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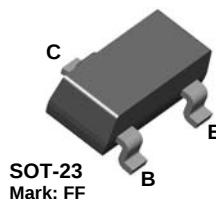
ON Semiconductor®

## 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<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. ON 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                               | 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  | $^\circ\text{C/W}$   |

**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  | $\mu\text{A}$ |
| $I_{EBO}$     | 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     | $I_C = 30\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ ,<br>$f = 100\text{ MHz}$ |       | 220  |      | MHz           |
| $C_c$         | Collector Capacitance                | $V_{CB} = 30\text{ V}$ , $I_E = 0$ ,<br>$f = 1.0\text{ MHz}$             |       | 3.5  |      | pF            |

## Typical Performance Characteristics

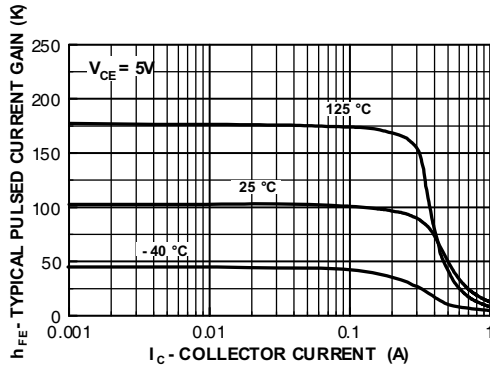


Figure 1. Typical Pulsed Current Gain vs. Collector Current

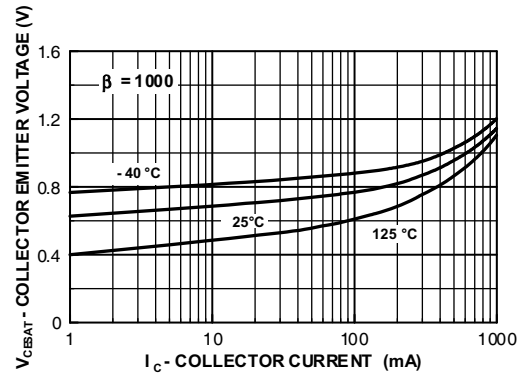


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

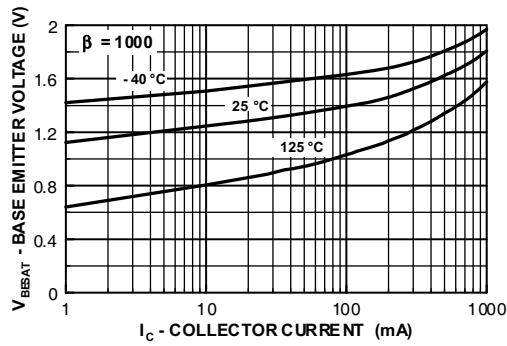


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

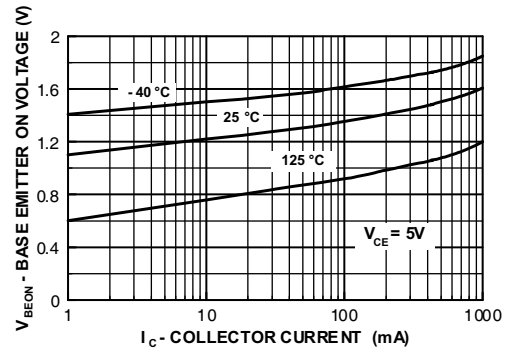


Figure 4. Base Emitter On Voltage vs. Collector Current

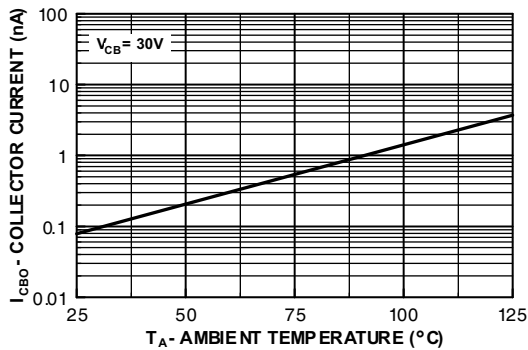


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

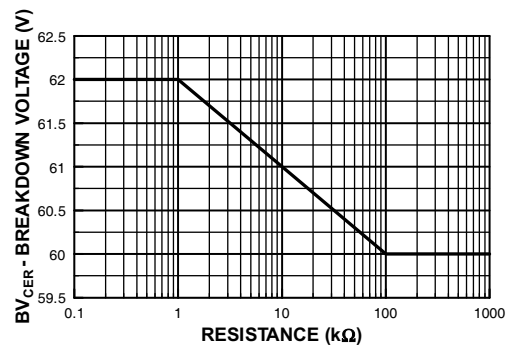


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

## Typical Performance Characteristics (Continued)

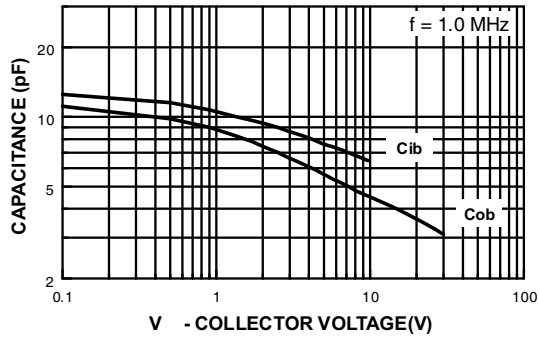


Figure 7. Input and Output Capacitance vs. Reverser Voltage

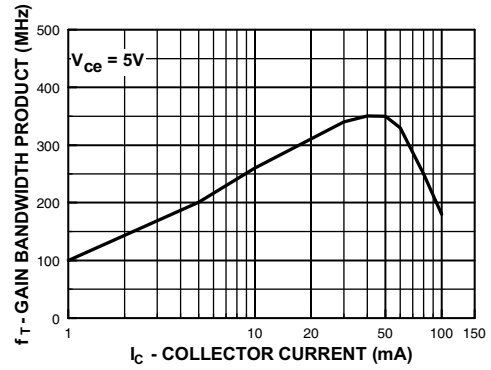


Figure 8. Gain Bandwidth Product vs. Collector Current

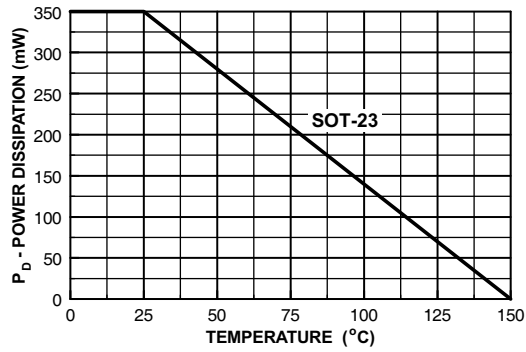


Figure 9. Power Dissipation vs. Ambient Temperature

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