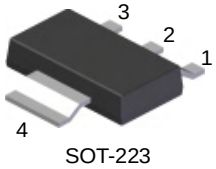
DCP54/-16

NPN SURFACE MOUNT TRANSISTOR

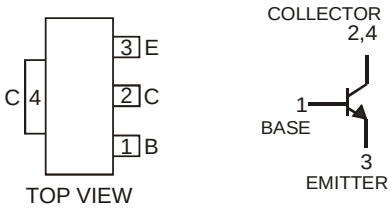
NEW PRODUCT

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



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°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°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°C (Note 3)	$R_{\theta JA}$	125	°C/W

Electrical Characteristics @T_A = 25°C unless otherwise specified

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

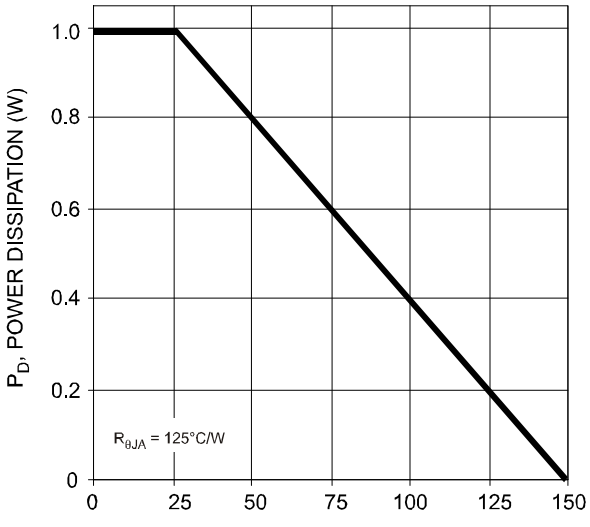


Fig. 1 Power Dissipation vs. Ambient Temperature

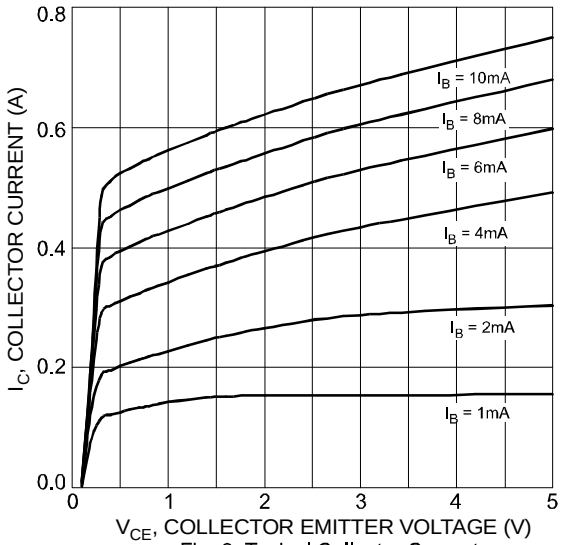


Fig. 2 Typical Collector Current
vs. Collector Emitter Voltage

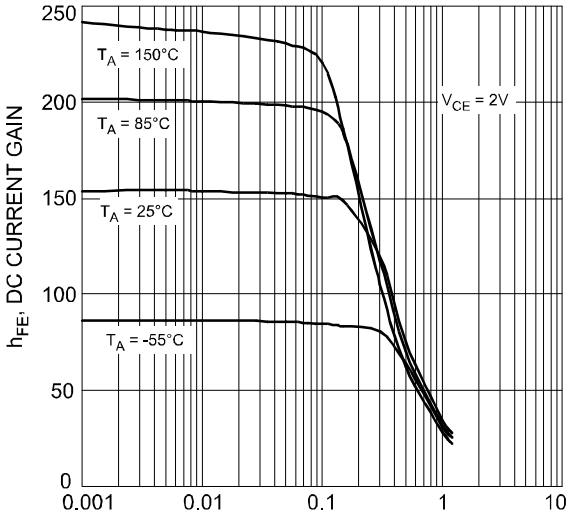


Fig. 3 Typical DC Current Gain vs. Collector Current

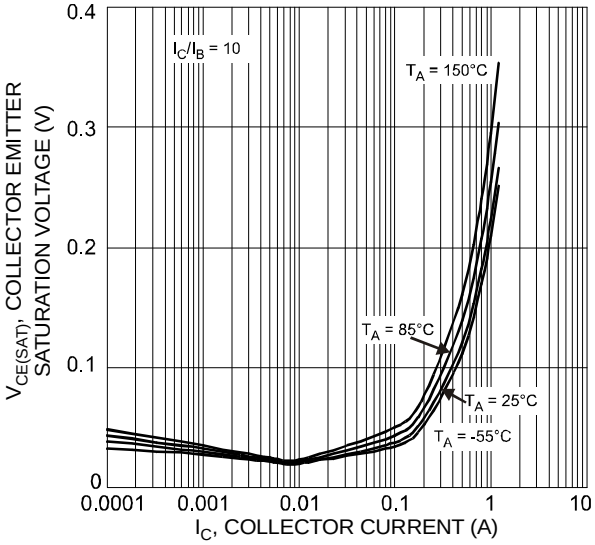


Fig. 4 Typical Collector Emitter Saturation Voltage
vs. Collector Current

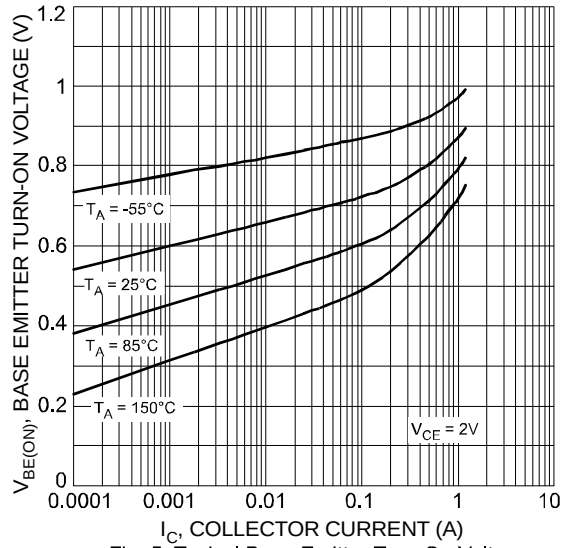


Fig. 5 Typical Base Emitter Turn-On Voltage
vs. Collector Current

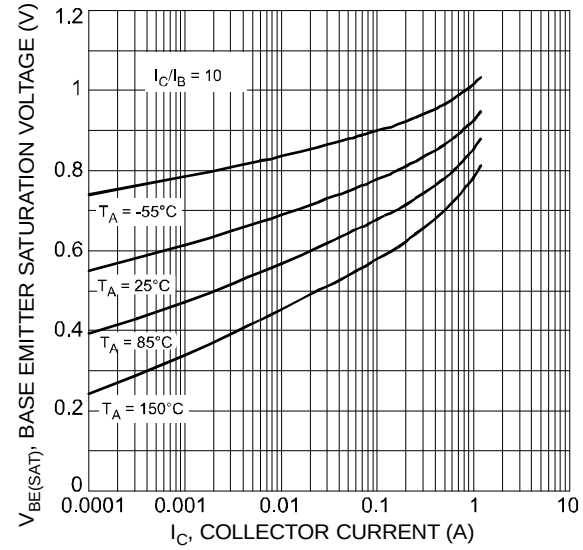


Fig. 6 Typical Base Emitter Saturation Voltage
vs. Collector Current

NEW PRODUCT

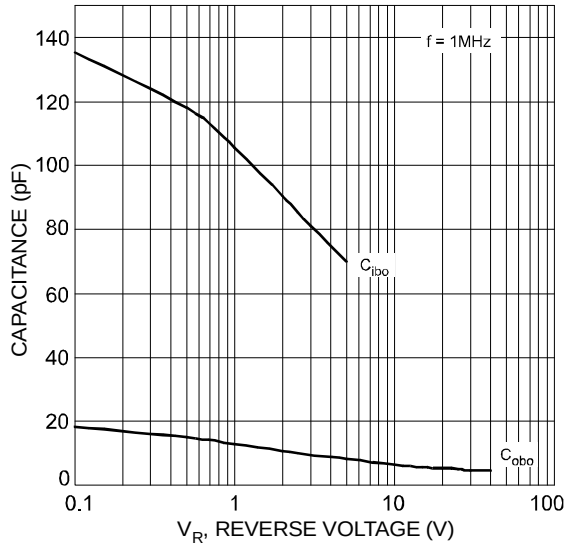


Fig. 7 Typical Capacitance Characteristics

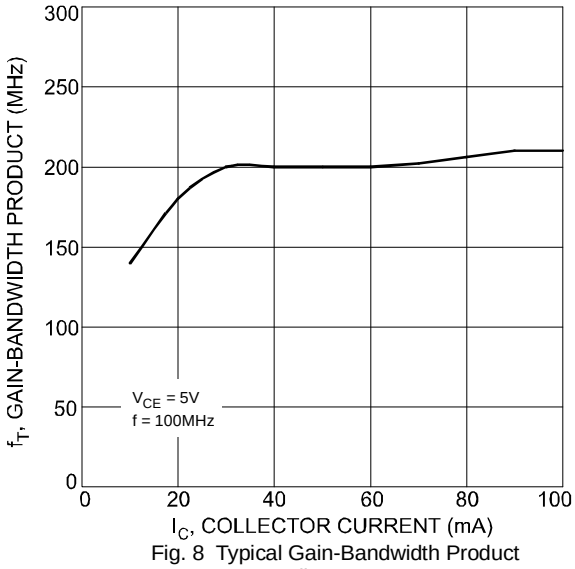


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

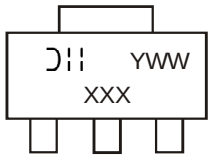
Ordering Information (Note 5)

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

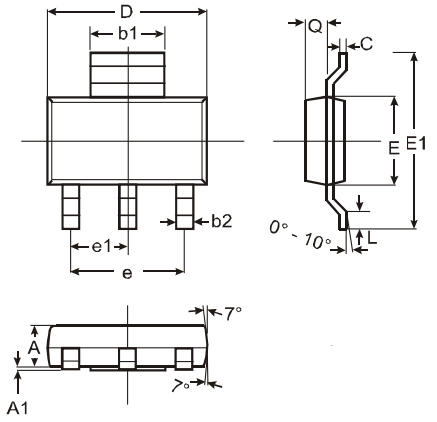
(Top View)



= 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			

NEW PRODUCT

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