

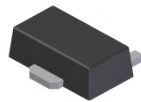
## Features

- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

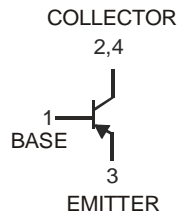
## Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Weight: 0.055 grams (approximate)

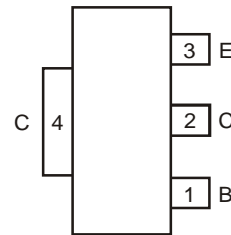
SOT89



Top View



Device Schematic



Top View  
Pin Out Configuration

## Ordering Information (Note 3)

Part Number	Case	Packaging
DCX69-13	SOT89	2500/Tape & Reel
DCX69-16-13	SOT89	2500/Tape & Reel
DCX69-25TA	SOT89	1000/Tape & Reel
DCX69-25-13	SOT89	2500/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



xxx = Product Type Marking Code:

P12 = DCX69  
P12-16 = DCX69-16  
P12-25 = DCX69-25

YWW = Date Code Marking  
Y = Last digit of year (ex: 7 = 2007)  
WW = Week code (01 – 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-25	V
Collector-Emitter Voltage	$V_{CEO}$	-20	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	V
Collector Current	$I_C$	-1.0	A
Peak Pulse Power	$I_{CM}$	-2.0	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 4)	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions	
<b>OFF CHARACTERISTICS (Note 5)</b>							
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-25	—	—	V	$I_C = -100\mu\text{A}, I_E = 0$	
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-20	—	—	V	$I_C = -10\text{mA}, I_B = 0$	
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	—	V	$I_E = -100\mu\text{A}, I_C = 0$	
Collector-Base Cutoff Current	$I_{CBO}$	—	—	-100 -10	nA $\mu\text{A}$	$V_{CB} = -25\text{V}, I_E = 0, T_A = 150^\circ\text{C}$	
Emitter-Base Cutoff Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5.0\text{V}, I_C = 0$	
<b>ON CHARACTERISTICS (Note 5)</b>							
DC Current Gain	DCX69, DCX69-16, DCX69-25	$h_{FE}$	50	—	—	—	$V_{CE} = -10\text{V}, I_C = -5.0\text{mA}$
			60	—	—	—	$V_{CE} = -1.0\text{V}, I_C = -1.0\text{A}$
			85	—	375	—	$V_{CE} = -1.0\text{V}, I_C = -500\text{mA}$
			100	—	250	—	$V_{CE} = -1.0\text{V}, I_C = -500\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	-0.5	V	$I_C = -1.0\text{A}, I_B = -100\text{mA}$	
						$I_C = -1.0\text{A}, I_B = -100\text{mA}$	
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	-0.7 -1.0	V	$V_{CE} = -10\text{V}, I_C = -5\text{mA}$ $V_{CE} = -1.0\text{V}, I_C = -500\text{mA}$	
<b>SMALL SIGNAL CHARACTERISTICS</b>							
Current Gain-Bandwidth Product	$f_T$	40	200	—	MHz	$V_{CE} = -5.0\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$	
Output Capacitance	$C_{obo}$	—	17	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$	

- Notes:
- Device mounted on FR-4 PCB; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.
  - Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

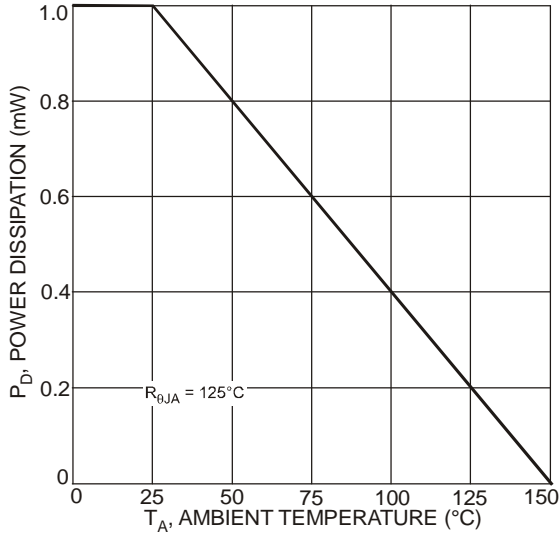


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

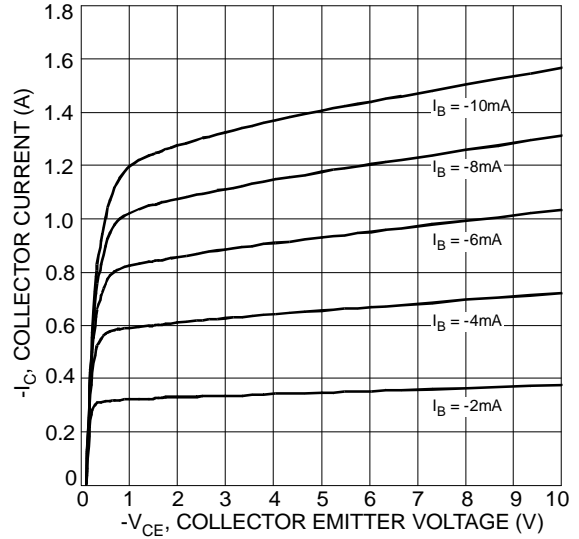


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

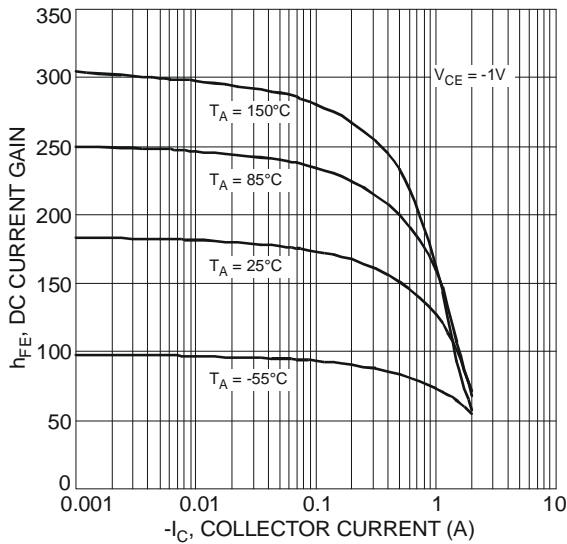


Fig. 3 Typical DC Current Gain vs. Collector Current (DCX69-16)

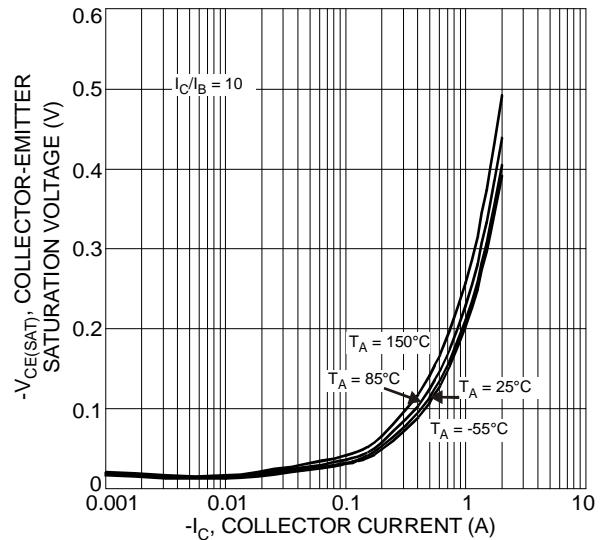


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

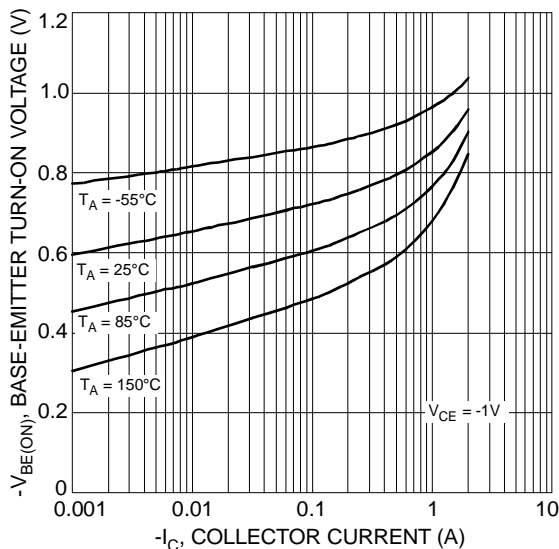


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

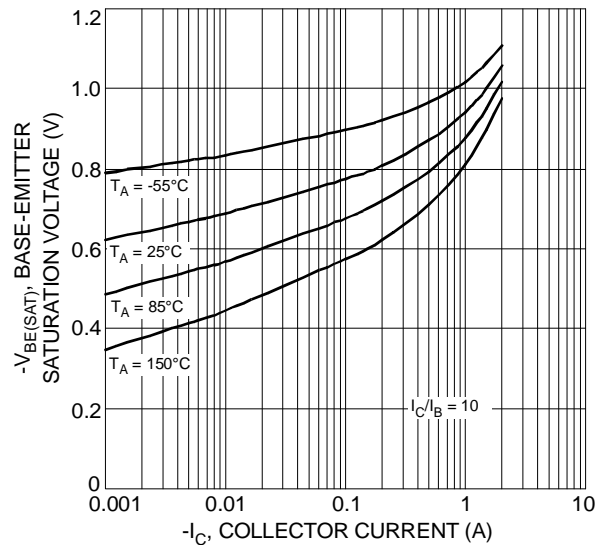


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

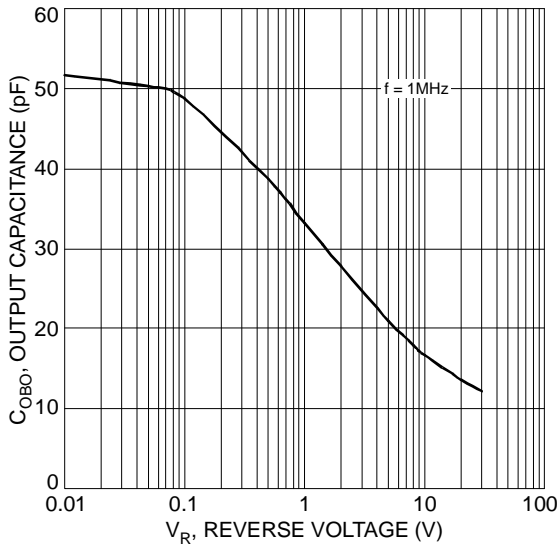


Fig. 7 Typical Output Capacitance Characteristics

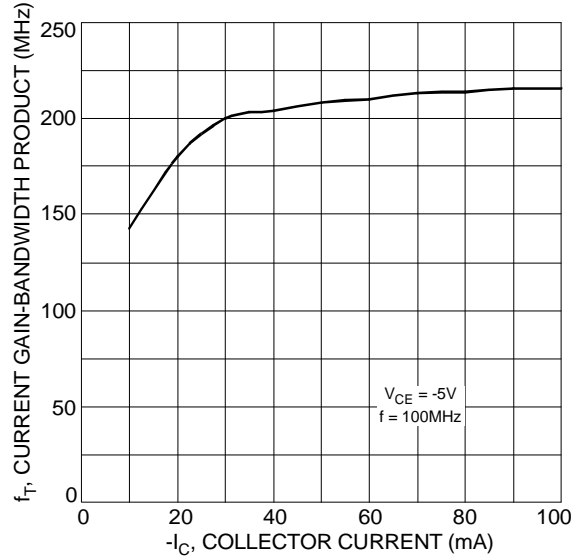
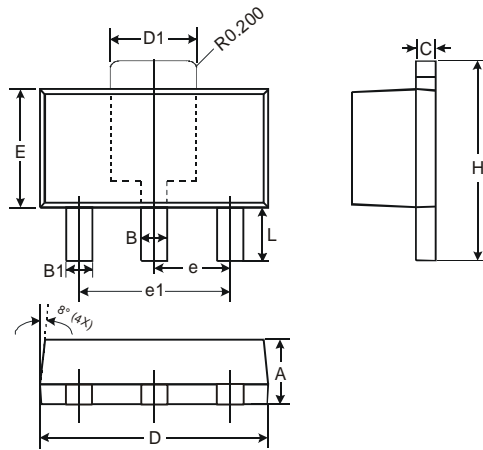


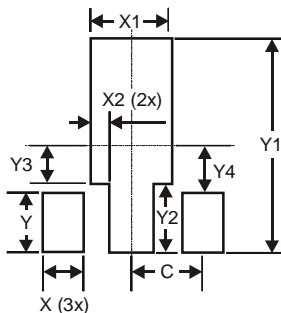
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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