



**THE DATASHEET OF
DCP54-13**



Features

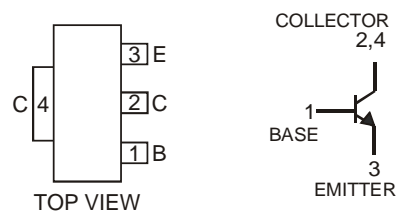
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP51)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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 @ $T_A = 25^\circ\text{C}$ 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	$^\circ\text{C}$
Thermal Resistance Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\theta JA}$	125	$^\circ\text{C/W}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

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

- 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 = 300 μs . Duty cycle $\leq 2\%$

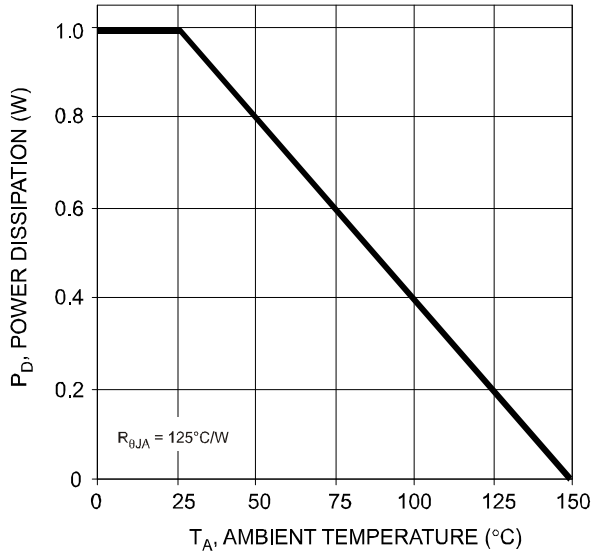


Fig. 1 Power Dissipation vs. Ambient Temperature

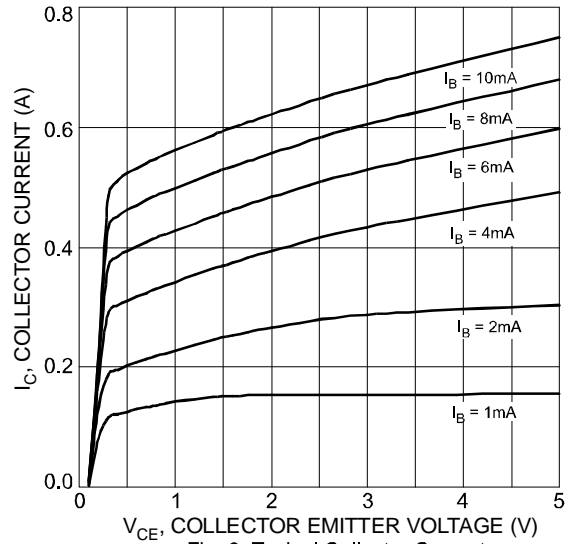


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

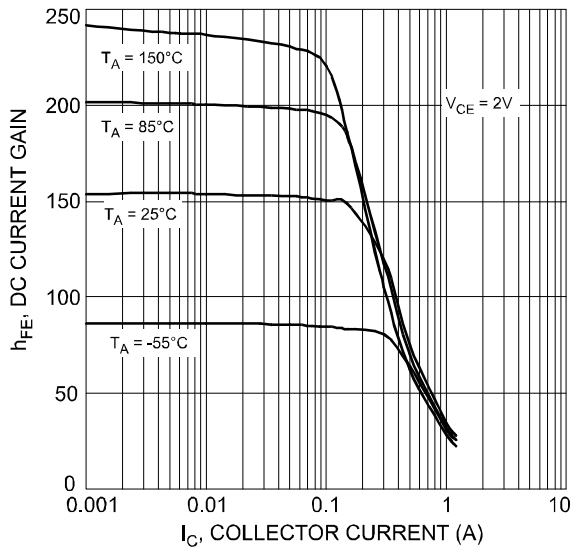


Fig. 3 Typical DC Current Gain vs. Collector Current

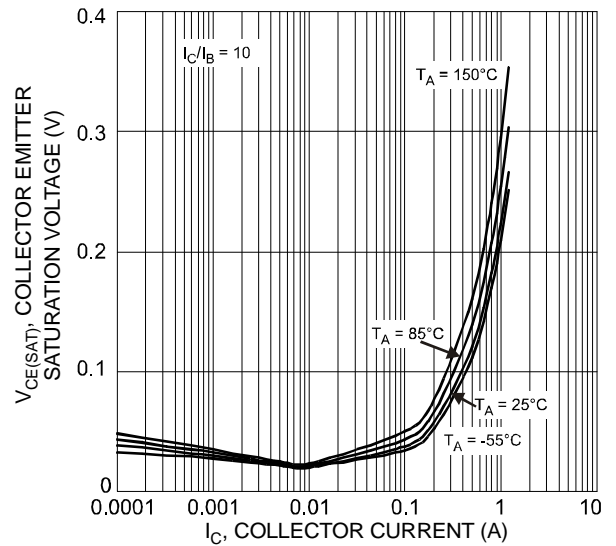


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

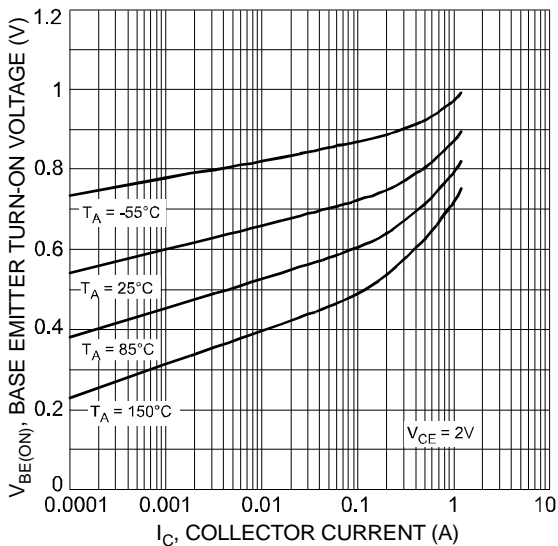


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

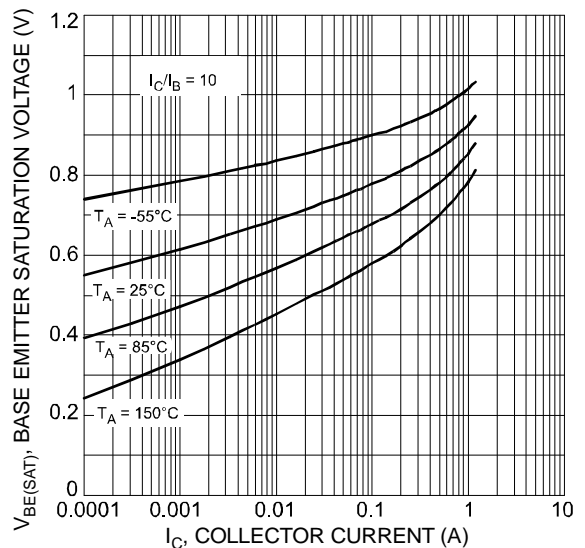
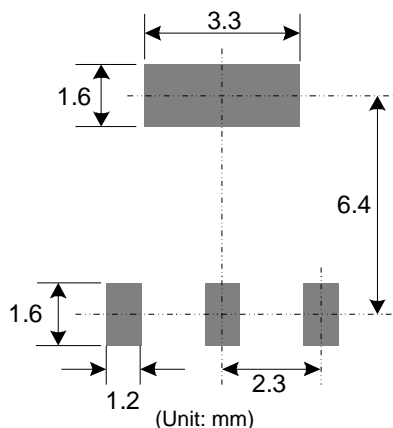


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

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



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