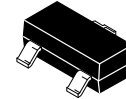


# NPN Darlington Transistor

## BCV27



SOT-23  
CASE 318

### Description

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

### ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Notes 1, 2)

| 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 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

### THERMAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Note 3)

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

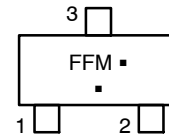
- PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

| Symbol        | Parameter                            | Test 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 | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cut–Off Current              | $V_{EB} = 10\text{ V}, I_C = 0$                                 | –     | –   | 0.1 | $\mu\text{A}$ |
| $h_{FE}$      | 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            |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### MARKING DIAGRAM



- Base
- Emitter
- Collector

FF = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device | Package                             | Shipping               |
|--------|-------------------------------------|------------------------|
| BCV27  | SOT-23<br>(Pb-Free,<br>Halide Free) | 3,000 /<br>Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

## TYPICAL CHARACTERISTICS

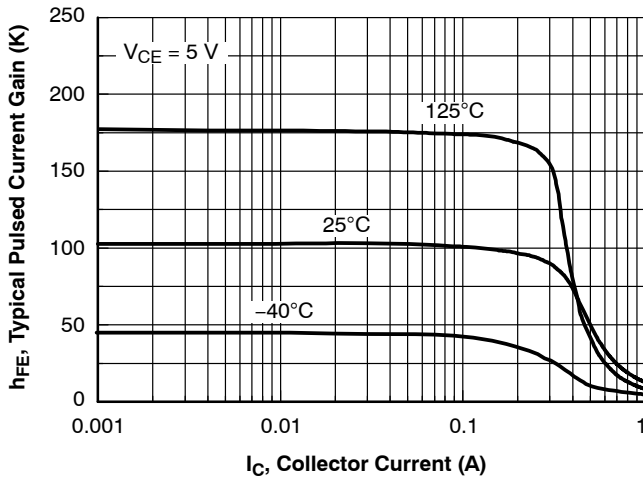


Figure 1. Typical Pulsed Current Gain vs. Collector Current

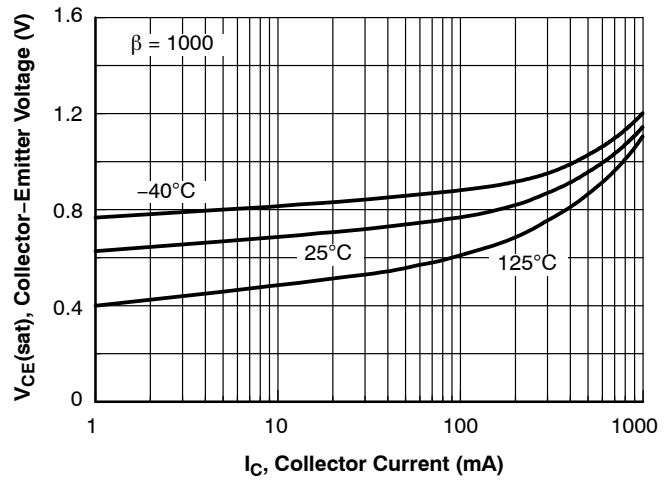


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

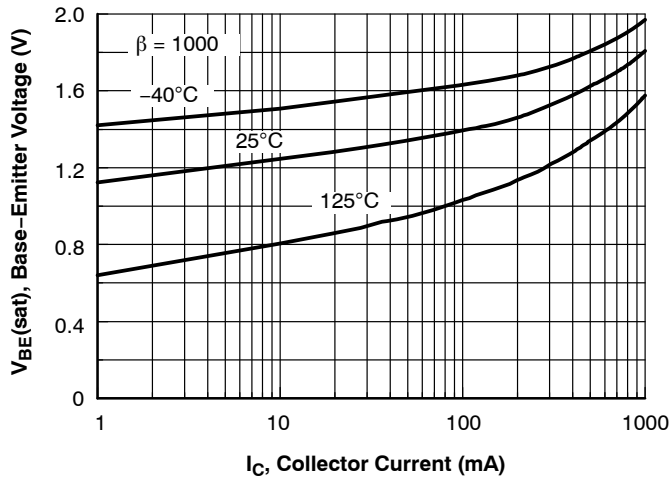


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

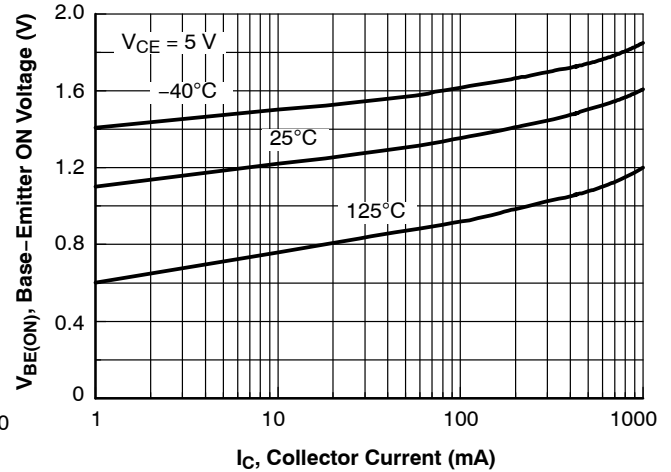


Figure 4. Base Emitter On Voltage vs. Collector Current

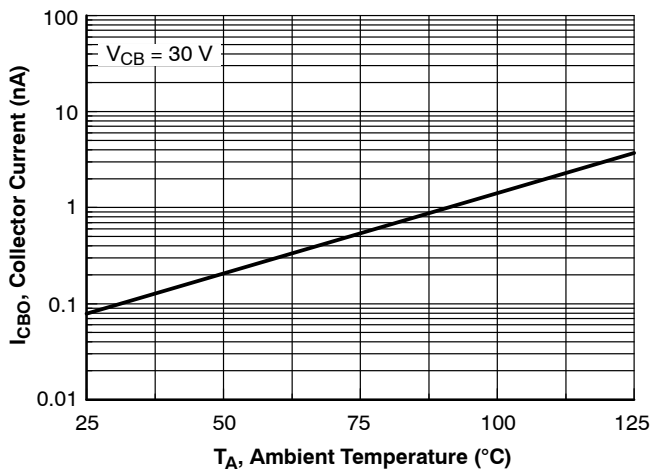


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

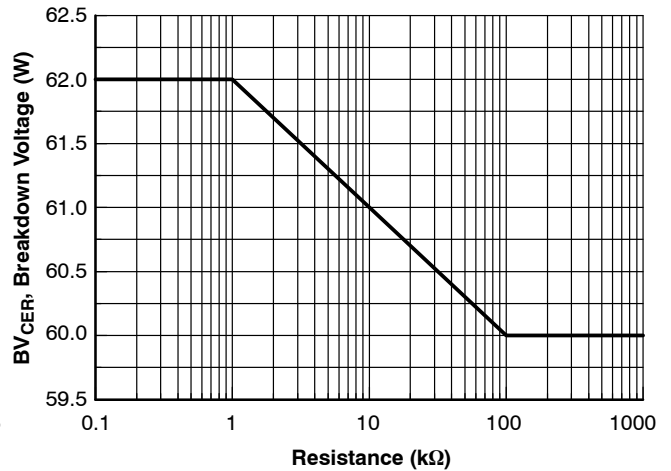


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

TYPICAL CHARACTERISTICS (Continued)

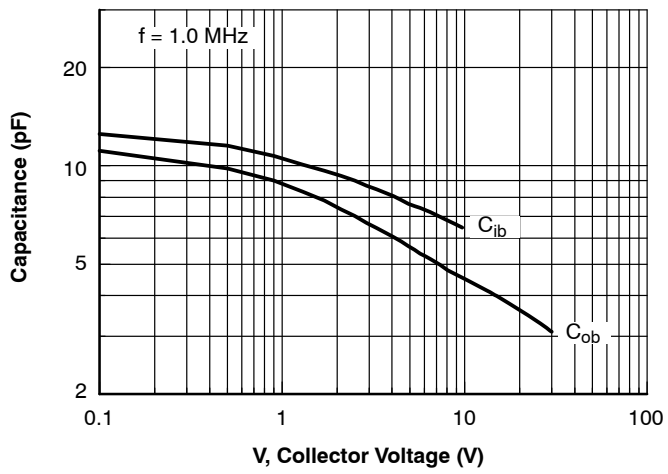


Figure 7. Input and Output Capacitance vs. Reverse Voltage

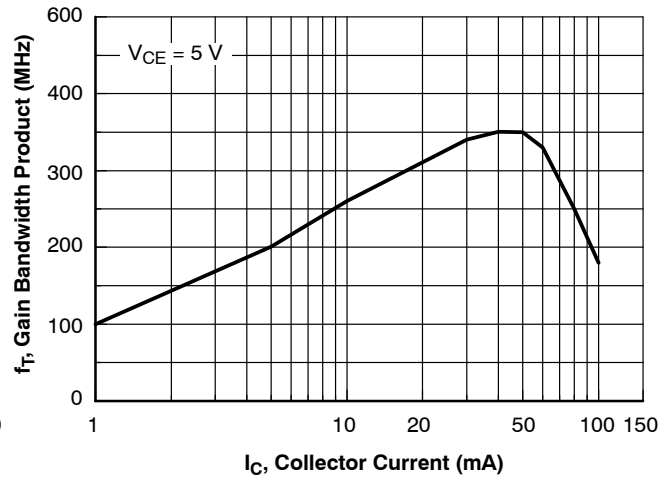


Figure 8. Gain Bandwidth Product vs. Collector Current

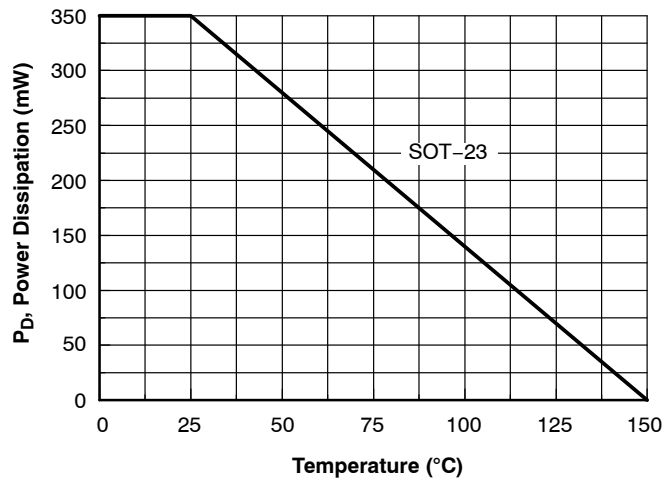


Figure 9. Power Dissipation vs. Ambient Temperature

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