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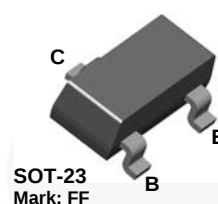
October 2014

BCV27

NPN Darlington Transistor

Description

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



Ordering Information

Part Number	Marking	Package	Packing Method
BCV27	FF	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings^{(1),(2)}

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°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics⁽³⁾

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

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation	350	mW
	Derate Above 25°C	2.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	$^\circ\text{C/W}$

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
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{ mA}, I_B = 0$	30			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\text{ }\mu\text{A}, I_E = 0$	40			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100\text{ nA}, I_C = 0$	10			V
I_{CBO}	Collector Cut-Off Current	$V_{CB} = 30\text{ V}, I_E = 0$			0.1	μA
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = 10\text{ V}, I_C = 0$			0.1	μA
h_{FE}	DC Current Gain	$I_C = 1.0\text{ mA}, V_{CE} = 5.0\text{ V}$	4000			
		$I_C = 10\text{ mA}, V_{CE} = 5.0\text{ V}$	10000			
		$I_C = 100\text{ mA}, V_{CE} = 5.0\text{ V}$	20000			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$			1.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 0.1\text{ mA}$			1.5	V
f_T	Current Gain - Bandwidth Product	$I_C = 30\text{ mA}, V_{CE} = 5.0\text{ V}, f = 100\text{ MHz}$		220		MHz
C_c	Collector Capacitance	$V_{CB} = 30\text{ V}, I_E = 0, f = 1.0\text{ MHz}$		3.5		pF

Typical Performance Characteristics

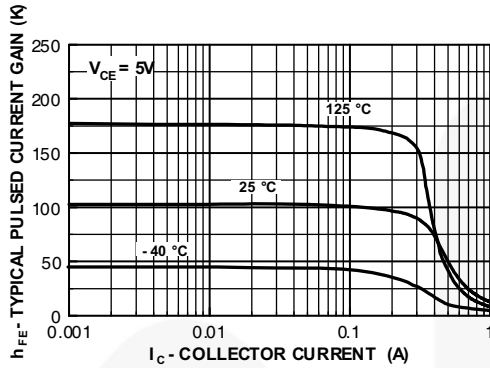


Figure 1. Typical Pulsed Current Gain vs. Collector Current

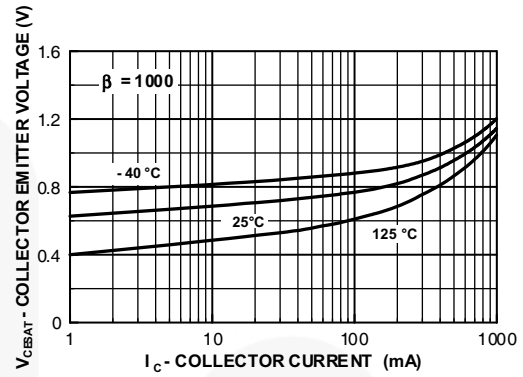


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

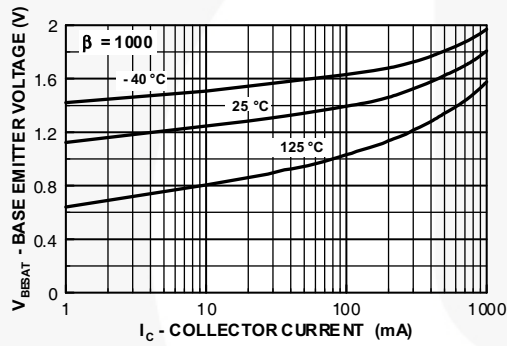


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

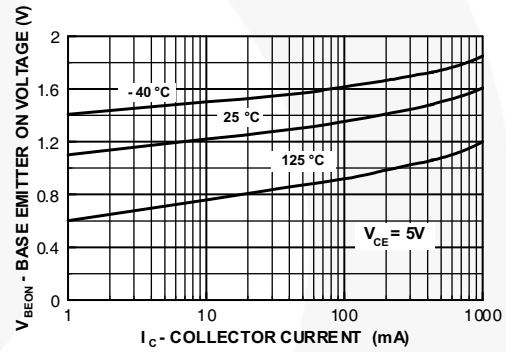


Figure 4. Base Emitter On Voltage vs. Collector Current

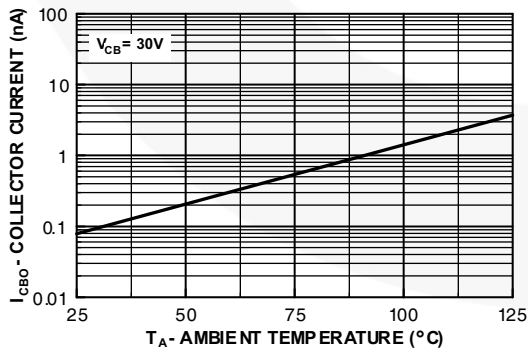


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

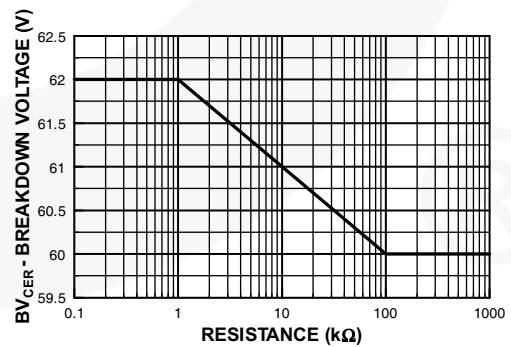


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

Typical Performance Characteristics (Continued)

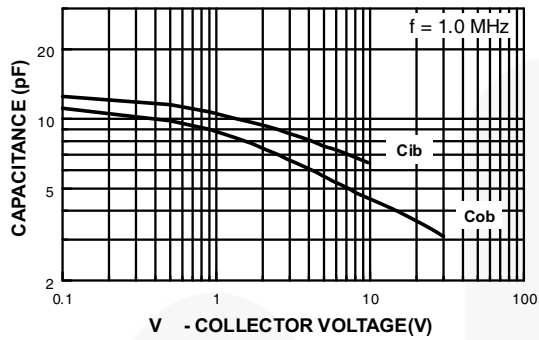


Figure 7. Input and Output Capacitance vs. Reverser Voltage

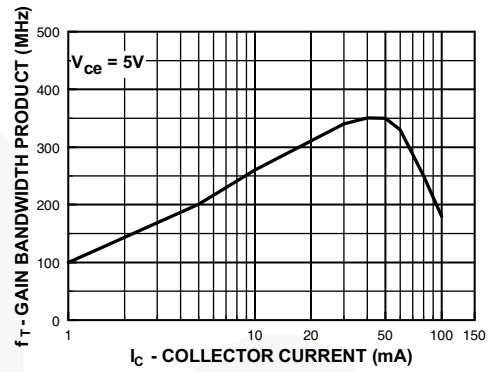


Figure 8. Gain Bandwidth Product vs. Collector Current

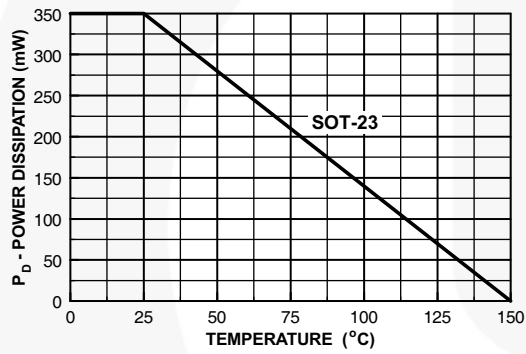


Figure 9. Power Dissipation vs. Ambient Temperature

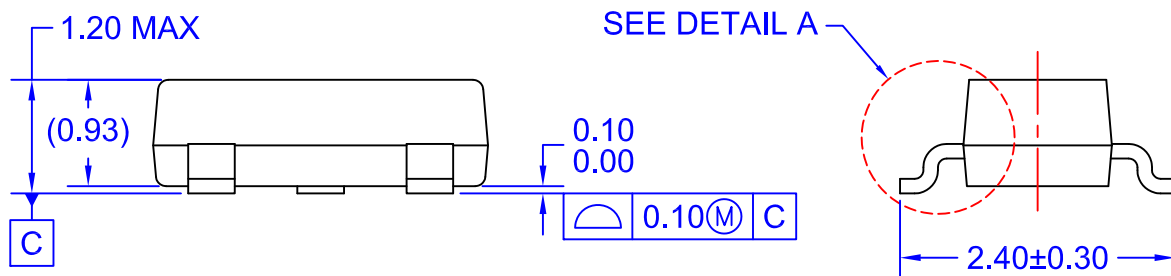


Figure 10.10 illustrates the dimensioning of a part with a hole. The diagram shows a cross-section of a mechanical part. Key dimensions and features are labeled:

- Hole Diameter:** 0.23 with a tolerance of 0.08.
- Distance from Left Face to Start of Hole:** 0.20 MIN.
- Distance from Left Face to Center of Hole:** 0.55.
- Distance from Center of Hole to Right Face:** 0.25.
- GAGE PLANE:** Indicated by a dashed red line.
- SEATING PLANE:** Indicated by a solid red line.

- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.
- E) DRAWING FILE NAME: MA03DREV12



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