

### Features

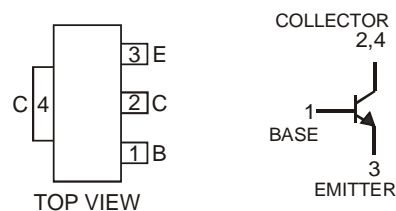
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP51)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	45	V
Collector-Base Voltage	V <sub>CBO</sub>	45	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Continuous Collector Current	I <sub>C</sub>	1	A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ <sub>T<sub>A</sub></sub> = 25°C	P <sub>d</sub>	1	W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C
Thermal Resistance Junction to Ambient Air @ <sub>T<sub>A</sub></sub> = 25°C (Note 3)	R <sub>θJA</sub>	125	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Off Characteristics (Note 4)</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	45	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	45	—	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5	—	—	V	I <sub>E</sub> = 10μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	100 10	nA μA	V <sub>CB</sub> = 30V, I <sub>E</sub> = 0 V <sub>CB</sub> = 30V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	10	μA	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0A
<b>On Characteristics (Note 4)</b>						
DC Current Gain	h <sub>FE</sub>	63	—	—	—	I <sub>C</sub> = 5mA, V <sub>CE</sub> = 2V
		63	—	250		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 2V
		40	—	—		I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2V
DCP54-16		100	—	250		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	500	mV	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Voltage	V <sub>BE(ON)</sub>	—	—	1	V	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2V
<b>Small Signal Characteristics</b>						
Transition Frequency	f <sub>T</sub>	—	200	—	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V, f = 100MHz

- 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 = 300μs. Duty cycle ≤ 2%

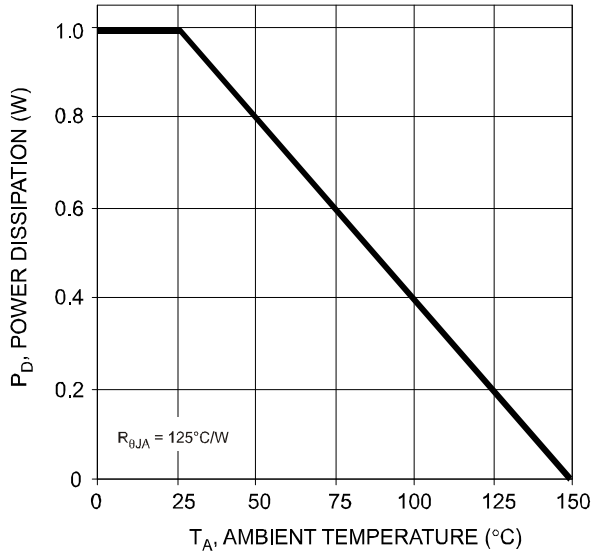


Fig. 1 Power Dissipation vs. Ambient Temperature

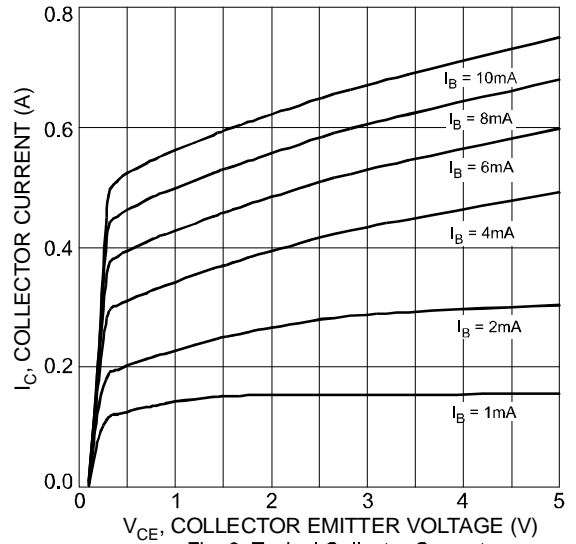


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

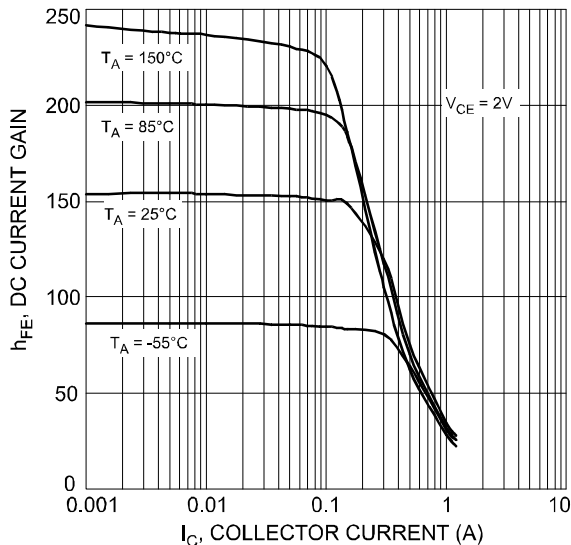


Fig. 3 Typical DC Current Gain vs. Collector Current

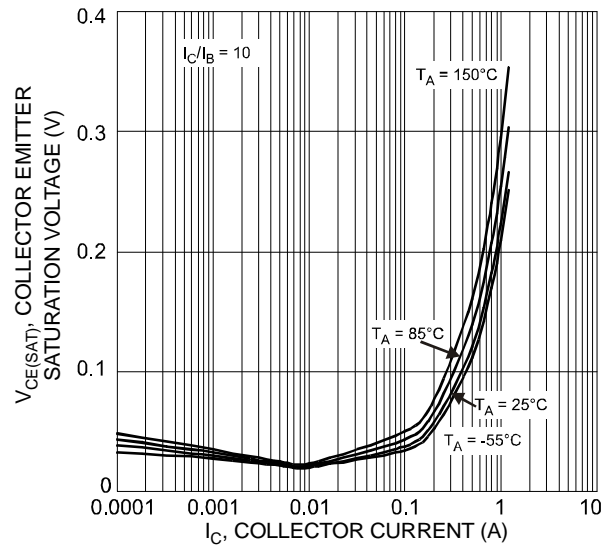


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

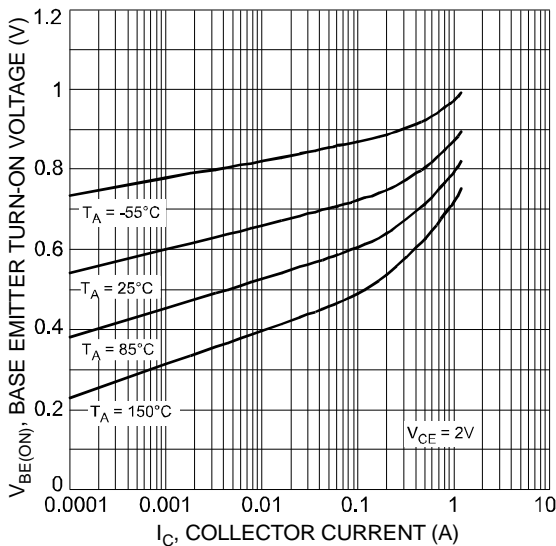


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

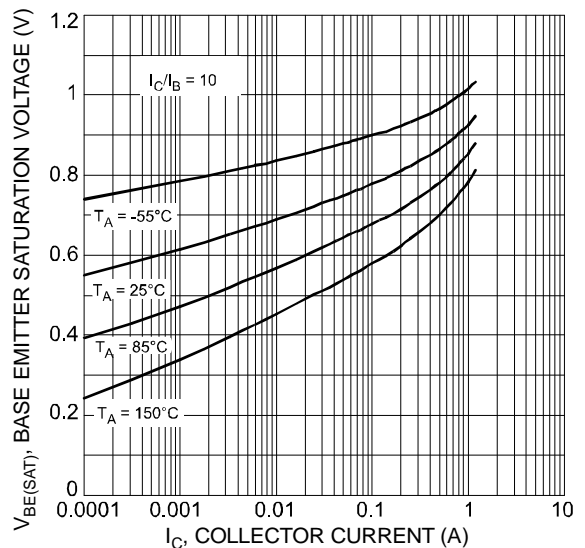


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

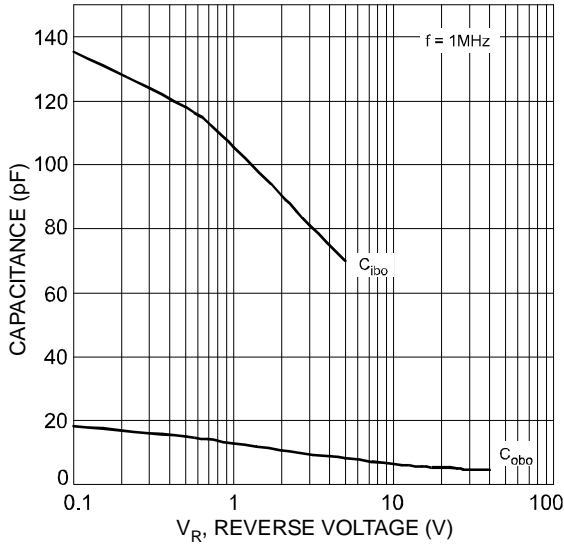


Fig. 7 Typical Capacitance Characteristics

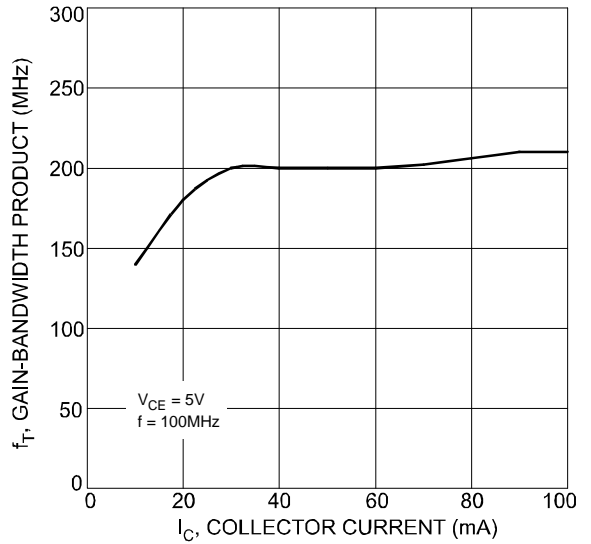


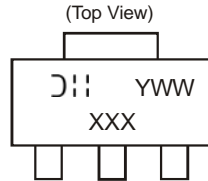
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

**Ordering Information** (Note 5)

Device	Packaging	Shipping
DCP54-13	SOT-223	2500/Tape & Reel
DCP54-16-13	SOT-223	2500/Tape & Reel

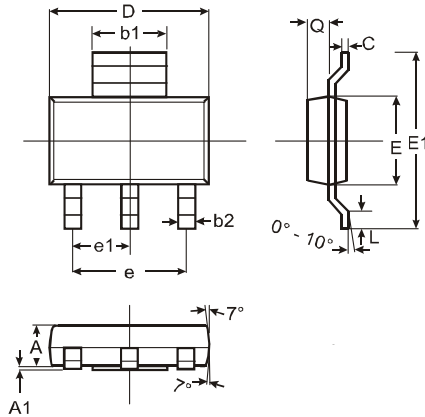
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

**Marking Information**



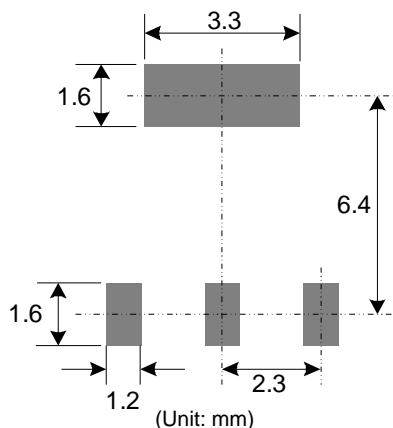
Dii = Manufacturer's code marking  
 XXX = Product type marking code Ex: N14 = DCP54  
 N14-16 = DCP54-16  
 YWW = Date code marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

**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)**



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