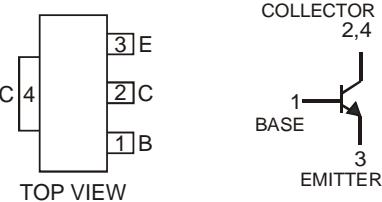


## Features

- 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)**



Schematic and Pin Configuration

## 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)

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

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	45	V
Collector-Base Voltage	$V_{CBO}$	45	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	1	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	$P_d$	1	W
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 @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Off Characteristics (Note 4)</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	45	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 10\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 30\text{V}, I_E = 0$
				10	μA	$V_{CB} = 30\text{V}, I_E = 0, T_A = 150^\circ\text{C}$
Emitter-Base Cutoff Current	$I_{EBO}$	—	—	10	μA	$V_{EB} = 5\text{V}, I_C = 0\text{A}$
<b>On Characteristics (Note 4)</b>						
DC Current Gain DCP54-16	$h_{FE}$	63	—	—	—	$I_C = 5\text{mA}, V_{CE} = 2\text{V}$
		63	—	250		$I_C = 150\text{mA}, V_{CE} = 2\text{V}$
		40	—	—		$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
		100	—	250		$I_C = 150\text{mA}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(\text{SAT})}$	—	—	500	mV	$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Voltage	$V_{BE(\text{ON})}$	—	—	1	V	$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
<b>Small Signal Characteristics</b>						
Transition Frequency	$f_T$	—	200	—	MHz	$I_C = 50\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz}$

Notes:

- No purposefully added lead.
- 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).
- 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>.
- Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%

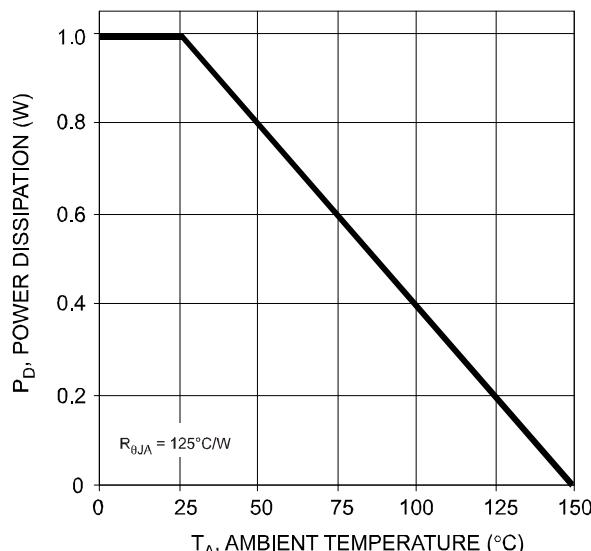


Fig. 1 Power Dissipation vs. Ambient Temperature

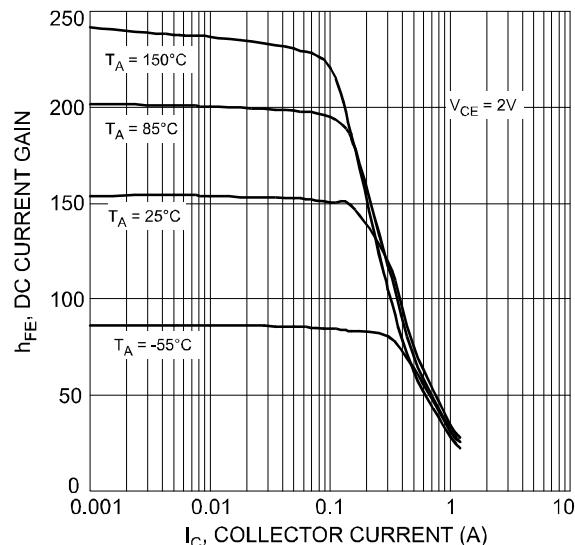


Fig. 3 Typical DC Current Gain vs. Collector Current

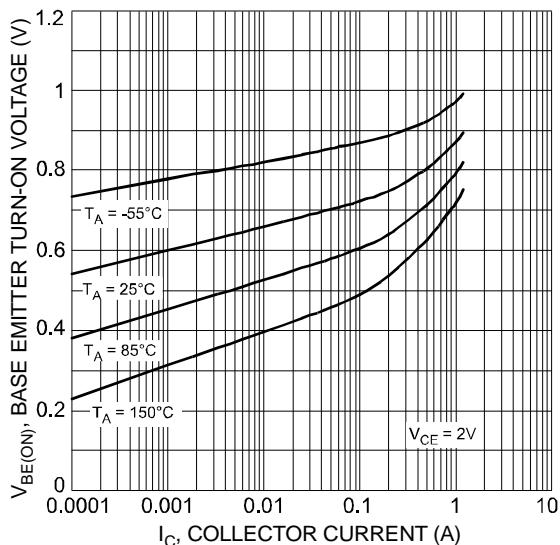


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

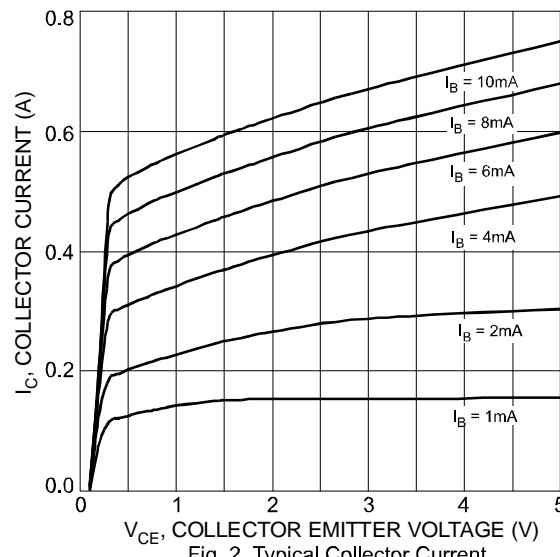


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

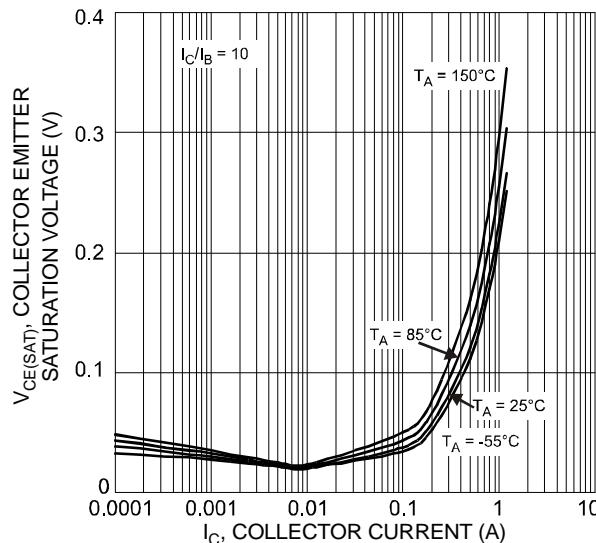


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

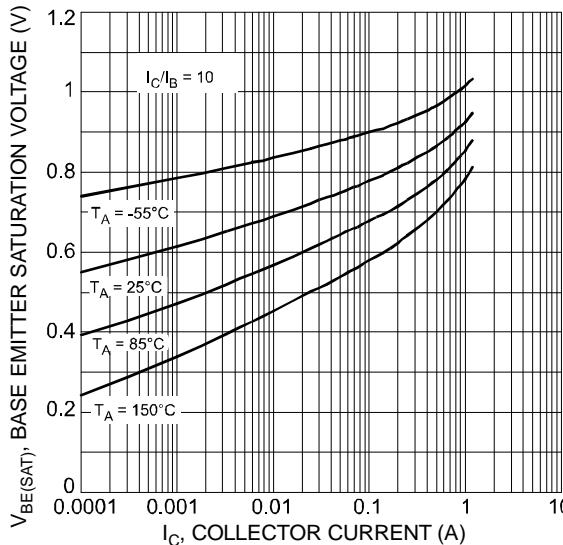


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

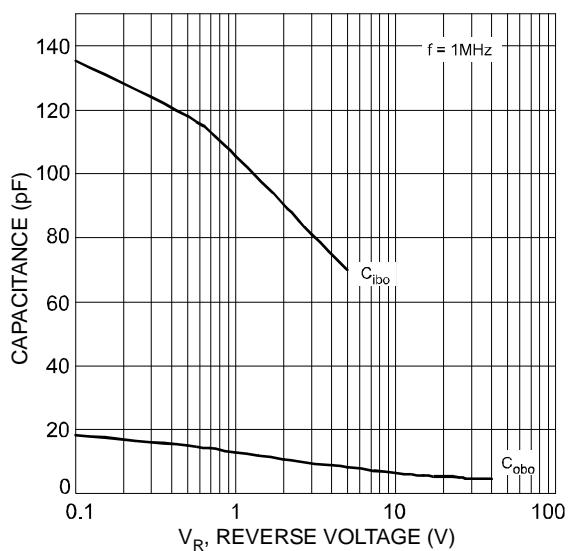


Fig. 7 Typical Capacitance Characteristics

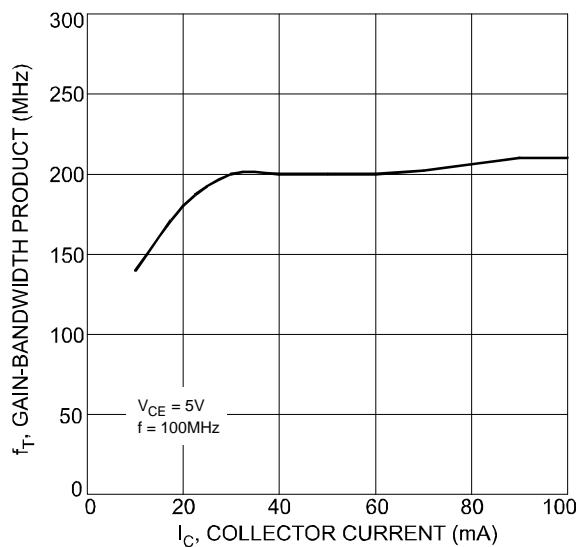


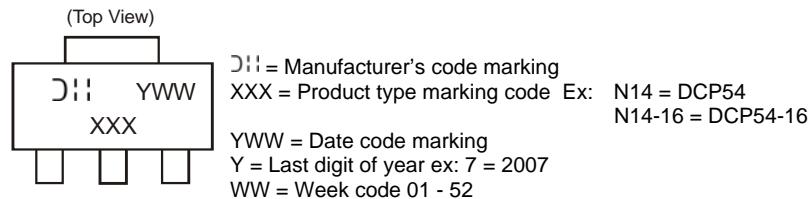
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

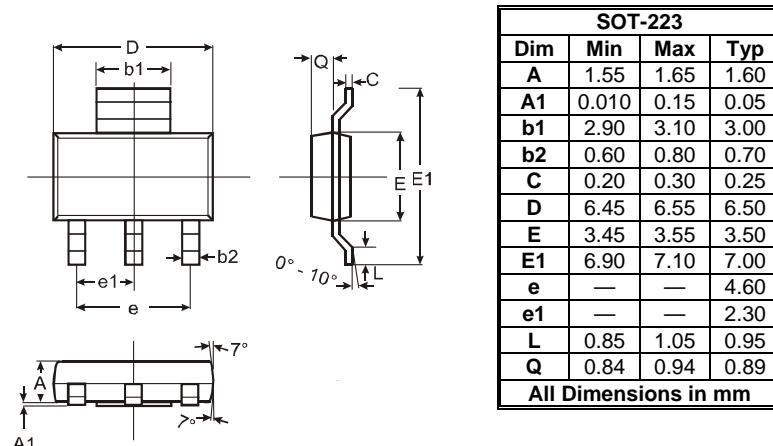
Device	Packaging	Shipping
DCP54-13	SOT-223	2500/Tape & Reel
DCP54-16-13	SOT-223	2500/Tape & Reel

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

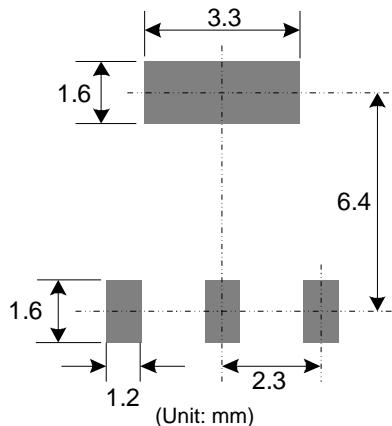
## Marking Information



## Package Outline Dimensions



**Suggested Pad Layout: (Based on IPC-SM-782)**



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