

## Features

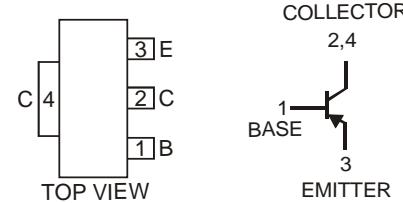
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCX55)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- Lead Free By Design/RoHS Compliant (Note 1)**
- "Green" Device (Note 2)



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)



Schematic and Pin Configuration

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{\text{CBO}}$	-60	V
Collector-Emitter Voltage	$V_{\text{CEO}}$	-60	V
Emitter-Base Voltage	$V_{\text{EBO}}$	-5	V
Peak Pulse Current	$I_{\text{CM}}$	-1.5	A
Continuous Collector Current	$I_{\text{C}}$	-1	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 3)	$R_{\text{JJA}}$	125	°C/W
Operating and Storage Temperature Range	$T_j, T_{\text{STG}}$	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS (Note 4)</b>						
Collector-Base Breakdown Voltage	$V_{(\text{BR})\text{CBO}}$	-60	—	—	V	$I_C = -100\mu\text{A}, I_E = 0\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(\text{BR})\text{CEO}}$	-60	—	—	V	$I_C = -10\text{mA}, I_B = 0\text{A}$
Emitter-Base Breakdown Voltage	$V_{(\text{BR})\text{EBO}}$	-5	—	—	V	$I_E = -10\mu\text{A}, I_C = 0\text{A}$
Collector Cut-off Current	$I_{\text{CBO}}$	—	—	-100	nA	$V_{\text{CB}} = -30\text{V}, I_E = 0$
		—	—	-20	$\mu\text{A}$	$V_{\text{CB}} = -30\text{V}, I_E = 0, T_A = 150^\circ\text{C}$
Emitter Cut-off Current	$I_{\text{EBO}}$	—	—	-100	nA	$V_{\text{EB}} = -5\text{V}, I_C = 0\text{A}$
<b>ON CHARACTERISTICS (Note 4)</b>						
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{SAT})}$	—	—	-0.5	V	$I_C = -500\text{mA}, I_B = -50\text{mA}$
Base-Emitter Turn-On Voltage	$V_{\text{BE}(\text{ON})}$	—	—	-1.0	V	$I_C = -500\text{mA}, V_{\text{CE}} = -2\text{V}$
DC Current Gain	DCX52, DCX52-16	63	—	—	—	$I_C = -5\text{mA}, V_{\text{CE}} = -2\text{V}$
		40	—	—	—	$I_C = -500\text{mA}, V_{\text{CE}} = -2\text{V}$
		63	—	250	—	$I_C = -150\text{mA}, V_{\text{CE}} = -2\text{V}$
		100	—	250	—	$I_C = -150\text{mA}, V_{\text{CE}} = -2\text{V}$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	200	—	MHz	$I_C = -50\text{mA}, V_{\text{CE}} = -5\text{V}, f = 100\text{MHz}$
Output Capacitance	$C_{\text{obo}}$	—	—	25	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$

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 = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

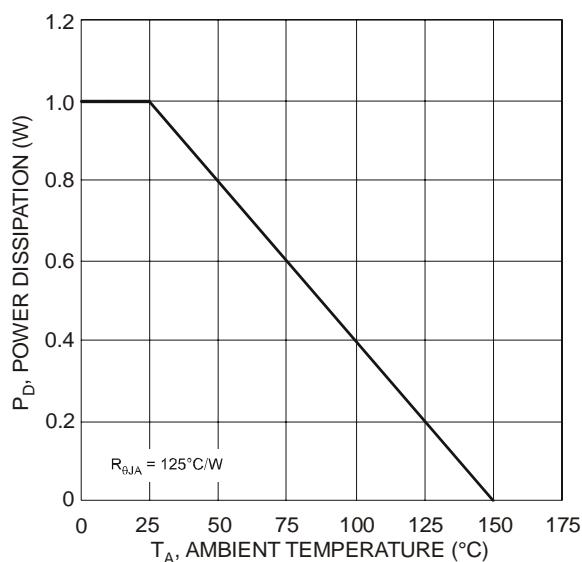


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

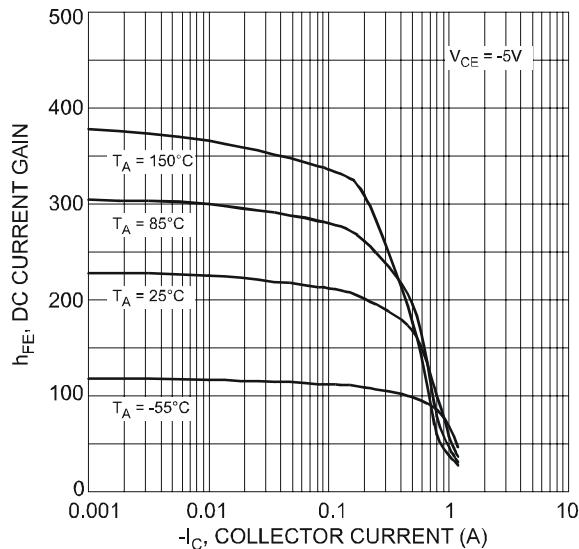


Fig. 3 Typical DC Current Gain vs. Collector Current

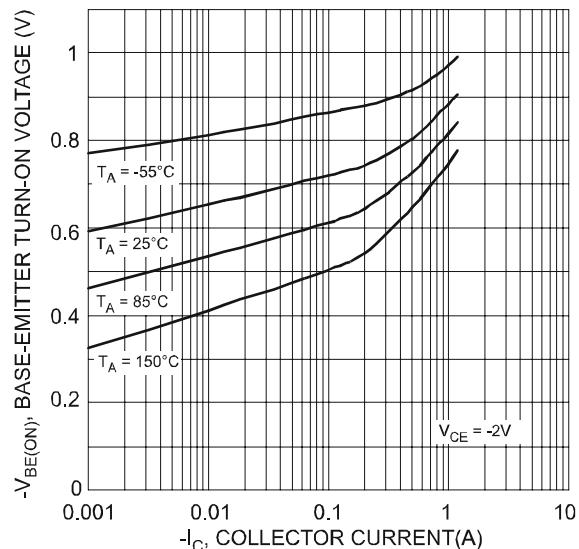


Fig. 5. Typical Base-Emitter Turn-On Voltage vs. Collector Current

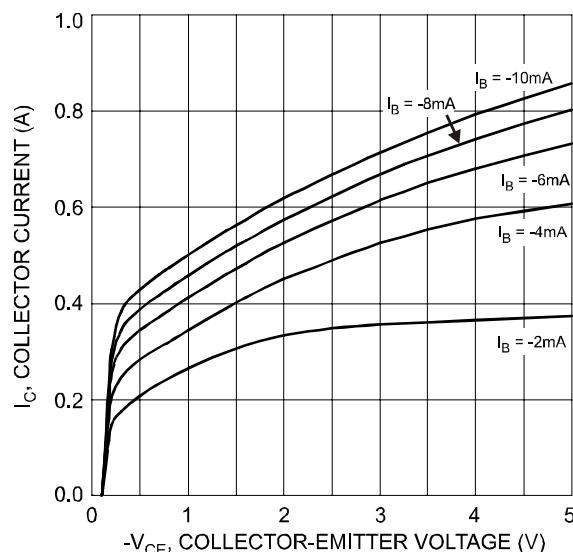


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

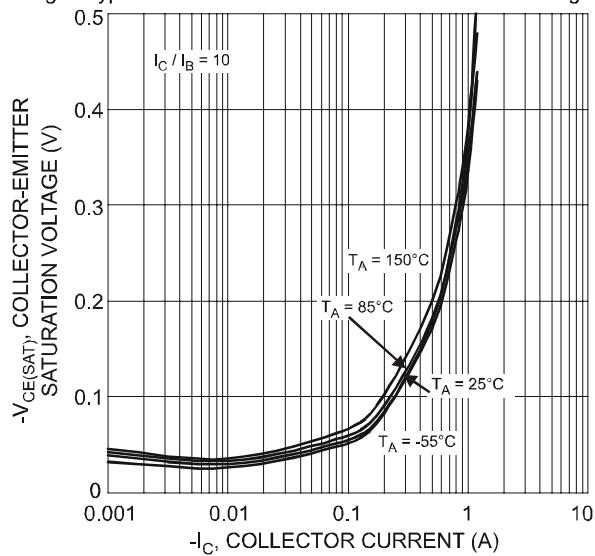


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

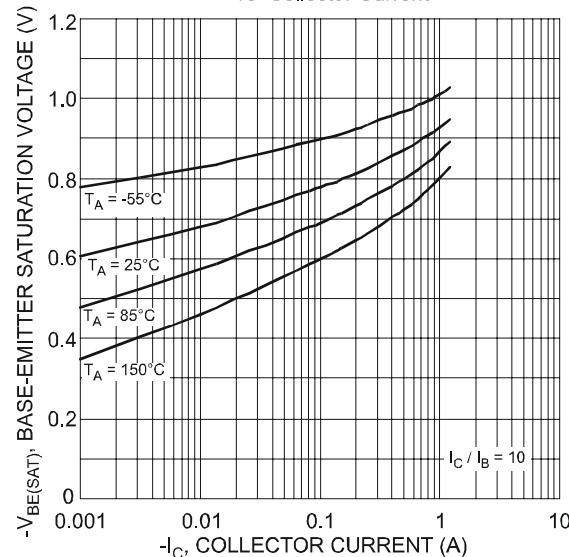


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

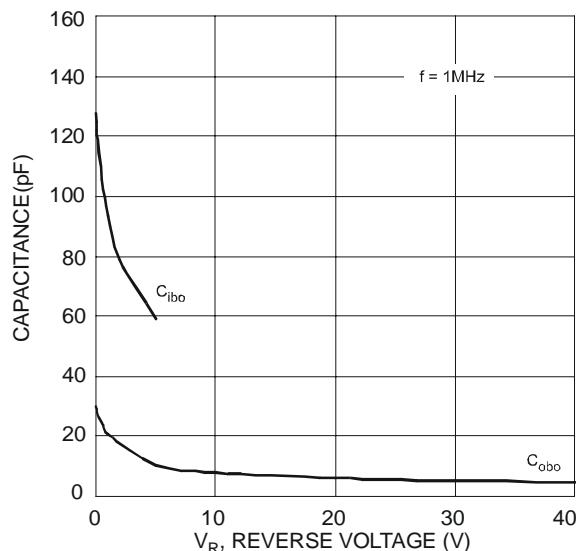


Fig. 7 Typical Capacitance Characteristics

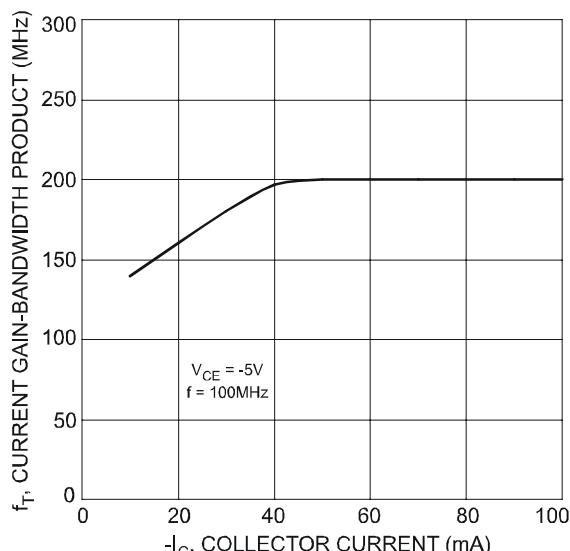


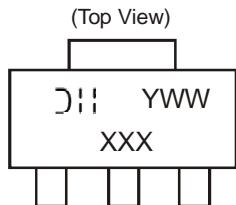
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DCX52-13	SOT89-3L	2500/Tape & Reel
DCX52-16-13	SOT89-3L	2500/Tape & Reel

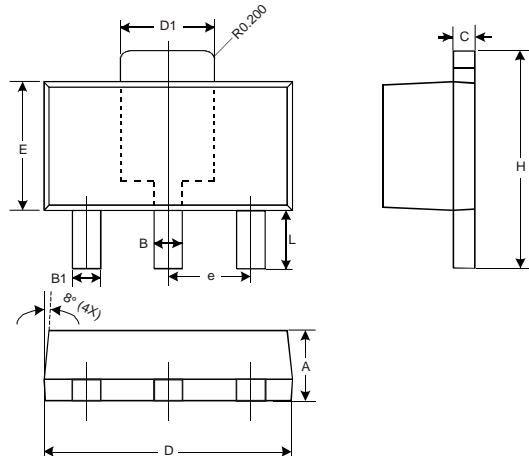
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

## Marking Information



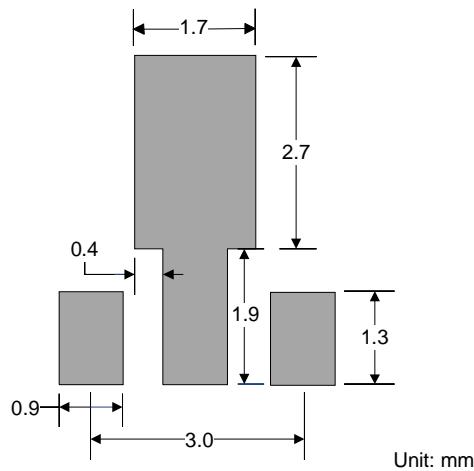
DII = Manufacturer's code marking  
 XXX = Product type marking code Ex: P16 = DCX52  
 P16-16 = DCX52 -16  
 YWW = Date code marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

## 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****IMPORTANT NOTICE**

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