

Features

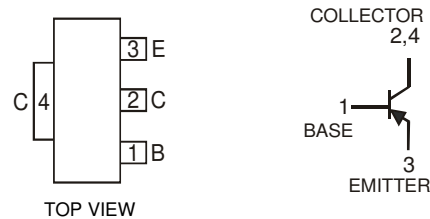
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP54)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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
- Terminal Connections: See Diagram
- Marking & Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams (approximate)



Schematic and Pin Configuration

Maximum Ratings @_{T_A} = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-45	V
Collector-Emitter Voltage	V_{CEO}	-45	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 @ $T_A = 25^\circ\text{C}$ (Note 3)	P_d	1 (Note 3)	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°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Conditions
OFF CHARACTERISTICS (Note 4)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-45	—	—	V	$I_C = -100\mu\text{A}, I_E = 0\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-45	—	—	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	$V_{CB} = -30\text{V}, I_E = 0\text{A}$
				-10	μA	$V_{CB} = -30\text{V}, I_E = 0\text{A}, T_A = 150^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	—	—	-10	μA	$V_{EB} = -5\text{V}, I_C = 0\text{A}$
ON CHARACTERISTICS (Note 4)						
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		$I_C = -150\text{mA}, V_{CE} = -2\text{V}$
SMALL SIGNAL CHARACTERISTICS						
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.
 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. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%

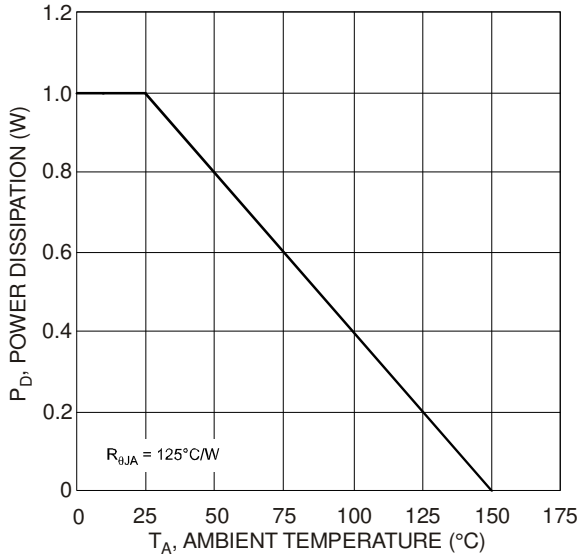


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

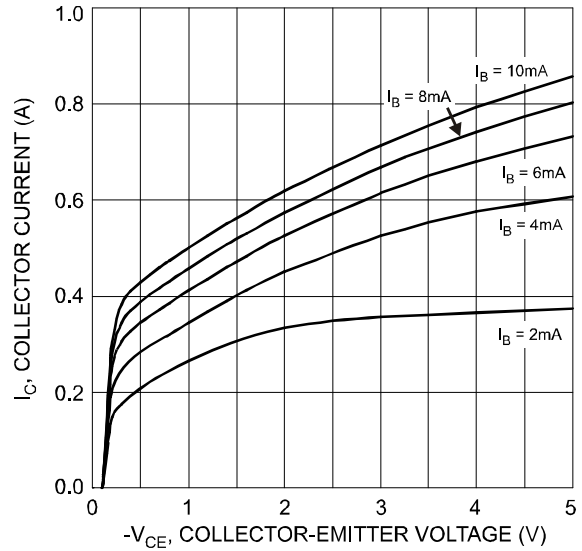


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

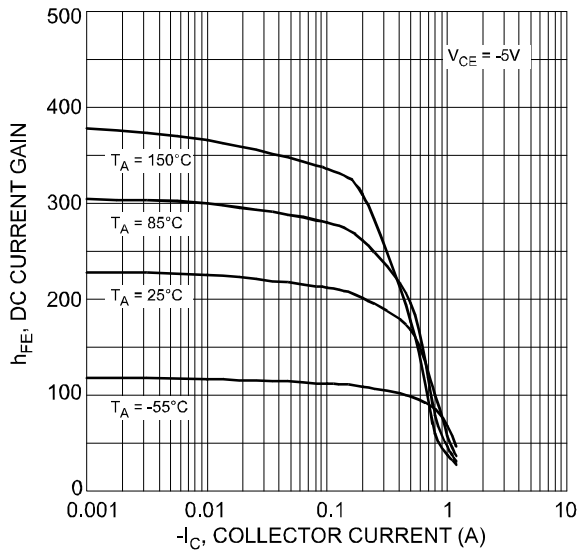


Fig. 3 Typical DC Current Gain vs. Collector Current

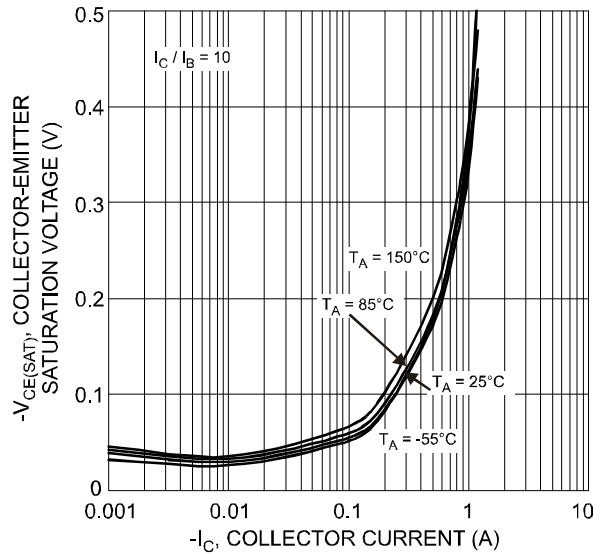


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

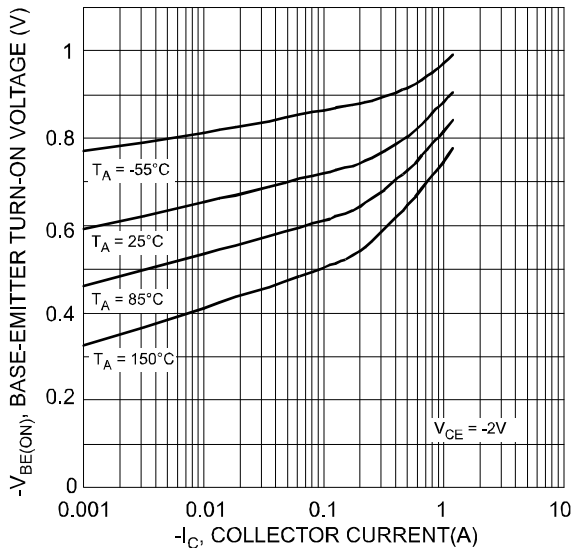


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

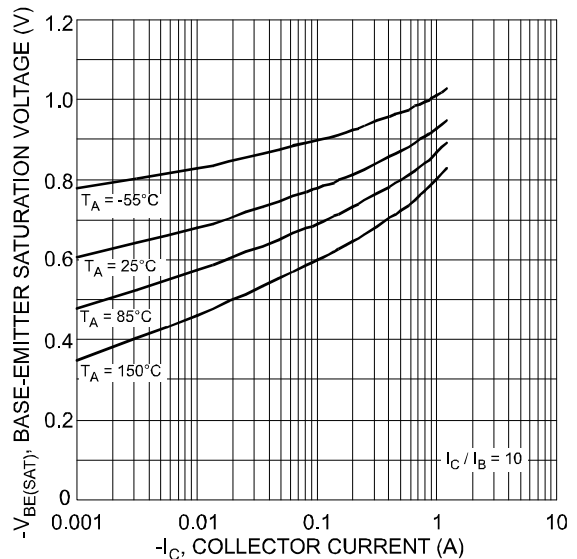


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

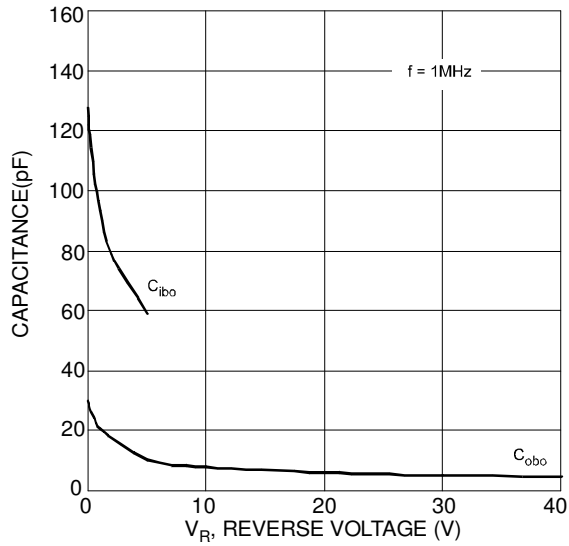


Fig. 7 Typical Capacitance Characteristics

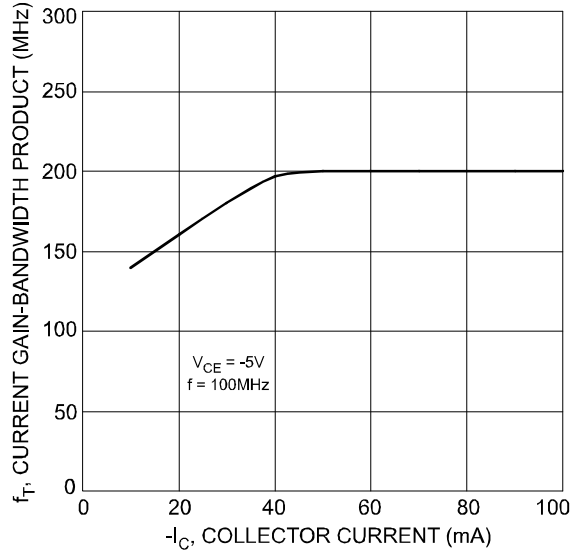


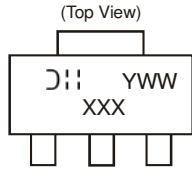
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 5)

Part Number	Case	Packaging
DCP51-13	SOT-223	2500 / Tape & Reel
DCP51-16-13	SOT-223	2500 / Tape & Reel

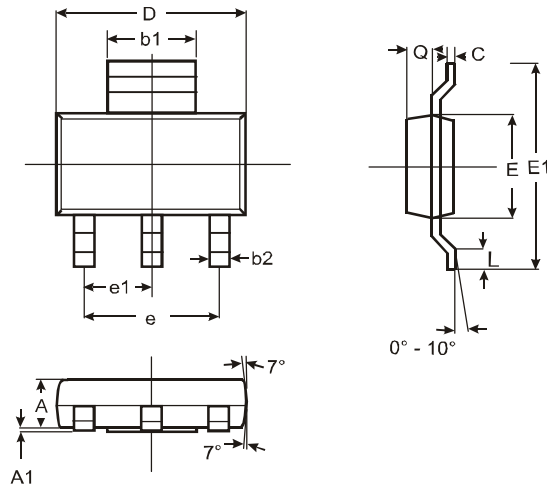
Notes: 5. For packaging details, please visit our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

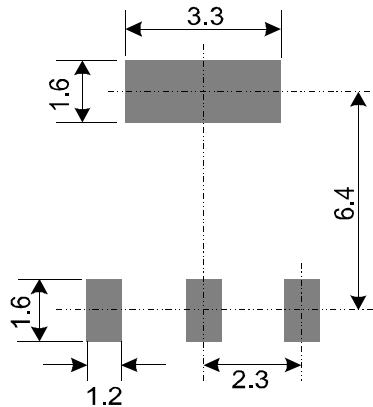


DII = Manufacturer's code marking
 XXX = Product type marking code Ex: P14 = DCP51
 P14-16 = DCP51-16
 YWW = Date code marking
 Y = Last digit of year ex: 7 = 2007
 WW = Week code 01 - 52

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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