

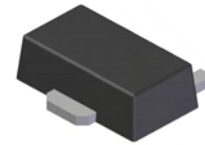


**THE DATASHEET OF  
DCX56-13**



**Features**

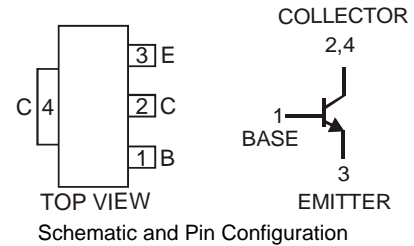
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCX53)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



SOT89-3L

**Mechanical Data**

- Case: SOT89-3L
- 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: 0.072 grams (approximate)



**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	80	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C</sub>	1	A
Peak Pulse Current	I <sub>CM</sub>	1.5	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ T <sub>A</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 (Note 3) @T <sub>A</sub> = 25°C	R <sub>θJA</sub>	125	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions		
<b>OFF CHARACTERISTICS (Note 4)</b>								
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	100	—	—	V	I <sub>C</sub> = 100μA, I <sub>E</sub> = 0		
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	80	—	—	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0		
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	5.0	—	—	V	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0		
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	0.1 20	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>	—	—	100	nA	V <sub>EB</sub> = 5.0V, I <sub>C</sub> = 0		
<b>ON CHARACTERISTICS (Note 4)</b>								
DC Current Gain	h <sub>FE</sub>	DCX56, DCX56-16		63 40	—	—	I <sub>C</sub> = 5.0mA, V <sub>CE</sub> = 2.0V I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2.0V	
		DCX56		63	—	250	—	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 2.0V
		DCX56-16		100	—	250	—	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 2.0V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	0.5	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA		
Base-Emitter Turn-On Voltage	V <sub>BE(ON)</sub>	—	—	1.0	V	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2.0V		
<b>SMALL SIGNAL CHARACTERISTICS</b>								
Current Gain-Bandwidth Product	f <sub>T</sub>	—	200	—	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V, f = 100MHz		
Output Capacitance	C <sub>obo</sub>	—	—	15	pF	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz		

- 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%.

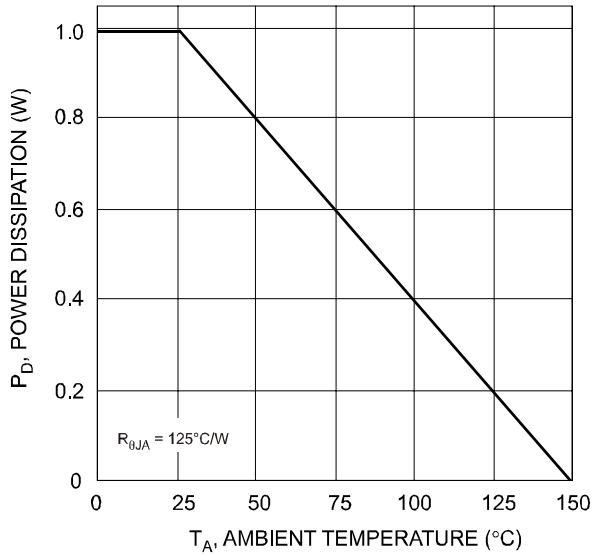


Fig. 1 Power Dissipation vs. Ambient Temperature

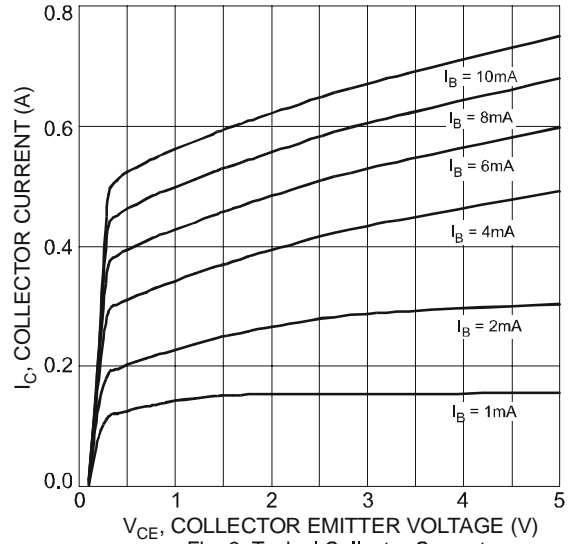


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

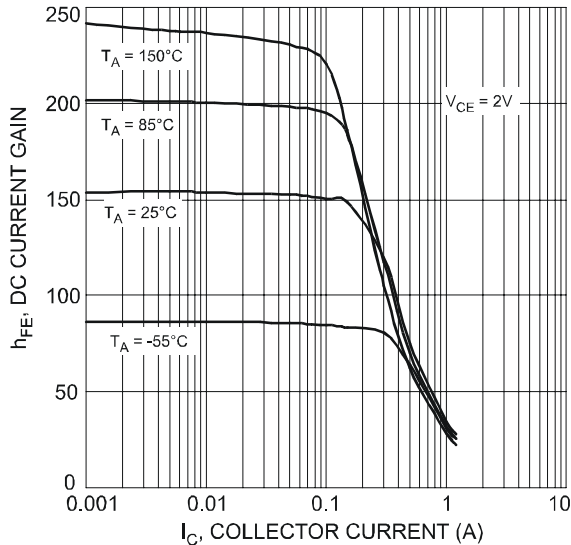


Fig. 3 Typical DC Current Gain vs. Collector Current

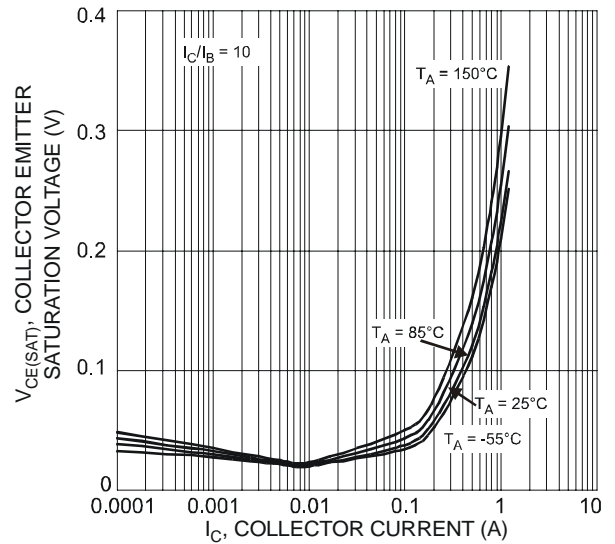


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

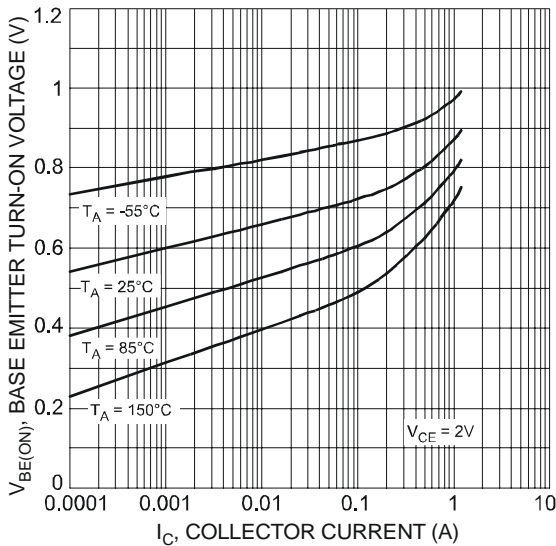


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

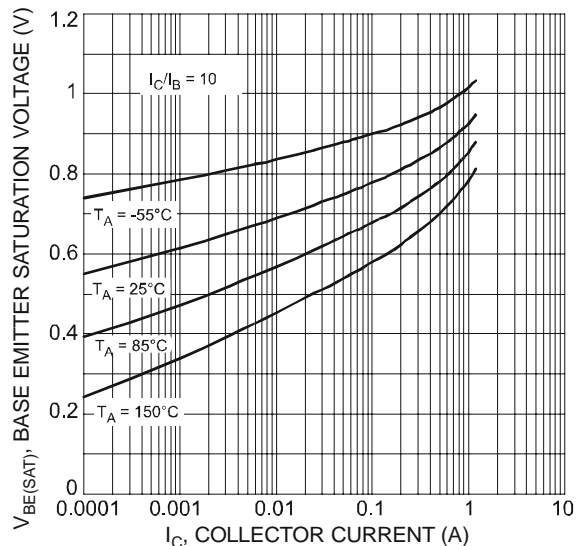


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

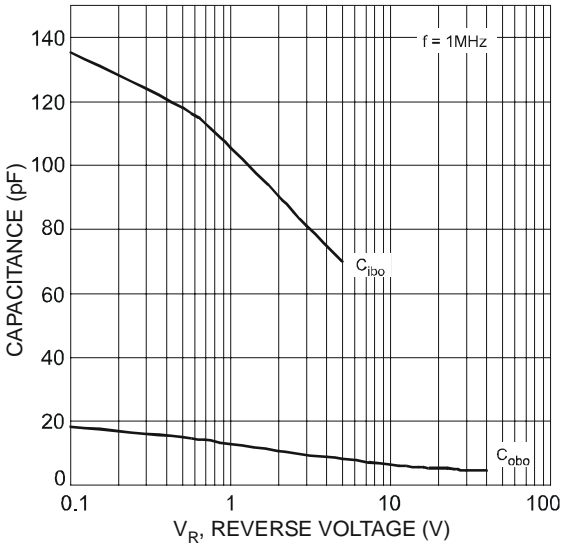


Fig. 7 Typical Capacitance Characteristics

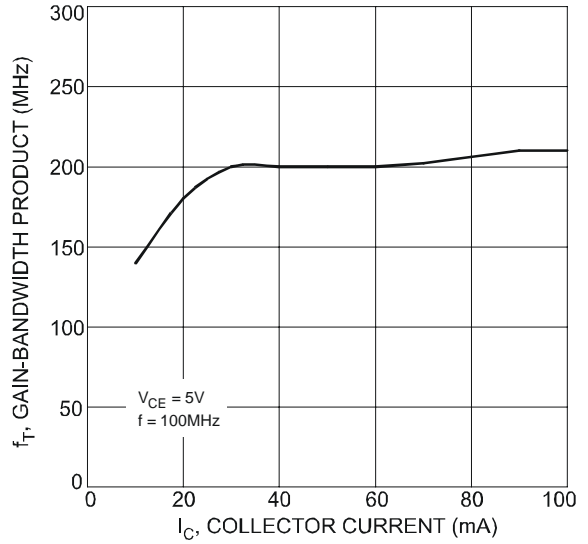


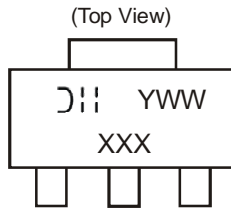
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DCX56-13	SOT89-3L	2500/Tape & Reel
DCX56-16-13	SOT89-3L	2500/Tape & Reel

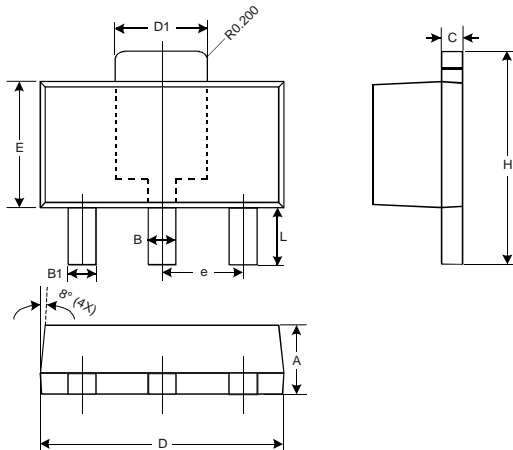
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

## Marking Information



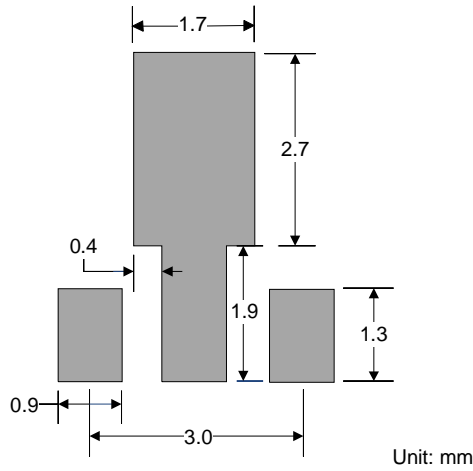
XXX = Product Type Marking Code ex. N18 = DCX56  
N18-16 = DCX56-16  
 ☺☺☺ = Manufacturer's code marking  
 YWW = Date Code Marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

## Package Outline Dimensions



SOT89-3L			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.45	0.55	0.50
B1	0.37	0.47	0.42
C	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.50	1.70	1.60
E	2.40	2.60	2.50
e	—	—	1.50
H	3.95	4.25	4.10
L	0.90	1.20	1.05
All Dimensions in mm			

## Suggested Pad Layout



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