

## Features

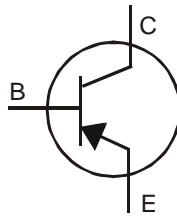
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP68)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note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

## Mechanical Data

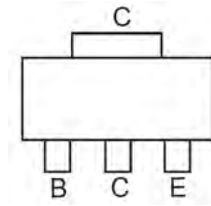
- Case: SOT223
- Case Material: Molded Plastic, "Green Molding" Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin
- Solderable per MIL-STD -202, Method 208
- Weight: 0.112 grams (approximate)



Top View



Device Schematic



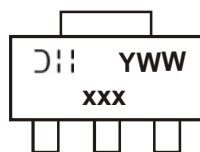
Top View  
Pin Out Configuration

## 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<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Units
Collector-Base Voltage	V <sub>CBO</sub>	-25	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-20	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	V
Collector Current	I <sub>C</sub>	-1.0	A
Peak Pulse Current	I <sub>CM</sub>	-2.0	A

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P <sub>D</sub>	1	W
Thermal Resistance, Junction to Ambient Air (Note 4)	R <sub>θJA</sub>	125	°C/W
Power Dissipation (Note 5)	P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	62.5	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
<b>OFF CHARACTERISTICS</b>							
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-25	—	—	V	I <sub>C</sub> = -100μA, I <sub>E</sub> = 0	
Collector-Emitter Breakdown Voltage (Note 6)	BV <sub>CEO</sub>	-20	—	—	V	I <sub>C</sub> = -10mA, I <sub>B</sub> = 0	
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5.0	—	—	V	I <sub>E</sub> = -100μA, I <sub>C</sub> = 0	
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-100 -10	nA μA	V <sub>CB</sub> = -25V, I <sub>E</sub> = 0 V <sub>CB</sub> = -25V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C	
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -5.0V, I <sub>C</sub> = 0	
<b>ON CHARACTERISTICS (Note 6)</b>							
DC Current Gain	DCP69, DCP69-16, DCP69-25	h <sub>FE</sub>	50	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5.0mA
			60	—	—		V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -1.0A
			85	—	375		V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -500mA
			100	—	250		V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -500mA
	DCP69-16	160	—	375		V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -500mA	
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-0.5	V	I <sub>C</sub> = -1.0A, I <sub>B</sub> = -100mA	
Base-Emitter Turn-On Voltage	V <sub>BE(on)</sub>	—	—	-0.7 -1.0	V	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5.0mA V <sub>CE</sub> = -1.0V, I <sub>C</sub> = -1.0A	
<b>SMALL SIGNAL CHARACTERISTICS</b>							
Current Gain-Bandwidth Product	f <sub>T</sub>	40	200	—	MHz	V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -50mA, f = 100MHz	
Output Capacitance	C <sub>obo</sub>	—	17	—	pF	V <sub>CB</sub> = -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 1in<sup>2</sup> copper pad layout

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

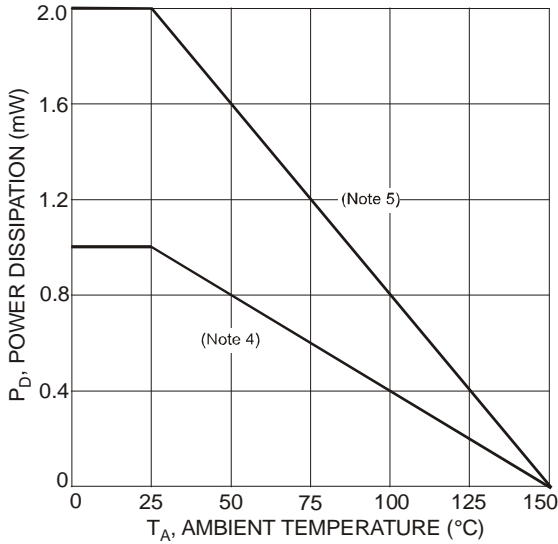


Fig. 1 Power Dissipation vs. Ambient Temperature

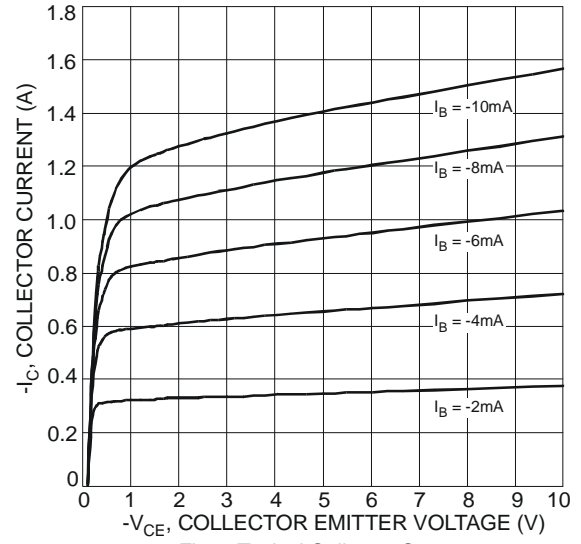


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

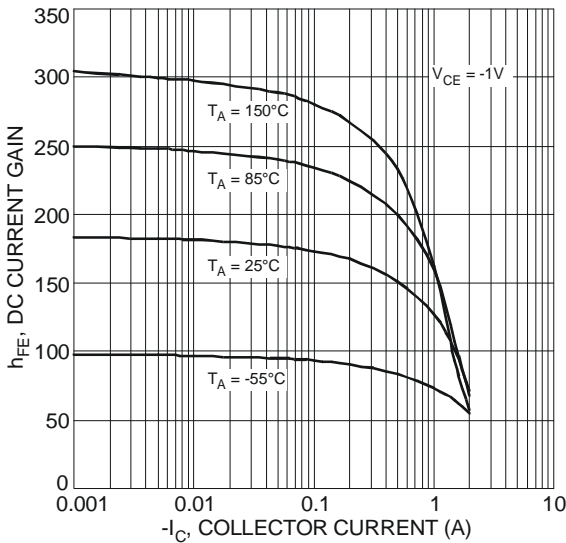


Fig. 3 Typical DC Current Gain vs. Collector Current (DCP69-16)

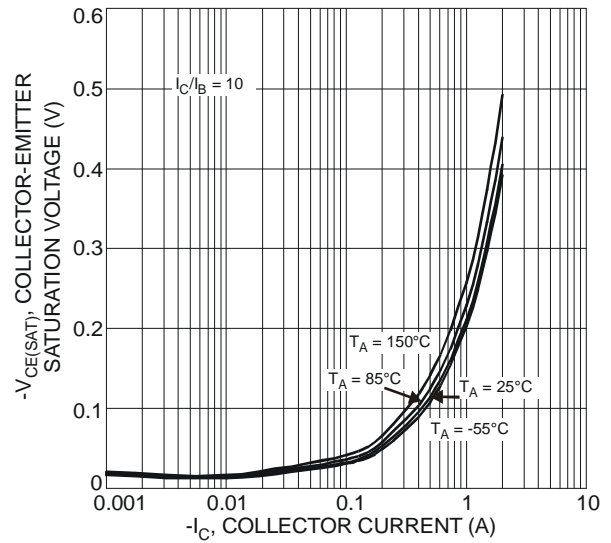


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

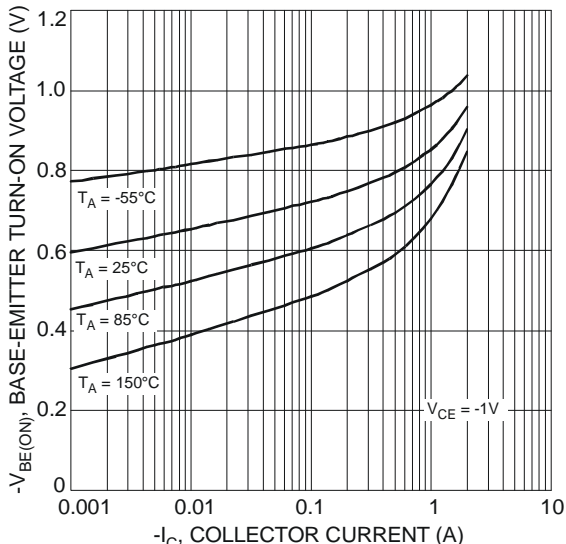


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

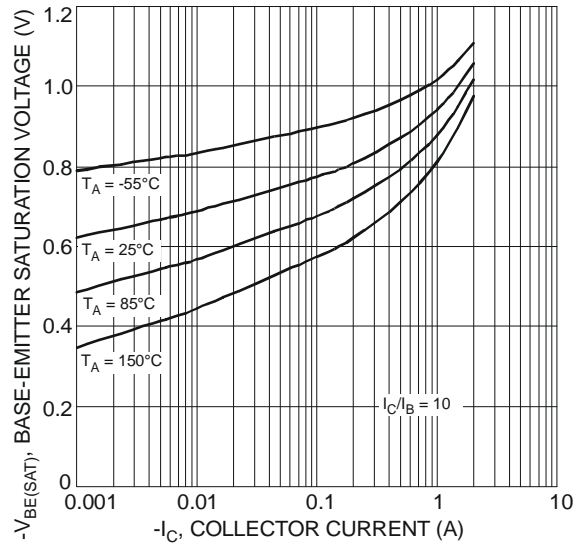


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

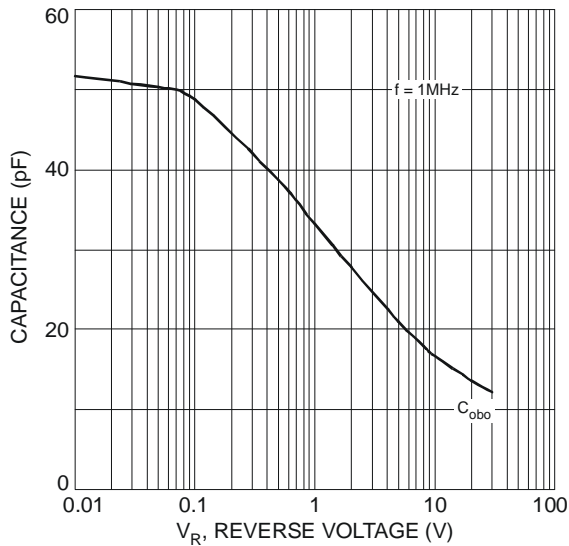


Fig. 7 Typical Output Capacitance Characteristics

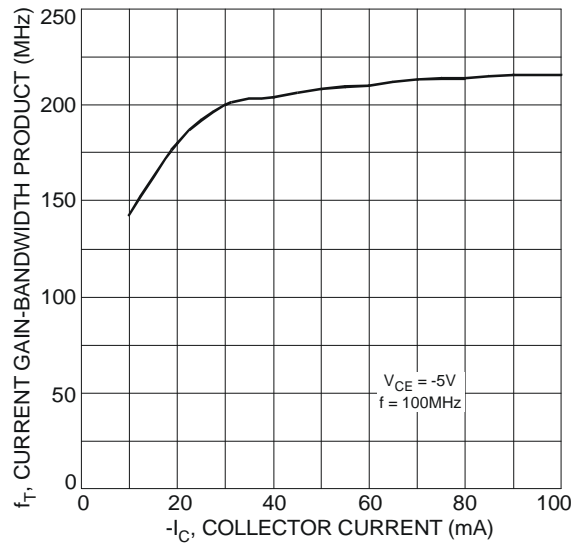
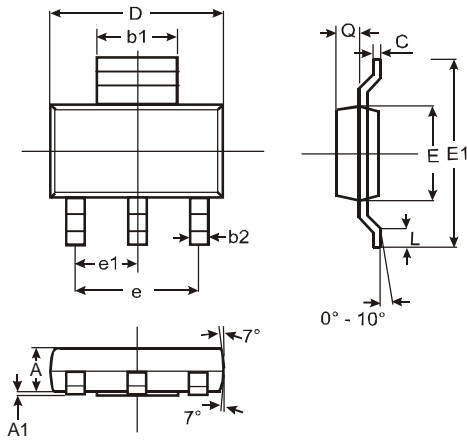


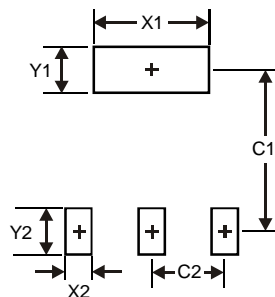
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

**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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