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# BDC01D

## One Watt Amplifier Transistor

### NPN Silicon

#### Features

- Pb-Free Package is Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	100	Vdc
Collector-Base Voltage	$V_{CBO}$	100	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current - Continuous	$I_C$	0.5	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 8.0	W mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.5 20	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

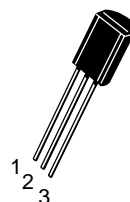
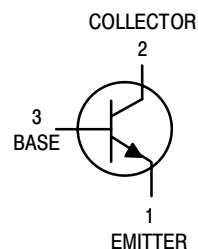
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



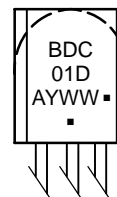
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TO-92 (TO-226)  
CASE 29-10  
STYLE 1

#### MARKING DIAGRAM



BDC01D = Device Code

A = Assembly Location

Y = Year

WW = Work Week

■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
BDC01DRL1	TO-92	2000 / Tape & Reel
BDC01DRL1G	TO-92 (Pb-Free)	5000 / Tape & Reel

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BDC01D

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	100	–	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 100 V, I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	0.1	μAdc
Emitter Cutoff Current (I <sub>C</sub> = 0, V <sub>EB</sub> = 5.0 V)	I <sub>EBO</sub>	–	100	nAdc
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 1.0 V) (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 2.0 V)	h <sub>FE</sub>	40 25	400 –	–
Collector–Emitter Saturation Voltage (Note 1) (I <sub>C</sub> = 1000 mA, I <sub>B</sub> = 100 mA)	V <sub>CE(sat)</sub>	–	0.7	Vdc
Collector–Emitter On Voltage (Note 1) (I <sub>C</sub> = 1000 mA, V <sub>CE</sub> = 1.0 V)	V <sub>BE(on)</sub>	–	1.2	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current Gain Bandwidth Product (I <sub>C</sub> = 200 mA, V <sub>CE</sub> = 5.0 V, f = 20 MHz)	f <sub>T</sub>	50	–	MHz
Output Capacitance (V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	–	30	pF

1. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle 2.0%.

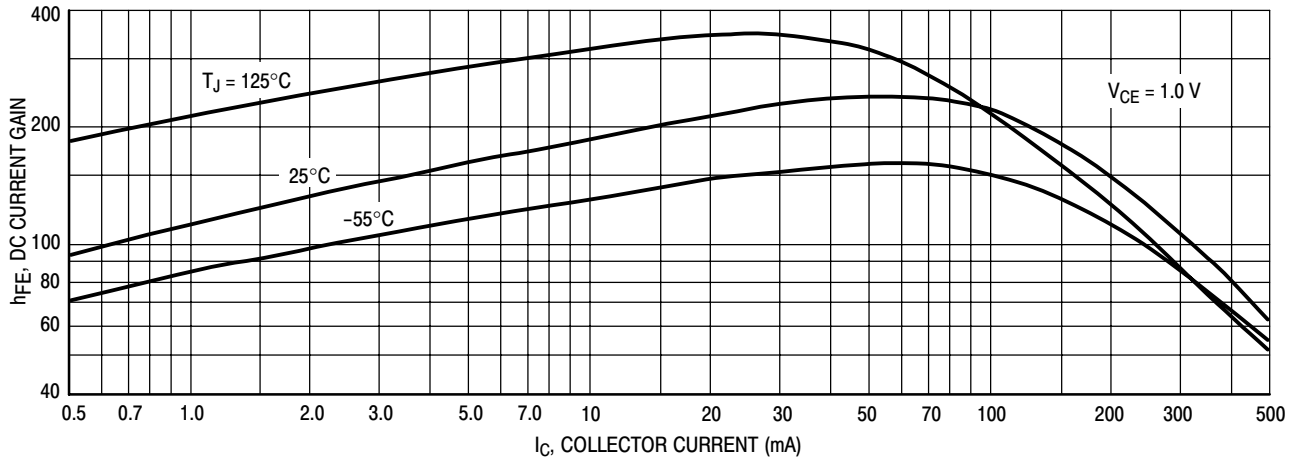


Figure 1. DC Current Gain

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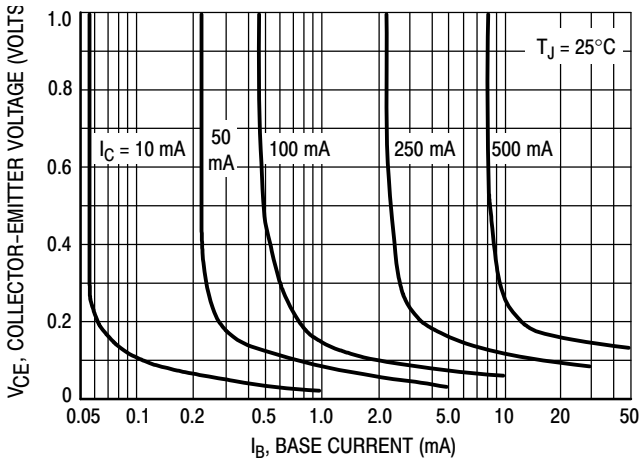


Figure 2. Collector Saturation Region

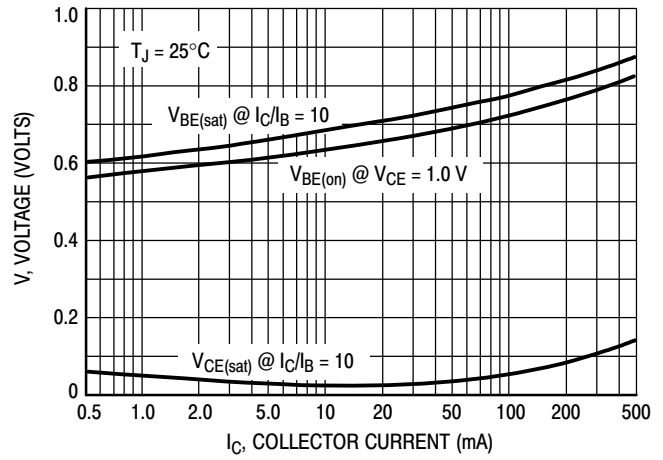


Figure 3. "On" Voltages

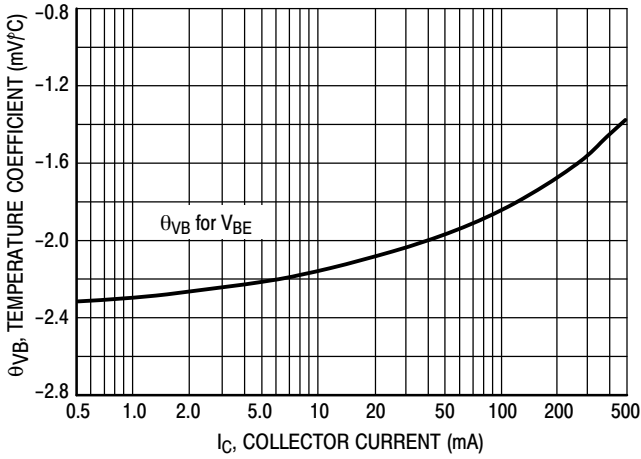


Figure 4. Base-Emitter Temperature Coefficient

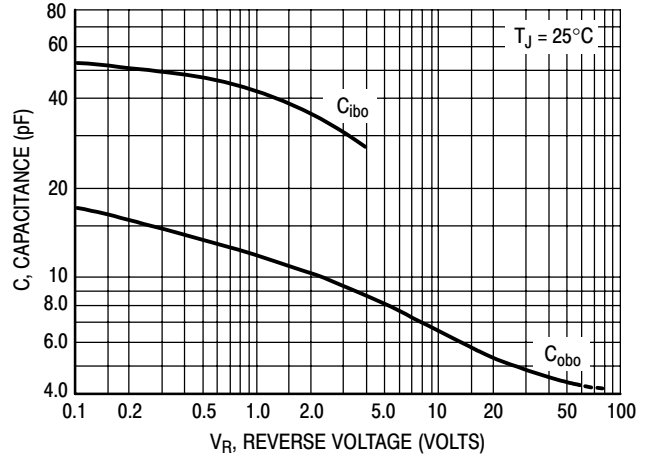


Figure 5. Capacitance

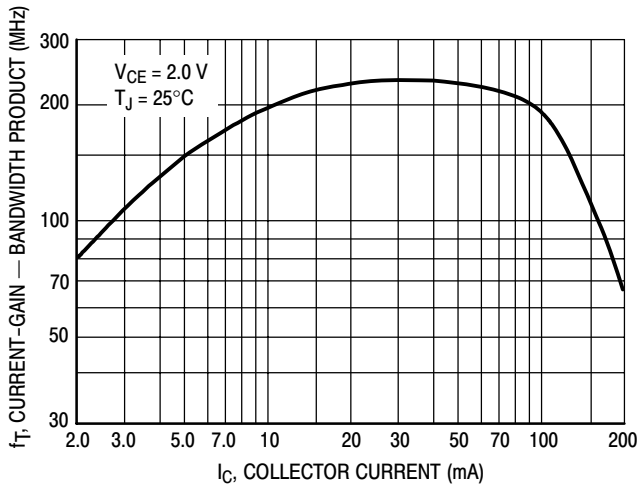


Figure 6. Current-Gain — Bandwidth Product

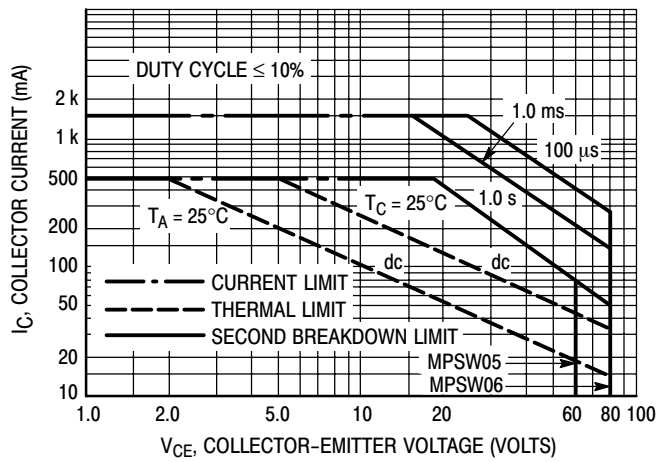
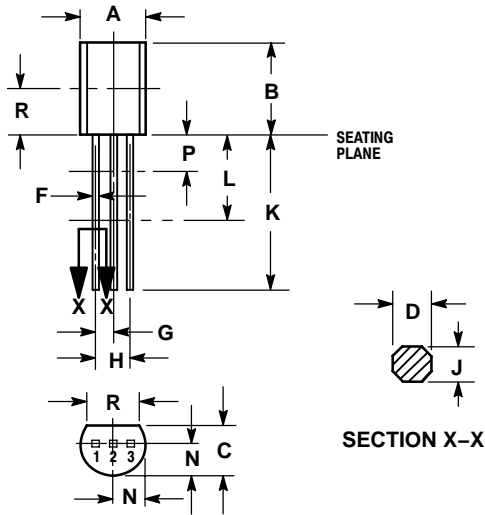


Figure 7. Active Region — Safe Operating Area

# BDC01D

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-10  
ISSUE AL



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.457	0.533
F	0.016	0.019	0.407	0.482
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---

### STYLE 14:

1. EMITTER
2. COLLECTOR
3. BASE

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