

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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### Features

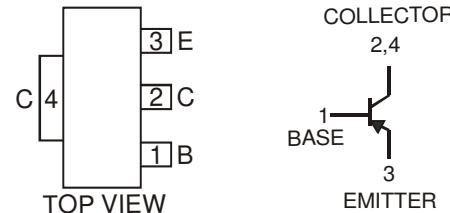
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DXT3904)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- Lead Free By Design/RoHS Compliant (Note 1)**
- "Green" Device (Note 2)



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 4
- Ordering Information: See Page 4
- Weight: 0.072 grams (approximate)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	V
Collector Current – Continuous	$I_C$	-200	mA

### 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 (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	125	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

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>.

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

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 4)</b>					
Collector-Base Breakdown Voltage	$V_{(\text{BR})\text{CBO}}$	-40	—	V	$I_C = -10\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(\text{BR})\text{CEO}}$	-40	—	V	$I_C = -1.0\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(\text{BR})\text{EBO}}$	-5.0	—	V	$I_E = -10\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{\text{CEX}}$	—	-50	nA	$V_{\text{CE}} = -30\text{V}, V_{\text{EB}(\text{OFF})} = -3.0\text{V}$
	$I_{\text{CBO}}$	—	-50	nA	$V_{\text{CB}} = -30\text{V}, I_E = 0$
Base Cutoff Current	$I_{\text{BL}}$	—	-50	nA	$V_{\text{CE}} = -30\text{V}, V_{\text{EB}(\text{OFF})} = -3.0\text{V}$
<b>ON CHARACTERISTICS (Note 4)</b>					
DC Current Gain	$h_{\text{FE}}$	60	—	—	$I_C = -100\mu\text{A}, V_{\text{CE}} = -1.0\text{V}$
		80	—	—	$I_C = -1.0\text{mA}, V_{\text{CE}} = -1.0\text{V}$
		100	300	—	$I_C = -10\text{mA}, V_{\text{CE}} = -1.0\text{V}$
		60	—	—	$I_C = -50\text{mA}, V_{\text{CE}} = -1.0\text{V}$
		30	—	—	$I_C = -100\text{mA}, V_{\text{CE}} = -1.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{SAT})}$	—	-0.25 -0.40	V	$I_C = -10\text{mA}, I_B = -1.0\text{mA}$ $I_C = -50\text{mA}, I_B = -5.0\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{SAT})}$	-0.65 —	-0.85 -0.95	V	$I_C = -10\text{mA}, I_B = -1.0\text{mA}$ $I_C = -50\text{mA}, I_B = -5.0\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{\text{obo}}$	—	4.5	pF	$V_{\text{CB}} = -5.0\text{V}, f = 1.0\text{MHz}, I_E = 0$
Input Capacitance	$C_{\text{ibo}}$	—	10	pF	$V_{\text{EB}} = -0.5\text{V}, f = 1.0\text{MHz}, I_C = 0$
Input Impedance	$h_{\text{ie}}$	2.0	12	k $\Omega$	$V_{\text{CE}} = -10\text{V}, I_C = -1.0\text{mA}, f = 1.0\text{kHz}$
Voltage Feedback Ratio	$h_{\text{re}}$	0.1	10	$\times 10^{-4}$	
Small Signal Current Gain	$h_{\text{fe}}$	100	400	—	
Output Admittance	$h_{\text{oe}}$	3.0	60	$\mu\text{S}$	
Current Gain-Bandwidth Product	$f_T$	250	—	MHz	$V_{\text{CE}} = -20\text{V}, I_C = -10\text{mA}, f = 100\text{MHz}$
Noise Figure	NF	—	4.0	dB	$V_{\text{CE}} = -5.0\text{V}, I_C = -100\mu\text{A}, R_S = 1.0\text{k}\Omega, f = 1.0\text{kHz}$
<b>SWITCHING CHARACTERISTICS</b>					
Delay Time	$t_d$	—	35	ns	$V_{\text{CC}} = -3.0\text{V}, I_C = -10\text{mA}$
Rise Time	$t_r$	—	35	ns	$V_{\text{BE}(\text{off})} = 0.5\text{V}, I_{B1} = -1.0\text{mA}$
Storage Time	$t_s$	—	225	ns	$V_{\text{CC}} = -3.0\text{V}, I_C = -10\text{mA}$
Fall Time	$t_f$	—	75	ns	$I_{B1} = I_{B2} = -1.0\text{mA}$

Notes: 4. Measured under pulsed condition. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

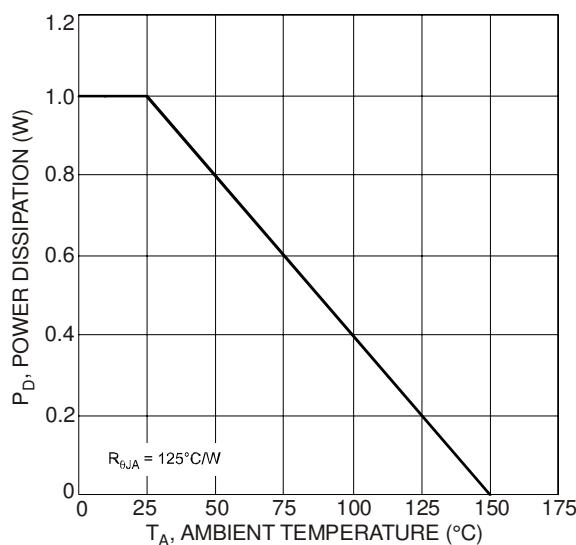


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

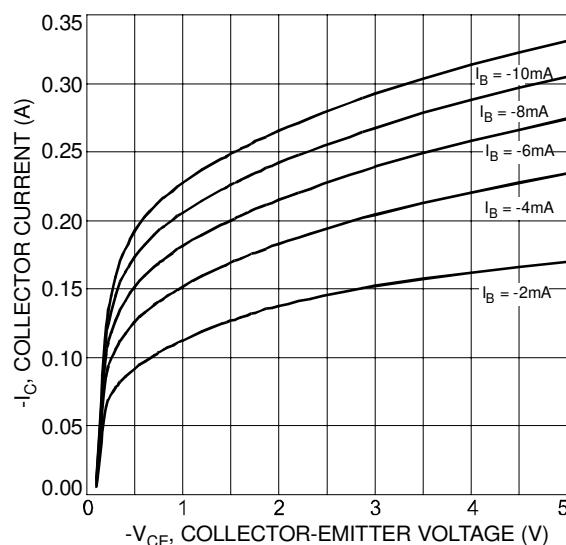


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

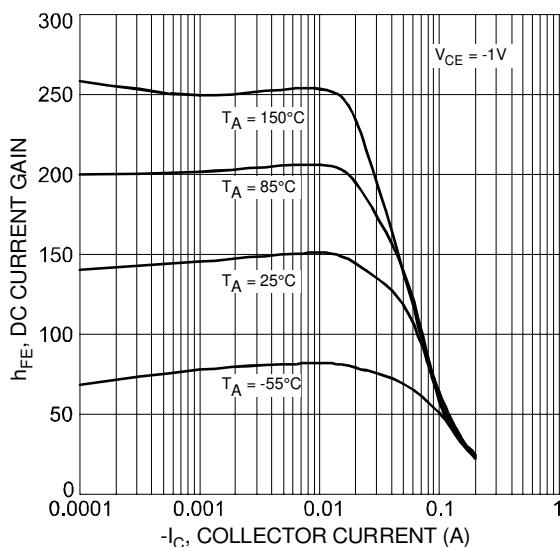


Fig. 3 Typical DC Current Gain vs. Collector Current

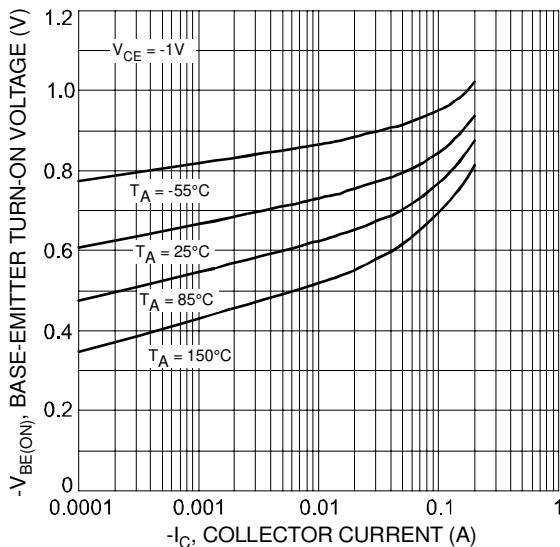


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

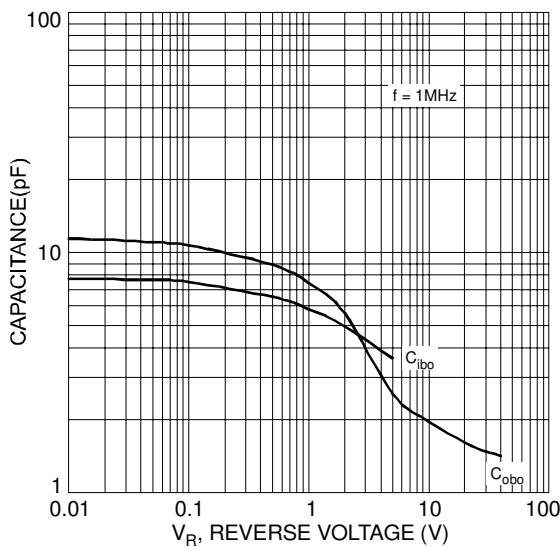


Fig. 7 Typical Capacitance Characteristics

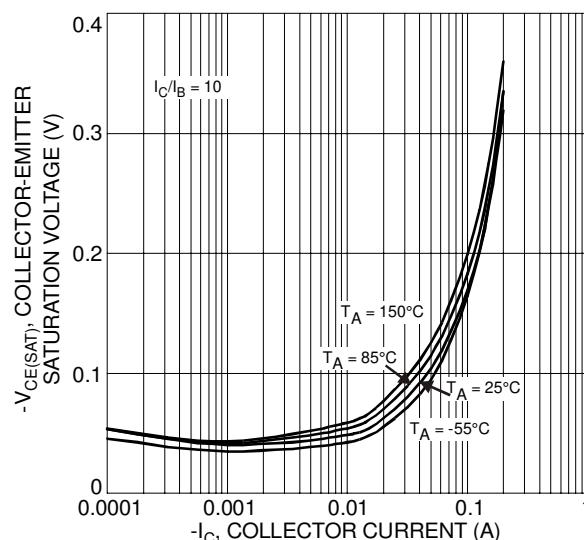


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

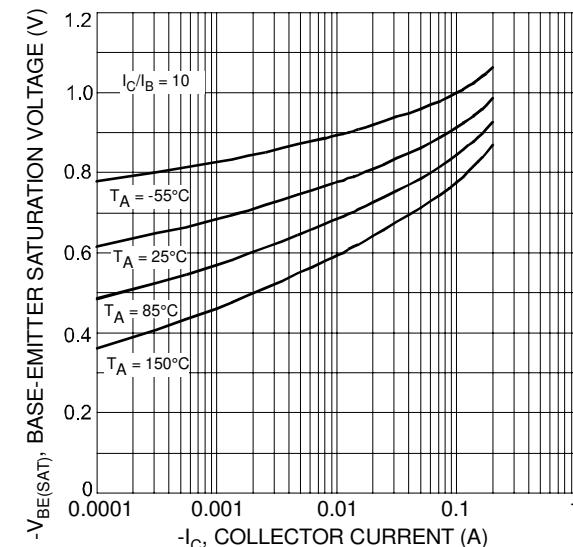


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

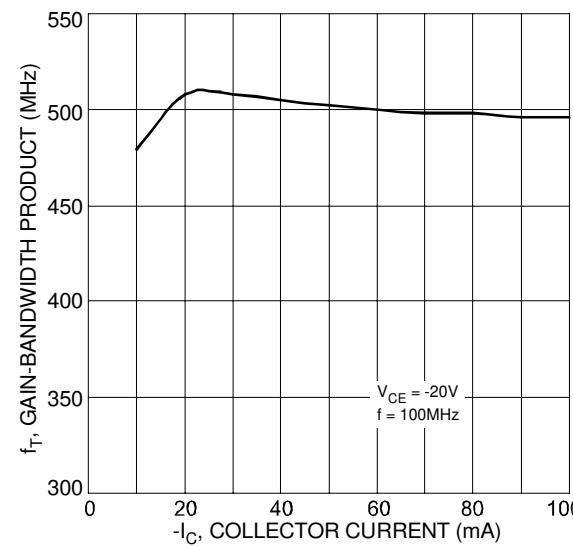


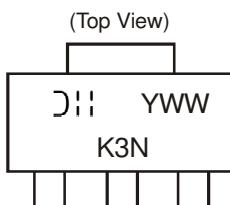
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DXT3906-13	SOT89-3L	2500/Tape & Reel

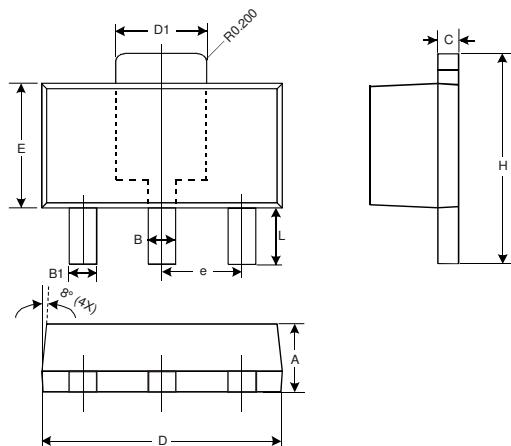
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

## Marking Information



K3N = Product Type Marking Code  
 DII = Manufacturer's Marking Code  
 YWW = Date Code Marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

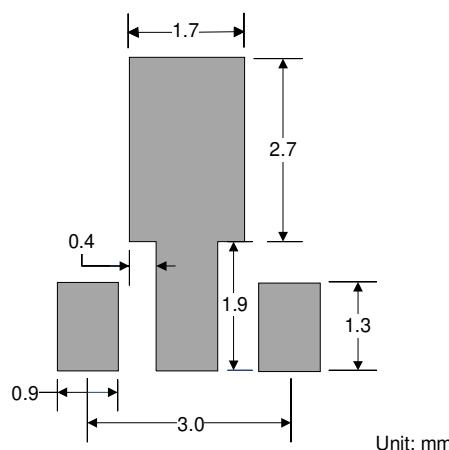
## Package Outline Dimensions



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

All Dimensions in mm

## Suggested Pad Layout



### IMPORTANT NOTICE

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