



# THE DATASHEET OF DCP55-13



### Features

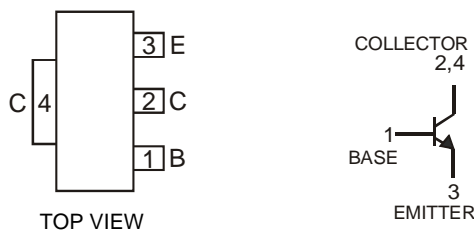
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP52)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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-020C
- Terminals: Finish – Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking & Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams (approximate)



Schematic and Pin Configuration

### Maximum Ratings @<sub>TA</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Peak Pulse Current	$I_{CM}$	1.5	A
Continuous Collector Current	$I_C$	1	A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_d$	1 (Note 3)	W
		2 (Note 4)	
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	°C
Thermal Resistance Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\theta JA}$	125	°C/W

### Electrical Characteristics @<sub>TA</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Conditions
<b>OFF CHARACTERISTICS (Note 5)</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	—	—	V	$I_C = 100\mu\text{A}, I_E = 0\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	—	—	V	$I_C = 10\text{mA}, I_B = 0\text{A}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10\mu\text{A}, I_C = 0\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 30\text{V}, I_E = 0\text{A}$
		—	—	20	$\mu\text{A}$	$V_{CB} = 30\text{V}, I_E = 0\text{A}, T_A = 150^\circ\text{C}$
Emitter Cut-Off Current	$I_{EBO}$	—	—	10	$\mu\text{A}$	$V_{EB} = 5\text{V}, I_C = 0\text{A}$
<b>ON CHARACTERISTICS (Note 5)</b>						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.5	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1.0	V	$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
DC Current Gain	$h_{FE}$	40	—	250	—	$I_C = 150\text{mA}, V_{CE} = 2\text{V}$
		25	—	—		$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
		100	—	250		$I_C = 150\text{mA}, V_{CE} = 2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	$f_T$	—	200	—	MHz	$I_C = 50\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz}$

- Note:
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 on Diodes, Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Device mounted on Polyimide PCB with a copper area of 1.8cm<sup>2</sup>.
  5. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

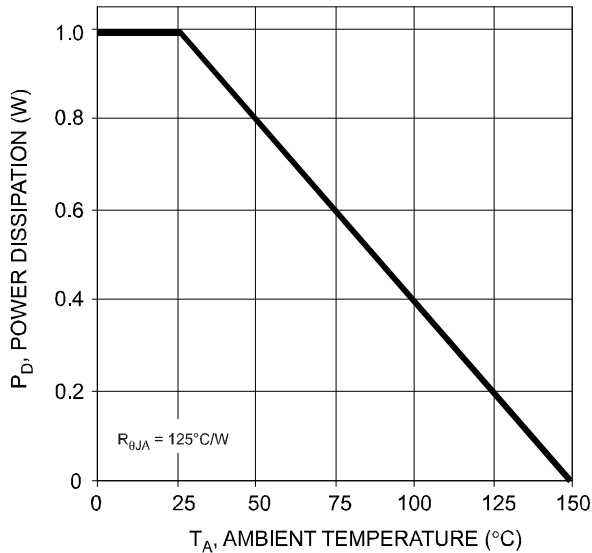


Fig. 1 Power Dissipation vs. Ambient Temperature

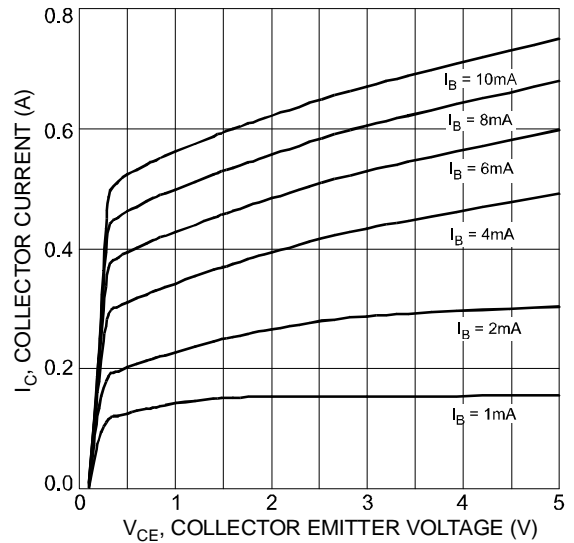


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

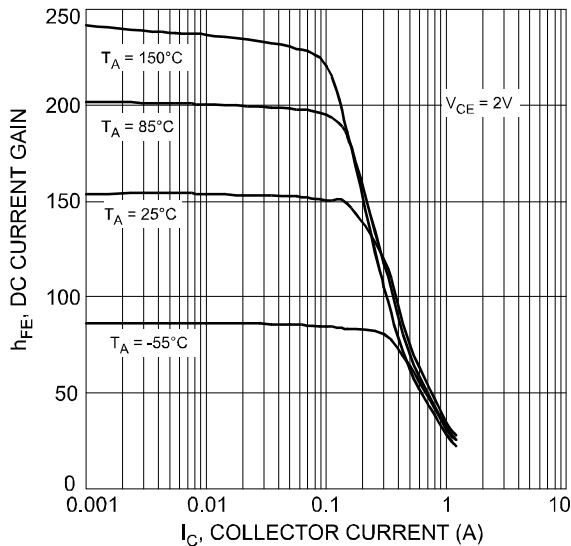


Fig. 3 Typical DC Current Gain vs. Collector Current

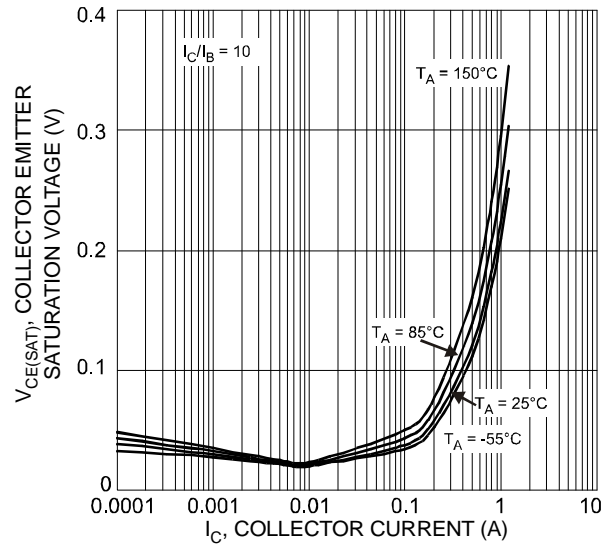


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

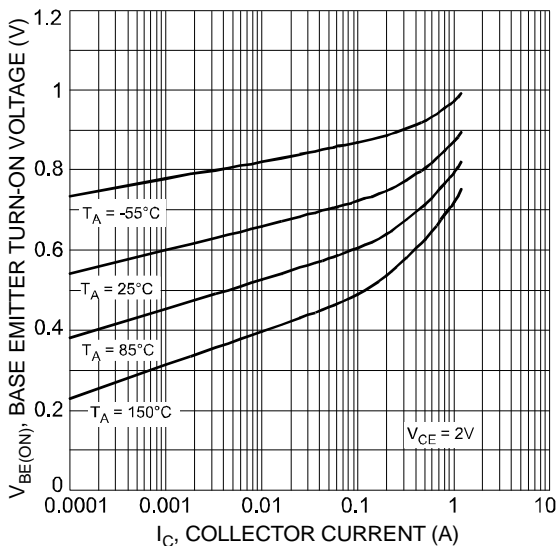


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

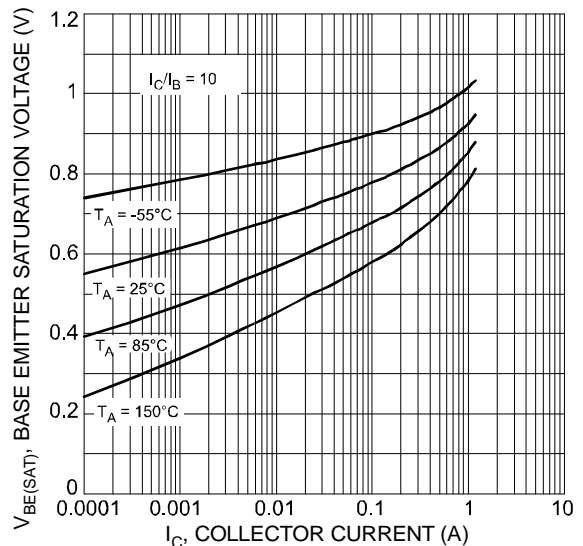


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

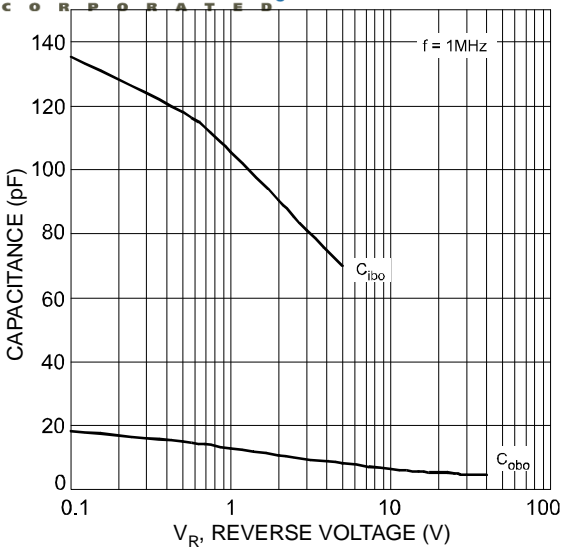


Fig. 7 Typical Capacitance Characteristics

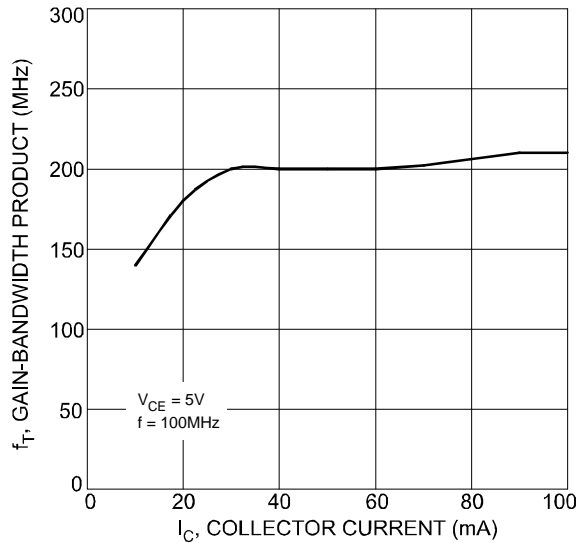


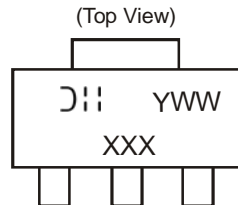
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

**Ordering Information** (Note 6)

Device	Packaging	Shipping
DCP55-13	SOT-223	2500 / Tape & Reel
DCP55-16-13	SOT-223	2500 / Tape & Reel

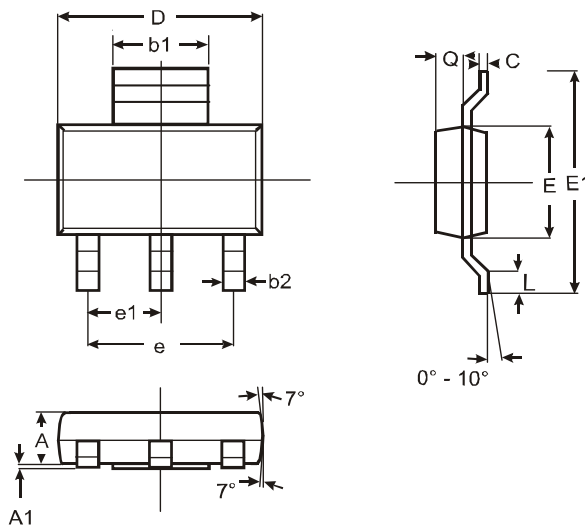
Note: 6. For packaging details, please visit our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



DII = Manufacturer's code marking  
 XXX = Product type marking code Ex: N16 = DCP55  
 N16-16 = DCP55-16  
 YWW = Date code marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

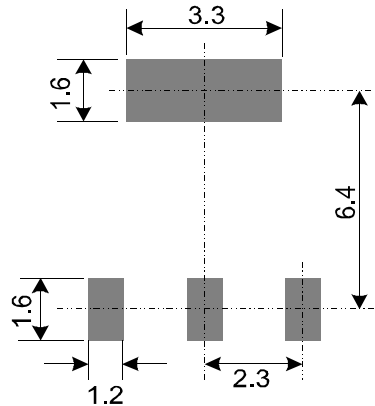
**Package Outline Dimensions**



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: (Based on IPC-SM-782)**



(Unit:mm)

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