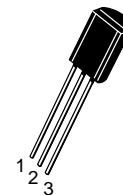
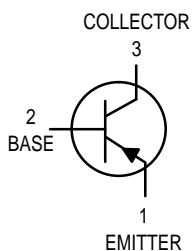


# One Watt Amplifier Transistors

## PNP Silicon

**BDB02C,D**



CASE 29-05, STYLE 1  
TO-92 (TO-226AE)

### MAXIMUM RATINGS

Rating	Symbol	BDB02C	BDB02D	Unit
Collector–Emitter Voltage	$V_{CEO}$	-80	-100	Vdc
Collector–Base Voltage	$V_{CES}$	-80	-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	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	2.5	20	Watt 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	$^\circ\text{C}/\text{W}$

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Voltage ( $I_C = -10\text{ mA}, I_B = 0$ )	BDB02C BDB02D	$V_{(BR)CEO}$	-80 -100	— —	Vdc
Collector Cutoff Current ( $V_{CB} = -80\text{ V}, I_E = 0$ ) ( $V_{CB} = -100\text{ V}, I_E = 0$ )	BDB02C BDB02D	$I_{CBO}$	— —	-0.1 -0.1	$\mu\text{Adc}$
Emitter Cutoff Current ( $I_C = 0, V_{EB} = -5.0\text{ V}$ )		$I_{EBO}$	—	-100	nAdc

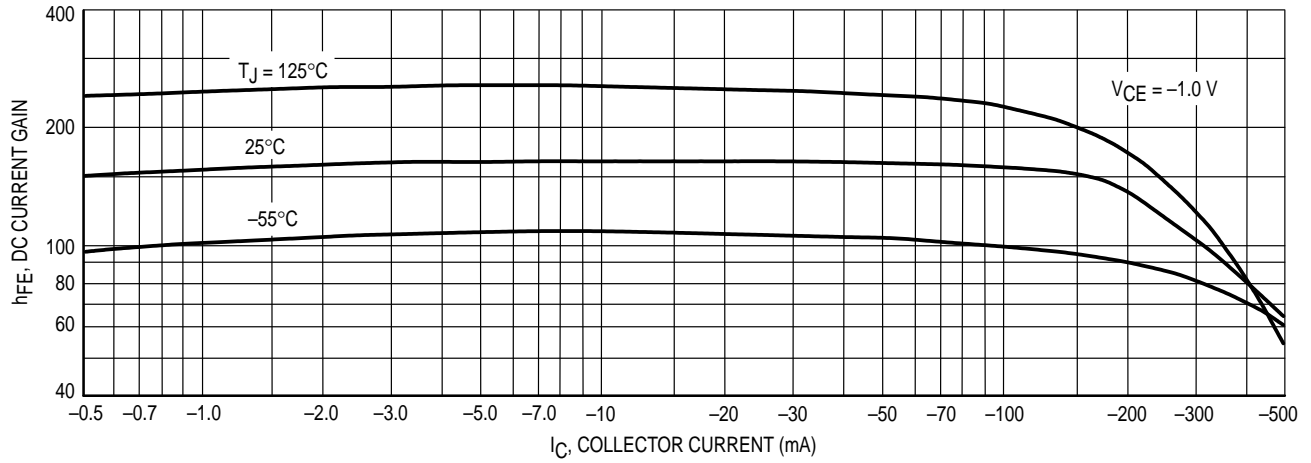
### ON CHARACTERISTICS

DC Current Gain ( $I_C = -100\text{ mA}, V_{CE} = -1.0\text{ V}$ ) ( $I_C = -500\text{ mA}, V_{CE} = -2.0\text{ V}$ )		$h_{FE}$	40 25	400 —	—
Collector–Emitter Saturation Voltage <sup>(1)</sup> ( $I_C = -1000\text{ mA}, I_B = -100\text{ mA}$ )		$V_{CE(sat)}$	—	-0.7	Vdc
Collector–Emitter On Voltage <sup>(1)</sup> ( $I_C = -1000\text{ mA}, V_{CE} = -1.0\text{ V}$ )		$V_{BE(on)}$	—	-1.2	Vdc

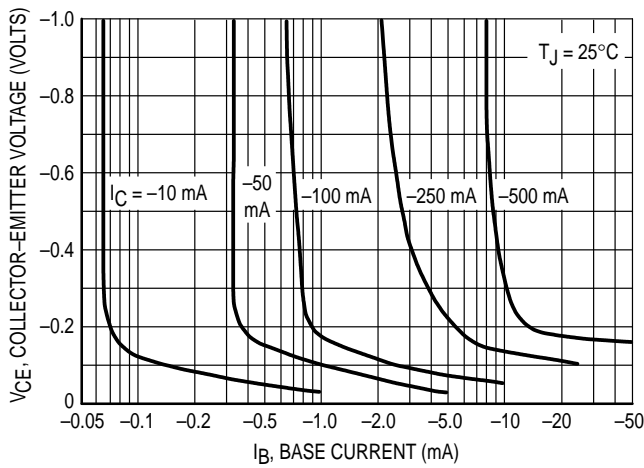
### DYNAMIC CHARACTERISTICS

Current–Gain — Bandwidth Product ( $I_C = -200\text{ mA}, V_{CE} = -5.0\text{ V}, f = 20\text{ MHz}$ )		$f_T$	50	—	MHz
Output Capacitance ( $V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$ )		$C_{ob}$	—	30	pF

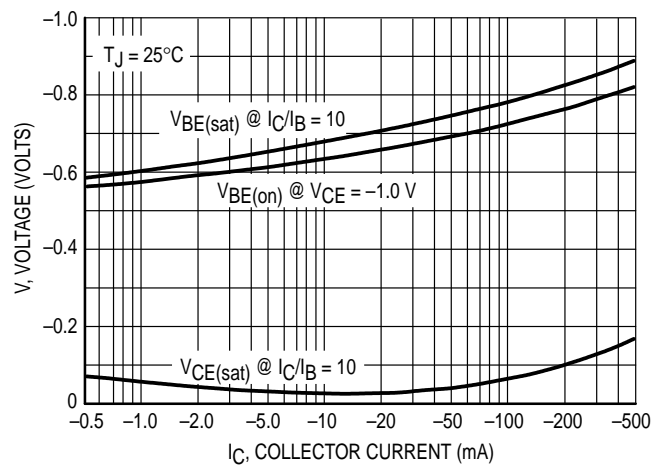
1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle 2.0%.



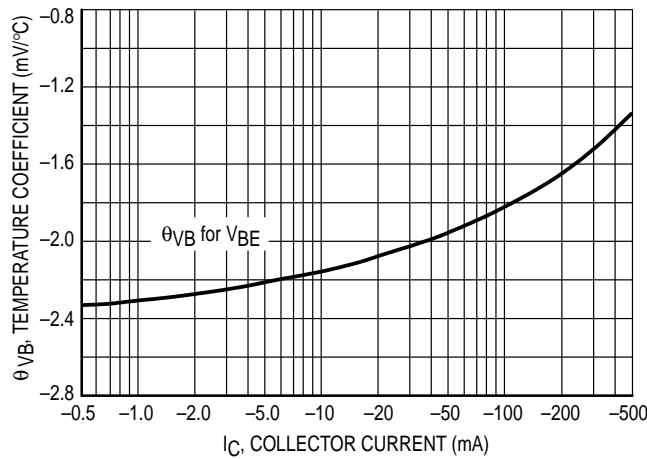
**Figure 1. DC Current Gain**



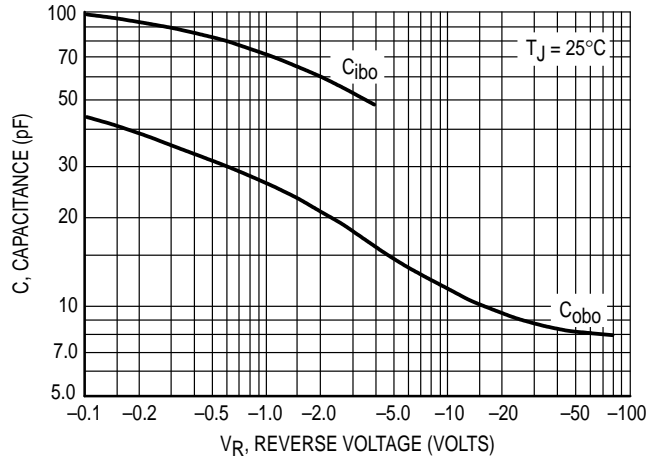
**Figure 2. Collector Saturation Region**



**Figure 3. On Voltages**



**Figure 4. Base-Emitter Temperature Coefficient**



**Figure 5. Capacitance**

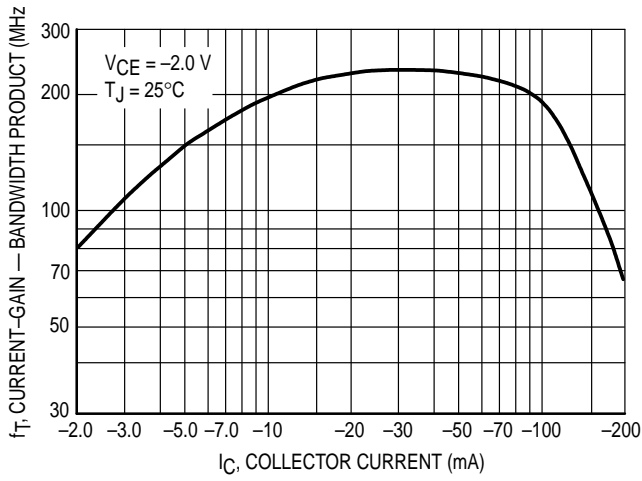


Figure 6. Current-Gain — Bandwidth Product

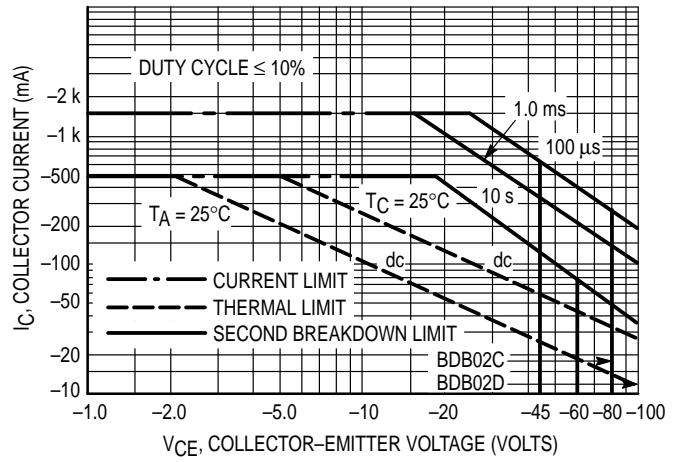
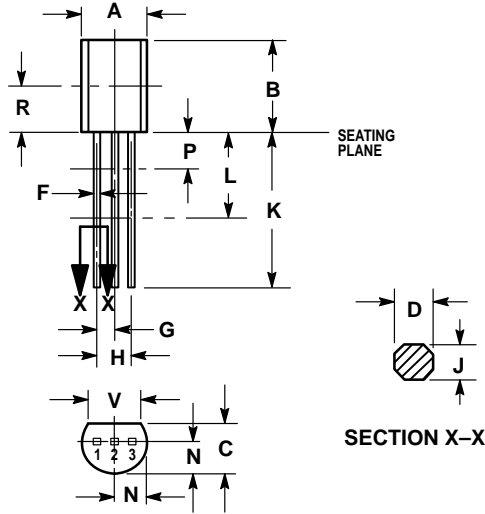


Figure 7. Active Region — Safe Operating Area

**PACKAGE DIMENSIONS**



- 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	0.022	0.46	0.56
F	0.016	0.019	0.41	0.48
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	—
V	0.135	—	3.43	—

**CASE 029-05  
(TO-226AE)  
ISSUE AD**

- STYLE 1:
1. EMITTER
  2. BASE
  3. COLLECTOR

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