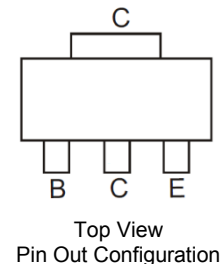
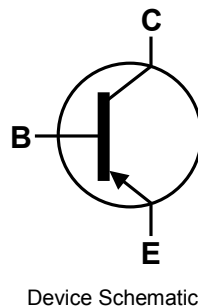
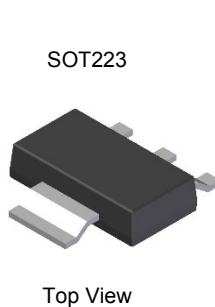


## Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP68)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>**

## Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green Molding" Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin, Solderable per MIL-STD -202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)



## Ordering Information (Note 4)

| Part Number | Status   | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|-------------|----------|------------|---------|--------------------|-----------------|-------------------|
| DCP69-13    | Active   | Standard   | P12     | 13                 | 12              | 2,500             |
| DCP69-16-13 | Obsolete | Standard   | P12-16  | 13                 | 12              | 2,500             |
| DCP69-25-13 | Obsolete | Standard   | P12-25  | 13                 | 12              | 2,500             |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant..
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



- xxx = Product Type Marking Code  
 P12 = DCP69  
 P12-16 = DCP69-16  
 P12-25 = DCP69-25  
 DII = Manufacturer's code marking  
 YWW = Date Code Marking  
 Y = Last digit of year (ex: 8 = 2018)  
 WW = Week code (01 – 53)

**Maximum Ratings @  $T_A = 25^\circ\text{C}$  unless otherwise specified**

| Characteristic            | Symbol    | Value | Units |
|---------------------------|-----------|-------|-------|
| Collector-Base Voltage    | $V_{CBO}$ | -25   | V     |
| Collector-Emitter Voltage | $V_{CEO}$ | -20   | V     |
| Emitter-Base Voltage      | $V_{EBO}$ | -5    | V     |
| Collector Current         | $I_C$     | -1    | A     |
| Peak Pulse Current        | $I_{CM}$  | -2    | A     |

**Thermal Characteristics @  $T_A = 25^\circ\text{C}$  unless otherwise specified**

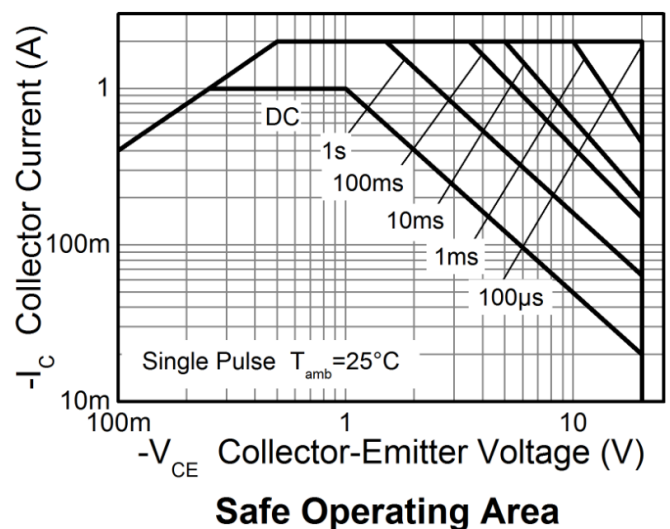
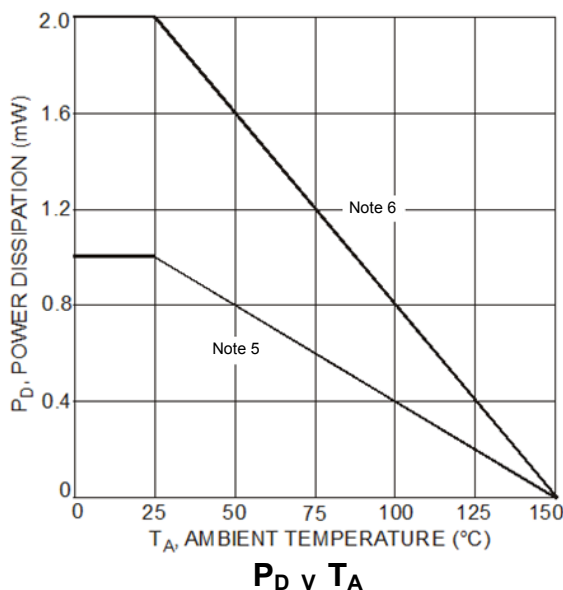
| Characteristic                                       | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 5)                           | $P_D$           | 1           | W                  |
| Thermal Resistance, Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 125         | $^\circ\text{C/W}$ |
| Power Dissipation (Note 6)                           | $P_D$           | 2           | W                  |
| Thermal Resistance, Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 62.5        | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range              | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

**ESD Ratings (Note 7)**

| Characteristic                           | Symbol  | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge—Human Body Model | ESD HBM | 4000  | V    | 3A          |
| Electrostatic Discharge—Machine Model    | ESD MM  | 400   | V    | C           |

- Notes:
- Device mounted on FR-4 PCB; pad layout as shown on in Diodes Inc. suggested pad layout document, which can be found on our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
  - Device mounted on FR-4 PCB with 1in<sup>2</sup> copper pad layout
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

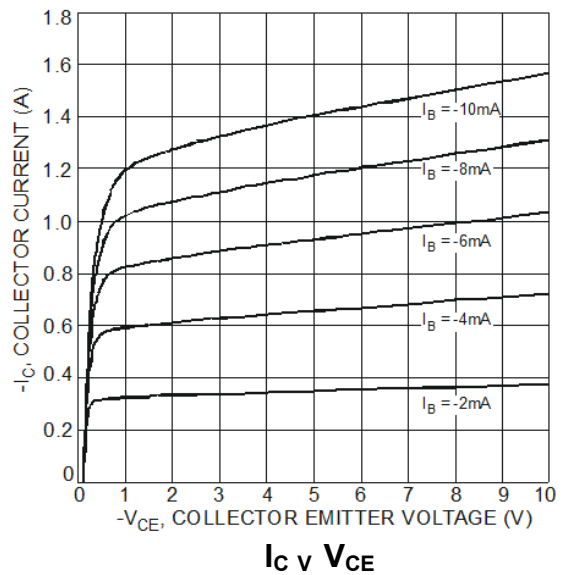
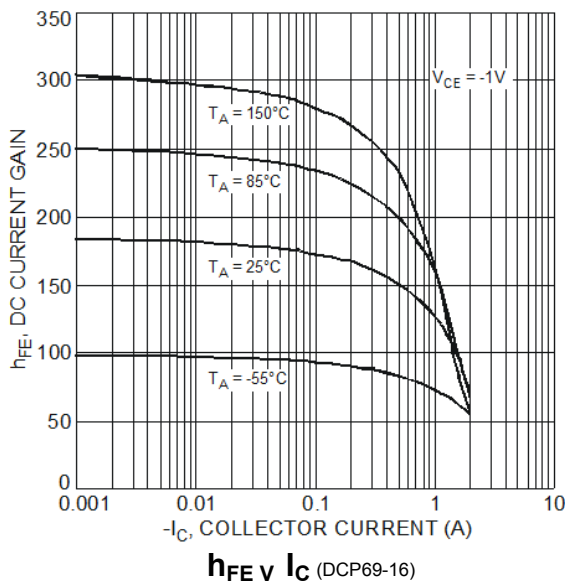


**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

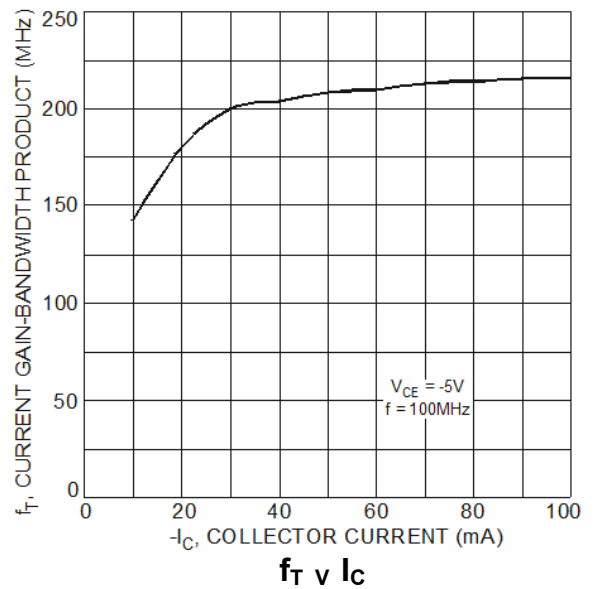
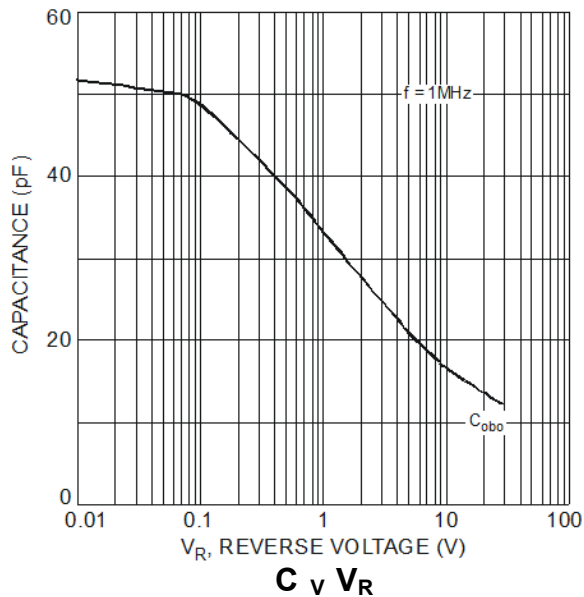
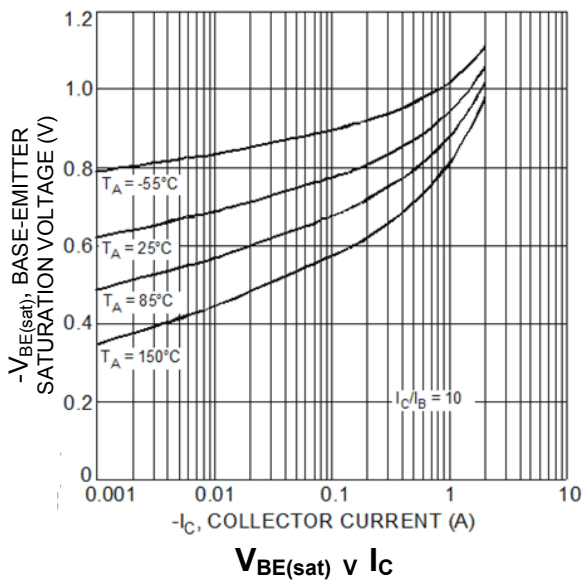
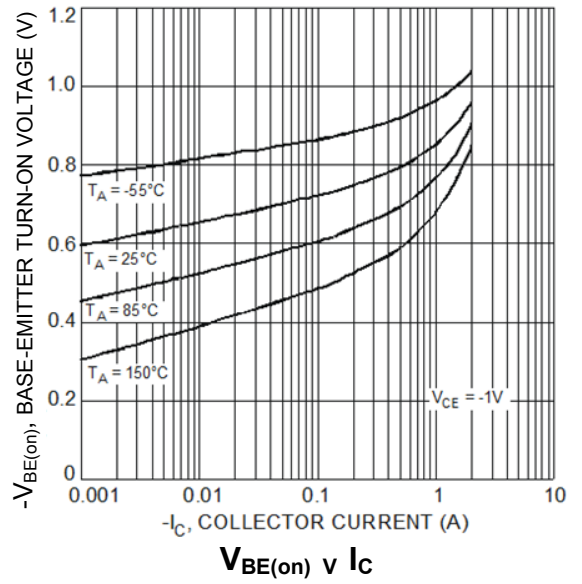
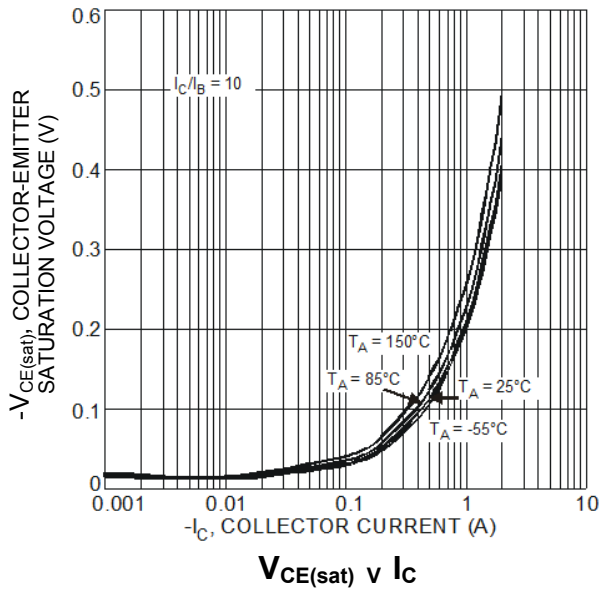
| Characteristic                               |                           | Symbol        | Min | Typ | Max         | Unit                | Test Condition  |
|--|---------------------------|---------------|-----|-----|-------------|---------------------|---|
| <b>OFF CHARACTERISTICS</b>                   |                           |               |     |     |             |                     |   |
| Collector-Base Breakdown Voltage             |                           | $BV_{CBO}$    | -25 | —   | —           | V                   | $I_C = -100\mu\text{A}, I_E = 0$  |
| Collector-Emitter Breakdown Voltage (Note 8) |                           | $BV_{CEO}$    | -20 | —   | —           | V                   | $I_C = -10\text{mA}, I_B = 0$   |
| Emitter-Base Breakdown Voltage               |                           | $BV_{EBO}$    | -5  | —   | —           | V                   | $I_E = -100\mu\text{A}, I_C = 0$  |
| Collector-Base Cut-Off Current               |                           | $I_{CBO}$     | —   | —   | -100<br>-10 | nA<br>$\mu\text{A}$ | $V_{CB} = -25\text{V}, I_E = 0$<br>$V_{CB} = -25\text{V}, I_E = 0, T_A = 150^\circ\text{C}$ |
| Emitter-Base Cut-Off Current                 |                           | $I_{EBO}$     | —   | —   | -100        | nA                  | $V_{EB} = -5.0\text{V}, I_C = 0$  |
| <b>ON CHARACTERISTICS (Note 8)</b>           |                           |               |     |     |             |                     |   |
| DC Current Gain                              | DCP69, DCP69-16, DCP69-25 | $h_{FE}$      | 50  | —   | —           | —                   | $V_{CE} = -10\text{V}, I_C = -5.0\text{mA}$   |
|  | DCP69                     |               | 60  | —   | —           |                     | $V_{CE} = -1\text{V}, I_C = -1\text{A}$   |
|  | DCP69-16                  |               | 85  | —   | 375         |                     | $V_{CE} = -1\text{V}, I_C = -500\text{mA}$  |
|  | DCP69-25                  |               | 100 | —   | 250         |                     | $V_{CE} = -1\text{V}, I_C = -500\text{mA}$  |
| Collector-Emitter Saturation Voltage         |                           | $V_{CE(sat)}$ | —   | —   | -0.5        | V                   | $I_C = -1\text{A}, I_B = -100\text{mA}$   |
| Base-Emitter Turn-On Voltage                 |                           | $V_{BE(on)}$  | —   | —   | -0.7<br>-1  | V                   | $V_{CE} = -10\text{V}, I_C = -5.0\text{mA}$<br>$V_{CE} = -1\text{V}, I_C = -1\text{A}$      |
| <b>SMALL SIGNAL CHARACTERISTICS</b>          |                           |               |     |     |             |                     |   |
| Transition frequency                         |                           | $f_T$         | 40  | 200 | —           | MHz                 | $V_{CE} = -5\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$                                |
| Output Capacitance                           |                           | $C_{obo}$     | —   | 17  | —           | pF                  | $V_{CB} = -10\text{V}, f = 1\text{MHz}$   |

Notes: 8. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



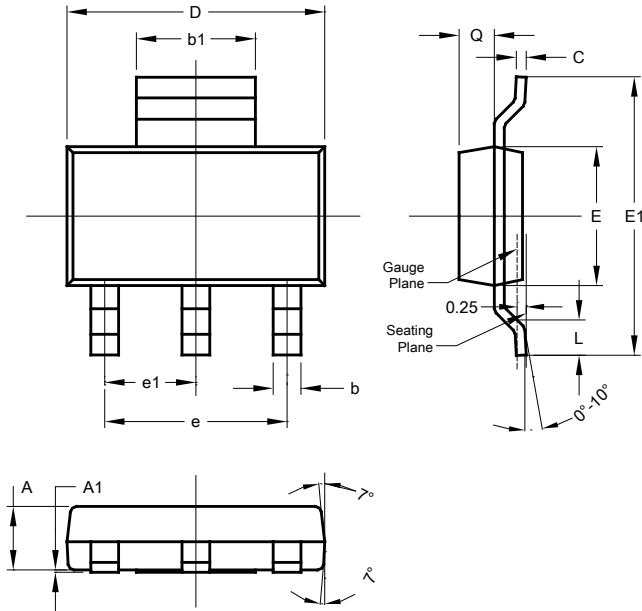
**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.) (continued)



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223**

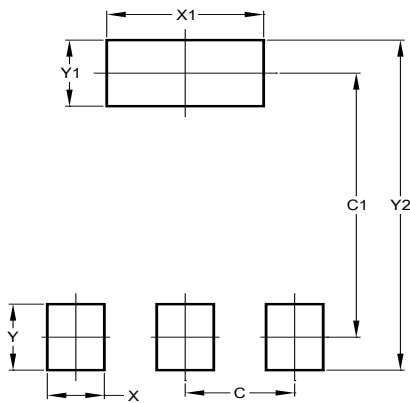


| SOT223               |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 1.55  | 1.65 | 1.60 |
| A1                   | 0.010 | 0.15 | 0.05 |
| b                    | 0.60  | 0.80 | 0.70 |
| b1                   | 2.90  | 3.10 | 3.00 |
| C                    | 0.20  | 0.30 | 0.25 |
| D                    | 6.45  | 6.55 | 6.50 |
| E                    | 3.45  | 3.55 | 3.50 |
| E1                   | 6.90  | 7.10 | 7.00 |
| e                    | -     | -    | 4.60 |
| e1                   | -     | -    | 2.30 |
| L                    | 0.85  | 1.05 | 0.95 |
| Q                    | 0.84  | 0.94 | 0.89 |
| All Dimensions in mm |       |      |      |

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.30          |
| C1         | 6.40          |
| X          | 1.20          |
| X1         | 3.30          |
| Y          | 1.60          |
| Y1         | 1.60          |
| Y2         | 8.00          |

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