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September 2015

BC517 — NPN Darlington Transistor

# BC517 NPN Darlington Transistor

## Features

- This device is designed for applications requiring extremely high current gain at currents to 1.0 A.
- Sourced from process 05.



## Ordering Information

Part Number	Top Mark	Package	Packing Method
BC517_D74Z	BC517	TO-92 3L (Bent Lead)	Ammo

## Absolute Maximum Ratings<sup>(1), (2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	30	V
$V_{CBO}$	Collector-Base Voltage	40	V
$V_{EBO}$	Emitter-Base Voltage	10	V
$I_C$	Collector Current - Continuous	1.2	A
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

### Thermal Characteristics<sup>(3)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$P_D$	Total Device Dissipation, $T_A = 25^\circ\text{C}$	625	mW
	Derate Above $25^\circ\text{C}$	5.0	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	$^\circ\text{C}/\text{W}$

**Note:**

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 2.0\text{ mA}, I_B = 0$	30			V
$V_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	40			V
$V_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100\ \text{nA}, I_C = 0$	10			V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 30\ \text{V}, I_E = 0$			100	nA
$h_{FE}$	DC Current Gain	$V_{CE} = 2\ \text{V}, I_C = 20\ \text{mA}$	30,000			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\ \text{mA}, I_B = 0.1\ \text{mA}$			1	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 10\ \text{mA}, V_{CE} = 5.0\ \text{V}$			1.4	V

## Typical Performance Characteristics

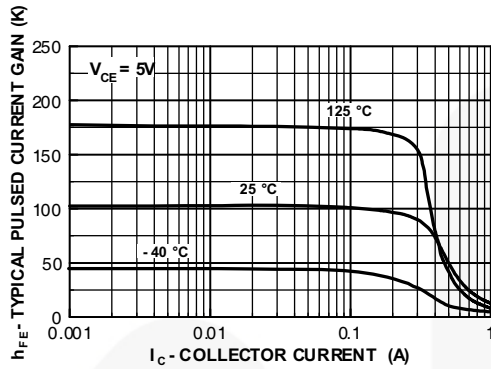


Figure 1. Typical Pulsed Current Gain vs. Collector Current

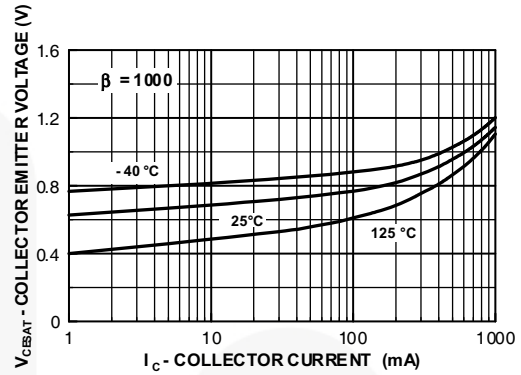


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

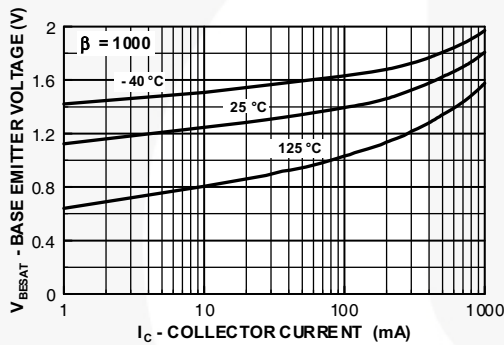


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

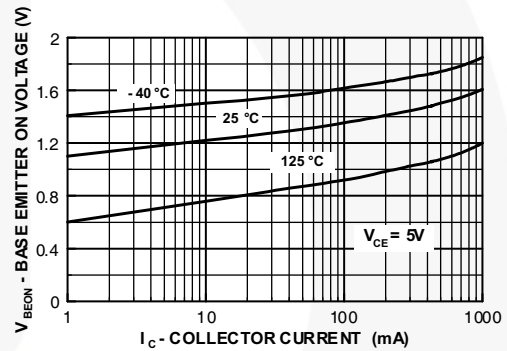


Figure 4. Base Emitter On Voltage vs. Collector Current

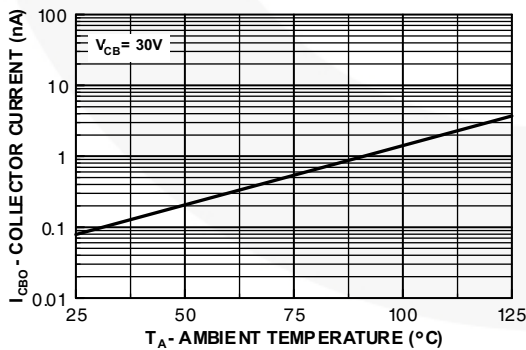


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

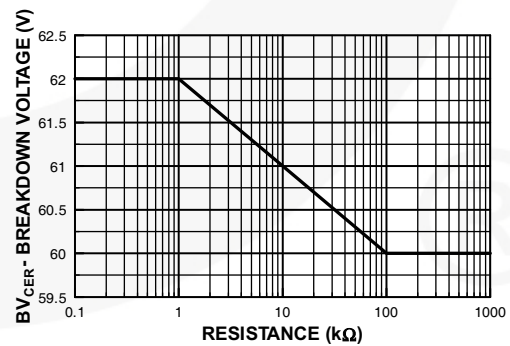


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

Typical Performance Characteristics (Continued)

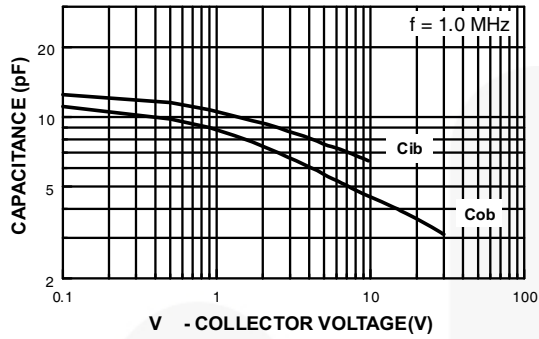


Figure 7. Input and Output Capacitance vs. Reverse Voltage

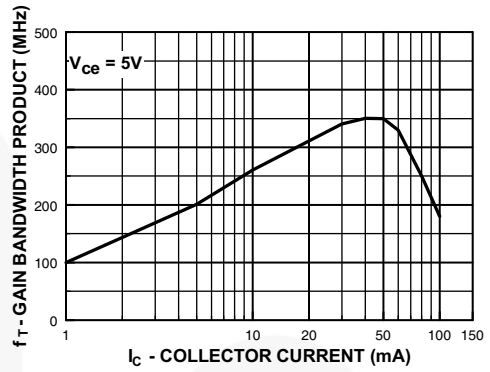


Figure 8. Gain Bandwidth Product vs. Collector Current

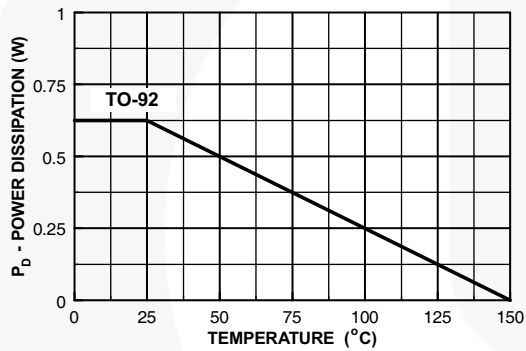
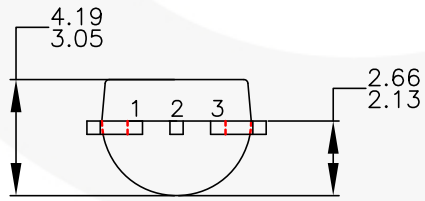
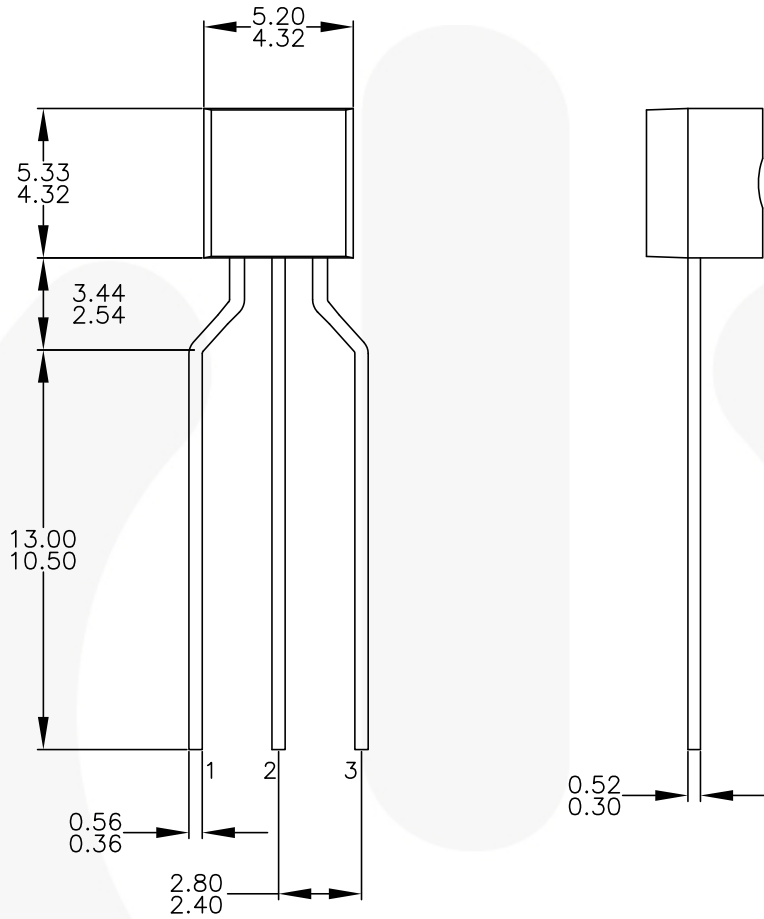


Figure 9. Power Dissipation vs. Ambient Temperature

Physical Dimensions








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  - B. ALL DIMENSIONS ARE IN MILLIMETERS.
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Figure 10. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo, Tape and Reel Packing



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