

Features

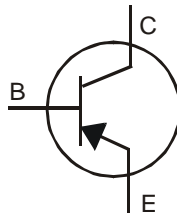
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP68)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

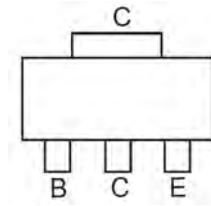
- Case: SOT223
- Case Material: Molded Plastic, "Green Molding" Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin
- Solderable per MIL-STD -202, Method 208
- Weight: 0.112 grams (approximate)



Top View



Device Schematic



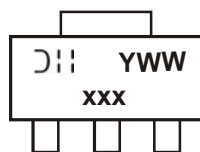
Top View
Pin Out Configuration

Ordering Information (Note 3)

| Part Number | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|-------------|---------|--------------------|-----------------|-------------------|
| DCP69-13 | P12 | 13 | 12 | 2500 |
| DCP69-16-13 | P12-16 | 13 | 12 | 2500 |
| DCP69-25-13 | P12-25 | 13 | 12 | 2500 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 3. For packaging details, go to our website at <http://www.diodes.com>.

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: 1 = 2011)

WW = Week code (01 – 53)

Maximum Ratings @T_A = 25°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} | -5.0 | V |
| Collector Current | I _C | -1.0 | A |
| Peak Pulse Current | I _{CM} | -2.0 | A |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 4) | P _D | 1 | W |
| Thermal Resistance, Junction to Ambient Air (Note 4) | R _{θJA} | 125 | °C/W |
| Power Dissipation (Note 5) | P _D | 2 | W |
| Thermal Resistance, Junction to Ambient Air (Note 5) | R _{θJA} | 62.5 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition | |
|--|---------------------------|-----------------|-----|--------------|----------|--|--|
| OFF CHARACTERISTICS | | | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | -25 | — | — | V | I _C = -100μA, I _E = 0 | |
| Collector-Emitter Breakdown Voltage (Note 6) | BV _{CEO} | -20 | — | — | V | I _C = -10mA, I _B = 0 | |
| Emitter-Base Breakdown Voltage | BV _{EBO} | -5.0 | — | — | V | I _E = -100μA, I _C = 0 | |
| Collector-Base Cutoff Current | I _{CBO} | — | — | -100 -10 | nA μA | V _{CB} = -25V, I _E = 0 V _{CB} = -25V, I _E = 0, T _A = 150°C | |
| Emitter-Base Cutoff Current | I _{EBO} | — | — | -100 | nA | V _{EB} = -5.0V, I _C = 0 | |
| ON CHARACTERISTICS (Note 6) | | | | | | | |
| DC Current Gain | DCP69, DCP69-16, DCP69-25 | h _{FE} | 50 | — | — | — | V _{CE} = -10V, I _C = -5.0mA |
| | | | 60 | — | — | | V _{CE} = -1.0V, I _C = -1.0A |
| | | | 85 | — | 375 | | V _{CE} = -1.0V, I _C = -500mA |
| | | | 100 | — | 250 | | V _{CE} = -1.0V, I _C = -500mA |
| | DCP69-16 | 160 | — | 375 | | V _{CE} = -1.0V, I _C = -500mA | |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | — | — | -0.5 | V | I _C = -1.0A, I _B = -100mA | |
| Base-Emitter Turn-On Voltage | V _{BE(on)} | — | — | -0.7 -1.0 | V | V _{CE} = -10V, I _C = -5.0mA V _{CE} = -1.0V, I _C = -1.0A | |
| SMALL SIGNAL CHARACTERISTICS | | | | | | | |
| Current Gain-Bandwidth Product | f _T | 40 | 200 | — | MHz | V _{CE} = -5.0V, I _C = -50mA, f = 100MHz | |
| Output Capacitance | C _{obo} | — | 17 | — | pF | V _{CB} = -10V, f = 1 MHz | |

Notes: 4. 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 <http://www.diodes.com>

5. Device mounted on FR-4 PCB with 1in² copper pad layout

6. Measured under pulsed conditions. Pulse width = 300μS. Duty cycle ≤ 2%.

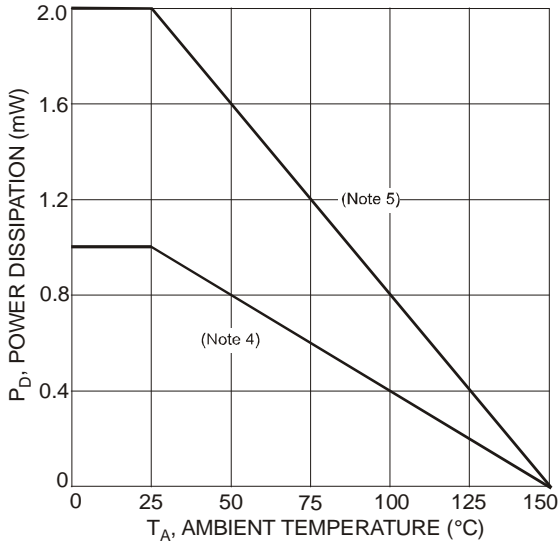


Fig. 1 Power Dissipation vs. Ambient Temperature

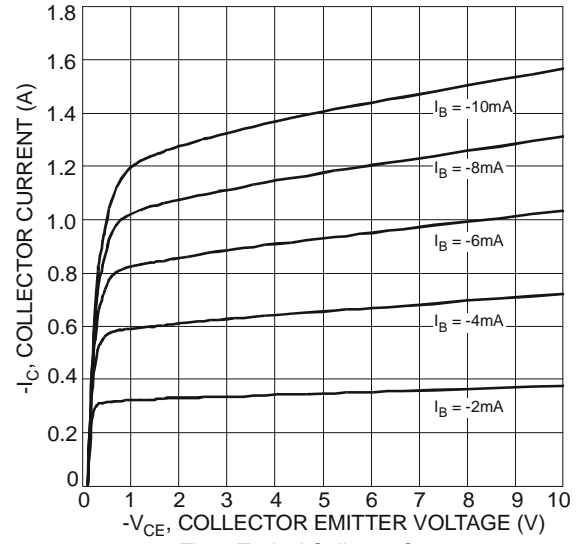


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

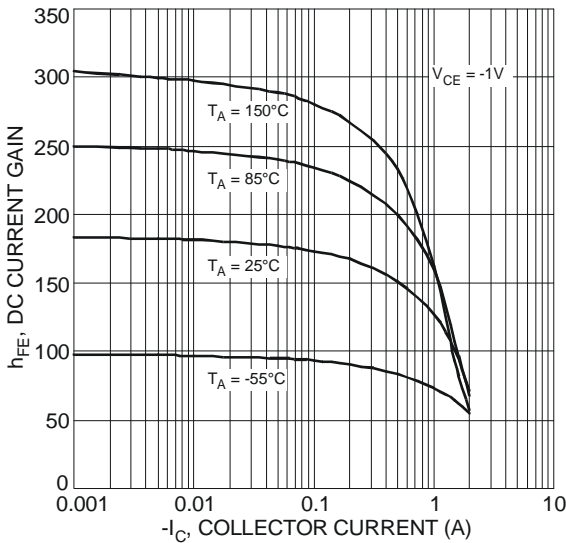


Fig. 3 Typical DC Current Gain vs. Collector Current (DCP69-16)

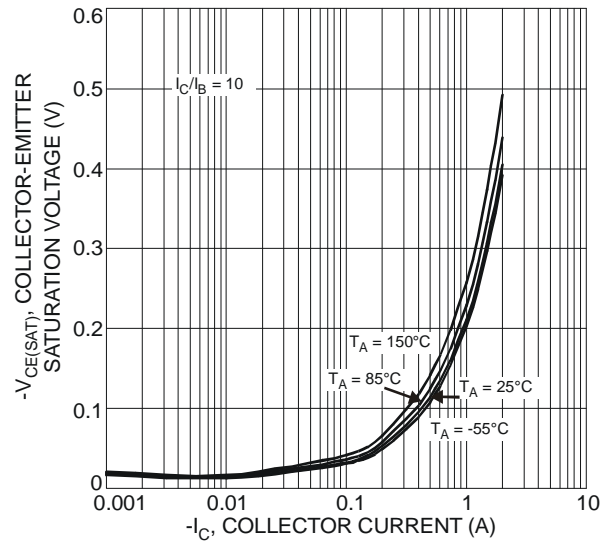


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

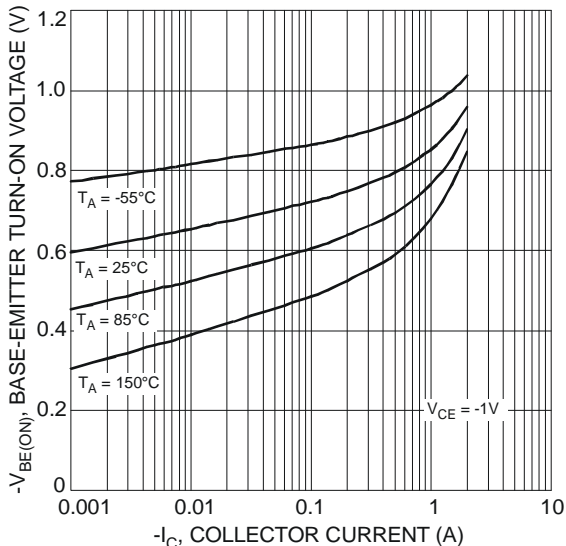


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

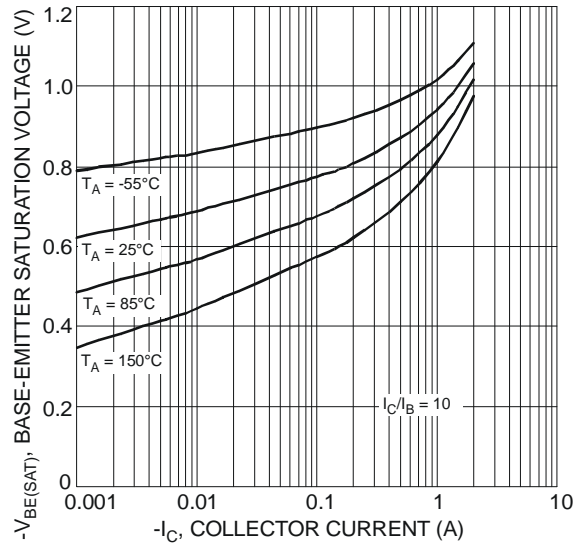


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

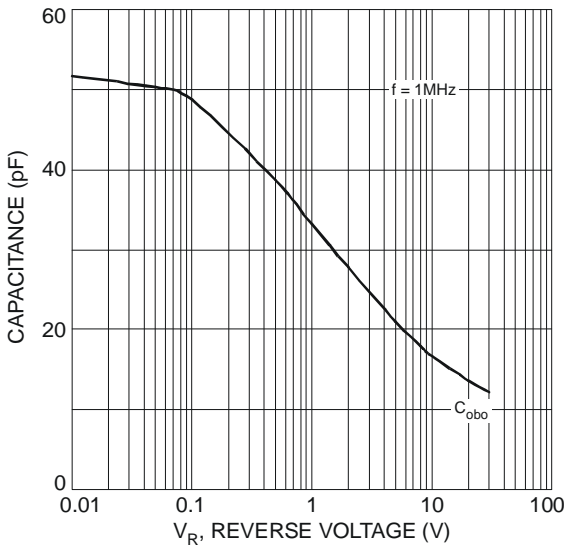


Fig. 7 Typical Output Capacitance Characteristics

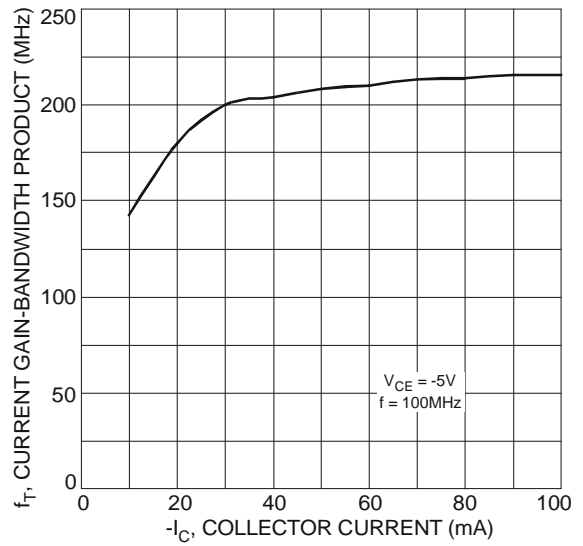
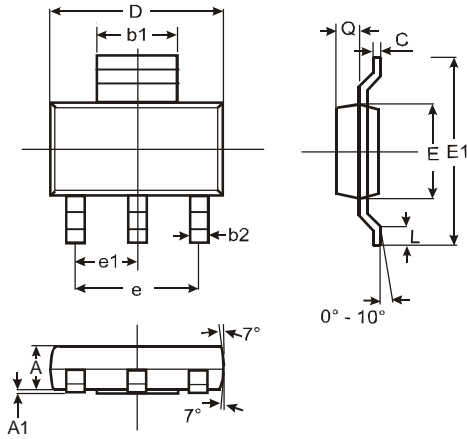


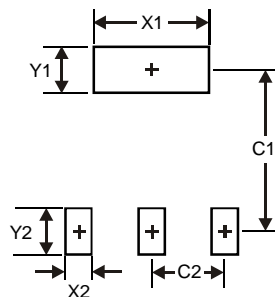
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions



| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b1 | 2.90 | 3.10 | 3.00 |
| b2 | 0.60 | 0.80 | 0.70 |
| 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



| Dimensions | Value (in mm) |
|------------|---------------|
| X1 | 3.3 |
| X2 | 1.2 |
| Y1 | 1.6 |
| Y2 | 1.6 |
| C1 | 6.4 |
| C2 | 2.3 |

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