

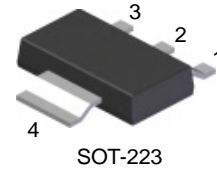


**THE DATASHEET OF  
DCP68-25-13**



### Features

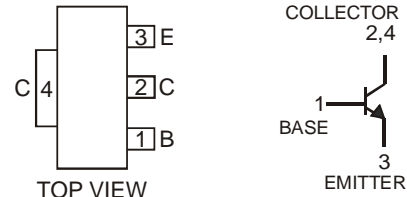
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP69)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



SOT-223

### Mechanical Data

- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish - Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams



Schematic and Pin Configuration

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

Characteristic	Symbol	Value	Units
Collector-Base Voltage	$V_{CB0}$	25	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current	$I_C$	1.0	A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 3)	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
<b>OFF CHARACTERISTICS (Note 4)</b>							
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	25	—	—	V	$I_C = 100\mu\text{A}, I_E = 0$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	20	—	—	V	$I_C = 1.0\text{mA}, I_B = 0$	
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	25	—	—	V	$I_C = 10\mu\text{A}, I_E = 0$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5.0	—	—	V	$I_E = 10\mu\text{A}, I_C = 0$	
Collector-Base Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 25\text{V}, I_E = 0$	
Emitter-Base Cutoff Current	$I_{EBO}$	—	—	10	$\mu\text{A}$	$V_{EB} = 5.0\text{V}, I_C = 0$	
<b>ON CHARACTERISTICS (Note 4)</b>							
DC Current Gain	DCP68, DCP68-25	$h_{FE}$	50	—	—	—	$V_{CE} = 10\text{V}, I_C = 5.0\text{mA}$
			60	—	—		$V_{CE} = 1.0\text{V}, I_C = 1.0\text{A}$
			85	—	375		$V_{CE} = 1.0\text{V}, I_C = 500\text{mA}$
			160	—	375		$V_{CE} = 1.0\text{V}, I_C = 500\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.5	V	$I_C = 1.0\text{A}, I_B = 100\text{mA}$	
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1.0	V	$V_{CE} = 1.0\text{V}, I_C = 1.0\text{A}$	
<b>SMALL SIGNAL CHARACTERISTICS</b>							
Current Gain-Bandwidth Product	$f_T$	—	330	—	MHZ	$I_C = 100\text{mA}, V_{CE} = 5.0\text{V}$ $f = 100\text{MHZ}$	

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" Policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB; pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

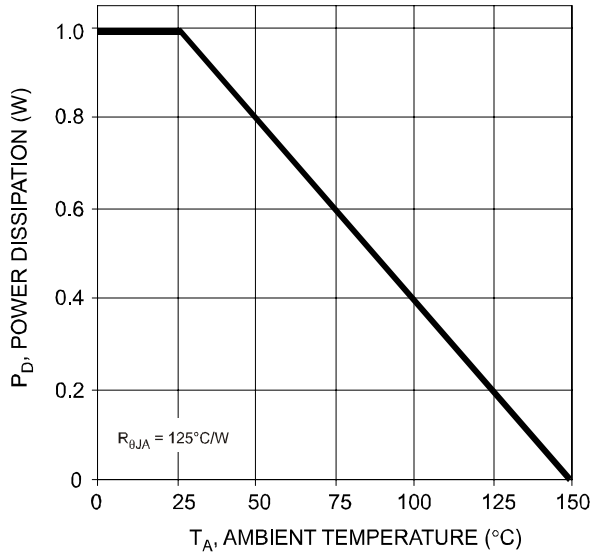


Fig. 1 Power Dissipation vs. Ambient Temperature

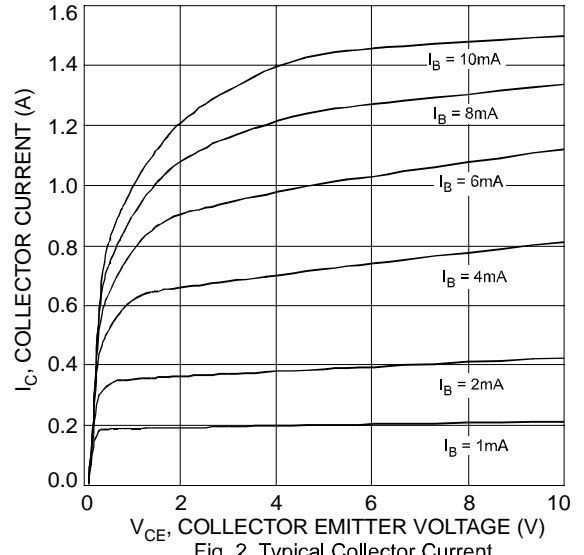


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

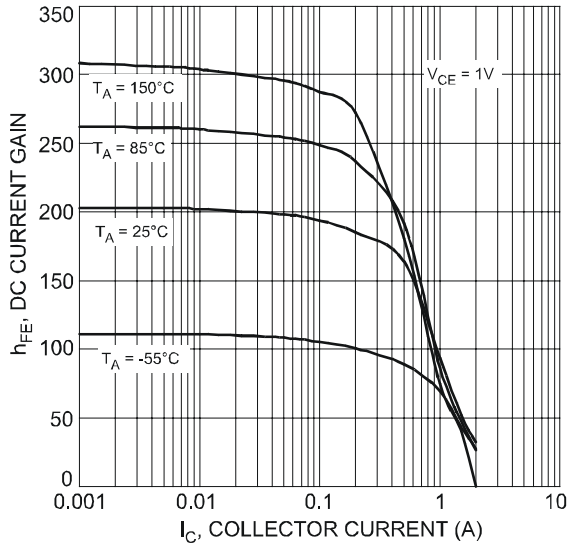


Fig. 3 Typical DC Current Gain vs. Collector Current (DCP68)

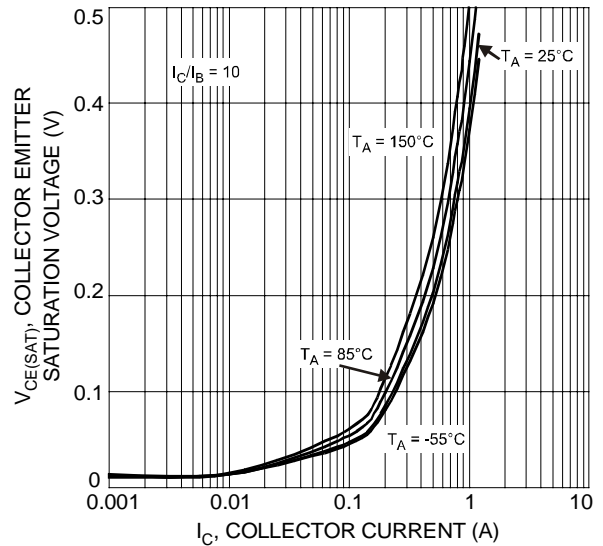


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

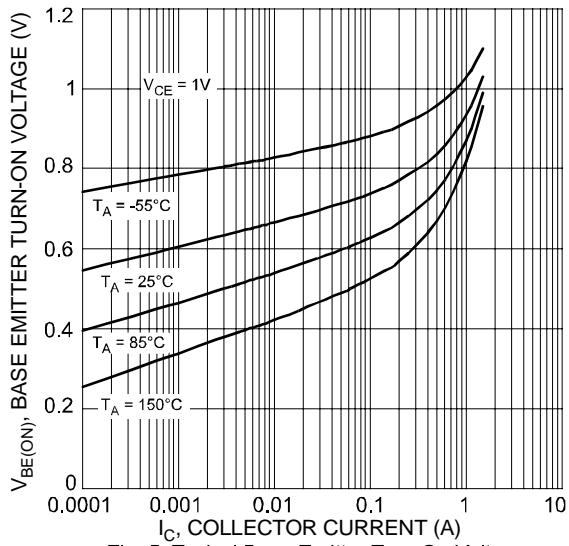


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

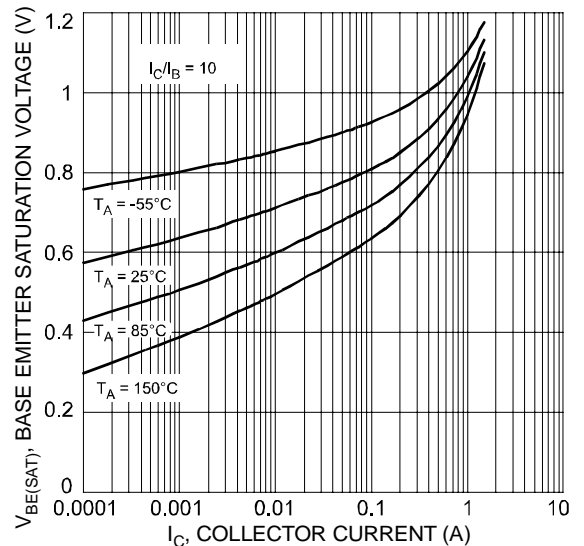


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

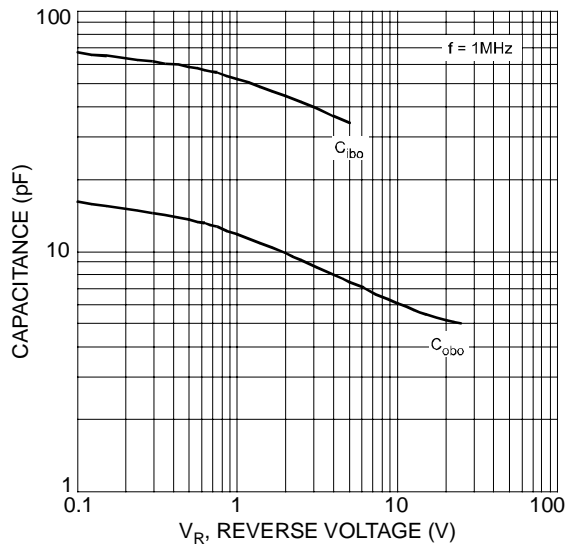


Fig. 7 Typical Capacitance Characteristics

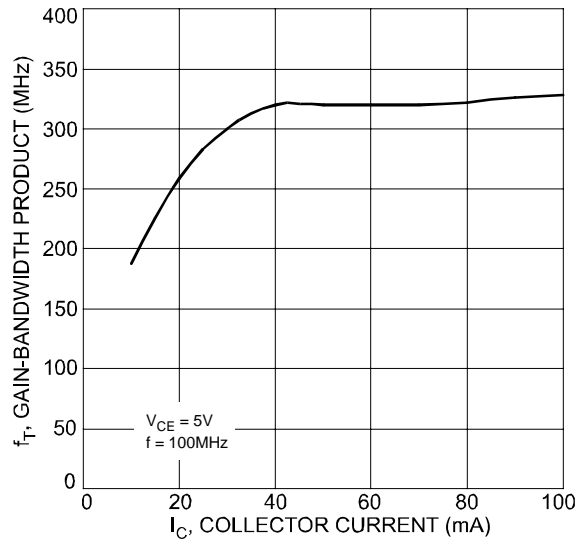


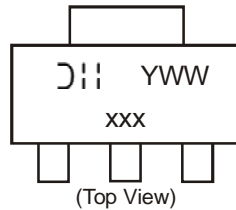
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DCP68-13	SOT-223	2500/Tape & Reel
DCP68-25-13	SOT-223	2500/Tape & Reel

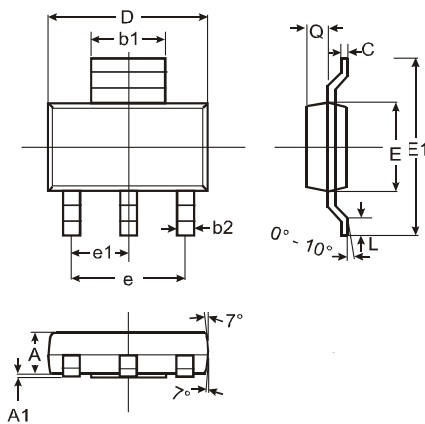
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



xxx = Product Type Marking Code:  
 N12 = DCP68  
 N12-25 = DCP68-25  
 YWW = Date Code Marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

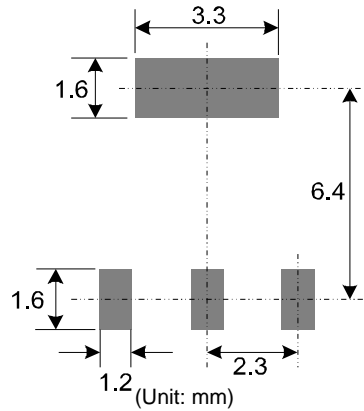
## Package Outline Dimensions



SOT-223			
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:**



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-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management