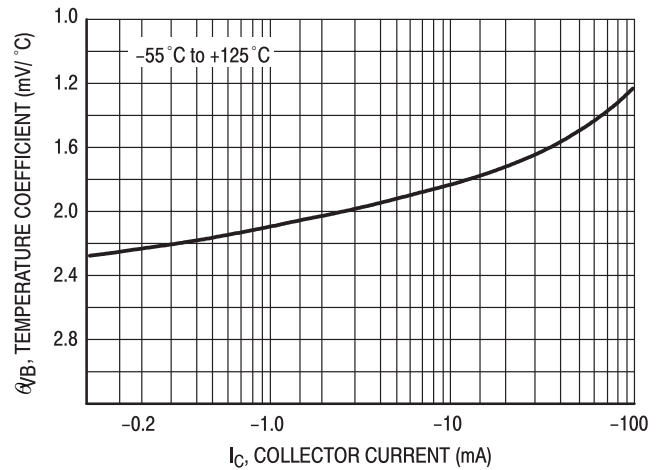**Figure 6. Current–Gain – Bandwidth Product**

Figure 7. Normalized DC Current Gain

Figure 8. "Saturation" and "On" Voltages

Figure 9. Collector Saturation Region

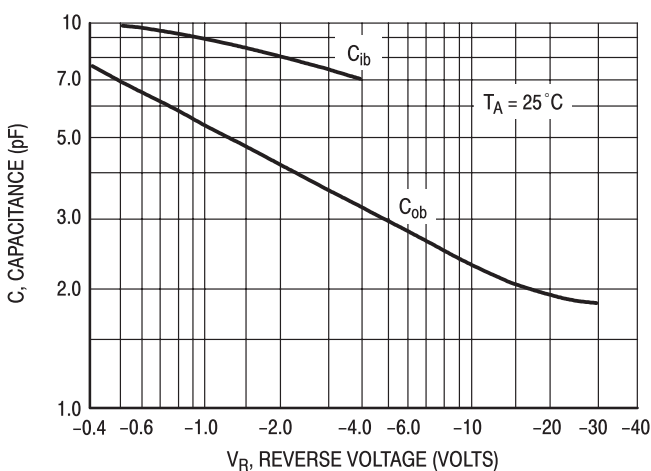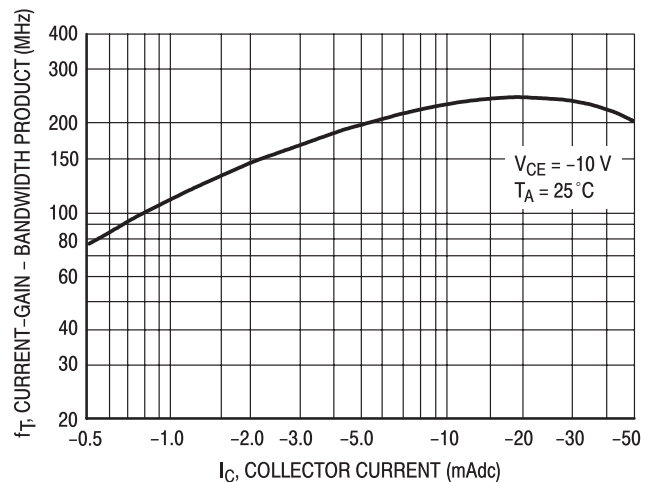**Figure 10. Base–Emitter Temperature Coefficient**
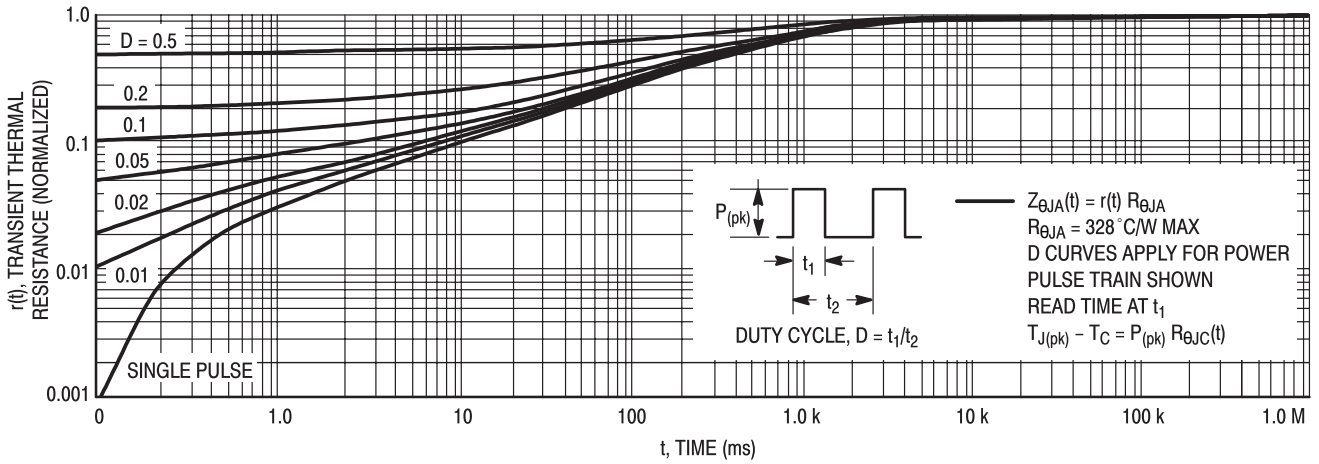

Figure 11. Capacitances

Figure 12. Current–Gain – Bandwidth Product

Figure 13. Thermal Response

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°C; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)}$ ≤ 150°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.
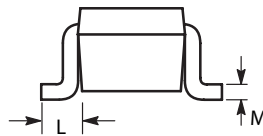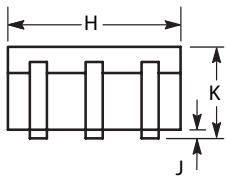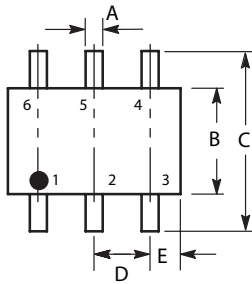
Figure 14. Active Region Safe Operating Area

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SOT-363 Package Outline Dimensions

Unit:mm

SOT-363		
Dim	**Min**	**Max**
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 REF	
E	0.30	0.40
H	1.80	2.20
J	-	0.10
K	0.80	1.10
L	0.25	0.40
M	0.10	0.25

0.5 mm (min)

0.65 mm

0.65 mm

0.4 mm (min)

1.9 mm